



# Instrumentation Test Cable **E67-3FT-EMEM+**

50Ω 3FT DC to 67 GHz Low Loss

## THE BIG DEAL

- Extremely low insertion loss
- Extra rugged construction includes protective shield and strain relief for longer life
- Stainless steel connector for long mating-cycle life
- Minimum Bend Radius of 10mm



Generic photo used for illustration purposes only

|            |               |
|------------|---------------|
| Model No.  | E67-3FT-EMEM+ |
| Case Style | UM3060-3      |
| Connectors | 1.85mm-Male   |

## APPLICATIONS

- Point to point or rack to rack connections
- High volume production test stations
- Research & development labs
- Environmental & temperature test chambers
- Replacement for OEM test port cables
- Field RF testing
- Cellular infrastructure site testing

### +RoHS Compliant

The +Suffix identifies RoHS Compliance.  
See our website for methodologies and qualifications

### Product Guarantee

Mini-Circuits' will repair or replace your test cable at its option if the connector attachment fails within six months of shipment. This guarantee excludes cable or connector interface damage from misuse or abuse.

## PRODUCT OVERVIEW

Mini-Circuits' E67 Model Series are ultra-wideband precision rugged instrumentation cables specially designed for use with 67 GHz VNA equipment in test environments. The cables provide excellent VSWR and very low insertion loss over its entire frequency range. 1.85mm straight to 1.85mm connector configuration provides direct connection from the ports of a 67 GHz VNA to 1.85mm connectorized devices without the need for adapters. These cables are available in a variety of lengths.

## KEY FEATURES

| Feature                                                                  | Advantages                                                                                                                                                                   |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DC-67 GHz operation designed for use with Vector Network Analyzers (VNA) | Covers a wide range of test applications; rugged 1.85mm connector interfaces directly with VNA without the need for an adapter for improved VSWR performance and lower cost. |
| Stainless Steel Connectors                                               | Stainless Steel Connectors maintains integrity of the cable-connector interface improving the reliability and extending life of use.                                         |
| Anti-Torque Component                                                    | Nut component feature on connector used to fit a torque wrench to minimize stress on connectors and prevent breakage                                                         |





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## ELECTRICAL SPECIFICATIONS AT +25°C

| Parameter       | Frequency (GHz) | Min. | Typ. | Max. | Units |
|-----------------|-----------------|------|------|------|-------|
| Frequency Range |                 | DC   | —    | 67   | GHz   |
| Length          |                 | 3    |      |      | ft    |
| Insertion Loss  | DC - 26.5       | —    | 2.2  | 4.0  | dB    |
|                 | 26.5 - 40       | —    | 3.8  | 5.1  |       |
|                 | 40 - 50         | —    | 4.6  | 6.0  |       |
|                 | 50 - 67         | —    | 5.4  | 6.4  |       |
| Return Loss     | DC - 26.5       | 19   | 36   | —    | dB    |
|                 | 26.5 - 40       | 17   | 33   | —    |       |
|                 | 40 - 50         | 16   | 29   | —    |       |
|                 | 50 - 67         | 16   | 27   | —    |       |

## ABSOLUTE MAXIMUM RATINGS

| Parameter                         | Ratings                                                                                                          |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------|
| Operating Temperature             | -55°C to +85°C                                                                                                   |
| Storage Temperature               | -55°C to +85°C                                                                                                   |
| Power Handling at 25°C, Sea Level | 57W at 1 GHz<br>22W at 6 GHz<br>12W at 18 GHz<br>10W at 26.6 GHz<br>8W at 40 GHz<br>7W at 50 GHz<br>6W at 67 GHz |

Permanent damage may occur if any of these limits are exceeded.



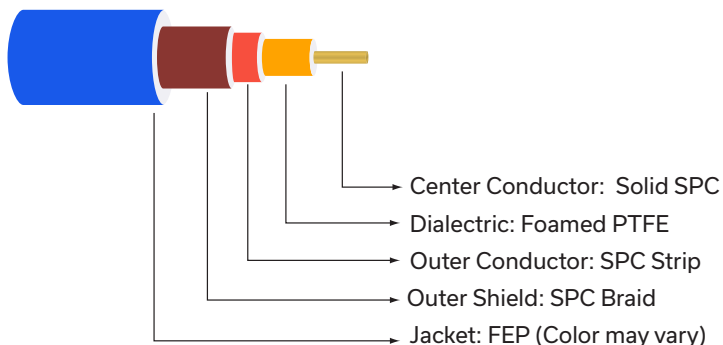


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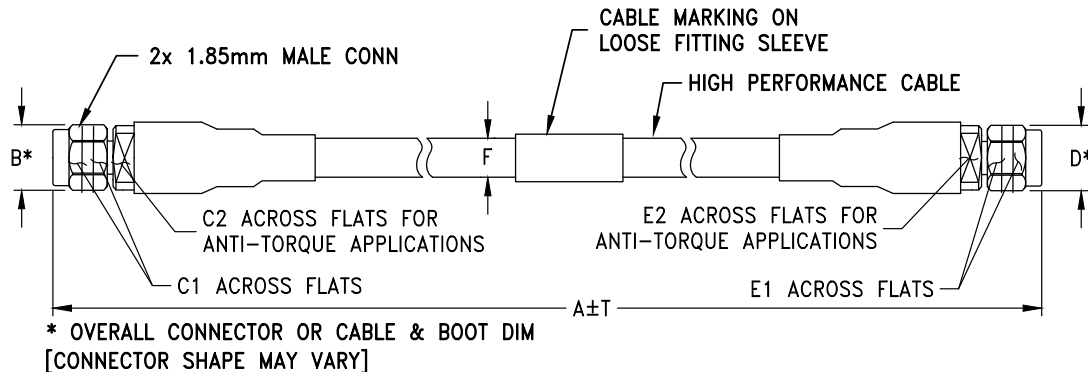
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## CABLE CONSTRUCTION



## OUTLINE DRAWING



## OUTLINE DIMENSIONS (Inch/mm)

| A    |        | B    | C1   | C2    | D    | E1   | E2   | F    | T    |      | wt    |
|------|--------|------|------|-------|------|------|------|------|------|------|-------|
| Feet | Meters | 0.36 | .315 | 0.256 | 0.36 | .315 | .276 | .100 | Inch | MM   | grams |
| 3.00 | 0.91   | 9.14 | 8.00 | 6.50  | 9.14 | 8.00 | 6.50 | 2.54 | 0.08 | 2.00 | 40    |





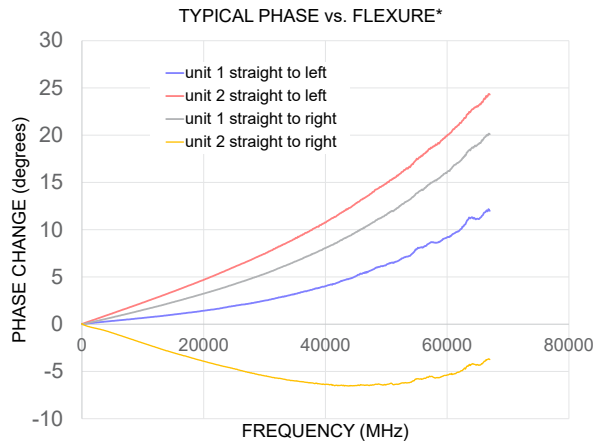
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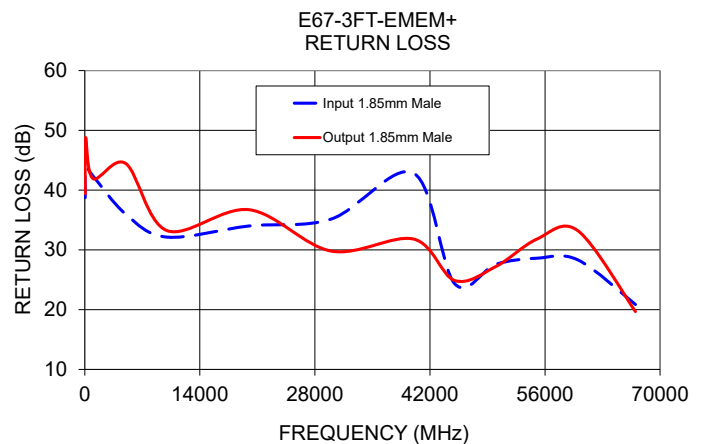
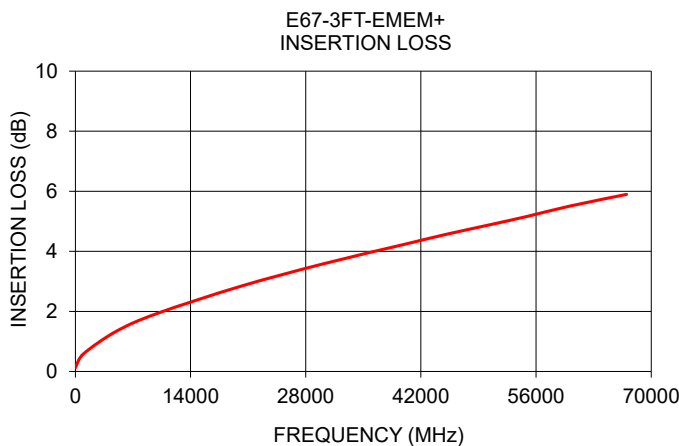
## TYPICAL PERFORMANCE DATA AND CHARTS

| Frequency (MHz) | Insertion Loss (dB) | Return Loss (dB) |            |
|-----------------|---------------------|------------------|------------|
|                 |                     | 1.85mm-Male      | 1.8mm-Male |
| 50              | 0.13                | 38.74            | 39.39      |
| 100             | 0.19                | 43.79            | 48.76      |
| 1000            | 0.59                | 42.37            | 41.93      |
| 5000            | 1.34                | 35.95            | 44.44      |
| 10000           | 1.94                | 32.14            | 33.23      |
| 20000           | 2.83                | 34.00            | 36.72      |
| 30000           | 3.57                | 35.17            | 29.79      |
| 40000           | 4.23                | 42.84            | 31.81      |
| 45000           | 4.56                | 24.35            | 24.88      |
| 50000           | 4.86                | 27.59            | 27.21      |
| 55000           | 5.17                | 28.61            | 31.80      |
| 60000           | 5.50                | 28.32            | 33.21      |
| 67000           | 5.90                | 20.87            | 19.68      |



\* Typical phase change over flexure performed on E67-1M-EMEM+ by wrapping cable 360° around 4" radii mandrels referenced to normalized straight position.

\*\* Setup is flipped and measurement is repeated.





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# Instrumentation Test Cable **E67-3FT-EMEM+**

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## PROPER CABLE CONNECTION USING ANTI-TORQUE NUT

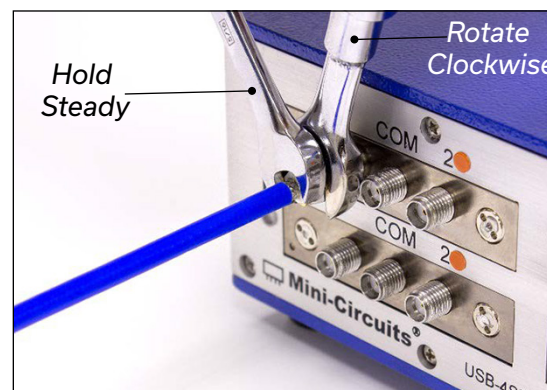
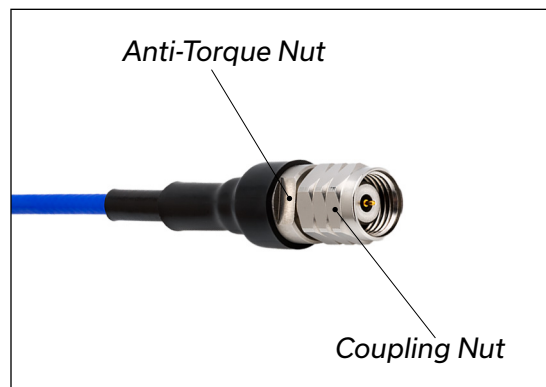
Mini-Circuits E67 Series interconnect cables are constructed with an anti-torque nut adjacent to the connector coupling nut. When used properly, this feature prevents possible damage to the cable due to torquing and twisting when tightening the cable connector.

To properly tighten the cable connector:

1) The cable connector includes a coupling nut which rotates to fasten the connector, and an anti-torque nut, which is fixed to prevent the cable from twisting during connection.

2) To properly tighten the cable, use a standard 1/4-inch open end wrench to brace the anti-torque nut.

3) Using a 5/16-inch open end wrench, rotate the coupling nut clockwise to tighten the cable connector.



**NOTE:** Mini-Circuits recommends using a 5/16-inch open end wrench calibrated to 8 inch-pounds maximum torque to prevent damage due to over-torquing the connector.

### NOTES

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)

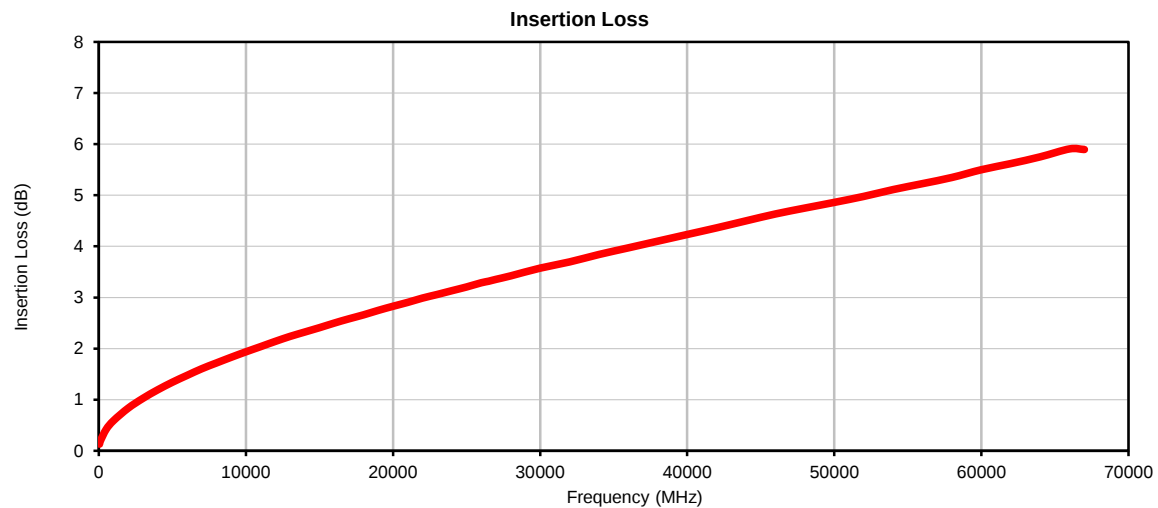


*Typical Performance Data*

| FREQUENCY<br>(MHz) | INSERTION LOSS<br>(dB) | 1.85mm-MALE 1<br>RETURN LOSS<br>(dB) | 1.85mm-MALE 2<br>RETURN LOSS<br>(dB) |
|--------------------|------------------------|--------------------------------------|--------------------------------------|
| 50                 | 0.13                   | 38.74                                | 39.39                                |
| 100                | 0.19                   | 43.79                                | 48.76                                |
| 500                | 0.42                   | 47.94                                | 58.17                                |
| 1000               | 0.59                   | 42.37                                | 41.93                                |
| 2000               | 0.84                   | 45.88                                | 40.77                                |
| 3000               | 1.03                   | 46.75                                | 42.67                                |
| 4000               | 1.19                   | 38.24                                | 38.20                                |
| 5000               | 1.34                   | 35.95                                | 44.44                                |
| 6000               | 1.48                   | 34.11                                | 34.09                                |
| 7000               | 1.61                   | 29.98                                | 29.97                                |
| 8000               | 1.72                   | 31.16                                | 31.60                                |
| 9000               | 1.83                   | 35.17                                | 34.03                                |
| 10000              | 1.94                   | 32.14                                | 33.23                                |
| 11000              | 2.04                   | 36.25                                | 35.38                                |
| 12000              | 2.14                   | 28.59                                | 31.53                                |
| 13000              | 2.24                   | 28.22                                | 28.86                                |
| 14000              | 2.32                   | 31.80                                | 33.68                                |
| 15000              | 2.41                   | 37.04                                | 34.74                                |
| 16000              | 2.50                   | 32.19                                | 32.01                                |
| 17000              | 2.58                   | 31.79                                | 36.89                                |
| 18000              | 2.66                   | 38.08                                | 45.75                                |
| 19000              | 2.75                   | 30.95                                | 35.17                                |
| 20000              | 2.83                   | 34.00                                | 36.72                                |
| 21000              | 2.90                   | 32.89                                | 37.11                                |
| 22000              | 2.99                   | 29.90                                | 28.26                                |
| 23000              | 3.06                   | 34.20                                | 34.96                                |
| 24000              | 3.13                   | 39.79                                | 39.74                                |
| 25000              | 3.21                   | 39.67                                | 38.48                                |
| 26000              | 3.29                   | 30.64                                | 27.67                                |
| 26500              | 3.32                   | 39.00                                | 31.00                                |
| 27000              | 3.35                   | 37.71                                | 30.79                                |
| 28000              | 3.42                   | 39.03                                | 29.04                                |
| 30000              | 3.57                   | 35.17                                | 29.79                                |
| 32000              | 3.70                   | 36.48                                | 30.04                                |
| 34000              | 3.84                   | 35.41                                | 29.11                                |
| 36000              | 3.97                   | 39.27                                | 28.51                                |
| 38000              | 4.10                   | 35.46                                | 30.01                                |
| 40000              | 4.23                   | 42.84                                | 31.81                                |
| 42000              | 4.36                   | 59.07                                | 34.56                                |
| 44000              | 4.50                   | 31.67                                | 31.02                                |
| 46000              | 4.63                   | 25.58                                | 27.54                                |
| 48000              | 4.75                   | 30.67                                | 28.06                                |
| 50000              | 4.86                   | 27.59                                | 27.21                                |
| 52000              | 4.98                   | 28.04                                | 30.33                                |
| 54000              | 5.11                   | 26.06                                | 33.04                                |
| 56000              | 5.23                   | 26.67                                | 27.49                                |
| 58000              | 5.35                   | 30.31                                | 27.28                                |
| 60000              | 5.50                   | 28.32                                | 33.21                                |
| 62000              | 5.62                   | 29.32                                | 35.66                                |
| 64000              | 5.75                   | 26.59                                | 39.07                                |
| 66000              | 5.91                   | 26.19                                | 29.32                                |
| 67000              | 5.90                   | 20.87                                | 19.68                                |

# Ultra Flex Test Cable, 1.85mm-M/1.85mm-M E67-3FT-EMEM+

## Typical Performance Curves



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IF/RF MICROWAVE COMPONENTS

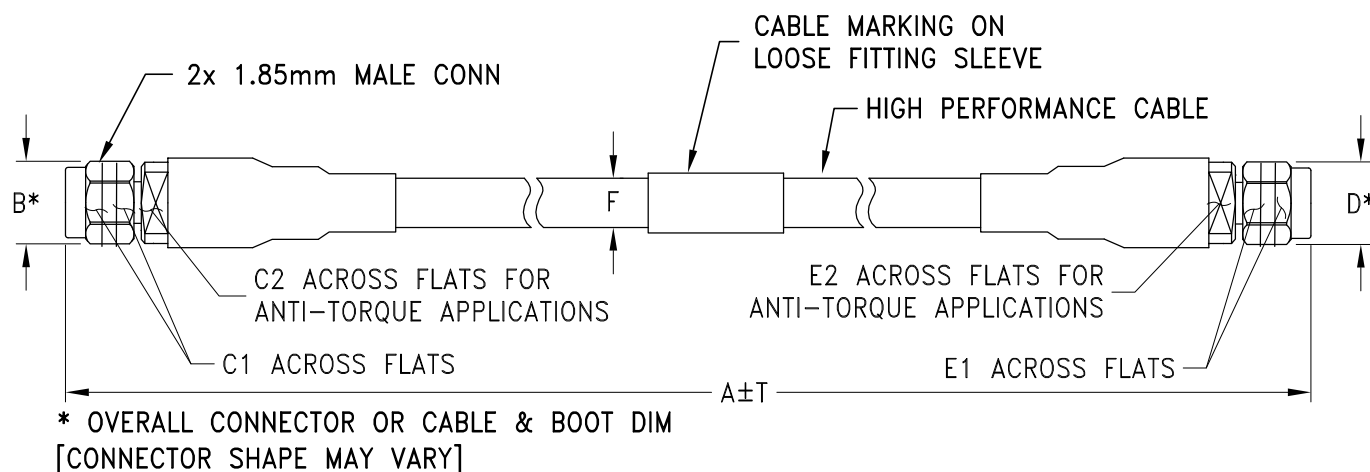
REV. OR  
E67-3FT-EMEM+  
9/3/2020  
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# Case Style

UM

## Outline Dimensions

UM3060



### UM3060 SERIES

#### 1.85 MM MALE (CONN)

| CASE<br>STYLE # | A    |      | B              | C1             | C2             | D             | E1             | E2             | F              | T    |     | WT.<br>(GRAMS) |
|-----------------|------|------|----------------|----------------|----------------|---------------|----------------|----------------|----------------|------|-----|----------------|
|                 | FEET | M    |                |                |                |               |                |                |                | INCH | MM  |                |
| UM3060-1.64     | 1.64 | 0.50 | 0.36<br>[9.14] | .315<br>[8.00] | .256<br>[6.50] | .36<br>[9.14] | .315<br>[8.00] | .256<br>[6.50] | .100<br>[2.54] | .08  | 2.0 | 34.0           |
| UM3060-2.00     | 2.00 | 0.61 |                |                |                |               |                |                |                | .08  | 2.0 | 35.0           |
| UM3060-3.00     | 3.00 | 0.91 |                |                |                |               |                |                |                | .08  | 2.0 | 40.0           |
| UM3060-3.28     | 3.28 | 1.00 |                |                |                |               |                |                |                | .08  | 2.0 | 42.0           |

Unless otherwise specified dimensions are in inches (mm).

Tolerances: 2 Pl. ±.03; 3 Pl. ±.015

Note:

1. E67 Flexible Coaxial Cable.
2. "A" Represents Length of Cable.

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RF/IF MICROWAVE COMPONENTS



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification         | Test/Inspection Condition                                                                                        | Reference/Spec              |
|-----------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Operating Temperature | -40° to 70° C<br>Ambient Environment                                                                             | Individual Model Data Sheet |
| Storage Temperature   | -55° to 85° C<br>Ambient Environment                                                                             | Individual Model Data Sheet |
| Mechanical Flexing    | 4,000 cycles<br>During each cycle, cable flexed from 90° through 0° to -90°<br>and back with a Radii of 3 inches | ---                         |