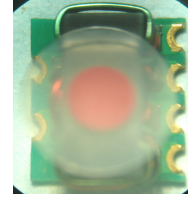


Reliability Test Report

M/A-Com Part Number: MABA-008980-CF0440
Part Type: Transformer
Platform: FR4 PCB Carrier
Test Laboratory: SGS-CSTC Standards Technical Services Co. LTD. Shenzhen China.

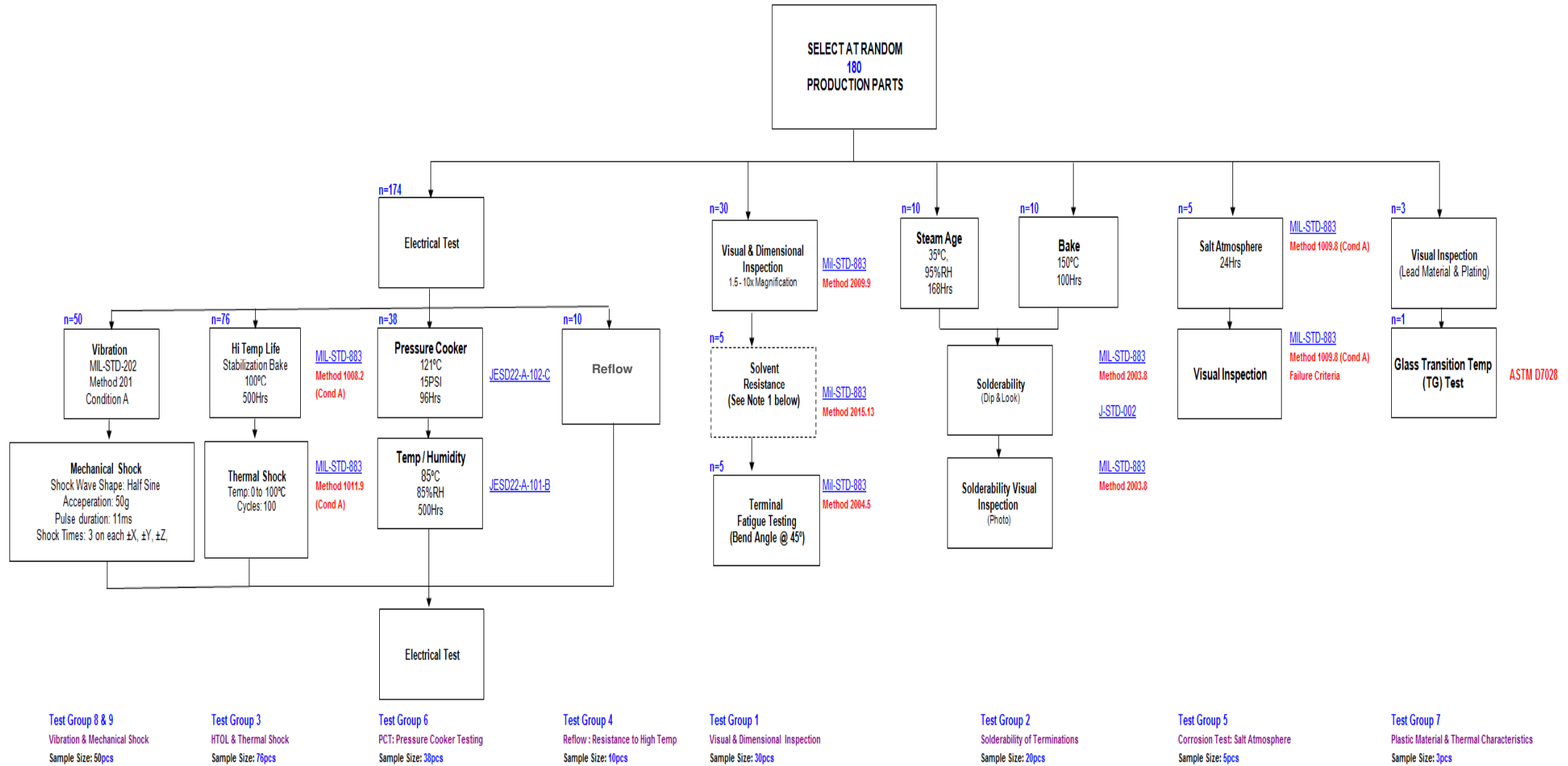


M/A-Com Part Numbers Qualified by Similarity: All FR4 Carriers

RELIABILITY TEST SUMMARY:

TEST GROUP	DESCRIPTION	TEST METHOD	TEST PARAMETERS / COMMENTS	EDCS-391692 REF #	SAMPLE SIZE	RESULT	REPORT SECTION REFERENCE
TEST GROUP 1	Visual & Dimensions	MIL-STD-883 Method 2009.9	Per visual spec	2.0.1	30	PASS	Section 1.1
	Solvent Resistance	MIL-STD-883 Method 2015.13	Perform at room temp	2.0.1	30	PASS	Section 1.2
	Terminal Fatigue	MIL-STD-883 Method 2004.5	Test Condition D	2.0.1	30	PASS	Section 1.3
TEST GROUP 2	Steam Age (10 Units)	N/A	35°C, 95%RH, 168Hrs	2.0.2	20	PASS	Section 2.1
	Bake (10 Units)	N/A	150°C, 100Hrs			PASS	Section 2.2
	Solderability	MIL-STD-883 Method 2003.8	Dip & Look			PASS	Section 2.3
	Solderability Visual	MIL-STD-883 Method 2003.8	Photos			PASS	
TEST GROUP 3	Electrical Test	N/A	MABA-008980-CF0440 Test File	2.0.3	76	PASS	Section 3.3
	Hi Temp. Life	MIL-STD-883 1008.2 COND.A	100°C, 500Hrs			PASS	Section 3.1
	Thermal Shock	MIL-STD-883 1011.9.COND.A	0°C to 100°C, 100 cycles			PASS	Section 3.2
	Electrical Test	N/A	MABA-008980-CF0440 Test File			PASS	Section 3.3
TEST GROUP 4	Electrical Test	N/A	MABA-008980-CF0440 Test File	2.0.4	10	PASS	Section 4.2
	Solder Temp. Shock	MIL-STD-750D Method 2031.2	260°C for 10Seconds	2.0.4	10	N/A	Test not required for SMT parts.
	IR/CONVECTION OVEN Profile	N/A	230°C for 30seconds	2.0.4	10	PASS	Section 4.1
	Electrical Test	N/A	MABA-008980-CF0440 Test File	2.0.4	10	PASS	Section 4.2
TEST GROUP 5	Salt Atmosphere	MIL-STD-883 1009.8 COND.A	24Hrs	2.0.5	5	PASS	Section 5.1
	Visual	MIL-STD-883 1009.8 COND.A	Failure Criteria			PASS	
TEST GROUP 6	Electrical Test	N/A	MABA-008980-CF0440 Test File	2.0.6	38	PASS	Section 6.3
	Pressure Cooker	JESD22-A-102-C	121°C, 15PSI, 96Hrs			PASS	Section 6.1
	Temp./Humidity	JESD22-A-101-B	85°C, 85%RH, 500Hrs			PASS	Section 6.2
	Electrical Test	N/A	MABA-008980-CF0440 Test File			PASS	Section 6.3
TEST GROUP 7	Lead Material & plating	Cross Section & XRF	Substrate Part Drawing	2.0.7	3	PASS	Section 7.1
	Glass Transition Temp (TG)	ASTM D7028	TG TEST	2.0.7	1	N/A	This test is not applicable to ceramic carriers
TEST GROUP 8 & 9	Electrical Test	N/A	MABA-008980-CF0440 Test File	2.0.8 & 2.0.9	50	PASS	Section 8.3
	Vibration	MIL-STD-202 Method 201 Condition A	Freq: 10Hz to 55Hz Displacement 1.524mm Swept Speed: 1min/cycle Orientation X,Y,Z axes Duration 2H/axis			PASS	Section 8.1
	Mechanical Shock	MIL-STD-202 Method 213B Condition A	Shock Wave Shape: Half Sine Acceleration: 50g Pulse duration: 11ms Shock Times: 3 on each ±X, ±Y, ±Z,			PASS	Section 8.2
	Electrical Test	N/A	MABA-008980-CF0440 Test File			PASS	Section 8.3

Reliability flow Chart:



Test Group 1

1.1 Dimensional Analysis:

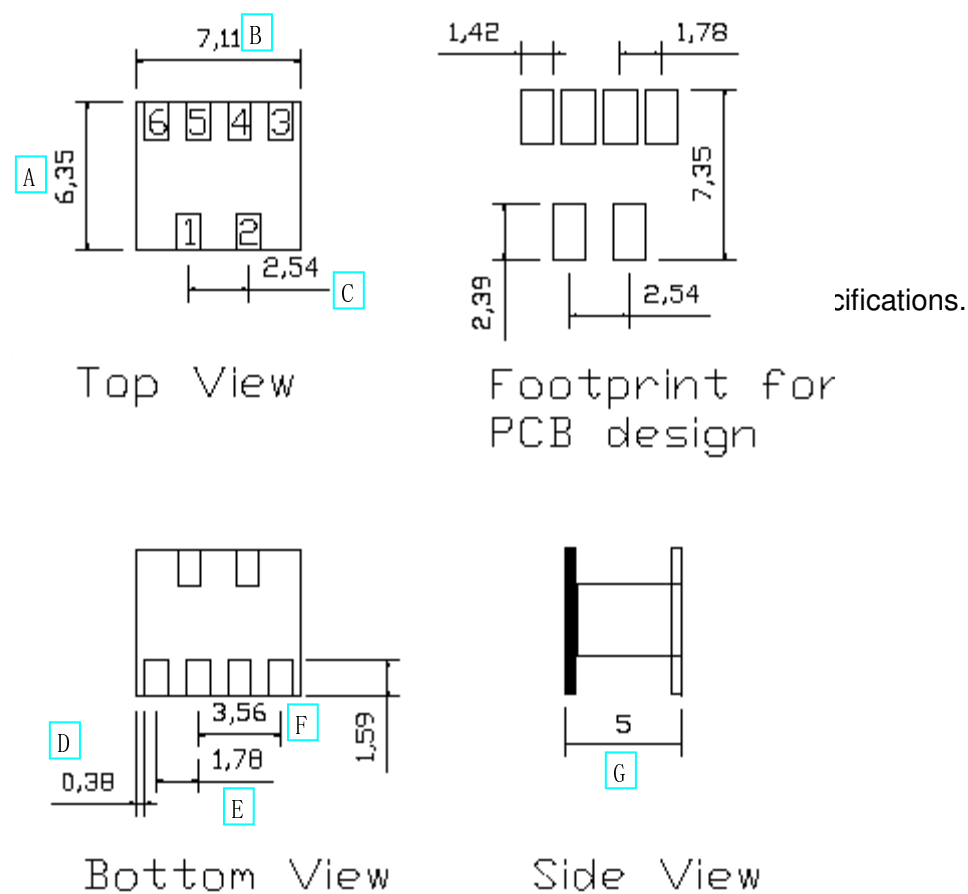
1.1.1 Test Purpose:

These measurements are to verify that the units meet the dimensional specifications outlined in the data sheet.

1.1.2 Test Method/Specification:

Refer to dimensional section of MABA-008980-CF0440 data sheet

See Figure 1.1A



	Dimension (mm)							Result
Nominal	A	B	C	D	E	F	G	
	6.35	7.11	2.54	0.38	1.78	3.56	5	
Tol range	5.97-6.73	6.73-7.49	2.16-2.92	0-0.76	1.40-2.16	3.18-3.94	4.62-5.38	
1	6.49	7.16	2.450	0.45	1.58	3.48	5.25	Pass
2	6.50	7.17	2.470	0.45	1.59	1.49	5.20	Pass
3	6.45	7.15	2.480	0.44	1.61	3.51	5.24	Pass
4	6.47	7.17	2.470	0.43	1.57	3.45	5.17	Pass
5	6.49	7.17	2.477	0.45	1.62	3.54	5.23	Pass
6	6.49	7.16	2.450	0.45	1.58	3.48	5.25	Pass
7	6.50	7.17	2.470	0.45	1.59	1.49	5.20	Pass
8	6.45	7.15	2.480	0.44	1.61	3.51	5.24	Pass
9	6.47	7.17	2.470	0.43	1.57	3.45	5.17	Pass
10	6.49	7.17	2.477	0.45	1.62	3.54	5.23	Pass
11	6.49	7.16	2.450	0.45	1.58	3.48	5.25	Pass
12	6.50	7.17	2.470	0.45	1.59	1.49	5.20	Pass
13	6.45	7.15	2.480	0.44	1.61	3.51	5.24	Pass
14	6.47	7.17	2.470	0.43	1.57	3.45	5.17	Pass
15	6.49	7.17	2.477	0.45	1.62	3.54	5.23	Pass
16	6.49	7.16	2.450	0.45	1.58	3.48	5.25	Pass
17	6.50	7.17	2.470	0.45	1.59	1.49	5.20	Pass
18	6.45	7.15	2.480	0.44	1.61	3.51	5.24	Pass
19	6.47	7.17	2.470	0.43	1.57	3.45	5.17	Pass
20	6.49	7.17	2.477	0.45	1.62	3.54	5.23	Pass
21	6.49	7.16	2.450	0.45	1.58	3.48	5.25	Pass
22	6.50	7.17	2.470	0.45	1.59	1.49	5.20	Pass
23	6.45	7.15	2.480	0.44	1.61	3.51	5.24	Pass
24	6.47	7.17	2.470	0.43	1.57	3.45	5.17	Pass
25	6.49	7.17	2.477	0.45	1.62	3.54	5.23	Pass
26	6.49	7.16	2.450	0.45	1.58	3.48	5.25	Pass
27	6.50	7.17	2.470	0.45	1.59	1.49	5.20	Pass
28	6.45	7.15	2.480	0.44	1.61	3.51	5.24	Pass
29	6.47	7.17	2.470	0.43	1.57	3.45	5.17	Pass
30	6.49	7.17	2.477	0.45	1.62	3.54	5.23	Pass

Figure 1.1B – Dimensional results

1.2 Solvent Resistance Test:

SGS Report Reference: SZRL06006D/2009 –Section 1.

1.2.1 Test Purpose:

The purpose of this test is to verify that the markings will not become illegible on the component parts when subjected to solvents.

1.2.2 Test Method/Specification:

Refer to Mil-STD-883G Method 2015.13.

1.2.3 Appearance Inspection:

Appearance inspection performed before and after test.

1.2.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 2 PCS (1#, 2#)

Appearance Inspection: No visual damage was found on samples before test.

See Photo 1.2A.

1.2.5 Test Procedure:

Lab Environmental Conditions: Ambient temperature: $25\pm 3^{\circ}\text{C}$, Relative humidity: $55\pm 20\%\text{RH}$.

1.2.6 Test Result(s):

Standard's failure criteria:

After subjection to the test, evidence of damage to the device and any specified markings which are missing in whole or in part, faded, smeared, blurred, or shifted (dislodged) to the extent that they cannot be readily identified from a distance of at least 15.0 cm (6 inches) with normal room lighting and without the aid of magnification or with a viewer having a magnification no greater than 3X shall constitute a failure.

Appearance Inspection: No visual damage was found on samples after test.

See Photo 1.2B.

Sample Item	Sample No.	Appearance after test	Conclusion
MABA008980-CF0440	1#	No visible damage	Pass
	2#	No visible damage	Pass

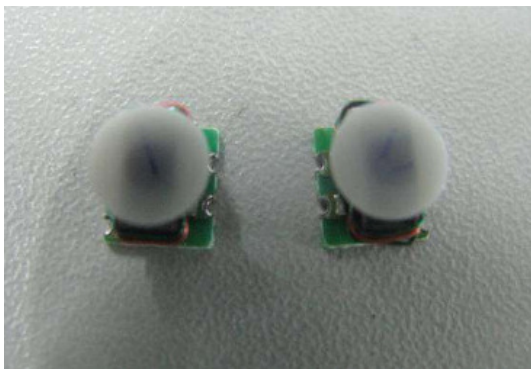


Photo 1.2A Samples Before Test

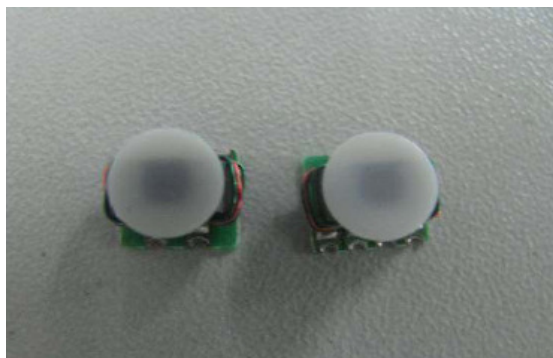


Photo 1.2B Samples After Test

1.3 Terminal Fatigue Testing:

SGS Report Reference: SZRL06006D

/2009 –Section 2.

1.3.1 Test Purpose:

This test is designed to check the capabilities of the device solder pads to withstand a delamination (peel) stress of specified tension and time.

1.3.2 Test Method/Specification:

Refer to Mil-STD-883G Method 2004.5 condition D.

Test Condition:

- A minimum tension of 8 ounces (2.22 N) shall be applied, without shock, to each solder pad to be tested in a direction perpendicular to the solder pad surface and maintained for 30 seconds minimum.

Test Profile:

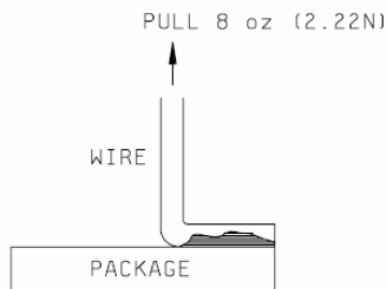


Figure 1.3A - Solder pad adhesion

1.3.3 Appearance Inspection:

Appearance inspection performed before and after test.

1.3.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 5 PCS (3#~7#)

Appearance Inspection: No visual damage was found on samples before test.

See Photo 1.3C.

1.3.5 Test Procedure:

Test Equipment:

Name: Testometric

Model: CMT6503

Equipment No. : 10611042



Photo 1.3B - Samples Under Test

Lab Environmental Conditions: Ambient temperature: 25±3°C, Relative humidity: 55±20%RH.

1.3.6 Test Result(s):

Standard's failure criteria:

When examined, using 10X magnification, after removal of the tension stress, the appearance of any delamination involving constituent solder pad interfaces shall be considered an adhesion failure of the solder pad. Separation of the solder pad from the device is an obvious (without visual magnification) adhesion failure. Separation of the wire from the solder fillet (leaving the solder pad intact) or wire breakage is considered a test procedure failure.

Sample Item	Sample No.	Appearance after test	Conclusion
MABA008980-CF0440	166#	No visible damage	Pass
	167#	No visible damage	Pass
	168#	No visible damage	Pass
	169#	No visible damage	Pass
	170#	No visible damage	Pass

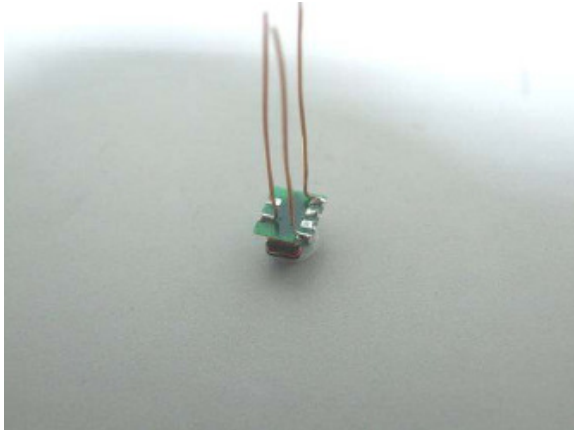


Photo 1.3C Sample Before Test

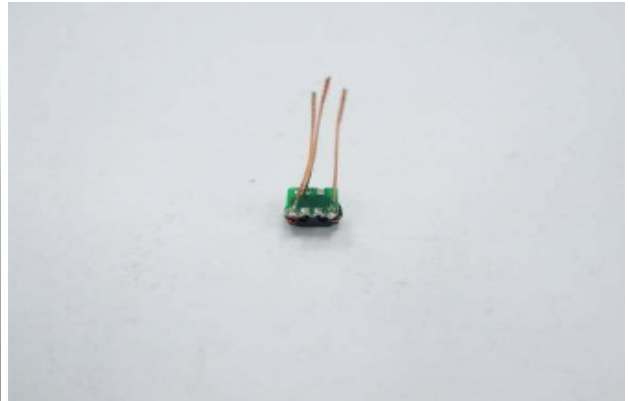


Photo 1.3D Sample After Test

Test Group 2

2.1 Steam Age Test:

SGS Report Reference: SZRL06006D/2009 –Section 3.

2.1.1 Test Purpose:

The test aim is to verify the samples' ability to resist the environment conditions.

2.1.2 Test Method/Specification:

Refer to client's requirements.

- Test Temperature: 35°C
- Test Humidity: 95%RH
- Test Duration: 168hours

2.1.3 Appearance Inspection:

Appearance inspection performed before and after test.

2.1.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 10 PCS

Appearance Inspection: No visual damage was found on samples before test.
See Photo 2.1B.

2.1.5 Test Procedure:

Test Equipment:

Name: Temp & Humidity Chamber

Model: ETH-B0-100

Equipment No. : POLY-I-242



Photo 2.1 A - Samples Under Test

Lab Environmental Conditions: Ambient temperature: 25±3°C, Relative humidity: 55±20%RH

2.1.6 Test Result(s):

Appearance Check: No visual damage was found on samples after test.

See Photo 2.1C.



Photo 2.1B Samples Before Test



Photo 2.1C Samples After Test

2.2 Bake Test:

SGS Report Reference: SZRL06006D/2009 –Section 4.

2.2.1 Test Purpose:

The test aim is to verify the samples' ability to resist the environment conditions.

2.2.2 Test Method/Specification:

Refer to client's requirements.

- Test Temperature: 150°C
- Test Duration: 100hours

2.2.3 Appearance Inspection:

Appearance inspection performed before and after test.

2.2.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 10 PCS

Appearance Inspection: No visual damage was found on samples before test.
See Photo 2.2B.

2.2.5 Test Procedure:

Test Equipment:

Name: Thermal Shock Chamber

Model: TS300

Equipment No. : SZREL-010



Photo 2.2 A - Samples Under Test

Lab Environmental Conditions: Ambient temperature: 25±3°C, Relative humidity: 55±20%RH

2.2.6 Test Result(s):

Appearance Check: No visual damage was found on samples after test.
See Photo 2.2C

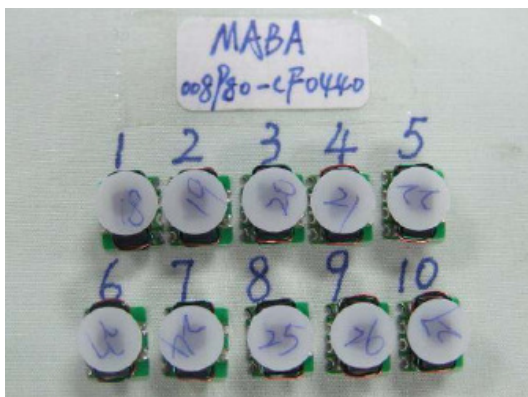


Photo 2.2B Samples Before Test



Photo 2.2C Samples After Test

2.3 Solderability Test:

2.3.1 Test Purpose:

The purpose of this test is to verify the solderability of the samples subjected to the steam age and bake testing outlined in sections 2.1 & 2.2.

2.3.2 Test Method/Specification:

Refer to Mil-STD-883 Method 2003.8.

- Dip and Look solderability Test.
- Solder Temperature $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$
- Solder: SN60
- Immersion rate: 1" per second ± 0.25 " per second
- Dwell Time: 5 seconds ± 0.5 second.

2.3.3 Appearance Inspection:

Appearance inspection performed before and after test.

2.3.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity:

10 PCS after Steam age test.

10PCS after Bake test.

Appearance Inspection: No visual damage was found on samples before test.

2.3.5 Test Result(s):

Appearance Check: Samples checked using magnification of 10-15x.

All samples meet the criteria for acceptable solderability.

The solder coverage is $>95\%$

See Photo 2.3A

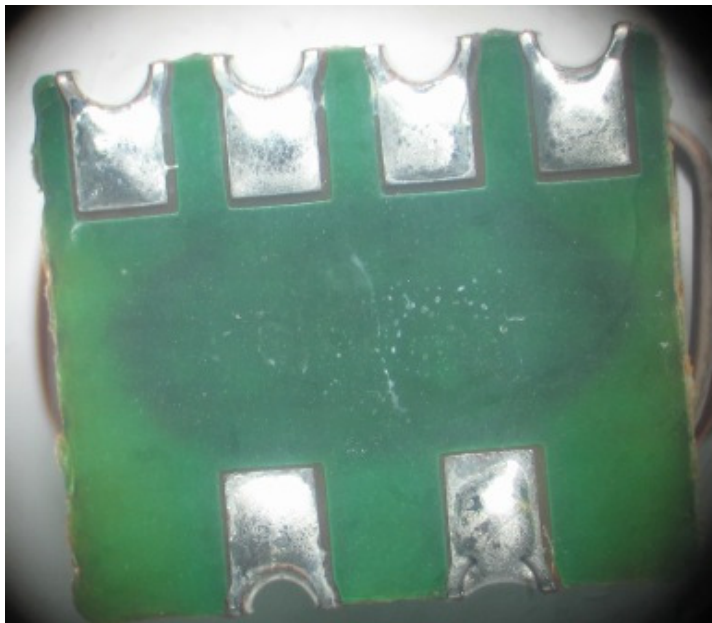


Photo 2.3A Sample After Solderability Test

Test Group 3:

3.1: High Temperature Life Stabilization Bake Test:

SGS Report Reference: SZRL06006D/2009 –Section 5.

3.1.1 Test Purpose:

The purpose of this test is to determine the effect on microelectronic devices of storage at elevated temperatures without electrical stress applied.

3.1.2 Test Method/Specification:

Refer to Mil-STD-883G Method 1008.2 condition A.

- Test Temperature: 100°C
- Test Duration: 500hours

3.1.3 Appearance Inspection:

Appearance inspection performed before and after test.

3.1.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 76 PCS

Appearance Inspection: No visual damage was found on samples before test.

See Photo 3.1B.

3.1.5 Test Procedure:

Test Equipment:

Name: Ramp Temperature Cycling Chamber

Model: WK-800/70/25

Equipment No. : SZREL-009



Photo 3.1 A - Samples Under Test

Lab Environmental Conditions: Ambient temperature: 25±3°C, Relative humidity: 55±20%RH

3.1.6 Test Result(s):

Appearance Check: No visual damage was found on samples after test.

See Photo 3.1C.

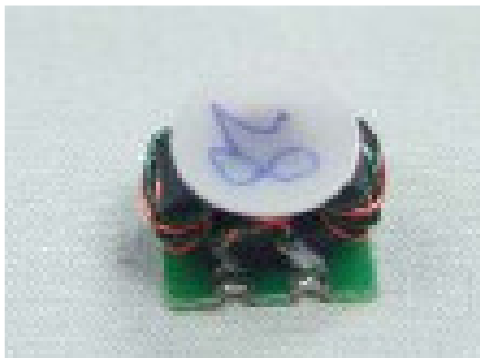


Photo 3.1B Sample Before Test

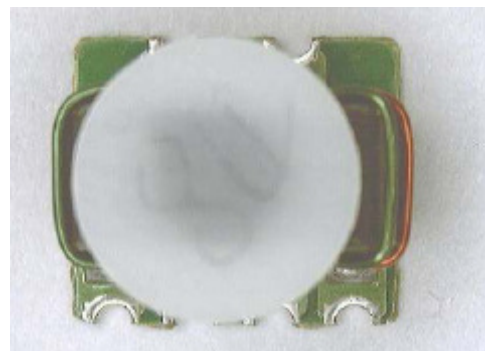


Photo 3.1C Sample After Test

3.2: Thermal Shock Test:

SGS Report Reference: SZRL06006D/2009 –Section 6.

3.2.1 Test Purpose:

The purpose of this test is to determine the resistance of the part to sudden exposure to extreme changes in temperature and the effect of alternate exposures to these extremes.

3.2.2 Test Method/Specification:

Refer to Mil-STD-883G Method 1011.9 condition A.

- Low Temperature: 0°C.
- High Temperature: 100 °C.
- Dwell Time: 10 minutes.
- Test Cycles: 100.
- Total duration: about 34 hours.

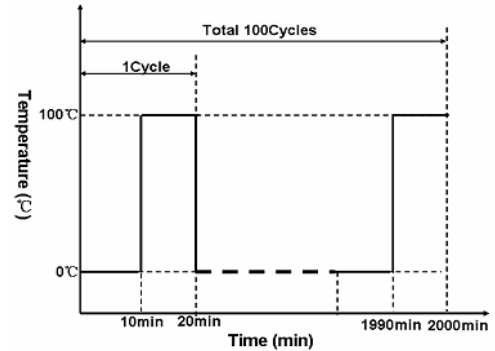


Photo 3.2A - Test Profile

3.2.3 Appearance Inspection:

Appearance inspection performed before and after test.

3.2.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 76 PCS (after Hi temp Life Stabilization Bake Test).

Appearance Inspection: No visual damage was found on samples before test.

See Photo 3.2C.

3.2.5 Test Procedure:

Test Equipment:

Name: Thermal Shock Chamber

Model: TS300

Equipment No. : SZREL-010



Photo 3.2 B - Samples Under Test

Lab Environmental Conditions: Ambient temperature: 25±3°C, Relative humidity: 55±20%RH

3.2.6 Test Result(s):

Appearance Check: No visual damage was found on samples after test.

See Photo 3.2D.

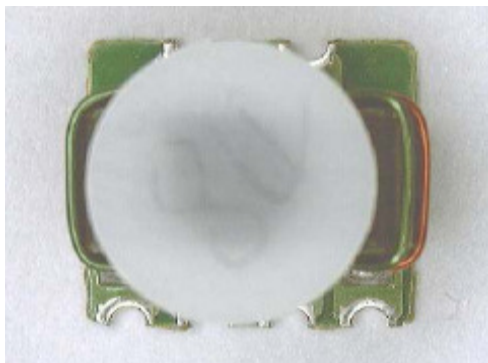


Photo 3.2C Sample Before Test

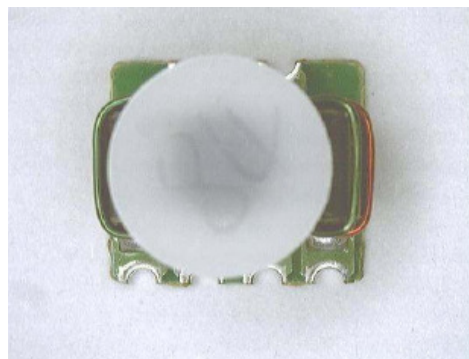


Photo 3.2D Sample After Test

3.3: Functional Test:

3.3.1 Initial Functional Test Results

The 76 units were functionally tested for Insertion loss before being subjected to High Temperature Life Stabilization Bake and Thermal Shock outlined in sections 3.1 & 3.2. All 76 units passed to specification.

The initial test results are plotted in Figure 3.3A below.

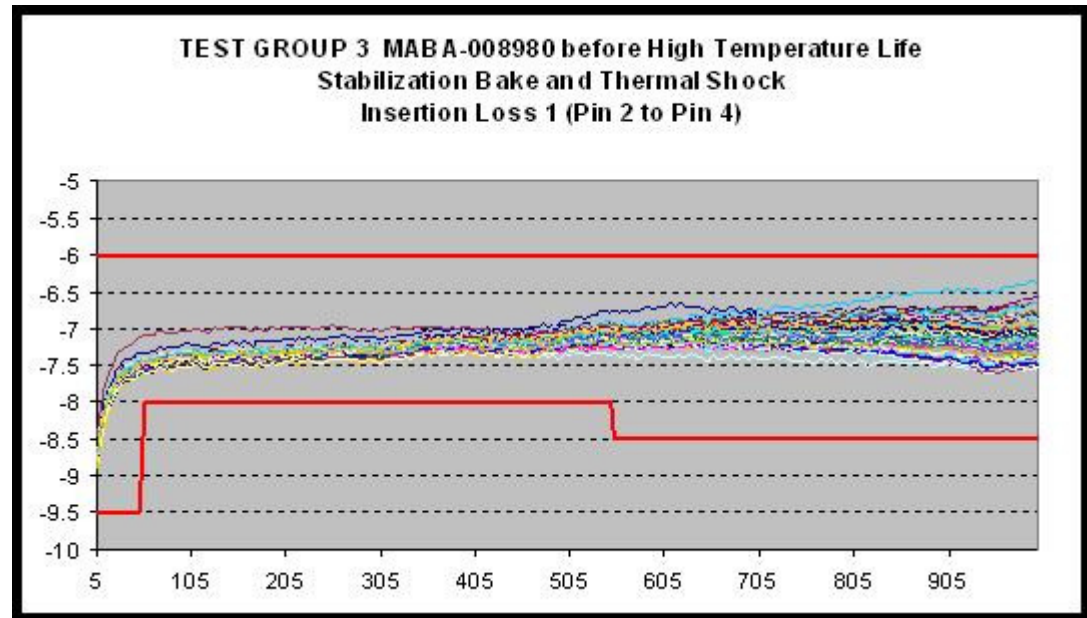


Figure 3.3A – Test Plots before Temperature Testing.

3.3.2 Functional Test Results After Temperature testing

The 76 units were functionally re-tested after High Temperature Life Stabilization Bake and Thermal Shock.

All 76 units continue to pass specification.

The test results after Temperature testing are plotted in Figure 3.3B below.

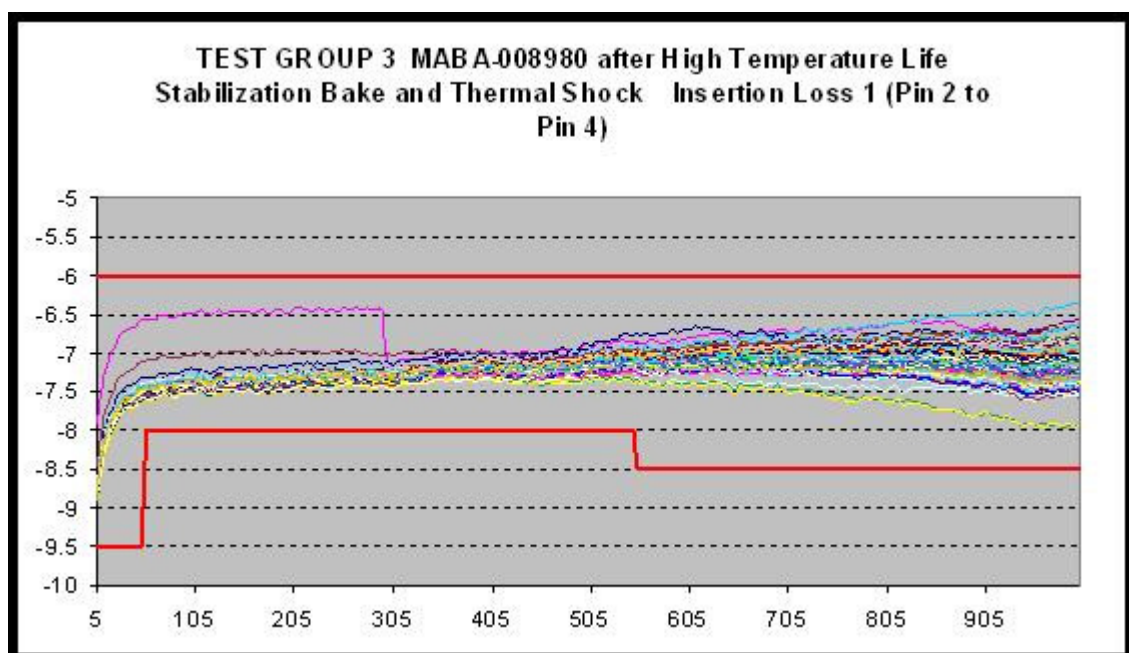


Figure 3.3B – Test Plots after Temperature Testing.

Test Group 4:

4.1 Convection Oven Profile:

4.1.1 Test Purpose:

The purpose of this test is to determine the resistance of the part to high temperature experienced during Convection Oven reflow.

4.1.2 Test Method/Specification:

Refer to client's reflow requirements.

- Test Temperature: 230°C
- Test Duration: 30seconds.

See Figure 4.1A

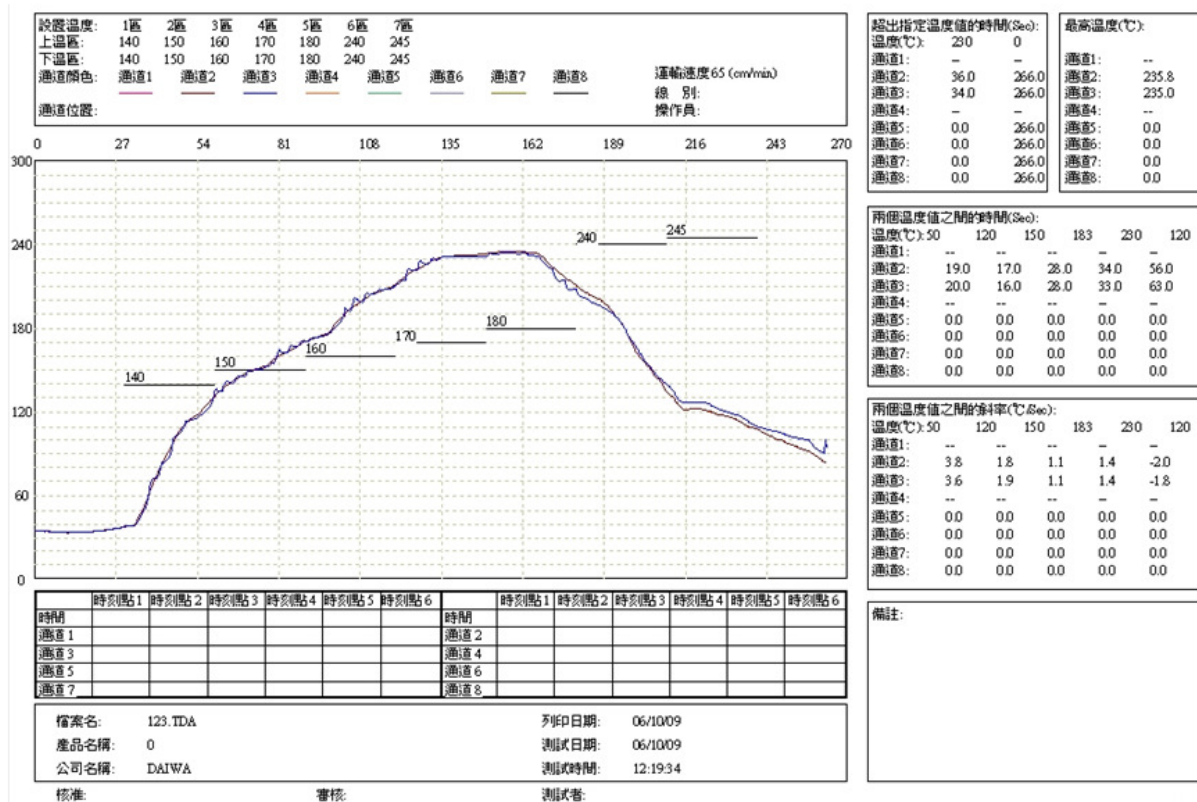


Figure 4.1A-Reflow Profile

4.1.3 Appearance Inspection:

Appearance inspection performed before and after test.

4.1.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 10 PCS

Appearance Inspection:

No visual damage was found on samples before test.

See Photo 4.1B.

4.1.5 Test Procedure:

Test Equipment:

7 Zone Convection Reflow Oven.

4.1.6 Test Result(s):

Appearance Check: No visual damage was found on samples after test.
See Photo 4.1C.

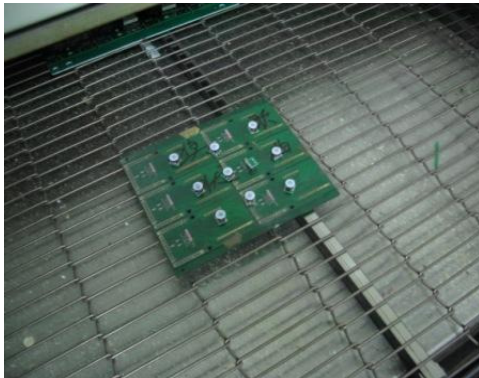


Photo 4.1B Samples Before Test

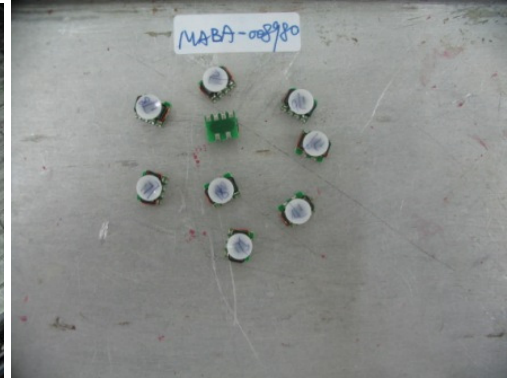


Photo 4.1C Samples After Test

4.2: Functional Test After Reflow:

4.2.1 Functional Test Results after Convection Reflow

The 10 finished good units were functionally tested for Insertion Loss after the Convection oven reflow outlined in section 4.1.

All 10 units pass functional specification after reflow.

The test results after Convection oven reflow are plotted in Figure 4.2A below.

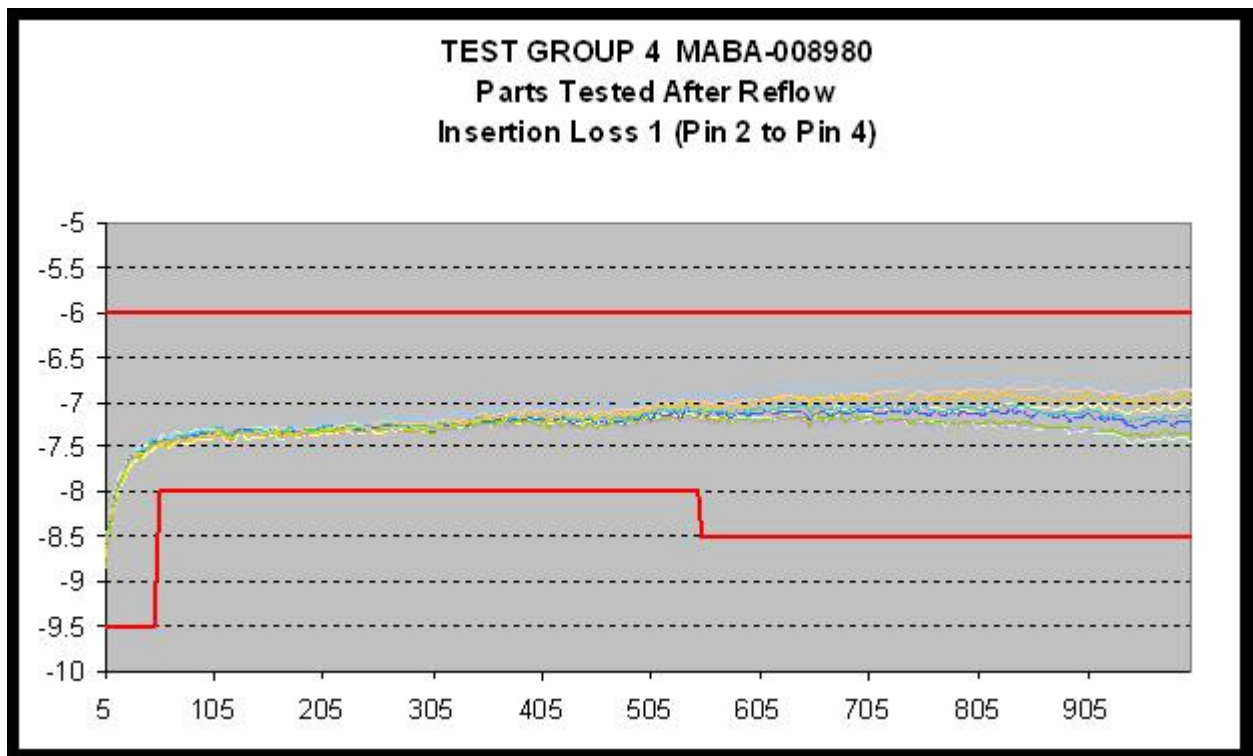


Figure 4.2A – Test Plots after Reflow.

Test Group 5:

5.1 Salt Atmosphere Test:

SGS Report Reference: SZRL06006D/2009 –Section 7.

5.1.1 Test Purpose:

This test provides a controlled corrosive environment which has been utilized to produce relative corrosion resistance information for specimens of metals and coated metals exposed in a given test chamber.

5.1.2 Test Method/Specification:

Refer to Mil-STD-883G Method 1009.8 condition A.

- Concentration of salt solution: 0.5%~3.0% NaCl (m/m)
- Chamber temperature: 35°C
- PH of salt solution at (35±2) °C: 6.5~7.2
- Exposure period: 24h

5.1.3 Appearance Inspection:

Appearance inspection performed before and after test.

5.1.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 5 PCS

Appearance Inspection: No visual damage was found on samples before test.

See Photo 5.1A.

5.1.5 Test Procedure:

Test Equipment:

Name: Salt Spray Chamber

Model: CEEC-YW-150

Equipment No. : 070042

Lab Environmental Conditions: Ambient temperature: 25±3°C, Relative humidity: 55±20%RH

5.1.6 Test Result(s):

Standard's failure criteria:

- Corrosion defects over more than 5 percent of the area of the finish or base metal of any package element other than leads such as lid, cap, or case.
- Leads missing, broken, or partially separated.
- Specified markings, which are missing in whole or in part, faded, smeared, blurred, shifted, or dislodged to the extent that they are not legible.

Appearance Inspection: No visual damage was found on samples before test. See 5.1B

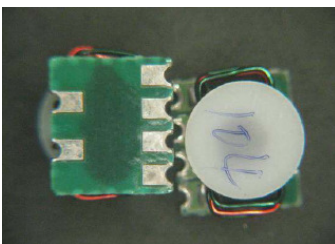


Photo 5.1A Samples Before Test

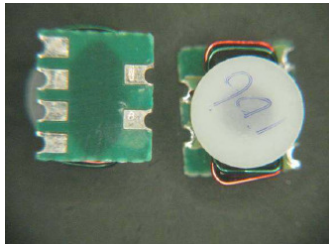


Photo 5.1B Samples After Test

Sample Item	Sample No.	Appearance after test	Conclusion
MABA008980-CF0440	104#	No visible damage	Pass
	105#	No visible damage	Pass
	106#	No visible damage	Pass
	107#	No visible damage	Pass
	108#	No visible damage	Pass

Test Group 6:

6.1 Pressure Cooker Test:

SGS Report Reference: SZRL06006D/2009 –Section 8.

6.1.1 Test Purpose:

This test is performed to evaluate the moisture resistance integrity of non-hermetic packaged solid state devices using moisture condensing or moisture saturated steam environments.

6.1.2 Test Method/Specification:

Refer to JESD22-A-102-C and client's requirements.

- Vapor pressure: 15 PSI
- Test Temperature: 121°C
- Test Duration: 96hours

6.1.3 Appearance Inspection:

Appearance inspection performed before and after test.

6.1.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 38 PCS

Appearance Inspection: No visual damage was found on samples before test.

See Photo 6.1B.

6.1.5 Test Procedure:

Test Equipment:

Name: Pressure Cooker Tester

Brand: KSON

Model: PCT-S/S022



Photo 6.1 A - Samples Under Test

Lab Environmental Conditions: Ambient temperature: 25±3°C, Relative humidity: 55±20%RH.

6.1.6 Test Result(s):

Appearance Check: No visual damage was found on samples after test.

See Photo 6.1C.

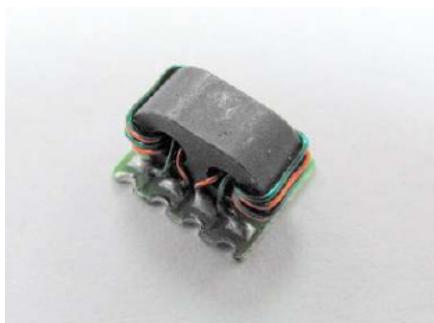


Photo 6.1B Sample Before Test



Photo 6.1C Samples After Test

6.2 Temp/Humidity Test:

SGS Report Reference: SZRL06006D/2009 –Section 9.

6.2.1 Test Purpose:

This test is performed for the purpose of evaluating the reliability of non-hermetic packaged solid-state devices in humid environments.

6.2.2 Test Method/Specification:

Refer to JESD22-A-101-B and client's requirements.

- Test Temperature: 85°C
- Test Humidity: 85%RH
- Test Duration: **500**hours

6.2.3 Appearance Inspection:

Appearance inspection performed before and after test.

6.2.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 38 PCS (after Pressure Cooker Test)

Appearance Inspection: No visual damage was found on samples before test.
See Photo 6.2B.

6.2.5 Test Procedure:

Test Equipment:

Name: Triple Temp & Humidity Chamber

Brand: GIANT FORCE

Model: GTH-162TR-SP/MAA0605-012

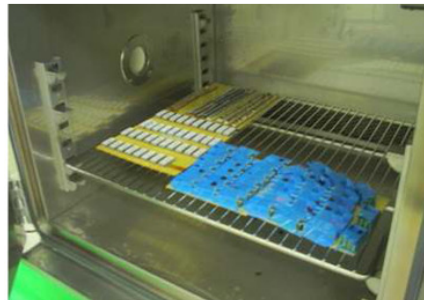


Photo 6.2 A - Samples Under Test

Lab Environmental Conditions: Ambient temperature: 25±3°C, Relative humidity: 55±20%RH.

6.2.6 Test Result(s):

Appearance Check: Slight Oxidation after test – but acceptable.

See Photo 6.2C.

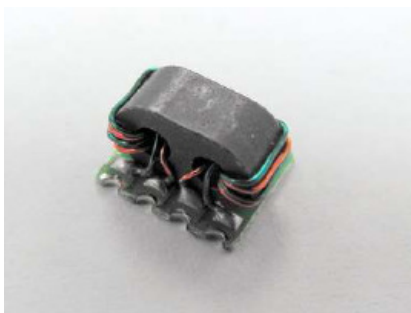


Photo 6.2B Sample Before Test



Photo 6.2C Samples After Test

6.3: Functional Test:

6.3.1 Initial Functional Test Results:

The 38 units were functionally tested for Insertion loss before being subjected to Pressure Cooker and Temp/Humidity testing outlined in sections 6.1 & 6.2.

All 38 units passed to specification.

The initial test results are plotted in Figure 6.3A below.

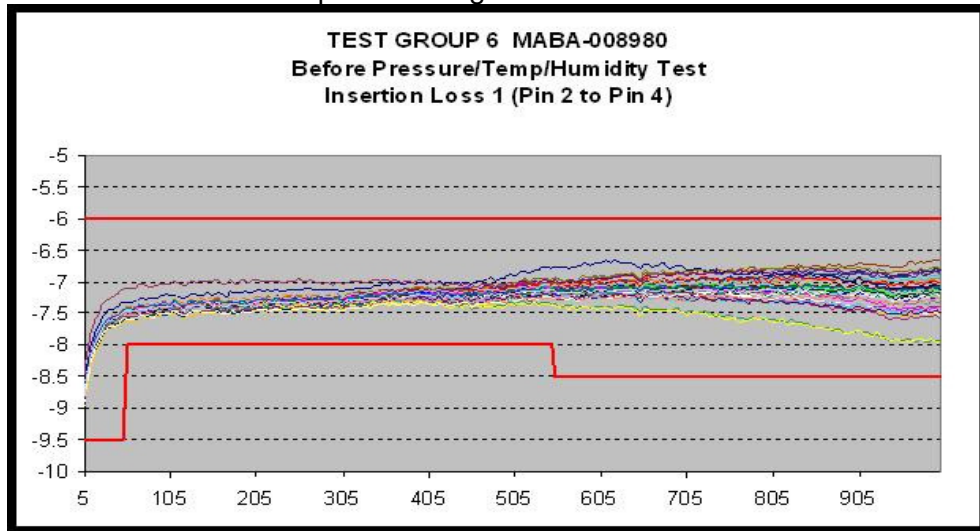


Figure 6.3A – Test Plots before Pressure Cooker and Temp/Humidity testing.

6.3.2 Functional Test Results After Pressure & Humidity testing:

The 38 units were functionally re-tested after Pressure Cooker and Temp/Humidity testing.

All 38 units continue to pass specification.

The test results after Temperature testing are plotted in Figure 6.3B below.

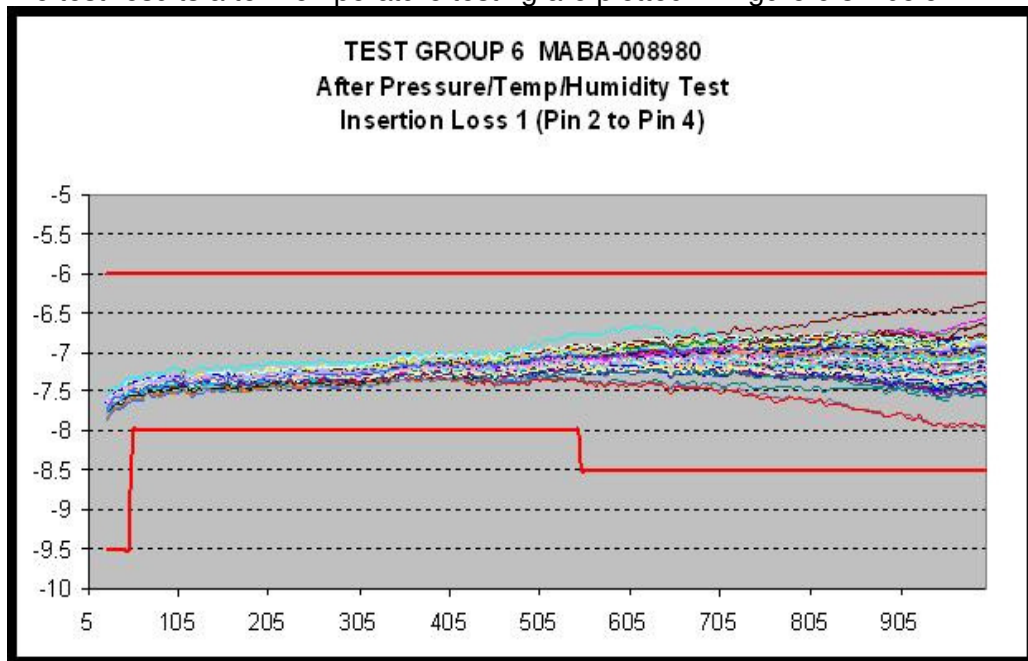


Figure 6.3B – Test Plots after Pressure Cooker and Temp/Humidity testing.

Test Group 7:

7.1 Lead Material & plating:

7.1.1 Test Purpose:

Measurements performed to verify that the lead plating thickness and composition meet specification.

7.1.2 Test Method/Specification:

Refer to Substrate material drawing 1000008117 for plating specification.

- Plating Thickness:
 - Ni: 3-5 μ m,
 - Au: (flash) 0.1 - .05 μ m

7.1.3 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 3 PCS

Appearance Inspection: No visual damage was found on samples before test.

7.1.4 Test Procedure: XRF and cross sectional analysis.

7.1.5. Test Results:

Lead plating on all samples meet the required thickness and composition specifications.
See Photo 7.1A



Photo 7.1A- Cross Section of sample and thickness measurements.

7.2 Glass Transition Test:

7.2.1 Test Purpose

This test is mainly to determine the glass transition temperature of organic films using thermal mechanical analysis (TMA).

7.2.2 Test Method/Specification

Refer to IPC-TM-650 Method 2.4.24.3 and client's requirements.

Test Method: Glass Transition Temperature and Z-Axis Thermal Expansion by TMA

Heat Flow: Heat from 22°C to 260°C at 5°C/min

7.2.3 Sample(s) Inspection before Test:

Quantity: 1 PCS (provided by client)

Appearance Inspection: No visual damage was found on samples before test.

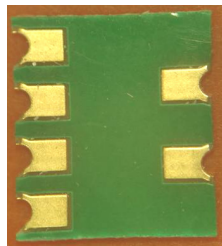


Photo 7.2A Sample Before Test

7.2.4 Test Setup

Name	Model	Equipment No.
Thermomechanical Analyzer	SEIKO TMA/SS6100	61-0089-00004

Lab Environmental Conditions:

Ambient temperature: 25±3 °C

Relative humidity: 55±20%RH



Photo 7.2B Sample During Test

7.1.5. Test Results:

Test Sample	Tg (°C)
1000008117	135.0

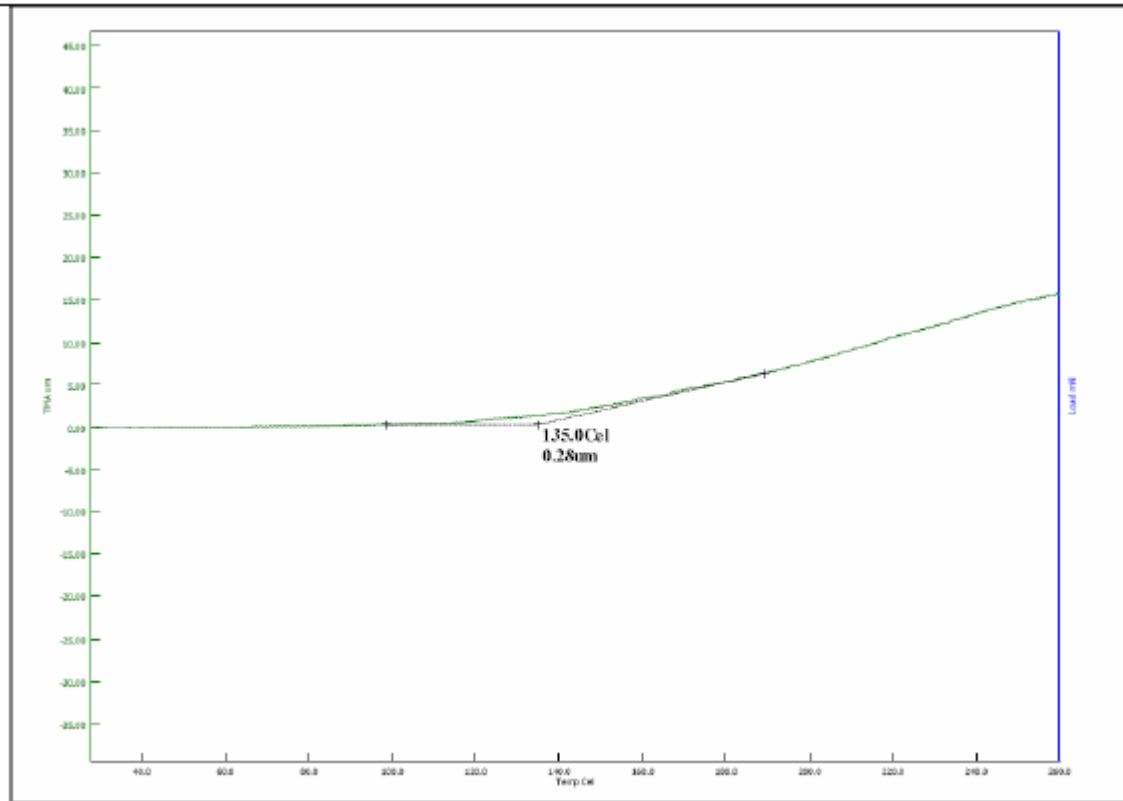


Photo 7.2C Profile for Tg Test

Test Group 8 & 9:

8.1 Vibration:

*TTS Report Reference: **WDZ0709-2**–Section 1.*

8.1.1 Test Purpose:

This test is performed to evaluate the resistance of the part to vibration.

8.1.2 Test Method/Specification:

Refer to MIL-STD-202, Method 201, Condition A.

- Freq: 10Hz to 55Hz
- Displacement 1.524mm
- Swept Speed: 1min/cycle
- Orientation X,Y,Z axes
- Duration 2H/axis

8.1.3 Appearance Inspection:

Appearance inspection performed before and after test.

8.1.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 50 PCS

Appearance Inspection: No visual damage was found on samples before test.

See Photo 8.1C.

8.1.5 Test Procedure:

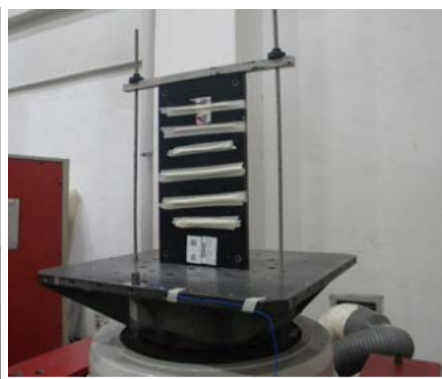
Test Equipment:

Name: Vibration System

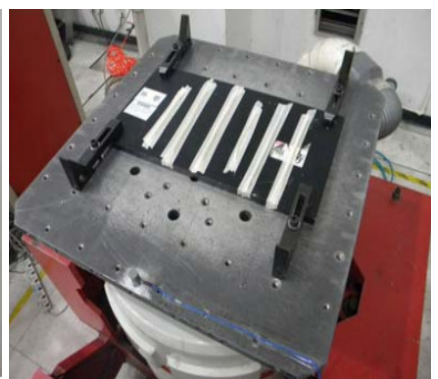
Model: V850-440



X-axis Vibration



Y-axis Vibration



Z-axis Vibration

Photo: 8.1A – Units under vibration

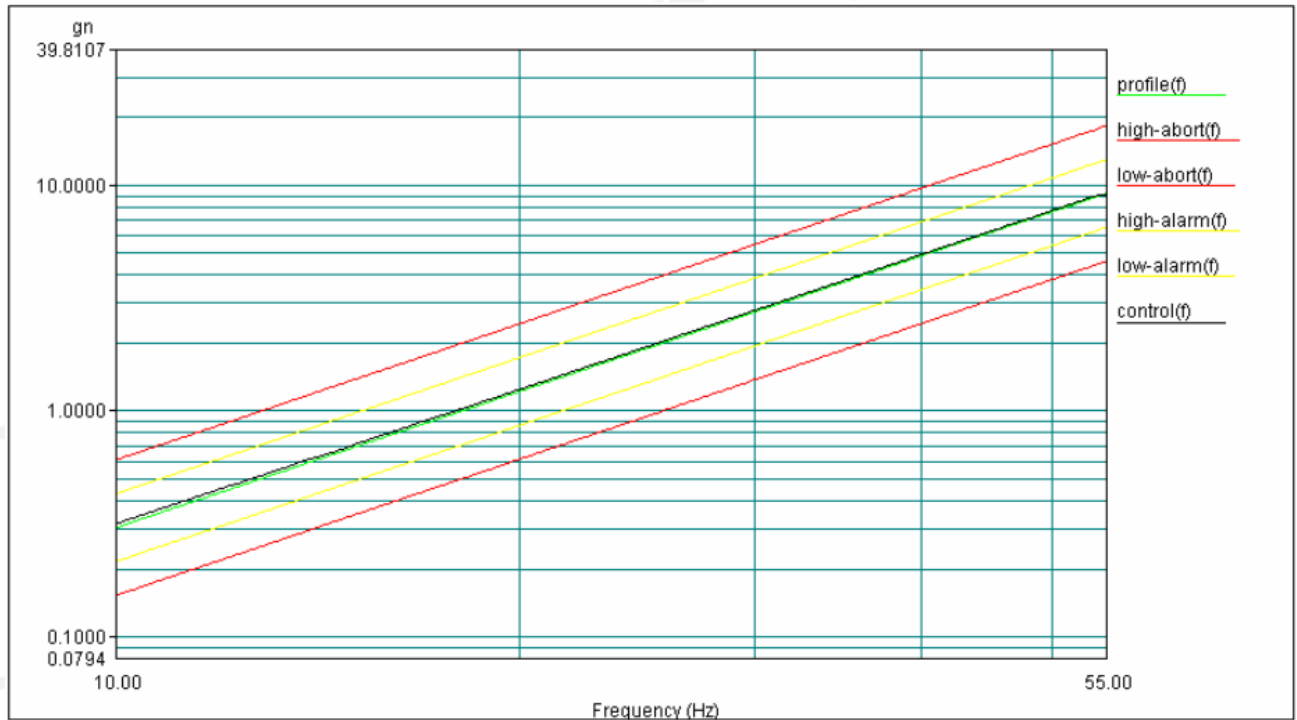


Figure: 8.1B – Vibration Curve

Lab Environmental Conditions: Ambient temperature: $25 \pm 3^\circ\text{C}$, Relative humidity: $55 \pm 20\% \text{RH}$.

8.1.6 Test Result(s):

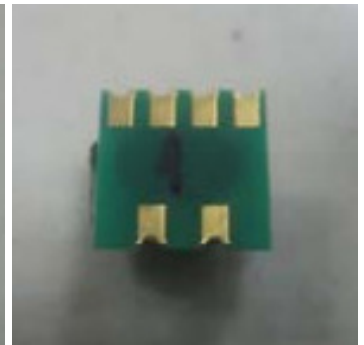
Appearance Check: No visual damage was found on samples after test.
See Photo 8.1D.



Photo: 8.1C – Samples Before Vibration & Mechanical Shock



Photo: 8.1D – Samples after Vibration



8.2 Mechanical Shock:

TTS Report Reference: WDZ0709-2 –Section 2.

8.2.1 Test Purpose:

This test is performed to evaluate the resistance of the part to mechanical shock.

8.2.2 Test Method/Specification:

Refer to MIL-STD-202, Method 213B, Condition A

- Shock Wave Shape: Half Sine
- Acceleration: 50g
- Pulse duration: 11ms
- Shock Times: 3 on each $\pm X$, $\pm Y$, $\pm Z$,

8.2.3 Appearance Inspection:

Appearance inspection performed before and after test.

8.2.4 Sample(s) Inspection before Test:

Sample(s) Description: MABA-008980-CF0440

Quantity: 50 PCS (after Vibration Test)

Appearance Inspection: No visual damage was found on samples before test.

8.2.5 Test Procedure:

Test Equipment:

Name: Mechanical Shock Tester

Model: DP-1200-60

Equipment No: TTS-YQ-094



+X axis Shock



-X axis Shock



+Y axis Shock



-Y axis Shock



+Z axis Shock



-Z axis Shock

Photo: 8.2A – Units under mechanical shock



Photo: 8.2B – Mechanical Shock Curve

Lab Environmental Conditions: Ambient temperature: $25 \pm 3^\circ\text{C}$, Relative humidity: $55 \pm 20\% \text{RH}$.

8.2.6 Test Result(s):

Appearance Check: No visual damage was found on samples after test.
See Photo 8.2C.



Photo: 8.2C – Samples After Mechanical Shock

8.3: Functional Test:

8.3.1 Initial Functional Test Results:

The 50 units were functionally tested for Insertion loss before being subjected to Vibration & Mechanical Shock testing outlined in sections 8.1 & 8.2.
All 50 units passed to specification.

The initial test results are plotted in Figure 8.3A below.

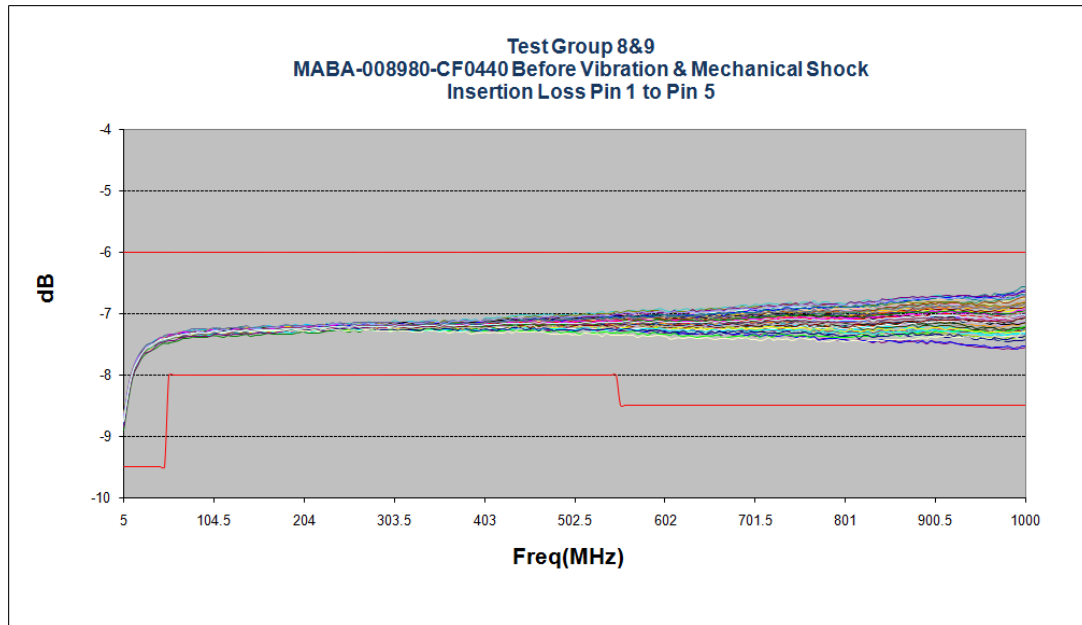


Figure 8.3A – Test Plots before Vibration & Mechanical Shock.

8.3.2 Functional Test Results After Vibration & Mechanical Shock:

The 50 units were functionally re-tested after Vibration & Mechanical Shock testing.
All 50 units continue to pass specification.

The test results after Vibration & Mechanical Shock are plotted in Figure 8.3B below.

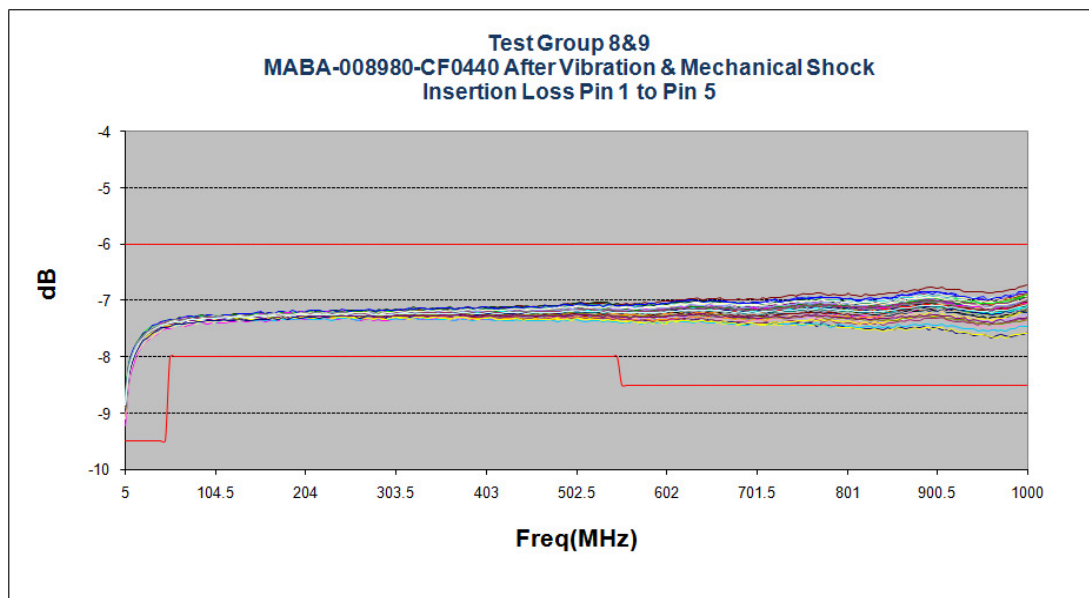


Figure 8.3B – Test Plots after Vibration & Mechanical Shock testing.