

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM S-8

REGISTRATION STATEMENT

UNDER

THE SECURITIES ACT OF 1933

AXCELIS TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

DELAWARE

34-1818596

(State or other jurisdiction of
incorporation or organization)

(I.R.S. Employer Identification No.)

55 CHERRY HILL DRIVE
BEVERLY, MASSACHUSETTS 01915

(Address of principal executive offices)

AXCELIS TECHNOLOGIES, INC. EMPLOYEE STOCK PURCHASE PLAN
(Full title of the plan)

BRIAN R. BACHMAN
VICE CHAIRMAN AND CHIEF EXECUTIVE OFFICER
AXCELIS TECHNOLOGIES, INC.

55 CHERRY HILL DRIVE
BEVERLY, MASSACHUSETTS 01915

(Name and address of agent for service)

(978) 232-4001

(Telephone number, including area code, of agent for service)

CALCULATION OF REGISTRATION FEE

TITLE OF SECURITIES TO BE REGISTERED	AMOUNT TO BE REGISTERED(1)	PROPOSED MAXIMUM OFFERING PRICE PER SHARE	PROPOSED MAXIMUM AGGREGATE OFFERING PRICE	AMOUNT OF REGISTRATION FEE
Common Stock, par value \$0.001 per share (2)	7,500,000	\$9.84375 (3)	\$73,828,125	\$19,491

(1) This Registration Statement also registers additional securities to be offered or issued upon adjustments or changes made to registered securities by reason of any stock splits, stock dividends or similar transactions as permitted by Rule 416(a) and Rule 416(b) under the Securities Act of 1933, as amended (the "Securities Act"). In addition, pursuant to Rule 416(c) under the Securities Act, this Registration Statement covers an indeterminate number of interests to be offered or sold pursuant to the Axcelis Technologies, Inc. Employee Stock Purchase Plan.

(2) Includes preferred stock purchase rights. Prior to the occurrence of certain events, the preferred stock purchase rights will not be evidenced separately from the Common Stock.

(3) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(h) under the Securities Act. The fee is calculated on the basis of the average of the high and low prices for the Registrant's Common

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

ITEM 3. INCORPORATION OF DOCUMENTS BY REFERENCE.

The following documents filed by the Registrant with the Securities and Exchange Commission (the "Commission") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), or the Securities Exchange Act of 1934, as amended (the "Exchange Act"), are incorporated by reference into this Registration Statement: (i) the Registrant's prospectus filed pursuant to Rule 424(b) under the Act on July 11, 2000, which contains audited financial statements for the fiscal year ended December 31, 1999; and (ii) the description of the Registrant's Common Stock contained in the Registrant's Registration Statement on Form 8-A filed with the Commission on July 3, 2000.

All documents subsequently filed by the Registrant with the Commission pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act after the date of this Registration Statement, but prior to the filing of a post-effective amendment to this Registration Statement which indicates that all securities offered by this Registration Statement have been sold or which deregisters all such securities then remaining unsold, shall be deemed to be incorporated by reference into this Registration Statement. Each document incorporated by reference into this Registration Statement shall be deemed to be a part of this Registration Statement from the date of filing of such document with the Commission until the information contained therein is superseded or updated by any subsequently filed document which is incorporated by reference into this Registration Statement or by any document which constitutes part of the prospectus relating to the Axcelis Technologies, Inc. Employee Stock Purchase Plan meeting the requirements of Section 10(a) of the Securities Act.

ITEM 4. DESCRIPTION OF SECURITIES.

The class of securities to be offered under this Registration Statement is registered under Section 12 of the Exchange Act.

ITEM 5. INTERESTS OF NAMED EXPERTS AND COUNSEL

None.

ITEM 6. INDEMNIFICATION OF DIRECTORS AND OFFICERS.

Section 102(b)(7) of the Delaware General Corporation Law (the "DGCL") permits a Delaware corporation, in its certificate of incorporation, to limit or eliminate, subject to certain statutory limitations, the liability of a director to the corporation or its stockholders for monetary damages for breach of fiduciary duty, except for liability (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the DGCL, or (iv) for any transaction from which the director derived an improper personal benefit. Article 10 of the Registrant's Restated Certificate of Incorporation provides that no director of the Registrant shall be personally liable to the Registrant or its stockholders in accordance with the foregoing provisions of Section 102(b)(7).

Under Section 145 of the DGCL, a Delaware corporation has the power to indemnify directors and officers under certain prescribed circumstances and, subject to certain limitations, against certain costs and expenses, including attorneys' fees, actually and reasonably incurred in connection with any action, suit or proceeding, whether civil, criminal, administrative or investigative, to which any of them is a party by reason of being a director or officer of the Registrant if it is determined that the director or the officer acted in accordance with the applicable standard of conduct set forth in such statutory provision. Article 10 of the Registrant's Restated Certificate of Incorporation provides that any person who was or is made a party or is threatened to be made a

party to or is otherwise involved in any action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that such person is or was a director or an officer of the Registrant or is or was serving at the request of the Registrant as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust or other enterprise, including service with respect to an employee benefit plan, whether the basis of such proceeding is alleged action in an official capacity as a director, officer, employee or agent or in any capacity while serving as a director, officer, employee or agent, shall be indemnified and held harmless by the Registrant to the fullest extent authorized by the DGCL.

The Registrant has purchased directors' and officers' liability insurance covering certain liabilities which may be incurred by the officers and directors of the Registrant in connection with the performance of their duties. In addition, the Registrant has entered into indemnity agreements with its directors and executive officers that obligate the Registrant to indemnify such directors and executive officers to the fullest extent permitted by the DGCL.

ITEM 7. EXEMPTION FROM REGISTRATION CLAIMED.

Not Applicable.

ITEM 8. EXHIBITS.

The following exhibits are filed herewith or incorporated by reference as part of this Registration Statement:

EXHIBIT NO. -----	DESCRIPTION -----
4.1	Restated Certificate of Incorporation of the Registrant (incorporated by reference to Exhibit 3.1 of the Registrant's Registration Statement on Form S-1/A filed on June 15, 2000 (File No. 333-36330)).
4.2	Bylaws of the Registrant, as amended (incorporated by reference to Exhibit 3.2 to Registrant's Registration Statement on Form S-1/A filed on June 15, 2000 (File No. 333-36330)).
5.1	Opinion of Kirkpatrick & Lockhart LLP regarding the legality of the shares being registered hereunder (filed herewith).
23.1	Consent of Ernst & Young LLP (filed herewith).
23.2	Consent of Kirkpatrick & Lockhart LLP (included in the Opinion filed as Exhibit 5.1).
24.1	Power of Attorney (filed herewith).

ITEM 9. UNDERTAKINGS.

(a) The undersigned Registrant hereby undertakes:

(1) To file, during any period in which offers of 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;

(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;

(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) and (a)(1)(ii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the Commission by the Registrant pursuant to Section 13 or Section 15(d) of the Exchange Act that are incorporated by reference in this Registration Statement.

(2) That, for the purpose of determining any liability under the Securities Act, 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.

(b) The undersigned Registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the Registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Exchange Act 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.

* * *

(h) Insofar as indemnification for liabilities arising under the Securities Act 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 Commission such indemnification is against public policy as expressed in the Securities Act 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 and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Beverly, Commonwealth of Massachusetts, on this 8th day of November, 2000.

AXCELIS TECHNOLOGIES, INC.

By: /s/ Kevin M. Bisson

Kevin M. Bisson
Vice President and Controller

Pursuant to the requirements of the Securities Act, this Registration Statement has been signed by the following persons in the capacities and on the date(s) indicated:

SIGNATURE -----	CAPACITY -----	DATE ----
* ----- Brian R. Bachman	Vice Chairman and Chief Executive Officer (Principal Executive Officer)	November 8, 2000
* ----- Mary G. Puma	President, Chief Operating Officer and Director	November 8, 2000
* ----- Cornelius F. Moses, III	Executive Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)	November 8, 2000
* ----- Stephen R. Hardis	Chairman of the Board	November 8, 2000

SIGNATURE

CAPACITY

DATE

*

- -----
Alexander M. Cutler

Director

November 8, 2000

*

- -----
Philip S. Paul

Director

November 8, 2000

*

- -----
Naoki Takahashi

Director

November 8, 2000

*

- -----
Gary L. Tooker

Director

November 8, 2000

*By: /s/ Kevin M. Bisson, Attorney-in-Fact

Kevin M. Bisson
Vice President and Controller

Pursuant to the requirements of the Securities Act of 1933, the Plan Administrator of the Axcelis Technologies, Inc. Employee Stock Purchase Plan has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Beverly, Commonwealth of Massachusetts, on November 8, 2000.

AXCELIS TECHNOLOGIES, INC.
EMPLOYEE STOCK PURCHASE PLAN

By: /s/ Kevin M. Bisson

Kevin M. Bisson
Vice President and Controller

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24.1	Power of Attorney (filed herewith).

November 8, 2000

Axcelis Technologies, Inc.
55 Cherry Hill Drive
Beverly, Massachusetts 01915

Ladies and Gentlemen:

We are counsel to Axcelis Technologies, Inc. (the "Company") and we have acted as counsel for the Company in connection with the preparation of the Registration Statement on Form S-8 to be filed by the Company with the Securities and Exchange Commission for the registration under the Securities Act of 1933, as amended, of 7,500,000 shares of the Company's common stock, par value \$0.001 per share (the "Shares"), which are to be issued from time to time to certain employees of the Company and its affiliates in connection with the Axcelis Technologies, Inc. Employee Stock Purchase Plan (the "Plan").

We have examined the originals, certified copies or copies otherwise identified to our satisfaction as being true copies of the Plan and such other documents as we have deemed necessary or appropriate for purposes of this opinion.

Based on the foregoing, we are of the opinion that the Shares have been duly and validly authorized and reserved for issuance, and that the Shares, when issued under the terms of the Plan, will be legally and validly issued, fully paid and nonassessable.

We hereby consent to the filing of this opinion as Exhibit 5.1 to the Registration Statement.

Very truly yours,

/s/ Kirkpatrick & Lockhart LLP

CONSENT OF ERNST & YOUNG LLP

We consent to the incorporation by reference in the Registration Statement (Form S-8) pertaining to the Axcelis Technologies, Inc. Employee Stock Purchase Plan, of our report dated May 3, 2000, except for Note 19, as to which the date is June 14, 2000, with respect to the combined financial statements of Axcelis Technologies, Inc. included in its Prospectus filed on July 11, 2000, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Boston, Massachusetts
October 31, 2000

POWER OF ATTORNEY

We, the undersigned directors and officers of Axcelis Technologies, Inc., do hereby constitute and appoint Brian R. Bachman, Mary G. Puma and Kevin M. Bisson, or any of them, our true and lawful attorneys and agents, to do any and all acts and things in our name and on our behalf in our capacities as directors and officers and to execute any and all instruments for us and in our names in the capacities indicated below, which said attorneys and agents, or any of them, may deem necessary or advisable to enable said corporation to comply with the Securities Act of 1933, as amended, and any rules, regulations and requirements of the Securities and Exchange Commission, in connection with the registration of securities to be issued under the Axcelis Technologies, Inc. Employee Stock Purchase Plan and under the Axcelis Technologies, Inc. 2000 Stock Plan, including specifically, but without limitation, power and authority to sign for us or any of us in our names in the capacities indicated below, any and all registration statements and amendments (including post-effective amendments) thereto, and we do hereby ratify and confirm all that said attorneys and agents, or any of them, shall do or cause to be done by virtue hereof.

This power of attorney shall not apply to any registration statement or amendment filed after July 31, 2001.

IN WITNESS WHEREOF, this Power of Attorney has been signed as of the 15th day of October, 2000.

SIGNATURE -----	CAPACITY -----	DATE ----
/s/ Brian R. Bachman ----- Brian R. Bachman	Vice Chairman and Chief Executive Officer (Principal Executive Officer)	October 15, 2000
/s/ Mary G. Puma ----- Mary G. Puma	President, Chief Operating Officer and Director	October 15, 2000
/s/ Cornelius F. Moses, III ----- Cornelius F. Moses, III	Executive Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)	October 15, 2000
/s/ Stephen R. Hardis ----- Stephen R. Hardis	Chairman of the Board	October 15, 2000
/s/ Alexander M. Cutler ----- Alexander M. Cutler	Director	October 15, 2000
----- Ned C. Lautenbach	Director	
/s/ Philip S. Paul ----- Philip S. Paul	Director	October 15, 2000
/s/ Naoki Takahashi ----- Naoki Takahashi	Director	October 15, 2000
/s/ Gary L. Tooker ----- Gary L. Tooker	Director	October 15, 2000

