



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

DIVISION OF  
CORPORATION FINANCE

Mail Stop 3030

September 18, 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 Fiscal Year Ended December 31, 2016  
Filed March 14, 2017  
File No. 000-30941**

Dear Ms. Puma:

We have completed our review of your filing. 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.

Sincerely,

/s/ Russell Mancuso

Russell Mancuso  
Branch Chief  
Office of Electronics and Machinery

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