

ULL04-Series are ultra low loss and phase stable (with bending) RF Cable Sets. Incorporate low density e-PTFE taped cables and low VSWR connectors.

- **Proprietary MIL-C-17 conformant cable**
- Loss and VSWR are stable with flexing/bending
- Shielding Effectiveness over -95dB

APPLICATIONS

- Radars, EW Systems where lowest loss and phase stability are important
- Interconnect within LRU's in military systems
- Test Cables for environmental testing



Electrical Specifications

Impedance	50 Ohms
Velocity of Propagation	76 %
Shielding Effectiveness	Better than -95dB
Capacitance	26.7 pF/ft 87.5 pF/m
Frequency Range	DC ~ 32.9 Ghz
Phase Stability Vs Flexures (360° wrap on a mandrel of 49.5mm diameter)	<1°/GHz, Typ. ±3.4°@18G
Phase Stability Vs Temp. (parts per million, ppm)	<10 ppm/degree (<1500 ppm in -40 ~ +85°)
Phase Stability Vs Temp. (degree/ meter / GHz)	<1° / m / GHz)
Atten. Stability Vs Temp.	<0.2 % /°C
Atten. Stability Vs Bending	± 0.2dB

Physical and Mechanical Specifications

Dimensions	inches	mm
Jacket	0.180	4.6
Bending Radius (minimum)	0.9	23
Weight	0.054 kg/m	
Temperature Range	-55° ~ + 150°C	

Attenuation and Power Handling Data

Frequency GHz	Insertion Loss		Power Watts
	dB/100ft	dB/100m	
0.4	6.4	20.9	900
3	17.8	58.4	320
10	33.3	109.4	165
12	36.7	120.4	150
18	45.5	149.4	120

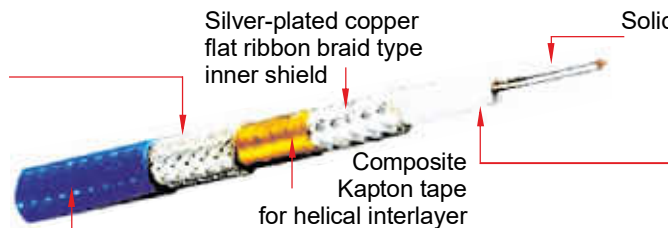
Imported Triple Shielded e-PTFE taped Phase Stable & Low Loss Cable Construction

Round wire braid type Outer Shield provides shielding and mechanical protection

Silver-plated copper flat ribbon braid type inner shield

Solid silver plated Center conductor for lowest attenuation

FEP (Fluorinated Ethylene Propylene) Jacket



Taped PTFE dielectric with 76% velocity

Ordering Codes Description

ULL04 - (Length) □ □ - (Connector 1) □ (□ / □) - (Connector 2) □ (□ / □) - □
 L L - 1 2 3 - 1 2 3 U

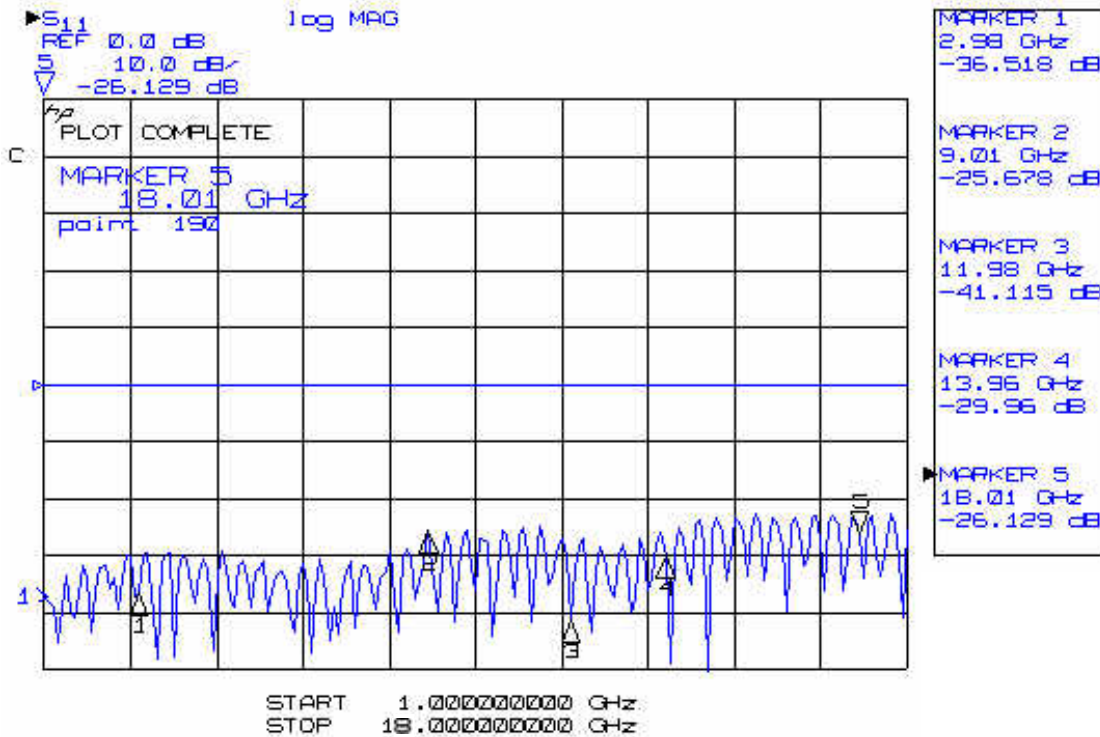
L L	Length	0.5 = 0.5 ; 1 = 1.0 ; 2 = 2.0
1	Connector Series	SMA = SMA ; N = N
2	Male/Female Designator	M = Male ; F = Female
3	Orientation of Connector	ST = Straight
U	Unit of Length	M = Meter ; F = Feet ; I = Inch

1 meter cable set with SMA (Male) on both sides = ULL04-1.0-SMA(M/ST)-SMA(M/ST)-M

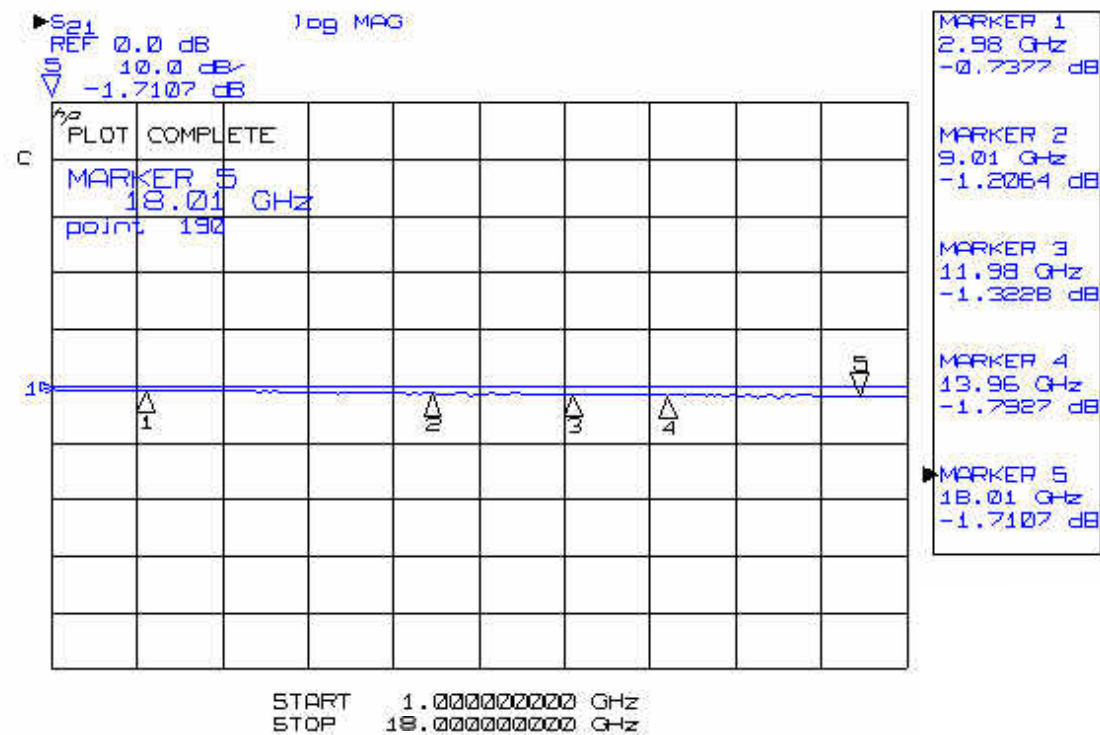
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S11 Plot of 1m ULL04 Pre-connectorized cable set with SMA(M) on both sides



S21 Plot of 1m ULL04 Pre-connectorized cable set with SMA(M) on both sides



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Connectors Specifications

Specifications	SMA Connectors	N Connectors	TNC Connectors
Outer Conductor	Stainless Steel, Passivated/Gold plated	Copper alloy	Copper alloy
Center Conductor	Brass, Gold Plated	Brass, Gold Plated	Brass, Gold Plated
Insulation	PTFE	PTFE	PTFE
Gasket	Silicon Rubber	Silicon Rubber	Silicon Rubber
Nominal Impedance	50 Ω	50 Ω	50Ω
Frequency range	DC~18 GHz	DC~11 GHz	DC~11 GHz
Mating/Unmating	500 operations	500 operations	500 operations
Vibration	As per MIL-STD-202, method 204, test condition D		
Mechanical Shock	As per MIL-STD-202, method 213, test condition I		
Thermal Shock	As per MIL-STD-202, method 107, test condition B		
Humidity	As per MIL-STD-202, method 106		
Temperature Cycle	As per MIL-STD-202, method 102A, test condition C		

Cable Set Ordering Codes

Ordering Code	Length	Insertion Loss (dB) Typical			
		0.5 GHz	2 GHz	11 GHz	18 GHz
SMA (Male) Straight - SMA (Male) Straight (DC to 18 GHz)					
ULL04-0.5-SMA(M/ST)-SMA(M/ST)-M	0.5m	0.25	0.49	0.95	1.20
ULL04-1.0-SMA(M/ST)-SMA(M/ST)-M	1m	0.41	0.63	1.42	1.95
ULL04-2.0-SMA(M/ST)-SMA(M/ST)-M	2m	0.71	1.24	2.75	3.50
ULL04-5.0-SMA(M/ST)-SMA(M/ST)-M	5m	1.64	2.90	6.45	8.15
ULL04-1.0-SMA(M/ST)-SMA(M/ST)-F	1 feet	0.14	0.21	0.6	0.85
ULL04-2.0-SMA(M/ST)-SMA(M/ST)-F	2 feet	0.24	0.55	0.99	1.29
SMA (Male) Straight - SMA (Male) Right Angle (DC to 12 GHz)					
ULL04-0.5-SMA(M/ST)-SMA(M/RA)-M	0.5m	0.29	0.51	0.99	-
ULL04-1.0-SMA(M/ST)-SMA(M/RA)-M	1m	0.42	0.64	1.44	-
ULL04-2.0-SMA(M/ST)-SMA(M/RA)-M	2m	0.79	1.25	2.96	-
ULL04-5.0-SMA(M/ST)-SMA(M/RA)-M	5m	1.70	3.10	6.95	-
ULL04-1.0-SMA(M/ST)-SMA(M/RA)-F	1 feet	0.15	0.24	0.69	-
ULL04-2.0-SMA(M/ST)-SMA(M/RA)-F	2 feet	0.25	0.59	1.07	-
SMA (Male) Right Angle - SMA (Male) Right Angle (DC~12 GHz)					
ULL04-0.5-SMA(M/RA)-SMA(M/RA)-M	0.5m	0.29	0.55	1.03	-
ULL04-1.0-SMA(M/RA)-SMA(M/RA)-M	1m	0.42	0.65	1.45	-
ULL04-2.0-SMA(M/RA)-SMA(M/RA)-M	2m	0.79	1.27	2.98	-
ULL04-5.0-SMA(M/RA)-SMA(M/RA)-M	5m	1.72	3.19	7.10	-
ULL04-1.0-SMA(M/RA)-SMA(M/RA)-F	1 feet	0.16	0.29	0.72	-
ULL04-2.0-SMA(M/RA)-SMA(M/RA)-F	2 feet	0.26	0.62	1.12	-
N (Male) Straight - N (Male) Straight (DC~11 GHz)					
ULL04-0.5-N(M/ST)-N(M/ST)-M	0.5m	0.28	0.52	0.99	-
ULL04-1.0-N(M/ST)-N(M/ST)-M	1m	0.43	0.64	1.43	-
ULL04-2.0-N(M/ST)-N(M/ST)-M	2m	0.79	1.26	2.85	-
ULL04-5.0-N(M/ST)-N(M/ST)-M	5m	1.63	3.10	6.55	-
ULL04-1.0-N(M/ST)-N(M/ST)-F	1 feet	0.15	0.24	0.68	-
ULL04-2.0-N(M/ST)-N(M/ST)-F	2 feet	0.25	0.56	0.99	-

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Specifications for Phase Stable & Low Loss Pre-Connectorized Cable Sets

Length Connector 1 Connector 2

- Should be flexible, easily routable
- Cable should conform to MIL standards MIL-C-17 and Connectors to MIL-PRF-39012

Electrical Specifications

- Impedance : 50 ohms
- Frequency : DC~18 GHz
- Velocity of Propagation : 76 %
- Shielding Effectiveness : better than -90 dB
- Power Handling : > 300 Watts Average @ 3 GHz
> 150 Watts Average @10 GHz
> 110 Watts Average @ 18 GHz
- Insertion Loss : < 0.20 dB/feet @ 3 GHz
< 0.38 dB/feet @ 10 GHz
< 0.50 dB/feet @ 18 GHz
- VSWR : < 1.30 (DC~11 GHz, for SMA straight connectors)
< 1.35 (11~18 GHz, for SMA straight connectors)

Physical & Mechanical Specifications

- Construction should be triple shielded taped PTFE dielectric for ultra low loss and electrical performance stability with time
- Center Conductor : Solid Silver Plated Copper
- Dielectric : Low Density PTFE
- Inner Shield : Silver Plated Copper Flat Ribbon Tape
- Interlayer : Metalized Foil Tape
- Outer Shield : Silver-Plated Copper Braid
- Jacket : Fluorinated Ethylene Propylene (FEP)
- Overall diameter : < 4.8 mm
- Bending Radius : < 23 mm (0.9 in)
- Temperature Range : -55°C to +125°C

Connector Specifications SMA (DC~18GHz)

- Outer Conductor: Stainless Steel Passivated/Brass Gold plated
- Center Conductor: Brass, Gold Plated
- Insulation: PTFE
- Frequency range: DC~18 GHz
- Should meet test conditions of MIL-STD-202 for vibration, mechanical shock, thermal shock, corrosion, humidity, temperature cycling

Specifications N Type (DC~11 GHz)

- Outer Conductor: Copper Alloy
- Center Conductor: Brass, Gold Plated
- Insulation: PTFE
- Frequency range: DC~11 GHz
- Should meet test conditions of MIL-STD-202 for vibration, mechanical shock, thermal shock, corrosion, humidity, temperature cycling