



# Investor Presentation

SECOND QUARTER 2019

Nasdaq: AAOI

# SAFE HARBOR STATEMENT

This presentation contains forward-looking statements. The statements contained in this presentation that are not purely historical are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act, as amended. These forward-looking statements involve assumptions and current expectations, which are subject to risks and uncertainties that could cause the company's actual results to differ materially from those anticipated in such forward-looking statements. These risks and uncertainties include but are not limited to: reduction in the size or quantity of customer orders; change in demand for the company's products due to industry conditions; our ability to maintain sufficient liquidity; changes in manufacturing operations; volatility in manufacturing costs; delays in shipments of products; disruptions in the supply chain; change in the rate of design wins or the rate of customer acceptance of new products; the company's reliance on a small number of customers for a substantial portion of its revenues; potential pricing pressure; a decline in demand for our customers' products or their rate of deployment of their products; general conditions in the internet datacenter, cable television ("CATV"), fiber-to-the-home ("FTTH"), or telecommunications ("Telecom") markets; changes in the world economy (particularly in the United States and China); the negative effects of seasonality; impact of the Tax Cuts and Jobs Act of 2017, including its impact on deferred tax assets and the one-time transition tax on unremitted foreign earnings and on the realization of deferred tax assets, and other risks and uncertainties described more fully in the company's documents filed with or furnished to the Securities and Exchange Commission. More information about these and other risks that may impact the company's business are set forth in the "Risk Factors" section of the company's quarterly and annual reports on file with the Securities and Exchange Commission, which are available online at [www.edgar.gov](http://www.edgar.gov).

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In this presentation we include certain other non-GAAP measures that we believe are useful to investors in evaluating our operating performance. Non-GAAP measures should not be considered as an alternative to income (loss) after tax, earnings per share, or any other measure of financial performance calculated and presented in accordance with GAAP. Our non-GAAP measures may not be comparable to similarly titled measures of other organizations because other organizations may not calculate such other non-GAAP measures in the same manner. You are encouraged to evaluate these adjustments and the reasons we consider them appropriate. For a reconciliation of GAAP measures to our non-GAAP measures, please see the Appendix to this presentation.

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# Investment

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## HIGHLIGHTS



**A Leader In  
Advanced Optics**



**Dynamic  
Markets**



**Marquee  
Customers**



**Proprietary  
Manufacturing**

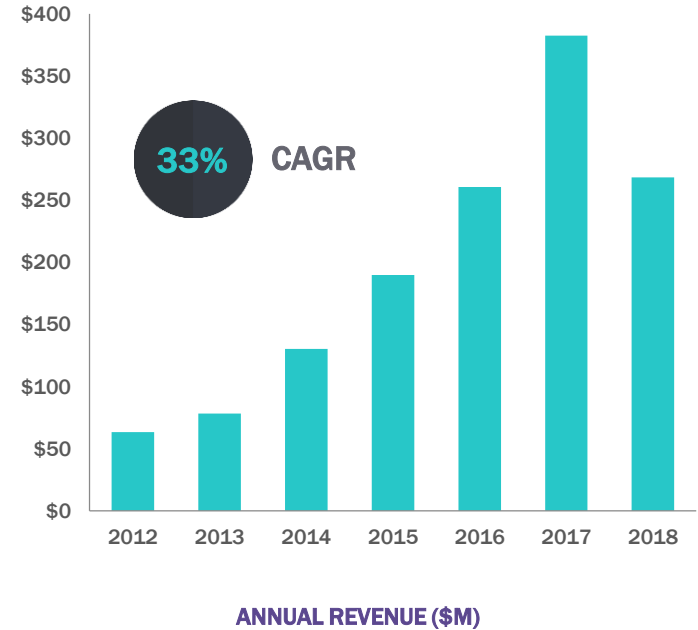
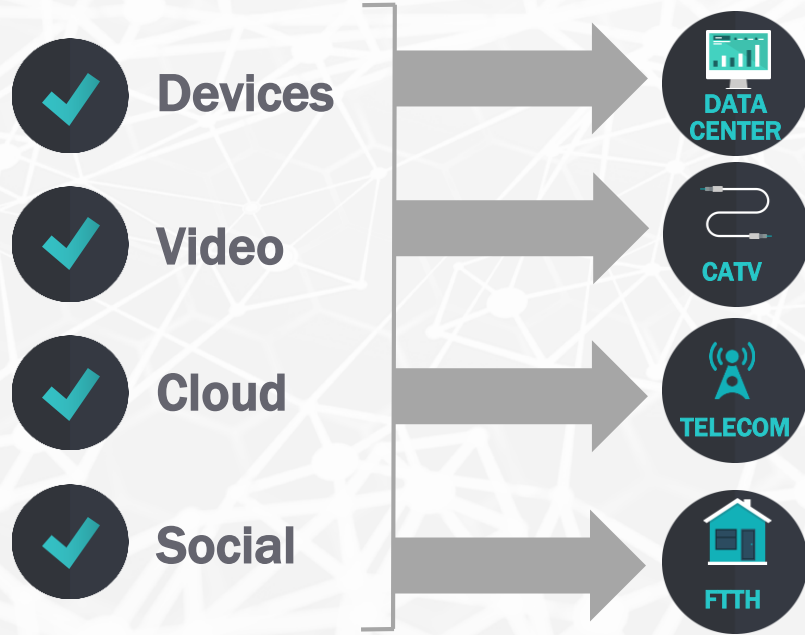


**Diversifying  
Customer Base**



**A leading provider of optical access products that  
enable the gigabit age**

# Bandwidth Demand Drives Revenue



# Four End-Markets With Strong Demand Drivers

## Datacenter

- ✓ Increasing size of datacenters
- ✓ Higher-speed interconnect - 1G to (10G/40G/100G/200G/400G)
- ✓ Continuous need to expand, refresh and replenish

## Cable Television

- ✓ DOCSIS 3.1 & upgrade cycle
- ✓ International market opportunities
- ✓ Continued outsourcing of design and production

## Telecommunications

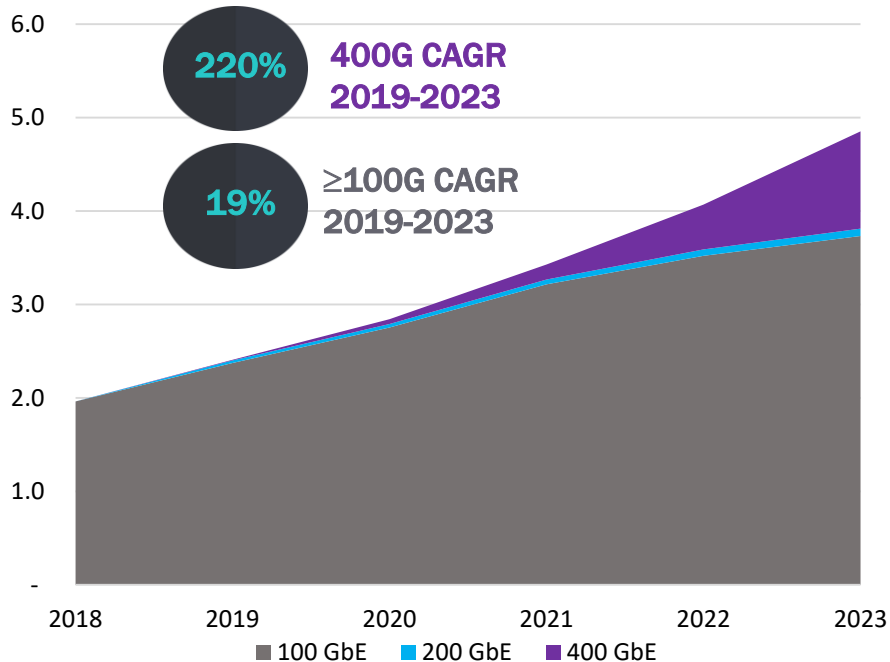
- ✓ 5G LTE deployment
- ✓ Backbone network for datacenter interconnect
- ✓ Aging access networks in need of rebuild

## Fiber-to-the-Home

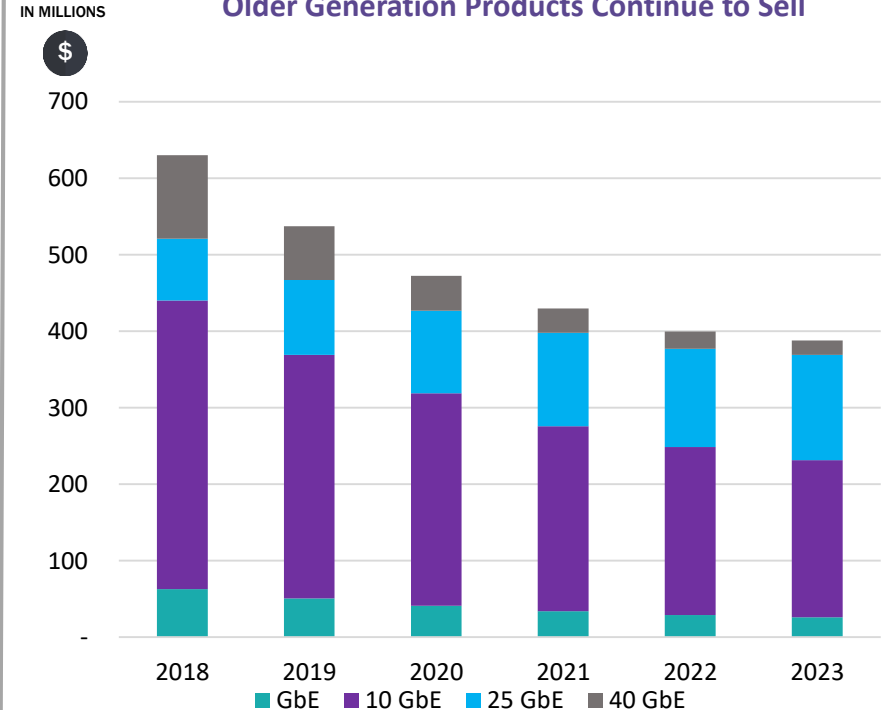
- ✓ 10 Gbps FTTH networks to replace 2.5Gbps
- ✓ Telecom carriers need to fiberize to compete with CATV, new entrants
- ✓ Greenfield economics favor fiber deployment

# Growing Datacenter Market

Total High-Speed (100G or greater) Market to Exceed \$4.5 Billion



Older Generation Products Continue to Sell



# DATACENTER MARKET CHARACTERISTICS DIFFER FROM CHARACTERISTICS OF TELECOM OPTICAL COMPONENT MARKET

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## Vertical Integration & In-house Manufacturing Optimal

### DATACENTER MARKET

- ✓ Rapid product development cycles favor controlling a substantial part of the manufacturing process
- ✓ Large production volume/relatively low diversity enables rapid ROI on factory equipment
- ✓ Integration of manufacturing process enhances efficiency

### TELECOM MARKET

- ✓ Telecom applications have much longer production cycles
- ✓ Small volume/high diversity favors outsourcing
- ✓ Initial costs of integration are high, and only economical with high production volume



# 100G Datacenter Transceiver Use Cases

	100G Technology	Lasers	# Fibers	Transceiver Cost*	Fiber Cost/m*	Optimal Distance (d)
Intra-Datacenter	Short-Reach (SR) AOC	4xVCSEL	8	\$	\$\$	<150m
	Long-Reach, PSM-4	4x1310-nm DFB (AOI) OR 1x1310-nm high power + modulators (SiPh)	8	\$\$	\$\$\$\$\$	150m<d<500m
	Long-Reach, CWDM (CWDM-4, CLR-4)	4xCWDM DFB	2	\$\$\$	\$\$\$	500m<d<2km
Interconnect	Extended Reach, 4WDM-10	4xCWDM	2	\$\$\$\$	\$\$\$	2km<d<10km
	100G-BASE-LR4	4xWDM (cooled)	2	\$\$\$\$\$\$	\$\$\$	2km<d<10km
	Coherent (DP-QPSK)	1x1550 (tunable, narrow linewidth)	2	\$\$\$\$\$\$\$\$\$	\$\$\$	>80km

# 400G: Multiple Standards to Meet Multiple Use Cases

400G intra-datacenter electrical/optical standards currently in existence or being developed:

Reach Distance	Data Center Unique Spec	IEEE Standards	100G single Lambda MSA
70m for OM3, 100m for OM4	-	400G SR8*	-
	-	400G SR4.2	-
500m	-	100G DR*	-
	-	400G DR4*	-
2km	-	-	100G FR*
	-	-	400G FR4*
10km	400G DR4+*	-	-

# Details of Current 400G Transceiver Form-factors

## Key Considerations for Designers:

Backward Compatibility

Connector Termination

Latch Mechanism

Mating Process

Protruding area safety

Electrical/optical breakout

Thermal dissipation

Common management interface specification



Dimensions (mm)	SFP-DD	QSFP-DD	OSFP	COBO
Width	14	19	22.93	36
Length (overall)	64.15	93	100.4	40
Length inside cage	54.15	49.6	82.48	-
Thickness	8.55	8.5	13.00	9.35
Electrical Channel	2x	8x	8x	8x, 16x
Thermal Capability	1 - 3.5W	7 - 14W	12 - 16W	15 - 20W

# 5G Requirements for Front/Mid-Haul Optics

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**Small-Cell Proliferation and C-RAN Evolution Creates Need for New Optical Solutions**

**25 Gbps/50 Gbps/100 Gbps transceivers needed**

## Front-Haul:

- Link remote radio head (RRH) to base station
- Distances typically several km
- 25 Gbps in SFP-28 form factor
- Outdoor RRH require high-temperature optics

## Mid-Haul:

- Longer distances typical in C-RAN (Cloud-Radio Access Network)
- 50 Gbps/100Gbps over 10+ km
- Typically standard commercial temperature range

# Vertical Integration

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A KEY DIFFERENTIATOR



Faster time to market



Cost advantages



High yield manufacturing

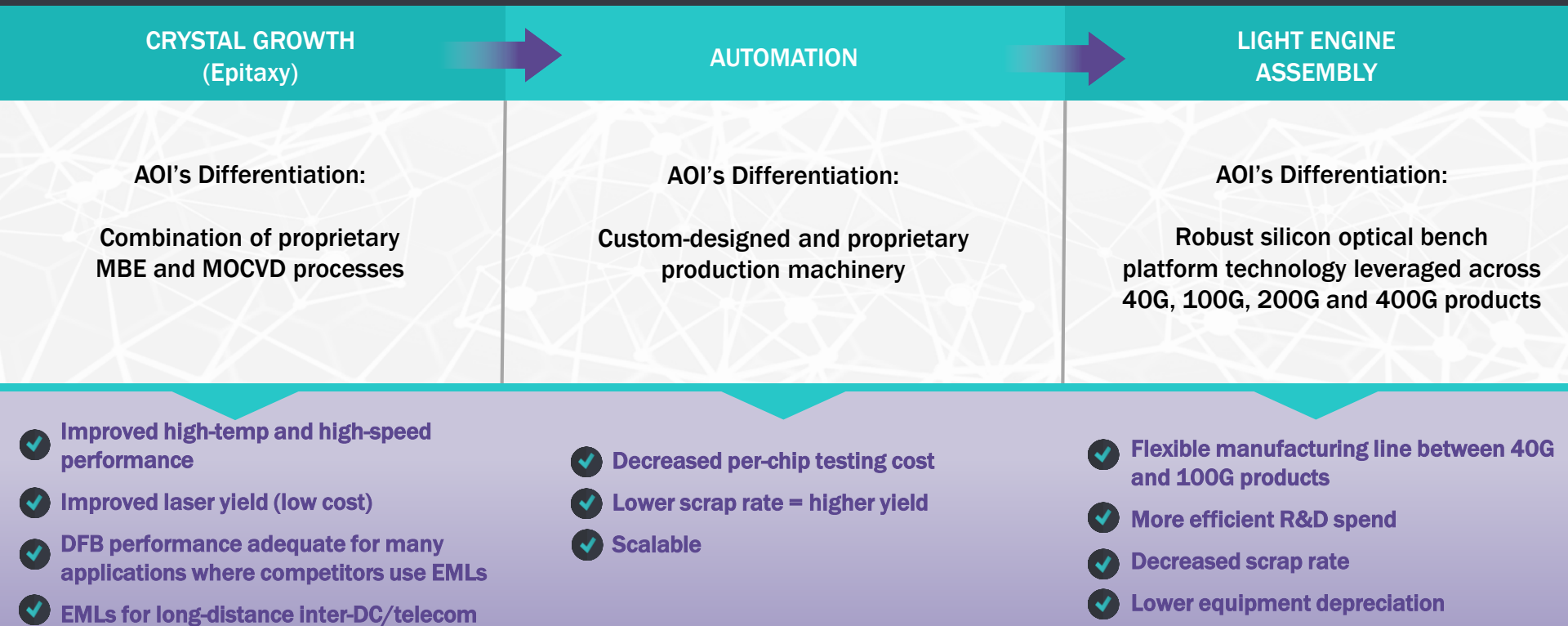


Flexible capacity support



Rapid response to customer & market demand

# A Closer Look...





# Automated Manufacturing Process



Automated Robotic Test Stations Increase Throughput, Decrease Human Error in Handling

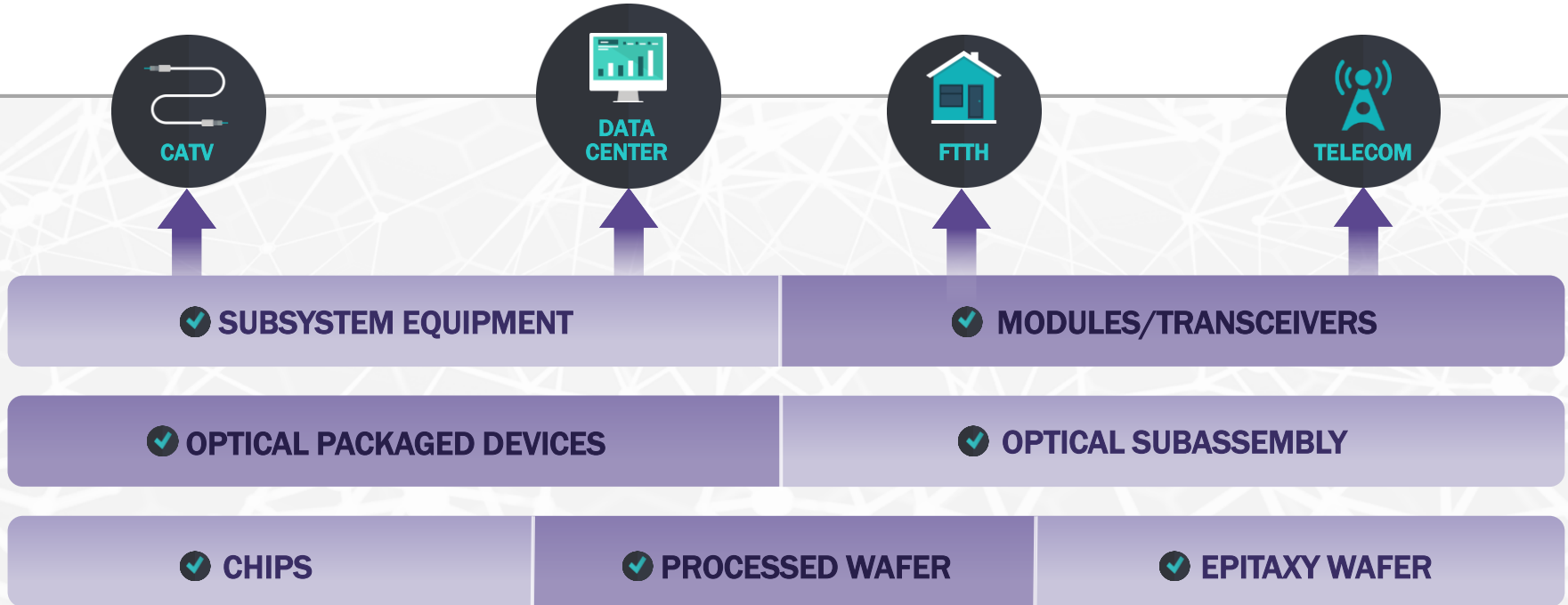
Automated Receiver Sub-Assembly Decreased Labor by 58% and Improved Quality Control



Automated Light Engine Final Assembly Decreased Labor by 85% and Improved Process Control and Quality

# Vertical Integration replicated across markets

In-house production and development  
of advanced laser diodes and light  
engines speeds time to market







# RESEARCH & DEVELOPMENT

- ✓ Excellent laser technology
- ✓ Proprietary Silicon Photonics Technology
- ✓ Strong R&D teams in all 3 sites from lasers, transceivers to equipment
- ✓ Customer NRE reimbursements

# MANUFACTURING & OPERATIONS

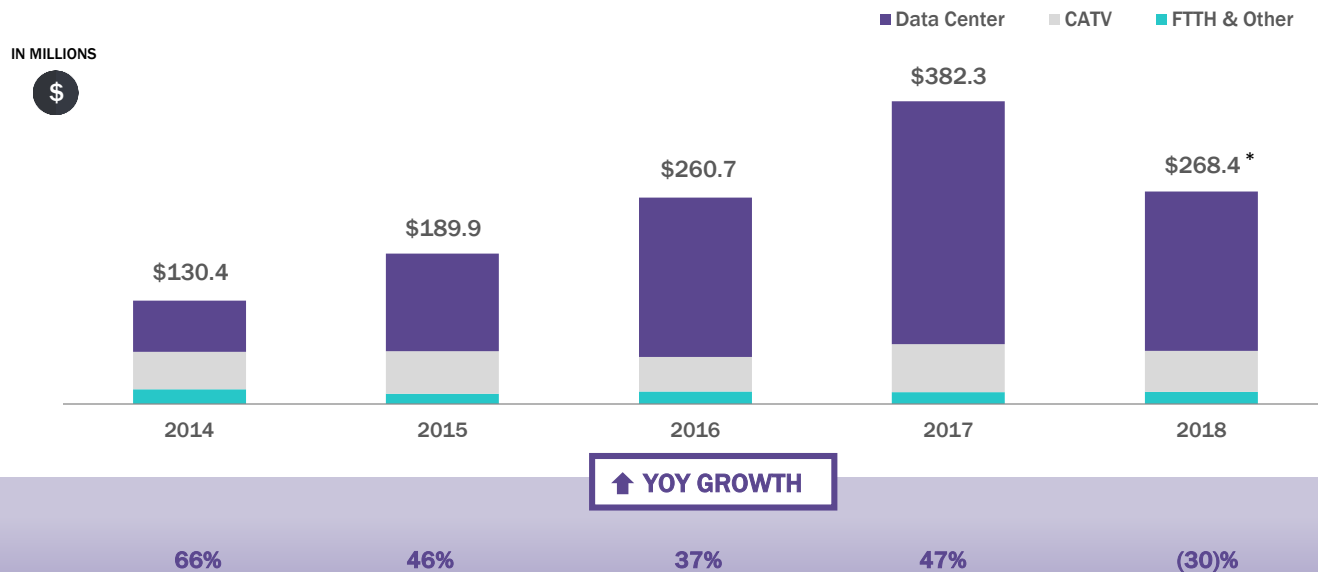
- ✓ Experienced in high-volume manufacture
- ✓ Efficient supply chain
- ✓ Vertical integration from laser chips to transceivers to equipment with cost advantages



# Financial Review

# Data Center Drives Revenue

## ANNUAL REVENUE BY END MARKET





# Q2/19 Results

**NON-GAAP\***

**\$**  
IN MILLIONS EXCEPT %

**Q2/19**

**REVENUE** \$ 43.4

**DATACENTER** \$ 31.8

**CATV** \$ 9.8

**GROSS MARGIN** 27.2%

**OPERATING LOSS** \$ 7.7

**NET LOSS** \$ 5.2

**CASH\*\*** \$ 84

# Balance Sheet Highlights

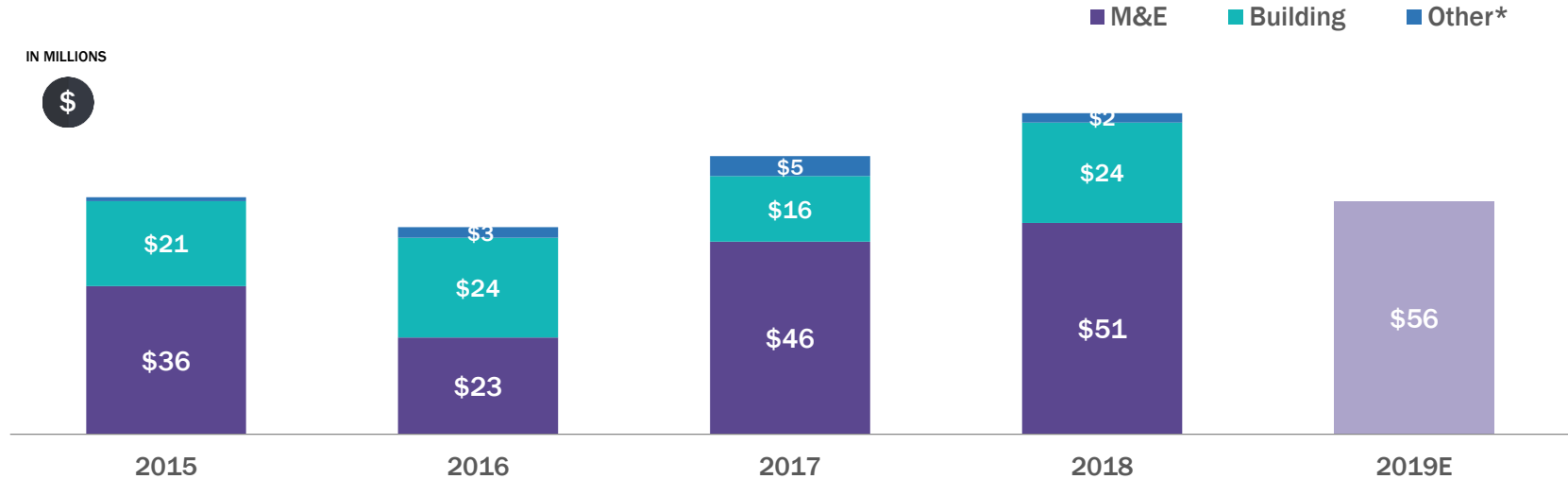
\$ IN MILLIONS	6/30/2017	6/30/2018	6/30/2019
CASH <sup>(1)</sup>	\$76	\$78	\$84
WORKING CAPITAL <sup>(2)</sup>	\$142	\$159	\$133
PROPERTY, PLANT & EQUIPMENT, NET	\$165	\$212	\$248
TOTAL ASSETS	\$407	\$472	\$495
TOTAL DEBT <sup>(3)</sup>	\$27	\$61	\$52
STOCKHOLDERS' EQUITY	\$308	\$343	\$312

(1) Cash: Cash, cash equivalents, short-term investments, and restricted cash.

(2) Working Capital: Total current assets less total current liabilities.

(3) Total Debt: Short-term loans, notes and bank acceptances payable and total long-term debt. Convertible notes outstanding are to be settled in common stock, not cash, so are excluded from total debt.

# Investing in Capacity & Vertical Integration



\* Defined as furniture and fixtures, computer equipment and software and transportation equipment.

# Investment

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## SUMMARY



**A leader In  
Advanced Optics**



**Focus on fast  
growing markets  
including hyperscale  
datacenters**



**Marquee global  
customers**



**Extensive internally  
developed technology**



**Manufacturing  
expertise creates  
differentiation &  
sustains margin**



**Operating model  
provides significant  
leverage**



# Questions





# Appendix

# MANAGEMENT TEAM



**Dr. Thompson Lin**  
FOUNDER, PRESIDENT & CEO

20+ YEARS



**Dr. Stefan Murry**  
CFO & CSO

20+ YEARS



**Dr. Fred Chang**  
COMPONENT BU HEAD

16+ YEARS



**Dr. Alex Anselm**  
SEMICONDUCTOR PRODUCTS  
DIVISION HEAD

18+ YEARS



**Jessica Hung**  
VP OF FINANCE &  
CORPORATE CONTROLLER

11+ YEARS



**Joshua Yeh**  
ASIA GM

11+ YEARS

# NON-GAAP FINANCIAL MEASURES

We provide non-GAAP gross margin, non-GAAP net income (loss), and non-GAAP earnings per share to eliminate the impact of items that we do not consider indicative of our overall operating performance. To arrive at our non-GAAP gross margin, we exclude stock-based compensation expense, expenses associated with discontinued products, and non-recurring expenses, if any, from our GAAP gross margin. To arrive at our non-GAAP net income (loss), we exclude all amortization of intangible assets, stock-based compensation expense, non-recurring expenses, unrealized foreign exchange gain (loss), losses from the disposal of idle assets, if any, non-recurring tax expenses (benefits), and expenses associated with discontinued products, if any, from our GAAP net income (loss). Included in our non-recurring expenses in Q2 2019 and Q2 2018 are certain legal and consulting fees (if any) and employee severance expenses (if any). Non-cash expenses associated with discontinued products in Q2 2019 and Q2 2018 include depreciation on certain equipment undergoing reconfiguration. Other expenses associated with discontinued products in Q2 2019 and Q2 2018 include inventory obsolescence charges associated with materials used in the manufacture of these discontinued products.

Our non-GAAP earnings per share is calculated by dividing our non-GAAP net income by the fully diluted share count. We believe that our non-GAAP measures are useful to investors in evaluating our operating performance for the following reasons:

- We believe that elimination of items such as stock-based compensation expense and non-recurring expenses is appropriate because treatment of these items may vary for reasons unrelated to our overall operating performance;
- We believe that elimination of expenses associated with discontinued products, including depreciation and inventory obsolescence is appropriate because these expenses are not indicative of our ongoing operations;
- We believe that non-GAAP measures provide better comparability with our past financial performance, period-to-period results and with our peer companies, many of which also use similar non-GAAP financial measures; and
- We anticipate that investors and securities analysts will utilize non-GAAP measures to evaluate our overall operating performance.

A reconciliation of our GAAP net income (loss) and GAAP earnings per share for Q1 2019 to our non-GAAP net income (loss) and earnings per share is provided.

Non-GAAP measures should not be considered as an alternative to net income (loss), earnings per share, or any other measure of financial performance calculated and presented in accordance with GAAP. Our non-GAAP measures may not be comparable to similarly titled measures of other organizations because other organizations may not calculate such other non-GAAP measures in the same manner. We have not reconciled the non-GAAP measures included in our guidance to the appropriate GAAP financial measures because the GAAP measures are not accessible on a forward-looking basis. GAAP measures that impact our non-GAAP financial measures may include stock-based compensation expense, non-recurring expenses, amortization of intangible assets, unrealized exchange loss (gain), asset impairment charges, and loss (gain) from disposal of idle assets. These GAAP measures cannot be reasonably predicted and may directly impact our non-GAAP gross margin, our non-GAAP net income and our non-GAAP fully-diluted earnings per share, although changes with respect to certain of these measures may offset other changes. In addition, certain of these measures are out of our control. Accordingly, a reconciliation of the non-GAAP financial measure guidance to the corresponding GAAP measures is not available without unreasonable effort.

# NON-GAAP RECONCILIATION

(In thousands)

## Preliminary Unaudited

	1Q17	2Q17	3Q17	4Q17	CY2017	1Q18	2Q18	3Q18	4Q18	CY2018	1Q19	2Q19	6MO2019
GAAP revenue	96,224	117,371	88,879	79,855	382,329	65,239	87,822	56,386	58,018	267,465	52,719	43,411	96,130
Non-recurring customer credit	-	-	-	-	-	-	-	-	891	891	-	-	-
Non-GAAP revenue	96,224	117,371	88,879	79,855	382,329	65,239	87,822	56,386	58,909	268,356	52,719	43,411	96,130
GAAP total gross profit	41,472	53,282	39,372	32,154	166,280	25,836	33,863	17,537	10,537	87,773	12,351	10,538	22,889
Non-recurring customer credit	-	-	-	-	-	-	-	-	891	891	-	-	-
Share-based compensation expense	78	134	125	124	461	177	211	205	202	795	189	199	388
Non-recurring expense	-	-	-	-	-	7	-	-	43	50	-	-	-
Expenses associated with discontinued products	-	-	-	459	459	71	1,432	1,412	2,852	5,767	925	1,067	1,992
Non-GAAP income from gross profit	41,550	53,416	39,497	32,737	167,200	26,091	35,506	19,154	14,525	95,276	13,465	11,804	25,269
GAAP total operating expense	17,157	19,017	21,321	21,834	79,329	23,666	24,920	27,141	22,814	98,541	24,220	24,366	48,586
Share-based compensation expense	1,429	2,126	1,957	1,822	7,334	2,391	2,689	2,689	2,558	10,327	2,754	2,821	5,575
Amortization expense	118	120	122	125	485	126	127	125	128	506	130	133	263
Non-recurring expense	100	290	378	290	1,058	284	330	685	1,134	2,433	69	813	882
Non-cash expenses associated with discontinued products	-	-	-	650	650	751	1,004	859	273	2,887	1,017	1,115	2,132
Non-GAAP total operating expense	15,510	16,481	18,864	18,947	69,802	20,114	20,770	22,783	18,721	82,388	20,250	19,484	39,734
GAAP operating income (loss)	24,315	34,265	18,051	10,320	86,951	2,170	8,943	(9,604)	(12,277)	(10,768)	(11,869)	(13,828)	(25,697)
Non-recurring customer credit	-	-	-	-	-	-	-	-	891	891	-	-	-
Share-based compensation expense	1,507	2,260	2,082	1,946	7,795	2,569	2,900	2,894	2,757	11,120	2,943	3,020	5,963
Amortization expense	118	120	122	125	485	126	127	125	128	506	130	133	263
Non-recurring expense	100	290	378	290	1,058	290	330	685	1,180	2,485	69	813	882
Expenses associated with discontinued products	-	-	-	459	459	71	1,432	1,412	2,852	5,767	925	1,067	1,992
Non-cash expenses associated with discontinued products	-	-	-	650	650	751	1,004	859	273	2,887	1,017	1,115	2,132
Non-GAAP operating income (loss)	26,040	36,935	20,633	13,790	97,398	5,977	14,736	(3,629)	(5,087)	11,997	(6,785)	(7,680)	(14,465)
GAAP other income (loss)	(872)	(111)	(541)	(901)	(2,425)	(1,046)	1,387	578	71	990	(1,079)	(729)	(1,808)
Loss (gain) from disposal of idle assets	-	2	-	-	2	-	-	-	8	8	-	-	-
Unrealized exchange loss (gain)	248	(101)	60	741	948	(203)	(911)	506	7	(601)	(227)	56	(171)
Non-recurring expense	0	0	0	0	0	0	0	0	0	0	173	-	173
Non-GAAP other income (loss)	(624)	(210)	(481)	(160)	(1,475)	(1,249)	476	1,084	86	397	(1,133)	(673)	(1,806)
GAAP net income (loss)	19,789	29,071	19,375	5,716	73,951	2,120	8,034	(3,732)	(8,568)	(2,146)	(10,474)	(11,366)	(21,840)
Non-recurring customer credit	-	-	-	-	-	-	-	-	891	891	-	-	-
Amortization of intangible assets	118	120	122	125	485	126	127	125	128	506	130	133	263
Share-based compensation expense	1,507	2,260	2,082	1,946	7,795	2,569	2,900	2,894	2,757	11,120	2,943	3,020	5,963
Non Recurring charges	100	290	378	290	1,058	290	330	685	1,180	2,485	242	812	1,054
Expenses associated with discontinued products	-	-	-	459	459	71	1,432	1,412	2,852	5,767	925	1,067	1,992
Non-cash expenses associated with discontinued products	-	-	-	650	650	751	1,004	859	273	2,887	1,017	1,116	2,133
Loss (gain) from disposal of idle assets	-	2	-	-	2	-	-	-	8	8	-	-	-
Unrealized exchange loss (gain)	248	(101)	60	741	948	(203)	(911)	506	7	(601)	(227)	56	(171)
Non-recurring Tax Benefit	-	(320)	-	8,016	7,696	(114)	(48)	-	-	(162)	-	-	-
Non-GAAP net income (loss)	21,762	31,322	22,017	17,943	93,044	5,610	12,868	2,749	(472)	20,755	(5,444)	(5,162)	(10,606)