

CHO-TWING
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TEST REPORT

Shock and Vibration Testing for T-WING^â Flexible Heat Spreaders

Prepared by:

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T-WING^a Shock and Vibration Study

Purpose:

To demonstrate the suitability of T-WING heat spreader for applications under shock and vibration, especially the ability of the T-WING heat spreader to adhere to the Plastic Quad Flatpack (PQFP) during shock and vibration.

Test Criterion:

The concern is the adhesion of the T-WING heat spreader to the PQFP after exposure to shock and vibration.

Procedure:

TOPLINE dummy components were used to simulate the PQFPs. The dummy components are actual components without the silicon die inside the package. These components were glued to the shock and vibration test plates which are roughly one inch thick aluminum square plates. They have been modified with bolt holes to securely anchor to the actual shock and vibration units.

Approximately 150 total PQFPs were glued to four aluminum plates. A distribution of T-WINGS were used for the test: 0.50 inch wide, 0.75 inch wide, 1.00 inch wide, 1.50 inches wide.

T-WING spreaders were manually installed onto the PQFPs. Hand pressure was used to apply the T-WING spreaders to the PQFPs. The T-WING spreaders were allowed to set for 30 minutes before initial pre-shock and vibration pull testing was performed.

PQFPs:

<u>Body Size</u>	<u>Dimensions</u>
Small PQFP	12mm x 12mm
Medium PQFP	18.5mm x 18.5mm
Intermediate PQFP	27mm x 27mm
Large PQFP	38mm x 38mm

Shock and Vibration Details:

The testing was done at Bell Technologies in Burlington, Massachusetts. The contact engineer at Bell Technologies is Norman Round.

Bell Technologies (formerly Associated Testing Laboratories)
53 Second Avenue
Burlington, MA 01803
781-272-9050 phone
781-272-8184 fax

Vibration Stress:

Random vibration (10 to 1,000 Hertz frequency) performed on 2 axes, with 2 G_{rms} to 12 G_{rms} amplitude; increasing by 2 G_{rms} increments; 10 minutes per step at 150 °F.

10 to 1,000 Hertz frequency

Shock Stress:

Will be at a peak of 60 Gs at a duration of 2 milliseconds. The test will be applied in 6 directions with 3 blows per direction.

Results:

All of the T-WING heat spreaders survived the testing, and none were loose or fell off any of the PQFPs. See data below showing the peel strength after shock and vibration.

Conclusion:

Chomerics' T-WING heat spreaders were not adversely affected by the shock and vibration as a result of their low weight and profile as well as the strength of the adhesive.

Peel Data after Shock and Vibration

T-WING Width	Number of Samples	Average Peel Strength	Average Peel Strength
0.50 inches	35	2.3 lbs./inch	36 oz. / inch
0.75 inches	10	1.4 lbs./inch	22 oz. / inch
0.75 inches	4	1.5 lbs./inch	23 oz. / inch
1.00 inches	18	2.1 lbs./inch	34 oz. / inch
1.00 inches	12	1.5 lbs./inch	24 oz. / inch
1.00 inches	12	1.9 lbs./inch	31 oz. / inch

Reference Technical Bulletin #71 for the control peel strength of 36 oz. / inch.