

UTiPHASE™ Qualification Test Plan

INTRODUCTION

All Amphenol CIT UTiPHASE™ cables have been tested to the Group A, Group B, and Group C qualification test requirements of MIL-DTL-17. Where appropriate to meet the high-performance microwave requirements of UTiPHASE, some tests and parameters have been modified. The following tables detail the full qualification test procedures and parameters.

This testing represents the minimum required to certify UTiPHASE for use. Additional tests or more aggressive regimens may be applicable for specific defense and space-rated applications. Please contact Amphenol CIT for more information.



UTiPHASE phase-linear microwave cable assemblies



UFP088D Series



UFP142A Series



UFP205A Series



UFP311A Series

UTiPHASE™ Qualification Test Plan

GROUP A

All tests and inspections are in accordance with MIL-DTL-17 and Amphenol CIT acceptance test procedures.

GROUP A MECHANICAL TESTS

Test	Units	M17 Paragraph	Requirements	Sample Plan
Jacket Spark	kV	4.8.2	5 minimum	100%
Workmanship	-	4.8.1	Visual	10
Cable Marking	-	4.8.1	As required	10
Weight	g/ft	4.8.24	Per cable specification drawing	10
Diameter	inch	4.8.1.1 (a)	Per cable specification drawing	10
Jacket Out of Round	inch	-	Per cable finished inspection report	10
Jacket Wall Thickness	inch	-	Per cable finished inspection report	10
Braid Diameter	inch	4.8.1.1 (a)	Per cable specification drawing	10
Shield Diameter	inch	4.8.1.1 (a)	Per cable specification drawing	10
Dielectric Diameter	inch	4.8.1.1 (a)	Per cable specification drawing	10
Center Conductor Diameter	inch	4.8.1.1 (a)	Per cable specification drawing	10
Dimensional Stability Post Thermal Shock ^{1), 2)}	inch	-	≤ 0.10 recession of jacket or dielectric relative to center conductor	10

GROUP A ELECTRICAL TESTS

Test	Units	M17 Paragraph	Requirements	Sample Plan
Impedance	Ω	4.8.7	Per cable specification drawing	10
Impedance Profile ³⁾	Ω	-	≤ 0.5	10
Insertion Loss ³⁾	dB/ft	4.8.8	Per cable specification drawing	10
VSWR ³⁾	-	4.8.9	Per cable specification drawing	10
Velocity of Propagation	%	-	Per cable specification drawing	10
Dynamic IL Stability Post Thermal Shock ^{1), 2)}	%	-	Per cable specification drawing	10

1) Thermal shock 20 cycles -65 °C to +125 °C with 1-hour dwells

2) Sample length shall be 2 ft with flush cut ends

3) Sample length shall not be less than 20 ft

UTiPHASE™ Qualification Test Plan

GROUP B

All tests and inspections are in accordance with MIL-DTL-17 and Amphenol CIT acceptance test procedures.

GROUP B MECHANICAL AND ELECTRICAL TESTS

Test	Units	M17 Paragraph	Requirements	Sample Plan
Eccentricity	%	4.8.1.3	≤ 10%	10
Minimum Static Bend Radius	inch	-	Wrapped 360° per cable specification drawing with ≤ 0.5 Ω impedance change	10
Cold Bend Test	-	4.8.19	2" diameter mandrel @ -55 °C +/- 2 °C, no visual damage	4
Continuity	-	4.8.2	Wire and jacket to be continuous	10
Capacitance	pF/ft	4.8.10	26 maximum	10
Corona Extinction Voltage	VRMS @ 60 Hz	4.8.6	Minimum	10
Dielectric Withstanding Voltage	VRMS @ 60 Hz	4.8.4	Per cable specification drawing	10

GROUP B POST THERMAL SHOCK¹⁾ MECHANICAL AND ELECTRICAL TESTS

Test	Units	M17 Paragraph	Requirements	Sample Plan
Impedance	Ω	4.8.7	Per cable specification drawing	10
Impedance Profile ²⁾	Ω	-	≤ 0.5	10
Insertion Loss ²⁾	dB/ft	4.8.8	Per cable specification drawing	10
VSWR ²⁾	-	4.8.9	Per cable specification drawing	10
Velocity of Propagation	%	-	Per cable specification drawing	10
Dimensional Stability ²⁾	%	-	≤ 5	10
Connector Interface Dimensions	-	-	Per connector specification drawing	10

1) Thermal shock per MIL-STD-202, Method 107, 20 cycles, -65 °C to +125 °C

2) Sample length shall not be less than 20 ft

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GROUP C

All tests and inspections are in accordance with MIL-DTL-17 and Amphenol CIT acceptance test procedures.

GROUP C MECHANICAL AND ELECTRICAL TESTS

Test	Units	M17 Paragraph	Requirements	Sample Plan
Stress Crack Resistance ¹⁾	inch	4.8.17	230 °C +/- 5 °C for 96 hours	4
RF Shielding ²⁾	dB	-	≥ 100 @ 1 GHz	10
Electrical Phase vs. Temperature ^{3), 4)}	PPM	-	This test is used to establish Phase vs. Temperature curve in cable specification drawing	10
Static-Bend Installation Validation, Electrical Phase vs. Temperature ⁵⁾	PPM	-	-65 °C to +125 °C, track to cable specification drawing phase vs. temperature curve	6

- 1) Sample lengths shall be approximately 3 ft
- 2) Assemblies shall be approximately 3 ft long and results recorded up to 18 GHz
- 3) Assemblies shall be approximately 10 ft long
- 4) Assemblies of equal length produced from the same manufacturing lot shall phase track within 200 PPM of each other
- 5) Assemblies to be approximately 6 ft long, formed into bent configuration with 6 reverse bends and mounted together to test plate