



UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

DIVISION OF
CORPORATION FINANCE

Mail Stop 3030

September 6, 2017

Via E-mail

Mary G. Puma
President and Chief Executive Officer
Axcelis Technologies, Inc.
108 Cherry Hill Drive
Beverly, MA 01915

**Re: Axcelis Technologies, Inc.
Form 10-K for the fiscal year ended December 31, 2016
Filed March 14, 2017
File No. 000-30941**

Dear Ms. Puma:

We have reviewed your filing and have the following comment. In our comment, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to our comment within ten business days by providing the requested information or advise us as soon as possible when you will respond. If you do not believe our comment applies to your facts and circumstances, please tell us why in your response.

After reviewing your response to our comment, we may have additional comments.

Item 1. Business, page 2

1. In your future filings, disclose the name of any customer and its relationship, if any, with you or any of your subsidiaries if sales to the customer are made in an aggregate amount equal to 10 percent or more of your consolidated revenues and the loss of such customer would have a material adverse effect on you and your subsidiaries taken as a whole.

We remind you that the company and its management are responsible for the accuracy and adequacy of their disclosures, notwithstanding any review, comments, action or absence of action by the staff.

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Axcelis Technologies, Inc.
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Please contact Tim Buchmiller at (202) 551-3635 or Russell Mancuso, Legal Branch Chief, at (202) 551-3617 with any questions.

Sincerely,

/s/ Tim Buchmiller for

Amanda Ravitz
Assistant Director
Office of Electronics and Machinery

cc: Matthew C. Dallett, Esq.
Locke Lord LLP