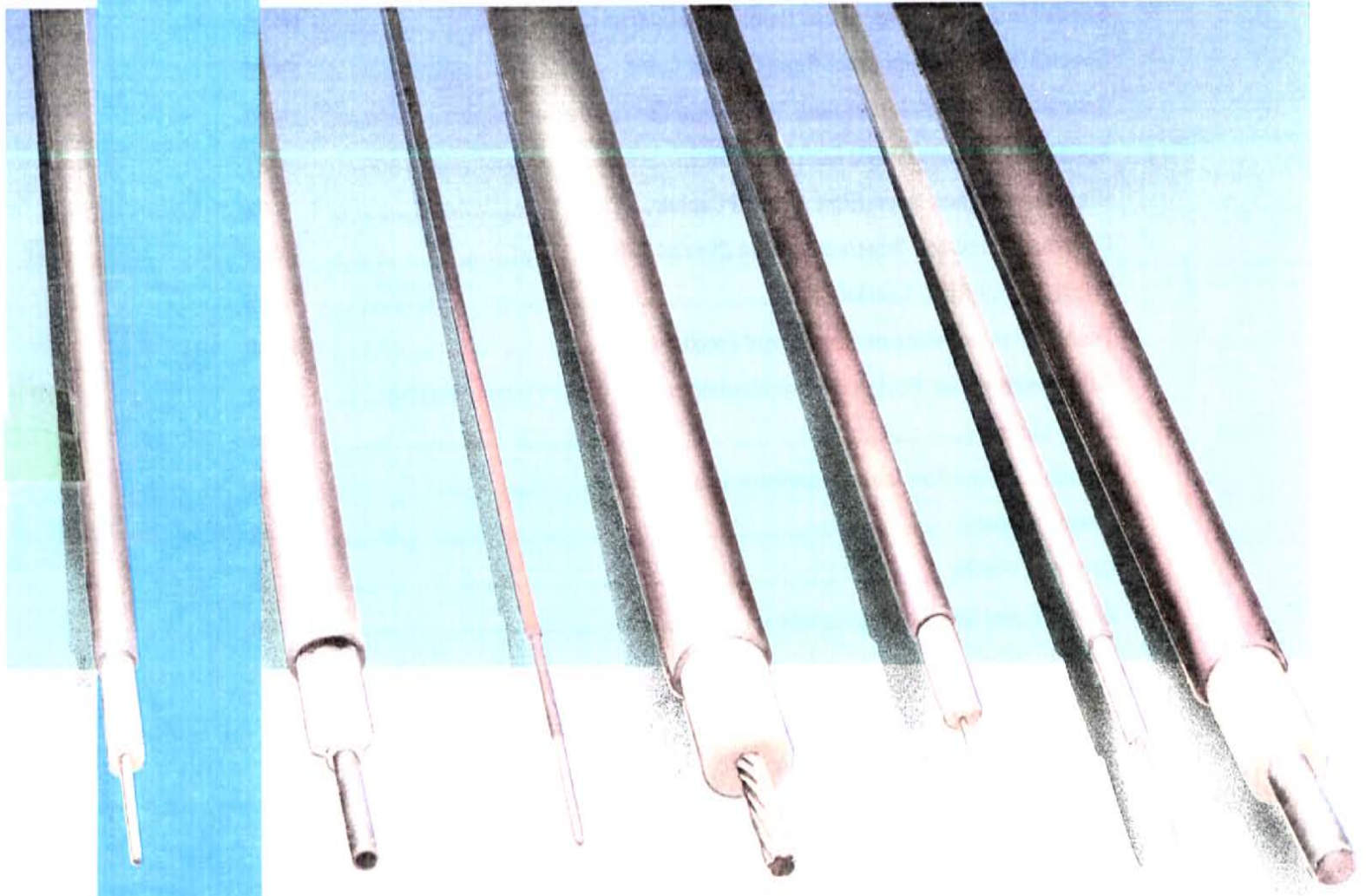


# SEMI-RIGID COAXIAL CABLE



**MICRO-COAX<sup>®</sup>**  
Leading the way in transmission line solutions.

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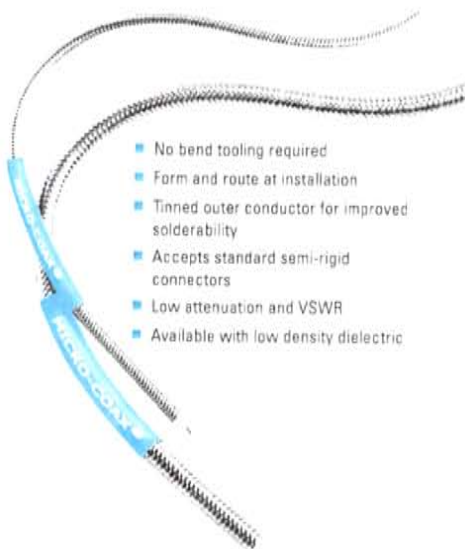
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New!

See pages 51-54  
for a formable alternative  
to semi-rigid or flexible  
microwave cable...

UTiFORM™

TIN-DIPPED  
HAND-FORMABLE  
MICROWAVE CABLE



- No bend tooling required
- Form and route at installation
- Tinned outer conductor for improved solderability
- Accepts standard semi-rigid connectors
- Low attenuation and VSWR
- Available with low density dielectric

Technical information in this document is subject to change without notice

**MICRO-COAX®**  
*Leading the way in transmission line solutions.*

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## GENERAL INFORMATION ON SEMI-RIGID COAXIAL CABLE

The purpose of Micro-Coax® Semi-Rigid Coaxial Cable is to transmit and/or receive a high-speed, high-frequency microwave signal. It is the most practical and beneficial method for achieving

- low loss, total shielding at or near theoretical value
- elimination of radiation leakage
- lowest possible attenuation
- unequaled SWR performance above 12 GHz
- miniaturization of power componentry

With Micro-Coax® Semi-Rigid Coax Cable, microwave signals can be delivered with maximum power handling efficiency and minimum interference in a very small configuration.

The outstanding performance characteristics of Micro-Coax® Semi-Rigid Coaxial Cable include:

■ **Workability:** It is easily bent, coiled, stripped, machined, soldered, or connected without impairing performance. Ends can be rapidly and reliably prepared.

■ **Attenuation:** A solid center conductor provides the optimum geometrical surface for transmission.

■ **Impedance Matching:** Low SWR. The dielectric is controlled to exacting tolerances, thus minimizing reflected power loss.

■ **Shielding:** Isolation greater than 130 dB. Virtually no extraneous signal pick-up.

■ **Packaging:** Metallic tubular outer conductor offers minimum size and maximum outer conductor integrity. Copper jackets can be soldered directly to circuit boards.

## TYPICAL APPLICATIONS FOR SEMI-RIGID COAXIAL CABLE

Semi-rigid coaxial cable finds application in frequency ranges from 500 megahertz (500 MHz) through 65 gigahertz (65.0 GHz) and beyond.

Almost any system designed for 500 megahertz and above, and in need of good operational performance and total shielding, can utilize semi-rigid coax. Semi-rigid lines and fabricated assemblies are used in high-speed computer

systems, medical electronics, communications systems, and nuclear power plants. In componentry, semi-rigid coax is used in oscillators and amplifiers, printed circuit boards, delay lines, and capacitor sections.

Semi-Rigid Coax is also used in CATV transmission systems where it helps to eliminate crosstalk, resulting in better reception with less interference.

## DESIGN CONSIDERATIONS FOR CABLE COMPONENTS

Micro-Coax® Semi-Rigid Coaxial Cable is an assembly of three basic parts, namely:

- a tubular metal jacket which serves as an outer conductor
- a dielectric or insulating material
- a metallic center conductor

Each of these parts has options as to material, size, and in most cases, configurations, as will be explained in this catalog

Cable components, both conductors and insulation, can be closely controlled to inner and outer diameters, and assembled in such a manner that tolerances are maintained through the entire cable length. This is true even when secondary operations, such as bending or coiling, are involved. Thus, the best practicable performance criteria can be established and maintained.



Micro-Coax® Semi-Rigid Coaxial Cable showing outer conductor, dielectric, and center conductor

## PART NUMBER DESIGNATION

The UT<sup>®</sup> part number designation is easy to understand because it is simple and short, especially for standard cable. Some part numbers for standard cable have been shortened. Materials for component parts are indicated under individual cable specifications.

UT - X - XXX X - XX - XXX - XX - XX

Code	Core Type
S	No Entry - Solid
	Spline Dielectric
T	Tubular Inner Cond.

Code	Cable Outer Diameter
VALUE	Nominal Diameter in Thousands of an inch

Code	Inner Conductor Material*
	No Entry - SPCW**
C	Silver Plated Copper
B	Silver Plated Beryllium Copper
Cu	Copper
AL	Aluminum Alloy 1100
AL52	Aluminum Alloy 5052
SS	Stainless Steel Alloy 304
L	High Resistance
Nb	Niobium
Au	Gold
W	Tungsten
Pd	Palladium

Code	Special Designations
M	No Entry - PTFE Dielectric
	Low Dielectric Compression
M17	MIL-C-17 QPL Cable
TYPE	Greater Than Standard Length
FEP	FEP Dielectric
TEFZEL	TEFZEL™ Dielectric***
PE	Polyethylene Dielectric
FPE	Foamed Polyethylene Dielectric
I	Magnesium Oxide Dielectric
LL	Low Density PTFE Dielectric
SiO <sub>2</sub>	Silicone Dioxide Dielectric
F	FEP Jacket

Code	Outer Conductor Finish
	No Entry - No Plating
SP	Silver Plating
TP	Tin Plating
GP	Gold Plating
CP	Cadmium Plating
EDS	Solder Plating
EDCU	Copper Plating

Code	Outer Conductor Material
	No Entry - Copper
AL	Aluminum Alloy 1100
AL52	Aluminum Alloy 5052
B	Beryllium Copper
CuSS	Copper Lined Stainless Steel Alloy 304
Nb	Niobium
SS	Stainless Steel Alloy 304
Au	Silver
BZ	Phosphor Bronze
Form	Tin-dipped, silver-plated copper wire braid

Code	Cable Impedance
	No Entry - 50 Ohms
VALUE	Nominal Impedance

- \* For some cables A, AA and SA will appear after the cable diameter code. An "A" signifies that the cable design was revised, "AA" signifies a tighter than standard impedance tolerance, and "SA" originally represented a temperature stable dielectric, however all micro-coax cables now use a temperature stable dielectric.
- \*\* SPCW is the abbreviation for silver plated copper-weld also known as silvered copper covered steel.
- \*\*\* TEFZEL™ is a trademark of Dupont.

# MIL-SPEC APPROVED SEMI-RIGID COAXIAL CABLES

## MIL-C-17 APPROVED

Many Micro-Coax® Semi-Rigid Coaxial Cables have successfully completed qualification and have been approved under MIL-C-17 Qualified Products List (QPL).

## HOW MIL-C-17 APPROVAL BENEFITS CUSTOMERS

■ Under MIL-C-17, all Micro-Coax® M17 qualified cables are inspected for quality and optimum performance prior to being put in stock. This eliminates the need for special purchasing specifications and costly, time consuming "customized" inspection previously required to conform to the customer's group testing requirements of MIL-C-17.

Tests ensure cable conformance with broadband performance requirements for attenuation and SWR (structural return loss), coaxial concentricity, conductor adherence, dimensional stability and weight.

- Four of the M17 qualified cables are in 0.047" (1.194mm) and 0.034" (0.864mm) OD sizes. These cables are finding increased usage in densely packaged and minimum weight systems such as advanced airborne applications.
- "M17" part numbers supersede familiar "RG" part numbers. RG specifications have been deleted by DESC (Defense Electronics Supply Center).
- Cables designated M17/129, 130 and 133 are marked continuously for visual cable identification.
- Outer conductor finishes, other than no plating or tin plating, can be specified for unplated M17 cable.
- Stocks of all M17 cables are carried at Micro-Coax® and distributor locations.

## MAXIMUM ATTENUATION and POWER RATINGS at 25° C

MIL-C-17/129			MIL-C-17/130			MIL-C-17/133			MIL-C-17/151			MIL-C-17/154		
Attenuation		Power	Attenuation		Power	Attenuation		Power	Attenuation		Power	Attenuation		Power
MHz	dB/100'	Watts	MHz	dB/100'	Watts	MHz	dB/100'	Watts	MHz	dB/100'	Watts	MHz	dB/100'	Watts
400	4.5	1900	500	8	600	500	15	180	500	28	45	500	42	14
1000	7.5	1400	1000	12	450	1000	22	130	1000	40	32	1000	60	10
3000	16	750	3000	21	250	5000	50	54	3000	70	18	3000	100	6
10000	33	350	5000	29	180	10000	80	35	5000	90	13	5000	140	4.5
18000	48	200	10000	45	120	20000	130	20	10000	130	9	10000	190	3.1
—	—	—	20000	70	70	—	—	—	20000	190	6.5	20000	280	2
Structural Return Loss			Structural Return Loss			Structural Return Loss			Structural Return Loss			Structural Return Loss		
MHz		dB	MHz		dB	MHz		dB	MHz		dB	MHz		dB
500		26	500		30	500		28	1000		22	500		22
5000		21	5000		23	5000		23	10000		18	5000		21
10000		19	18000		21	20000		15	20000		14	20000		15
18000		16	—		—	—		—	—		—	—		—

## MIL-C-17 APPROVED SEMI-RIGID COAXIAL CABLE\*

MIL-C-17 Part Number	M17/154-00001	M17/154-00002	M17/151-00001	M17/151-00002
Micro-Coax Part Number	UT 34-M17	UT 34-TP-M17	UT 47-M17	UT 47-TP-M17
<b>DIMENSIONS</b>				
Outer Conductor Diameter (in) (mm)	0.034 ± 0.001 0.86 ± 0.0254	0.034 +0.002/-0.001 0.86 +0.0508/-0.0254	0.047 ± 0.001 1.19 ± 0.0254	0.047 +0.002/-0.001 1.19 +0.0508/-0.0254
Dielectric Diameter (in) (mm)	0.026 ± 0.001 0.66 ± 0.0254	0.026 ± 0.001 0.66 ± 0.0254	0.037 ± 0.001 0.94 ± 0.0254	0.037 ± 0.001 0.94 ± 0.0254
Center Conductor Diameter (in) (mm)	0.008 ± 0.0005 0.203 ± 0.0127	0.008 ± 0.0005 0.203 ± 0.0127	0.0113 ± 0.0005 0.287 ± 0.0127	0.0113 ± 0.0005 0.287 ± 0.0127
<b>MATERIALS</b>				
Outer Conductor	COPPER	TIN-PLATED COPPER	COPPER	TIN-PLATED COPPER
Dielectric	PTFE	PTFE	PTFE	PTFE
Center Conductor	SPCW	SPCW	SPCW	SPCW
<b>ELECTRICAL PROPERTIES</b>				
Characteristic Impedance (ohms)	50 ± 3.0	50 ± 3.0	50 ± 2.5	50 ± 2.5
Capacitance (pF/ft. Maximum) (pF/m. Maximum)	32.2 105.0	32.2 105.0	32.2 105.0	32.2 105.0
Corona Extinction Voltage (VRMS @ 60 Hz)	750	750	1000	1000
Voltage Withstanding (VRMS @ 60 Hz)	2000	2000	2000	2000
Operating Frequency (Maximum GHz)	20.0	20.0	20.0	20.0
Attenuation	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
Power	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
Structural Return Loss	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
<b>MECHANICAL PROPERTIES</b>				
Operating Temperature Range (°C)	-40 to 100	-40 to 100	-40 to 100	-40 to 100
Minimum Inside Bend Diameter (in) (mm)	0.25 6.35	0.25 6.35	0.25 6.35	0.25 6.35
Maximum Weight (lbs/100ft) (kg/100m)	0.26 0.39	0.28 0.42	0.45 0.67	0.48 0.71
Dimensional Stability Temperature (°C) Maximum Dimension (in) (mm)	100 0.015 0.38	100 0.015 0.38	125 0.015 0.38	125 0.015 0.38
Center Conductor Adhesion Minimum lbs Minimum kg Maximum lbs Maximum kg	0.5 0.23 5.5 2.50	0.5 0.23 5.5 2.50	2.0 0.91 10.0 4.54	2.0 0.91 10.0 4.54

\* Standard inventory item.

## MIL-C-17 APPROVED SEMI-RIGID COAXIAL CABLE\*

MIL-C-17 Part Number	M17/133-RG-405	M17/133-00001	M17/133-00002	M17/133-00003
Micro-Coax Part Number	UT 85-H-M17	UT 85-H-TP-M17	UT 85C-H-M17	UT 85C-H-TP-M17
<b>DIMENSIONS</b>				
Outer Conductor Diameter (in) (mm)	0.0865 ± 0.001 2.20 ± 0.0254	0.0865 +0.002/-0.001 2.20 +0.0508/-0.0254	0.0865 ± 0.001 2.20 ± 0.0254	0.0865 +0.002/-0.001 2.20 +0.0508/-0.0254
Dielectric Diameter (in) (mm)	0.066 ± 0.002 1.676 ± 0.0508	0.066 ± 0.002 1.676 ± 0.0508	0.066 ± 0.002 1.676 ± 0.0508	0.066 ± 0.002 1.676 ± 0.0508
Center Conductor Diameter (in) (mm)	0.0201 ± 0.0005 0.511 ± 0.0127	0.0201 ± 0.0005 0.511 ± 0.0127	0.0201 ± 0.0005 0.511 ± 0.0127	0.0201 ± 0.0005 0.511 ± 0.0127
<b>MATERIALS</b>				
Outer Conductor	COPPER	TIN-PLATED COPPER	COPPER	TIN-PLATED COPPER
Dielectric	PTFE	PTFE	PTFE	PTFE
Center Conductor	SPCW	SPCW	SPC	SPC
<b>ELECTRICAL PROPERTIES</b>				
Characteristic Impedance (ohms)	50 ± 1.5	50 ± 1.5	50 ± 1.5	50 ± 1.5
Capacitance (pF/ft. Maximum) (pF/m. Maximum)	32.2 105.0	32.2 105.0	32.0 105.0	32.0 105.0
Corona Extinction Voltage (VRMS @ 60 Hz)	1500	1500	1500	1500
Voltage Withstanding (VRMS @ 60 Hz)	5000	5000	5000	5000
Operating Frequency (Maximum GHz)	20.0	20.0	20.0	20.0
Attenuation	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
Power	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
Structural Return Loss	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
<b>MECHANICAL PROPERTIES</b>				
Operating Temperature Range (°C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Minimum Inside Bend Diameter (in) (mm)	0.25 6.35	0.25 6.35	0.25 6.35	0.25 6.35
Maximum Weight (lbs/100ft) (kg/100m)	1.53 2.28	1.58 2.35	1.52 2.26	1.57 2.34
Dimensional Stability Temperature (°C) Maximum Dimension (in) (mm)	125 0.015 0.38	125 0.015 0.38	125 0.015 0.38	125 0.015 0.38
Center Conductor Adhesion Minimum lbs Minimum kg Maximum lbs Maximum kg	4.0 1.81 35.0 15.88	4.0 1.81 35.0 15.88	4.0 1.81 35.0 15.88	4.0 1.81 35.0 15.88

\* Standard inventory item.



## MIL-C-17 APPROVED SEMI-RIGID COAXIAL CABLE\*

MIL-C-17 Part Number	M17/133-00006	M17/133-00007	M17/133-00008	M17/133-00009
Micro-Coax Part Number	UT 85-M17	UT 85-TP-M17	UT 85C-M17	UT 85C-TP-M17
<b>DIMENSIONS</b>				
Outer Conductor Diameter (in) (mm)	0.0865 ± 0.001 2.20 ± 0.0254	.0865 + .002/-0.001 2.18 + .0508/-0.0254	0.0865 ± 0.001 2.20 ± 0.0254	0.0865 + .002/-0.001 2.20 + .0508/-0.0254
Dielectric Diameter (in) (mm)	0.066 ± 0.002 1.676 ± 0.0508	0.066 ± 0.002 1.676 ± 0.0508	0.066 ± 0.002 1.676 ± 0.0508	0.066 ± 0.002 1.676 ± 0.0508
Center Conductor Diameter (in) (mm)	0.0201 ± 0.0005 0.511 ± 0.0127	0.0201 ± 0.0005 0.511 ± 0.0127	0.0201 ± 0.0005 0.511 ± 0.0127	0.0201 ± 0.0005 0.511 ± 0.0127
<b>MATERIALS</b>				
Outer Conductor	COPPER	TIN-PLATED COPPER	COPPER	TIN-PLATED COPPER
Dielectric	PTFE	PTFE	PTFE	PTFE
Center Conductor	SPCW	SPCW	SPC	SPC
<b>ELECTRICAL PROPERTIES</b>				
Characteristic Impedance (ohms)	50 ± 1.5	50 ± 1.5	50 ± 1.5	50 ± 1.5
Capacitance (pF/ft. Maximum) (pF/m. Maximum)	32.0 105.0	32.0 105.0	32.0 105.0	32.0 105.0
Corona Extinction Voltage (VRMS @ 60 Hz)	1500	1500	1500	1500
Voltage Withstanding (VRMS @ 60 Hz)	5000	5000	5000	5000
Operating Frequency (Maximum GHz)	20.0	20.0	20.0	20.0
Attenuation	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
Power	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
Structural Return Loss	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
<b>MECHANICAL PROPERTIES</b>				
Operating Temperature Range (°C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Minimum Inside Bend Diameter (in) (mm)	0.100 2.54	0.100 2.54	0.100 2.54	0.100 2.54
Maximum Weight (lbs/100ft) (kg/100m)	1.53 2.28	1.58 2.35	1.52 2.26	1.57 2.35
Dimensional Stability Temperature (°C) Maximum Dimension (in) (mm)	125 0.015 0.38	125 0.015 0.38	125 0.015 0.38	125 0.015 0.38
Center Conductor Adhesion Minimum lbs Minimum kg Maximum lbs Maximum kg	4.0 1.81 35.0 15.88	4.0 1.81 35.0 15.88	4.0 1.81 35.0 15.88	4.0 1.81 35.0 15.88

\* Standard inventory item.

## MIL-C-17 APPROVED SEMI-RIGID COAXIAL CABLE\*

MIL-C-17 Part Number	M17/133-00016	M17/130-RG-402	M17/130-00001	M17/130-00004
Micro-Coax Part Number	UT 85-SP-M17	UT 141-HA-M17	UT 141-HA-TP-M17	UT 141-SA-M17
<b>DIMENSIONS</b>				
Outer Conductor Diameter (in) (mm)	0.086 + 0.002/-0.001 2.18 + 0.0508/-0.0254	0.141 ± 0.001 3.58 ± 0.0254	0.141 +0.002/-0.001 3.58 +0.0508/-0.0254	0.141 ± 0.001 3.58 ± 0.0254
Dielectric Diameter (in) (mm)	0.066 ± 0.002 1.676 ± 0.0508	0.1175 ± 0.001 2.985 ± 0.0254	0.1175 ± 0.001 2.985 ± 0.0254	0.1175 ± 0.001 2.985 ± 0.0254
Center Conductor Diameter (in) (mm)	0.0201 ± 0.0005 0.511 ± 0.0127	0.0362 ± 0.0007 0.9195 ± 0.0178	0.0362 ± 0.0007 0.9195 ± 0.0178	0.0362 ± 0.0007 0.9195 ± 0.0178
<b>MATERIALS</b>				
Outer Conductor	SILVER-PLATED COPPER	COPPER	TIN-PLATED COPPER	COPPER
Dielectric	PTFE	PTFE	PTFE	PTFE
Center Conductor	SPCW	SPCW	SPCW	SPCW
<b>ELECTRICAL PROPERTIES</b>				
Characteristic Impedance (ohms)	50 ± 1.5	50 ± 1.0	50 ± 1.0	50 ± 1.0
Capacitance (pF/ft, Maximum) (pF/m, Maximum)	32.0 105.0	29.9 98.10	29.9 98.10	29.9 98.10
Corona Extinction Voltage (VRMS @ 60 Hz)	1500	1900	1900	1900
Voltage Withstanding (VRMS @ 60 Hz)	5000	5000	5000	5000
Operating Frequency (Maximum GHz)	20.0	20.0	20.0	20.0
Attenuation	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
Power	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
Structural Return Loss	See Table Page 6	See Table Page 6	See Table Page 6	See Table Page 6
<b>MECHANICAL PROPERTIES</b>				
Operating Temperature Range (°C)	-40 to 125	-40 to 125	-40 to 125	-40 to 125
Minimum Inside Bend Diameter (in) (mm)	0.100 2.54	0.50 12.7	0.50 12.7	0.15 3.81
Maximum Weight (lbs/100ft) (kg/100m)	1.58 2.35	3.44 5.12	3.51 5.22	3.44 5.12
Dimensional Stability Temperature (°C) Maximum Dimension (in) (mm)	125 0.015 0.38	125 0.015 0.38	125 0.015 0.38	125 0.015 0.38
Center Conductor Adhesion Minimum lbs Minimum kg Maximum lbs Maximum kg	4.0 1.81 35.0 15.88	4.0 1.81 65.0 29.48	4.0 1.81 65.0 29.48	4.0 1.81 65.0 29.48

\* Standard inventory item.

## MIL-C-17 APPROVED SEMI-RIGID COAXIAL CABLE\*

MIL-C-17 Part Number	M17/130-00005	M17/129-RG-401	M17/129-00001
Micro-Coax Part Number	UT 141-SA-TP-M17	UT 250-A-M17	UT 250-A-TP-M17
<b>DIMENSIONS</b>			
Outer Conductor Diameter (in) (mm)	0.141 +0.002/-0.001 3.58 +0.0508/-0.0254	0.250 ± 0.001 6.35 ± 0.0254	0.250 +0.002/-0.001 6.35 +0.0508/-0.0254
Dielectric Diameter (in) (mm)	0.1175 ± 0.001 2.985 ± 0.0254	0.209 ± 0.002 5.309 ± 0.0508	0.209 ± 0.002 5.309 ± 0.0508
Center Conductor Diameter (in) (mm)	0.0362 ± 0.0007 0.9195 ± 0.0178	0.0641 ± 0.001 1.628 ± 0.0254	0.0641 ± 0.001 1.628 ± 0.0254
<b>MATERIALS</b>			
Outer Conductor	TIN-PLATED COPPER	COPPER	TIN-PLATED COPPER
Dielectric	PTFE	PTFE	PTFE
Center Conductor	SPCW	SPC	SPC
<b>ELECTRICAL PROPERTIES</b>			
Characteristic Impedance (ohms)	50 ± 1.0	50 ± 0.5	50 ± 0.5
Capacitance (pF/ft. Maximum) (pF/m. Maximum)	29.9 98.10	29.6 97.12	29.6 97.12
Corona Extinction Voltage (VRMS @ 60 Hz)	1900	3000	3000
Voltage Withstanding (VRMS @ 60 Hz)	5000	7500	7500
Operating Frequency (Maximum GHz)	20.0	18.0	18.0
Attenuation	See Table Page 6	See Table Page 6	See Table Page 6
Power	See Table Page 6	See Table Page 6	See Table Page 6
Structural Return Loss	See Table Page 6	See Table Page 6	See Table Page 6
<b>MECHANICAL PROPERTIES</b>			
Operating Temperature Range (°C)	-40 to 125	-40 to 90	-40 to 90
Minimum Inside Bend Diameter (in) (mm)	0.15 3.81	0.75 19.05	0.75 19.05
Maximum Weight (lbs/100ft) (kg/100m)	3.51 5.22	10.5 15.6	10.6 15.8
Dimensional Stability Temperature (°C) Maximum Dimension (in) (mm)	125 0.015 0.38	125 0.015 0.38	125 0.015 0.38
Center Conductor Adhesion Minimum lbs Minimum kg Maximum lbs Maximum kg	4.0 1.81 65.0 29.48	4.0 1.81 100.0 45.4	4.0 1.81 100.0 45.4

\* Standard inventory item.

NOTE: Please see page 47 for additional MIL-C-17 approved cables.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 8		UT 13		UT 20		UT 20-SS	
<b>DIMENSIONS</b>								
Outer Conductor Diameter (in) (mm)	0.008 ± 0.001 0.20 ± 0.0254		0.013 ± 0.001 0.33 ± 0.0254		0.023 ± 0.001 0.58 ± 0.0254		0.020 ± 0.001 0.51 ± 0.0254	
Dielectric Diameter (in) (mm)	0.004 ± 0.001 0.10 ± 0.0254		0.010 ± 0.001 0.25 ± 0.0254		0.0165 ± 0.001 0.42 ± 0.0254		0.015 ± 0.001 0.38 ± 0.0254	
Center Conductor Diameter (in) (mm)	0.002 ± 0.0005 0.05 ± 0.0127		0.0031 ± 0.0005 0.08 ± 0.0127		0.005 ± 0.0005 0.13 ± 0.0254		0.0045 ± 0.0005 0.11 ± 0.0127	
Length Range (ft) (m)	1 - 8 0.31 - 2.44		1 - 10 0.31 - 3.05		1 - 10 0.31 - 3.05		1 - 10 0.31 - 3.05	
<b>MATERIALS</b>								
Outer Conductor	COPPER		COPPER		COPPER		304 SS	
Dielectric	PTFE		PTFE		PTFE		PTFE	
Center Conductor	COPPER		SPCW		SPCW		SPCW	
<b>ELECTRICAL PROPERTIES</b>								
Characteristic Impedance (ohms)	50 ± 3.0		50 ± 2.0		50 ± 2.0		50 ± 2.0	
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1	
Corona Extinction Voltage (VRMS @ 60 Hz)	150		150		500		500	
Voltage Withstanding (VRMS @ 60 Hz)	250		500		750		750	
Moding Frequency (GHz)	788		402		245		270	
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20° C and Sea Level	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER
0.5 GHz	145.8	3.8	87.8	7.9	53.3	20.4	134.9	7.6
1.0 GHz	206.4	2.7	124.4	5.5	75.6	14.4	191.0	5.3
5.0 GHz	463.5	1.2	280.6	2.5	171.4	6.4	429.5	2.4
10.0 GHz	657.7	0.8	399.2	1.7	244.8	4.5	609.8	1.7
20.0 GHz	934.4	0.6	569.4	1.2	351.1	3.1	867.2	1.2
<b>MECHANICAL PROPERTIES</b>								
Outer Conductor Integrity Temp. (° C)	200		150		150		150	
Max. Operating Temp. (° C)	150		125		125		125	
Min. Inside Bend Radius (in) (mm)	0.032 0.81		0.050 1.27		0.050 1.27		0.050 1.27	
Weight (lbs/100ft) (kg/100m)	0.02 0.03		0.03 0.04		0.10 0.15		0.07 0.10	

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 34		UT 34-TP		UT 34-SP		UT 34-M		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.034 ± 0.001 0.86 ± 0.0254		0.034 +0.002/-0.001 0.86 +0.0508/-0.0254		0.034 +0.002/-0.001 0.86 +0.0508/-0.0254		0.0375 ± 0.001 0.95 ± 0.0254		
Dielectric Diameter (in) (mm)	0.026 ± 0.001 0.66 ± 0.0254		0.026 ± 0.001 0.66 ± 0.0254		0.026 ± 0.001 0.66 +0.0508/-0.0254		0.024 ± 0.001 0.61 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.008 ± 0.0005 0.20 ± 0.0127		0.008 ± 0.0005 0.20 ± 0.0127		0.008 ± 0.0005 0.20 ± 0.0127		0.008 ± 0.0005 0.20 ± 0.0127		
Length Range (ft) (m)	1 - 15 0.31 - 4.57		1 - 15 0.31 - 4.57		1 - 15 0.31 - 4.57		1 - 15 0.31 - 4.57		
<b>MATERIALS</b>									
Outer Conductor	COPPER		TIN/COPPER		SILVER/COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPCW		SPCW		SPCW		SPCW		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 1.5		50 ± 1.5		50 ± 1.5		50 ± 4.0		
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1		
Corona Extinction Voltage (VRMS @ 60 Hz)	750		750		750		750		
Voltage Withstanding (VRMS @ 60 Hz)	2000		2000		2000		2000		
Moding Frequency (GHz)	155		155		155		155		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20° C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	34.0	35.7	34.0	30.5	34.0	28.5	32.7	68.3
	1.0 GHz	48.3	25.2	48.3	21.5	48.3	20.0	46.5	48.1
	5.0 GHz	110.4	11.1	110.4	9.5	110.4	8.8	106.2	21.2
	10.0 GHz	158.6	7.7	158.6	6.6	158.6	6.2	152.6	14.8
	20.0 GHz	229.1	5.4	229.1	4.6	229.1	4.3	220.7	10.3
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	150		150		150		225		
Max. Operating Temp. (°C)	125		125		125		200		
Min. Inside Bend Radius (in) (mm)	0.050 1.27		0.050 1.27		0.050 1.27		0.050 1.27		
Weight (lbs/100ft) (kg/100m)	0.21 0.31		0.21 0.31		0.21 0.31		.26 .39		

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 34C-10		UT 34-25		UT 34-95		UT 43C-10		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.034 ± 0.001 0.86 ± 0.0254		0.034 ± 0.001 0.86 ± 0.0254		0.034 ± 0.001 0.86 ± 0.0254		0.043 ± 0.001 1.09 ± 0.0254		
Dielectric Diameter (in) (mm)	0.025 ± 0.001 0.64 ± 0.0254		0.023 ± 0.001 0.58 ± 0.0254		0.027 ± 0.001 0.69 ± 0.0254		0.036 ± 0.001 0.91 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.0201 ± 0.0005 0.51 ± 0.0127		0.0126 ± 0.0005 0.32 ± 0.0127		0.0028 ± 0.0005 0.07 ± 0.0127		0.0285 ± 0.0005 0.72 ± 0.0127		
Length Range (ft) (m)	1 - 15 0.31 - 4.57		1 - 15 0.31 - 4.57		1 - 15 0.31 - 4.57		1 - 15 0.31 - 4.57		
<b>MATERIALS</b>									
Outer Conductor	COPPER		COPPER		COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPC		SPCW		SPCW		SPC		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	10 ± 3.0		25 ± 2.0		95 ± 4.0		10 ± 1.5		
Capacitance (Nominal) (pF/ft) (pF/m)	145.1 476.0		58.0 190.4		14.8 48.6		145.1 476.0		
Corona Extinction Voltage (VRMS @ 60 Hz)	200		200		1000		200		
Voltage Withstanding (VRMS @ 60 Hz)	500		500		2000		500		
Moding Frequency (GHz)	116		148		177		81		
Typical Attenuation (dB/100 ft) / Average Power (Watts CW) @ 20°C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	100.0	15.0	49.9	30.0	42.0	28.2	65.6	27.7
	1.0 GHz	141.8	10.6	70.8	21.2	60.4	19.9	93.0	19.5
	5.0 GHz	319.3	4.7	160.6	9.4	137.4	8.8	210.3	8.7
	10.0 GHz	454.0	3.3	229.5	6.6	196.8	6.1	299.8	6.1
	20.0 GHz	646.9	2.3	329.4	4.6	283.1	4.3	428.9	4.3
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	175		175		150		175		
Max. Operating Temp. (°C)	150		150		125		150		
Min. Inside Bend Radius (in) (mm)	0.125 3.18		0.050 1.27		0.125 3.18		0.125 3.18		
Weight (lbs/100ft) (kg/100m)	0.30 0.45		0.26 0.39		0.19 0.28		0.45 0.67		

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 47		UT 47-TP		UT 47-SP		UT 47-70		UT 70C	
<b>DIMENSIONS</b>										
Outer Conductor Diameter [in] [mm]	0.047 ± 0.001 1.19 ± 0.0254		0.047 ± 0.002/-0.001 1.19 ± 0.0508/-0.0254		0.047 ± 0.002/-0.001 1.19 ± 0.0508/-0.0254		0.047 ± 0.001 1.19 ± 0.0254		0.070 ± 0.001 1.78 ± 0.0254	
Dielectric Diameter [in] [mm]	0.037 ± 0.001 0.94 ± 0.0254		0.037 ± 0.001 0.94 ± 0.0254		0.037 ± 0.001 0.94 ± 0.0254		0.0375 ± 0.001 0.95 ± 0.0254		0.059 ± 0.001 1.50 ± 0.0254	
Center Conductor Diameter [in] [mm]	0.0113 ± 0.0005 0.29 ± 0.0127		0.0113 ± 0.0005 0.29 ± 0.0127		0.0113 ± 0.0005 0.29 ± 0.0127		0.0071 ± 0.0005 0.18 ± 0.0127		0.0179 ± 0.0005 0.45 ± 0.0127	
Length Range [ft] [m]	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 7.62	
<b>MATERIALS</b>										
Outer Conductor	COPPER		TIN/COPPER		SILVER/COPPER		SILVER/COPPER		COPPER	
Dielectric	PTFE		PTFE		PTFE		PTFE		PTFE	
Center Conductor	SPCW		SPCW		SPCW		SPCW		SPC	
<b>ELECTRICAL PROPERTIES</b>										
Characteristic Impedance [ohms]	50 ± 1.5		50 ± 1.5		50 ± 1.5		70 ± 1.5		50 ± 1.0	
Capacitance [Nominal] [pF/ft] [pF/m]	29.0 95.1		29.0 95.1		29.0 95.1		20.7 68.0		29.0 95.1	
Corona Extinction Voltage [VRMS @ 60Hz]	1000		1000		1000		1000		1200	
Voltage Withstanding [VRMS @ 60Hz]	2000		2000		2000		2000		2300	
Moding Frequency (GHz)	109		109		109		118		68	
Typical Attenuation [dB/100ft] /Average Power [Watts CW] @ 20°C and Sea Level										
	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER
0.5 GHz	24.0	80.5	24.0	67.4	24.0	62.2	24.8	77.4	15.2	124.0
1.0 GHz	34.2	56.6	34.2	47.4	34.2	43.7	35.3	54.4	21.7	86.9
5.0 GHz	78.8	24.7	78.8	20.7	78.8	19.1	81.3	23.8	50.7	37.4
10.0 GHz	113.8	17.2	113.8	14.4	113.8	13.3	117.4	16.6	74.5	25.7
20.0 GHz	165.9	11.9	165.9	9.9	165.9	9.2	170.8	11.4	110.2	17.5
<b>MECHANICAL PROPERTIES</b>										
Outer Conductor Integrity Temp. [°C]	175		175		175		175		135	
Max. Operating Temp. [°C]	150		150		150		150		125	
Min. Inside Bend Radius [in] [mm]	0.050 1.27		0.050 1.27		0.050 1.27		0.050 1.27		0.125 3.18	
Weight [lbs/100ft] [kg/100m]	0.38 0.57		0.38 0.57		0.38 0.57		0.36 0.54		0.77 1.15	

\*Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 85		UT 85-TP		UT 85-SP		UT 85C		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.0865 ± 0.001 2.20 ± 0.0254		0.0865 +0.002/-0.001 2.20 +0.0508/-0.0254		0.0865 +0.002/-0.001 2.20 +0.0508/-0.0254		0.0865 ± 0.001 2.20 ± 0.0254		
Dielectric Diameter (in) (mm)	0.066 ± 0.001 1.68 ± 0.0254		0.066 ± 0.001 1.68 ± 0.0254		0.066 ± 0.001 1.68 ± 0.0254		0.066 ± 0.001 1.68 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.0201 ± 0.0005 0.51 ± 0.0127		0.0201 ± 0.0005 0.51 ± 0.0127		0.0201 ± 0.0005 0.51 ± 0.0127		0.0201 ± 0.0005 0.51 ± 0.0127		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	COPPER		TIN/COPPER		SILVER/COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPCW		SPCW		SPCW		SPC		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 1.0		50 ± 1.0		50 ± 1.0		50 ± 1.5		
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1		
Corona Extinction Voltage (VRMS @ 60 Hz)	1500		1500		1500		1500		
Voltage Withstanding (VRMS @ 60 Hz)	5000		5000		5000		5000		
Moding Frequency (GHz)	61		61		61		61		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20° C and Sea Level	ATTEN	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	13.6	232.0	13.6	190.3	13.6	173.5	13.6	232.0
	1.0 GHz	19.5	162.4	19.5	133.2	19.5	121.5	19.5	162.4
	5.0 GHz	45.9	69.8	45.9	57.2	45.9	52.2	45.9	69.8
	10.0 GHz	67.5	47.9	67.5	39.3	67.5	35.8	67.5	47.9
	20.0 GHz	100.3	32.6	100.3	26.7	100.3	24.3	100.3	32.6
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (° C)	175		175		175		175		
Max. Operating Temp. (° C)	125		125		125		125		
Min. Inside Bend Radius (in) (mm)	0.050 1.27		0.050 1.27		0.050 1.27		0.050 1.27		
Weight (lbs/100ft) (kg/100m)	1.36 2.02		1.36 2.02		1.36 2.02		1.37 2.04		

\* Standard inventory item.



## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 85C-TP	UT 85C-SP	UT 85-TYPE	UT 85-SS					
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.0865 +0.002/-0.001 2.20 +0.0508/-0.0254	0.0865 +0.002/-0.001 2.20 +0.0508/-0.0254	0.0865 ± 0.002 2.20 ± 0.0508	0.0865 ± 0.001 2.20 ± 0.0254					
Dielectric Diameter (in) (mm)	0.066 ± 0.001 1.68 ± 0.0254	0.066 ± 0.001 1.68 ± 0.0254	0.066 ± 0.002 1.68 ± 0.0508	0.066 ± 0.001 1.68 ± 0.0254					
Center Conductor Diameter (in) (mm)	0.0201 ± 0.0005 0.51 ± 0.0127	0.0201 ± 0.0005 0.51 ± 0.0127	0.0201 ± 0.0005 0.51 ± 0.0127	0.0201 ± 0.0005 0.51 ± 0.0127					
Length Range (ft) (m)	1 - 20 0.31 - 6.10	1 - 20 0.31 - 6.10	21 - 100 6.40 - 30.48	1 - 20 0.31 - 6.10					
<b>MATERIALS</b>									
Outer Conductor	TIN/COPPER	SILVER/COPPER	COPPER	304 SS					
Dielectric	PTFE	PTFE	PTFE	PTFE					
Center Conductor	SPC	SPC	SPCW	SPCW					
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 1.5	50 ± 1.5	50 ± 1.5	50 ± 1.0					
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1	29.0 95.1	29.0 95.1	29.0 95.1					
Corona Extinction Voltage (VRMS @ 60 Hz)	1500	1500	1500	1500					
Voltage Withstanding (VRMS @ 60 Hz)	5000	5000	5000	5000					
Moding Frequency (GHz)	61	61	61	61					
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20° C and Sea Level	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER	
	0.5 GHz	13.6	190.3	13.6	173.5	13.6	189.0	31.2	142.8
	1.0 GHz	19.5	133.2	19.5	121.5	19.5	132.3	44.4	100.6
	5.0 GHz	45.9	57.2	45.9	52.2	45.9	56.7	101.6	44.2
	10.0 GHz	67.5	39.3	67.5	35.8	67.5	38.9	146.1	30.9
	20.0 GHz	100.3	26.7	100.3	24.3	100.3	26.4	211.4	21.4
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	175	175	150	225					
Max. Operating Temp. (°C)	125	125	125	200					
Min. Inside Bend Radius (in) (mm)	0.050 1.27	0.050 1.27	0.125 3.18	0.125 3.18					
Weight (lbs/100ft) (kg/100m)	1.37 2.04	1.37 2.04	1.36 2.02	1.25 1.86					

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 85-75-TP		UT 85-93		UT 90C-25		UT 130-93	
<b>DIMENSIONS</b>								
Outer Conductor Diameter (in) (mm)	0.085 +0.002/-0.001 2.16 +0.0508/-0.0254		0.085 ± 0.001 2.16 ± 0.0254		0.090 ± 0.001 2.29 ± 0.0254		0.130 ± 0.001 3.30 ± 0.0254	
Dielectric Diameter (in) (mm)	0.067 ± 0.001 1.70 ± 0.0254		0.073 ± 0.001 1.85 ± 0.0254		0.073 ± 0.001 1.85 ± 0.0254		0.103 ± 0.001 2.62 ± 0.0254	
Center Conductor Diameter (in) (mm)	0.0113 ± 0.0005 0.29 ± 0.0127		0.008 ± 0.0005 0.20 ± 0.0127		0.0403 ± 0.001 1.02 ± 0.0254		0.0113 ± 0.0005 0.29 ± 0.0127	
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10	
<b>MATERIALS</b>								
Outer Conductor	TIN/COPPER		COPPER		COPPER		COPPER	
Dielectric	PTFE		PTFE		PTFE		PTFE	
Center Conductor	SPCW		SPCW		SPC		SPCW	
<b>ELECTRICAL PROPERTIES</b>								
Characteristic Impedance (ohms)	75 ± 1.0		93 ± 1.5		25 ± 1.0		93 ± 1.5	
Capacitance (Nominal) (pF/ft) (pF/m)	19.3 63.5		15.6 51.2		58.0 190.4		15.6 51.2	
Corona Extinction Voltage (VRMS @ 60 Hz)	1200		1200		750		1500	
Voltage Withstanding (VRMS @ 60 Hz)	2500		2500		1000		3000	
Moding Frequency (GHz)	67		65		46		46	
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level								
	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER
0.5 GHz	14.5	173.3	15.6	159.4	16.1	205.0	11.2	380.0
1.0 GHz	20.7	121.4	22.3	111.7	23.0	143.8	16.1	226.0
5.0 GHz	48.7	52.2	52.2	48.2	53.8	62.1	38.2	113.5
10.0 GHz	71.3	35.9	76.3	33.2	78.5	42.8	56.5	77.6
20.0 GHz	105.7	24.4	112.7	22.7	116.0	29.3	84.7	52.4
<b>MECHANICAL PROPERTIES</b>								
Outer Conductor Integrity Temp. (°C)	150		150		175		175	
Max. Operating Temp. (°C)	125		125		125		125	
Min. Inside Bend Radius (in) (mm)	0.125 3.18		0.125 3.18		0.125 3.18		0.188 4.78	
Weight (lbs/100ft) (kg/100m)	1.20 1.79		0.99 1.47		1.61 2.40		2.74 4.08	

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 141-A		UT 141-A-TP		UT 141-A-SP		UT 141-75	
<b>DIMENSIONS</b>								
Outer Conductor Diameter (in) (mm)	0.141 ± 0.001 3.58 ± 0.0254		0.141 +0.002/-0.001 3.58 +0.0508/-0.0254		0.141 +0.002/-0.001 3.58 +0.0508/-0.0254		0.141 ± 0.001 3.58 ± 0.0254	
Dielectric Diameter (in) (mm)	0.1175 ± 0.001 2.98 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254	
Center Conductor Diameter (in) (mm)	0.0359 +0.0010/-0.0004 0.91 +0.0254/-0.0102		0.0359 +0.0010/-0.0004 0.91 +0.0254/-0.0102		0.0359 +0.0010/-0.0004 0.91 +0.0254/-0.0102		0.0201 ± 0.0005 0.51 ± 0.0127	
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10	
<b>MATERIALS</b>								
Outer Conductor	COPPER		TIN/COPPER		SILVER/COPPER		COPPER	
Dielectric	PTFE		PTFE		PTFE		PTFE	
Center Conductor	SPCW		SPCW		SPCW		SPCW	
<b>ELECTRICAL PROPERTIES</b>								
Characteristic Impedance (ohms)	50 ± 1.0		50 ± 1.0		50 ± 1.0		75 ± 1.0	
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		19.3 63.5	
Corona Extinction Voltage (VRMS @ 60 Hz)	1900		1900		1900		2000	
Voltage Withstanding (VRMS @ 60 Hz)	5000		5000		5000		5000	
Moding Frequency (GHz)	34		34		34		38	
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER
	0.5 GHz	600.5	7.8	483.5	7.8	436.5	8.4	549.0
	1.0 GHz	417.5	11.3	336.2	11.3	303.4	12.1	382.2
	5.0 GHz	174.4	27.7	140.4	27.7	126.7	29.4	160.6
	10.0 GHz	117.5	41.5	94.6	41.5	85.5	44.1	108.6
	20.0 GHz	77.9	63.6	62.7	63.6	56.6	67.2	72.4
<b>MECHANICAL PROPERTIES</b>								
Outer Conductor Integrity Temp. (°C)	175		175		175		175	
Max. Operating Temp. (°C)	125		125		125		125	
Min. Inside Bend Radius (in) (mm)	0.075 1.91		0.075 1.91		0.075 1.91		0.075 1.91	
Weight (lbs/100ft) (kg/100m)	3.14 4.67		3.14 4.67		3.14 4.67		2.97 4.42	

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 141-AA		UT 141C		UT 141C-TP		UT 141C-SP		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.141 ± 0.001 3.58 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.141 +0.002/-0.001 3.58 +0.0508/-0.0254		0.141 +0.002/-0.001 3.58 +0.0508/-0.0254		
Dielectric Diameter (in) (mm)	0.1175 ± 0.001 2.98 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.0359 +0.0010/-0.0004 0.91 +0.0254/-0.0102		0.0359 +0.0010/-0.0004 0.91 +0.0254/-0.0102		0.0359 +0.0010/-0.0004 0.91 +0.0254/-0.0102		0.0359 +0.0010/-0.0004 0.91 +0.0254/-0.0102		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	COPPER		COPPER		TIN/COPPER		SILVER/COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPCW		SPC		SPC		SPC		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 0.5		50 ± 1.0		50 ± 1.0		50 ± 1.0		
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1		
Corona Extinction Voltage (VRMS @ 60 Hz)	1900		1900		1900		1900		
Voltage Withstanding (VRMS @ 60 Hz)	5000		5000		5000		5000		
Moding Frequency (GHz)	34		34		34		34		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	7.8	600.5	7.8	600.5	7.8	483.5	7.8	436.5
	1.0 GHz	11.3	417.5	11.3	417.5	11.3	336.2	11.3	303.4
	5.0 GHz	27.7	174.4	27.7	174.4	27.7	140.4	27.7	126.7
	10.0 GHz	41.5	117.5	41.5	117.5	41.5	94.6	41.5	85.5
	20.0 GHz	63.6	77.9	63.6	77.9	63.6	62.7	63.6	56.6
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	175		175		175		175		
Max. Operating Temp. (°C)	125		125		125		125		
Min. Inside Bend Radius (in) (mm)	0.075 1.91		0.075 1.91		0.075 1.91		0.075 1.91		
Weight (lbs/100ft) (kg/100m)	3.14 4.67		3.17 4.72		3.17 4.72		3.17 4.72		

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 141C-15		UT 141C-25		UT 141C-35		UT 141-70		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.141 ± 0.001 3.58 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		
Dielectric Diameter (in) (mm)	0.114 ± 0.001 2.90 ± 0.0254		0.117 ± 0.001 2.97 ± 0.0254		0.117 ± 0.001 2.97 ± 0.0254		0.107 ± 0.001 2.72 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.080 ± 0.001 0.203 ± 0.0254		0.064 ± 0.001 1.63 ± 0.0254		0.0508 ± 0.001 1.29 ± 0.0254		0.0201 ± 0.0005 0.51 ± 0.0127		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	COPPER		COPPER		COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPC		SPC		SPC		SPCW		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	15 ± 1.0		25 ± 1.0		35 ± 1.0		70 ± 1.0		
Capacitance (Nominal) (pF/ft) (pF/m)	96.7 317.4		58.0 190.4		41.5 136.0		20.7 68.0		
Corona Extinction Voltage (VRMS @ 60 Hz)	750		1000		1500		2000		
Voltage Withstanding (VRMS @ 60 Hz)	1000		2000		3000		5000		
Moding Frequency (GHz)	27		29		31		41		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER	
	0.5 GHz	15.3	313.6	10.1	471.7	8.6	552.4	9.0	515.5
	1.0 GHz	21.9	219.8	14.6	329.1	12.4	384.6	13.0	359.2
	5.0 GHz	51.2	94.8	34.9	139.4	30.1	161.5	31.2	151.5
	10.0 GHz	74.9	65.3	51.8	94.9	45.0	109.2	46.6	102.7
	20.0 GHz	110.8	44.5	78.1	63.7	68.5	72.7	70.8	68.6
	<b>MECHANICAL PROPERTIES</b>								
Outer Conductor Integrity Temp. (°C)	175		175		175		175		
Max. Operating Temp. (°C)	150		125		125		125		
Min. Inside Bend Radius (in) (mm)	0.188 4.78		0.188 4.78		0.188 4.78		0.188 4.78		
Weight (lbs/100ft) (kg/100m)	4.53 6.74		3.85 5.73		3.50 5.21		3.51 5.22		

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 141-A-TYPE		UT 141-SS		UT 250C		UT 250C-TP		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.141 ± 0.002 3.58 ± 0.0508		0.141 ± 0.001 3.58 ± 0.0254		0.250 ± 0.001 6.35 ± 0.0254		0.250 +0.002/-0.001 6.35 +0.0508/-0.0254		
Dielectric Diameter (in) (mm)	0.1175 ± 0.002 2.98 ± 0.0508		0.1175 ± 0.001 2.98 ± 0.0254		0.209 ± 0.002 5.31 ± 0.0508		0.209 ± 0.002 5.31 ± 0.0508		
Center Conductor Diameter (in) (mm)	0.0359 +0.0010/-0.0004 0.91 +0.0254/-0.0102		0.0359 ± 0.001 0.91 ± 0.0254		0.0641 ± 0.001 1.63 ± 0.0254		0.0641 ± 0.001 1.63 ± 0.0254		
Length Range (ft) (m)	21 - 150 6.40 - 45.72		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	COPPER		304 SS		COPPER		TIN/COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPCW		SPCW		SPC		SPC		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 1.0		50 ± 1.0		50 ± 0.5		50 ± 0.5		
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1		
Corona Extinction Voltage (VRMS @ 60 Hz)	1900		1900		3000		3000		
Voltage Withstanding (VRMS @ 60 Hz)	5000		5000		7500		7500		
Moding Frequency (GHz)	34		34		19		19		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER	
	0.5 GHz	7.8	488.7	17.7	347.0	4.6	1332.1	4.6	1061.2
	1.0 GHz	11.3	339.6	25.3	243.6	6.8	914.6	6.8	728.4
	5.0 GHz	27.7	141.5	59.0	105.7	17.4	364.4	17.4	290.0
	10.0 GHz	41.5	95.2	85.8	73.1	27.0	238.2	27.0	189.5
	20.0 GHz	63.6	63.0	126.2	50.1	—	—	—	—
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	150		250		150		150		
Max. Operating Temp. (°C)	125		240		100		100		
Min. Inside Bend Radius (in) (mm)	0.250 6.35		0.250 6.35		0.375 9.53		0.375 9.53		
Weight (lbs/100ft) (kg/100m)	3.14 4.67		2.93 4.36		9.9 14.7		9.9 14.7		

\* Standard inventory item.

## STANDARD SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 250C-SP		UT 250C-TYPE		UT 325C		UT 390C		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.250 +0.002/-0.001 6.35 +0.0508/-0.0254		0.250 ± 0.002 6.35 ± 0.0508		0.325 ± 0.002 8.26 ± 0.0508		0.390 ± 0.002 9.91 ± 0.0508		
Dielectric Diameter (in) (mm)	0.209 ± 0.002 5.31 ± 0.0508		0.2085 ± 0.002 5.31 ± 0.0508		0.285 ± 0.002 7.24 ± 0.0508		0.332 ± 0.002 8.43 ± 0.0508		
Center Conductor Diameter (in) (mm)	0.0641 ± 0.001 1.63 ± 0.0254		0.0641 ± 0.001 1.63 ± 0.0254		7 × 0.0312 ± 0.0005 7 × 0.79 ± 0.0127		0.102 ± 0.001 2.59 ± 0.0254		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		21 - 150 6.40 - 76.2		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	SILVER/COPPER		COPPER		COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPC		SPC		SPC		SPC		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance [ohms]	50 ± 0.5		50 ± 1.0		50 ± 1.0		50 ± 0.5		
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1		
Corona Extinction Voltage (VRMS @ 60 Hz)	3000		3000		3000		6000		
Voltage Withstanding (VRMS @ 60 Hz)	7500		7500		7500		12000		
Moding Frequency (GHz)	19		19		14		12		
Typical Attenuation [dB/100 ft] /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN		POWER		ATTEN		POWER		
	0.5 GHz	4.6	951.6	4.6	1329.0	3.5	1702.7	3.0	3426.0
	1.0 GHz	6.8	653.1	6.8	912.0	5.2	1156.7	4.6	2324.0
	5.0 GHz	17.4	259.9	17.4	363.7	13.8	443.7	12.5	883.0
	10.0 GHz	27.0	169.8	27.0	237.8	22.0	283.5	20.1	562.0
	20.0 GHz	—	—	—	—	—	—	—	—
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	150		150		125		175		
Max. Operating Temp. (°C)	100		100		90		90		
Min. Inside Bend Radius (in) (mm)	0.375 9.53		0.375 9.53		0.750 19.05		0.750 19.05		
Weight (lbs/100ft) (kg/100m)	9.9 14.7		9.9 14.7		14.5 22.0		22.3 33.2		

\* Standard inventory item.

## LOW LOSS PHASE STABLE SEMI-RIGID COAXIAL CABLE\*

MICRO-COAX Part Number	UT 31-LL		UT 47C-LL		UT 70-LL		UT 85C-LL		UT 120C-LL		UT 141C-LL	
<b>DIMENSIONS</b>												
<b>Outer Conductor Diameter</b> (in) (mm)	0.031 ± 0.001 0.787 ± 0.025		0.047 ± 0.001 1.194 ± 0.025		0.070 ± 0.001 1.778 ± 0.025		0.0865 ± 0.001 2.197 ± 0.025		0.120 ± 0.001 3.048 ± 0.025		0.141 ± 0.002 3.581 ± 0.051	
<b>Dielectric Diameter</b> (in) (mm)	0.024 ± 0.001 0.610 ± 0.025		0.037 ± 0.001 0.940 ± 0.025		0.059 ± 0.001 1.499 ± 0.025		0.066 ± 0.001 1.676 ± 0.025		0.106 ± 0.001 2.692 ± 0.025		0.1175 ± 0.002 2.984 ± 0.051	
<b>Center Conductor Diameter</b> (in) (mm)	0.0080 ± 0.0005 0.203 ± 0.013		0.0126 ± 0.0005 0.320 ± 0.013		0.0201 ± 0.0005 0.511 ± 0.013		0.0226 ± 0.0005 0.574 ± 0.013		0.036 ± 0.001 0.914 ± 0.025		0.0403 ± 0.001 1.024 ± 0.025	
<b>Length Range</b> (ft) (m)	1-20 0.31-6.10		1-20 0.31-6.10		1-20 0.31-6.10		1-20 0.31-6.10		1-20 0.31-6.10		1-20 0.31-6.10	
<b>MATERIALS</b>												
<b>Outer Conductor</b>	COPPER		COPPER		COPPER		COPPER		COPPER		COPPER	
<b>Dielectric</b>	LD PTFE		LD PTFE		LD PTFE		LD PTFE		LD PTFE		LD PTFE	
<b>Center Conductor</b>	SPCW		SPC		SPCW		SPC		SPC		SPC	
<b>ELECTRICAL PROPERTIES</b>												
<b>Characteristic Impedance</b>	50 ± 2		50 ± 2		50 ± 1.5		50 ± 1.5		50 ± 1		50 ± 1.5	
<b>Capacitance (Nominal)</b> (pF/ft) (pF/M)	26.6 87.3		26.6 87.3		26.6 87.3		26.6 87.3		26.6 87.3		26.6 87.3	
<b>Corona Extinction Voltage</b> (VRMS @ 60 Hz)	500		1000		1200		1500		1800		1900	
<b>Voltage Withstanding</b> (VRMS @ 60 Hz)	1000		2000		2300		2500		4000		5000	
<b>Higher Order Mode (GHz)</b>	175		115		72		64		40		36	
<b>Typical Attenuation</b> (dB/100 ft)/Average Power (Watts CW) @ 20°C and Sea Level	Atten	Power	Atten	Power	Atten	Power	Atten	Power	Atten	Power	Atten	Power
0.5 GHz	33.8	60	22.0	124	13.9	263	12.4	340	7.8	676	7.0	821
1.0 GHz	47.8	42	31.2	88	19.7	185	17.6	239	11.0	475	10.0	576
5.0 GHz	107.6	19	70.5	39	44.6	81	40.1	105	25.4	206	23.0	249
10.0 GHz	152.8	13	100.4	27	63.8	56	57.4	73	36.6	142	33.3	172
18.0 GHz	206.2	10	135.8	20	86.8	41	78.1	53	50.2	103	45.8	124
20.0 GHz	217.6	9	143.3	19	91.7	39	82.6	50	53.2	98	48.5	117
26.5 GHz	251.3	8	165.8	16	106.4	34	95.9	43	62.1	84	56.7	100
40.0 GHz	310.5	6	205.6	13	132.6	27	119.6	35	78.1	66	-	-
60.0 GHz	383.0	5	254.5	10	165.0	21	149.2	28	-	-	-	-
<b>MECHANICAL PROPERTIES</b>												
<b>Max. Operating Temp. (°C)</b>	250		250		250		250		250		250	
<b>Min. Inside Bend Radius</b> (in) (mm)	.125 3.175		.125 3.175		.250 6.35		.250 6.35		.375 9.525		.500 12.7	
<b>Weight</b> (lbs/100 ft) (kg/100 m)	.16 .24		0.39 0.59		0.77 1.15		1.39 2.07		2.10 3.13		3.20 4.76	

\*Standard inventory item.

**NOTE:** For tin-plated outer conductor add "-TP" to the part number. Tin plating will add 0.001 inch (.025 mm) to the outer conductor diameter and slightly reduce the average power. Tin plating will also reduce the maximum operating temperature to 225°C.



## SPECIAL ORDER LOW IMPEDANCE SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 34C-17		UT 44C-5		UT 47C-35		UT 70C-25	
<b>DIMENSIONS</b>								
Outer Conductor Diameter (in) (mm)	0.034 ± 0.001 0.86 ± 0.0254		0.044 ± 0.001 1.12 ± 0.0254		0.047 ± 0.001 1.19 ± 0.0254		0.070 ± 0.001 1.78 ± 0.0254	
Dielectric Diameter (in) (mm)	0.025 ± 0.001 0.64 ± 0.0254		0.036 ± 0.001 0.91 ± 0.0254		0.037 ± 0.001 0.94 ± 0.0254		0.056 ± 0.001 1.42 ± 0.0254	
Center Conductor Diameter (in) (mm)	0.0159 ± 0.0005 0.40 ± 0.0127		0.032 ± 0.0005 0.81 ± 0.0127		0.0159 ± 0.0005 0.40 ± 0.0127		0.032 ± .001 0.81 ± .0254	
Length Range (ft) (m)	1 - 15 0.31 - 4.57		1 - 15 0.31 - 4.57		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10	
<b>MATERIALS</b>								
Outer Conductor	COPPER		COPPER		COPPER		COPPER	
Dielectric	PTFE		PTFE		PTFE		PTFE	
Center Conductor	SPC		SPC		SPC		SPC	
<b>ELECTRICAL PROPERTIES</b>								
Characteristic Impedance (ohms)	17 ± 1.0		5 ± 1.5		35 ± 1.5		25 ± 1.5	
Capacitance (Nominal) (pF/ft) (pF/m)	85.4 280.0		290.2 952.1		41.5 136.0		58.0 190.4	
Corona Extinction Voltage (VRMS @ 60 Hz)	200		150		850		1500	
Voltage Withstanding (VRMS @ 60 Hz)	500		250		2000		2500	
Moding Frequency (GHz)	128		77		100		59	
Typical Attenuation (dB/100 ft) / Average Power (Watts CW) @ 20° C and Sea Level	ATTEN.		POWER		ATTEN.		POWER	
	0.5 GHz	61.9	27.0	121.8	15.2	26.2	74.1	21.7
	1.0 GHz	87.8	19.0	172.5	10.7	37.3	52.1	30.9
	5.0 GHz	198.7	8.4	388.1	4.8	85.7	22.8	71.4
	10.0 GHz	283.4	5.9	551.2	3.4	123.7	15.9	103.4
	20.0 GHz	405.7	4.1	784.4	2.4	179.7	11.0	151.1
<b>MECHANICAL PROPERTIES</b>								
Outer Conductor Integrity Temp. (° C)	175		175		175		150	
Max. Operating Temp. (° C)	150		150		150		125	
Min. Inside Bend Radius (in) (mm)	0.125 3.18		0.125 3.18		0.125 3.18		0.125 3.18	
Weight (lbs/100ft) (kg/100m)	0.27 0.40		0.53 0.79		0.42 0.62		1.01 1.50	

\* Available on special order.

## SPECIAL ORDER LOW IMPEDANCE SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 85C-15		UT 90C-35		UT 141C-10		UT 300C-25		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.0865 ± 0.001 2.20 ± 0.0254		0.090 ± 0.001 2.29 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.300 ± 0.002 7.62 ± 0.0508		
Dielectric Diameter (in) (mm)	0.066 ± 0.001 1.68 ± 0.0254		0.074 ± 0.001 1.88 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		0.261 ± 0.002 6.63 ± 0.0508		
Center Conductor Diameter (in) (mm)	0.046 ± 0.001 1.17 ± 0.0254		0.032 ± 0.001 0.81 ± 0.0254		0.092 ± 0.001 2.34 ± 0.0254		0.144 ± 0.001 3.66 ± 0.0254		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	COPPER		COPPER		COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPC		SPC		SPC		SPC		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	15 ± 1.0		35 ± 1.0		10 ± 1.0		25 ± 1.0		
Capacitance (Nominal) (pF/ft) (pF/m)	96.7 317.4		41.5 136.0		145.1 476.0		58.0 190.4		
Corona Extinction Voltage (VRMS @ 60 Hz)	850		1500		750		3000		
Voltage Withstanding (VRMS @ 60 Hz)	2000		2500		1000		7500		
Moding Frequency (GHz)	47		49		25		13		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	25.2	103.5	13.4	200.6	19.6	245.0	4.8	1510.5
	1.0 GHz	35.8	72.8	19.1	140.4	28.0	172.0	7.0	1037.9
	5.0 GHz	82.4	31.8	45.1	60.2	64.8	74.8	18.0	414.7
	10.0 GHz	119.0	22.1	66.2	41.3	94.1	51.8	27.9	271.5
	20.0 GHz	173.2	15.3	98.4	28.0	138.0	35.6	—	—
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	150		150		175		150		
Max. Operating Temp. (°C)	125		125		150		100		
Min. Inside Bend Radius (in) (mm)	0.125 3.18		0.125 3.18		0.125 3.18		0.50 12.7		
Weight (lbs/100ft) (kg/100m)	1.76 2.62		1.44 2.14		4.81 7.16		16.49 24.54		

\* Available on special order.

## SPECIAL ORDER SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 20-M		UT 47-M		UT 100B		UT 141B		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.023 ± 0.001 0.58 ± 0.0254		0.0495 ± 0.001 1.26 ± 0.0254		0.100 ± 0.001 2.54 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		
Dielectric Diameter (in) (mm)	0.015 ± 0.001 0.38 ± 0.0254		0.037 ± 0.001 0.94 ± 0.0254		0.070 ± 0.001 1.78 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.0045 ± 0.0005 0.11 ± 0.0254		0.0113 ± 0.0005 0.29 ± 0.0127		0.0201 ± 0.0005 0.51 ± 0.0127		0.0359 ± 0.001 0.91 ± 0.0254		
Length Range (ft) (m)	1 - 10 0.31 - 3.05		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 25 0.31 - 7.62		
<b>MATERIALS</b>									
Outer Conductor	COPPER		COPPER		COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPCW		SPCW		SPBeCu		SPBeCu		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 6.0		50 ± 4.0		53 ± 1.0		50 ± 1.0		
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1		
Corona Extinction Voltage (VRMS @ 60 Hz)	250		750		1500		1900		
Voltage Withstanding (VRMS @ 60 Hz)	750		1500		2500		5000		
Moding Frequency (GHz)	245		109		58		34		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20° C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	45.0	34.7	19.9	125.4	12.8	276.4	7.8	600.5
	1.0 GHz	63.9	24.4	28.5	88.1	18.4	193.5	11.3	417.5
	5.0 GHz	145.2	10.8	65.9	38.5	43.5	82.9	27.7	174.4
	10.0 GHz	207.7	7.6	95.7	26.8	63.9	56.9	41.5	117.5
	20.0 GHz	298.7	5.3	140.2	18.5	95.3	38.6	63.6	77.9
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (° C)	250		250		175		175		
Max. Operating Temp. (° C)	225		225		125		125		
Min. Inside Bend Radius (in) (mm)	0.032 0.81		0.050 1.27		0.188 4.77		0.188 4.77		
Weight (lbs/100ft) (kg/100m)	0.08 0.12		0.41 0.61		2.00 2.98		3.15 4.69		

\* Available on special order.

† Standard inventory item.

## SPECIAL ORDER SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 141L		UT 141C-SS		UT 250-AL-FPE		UT 325C-AL	
<b>DIMENSIONS</b>								
Outer Conductor Diameter (in) (mm)	0.141 ± 0.001 3.58 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.250 ± 0.002 6.35 ± 0.0508		0.325 ± 0.002 8.26 ± 0.0508	
Dielectric Diameter (in) (mm)	0.1175 ± 0.001 2.98 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		0.214 ± 0.002 5.44 ± 0.0508		0.285 ± 0.001 7.24 ± 0.0254	
Center Conductor Diameter (in) (mm)	0.0359 ± 0.001 0.91 ± 0.0254		0.0359 ± 0.001 0.91 ± 0.0254		0.076 ± 0.001 1.93 ± 0.0254		7 x 0.0312 ± 0.0005 7 x 0.79 ± 0.0127	
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10	
<b>MATERIALS</b>								
Outer Conductor	COPPER		304 SS		1100 AL		1100 AL	
Dielectric	PTFE		PTFE		†FPE		PTFE	
Center Conductor	TOPHET C**		SPC		COPPER		SPC	
<b>ELECTRICAL PROPERTIES</b>								
Characteristic Impedance (ohms)	50 ± 1.0		50 ± 1.0		50 ± 1.0		50 ± 1.0	
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		25.3 82.9		29.0 95.1	
Corona Extinction Voltage (VRMS @ 60 Hz)	1900		1900		1500		3000	
Voltage Withstanding (VRMS @ 60 Hz)	5000		5000		3000		7500	
Moding Frequency (GHz)	34		34		20		14	
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER
0.5 GHz	48.1	96.2	17.7	347.0	4.6	267.1	3.7	1566.4
1.0 GHz	68.2	67.8	25.3	243.6	6.2	183.1	5.4	1067.8
5.0 GHz	154.9	30.0	59.0	105.7	15.9	72.6	14.5	414.6
10.0 GHz	221.4	21.0	85.8	73.1	24.6	47.3	22.9	266.8
20.0 GHz	318.0	14.7	126.2	50.1	38.9	30.1	—	—
<b>MECHANICAL PROPERTIES</b>								
Outer Conductor Integrity Temp. (°C)	175		250		—		150	
Max. Operating Temp. (°C)	125		240		100		90	
Min. Inside Bend Radius (in) (mm)	0.188 4.77		0.188 4.77		0.375 9.53		0.750 19.05	
Weight (lbs/100ft) (kg/100m)	3.14 4.67		2.97 4.42		6.20 9.23		10.06 14.97	

† Foamed Polyethylene

\* Available on special order.

\*\*Trademark of Driver Harris Company.

## SPECIAL ORDER HIGH IMPEDANCE SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 48-75		UT 85B-70		UT 90-70		UT 90-100		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.048 ± 0.001 1.22 ± 0.0254		0.085 ± 0.001 2.16 ± 0.0254		0.090 ± 0.001 2.29 ± 0.0254		0.090 ± 0.001 2.29 ± 0.0254		
Dielectric Diameter (in) (mm)	0.037 ± 0.001 0.94 ± 0.0254		0.060 ± 0.001 1.52 ± 0.0254		0.074 ± 0.001 1.88 ± 0.0254		0.075 ± 0.001 1.91 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.0063 ± 0.0005 0.16 ± 0.0127		0.0113 ± 0.0005 0.29 ± 0.0127		0.0142 ± 0.0005 0.36 ± 0.0127		0.0071 ± 0.0005 0.18 ± 0.0127		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	COPPER		COPPER		COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPCW		SPBeCu		SPCW		SPCW		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	75 ± 1.0		70 ± 1.0		70 ± 1.0		100 ± 1.5		
Capacitance (Nominal) (pF/ft) (pF/m)	19.3 63.5		20.7 68.0		20.7 68.0		14.5 47.6		
Corona Extinction Voltage (VRMS @ 60 Hz)	1000		1200		1500		1500		
Voltage Withstanding (VRMS @ 60 Hz)	2000		2000		2500		2500		
Moding Frequency (GHz)	121		74		59		64		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20° C and Sea Level	ATTEN	POWER	ATTEN.	POWER	ATTEN	POWER	ATTEN.	POWER	
	0.5 GHz	25.8	75.4	15.9	196.7	12.7	207.1	16.3	159.6
	1.0 GHz	36.8	53.0	22.4	137.9	18.3	144.9	23.2	111.9
	5.0 GHz	84.5	23.2	52.4	59.6	43.1	62.0	54.3	48.4
	10.0 GHz	122.0	16.2	76.6	41.1	63.4	42.5	79.2	33.4
	20.0 GHz	177.4	11.2	113.1	28.1	94.5	28.8	116.8	22.8
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	175		175		150		150		
Max. Operating Temp. (°C)	150		150		125		125		
Min. Inside Bend Radius (in) (mm)	0.050 1.27		0.125 3.18		0.125 3.18		0.125 3.18		
Weight (lbs/100ft) (kg/100m)	0.40 0.60		1.40 2.08		1.25 1.86		1.19 1.77		

\* Available on special order.

## SPECIAL ORDER HIGH IMPEDANCE SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 130-93-SS		UT 141C-70		UT 141C-75		UT 250-75		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.130 ± 0.001 3.30 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.250 ± 0.001 6.35 ± 0.0254		
Dielectric Diameter (in) (mm)	0.103 ± 0.001 2.62 ± 0.0254		0.107 ± 0.001 2.72 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		0.214 ± 0.001 5.44 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.0113 ± 0.0005 0.29 ± 0.0127		0.0201 ± 0.0005 0.51 ± 0.0127		0.0201 ± 0.0005 0.51 ± 0.0127		0.0359 ± 0.001 0.91 ± 0.0254		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	304 SS		COPPER		COPPER		COPPER		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	SPCW		SPC		SPC		SPCW		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	93 ± 1.5		70 ± 1.0		75 ± 1.0		75 ± 1.0		
Capacitance (Nominal) (pF/ft) (pF/m)	15.6 51.2		20.7 68.0		19.3 63.5		19.3 63.5		
Corona Extinction Voltage (VRMS @ 60 Hz)	1500		2000		2000		3000		
Voltage Withstanding (VRMS @ 60 Hz)	3000		5000		5000		7500		
Moding Frequency (GHz)	46		41		38		21		
Typical Attenuation (dB/100 ft) / Average Power (Watts CW) @ 20° C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	17.2	277.4	9.0	515.5	8.4	549.0	4.8	1653.0
	1.0 GHz	24.6	194.7	13.0	359.2	12.1	382.2	7.1	1133.7
	5.0 GHz	57.4	84.4	31.2	151.5	29.4	160.6	18.1	449.9
	10.0 GHz	83.6	58.3	46.6	102.7	44.1	108.6	28.1	293.4
	20.0 GHz	123.0	40.0	70.8	68.6	67.2	72.4	44.6	186.9
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (° C)	225		175		175		150		
Max. Operating Temp. (° C)	200		125		125		100		
Min. Inside Bend Radius (in) (mm)	0.188 4.78		0.188 4.78		0.188 4.78		0.375 9.52		
Weight (lbs/100ft) (kg/100m)	2.52 3.75		3.52 5.24		2.98 4.43		8.78 13.06		

\* Available on special order.

## SPLINE 50 OHM SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT S-250		UT S-250-AL		UT S-325		UT S-325-AL		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.250 ± 0.002 6.35 ± 0.0508		0.250 ± 0.002 6.35 ± 0.0508		0.325 ± 0.002 8.26 ± 0.0508		0.325 ± 0.002 8.26 ± 0.0508		
Dielectric Diameter (in) (mm)	0.221 ± 0.002 5.61 ± 0.0508		0.221 ± 0.002 5.61 ± 0.0508		0.285 ± 0.002 7.24 ± 0.0508		0.285 ± 0.002 7.24 ± 0.0508		
Center Conductor Diameter (in) (mm)	0.086 ± 0.001 2.18 ± 0.0254		0.086 ± 0.001 2.18 ± 0.0254		0.110 ± 0.001 2.79 ± 0.0254		0.110 ± 0.001 2.79 ± 0.0254		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	COPPER		1100 AL		COPPER		1100 AL		
Dielectric	PTFE/AIR		PTFE/AIR		PTFE/AIR		PTFE/AIR		
Center Conductor	SPC(Tube)		SPC(Tube)		SPC(Tube)		SPC(Tube)		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 1.0		50 ± 1.0		50 ± 1.0		50 ± 1.0		
Capacitance (Nominal) (pF/ft) (pF/m)	23.4 76.8		23.4 76.8		23.4 76.8		23.4 76.8		
Corona Extinction Voltage (VRMS @ 60 Hz)	1400		1400		2000		2000		
Voltage Withstanding (VRMS @ 60 Hz)	4000		4000		5000		5000		
Moding Frequency (GHz)	21		21		16		16		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	3.7	630.0	4.0	491.3	2.9	825.0	3.1	729.7
	1.0 GHz	5.4	431.0	5.8	338.1	4.3	559.6	4.6	496.4
	5.0 GHz	13.8	169.5	14.8	135.8	11.5	213.6	12.2	191.4
	10.0 GHz	21.5	109.9	22.9	89.3	18.1	136.1	19.2	122.6
	20.0 GHz	34.3	97.7	36.3	57.4	—	—	—	—
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	—		—		—		—		
Max. Operating Temp. (°C)	250		250		250		250		
Min. Inside Bend Radius (in) (mm)	3.0 76.2		3.0 76.2		5.0 127.0		5.0 127.0		
Weight (lbs/100ft) (kg/100m)	5.6 8.33		2.6 3.87		9.5 14.14		4.5 66.96		

\* Available on special order.

## HIGH TEMPERATURE SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 85-I		UT 141-I		UT 160-CuSS-I		UT 250-I		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.085 ± 0.001 2.16 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.160 ± 0.002 4.06 ± 0.0508		0.250 ± 0.002 6.35 ± 0.0508		
Dielectric Diameter (in) (mm)	0.065 ± 0.001 1.65 ± 0.0254		0.118 ± 0.002 3.00 ± 0.0508		0.118 ± 0.001 3.00 ± 0.0254		0.215 Nominal 5.46 Nominal		
Center Conductor Diameter (in) (mm)	0.009 ± 0.001 0.23 ± 0.0254		0.017 ± 0.001 0.43 ± 0.0254		0.017 ± 0.001 0.43 ± 0.0254		0.033 Nominal 0.84 Nominal		
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	COPPER		COPPER		Cu/304 SS		COPPER		
Dielectric	†MgO		MgO		MgO		MgO		
Center Conductor	SPCW		SPCW		SPCW		SPCW		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 4.0		50 ± 3.0		50 ± 3.0		50 ± 3.0		
Capacitance (Nominal) (pF/ft) (pF/m)	48.6 159.3		48.6 159.3		48.6 159.3		48.6 159.3		
Corona Extinction Voltage (VRMS @ 60 Hz)	—		—		—		—		
Voltage Withstanding (VRMS @ 60 Hz)	1500		2500		2500		3000		
Moding Frequency (GHz)	42		23		23		12		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20° C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	29.2	341.1	16.4	948.6	16.4	1417.9	7.9	2783.8
	1.0 GHz	42.1	238.7	23.9	658.7	23.9	985.2	11.8	1906.0
	5.0 GHz	100.4	102.4	59.7	273.7	59.7	410.5	32.2	751.8
	10.0 GHz	148.6	70.2	91.0	121.3	91.0	276.1	51.9	488.4
	20.0 GHz	223.4	47.7	142.0	83.8	142.0	182.7	—	—
	—	—	—	—	—	—	—	—	—
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	—		—		—		—		
Max. Operating Temp. (°C)	400		400		475		400		
Min. Inside Bend Radius (in) (mm)	0.250 6.35		0.500 12.71		0.750 19.05		1.00 25.4		
Weight (lbs/100ft) (kg/100m)	1.30 1.93		3.00 4.46		4.25 6.32		9.41 13.99		

† Magnesium Oxide

\* Available on special order.



## CRYOGENIC FEED AND SUPERCONDUCTIVE 50 OHM SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 20SS-SS		UT 85B-B		UT 85Nb-Nb		UT 141B-SS		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.020 ± 0.001 0.51 ± 0.0254		0.0865 ± 0.001 2.20 ± 0.0254		0.0865 ± 0.001 2.20 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		
Dielectric Diameter (in) (mm)	0.015 ± 0.001 0.38 ± 0.0254		0.066 ± 0.001 1.68 ± 0.0254		0.066 ± 0.001 1.68 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.0045 ± 0.0005 0.11 ± 0.0127		0.0201 ± 0.0005 0.51 ± 0.0127		0.0201 ± 0.0005 0.51 ± 0.0127		0.0359 ± 0.001 0.91 ± 0.0254		
Length Range (ft) (m)	1 - 10 0.31 - 3.05		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		
<b>MATERIALS</b>									
Outer Conductor	304 SS		BeCu		NIOBIUM		304 SS		
Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	304 SS		SPBeCu		NIOBIUM		SPBeCu		
<b>ELECTRICAL PROPERTIES</b>									
Characteristic Impedance (ohms)	50 ± 2.0		50 ± 1.0		50 ± 1.0		50 ± 1.0		
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1		
Corona Extinction Voltage (VRMS @ 60 Hz)	500		1500		1500		1900		
Voltage Withstanding (VRMS @ 60 Hz)	750		2500		2500		5000		
Moding Frequency (GHz)	270		61		61		34		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
	0.5 GHz	389.5	2.6	17.2	226.7	48.5	67.5	17.7	347.0
	1.0 GHz	551.0	1.8	24.5	159.1	68.8	47.6	25.3	243.6
	5.0 GHz	1234.4	0.8	57.2	69.0	156.1	21.0	59.0	105.7
	10.0 GHz	1748.2	0.6	83.3	47.7	223.2	14.7	85.8	73.1
	20.0 GHz	2477.2	0.4	122.6	32.7	320.5	10.3	126.2	50.1
<b>MECHANICAL PROPERTIES</b>									
Outer Conductor Integrity Temp. (°C)	175		225		175		250		
Max. Operating Temp. (°C)	150		200		150		240		
Min. Inside Bend Radius (in) (mm)	0.125 3.18		0.125 3.18		0.125 3.18		0.250 6.35		
Weight (lbs/100ft) (kg/100m)	0.07 0.10		1.28 1.90		1.33 1.98		2.94 4.37		

\* Available on special order.

## CRYOGENIC FEED AND SUPERCONDUCTIVE 50 OHM SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT-T-141B-SS		UT 141Nb-Nb		UT 250SS-SS		UT 250B-B	
<b>DIMENSIONS</b>								
Outer Conductor Diameter (in) (mm)	0.141 ± 0.001 3.58 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		0.250 ± 0.002 6.35 ± 0.508		0.250 ± 0.002 6.35 ± 0.508	
Dielectric Diameter (in) (mm)	0.1175 ± 0.001 2.98 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		0.209 ± 0.002 5.31 ± 0.0508		0.2085 ± 0.002 5.30 ± 0.0508	
Center Conductor Diameter (in) (mm)	0.0359 ± 0.001 0.91 ± 0.0254		0.0359 ± 0.001 0.91 ± 0.0254		0.0641 ± 0.001 1.63 ± 0.0254		0.0641 ± 0.001 1.63 ± 0.0254	
Length Range (ft) (m)	1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10		1 - 20 0.31 - 6.10	
<b>MATERIALS</b>								
Outer Conductor	304 SS		NIOBIUM		304 SS		BeCu	
Dielectric	PTFE		PTFE		PTFE		PTFE	
Center Conductor	SPBeCu(Tube)		NIOBIUM		304 SS		SPBeCu	
<b>ELECTRICAL PROPERTIES</b>								
Characteristic Impedance (ohms)	50 ± 1.0		50 ± 1.0		50 ± 0.5		50 ± 0.5	
Capacitance (Nominal) (pF/ft) (pF/m)	29.0 95.1		29.0 95.1		29.0 95.1		29.0 95.1	
Corona Extinction Voltage (VRMS @ 60 Hz)	1900		1900		3000		3000	
Voltage Withstanding (VRMS @ 60 Hz)	5000		5000		7000		7000	
Moding Frequency (GHz)	34		34		19		19	
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20°C and Sea Level	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER	ATTEN	POWER
0.5 GHz	17.7	347.0	27.4	159.3	28.4	295.5	5.7	1336.1
1.0 GHz	25.3	243.6	39.0	112.1	40.4	208.0	8.4	923.7
5.0 GHz	59.0	105.7	89.5	49.1	92.6	91.3	21.0	377.6
10.0 GHz	85.8	73.1	129.0	34.2	133.4	63.7	32.1	250.8
20.0 GHz	126.2	50.1	187.4	23.7	193.5	44.2	50.3	163.4
<b>MECHANICAL PROPERTIES</b>								
Outer Conductor Integrity Temp. (°C)	250		175		250		230	
Max. Operating Temp. (°C)	240		125		230		250	
Min. Inside Bend Radius (in) (mm)	0.250 6.35		0.250 6.35		0.500 12.70		0.500 12.70	
Weight (lbs/100ft) (kg/100m)	2.86 4.26		3.09 4.60		9.14 13.60		9.42 14.02	

\* Available on special order.

## TRIAxIAL SEMI-RIGID COAXIAL CABLE\*

Micro-Coax Part Number	UT 34-50-50		UT 78-50-25		UT 85-50-50		UT 141-50-50		
<b>DIMENSIONS</b>									
Outer Conductor Diameter (in) (mm)	0.034 ± 0.001 0.86 ± 0.0254		0.078 ± 0.001 1.98 ± 0.0254		0.085 ± 0.001 2.16 ± 0.0254		0.141 ± 0.001 3.58 ± 0.0254		
Outer Dielectric Diameter (in) (mm)	0.026 ± 0.001 0.66 ± 0.0254		0.058 ± 0.001 1.47 ± 0.0254		0.066 ± 0.001 1.68 ± 0.0254		0.1175 ± 0.001 2.98 ± 0.0254		
Inner Conductor Diameter (in) (mm)	0.008 ± 0.0005 0.20 ± 0.0127		0.034 ± 0.001 0.86 ± 0.0254		0.0201 ± 0.001 0.51 ± 0.0254		0.0359 ± 0.001 0.91 ± 0.0254		
Inner Dielectric Diameter (in) (mm)	0.0045 ± 0.001 0.11 ± 0.0254		0.026 ± 0.001 0.66 ± 0.0254		0.015 ± 0.001 0.38 ± 0.0254		0.026 ± 0.001 0.66 ± 0.0254		
Center Conductor Diameter (in) (mm)	0.002 ± 0.0005 0.05 ± 0.0127		0.008 ± 0.0005 0.20 ± 0.0127		0.0045 ± 0.0005 0.11 ± 0.0127		0.008 ± 0.0005 0.20 ± 0.0127		
<b>MATERIALS</b>									
Outer Conductor	COPPER		COPPER		COPPER		COPPER		
Outer Dielectric	PTFE		PTFE		PTFE		PTFE		
Inner Conductor	COPPER		COPPER		COPPER		COPPER		
Inner Dielectric	PTFE		PTFE		PTFE		PTFE		
Center Conductor	COPPER		SPCW		SPCW		SPCW		
<b>ELECTRICAL PROPERTIES</b>									
Outer Characteristic Impedance (ohms)	50 ± 3.0		25 ± 3.0		50 ± 1.5		50 ± 1.0		
Inner Characteristic Impedance (ohms)	50 ± 5.0		50 ± 3.0		50 ± 2.0		50 ± 3.0		
Typical Attenuation (dB/100 ft) /Average Power (Watts CW) @ 20° C and Sea Level									
	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	ATTEN.	POWER	
Inner Coax	0.5 GHz	145.8	4.1	34.0	34.2	58.5	19.9	34.0	34.2
	1.0 GHz	206.4	2.9	48.3	24.1	83.0	14.1	48.3	24.1
	5.0 GHz	463.5	1.3	110.4	10.6	188.0	6.3	110.4	10.6
	10.0 GHz	657.7	0.9	158.6	7.4	268.3	4.4	158.6	7.4
	20.0 GHz	934.4	0.6	229.1	5.1	384.3	3.1	229.1	5.1
Outer Coax	0.5 GHz	34.0	21.9	21.6	68.2	13.6	116.0	7.8	300.2
	1.0 GHz	48.3	15.4	30.8	47.9	19.5	81.2	11.3	208.8
	5.0 GHz	110.4	6.8	71.1	20.9	45.9	34.9	27.7	87.2
	10.0 GHz	158.6	4.8	102.9	14.5	67.5	24.0	41.5	58.8
	20.0 GHz	229.1	3.3	150.5	10.0	100.3	16.3	63.6	39.0
<b>MECHANICAL PROPERTIES</b>									
Max. Operating Temp. (°C)	125		125		125		125		
Min. Inside Bend Radius (in) (mm)	0.125 3.18		0.125 3.18		0.125 3.18		0.188 4.76		
Weight (lbs/100ft) (kg/100m)	0.21 0.31		1.29 1.92		1.31 1.95		3.13 4.66		

\* Available on special order.

## TECHNICAL INFORMATION ON COAXIAL CABLE

### THE OUTER CONDUCTOR



**Function:** To minimize power loss. The OD or outer surface maximizes the mechanical integrity of the cable and provides the desired interface with standard or special connections. The ID or inner surface of the outer conductor acts as a conductor.

**Materials:** Copper tubing is frequently used as the outer conductor in Semi-Rigid Coaxial Cables. Design considerations may dictate the selection of another material based on the properties that are most important in a specific application. See Guide to Outer Conductor Selection below.

**Properties:** Extremely close tolerances in ID and OD of the outer conductor must be maintained throughout the entire length of a cable so that exact performance data can be established.

**Platings and Finishes:** Platings and finishes used on outer conductors are electro-deposited. While direct plating on copper base alloys is practical, gold is usually plated over a silver strike or under-plate. Other outer conductor materials, such as aluminum, require a copper strike or under-plate prior to the final plating operation. There are many plating options to meet unusual environmental conditions, such as salt spray or high humidity, as well as for cosmetic appearance and solderability. See Platings and Finishes for Outer and Center Conductors below. For finishes other than those shown, consult Micro-Coax®.

## GUIDE TO OUTER CONDUCTOR SELECTION

Outer Conductor Material	High Frequency Conductivity	Low Frequency Conductivity	Ease of Soldering	Strength	Weight	Machinability	Corrosion Resistance	Thermal Conductivity
Copper	E	E	E	G	H	F	P	H
Aluminum 1100	F	F	S	P	L	P	P	H
Aluminum 5200	F	F	S	G	L	F	P	H
Beryllium Copper	F	F	E	E	H	F	G	L
Stainless Steel	P	P	S	E	H	G	E	L
Stainless Steel over Copper	E	P	S	E	H	G	E	L
Silver	E	E	E	P	H	F	P	H
Phosphor Bronze	F	F	G	E	H	G	E	H
Invar	F	F	S	E	H	G	E	VL
Niobium	F§	F§	P	E	H	P	F	VL
Brass 70/30	F	F	E	E	H	E	G	H

E = Excellent; G = Good; F = Fair; P = Poor; H = High; L = Low; VL = Very Low; S = Special Process  
§ = Superconductive at cryogenic temperatures

## PLATINGS AND FINISHES FOR OUTER AND CENTER CONDUCTORS

Plating Material	Specification	Part Number Suffix	Remarks
Silver	QQ-S-365, Type II, Class A	SP	Standard on all copper wire. Meets environmental specs and allows soldering without flux.
Tin	ASTM B-545	TP	Lower cost than silver but not as cosmetically pleasing. Improved solderability. Does not tarnish easily.
Gold	MIL-G-45204 Type II	GP	Excellent corrosion resistance. Very high cost. Available on special order only.
Solder	60/40 SnPb	EDS	Very good solderability. Costs more than tin or cadmium. Easily damaged.

# THE CENTER CONDUCTOR



**Function:** The center conductor, usually of solid metal, is the primary signal carrier in Semi-Rigid Cables. Most attenuation occurs on the surface area. A Tubular conductor reduces thermal conductivity without any related reduction in high frequency conductivity, and reduces overall weight in large cables.

**Materials:** Copper-based or copper-clad wire is frequently used as the center conductor because of excellent high frequency conductivity. Design considerations may dictate the selection of another material based on the properties that are most important in a specific application. See the Guide to Center Conductor Selection below.

**Properties:** In addition to the material properties in the Selection Guide below, cost is a consideration. A further selection factor in special cases is the ability to minimize the effects of radiation. Consult with Micro-Coax®.

**Platings and Finishes:** Center conductors are normally silver-plated to prevent oxidation during manufacture and to improve the solderability of the finished product. For other plating options to meet special requirements, see the table of Platings and Finishes on page 36. For finishes other than those shown, consult with Micro-Coax®.

## GUIDE TO CENTER CONDUCTOR SELECTION

Center Conductor Material	High Frequency Conductivity	Low Frequency Conductivity	Ease of Soldering	Strength	Weight	Thermal Conductivity	Impedance Control
Silver-Plated Copper	E	E	E	L	H	H	G
Silver-Plated C-Clad Steel	E	F	E	H	H	L	E
Unplated Copper	E	E	G	L	H	H	G
Stranded Copper	G	E	E	L	H	H	P
Silver-Plated BeCu	G	F	E	H	H	L	E
Aluminum	G	G	S	VL	L	H	G
Gold	G	G	E	L	H	H	F
Niobium	L§	L§	P	H	H	L	G
Palladium	L	L	E	H	H	H	G
Stainless Steel	L	L	S	H	H	L	E
Tophet Ct	L	L	NA	H	H	L	E
Tungsten	L	L	NA	H	H	L	E
Tubular BeCu	L	L	E	H	L	VL	G
Silver-Plated Tubular BeCu	G	L	E	H	L	VL	G
Silver-Plated St. St. Tube	F	VL	G	H	L	VL	G
Tubular Stainless Steel	L	VL	S	H	L	VL	G
Silver Tube over St. St. Tube	E	L	G	H	L	L	G

E = Excellent, G = Good, F = Fair, P = Poor, H = High, L = Low, VL = Very Low, NA = Not Applicable, S = Special Process  
 § = Superconductive at cryogenic temperatures. All conductors are solid unless otherwise noted. † = Trademark Driver-Harris Company

## ELECTRICAL AND PHYSICAL PROPERTIES OF CONDUCTORS

Conductor Material	Ratio: Conductivity Compared to Copper	BTU/Hr./Sq. Ft./°F/Ft. Thermal Conductivity 68°F	In/In/°F x 10 <sup>-6</sup> Thermal Expansion	PSI Yield Strength Annealed
OFHC Copper	1.00:1	226	9.8-68/572°F	10000
DLP Copper	1.04:1	219	9.8-68/572°F	10000
Beryllium Copper 25	4.60:1	68	9.9-68/572°F	20000
Aluminum 1100	1.76:1	128	13.1-68/212°F	5000
Aluminum 5052	2.88:1	80	13.2-68/212°F	13000
304 Stainless Steel	44.8:1	9	9.6-32/212°F	40000
Niobium	13.20:1	31	3.8-68°F	35000
Fine Silver	1.00:1	242	10.9-68°F	8000
Phosphor Bronze	6.73:1	440	9.9-68°F/572°F	19000
Gold	1.42:1	172	7.9-68°F	—
Tungsten	4.05:1	97	2.5-68°F	220000
Palladium	6.31:1	41	6.5-68°F	5000
Tophet Ct	65.1:1	8	7.6-68/212°F	70000

Metric Factors: Cal/Sec/Cm/°C x 2.419 x 10<sup>7</sup> = BTU/Hr/Ft<sup>2</sup>/°F cm/cm/°C x 5/9 = In/In/°F Ksi x .7031 = Kg/mm<sup>2</sup> † = Trademark Driver-Harris Company

## DIELECTRIC OR INSULATING MATERIAL



**Function:** In Semi-Rigid Cable, the dielectric material between the outer and center conductors maintains the spacing and geometry of the cable and assures mechanical integrity during forming and bending, or under pressure. The outer conductor can also be insulated to give added resistance to electrical breakdown, abrasion, cut-through, and chemical solvents, or where packaging requires that the cable must be isolated from other circuit components

**Materials:** The Guide to Dielectrics and Insulating Jackets below gives performance information on the most commonly used dielectric or insulating materials. As a general rule, the lower the dielectric constant, the lower the bulk loss and attenuation, and the higher the velocity of propagation of the cable. An additional selection factor, not shown in the table, is the ability to bond to conductors and/or other plastics.

## GUIDE TO DIELECTRICS AND INSULATING JACKETS

Dielectric Material	Dielectric Constant	Loss Tangent	Resistance to Chemicals	Resistance to Moisture	Resistance to Radiation	Dielectric Strength	Cut-through Resistance	Mechanical Strength	Temperature Stability
Teflon, Solid, PTFE (1)	VL	E	E	E	P	E	G	E	VG
Teflon, Solid, FEP (2)	VL	G	E	E	P	E	G	E	G
Teflon Spline, PTFE (1)	VL	U	E	G	P	E	F	F	G
Tefzel (3)	FL	G	E	E	G	E	E	E	G
Polyolefin, Solid	FL	F	F	E	F	G	G	E	F
Polyolefin, Foam	VL	G	F	G	F	G	F	F	F
Polyolefin, Irradiated	FL	F	F	E	F	G	G	E	F
H. Film	FL	G	G	G	F	F	E	E	G
Polyvinylchloride	VH	F	G	G	F	G	G	E	F
Mylar (4)	H	F	G	G	G	G	G	G	G
Magnesium Oxide Powder	H	G	P	P	E	G	NA	P	E
Kynar (5)	H	G	G	G	G	G	G	G	G

VL = Very Low; FL = Fairly Low; H = High; VH = Very High  
 U = Superior; E = Excellent; VG = Very Good; G = Good; F = Fair  
 P = Poor; NA = Not Applicable

(1) — Polytetrafluoroethylene (duPont TM)  
 (2) — Fluorinated Ethylene Propylene (duPont TM)  
 (3) — Polymer of ethylene and tetrafluoroethylene (duPont TM)  
 (4) — Polyethylene Terrephthalate (duPont tradename)  
 (5) — Polyvinylidene Fluoride (Pennwalt Corp. tradename)

## ELECTRICAL AND PHYSICAL PROPERTIES OF DIELECTRICS

Dielectric Material	Dielectric Constant 10 <sup>9</sup> Hz	Dissipation Factor 10 <sup>9</sup> Hz	Volume Resistivity Ohm-cm	Maximum Service Temp. °C
PTFE Solid	2.03	0.0002	10 <sup>18</sup>	250
Low Density PTFE	1.70	0.000064	—	250
PTFE Spline	1.3	0.0002	—	250
FEP	2.10	0.0007	10 <sup>18</sup>	200
Polyethylene Solid	2.35	0.0003	10 <sup>16</sup>	100
Polyethylene Foamed	1.6	0.0005	10 <sup>12</sup>	100
Tefzel	2.30	0.005	10 <sup>16</sup>	150
Polyvinylchloride	3.0-8.0	0.07-0.16	10 <sup>12</sup>	105
Nylon	3.5-4.6	0.04	10 <sup>14</sup>	120
Silicone Rubber	3.50	0.02	10 <sup>13</sup>	200
Kel-F	2.37	0.03	10 <sup>18</sup>	150
Powdered Mgo	5.55	0.0003	10 <sup>8</sup>	1,000

# EXPOSURE OF PTFE INSULATED CABLES TO ELEVATED TEMPERATURES

Exposure of cables with PTFE insulation to elevated temperatures causes stressing of the outer conductor, since the thermal expansion coefficient of the core insulation is about ten times greater than that of the metal conductors. The effects of this outer conductor stressing require distinction of two temperature levels as cables are subjected to increasing temperatures

## ( $T_0$ ): Recommended Maximum Operating Temperature

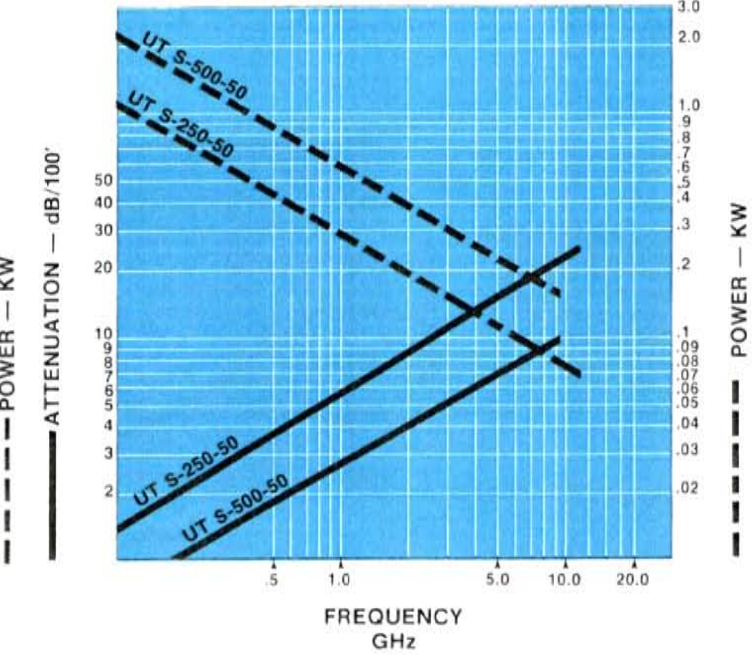
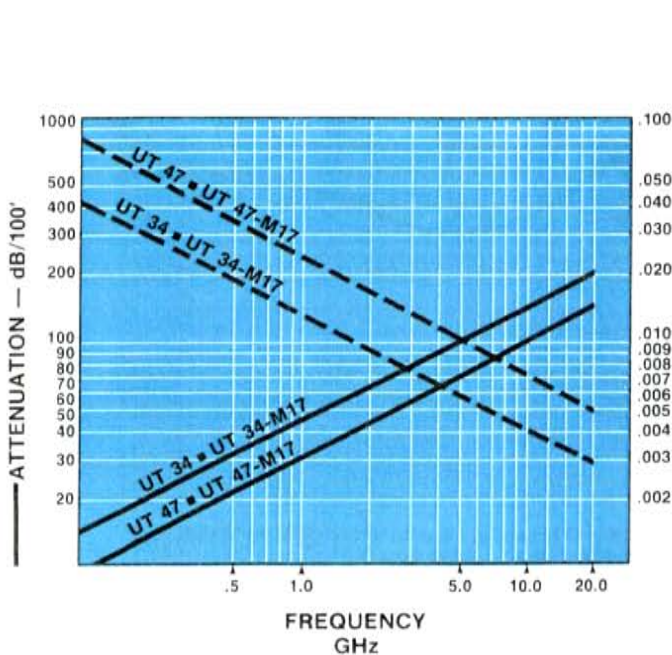
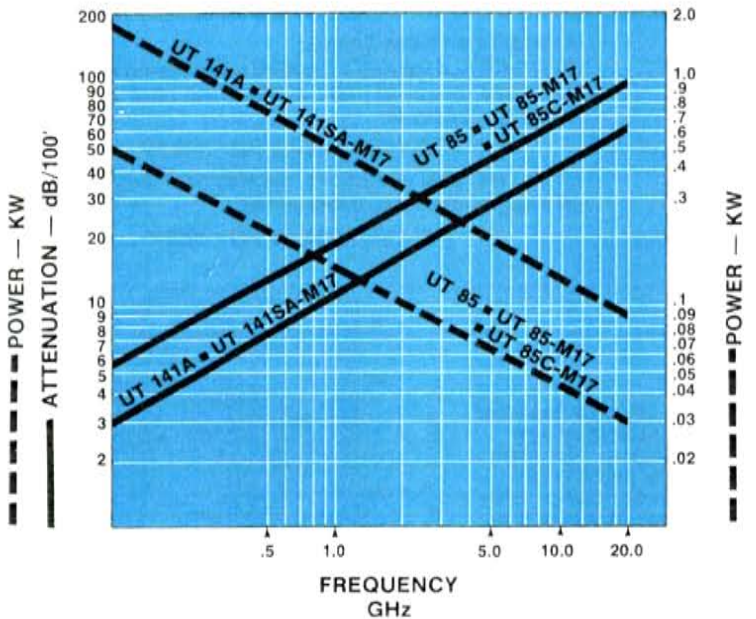
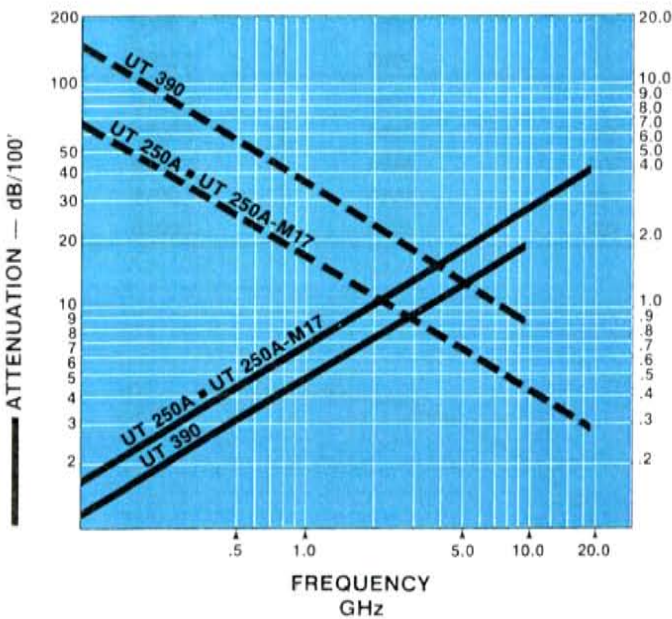
The first significant effect on cable characteristics occurs as the expansive forces on the core material exceed the yield strength of the outer conductor material, so that a permanent increase in the cable outer diameter results. The outer conductor OD increase is accompanied by a permanent increase in impedance, and permanent decrease in capacitance, core adhesion, and corona extinction poten-

tial. The temperature at which such changes begin is denoted in this catalog as  $T_0$ , the maximum recommended operating temperature, which has been determined by testing 1 ft. long specimens until a discernible increase in outer conductor OD was measured on 30% of the number of test specimens.

## ( $T_1$ ): Outer Conductor Integrity Test Temperature

The second significant effect of temperature exposure is to cause catastrophic failure of the outer conductor as the core stresses exceed the tensile strength of the outer conductor material. This temperature is denoted in this catalog as  $T_1$ , the outer conductor integrity test temperature which has been determined by testing 2 ft. long specimens, with no failures allowed at the rated temperature. (For test details, refer to MIL-C-17.)

## Attenuation and Average Power Rating For Standard 50 Ohm Micro-Coax Cables



# DETERMINING CHANGES IN PHASE OCCURRING WITH CHANGES IN TEMPERATURE

Changes in temperature affect the electrical length of Semi-Rigid Coaxial Cables. The information provided is intended as a guide for designers as to the approximate phase changes that take place as temperature changes occur.

The information here covers the characteristics of the two most commonly used semi-rigid cables: 1) cable with a solid PTFE dielectric, and 2) cable with a semi-solid (spline) PTFE dielectric. It also includes a quick reference chart for prediction of changes of phase or group delay.

The data disregard minor hysteresis effects and are average values. For the temperature range shown, they are not significantly affected by the inner and outer conductor materials.

The data were originally verified by Micro-Coax® at 0.4 GHz per paragraph 4.8.14 of MIL-C-17 and subsequently substantiated at 9 GHz for solid PTFE dielectric cable by an independent source.

ELECTRICAL LENGTH OR DELAY CHANGE WITH TEMPERATURE		
t (°C)	Solid PTFE Coax	Semi-Solid PTFE Coax
-40	1.0023	.9990
-30	1.0021	.9991
-20	1.0019	.9993
-10	1.0017	.9995
0	1.0014	.9996
10	1.0007	.9997
20	1.0001	.9999
30	1.0000	1.0000
40	.9998	1.0002
50	.9996	1.0004
60	.9995	1.0006
70	.9995	1.0008
80	.9995	1.0010
90	.9995	1.0012
100	.9995	1.0014
110	.9995	1.0015
120	.9995	1.0016

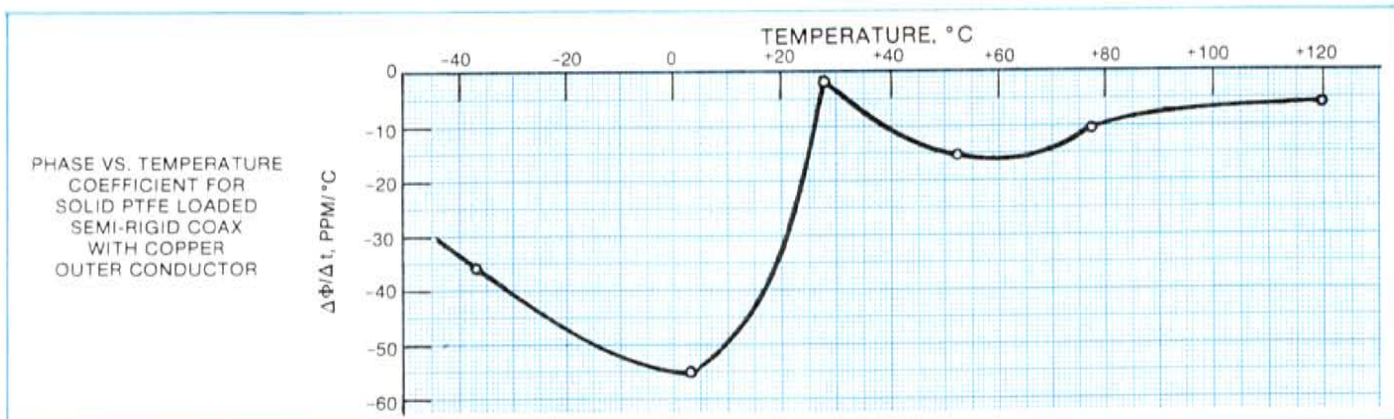
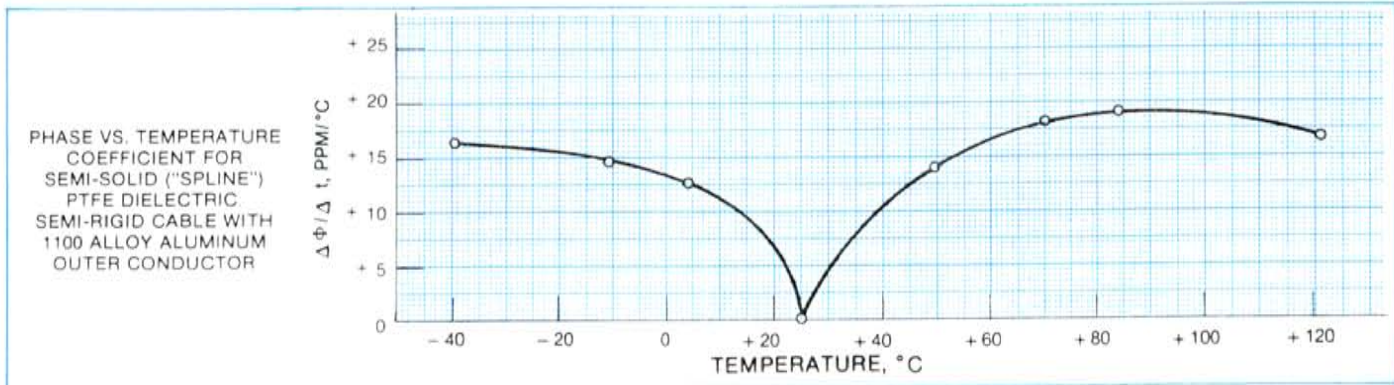
### EXAMPLES FROM TABLE:

At t = -40° C, a solid PTFE loaded cable having an electrical length of 100° at 25° C will have an electrical length of:

$$[1 + (-35) (10^{-6}) (-65)] \times 100 = 100.23^\circ$$

Under identical conditions, the electrical length of a spline-dielectric cable will be:

$$[1 + (16) (10^{-6}) (-65)] \times 100 = 99.90^\circ$$



Electrical Length at Temperature (t) may be calculated from  $L_t = \left[ 1 + \left( \frac{\Delta\Phi}{\Delta t} \right) (10^{-6}) (\Delta t) \right] L_{25}$   
 WHERE  $\Delta\Phi/\Delta t$  = Graph Value  
 $\Delta t = t - 25$   
 $L_{25}$  = Electrical Length at 25°C



## HELPFUL FORMULAS

### CHARACTERISTIC IMPEDANCE:

$$Z_0 = \frac{138}{\sqrt{e}} \log_{10} \frac{D}{d} \quad \dots \text{ohms}$$

### VELOCITY OF PROPAGATION:

$$V_p = \frac{1}{\sqrt{e}} \times 100 \quad \dots \text{Percent of Free-Space Velocity}$$

### CAPACITANCE:

$$C = \frac{7.38e}{\log_{10} \frac{D}{d}} \quad \dots \text{pF/ft} \quad C = \frac{24.2e}{\log_{10} \frac{D}{d}} \quad \dots \text{pF/m}$$

### DELAY:

$$T = 1.016 \sqrt{e} (L) \dots \text{ns} \quad T = 3.33 \sqrt{e} (L) \dots \text{ns}$$

$$L = \frac{984 T}{\sqrt{e}} \quad \dots \text{ft} \quad L = \frac{0.300 T}{\sqrt{e}} \quad \dots \text{m}$$

**MODING FREQUENCY:** (At which cable may begin to support a propagation mode in addition to a

transverse electromagnetic mode)

$$f_{co} = \frac{7.5}{\sqrt{e} (D + d)} \dots \text{GHz}$$

### ATTENUATION (THEORETICAL) AT 20°C:

$$\alpha = \frac{434}{Z_0} \left[ \frac{\sqrt{R_1}}{d} + \frac{\sqrt{R_2}}{D} \right] f^{1/2} + 2.78 e^{1/2} F_p \quad \dots \text{dB/100 ft}$$

Where  $R_1=R_2 = 1.0$  for copper conductors. See table on page 37 for other conductor materials.

To obtain attenuation in dB/m, divide by 30.48

To compute attenuation for temperatures other than 20°C, (do not use for temp. less than -200°C) modify  $R_1$  and  $R_2$  in accordance with the temperature coefficient of resistance of the particular conductor materials. For copper and aluminum, the resistance at temperature  $t$  is:

$$R_t = R_{20} [1 + 0.0039 (t - 20)]$$

### CABLE RISE TIME (10% to 90% amplitude):

$$TR = 1.29 A^2 L^2 \times 10^{-2} \dots \text{ps}$$

Note: A and L must be in the same length units, i.e., feet or meters

## CALCULATING AVERAGE POWER RATINGS FOR SEMI-RIGID CABLES WITH SOLID PTFE INSULATION

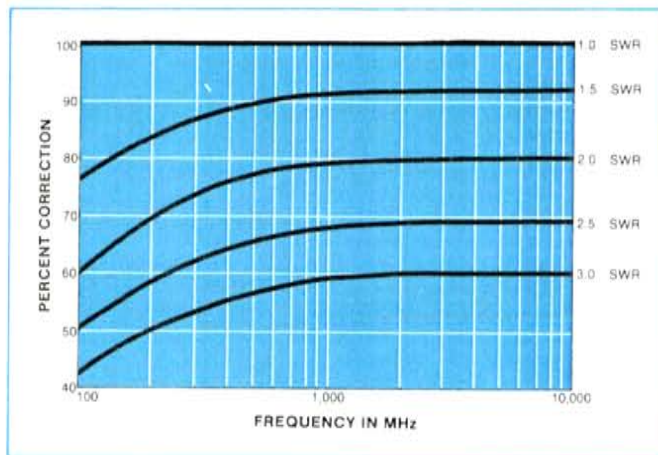
Average Power — Kilowatts

$$P_a = 5.2 \frac{Q/L}{\alpha}$$

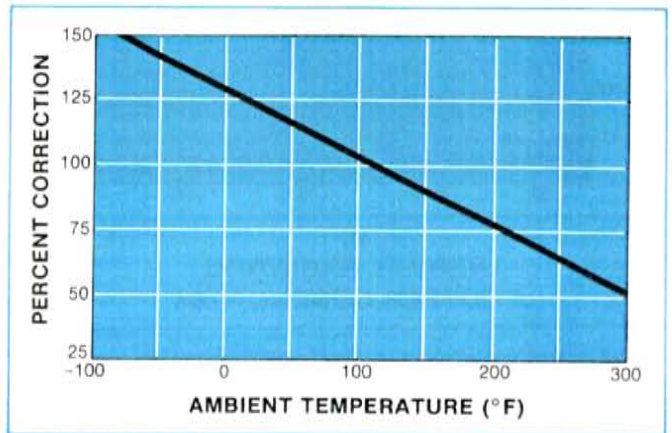
$$Q/L = (hr + hc) \pi (OD) (t_o - t_a)$$

Center conductor heating

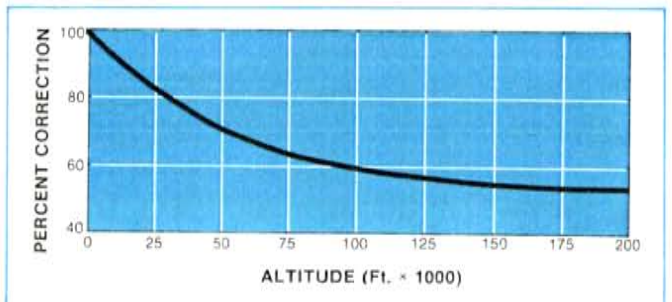
$$t_i = 24.8 R_z Q/L + t_o$$



VSWR CORRECTION FACTOR

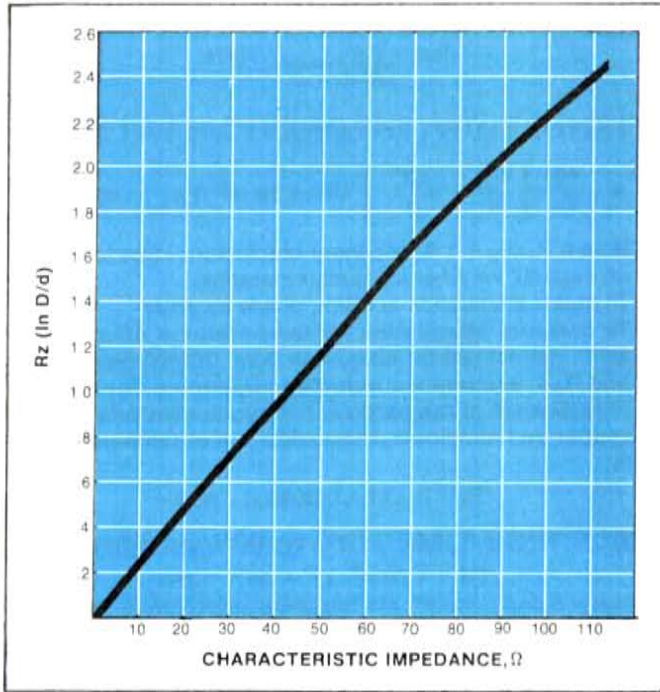


TEMPERATURE CORRECTION — TEFLON DIELECTRIC

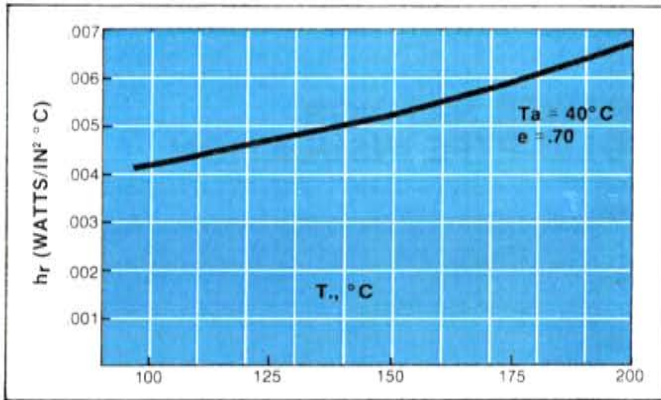


ALTITUDE CORRECTION FACTOR

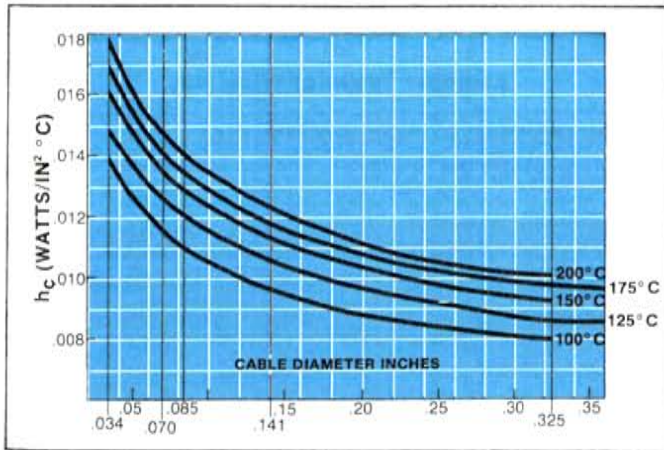
# CALCULATING AVERAGE POWER RATINGS



PARAMETER R<sub>z</sub>



h<sub>r</sub>  
THERMAL RADIATION  
of COPPER CONDUCTORS



h<sub>c</sub>  
THERMAL CONVECTION  
of COPPER CONDUCTORS

## SYMBOLS

- e Dielectric constant
- F<sub>p</sub> Power factor or dielectric bulk loss
- ρ Reflection coefficient
- SWR Standing wave ratio
- α Attenuation
- A Attenuation at 1.0 GHz in dB/100 ft.
- f Frequency in MHz
- f<sub>co</sub> Moding frequency in GHz
- R<sub>1</sub> Ratio of center conductor conductivity to copper
- R<sub>2</sub> Ratio of outer conductor conductivity to copper
- R<sub>t</sub> Resistance of conductor at temperature t<sub>a</sub>
- R<sub>20</sub> Resistance of conductor at temperature 20°C
- T<sub>R</sub> Rise Time
- L Length
- T Time in nanoseconds
- T<sub>μ</sub> Time in microseconds
- t<sub>i</sub> Temperature of inner conductor, °C, -maximum 250°C
- t<sub>o</sub> Temperature of outer conductor, °C -cable rating
- t<sub>a</sub> Temperature of ambient environment, °C
- OD Outer diameter of cable, inches
- ID Inner diameter of jacket, inches
- D Dielectric diameter, inches
- d Center conductor diameter, inches
- Z<sub>o</sub> Characteristic impedance

# SEMI-RIGID COAXIAL CABLE ASSEMBLIES

## DESIGN RECOMMENDATIONS

Micro-Coax presents the following guidelines for the design and specification of connectorized semi-rigid coaxial cable assemblies. This is not a statement of process capability limitations, however, observation of these concepts will optimize custom tooling, planning, and fabrication lead time, product integrity, and ultimately - cost.

IF APPLICATION REQUIREMENTS ALLOW . . .

- Let all bends be the same size radius
- Avoid the use of minimum allowable bend radii, since electrical performance is affected by sharp bends.
- Define cable assembly bend configuration with respect to the connectors' reference planes (if connectorized) or end preparation requirements (if non-connectorized) as detailed in MIL-D-9898.
- Allow a straight length between bends equal to at least 3 times the diameter of the cable. This will eliminate the need to design and fabricate custom tooling.
- Allow a tolerance of nominal length  $\pm .010$  inches for each incremental feature along the path of cable travel.
- Allow a tolerance of nominal bend  $\pm 3^\circ$  for each individual bend along the path of cable travel.
- Linear dimensions defining connector to connector x, y, and z delta's should be tolerated: nominal length  $\pm .030$  inches. Multi-featured products needing tighter control than this are difficult, but possible.
- Specify a certain connector brand only if it is an absolute requirement, thus avoiding procurement delays.
- Specify a plated outer conductor only if it is an absolute requirement. Plating can offer improved solderability, environmental protection, and is cosmetically pleasing, but has no functional use in terms of cable performance.
- Specify SWR, phase matching, levels of test, etc., only across frequency bands of interests, because over-testing can be expensive.

CONSULT THE STAFF AT MICRO-COAX FOR DESIGN, ASSISTANCE, OR FOR CLARIFICATION OF THESE RECOMMENDATIONS.

## CABLE PRECONDITIONING

(Per MIL-C-17G)

The electro-mechanical performances specified for semi-rigid cables are achieved by a compression fit between the outer conductor and the dielectric core which, in turn, necessitates manufacturing processes that cause deformation of the core by compression and elongation. The resulting stress that is initially nonuniform tends to equalize by cold flow within a few weeks after manufacturing, and will cause withdrawal of the core into the cable. If this occurs in cable that has become part of a cable assembly, the resultant development of an air-void of the cable-connector interface causes VSWR increase. It is therefore advantageous to achieve core stress relief by preconditioning cable before it becomes a cable assembly.

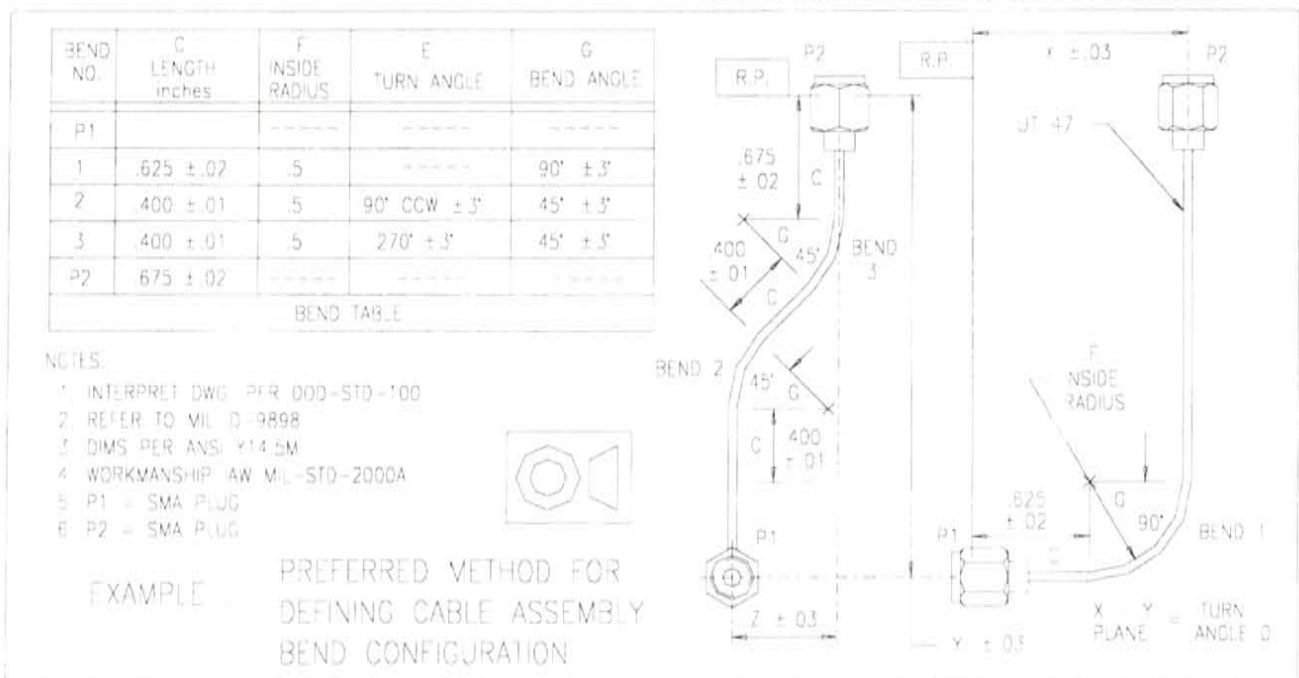
Preconditioning is not effective on long lengths of cable. Bending of cable, which is usually involved with the manufacture of cable, tends to introduce nonuniform core stresses; therefore, preconditioning is more effective when performed on cable assemblies that are complete, except for the final end preparation and before attaching the connectors. Since preconditioning will result in the withdrawal of the dielectric into the cable, preparation of the cable assembly should allow for a  $\frac{1}{2}$ " length on each cable and beyond the design dimension. The outer conductor and the core should not be cut to the final dimensions until preconditioning has been completed.

A recommended preconditioning procedure consists of three cycles of the following routine:

- Step 1: Heat the specimen to the maximum operating temperature as specified on pages 7-35. Maintain at temperature for 1 hour min.
- Step 2: Return specimen to room ambient temperature. Trim protruding core, if any, with the edge of the outer conductor.
- Step 3: Maintain specimen at room temperature for 1 hour minimum.
- Step 4: Cool specimen to  $-45^\circ\text{C}$  and maintain for 1 hour minimum.
- Step 5: Return specimen to room temperature and maintain for 1 hour minimum.

After the last temperature cycle, maintain the specimen at room temperature for 24 hours minimum before proceeding with further processing.

SPECIAL PRECONDITIONING REQUIREMENTS CAN BE OBTAINED BY CONSULTING THE ENGINEERING STAFF AT MICRO-COAX.



## COAXIAL DELAY LINES

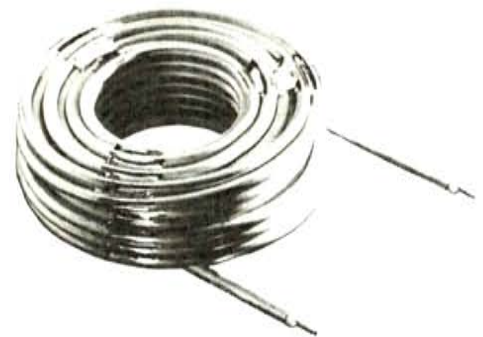
Micro-Coax delay lines are a highly reliable method of providing short delays in RF and Microwave systems such as:

- Cellular Base Stations
- Radar Systems
- Microwave Altimeters
- ECM Systems

We specialize in solving unique coaxial delay line packaging and electrical problems. Our custom delay lines offer an unbeatable combination of high performance, low cost, and quick delivery.

### ELECTRICAL

- Tolerances to within 15 picoseconds
- Low density PTFE dielectrics to maximize phase stability over temperature extremes from -55°C to 250°C.
- Automated bend tooling to minimize VSWR discontinuities.

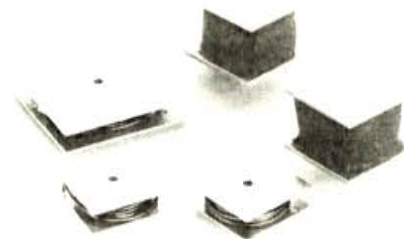


### MECHANICAL

- Cable Diameters from .008" to 0.250"
- Leads feedthru, surface mount, or connectorized.

### PACKAGING

- Supplied solder tacked, on spools, potted, free coiled, or in custom packaging.
- Multiple coils and delays in one package.
- Low density PTFE dielectrics for high temperature applications, such as reflow soldering.
- Automated tooling to ensure repeatability.
- Single or double layers of cable to minimize height.



### TESTING CAPABILITY

- VNA's used to ensure electrical requirements are consistently met.

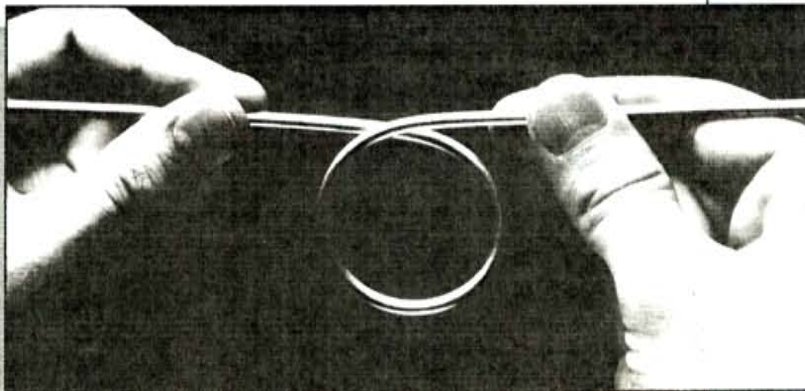
## ALUMILINE HAND-FORMABLE MICROWAVE COAXIAL CABLE

### Solid-PTFE ALUMiLINE

- Same characteristics as MIL-C-17 copper cables except for jacket material
- Outstanding overall performance
- Replaces semi-rigid size for size
- Accepts standard connectors

### Low-density PTFE

- No expansion of dielectric for excellent phase stability
- Lower loss
- Greater power handling
- Operates from  $-65$  to  $+225^{\circ}\text{C}$
- Ideal for hostile environments



### Features of all ALUMiLINE cables

- Easy to form by hand into nearly any shape
- Tin plated for easy soldering, except for MI7-133-00012 and MI7-130-0008
- No need for expensive tooling or installation drawings
- Lightweight
- Completely RF shielded

When tight packaging throws you a curve, ALUMiLINE cables are the answer. They're rugged and completely RF shielded, just like semi-rigid cable. But they're also flexible, so you can easily form them into nearly any shape by hand. You won't have to include them on drawings or tool up to bend them. Just form them, connect them, and torque them up. It's that simple.

ALUMiLINE cables are incredibly versatile. They replace semi-rigid size for size, so they're perfect for every semi-rigid application. They eliminate crosstalk, so they're a great choice when you're replacing RG-type cable in an enclosure. And they deliver performance equal to the best microwave cables...for a lot less money.

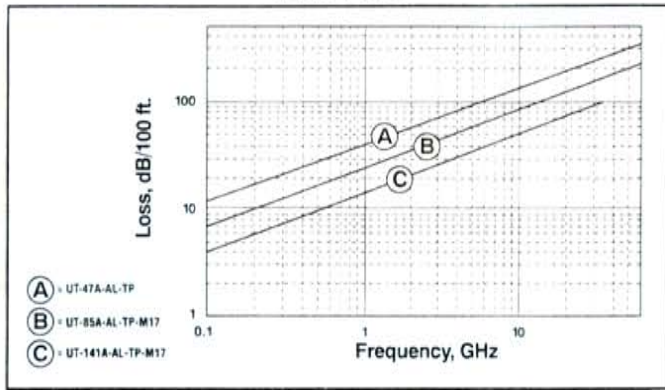
MICRO-COAX has developed two types of ALUMiLINE, each one designed to serve specific applications. Solid PTFE ALUMiLINE has a solid PTFE dielectric, meets MIL-C-17 spec for spec, and accepts standard connectors.

Low-density ALUMiLINE offers the highest level of performance. It's extremely phase stable because the low-density dielectric won't expand with temperature. And it has lower loss, greater power handling ability, and operates over a greater range of operating temperatures than MIL-C-17 cables.

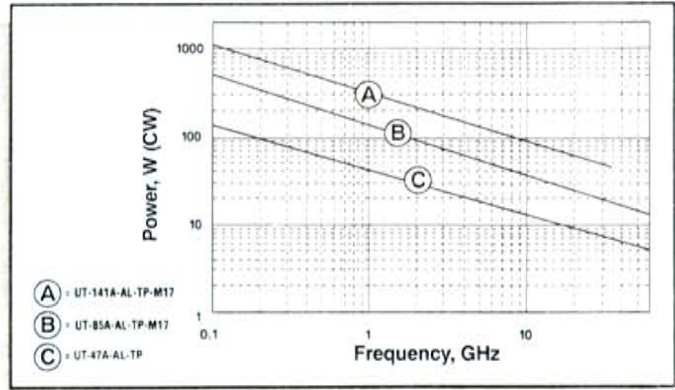
ALUMiLINE is tin-plated for easy soldering, and is available with a 0.086-in. diameter for operation to 61 GHz, a 0.141-in. diameter for operation to 34 GHz, or a 0.047-in. diameter for operation to 115 GHz.

So, before you design-in semi-rigid cables, check out the drop-in versatility of ALUMiLINE cables from MICRO-COAX. They're perfect when you're caught between a rack and a tight space.

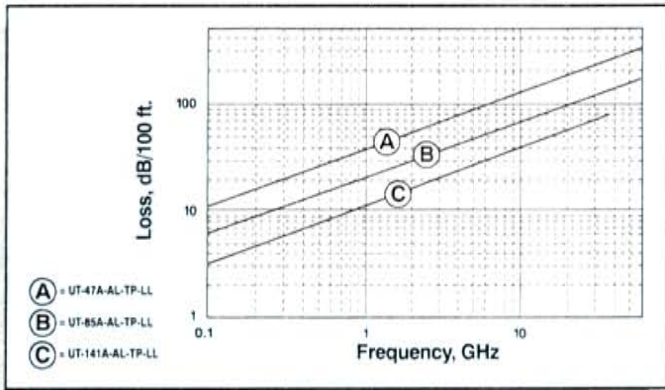
### Maximum Insertion Loss (Solid PTFE)



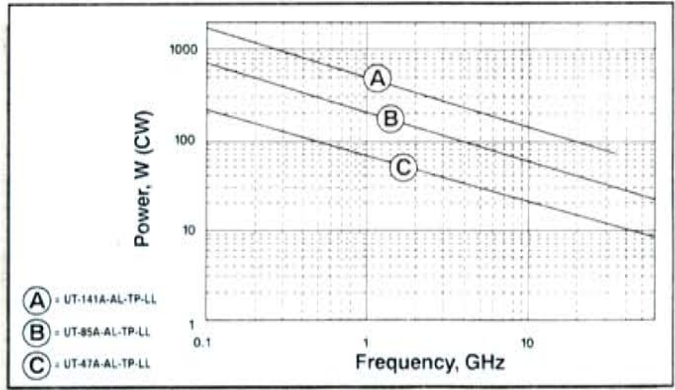
### Power Handling (Solid PTFE)



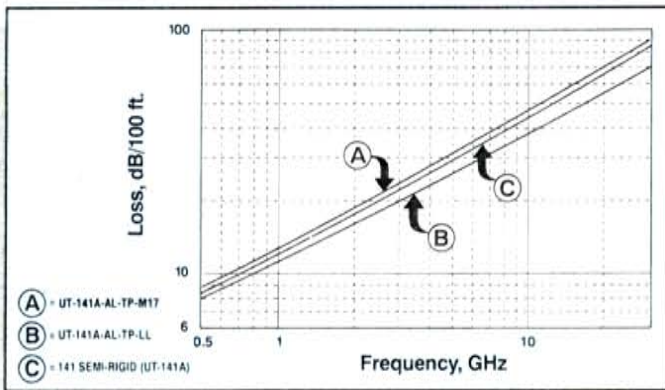
### Maximum Insertion Loss (Low-density PTFE)



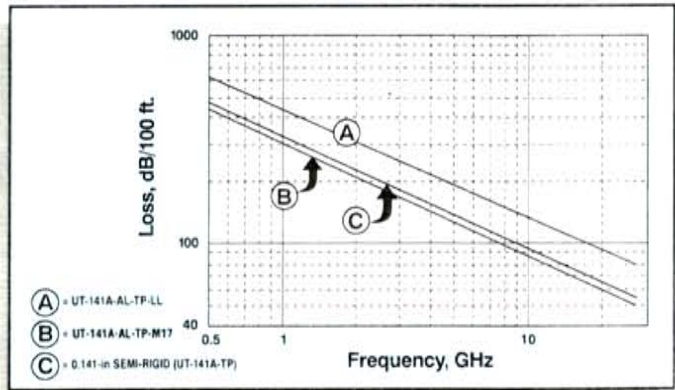
### Power Handling (Low-density PTFE)



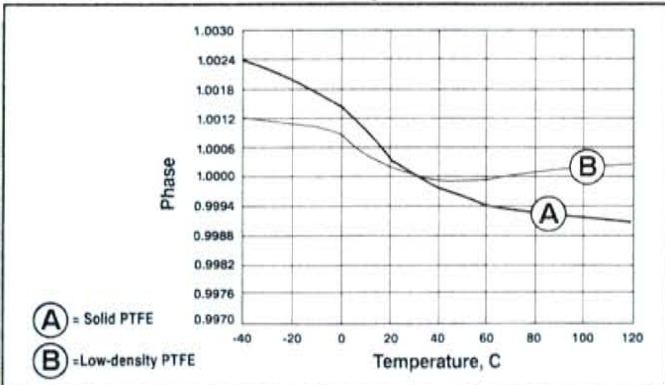
### Insertion Loss Comparison (Solid PTFE, Low-density PTFE, Semi-rigid)



### Power Handling Comparison (Solid PTFE, Low-density PTFE, Semi-rigid)



### Phase vs Temperature



## ALUMILINE SPECIFICATIONS

MIL-C-17 Part Number				M17/133-00012	M17/133-00013	M17/130-00008	M17/130-00009	
Micro-Coax Part Number	UT 47-AL-TP	UT 47C-AL-TP-LL	UT 85C-AL-TP-LL	UT 85-AL-M17	UT 85-AL-TP-M17	UT 141-SA-AL-M17	UT 141-SA-AL-TP-M17	UT 141C-AL-TP-LL
<b>Materials</b>								
Outer Conductor	Tin Plated AL	Tin Plated AL	Tin Plated AL	Aluminum	Tin Plated AL	Aluminum	Tin Plated AL	Tin Plated AL
Dielectric	PTFE	LD-PTFE	LD-PTFE	PTFE	PTFE	PTFE	PTFE	LD-PTFE
Center Conductor*	SPCW	SPC	SPC	SPCW	SPCW	SPCW	SPCW	SPC
<b>Mechanical Data</b>								
Outer Diameter (IN)	.047 + .002/ - .001	.047 + .002/ - .001	.0865 + .002/ - .001	.0865 ± .001	.0865 + .002/ - .001	.141 ± .001	.141 + .002/ - .001	.141 + .002/ - .001
Dielectric Diameter (IN)	.037 ± .001	.037 ± .001	.066 ± .001	.066 ± .002	.066 ± .002	.1175 ± .001	.1175 ± .001	.1175 ± .001
Center Conductor Diameter (IN)	.0113 ± .0005	.0126 ± .0005	.0226 ± .0005	.0201 ± .0005	.0201 ± .0005	.0362 ± .0007	.0362 ± .0007	.0403 ± .001
Minimum Inside Bend Radius (IN)	0.07	0.125	0.25	0.07	0.07	0.125	0.125	0.50
Weight (LBS/100')	0.21	0.20	0.67	0.75	0.80	1.88	2.05	1.77
<b>Electrical Data</b>								
Impedance (ohms)	50 ± 1.5	50 ± 2	50 ± 2	50 ± 1.5	50 ± 1.5	50 ± 1	50 ± 1	50 ± 2
Capacitance (pF/ft.)	29	27	27	29	29	29	29	27
Corona Extinction Voltage (VRMS @ 60 GHz)	1000	1000	1500	1500	1500	1900	1900	1900
Voltage Withstanding (VRMS @ 60 Hz)	2000	2000	2500	5000	5000	5000	5000	5000
Frequency Range (GHz)	DC to 108	DC to 115	DC to 64	DC to 61	DC to 61	DC to 34	DC to 34	DC to 36
<b>Environmental Data</b>								
Temperature Range (C)	-65 to +125	-65 to +225	-65 to +225	-40 to +125	-40 to +125	-40 to +125	-40 to +125	-65 to +225

\*SPC = silver-plated copper

SPCW = silver-plated Copperweld

## OTHER PRODUCTS

### ■ UTiFLEX Miniature Low Loss Flexible Cable Assemblies

These general-purpose microwave miniature cables have been designed to offer superior electrical performance in the smallest possible package for fixed installations. They are a cost-effective alternative when an RG cable cannot perform to your system needs or when a semi-rigid cable is too cumbersome. The UTiFLEX Miniature cables are available with a large selection of connectors and can be easily customized to meet your exact requirements.

### ■ UTiFLEX Ultra Low Loss Flexible Cable Assemblies

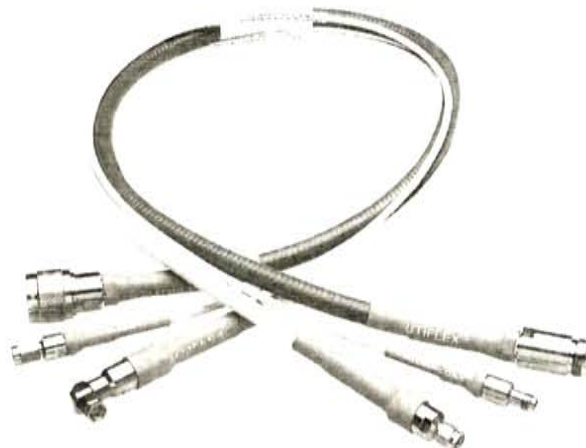
UTiFLEX Ultra Low Loss cable assemblies are optimized to provide the lowest insertion loss available in a flexible cable construction up to 18, 26.5, and 40 GHz. The cables utilize an ultra low density PTFE dielectric that lowers weight and insertion loss, improves electrical stability, and provides greater resilience and flexibility when compared to standard microwave cables.

### ■ UTiFLEX Low Loss Flexible Cable Assemblies

UTiFLEX Low Loss cable assemblies provide you with the complete high performance microwave cable. They have outstanding mechanical integrity without sacrificing insertion loss, phase stability, or SWR. UTiFLEX Low Loss cable assemblies are extremely versatile, moderately priced, and fit a large variety of applications.

### ■ UTiFLEX Ultralight Flexible Cable Assemblies

UTiFLEX Ultralight cable assemblies are optimized for spaceflight applications. They provide the lightest weight, lowest insertion loss, and best radiation resistance in a flexible cable construction. The cables utilize DuPont's Aracon® metal clad fiber for the outer shield, an ultra low density PTFE for the dielectric, and a carbon loaded Tefzel® jacket. If required, cable assemblies are manufactured in a Class 100 clean room by NASA Certified solder technicians.





## COMPANY PROFILE

*MICRO-COAX*<sup>®</sup> has led the way in transmission line solutions for nearly 40 years. The Company's name has evolved, along with its capabilities, from the Micro Delay Division of Uniform Tubes to *MICRO-COAX*<sup>®</sup>. Our sales offices are located throughout the world, but all design and manufacturing are performed in our 90,000 sq. ft. facility located in Pottstown, Pennsylvania.

The Company's initial products, semi-rigid coaxial cable and delay lines, are today part of a growing line of microwave components that include UTIFLEX high performance flexible microwave cables. Because *MICRO-COAX*<sup>®</sup> has a very broad offering of transmission line products, we can provide the best solution to your transmission line needs. Our experienced Engineering staff has the capability to custom design cable and connectors to meet your most demanding and time sensitive requirements.

*MICRO-COAX*<sup>®</sup> enjoys an outstanding reputation for service and product quality throughout the industries it serves. In fact, our commitment to quality was recognized in 1995 when we received ISO 9002 registration. Statistical Process Control (SPC) techniques are employed throughout the facility to monitor both service and product quality with the goal of continuous improvement.

*MICRO-COAX*<sup>®</sup> maintains complete control over all processes by manufacturing all of our own cable, cable assemblies, and many connectors. This is further enhanced by continuous investment in new products and processes with the goal of responding faster and bringing better products and services to the microwave transmission line market.

The products offered by *MICRO-COAX*<sup>®</sup> today serve more applications than ever before. Our products can be found in systems ranging from military communications, radar, missile guidance, and satellites, to cellular telephones, cellular transmitters and receivers, and a wide range of test equipment. When you want the most innovative transmission line solutions, there's just one name to remember, *MICRO-COAX*<sup>®</sup>.



## ORDERING AND SERVICE INFORMATION

### How to Order

Please order by catalog part number and/or drawing number adding any special requirements such as plating. Lengths required, straight or coiled, must be given when purchasing any cable type.

### Where to Order

Address all purchase orders and communications to:

In USA:  
Micro-Coax®  
206 Jones Boulevard  
Pottstown, PA 19464-3465  
Telephone: (610) 495-0110  
Fax: (610) 495-6656  
E-mail: sales@micro-coax.com  
www.micro-coax.com

In Europe:  
Rosenberger Micro-Coax  
1 Bacchus House, Calleva Park  
Aldermaston, Reading RG78EN  
Berkshire, England  
Telephone: 44-1189-810023  
Fax: 44-1189-816180

### Terms

Formal price quotations remain in effect for 30 days unless otherwise agreed on quotation. Terms of payment are Net 30 Days, subject to approval of credit.

### Source Inspection

Prices quoted are based on inspection at destination. A charge per day or part of a day applies to any order requiring source inspection.

### Return Policy

Please contact Micro-Coax® for an RMA number before returning product. The RMA number should be referenced on the packing container and all associated paperwork. Standard items may be returned for credit subject to a restocking charge.

### Non-Recurring Engineering Charges

Non-recurring engineering charges, if any, reimburse Micro-Coax® in part for tools and fixtures needed for a particular job. They do not give the customer any claim or right to remove these tools from our plant or have say in the use or disposition of these tools. There will be no charge for upkeep or repair of tools and fixtures. Upon completion of an order, Micro-Coax® may dispose of said tools and fixtures as it sees fit.

### Sample Policy

Samples are normally available for most standard stock items. A cable sample quantity of 2 feet is applicable. Non-stock items may be sampled depending on availability at the time of the request.

### Shipments

Unless specific instructions accompany the order, shipment is made FOB Pottstown, PA. Micro-Coax® will use its judgement as to the best method of shipment. Micro-Coax® reserves the right to ship COD or upon receipt of advance payment if satisfactory credit cannot be established. All claims for shortages must be made within Ten Days after customer's receipt of material from Micro-Coax®.

**Now, from the industry leader  
in microwave semi-rigid and flexible cable  
technology, the perfect alternative to both...**

## **UTiFORM™ Tin-Dipped, Hand-Formable Microwave Cable**

For nearly 40 years, designers throughout the world have learned to rely upon microwave transmission line products from Micro-Coax. We've built our reputation on delivering reliable, high-performance, cost-effective solutions to the most challenging cable configuration problems.

Now, with the introduction of UTiFORM™ cable, the "industry standard" product line is complete.

### **UTiFORM™ Features and Benefits**

#### **Hand-Formable**

- No complicated bend specifications required
- Retains shape
- Can be reformed with no damage

#### **Available with Low-Density Dielectrics**

- Improved insertion loss
  - Higher operating temperatures
  - Improved phase and IL stability vs. temperature
    - Increased power handling
    - Dedicated connectors available

#### **Easy to Use**

- Accepts standard semi-rigid connectors
- Cuts and strips with standard semi-rigid machines
- Form and route at installation
- No bend tooling required
- Tinned outer conductor for improved solderability

#### **Performance**

- 100% shielding
- Higher temperature rating than semi-rigid
- Excellent attenuation and VSWR
- Low cost

#### **Availability**

- Stock
- Packaged on spools in lengths of 50, 100, 250, 500 and 1000 ft.
- Metric lengths available
- Halogen-free jacket options available





## MECHANICAL CHARACTERISTICS

UTIFORM™ PART NUMBER	UT-141-Form	UT-141C-Form	UT-141C-Form-F	UT-141C-Form-LL	UT-250C-Form
Wire Diameter inch (mm)	0.036 (.91)	0.036 (.91)	0.036 (.91)	0.040 (1.02)	0.064 (1.63)
Dielectric Diameter inch (mm)	0.118 (3.00)	0.118 (3.00)	0.118 (3.00)	0.118 (3.00)	0.209 (5.31)
Outer Conductor Diameter inch (mm)	0.140 (3.56)	0.140 (3.56)	0.140 (3.56)	0.140 (3.56)	0.246 (6.25)
Jacket Diameter inch (mm)	—	—	0.161 (4.09)	—	—
Weight grams/ft (meter)	12.7 (41.7)	12.7 (41.7)	15.4 (50.5)	12.4 (40.7)	51.2 (168.0)
Bend Radius inch (mm)	0.375 (9.53)	0.375 (9.53)	0.375 (9.53)	0.500 (12.7)	0.500 (12.7)
Maximum Temperature (°C)	200	200	200	225	200
Maximum Length ft (meters)	1000 (305)	1000 (305)	1000 (305)	1000 (305)	500 (152.5)

## ELECTRICAL CHARACTERISTICS

Impedance Ohms	50	50	50	50	50
Capacitance pf/ft (meter)	29 (95.1)	29 (95.1)	29 (95.1)	27 (95.1)	29 (95.1)
Velocity of Propagation	70%	70%	70%	77%	70%
Maximum Voltage V	1900	1900	1900	1900	3000
Signal Delay ns/ft (meter)	1.45 (4.76)	1.45 (4.76)	1.45 (4.76)	1.32 (4.33)	1.45 (4.76)
Frequency Range GHz	DC-30	DC-30	DC-30	DC-29	DC-19
Shielding	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54
Insertion Loss	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54
Power Handling	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54

## MATERIALS

Wire	SPCW	SPC	SPC	SPC	SPC
Dielectric	Solid PTFE	Solid PTFE	Solid PTFE	LD PTFE	Solid PTFE
Outer Conductor	Tin-Dipped SPC Braid	Tin-Dipped SPC Braid	Tin-Dipped SPC Braid	Tin-Dipped SPC Braid	Tin-Dipped SPC Braid
Jacket	—	—	FEP	—	—



Our 90,000-sq. ft. facility in Pottstown, PA, was custom built to Micro-Coax specifications and provides significantly advanced research, manufacturing, administrative, and control capabilities. Many of the materials used to manufacture our products are also built in this facility providing unprecedented efficiencies in cost and time to market.

Additionally, our facility in the United Kingdom offers 12,000 sq. ft. of state-of-the-art manufacturing and distribution capabilities.



## MECHANICAL CHARACTERISTICS

UTiFORM™ PART NUMBER	UT-47-Form	UT-85-Form	UT-85C-Form	UT-85C-Form-F	UT-85C-Form-LL
Wire Diameter inch (mm)	0.011 (.28)	0.020 (.51)	0.020 (.51)	0.020 (.51)	0.023 (.58)
Dielectric Diameter inch (mm)	0.037 (.94)	0.066 (1.68)	0.066 (1.68)	0.066 (1.68)	0.066 (1.68)
Outer Conductor Diameter inch (mm)	0.047 (1.19)	0.083 (2.11)	0.083 (2.11)	0.083 (2.11)	0.083 (2.11)
Jacket Diameter inch (mm)	—	—	—	0.099 (2.51)	—
Weight grams/ft (meter)	1.4 (4.6)	3.8 (12.5)	3.8 (12.5)	4.7 (15.4)	3.7 (12.1)
Bend Radius inch (mm)	0.100 (2.54)	0.125 (3.18)	0.125 (3.18)	0.125 (3.18)	0.250 (6.35)
Maximum Temperature (°C)	200	200	200	200	225
Maximum Length ft (meters)	1000 (305)	1000 (305)	1000 (305)	1000 (305)	1000 (305)

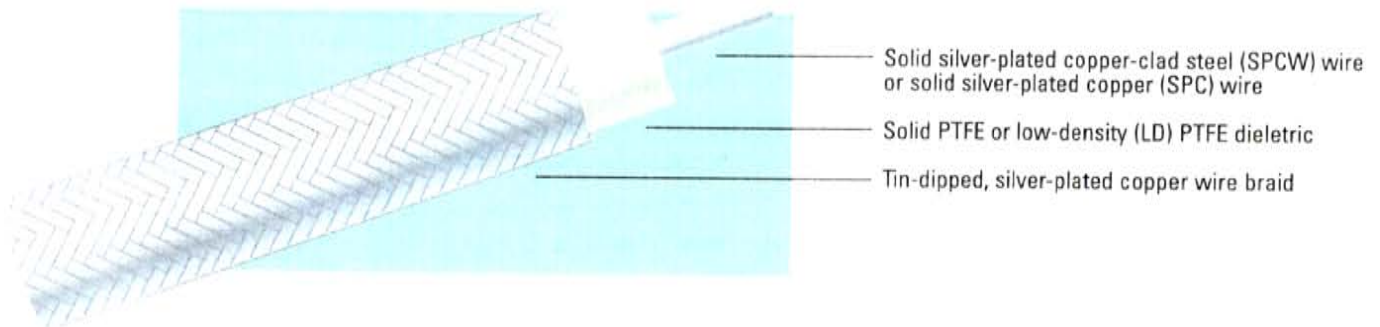
## ELECTRICAL CHARACTERISTICS

Impedance Ohms	50	50	50	50	50
Capacitance pf/ft (meter)	29 (95.1)	29 (95.1)	29 (95.1)	29 (95.1)	27 (95.1)
Velocity of Propagation	70%	70%	70%	70%	77%
Maximum Voltage V	1000	1500	1500	1500	1500
Signal Delay ns/ft (meter)	1.45 (4.76)	1.45 (4.76)	1.45 (4.76)	1.45 (4.76)	1.32 (4.33)
Frequency Range GHz	DC-95	DC-54	DC-54	DC-54	DC-52
Shielding	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54
Insertion Loss	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54
Power Handling	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54	See graph Pg 54

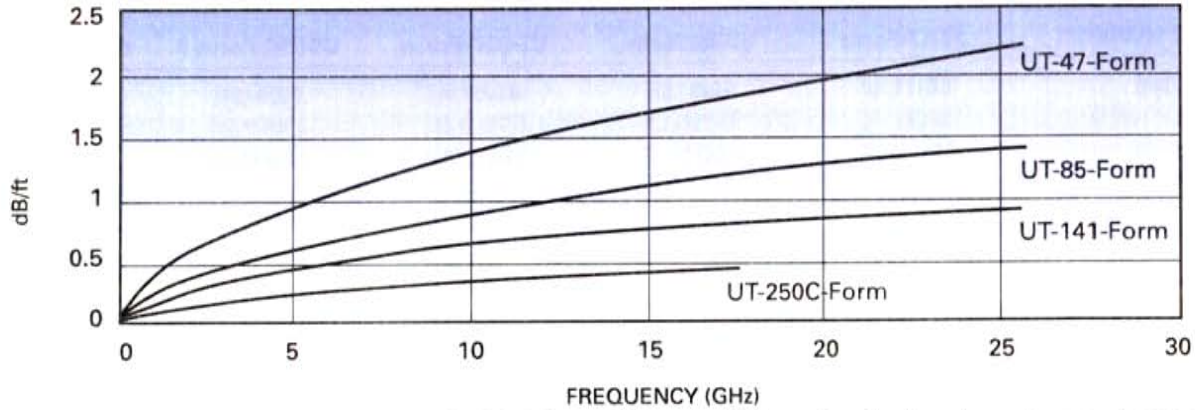
## MATERIALS

Wire	SPCW	SPCW	SPC	SPC	SPC
Dielectric	Solid PTFE	Solid PTFE	Solid PTFE	Solid PTFE	LD PTFE
Outer Conductor	Tin-Dipped SPC Braid	Tin-Dipped SPC Braid	Tin-Dipped SPC Braid	Tin-Dipped SPC Braid	Tin-Dipped SPC Braid
Jacket	—	—	—	FEP	—

Typical UTiFORM™ construction

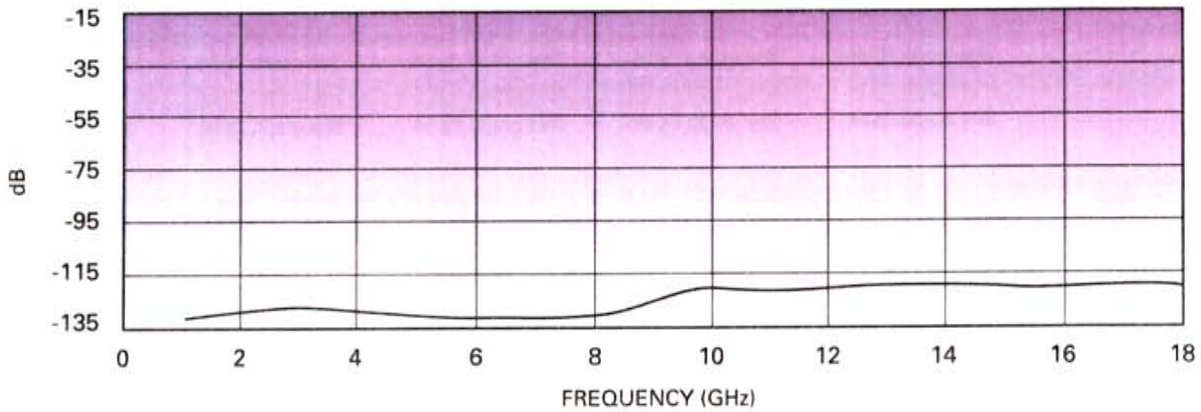


## MAXIMUM INSERTION LOSS



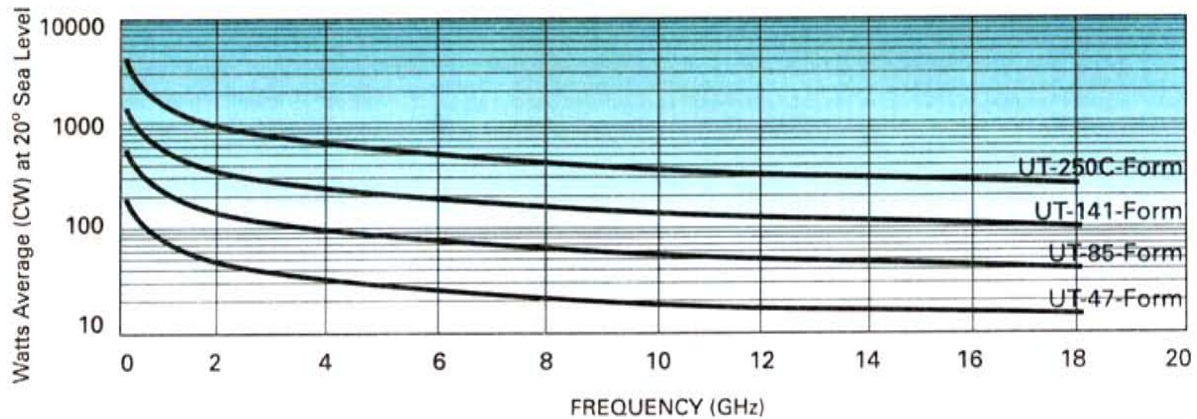
Note: "LL" versions of UT-85-Form and UT-141-Form exhibit up to 10% lower insertion loss depending upon frequency

## SHIELDING EFFECTIVENESS



Note: Tested per MIL-STD-1344A, Method 3008

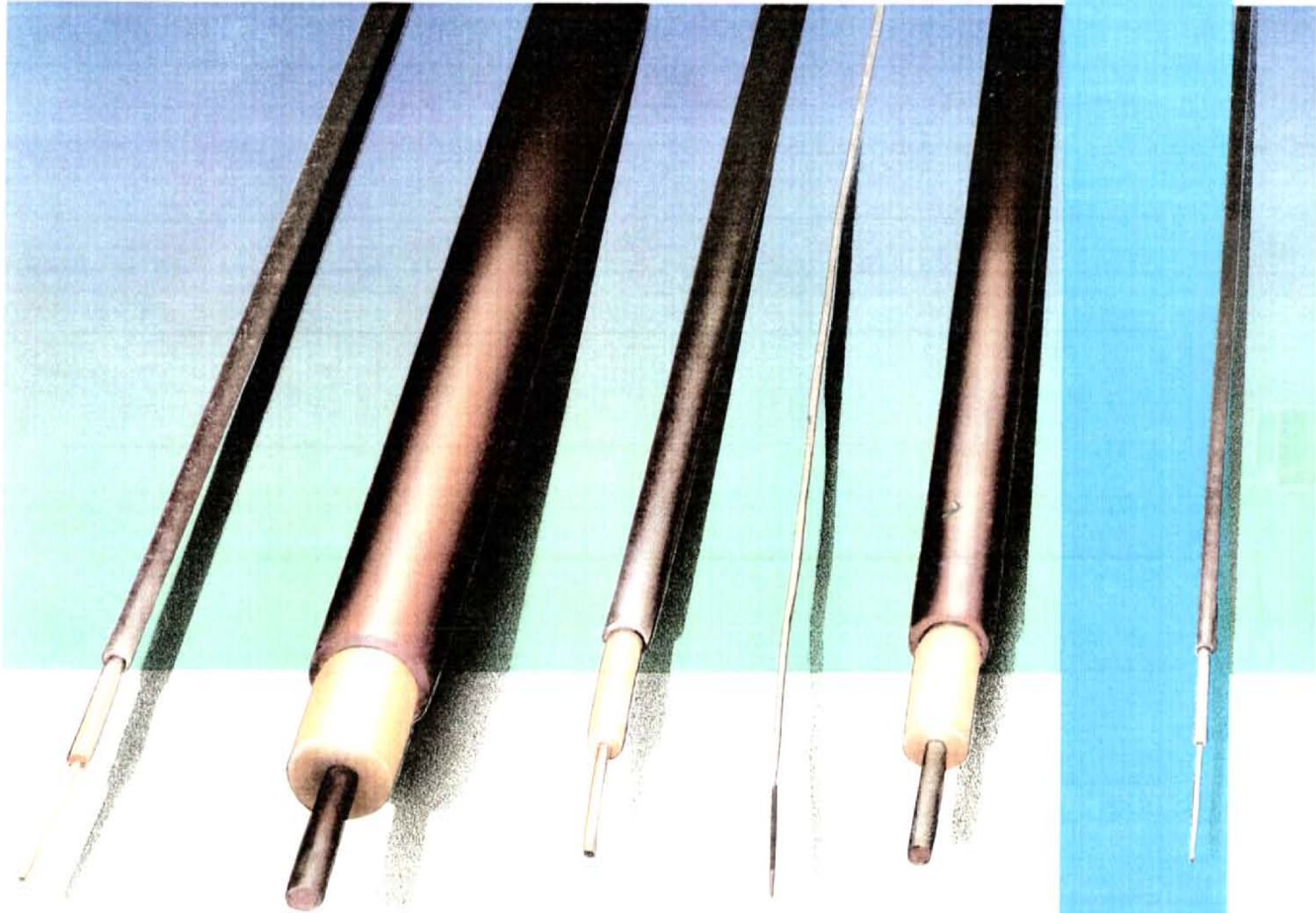
## POWER HANDLING



Note: "LL" versions of UT-85-Form and UT-141-Form can handle approximately 10% more power

MICRO-COAX





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