

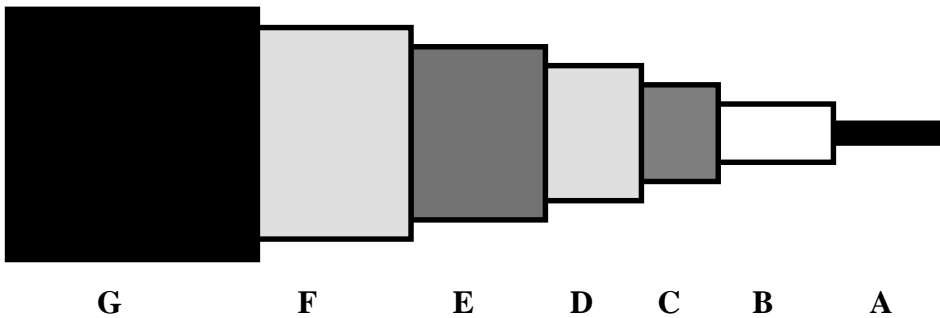
Times Microwave Systems

Hermetically Sealed Assemblies

SCOPE

This Specification details the Electrical, Mechanical and Environmental Characteristics of Times Microwave Systems MILTECH™ 210 .21” 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 Covered Steel
- B** Dielectric: Taped Polytetrafluoroethylene
- C** First Shield: Silver Plated Copper Strip
- D** Interlayer: Aluminum Backed Tape
- E** Second Shield: Silver Plated Copper Braid
- F** Vapor Shield: Composit Tapes
- G** Outer Jacket: Nomex®

Cable Mechanical Characteristics

Diameter: .21 +/- .015” (5.3 +/- .4 mm)
 Mass: .035 lbs/ft (52 g/m)
 Minimum Bend Radius : 1.0 inch 25.4 mm)

CAGE: 68999	Drawn: JR Revision: C	Hermetically Sealed Coaxial Transmission Line
 TIMES MICROWAVE SYSTEMS	Sheet 1 of 6	MILTECH210

Times Microwave Systems

Hermetically Sealed Assemblies

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
C	TNC Plug NR	SD48128
E	SMA Plug NR	SD14218
EX	SMA Plug Right Angle NR	SD14217
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

CAGE: 68999	Drawn: JR Revision: C	Hermetically Sealed Coaxial Transmission Line
	Sheet 2 of 6	MILTECH210

Times Microwave Systems

Hermetically Sealed Assemblies


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	75 Pounds minimum
Vapor Leakage	1×10^{-5} cc/sec/ft of Helium maximum including connectors
Vibration	In accordance with MIL-T-81490
Shock	In accordance with MIL-T-81490

CAGE: 68999	Drawn: JR Revision: C	Hermetically Sealed Coaxial Transmission Line
 TIMES MICROWAVE SYSTEMS	Sheet 3 of 6	MILTECH210

Times Microwave Systems

Hermetically Sealed Assemblies

ORDERING INFORMATION

A Complete Part Number is specified as follows:

MILTECH340/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 a Replaceable SMA male on one end and a Replaceable TNC male on the other end would have the Part Number **MILTECH210/in60/RE/RC**

Example 2 - a 430 millimetre long Cable Assembly with a Replaceable SMA male on one end and a Replaceable TNC male on the other end would have the Part Number **MILTECH210/mm430/RE/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
MILTECH210/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.

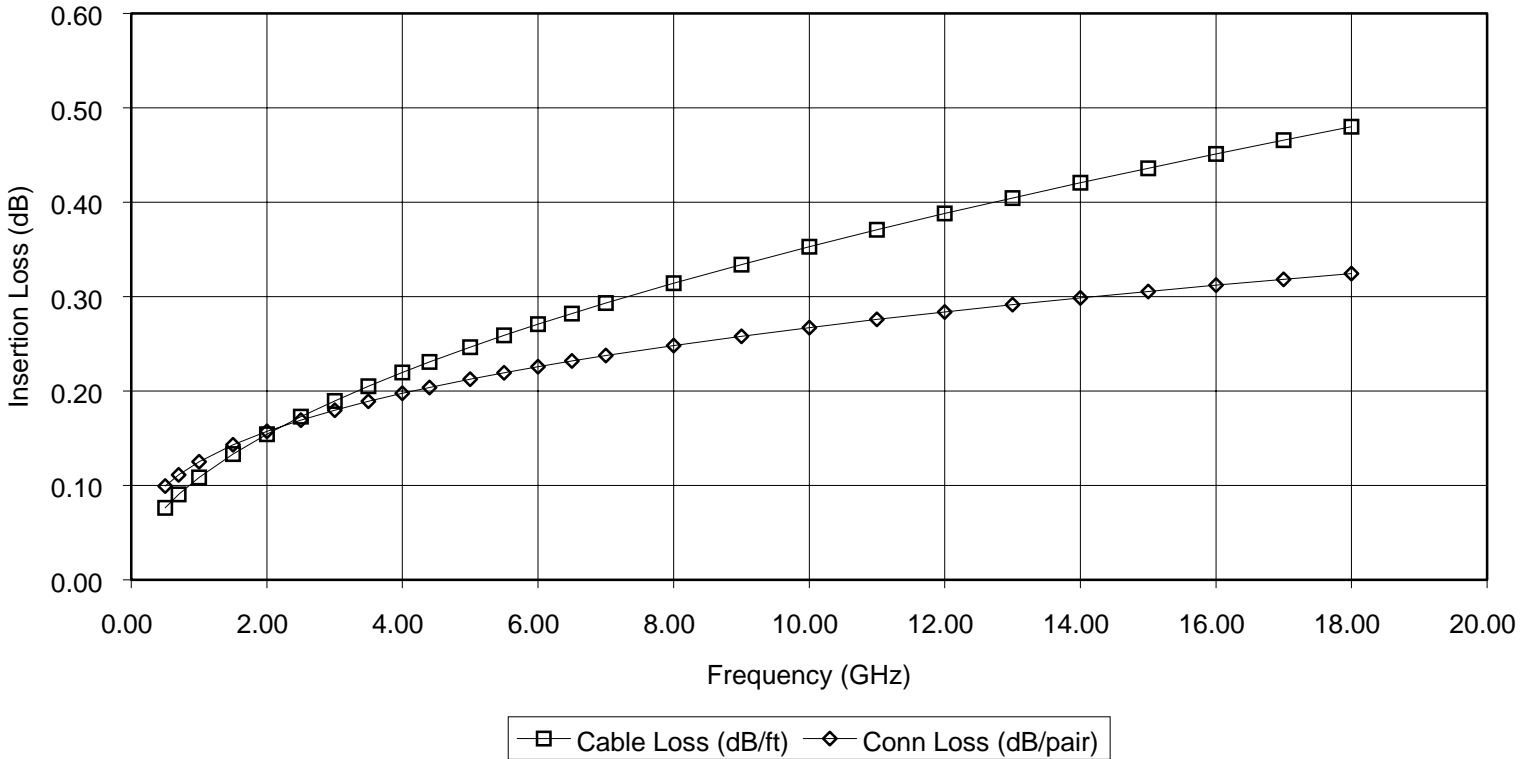
CAGE: 68999	Drawn: JR Revision: C	Hermetically Sealed Coaxial Transmission Line
 TIMES MICROWAVE SYSTEMS	Sheet 4 of 6	MILTECH210


Times Microwave Systems

Hermetically Sealed Assemblies

Cable and Connector Insertion Loss vs. Frequency

Insertion Loss
for Cable and Connectors



CAGE: 68999	Drawn: JR Revision: C	Hermetically Sealed Coaxial Transmission Line
	Sheet 5 of 6	MILTECH210

Times Microwave Systems

Hermetically Sealed Assemblies

Cable Insertion Loss vs. Frequency

Frequency (MHz)	Insertion Loss @ 23 C	
	(dB/100ft)	(dB/100 metres)
500	7.8	25.6
1000	11.0	36.1
2000	16.0	52.5
4000	22.0	72.2
6000	27.0	89.2
8000	32.0	105.0
10000	36.0	118.1
12000	39.0	128.0
14000	42.0	137.8
16000	46.0	150.9
18000	48.0	157.5


Cable Insertion Loss at Intermediate Frequencies can be calculated as follows

$$.34158 \times \text{SqRt}(\text{FMHz}) + .000146 \times (\text{FMHz}) \text{ dB per 100 feet}$$

or

$$1.1207 \times \text{SqRt}(\text{FMHz}) + .000480 \times (\text{FMHz}) \text{ dB per 100 metres}$$

(where FMHz is the frequency in MHz)

CAGE: 68999	Drawn: JR Revision: C	Hermetically Sealed Coaxial Transmission Line
 TIMES MICROWAVE SYSTEMS	Sheet 6 of 6	MILTECH210