SMA In-Series Adapters

1. INTRODUCTION

1.1. Purpose

Testing was performed on the TE Connectivity (TE) SMA In-Line Series Adapters to determine their conformance to the requirements of Product Specification 108-2460 Revision A.

1.2. Scope

This report covers the electrical, mechanical, and environmental performance of the SMA In-Line Series Adapters. Testing was performed at the Omni Spectra Test Laboratory, 140 Fourth Avenue, Waltham MA. between 21Sep82 and 28Feb83. The test file number for this testing is 55339-729-82. This documentation is on file at and available from the Omni Spectra Test Laboratory.

1.3. Conclusion

The SMA In-Line Series Adapters listed in paragraph 1.5., conformed to the electrical, mechanical, and environmental performance requirements of Product Specification 108-2460 Revision A.

1.4. Test Specimens

Test specimens were representative of normal production lots. Specimens identified with the following part numbers were used for test:

Test Group	Quantity	Part Number	Description
1	6	1055090-1	Right angle plug-to-jack adapter
2	6	1054986-1	Bulkhead feed through jack-to-jack adapter
3	6	1053765-1	Plug-to-plug adapter
4	6	1053633-1	Jack-to-jack adapter

Figure 1

1.5. Environmental Conditions

Unless otherwise stated, the following environmental conditions prevailed during testing:

- Temperature: 15 to 35°C
- Relative Humidity: 20 to 80%

1.6. Qualification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Visual examination	1	1	1	1
Dimensional examination	2	2	2	2
Center contact retention with axial rotation	3			
Center contact retention without axial rotation		3	3	3
Insulation resistance	4	4	4	4
Voltage Standing Wave Ratio (VSWR)	5	5	5	5
RF leakage		6	6	6
RF insertion loss	6	7	7	7
Dielectric Withstanding Voltage (DWV)	7	8	8	8
Durability	8	9	9	9
Engaging/disengaging force	9	10	10	10
Coupling proof torque	10	11	11	11
Insertion/withdrawal force	11	12	12	12
Contact resistance	12	13	13	13

NOTE *(a) See paragraph 1.4.*
(b) Numbers indicate sequence in which tests are performed.

Figure 2

2. SUMMARY OF TESTING

2.1. Visual Examination

Specimens were visually examined and no evidence of physical damage detrimental to product performance was observed.

2.2. Dimensional Examination

All measured dimensions met the product drawing requirements.

2.3. Center Contact Retention with Axial Rotation

There was no axial movement or rotation of the center contact.

2.4. Center Contact Retention Without Axial Rotation

There was no axial movement of the center contact.

2.5. Insulation Resistance

All insulation resistance measurements were greater than 5000 megohms.

2.6. VSWR

All voltage standing wave ratio measurements were less than 1.05 for right angle product and 1.10 for straight product.

2.7. RF Leakage

All RF leakage measurements were less than -60 dB.

2.8. RF Insertion Loss

All insertion loss measurements were less than 0.03 dB at 6 GHz.

2.9. DWV

No dielectric breakdown or flashover occurred.

2.10. Durability

No evidence of physical damage was visible as a result of mating and unmating the specimens 500 times.

2.11. Engaging/disengaging Force

All engaging/disengaging force measurements were less 2.0 in•lbs.

2.12. Coupling Proof Torque

No coupling mechanisms dislodged from the adapters.

2.13. Insertion/withdrawal Force

All insertion force measurements were less than 3 pounds. All extraction force measurements were greater than 1 ounce.

2.14. Contact Resistance

All contact resistance measurements were less than 4 milliohms for the center contact and less than 2 milliohms for the outer contact.

3. TEST METHODS

3.1. Visual Examination

Specimens were visually examined for evidence of physical damage detrimental to product performance.

3.2. Dimensional Examination

Specimens were dimensionally measured per the product drawing.

3.3. Center Contact Retention with Axial Rotation

A minimum axial force of 6 pounds was applied to the center contact at a maximum rate of 1 pound per second and held for 5 seconds. A radial torque of 4 in•oz was applied to the center contact and held for 10 seconds.

3.4. Center Contact Retention Without Axial Rotation

A minimum axial force of 6 pounds was applied to the center contact at a maximum rate of 1 pound per second and held for 5 seconds.

3.5. Insulation Resistance

Insulation resistance was measured between the center and outer contacts of mated specimens. A test voltage of 500 volts DC was applied for 2 minutes before the resistance was measured.

3.6. VSWR

VSWR was measured on mated specimens using a sweep range of 0.5 and 18 GHz.

3.7. RF Leakage

RF leakage was measured on mated specimens at a frequency of 2 to 3 GHz.

3.8. RF Insertion Loss

A full Two-Port Calibration was performed on a network analyzer and the insertion loss, S_{21}, of the specimen was measured.

3.9. DWV

A test potential of 1500 volts rms was applied between adjacent contacts of mated specimens for 1 minute and then returned to zero.

3.10. Durability

Specimens were mated and unmated 500 times at a maximum rate of 12 cycles per minute.

3.11. Engaging/disengaging Force

The force necessary to completely engage and disengage the specimen from its mating part was measured.

3.12. Coupling Proof Torque

A maximum radial torque of 15 in•lb was applied to the coupling nut of mated specimens and held for 1 minute.

3.13. Insertion/withdrawal Force

Specimens were sized 3 times using a .0375 +.0001 inch diameter pin inserted to a minimum depth of .030 to .045 inch. After sizing, the force necessary to insert a .0370 +.0001 inch diameter pin to a minimum depth of .050 to .075 inch was measured. After the .0370 +.0001 inch diameter pin was removed, a .0355 -.0001 inch diameter pin was inserted to a minimum depth of .050 to .075, the force necessary to withdraw this pin was measured.

3.14. Contact Resistance

Contact resistance measurements were made using a 4 terminal measuring technique. The test current was maintained at 100 milliamperes maximum with a 50 millivolt maximum open circuit voltage.