

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-Q

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

For the quarterly period ended June 30, 2022

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

Commission File Number: 001-37824

IMPINJ, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

91-2041398
(I.R.S. Employer
Identification No.)

400 Fairview Avenue North, Suite 1200, Seattle, Washington
(Address of principal executive offices)

98109
(Zip Code)

Registrant's telephone number, including area code: (206) 517-5300

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

<u>Title of each class</u>	<u>Trading symbol(s)</u>	<u>Name of each exchange on which registered</u>
Common Stock, par value \$0.001 per share	PI	The Nasdaq Global Select Market

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

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

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

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

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

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

As of July 15, 2022, 25,599,992 shares of common stock were outstanding.

IMPINJ, INC.
QUARTERLY REPORT ON FORM 10-Q

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Risk Factor Summary

Our business is subject to numerous risks and uncertainties, including those highlighted in the section of this report captioned “Risk Factors.” These risks include the following:

- if RAIN market adoption does not continue to develop, or develops slower than we expect, or if RAIN adoption by retailers does not continue at the rate we expect, our business will suffer;
- our market is very competitive, and if we fail to compete successfully, our business and operating results will suffer;
- an inability or limited ability of enterprise systems to exploit RAIN information may adversely affect the market for our products;
- if end users or our direct customers fail to design our products into their products and systems, our operating results and prospects will be adversely affected;
- alternative technologies or standards, or changes in existing technologies or standards, may adversely affect RAIN market growth and our business;
- we obtain products we sell through third parties who operate outside of United States and with whom we do not have long-term supply contracts, and if we are unable to effectively manage our relationships with suppliers our operating results and financial condition would be adversely affected;
- we are vulnerable to silicon wafer shortages, which may adversely affect our ability to meet demand for our products;
- our products must meet demanding technical and quality specifications and failure of our products to operate as expected could have an adverse effect on our operating results;
- Covid-19 has adversely affected our business, and the magnitude and duration of future Covid-19 effects on our business are uncertain;
- we rely on a small number of customers for a large share of our revenues;
- because we sell and fulfill through channel partners, our ability to affect or determine end-user demand is limited;
- our growth strategy depends in part on the success of strategic relationships with third parties and their continued performance and alignment;
- if we are unable to protect our intellectual property, then our business could be adversely affected;
- we may become party to intellectual property disputes, which could be time consuming, costly to prosecute, defend or settle, result in the loss of significant rights, and adversely affect RAIN adoption generally;
- we have a history of losses and have only achieved profitability intermittently, and we cannot be certain that we will attain or sustain profitability in the future;
- we have a history of significant fluctuations in our quarterly and annual operating results;
- servicing \$287.5 million aggregate principal amount 1.125% convertible senior notes due 2027, or the 2021 Notes, may require a significant amount of cash, and we may not have sufficient cash flow or the ability to raise the funds necessary to satisfy our obligations under the 2021 Notes, in which case our indebtedness may limit our operating flexibility or otherwise affect our business; and
- our executive officers, directors, principal stockholders, together with their affiliates, beneficially owned approximately 25.4% of our outstanding common stock as of June 30, 2022, and as a result are able to exercise significant influence over matters subject to stockholder approval.

PART I — FINANCIAL INFORMATION
Item 1. Financial Statements (unaudited)

IMPINJ, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(in thousands, except par value, unaudited)

	June 30, 2022	December 31, 2021
Assets:		
Current assets:		
Cash and cash equivalents	\$ 32,580	\$ 123,903
Short-term investments	130,719	69,443
Accounts receivable, net	40,128	35,449
Inventory	32,047	21,958
Prepaid expenses and other current assets	3,603	5,049
Total current assets	239,077	255,802
Long-term investments	20,440	14,225
Property and equipment, net	28,726	27,500
Operating lease right-of-use assets	10,044	11,667
Other non-current assets	2,240	2,462
Goodwill	3,881	3,881
Total assets	<u>\$ 304,408</u>	<u>\$ 315,537</u>
Liabilities and stockholders' equity:		
Current liabilities:		
Accounts payable	\$ 10,099	\$ 11,732
Accrued compensation and employee related benefits	5,928	6,365
Accrued and other current liabilities	2,920	2,481
Current portion of operating lease liabilities	3,635	4,143
Restructuring liabilities	119	591
Current portion of long-term debt	—	9,633
Current portion of deferred revenue	2,632	558
Total current liabilities	25,333	35,503
Long-term debt, net of current portion	279,449	278,661
Operating lease liabilities, net of current portion	10,408	11,934
Other long-term liabilities	113	279
Deferred revenue, net of current portion	364	236
Total liabilities	<u>315,667</u>	<u>326,613</u>
Commitments and contingencies (Note 5)		
Stockholders' equity:		
Preferred stock, \$0.001 par value — 5,000 shares authorized, no shares issued and outstanding at June 30, 2022 and December 31, 2021	—	—
Common stock, \$0.001 par value — 495,000 shares authorized, 25,547 and 24,737 shares issued and outstanding at June 30, 2022 and December 31, 2021, respectively	26	25
Additional paid-in capital	374,409	351,422
Accumulated other comprehensive (loss) income	(1,226)	(39)
Accumulated deficit	(384,468)	(362,484)
Total stockholders' equity	<u>(11,259)</u>	<u>(11,076)</u>
Total liabilities and stockholders' equity	<u>\$ 304,408</u>	<u>\$ 315,537</u>

See accompanying notes to condensed consolidated financial statements.

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

	Three Months Ended June 30,		Six Months Ended June 30,	
	2022	2021	2022	2021
Revenue	\$ 59,796	\$ 47,268	\$ 112,940	\$ 92,516
Cost of revenue	28,294	22,491	52,659	45,758
Gross profit	31,502	24,777	60,281	46,758
Operating expenses:				
Research and development	18,369	15,900	36,358	29,691
Sales and marketing	9,614	8,196	18,913	15,841
General and administrative	11,995	8,998	22,801	17,152
Restructuring costs	—	—	—	1,263
Total operating expenses	39,978	33,094	78,072	63,947
Loss from operations	(8,476)	(8,317)	(17,791)	(17,189)
Other income (expense), net	429	(4)	593	19
Induced conversion expense	(2,232)	—	(2,232)	—
Interest expense	(1,250)	(525)	(2,511)	(1,050)
Loss before income taxes	(11,529)	(8,846)	(21,941)	(18,220)
Income tax expense	6	(60)	(43)	(102)
Net loss	\$ (11,523)	\$ (8,906)	\$ (21,984)	\$ (18,322)
Net loss per share — basic and diluted	\$ (0.45)	\$ (0.37)	\$ (0.87)	\$ (0.77)
Weighted-average shares outstanding — basic and diluted	25,429	24,120	25,204	23,895

See accompanying notes to condensed consolidated financial statements.

IMPINJ, INC.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(in thousands, unaudited)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2022	2021	2022	2021
Net loss	\$ (11,523)	\$ (8,906)	\$ (21,984)	\$ (18,322)
Other comprehensive loss, net of tax:				
Unrealized loss on investments	(510)	1	(1,187)	1
Total other comprehensive loss	(510)	1	(1,187)	1
Comprehensive loss	<u>\$ (12,033)</u>	<u>\$ (8,905)</u>	<u>\$ (23,171)</u>	<u>\$ (18,321)</u>

See accompanying notes to condensed consolidated financial statements.

IMPINJ, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands, unaudited)

	Six Months Ended June 30,	
	2022	2021
Operating activities:		
Net loss	\$ (21,984)	\$ (18,322)
Adjustments to reconcile net loss to net cash provided by operating activities:		
Depreciation	2,973	2,076
Stock-based compensation	22,173	18,031
Accretion of discount or amortization of premium on investments	419	468
Amortization of debt issuance costs	806	188
Induced conversion expense related to convertible notes	2,232	—
Changes in operating assets and liabilities:		
Accounts receivable	(4,679)	(973)
Inventory	(10,089)	12,265
Prepaid expenses and other assets	1,463	(186)
Accounts payable	(2,201)	(3,053)
Accrued compensation and employee related benefits	(437)	422
Accrued and other liabilities	366	364
Operating lease right-of-use assets	1,623	1,458
Operating lease liabilities	(2,034)	(1,834)
Restructuring liabilities	(472)	630
Deferred revenue	2,202	(6,553)
Net cash provided by (used in) operating activities	(7,639)	4,981
Investing activities:		
Purchases of investments	(115,697)	(19,825)
Proceeds from maturities of investments	46,805	41,000
Purchases of property and equipment	(3,724)	(7,858)
Net cash provided by (used in) investing activities	(72,616)	13,317
Financing activities:		
Principal payments on finance lease obligations	—	(2)
Proceeds from exercise of stock options and employee stock purchase plan	6,496	9,243
Payment of 2019 Notes	(17,564)	—
Net cash provided by (used in) financing activities	(11,068)	9,241
Net increase (decrease) in cash and cash equivalents	(91,323)	27,539
Cash and cash equivalents		
Beginning of period	123,903	23,636
End of period	\$ 32,580	\$ 51,175
Supplemental disclosure of cashflow information:		
Cash paid for interest	\$ 1,803	\$ 863
Purchases of property and equipment not yet paid	891	5,069

See accompanying notes to condensed consolidated financial statements.

IMPINJ, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY
(in thousands, unaudited)

	Common Stock		Additional	Accumulated	Accumulated	Total
	Shares	Amount	Paid-in	Deficit	Other Comprehensive Income (Loss)	Stockholders' Equity
Balance at December 31, 2021	24,737	\$ 25	\$ 351,422	\$ (362,484)	\$ (39)	\$ (11,076)
Issuance of common stock	483	—	4,611	—	—	4,611
Stock-based compensation	—	—	11,314	—	—	11,314
Net loss	—	—	—	(10,461)	—	(10,461)
Other comprehensive loss	—	—	—	—	(677)	(677)
Balance at March 31, 2022	25,220	\$ 25	\$ 367,347	\$ (372,945)	\$ (716)	\$ (6,289)
Issuance of common stock	327	1	1,884	—	—	1,885
Stock-based compensation	—	—	10,859	—	—	10,859
Net loss	—	—	—	(11,523)	—	(11,523)
Other comprehensive loss	—	—	—	—	(510)	(510)
Induced conversion on 2019 Notes	—	—	(5,681)	—	—	(5,681)
Balance at June 30, 2022	25,547	26	374,409	(384,468)	(1,226)	(11,259)

	Common Stock		Additional	Accumulated	Accumulated	Total
	Shares	Amount	Paid-in	Deficit	Other Comprehensive Income	Stockholders' Equity
Balance at December 31, 2020	23,350	\$ 23	\$ 423,759	\$ (314,666)	\$ 3	\$ 109,119
Cumulative-effect adjustment from adoption of ASU 2020-06	—	—	(32,743)	3,442	—	(29,301)
Issuance of common stock	702	1	8,523	—	—	8,524
Stock-based compensation	—	—	7,449	—	—	7,449
Net loss	—	—	—	(9,416)	—	(9,416)
Balance at March 31, 2021	24,052	\$ 24	\$ 406,988	\$ (320,640)	\$ 3	\$ 86,375
Issuance of common stock	202	—	719	—	—	719
Stock-based compensation	—	—	10,582	—	—	10,582
Net loss	—	—	—	(8,906)	—	(8,906)
Other comprehensive loss	—	—	—	—	1	1
Balance at June 30, 2021	24,254	\$ 24	\$ 418,289	\$ (329,546)	\$ 4	\$ 88,771

See accompanying notes to condensed consolidated financial statements.

IMPINJ, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(unaudited)

Note 1. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying condensed consolidated financial statements include Impinj, Inc. and its wholly owned subsidiaries. We have eliminated intercompany balances and transactions in consolidation. We have prepared these condensed consolidated financial statements in conformity with U.S. generally accepted accounting principles, or GAAP, and applicable rules and regulations of the Securities and Exchange Commission, or SEC, regarding interim financial reporting. Certain information and note disclosures normally included in the financial statements prepared in accordance with GAAP have been condensed or omitted pursuant to such rules and regulations. Accordingly, these interim condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and accompanying notes as of and for the year ended December 31, 2021 included in Impinj, Inc.'s Annual Report on Form 10-K, which was filed with the SEC on February 14, 2022. The condensed consolidated balance sheet as of December 31, 2021, included herein, was derived from the audited consolidated financial statements of Impinj, Inc.

The unaudited condensed consolidated interim financial statements, in the opinion of management, reflect all adjustments, consisting of normal recurring adjustments, necessary to state fairly our financial position, results of operations, and our cash flows for the periods presented. Interim results are not necessarily indicative of the results for a full year or for any other future period.

Use of Estimates

Preparing financial statements in conformity with GAAP requires us to make certain estimates, judgments and assumptions that affect the reported amounts of assets and liabilities and the related disclosures as of the date of the financial statements, as well as the reported amounts of revenue and expenses during the periods presented. On an ongoing basis, we evaluate our estimates, including those related to revenue recognition, sales incentives, estimates to complete development contracts, deferred revenue, inventory excess and obsolescence, income taxes, determination of the fair value of stock awards and compensation and employee-related benefits. To the extent there are material differences between these estimates, judgments, or assumptions and actual results, our financial statements will be affected.

Recently Adopted Accounting Standards

In August 2020, the FASB issued guidance on debt with conversion and other options, or ASU 2020-06. This guidance eliminates the beneficial- and cash-conversion accounting models for convertible instruments and amends the derivative scope exception for contracts in an entity's own equity. Additionally, this guidance requires the application of the "if-converted" method to calculate the impact of convertible instruments on diluted earnings per share. We adopted ASU 2020-06 on January 1, 2021 using the modified retrospective transition method and accounted for the 2019 Notes (as defined below) on a whole-instrument basis. Upon adoption, we recorded a \$29.3 million increase to long-term debt, a \$32.7 million decrease to additional paid-in capital and a \$3.4 million decrease to accumulated deficit on January 1, 2021. We had no changes to net deferred tax liabilities with a decrease in deferred tax liability offset by a corresponding increase in valuation allowance upon adoption. We use the "if-converted" method to calculate the impact of convertible instruments on diluted earnings per share for the three and six months ended June 30, 2022 and 2021, upon adoption of this guidance.

The condensed consolidated financial statements as of and for the three and six months ended June 30, 2022, and 2021, are presented under ASU 2020-06.

Recently Issued Accounting Standards Not Yet Adopted

Recent accounting pronouncements issued by the FASB (including its Emerging Issues Task Force), the American Institute of Certified Public Accountants, and the SEC did not have, or are not expected to have, a material impact on our present or future consolidated financial statements.

Note 2. Fair Value Measurements

Accounting standards define fair value as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market in an orderly transaction between market participants on the measurement date. The standards also establish a fair value hierarchy, which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. There are three levels of inputs that may be used to measure fair value:

- Level 1 — Quoted prices in active markets for identical assets or liabilities.
- Level 2 — Assets and liabilities valued based on observable market data for similar instruments, such as quoted prices for similar assets or liabilities.
- Level 3 — Unobservable inputs that are supported by little or no market activity; instruments valued based on the best available data, some of which is internally developed, and considers risk premiums that a market participant would require.

We applied the following methods and assumptions in estimating our fair value measurements:

Cash Equivalents — Cash equivalents consist of highly liquid investments, including money market funds with original maturities of less than three months at the acquisition date. We record the fair value measurement of these assets based on quoted market prices in active markets.

Investments — Our investments comprise fixed income securities, which include U.S. government agency securities, corporate notes and bonds, commercial paper, treasury bills and asset-backed securities. The fair value measurement of these assets is based on observable market-based inputs or inputs that are derived principally from or corroborated by observable market data by correlation or other means.

Long-term Debt — See Note 6 for the carrying amount and estimated fair value of the Notes.

The following table presents the balances of assets measured at fair value on a recurring basis, by level within the fair value hierarchy, as of the dates presented (in thousands):

	June 30, 2022			December 31, 2021		
	Level 1	Level 2	Total	Level 1	Level 2	Total
Cash equivalents:						
Money market funds	\$ 25,878	\$ —	\$ 25,878	\$ 113,058	\$ —	\$ 113,058
Total cash equivalents	25,878	—	25,878	113,058	—	113,058
Short-term investments:						
U.S. government agency securities	—	51,607	51,607	—	4,066	4,066
Corporate notes and bonds	—	43,204	43,204	—	36,966	36,966
Commercial paper	—	19,447	19,447	—	16,489	16,489
Treasury bill	—	12,456	12,456	—	4,490	4,490
Asset-backed securities	—	4,005	4,005	—	7,432	7,432
Total short-term investments	—	130,719	130,719	—	69,443	69,443
Long-term investments:						
U.S. government agency securities	—	18,011	18,011	—	14,225	14,225
Corporate notes and bonds	—	1,463	1,463	—	—	—
Asset-backed securities	—	966	966	—	—	—
Total long-term investments	—	20,440	20,440	—	14,225	14,225
Total	\$ 25,878	\$ 151,159	\$ 177,037	\$ 113,058	\$ 83,668	\$ 196,726

We did not have any Level 3 assets nor did we measure any liabilities at fair value as of June 30, 2022 or December 31, 2021. Short-term investments are expected to mature within 1 year from the reporting date. Long-term investments are expected to mature between 1 and 2 years from the reporting date. Amortized Cost of all investments by category does not materially differ from fair value. See Note 6 for the carrying amount and estimated fair value of the Notes.

Note 3. Inventory

The following table presents the detail of inventories as of the dates presented (in thousands):

	June 30, 2022	December 31, 2021
Raw materials	\$ 7,987	\$ 6,305
Work-in-process	10,397	7,873
Finished goods	13,663	7,780
Total inventory	<u>\$ 32,047</u>	<u>\$ 21,958</u>

For the three and six months ended June 30, 2022, sales of fully reserved inventory had an immaterial impact on net gross margin. For the six months ended June 30, 2021, sales of fully reserved inventory had a favorable net gross margin impact of 1.2%, respectively. For the three months ended June 30, 2021, sales of fully reserved inventory had an immaterial impact on net gross margin.

Note 4. Stock-Based Awards

Stock Options

The following table summarizes stock option activity for the six months ended June 30, 2022 (in thousands):

	Number of Underlying Shares
Outstanding at December 31, 2021	2,288
Granted	—
Exercised	(228)
Forfeited or expired	(13)
Outstanding at June 30, 2022	<u>2,047</u>
Vested and exercisable at June 30, 2022	1,630

Restricted Stock Units

We grant (i) RSUs with a service condition, (ii) RSUs with performance and service conditions (“PSUs”), and (iii) RSUs with market and service conditions (“MSUs”) as further explained below.

We historically paid annual bonuses to our senior executives and other bonus-eligible employees with PSUs. In fiscal year 2022, we will pay employees’ bonus half with cash and half with PSUs. The number of annual PSUs that will ultimately vest depends on us attaining financial metrics for the year as well as on an employee’s continued employment through the vesting date. The compensation committee and board of directors typically certify PSU attainment in the first quarter of each year.

On April 12, 2021 and May 20, 2021, we granted a total of 83,750 MSUs to certain executives. The MSUs are eligible to vest based on our total stockholder return (“TSR”) relative to the TSR of the constituents in the S&P Semiconductor Select Industry Index over two measurement periods. Half of the MSUs are eligible to vest based on our relative TSR from January 1, 2021 through December 31, 2022, and half of the MSUs are eligible to vest based on our relative TSR from January 1, 2021 through December 31, 2023. We use a Monte Carlo simulation in estimating the fair value at grant date and recognize compensation cost over the implied service period. We estimated the aggregate grant-date fair value of these shares to be \$6.4 million using the Monte Carlo simulation valuation method.

On March 23, 2022 we granted a total of 57,000 MSUs to certain executives. The MSUs are eligible to vest based on our TSR relative to the TSR of the constituents in the S&P Semiconductor Select Industry Index over two measurement periods. Half of the MSUs are eligible to vest based on our relative TSR from January 1, 2022 through December 31, 2023, and half of the MSUs are eligible to vest based on our relative TSR from January 1, 2022 through December 31, 2024. We use a Monte Carlo simulation in estimating the fair value at grant date and recognize compensation cost over the implied service period. We estimated the aggregate grant-date fair value of these shares to be \$4.6 million using the Monte Carlo simulation valuation method.

The following table summarizes activity for RSUs, PSUs, and MSUs, for the six months ended June 30, 2022 (in thousands):

	Number of Underlying Shares		
	RSUs	MSUs	PSUs
Outstanding at December 31, 2021	1,165	84	268
Granted	652	57	75
Vested	(273)	—	(268)
Forfeited	(46)	—	—
Outstanding at June 30, 2022	<u>1,498</u>	<u>141</u>	<u>75</u>

We recorded \$1.2 million and \$1.9 million of stock-based compensation expense related to the MSUs for the three and six months ended June 30, 2022. We recorded \$558,000 of stock-based compensation expense related to the MSUs for the three and six months ended June 30, 2021.

Stock-Based Compensation Expense

The following table presents stock-based compensation expense included in our condensed consolidated statements of operations for the periods presented (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2022	2021	2022	2021
Cost of revenue	\$ 299	\$ 471	\$ 898	\$ 760
Research and development expense	4,336	4,568	9,111	7,678
Sales and marketing expense	2,642	2,320	5,394	4,122
General and administrative expense	3,582	3,223	6,770	5,471
Total stock-based compensation expense	<u>\$ 10,859</u>	<u>\$ 10,582</u>	<u>\$ 22,173</u>	<u>\$ 18,031</u>

Note 5. Commitments and Contingencies

For information on our commitments and contingencies, see Part II, Item 8 (Financial Statements and Supplementary Data, Note 11. Commitments and Contingencies) of our Annual Report on Form 10-K for the year ended December 31, 2021. There have been no material changes to our commitments and contingencies, outside of the ordinary course of our business, as previously disclosed in our Annual Report on Form 10-K for the year ended December 31, 2021, except for “Obligations with Third-Parties” and “Litigation” as discussed below.

Obligations with Third Parties

We have certain non-cancelable obligations, which include obligations with third-party manufacturers who manufacture our products. We are committed to purchase \$46.7 million of inventory as of June 30, 2022.

Litigation

From time to time, we are subject to various legal proceedings or claims that arise in the ordinary course of business. We accrue a liability when management believes that it is both probable that a liability has been incurred and the amount of loss can be reasonably estimated. As of June 30, 2022 and December 31, 2021, we did not have accrued contingency liabilities. The following is a description of our significant legal proceedings. Although we believe that resolving these claims, individually or in aggregate, will not have a material adverse impact on our financial statements, these matters are subject to inherent uncertainties.

Patent Infringement Claims and Counterclaims

Impinj Patent Infringement Claims Against NXP in California

On June 6, 2019, we filed a patent infringement lawsuit against NXP USA, Inc., a Delaware corporation and subsidiary of NXP Semiconductors N.V., in the U.S. District Court for the Northern District of California, or the Court. The original complaint alleged that certain NXP integrated circuit products infringe 26 of our U.S. patents. At the order of the Court, we filed an amended complaint limited to eight of the original 26 patents. We subsequently elected to go forward with asserting infringement of six of those eight patents. We are seeking, among other things, past damages, including lost profits, but no less than a reasonable royalty; enhanced damages for willful infringement; and reasonable attorneys’ fees and costs for infringement of the asserted patents. We are also seeking an injunction against NXP USA making, selling, using, offering for sale or importing its UCODE 8 and UCODE 9 ICs. Defendants responded to our complaint on September 30, 2019 citing numerous defenses including denying infringement, claiming our asserted patents are invalid, and that the infringed patents were licensed on a royalty-free basis under Impinj’s commitments to GS1 EPCglobal.

In February 2020, NXP filed *inter partes* review, or IPR, petitions with the Patent Trial and Appeal Board for the U.S. Patent and Trademark Office, or PTAB, against 12 of the originally asserted 26 patents, including the six patents asserted in the amended complaint. In August and September of 2020, the PTAB declined to institute review of four of the six patents at issue. On October 27, 2020, we filed a second amended complaint removing without prejudice the two of the six patents against which the PTAB instituted IPRs, leaving four patents in suit.

On September 24, 2020, the Court lifted the stay on two of the four patents in suit, and on July 23, 2021, the Court held a claim construction hearing for those two patents.

On September 3, 2021, the Court lifted the stay on the other two of the four patents in suit, and on March 4, 2022, the Court held a claim construction hearing for those two patents.

The Court has issued a schedule that provides for, among other things, a fact discovery deadline of April 25, 2022, an expert discovery deadline of September 12, 2022, and a trial for all four patents in suit beginning on June 5, 2023.

NXP Patent Infringement Claims Against Impinj in Washington

On October 4, 2019, NXP USA, Inc. and NXP B.V., filed a patent infringement lawsuit against us in the U.S. District Court for the District of Delaware. The complaint alleges that certain of our products infringe eight U.S. patents owned by plaintiffs. The plaintiffs are seeking, among other things, past damages adequate to compensate them for our alleged infringement of each of the patents-in-suit, and reasonable attorneys’ fees and costs. They are also seeking an injunction against us, enjoining continuing acts of infringement of the patents-in-suit. We have denied that we are infringing any of the patents, and we have asserted that we are licensed under four of them and that all eight are invalid. On September 23, 2020, the District of Delaware granted Impinj’s motion to transfer the case to the U.S. District Court for the Western District of Washington in Seattle.

On December 11, 2020, we also moved to stay the case with respect to six of the eight patents in suit pending final resolution of petitions that we filed for IPR review by the PTAB. On February 12, 2021, the Court granted our motion to stay the case as to these six patents. The PTAB instituted IPRs on two of the six challenged patents but denied them on the other four. The Court subsequently removed the stay on the four against which IPRs were not instituted. The U.S. Patent and Trademark Office on July 8, 2022 instituted a reexamination of one of the remaining six patents.

On March 9, 2021, we moved for summary judgment of noninfringement on the four patents to which we assert a license, including the two patents that were not subject to a stay. That motion was fully briefed and is pending. On July 28, 2021, the Court deferred ruling on our motion for summary judgment pending further discovery. On September 17, 2021, the Court struck all scheduled dates for the case pending reassignment to a new judge. On May 17, 2022, the case was reassigned to Judge John Chun, who set a schedule that includes an October 28, 2022 discovery cutoff and an April 10, 2023 trial date.

Impinj Patent Infringement Claims Against NXP in Texas

On May 25, 2021, we filed a new patent infringement lawsuit against NXP USA, Inc. in the United States District Court for the Western District of Texas (Waco), asserting that NXP has infringed nine of our patents, including seven that were originally asserted in the Northern California case. We are seeking among other things, past damages, including lost profits, but no less than a reasonable royalty; enhanced damages for willful infringement; and reasonable attorney's fees and costs for infringement of the asserted patents. We are also seeking an injunction against NXP making, selling, using, offering for sale or importing its UCODE 7, 8, and 9 endpoint ICs.

On July 26, 2021, NXP USA filed an answer to our complaint and counterclaimed that we infringe nine patents, one of which NXP USA owns and eight of which NXP USA recently exclusively licensed from a third party.

The Court issued a claim construction order on February 10, 2022. The Court has also ordered that the initial trial will involve three patents from each side, with up to two additional trials if necessary. The schedule sets, among other things, a deadline of October 27, 2022 for the parties to select the first set of patents for the initial trial, with that trial to begin on February 21, 2023. On July 11, 2022, the Court granted our motion to file an amended complaint adding NXP B.V. and NXP Semiconductors Netherlands B.V. as defendants.

NXP Patent Infringement Claims Against Impinj in China

On December 7, 2020, Impinj Radio Frequency Technology (Shanghai) Co., Ltd., or Impinj Shanghai, was served with patent infringement lawsuits filed in the Intellectual Property Court in Shanghai, China, or Shanghai Intellectual Property Court, in which NXP asserts that certain of our products infringe three Chinese patents owned by NXP, which closely correspond to three of the eight U.S. patents NXP has already asserted in U.S. District Court described above. The plaintiffs are seeking, among other things, past damages, and reasonable attorneys' fees and costs. They are also seeking an injunction against us, enjoining continuing acts of infringement of the patents-in-suit. Impinj Shanghai objected to the jurisdiction of the Shanghai Intellectual Property Court and filed a motion to stay the proceedings. The jurisdictional challenge was rejected by the Shanghai court in March 2021; a subsequent appeal filed by Impinj Shanghai was denied before the IP Tribunal of the Supreme People's Court in third-quarter 2021. Impinj, Inc. was formally served in July 2021, officially adding Impinj, Inc. to the suit. Impinj Shanghai also filed invalidity requests against all three Chinese patents before the China National Intellectual Property Administration, or CNIPA. In July 2021, the CNIPA issued decisions upholding the validity of the three Chinese patents. In October 2021, Impinj Shanghai filed for review of all of the CNIPA decisions by the Beijing Intellectual Property Court. Trials for all three patents, originally scheduled for May 22, 2022, were deferred by the Court and no new trial date has yet been set.

Note 6. Long-term debt

Convertible Senior Notes

In December 2019, we issued \$86.3 million aggregate principal amount of convertible promissory notes (the “2019 Notes”) due December 15, 2026, and in November 2021, we issued \$287.5 million aggregate principal amount of convertible promissory notes due May 15, 2027 (the “2021 Notes” and, together with the 2019 Notes, the “Notes”).

The following table presents the outstanding principal amount and carrying value of the Notes as of the dates indicated (in thousands):

	June 30, 2022			December 31, 2021		
	Principal Amount	Unamortized debt issuance costs	Net Carrying Amount	Principal Amount	Unamortized debt issuance costs	Net Carrying Amount
2019 Notes ⁽¹⁾⁽²⁾	\$ -	\$ -	\$ -	\$ 9,850	\$ (217)	\$ 9,633
2021 Notes	287,500	(8,051)	279,449	287,500	(8,839)	278,661
Total Debt	287,500	(8,051)	279,449	297,350	(9,056)	288,294
Short-term Debt	-	-	-	9,850	(217)	9,633
Long-term Debt	\$ 287,500	\$ (8,051)	\$ 279,449	\$ 287,500	\$ (8,839)	\$ 278,661

(1) In November 2021, we completed a privately negotiated repurchase of \$76.4 million principal amount of the 2019 Notes (“2019 Note Repurchase”) which we accounted for as an induced conversion in accordance with Accounting Standards Codification 470-20, Debt with Conversion and Other Options (ASC 470-20). As a result of this transaction, we recorded unamortized debt issuance costs of \$1.8 million in additional paid-in capital for the year ended December 31, 2021. Please refer to section “Repurchase of the Convertible Senior Notes – 2019”.

(2) In June 2022, we completed a repurchase of \$9.85 million of the remaining principal amount of the 2019 Notes (“2019 Note Repurchase”) which we accounted for as an induced conversion in accordance with Accounting Standards Codification 470-20, Debt with Conversion and Other Options (ASC 470-20). As a result of this transaction, we recorded unamortized debt issuance costs of \$199,000 in additional paid-in capital for the three and six months ended June 30, 2022. Please refer to section “Repurchase of the Convertible Senior Notes – 2019”.

Further details of the Notes are as follows:

Issuance	Maturity Date	Interest Rate	First Interest Payment Date	Effective Interest Rate	Semi-Annual Interest Payment Dates	Initial Conversion Rate per \$1,000 Principal	Initial Conversion Price	Number of Shares (in millions) ⁽¹⁾
2019 Notes	December 15, 2026	2%	June 15, 2020	2.47%	June 15; December 15	28.9415	\$ 34.55	N/A
2021 Notes	May 15, 2027	1.125%	May 15, 2022	1.72%	May 15; November 15	9.0061	\$ 111.04	2.6

(1) The 2019 Notes were repurchased in November 2021 (\$76.4 million) and June 2022 (\$9.85 million).

The Notes are senior unsecured obligations, do not contain any financial covenants and are governed by indentures for both (the Indentures). The total net proceeds from the Notes, after deducting initial debt issuance costs, fees and expenses, were \$83.5 million and \$278.4 million, respectively. We used a portion of the proceeds from the 2019 Notes to pay the cost of the capped call transactions described in the section “*Capped Calls*” and to repay our senior credit facility. We used approximately \$183.6 million of the net proceeds of the 2021 Notes, excluding accrued interest, to repurchase approximately \$76.4 million aggregate principal amount of the 2019 Notes through individual privately negotiated transactions concurrent with us offering the 2021 Notes. We used approximately \$17.6 million, excluding accrued interest, to repurchase the remaining \$9.85 million aggregate principal amount of the 2019 Notes in June 2022. Please refer to the section “*Repurchase of the Convertible Senior Notes - 2019*” for further details of both transactions. We will use the remainder of the net proceeds from the 2021 Notes for general corporate purposes.

Terms of the Notes

The Notes holders may convert their respective Notes at their option at any time prior to the close of business on the business day immediately preceding the respective conversion dates under the following circumstances:

- during any fiscal quarter commencing after the fiscal quarter ended on March 31, 2022 for the 2021 Notes (and only during such fiscal quarter), if the last reported sale price of our common stock, for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding fiscal quarter is greater than or equal to 130% of the conversion price on each applicable trading day;
- during the five business day period after any five consecutive trading day period in which the trading price per \$1,000 principal amount of the Notes for each trading day was less than 98% of the product of the last reported sale price of our

common stock and the conversion rate on each such trading day;

- prior to the close of business on the second scheduled trading day immediately preceding the redemption date if we call the Notes for redemption; or
- upon the occurrence of specified corporate events, as described in the indenture.

Regardless of the foregoing circumstances, holders may convert all or any portion of the Notes, in increments of \$1,000 principal amount, on or after February 15, 2027 (2021 Notes), until the close of business on the second scheduled trading day immediately preceding the maturity date.

We may redeem all, or a portion of the Notes for cash, at our option, on or after November 20, 2024 (2021 Notes), if the last reported sale price of our common stock has been at least 130% of the conversion price at least 20 trading days (whether or not consecutive) during any 30 consecutive trading day period at a redemption price equal to 100% of the principal amount of the Notes being redeemed, plus any accrued and unpaid interest to, but excluding, the redemption date.

Notes holders who convert their Notes in connection with certain corporate events that constitute a make-whole fundamental change (as defined in the Indenture) are, under certain circumstances, entitled to an increase in the conversion rate. Additionally in the event of a corporate event constituting a fundamental change (as defined in the Indenture), Notes holders may require us to repurchase all or a portion of their Notes at a repurchase price equal to 100% of the principal amount of the Notes being repurchased, plus any accrued and unpaid interest to, but excluding, the repurchase date.

Accounting for the Notes

Prior to January 1, 2021, we separated the 2019 Notes into liability and equity components.

We determined the fair value of the liability component to be \$52.5 million calculated as the present value of future cash flows discounted at the borrowing rate for a similar nonconvertible debt instrument based on the expected term. We determined the borrowing rate to be 9.90% based on the market rates for nonconvertible debt instruments issued by other companies with publicly available credit ratings considered to be comparable to us. We recognized the excess of the principal amount of the 2019 Notes over the initial carrying amount of the liability component as a debt discount of \$33.8 million and amortized it to interest expense over the expected term of the 2019 Notes using the effective interest rate method. We recorded the equity component of \$33.8 million as additional paid-in capital, calculated as the difference between the total proceeds of \$86.3 million and the initial carrying amount of the liability component.

We allocated the 2019 Notes total issuance costs of \$2.8 million between liability and equity in the same proportion as the allocation of our total proceeds to liability and equity components. We amortized the issuance costs attributable to the liability component of \$1.7 million to interest expense over the respective term of the 2019 Notes using the effective interest rate method. We netted the issuance costs attributable to the equity component of \$1.1 million against the respective equity component in additional paid-in capital.

Effective January 1, 2021, we early adopted ASU 2020-06 using the modified retrospective approach. As a result, we accounted for the 2019 Notes as a single liability measured at amortized cost, as no other embedded features require bifurcation and recognition as derivatives. Upon adoption, we recorded a \$29.3 million increase to long-term debt, a \$32.7 million decrease to additional paid-in capital and a \$3.4 million decrease to accumulated deficit. We had no changes to net deferred tax liabilities with a decrease in deferred tax liability offset by a corresponding increase in valuation allowance upon adoption.

We accounted for the 2021 Notes issuance as a single liability measured at its amortized cost, as no other embedded features require bifurcation and recognition as derivatives. We presented the 2021 Notes total issuance costs of \$9.1 million as a direct deduction from the face amount of the 2021 Notes. We amortized the issuance costs to interest expense over the respective term of the 2021 Notes using the effective interest rate method.

Interest expense related to the Notes was as follows (in thousands):

	Three Months Ended June 30, 2022			Three Months Ended June 30, 2021	
	2019 Notes	2021 Notes	Total	2019 Notes	Total
Amortization of debt issuance costs	8	395	403	93	93
Cash interest expense	38	809	847	432	432
Total interest expense	<u>\$ 46</u>	<u>\$ 1,204</u>	<u>\$ 1,250</u>	<u>\$ 525</u>	<u>\$ 525</u>

	Six Months Ended June 30, 2022			Six Months Ended June 30, 2021	
	2019 Notes	2021 Notes	Total	2019 Notes	Total
Amortization of debt issuance costs	19	788	807	187	187
Cash interest expense	87	1,617	1,704	863	863
Total interest expense	\$ 106	\$ 2,405	\$ 2,511	\$ 1,050	\$ 1,050

Accrued interest related to the 2019 Notes as of June 30, 2021 was \$77,000. Accrued interest related to the 2021 Notes as of June 30, 2022 was \$404,000. We record accrued interest in accrued liabilities in our consolidated balance sheet.

Our estimated fair value of the 2021 Notes was \$240.9 million and \$314.3 million as of June 30, 2022 and December 31, 2021, respectively, which we determined through consideration of quoted market prices. Our estimated fair value of the 2019 Notes was \$26.2 million as of December 31, 2021, which we determined through consideration of quoted market prices. The fair value for the Notes is classified as Level 2, as defined in Note 2.

Capped Calls

In connection with issuing the 2019 Notes, we entered into privately negotiated capped-call transactions with certain financial counterparties. The capped-call transactions are generally designed to reduce the potential dilution to our common stock upon any conversion or settlement of the 2019 Notes, or to offset any cash payments we are required to make in excess of the principal amount upon conversion of the 2019 Notes, as the case may be, with such reduction or offset subject to a cap based on the cap price. If, however, the market price per share of our common stock exceeds the cap price of the capped-call transactions, then our stock would experience some dilution and/or the capped call would not fully offset the potential cash payments, in each case, to the extent the then-market price per share of our common stock exceeds the cap price. The initial cap price of the capped-call transactions is \$54.20 per share, which represents a 100% premium over the last reported sale price of our common stock of \$27.10 per share on December 11, 2019 subject to certain adjustments under the terms of the capped-call transactions. The capped-call transactions expire over 40 consecutive scheduled trading days ending on December 11, 2026.

The capped-call transactions meet the criteria for classification in equity, are not accounted for as derivatives, and are not remeasured each reporting period. We paid \$10.1 million for the capped-call transactions, which we recorded as a reduction to additional paid-in-capital within shareholders' equity.

Repurchase of the Convertible Senior Notes – 2019

In November 2021 and June 2022, we completed a privately negotiated induced conversion of \$76.4 million and \$9.85 million principal amount, respectively of the 2019 Notes. We accounted for the 2019 Notes Repurchase transactions as induced conversions in accordance with Accounting Standards Codification 470-20, *Debt with Conversion and Other Options* (ASC 470-20). In connection with the induced conversions, we paid approximately \$183.6 million in cash in November 2021 and \$17.6 million in cash in June 2022, and also paid accrued and unpaid interest thereon. As a result of the induced conversion, we recorded \$11.3 million in November 2021 and \$2.2 million in June 2022 in induced conversion expense which is included in the Condensed Consolidated Statements of Operations. The induced conversion expense represents the fair value of the consideration issued upon conversion in excess of the fair value of the securities issuable under the original terms of the 2019 Notes. We accounted for the remaining cash consideration under the original terms of the 2019 Notes under the general conversion accounting guidance, where the difference between the carrying amount of the 2019 Notes retired, including unamortized debt issuance costs of \$1.8 million in November 2021 and \$199,000 in June 2022, and the cash consideration paid, was recorded in additional paid-in capital.

Note 7. Leases

The following table presents the components of lease expense in our condensed consolidated statements of operations for the periods presented (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2022	2021	2022	2021
Operating lease costs ^(a)				
Single lease costs	\$ 1,039	\$ 1,038	\$ 2,086	\$ 2,076
Variable lease costs	566	510	1,093	967
Sublease income ^(b)	(494)	(475)	(988)	(950)
Total operating lease costs	<u>\$ 1,111</u>	<u>\$ 1,073</u>	<u>\$ 2,191</u>	<u>\$ 2,093</u>

(a) Includes short-term lease costs, which are immaterial.

(b) Sublease income is related to unused office space that we sublet as part of the restructuring in fiscal 2018 where we continue to have the primary obligations.

The following table presents supplemental cash-flow information related to operating leases for the periods presented (in thousands):

	Six Months Ended June 30,	
	2022	2021
Cash paid for amounts included in the measurement of lease liabilities		
Operating cash flows used	\$ 2,528	\$ 2,445
Lease liabilities arising from remeasurement of right-of-use assets		
Operating leases	\$ —	\$ 698

The following table presents weighted-average remaining lease term and weighted-average discount rate related to operating leases as of the dates presented:

	June 30, 2022	December 31, 2021
Weighted-average remaining lease term (years)	4.1	4.4
Weighted-average discount rate	6.8 %	6.7 %

The following table presents future lease payments under operating leases as of June 30, 2022 (in thousands):

	Operating Leases		
	Lease Payments	Sublease Income	Net
2022	\$ 2,544	\$ (739)	\$ 1,805
2023	3,592	(123)	3,469
2024	3,283	—	3,283
2025	3,331	—	3,331
2026	3,414	—	3,414
Thereafter	—	—	—
Total lease payments	<u>\$ 16,164</u>	<u>\$ (862)</u>	<u>\$ 15,302</u>
Less: Imputed interest	(2,121)		
Present value of lease liabilities	14,043		
Less: Current portion of lease liabilities	3,635		
Lease liabilities, net of current portion	<u>\$ 10,408</u>		

Note 8. Net Loss Per Share

Upon us adopting ASU 2020-06 using the modified retrospective transition method on January 1, 2021, we applied the “if-converted” method for calculating any potential dilutive effect of the conversion of the 2019 Notes or the 2021 Notes on diluted net loss per share for the three and six months ended June 30, 2022 and June 30, 2021.

The following table provides a reconciliation of the numerator and denominator used in computing basic and diluted net loss per share for the periods presented (in thousands, except per share amounts):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2022	2021	2022	2021
Numerator:				
Net loss	\$ (11,523)	\$ (8,906)	\$ (21,984)	\$ (18,322)
Denominator:				
Weighted-average shares outstanding — basic and diluted	25,429	24,120	25,204	23,895
Net loss per share — basic and diluted	<u>\$ (0.45)</u>	<u>\$ (0.37)</u>	<u>\$ (0.87)</u>	<u>\$ (0.77)</u>

The following table presents the outstanding shares of our common stock equivalents excluded from the computation of diluted net loss per share as of the dates presented because their effect would have been antidilutive (in thousands):

	Three and Six Months Ended June 30,	
	2022	2021
Stock options	2,047	2,645
RSUs, MSUs, and PSUs	1,714	1,582
Employee stock purchase plan shares	29	31
2019 Notes	—	2,496
2021 Notes	2,589	—

Note 9. Segment Information

We have one reportable operating segment, which is the development and sale of our RAIN RFID products and services. We identify this one reportable segment based on how our chief operating decision-maker manages our business, makes decisions and evaluates our operating performance. Our chief executive officer is the chief operating decision-maker and reviews financial and operational information on an entity-wide basis as one business activity. We do not have segment managers who are separately accountable for operations, operating results or plans. Accordingly, we determined that we have a single reportable operating segment.

The chief executive officer reviews information about our revenue categories, which are endpoint ICs and systems. We define systems as reader ICs, readers, gateways and software. The following table presents our revenue categories for the periods presented (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2022	2021	2022	2021
Endpoint ICs	\$ 42,854	\$ 30,784	\$ 81,649	\$ 68,866
Systems	16,942	16,484	31,291	23,650
Total revenue	<u>\$ 59,796</u>	<u>\$ 47,268</u>	<u>\$ 112,940</u>	<u>\$ 92,516</u>

Note 10. Deferred Revenue

Deferred revenue, comprising individually immaterial amounts for extended warranty, enhanced maintenance and advance payments on non-recurring engineering services contracts, represents contracted revenue that has not yet been recognized. Deferred revenue as of December 31, 2020, included a \$6.0 million advance payment for a system order, which we recognized as revenue in first-half 2021. We recognized \$270,000 of revenue related to amounts included in deferred revenue as of December 31, 2021 for the six months ended June 30, 2022. We recognized \$6.6 million of revenue related to amounts included in deferred revenue as of December 31, 2020 for the six months ended June 30, 2021.

The following table presents the changes in deferred revenue for the periods presented (in thousands):

	Six Months Ended June 30,	
	2022	2021
Balance at beginning of period	\$ 794	\$ 7,088
Deferral of revenue	2,661	319
Recognition of deferred revenue	(459)	(6,872)
Balance at end of period	\$ 2,996	\$ 535

Note 11. Related-Party Transactions

We have a consulting agreement with a limited liability company owned by Cathal Phelan, a member of our board of directors, pursuant to which Mr. Phelan provides advisory and consulting services. The term of the consulting agreement began in May 2020 through December 2020, which was extended by an additional 12 months to December 2021 as mutually agreed upon by Mr. Phelan and us. In 2021, again as mutually agreed by Mr. Phelan and us, we further extended the term by 12 months to December 2022. We recognized \$134,000 and \$269,000 of consulting fee expense to Mr. Phelan, or the limited liability company owned by Mr. Phelan, for the three and six months ended June 30, 2022, respectively. We recognized \$115,200 and \$249,600 of consulting fee expense to Mr. Phelan, or the limited liability company owned by Mr. Phelan, for the three and six months ended June 30, 2021, respectively.

Note 12. Restructuring

On February 2, 2021, we restructured our go-to-market organization to strategically align our global sales, product, partner development and marketing teams. As part of the restructuring, we eliminated approximately seven full-time positions within our go-to-market organization, representing about 2% of our workforce. We incurred restructuring charges of \$1.7 million for employee termination benefits as well as \$50,000 in other associated costs for legal expenses for the year ended December 31, 2021. We substantially completed our restructuring by June 30, 2021.

A summary of accrued restructuring costs as of June 30, 2022, is shown in the table below (in thousands):

	Employee Termination Benefits	Other Associated Costs	Total
Restructuring costs incurred in 2021	\$ 1,671	\$ 50	\$ 1,721
Cash payments in 2021	\$ (1,080)	\$ (50)	\$ (1,130)
Cash payments in 2022	(472)	—	(472)
Accrued restructuring costs as of June 30, 2022	\$ 119	\$ —	\$ 119

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

This report contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Statements containing words such as “may,” “believe,” “anticipate,” “expect,” “intend,” “plan,” “project,” “projections,” “business outlook,” “estimate,” or similar expressions constitute forward-looking statements. You should read these statements carefully because they discuss future expectations, contain projections of future results of operations or financial condition or state other “forward-looking” information. These statements relate to our future plans, objectives, expectations, intentions and financial performance and the assumptions that underlie these statements. They include, but are not limited to, statements about:

- our market opportunity; the adoption of RAIN RFID technology and solutions; our ability to compete effectively against competitors and competing technologies; our market share and technology leadership; and the implementation of our business model, strategic plans and product development plans;*
- the impact of Covid-19, including on macroeconomic conditions, supply chains and our business, results of operations and financial condition;*
- our future financial performance, including our average selling prices, gross margins, liquidity and capital resources, as well as future macroeconomic conditions;*
- the performance of third parties on which we rely for product manufacturing, assembly and testing; and our relationship with third parties on which we rely for product distribution, sales, integration and development; our ability to adequately protect our intellectual property;*
- the regulatory regime for our products and services; and*
- our leadership of standards-setting processes.*

Our actual results may differ materially from those contained in or implied by any forward-looking statements. Factors that could cause or contribute to these differences include those discussed below and elsewhere in this report, including those factors discussed in Part II, Item 1A (Risk Factors).

In light of the significant uncertainties and risks inherent in these forward-looking statements, you should not regard these statements as a representation or warranty by us or anyone else that we will achieve our objectives and plans in any specified time frame, or at all, or as predictions of future events. Moreover, neither we nor any other person assumes responsibility for the accuracy and completeness of the forward-looking statements. We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

Our Business

Our vision is a boundless Internet of Things, or IoT. We are driving a future in which everyday physical items are wirelessly connected to digital counterparts, or digital twins, in the cloud, and in which businesses and people access information about an item from its digital twin. Our mission is to connect every thing. We deliver a platform that powers item-to-cloud connectivity, and on which enterprise solution providers innovate IoT whole products.

Today, we deliver the identity, location and authenticity of billions of physical items. We believe our future is extending that delivery to trillions of physical items and enabling ubiquitous access to cloud-based digital twins of those items, each storing an item’s ownership, history and links. We believe the item-to-cloud connectivity that our platform will deliver will enhance businesses efficiencies and commerce and, ultimately, improve peoples’ lives.

Our platform, which comprises multiple product families, wirelessly connects individual items and delivers data about the connected items to business and consumer applications enabled by our partner network. We link the products within our platform to deliver capabilities and performance that surpasses mix-and-match solutions built from competitor products.

We and our partners connect the items via a miniature radio chip embedded in the item or in its packaging, reading and delivering each item’s identity, location and authenticity. To date, we have enabled connectivity to more than 60 billion items, enabling businesses and consumers to derive timely information from those connected items.

Our platform uses RAIN, a type of radio-frequency identification, or RFID, technology we pioneered. We spearheaded development of the RAIN radio standard, lobbied governments to allocate frequency spectrum and cofounded the RAIN Alliance that today has more than 150 member companies. Our industry uses free spectrum in 81 countries encompassing roughly 95% of the world’s GDP and has connected many tens of billions of items to date. We believe RAIN’s capabilities – in particular, endpoint ICs with serialized identifiers, 30-foot range reading up to 1,000 items per second without line-of-sight, radio-frequency energy harvesting for battery-free operation, essentially unlimited life and, in the future, cryptographic item authentication – position RAIN to be the leading item-to-cloud connectivity technology for the IoT.

Factors Affecting Our Performance

Inventory Supply

From time to time, we experience inventory overages or shortages, either due to us mis-estimating customer or end-user demand; constrained supplier manufacturing capacity or product availability, including impacts from Covid-19; fluctuations in our market, including competitor product availability or in the global economy; changes in regulations or tariffs; or for a host of other reasons. These inventory dynamics can impact some or all our products. High inventory levels can result in product obsolescence, increases in reserves or unexpected expenses that adversely affect our business. Low inventory levels can affect our ability to meet customer demand, lengthen lead times and potentially cause us to miss opportunities, lose market share and/or damage customer relationships, also adversely affecting our business. For example, in 2010 we experienced wafer shortages relative to our submitted endpoint IC wafer purchase orders because of high worldwide demand for semiconductor foundry capacity. These shortages adversely affected our ability to meet our customers' demand and, in some cases, caused customers to cancel orders, qualify alternative suppliers or purchase from our competitors.

In 2020, during the Covid-19 economic downturn, we built endpoint IC inventory. Beginning in fourth-quarter 2020, demand for all our endpoint ICs increased dramatically. Worldwide wafer demand also increased dramatically, leading to wafer shortfalls in many industries, including ours. In first-quarter 2021, we consumed the inventory we built in 2020 at a pace that exceeded our first-quarter 2021 wafer supply and post-processing capacity. In the second and third quarters, we moderated our sales and inventory burndown, stretching our IC supply but constraining our ability to fully capitalize on the increased endpoint IC demand, while we also expanded and matured our post-processing capacity. Despite that moderation, by end of third-quarter 2021 we had mostly consumed our prebuilt inventory. Demand for our endpoint ICs continued to exceed our ability to supply in both fourth-quarter 2021 and first-half 2022, and we expect it to continue during the remainder of 2022.

Our foundry partner has signaled continued tight availability for endpoint IC wafers in our process nodes into 2023, preventing us from fully capitalizing on our demand. Although we believe they have prioritized us for upside wafers, and have allocated sufficient second-half 2022 upside wafers for us to deliver second-half 2022 endpoint IC volumes that exceed first half, much of the upside is 200mm rather than 300mm wafers, causing us to transition some customers back from M700 to our older product families. And even with this upside, we remain unable to fully satisfy demand. These mix shifts and supply shortfalls may cause us to lose market share if our competitors are able to deliver higher endpoint IC volumes than we can. Any inability to obtain sufficient wafer supply, or the right mix of wafer supply at reasonable prices, or wafer supply at all, would negatively impact our operating results and prospects.

We also experienced supply constraints for systems components in 2021 and in first-half 2022. Those constraints limited our ability to deliver sufficient systems products to meet demand. For reader ICs, we experienced long packaging lead times for our Indy reader IC product and testing delays for our new E-family. The Indy lead times stabilized by the end of first-half 2022 and we expect the E-family testing delays to stabilize in second-half 2022, allowing us to catch up to demand by year end. For readers and gateways, we saw shortages and price increases for electronic and other components, negatively impacting product availability. We expect the shortages to persist at least through the end of 2022. For all products, we passed the cost increases to our customers. Overall, these packaging, test and supply shortfalls, as well as the cost increases, may decrease sales and cause market-share losses if our customers purchase competing products over ours. Any inability to obtain sufficient systems supply at reasonable prices, or at all, would negatively impact our operating results and prospects.

Covid-19

We are actively monitoring and mitigating the impacts of Covid-19 in all aspects of our business, including for our employees, suppliers, partners and end users.

In 2021, as the worldwide economy began to recover from the downturn caused by Covid-19, demand for all our products increased. Unfortunately, at the same time, we experienced supply constraints and higher costs that limited our ability to capitalize on the increased demand, as discussed above.

Government restrictions in the early days of the pandemic caused us to mostly close our offices starting early 2020. Today, except for those employees who need to be in the office to fulfill their roles, most of our employees still work from home. As we begin reopening our offices, our first priority is protecting our employees' health and safety, and we will prioritize health and safety over a rapid office return.

Recently, a resurgence of Covid-19 in geographies where our manufacturing subcontractors are located has caused governments to reinstitute mandatory factory staff reductions, facility closures or both, impacting our endpoint IC and systems production and our ability to ship products.

Covid-19 travel restrictions adversely affected our business by slowing new-product launches and typical sales activities, and those activities are still somewhat restricted. We previously anticipated that second-half 2021 and first-half 2022 would bring a return to some semblance of travel and sales normalcy, but for the most part our anticipations were not met. Moreover, there is no assurance that Covid-19's impact on our employees or business activities will return to normal in second-half 2022. Our compliance with legal and regulatory requirements related to Covid-19 may subject us to future challenges, particularly as those requirements evolve.

Covid-19 negatively impacted our results of operations, cash flows and financial position in 2020. It caused supply and travel disruptions in 2021. We expect it to continue disrupting our business in 2022, in ways that are difficult for us to fully predict. Given the ongoing uncertainty over Covid-19's epidemiological, economic and operational impacts we cannot reasonably estimate the extent or duration of Covid-19's continuing impact on our business. The extent to which Covid-19 impacts our future results will depend on developments that are inherently unpredictable, including the emergence of new Covid-19 variants and actions we and others take in response to Covid-19.

For more information on Covid-19's impact on our business, please refer to Part I, Item 1A (Risk Factors) of this report.

Investing for Growth

We have invested in, and plan to continue investing in, research and development to enhance and extend our platform, including enhancing existing products, introducing new products and tightening the platform linkages between our products. Although we sell our products into many end markets, relying significantly on our partner channel, we are today focusing particular attention on retail self-checkout and loss prevention and supply chain and logistics, or SC&L, portal and conveyor opportunities.

Most of our investments precede any sales benefits from the investments and, in some instances, we may never see any benefits if the market is not receptive to our product or sales approach, product development is late or fails, or for other causes. We sometimes enter into arrangements with end users, suppliers or channel partners for them to fund a portion of our investment, but even in those instances the results of our investments remain uncertain, and in some instances, we may be required to refund the investment if the development is unsuccessful or the market opportunity fails to materialize. In some instances, we delay or cancel investments without or until we obtain such funding. The outcome of an investment is almost always uncertain, and if our results do not meet expectations then our operating results, profitability and stock price may be adversely affected.

While our long-term plan to invest for growth remains unchanged, Covid-19 has introduced new uncertainty to our business. We will continue to monitor the impacts of Covid-19 on our supply chain, market and opportunities and adjust our investment strategy as appropriate.

Market Adoption

Our financial performance depends on the pace and scope of end-user adoption of our products in multiple industries, but especially in retail apparel, which is our largest market. Covid-19 has had, and we expect it to continue to have, a materially adverse impact on the retail industry. Covid-19 may also accelerate an ongoing shift in consumer shopping away from physical stores, which could adversely affect demand for endpoint ICs by retailers. The extent to which Covid-19 materially impacts the retail industry is unclear, as is the extent to which it will impact our product sales. Other industries that are potential future drivers of RAIN adoption have also been impacted by Covid-19, although the long-term impact on our business is unclear. For example, the aviation industry, which had proposed widespread luggage tagging, has been negatively impacted by Covid-19. By contrast, SC&L has experienced increased demand which could positively impact our financial performance if SC&L further adopts RAIN.

The pace and scope of end-user adoption, slowed in 2020 by Covid-19, remains uncertain today, potentially causing large fluctuations in our operating results. For a first historical example of the potential impact of those fluctuations, in 2015 and 2016 several major retailers commenced deployments that significantly increased our endpoint IC sales, lengthening our product lead times. In 2017 we invested in endpoint IC inventory to reduce those lead times, but in second-half 2017 the endpoint IC growth rate slowed, we believe due primarily to delays in new deployments at several large retailers. That decelerating growth rate engendered an endpoint IC channel inventory correction that negatively impacted our operating results for several subsequent quarters. For a second historical example, in late 2018 and in 2019 a large North American logistics provider purchased and deployed significant quantities of our gateways, positively impacting our operating results for several quarters, then transitioned to an operational phase in first-half 2020, reducing our gateway sales. For a third historical example, in first-quarter 2020 we saw high endpoint IC demand as our inlay partners built inventory ahead of Covid-19, followed by several quarters of depressed demand as those same inlay partners consumed that inventory, followed by high demand in 2021 as those same inlay partners deliver into recovering end-user opportunities.

Given the uncertainties in our market, we cannot be certain that RAIN adoption will continue; that we will have appropriate product inventory; that we will not experience future product inventory shortfalls or overages; or that Covid-19 will not materially impact our business going forward. We also cannot be certain that we will be able to maintain or grow our market share for any of our

products, whether because of insufficient inventory, Covid-19, competitors copying our products, insufficient wafer or other product supply, competition generally or for a host of other reasons, many of which are outside our control.

Regardless of the uneven pace of retail, SC&L and other industry adoption, we believe the underlying, long-term trend is continued RAIN adoption and as a result we have continued investing in new products. In our endpoint IC business, in 2020 we introduced our new Impinj M700, which offers significant performance advantages over other endpoint ICs on the market and which we believe will foster adoption. In our systems business, in 2020 we introduced our new Impinj R700 reader and in 2021 our new Impinj E710, E510 and E310 reader ICs, which likewise offer significant performance advantages over other readers and reader ICs on the market and which we believe will also foster adoption. Market adoption could be impacted by product availability. See further discussion of product availability under “Inventory Supply”.

We sell our products through partners and distributors and have limited ability to determine end-user demand. Consequently, we may incorrectly forecast that demand or not identify market shifts in a timely fashion, potentially affecting our business adversely. If RAIN market adoption, and adoption of our products specifically, does not meet our expectations or if we are unable to meet partner or end-user volume or performance expectations, because of the impact of Covid-19, recovering demand, or otherwise, then our operating results and growth prospects will be adversely affected. If we reduce prices to win opportunities, then our gross margins may be negatively affected. In contrast, if our endpoint IC, reader IC, reader or gateway sales exceed expectations, then our revenue and profitability may be positively affected.

Timing and Complexity of End Customer Deployments

From 2010 to 2021, our endpoint IC sales volumes increased at a compounded annual growth rate of 27%. However, the pace has been uneven and unpredictable. For example, our endpoint IC unit sales volumes increased significantly in 2016, declined in second-half 2017 and in first-half 2018, returned to growth in second-half 2018 and in 2019 (the latter albeit not at the same pace as in 2016), declined again in second- and third-quarter 2020 due to Covid-19, and recovered in fourth-quarter 2020, in 2021 and in first-half 2022. We expect short-term demand to remain unpredictable in scope and timing. Longer term, we believe our endpoint IC opportunity will continue to grow, but we cannot predict whether historical annual growth rates are indicative of the pace of future growth.

Our systems business, at least for our readers and gateways, relies disproportionally on large-scale deployments at discrete end users. The timing of those large deployments causes large variability in our systems revenue. For example, we generated 14% of total 2019 revenue from a large North American SC&L provider in connection with a project-based gateway deployment. We did not have comparable new project-based revenue in 2020. As another example, in second-quarter 2021, we generated 13% of our quarterly revenue from a project-based gateway deployment for RAIN-based loss-prevention at a large European retailer.

Finally, although we promote our platform as an integrated offering, we sell our products individually, and end users often use only certain of our products. For any given end-user solution, whether an end user chooses to deploy our entire platform or only a portion will also affect our operating results.

Average Selling Price

Our product average selling prices, or ASPs, fluctuate based on competitive pressures and the discounting we offer to win opportunities, but generally decline over time. Historically, we have been able to compensate these ASP declines by reducing the per-unit cost of most of our products, by reducing supplier costs and implementing manufacturing and quality improvements, as well as by introducing newer and lower-cost products, but the timing of these cost reductions and new-product introductions fluctuates and may not materialize in any given quarter or year. In second-half 2021, due to wafer and component supply shortfalls at many of our suppliers, we began experiencing increasing rather than decreasing costs for both endpoint ICs and systems. In fourth-quarter 2021, our foundry partner increased our wafer pricing and we began raising prices to offset the impact of those increased costs. Many of our vendors and subcontractors have signaled future price increases, although the timing and significance of these price increases are currently unknown. Such increases, if or when they occur, could cause us to pass the higher costs to our customers. If we are unable to successfully increase our prices or if our customers choose competitors’ products due to our higher prices, then our product margins, operating results or both may suffer. In the near term, we expect margins to be volatile based on product mix and the timing of our price changes.

Seasonality

We typically renegotiate pricing with most of our endpoint IC OEMs with an effective date of the first quarter of the calendar year, reducing both revenue and gross margins in the first quarter compared to prior periods. Historically, the impact tends to decline in subsequent quarters as we reduce costs and, to the extent we can migrate our customers to newer, lower-cost products, adjust product mix. Endpoint IC volumes also tend to be historically lower in the fourth quarter than in the third quarter. We may not see these historical trends hold in 2022 due to the price increases noted above, and ongoing demand, and supply constraints.

System sales tend to be stronger in the fourth quarter of the calendar year, and less strong in the first quarter. We believe this seasonality is due to the availability of residual funding for capital expenditures prior to the end of many customers' fiscal years. Like for our endpoint ICs, we may not see these historical trends hold in 2022 due to the price increases noted above and ongoing demand, and supply constraints.

While, over the longer term, we expect these seasonal trends to continue, quarter-to-quarter variability in our revenue can be caused by a number of factors including uncertainty in demand and supply, the timing of large deployments, competitor product availability as well as supply constraints, any or all of which can mask seasonality in any given period. These risks and uncertainties, as well as other risks and uncertainties, including but not limited to the impacts of Covid-19, can cause our actual results to differ significantly from our expectations, as described in greater detail in the sections of this report captioned "— Covid-19" and in Part I, Item 1A (Risk Factors).

Results of Operations

The following table presents our results of operations for the periods indicated:

(in thousands, except percentages)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Revenue	\$ 59,796	\$ 47,268	\$ 12,528	\$ 112,940	\$ 92,516	\$ 20,424
Gross profit	\$ 31,502	\$ 24,777	\$ 6,725	\$ 60,281	\$ 46,758	\$ 13,523
Gross margin	52.7%	52.4%	0.3%	53.4%	50.5%	2.9%
Loss from operations	\$ (8,476)	\$ (8,317)	\$ (159)	\$ (17,791)	\$ (17,189)	\$ (602)

Three months ended June 30, 2022 compared with three months ended June 30, 2021

Revenue and gross profit increased, due primarily to higher endpoint IC revenue which was driven by higher ASP and shipment volumes. Gross margin increased, due primarily to higher product margin, offset by higher indirect costs. Loss from operations remained comparable to the prior period, with increased gross profit offset by increased operating expenses. The operating-expense increase was due primarily to higher research and development and sales and marketing personnel costs; stock-based compensation expense; and non-settlement-related legal fees.

Six months ended June 30, 2022 compared with six months ended June 30, 2021

Revenue and gross profit increased, due primarily to higher endpoint IC and systems revenue compared to the prior year. The endpoint IC increase was driven by higher ASP offset by lower shipment volumes, including reduced volumes of fully reserved inventory. The systems increase was driven by volume and ASP increases in reader and reader ICs. Gross margin increased, due primarily to increased product margins, offset by less sales of fully reserved inventory and the impact of higher indirect costs. Loss from operations increased slightly from the prior period due to increased gross profit offset by increased operating expenses. The operating-expense increase was due primarily to higher research and development, sales and marketing and general and administrative personnel costs; stock-based compensation expense; non-settlement-related legal fees, product-development costs; and infrastructure costs.

Revenue

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Endpoint ICs	\$ 42,854	\$ 30,784	\$ 12,070	\$ 81,649	\$ 68,866	\$ 12,783
Systems	16,942	16,484	458	31,291	23,650	7,641
Total revenue	\$ 59,796	\$ 47,268	\$ 12,528	\$ 112,940	\$ 92,516	\$ 20,424

We currently derive substantially all our revenue from sales of endpoint ICs, reader ICs, readers and gateways. We sell our endpoint ICs primarily to inlay manufacturers; our reader ICs primarily to OEMs and ODMs through distributors; and our readers and gateways to value-added resellers, or VARs, and system integrators, or SIs, primarily through distributors. We expect endpoint IC sales to represent the majority of our revenue for the foreseeable future.

Three months ended June 30, 2022 compared with three months ended June 30, 2021

Endpoint IC revenue increased \$12.1 million, due primarily to a \$9.0 million increase due to higher ASPs and a \$3.1 million increase in higher shipment volumes. The ASP increase was due primarily to product mix, with a higher contribution from industrial and specialized products, as well as to price increases that we implemented in fourth-quarter 2021.

Systems revenue increased \$458,000, due primarily to increases of \$2.1 million in reader IC revenue and \$1.3 million in reader revenue, offset by a \$2.7 million decrease in gateway revenue. The increased reader IC revenue was due to increased shipment volumes and higher ASPs. The increased reader revenue was due to higher ASPs. The decreased gateway revenue was due to decreased shipment volumes as well as lower ASPs.

Six months ended June 30, 2022 compared with six months ended June 30, 2021

Endpoint IC revenue increased \$12.8 million, due primarily to a \$17.2 million increase due to higher ASPs, offset by a \$4.4 million decrease in shipment volumes, including reduced volumes of fully reserved inventory. The ASP increase was due primarily to product mix, with a higher contribution from industrial and specialized products, as well as to price increases that we implemented in fourth-quarter 2021.

Systems revenue increased \$7.6 million, due primarily to increases of \$6 million in reader revenue and \$4.3 million in reader IC revenue, offset by decreases of \$1.9 million in gateway revenue and \$790,000 in NRE revenue (Non-Recurring Engineering revenue). The increase in reader and reader IC revenue was due to increased shipment volumes as well as higher ASPs. The decrease in gateway revenue was due to lower ASPs.

For more information, see the sections captioned “—Factors Affecting Our Performance—Covid-19” and “Risk Factors—Covid-19 has adversely affected our business, and the magnitude and duration of future Covid-19 effects on our financial position, results of operations, cash flows and business prospects are uncertain.”

Gross Profit and Gross Margin

(in thousands, except percentages)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Cost of revenue	\$ 28,294	\$ 22,491	\$ 5,803	\$ 52,659	\$ 45,758	\$ 6,901
Gross profit	\$ 31,502	\$ 24,777	\$ 6,725	\$ 60,281	\$ 46,758	\$ 13,523
Gross margin	52.7%	52.4%	0.3%	53.4%	50.5%	2.9%

Cost of revenue includes costs associated with manufacturing our endpoint ICs, reader ICs, readers and gateways, including direct materials and outsourced manufacturing costs as well as associated overhead costs such as logistics, quality control, planning and procurement. Cost of revenue also includes charges for excess and obsolescence and warranty costs. Our gross margin varies from period to period based on mix of endpoint IC and systems, underlying product margins driven by changes in ASPs or costs, as well as from inventory excess and obsolescence charges.

Three months ended June 30, 2022 compared with three months ended June 30, 2021

Gross profit increased, due primarily to higher endpoint IC revenue and higher gross margins. The higher gross margins were due primarily to higher product margin offset by higher indirect costs. Product margin increased primarily due to endpoint IC margins, the result of higher contribution from industrial and specialty products as well as a larger mix of M700 endpoint ICs, slightly offset by a decrease in systems margins due to less high-margin project revenue and due to endpoint IC and systems mix with systems representing a smaller portion of our total revenue.

Six months ended June 30, 2022 compared with six months ended June 30, 2021

Gross profit increased, due primarily to higher endpoint IC and systems revenue and higher gross margins. The gross margin increase was due primarily to higher product margin offset by less sales of fully reserved inventory and the impact of higher indirect costs. Product margin increased primarily due to endpoint IC margins, the result of higher contribution from industrial and specialty products and a larger mix of M700 endpoint ICs, and due to endpoint IC and systems mix with systems representing a larger portion of our total revenue, offset by a decrease in systems margins due to less high-margin project revenue. Sales of fully reserved inventory had an immaterial gross margin impact in first-half 2022 compared to a favorable gross margin impact of 1.2% in first-half 2021.

Operating Expenses

Research and Development

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Research and development	\$ 18,369	\$ 15,900	\$ 2,469	\$ 36,358	\$ 29,691	\$ 6,667

Research and development expense comprises primarily personnel expenses (salaries, benefits and other employee related costs) and stock-based compensation expense for our product-development personnel; product development costs which include external consulting and service costs, prototype materials and other new-product development costs; and an allocated portion of infrastructure costs which include occupancy, depreciation and software costs. We expect research and development expense to increase in absolute dollars in future periods as we focus on new product development and introductions.

Three months ended June 30, 2022 compared with three months ended June 30, 2021

Research and development expense increased \$2.5 million, due primarily to increases of \$2.0 million in personnel expenses due to higher headcount and a change in our bonus payment structure from 100% PSUs to 50% cash and 50% PSUs, and \$520,000 in infrastructure costs from increased software costs.

Six months ended June 30, 2022 compared with six months ended June 30, 2021

Research and development expense increased \$6.7 million, due primarily to increases of \$3.2 million in personnel expenses from higher headcount and the change in bonus payment structure from 100% PSUs to 50% cash and 50% PSUs, \$1.4 million in stock-based compensation expense primarily related to increased outstanding equity grants, \$1.2 million in infrastructure costs from increased software costs and \$660,000 in product development costs.

Sales and Marketing

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Sales and marketing	\$ 9,614	\$ 8,196	\$ 1,418	\$ 18,913	\$ 15,841	\$ 3,072

Sales and marketing expense comprises primarily personnel expenses (salaries, incentive sales compensation, or commission, benefits and other employee related costs) and stock-based compensation expense for our sales and marketing personnel; travel, advertising and promotional expenses; and an allocated portion of infrastructure costs which include occupancy, depreciation and software costs. We expect sales and marketing expense to remain approximately constant on an absolute dollar basis, except for incentive sales compensation which fluctuates as a function of revenue. Expenses associated with our sales and marketing activities related to marketing events requiring travel will continue to fluctuate depending on current and future Covid-19 travel restrictions.

Three months ended June 30, 2022 compared with three months ended June 30, 2021

Sales and marketing expense increased \$1.4 million, due primarily to increases of \$970,000 in personnel expenses from higher headcount and the change in bonus payment structure from 100% PSUs to 50% cash and 50% PSUs, and \$320,000 in stock-based compensation expense primarily related to increased outstanding equity grants.

Six months ended June 30, 2022 compared with six months ended June 30, 2021

Sales and marketing expense increased \$3.1 million, due primarily to increases of \$1.3 million in personnel expenses from higher headcount and the change in bonus payment structure from 100% PSUs to 50% cash and 50% PSUs, \$1.3 million in stock-based compensation expense primarily related to increased outstanding equity grants, \$280,000 in contractor expenses and \$211,000 in marketing and advertising expenses.

General and Administrative

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
General and administrative	\$ 11,995	\$ 8,998	\$ 2,997	\$ 22,801	\$ 17,152	\$ 5,649

General and administrative expense comprises primarily personnel expenses (salaries, benefits, and other employee related costs) and stock-based compensation expense for our executive, finance, human resources and information technology personnel; legal, accounting and other professional service fees; travel and insurance expense; and an allocated portion of infrastructure costs which include, occupancy, depreciation and software costs.

Three months ended June 30, 2022 compared with three months ended June 30, 2021

General and administrative expense increased \$3.0 million, due primarily to a \$1.9 million increase in non-settlement-related legal fees, a \$576,000 increase in personnel expenses from higher headcount and the change in bonus payment structure from 100% PSUs to 50% cash and 50% PSUs, and \$360,000 increase in stock-based compensation expense primarily related to increased outstanding equity grants.

Six months ended June 30, 2022 compared with six months ended June 30, 2021

General and administrative expense increased \$5.6 million, due primarily to a \$3.0 million increase in non-settlement-related legal fees, \$1.3 million in stock-based compensation expense primarily related to increased outstanding equity grants and \$835,000 in personnel expenses from higher headcount and the change in bonus payment structure from 100% PSUs to 50% cash and 50% PSUs.

Induced Conversion Expense

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Induced conversion expense	\$ 2,232	\$ —	\$ 2,232	\$ 2,232	\$ —	\$ 2,232

In June 2022, we repurchased the remaining \$9.85 million principal amount of the 2019 Convertible Notes (“2019 Note Repurchase”). We accounted for the 2019 Notes Repurchase transaction as an induced conversion in accordance with Accounting Standards Codification 470-20, Debt with Conversion and Other Options (ASC 470-20). As a result of the induced conversion, we recorded \$2.2 million in induced conversion expense which is included in the Consolidated Statements of Operations for the three and six months ended June 30, 2022. The induced conversion expense represents the fair value of the consideration issued upon conversion in excess of the fair value of the securities issuable under the original terms of the 2019 Convertible Notes. For further information on the 2019 Notes, please refer to Note 6 to our consolidated financial statements included elsewhere in this report.

Restructuring Costs

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Restructuring costs	\$ —	\$ —	\$ —	\$ —	\$ 1,263	\$ (1,263)

On February 2, 2021, we restructured our go-to-market organization to strategically align our global sales, product, partner development and marketing teams. As part of the restructuring, we eliminated approximately seven full-time positions in our go-to-market organization, representing about 2% of our workforce. We incurred restructuring charges of \$1.7 million for employee termination benefits as well as \$50,000 in other associated legal costs for the year ended December 31, 2021. We substantially completed our restructuring by June 30, 2021. For further information on this restructuring, please refer to Note 12 to our condensed consolidated financial statements included elsewhere in this report.

Other Income (Expense), net

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Other income (expense), net	\$ 429	\$ (4)	\$ 433	\$ 593	\$ 19	\$ 574

Other income (expense), net comprises primarily interest income on our short-term investments.

Other income (expense), net increased from the prior periods due to an increase in interest rates.

Interest Expense

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Interest expense	\$ 1,250	\$ 525	\$ 725	\$ 2,511	\$ 1,050	\$ 1,461

Interest expense comprises primarily cash interest, amortization of debt issuance costs and debt discount on our debt.

In August 2020, the FASB issued guidance on debt with conversion and other options, or ASU 2020-06. On January 1, 2021, we adopted ASU 2020-06 using the modified retrospective transition method, accounting for the 2019 Notes on a whole-instrument basis. Our condensed consolidated financial statements for the three months ended June 30, 2022 and June 30, 2021, are presented under the new standard and we no longer record amortization of debt discount.

Three months ended June 30, 2022 compared with three months ended June 30, 2021

Interest expense increased \$725,000, due primarily to us issuing the \$287.5 million aggregate principal amount of the 2021 Notes in November 2021, due May 15, 2027. For further information on the 2021 Notes, please refer to Note 6 to our consolidated financial statements included elsewhere in this report.

Six months ended June 30, 2022 compared with six months ended June 30, 2021

Interest expense increased \$1.5 million, due primarily to us issuing the \$287.5 million aggregate principal amount of the 2021 Notes in November 2021, due May 15, 2027. For further information on the 2021 Notes, please refer to Note 6 to our consolidated financial statements included elsewhere in this report.

Income Tax Expense

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Income tax expense	\$ (6)	\$ 60	\$ (66)	\$ 43	\$ 102	\$ (59)

We are subject to federal and state income taxes in the United States and foreign jurisdictions. Income tax expense remained comparable for the periods stated above.

Non-GAAP Financial Measures

Our key non-GAAP performance measures include adjusted EBITDA and non-GAAP net income (loss), as defined below. We use adjusted EBITDA and non-GAAP net income (loss) as key measures to understand and evaluate our core operating performance and trends, to prepare and approve our annual budget and to develop short- and long-term operating plans. We believe these measures provide useful information for period-to-period comparisons of our business to allow investors and others to understand and evaluate our operating results in the same manner as our management and board of directors. Our presentation of these non-GAAP financial measures is not meant to be considered in isolation or as a substitute for our financial results prepared in accordance with GAAP, and our non-GAAP measures may be different from similarly termed non-GAAP measures used by other companies.

Adjusted EBITDA

We define adjusted EBITDA as net income (loss) determined in accordance with GAAP, excluding, if applicable for the periods presented, the effects of stock-based compensation; depreciation; investigation costs; restructuring costs; settlement and related costs; induced conversion expense; other income, net; interest expense; loss on debt extinguishment; and income tax benefit (expense). In fourth-quarter 2021, we revised our definition of adjusted EBITDA to exclude the expense incurred in connection with the induced conversion expense associated with repurchases of our 2019 Notes. We have excluded these costs and expenses because we do not believe they reflect our core operations and us excluding them enables more consistent evaluation of our operating performance. The following table presents a reconciliation of net loss to adjusted EBITDA:

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Net loss	\$ (11,523)	\$ (8,906)	\$ (2,617)	\$ (21,984)	\$ (18,322)	\$ (3,662)
Adjustments:						
Other income (expense), net	(429)	4	(433)	(593)	(19)	(574)
Interest expense	1,250	525	725	2,511	1,050	1,461
Income tax expense	(6)	60	(66)	43	102	(59)
Depreciation	1,465	1,036	429	2,973	2,076	897
Stock-based compensation	10,859	10,582	277	22,173	18,031	4,142
Restructuring costs	—	—	—	—	1,263	(1,263)
Induced conversion expense	2,232	—	2,232	2,232	—	2,232
Adjusted EBITDA	\$ 3,848	\$ 3,301	\$ 547	\$ 7,355	\$ 4,181	\$ 3,174

Non-GAAP Net Income (Loss)

We define non-GAAP net income (loss) as net income (loss), excluding, if applicable for the periods presented, the effects of stock-based compensation; depreciation; restructuring costs; settlement and related costs; induced conversion expense; amortization of debt discount related to the equity component of the Notes; and prepayment penalty on debt extinguishment. On January 1, 2021, we adopted ASU 2020-06 using the modified retrospective transition method, accounting for the 2019 Notes on a whole-instrument basis. In fourth-quarter 2021, we revised our definition of non-GAAP net income (loss) to exclude the expense incurred in connection with the induced conversion expense associated with repurchases of our 2019 Notes.

The following table presents a reconciliation of net loss to non-GAAP net income (loss):

(in thousands)	Three Months Ended June 30,			Six Months Ended June 30,		
	2022	2021	Change	2022	2021	Change
Net loss	\$ (11,523)	\$ (8,906)	\$ (2,617)	\$ (21,984)	\$ (18,322)	\$ (3,662)
Adjustments:						
Depreciation	1,465	1,036	429	2,973	2,076	897
Stock-based compensation	10,859	10,582	277	22,173	18,031	4,142
Restructuring costs	—	—	—	—	1,263	(1,263)
Induced conversion expense	2,232	—	2,232	2,232	—	2,232
Non-GAAP net income	\$ 3,033	\$ 2,712	\$ 321	\$ 5,394	\$ 3,048	\$ 2,346

Liquidity and Capital Resources

As of June 30, 2022, we had cash, cash equivalents and short-term investments of \$163.3 million, comprising cash deposits held at major financial institutions and short-term investments in a variety of securities, including U.S. government agencies, treasury bills, corporate notes and bonds, commercial paper, asset-backed securities, and money market funds. We had working capital of \$213.7 million as of June 30, 2022.

Historically, we have funded our operations primarily through cash generated from operations and by issuing equity securities, convertible-debt offerings and/or borrowing under our prior senior credit facility. In 2022, our principal uses of cash are funding our operations to capture our market opportunity and capital expenditures.

We believe, based on our current operating plan, that our existing cash, cash equivalents and short-term investments will be sufficient to meet our anticipated cash needs for at least the next 12 months. Over the longer term, we plan to continue investing to enhance and extend our platform. If our available funds are insufficient to fund our future activities or execute on our strategy, we may raise additional capital through equity, equity-linked or debt financing, to the extent such funding sources are available. Alternatively, we may be required to reduce expenses to manage liquidity; however, any such reductions could adversely impact our business and competitive position.

Sources of Funds

From time to time, we may explore additional financing sources and means to lower our cost of capital, which could include equity, equity-linked or debt financing. In addition, in connection with any future acquisitions, we may pursue additional funding which may be in the form of additional debt, equity or equity-linked financing or a combination thereof. We can provide no assurance that any additional financing will be available to us on acceptable terms.

2019 Notes

In December 2019, we issued the 2019 Notes in an aggregate principal amount of \$86.3 million. The 2019 Notes are our senior unsecured obligations. The 2019 Notes bear interest at a fixed rate of 2.00% per year, payable semi-annually in arrears on June 15 and December 15 of each year, beginning on June 15, 2020. The 2019 Notes will be convertible into cash, shares of our common stock or a combination thereof, at our election. The 2019 Notes will mature on December 15, 2026, unless earlier repurchased, redeemed, or converted in accordance with the terms of the indenture for the 2019 Notes.

The net proceeds from issuing the 2019 Notes were approximately \$83.5 million after deducting fees and expenses. We used the net proceeds from issuing the 2019 Notes to pay the cost of the capped call transactions and repay our senior credit facility. We intend to use the remainder of the net proceeds for general corporate purposes.

In November 2021, we completed a privately negotiated repurchase of \$76.4 million principal amount of the 2019 Convertible Notes. We accounted for the 2019 Notes Repurchase transaction as an induced conversion in accordance with Accounting Standards Codification 470-20, *Debt with Conversion and Other Options* (ASC 470-20). In connection with the induced conversion, we paid approximately \$183.6 million in cash, and paid accrued and unpaid interest thereon.

In June 2022, we repurchased the remaining \$9.85 million principal amount of the 2019 Notes. We accounted for the 2019 Notes Repurchase as an induced conversion in accordance with Accounting Standards Codification 470-20, *Debt with Conversion and Other Options* (ASC 470-20). In connection with the induced conversion, we paid approximately \$17.6 million in cash and accrued and unpaid interest thereon.

For further information on the terms of this debt, please refer to Note 6 to our consolidated financial statements included elsewhere in this report.

2021 Notes

In November 2021, we issued the 2021 Notes in an aggregate principal amount of \$287.5 million. The 2021 Notes are our senior unsecured obligations. The 2021 Notes bear interest at a fixed rate of 1.125% per year, payable semi-annually in arrears on May 15 and November 15 of each year, beginning on May 15, 2022. The 2021 Notes will be convertible into cash, shares of our common stock or a combination thereof, at our election. The 2021 Notes will mature on May 15, 2027, unless earlier repurchased, redeemed, or converted in accordance with the terms of the indenture for the 2021 Notes.

The net proceeds from issuing the 2021 Notes were approximately \$278.4 million after deducting initial debt issuance costs, and fees and expenses. We used approximately \$183.6 million of the net proceeds for the cash repurchase of approximately \$76.4 million aggregate principal amount of the 2019 Notes through individual privately negotiated transactions concurrent with the offering of the 2021 Notes in November 2021. We used an additional \$17.6 million of cash to repurchase the remaining \$9.85 million aggregate principal of the 2019 Notes through individual privately negotiated transactions in June 2022. Please refer to the section “**Repurchase of the Convertible Senior Notes – 2019**” as described in Note 6 to our consolidated financial statements included elsewhere in this report. We will use the remainder of the net proceeds from the offering for general corporate purposes.

For further information on the terms of this debt, please refer to Note 6 to our consolidated financial statements included elsewhere in this report.

Cash Flows

The following table presents selected cash flow information for the periods presented:

(in thousands)	Six Months Ended June 30,	
	2022	2021
Net cash provided by (used in) operating activities	\$ (7,639)	\$ 4,981
Net cash provided by (used in) investing activities	(72,616)	13,317
Net cash provided by (used in) financing activities	(11,068)	9,241

Operating Cash Flows

For the six months ended June 30, 2022, we used \$7.6 million of net cash from operating activities. This net cash usage was driven primarily by \$14.2 million in working-capital, primarily from increased cash usage for inventory purchases, accounts receivable and accounts payable, and \$6.6 million of net loss adjusted for non-cash items.

For the six months ended June 30, 2021, we generated \$5.0 million of net cash from operating activities. These net cash proceeds were driven primarily by a \$2.5 million working-capital contribution, primarily from lower cash usage for inventory purchases, and \$2.5 million of net loss adjusted for non-cash items.

Investing Cash Flows

For the six months ended June 30, 2022, we used \$72.6 million of net cash from investing activities. This net cash usage was driven primarily by investment and property and equipment purchases of \$115.7 million and \$3.7 million, respectively, partially offset by investment maturities of \$46.8 million.

For the six months ended June 30, 2021, we generated \$13.3 million of net cash from investing activities. The net cash proceeds were driven primarily by investment maturities of \$41.0 million, partially offset by investment and property and equipment purchases of \$19.8 million and \$7.9 million, respectively.

Financing Cash Flows

For the six months ended June 30, 2022, we used \$11.1 million of net cash from financing activities. This net cash usage was driven primarily by \$6.5 million from stock-option exercises and our employee stock purchase plan. This amount was offset by \$17.6 million for the cash repurchase of the remaining \$9.85 million principal amount of the 2019 Notes described in the section “Repurchase of the Convertible Senior Notes – 2019” as described in Note 6 to our consolidated financial statements included elsewhere in this report

For the six months ended June 30, 2021, we generated \$9.2 million of net cash from financing activities. These net cash proceeds were driven primarily by \$9.2 million from stock-options exercises and our employee stock purchase plan.

Cash Requirements and Contractual Obligations

Our primary cash requirements are for operating expenses and capital expenditures. Our operating expenses have generally increased as we invest in sales and marketing and in developing products and technologies that we believe have the potential to drive long-term business growth.

The following table reflects a summary of our contractual obligations as of June 30, 2022:

	Payments Due By Period				
	Total	Less Than 1 Year	1-3 Years	3-5 Years	More Than 5 Years
(in thousands)					
Convertible senior notes ⁽¹⁾	\$ 303,672	\$ 3,234	\$ 6,469	\$ 293,969	\$ —
Operating lease obligations					
Operating lease obligations	16,164	4,447	6,646	5,071	—
Sublease income	(862)	(862)	—	—	—
Net operating lease commitments	15,302	3,585	6,646	5,071	—
Purchase commitments ⁽²⁾	57,536	57,536	—	—	—
Total	\$ 376,510	\$ 64,355	\$ 13,115	\$ 299,040	\$ —

⁽¹⁾ Consists of the 2021 Notes, including \$16.2 million of interest payments.

⁽²⁾ Purchase commitments comprise primarily non-cancelable commitments to purchase \$46.7 million of inventory as of June 30, 2022, as well as non-cancelable software license agreements with vendors.

Off-Balance Sheet Arrangements

Since inception, we have not had any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or for another contractually narrow or limited purpose.

Critical Accounting Policies and Significant Estimates

We have prepared our condensed consolidated financial statements in accordance with GAAP. Our preparation of these financial statements requires us to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue, expenses and related disclosures. We evaluate our estimates and assumptions on an ongoing basis. Our estimates are based on historical experience and various other assumptions that we believe to be reasonable under the circumstances. Our actual results could differ from these estimates and assumptions. For information on our critical accounting policies and estimates, see Part II, Item 7 (Management's Discussion and Analysis of Financial Condition and Results of Operations) of our Annual Report on Form 10-K for the year ended December 31, 2021.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

We are exposed to market risks in the ordinary course of our business. Some of these risks are related to fluctuations in interest rates.

Interest Rate Risk

Under our current investment policy, we invest our excess cash in money market funds, U.S. government agency securities, corporate bonds and notes and commercial paper. Our current investment policy seeks first to preserve principal, second to provide liquidity for our operating and capital needs and third to maximize yield without putting our principal at risk. We do not enter into investments for trading or speculative purposes.

As of June 30, 2022, we had cash, cash equivalents and short-term investments of \$163.3 million. Our investments are exposed to market risk due to fluctuations in prevailing interest rates, which may reduce the yield on our investments or their fair value. Because the majority of our investment portfolio is short-term in nature, we do not believe an immediate 10% increase in interest rates would have a material effect on the fair market value of our portfolio, and therefore we do not expect our results of operations or cash flows to be materially affected by a sudden change in market interest rates.

Our convertible notes have fixed interest rates, thus a hypothetical 100 basis point increase in interest rates would not impact interest expense.

Inflation Risk

We do not believe that inflation has had a material effect on our business, financial condition or results of operations. If our costs were to become subject to significant inflationary pressures, we may not be able to fully offset such higher costs through price increases. Our inability or failure to do so could adversely affect our business, financial condition and results of operations.

Foreign Currency Exchange Risk

We view our foreign subsidiaries as extensions of the U.S. Company. The functional currency of our foreign subsidiaries is the U.S. dollar. Accordingly, gains and losses resulting from remeasuring transactions denominated in currencies other than U.S. dollars are included in other income, net on the consolidated statements of operations. For any of the periods presented, we did not have material impact from exposure to foreign currency fluctuation. As we grow operations, our exposure to foreign currency risk will likely become more significant.

Item 4. Controls and Procedures.

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our principal executive officer and our principal financial officer, evaluated the effectiveness of our disclosure controls and procedures as of June 30, 2022. Disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, 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 (1) recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and (2) accumulated and communicated to management, including its principal executive officer and principal financial officer, as appropriate to allow timely decisions regarding required disclosure. Based on the evaluation of our disclosure controls and procedures, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures were effective at a reasonable assurance level as of June 30, 2022.

Changes in Internal Control over Financial Reporting

There were no changes that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting during the three months ended June 30, 2022.

Limitations on Controls

Our disclosure controls and procedures and internal control over financial reporting are designed to provide reasonable assurance of achieving the desired control objectives. Our management recognizes that any control system, no matter how well designed and operated, is based upon certain judgments and assumptions and cannot provide absolute assurance that its objectives will be met. Similarly, an evaluation of controls cannot provide absolute assurance that misstatements due to error or fraud will not occur or that all control issues and instances of fraud, if any, have been detected.

PART II — OTHER INFORMATION

Item 1. Legal Proceedings.

In the normal course of business, we may be named as a party to various legal claims, actions and complaints. We cannot predict whether any resulting liability will have a material adverse effect on our financial position, results of operations or cash flows.

Patent Litigation

On June 6, 2019, we filed a patent infringement lawsuit against a competitor, NXP, USA Inc., and on October 4, 2019, NXP USA, Inc. and its parent NXP Semiconductors N.V., filed a patent infringement lawsuit against us. Both we and NXP subsequently filed additional lawsuits against each other. On May 25, 2021, we filed an additional patent infringement suit against NXP. The outcome of this patent litigation remains uncertain, and we may file additional lawsuits against NXP USA, Inc. and/or its parent or they may file additional lawsuits against us. For further information on these lawsuits, please refer to Note 5 of our consolidated financial statements included elsewhere in this report.

Item 1A. Risk Factors.

You should carefully consider the following risk factors, in addition to the other information contained in this report, including the section of this report captioned “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and our financial statements and related notes. If any of the events described in the following risk factors and the risks described elsewhere in this report occur, our business, operating results and financial condition could be materially impacted. This report also contains forward-looking statements that involve risks and uncertainties. Our actual results could differ materially from those anticipated in the forward-looking statements as a result of factors that are described below and elsewhere in this report.

Risks Relating to Our Platform, Products and Technologies

The extent and pace of RAIN market adoption is uncertain. If RAIN market adoption does not continue to develop, or develops slower than we expect, our business will suffer.

The RAIN market is still developing. RAIN adoption, and adoption of our products and platform, depend on numerous factors, including:

- the extent to which end users understand and embrace the benefits that RAIN offers;
- whether the benefits of RAIN adoption outweigh the cost and time to replace or modify end users’ existing systems and processes; and
- whether RAIN products and applications meet end users’ current or anticipated needs.

In the past, we have, at times, anticipated and forecasted a pace of end-user adoption that exceeded the actual pace. Additionally, adoption has not progressed evenly for many reasons, such as the project-based nature of many end-user deployments. We expect continued difficulty forecasting the pace of adoption. As a result, we may be unable to accurately forecast our future operating results, including revenue, gross margins, cash flows and profitability, any or all of which could negatively impact our financial performance.

RAIN adoption is concentrated in key industries, particularly retail. If retailer adoption does not continue at the rate we expect, our business will be adversely affected.

Our financial performance depends on the pace of end-user RAIN adoption in key industries such as retail, our largest market. Retailers with primarily a physical marketplace presence have experienced financial stress in recent periods. Many of these same retailers have deployed RAIN to improve their competitiveness. If they fail to compete effectively then the number of stores they maintain, and the scope of their RAIN deployments, may decrease. Other industries that we currently regard as being key for RAIN adoption include supply chain and logistics, aviation and automotive, many of which face similar stressors as the retail market.

Our market is very competitive. If we fail to compete successfully then our business and operating results will suffer.

We face significant competition from both established and emerging competitors. We believe our principal current competitors are: In endpoint ICs, NXP, Alien, EM Microelectronic and Kiloway; in reader ICs, ST, Phychips, Iotelligent and MagicRF; and in readers and gateways, Alien and Zebra. Our channel partners, including our OEMs, ODMs, distributors, SIs, VARs and software solution partners may choose to compete with us rather than purchase our products, which would not only reduce our customer base but also increase competition in the market, adversely affecting our operating results, business and prospects. Companies in adjacent

markets or newly formed companies may decide to enter our market, particularly as RAIN adoption grows. Further, the Chinese government has made development of the Chinese semiconductor industry a priority, potentially increasing competition for us globally while possibly restricting our ability to participate in the Chinese market.

Competition for customers is intense. Because the RAIN market is evolving rapidly, winning customer and end-user accounts at an early stage in the development of the market is critical to growing our business. End users that instead use competing products and technologies may face high switching costs, which may affect our and our channel partners' ability to successfully convert them to our products. Failure to obtain orders from customers and end users, for competitive reasons or otherwise, will materially adversely affect our operating results, business and prospects.

Some of our competitors may devote more resources than we can to the development, promotion, sale and support of their products. Our competitors include companies that have much greater financial, operating, research and development, marketing and other resources than us. These competitors may discount their products to gain market share. In doing so, they could simply accept lower margins, or they could maintain margins by achieving cost savings through better, more efficient designs or production methods. They may also bundle other technologies, including those we do not have in our product portfolio, with their RAIN products.

We are expected to introduce new products and product enhancements on a regular basis.

We introduce new products and services to keep pace with technology advancements, satisfy increasingly demanding end-user requirements and grow market acceptance. We commit significant resources to developing these new products and services while improving performance, reliability and reducing costs. Because our products are often used in, and incorporated into, complex business processes and use cases, new products and services may take time to be successful or may not succeed at all.

In the future, our success in developing the technologies or processes necessary for new or enhanced products and services, or in licensing or otherwise acquiring these technologies from third parties, and our ability to introduce new products and services before our competition, will depend on various factors, including:

- our timely and efficient completion of the design process;
- our timely and efficient implementation of manufacturing, assembly and testing procedures;
- product or service performance;
- product certification;
- our ability to attract, retain and manage technical personnel;
- the quality, reliability and selling price of the product or service; and
- effective marketing, sales and service.

An inability or limited ability of enterprise systems to exploit RAIN information may adversely affect the market for our products.

A successful end-user RAIN deployment requires not only tags and readers or gateways, but RAIN integration with information systems and applications that derive business value from RAIN data. Unless third parties continue developing and advancing business analytics tools, and end users enhance their information systems to use these tools, RAIN deployments could stall. Our efforts to foster third-party development and deployment of these tools could fail. In addition, our guidance to business-analytics providers for integrating our products with their tools could prove ineffective.

Solution providers and SIs are essential to the RAIN market. They provide deployment know-how to enable end users to successfully deploy RAIN solutions. Integrating our products with end-user information systems could prove more difficult or time consuming than we or they anticipate, which could delay deployments.

The selling prices of our products could fluctuate substantially, which could have a material adverse effect on our revenue and gross margins.

Our product ASPs have historically decreased with time and with RAIN market growth, although some periods, like 2021, have seen ASP increases. Historically, we have reduced our product prices to meet end-user demands or to respond to market pressure from our competition. We have also sometimes reduced prices to encourage adoption, address macroeconomic conditions or for other reasons. Although we expect further price decreases in the long term, we raised prices in 2021 to accommodate higher product costs and we may be required to do so again in the future. Further, we anticipate that recent macroeconomic conditions, including inflation, may also contribute to upward pressure on our product costs. If, we are unable to offset ASP reductions with increased sales volumes or reduced product costs, or if we are unable to successfully increase ASPs to offset cost increases, then our revenue and gross margins will suffer.

Rapid market innovation, which we continue to experience, can drive intense pricing pressure, particularly for older products or products using older technology. New requirements can render older products uncompetitive for new opportunities. In addition, costs for producing older products may stay the same or even increase due to reduced volumes or limited capacity for producing these products. When demand for older products declines, or during times of increased market inventory, ASPs may decline quickly. To sell our products profitably we must continually improve our technology and processes and reduce costs in line with the lower selling prices. If we and our third-party suppliers and manufacturers cannot develop and implement processes or improve efficiencies sufficient to maintain required margins, we may be unable to sell our products profitably.

We generate most of our revenue from our endpoint ICs, and a decline in sales of these products or increased price competition in the market for endpoint ICs could adversely affect our operating results and financial condition.

We derive, and expect to continue to derive, most of our product revenue from our endpoint ICs. Accordingly, we are vulnerable to fluctuations in endpoint IC demand, wafer supply and wafer prices. If demand declines, or if we are unable to procure enough wafers to meet the demand we do have, or if we are unable to raise prices to accommodate cost increases, then our business and operating results will suffer. In addition, the continued adoption of, and demand for, our existing endpoint ICs, as well as for our new endpoint ICs, derives in part from our ability to continually innovate and to demonstrate the benefits of using our endpoint ICs with our reader ICs, readers and gateways. If we fail to establish the benefits of using our endpoint ICs with our platform, we may not be successful in countering competitive pressures to lower prices for our endpoint ICs and our business and operating results could be adversely affected.

Changes in our product mix could adversely affect our overall gross margin.

We generate most of our revenue from endpoint IC sales, with lower gross margins than our other products. In addition, endpoint IC gross margins are affected by product mix, which can fluctuate based on competitive pressures and end-user demand. A further shift in sales mix away from our higher margin products to lower margin products, especially to our endpoint ICs, will negatively affect our gross margins.

Our products must meet demanding technical and quality specifications. Defects, errors or interoperability issues with our products, the failure of our products to operate as expected, or undue difficulty in deploying our products in actual operations could affect our reputation, result in significant costs to us and impair our ability to sell our products.

Our products must meet demanding customer specifications for quality, reliability and performance. They are also highly technical and are deployed in large, complex systems. Our partners and end users may discover errors, defects or incompatibilities in our products, including after deploying them. In addition, our partners or end users may find compatibility or interoperability issues between our products and their enterprise software systems, or between our products and other RAIN products. They may also experience problems when our products are combined with or incorporated into products from other vendors, such as our tag OEMs using our endpoint ICs with their antennas, or our reader partners using our reader ICs in their readers. We may have difficulty identifying and correcting the problems when third parties are combining, incorporating or assembling our products.

If we are unable to fix errors or other problems, we could experience:

- loss of customers or customer orders;
- lost or delayed market acceptance and sales of our products;
- loss of market share;
- damage to our brand and reputation;
- impaired ability to attract new customers or achieve market acceptance;

- diversion of development resources;
- increased service and warranty costs;
- replacement costs;
- legal actions by our customers; and
- increased insurance costs.

We have experienced, and may in the future experience, production issues, including but not limited to production delays, insufficient production capacity and component shortages. For example, we are currently subject to ongoing shortages for silicon wafers and components used in our readers and gateways; for more information, see “—Shortages of silicon wafers and components used in our readers and gateways may adversely affect our ability to meet demand for our products and adversely affect our revenues and/or gross margins.” If we are unable to resolve these issues in a timely manner, or at all, then our operating results will be adversely affected.

When we introduce new products, our success in ramping adoption depends, in part, on us making these products easy to deploy by our partners and their end customers. For example, for our new M700 endpoint ICs and E710, E510 and E310 reader ICs, we continue supporting our partners to produce high-performing, high-quality products. Until our partners are able to deploy our products widely, adoption and our operating results could suffer.

Given the technical and business requirements against which end users evaluate RAIN and our products and platform, our business results and prospects could suffer if we are unable to make our products and our platform easy to deploy. To demonstrate the benefits of our platform in meeting business needs and to develop deployment methods to meet those needs, we frequently enter into proof-of-concept deployments, or POCs, with prospective end users. These POCs can extend for relatively long periods of time, and they may not be successful for a variety of reasons, including changes in end-user requirements, changes in end-user commitment or deployment challenges.

End users or our direct customers must design our products into their products and systems. If they fail to do so, our operating results and prospects will be adversely affected.

Convincing end users or our direct customers to design RAIN and our products into their products and systems requires educating them about RAIN’s value over other technologies. They may currently use other technologies or products and may not feel the need to learn about how RAIN or our products can improve their systems. Even when convinced, they often undertake long pilots or qualification processes prior to placing orders. We spend significant time and resources to have RAIN and our products selected by a potential end user or customer. End users or our direct customers adopting RAIN often involves them weighing the benefits of RAIN against the costs of modifying or replacing their existing systems, and if they remain unconvinced, they may not deploy. If we fail to develop new products that adequately or competitively address the needs of end users or our direct customers, they may not select our products to be designed into their systems, which could adversely affect our business, prospects and operating results.

Our visibility into the length of the sales and deployment cycles for our products is limited.

We have limited visibility into the length of product sales and deployment cycles, and these cycles are often longer than we anticipate. Many factors contribute to our uncertainty, including the time channel partners and end users spend evaluating our products, time educating them on RAIN’s benefits, and time integrating our products with their systems. The length and uncertain timing of the sales and deployment cycles can lead to delayed product orders. In anticipation of those orders, we may incur substantial costs before the sales cycle is complete and before we receive any customer orders or payments, if we receive them at all.

Alternative technologies, or changes in RAIN standards, may enable competitive products and services and may adversely affect RAIN market growth and our business.

Technology developments may affect our business negatively. Breakthroughs in legacy RFID technologies or markets, including those using low frequency or high frequency RFID technology, could adversely affect RAIN market growth generally and demand for our products in particular. Likewise, new technologies may allow lower-cost ICs than our current silicon-based technology allows. If we are unable to innovate using new or enhanced technologies or processes or are slow to react to changes in existing technologies or in the market, or have difficulty competing with advances in new or legacy technologies, then our development of new or enhanced products could be impacted and result in product obsolescence, decreased revenue and reduced market share.

Significant changes in RAIN standards bodies, standards or qualification processes could impede our ability to sell our products and services.

We participate in developing RAIN industry standards, including with GS1 and ISO, and have designed our products to comply with those standards. We have historically taken a leadership position in standards development. In the future, we could lose that leadership position or our influence in standards development, or we could choose not to participate in certain standards activities.

New industry standards, or changes to existing standards, could render our products obsolete and cause us to incur substantial development costs to adapt to the new or changed standards. If the industry standards diverge from our or the RAIN market's needs, then our products may fail to keep pace with the market or cause end users to delay their deployments. Moreover, the adoption or expected adoption of new or changed standards could slow our sale of existing products before we can introduce new products that meet the new or changed standards. New standards or changes to existing standards could also limit our ability to implement new features in our products if those features do not meet the new or changed standards. The lost opportunities as well as time and expense for us to develop new products or change our existing products to comply with new or changed standards could be substantial, and we may not successfully develop products that comply with new or changed standards.

Certain organizations develop requirements for RAIN tags and test tags against those requirements. As one example, the ARC Program at Auburn University, or ARC, develops tag performance and quality requirements for end users that engage them. Some participants in the RAIN market are ARC sponsors, but we are not among them. Some other organizations perform this function as well. ARC or a similar organization could develop specifications that few or none of our endpoint ICs meet.

Changes in government spectrum regulations or their enforcement could adversely affect our ability to sell our products.

Government radio regulations require that our readers and gateways be certified for spectral compliance in jurisdictions where they are sold or operated. Our readers and gateways are collectively certified for use in more than 40 countries worldwide, including the United States, Canada, Mexico, China, Japan, South Korea and every country in the EU. If one of our reader or gateway products is found to be noncompliant despite being certified, we could be required to modify field-deployed readers or gateways and could spend significant resources and miss sales opportunities in the process.

Government regulations may change, possibly without notice, requiring us to redesign our products to conform with the new regulations or constraining our ability to incorporate new features into our products. Such changes could cause us to incur significant costs, including costs associated with obsolete inventory. Regulatory changes may also cause us forego opportunities to improve our products, potentially delaying our time-to-market.

Sales of some of our products could cannibalize revenue from other products.

Our sales of some of our products enable our channel partners to develop their own products that compete with other of our products. For example, sales of our reader ICs allow our OEM partners to build and sell readers and gateways that may compete with our readers and gateways. Similarly, sales of our readers allow our channel partners to build and sell gateways that compete with our xArray and xSpan. In the future, we may see one product line expand at the expense of another, or we may be asked by partners to disadvantage or divest a product line. We cannot predict whether we can manage such conflicts in the future or retain channel partners despite conflicts.

Pricing commitments and other restrictive provisions in our customer agreements could adversely affect our operating results.

In the ordinary course of business, we enter into agreements containing pricing terms that could, in some instances, adversely affect our operating results and gross margins. For example, some contracts specify future IC, reader or gateway pricing or contain most-favored customer pricing for certain products. Other agreements contain exclusivity terms that prevent us from pursuing certain business with other customers during the exclusivity period. Reducing prices or offering favorable terms to one customer could adversely affect our ability to negotiate favorable terms with other customers.

Risks Relating to Our Personnel and Business Operations

We obtain the products we sell through third parties with whom we do not have long-term supply contracts. If we are unable to effectively manage our relationships with suppliers, our operating results and financial condition will be adversely affected.

Our ability to secure cost-effective, quality products in a timely manner could be adversely affected by many factors, including:

- Third-party manufacturing capacity may not be available when we need it.

- Some products have long lead times, and we place orders for them five or more months before our anticipated delivery dates to our customers. If we inaccurately forecast customer demand, we may be unable to meet our customers' delivery requirements or we may accumulate excess inventory, increasing our costs.
- Supply disruptions may affect our ability to meet our customers' demand, whether in a cost-effective manner or at all, potentially causing customers to cancel orders, qualify alternative suppliers or purchase from our competitors. Supply disruptions can also distort demand, making it even harder to meet true demand with finished products.

If our suppliers fail to manufacture our products at reasonable prices or with satisfactory quality levels, then our ability to bring those products to market and our reputation could both suffer. If supplier capacity diminishes, whether from closures, bankruptcy, capacity allocation, in response to Covid-19, catastrophic loss of facilities or otherwise, we could have difficulty fulfilling orders, our revenue could decline and our growth prospects could be impaired. Transitioning our assembly services or IC foundries to new providers would take many months and, in the case of ICs, could take several years. And transition would require a requalification by our customers or end users, which could also adversely affect our ability to sell our products and our operating results. Moreover, in the event of a quality issue, the process of testing failed products and diagnosing and fixing defects is time consuming and costly and could constrain our ability to supply customers with new products.

Shortages of silicon wafers and components used in our readers and gateways may adversely affect our ability to meet demand for our products and adversely affect our revenues and/or gross margins.

The semiconductor industry has experienced periods of capacity shortfall. Many industries, ours included, are experiencing such a shortfall in 2021 and 2022, due to significant worldwide semiconductor demand and limited foundry supply. We exited fourth-quarter 2021 with limited semiconductor inventory and tight foundry supply for both our 200mm and 300mm products, and our foundry partner has signaled tight wafer availability into 2023. They have also raised prices. Absent a significantly higher wafer allocation in 2022 over 2021, and without the benefit of the wafer inventory buffer we had entering 2021, we will be unable to meet 2022 endpoint IC demand, potentially by a significant amount. Our foundry partner has signaled continued tight availability for endpoint IC wafers in our process nodes into 2023, preventing us from fully capitalizing on our demand. Although we believe they have prioritized us for upside wafers, and have allocated sufficient second-half 2022 upside wafers for us to deliver second-half 2022 endpoint IC volumes that exceed first half, much of the upside is 200mm rather than 300mm wafers, causing us to transition some customers back from M700 to our older product families. Wafer shortfalls may decrease sales and cause market-share losses if we are unable to supply enough products and/or our customers purchase competing products or, alternatively, may artificially increase sales as customers overbuy our products, followed by sales declines in future periods as they consume their accumulated inventory. Additionally, if we are unable to raise our prices to cover our higher costs, our gross margins and other financial results could suffer.

We have also experienced, and expect to continue experiencing, shortages and price increases for components we use in readers and gateways, potentially impacting future product availability and/or costs. If we are unable to increase our prices to cover our increased costs, our gross margins and other financial results could suffer.

At times, our suppliers ask us to purchase excess products to ensure we do not face a subsequent shortage. For example, in certain quarters of 2014, 2015 and 2016, we purchased more endpoint IC wafers than we needed, which reduced our available cash. In addition, we may invest in inventory to support anticipated business growth, as we did with endpoint IC inventory in 2017 and 2020. If we are unable to sell the inventory we purchased, or if we must sell it at lower prices due to excess inventory or obsolescence, then our business will be negatively impacted.

We bear inventory risks due to our reliance on channel partners to sell and distribute our products.

We typically manufacture our products based on channel-partner forecasts before we receive purchase orders. However, many of our channel partners have difficulty accurately forecasting end-user demand and the timing of that demand. They also sometimes cancel purchase orders or reschedule product shipments, in some cases with little or no advance notice to us. We also sometimes receive soft commitments for large orders which do not materialize. In addition, when we introduce new products, we may initially carry higher inventory or have slower inventory turns depending on market acceptance. We have additional uncertainty arising from our competition's business practices and from unanticipated external events, such as changes in regulatory standards, all of which can adversely affect demand and consequently our inventory levels, sales and operating results.

Covid-19 has adversely affected our business, and the magnitude and duration of future Covid-19 effects on our business are uncertain.

Covid-19 has created significant worldwide economic volatility, uncertainty and disruption, and those effects are likely to persist for some time. Our significant Covid-19 risks include:

- uncertain product demand in many business activities globally, particularly in the retail industry, as well as overall delays in RAIN market adoption;

- product delays or shortages due to restrictions on our ability, or that of our suppliers, to operate at normal capacity due to personnel movement restrictions or other limitations;
- challenges in effectively managing our inventory due to uncertain product demand or supply;
- partner-requested preordering or rescheduling as a result of supply concerns which can distort channel inventory, either positively or negatively;
- increased operating and product costs;
- delays in customer pilots which can delay project-based deployments;
- delays in research and development efforts which can, in turn, delay new product introductions or product enhancements;
- inability to engage in in-person sales and market activities, which can reduce our ability to effectively sell our products and drive future demand;
- cost-reduction initiatives, such as lay-offs and furloughs; and
- maintaining employee engagement and productivity in a remote or hybrid work environment.

The extent to which Covid-19 will continue to impact market demand is unclear. In 2020 and 2021, Covid-19 adversely affected retail, including retail apparel where RAIN is widely adopted. It also affected many other markets that use our products, including aviation, sporting events such as footraces, and others. These markets continued to feel Covid-19's impacts in 2021, and the impacts will likely persist into the future.

Also, Covid-19 has, and continues to, create uncertainties with respect to supply. Because most our products are manufactured and processed in Asia, particularly in China where authorities continue to impose strict quarantine restrictions in response to Covid-19 outbreaks, our international supply chains are vulnerable to Covid-19 related disruptions. The impacts of Covid-19 on our future product supply remains uncertain.

Uncertainties surrounding global trade policies could have a material adverse effect on us.

Changes in U.S. and foreign laws and policies governing foreign trade, manufacturing, development and investment in the jurisdictions where we currently develop and sell products, and any negative consequences resulting from such changes, could materially affect our business.

The U.S. government has imposed significant tariffs on a variety of items imported other countries, particularly China. China responded by imposing significant tariffs on a variety of items imported from the United States. Although the United States and China signed a preliminary trade agreement in early 2020, the tariffs remain in place as negotiations between the countries continue. The future of these existing tariffs, as well as the possibility for new tariffs, remains uncertain.

Other causes of uncertainty include the Chinese government's efforts to promote China's domestic semiconductor industry, and the collateral effects of sanctions and other actions taken against Russia as a result of Russia's invasion of Ukraine. While our direct business with customers in Russia is not material, the macroeconomic effects of sanctions or other actions against Russia now or in the future could negatively affect our business. These effects include increases in the cost of energy and in inflation generally.

We are subject to risks inherent in operating abroad and may not be able to successfully maintain or expand our international operations.

In 2021, we derived 83% of our total revenue from sales outside the United States. We anticipate growing our business, in part, by continuing to expand our international operations, which has a variety of significant risks, including:

- changes, some unexpected or unanticipated, in regulatory requirements, taxes, trade laws, tariffs, export quotas, custom duties or other trade restrictions;
- lack of established, clear, or fairly implemented standards or regulations with which our products must comply;
- greater difficulty in enforcing contracts, judgments and arbitration awards in international courts, and in collecting accounts receivable and longer payment and collection periods;
- limited or unfavorable intellectual property protection;
- misappropriation of our intellectual property;
- inflation and fluctuations in foreign currency exchange rates and interest rates;

- restrictions, or changes thereof, on foreign trade or investment, including currency-exchange controls; including as a result of U.S. and other sanctions against Russia as a result of Russia's invasion of Ukraine;
- changes in a country's or region's political, regulatory, legal or economic conditions, including, for example, global and regional economic disruptions caused by Covid-19;
- political, social and economic instability abroad, wars and other armed conflicts, terrorist attacks and security concerns in general, including, for example, Russia's invasion of Ukraine;
- differing regulations with regard to maintaining operations, products and public information;
- inequities or difficulties obtaining or maintaining export and import licenses;
- differing labor regulations, including where labor laws may be more advantageous to employees than in the United States;
- restrictions on earnings repatriation;
- corrupt or unethical practices in foreign jurisdictions that may subject us to exposure under applicable anti-corruption and anti-bribery laws such as the U.S. Foreign Corrupt Practices Act of 1977, as amended, or FCPA, and the United Kingdom Bribery Act of 2010, or U.K. Bribery Act; and
- regulations, and changes thereof, relating to data privacy, cybersecurity, and the unauthorized use of, or access to, commercial and personal information, particularly in Europe.

Various foreign regulatory or governmental bodies may issue rulings that invalidate prior laws, regulations, or legal frameworks in ways that may adversely impact our business. For example, the European Union Court of Justice in October 2015 invalidated the EU-U.S. Safe Harbor Framework, which facilitated personal data transfers to the United States in compliance with applicable EU data-protection laws. The EU-U.S. Privacy Shield, subsequently adopted in 2016 to provide a mechanism for companies to transfer EU personal data to the United States, was also invalidated by the European Union Court of Justice in July 2020. As another example, the European Commission adopted the General Data Protection Regulation, or GDPR, which became effective on May 25, 2018. The GDPR imposes more stringent data-protection requirements than the former regulatory regime in the EU and provides for greater penalties for noncompliance of up to the greater of 4% of worldwide annual revenue or €20 million. Significant regulatory uncertainty remains surrounding data transfers from the European Economic Area to the United States. In China, we are monitoring legal and government advisory developments regarding cybersecurity-focused legislation for impacts to our business related to cross-border transfer limitations and evolving privacy, security, or data protection requirements. We may be required to change our policies and practices with respect to data transfer and other aspects of our data processing and security, which may be burdensome or involve substantial cost and expense, in an effort to address new and evolving limitations and requirements relating to privacy, security, data storage and data protection.

The United Kingdom, or UK, has enacted legislation that substantially implements the GDPR and which provides for penalties of up to the greater of 4% of worldwide annual revenue and £17.5 million. Following the UK's exit from the EU, however, which became effective January 31, 2020, with a transition period ending December 31, 2020, significant uncertainty remains regarding matters such as data transfers between the UK, the EU and other jurisdictions. This uncertainty and other developments could require us to further change the way we conduct our business and transmit data between the U.S., the UK, the EU, and the rest of the world. Likewise, the California Consumer Privacy Act of 2018, or the CCPA, became effective on January 1, 2020. The CCPA imposes stringent data privacy and data protection requirements for certain data of California residents and provides for noncompliance penalties of up to \$7,500 per violation. In addition, the California Privacy Rights Act, or CPRA, was passed by voters in California's November 2020 election. The CPRA significantly modifies the CCPA, creating additional obligations with respect to consumer data commencing on January 1, 2022, and going into effect generally on January 1, 2023. Other states, including Virginia, Colorado, Utah, and Connecticut, have enacted similar legislation. Aspects of the CCPA, the CPRA, the GDPR and other laws and regulations relating to privacy, data protection, and security remain unclear as of the date of this report, but these laws and regulations potentially are far reaching. Laws and regulations relating to privacy, data protection and security, and continued evolution of such laws and regulations and their interpretation and enforcement, may require us to modify our practices and policies, which we may not be able to do on commercially reasonable terms or at all, and otherwise cause us to incur substantial costs and expenses in an effort to comply. Any failure or perceived failure by us or any third parties with which we do business to comply with these laws and regulations may result in actions against us by governmental entities, private claims and litigation, legal and other costs, substantial time and resources and fines, penalties or other liabilities. Any such actions may be expensive to defend, may incur substantial legal and other costs and substantial time and resources and likely would damage our reputation and adversely affect our business, financial condition and results of operations.

We opened an office in Shanghai, China in 2011. In addition to the risks listed above, our China operations expose us to risks associated with Chinese laws and policies governing Chinese operations and also to U.S. laws and regulations relating to foreign trade and investment. To date, legal, policy or regulatory changes have not had a material adverse effect on our business or financial

condition, but they may in the future. We may experience increased costs for, or significant impact to, our Chinese operations in the event of changes in Chinese government policies or political unrest or unstable economic conditions in China. The nationalization or other expropriation of private enterprises by the Chinese government could result in total loss of our China investment. Any of these matters could materially and adversely affect our business and results of operations.

Our failure to comply with anti-corruption and anti-bribery laws related to our foreign activities could subject us to penalties and other adverse consequences. Anti-corruption and anti-bribery laws generally prohibit companies and their employees and intermediaries from making payments to foreign officials for the purpose of obtaining or keeping business, securing an advantage or directing business to another person, and require companies to maintain accurate books and records and a system of internal accounting controls. Under the FCPA, U.S. companies may be held liable for corrupt actions taken by directors, officers, employees, agents, or other strategic or local partners or representatives. If we, our intermediaries or our solution providers, SIs, OEMs, ODMs, VARs, distributors, tag manufacturers or other partners fail to comply with FCPA or similar legislation, government authorities in the United States and elsewhere could seek to impose civil or criminal fines and penalties which could have a material adverse effect on our business, operating results and financial conditions. Moreover, China is an area of heightened exposure regarding compliance with anticorruption laws such as the FCPA and the U.K. Bribery Act. We intend to increase our international sales and business in China and, as such, our risk of violating laws such as the FCPA or U.K. Bribery Act also increases.

We generally conduct our China operations through a wholly owned subsidiary and our European operations through our U.K. subsidiary. For other worldwide jurisdictions, we generally report our taxable income based on our business operations in those jurisdictions. The relevant taxing authorities may disagree with our determinations as to the income and expenses attributable to the jurisdiction or subsidiary. In the event of a disagreement, if our position is not sustained, we could be required to pay additional taxes, interest and penalties, which could result in tax charges, higher effective tax rates, reduced cash flows and lower overall profitability.

We have added engineering personnel in South America and are expanding our operations team in Southeast Asia, each through subsidiaries in these jurisdictions. Expanding our presence in this way increases our exposure to risks inherent in operating globally.

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

The U.S. and various foreign governments have imposed controls, export license requirements and restrictions on the import or export of certain products, technologies and software. We must export our products in compliance with U.S. export controls, including the Commerce Department's Export Administration Regulations and various economic and trade sanctions established by the Treasury Department's Office of Foreign Assets Controls. We may not always be successful in obtaining necessary export licenses, and our failure to obtain required import or export approval for our products or limitations on our ability to export or sell our products imposed by these laws may harm our international and domestic sales and adversely affect our revenue. Noncompliance with these laws could have negative consequences, including government investigations, penalties and reputational harm.

Changes in our products or changes in export, import and economic sanctions laws and regulations may delay us introducing new products in international markets, prevent our customers from using our products internationally or, in some cases, prevent the export or import of our products to or from certain countries altogether. The U.S. government has imposed significant tariffs on a variety of items imported from China. China has responded by imposing significant tariffs on a variety of items imported from the United States. Such tariffs could have a material impact on our product costs and decrease our ability to sell our products to existing or potential customers and harm our ability to compete internationally. Further, it is possible that additional sanctions or restrictions may be imposed by the U.S. government on items imported into the United States from China and any such measures could further adversely affect our ability to sell our products to existing or potential customers and harm our ability to compete internationally. Any change in export or import regulations or legislation; shift or change in enforcement; or change in the countries, persons or technologies targeted by these regulations could result in decreased use of our products by, or in our decreased ability to export or sell our products to, existing or potential customers with international operations, adversely affecting our business and results of operations.

Instability or deterioration in the political, social, business or economic conditions in key production jurisdictions could harm our business, financial condition and operating results.

We outsource our manufacturing and production to suppliers in a small number of jurisdictions including Thailand, Malaysia, Taiwan and China. These jurisdictions have experienced significant changes in political, social, business or economic conditions in the past and may experience them in the future. Some of these jurisdictions have also experienced, and may continue to experience, intermittent or sustained mandatory shutdowns or other restrictions to combat the spread of Covid-19.

Deterioration in the political, social, business or economic conditions in any jurisdictions in which we have significant suppliers could slow or halt product shipments or disrupt our ability to manufacture, test or post-process products. In response, we could be

forced to transfer our manufacturing, testing and post-processing activities to more stable, and potentially more costly, regions or find alternative suppliers.

In particular, we source a significant portion of our wafers from suppliers in Taiwan, and our supply of wafers and other critical components may be materially and adversely affected by diplomatic, geopolitical and other developments affecting the relationship between China and Taiwan. Since 1949, Taiwan and the Chinese mainland have been separately governed. The government of the People's Republic of China claims that it is the only legitimate government in China, including Taiwan and mainland China, and that Taiwan is part of China. Although significant economic and cultural relations have been established between Taiwan and mainland China in the past few years, the People's Republic of China has refused to renounce the use of military force to gain control over Taiwan, there can be no assurances that relations between Taiwan and mainland China will not deteriorate, particularly in light of ongoing tensions between China, the United States and Taiwan. Any such developments could materially and adversely affect our business, financial condition and results of operations.

Our business operations could be disrupted by natural disasters.

In addition to the pandemic risk discussed earlier under “—Covid-19 has adversely affected our business, and the magnitude and duration of future Covid-19 effects on our business are uncertain,” other disasters, whether natural or manmade, could decrease demand for our products, disable our facilities, disrupt operations or cause catastrophic losses. We have facilities in areas with known seismic activity, such as our headquarters in Seattle, Washington. We have facilities in areas with known flooding, such as our office in Shanghai, China. We have a wafer testing and dicing subcontractor in Thailand, a region with a known, and recent, history of flooding. A loss at any of these or other of our or our suppliers' facilities could disrupt operations, delay production and shipments, reduce revenue and engender potentially large expenses to repair or replace the facility. We do not carry insurance that covers potential losses caused by pandemics, earthquakes, floods or other disasters.

Risks Relating to Our Relationships with Customers, Channel Partners and End Users

We rely on a small number of customers for a large share of our revenues.

We sell our endpoint ICs directly to inlay and tag OEMs and ODMs. We sell our reader ICs to OEMs and ODMs, primarily through distribution. We sell our readers and gateways to VARs and SIs, primarily through distribution. In 2021, sales to tag OEMs Avery Dennison and Arizon accounted for 32% and 11% of our total revenue, respectively. In March 2020, Avery Dennison acquired Smartrac's RFID inlay segment. Sales concentration to a smaller number of OEMs decreases our bargaining power and increases the risk that our pricing or sales could decline based on sales measures taken by our competitors or our own failure to compete effectively.

If we fail to retain our endpoint IC, reader IC, reader or gateway partners or distributors or fail to establish new relationships, our business, financial condition or operating results could be harmed. Our competitors' relationships with, or acquisitions of, these partners or distributors could interfere with our relationships with them. Any such interference could impair or delay our product sales or increase our cost of sales.

We engage directly with end users to adopt our products in large projects. These projects, often involving large purchases of our readers and gateways, are often discrete deployments that can result in significant sales for periods of time. They also increase the volatility of our revenues and operating results. If we are unable to replace project-based revenue with new revenue streams, or if end users with large projects change or delay them without giving us with adequate notice, our sales could decline from period to period and harm our stock price.

Because we sell and fulfill through channel partners, our ability to affect or determine end-user demand is limited.

End users drive demand for our products but, because we sell our products primarily through channel partners, we are one step removed from those end users and often unable to directly assess their demand. Our channel partners may choose to prioritize selling our competitors' products over ours, or they may offer products that compete with our products or limit sales of our products. If our channel partners do not sell enough of our products or if they choose to decrease their inventories of our products for any reason, our sales to these channel partners and our revenue will decline.

Our channel partners may not properly forecast end users' demand for our products.

Our channel partners may purchase more of our products than they need to satisfy end-user demand, increasing their inventory and reducing future sales. Distributors may return products in exchange for other products, subject to time and quantity limitations. Our reserve estimates for products stocked by our distributors are based principally on reports provided to us by our distributors, typically on a monthly basis. If the inventory and resale information our partners and distributors provide is inaccurate, or if we do not receive it in a timely manner, then we may not have a reliable view of products being sold to end users which could impact our operating results.

Our growth strategy depends in part on the success of strategic relationships with third parties and their continued performance and alignment.

We invest in relationships with SIs, VARs and software providers whose product offerings complement ours and through which we fulfill our product sales. Our business will be harmed if we fail to develop and grow these partner relationships. For example, our operating results may suffer if our efforts developing partner relationships increase costs but do not increase revenue. Partner relationships may also involve exclusivity provisions, multiple levels of distribution, discount pricing or investments in other companies. The cost of developing and maintaining partner relationships may go unrecovered and our efforts may not generate a corresponding increase in revenue.

Our business depends on our brand recognition and reputation, and if we fail to maintain or enhance our brand recognition or reputation then our business could be harmed.

We believe that building our brand and reputation is key to our relationships with partners and end users and to our ability to attract new partners and end users. We also believe that our brand and reputation will be increasingly important as market competition increases. Our success depends on a range of factors, including:

- continuing to deliver high-quality, innovative and defect-free products;
- maintaining high customer satisfaction;
- successfully differentiating our products from those of our competitors; and
- appropriately managing both positive and negative publicity.

Product supply shortages have challenged our ability to meet customer needs and we have recently increased prices in response to our suppliers increasing their prices to us. Our inability to supply customers with products they need, and/or our need to increase our prices could result in long-lasting, negative consequences to our relationships with customers, to RAIN adoption and to our business overall.

Increasing attention to environmental, social and governance matters may cause us to incur additional costs or expose us to additional risks.

Investors, governmental and nongovernmental organizations and customers are increasing their focus and scrutiny on corporate environmental, social and governance, or ESG, practices. Our ESG practices may not meet the standards of our investors, customers or other stakeholders, and they as well as advocacy groups may campaign for us change our business, operations or practices to better address ESG-related concerns. A failure, or perceived failure, of us to respond to any such campaigns could harm our business and reputation and have a negative impact on the market price of our securities. Moreover, as ESG best practices, reporting standards and disclosure requirements continue developing, we may incur increasing costs related to ESG monitoring and reporting.

Risks Relating to Our Intellectual Property

If we are unable to protect our intellectual property, then our business could be adversely affected.

Our success depends in part upon our ability to obtain, maintain and enforce patents, copyrights, trade secrets, trademarks and other intellectual property rights and to prevent third parties from infringing, misappropriating or circumventing those rights. We rely on a variety of intellectual property rights, including patents in the United States and copyrights, trademarks and trade secrets in the United States and foreign countries. We have historically focused on filing U.S. patent applications for a number of reasons including the fact that many RAIN products are used in or imported into the United States. By seeking patent protection primarily in the United States, our ability to assert our intellectual property rights outside the United States is limited, including in some significant foreign markets such as China. We have registered trademarks and domain names in selected foreign countries where we believe filing for such protection is appropriate and we have a small number of foreign patent applications and issued and allowed foreign patents. Regardless, some of our products and technologies may not be adequately protected by any patent, patent application, trademark, copyright, trade secret or domain name. Also, effective intellectual property protection may be unavailable or more limited in one or more relevant jurisdictions relative to those protections available in the United States.

We cannot guarantee that:

- any of the patents, trademarks, copyrights, trade secrets or other intellectual property rights we presently employ in our business will not lapse or be invalidated, circumvented, challenged or abandoned;
- our intellectual property rights will provide competitive advantages to us;

- our ability to assert our intellectual property rights against potential competitors or to settle current or future disputes will not be limited by our agreements with third parties;
- any of our pending or future patent applications will be issued or have the coverage we originally sought;
- our intellectual property rights can or will be enforced, particularly in jurisdictions where competition may be intense or where legal protections may be weak;
- we will not lose the ability to assert our intellectual property rights against, or to license our technology to, others and collect royalties or other payments; or
- we will retain the right to ask for a royalty-bearing license to an industry standard if we fail to file an intellectual property declaration pursuant to the standards process.

Monitoring and addressing unauthorized use of our intellectual property is difficult and costly. Unauthorized use of our intellectual property has already occurred and may occur again. Our failure to identify unauthorized use or otherwise adequately protect our intellectual property could adversely affect our business.

Litigation to enforce our intellectual property rights is time consuming, distracting, expensive and could result in outcomes or consequences that are harmful to us. We could incur significant costs and divert our attention and the attention of our employees by threatening or initiating litigation, which could, in turn, decrease revenue and increase expenses. Because litigation outcomes are uncertain, we could lose an enforcement action or weaken our intellectual property rights in litigation. An adverse decision could impair our intellectual property rights, limit the value of our technology or otherwise negatively impact our business, financial condition and operating results. At the same time, a decision not to enforce our intellectual property rights could embolden others to violate or potentially violate our intellectual property rights and thus weaken those rights over time.

On June 6, 2019, we filed a patent infringement lawsuit against NXP USA, Inc., a Delaware corporation and subsidiary of NXP Semiconductors N.V., or NXP, in the U.S. District Court for the Northern District of California, or the Court. For further information regarding this litigation, please refer to Note 11 of our condensed consolidated financial statements included elsewhere in this report.

If we are unsuccessful in prosecuting our patent-infringement claims against NXP or in defending ourselves against NXP's counterclaims, or to the extent we cannot maintain the validity and enforceability of our patents, we could see a material adverse effect on our business, results of operations or financial condition. Regardless of the outcome, our lawsuit against NXP will increase our expenses and distract management and key employees, and could negatively impact our relationships with partners or end users and result in retaliatory claims against us.

Some of our technology is not patented or patentable and constitutes trade secrets. To protect our trade secrets, we require our employees, consultants, advisors and other collaborators to enter into confidentiality agreements. We also rely on contractual protections with our channel partners, suppliers and end users, and we implement security measures to protect our trade secrets and other confidential information. We cannot guarantee we have entered into appropriate agreements with all parties that have access to our trade secrets or confidential information. Moreover, the agreements we have entered into may not provide sufficient protection for our trade secrets or other confidential information in the event of any unauthorized use or disclosure. Our trade secrets and other confidential information could also be obtained by third parties by breaches of our security systems. Our suppliers, employees or consultants could also assert rights to our trade secrets or other confidential information.

Our use of overseas manufacturers has extra risk. The intellectual property protection in countries where our third-party contractors operate is weaker than in the United States. If the steps we have taken and the protection provided by law do not adequately safeguard our intellectual property rights, then we could suffer lost profits due to sales of competing products that exploit our intellectual property rights.

We may become party to intellectual property disputes which could be time consuming, costly to prosecute, defend or settle, result in the loss of significant rights, and adversely affect RAIN adoption generally.

Many companies in our industry, as well as non-practicing entities, hold patents and other intellectual property rights and may pursue, protect and enforce those intellectual property rights. We have received, and may receive in the future, invitations to license patent and other intellectual property rights to technologies that could be important to our business. We also receive assertions against us, our channel partners and or end users claiming that we or they infringe patent or other intellectual property rights. Offers to purchase patents or other intellectual property rights, or claims that we infringe patents or other intellectual property rights, regardless of their merit or resolution, are costly to resolve and divert the efforts and attention of our management and technical personnel. If we decline to accept an offer or refute a claim, then the offering or claiming party may pursue litigation against us.

Intellectual property disputes have adversely affected RAIN adoption. As one example, in 2011 Round Rock Research filed lawsuits against 11 end users, including Walmart and Macy's, for RAIN-related patent infringement. We believe those lawsuits adversely affected demand for our products from 2011 to 2014. In 2013, Round Rock Research entered into licensing agreements with

many RAIN suppliers, including us; in early 2015 they reached a settlement agreement with the last of the end-user defendants. The licensed Round Rock patents all expired by the end of 2019. However, we, our channel partners, suppliers or end users could be involved in similar disputes in the future which could adversely affect our operating results and growth prospects.

We may be forced, or choose, to take action to protect our own intellectual property against infringement by others. Our actions could adversely affect RAIN adoption as well as our own operating and growth prospects. For example, in June 2019 we filed a patent infringement lawsuit against NXP USA, Inc., a Delaware corporation and subsidiary of NXP, in the U.S. District Court for the Northern District of California and in October 2019, NXP USA, Inc. and NXP filed a patent infringement lawsuit against us in the U.S. District Court for the District of Delaware. For more information, see “-If we are unable to protect our intellectual property, our business could be adversely affected.”

Many of our agreements require us to indemnify and defend our channel partners and end users from third-party infringement claims and pay damages in the case of adverse rulings. These damages could be sizable and disproportionate to the business we derive from the accused channel partners or end users. Moreover, we may not know whether we are infringing a third party’s rights due to the large number of RAIN-related patents or to other systemic factors. For example, patent applications in the United States are maintained in confidence for up to 18 months after filing or, in some instances, for the entire time prior to patent issuance. Consequently, we may not be able to account for such rights until after a patent issues.

Competitors may file patent applications or receive patents that block or compete with our patents. Claims of this sort can harm our relationships with our channel partners or end users and may deter these partners or end users from doing business with us. Further, we may or may not prevail in patent-related proceedings given the complexity and inherent uncertainties in intellectual property litigation. If any pending or future proceedings result in an adverse outcome, then we could be required to:

- cease the manufacture, use or sale of the infringing products, processes or technology;
- pay substantial damages for infringement;
- expend significant resources to develop non-infringing products, processes or technology;
- license technology from the party claiming infringement, which license may not be available on commercially reasonable terms, or at all;
- cross-license our technology to a competitor to resolve an infringement claim, which could weaken our ability to compete with that competitor; or
- pay substantial damages to our channel partners or end users to cause them to discontinue their use of, or replace, infringing products with non-infringing products.

Any of the foregoing could have an adverse effect on our business, financial condition and operating results.

Intellectual property licensing from or to others, including competitors, may subject us to requirements or limitations that could adversely affect our business and prospects.

Various intellectual-property license agreements give us access to the patents and intellectual property of others, for example to necessary intellectual property in GS1 EPCglobal protocols and ISO standards. We have similarly licensed some of our patents and intellectual property to others, for example pursuant to agreements in connection with us participating in developing GS1 EPCglobal protocols and ISO standards.

For the former, in the course of us participating in developing GS1 EPCglobal UHF Gen2, UHF Gen2 V2, tag data standards, low-level reader protocol and other protocols, we agreed to license on a royalty-free basis those of our patents that are necessarily infringed by the practice of these protocols to other GS1 EPCglobal members, subject to reciprocal royalty-free rights from those other members. For the latter, in the course of us participating in developing ISO standards, we agreed to license on a RAND basis those of our patents that are necessarily infringed by the practice of those ISO standards, again subject to reciprocal royalty-free rights from the other ISO members.

Because it may not be clear whether a member’s intellectual property is necessary to the practice of current or future protocols or standards, disputes could arise among members, resulting in our inability to receive a license on royalty-free or RAND terms or to assert our not-necessary patents against others. Further, some GS1 EPCglobal members declined to license their intellectual property on royalty-free terms, instead demanding reasonable and nondiscriminatory, or RAND, terms. Disputes or confusion may arise about whether we may invoke our necessary intellectual property if those members choose to assert their RAND intellectual property, potentially causing or at least complicating any ensuing litigation and harming our business, financial condition and operating results.

In the course of us participating in ISO, we may be required to grant to all users worldwide a license to those of our patents that are necessarily infringed by the practice of other standards, including at frequencies other than UHF, on RAND terms, again subject to reciprocity. As a result, we are not always able to limit to whom and, to a certain extent, on what terms we license our technologies, and our control over and our ability to generate licensing revenue from some of our patents may be limited. We may also choose to license our patents or intellectual property to others in the future. We cannot guarantee that any patents and technology that we provide in any will not be used against us.

We rely on third-party license agreements; impairment of those agreements may cause production or shipment delays that could harm our business.

We have license agreements with third parties for patents, software and technology we use in our operations and in our products. For example, we license tools from design-automation software vendors to design our silicon products. Third-party licenses for patents, software and other technology important to our business may not continue to be available on commercially reasonable terms, if at all. Loss of any such licenses could cause manufacturing interruptions or delays or reductions in product shipments until we can develop, license, integrate, and deploy alternative technologies, if even possible, which could harm our business and operating results.

Our use of open-source software may expose us to additional risks and harm our intellectual property.

Our products, processes and technology sometimes use or incorporate software that is subject to an open-source license. Open-source software is typically freely accessible, usable and modifiable, and is made available to the general public on an “as-is” basis under the terms of a nonnegotiable license. Use and distribution of open-source software may entail greater risks than use of third-party commercial software. Certain open-source software licenses require a user who intends to distribute the open-source software as a component of the user’s software to disclose publicly part or all of the user’s source code. In addition, certain open-source software licenses require the user of such software to make derivative works of the open-source code available to others at low or no cost. Consequently, open-source licensing can subject our previously proprietary software to open-source licensing terms, which could enable our competitors to create similar offerings with lower development effort and time and ultimately could result in a loss of sales. In addition, open-source licensors generally do not provide warranties or other contractual protections regarding infringement claims or the quality of their code, opening us to business risks that could materially harm our operating results.

We may face claims alleging noncompliance with open-source license terms or infringement or misappropriation of proprietary software. These claims could result in litigation, require us to purchase a costly license, or require us to devote research and development resources to change our software, any of which would have a negative effect on our business and operating results. Few courts have interpreted open-source licenses, and these licenses could be construed in a way that could impose unanticipated conditions or restrictions on our ability to commercialize our offerings. In addition, if there are changes in the licensing terms for the open-source software we use, we may be forced to re-engineer our solutions, incur additional costs or discontinue the sale of our products. We cannot guarantee that we have incorporated all open-source software in a manner that is consistent with our current policies and procedures, or in a manner that will not subject us to liability.

Risks Relating to Privacy and Cybersecurity

Privacy and security concerns relating to RAIN could damage our reputation and deter current or potential customers from using our products.

Privacy advocates and others have raised and may continue raising concerns about RAIN compromising consumer privacy or facilitating theft. These concerns include unauthorized parties potentially collecting personal information or personal data, tracking consumers, stealing identities or causing other issues relating to privacy or data protection. If such concerns increase, or if actual malicious or inadvertent breaches of privacy or theft occur or are perceived to have occurred, then our reputation could be damaged, our business and prospects may suffer, and we could incur significant liability. We may be or be alleged to be subject to contractual or self-regulatory obligations, in addition to legal and regulatory obligations, relating to privacy, data protection and security with respect to RAIN. These actual or asserted obligations may require us to modify our practices and policies, which we may not be able to do on commercially reasonable terms or at all, and otherwise cause us to incur substantial costs and expenses. Any failure or perceived failure to comply with any laws, regulations, or contractual or other obligations to which we are or may be asserted to be subject may result in regulatory actions, private claims and litigation, legal and other costs, substantial time and resources and fines, penalties or other liabilities. Any such actions may be expensive to defend, may entail substantial legal and other costs as well as time and resources and likely would damage our reputation and adversely affect our business, financial condition and results of operations.

In addition to concerns over privacy or theft, it is possible for those with malicious intent to misuse RAIN to facilitate theft or damage the public trust. If a theft or other damaging incident occurs or is perceived to occur and customer or end-user data, personal information or other confidential information is accessed or used without authorization, then our and our customers’ operations could be disrupted and our customers or we could be the target of regulatory investigations or proceedings and private claims, demands or

litigation, and we could face potential liability and significant costs and expenses to remediate and otherwise respond to the incident. Concerns about security and privacy, even if unfounded, could also damage our reputation and operating results or could delay overall RAIN industry development. In such an event, our business and prospects may suffer, and we could incur claims, proceedings and significant liability. We also could be required to expend significant capital and resources to address any security incident or breach and to implement measures to prevent further breaches or incidents.

We cannot ensure that any limitation-of-liability provisions in our customer and user agreements, contracts with third-party vendors and service providers or other contracts are enforceable or adequate or would protect us from any liabilities or damages against claims relating to a security breach or other security-related matter.

Government regulations and guidelines and other standards relating to consumer privacy may adversely impact adoption of our products, require us to make design changes or constrain our ability to implement new and desired product features.

Our customers are subject to laws and regulations related to collecting, storing, transmitting and using personal information and personal data, as well as additional laws and regulations that address privacy and security related to RFID in general. Because RAIN is a type of RFID, we believe these laws and regulations apply to RAIN.

The European Commission, or the EC, has issued guidance to address privacy concerns about RFID. In May 2009, the EC issued a recommendation that retailers in the EU inform their customers when RFID tags are either on or embedded within products. In April 2011, the EC signed a voluntary agreement with private and public entities to develop privacy guidelines for companies using RFID in the EU. While compliance with the guidelines is voluntary, our customers that do business in the EU prefer products that comply with the guidelines. If our RAIN products do not provide the necessary functionality to allow customers to comply with the guidelines then our business may suffer.

The data-security and privacy legislative and regulatory landscape in the United States, EU and other foreign jurisdictions continues to evolve, and new or changed laws, regulations, guidelines and standards may adversely impact our business, including our ability to develop future products. If we fail to develop products that meet end-user privacy requirements, then end users may choose not to use our products.

Although the Gen2 V2 protocol includes features for addressing consumer privacy and authenticating a tag, and although we have incorporated custom features in our products to further protect consumer privacy, a third party may still breach these features, including as implemented in our products, in which case our reputation could be damaged and our business and prospects could suffer.

A breach of security or other security incidents impacting our systems or others used in our business could have an adverse effect on our business.

We use security systems to maintain our facility's physical and information-technology security and to protect our proprietary and confidential information, including that of our customers, suppliers and employees. We face risks of security breaches and incidents from a variety of sources, including viruses, ransomware, hacking, malicious code, and social engineering and other forms of employee or contractor negligence, unintentional acts, or malfeasance. Accidental or willful security breaches or incidents or other unauthorized access to our facilities or information systems could compromise access to and the integrity of this information. The consequences of loss and possible misuse of our proprietary and confidential information, including information relating to individuals, could include, among other things, unfavorable publicity, damage to our reputation, difficulty marketing or selling our products, customer allegations of breach of contract, loss or theft of intellectual property, claims and litigation, governmental and regulatory proceedings, and possible fines, penalties and other damages and liabilities, any of which could have a material adverse effect on our business, financial condition, reputation and relationships with customers and partners.

We rely on third-party providers of corporate infrastructure services such as for human resources, electronic communications and financial functions. Additionally, our platform operates in conjunction with, and we are dependent upon, third-party products, services, and components. Consequently, we depend on the security systems of these third-party providers. There have been and may continue to be significant attacks on certain third-party providers, and we cannot guarantee that our or our third-party providers' systems and networks have not been breached or that they do not contain exploitable defects or bugs that could result in a breach of or disruption to our systems and networks or the systems and networks of third parties that support us and our platform. These third-party providers also face risks of security breaches or incidents, and our ability to monitor their security is limited. Any security breaches, incidents or other unauthorized access to our service-providers' systems or viruses, loggers, ransomware or other errors, vulnerabilities, or malfeasance code in their data or software could expose us to loss, unavailability, or misappropriation of, or unauthorized use or disclosure of, confidential and proprietary information. If there is a security vulnerability, error, ransomware or other bug or malfeasance code in one of these third-party products, services and components and if there is a security exploit targeting them, we could face increased costs, claims, liability, reduced revenue and harm to our reputation or competitive position. Because the techniques used to obtain unauthorized access to or sabotage security systems change frequently and are often not recognized until after an attack, we may be unable to anticipate the techniques or implement adequate preventative measures, thereby exposing us to material adverse effect on our business, operations and financial condition. Using third-party providers also introduces risk of a cybersecurity incident. We use Okta products, including those that Okta reported on January 20, 2022 as breached. We conducted an internal investigation and found no indication of a breach of our systems. Okta confirmed on March 24, 2022 that Impinj was not impacted by their incident.

We may incur significant costs in an effort to detect and prevent security breaches and other security-related incidents. In the event of an actual or perceived security breach or incident, we could be required to expend significant capital and other resources to mitigate, notify third parties of, and otherwise address, the breach or incident and its root cause and to take steps to prevent further breaches or incidents. Claims relating to an actual or perceived security breach or incident may not be adequately covered by our insurance and may result in increased insurance costs or insurance not being available to us at all.

Risks Relating to Our Financial Position and Capital Needs

We have a history of losses and have only achieved profitability intermittently. We cannot be certain that we will attain or sustain profitability in the future.

We have incurred losses since our inception in 2000. Whereas we were profitable between 2013 and 2015, we had a net loss of \$51.3 million for the year ended, and an accumulated deficit of \$362.5 million as of, December 31, 2021. Our ability to attain or sustain profitability depends on numerous factors, many of which are out of our control, including continued RAIN adoption and us maintaining or growing our market share. We expect significant expenses to support operations, product development and business and headcount expansion in sales, engineering, and marketing and may, for periods of time, choose to invest to grow the market and our share, reduce costs, improve our efficiencies or shorten our supply chain. If we fail to increase our revenue or manage our expenses, or if our investments in growing the market or our market share do not succeed, then we may not attain or sustain profitability in the future.

We have a history of significant fluctuations in our quarterly and annual operating results.

You should consider our business and its prospects in light of the risks and difficulties we encounter in the uncertain and rapidly evolving RAIN market. Because this market is new, large and evolving, predicting its growth rate and ultimate size is difficult. The rapidly evolving nature of the markets in which we sell our products, as well as other factors that are beyond our control, reduce our ability to accurately gauge our future prospects and forecast our quarterly or annual performance. If sales exceed expectations or if we reduce prices to win a large opportunity or in response to competition, then our revenue and profitability may be positively affected, but gross margins may be negatively affected. If we are unable to obtain semiconductor wafers or electronic components, then our sales will decline and our revenue and profitability may be negatively affected. If research analysts or investors view our decisions negatively, the trading price of our common stock could decline.

Historically, our success predicting future sales of our products and platform has been limited. End users drive demand for our products, but we sell nearly all our products through channel partners so our ability to forecast end-user demand is limited. We rely on those same channel partners to integrate our products with end-user information systems and this integration has been uneven and unpredictable in scope, timing and implementation. Also, RAIN-based systems often require time-consuming proofs-of-concepts and other steps such as designing and implementing new business processes, which make sales of our products difficult to forecast. Partly as a consequence, in the past, both we and other industry participants have at times overestimated the RAIN market size and growth rates, then failed to meet expectations.

Our history shows sales volatility and highlights our limited ability to forecast sales. For example, in 2016 our endpoint IC sales exceeded both our expectations and those of our industry's analysts due in large part to several coincident large end-user deployments. Then, in the latter part of 2017 and in early 2018, the pace of endpoint IC unit-volume growth slowed relative to 2016, we believe due to multiple factors including, but not limited to, delays in new deployments and in planned expansions at several large retailers as well as a correction in our endpoint IC channel inventory. Then, in the latter part of 2018 and in 2019, due to shorter lead times for our endpoint ICs, we were increasingly receiving orders and shipping the ordered products within the same quarter. Those shortened lead times decreased our ability to predict both optimal inventory and order volume for a quarter. Then, in early 2020, Covid-19 introduced even greater uncertainty in our business, with us choosing to build product inventory during the pandemic-induced downturn. In 2021 we saw strong demand exceeding our available product supply, and supply-demand imbalance has so far continued into 2022. Our foundry partner has signaled continued tight availability for endpoint IC wafers in our process nodes into 2023, preventing us from fully capitalizing on our demand. Although we believe they have prioritized us for upside wafers, and have allocated sufficient second-half 2022 upside wafers for us to deliver second-half 2022 endpoint IC volumes that exceed first half, much of the upside is 200mm rather than 300mm wafers, causing us to transition some customers back from M700 to our older product families.

We expect that for the foreseeable future our visibility to future sales, including volumes and prices, will continue to be limited. Our poor visibility may cause fluctuations, particularly on a quarterly basis, in our actual operating results and in differences between our expected and actual operating results.

Many factors, most of which are outside our control, may cause or contribute to fluctuations in our quarterly and annual operating results. These fluctuations make financial planning and forecasting difficult. In addition, these fluctuations may cause unanticipated decreases in our available cash, which could negatively affect our business and prospects. Material factors that contribute to fluctuations in our operating results and revenue include:

- macroeconomic conditions, including inflation and recession, and their impact on our business and our customers, end-users, suppliers and other business partners;
- variations in RAIN adoption and deployment delays by end users;
- fluctuations in demand for our products or platform, including by tag manufacturers and other significant customers on which we rely for a substantial portion of our revenue;
- fluctuations in the pricing and availability or supply of our products or key inputs, especially semiconductor wafers, used to produce our products;
- variations in the quality of our products and return rates;
- delays in new-product introductions and in the maturity of our new-product technologies;
- decreases in selling prices for our products;
- delays in our product-shipment timing, customer or end-user sales or deployment cycles, or work performed under development contracts;
- intellectual property disputes involving us, our customers, end users or other participants in our industry;
- adverse outcomes of litigation or governmental proceedings;
- timing variability in product introductions, enhancements, services, and technologies by us and our competitors and market acceptance of these new or enhanced products, services and technologies;
- unanticipated excess or obsolete inventory as a result of supply-chain mismanagement, new-product introduction, quality issues or otherwise;
- changes in the amount and timing of our operating costs, including those related to the expansion of our business, operations and infrastructure;
- changes in business cycles or seasonal fluctuations that may affect the markets in which we sell;
- changes in industry standards or specifications, or changes in government regulations, relating to RAIN, or to our products or our platform;
- late, delayed or cancelled payments from our customers; and
- unanticipated impairment of long-lived assets and goodwill.

A substantial portion of our operating expenses are fixed for the short term, and as a result, fluctuations in revenue or unanticipated expenses can have a material and immediate impact on our profitability and negatively affect our operating results, which could cause the price of our common stock to decline.

Risks Relating to U.S. Federal Income Tax

Our ability to use net operating losses to offset future taxable income may be limited.

As of December 31, 2021, we had federal net operating loss carryforwards, or NOLs, of \$274.7 million and federal research and development credit carryforwards of \$18.3 million which we may use to reduce future taxable income or offset income taxes due. We have established a valuation allowance against the carrying value of these deferred tax assets. The tax loss and research and development credit carryforwards began expiring in 2020. Insufficient future taxable income will adversely affect our ability to utilize these NOLs and credit carryforwards. Reductions in corporate tax rates may also reduce our ability to utilize the NOLs.

Under Sections 382 and 383 of the U.S. Internal Revenue Code, or the Code, a corporation that experiences a more-than 50% ownership change over a three-year testing period is limited in its ability to use its pre-change NOLs and other tax assets to offset future taxable income or income taxes. Our existing NOLs and credit carryforwards may be subject to limitations arising from previous ownership changes; if we undergo a future ownership change then our ability to use our NOLs and credit carryforwards could be further limited by Sections 382 and 383 of the Code. Future changes in our stock ownership, the causes of which may be outside our control, could result in an ownership change under Sections 382 and 383 of the Code. Our NOLs may also be impaired under state law. As a result of these limitations, we may not be able to utilize a material portion of, or possibly any of, the NOLs and credit carryforwards.

We could be subject to additional income tax liabilities.

We are subject to income taxes in the United States and certain foreign jurisdictions. During the ordinary course of business, we use significant judgment in evaluating our worldwide income-tax obligations and we conduct many transactions for which the ultimate tax determination is uncertain. Additionally, our effective tax rates could be adversely affected by earnings being lower than anticipated in countries where we have lower statutory rates and higher than anticipated in countries where we have higher statutory rates, by changes in currency exchange rates, by changes in the valuation of our deferred tax assets and liabilities or by changes in the relevant tax, accounting and other laws, regulations, principles and interpretations. We are subject to audit in various jurisdictions and these jurisdictions may assess additional income tax against us. Although we believe our tax determinations are proper, the final determination of any tax audits and possible litigation could be materially different from our historical income-tax provisions and accruals. The results of an audit or litigation could have a material effect on our operating results or cash flows in the period or periods for which that determination is made.

Taxing authorities may successfully assert that we should have collected or in the future should collect sales and use, value-added or similar taxes, and we could be subject to liability with respect to past or future sales, any of which could negatively affect our operating results.

We do not collect sales and use, value-added or similar taxes in all jurisdictions in which we have sales, based on our belief that such taxes are either not applicable or an exemption from such taxes applies. Sales and use, value-added and similar tax laws and rates vary greatly by jurisdiction. Certain jurisdictions in which we do not collect such taxes may assert that such taxes are applicable, which could result in tax assessments, penalties and interest, and we may be required to collect such taxes in the future, including as a result of a change in law. Such tax assessments, penalties and interest or future requirements may negatively affect our operating results.

Risks Relating to Our Financial Reporting and Disclosure

If we fail to maintain an effective system of disclosure controls and internal controls over financial reporting, our ability to produce timely and accurate financial statements or comply with applicable regulations could be impaired, which may adversely affect investor confidence in us and, in turn, lead to a decline in the market price of our common stock.

As a public company, we are required to comply with the requirements of the Securities Exchange Act of 1934, as amended, or the Exchange Act, the Sarbanes-Oxley Act of 2002, or the Sarbanes-Oxley Act, and the rules and regulations of The Nasdaq Stock Market. The Sarbanes-Oxley Act, among other things, requires that we maintain effective disclosure controls and procedures and internal control over financial reporting. Effective internal controls are necessary for us to provide reliable financial reports and prevent fraud.

For example, under Section 404 of the Sarbanes-Oxley Act, or Section 404, we are required to make a formal assessment of the effectiveness of our internal control over financial reporting. As an “emerging growth company”, we availed ourselves of an exemption from the requirement that our independent registered public accounting firm attest to the effectiveness of our internal control over financial reporting. However, we ceased to be an “emerging growth company” on December 31, 2021. As a result, our independent registered public accounting firm is required to undertake an assessment of our internal control over financial reporting and the cost of our compliance with Section 404 will correspondingly increase. Compliance with the applicable provisions of Section 404 will continue to divert resources and take significant time and effort. Moreover, we may be unable to successfully complete all the procedures, certifications and attestation requirements of Section 404 in a timely manner.

Additionally, we have previously identified and reported material weaknesses in our internal controls over financial reporting in prior years, and while these identified material weaknesses have been remediated, there can be no assurance that our remediation will be effective in future periods or prevent other material weaknesses or significant deficiencies in our internal control over financial reporting from arising in the future. We may identify additional material weaknesses in our internal controls over financial reporting in future periods. A material weakness, even if quickly remedied, could reduce the market’s confidence in our financial statements and harm our stock price. Any inability to provide reliable financial reports or prevent fraud could harm our business.

Any failure to implement and maintain effective disclosure controls and procedures and internal control over financial reporting, including identifying material weaknesses, could cause investors to lose confidence in the accuracy and completeness of our financial statements and reports, which would likely adversely affect the market price of our common stock. In addition, we could be subject to sanctions or investigations by The Nasdaq Stock Market, the SEC and other regulatory authorities.

We have incurred and, in the future, will incur high costs of being a public company.

We have incurred significant legal, accounting and other costs associated with public company reporting requirements. We ceased to be an “emerging growth company” on December 31, 2021 and are no longer eligible for reduced disclosure requirements and exemptions applicable to “emerging growth companies.” As such, we are required to hold a say-on-pay vote and a say-on-frequency vote at our 2022 annual meeting of stockholders. We expect that our loss of “emerging growth company” status will require additional attention from management and will result in increased costs to us, which could include higher legal fees, accounting fees and fees associated with investor relations activities, among others. We have hired and may need to continue to hire additional accounting and information technology staff with appropriate public company experience and technical accounting knowledge. We cannot predict or estimate the amount of additional costs we may incur as a result of being a public company.

We have and will continue to incur costs associated with recently adopted corporate governance requirements, including those of the SEC and The Nasdaq Global Select Market. We expect those governance requirements to lead to ongoing legal and financial costs and make some activities more time consuming and costly. We also expect those requirements to increase the difficulty and expense for us to obtain director and officer liability insurance, and we may need to accept reduced policy limits and coverage or pay substantially higher costs to obtain similar or higher coverage to what we have today. As a result, we may find it difficult to attract and retain qualified persons to serve on our board of directors or as executive officers or may need to pay higher compensation to attract and retain them. Although we monitor developments with respect to those requirements, we cannot predict or estimate the additional costs we may incur or the timing of such costs.

Risks Relating to Owning or Trading of Our Securities

The market price of our common stock has been and will likely continue to be volatile, and the value of your investment could decline significantly.

Since July 2016, when we sold shares of our common stock in our initial public offering through June 30, 2022, our stock price has ranged from \$9.95 to \$94.39. The following factors, in addition to general risks and other risks described in this report, may have a material effect on the trading price of our common stock:

- price and volume fluctuations in the overall stock market;
- changes in operating performance, stock market valuations, and volatility in the market prices of other technology companies generally, or those in our industry in particular;
- actual or anticipated quarterly variations in our results of operations or those of our competitors;
- actual or anticipated changes in our growth rate relative to our competitors;
- delays in end-user deployments of RAIN systems;
- announcements by us or our competitors of acquisitions, new products, significant contracts, commercial relationships or capital commitments;

- supply interruptions, including semiconductor wafer or other product shortfalls;
- developments relating to intellectual property rights or in disputes relating to those rights;
- our ability to develop and market new and enhanced products on a timely basis;
- commencement of, or our involvement in, litigation;
- changes in our board of directors or management;
- changes in governmental regulations or in the status of our regulatory approvals;
- unstable political and economic conditions, including instability resulting from wars and other armed conflicts, such as Russia's invasion of Ukraine;
- the trading volume of our stock;
- actual or perceived security breaches;
- limited public float;
- any future sales of our common stock or other securities;
- financial analysts dropping or reducing their coverage of us; changes in financial estimates by analysts who do cover us; or our failure to meet analyst estimates or investor expectations;
- fluctuations in the values of companies investors perceive to be comparable to us;
- the financial projections we may provide to the public, any changes in these projections or our failure to meet these projections;
- general economic conditions and slow or negative growth of markets in which we operate.

Technology company stocks like ours have experienced extreme price and volume fluctuations often unrelated or disproportionate to the operating performance of those companies. Securities class-action litigation is frequently instituted against companies whose stock prices decline significantly, as it was against us. Such litigation causes substantial costs and a diversion of management's attention and resources. For further information regarding this litigation risk, please refer to Note 11 of our condensed consolidated financial statements included elsewhere in this report.

We may need to raise additional capital which may not be available on favorable terms, if at all, causing dilution to stockholders, restricting our operations or adversely affecting our ability to operate our business.

In the course of running our business we may need to raise capital, potentially diluting our stockholders. In December 2019, we issued and sold \$86.3 million aggregate principal amount of the 2019 Notes. In November 2021, we issued and sold \$287.5 million aggregate principal amount of the 2021 Notes. We may in the future engage in additional equity, equity-linked or debt financings to secure additional funds. We used approximately \$183.6 million of the net proceeds, excluding accrued interest, to repurchase approximately \$76.4 million aggregate principal of the 2019 Notes through individual privately negotiated transactions concurrent with such offering. We used an additional \$17.6 million of cash to repurchase the remaining \$9.85 million aggregate principal of the 2019 Notes through individual privately negotiated transactions in June 2022. If unforeseen circumstances drive our financing needs, such as unforeseen expenditures or if our operating results are worse than we expect, then we may not be able to raise capital on favorable terms, if at all. Debt financing, if available, may include covenants limiting or restricting our ability to take specific actions such as incurring additional debt, expending capital or declaring dividends, or which impose financial covenants that limit our ability to achieve our business objectives. If we need but cannot raise additional capital on acceptable terms then we may not be able to meet our business objectives, our stock price may fall, and you may lose some or all of your investment.

Transactions relating to the 2019 Notes or the 2021 Notes may affect our stock's value.

If the 2021 Notes are converted by holders, then we have the ability under the indenture for the 2021 Notes to deliver cash, stock or any combination of cash or stock, at our election. If we elect to deliver stock, then doing so will dilute the ownership interests of our existing stockholders. Any sales in the public market of the stock issuable upon a conversion could decrease our stock price. Anticipated future conversions of the 2021 Notes into shares of our stock could also decrease our stock price. The holders of the 2021 Notes may also engage in short selling to hedge their positions in the 2021 Notes, which could also decrease our stock price.

In connection with us issuing the 2019 Notes, we entered into privately negotiated capped-call transactions with financial counterparties and these capped-call transactions were left intact even after we acquired the outstanding 2019 Notes in June 2022. The capped-call transactions were generally designed to reduce potential dilution to our stock upon any conversion or settlement of the 2019 Notes or offset any cash payments we were required to make in excess of the principal amount of converted 2019 Notes, as the case may be, with such reduction or offset subject to a cap based on the cap price. From time to time, the financial counterparties to the capped calls may modify their hedge positions by entering into or unwinding various derivative transactions with respect to our stock or purchasing or selling our stock or other securities of ours in secondary market transactions prior to the maturity of the capped calls. This activity could cause a decrease in our stock price.

For more information on the 2019 Notes, the 2021 Notes and the capped-call transactions, see Note 6 of our consolidated financial statements included elsewhere in this report.

Our principal stockholders and management own a significant percentage of our stock and are able to exercise significant influence over matters subject to stockholder approval.

As of June 30, 2022, our executive officers, directors and principal stockholders, together with their respective affiliates, beneficially owned approximately 25.4% of our stock. As a result, our executive officers, directors and principal stockholders may be able to significantly influence, in their capacity as stockholders, matters requiring approval by our stockholders, including electing directors and approving mergers, acquisitions or other transactions. They may have interests that differ from yours and may vote in a way with which you disagree, and which may be adverse to your interests. This concentration of ownership could have the effect of delaying or preventing a change in our control or otherwise discouraging a potential acquirer from attempting to obtain control of us, which in turn could have a material adverse effect on our stock price and may prevent attempts by our stockholders to replace or remove our board of directors or management.

Servicing the 2021 Notes may require a significant amount of cash, and we may not have sufficient cash flow or the ability to raise the funds necessary to satisfy our obligations under the 2021 Notes, and our current and future indebtedness may limit our operating flexibility or otherwise affect our business.

Our ability to make scheduled payments of the principal of, to pay interest on or to refinance any current or future indebtedness, including the 2021 Notes, or to make cash payments in connection with any conversion of the 2021 Notes or upon any fundamental change if holders require us to repurchase their 2021 Notes for cash, depends on our future performance, which is subject to economic, financial, competitive and other factors beyond our control. Our business may not generate sufficient future cash from operations to service our indebtedness and make necessary capital expenditures. If we are unable to generate sufficient cash flow, we may be required to adopt one or more alternatives, such as selling assets, restructuring indebtedness or obtaining additional equity capital on terms that may be onerous or highly dilutive. Our ability to refinance any of our indebtedness, including the 2021 Notes, will depend on the capital markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in us defaulting on our debt obligations. In addition, our existing and future indebtedness could have important consequences to our stockholders and significant effects on our business. For example, it could:

- make it more difficult for us to satisfy our debt obligations, including the 2021 Notes;
- increase our vulnerability to general adverse economic and industry conditions;
- require us to dedicate a substantial portion of our cash flow from operations to payments on our indebtedness, thereby reducing the cash available to run our business;
- limit our flexibility in planning for, or reacting to, changes in our business or in the RAIN industry;
- restrict us from exploiting business opportunities;
- place us at a competitive disadvantage compared to our competitors that have less indebtedness; and
- limit our availability to borrow additional funds for working capital, capital expenditures, acquisitions, debt service requirements, execution of our business strategy or for other purposes.

Anti-takeover provisions in our charter documents and under Delaware or Washington law could make an acquisition of us difficult, limit attempts by our stockholders to replace or remove our current management and limit our stock price.

Provisions of our certificate of incorporation and our bylaws may delay or discourage transactions involving an actual or potential change in our control or change in our management, including transactions in which stockholders might otherwise receive a premium for their shares, or transactions that our stockholders might otherwise deem to be in their best interests. Therefore, these provisions could adversely affect our stock price. Among other things, our certificate of incorporation and bylaws:

- permit our board of directors to issue up to 5,000,000 shares of preferred stock, with any rights, preferences and privileges as they may designate;
- provide that the authorized number of directors may be changed only by resolution of the board of directors;
- provide that all vacancies, including newly created directorships, may, except as otherwise required by law, be filled by the affirmative vote of a majority of directors then in office, even if less than a quorum;
- divide our board of directors into three classes, each of which stands for election once every three years (subject to gradual declassification beginning at the 2021 annual meeting of stockholders, such that our board of directors will be fully declassified beginning at the 2023 annual meeting of stockholders);
- restrict the forum for certain litigation against us to Delaware;
- require that any action taken by our stockholders be effected at a duly called annual or special meeting of stockholders and not by written consent;
- provide that stockholders seeking to present proposals before a meeting of stockholders or to nominate candidates for election as directors at a meeting of stockholders must provide notice in writing in a timely manner, and also specify requirements as to the form and content of a stockholder's notice;
- do not provide for cumulative voting rights (therefore allowing the holders of a majority of the shares of common stock entitled to vote in any uncontested election of directors to elect all of the directors standing for election, if they should so choose);
- provide that special meetings of our stockholders may be called only by the chair of the board, our chief executive officer or by the board of directors; and
- provide that stockholders will be permitted to amend our bylaws only upon receiving at least two-thirds of the total votes entitled to be cast by holders of all outstanding shares then entitled to vote generally in the election of directors, voting together as a single class.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which generally prohibits a Delaware corporation from engaging in any of a broad range of business combinations with any "interested" stockholder for a period of three years following the date on which the stockholder became an "interested" stockholder. Likewise, because our principal executive offices are located in Washington, the anti-takeover provisions of the Washington Business Corporation Act may apply to us under certain circumstances now or in the future. These provisions prohibit a "target corporation" from engaging in any of a broad range of business combinations with any stockholder constituting an "acquiring person" for a period of five years following the date on which the stockholder became an "acquiring person."

Our bylaws provide that the Court of Chancery of the State of Delaware is the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our bylaws provide that, unless we otherwise consent in writing, the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a breach of fiduciary duty, any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our certificate of incorporation or our bylaws or any action asserting a claim against us that is governed by the internal affairs doctrine. The choice of forum provision may limit stockholders' ability to bring a claim in a judicial forum favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. Alternatively, if a court were to find the choice of forum provision contained in our bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business and financial condition.

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

Not applicable.

Item 6. Exhibits

Exhibit Number	Exhibit Description	Incorporation by Reference			Filed Herewith
		Form	Date	Number	
3.2	Amended and Restated Bylaws of Impinj, Inc. adopted as of April 18, 2022	8-K	4/21/2022	3.2	
10.1	Outside Director Compensation Policy, as amended May 26, 2022				X
31.1	Certification of Principal Executive Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended				X
31.2	Certification of Principal Financial Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended				X
32.1*	Certification of Principal Executive Officer Required Under Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350				X
32.2*	Certification of Principal Financial Officer Required Under Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350				X
101	Inline XBRL Document Set for the condensed consolidated financial statements and accompanying notes in Part I, Item 1, “Financial Statements” of this Quarterly Report on Form 10-Q.				X
104	Inline XBRL for the cover page of this Quarterly Report on Form 10-Q, included in the Exhibit 101 Inline XBRL Document Set.				X

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

SIGNATURES

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

Date: July 27, 2022

Impinj, Inc.

By: /s/ Cary Baker

Cary Baker

Chief Financial Officer (principal financial officer and duly authorized signatory)

IMPINJ, INC.

OUTSIDE DIRECTOR COMPENSATION POLICY

(as amended May 26, 2022 (the “Effective Date”))

Impinj, Inc. (the “Company”) believes that the granting of cash compensation and equity to members of its Board of Directors (the “Board,” and members of the Board, the “Directors”) represents an effective tool to attract, retain, and reward Directors who are not employees of the Company (the “Outside Directors”). This Outside Director Compensation Policy (the “Policy”) is intended to formalize the Company’s policy regarding grants of cash compensation and equity to its Outside Directors. Unless defined in this Policy, capitalized terms are defined in the Company’s 2016 Equity Incentive Plan, as may be amended from time to time (the “Plan”). Each Outside Director is solely responsible for any tax obligations he or she incurs from the receipt of any compensation under this Policy.

1. CASH RETAINERS*Annual Cash Retainer*

Each Outside Director will be paid an annual cash retainer of \$40,000. There are no per-meeting attendance fees for attending Board meetings. This cash compensation will be paid quarterly in arrears on a prorated basis.

Chair Annual Cash Retainer

Each Outside Director who serves as chair of the Board or chair of a committee of the Board will be eligible to earn additional annual fees as follows:

Chair of the Board:	\$17,500
Chair of Audit and Risk Committee:	\$16,000
Chair of Nominating and Corporate Governance Committee:	\$10,000
Chair of Compensation Committee	\$10,000

This additional cash compensation will be paid quarterly in arrears on a prorated basis.

Committee Member Annual Cash Retainer

Effective as of the Effective Date, each Outside Director who serves as a member of a committee of the Board (other than the chair of such committee) will be eligible to earn additional annual fees as follows:

Member of Audit and Risk Committee: \$8,000

Member of Nominating and Corporate Governance Committee: \$5,000

Member of Compensation Committee \$5,000

This additional cash compensation will be paid quarterly in arrears on a prorated basis.

2. EQUITY COMPENSATION

Outside Directors may be granted all types of equity awards (except incentive stock options) under the Plan or any other Company equity plan in place at the time of grant, including discretionary Awards not covered under this Policy. All grants of Awards to Outside Directors under this Policy will be made in accordance with this Section 2 and no Awards may be made if they would exceed any limitations under the Plan.

(a) Automatic Outside Director Awards.

(i) **No Discretion.** All grants of Initial Awards (defined below), Annual Awards (defined below) and Board Chair Awards (defined below and, together with Initial Awards and Annual Awards, “**Automatic Outside Director Awards**”) to Outside Directors pursuant to this Section 2(a) will be automatic and nondiscretionary. No person will have any discretion to select which Outside Directors will be granted any Automatic Outside Director Awards under this Section 2(a) or to determine the number of Shares to be covered by such Automatic Outside Director Awards.

(ii) **Initial Award.** Upon the date of an Outside Director’s initial appointment to the Board (such date, the “**Start Date**”) (other than by appointment on the date of each annual meeting of the Company’s stockholders (the “**Annual Meeting**”) following the Effective Date), such Outside Director shall automatically be granted an Award of Restricted Stock Units as set forth in this Section 2(a)(ii) (the “**Initial Award**”). The number of Restricted Stock Units subject to the Initial Award shall equal the quotient of (A) \$175,000 *multiplied by* a fraction (1) the numerator of which is (x) 12 *minus* (y) the number of months between the date of the last Annual Meeting and the Start Date and (2) the denominator of which is 12; divided by (B) the Per Share Value. Subject to the terms of the Plan and this Policy, each Initial Award will fully vest upon the first anniversary of the grant date, subject to the Outside Director continuing to be a Service Provider through the vesting date. For the avoidance of doubt, if a member of the Board is an Employee (an “**Inside Director**”) and becomes an Outside Director by reason of no longer continuing as an Employee, such a transition from an Inside Director to an Outside Director will not result in a grant under this Section 2(a)(ii).

(iii) **Annual Award.** On the date of each Annual Meeting following the Effective Date, each Outside Director automatically will be granted an Award of Restricted Stock Units (an “**Annual Award**”). The number of Restricted Stock Units subject to the Annual Award shall equal (A) \$175,000 divided by (B) the Per Share Value. Subject to the terms of the Plan and this Policy,

each Annual Award will fully vest upon the earlier of (i) the first anniversary of the grant date and (ii) the date of the next Annual Meeting following the grant date, in each case subject to the Outside Director continuing to be a Service Provider through the vesting date. The vesting schedule described in the preceding sentence shall also apply to any Annual Award issued and outstanding as of the Effective Date.

(iv)Board Chair Award. On the date of each Annual Meeting following the Effective Date, each Outside Director who is serving as Chair of the Board and is eligible for an Annual Award automatically will be granted an additional Award of Restricted Stock Units (a “**Board Chair Annual Award**”). The number of Restricted Stock Units subject to the Board Chair Annual Award shall equal (A) \$17,500 divided by (B) the Per Share Value. Subject to the terms of the Plan and this Policy, each Annual Award will fully vest upon the earlier of (i) the first anniversary of the grant date and (ii) the date of the next Annual Meeting following the grant date, in each case subject to the Outside Director continuing to be a Service Provider through the vesting date. The vesting schedule described in the preceding sentence shall also apply to any Board Chair Annual Award issued and outstanding as of the Effective Date. In the event that an Outside Director who is serving or is appointed as Chair of the Board is eligible for an Initial Award, such Outside Director will also be eligible to receive a Board Chair Annual Award, pro-rated in the same manner as the Initial Award in Section 2(a)(ii) (a “**Board Chair Initial Award**” and, together with board Chair Annual Awards, “**Board Chair Awards**”).

(v)Deferred Payment Alternative. Notwithstanding the provisions set forth herein, Outside Directors may be permitted, in the sole discretion of the Administrator, to defer the delivery of the Shares subject to the Automatic Outside Director Award upon vesting in accordance with the terms and conditions of a deferral program approved by the Administrator. Any such deferral election shall be subject to such rules, conditions and procedures as shall be determined by the Administrator, in its sole discretion, which rules, conditions and procedures shall at all times comply with the requirements of Section 409A of the Code, unless otherwise specifically determined by Administrator. If an Outside Director elects to defer the settlement of any vested Automatic Outside Director Award in accordance with this Section, payment of the deferred vested Automatic Outside Director Award shall be made in accordance with the terms of the deferral election.

(vi)Per Share Value. “**Per Share Value**” means the average trading price for a share of the Company’s Common Stock over the period (i) beginning on the date that is 10 trading days prior to the announcement of its quarterly earnings for the fiscal quarter immediately prior to the grant date of such Award (an “**Earnings Announcement**”) and (ii) ending on the date that is nine trading days after such Earnings Announcement.

(vii)Change in Control. In the event of a Change in Control, each Outside Director will fully vest in his or her Automatic Outside Director Awards granted under this Policy.

(b) Share Holding Requirements. An Outside Director shall not sell, pledge, assign, hypothecate, transfer, or dispose of in any manner other than by will or by the laws of descent or distribution Shares issued pursuant to an Automatic Outside Director Award while the Outside Director continues to serve as a Director. Notwithstanding the foregoing, an Outside Director may sell

Shares issued pursuant to an Automatic Outside Director Award in order to pay for any tax obligations he or she incurs from the vesting and/or settlement of such Award.

3. TRAVEL EXPENSES

Each Outside Director's reasonable, customary and documented travel expenses to Board and Board committee meetings will be reimbursed by the Company.

4. ADDITIONAL PROVISIONS

All provisions of the Plan not inconsistent with this Policy will apply to Automatic Outside Director Awards granted to Outside Directors.

5. REVISIONS

The Board, in its discretion, may at any time change and otherwise revise the terms of the cash compensation granted under this Policy, including, without limitation, the amount or timing of payment of any future grants of cash compensation. The Board, in its discretion, may at any time change and otherwise revise the terms of Automatic Outside Director Awards to be granted under this Policy, including, without limitation, the number of Shares subject thereto. The Board, in its discretion, may at any time suspend or terminate the Policy.

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CERTIFICATIONS

I, Chris Diorio, Ph.D., certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Impinj, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer 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: July 27, 2022

/s/ Chris Diorio

Chris Diorio, Ph.D.

Chief Executive Officer

(Principal Executive Officer)

CERTIFICATIONS

I, Cary Baker, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Impinj, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer 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: July 27, 2022

/s/ Cary Baker

Cary Baker
 Chief Financial Officer
 (Principal Financial Officer)

IMPINJ, INC.
CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of Impinj, Inc. (the "Company") on Form 10-Q for the quarter ended June 30, 2022, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Chris Diorio, Ph.D., Chief Executive Officer (*Principal Executive Officer*) of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Chris Diorio

Chris Diorio, Ph.D.

Chief Executive Officer

(Principal Executive Officer)

Date: July 27, 2022

A signed original of this written statement required by Section 906 of the Sarbanes-Oxley Act of 2002 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

This certification accompanies the Report 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 Impinj, 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 Report), irrespective of any general incorporation language contained in such filing.

IMPINJ, INC.
CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of Impinj, Inc. (the "Company") on Form 10-Q for the quarter ended June 30, 2022, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Cary Baker, Chief Financial Officer (*Principal Financial Officer*) of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Cary Baker

Cary Baker
Chief Financial Officer
(Principal Financial Officer)

Date: July 27, 2022

A signed original of this written statement required by Section 906 of the Sarbanes-Oxley Act of 2002 has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

This certification accompanies the Report 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 Impinj, 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 Report), irrespective of any general incorporation language contained in such filing.
