Qualification Acceptance Testing
For Commercial Coaxial Attenuator

THIS SPECIFICATION AND/OR THE SUBJECT MATTER IS RESTRICTED SOLELY FOR THE USE OF EMC TECHNOLOGY, FLORIDA RF LABS AND ITS APPROVED VENDORS.

REV.	EN	DESCRIPTION
-	14-0039	INITIAL RELEASE REF TP-9129 REV -
A	14-0252	ADD SUBGROUP 1 MECHANICAL TESTS

1.0 SCOPE

This document details the Quality Conformance Inspection requirements for commercial coaxial attenuators.

Percent defective allowable (PDA) of 10% applies to Group A Inspection. If cumulative number of failures exceeds the PDA the entire inspection lot shall be rejected.

2.0 GROUP A INSPECTION (30pcs)

2.1 Visual Mechanical Inspection

Verify that materials, design, construction, physical dimensions, markings and workmanship are in accordance with applicable requirements per the appropriate SCD.

2.2 Electrical Inspection

2.2.1 **Initial Electricals.** Measure and record VSWR @ 2, 4, 6 GHz and attenuation at DC, 2, 4, 6 GHz.

Shop Order:	137698		
Part #:	42S06.00QS		
Description:	ATTENUATOR 6dB 6GHz		
Sales Order:	356352		
Test Plan:	TP-9129 Rev. A		
DATE	3/5/2014		
Test:	Group A INI		
Spec. Limits:			
VSWR (≤4GHz	1.2	:1	
VSWR (>4GHz	1.35	:1	
Attenuation:	6.0	dB	
Attn Tol.:	0.6	± dB	
Delta Attn.Tol	n/a	± dB	
Note: MALE CONN ON port 1			
Test Stage:	INI	INI	INI
Serial Number	2000 MHz VSWR	4000 MHz VSWR	6000 MHz VSWR
1	1.03	1.07	1.06
2	1.02	1.06	1.07
3	1.02	1.07	1.08
4	1.02	1.06	1.06
5	1.03	1.07	1.07
6	1.02	1.07	1.10
7	1.02	1.06	1.08
8	1.02	1.06	1.06
9	1.02	1.06	1.08
10	1.03	1.06	1.05

Please See Appendix for full Test Data

2.2.1.1 Acceptance limits are as follows:

	42503.00	**42506.00**	**42530.00**
Attenuation	Nominal ± 0.6 dB	Nominal ±0.6 dB	Nominal ±1.0 dB
VSWR (DC – 4 GHz)	1.20:1 max.	1.20:1 max.	1.20:1 max.
VSWR (4 – 6 GHz)	1.35:1 max	1.35:1 max	1.35:1 max

2.2.2 **Thermal Shock.** Subject coaxial attenuators to 10 cycles of thermal shock, -55°C to +125°C, 30 min each cycle, in accordance with MIL-STD-202, Method 107, with the exceptions listed.

2.2.3 **<u>After Thermal Shock Electricals.</u>** Measure and record VSWR @ 2, 4, 6 GHz and attenuation at DC, 2, 4, 6 GHz.

Shop Order:	137698		
Part #:	42S06.00QS		
Description:	ATTENUATOR 6dB 6GHz		
Sales Order:	356352		
Test Plan:	TP-9129 Rev. A		
DATE	3/6/2014		
Test:	Group A ATS		
Spec. Limits:			
VSWR (≤4GHz	1.2	:1	
VSWR (>4GHz	1.35	:1	
Attenuation:	6.0	dB	
Attn Tol.:	0.6	± dB	
Delta Attn.Tol	0.2	± dB	
Note: MALE CONN ON port 1			
Test Stage:	ATS	ATS	ATS
Serial Number	2000 MHz VSWR	4000 MHz VSWR	6000 MHz VSWR
1	1.03	1.07	1.06
2	1.02	1.06	1.06
3	1.02	1.07	1.08
4	1.02	1.06	1.06
5	1.03	1.07	1.07
6	1.02	1.07	1.09
7	1.02	1.06	1.08
8	1.02	1.06	1.06
9	1.02	1.06	1.08
10	1.03	1.06	1.05

Please See Appendix for full Test Data

2.2.3.1 **Acceptance limits:** VSWR and Attenuation per 2.2.1.1 Attenuation Δ ±0.2 dB from initial electrical at 2.2.1 (for reference only).

2.2.4 **<u>Burn-In.</u>** Burn-in at 125°C for a duration of 168 hours with the input power of 2W.

Shop Order:	137698		
Part #:	42S06.00QS		
Description:	IAL ATTENUATOR 6dB 6GHz		
Sales Order:	356352		
Test Plan:	TP-9129 Rev. A		
DATE	3/13/2014		
Test:	Group A ABI		
Spec. Limits:			
VSWR (≤4GHz):	1.3	:1	
VSWR (>4GHz):	1.5	:1	
Attenuation:	6.0	dB	
Attn Tol.:	0.6	± dB	
Delta Attn.Tol.:	0.2	± dB	
Note: MALE CONN ON port 1			
Test Stage:	ABI	ABI	ABI
Serial Number	2000 MHz VSWR	4000 MHz VSWR	6000 MHz VSWR
1	1.03	1.06	1.04
2	1.02	1.06	1.06
3	1.02	1.06	1.07
4	1.02	1.06	1.05
5	1.03	1.07	1.06
6	1.02	1.07	1.08
7	1.02	1.06	1.07
8	1.02	1.06	1.05
9	1.02	1.05	1.07
10	1.02	1.05	1.04

Please See Appendix for full Test Data

2.2.5 **<u>Final Electricals.</u>** Measure and record VSWR @ 2, 4, 6 GHz and attenuation at DC, 2, 4, 6 GHz.

2.2.5.1 **Acceptance limits:** VSWR and Attenuation per 2.2.1.1. Attenuation Δ ±0.2 dB from after thermal shock electrical at 2.2.3 (for reference only).

2.2.6 **<u>Percent Defective Allowable (PDA).</u>** The total PDA through Group A Inspection shall be 10%. If the cumulative number of failures exceeds the PDA the entire lot shall be rejected.

2.2.6.1 If an inspection lot is rejected the lot may be reworked and resubmitted for Group A Inspection provided a failure analysis has been completed and corrective action implemented.

2.3 Subgroup 1 Inspection (1 pc. that has successfully completed Group A tests).

2.3.1 **Initial Electricals.** Measure and record VSWR @ 2, 4, 6 GHz and attenuation at DC, 2, 4, 6 GHz. Final Electrical measurements from 2.2.5 may be used.

Shop Order:	137698						
Part #:	42S06.00QS						
Description:	ATTENUATOR 6dB 6GHz						
Sales Order:	356352						
Test Plan:	TP-9129 Rev. A						
DATE	3/13/2014						
Test:	SG1 INI						
Spec. Limits:							
VSWR (≤4GHz):	1.3	:1					
VSWR (>4GHz):	1.5	:1					
Attenuation:	6.0	dB					
Attn Tol.:	0.6	± dB					
Delta Attn.Tol.:	0.2	± dB					
Note: MALE CONN ON port 1							
Test Stage:	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI
Serial Number	2000 MHz VSWR	4000 MHz VSWR	6000 MHz VSWR	2000 MHz ATTN (dB)	4000 MHz ATTN (dB)	6000 MHz ATTN (dB)	DC ATTN (dB)
30	1.01	1.05	1.07	5.99	6.06	6.14	5.91

2.3.1.1 **Acceptance limits:** VSWR and Attenuation per 2.2.1.1.

2.3.2 **Coaxial Connector Wear Resistance.** Subject both connectors of each device to 500 cycles of connection and disconnection at 8in/lbs, per MIL-DTL-3933 with the exceptions listed. There shall be no damage to connectors that will cause electrical failure.

Shop Order:	137698						
Part #:	42S06.00QS						
Description:	ATTENUATOR 6dB 6GHz						
Sales Order:	356352						
Test Plan:	TP-9129 Rev. A						
DATE	3/14/2014						
Test:	SG1 FINAL						
Spec. Limits:							
VSWR (≤4GHz):	1.3	:1					
VSWR (>4GHz):	1.5	:1					
Attenuation:	6.0	dB					
Attn Tol.:	0.6	± dB					
Delta Attn.Tol.:	0.2	± dB					
Note: MALE CONN ON port 1							
Test Stage:	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI
Serial Number	2000 MHz VSWR	4000 MHz VSWR	6000 MHz VSWR	2000 MHz ATTN (dB)	4000 MHz ATTN (dB)	6000 MHz ATTN (dB)	DC ATTN (dB)
30	1.02	1.06	1.08	5.99	6.05	6.13	5.91

2.3.3 **Final Electricals.** Measure and record VSWR @ 2, 4, 6 GHz and attenuation at DC, 2, 4, 6 GHz.

2.3.3.1 **Acceptance limits:** VSWR and Attenuation per 2.2.1.1.

2.3.4 **Connector Repeatability.** Measure and record attenuation of each device @ DC, 2, 4, 6 GHz, for a total of 10 measurements. Devices shall be disconnected completely and rotated axially 36˚ in between each measurement, for a total of 360˚ or one full rotation. Connection and disconnection torque at 8in/lbs, per MIL-DTL-3933 with the exceptions listed.

Shop Order:	137698							
Part #:	42S06.00QS							
Description:	ATTENUATOR 6dB 6GHz							
Sales Order:	356352							
Test Plan:	TP-9129 Rev. A							
DATE	3/14/2014							
Test:	Connector Repeatability							
Spec. Limits:								
VSWR (≤4GHz):	1.3	:1						
VSWR (>4GHz):	1.5	:1						
Attenuation:	6.0	dB						
Attn Tol.:	0.6	± dB						
Delta Attn.Tol.:	0.2	± dB						
Note: MALE CONN ON port 1								
	Test Stage:	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI	SG1 INI
Measurement #	Serial Number	2000 MHz VSWR	4000 MHz VSWR	6000 MHz VSWR	2000 MHz ATTN (dB)	4000 MHz ATTN (dB)	6000 MHz ATTN (dB)	DC ATTN (dB)
1	30	1.02	1.06	1.08	5.97	6.03	6.12	5.91
2	30	1.02	1.06	1.08	5.97	6.03	6.11	5.91
3	30	1.02	1.06	1.08	5.97	6.04	6.12	5.91
4	30	1.02	1.06	1.08	5.98	6.04	6.13	5.91
5	30	1.02	1.06	1.08	5.98	6.05	6.13	5.91
6	30	1.02	1.06	1.08	5.98	6.05	6.13	5.91
7	30	1.02	1.06	1.08	5.99	6.05	6.14	5.91
8	30	1.02	1.06	1.08	5.99	6.05	6.13	5.91
9	30	1.02	1.06	1.08	5.99	6.05	6.13	5.91
10	30	1.02	1.06	1.08	5.98	6.04	6.13	5.91

2.3.4.1 **Acceptance limits:** Attenuation per 2.2.1.1.

3.0 DATA AND SAMPLES REQUIREMENTS

A certificate of conformance, variables data for VSWR and attenuation and attributes data (number of units tested, number passed) recorded by test and listing test operator and date performed, shall accompany shipments of deliverable units.

Reference Document 42S06 00QS 356352 for Test Data Appendix

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