Screening and Qualification Inspection for Coaxial Attenuators Level S, Based on MIL-DTL-3933

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

ESTA ESPECIFICACIÓN Y/O SU CONTENIDO ESTÁ RESTRINGIDO PARA USO UNICAMENTE DE EMC TECHNOLOGY, FLORIDA RF LABS Y SUS PROVEEDORES APROBADOS.

REV.	EN	DESCRIPTION
-	13-3886	Initial Release
A	14-0389	Add Fixed devices and change to generic TP, add three frequencies to test sample lot
B	14-0787	Removed sequences and added for screening, qualification inspection & Data and samples requirements
C		Added excel charts to screening and qualification inspection as well as additional reference proceding appendix

1.0 SCOPE

Quality Conformance Inspection shall consist of Screening and Qualification Inspection based on MIL-DTL-3933. All samples MUST pass Screening before being subjected to Qualification Inspection. The first Qualification sample lot shall consist of 3 different attenuator values of low, middle and high attenuation values (e.g. 3dB, 6dB & 10dB) divided into equal number of devices in each test Group and Subgroup. Subsequent Qualification Inspection lots shall consist of the number of samples per attenuation value described in this document.

2.0 SCREENING (100% of test lots)

2.1 Thermal Shock: Perform thermal shock test in accordance with MIL-STD-202, Method 107, Condition B, with the exception of temperature extremes shall be -55°C and +125°C, the number of cycles shall be ten (10), and each cycle duration shall be fifteen (15) minutes.

2.2 Pre- Power Conditioning Electricals:

2.2.1 Measure and record DC resistance from center conductor to center conductor and center conductor to case

Part #	42UWXX.00FQS						
Description	QUAL for 42UW						
TP #	9120						
Sales Order	357134						
Shop Order	138592						
Start Date	4/10/2014						
End Date	4/11/2014						
Lot#:	842058 & 842059						
	DCR						
42UW03.00FQS							
S/N	**RAB**	**RAC**	**RBC**				
1	18.37	166.21	166.93		Value	3	dB
2	17.22	161.32	160.48		Tolerance	0.5	dB
3	17.40	165.94	168.44				
4	18.44	167.14	168.66				
5	18.24	166.27	168.14				
6	17.63	164.09	162.75				
7	18.53	167.60	166.98				
8	18.32	164.47	165.13				
9	17.82	165.24	164.32				
10	18.22	163.02	164.51				
42UW06.00FQS							
SN	**RAB**	**RAC**	**RBC**				
1	34.46	85.70	85.71		Value	6	dB
2	32.14	86.30	86.32		Tolerance	0.5	dB
3	32.68	88.92	87.82				
4	33.78	91.12	90.59				
5	32.47	88.58	86.72				
6	33.26	83.20	82.57				
7	30.33	81.04	80.72				
8	33.46	82.62	82.33				
9	31.63	84.90	85.34				
10	31.21	82.78	83.08				
42UW10.00FQS							
SN	**RAB**	**RAC**	**RBC**				
1	50.51	61.19	60.10		Value	10	dB
2	50.01	60.30	59.74		Tolerance	0.6	dB
3	49.62	60.18	59.03				
4	49.11	59.26	58.88				
5	50.01	59.71	60.76				
6	51.03	61.53	60.88				
7	49.86	59.95	60.02				
8	49.37	58.94	59.96				
9	52.97	63.36	64.14				
10	50.35	60.00	60.95				

2.2.2 Measure VSWR at each end (input and output) at 1.0 GHz to max product frequency in 1 GHz increments.

Part #	42UWXX.00FQS										
Description	QUAL for 42UW										
TP #	9120										
Sales Order	357134										
Shop Order	138592										
Start Date	4/10/2014										
End Date	4/11/2014										
Lot#:	842058 & 842059										
Value	3	dB		Value	6	dB		Value	10	dB	
Tolerance	0.5	dB		Tolerance	0.5	dB		Tolerance	0.6	dB	
VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1	
VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1	
VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1	
VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1	

2.2.2.1 Acceptance Limits: In accordance with control drawing requirements.

2.2.3 Measure and record Attenuation between ends at DC and at 1.0 GHz to max product frequency in 1 GHz increments.

S/N	
42UW03.00FQS	DCA
1	2.96
2	2.91
3	2.87
4	2.96
5	2.94
6	2.92
7	2.97
8	2.97
9	2.93
10	2.97

Please See Appendix for full Test Data

S/N	
42UW06.00FQS	DCA
1	6.04
2	5.77
3	5.75
4	5.77
5	5.75
6	6.03
7	5.80
8	6.07
9	5.76
10	5.81

Please See Appendix for full Test Data

S/N	
42UW10.00FQS	DCA
1	9.84
2	9.85
3	9.84
4	9.83
5	9.82
6	9.85
7	9.83
8	9.82
9	9.83
10	9.84

Please See Appendix for full Test Data

2.2.3.1 Acceptance Limits: In accordance with control drawing requirements.

2.3 Power Conditioning: Each end of the attenuator (input and output) shall be subjected to a direct current power level equal to the specified average power at a temperature of 75 ±5° C for a period of 48 +/-3 hours at EACH end for a total of 96 hours. Attenuators shall be terminated in a 50Ω load.

NOTE: Direct current power level is equal to the applied voltage times current.

2.4 Post Power Conditioning Electricals:

2.4.1. Repeat step 2.2.1 (DC resistance).

Part #	42UWXX.00FQS												
Description	QUAL for 42UW												
TP #	9120												
Sales Order	357134												
Shop Order	138592												
Start Date	4/25/2014												
End Date	4/29/2014												
Lot#:	842058 & 842059												
	DCR												
42UW03.00FQS													
S/N	**RAB**	**RAC**	**RBC**		**Δ RAB**	**Δ RAB %**	**Δ RAC**	**Δ RAC %**	**Δ RBC**	**Δ RBC %**			
1	18.35	166.21	166.94		-0.02	-0.10%	0.00	0.00%	0.01	0.01%		Value	3 dB
2	17.33	161.34	160.53		0.11	0.66%	0.02	0.01%	0.05	0.03%		Δ RAB +/-	2.00% **Ω**
3	17.40	165.94	168.45		0.00	-0.01%	0.00	0.00%	0.01	0.01%		Δ RAC +/-	2.00% **Ω**
4	18.54	167.17	168.74		0.10	0.52%	0.03	0.02%	0.08	0.05%		Δ RBC +/-	2.00% **Ω**
5	18.28	166.29	168.18		0.03	0.19%	0.02	0.01%	0.04	0.02%			
6	17.84	165.24	165.05		0.21	1.18%	1.15	0.69%	2.30	1.39%			
7	18.54	167.62	167.00		0.02	0.08%	0.03	0.02%	0.01	0.01%			
8	18.38	164.50	165.19		0.06	0.34%	0.04	0.02%	0.05	0.03%			
9	17.82	165.24	164.33		-0.01	-0.04%	0.00	0.00%	0.01	0.00%			
10	18.27	163.08	164.56		0.05	0.26%	0.06	0.04%	0.05	0.03%			
42UW06.00FQS													
SN	**RAB**	**RAC**	**RBC**		**Δ RAB**	**Δ RAB %**	**Δ RAC**	**Δ RAC %**	**Δ RBC**	**Δ RBC %**			
1	34.49	85.68	85.72		0.02	0.07%	-0.02	-0.02%	0.01	0.01%		Value	6 dB
2	32.11	86.25	86.30		-0.04	-0.12%	-0.05	-0.05%	-0.02	-0.02%		Δ RAB +/-	2.00% **Ω**
3	32.66	88.91	87.81		-0.02	-0.05%	-0.01	-0.01%	0.00	0.00%		Δ RAC +/-	2.00% **Ω**
4	33.76	91.10	90.59		-0.02	-0.06%	-0.02	-0.02%	0.00	0.00%		Δ RBC +/-	2.00% **Ω**
5	32.48	88.57	86.73		0.01	0.03%	-0.02	-0.02%	0.00	0.00%			
6	33.26	83.18	82.62		0.00	0.01%	-0.01	-0.01%	0.05	0.06%			
7	30.31	81.01	80.71		-0.02	-0.07%	-0.03	-0.03%	-0.01	-0.01%			
8	33.49	82.63	82.38		0.03	0.08%	0.01	0.01%	0.06	0.07%			
9	31.62	84.87	85.31		-0.01	-0.02%	-0.03	-0.04%	-0.03	-0.03%			
10	31.20	82.75	83.04		0.00	-0.02%	-0.03	-0.04%	-0.03	-0.04%			
42UW10.00FQS													
SN	**RAB**	**RAC**	**RBC**		**Δ RAB**	**Δ RAB %**	**Δ RAC**	**Δ RAC %**	**Δ RBC**	**Δ RBC %**			
1	50.50	61.17	60.06		-0.01	-0.01%	-0.02	-0.03%	-0.04	-0.06%		Value	10 dB
2	50.02	60.28	59.71		0.00	0.01%	-0.02	-0.03%	-0.02	-0.04%		Δ RAB +/-	2.00% **Ω**
3	49.63	60.17	59.00		0.01	0.01%	-0.01	-0.02%	-0.03	-0.05%		Δ RAC +/-	2.00% **Ω**
4	49.14	59.28	58.89		0.03	0.07%	0.02	0.03%	0.02	0.03%		Δ RBC +/-	2.00% **Ω**
5	50.02	59.72	60.76		0.02	0.03%	0.01	0.02%	0.00	-0.01%			
6	50.99	61.48	60.86		-0.04	-0.08%	-0.05	-0.08%	-0.02	-0.03%			
7	49.82	59.89	59.98		-0.03	-0.07%	-0.06	-0.10%	-0.03	-0.06%			
8	49.38	58.92	59.96		0.01	0.02%	-0.02	-0.03%	0.00	0.00%			
9	52.97	63.32	64.12		-0.01	-0.02%	-0.04	-0.06%	-0.02	-0.04%			
10	50.34	59.97	60.93		-0.01	-0.02%	-0.03	-0.04%	-0.02	-0.03%			

2.4.1.1. Acceptance limit: Delta ±2% 0r .25Ω, whichever is greater.

2.4.2. Repeat step 2.2.2 (VSWR).

2.4.2.1. Acceptance limit: Delta ±0.1

2.4.3. Repeat step 2.2.3 (Attenuation).

S/N		
42UW03.00FQS	DCA	**Δ DCA**
1	2.96	2.96
2	2.92	2.92
3	2.87	2.87
4	2.96	2.96
5	2.94	2.94
6	2.93	2.93
7	2.97	2.97
8	2.98	2.98
9	2.93	2.93
10	2.97	2.97

Please See Appendix for full Test Data

S/N	DELTA S11	DELTA S22
42UW03.00FQS	1000 MHz	1000 MHz
1	#VALUE!	0.00
2	0.00	0.00
3	0.00	0.00
4	0.00	0.00
5	0.00	0.00
6	0.00	0.00
7	0.00	0.00
8	0.00	0.00
9	0.00	0.00
10	0.00	0.00

Please See Appendix for full Test Data

S/N		
42UW06.00FQS	DCA	**Δ DCA**
1	6.04	6.04
2	5.77	5.77
3	5.74	5.74
4	5.77	5.77
5	5.75	5.75
6	6.03	6.03
7	5.80	5.80
8	6.07	6.07
9	5.76	5.76
10	5.81	5.81

Please See Appendix for full Test Data

S/N	DELTA S11	DELTA S22
42UW06.00FQS	1000 MHz	1000 MHz
1	#VALUE!	0.00
2	0.00	0.00
3	0.00	0.00
4	0.00	0.00
5	0.00	0.00
6	0.00	0.00
7	0.00	0.00
8	0.00	0.00
9	0.00	0.00
10	0.00	0.00

Please See Appendix for full Test Data

S/N		
42UW10.00FQS	DCA	**Δ DCA**
1	9.84	9.84
2	9.85	9.85
3	9.84	9.84
4	9.83	9.83
5	9.82	9.82
6	9.85	9.85
7	9.83	9.83
8	9.82	9.82
9	9.83	9.83
10	9.84	9.84

Please See Appendix for full Test Data

S/N	DELTA S11	DELTA S22
42UW10.00FQS	1000 MHz	1000 MHz
1	#VALUE!	0.00
2	0.00	0.00
3	0.00	0.00
4	0.00	0.00
5	0.00	0.00
6	0.00	0.00
7	0.00	0.00
8	0.00	0.00
9	0.00	0.00
10	0.00	0.00

Please See Appendix for full Test Data

2.4.3.1. Acceptance limit: DC Attenuation Delta ±0.2 dB, for Reference only, exception due to temp variable parts.

2.4.4. Percent Defects Allowed (PDA). Calculate the percent of defects from Pre to Post Power Conditioning tests. If the cumulative number of failures exceeds the PDA the entire lot shall be rejected.

2.4.4.1. Acceptance limit: ≤10%.

Attenuators that exceed the delta limits shall be considered to have failed and shall be removed from the lot

2.5 Subgroup 1 (Temperature Variable Products only) - Three (3) sample units that have successfully undergone Screening tests. One sample per attenuation value.

2.5.1 TCA: Measure and record attenuation at DC (0 Hz) and 1.0 GHz to max product frequency in 1 GHz increments, every 20°C over the temperature range -55°C to +125°C.

2.5.1.1 Calculate, using linear regression, the slope of the curve.

2.5.2.2 Calculate TCA using the following formula:

TCA = Slope/Attenuation @ 25°C

Part #	42UWXX.00FQS										
Description	QUAL for 42UW										
TP #	9120										
Sales Order	357134										
Shop Order	138592										
Start Date	4/24/2014										
End Date	4/25/2014										
Lot#:	842058 & 842059										
Value	3	dB		Value	6	dB		Value	10	dB	
Tolerance	0.5	dB		Tolerance	0.5	dB		Tolerance	0.6	dB	
VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1	
VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1	
VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1	
VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1	
Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB	

2.5.2.2.1 Acceptance limits: Nominal TCA ±0.001 dB/dB/°C for DC attenuation. TCA at frequency results are for Reference only.

2.6 Visual and Mechanical Inspection: Verify and record that dimensions marking and workmanship, are in accordance with specification requirements.

3.0 QUALIFICATION INSPECTION (21 SAMPLES-9 PIECES GROUP 1 AND 12 PIECES GROUP 2)

Qualification Inspection tests shall be performed on twenty seven (27) samples from a lots which have previously been subjected to and passed, Screening Inspection (9 pieces per value). The Inspection lot shall be divided into two groups. Groups 1 and 2 and 3. Group 1 shall be performed on nine (9) samples (3 pieces per value) and Group 2 shall be performed on twelve (12) samples (4 pieces per value) which must include the three (3) TCA samples from Screening Subgroup1 (1 piece per value).

3.1 Group I - Nine (9) sample units from Screening lot

3.1.1 Stability of attenuation with temperature change:
Measure attenuation at 1 GHz at 23 ±2°C, at 200mW (23dBm) input power and at both extremes of the operating temperature range -55°C and +100°C.

S/O	138592						
TP	9120				Frequency Sensitivty Max	REF Only	dB/dB/GHz
Test Stage	3.1.1				Power Sensitivty Max	REF Only	dB/dB/Watt
Begin Date:5/8/14					Temperature Sensitivy Nom	0.003	dB/dB/˚C
End Date:5/8/14							
TCA	-3	dB/dB/C					
TCA Tolerance	0.001	(+/-) dB/dB/C					

Stability of Atten vs Temperature Change (23 dBm Input)

	˚C	˚C	˚C		
42UW03.00FQS	-55	25	100	25˚C to -55˚C	25˚C to 100˚C
S/N	ATTN	ATTN	ATTN	dB/dB/˚C	dB/dB/˚C
1	3.05	3	2.95	0.000208333	0.000222222
2	2.92	2.87	2.82	0.00021777	0.000232288
3	3.15	3.1	3.05	0.000201613	0.000215054

Stability of Atten vs Temperature Change (23 dBm Input)

	˚C	˚C	˚C		
42UW06.00FQS	-55	25	100	25˚C to -55˚C	25˚C to 100˚C
S/N	ATTN	ATTN	ATTN	dB/dB/˚C	dB/dB/˚C
1	6.21	6.01	6	0.000415973	2.21852E-05
2	6.31	6.12	6.1	0.000388072	4.3573E-05
3	6.15	5.9	5.88	0.000529661	4.51977E-05

Stability of Atten vs Temperature Change (23 dBm Input)

	˚C	˚C	˚C		
42UW10.00FQS	-55	25	100	25˚C to -55˚C	25˚C to 100˚C
S/N	ATTN	ATTN	ATTN	dB/dB/˚C	dB/dB/˚C
1	10.1	10.07	9.99	3.72393E-05	0.000105925
2	10.21	10.1	10.09	0.000136139	1.32013E-05
3	10	9.98	9.91	2.50501E-05	9.35204E-05

3.1.1.1 Acceptance limit: +/- .001dB/dB/°C, for Reference only due to temp variable device and device self-heating.

3.1.2 Stability of attenuation after thermal shock:

3.1.2.1 Measure and record attenuation at DC and 1.0 GHz to max product frequency in 1 GHz increments.

3.1.2.2 Perform thermal shock per MIL-STD-202, Method 107, Condition B Temperature extremes shall be -55°C and +125°C, the number of cycles shall be five (5), and each cycle duration shall be fifteen (15) minutes.

3.1.2.3 Measure and record attenuation at 1.0 GHz to max product frequency in 1 GHz increments.

3.1.2.3.1 Acceptance Limit: In accordance with control drawing requirements.

3.1.3 Stability of attenuation after vibration and shock:

3.1.3.1 Perform vibration shock in accordance with MIL-STD-202, Method 213, and Condition I.

Part #	42UWXX.00FQS										
Description	QUAL for 42UW										
TP #	9120										
Sales Order	357134										
Shop Order	138592										
Start Date	6/26/2014										
End Date	6/26/2014										
Lot#:	846169										
Test Stage	3.1.3	Stability of Attenuation after Vibration and Shock									

Value	3	dB	Value	6	dB	Value	10	dB
Tolerance	0.5	dB	Tolerance	0.5	dB	Tolerance	0.6	dB
VSWR DC-4 GHz	1.15	:1	VSWR DC-4 GHz	1.15	:1	VSWR DC-4 GHz	1.15	:1
VSWR 4-12.4 GHz	1.25	:1	VSWR 4-12.4 GHz	1.25	:1	VSWR 4-12.4 GHz	1.25	:1
VSWR 12.4-18 GHz	1.35	:1	VSWR 12.4-18 GHz	1.35	:1	VSWR 12.4-18 GHz	1.35	:1
VSWR 18-26 GHz	1.50	:1	VSWR 18-26 GHz	1.50	:1	VSWR 18-26 GHz	1.50	:1
Δ DCATolerance +/-	0.20	dB	Δ DCATolerance +/-	0.20	dB	Δ DCATolerance +/-	0.20	dB

Post Vibration and Shock

S/N **42UW03.00FQS**	**DCA**	
1	2.97	
2	2.94	Please See Appendix for full Test Data
3	2.88	

Post Vibration and Shock

S/N **42UW06.00FQS**	**DCA**	
1	6.06	
2	5.78	Please See Appendix for full Test Data
3	5.76	

Post Vibration and Shock

S/N **42UW10.00FQS**	**DCA**	
1	9.86	
2	9.86	Please See Appendix for full Test Data
3	9.86	

3.1.3.2 Measure and record attenuation as specified in 3.1.2.1.

3.1.3.2.1 Acceptance Limit: In accordance with control drawing requirements.

3.1.4 Stability of attenuation after peak power: Test only if specified in SCD.

3.1.4.1 Subject devices to maximum peak power (DC pulsed) per SCD for 1 hour at each end.

Part #	42UWXX.00FQS										
Description	QUAL for 42UW										
TP #	9120										
Sales Order	357134										
Shop Order	138592										
Start Date	7/9/2014										
End Date	7/9/2014										
Lot#:	846169										
Test Stage	3.1.4	Stability of Attenuation after Peak Power									
Value	3	dB		Value	6	dB		Value	10	dB	
Tolerance	0.5	dB		Tolerance	0.5	dB		Tolerance	0.6	dB	
VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1	
VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1	
VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1	
VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1	
Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB	

3.1.4.2 Measure and record attenuation as specified in 3.1.2.1

	Post Peak Power	
S/N		
42UW03.00FQS	**DCA**	
1		Please See Appendix for full Test Data
2		
3		
	Post Peak Power	
S/N		
42UW06.00FQS	**DCA**	
1		Please See Appendix for full Test Data
2		
3		
	Post Peak Power	
S/N		
42UW10.00FQS	**DCA**	
1		Please See Appendix for full Test Data
2		
3		

3.1.4.2.1 Acceptance Limit: In accordance with control drawing requirements.

3.1.5 Sensitivity of attenuation: Calculate sensitivity of attenuation after change in frequency at 1 GHz and maximum product frequency, change in input power (at the reference power of 1 mW and maximum power of 200 mW, and change in temperature as specified in paragraph 4.7.12 of MIL-DTL-3933.

S/O	138592
TP	9120
Test Stage	3.1.5
Begin Date	7/9/2014
End Date	7/11/2014

Frequency Sensitivty Max	REF Only	dB/dB/GHz
Power Sensitivty Max	REF Only	dB/dB/Watt
Temperature Sensitivy Nom	0.003	dB/dB/˚C

Value	3	dB
Tolerance	0.5	dB
VSWR DC-4 GHz	1.15	:1
VSWR 4-12.4 GH	1.25	:1
VSWR 12.4-18 G	1.35	:1
VSWR 18-26 GH	1.50	:1
Δ DCATolerance	0.20	dB

Value	6	dB
Tolerance	0.5	dB
VSWR DC-4 GHz	1.15	:1
VSWR 4-12.4 GHz	1.25	:1
VSWR 12.4-18 GHz	1.35	:1
VSWR 18-26 GHz	1.50	:1
Δ DCATolerance +/-	0.20	dB

Value	10	dB
Tolerance	0.6	dB
VSWR DC-4 GHz	1.15	:1
VSWR 4-12.4 GHz	1.25	:1
VSWR 12.4-18 GHz	1.35	:1
VSWR 18-26 GHz	1.50	:1
Δ DCATolerance +/-	0.20	dB

	Stability of Atten vs Frequency			Stability of Attenuation vs Power		
	GHz	GHz	Units	Watts	Watts	Units
42UW03.00FQS	1	26	dB/dB/GHz	0.001	0.2	dB/dB/Watt
S/N	ATTN	ATTN		ATTN	ATTN	
1	2.98	3.31	0.0039879	3	3	0
2	2.96	3.33	0.0044444	2.97	2.87	0.16919615
3	3.39	2.93	0.0062799	3.27	3.1	0.26124506

	Stability of Attenuation vs Temperature Change				
	˚C	˚C	˚C		
42UW03.00FQS	-55	25	100	25˚C to -55˚C	25˚C to 100˚C
S/N	ATTN	ATTN	ATTN	dB/dB/˚C	dB/dB/˚C
1	3.05	3	2.95	0.000208333	0.000222222
2	2.92	2.97	2.82	0.000210438	0.000673401
3	3.15	3.27	3.05	0.000458716	0.000897044

	Stability of Atten vs Frequency			Stability of Attenuation vs Power		
	GHz	GHz		Watts	Watts	
42UW06.00FQS	1	26	Units	0.001	0.2	Units
S/N	ATTN	ATTN	dB/dB/GHz	ATTN	ATTN	dB/dB/Watt
1	6.06	6.27	0.0013397	6.09	6.01	0.0660115
2	5.79	6.49	0.0043143	5.92	6.12	0.16976776
3	5.77	6.33	0.0035387	5.8	5.9	0.0866401

	Stability of Attenuation vs Temperature Change				
	˚C	˚C	˚C		
42UW06.00FQS	-55	25	100	25˚C to -55˚C	25˚C to 100˚C
S/N	ATTN	ATTN	ATTN	dB/dB/˚C	dB/dB/˚C
1	6.21	6.01	6	0.000415973	2.21852E-05
2	6.31	6.12	6.1	0.000388072	4.3573E-05
3	6.15	5.9	5.88	0.000529661	4.51977E-05

	Stability of Atten vs Frequency			Stability of Attenuation vs Power		
	GHz	GHz		Watts	Watts	Units
42UW10.00FQS	1	26	Units	0.001	0.2	dB/dB/Watt
S/N	ATTN	ATTN	dB/dB/GHz	ATTN	ATTN	
1	9.86	10.46	0.0022945	9.91	10.07	0.0811322
2	9.87	10.52	0.0024715	9.91	10.1	0.09634449
3	9.87	10.6	0.0027547	9.9	9.98	0.04060708

	Stability of Attenuation vs Temperature Change				
	˚C	˚C	˚C		
42UW10.00FQS	-55	25	100	25˚C to -55˚C	25˚C to 100˚C
S/N	ATTN	ATTN	ATTN	dB/dB/˚C	dB/dB/˚C
1	10.1	10.07	9.99	3.72393E-05	0.000105925
2	10.21	10.1	10.09	0.000136139	1.32013E-05
3	10	9.98	9.91	2.50501E-05	9.35204E-05

3.1.5.1 Acceptance Limits: In accordance with control drawing requirements. Results are for Reference only, due to temp variable device and device self-heating.

3.1.6 Visual and Mechanical Inspection: Verify and record that dimensions, material, marking and workmanship are in accordance with specification requirements.

3.2 Group 2 - Twelve (12) sample units from the Screening lot.
Samples used must include the three (3) TCA samples from Screening Subgroup1.

3.2.1 Electrical Test. Perform the electrical tests listed below at 0, 500, & 1000 hours:

3.2.1.1 Measure and record DC resistance from center conductor to center conductor and center conductor to case

3.2.1.2 Measure VSWR at each end (input and output) at 1.0 GHz to max product frequency in 1 GHz increments.

Sales Order	357134										
Shop Order	138592										
Start Date	5/7/2014										
End Date	5/7/2014										
Lot#:	842058 & 842059										
Test Stage	3.2 INITIAL										
Value	3	dB		Value	6	dB		Value	10	dB	
Tolerance	0.5	dB		Tolerance	0.5	dB		Tolerance	0.6	dB	
VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1	
VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1	
VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1	
VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1	
Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB	

3.2.1.2.1 Acceptance Limits: In accordance with control drawing requirements.

3.2.1.3 Measure and record Attenuation between ends at DC and at 1.0 GHz to max product frequency in 1 GHz increments.

S/N	
42UW03.00FQS	DCA
4	2.96
5	2.94
6	2.93
7	2.97

Please see Appendix for full Test Data

S/N	
42UW06.00FQS	DCA
4	5.77
5	5.75
6	6.03
7	5.80

Please see Appendix for full Test Data

S/N	
42UW10.00FQS	DCA
4	9.83
5	9.82
6	9.85
7	9.83

Please see Appendix for full Test Data

3.2.1.3.1 Acceptance Limits: In accordance with control drawing requirements.

3.2.2 Burn-in Attenuators shall be burned-in for 500 hours at EACH end (1000 hours total) at maximum power per SCD at 75°C. Attenuators shall be terminated in a 50Ω load.

Part #	42UWXX.00FQS
Description	QUAL for 42UW
TP #	9120
Sales Order	357134
Shop Order	138592
Start Date	5/29/2014
End Date	5/29/2014
Lot#:	842058 & 842059
Test Stage	Post 500 hr BI

Value	3	dB		Value	6	dB		Value	10	dB
Tolerance	0.5	dB		Tolerance	0.5	dB		Tolerance	0.6	dB
VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1
VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1
VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1
VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1
Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB

S/N	500 HR
42UW03.00FQS	
4	Please see Appendix for full Test Data
5	
6	
7	

S/N	500 HR
42UW06.00FQS	
4	Please see Appendix for full Test Data
5	
6	
7	

S/N	500 HR
42UW10.00FQS	
4	Please see Appendix for full Test Data
5	
6	
7	

3.2.2.1 Repeat step 3.2.2

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Part #	42UWXX.00FQS
Description	QUAL for 42UW
TP #	9120
Sales Order	357134
Shop Order	138592
Start Date	6/26/2014
End Date	6/26/2014
Lot#:	842058 & 842059
Test Stage	Post 1000 hr BI

Value	3	dB		Value	6	dB		Value	10	dB
Tolerance	0.5	dB		Tolerance	0.5	dB		Tolerance	0.6	dB
VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1		VSWR DC-4 GHz	1.15	:1
VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1		VSWR 4-12.4 GHz	1.25	:1
VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1		VSWR 12.4-18 GHz	1.35	:1
VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1		VSWR 18-26 GHz	1.50	:1
Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB		Δ DCATolerance +/-	0.20	dB

S/N	1000 HR			
42UW03.00FQS				
4	Please see Appendix for full Test Data			
5				
6				
7				
S/N	1000 HR			
42UW06.00FQS				
4	Please see Appendix for full Test Data			
5				
6				
7				
S/N	1000 HR			
42UW10.00FQS				
4	Please see Appendix for full Test Data			
5				
6				
7				

3.2.2.1 Acceptance limit: In accordance with control drawing requirements.

3.2.3 Visual and Mechanical Inspection: Verify and record that dimensions, material, marking and workmanship are in accordance with specification requirements.

3.2.4 Visual and Mechanical Inspection: Verify and record that dimensions, material, marking and workmanship are in accordance with specification requirements.

4.0 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. Test samples shall be packaged in an anti-static bag and clearly marked as Qualification Inspection samples.

Reference Document 138592 for Test Data Appendix

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