

METHOD 2038

SOLDER COLUMN PACKAGE DESTRUCTIVE LEAD PULL TEST

1. PURPOSE. This method provides a test for determining the integrity of solder column type package leads by measuring the capability of the package column to withstand an axial force.

2. APPARATUS. The apparatus for this test shall consist of suitable equipment for applying the specified stress to the package column. A calibrated measurement and indication of the applied stress in grams-force (gf) shall be provided by equipment capable of measuring stresses up to twice the specified minimum limit value, with an accuracy of ± 5 percent.

3. PROCEDURE. Tension only shall be applied, without shock, to each lead to be tested in a direction parallel to the axis of the lead. The tension shall be increased until the minimum acceptable pull strength is reached or upon separation of the lead from the package. The tension shall be applied as close to the end of the lead as possible, gripped on no more than half of the column length.

3.1 Pull Rate. Pull rate should not exceed 1.0 inch/minute.

3.2 Failure criteria. The minimum acceptable lead pull strength shall be 2,810 grams-force per square mm of cross-sectional lead area. For typical column diameters, minimum lead pull strengths are defined in table I below.

TABLE I. Minimum lead pull strength.

Column Diameter	Minimum Lead Pull Strength
0.55 mm (0.022 in)	670 grams-force
0.51 mm (0.020 in)	575 grams-force
0.41 mm (0.016 in)	370 grams-force
0.33 mm (0.013 in)	240 grams-force

3.3 Failure category. Failure categories are as follows:

- a. Column failure, where failure occurs through the core of the solder column.
- b. Pad/column joint failure, where failure occurs at the pad/column attach joint.
- c. Pad failure, where failure occurs when the pad is separated from the package.

4. SUMMARY. The following details shall be specified in the applicable acquisition document:

- a. Number of leads tested.
- b. Measured lead pull strength for each lead tested.
- c. Failure category for each lead tested.