

SCHEDULE 13G

Amendment No. 4
Axcelis Technologies Incorporated
Common Stock
Cusip #054540109

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Item 1: Reporting Person - FMR Corp.
Item 4: Delaware
Item 5: 939,800
Item 6: 0
Item 7: 15,194,609
Item 8: 0
Item 9: 15,194,609
Item 11: 15.000%
Item 12: HC

Cusip #054540109
Item 1: Reporting Person - Edward C. Johnson 3d
Item 4: United States of America
Item 5: 0
Item 6: 0
Item 7: 15,194,609
Item 8: 0
Item 9: 15,194,609
Item 11: 15.000%
Item 12: IN

SCHEDULE 13G - TO BE INCLUDED IN
STATEMENTS
FILED PURSUANT TO RULE 13d-1(b) or 13d-2(b)

Item 1(a). Name of Issuer:
Axcelis Technologies Incorporated

Item 1(b). Name of Issuer's Principal Executive Offices:
108 Cherry Hill Drive
Beverly, MA 01915

Item 2(a). Name of Person Filing:
FMR Corp.

Item 2(b). Address or Principal Business Office or, if None,
Residence:
82 Devonshire Street, Boston,
Massachusetts 02109

Item 2(c). Citizenship:
Not applicable

Item 2(d). Title of Class of Securities:
Common Stock

Item 2(e). CUSIP Number:
054540109

Item 3. This statement is filed pursuant to Rule 13d-1(b) or 13d-2(b) and the person filing, FMR Corp., is a parent holding company in accordance with Section 240.13d-1(b)(ii)(G). (Note: See Item 7).

Item 4. Ownership

(a) Amount Beneficially Owned: 15,194,609

(b) Percent of Class: 15.000%

(c) Number of shares as to which such person has:

(i) sole power to vote or to direct the vote: 939,800

(ii) shared power to vote or to direct the vote: 0

(iii) sole power to dispose or to direct the disposition of: 15,194,609

(iv) shared power to dispose or to direct the disposition of: 0

Item 5. Ownership of Five Percent or Less of a Class.

Not applicable.

Item 6. Ownership of More than Five Percent on Behalf of Another Person.

Various persons have the right to receive or the power to direct the receipt of dividends from, or the proceeds from the sale of, the Common Stock of Axcelis Technologies Incorporated. The interest of one person, Fidelity Low Priced Stock Fund, an investment company registered under the Investment Company Act of 1940, in the Common Stock of Axcelis Technologies Incorporated, amounted to 9,000,004 shares or 8.885% of the total outstanding Common Stock at December 31, 2006.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on By the Parent Holding Company.

See attached Exhibit A.

Item 8. Identification and Classification of Members of the Group.

Not applicable. See attached Exhibit A.

Item 9. Notice of Dissolution of Group.

Not applicable.

Item 10. Certification.

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were acquired in the ordinary course of business and were not acquired for the purpose of and do not have the effect of changing or influencing the control of the issuer of such securities and were not acquired in connection with or as a participant in any transaction having such purpose or effect.

Signature

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

February 14, 2007
Date

/s/Eric D. Roiter
Signature

Eric D, Roiter
Duly authorized under Power of Attorney
dated December 30, 1997 by and on behalf of FMR Corp. and
its direct and indirect subsidiaries

Pursuant to the instructions in Item 7 of Schedule 13G, Fidelity Management & Research Company ("Fidelity"), 82 Devonshire Street, Boston, Massachusetts 02109, a wholly-owned subsidiary of FMR Corp. and an investment adviser registered under Section 203 of the Investment Advisers Act of 1940, is the beneficial owner of 14,178,109 shares or 13.997% of the Common Stock outstanding of Axcelis Technologies Incorporated ("the Company") as a result of acting as investment adviser to various investment companies registered under Section 8 of the Investment Company Act of 1940.

The ownership of one investment company, Fidelity Low Priced Stock Fund, amounted to 9,000,004 shares or 8.885% of the Common Stock outstanding. Fidelity Low Priced Stock Fund has its principal business office at 82 Devonshire Street, Boston, Massachusetts 02109.

Edward C. Johnson 3d and FMR Corp., through its control of Fidelity, and the funds each has sole power to dispose of the 14,178,109 shares owned by the Funds.

Members of the family of Edward C. Johnson 3d, Chairman of FMR Corp., are the predominant owners, directly or through trusts, of Series B shares of common stock of FMR Corp., representing 49% of the voting power of FMR Corp. The Johnson family group and all other Series B shareholders have entered into a shareholders' voting agreement under which all Series B shares will be voted in accordance with the majority vote of Series B shares. Accordingly, through their ownership of voting common stock and the execution of the shareholders' voting agreement, members of the Johnson family may be deemed, under the Investment Company Act of 1940, to form a controlling group with respect to FMR Corp.

Neither FMR Corp. nor Edward C. Johnson 3d, Chairman of FMR Corp., has the sole power to vote or direct the voting of the shares owned directly by the Fidelity Funds, which power resides with the Funds' Boards of Trustees. Fidelity carries out the voting of the shares under written guidelines established by the Funds' Boards of Trustees.

Fidelity Management Trust Company, 82 Devonshire Street, Boston, Massachusetts 02109, a wholly-owned subsidiary of FMR Corp. and a bank as defined in Section 3(a)(6) of the Securities Exchange Act of 1934, is the beneficial owner of 42,100 shares or 0.042% of the Common Stock outstanding of the Company as a result of its serving as investment manager of the institutional account(s).

Edward C. Johnson 3d and FMR Corp., through its control of Fidelity Management Trust Company, each has sole dispositive power over 42,100 shares and sole power to vote or to direct the voting of 42,100 shares of Common Stock owned by the institutional account(s) as reported above.

Pyramis Global Advisors Trust Company ("PGATC"), 53 State Street, Boston, Massachusetts, 02109, an indirect wholly-owned subsidiary of FMR Corp. and a bank as defined in Section 3(a)(6) of the Securities Exchange Act of 1934, is the beneficial owner of 974,400 shares or 0.962% of the outstanding Common Stock of the Axcelis Technologies Incorporated as a result of its serving as investment manager of institutional accounts owning such shares.

Edward C. Johnson 3d and FMR Corp., through its control of Pyramis Global Advisors Trust Company, each has sole dispositive power over 974,400 shares and sole power to vote or to direct the voting of 870,000 shares of Common Stock owned by the institutional accounts managed by PGATC as reported above.

The undersigned persons, on February 14, 2007, agree and consent to the joint filing on their behalf of this Schedule 13G in connection with their beneficial ownership of the Common Stock of Axcelis Technologies Incorporated at December 31, 2006.

FMR Corp.

By /s/ Eric D. Roiter
Eric D. Roiter

Duly authorized under Power of Attorney dated December 30, 1997, by and on behalf of FMR Corp. and its direct and indirect subsidiaries

Edward C. Johnson 3d

By /s/ Eric D. Roiter
Eric D. Roiter

Duly authorized under Power of Attorney dated December 30, 1997, by and on behalf of Edward C. Johnson 3d

Fidelity Management & Research Company

By /s/ Eric D. Roiter
Eric D. Roiter
Senior V.P. and General Counsel

Fidelity Low Priced Stock Fund

By /s/ Eric D. Roiter
Eric D. Roiter
Secretary