UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 10-Q

(Mark One)

☒ **Quarterly report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

For the Quarterly Period Ended June 28, 2019

☐ **Transition report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934**

Commission File No. 000-25826

HARMONIC INC.
(Exact name of registrant as specified in its charter)

Delaware	**77-0201147**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**

4300 North First Street
San Jose, CA 95134
(408) 542-2500
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock, $0.001 par value	HLIT	NASDAQ Global Select Market

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☒
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The number of shares of the registrant's Common Stock, $.001 par value, outstanding on July 26, 2019 was 89,609,067.

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PART I

FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

HARMONIC INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited, in thousands, except per share data)

	June 28, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 58,064	$ 65,989
Accounts receivable, net	70,571	81,795
Inventories	27,659	25,638
Prepaid expenses and other current assets	29,209	23,280
Total current assets	185,503	196,702
Property and equipment, net	19,312	22,321
Operating lease right-of-use assets	30,386	—
Goodwill	240,335	240,618
Intangibles, net	8,640	12,817
Other long-term assets	42,545	38,377
Total assets	$ 526,721	$ 510,835
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Other debts and finance lease obligations, current	$ 1,379	$ 7,175
Accounts payable	31,849	33,778
Income taxes payable	989	1,099
Deferred revenue	47,330	41,592
Accrued and other current liabilities	56,764	52,761
Total current liabilities	138,311	136,405
Convertible notes, long-term	118,070	114,808
Other debts and finance lease obligations, long-term	16,697	12,684
Income taxes payable, long-term	266	460
Other non-current liabilities	41,311	18,228
Total liabilities	314,655	282,585
Commitments and contingencies (Note 17)		
Stockholders' equity:		
Preferred stock, $0.001 par value, 5,000 shares authorized; no shares issued or outstanding	—	—
Common stock, $0.001 par value, 150,000 shares authorized; 89,074 and 87,057 shares issued and outstanding at June 28, 2019 and December 31, 2018, respectively	89	87
Additional paid-in capital	2,302,798	2,296,795
Accumulated deficit	(2,089,167)	(2,067,416)
Accumulated other comprehensive loss	(1,654)	(1,216)
Total stockholders' equity	212,066	228,250
Total liabilities and stockholders' equity	$ 526,721	$ 510,835

The accompanying notes are an integral part of these condensed consolidated financial statements.

HARMONIC INC.
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(Unaudited, in thousands, except per share data)

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Revenue:				
Appliance and integration	$ 54,417	$ 68,434	$ 106,782	$ 132,420
SaaS and service	30,448	30,726	58,189	56,867
Total net revenue	84,865	99,160	164,971	189,287
Cost of revenue:				
Appliance and integration	29,312	36,662	56,366	67,238
SaaS and service	11,625	10,895	22,828	23,263
Total cost of revenue	40,937	47,557	79,194	90,501
Total gross profit	43,928	51,603	85,777	98,786
Operating expenses:				
Research and development	21,313	21,542	42,714	44,999
Selling, general and administrative	29,319	27,988	57,330	59,151
Amortization of intangibles	784	800	1,572	1,604
Restructuring and related charges	276	631	333	1,717
Total operating expenses	51,692	50,961	101,949	107,471
Income (loss) from operations	(7,764)	642	(16,172)	(8,685)
Interest expense, net	(2,956)	(2,863)	(5,862)	(5,620)
Other income (expense), net	(428)	199	(739)	(333)
Loss before income taxes	(11,148)	(2,022)	(22,773)	(14,638)
Provision for income taxes	697	891	378	1,969
Net loss	$ (11,845)	$ (2,913)	$ (23,151)	$ (16,607)
Net loss per share:				
Basic and diluted	$ (0.13)	$ (0.03)	$ (0.26)	$ (0.20)
Shares used in per share calculation:				
Basic and diluted	88,931	85,304	88,554	84,616

The accompanying notes are an integral part of these condensed consolidated financial statements.

HARMONIC INC.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(Unaudited, in thousands)

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Net loss	$ (11,845)	$ (2,913)	$ (23,151)	$ (16,607)
Losses (gains) reclassified into earnings	(101)	—	56	—
Change in foreign currency translation adjustments	857	(4,758)	(443)	(3,024)
Other comprehensive income (loss) before tax	756	(4,758)	(387)	(3,024)
Less: Provision for (benefit from) income taxes	(55)	369	51	369
Other comprehensive income (loss), net of tax	811	(5,127)	(438)	(3,393)
Total comprehensive loss	$ (11,034)	$ (8,040)	$ (23,589)	$ (20,000)

The accompanying notes are an integral part of these condensed consolidated financial statements.

HARMONIC INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Unaudited, in thousands)

	Common Stock Shares	Common Stock Amount	Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Equity
Balance at December 31, 2017	82,554	$ 83	$ 2,272,690	$ (2,057,812)	$ 3,382	$ 218,343
Cumulative effect to retained earnings related to adoption of ASC 606	—	—	—	11,431	—	11,431
Balance at January 1, 2018	82,554	83	2,272,690	(2,046,381)	3,382	229,774
Net loss	—	—	—	(16,607)	—	(16,607)
Other comprehensive income, net of tax	—	—	—	—	(3,393)	(3,393)
Issuance of common stock under option, stock award and purchase plans	2,885	2	2,310	—	—	2,312
Stock-based compensation	—	—	8,649	—	—	8,649
Balance at June 29, 2018	85,439	$ 85	$ 2,283,649	$ (2,062,988)	$ (11)	$ 220,735
Balance at December 31, 2018	87,057	$ 87	$ 2,296,795	$ (2,067,416)	$ (1,216)	$ 228,250
Cumulative effect to retained earnings related to adoption of Topic 718 (1)	—	—	—	1,400	—	1,400
Balance at January 1, 2019	87,057	87	2,296,795	(2,066,016)	(1,216)	229,650
Net loss	—	—	—	(23,151)	—	(23,151)
Other comprehensive loss, net of tax	—	—	—	—	(438)	(438)
Issuance of common stock under option, stock award and purchase plans	2,017	2	1,317	—	—	1,319
Stock-based compensation	—	—	4,686	—	—	4,686
Balance at June 28, 2019	89,074	$ 89	$ 2,302,798	$ (2,089,167)	$ (1,654)	$ 212,066

(1) See Note 2, "Recent Accounting Pronouncements" for more information on the adoption of Accounting Standard Update ("ASU") No. 2018-07, Compensation-Stock Compensation ("Topic 718"): Improvements to Nonemployee Share-Based Payment Accounting issued by the Financial Accounting Standards Board.

HARMONIC INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited, in thousands)

	Six months ended	
	June 28, 2019	**June 29, 2018**
Cash flows from operating activities:		
Net loss	$ (23,151)	$ (16,607)
Adjustments to reconcile net loss to net cash provided by (used in) operating activities:		
Amortization of intangibles	4,162	4,194
Depreciation	5,716	6,771
Stock-based compensation	4,623	8,769
Amortization of discount on convertible debt and issuance cost	3,262	2,954
Amortization of non-cash warrant	48	395
Restructuring, asset impairment and loss on retirement of fixed assets	101	93
Deferred income taxes, net	(145)	530
Foreign currency adjustments	(325)	(1,042)
Provision for excess and obsolete inventories	384	822
Allowance for doubtful accounts and returns	500	623
Other non-cash adjustments, net	303	64
Changes in operating assets and liabilities:		
Accounts receivable	10,699	(13,572)
Inventories	(2,440)	2,000
Prepaid expenses and other assets	(1,526)	1,897
Accounts payable	(1,752)	(4,187)
Deferred revenue	4,989	9,378
Income taxes payable	(292)	503
Accrued and other liabilities	(9,802)	(337)
Net cash provided by (used in) operating activities	(4,646)	3,248
Cash flows from investing activities:		
Purchases of property and equipment	(2,939)	(3,181)
Net cash used in investing activities	(2,939)	(3,181)
Cash flows from financing activities:		
Proceeds from other debts and finance leases	4,503	—
Repayment of other debts and finance leases	(6,162)	(6,176)
Proceeds from common stock issued to employees	2,147	2,366
Payment of tax withholding obligations related to net share settlements of restricted stock units	(828)	(54)
Net cash used in financing activities	(340)	(3,864)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	—	(588)
Net increase (decrease) in cash, cash equivalents and restricted cash	(7,925)	(4,385)
Cash, cash equivalents and restricted cash at beginning of period	65,989	58,757
Cash, cash equivalents and restricted cash at end of period	$ 58,064	$ 54,372
Supplemental disclosures of cash flow information:		
Income tax payments, net	860	750
Interest payments, net	2,495	2,545
Supplemental schedule of non-cash investing and financing activities:		
Capital expenditures incurred but not yet paid	78	491
Reconciliation of cash, cash equivalents, and restricted cash to the condensed consolidated balance sheets		
Cash and cash equivalents	$ 58,064	$ 54,098
Restricted cash included in prepaid expenses and other current assets	—	274
Total cash, cash equivalents and restricted cash	$ 58,064	$ 54,372

The accompanying notes are an integral part of these condensed consolidated financial statements.

HARMONIC INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

NOTE 1: BASIS OF PRESENTATION AND SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation

The accompanying unaudited condensed consolidated financial statements, in the opinion of management, include all adjustments (consisting only of normal recurring adjustments) which Harmonic Inc. (“Harmonic,” or the “Company”) considers necessary to present fairly the results of operations for the interim periods covered and the consolidated financial condition of the Company at the date of the balance sheets. This Quarterly Report on Form 10-Q should be read in conjunction with the Company’s audited consolidated financial statements contained in the Company’s Annual Report on Form 10-K, which was filed with the Securities and Exchange Commission (“SEC”) on March 1, 2019 (the “2018 Form 10-K”). The interim results presented herein are not necessarily indicative of the results of operations that may be expected for the full fiscal year ending December 31, 2019, or any other future period. The Company’s fiscal quarters are based on 13-week periods, except for the fourth quarter, which ends on December 31.

The condensed consolidated financial statements include the accounts of the Company and its subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation. The condensed consolidated balance sheet as of December 31, 2018 was derived from audited financial statements, and the unaudited condensed consolidated financial statements included herein have been prepared pursuant to the rules and regulations of the SEC for interim reporting. As permitted under those requirements, certain footnotes or other financial information that are normally required by generally accepted accounting principles in the United States of America (“U.S. GAAP”) have been condensed or omitted.

Use of Estimates

The preparation of the condensed consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. The Company’s reported financial positions or results of operations may be materially different under changed conditions or when using different estimates and assumptions, particularly with respect to significant accounting policies. If estimates or assumptions differ from actual results, subsequent periods are adjusted to reflect more current information.

Reclassifications

Certain prior period balances have been reclassified to conform to the current period’s presentation. These reclassifications did not have a material impact on previously reported financial statements.

Beginning in the first quarter of fiscal 2019, the Company revised the classification of total revenue in the Condensed Consolidated Statements of Operations from the two previous categories, “Product” and “Service”, to two new categories, “Appliance and integration” and “SaaS and service”. The Company has also reclassified revenue into the two new categories for all prior periods to conform to the current period’s presentation. This reclassification within revenue did not have an impact on total revenue or any segment revenue for any periods presented.

Significant Accounting Policies

The Company’s significant accounting policies are described in Note 2 to its audited Consolidated Financial Statements included in the 2018 Form 10-K. There have been no significant changes to these policies during the six months ended June 28, 2019 other than those disclosed in Note 2, “Recent Accounting Pronouncements”.

NOTE 2: RECENT ACCOUNTING PRONOUNCEMENTS

Recently Adopted Accounting Pronouncements

Accounting Standards Codification (ASC) Topic 842, "Leases"

On January 1, 2019, the Company adopted ASC 842, Leases ("Topic 842"), using the modified retrospective method, applying Topic 842 to all leases existing at the date of initial application. The Company elected to use the effective date as the date of initial application. Consequently, prior period balances and disclosures have not been restated. The Company elected certain practical expedients, which among other things, allowed the Company to carry forward prior conclusions about lease identification and classification.

Adoption of the standard resulted in the balance sheet recognition of additional lease assets and liabilities of approximately $23.3 million; however, the adoption of the standard did not have an impact on the Company's beginning retained earnings, results from operations or cash flows. See Note 4, "Leases" for additional information.

ASU No. 2018-07, Compensation-Stock Compensation (Topic 718)

In June 2018, the FASB issued ASU No. 2018-07, Compensation-Stock Compensation ("Topic 718"): Improvements to Nonemployee Share-Based Payment Accounting. The new ASU expands the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. An entity should apply the requirements of Topic 718 to nonemployee awards except for specific guidance on inputs to an option pricing model and the attribution of cost. The Company adopted this new standard in the first quarter of fiscal 2019, and the adoption resulted in an adjustment of $1.4 million as the cumulative effect adjustment to opening retained earnings relating to the accounting of warrants which were previously granted to Comcast. This represents the cumulative impact of the remeasurement of unvested Comcast warrants on the date of adoption. See Note 15, "Warrants" for additional information.

ASU No. 2018-15, Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40)

In August 2018, the FASB issued ASU No. 2018-15, Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract. This new standard requires an entity (customer) in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. Costs for implementation activities in the application development stage can be capitalized depending on the nature of the costs, while costs incurred during the preliminary project and post-implementation stages are expensed as the activities are performed. The costs capitalized are expensed over the term of the hosting arrangement. The amendments in the new ASU also require the entity to present the expense related to the capitalized implementation costs in the same line item in the statement of income as the fees associated with the hosting element (service) of the arrangement and classify payments for capitalized implementation costs in the statement of cash flows in the same manner as payments made for fees associated with the hosting element.

The Company early adopted this new standard in the third quarter of fiscal 2018 and applied it prospectively to all implementation costs incurred after the date of adoption. The adoption of this standard did not have a significant impact on the Company's Consolidated Financial Statements for the year ended December 31, 2018.

Recently Issued Accounting Pronouncements

In June 2016, the FASB issued ASU No. 2016-13, Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments, which changes the impairment model for most financial assets and certain other instruments. For trade receivables and other instruments, the Company will be required to use a new forward-looking "expected loss" model. Additionally, credit losses on available-for-sale debt securities should be recorded through an allowance for credit losses limited to the amount by which fair value is below amortized cost. The new ASU will be effective for the Company beginning in the first quarter of fiscal 2020 and early adoption is permitted. The adoption of the new ASU is not expected to have a material impact on the Company's consolidated financial statements.

In January 2017, the FASB issued ASU No. 2017-04, Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment. The new ASU removes Step 2 of the goodwill impairment test and requires the assessment of fair value of individual assets and liabilities of a reporting unit to measure goodwill impairments. Goodwill impairment will then be the amount by which a reporting unit's carrying value exceeds its fair value. The new ASU will be effective for the Company beginning in the first quarter of fiscal 2020 on a prospective basis, and early adoption is permitted. The adoption of the new ASU is not expected to have a material impact on the Company’s consolidated financial statements.

In August 2018, the FASB issued ASU 2018-13, which removes, modifies and adds to the disclosure requirements on fair value measurements in Topic 820. The amendments on changes in unrealized gains and losses, the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements, and the narrative description of measurement uncertainty should be applied prospectively for only the most recent interim or annual period presented in the initial fiscal year of adoption. All other amendments should be applied retrospectively to all periods presented upon their effective date. This guidance will become effective for the Company in fiscal years beginning after December 15, 2019, including interim periods within that reporting period. Early adoption is permitted upon issuance of this updated guidance. An entity is permitted to early adopt any removed or modified disclosures upon issuance of this updated guidance and delay adoption of the additional disclosures until their effective date. The Company does not currently hold any level 3 assets or liabilities which require recurring measurements and the Company expects the impact to its disclosure will be relatively limited.

In August 2018, the FASB issued ASU No. 2018-14, Compensation - Retirement Benefits - Defined Benefit Plans - General Subtopic 715-20 - Disclosure Framework - Changes to the Disclosure Requirements for Defined Benefit Plans, which is designed to improve the effectiveness of disclosures by removing and adding disclosures related to defined benefit plans. The new ASU is effective for the Company for fiscal years ending after December 15, 2020, and early adoption is permitted. The Company is currently evaluating the impact of adopting the new ASU on its consolidated financial statements.

NOTE 3: REVENUE

The Company’s principal sources of revenue are from the sale of hardware, software, hardware and software maintenance contracts, and end-to-end solutions, encompassing design, manufacture, test, integration and installation of products. The Company also derives recurring revenue from subscriptions, which are comprised of subscription fees from customers utilizing the Company’s cloud-based video processing solutions.

Beginning in the first quarter of fiscal 2019, the Company revised the classification of total revenue in the Condensed Consolidated Statement of Operations from the two previous categories, “Product” and “Service”, to two new categories, “Appliance and integration” and “SaaS and service”. The “Appliance and integration” revenue category includes hardware, licenses and professional services and is reflective of non-recurring revenue, while the “SaaS and service” category includes usage fees for the Company’s SaaS platform and support revenue stream from the Company’s appliance-based customers and reflects the Company’s recurring revenue stream.

Significant Judgments. The Company has revenue arrangements that include promises to transfer multiple products and services to a customer. The Company may exercise significant judgment when determining whether products and services are considered distinct performance obligations that should be accounted for separately versus together.

The Company allocates the transaction price to all separate performance obligations based on the relative standalone selling prices (“SSP”) of each obligation. The Company’s best evidence for SSP is the price the Company charges for that good or service when the Company sells it separately in similar circumstances to similar customers. If goods or services are not always sold separately, the Company uses the best estimate of SSP in the allocation of the transaction price. The objective of determining the best estimate of SSP is to estimate the price at which the Company would transact a sale if the product or service were sold on a standalone basis. The Company’s process for determining the best estimate of SSP involves management’s judgment, and considers multiple factors including, but not limited to, major product groupings, geographies, gross margin objectives and pricing practices. Pricing practices taken into consideration include contractually stated prices, discounts and applicable price lists. These factors may vary over time, depending upon the unique facts and circumstances related to each deliverable. If the facts and circumstances underlying the factors considered change or should future facts and circumstances lead the Company to consider additional factors, the Company’s best estimate of SSP may also change.

Contract Balances. Deferred revenue represents the Company’s obligation to transfer goods or services to a customer for which the Company has received consideration (or an amount of consideration is due) from the customer. The Company’s payment terms vary by the type and location of its customer and the products or services offered. The term between invoicing and when payment is due is not significant. For certain products or services and customer types, the Company requires payment before the products or services are delivered to the customer.

Contract assets exist when the Company has satisfied a performance obligation but does not have an unconditional right to consideration (e.g., because the entity first must satisfy another performance obligation in the contract before it is entitled to invoice the customer).

Contract assets and deferred revenue consisted of the following (in thousands):

	As of	
	June 28, 2019	December 31, 2018
Contract assets	$ 4,163	$ 3,834
Deferred revenue	51,891	46,922

Contract assets and Deferred revenue (long-term) are reported as components of “Prepaid expenses and other current assets” and “Other non-current liabilities”, respectively, on the Condensed Consolidated Balance Sheets. See Note 8, “Balance Sheet Components” for additional information.

During the three months ended June 28, 2019 and June 29, 2018, the Company recognized revenue of $10.1 million and $15.0 million, respectively, that was included in the deferred revenue balance at the beginning of each fiscal year. During the six months ended June 28, 2019 and June 29, 2018, the Company recognized revenue of $31.3 million and $35.4 million, respectively, that was included in the deferred revenue balance at the beginning of each fiscal year.

The Company elected the practical expedient under Topic 606 to not disclose the transaction price allocated to remaining performance obligations, since the majority of the Company’s arrangements have original expected durations of one year or less, or the invoicing corresponds to the value of the Company’s performance completed to date.

See Note 16, “Segment Information” for disaggregated revenue information.

NOTE 4: LEASES

Under Topic 842, operating lease expense is generally recognized evenly over the term of the lease. The Company has operating leases primarily consisting of facilities with remaining lease terms of one year to eleven years. The lease term represents the non-cancelable period of the lease. For certain leases, the Company has an option to extend the lease term. These renewal options are not considered in the remaining lease term unless it is reasonably certain that the Company will exercise such options.

The Company elected certain practical expedients under Topic 842 which are: (i) to not record leases with an initial term of twelve months or less on the balance sheet; (ii) to combine the lease and non-lease components in determining the lease liabilities and right-of-use assets, and (iii) to carry forward prior conclusions about lease identification and classification.

The Company’s lease contracts do not provide an implicit borrowing rate, hence the Company determined the incremental borrowing rate based on information available at lease commencement to determine the present value of lease liability. The Company uses the parent entity’s incremental borrowing rates as the treasury operations are managed centrally by the parent entity and, consequently, the pricing of leases at a subsidiary level is typically significantly influenced by the credit risk evaluated at the parent or consolidated group level on the basis of guarantees or other payment mechanisms that allow the lessor to look beyond just the subsidiary for payment.

During the second quarter of fiscal 2019, the Company entered into a lease for a new facility which is intended to become the Company’s new headquarters in 2020. The new lease commenced in May 2019, as the facility was made available to the Company for constructing leasehold improvements. The lease was assessed under Topic 842 to be an operating lease and has a term of approximately eleven years.

The new lease resulted in the balance sheet recognition of $10.3 million in “Operating lease right-of use assets”, $4.0 million in “Prepaid expenses and other current assets”, $14.0 million in “Other non-current liabilities”, and $0.3 million in “Accrued and other current liabilities”.

The components of lease expense are as follows (in thousands):

	Three months ended June 28, 2019	Six months ended June 28, 2019
Operating lease cost	$ 2,231	$ 4,227
Variable lease cost	744	1,523
Total lease cost	$ 2,975	$ 5,750

Supplemental cash flow information related to leases are as follows (in thousands):

	Three months ended June 28, 2019	Six months ended June 28, 2019
Cash paid for amounts included in the measurement of operating lease liabilities	$ 2,494	$ 4,624
ROU assets obtained in exchange for operating lease obligations	$ 10,305	$ 10,305

Other information related to leases are as follows:

	Six months ended June 28, 2019
Operating leases	
Weighted-average remaining lease term (years)	7.1 years
Weighted-average discount rate	6.7%

Future minimum lease payments under non-cancelable operating leases as of June 28, 2019 are as follows (in thousands):

Years ending December 31,	
2019 (remaining six months)	$ 5,624
2020	9,525
2021	5,819
2022	4,444
2023	4,206
Thereafter	20,577
Total future minimum lease payments	$ 50,195
Less: imputed interest	(11,259)
Total	$ 38,936

Future minimum lease payments under non-cancelable operating leases as of December 31, 2018, as defined under the previous lease accounting guidance of ASC Topic 840, were as follows (in thousands):

Years ending December 31,	
2019	$ 13,515
2020	10,139
2021	4,088
2022	2,523
2023	2,220
Thereafter	6,694
Total future minimum lease payments	$ 39,179

NOTE 5: INVESTMENTS IN EQUITY SECURITIES

EDC

In 2014, the Company acquired an 18.4% interest in Encoding.com, Inc. ("EDC"), a privately held video transcoding service company headquartered in San Francisco, California, for $3.5 million by purchasing EDC's Series B preferred stock. EDC is considered a VIE but the Company determined that it is not the primary beneficiary of EDC. As a result, EDC is measured at its cost minus impairment, if any.

The Company determined that there were no indicators at June 28, 2019 that the EDC investment was impaired. The Company's maximum exposure to loss from the EDC's investment at June 28, 2019 and December 31, 2018, was limited to its investment cost of $3.6 million, including $0.1 million of transaction costs.

NOTE 6: DERIVATIVES AND HEDGING ACTIVITIES

The Company uses forward contracts to manage exposures to foreign currency exchange rates. The Company's primary objective in holding derivative instruments is to reduce the volatility of earnings and cash flows associated with fluctuations in foreign currency exchange rates and the Company does not use derivative instruments for trading purposes. The use of derivative instruments exposes the Company to credit risk to the extent that the counterparties may be unable to meet their contractual obligations. As such, the potential risk of loss with any one counterparty is closely monitored by the Company.

Derivatives Not Designated as Hedging Instruments (Balance Sheet Hedges)

The Company's balance sheet hedges consist of foreign currency forward contracts that generally mature within three months, are carried at fair value, and are used to minimize the short-term impact of foreign currency exchange rate fluctuation on cash and certain trade and inter-company receivables and payables. Changes in the fair value of these foreign currency forward contracts are recognized in "Other expense, net" in the Condensed Consolidated Statement of Operations and are largely offset by the changes in the fair value of the assets or liabilities being hedged.

Losses on the non-designated derivative instruments recognized during the periods presented were as follows (in thousands):

		Three months ended		Six months ended	
	Financial Statement Location	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Derivatives not designated as hedging instruments:					
Losses recognized in income	Other expense, net	$ (44)	$ (1,268)	$ (609)	$ (1,382)

The U.S. dollar equivalents of all outstanding notional amounts of foreign currency forward contracts are summarized as follows (in thousands):

	June 28, 2019	December 31, 2018
Derivatives not designated as hedging instruments:		
Purchase	$ 33,716	$ 28,975

The locations and fair value amounts of the Company's derivative instruments reported in its Condensed Consolidated Balance Sheets are as follows (in thousands):

		Asset Derivatives			Derivative Liabilities	
	Balance Sheet Location	June 28, 2019	December 31, 2018	Balance Sheet Location	June 28, 2019	December 31, 2018
Derivatives not designated as hedging instruments:						
Foreign currency contracts	Prepaid expenses and other current assets	$ —	$ —	Accrued and other current liabilities	$ 313	$ 333
Total derivatives		$ —	$ —		$ 313	$ 333

Offsetting of Derivative Assets and Liabilities

The Company recognizes all derivative instruments on a gross basis in the Condensed Consolidated Balance Sheets. However, the arrangements with its counterparties allows for net settlement, which are designed to reduce credit risk by permitting net settlement with the same counterparty. As of June 28, 2019, information related to the offsetting arrangements was as follows (in thousands):

	Gross Amounts of Derivatives	Gross Amounts of Derivatives Offset in the Condensed Consolidated Balance Sheets	Net Amounts of Derivatives Presented in the Condensed Consolidated Balance Sheets
Derivative assets	$ —	—	$ —
Derivative liabilities	$ 313	—	$ 313

In connection with foreign currency derivatives entered in Israel, the Company's subsidiaries in Israel are required to maintain a compensating balance with their bank at the end of each month. The compensating balance arrangements do not legally restrict the use of cash. As of June 28, 2019, the total compensating balance maintained was $1.0 million.

NOTE 7: FAIR VALUE MEASUREMENTS

The authoritative accounting guidance establishes a framework for measuring fair value and requires disclosure about the fair value measurements of assets and liabilities. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability, in the principal or most advantageous market for the asset or liability, in an orderly transaction between market participants on the measurement date. This guidance requires the Company to classify and disclose assets and liabilities measured at fair value on a recurring basis, as well as fair value measurements of assets and liabilities measured on a nonrecurring basis in periods subsequent to initial measurement, in a three-tier fair value hierarchy as described below.

Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. The guidance describes three levels of inputs that may be used to measure fair value:

- Level 1 — Observable inputs that reflect quoted prices for identical assets or liabilities in active markets.
- Level 2 — Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities, quoted prices in markets that are not active, or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. The forward exchange contracts are classified as Level 2 because they are valued using quoted market prices and other observable data for similar instruments in an active market.
- Level 3 — Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

The following table sets forth the fair value of the Company’s financial assets and liabilities measured at fair value on a recurring basis based on the three-tier fair value hierarchy (in thousands):

	Level 1	Level 2	Level 3	Total
As of June 28, 2019				
Accrued and other current liabilities				
Derivative liabilities	$ —	$ 313	$ —	$ 313
Total liabilities measured and recorded at fair value	$ —	$ 313	$ —	$ 313
	Level 1	**Level 2**	**Level 3**	**Total**
As of December 31, 2018				
Accrued and other current liabilities				
Derivative liabilities	$ —	$ 333	$ —	$ 333
Total liabilities measured and recorded at fair value	$ —	$ 333	$ —	$ 333

The Company’s liability for the TVN VDP (as defined below) was $1.4 million and $2.4 million as of June 28, 2019 and December 31, 2018, respectively. This amount is not included in the table above because its fair value at inception, based on Level 3 inputs, was determined during the fourth quarter of fiscal 2016. The fair value of this liability has not been subsequently remeasured based on the applicable accounting guidance. See Note 10, “Restructuring and related charges-TVN VDP,” for additional information on the Company’s TVN VDP liabilities.

The carrying value of the Company’s financial instruments, including cash equivalents, restricted cash, accounts receivable, accounts payable and accrued and other current liabilities, approximate fair value due to their short maturities.

The Company uses the market approach to measure fair value for its financial assets and liabilities. The market approach uses prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities. The fair value of the Company’s convertible notes is influenced by interest rates, the Company’s stock price and stock market volatility. The fair value of the Company’s convertible notes was approximately $150.0 million and $136.5 million as of June 28, 2019 and December 31, 2018, respectively, and represents a Level 2 valuation. The Company’s other debts assumed from the Thomson Video Networks (“TVN”) acquisition are classified within Level 2 because these borrowings are not actively traded and the majority of them have a variable interest rate structure based upon market rates currently available to the Company for debt with similar terms and maturities, therefore, the carrying value of these debts approximate its fair value. The other debts, excluding finance leases, outstanding as of June 28, 2019 and December 31, 2018 were in the aggregate of $18.0 million and $19.7 million, respectively. (See Note 11, “Convertible Notes, Other debts and Finance Leases” for additional information).

During the six months ended June 28, 2019, there were no nonrecurring fair value measurements of assets and liabilities subsequent to initial recognition.

NOTE 8: BALANCE SHEET COMPONENTS

The following tables provide details of selected balance sheet components (in thousands):

	June 28, 2019	December 31, 2018
Accounts receivable, net:		
Accounts receivable	$ 73,349	$ 85,292
Less: allowances for doubtful accounts and sales returns	(2,778)	(3,497)
Total	$ 70,571	$ 81,795

	June 28, 2019	December 31, 2018
Inventories:		
Raw materials	$ 1,199	$ 1,705
Work-in-process	1,052	991
Finished goods	15,308	12,267
Service-related spares	10,100	10,675
Total	$ 27,659	$ 25,638

	June 28, 2019	December 31, 2018
Prepaid expenses and other current assets:		
Deferred cost of revenue	$ 8,153	$ 3,671
Prepaid expenses	7,998	4,834
Contract assets(1)	4,163	3,834
Capitalized sales commissions	1,168	1,098
French R&D tax credits receivable	—	7,305
Other	7,727	2,538
Total	$ 29,209	$ 23,280

(1) Contract assets reflect the satisfied performance obligations for which the Company does not yet have an unconditional right to consideration.

	June 28, 2019	December 31, 2018
Property and equipment, net:		
Machinery and equipment	$ 74,675	$ 75,094
Capitalized software	33,375	32,696
Leasehold improvements	14,963	14,951
Furniture and fixtures	6,045	6,049
Property and equipment, gross	129,058	128,790
Less: accumulated depreciation and amortization	(109,746)	(106,469)
Total	$ 19,312	$ 22,321

	June 28, 2019		December 31, 2018	
Other long-term assets:				
French R&D tax credits receivable[2]	$	21,830	$	19,249
Deferred tax assets		8,932		8,695
Equity investment		3,593		3,593
Other		8,190		6,840
Total	$	42,545	$	38,377

(2) The Company's TVN subsidiary in France (the "TVN French Subsidiary") participates in the French Crédit d'Impôt Recherche program (the "R&D tax credits") which allows companies to monetize eligible research expenses. The R&D tax credits can be used to offset against income tax payable to the French government in each of the four years after being incurred, or if not utilized, are recoverable in cash. The amount of R&D tax credits recoverable are subject to audit by the French government. The R&D tax credits receivable at June 28, 2019 were approximately $21.8 million and are expected to be recoverable from 2020 through 2023.

	June 28, 2019		December 31, 2018	
Accrued and other current liabilities:				
Accrued employee compensation and related expenses	$	16,694	$	21,451
Operating lease liability (short-term)		10,519		—
Accrued warranty		4,802		4,869
Contingent inventory reserves		2,263		2,500
Accrued TVN VDP, current [3]		1,285		1,585
Accrued Avid litigation settlement, current		—		1,500
Others		21,201		20,856
Total	$	56,764	$	52,761

(3) See Note 10, "Restructuring and related charges-TVN VDP," for additional information on the Company's TVN VDP liabilities.

	June 28, 2019		December 31, 2018	
Other non-current liabilities:				
Operating lease liability (long-term)	$	27,009	$	—
Deferred revenue (long-term)		4,561		5,330
Others		9,741		12,898
Total	$	41,311	$	18,228

NOTE 9: GOODWILL AND IDENTIFIED INTANGIBLE ASSETS

Goodwill

Goodwill represents the difference between the purchase price and the estimated fair value of the identifiable assets acquired and liabilities assumed. Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment. The Company has two reporting units, Video and Cable Access.

The Company tests for goodwill impairment at the reporting unit level on an annual basis, or more frequently if events or changes in circumstances indicate that the asset is more likely than not impaired. The Company’s annual goodwill impairment test is performed in the fiscal fourth quarter, with a testing date at the end of October. In evaluating goodwill for impairment, the Company first assesses qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying value (including goodwill). If the Company concludes that it is not more likely than not that the fair value of a reporting unit is less than its carrying value, then no further testing is required. However, if the Company concludes that it is more likely than not that the fair value of a reporting unit is less than its carrying value, then the two-step goodwill impairment test is performed to identify a potential goodwill impairment and measure the amount of impairment to be recognized, if any. The two-step impairment test involves estimating the fair value of all assets and liabilities of the reporting unit, including the implied fair value of goodwill, through either estimated discounted future cash flows or market-based methodologies. No impairment indicators were identified as of June 28, 2019.

The changes in the carrying amount of goodwill for the six months ended June 28, 2019 were as follows (in thousands):

	Video	Cable Access	Total
Balance as of December 31, 2018	$ 179,839	$ 60,779	$ 240,618
Foreign currency translation adjustment, net	(282)	(1)	(283)
Balance as of June 28, 2019	$ 179,557	$ 60,778	$ 240,335

Intangible Assets, Net

The following is a summary of intangible assets, net (in thousands):

	June 28, 2019				December 31, 2018		
	Weighted Average Remaining Life (Years)	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Developed core technology	0.7	$ 31,708	$ (28,167)	$ 3,541	$ 31,707	$ (25,576)	$ 6,131
Customer relationships/contracts	1.7	44,628	(39,632)	4,996	44,650	(38,146)	6,504
Trademarks and trade names	0.7	618	(515)	103	623	(441)	182
Maintenance agreements and related relationships	n/a	5,500	(5,500)	—	5,500	(5,500)	—
Order backlog	n/a	3,104	(3,104)	—	3,112	(3,112)	—
Total identifiable intangibles, net		$ 85,558	$ (76,918)	$ 8,640	$ 85,592	$ (72,775)	$ 12,817

Amortization expense for the identifiable purchased intangible assets for the three and six months ended June 28, 2019 and June 29, 2018 was allocated as follows (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Included in cost of revenue	$ 1,295	$ 1,295	$ 2,590	$ 2,590
Included in operating expenses	784	800	1,572	1,604
Total amortization expense	$ 2,079	$ 2,095	$ 4,162	$ 4,194

The estimated future amortization expense of purchased intangible assets with definite lives is as follows (in thousands):

	Cost of Revenue	Operating Expenses	Total
Year ended December 31,			
2019 (remaining six months)	$ 2,590	$ 1,576	$ 4,166
2020	951	3,023	3,974
2021	—	500	500
Total future amortization expense	$ 3,541	$ 5,099	$ 8,640

NOTE 10: RESTRUCTURING AND RELATED CHARGES

The Company has implemented several restructuring plans in an effort to better align its resources with its business strategy. The goal of these plans was to bring operational expenses to appropriate levels relative to its net revenues, while simultaneously implementing extensive company-wide expense control programs. These restructuring plans have primarily been comprised of excess facilities, severance payments and termination benefits related to headcount reductions.

In the three and six months ended June 28, 2019, the Company recorded an aggregate amount of $0.1 million and $0.4 million, respectively, of restructuring and related charges for severance and employee benefits for certain employees, primarily in one specific function within the Video segment. The activities associated with the charges were substantially completed in the first quarter of fiscal 2019. The Company made $0.3 million in payments in the six months ended June 28, 2019, with the remaining $0.1 million liability outstanding as of June 28, 2019.

The Company initiated restructuring plans during fiscal 2018 and prior years. During fiscal 2018, the Company revised certain estimates made in connection with the prior restructuring plans and recorded credits of $0.2 million. As of June 28, 2019, total liabilities related to the prior restructuring plans were $3.0 million.

The Company accounts for its restructuring plans under the authoritative guidance for exit or disposal activities. The restructuring and related charges are included in “Cost of revenue” and “Operating expenses - Restructuring and related charges” in the Condensed Consolidated Statements of Operations. The following table summarizes the restructuring and related charges (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Restructuring and related charges in:				
Cost of revenue	$ 91	$ 115	$ 392	$ 877
Operating expenses - Restructuring and related charges	276	631	333	1,717
Total restructuring and related charges	$ 367	$ 746	$ 725	$ 2,594

As of June 28, 2019 and December 31, 2018, the Company’s total restructuring liability was $3.4 million and $5.3 million, respectively, of which $3.1 million and $3.3 million, respectively, were reported as a component of “Accrued and other current liabilities”, and the remaining $0.3 million and $2.0 million, respectively, were reported as a component of “Other non-current liabilities” on the Company’s Condensed Consolidated Balance Sheets.

The following table summarizes the activities related to the Company's restructuring plans during the six months ended June 28, 2019 (in thousands):

	Excess facilities	Severance and benefits	TVN VDP (1)	Others	Total
Balance at December 31, 2018	$ 2,926	$ —	$ 2,409	$ —	$ 5,335
Charges for current period	—	433	27	241	701
Adjustments to restructuring provisions	47	—	(23)	—	24
Cash payments	(955)	(284)	(979)	—	(2,218)
Others	(382)	—	(24)	—	(406)
Balance at June 28, 2019	$ 1,636	$ 149	$ 1,410	$ 241	$ 3,436

(1) "TVN VDP" consists of restructuring-related costs in connection with the TVN acquisition that included global workforce reductions, exiting certain operating facilities and disposing of excess assets and an employee voluntary departure plan in France.

TVN VDP

The amount recorded for the six months ended June 28, 2019 was immaterial. The amount recorded for the six months ended June 29, 2018 was $0.5 million. The TVN VDP liability balance as of June 28, 2019 was $1.4 million, payable through 2020.

NOTE 11: CONVERTIBLE NOTES, OTHER DEBTS AND FINANCE LEASES

4.00% Convertible Senior Notes

In December 2015, the Company issued $128.25 million in aggregate principal amount of 4.00% Senior Convertible Notes due 2020 (the "offering" or "Notes", as applicable) pursuant to an indenture (the "Indenture"), dated December 14, 2015, by and between the Company and U.S. Bank National Association, as trustee. The Notes bear interest at a rate of 4.00% per year, payable in cash on June 1 and December 1 of each year and the Notes will mature on December 1, 2020 unless earlier repurchased or converted. The Notes will be convertible into cash, shares of the Company's common stock, par value $0.001 ("Common Stock"), or a combination thereof, at the Company's election, at an initial conversion rate of 173.9978 shares of Common Stock per $1,000 principal amount of Notes (which is equivalent to an initial conversion price of approximately $5.75 per share). The conversion rate, and thus the effective conversion price, may be adjusted under certain circumstances, including in connection with conversions made following certain fundamental changes and under other circumstances, in each case, as set forth in the Indenture.

Prior to the close of business on the business day immediately preceding September 1, 2020, the Notes will be convertible only under the following circumstances: (1) during any fiscal quarter (and only during such fiscal quarter), if the last reported sale price of the Company's common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on the last trading day of the immediately preceding fiscal quarter is greater than or equal to 130% of the conversion price of the Notes on each applicable trading day; (2) during the five business day period after any 5 consecutive trading day period (the "measurement period ") in which the trading price per $1,000 principal amount of Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price of the Company's common stock and the conversion rate on each such trading day; or (3) upon the occurrence of specified corporate events. Commencing on September 1, 2020 until the close of business on the second scheduled trading day immediately preceding the maturity date, the Notes will be convertible in multiples of $1,000 principal amount regardless of the foregoing circumstances.

If a fundamental change occurs, holders of the Notes may require the Company to purchase all or any portion of their Notes for cash at a repurchase price equal to 100% of the principal amount of the Notes to be repurchased, plus any accrued and unpaid interest to, but excluding, the fundamental change repurchase date.

Concurrent with the closing of the offering, the Company used $49.9 million of the net proceeds to repurchase 11.1 million shares of the Company's common stock from purchasers of Notes in the offering in privately negotiated transactions. In addition, the Company incurred approximately $4.1 million of debt issuance cost, resulting in net proceeds to the Company of approximately $74.2 million, which was used to fund the TVN acquisition.

In accordance with the accounting guidance on embedded conversion features, the conversion feature associated with the Notes was valued at $26.1 million and bifurcated from the host debt instrument and recorded in stockholders' equity. The resulting debt discount on the Notes is being amortized to interest expense at the effective interest rate over the contractual term of the Notes. The following table presents the components of the Notes as of June 28, 2019 and December 31, 2018 (in thousands, except for years and percentages):

	June 28, 2019	December 31, 2018
Liability:		
Principal amount	$ 128,250	$ 128,250
Less: Debt discount, net of amortization	(9,085)	(11,996)
Less: Debt issuance costs, net of amortization	(1,095)	(1,446)
Carrying amount	$ 118,070	$ 114,808
Remaining amortization period (years)	1.4	1.9
Effective interest rate on liability component	9.94%	9.94%
Carrying amount of equity component	$ 26,062	$ 26,062

The following table presents interest expense recognized for the Notes (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Contractual interest expense	$ 1,282	$ 1,282	$ 2,565	$ 2,565
Amortization of debt discount	1,479	1,340	2,912	2,637
Amortization of debt issuance costs	178	161	350	317
Total interest expense recognized	$ 2,939	$ 2,783	$ 5,827	$ 5,519

Other Debts and Finance Leases

The Company has a variety of debt and credit facilities in France to satisfy the financing requirements of TVN operations. These arrangements are summarized in the table below (in thousands):

	June 28, 2019	December 31, 2018
Financing from French government agencies related to various government incentive programs (1)	$ 17,218	$ 18,783
Term loans	759	914
Obligations under finance leases	99	162
Total debt obligations	18,076	19,859
Less: current portion	(1,379)	(7,175)
Long-term portion	$ 16,697	$ 12,684

(1) As of June 28, 2019 and December 31, 2018, loans backed by French R&D tax credit receivables were $15.1 million and $16.7 million, respectively. As of June 28, 2019, the TVN French Subsidiary had an aggregate of $21.8 million of R&D tax credit receivables from the French government from 2020 through 2023. See Note 8, "Balance Sheet Components" for additional information. These tax loans have a fixed rate of 0.6%, plus EURIBOR 1 month + 1.3% and mature between 2020 through 2022. The remaining loans of $2.1 million at June 28, 2019, primarily relate to financial support from French government agencies for R&D innovation projects at minimal interest rates, and these loans mature between 2019 through 2025.

Future minimum repayments

The table below presents the future minimum repayments of debts and finance lease obligations for TVN as of June 28, 2019 (in thousands):

Years ending December 31,	Finance lease obligations	Other Debt obligations
2019 (remaining six months)	$ 77	$ 946
2020	22	6,563
2021	—	5,297
2022	—	4,791
2023	—	153
Thereafter	—	227
Total	$ 99	$ 17,977

Line of Credit

On September 27, 2017, the Company entered into a Loan and Security Agreement (the "Loan Agreement") with Silicon Valley Bank (the "Bank"). The Loan Agreement provides for a secured revolving credit facility in an aggregate principal amount of up to $15.0 million. Under the terms of the Loan Agreement, the principal amount of loans, plus the face amount of any outstanding letters of credit, at any time cannot exceed up to 85% of the Company's eligible receivables. Under the terms of the Loan Agreement, the Company may also request letters of credit from the Bank. The proceeds of any loans under the Loan Agreement will be used for working capital and general corporate purposes.

Loans under the Loan Agreement will bear interest, at the Company's option, and subject to certain conditions, at an annual rate of either a prime rate or a LIBOR rate plus an applicable margin of 2.25%. There will be no applicable margin for prime rate advances when the Company is in compliance with the liquidity requirement of at least $20.0 million in the aggregate of consolidated cash plus availability under the Loan Agreement (the "Liquidity Requirement") and a 0.25% margin for prime rate advances when the Company is not in compliance with the Liquidity Requirement. The Company may not request LIBOR advances when it is not in compliance with the Liquidity Requirement. Interest on each advance is due and payable monthly and the principal balance is due at maturity. The Company's obligations under the revolving credit facility are secured by a security interest on substantially all of its assets, excluding intellectual property.

The Loan Agreement contains customary affirmative and negative covenants. The Company must comply with financial covenants requiring it to maintain (i) a short-term asset to short-term liabilities ratio of at least 1.10 to 1.00 and (ii) a minimum adjusted EBITDA, in the amounts and for the periods as set forth in the Loan Agreement. The Company must also maintain a minimum liquidity amount, comprised of unrestricted cash held at accounts with the Bank plus proceeds available to be drawn under the Loan Agreement, equal to at least $10.0 million at all times. As of June 28, 2019, the Company was in compliance with the covenants under the Loan Agreement.

As of June 28, 2019, the Company has committed $2.1 million towards security for letters of credit issued under the Loan Agreement. There were no other borrowings under the Loan Agreement as of June 28, 2019.

NOTE 12: EMPLOYEE BENEFIT PLANS AND STOCK-BASED COMPENSATION

Equity Award Plans

The Company's stock benefit plans include the 2002 Employee Stock Purchase Plan ("ESPP") and current active stock plans adopted in 1995 and 2002. See Note 12, "Employee Benefit Plans and Stock-based Compensation" of Notes to Consolidated Financial Statements in the 2018 Form 10-K for details pertaining to each plan.

The Company's stockholders approved an amendment to the ESPP at the 2019 annual meeting of stockholders (the "2019 Annual Meeting") to increase the number of shares of common stock reserved for issuance under the ESPP by 1,000,000 shares. The Company's stockholders also approved an amendment to the 1995 Stock Plan at the 2019 Annual Meeting to increase the number of shares of common stock reserved for issuance thereunder by 3,500,000 shares. As of June 28, 2019, there were 1.8 million and 5.2 million shares of common stock reserved for future grants under the Company's ESPP and active stock plans, respectively.

Stock Option Activities

The following table summarizes the Company's stock option activities and related information during the six months ended June 28, 2019 (in thousands, except per share amounts and terms):

	Stock Options Outstanding			
	Number of Shares	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Term (Years)	Aggregate Intrinsic Value
Balance at December 31, 2018	3,068	$ 5.76		
Exercised	(39)	3.75		
Canceled or expired	(379)	6.14		
Balance at June 28, 2019	2,650	5.73	2.2	$ 1,690.3
As of June 28, 2019				
Vested and expected to vest	2,650	5.73	2.2	$ 1,690.3
Exercisable	2,645	5.74	2.2	$ 1,684.4

The aggregate intrinsic value disclosed above represents the difference between the exercise price of the options and the fair value of the Company's common stock. There were no employee stock options granted in the six months ended June 28, 2019.

There were no realized tax benefits attributable to stock options exercised in jurisdictions where this expense is deductible for tax purposes for the six months ended June 28, 2019 and June 29, 2018, respectively.

Restricted Stock Units ("RSUs") Activities

The following table summarizes the Company's RSUs activities and related information during the six months ended June 28, 2019 (in thousands, except per share amounts):

	Restricted Stock Units Outstanding	
	Number of Shares	Weighted Average Grant Date Fair Value Per Share
Balance at December 31, 2018	3,403	$ 3.99
Granted	2,501	5.67
Vested	(1,600)	3.97
Forfeited	(45)	4.72
Balance at June 28, 2019	4,259	4.99

Performance- and Market-based awards

In the second quarter of 2019, the Company granted 85,000 performance-based RSUs ("PRSUs") to certain key executives that are expected to vest during a period of one to two years from the date of grant. The vesting condition for the PRSUs include achievement of certain financial operating goals. The stock-based compensation recognized for the PRSUs for the three months ended June 28, 2019 was $0.1 million. The unrecognized stock-based compensation of the PRSUs as of June 28, 2019 was $0.4 million. No PRSUs had vested as of June 28, 2019.

In the second quarter of 2019, the Company granted 200,000 market-based RSUs ("MRSUs") under the 1995 Stock Plan to a key executive that is expected to vest during a three-year period. The vesting condition for the MRSUs include performance of the Company's total shareholder return ("TSR") relative to the TSR of the NASDAQ Telecommunication Index. The aggregate grant-date fair value of these shares was estimated to be $1.1 million using a Monte-Carlo simulation valuation method. The stock-based compensation recognized for the MRSUs for the three months ended June 28, 2019 was $0.1 million. The unrecognized stock-based compensation of the MRSUs as of June 28, 2019 was $1.0 million. No MRSUs had vested as of June 28, 2019.

French Retirement Benefit Plan

The Company assumed obligations under a defined benefit pension plan in connection with the acquisition of TVN in 2016. The plan is unfunded and there are no contributions required by laws or funding regulations, discretionary contributions or non-cash contributions expected to be made. The table below presents the components of net periodic benefit costs (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Service cost	$ 57	$ 63	$ 114	$ 126
Interest cost	19	19	39	38
Net periodic benefit cost	$ 76	$ 82	$ 153	$ 164

The present value of the Company's pension obligation as of June 28, 2019 was $5.0 million, of which $0.1 million was reported as a component of "Accrued and other current liabilities" and $4.9 million was reported as a component of "Other non-current liabilities" on the Company's Condensed Consolidated Balance Sheets. The present value of the Company's pension obligation as of December 31, 2018 was $4.9 million.

401(k) Plan

The Company has a retirement/savings plan for its U.S. employees, which qualifies as a thrift plan under Section 401(k) of the Internal Revenue Code. This plan allows participants to contribute up to the applicable Internal Revenue Code limitations under the plan. The Company has made discretionary contributions to the plan of 25% of the first 4% contributed by eligible participants, up to a maximum contribution per participant of $1,000 per year. The contributions for the six months ended June 28, 2019 and June 29, 2018 were $208,000 and $214,000, respectively.

Stock-based Compensation

The following table summarizes stock-based compensation for all plans (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Stock-based compensation in:				
Cost of revenue	$ 195	$ 448	$ 420	$ 963
Research and development expense	582	818	1,198	2,622
Selling, general and administrative expense	1,733	1,746	3,005	5,184
Total stock-based compensation in operating expense	2,315	2,564	4,203	7,806
Total stock-based compensation	$ 2,510	$ 3,012	$ 4,623	$ 8,769

As of June 28, 2019, total unrecognized stock-based compensation cost related to unvested RSUs was $18.3 million and is expected to be recognized over a weighted-average period of approximately 1.66 years.

Valuation Assumptions

The Company estimates the fair value of employee stock options and stock purchase rights under the ESPP using a Black-Scholes option valuation model. The value of the stock purchase rights under the ESPP consists of: (1) the 15% discount on the purchase of the stock; (2) 85% of the fair value of the call option; and (3) 15% of the fair value of the put option. The call option and put option were valued using the Black-Scholes option pricing model.

	ESPP Purchase Period Ending	
	July 1, 2019	July 2, 2018
Expected term (years)	0.5	0.5
Volatility	43%	60%
Risk-free interest rate	2.5%	1.7%
Expected dividends	0.0%	0.0%
Estimated weighted average fair value per share at purchase date	$1.31	$1.34

The expected term of the stock purchase rights under the ESPP represents the period of time from the beginning of the offering period to the purchase date. The Company uses its historical volatility for a period equivalent to the expected term of the options to estimate the expected volatility. The risk-free interest rate assumption is based on U.S. Treasury zero-coupon issues with remaining terms similar to the expected term. The Company has not paid and does not plan to pay any cash dividends in the foreseeable future.

NOTE 13: INCOME TAXES

The Company reported the following operating results for the periods presented (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Loss before income taxes	$ (11,148)	$ (2,022)	$ (22,773)	$ (14,638)
Provision for (benefit from) income taxes	697	891	378	1,969
Effective income tax rate	(6.3)%	(44.1)%	(1.7)%	(13.5)%

The Company operates in multiple jurisdictions and its profits are taxed pursuant to the tax laws of these jurisdictions. The Company’s effective income tax rate may be affected by changes in, or interpretations of tax laws and tax agreements in any given jurisdiction, utilization of net operating loss and tax credit carry forwards, changes in geographical mix of income and expense, and changes in management’s assessment of matters such as the ability to realize deferred tax assets. The Company’s effective tax rate varies from year to year primarily due to the absence of several onetime, discrete items that benefited or decremented the tax rates in the previous years.

The Company's effective income tax rate of (1.7)% for the six months ended June 28, 2019 was different from the U.S. federal statutory rate of 21%, primarily due to geographical mix of income and losses, full valuation allowance against U.S. federal, California and other states deferred tax assets, foreign withholding taxes and income taxes on earnings from operations in foreign tax jurisdictions. In addition, during the six months ended June 28, 2019, the Company recorded a one-time benefit of approximately $0.8 million due to a valuation allowance release for one of its foreign subsidiaries. This release of valuation allowance was due to changes in forecasted taxable income resulting from the Company receiving a favorable tax ruling during the quarter.

The Company's effective income tax rate of (13.5)% for the six months ended June 29, 2018 was different from the U.S. federal statutory rate of 21%, primarily due to the Company’s geographical income mix and favorable tax rates associated with certain earnings from operations in lower-tax jurisdictions, the increase in the valuation allowance against U.S. federal, California and other state deferred tax assets, detriment from non-deductible stock-based compensation, and the net of various discrete tax adjustments. For the six months ended June 29, 2018, the discrete adjustments to the Company's tax expense were primarily withholding taxes.

The Company files U.S. federal and state, and foreign income tax returns in jurisdictions with varying statutes of limitations during which such tax returns may be audited and adjusted by the relevant tax authorities. The 2015 through 2018 tax years generally remain subject to examination by U.S. federal and most state tax authorities. In significant foreign jurisdictions, the 2013 through 2018 tax years generally remain subject to examination by their respective tax authorities. If, upon the conclusion of an audit, the ultimate determination of taxes owed in the jurisdictions under audit is for an amount in excess of the tax provision the Company has recorded in the applicable period, the Company’s overall tax expense, effective tax rate, operating results and cash flow could be materially and adversely impacted in the period of adjustment.

On July 27, 2015, the U.S. Tax Court issued an opinion in Altera Corp. v. Commissioner, 145 T.C. No.3 (2015) related to the treatment of stock-based compensation expense in an intercompany cost-sharing arrangement. A final decision was entered by the U.S. Tax Court on December 1, 2015 (the "2015 Decision"). On February 19, 2016, the U.S. Internal Revenue Service filed a notice of appeal in Altera Corp. v. Commissioner, 145 T.C. No. 3 (2015), to the Ninth Circuit Court of Appeals. The Ninth Circuit was to decide whether a regulation that mandates that stock-based compensation costs related to the intangible development activity of a qualified cost sharing arrangement (a "QCSA") must be included in the joint cost pool of the QCSA (the "all costs rule") is consistent with the arm's length standard as set forth in Section 482 of the Internal Revenue Code. On June 7, 2019, the Ninth Circuit overturned the earlier Tax Court decision and ruled to include share-based compensation in the cost sharing pool. The company continues to include share-based compensation in the cost base consistent with the Ninth Circuit's ruling.

As of June 28, 2019, the total amount of gross unrecognized tax benefits, including interest and penalties, was approximately $17.3 million, of which $16.0 million would affect the Company's effective tax rate if the benefits are eventually recognized, subject to valuation allowance considerations. The Company recognizes interest and penalties related to unrecognized tax positions in income tax expense. The Company had $25 thousand of gross interest and penalties accrued as of June 28, 2019. The Company will continue to review its tax positions and provide for, or reverse, unrecognized tax benefits as issues arise. For the six months ended June 28, 2019, the Company released $0.7 million of unrecognized tax benefits due to closures of tax audits in foreign jurisdictions.

NOTE 14: NET LOSS PER SHARE

The following table sets forth the computation of the basic and diluted net loss per share (in thousands, except per share amounts):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Numerator:				
Net loss	$ (11,845)	$ (2,913)	$ (23,151)	$ (16,607)
Denominator:				
Weighted average number of common shares outstanding				
Basic and diluted	88,931	85,304	88,554	84,616
Net loss per share:				
Basic and diluted	$ (0.13)	$ (0.03)	$ (0.26)	$ (0.20)

Basic net loss per share was the same as diluted net loss per share for the three and six months ended June 28, 2019 and June 29, 2018, as the inclusion of potential common shares outstanding would have been anti-dilutive due to the Company's net losses for the periods presented. The following table sets forth the potential weighted common shares outstanding that were excluded from the computation of basic and diluted net loss per share calculations (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Stock options	2,664	3,234	2,803	3,469
RSUs	2,668	3,326	2,534	2,766
Stock purchase rights under the ESPP	509	541	499	689
Warrants (1)	1,954	782	1,954	782
Total (2)	7,795	7,883	7,790	7,706

(1) On September 26, 2016, in connection with the execution of a product supply agreement pursuant to which an affiliate of Comcast Corporation (together with Comcast Corporation, "Comcast") may, in its sole discretion, purchase from the Company licenses to certain of the Company's software products, the Company granted Comcast a warrant to purchase shares of its common stock. (See Note 15, "Warrants" and Note 18, "Subsequent Event" for additional information).

(2) Excluded from the table above are the Notes, which are convertible under certain conditions into an aggregate of 22,304,348 shares of common stock. (See Note 11, “Convertible Notes, Other Debts and Finance Leases” for additional information on the Notes). Since the Company’s intent is to settle the principal amount of the Notes in cash, the treasury stock method is being used to calculate any potential dilutive effect of the conversion spread on diluted net income per share, if applicable. The conversion spread will have a dilutive impact on diluted net income per share when the Company’s average market price of its common stock for a given period exceeds the conversion price of $5.75 per share.

NOTE 15: WARRANTS

On September 26, 2016, the Company granted a warrant to purchase shares of common stock (the “Warrant”) to Comcast pursuant to which Comcast may, subject to certain vesting provisions, purchase up to 7,816,162 shares of the Company’s common stock subject to adjustment in accordance with the terms of the Warrant, for a per share exercise price of $4.76. Comcast may exercise the Warrant for cash or on a net share basis. The Warrant expires on September 26, 2023 or the prior consummation of a change of control of the Company.

Comcast’s right to purchase 781,617 shares vested as of the Warrant issuance date as an incentive to enter into the software license product supply agreement. Comcast’s right to purchase 1,172,425 shares vested as of July 31, 2018 upon the acceptance and completion of field trials. Comcast’s right to purchase an additional 781,617 shares will vest upon Comcast’s election for enterprise license pricing for the Company’s CableOS software products. Such pricing would obligate Comcast to make certain total payments to the Company over the term of the product supply agreement. Comcast’s rights to purchase additional shares in specified tranches vest when Comcast exceeds specified cumulative purchase amounts from the Company under the product supply agreement and, for certain tranches, such purchases are made within specified time periods.

The Warrant is considered an incentive for Comcast to purchase certain of the Company’s products. Therefore, the value of the vested Warrant is recorded as an asset, which is recognized as a reduction in the Company’s net revenues in proportion to the pertinent sales to Comcast. The Warrant is considered indexed to the Company’s common stock and classified as stockholders’ equity based on its terms. Accordingly, the vested Warrant amounts are included in “Additional paid-in capital”.

Prior to adoption of new accounting guidance on January 1, 2019, changes in fair value of the warrant shares were being marked to market until final vesting, and any adjustment as such was being recorded in revenue. The change in fair value together with vested warrant shares was being amortized to revenue using a ratio of revenue recognized from the customer in the period compared to total revenue expected from the customer. The value of the Warrant was recorded as a reduction in the Company’s net revenues to the extent such value did not exceed net revenues from pertinent sales to Comcast. In the first quarter of fiscal 2019, due to the adoption of Topic 718 as disclosed in Note 2, “Recent Accounting Pronouncements”, the fair value of unvested warrant shares is no longer required to be marked to market. As a result, the charge to revenue for warrant shares no longer includes the change in fair value of the warrant shares.

In fiscal 2018, the fair value of the Warrant was determined using the Black-Scholes option pricing model. The assumptions utilized in the Black-Scholes model included the risk-free interest rate, expected volatility, and expected life in years. The risk-free interest rate was based on the U.S. Treasury yield curve rates with maturity terms similar to the expected life of the Warrant. Expected volatility was determined utilizing historical volatility over a period of time equal to the expected life of the Warrant. Expected life was equal to the remaining contractual term of the Warrant. The dividend yield was assumed to be zero since the Company had not historically declared dividends and did not have any plans to declare dividends in the future.

During the three and six months ended June 28, 2019, the Company recorded $23 thousand and $48 thousand, respectively, as a reduction to net revenues in connection with amortization of the Warrant. During the three and six months ended June 29, 2018, the Company recorded $0.3 million and $0.4 million, respectively, as a reduction to net revenues in connection with amortization of the Warrant.

On July 9, 2019, in connection with Comcast’s election of enterprise license pricing for the Company’s CableOS software, all of the remaining milestones and thresholds required to fulfill each of the vesting requirements of the Warrant were deemed satisfied and achieved or otherwise waived such that all Warrant shares were fully vested and exercisable as of July 1, 2019. Refer to Note 18, “Subsequent Event”, for more information.

NOTE 16: SEGMENT INFORMATION

Operating segments are defined as components of an enterprise that engages in business activities for which separate financial information is available and evaluated by the Company's Chief Operating Decision Maker (the "CODM"), which for Harmonic is its Chief Executive Officer, in deciding how to allocate resources and assess performance. Based on our internal reporting structure, the Company consists of two operating segments: Video and Cable Access. The operating segments were determined based on the nature of the products offered. The Video segment sells video processing and production and playout solutions and services worldwide to broadcast and media companies, streaming new media companies, cable operators, and satellite and telecommunications ("telco") Pay-TV service providers. The Cable Access segment sells cable access solutions and related services to cable operators globally.

The following table provides summary financial information by reportable segment (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Video				
Revenue	$ 71,625	$ 79,208	$ 138,801	$ 150,956
Gross profit	41,444	43,558	80,046	84,784
Operating income	4,459	6,239	6,427	8,234
Cable Access				
Revenue	$ 13,240	$ 19,952	$ 26,170	$ 38,331
Gross profit	4,063	9,903	9,131	18,432
Operating income (loss)	(7,266)	256	(13,088)	(1,368)
Total				
Revenue	$ 84,865	$ 99,160	$ 164,971	$ 189,287
Gross profit	45,507	53,461	89,177	103,216
Operating income (loss)	(2,807)	6,495	(6,661)	6,866

A reconciliation of the Company's consolidated segment operating income (loss) to consolidated loss before income taxes is as follows (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Total segment operating income (loss)	$ (2,807)	$ 6,495	$ (6,661)	$ 6,866
Unallocated corporate expenses	(368)	(746)	(726)	(2,588)
Stock-based compensation	(2,510)	(3,012)	(4,623)	(8,769)
Amortization of intangibles	(2,079)	(2,095)	(4,162)	(4,194)
Loss from operations	(7,764)	642	(16,172)	(8,685)
Non-operating expense, net	(3,384)	(2,664)	(6,601)	(5,953)
Loss before income taxes	$ (11,148)	$ (2,022)	$ (22,773)	$ (14,638)

Unallocated Corporate Expenses

Together with amortization of intangibles and stock-based compensation, the Company does not allocate restructuring and related charges, TVN acquisition and integration-related costs, and certain other non-recurring charges to the operating income (loss) for each segment because management does not include this information in the measurement of the performance of the operating segments. A measure of assets by segment is not applicable as segment assets are not included in the discrete financial information provided to the CODM.

Geographic Information

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Net Revenue (in thousands) (1)				
United States	$ 35,710	$ 40,468	$ 65,825	$ 82,244
Other Countries	49,155	58,692	99,146	107,043
Total	$ 84,865	$ 99,160	$ 164,971	$ 189,287

(1) Revenue is attributed to countries based on the location of the customer.

Market Information

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Market (in thousands)				
Service Provider	$ 43,438	$ 54,142	$ 87,650	$ 106,359
Broadcast and Media	41,427	45,018	77,321	82,928
Total	$ 84,865	$ 99,160	$ 164,971	$ 189,287

NOTE 17: COMMITMENTS AND CONTINGENCIES

Warranties

The Company accrues for estimated warranty costs at the time of product shipment. Management periodically reviews the estimated fair value of its warranty liability and records adjustments based on the terms of warranties provided to customers, historical and anticipated warranty claims experience, and estimates of the timing and cost of warranty claims. Activity for the Company's warranty accrual, which is included in "Accrued and other current liabilities", is summarized below (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Balance at beginning of period	$ 4,587	$ 4,522	$ 4,869	$ 4,381
Accrual for current period warranties	1,570	1,714	2,973	3,450
Warranty costs incurred	(1,355)	(1,589)	(3,040)	(3,184)
Balance at end of period	$ 4,802	$ 4,647	$ 4,802	$ 4,647

Purchase Obligations

The Company relies on a limited number of contract manufacturers and suppliers to provide manufacturing services for a substantial majority of its products. The Company had approximately $46.1 million of non-cancelable commitments to purchase inventories and other commitments as of June 28, 2019.

Standby Letters of Credit and Guarantees

As of June 28, 2019 and December 31, 2018, the Company has outstanding bank guarantees and standby letters of credit in aggregate of $2.5 million and $2.3 million, respectively, consisting of building leases and performance bonds issued to customers.

During 2017, one of the Company's subsidiaries entered into a $2.0 million credit facility with a foreign bank for the purpose of issuing performance guarantees. The credit facility is secured by a $2.2 million guarantee issued by the Company. There were no amounts outstanding under this credit facility as of June 28, 2019 and December 31, 2018, respectively.

Indemnification

Harmonic is obligated to indemnify its officers and the members of its Board of Directors (the "Board") pursuant to its bylaws and contractual indemnity agreements. Harmonic also indemnifies some of its suppliers and most of its customers for specified intellectual property matters pursuant to certain contractual arrangements, subject to certain limitations. The scope of these indemnities varies, but, in some instances, includes indemnification for damages and expenses (including reasonable attorneys' fees). There have been no amounts accrued in respect of these indemnification provisions through June 28, 2019.

Legal proceedings

In October 2011, Avid Technology, Inc. ("Avid") filed a complaint in the United States District Court for the District of Delaware alleging that the Company's MediaGrid product infringes two patents held by Avid. A jury trial on this complaint commenced on January 23, 2014 and, on February 4, 2014, the jury returned a unanimous verdict in favor of the Company, rejecting Avid's infringement allegations in their entirety. In January 2015, Avid filed an appeal with respect to the jury's verdict with the Federal Circuit. In January 2016, the Federal Circuit issued an order vacating the verdict of noninfringement and remanding the case to the trial court for a new trial on infringement.

In June 2012, Avid served a subsequent complaint in the United States District Court for the District of Delaware alleging that the Company's Spectrum product infringes one patent held by Avid. The complaint sought injunctive relief and unspecified damages. In September 2013, the U.S. Patent Trial and Appeal Board ("PTAB") authorized an inter partes review to be instituted as to claims 1-16 of the patent asserted in this second complaint. In July 2014, the PTAB issued a decision finding claims 1-10 invalid and claims 11-16 not invalid. The Company filed an appeal with respect to the PTAB's decision on claims 11-16 in September 2014, and the Federal Circuit affirmed the PTAB's decision in April 2016.

In July 2017, the court issued a scheduling order consolidating both cases and setting the trial date for November 6, 2017.

On October 19, 2017, the parties agreed to settle the consolidated cases by entering into a settlement and patent portfolio cross-license agreement, and the cases were dismissed with prejudice. In connection with the agreement, the Company recorded a $6.0 million litigation settlement expense in “Selling, general and administrative expenses” in the Company’s 2017 Consolidated Statement of Operations. Of the associated $6.0 million liability, $2.5 million was paid in October 2017, $1.5 million was paid in the second quarter of 2019, and $2.0 million will be paid in the third quarter of 2020.

From time to time, the Company is involved in lawsuits as well as subject to various legal proceedings, claims, threats of litigation, and investigations in the ordinary course of business, including claims of alleged infringement of third-party patents and other intellectual property rights, commercial, employment, and other matters. The Company assesses potential liabilities in connection with each lawsuit and threatened lawsuits and accrues an estimated loss for these loss contingencies if both of the following conditions are met: information available prior to issuance of the financial statements indicates that it is probable that a liability has been incurred at the date of the financial statements and the amount of loss can be reasonably estimated. While certain matters to which the Company is a party specify the damages claimed, such claims may not represent reasonably probable losses. Given the inherent uncertainties of litigation, the ultimate outcome of these matters cannot be predicted at this time, nor can the amount of possible loss or range of loss, if any, be reasonably estimated.

NOTE 18: SUBSEQUENT EVENT

On July 9, 2019, Comcast elected enterprise license pricing for the Company's CableOS software under the product supply agreement. In connection with the election, which is effective as of July 1, 2019 (the "Effective Date"), Comcast committed to $175 million in software license fees over the four-year term of the enterprise license, subject to certain incentive credits that may be earned by Comcast pursuant to other purchases of CableOS-related products. Comcast will pay the initial $50 million of the enterprise license fees in 2019.

In consideration for the election commitments and certain other purchase commitments, the Company deemed that all of the remaining milestones and thresholds required to fulfill each of the vesting requirements of the Warrant were satisfied and achieved or otherwise waived such that all Warrant shares were fully vested and exercisable as of the Effective Date. The remaining terms of the Warrant have not been modified or amended.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The terms "Harmonic," "Company," "we," "us," "its," and "our," as used in this Quarterly Report on Form 10-Q (this "Form 10-Q"), refer to Harmonic Inc. and its subsidiaries and its predecessors as a combined entity, except where the context requires otherwise.

Some of the statements contained in this Form 10-Q are forward-looking statements that involve risk and uncertainties. The statements contained in this Form 10-Q that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, including, without limitation, statements regarding our expectations, beliefs, intentions or strategies regarding the future. In some cases, you can identify forward-looking statements by terminology such as, "may," "will," "should," "expects," "plans," "anticipates," "believes," "intends," "estimates," "predicts," "potential," or "continue" or the negative of these terms or other comparable terminology. These forward-looking statements include, but are not limited to, statements regarding:

- developing trends and demands in the markets we address, particularly emerging markets;
- economic conditions, particularly in certain geographies, and in financial markets;
- new and future products and services;
- spending of our customers;
- our strategic direction, future business plans and growth strategy;
- industry and customer consolidation;
- expected demand for and benefits of our products and services;
- concentration of revenue sources;
- expectations regarding our CableOS solutions;
- expectations regarding the impact of warrants issued to Comcast on our business;
- potential future acquisitions and dispositions;
- anticipated results of potential or actual litigation;
- our competitive environment;
- the impact of our restructuring plans;
- the impact of governmental regulations, including with respect to tariffs and economic sanctions;
- anticipated revenue and expenses, including the sources of such revenue and expenses;
- expected impacts of changes in accounting rules;
- expectations regarding the usability of our inventory and the risk that inventory will exceed forecasted demand;
- expectations and estimates related to goodwill and intangible assets and their associated carrying value;
- expectations regarding the applicability of tax provisions, including with respect to credits related to our acquisition of Thomson Video Networks ("TVN"); and
- use of cash, cash needs and ability to raise capital, including repaying or refinancing our convertible notes.

These statements are subject to known and unknown risks, uncertainties and other factors, any of which may cause our actual results to differ materially from those implied by the forward-looking statements. Important factors that may cause actual results to differ from expectations include those discussed in "Risk Factors" beginning on page 44 of this Form 10-Q. All forward-looking statements included in this Quarterly Report on Form 10-Q are based on information available to us on the date thereof, and we assume no obligation to update any such forward-looking statements.

OVERVIEW

We are a leading global provider of (i) versatile and high performance video delivery software, products, system solutions and services that enable our customers to efficiently create, prepare, store, playout and deliver a full range of high-quality broadcast and OTT video services to consumer devices, including televisions, personal computers, laptops, tablets and smart phones and (ii) cable access solutions that enable cable operators to more efficiently and effectively deploy high-speed internet, for data, voice and video services to consumers' homes.

We had previously classified our total revenue in two categories, "Product" and "Service". Beginning in the first quarter of fiscal 2019, to better reflect the nature of our business and sharpen the focus on our revenue priorities, we have updated our revenue categories to "Appliance and integration" and "SaaS and service". The "Appliance and integration" revenue category includes hardware, licenses and professional services and is reflective of non-recurring revenue, while the "SaaS and service" category includes usage fees for our SaaS platform and support revenue stream from our appliance-based customers and reflects our recurring revenue stream.

We do business in three geographic regions: the Americas, EMEA and APAC and operate in two segments, Video and Cable Access. Our Video business sells video processing, production and playout solutions, and services worldwide to cable operators and satellite and telecommunications ("telco") Pay-TV service providers, which we refer to collectively as "service providers," as well as to broadcast and media companies, including streaming media companies. Our Video business infrastructure solutions are delivered either through shipment of our products, software licenses or as software-as-a-service ("SaaS") subscriptions. Our Cable Access business sells cable access solutions and related services, including our CableOS software-based cable access solution, primarily to cable operators globally.

Historically, our revenue has been dependent upon capital spending in the cable, satellite, telco, broadcast and media industries, including streaming media. Our customers' capital spending patterns are dependent on a variety of factors, including but not limited to: economic conditions in the U.S. and international markets; access to financing; annual budget cycles of each of the industries we serve; impact of industry consolidations; and customers suspending or reducing capital spending in anticipation of new products or new standards, new industry trends and/or technology shifts. If our product portfolio and product development plans do not position us well to capture an increased portion of the capital spending in the markets in which we compete, our revenue may decline. As we attempt to further diversify our customer base in these markets, we may need to continue to build alliances with other equipment manufacturers, content providers, resellers and system integrators, managed services providers and software developers; adapt our products for new applications; take orders at prices resulting in lower margins; and build internal expertise to handle the particular operational, payment, financing and/or contractual demands of our customers, which could result in higher operating costs for us.

A majority of our revenue has been derived from relatively few customers, due in part to the consolidation of our service provider customers. Sales to our 10 largest customers during the three and six months ended June 28, 2019 accounted for 42% and 39% of our net revenue, respectively, compared to 38% and 36% for the corresponding periods in 2018. Although we are attempting to broaden our customer base by penetrating new markets and further expanding internationally, we expect to see continuing industry consolidation and customer concentration. During the three months ended June 28, 2019, Comcast accounted for 10% of our net revenue. During the six months ended June 28, 2019, no single customer accounted for more than 10% of our net revenue. During the three and six months ended June 29, 2018, Comcast accounted for 15% and 14% of our net revenue, respectively. The loss of any significant customer, any material reduction in orders by any significant customer, or our failure to qualify our new products with a significant customer could materially and adversely affect our operating results, financial condition and cash flows.

Our net revenue decreased $14.3 million, or 14%, in the three months ended June 28, 2019, compared to the corresponding period in 2018, primarily due to a decrease in revenue of $7.6 million and $7.0 million in our Video segment and Cable Access segment revenue, respectively. Our net revenue decreased $24.3 million, or 13%, in the six months ended June 28, 2019, compared to the corresponding period in 2018, primarily due to a decrease in revenue of $12.2 million and $12.5 million in our Video segment and Cable Access segment revenue, respectively.

The decrease in our Cable Access segment revenue in the three and six months ended June 28, 2019 was primarily due to a shift in timing of CableOS related hardware shipments from the first half to the second half of the year, as a result of a temporary slowing in deployment by certain large customers for purposes of implementing trial-informed improvements to their system architectures before volume deployment. Subsequent to the second quarter of fiscal 2019, as a result of our announcement that Comcast has elected enterprise license pricing for CableOS software, we expect increasing deployments with our Cable Access customers. The decrease in our Video segment revenue in the three and six months ended June 28, 2019 was primarily due to a shift in timing of certain bookings from the first half of the year to later in the year. We also continue to experience SaaS opportunities taking more time to close than traditional appliance-based video processing sales opportunities, thereby creating a near-term impact on revenue.

Our Video segment customers continue to be cautious with investments in new technologies, such as next-generation IP architectures and Ultra HD. We believe a material and growing portion of the opportunities for our video business are linked to a migration by our customers to IP workflows and the distribution of linear and on-demand, OTT, and new mobile video services. We continue to steadily transition our video business away from legacy and customized computing hardware to more software-centric solutions and services, including OTT SaaS subscription offerings that enable video compression and processing through our VOS software platform running on standard off-the-shelf servers, in data centers and in the cloud.

Our Cable Access strategy is to continue to deliver software-based cable access technologies, which we refer to as our CableOS solutions, to our cable operator customers. We believe our CableOS software-based cable access solutions are superior to hardware-based systems and deliver unprecedented scalability, agility and cost savings for our customers. Our CableOS solutions, which can be deployed based on a centralized, distributed Remote PHY or hybrid architecture, enable our customers to migrate to multi-gigabit broadband capacity and the fast deployment of DOCSIS 3.1 data, video and voice services. We believe our CableOS solutions resolve space and power constraints in the headend and hub, eliminate dependence on hardware upgrade cycles and significantly reduce total cost of ownership, and will help us become a major player in the cable access market. In the meantime, we believe our Cable Access segment is gaining momentum in the marketplace as our customers have begun to adopt new virtualized DOCSIS 3.1 CMTS solutions and distributed access architectures. While we are in the early stages of field trials and deployments and may experience near-term challenges, we continue to make progress in the development of our CableOS solutions and in the growth of our CableOS business, with expanded commercial deployments, field trials, and customer engagements.

To support our Cable Access strategy and foster the further development and growth of this segment, in September 2016, we issued Comcast a Warrant to further incentivize Comcast to purchase our products and adopt our technologies, particularly our CableOS solutions. Pursuant to the Warrant, Comcast may purchase up to 7,816,162 shares of our common stock, for a per share exercise price of $4.76. On July 9, 2019, Comcast elected enterprise license pricing for the Company's CableOS software under the product supply agreement. In connection with the election, effective as of July 1, 2019 (the "Effective Date"), Comcast committed to $175 million in software license fees over the four-year term of the enterprise license, subject to certain incentive credits that may be earned by Comcast pursuant to other purchases of CableOS-related products. Comcast agreed to pay the initial $50 million of the enterprise license fees in 2019. In consideration for the election commitments and certain other purchase commitments, all of the remaining milestones and thresholds required to fulfill each of the vesting requirements of the Warrant were deemed satisfied and achieved or otherwise waived such that all Warrant shares were fully vested and exercisable as of the Effective Date. Because the Warrant is considered an incentive for Comcast to purchase certain of the Company’s products, the value of the Warrant is recorded as a reduction in the Company’s net revenues to the extent such value does not exceed net revenues from pertinent sales to Comcast. (See Note 15, “Warrants,” of the Notes to our Condensed Consolidated Financial Statements for additional information).

As the timing of our customers' investment decisions can be uncertain, we have implemented restructuring plans to better align the Company's resources and strategic goals. We continue to focus on expense controls on a company-wide basis. (See Note 10, “Restructuring and Related Charges” of the Notes to our Condensed Consolidated Financial Statements for additional information).

Our aggregate balance of cash and cash equivalents as of June 28, 2019 was $58.1 million. During the six months ended June 28, 2019, we used $4.6 million of cash from operating activities. We also entered into a line of credit with Silicon Valley Bank in September 2017 which has not been used to withdraw any cash to date. We expect that our current sources of liquidity will provide us adequate liquidity based on our current plan for the next twelve months.

CRITICAL ACCOUNTING POLICIES, JUDGMENTS AND ESTIMATES

Our unaudited condensed consolidated financial statements and the related notes included elsewhere in this report are prepared in accordance with U.S. GAAP. The preparation of these unaudited condensed consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Our critical accounting policies, judgments and estimates are disclosed in our 2018 Annual Report on Form 10-K, as filed with the SEC. There have been no significant changes to these policies during the six months ended June 28, 2019 other than those disclosed in Note 2 to the Condensed Consolidated Financial Statements in Item 1.

ACCOUNTING PRONOUNCEMENTS

For a summary of recent accounting pronouncements applicable to our condensed consolidated financial statements, see Note 2 to the Condensed Consolidated Financial Statements in Item 1, which is incorporated herein by reference.

RESULTS OF OPERATIONS

Net Revenue

The following table presents the breakdown of revenue by segment for the three and six months ended June 28, 2019 and June 29, 2018 (in thousands, except percentages):

	Three months ended		Q2 FY19 vs Q2 FY18		Six months ended		Q2 FY19 YTD vs Q2 FY18 YTD	
	June 28, 2019	June 29, 2018			June 28, 2019	June 29, 2018		
Segment:								
Video	$ 71,625	$ 79,208	$ (7,583)	(10)%	$ 138,801	$ 150,956	$ (12,155)	(8)%
Cable Access	13,263	20,236	(6,973)	(34)%	26,218	38,726	(12,508)	(32)%
Total segment revenue	84,888	99,444	(14,556)	(15)%	165,019	189,682	(24,663)	(13)%
Amortization of warrants	(23)	(284)	261	—	(48)	(395)	347	—
Total net revenue	$ 84,865	$ 99,160	$ (14,295)	(14)%	164,971	189,287	$ (24,316)	(13)%
Segment revenue as a % of total segment revenue:								
Video	84%	80%			84%	80%		
Cable Access	16%	20%			16%	20%		

The following table presents the breakdown of revenue by geographical region for the three and six months ended June 28, 2019 and June 29, 2018 (in thousands, except percentages):

	Three months ended		Q2 FY19 vs Q2 FY18		Six months ended		Q2 FY19 YTD vs Q2 FY18 YTD	
	June 28, 2019	June 29, 2018			June 28, 2019	June 29, 2018		
Geography:								
Americas	$ 42,437	$ 52,918	$ (10,481)	(20)%	$ 76,625	$ 101,774	$ (25,149)	(25)%
EMEA	25,203	31,676	(6,473)	(20)%	53,281	54,878	(1,597)	(3)%
APAC	17,225	14,566	2,659	18 %	35,065	32,635	2,430	7 %
Total net revenue	$ 84,865	$ 99,160	$ (14,295)	(14)%	$ 164,971	$ 189,287	$ (24,316)	(13)%
Regional revenue as a % of total net revenue:								
Americas	50%	53%			47%	54%		
EMEA	30%	32%			32%	29%		
APAC	20%	15%			21%	17%		

Our Video segment net revenue decreased 10% and 8% in the three and six months ended June 28, 2019, respectively, compared to the corresponding periods in 2018, primarily due to a shift in timing of certain bookings from the first half of the year to later in the year. We also continue to experience SaaS opportunities taking more time to close than traditional appliance-based video processing sales opportunities, thereby creating a near-term impact on revenue.

Our Cable Access segment net revenue decreased 34% and 32% in the three and six months ended June 28, 2019, respectively, compared to the corresponding periods in 2018. The decreases were primarily due to a shift in timing of CableOS related hardware shipments from the first half to the second half of the year, as a result of a temporary slowing by certain large customers for purposes of implementing trial-informed improvements to their system architectures before volume deployment.

Net revenue in the Americas decreased 20% and 25% in the three and six months ended June 28, 2019, respectively, compared to the corresponding periods in 2018, primarily due to a decrease in our Cable Access segment revenue.

EMEA net revenue decreased 20% and 3% in the three and six months ended June 28, 2019, respectively, compared to the corresponding periods in 2018, primarily due to a decrease in revenue in the Video segment.

APAC net revenue increased 18% and 7% in the three and six months ended June 28, 2019, respectively, compared to the corresponding periods in 2018, primarily due to an increase in revenue in the Video segment.

Gross Profit

The following table presents the gross profit and gross profit as a percentage of net revenue ("gross margin") for the three and six months ended June 28, 2019 and June 29, 2018 (in thousands, except percentages):

	Three months ended				Six months ended			
	June 28, 2019	June 29, 2018	Q2 FY19 vs Q2 FY18		June 28, 2019	June 29, 2018	Q2 FY19 YTD vs Q2 FY18 YTD	
Gross profit	$ 43,928	$ 51,603	$ (7,675)	(15)%	$ 85,777	$ 98,786	$ (13,009)	(13)%
As a percentage of net revenue ("gross margin")	51.8%	52.0%	(0.4)%		52.0%	52.2%	(0.1)%	

Our gross margins are dependent upon, among other factors, the proportion of software sales, product mix, customer mix, product introduction costs, price reductions granted to customers and achievement of cost reductions.

Despite a decrease in revenue, gross margin in the three and six months ended June 28, 2019 remained relatively flat compared to the corresponding periods in 2018. This was due to consistently maintaining a higher composition of software in the overall product mix in each period.

Research and Development

The following table presents the research and development expenses and the expenses as a percentage of net revenue for the three and six months ended June 28, 2019 and June 29, 2018 (in thousands, except percentages):

	Three months ended				Six months ended			
	June 28, 2019	June 29, 2018	Q2 FY19 vs Q2 FY18		June 28, 2019	June 29, 2018	Q2 FY19 YTD vs Q2 FY18 YTD	
Research and development	$ 21,313	$ 21,542	$ (229)	(1)%	$ 42,714	$ 44,999	$ (2,285)	(5)%
As a percentage of net revenue	25.1%	21.7%			25.9%	23.8%		

Our research and development expenses consist primarily of employee salaries and related expenses, contractors and outside consultants, supplies and materials, equipment depreciation and facilities costs, all associated with the design and development of new products and enhancements of existing products.

Research and development expenses decreased 1% and 5% in the three and six months ended June 28, 2019, respectively, compared to the corresponding periods in 2018, primarily due to lower employee compensation costs due to headcount reductions primarily in our Video segment, our continuing transformation from a capital-intensive hardware development model to a predominantly software development model and lower stock-based compensation expense due to the timing of certain grants.

Selling, General and Administrative

The following table presents the selling, general and administrative expenses and the expenses as a percentage of net revenue for the three and six months ended June 28, 2019 and June 29, 2018 (in thousands, except percentages):

	Three months ended		Q2 FY19 vs Q2 FY18		Six months ended		Q2 FY19 YTD vs Q2 FY18 YTD	
	June 28, 2019	June 29, 2018			June 28, 2019	June 29, 2018		
Selling, general and administrative	$ 29,319	$ 27,988	$ 1,331	5%	$ 57,330	$ 59,151	$ (1,821)	(3)%
As a percentage of net revenue	34.5%	28.2%			34.8%	31.2%		

Selling, general and administrative expenses increased 5% in the three months ended June 28, 2019 primarily due to incremental sales and marketing activity across both segments compared to the corresponding period in 2018.

Selling, general and administrative expenses decreased 3% in the six months ended June 28, 2019 compared to the corresponding period in 2018, primarily due to lower employee compensation costs due to headcount reductions, lower stock-based compensation expense due to the timing of certain grants, lower sales commissions and recovery of certain previously reserved receivables.

Segment Operating Income (Loss)

The following table presents a breakdown of operating income (loss) by segment for the three and six months ended June 28, 2019 and June 29, 2018 (in thousands, except percentages):

	Three months ended		Q2 FY19 vs Q2 FY18		Six months ended		Q2 FY19 YTD vs Q2 FY18 YTD	
	June 28, 2019	June 29, 2018			June 28, 2019	June 29, 2018		
Video	$ 4,459	$ 6,239	$ (1,780)	(29)%	$ 6,427	$ 8,234	$ (1,807)	(22)%
Cable Access	(7,243)	540	(7,783)	(1,441)%	(13,040)	(973)	(12,067)	1,240 %
Total segment operating income (loss)	$ (2,784)	$ 6,779	$ (9,563)	(141)%	$ (6,613)	$ 7,261	$ (13,874)	(191)%
Segment operating income (loss) as a % of segment revenue (“operating margin”):								
Video	6.2 %	7.9%	(1.7)%		4.6 %	5.5 %	(0.9)%	
Cable Access	(54.6)%	2.7%	(57.3)%		(49.7)%	(2.5)%	(47.2)%	

The operating margin for the Video segment in the three and six months ended June 28, 2019 decreased 1.7% and 0.9%, respectively, compared to the corresponding periods in 2018 primarily due to the decrease in revenue in each period, offset by lower operating expenses due to headcount reductions and lower discretionary spending as a result of vigilant cost management throughout the Company.

The operating margin for the Cable Access segment decreased 57.3% and 47.2% in the three and six months ended June 28, 2019, respectively, compared to the corresponding periods in 2018, primarily due to a decrease in high margin sales of CableOS software and support services. This decrease was partially offset by lower operating expenses due to headcount reductions and lower discretionary spending as a result of vigilant cost management throughout the Company.

The following table presents a reconciliation of total segment operating income (loss) to consolidated loss before income taxes (in thousands):

	Three months ended		Six months ended	
	June 28, 2019	June 29, 2018	June 28, 2019	June 29, 2018
Total segment operating income (loss)	$ (2,784)	$ 6,779	$ (6,613)	$ 7,261
Amortization of warrants	(23)	(284)	(48)	(395)
Unallocated corporate expenses	(368)	(746)	(726)	(2,588)
Stock-based compensation	(2,510)	(3,012)	(4,623)	(8,769)
Amortization of intangibles	(2,079)	(2,095)	(4,162)	(4,194)
Income (loss) from operations	(7,764)	642	(16,172)	(8,685)
Non-operating expense, net	(3,384)	(2,664)	(6,601)	(5,953)
Loss before income taxes	$ (11,148)	$ (2,022)	$ (22,773)	$ (14,638)

Unallocated Corporate Expenses

Together with amortization of intangibles and stock-based compensation, we do not allocate restructuring and related charges and certain other non-recurring charges to the operating income for each segment because our management does not include this information in the measurement of the performance of the operating segments.

Amortization of Intangibles

The following table presents the amortization of intangible assets charged to operating expenses and the expense as a percentage of net revenue for the three and six months ended June 28, 2019 and June 29, 2018 (in thousands, except percentages):

	Three months ended		Q2 FY19 vs Q2 FY18		Six months ended		Q2 FY19 YTD vs Q2 FY18 YTD	
	June 28, 2019	June 29, 2018			June 28, 2019	June 29, 2018		
Amortization of intangibles	$ 784	$ 800	$ (16)	(2)%	$ 1,572	$ 1,604	$ (32)	(2)%
As a percentage of net revenue	0.9%	0.8%			1.0%	0.8%		

The amortization of intangibles expense in the three and six months ended June 28, 2019 remained relatively flat compared to the corresponding periods in 2018.

Restructuring and related charges

We have implemented certain restructuring plans in the past few years. The goal of these plans is to bring operational expenses to appropriate levels relative to our net revenues, while simultaneously implementing extensive company-wide expense control programs.

The restructuring and related charges are included in “Cost of revenue” and “Operating expenses-restructuring and related charges” in the Condensed Consolidated Statement of Operations. The following table summarizes the restructuring and related charges (in thousands, except percentages):

	Three months ended				Six months ended			
	June 28, 2019	June 29, 2018	Q2 FY19 vs Q2 FY18		June 28, 2019	June 29, 2018	Q2 FY19 YTD vs Q2 FY18 YTD	
Restructuring and related charges in:								
Cost of revenue	$ 91	$ 115	$ (24)	(21)%	$ 392	$ 877	$ (485)	(55)%
Operating expenses-Restructuring and related charges	276	631	(355)	(56)%	333	1,717	(1,384)	(81)%
Total restructuring and related charges	$ 367	$ 746	$ (379)	(51)%	$ 725	$ 2,594	$ (1,869)	(72)%

Restructuring and related charges in the three and six months ended June 28, 2019 decreased by 51% and 72%, respectively, compared to the corresponding periods in 2018, primarily due to higher severance and employee benefit costs recorded under the restructuring plan initiated in the first quarter of 2018. See Note 10, “Restructuring and Related Charges,” of the notes to our Condensed Consolidated Financial Statements for additional information.

Interest Expense, Net

Interest expense, net was $3.0 million and $2.9 million for the three months ended June 28, 2019 and June 29, 2018, respectively. Interest expense, net was $5.9 million and $5.6 million for the six months ended June 28, 2019 and June 29, 2018, respectively. Interest expense, net increased in the three and six months ended June 28, 2019, compared to the corresponding periods in 2018, primarily due to higher amortization of debt discount and issuance costs for the Notes issued in December 2015.

Other Income (Expense), Net

Other income (expense), net was $(0.4) million and $0.2 million for the three months ended June 28, 2019 and June 29, 2018, respectively. Other expense, net was $0.7 million and $0.3 million for the six months ended June 28, 2019 and June 29, 2018, respectively. The increase in Other income (expense), net during the three and six months ended June 28, 2019, compared to the corresponding periods in 2018, was primarily due to recovery of previously expensed bad debts and a gain from a change in the fair valuation of equity investment in the second quarter of 2018 which did not recur in 2019.

Our other income (expense), net is primarily comprised of foreign exchange gains and losses on cash, accounts receivable and intercompany balances denominated in currencies other than the functional currency of the reporting entity. Our foreign currency exposure is primarily driven by fluctuations in the foreign currency exchanges rates of the Euro, British pound, Japanese yen and Israeli shekel.

To mitigate the volatility related to fluctuations in foreign exchange rates, we enter into various foreign currency forward contracts. See “Foreign Currency Exchange Risk” under Item 3 of this Quarterly Report on Form 10-Q for additional information.

Income Taxes

The following table presents the provision for (benefit from) income taxes and the effective income tax rate for the three and six months ended June 28, 2019 and June 29, 2018 (in thousands, except percentages):

	Three months ended		Q2 FY19 vs Q2 FY18		Six months ended		Q2 FY19 YTD vs Q2 FY18 YTD	
	June 28, 2019	June 29, 2018			June 28, 2019	June 29, 2018		
Provision for (benefit from) income taxes	$ 697	$ 891	$ (194)	(22)%	$ 378	$ 1,969	$ (1,591)	(81)%
Effective income tax rate	(6.3)%	(44.1)%			(1.7)%	(13.5)%		

We operate in multiple jurisdictions and our profits are taxed pursuant to the tax laws of these jurisdictions. Our effective income tax rate may be affected by changes in, or interpretations of tax laws and tax agreements in any given jurisdiction, utilization of net operating loss and tax credit carry forwards, changes in geographical mix of income and expense, and changes in management's assessment of matters such as the ability to realize deferred tax assets. Our effective tax rate varies from year to year primarily due to the absence of several one-time, discrete items that benefited or decremented the tax rates in the previous years.

Our effective income tax rate of (1.7%) for the six months ended June 28, 2019 was different from the U.S. federal statutory rate of 21%, primarily due to our geographical mix of income and losses, the full valuation allowance against U.S. federal, California and other state deferred tax assets, foreign withholding taxes and income taxes on earnings from operations in foreign tax jurisdictions. In addition, during the six months ended June 28, 2019, we recorded a one-time benefit of approximately $0.8 million due to a valuation allowance release for one of our foreign subsidiaries. This release of valuation allowance was due to changes in forecasted taxable income resulting from receiving a favorable tax ruling during the period.

Our effective income tax rate of (13.5)% for the six months ended June 29, 2018 was different from the U.S. federal statutory rate of 21%, primarily due to our geographical income mix and favorable tax rates associated with certain earnings from operations in lower-tax jurisdictions, the increase in the valuation allowance against U.S. federal, California and other state deferred tax assets, detriment from non-deductible stock-based compensation, and the net of various discrete tax adjustments. For the six months ended June 29, 2018, the discrete adjustments to our tax expense were primarily withholding taxes.

Liquidity and Capital Resources

As of June 28, 2019, our principal sources of liquidity consisted of cash and cash equivalents of $58.1 million, net accounts receivable of $70.6 million, our $15 million line of credit with Silicon Valley Bank, described in more detail below, and financing from French government agencies. As of June 28, 2019, we had $128.3 million in aggregate principal amount of convertible senior notes outstanding ("Notes"), which are due on December 1, 2020. The Notes bear interest at a fixed rate of 4.0% per year, payable semiannually in arrears on June 1 and December 1 of each year. We also had debts with French government agencies and to a lesser extent, with other financial institutions, primarily in France, in the aggregate of $18.0 million at June 28, 2019.

Our cash and cash equivalents of $58.1 million as of June 28, 2019 consisted of bank deposits held throughout the world, of which $50.7 million of the cash and cash equivalents balance was held outside of the U.S. At present, such foreign funds are considered to be indefinitely reinvested in foreign countries to the extent of indefinitely reinvested foreign earnings. In the event funds from foreign operations are needed to fund cash needs in the United States and if U.S. taxes have not already been previously accrued, we may be required to accrue and pay additional U.S. and foreign withholding taxes in order to repatriate these funds.

Our principal uses of cash will include repayments of debts and related interest, purchases of inventory, payroll and other operating expenses related to the development and marketing of our products, purchases of property and equipment and other contractual obligations for the foreseeable future. We believe that our cash and cash equivalents of $58.1 million at June 28, 2019 will be sufficient to fund our principal uses of cash for at least the next 12 months. However, we may need to raise additional funds to fund our operations, take advantage of unanticipated strategic opportunities or strengthen our financial position. In the future, we may enter into other arrangements for potential investments in, or acquisitions of, complementary businesses, services or technologies, which could require us to seek additional equity or debt financing. Additional funds may not be available on terms favorable to us or at all.

On September 27, 2017, we entered into a Loan and Security Agreement (the "Loan Agreement") with Silicon Valley Bank (the "Bank"). The Loan Agreement provides for a secured revolving credit facility in an aggregate principal amount of up to $15.0 million. Under the terms of the Loan Agreement, the principal amount of loans, plus the face amount of any outstanding letters of credit, at any time cannot exceed up to 85% of our eligible receivables. Under the terms of the Loan Agreement, we may also request letters of credit from the Bank. The face value of any outstanding letters of credit reduce the amount otherwise available under the revolving credit facility. Loans under the Loan Agreement will bear interest at our option, and subject to certain conditions, at an annual rate of either a prime rate or a LIBOR rate plus an applicable margin of 2.25%. There will be no applicable margin for prime rate advances when we are in compliance with the liquidity requirement of at least $20.0 million in the aggregate of consolidated cash plus availability under the Loan Agreement (the "Liquidity Requirement") and a 0.25% margin for prime rate advances when we are not in compliance with the Liquidity Requirement. We may not request LIBOR advances when not in compliance with the Liquidity Requirement. Interest on each advance is due and payable monthly and the principal balance is due at maturity. Our obligations under the revolving credit facility are secured by a security interest on substantially all of its assets, excluding intellectual property. The Loan Agreement contains customary affirmative and negative covenants. We must comply with financial covenants requiring maintaining (i) a minimum short-term asset to short-term liabilities ratio and (ii) minimum adjusted EBITDA, in the amounts and for the periods as set forth in the Loan Agreement. We must also maintain a minimum liquidity amount, comprised of unrestricted cash held at accounts with the Bank plus proceeds available to be drawn under the Loan Agreement, equal to $10.0 million at all times. As of June 28, 2019, we were in compliance with the covenants under the Loan Agreement.

As of June 28, 2019, the Company had committed $2.1 million towards security for letters of credit issued under the Loan Agreement. There were no cash borrowings under the Loan Agreement as of June 28, 2019.

The table below sets forth selected cash flow data for the periods presented (in thousands):

	Six months ended	
	June 28, 2019	**June 29, 2018**
Net cash provided by (used in):		
Operating activities	$ (4,646)	$ 3,248
Investing activities	(2,939)	(3,181)
Financing activities	(340)	(3,864)
Effect of foreign exchange rate changes on cash, cash equivalents and restricted cash	—	(588)
Net decrease in cash, cash equivalents and restricted cash	$ (7,925)	$ (4,385)

Operating Activities

Net cash used in operations increased $7.9 million in the six months ended June 28, 2019, compared to the corresponding period in 2018, primarily due to an increase in net loss and higher cash being used for our working capital needs.

We expect that cash provided by or used in operating activities may fluctuate in future periods as a result of a number of factors, including fluctuations in our operating results, shipment linearity, accounts receivable collections performance, inventory and supply chain management, and the timing and amount of compensation and other payments.

Investing Activities

Net cash used in investing activities decreased $0.2 million in the six months ended June 28, 2019, compared to the corresponding period in 2018, due to a decrease in purchases of property and equipment.

Financing Activities

Net cash used in financing activities decreased $3.5 million in the six months ended June 28, 2019, compared to the corresponding period in 2018, primarily due to an increase in the French R&D tax credit collected in the current period, partially offset by higher payment of tax withholding obligations related to net share settlements of restricted stock units.

Contractual Obligations and Commitments

Future payments under contractual obligations and other commercial commitments, as of June 28, 2019 are as follows (in thousands):

	Payments due in each fiscal year				
	Total Amounts Committed	2019 (Remaining six months)	2020 and 2021	2022 and 2023	Thereafter
Convertible debt	$ 128,250	$ —	$ 128,250	$ —	$ —
Purchase commitments	46,122	30,472	14,084	1,566	—
Operating leases	50,195	5,624	15,344	8,650	20,577
TVN debt	17,977	946	11,860	4,944	227
Interest on convertible debt	7,695	2,565	5,130	—	—
Other commitments (1)	3,022	1,404	1,574	44	—
Avid litigation settlement fees	2,000	—	2,000	—	—
TVN VDP Obligations	1,410	591	819	—	—
Finance lease	99	77	22	—	—
Total contractual obligations	$ 256,770	$ 41,679	$ 179,083	$ 15,204	$ 20,804
Other commercial commitments:					
Standby letters of credit	$ 2,376	$ 97	$ 2,279	$ —	$ —
Total commercial commitments	$ 2,376	$ 97	$ 2,279	$ —	$ —

(1) Primarily includes variable lease payments that do not depend on an index or rate, or usage of an underlying asset, and payments associated with lease arrangements with an initial term of twelve months or less.

Off-Balance Sheet Arrangements

We did not have any off-balance sheet arrangements as of June 28, 2019.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market risk represents the risk of loss that may impact our operating results, financial position or liquidity due to adverse changes in market prices and rates. We are exposed to market risk because of changes in interest rates, foreign currency exchange rates, when other currencies held by our subsidiaries are measured against the U.S. dollar, and to changes in the value of financial instruments held by us.

Foreign Currency Exchange Risk

We market and sell our products and services through our direct sales force and indirect channel partners in North America, EMEA, APAC and Latin America. Accordingly, we are subject to exposure from adverse movements in foreign currency exchange rates, primarily the Euro, British pound, Israeli shekel and Japanese yen. Our U.S. dollar functional subsidiaries, which accounted for approximately 93% of our consolidated net revenue in the six months ended June 28, 2019, recorded net billings denominated in foreign currencies of approximately 17% of their net billings in the six months of 2019, compared to 16% in the corresponding period in 2018. In addition, a portion of our operating expenses, primarily the cost of personnel to deliver technical support on our products and professional services, sales and sales support and research and development, are denominated in foreign currencies, primarily the Euro, Israeli shekel and British pound.

We use derivative instruments, primarily forward contracts, to manage exposures to foreign currency exchange rates and we do not enter into foreign currency forward contracts for trading purposes.

Derivatives Not Designated as Hedging Instruments (Balance Sheet Hedges)

We enter into forward currency contracts to hedge foreign currency denominated monetary assets and liabilities. These derivative instruments are marked to market through earnings each accounting period and mature generally within three months. Changes in the fair value of these foreign currency forward contracts are recognized in “Other expense, net” in the Condensed Consolidated Statement of Operations and are largely offset by the changes in the fair value of the underlying assets or liabilities being hedged.

The U.S. dollar equivalents of all outstanding notional amounts of foreign currency forward contracts, including the Euro, British pound, Israeli shekel and Japanese yen, are summarized as follows (in thousands):

	June 28, 2019	December 31, 2018
Derivatives not designated as hedging instruments:		
Purchase	$ 33,716	$ 28,975

Interest Rate Risk

Our exposure to market risk for changes in interest rates relates primarily to our outstanding debt arrangements with variable rate interests. The aggregate debt balance of such instruments at June 28, 2019 was $18.1 million, of which $0.1 million relates to obligations under finance leases with fixed interest rates. The remaining $18.0 million are debt instruments primarily financed by French government agencies, and to a lesser extent, term loans from other financing institutions. These debt instruments have maturities ranging from three to seven years, with expiries ranging from 2019 through 2025. A majority of the loans are tied to the 1-month EURIBOR rate plus spread. See Note 11, “Convertible notes, Other Debts and Finance Leases” of the notes to our Condensed Consolidated Financial Statements for additional information. As of June 28, 2019, a hypothetical 1.0% increase in market interest rates on our debts subject to variable interest rate fluctuations would increase our interest expense by approximately $0.2 million annually.

As of June 28, 2019, we had $128.3 million aggregate principal amount of the Notes outstanding, which have a fixed 4.0% coupon rate.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of disclosure controls and procedures

We maintain “disclosure controls and procedures,” as such term is defined in Rule 13a-15(e) under the Exchange Act, that are designed to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

In designing and evaluating our disclosure controls and procedures, management recognized that disclosure controls and procedures, no matter how well conceived and operated, can provide only reasonable, and not absolute, assurance that the objectives of the disclosure controls and procedures are met. Additionally, in designing disclosure controls and procedures, our management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible disclosure controls and procedures. The design of any disclosure controls and procedures also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Based on their evaluation as of the end of the period covered by this Form 10-Q, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures were effective at a reasonable assurance level.

Changes in Internal Control over Financial Reporting

Our Chief Executive Officer and Chief Financial Officer evaluated the changes in our internal control over financial reporting that occurred during the quarterly period covered by this Form 10-Q. Based on their evaluation, it is concluded that there had been no change in our internal control over financial reporting during the quarter ended June 28, 2019 that have materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II

OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

From time to time, we are involved in lawsuits as well as subject to various legal proceedings, claims, threats of litigation, and investigations in the ordinary course of business, including claims of alleged infringement of third-party patents and other intellectual property rights, commercial, employment, and other matters. While certain matters to which we are a party may specify the damages claimed, such claims may not represent reasonably possible losses. Given the inherent uncertainties of litigation, the ultimate outcome of these matters cannot be predicted at this time, nor can the amount of possible loss or range of loss, if any, be reasonably estimated.

An unfavorable outcome on any litigation matters could require us to pay substantial damages, or, in connection with any intellectual property infringement claims, could require us to pay ongoing royalty payments or could prevent us from selling certain of our products. As a result, a settlement of, or an unfavorable outcome on, any of the matters referenced above or other litigation matters could have a material adverse effect on our business, operating results, financial condition and cash flows.

Our industry is characterized by the existence of a large number of patents and frequent claims and related litigation regarding patent and other intellectual property rights. From time to time, third parties have asserted, and may in the future assert, exclusive patent, copyright, trademark and other intellectual property rights against us or our customers. Such assertions arise in the normal course of our operations. The resolution of any such assertions and claims cannot be predicted with certainty.

ITEM 1A. RISK FACTORS

We depend on cable, satellite and telco, and broadcast and media industry spending for our revenue and any material decrease or delay in spending in any of these industries would negatively impact our operating results, financial condition and cash flows.

Our revenue has been derived from worldwide sales to service providers and broadcast and media companies, as well as, in recent years, streaming media companies. We expect that these markets will provide our revenue for the foreseeable future. Demand for our products will depend on the magnitude and timing of spending by customers in each of these markets for the purpose of creating, expanding or upgrading their systems. These spending patterns are dependent on a variety of factors, including:

- the impact of general economic conditions, actual and projected;
- access to financing;
- annual budget cycles of customers in each of the industries we serve;
- the impact of industry consolidation;
- customers suspending or reducing spending in anticipation of: (i) new video or cable industry standards; (ii) industry trends and technology shifts, such as virtualization and cloud-based solutions, and (iii) new products, such as products and services based on our VOS software platform or our CableOS software-based cable access solution;
- delayed or reduced spending as customers transition to or contemplate adopting new business and operating models enabled by software- and cloud-based solutions, including software-as-a-service (SaaS) unified video processing solutions;
- federal, state, local and foreign government regulation of telecommunications, television broadcasting and streaming media;
- overall demand for communication services and consumer acceptance of new video and data technologies and services;
- competitive pressures, including pricing pressures;
- the impact of fluctuations in currency exchange rates; and
- discretionary end-user customer spending patterns.

In the past, specific factors contributing to reduced spending have included:

- weak or uncertain economic and financial conditions in the U.S. or one or more international markets;
- uncertainty related to development of digital video industry standards;
- delays in evaluations of new services, new standards and systems architectures by many operators;
- emphasis by operators on generating revenue from existing customers, rather than from new customers, through construction, expansion or upgrades;
- a reduction in the amount of capital available to finance projects of our customers and potential customers;
- proposed and completed business combinations and divestitures by our customers and the length of regulatory review of each;
- completion of a new system or significant expansion or upgrade to a system; and

• bankruptcies and financial restructuring of major customers.

In the past, adverse economic conditions in one or more of the geographies in which we offer our products have adversely affected our customers’ spending in those geographies and, as a result, our business. During challenging economic times, and in tight credit markets, many customers may delay or reduce capital expenditures. This could result in reductions in revenue from our products, longer sales cycles, difficulties in collection of accounts receivable, slower adoption of new technologies and increased price competition. If global economic and market conditions, or economic conditions in the U.S., Europe or other key markets, deteriorate, we could experience a material and adverse effect on our business, results of operations, financial condition and cash flows. Additionally, since most of our international revenue is denominated in U.S. dollars, global economic and market conditions may impact currency exchange rates and cause our products to become relatively more expensive to customers in a particular country or region, which could lead to delayed or reduced spending in those countries or regions, thereby negatively impacting our business and financial condition.

In addition, industry consolidation has in the past constrained, and may in the future constrain or delay, spending by our customers. Further, if our product portfolio and product development plans do not position us well to capture an increased portion of the spending of customers in the markets on which we focus, our revenue may decline.

As a result of these various factors and potential issues related to customer spending, we may not be able to maintain or increase our revenue in the future, and our operating results, financial condition and cash flows could be materially and adversely affected.

The markets in which we operate are intensely competitive.

The markets for our products are extremely competitive and have been characterized by rapid technological change and declining average sales prices in the past.

Large integrated system suppliers, such as Arris Group, Cisco Systems and Ericsson, with which we have historically competed in our Video business segment, announced sale and divestiture transactions in the last several months that impacted these companies’ video businesses: Arris was acquired by CommScope; Cisco Systems sold its video solutions group (now called Synamedia) to Permira, a private equity firm; and Ericsson completed the sale of a majority stake in its MediaKind video technology business to One Equity Partners, a private equity firm. In certain product lines, our competitors include companies such as ATEME and Elemental Technologies (an Amazon Web Services company). With respect to production and playout products, competitors include Evertz Microsystems, EVS, Grass Valley (a Belden brand) and Imagine Communications. In the OTT market, our competitors include end-to-end online video platforms such as Brightcove and Verizon Digital Media Services, who provide comprehensive OTT infrastructure solutions, some of which overlap with our products and services. Our competitors in our Cable Access business include Arris, Casa Systems, Cisco Systems and Huawei Technologies.

A number of our principal business competitors in both of our business segments are substantially larger and/or may have access to greater financial, technical, marketing and other resources than we have. Consolidation in the Video industry has led to the acquisition of a number of our historic competitors over the last several years by substantially larger companies and private equity firms. With respect to our Cable Access business, our competitors are also substantially larger than us, and the acquisition of Arris by CommScope will create a significantly larger combined business.

In addition, some of our larger competitors have more long-standing and established relationships with domestic and foreign customers. Many of these large enterprises are in a better position to withstand any significant reduction in spending by customers in our markets. They often have broader product lines and market focus, and may not be as susceptible to downturns in a particular market. These competitors may also be able to bundle their products together to meet the needs of a particular customer, and may be capable of delivering more complete solutions than we are able to provide. To the extent large enterprises that currently do not compete directly with us choose to enter our markets by acquisition or otherwise, competition would likely intensify.

Further, some of our competitors that have greater financial resources have offered, and in the future may offer, their products at lower prices than we offer for our competing products or on more attractive financing or payment terms, which has in the past caused, and may in the future cause, us to lose sales opportunities and the resulting revenue or to reduce our prices in response to that competition. Also, some competitors that are smaller than we are have engaged in, and may continue to engage in, aggressive price competition in order to gain customer traction and market share. Reductions in prices for any of our products could materially and adversely affect our operating margins and revenue.

Additionally, certain customers and potential customers have developed, and may continue to develop, their own solutions that may cause such customers or potential customers to not consider our product offerings or to displace our installed products with their own solutions. The growing availability of open source codecs and related software, as well as new server chipsets that incorporate encoding technology, has, in certain respects, lowered the barriers to entry for the video processing industry. The development of solutions by potential and existing customers and the reduction of the barriers to entry to enter the video processing industry could result in increased competition and adversely affect our results of operations and business.

If any of our competitors' products or technologies were to become the industry standard, our business could be seriously harmed. If our competitors are successful in bringing their products to market earlier than us, or if these products are more technologically capable than ours, our revenue could be materially and adversely affected.

We need to develop and introduce new and enhanced products in a timely manner to meet the needs of our customers and to remain competitive.

All of the markets we address are characterized by continuing technological advancement, changes in customer requirements and evolving industry standards. To compete successfully, we must continually design, develop, manufacture and sell new or enhanced products that provide increasingly higher levels of performance and reliability and meet our customers changing needs. However, we may not be successful in those efforts if, among other things, our products:

- are not cost effective;
- are not brought to market in a timely manner;
- are not in accordance with evolving industry standards;
- fail to meet market acceptance or customer requirements; or
- are ahead of the needs of their markets.

We are currently developing and marketing products based on the latest video compression standards, such as HEVC, which provides significantly greater compression efficiency, thereby making more bandwidth available to operators. At the same time, we continue to devote development resources to enhance the existing AVC/H.264 compression of our products, which many of our customers continue to require. There can be no assurance that these efforts will be successful in the near future, or at all, or that our competitors will not take significant market share in encoding or transcoding.

We continue to focus our development efforts on key product solutions in our Video and Cable Access businesses. Our VOS solution is a software-based, cloud-enabled platform that unifies the entire media processing chain, from ingest to delivery. We have launched a number of VOS-based product solutions and services, including our VOS Cluster and VOS360 SaaS solutions, and continue to develop and expand the capabilities of our VOS software platform. In our Cable Access business, we have launched and continue to develop our CableOS software-based cable access solutions.

Many of these products and initiatives are intended to integrate existing and new features and functions in response to shifts in customer demands in the relevant market, as well as to general technology trends that we believe will significantly impact our industry. The success of these significant and costly development efforts will be predicated, for certain products and initiatives, on the timing of market adoption of the new standards on which the resulting products are based, and for other products, the timing of customer adoption of our products and solutions, as well as our ability to timely develop the features and capabilities of our products and solutions. If new standards or some of our new products are adopted later than we predict or not adopted at all, or if adoption occurs earlier than we are able to deliver the applicable products or functionality, we risk spending significant research and development time and dollars on products or features that may never achieve market acceptance or that miss the customer demand window and thus do not produce the revenue that a timely introduction would have likely produced.

If we fail to develop and market new and enhanced products on a timely basis, our operating results, financial condition and cash flows could be materially and adversely affected.

Our software-based cable access product initiatives expose us to certain technology transition risks that may adversely impact our operating results, financial condition and cash flows.

We believe our CableOS software-based cable access solutions, supporting centralized, distributed Remote PHY or hybrid configurations, will significantly reduce cable headend costs and increase operational efficiency, and are an important step in cable operators' transition to all-IP networks. If we are unsuccessful in developing and deploying our cable access solutions in a timely manner, or are otherwise delayed in making our solutions available to our customers, our business may be adversely impacted, particularly if our competitors develop and market similar products and solutions before we do.

We believe software-based cable access solutions will, over time, replace and make obsolete current CMTS solutions, which is a market our products have historically not addressed, as well as cable edge-QAM products. If demand for our software-based cable access solutions is weaker than expected, our near and long-term operating results, financial condition and cash flows could be adversely impacted. Further, in September 2016 we granted Comcast a warrant (the "Warrant") to purchase shares of our common stock to further incentivize them to purchase our products and adopt our technologies, particularly our CableOS software-based cable access solution. Notwithstanding Comcast's recent election to license our CableOS software and its significant commitment in software license fees to us, if Comcast deploys our CableOS solution in its networks more slowly than we anticipate or at a scale below our expectations, we may be unable to fully realize the anticipated benefits of our relationship with Comcast and our business and operating results, financial condition and cash flows could be materially and adversely affected. Moreover, if competitors adapt new cable industry technology standards into competing cable access solutions faster than we do, or promulgate a new or competitive architecture for next-generation cable access solutions that renders our CableOS solution obsolete, our business may be adversely impacted.

The sales cycle for our CableOS solutions tends to be long. For cable operators, upgrading or expanding network infrastructure is complex and expensive, and investing in a CableOS solution is a significant strategic decision that may require considerable time to evaluate, test and qualify. Potential customers need to ensure our CableOS solution will interoperate with the various components of its existing network infrastructure, including third-party equipment, servers and software. In addition, since we are a relatively new entrant into the CMTS market, we need to demonstrate significant performance, functionality and/or cost advantages with our CableOS solutions that outweigh customer switching costs. If sales cycles are significantly longer than anticipated or we are otherwise unsuccessful in growing our CableOS sales, our operating results, financial condition and cash flows could be materially and adversely affected.

Our future growth depends on market acceptance of several broadband services, on the adoption of new broadband technologies, and on several other broadband industry trends.

Future demand for many of our products will depend significantly on the growing market acceptance of emerging broadband services, including digital video, VOD, Ultra HD, IP video services (particularly streaming to tablet computers, connected TVs and mobile devices) and very high-speed data services. The market demand for such emerging services is rapidly growing, with many custom or proprietary systems in use, which increases the challenge of delivering interoperable products intended to address the requirements of such services.

The effective delivery of these services will depend, in part, on a variety of new network architectures, standards and devices, such as:

- the adoption of cloud-native media processing architectures;
- the adoption of advanced video compression standards, such as next generation H.264 compression and HEVC;
- the adoption of our cable access solutions;
- fiber to the premises, or FTTP, networks designed to facilitate the delivery of video services by telcos;

- the greater use of protocols such as IP;

- the further adoption of bandwidth-optimization techniques, such as DOCSIS 3.0 and DOCSIS 3.1 and associated specifications; and

- the introduction of new consumer devices, such as advanced set-top boxes, cloud DVRs, connected TVs, tablet computers, and a variety of smart phone mobile devices.

If adoption of these emerging services and/or technologies is not as widespread or as rapid as we expect, or if we are unable to develop new products based on these technologies on a timely basis, our operating results, financial condition and cash flows could be materially and adversely affected.

Furthermore, other technological, industry and regulatory trends and requirements may affect the growth of our business.
These trends and requirements include the following:

- convergence, whereby network operators bundle video, voice and data services to consumers, including mobile delivery options;

- the increasing availability of traditional broadcast video content and video-on-demand on the Internet;

- adoption of high-bandwidth technology, such as DOCSIS 3.x, next generation LTE and FTTP;

- the use of digital video by businesses, governments and educational institutions;

- efforts by regulators and governments in the U.S. and internationally to encourage the adoption of broadband and digital technologies, as well as to regulate broadband access and delivery;

- consumer interest in higher resolution video such as Ultra HD or retina-display technologies on mobile devices;

- the need to develop partnerships with other companies involved in video infrastructure workflow and broadband services;

- the continued adoption of the television viewing behaviors of consumers in developed economies by the growing middle class across emerging economies;

- the extent and nature of regulatory attitudes towards issues such as network neutrality, competition between operators, access by third parties to networks of other operators, local franchising requirements for telcos to offer video, and other new services, such as mobile video; and

- the outcome of disputes and negotiations between content owners and service providers regarding rights of service providers to store and distribute recorded broadcast content, which outcomes may drive adoption of one technology over another in some cases.

If we fail to recognize and respond to these trends, by timely developing products, features and services required by these trends, we are likely to lose revenue opportunities and our operating results, financial condition and cash flows could be materially and adversely affected.

We depend significantly on our international revenue and are subject to the risks associated with international operations, including those of our resellers, contract manufacturers and outsourcing partners, which may negatively affect our operating results.

Revenue derived from customers outside of the U.S. for the six months ended June 28, 2019 and June 29, 2018 represented approximately 60% and 54% of our revenue, respectively. Although no assurance can be given with respect to international sales growth in any one or more regions, we expect that international revenue will likely continue to represent, from year to year, a majority, and potentially increasing, percentage of our annual revenue for the foreseeable future. A significant percentage of our revenue is generated from sales to resellers, value-added resellers (“VARs”) and systems integrators, particularly in emerging market countries. Furthermore, the majority of our employees are based in our international offices and locations, and most of our contract manufacturing occurs outside of the U.S. In addition, we outsource a portion of our research and development activities to certain third-party partners with development centers located in different countries, particularly Ukraine and India.

Our international operations, the international operations of our resellers, contract manufacturers and outsourcing partners, and our efforts to maintain and increase revenue in international markets are subject to a number of risks, which are generally greater with respect to emerging market countries, including the following:

• growth and stability of the economy in one or more international regions;

• fluctuations in currency exchange rates;

• changes in foreign government regulations and telecommunications standards;

• import and export license requirements, tariffs, taxes, economic sanctions, contractual limitations and other trade barriers;

• our significant reliance on resellers and others to purchase and resell our products and solutions, particularly in emerging market countries;

• availability of credit, particularly in emerging market countries;

• longer collection periods and greater difficulty in enforcing contracts and collecting accounts receivable, especially from smaller customers and resellers, particularly in emerging market countries;

• compliance with the U.S. Foreign Corrupt Practices Act (the "FCPA"), the U.K. Bribery Act and/or similar anti-corruption and anti-bribery laws, particularly in emerging market countries;

• the burden of complying with a wide variety of foreign laws, treaties and technical standards;

• fulfilling "country of origin" requirements for our products for certain customers;

• difficulty in staffing and managing foreign operations;

• business and operational disruptions or delays caused by political, social and economic instability and unrest, including risks related to terrorist activity, particularly in emerging market countries (e.g., recent significant civil, political and economic disturbances in Ukraine);

• changes in economic policies by foreign governments, including the imposition and potential continued expansion of economic sanctions by the U.S. and the European Union on the Russian Federation;

• changes in diplomatic and trade relationships, including the imposition of new trade restrictions, trade protection measures, import or export requirements, trade embargoes and other trade barriers, including those imposed by the U.S. against China;

• any negative economic impacts resulting from the political environment in the U.S. or the U.K.'s referendum to exit the European Union; and

• business and economic disruptions and delays caused by outbreaks of disease, epidemics and potential pandemics.

We have certain international customers who are billed in their local currency, primarily the Euro, British pound and Japanese yen, which subjects us to foreign currency risk. In addition, a portion of our operating expenses relating to the cost of certain international employees, are denominated in foreign currencies, primarily the Euro, Israeli shekel, British pound, Singapore dollar, Chinese yuan and Indian rupee. Although we do hedge against the Euro, British pound, Israeli shekel and Japanese yen, gains and losses on the conversion to U.S. dollars of accounts receivable, accounts payable and other monetary assets and liabilities arising from international operations may contribute to fluctuations in our operating results. Furthermore, payment cycles for international customers are typically longer than those for customers in the U.S. Unpredictable payment cycles could cause us to fail to meet or exceed the expectations of security analysts and investors for any given period.

Most of our international revenue is denominated in U.S. dollars, and fluctuations in currency exchange rates could cause our products to become relatively more expensive to customers in a particular country or region, leading to a reduction in revenue or profitability from sales in that country or region. The potential negative impact of a strong U.S. dollar on our business may be exacerbated by the significant devaluation of a number of foreign currencies. Also, if the U.S. dollar were to weaken against many foreign currencies, there can be no assurance that a weaker dollar would lead to growth in customer spending in foreign markets.

Our operations outside the U.S. also require us to comply with a number of U.S. and international regulations that prohibit improper payments or offers of payments to foreign governments and their officials and political parties for corrupt purposes. For example, our operations in countries outside the U.S. are subject to the FCPA and similar laws, including the U.K. Bribery Act. Our activities in certain emerging countries create the risk of unauthorized payments or offers of payments by one of our employees, consultants, sales agents or channel partners that could be in violation of various anti-corruption laws, even though these parties may not be under our control. Under the FCPA and U.K. Bribery Act, companies may be held liable for the corrupt actions taken by their directors, officers, employees, channel partners, sales agents, consultants, or other strategic or local partners or representatives. We have internal control policies and procedures with respect to FCPA compliance, have implemented FCPA training and compliance programs for our employees, and include in our agreements with resellers a requirement that those parties comply with the FCPA. However, we cannot provide assurances that our policies, procedures and programs will prevent violations of the FCPA or similar laws by our employees or agents, particularly in emerging market countries, and as we expand our international operations. Any such violation, even if prohibited by our policies, could result in criminal or civil sanctions against us.

The effect of one or more of these international risks could have a material and adverse effect on our business, financial condition, operating results and cash flows.

We purchase several key components, subassemblies and modules used in the manufacture or integration of our products from sole or limited sources, and we rely on contract manufacturers and other subcontractors.

Our reliance on sole or limited suppliers, particularly foreign suppliers, and our reliance on contractors for manufacturing and installation of our products, involves several risks, including a potential inability to obtain an adequate supply of required components, subassemblies or modules; reduced control over costs, quality and timely delivery of components, subassemblies or modules; supplier discontinuation of components, subassemblies or modules we require; and timely installation of products. In addition, our financial results may be impacted by tariffs imposed by the U.S. on goods from other countries and tariffs imposed by other countries on U.S. goods, including the tariffs proposed by the U.S. government on various imports from China and by the Chinese government on certain U.S. goods, the scope and duration of which, if implemented, remain uncertain. If any such tariffs are imposed on products or components that we import, including those obtained from a sole supplier or a limited group of suppliers, we could experience reduced revenues or may have to raise our prices, either of which could have an adverse effect on our business, financial condition and operating results.

These risks could be heightened during a substantial economic slowdown, because our suppliers and subcontractors are more likely to experience adverse changes in their financial condition and operations during such a period. Further, these risks could materially and adversely affect our business if one of our sole sources, or a sole source of one of our suppliers or contract manufacturers, is adversely affected by a natural disaster. While we expend resources to qualify additional component sources, consolidation of suppliers and the small number of viable alternatives have limited the results of these efforts. Managing our supplier and contractor relationships is particularly difficult during time periods in which we introduce new products and during time periods in which demand for our products is increasing, especially if demand increases more quickly than we expect.

Plexus Services Corp., which manufactures our products at its facilities in Malaysia, currently serves as our primary contract manufacturer, and currently provides us with a majority, by dollar amount, of the products that we purchase from our contract manufacturers. Most of the products manufactured by our French and Israeli operations are outsourced to another third-party manufacturer in France and Israel, respectively. From time to time we assess our relationship with our contract manufacturers, and we do not generally maintain long-term agreements with any of our suppliers or contract manufacturers. Our agreement with Plexus has automatic annual renewals, unless prior notice is given by either party, and has been automatically renewed for a term expiring in October 2019.

Difficulties in managing relationships with any of our current contract manufacturers, particularly Plexus, that manufacture our products off-shore, or any of our suppliers of key components, subassemblies and modules used in our products, could impede our ability to meet our customers' requirements and adversely affect our operating results. An inability to obtain adequate and timely deliveries of our products or any materials used in our products, or the inability of any of our contract manufacturers to scale their production to meet demand, or any other circumstance that would require us to seek alternative sources of supply, could negatively affect our ability to ship our products on a timely basis, which could damage relationships with current and prospective customers and harm our business and materially and adversely affect our revenue and other operating results. Furthermore, if we fail to meet customers' supply expectations, our revenue would be adversely affected and we may lose sales opportunities, both short and long term, which could materially and adversely affect our business and our operating results, financial condition and cash flows. Increases, from time to time, in demand on our suppliers and subcontractors from our customers or from other parties have, on occasion, caused delays in the availability of certain components and products. In response, we may increase our inventories of certain components and products and expedite shipments of our products when necessary. These actions could increase our costs and could also increase our risk of holding obsolete or excess inventory, which, despite our use of a demand order fulfillment model, could materially and adversely affect our business, operating results, financial condition and cash flows.

The loss of one or more of our key customers, a failure to continue diversifying our customer base, or a decrease in the number of larger transactions could harm our business and our operating results.

Historically, a significant portion of our revenue has been derived from relatively few customers, due in part to the consolidation of media customers. Sales to our top 10 customers in the six months ended June 28, 2019 and June 29, 2018 accounted for approximately 39% and 36% of revenue, respectively. Although we have broadened our customer base by further penetrating new markets and expanding internationally, we expect to see continuing industry consolidation and customer concentration.

During the three months ended June 28, 2019, Comcast accounted for more than 10% of our net revenue and during the six months ended June 28, 2019, no single customer accounted for more than 10% of our net revenue. During the six months ended June 29, 2018, Comcast accounted for 14% of our net revenue. Further consolidation in the cable industry could lead to additional revenue concentration for us. The loss of any significant customer, or any material reduction in orders from any other significant customer, or our failure to qualify our new products with any significant customer could materially and adversely affect, either long term or in a particular quarter, our operating results, financial condition and cash flows. Further, notwithstanding Comcast's recent election to license our CableOS software and significant commitment of license fees to us, if Comcast deploys our solutions more slowly or at a scale that is lower than we anticipate, we may be unable to realize the anticipated benefits of the Warrant and our operating results, financial condition and cash flows could be materially and adversely effected.

In addition, we are involved in most quarters in one or more relatively large individual transactions. A decrease in the number of the relatively larger individual transactions in which we are involved in any quarter could materially and adversely affect our operating results for that quarter.

As a result of these and other factors, we may be unable to increase our revenues from some or all of the markets we address, or to do so profitably, and any failure to increase revenues and profits from these customers could materially and adversely affect our operating results, financial condition and cash flows.

We rely on resellers, value-added resellers and systems integrators for a significant portion of our revenue, and disruptions to, or our failure to develop and manage our relationships with these customers or the processes and procedures that support them could adversely affect our business.

We generate a significant percentage of our revenue through sales to resellers, VARs and systems integrators that assist us with fulfillment or installation obligations. We expect that these sales will continue to generate a significant percentage of our revenue in the future. Accordingly, our future success is highly dependent upon establishing and maintaining successful relationships with a variety of channel partners.

We generally have no long-term contracts or minimum purchase commitments with any of our reseller, VAR or system integrator customers, and our contracts with these parties do not prohibit them from purchasing or offering products or services that compete with ours. Our competitors may provide incentives to any of our reseller, VAR or systems integrator customers to favor their products or, in effect, to prevent or reduce sales of our products. Any of our reseller, VAR or systems integrator customers may independently choose not to purchase or offer our products. Many of our resellers, and some of our VARs and system integrators are small, are based in a variety of international locations, and may have relatively unsophisticated processes and limited financial resources to conduct their business. Any significant disruption of our sales to these customers, including as a result of the inability or unwillingness of these customers to continue purchasing our products, or their failure to properly manage their business with respect to the purchase of, and payment for, our products, or their ability to comply with our policies and procedures as well as applicable laws, could materially and adversely affect our business, operating results, financial condition and cash flows. In addition, our failure to continue to establish or maintain successful relationships with reseller, VAR and systems integrator customers could likewise materially and adversely affect our business, operating results, financial condition and cash flows.

We have made, and may continue to make, acquisitions, and any acquisition could disrupt our operations, cause dilution to our stockholders and materially and adversely affect our business, operating results, cash flows and financial condition.

As part of our business strategy, from time to time we have acquired, and we may continue to acquire, businesses, technologies, assets and product lines that we believe complement or expand our existing business. For example, in February 2016, we announced the closing of our acquisition of TVN, which is headquartered in Rennes, France. Acquisitions involve numerous risks, including the following:

- unanticipated costs or delays associated with an acquisition;
- difficulties in the assimilation and integration of acquired operations, technologies and/or products;
- potential disruption of our business and the diversion of management’s attention from the regular operations of the business during the acquisition process;
- the challenges of managing a larger and more geographically widespread operation and product portfolio after the closing of the acquisition;
- potential adverse effects on new and existing business relationships with suppliers, contract manufacturers, resellers, partners and customers;
- compliance with regulatory requirements, such as local employment regulations and organized labor in France;
- risks associated with entering markets in which we may have no or limited prior experience;
- the potential loss of key employees of acquired businesses and our own business as a result of integration;
- difficulties in bringing acquired products and businesses into compliance with applicable legal requirements in jurisdictions in which we operate and sell products;
- impact of known potential liabilities or unknown liabilities, including litigation and infringement claims, associated with companies we acquire;
- substantial charges for acquisition costs or for the amortization of certain purchased intangible assets, deferred stock compensation or similar items;
- substantial impairments to goodwill or intangible assets in the event that an acquisition proves to be less valuable than the price we paid for it;
- difficulties in establishing and maintaining uniform financial and other standards, controls, procedures and policies;
- delays in realizing, or failure to realize, the anticipated benefits of an acquisition; and
- the possibility that any acquisition may be viewed negatively by our customers or investors or the financial markets.

Competition within our industry for acquisitions of businesses, technologies, assets and product lines has been, and is likely to continue to be, intense. As such, even if we are able to identify an acquisition that we would like to consummate, we may not be able to complete the acquisition on commercially reasonable terms or because the target chooses to be acquired by another company. Furthermore, in the event that we are able to identify and consummate any future acquisitions, we may, in each of those acquisitions:

- issue equity securities which would dilute current stockholders' percentage ownership;
- incur substantial debt to finance the acquisition or assume substantial debt in the acquisition;
- incur significant acquisition-related expenses;
- assume substantial liabilities, contingent or otherwise; or
- expend significant cash.

These financing activities or expenditures could materially and adversely affect our operating results, cash flows and financial condition or the price of our common stock. Alternatively, due to difficulties in the capital or credit markets at the time, we may be unable to secure capital necessary to complete an acquisition on reasonable terms, or at all. Moreover, even if we were to obtain benefits from acquisitions in the form of increased revenue and earnings per share, there may be a delay between the time the expenses associated with an acquisition are incurred and the time we recognize such benefits.

In addition to the risks outlined above, if we are unable to successfully receive payment of any significant portion of TVN's existing French R&D tax credit receivables from the French tax authority as expected, or are unable to successfully apply for or otherwise obtain the financial benefit of new French R&D tax credits in future years, our ability to achieve the anticipated benefits of the acquisition as well as our business, operating results and financial condition could be adversely affected.

As of June 28, 2019, we had approximately $240.3 million of goodwill recorded on our balance sheet associated with prior acquisitions. In the event we determine that our goodwill is impaired, we would be required to write down all or a portion of such goodwill, which could result in a material non-cash charge to our results of operations in the period in which such write-down occurs.

If we are unable to successfully address one or more of these risks, our business, operating results, financial condition and cash flows could be materially and adversely affected.

We may not be able to effectively manage our operations.

In recent years, we have expanded our international operations significantly. For example, upon the closing of our acquisition of TVN on February 29, 2016, we added 438 employees, most of whom were based in France.

As of June 28, 2019, we had 791 employees in our international operations, representing approximately 68% of our worldwide workforce. Our ability to manage our business effectively in the future, including with respect to any future growth, our operation as both a hardware and increasingly software-centric business, the integration of any acquisition efforts such as our recent acquisition of TVN, and the breadth of our international operations, will require us to train, motivate and manage our employees successfully, to attract and integrate new employees into our overall operations, to retain key employees and to continue to improve and evolve our operational, financial and management systems. There can be no assurance that we will be successful in any of these efforts, and our failure to effectively manage our operations could have a material and adverse effect on our business, operating results, cash flows and financial condition.

We face risks associated with having outsourced engineering resources located in Ukraine.

We outsource a portion of our research and development activities for both our Video and Cable Access business segments to a third-party partner with engineering resources located in Ukraine. Political, social and economic instability and unrest or violence in Ukraine, including the ongoing conflict with Russian-backed separatists or conflict with the Russian Federation directly, could cause disruptions to the business and operations of our outsourcing partner, which could slow or delay the development work our partner is undertaking for us. Instability, unrest or conflict could limit or prevent our employees from traveling to, from, or within Ukraine to direct and coordinate our outsourced engineering teams, or cause us to shift all or portions of the development work occurring in Ukraine to other locations or countries. The resulting delays could negatively impact our product development efforts, operating results and our business.

In order to manage our growth, we must be successful in addressing management succession issues and attracting and retaining qualified personnel.

Our future success will depend, to a significant extent, on the ability of our management to operate effectively, both individually and as a group. We must successfully manage transition and replacement issues that may result from the departure or retirement of members of our executive management. We cannot provide assurances that changes of management personnel in the future would not cause disruption to operations or customer relationships or a decline in our operating results.

We are also dependent on our ability to retain and motivate our existing highly qualified personnel, in addition to attracting new highly qualified personnel. Competition for qualified management, technical and other personnel is often intense, particularly in Silicon Valley, Israel and Hong Kong where we have significant research and development activities, and we may not be successful in attracting and retaining such personnel. Competitors and others have in the past attempted, and are likely in the future to attempt, to recruit our employees. While our employees are required to sign standard agreements concerning confidentiality, non-solicitation and ownership of inventions, we generally do not have non-competition agreements with our personnel. The loss of the services of any of our key personnel, the inability to attract or retain highly qualified personnel in the future or delays in hiring such personnel, particularly senior management and engineers and other technical personnel, could negatively affect our business and operating results. Furthermore, a certain portion of our personnel in the U.S. is comprised of foreign nationals whose ability to work for us depends on obtaining the necessary visas. Our ability to hire and retain foreign nationals in the U.S., and their ability to remain and work in the U.S., is affected by various laws and regulations, including limitations on the availability of visas. Changes in U.S. laws or regulations affecting the availability of visas may adversely affect our ability to hire or retain key personnel and as a result may impair our operations.

We face risks associated with having facilities and employees located in Israel.

As of June 28, 2019, we maintained facilities in Israel with a total of 170 employees, or approximately 15% of our worldwide workforce. Our employees in Israel engage in a number of activities, for both our Video and Cable Access business segments, including research and development, product development, and supply chain management for certain product lines and sales activities.

As such, we are directly affected by the political, economic and military conditions affecting Israel. Any significant conflict involving Israel could have a direct effect on our business or that of our Israeli contract manufacturers, in the form of physical damage or injury, restrictions from traveling or reluctance to travel to from or within Israel by our Israeli and other employees or those of our subcontractors, or the loss of Israeli employees to active military duty. Most of our employees in Israel are currently obligated to perform annual reserve duty in the Israel Defense Forces, and approximately 11% of those employees were called for active military duty in 2018. In the event that more of our employees are called to active duty, certain of our research and development activities may be significantly delayed and adversely affected. Further, the interruption or curtailment of trade between Israel and its trading partners, as a result of terrorist attacks or hostilities, conflicts between Israel and any other Middle Eastern country or organization, or any other cause, could significantly harm our business. Additionally, current or future tensions or conflicts in the Middle East could materially and adversely affect our business, operating results, financial condition and cash flows.

Our operating results are likely to fluctuate significantly and, as a result, may fail to meet or exceed the expectations of securities analysts or investors, causing our stock price to decline.

Our operating results have fluctuated in the past and are likely to continue to fluctuate in the future, on an annual and a quarterly basis, as a result of several factors, many of which are outside of our control. Some of the factors that may cause these fluctuations include:

- the level and timing of spending of our customers in the U.S., Europe and in other markets;

• economic and financial conditions specific to each of the cable, satellite and telco, and broadcast and media industries, as well as general economic and financial market conditions, including any stemming from an unstable political environment in the United States or abroad as well as those resulting from regulatory, trade or tax policy changes from the Tax Cuts and Jobs Act that was enacted in December 2017 (the “TCJA”);

• changes in market acceptance of and demand for our products or our customers’ services or products;

• the timing and amount of orders, especially from large individual transactions and transactions with our significant customers;

• the mix of our products sold and the effect it has on gross margins;

• the timing of revenue recognition, including revenue recognition on sales arrangements and from transactions with significant service and support components, which may span several quarters;

• our transition to a SaaS subscription model for our Video business, which may cause near-term declines in revenue;

• the timing of completion of our customers’ projects;

• the length of each customer product upgrade cycle and the volume of purchases during the cycle;

• competitive market conditions, including pricing actions by our competitors;

• the level and mix of our domestic and international revenue;

• new product introductions by our competitors or by us;

• uncertainty in both the U.K. and the European Union due to the U.K.’s referendum to exit the European Union, which could adversely affect our results, financial condition and prospects;

• changes in domestic and international regulatory environments affecting our business;

• the evaluation of new services, new standards and system architectures by our customers;

• the cost and timely availability to us of components, subassemblies and modules;

• the mix of our customer base, by industry and size, and sales channels;

• changes in our operating and extraordinary expenses;

• the timing of acquisitions and dispositions by us and the financial impact of such transactions;

• impairment of our goodwill and intangibles;

• the impact of litigation, such as related litigation expenses and settlement costs;

• write-downs of inventory and investments;

• changes in our effective federal tax rate, including as a result of changes in our valuation allowance against our deferred tax assets, and changes in our effective state tax rates, including as a result of apportionment;

• changes to tax rules related to the deferral of foreign earnings and compliance with foreign tax rules;

• the impact of applicable accounting guidance on accounting for uncertainty in income taxes that requires us to establish reserves for uncertain tax positions and accrue potential tax penalties and interest; and

- the impact of applicable accounting guidance on business combinations that requires us to record charges for certain acquisition related costs and expenses and generally to expense restructuring costs associated with a business combination subsequent to the acquisition date.

The timing of deployment of our products by our customers can be subject to a number of other risks, including the availability of skilled engineering and technical personnel, the availability of third-party equipment and services, our customers' ability to negotiate and enter into rights agreements with video content owners that provide our customers with the right to deliver certain video content, and our customers' need for local franchise and licensing approvals.

We often recognize a substantial portion of our quarterly revenue in the last month of the quarter. We establish our expenditure levels for product development and other operating expenses based on projected revenue levels for a specified period, and expenses are relatively fixed in the short term. Accordingly, even small variations in the timing of revenue, particularly from relatively large individual transactions, can cause significant fluctuations in operating results in a particular quarter.

As a result of these factors and other factors, our operating results in one or more future periods may fail to meet or exceed the expectations of securities analysts or investors. In that event, the trading price of our common stock would likely decline.

Fluctuations in our future effective tax rates could affect our future operating results, financial condition and cash flows.

We are required to periodically review our deferred tax assets and determine whether, based on available evidence, a valuation allowance is necessary. The realization of our deferred tax assets, which are predominantly in the U.S., is dependent upon the generation of sufficient U.S. and foreign taxable income in the future to offset these assets. Based on our evaluation, a history of operating losses in recent years has led to uncertainty with respect to our ability to realize certain of our net deferred tax assets, and as a result we recorded a net increase in valuation allowance of $0.9 million and $9.0 million in 2018 and 2017, respectively, against our U.S. net deferred tax assets. The increases in valuation allowance in 2018 and 2017 were offset partially by the valuation allowance release of $1.5 million and $5.8 million, respectively. The releases of valuation allowance were associated with our foreign subsidiaries and a one-time benefit in 2017 of $2.6 million relating to the refund of alternative minimum tax credit carryforwards related to the TCJA.

The calculation of tax liabilities involves dealing with uncertainties in the application of complex global tax regulations. We recognize potential liabilities for anticipated tax audit issues in the U.S. and other tax jurisdictions based on our estimate of whether, and the extent to which, additional taxes will be due. In the event we determine that it is appropriate to create a reserve or increase an existing reserve for any such potential liabilities, the amount of the additional reserve is charged as an expense in the period in which it is determined. If payment of these amounts ultimately proves to be unnecessary, the reversal of the liabilities would result in tax benefits being recognized in the period when we determine the liabilities are no longer necessary. If the estimate of tax liabilities proves to be less than the ultimate tax assessment for the applicable period, a further charge to expense in the period such short fall is determined would result. Either such charge to expense could have a material and adverse effect on our operating results for the applicable period.

Our future effective income tax rates could be adversely affected if tax authorities challenge our international tax structure or if the relative mix of U.S. and international income changes for any reason. Accordingly, there can be no assurance that our income tax rate will be less than the U.S. federal statutory rate in future periods.

The United States recently passed a comprehensive tax reform bill that could adversely affect our financial performance.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act of 2017, or the Tax Act. The Tax Act made broad and complex changes to the U.S. tax code. The changes included, but were not limited to, reducing the U.S. federal corporate tax rate from 35% to 21%, imposing a mandatory one-time transition tax on certain unrepatriated earnings of foreign subsidiaries, eliminating the corporate alternative minimum tax, or AMT, and a requirement to pay a minimum tax on foreign earnings for tax years beginning after December 31, 2017. Notwithstanding the reduction in the corporate income tax rate, the overall impact of the new federal tax law is uncertain, and our financial performance could be adversely affected. In addition, it is uncertain if, and to what extent, various states will conform to the new tax law and foreign countries will react by adopting tax legislation or taking other actions that could adversely affect our business.

We or our customers may face intellectual property infringement claims from third parties.

Our industry is characterized by the existence of a large number of patents and frequent claims and related litigation regarding patent and other intellectual property rights. In particular, leading companies in the telecommunications industry have extensive patent portfolios. Also, patent infringement claims and litigation by entities that purchase or control patents, but do not produce goods or services covered by the claims of such patents (so-called “non-practicing entities” or “NPEs”), have increased rapidly over the last decade or so. From time to time, third parties, including NPEs, have asserted, and may assert in the future, patent, copyright, trademark and other intellectual property rights against us or our customers. Our suppliers and their customers, including us, may have similar claims asserted against them. A number of third parties, including companies with greater financial and other resources than us, have asserted patent rights to technologies that are important to us.

Any intellectual property litigation, regardless of its outcome, could result in substantial expense and significant diversion of the efforts of our management and technical personnel. An adverse determination in any such proceeding could subject us to significant liabilities and temporary or permanent injunctions and require us to seek licenses from third parties or pay royalties that may be substantial. Furthermore, necessary licenses may not be available on terms satisfactory to us, or at all. An unfavorable outcome on any such litigation matter could require that we pay substantial damages, could require that we pay ongoing royalty payments, or could prohibit us from selling certain of our products. Any such outcome could have a material and adverse effect on our business, operating results, financial condition and cash flows.

Our suppliers and customers may have intellectual property claims relating to our products asserted against them. We have agreed to indemnify some of our suppliers and most of our customers for patent infringement relating to our products. The scope of this indemnity varies, but, in some instances, includes indemnification for damages and expenses (including reasonable attorney’s fees) incurred by the supplier or customer in connection with such claims. If a supplier or a customer seeks to enforce a claim for indemnification against us, we could incur significant costs defending such claim, the underlying claim or both. An adverse determination in either such proceeding could subject us to significant liabilities and have a material and adverse effect on our operating results, cash flows and financial condition.

We may be the subject of litigation which, if adversely determined, could harm our business and operating results.

We may be subject to claims arising in the normal course of business. The costs of defending any litigation, whether in cash expenses or in management time, could harm our business and materially and adversely affect our operating results and cash flows. An unfavorable outcome on any litigation matter could require that we pay substantial damages, or, in connection with any intellectual property infringement claims, could require that we pay ongoing royalty payments or prohibit us from selling certain of our products. In addition, we may decide to settle any litigation, which could cause us to incur significant settlement costs. A settlement or an unfavorable outcome on any litigation matter could have a material and adverse effect on our business, operating results, financial condition and cash flows.

We may sell one or more of our product lines, from time to time, as a result of our evaluation of our products and markets, and any such divestiture could adversely affect our continuing business and our expenses, revenues, results of operation, cash flows and financial position.

We periodically evaluate our various product lines and may, as a result, consider the divestiture of one or more of those product lines. We have sold product lines in the past, and any prior or future divestiture could adversely affect our continuing business and expenses, revenues, results of operations, cash flows and financial position.

Divestitures of product lines have inherent risks, including the expense of selling the product line, the possibility that any anticipated sale will not occur, delays in closing any sale, the risk of lower-than-expected proceeds from the sale of the divested business, unexpected costs associated with the separation of the business to be sold from the seller’s information technology and other operating systems, and potential post-closing claims for indemnification or breach of transition services obligations of the seller. Expected cost savings, which are offset by revenue losses from divested businesses, may also be difficult to achieve or maximize due to the seller's fixed cost structure, and a seller may experience varying success in reducing fixed costs or transferring liabilities previously associated with the divested business.

We could be negatively affected as a result of a future proxy contest and the actions of activist stockholders.

If a proxy contest with respect to election of our directors is initiated in the future, or if other activist stockholder activities occur, our business could be adversely affected because:

• responding to a proxy contest and other actions by activist stockholders can be costly and time-consuming, disrupting our operations and diverting the attention of management and our employees;

• perceived uncertainties as to our future direction caused by activist activities may result in the loss of potential business opportunities, and may make it more difficult to attract and retain qualified personnel and business partners; and

• if individuals are elected to our Board with a specific agenda, it may adversely affect our ability to effectively and timely implement our strategic plans.

Our failure to adequately protect our proprietary rights and data may adversely affect us.

At June 28, 2019, we held 83 issued U.S. patents and 54 issued foreign patents, and had 97 patent applications pending. Although we attempt to protect our intellectual property rights through patents, trademarks, copyrights, licensing arrangements, maintaining certain technology as trade secrets and other measures, we can give no assurances that any patent, trademark, copyright or other intellectual property rights owned by us will not be invalidated, circumvented or challenged, that such intellectual property rights will provide competitive advantages to us, or that any of our pending or future patent applications will be issued with the scope of the claims sought by us, if at all. We can give no assurances that others will not develop technologies that are similar or superior to our technologies, duplicate our technologies or design around the patents that we own. In addition, effective patent, copyright and trade secret protection may be unavailable or limited in certain foreign countries in which we do business or may do business in the future.

We may enter into confidentiality or license agreements with our employees, consultants, and vendors and our customers, as needed, and generally limit access to, and distribution of, our proprietary information. Nevertheless, we cannot provide assurances that the steps taken by us will prevent misappropriation of our technology. In addition, we have taken in the past, and may take in the future, legal action to enforce our patents and other intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others, or to defend against claims of infringement or invalidity. Such litigation could result in substantial costs and diversion of management time and other resources, and could materially and adversely affect our business, operating results, financial condition and cash flows.

Our products include third-party technology and intellectual property, and our inability to acquire new technologies or use third-party technology in the future could harm our business.

In order to successfully develop and market certain of our planned products, we may be required to enter into technology development or licensing agreements with third parties. Although companies with technology useful to us are often willing to enter into technology development or licensing agreements with respect to such technology, we cannot provide assurances that such agreements may be negotiated on commercially reasonable terms, or at all. The failure to enter, or a delay in entering, into such technology development or licensing agreements, when necessary or desirable, could limit our ability to develop and market new products and could materially and adversely affect our business.

We incorporate certain third-party technologies, including software programs, into our products, and, as noted, intend to utilize additional third-party technologies in the future. In addition, the technologies that we license may not operate properly or as specified, and we may not be able to secure alternatives in a timely manner, either of which could harm our business. We could face delays in product releases until alternative technology can be identified, licensed or developed, and integrated into our products, if we are able to do so at all. These delays, or a failure to secure or develop adequate technology, could materially and adversely affect our business, operating results, financial condition and cash flows.

Our use of open source software in some of our products may expose us to certain risks.

Some of our products contain software modules licensed for use from third-party authors under open source licenses. Use and distribution of open source software may entail greater risks than use of third-party commercial software, as open source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of the code. Some open source licenses contain requirements that we make available source code for modifications or derivative works we create based upon the type of open source software we use. If we combine our proprietary software with open source software in a certain manner, we could, under certain of the open source licenses, be required to release the source code of our proprietary software to the public. This could allow our competitors to create similar products with lower development effort and in less time and ultimately could result in a loss of product sales for us.

Although we monitor our use of open source closely, it is possible our past, present or future use of open source has triggered or may trigger the foregoing requirements. Furthermore, the terms of many open source licenses have not been interpreted by U.S. courts, and there is a risk that such licenses could be construed in a manner that could impose unanticipated conditions or restrictions on our ability to commercialize our products. In such event, we could be required to seek licenses from third parties in order to continue offering our products, to re-engineer our products or to discontinue the sale of our products in the event re-engineering cannot be accomplished on a timely basis, any of which could materially and adversely affect our operating results, financial condition and cash flows.

We are subject to import and export control and trade and economic sanction laws and regulations that could subject us to liability or impair our ability to compete in international markets.

Our products are subject to U.S. export control laws, and may be exported outside the U.S. only with the required export license or through an export license exception, in most cases because we incorporate encryption technology into certain of our products. We are also subject to U.S. trade and economic sanction regulations which include prohibitions on the sale or supply of certain products and services to U.S. embargoed or sanctioned countries, governments, persons and entities. In addition, various countries regulate the import of certain technology and have enacted laws that could limit our ability to distribute our products, or could limit our customers' ability to implement our products, in those countries. Although we take precautions and have processes in place to prevent our products and services from being provided in violation of such laws, our products may have been in the past, and could in the future be, provided inadvertently in violation of such laws, despite the precautions we take. If we fail to comply with these laws, we and certain of our employees could be subject to civil or criminal penalties, including the possible loss of export privileges, monetary penalties, and, in extreme cases, imprisonment of responsible employees for knowing and willful violations of these laws. Additionally, our business and operating results be adversely affected through penalties, reputational harm, loss of access to certain markets, or otherwise.

In addition, we may be subject to customs duties that could have a significant adverse impact on our operating results or, if we are able to pass on the related costs in any particular situation, would increase the cost of the related product to our customers. As a result, the future imposition of significant increases in the level of customs duties or the creation of import quotas on our products in Europe or in other jurisdictions, or any of the limitations on international sales described above, could have a material adverse effect on our business, operating results, financial condition and cash flows. Further, some of our customers in Europe have been, or are being, audited by local governmental authorities regarding the tariff classifications used for importation of our products. Import duties and tariffs vary by country and a different tariff classification for any of our products may result in higher duties or tariffs, which could have an adverse impact on our operating results and potentially increase the cost of the related products to our customers.

We may need additional capital in the future and may not be able to secure adequate funds at all or on terms acceptable to us.

We engage in the design, development and manufacture and sale of a variety of video and cable access products and system solutions, which has required, and will continue to require, significant research and development expenditures.

We believe that our existing cash of approximately $58.1 million at June 28, 2019 will satisfy our cash requirements for at least the next 12 months. However, we may need to raise additional funds to take advantage of presently unanticipated strategic opportunities, satisfy our other cash requirements from time to time, or strengthen our financial position. Our ability to raise funds may be adversely affected by a number of factors, including factors beyond our control, such as weakness in the economic conditions in markets in which we sell our products and continued uncertainty in financial, capital and credit markets. There can be no assurance that equity or debt financing will be available to us on reasonable terms, if at all, when and if it is needed.

We may raise additional financing through public or private equity offerings, debt financings, or corporate partnership or licensing arrangements. To the extent we raise additional capital by issuing equity securities or convertible debt, our stockholders may experience dilution. To the extent that we raise additional funds through collaboration and licensing arrangements, it may be necessary to relinquish some rights to our technologies or products, or grant licenses on terms that are not favorable to us. To the extent we raise capital through debt financing arrangements, we may be required to pledge assets or enter into covenants that could restrict our operations or our ability to incur further indebtedness and the interest on such debt may adversely affect our operating results.

If adequate capital is not available, or is not available on reasonable terms, when needed, we may not be able to take advantage of acquisition or other market opportunities, to timely develop new products, or to otherwise respond to competitive pressures.

Cybersecurity incidents, including data security breaches or computer viruses, could harm our business by disrupting our business operations, compromising our products and services, damaging our reputation or exposing us to liability.

Cyber criminals and hackers may attempt to penetrate our network security, misappropriate our proprietary information or cause business interruptions. Because the techniques used by such computer programmers to access or sabotage networks change frequently and may not be recognized until launched against a target, we may be unable to anticipate these techniques or to implement adequate preventative measures. In the past, we have faced compromises to our network security. While we have invested in and continue to update our network security and cybersecurity infrastructure and systems, if our cybersecurity systems fail to protect against unauthorized access, sophisticated cyber-attacks, phishing schemes, data protection breaches, computer viruses, denial-of-service attacks and similar disruptions from unauthorized tampering or human error, our ability to conduct our business effectively could be damaged in a number of ways, including:

- our intellectual property and other proprietary data, or financial assets, could be stolen;

- our ability to manage and conduct our business operations could be seriously disrupted;

- defects and security vulnerabilities could be introduced into our product, software and SaaS offerings, thereby damaging the reputation and perceived reliability and security of our products; and

- personally identifiable data of our customers, employees and business partners could be compromised.

Should any of the above events occur, our reputation, competitive position and business could be significantly harmed, and we could be subject to claims for liability from customers, third parties and governmental authorities. Additionally, we could incur significant costs in order to upgrade our cybersecurity systems and remediate damages. Consequently, our business, operating results, financial condition and cash flows could be materially and adversely affected. In addition, our business operations utilize and rely upon numerous third-party vendors, manufacturers, solution providers, partners and consultants, and any failure of such third parties’ cybersecurity measures could materially and adversely affect or disrupt our business.

Our operating results could be adversely affected by natural disasters affecting us or impacting our third-party manufacturers, suppliers, resellers or customers.

Our corporate headquarters is located in California, which is prone to earthquakes. We have employees, consultants and contractors located in regions and countries around the world. In the event that any of our business, sales or research and development centers or offices in the U.S. or internationally are adversely affected by an earthquake or by any other natural disaster, we may sustain damage to our operations and properties, which could cause a sustained interruption or loss of affected operations, and cause us to suffer significant financial losses.

We rely on third-party contract manufacturers for the production of our products. Any significant disruption in the business or operations of such manufacturers or of their or our suppliers could adversely impact our business. Our principal contract manufacturers and several of their and our suppliers and our resellers have operations in locations that are subject to natural disasters, such as severe weather, tsunamis, floods, fires and earthquakes, which could disrupt their operations and, in turn, our operations.

In addition, if there is a natural disaster in any of the locations in which our significant customers are located, we face the risk that our customers may incur losses or sustained business interruption, or both, which may materially impair their ability to continue their purchase of products from us. Accordingly, natural disaster in one of the geographies in which we, or our third-party manufacturers, their or our suppliers or our customers, operate could have a material and adverse effect on our business, operating results, cash flows and financial condition.

Our business and industry are subject to various laws and regulations that could adversely affect our business, operating results, cash flows and financial condition.

Our business and industry are regulated under various federal, state, local and international laws. For example, we are subject to environmental regulations such as the European Union’s Waste Electrical and Electronic Equipment (WEEE) and Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directives and similar legislation enacted in other jurisdictions worldwide. Our failure to comply with these laws could result in our being directly or indirectly liable for costs, fines or penalties and third-party claims, and could jeopardize our ability to conduct business in such regions and countries. We expect that our operations will be affected by other new environmental laws and regulations on an ongoing basis. Although we cannot predict the ultimate impact of any such new laws and regulations, they would likely result in additional costs, and could require that we redesign or change how we manufacture our products, any of which could have a material and adverse effect on our operating results, financial condition and cash flows.

We are subject to the Sarbanes-Oxley Act of 2002 which, among other things, requires an annual review and evaluation of our internal control over financial reporting. If we conclude in future periods that our internal control over financial reporting is not effective or if our independent registered public accounting firm is unable to provide an unqualified attestation as of future year-ends, we may incur substantial additional costs in an effort to correct such problems, and investors may lose confidence in our financial statements, and our stock price may decrease in the short term, until we correct such problems, and perhaps in the long term, as well.

We are subject to requirements under the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 that require us to conduct research, disclose, and report whether or not our products contain certain conflict minerals sourced from the Democratic Republic of Congo or its surrounding countries. The implementation of these requirements could adversely affect the sourcing, availability, and pricing of the materials used in the manufacture of components used in our products. In addition, we may incur certain additional costs to comply with the disclosure requirements, including costs related to conducting diligence procedures to determine the sources of conflict minerals that may be used or necessary to the production of our products and, if applicable, potential changes to products, processes or sources of supply as a consequence of such verification activities. It is also possible that we may face reputational harm if we determine that certain of our products contain minerals not determined to be conflict-free and/or we are unable to alter our products, processes or sources of supply to avoid such materials.

Changes in telecommunications legislation and regulations in the U.S. and other countries could affect our sales and the revenue we are able to derive from our products. In particular, on December 14, 2017, the U.S. Federal Communications Commission (FCC) voted to repeal the “net neutrality” rules and return to a “light-touch” regulatory framework. The FCC’s new rules, which took effect in June 2018, granted providers of broadband internet access services greater freedom to make changes to their services, including, potentially, changes that may discriminate against or otherwise harm our business. However, a number of parties have appealed these rules, which appeals are currently being reviewed by the D.C. Circuit Court of Appeals; thus the future impact of the FCC's repeal and any changes thereto remains uncertain. Additionally, on September 30, 2018, California enacted the California Internet Consumer Protection and Net Neutrality Act of 2018, making California the fourth state to enact a state-level net neutrality law since the FCC repealed its nationwide regulations, mandating that all broadband services in California must be provided in accordance with state net neutrality requirements. The U.S. Department of Justice has sued to block the law going into effect, and California has agreed to delay enforcement until the resolution of the FCC’s repeal of the federal rules. A number of other states are considering legislation or executive actions that would regulate the conduct of broadband providers. We cannot predict whether the FCC order or state initiatives will be modified, overturned, or vacated by legal action of the court, federal legislation, or the FCC. The repeal of the net neutrality rules or other regulations dealing with access by competitors to the networks of incumbent operators could slow or stop infrastructure and services investments or expansion by service providers.

Increased regulation of our customers' pricing or service offerings could limit their investments and, consequently, revenue from our products. The impact of new or revised legislation or regulations could have a material adverse effect on our business, operating results, financial condition and cash flows.

Some anti-takeover provisions contained in our certificate of incorporation and bylaws, as well as provisions of Delaware law, could impair a takeover attempt.

We have provisions in our certificate of incorporation and bylaws that could have the effect of rendering more difficult or discouraging an acquisition deemed undesirable by our Board. These include provisions:

- authorizing blank check preferred stock, which could be issued with voting, liquidation, dividend and other rights superior to our common stock;
- limiting the liability of, and providing indemnification to, our directors and officers;
- limiting the ability of our stockholders to call, and bring business before, special meetings;
- requiring advance notice of stockholder proposals for business to be conducted at meetings of our stockholders and for nominations of candidates for election to our Board;
- controlling the procedures for conducting and scheduling of Board and stockholder meetings; and
- providing the Board with the express power to postpone previously scheduled annual meetings and to cancel previously scheduled special meetings.

These provisions could delay hostile takeovers, changes in control of the Company or changes in our management. As a Delaware corporation, we are also subject to provisions of Delaware law, including Section 203 of the Delaware General Corporation law, which prevents some stockholders holding more than 15% of our outstanding common stock from engaging in certain business combinations without approval of the holders of substantially all of our outstanding common stock. Any provision of our certificate of incorporation or bylaws or Delaware law that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock, and could also affect the price that some investors are willing to pay for our common stock.

The nature of our business requires the application of complex revenue and expense recognition rules and the current legislative and regulatory environment affecting generally accepted accounting principles is uncertain. Significant changes in current principles could affect our financial statements going forward and changes in financial accounting standards or practices may cause adverse, unexpected financial reporting fluctuations and harm our operating results.

United States generally accepted accounting principles ("U.S. GAAP") are subject to interpretation by the FASB, the SEC and various bodies formed to promulgate and interpret appropriate accounting principles. We are also subject to evolving rules and regulations of the countries in which we do business. Changes to accounting standards or interpretations thereof may result in different accounting principles under U.S. GAAP that could have a significant effect on our reported financial results.

In addition, we have in the past and may in the future need to significantly change our customer contracts, accounting systems and processes when we adopt future or proposed changes in accounting principles. The cost and effect of these changes may negatively impact our results of operations during the periods of transition.

We are implementing a new enterprise resource planning system, and if this new system proves ineffective or if we experience issues with the transition, we may be unable to timely or accurately prepare financial reports, make payments to our suppliers and employees, or invoice and collect from our users.

We are implementing a new enterprise resource planning, or ERP system. Our ERP system is critical to our ability to accurately maintain books and records and to prepare our financial statements. The transition to our new ERP system may be disruptive to our business if the ERP system does not work as planned or if we experience issues relating to the implementation. Such disruptions could impact our ability to timely or accurately make payments to our suppliers and employees, and could also inhibit our ability to invoice, and collect from our customers. Data integrity problems or other issues may be discovered which, if not corrected, could impact our business or financial results. In addition, we may experience periodic or prolonged disruption of our financial functions arising out of this conversion, general use of such system, other periodic upgrades or updates, or other external factors that are outside of our control. If we encounter unforeseen problems with our ERP system or other related systems and infrastructure, it could adversely affect our financial reporting systems and our ability to produce financial reports, the effectiveness of internal controls over financial reporting, and our business, operating results and financial condition could be adversely affected.

The conditional conversion feature of our convertible senior notes, if triggered, may adversely affect our financial condition and operating results.

In December 2015, we issued $128.3 million in aggregate principal amount of 4.0% convertible senior notes due 2020 (the "Notes") through a private placement with a financial institution. The Notes bear interest at 4.0% per annum, which is payable semiannually in arrears on June 1 and December 1 of each year, commencing June 1, 2016. In the event the conditional conversion feature of the Notes is triggered, holders of the Notes will be entitled to convert the Notes at any time during specified periods at their option. If one or more holders elect to convert their Notes, unless we elect to satisfy our conversion obligation by delivering solely shares of our common stock (other than paying cash in lieu of delivering any fractional share), we would be required to settle a portion or all of our conversion obligation through the payment of cash, which could adversely affect our liquidity. In addition, even if holders do not elect to convert their Notes, we could be required under applicable accounting rules to reclassify all or a portion of the outstanding principal of the Notes as a current rather than long-term liability, which would result in a material reduction of our net working capital.

The accounting method for convertible debt securities that may be settled in cash, such as the Notes, could have a material effect on our reported financial results.

Under Accounting Standards Codification 470-20, Debt with Conversion and Other Options, which we refer to as ASC 470-20, an entity must separately account for the liability and equity components of the convertible debt instruments (such as the Notes) that may be settled entirely or partially in cash upon conversion in a manner that reflects the issuer's economic interest cost. The effect of ASC 470-20 on the accounting for the Notes is that the equity component is required to be included in the additional paid-in capital section of stockholders' equity on our consolidated balance sheet, and the value of the equity component is being treated as a debt discount. As a result, we are required to record a greater amount of non-cash interest expense in current and future periods presented as a result of the amortization of the discounted carrying value of the Notes to their face amount over the term of the Notes. The increased net loss resulting from the amortization of the debt discount under ASC 470-20 could adversely affect our reported or future financial results, the trading price of our common stock and the trading price of the Notes.

In addition, under certain circumstances, convertible debt instruments (such as the Notes) that may be settled entirely or partly in cash are currently accounted for utilizing the treasury stock method, the effect of which is that the shares issuable upon conversion of the Notes are not included in the calculation of diluted earnings per share except to the extent that the conversion value of the Notes exceeds their principal amount. Under the treasury stock method, for diluted earnings per share purposes, the transaction is accounted for as if the number of shares of common stock that would be necessary to settle such excess, if we elected to settle such excess in shares, are issued. We cannot be sure that the accounting standards in the future will continue to permit the use of the treasury stock method or circumstances would change such that we would no longer be permitted to use the treasury stock method. If we are unable to use the treasury stock method in accounting for the shares issuable upon conversion of the Notes, our diluted earnings per share may be adversely affected.

Our common stock price, and therefore the price of our Notes, may be extremely volatile, and the value of an investment in our stock may decline.

Our common stock price has been highly volatile. We expect that this volatility will continue in the future due to factors such as:

- general market and economic conditions;
- actual or anticipated variations in operating results;

- increases or decreases in the general stock market or to the stock prices of technology companies;
- announcements of technological innovations, new products or new services by us or by our competitors or customers;
- changes in financial estimates or recommendations by stock market analysts regarding us or our competitors;
- announcements by us or our competitors of significant acquisitions, dispositions, strategic partnerships, joint ventures or capital commitments;
- announcements by our customers regarding end user market conditions and the status of existing and future infrastructure network deployments;
- additions or departures of key personnel; and
- future equity or debt offerings or our announcements of these offerings.

In addition, in recent years, the stock market in general, and The NASDAQ Stock Market and the securities of technology companies in particular, have experienced extreme price and volume fluctuations. These fluctuations have often been unrelated or disproportionate to the operating performance of individual companies. These broad market fluctuations have in the past, and may in the future, materially and adversely affect our stock price, regardless of our operating results. In these circumstances, investors may be unable to sell their shares of our common stock at or above their purchase price over the short term, or at all.

Our stock price may decline if additional shares are sold in the market or if analysts drop coverage of or downgrade our stock.

Future sales of substantial amounts of shares of our common stock by our existing stockholders in the public market, or the perception that these sales could occur, may cause the market price of our common stock to decline. In addition, we issue additional shares upon exercise of stock options, including under our 2002 Employee Stock Purchase Plan ("ESPP"), and in connection with grants of restricted stock units ("RSUs") on an ongoing basis. To the extent we do not elect to pay solely cash upon conversion of our Notes, we will also be required to issue additional shares of common stock upon conversion. Increased sales of our common stock in the market after exercise of outstanding stock options or grants of restricted stock units could exert downward pressure on our stock price. These sales also might make it more difficult for us to sell equity or equity-related securities in the future at a time and price we deem appropriate.

The trading market for our common stock relies in part on the availability of research and reports that third-party industry or securities analysts publish about us. If one or more of the analysts who do cover us downgrade our stock, our stock price may decline. If one or more of these analysts cease coverage of us, we could lose visibility in the market, which in turn could cause the liquidity of our stock and our stock price to decline.

ITEM 6. EXHIBITS

Exhibit Number	Exhibit Index
3.2	Amended and Restated Bylaws of Harmonic Inc.
31.1	Section 302 Certification of Principal Executive Officer
31.2	Section 302 Certification of Principal Financial Officer
32.1*	Section 906 Certification of Principal Executive Officer
32.2*	Section 906 Certification of Principal Financial Officer
10.1	Lease Termination Agreement dated as of May 15, 2019 by and between Harmonic Inc. and Google LLC.
101	The following materials from Registrant's Quarterly Report on Form 10-Q for the quarter ended June 28, 2019, formatted in Extensible Business Reporting Language (XBRL) include:
	(i) Condensed Consolidated Balance Sheets at June 28, 2019 and December 31, 2018, (ii) Condensed Consolidated Statements of Operations for the three and six months ended June 28, 2019 and June 29, 2018, (iii) Condensed Consolidated Statements of Comprehensive Loss for the three and six months ended June 28, 2019 and June 29, 2018, (iv) Condensed Consolidated Statements of Cash Flows for the three and six months ended June 28, 2019 and June 29, 2018, and (v) Notes to Condensed Consolidated Financial Statements.

* The certifications attached as Exhibits 32.1 and 32.2 that accompany this Quarterly Report on Form 10-Q, are deemed furnished and not filed with the Securities and Exchange Commission and are not to be incorporated by reference into any filing of Harmonic Inc. under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Quarterly Report on Form 10-Q, irrespective of any general incorporation language contained in such filing.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

HARMONIC INC.

By: /s/ Sanjay Kalra

Sanjay Kalra

Chief Financial Officer

Date: August 5, 2019

AMENDED AND RESTATED

BYLAWS

OF

HARMONIC INC.
(a Delaware corporation)

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HARMONIC INC.
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ARTICLE I

CORPORATE OFFICES

1.1 REGISTERED OFFICE

The registered office of the corporation shall be fixed in the certificate of incorporation of the corporation.

1.2 OTHER OFFICES

The board of directors may at any time establish branch or subordinate offices at any place or places where the corporation is qualified to do business.

ARTICLE II

MEETINGS OF STOCKHOLDERS

2.1 PLACE OF MEETINGS

Meetings of stockholders shall be held at any place within or outside the State of Delaware designated by the board of directors. In the absence of any such designation, stockholders' meetings shall be held at the principal executive office of the corporation.

2.2 ANNUAL MEETING

The annual meeting of stockholders shall be held each year on a date and at a time designated by the board of directors. In the absence of such designation, the annual meeting of stockholders shall be held on the first Tuesday in May in each year at 9:00 a.m. However, if such day falls on a legal holiday, then the meeting shall be held at the same time and place on the next succeeding full business day. At the meeting, directors shall be elected, and any other proper business may be transacted.

2.3 SPECIAL MEETING

A special meeting of the stockholders may be called at any time by the board of directors, the chairman of the board of directors, or by the president, but such special meetings may not be called by any other person or persons except as otherwise required by General Corporation Law of

Delaware or Section 3.4 herein. Only such business shall be considered at a special meeting of stockholders as shall have been stated in the notice for such meeting.

2.4 NOTICE OF STOCKHOLDERS' MEETINGS

All notices of meetings of stockholders shall be sent or otherwise given in accordance with Section 2.5 of these bylaws not less than ten (10) nor more than sixty (60) days before the date of the meeting. The notice shall specify the place, date and hour of the meeting and (i) in the case of a special meeting, the purpose or purposes for which the meeting is called (no business other than that specified in the notice may be transacted) or (ii) in the case of the annual meeting, those matters which the board of directors, at the time of giving the notice, intends to present for action by the stockholders (but any proper matter may be presented at the meeting for such action). The notice of any meeting at which directors are to be elected shall include the name of any nominee or nominees who, at the time of the notice, the board intends to present for election. Any previously scheduled meeting of the stockholders may be postponed, and (unless the certificate of incorporation otherwise provides) any special meeting of the stockholders may be cancelled, by resolution of the board of directors upon public notice given prior to the date previously scheduled for such meeting of stockholders.

2.5 ADVANCE NOTICE OF STOCKHOLDER NOMINEES AND STOCKHOLDER BUSINESS

(a) To be properly brought before an annual meeting or special meeting, nominations for the election of directors or other business must be (i) specified in the notice of meeting (or any supplement thereto) given by or at the direction of the board of directors, (ii) otherwise properly brought before the meeting by or at the direction of the board of directors or (iii) otherwise properly brought before the meeting by a stockholder who (x) is a stockholder of record at the time of the giving of notice required by this Section 2.5 and on the record date for the determination of stockholders entitled to vote at the meeting and (y) has timely complied in proper written form with the notice procedures set forth in this Section 2.5. In addition, for business to be properly brought before an annual meeting by a stockholder, such business must be a proper matter for stockholder action pursuant to these bylaws and applicable law. Except as otherwise required by General Corporation Law of Delaware or Section 3.4 herein, stockholders may not bring business before a special meeting of stockholders.

(b) For business to be properly brought before an annual meeting by a stockholder, the stockholder must have given timely notice thereof in proper written form to the Secretary of the corporation. To be timely, a stockholder's notice must be received by the Secretary at the principal executive offices of the corporation not less than sixty (60) calendar days nor earlier than ninety (90) calendar days before the one-year anniversary of the date of the preceding year's annual meeting of stockholders; provided, however, that in the event that no annual meeting was held in the preceding year or the date of the annual meeting has been changed by more than thirty (30) days from the date of the preceding year's annual meeting , then notice by the stockholder to be timely must be so received not later than the close of business on the later of (i) ninety (90) calendar days prior to such annual meeting, or (ii) ten (10) calendar days following the day on which Public

Announcement (as defined below) of the date of such annual meeting is first made. In no event shall any adjournment or postponement of an annual meeting or the announcement thereof commence a new time period for the giving of a stockholder's notice as described in this Section 2.5. "Public Announcement" shall mean disclosure in a press release reported by the Dow Jones News Service, Associated Press or a comparable national news service or in a document publicly filed by the corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the Securities Exchange Act of 1934, as amended, or any successor thereto (the "1934 Act"). To be in proper written form, a stockholder's notice to the Secretary shall set forth as to each matter the stockholder proposes to bring before the annual meeting: (1) a brief description of the business desired to be brought before the annual meeting and the reasons for conducting such business at the annual meeting, (2) the name and address, as they appear on the corporation's books, of the stockholder proposing such business and any Stockholder Associated Person (as defined below), (3) the class and number of shares of the corporation which are held of record or are beneficially owned by the stockholder or any Stockholder Associated Person and any derivative positions held or beneficially held by the stockholder or any Stockholder Associated Person, (4) whether and the extent to which any hedging or other transaction or series of transactions has been entered into by or on behalf of such stockholder or any Stockholder Associated Person with respect to any securities of the corporation, and a description of any other agreement, arrangement or understanding (including any short position or any borrowing or lending of shares), the effect of which is to mitigate loss to, or manage the risk or benefit from share price changes for, or increase or decrease the voting power of, such stockholder or any Stockholder Associated Person with respect to any securities of the corporation, (5) any material interest of the stockholder or a Stockholder Associated Person in such business and (6) a statement whether either such stockholder or any Stockholder Associated Person will deliver a proxy statement and form of proxy to holders of at least the percentage of the corporation's voting shares required under applicable law to carry the proposal (such information provided and statements made as required by clauses (1) through (6) constitute a "Business Solicitation Statement"). In addition, to be in proper written form, a stockholder's notice to the Secretary must be supplemented not later than ten (10) calendar days following the record date to disclose the information contained in clauses (3) and (4) above as of the record date (the "Supplement"). For purposes of this Section 2.5, a "Stockholder Associated Person" of any stockholder shall mean (x) any person controlling, directly or indirectly, or acting in concert with, such stockholder, (y) any beneficial owner of shares of stock of the corporation owned of record or beneficially by such stockholder and on whose behalf the proposal or nomination, as the case may be, is being made, or (z) any person controlling, controlled by or under common control with such person referred to in the preceding clauses (x) and (y). Without exception, no business proposed by a stockholder shall be conducted at any annual meeting except in accordance with the procedures set forth in this Section 2.5. In addition, business proposed to be brought by a stockholder may not be brought before the annual meeting if such stockholder or a Stockholder Associated Person, as applicable, takes action contrary to the representations made in the Business Solicitation Statement or if the Business Solicitation Statement contains an untrue statement of a material fact or omits to state a material fact necessary to make the statements therein not misleading. The chairperson of the annual meeting shall, if the facts warrant, determine and declare at the meeting that business was not properly brought before the meeting and in accordance with the provisions of this Section 2.5, and, if the chairperson should so determine, he or she shall so declare at the meeting that any such business not properly brought before the meeting shall not be transacted.

(c) Only persons who are nominated in accordance with the procedures set forth in this Section 2.5(c) shall be eligible for election as directors. Nominations of persons for election to the board of directors of the corporation may be made at an annual meeting of stockholders by or at the direction of the board of directors or by any stockholder of the corporation entitled to vote in the election of directors at the meeting who timely complies with the notice procedures set forth in this paragraph 2.5(c). To be timely, such nominations, other than those made by or at the direction of the board of directors, shall be made pursuant to the notice provisions of Section 2.5(b), and shall be in proper written form as set forth in this Section 2.5(c). Nominations of persons for election to the board of directors of the corporation may be made at a special meeting of stockholders by a stockholder (if the business to be conducted at such meeting, as specified in the notice described in Section 2.4(i), includes the election of directors) if the notice required by this Section 2.5(c) shall be delivered to the Secretary of the corporation not later than the close of business on the later of ninety (90) calendar days prior to such special meeting or ten (10) calendar days following the day on which Public Announcement (as defined above) is first made of the date of the special meeting and of the nominees proposed by the board of directors to be elected at such meeting. To be in proper written form, a stockholder's notice delivered pursuant to this Section 2.5(c) shall set forth (i) as to each person (a "nominee") whom the stockholder proposes to nominate for election or re-election as a director: (A) the name, age, business address and residence address of the nominee, (B) the principal occupation or employment of the nominee, (C) the class and number of shares of the corporation which are held of record or are beneficially owned by the nominee and any derivative positions held or beneficially held by the nominee, (D) whether and the extent to which any hedging or other transaction or series of transactions has been entered into by or on behalf of the nominee with respect to any securities of the corporation, and a description of any other agreement, arrangement or understanding (including any short position or any borrowing or lending of shares), the effect or intent of which is to mitigate loss to, or manage the risk or benefit from share price changes for, or increase or decrease the voting power of the nominee with respect to any securities of the corporation, (E) a description of all arrangements or understandings between the stockholder and each nominee and any other person or persons (naming such person or persons) pursuant to which the nominations are to be made by the stockholder, (F) a written statement executed by the nominee acknowledging that as a director of the corporation, the nominee will owe fiduciary duties under Delaware law with respect to the corporation and its stockholders, and (G) any other information relating to the nominee that would be required to be disclosed about such nominee if proxies were being solicited for the election of the nominee as a director, or is otherwise required, in each case pursuant to Regulation 14A under the 1934 Act (including without limitation the nominee's written consent to being named in the proxy statement, if any, as a nominee and to serving as a director if elected); and (ii) as to such stockholder giving notice, (x) the information required to be provided in a stockholder's notice pursuant to clauses (2) through (5) of Section 2.5(b) and the Supplement referenced in Section 2.5(b) (except that the references to "business" in such Section 2.5(b) shall instead refer to nominations of directors for purposes of this Section 2.5(c)), and (y) a statement whether either such stockholder or Stockholder Associated Person will deliver a proxy statement and form of proxy to holders of a number of the corporation's voting shares reasonably believed by such stockholder or Stockholder Associated Person to be necessary to elect such nominee(s) (such information provided and statements made as required by preceding clauses (i) and (ii) above constitute a "Nominee Solicitation Statement"). At the request of the board of directors, any person nominated by a stockholder for election as a director shall furnish to the Secretary of the corporation (1) that information required to be set forth in the stockholder's Nominee Solicitation Statement as of a date subsequent to the date on which the notice of such person's nomination was given and (2) such other information as may reasonably be required by the corporation to determine the eligibility of such proposed nominee to serve as independent director of the corporation or that could be material to a reasonable stockholder's understanding of the independence, or lack thereof, of such nominee; in the absence of the furnishing of such information if requested, such stockholder's nomination shall not be considered in proper form pursuant to this Section 2.5(c). Without exception, no person nominated by a stockholder shall be eligible for election or re-election as a director of the corporation unless nominated in accordance with the procedures set forth in this Section 2.5(c). In addition, a nominee shall not be eligible for election or re-election if a stockholder or Stockholder Associated Person, as applicable, takes action contrary to the representations made in the Nominee Solicitation Statement or if the Nominee Solicitation Statement contains an untrue statement of a material fact or omits to state a material fact necessary to make the statements therein not misleading. The chairperson of the meeting shall, if the facts warrants, determine and declare at the meeting that a nomination was not made in accordance with the procedures prescribed by these bylaws, and if the chairperson should so determine, he or she shall so declare at the meeting, and the defective nomination shall be disregarded.

(d) In addition to the foregoing provisions of this Section 2.5, a stockholder must also comply with all applicable requirements of state law and of the 1934 Act and the rules and regulations thereunder with respect to the matters set forth in this Section 2.5, including with respect to business such stockholder intends to bring before the annual meeting that involves a proposal or nomination that such stockholder requests to be included in the corporation's proxy statement, the requirements of Rule 14a-8 (or any successor provision) under the 1934 Act. Nothing in this Section 2.5 shall be deemed to affect any right of the corporation to omit a proposal from the corporation's proxy statement pursuant to Rule 14a-8 (or any successor provision) under the 1934 Act.

2.6 MANNER OF GIVING NOTICE; AFFIDAVIT OF NOTICE

Written notice of any meeting of stockholders shall be given either personally or by first-class mail or by telegraphic or other written communication. Notices not personally delivered shall be sent charges prepaid and shall be addressed to the stockholder at the address of that stockholder appearing on the books of the corporation or given by the stockholder to the corporation for the purpose of notice. Notice shall be deemed to have been given at the time when delivered personally or deposited in the mail or sent by telegram or other means of written communication. If any notice addressed to a stockholder at the address of that stockholder appearing on the books of the corporation is returned to the corporation by the United States Postal Service marked to indicate that the United States Postal Service is unable to deliver the notice to the stockholder at that address, then all future notices or reports shall be deemed to have been duly given without further mailing if the same shall be available to the stockholder on written demand of the stockholder at the principal executive office of the corporation for a period of one (1) year from the date of the giving of the notice.

An affidavit of the mailing or other means of giving any notice of any stockholders' meeting, executed by the secretary, assistant secretary or any transfer agent of the corporation giving the notice, shall be prima facie evidence of the giving of such notice.

2.7 QUORUM

The holders of a majority in voting power of the stock issued and outstanding and entitled to vote thereat, present in person or represented by proxy at the meeting, shall constitute a quorum at all meetings of the stockholders for the transaction of business except as otherwise provided by statute or by the certificate of incorporation. If, however, such quorum is not present or represented at any meeting of the stockholders, then either (i) the chairman of the meeting or (ii) the holders of a majority of the shares represented at the meeting and entitled to vote thereat, present in person or represented by proxy, shall have power to adjourn the meeting in accordance with Section 2.8 of these bylaws.

When a quorum is present at any meeting, the vote of the holders of a majority of the stock having voting power present in person or represented by proxy shall decide any question brought before such meeting, unless the question is one upon which, by express provision of the laws of the State of Delaware or of the certificate of incorporation or these bylaws, a different vote is required, in which case such express provision shall govern and control the decision of the question.

If a quorum be initially present, the stockholders may continue to transact business until adjournment, notwithstanding the withdrawal of enough stockholders to leave less than a quorum, if any action taken is approved by a majority of the stockholders initially constituting the quorum.

2.8 ADJOURNED MEETING; NOTICE

Any stockholders' meeting, annual or special, whether or not a quorum is present, may be adjourned from time to time by (i) the chairman of the meeting or (ii) the stockholders by the vote of the holders of a majority of the shares represented at that meeting and entitled to vote thereat, either in person or by proxy. In the absence of a quorum, no other business may be transacted at that meeting except as provided in Section 2.7 of these bylaws.

When a meeting is adjourned to another time and place, unless these bylaws otherwise require, notice need not be given of the adjourned meeting if the time and place thereof are announced at the meeting at which the adjournment is taken. In no event shall the public announcement of an adjournment of a stockholders meeting commence a new time period for the giving of a stockholder's notice as described in Section 2.5(b) or 2.5(c) herein. At the adjourned meeting the corporation may transact any business that might have been transacted at the original meeting. If the adjournment is for more than thirty (30) days, or if after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

2.9 VOTING

The stockholders entitled to vote at any meeting of stockholders shall be determined in accordance with the provisions of Section 2.12 of these bylaws, subject to the provisions of Sections 217 and 218 of the General Corporation Law of Delaware (relating to voting rights of fiduciaries, pledgors and joint owners, and to voting trusts and other voting agreements).

Except as may be otherwise provided in the certificate of incorporation or these bylaws, each stockholder shall be entitled to one vote for each share of capital stock held by such stockholder. Any stockholder entitled to vote on any matter may vote part of the shares in favor of the proposal and refrain from voting the remaining shares or, except when the matter is the election of directors, may vote them against the proposal; but, if the stockholder fails to specify the number of shares which the stockholder is voting affirmatively, it will be conclusively presumed that the stockholder's approving vote is with respect to all shares which the stockholder is entitled to vote.

2.10 VALIDATION OF MEETINGS; WAIVER OF NOTICE; CONSENT

The transactions of any meeting of stockholders, either annual or special, however called and noticed, and wherever held, shall be as valid as though they had been taken at a meeting duly held after regular call and notice, if a quorum be present either in person or by proxy, and if, either before or after the meeting, each person entitled to vote, who was not present in person or by proxy, signs a written waiver of notice or a consent to the holding of the meeting or an approval of the minutes thereof. The waiver of notice or consent or approval need not specify either the business to be transacted or the purpose of any annual or special meeting of stockholders. All such waivers, consents, and approvals shall be filed with the corporate records or made a part of the minutes of the meeting.

Attendance by a person at a meeting shall also constitute a waiver of notice of and presence at that meeting, except when the person objects at the beginning of the meeting to the transaction of any business because the meeting is not lawfully called or convened. Attendance at a meeting is not a waiver of any right to object to the consideration of matters required by law to be included in the notice of the meeting but not so included, if that objection is expressly made at the meeting.

2.11 STOCKHOLDER ACTION BY WRITTEN CONSENT WITHOUT A MEETING

Any action required or permitted to be taken at any annual or special meeting of stockholders may be taken without a meeting, without prior notice and without a vote, if a consent or consents in writing setting forth the action so taken shall be signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted. Such consents shall be delivered to the corporation by delivery to it registered office in the state of Delaware, its principal place of business, or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to a corporation's registered office shall be by hand or by certified or registered mail, return receipt requested.

2.12 RECORD DATE FOR STOCKHOLDER NOTICE; VOTING

For purposes of determining the stockholders entitled to notice of any meeting or to vote thereat or entitled to give consent to corporate action without a meeting, the board of directors may fix, in advance, a record date, which shall not precede the date upon which the resolution fixing the record date is adopted by the board of directors and which shall not be more than sixty (60) days nor less than ten (10) days before the date of any such meeting, and in such event only stockholders of record on the date so fixed are entitled to notice and to vote, notwithstanding any transfer of any shares on the books of the corporation after the record date.

If the board of directors does not so fix a record date:

(a) the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the business day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the business day next preceding the day on which the meeting is held; and

(b) the record date for determining stockholders entitled to give consent to corporate action in writing without a meeting, (i) when no prior action by the board is required, shall be the day on which the first written consent is delivered to the corporation as provided in Section 2.3(b) of the General Corporation Law of Delaware, or (ii) when prior action by the board is required, shall be at the close of business on the day on which the board adopts the resolution relating to that action.

A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting unless the board of directors fixes a new record date for the adjourned meeting, but the board of directors shall fix a new record date if the meeting is adjourned for more than thirty (30) days from the date set for the original meeting.

The record date for any other purpose shall be as provided in Section 8.1 of these bylaws.

2.13 PROXIES

Every person entitled to vote for directors, or on any other matter, shall have the right to do so either in person or by one or more agents authorized by a written proxy signed by the person and filed with the secretary of the corporation, but no such proxy shall be voted or acted upon after three (3) years from its date, unless the proxy provides for a longer period. A proxy shall be deemed signed if the stockholder's name is placed on the proxy (whether by manual signature, typewriting, telegraphic transmission, telefacsimile or otherwise) by the stockholder or the stockholder's attorney-in-fact. The revocability of a proxy that states on its face that it is irrevocable shall be governed by the provisions of Section 212(e) of the General Corporation Law of Delaware.

2.14 ORGANIZATION

The president, or in the absence of the president, the chairman of the board, shall call the meeting of the stockholders to order, and shall act as chairman of the meeting. In the absence of the president, the chairman of the board, and all of the vice presidents, the stockholders shall appoint a chairman for such meeting. The chairman of any meeting of stockholders shall determine the order of business and the procedures at the meeting, including such matters as the regulation of the manner of voting and the conduct of business. The secretary of the corporation shall act as secretary of all meetings of the stockholders, but in the absence of the secretary at any meeting of the stockholders, the chairman of the meeting may appoint any person to act as secretary of the meeting.

2.15 LIST OF STOCKHOLDERS ENTITLED TO VOTE

The officer who has charge of the stock ledger of the corporation shall prepare and make, at least ten (10) days before every meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, during ordinary business hours, for a period of at least ten (10) days prior to the meeting, either at a place within the city where the meeting is to be held, which place shall be specified in the notice of the meeting, or, if not so specified, at the place where the meeting is to be held. The list shall also be produced and kept at the time and place of the meeting during the whole time thereof, and may be inspected by any stockholder who is present.

2.16 INSPECTORS OF ELECTION

Before any meeting of stockholders, the board of directors may appoint an inspector or inspectors of election to act at the meeting or its adjournment. If no inspector of election is so appointed, then the chairman of the meeting may, and on the request of any stockholder or a stockholder’s proxy shall, appoint an inspector or inspectors of election to act at the meeting. The number of inspectors shall be either one (1) or three (3). If inspectors are appointed at a meeting pursuant to the request of one (1) or more stockholders or proxies, then the holders of a majority of shares or their proxies present at the meeting shall determine whether one (1) or three (3) inspectors are to be appointed. If any person appointed as inspector fails to appear or fails or refuses to act, then the chairman of the meeting may, and upon the request of any stockholder or a stockholder’s proxy shall, appoint a person to fill that vacancy.

Such inspectors shall:

(a) determine the number of shares outstanding and the voting power of each, the number of shares represented at the meeting, the existence of a quorum, and the authenticity, validity, and effect of proxies;

(b) receive votes, ballots or consents;

(c) hear and determine all challenges and questions in any way arising in connection with the right to vote;

(d) count and tabulate all votes or consents;

(e) determine when the polls shall close;

(f) determine the result; and

(g) do any other acts that may be proper to conduct the election or vote with fairness to all stockholders.

ARTICLE III

DIRECTORS

3.1 POWERS

Subject to the provisions of the General Corporation Law of Delaware and to any limitations in the certificate of incorporation or these bylaws relating to action required to be approved by the stockholders or by the outstanding shares, the business and affairs of the corporation shall be managed and shall be exercised by or under the direction of the board of directors. In addition to the powers and authorities these bylaws expressly confer upon them, the board of directors may exercise all such powers of the corporation and do all such lawful acts and things as are not by the General Corporation Law of Delaware or by the certificate of incorporation or by these bylaws required to be exercised or done by the stockholders.

3.2 NUMBER OF DIRECTORS

The board of directors shall consist of seven (7) members. The number of directors may be changed by an amendment to this bylaw, duly adopted by the board of directors or by the stockholders, or by a duly adopted amendment to the certificate of incorporation. No reduction of the authorized number of directors shall have the effect of removing any director before that director’s term of office expires. If for any cause, the directors shall not have been elected at an annual meeting, they may be elected as soon thereafter as convenient at a special meeting of the stockholders called for that purpose in the manner provided in these Bylaws.

3.3 ELECTION AND TERM OF OFFICE OF DIRECTORS

Except as provided in Section 3.4 of these bylaws, directors shall be elected at each annual meeting of stockholders to hold office until the next annual meeting. Each director, including a director elected or appointed to fill a vacancy, shall hold office until the expiration of the term for which elected and until such director’s successor has been elected and qualified or until such director’s earlier resignation or removal.

3.4 RESIGNATION AND VACANCIES

Any director may resign effective on giving written notice to the chairman of the board, the president, the secretary or the board of directors, unless the notice specifies a later time for that resignation to become effective. If the resignation of a director is effective at a future time, the board of directors may elect a successor to take office when the resignation becomes effective.

Vacancies in the board of directors may be filled by a majority of the remaining directors, even if less than a quorum, or by a sole remaining director; however, a vacancy created by the removal of a director by the vote of the stockholders or by court order may be filled only by the affirmative vote of a majority of the shares represented and voting at a duly held meeting at which a quorum is present (which shares voting affirmatively also constitute a majority of the required quorum). Each director so elected shall hold office until the next annual meeting of the stockholders and until a successor has been elected and qualified.

Unless otherwise provided in the certificate of incorporation or these bylaws:

(i) Vacancies and newly created directorships resulting from any increase in the authorized number of directors elected by all of the stockholders having the right to vote as a single class may be filled by a majority of the directors then in office, although less than a quorum, or by a sole remaining director.

(ii) Whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the provisions of the certificate of incorporation, vacancies and newly created directorships of such class or classes or series may be filled by a majority of the directors elected by such class or classes or series thereof then in office, or by a sole remaining director so elected.

Any directors chosen pursuant to this Section 3.4 shall hold office for a term expiring at the next annual meeting of stockholders and until such director's successor shall have been duly elected and qualified.

If at any time, by reason of death or resignation or other cause, the corporation should have no directors in office, then any officer or any stockholder or an executor, administrator, trustee or guardian of a stockholder, or other fiduciary entrusted with like responsibility for the person or estate of a stockholder, may call a special meeting of stockholders in accordance with the provisions of the certificate of incorporation or these bylaws, or may apply to the Court of Chancery for a decree summarily ordering an election as provided in Section 211 of the General Corporation Law of Delaware.

If, at the time of filling any vacancy or any newly created directorship, the directors then in office constitute less than a majority of the whole board (as constituted immediately prior to any such increase), then the Court of Chancery may, upon application of any stockholder or stockholders holding at least ten percent (10%) of the total number of the shares at the time outstanding having the right to vote for such directors, summarily order an election to be held to fill any such vacancies or newly created directorships, or to replace the directors chosen by the directors then in office as aforesaid, which election shall be governed by the provisions of Section 211 of the General Corporation Law of Delaware as far as applicable.

3.5 REMOVAL OF DIRECTORS

Unless otherwise restricted by statute, by the certificate of incorporation or by these bylaws, any director or the entire board of directors may be removed, with or without cause, by the holders of a majority of the shares then entitled to vote at an election of directors; provided, however, that, if and so long as stockholders of the corporation are entitled to cumulative voting, if less than the entire board is to be removed, no director may be removed without cause if the votes cast against his removal would be sufficient to elect him if then cumulatively voted at an election of the entire board of directors.

3.6 PLACE OF MEETINGS; MEETINGS BY TELEPHONE

Regular meetings of the board of directors may be held at any place within or outside the State of Delaware that has been designated from time to time by resolution of the board. In the absence of such a designation, regular meetings shall be held at the principal executive office of the corporation. Special meetings of the board may be held at any place within or outside the State of Delaware that has been designated in the notice of the meeting or, if not stated in the notice or if there is no notice, at the principal executive office of the corporation.

Any meeting of the board, regular or special, may be held by conference telephone or similar communication equipment, so long as all directors participating in the meeting can hear one another; and all such participating directors shall be deemed to be present in person at the meeting.

3.7 FIRST MEETINGS

The first meeting of each newly elected board of directors shall be held at such time and place as shall be fixed by the vote of the stockholders at the annual meeting. In the event of the failure of the stockholders to fix the time or place of such first meeting of the newly elected board of directors, or in the event such meeting is not held at the time and place so fixed by the stockholders, the meeting may be held at such time and place as shall be specified in a notice given as hereinafter provided for special meetings of the board of directors, or as shall be specified in a written waiver signed by all of the directors.

3.8 REGULAR MEETINGS

Regular meetings of the board of directors may be held without notice at such time as shall from time to time be determined by the board of directors. If any regular meeting day shall fall on a legal holiday, then the meeting shall be held at the same time and place on the next succeeding full business day.

3.9 SPECIAL MEETINGS; NOTICE

Special meetings of the board of directors for any purpose or purposes may be called at any time by the chairman of the board of directors, the president, any vice president, the secretary or any two directors.

The person or persons authorized to call special meetings of the board of directors may fix the time and place of the meetings. Notice of the time and place of special meetings shall be delivered personally or by telephone to each director or sent by first-class mail, courier service or telegram, telecopy or other electronic or wireless means, charges prepaid, addressed to each director at that director’s address as it is shown on the records of the corporation. If the notice is by mail, such notice shall be deposited in the United States mail at least four (4) days before the time of the holding of the meeting. If the notice is by courier service, telegram, overnight mail, telecopy or other electronic or wireless means, such notice shall be deemed adequately delivered when the notice is transmitted at least twenty-four (24) hours prior to the time set for such meeting. If the notice is by telephone or by hand delivery, such notice shall be deemed adequately delivered when the notice is given at least twenty-four (24) hours prior to the time set for such meeting. Any oral notice given personally or by telephone may be communicated either to the director or to a person at the office of the director who the person giving the notice has reason to believe will promptly communicate it to the director. The notice need not specify the purpose or the place of the meeting, if the meeting is to be held at the principal executive office of the corporation.

3.10 QUORUM

A majority of the authorized number of directors shall constitute a quorum for the transaction of business, except to adjourn as provided in Section 3.12 of these bylaws. Every act or decision done or made by a majority of the directors present at a duly held meeting at which a quorum is present shall be regarded as the act of the board of directors, subject to the provisions of the certificate of incorporation and applicable law.

A meeting at which a quorum is initially present may continue to transact business notwithstanding the withdrawal of directors, if any action taken is approved by at least a majority of the quorum for that meeting.

3.11 WAIVER OF NOTICE

Notice of a meeting need not be given to any director (i) who signs a waiver of notice, whether before or after the meeting, or (ii) who attends the meeting without protesting, prior thereto or at its commencement, the lack of notice to such directors. All such waivers shall be filed with the corporate records or made part of the minutes of the meeting. A waiver of notice need not specify the purpose of any regular or special meeting of the board of directors.

3.12 ADJOURNMENT

A majority of the directors present, whether or not constituting a quorum, may adjourn any meeting of the board to another time and place.

3.13 NOTICE OF ADJOURNMENT

Notice of the time and place of holding an adjourned meeting of the board need not be given unless the meeting is adjourned for more than twenty-four (24) hours. If the meeting is adjourned for more than twenty-four (24) hours, then notice of the time and place of the adjourned meeting shall be given before the adjourned meeting takes place, in the manner specified in Section 3.9 of these bylaws, to the directors who were not present at the time of the adjournment.

3.14 BOARD ACTION BY WRITTEN CONSENT WITHOUT A MEETING

Any action required or permitted to be taken by the board of directors may be taken without a meeting, provided that all members of the board individually or collectively consent in writing to that action. Such action by written consent shall have the same force and effect as a unanimous vote of the board of directors. Such written consent and any counterparts thereof shall be filed with the minutes of the proceedings of the board of directors.

3.15 FEES AND COMPENSATION OF DIRECTORS

Directors and members of committees may receive such compensation, if any, for their services and such reimbursement of expenses as may be fixed or determined by resolution of the board of directors. This Section 3.15 shall not be construed to preclude any director from serving the corporation in any other capacity as an officer, agent, employee or otherwise and receiving compensation for those services.

3.16 APPROVAL OF LOANS TO OFFICERS

The corporation may lend money to, or guarantee any obligation of, or otherwise assist any officer or other employee of the corporation or any of its subsidiaries, including any officer or employee who is a director of the corporation or any of its subsidiaries, whenever, in the judgment of the directors, such loan, guaranty or assistance may reasonably be expected to benefit the corporation. The loan, guaranty or other assistance may be with or without interest and may be unsecured, or secured in such manner as the board of directors shall approve, including, without limitation, a pledge of shares of stock of the corporation. Nothing contained in this section shall be deemed to deny, limit or restrict the powers of guaranty or warranty of the corporation at common law or under any statute.

3.17 SOLE DIRECTOR PROVIDED BY CERTIFICATE OF INCORPORATION

In the event only one director is required by these bylaws or the certificate of incorporation, then any reference herein to notices, waivers, consents, meetings or other actions by a majority or quorum of the directors shall be deemed to refer to such notice, waiver, etc., by such sole director, who shall have all the rights and duties and shall be entitled to exercise all of the powers and shall assume all the responsibilities otherwise herein described as given to the board of directors.

ARTICLE IV

COMMITTEES

4.1 COMMITTEES OF DIRECTORS

The board of directors may, by resolution adopted by a majority of the authorized number of directors, designate one (1) or more committees, each consisting of two or more directors, to serve at the pleasure of the board. The board may designate one (1) or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. The appointment of members or alternate members of a committee requires the vote of a majority of the authorized number of directors. Any committee, to the extent provided in the resolution of the board, shall have and may exercise all the powers and authority of the board, but no such committee shall have the power or authority to (i) amend the certificate of incorporation (except that a committee may, to the extent authorized in the resolution or resolutions providing for the issuance of shares of stock adopted by the board of directors as provided in Section 151(a) of the General Corporation Law of Delaware, fix the designations and any of the preferences or rights of such shares relating to dividends, redemption, dissolution, any distribution of assets of the corporation or the conversion into, or the exchange of such shares for, shares of any other class or classes or any other series of the same or any other class or classes of stock of the corporation), (ii) adopt an agreement of merger or consolidation under Sections 251 or 252 of the General Corporation Law of Delaware, (iii) recommend to the stockholders the sale, lease or exchange of all or substantially all of the corporation’s property and assets, (iv) recommend to the stockholders a dissolution of the corporation or a revocation of a dissolution or (v) amend the bylaws of the corporation; and, unless the board resolution establishing the committee, the bylaws or the certificate of incorporation expressly so provide, no such committee shall have the power or authority to declare a dividend, to authorize the issuance of stock, or to adopt a certificate of ownership and merger pursuant to Section 253 of the General Corporation Law of Delaware.

4.2 MEETINGS AND ACTION OF COMMITTEES

Meetings and actions of committees shall be governed by, and held and taken in accordance with, the following provisions of Article III of these bylaws: Section 3.6 (place of meetings; meetings by telephone), Section 3.8 (regular meetings), Section 3.9 (special meetings; notice), Section 3.10 (quorum), Section 3.11 (waiver of notice), Section 3.12 (adjournment), Section 3.13 (notice of adjournment) and Section 3.14 (board action by written consent without meeting), with such changes in the context of those bylaws as are necessary to substitute the committee and its members for the board of directors and its members; provided, however, that the time of regular meetings of committees may be determined either by resolution of the board of directors or by resolution of the committee, that special meetings of committees may also be called by resolution of the board of directors, and that notice of special meetings of committees shall also be given to all alternate members, who shall have the right to attend all meetings of the committee. The board of directors may adopt rules for the government of any committee not inconsistent with the provisions of these bylaws.

4.3 COMMITTEE MINUTES

Each committee shall keep regular minutes of its meetings and report the same to the board of directors when required.

ARTICLE V

OFFICERS

5.1 OFFICERS

The Corporate Officers of the corporation shall be a president, a secretary and a chief financial officer. The corporation may also have, at the discretion of the board of directors, a chairman of the board, one or more vice presidents (however denominated), one or more assistant secretaries, one or more assistant treasurers and such other officers as may be appointed in accordance with the provisions of Section 5.3 of these bylaws. Any number of offices may be held by the same person.

In addition to the Corporate Officers of the Company described above, there may also be such Administrative Officers of the corporation as may be designated and appointed from time to time by the president of the corporation in accordance with the provisions of Section 5.12 of these bylaws.

5.2 ELECTION OF OFFICERS

The Corporate Officers of the corporation, except such officers as may be appointed in accordance with the provisions of Section 5.3 or Section 5.5 of these bylaws, shall be chosen by the board of directors, subject to the rights, if any, of an officer under any contract of employment, and shall hold their respective offices for such terms as the board of directors may from time to time determine.

5.3 SUBORDINATE OFFICERS

The board of directors may appoint, or may empower the president to appoint, such other Corporate Officers as the business of the corporation may require, each of whom shall hold office for such period, have such power and authority, and perform such duties as are provided in these bylaws or as the board of directors may from time to time determine.

The president may from time to time designate and appoint Administrative Officers of the corporation in accordance with the provisions of Section 5.12 of these bylaws.

5.4 REMOVAL AND RESIGNATION OF OFFICERS

Subject to the rights, if any, of a Corporate Officer under any contract of employment, any Corporate Officer may be removed, either with or without cause, by the board of directors at any regular or special meeting of the board or, except in case of a Corporate Officer chosen by the board of directors, by any Corporate Officer upon whom such power of removal may be conferred by the board of directors.

Any Corporate Officer may resign at any time by giving written notice to the corporation. Any resignation shall take effect at the date of the receipt of that notice or at any later time specified in that notice; and, unless otherwise specified in that notice, the acceptance of the resignation shall not be necessary to make it effective. Any resignation is without prejudice to the rights, if any, of the corporation under any contract to which the Corporate Officer is a party.

Any Administrative Officer designated and appointed by the president may be removed, either with or without cause, at any time by the president. Any Administrative Officer may resign at any time by giving written notice to the president or to the secretary of the corporation.

5.5 VACANCIES IN OFFICES

A vacancy in any office because of death, resignation, removal, disqualification or any other cause shall be filled in the manner prescribed in these bylaws for regular appointments to that office.

5.6 CHAIRMAN OF THE BOARD

The chairman of the board, if such an officer be elected, shall, if present, preside at meetings of the board of directors and exercise such other powers and perform such other duties as may from time to time be assigned to him by the board of directors or as may be prescribed by these bylaws. If there is no president, then the chairman of the board shall also be the chief executive officer of the corporation and shall have the powers and duties prescribed in Section 5.7 of these bylaws.

5.7 PRESIDENT

Subject to such supervisory powers, if any, as may be given by the board of directors to the chairman of the board, if there be such an officer, the president shall be the chief executive officer of the corporation and shall, subject to the control of the board of directors, have general supervision, direction and control of the business and the officers of the corporation. He or she shall preside at all meetings of the stockholders and, in the absence or nonexistence of a chairman of the board, at all meetings of the board of directors. He or she shall have the general powers and duties of management usually vested in the office of president of a corporation, and shall have such other powers and perform such other duties as may be prescribed by the board of directors or these bylaws.

5.8 VICE PRESIDENTS

In the absence or disability of the president, and if there is no chairman of the board, the vice presidents, if any, in order of their rank as fixed by the board of directors or, if not ranked, a vice president designated by the board of directors, shall perform all the duties of the president and when so acting shall have all the powers of, and be subject to all the restrictions upon, the president. The vice presidents shall have such other powers and perform such other duties as from time to time may be prescribed for them respectively by the board of directors, these bylaws, the president or the chairman of the board.

5.9 SECRETARY

The secretary shall keep or cause to be kept, at the principal executive office of the corporation or such other place as the board of directors may direct, a book of minutes of all meetings and actions of the board of directors, committees of directors and stockholders. The minutes shall show the time and place of each meeting, whether regular or special (and, if special, how authorized and the notice given), the names of those present at directors' meetings or committee meetings, the number of shares present or represented at stockholders' meetings and the proceedings thereof.

The secretary shall keep, or cause to be kept, at the principal executive office of the corporation or at the office of the corporation's transfer agent or registrar, as determined by resolution of the board of directors, a share register or a duplicate share register, showing the names of all stockholders and their addresses, the number and classes of shares held by each, the number and date of certificates evidencing such shares and the number and date of cancellation of every certificate surrendered for cancellation.

The secretary shall give, or cause to be given, notice of all meetings of the stockholders and of the board of directors required to be given by law or by these bylaws. He or she shall keep the seal of the corporation, if one be adopted, in safe custody and shall have such other powers and perform such other duties as may be prescribed by the board of directors or by these bylaws.

5.10 CHIEF FINANCIAL OFFICER

The chief financial officer shall keep and maintain, or cause to be kept and maintained, adequate and correct books and records of accounts of the properties and business transactions of the corporation, including accounts of its assets, liabilities, receipts, disbursements, gains, losses, capital, retained earnings and shares. The books of account shall at all reasonable times be open to inspection by any director for a purpose reasonably related to his position as a director.

The chief financial officer shall deposit all money and other valuables in the name and to the credit of the corporation with such depositaries as may be designated by the board of directors. He or she shall disburse the funds of the corporation as may be ordered by the board of directors, shall render to the president and directors, whenever they request it, an account of all of his or her transactions as chief financial officer and of the financial condition of the corporation, and shall have such other powers and perform such other duties as may be prescribed by the board of directors or these bylaws.

5.11 ASSISTANT SECRETARY

The assistant secretary, if any, or, if there is more than one, the assistant secretaries in the order determined by the board of directors (or if there be no such determination, then in the order of their election) shall, in the absence of the secretary or in the event of his or her inability or refusal to act, perform the duties and exercise the powers of the secretary and shall perform such other duties and have such other powers as the board of directors may from time to time prescribe.

5.12 ADMINISTRATIVE OFFICERS

In addition to the Corporate Officers of the corporation as provided in Section 5.1 of these bylaws and such subordinate Corporate Officers as may be appointed in accordance with Section 5.3 of these bylaws, there may also be such Administrative Officers of the corporation as may be designated and appointed from time to time by the president of the corporation. Administrative Officers shall perform such duties and have such powers as from time to time may be determined by the president or the board of directors in order to assist the Corporate Officers in the furtherance of their duties. In the performance of such duties and the exercise of such powers, however, such Administrative Officers shall have limited authority to act on behalf of the corporation as the board of directors shall establish, including but not limited to limitations on the dollar amount and on the scope of agreements or commitments that may be made by such Administrative Officers on behalf of the corporation, which limitations may not be exceeded by such individuals or altered by the president without further approval by the board of directors.

5.13 AUTHORITY AND DUTIES OF OFFICERS

In addition to the foregoing powers, authority and duties, all officers of the corporation shall respectively have such authority and powers and perform such duties in the management of the business of the corporation as may be designated from time to time by the board of directors.

ARTICLE VI

INDEMNIFICATION OF DIRECTORS, OFFICERS, EMPLOYEES AND OTHER AGENTS

6.1 INDEMNIFICATION OF DIRECTORS AND OFFICERS

The corporation shall, to the maximum extent and in the manner permitted by the General Corporation Law of Delaware as the same now exists or may hereafter be amended, indemnify any person against expenses (including attorneys’ fees), judgments, fines, and amounts paid in settlement actually and reasonably incurred in connection with any threatened, pending or completed action, suit, or proceeding in which such person was or is a party or is threatened to be made a party by reason of the fact that such person is or was a director or officer of the corporation. For purposes of this Section 6.1, a “director” or “officer” of the corporation shall mean any person (i) who is or was a director or officer of the corporation, (ii) who is or was serving at the request of the corporation as a director or officer of another corporation, partnership, joint venture, trust or other enterprise or (iii) who was a director or officer of a corporation which was a predecessor corporation of the corporation or of another enterprise at the request of such predecessor corporation.

The corporation shall be required to indemnify a director or officer in connection with an action, suit, or proceeding (or part thereof) initiated by such director or officer only if the initiation of such action, suit, or proceeding (or part thereof) by the director or officer was authorized by the board of Directors of the corporation.

The corporation shall pay the expenses (including attorney's fees) incurred by a director or officer of the corporation entitled to indemnification hereunder in defending any action, suit or proceeding referred to in this Section 6.1 in advance of its final disposition; provided, however, that payment of expenses incurred by a director or officer of the corporation in advance of the final disposition of such action, suit or proceeding shall be made only upon receipt of an undertaking by the director or officer to repay all amounts advanced if it should ultimately be determined that the director or officer is not entitled to be indemnified under this Section 6.1 or otherwise.

The rights conferred on any person by this Article shall not be exclusive of any other rights which such person may have or hereafter acquire under any statute, provision of the corporation's certificate of incorporation, these bylaws, agreement, vote of the stockholders or disinterested directors or otherwise.

Any repeal or modification of the foregoing provisions of this Article shall not adversely affect any right or protection hereunder of any person in respect of any act or omission occurring prior to the time of such repeal or modification.

6.2 INDEMNIFICATION OF OTHERS

The corporation shall have the power, to the maximum extent and in the manner permitted by the General Corporation Law of Delaware as the same now exists or may hereafter be amended, to indemnify any person (other than directors and officers) against expenses (including attorneys' fees), judgments, fines, and amounts paid in settlement actually and reasonably incurred in connection with any threatened, pending or completed action, suit, or proceeding, in which such person was or is a party or is threatened to be made a party by reason of the fact that such person is or was an employee or agent of the corporation. For purposes of this Section 6.2, an "employee" or "agent" of the corporation (other than a director or officer) shall mean any person (i) who is or was an employee or agent of the corporation, (ii) who is or was serving at the request of the corporation as an employee or agent of another corporation, partnership, joint venture, trust or other enterprise or (iii) who was an employee or agent of a corporation which was a predecessor corporation of the corporation or of another enterprise at the request of such predecessor corporation.

6.3 INSURANCE

The corporation may purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against him or her and incurred by him or her in any such capacity, or arising out of his or her status as such, whether or not the corporation would have the power to indemnify him or her against such liability under the provisions of the General Corporation Law of Delaware.

ARTICLE VII

RECORDS AND REPORTS

7.1 MAINTENANCE AND INSPECTION OF RECORDS

The corporation shall, either at its principal executive office or at such place or places as designated by the board of directors, keep a record of its stockholders listing their names and addresses and the number and class of shares held by each stockholder, a copy of these bylaws as amended to date, accounting books and other records of its business and properties.

Any stockholder of record, in person or by attorney or other agent, shall, upon written demand under oath stating the purpose thereof, have the right during the usual hours for business to inspect for any proper purpose the corporation's stock ledger, a list of its stockholders, and its other books and records and to make copies or extracts therefrom. A proper purpose shall mean a purpose reasonably related to such person's interest as a stockholder. In every instance where an attorney or other agent is the person who seeks the right to inspection, the demand under oath shall be accompanied by a power of attorney or such other writing that authorizes the attorney or other agent to so act on behalf of the stockholder. The demand under oath shall be directed to the corporation at its registered office in Delaware or at its principal place of business.

7.2 INSPECTION BY DIRECTORS

Any director shall have the right to examine the corporation's stock ledger, a list of its stockholders and its other books and records for a purpose reasonably related to his or her position as a director.

7.3 ANNUAL STATEMENT TO STOCKHOLDERS

The board of directors shall present at each annual meeting, and at any special meeting of the stockholders when called for by vote of the stockholders, a full and clear statement of the business and condition of the corporation.

7.4 REPRESENTATION OF SHARES OF OTHER CORPORATIONS

The chairman of the board, if any, the president, any vice president, the chief financial officer, the secretary or any assistant secretary of this corporation, or any other person authorized by the board of directors or the president or a vice president, is authorized to vote, represent and exercise on behalf of this corporation all rights incident to any and all shares of the stock of any other corporation or corporations standing in the name of this corporation. The authority herein granted may be exercised either by such person directly or by any other person authorized to do so by proxy or power of attorney duly executed by such person having the authority.

7.5 CERTIFICATION AND INSPECTION OF BYLAWS

The original or a copy of these bylaws, as amended or otherwise altered to date, certified by the secretary, shall be kept at the corporation's principal executive office and shall be open to inspection by the stockholders of the corporation, at all reasonable times during office hours.

ARTICLE VIII

GENERAL MATTERS

8.1 RECORD DATE FOR PURPOSES OTHER THAN NOTICE AND VOTING

For purposes of determining the stockholders entitled to receive payment of any dividend or other distribution or allotment of any rights or the stockholders entitled to exercise any rights in respect of any change, conversion or exchange of stock, or for the purpose of any other lawful action, the board of directors may fix, in advance, a record date, which shall not precede the date upon which the resolution fixing the record date is adopted and which shall not be more than sixty (60) days before any such action. In that case, only stockholders of record at the close of business on the date so fixed are entitled to receive the dividend, distribution or allotment of rights, or to exercise such rights, as the case may be, notwithstanding any transfer of any shares on the books of the corporation after the record date so fixed, except as otherwise provided by law.

If the board of directors does not so fix a record date, then the record date for determining stockholders for any such purpose shall be at the close of business on the day on which the board of directors adopts the applicable resolution.

8.2 CHECKS; DRAFTS; EVIDENCES OF INDEBTEDNESS

From time to time, the board of directors shall determine by resolution which person or persons may sign or endorse all checks, drafts, other orders for payment of money, notes or other evidences of indebtedness that are issued in the name of or payable to the corporation, and only the persons so authorized shall sign or endorse those instruments.

8.3 CORPORATE CONTRACTS AND INSTRUMENTS: HOW EXECUTED

The board of directors, except as otherwise provided in these bylaws, may authorize and empower any officer or officers, or agent or agents, to enter into any contract or execute any instrument in the name of and on behalf of the corporation; such power and authority may be general or confined to specific instances. Unless so authorized or ratified by the board of directors or within the agency power of an officer, no officer, agent or employee shall have any power or authority to bind the corporation by any contract or engagement or to pledge its credit or to render it liable for any purpose or for any amount.

8.4 STOCK CERTIFICATES; TRANSFER; PARTLY PAID SHARES

The shares of the corporation shall be represented by certificates, provided that the board of directors of the corporation may provide by resolution or resolutions that some or all of any or all classes or series of its stock shall be uncertificated shares. Any such resolution shall not apply to shares represented by a certificate until such certificate is surrendered to the corporation. Notwithstanding the adoption of such a resolution by the board of directors, every holder of stock represented by certificates and, upon request, every holder of uncertificated shares, shall be entitled to have a certificate signed by, or in the name of the corporation by, the chairman or vice-chairman of the board of directors, or the president or vice-president, and by the treasurer or an assistant treasurer, or the secretary or an assistant secretary of such corporation representing the number of shares registered in certificate form. Any or all of the signatures on the certificate may be a facsimile. In case any officer, transfer agent or registrar who has signed or whose facsimile signature has been placed upon a certificate has ceased to be such officer, transfer agent or registrar before such certificate is issued, it may be issued by the corporation with the same effect as if he or she were such officer, transfer agent or registrar at the date of issue.

Certificates for shares shall be of such form and device as the board of directors may designate and shall state the name of the record holder of the shares represented thereby; its number; date of issuance; the number of shares for which it is issued; a summary statement or reference to the powers, designations, preferences or other special rights of such stock and the qualifications, limitations or restrictions of such preferences and/or rights, if any; a statement or summary of liens, if any; a conspicuous notice of restrictions upon transfer or registration of transfer, if any; a statement as to any applicable voting trust agreement; if the shares be assessable, or, if assessments are collectible by personal action, a plain statement of such facts.

Upon surrender to the secretary or transfer agent of the corporation of a certificate for shares duly endorsed or accompanied by proper evidence of succession, assignment or authority to transfer, it shall be the duty of the corporation to issue a new certificate to the person entitled thereto, cancel the old certificate and record the transaction upon its books.

The corporation may issue the whole or any part of its shares as partly paid and subject to call for the remainder of the consideration to be paid therefor. Upon the face or back of each stock certificate issued to represent any such partly paid shares, or upon the books and records of the corporation in the case of uncertificated partly paid shares, the total amount of the consideration to be paid therefor and the amount paid thereon shall be stated. Upon the declaration of any dividend on fully paid shares, the corporation shall declare a dividend upon partly paid shares of the same class, but only upon the basis of the percentage of the consideration actually paid thereon.

8.5 SPECIAL DESIGNATION ON CERTIFICATES

If the corporation is authorized to issue more than one class of stock or more than one series of any class, then the powers, the designations, the preferences and the relative, participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights shall be set forth in full or summarized on the face or back of the certificate that the corporation shall issue to represent such class or series of stock; provided, however, that, except as otherwise provided in Section 202 of the General Corporation Law of Delaware, in lieu of the foregoing requirements there may be set forth on the face or back of the certificate that the corporation shall issue to represent such class or series of stock a statement that the corporation will furnish without charge to each stockholder who so requests the powers, the designations, the preferences and the relative, participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights.

8.6 LOST CERTIFICATES

Except as provided in this Section 8.6, no new certificates for shares shall be issued to replace a previously issued certificate unless the latter is surrendered to the corporation and cancelled at the same time. The board of directors may, in case any share certificate or certificate for any other security is lost, stolen or destroyed, authorize the issuance of replacement certificates on such terms and conditions as the board may require; the board may require indemnification of the corporation secured by a bond or other adequate security sufficient to protect the corporation against any claim that may be made against it, including any expense or liability, on account of the alleged loss, theft or destruction of the certificate or the issuance of the replacement certificate.

8.7 TRANSFER AGENTS AND REGISTRARS

The board of directors may appoint one or more transfer agents or transfer clerks, and one or more registrars, each of which shall be an incorporated bank or trust company — either domestic or foreign, who shall be appointed at such times and places as the requirements of the corporation may necessitate and the board of directors may designate.

8.8 CONSTRUCTION; DEFINITIONS

Unless the context requires otherwise, the general provisions, rules of construction and definitions in the General Corporation Law of Delaware shall govern the construction of these bylaws. Without limiting the generality of this provision, as used in these bylaws, the singular number includes the plural, the plural number includes the singular, and the term “person” includes both an entity and a natural person.

ARTICLE IX

AMENDMENTS

The original or other bylaws of the corporation may be adopted, amended or repealed by the stockholders entitled to vote; provided, however, that the corporation may, in its certificate of incorporation, confer the power to adopt, amend or repeal bylaws upon the directors. The fact that such power has been so conferred upon the directors shall not divest the stockholders of the power, nor limit their power to adopt, amend or repeal bylaws.

Whenever an amendment or new bylaw is adopted, it shall be copied in the book of bylaws with the original bylaws, in the appropriate place. If any bylaw is repealed, the fact of repeal with the date of the meeting at which the repeal was enacted or the filing of the operative written consent(s) shall be stated in said book.

ARTICLE X

DISSOLUTION

If it should be deemed advisable in the judgment of the board of directors of the corporation that the corporation should be dissolved, the board, after the adoption of a resolution to that effect by a majority of the whole board at any meeting called for that purpose, shall cause notice to be mailed to each stockholder entitled to vote thereon of the adoption of the resolution and of a meeting of stockholders to take action upon the resolution.

At the meeting a vote shall be taken for and against the proposed dissolution. If a majority of the outstanding stock of the corporation entitled to vote thereon votes for the proposed dissolution, then a certificate stating that the dissolution has been authorized in accordance with the provisions of Section 275 of the General Corporation Law of Delaware and setting forth the names and residences of the directors and officers shall be executed, acknowledged, and filed and shall become effective in accordance with Section 103 of the General Corporation Law of Delaware. Upon such certificate's becoming effective in accordance with Section 103 of the General Corporation Law of Delaware, the corporation shall be dissolved.

Whenever all the stockholders entitled to vote on a dissolution consent in writing, either in person or by duly authorized attorney, to a dissolution, no meeting of directors or stockholders shall be necessary. The consent shall be filed and shall become effective in accordance with Section 103 of the General Corporation Law of Delaware. Upon such consent's becoming effective in accordance with Section 103 of the General Corporation Law of Delaware, the corporation shall be dissolved. If the consent is signed by an attorney, then the original power of attorney or a photocopy thereof shall be attached to and filed with the consent. The consent filed with the Secretary of State shall have attached to it the affidavit of the secretary or some other officer of the corporation stating that the consent has been signed by or on behalf of all the stockholders entitled to vote on a dissolution; in addition, there shall be attached to the consent a certification by the secretary or some other officer of the corporation setting forth the names and residences of the directors and officers of the corporation.

ARTICLE XI

CUSTODIAN

11.1 APPOINTMENT OF A CUSTODIAN IN CERTAIN CASES

The Court of Chancery, upon application of any stockholder, may appoint one or more persons to be custodians and, if the corporation is insolvent, to be receivers, of and for the corporation when:

(i) at any meeting held for the election of directors the stockholders are so divided that they have failed to elect successors to directors whose terms have expired or would have expired upon qualification of their successors; or

(ii) the business of the corporation is suffering or is threatened with irreparable injury because the directors are so divided respecting the management of the affairs of the corporation that the required vote for action by the board of directors cannot be obtained and the stockholders are unable to terminate this division; or

(iii) the corporation has abandoned its business and has failed within a reasonable time to take steps to dissolve, liquidate or distribute its assets.

11.2 DUTIES OF CUSTODIAN

The custodian shall have all the powers and title of a receiver appointed under Section 291 of the General Corporation Law of Delaware, but the authority of the custodian shall be to continue the business of the corporation and not to liquidate its affairs and distribute its assets, except when the Court of Chancery otherwise orders and except in cases arising under Sections 226(a)(3) or 352(a)(2) of the General Corporation Law of Delaware.

HARMONIC INC.

CERTIFICATE OF AMENDMENT OF BYLAWS

The undersigned hereby certifies that he or she is the duly elected, qualified, and acting Secretary or Assistant Secretary of Harmonic Inc., a Delaware corporation, and that the foregoing bylaws were amended and restated on June 5, 2019 by the corporation's board of directors.

IN WITNESS WHEREOF, the undersigned has hereunto set his or her hand this 5th day of June, 2019.

/s/ Timothy C. Chu
Secretary

LEASE TERMINATION AGREEMENT

THIS LEASE TERMINATION AGREEMENT (this "**Agreement**") is made and entered into effective as of May 15, 2019 (the "**Effective Date**"), by and between GOOGLE LLC, a Delaware limited liability company ("**Landlord**"), and HARMONIC INC., a Delaware corporation ("**Tenant**").

R E C I T A L S :

A. Landlord and Tenant are parties to that certain Lease (as defined below), pursuant to which Landlord is currently leasing to Tenant, and Tenant is currently leasing from Landlord, certain space (the "**Premises**") containing approximately 188,332 rentable square feet, comprising the entire building addressed as 4300 North First Street, San Jose, California (the "**Building**"). As used herein, "**Lease**" shall mean and refer, collectively, to the following document(s):

i. Lease dated as of December 15, 2009 (the "**Original Lease**"), between CRP North First Street, L.L.C., a Delaware limited liability company ("**CRP**") (as predecessor-in-interest to Landlord), and Tenant; and

ii. Commencement Date Memorandum entered into as of September 9, 2010 (the "**Commencement Date Memorandum**"), between CRP and Tenant.

B. Landlord and Tenant now desire to enter into this Agreement in order to terminate the Lease and to release one another from their respective obligations thereunder, except as otherwise provided herein.

A G R E E M E N T :

NOW, THEREFORE, in consideration of the foregoing recitals and the conditions and the mutual covenants hereinafter contained, and for other good and valuable consideration hereinafter set forth, the receipt and sufficiency of which are hereby acknowledged, Landlord and Tenant hereby agree as follows:

1. Capitalized Terms. All capitalized terms when used herein shall have the same meanings given such terms in the Lease unless expressly superseded by the terms of this Agreement.

2. Termination of the Lease. Landlord and Tenant hereby agree that the Lease shall terminate and be of no further force or effect as of the earlier to occur of (i) the Surrender Date (as defined below), or (ii) April 30, 2020 (the "**Termination Date**"). Effective as of the Effective Date, all rights of Tenant to extend the Lease Term (including, without limitation, pursuant to and in accordance with Section 29 of the Original Lease), or rights of first offer or refusal to lease any other space in the Building or Project (including, without limitation, pursuant to and in accordance with Section 32 of the Original Lease) or rights of first offer to purchase the Real Property or the Project (including, without limitation, pursuant to and in accordance with Section 33 of the Original Lease), are hereby terminated and are of no further force or effect.

3. Surrender of Premises. Tenant hereby agrees to vacate the Premises and surrender and deliver exclusive possession of the Premises to Landlord at any time during the period commencing on July 31, 2019 and ending on the Termination Date in accordance with the applicable surrender provisions of the Lease; provided, however, that, notwithstanding anything to the contrary set forth in the Lease (including, without limitation, Section 21 of the Original Lease), Tenant shall not be required to remove (A) any alterations, additions or improvements previously made to the Premises prior to the Effective Date, (B) the Lines, or (C) the Generator (the date on which Tenant so surrenders and delivers exclusive possession of the Premises to Landlord in accordance with this Agreement is referred to as the "**Surrender Date**"). Without limiting the generality of the foregoing, on or before the Surrender Date, Tenant shall, at Tenant's sole cost and expense, remove or cause to be removed from the Premises any and all furniture, trade fixtures and equipment, free-standing cabinet work, and, subject to the foregoing sentence, all other articles of personal property owned by Tenant or installed or placed by Tenant at its expense in the Premises, and such similar articles of any other persons claiming under Tenant, and deliver the Premises to Landlord in a broom-clean condition. Tenant shall immediately repair at its own expense all damage to the Premises and the Building resulting from any such removal. If Tenant fails to complete such removal and/or repair all damage to the Premises and the Building caused by such removal, Landlord may (but shall not be obligated to) do so, and may charge the reasonable and actual costs incurred by Landlord in connection therewith to Tenant, which costs shall be reimbursed by Tenant to Landlord within thirty (30) days after Tenant's receipt of invoice therefor from Landlord.

4. Consideration to Landlord; Return of Security Deposit.

(a) Consideration to Landlord. In consideration for Landlord's execution of this Agreement, and as conditions to the effectiveness of this Agreement: (i) Tenant shall deliver to Landlord upon the Surrender Date the sum of One Million Six

Hundred Thousand and No/100 Dollars ($1,600,000.00), in currency which, at the time of payment, is legal tender for private and public debts in the United States of America, or at Landlord's election, by wire or ACH transfer pursuant to wiring instructions which shall be provided by Landlord to Tenant, or as otherwise specified by Landlord, which amount represents the obligations owed by Tenant to Landlord under the Lease (the "**Termination Fee**"), and (ii) Tenant shall, at Tenant's sole cost and expense, transfer to Landlord upon the Surrender Date any and all permits (collectively, the "**Permits**") required by Landlord, including, without limitation the Bay Area Air Quality Management District permit (the "**BAAQMD Permit**") and any permits relative to the Generator (collectively, the "**Generator Permit**"). If and to the extent any of the Permits required to be transferred to Landlord pursuant to the preceding sentence have, as of the Effective Date, lapsed, then Tenant shall, at its sole cost and expense, cause such Permits to be current and in effect prior to the transfers thereof to Landlord as required by this Agreement; provided, however, that, if Tenant fails to so cause such Permits to be current and in effect, then Landlord may (but shall not be obligated to) do so, and may charge the costs incurred by Landlord in connection therewith to Tenant, plus a fee equal to ten percent (10%) of the total of such costs as compensation to Landlord for administrative review and related functions performed by Landlord or its agents in connection with causing such Permits to be current and in effect (collectively, the "**Permit Costs**"), which Permit Costs shall be reimbursed by Tenant to Landlord within thirty (30) days after Tenant's receipt of invoice therefor from Landlord.

(b) Return of Security Deposit. Landlord and Tenant hereby acknowledge that, in accordance with the applicable security deposit provisions of the Lease, Tenant has previously delivered to Landlord the total sum of Three Hundred Thirteen Thousand Five Hundred and No/100 Dollars ($313,500.00) (the "**Security Deposit**") as the security deposit for the faithful performance by Tenant of the terms, covenants and conditions of the Lease. Pursuant to such applicable security deposit provisions of the Lease, any remaining, unapplied portion of the Security Deposit then held by Landlord shall be returned by Landlord to Tenant within thirty (30) days following the Termination Date so long as Tenant is not in default under the Lease or this Agreement.

5. Release of Liability. Except for the obligations, duties and rights of the parties as set forth in this Agreement (including, without limitation, (A) Tenant's obligation to deliver the Termination Fee (and, if applicable, the Permit Costs) to Landlord, and (B) Tenant's obligation to transfer the Permits to Landlord, in each case pursuant to Section 4(a) above), Tenant's representations and warranties as set forth in this Agreement below and Tenant's continuing liability as set forth in this Agreement below, and conditioned on the performance by the parties of the provisions of this Agreement:

i. Landlord and Tenant shall, as of the Termination Date, be fully and unconditionally released and discharged from their respective obligations arising after the Termination Date from or connected with the provisions of the Lease, specifically including, without limitation, any right Tenant may have to audit or review Landlord's books or records or to contest any operating expenses and other expenses billed to Tenant as additional rent under the Lease; and

ii. this Agreement shall fully and finally settle all demands, charges, claims, accounts or causes of action of any nature, including, without limitation, both known and unknown claims and causes of action that may arise out of or in connection with the obligations of the parties under the Lease after the Termination Date.

With respect to the releases set forth hereinabove, each of the parties hereby acknowledge that it has been advised by legal counsel and is familiar with the provisions of California Civil Code Section 1542, which provides as follows:

"A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS THAT THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE AND THAT, IF KNOWN BY HIM OR HER WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASED PARTY."

EACH OF THE UNDERSIGNED, BEING AWARE OF SAID CODE SECTION, HEREBY EXPRESSLY WAIVES ALL RIGHTS IT MAY HAVE THEREUNDER, AS WELL AS ANY OTHER STATUTES OR COMMON LAW PRINCIPLES OF SIMILAR EFFECT PERTAINING TO THE RELEASES SET FORTH HEREIN. EACH PARTY ACKNOWLEDGES THAT IT HAS RECEIVED THE ADVICE OF LEGAL COUNSEL WITH RESPECT TO THE AFOREMENTIONED WAIVER AND UNDERSTANDS THE TERMS THEREOF.

6. Representations of Tenant. Tenant represents and warrants to Landlord that: (i) Tenant has not heretofore assigned or sublet all or any portion of its interest in the Lease; (ii) no other person, firm or entity has any right, title or interest in the Lease; (iii) Tenant has the full right, legal power and actual authority to enter into this Agreement and to terminate the Lease without the consent of any person, firm or entity; and (iv) Tenant has the full right, legal power and actual authority to bind Tenant to the terms and conditions hereof. Tenant further represents and warrants to Landlord that as of the Effective Date there are no, and as of the Termination Date there shall not be any, mechanics' liens and/or other liens encumbering all or any portion of the Premises, by virtue of any act or omission on the part of Tenant, its predecessors, contractors, agents, employees, successors and/or assigns. Notwithstanding the termination of the Lease and the release of liability as provided for herein, the representations and warranties set forth in this Section shall survive the Termination Date and Tenant shall be liable to Landlord for any inaccuracy or any breach thereof.

7. Continuing Liability. Notwithstanding the termination of the Lease and the release of liability provided for herein, Tenant shall remain liable for: (i) the performance of all of its obligations under the Lease, with respect to the period of its tenancy prior to and including the Termination Date (including, without limitation, Tenant's payment of reconciliation of Operating Expense, Real Property Taxes and any other expenses to Landlord); and (ii) all of Tenant's indemnification and other obligations which expressly survive the termination of the Lease, and Landlord shall have all the rights and remedies with respect to such obligations as set forth in the Lease. In the event that Tenant retains possession of the Premises or any part thereof after the Termination Date, then the applicable holdover provisions of the Lease shall apply (except that, notwithstanding anything to the contrary contained in the Lease (including, without limitation Section 22 of the Original Lease), such holdover tenancy shall be from month-to-month only, and shall not constitute a renewal of the Lease Term or an extension for any further term, and in such case Basic Monthly Rent shall be payable at a monthly rate equal to three hundred percent (300%) of the Basic Monthly Rent applicable during the last rental period of the Lease Term under the Lease).

8. Attorneys' Fees. Notwithstanding anything to the contrary contained in the Lease, in any action or proceeding arising out of this Agreement, each party shall bear its own attorneys' fees.

9. Disposition of Personal Property. Any furniture, trade fixtures, equipment or other personal property that remains in or about the Premises after the Termination Date shall be deemed abandoned by Tenant ("**Abandoned Personal Property**"), and may be retained, stored, transferred, sold, or disposed of by Landlord, at its sole discretion, with no duty to account to Tenant or to any third party therefor. Landlord may charge all costs incurred by Landlord in connection with such storage, transfer or disposal of such Abandoned Personal Property to Tenant and recover all or a portion of such costs from the remaining, unapplied balance of the security deposit then held by Landlord under the Lease. Tenant hereby waives any and all rights Tenant may have to notice under California Civil Code Sections 1993 et seq. with respect to such Abandoned Personal Property.

10. Governing Law. This Agreement shall be governed by and construed under the laws of the State of California.

11. Confidentiality. Tenant acknowledges that Landlord is only willing to enter into this Agreement on the terms and conditions set forth herein (including, without limitation, the economic terms), subject to Tenant agreeing to keep the content of this Agreement and any related documents strictly confidential, except that Tenant shall be allowed to disclose the content of this Agreement and any related documents solely to the extent required by applicable laws and/or court order. and to its financial and legal consultants. Tenant's obligations under this Section 11 shall survive the Termination Date and Tenant shall be liable to Landlord for any violation or any breach thereof.

12. Counterparts. This Agreement may be executed in any number of counterparts, which may be delivered electronically, via facsimile or by other means. Each party may rely upon signatures delivered electronically or via facsimile as if such signatures were originals. Each counterpart of this Agreement shall be deemed to be an original, and all such counterparts (including those delivered electronically or via facsimile), when taken together, shall be deemed to constitute one and the same instrument.

13. Binding Effect. This Agreement shall inure to the benefit of, and shall be binding upon, Landlord and Tenant and their respective legal representatives, related entities, successors and/or assigns.

14. Time of the Essence. Time is of the essence for this Agreement and the provisions contained herein.

15. Further Assurances. Landlord and Tenant each hereby agree to execute such further documents or instruments as may be necessary or appropriate to carry out the intention of this Agreement.

16. Voluntary Agreement. Each of the parties have read this Agreement and the mutual releases contained herein, and on the advice of legal counsel each party has freely and voluntarily entered into this Agreement.

17. Landlord's Address for Notices. Effective as of the Effective Date, all notices, consents, demands and other communications delivered by Tenant to Landlord pursuant to and in accordance with the Lease must be addressed to the following addresses:

Originals sent to:

Google LLC
1600 Amphitheatre Parkway
Mountain View, California 94043
Attention: Lease Administration

and

Google LLC
1600 Amphitheatre Parkway
Mountain View, California 94043
Attention: Legal Department / RE Matters

18. California Statutory CASp Disclosure. For purposes of Section 1938(a) of the California Civil Code, Landlord hereby discloses to Tenant, and Tenant hereby acknowledges, that the Premises has not undergone inspection by a Certified Access Specialist (CASp). In addition, the following notice is hereby provided pursuant to Section 1938(e) of the California Civil Code: "A Certified Access Specialist (CASp) can inspect the subject premises and determine whether the subject premises comply with all of the applicable construction-related accessibility standards under state law. Although state law does not require a CASp inspection of the subject premises, the commercial property owner or lessor may not prohibit the lessee or tenant from obtaining a CASp inspection of the subject premises for the occupancy or potential occupancy of the lessee or tenant, if requested by the lessee or tenant. The parties shall mutually agree on the arrangements for the time and manner of the CASp inspection, the payment of the fee for the CASp inspection, and the cost of making any repairs necessary to correct violations of construction-related accessibility standards within the premises." In furtherance of and in connection with such notice: (i) Tenant, having read such notice and understanding Tenant's right to request and obtain a CASp inspection and with advice of counsel, hereby elects not to obtain such CASp inspection and forever waives its rights to obtain a CASp inspection with respect to the Premises, the Building and/or the Project to the extent permitted by applicable laws now or hereafter in effect; and (ii) if the waiver set forth in clause (i) hereinabove is not enforceable pursuant to applicable laws now or hereafter in effect, then Landlord and Tenant hereby agree as follows (which constitute the mutual agreement of the parties as to the matters described in the last sentence of the foregoing notice): (A) Tenant shall have the one-time right to request for and obtain a CASp inspection, which request must be made, if at all, in a written notice delivered by Tenant to Landlord on or before the date which is ten (10) days following the Effective Date; (B) any CASp inspection timely requested by Tenant shall be conducted (1) between the hours of 9:00 a.m. and 5:00 p.m. on any business day, (2) only after ten (10) days' prior written notice to Landlord of the date of such CASp inspection, (3) in a professional manner by a CASp designated by Landlord and without any testing that would damage the Premises, the Building, or the Project in any way, (4) in accordance with all of the provisions of the Lease applicable to Tenant contracts for construction, and (5) at Tenant's sole cost and expense, including, without limitation, Tenant's payment of the fee for such CASp inspection, the fee for any reports and/or certificates prepared by the CASp in connection with such CASp inspection (collectively, the **"CASp Reports")** and all other costs and expenses in connection therewith; (C) Landlord shall be an express third party beneficiary of Tenant's contract with the CASp, and any CASp Reports shall be addressed to both Landlord and Tenant; (D) Tenant shall deliver a copy of any CASp Reports to Landlord within two (2) business days after Tenant's receipt thereof; (E) any information generated by the CASp inspection and/or contained in the CASp Reports shall not be disclosed by Tenant to anyone other than (I) contractors, subcontractors and/or consultants of Tenant, in each instance who have a need to know such information and who agree in writing not to further disclose such information, or (II) any governmental entity, agency or other person, in each instance to whom disclosure is required by law or by regulatory or judicial process; (F) Tenant, at its sole cost and expense, shall be responsible for making any improvements, alterations, modifications and/or repairs to or within the Premises to correct violations of construction-related accessibility standards, including, without limitation, any violations disclosed by such CASp inspection; and (G) if such CASp inspection identifies any improvements, alterations, modifications and/or repairs necessary to correct violations of construction-related accessibility standards relating to those items of the Building and/or the Project located outside the Premises that are Landlord's obligation to repair as set forth in the Lease, then Landlord shall perform such improvements, alterations, modifications and/or repairs as and to the extent required by applicable laws to correct such violations, and Tenant shall reimburse Landlord for the cost of such improvements, alterations, modifications and/or repairs within ten (10) business days after Tenant's receipt of an invoice therefor from Landlord.

19. Brokers. Landlord and Tenant each hereby represents and warrants to the other that it has had no dealings with any real estate broker or agent in connection with the negotiation of this Agreement, except for JLL, representing Tenant (the "**Tenant's Broker**"), and that it knows of no other real estate broker or agent who is entitled to a commission in connection with this Agreement. Tenant shall be solely responsible for paying any commission or other consideration payable to the Tenant's Broker in connection with this Agreement. Each party agrees to indemnify and defend the other party against and hold the other party harmless from any and all claims, demands, losses, liabilities, lawsuits, judgments, and costs and expenses (including, without limitation, reasonable attorneys' fees) with respect to any leasing commission or equivalent compensation alleged to be owing on account of any breach of the foregoing representation, warranty and covenant by the indemnifying party in connection with this Agreement.

20. Authority. If Tenant is a corporation, trust, limited liability company or partnership, each individual executing this Agreement on behalf of Tenant hereby represents and warrants that Tenant is a duly formed and existing entity qualified to do business in California and that Tenant has full right and authority to execute and deliver this Agreement and that each person signing on behalf of Tenant is authorized to do so. In such event, Tenant shall, within ten (10) days after Landlord's written request, deliver to Landlord satisfactory evidence of such authority, and, upon demand by Landlord, Tenant shall also deliver to Landlord satisfactory evidence of (i) good standing in Tenant's state of formation and (ii) qualification to do business in California.

21. Entire Agreement. It is understood and acknowledged that there are no oral agreements between the parties hereto affecting this Agreement and this Agreement supersedes and cancels any and all previous negotiations, arrangements, agreements and understandings, if any, between the parties hereto, relating in any manner to the termination of the Lease and the

release of liability, as provided herein, and none thereof shall be used to interpret or construe this Agreement. This Agreement contains all of the terms, covenants, conditions, warranties and agreements of the parties relating in any manner to the termination of the Lease and the release of liability, as provided herein, and this Agreement shall be considered to be the only agreement between the parties hereto and their representatives and agents relating in any manner to the termination of the Lease and the release of liability. None of the terms, covenants, conditions or provisions of this Agreement can be modified, deleted or added to except in writing signed by the parties hereto. All negotiations and oral agreements acceptable to both parties have been merged into and are included herein. There are no other representations or warranties between the parties, and all reliance with respect to representations is based entirely upon the representations and agreements contained in this Agreement.

[**SIGNATURES CONTAINED ON THE FOLLOWING PAGE**]

IN WITNESS WHEREOF, Landlord and Tenant have executed this Agreement as of the date first above written.

"LANDLORD":

GOOGLE LLC,
a Delaware limited liability company

By:__

Name:__

Title:__

"TENANT":

HARMONIC INC.,
a Delaware corporation

By:__

Name:__

Title:__

By:__

Name:__

Title:__

[**SIGNATURE PAGE FOR LEASE TERMINATION AGREEMENT**]

Exhibit 31.1

Harmonic Inc.
Certification of Principal Executive Officer
Pursuant to Section 302 of
The Sarbanes-Oxley Act of 2002

I, Patrick J. Harshman, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Harmonic Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant, and have:

    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report, based on such evaluation; and

    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 5, 2019

By: /s/ Patrick J. Harshman
Patrick J. Harshman
President and Chief Executive Officer

Exhibit 31.2

Harmonic Inc.
Certification of Principal Financial Officer
Pursuant to Section 302 of
The Sarbanes-Oxley Act of 2002

I, Sanjay Kalra, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Harmonic Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant, and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report, based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 5, 2019

By: /s/ Sanjay Kalra
Sanjay Kalra
Chief Financial Officer

Exhibit 32.1

Harmonic Inc.
Certification of Principal Executive Officer
Pursuant to 18 U.S.C. Section 1350 as Adopted Pursuant to
Section 906 of the Sarbanes-Oxley Act of 2002

As of the date hereof, I, Patrick J. Harshman, President and Chief Executive Officer of Harmonic Inc. (the “Company”), certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that the Company’s Quarterly Report on Form 10-Q for the quarter ended June 28, 2019, as filed with the Securities and Exchange Commission (the “Report”), fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, and that information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company. This written statement is being furnished to the Securities and Exchange Commission as an exhibit accompanying such Report and shall not be deemed filed pursuant to the Securities Exchange Act of 1934, as amended.

Date: August 5, 2019

/s/ Patrick J. Harshman

Patrick J. Harshman
President and Chief Executive Officer

Exhibit 32.2

Harmonic Inc.
Certification of Principal Financial Officer
Pursuant to 18 U.S.C. Section 1350 as Adopted Pursuant to
Section 906 of the Sarbanes-Oxley Act of 2002

As of the date hereof, I, Sanjay Kalra, Chief Financial Officer of Harmonic Inc. (the “Company”), certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that the Company’s Quarterly Report on Form 10-Q for the quarter ended June 28, 2019, as filed with the Securities and Exchange Commission (the “Report”), fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, and that information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company. This written statement is being furnished to the Securities and Exchange Commission as an exhibit accompanying such Report and shall not be deemed filed pursuant to the Securities Exchange Act of 1934, as amended.

Date: August 5, 2019

/s/ Sanjay Kalra

Sanjay Kalra
Chief Financial Officer