



# **POET**

## **TECHNOLOGIES INC.**

**Management's Discussion  
and Analysis  
For the Six Months Ended June 30, 2017**



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## **MANAGEMENT’S DISCUSSION AND ANALYSIS FOR SIX MONTHS ENDED JUNE 30, 2017**

The following discussion and analysis of the operations, results, and financial position of POET Technologies Inc., (the “Company”) for the six months ended June 30, 2017 (the “Period”) should be read in conjunction with the Company’s condensed unaudited interim consolidated financial statements for the six months ended June 30, 2017 and the Company’s audited consolidated financial statements for the year ended December 31, 2016 and the related notes thereto both of which were prepared in accordance with International Financial Reporting Standards (“IFRS”). The effective date of this report is August 10, 2017. All financial figures are in United States dollars (“USD”) unless otherwise indicated. The abbreviation “U.S.” used throughout refers to the United States of America.

### ***Forward-Looking Statements***

This management discussion and analysis contains forward-looking statements that involve risks and uncertainties. It uses words such as “may”, “would”, “could”, “will”, “likely”, “expect”, “anticipate”, “believe”, “intend”, “plan”, “forecast”, “project”, “estimate”, and other similar expressions to identify forward-looking statements. Forward-looking statements are subject to a variety of risks and uncertainties which could cause actual events or results to differ from those reflected in the forward-looking statements, including, without limitation, risks and uncertainties relating to the early stage of the Company’s development and the possibility that future development of the Company’s technology and business will not be consistent with management’s expectations, difficulties in achieving commercial production or interruptions in such production if achieved, inherent risks of operating a manufacturing facility, including risks associated with supplier delays, factory uptime, inventory management and other operating uncertainties, the inherent uncertainty of cost estimates and the potential for unexpected costs and expenses, the uncertainty of profitability and failure to obtain adequate financing on a timely basis. The Company undertakes no obligation to update forward-looking statements if circumstances or Management’s estimates or opinions should change, except to the extent required by law. The reader is cautioned not to place undue reliance on forward-looking statements.

The Company is incorporated under the laws of the Province of Ontario. The Company’s shares trade under the symbol “PTK” on the TSX Venture Exchange in Canada and under the symbol “POETF” on the OTCQX in the U.S.

## **BUSINESS**

### **Overview**

We are an advanced semiconductor development and manufacturing company dedicated to enabling the integration of photonics and electronics through both monolithic and hybrid approaches to device design and packaging. The favorable economics of integration have been well established in silicon-based electronics, as demonstrated by Very Large Scale Integrated (VLSI) circuits. Through integration, we believe that the

Company can capture a meaningful portion of the market for photonics devices that address the need for increased bandwidth, speed, sensitivity and cost across a range of high growth data communications and photonic sensing applications. We believe that the integration of discrete functions onto fewer devices or ultimately onto a single chip is the optimal way to lower cost, reduce size, limit power consumption and increase the performance, scalability and value of photonics devices, making opto-electronics a more viable economic proposition.

The cost of building silicon-based devices today contrasts sharply with the cost of building photonics-based devices. While the majority of the cost of building silicon-based devices is in fabricating the device on the wafer, the majority of the cost of building photonics devices today is in the packaging and testing process. It is inevitable that these costs will be reduced through integration. By deploying novel approaches to both monolithic and hybrid integration of photonics devices, we believe the Company can become a global leader in photonics.

Over the past few years, our Company has been focused on monolithic integration, based on our proprietary POET gallium arsenide-based (GaAs) platform. POET has developed a design for a single, monolithic semiconductor chip (our “photonic engine” technology) that has all of the elements needed to communicate data at the speed of light, yet with the lower cost profile of copper. We believe we are the only company that has demonstrated the capability to cost effectively integrate multiple electronic and optical functions on a single chip. The POET photonic engine, as designed, integrates at least three essential discrete devices onto a single GaAs chip: a vertical-cavity surface-emitting laser (VCSEL), a photodetector and an electronic circuit based on either a thyristor or a heterostructure field-effect transistor (HFET).

A single chip solution is not only the lowest cost approach to photonic integration, it has the added benefits of lower power consumption and smaller size – all by a factor of 2X to 10X compared to conventional solutions. The added benefits of lower power and smaller size could open up entirely new markets for photonic applications, including on-board and on-chip data transfer (“inside the box”). By integrating multiple device functions, we believe we can capture the combined value associated with discrete devices, such as lasers, detectors and multiplexers, disrupting the market for conventional solutions and creating new and expanded applications for our photonic engine technology.

The first application of the POET photonic engine technology will be in the data center market, initially in the form of Active Optical Cables (AOCs), a market that is today largely served by Direct Attach Copper (DAC) cables. This “ultra short reach” segment of the data communications market covers distances of less than five meters at datacom speeds of 25 to 100 Gigabits per second (Gbs). By providing a monolithically integrated solution, we believe we can disrupt the market for copper-based short reach datacom, with a simple, low cost, scalable device that consumes vastly lower power. According to *LightCounting*<sup>1</sup>, the current market size for GaAs-based AOCs is \$339 million, growing to \$779 million by 2021. The expected growth is the result of major cloud-based data center operators committing to AOCs because of the higher cost associated with the power consumption of copper-based cables.

In addition to monolithic integration, we are developing solutions based on a novel “hybrid” integration approach, which combines Indium Phosphide (InP)-based photonics chips and dielectric waveguide devices on a silicon base into a single package. This approach enables the replacement of high-cost optical components, such as mirrors and lenses, with embedded dielectric devices, dramatically lowering the cost of potential solutions

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<sup>1</sup> LightCounting, *Integrated Optical Devices*, January 2016

aimed at the “medium-reach” segment of the data communications market (i.e., 500m–10 kilometers). Our ability to address hybrid integration is a direct result of our acquisitions, in 2016, of DenseLight Semiconductor Pte. Ltd. (“DenseLight”) based in Singapore, and BB Photonics, Inc. based in New Jersey.

Historically, DenseLight has manufactured and sold a range of InP-based devices, primarily superluminescent light emitting diodes (SLEDs) for use in optical networks and sensing platforms. These devices span a variety of form factors, including chips, modules and high-value, programmable subsystems. Recently, we announced the expected availability in 2017 of narrow linewidth lasers for test and measurement applications, including LIDAR, as well as a newly designed de-multiplexer chip, based on a proprietary design from BB Photonics. POET is applying the intellectual property acquired from BB Photonics to its DenseLight product portfolio in several novel ways to lower overall module cost by eliminating the conventional gold box hermetic packaging, which is a complex process that requires active alignment and the use of lenses and metallized fibers. By incorporating BB Photonics designs for waveguide couplers, multiplexers and filters, we believe the packaging costs of our DenseLight modules can be reduced by up to 70% from current levels. This combination of DenseLight and BB Photonics under the POET umbrella offers an unprecedented opportunity for the Company to address the market for sensing products with novel low-cost solutions. In addition, we believe it will allow POET to pursue the large and growing market for 100G and potentially 400G transceiver products, with both integrated transceivers as well as active and passive components.

InP-based transceivers currently represent a \$4.5 billion market, according to *LightCounting*, growing to over \$7 billion by 2021, largely as a result of the proliferation of hybrid integration aimed at reducing the cost of the optical components.<sup>2</sup> The majority of today’s disaggregated suppliers shipping 100G transceivers in a 4x25G format have developed assembly methods for placing multiple laser chips on one substrate and coupling the output into one fiber using micro-optic filters and other elements. POET’s approach is to develop Dielectric-InP Photonics, by combining athermal dielectric waveguides, integrated lasers, PIN diodes and discrete electronics. This example of “hybrid” integration involves the placement of both monolithically integrated and discrete devices onto a waveguide optical bench, requiring no active alignment. We believe this solution will be cost competitive with silicon photonics in the <2km data center market, and it should ultimately be scalable to 10km, as well as support 200G and 400G datacom speeds.

In addition to building transceivers, we believe the Company has the opportunity to sell individual components to other suppliers of optical transceivers, including receiver optical sub-assemblies (ROSA), modulators, multiplexers, demultiplexers and single-chip local area network (LAN) wavelength division multiplexing (WDM) lasers.

As we continue in the product development phase for our hybrid solutions, we are focusing our efforts on meeting specifications for targeted photonic products, starting with 100G transceiver components for the data communications market. Device developments in these areas can also be applied to lower the cost and increase performance of next generation optical sensing products. Product development activities are iterative, and include the optimization of designs, testing the manufacturability and reliability of prototypes, and successfully demonstrating the required scalability and cost parameters. We continue to expect that the product development phase for the hybrid technology, and for the integration of the BB Photonics technology into the DenseLight product line, will comprise a majority of the 2017 calendar year. As such, we currently expect initial commercial revenues for our new sensing products in 2017, followed by early commercial revenues for our 100G transceiver components in 2018, with the transceiver optical engine itself currently expected in mid 2019.

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<sup>2</sup> Ibid.

Over the past several months we have encountered challenges in the design and manufacturing of the GaAs-based monolithic chip. The primary POET technology utilizes a Thyristor (Double Heterojunction Opto-Electronic Switch – DOES) as the fundamental switch element for the lasers and detectors. Conventional Thyristors are typically three terminal devices, but they lack the ability for fast switching. High speed switching requires access to all four terminals of the POET Thyristor, but electrical access to the fourth terminal has proved extremely challenging. As an alternative to the original thyristor-based switch, we began a program using a bipolar design and we have demonstrated proof of concept with this approach. However, the bipolar switch design is fabricated on a different epitaxial stack design than the thyristor, requiring either the completion of the development using a thyristor switch, or re-developing the detector, VCSEL and the HFETs on a new epitaxial stack. Because of the high cost and relatively long development cycles related to GaAs platform, we have determined that we should not proceed with the GaAs development program without a strategic partner and the funding such a partner would provide. Instead, we are focusing on the nearer-term, higher return on investment opportunities by addressing the much larger, high-growth markets afforded to us with the InP-based hybrid technology.

Revenue was \$1,360,932 for the six months ended June 30, 2017 and gross margin for the period was 55%. Reported revenue and gross margin in 2016 was \$576,741 and 51% respectively. It is important to note, however, that revenue and gross margin for the comparable period in 2016 was only reported since the acquisition of DenseLight on May 11, 2016. Our net loss from operations, before taxes for the period was \$6,491,907 compared to a net loss from operations, before taxes of \$6,417,573 for the same period in 2016. Our largest 10 customers comprised approximately 70% of our revenue.

#### Industry Background

The two target markets in which we currently sell or plan to sell products near-term are Photonic Sensing and Data Communications. The global photonics market is forecasted to grow at a compound average growth rate (CAGR) of 8% to 12% through 2021, reaching an estimated \$54 billion.<sup>3</sup> This market includes Photonic Sensing (which consists of devices for test and measurement, navigation, LIDAR systems) and Data Communications (both telecom applications and optical data communications).

The Photonics Sensing market<sup>4</sup> represents a Total Available Market (“TAM”) of approximately \$23 billion of system sales and comprises the following segments: 1) Test & Measurement (TAM: \$10 billion), which includes monitoring equipment for communication, components and material testing, as well as sensing equipment such as distributed temperature and strain measurement; 2) Structural Health Monitoring (TAM: \$6 billion), which includes devices to monitor the power grid, and fiber optic-based sensors in rail lines, nuclear facilities, etc.; 3) Guidance and Navigation (TAM: \$4.5 billion), which includes navigational guidance systems, gyrocompasses, and optical-based systems for navigating self-driving automobiles; and 4) Medical and Health Care (TAM: \$2.5 billion), which includes devices for non-invasive blood glucose monitoring, pulse-oximeter devices, and ophthalmic examination. Component sales to systems providers typically represent approximately 10% of system market TAM’s. We plan to address these high growth markets with component sales in a combination of current and expected new products from our DenseLight subsidiary.

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<sup>3</sup> MarketsandMarkets *Photonics Market by Application – Global Forecasts to 2021*, September 2016

<sup>4</sup> Global Market Insights *Optical Sensors Market Size By Product, By Application, Industry Analysis Report, Regional Outlook, Application Potential, Price Trends, Competitive Market Share & Forecast, 2016 – 2024*, August 2016

The growth of the overall Data Communications market is forecasted to grow at a 27% CAGR over the period 2015 to 2020 and is being driven largely by cloud data centers, which have a forecasted CAGR of 29.6% over the same period. This compares to traditional data centers at only a 9% CAGR<sup>5</sup>. The expected growth in the networking and data communication market is the result of many factors, including smartphone use, over-the-top video consumption, social networking and the “Internet of Things”. Increased consumer demand for data requires both data storage and data communications at higher speeds. As a result, data center operators are increasing the size and scale of their facilities, while simultaneously looking to component suppliers for solutions capable of providing higher data transmission rates. Within data centers, data communications over distances of up to 2 kilometers have already been transitioned from inherently lower speed copper cable to optical fibers. Furthermore, short reach communications, either rack-to-rack or within the rack as well as those requiring speeds of up to 100G, are now increasingly being converted from copper to optical cables.

Photonic transceivers will represent a \$36 billion market opportunity in 2025, according to *Oculi, llc*. The primary segments for photonic transceivers are Ethernet, wide area network (WAN) and dense wavelength division multiplexing (DWDM), all of which are predominantly addressed by InP-based optical technologies. Ethernet transceivers are forecasted to grow to \$7.4 billion by 2025 with 100G driving a majority of the growth. Within Ethernet, singlemode transceivers based on InP devices are forecasted to outgrow multimode transceivers based on GaAs devices by a factor of 6:1. Segmented by distance, the majority of growth is expected in the <10km segment (\$4.3 billion by 2025).<sup>6</sup>

### Our Strategy

Our vision is to become a global leader in photonics by deploying both monolithic and hybrid approaches to the integration of photonics devices into a wide variety of vertical market applications. Our strategy includes the following key elements:

- *Continue our transition from an R&D company to a commercial enterprise based on products and solutions.* We will continue to leverage DenseLight’s existing manufacturing and sales capabilities in order to introduce new sensing and datacom products, as well as our hybrid integrated optical engine once it is fully productized. In addition, we intend to grow revenue from the product families offered by our DenseLight subsidiary, largely through the introduction of new discrete and integrated products based on innovations we have developed internally and acquired from BB Photonics.

- *Initiate product development cycles for our InP-based hybrid integrated products targeted at the 100G datacom market and incorporate our dielectric technology into the DenseLight product-line.* We have made substantial progress in designing novel discrete dielectric components which can be incorporated into a hybrid optical engine and sold on the merchant market. We have also begun integrating those components into the DenseLight product-line, along with the development of designs for integrated packaging solutions. Product development is an iterative process, involving optimization of designs, testing the manufacturability and reliability of prototypes, and demonstrating required scalability and cost parameters.

- *Pursue multiple potential sources of non-product revenue and strategic partnerships.* In addition to product sales, we have been pursuing Non-Recurring Engineering (“NRE”) revenues from end-use customers and/or from strategic partners. In particular, we believe our 100G transceiver components represent a uniquely attractive opportunity for collaborative development with a strategic partner(s). We also believe that the

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<sup>5</sup> Cisco Global Cloud Index, 2015-2020, November 2016

<sup>6</sup> Oculi, llc Estimates for 2025 commissioned by POET Technologies, Inc., March 2017

continued development of our GaAs platform is dependent on securing a strategic partner.

· *Continue to invest in our capabilities and infrastructure.* We intend to continue to invest in new products, new technology and our production infrastructure and facilities to maintain and strengthen our competitive position. Our R&D programs in Singapore are partially reimbursed by the Singapore Economic Development Board, whose support will help to defer the costs associated with bringing innovative new products to market.

· *Selectively pursue other opportunities that leverage our existing expertise.* Our expertise in designing and manufacturing photonics devices, both discrete and integrated, positions us well to pursue applications in high growth markets and our Singapore operation is ideally located to support customers in Asia, where much of the growth in photonics is occurring.

· *Pursue complementary strategic alliance or acquisition opportunities.* We intend to evaluate and selectively pursue strategic alliances or acquisition opportunities that we believe will accelerate our penetration of specific applications or vertical markets with our technology or products.

### Our Technology

Prior to and since our acquisitions of DenseLight and BB Photonics, we have been focused on a new process for making devices using gallium arsenide (GaAs) as the substrate for wafers. The primary appeal of gallium arsenide is that it's the most suitable substrate for integrating small-scale integration (SSI) electronics and optics onto a single chip, especially for short reach applications. Optical connections are much faster and more efficient than copper for transferring data within and to/from a chip. The POET photonic engine integrates at least three essential discrete devices onto a single GaAs chip: a vertical-cavity surface-emitting laser (VCSEL), a photodetector and an electronic circuit based on either a thyristor or a heterostructure field-effect transistor (HFET).

In addition to the GaAs-based monolithic integration of the POET optical engine, we are pursuing the development of an InP-based 100G optical engine using a hybrid approach to integration. At the core of this development are the active laser components supplied by DenseLight and the novel passive components based on BB Photonics technology. BB Photonics has designed a multi-layer, athermal waveguide and a spot size converter that can be incorporated directly into the InP epitaxial stack. Our objective is to place several integrated and discrete components on a waveguide optical bench that does not require active optical alignment, which would substantially reduce the cost of the device by eliminating the need for lenses and mirrors. We intend to offer both components to transceiver makers, as well as to develop our own 100G, scalable transceiver optical engine.

### Our Products

We expect our InP-based solutions, based on DenseLight and BB Photonics technologies, will add to the Company's current and future product portfolio, including:

- Broadband Super-Luminescent LEDs (Light Emitting Diodes)
- Narrow Linewidth Lasers
- DFB (Distributed Feedback) Lasers for Data Communications
- 100Gbs ROSA (Receiver Optical Sub-Assemblies) and TOSA (Transmitter Optical Sub-Assemblies) for 100G Transceiver Optical Engines
- High Power ELEDs (Edge Emitting Light Emitting Diodes)

- CWDM (Coarse Wavelength Division Multiplexing) Solutions

Upon securing a strategic partner and completing further development, the GaAs-based POET optical engine may provide the following advantages to the industry:

- Up to 10X power savings improvement over existing copper technologies (especially for high speed data communication links)
- Up to 5X cost improvement over existing optical component solutions
- Performance and power of optical solutions at price points competitive to that of copper, thus potentially accelerating the adoption of optical communications solutions
- Flexible and integrated solution that can be applied to virtually any technical application that commands an optical IO for high bandwidth, including chip-to-chip communications, on-board optics and on-chip optical communications

### Intellectual Property

We have 55 issued patents and 8 patents pending, including two related to our integrated dielectric waveguide technology. The patents cover device structures, underlying technology, applications of the technology and fabrication processes. We believe these patents provide a significant barrier to entry against competition, along with trade secrets and know-how acquired from DenseLight and BB Photonics. We intend to continue to apply for additional patents in the future. Currently, we are working on the design of integrated devices, manufacturing processes, and products for data communication applications in the data center market, along with products for photonic sensing markets that employ novel packaging technologies.

### Fabrication and Assembly Capabilities

We provide one-stop design and manufacturing solutions, from photonics design and simulation, epitaxial growth, wafer fabrication, chip production, in-line optical coating, sub-mounting, photonic measurements, product testing and screening. We are operationally ready for responsive prototyping and quality production. The 50,000 sq. ft. purpose-built facility in Singapore houses our R&D, product design and manufacturing operations under one roof. Its 15,000 sq. ft. clean room is fully equipped for enabling vertically integrated volume manufacturing, from wafer fabrication to test and packaging. We are ISO9001 certified in Singapore processing Indium Phosphide (InP) and Gallium Arsenide (GaAs) based opto-electronic devices and photonic integrated circuits through our in-house wafer fabrication and assembly & test facilities.

We have an experienced team with deep know-how in GaAs and InP semiconductors wafer processing and we continue to build on this technical base. Together with our operationally ready manufacturing and photonics design center, various ODM and design-in programs can be supported for both discrete and integrated optical components.

### *Significant Events and Milestones During 2017*

In 2017, we continued to execute on our stated strategic plan. We achieved the following significant milestones during the first half of 2017:

- 1) On January 16, 2017, the Company announced certain organizational changes that included the addition of Rajan Rajgopal as the president and general manager of DenseLight and Soma Sankaran as vice president of sales for the Asia-Pacific region.
- 2) On January 31, 2017, the Company announced the development of micro multiplexer and de-



multiplexer solutions. The Company announced that it expects to release in the second half of 2017 a low loss, low cost micro multiplexer and de-multiplexer product for 100G and above transceivers based on the technology developed at its subsidiary BB Photonics Inc. The Company also unveiled its next generation Constellation Series of Narrow Linewidth Laser solutions for test and measurement applications. Introduced specifically to meet superior Relative Intensity Noise (RIN) performance and ultra-narrow linewidths requirements, this new family of products simplifies the overall design process for OEMs, while shortening development time and significantly accelerating time-to-market.

- 3) On February 1, 2017, the Company announced the appointment of David Lazovsky as Executive Chairman of the Board of Directors. Ajit Manocha will remain as a Director on the Board.
- 4) On April 3, 2017, the Company announced that it successfully demonstrated the functionality of the VCSEL for the integrated GaAs opto-electronic platform.

### ***Summary of Quarterly Results***

Following are the highlights of financial data of the Company for the most recently completed eight quarters, which have been derived from the Company's consolidated financial statements prepared in accordance with IFRS:

	<u>Jun.30/17</u>	<u>Mar.31/17</u>	<u>Dec.31/16</u>	<u>Sep.30/16</u>	<u>Jun.30/16</u>	<u>Mar. 1/16</u>	<u>Dec. 31/15</u>	<u>Sep. 30/15</u>
Sales	\$ 648,382	\$ 712,550	\$ 423,461	\$ 861,545	\$ 576,741	\$ -	\$ -	\$ -
Cost of sales	320,857	288,191	346,462	318,976	280,563	-	-	-
Research and development	1,186,042	1,147,003	1,104,733	581,354	576,073	530,469	932,618	767,124
Depreciation and amortization	558,919	540,393	643,344	550,420	239,958	87,844	83,526	82,022
Professional fees	167,726	155,742	96,009	207,220	272,287	140,200	225,118	110,389
Wages and benefits	604,608	645,880	586,596	676,700	1,054,413	483,169	414,857	423,214
Management and consulting fees	40,330	103,931	51,303	230,352	172,401	157,805	156,154	160,303
Stock-based compensation <sup>(1)</sup>	159,783	894,813	903,253	1,019,970	887,990	1,259,051	1,491,713	1,621,751
General expenses and rent	653,933	547,052	758,947	508,178	546,626	260,764	353,399	285,802
Impairment and other loss	-	-	29,807	-	-	80,453	-	-
Change in fair values	-	-	-	(283,130)	-	-	-	-
Other (income), including interest	<u>(142,557)</u>	<u>(19,807)</u>	<u>(19,647)</u>	<u>(11,473)</u>	<u>(14,950)</u>	<u>(20,802)</u>	<u>(20,188)</u>	<u>(18,979)</u>
Net loss before taxes	<u>\$ 2,901,259</u>	<u>\$ 3,590,648</u>	<u>\$ 4,077,346</u>	<u>\$ 2,937,022</u>	<u>\$ 3,438,620</u>	<u>\$ 2,978,953</u>	<u>\$ 3,637,197</u>	<u>\$ 3,431,626</u>

- (1) Stock based compensation allocated between General & Administrative and Research & Development issuances are combined for MD&A purposes. For financial statement presentation purposes, stock based compensation is split between *General & Administrative* and *Research & Development*.

### ***Explanation of Quarterly Results for the three months ended June 30, 2017 ("Q2 2017")***

Net loss before taxes for Q2 2017, includes the operations of DenseLight and BB Photonics for the entire quarter, while the loss for the six months ended June 30, 2016 ("Q2 2016") reflected the operations of the Company with those subsidiaries from May 11, 2016 to June 30, 2016. Net loss before taxes for Q2 2017 was \$2,901,259 as compared to net loss before taxes of \$3,438,620 in Q2 2016. The following discusses the significant variances between Q2 2017 and Q2 2016.

During Q2 2017, the Company reported revenue of \$648,382 through its DenseLight subsidiary compared to \$576,741 in Q2 2016. Revenue in Q2 2016 included \$110,533 of service revenue as compared to nil in Q2 2017. On a comparative basis, product revenue therefore increased by 39% over Q2 2016.

Cost of sales was \$320,857 in Q2 2017, which resulted in a gross margin of 51% compared to cost of sales of \$280,563 and gross margin of 51% in Q2 2016. After careful analysis of the DenseLight operation, management determined that certain costs that were historically included in cost of sales should be more appropriately grouped with “general expenses and rent”. Prior period figures have been adjusted to provide a more accurate reflection of the Company’s cost of sales by retroactively reflecting this new classification methodology to the acquisition date.

Research and development (“R&D”) increased by 106% or \$609,969 from \$576,073 in Q2 2016 to \$1,186,042 in Q2 2017. Q2 2017 R&D includes six months of R&D activity from both DenseLight and BB Photonics subsidiaries as compared to activity from only May 11, 2016 to June 30, 2016 in Q2. The limited reporting activity of those subsidiaries resulted in the large variance between the two periods. The Company has dedicated additional resources to expanding the portfolio of DenseLight sensing products through the incorporation of the BB Photonics dielectric waveguide technology and the development of wafer-level packaging.

Professional fees in Q2 2017 decreased by 38% or \$104,561 from \$272,287 in Q2 2016 to \$167,726 in Q2 2017. Professional fees were unusually high in Q2 2016 due to the professional services required to related to both the DenseLight and BB Photonics acquisitions.

Wages and benefits decreased by 43% or \$449,805 from \$1,054,413 in Q2 2016 to \$604,608 in Q2 2017. Q2 2016 wages included accrued bonus of \$550,000 to the CEO. The bonus was deferred and eventually paid in 2017.

General expenses and rent increased by 20% or \$107,307 from \$546,626 in Q2 2016 to \$653,933 in Q2 2017. The increased expense is a result of only a partial inclusion of general expenses and rent in Q2 2016 related to the DenseLight and BB Photonics acquisitions which were effective May 11, 2016 and June 22, 2016 respectively. Due to the reclassification of certain overhead expenses that were historically classified as cost of sales, the utilization of those expenses will also result in period over period variances.

In Q2 2017, management and consulting fees decreased by 77% or \$132,071 from \$172,401 in Q2 2016 to \$40,330 in Q2 2017. The resignation of Ajit Manocha from the position of Executive Chairman of the Board in February 2017 contributed to the decrease. This reduction in management and consulting fees was partially offset by an increase in wages and benefits for the compensation to the David Lazovsky who replaced Ajit Manocha as the Executive Chairman of the Board. David Lazovsky is paid \$200,000 annually in his capacity as Executive Chairman as compared to \$500,000 previously paid to Ajit Manocha.

Non-cash stock-based compensation decreased by 82% or \$728,207 from \$887,990 in Q2 2016 to \$159,783 in Q2 2017. The valuation of stock options is driven by a number of factors including the number of options granted, the strike price and the volatility of the Company’s stock. The resignation or termination of employees who had unvested stock options contributed to the substantial reduction from Q2 2016. The stock option expense is dependent on the timing of the stock option grant and the amortization of the options as they vest. The stock options vest in accordance with the policies determined by the Board of Directors from time to time consistent with the provisions of the 2016 Plan which grants discretion to the Board of Directors.

Depreciation and amortization increased by 133% or \$318,961 from \$239,958 in Q2 2016 to \$558,919 in Q2 2017. The increase was a result of depreciation and amortization relating to the property and equipment, patents and licenses and intangible assets acquired during and after the acquisition of DenseLight and BB Photonics in Q2 2016. The Company acquired \$11,225,454 in property and equipment, patents and licenses and intangible assets since Q2 2016.

### ***Explanation of Quarterly Results for the six months ended June 30, 2017 (the “period”)***

Net loss before taxes for the six-month period ended June 30, 2017 was \$6,491,907 as compared to net loss before taxes of \$6,417,573 for the six months ended June 30, 2016. The loss of the period ended June 30, 2017 includes the operations of DenseLight and BB Photonics for the entire period, while the loss for the six months ended June 30, 2016 reflected the operations of the Company with those subsidiaries from May 11, 2016 to June 30, 2016.

During the six-month period ended June 30, 2017, the Company reported revenue of \$1,360,932 through its DenseLight subsidiary compared to \$576,741 in the six months ended June 30, 2016. Revenue for the period ended June 30, 2017 was for six months, while the revenue in 2016 was only from May 11, 2016 to June 30, 2016.

Gross margin for the six-month period ended June 30, 2017 was 55% as compared to 51% for the same period in 2016. The increased revenue over 2016 contributes to higher gross margin due to a better absorption of costs from higher revenue. After careful analysis of the DenseLight operation, management determined that certain costs that were historically included in cost of sales should more appropriately be grouped with “general expenses and rent”. Prior period figures have been adjusted to provide a more accurate reflection of the Company’s cost of sales by retroactively reflecting this new classification methodology to the acquisition date.

R&D increased by 111% or \$1,226,503 from \$1,106,542 in the first six months of 2016 to \$2,333,045 in the first six months of 2017. R&D costs relating to the development programs of BB Photonics and DenseLight in 2016 only reflect activity from May 11, 2016 to June 30, 2016 while 2017 costs reflect six months of R&D costs for both subsidiaries.

General expenses and rent increased by 49% or \$393,595 from \$807,390 in the first six months of 2016 to \$1,200,985 in the first six months of 2017. This increase was also a result of only partial inclusion of the activity of BB Photonics and DenseLight in 2016 as acquisitions which were effective June 22, 2016 and May 11, 2016 respectively.

Non-cash stock-based compensation decreased by 51% or \$1,092,445 from \$2,147,041 in the first six months of 2016 to \$1,054,596 in the first six months of 2017. The resignation or termination of employees who had unvested stock options contributed to the substantial reduction in 2017. The valuation of stock options is driven by a number of factors including the number of options granted, the strike price and the volatility of the Company’s stock. The stock option expense is dependent on the timing of the stock option grant and the amortization of the options as they vest. The stock options vest in accordance with the policies determined by the Board of Directors from time to time consistent with the provisions of the 2016 Plan which grants discretion to the Board of Directors.

For the first six months of 2017, management and consulting fees decreased by 56% or \$185,945 from the same period in 2016. The first six-month 2017 expense was \$144,261 as compared to \$330,206 in the same period of 2016. The resignation of Ajit Manocha from the position of Executive Chairman of the Board in February 2017 contributed to the decrease. This reduction in management and consulting fees was partially offset by an increase in wages and benefits for the compensation to the David Lazovsky who replaced Ajit Manocha as the Executive Chairman of the Board. David Lazovsky is paid \$200,000 annually in his capacity as Executive Chairman as compared to \$500,000 that previously paid to Ajit Manocha.

Wages and benefits decreased by 19% or \$287,094 from \$1,537,582 in the first six months of 2016 to \$1,250,488 in the comparable period in 2017. A number of factors contributed to the decrease: 2016 wages included (1) accrued bonus of \$550,000 to the CEO, which was deferred and eventually paid in 2017; and (2) wages paid to the former Executive Co-Chairman of the Board of \$136,655. These increases were offset by (1) the resignation of Dr. Subhash Deshmukh (2) the inclusion of the compensation of the new Executive Chairman of the Board (3) wages of DenseLight and BB Photonics for the entire 2017 period as compared to only the period from May 11, 2016 to June 30, 2016 in the prior period. The net effect of these changes resulted in the reduction in wages and benefits of \$287,094 from the first six months of 2016 compared to the first six months of 2017.

Depreciation and amortization increased by 235% or \$771,510 from the first six months of 2016 to the comparable period in 2017. The expense in 2016 was \$327,802 as compared to \$1,099,312 in 2017. The increase was a result of depreciation and amortization relating to the property and equipment, patents and licenses and intangible assets acquired during and after the acquisition of DenseLight and BB Photonics in 2016. The Company acquired \$11,225,454 in property and equipment, patents and licenses and intangible assets since June 2016.

### ***Explanation of Material Variations by Quarter for the Last Eight Quarters***

#### ***Q2 2017 compared to Q1 2017***

Gross margin was 51% in Q2 2017 as compared to 60% in Q1 2017. The reduced gross margin is a result of lower absorption of factory costs from reduced revenue of \$712,550 in Q1 2017 to \$648,382 in Q2 2017. Cost of sales includes certain fixed costs that do not change in a linear fashion with revenue. As revenue decreases, gross margin will also decrease.

Management and consulting fees decreased by \$63,601 or 62% from \$103,931 in Q1 2017 to \$40,330 in Q2 2017. The resignation of Ajit Manocha as Executive Chairman of the board contributed to this the decrease.

Non-cash stock-based compensation decreased by \$735,030 or 82% from \$894,813 in Q1 2017 to \$159,783 in Q2 2017. The resignation or termination of employees who had unvested stock options contributed to the substantial reduction from Q1 2017. The valuation of stock options is driven by a number of factors including the number of options granted, the strike price and the volatility of the Company's stock. The stock option expense is dependent on the timing of the stock option grant and the amortization of the options as they vest. The stock options vest in accordance with the policies determined by the Board of Directors from time to time consistent with the provisions of the 2016 Plan which grants discretion to the Board of Directors.

General expenses and rent increased by \$106,881 or 20% from \$547,052 in Q1 2017 to \$653,933 in Q2 2017. In Q2, the Company had a number of unforeseen facility costs related to the maintenance of the factory.

#### ***Q1 2017 compared to Q4 2016***

Sales in Q1 2017 were \$712,550 as compared to \$423,461 in Q4 2016. Backlog from 2016 contributed to increased Q1 sales, along with \$80,000 of NRE revenue. Gross margins for the quarter were 60% and were compared to the prior period of Q4 2016, which was 18%.

R&D increased by \$42,270 or 4% from \$1,104,733 in Q4 2016 to \$1,147,003 in Q1 2017. Development costs of \$272,000, which were capitalized in prior periods, were expensed to R&D in Q4 as the Company no longer felt those capitalized costs continued to meet the criteria for capitalization. The Company did not expense any capitalized R&D costs in Q1 2017.

Professional fees increased by \$59,733 or 62% from \$96,009 in Q4 2016 to \$155,742 in Q1 2017. Professional fees relating the Company's year- end audit contributed to the period over period increase.

Wages and benefits increased by 10% or \$59,284 from \$586,596 in Q4 2016 to \$645,880 Q1 2017. Wages and benefits were lower in Q4 2016 due to the reversal of an accrued and unpaid retention bonus of \$100,000 to the former COO in Q1 2017. Additionally, Q1 2017 wages and benefits included the wages of the new CFO, the new President of DenseLight, the new VP of Sales for the Asia-Pacific region and the new Executive Chairman of the Board.

General expenses and rent decreased by \$211,895 or 28% from \$758,947 in Q4 2016 to \$547,052 in Q1 2017. General expenses were higher in Q4 2016 due to the ancillary costs such as travel and other administrative costs associated with the \$9.3 million equity financing in Q4 2016.

A reclassification of \$75,000 of consulting fees paid to a director in Q4 2016 from management and consulting to the cost of financing resulted in a lower overall expense to \$51,303 in Q4 2016, resulting in the increase of \$52,628 or 102%. Management and consulting fees were \$103,931 in Q1 2017.

#### Q4 2016 compared to Q3 2016

Sales in Q4 2016 were \$423,461 as compared to \$861,545 in Q3 2016. The reduction in Q4 sales was a result of backlog pushed into Q1 2017 due to production challenges with one large customer. Expected Q4 NRE was also delayed and was not recognized until Q1 2017.

R&D expenses increased by \$523,379 or 90% from \$1,104,733 in Q4 2016 as compared to \$581,534 in Q3 2016. Development costs of \$272,000, which were capitalized in prior periods, were expensed to R&D in Q4 as the Company no longer felt those capitalized costs continued to meet the criteria for capitalization. Q3 R&D was also limited in scope because of import/export restrictions on its technology. Those restrictions were resolved which resulted in the Company incurring costs in Q4 2016 that would have been incurred more evenly throughout the year.

Q4 2016 professional fees were \$96,009 as compared to \$207,220 in Q3 2016. The period over period reduction of \$111,211 or 54% was a result of the Company settling most issues in Q3 and earlier periods relating to corporate acquisitions, financing and the recent import/export licensing issues that required professional advisors.

Wages and benefits were \$586,596 in Q4 2016 and \$676,700 in Q3 2016. The reduction of \$90,104 or 13% was from cost savings resulting from the 10-20% temporary non-recoverable reduction in US management compensation, a recovery of an accrued but unpaid retention bonus of \$100,000 to the former COO and roles that became either vacant or redundant at DenseLight.

The reduction in management and consulting fees of \$179,049 or 78% from \$230,352 in Q3 2016 to \$51,303 in Q4 2016 was a result of a 10% to 20% reduction in management fees to head office based executives along with a reclassification of \$75,000 of consulting fees paid to a director in Q3 2016. The fees were paid in Q3 2016 and classified as general consulting fees but were reclassified to financing cost in Q4 2016.

General expenses and rent increased by \$250,769 or 49% from \$508,178 in Q3 2016 to \$758,947 in Q4 2016. The increase included ancillary costs such as travel and other administrative costs related to the \$9.3M financing that was not included as finance costs.

#### Q3 2016 compared to Q2 2016

Sales in Q3 2016 were wholly related to the sales of products and services of DenseLight. Sales increased by \$284,804 or 49% from \$576,741 in Q2 2016 to \$861,545 in Q3 2016. The increase in sales also resulted in increased gross margin from 51% in Q2 2016 to 63% in Q3 2016. The increase in gross margin resulted from better absorption of fixed costs with increased revenue.

Q3 2016 was the first full quarter since the acquisition of DenseLight and BB Photonics. Depreciation increased by \$310,462 or 129% over Q2 2016 from \$239,958 to \$550,420 due primarily to the depreciation and amortization expense on property and equipment acquired through the acquisition of DenseLight and BB Photonics. The Company also acquired additional property and equipment during Q3 2016. Depreciation on the new property and equipment also contributed to the increase over Q2 2016.

Professional fees decreased by \$65,067 or 24% from \$272,287 in Q2 2016 to \$207,220 in Q3 2016. Professional fees in Q2 2016 included the cost of acquiring both DenseLight and BB Photonics. Professional fees in Q3 2016 were also higher due to professional fees incurred in dealing with import and export issues and responding to regulatory inquiries.

Wages and benefits decreased by \$377,713 or 36% from \$1,054,413 in Q2 2016 to \$676,700 in Q3 2016. The expense in Q3 2016 reflects a full quarter operating wages of DenseLight that was acquired on May 11, 2016, while representing only a partial quarter in Q2. Q2 2016 wages and benefits included the accrued but unpaid one

time executive retention bonuses totaling \$550,000 to the CEO and COO that was payable in mid-June 2016 at the one year anniversary date of commencement of the respective employment terms, the amount was voluntarily deferred by them and paid in 2017. The \$100,000 bonus to the COO was reversed in Q1 2017.

Management and consulting fees of \$230,352 in Q3 2016 increased by \$57,951 or 34% over \$172,401 in Q2 2016. The Q3 2016 expense included \$75,000 of fees paid to a director in the normal course of business for strategic, technology, integration and general business consulting services, an expense which was later reclassified to financing costs in Q4 2016.

General expenses and rent of \$508,176 in Q3 2016 is lower than \$546,626 in Q2 2016 by \$38,448 or 7%. Although Q3 2016 includes a full quarter of operating costs of DenseLight, the Q2 2016 expense included all the ancillary costs relating to the acquisitions of both DenseLight and BB Photonics.

Non-cash stock-based compensation increased by \$131,980 or 15% from \$887,890 in Q2 2016 to \$1,019,970 in Q3 2016. The valuation of stock options is driven by a number of factors including the number of options granted, the strike price and the volatility of the Company's stock. The stock option expense is dependent on the timing of the stock option grant and the amortization of the options as they vest. The stock options vest in accordance with the policies determined by the Board of Directors from time to time consistent with the provisions of the 2016 Plan which grants discretion to the Board of Directors.

Shareholders of DenseLight were entitled to an additional 1,000,000 shares of the Company if DenseLight met or exceeded a certain revenue target by December 31, 2016. On the date of the acquisition, this contingent consideration was valued at \$283,130. As at September 30, 2016, it was determined that DenseLight would not meet the revenue target. The \$283,130 of contingent consideration was therefore reclassified to earnings during Q3 2016.

#### Q2 2016 compared to Q1 2016

The Company had no sales in Q1 2016. The sales are wholly related to DenseLight that was acquired on May 11, 2016, which led to sales of \$576,741 in Q2 2016 versus nil in Q1 2016

Depreciation and amortization in Q2 2016 was \$239,958 as compared to \$87,844 in Q1 2016. The increase of \$152,114 or 173% over Q1 2016 included \$149,723 of depreciation relating to depreciation and amortization expense on new property and equipment resulting from the acquisition of DenseLight and BB Photonics of \$8,706,029.

Professional fees increased by \$132,087 or 94% from \$140,200 in Q1 2016 to \$272,287 in Q2 2016. The acquisition of DenseLight and BB Photonics contributed to the substantial increase from Q1 2016 to Q2 2016. The Company required the services of various professional consultants including lawyers, accountants and appraisers to complete the acquisition of both companies.

Wages and benefits had a substantial increase of \$571,244 or 118% from \$483,169 in Q1 2016 to \$1,054,413 in Q2 2016. The increase was a result of accrued executive retention bonuses totaling \$550,000 to the CEO and COO that was payable in mid-June 2016, the amount was voluntarily deferred by them and paid in 2017, as well as the inclusion of DenseLight and its wages and benefits of \$261,721 for the period from May 11, 2016, acquisition date to the quarter end. The \$100,000 bonus to the COO was reversed in Q1 2017.

General expenses and rent increased by \$285,862 or 109% from \$260,764 in Q1 2016 to \$546,626 in Q2 2016. DenseLight contributed \$203,402 to the increase during the period. The difference resulted from additional costs incurred relating to the acquisition of DenseLight and BB Photonics.

Non-cash stock-based compensation decreased by \$371,061 or 29% from \$1,259,051 in Q1 2016 to \$887,990 in Q2 2016. The valuation of stock options is driven by a number of factors including the number of options granted, the strike price and the volatility of the Company's stock. The stock option expense is dependent on the timing of the stock option grant and the amortization of the options as they vest. The stock options vest in accordance with the policies determined by the Board of Directors from time to time consistent with the provisions of the 2015 Plan which grants discretion to the Board of Directors.

### Q1 2016 compared to Q4 2015

R&D decreased by \$402,149 or 43% from \$932,618 in Q4 2015 to \$530,469 in Q1 2016. In Q4 2015, the Company committed to transition to an increased outsourcing model. During Q4 2015, the Company incurred additional upfront costs associated with establishing new foundry and technology development relationships to expedite technology development.

Professional fees decreased by \$84,918 or 38% from \$225,118 in Q4 2015 to \$140,200 in Q1 2016. In Q4 2015, the Company paid additional legal fees associated with the expansion of the Company's patent portfolio coverage in a number of foreign jurisdictions. The Company also spent additional fees on professional services involved in testing the efficiency of the Company's internal controls as required by the Sarbanes Oxley Act of 2002.

In Q1 2016, the Company paid a \$25,000 performance bonus to the COO. In addition to this payment there was a differential increase of \$43,312 in wages and benefits over Q4 2015 was partially due to marginal increase in salaries and higher director fees paid in Q1 2016 than Q4 2015. Cumulative increase in wages and benefits over Q4 2015 was \$68,312 or 16% from \$414,857 in Q4 2015 to \$483,169 in Q1 2016.

General expenses decreased by \$92,635 or 26% from \$353,399 in Q4 2015 to \$260,764 in Q1 2016 due primarily to the costs of closing the UConn lab facilities in Q4 2015 and the investor relations and travel costs associated with the Company's road show in November 2015 to generate interest in the Company and its technology.

In Q1 2016, non-cash stock-based compensation of \$1,259,051 decreased by \$232,662 or 16% from \$1,491,713 in Q4 2015. This is a result of the timing of stock based compensation expense relative to the vesting date of the historical granted stock options. The valuation of stock options is driven by a number of factors including the quantity of options granted, the strike price and the volatility of the Company's stock. The stock option expense is dependent on the timing of the stock option grant and the amortization of the options as they vest.

### Q4 2015 compared to Q3 2015

In Q4 2015, professional fees of \$225,118 increased by \$114,729 or 104% over \$110,389 in Q3 2015 due to the legal fees incurred relating to the expanded coverage of the Company's patent portfolio and additional fees related to testing the effectiveness of the Company's internal controls as required by the Sarbanes Oxley Act.

General and administrative increased by \$67,597 or 24% from \$353,399 in Q4 2015 as compared to \$285,802 in Q3 2015 due to the increase in investor relations and travel during the quarter. Additionally, the Company incurred moving and travel costs associated with the closure of the UConn facilities.

In Q4 2015, the costs associated with new established foundry and technology development relationships to expedite the technology development were incurred. The Company incurred costs of \$449,200 relating to these new parties on the expedited technology work being done as compared to \$290,215 in Q3 2015, which accounts for the majority of the \$165,494 or 22% increase in R&D expenses from \$767,124 in Q3 2015 to \$932,618 in Q4 2015.

In Q4 2015, non-cash stock-based compensation of \$1,491,713 decreased by \$130,038 or 8% from \$1,621,751 in Q3 2015. This is a result of the timing of stock based compensation expense relative to the vesting date of the historical granted stock options. The valuation of stock options is driven by a number of factors including the quantity of options granted, the strike price and the volatility of the Company's stock. The stock option expense is dependent on the timing of the stock option grant and the amortization of the options as they vest.

### ***Segment Disclosure***

The Company and its subsidiaries operate in a single segment; the design, manufacture and sale of semiconductor products and services for commercial applications. The Company's operating and reporting segment reflects the management reporting structure of the organization and the manner in which the chief operating decision maker regularly assesses information for decision making purposes, including the allocation of resources. A summary of the Company's operations is below:

**ODIS Inc. ("ODIS")**

Odis is the developer of the POET platform semiconductor process IP for fabrication of integrated circuit devices containing both electronic and optical elements on a single die ("monolithic integration") and in a single package ("hybrid integration").

**BB Photonics**

BB Photonics develops photonic integrated components for the datacenter market utilizing embedded dielectric technology that is intended to enable on-chip athermal wavelength control and lower the total solution cost of datacenter photonic integrated circuits.

**DenseLight**

DenseLight designs, manufactures, and delivers photonic optical light source products and solutions to the communications, medical, instrumentations, industrial, defense, and security industries. DenseLight processes compound semiconductor-based optoelectronic devices and photonic integrated circuits through its in-house wafer fabrication and assembly & test facilities.

The Company operates geographically in the United States, Canada and Singapore. Geographical information is as follows:

2017				
As of June 30,	Singapore	US	Canada	Consolidated
Current assets	\$ 2,244,153	\$ 7,664,163	\$ 2,008,406	\$ 11,916,722
Property and equipment	8,349,684	318,737	2,127	8,670,548
Patents and licenses	-	454,997	-	454,997
Goodwill and intangibles assets	7,067,535	1,471,719	-	8,539,254
<b>Total Assets</b>	<b>\$ 17,661,372</b>	<b>\$ 9,909,616</b>	<b>\$ 2,010,533</b>	<b>\$ 29,581,521</b>
Six Months Ended June 30,	Singapore	US	Canada	Consolidated
Sales	\$ (1,360,932)	\$ -	\$ -	\$ (1,360,932)
Cost of sales	609,048	-	-	609,048
Selling, marketing and administration	1,464,967	3,047,999	410,511	4,923,477
Research and development	1,119,598	1,251,517	111,563	2,482,678
Other income including investment income	(145,044)	(2,395)	(14,925)	(162,364)
<b>Net loss from operations before income tax recovery</b>	<b>\$ 1,687,637</b>	<b>\$ 4,297,121</b>	<b>\$ 507,149</b>	<b>\$ 6,491,907</b>



As of December 31,	Singapore	US	Canada	Consolidated
Current assets	\$ 2,118,561	\$ 10,058,018	\$ 4,957,624	\$ 17,134,203
Property and equipment	9,039,069	322,633	2,508	9,364,210
Patents and licenses	-	449,676	-	449,676
Goodwill and intangible assets	7,086,149	1,471,719	-	8,557,868
Total Assets	\$ 18,243,779	\$ 12,302,046	\$ 4,960,132	\$ 35,505,957

  

Six Months Ended June 30,	Singapore	US	Canada	Consolidated
Sales	\$ (576,741)	\$ -	\$ -	\$ (576,741)
Cost of sales	280,563	-	-	280,563
Selling, marketing and administration	487,069	4,140,642	717,381	5,345,092
Research and development	156,853	1,167,105	-	1,323,958
Impairment loss	-	63,522	-	63,522
Loss on disposal of property and equipment	-	-	16,931	16,931
Other income including investment income	-	-	(35,752)	(35,752)
Net loss from operations before income tax recovery	\$ 347,744	\$ 5,371,269	\$ 698,560	\$ 6,417,573

### ***Liquidity and Capital Resources***

The Company had working capital of \$11,186,946 on June 30, 2017 as compared to \$15,509,859 on December 31, 2016.

The Company's balance sheet as of June 30, 2017 reflects assets with a book value of \$29,581,521, compared to \$35,505,597 as of December 31, 2016. Forty percent (40%) of the book value, or \$11,916,722, was in current assets consisting primarily of cash and short-term investments, compared to 48%, or \$17,134,203 as of December 31, 2016.

### ***Acquisitions***

#### **DenseLight**

On May 11, 2016, the Company acquired all the issued and outstanding shares of DenseLight, a designer, manufacturer and provider of photonic sensing and optical light source products for consideration of \$10,500,000. The all-stock purchase was accomplished with the issuance of 13,611,150 common shares of the Company at a price of \$0.7714 per share. The Company also committed to issuing shares representing \$1,000,000 to the sellers in the event that DenseLight met or exceeded a pre-determined revenue target during calendar 2016. The revenue targets were not met.

This acquisition provides the Company with direct and preferred access to a fab infrastructure for future product development, access to product sales and channel distribution networks and a broader product portfolio of photonic products, technology and know-how.

Upon closing the acquisition, the Company negotiated a settlement agreement relating to obligations that were due to past or current employees of DenseLight. As part of the settlement agreement, the Company issued 1,738,236 common shares at a price of \$0.7714 per share for a total of \$1,343,629. The Company also paid \$240,266 to current and past employees as part of the debt settlement. Accounts payable and

accrued liabilities include \$184,570 still due to past and current employees that will be paid over the next 6 months.

The Company also settled a loan of \$500,000 owing to EDB Investments Pte. Ltd., an investor in DenseLight, with the issuance of 648,150 shares at a price of 0.771 per share.

Former management shareholders of DenseLight agreed not to sell, transfer, pledge or otherwise dispose of the shares of the Company for a period of six months, at which time they may each sell up to 25% of their shares. They may sell an additional 25% of the shares after twelve months. These restrictions expired on May 11, 2017. Thereafter, all management shareholders shall be able to sell the remaining shares after 24 months from closing. Former non-management shareholders of DenseLight agreed not to sell, transfer, pledge or otherwise dispose of the shares they received for six months, at which time they may sell up to 25% of the shares received. Thereafter, they may sell the remaining shares after 12 months from closing. These restrictions expired on May 11, 2017.

On acquisition, DenseLight held accounts receivable and unbilled revenue in the amount of \$198,898 that reflected their fair value. The Company does not expect that there will be any unrealized contractual cash flows. The billed receivables at closing have been subsequently collected.

The acquisition has been accounted for using the acquisition method of accounting. Acquisition related costs of \$197,284 were expensed in the year and included in selling, marketing and administrative expenses.

#### **Fair value of consideration paid**

Fair value of 13,611,150 shares issued	\$ 10,500,000
Contingent consideration payable	283,130
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Total consideration	\$ 10,783,130
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#### **Recognised amounts of identifiable net assets:**

Cash	\$ 2,971
Accounts receivables and unbilled revenue	198,898
Prepaid and other current assets	293,386
Inventory	319,257
Property and equipment	8,635,650
Customer relationships	186,131
Goodwill	6,630,544
Trade payables	(2,979,546)
Loans and advances	(1,000,000)
Deferred tax liability	(1,504,161)
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Net assets acquired	\$ 10,783,130
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Loans and advances include \$500,000 that was advanced to DenseLight by the Company prior to its acquisition. This advance was used by DenseLight to cover the expenses required for the development under the Development Services Agreement between DenseLight and the Company, based on the special pricing negotiated between the parties.

The purchase and sale agreement provides for an additional \$1,000,000 worth of shares to be issued to the sellers should gross revenue from DenseLight exceed certain targets for 2016. The fair value of this contingent consideration payable is determined by estimating the probability of the Company making that future payment and then discounting it to present value using a discount rate of 9% being the

estimated cost of debt for the Company. At December 31, 2016, DenseLight did not exceed the established revenue targets for 2016. The Company has therefore adjusted the fair value of contingent consideration to nil through earnings.

A deferred tax liability of \$1,504,161 was created on the date of purchase relating to the fair value adjustment of the assets acquired. Deferred tax liability relating to the DenseLight acquisition at June 30, 2017 was \$1,154,597.

### **BB Photonics**

On June 22, 2016, the Company acquired all the issued and outstanding shares of BB Photonics, a designer of integrated photonic solutions for the data communications market for consideration of \$1,550,000. The all-stock purchase was accomplished with the issuance of 1,996,090 common share of the Company at a price of \$0.777 per share.

The acquisition of BB Photonics provides the Company with additional differentiated intellectual property and know-how for product development, which will enable the Company to better reach its first identified commercial market, the end-to-end data communications market, as well as to augment its sensing roadmap.

The acquisition has been accounted for using the acquisition method of accounting. Acquisition related costs of \$59,930 were expensed in the year and included in selling, marketing and administrative expenses.

### **Fair value of consideration paid**

Fair value of 1,996,090 shares issued	\$ 1,550,000
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### **Recognised amounts of identifiable net assets:**

Cash	\$ 15,820
Property and equipment	70,379
Intangibles	714,000
Goodwill	1,050,459
Trade payables	(7,918)
Deferred tax liability	(292,740)
Net assets acquired	\$ 1,550,000

A deferred tax liability of \$292,740 was created on the date of acquisition and related to the value of the In-Process Research and Development (IPR&D). Externally generated IPR&D is subject to impairment whenever events or changes indicate that its carrying amount may not be recoverable. Since the Company is still in the process of completing its technology and related products, the IPR&D and related deferred tax liability has not been impaired or amortized.

### ***Related Party Transactions***

Compensation to key management personnel was as follows:

	<b>Three Months Ended June 30,</b>		<b>Six Months Ended June 30,</b>	
	<b>2017</b>	<b>2016</b>	<b>2017</b>	<b>2016</b>
Salaries	\$ 218,500	\$ 1,171,333	\$ 487,133	\$ 1,725,623
Share-based payments (1)	557,345	775,842	1,280,798	1,684,305
Total	\$ 775,845	\$ 1,947,175	\$ 1,767,931	\$ 3,409,928

(1) Share-based payments are the fair value of options granted to key management personnel and expensed during the various periods as calculated using the Black-Scholes model.

The Company paid or accrued \$28,313 and \$55,556 in fees for the three and six months ended June 30, 2017 (2016 - \$28,996 and \$56,333) to a law firm, of which a director is counsel, for legal services rendered to the Company.

During the period ended June 30, 2017, the Company paid the final instalment of \$25,000 on a total of \$150,000 of consulting fees to a director which were charged against the financing concluded on November 2, 2016.

All transactions with related parties have occurred in the normal course of operations and are measured at the exchange amounts, which are the amounts of consideration established and agreed to by the related parties.

### ***Critical Accounting Estimates***

#### *Accounts receivable*

Accounts receivable are amounts due from customers from the sale of products or services in the ordinary course of business. Accounts receivables are classified as current (on the consolidated statements of financial position) if payment is due within one year of the reporting period date, and are initially recognized at fair value and subsequently measured at amortized cost.

The provision policy for doubtful accounts of the Company is based on the ageing analysis and management's ongoing evaluation of the recoverability of the outstanding receivables. A considerable amount of judgment is required in assessing the ultimate realization of these receivables, including the assessment of the creditworthiness and the past collection history of each customer. If the financial conditions of these customers were to deteriorate, resulting in an impairment of their ability to make payments, additional allowances may be required. As at the balance sheet date, no provision was required for accounts receivable.

#### *Inventory*

Inventory consists of raw material inventory, work in process, and finished goods and are recorded at the lower of cost and net realizable value. Cost is determined on a first in first out basis and includes all costs of purchase, costs of conversion and other costs incurred in bringing the inventory to its present condition.

An assessment is made of the net realizable value of inventory at each reporting period. Net realizable value is the estimated selling price less the estimated cost of completion and the estimated costs necessary to make the sale. When circumstances that previously caused inventory to be written down no longer exist or when there is clear evidence of an increase in net realizable value because of changed economic circumstances, the amount of any write down previously recorded is reversed so that the new carrying amount is the lower of the cost and the revised net realizable value. Raw materials are not written down unless the goods in which they are incorporated are expected to be sold for less than cost, in which case, they are written down by reference to replacement cost of the raw materials, as this is the best indicator of net realizable value.

### *Property and equipment*

Property and equipment are recorded at cost. Depreciation is calculated based on the estimated useful life of the asset using the following method and useful lives:

Machinery and equipment	Straight Line, 5 years
Leasehold improvements	Straight Line, 5 years or life of the lease, whichever is less
Office equipment	Straight Line, 5 years

### *Patents and licenses*

Patents and licenses are recorded at cost and amortized on a straight-line basis over 12 years. Ongoing maintenance costs are expensed as incurred.

### *Intangible assets*

Internally generated intangible assets are recorded at cost and will be amortized on a straight-line basis based on the best estimate of the useful life of the asset developed from the point at which the asset is ready for use. Internally generated intangible assets are tested for impairment whenever events or changes indicate that its carrying amount may not be recoverable. Externally acquired intangible assets are amortized on a straight-line basis over 5 years commencing when the asset is ready for use. Externally generated intangible assets are tested for impairment whenever events or changes indicate that its carrying amount may not be recoverable

### *Stock-based Compensation*

Stock options and warrants awarded to non-employees are accounted for using the fair value of the instrument awarded or service provided, whichever is considered more reliable. Stock options and warrants awarded to employees are accounted for using the fair value method. The fair value of such stock options and warrants granted is recognized as an expense on a proportionate basis consistent with the vesting features of each tranche of the grant. The fair value is calculated using the Black-Scholes option-pricing model with assumptions applicable at the date of grant.

### *Other stock-based payments*

The Company accounts for other stock-based payments based on the fair value of the equity instruments issued or service provided, whichever is more reliable.

### *Cumulative Translation Adjustment*

IFRS requires certain gains and losses such as certain exchange gains and losses arising from the translation of the financial statements of a self-sustaining foreign operation to be included in comprehensive income.

### ***Recent Accounting Pronouncements***

The Company has considered all recently issued accounting pronouncements and does not believe the adopting of such pronouncements will have a material impact on its consolidated financial statements. Please see note 3 of the financial statements for additional information.

### ***Financial Instruments and Risk Management***

The Company's financial instruments consist of cash, short-term investments, accounts receivable, non-current assets held for sale, accounts payable and accrued liabilities and contingent consideration payable. Unless otherwise noted, it is management's opinion that the Company is not exposed to significant interest risk arising from these financial instruments. The Company estimates that the fair value of these instruments approximates fair value due to their short-term nature.

### ***Exchange Rate Risk***

The Company is exposed to foreign currency risk with the Canadian dollar and Singapore dollar due to cash reserves and other current assets and liabilities that are maintained in those currencies, all of which are exposed to currency fluctuations. Most of the Company's operations are transacted in US dollars and Singapore Dollars. A 10% change in the Canadian dollar and Singapore dollar would increase or decrease other comprehensive loss by \$363,677.

### ***Interest Rate Risk***

Cash equivalents bear interest at fixed rates, and as such, are subject to interest rate risk resulting from changes in fair value from market fluctuations in interest rates. The Company does not depend on interest from its investments to fund its operations.

### ***Credit Risk***

The Company is exposed to credit risk associated with its accounts receivable. The Company has accounts receivable from both governmental and non-governmental agencies. Credit risk is minimized substantially by ensuring the credit worthiness of the entities with which it carries on business. Credit terms are provided on a case-by-case basis. The Company has not experienced any significant instances of non-payment from its customers.

The Company's accounts receivable ageing was as follows:

	<b>June 30, 2017</b>	December 31, 2016
Current	<b>\$ 408,764</b>	\$ 125,610
31 - 60 days	<b>22,745</b>	16,346
61 - 90 days	-	75,816
> 90 days	<b>98,360</b>	75,077
	<b>\$ 529,869</b>	\$ 292,849

### ***World Economic Risk***

Like many other companies, the world economic climate could have an impact on the Company's business and the business of many of its current and prospective customers. A slump in demand for electronic-based devices, due to a world economic crisis, may impact any anticipated licensing revenue.

### ***Obsolescence Risk***

The Company designs, manufactures and sells various highly technological electronic products that could become obsolete should lower priced competitors or new technology enter the market. This would expose the company to obsolescence risk in inventory balances, but also a risk of obsolescence in the product offering. The redesign of the product offering could take significant time or could never occur.

### ***Liquidity Risk***

The Company predominately relies on equity funding for liquidity to meet current and foreseeable financial requirements.

## ***Strategy and Outlook***

There are a number of projects planned for the remainder of 2017 that the Company expects will address the short-term and long-term growth plans of the Company including, but not limited to the following:

- *Continue our transition from an R&D company to a commercial enterprise based on products and solutions;*
- *Initiate product development cycles for our InP-based hybrid integrated products targeted at the 100G datacom market and incorporate our dielectric technology into the DenseLight product-line.*
- *Pursue multiple potential sources of non-product revenue and strategic partnerships;*
- *Continue to invest in our capabilities and infrastructure;*
- *Selectively pursue other opportunities that leverage our existing expertise; and*
- *Pursue complementary strategic alliance or acquisition opportunities.*

## ***Outstanding Share Data***

### ***Common Shares***

As of June 30, 2017 and August 10, 2017, there were 259,923,853 and 259,923,853 outstanding common shares of the Company.

### ***Stock Options and Warrants***

As of June 30, 2017 and August 10, 2017, there were 34,800,000 warrants outstanding to purchase common shares at an exercise price of CA\$0.52.

Total stock options outstanding as at June 30, 2017 and August 10, 2017 were 23,985,291 and 33,360,291 priced between CA\$0.20 and CA\$1.99 per common share.

Additional detailed share data information is available in the Company's Notes to Consolidated Financial Statement.

## ***Off-Balance Sheet Arrangements***

The Company has not entered into any off-balance sheet arrangements.

## ***Key Business Risks and Uncertainties***

***The process of developing new, technologically advanced products in semiconductor manufacturing and photonics products is highly complex and uncertain, and we cannot guarantee a positive result.***

The development of new, technologically advanced products is a complex and uncertain process requiring frequent innovation, highly-skilled engineering and development personnel and significant capital, as well as the accurate anticipation of technological and market trends. We cannot assure you that we will be able to identify, develop, manufacture, market or support new or enhanced products successfully or on a timely basis. Further, we cannot assure you that our new products will gain market acceptance or that we will be able to respond effectively to product introductions by competitors, technological changes or emerging industry standards. We also may not be able to develop the underlying core technologies necessary to create new products and enhancements, license these technologies from third parties, or remain competitive in our markets.

***Customer demand is difficult to forecast accurately and, as a result, we may be unable to match production with customer demand.***

We make planning and spending decisions, including determining the levels of business that we will seek and accept, production schedules, component procurement commitments, personnel needs and other resource requirements, based on our estimates of product demand and customer requirements. Our products are typically sold pursuant to individual purchase orders. While our customers may provide us with their demand forecasts, they are typically not contractually committed to buy any quantity of products beyond firm purchase orders. Furthermore, many of our customers may increase, decrease, cancel or delay purchase orders already in place without significant penalty. The short-term nature of commitments by our customers and the possibility of unexpected changes in demand for their products reduce our ability to accurately estimate future customer requirements. If any of our customers decrease, stop or delay purchasing our products for any reason, we will likely have excess manufacturing capacity or inventory and our business and results of operations would be harmed.

***If our customers do not qualify our products for use on a timely basis, our results of operations may suffer.***

Prior to the sale of new products, our customers typically require us to “qualify” our products for use in their applications. At the successful completion of this qualification process, we refer to the resulting sales opportunity as a “design win.” Additionally, new customers often audit our manufacturing facilities and perform other evaluations during this qualification process. The qualification process involves product sampling and reliability testing and collaboration with our product management and engineering teams in the design and manufacturing stages. If we are unable to accurately predict the amount of time required to qualify our products with customers, or are unable to qualify our products with certain customers at all, then our ability to generate revenue could be delayed or our revenue would be lower than expected and we may not be able to recover the costs associated with the qualification process or with our product development efforts, which would have an adverse effect on our results of operations.

***The markets in which we operate are highly competitive, which could result in lost sales and lower revenues.***

The market for optical components and modules is highly competitive and this competition could result in our existing customers moving their orders to our competitors. We are aware of a number of companies that have developed or are developing optical component products, including LEDs, lasers, pluggable components, modules and subsystems, among others, that compete directly with our current and proposed product offerings.

Some of our current competitors, as well as some of our potential competitors, have longer operating histories, greater name recognition, broader customer relationships and industry alliances and substantially greater financial, technical and marketing resources than we do. We may not be able to compete successfully with our competitors and aggressive competition in the market may result in lower prices for our products and/or decreased gross margins. Any such development could have a material adverse effect on our business, financial condition and results of operations.

***Our products, including those sold by predecessor company, OPEL Solar, could contain defects that may cause us to incur significant costs or result in a loss of customers or subject us to claims for which we may not be fully insured.***

Our predecessor company, Opel Solar, sold solar systems and products between 2007 and 2012, and some of those products may still be under warranty. We have not undertaken to quantify the size of that warranty obligation and it is not recorded on our balance sheet because it is not determinable. Although we carry product liability insurance, this insurance may not adequately cover our costs arising from defects or warranty claims related to those products.



Our current products sold by DenseLight are complex and undergo quality testing as well as formal qualification by our customers. Our customers' testing procedures are limited to evaluating our products under likely and foreseeable failure scenarios and over varying amounts of time. For various reasons, such as the occurrence of performance problems that are unforeseeable in testing or that are detected only when products age or are operated under peak stress conditions, our products may fail to perform as expected long after customer acceptance. Failures could result from faulty components or design, problems in manufacturing or other unforeseen reasons. As a result, we could incur significant costs to repair or replace defective products under warranty, particularly when such failures occur in installed systems. Our products are typically embedded in, or deployed in conjunction with, our customers' products, which incorporate a variety of components, modules and subsystems and may be expected to interoperate with modules produced by third parties. As a result, not all defects are immediately detectable and when problems occur, it may be difficult to identify the source of the problem. While we have not experienced material failures in the past, we will continue to face this risk going forward because our products are widely deployed in many demanding environments and applications worldwide. In addition, we may in certain circumstances honor warranty claims after the warranty has expired or for problems not covered by warranty to maintain customer relationships. Any significant product failure could result in litigation, damages, repair costs and lost future sales of the affected product and other products, divert the attention of our engineering personnel from our product development efforts and cause significant customer relations problems, all of which would harm our business. Although we carry product liability insurance, this insurance may not adequately cover our costs arising from defects in our products or otherwise.

***The business that we acquired did not have a history of profitable operations. Our ability to successfully manage our manufacturing operations is essential to our overall success, and if we fail to do so, our financial results will suffer.***

At the time of the acquisition of DenseLight Semiconductors, Pte. Ltd. in May of 2016, the company had been operating at a loss for several years and was at a minimum staffing level. Since the acquisition, we have committed substantial capital and management attention to improving the operation, increasing sales and driving to profitability. Even though substantial changes in the management and personnel have been made, the results to date have been less than anticipated and more improvement will be required in order to make the DenseLight operation profitable. We cannot guarantee that our efforts to improve the DenseLight operation will be successful, and if they are not, the operation will continue to need capital and attention from the senior management of the company and our financial results may suffer as a result.

***If we encounter manufacturing problems or if manufacturing at our Singapore operation is discontinued for any reason, including an industrial or workplace accident, we may lose sales and damage our customer relationships, or be subject to claims for which we may not be fully insured.***

We may experience delays, disruptions or quality control problems in our manufacturing operations. These and other factors may cause less than acceptable yields at our wafer fabrication facility. Manufacturing yields depend on a number of factors, including the quality of available raw materials, the degradation or change in equipment calibration and the rate and timing of the introduction of new products. Changes in manufacturing processes required as a result of changes in product specifications, changing customer needs and the introduction of new products may significantly reduce our manufacturing yields, resulting in low or negative margins on those products. In addition, because of our wafer size, we use equipment that is not readily available on the open market and for which spare parts and qualified service people may not be available. If any of our key equipment were to be damaged or destroyed for any reason, our manufacturing process would be severely disrupted. Any such manufacturing problems would likely delay product shipments to our customers, which would negatively affect our sales, competitive position and reputation.

Our operations in Singapore are subject to government regulations that protect the workplace safety of employees. We strive to maintain an accident-free workplace, but we cannot guarantee that industrial accidents will not take place, or that we will not be subject to liability for these and other workplace related claims. We

have obtained insurance policies to protect the company against claims for workplace related claims, but we cannot guarantee that these and other insurance policies carried by the Company will be sufficient to cover the full costs of such claims, which could have a material adverse effect on the Company.

***We have limited operating history in the AOC market, and our business could be harmed if this market does not develop as we expect.***

The initial target market for our GaAs-based photonic engine is the Active Optical Cable (AOC) market and we have no experience in selling products in this market. We may not be successful in developing a product for this market and even if we do, it may never gain widespread acceptance by large data center operators. If our expectations for the growth of the AOC market are not realized, our financial condition or results of operations may be adversely affected.

***We depend on a limited number of suppliers and key contract manufacturers who could disrupt our business and technology development activities if they stopped, decreased, delayed or were unable to meet our demand for shipments of their products or manufacturing of our products.***

We depend on a limited number of suppliers of epitaxial wafers and contract manufacturers for both our GaAs and InP development and production activities. Some of these suppliers are sole source suppliers. We typically have not entered into long-term agreements with our suppliers. As a result, these suppliers generally may stop supplying us materials and other components at any time. Our reliance on a sole supplier or limited number of suppliers could result in delivery problems, reduced control over technology development, product development, pricing and quality, and an inability to identify and qualify another supplier in a timely manner. Some of our suppliers that may be small or under-capitalized may experience financial difficulties that could prevent them from supplying us materials and other components. In addition, our suppliers, including our sole source suppliers, may experience manufacturing delays or shut downs due to circumstances beyond their control such as earthquakes, floods, fires, labor unrest, political unrest or other natural disasters.

Any supply deficiencies relating to the quality or quantities of materials or equipment we use to manufacture our products could materially and adversely affect our ability to fulfill customer orders and our results of operations. Lead times for the purchase of certain materials and equipment from suppliers have increased and in some cases have limited our ability to rapidly respond to increased demand, and may continue to do so in the future. To the extent we introduce additional contract manufacturing partners, introduce new products with new partners and/or move existing internal or external production lines to new partners, we could experience supply disruptions during the transition process. In addition, due to our customers' requirements relating to the qualification of our suppliers and contract manufacturing facilities and operations, we cannot quickly enter into alternative supplier relationships, which prevent us from being able to respond immediately to adverse events affecting our suppliers.

***Our international business and operations expose us to additional risks.***

Products shipped to customers located outside Canada and the United States account for a majority of our revenues. In addition, we have significant tangible assets located outside the United States. Our manufacturing facilities are located in Singapore. Conducting business outside Canada and the United States subjects us to a number of additional risks and challenges, including:

- periodic changes in a specific country's or region's economic conditions, such as recession;
- licenses and other trade barriers;
- the provision of services may require export licenses;
- environmental regulations;

- certification requirements;
- fluctuations in foreign currency exchange rates;
- inadequate protection of intellectual property rights in some countries;
- preferences of certain customers for locally produced products;
- potential political, legal and economic instability, foreign conflicts, and the impact of regional and global infectious illnesses in the countries in which we and our customers, suppliers and contract manufacturers are located;
- Canadian and U. S. and foreign anticorruption laws;
- seasonal reductions in business activities in certain countries or regions; and
- fluctuations in freight rates and transportation disruptions.

These factors, individually or in combination, could impair our ability to effectively operate one or more of our foreign facilities or deliver our products, result in unexpected and material expenses, or cause an unexpected decline in the demand for our products in certain countries or regions. Our failure to manage the risks and challenges associated with our international business and operations could have a material adverse effect on our business.

***If we fail to attract and retain key personnel, our business could suffer.***

Our future success depends, in part, on our ability to attract and retain key personnel, including executive management. Competition for highly skilled technical personnel is extremely intense and we may face difficulty identifying and hiring qualified engineers in many areas of our business. We may not be able to hire and retain such personnel at compensation levels consistent with our existing compensation and salary structure. Our future success also depends on the continued contributions of our executive management team and other key management and technical personnel, each of whom would be difficult to replace. The loss of services of these or other executive officers or key personnel or the inability to continue to attract qualified personnel could have a material adverse effect on our business.

***Our prior acquisitions created a large amount of goodwill, which may have to be impaired in the future and as a result may adversely affect our financial results. In addition, past and any future acquisitions may adversely affect our financial condition and results of operations.***

As part of our business strategy, we have in the past and may in the future pursue acquisitions of companies that we believe could enhance or complement our current product portfolio, augment our technology roadmap or diversify our revenue base. Acquisitions involve numerous risks, any of which could harm our business, including:

- difficulties integrating the acquired business;
- unanticipated costs, capital expenditures, liabilities or changes to product development efforts;
- difficulties integrating the business relationships with suppliers and customers of the acquired business with our existing operations;
- acts or omissions by the acquired company prior to the acquisition that may subject us to unknown risks or liabilities;
- risks associated with entering markets in which we have little or no prior experience;

- potential loss of key employees, particularly those of the acquired organizations; and
- diversion of financial and management resources from our existing business;

Our prior acquisitions have resulted, and future acquisitions may result in the recording of goodwill and other intangible assets subject to potential impairment in the future, adversely affecting our operating results. We may not achieve the anticipated benefits of an acquisition if we fail to evaluate it properly, and we may incur costs in excess of what we anticipate. A failure to evaluate and execute an acquisition appropriately or otherwise adequately address these risks may adversely affect our financial condition and results of operations.

***Our predecessor company received and our current companies receive and expect to receive in the future subsidies and other types of funding from government agencies in the locations in which we operate. The funding agreements stipulate that if we do not comply with various covenants, including eligibility requirements, and/or do not achieve certain pre-defined objectives, those government agencies may reclaim all or a portion of the funding provided. If this were to occur, we would either not be in a position to repay the claimed amounts or would have to borrow large sums in order to do so, which would adversely affect our financial condition.***

Our predecessor company Opel Solar, received research and development grants from the United States Air Force and from NASA; our recently acquired subsidiary company, DenseLight Semiconductor, Pte, Ltd. is expected to receive funding for new product development activities conducted in Singapore from the Economic Development Board; and we expect that our recently acquired subsidiary company BB Photonics U.K., may also apply for certain grants to defer the cost of development in the U.K. The rules for eligibility vary widely across government agencies, are complex and may be subject to different interpretations. Furthermore, some of the grants set pre-defined development or spending objectives, which we may not achieve. We cannot guarantee that one or more agencies will not seek repayment of all or a portion of the funds provided, and if this were to occur, we would have to borrow large sums in order to make the repayments, which would adversely affect our financial condition.

***We may be subject to disruptions or failures in information technology systems and network infrastructures that could have a material adverse effect on our business and financial condition.***

We rely on the efficient and uninterrupted operation of complex information technology systems and network infrastructures to operate our business. A disruption, infiltration or failure of our information technology systems as a result of software or hardware malfunctions, system implementations or upgrades, computer viruses, third-party security breaches, employee error, theft or misuse, malfeasance, power disruptions, natural disasters or accidents could cause a breach of data security, loss of intellectual property and critical data and the release and misappropriation of sensitive competitive information and partner, customer, and employee personal data. Any of these events could harm our competitive position, result in a loss of customer confidence, cause us to incur significant costs to remedy any damages and ultimately materially adversely affect our business and financial condition.

***We have a history of large operating losses. We may not be able to sustain profitability in the future and as a result we may not be able to maintain sufficient levels of liquidity.***

We have historically incurred losses and negative cash flows from operations since our inception. As of June 30, 2017, we had an accumulated deficit of \$110,418,293. For the six months June 30, 2017 and June 30, 2016, we incurred losses from operations before income taxes of \$6,491,907 and \$6,417,573 respectively.

As of June 30, 2017, we held \$9,774,889 in cash and short-term investments, and we had working capital of \$11,186,946.

The optical communications industry is subject to significant operational fluctuations. In order to remain competitive we incur substantial costs associated with research and development, qualification, production capacity and sales and marketing activities in connection with products that may be purchased, if at all, long after we have incurred such costs. In addition, the rapidly changing industry in which we operate, the length of time between developing and introducing a product to market, frequent changing customer specifications for products, customer cancellations of products and general down cycles in the industry, among other things, make our prospects difficult to evaluate. As a result of these factors, it is possible that we may not (i) generate sufficient positive cash flow from operations; (ii) raise funds through the issuance of equity, equity-linked or convertible debt securities; or (iii) otherwise have sufficient capital resources to meet our future capital or liquidity needs. There are no guarantees we will be able to generate additional financial resources beyond our existing balances.

***We may not be able to obtain additional capital when desired, on favorable terms or at all.***

We operate in a market that makes our prospects difficult to evaluate and, to remain competitive, we will be required to make continued investments in capital equipment, facilities and technology. We expect that substantial capital will be required to continue technology and product development, to expand our manufacturing capacity if we need to do so and to fund working capital for anticipated growth. If we do not generate sufficient cash flow from operations or otherwise have the capital resources to meet our future capital needs, we may need additional financing to implement our business strategy.

If we raise additional funds through the issuance of our common stock or convertible securities, the ownership interests of our stockholders could be significantly diluted. These newly issued securities may have rights, preferences or privileges senior to those of existing stockholders. Additional financing may not, however, be available on terms favorable to us, or at all, if and when needed, and our ability to fund our operations, take advantage of unanticipated opportunities, develop or enhance our infrastructure or respond to competitive pressures could be significantly limited. If we cannot raise required capital when needed, including under our Short Form Prospectus filed with the Canadian Securities Exchange and the U.S. SEC in October 2016, we may be unable to continue technology and product development, meet the demands of existing and prospective customers, adversely affecting our sales and market opportunities and consequently our business, financial condition and results of operations.

***Our business could be negatively impacted as a result of shareholder activism.***

In recent years, shareholder activists have become involved in numerous public companies. Shareholder activists frequently propose to involve themselves in the governance, strategic direction, and operations of the company. We may in the future become subject to such shareholder activity and demands. Such demands may disrupt our business and divert the attention of our management and employees, and any perceived uncertainties as to our future direction resulting from such a situation could result in the loss of potential business opportunities, be exploited by our competitors, cause concern to our current or potential customers, and make it more difficult to attract and retain qualified personnel and business partners, all of which could adversely affect our business. In addition, actions of activist shareholders may cause significant fluctuations in our stock price based on temporary or speculative market perceptions or other factors that do not necessarily reflect the underlying fundamentals and prospects of our business.

***If we fail to protect, or incur significant costs in defending, our intellectual property and other proprietary rights, our business and results of operations could be materially harmed.***

Our success depends on our ability to protect our intellectual property and other proprietary rights. We rely on a combination of patent, trademark, copyright, trade secret and unfair competition laws, as well as license agreements and other contractual provisions, to establish and protect our intellectual property and other proprietary rights. We have applied for patent registrations in the U.S. and in other foreign countries, some of which have been issued. We cannot guarantee that our pending applications will be approved by the applicable

governmental authorities. Moreover, our existing and future patents and trademarks may not be sufficiently broad to protect our proprietary rights or may be held invalid or unenforceable in court. A failure to obtain patents or trademark registrations or a successful challenge to our registrations in the U.S. or other foreign countries may limit our ability to protect the intellectual property rights that these applications and registrations intended to cover.

Policing unauthorized use of our technology is difficult and we cannot be certain that the steps we have taken will prevent the misappropriation, unauthorized use or other infringement of our intellectual property rights. Further, we may not be able to effectively protect our intellectual property rights from misappropriation or other infringement in foreign countries where we have not applied for patent protections, and where effective patent, trademark, trade secret and other intellectual property laws may be unavailable, or may not protect our proprietary rights as fully as Canadian or U.S. law. We may seek to secure comparable intellectual property protections in other countries. However, the level of protection afforded by patent and other laws in other countries may not be comparable to that afforded in Canada and the U.S.

We also attempt to protect our intellectual property, including our trade secrets and know-how, through the use of trade secret and other intellectual property laws, and contractual provisions. We enter into confidentiality and invention assignment agreements with our employees and independent consultants. We also use non-disclosure agreements with other third parties who may have access to our proprietary technologies and information. Such measures, however, provide only limited protection, and there can be no assurance that our confidentiality and non-disclosure agreements will not be breached, especially after our employees end their employment, and that our trade secrets will not otherwise become known by competitors or that we will have adequate remedies in the event of unauthorized use or disclosure of proprietary information. Unauthorized third parties may try to copy or reverse engineer our products or portions of our products, otherwise obtain and use our intellectual property, or may independently develop similar or equivalent trade secrets or know-how. If we fail to protect our intellectual property and other proprietary rights, or if such intellectual property and proprietary rights are infringed or misappropriated, our business, results of operations or financial condition could be materially harmed.

In the future, we may need to take legal actions to prevent third parties from infringing upon or misappropriating our intellectual property or from otherwise gaining access to our technology. Protecting and enforcing our intellectual property rights and determining their validity and scope could result in significant litigation costs and require significant time and attention from our technical and management personnel, which could significantly harm our business. We may not prevail in such proceedings, and an adverse outcome may adversely impact our competitive advantage or otherwise harm our financial condition and our business.

***We may be involved in intellectual property disputes in the future, which could divert management's attention, cause us to incur significant costs and prevent us from selling or using the challenged technology.***

Participants in the markets in which we sell our products have experienced frequent litigation regarding patent and other intellectual property rights. While we have a policy in place that is designed to reduce the risk of infringement of intellectual property rights of others, there can be no assurance that third parties will not assert infringement claims against us. We cannot be certain that our products would not be found infringing on the intellectual property rights of others. Regardless of their merit, responding to such claims can be time consuming, divert management's attention and resources and may cause us to incur significant expenses. Intellectual property claims against us could result in a requirement to license technology from others, discontinue manufacturing or selling the infringing products, or pay substantial monetary damages, each of which could result in a substantial reduction in our revenue and could result in losses over an extended period of time.

***If we fail to obtain the right to use the intellectual property rights of others that are necessary to operate our business, and to protect their intellectual property, our business and results of operations will be adversely affected.***

From time to time, we may choose to or be required to license technology or intellectual property from third parties in connection with the development of our products. We cannot assure you that third party licenses will be available to us on commercially reasonable terms, if at all. Generally, a license, if granted, would include payments of up-front fees, ongoing royalties or both. These payments or other terms could have a significant adverse impact on our results of operations. Our inability to obtain a necessary third party license required for our product offerings or to develop new products and product enhancements could require us to substitute technology of lower quality or performance standards, or of greater cost, either of which could adversely affect our business. If we are not able to obtain licenses from third parties, if necessary, then we may also be subject to litigation to defend against infringement claims from these third parties. Our competitors may be able to obtain licenses or cross-license their technology on better terms than we can, which could put us at a competitive disadvantage.

***If we fail to maintain effective internal control over financial reporting in the future, the accuracy and timing of our financial reporting may be adversely affected.***

Preparing our consolidated financial statements involves a number of complex manual and automated processes, which are dependent upon individual data input or review and require significant management judgment. One or more of these elements may result in errors that may not be detected and could result in a material misstatement of our consolidated financial statements. The Sarbanes-Oxley Act in the U.S. requires, among other things, that as a publicly traded company we disclose whether our internal control over financial reporting and disclosure controls and procedures are effective. As long as we qualify as an “emerging growth company” under the JOBS Act, which may be up to five years following the filing of our Form 20F Registration Statement, we will not have to provide an auditor’s attestation report on our internal controls. During the course of any evaluation, documentation or attestation, we or our independent registered public accounting firm may identify weaknesses and deficiencies that we may not otherwise identify in a timely manner or at all as a result of the deferred implementation of this additional level of review.

We have implemented internal controls that we believe provide reasonable assurance that we will be able to avoid accounting errors or material weaknesses in future periods. However, our internal controls cannot guarantee that no accounting errors exist or that all accounting errors, no matter how immaterial, will be detected because a control system, no matter how well designed and operated, can provide only reasonable, but not absolute assurance that the control system’s objectives will be met. If we are unable to implement and maintain effective internal control over financial reporting, our ability to accurately and timely report our financial results could be adversely impacted. This could result in late filings of our annual and quarterly reports under the Securities Exchange Act of 1934, or the Exchange Act, restatements of our consolidated financial statements, a decline in our stock price, suspension or delisting of our common stock by the TSX Venture Exchange, or other material adverse effects on our business, reputation, results of operations or financial condition.

***Our ability to use our net operating losses and certain other tax attributes may be limited.***

As of December 31, 2016, we had accumulated net operating losses, or NOLs, of approximately \$113 million. In the interim period through June 30, 2017 we have incurred additional losses for accounting purposes from operations of \$6.5 million. Varying jurisdictional tax codes have restrictions on the use of NOLs, if a corporation undergoes an “ownership change,” the corporation’s ability to use its pre-change NOLs, R&D credits and other pre-change tax attributes to offset its post-change income may be limited. An ownership change is generally defined as a greater than 50% change in equity ownership by value over a 3-year period. Based upon an analysis of our equity ownership, we do not believe that we have experienced such ownership changes and therefore our annual utilization of our NOLs is not limited. However, should we experience additional ownership changes, our NOL carry forwards may be limited.

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

We are subject to export and import control laws, trade regulations and other trade requirements that limit which raw materials and technology we can import or export and which products we sell and where and to whom we sell our products. Specifically, the Bureau of Industry and Security of the U.S. Department of Commerce is responsible for regulating the export of most commercial items that are so called dual-use goods that may have both commercial and military applications. A limited number of our products are exported by license under certain classifications. Export Control Classification requirements are dependent upon an item's technical characteristics, the destination, the end-use, and the end-user, and other activities of the end-user. Should the regulations applicable to our products change, or the restrictions applicable to countries to which we ship our products change, then the export of our products to such countries could be restricted. As a result, our ability to export or sell our products to certain countries could be restricted, which could adversely affect our business, financial condition and results of operations. Changes in our products or any change in export or import regulations or related legislation, shift in approach to the enforcement or scope of existing regulations, or change in the countries, persons or technologies targeted by such regulations, could result in delayed or decreased sales of our products to existing or potential customers. In such event, our business and results of operations could be adversely affected.

***Our manufacturing operations are subject to environmental regulation that could limit our growth or impose substantial costs, adversely affecting our financial condition and results of operations.***

Our properties, operations and products are subject to the environmental laws and regulations of the jurisdictions in which we operate and sell products. These laws and regulations govern, among other things, air emissions, wastewater discharges, the management and disposal of hazardous materials, the contamination of soil and groundwater, employee health and safety and the content, performance, packaging and disposal of products. Our failure to comply with current and future environmental laws and regulations, or the identification of contamination for which we are liable, could subject us to substantial costs, including fines, cleanup costs, third-party property damages or personal injury claims, and make significant investments to upgrade our facilities or curtail our operations. Identification of presently unidentified environmental conditions, more vigorous enforcement by a governmental authority, enactment of more stringent legal requirements or other unanticipated events could give rise to adverse publicity, restrict our operations, affect the design or marketability of our products or otherwise cause us to incur material environmental costs, adversely affecting our financial condition and results of operations.

***We are exposed to risks and increased expenses and business risk as a result of Restriction on Hazardous Substances, or RoHS directives.***

Following the lead of the European Union, or EU, various governmental agencies have either already put into place or are planning to introduce regulations that regulate the permissible levels of hazardous substances in products sold in various regions of the world. For example, the RoHS directive for EU took effect on July 1, 2006. The labeling provisions of similar legislation in China went into effect on March 1, 2007. Consequently, many suppliers of products sold into the EU have required their suppliers to be compliant with the new directive. We anticipate that our customers may adopt this approach and will require our full compliance, which will require a significant amount of resources and effort in planning and executing our RoHS program, it is possible that some of our products might be incompatible with such regulations. In such events, we could experience the following consequences: loss of revenue, damages reputation, diversion of resources, monetary penalties, and legal action.

***Failure to comply with the U.S. Foreign Corrupt Practices Act could subject us to penalties and other adverse consequences.***



We are subject to the U.S. Foreign Corrupt Practices Act, which generally prohibits companies operating in the U.S. from engaging in bribery or other prohibited payments to foreign officials for the purpose of obtaining or retaining business. In addition, we are required to maintain records that accurately and fairly represent our transactions and have an adequate system of internal accounting controls. Foreign companies, including some that may compete with us, may not be subject to these prohibitions, and therefore may have a competitive advantage over us. If we are not successful in implementing and maintaining adequate preventative measures, we may be responsible for acts of our employees or other agents engaging in such conduct. We could suffer severe penalties and other consequences that may have a material adverse effect on our financial condition and results of operations.

***Natural disasters or other catastrophic events could harm our operations.***

Our operations in the U.S., Canada and Singapore could be subject to significant risk of natural disasters, including earthquakes, hurricanes, typhoons, flooding and tornadoes, as well as other catastrophic events, such as epidemics, terrorist attacks or wars. For example, our wafer fabrication facility in Singapore is in an area that is susceptible to hurricanes. Any disruption in our manufacturing facilities arising from these and other natural disasters or other catastrophic events could cause significant delays in the production or shipment of our products until we are able to arrange for third parties to manufacture our products. We may not be able to obtain alternate capacity on favorable terms or at all. Our property insurance coverage with respect to natural disaster is limited and is subject to deductible and coverage limits. Such coverage may not be adequate or continue to be available at commercially reasonable rates and terms. The occurrence of any of these circumstances may adversely affect our financial condition and results of operation.

The Company may experience these factors in the future and these factors may have a material adverse effect on the Company's business, operating results and financial condition.

Please refer to the Company's Annual Information Forms filed on SEDAR for a detailed discussion of Risks and Uncertainties most recently filed on April 17, 2017.

***Additional Information***

Additional information relating to the Company is available on SEDAR at [www.sedar.com](http://www.sedar.com) including the information contained in the Company's Annual Information Form filed on SEDAR on April 17, 2017.

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