

Axcelis Technologies, Inc.
108 Cherry Hill Drive
Beverly, MA 01915

April 12, 2017

VIA EDGAR

Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, DC 20549
Attn: Mr. Tim Buchmiller

Re: Axcelis Technologies, Inc. Registration Statement on Form S-3 (File No. 333-217192)

Ladies and Gentlemen:

Pursuant to Rule 461 of the Securities Act of 1933, Axcelis Technologies, Inc. (the "Company") requests the acceleration of the effectiveness of the Registration Statement on Form S-3 (File No. 333-217192) for Friday, April 14, 2017 at 4:00 p.m. (EST), or as soon as possible thereafter.

In connection with this request, the Company acknowledges that:

- (i) should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- (ii) the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the Company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- (iii) the Company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

If you have any question regarding the foregoing, please call Matthew C. Dallett, Esq. of Locke Lord LLP at (617) 239-0303.

Very truly yours,

/s/ Lynnette C. Fallon

Lynnette C. Fallon

Executive Vice President, Human Resources/Legal and General Counsel

cc: Matthew C. Dallett
Locke Lord LLP
