

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 8-A

FOR REGISTRATION OF CERTAIN CLASSES OF SECURITIES

PURSUANT TO SECTION 12(b) OR 12(g) OF THE

SECURITIES EXCHANGE ACT OF 1934

AXCELIS TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

Delaware

34-1818596

(State of incorporation or organization) (I.R.S. Employer Identification No.)

55 Cherry Hill Drive, Beverly, Massachusetts

01915

(Address of principal executive offices)

(Zip Code)

If this form relates to the registration of a class of securities pursuant to Section 12(b) of the Exchange Act and is effective pursuant to General Instruction A.(c), check the following box. []

If this form relates to the registration of a class of securities pursuant to Section 12(g) of the Exchange Act and is effective pursuant to General Instruction A.(d), check the following box. [X]

Securities Act registration statement file number to which this form relates: 333-36330

Securities to be registered pursuant to Section 12(b) of the Act:

None

(Title of class)

Securities to be registered pursuant to Section 12(g) of the Act:

Common Stock, Par Value \$0.001 Per Share

(Title of class)

Preferred Share Purchase Rights

(Title of class)

ITEM 1. Description of Registrant's Securities to be Registered.

This registration statement relates to the Common Stock, \$0.001 par value (the "Common Stock"), and the related Rights to purchase Preferred Stock (the "Preferred Share Purchase Rights") of Axcelis Technologies, Inc., a Delaware corporation (the "Company"). The information required in response to this Item with respect to the Common Stock and the Preferred Share Purchase Rights is set forth under the caption "Description of Capital Stock" in the form of prospectus that is included in the Company's Registration Statement on Form S-1, File No. 333-36330 (the "S-1 Registration Statement"), as filed with the Securities and Exchange Commission on May 4, 2000, and as subsequently amended and included in the prospectus to be filed pursuant to Rule 424(b) under the Securities Act. Such information is hereby incorporated herein by reference in its entirety.

ITEM 2. Exhibits.

The following exhibits are incorporated by reference from the S-1 Registration Statement.

Exhibit No. Description.

- 3.1 Amended and Restated Certificate of Incorporation of the registrant (incorporated by reference from Exhibit 3.1 to the S-1 Registration Statement).
- 3.2 Bylaws of the registrant, as amended (incorporated by reference from Exhibit 3.2 to the S-1 Registration Statement).
- 4.1 Specimen Stock Certificate (incorporated by reference from Exhibit 4.1 to the S-1 Registration Statement).
- 4.2 Rights Agreement between the registrant and the rights agent named therein (incorporated by reference from Exhibit 4.2 to the S-1 Registration Statement).

SIGNATURE

Pursuant to the requirements of Section 12 of the Securities Exchange Act of 1934, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereto duly authorized.

AXCELIS TECHNOLOGIES, INC.

Date: June 30, 2000

By: /S/ BRIAN R. BACHMAN

Brian R. Bachman
Vice Chairman and Chief Executive Officer