

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 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 September 29, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____
Commission File Number: 001-34674

Calix, Inc.

(Exact Name of Registrant as Specified in Its Charter)

Delaware
(State or Other Jurisdiction of
Incorporation or Organization)

68-0438710
(I.R.S. Employer
Identification No.)

2777 Orchard Parkway, San Jose, CA 95134
(Address of Principal Executive Offices) (Zip Code)

(408) 514-3000
(Registrant's Telephone Number, Including Area Code)

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) 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	<input type="checkbox"/>	Accelerated Filer	<input checked="" type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller Reporting Company	<input type="checkbox"/>
Emerging Growth Company	<input type="checkbox"/>		

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:

As of November 1, 2018, there were 53,130,167 shares of the Registrant's common stock, par value \$0.025 outstanding.

Calix, Inc.
Form 10-Q
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PART I. FINANCIAL INFORMATION

ITEM 1. Financial Statements

CALIX, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(In thousands, except par value)

	September 29, 2018	December 31, 2017
	(Unaudited)	(See Note 1)
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 53,033	\$ 39,775
Accounts receivable, net	67,671	80,392
Inventory	30,267	31,529
Prepaid expenses and other current assets	10,640	10,759
Total current assets	161,611	162,455
Property and equipment, net	21,252	15,681
Goodwill	116,175	116,175
Other assets	1,987	759
	<u>\$ 301,025</u>	<u>\$ 295,070</u>
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 32,792	\$ 35,977
Accrued liabilities	57,052	49,279
Deferred revenue	16,813	13,076
Line of credit	30,000	30,000
Total current liabilities	136,657	128,332
Long-term portion of deferred revenue	18,108	20,645
Other long-term liabilities	2,186	1,130
Total liabilities	156,951	150,107
Commitments and contingencies (See Note 7)		
Stockholders' equity:		
Preferred stock, \$0.025 par value; 5,000 shares authorized; no shares issued and outstanding as of September 29, 2018 and December 31, 2017	—	—
Common stock, \$0.025 par value; 100,000 shares authorized; 58,455 shares issued and 53,125 shares outstanding as of September 29, 2018, and 56,839 shares issued and 51,509 shares outstanding as of December 31, 2017	1,462	1,421
Additional paid-in capital	862,642	851,054
Accumulated other comprehensive loss	(740)	(169)
Accumulated deficit	(679,304)	(667,357)
Treasury stock, 5,330 shares as of September 29, 2018 and December 31, 2017	(39,986)	(39,986)
Total stockholders' equity	144,074	144,963
	<u>\$ 301,025</u>	<u>\$ 295,070</u>

See accompanying notes to condensed consolidated financial statements.

CALIX, INC.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(In thousands, except per share data)
(Unaudited)

	Three Months Ended		Nine Months Ended	
	September 29, 2018	September 30, 2017	September 29, 2018	September 30, 2017
Revenue:				
Systems	\$ 104,992	\$ 106,442	\$ 300,846	\$ 305,395
Services	9,707	22,385	24,958	67,073
Total revenue	114,699	128,827	325,804	372,468
Cost of revenue:				
Systems ⁽¹⁾	54,354	55,494	160,350	171,166
Services ⁽¹⁾	7,512	28,700	19,696	78,969
Total cost of revenue	61,866	84,194	180,046	250,135
Gross profit	52,833	44,633	145,758	122,333
Operating expenses:				
Research and development ⁽¹⁾	21,111	32,633	68,748	99,391
Sales and marketing ⁽¹⁾	20,722	18,448	61,150	59,306
General and administrative ⁽¹⁾	10,481	10,203	29,947	30,161
Restructuring charges (benefit)	(157)	612	5,976	2,268
Gain on sale of product line	—	—	(6,704)	—
Total operating expenses	52,157	61,896	159,117	191,126
Income (loss) from operations	676	(17,263)	(13,359)	(68,793)
Interest and other income (expense), net:				
Interest income (expense), net	(142)	(60)	(530)	88
Other income (expense), net	360	(305)	522	(386)
Total interest and other income (expense), net	218	(365)	(8)	(298)
Income (loss) before provision for income taxes	894	(17,628)	(13,367)	(69,091)
Provision for income taxes	85	225	353	1,075
Net income (loss)	\$ 809	\$ (17,853)	\$ (13,720)	\$ (70,166)
Net income (loss) per common share:				
Basic	\$ 0.02	\$ (0.35)	\$ (0.26)	\$ (1.40)
Diluted	\$ 0.02	\$ (0.35)	\$ (0.26)	\$ (1.40)
Weighted-average number of shares used to compute				
net income (loss) per common share:				
Basic	53,082	50,336	52,330	49,960
Diluted	53,828	50,336	52,330	49,960
Net income (loss)	\$ 809	\$ (17,853)	\$ (13,720)	\$ (70,166)
Other comprehensive income (loss), net of tax:				
Unrealized gains on available-for-sale				
marketable securities, net	—	4	—	3
Foreign currency translation adjustments, net	(343)	116	(572)	309
Total other comprehensive income (loss), net of tax	(343)	120	(572)	312
Comprehensive income (loss)	\$ 466	\$ (17,733)	\$ (14,292)	\$ (69,854)
⁽¹⁾ Includes stock-based compensation as follows:				
Cost of revenue:				
Systems	\$ 123	\$ 137	\$ 376	\$ 349
Services	89	69	257	200
Research and development	800	1,215	2,597	3,663

Sales and marketing	830	816	2,465	2,581
General and administrative	657	759	2,105	2,521

See accompanying notes to condensed consolidated financial statements.

CALIX, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(In thousands)
(Unaudited)

	Nine Months Ended	
	September 29, 2018	September 30, 2017
Operating activities:		
Net loss	\$ (13,720)	\$ (70,166)
Adjustments to reconcile net loss to net cash provided by (used in) operating activities:		
Stock-based compensation	7,800	9,314
Depreciation and amortization	7,092	7,632
Amortization of intangible assets	—	813
Loss on retirement of property and equipment	311	148
Gain on sale of product line	(6,704)	—
Changes in operating assets and liabilities:		
Accounts receivable, net	13,213	7,109
Inventory	(755)	8,224
Prepaid expenses and other assets	(540)	11,584
Accounts payable	(5,096)	5,543
Accrued liabilities	3,652	(10,132)
Deferred revenue	398	1,310
Other long-term liabilities	(431)	(4)
Net cash provided by (used) in operating activities	5,220	(28,625)
Investing activities:		
Purchases of property and equipment	(5,561)	(6,786)
Purchases of marketable securities	—	(8,732)
Sales of marketable securities	—	5,051
Maturities of marketable securities	—	24,841
Proceeds from sale of product line	10,350	—
Net cash provided by investing activities	4,789	14,374
Financing activities:		
Proceeds from exercise of stock options	79	29
Proceeds from employee stock purchase plans	3,806	673
Taxes paid for awards vested under equity incentive plan	(53)	(2,743)
Proceeds from line of credit	404,763	68,534
Repayment of line of credit	(404,763)	(38,534)
Payments to originate or amend the line of credit	(115)	(186)
Net cash provided by financing activities	3,717	27,773
Effect of exchange rate changes on cash and cash equivalents	(468)	303
Net increase in cash and cash equivalents	13,258	13,825
Cash and cash equivalents at beginning of period	39,775	50,359
Cash and cash equivalents at end of period	<u>\$ 53,033</u>	<u>\$ 64,184</u>

See accompanying notes to condensed consolidated financial statements.

CALIX, INC.

**NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)**

1. Company and Basis of Presentation

Company

Calix, Inc. (together with its subsidiaries, “Calix” or the “Company”) was incorporated in August 1999, and is a Delaware corporation. The Company is a leading global provider of cloud and software platforms, systems and services required to deliver the unified access network and smart home and business services of tomorrow. The Company’s platforms and services help its customers to build next generation networks by embracing a DevOps operating model, optimizing the subscriber experience by leveraging big data analytics and turn the complexity of the smart home and business into new revenue streams. The Company’s cloud and software platforms, systems and services enable communication service providers (“CSPs”) to provide a wide range of revenue-generating services, from basic voice and data to advanced broadband services, over legacy and next-generation access networks. The Company focuses on CSP access networks, the portion of the network that governs available bandwidth and determines the range and quality of services that can be offered to subscribers.

Basis of Presentation

The accompanying unaudited condensed consolidated financial statements, including the accounts of Calix, Inc. and its wholly-owned subsidiaries, have been prepared in accordance with the requirements of the U.S. Securities and Exchange Commission (“SEC”) for interim reporting. As permitted under those rules, certain footnotes or other financial information that are normally required by U.S. generally accepted accounting principles (“GAAP”) can be condensed or omitted. In the opinion of management, the financial statements include all normal and recurring adjustments that are considered necessary for the fair presentation of the Company’s financial position and operating results. All intercompany balances and transactions have been eliminated in consolidation. The Condensed Consolidated Balance Sheet at December 31, 2017 has been derived from the audited financial statements at that date.

The results of the Company’s operations can vary during each quarter of the year. Therefore, the results and trends in these interim financial statements may not be the same as those for the full year or any future periods. The information included in this Quarterly Report on Form 10-Q should be read in conjunction with the audited financial statements included in the Company’s Annual Report on Form 10-K for the year ended December 31, 2017 .

The Company’s fiscal year begins on January 1st and ends on December 31st. Quarterly periods are based on a 4-4-5 calendar with the first, second and third quarters ending on the 13th Saturday of each fiscal period. As a result, the Company had one fewer day in the nine months ended September 29, 2018 than in the nine months ended September 30, 2017 . The preparation of financial statements in conformity with GAAP for interim financial reporting requires management to make estimates and assumptions that affect the amounts reported in the condensed consolidated financial statements and accompanying notes. Actual results could differ from those estimates.

Liquidity and Capital Resources

Since its inception, the Company has incurred significant losses, and as of September 29, 2018 , the Company had an accumulated deficit of \$679.3 million . Based on its current operating plan and operating cash flows, management plans to finance its future operations and capital expenditures with existing cash and cash equivalents and its existing credit facility with Silicon Valley Bank (“SVB”), which it believes will be sufficient to fund its operations and capital expenditures through at least the next twelve months. See Note 6 for more information on the Company’s credit facility with SVB. The Company may also need to seek other sources of liquidity, including but not limited to the sale of equity or incremental borrowings, to support its working capital needs. However, there can be no assurances that such capital will be available on terms which are acceptable to the Company or at all or that the Company will achieve profitable operations. If the Company is unable to generate sufficient cash flows or obtain other sources of liquidity, the Company will be forced to limit its development activities, reduce its investment in growth initiatives and institute cost-cutting measures, all of which may adversely impact the Company’s business and growth. The accompanying consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

2. Significant Accounting Policies

The Company’s significant accounting policies are disclosed in its Annual Report on Form 10-K for the year ended December 31, 2017 . The Company’s significant accounting policies did not change during the nine months ended September 29, 2018 , except for those impacted by the newly adopted accounting standard below.

Newly Adopted Accounting Standard

Revenue from Contracts with Customers

In May 2014, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update No. 2014-09, Revenue from Contracts with Customers (Topic 606) (“ASU 2014-09”), which provides guidance for revenue recognition. ASU 2014-09 supersedes the revenue recognition requirements in Topic 605, Revenue Recognition, and most industry-specific guidance. Additionally, it supersedes some cost guidance included in Subtopic 605-35, Revenue Recognition-Construction-Type and Production-Type Contracts, and creates new Subtopic 340-40, Other Assets and Deferred Costs-Contracts with Customers. The Company determines revenue recognition through the following steps: identification of the contract, or contracts, with a customer; identification of the performance obligations in the contract; determination of the transaction price; allocation of the transaction price to the performance obligations in the contract; and recognition of revenue when, or as, the Company satisfies a performance obligation. The standard’s core principle is that a company will recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. In doing so, companies will need to use more judgment and make more estimates than under the previous guidance. These may include identifying performance obligations in the contract, estimating the amount of variable consideration to include in the transaction price and allocating the transaction price to each separate performance obligation. The new standard permits adoption by using either (i) a full retrospective approach for all periods presented in the period of adoption or (ii) a modified retrospective approach with the cumulative effect of initially applying the new standard recognized at the date of initial application and providing certain additional disclosures.

On January 1, 2018, the Company adopted Topic 606 and Subtopic 340-40 using the modified retrospective transition method applied to those contracts which were not completed as of January 1, 2018. Accordingly, results for reporting periods beginning after January 1, 2018 are presented under Topic 606, while results for prior periods have not been restated and continues to be reported under the accounting standards in effect for those periods. The Company recognized the cumulative effect of initially applying the standards as an adjustment to the opening balance of accumulated deficit of \$1.8 million as of January 1, 2018, with the impact primarily relating to deferring the costs of obtaining contracts (sales commissions) and the upfront recognition of software license revenue. The impact to revenue of applying Topic 606 for the three and nine months ended September 29, 2018 was an increase of \$0.9 million and \$4.8 million, respectively.

Significant changes to the Company’s accounting policies as a result of adopting Topic 606 are discussed below.

Revenue Recognition

Revenue is recognized when a performance obligation is satisfied, which occurs when control of the promised goods or services is transferred to the customer, in an amount that reflects the consideration the Company expects to be entitled to in exchange for those goods or services.

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer and is the unit of account in Topic 606. A contract’s transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. The Company’s hardware products contain both software and non-software components that function together to deliver the products’ essential functionality and therefore constitutes a single performance obligation as the promise to transfer the individual software and non-software components is not separately identifiable and, therefore, not distinct. The Company’s contracts may include multiple performance obligations. For such arrangements, the Company allocates the contract’s transaction price to each performance obligation using the relative stand-alone selling price of each distinct good or service in the contract. The Company generally determines stand-alone selling prices based on the prices charged to customers or its best estimate of stand-alone selling price. The Company’s estimate of stand-alone selling price is established considering multiple factors including, but not limited to, geographies, market conditions, competitive landscape, internal costs, gross margin objectives, characteristics of targeted customers and pricing practices. The determination of estimated stand-alone selling price is made through consultation with and formal approval by management, taking into consideration the go-to-market strategy.

For certain revenue arrangements involving delivery of both systems and professional services, each is considered a distinct performance obligation. Systems revenue is recognized at a point in time when management has determined that control over systems has transferred to the customer, which is generally when legal title has transferred to the customer. For the same revenue arrangements, management believes that control of the associated professional services is transferred to the customer over time. As such, professional services revenue is recognized over the period in which the services are provided using a cost input measure. Prior to adoption of Topic 606, the Company recognized revenue (and corresponding cost of revenue) for systems and associated professional services under the same revenue arrangement as services were delivered and milestones were accepted by the customer and as the systems were installed or delivered to the customer. Accordingly, the Company now recognizes revenue when control of the systems and services has been transferred to the customer, which may be earlier than system installation or customer acceptance, in accordance with the agreed-upon specifications in the contract.

The Company derives revenue from contracts with customers primarily from the following and categorizes its revenue as follows:

- Systems include revenue from the sale of access and premises systems, software platform licenses and cloud-based software subscriptions.
- Services include revenue from professional services, customer support, software- and cloud-based maintenance, extended warranty subscriptions, training and managed services.

The following is a summary of revenue disaggregated by geographic region based upon the location of the customers (in thousands):

	Three Months Ended		Nine Months Ended	
	September 29, 2018	September 30, 2017 ⁽¹⁾	September 29, 2018	September 30, 2017 ⁽¹⁾
United States	\$ 99,224	\$ 117,686	\$ 281,304	\$ 332,333
Caribbean	1,794	2,042	4,468	6,755
Canada	3,321	2,289	7,861	7,796
Europe	2,137	1,598	7,108	4,366
Other	8,223	5,212	25,063	21,218
Total	\$ 114,699	\$ 128,827	\$ 325,804	\$ 372,468

(1) Fiscal 2017 revenue amounts are accounted for under Topic 605.

Concentration of Customer Risk

The Company had one customer that accounted for more than 10% of its total revenue for the three and nine months ended September 29, 2018 . The Company had one customer that accounted for more than 10% of its total revenue for the three months ended September 30, 2017 and two customers that each accounted for more than 10% of its total revenue for the nine months ended September 30, 2017 . The one customer represented 21% and 19% of the Company’s total revenue for the three and nine months ended September 29, 2018 , respectively. The two customers together represented 41% and 43% of the Company’s total revenue for the three and nine months ended September 30, 2017 , respectively. The one customer represented more than 10% of the Company’s accounts receivable as of December 31, 2017 .

Deferred Revenue

Deferred revenue results from transactions where the Company billed the customer for products or services and when cash payments are received or due prior to transferring control of the promised goods or services to the customer. The increase in the deferred revenue balance for the three and nine months ended September 29, 2018 is primarily driven by cash payments received or due in advance of satisfying our performance obligations, offset by \$5.3 million and \$10.5 million of revenue recognized that was included in the deferred revenue balance at the beginning of each period, respectively.

Revenue allocated to remaining performance obligations represent contract revenue that has not yet been recognized, which includes deferred revenue and amounts that will be invoiced and recognized as revenue in future periods. This amount was \$34.9 million as of the end of the third quarter of 2018, and the Company expects to recognize 48.1% of such revenue over the next 12 months and the remainder thereafter.

Payment terms to customers typically range from net 30 to net 90 days and vary by the type and location of customer and the products or services offered. The period between the transfer of control of the promised good or service to a customer and when payment is due is not significant.

Contract Costs

In connection with the adoption of Topic 606 on January 1, 2018, the Company also adopted the guidance in ASC 340-40, Other Assets and Deferred Costs - Contracts with Customers, with respect to capitalization and amortization of incremental costs of obtaining a contract. The new cost guidance requires the capitalization of all incremental costs incurred to obtain a contract with a customer that it would not have incurred if the contract had not been obtained, provided it expects to recover the costs. As a result of this new guidance, the Company capitalizes certain sales commissions related primarily to extended warranty and Calix Cloud products for which the expected amortization period is greater than one year.

The Company expects that sales commissions as a result of obtaining customer contracts are recoverable, and therefore the Company defers and capitalizes them as contract costs.

Capitalized commissions are amortized as sales and marketing expenses over the period that the related revenue is recognized, which typically range from three to ten years for extended warranty and cloud offerings. The Company classifies the unamortized portion of deferred commissions as current or noncurrent based on the timing of when the Company expects to recognize the expense. The current and noncurrent portions of deferred commissions are included in prepaid expenses and other current assets and other assets, respectively, in the Company's Condensed Consolidated Balance Sheets.

As of September 29, 2018, the unamortized balance of deferred commissions was \$0.8 million. For the three and nine ended September 29, 2018, the amount of amortization was less than \$0.1 million, and there was no impairment loss in relation to the costs capitalized.

Practical Expedients

The Company expenses sales commissions as sales and marketing expenses when incurred if the expected amortization period is one year or less. This applies generally to all transactions other than extended warranty contracts and Calix Cloud products.

The Company does not disclose the value of unsatisfied performance obligations for (i) contracts with an original expected length of one year or less and (ii) contracts for which the Company recognizes revenue at the amount to which it has the right to invoice for services performed.

The Company does not adjust the promised amount of consideration for the effects of a significant financing component if the Company expects, at contract inception, that the period between when the Company transfers a promised good or service to a customer and when the customer pays for that good or service will be one year or less.

Cumulative Effect of Adoption

The cumulative effect of changes made to the Condensed Consolidated January 1, 2018 Balance Sheet was as follows (in thousands):

	Balance at December 31, 2017	Adjustments	Balance at January 1, 2018
Accounts receivable, net	\$ 80,392	\$ 491	\$ 80,883
Prepaid expenses and other current assets	10,759	(245)	10,514
Other assets	759	698	1,457
Total assets	295,070	944	296,014
Deferred revenue	13,076	(829)	12,247
Total liabilities	150,107	(829)	149,278
Accumulated deficit	(667,357)	1,773	(665,584)
Total liabilities and stockholders' equity	295,070	944	296,014

The impact of adopting the new revenue standard on the Company's consolidated financial statements as of and for the three and nine months ended September 29, 2018 were as follows (in thousands):

Condensed Consolidated Balance Sheet

As of September 29, 2018 (Unaudited)	As Reported	Adjustments	Balances Without Adoption of Topic 606
Accounts receivable, net	\$ 67,671	\$ (3,066)	\$ 64,605
Prepaid expenses and other current assets	10,640	3,451	14,091
Other assets	1,987	(599)	1,388
Total assets	301,025	(214)	300,811
Accrued liabilities	57,052	(595)	56,457
Deferred revenue	34,921	3,677	38,598
Total liabilities	156,951	3,082	160,033
Accumulated deficit	(679,304)	(3,296)	(682,600)
Total liabilities and stockholders' equity	301,025	(214)	300,811

Condensed Consolidated Statement of Comprehensive Income (Loss)

Three Months Ended September 29, 2018 (Unaudited)	As Reported	Adjustments	Balances Without Adoption of Topic 606
Revenue:			
Systems	\$ 104,992	\$ (401)	\$ 104,591
Services	9,707	(481)	9,226
Total revenue	114,699	(882)	113,817
Cost of revenue:			
Systems	54,354	(292)	54,062
Services	7,512	(605)	6,907
Total cost of revenue	61,866	(897)	60,969
Gross profit	52,833	15	52,848
Sales and marketing	20,722	(14)	20,708
Net income	809	29	838

Nine Months Ended September 29, 2018 (Unaudited)	As Reported	Adjustments	Balances Without Adoption of Topic 606
Revenue:			
Systems	\$ 300,846	\$ (3,596)	\$ 297,250
Services	24,958	(1,233)	23,725
Total revenue	325,804	(4,829)	320,975
Cost of revenue:			
Systems	160,350	(2,190)	158,160
Services	19,696	(1,070)	18,626
Total cost of revenue	180,046	(3,260)	176,786
Gross profit	145,758	(1,569)	144,189
Sales and marketing	61,150	(46)	61,104
Net loss	(13,720)	(1,523)	(15,243)

Recent Accounting Pronouncements Not Yet Adopted

Leases

In February 2016, the FASB issued Accounting Standards Update No. 2016-02, Leases (Topic 842) (“ASU 2016-02”), which requires recognition of an asset and liability for lease arrangements longer than twelve months. ASU 2016-02 will be effective for the Company beginning in the first quarter of 2019. Early application is permitted, and the standard can be adopted using either a modified retrospective approach whereby the Company would recognize and measure leases at the beginning of the earliest period presented, or using the effective date approach whereby the Company would initially account for the impact of the adoption with a cumulative-effect adjustment to the January 1, 2019 financial statements. The effective date approach will eliminate the need to restate amounts presented prior to January 1, 2019. The Company is not planning to early adopt, and accordingly, it will adopt the new standard effective January 1, 2019 using the effective date approach. The Company is currently assessing the potential impact of adopting this new guidance on its consolidated financial statements.

Income taxes

On December 22, 2017, the SEC staff issued Staff Accounting Bulletin No. 118 (“SAB 118”) which provides guidance on accounting for the tax effects of the Tax Cuts and Jobs Act (the “Tax Act”). SAB 118 provides a measurement period that should not extend beyond one year from the Tax Act enactment date for companies to complete the accounting under ASC 740, Income Taxes, for the year ended December 31, 2017. In accordance with SAB 118, a company must reflect the income tax effects of those aspects of the Tax Act for which the accounting under ASC 740 is complete.

The Company has not completed its accounting for tax reform with respect to the year ended December 31, 2017 relating to the calculation of the transition tax. The Company is still within the measurement period as of the third quarter of 2018 and is reviewing the earnings and profits of its material foreign subsidiaries to determine if a true up of the transition tax entry recorded at December 31, 2017 will be needed.

Cloud Computing Costs

In August 2018, the FASB issued ASU No. 2018-15, Intangibles (Topic 350): Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract, which aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. This new standard also requires customers to expense the capitalized implementation costs of a hosting arrangement that is a service contract over the term of the hosting arrangement. This new standard becomes effective for the Company in the first quarter of 2020, with early adoption permitted. This new standard can be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. The Company is currently assessing the potential impact of adopting this new guidance on its consolidated financial statements.

3. Cash and Cash Equivalents

Cash and cash equivalents consisted of the following (in thousands):

	September 29, 2018	December 31, 2017
Cash and cash equivalents:		
Cash	\$ 49,213	\$ 35,999
Money market funds	3,820	3,776
	<u>\$ 53,033</u>	<u>\$ 39,775</u>

The carrying amounts of the Company’s money market funds approximate their fair values due to their nature, duration and short maturities.

4. Fair Value Measurements

The Company measures its cash equivalents and marketable securities at fair value on a recurring basis. Fair value is an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. The Company utilizes the following three-tier value hierarchy which prioritizes the inputs used in measuring fair value:

Level 1 – Observable inputs that reflect quoted prices (unadjusted) for identical assets or liabilities in active markets.

Level 2 – Observable inputs other than quoted prices included in level 1 for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, and model-driven valuations in which all significant inputs and significant value drivers are observable in active markets.

Level 3 – Unobservable inputs to the valuation derived from fair valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

As of September 29, 2018 and December 31, 2017, the Company had money market funds of \$3.8 million for each period, and each was classified as a level 1 financial asset. The fair values of money market funds classified as level 1 were derived from quoted market prices as active markets for these instruments exist. The Company had no level 2 or level 3 financial assets.

5. Balance Sheet Details

Accounts receivable, net consisted of the following (in thousands):

	September 29, 2018	December 31, 2017
Accounts receivable	\$ 68,284	\$ 81,793
Allowance for doubtful accounts	(613)	(579)
Product return reserve ⁽¹⁾	—	(822)
	<u>\$ 67,671</u>	<u>\$ 80,392</u>

(1) With adoption of Topic 606 on January 1, 2018, the product return reserve is considered a contract liability and has been reclassified to accrued liabilities.

Inventory consisted of the following (in thousands):

	September 29, 2018	December 31, 2017
Raw materials	\$ 1,554	\$ 1,211
Finished goods	28,713	30,318
	<u>\$ 30,267</u>	<u>\$ 31,529</u>

Property and equipment, net consisted of the following (in thousands):

	September 29, 2018	December 31, 2017
Test equipment	\$ 44,040	\$ 39,952
Computer equipment and software	39,833	32,175
Furniture and fixtures	2,869	2,714
Leasehold improvements	5,176	6,029
Total	<u>91,918</u>	<u>80,870</u>
Accumulated depreciation and amortization	(70,666)	(65,189)
	<u>\$ 21,252</u>	<u>\$ 15,681</u>

Accrued liabilities consisted of the following (in thousands):

	September 29, 2018	December 31, 2017
Accrued compensation and related benefits	\$ 22,623	\$ 15,563
Accrued warranty and retrofit	8,660	8,708
Accrued professional and consulting fees	7,347	9,604
Accrued excess and obsolete inventory at contract manufacturers	3,307	2,430
Accrued customer rebates/prepayments	1,977	1,432
Accrued freight	1,276	593
Accrued non-income related taxes	1,157	1,778
Accrued business events	878	1,272
Accrued insurance	665	827
Accrued restructuring charges	595	1,417
Product return reserve ⁽¹⁾	591	—
Accrued other	7,976	5,655
	<u>\$ 57,052</u>	<u>\$ 49,279</u>

(1) With adoption of Topic 606 on January 1, 2018, the product return reserve is considered a contract liability and has been reclassified to accrued liabilities from accounts receivable.

Accrued Warranty and Retrofit

The Company provides a standard warranty for its hardware products. Hardware generally has a one -, three - or five -year standard warranty from the date of shipment. Under certain circumstances, the Company also provides fixes on specifically identified performance failures for products that are outside of the standard warranty period and recognizes estimated costs related to retrofit activities upon identification of such product failures. The Company accrues for potential warranty and retrofit claims based on the Company's historical product failure rates and historical costs incurred in correcting product failures along with other relevant information related to any specifically identified product failures. The Company's warranty and retrofit accruals are based on estimates of losses that are probable based on information available. The adequacy of the accrual is reviewed on a periodic basis and adjusted, if necessary, based on additional information as it becomes available. Changes in the Company's warranty and retrofit reserves in the periods as indicated were as follows (in thousands):

	Three Months Ended		Nine Months Ended	
	September 29, 2018	September 30, 2017	September 29, 2018	September 30, 2017
Balance at beginning of period	\$ 8,188	\$ 9,265	\$ 8,708	\$ 12,214
Provision for warranty and retrofit charged to cost of revenue	1,282	2,057	4,311	5,661
Utilization of reserve	(810)	(2,868)	(4,359)	(9,421)
Balance at end of period	<u>\$ 8,660</u>	<u>\$ 8,454</u>	<u>\$ 8,660</u>	<u>\$ 8,454</u>

Accrued Restructuring Charges

The Company adopted a restructuring plan in March 2017. This restructuring plan realigned the Company's business, increasing its focus towards its investments in software defined access and cloud products, while reducing its expense structure in its traditional systems business. The Company began to take actions under this plan beginning in March 2017 and recognized \$4.2 million of restructuring charges for the year ended December 31, 2017 consisting primarily of severance and other one-time termination benefits. Actions pursuant to this restructuring plan were complete as of December 31, 2017.

The Company established a new restructuring plan in February 2018 to further realign its business resources based on the production releases of its platform offerings. The Company incurred restructuring charges of approximately \$6.0 million, consisting of primarily of severance and other termination related benefits, in the first nine months of 2018.

The following table summarizes the activities pursuant to the above restructuring plans (in thousands):

	Severance and Related Benefits	Facilities	Total
Balance at December 31, 2017	\$ 975	\$ 442	\$ 1,417
Restructuring charges	5,203	773	5,976
Cash payments	(6,032)	(766)	(6,798)
Balance at September 30, 2018	<u>\$ 146</u>	<u>\$ 449</u>	<u>\$ 595</u>

Deferred revenue consisted of the following (in thousands):

	September 29, 2018	December 31, 2017
Current:		
Products and services	\$ 12,602	\$ 9,125
Extended warranty	4,211	3,951
	<u>16,813</u>	<u>13,076</u>
Long-term:		
Products and services	476	18
Extended warranty	17,632	20,627
	<u>18,108</u>	<u>20,645</u>
	<u>\$ 34,921</u>	<u>\$ 33,721</u>

6. Credit Agreements

Line of Credit

On August 7, 2017, the Company entered into a loan and security agreement (the "Loan Agreement") with SVB. The Loan Agreement provides for a senior secured revolving credit facility with SVB, pursuant to which SVB agreed to make revolving advances available to the Company in a principal amount of up to \$30.0 million based on a customary accounts receivable borrowing base, subject to certain exceptions for accounts originating outside the United States and certain specific accounts, which could reduce the amount available to the Company under the credit facility.

The credit facility includes affirmative and negative covenants applicable to the Company and its subsidiaries. Furthermore, the Loan Agreement requires the Company to maintain a liquidity ratio at minimum levels set forth in more detail in the Loan Agreement. The credit facility also includes events of default, the occurrence and continuation of which would provide SVB with the right to demand immediate repayment of any principal and unpaid interest under the credit facility, and to exercise remedies against the Company and the collateral securing the loans under the credit facility. For the month ended November 30, 2017, the Company was not able to maintain the minimum Adjusted Quick Ratio, or AQR, (as defined in the Loan

Agreement) at the level required in the Loan Agreement, which constituted an event of default. Although SVB waived this event of default effective as of November 30, 2017 and, therefore, this default did not change the Company's ability to borrow under the Loan Agreement, the Company was required to amend certain covenants under the Loan Agreement. In February 2018, the Company entered into an amendment to the Loan Agreement that, among other things, amended certain affirmative financial covenants, including reductions to the required minimum level of the AQR and the inclusion of an additional financial covenant related to the maintenance of Adjusted EBITDA (as defined in the Loan Agreement, as amended). In August 2018, the Company entered into a second amendment to the Loan Agreement that, among other things, extended the maturity date from August 7, 2019 to August 7, 2020, amended certain financial covenants, including covenants with respect to the AQR and the Adjusted EBITDA, and changed the compliance requirements for the AQR covenant from a monthly basis to a quarterly basis. As of September 29, 2018, the Company was in compliance with these requirements.

As of September 29, 2018, the Company had borrowings outstanding of \$30.0 million, representing the full amount available under the line of credit.

Equipment Financing Arrangement

In the second and third quarters of 2018, the Company entered into financing arrangements to purchase research and development equipment for approximately \$2.4 million. Each agreement is to be paid over 36 months.

7. Commitments and Contingencies

Lease Commitments

The Company leases office space under non-cancelable operating leases. Certain of the Company's operating leases contain renewal options and rent acceleration clauses. Future minimum payments under the non-cancelable operating leases consisted of the following as of September 29, 2018 (in thousands):

<u>Period</u>	<u>Minimum Future Lease Payments</u>
Remainder of 2018	\$ 699
2019	3,828
2020	3,817
2021	3,468
2022	3,300
Thereafter	9,465
	<u>\$ 24,577</u>

The Company leases its headquarters office space in San Jose, California under a lease agreement that expires in December 2025. In March 2018, the Company entered into this lease agreement for approximately 65,000 square feet, which commenced in September 2018. The future minimum lease payments under the lease are \$16.1 million and are included in the table above. The above table also includes future minimum lease payments for the Company's office facilities in Minneapolis, Minnesota; Nanjing, China; Richardson, Texas; and Petaluma and Santa Barbara, California, which expire at various dates through 2024.

In June 2018, the Company entered into a co-location license agreement to lease data center space in West Jordan, Utah for a term of 84 months. The future minimum lease payments under the lease are \$3.0 million and are included in the table above.

In August 2018, the Company entered into a new office lease agreement for 22,000 square feet in Petaluma, California as its current office lease in Petaluma, California expires in February 2019. The lease is expected to commence in February 2019 for a term of 64 months. The future minimum lease payments of \$2.8 million are included in the table above.

For the three and nine months ended September 29, 2018, total rent expense of the Company was \$0.8 million and \$2.4 million, respectively. For the three and nine months ended September 30, 2017, total rent expense of the Company was \$0.9 million and \$2.8 million, respectively.

Purchase Commitments

The Company's primary contract manufacturers place orders for component inventory in advance based upon the Company's build forecasts in order to reduce manufacturing lead times and ensure adequate component supply. The components are used by the contract manufacturers to build the products included in the build forecasts. The Company generally does not take ownership of the components held by contract manufacturers. The Company places purchase orders with its contract

manufacturers in order to fulfill its monthly finished product inventory requirements. The Company incurs a liability when the contract manufacturers convert the component inventory to a finished product and takes ownership of the inventory when transferred to the designated shipping warehouse. In the event of termination of services with a contract manufacturer, the Company may be required to purchase the remaining components inventory held by the contract manufacturer as well as any outstanding orders pursuant to the contractual provisions with such contract manufacturer. As of September 29, 2018, the Company had approximately \$59.1 million of outstanding purchase commitments for inventories to be delivered by its suppliers, including contract manufacturers, within one year.

The Company has from time to time, and subject to certain conditions, reimbursed its contract manufacturers for component inventory purchases when this inventory has been rendered excess or obsolete, for example due to manufacturing and engineering change orders resulting from design changes, manufacturing discontinuation of parts by its suppliers, or in cases where inventory levels greatly exceed projected demand. The estimated excess and obsolete inventory liabilities related to such manufacturing and engineering change orders and other factors, which are included in accrued liabilities in the accompanying balance sheets, were \$3.3 million and \$2.4 million as of September 29, 2018 and December 31, 2017, respectively. The Company records the related charges in cost of systems revenue in its Condensed Consolidated Statements of Comprehensive Income (Loss).

In March 2018, the Company entered into an agreement with a vendor for engineering services pursuant to which the Company will be obligated to make future minimum payments of \$17.5 million through 2022.

Litigation

From time to time, the Company is involved in various legal proceedings arising from the normal course of business activities.

The Company is not currently a party to any legal proceedings that, if determined adversely to the Company, in management's opinion, are currently expected to individually or in the aggregate have a material adverse effect on the Company's business, operating results or financial condition taken as a whole.

8. Stockholders' Equity

Equity Incentive Plans

As of September 29, 2018, the Company maintains two equity incentive plans, the 2002 Stock Plan and the 2010 Equity Incentive Award Plan (together, the "Plans"). These plans were approved by the stockholders and are described in the Company's Annual Report on Form 10-K filed with the SEC on March 14, 2018. Currently, the Company only grants shares from the 2010 Equity Incentive Award Plan. To date, awards granted under the Plans consist of stock options, restricted stock units ("RSUs") and performance restricted stock units ("PRSUs").

Stock Options

During the three months ended September 29, 2018, stock options exercisable for up to an aggregate of 165,000 shares of common stock were granted with a grant date fair value of \$7.00 per share. During the nine months ended September 29, 2018, stock options exercisable for up to an aggregate of 230,000 shares of common stock were granted with a weighted average grant date fair value of \$6.77 per share.

In August 2017, the Company granted performance-based stock option awards exercisable for up to an aggregate of 1.2 million shares of common stock to its executives. In February 2018, the Compensation Committee of the Company's Board of Directors concluded that the performance target was not met and all such performance-based stock options were forfeited and canceled at that time.

During the three months ended September 29, 2018, 4,993 shares of common stock were issued pursuant to the exercise of stock options at a weighted-average exercise price of \$5.47 per share. During the nine months ended September 29, 2018, 13,488 shares of common stock were issued pursuant to the exercise of stock options at a weighted-average exercise price of \$5.81 per share. As of September 29, 2018, unrecognized stock-based compensation expense of \$3.3 million related to stock options, net of estimated forfeitures, is expected to be recognized over a weighted-average period of 2.7 years.

Restricted Stock Units

During the three months ended September 29, 2018, no RSUs were granted. During the three months ended September 29, 2018, 88,904 RSUs vested. During the nine months ended September 29, 2018, 174,146 RSUs were granted with a weighted average grant date fair value of \$6.66 per share. During the nine months ended September 29, 2018, 750,286 RSUs vested. As of September 29, 2018, unrecognized stock-based compensation expense of \$4.4 million related to RSUs, net of estimated forfeitures, was expected to be recognized over a weighted-average period of 1.4 years.

Performance Restricted Stock Units

During the three and nine months ended September 29, 2018, no PRSUs were granted. During the three months ended September 29, 2018, no PRSUs vested. During the nine months ended September 29, 2018, 87,500 PRSUs vested. As of September 29, 2018, unrecognized stock-based compensation expense of \$0.1 million related to PRSUs, net of estimated forfeitures, is expected to be recognized over a weighted-average period of 0.4 years.

Employee Stock Purchase Plans

The Company maintains two employee stock purchase plans - the Amended and Restated Employee Stock Purchase Plan (the “ESPP”) and an the Amended and Restated 2017 Nonqualified Employee Stock Purchase Plan (the “Nonqualified ESPP”).

The ESPP allows eligible employees to purchase shares of the Company’s common stock through payroll deductions of up to 15% of their annual compensation subject to certain Internal Revenue Code limitations. In addition, no participant may purchase more than 2,000 shares of common stock in each offering period.

The offering periods under the ESPP are six-month periods commencing on May 15th and November 15th of each year. The price of common stock purchased under the ESPP is 85% of the lower of the fair market value of the common stock on the commencement date and the end date of each six -month offering period. As of September 29, 2018, there were 2.0 million shares available for issuance under the ESPP. During the three and nine months ended September 29, 2018, 485,227 shares were purchased under the ESPP. As of September 29, 2018, unrecognized stock-based compensation expense of \$0.2 million related to the ESPP is expected to be recognized over a remaining service period of 0.1 years.

Nonqualified ESPP allows eligible employees to purchase shares of the Company’s common stock through payroll deductions of up to 25% of their annual compensation. Eligible employees have the right to (a) purchase the maximum number of whole shares of common stock that can be purchased with the elected payroll deductions during each offering period for which the employee is enrolled at a purchase price equal to the closing price of the Company’s common stock on the last day of such offering period and (b) receive an equal number of shares of the Company’s common stock that are subject to a risk of forfeiture in the event the employee terminates employment within the one year period immediately following the purchase date. The Nonqualified ESPP provides two six -month offering periods, currently from December 21 through June 20 and June 21 through December 20 of each year. At the annual meeting of stockholders of the Company on May 16, 2018, the stockholders approved to amend certain terms and increase the number of shares of common stock issuable under the Nonqualified ESPP by 2,500,000 shares. The maximum number of shares of common stock currently authorized for issuance under the Nonqualified ESPP is 3,500,000 shares, with a maximum of 500,000 shares allocated per purchase period. During the nine months ended September 29, 2018, shares totaling 165,311 were purchased and issued, with an additional equal number of shares issued subject to a risk of forfeiture. As of September 29, 2018, there were 2.9 million shares available for issuance under the Nonqualified ESPP. As of September 29, 2018, unrecognized stock-based compensation expense of \$1.9 million related to the Nonqualified ESPP is expected to be recognized over a remaining service period of 1.0 year.

9. Accumulated Other Comprehensive Loss

The table below summarizes the changes in accumulated other comprehensive loss by component for the periods indicated (in thousands):

	Three Months Ended			
	September 29, 2018	September 30, 2017		
	Foreign Currency Translation Adjustments	Unrealized Gains and Losses on Available-for-Sale Marketable Securities	Foreign Currency Translation Adjustments	Total
Balance at beginning of period	\$ (397)	\$ (7)	\$ (457)	\$ (464)
Other comprehensive income (loss)	(343)	4	116	120
Balance at end of period	\$ (740)	\$ (3)	\$ (341)	\$ (344)

	Nine Months Ended			
	September 29, 2018	September 30, 2017		
	Foreign Currency Translation Adjustments	Unrealized Gains and Losses on Available-for-Sale Marketable Securities	Foreign Currency Translation Adjustments	Total
Balance at beginning of period	\$ (169)	\$ (6)	\$ (650)	\$ (656)
Other comprehensive income (loss)	(571)	3	309	312
Balance at end of period	\$ (740)	\$ (3)	\$ (341)	\$ (344)

Realized gains and losses on sales of available-for-sale marketable securities, if any, are reclassified from accumulated other comprehensive loss to “Other income (expense)” in the accompanying Condensed Consolidated Statements of Comprehensive Income (Loss).

10. Product Line Divestiture

In February 2018, the Company sold its outdoor cabinet product line to Clearfield, Inc. (“Clearfield”) for \$10.4 million in cash as well as the assumption by Clearfield of the related product warranty liabilities and open purchase order commitments with its contract manufacturer. The Company transferred \$2.1 million in net inventory and agreed to solicit orders on Clearfield’s behalf on the newly transferred outdoor cabinets product lines free of charge for 15 months . The Company established a liability of \$1.6 million in deferred revenue for providing this service and is amortizing this amount to service revenue over the corresponding 15-month period. The Company also recognized a \$6.7 million gain for the nine months ended September 29, 2018 within operating expenses in the Condensed Consolidated Statements of Comprehensive Income (Loss).

11. Income Taxes

The following table presents the provision for income taxes from continuing operations and the effective tax rates for the periods indicated (in thousands, except percentages):

	Three Months Ended		Nine Months Ended	
	September 29, 2018	September 30, 2017	September 29, 2018	September 30, 2017
Provision for income taxes	\$ 85	\$ 225	\$ 353	\$ 1,075
Effective tax rate	9.5%	(1.3)%	(2.6)%	(1.6)%

The income tax provision for the three and nine months ended September 29, 2018 and September 30, 2017 consisted primarily of foreign and state income taxes. The effective tax rate for the three and nine months ended September 29, 2018 and September 30, 2017 was determined using an estimated annual effective tax rate adjusted for discrete items, if any, that occurred during the respective periods. The Company’s effective tax rate for the three and nine months ended September 29, 2018 and September 30, 2017 was impacted by the change in foreign income tax expense.

Deferred tax assets are recognized if realization of such assets is more likely than not. The Company has established and continues to maintain a full valuation allowance against its net deferred tax assets, with the exception of certain foreign deferred tax assets, as the Company does not believe that realization of those assets is more likely than not .

The Company’s effective tax rate may be subject to fluctuation during the year as new information is obtained, which may affect the assumptions used to estimate the annual effective tax rate, including factors such as the mix of forecasted pre-tax earnings in the various jurisdictions in which it operates, valuation allowances against deferred tax assets, the recognition or de-recognition of tax benefits related to uncertain tax positions, and changes in or the interpretation of tax laws in jurisdictions where it conducts business .

12. Net Income (Loss) Per Common Share

The following table sets forth the computation of basic and diluted net income (loss) per common share for the periods indicated (in thousands, except per share data):

	Three Months Ended		Nine Months Ended	
	September 29, 2018	September 30, 2017	September 29, 2018	September 30, 2017
Numerator:				
Net income (loss)	\$ 809	\$ (17,853)	\$ (13,720)	\$ (70,166)
Denominator:				
Weighted-average common shares outstanding used to compute basic net income (loss) per share	53,082	50,336	52,330	49,960
Effect of dilutive common stock equivalents	746	—	—	—
Weighted-average common shares outstanding used to compute diluted net income (loss) per share	53,828	50,336	52,330	49,960
Net income (loss) per common share:				
Basic net income (loss) per common share	\$ 0.02	\$ (0.35)	\$ (0.26)	\$ (1.40)
Diluted net income (loss) per common share	\$ 0.02	\$ (0.35)	\$ (0.26)	\$ (1.40)
Potentially dilutive shares, weighted average	2,513	5,741	6,032	5,704

Potentially dilutive shares have been excluded from the computation of diluted net income (loss) per common share when their effect is antidilutive. These antidilutive shares were primarily from stock options, restricted stock units and performance restricted stock units. For each of the periods presented where the Company reported a net loss, the effect of all potentially dilutive securities would be antidilutive, and as a result diluted net loss per common share is the same as basic net loss per common share.

ITEM 2. Management’s Discussion and Analysis of Financial Condition and Results of Operations

This report includes “forward-looking statements” within the meaning of Section 27A of the Securities Act and Section 21E of the Securities and Exchange Act of 1934, as amended. All statements other than statements of historical facts are “forward-looking statements” for purposes of these provisions, including any projections of earnings, revenue or other financial items, any statement of or concerning the following: the plans and objectives of management for future operations, proposed new products or licensing, product development, anticipated customer demand or capital expenditures, future economic and/or market conditions or performance, and assumptions underlying any of the above. In some cases, forward-looking statements can be identified by the use of terminology such as “may,” “will,” “expects,” “believes,” “intends,” “plans,” “anticipates,” “estimates,” “projects,” “potential,” or “continue” or the negative thereof or other comparable terminology. Although we believe that the expectations reflected in the forward-looking statements contained herein are reasonable, there can be no assurance that such expectations or any of the forward-looking statements will prove to be correct, and actual results could differ materially from those projected or assumed in the forward-looking statements. Our future financial condition and results of operations, as well as any forward-looking statements, are subject to inherent risks and uncertainties, including those identified in the Risk Factors discussed in Part II, Item 1A, in the discussion below, as well as in other sections of this report and in our Annual Report on Form 10-K for the year ended December 31, 2017. All forward-looking statements and reasons why results may differ included in this Quarterly Report on Form 10-Q are made as of the date hereof, and we assume no obligation to update these forward-looking statements or reasons why actual results might differ.

Overview

We are a leading global provider of cloud and software platforms, systems and software for fiber- and copper-based network architectures and a pioneer in software defined access and cloud products focused on access networks and the subscriber. Our portfolio allows for a broad range of subscriber services to be provisioned and delivered over a single unified network. Our access systems can deliver voice and data services, advanced broadband services, mobile broadband, as well as high-definition video and online gaming. Our next generation of premises systems will enable CSPs to address the complexity of the smart home and business and offer new services to their device enabled subscribers. We have designed all of these platforms and systems so that they can be monitored, analyzed, managed and supported by Calix Cloud.

We market our cloud and software platforms, systems and services to CSPs globally through our direct sales force as well as select resellers. Our customers range from smaller, regional CSPs to some of the world’s largest CSPs. We have enabled over 1,400 customers to deploy gigabit passive optical network, Active Ethernet and point-to-point Ethernet fiber access networks.

Our revenue was \$114.7 million and \$325.8 million for the three and nine months ended September 29, 2018, respectively, compared to \$128.8 million and \$372.5 million for the three and nine months ended September 30, 2017, respectively. Our revenue and revenue growth will depend on our ability to sell and license our cloud and software platforms, systems and services to existing customers as well as our ability to attract new customers, particularly larger CSPs, in the U.S. and internationally.

During the first nine months of 2018, we recognized revenue based on the ASU 2014-09, "Revenue from Contracts with Customers (Topic 606)," but revenue for the three and nine months ended September 30, 2017 was recognized based on Topic 605. Revenue for the third quarter and first nine months of fiscal 2018 was \$0.9 million and \$4.8 million higher, respectively, than it would be if recognized under Topic 605. For additional information on the impact of the new accounting standard on our revenue, see Note 2 to the unaudited condensed consolidated financial statements set forth in Part I, Item 1 of this Quarterly Report on Form 10-Q.

Revenue fluctuations result from many factors, including: increases or decreases in customer orders for our products and services, market, financial or other factors that may delay or materially impact customer purchasing decisions, contractual terms with customers that result in delayed revenue recognition and varying budget cycles and seasonal buying patterns of our customers. More specifically, our customers tend to spend less in the first quarter as they are finalizing their annual budgets, and in certain regions, customers are also challenged by winter weather conditions that inhibit fiber deployment in outside infrastructure. Our revenue is also dependent upon our customers' timing of purchases, capital expenditure plans and decisions to upgrade their network or adopt new technologies, including expenditure plans for turnkey solutions projects, which are generally non-recurring in nature. In particular, since the end of 2017, we experienced significantly lower order volumes by our largest customer due to the timing of their recent acquisition, and we expect that this acquisition may continue to disrupt the customer's expenditure plans and result in continued delays and lower levels of purchases of our products and services.

Cost of revenue is strongly correlated to revenue and tends to fluctuate due to all of the above factors that could impact revenue. Factors that impacted our cost of revenue for the three and nine months ended September 29, 2018, and that we expect would impact cost of revenue in future periods, also include: changes in the mix of products delivered, customer location and regional mix, changes in product warranty and incurrence of retrofit costs, changes in the cost of our inventory, including higher costs due to materials shortages, supply constraints or unfavorable changes in trade policies, tariffs and inventory write-downs. Cost of revenue also includes fixed expenses related to our internal operations, which could impact our cost of revenue as a percentage of revenue if there are large fluctuations in revenue.

During the three and nine months ended September 29, 2018, our gross profit and gross margin were positively impacted by the customer mix shift as well as a decrease in our services revenue, which carries a lower than corporate average gross margin, as a mix of total revenue. Overall, our gross profit and gross margin fluctuate based on timing of factors such as new product introductions or upgrades to existing products, changes in customer mix, changes in the mix of products demanded and sold (and any related write-downs of existing inventory), and may be negatively impacted by increases in mix of revenue towards professional services, increases in mix of revenue from channel sales rather than direct sales or other unfavorable customer or product mix, shipment volumes and any related volume discounts, changes in our product and services costs, pricing decreases or discounts, customer rebates and incentive programs due to competitive pressure or materials shortages, supply constraints or unfavorable changes in trade policies.

Our operating expenses have fluctuated based on the following factors: changes in headcount and personnel costs, which comprise a significant portion of our operating expenses; timing of variable compensation expenses due to fluctuations in shipment volumes; timing of research and development expenses, including investments in innovative solutions, such as next generation solutions and new customer segments, prototype builds and outsourced development projects; investments in our business and information technology infrastructure; and fluctuations in stock-based compensation expenses due to timing of equity grants or other factors affecting vesting. During the three and nine months ended September 29, 2018 as compared with the corresponding periods in 2017, our total operating expense decreased largely due to the restructuring actions we took in 2017 and early 2018. In March 2017, we adopted a restructuring plan to realign our business to increase focus towards investments in software platforms and to reduce the expense structure in our traditional systems business. We incurred pre-tax restructuring charges of \$4.2 million in 2017 under this plan. In the first quarter of 2018, we established a new restructuring plan to further align our business resources based on the production releases of our platform offerings and incurred restructuring charges of \$6.0 million during the first nine months of 2018. Our restructuring activities were completed by the end of the second quarter of 2018.

Net income was \$0.8 million for the three months ended September 29, 2018 and a net loss of \$13.7 million for the nine months ended September 29, 2018, compared to net losses of \$17.9 million and \$70.2 million for the three and nine months ended September 30, 2017, respectively. Since our inception we have incurred significant losses, and as of September 29, 2018, we had an accumulated deficit of \$679.3 million. Further, as a result of the fluctuations described above and a number of other factors, many of which are outside our control, our quarterly operating results fluctuate from period to period. Comparing our

operating results on a period-to-period basis may not be meaningful, and you should not rely on our past results as an indication of our future performance.

Product Line Divestiture

In February 2018, we sold our outdoor cabinet product line to Clearfield, Inc. for \$10.4 million in cash as well as the assumption by Clearfield of related product warranty liabilities and open purchase order commitments with our contract manufacturer. The divestiture of this non-strategic product line reflects our continued focus on execution on our platforms and business strategy.

Critical Accounting Policies and Estimates

Our financial statements are prepared in accordance with U.S. GAAP. These accounting principles require us to make certain estimates and judgments that can affect the reported amounts of assets and liabilities as of the date of the financial statements, as well as the reported amounts of revenue and expenses during the periods presented. Management bases its estimates, assumptions and judgments on historical experience and on various other factors that are believed to be reasonable under the circumstances. To the extent there are material differences between these estimates and actual results, our financial statements may be affected. Our management evaluates its estimates, assumptions and judgments on an ongoing basis.

Our critical accounting policies and estimates are described under “Critical Accounting Policies and Estimates” in “Management’s Discussion and Analysis of Financial Condition and Results of Operations” included in our Annual Report on Form 10-K for the year ended December 31, 2017 . For the nine months ended September 29, 2018 , there have been no significant changes in our critical accounting policies and estimates other than the adoption of Accounting Standards Update No. 2014-09, Revenue from Contracts with Customers (Topic 606) (“ASU 2014-09”).

Recent Accounting Pronouncements

See Note 2 to the unaudited condensed consolidated financial statements set forth in Part I, Item 1 of this Quarterly Report on Form 10-Q for a full description of recent accounting pronouncements, including the expected dates of adoption and estimated effects on results of operations and financial condition, which is incorporated herein by reference.

Results of Operations

Comparison of the Three and Nine Months Ended September 29, 2018 and September 30, 2017

Revenue

Our revenue is comprised of the following:

- Systems include revenue from the sale of access and premises systems, software platform licenses and cloud-based software subscriptions.
- Services include revenue from professional services, customer support, software- and cloud-based maintenance, extended warranty subscriptions, training and managed services.

The following table sets forth our revenue (dollars in thousands):

	Three Months Ended				Nine Months Ended			
	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent
Revenue:								
Systems	\$ 104,992	\$ 106,442	\$ (1,450)	(1)%	\$ 300,846	\$ 305,395	\$ (4,549)	(1)%
Services	9,707	22,385	(12,678)	(57)%	24,958	67,073	(42,115)	(63)%
	<u>\$ 114,699</u>	<u>\$ 128,827</u>	<u>\$ (14,128)</u>	(11)%	<u>\$ 325,804</u>	<u>\$ 372,468</u>	<u>\$ (46,664)</u>	(13)%
Percent of total revenue:								
Systems	92%	83%			92%	82%		
Services	8%	17%			8%	18%		
	<u>100%</u>	<u>100%</u>			<u>100%</u>	<u>100%</u>		

Our revenue decreased by \$14.1 million , or 11% , for the three months ended September 29, 2018 , as compared to the corresponding period in 2017 due to lower services revenue of \$12.7 million and to lower systems revenue of \$1.5 million . Both of these declines were primarily related to a lower level of Connect America Fund, or CAF, projects. Systems revenue

also declined due to lower revenue in traditional systems partially offset by greater traction with our AXOS and Calix Cloud platforms.

For the nine months ended September 29, 2018, our revenue decreased by \$46.7 million, or 13%, as compared with the corresponding period in 2017 due to lower services revenue of \$42.1 million primarily driven by a lower level of CAF professional services and the substantial completion of services associated with a significant turnkey network improvement project during the first quarter of 2017 and to lower systems revenue of \$4.5 million, also impacted by a lower level of CAF projects and a decline in sales of our traditional systems. This was partially offset by greater traction with our AXOS and Calix Cloud platforms.

For the three and nine months ended September 29, 2018, revenue generated in the United States was \$99.2 million and \$281.3 million, or 87% and 86% of our total revenue, respectively, compared to \$117.7 million and \$332.3 million, or 91% and 89% of our total revenue, respectively, for the same periods in 2017. International revenue was \$15.5 million and \$44.5 million, or 13% and 14% of our total revenue, respectively, for the three and nine months ended September 29, 2018, as compared to \$11.1 million and \$40.1 million, or 9% and 11% of our total revenue, respectively, for the same periods in 2017.

We had one customer that accounted for more than 10% of our total revenue for the three and nine months ended September 29, 2018 as compared to one customer in the three months ended September 30, 2017 and two customers for the nine months ended September 30, 2017. See Note 2 to the unaudited condensed consolidated financial statements set forth in Part I, Item 1 of this Quarterly Report on Form 10-Q for more details on concentration of revenue for the periods presented.

Cost of Revenue, Gross Profit and Gross Margin

The following table sets forth our cost of revenue (dollars in thousands):

	Three Months Ended				Nine Months Ended			
	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent
Cost of revenue:								
Systems	\$ 54,354	\$ 55,494	\$ (1,140)	(2)%	\$ 160,350	\$ 171,166	\$ (10,816)	(6)%
Services	7,512	28,700	(21,188)	(74)%	19,696	78,969	(59,273)	(75)%
	<u>\$ 61,866</u>	<u>\$ 84,194</u>	<u>\$ (22,328)</u>	<u>(27)%</u>	<u>\$ 180,046</u>	<u>\$ 250,135</u>	<u>\$ (70,089)</u>	<u>(28)%</u>

Our cost of revenue decreased by \$22.3 million and \$70.1 million for the three and nine months ended September 29, 2018, respectively, as compared with the corresponding periods in 2017. This was primarily attributable to a decrease in cost of service revenue by \$21.2 million and \$59.3 million during the same periods, as we experienced higher levels of service activities in 2017, as well as higher costs attributed to rework, delays, unanticipated costs and overruns (including third party costs) for our turnkey network improvement projects in the year ago periods. Our cost of systems revenue also decreased by \$1.1 million and \$10.8 million for the three and nine months ended September 29, 2018, respectively, as compared with the corresponding periods in 2017 mainly due to improved regional and new product mix.

The following table sets forth our gross profit and gross margin (dollars in thousands):

	Three Months Ended				Nine Months Ended			
	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent
Gross profit:								
Systems	\$ 50,638	\$ 50,948	\$ (310)	(1)%	\$ 140,496	\$ 134,229	\$ 6,267	5%
Services	2,195	(6,315)	8,510	(135)%	5,262	(11,896)	17,158	(144)%
	<u>\$ 52,833</u>	<u>\$ 44,633</u>	<u>\$ 8,200</u>	<u>18%</u>	<u>\$ 145,758</u>	<u>\$ 122,333</u>	<u>\$ 23,425</u>	<u>19%</u>
Gross margin:								
Systems	48%	48%			47%	44%		
Services	23%	(28)%			21%	(18)%		
Overall	46%	35%			45%	33%		

Gross profit increased to \$52.8 million and \$145.8 million for the three and nine months ended September 29, 2018, respectively, from \$44.6 million and \$122.3 million during the corresponding periods in 2017. Gross margin increased to 46% and 45% for the three and nine months ended September 29, 2018, respectively, from 35% and 33% for the corresponding periods in 2017. The increase in gross profit and gross margin for the three and nine months ended September 29, 2018 was

primarily due to a shift in customer mix as well as a decrease in our services revenue, which carries a lower than average gross margin, as a mix of total revenue. Specifically, systems gross margin increased due to strength in sales to our smaller regional customers and to an increasing mix of new products that have higher margins than some of our older traditional products. Services gross margin improved primarily due to process improvements and efficiencies implemented over the past twelve months.

Given the recently enacted U.S. tariffs, we are working aggressively with partners and suppliers to re-engineer our supply chain and move production outside of China in addition to other supply chain improvements. We anticipate the cost impact of the current U.S. tariffs to be significant going forward, including in the next several quarters, but expect that we would be able to mitigate the impact of these tariffs through our supply chain re-engineering efforts with the cost impact diminishing beginning after the first half of 2019. We further anticipate that if we are successful in mitigating the impact of these tariffs within our planned timing, we would be able to avoid raising prices to our customers. Regardless of our mitigation plans, we expect these U.S. tariffs as well as the costs to realign our global supply chain will negatively impact overall gross margin.

Operating Expenses

Research and Development Expenses

The following table sets forth our research and development expenses (dollars in thousands):

	Three Months Ended				Nine Months Ended			
	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent
Research and development	\$ 21,111	\$ 32,633	\$ (11,522)	(35)%	\$ 68,748	\$ 99,391	\$ (30,643)	(31)%
Percent of total revenue	18%	25%			21%	27%		

The decrease in research and development expenses by \$11.5 million and \$30.6 million for the three and nine months ended September 29, 2018, respectively, as compared with the corresponding periods in 2017 was primarily due to the leverage of our software platforms enabling us to lower our level of investment and introduce new products faster. In addition, during 2017 and the first quarter of 2018, we restructured our business to increase our focus towards investments in software platforms and to reduce the expense structure in our traditional systems business. As a result, our personnel for research and development decreased for the three and nine months ended September 29, 2018 as compared with the corresponding periods in 2017, which resulted in lower compensation and employee benefits of \$5.5 million and \$16.9 million, respectively. The decrease was also due to lower expenses for the three and nine months ended September 29, 2018 as compared with the corresponding periods in 2017 for outside services of \$3.4 million and \$5.2 million, respectively, and lower expenditures relating to prototype and expendable equipment of \$1.4 million and \$5.4 million, respectively. We expect our investments in research and development will be relatively consistent in absolute dollars from our current levels in the near term.

Sales and Marketing Expenses

The following table sets forth our sales and marketing expenses (dollars in thousands):

	Three Months Ended				Nine Months Ended			
	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent
Sales and marketing	\$ 20,722	\$ 18,448	\$ 2,274	12%	\$ 61,150	\$ 59,306	\$ 1,844	3%
Percent of total revenue	18%	14%			19%	16%		

The increase in sales and marketing expenses by \$2.3 million and \$1.8 million for the three and nine months ended September 29, 2018, respectively, as compared with the corresponding periods in 2017 was primarily due to increased headcount, bonuses and marketing programs for new products. We expect sales and marketing expenses to increase in absolute dollars as variable compensation increases with revenue and as our annual ConneXions user group occurs in October 2018.

General and Administrative Expenses

The following table sets forth our general and administrative expenses (dollars in thousands):

	Three Months Ended				Nine Months Ended			
	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent
General and administrative	\$ 10,481	\$ 10,203	\$ 278	3%	\$ 29,947	\$ 30,161	\$ (214)	(1)%
Percent of total revenue	9%	8%			9%	8%		

The increase in general and administrative expenses by \$0.3 million for the three months ended September 29, 2018 as compared with the corresponding period in 2017 was mainly due to higher personnel costs offset by lower professional services expenses primarily related to outside consulting services for the implementation of a new SaaS-based enterprise resource planning infrastructure, or SaaS-based ERP.

General and administrative expenses were flat for the nine months ended September 29, 2018 as compared with the corresponding period in 2017. We expect general and administrative expenses to remain elevated until the completion of our SaaS-based ERP project in the first half of 2019.

Gain on Sale of Product Line

During the nine months ended September 29, 2018, we recognized a gain of \$6.7 million relating to the sale of our outdoor cabinet product line to Clearfield, Inc. for \$10.4 million. See Note 10, “*Product Line Divestiture*” of the Notes to Condensed Consolidated Financial Statements in this Quarterly Report on Form 10-Q for further details.

Restructuring Charges

The following table sets forth our restructuring charges (benefit) (dollars in thousands):

	Three Months Ended				Nine Months Ended			
	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent
Restructuring charges (benefit)	\$ (157)	\$ 612	\$ (769)	(126)%	\$ 5,976	\$ 2,268	\$ 3,708	163%
Percent of total revenue	—%	—%			2%	1%		

We adopted a restructuring plan in March 2017. This restructuring plan realigned our business, increasing our focus towards investments in software platforms and cloud products, while reducing our expense structure in the traditional systems business. We began to take actions under this plan beginning in March 2017 and recognized \$0.6 million and \$2.3 million of restructuring charges for the three and nine months ended September 30, 2017, respectively, consisting of severance and other one-time termination benefits. Actions pursuant to this restructuring plan were complete as of December 31, 2017.

We also established a new restructuring plan in February 2018 to further realign our business resources based on the production releases of our platform offerings. We incurred restructuring charges (benefit) of \$(0.2) million and \$6.0 million for the three and nine months ended September 29, 2018, respectively, consisting primarily of severance and other termination related benefits. Actions pursuant to this restructuring plan were complete as of June 30, 2018. See “Accrued Restructuring Charges” in Note 5, “Balance Sheet Details” of the Notes to Condensed Consolidated Financial Statements in this Quarterly Report on Form 10-Q for further details.

Provision for Income Taxes

The following table sets forth our provision for income taxes (dollars in thousands):

	Three Months Ended				Nine Months Ended			
	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent	September 29, 2018	September 30, 2017	Variance in Dollars	Variance in Percent
Provision for income taxes	\$ 85	\$ 225	\$ (140)	(62)%	\$ 353	\$ 1,075	\$ (722)	(67)%
Effective tax rate	9.5%	(1.3)%			(2.6)%	(1.6)%		

The income tax provision for the three and nine months ended September 29, 2018 and September 30, 2017 consisted primarily of foreign and state income taxes. The effective tax rate for the three and nine months ended September 29, 2018 and September 30, 2017 was determined using an estimated annual effective tax rate adjusted for discrete items, if any, that

occurred during the respective periods. Our effective tax rate for the three and nine months ended September 29, 2018 and September 30, 2017 was impacted by the change in foreign income tax expense.

Deferred tax assets are recognized if realization of such assets is more likely than not. We have established and continue to maintain a full valuation allowance against our net deferred tax assets, with the exception of certain foreign deferred tax assets, as we do not believe that realization of those assets is more likely than not.

Our effective tax rate may be subject to fluctuation during the year as new information is obtained, which may affect the assumptions used to estimate the annual effective tax rate, including factors such as the mix of forecasted pre-tax earnings in the various jurisdictions in which we operate, valuation allowances against deferred tax assets, the recognition or de-recognition of tax benefits related to uncertain tax positions, and changes in or the interpretation of tax laws in jurisdictions where we conduct business.

Liquidity and Capital Resources

We have funded our operations and investing activities primarily through cash generated from operations, borrowings on our line of credit, an equipment financing arrangement for financing certain lab equipment and sales of our common stock. As of September 29, 2018, we had cash and cash equivalents of \$53.0 million, which consisted of deposits held at banks and money market mutual funds held at major financial institutions.

Operating Activities

Net cash provided by operating activities was \$5.2 million for the nine months ended September 29, 2018 and consisted of a net loss of \$13.7 million, partially offset by \$10.4 million of cash flow increases reflected in the net change in assets and liabilities and \$8.5 million of non-cash charges. Cash flow increases resulting from the net change in assets and liabilities primarily consisted of a decrease in accounts receivable of \$13.2 million mainly due to collection from one of our key customers in early January 2018, an increase in accrued liabilities of \$3.7 million primarily due to accrued incentive compensation and an increase in deferred revenue of \$0.4 million due to the sale of our Cloud software platform. This was partially offset by a decrease in accounts payable of \$5.1 million primarily due to a commensurate decline in cost of revenue. Non-cash charges primarily consisted of stock-based compensation of \$7.8 million, depreciation and amortization of \$7.1 million offset by gain on sale of product line of \$6.7 million.

During the nine months ended September 30, 2017, cash used in operating activities increased as we continued to invest in research and development to pursue broader market and customer opportunities. Furthermore, during this period we continued to experience losses due to factors such as higher costs, delays and project overruns associated with our professional services business for turnkey network improvement projects (including CAF projects). As described below, these turnkey network improvement projects generally involve greater working capital needs at the outset as services and products are supplied, while revenue and cash collections occur after projects are accepted or agreed-upon milestones are reached. Net cash used in operations of \$28.6 million for the nine months ended September 30, 2017 consisted of a net loss of \$70.2 million, partially offset by \$23.6 million of cash flow increases reflected in the net change in assets and liabilities and \$17.9 million of non-cash charges. Cash flow increases resulting from the net change in assets and liabilities primarily consisted of a decrease in deferred cost of revenue of \$11.9 million mainly due to recognition of associated costs related to turnkey network improvement projects that are either accepted or for which agreed-upon milestones are reached, partly offset by an increase in deferred revenue of \$1.3 million attributed to additional deferral of revenue related to turnkey network improvement projects, a decrease in inventories of \$8.2 million primarily due to higher inventory turnover, a decrease in accounts receivable of \$7.1 million mainly due to collection from one of our customers for turnkey improvement projects and an increase in accounts payable of \$5.5 million primarily due to the timing of inventory receipts and payments to our manufacturers. This was partially offset by a decrease in accrued expenses and other liabilities of \$10.1 million primarily due to a decrease in customer advance payments for turnkey services projects for one of our customers and partly due to the timing of our payments of payroll, sales commissions and other expenses. Non-cash charges primarily consisted of stock-based compensation of \$9.3 million, depreciation and amortization of \$7.6 million and amortization of intangible assets of \$0.8 million.

Investing Activities

Net cash provided by investing activities of \$4.8 million for the nine months ended September 29, 2018 consisted of cash proceeds of \$10.4 million from the sale of our outdoor cabinet product line partially offset by capital expenditures of \$5.6 million for purchases of test equipment, computer equipment and software.

Net cash provided by investing activities of \$14.4 million for the nine months ended September 30, 2017 consisted of net sales and maturities of marketable securities of \$21.2 million partially offset by capital expenditures of \$6.8 million for purchases of test equipment, computer equipment and software.

Financing Activities

Net cash provided by financing activities of \$3.7 million for the nine months ended September 29, 2018 consisted primarily of the proceeds from the issuance of common stock under our employee stock purchase plans.

Net cash provided by financing activities of \$27.8 million for the nine months ended September 30, 2017 primarily consisted of net proceeds from our line of credit of \$30.0 million and the proceeds from the issuance of common stock under our employee stock purchase plan of \$0.7 million, partially offset by the payment of payroll taxes for the vesting of awards under our 2010 Equity Incentive Award Plan of \$2.7 million and payments to originate the line of credit of \$0.2 million.

Working Capital and Capital Expenditure Needs

Our material cash commitments include contractual obligations under our Loan Agreement, normal recurring trade payables, compensation-related and expense accruals, operating leases and non-cancelable firm purchase commitments. We believe that our outsourced approach to manufacturing provides us significant flexibility in both managing inventory levels and financing our inventory. In the event that our revenue plan does not meet our expectations, we may be required to eliminate or curtail expenditures to mitigate the impact on our working capital.

In August 2017, we entered into the Loan Agreement for a senior secured revolving credit facility with SVB, which provides for a revolving credit facility of up to \$30.0 million based on a customary accounts receivable borrowing base, subject to certain exceptions for accounts originating outside the United States and certain specific accounts, which could reduce the amount available to us under the credit facility. The Loan Agreement includes affirmative and negative covenants and requires us to maintain a liquidity ratio at minimum levels specified in the Loan Agreement. For the month ended November 30, 2017, we were not able to maintain the minimum Adjusted Quick Ratio, or AQR, (as defined in the Loan Agreement) at the level required in the Loan Agreement, which constituted an event of default. Although SVB waived this event of default effective as of November 30, 2017 and, therefore, this default did not change our ability to borrow under the Loan Agreement, we were required to amend certain covenants under the Loan Agreement and, in February 2018, we entered into an amendment to the Loan Agreement that, among other things, amended certain affirmative financial covenants, including reductions to the required minimum level of the AQR and the inclusion of an additional financial covenant related to the maintenance of Adjusted EBITDA (as defined in the Loan Agreement, as amended). In August 2018, we entered into a second amendment to Loan Agreement that, among other things, extended the maturity date from August 7, 2019 to August 7, 2020, amended certain financial covenants, including covenants with respect to the AQR and the Adjusted EBITDA, and changed the compliance requirements for the AQR covenant from a monthly basis to a quarterly basis. As of September 29, 2018, we are in compliance with these covenants. Although we were compliant with the financial covenants under the Loan Agreement at September 29, 2018, given our current financial position and history of operating losses, it is possible that we may fail to meet the minimum levels required by the financial covenants in a future period. In particular, if we are unable to generate positive cash flows on a continued basis, we could fall below the minimum AQR requirement, which would constitute an event of default under the Loan Agreement.

As of September 29, 2018, \$30.0 million in principal amount of borrowings was outstanding under this line of credit. Please refer to Note 6, “*Credit Agreements*” of the Notes to Condensed Consolidated Financial Statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q for more details on this credit facility.

We established a new restructuring plan in early 2018 to further realign our business resources based on the production releases of our platform offerings. We incurred restructuring charges of \$6.0 million for the nine months ended September 29, 2018 consisting of primarily of severance and other termination related benefits. These actions were completed as of June 30, 2018 and are expected to result in annualized savings of over \$20 million.

In February 2018, we sold our outdoor cabinet product line to Clearfield, Inc. for \$10.4 million in cash as well as the assumption by Clearfield of the related product warranty liabilities and open purchase order commitments with our contract manufacturer. We believe the divestiture of this non-strategic product line reflects our strategic focus on our software and cloud platforms. See Note 10, “*Product Line Divestiture*” of Notes to Condensed Consolidated Financial Statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q.

In the second and third quarters of 2018, we entered into financing arrangements to purchase research and development equipment for approximately \$2.4 million. Each agreement is to be paid over 36 months.

We believe, based on our current operating plan and expected operating cash flows, that our existing cash and cash equivalents, along with available borrowings under our SVB line of credit, will be sufficient to meet our anticipated cash needs for at least the next twelve months. We expect to continue to draw on the SVB line of credit from time to time to support our working capital needs. Our future capital requirements will depend on many factors including our rate of revenue growth; timing of customer payments and payment terms, particularly of larger customers; the timing and extent of spending to support development efforts, particularly research and development related to growth initiatives such as our software defined access

portfolio, our ability to partner with third parties to outsource our research and development projects; our ability to manage product cost, including the cost impact of the current U.S. tariffs as well as our ability to mitigate the cost impact through supply chain re-engineering as currently planned, the possibility of additional tariffs that may impact our product costs and higher component costs associated with new technologies; our ability to implement efficiencies and maintain product margin levels; the timing, extent and size of turnkey professional services projects and our ability to develop operational efficiencies and successfully scale that business; the expansion of sales and marketing activities; the timing of introductions and customer adoption of new products and enhancements to existing products; the acquisition of new capabilities or technologies; and the continued market acceptance of our products. If we are unable to execute to our current operating plan or generate positive operating income and positive cash flows, our liquidity, results of operations and financial condition will be adversely affected and we may fail to comply with the covenants in the Loan Agreement, in which case we may not be able to borrow under the SVB line of credit. In particular, until we are able to mitigate the cost impact of the U.S. tariffs, these tariffs will have a material adverse impact on our cash flows. Re-engineering of our supply chain to mitigate the impact of the tariffs requires significant effort, may take longer to complete than anticipated and may require higher expenditures than planned. Moreover, there remains uncertainty as to the scope of the tariffs and whether additional tariffs or other measures may be imposed that could have further cost impact to us. We may need to seek other sources of liquidity, including the sale of equity or incremental borrowings, to support our working capital needs. In addition, we may choose to seek other sources of liquidity even if we believe we have generated sufficient cash flows to support our operational needs. There is no assurance that any other sources of liquidity may be available to us on acceptable terms or at all. If we are unable to generate sufficient cash flows or obtain other sources of liquidity, we will be forced to limit our development activities, reduce our investment in growth initiatives and institute cost-cutting measures, all of which may adversely impact our business and growth.

Contractual Obligations and Commitments

Our principal commitments as of September 29, 2018 consist of our contractual obligations under the Loan Agreement, equipment financing arrangements, operating leases for office space and non-cancelable outstanding purchase obligations. The following table summarizes our contractual obligations at September 29, 2018 (in thousands):

	Payments Due by Period				
	Total	Less Than 1 Year	1-3 Years	3-5 Years	More than 5 Years
Line of credit, including interest ⁽¹⁾	\$ 33,756	\$ 2,025	\$ 31,731	\$ —	\$ —
Equipment financing arrangements ⁽²⁾	2,243	847	1,396	—	—
Operating lease obligations ⁽³⁾	24,577	3,463	10,817	6,728	3,569
Non-cancelable purchase commitments ⁽⁴⁾	76,652	59,108	17,544	—	—
	<u>\$ 137,228</u>	<u>\$ 65,443</u>	<u>\$ 61,488</u>	<u>\$ 6,728</u>	<u>\$ 3,569</u>

(1) Line of credit contractual obligations include projected interest payments over the term of the Loan Agreement, assuming interest rate in effect for the outstanding borrowings as of September 29, 2018 and payment of the borrowings on August 7, 2020, the contractual maturity date of the credit facility. See Note 6, “*Credit Agreements*” of the Notes to Condensed Consolidated Financial Statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q for further discussion regarding our contractual obligations relating to our line of credit.

(2) Represents loan payments, including interest, for an equipment financing arrangements. See Note 7, “*Commitments and Contingencies*” of the Notes to Condensed Consolidated Financial Statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q for further discussion regarding our outstanding purchase commitments.

(3) Future minimum operating lease obligations in the table above include primarily payments for our office space in Petaluma, San Jose and Santa Barbara, California; Minneapolis, Minnesota; Nanjing, China; and Richardson, Texas, which expire at various dates through 2025. See Note 6, “*Credit Agreements*” of the Notes to Condensed Consolidated Financial Statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q for further discussion regarding our operating leases.

(4) Represents outstanding purchase commitments for inventory and services to be delivered by our suppliers, including contract manufacturers and engineering service providers. See Note 7, “*Commitments and Contingencies*” of the Notes to Condensed Consolidated Financial Statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q for further discussion regarding our outstanding purchase commitments.

Off-Balance Sheet Arrangements

As of September 29, 2018 and December 31, 2017, we did not have any off-balance sheet arrangements.

ITEM 3. Quantitative and Qualitative Disclosures About Market Risk

Interest Rate Risk

The primary objectives of our investment activity are to preserve principal, provide liquidity and maximize income without significantly increasing risk. By policy, we do not enter into investments for trading or speculative purposes. At September 29, 2018, we had cash and cash equivalents of \$53.0 million, which were held primarily in cash and money market funds. Due to the nature of these money market funds, we believe that we do not have any material exposure to changes in the fair value of our cash equivalents as a result of changes in interest rates.

Our exposure to interest rate risk also relates to the amount of interest we must pay on our borrowings under our revolving credit facility pursuant to our Loan Agreement with SVB. Borrowings under the Loan Agreement will bear interest through maturity at a variable annual rate based upon an annual rate of either a prime rate or a LIBOR rate, plus an applicable margin between 0.50% to 1.50% for prime rate advances and between 2.00% and 3.00% for LIBOR advances based on the Company’s maintenance of an applicable liquidity ratio. As of September 29, 2018, we had \$30.0 million outstanding in borrowings under the Loan Agreement.

Foreign Currency Exchange Risk

Our primary foreign currency exposures are described below.

Economic Exposure

The direct effect of foreign currency fluctuations on our sales and expenses has not been material because our sales and expenses are primarily denominated in U.S. dollars (“USD”). However, we are indirectly exposed to changes in foreign currency exchange rates to the extent of our use of foreign contract manufacturers whom we pay in USD. Increases in the local currency rates of these vendors in relation to USD could cause an increase in the price of products that we purchase. Additionally, if the USD strengthens relative to other currencies, such strengthening could have an indirect effect on our sales to the extent it raises the cost of our products to non-U.S. customers and thereby reduces demand. A weaker USD could have the opposite effect. The precise indirect effect of currency fluctuations is difficult to measure or predict because our sales are influenced by many factors in addition to the impact of such currency fluctuations.

Translation Exposure

Our sales contracts are primarily denominated in USD and, therefore, the majority of our revenue is not subject to foreign currency risk. We are directly exposed to changes in foreign exchange rates to the extent such changes affect our expenses related to our foreign assets and liabilities with our subsidiaries in Brazil, China and the United Kingdom, whose functional currencies are the Brazilian Real (“BRL”), Chinese Renminbi (“RMB”) and British Pounds Sterling (“GBP”), respectively.

Our operating expenses are incurred primarily in the United States, with a small portion of expenses incurred in Brazil associated with the administration of the entity, in China associated with our research and development operations that are maintained there, and in the United Kingdom for our international sales and marketing activities. Our operating expenses are generally denominated in the functional currencies of our subsidiaries in which the operations are located. The percentages of our operating expenses denominated in the following currencies for the indicated periods were as follows:

	Nine Months Ended	
	September 29, 2018	September 30, 2017
USD	89%	90%
RMB	8%	7%
GBP	3%	3%
BRL	—%	—%
	100%	100%

If USD had appreciated or depreciated by 10%, relative to RMB, GBP and BRL, our operating expenses for the first nine months of 2018 would have decreased or increased by approximately \$1.9 million, or approximately 1%. We do not currently enter into forward exchange contracts to hedge exposure denominated in foreign currencies or any derivative financial instruments. In the future, we may consider entering into hedging transactions to help mitigate our foreign currency exchange risk.

Foreign exchange rate fluctuations may also adversely impact our financial position as the assets and liabilities of our foreign operations are translated into USD in preparing our Condensed Consolidated Balance Sheets. The effect of foreign exchange rate fluctuations on our consolidated financial position for the nine months ended September 29, 2018 was a net translation loss

of approximately \$ 0.6 million . This loss is recognized as an adjustment to stockholders' equity through accumulated other comprehensive loss.

Transaction Exposure

We have certain assets and liabilities, primarily receivables and accounts payable (including inter-company transactions) that are denominated in currencies other than the relevant entity's functional currency. In certain circumstances, changes in the functional currency value of these assets and liabilities create fluctuations in our reported consolidated financial position, cash flows and results of operations. Transaction gains and losses on these foreign currency denominated assets and liabilities are recognized each period within other income (expense), net in our Condensed Consolidated Statements of Comprehensive Income (Loss). During the nine months ended September 29, 2018 , the net gain we recognized related to these foreign exchange assets and liabilities was approximately \$0.4 million .

ITEM 4. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Based on their evaluation as of September 29, 2018 , our Chief Executive Officer and Chief Financial Officer, with the participation of our management, have concluded that our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) were effective at the reasonable assurance level.

Limitations on the Effectiveness of Controls

Our disclosure controls and procedures provide our Chief Executive Officer and Chief Financial Officer reasonable assurance that our disclosure controls and procedures will achieve their objectives. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate, to allow timely decisions regarding required disclosure. Our management, including our Chief Executive Officer and Chief Financial Officer, does not expect that our disclosure controls and procedures or our internal control over financial reporting can or will prevent all human error. Our management recognizes that a control system, no matter how well designed and implemented, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Furthermore, the design of a control system must reflect the fact that there are internal resource constraints, and the benefit of controls must be weighed relative to their corresponding costs. Because of the limitations in all control systems, no evaluation of controls can provide complete assurance that all control issues and instances of error, if any, within our company are detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur due to human error or mistake. Additionally, controls, no matter how well designed, could be circumvented by the individual acts of specific persons within the organization. The design of any system of controls is also 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 objectives under all potential future conditions.

Changes in Internal Control over Financial Reporting

There was no change in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the period covered by this report that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. Legal Proceedings

For a description of our material pending legal proceedings, please refer to Note 7 “*Commitments and Contingencies – Litigation*” of the Notes to Condensed Consolidated Financial Statements included in Part I, Item 1 of this Quarterly Report on Form 10-Q, which is incorporated by reference.

ITEM 1A. Risk Factors

We have identified the following additional risks and uncertainties that may affect our business, financial condition and/or results of operations. The risks described below include any material changes to and supersede the description of the risk factors disclosed in Part I, Item 1A of our Annual Report on Form 10-K for the year ended December 31, 2017, as filed with the Securities and Exchange Commission on March 14, 2018. Investors should carefully consider the risks described below, together with the other information set forth in this Quarterly Report on Form 10-Q, before making any investment decision. The risks described below are not the only ones we face. Additional risks not currently known to us or that we currently believe are immaterial may also significantly impair our business operations. Our business could be harmed by any of these risks. The trading price of our common stock could decline due to any of these risks, and investors may lose all or part of their investment.

Risks Related to Our Business and Industry

Our markets are rapidly changing, which makes it difficult to predict our future revenue and plan our expenses appropriately.

We compete in markets characterized by rapid technological change, changing needs of CSPs, evolving industry standards and frequent introductions of new products and services. We invest significant amounts to pursue innovative technologies that we believe would be adopted by CSPs. In addition, on an ongoing basis we expect to reposition our product and service offerings and introduce new products and services as we encounter rapidly changing CSP requirements and increasing competitive pressures. If we cannot keep pace with rapid technological developments to meet our customers’ needs and compete with evolving industry standards or if the technologies we choose to invest in fail to meet customer needs or are not adopted by customers, the use of our products and our revenue could decline, making it difficult to forecast our future revenue and plan our operating expenses appropriately.

Adverse global economic conditions and geopolitical issues could have a negative effect on our business, results of operations and financial condition and liquidity.

As a global company, our performance is affected by global economic conditions as well as geopolitical issues. In recent years concerns about the global economic outlook have adversely affected market and business conditions in general. Macroeconomic weakness and uncertainty also make it more difficult for us to accurately forecast revenue, gross margin and expenses. Geopolitical issues, such as the ones resulting in the recent tariffs imposed by both the U.S. and China create uncertainty for global commerce. Sustained uncertainty about, or worsening of, global economic conditions and geopolitical issues may cause our customers to reduce or delay spending and could intensify pricing pressures. Any or all of these factors could negatively affect demand for our products and our business, financial condition and result of operations.

We have a history of losses, and we may not be able to generate positive operating income and positive cash flows in the future.

We have experienced net losses in each year of our existence. We incurred net losses of \$83.0 million in 2017, \$27.4 million in 2016, and \$26.3 million in 2015. For the first nine months of 2018, we incurred a net loss of \$13.7 million. As of September 29, 2018, we had an accumulated deficit of \$679.3 million.

We expect to continue to incur significant expenses and cash outlays for research and development associated with our platforms and systems, including our cloud and services operations, investments in innovative technologies, expansion of our product portfolio, sales and marketing, customer support and general and administrative functions as we expand our business and operations and target new customer segments, primarily larger CSPs including cable MSOs. Given our anticipated growth and the intense competitive pressures we face, we may be unable to control our operating costs.

We cannot guarantee that we will achieve profitability in the future. We will have to generate and sustain significant and consistent increased revenue, while continuing to control our expenses, in order to achieve and then maintain profitability. We may also incur significant losses in the future for a number of reasons, including the risks discussed in this “Risk Factors”

section and other factors that we cannot anticipate. If we are unable to generate positive operating income and positive cash flows from operations, our liquidity, results of operations and financial condition will be adversely affected. If we are unable to generate cash flows to support our operational needs, we may need to seek other sources of liquidity, including additional borrowings, to support our working capital needs. In addition, we may choose to seek other sources of liquidity even if we believe we have generated sufficient cash flows to support our operational needs. There is no assurance that any other sources of liquidity may be available to us on acceptable terms or at all. If we are unable to generate sufficient cash flows or obtain other sources of liquidity, we will be forced to limit our development activities, reduce our investment in growth initiatives and institute cost-cutting measures, all of which would adversely impact our business and growth.

Our quarterly and annual operating results may fluctuate significantly, which may make it difficult to predict our future performance and could cause the market price of our stock to decline.

A number of factors, many of which are outside of our control, may cause or contribute to significant fluctuations in our quarterly and annual operating results. These fluctuations may make financial planning and forecasting difficult. Comparing our operating results on a period-to-period basis may not be meaningful, and you should not rely on our past results as an indication of our future performance. If our revenue or operating results fall below the expectations of investors or securities analysts, or below any guidance we may provide to the market, the market price of our stock would likely decline. Moreover, we may experience delays in recognizing revenue under applicable revenue recognition rules. For example, revenue associated with large turnkey network improvement projects, which include projects that are funded by the CAF program, is generally deferred until customer acceptance is received and may be subject to delays, rework requirements and unexpected costs, among other uncertainties. Certain government-funded contracts, such as those funded by U.S. Department of Agriculture's Rural Utility Service, or RUS, also include acceptance and administrative requirements that delay revenue recognition. The extent of these delays and their impact on our revenue can fluctuate considerably depending on the number and size of purchase orders under these contracts for a given time period. In addition, unanticipated decreases in our available liquidity due to fluctuating operating results could limit our growth and delay implementation of our expansion plans.

In addition to the other risk factors listed in this "Risk Factors" section, factors that have in the past and may continue to contribute to the variability of our operating results include:

- our ability to predict our revenue and reduce and control product costs, including larger scale turnkey network improvement projects that may span several quarters;
- the impact of global economic conditions;
- the impact of current and future tariffs that may impact our products, including the U.S. tariffs on goods imported from China;
- our ability to increase our sales to larger CSPs globally;
- the capital spending patterns of CSPs and any decrease or delay in capital spending by CSPs due to macro-economic conditions, regulatory uncertainties or other reasons;
- the impact of government-sponsored programs on our customers;
- intense competition;
- our ability to develop new products or enhancements that support technological advances and meet changing CSP requirements;
- our ability to achieve market acceptance of our products and CSPs' willingness to deploy our new products;
- the concentration of our customer base as well as our dependence on a limited number of key customers;
- the length and unpredictability of our sales cycles and timing of orders;
- our lack of long-term, committed-volume purchase contracts with our customers;
- our exposure to the credit risks of our customers;
- fluctuations in our gross margin;
- the interoperability of our products with CSP networks;
- our dependence on sole-, single- and limited-source suppliers;
- our ability to manage our relationships with our third-party vendors, including contract manufacturers, ODMs, logistics providers, component suppliers and development partners;
- our ability to forecast our manufacturing requirements and manage our inventory;
- our products' compliance with industry standards;
- our ability to expand our international operations;
- our ability to protect our intellectual property and the cost of doing so;
- the quality of our products, including any undetected hardware defects or bugs in our software;
- our ability to estimate future warranty obligations due to product failure rates;
- our ability to obtain necessary third-party technology licenses at reasonable costs;
- the regulatory and physical impacts of climate change and other natural events;
- the attraction and retention of qualified employees and key management personnel;

- our ability to build and sustain an adequate and secure information technology infrastructure; and
- our ability to maintain proper and effective internal controls.

Our gross margin may fluctuate over time, and our current level of gross margin may not be sustainable.

Our current level of gross margin may not be sustainable and may be adversely affected by numerous factors, including:

- changes in customer, geographic or product mix, including the mix of configurations within each product group;
- the pursuit or addition of new large customers;
- increased price competition, including the impact of customer discounts and rebates;
- the impact of current and future tariffs that may impact our products, including the U.S. tariffs on goods imported from China;
- our ability to reduce and control product costs;
- an increase in revenue mix toward services, which typically have lower margins;
- changes in component pricing;
- changes in contract manufacturer rates;
- charges incurred due to inventory holding periods if parts ordering does not correctly anticipate product demand;
- introduction of new products and new technologies, which may involve higher component costs;
- our ability to scale our services business in order to gain desired efficiencies;
- changes in shipment volume;
- changes in or increased reliance on distribution channels;
- potential liabilities associated with increased reliance on third-party vendors;
- increased expansion efforts into new or emerging markets;
- increased warranty costs;
- excess and obsolete inventory and inventory holding charges;
- expediting costs incurred to meet customer delivery requirements; and
- potential costs associated with contractual liquidated damages obligations.

Substantially all of the products we currently sell in the United States are manufactured in China. The imposition by the federal government of tariffs on goods imported from China has significantly increased the cost of our products manufactured in China and imported into the United States which may have a material adverse effect on our business, gross margins and results of operations.

Recently, the federal government imposed significant tariffs on goods imported from China in connection with China's intellectual property practices with proposed additional tariffs of \$200 billion or more covering a broader list of goods imported from China. Substantially all of the products that we sell in the United States are currently manufactured in China. Accordingly, we expect that these U.S. tariffs as currently implemented would have significant cost impact to us to the extent we are not able to mitigate the impact of the tariffs. Although we are actively working to modify our supply chain operations to avoid the impact of these tariffs, if we are not able to successfully modify our supply chain operations as planned, the tariffs could have a material adverse impact on our product margins, result of operations and cash flows. Furthermore, transition of global supply chain operations is complex, require significant resources and carry numerous risks of disruptions to the manufacture and supply of our products, delays in implementation of our transition plans and significant unanticipated costs, including exacerbation of the risks associated with our reliance upon third-party manufacturing and supply partners. Disruptions, delays or unanticipated costs associated with the supply of our products due to our transition efforts could impair our ability to meet customer requirements, result in cancellation of orders and harm our relationships with our customers, all of which could materially impact our revenues, gross margin and result of operations. Additional risks associated with our reliance upon third-party manufacturing and supply partners are described in the below risk factors captioned *"We utilize domestic and international third-party vendors to assist in the design, development and manufacture of certain of our products, and to provide logistics services in the distribution of our products. If these vendors fail to provide these services, we could incur additional costs and delays or lose revenue"* and *"If we fail to forecast our manufacturing requirements accurately or fail to properly manage our inventory with our contract manufacturers, we could incur additional costs, experience manufacturing delays and lose revenue."*

The imposition of any additional tariffs or trade restrictions that may be implemented by the United States or other countries in connection with a global trade war, could increase the cost of our products manufactured in China or other countries, which in turn could adversely affect the demand for these products and have a material adverse effect on our business, gross margins and results of operations.

Our business is dependent on the capital spending patterns of CSPs, and any decrease or delay in capital spending by CSPs in response to economic conditions, seasonality, uncertainties associated with the implementation of regulatory reform or otherwise would reduce our revenue and harm our business.

Demand for our products depends on the magnitude and timing of capital spending by CSPs as they construct, expand, upgrade and maintain their access networks. Any future economic downturn may cause a slowdown in telecommunications industry spending, including in the specific geographies and markets in which we operate. In response to reduced consumer spending, challenging capital markets or declining liquidity trends, capital spending for network infrastructure projects of CSPs could be delayed or canceled. In addition, capital spending is cyclical in our industry, sporadic among individual CSPs and can change on short notice. As a result, we may not have visibility into changes in spending behavior until nearly the end of a given quarter.

CSP spending on network construction, maintenance, expansion and upgrades is also affected by reductions in their budgets, delays in their purchasing cycles, access to external capital (such as government grants and loan programs or the capital markets) and seasonality and delays in capital allocation decisions. For example, our CSP customers tend to spend less in the first quarter as they are still finalizing their annual budgets and in certain regions customers are also challenged by winter weather conditions that inhibit outside fiber deployment, resulting in weaker demand for our products in the first quarter of our fiscal year. Also, softness in demand across any of our customer markets, including due to macro-economic conditions beyond our control or uncertainties associated with the implementation of regulatory reform, has in the past and could in the future lead to unexpected slowdown in capital expenditures by service providers.

Many factors affecting our results of operations are beyond our control, particularly in the case of large CSP orders and network infrastructure deployments involving multiple vendors and technologies where the achievement of certain thresholds for acceptance is subject to the readiness and performance of the CSP or other providers and changes in CSP requirements or installation plans. Further, CSPs may not pursue investment for our new platforms or infrastructure upgrades that require our access systems and software. Infrastructure improvements may be delayed or prevented by a variety of factors including cost, regulatory obstacles (including uncertainties associated with the implementation of regulatory reforms), mergers, lack of consumer demand for advanced communications services and alternative approaches to service delivery. Reductions in capital expenditures by CSPs, particularly CSPs that are significant customers, may have a material negative impact on our revenue and results of operations and slow our rate of revenue growth. As a consequence, our results for a particular period may be difficult to predict, and our prior results are not necessarily indicative of results in future periods.

Government-sponsored programs could impact the timing and buying patterns of CSPs, which may cause fluctuations in our operating results.

We sell to CSPs, which include U.S.-based IOCs, which have revenue that is particularly dependent upon interstate and intrastate access charges and federal and state subsidies. The FCC and some states may consider changes to such payments and subsidies, and these changes could reduce IOC revenue. Furthermore, many IOCs use or expect to use government-supported loan programs or grants, such as RUS loans and grants, to finance capital spending. Changes to these programs, including uncertainty from government and administrative change, could reduce the ability of IOCs to access capital and thus reduce our revenue opportunities.

Many of our customers were awarded grants or loans under government stimulus programs such as the Broadband Stimulus programs under the American Recovery and Reinvestment Act of 2009, or ARRA, and the funds distributed under the FCC's CAF program, and have purchased and will continue to purchase products from us or other suppliers while such programs and funding are available. However, customers may substantially curtail purchases as funding winds down or as planned purchases are completed.

In addition, any changes in government regulations and subsidies could cause our customers to change their purchasing decisions, which could have an adverse effect on our operating results and financial condition.

We face intense competition that could reduce our revenue and adversely affect our financial results.

The market for our products is highly competitive, and we expect competition from both established and new companies to increase. Our competitors include companies such as ADTRAN, Arris Group, Inc., Ciena Corporation, Cisco Systems Inc., Huawei Technologies Co. Ltd., Juniper Networks Inc., Nokia Corporation, ZTE Corporation and DASAN Zhong Solutions, Inc., among others.

Our ability to compete successfully depends on a number of factors, including:

- the successful development of new products;
- our ability to anticipate CSP and market requirements and changes in technology and industry standards;
- our ability to differentiate our products from our competitors' offerings based on performance, cost-effectiveness or other factors;

- our ongoing ability to successfully integrate acquired product lines and customer bases into our business;
- our ability to meet increased customer demand for professional services associated with network improvement projects;
- our ability to gain customer acceptance of our products; and
- our ability to market and sell our products.

The broadband access equipment market has undergone and continues to undergo consolidation, as participants have merged, made acquisitions or entered into partnerships or other strategic relationships with one another to offer more comprehensive solutions than they individually had offered. Examples include Arris' acquisition of Pace plc in January 2016; Nokia's acquisition of Alcatel-Lucent in January 2016; and the merger of DASAN Zhone Solutions with DASAN Network Solutions in September 2016. We expect this trend to continue as companies attempt to strengthen or maintain their market positions in an evolving industry.

Many of our current or potential competitors have longer operating histories, greater name recognition, larger customer bases and significantly greater financial, technical, sales, marketing and other resources than we do and are better positioned to acquire and offer complementary products and services. Many of our competitors have broader product lines and can offer bundled solutions, which may appeal to certain customers. Our competitors may also invest additional resources in developing more compelling product offerings. Potential customers may also prefer to purchase from their existing suppliers rather than a new supplier, regardless of product performance or features, because the products that we and our competitors offer require a substantial investment of time and funds to qualify and install.

Some of our competitors may offer substantial discounts or rebates to win new customers or to retain existing customers. If we are forced to reduce prices in order to secure customers, we may be unable to sustain gross margin at desired levels or achieve profitability. Competitive pressures could result in increased pricing pressure, reduced profit margin, increased sales and marketing expenses and failure to increase, or the loss of, market share, any of which could reduce our revenue and adversely affect our financial results.

An increase in revenue mix towards services will adversely affect our gross margin.

In recent years, there has been greater customer demand for certain professional and support services for our products, which usually have a lower gross margin than product purchases. In particular, we have experienced increased demand for professional services associated with network improvement projects, which typically are turnkey projects whereby we supply products and related professional services such as network planning, product installation, testing and network turn up. Revenue recognized from such professional services may be delayed because of the timing of completion and acceptance of a project or milestone, including third-party delays that may be outside our control. Additionally, if we are unable to meet project deadlines for professional and support services due to our suppliers' inability to meet our demands for components or for any other reasons, we will incur additional costs, including higher premiums to source necessary components, additional costs and expedited fees to meet project deadlines, all of which negatively impact our gross margin. We also rely upon third-party subcontractors to assist with some of our services projects, which generally result in higher costs and increased risk of cost overruns, including expenditures for costly rework, which also negatively impact our gross margin. Increases in professional services as a proportion of our revenue mix have resulted in lower overall gross margin and may continue to result in lower overall gross margin in future periods. This negative impact on gross margin is exacerbated in periods where we experience accelerated levels of activity and incur ramp up costs to meet project requirements and customer deadlines. Furthermore, we may not achieve the desired efficiencies and scale in our professional services business, which will have an adverse impact on our gross margin.

Product development is costly, and if we fail to develop new products or enhancements that meet changing CSP requirements, we could experience lower sales.

Our industry is characterized by rapid technological advances, frequent new product introductions, evolving industry standards and unanticipated changes in subscriber requirements. Our future success will depend significantly on our ability to anticipate and adapt to such changes, and to offer, on a timely and cost-effective basis, products and features that meet changing CSP demands and industry standards. We intend to continue to invest in developing new products and enhancing the functionality of our platforms, including to reach a broader set of customers. Developing our products is expensive and complex and involves uncertainties. We may not have sufficient resources to successfully manage lengthy product development cycles. Our research and development expenses were \$127.5 million, or 25% of our revenue, in 2017, \$106.9 million, or 23% of our revenue, in 2016 and \$89.7 million, or 22% of our revenue, in 2015. For the first nine months of 2018, our research and development expenses were \$68.7 million, or 21% of our revenue. We believe that we must continue to dedicate a significant amount of resources to our research and development efforts, including increased reliance on third-party development partners, to maintain our competitive position. These investments may take several years to generate positive returns, if ever. In addition, we may experience design, manufacturing, marketing and other difficulties that could delay or prevent the development,

introduction or marketing of new products and enhancements. If we fail to meet our development targets, demand for our products will decline.

In addition, the introduction of new or enhanced products also requires that we manage the transition from older products to these new or enhanced products in order to minimize disruption in customer ordering patterns, fulfill ongoing customer commitments and ensure that adequate supplies of new products are available for delivery to meet anticipated customer demand. If we fail to maintain compatibility with other software or equipment found in our customers' existing and planned networks, we may face substantially reduced demand for our products, which would reduce our revenue opportunities and market share. Moreover, as customers complete infrastructure deployments, they may require greater levels of service and support than we have provided in the past. We may not be able to provide products, services and support to compete effectively for these market opportunities. If we are unable to anticipate and develop new products or enhancements to our existing products on a timely and cost-effective basis, we could experience lower sales, which would harm our business.

Our new products are early in their life cycles and subject to uncertain market demand. If our customers are unwilling to install our new products or deploy our new services, or we are unable to achieve market acceptance of our new products, our business and financial results will be harmed.

Our new products are early in their life cycles and subject to uncertain market demand. They also may face obstacles in manufacturing, deployment and competitive response. Potential customers may choose not to invest the additional capital required for initial system deployment of new products. In addition, demand for new products is dependent on the success of our customers in deploying and selling advanced services to their subscribers. Our products support a variety of advanced broadband services, such as high-speed Internet, Internet protocol television, mobile broadband, high-definition video and online gaming. If subscriber demand for such services does not grow as expected or declines or our customers are unable or unwilling to deploy and market these services, demand for our products may decrease or fail to grow at rates we anticipate.

Our customer base is concentrated, and there are a limited number of potential customers for our products. The loss of any of our key customers, a decrease in purchases by our key customers or our inability to grow our customer base would adversely impact our revenue and results of operations and any delays in payment by a key customer could negatively impact our cash flows and working capital.

Historically, a large portion of our sales has been to a limited number of customers. For example, one customer accounted for 31% of our revenue in 2017, 21% of our revenue in 2016 and 22% of our revenue in 2015, and another customer accounted for 15% of our revenue in 2016. However, we cannot anticipate the level of purchases in the future by these customers. Customer purchases may be delayed or impacted due to financial difficulties, spending cuts or corporate consolidations. For example, one of our customers completed a large acquisition at the end of 2017, which continues to disrupt its normal expenditure plans, including continued delays and reduction in purchases of our products and services as it finalizes its transition activities and corporate strategies. We have experienced and expect to continue to experience delays or declines in purchases by certain CSPs due to deterioration and weakness in their financial condition. Any decrease or delay in purchases and/or capital expenditure plans of any of our key customers, or our inability to grow our sales with existing customers, may have a material negative impact on our revenue and results of operations.

We anticipate that a large portion of our revenue will continue to depend on sales to a limited number of customers. In addition, some larger customers may demand discounts and rebates or desire to purchase their access systems and software from multiple providers. As a result of these factors, our future revenue opportunities may be limited, our margins could be reduced and our profitability may be adversely impacted. The loss of, or reduction in, orders from any key customer would significantly reduce our revenue and harm our business. Furthermore, delays in payment and/or extended payment terms from any of our key or larger customers could have a material negative impact on our cash flows and working capital to support our business operations.

Furthermore, in recent years, the CSP market has undergone substantial consolidation. Industry consolidation generally has negative implications for equipment suppliers, including a reduction in the number of potential customers, a decrease in aggregate capital spending and greater pricing leverage on the part of CSPs over equipment suppliers. Continued consolidation of the CSP industry and among ILEC and IOC customers, who represent a large part of our business, could make it more difficult for us to grow our customer base, increase sales of our products and maintain adequate gross margin.

Our sales cycles can be long and unpredictable, and our sales efforts require considerable time and expense. As a result, our sales are difficult to predict and may vary substantially from quarter to quarter, which may cause our operating results to fluctuate significantly.

The timing of our revenue is difficult to predict. Our sales efforts often involve educating CSPs about the use and benefits of our products. CSPs typically undertake a significant evaluation process, which frequently involves not only our products but

also those of our competitors and results in a lengthy sales cycle. Sales cycles for larger customers are relatively longer and require considerably more time and expense. We spend substantial time, effort and money in our sales efforts without any assurance that our efforts will produce sales. In addition, product purchases are frequently subject to budget constraints, multiple approvals and unplanned administrative, processing and other delays. The timing of revenue related to sales of products and services that have installation requirements may be difficult to predict due to interdependencies that may be beyond our control, such as CSP testing and turn-up protocols or other vendors' products, services or installations of equipment upon which our products and services rely. In addition, larger projects may have longer periods between project commencement and completion and recognition of revenue. Such delays may result in fluctuations in our quarterly revenue. If sales expected from a specific customer for a particular quarter are not realized in that quarter or at all, we may not achieve our revenue forecasts and our financial results would be adversely affected.

Our focus on CSPs with relatively small networks limits our revenue from sales to any one customer and makes our future operating results difficult to predict.

A large portion of our sales efforts continue to be focused on CSPs with relatively small networks, cable MSOs and selected international CSPs. Our current and potential customers generally operate small networks with limited capital expenditure budgets. Accordingly, we believe the potential revenue from the sale of our products to any one of these customers is limited. As a result, we must identify and sell products to new customers each quarter to continue to increase our sales. In addition, the spending patterns of many of our customers are characterized by small and sporadic purchases. As a consequence, we have limited backlog and will likely continue to have limited visibility into future operating results.

We do not have long-term, committed-volume purchase contracts with our customers, and therefore have no guarantee of future revenue from any customer.

We typically have not entered into long-term, committed-volume purchase contracts with our customers, including our key customers which account for a material portion of our revenue. As a result, any of our customers may cease to purchase our products at any time. In addition, our customers may attempt to renegotiate terms of sale, including price and quantity. If any of our key customers stop purchasing our access platforms, systems and software for any reason, our business and results of operations would be harmed.

Our efforts to increase our sales to CSPs globally, including cable MSOs, may be unsuccessful.

Our sales and marketing efforts have been focused on CSPs in North America. Part of our long-term strategy is to increase sales to CSPs globally, including cable MSOs. We have devoted and continue to devote substantial technical, marketing and sales resources to the pursuit of these larger CSPs, who have lengthy equipment qualification and sales cycles, without any assurance of generating sales. In particular, sales to these larger CSPs may require us to upgrade our products to meet more stringent performance criteria and interoperability requirements, develop new customer-specific features or adapt our products to meet international standards. If we are unable to successfully increase our sales to larger CSPs, our operating results, financial condition, cash flows and long-term growth may be negatively impacted.

We are exposed to the credit risks of our customers; if we have inadequately assessed their creditworthiness, we may have more exposure to accounts receivable risk than we anticipate. Failure to collect our accounts receivable in amounts that we anticipate could adversely affect our operating results and financial condition.

In the course of our sales to customers, we may encounter difficulty collecting accounts receivable and could be exposed to risks associated with uncollectible accounts receivable. We maintain an allowance for doubtful accounts for estimated losses resulting from the inability or unwillingness of our customers to make required payments. However, these allowances are based on our judgment and a variety of factors and assumptions.

We perform credit evaluations of our customers' financial condition. However, our evaluation of the creditworthiness of customers may not be accurate if they do not provide us with timely and accurate financial information, or if their situations change after we evaluate their credit. While we attempt to monitor these situations carefully, adjust our allowances for doubtful accounts as appropriate and take measures to collect accounts receivable balances, we have written down accounts receivable and written off doubtful accounts in prior periods and may be unable to avoid additional write-downs or write-offs of doubtful accounts in the future. Such write-downs or write-offs could negatively affect our operating results for the period in which they occur, and could harm our financial condition.

Our products must interoperate with many software applications and hardware products found in our customers' networks. If we are unable to ensure that our products interoperate properly, our business will be harmed.

Our products must interoperate with our customers' existing and planned networks, which often have varied and complex specifications, utilize multiple protocol standards, include software applications and products from multiple vendors and contain multiple generations of products that have been added over time. As a result, we must continually ensure that our products interoperate properly with these existing and planned networks. To meet these requirements, we must undertake development efforts that require substantial capital investment and employee resources. We may not accomplish these development goals quickly or cost-effectively, if at all. If we fail to maintain compatibility with other software or equipment found in our customers' existing and planned networks, we may face substantially reduced demand for our products, which would reduce our revenue opportunities and market share.

We have entered into interoperability arrangements with a number of equipment and software vendors for the use or integration of their technology with our products. These arrangements give us access to and enable interoperability with various products that we do not otherwise offer. If these relationships fail, we may have to devote substantially more resources to the development of alternative products and processes and our efforts may not be as effective as the combined solutions under our current arrangements. In some cases, these other vendors are either companies that we compete with directly or companies that have extensive relationships with our existing and potential customers and may have influence over the purchasing decisions of those customers. Some of our competitors have stronger relationships with some of our existing and other potential interoperability partners, and as a result, our ability to have successful interoperability arrangements with these companies may be harmed. Our failure to establish or maintain key relationships with third-party equipment and software vendors may harm our ability to successfully sell and market our products.

The quality of our support and services offerings is important to our customers, and if we fail to continue to offer high quality support and services, we could lose customers, which would harm our business.

Once our products are deployed within our customers' networks, they depend on our support organization to resolve any issues relating to those products. A high level of support is critical for the successful marketing and sale of our products. Furthermore, our services to customers have increasingly broadened to include network design and services to deploy our products within our customers' networks, such as our professional services associated with turnkey network improvement projects for our customers. If we do not effectively assist our customers in deploying our products, succeed in helping them quickly resolve post-deployment issues or provide effective ongoing support, it could adversely affect our ability to sell our products to existing customers and harm our reputation with potential new customers. As a result, our failure to maintain high quality support and services could result in the loss of customers, which would harm our business.

Our products are highly technical and may contain undetected hardware defects or software bugs, which could harm our reputation and adversely affect our business.

Our products are highly technical and, when deployed, are critical to the operation of many networks. Our products have contained and may contain undetected defects, bugs or security vulnerabilities. Some defects in our products may only be discovered after a product has been installed and used by customers and may in some cases only be detected under certain circumstances or after extended use. Any errors, bugs, defects or security vulnerabilities discovered in our products after commercial release could result in loss of revenue or delay in revenue recognition, loss of customers and increased service and warranty and retrofit costs, any of which could adversely affect our business, operating results and financial condition. In addition, we could face claims for product liability, tort or breach of warranty. Our contracts with customers contain provisions relating to warranty disclaimers and liability limitations, which may not be upheld. Defending a lawsuit, regardless of its merit, is costly and may divert management's attention and adversely affect the market's perception of us and our products. In addition, if our business liability insurance coverage proves inadequate or future coverage is unavailable on acceptable terms or at all, our business, operating results and financial condition could be adversely impacted.

Privacy concerns relating to our products and services could affect our business practices, damage our reputation and deter customers from purchasing our products and services.

Government and regulatory authorities in the United States and around the world have implemented and are continuing to implement laws and regulations concerning data protection. For example, in July 2016, the European Commission adopted the EU-U.S. Privacy Shield to replace Safe Harbor as a compliance mechanism for the transfer of personal data from the European Union to the United States. In addition, the General Data Protection Regulation adopted by the EU Parliament became effective in May 2018 to harmonize data privacy laws across Europe. Among other requirements, the GDPR imposes specific duties and requirements upon companies that collect, process or control personal data of EU residents. Although we currently do not have material operations or business in the EU, the GDPR regulations could cause us to incur substantial costs in order to expand our business or deliver certain services in the EU. Furthermore, the GDPR imposes penalties for noncompliance of up to the

greater of €20 million or 4% of a company's worldwide revenue; accordingly, any non-compliance with the GDPR could result in a material adverse effect on our business, financial condition and results of operations. The interpretation and application of these data protection laws and regulations are often uncertain and in flux, and it is possible that they may be interpreted and applied in a manner that is inconsistent with our data practices. Complying with these various laws could cause us to incur substantial costs or require us to change our business practices in a manner adverse to our business.

Concerns about or regulatory actions involving our practices with regard to the collection, use, disclosure, or security of customer information or other privacy related matters, even if unfounded, could damage our reputation and adversely affect operating results. While we strive to comply with all data protection laws and regulations, the failure or perceived failure to comply may result in inquiries and other proceedings or actions against us by government entities or others, or could cause us to lose customers, which could potentially have an adverse effect on our business.

We are subject to cybersecurity and privacy risks.

Our information systems and data centers (including third-party data centers) contain sensitive information that help us operate our business efficiently, interface with and provide software solutions to customers, maintain financial accuracy and accurately produce our financial statements. In addition, we host sensitive data in data centers, including subscriber data, in the course of providing services and solutions to customers. Malicious hackers may attempt to gain access to our network or data centers; steal proprietary information related to our business, products, employees, and customers; or interrupt our systems and services or those of our customers or others. The theft, loss, or misuse of personal data collected, used, stored or transferred by us to run our business could result in significantly increased security and remediation costs or costs related to defending legal claims. If we do not allocate and effectively manage the resources necessary to build and sustain the proper technology infrastructure, we could be subject to cyberattacks, transaction errors, processing inefficiencies, the loss of customers, business disruptions or the loss of or damage to intellectual property through security breaches. If our data management systems, including those of our third-party data centers, do not effectively and securely collect, store, process and report relevant data for the operation of our business, whether due to cyberattacks, equipment malfunction or constraints, software deficiencies or human error, our ability to effectively plan, forecast and execute our business plan and comply with laws and regulations will be impaired, perhaps materially. Any such impairment could materially and adversely affect our financial condition, results of operations, cash flows, the timeliness with which we internally and externally report our operating results and our business and reputation.

While we have applied multiple layers of security to control access to our information technology systems and use encryption and authentication technologies to secure the transmission and storage of data, these security measures may be compromised as a result of third-party security breaches, employee error, malfeasance, faulty password management or other irregularity, and result in persons obtaining unauthorized access to our data or accounts. Third parties may attempt to fraudulently induce employees into disclosing user names, passwords or other sensitive information, which may in turn be used to access our information technology systems.

While we seek to apply best practice policies and devote significant resources to network security, data encryption and other security measures to protect our information technology and communications systems and data, these security measures cannot provide absolute security. We or our third-party hosting providers may experience a system breach and be unable to protect sensitive data. The costs to us to eliminate or alleviate network security problems, bugs, viruses, worms, malicious software programs and security vulnerabilities could be significant, and our efforts to address these problems may not be successful and could result in unexpected interruptions, delays and cessation of service which may harm our business operations.

Although our systems have been designed around industry-standard architectures to reduce downtime in the event of outages or catastrophic occurrences, they remain vulnerable to damage or interruption from earthquakes, floods, fires, power loss, telecommunication failures, terrorist attacks, cyberattacks, viruses, denial-of-service attacks, human error, hardware or software defects or malfunctions, and similar events or disruptions. Some of our systems are not fully redundant, and our disaster recovery planning is not sufficient for all eventualities. Our systems are also subject to break-ins, sabotage and intentional acts of vandalism. Despite any precautions we may take, the occurrence of a natural disaster, a decision by any of our third-party hosting providers to close a facility we use without adequate notice for financial or other reasons, a data breach or other unanticipated problems at our hosting facilities could cause system interruptions and delays which may result in loss of critical data and lengthy interruptions in our services.

Our estimates regarding future warranty or product obligations may change due to product failure rates, shipment volumes, field service obligations and rework costs incurred in correcting product failures. If our estimates change, the liability for warranty or product obligations may be increased, impacting future cost of revenue.

Our products are highly complex, and our product development, manufacturing and integration testing may not be adequate to detect all defects, errors, failures and quality issues. Quality or performance problems for products covered under warranty could adversely impact our reputation and negatively affect our operating results and financial position. The development and

production of new products with high complexity often involves problems with software, components and manufacturing methods. If significant warranty or other product obligations arise due to reliability or quality issues arising from defects in software, faulty components or improper manufacturing methods, our operating results and financial position could be negatively impacted by:

- cost associated with fixing software or hardware defects;
- high service and warranty expenses;
- high inventory obsolescence expense;
- delays in collecting accounts receivable;
- payment of liquidated damages for performance failures; and
- declining sales to existing customers.

We do not have manufacturing capabilities, and therefore we depend upon a small number of outside contract manufacturers and original design manufacturers (“ODMs”). We do not have supply contracts with all of these contract manufacturers and ODMs. Consequently, our operations could be disrupted if we encounter problems with any of these contract manufacturers or ODMs.

We do not have internal manufacturing capabilities and rely upon a small number of contract manufacturers and ODMs to build our products. In particular, we rely on Flex for the manufacture of most of our products. Our reliance on a small number of contract manufacturers and ODMs makes us vulnerable to possible capacity constraints and reduced control over component availability, delivery schedules, manufacturing yields and costs.

We do not have supply contracts with some of our contract manufacturers and ODMs. Consequently, these contract manufacturers are not obligated to supply products to us for any specific period, in any specific quantity or at any certain price. In addition, we are dependent upon our contract manufacturers’ and ODMs’ quality systems and controls and the adherence of such systems and controls to applicable standards. If our contract manufacturers and ODMs fail to maintain levels of quality manufacture suitable for us or our customers, we may incur higher costs and our relationships with our customers may be harmed.

The revenue that Flex and other contract manufacturers generate from our orders represent a relatively small percentage of those manufacturers’ overall revenue. As a result, fulfilling our orders may not be considered a priority if such manufacturers are constrained in their ability to fulfill all of their customer obligations in a timely manner. In addition, a substantial part of our manufacturing is done in our contract manufacturer and ODM facilities that are located outside of the United States, including Flex’s facilities. We believe that the location of these facilities outside of the United States increases supply risk, including the risk of supply interruptions or reductions in manufacturing quality or controls. Moreover, regulatory changes or government actions relating to export or import regulations, economic sanctions or related legislation, or the possibility of such changes or actions, may create uncertainty or result in changes to or disruption in our operations with our contract manufacturers.

If Flex or any of our other contract manufacturers or ODMs were unable or unwilling to continue manufacturing our products in required volumes and at high quality levels, we would have to identify, qualify and select acceptable alternative contract manufacturers. An alternative contract manufacturer may not be available to us when needed or may not be in a position to satisfy our production requirements at commercially reasonable prices and quality. Any significant interruption in manufacturing would require us to reduce our supply of products to our customers, which in turn would reduce our revenue and harm our relationships with our customers.

We and our business partners, including our contract manufacturers and suppliers, depend on sole-source, single-source and limited-source suppliers for some key components. If we and our business partners are unable to source these components on a timely or cost-effective basis, we will not be able to deliver our products to our customers.

We and our business partners, including our contract manufacturers and suppliers, depend on sole-source, single-source and limited-source suppliers for some key components of our products. For example, certain of our application-specific integrated circuit processors and resistor networks are purchased from sole-source suppliers.

Any of the sole-source, single-source and limited-source suppliers upon whom we or our business partners rely could stop producing our components, cease operations, or enter into exclusive arrangements with our competitors. We may also experience shortages or delay of critical components as a result of growing demand in the industry or other sectors. For example, growth in electronic and IoT devices, wireless products, automotive electronics and artificial intelligence all drive increased demand for certain components, such as chipsets and memory products, which may result in lower availability and increased prices for such components. The cost of components may also be impacted by regulatory requirements.

In addition, purchase volumes of such components may be too low for Calix to be considered a priority customer by these suppliers, and we may not be able to negotiate commercially reasonable terms for our business needs. As a result, these suppliers could stop selling to us and our business partners at commercially reasonable prices, or at all. Any such interruption or

delay may force us and our business partners to seek similar components from alternative sources, which may not be available, or result in higher than anticipated prices for such components. Switching suppliers could also require that we redesign our products to accommodate new components, and could require us to re-qualify our products with our customers, which would be costly and time-consuming. Any interruption in the supply of sole-source, single-source or limited-source components for our products would adversely affect our ability to meet scheduled product deliveries to our customers, could result in lost revenue or higher expenses and would harm our business.

We utilize domestic and international third-party vendors to assist in the design, development and manufacture of certain of our products, and to provide logistics services in the distribution of our products. If these vendors fail to provide these services, we could incur additional costs and delays or lose revenue.

From time to time we enter into ODM, original equipment manufacturer, or OEM, and development agreements for the design, development and/or manufacture of certain of our products in order to enable us to offer products on an accelerated basis. For example, a third party assisted in the design and currently manufactures portions of our E-Series systems and nodes family. We also rely upon limited third party vendors for logistics services to distribute our products. If any of these third-party vendors stop providing their services, for any reason, we would have to obtain similar services from alternative sources, which may not be available on commercially reasonable terms, if at all. We also have limited control over disruptions that may occur at the facilities of these third-party partners, such as supply interruptions or manufacturing quality that may occur at ODM and OEM facilities and strikes or systems failures that may interrupt transportation and logistics services. In addition, switching development firms or manufacturers could require us to extend our development timeline and/or re-qualify our products with our customers, which would also be costly and time-consuming. Any interruption in the development, supply or distribution of our products would adversely affect our ability to meet scheduled product deliveries to our customers and could result in lost revenue or higher costs, which would negatively impact our margins and operating results and harm our business.

If we fail to forecast our manufacturing requirements accurately or fail to properly manage our inventory with our contract manufacturers, we could incur additional costs, experience manufacturing delays and lose revenue.

We bear inventory risk under our contract manufacturing arrangements and our ODM and OEM agreements. Lead times for the materials and components that we order through our manufacturers vary significantly and depend on numerous factors, including the specific supplier, contract terms and market demand for a component at a given time. Lead times for certain key materials and components incorporated into our products are currently lengthy, requiring our manufacturers to order materials and components several months in advance of manufacture.

If we overestimate our production requirements, our manufacturers may purchase excess components and build excess inventory. If our manufacturers, at our request, purchase excess components that are unique to our products or build excess products, we could be required to pay for these excess parts or products and their storage costs. Historically, we have reimbursed our primary contract manufacturers for a portion of inventory purchases when our inventory has been rendered excess or obsolete. Examples of when inventory may be rendered excess or obsolete include manufacturing and engineering change orders resulting from design changes or in cases where inventory levels greatly exceed projected demand. If we incur payments to our manufacturers associated with excess or obsolete inventory, this may have an adverse effect on our gross margins, financial condition and results of operations.

We have experienced unanticipated increases in demand from customers, which resulted in delayed shipments and variable shipping patterns. If we underestimate our product requirements, our manufacturers may have inadequate component inventory, which could interrupt manufacturing of our products, increase our cost of product revenue associated with expedite fees and air freight and/or result in delays or cancellation of sales.

As the market for our products evolves, changing customer requirements may adversely affect the valuation of our inventory.

Customer demand for our products can change rapidly in response to market and technology developments. Demand can be affected not only by customer- or market-specific issues, but also by broader economic and/or geopolitical factors. We may, from time to time, adjust inventory valuations downward in response to our assessment of demand from our customers for specific products or product lines. The related excess inventory charges may have an adverse effect on our gross margin, financial condition and results of operations.

If we fail to comply with evolving industry standards, sales of our existing and future products would be adversely affected.

The markets for our products are characterized by a significant number of standards, both domestic and international, which are evolving as new technologies are developed and deployed. As we expand into adjacent markets and increase our international footprint, we are likely to encounter additional standards. Our products must comply with these standards in order to be widely

marketable. In some cases, we are compelled to obtain certifications or authorizations before our products can be introduced, marketed or sold in new markets or to customers that we have not historically served. For example, our ability to maintain Operations System Modification for Intelligent Network Elements certification for our products will affect our ongoing ability to continue to sell our products to Tier 1 CSPs.

In addition, our ability to expand our international operations and create international market demand for our products may be limited by regulations or standards adopted by other countries that may require us to redesign our existing products or develop new products suitable for sale in those countries. Although we believe our products are currently in compliance with domestic and international standards and regulations in countries in which we currently sell, we may not be able to design our products to comply with evolving standards and regulations in the future. This ongoing evolution of standards may directly affect our ability to market or sell our products. Further, the cost of complying with the evolving standards and regulations or the failure to obtain timely domestic or foreign regulatory approvals or certification could prevent us from selling our products where these standards or regulations apply, which would result in lower revenue and lost market share.

We may be unable to successfully expand our international operations. In addition, we may be subject to a variety of international risks that could harm our business.

We currently generate most of our sales from customers in North America and have more limited experience marketing, selling and supporting our products and services outside North America or managing the administrative aspects of a worldwide operation. Our ability to expand our international operations is dependent on our ability to create or maintain international market demand for our products. In addition, as we expand our operations internationally, our support organization will face additional challenges including those associated with delivering support, training and documentation in languages other than English. If we invest substantial time and resources to expand our international operations and are unable to do so successfully and in a timely manner, our business, financial condition and results of operations may suffer.

In the course of expanding our international operations and operating overseas, we will be subject to a variety of risks, including:

- differing regulatory requirements, including tax laws, trade laws, data privacy laws, labor regulations, tariffs, export quotas, custom duties or other trade restrictions;
- liability or damage to our reputation resulting from corruption or unethical business practices in some countries;
- exposure to effects of fluctuations in currency exchange rates if, over time, international customer contracts are increasingly denominated in local currencies;
- longer collection periods and difficulties in collecting accounts receivable;
- greater difficulty supporting and localizing our products;
- different or unique competitive pressures as a result of, among other things, the presence of local equipment suppliers;
- challenges inherent in efficiently managing an increased number of employees over large geographic distances, including the need to implement appropriate systems, policies and compensation, benefits and compliance programs;
- limited or unfavorable intellectual property protection;
- risk of change in international political or economic conditions, terrorist attacks or acts of war; and
- restrictions on the repatriation of earnings.

We engage resellers to promote, sell, install and support our products to some customers in North America and internationally. Their failure to do so or our inability to recruit or retain appropriate resellers may reduce our sales and thus harm our business.

We engage some value-added resellers, or VARs, who provide sales and support services for our products. We compete with other telecommunications systems providers for our VARs' business and many of our VARs are free to market competing products. Our use of VARs and other third-party support partners and the associated risks of doing so are likely to increase as we expand sales outside of North America. If a VAR promotes a competitor's products to the detriment of our products or otherwise fails to market our products and services effectively, we could lose market share. In addition, the loss of a key VAR or the failure of VARs to provide adequate customer service could have a negative effect on customer satisfaction and could cause harm to our business. If we do not properly recruit and train VARs to sell, install and service our products, our business, financial condition and results of operations may suffer.

The results of the United Kingdom's referendum on withdrawal from the European Union may have a negative effect on global economic conditions, financial markets and our business.

In June 2016, a majority of voters in the United Kingdom elected to withdraw from the European Union in a national referendum, commonly referred to as Brexit. In March 2017, the United Kingdom began the process to exit the European Union, with the terms of the withdrawal subject to a negotiation period that could last at least two years. The referendum has

created significant uncertainty about the future relationship between the United Kingdom and the European Union, including with respect to the laws and regulations that will apply as the United Kingdom determines which European Union laws to replace or replicate in the event of a withdrawal. The referendum has also given rise to calls for the governments of other European Union member states to consider withdrawal. These developments, or the perception that any of them could occur, have had and may continue to have a material adverse effect on global economic conditions and the stability of global financial markets, and may significantly reduce global market liquidity and restrict the ability of key market participants to operate in certain financial markets. Any of these factors could depress economic activity and restrict our access to capital, or the access to capital of our customers or partners, which could have a material adverse effect on our operations in the United Kingdom, and generally on our business, financial condition and results of operations and reduce the price of our securities.

We may have difficulty evolving and scaling our business and operations to meet customer and market demand, which could result in lower profitability or cause us to fail to execute on our business strategies.

In order to grow our business, we will need to continually evolve and scale our business and operations to meet customer and market demand. Evolving and scaling our business and operations places increased demands on our management as well as our financial and operational resources to effectively:

- manage organizational change;
- manage a larger organization;
- accelerate and/or refocus research and development activities;
- expand our manufacturing, supply chain and distribution capacity;
- increase our sales and marketing efforts;
- broaden our customer-support and services capabilities;
- maintain or increase operational efficiencies;
- scale support operations in a cost-effective manner;
- implement appropriate operational and financial systems; and
- maintain effective financial disclosure controls and procedures.

If we cannot evolve and scale our business and operations effectively, we may not be able to execute our business strategies in a cost-effective manner and our business, financial condition, profitability and results of operations could be adversely affected.

We may not be able to protect our intellectual property, which could impair our ability to compete effectively.

We depend on certain proprietary technology for our success and ability to compete. We rely on intellectual property laws as well as nondisclosure agreements, licensing arrangements and confidentiality provisions to establish and protect our proprietary rights. U.S. patent, copyright and trade secret laws afford us only limited protection, and the laws of some foreign countries do not protect proprietary rights to the same extent. Our pending patent applications may not result in issued patents, and our issued patents may not be enforceable. Any infringement of our proprietary rights could result in significant litigation costs. Further, any failure by us to adequately protect our proprietary rights could result in our competitors offering similar products, resulting in the loss of our competitive advantage and decreased sales.

Despite our efforts to protect our proprietary rights, attempts may be made to copy or reverse engineer aspects of our products or to obtain and use information that we regard as proprietary. Accordingly, we may be unable to protect our proprietary rights against unauthorized third-party copying or use. Furthermore, policing the unauthorized use of our intellectual property is difficult and costly. Litigation may be necessary in the future to enforce our intellectual property rights, to protect our trade secrets or to determine the validity and scope of the proprietary rights of others. Litigation could result in substantial costs, diversion of resources and harm to our business.

We could become subject to litigation regarding intellectual property rights that could harm our business.

We may be subject to intellectual property infringement claims that are costly to defend and could limit our ability to use some technologies in the future. Third parties may assert patent, copyright, trademark or other intellectual property rights to technologies or rights that are important to our business. Such claims may originate from non-practicing entities, patent holding companies or other adverse patent owners who have no relevant product revenue, and therefore, our own issued and pending patents may provide little or no deterrence to suit from these entities.

We have received in the past and expect that in the future we may receive communications from competitors and other companies alleging that we may be infringing their patents, trade secrets or other intellectual property rights; offering licenses to such intellectual property; threatening litigation or requiring us to act as a third-party witness in litigation. In addition, we have agreed, and may in the future agree, to indemnify our customers for expenses or liabilities resulting from certain claimed infringements of patents, trademarks or copyrights of third parties. Such indemnification may require us to be financially responsible for claims made against our customers, including costs of litigation and damages awarded, which could negatively

impact our results of operations. Any claims asserting that our products infringe the proprietary rights of third parties, with or without merit, could be time-consuming, result in costly litigation and divert the efforts of our engineering teams and management. These claims could also result in product shipment delays or require us to modify our products or enter into royalty or licensing agreements. Such royalty or licensing agreements, if required, may not be available to us on acceptable terms, if at all.

Our use of open source software could impose limitations on our ability to commercialize our products.

We incorporate open source software into our products. Although we closely monitor our use of open source software, the terms of many open source software licenses have not been interpreted by the 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 sell our products. In such event, we could be required to make our proprietary software generally available to third parties, including competitors, at no cost, 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 or at all, any of which could adversely affect our revenue and operating expenses.

If we are unable to obtain necessary third-party technology licenses, our ability to develop new products or product enhancements may be impaired.

While our current licenses of third-party technology generally relate to commercially available off-the-shelf technology, we may from time to time be required to license additional technology from third parties to develop new products or product enhancements. These third-party licenses may be unavailable to us on commercially reasonable terms, if at all. Our inability to obtain necessary third-party licenses may force us to obtain substitute technology of lower quality or performance standards or at greater cost, or may increase the time-to-market of our products or product enhancements, any of which could harm the competitiveness of our products and result in lost revenue.

Our ability to incur debt and the use of our funds could be limited by borrowing base restrictions and restrictive covenants in our loan and security agreement for our revolving credit facility.

The Loan Agreement we entered into in August 2017 with SVB provides for a revolving credit facility based on a customary accounts receivable borrowing base, subject to certain exceptions and exclusions, such that borrowings available to us are limited by eligible accounts receivable (as defined in the Loan Agreement). We are dependent on our existing cash, cash equivalents and borrowings available under our Loan Agreement to provide adequate funds for ongoing operations, planned capital expenditures and working capital requirements for at least the next twelve months. If our financial position deteriorates, our borrowing capacity under the credit facility may be reduced, which would adversely impact our business and growth. In addition, the Loan Agreement includes affirmative and negative covenants and requires that we maintain a specified minimum liquidity ratio and maintenance of Adjusted EBITDA (as defined in the Loan Agreement, as amended). The negative covenants also include, among others, restrictions on our and our subsidiaries' transferring collateral, making changes to the nature of our business or the business of the applicable subsidiary, incurring additional indebtedness, engaging in mergers or acquisitions, paying dividends or making other distributions, making investments, engaging in transactions with affiliates, making payments in respect of subordinated debt, creating liens and selling assets, in each case subject to certain exceptions. Failure to maintain these restrictive covenants and requirements can limit the amount of borrowings that are available to us, increase the cost of borrowings under the facility, and/or require us to make immediate payments to reduce borrowings. For the month ended November 30, 2017, we were not able to maintain the minimum AQR at the level required in the Loan Agreement, which constituted an event of default. Although SVB waived this event of default effective as of November 30, 2017 and, therefore, this default did not terminate our ability to borrow under the Loan Agreement, we were required to pay an amendment fee and amend certain covenants under the Loan Agreement and, in February 2018, we entered into an amendment to the Loan Agreement that, among other things, amended certain affirmative financial covenants, including reductions to the required minimum level of the AQR and the inclusion of an additional financial covenant related to the maintenance of Adjusted EBITDA. In August 2018, we entered into a Second Amendment to the Loan Agreement to, among other things, provide for the extension of the maturity date of the senior secured revolving credit facility to August 7, 2020 and further amend certain financial covenants, including covenants with respect to the AQR and the Adjusted EBITDA. Although we were compliant with the financial covenants under the Loan Agreement at September 29, 2018, we have in the past been unable to meet the AQR level required in the Loan Agreement. Given our current financial position and history of operating losses, it is possible that we may fail to meet the minimum levels required by the financial covenants in a future period. In particular, if we are unable to generate positive cash flows on a continued basis, we could fall below the minimum AQR requirement, which would constitute an event of default under the Loan Agreement. Events beyond our control could have a material adverse impact on our results of operations, financial condition or liquidity, in which case we may not be able to meet our financial covenants. The Loan Agreement covenants may also affect our ability to obtain future financing and to pursue attractive business opportunities and our flexibility in planning for, and reacting to, changes in business conditions. These covenants could place us at a disadvantage

compared to some of our competitors, who may have fewer restrictive covenants and may not be required to operate under these restrictions.

Our failure or the failure of our manufacturers to comply with environmental and other legal regulations could adversely impact our results of operations.

The manufacture, assembly and testing of our products may require the use of hazardous materials that are subject to environmental, health and safety regulations, or materials subject to laws restricting the use of conflict minerals. Our failure or the failure of our contract manufacturers, ODMs and OEMs to comply with any of these requirements could result in regulatory penalties, legal claims or disruption of production. In addition, our failure or the failure of our manufacturers to properly manage the use, transportation, emission, discharge, storage, recycling or disposal of hazardous materials could subject us to increased costs or liabilities. Existing and future environmental regulations and other legal requirements may restrict our use of certain materials to manufacture, assemble and test products. Any of these consequences could adversely impact our results of operations by increasing our expenses and/or requiring us to alter our manufacturing processes.

Regulatory and physical impacts of climate change and other natural events may affect our customers and our contract manufacturers, resulting in adverse effects on our operating results.

As emissions of greenhouse gases continue to alter the composition of the atmosphere, affecting large-scale weather patterns and the global climate, any new regulation of greenhouse gas emissions may result in additional costs to our customers and our contract manufacturers. In addition, the physical impacts of climate change and other natural events, including changes in weather patterns, drought, rising ocean and temperature levels, earthquakes and tsunamis may impact our customers, suppliers and contract manufacturers, and our operations. These potential physical effects may adversely affect our revenue, costs, production and delivery schedules, and cause harm to our results of operations and financial condition.

We have in the past pursued, and may in the future continue to pursue, acquisitions which involve a number of risks and uncertainties. If we are unable to address and resolve these risks and uncertainties successfully, such acquisitions could disrupt our business and result in higher costs than we anticipate.

We acquired Occam in 2011 and Ericsson's fiber access assets in 2012. We may in the future acquire other businesses, products or technologies to expand our product offerings and capabilities, customer base and business. We have evaluated and expect to continue to evaluate a wide array of potential strategic transactions. We have limited experience making such acquisitions or integrating these businesses after such acquisitions. Unanticipated costs to us from these historical transactions as well as both anticipated and unanticipated costs to us related to any future transactions could exceed amounts that are covered by insurance and could have a material adverse impact on our financial condition and results of operations. For example, the Occam acquisition resulted in litigation with defense costs that were in excess of available directors and officers liability insurance coverage, including costs for which coverage was denied by our insurance carriers. In addition, the anticipated benefit of any acquisitions may never materialize or the process of integrating acquired businesses, products or technologies may create unforeseen operating difficulties and expenditures.

Some of the areas where we have experienced and may in the future experience acquisition-related risks include:

- expenses and distractions, including diversion of management time related to litigation;
- expenses and distractions related to potential claims resulting from any possible future acquisitions, whether or not they are completed;
- retaining and integrating employees from acquired businesses;
- issuance of dilutive equity securities or incurrence of debt;
- integrating various accounting, management, information, human resource and other systems to permit effective management;
- incurring possible write-offs, impairment charges, contingent liabilities, amortization expense of intangible assets or impairment of goodwill and intangible assets with finite useful lives;
- difficulties integrating and supporting acquired products or technologies;
- unexpected capital expenditure requirements;
- insufficient revenue to offset increased expenses associated with acquisitions; and
- opportunity costs associated with committing capital to such acquisitions.

If our goodwill becomes impaired, we may be required to record a significant charge to our results of operations. We review our goodwill for impairment annually or when events or changes in circumstances indicate the carrying value may not be recoverable, such as a sustained or significant decline in stock price and market capitalization. If the carrying value of goodwill was deemed to be impaired, an impairment loss equal to the amount by which the carrying amount exceeds the estimated fair value would be recognized. Any such impairment could materially and adversely affect our financial condition and results of operations.

Foreign acquisitions would involve risks in addition to those mentioned above, including those related to integration of operations across different cultures and languages, currency risks and the particular economic, political and regulatory risks associated with specific countries. We may not be able to address these risks and uncertainties successfully, or at all, without incurring significant costs, delays or other operating problems.

Our inability to address or anticipate any of these risks and uncertainties could disrupt our business and could have a material impact on our financial condition and results of operations.

Our use of and reliance upon development resources in China may expose us to unanticipated costs or liabilities.

We operate a wholly foreign owned enterprise in Nanjing, China, where a dedicated team of engineers performs product development, quality assurance, cost reduction and other engineering work. We also outsource a portion of our software development to a team of software engineers based in Shenyang, China. Our reliance upon development resources in China may not enable us to achieve meaningful product cost reductions or greater resource efficiency. Further, our development efforts and other operations in China involve significant risks, including:

- difficulty hiring and retaining appropriate engineering resources due to intense competition for such resources and resulting wage inflation;
- the knowledge transfer related to our technology and exposure to misappropriation of intellectual property or confidential information, including information that is proprietary to us, our customers and third parties;
- heightened exposure to changes in the economic, security and political conditions of China;
- fluctuation in currency exchange rates and tax risks associated with international operations;
- development efforts that do not meet our requirements because of language, cultural or other differences associated with international operations, resulting in errors or delays; and
- uncertainty with regards to tariffs imposed by the federal government on products imported from China and future actions the federal government may take with respect to international trade agreements and U.S. tax provisions related to international commerce that could adversely affect our international operations.

Difficulties resulting from the factors above and other risks related to our operations in China could expose us to increased expense, impair our development efforts, harm our competitive position and damage our reputation.

Our customers are subject to government regulation, and changes in current or future laws or regulations that negatively impact our customers could harm our business.

The FCC has jurisdiction over all of our U.S. customers. FCC regulatory policies that create disincentives for investment in access network infrastructure or impact the competitive environment in which our customers operate may harm our business. For example, future FCC regulation affecting providers of broadband Internet access services could impede the penetration of our customers into certain markets or affect the prices they may charge in such markets. Similarly, changes to regulatory tariff requirements or other regulations relating to pricing or terms of carriage on communication networks could slow the development or expansion of network infrastructures. Consequently, such changes could adversely affect the sale of our products and services. Furthermore, many of our customers are subject to FCC rate regulation of interstate telecommunications services and are recipients of CAF capital incentive payments, which are intended to subsidize broadband and telecommunications services in areas that are expensive to serve. Changes to these programs, rules and regulations that could affect the ability of IOCs to access capital, and which could in turn reduce our revenue opportunities, remain possible.

In addition, many of our customers are subject to state regulation of intrastate telecommunications services, including rates for such services, and may also receive funding from state universal service funds. Changes in rate regulations or universal service funding rules, either at the U.S. federal or state level, could adversely affect our customers' revenue and capital spending plans. Moreover, various international regulatory bodies have jurisdiction over certain of our non-U.S. customers. Changes in these domestic and international standards, laws and regulations, or judgments in favor of plaintiffs in lawsuits against CSPs based on changed standards, laws and regulations could adversely affect the development of broadband networks and services. This, in turn, could directly or indirectly adversely impact the communications industry in which our customers operate.

Many jurisdictions, including international governments and regulators, are also evaluating, implementing and enforcing regulations relating to cyber security, privacy and data protection, which can affect the market and requirements for networking and communications equipment. To the extent our customers are adversely affected by laws or regulations regarding their business, products or service offerings, our business, financial condition and results of operations would suffer.

We are subject to governmental export and import controls that could subject us to liability or impair our ability to compete in additional international markets.

Our products are subject to U.S. export and trade controls and restrictions. International shipments of certain of our products may require export licenses or are subject to additional requirements for export. In addition, the import laws of other countries

may limit our ability to distribute our products, or our customers' ability to buy and use our products, in those countries. Changes in our products or changes in export and import regulations or duties may create delays in the introduction of our products in international markets, prevent our customers with international operations from deploying our products or, in some cases, prevent the export or import of our products to certain countries altogether. Any change in export or import regulations, duties or related legislation, shift in approach to the enforcement or scope of existing regulations, or change in the countries, persons or technologies targeted by such regulations, could negatively impact our ability to sell, profitably or at all, our products to existing or potential international customers.

If we lose any of our key personnel, or are unable to attract, train and retain qualified personnel, our ability to manage our business and continue our growth would be negatively impacted.

Our success depends, in large part, on the continued contributions of our key management, engineering, sales and marketing personnel, many of whom are highly skilled and would be difficult to replace. None of our senior management or key technical or sales personnel is bound by a written employment contract to remain with us for a specified period. In addition, we do not currently maintain key person life insurance covering our key personnel. If we lose the services of any key personnel, our business, financial condition and results of operations may suffer.

Competition for skilled personnel, particularly those specializing in engineering and sales, is intense. We cannot be certain that we will be successful in attracting and retaining qualified personnel, or that newly hired personnel will function effectively, both individually and as a group. In particular, we must continue to expand our direct sales force, including hiring additional sales managers, to grow our customer base and increase sales. If we are unable to effectively recruit, hire and utilize new employees, execution of our business strategy and our ability to react to changing market conditions may be impeded, and our business, financial condition and results of operations may suffer.

Volatility or lack of performance in our stock price may also affect our ability to attract and retain our key personnel. Our executive officers and employees hold a substantial number of shares of our common stock and vested stock options. Employees may be more likely to leave us if the shares they own or the shares underlying their equity awards decline in value, or if the exercise prices of stock options that they hold are significantly above the market price of our common stock. If we are unable to retain our employees, our business, operating results and financial condition will be harmed.

If we fail to maintain proper and effective internal controls, our ability to produce accurate financial statements on a timely basis could be impaired, which would adversely affect our operating results, our ability to operate our business and our stock price.

Ensuring that we have adequate internal financial and accounting controls and procedures in place to produce accurate financial statements on a timely basis is a costly and time-consuming effort that needs to be re-evaluated frequently. We have in the past discovered, and may in the future discover areas of our internal financial and accounting controls and procedures that need improvement.

Our management is responsible for establishing and maintaining adequate internal control over financial reporting to provide reasonable assurance regarding the reliability of our financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles. Our management does not expect that our internal control over financial reporting will prevent or detect all error and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the control system's objectives will be met. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, within our company will have been detected.

We are required to comply with Section 404 of the Sarbanes-Oxley Act, or SOX, which requires us to expend significant resources in developing the required documentation and testing procedures. We cannot be certain that the actions we have taken and are taking to improve our internal controls over financial reporting will be sufficient to maintain effective internal controls over financial reporting in subsequent reporting periods or that we will be able to implement our planned processes and procedures in a timely manner. In addition, new and revised accounting standards and financial reporting requirements may occur in the future and implementing changes required by new standards, requirements or laws may require a significant expenditure of our management's time, attention and resources which may adversely affect our reported financial results. If we are unable to produce accurate financial statements on a timely basis, investors could lose confidence in the reliability of our financial statements, which could cause the market price of our common stock to decline and make it more difficult for us to finance our operations and growth.

We incur significant costs as a result of operating as a public company, which may adversely affect our operating results and financial condition.

As a public company, we incur significant accounting, legal and other expenses, including costs associated with our public company reporting requirements. We also anticipate that we will continue to incur costs associated with corporate governance requirements, including requirements and rules under SOX and the Dodd-Frank Wall Street Reform and Consumer Protection Act, or Dodd-Frank, among other rules and regulations implemented by the SEC, as well as listing requirements of the New York Stock Exchange, or NYSE. Furthermore, these laws and regulations could make it difficult or costly for us to obtain certain types of insurance, including director and officer liability insurance, and we may be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these requirements could also make it difficult for us to attract and retain qualified persons to serve on our Board of Directors, our board committees or as executive officers.

New laws and regulations as well as changes to existing laws and regulations affecting public companies, including the provisions of SOX and the Dodd-Frank Act and rules adopted by the SEC and the NYSE, would likely result in increased costs to us as we respond to their requirements. We continue to invest resources to comply with evolving laws and regulations, and this investment may result in increased general and administrative expense.

Risks Related to Ownership of Our Common Stock

Our stock price may continue to be volatile, and the value of an investment in our common stock may decline.

The trading price of our common stock has been, and is likely to continue to be, volatile, which means that it could decline substantially within a short period of time and could fluctuate widely in response to various factors, some of which are beyond our control. These factors include those discussed in the “Risk Factors” section of this Annual Report on Form 10-K and others such as:

- quarterly variations in our results of operations or those of our competitors;
- failure to meet any guidance that we have previously provided regarding our anticipated results;
- changes in earnings estimates or recommendations by securities analysts;
- failure to meet securities analysts’ estimates;
- announcements by us or our competitors of new products, significant contracts, commercial relationships, acquisitions or capital commitments;
- developments with respect to intellectual property rights;
- our ability to develop and market new and enhanced products on a timely basis;
- our commencement of, or involvement in, litigation and developments relating to such litigation;
- changes in governmental regulations; and
- a slowdown in the communications industry or the general economy.

In recent years, the stock market in general, and the market for technology companies in particular, has experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. Broad market and industry factors may seriously affect the market price of our common stock, regardless of our actual operating performance. In addition, in the past, following periods of volatility in the overall market and the market price of a particular company’s securities, securities class action litigation has often been instituted against these companies. This litigation, if instituted against us, could result in substantial costs and a diversion of our management’s attention and resources.

If securities or industry analysts do not publish research or reports about our business or if they issue an adverse or misleading opinion regarding our stock, our stock price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. If any of the analysts who cover us issue an adverse or misleading opinion regarding our stock, our stock price would likely decline. If several of these analysts cease coverage of our company or fail to publish reports on us regularly, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

Provisions in our charter documents and under Delaware law could discourage a takeover that stockholders may consider favorable and may lead to entrenchment of our management and Board of Directors.

Our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that could have the effect of delaying or preventing changes in control or changes in our management or our Board of Directors. These provisions include:

- a classified Board of Directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our Board of Directors;

- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- the exclusive right of our Board of Directors to elect a director to fill a vacancy created by the expansion of the Board of Directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our Board of Directors;
- the ability of our Board of Directors to issue shares of preferred stock and to determine the price and other terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquirer;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- the requirement that a special meeting of stockholders may be called only by the chairman of the Board of Directors, the chief executive officer or the Board of Directors, which may delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and
- advance notice procedures that stockholders must comply with in order to nominate candidates to our Board of Directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of us.

We are also subject to certain anti-takeover provisions under Delaware law. Under Delaware law, a corporation may not, in general, engage in a business combination with any holder of 15% or more of its capital stock unless the holder has held the stock for three years or, among other things, the Board of Directors has approved the transaction.

We may need additional capital in the future to finance our business.

We may need to raise additional capital to fund operations in the future. Our working capital needs and cash use have continued to increase to support our growth initiatives, and we may need additional capital if our current plans and assumptions change. In addition, the recently implemented U.S. tariffs are expected to have significant negative impact on our cash flows until we are able to mitigate the impact of the tariffs whether through re-engineering of our supply chain or otherwise. Delays in our mitigation plans or unanticipated expenditures associated with these mitigation efforts would further negatively impact our cash flows and result of operations. Failure to maintain certain restrictive covenants and requirements under the Loan Agreement could result in limiting the amount of borrowings that are available to us, increase the cost of borrowings under the credit facility, and/or cause us to make immediate payments to reduce borrowings or result in an event of default. If future financings involve the issuance of equity securities, our then-existing stockholders would suffer dilution. If we raise additional debt financing, we may be subject to restrictive covenants that limit our ability to conduct our business. If we are unable to generate positive operating income and positive cash flows from operations, our liquidity, results of operations and financial condition will be adversely affected. Furthermore, if we are unable to generate sufficient cash flows to support our operational needs, we may need to seek additional sources of liquidity, including borrowings, to support our working capital needs. In addition, we may choose to seek other sources of liquidity even if we believe we have generated sufficient cash flows to support our operational needs. There is no assurance that any other sources of liquidity may be available to us on acceptable terms or at all. If we are unable to generate sufficient cash flows or obtain other sources of liquidity, we will be forced to limit our development activities, reduce our investment in growth initiatives and institute cost-cutting measures, all of which would adversely impact our business and growth.

We do not currently intend to pay dividends on our common stock and, consequently, our stockholders' ability to achieve a return on their investment will depend on appreciation in the price of our common stock.

We do not currently intend to pay any cash dividends on our common stock for the foreseeable future. We currently intend to invest our future earnings, if any, to fund our growth. Additionally, the terms of our credit facility restrict our ability to pay dividends under certain circumstances. Therefore, our stockholders are not likely to receive any dividends on our common stock for the foreseeable future.

ITEM 2. Unregistered Sales of Equity Securities and Use of Proceeds

None.

ITEM 3. Defaults Upon Senior Securities

None.

ITEM 4. Mine Safety Disclosures

Not applicable.

ITEM 5. Other Information

None.

ITEM 6. Exhibits

Exhibit Number	Description
10.1	Second Amendment to Loan and Security Agreement dated August 24, 2018 by and between Silicon Valley Bank and Calix, Inc. †
31.1	Certification of Chief Executive Officer of Calix, Inc. Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Chief Financial Officer of Calix, Inc. Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Certification of Chief Executive Officer and Chief Financial Officer of Calix, Inc. Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

†

Confidential treatment has been requested as to certain portions of this agreement.

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.

CALIX, INC.
(Registrant)

Date: November 5, 2018

By: /s/ Carl Russo
Carl Russo
Chief Executive Officer
(Principal Executive Officer)

Date: November 5, 2018

By: /s/ Cory Sindelar
Cory Sindelar
Chief Financial Officer
(Principal Financial Officer)

**SECOND AMENDMENT TO
LOAN AND SECURITY AGREEMENT**

THIS SECOND AMENDMENT TO LOAN AND SECURITY AGREEMENT (this “**Amendment**”) is entered into this 24th day of August, 2018, by and between SILICON VALLEY BANK, a California corporation (“**Bank**”), and CALIX, INC., a Delaware corporation (“**Borrower**”).

RECITALS

- A. Bank and Borrower have entered into that certain Loan and Security Agreement dated as of August 7, 2017 (as the same may from time to time be amended, modified, supplemented or restated, the “**Loan Agreement**”).
- B. Bank has extended credit to Borrower for the purposes permitted in the Loan Agreement.
- C. Borrower has requested that Bank (i) extend the Revolving Line Maturity Date, (ii) modify the financial covenants, and (iii) make certain other revisions to the Loan Agreement as more fully set forth herein.
- D. Bank has agreed to so amend certain provisions of the Loan Agreement, but only to the extent, in accordance with the terms, subject to the conditions and in reliance upon the representations and warranties set forth below.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing recitals and other good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, and intending to be legally bound, the parties hereto agree as follows:

1. Definitions. Capitalized terms used but not defined in this Amendment shall have the meanings given to them in the Loan Agreement.

2. Amendments to Loan Agreement.

2.1 Section 6.2 (Financial Statements, Reports, Certificates).

(a) Section 6.2(a) of the Loan Agreement is hereby deleted in its entirety and replaced with the following:

(a) a Borrowing Base Report (and any schedules related thereto and including any other information reasonably requested by Bank with respect to Borrower’s Accounts, including without limitation, a detailed accounts receivable ledger) (i) no later than Friday of each week when a Streamline Period is not in effect, and (ii) within seven (7) days after the end of each month when a Streamline Period is in effect;

*** Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to portions of this agreement.

(b) Section 6.2(l) is hereby inserted in the Loan Agreement immediately following Section 6.2(k) of the Loan Agreement:

(l) Beneficial Ownership Information. Borrower shall provide Bank with prompt written notice of any changes to the beneficial ownership information set out in the Beneficial Ownership Information Disclosure Form. Borrower understands and acknowledges that Bank relies on such true, accurate and up-to-date beneficial ownership information to meet Bank's regulatory obligations to obtain, verify and record information about the beneficial owners of its legal entity customers.

2.2 Section 6.9 (Financial Covenants). Section 6.9 of the Loan Agreement is hereby deleted in its entirety and replaced with the following:

6.9 Financial Covenants. Maintain at all times on a consolidated basis with respect to Borrower:

(a) Adjusted Quick Ratio. Tested as of the last day of each fiscal quarter of Borrower, an Adjusted Quick Ratio as set forth below:

<u>Fiscal Quarter Ending</u>	<u>Adjusted Quick Ratio</u>
September 30, 2018	At least 0.90:1.00
December 31, 2018	At least 0.90:1.00
March 31, 2019 and each fiscal quarter thereafter	At least 1.00:1.00

(b) Adjusted EBITDA. Tested as of the last day of each fiscal quarter of Borrower, an Adjusted EBITDA of at least the following amounts at the following times:

<u>Fiscal Quarter Ending</u>	<u>Adjusted EBITDA</u>
September 30, 2018	\$3,000,000
December 31, 2018	\$5,000,000
March 31, 2019 and each fiscal quarter thereafter	\$1.00

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2.3 Section 7.2 (Changes in Business, Management, Control or Business Locations) . The following sentence is hereby added at the end of the second paragraph of Section 7.2 of the Loan Agreement:

“If Borrower intends to add any new offices or business locations, including warehouses, containing in excess of [***] of Borrower’s assets or property, then Borrower will first receive the written consent of Bank, and the landlord of any such new offices or business locations, including warehouses, shall execute and deliver a landlord consent in form and substance satisfactory to Bank.”

2.4 Section 13 (Definitions) .

(a) The following terms and their respective definitions set forth in Section 13.1 of the Loan Agreement are hereby deleted in their entirety and replaced with the following:

“ **Eligible Foreign Accounts** ” are Accounts for which the Account Debtor is [***], which are Account Debtors that do not have their principal place of business in the United States, and which (a) otherwise satisfy the definition of Eligible Accounts, (b) are billed and collected in the United States, and (c) are billed and/or payable in Dollars, Euros, Pounding Sterling, or Canadian Dollars.

“ **Revolving Line Maturity Date** ” is August 7, 2020.

(b) Clause (c) of the definition of “ **Permitted Liens** ” set forth in Section 13.1 of the Loan Agreement is hereby deleted in its entirety and replaced with the following:

(c) purchase money Liens or Liens in connection with capital leases (i) on Equipment acquired or held by Borrower incurred for financing the acquisition of the Equipment securing no more than Six Million Dollars (\$6,000,000) in the aggregate amount outstanding, or (ii) existing on Equipment when acquired, if the Lien is confined to the property and improvements and the proceeds of the Equipment;

(c) The following new defined term is hereby inserted alphabetically to Section 13.1 of the Loan Agreement:

“ **Beneficial Ownership Information Disclosure Form** ” means the form attached hereto as Exhibit E.

2.5 Compliance Certificate . Exhibit B of the Loan Agreement is hereby replaced in its entirety with Exhibit B attached hereto. From and after the date hereof, all references in the Loan Agreement to the Compliance Certificate shall be deemed to refer to Exhibit B attached hereto.

2.6 Beneficial Ownership Information Disclosure Form . The Loan Agreement is hereby amended by adding the Beneficial Ownership Information Disclosure Form attached hereto as Exhibit E as Exhibit E to the Loan Agreement. From and after the date hereof,

[***] Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to portions of this agreement.

all references in the Loan Agreement to the Beneficial Ownership Information Disclosure Form shall be deemed to refer to the Beneficial Ownership Information Disclosure Form attached hereto as Exhibit E

3. Limitation of Amendment.

3.1 The amendments set forth in Section 2, above, are effective for the purposes set forth herein and shall be limited precisely as written and shall not be deemed to (a) be a consent to any amendment, waiver or modification of any other term or condition of any Loan Document, or (b) otherwise prejudice any right or remedy which Bank may now have or may have in the future under or in connection with any Loan Document.

3.2 This Amendment shall be construed in connection with and as part of the Loan Documents and all terms, conditions, representations, warranties, covenants and agreements set forth in the Loan Documents, except as herein amended, are hereby ratified and confirmed and shall remain in full force and effect.

3.3 In addition to those Events of Default specifically enumerated in the Loan Documents, the failure to comply with the terms of any covenant or agreement contained herein shall constitute an Event of Default and shall entitle Bank to exercise all rights and remedies provided to Bank under the terms of any of the other Loan Documents as a result of the occurrence of the same.

4. Representations and Warranties. To induce Bank to enter into this Amendment, Borrower hereby represents and warrants to Bank as follows:

4.1 Immediately after giving effect to this Amendment (1) the representations and warranties contained in the Loan Documents are true, accurate and complete in all material respects as of the date hereof (except to the extent such representations and warranties relate to an earlier date, in which case they are true and correct as of such date), and (1) no Event of Default has occurred and is continuing;

4.2 Borrower has the power and authority to execute and deliver this Amendment and to perform its obligations under the Loan Agreement, as amended by this Amendment;

4.3 The organizational documents of Borrower delivered to Bank on the Effective Date remain true, accurate and complete and have not been amended, supplemented or restated and are and continue to be in full force and effect;

4.4 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, have been duly authorized;

4.5 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, do not and will not contravene (a) any material law or regulation binding on or affecting

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Borrower, (b) any contractual restriction with a Person binding on Borrower in any material respects, (c) in any material respects, any order, judgment or decree of any court or other governmental or public body or authority, or subdivision thereof, binding on Borrower, or (d) the organizational documents of Borrower;

4.6 The execution and delivery by Borrower of this Amendment and the performance by Borrower of its obligations under the Loan Agreement, as amended by this Amendment, do not require any order, consent, approval, license, authorization or validation of, or filing, recording or registration with, or exemption by any governmental or public body or authority, or subdivision thereof, binding on Borrower, except as already has been obtained or made; and

4.7 This Amendment has been duly executed and delivered by Borrower and is the binding obligation of Borrower, enforceable against Borrower in accordance with its terms, except as such enforceability may be limited by bankruptcy, insolvency, reorganization, liquidation, moratorium or other similar laws of general application and equitable principles relating to or affecting creditors' rights.

5. Integration . This Amendment and the Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements. All prior agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of this Amendment and the Loan Documents merge into this Amendment and the Loan Documents.

6. Counterparts. This Amendment may be executed in any number of counterparts and all of such counterparts taken together shall be deemed to constitute one and the same instrument.

7. Effectiveness . This Amendment shall be deemed effective upon (a) the due execution and delivery to Bank of this Amendment by each party hereto, (b) Borrower's payment of an amendment fee to Bank of One Hundred Five Thousand Dollars (\$105,000), and (c) payment of Bank's legal fees and expenses in connection with the negotiation and preparation of this Amendment.

[Signature page follows.]

*** Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to portions of this agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Amendment to be duly executed and delivered as of the date first written above.

BORROWER:

CALIX, INC.

By: /s/ Cory Sindelar
Name: Cory Sindelar
Title: Chief Financial Officer

BANK:

SILICON VALLEY BANK

By: /s/ Stephen Chang
Name: Stephen Chang
Title: Director

*** Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to portions of this agreement.

EXHIBIT B

COMPLIANCE CERTIFICATE

TO: SILICON VALLEY BANK
FROM: CALIX, INC.

Date: _____

The undersigned authorized officer of CALIX, INC. (“**Borrower**”) certifies, solely in his or her capacity as an officer of Borrower and not in his or her individual capacity, that under the terms and conditions of the Loan and Security Agreement between Borrower and Bank (the “**Agreement**”), (1) Borrower is in complete compliance for the period ending _____ with all required covenants except as noted below, (2) there are no Events of Default, (3) all representations and warranties in the Agreement are true and correct in all material respects on this date except as noted below; provided, however, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided, further that those representations and warranties expressly referring to a specific date shall be true, accurate and complete in all material respects as of such date, (4) Borrower, and each of its Subsidiaries, has timely filed all required tax returns and reports, and Borrower has timely paid all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower except as otherwise permitted pursuant to the terms of Section 5.9 of the Agreement, and (5) no Liens have been levied or claims made against Borrower or any of its Subsidiaries, if any, relating to unpaid employee payroll or benefits of which Borrower has not previously provided written notification to Bank. Attached are the required documents supporting the certification. The undersigned certifies that these are prepared in accordance with GAAP consistently applied from one period to the next except as explained in an accompanying letter or footnotes. The undersigned acknowledges that no borrowings may be requested at any time or date of determination that Borrower is not in compliance with any of the terms of the Agreement, and that compliance is determined not just at the date this certificate is delivered. Capitalized terms used but not otherwise defined herein shall have the meanings given them in the Agreement.

Please indicate compliance status by circling Yes/No under “Complies” column.

<u>Reporting Covenants</u>	<u>Required</u>	<u>Complies</u>
Monthly financial statements with Compliance Certificate	Monthly within 30 days	Yes No
Annual financial statements (CPA Audited)	Earlier of 120 days of FYE, or 10-K filing date	Yes No
Quarterly financial statements	Earlier of 90 days of FQE, or 10-Q filing date	Yes No
10-Q, 10-K and 8-K	Within 5 days after filing with SEC	Yes No
A/R & A/P Agings	Monthly within 30 days	Yes No
Deferred Revenue Report	Monthly within 30 days	Yes No
Detailed Debtor Listing	Monthly within 30 days	Yes No
Borrowing Base Reports	If Streamline Period in effect, monthly within 7 days; if Streamline Period not in effect, Friday of each week	Yes No
Board approved projections	Within later of 60 days of Board approval or FYE, and as within 10 days of any amendment/update	Yes No
The following Intellectual Property was registered after the Effective Date or after the last delivery date of a Compliance Certificate (if no registrations, state “None”)		

*** Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to portions of this agreement.

<u>Financial Covenants</u>	<u>Required</u>	<u>Actual</u>	<u>Complies</u>
Maintain as indicated:			
Adjusted Quick Ratio (tested quarterly)	See attached schedule	See attached schedule	Yes No
Adjusted EBITDA (tested quarterly)	See attached schedule	See attached schedule	Yes No

<u>Performance Pricing</u>		
	<u>Interest Rate</u>	<u>Applies</u>
AQR \geq 1.50	LIBOR + 2.00% or Prime + 0.50%	Yes No
AQR \geq 1.25 and $<$ 1.50	LIBOR + 2.50% or Prime + 1.00	Yes No
AQR $<$ 1.25	LIBOR + 3.00% or Prime + 1.50%	Yes No

	<u>Unused Line Fee</u>	<u>Applies</u>
AQR \geq 1.25	0.25%	Yes No
AQR $<$ 1.25	0.375%	Yes No

	<u>Streamline Period</u>	<u>Applies</u>
(i) AQR \geq 1.10 from the Effective Date through December 31, 2017, or (ii) AQR \geq 1.25 from January 1, 2018 and at all times thereafter	Yes	Yes No
(i) AQR $<$ 1.10 from the Effective Date through December 31, 2017, or (ii) AQR $<$ 1.25 from January 1, 2018 and at all times thereafter	No	Yes No

The following financial covenant analyses and information set forth in Schedule 1 attached hereto are true and accurate as of the date of this Certificate.

The following are the exceptions with respect to the certification above: (If no exceptions exist, state "No exceptions to note.")

Attached are copies of all correspondence, reports, documents and other filings with any Governmental Authority regarding compliance with or maintenance of Governmental Approvals or Requirements of Law or that could reasonably be expected to have a material effect on any of the Governmental Approvals or otherwise on the operations of Borrower or any of its Subsidiaries.

*** Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to portions of this agreement.

CALIX, INC.

By: __
Name: __
Title: __

BANK USE ONLY

Received by: _____
AUTHORIZED SIGNER

Date: _____

Verified: _____
AUTHORIZED SIGNER

Date: _____

Compliance Status: Yes No

*** Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to portions of this agreement.

Schedule 1 to Compliance Certificate

Financial Covenants of Borrower

In the event of a conflict between this Schedule and the Loan Agreement, the terms of the Loan Agreement shall govern.

Dated: _____

I. Adjusted Quick Ratio (Section 6.9(a))

Required: Tested as of the last day of each fiscal quarter of Borrower, an Adjusted Quick Ratio as set forth below:

<u>Fiscal Quarter Ending</u>	<u>Adjusted Quick Ratio</u>
September 30, 2018	At least 0.90:1.00
December 31, 2018	At least 0.90:1.00
March 31, 2019 and each fiscal quarter thereafter	At least 1.00:1.00

Actual:

- A. Aggregate value of the unrestricted and unencumbered cash and Cash Equivalents of Borrower at Bank and Bank's Affiliates, or held in accounts subject to Control Agreements as permitted under the Agreement \$ _____
- B. Aggregate value of net billed accounts receivable of Borrower \$ _____
- C. Quick Assets (the sum of lines A and B) \$ _____
- D. Aggregate value of liabilities of Borrower on its consolidated balance sheet including all Indebtedness and current portion of Subordinated Debt permitted by Bank to be paid by Borrower (but excluding (i) all other Subordinated Debt, (ii) Obligations to Bank, and (iii) any Indebtedness that is cash secured or is otherwise collateralized pursuant to terms acceptable to Bank in its sole discretion), that matures within one (1) year \$ _____
- E. Aggregate value of Obligations to Bank \$ _____
- F. The sum of lines D and E \$ _____
- G. Aggregate value of the current portion of all amounts received or invoiced by Borrower in advance of performance under contracts and not yet recognized as revenue \$ _____
- H. Line F minus line G \$ _____
- I. Adjusted Quick Ratio (line C divided by line H) _____:1.00

Is line I at least the required amount for such fiscal quarter?

_____ No, not in compliance ___ Yes, in compliance

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II **Adjusted EBITDA** (Section 6.9(b))

Required: Tested as of the last day of each fiscal quarter of Borrower, an Adjusted EBITDA of at least the following amounts at the following times:

<u>Fiscal Quarter Ending</u>	<u>Adjusted EBITDA</u>
September 30, 2018	\$3,000,000
December 31, 2018	\$5,000,000
March 31, 2019 and each fiscal quarter thereafter	\$1.00

Actual:

A.	Net Income of Borrower	\$ _____
B.	To the extent included in the determination of Net Income	
	1. The provision for income taxes	\$ _____
	2. Depreciation expense	\$ _____
	3. Amortization expense	\$ _____
	4. Interest Expense	\$ _____
C.	EBITDA (line A plus lines B.1-B.4)	\$ _____
D.	Non-cash stock compensation expense	\$ _____
E.	Other non-cash items approved by Bank in writing on a case-by-case basis	\$ _____
F.	One-time non-recurring restructuring expenses actually incurred by Borrower in the fiscal quarter ending March 31, 2018 not to exceed \$3,000,000 in the aggregate	\$ _____
G.	Adjusted EBITDA (line C plus lines D-F)	\$ _____

Is line G at least the amount required above?

No, not in compliance _____ Yes, in compliance

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EXHIBIT E

BENEFICIAL OWNERSHIP INFORMATION DISCLOSURE FORM

1. Is the Borrower any of the following:

- i. a public company or an issuer of securities that are registered with the Securities and Exchange Commission under Section 12 of the Securities Exchange Act of 1934 or that is required to file reports under Section 15(d) of that Act;
- ii. an investment company registered with the Securities and Exchange Commission under the Investment Company Act of 1940;
- iii. an investment adviser registered with the Securities and Exchange Commission under the Investment Advisers Act of 1940; or
- iv. a pooled investment vehicle operated or advised by a regulated financial institution (including an SEC-registered investment adviser)?

Yes No

If yes, skip to signature page below. If no, continue to 2:

2. Is the Borrower a pooled investment vehicle that is ***not*** operated or advised by a regulated financial institution?

Yes No

If yes, skip to 4 below. If no, continue to 3:

3. Does any **individual**, *directly or indirectly* (for example, if applicable, through such individual's equity interests in the Borrower's parent entity), through any contract, arrangement, understanding, relationship or otherwise, **own 25% or more** of the equity interests of Borrower:

Yes No

If yes, complete the following information:

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	Name	Date of birth	Residential address	For US Persons, Social Security Number: (non-US persons should provide SSN if available)	For Non-US Persons: Type of ID, ID number, country of issuance, expiration date	Percentage of ownership/Name of Entity (if indirect ownership, explain structure)
1						
2						
3						
4						

4. Identify one individual with significant responsibility for managing Borrower i.e., an executive officer or senior manager (e.g., Chief Executive Officer, President, Vice President, Chief Financial Officer, Treasurer, Chief Operating Officer, Managing Member or General Partner) or any other individual who regularly performs similar functions. If appropriate, an individual listed in Section 1 above may also be listed here.

	Name	Date of birth	Residential address	For US Persons, Social Security Number: (non-US persons should provide SSN if available)	For Non-US Persons: Type of ID, ID number, country of issuance, expiration date	Name of Entity
1						

The undersigned, hereby certifies, to the best of his or her knowledge, that the information set out in this Beneficial Ownership Information Disclosure Form is true, complete and correct.

Date: August 24, 2018

By: /s/ Cory Sindelar
Name: Cory Sindelar
Title: CFO
Email: cory.sindelar@calix.com
Phone: (408) 474-0052

*** Certain information in this document has been omitted and filed separately with the Securities and Exchange Commission. Confidential treatment has been requested with respect to portions of this agreement.

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER
PURSUANT TO SECTION 302 OF
THE SARBANES-OXLEY ACT OF 2002**

I, Carl Russo , certify that:

1. I have reviewed this quarterly report on Form 10-Q of Calix, Inc. for the quarter ended September 29, 2018 ;
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 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 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: November 5, 2018

/s/ Carl Russo

Carl Russo

Chief Executive Officer

**CERTIFICATION OF INTERIM CHIEF FINANCIAL OFFICER
PURSUANT TO SECTION 302 OF
THE SARBANES-OXLEY ACT OF 2002**

I, Cory Sindelar , certify that:

1. I have reviewed this quarterly report on Form 10-Q of Calix, Inc. for the quarter ended September 29, 2018 ;
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 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 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: November 5, 2018

/s/ Cory Sindelar

Cory Sindelar
Chief Financial Officer

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER AND INTERIM CHIEF FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

I, Carl Russo , certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that the Quarterly Report of Calix, Inc. (the "Company") on Form 10-Q for the fiscal quarter ended September 29, 2018 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that information contained in such Quarterly Report on Form 10-Q fairly presents in all material respects the financial condition and results of operations of the Company.

Date: November 5, 2018

/s/ Carl Russo

Carl Russo

Chief Executive Officer

I, Cory Sindelar , certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that the Quarterly Report of Calix, Inc. (the "Company") on Form 10-Q for the fiscal quarter ended September 29, 2018 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that information contained in such Quarterly Report on Form 10-Q fairly presents in all material respects the financial condition and results of operations of the Company.

Date: November 5, 2018

/s/ Cory Sindelar

Cory Sindelar

Chief Financial Officer

This certification accompanies the Form 10-Q to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of Calix, 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 the Form 10-Q), irrespective of any general incorporation language contained in such filing.