

SCHEDULE 13G/A
Under the Securities Exchange Act of 1934
Amendment No. 1*

Axcelis Technologies, Inc.
(Name of Issuer)

Common
(Title of Class of Securities)

054540208
(CUSIP Number)

September 29, 2016
(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)
- Rule 13d-1(c)
- Rule 13d-1(d)

*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 cover 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. 054540208

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

Donald Smith & Co., Inc.
13-2807845

2. Check the Appropriate Box if a Member of a Group (See Instructions)

- (a)
- (b)

3. SEC Use Only

4. Citizenship or Place of Organization
A Delaware Corporation

| | | |
|---|-----------------------------|------------------|
| Number of Shares Beneficially Owned by Each Reporting Person With | 5. Sole Voting Power | 2,719,015 shares |
| | 6. Shared Voting Power | 0 |
| | 7. Sole Dispositive Power | 2,987,305 shares |
| | 8. Shared Dispositive Power | 0 |

9. Aggregate Amount Beneficially Owned by Each Reporting Person
2,987,305 shares

10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions)

11. Percent of Class Represented by Amount in Row (9) 10.25%

12. Type of Reporting Person (See Instructions) IA

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

Donald Smith Value Fund, L.P.
27-0229715

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)
(b) [X]

3. SEC Use Only

4. Citizenship or Place of Organization
A Delaware Corporation

| | | |
|---|-----------------------------|------------------|
| Number of Shares Beneficially Owned by Each Reporting Person With | 5. Sole Voting Power | 71,900 shares |
| | 6. Shared Voting Power | 0 |
| | 7. Sole Dispositive Power | 2,987,305 shares |
| | 8. Shared Dispositive Power | 0 |

9. Aggregate Amount Beneficially Owned by Each Reporting Person
2,987,305 shares

10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions)

11. Percent of Class Represented by Amount in Row (9) 10.25%

12. Type of Reporting Person (See Instructions) PN

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

Donald Smith Long/Short Equities Fund, L.P.
27-1481102

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)
(b) [X]

3. SEC Use Only

4. Citizenship or Place of Organization
A Delaware Corporation

| | | |
|---|-----------------------------|------------------|
| Number of Shares Beneficially Owned by Each Reporting Person With | 5. Sole Voting Power | 13,040 shares |
| | 6. Shared Voting Power | 0 |
| | 7. Sole Dispositive Power | 2,987,305 shares |
| | 8. Shared Dispositive Power | 0 |

9. Aggregate Amount Beneficially Owned by Each Reporting Person
2,987,305 shares

10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions)

11. Percent of Class Represented by Amount in Row (9) 10.25%

12. Type of Reporting Person (See Instructions) PN

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

Velin Mezhnev

2. Check the Appropriate Box if a Member of a Group (See Instructions)

(a)
(b)

3. SEC Use Only

4. Citizenship or Place of Organization
A Delaware Corporation

| | | |
|---|-----------------------------|------------------|
| Number of Shares Beneficially Owned by Each Reporting Person With | 5. Sole Voting Power | 6,950 shares |
| | 6. Shared Voting Power | 0 |
| | 7. Sole Dispositive Power | 2,987,305 shares |
| | 8. Shared Dispositive Power | 0 |

9. Aggregate Amount Beneficially Owned by Each Reporting Person
2,987,305 shares

10. Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions)

11. Percent of Class Represented by Amount in Row (9) 10.25%

12. Type of Reporting Person (See Instructions) IN

Item 1.

- (a) Name of Issuer: Axcelis Technologies, Inc.
- (b) Address of Issuer's Principal Executive Offices
108 Cherry Hill Drive
Beverly, MA 01915

Item 2.

- (a) Name of Person Filing: Donald Smith & Co., Inc.
- (b) Address of Principal Business Office:
152 West 57th Street
New York, NY 10019
- (c) Citizenship: A Delaware Corporation
- (d) Title of Class of Securities: Common
- (e) CUSIP Number: 054540208

Item 3. This statement is filed pursuant to Section 240.13d-1(b), and the person filing is an investment advisor registered in accordance with Section 240.13d-1(b)(1)(ii)(E);

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: 2,987,305
- (b) Percent of class: 10.25%
- (c) Number of shares as to which the person has:
 - (i) SOLE POWER TO VOTE: 2,810,905
 - (ii) SHARED POWER TO VOTE: SEE ITEM 6 OF COVER PAGE
 - (iii) SOLE POWER TO DISPOSE: 2,987,305
 - (iv) SHARED POWER TO DISPOSE:

Item 5. Ownership of Five Percent or Less is
NOT APPLICABLE

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

1. Donald Smith & Co., Inc. does not serve as custodian of the assets of any of its clients; accordingly, in each instance only the client or the client's custodian or trustee bank has the right to receive dividends paid with respect to, and proceeds from the sale of, such securities.

The ultimate power to direct the receipt of dividends paid with respect to, and the proceeds from the sale of, such securities, is vested in the institutional clients which Donald Smith & Co., Inc. serves as investment advisor. Any and all discretionary authority which has been delegated to Donald Smith & Co., Inc. may be revoked in whole or in part at any time.

To the knowledge of Donald Smith & Co., Inc., with respect to all securities reported in this schedule owned by advisory clients of Donald Smith & Co., Inc., not more than 5% of the class of such securities is owned by any one client.

2. With respect to the remaining securities owned, 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, Inc. No one person's interest in the Common Stock of Axcelis Technologies, Inc. is more than five percent of the total outstanding Common Stock.

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
See EXHIBIT A

Item 9. Notice of Dissolution of Group
NOT APPLICABLE

Item 10. Certification

(a)

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.

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.

September 30, 2016
Date

Donald G. Smith _____
Signature

President _____
Title

SCHEDULE 13G - TO BE INCLUDED IN
STATEMENTS

FILED PURSUANT TO RULE 13d-1(b) or 13d-2(b)
RULE 13d-1(f)(1) EXHIBIT A:

Donald Smith & Co., Inc. IA
Donald Smith Value Fund, L.P. PN
Donald Smith Long/Short Equities Fund, L.P. PN
Velin Mezhnev, IN

SCHEDULE 13G - TO BE INCLUDED IN
STATEMENTS

FILED PURSUANT TO RULE 13d-1(b) or 13d-2(b)
RULE 13d-1(f)(1) AGREEMENT

The undersigned persons, on September 30, 2016, 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, Inc. at September 29, 2016.

Donald Smith & Co., Inc.

By /s/ Donald G. Smith
Donald G. Smith
President
Duly authorized by and on behalf of Donald Smith & Co., Inc.

Donald Smith Value Fund, L.P.

By /s/ Donald G. Smith
Donald G. Smith
President
Duly authorized by and on behalf of
Donald Smith Value Fund, L.P.

Donald Smith Long/Short Equities Fund, L.P.

By /s/ Donald G. Smith
Donald G. Smith
President
Duly authorized by and on behalf of
Donald Smith Long/Short Equities Fund, L.P

Velin Mezinev

By /s/ Donald G. Smith
Donald G. Smith
President
Duly authorized by and on behalf of Velin Mezinev