

**FIFTH AMENDED AND RESTATED  
CERTIFICATE OF INCORPORATION  
OF  
APOGEE PHOTONICS, INC.**

**Pursuant to Sections 242 and 245  
of the General Corporation Law of  
the State of Delaware**

Apogee Photonics, Inc. (hereinafter called the "Corporation"), organized and existing under and by virtue of the General Corporation Law of the State of Delaware, does hereby certify as follows:

1. That the name of this corporation is Apogee Photonics, Inc. This Corporation was originally incorporated pursuant to the General Corporation Law on April 18, 2000 under the name ASIP, Inc. An Amended and Restated Certificate of Incorporation was filed on July 14, 2000 along with a Certificate of Designation, and a Certificate of Amendment was filed on July 18, 2001. A Certificate of Correction was filed on October 24, 2001, and a Certificate of Amendment was filed on October 25, 2001 along with a Certificate of Designation. A Certificate of Renewal was filed on June 23, 2003. A Second Amended and Restated Certificate of Incorporation and a Certificate of Designation were filed on July 8, 2003. A Certificate of Designation and a Certificate of Amendment were filed on November 12, 2003. A Certificate of Renewal was filed on June 9, 2005. A Third Amended and Restated Certificate of Incorporation was filed on July 8, 2005. A Certificate of Amendment was filed on August 15, 2005. A Certificate of Ownership was filed on March 15, 2006. A Fourth Amended and Restated Certificate of Incorporation was filed on November 29, 2006.

2. This Fifth Amended and Restated Certificate of Incorporation (a) has been adopted in accordance with the provisions of Sections 242 and 245 of the General Corporation Law and (b) amends and restates the Certificate of Incorporation of this Corporation.

3. The Fourth Amended and Restated Certificate of Incorporation of this Corporation is hereby amended and restated to read in its entirety as follows:

**FIRST:** The name of the Corporation is Apogee Photonics, Inc.

**SECOND:** The registered office of the Corporation is to be located at Corporation Trust Center, 1209 Orange Street, in the City of Wilmington, in the County of New Castle, in the State of Delaware. The name of its registered agent at that address is The Corporation Trust Company.

**THIRD:** The purpose of the Corporation is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of the State of Delaware.

**FOURTH:** The total number of shares of all classes of stock which the Corporation shall have authority to issue is (i) 60,000,000 shares of Common Stock,

\$0.001 par value per share ("Common Stock") and (ii) 43,983,935 shares of Preferred Stock, \$0.001 par value per share, of which 2,145,361 shares shall be designated Series A-1(A) Convertible Preferred Stock ("Series A-1(A) Preferred Stock"), 1,838,574 shares shall be designated Series A-1(T) Convertible Preferred Stock ("Series A-1(T) Preferred Stock") and 40,000,000 shares shall be designated Series B Convertible Preferred Stock ("Series B Preferred Stock"). The Series A-1(A) Preferred Stock, Series A-1(T) Preferred Stock and Series B Preferred Stock are referred to herein collectively as the "Preferred Stock," unless otherwise referred to specifically.

The following is a statement of the designations and the powers, preferences and rights, and the qualifications, limitations and restrictions thereof in respect of each class of capital stock of the Corporation.

A. COMMON STOCK.

1. General. The voting, dividend and liquidation rights of the holders of the Common Stock are subject to and qualified by the rights of the holders of the Preferred Stock of any series as may be designated by the Board of Directors of the Corporation (the "Board of Directors") upon any issuance of the Preferred Stock of any series.

2. Voting. The holders of the Common Stock are entitled to one vote for each share held at all meetings of stockholders (and written actions in lieu of meetings). No holder of Common Stock shall be entitled to cumulative voting. Except as otherwise provided in this Article, the number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by the affirmative vote of the holders of a majority of the stock of the Corporation entitled to vote, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law of Delaware.

3. Dividends. Dividends may be declared and paid on the Common Stock from funds lawfully available therefor as and when determined by the Board of Directors and subject to any preferential dividend rights of any then outstanding Preferred Stock.

4. Liquidation. Upon the liquidation, dissolution or winding up of the Corporation, whether voluntary or involuntary, the assets of the Corporation shall be distributed as provided in Section C.2 of Article FOURTH below.

B. PREFERRED STOCK.

Preferred Stock may be issued from time to time in one or more series, each of such series to have such terms as stated or expressed herein and in the resolution or resolutions providing for the issue of such series adopted by the Board of Directors of the Corporation as hereinafter provided. Any shares of Preferred Stock which may be redeemed, purchased or acquired by the Corporation may be reissued except as otherwise provided by law or by the terms of any series of Preferred Stock. Different series of Preferred Stock shall not be construed to constitute different classes of shares for the purposes of voting by classes unless expressly provided.

Authority is hereby expressly granted to the Board of Directors from time to time to issue the Preferred Stock in one or more series, and in connection with the creation of any such series, by resolution or resolutions providing for the issue of the shares thereof, to determine and fix such voting powers, full or limited, or no voting powers, and such designations, preferences and relative participating, optional or other special rights, and qualifications, limitations or restrictions thereof, including without limitation thereof, dividend rights, special voting rights, conversion rights, redemption privileges and liquidation preferences, as shall be stated and expressed in such resolutions, all to the full extent now or hereafter permitted by the General Corporation Law of Delaware. Without limiting the generality of the foregoing, the resolutions providing for issuance of any series of Preferred Stock may provide that such series shall be superior or rank equally or be junior to the Preferred Stock of any other series to the extent permitted by law. Except as otherwise specifically provided in this Certificate of Incorporation, no vote of the holders of the Preferred Stock or Common Stock shall be a prerequisite to the issuance of any shares of any series of the Preferred Stock authorized by and complying with the conditions of this Certificate of Incorporation, the right to have such vote being expressly waived by all present and future holders of the capital stock of the Corporation.

C. SERIES A-1(A) CONVERTIBLE PREFERRED STOCK, SERIES A-1(T) CONVERTIBLE PREFERRED STOCK AND SERIES B CONVERTIBLE PREFERRED STOCK.

1. Dividends.

(a) Holders of Series B Preferred Stock, in preference to the holders of Common Stock, Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock, shall be entitled to receive, when, as and if declared by the Board of Directors, but only out of funds that are legally available therefor, non-cumulative cash dividends, at the rate of \$0.0546 per annum on each outstanding share of Series B Preferred Stock (such number to be adjusted for any stock dividends, combinations, splits, recapitalizations and the like after the filing date hereof). The right to such dividends on shares of the Series B Preferred Stock shall not be cumulative and no rights shall accrue to holders of the Series B Preferred Stock by reason of the fact that dividends on said shares are or are not declared in any prior year.

(b) So long as any shares of Preferred Stock are outstanding, the Corporation shall not pay or declare any dividend, whether in cash or property, or make any other distribution on the Common Stock until (i) all dividends as set forth in Section 1(a) above on the Series B Preferred Stock have been paid, (ii) the holders of the Series B Preferred Stock then outstanding shall have first received, or simultaneously receive (in addition to the dividends described in Section 1(a) above), a cash dividend on each outstanding share of Preferred Stock in an amount at least equal to the product of (A) the per share amount, if any, of the dividends or other distributions to be declared, paid or set aside for the Common Stock, multiplied by (B) the number of whole shares of Common Stock into which such share of Series B Preferred Stock, as applicable, is then convertible, and (iii) after payment of all amounts to the holders of Series B Preferred Stock pursuant to clauses (i) and (ii) above, the holders of the Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock then outstanding shall have first received, or simultaneously receive, a cash dividend on each outstanding share of Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock, respectively, in an amount at least equal to the product

of (X) the per share amount, if any, of the dividends or other distributions to be declared, paid or set aside for the Common Stock, multiplied by (Y) the number of whole shares of Common Stock into which such share of Series A-1(A) Preferred Stock or Series A-1(T) Preferred Stock, as applicable, is then convertible.

2. Liquidation, Dissolution or Winding Up; Certain Mergers, Consolidations and Asset Sales.

(a) In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation, the holders of shares of Series B Preferred Stock then outstanding shall be entitled to be paid out of the assets of the Corporation available for distribution to its stockholders, an amount equal to \$1.3648 per share (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization affecting such shares), plus any dividends declared but unpaid thereon. Any payment to be made to the holders of shares of Series B Preferred Stock pursuant to this Section 2 shall be made before any payment shall be made to the holders of Common Stock or any other class or series of stock ranking on liquidation junior to the Series B Preferred Stock, including without limitation the Series A-1(A) Preferred Stock and the Series A-1(T) Preferred Stock (the Common Stock, Series A-1(A) Preferred Stock, Series A-1(T) Preferred Stock and any other series of stock ranking on liquidation junior to the Series B Preferred Stock, collectively referred to herein as "Junior Stock"). If upon any such liquidation, dissolution or winding up of the Corporation the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series B Preferred Stock the full amount to which they shall be entitled under this paragraph 2(a), the holders of shares of Series B Preferred Stock shall share ratably in any distribution of the assets and funds of the Corporation in proportion to the respective amounts which would otherwise be payable in respect of the Series B Preferred Stock held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

(b) After payment of all amounts to the Series B Preferred Stock pursuant to paragraph 2(a) above, in the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation, the holders of shares of Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock then outstanding shall be entitled to be paid out of the remaining assets of the Corporation available for distribution to its stockholders an amount equal to (i) in the case of the Series A-1(A) Preferred Stock, \$1.165305 per share, and (ii) in the case of the Series A-1(T) Preferred Stock, \$2.044278 per share (each subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization affecting such shares of Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock, respectively). Any payment to be made to the holders of shares of Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock pursuant this Section 2(b) shall be made before any payment shall be made to the holders of Common Stock or any other class or series of stock ranking on liquidation junior to the Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock. If upon any such liquidation, dissolution or winding up of the Corporation the remaining assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock the full amount to which they shall be entitled under this paragraph 2(b), the holders of shares of Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock shall share ratably in any

distribution of the remaining assets and funds of the Corporation in proportion to the respective amounts which would otherwise be payable in respect of the Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

(c) After the payment of all preferential amounts required to be paid to the holders of Preferred Stock pursuant to paragraphs 2(a) and 2(b) above, upon the dissolution, liquidation or winding up of the Corporation, the remaining assets of the Corporation legally available for distribution (or the consideration received in such transaction), if any, shall be distributed ratably to the holders of the Common Stock and Preferred Stock on an as-if-converted to Common Stock basis.

(d) Any (i) sale, lease or other conveyance of all or substantially all of the assets of the Corporation; (ii) merger or consolidation of the Corporation with or into another entity in which the stockholders of the Corporation immediately prior to such merger or consolidation own less than 50% of the voting securities of the surviving entity; (iii) other transaction or series of related transactions as a result of which the stockholders of the Corporation immediately prior to such transaction or series of related transactions own less than 50% of the voting securities of the Corporation or other surviving entity following such transaction or related transactions (other than the sale of equity securities by the Corporation in a bona fide transaction for the primary purpose of raising capital); (iv) transaction or series of related transactions as a result of which a stockholder or a group of affiliated stockholders increases its aggregate ownership of voting securities of the Corporation by an amount greater than 50% of the total voting securities of the Corporation (other than the sale of equity securities by the Corporation in a bona fide transaction for the primary purpose of raising capital); and (v) liquidation, dissolution or winding up of the Corporation, whether voluntary or involuntary (any such event, a "Liquidity Event"), shall be deemed to be a liquidation of the Corporation for purposes of this Section 2, and the plan of merger or consolidation or other transaction agreement with respect to such transaction or series of transactions shall provide that the consideration payable to the stockholders of the Corporation (in the case of a merger or consolidation or other transaction other than a sale, lease or conveyance of assets), or consideration payable to the Corporation, together with all other available assets of the Corporation (in the case of an asset sale, lease or conveyance), shall be distributed to the holders of capital stock of the Corporation in accordance with paragraphs 2(a), 2(b) and 2(c) above. The amount deemed distributed to the holders of the Corporation's capital stock upon any such transaction or series of transactions shall be the cash or the value of the property, rights or securities distributed to such holders by the Corporation or the acquiring person, firm or other entity. The value of such property, rights or other securities shall be determined in good faith by the Board of Directors.

### 3. Voting.

(a) On any matter presented to the stockholders of the Corporation for their action or consideration at any meeting of stockholders of the Corporation (or by written action of stockholders in lieu of meeting), each holder of outstanding shares of Preferred Stock shall be entitled to the number of votes equal to the number of whole shares of Common Stock into which the shares of Preferred Stock held by such holder are convertible as of the record date for

determining stockholders entitled to vote on such matter. Except as required by law, by the provisions of this Section 3, or as otherwise provided herein, holders of Series A-1(A) Preferred Stock, Series A-1(T) Preferred Stock and Series B Preferred Stock shall vote together with the holders of Common Stock as a single class. No holder of Preferred Stock of the Corporation shall be entitled to cumulative voting.

(b) In addition to any other rights provided by law, so long as at least one million (1,000,000) shares of Preferred Stock shall be outstanding (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization affecting such shares), the Corporation shall not (by amendment, merger, consolidation or otherwise), without first obtaining the affirmative vote or written consent of the holders of at least a majority of the then-outstanding shares of Preferred Stock (voting together as a single class and not as separate series and on an as converted basis), approve or effect:

(i) any Liquidity Event or any other liquidation or dissolution of the Corporation;

(ii) the redemption, repurchase or acquisition of capital stock, or options to purchase capital stock, of the Corporation, directly or indirectly, through subsidiaries or otherwise (other than the repurchase of capital stock of the Corporation from service providers of the Corporation at cost pursuant to agreements to repurchase such capital stock approved by the Board of Directors);

(iii) any sale or transfer of all or substantially all of the Corporation's assets;

(iv) any amendment of the Corporation's Certificate of Incorporation or bylaws;

(v) the authorization, issuance or reclassification, directly or indirectly, of other shares of the Corporation's capital stock having rights or preferences superior to or on parity with any series of Preferred Stock;

(vi) any modification of the rights, preferences, privileges or powers of any series of Preferred Stock, or the restrictions provided for the benefit of any series of Preferred Stock;

(vii) the authorization or issuance of additional shares of Preferred Stock, any change in the number of shares designated as any series of Preferred Stock, or the authorization of additional shares of Common Stock;

(viii) any increase or decrease in the authorized number of directors comprising the Board of Directors; or

(ix) the declaration or payment of a dividend on Common Stock or on any other class or series of capital stock of the Corporation.

4. Optional Conversion. The holders of Preferred Stock shall have conversion rights as follows (the "Conversion Rights"):

(a) Right to Convert. Each share of Preferred Stock shall be convertible, at the option of the holder thereof, at any time and from time to time, and without the payment of additional consideration by the holder thereof, into such number of fully paid and nonassessable shares of Common Stock as is determined by dividing (i) \$1.3648 (as adjusted for any stock dividend, stock split, combination or other similar recapitalization affecting such shares) in the case of the Series A-1(A) Preferred Stock, (ii) \$1.3648 (as adjusted for any stock dividend, stock split, combination or other similar recapitalization affecting such shares) in the case of the Series A-1(T) Preferred Stock, and (iii) \$1.3648 (as adjusted for any stock dividend, stock split, combination or other similar recapitalization affecting such shares) in the case of the Series B Preferred Stock, by the Series A-1(A) Conversion Price (as defined below), the Series A-1(T) Conversion Price (as defined below), or the Series B Conversion Price (as defined below), as may be applicable, in effect at the time of conversion. The "Series A-1(A) Conversion Price" shall initially be \$1.3648. The "Series A-1(T) Conversion Price" shall initially be \$1.3648. The "Series B Conversion Price" shall initially be \$1.3648. Such initial Series A-1(A) Conversion Price, initial Series A-1(T) Conversion Price and initial Series B Conversion Price, and the rate at which shares of Series A-1(A) Preferred Stock, Series A-1(T) Preferred Stock and Series B Preferred Stock may be converted into shares of Common Stock, shall be subject to adjustment as provided below. The Series A-1(A) Conversion Price, Series A-1(T) Conversion Price and Series B Conversion Price are occasionally referred to herein collectively as the "Conversion Price."

In the event of a liquidation of the Corporation, the Conversion Rights shall terminate at the close of business on the first full day preceding the date fixed for the payment of any amounts distributable on such liquidation to the holders of Preferred Stock.

(b) Fractional Shares. No fractional shares of Common Stock shall be issued upon conversion of the Preferred Stock. In lieu of any fractional shares to which the holder would otherwise be entitled, the Corporation shall pay cash equal to such fraction multiplied by the then-effective Conversion Price, as may be applicable.

(c) Mechanics of Conversion.

(i) In order for a holder of Preferred Stock to convert shares of Preferred Stock into shares of Common Stock, such holder shall surrender the certificate or certificates for such shares of Preferred Stock at the office of the transfer agent for the Corporation (or at the principal office of the Corporation if the Corporation serves as its own transfer agent), together with written notice that such holder elects to convert all or any number of the shares of the Preferred Stock represented by such certificate or certificates. Such notice shall state such holder's name or the names of the nominees in which such holder wishes the certificate or certificates for shares of Common Stock to be issued. If required by the Corporation, certificates surrendered for conversion shall be endorsed or accompanied by a written instrument or instruments of transfer, in form satisfactory to the Corporation, duly executed by the registered holder or his or its attorney duly authorized in writing. The date of receipt of such certificates and notice by the transfer agent (or by the Corporation if the

Corporation serves as its own transfer agent) shall be the conversion date ("Conversion Date"), and the shares of Common Stock issuable upon conversion of the shares represented by such certificate shall be deemed to be outstanding of record as of such date. The Corporation shall, as soon as practicable after the Conversion Date, issue and deliver at such office to such holder of Preferred Stock (or to the extent that such issuance and delivery will not violate applicable federal and state securities laws, his or its nominees), a certificate or certificates for the number of shares of Common Stock to which such holder shall be entitled, together with cash in lieu of any fraction of a share.

(ii) The Corporation shall at all times when Preferred Stock shall be outstanding, reserve and keep available out of its authorized but unissued stock, for the purpose of effecting the conversion of Preferred Stock, such number of its duly authorized shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding Preferred Stock. Before taking any action which would cause an adjustment reducing the then applicable Conversion Price below the then par value of the shares of Common Stock issuable upon conversion of the series of Preferred Stock, as may be applicable, the Corporation will take any corporate action which may, in the opinion of its counsel, be necessary in order that the Corporation may validly and legally issue fully paid and nonassessable shares of Common Stock at such adjusted Series A-1(A) Conversion Price, Series A-1(T) Conversion Price or Series B Conversion Price, as may be applicable.

(iii) Upon any such conversion, no adjustment to the applicable Conversion Price shall be made for any declared but unpaid dividends on the Preferred Stock, as may be applicable, surrendered for conversion or on the Common Stock delivered upon conversion.

(iv) All shares of Preferred Stock which shall have been surrendered for conversion as herein provided shall no longer be deemed to be outstanding and all rights with respect to such shares, including the rights, if any, to receive notices and to vote (other than as a holder of Common Stock), shall immediately cease and terminate on the Conversion Date, except only the right of the holders thereof to receive shares of Common Stock in exchange therefor and payment of any dividends declared but unpaid thereon. Any shares of Preferred Stock so converted shall be retired and cancelled and shall not be reissued, and the Corporation (without the need for stockholder action) may from time to time take such appropriate action as may be necessary to reduce the authorized number of shares of Preferred Stock, as may be applicable, accordingly.

(v) The Corporation shall pay any and all issue and other taxes that may be payable in respect of any issuance or delivery of shares of Common Stock upon conversion of shares of Preferred Stock pursuant to this Section 4. The Corporation shall not, however, be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of shares of Common Stock in a name other than that in which the shares of Preferred Stock so converted were registered, and no such issuance or delivery shall be made unless and until the person or entity requesting such issuance has paid to the Corporation the amount of any such tax or has established, to the satisfaction of the Corporation, that such tax has been paid.



(d) Adjustments to Conversion Price for Diluting Issues:

(i) Special Definitions. For purposes of this Section 4, the following definitions shall apply:

(A) "Convertible Securities" shall mean any evidences of indebtedness, shares or other securities directly or indirectly convertible into or exchangeable for Common Stock, including without limitation Preferred Stock, but excluding Options (defined below).

(B) "Options" shall mean rights, options or warrants to subscribe for, purchase or otherwise acquire Common Stock or Convertible Securities.

(C) "Original Issue Date" shall mean the date on which a share of Series B Preferred Stock was first issued.

(D) "Additional Shares of Common Stock" shall mean all shares of Common Stock issued (or, pursuant to Subsection 4(d)(iv) below, deemed to be issued) by the Corporation after the Original Issue Date, other than:

- (I) shares of Common Stock issued or issuable upon conversion or exchange of any Convertible Securities or exercise and, if applicable, conversion of any Options outstanding on the Original Issue Date;
- (II) shares of Common Stock issued or issuable as a dividend or distribution on Preferred Stock;
- (III) in any instance for which appropriate adjustment to the applicable Conversion Price has been made pursuant to Subsection 4(e) or 4(f) below;
- (IV) shares of Common Stock (or Options with respect thereto), issued or issuable to employees or directors of, or consultants to, the Corporation after the Original Issue Date pursuant to a plan or arrangement approved by the Board of Directors and by a majority of the members of the Board of Directors who are not employees of the Corporation or any of its subsidiaries;
- (V) securities issued in connection with a bona fide business acquisition of or by the Corporation, whether by merger, consolidation, sale of assets, sale or exchange of stock, or otherwise;

- (VI) securities issued in connection with bank or finance company credit facilities, equipment financing transactions and other leasing lines of credit or other collaborative or strategic arrangements or relationships with service providers or other entities or individuals which are not primarily intended to provide equity financing to the Corporation and which are approved by the Board of Directors, including, if any, each of the Preferred Directors (as defined below);
- (VII) the issuance of shares of Common Stock by the Corporation in a firm-commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended (the "Securities Act");
- (VIII) shares of Common Stock issued or issuable upon conversion of the Series A-1(A) Preferred Stock, Series A-1(T) Preferred Stock or Series B Preferred Stock;
- (IX) shares of Common Stock issued or deemed issued pursuant to subsection 4(d)(v) as a result of a decrease in the Conversion Price of any series of Preferred Stock resulting from the operation of Section 4(d);
- (X) shares of Common Stock issued or issuable to Middlefield Ventures, Inc.;
- (XI) securities issued pursuant to the Recapitalization, as such term is defined in the Agreement and Plan of Merger and Reorganization dated July 1, 2005; and
- (XII) shares of Common Stock issued for no additional consideration in connection with any offering of Series B Preferred Stock.

(ii) Intentionally Left Blank.

(iii) No Adjustment of Conversion Price. No adjustment in the Series A-1(A) Conversion Price, the Series A-1(T) Conversion Price, or the Series B Conversion Price, as may be applicable, shall be made as the result of the issuance of Additional Shares of Common Stock if: (a) the consideration per share (determined pursuant to Subsection 4(d)(vi)) for such Additional Share of Common Stock issued or deemed to be issued by the Corporation is equal to or greater than the Series B Conversion Price in effect immediately prior to the issuance or deemed issuance of such Additional Shares of Common Stock, or (b) prior to such issuance or

deemed issuance, the Corporation receives written notice from the holders of at least a majority of the then-outstanding shares of Preferred Stock, voting together as a single class and not as separate series and on an as converted basis, agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock.

(iv) Issue of Securities Deemed Issue of Additional Shares of Common Stock. If the Corporation at any time or from time to time after the Original Issue Date shall issue any Options or Convertible Securities, then the maximum number of shares of Common Stock (as set forth in the instrument relating thereto without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or, in the case of Convertible Securities and Options therefor, the conversion, exercise and/or exchange of such Convertible Securities, shall be deemed to be Additional Shares of Common Stock issued as of the time of such issue or, in case such a record date shall have been fixed, as to the close of business on such record date; *provided* that Additional Shares of Common Stock shall not be deemed to have been issued unless the consideration per share (determined pursuant to Subsection 4(d)(vi) hereof) of such Additional Shares of Common Stock would be less than the Series B Conversion Price in effect on the date of and immediately prior to such issue, and, *provided further*, that in any such case in which Additional Shares of Common Stock are deemed to be issued:

(A) No further adjustment in the applicable Conversion Price shall be made upon the subsequent issue of Convertible Securities or shares of Common Stock upon the exercise of such Options or conversion or exchange of such Convertible Securities;

(B) If such Options or Convertible Securities by their terms provide, with the passage of time or otherwise, for any increase or decrease in the consideration payable to the Corporation, then upon the exercise, conversion or exchange thereof, the applicable Conversion Price computed upon the original issue thereof (or upon the occurrence of a record date with respect thereto), and any subsequent adjustments based thereon, shall, upon any such increase or decrease becoming effective, be recomputed to reflect such increase or decrease insofar as it affects such Options or the rights of conversion or exchange under such Convertible Securities;

(C) Upon the expiration or termination of any such unexercised Option or unconverted or unexchanged Convertible Security, the applicable Conversion Price then in effect shall thereupon be readjusted to the Conversion Price as would have been in effect had the adjustment made upon the issuance of such Option or Convertible Security been made upon the basis of the issuance of only the number of shares of Common Stock then actually issued upon the exercise of such Options or the conversion or exchange of such Convertible Securities;

(D) In the event of any change in the number of shares of Common Stock issuable upon the exercise, conversion or exchange of any such Option or Convertible Security, including, but not limited to, a change resulting from the anti-dilution provisions thereof, the applicable Conversion Price then in effect shall forthwith be readjusted to such Conversion Price as would have obtained had the adjustment which was made upon the

issuance of such Option or Convertible Security not exercised, converted or exchanged prior to such change been made upon the basis of such change; and

(E) No readjustment pursuant to clause (B), (C) or (D) above shall have the effect of increasing the applicable Conversion Price to an amount which exceeds the lower of (i) the applicable Conversion Price on the original adjustment date, or (ii) the applicable Conversion Price that would have resulted from any issuances of Additional Shares of Common Stock between the original adjustment date and such readjustment date.

(v) Adjustment of Conversion Price Upon Issuance of Additional Shares of Common Stock. In the event the Corporation shall at any time after the Original Issue Date issue Additional Shares of Common Stock (including Additional Shares of Common Stock deemed to be issued pursuant to Subsection 4(d)(iv)), without consideration or for a consideration per share less than the Series B Conversion Price in effect immediately prior to such issue, then and in such event, subject to the provisions of this Section 4:

(A) in the case of the Series A-1(A) Preferred Stock and the Series A-1(T) Preferred Stock, the applicable Conversion Price for the Series A-1(A) Preferred Stock and Series A-1(T) Preferred Stock, respectively, shall be reduced, concurrently with such issue, to a price (calculated to the nearest cent) determined by multiplying such applicable Conversion Price by a fraction, (A) the numerator of which shall be (1) the number of shares of Common Stock outstanding immediately prior to such issue plus (2) the number of shares of Common Stock which the aggregate consideration received or to be received by the Corporation for the total number of Additional Shares of Common Stock so issued would purchase at such applicable Conversion Price in effect immediately prior to such issuance; and (B) the denominator of which shall be (1) the number of shares of Common Stock outstanding immediately prior to such issue plus (2) the number of such Additional Shares of Common Stock so issued; provided that, (i) for the purpose of this Subsection 4(d)(v), all shares of Common Stock issuable upon the exercise of Options and/or the conversion, exercise and/or exchange of Convertible Securities outstanding immediately prior to such issue shall be deemed to be outstanding, and (ii) the number of shares of Common Stock deemed issuable upon the exercise of Options and the conversion, exercise and/or exchange of such outstanding Convertible Securities shall not give effect to any adjustments to the conversion or exchange price or conversion or exchange rate of such Options or Convertible Securities resulting from the issuance of Additional Shares of Common Stock that is the subject of this calculation.

(B) In the case of the Series B Preferred Stock, the Series B Conversion Price shall be reduced, concurrently with such issue, to the lowest price per share at which any of the Additional Shares of Common Stock are issued.

(vi) Determination of Consideration. For purposes of this Subsection 4(d), the consideration received by the Corporation for the issue of any Additional Shares of Common Stock shall be computed as follows:

(A) Cash and Property: Such consideration shall:

- (I) insofar as it consists of cash, be computed at the aggregate of cash received by the Corporation, excluding amounts paid or payable for accrued interest;
- (II) insofar as it consists of property other than cash, be computed at the fair market value thereof at the time of such issue, as determined in good faith by the Board of Directors; and
- (III) in the event Additional Shares of Common Stock are issued together with other shares or securities or other assets of the Corporation for consideration which covers both, be the proportion of such consideration so received for such Additional Shares of Common Stock, computed as provided in clauses (I) and (II) above, as determined in good faith by the Board of Directors.

(B) Options and Convertible Securities. The consideration per share received by the Corporation for Additional Shares of Common Stock deemed to have been issued pursuant to Subsection 4(d)(iv), relating to Options and Convertible Securities, shall be determined by dividing

(x) the total amount, if any, received or receivable by the Corporation as consideration for the issue of such Options or Convertible Securities, plus the minimum aggregate amount of additional consideration (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such consideration) payable to the Corporation upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities, by

(y) the maximum number of shares of Common Stock (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or the conversion, exercise and/or exchange of such Convertible Securities or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities.

(vii) Multiple Closing Dates. In the event the Corporation shall issue on more than one date Additional Shares of Common Stock of the same series or class in a series of one or more related transactions, and such issuance dates occur within a period of no more than 120 days, then, upon the final such issuance, the applicable Conversion Price shall be readjusted to give effect to all such issuances as if they occurred on the date of the final such issuance (and without giving effect to any adjustments as a result of such prior issuances within such period).

(c) Adjustment for Stock Splits and Combinations. If the Corporation shall at any time or from time to time after the Original Issue Date effect a subdivision of the outstanding Common Stock, the applicable Conversion Price then in effect immediately before that subdivision shall be proportionately decreased. If the Corporation shall at any time or from time to time after the Original Issue Date combine the outstanding shares of Common Stock, the applicable Conversion Price then in effect immediately before the combination shall be proportionately increased. Any adjustment under this paragraph shall become effective at the close of business on the date the subdivision or combination becomes effective.

(f) Adjustment for Certain Dividends and Distributions. In the event the Corporation at any time, or from time to time after the Original Issue Date shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable in additional shares of Common Stock, then and in each such event the applicable Conversion Price then in effect immediately before such event shall be decreased as of the time of such issuance or, in the event such a record date shall have been fixed, as of the close of business on such record date, by multiplying such applicable Conversion Price then in effect by a fraction:

(1) the numerator of which shall be the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date, and

(2) the denominator of which shall be the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date plus the number of shares of Common Stock issuable in payment of such dividend or distribution;

*provided, however*, if such record date shall have been fixed and such dividend is not fully paid or if such distribution is not fully made on the date fixed therefor, the applicable Conversion Price shall be recomputed accordingly as of the close of business on such record date and thereafter the applicable Conversion Price shall be adjusted pursuant to this paragraph as of the time of actual payment of such dividends or distributions; and *provided further*, however, that no such adjustment shall be made if the holders of Preferred Stock simultaneously receive a dividend or other distribution of shares of Common Stock in a number equal to the number of shares of Common Stock as they would have received if all outstanding shares of Preferred Stock had been converted into Common Stock on the date of such event.

(g) Adjustments for Other Dividends and Distributions. In the event the Corporation at any time or from time to time after the Original Issue Date shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable in securities of the Corporation (other than shares of Common Stock) or in cash or other property (other than cash out of earnings or earned surplus, determined in accordance with generally accepted accounting principles), then and in each such event provision shall be made so that the holders of the Preferred Stock shall receive upon conversion thereof in addition to the number of shares of Common Stock receivable thereupon, the kind and amount of securities of the Corporation, cash or other property which they would have been entitled to receive had the Preferred Stock been converted into Common Stock on the

date of such event and had they thereafter, during the period from the date of such event to and including the conversion date, retained such securities receivable by them as aforesaid during such period, giving application to all adjustments called for during such period under this paragraph with respect to the rights of the holders of the applicable series of Preferred Stock; *provided, however*, that no such adjustment shall be made if the holders of the applicable series of Preferred Stock simultaneously receive a dividend or other distribution of such securities, cash or other property in an amount equal to the amount of such securities as they would have received if all outstanding shares of such applicable series of Preferred Stock had been converted into Common Stock on the date of such event.

(h) Adjustment for Merger or Reorganization, etc. If there shall occur any reorganization, recapitalization, consolidation or merger involving the Corporation in which the Common Stock (but not the Preferred Stock) is converted into or exchanged for securities, cash or other property (other than a transaction covered by Section 2 or by paragraphs (e), (f) or (g) of this Section 4 or a change in par value or from par value to no par value or from no par value to par value), then, following any such reorganization, recapitalization, consolidation or merger, each share of Preferred Stock shall (except, in the case of any merger or consolidation, to the extent that payment shall have been made pursuant to Section 2(d)) be convertible into the kind and amount of securities, cash or other property which a holder of the number of shares of Common Stock of the Corporation issuable upon the conversion of one share of Preferred Stock immediately prior to such reorganization, recapitalization, consolidation or merger would have been entitled to receive pursuant to such transaction; and, in such case, appropriate adjustment (as determined in good faith by the Board of Directors) shall be made in the application of the provisions in this Section 4 set forth with respect to the rights and interest thereafter of the holders of the Preferred Stock, to the end that the provisions set forth in this Section 4 (including provisions with respect to changes in and other adjustments of the Series A-1(A) Conversion Price, the Series A-1(T) Conversion Price and the Series B Conversion Price, as may be applicable) shall thereafter be applicable, as nearly as reasonably may be, in relation to any shares of stock or other property thereafter deliverable upon the conversion of the Preferred Stock, as may be applicable.

(i) No Impairment. The Corporation will not, without the appropriate vote of the stockholders under the General Corporation Law of the State of Delaware and Section C.3 of this Article FOURTH, by amendment of its Certificate of Incorporation or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms to be observed or performed hereunder by the Corporation, but will at all times in good faith assist in the carrying out of all the provisions of this Section 4 and in the taking of all such action as may be necessary or appropriate in order to protect the Conversion Rights of the holders of Preferred Stock against impairment.

(j) Certificate as to Adjustments. Upon the occurrence of each adjustment or readjustment of the applicable Conversion Price pursuant to this Section 4, the Corporation at its expense shall promptly compute such adjustment or readjustment in accordance with the terms hereof and furnish to each holder of each series of Preferred Stock affected by an adjustment a certificate setting forth such adjustment or readjustment and showing in detail the facts upon which such adjustment or readjustment is based. The Corporation shall, upon the written request

at any time of any holder of Preferred Stock, furnish or cause to be furnished to such holder a certificate setting forth (i) the Conversion Price then in effect, and (ii) the number of shares of Common Stock and the amount, if any, of other securities, cash or property which then would be received upon the conversion of such applicable series of Preferred Stock.

(k) Notice of Record Date. In the event:

(i) the Corporation shall take a record of the holders of its Common Stock (or other stock or securities at the time issuable upon conversion of the Preferred Stock) for the purpose of entitling or enabling them to receive any dividend or other distribution, or to receive any right to subscribe for or purchase any shares of stock of any class or any other securities, or to receive any other right;

(ii) of any capital reorganization of the Corporation, any reclassification of the Common Stock of the Corporation, any consolidation or merger of the Corporation with or into another corporation (other than a consolidation or merger in which the Corporation is the surviving entity and its Common Stock is not converted into or exchanged for any other securities or property), or any transfer of all or substantially all of the assets of the Corporation; or

(iii) of the voluntary or involuntary dissolution, liquidation or winding-up of the Corporation,

then, and in each such case, the Corporation will mail or cause to be mailed to the holders of the Preferred Stock a notice specifying, as the case may be, (i) the record date for such dividend, distribution or right, and the amount and character of such dividend, distribution or right, or (ii) the effective date on which such reorganization, reclassification, consolidation, merger, transfer, dissolution, liquidation or winding-up is to take place, and the time, if any is to be fixed, as of which the holders of record of Common Stock (or such other stock or securities at the time issuable upon the conversion of the Preferred Stock) shall be entitled to exchange their shares of Common Stock (or such other stock or securities) for securities or other property deliverable upon such reorganization, reclassification, consolidation, merger, transfer, dissolution, liquidation or winding up.

5. Mandatory Conversion.

(a) Upon the earlier of (i) the closing of the sale of shares of Common Stock, at a price to the public of at least \$2.7296 per share (subject to appropriate adjustments for stock splits, stock dividends, combinations and other similar recapitalizations affecting such shares) in a firm-commitment public offering underwritten by a nationally recognized investment bank approved by a majority of the Board of Directors and reasonably acceptable to the holders of a majority of the Preferred Stock then outstanding (voting together as a single class and not as separate series and on an as converted basis) pursuant to an effective registration statement under the Securities Act resulting in at least \$30,000,000 of aggregate proceeds to the Corporation (prior to underwriter commissions and expenses) (a "Qualified Public Offering") or (ii) the vote of the holders of at least a majority of the shares of Preferred Stock then outstanding (voting together as a single class and not as separate series and on an as converted basis) (such date, the



"Mandatory Conversion Date"), (X) all outstanding shares of Preferred Stock shall automatically be converted into shares of Common Stock, at the then effective conversion rate applicable for each outstanding series of Preferred Stock, as applicable and (Y) the number of authorized shares of Preferred Stock shall be automatically reduced by the number of shares of Preferred Stock that had been designated as Series A-1(A) Preferred Stock, Series A-1(T) Preferred Stock, and Series B Preferred Stock, as may be applicable, and all provisions included under the caption "Preferred Stock," and all references herein to the Series A-1(A) Preferred Stock, Series A-1(T) Preferred Stock and Series B Preferred Stock, as may be applicable, shall be deleted and shall be of no further force or effect.

(b) All holders of record of shares of Preferred Stock shall be given written notice of the Mandatory Conversion Date and the place designated for mandatory conversion of all such shares of Preferred Stock pursuant to this Section 5. Such notice need not be given in advance of the occurrence of the Mandatory Conversion Date. Such notice shall be sent by first class or registered mail, postage prepaid, or by a reputable overnight courier service guaranteeing next business day delivery, charges prepaid, to each record holder of Preferred Stock at such holder's address last shown on the records of the transfer agent for the Corporation (or the records of the Corporation, if it serves as its own transfer agent). Upon receipt of such notice, each holder of shares of Preferred Stock shall surrender his or its certificate or certificates for all such shares to the Corporation at the place designated in such notice, and shall thereafter receive certificates for the number of shares of Common Stock to which such holder is entitled pursuant to this Section 5. On the Mandatory Conversion Date, all outstanding shares of Preferred Stock shall be deemed to have been converted into shares of Common Stock, which shall be deemed to be outstanding of record, and all rights with respect to the Preferred Stock so converted, including the rights, if any, to receive notices and vote (other than as a holder of Common Stock) will terminate, except only the rights of the holders thereof, upon surrender of their certificate or certificates therefor, to receive certificates for the number of shares of Common Stock into which such applicable series of Preferred Stock has been converted, and payment of any declared but unpaid dividends thereon. If so required by the Corporation, certificates surrendered for conversion shall be endorsed or accompanied by written instrument or instruments of transfer, in form satisfactory to the Corporation, duly executed by the registered holder or by his or its attorney duly authorized in writing. As soon as practicable after the Mandatory Conversion Date and the surrender of the certificate or certificates for Preferred Stock the Corporation shall cause to be issued and delivered to such holder, or on his or its written order, a certificate or certificates for the number of full shares of Common Stock issuable on such conversion in accordance with the provisions hereof and cash as provided in Subsection 4(b) in respect of any fraction of a share of Common Stock otherwise issuable upon such conversion.

(c) All certificates evidencing shares of Preferred Stock which are required to be surrendered for conversion in accordance with the provisions hereof shall, from and after the Mandatory Conversion Date, be deemed to have been retired and cancelled and the shares of Preferred Stock represented thereby converted into Common Stock for all purposes, notwithstanding the failure of the holder or holders thereof to surrender such certificates on or prior to such date. Such converted Preferred Stock may not be reissued, and the Corporation may thereafter take such appropriate action (without the need for stockholder action) as may be necessary to reduce the authorized number of shares of each applicable series of Preferred Stock accordingly.

6. Redemption. The Preferred Stock shall not be redeemable.

7. Amendment. Subject to the terms hereof, the Corporation reserves the right to amend, alter, change or repeal any provision contained in this Certificate of Incorporation, in the manner now or hereafter prescribed by statute, and all rights conferred upon stockholders herein are granted subject to this reservation.

8. Election of Directors. As long as any shares of Series B Preferred Stock are outstanding, the holders of such shares of Series B Preferred Stock shall be entitled to elect two (2) directors of the Corporation at any election of directors (the "Preferred Directors"). The holders of outstanding Common Stock shall be entitled to elect one (1) director of the Corporation at any election of directors. The holders of Preferred Stock and Common Stock (voting together as a single class and not as separate classes or series, and on an as-converted basis) shall be entitled to elect any remaining directors of the Corporation.

Notwithstanding the provisions of Section 223(a)(1) and 223(a)(2) of the General Corporation Law, any vacancy, including newly created directorships resulting from any increase in the authorized number of directors or amendment of this Certificate of Incorporation, and vacancies created by removal or resignation of a director, may be filled by a majority of the directors then in office, though less than a quorum, or by a sole remaining director, and the directors so chosen shall hold office until the next annual election and until their successors are duly elected and shall qualify, unless sooner displaced; provided, however, that where such vacancy occurs among the directors elected by the holders of a class or series of stock, the holders of shares of such class or series may override the Board's action to fill such vacancy by (i) voting for their own designee to fill such vacancy at a meeting of the Corporation's stockholders or (ii) written consent, if the consenting stockholders hold a sufficient number of shares to elect their designee at a meeting of the stockholders. Any director may be removed during his or her term of office, either with or without cause, by, and only by, the affirmative vote of the holders of the shares of the class or series of stock entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or pursuant to a written consent of stockholders, and any vacancy thereby created may be filled by the holders of that class or series of stock represented at the meeting or pursuant to written consent.

FIFTH: In furtherance of and not in limitation of powers conferred by statute, it is further provided that:

(a) Elections of directors need not be by written ballot unless, and only to the extent, otherwise provided in the Bylaws;

(b) Meetings of stockholders may be held within or without the State of Delaware, as the Bylaws may provide; and

(c) Subject to any applicable requirements of law, the books of the Corporation may be kept outside the State of Delaware at such locations as may be designated by the Board of Directors or in the Bylaws of the Corporation.

SIXTH: Whenever a compromise or arrangement is proposed between this Corporation and its creditors or any class of them and/or between this Corporation and its stockholders or any class of them, any court of equitable jurisdiction within the State of Delaware may, on the application in a summary way of this Corporation or of any creditor or stockholder thereof or on the application of any receiver or receivers appointed for this Corporation under the provisions of Section 291 of Title 8 of the Delaware Code or on the application of trustees in dissolution or of any receiver or receivers appointed for this Corporation under the provisions Section 279 of Title 8 of the Delaware Code, order a meeting of the creditors or class of creditors, and/or of the stockholders or class of stockholders of this Corporation, as the case may be, to be summoned in such manner as the said court directs. If a majority in number representing three-fourths in value of the creditors or class of creditors, and/or of the stockholders or class of stockholders of this Corporation, as the case may be, agree to any compromise or arrangement and to any reorganization of this Corporation as a consequence of such compromise or arrangement, the said compromise or arrangement and the said reorganization shall, if sanctioned by the court to which the said application has been made, be binding on all the creditors or class of creditors, and/or on all the stockholders or class of stockholders, of this Corporation, as the case may be, and also on this Corporation.


SEVENTH: (a) To the fullest extent permitted by the Delaware General Corporation Law as the same exists or as may hereafter be amended, a director of the Corporation shall not be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director.

(a) The Corporation shall indemnify to the fullest extent permitted by law any person made or threatened to be made a party to an action or proceeding, whether criminal, civil, administrative or investigative, by reason of the fact that he, his testator or intestate is or was a director or executive officer of the Corporation or any predecessor of the Corporation or serves or served any other enterprise as a director or executive officer at the request of the Corporation or any predecessor to the Corporation. The Corporation shall have the authority upon approval of the Board of Directors to indemnify any other officer and employee of the Corporation.

(b) Neither any amendment nor repeal of this Article SEVENTH, nor the adoption of any provision of the Corporation's Certificate of Incorporation inconsistent with this Article SEVENTH, shall eliminate or reduce the effect of this Article SEVENTH in respect of any matter occurring, or any action or proceeding accruing or arising or that, but for this Article SEVENTH, would accrue or arise, prior to such amendment, repeal or adoption of an inconsistent provision.

IN WITNESS WHEREOF, the Corporation has caused this Fifth Amended and Restated Certificate of Incorporation to be signed by its Chief Executive Officer this 21st day of December 2006.

APOGEE PHOTONICS, INC.

By:   
Michael P. Decolle, President and Chief  
Executive Officer

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