

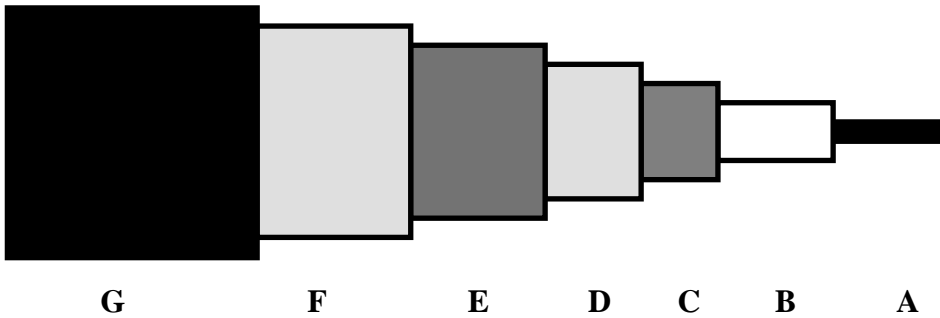
# Times Microwave Systems

## Hermetically Sealed Assemblies

### SCOPE

This Specification details the Electrical, Mechanical and Environmental Characteristics of Times Microwave Systems MILTECH™ 340-LS/ZHAL .34" 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 Clad Aluminum
- B** Dielectric: Taped Polytetrafluoroethylene
- C** First Shield: Silver Plated Copper Strip
- D** Interlayer: Aluminum Backed Tape
- E** Second Shield: Silver Plated Copper Braid Composite
- F** Inner Jacket: FEP
- G** Outer Jacket : Low smoke, low toxicity, zero halogen Polyolefin \*)

\*) complies with the Low Smoke and Toxicity requirements of NES 518 and MIL-C-17G standards.

### Cable Mechanical Characteristics

Diameter: .34 +/- .015" (8.6 +/- .4 mm)  
 Mass: .07 lbs/ft (100 g/m)  
 Minimum Bend Radius : 1.9 inch (48.3 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
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	80% 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	$1 \times 10^{-5}$ 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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## Hermetically Sealed Assemblies

### ORDERING INFORMATION

A Complete Part Number is specified as follows:

**MILTECH340-LS/ZHAL/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 **MILTECH 340-LS/ZHAL /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 **MILTECH 340-LS/ZHAL /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  
MILTECH 340-EL/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

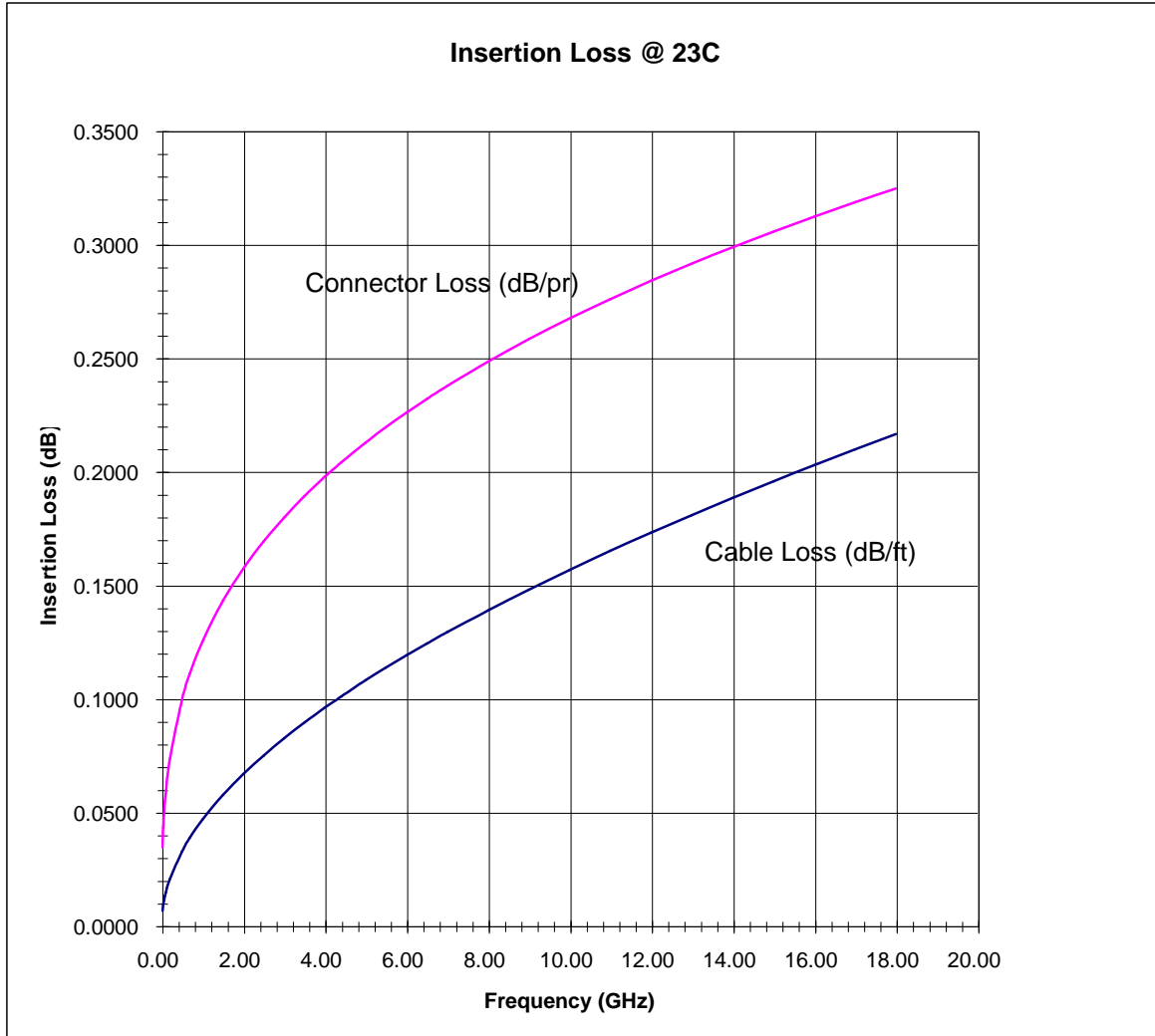
Each Cable Assembly is measured for Insertion Loss and VSWR over the Test Frequency Range.


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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)
500	3.5	11.5
1000	5.0	16.4
2000	7.0	23.0
4000	10.0	32.8
6000	12.0	39.4
8000	14.0	45.9
10000	16.0	52.5
12000	18.0	59.1
14000	19.0	62.3
16000	21.0	68.9
18000	22.0	72.2


**Cable Insertion Loss at Intermediate Frequencies can be calculated as follows**

$$.14562 \times \text{SqRt}(\text{FMHz}) + .000146 \times (\text{FMHz}) \text{ dB per 100 feet}$$

or

$$.47775 \times \text{SqRt}(\text{FMHz}) + .000480 \times (\text{FMHz}) \text{ dB per 100 metres}$$

(where FMHz is the frequency in MHz)

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