

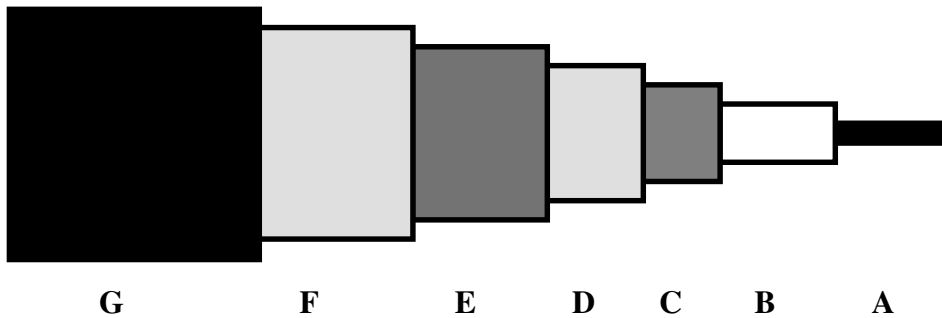
Times Microwave Systems

Hermetically Sealed Assemblies

SCOPE

This Specification details the Electrical, Mechanical and Environmental Characteristics of Times Microwave Systems MILTECH™ 230 .23” Diameter Hermetically Sealed Coaxial Transmission Lines. This product is recommended for all applications where Long Term Stability of Electrical Performance is of Prime Importance. Due to the unique processes used to manufacture these Cable Assemblies, the cable and connector sections are not available as separate items with the exception of the Replaceable Front Ends that are listed in the Connector Section of this Specification.

CABLE CHARACTERISTICS




Cable Materials

- A** Center Conductor: Solid Silver Plated Copper
- B** Dielectric: Taped Polytetrafluoroethylene
- C** First Shield: Silver Plated Copper Strip Braid
- D** Interlayer: Aluminum Backed Tape
- E** Second Shield: Silver Plated Copper Braid
- F** Vapor Shield: Composite Tapes
- G** Outer Jacket : Nomex®

Cable Mechanical Characteristics

Diameter: .23 +/- .015” (5.8 +/- .4 mm)
 Mass: .045 lbs/ft (68 g/m)
 Minimum Bend Radius : 1.15 inch (29.2 mm)

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CONNECTOR CHARACTERISTICS

All of the connectors used are of a precision stainless steel design which meet or exceed all interface requirements of MIL-C-39012 and are uniquely designed to provide maximum mechanical and environmental performance to 18 GHz unless otherwise noted.


Connector Materials

Center Contacts - Gold Plated Beryllium Copper
 Dielectrics - PTFE (Polytetrafluoroethylene)
 Bodies and Coupling Nuts - Passivated Stainless Steel

Front End Connector Types thread onto a factory installed Universal Intermediate Section. This design approach provides for easy replacement of a connector in the case of damage or when the need arises to change to a different type of interface or angular configuration. For selections not indicated below contact the Factory for availability.

Common Connector Types

Connector Designator	Connector Type	Outline Drawing Number
A	N Plug	SD48252
C	TNC Plug	SD48236
E	SMA Plug	SD48248
EX	SMA Plug Right Angle	SD48247
RA	N Plug Front End	SD48721
RC	TNC Plug Front End	SD48555
RE	SMA Plug Front End	SD48530
RD	TNC Female Bulkhead Jack Front End	SD48590
RCX	TNC Plug Right Angle Front End	SD48572
RCY	TNC plug 45 Degree Front End	SD48576
RG	TK Male Plug Front End	SD48554

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ASSEMBLY CHARACTERISTICS

Electrical Characteristics

Tested Frequency Range	.5 to 18 GHz
Characteristic Impedance	50 Ohms
VSWR	1.40:1 maximum ; add 0.05 per angle connector
Insertion Loss	See Graph and Chart on pages 5 and 6, add 0.1 dB per angle connector
Velocity of Propagation	76% Nominal
Maximum Operating Voltage	2500 Volts (1000 volts with SMA)
RF Leakage	-90 dB maximum per foot over Tested Frequency Range including connectors
Insertion Loss Stability	In accordance with MIL-T-81490
VSWR Stability	In accordance with MIL-T-81490

Mechanical Characteristics

Operating Temperature Range	-55 to +150 degrees C (200 C maximum available on request)
Chemical Resistance	In accordance with MIL-T-81490 and MIL-C-87104
Flexure	In accordance with MIL-C-87104
Salt Fog	In accordance with MIL-T-81490 and MIL-C-87104
Humidity	In accordance with MIL-T-81490 and MIL-C-87104
Abrasion Resistance	In accordance with MIL-T-81490 and MIL-C-87104 / .020" edge
Cable Connector Tensile Strength	45 Pounds minimum
Vapor Leakage	1x10 ⁻⁵ cc/sec/ft of Helium maximum including connectors
Vibration	In accordance with MIL-T-81490
Shock	In accordance with MIL-T-81490

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ORDERING INFORMATION

A Complete Part Number is specified as follows:

MILTECH230/L/C1/C2

Where **L** = Length (in Inches or millimetres, see below)
C1 = Connector 1 Designator
C2 = Connector 2 Designator

Example 1 - a 60 inch long Cable Assembly with an SMA male on one end and a Replaceable TNC male on the other end would have the Part Number **MILTECH230/in60/E/RC**

Example 2 - a 430 millimetre long Cable Assembly with an SMA male on one end and a Replaceable TNC male on the other end would have the Part Number **MILTECH230/mm430/E/RC**

Marking

Cable Assemblies are marked in the center or on each end depending on Cable Assembly Length as follows:


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MFG: 68999
MILTECH230/xxx/xx/xx

Length Tolerances

+/- .25" (6.4mm) for Cable Assemblies less than 5 ft (1524mm)
+/- .5" (13mm) for Cable Assemblies between 5 ft (1524mm) and 10 ft (2540mm)
+/- .5% for Cable Assemblies Greater than 10 ft (2540mm)

Testing

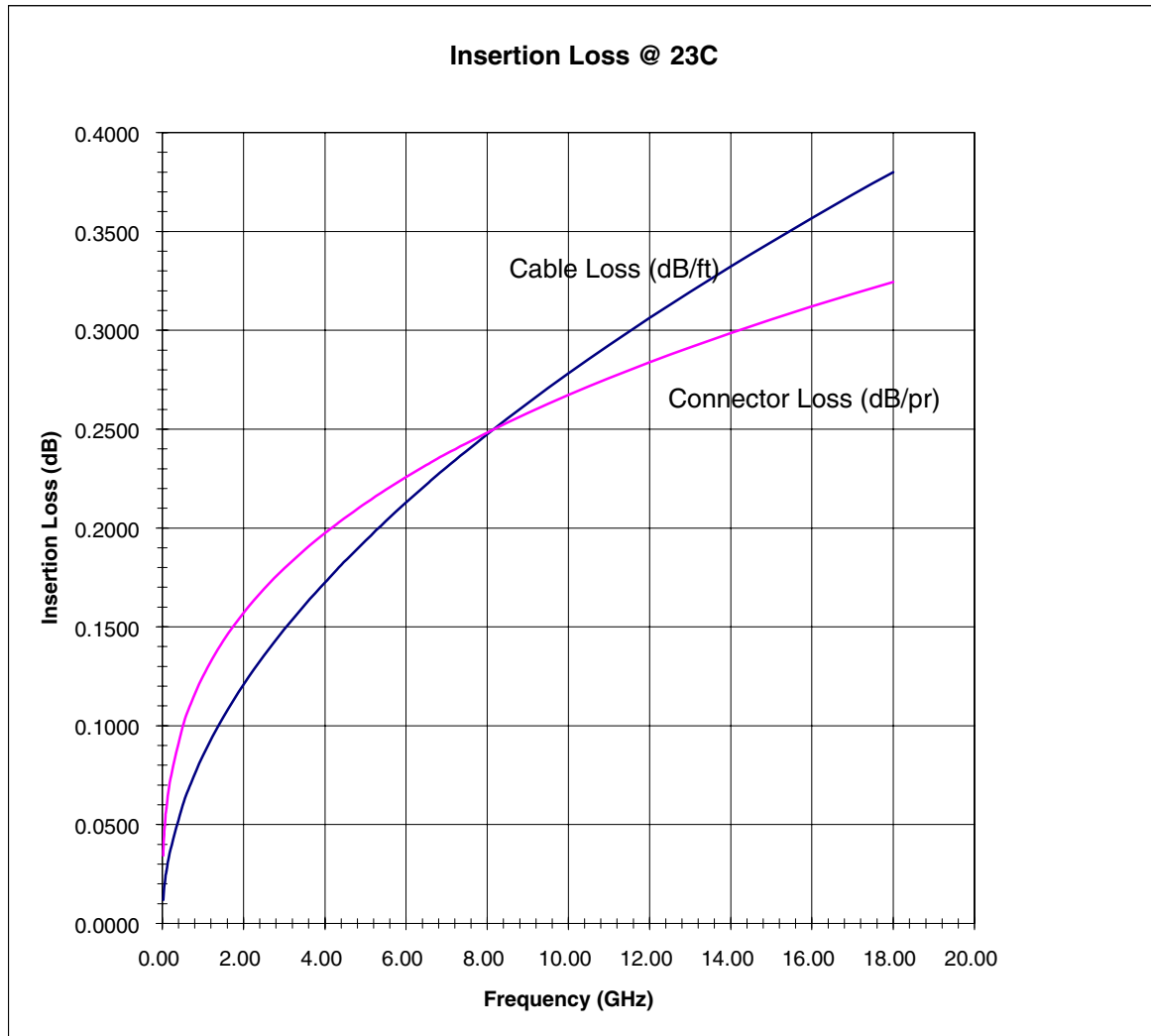
Each Cable Assembly is measured for Insertion Loss and VSWR over the Test Frequency Range.


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Cable and Connector Insertion Loss vs. Frequency



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Cable Insertion Loss vs. Frequency

Frequency (MHz)	Insertion Loss @ 23 C	
	(dB/100ft)	(dB/100 metres)
100	2.68	8.79
200	3.80	12.45
400	5.39	17.67
500	6.03	19.78
1000	8.57	28.11
2000	12.21	40.04
3000	15.03	49.30
4000	17.44	57.19
5000	19.57	64.19
6000	21.52	70.57
7000	23.32	76.47
8000	25.00	82.00
9000	26.59	87.22
10000	28.11	92.19
11000	29.55	96.93
12000	30.94	101.49
13000	32.28	105.88
14000	33.57	110.12
15000	34.83	114.23
16000	36.04	118.22
17000	37.23	122.10
18000	38.38	125.88


Cable Insertion Loss at Intermediate Frequencies can be calculated as follows

$$.26643 \times \text{SqRt}(\text{FMHz}) + .000146 \times (\text{FMHz}) \text{ dB per 100 feet}$$

or

$$.87390 \times \text{SqRt}(\text{FMHz}) + .000480 \times (\text{FMHz}) \text{ dB per 100 metres}$$

(where FMHz is the frequency in MHz)

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