ATTACHMENT 6

AEC-Q200-006
TERMINAL STRENGTH (SMD) TEST

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METHOD - 006
Terminal Strength (SMD) Test

Text enhancements and differences made since the last revision of this document are shown as underlined areas. Several figures and tables have also been revised, but changes to these areas have not been underlined.

Unless otherwise stated herein, the date of implementation of this standard for new qualifications and re-qualifications is as of the publish date above.

1 Scope

The purpose of this test is to verify that an external lateral (shear) force applied to a surface mount component (surface mount device – SMD), while soldered to a printed circuit board (PCB), would not adversely affect the component being tested. This lateral force could be present during manufacturing and handling of a finished PCB assembly.

For other attachment methods (for example conductive glue), it is outside the scope of this document and agreement between Supplier and User shall take place on how these attachment methods are tested.

2 Description

This test is designed to evaluate the effect of the lateral force on:
- the surface mount device (SMD), ie. component
- the joint between the component body and component terminals
- the joint between terminals and PCB

In the previous Revision A, this test verified the joint between terminations/lead frame of the SMD and the PCB. In Revision B, this is expanded to include the items listed above.

3 Reference Documents

AEC-Q200: Stress test qualification for passive electrical components.

IEC 60068-2-21: Environmental testing – Part 2-21: Tests – Test U- Robustness of terminations and integral mounting devices

IEC 60115-8: Fixed resistors for use in electronic equipment - Part 8: Sectional specification - Fixed surface mount resistors

4 Samples

4.1 Preparation

Unless otherwise specified, the SMD shall be tested while mounted onto a 0.062 inch (1.6mm ± 0.2mm) thick FR-4 PCB using 1 ounce (35µm ± 10µm) of copper plating.

The Manufacturer shall use the recommended pad layout for the component being tested. Mounting of the component shall be in accordance with provisions of AEC-Q200.

4.2 Sample Size

The total number of components and lots to be tested is listed in Table C of AEC-Q200 specification.

5 Test Procedure

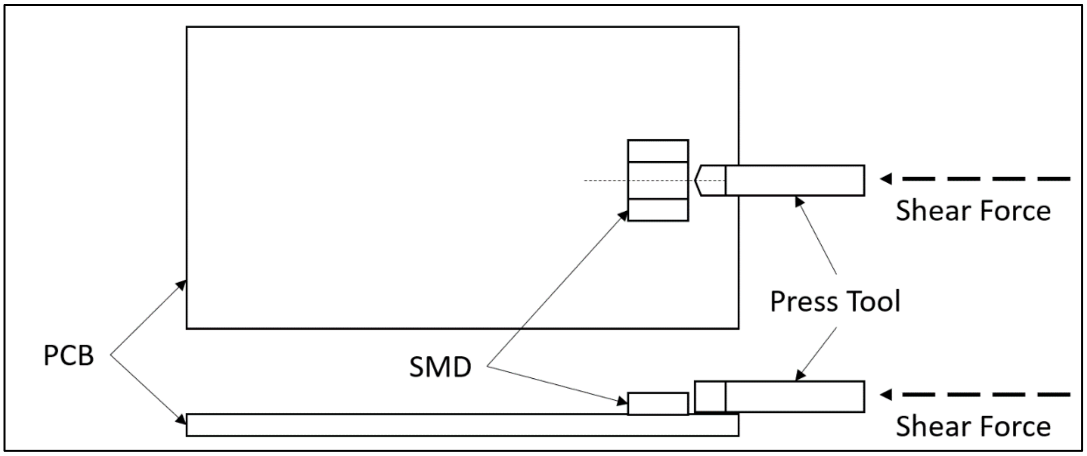
With the component mounted on a PCB as described in 4.1, the test shall be performed as follows:

a. Pre and post external visual and electrical verifications as required by AEC-Q200, shall comply with the applicable component specification.
b. Table 1 shall be used when applicable. For geometries and sizes not covered by Table 1, it is up to the Supplier to choose an appropriate force. Rationale for choosing a different force shall be provided to the User upon request.
c. Regardless of size or geometry, the duration of the applied force is 10 (+1,-0) seconds.
d. The force shall be gradually applied as not to apply a shock to the component.
e. The press tool shall apply an even force lateral to the component (see Example given in Figure 1). Care should be taken to reduce the torsional effect.
f. The shape and design of the press tool is determined by the Supplier and shall be provided to the User upon request.

Table 1: Shear Force
(Modified version of Table 9 of IEC 60115-8)

Size			Minimum Force (N)
Rectangular (Inches/mm)	**Transverse (Inches/mm)**	**Cylindrical (Inches/mm)**	
008004/0201	-	-	0.5
01005/0402	-	-	1
0201/0603	-	-	2
0402/1005	-	-	3
0603/1608	-	-	5
-	0204/0510	-	7
0805/2012	-	0102/2211	9
≥1206/3216	≥0306/0816	≥0204/3715	17.7

Figure 1: Example of Shear Force Direction



6 Failure Criteria

The following criteria would constitute failures of the test:

a. External Visual: Evidence of mechanical damage that would adversely affect the reliability of the component (examples: cracking of the component or its solder joint), or Component being partially or entirely sheared off from its pad.

b. Post-stress Test: Not meeting the individual component specification or manufacturer's data sheet.

Revision History

Rev #	Date of change	Brief summary listing affected paragraphs
-	February 15, 2005	Initial Release.
A	June 1, 2010	Notice Statement (Page 2) Added. Format Updated.
B	August 22, 2025	Changed test name from Terminal Strength (SMD) /Shear Stress Test to Terminal Strength (SMD) Test. Re-numbered section headings Updated “Scope” clause for clarification. Updated “Description” clause to clarify that this test addresses the entirety of the component on the PCB (this includes the component body, joint between body and terminals and joint between terminals and PCB). Moved ‘Equipment’ text to ‘Preparation. Added “Reference” section to include AEC-Q200, IEC 60068-2-21, and IEC 60115-8. Clarified the “Samples” section. Moved “Sample Size” clause from 3.1 to 4.2. For “Test Procedure” clause, enumerated the procedures, changed required force from 17.7N to either the use of Table 1 or force in accordance to Supplier recommendation, changed force duration from 60s to 10s, removed post-test inspection since there’s reference to pre and post-test visual inspection in new procedure. Replaced Figure 1 with updated figure. Expanded on “Failure Criteria” clause.