

Schedule 13G

Under the Securities Exchange Act of 1934  
(New)

AXCELIS TECHNOLOGIES INC  
(Name of Issuer)

Common Stock  
(Title of Class of Securities)

054540109  
(CUSIP Number)

December 31, 2006  
(Date of Event Which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this  
Schedule is filed:

Rule 13d-1(b)

\*The remainder of this cover page shall be filled out for a reporting  
person's initial filing on this form with respect to the subject class  
of securities, and for any subsequent amendment containing information which  
would alter the disclosures provided in a prior page.

The information required in the remainder of this cover page shall not  
be deemed to be "filed" for the purpose of Section 18 of the Securities  
Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that  
section of the Act but shall be subject to all other provisions of the Act  
(however, see the Notes).

CUSIP No. 054540109  
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-----  
(1) Names of Reporting Persons.  
I.R.S. Identification Nos. of above persons (entities only).

BARCLAYS GLOBAL INVESTORS, NA., 943112180  
-----

(2) Check the appropriate box if a member of a Group\*  
(a) / /  
(b) /X/

-----  
(3) SEC Use Only

-----  
(4) Citizenship or Place of Organization  
U.S.A.

-----  
Number of Shares  
Beneficially Owned  
by Each Reporting  
Person With

(5) Sole Voting Power  
1,774,660  
-----

(6) Shared Voting Power  
-  
-----

(7) Sole Dispositive Power  
2,151,285  
-----

(8) Shared Dispositive Power  
-  
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-----  
(9) Aggregate Amount Beneficially Owned by Each Reporting Person  
2,151,285  
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(10) Check Box if the Aggregate Amount in Row (9) Excludes Certain Shares\*  
-----

(11) Percent of Class Represented by Amount in Row (9)  
2.12%  
-----

(12) Type of Reporting Person\*  
BK

CUSIP No. 054540109  
-----

(1) Names of Reporting Persons.  
I.R.S. Identification Nos. of above persons (entities only).

BARCLAYS GLOBAL FUND ADVISORS

(2) Check the appropriate box if a member of a Group\*

(a) / /

(b) /X/

(3) SEC Use Only

(4) Citizenship or Place of Organization  
U.S.A.

Number of Shares  
Beneficially Owned  
by Each Reporting  
Person With

(5) Sole Voting Power  
3,160,659

(6) Shared Voting Power  
-

(7) Sole Dispositive Power  
3,160,659

(8) Shared Dispositive Power  
-

(9) Aggregate Amount Beneficially Owned by Each Reporting Person  
3,160,659

(10) Check Box if the Aggregate Amount in Row (9) Excludes Certain Shares\*

(11) Percent of Class Represented by Amount in Row (9)  
3.12%

(12) Type of Reporting Person\*  
IA

CUSIP No. 054540109  
-----

(1) Names of Reporting Persons.  
I.R.S. Identification Nos. of above persons (entities only).

BARCLAYS GLOBAL INVESTORS, LTD

(2) Check the appropriate box if a member of a Group\*

(a) / /

(b) /X/

(3) SEC Use Only

(4) Citizenship or Place of Organization  
England

Number of Shares  
Beneficially Owned  
by Each Reporting  
Person With

(5) Sole Voting Power  
64,521

(6) Shared Voting Power  
-

(7) Sole Dispositive Power  
64,521

(8) Shared Dispositive Power  
-

(9) Aggregate  
64,521

(10) Check Box if the Aggregate Amount in Row (9) Excludes Certain Shares\*

(11) Percent of Class Represented by Amount in Row (9)  
0.06%

(12) Type of Reporting Person\*  
BK

CUSIP No. 054540109

(1) Names of Reporting Persons.  
I.R.S. Identification Nos. of above persons (entities only).

BARCLAYS GLOBAL INVESTORS JAPAN TRUST AND BANKING COMPANY LIMITED

(2) Check the appropriate box if a member of a Group\*

(a) / /

(b) /X/

(3) SEC Use Only

(4) Citizenship or Place of Organization  
Japan

Number of Shares  
Beneficially Owned  
by Each Reporting  
Person With

(5) Sole Voting Power

-

(6) Shared Voting Power

-

(7) Sole Dispositive Power

-

(8) Shared Dispositive Power

-

(9) Aggregate

-

(10) Check Box if the Aggregate Amount in Row (9) Excludes Certain Shares\*

(11) Percent of Class Represented by Amount in Row (9)  
0.00%

(12) Type of Reporting Person\*  
BK

CUSIP No. 054540109

(1) Names of Reporting Persons.  
I.R.S. Identification Nos. of above persons (entities only).

BARCLAYS GLOBAL INVESTORS JAPAN LIMITED

(2) Check the appropriate box if a member of a Group\*

(a) / /

(b) /X/

(3) SEC Use Only

(4) Citizenship or Place of Organization  
Japan

Number of Shares  
Beneficially Owned  
by Each Reporting  
Person With

(5) Sole Voting Power

-

(6) Shared Voting Power

-----  
(7) Sole Dispositive Power  
-----

-----  
(8) Shared Dispositive Power  
-----

-----  
(9) Aggregate  
-----

-----  
(10) Check Box if the Aggregate Amount in Row (9) Excludes Certain Shares\*  
-----

-----  
(11) Percent of Class Represented by Amount in Row (9)  
0.00%  
-----

-----  
(12) Type of Reporting Person\*  
IA  
-----

-----  
ITEM 1(A). NAME OF ISSUER  
AXCELIS TECHNOLOGIES INC  
-----

-----  
ITEM 1(B). ADDRESS OF ISSUER'S PRINCIPAL EXECUTIVE OFFICES  
108 CHERRY HILLS DR  
BEVERLY, MA 01915  
-----

-----  
ITEM 2(A). NAME OF PERSON(S) FILING  
BARCLAYS GLOBAL INVESTORS, NA  
-----

-----  
ITEM 2(B). ADDRESS OF PRINCIPAL BUSINESS OFFICE OR, IF NONE, RESIDENCE  
45 Fremont Street  
San Francisco, CA 94105  
-----

-----  
ITEM 2(C). CITIZENSHIP  
U.S.A  
-----

-----  
ITEM 2(D). TITLE OF CLASS OF SECURITIES  
Common Stock  
-----

-----  
ITEM 2(E). CUSIP NUMBER  
054540109  
-----

-----  
ITEM 3. IF THIS STATEMENT IS FILED PURSUANT TO RULES 13D-1(B),  
OR 13D-2(B), CHECK WHETHER THE PERSON FILING IS A

- (a) // Broker or Dealer registered under Section 15 of the Act  
(15 U.S.C. 78o).
- (b) /X/ Bank as defined in section 3(a) (6) of the Act (15 U.S.C. 78c).
- (c) // Insurance Company as defined in section 3(a) (19) of the Act  
(15 U.S.C. 78c).
- (d) // Investment Company registered under section 8 of the Investment  
Company Act of 1940 (15 U.S.C. 80a-8).
- (e) // Investment Adviser in accordance with section 240.13d(b)(1)(ii)(E).
- (f) // Employee Benefit Plan or endowment fund in accordance with section  
240.13d-1(b)(1)(ii)(F).
- (g) // Parent Holding Company or control person in accordance with section  
240.13d-1(b)(1)(ii)(G).
- (h) // A savings association as defined in section 3(b) of the Federal Deposit  
Insurance Act (12 U.S.C. 1813).
- (i) // A church plan that is excluded from the definition of an investment  
company under section 3(c)(14) of the Investment Company Act of 1940  
(15U.S.C. 80a-3).
- (j) // Group, in accordance with section 240.13d-1(b)(1)(ii)(J)

-----  
ITEM 1(A). NAME OF ISSUER  
AXCELIS TECHNOLOGIES INC  
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ITEM 1(B). ADDRESS OF ISSUER'S PRINCIPAL EXECUTIVE OFFICES  
108 CHERRY HILLS DR  
BEVERLY, MA 01915  
-----

-----  
ITEM 2(A). NAME OF PERSON(S) FILING  
BARCLAYS GLOBAL FUND ADVISORS  
-----

ITEM 2(B). ADDRESS OF PRINCIPAL BUSINESS OFFICE OR, IF NONE, RESIDENCE  
45 Fremont Street  
San Francisco, CA 94105

ITEM 2(C). CITIZENSHIP  
U.S.A

ITEM 2(D). TITLE OF CLASS OF SECURITIES  
Common Stock

ITEM 2(E). CUSIP NUMBER  
054540109

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- (j) // Group, in accordance with section 240.13d-1(b)(1)(ii)(J)

ITEM 1(A). NAME OF ISSUER  
AXCELIS TECHNOLOGIES INC

ITEM 1(B). ADDRESS OF ISSUER'S PRINCIPAL EXECUTIVE OFFICES  
108 CHERRY HILLS DR  
BEVERLY, MA 01915

ITEM 2(A). NAME OF PERSON(S) FILING  
BARCLAYS GLOBAL INVESTORS, LTD

ITEM 2(B). ADDRESS OF PRINCIPAL BUSINESS OFFICE OR, IF NONE, RESIDENCE  
Murray House  
1 Royal Mint Court  
LONDON, EC3N 4HH

ITEM 2(C). CITIZENSHIP  
England

ITEM 2(D). TITLE OF CLASS OF SECURITIES  
Common Stock

ITEM 2(E). CUSIP NUMBER  
054540109

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- (j) // Group, in accordance with section 240.13d-1(b)(1)(ii)(J)

ITEM 1(A). NAME OF ISSUER  
AXCELIS TECHNOLOGIES INC

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ITEM 1(B). ADDRESS OF ISSUER'S PRINCIPAL EXECUTIVE OFFICES  
108 CHERRY HILLS DR  
BEVERLY, MA 01915  
-----

ITEM 2(A). NAME OF PERSON(S) FILING  
BARCLAYS GLOBAL INVESTORS JAPAN TRUST AND BANKING COMPANY LIMITED  
-----

ITEM 2(B). ADDRESS OF PRINCIPAL BUSINESS OFFICE OR, IF NONE, RESIDENCE  
Ebisu Prime Square Tower 8th Floor  
1-1-39 Hiroo Shibuya-Ku  
Tokyo 150-0012 Japan  
-----

ITEM 2(C). CITIZENSHIP  
Japan  
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ITEM 2(D). TITLE OF CLASS OF SECURITIES  
Common Stock  
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ITEM 2(E). CUSIP NUMBER  
054540109  
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BEVERLY, MA 01915  
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BARCLAYS GLOBAL INVESTORS JAPAN LIMITED  
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ITEM 2(B). ADDRESS OF PRINCIPAL BUSINESS OFFICE OR, IF NONE, RESIDENCE  
Ebisu Prime Square Tower 8th Floor  
1-1-39 Hiroo Shibuya-Ku  
Tokyo 150-8402 Japan  
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ITEM 2(C). CITIZENSHIP  
Japan  
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ITEM 2(D). TITLE OF CLASS OF SECURITIES  
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- (j) // Group, in accordance with section 240.13d-1(b)(1)(ii)(J)

ITEM 4. OWNERSHIP

Provide the following information regarding the aggregate number and percentage of the class of securities of the issuer identified in Item 1.

(a) Amount Beneficially Owned:  
5,376,465

(b) Percent of Class:  
5.30%

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

- (i) sole power to vote or to direct the vote  
4,999,840
- (ii) shared power to vote or to direct the vote  
-
- (iii) sole power to dispose or to direct the disposition of  
5,376,465
- (iv) shared power to dispose or to direct the disposition of  
-

ITEM 5. OWNERSHIP OF FIVE PERCENT OR LESS OF A CLASS

If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following. //

ITEM 6. OWNERSHIP OF MORE THAN FIVE PERCENT ON BEHALF OF ANOTHER PERSON

The shares reported are held by the company in trust accounts for the economic benefit of the beneficiaries of those accounts. See also Items 2(a) above.

ITEM 7. IDENTIFICATION AND CLASSIFICATION OF THE SUBSIDIARY WHICH ACQUIRED THE SECURITY BEING REPORTED ON BY THE PARENT HOLDING COMPANY

Not applicable

ITEM 8. IDENTIFICATION AND CLASSIFICATION OF MEMBERS OF THE GROUP

Not applicable

ITEM 9. NOTICE OF DISSOLUTION OF GROUP

Not applicable

ITEM 10. CERTIFICATION

(a) The following certification shall be included if the statement is filed pursuant to section 240.13d-1(b):

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

(b) The following certification shall be included if the statement is filed pursuant to section 240.13d-1(c):

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

January 9, 2007

-----  
Date

-----  
Signature

Robert J. Kamai  
Principal

-----  
Name/Title