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As filed with the Securities and Exchange Commission on October 17, 2016

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

APPLIED OPTOELECTRONICS, INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware
(State or Other Jurisdiction
of Incorporation or Organization)

76-0533927
(I.R.S. Employer
Identification Number)

13139 Jess Pirtle Blvd.
Sugar Land, TX 77478
(281) 295-1800

(Address, Including Zip Code, and Telephone Number, Including Area Code, of Registrant's Principal Executive Offices)

David C. Kuo
General Counsel and Corporate Secretary
13139 Jess Pirtle Blvd.
Sugar Land, TX 77478
(281) 295-1808

(Name, Address, Including Zip Code, and Telephone Number, Including Area Code, of Agent For Service)

Copies to:

Frank Wu
Haynes and Boone, LLP
1221 McKinney Street, Suite 2100
Houston, TX 77010-2007
(713) 547-2572
(713) 236-5659 (facsimile)

**Approximate date of commencement of proposed sale to the public:
From time to time after the effective date of this Registration Statement.**

If the only securities being registered on this form are being offered pursuant to dividend or interest reinvestment plans, please check the following box.

If any of the securities being registered on this form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box.

If this form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

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

Large accelerated filer

Accelerated filer

Non-accelerated filer
(Do not check if
smaller reporting company)

Smaller reporting company

Calculation of Registration Fee

Title of Each Class of Securities to be Registered	Amount to be Registered(1)	Proposed Maximum Offering Price Per Security(2)	Proposed Maximum Aggregate Offering Price(3)	Amount of Registration Fee(4)
Common Stock, \$0.001 par value per share				
Preferred Stock, \$0.001 par value per share				
Warrants(5)				
Units(6)				
Total			\$250,000,000	\$28,975

- (1) The amount to be registered consists of up to \$250,000,000 of an indeterminate number of shares of common stock, shares of preferred stock, warrants and units. There is also being registered hereunder such currently indeterminate number of common stock, preferred stock, and warrants as may from time to time be issued at indeterminate prices upon conversion, redemption, exchange, exercise or settlement of any securities registered hereunder. Any securities registered hereunder may be sold separately or as units with the other securities registered hereunder. In addition, pursuant to Rule 416 under the Securities Act of 1933, as amended, (the "Securities Act") the shares being registered hereunder include such indeterminate number of shares of common stock and preferred stock as may be issuable with respect to the shares being registered hereunder as a result of stock splits, stock dividends or similar transactions.
- (2) The proposed maximum aggregate offering price per security will be determined from time to time by the registrant in connection with the issuance by the registrant of the securities registered hereunder and is not specified as to each class of security pursuant to General Instruction II.D. of Form S-3 under the Securities Act.
- (3) Estimated solely for purposes of computing the registration fee and exclusive of accrued interest, distributions and dividends, if any. In no event will the aggregate initial offering price of all securities issued from time to time pursuant to this Registration Statement exceed \$250,000,000.
- (4) The registration fee has been calculated in accordance with Rule 457(o) under the Securities Act based on the proposed maximum aggregate offering price. Pursuant to Rule 415(a)(6) under the Securities Act, the securities registered pursuant to this registration statement include unsold securities previously registered for sale pursuant to the Registrant's previously filed registration statement on Form S-3 (File No. 333-204703), which became effective on June 23, 2015 (the "Prior Registration Statement"). The Prior Registration Statement registered \$140,000,000 of an indeterminate number of shares of common stock, shares of preferred stock, warrants and units for sale from time to time. Of this amount, \$100,000,000 remain unsold as of October 17, 2016. In connection with the registration of unsold securities on the Prior Registration Statement, the Registrant paid a registration fee of \$10,070 for such unsold securities. This unsold amount is being carried forward to this Registration Statement and the filing fee paid with respect to the unsold amount of \$100,000,000 in the Prior Registration Statement is being used to pay a portion of the filing fee in connection with the filing of this Registration Statement. Pursuant to Rule 415(a)(6) under the Securities Act, the offering of unsold securities under the Prior Registration Statement will be deemed terminated as of the date of effectiveness of this Registration Statement.
- (5) Including such indeterminate number of warrants or other rights, including without limitation share purchase or subscription rights, as may be issued from time to time at indeterminate prices.
- (6) Each unit will be issued under a unit agreement and will represent an interest in two or more securities, which may or may not be separable from one another.

THE REGISTRANT HEREBY AMENDS THIS REGISTRATION STATEMENT ON SUCH DATE OR DATES AS MAY BE NECESSARY TO DELAY ITS EFFECTIVE DATE UNTIL THE REGISTRANT SHALL FILE A FURTHER AMENDMENT WHICH SPECIFICALLY STATES THAT THIS REGISTRATION STATEMENT SHALL THEREAFTER BECOME EFFECTIVE IN ACCORDANCE WITH SECTION 8(A) OF THE SECURITIES ACT OR UNTIL THE REGISTRATION STATEMENT SHALL BECOME EFFECTIVE ON SUCH DATE AS THE SECURITIES AND EXCHANGE COMMISSION, ACTING PURSUANT TO SAID SECTION 8(A), MAY DETERMINE.

EXPLANATORY STATEMENT

The \$250,000,000 of indeterminate number of shares of common stock, shares of preferred stock, warrants and units to be issued under this Registration Statement includes \$100,000,000 of such securities previously registered under the Prior Registration Statement. Pursuant to Rule 415(a)(6), the offering of the unsold securities registered under the Prior Registration Statement will be deemed terminated as of the date of effectiveness of this registration statement. Accordingly, this Registration Statement will replace the Prior Registration Statement as of the date of effectiveness of this Registration Statement.

The information in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Subject to Completion, dated October 17, 2016

Prospectus



APPLIED OPTOELECTRONICS, INC.

\$250,000,000

**Common Stock
Preferred Stock
Warrants
Units**

We may offer and sell any combination of the securities listed above from time to time, in one or more classes or series and in amounts, at prices and on terms that we will determine at the time of the offering. The aggregate initial offering price of the securities that we will offer will not exceed \$250,000,000.

This prospectus provides you with a general description of the securities we may offer. Each time we sell securities, we will provide a supplement to this prospectus that contains specific information about the offering including the price at which we are offering securities to the public. The prospectus supplement may also add, update or change information contained in this prospectus. You should carefully read this prospectus, all prospectus supplements and all other documents incorporated by reference in this prospectus before you invest in our securities.

We may offer and sell these securities in the same offering or in separate offerings through underwriters, dealers or agents or directly to purchasers, on a continuous or delayed basis. The prospectus supplement for each offering will describe in detail the plan of distribution for that offering and will set forth the names of any underwriters, dealers or agents involved in the offering and any applicable fees, commissions or discount arrangements. See "Plan of Distribution."

We encourage you to carefully review and consider this prospectus and any prospectus supplement before investing in our securities. We also encourage you to read the documents to which we have referred you in the "Where To Learn More About Us" section of this prospectus for information on us and for our financial statements.

Our common stock is quoted on NASDAQ Global Market under the symbol "AAOI." On October 12, 2016, the closing price for our common stock, as reported on the NASDAQ Global Market, was \$21.43 per share.

We are an "emerging growth company" as defined under the federal securities laws and, as such, have elected to comply with certain reduced public company reporting requirements.

THIS PROSPECTUS MAY NOT BE USED TO SELL SECURITIES UNLESS ACCOMPANIED BY A PROSPECTUS SUPPLEMENT DESCRIBING THE METHOD AND TERMS OF THE OFFERING OF SUCH SECURITIES.

INVESTING IN OUR SECURITIES INVOLVES A HIGH DEGREE OF RISK. RISKS ASSOCIATED WITH AN INVESTMENT IN OUR SECURITIES WILL BE DESCRIBED IN THE APPLICABLE PROSPECTUS SUPPLEMENT AND OUR PERIODIC AND OTHER REPORTS WE FILE WITH THE SECURITIES AND EXCHANGE COMMISSION, AS DESCRIBED IN "RISK FACTORS" ON PAGE 5. YOU SHOULD CAREFULLY CONSIDER THOSE RISK FACTORS BEFORE INVESTING.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR PASSED UPON THE ACCURACY OR ADEQUACY OF THE DISCLOSURES IN THE PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

The date of this prospectus is _____, 2016.

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ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission (the "SEC") utilizing a "shelf" registration process. Under the shelf registration process, we may offer and sell either individually or in combination with other securities any of the securities described in this prospectus, from time to time, in one or more offerings, at prices and on terms to be determined at or prior to the applicable offering. The aggregate initial offering price of all securities sold under this prospectus will not exceed \$250,000,000.

This prospectus only provides you with a general description of the securities we may offer. Each time we sell securities described in the prospectus, we will provide a supplement to this prospectus that will contain specific information about the terms of that offering.

THIS PROSPECTUS MAY NOT BE USED TO OFFER AND SELL SECURITIES UNLESS IT IS ACCOMPANIED BY A PROSPECTUS SUPPLEMENT.

The prospectus supplement may also add, update or change information contained in this prospectus and, accordingly to the extent inconsistent, information in this prospectus is superseded by the information in the prospectus supplement. You should read carefully both this prospectus and any accompanying prospectus supplement or other offering materials, together with the additional information described under "Where To Learn More About Us" and "Incorporation of Certain Documents By Reference," beginning on page 20 of this prospectus.

You should rely only on the information contained in or incorporated by reference into this prospectus and any prospectus supplement or issuer free writing prospectus relating to a particular offering. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you must not rely on it as having been authorized by us. Neither this prospectus nor any prospectus supplement nor any related issuer free writing prospectus shall constitute an offer to sell or a solicitation of an offer to buy offered securities in any jurisdiction in which it is unlawful for such person to make such an offering or solicitation.

We may sell the securities directly to or through underwriters, dealers or agents. We, and our underwriters or agents, reserve the right to accept or reject all or part of any proposed purchase of securities. If we do offer securities through underwriters, dealers or agents, we will include in any applicable prospectus supplement:

- the names of those underwriters, dealers or agents;
- applicable fees, discounts, and commissions to be paid to them;
- details regarding over-allotment options, if any; and
- the net proceeds to us.

This prospectus and any accompanying prospectus supplement or other offering materials do not contain all of the information included in the registration statement as permitted by the rules and regulations of the SEC. For further information, we refer you to the registration statement on Form S-3, including its exhibits. We are subject to the informational requirements of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and, therefore, file reports and other information with the SEC. Statements contained in this prospectus and any accompanying prospectus supplement or other offering materials about the provisions or contents of any agreement or other document are only summaries. If the SEC rules require that any agreement or document be filed as an exhibit to the registration statement, then you should refer to that agreement or document for its complete contents.

You should not assume that the information in this prospectus, any accompanying prospectus supplement or any other offering materials is accurate as of any date other than the date on the front of each document, regardless of the time of delivery of this prospectus, any accompanying prospectus supplement or any sale of securities. Our business, financial condition, results of operations and prospects may have changed since that date.

PROSPECTUS SUMMARY

The following summary highlights selected information contained elsewhere in this prospectus or incorporated by reference into this prospectus. It does not contain all the information you should consider before investing in our securities. You should read carefully this prospectus, any accompanying prospectus supplement and any other offering materials, together with the additional information described under "Where To Learn More About Us" and "Incorporation of Certain Documents By Reference," beginning on page 20 of this prospectus.

As used in this prospectus, the terms "we," "us," "our," and "Company" refer to Applied Optoelectronics, Inc.

The Company

We are a leading, vertically integrated provider of fiber-optic networking products, primarily for three networking end-markets: internet data center, cable television, or CATV, and fiber-to-the-home, or FTTH. We design and manufacture a range of optical communications products at varying levels of integration, from components, subassemblies and modules to complete turn-key equipment.

In designing products for our customers, we begin with the fundamental building blocks of lasers and laser components. From these foundational products, we design and manufacture a wide range of products to meet our customers' needs and specifications, and such products differ from each other by their end market, intended use and level of integration. We are primarily focused on the higher-performance segments within all three of our target markets, which increasingly demand faster connectivity and innovation.

The three end markets we target are all driven by significant bandwidth demand fueled by the growth of network-connected devices, video traffic, cloud computing and online social networking. To address this increased bandwidth demand, CATV and telecommunications service providers are competing directly against each other by providing bundles of voice, video and data services to their subscribers and investing to enhance the capacity, reliability and capability of their networks. The trend of rising bandwidth consumption also impacts the internet data center market, as reflected in the shift to higher speed server connections. As a result of these trends, fiber-optic networking technology is becoming essential in all three of our target markets, as it is often the only economic way to deliver the desired bandwidth.

The internet data center market is our largest and fastest growing market. Our customers in this market are generally large internet-based ("Web 2.0") data center operators, to whom we supply optical transceivers that plug into switches and servers within the data center and allow these network devices to send and receive data over fiber optic cables. The majority of the data center optical transceivers that we sell utilize our own lasers and subassemblies (we refer to the transceivers subassemblies as "light engines"), and we believe that our in-house technology and manufacturing capability for these lasers and subassemblies gives us an advantage over many of our competitors who often lack either development or manufacturing capabilities for these advanced optical modules.

The CATV market is our most established market, for which we supply a broad array of products including lasers, transmitters and turn-key equipment. Sales of headend, node and distribution equipment have contributed significantly to our revenue in recent years as a result of our ability to meet the needs of CATV equipment vendors who have continued to outsource both the design and manufacturing of this equipment. While equipment vendors have relied upon third parties to assemble portions of their products, within the past six years certain of our customers have accelerated the outsourcing of the design and manufacturing of both headend equipment and node equipment to third parties. The shift is due in part to the sophisticated engineering expertise needed to perform this work.

We believe that our extensive high-speed optical, mixed-signal semiconductor and mechanical engineering capabilities position us well to benefit from these industry dynamics.

Our vertically integrated manufacturing model provides us several advantages, including rapid product development, fast response times to customer requests and control over product quality and manufacturing costs. We design, manufacture and integrate our own analog and digital lasers using a combination of Metal Organic Chemical Vapor Deposition, or MOCVD, and our proprietary Molecular Beam Epitaxy, or MBE, fabrication process, which we believe is unique in our industry. We manufacture the majority of the laser chips and optical components that are used in our products. The lasers we manufacture are proven to be reliable over time and highly tolerant of changes in temperature and humidity, making them well-suited to the CATV and FTTH markets where networking equipment is often installed outdoors.

Corporate Information

We were incorporated in the State of Texas in 1997. In March 2013, we converted from a Texas corporation into a Delaware corporation. Prime World International Holdings, Ltd. ("Prime World") is our wholly-owned subsidiary incorporated in the British Virgin Islands on January 13, 2006. Prime World is the parent company of Global Technology, Inc. ("Global"). Global was established in June 2002 in the People's Republic of China ("PRC") and was acquired by Prime World on March 30, 2006. We also operate a division, AOI—Taiwan, which is qualified to do business in Taiwan and primarily manufactures transceivers and performs research and development activities.

On July 31, 2016, the Company contributed to Prime World, the Company's business assets, liabilities and contracts relating to AOI—Taiwan. The business assets include all tangible and intangible assets, account receivable, properties, and rights used by the Company to carry out the operation of AOI—Taiwan. Upon approval by the Department of Commerce, Ministry of Economic Affairs of Taiwan, AOI—Taiwan will operate as a Taiwan branch of Prime World International Holdings, Ltd.

Our principal executive offices are located at 13139 Jess Pirtle Blvd., Sugar Land, TX 77478, and our telephone number is (281) 295-1800. Our website address is www.ao-inc.com. The information on our website is not incorporated by reference into this prospectus and does not constitute a part of this prospectus.

The Securities We May Offer

We may offer up to \$250,000,000 of common stock, preferred stock, warrants and units in one or more offerings and in any combination. This prospectus provides you with a general description of the securities we may offer. This prospectus may not be used to offer or sell securities unless accompanied by a prospectus supplement.

RISK FACTORS

An investment in our securities involves a high degree of risk. The prospectus supplement applicable to each offering of our securities will contain a discussion of the risks applicable to an investment in our securities. Before deciding whether to invest in our securities, you should carefully consider the specific factors discussed under the heading "Risk Factors" in the applicable prospectus supplement, together with all of the other information contained or incorporated by reference in the prospectus supplement or appearing or incorporated by reference in this prospectus. You should also consider the risks, uncertainties and assumptions discussed under Item 1A, "Risk Factors," in our Annual Report on Form 10-K, for the fiscal year ended December 31, 2015, filed with the SEC on March 14, 2016, and our Form 10-Qs, for the fiscal periods ended March 31, 2016 and June 30, 2016, filed with the SEC on May 10, 2016 and August 8, 2016, as amended, all of which are incorporated herein by reference, as updated or superseded by the risks and uncertainties described under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus and any prospectus supplement related to a particular offering. The risks and uncertainties we have described are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our operations. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks actually occurs, our business, business prospects, financial condition or results of operations could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the section below entitled "Cautionary Note Regarding Forward-Looking Statements."

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and each prospectus supplement contains, and the documents incorporated by reference herein include "forward-looking statements" within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act. These statements relate to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements include, but are not limited to, statements about reduction in the size or quantity of customer orders; change in demand for our products due to industry conditions; 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; our reliance on a small number of customers for a substantial portion of our revenues; potential pricing pressure; a decline in demand for our customers' products or their rate of deployment of their products; general conditions in the CATV, internet data center or FTTH markets; changes in the world economy (particularly in the United States and China); and the negative effects of seasonality.

In some cases, you can identify forward-looking statement by terms such as "believe," "may," "estimate," "continue," "anticipate," "intend," "should," "could," "would," "target," "seek," "aim," "believe," "predicts," "think," "objectives," "optimistic," "new," "goal," "strategy," "potential," "is likely," "will," "expect," "plan" "project," "permit" and similar expressions intended to identify forward-looking statements. These statements reflect our current views with respect to future events, are based on assumptions and are subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in greater detail under the heading "Risk Factors" in our SEC filings, and under the caption "Risk Factors" in this prospectus or any prospectus supplement. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable

statement. You should read this prospectus, the registration statement of which this prospectus is a part, any prospectus supplement and the exhibits and documents incorporated by reference herein and therein completely and with the understanding that our actual future results may be materially different from those described in forward-looking statements. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

You should assume that information contained in or incorporated by reference into this prospectus is accurate only as of the date on the front cover of this prospectus or the date of the document incorporated by reference, as applicable. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments.

USE OF PROCEEDS

We cannot guarantee that we will receive any proceeds in connection with this offering because we may be unable or choose not to issue and sell any securities covered by this prospectus.

Unless otherwise set forth in the applicable prospectus supplement or free writing prospectus, we intend to use the net proceeds from any sales of securities by us under this prospectus and any accompanying prospectus supplement for general corporate purposes, which may include, among other things, debt repayment, working capital, and capital expenditures.

We may also use such proceeds to fund acquisitions of businesses, technologies or product lines that complement our current business. We may set forth additional information on the use of net proceeds from the sale of the securities we offer under this prospectus in a prospectus supplement related to a specific offering.

Investors are cautioned, however, that expenditures may vary substantially from these uses. Investors will be relying on the judgment of our management, who will have broad discretion regarding the application of the proceeds of this offering. The amounts and timing of our actual expenditures will depend upon numerous factors, including the amount of cash generated by our operations, competition and other operational factors. We may find it necessary or advisable to use portions of the proceeds from this offering for other purposes.

From time to time, we evaluate these and other factors and we anticipate continuing to make such evaluations to determine if the existing allocation of resources, including the proceeds of sale of securities offered by us, is being optimized. Circumstances that may give rise to a change in the use of proceeds include:

- the need or desire on our part to accelerate, increase or eliminate existing initiatives due to, among other things, changing market;
- conditions and competitive developments;
- the availability of other sources of cash including cash flow from operations and alternative financing arrangements, if any;
- our ability to negotiate definitive agreements with acquisition candidates; and
- the availability and terms of debt financing to fund a portion of the purchase price(s) for potential acquisitions.

Pending other uses, we intend to invest the proceeds to us in investment-grade, interest-bearing securities such as money market funds, certificates of deposit, or direct or guaranteed obligations of the U.S. government, or hold as cash. We cannot predict whether the proceeds invested will yield a favorable, or any, return.

DESCRIPTION OF SECURITIES TO BE OFFERED

The descriptions of the securities contained in this prospectus, together with the applicable prospectus supplements, summarize the material terms and provisions of the various types of securities that we may offer. We will describe in the applicable prospectus supplement relating to any securities the particular terms of the securities offered by that prospectus supplement. If we so indicate in the applicable prospectus supplement, the terms of the securities may differ from the terms we have summarized below. We will also include information in the prospectus supplement, where applicable, about material U.S. federal income tax considerations relating to the securities, and the securities exchange, if any, on which the securities will be listed.

We may sell from time to time, in one or more primary offerings, our common stock, preferred stock, warrants and units, or any combination of the foregoing.

In this prospectus, we refer to the common stock, preferred stock, warrants, units or any combination of the foregoing securities to be sold by us in a primary offering collectively as "securities." The total dollar amount of all securities that we may issue under this prospectus will not exceed \$250,000,000.

This prospectus may not be used to consummate a sale of securities unless it is accompanied by a prospectus supplement.

The following is a summary of the material provisions of the securities as set forth in our certificate of incorporation, as amended to date, and bylaws, as amended to date. For additional detail about our capital stock, please refer to our amended and restated certificate of incorporation and amended and restated bylaws, as well as applicable Delaware law.

Description of Capital Stock

The following description of our capital stock summarizes the material terms and provisions of the capital stock that we may offer under this prospectus, is not complete and is qualified in its entirety by reference to our certificate of incorporation and bylaws, as may be amended from time to time, which have been filed with the SEC as exhibits to the registration statement and each of which is incorporated by reference in this prospectus. In addition, you should be aware that the summary below does not give full effect to the terms of the provisions of statutory or common law.

General

While the terms we have summarized below will apply generally to any future common stock or preferred stock that we may offer, we will describe the specific terms of any series of preferred stock in more detail in the applicable prospectus supplement. If we so indicate in a prospectus supplement, the terms of any preferred stock we offer under that prospectus supplement may differ from the terms we describe below.

Our authorized capital stock consists of 45,000,000 shares of common stock, par value \$0.001 per share, and 5,000,000 shares of undesignated preferred stock, par value \$0.001 per share. As of October 12, 2016, there were 17,196,699 shares of common stock outstanding and no shares of preferred stock outstanding.

Common Stock

Holders of our common stock are entitled to one vote for each share of common stock held of record for the election of directors and on all matters submitted to a vote of stockholders. Holders of our common stock are also entitled to receive dividends ratably, if any, as may be declared by our board of directors out of legally available funds, subject to any preferential dividend rights of any

preferred stock then outstanding. Upon our dissolution, liquidation or winding up, holders of our common stock are entitled to share ratably in our net assets legally available after the payment of all our debts and other liabilities, subject to the preferential rights of any preferred stock then outstanding. Holders of our common stock have no subscription, preemptive, redemption or conversion rights. The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future. Except with respect to the election of directors (which is determined by our stockholders by a plurality of the votes cast by the stockholders entitled to vote on the election) and as described below in "Provisions of our Certificate of Incorporation and Bylaws and Delaware Anti-Takeover Law," a majority vote of common stockholders is generally required to take action under our amended and restated certificate of incorporation and amended and restated bylaws.

Listing

Our common stock is listed on the NASDAQ Global Market under the symbol "AAOI." On October 12, 2016 the closing price of our common stock, as reported on the NASDAQ Global Market, was \$21.43 per share. As of the close of business on October 12, 2016, there were approximately 69 stockholders of record of our common stock.

Transfer Agent and Registrar

Continental Stock Transfer & Trust Company acts as the transfer agent and registrar for our common stock. The transfer agent and registrar's address is 17 Battery Place, 8th Floor, New York, New York 10004.

Preferred Stock

Our board of directors is authorized, without action by the stockholders, to designate and issue up to an aggregate of 5,000,000 shares of preferred stock in one or more series. The board of directors can fix the rights, preferences and privileges of the shares of each series and any of its qualifications, limitations or restrictions. Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of common stock. The issuance of preferred stock, while providing flexibility in connection with possible future financings and acquisitions and other corporate purposes could, under certain circumstances, have the effect of delaying, deferring or preventing a change in control of our company and might harm the market price of our common stock.

Our board of directors will make any determination to issue such shares based on its judgment as to our company's best interests and the best interests of our stockholders.

We will incorporate by reference as an exhibit to the registration statement, which includes this prospectus, the form of any certificate of designations that describes the terms of the series of preferred stock we are offering. This description and the applicable prospectus supplement will include:

- the title and stated value;
- the number of shares authorized;
- the liquidation preference per share;
- the purchase price;
- the dividend rate, period and payment date, and method of calculation for dividends;
- whether dividends will be cumulative or non-cumulative and, if cumulative, the date from which dividends will accumulate;

- the procedures for any auction and remarketing, if any;
- the provisions for a sinking fund, if any;
- the provisions for redemption or repurchase, if applicable, and any restrictions on our ability to exercise those redemption and repurchase rights;
- any listing of the preferred stock on any securities exchange or market;
- whether the preferred stock will be convertible into our common stock, and, if applicable, the conversion price, or how it will be calculated, and the conversion period;
- voting rights, if any, of the preferred stock;
- preemptive rights, if any;
- restrictions on transfer, sale or other assignment, if any;
- whether interests in the preferred stock will be represented by depositary shares;
- a discussion of any material United States federal income tax considerations applicable to the preferred stock;
- the relative ranking and preferences of the preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs;
- any limitations on issuance of any class or series of preferred stock ranking senior to or on a parity with the series of preferred stock as to dividend rights and rights if we liquidate, dissolve or wind up our affairs; and
- any other specific terms, preferences, rights or limitations of, or restrictions on, the preferred stock.

When we issue shares of preferred stock under this prospectus, the shares will fully be paid and nonassessable and will not have, or be subject to, any preemptive or similar rights.

Registration Rights

As of the date hereof, no holder of our common stock is eligible to exercise any contractual rights to require us to register any shares of such holder under the Securities Act.

Provisions of Our Certificate of Incorporation and Bylaws and Delaware Anti-Takeover Law

Our amended and restated certificate of incorporation and amended and restated bylaws include a number of provisions that may have the effect of encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts. These provisions include the items described below.

Board composition and filling vacancies

In accordance with our amended and restated certificate of incorporation, our board of directors is divided into three classes serving staggered three year terms, with one class being elected each year. Our amended and restated certificate of incorporation also provides that directors may be removed only for cause and then only by the affirmative vote of the holders of 66²/₃% or more of the shares then entitled to vote at an election of directors. Furthermore, any vacancy on our board of directors, however occurring, including a vacancy resulting from an increase in the size of our board of directors, may only be filled by the affirmative vote of a majority of our directors then in office even if less than a quorum.

No written consent of stockholders

Our amended and restated certificate of incorporation provides that all stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting.

Meetings of stockholders

Our amended and restated bylaws provide that only a majority of the members of our board of directors then in office, the Chairman of the board of directors or the Chief Executive Officer may call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Our amended and restated bylaws limit the business that may be conducted at an annual meeting of stockholders to those matters properly brought before the meeting.

Advance notice requirements

Our amended and restated bylaws establish advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures provide that notice of stockholder proposals must be timely given in writing to our corporate secretary before the meeting at which the action is to be taken. Generally, to be timely, notice must be received at our principal executive offices not less than 90 days or more than 120 days before the first anniversary date of the annual meeting for the preceding year. The notice must contain certain information specified in our amended and restated bylaws.

Amendment to bylaws and certificate of incorporation

As required by the Delaware General Corporation Law (the "DGCL"), any amendment of our amended and restated certificate of incorporation must first be approved by a majority of our board of directors and, if required by law or our amended and restated certificate of incorporation, thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment, and a majority of the outstanding shares of each class entitled to vote thereon as a class, except that the amendment of the provisions relating to stockholder action, directors, limitation of liability and the amendment of our amended and restated bylaws and amended and restated certificate of incorporation must be approved by not less than 66²/₃% of the outstanding shares entitled to vote on the amendment, and not less than 66²/₃% of the outstanding shares of each class entitled to vote thereon as a class. Our bylaws may be amended by the affirmative vote of a majority vote of the directors then in office, subject to any limitations set forth in the bylaws; and may also be amended by the affirmative vote of at least 66²/₃% of the outstanding shares entitled to vote on the amendment, or, if the board of directors recommends that the stockholders approve the amendment, by the affirmative vote of the majority of the outstanding shares entitled to vote on the amendment, in each case voting together as a single class.

Blank check preferred stock

Our amended and restated certificate of incorporation authorizes 5,000,000 shares of preferred stock. The existence of authorized but unissued shares of preferred stock may enable our board of directors to render more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of us or our stockholders, our board of directors could cause shares of preferred stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent stockholder or stockholder

group. In this regard, our amended and restated certificate of incorporation grants our board of directors' broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in control of us.

Choice of Forum

Our amended and restated certificate of incorporation provides that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the exclusive forum for: (a) any derivative action or proceeding brought on our behalf; (b) any action asserting a breach of fiduciary duty; (c) any action asserting a claim against us arising pursuant to the DGCL, our amended and restated certificate of incorporation or our amended or restated bylaws; or (d) any action asserting a claim against us that is governed by the internal affairs doctrine. However, several lawsuits involving other companies are currently pending challenging the validity of choice of forum provisions in certificates of incorporation, and it is possible that a court could rule that such provision is inapplicable or unenforceable.

Anti-takeover effects of the Delaware General Corporation Law

We are subject to the provisions of Section 203 of the DGCL, or Section 203. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a 3-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. A "business combination" includes, among other things, a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. An "interested stockholder" is a person who, together with affiliates and associates, owns, or did own within the three years before the determination of interested stockholder status, 15% or more of the corporation's voting stock. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions:

- before the stockholder became interested, the board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances; or
- at or after the time the stockholder became interested, the business combination was approved by the board of directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

The restrictions in Section 203 do not apply to corporations that have elected, in the manner provided in Section 203, not to be subject to Section 203 of the DGCL or, with certain exceptions, which do not have a class of voting stock that is listed on a national securities exchange or authorized for quotation on the NASDAQ Stock Market or held of record by more than 2,000 stockholders. Our certificate of incorporation and bylaws do not opt out of Section 203.

Section 203 could delay or prohibit mergers or other takeover or change in control attempts with respect to us and, accordingly, may discourage attempts to acquire us even though such a transaction may offer our stockholders the opportunity to sell their stock at a price above the prevailing market price.

Description of Warrants

The following description, together with the additional information we may include in any applicable prospectus supplements, summarizes the material terms and provisions of the warrants that we may offer under this prospectus and the related warrant agreements and warrant certificates. While the terms summarized below will apply generally to any warrants that we may offer, we will describe the particular terms of any series of warrants in more detail in the applicable prospectus supplement. If we indicate in the prospectus supplement, the terms of any warrants offered under that prospectus supplement may differ from the terms described below. Specific warrant agreements will contain additional important terms and provisions and will be incorporated by reference as an exhibit to the registration statement, which includes this prospectus.

We do not have any warrants outstanding as of the date hereof.

General

We may issue warrants for the purchase of common stock and/or preferred stock in one or more series. We may issue warrants independently or together with common stock and/or preferred stock, and the warrants may be attached to or separate from these securities.

We will evidence each series of warrants by warrant certificates that we will issue under a separate warrant agreement. We may enter into the warrant agreement with a warrant agent. We may also choose to act as our own warrant agent. We will indicate the name and address of the warrant agent in the applicable prospectus supplement relating to a particular series of warrants.

We will describe in the applicable prospectus supplement the terms of the series of warrants, including:

- the offering price and aggregate number of warrants offered;
- the currency for which the warrants may be purchased;
- if applicable, the designation and terms of the securities with which the warrants are issued and the number of warrants issued with each such security or each principal amount of such security;
- if applicable, the date on and after which the warrants and the related securities will be separately transferable;
- in the case of warrants to purchase common stock or preferred stock, the number of shares of common stock or preferred stock, as the case may be, purchasable upon the exercise of one warrant and the price at which these shares may be purchased upon such exercise;
- the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreement and the warrants;
- the terms of any rights to redeem or call the warrants;
- any provisions for changes to or adjustments in the exercise price or number of securities issuable upon exercise of the warrants;
- anti-dilution provisions of the warrants, if any;
- the periods during which, and places at which, the warrants are exercisable;

- the manner of exercise of the warrants, including any cashless exercise rights;
- the dates on which the right to exercise the warrants will commence and expire;
- the manner in which the warrant agreement and warrants may be modified;
- federal income tax consequences of holding or exercising the warrants;
- any securities exchange or quotation system on which the warrants or any securities deliverable upon exercise of the warrants may be listed or quoted;
- the terms of the securities issuable upon exercise of the warrants; and
- any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

Before exercising their warrants, holders of warrants will not have any of the rights of holders of the securities purchasable upon such exercise, including, in the case of warrants to purchase common stock or preferred stock, the right to receive dividends, if any, or, payments upon our liquidation, dissolution or winding up or to exercise voting rights, if any.

Exercise of Warrants

Each warrant will entitle the holder to purchase the securities that we specify in the applicable prospectus supplement at the exercise price that we describe in the applicable prospectus supplement. Unless we otherwise specify in the applicable prospectus supplement, holders of the warrants may exercise the warrants at any time up to 5:00 P.M. eastern time, the close of business, on the expiration date that we set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

Holders of the warrants may exercise the warrants by delivering the warrant certificate representing the warrants to be exercised together with specified information, and paying the required exercise price by the methods provided in the applicable prospectus supplement. We will set forth on the reverse side of the warrant certificate, and in the applicable prospectus supplement, the information that the holder of the warrant will be required to deliver to the warrant agent.

Upon receipt of the required payment and the warrant certificate properly completed and duly executed at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement, we will issue and deliver the securities purchasable upon such exercise. If fewer than all of the warrants represented by the warrant certificate are exercised, then we will issue a new warrant certificate for the remaining amount of warrants.

Enforceability of Rights By Holders of Warrants

Any warrant agent will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any warrant. A single bank or trust company may act as warrant agent for more than one issue of warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a warrant may, without the consent of the related warrant agent or the holder of any other warrant, enforce by appropriate legal action the holder's right to exercise, and receive the securities purchasable upon exercise of, its warrants in accordance with their terms.

Warrant Agreement Will Not Be Qualified Under Trust Indenture Act of 1939, as amended (the "TIA")

No warrant agreement will be qualified as an indenture, and no warrant agent will be required to qualify as a trustee, under the TIA. Therefore, holders of warrants issued under a warrant agreement will not have the protection of the Trust Indenture Act with respect to their warrants.

Description of Units

We may issue units comprised of shares of common stock, shares of preferred stock, and warrants in any combination. We may issue units in such amounts and in as many distinct series as we wish. This section outlines certain provisions of the units that we may issue. If we issue units, they will be issued under one or more unit agreements to be entered into between us and a bank or other financial institution, as unit agent. The information described in this section may not be complete in all respects and is qualified entirely by reference to the unit agreement with respect to the units of any particular series. The specific terms of any series of units offered will be described in the applicable prospectus supplement. If so described in a particular supplement, the specific terms of any series of units may differ from the general description of terms presented below. We urge you to read any prospectus supplement related to any series of units we may offer, as well as the complete unit agreement and unit certificate that contain the terms of the units. If we issue units, forms of unit agreements and unit certificates relating to such units will be incorporated by reference as exhibits to the registration statement, which includes this prospectus.

Each unit that we may issue will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date. The applicable prospectus supplement may describe:

- the designation and terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;
- any provisions of the governing unit agreement;
- the price or prices at which such units will be issued;
- the applicable United States federal income tax considerations relating to the units;
- any provisions for the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units; and
- any other terms of the units and of the securities comprising the units.

The provisions described in this section, as well as those described under "Description of Capital Stock" and "Description of Warrants" will apply to the securities included in each unit to the extent relevant and as may be updated in any prospectus supplements.

Issuance in Series

We may issue units in such amounts and in as many distinct series as we wish. This section summarizes terms of the units that apply generally to all series. Most of the financial and other specific terms of your series will be described in the applicable prospectus supplement.

Unit Agreements

We will issue the units under one or more unit agreements to be entered into between us and a bank or other financial institution, as unit agent. We may add, replace or terminate unit agents from time to time. We will identify the unit agreement under which each series of units will be issued and the unit agent under that agreement in the applicable prospectus supplement.

PLAN OF DISTRIBUTION

We may sell the securities offered by this prospectus from time to time in one or more transactions, including, without limitation:

- to or through underwriters, brokers or dealers (acting as agent or principal);
- directly to one or more other purchasers;
- upon the exercise of rights distributed or issued to our security holders;
- through a block trade in which the broker or dealer engaged to handle the block trade will attempt to sell the securities as agent, but may position and resell a portion of the block as principal to facilitate the transaction;
- in "at the market" offerings within the meanings of Rule 415(a)(4) under the Securities Act of 1933 or through a market maker or into an existing market, on an exchange, or otherwise;
- directly to purchasers, through a specific bidding or auction process, on a negotiated basis or otherwise;
- through agents on a best-efforts basis;
- through any other method permitted pursuant to applicable law; or
- otherwise through a combination of any of the above methods of sale.

In addition, we may enter into option, share lending or other types of transactions that require us to deliver shares of common stock to an underwriter, broker or dealer, who will then resell or transfer the shares of common stock under this prospectus. We may also enter into hedging transactions with respect to our securities. For example, we may:

- enter into transactions involving short sales of the shares of common stock by underwriters, brokers or dealers;
- sell shares of common stock short and deliver the shares to close out short positions;
- enter into option or other types of transactions that require us to deliver shares of common stock to an underwriter, broker or dealer, who will then resell or transfer the shares of common stock under this prospectus; or
- loan or pledge the shares of common stock to an underwriter, broker or dealer, who may sell the loaned shares or, in the event of default, sell the pledged shares.

We may enter into derivative transactions with third parties, or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement indicates, in connection with those derivatives, the third parties may sell securities covered by this prospectus and the applicable prospectus supplement, including in short sale transactions. If so, the third party may use securities pledged by us or borrowed from us or others to settle those sales or to close out any related open borrowings of stock, and may use securities received from us in settlement of those derivatives to close out any related open borrowings of stock. The third party in such sale transactions will be an underwriter and, if not identified in this prospectus, will be identified in the applicable prospectus supplement (or a post-effective amendment). In addition, we may otherwise loan or pledge securities to a financial institution or other third party that in turn may sell the securities short using this prospectus. Such financial institution or other third party may transfer its economic short position to investors in our securities or in connection with a concurrent offering of other securities.

If we use any underwriter, we will provide a prospectus supplement that will name any underwriter involved in the offer and sale of the securities. The prospectus supplement will also set forth the terms of the offering, including:

- the purchase price of the securities and the proceeds we will receive from the sale of the securities;
- any underwriting discounts and other items constituting underwriters' compensation;
- any public offering or purchase price and any discounts or commissions allowed or re-allowed or paid to dealers;
- any commissions allowed or paid to agents;
- any securities exchanges on which the securities may be listed;
- the method of distribution of the securities;
- the terms of any agreement, arrangement or understanding entered into with the underwriters, brokers or dealers; and
- any other information we think is important.

If underwriters or dealers are used in the sale, the securities will be acquired by the underwriters or dealers for their own account. The securities may be sold from time to time by us in one or more transactions:

- at a fixed price or prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to such prevailing market prices;
- at varying prices determined at the time of sale; or
- at negotiated prices.

Such sales may be effected:

- in transactions on any national securities exchange or quotation service on which the securities may be listed or quoted at the time of sale;
- in transactions in the over-the-counter market;
- in block transactions in which the broker or dealer so engaged will attempt to sell the securities as agent but may position and resell a portion of the block as principal to facilitate the transaction, or in crosses, in which the same broker acts as an agent on both sides of the trade;
- through the writing of options; or
- through other types of transactions.

General

Any public offering price and any discounts, commissions, concessions or other items constituting compensation allowed or reallowed or paid to underwriters, dealers, agents or remarketing firms may be changed from time to time. Underwriters, dealers, agents and remarketing firms that participate in the distribution of the offered securities may be "underwriters" as defined in the Securities Act. Any discounts or commissions they receive from us and any profits they receive on the resale of the offered securities may be treated as underwriting discounts and commissions under the Securities Act. We will identify any underwriters, agents or dealers and describe their commissions, fees or discounts in the

applicable prospectus supplement or pricing supplement, as the case may be. In compliance with the guidelines of the Financial Industry Regulatory Authority ("FINRA"), the maximum discount or commission to be received by a FINRA member or independent broker-dealer may not exceed 8% of the aggregate amount of the securities offered pursuant to this prospectus and any applicable prospectus supplement.

At-the-Market Offerings

If we reach an agreement with an underwriter or agent on a placement, including the number and types of securities to be offered in the placement and any minimum price below which sales may not be made, such underwriter or agent would agree to use its commercially reasonable efforts, consistent with its normal trading and sales practices, to try to sell such securities on such terms. An underwriter or agent could make sales in privately negotiated transactions and/or any other method permitted by law, including sales deemed to be an "at-the-market" offering as defined in Rule 415 promulgated under the Securities Act, sales made directly on the NASDAQ Global Market, the existing trading market for our common stock, or sales made to or through a market maker other than on an exchange. The name of any such underwriter or agent involved in the offer and sale of the securities, the amounts underwritten, and the nature of its obligations to take the securities will be described in the applicable prospectus supplement.

Underwriters and Agents

If underwriters are used in a sale, they will acquire the offered securities for their own account. The underwriters may resell the offered securities in one or more transactions, including negotiated transactions. These sales may be made at a fixed public offering price or prices, which may be changed, at market prices prevailing at the time of the sale, at prices related to such prevailing market price or at negotiated prices. We may offer the securities to the public through an underwriting syndicate or through a single underwriter. The underwriters in any particular offering will be mentioned in the applicable prospectus supplement or pricing supplement, as the case may be.

Unless otherwise specified in connection with any particular offering of securities, the obligations of the underwriters to purchase the offered securities will be subject to certain conditions contained in an underwriting agreement that we will enter into with the underwriters at the time of the sale to them. The underwriters will be obligated to purchase all of the securities of the series offered if any of the securities are purchased, unless otherwise specified in connection with any particular offering of securities. Any initial offering price and any discounts or concessions allowed, reallocated or paid to dealers may be changed from time to time.

We may designate agents to sell the offered securities. Unless otherwise specified in connection with any particular offering of securities, the agents will agree to use their best efforts to solicit purchases for the period of their appointment. We may also sell the offered securities to one or more remarketing firms, acting as principals for their own accounts or as agents for us. These firms will remarket the offered securities upon purchasing them in accordance with a redemption or repayment pursuant to the terms of the offered securities. A prospectus supplement or pricing supplement, as the case may be, will identify any remarketing firm and will describe the terms of its agreement, if any, with us and its compensation.

In connection with offerings made through underwriters or agents, we may enter into agreements with such underwriters or agents pursuant to which we receive our outstanding securities in consideration for the securities being offered to the public for cash. In connection with these arrangements, the underwriters or agents may also sell securities covered by this prospectus to hedge their positions in these outstanding securities, including in short sale transactions. If so, the

underwriters or agents may use the securities received from us under these arrangements to close out any related open borrowings of securities.

Dealers

We may sell the offered securities to dealers as principals. We may negotiate and pay dealers' commissions, discounts or concessions for their services. The dealer may then resell such securities to the public either at varying prices to be determined by the dealer or at a fixed offering price agreed to with us at the time of resale. Dealers engaged by us may allow other dealers to participate in resales.

Direct Sales

We may choose to sell the offered securities directly. In this case, no underwriters or agents would be involved.

Institutional Purchasers

We may authorize agents, dealers or underwriters to solicit certain institutional investors to purchase offered securities on a delayed delivery basis pursuant to delayed delivery contracts providing for payment and delivery on a specified future date. The applicable prospectus supplement or pricing supplement, as the case may be, will provide the details of any such arrangement, including the offering price and commissions payable on the solicitations.

We will enter into such delayed contracts only with institutional purchasers that we approve. These institutions may include commercial and savings banks, insurance companies, pension funds, investment companies and educational and charitable institutions.

Indemnification; Other Relationships

We may have agreements with agents, underwriters, dealers and remarketing firms to indemnify them against certain civil liabilities, including liabilities under the Securities Act. Agents, underwriters, dealers and remarketing firms, and their affiliates, may engage in transactions with, or perform services for, us in the ordinary course of business. This includes commercial banking and investment banking transactions.

Market-Making, Stabilization and Other Transactions

There is currently no market for the offered preferred stock. If the offered preferred stock is traded after its initial issuance, it may trade at a discount from its initial offering price, depending upon prevailing interest rates, the market for similar securities and other factors. While it is possible that an underwriter could inform us that it intends to make a market in the offered preferred stock, such underwriter would not be obligated to do so, and any such market-making could be discontinued at any time without notice. Therefore, no assurance is given as to whether an active trading market will develop for the offered preferred stock. If we seek to list the preferred stock on any exchange or quotation system, any such listing with respect to any particular preferred stock will be described in the applicable prospectus supplement or pricing supplement, as the case may be.

In connection with any offering, the underwriters may also engage in penalty bids. Penalty bids permit the underwriters to reclaim a selling concession from a syndicate member when the securities originally sold by the syndicate member are purchased in a syndicate covering transaction to cover syndicate short positions. Stabilizing transactions, syndicate covering transactions and penalty bids may cause the price of the securities to be higher than it would be in the absence of the transactions. The underwriters may, if they commence these transactions, discontinue them at any time.

Some of the underwriters, dealers or agents used by us in any offering of securities under this prospectus may be customers of, engage in transactions with, and perform services for us or affiliates of ours in the ordinary course of business. Any underwriters to which offered securities are sold by us for public offering and sale may make a market in such securities, but those underwriters will not be obligated to do so and may discontinue any market making at any time.

The anticipated date of delivery of the securities offered by this prospectus will be described in the applicable prospectus supplement relating to the offering.

No FINRA member may participate in any offering of securities made under this prospectus if such member has a conflict of interest under FINRA Rule 5121, including if 5% or more of the net proceeds, not including underwriting compensation, of any offering of securities made under this prospectus will be received by a FINRA member participating in the offering or affiliates or associated persons of such FINRA members, unless a qualified independent underwriter has participated in the offering or the offering otherwise complies with FINRA Rule 5121.

To comply with the securities laws of some states, if applicable, the securities may be sold in these jurisdictions only through registered or licensed brokers or dealers. In addition, in some states the securities may not be sold unless they have been registered or qualified for sale or an exemption from registration or qualification requirements is available and is complied with.

LEGAL MATTERS

The validity of the securities offered by this prospectus has been passed upon for us by Haynes and Boone, LLP, Houston, Texas, counsel to Applied Optoelectronics, Inc. Certain legal matters will be passed upon for any agents or underwriters by counsel for such agents or underwriters identified in the applicable prospectus supplement.

EXPERTS

The consolidated financial statements of Applied Optoelectronics, Inc. and its subsidiaries incorporated by reference in this prospectus and elsewhere in the registration statement have been so incorporated by reference in reliance upon the report of Grant Thornton LLP, independent registered public accountants, upon the authority of said firm as experts in accounting and auditing.

WHERE TO LEARN MORE ABOUT US

We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities being offered under this prospectus. This prospectus, which forms part of the registration statement, does not contain all of the information in the registration statement. We have omitted certain parts of the registration statement, as permitted by the rules and regulations of the SEC. For further information regarding us and our securities, please see the registration statement and our other filings with the SEC, including our annual, quarterly, and current reports and any proxy statements, which you may read and copy at the Public Reference Room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. You may obtain information about the Public Reference Room by calling the SEC at 1-800-SEC-0330. Our public filings with the SEC are also available to the public on the SEC's Internet website at <http://www.sec.gov>.

We furnish holders of our common stock with annual reports containing audited financial statements prepared in accordance with accounting principles generally accepted in the United States following the end of each fiscal year. We file reports and other information with the SEC pursuant to the reporting requirements of the Exchange Act. In addition, the reports, proxy statements and other information that we file with the SEC are available to you free of charge through the Investor Relations page of our website, <http://ao-inc.com/>, as soon as reasonably practicable after they have been

electronically filed with, or furnished to, the SEC. We have included our website address as a textual reference and do not intend it as an active link to our website. The contents of our website are not part of this prospectus, and you should not consider the contents of our website in making an investment decision with respect to our securities.

Descriptions in this prospectus of documents are intended to be summaries of the material, relevant portions of those documents, but may not be complete descriptions of those documents. For complete copies of those documents, please refer to the exhibits to the registration statement and other documents filed by us with the SEC.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to "incorporate by reference" into this prospectus the documents we file with them, which means that we can disclose important information to you by referring you to these documents. The information that we incorporate by reference into this prospectus is considered to be part of this prospectus, and information that we file later with the SEC automatically updates and supersedes any information in this prospectus. We have filed the following documents with the SEC. These documents are incorporated by reference as of their respective dates of filing, as well as any future documents (excluding information furnished pursuant to Items 2.02 and 7.01 of Form 8-K) we file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, subsequent to the date of this prospectus and prior to the termination of the offering:

1. our Annual Report on Form 10-K for the fiscal year ended December 31, 2015, as filed with the SEC on March 14, 2016;
2. our Definitive Proxy Statement with respect to the 2016 Annual Meeting of Stockholders to be held on May 27, 2016, as filed with the SEC on April 15, 2016;
3. our Quarterly Reports on Form 10-Q for the quarterly periods ended March 31, 2016 and June 30, 2016, as filed with the SEC on May 10, 2016 and August 8, 2016 and on Form 10-Q/A for the quarterly period ended June 30, 2016, as filed with the SEC on August 9, 2016;
4. our Current Reports on Form 8-K as filed with the SEC on February 25, 2016, April 6, 2016, April 14, 2016, April 28, 2016, May 27, 2016, June 17, 2016, June 30, 2016; and October 7, 2016;
5. the description of our common stock contained in our Registration Statement on Form 8-A filed under the Exchange Act on September 23, 2013, including any amendment or report filed for the purpose of updating such description; and
6. all other reports filed by us under Section 13(a) or 15(d) of the Exchange Act since the end of our fiscal year ended December 31, 2015.

In addition, all documents subsequently filed by us pursuant to Section 13(a), 13(c), 14 and 15(d) of the Exchange Act after the date of this registration statement and prior to the filing of a post-effective amendment that indicates that all securities offered have been sold or that deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference into this registration statement and to be a part hereof from the date of filing of such documents. Any statement contained in a document incorporated by reference herein shall be deemed to be modified or superseded for purposes of this registration statement to the extent that a statement contained herein or in any other subsequently filed document that is incorporated by reference herein modifies or supersedes such earlier statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this registration statement.

Nothing in this registration statement shall be deemed to incorporate information furnished but not filed with the SEC pursuant to Item 2.02 or Item 7.01 of Form 8-K.

We will provide, without charge, upon written or oral request of any person to whom a copy of this prospectus is delivered, a copy of any or all of the foregoing documents and information that has been or may be incorporated in this prospectus by reference, other than exhibits to such documents. Requests for such documents and information should be directed to:

Applied Optoelectronics, Inc.
Attn: Dr. Stefan Murry, Chief Financial Officer
13139 Jess Pirtle Blvd.
Sugar Land, TX 77478
(281) 295-1800

You may also access the documents incorporated by reference in this prospectus through our website at <http://ao-inc.com/>. Except for the specific incorporated documents listed above, no information available on or through our website shall be deemed to be incorporated in this prospectus or the registration statement of which it forms a part.

See also "Where to Learn More About Us."

\$250,000,000



**Common Stock
Preferred Stock
Warrants
Units**

PROSPECTUS

, 2016

PART II**INFORMATION NOT REQUIRED IN PROSPECTUS****Item 14. Other Expenses of Issuance and Distribution.***

The estimated expenses payable by us in connection with the issuance and distribution of the securities being registered (other than underwriting discounts and commissions) are as follows:

SEC registration fee	\$ 28,975
FINRA filing fee	*
Legal fees and expenses	*
Accounting fees and expenses	*
Printing fees and expenses	*
Transfer agent and trustee fees and expenses	*
Miscellaneous fees and expenses	*
Total	\$ <u> </u> *

* These fees are calculated based on the securities offered and the number of issuances and accordingly cannot be estimated at this time. In accordance with Rule 430B under the Securities Act, the applicable prospectus supplement will set forth the estimated amount of expenses of any offering of securities.

Item 15. Indemnification of Directors and Officers.

Delaware law provides a detailed statutory framework covering indemnification of our directors, officers, employees or agents against liabilities and expenses arising out of legal proceedings brought against them by reason of their status or service as directors, officers, employees or agents. Section 145 of the DGCL ("Section 145") provides that a director, officer, employee or agent of a corporation (i) shall be indemnified by the corporation for expenses actually and reasonably incurred in defense of any action or proceeding if such person is sued by reason of his service to the corporation, to the extent that such person has been successful in defense of such action or proceeding, or in defense of any claim, issue or matter raised in such litigation, (ii) may, in actions other than actions by or in the right of the corporation (such as derivative actions), be indemnified for expenses actually and reasonably incurred, judgments, fines and amounts paid in settlement of such litigation, even if he is not successful on the merits, if he acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation (and in a criminal proceeding, if he did not have reasonable cause to believe his conduct was unlawful), and (iii) may be indemnified by the corporation for expenses actually and reasonably incurred (but not judgments or settlements) in any action by the corporation or of a derivative action (such as a suit by a stockholder alleging a breach by the director or officer of a duty owed to the corporation), even if he is not successful, provided that he acted in good faith and in a manner reasonably believed to be in or not opposed to the best interests of the corporation, provided that no indemnification is permitted without court approval if the director has been adjudged liable to the corporation. Delaware law also permits a corporation to elect to indemnify its officers, directors, employees and agents under a broader range of circumstances than that provided under Section 145.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws limit or eliminate the personal liability of our directors to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended. Consequently, a director will not be

personally liable to us or our stockholders for monetary damages or breach of fiduciary duty as a director, except for liability for:

- any breach of the director's duty of loyalty to us or our stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- any unlawful payments related to dividends or unlawful stock purchases, redemptions or other distributions; or
- any transaction from which the director derived an improper personal benefit.

These limitations of liability do not alter director liability under the federal securities laws and do not affect the availability of equitable remedies such as an injunction or rescission.

In addition, our amended and restated bylaws provide that:

- we will indemnify our directors, officers and, in the discretion of our board of directors, certain employees to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended; and
- we will advance reasonable expenses, including attorneys' fees, to our directors and, in the discretion of our board of directors, to our officers and certain employees, in connection with legal proceedings relating to their service for or on behalf of us, subject to limited exceptions.

We have entered into indemnification agreements with each of our directors and certain of our executive officers. These agreements provide that we will indemnify each of our directors and certain of our executive officers to the fullest extent permitted by Delaware law.

We also maintain general liability insurance which covers certain liabilities of our directors and officers arising out of claims based on acts or omissions in their capacities as directors or officers, including liabilities under the Securities Act.

Item 16. Exhibits.

A list of exhibits filed with this registration statement on Form S-3 is set forth on the Exhibit Index and is incorporated herein by reference.

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

(a) (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Securities and Exchange Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering

price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

provided, however, that paragraphs (a)(1)(i), (a)(1)(ii) and (a)(1)(iii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Securities and Exchange Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement;

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof;

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering;

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(i) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof; *provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date;

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following

communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

- (i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;
- (ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;
- (iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and
- (iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser;

(b) That, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof; and

(c) To supplement the prospectus, after the expiration of the subscription period to set forth the results of the subscription offer, the transactions by the underwriters during the subscription period, the amount of unsubscribed securities to be purchased by the underwriters, and the terms of any subsequent reoffering thereof. If any public offering by the underwriters is to be made on terms differing from those set forth on the cover page of the prospectus, a post-effective amendment will be filed to set forth the terms of such offering.

(d) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in Sugar Land, Texas on the 17th day of October, 2016.

APPLIED OPTOELECTRONICS, INC.

By: /s/ CHIH-HSIANG (THOMPSON) LIN

CHIH-HSIANG (THOMPSON) LIN,
*President, Chief Executive Officer and Chairman of the
Board of Directors*

POWER OF ATTORNEY

Each person whose signature appears below hereby constitutes and appoints Chih-Hsiang (Thompson) Lin and Stefan J. Murry, and each of them, his or her true and lawful agent, proxy and attorney-in-fact, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to (i) act on, sign and file with the Securities and Exchange Commission any and all amendments (including post-effective amendments) to this registration statement together with all schedules and exhibits thereto and any subsequent registration statement filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended, together with all schedules and exhibits thereto, (ii) act on, sign and file such certificates, instruments, agreements and other documents as may be necessary or appropriate in connection therewith, (iii) act on and file any supplement to any prospectus included in this registration statement or any such amendment or any subsequent registration statement filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended and (iv) take any and all actions which may be necessary or appropriate to be done, as fully for all intents and purposes as he or she might or could do in person, hereby approving, ratifying and confirming all that such agent, proxy and attorney-in-fact or any of his substitutes may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed by the following persons in the capacities indicated on October 17, 2016.

APPLIED OPTOELECTRONICS, INC.

Signature

Date

 /s/ CHIH-HSIANG (THOMPSON) LIN

CHIH-HSIANG (THOMPSON) LIN,
President, Chief Executive Officer and Chairman of the
Board of Director (principal executive officer)

October 17, 2016

<u>Signature</u>	<u>Date</u>
<hr/> <p>/s/ STEFAN J. MURRY</p> <hr/> <p>STEFAN J. MURRY Chief Financial Officer (principal financial officer and principal accounting officer)</p>	October 17, 2016
<hr/> <p>/s/ CHE-WEI LIN</p> <hr/> <p>CHE-WEI LIN, Director</p>	October 17, 2016
<hr/> <p>/s/ WILLIAM H. YEH</p> <hr/> <p>WILLIAM H. YEH, Director</p>	October 17, 2016
<hr/> <p>/s/ RICHARD B. BLACK</p> <hr/> <p>RICHARD B. BLACK, Director</p>	October 17, 2016
<hr/> <p>/s/ ALEX IGNATIEV</p> <hr/> <p>ALEX IGNATIEV, Director</p>	October 17, 2016
<hr/> <p>/s/ ALAN MOORE</p> <hr/> <p>ALAN MOORE, Director</p>	October 17, 2016
<hr/> <p>/s/ MIN-CHU (MIKE) CHEN</p> <hr/> <p>MIN-CHU (MIKE) CHEN, Director</p>	October 17, 2016

Applied Optoelectronics, Inc.**Exhibit Index**

The following is a list of exhibits filed as a part of this registration statement.

<u>Exhibit Number</u>	<u>Description</u>
1.1*	Form of Underwriting Agreement.
3.1	Amended and Restated Certificate of Incorporation of the Company, (incorporated by reference to Exhibit 3.1 of the Company's Form 10-Q filed on November 14, 2013).
3.2	Amended and Restated Bylaws of the Company (incorporated by reference from Exhibit 3.2 of the Company's Form 10-Q, filed on November 14, 2013).
4.1*	Form of Certificate of Designation of Preferred Stock.
4.2*	Form of Warrant Certificate and Warrant Agreement.
4.3*	Form of Unit Agreement.
5.1+	Opinion of Haynes and Boone, LLP.
23.1+	Consent of Haynes and Boone, LLP (included on Exhibit 5.1).
23.2+	Consent of Grant Thornton LLP.
24.1+	Power of Attorney (included on the signature page of this Registration Statement).

We will file as an exhibit to a Current Report on Form 8-K any additional required opinions of counsel with respect to the legality of the securities offered hereby and any required opinion of counsel of Applied Optoelectronics, Inc. as to certain tax matters relative to the securities offered hereby.

* To be filed as an exhibit to a Current Report on Form 8-K of the registrant or other document to be incorporated herein by reference.

+ Filed herewith.

October 17, 2016

Applied Optoelectronics, Inc.
13119 Jess Pirtle Blvd.
Sugar Land, TX 77478

Ladies and Gentlemen:

We have acted as counsel for Applied Optoelectronics, Inc., a Delaware corporation (the "**Company**"), in connection with the filing with the Securities and Exchange Commission (the "**Commission**") on the date hereof, under the Securities Act of 1933, as amended (the "**Act**") of a registration statement on Form S-3 (the "**Registration Statement**") by the Company relating to (i) shares of common stock, par value \$.01 per share, of the Company (the "**Common Stock**"), (ii) shares of preferred stock, par value \$.01 per share, of the Company (the "**Preferred Stock**"), (iii) warrants to purchase Common Stock or Preferred Stock (the "**Warrants**") and (iv) units comprising one or more securities described in clauses (i) through (iii) above in any combination (the "**Units**" and, together with the Common Stock, the Preferred Stock and the Warrants, the "**Securities**" and individually a "**Security**") that may be issued and sold from time to time pursuant to Rule 415 under the Act for an aggregate initial offering price not to exceed \$250,000,000.

For purposes of the opinions we express below, we have examined originals, or copies certified or otherwise identified, of (i) the certificate of incorporation and bylaws, each as amended to date, of the Company (the "**Company Charter Documents**"); (ii) the Registration Statement and all exhibits thereto; (iii) the minutes and records of the corporate proceedings of the Company with respect to the filing of this Registration Statement; and (iv) such other corporate records of the Company as we have deemed necessary or appropriate for purposes of the opinions hereafter expressed.

As to questions of fact material to the opinions expressed below, we have, without independent verification of their accuracy, relied to the extent we deem reasonably appropriate upon the representations and warranties of the Company contained in such documents, records, certificates, instruments or representations furnished or made available to us by the Company.

In making the foregoing examination, we have assumed (i) the genuineness of all signatures, (ii) the authenticity of all documents submitted to us as originals, (iii) the conformity to original documents of all documents submitted to us as certified or photostatic copies, (iv) that all agreement or instruments we have examined are the valid, binding and enforceable obligations of the parties thereto, and (v) that all factual information on which we have relied was accurate and complete.

We have also assumed that (i) the Registration Statement, and any amendments thereto (including post-effective amendments), will have become effective; (ii) no stop order of the Commission preventing or suspending the use of the prospectus contained in the Registration Statement or any prospectus supplement will have been issued; (iii) along with the prospectus contained in the Registration Statement, a prospectus supplement will have been prepared and filed with the Commission properly describing the Securities offered thereby and along with the prospectus contained in the Registration Statement, will have been delivered to the purchaser(s) of the Securities as required in accordance with applicable law; (iv) a definitive purchase, underwriting or similar agreement with respect to any Securities offered will have been duly authorized and validly executed and delivered by the Company and the other parties thereto and will be an enforceable obligation of the parties thereto; (v) in connection with the sale of Warrants, any required warrant agreement or agreement relating to the Warrants (a "**Warrant Agreement**") will have been executed and delivered by all applicable parties and will be enforceable in all respects in accordance with its terms; (vi) in connection with the sale of Units, any required unit agreement (a "**Unit Agreement**") will have been executed and delivered by all applicable parties and will be enforceable in all respects in accordance with its terms; (vii) any securities issuable upon conversion, exchange, redemption or exercise of any Securities being offered will be duly and validly authorized, created and, if appropriate, reserved for issuance upon such conversion, exchange, redemption or exercise; and (viii) with respect to shares of Common Stock or

Preferred Stock, there will be sufficient shares of Common Stock or Preferred Stock authorized under the Company Charter Documents and not otherwise reserved for issuance.

Based on the foregoing, and subject to the limitations and qualifications set forth herein, we are of the opinion that:

1. With respect to shares of Common Stock, when (i) the Board of Directors of the Company or, to the extent permitted by the General Corporation Law of the State of Delaware and the Charter Documents, a duly constituted and acting committee thereof (such Board of Directors or committee being hereinafter referred to as the "**Company Board**") has taken all necessary corporate action to approve the issuance thereof and the terms of the offering of shares of Common Stock and related matters, and (ii) certificates representing the shares of Common Stock have been duly executed, countersigned, registered and delivered, or if uncertificated, valid book-entry notations have been made in the share register of the Company, in each case in accordance with the provisions of the Charter Documents, either (a) in accordance with the applicable definitive purchase, underwriting or similar agreement approved by the Company Board and upon payment of the consideration therefor (which shall not be less than the par value of the Common Stock) provided for therein, all in accordance with the Registration Statement and any applicable prospectus supplement, or (b) upon conversion, exchange, redemption or exercise of any other Security, in accordance with the terms of such Security or the instrument governing such Security providing for such conversion, exchange, redemption or exercise as approved by the Company Board, and for the consideration approved by the Company Board (which shall not be less than the par value of the Common Stock), all in accordance with the Registration Statement and any applicable prospectus supplement, the shares of Common Stock will be validly issued, fully paid and non-assessable.

2. With respect to shares of Preferred Stock, when (i) the Company Board has taken all necessary corporate action to approve and establish the terms of the shares of Preferred Stock, to approve the issuance thereof and the terms of the offering thereof and related matters, including the adoption of a Certificate of Designations relating to such Preferred Stock (a "**Certificate of Designations**"), and such Certificate of Designations has been filed with the Secretary of State of the State of Delaware, and (ii) certificates representing the shares of Preferred Stock have been duly executed, countersigned, registered and delivered, or if uncertificated, valid book-entry notations have been made in the share register of the Company, in each case in accordance with the provisions of the Charter Documents, either (a) in accordance with the applicable definitive purchase, underwriting or similar agreement approved by the Company Board and upon payment of the consideration therefor (which shall not be less than the par value of the Preferred Stock) provided for therein, all in accordance with the Registration Statement and any applicable prospectus supplement, or (b) upon conversion, exchange, redemption or exercise of any other Security, in accordance with the terms of such Security or the instrument governing such Security providing for such conversion, exchange, redemption or exercise as approved by the Company Board, and for the consideration approved by the Company Board (which shall not be less than the par value of the Preferred Stock), all in accordance with the Registration Statement and any applicable prospectus supplement, the shares of Preferred Stock will be validly issued, fully paid and non-assessable.

3. With respect to Warrants, when (i) the Company Board has taken all necessary corporate action to approve the creation of and the issuance and terms of the Warrants, the terms of the offering thereof and related matters, (ii) the Warrant Agreements and Warrants have been duly prepared, authorized and validly executed and delivered by the Company and the other parties thereto (if any) in compliance with all applicable laws, and (iii) the Warrants or certificates representing the Warrants have been duly registered and delivered in accordance with the appropriate Warrant Agreements and the applicable definitive purchase, underwriting or similar

agreement approved by the Company Board and upon payment of the consideration therefor provided for therein (which shall not be less than the par value of any Common Stock or Preferred Stock underlying such Warrants), all in accordance with the Registration Statement and any prospectus supplement, the Warrants will constitute valid and legally binding obligations of the Company.

4. With respect to Units, when (i) the Company Board has taken all necessary corporate action to approve the creation of and the issuance and terms of the Units, the terms of the offering thereof and related matters, (ii) the Unit Agreements and Units have been duly prepared, authorized and validly executed and delivered by the Company and the other parties thereto (if any) in compliance with all applicable laws, and (iii) the Units or certificates representing the Units have been duly registered and delivered in accordance with the appropriate Unit Agreements and the applicable definitive purchase, underwriting or similar agreement approved by the Company Board and upon payment of the consideration therefor provided for therein (which shall not be less than the par value of any Common Stock or Preferred Stock underlying such Unit), all in accordance with the Registration Statement and any prospectus supplement, the Units will constitute valid and legally binding obligations of the Company.

The opinions set forth above are subject to the following qualifications, limitations and exceptions:

(a) The opinions are subject to (i) the effect of any applicable bankruptcy, insolvency, reorganization, moratorium, rearrangement, liquidation, conservatorship or other similar laws now or hereafter in effect relating to or affecting the rights of creditors generally, (ii) provisions of applicable law pertaining to the voidability of preferential or fraudulent transfers and conveyances and (iii) the fact that the remedy of specific performance and injunctive and other forms of equitable relief may be subject to equitable defenses and to the discretion of the court before which any proceeding therefor may be brought.

(b) The opinions are subject to the effect of (i) general principles of equity, including (without limitation) concepts of materiality, reasonableness, good faith and fair dealing, general matters of public policy and other similar doctrines generally affecting the enforceability of agreements (regardless of whether considered in a proceeding in equity or at law), (ii) provisions purporting to make a guarantor primarily liable rather than as a surety and (iii) other commonly-recognized statutory and judicial constraints on enforceability, including statutes of limitation, limitations on rights to indemnification that contravene law or public policy and the effectiveness of waivers of rights or benefits that cannot be effectively waived under applicable law.

(c) In rendering the opinions, we have assumed that, at the time of the sale of the Securities, (i) the resolutions of the Board of Directors or similar governing body, as reflected in the minutes and proceedings of the Company, will not have been modified or rescinded, (ii) the Company will continue to be incorporated and in existence and good standing under the laws of the State of Delaware and (iii) there will not have occurred any change in the laws affecting the authorization, execution, delivery, issuance, sale, ranking, validity or enforceability of the Securities.

The opinions expressed herein are limited to the federal laws of the United States of America, and, to the extent relevant to the opinions expressed herein, the Delaware General Corporation Law as in effect on the date hereof (all of the foregoing being referred to as the "**Opined on Law**"). We do not express any opinion with respect to any other laws, or the laws of any other jurisdiction (including, without limitation, any laws of any other jurisdiction which might be referenced by the choice-of-law rules of the Opined Law), other than the Opined on Law or as to the effect of any such other laws on the opinions herein stated.

We hereby consent to the filing of this opinion as Exhibit 5.1 to the Registration Statement and to the reference to our firm contained therein under the heading "Legal Matters." In giving this consent,

we do not hereby admit we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Haynes and Boone, LLP

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QuickLinks

[Exhibit 5.1](#)

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our report dated March 14, 2016 with respect to the consolidated financial statements of Applied Optoelectronics, Inc. included in the Annual Report on Form 10-K for the year ended December 31, 2015, which is incorporated by reference in this Registration Statement. We consent to the incorporation by reference of the aforementioned report in this Registration Statement, and to the use of our name as it appears under the caption "Experts."

/s/ GRANT THORNTON LLP

Houston, Texas
October 17, 2016

QuickLinks

[Exhibit 23.2](#)

[CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM](#)