



# Semi-Rigid and Flexible Microwave and RF Cable



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# Cable Selection Guide

In order to simplify the selection process, microwave cables are divided into two families: Semi-Rigid Coaxial Cable and M-FLEX® Flexible Coaxial Cable. Each cable family has unique properties best suited for different applications. Use the following table and information to select the cable that best suits your needs.

|                      | SEMI-RIGID CABLE   | M-FLEX CABLE  |
|----------------------|--|---|
| RF Shielding         | -130 dB  | -90 dB (prior to bending)   |
| Attenuation          | Excellent  | Very Good   |
| VSWR                 | Excellent  | Very Good   |
| Maximum Frequency    | 110 GHz  | 26.5 GHz  |
| Ease of Installation | <ul style="list-style-type: none"> <li>• Typically preformed to specific drawing dimensions</li> <li>• Minor adjustments can be made during integration</li> <li>• Aluminum-jacketed cables are often hand-formed</li> <li>• Installation can be more difficult by the inability of the cable to be “snaked” through tight spaces</li> </ul> | <ul style="list-style-type: none"> <li>• A true flexible cable that can be easily routed without preforming</li> <li>• Can be flexed thousands of times and “snaked” through tight spaces</li> </ul>  |
| Packaging Density    | Maximum efficiency due to small cable diameter, tight bend radius, and ability to control cable routing by forming to exact dimensions   | <ul style="list-style-type: none"> <li>• Good efficiency due to its ease of reshaping during installation</li> <li>• Consideration must be given to the limited bending allowed at the connector-to-cable interface</li> <li>• Bend restrictors are often needed</li> </ul> |

## Semi-Rigid Coaxial Cable

We offer more semi-rigid coaxial cable options than any other cable. Cables with a large range of impedances, diameters, materials, and finishes are available for immediate delivery. Semi-rigid cable comes as close as possible to the ideal coaxial cable and should be the first choice by any RF/microwave engineer.

### MIL-DTL-17 Qualified Cables

We offer a full range of MIL-DTL-17-qualified cables. These cables undergo additional testing to ensure they are fully capable of satisfying the most demanding military applications.

### Copper 50 $\Omega$ Cables

Diameters from 0.013" to 0.390" in lengths up to 150' on select cables. Many standard connectors are available from numerous suppliers.

### Dimensionally Stable "DS" 50 $\Omega$ Cables

The newest addition to our semi-rigid cable product line utilizes a unique solid PTFE dielectric that provides significantly improved thermal stability compared to traditional solid PTFE semi-rigid cables. The improved thermal stability reduces the need for temperature preconditioning and virtually eliminates the dielectric protrusion when soldering. All other mechanical and electrical performances are equal or better than the traditional solid PTFE equivalents.

### Low-Loss & Ultra-Low-Loss 50 $\Omega$ Cables

When even better performance is required, our Low-Loss and Ultra-Low-Loss Semi-Rigid Coaxial Cables typically lower the attenuation by another 20% and extend the operating temperature to 250 °C.

### Aluminum 50 $\Omega$ Cables

Available in both standard and low-loss versions, aluminum-jacketed cables offer easier bending and significant weight reduction.

### Stainless Steel 50 $\Omega$ Cables

Stainless steel cables satisfy cryogenic or medical applications where low thermal conductivity or hypoallergenic properties are required.

### Non-50 $\Omega$ Cables

Available in impedances from 5 to 100  $\Omega$  ranging in diameters from 0.020" to 0.250".

### Custom Made-to-Order Cables

Our semi-rigid cables have been tested to the toughest requirements and built with a large spectrum of materials at every size imaginable and at almost any impedance. They can be insulated with an FEP or other polymer jackets as required by special request. Contact us if you cannot find the semi-rigid cable you need in this catalog. We may already have the special cable you need – or can build your custom configuration.

## M-FLEX® Flexible Microwave Coaxial Cable

M-FLEX is a family of flexible cables capable of accepting connectors designed for semi-rigid cables. Unlike other single- or double-braided "RG" type flexible cables, M-FLEX cables are true microwave cables capable of operating at frequencies of 26.5 GHz. The extended frequency range is the result of a precision, helically wrapped, silver-plated copper foil inner shield. This inner shield allows for outstanding flexibility while providing 100% coverage. The electrical performance of the M-FLEX cables approaches that of their semi-rigid counterparts. M-FLEX cables are intended for static installations and are not recommended for applications that require extended flexing like a test lead. M-FLEX cables are supplied in long continuous lengths, which make them ideal for automated cutting and stripping equipment.

# Cable Construction

## Center Conductor



### Function

The center conductor is either a solid or stranded metal wire that acts as the primary electrical signal carrier for any coaxial cable. Most attenuation occurs at the surface of the center conductor due to the “skin effect” of microwave signals, making the finish or plating a very important element. Stranded center conductors are generally only used in flexible cable constructions for added flexibility and longer flex life. In comparison, solid center conductors have lower attenuation and tend to be more amplitude-stable with flexure, while stranded center conductors tend to be more phase-stable with flexure. For larger semi-rigid cables, a tubular center conductor can be substituted. The tubular center conductor reduces weight and thermal conductivity without any impact on the electrical performance.

### Materials

Silver-plated copper (SPC) per ASTM B-298 and silver-plated copper-clad steel, also referred to as silver-plated copper weld (SPCW) per ASTM B-501, are the two most common center conductor materials. Silver plating, besides being an excellent electrical conductor, prevents oxidization during manufacture and improves the solderability of the finished cable. Stainless steel and beryllium copper are also used when low thermal conductivity is a priority. Other materials, including many copper alloys, are available upon special request.

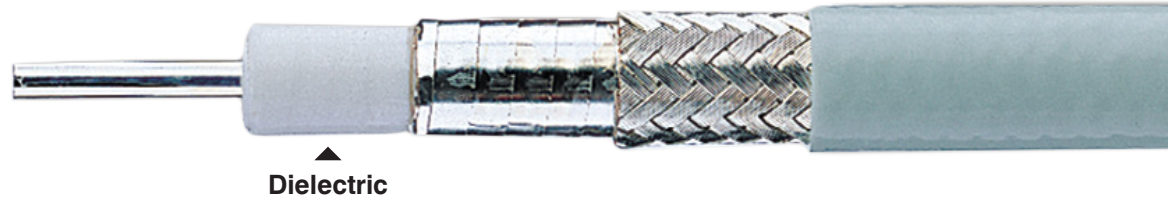
## GUIDE TO CENTER CONDUCTOR SELECTION

| Center Conductor Material       | DC Resistance ( $\Omega \cdot \text{in } 2/\text{ft}$ ) | Microwave Frequency Conductivity Compared to Copper (Ratio) | Thermal Conductivity | Used with “Pin-Less” Connector | Magnetic | Ease of Soldering | RoHS-Compliant |
|---------------------------------|---|---|----------------------|--------------------------------|----------|-------------------|----------------|
| Silver-Plated Copper            | 10.4  | 1.0:1   | Very High            | No                             | No       | Excellent         | Yes            |
| Silver-Plated Copper-Clad Steel | 93.1  | 1.0:1   | Low                  | Yes                            | Yes      | Excellent         | Yes            |
| Stainless Steel                 | 464.6   | 44.8:1  | Very Low             | No                             | Slightly | Poor              | Yes            |
| Silver-Plated Beryllium Copper  | 47.7  | 1.0:1   | Low                  | No                             | No       | Excellent         | Yes            |

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## Dielectric



### Function

The insulating material between the center and outer conductor maintains the spacing and geometry of the cable and ensures mechanical integrity during forming and bending. Most transmission losses are caused either directly or indirectly by the dielectric. Cables with a low dielectric constant, while offering lower bulk dielectric losses, also require a larger center conductor diameter to maintain the same characteristic impedance. The larger center conductor can significantly lower the overall cable attenuation. In addition, the dielectric determines the velocity of propagation, temperature range, power rating, phase and amplitude stability, and contributes to cable flexibility.

### Materials

The most commonly used dielectric for high-performance microwave coaxial cable is Polytetrafluoroethylene (PTFE), in both full-density and low-density (aka low-loss or microporous) forms. PTFE is an excellent choice for a cable dielectric due to its low reactivity to chemicals, an operating temperature that can withstand the heat of soldering,

and low dielectric constant that is stable at microwave frequencies. Full-density PTFE meets all the requirements of MIL-DTL-17, Type F-1. Most cables utilize full-density PTFE in the solid form; however, larger semi-rigid cables are also available in a spline configuration. Low-density and ultra-low-density PTFE utilizes the same base material as the full-density version; it is just less dense. As a result of the lower density, both the dielectric constant and dissipation factor are reduced, leading to an overall lowering of the cable attenuation. Low-density PTFE is also much more thermally stable than solid PTFE. The trade-off is that anytime the dielectric density is reduced, the mechanical integrity is also reduced. As a result, cables employing a low-density dielectric will have larger minimum bend radii than the solid full-density versions.

Fluorinated Ethylene Propylene (FEP) and Perfluoroalkoxy (PFA) are two other dielectrics that are often used when very thin walls are required, such as those on low-impedance cables. Both FEP and PFA have properties that are similar to PTFE. Other materials, including polyethylene, are available upon special request.

### GUIDE TO DIELECTRIC SELECTION

| Dielectric Material    | Dielectric Constant | Dissipation Factor | Phase Stability vs. Temperature | Maximum Service Temp. °C | Thermal Stability | RoHS-Compliant |
|------------------------|---------------------|--------------------|---------------------------------|--------------------------|-------------------|----------------|
| Solid PTFE             | 2.03                | 0.0002             | Good                            | 260                      | Good              | Yes            |
| Low-Density PTFE       | 1.70                | 0.0001             | Very Good                       | 260                      | Excellent         | Yes            |
| Ultra-Low-Density PTFE | 1.45                | 0.0001             | Very Good                       | 260                      | Excellent         | Yes            |
| FEP                    | 2.05                | 0.0010             | Good                            | 204                      | Good              | Yes            |
| PFA                    | 2.06                | 0.0003             | Good                            | 260                      | Good              | Yes            |

# Cable Construction Cont'd.

## Outer Conductor

Outer Conductor  
▼



### Function

The outer conductor serves many purposes. It controls RF leakage and is the electrical shield that contributes to cable attenuation. Through precision mechanical tolerances, the outer conductor minimizes return loss (VSWR) by maintaining a constant characteristic impedance. The outer conductor is the primary strength member that keeps connectors firmly attached to the cable. It often provides environmental protection and determines the cable's flexibility.

### Materials

The most commonly used materials are copper and aluminum because of their low DC resistance. These materials can be in many forms, such as tube for semi-rigid cable, tin-coated braid for conformable cable, or a foil in high-performance flexible cables. Material selection typically involves trade-offs between electrical performance, size, and flexibility.

## GUIDE TO OUTER CONDUCTOR SELECTION

| Outer Conductor Material | DC Resistance ( $\Omega \cdot \text{in } 2/\text{ft}$ ) | Microwave Frequency Conductivity Compared to Copper (Ratio) | Thermal Conductivity | Weight    | Magnetic | Ease of Soldering | RoHS-Compliant |
|--------------------------|---|---|----------------------|-----------|----------|-------------------|----------------|
| Copper                   | 10.4  | 1.0:1   | Very High            | Very High | No       | Excellent         | Yes            |
| Aluminum                 | 18.3  | 1.8:1   | High                 | Low       | No       | Poor              | Yes            |
| Stainless Steel 304      | 464.6   | 44.8:1  | Very Low             | High      | Slightly | Poor              | Yes            |



## Plating & Finishes (applies to semi-rigid cables only)



Copper and aluminum conductors are often plated for additional corrosion protection and solderability. The most common plating materials, tin and silver, are very soft and ductile.

Silver, which has superior electrical conductive properties along with being very corrosive-resistant to atmospheric oxygen, is vulnerable to tarnish by atmospheric sulfides and nitrates. Silver-plating is the preferred inner conductor plating and is part of the conductive path inside the cable. For semi-rigid cables, silver-plating the outer conductor is not recommended for high humidity or saltwater environments due to its susceptibility to galvanic corrosion.

Tin is economical and corrosion-resistant, has excellent solderability, and is the preferred plating for semi-rigid cable outer conductors. Tin plating can be prone to tin "whiskers," which are electrically conductive, crystalline tin structures. These whiskers sometimes grow from surfaces where tin is used as a final finish. They have been observed to increase to lengths of several millimeters and can cause short circuits by bridging closely spaced circuit elements maintained at different electrical potentials.

Other plating and finishes are available by special request.

### GUIDE TO SEMI-RIGID CABLE OUTER CONDUCTOR PLATING SELECTION

| Plating Material  | Specification   | Part Number Suffix | Remarks   | RoHS-Compliant |
|-------------------|-----------------|--------------------|---|----------------|
| Silver            | ASTM B-700      | SP                 | <ul style="list-style-type: none"> <li>• Excellent corrosion protection and solderability</li> <li>• Not susceptible to silver whiskers</li> <li>• Not recommended for high humidity or saltwater environments</li> </ul> | Yes            |
| Tin               | ASTM B-545      | TP                 | <ul style="list-style-type: none"> <li>• Lowest cost</li> <li>• Excellent corrosion protection</li> <li>• Improves solderability</li> <li>• Low melting point of 220 °C</li> <li>• Susceptible to tin whiskers</li> </ul> | Yes            |
| Tin-Lead (90/100) | SAE-AMS-P-81728 | EDS9010            | <ul style="list-style-type: none"> <li>• Very good corrosion protection and solderability</li> <li>• Low melting point of 220 °C</li> <li>• Not susceptible to tin whiskers</li> </ul>                                    | Yes            |

# Semi-Rigid Coaxial Cable



## Features & Benefits

Semi-rigid coaxial cables are available in a wide variety of sizes, materials, and characteristic impedances. To be considered a semi-rigid coaxial cable, the cable must employ a solid metallic tube for the outer conductor. Most semi-rigid coaxial cables are less than 0.250" in diameter; however, some select cables are as large as 0.500". A silver-plated copper-center conductor, PTFE dielectric, and copper outer conductor are the most common materials. Impedances are available from 5 to 100  $\Omega$ . Typical maximum operating temperatures range from 125 °C to 250 °C.

Semi-rigid coaxial cables are used to transmit and receive microwave signals up to 110 GHz. These cables are the best pure microwave transmission medium available in the world.

- » RF shielding in excess of -130 dB
- » Lowest attenuation and lightest weight for any given geometry
- » Unequaled impedance control and VSWR performance
- » Smallest overall diameters available in a microwave cable
- » Very tight bend radii allow utilization in the tightest configurations
- » Environmentally sealed with no concern for jacket cuts or abrasions
- » Numerous connector options available off the shelf from many different suppliers

Because semi-rigid coaxial cables can be precisely formed, they allow maximum packaging efficiency with no wasted space. While semi-rigid cables will hold their shape once formed, most are still pliable enough to provide some flexibility during system integration.

Semi-rigid coaxial cables are the benchmark against which all other coaxial cables are compared.

## Typical Applications

Semi-rigid coaxial cable finds applications from very low frequencies through 110 GHz.

Almost any system operating above 500 MHz and in need of good operational performance and total shielding should use semi-rigid coaxial cable, including defense electronics, test and measurement instrumentation, medical electronics, telecommunications, and space flight systems, among other precision applications. In componentry, semi-rigid coaxial cable is used in oscillators, amplifiers, printed circuit boards, delay lines, and capacitor sections.

## The CarlisleIT Advantage

CarlisleIT represents nearly 100 years of combined experience between the two original semi-rigid coaxial cable companies: Uniform Tubes, Inc., and Precision Tubes, Inc. The "UT" prefix in our part numbers is recognized around the world for its legacy of quality and reliable performance.

CarlisleIT is highly vertically integrated. Besides manufacturing all the cable we sell, we also extrude the PTFE dielectric, draw down and plate the copper tubing for the outer conductor, and straighten and mark the cable all in-house. This vertical integration not only gives CarlisleIT more control over the quality of the raw materials used to make a high-performance microwave cable, but also allows quick-turn capability, positioning CarlisleIT as the semi-rigid cable cost leader.

Unlike many other semi-rigid cable manufacturers, we build our semi-rigid cable in straight lengths (not coils). Building cable in straight lengths allows better mechanical tolerance control, and more

importantly, better control of the adhesion between the conductors and the dielectric. This is true even when employing secondary operations such as bending, coiling, temperature cycling, soldering, or stripping the outer conductor when preparing for connector installation. In addition, we are the only semi-rigid cable manufacturer that marks its cable with our name, part number, and lot number for easy traceability.\*

With the largest selection of semi-rigid coaxial cables in the industry, we have a solution for all of your cable configuration needs. Our extensive line of semi-rigid coaxial cable includes:

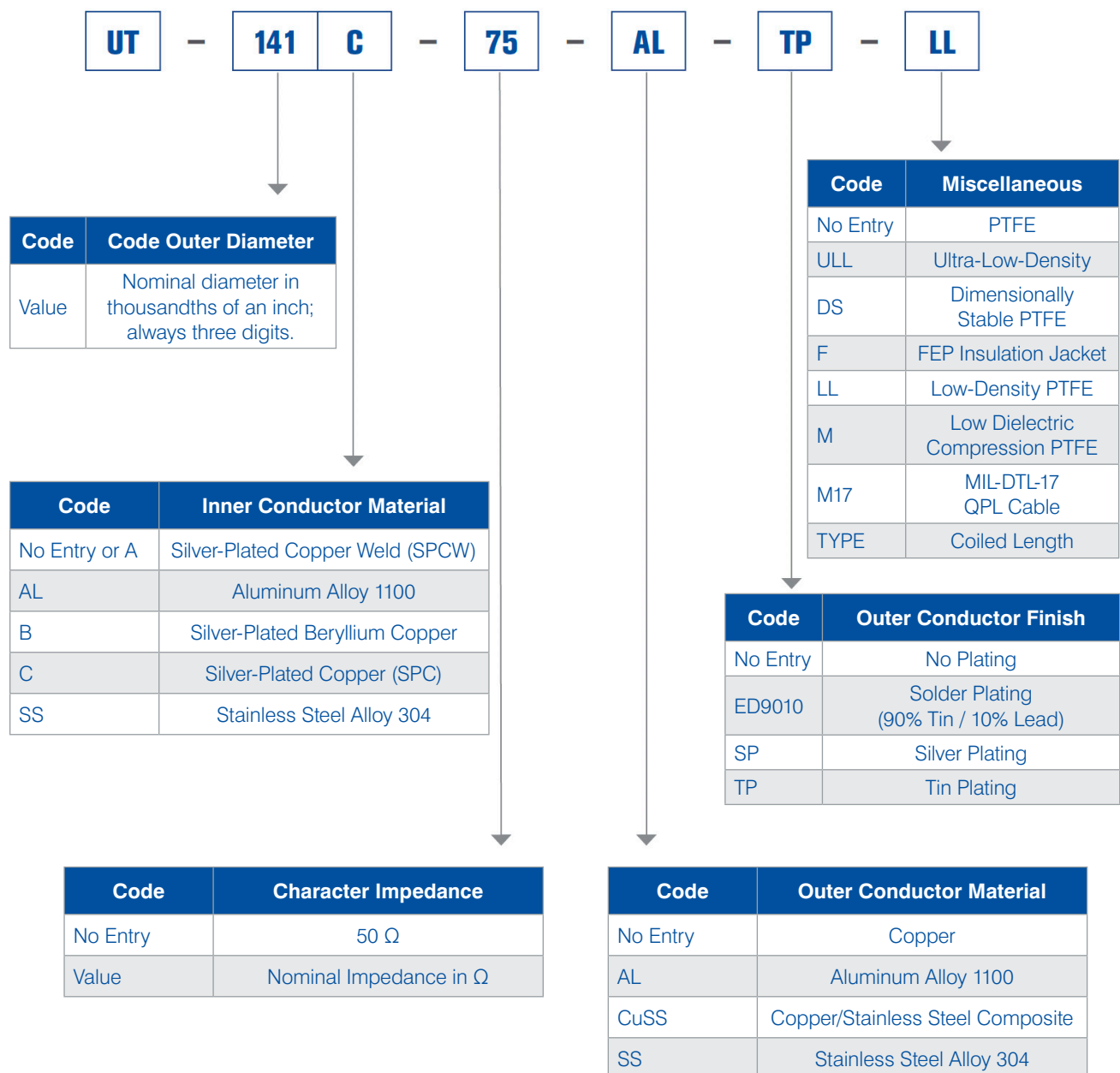
- » MIL-DTL-17 certified cables.
- » Standard copper-jacketed cables ranging from 0.013" to 0.390" and impedances from 5 to 100  $\Omega$
- » Low-loss cables employing a low-density PTFE dielectric for improved attenuation, phase stability, and increased temperature range
- » Lightweight tin-plated, aluminum-jacketed cables that can be hand-formed
- » Stainless steel jacketed cables for cryogenic and medical applications, where either low thermal conductivity or hypoallergenic qualities are required.

\*For cable diameters of 0.085" and larger

# Semi-Rigid Coaxial Cable Cont'd.

## Part Number Designation

The UT 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.



Additional descriptors where noted:

H=Hard Jacket

STR=Stranded Center Conductor



# Semi-Rigid Coaxial Cable Cont'd.

## 50 Ω Copper

Standard copper 50 Ω semi-rigid cables feature low attenuation and VSWR covering the entire microwave spectrum. With numerous connector options available off the shelf, this family of cables is one of the most versatile available today. They meet the demands of package density and provide total shielding for elimination of signal loss and noise.

| CarlisleIT Description  | UT-013                               | UT-020                               | UT-034                               | UT-034-TP                                      | UT-034-SP                                      |       |
|---|--------------------------------------|--------------------------------------|--------------------------------------|--|--|-------|
| MIL-DTL-17 Description  | -                                    | -                                    | UT-034-M17                           | UT-034-TP-M17                                  | -  |       |
| MIL-DTL-17 Part Number  | -                                    | -                                    | M17/154-00001                        | M17/154-00002                                  | -  |       |
| <b>Dimensions</b>   |                                      |                                      |                                      |  |  |       |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.013 ± 0.001<br>(0.330 ± 0.025)     | 0.023 ± 0.001<br>(0.584 ± 0.025)     | 0.034 ± 0.001<br>(0.864 ± 0.025)     | 0.034 + 0.002/-0.001<br>(0.864 + 0.051/-0.025) | 0.034 + 0.002/-0.001<br>(0.864 + 0.051/-0.025) |       |
| Dielectric Diameter <i>in (mm)</i>  | -                                    | -                                    | 0.026 ± 0.001<br>(0.660 ± 0.025)     | 0.026 ± 0.001<br>(0.660 ± 0.025)               | -  |       |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0031 ± 0.0005<br>(0.0787 ± 0.0127) | 0.0050 ± 0.0005<br>(0.1270 ± 0.0127) | 0.0080 ± 0.0005<br>(0.2032 ± 0.0127) | 0.0080 ± 0.0005<br>(0.2032 ± 0.0127)           | 0.0080 ± 0.0005<br>(0.2032 ± 0.0127)           |       |
| Maximum Straight Length <i>ft (m)</i>   | 10 (3.05)                            | 10 (3.05)                            | 15 (4.57)                            | 15 (4.57)                                      | 15 (4.57)                                      |       |
| Maximum Coiled Length $\frac{1}{2}$ <i>ft (m)</i>                               | -                                    | - *                                  | 15 (4.57)                            | 15 (4.57)                                      | 15 (4.57)                                      |       |
| *1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |                                      |                                      |                                      |  |  |       |
| <b>Materials</b>  |                                      |                                      |                                      |  |  |       |
| Outer Conductor   | Copper                               | Copper                               | Copper                               | Copper   | Copper   |       |
| Outer Conductor Plating   | None                                 | None                                 | None                                 | Tin  | Silver   |       |
| Dielectric  | PTFE                                 | PTFE                                 | PTFE                                 | PTFE   | PTFE   |       |
| Center Conductor  | SPCW                                 | SPCW                                 | SPCW                                 | SPCW   | SPCW   |       |
| RoHS-Compliant  | Yes                                  | Yes                                  | Yes                                  | Yes  | Yes  |       |
| <b>Mechanical Characteristics</b>   |                                      |                                      |                                      |  |  |       |
| Outer Conductor Integrity Temperature   | 150 °C                               | 150 °C                               | 150 °C                               | 150 °C   | 150 °C   |       |
| Maximum Operating Temperature   | 125 °C                               | 125 °C                               | 125 °C                               | 125 °C   | 125 °C   |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.05<br>(1.27)                       | 0.05<br>(1.27)                       | 0.05<br>(1.27)                       | 0.05<br>(1.27)                                 | 0.05<br>(1.27)                                 |       |
| Weight <i>lbs/ft (kg/m)</i>   | 0.03/100<br>(0.05/100)               | 0.10/100<br>(0.15/100)               | 0.22/100<br>(0.33/100)               | 0.22/100<br>(0.33/100)                         | 0.22/100<br>(0.33/100)                         |       |
| <b>Electrical Characteristics</b>   |                                      |                                      |                                      |  |  |       |
| Characteristic Impedance Ω  | 50.0 ± 2.0                           | 50.0 ± 2.0                           | 50.0 ± 1.5                           | 50.0 ± 1.5                                     | 50.0 ± 1.5                                     |       |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                                 | 29.0<br>(95.2)                                 |       |
| Velocity of Propagation   | 70%                                  | 70%                                  | 70%                                  | 70%  | 70%  |       |
| Corona Extinction Voltage   | @ 60 Hz                              | 150 VRMS                             | 500 VRMS                             | 750 VRMS                                       | 750 VRMS                                       |       |
| Voltage Withstanding  | @ 60 Hz                              | 900 VRMS                             | 1500 VRMS                            | 2100 VRMS                                      | 2100 VRMS                                      |       |
| Higher Order Mode Frequency   | 402 GHz                              | 239 GHz                              | 155 GHz                              | 155 GHz  | 155 GHz  |       |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                            | 87.8                                 | 51.6                                 | 34.0   | 34.0   | 34.0  |
|   | @ 1.0 GHz                            | 124.4                                | 73.3                                 | 48.3   | 48.3   | 48.3  |
|   | @ 5.0 GHz                            | 280.5                                | 166.1                                | 110.4  | 110.4  | 110.4 |
|   | @ 10.0 GHz                           | 399.1                                | 237.4                                | 158.5  | 158.5  | 158.5 |
|   | @ 18.0 GHz                           | 539.3                                | 322.3                                | 216.5  | 216.5  | 216.5 |
|   | @ 26.5 GHz                           | 658.2                                | 394.9                                | 266.6  | 266.6  | 266.6 |
|   | @ 40.0 GHz                           | 814.9                                | 491.4                                | 333.7  | 333.7  | 333.7 |
|   | @ 50.0 GHz                           | 915.5                                | 553.8                                | 377.5  | 377.5  | 377.5 |
|   | @ 65.0 GHz                           | 1,050.4                              | 638.1                                | 437.0  | 437.0  | 437.0 |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                            | 6.4                                  | 17.2                                 | 35.7   | 30.5   | 28.5  |
|   | @ 1.0 GHz                            | 4.5                                  | 12.1                                 | 25.2   | 21.5   | 20.0  |
|   | @ 5.0 GHz                            | 2.0                                  | 5.4                                  | 11.1   | 9.5  | 8.8   |
|   | @ 10.0 GHz                           | 1.4                                  | 3.8                                  | 7.7  | 6.6  | 6.2   |
|   | @ 18.0 GHz                           | 1.0                                  | 2.8                                  | 5.7  | 4.8  | 4.5   |
|   | @ 26.5 GHz                           | 0.9                                  | 2.3                                  | 4.6  | 3.9  | 3.7   |
|   | @ 40.0 GHz                           | 0.7                                  | 1.8                                  | 3.7  | 3.2  | 3.0   |
|   | @ 50.0 GHz                           | 0.6                                  | 1.6                                  | 3.3  | 2.8  | 2.6   |
|   | @ 65.0 GHz                           | 0.5                                  | 1.4                                  | 2.8  | 2.45   | 2.3   |
| @ 90.0 GHz  | 0.5                                  | 1.2                                  | 2.4                                  | 2.0  | 1.9  |       |

| CarlisleIT Description  | UT-034C                              | UT-047                               | UT-047-TP                                    | UT-047-SP                                    | UT-047C                              | UT-056                               |
|---|--------------------------------------|--------------------------------------|--|--|--------------------------------------|--------------------------------------|
| MIL-DTL-17 Description  | -                                    | UT-047-M17                           | UT-047-TP-M17                                | -  | -                                    | -                                    |
| MIL-DTL-17 Part Number  | -                                    | M17/151-00001                        | M17/151-00002                                | -  | -                                    | -                                    |
| <b>Dimensions</b>   |                                      |                                      |  |  |                                      |                                      |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.034 ± 0.001<br>(0.864 ± 0.025)     | 0.047 ± 0.001<br>(1.194 ± 0.025)     | 0.047 +0.002/-0.001<br>(1.194 +0.051/-0.025) | 0.047 +0.002/-0.001<br>(1.194 +0.051/-0.025) | 0.047 ± 0.001<br>(1.194 ± 0.025)     | 0.056 ± 0.002<br>(1.422 ± 0.051)     |
| Dielectric Diameter <i>in (mm)</i>  | -                                    | 0.037 ± 0.001<br>(0.940 ± 0.025)     | 0.037 ± 0.001<br>(0.940 ± 0.025)             | -  | -                                    | -                                    |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0080 ± 0.0005<br>(0.2032 ± 0.0127) | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127) | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127)         | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127)         | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127) | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127) |
| Maximum Straight Length <i>ft (m)</i>   | 15 (4.57)                            | 20 (6.10)                            | 20 (6.10)                                    | 20 (6.10)                                    | 20 (6.10)                            | 20 (6.10)                            |
| Maximum Coiled Length <sup>\1</sup> <i>ft (m)</i>                               | 15 (4.57)                            | 20 (6.10)                            | 20 (6.10)                                    | 20 (6.10)                                    | 20 (6.10)                            | 20 (6.10)                            |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |                                      |                                      |  |  |                                      |                                      |
| <b>Materials</b>  |                                      |                                      |  |  |                                      |                                      |
| Outer Conductor   | Copper                               | Copper                               | Copper                                       | Copper                                       | Copper                               | Copper                               |
| Outer Conductor Plating   | None                                 | None                                 | Tin  | Silver                                       | None                                 | None                                 |
| Dielectric  | PTFE                                 | PTFE                                 | PTFE   | PTFE   | PTFE                                 | PTFE                                 |
| Center Conductor  | SPC                                  | SPCW                                 | SPCW   | SPCW   | SPC                                  | SPCW                                 |
| RoHS-Compliant  | Yes                                  | Yes                                  | Yes  | Yes  | Yes                                  | Yes                                  |
| <b>Mechanical Characteristics</b>   |                                      |                                      |  |  |                                      |                                      |
| Outer Conductor Integrity Temperature   | 150 °C                               | 175 °C                               | 175 °C                                       | 175 °C                                       | 175 °C                               | 200 °C                               |
| Maximum Operating Temperature   | 125 °C                               | 150 °C                               | 150 °C                                       | 150 °C                                       | 150 °C                               | 175 °C                               |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.063<br>(1.6)                       | 0.05<br>(1.27)                       | 0.05<br>(1.27)                               | 0.05<br>(1.27)                               | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     |
| Weight <i>lbs/ft (kg/m)</i>   | 0.22/100<br>(0.33/100)               | 0.40/100<br>(0.60/100)               | 0.40/100<br>(0.60/100)                       | 0.40/100<br>(0.60/100)                       | 0.40/100<br>(0.60/100)               | 0.70/100<br>(1.05/100)               |
| <b>Electrical Characteristics</b>   |                                      |                                      |  |  |                                      |                                      |
| Characteristic Impedance Ω  | 50.0 ± 3.0                           | 50.0 ± 1.5                           | 50.0 ± 1.5                                   | 50.0 ± 1.5                                   | 50.0 ± 2.5                           | 50.0 ± 2.5                           |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                               | 29.0<br>(95.2)                               | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       |
| Velocity of Propagation   | 70%                                  | 70%                                  | 70%  | 70%  | 70%                                  | 70%                                  |
| Corona Extinction Voltage   | @ 60 Hz 750 VRMS                     | 1000 VRMS                            | 1000 VRMS                                    | 1000 VRMS                                    | 1000 VRMS                            | 1500 VRMS                            |
| Voltage Withstanding  | @ 60 Hz 2100 VRMS                    | 3000 VRMS                            | 3000 VRMS                                    | 3000 VRMS                                    | 3000 VRMS                            | 3000 VRMS                            |
| Higher Order Mode Frequency   | 155 GHz                              | 109 GHz                              | 109 GHz                                      | 109 GHz                                      | 109 GHz                              | 109 GHz                              |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                            | 34.0                                 | 24.0   | 24.0   | 24.0                                 | 24.0                                 |
|   | @ 1.0 GHz                            | 48.3                                 | 34.2   | 34.2   | 34.2                                 | 34.2                                 |
|   | @ 5.0 GHz                            | 110.4                                | 78.8   | 78.8   | 78.8                                 | 78.8                                 |
|   | @ 10.0 GHz                           | 158.5                                | 113.8  | 113.8  | 113.8                                | 113.8                                |
|   | @ 18.0 GHz                           | 216.5                                | 156.5  | 156.5  | 156.5                                | 156.5                                |
|   | @ 26.5 GHz                           | 266.6                                | 193.8  | 193.8  | 193.8                                | 193.8                                |
|   | @ 40.0 GHz                           | 333.7                                | 244.2  | 244.2  | 244.2                                | 244.2                                |
|   | @ 50.0 GHz                           | 377.5                                | 277.5  | 277.5  | 277.5                                | 277.5                                |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                            | 35.7                                 | 80.5   | 67.5   | 62.2                                 | 80.5                                 |
|   | @ 1.0 GHz                            | 25.2                                 | 56.6   | 47.4   | 43.8                                 | 56.6                                 |
|   | @ 5.0 GHz                            | 11.1                                 | 24.7   | 20.7   | 19.1                                 | 24.7                                 |
|   | @ 10.0 GHz                           | 7.7                                  | 17.2   | 14.4   | 13.3                                 | 17.2                                 |
|   | @ 18.0 GHz                           | 5.7                                  | 12.6   | 10.5   | 9.7                                  | 12.6                                 |
|   | @ 26.5 GHz                           | 4.6                                  | 10.2   | 8.5  | 7.9                                  | 10.2                                 |
|   | @ 40.0 GHz                           | 3.7                                  | 8.1  | 6.8  | 6.3                                  | 8.1                                  |
|   | @ 50.0 GHz                           | 3.3                                  | 7.2  | 6.0  | 5.5                                  | 7.2                                  |
| @ 65.0 GHz  | 2.8                                  | 6.2                                  | 5.2  | 4.8  | 6.2                                  |                                      |
| @ 90.0 GHz  | 2.4                                  | 5.1                                  | 4.3  | 4.0  | 5.1                                  |                                      |

# Semi-Rigid Coaxial Cable Cont'd.

## 50 Ω Copper

| CarlisleIT Description  | UT-056-STR                                  | UT-070C                              | UT-085-H                             | UT-085-H-TP                                       | UT-085C-H                            |       |
|---|---|--------------------------------------|--------------------------------------|---|--------------------------------------|-------|
| MIL-DTL-17 Description  | -   | -                                    | UT-085-H-M17                         | UT-085-H-TP-M17                                   | UT-085C-H-M17                        |       |
| MIL-DTL-17 Part Number  | -   | -                                    | M17/133-RG-405                       | M17/133-00001                                     | M17/133-00002                        |       |
| <b>Dimensions</b>   |   |                                      |                                      |   |                                      |       |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.056 ± 0.002<br>(1.422 ± 0.051)            | 0.070 ± 0.001<br>(1.778 ± 0.025)     | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   | 0.0865 + 0.0020/-0.0010<br>(2.197 + 0.051/-0.025) | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   |       |
| Dielectric Diameter <i>in (mm)</i>  | -   | -                                    | 0.066 ± 0.001<br>(1.676 ± 0.025)     | 0.066 ± 0.001<br>(1.676 ± 0.025)                  | 0.066 ± 0.001<br>(1.676 ± 0.025)     |       |
| Center Conductor Diameter <i>in (mm)</i>  | 7 x 0.004 ± 0.0005<br>(7 x 0.1016 ± 0.0127) | 0.0179 ± 0.0005<br>(0.4547 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127)              | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) |       |
| Maximum Straight Length <i>ft (m)</i>   | 20 (6.10)                                   | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)   | 20 (6.10)                            |       |
| Maximum Coiled Length \1 <i>ft (m)</i>  | 20 (6.10)                                   | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)   | 20 (6.10)                            |       |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |   |                                      |                                      |   |                                      |       |
| <b>Materials</b>  |   |                                      |                                      |   |                                      |       |
| Outer Conductor   | Copper                                      | Copper                               | Copper                               | Copper  | Copper                               |       |
| Outer Conductor Plating   | None  | None                                 | None                                 | Tin   | None                                 |       |
| Dielectric  | PTFE  | PTFE                                 | PTFE                                 | PTFE  | PTFE                                 |       |
| Center Conductor  | Stranded SPCW                               | SPC                                  | SPCW                                 | SPCW  | SPC                                  |       |
| RoHS-Compliant  | Yes   | Yes                                  | Yes                                  | Yes   | Yes                                  |       |
| <b>Mechanical Characteristics</b>   |   |                                      |                                      |   |                                      |       |
| Outer Conductor Integrity Temperature   | 200 °C                                      | 135 °C                               | 175 °C                               | 175 °C  | 175 °C                               |       |
| Maximum Operating Temperature   | 175 °C                                      | 100 °C                               | 125 °C                               | 125 °C  | 125 °C                               |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.063<br>(1.6)                              | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     | 0.125<br>(3.175)                                  | 0.125<br>(3.175)                     |       |
| Weight <i>lbs/ft (kg/m)</i>   | 0.72/100<br>(1.08/100)                      | 0.80/100<br>(1.20/100)               | 1.42/100<br>(2.13/100)               | 1.42/100<br>(2.13/100)                            | 1.43/100<br>(2.15/100)               |       |
| <b>Electrical Characteristics</b>   |   |                                      |                                      |   |                                      |       |
| Characteristic Impedance Ω  | 50.0 ± 4.0                                  | 50.0 ± 1.0                           | 50.0 ± 1.0                           | 50.0 ± 1.0  | 50.0 ± 1.0                           |       |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                              | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                                    | 29.0<br>(95.2)                       |       |
| Velocity of Propagation   | 70%   | 70%                                  | 70%                                  | 70%   | 70%                                  |       |
| Corona Extinction Voltage @ 60 Hz   | 1000 VRMS                                   | 1200 VRMS                            | 1500 VRMS                            | 1500 VRMS   | 1500 VRMS                            |       |
| Voltage Withstanding @ 60 Hz  | 3000 VRMS                                   | 4800 VRMS                            | 5400 VRMS                            | 5400 VRMS   | 5400 VRMS                            |       |
| Higher Order Mode Frequency   | 111 GHz                                     | 68 GHz                               | 61 GHz                               | 61 GHz  | 61 GHz                               |       |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                                   | 24.7                                 | 15.2                                 | 13.6  | 13.6                                 |       |
|   | @ 1.0 GHz                                   | 35.2                                 | 21.7                                 | 19.5  | 19.5                                 |       |
|   | @ 5.0 GHz                                   | 81.0                                 | 50.9                                 | 46.0  | 46.0                                 |       |
|   | @ 10.0 GHz                                  | 117.0                                | 74.4                                 | 67.4  | 67.4                                 |       |
|   | @ 18.0 GHz                                  | 160.8                                | 103.7                                | 94.3  | 94.3                                 |       |
|   | @ 26.5 GHz                                  | 199.0                                | 129.7                                | 118.3   | 118.3                                |       |
|   | @ 40.0 GHz                                  | 250.6                                | 165.5                                | 151.5   | 151.5                                |       |
|   | @ 50.0 GHz                                  | 284.6                                | 189.4                                | 173.8   | 173.8                                |       |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 65.0 GHz                                  | 331.2                                | 222.6                                | -   | -                                    |       |
|   | @ 90.0 GHz                                  | 400.9                                | -                                    | -   | -                                    |       |
|   | @ 0.5 GHz                                   | 107.3                                | 124.0                                | 232.0   | 190.3                                | 232.0 |
|   | @ 1.0 GHz                                   | 75.4                                 | 86.9                                 | 162.5   | 133.2                                | 162.5 |
|   | @ 5.0 GHz                                   | 33.0                                 | 37.4                                 | 69.8  | 57.2                                 | 69.8  |
|   | @ 10.0 GHz                                  | 23.0                                 | 25.7                                 | 47.9  | 39.3                                 | 47.9  |
|   | @ 18.0 GHz                                  | 16.8                                 | 18.6                                 | 34.6  | 28.3                                 | 34.6  |
|   | @ 26.5 GHz                                  | 13.6                                 | 14.9                                 | 27.7  | 22.7                                 | 27.7  |
| @ 40.0 GHz  | 10.9  | 11.8                                 | 21.8                                 | 17.9  | 21.8                                 |       |
| @ 50.0 GHz  | 9.6   | 10.3                                 | 19.1                                 | 15.7  | 19.1                                 |       |
| @ 65.0 GHz  | 8.3   | 8.8                                  | -                                    | -   | -                                    |       |
| @ 90.0 GHz  | 6.9   | -                                    | -                                    | -   | -                                    |       |



| CarlisleIT Description  | UT-085C-H-TP                                    | UT-085                               | UT-085-TP                                       | UT-085-SP                                       | UT-085C                              |
|---|---|--------------------------------------|---|---|--------------------------------------|
| MIL-DTL-17 Description  | UT-085C-H-TP-M17                                | UT-085-M17                           | UT-085-TP-M17                                   | UT-085-SP-M17                                   | UT-085C-M17                          |
| MIL-DTL-17 Part Number  | M17/133-00003                                   | M17/133-00006                        | M17/133-00007                                   | M17/133-00016                                   | M17/133-00008                        |
| <b>Dimensions</b>   |   |                                      |   |   |                                      |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.0865 +0.0020/-0.0010<br>(2.197 +0.051/-0.025) | 0.0865 ± 0.001<br>(2.197 ± 0.025)    | 0.0865 +0.0020/-0.0010<br>(2.197 +0.051/-0.025) | 0.0865 +0.0020/-0.0010<br>(2.197 +0.051/-0.025) | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   |
| Dielectric Diameter <i>in (mm)</i>  | 0.066 ± 0.001<br>(1.676 ± 0.025)                | 0.066 ± 0.001<br>(1.676 ± 0.025)     | 0.066 ± 0.001<br>(1.676 ± 0.025)                | 0.066 ± 0.001<br>(1.676 ± 0.025)                | 0.066 ± 0.001<br>(1.676 ± 0.025)     |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127)            | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127)            | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127)            | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) |
| Maximum Straight Length <i>ft (m)</i>   | 20 (6.10)                                       | 20 (6.10)                            | 20 (6.10)                                       | 20 (6.10)                                       | 20 (6.10)                            |
| Maximum Coiled Length \1 <i>ft (m)</i>  | 20 (6.10)                                       | 20 (6.10)                            | 20 (6.10)                                       | 20 (6.10)                                       | 20 (6.10)                            |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |   |                                      |   |   |                                      |
| <b>Materials</b>  |   |                                      |   |   |                                      |
| Outer Conductor   | Copper  | Copper                               | Copper  | Copper  | Copper                               |
| Outer Conductor Plating   | Tin   | None                                 | Tin   | Silver  | None                                 |
| Dielectric  | PTFE  | PTFE                                 | PTFE  | PTFE  | PTFE                                 |
| Center Conductor  | SPC   | SPCW                                 | SPCW  | SPCW  | SPC                                  |
| RoHS-Compliant  | Yes   | Yes                                  | Yes   | Yes   | Yes                                  |
| <b>Mechanical Characteristics</b>   |   |                                      |   |   |                                      |
| Outer Conductor Integrity Temperature   | 175 °C  | 175 °C                               | 175 °C  | 175 °C  | 175 °C                               |
| Maximum Operating Temperature   | 125 °C  | 125 °C                               | 125 °C  | 125 °C  | 125 °C                               |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.125 (3.175)                                   | 0.05 (1.27)                          | 0.05 (1.27)                                     | 0.05 (1.27)                                     | 0.05 (1.27)                          |
| Weight <i>lbs/ft (kg/m)</i>   | 1.43/100<br>(2.15/100)                          | 1.42/100<br>(2.13/100)               | 1.42/100<br>(2.13/100)                          | 1.42/100<br>(2.13/100)                          | 1.42/100<br>(2.13/100)               |
| <b>Electrical Characteristics</b>   |   |                                      |   |   |                                      |
| Characteristic Impedance Ω  | 50.0 ± 1.0                                      | 50.0 ± 1.0                           | 50.0 ± 1.0                                      | 50.0 ± 1.0                                      | 50.0 ± 1.0                           |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                                  | 29.0<br>(95.2)                       | 29.0<br>(95.2)                                  | 29.0<br>(95.2)                                  | 29.0<br>(95.2)                       |
| Velocity of Propagation   | 70%   | 70%                                  | 70%   | 70%   | 70%                                  |
| Corona Extinction Voltage   | @ 60 Hz 1500 VRMS                               | 1500 VRMS                            | 1500 VRMS                                       | 1500 VRMS                                       | 1500 VRMS                            |
| Voltage Withstanding  | @ 60 Hz 5400 VRMS                               | 5400 VRMS                            | 5400 VRMS                                       | 5400 VRMS                                       | 5400 VRMS                            |
| Higher Order Mode Frequency   | 61 GHz  | 61 GHz                               | 61 GHz  | 61 GHz  | 61 GHz                               |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                                       | 13.6                                 | 13.6  | 13.6  | 13.6                                 |
|   | @ 1.0 GHz                                       | 19.5                                 | 19.5  | 19.5  | 19.5                                 |
|   | @ 5.0 GHz                                       | 46.0                                 | 46.0  | 46.0  | 46.0                                 |
|   | @ 10.0 GHz                                      | 67.4                                 | 67.4  | 67.4  | 67.4                                 |
|   | @ 18.0 GHz                                      | 94.3                                 | 94.3  | 94.3  | 94.3                                 |
|   | @ 26.5 GHz                                      | 118.3                                | 118.3   | 118.3   | 118.3                                |
|   | @ 40.0 GHz                                      | 151.5                                | 151.5   | 151.5   | 151.5                                |
|   | @ 50.0 GHz                                      | 173.8                                | 173.8   | 173.8   | 173.8                                |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                                       | 190.3                                | 232.0   | 190.3   | 173.5                                |
|   | @ 1.0 GHz                                       | 133.2                                | 162.5   | 133.2   | 121.5                                |
|   | @ 5.0 GHz                                       | 57.2                                 | 69.8  | 57.2  | 52.2                                 |
|   | @ 10.0 GHz                                      | 39.3                                 | 47.9  | 39.3  | 35.8                                 |
|   | @ 18.0 GHz                                      | 28.3                                 | 34.6  | 28.3  | 25.8                                 |
|   | @ 26.5 GHz                                      | 22.7                                 | 27.7  | 22.7  | 20.7                                 |
|   | @ 40.0 GHz                                      | 17.9                                 | 21.8  | 17.9  | 16.3                                 |
|   | @ 50.0 GHz                                      | 15.7                                 | 19.1  | 15.7  | 14.3                                 |
| @ 65.0 GHz  | -   | -                                    | -   | -   |                                      |
| @ 90.0 GHz  | -   | -                                    | -   | -   |                                      |

# Semi-Rigid Coaxial Cable Cont'd.

## 50 Ω Copper

| CarlisleIT Description  | UT-085C-TP                                       | UT-085C-SP                                       | UT-141A-HA                           | UT-141A-H-TP                                  | UT-141A                              |       |
|---|--|--|--------------------------------------|---|--------------------------------------|-------|
| MIL-DTL-17 Description  | UT-085C-TP-M17                                   | -  | UT-141-HA-M17                        | UT-141-HA-TP-M17                              | UT-141-SA-M17                        |       |
| MIL-DTL-17 Part Number  | M17/133-00009                                    | -  | M17/130-RG-402                       | M17/130-00001                                 | M17/130-00004                        |       |
| Dimensions  |  |  |                                      |   |                                      |       |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.0865 +0.0020/-0.0010<br>(2.197 + 0.051/-0.025) | 0.0865 +0.0020/-0.0010<br>(2.197 + 0.051/-0.025) | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.141 +0.002/-0.001<br>(3.581 + 0.051/-0.025) | 0.141 ± 0.001<br>(3.581 ± 0.025)     |       |
| Dielectric Diameter <i>in (mm)</i>  | 0.066 ± 0.001<br>(1.676 ± 0.025)                 | -  | 0.1175 ± 0.0010<br>(2.985 ± 0.025)   | 0.1175 ± 0.0010<br>(2.985 ± 0.025)            | 0.1175 ± 0.0010<br>(2.985 ± 0.025)   |       |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127)             | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127)             | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178) | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178)          | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178) |       |
| Maximum Straight Length <i>ft (m)</i>   | 20 (6.10)  | 20 (6.10)  | 20 (6.10)                            | 20 (6.10)                                     | 20 (6.10)                            |       |
| Maximum Coiled Length \1 <i>ft (m)</i>  | 20 (6.10)  | 20 (6.10)  | 20 (6.10)                            | 20 (6.10)                                     | 20 (6.10)                            |       |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |  |  |                                      |   |                                      |       |
| Materials   |  |  |                                      |   |                                      |       |
| Outer Conductor   | Copper   | Copper   | Copper                               | Copper  | Copper                               |       |
| Outer Conductor Plating   | Tin  | Silver   | None                                 | Tin   | None                                 |       |
| Dielectric  | PTFE   | PTFE   | PTFE                                 | PTFE  | PTFE                                 |       |
| Center Conductor  | SPC  | SPC  | SPCW                                 | SPCW  | SPCW                                 |       |
| RoHS-Compliant  | Yes  | Yes  | Yes                                  | Yes   | Yes                                  |       |
| Mechanical Characteristics  |  |  |                                      |   |                                      |       |
| Outer Conductor Integrity Temperature   | 175 °C   | 175 °C   | 175 °C                               | 175 °C  | 175 °C                               |       |
| Maximum Operating Temperature   | 125 °C   | 125 °C   | 125 °C                               | 125 °C  | 125 °C                               |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.05<br>(1.27)                                   | 0.05<br>(1.27)                                   | 0.25<br>(6.35)                       | 0.25<br>(6.35)                                | 0.25<br>(6.35)                       |       |
| Weight <i>lbs/ft (kg/m)</i>   | 1.43/100<br>(2.15/100)                           | 1.43/100<br>(2.15/100)                           | 3.29/100<br>(4.94/100)               | 3.29/100<br>(4.94/100)                        | 3.29/100<br>(4.94/100)               |       |
| Electrical Characteristics  |  |  |                                      |   |                                      |       |
| Characteristic Impedance Ω  | 50.0 ± 1.5                                       | 50.0 ± 1.5                                       | 50.0 ± 1.0                           | 50.0 ± 1.0                                    | 50.0 ± 1.0                           |       |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                                   | 29.0<br>(95.2)                                   | 29.0<br>(95.2)                       | 29.0<br>(95.2)                                | 29.0<br>(95.2)                       |       |
| Velocity of Propagation   | 70%  | 70%  | 70%                                  | 70%   | 70%                                  |       |
| Corona Extinction Voltage @ 60 Hz   | 1500 VRMS  | 1500 VRMS  | 1900 VRMS                            | 1900 VRMS                                     | 1900 VRMS                            |       |
| Voltage Withstanding @ 60 Hz  | 5400 VRMS  | 5400 VRMS  | 9600 VRMS                            | 9600 VRMS                                     | 9600 VRMS                            |       |
| Higher Order Mode Frequency   | 61 GHz   | 61 GHz   | 34 GHz                               | 34 GHz  | 34 GHz                               |       |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz  | 13.6   | 13.6                                 | 7.6   | 7.6                                  | 7.6   |
|   | @ 1.0 GHz  | 19.5   | 19.5                                 | 11.3  | 11.3                                 | 11.3  |
|   | @ 5.0 GHz  | 46.0   | 46.0                                 | 27.6  | 27.6                                 | 27.6  |
|   | @ 10.0 GHz                                       | 67.4   | 67.4                                 | 41.6  | 41.6                                 | 41.6  |
|   | @ 18.0 GHz                                       | 94.3   | 94.3                                 | 59.6  | 59.6                                 | 59.6  |
|   | @ 26.5 GHz                                       | 118.3  | 118.3                                | 76.2  | 76.2                                 | 76.2  |
|   | @ 40.0 GHz                                       | 151.5  | 151.5                                | -   | -                                    | -     |
|   | @ 50.0 GHz                                       | 173.8  | 173.8                                | -   | -                                    | -     |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz  | 190.3  | 173.4                                | 600.4   | 483.5                                | 600.4 |
|   | @ 1.0 GHz  | 133.2  | 121.5                                | 450.0   | 336.2                                | 450.0 |
|   | @ 5.0 GHz  | 57.2   | 52.2                                 | 180.0   | 140.4                                | 180.0 |
|   | @ 10.0 GHz                                       | 39.3   | 35.8                                 | 120.0   | 94.6                                 | 120.0 |
|   | @ 18.0 GHz                                       | 28.3   | 25.8                                 | 83.0  | 66.8                                 | 83.0  |
|   | @ 26.5 GHz                                       | 22.7   | 20.7                                 | 65.6  | 52.7                                 | 65.6  |
|   | @ 40.0 GHz                                       | 17.9   | 16.3                                 | -   | -                                    | -     |
|   | @ 50.0 GHz                                       | 15.7   | 14.3                                 | -   | -                                    | -     |
| @ 65.0 GHz  | -  | -  | -                                    | -   | -                                    |       |
| @ 90.0 GHz  | -  | -  | -                                    | -   | -                                    |       |

| CarlisleIT Description  | UT-141A-TP                                    | UT-141A-SP                                    | UT-141C                              | UT-141C-TP                                  | UT-141C-SP                                     |
|---|---|---|--------------------------------------|---|--|
| MIL-DTL-17 Description  | UT-141-SA-TP-M17                              | UT-141-SA-SP-M17                              | -                                    | -   | -  |
| MIL-DTL-17 Part Number  | M17/130-00005                                 | M17/130-00012                                 | -                                    | -   | -  |
| <b>Dimensions</b>   |   |   |                                      |   |  |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.141 +0.002/-0.001<br>(3.581 + 0.051/-0.025) | 0.141 +0.002/-0.001<br>(3.581 + 0.051/-0.025) | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.141+0.002/-0.001<br>(3.581 +0.051/-0.025) | 0.141 + 0.002/-0.001<br>(3.581 + 0.051/-0.025) |
| Dielectric Diameter <i>in (mm)</i>  | 0.1175 ± 0.0010<br>(2.985 ± 0.025)            | 0.1175 ± 0.0010<br>(2.985 ± 0.025)            | -                                    | -   | -  |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178)          | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178)          | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178) | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178)        | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178)           |
| Maximum Straight Length <i>ft (m)</i>   | 20 (6.10)                                     | 20 (6.10)                                     | 20 (6.10)                            | 20 (6.10)                                   | 20 (6.10)                                      |
| Maximum Coiled Length \1 <i>ft (m)</i>  | 20 (6.10)                                     | 20 (6.10)                                     | 20 (6.10)                            | 20 (6.10)                                   | 20 (6.10)                                      |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |   |   |                                      |   |  |
| <b>Materials</b>  |   |   |                                      |   |  |
| Outer Conductor   | Copper  | Copper  | Copper                               | Copper                                      | Copper   |
| Outer Conductor Plating   | Tin   | Silver  | None                                 | Tin   | None   |
| Dielectric  | PTFE  | PTFE  | PTFE                                 | PTFE  | PTFE   |
| Center Conductor  | SPCW  | SPCW  | SPC                                  | SPC   | SPC  |
| RoHS-Compliant  | Yes   | Yes   | Yes                                  | Yes   | Yes  |
| <b>Mechanical Characteristics</b>   |   |   |                                      |   |  |
| Outer Conductor Integrity Temperature   | 175 °C  | 175 °C  | 175 °C                               | 175 °C                                      | 175 °C   |
| Maximum Operating Temperature   | 125 °C  | 125 °C  | 125 °C                               | 125 °C                                      | 125 °C   |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.075<br>(1.905)                              | 0.075<br>(1.905)                              | 0.075<br>(1.905)                     | 0.075<br>(1.905)                            | 0.075<br>(1.905)                               |
| Weight <i>lbs/ft (kg/m)</i>   | 3.29/100<br>(4.94/100)                        | 3.29/100<br>(4.94/100)                        | 3.32/100<br>(4.94/100)               | 3.32/100<br>(4.94/100)                      | 3.32/100<br>(4.94/100)                         |
| <b>Electrical Characteristics</b>   |   |   |                                      |   |  |
| Characteristic Impedance $\Omega$   | 50.0 ± 1.0                                    | 50.0 ± 1.0                                    | 50.0 ± 1.0                           | 50.0 ± 1.0                                  | 50.0 ± 1.0                                     |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                                | 29.0<br>(95.2)                                | 29.0<br>(95.2)                       | 29.0<br>(95.2)                              | 29.0<br>(95.2)                                 |
| Velocity of Propagation   | 70%   | 70%   | 70%                                  | 70%   | 70%  |
| Corona Extinction Voltage   | @ 60 Hz                                       | 1900 VRMS                                     | 1900 VRMS                            | 1900 VRMS                                   | 1900 VRMS                                      |
| Voltage Withstanding  | @ 60 Hz                                       | 9600 VRMS                                     | 9600 VRMS                            | 9600 VRMS                                   | 9600 VRMS                                      |
| Higher Order Mode Frequency   | 34 GHz  | 34 GHz  | 34 GHz                               | 34 GHz                                      | 34 GHz   |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                                     | 7.6   | 7.6                                  | 7.6   | 7.6  |
|   | @ 1.0 GHz                                     | 11.3  | 11.3                                 | 11.3  | 11.3   |
|   | @ 5.0 GHz                                     | 27.6  | 27.6                                 | 27.6  | 27.6   |
|   | @ 10.0 GHz                                    | 41.6  | 41.6                                 | 41.6  | 41.6   |
|   | @ 18.0 GHz                                    | 59.6  | 59.6                                 | 59.6  | 59.6   |
|   | @ 26.5 GHz                                    | 76.2  | 76.2                                 | 76.2  | 76.2   |
|   | @ 40.0 GHz                                    | -   | -                                    | -   | -  |
|   | @ 50.0 GHz                                    | -   | -                                    | -   | -  |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                                     | 483.5   | 436.4                                | 600.4                                       | 483.5  |
|   | @ 1.0 GHz                                     | 336.2   | 303.4                                | 450.0                                       | 336.2  |
|   | @ 5.0 GHz                                     | 140.4   | 126.7                                | 180.0                                       | 140.4  |
|   | @ 10.0 GHz                                    | 94.6  | 85.3                                 | 120.0                                       | 94.6   |
|   | @ 18.0 GHz                                    | 66.8  | 60.3                                 | 83.0  | 66.8   |
|   | @ 26.5 GHz                                    | 52.7  | 47.6                                 | 65.6  | 52.7   |
|   | @ 40.0 GHz                                    | -   | -                                    | -   | -  |
|   | @ 50.0 GHz                                    | -   | -                                    | -   | -  |
| @ 65.0 GHz  | -   | -   | -                                    | -   |  |
| @ 90.0 GHz  | -   | -   | -                                    | -   |  |

# Semi-Rigid Coaxial Cable Cont'd.

## 50 Ω Copper

| CarlisleIT Description  | UT-215-TP                                    | UT-250C                              | UT-250C-TP                                   |
|---|--|--------------------------------------|--|
| MIL-DTL-17 Description  | -  | UT-250A-M17                          | UT-250A-TP-M17                               |
| MIL-DTL-17 Part Number  | -  | M17/129-RG-401                       | M17/129-00001                                |
| <b>Dimensions</b>   |  |                                      |  |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.215 +0.003/-0.002<br>(5.461 +0.076/-0.051) | 0.250 ± 0.001<br>(6.350 ± 0.025)     | 0.250 +0.002/-0.001<br>(6.350 +0.051/-0.025) |
| Dielectric Diameter <i>in (mm)</i>  | -  | 0.209 ± 0.002<br>(5.309 ± 0.051)     | 0.209 ± 0.002<br>(5.309 ± 0.051)             |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0571 ± 0.0005<br>(1.4503 ± 0.0127)         | 0.0641 ± 0.0010<br>(1.6281 ± 0.0254) | 0.0641 ± 0.0010<br>(1.6281 ± 0.0254)         |
| Maximum Straight Length <i>ft (m)</i>   | 20 (6.10)                                    | 20 (6.10)                            | 20 (6.10)                                    |
| Maximum Coiled Length \1 <i>ft (m)</i>  | 20 (6.10)                                    | 20 (6.10)                            | 20 (6.10)                                    |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |  |                                      |  |
| <b>Materials</b>  |  |                                      |  |
| Outer Conductor   | Copper                                       | Copper                               | Copper                                       |
| Outer Conductor Plating   | Tin  | None                                 | Tin  |
| Dielectric  | PTFE   | PTFE                                 | PTFE   |
| Center Conductor  | SPCW   | SPC                                  | SPCW   |
| RoHS-Compliant  | Yes  | Yes                                  | Yes  |
| <b>Mechanical Characteristics</b>   |  |                                      |  |
| Outer Conductor Integrity Temperature   | 150 °C                                       | 150 °C                               | 150 °C                                       |
| Maximum Operating Temperature   | 125 °C                                       | 100 °C                               | 100 °C                                       |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.375<br>(9.525)                             | 0.125<br>(3.175)                     | 0.125<br>(3.175)                             |
| Weight <i>lbs/ft (kg/m)</i>   | 7.17/100<br>(10.76/100)                      | 10.38/100<br>(15.58/100)             | 10.38/100<br>(15.58/100)                     |
| <b>Electrical Characteristics</b>   |  |                                      |  |
| Characteristic Impedance Ω  | 50.0 ± 2.0                                   | 50.0 ± 0.5                           | 50.0 ± 0.5                                   |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                               | 29.0<br>(95.2)                       | 29.0<br>(95.2)                               |
| Velocity of Propagation   | 70%  | 70%                                  | 70%  |
| Corona Extinction Voltage @ 60 Hz   | 3000 VRMS                                    | 3000 VRMS                            | 3000 VRMS                                    |
| Voltage Withstanding @ 60 Hz  | 15000 VRMS                                   | 15000 VRMS                           | 15000 VRMS                                   |
| Higher Order Mode Frequency   | 22 GHz                                       | 19 GHz                               | 19 GHz                                       |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                                    | 5.1                                  | 4.3  |
|   | @ 1.0 GHz                                    | 7.5                                  | 6.7  |
|   | @ 5.0 GHz                                    | 19.1                                 | 17.4   |
|   | @ 10.0 GHz                                   | 29.4                                 | 27.0   |
|   | @ 18.0 GHz                                   | 43.3                                 | 40.0   |
|   | @ 26.5 GHz                                   | -                                    | -  |
|   | @ 40.0 GHz                                   | -                                    | -  |
|   | @ 50.0 GHz                                   | -                                    | -  |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                                    | 844.1                                | 1,780.0                                      |
|   | @ 1.0 GHz                                    | 581.2                                | 914.8  |
|   | @ 5.0 GHz                                    | 234.0                                | 364.5  |
|   | @ 10.0 GHz                                   | 154.0                                | 238.3  |
|   | @ 18.0 GHz                                   | 106.1                                | 163.2  |
|   | @ 26.5 GHz                                   | -                                    | -  |
|   | @ 40.0 GHz                                   | -                                    | -  |
|   | @ 50.0 GHz                                   | -                                    | -  |

| CarlisleIT Description  | UT-250C-SP                                   | UT-325C                                      | UT-390C                            |
|---|--|--|------------------------------------|
| MIL-DTL-17 Description  | -  | -  | -                                  |
| MIL-DTL-17 Part Number  | -  | -  | -                                  |
| <b>Dimensions</b>   |  |  |                                    |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.250 +0.002/-0.001<br>(6.350 +0.051/-0.025) | 0.325 ± 0.002<br>(8.255 ± 0.051)             | 0.390 ± 0.002<br>(9.906 ± 0.051)   |
| Dielectric Diameter <i>in (mm)</i>  | -  | -  | -                                  |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0641 ± 0.0010<br>(1.6281 ± 0.0254)         | 7 × 0.0312 ± 0.0010<br>(7 × 0.7925 ± 0.0254) | 0.102 ± 0.001<br>(2.5908 ± 0.0254) |
| Maximum Straight Length <i>ft (m)</i>   | 20 (6.10)                                    | 20 (6.10)                                    | 20 (6.10)                          |
| Maximum Coiled Length \1 <i>ft (m)</i>  | 20 (6.10)                                    | -  | -                                  |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |  |  |                                    |
| <b>Materials</b>  |  |  |                                    |
| Outer Conductor   | Copper                                       | Copper                                       | Copper                             |
| Outer Conductor Plating   | Silver                                       | None   | None                               |
| Dielectric  | PTFE   | PTFE   | PTFE                               |
| Center Conductor  | SPC  | Stranded SPC                                 | SPC                                |
| RoHS-Compliant  | Yes  | Yes  | Yes                                |
| <b>Mechanical Characteristics</b>   |  |  |                                    |
| Outer Conductor Integrity Temperature   | 150 °C                                       | 125 °C                                       | 175 °C                             |
| Maximum Operating Temperature   | 100 °C                                       | 90 °C  | 90 °C                              |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.125<br>(3.175)                             | 0.75<br>(19.05)                              | 0.75<br>(19.05)                    |
| Weight <i>lbs/ft (kg/m)</i>   | 10.38/100<br>(15.58/100)                     | 15.93/100<br>(23.92/100)                     | 24.40/100<br>(36.63/100)           |
| <b>Electrical Characteristics</b>   |  |  |                                    |
| Characteristic Impedance Ω  | 50.0 ± 0.5                                   | 50.0 ± 1.0                                   | 50.0 ± 0.5                         |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                               | 29.0<br>(95.2)                               | 29.0<br>(95.2)                     |
| Velocity of Propagation   | 70%  | 70%  | 70%                                |
| Corona Extinction Voltage   | @ 60 Hz<br>3000 VRMS                         | 3000 VRMS                                    | 6000 VRMS                          |
| Voltage Withstanding  | @ 60 Hz<br>16800 VRMS                        | 22800 VRMS                                   | 26700 VRMS                         |
| Higher Order Mode Frequency   | 19 GHz                                       | 14 GHz                                       | 12 GHz                             |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                                    | 4.3  | 3.0                                |
|   | @ 1.0 GHz                                    | 6.7  | 4.6                                |
|   | @ 5.0 GHz                                    | 17.4   | 12.5                               |
|   | @ 10.0 GHz                                   | 27.0   | 20.1                               |
|   | @ 18.0 GHz                                   | 40.0   | -                                  |
|   | @ 26.5 GHz                                   | -  | -                                  |
|   | @ 40.0 GHz                                   | -  | -                                  |
|   | @ 50.0 GHz                                   | -  | -                                  |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                                    | 951.8  | 3,425.8                            |
|   | @ 1.0 GHz                                    | 653.3  | 2,321.5                            |
|   | @ 5.0 GHz                                    | 260.0  | 883.1                              |
|   | @ 10.0 GHz                                   | 169.8  | 561.6                              |
|   | @ 18.0 GHz                                   | 116.3  | -                                  |
|   | @ 26.5 GHz                                   | -  | -                                  |
|   | @ 40.0 GHz                                   | -  | -                                  |
|   | @ 50.0 GHz                                   | -  | -                                  |

# Semi-Rigid Coaxial Cable Cont'd.

## 50 Ω Aluminum

Standard aluminum 50 Ω semi-rigid cables are ideal for hand forming or where weight savings is a premium. Connectors can be easily soldered to the tin-plated aluminum outer conductor.

| CarlisleIT Description  | UT-047-AL-TP                                 | UT-085-AL                            | UT-085-AL-TP                                    |
|---|--|--------------------------------------|---|
| MIL-DTL-17 Description  | -  | UT-085-AL-M17                        | UT-085-AL-TP-M17                                |
| MIL-DTL-17 Part Number  | -  | M17/133-00012                        | M17/133-00013                                   |
| <b>Dimensions</b>   |  |                                      |   |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.047 +0.002/-0.001<br>(1.194 +0.051/-0.025) | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   | 0.0865 +0.0020/-0.0010<br>(2.197 +0.051/-0.025) |
| Dielectric Diameter <i>in (mm)</i>  | -  | 0.066 ± 0.001<br>(1.676 ± 0.025)     | 0.066 ± 0.001<br>(1.676 ± 0.025)                |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127)         | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127)            |
| Maximum Straight Length <i>ft (m)</i>   | 20 (6.10)                                    | 20 (6.10)                            | 20 (6.10)                                       |
| Maximum Coiled Length \1 <i>ft (m)</i>  | 20 (6.10)                                    | 20 (6.10)                            | 20 (6.10)                                       |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |  |                                      |   |
| <b>Materials</b>  |  |                                      |   |
| Outer Conductor   | Aluminum                                     | Aluminum                             | Aluminum  |
| Outer Conductor Plating   | Tin  | None                                 | Tin   |
| Dielectric  | PTFE   | PTFE                                 | PTFE  |
| Center Conductor  | SPCW   | SPCW                                 | SPCW  |
| RoHS-Compliant  | Yes  | Yes                                  | Yes   |
| <b>Mechanical Characteristics</b>   |  |                                      |   |
| Outer Conductor Integrity Temperature   | 225 °C                                       | 225 °C                               | 225 °C  |
| Maximum Operating Temperature   | 225 °C                                       | 225 °C                               | 225 °C  |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.07<br>(1.778)                              | 0.07<br>(1.778)                      | 0.07<br>(1.778)                                 |
| Weight <i>lbs/ft (kg/m)</i>   | 0.21/100<br>(0.32/100)                       | 0.72/100<br>(1.08/100)               | 0.72/100<br>(1.08/100)                          |
| <b>Electrical Characteristics</b>   |  |                                      |   |
| Characteristic Impedance Ω  | 50.0 ± 1.5                                   | 50.0 ± 1.0                           | 50.0 ± 1.0                                      |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                               | 29.0<br>(95.2)                       | 29.0<br>(95.2)                                  |
| Velocity of Propagation   | 70%  | 70%                                  | 70%   |
| Corona Extinction Voltage @ 60 Hz   | 1000 VRMS                                    | 1500 VRMS                            | 1500 VRMS                                       |
| Voltage Withstanding @ 60 Hz  | 3000 VRMS                                    | 5400 VRMS                            | 5400 VRMS                                       |
| Higher Order Mode Frequency   | 109 GHz                                      | 61 GHz                               | 61 GHz  |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                                    | 25.8                                 | 14.3  |
|   | @ 1.0 GHz                                    | 36.7                                 | 21.0  |
|   | @ 5.0 GHz                                    | 84.5                                 | 47.6  |
|   | @ 10.0 GHz                                   | 121.9                                | 72.0  |
|   | @ 18.0 GHz                                   | 167.3                                | 100.3   |
|   | @ 26.5 GHz                                   | 206.9                                | 125.6   |
|   | @ 40.0 GHz                                   | 260.4                                | 160.5   |
|   | @ 50.0 GHz                                   | 295.5                                | 183.9   |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                                    | 85.4                                 | 231.8   |
|   | @ 1.0 GHz                                    | 60.1                                 | 162.5   |
|   | @ 5.0 GHz                                    | 26.3                                 | 70.1  |
|   | @ 10.0 GHz                                   | 18.3                                 | 48.3  |
|   | @ 18.0 GHz                                   | 13.4                                 | 35.0  |
|   | @ 26.5 GHz                                   | 10.9                                 | 28.1  |
|   | @ 40.0 GHz                                   | 8.7                                  | 22.2  |
|   | @ 50.0 GHz                                   | 7.7                                  | 19.5  |
| @ 65.0 GHz  | 6.7  | -                                    |   |
| @ 90.0 GHz  | 5.5  | -                                    |   |

| CarlisleIT Description  | UT-141A-AL                           | UT-141A-AL-TP                                | UT-250C-AL-TP                                |         |
|---|--------------------------------------|--|--|---------|
| MIL-DTL-17 Description  | UT-141-SA-AL-M17                     | UT-141-SA-AL-TP-M17                          | -  |         |
| MIL-DTL-17 Part Number  | M17/130-00008                        | M17/130-00009                                | -  |         |
| <b>Dimensions</b>   |                                      |  |  |         |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.141 +0.002/-0.001<br>(3.581 +0.051/-0.025) | 0.250 +0.003/-0.002<br>(6.350 +0.076/-0.051) |         |
| Dielectric Diameter <i>in (mm)</i>  | 0.1175 ± 0.0010<br>(2.985 ± 0.025)   | 0.1175 ± 0.0010<br>(2.985 ± 0.025)           | -  |         |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178) | 0.0362 ± 0.0007<br>(0.9195± 0.0178)          | 0.0641 ± 0.0010<br>(1.6281 ± 0.0254)         |         |
| Maximum Straight Length <i>ft (m)</i>   | 20 (6.10)                            | 20 (6.10)                                    | 20 (6.10)                                    |         |
| Maximum Coiled Length \1 <i>ft (m)</i>  | 20 (6.10)                            | 20 (6.10)                                    | 20 (6.10)                                    |         |
| \1 Add "TYPE" to the part description for coiled lengths (Example: UT-034-TYPE) |                                      |  |  |         |
| <b>Materials</b>  |                                      |  |  |         |
| Outer Conductor   | Aluminum                             | Aluminum                                     | Aluminum                                     |         |
| Outer Conductor Plating   | None                                 | Tin  | Tin  |         |
| Dielectric  | PTFE                                 | PTFE   | PTFE   |         |
| Center Conductor  | SPCW                                 | SPCW   | SPC  |         |
| RoHS-Compliant  | Yes                                  | Yes  | Yes  |         |
| <b>Mechanical Characteristics</b>   |                                      |  |  |         |
| Outer Conductor Integrity Temperature   | 225 °C                               | 225 °C                                       | 225 °C                                       |         |
| Maximum Operating Temperature   | 225 °C                               | 225 °C                                       | 225 °C                                       |         |
| Minimum Inside Bend Radius <i>in (mm)</i>                                       | 0.125<br>(3.175)                     | 0.125<br>(3.175)                             | 0.25<br>(6.35)                               |         |
| Weight <i>lbs/ft (kg/m)</i>   | 1.93/100<br>(2.90/100)               | 1.93/100<br>(2.90/100)                       | 6.18/100<br>(9.28/100)                       |         |
| <b>Electrical Characteristics</b>   |                                      |  |  |         |
| Characteristic Impedance $\Omega$   | 50.0 ± 1.0                           | 50.0 ± 1.0                                   | 50.0 ± 0.5                                   |         |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                       | 29.0<br>(95.2)                               | 29.0<br>(95.2)                               |         |
| Velocity of Propagation   | 70%                                  | 70%  | 70%  |         |
| Corona Extinction Voltage @ 60 Hz   | 1900 VRMS                            | 1900 VRMS                                    | 3000 VRMS                                    |         |
| Voltage Withstanding @ 60 Hz  | 9600 VRMS                            | 9600 VRMS                                    | 16800 VRMS                                   |         |
| Higher Order Mode Frequency   | 34 GHz                               | 34 GHz                                       | 19 GHz                                       |         |
| Attenuation<br>(dB/100 ft, Typical)   | @ 0.5 GHz                            | 7.9  | 7.9  | 4.9     |
|   | @ 1.0 GHz                            | 11.5   | 11.5   | 7.2     |
|   | @ 5.0 GHz                            | 28.7   | 28.7   | 18.4    |
|   | @ 10.0 GHz                           | 43.3   | 43.3   | 28.4    |
|   | @ 18.0 GHz                           | 63.0   | 63.0   | 42.0    |
|   | @ 26.5 GHz                           | 80.3   | 80.3   | -       |
|   | @ 40.0 GHz                           | -  | -  | -       |
|   | @ 50.0 GHz                           | -  | -  | -       |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                            | 557.7  | 571.7  | 1,395.1 |
|   | @ 1.0 GHz                            | 388.5  | 398.2  | 961.1   |
|   | @ 5.0 GHz                            | 163.4  | 167.5  | 387.6   |
|   | @ 10.0 GHz                           | 110.6  | 113.4  | 255.3   |
|   | @ 18.0 GHz                           | 78.5   | 80.5   | 176.2   |
|   | @ 26.5 GHz                           | 62.2   | 63.8   | -       |
|   | @ 40.0 GHz                           | -  | -  | -       |
|   | @ 50.0 GHz                           | -  | -  | -       |
| @ 65.0 GHz  | -                                    | -  | -  |         |
| @ 90.0 GHz  | -                                    | -  | -  |         |

# Semi-Rigid Coaxial Cable Cont'd.

## Dimensionally Stable 50 Ω Copper

Dimensionally stable “M” and “DS” semi-rigid cables utilize a unique dielectric that provides significantly improved thermal stability. Besides virtually eliminating dielectric protrusion from the heat of soldering, this feature makes them ideal for applications that must operate at the most extreme temperatures.

| CarlisleIT Description   | UT-020-M                             | UT-034-M                             | UT-047-M                             | UT-085-DS                            |       |
|--|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------|
| CarlisleIT Description (Tin-Plated)                                    | UT-020-TP-M                          | UT-034-TP-M                          | UT-047-TP-M                          | UT-085-TP-DS                         |       |
| <b>Dimensions</b>  |                                      |                                      |                                      |                                      |       |
| Outer Conductor Diameter<br>(+0.001 inch for tin plate) <i>in (mm)</i> | 0.023 ± 0.001<br>(0.584 ± 0.025)     | 0.038 ± 0.001<br>(0.953 ± 0.025)     | 0.050 ± 0.001<br>(1.257 ± 0.025)     | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   |       |
| Center Conductor Diameter <i>in (mm)</i>                               | 0.0045 ± 0.0005<br>(0.1143 ± 0.0127) | 0.0080 ± 0.0005<br>(0.2032 ± 0.0127) | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) |       |
| Maximum Straight Length <i>ft (m)</i>                                  | 20 (3.05)                            | 15 (4.57)                            | 20 (6.10)                            | 20 (6.10)                            |       |
| <b>Materials</b>   |                                      |                                      |                                      |                                      |       |
| Outer Conductor  | Copper                               | Copper                               | Copper                               | Copper                               |       |
| Outer Conductor Plating  | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          |       |
| Dielectric   | PTFE                                 | PTFE                                 | PTFE                                 | PTFE                                 |       |
| Center Conductor   | SPCW                                 | SPCW                                 | SPCW                                 | SPCW                                 |       |
| RoHS-Compliant   | Yes                                  | Yes                                  | Yes                                  | Yes                                  |       |
| <b>Mechanical Characteristics</b>                                      |                                      |                                      |                                      |                                      |       |
| Outer Conductor Integrity Temperature                                  | 250 °C                               | 225 °C                               | 250 °C                               | 250 °C                               |       |
| Maximum Operating Temperature  | 225 °C                               | 300 °C                               | 225 °C                               | 250 <sup>1</sup> °C                  |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                              | 0.032<br>(0.813)                     | 0.05<br>(1.27)                       | 0.063<br>(1.6)                       | 0.05<br>(1.27)                       |       |
| Weight <i>lbs/ft (kg/m)</i>  | 0.10/100<br>(0.15/100)               | 0.22/100<br>(0.33/100)               | 0.42/100<br>(0.63/100)               | 1.42/100<br>(2.13/100)               |       |
| 1 225 °C for tin-plated outer conductor                                |                                      |                                      |                                      |                                      |       |
| <b>Electrical Characteristics</b>                                      |                                      |                                      |                                      |                                      |       |
| Characteristic Impedance Ω   | 50.0 ± 6.0                           | 50.0 ± 4.0                           | 50.0 ± 4.0                           | 50.0 ± 1.0                           |       |
| Capacitance <i>pF/ft (pF/m)</i>  | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       |       |
| Velocity of Propagation  | 70%                                  | 70%                                  | 70%                                  | 70%                                  |       |
| Corona Extinction Voltage  | @ 60 Hz<br>250 VRMS                  | 750 VRMS                             | 750 VRMS                             | 1500 VRMS                            |       |
| Voltage Withstanding   | @ 60 Hz<br>1200 VRMS                 | 1800 VRMS                            | 3000 VRMS                            | 5400 VRMS                            |       |
| Higher Order Mode Frequency  | 245 GHz                              | 139 GHz                              | 104 GHz                              | 61 GHz                               |       |
| Attenuation<br>(dB/100 ft, Typical)                                    | @ 0.5 GHz                            | 51.6                                 | 29.4                                 | 22.4                                 | 13.6  |
|  | @ 1.0 GHz                            | 73.3                                 | 41.9                                 | 32.0                                 | 19.5  |
|  | @ 5.0 GHz                            | 166.1                                | 95.9                                 | 73.8                                 | 46.0  |
|  | @ 10.0 GHz                           | 237.3                                | 138.1                                | 106.8                                | 67.4  |
|  | @ 18.0 GHz                           | 322.2                                | 189.0                                | 147.1                                | 94.3  |
|  | @ 26.5 GHz                           | 394.9                                | 233.3                                | 182.4                                | 118.3 |
|  | @ 40.0 GHz                           | 491.3                                | 292.8                                | 230.3                                | 151.5 |
|  | @ 50.0 GHz                           | 553.7                                | 331.7                                | 261.8                                | 173.8 |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)                                | @ 0.5 GHz                            | 30.9                                 | 75.8                                 | 125.4                                | 306.9 |
|  | @ 1.0 GHz                            | 21.8                                 | 53.4                                 | 88.2                                 | 215.0 |
|  | @ 5.0 GHz                            | 9.6                                  | 23.4                                 | 38.5                                 | 92.5  |
|  | @ 10.0 GHz                           | 6.8                                  | 16.4                                 | 26.8                                 | 63.7  |
|  | @ 18.0 GHz                           | 5.0                                  | 12.0                                 | 19.6                                 | 46.0  |
|  | @ 26.5 GHz                           | 4.1                                  | 9.8                                  | 15.9                                 | 36.9  |
|  | @ 40.0 GHz                           | 3.3                                  | 7.8                                  | 12.7                                 | 29.1  |
|  | @ 50.0 GHz                           | 2.9                                  | 6.9                                  | 11.2                                 | 25.5  |
| @ 65.0 GHz   | 2.6                                  | 6.0                                  | 9.6                                  | -                                    |       |
| @ 90.0 GHz   | 2.1                                  | 5.0                                  | 8.0                                  | -                                    |       |



| CarlisleIT Description   | UT-085C-DS                           | UT-141-DS                            | UT-141C-DS                           |
|--|--------------------------------------|--------------------------------------|--------------------------------------|
| CarlisleIT Description (Tin Plated)                                    | UT-085C-TP-DS                        | UT-141-TP-DS                         | UT-141C-TP-DS                        |
| <b>Dimensions</b>  |                                      |                                      |                                      |
| Outer Conductor Diameter<br>(+0.001 inch for tin plate) <i>in (mm)</i> | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.141 ± 0.001<br>(3.581 ± 0.025)     |
| Center Conductor Diameter <i>in (mm)</i>                               | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178) | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178) |
| Maximum Straight Length <i>ft (m)</i>                                  | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            |
| <b>Materials</b>   |                                      |                                      |                                      |
| Outer Conductor  | Copper                               | Copper                               | Copper                               |
| Outer Conductor Plating  | None or Tin                          | None or Tin                          | None or Tin                          |
| Dielectric   | PTFE                                 | PTFE                                 | PTFE                                 |
| Center Conductor   | SPCW                                 | SPCW                                 | SPCW                                 |
| RoHS-Compliant   | Yes                                  | Yes                                  | Yes                                  |
| <b>Mechanical Characteristics</b>                                      |                                      |                                      |                                      |
| Outer Conductor Integrity Temperature                                  | 250 °C                               | 225 °C                               | 250 °C                               |
| Maximum Operating Temperature  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  |
| Minimum Inside Bend Radius <i>in (mm)</i>                              | 0.05<br>(1.27)                       | 0.075<br>(1.905)                     | 0.075<br>(1.905)                     |
| Weight <i>lbs/ft (kg/m)</i>  | 1.43/100<br>(2.15/100)               | 3.29/100<br>(4.94/100)               | 3.32/100<br>(4.98/100)               |
| 1 225 °C for tin-plated outer conductor                                |                                      |                                      |                                      |
| <b>Electrical Characteristics</b>                                      |                                      |                                      |                                      |
| Characteristic Impedance $\Omega$                                      | 50.0 ± 1.5                           | 50.0 ± 1.0                           | 50.0 ± 1.0                           |
| Capacitance <i>pF/ft (pF/m)</i>  | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       |
| Velocity of Propagation  | 70%                                  | 70%                                  | 70%                                  |
| Corona Extinction Voltage @ 60 Hz                                      | 1500 VRMS                            | 1900 VRMS                            | 1900 VRMS                            |
| Voltage Withstanding @ 60 Hz   | 5400 VRMS                            | 9600 VRMS                            | 9600 VRMS                            |
| Higher Order Mode Frequency  | 61 GHz                               | 34 GHz                               | 34 GHz                               |
| Attenuation<br>(dB/100 ft, Typical)                                    | @ 0.5 GHz                            | 13.6                                 | 7.8                                  |
|  | @ 1.0 GHz                            | 19.5                                 | 11.3                                 |
|  | @ 5.0 GHz                            | 46.0                                 | 27.7                                 |
|  | @ 10.0 GHz                           | 67.4                                 | 41.6                                 |
|  | @ 18.0 GHz                           | 94.3                                 | 59.6                                 |
|  | @ 26.5 GHz                           | 118.3                                | 76.2                                 |
|  | @ 40.0 GHz                           | 151.5                                | -                                    |
|  | @ 50.0 GHz                           | 173.8                                | -                                    |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)                                | @ 0.5 GHz                            | 306.9                                | 737.4                                |
|  | @ 1.0 GHz                            | 215.0                                | 513.0                                |
|  | @ 5.0 GHz                            | 92.5                                 | 214.8                                |
|  | @ 10.0 GHz                           | 63.7                                 | 145.0                                |
|  | @ 18.0 GHz                           | 46.0                                 | 102.6                                |
|  | @ 26.5 GHz                           | 36.9                                 | 81.2                                 |
|  | @ 40.0 GHz                           | 29.1                                 | -                                    |
|  | @ 50.0 GHz                           | 25.5                                 | -                                    |
| @ 65.0 GHz   | -                                    | -                                    |                                      |
| @ 90.0 GHz   | -                                    | -                                    |                                      |

# Semi-Rigid Coaxial Cable Cont'd.

## Low-Loss 50 Ω Copper

Low-loss semi-rigid cables provide lower attenuation, better phase stability with temperature, and a higher operating temperature when compared to traditional solid PTFE semi-rigid cables.

| CarlisleIT Description   | UT-031-LL                            | UT-047C-LL                           | UT-070-LL                            | UT-085C-LL                           |
|--|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| CarlisleIT Description (Tin-Plated)                                    | UT-031-TP-LL                         | UT-047C-TP-LL                        | UT-070-TP-LL                         | UT-085C-TP-LL                        |
| <b>Dimensions</b>  |                                      |                                      |                                      |                                      |
| Outer Conductor Diameter<br>(+0.001 inch for tin plate) <i>in (mm)</i> | 0.031 ± 0.001<br>(0.787 ± 0.025)     | 0.047 ± 0.001<br>(1.194 ± 0.025)     | 0.070 ± 0.001<br>(1.778 ± 0.025)     | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   |
| Center Conductor Diameter <i>in (mm)</i>                               | 0.0080 ± 0.0005<br>(0.2032 ± 0.0127) | 0.0126 ± 0.0005<br>(0.3200 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0226 ± 0.0005<br>(0.5740 ± 0.0127) |
| Maximum Straight Length <i>ft (m)</i>                                  | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            |
| <b>Materials</b>   |                                      |                                      |                                      |                                      |
| Outer Conductor  | Copper                               | Copper                               | Copper                               | Copper                               |
| Outer Conductor Plating  | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          |
| Dielectric   | LD PTFE                              | LD PTFE                              | LD PTFE                              | LD PTFE                              |
| Center Conductor   | SPCW                                 | SPC                                  | SPCW                                 | SPC                                  |
| RoHS-Compliant   | Yes                                  | Yes                                  | Yes                                  | Yes                                  |
| <b>Mechanical Characteristics</b>                                      |                                      |                                      |                                      |                                      |
| Outer Conductor Integrity Temperature                                  | 250 °C                               | 225 °C                               | 250 °C                               | 250 °C                               |
| Maximum Operating Temperature  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  |
| Minimum Inside Bend Radius <i>in (mm)</i>                              | 0.063<br>(1.600)                     | 0.125<br>(3.175)                     | 0.25<br>(6.35)                       | 0.25<br>(6.35)                       |
| Weight <i>lbs/ft (kg/m)</i>  | 0.17/100<br>(0.26/100)               | 0.39/100<br>(0.59/100)               | 0.75/100<br>(1.13/100)               | 1.39/100<br>(2.09/100)               |
| 1 225 °C for tin-plated outer conductor                                |                                      |                                      |                                      |                                      |
| <b>Electrical Characteristics</b>                                      |                                      |                                      |                                      |                                      |
| Characteristic Impedance Ω   | 50.0 ± 2.0                           | 50.0 ± 2.0                           | 50.0 ± 1.5                           | 50.0 ± 1.5                           |
| Capacitance <i>pF/ft (pF/m)</i>  | 26.5<br>(86.8)                       | 26.5<br>(86.8)                       | 26.5<br>(86.8)                       | 26.5<br>(86.8)                       |
| Velocity of Propagation  | 77%                                  | 77%                                  | 77%                                  | 77%                                  |
| Corona Extinction Voltage  | @ 60 Hz                              | 500 VRMS                             | 1000 VRMS                            | 1200 VRMS                            |
| Voltage Withstanding   | @ 60 Hz                              | 1800 VRMS                            | 2700 VRMS                            | 4200 VRMS                            |
| Higher Order Mode Frequency  | 180 GHz                              | 116 GHz                              | 73 GHz                               | 65 GHz                               |
| Attenuation<br>(dB/100 ft, Typical)                                    | @ 0.5 GHz                            | 33.6                                 | 21.9                                 | 13.8                                 |
|  | @ 1.0 GHz                            | 47.6                                 | 31.1                                 | 19.6                                 |
|  | @ 5.0 GHz                            | 107.1                                | 70.2                                 | 44.5                                 |
|  | @ 10.0 GHz                           | 152.2                                | 100.0                                | 63.6                                 |
|  | @ 18.0 GHz                           | 205.4                                | 135.2                                | 86.4                                 |
|  | @ 26.5 GHz                           | 250.3                                | 165.2                                | 106.0                                |
|  | @ 40.0 GHz                           | 309.3                                | 204.8                                | 132.0                                |
|  | @ 50.0 GHz                           | 347.1                                | 230.2                                | 148.9                                |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)                                | @ 0.5 GHz                            | 60.2                                 | 125.6                                | 265.5                                |
|  | @ 1.0 GHz                            | 42.5                                 | 88.7                                 | 187.2                                |
|  | @ 5.0 GHz                            | 18.9                                 | 39.4                                 | 82.8                                 |
|  | @ 10.0 GHz                           | 13.3                                 | 27.7                                 | 58.1                                 |
|  | @ 18.0 GHz                           | 9.9                                  | 20.5                                 | 42.9                                 |
|  | @ 26.5 GHz                           | 8.1                                  | 16.8                                 | 35.1                                 |
|  | @ 40.0 GHz                           | 6.6                                  | 13.6                                 | 28.2                                 |
|  | @ 50.0 GHz                           | 5.9                                  | 12.1                                 | 25.1                                 |
| @ 65.0 GHz   | 5.1                                  | 10.6                                 | 21.8                                 |                                      |
| @ 90.0 GHz   | 4.3                                  | 8.9                                  | -                                    |                                      |

## Ultra-Low-Loss 50Ω Copper

| CarlisleIT Description   | UT-120C-LL                           | UT-141C-LL                           | UT-250C-LL                           |
|--|--------------------------------------|--------------------------------------|--------------------------------------|
| CarlisleIT Description (Tin-Plated)                                    | UT-120C-TP-LL                        | UT-141C-TP-LL                        | UT-250C-TP-LL                        |
| <b>Dimensions</b>  |                                      |                                      |                                      |
| Outer Conductor Diameter<br>(+0.001 inch for tin plate) <i>in (mm)</i> | 0.120 ± 0.001<br>(3.048 ± 0.025)     | 0.141 ± 0.002<br>(3.581 ± 0.051)     | 0.250 ± 0.002<br>(6.350 ± 0.051)     |
| Center Conductor Diameter <i>in (mm)</i>                               | 0.0359 ± 0.0005<br>(0.9119 ± 0.0127) | 0.0403 ± 0.0010<br>(1.0236 ± 0.0254) | 0.0720 ± 0.0010<br>(1.8288 ± 0.0254) |
| Maximum Straight Length <i>ft (m)</i>                                  | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            |
| <b>Materials</b>   |                                      |                                      |                                      |
| Outer Conductor  | Copper                               | Copper                               | Copper                               |
| Outer Conductor Plating  | None or Tin                          | None or Tin                          | None or Tin                          |
| Dielectric   | LD PTFE                              | LD PTFE                              | LD PTFE                              |
| Center Conductor   | SPC                                  | SPC                                  | SPC                                  |
| RoHS-Compliant   | Yes                                  | Yes                                  | Yes                                  |
| <b>Mechanical Characteristics</b>                                      |                                      |                                      |                                      |
| Outer Conductor Integrity Temperature                                  | 250 °C                               | 225 °C                               | 250 °C                               |
| Maximum Operating Temperature  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  |
| Minimum Inside Bend Radius <i>in (mm)</i>                              | 0.188<br>(4.775)                     | 0.5<br>(12.7)                        | 0.75<br>(19.05)                      |
| Weight <i>lbs/ft (kg/m)</i>  | 2.01/100<br>(3.02/100)               | 3.18/100<br>(4.77/100)               | 9.40/100<br>(14.11/100)              |
| 1 225 °C for tin-plated outer conductor                                |                                      |                                      |                                      |
| <b>Electrical Characteristics</b>                                      |                                      |                                      |                                      |
| Characteristic Impedance Ω   | 50.0 ± 1.5                           | 50.0 ± 1.5                           | 50.0 ± 1.0                           |
| Capacitance <i>pF/ft (pF/m)</i>  | 26.5<br>(86.8)                       | 26.5<br>(86.8)                       | 26.5<br>(86.8)                       |
| Velocity of Propagation  | 77%                                  | 77%                                  | 77%                                  |
| Corona Extinction Voltage @ 60 Hz                                      | 1800 VRMS                            | 1900 VRMS                            | 3000 VRMS                            |
| Voltage Withstanding @ 60 Hz   | 7800 VRMS                            | 8400 VRMS                            | 15600 VRMS                           |
| Higher Order Mode Frequency  | 41 GHz                               | 37 GHz                               | 20 GHz                               |
| Attenuation<br>(dB/100 ft, Typical)                                    | @ 0.5 GHz                            | 7.7                                  | 3.9                                  |
|  | @ 1.0 GHz                            | 11.0                                 | 5.6                                  |
|  | @ 5.0 GHz                            | 25.3                                 | 13.1                                 |
|  | @ 10.0 GHz                           | 36.4                                 | 19.3                                 |
|  | @ 18.0 GHz                           | 50.0                                 | 26.9                                 |
|  | @ 26.5 GHz                           | 61.8                                 | -                                    |
|  | @ 40.0 GHz                           | 77.7                                 | -                                    |
|  | @ 50.0 GHz                           | -                                    | -                                    |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)                                | @ 0.5 GHz                            | 683.1                                | 2130.7                               |
|  | @ 1.0 GHz                            | 480.8                                | 1492.3                               |
|  | @ 5.0 GHz                            | 210.8                                | 641.5                                |
|  | @ 10.0 GHz                           | 146.9                                | 440.9                                |
|  | @ 18.0 GHz                           | 107.6                                | 318.1                                |
|  | @ 26.5 GHz                           | 87.5                                 | -                                    |
|  | @ 40.0 GHz                           | 70                                   | -                                    |
|  | @ 50.0 GHz                           | -                                    | -                                    |
| @ 65.0 GHz   | -                                    | -                                    |                                      |
| @ 90.0 GHz   | -                                    | -                                    |                                      |

# Semi-Rigid Coaxial Cable Cont'd.

## Low-Loss 50 Ω Aluminum

Low-loss aluminum semi-rigid cables provide lower attenuation, better phase stability with temperature, and a higher operating temperature compared to traditional solid PTFE aluminum semi-rigid cables. Low-loss aluminum semi-rigid cables are ideal for hand forming or where weight savings is a premium. Connectors can be easily soldered to the tin-plated aluminum outer conductor.

| CarlisleIT Description   | UT-047C-AL-TP-LL                             | UT-085C-AL-TP-LL                                | UT-141C-AL-TP-LL                             |       |
|--|--|---|--|-------|
| <b>Dimensions</b>  |  |   |  |       |
| Outer Conductor Diameter<br>(+0.001 inch for tin plate) <i>in (mm)</i> | 0.047 +0.002/-0.001<br>(1.194 +0.051/-0.025) | 0.0865 +0.0020/-0.0010<br>(2.197 +0.051/-0.025) | 0.141 +0.003/-0.002<br>(3.581 +0.076/-0.051) |       |
| Center Conductor Diameter <i>in (mm)</i>                               | 0.0126 ± 0.0005<br>(0.3200 ± 0.0127)         | 0.0226 ± 0.0005<br>(0.5740 ± 0.0127)            | 0.0403 ± 0.0010<br>(1.0236 ± 0.0254)         |       |
| Maximum Straight Length <i>ft (m)</i>                                  | 20 (6.10)                                    | 20 (6.10)                                       | 20 (6.10)                                    |       |
| <b>Materials</b>   |  |   |  |       |
| Outer Conductor  | Aluminum                                     | Aluminum  | Aluminum                                     |       |
| Outer Conductor Plating  | Tin  | Tin   | Tin  |       |
| Dielectric   | LD PTFE                                      | LD PTFE   | LD PTFE                                      |       |
| Center Conductor   | SPC  | SPC   | SPC  |       |
| RoHS-Compliant   | Yes  | Yes   | Yes  |       |
| <b>Mechanical Characteristics</b>                                      |  |   |  |       |
| Outer Conductor Integrity Temperature                                  | 225 °C                                       | 225 °C  | 225 °C                                       |       |
| Maximum Operating Temperature  | 225 °C                                       | 225 °C  | 225 °C                                       |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                              | 0.125<br>(3.175)                             | 0.25<br>(6.35)                                  | 0.5<br>(12.7)                                |       |
| Weight <i>lbs/ft (kg/m)</i>  | 0.20/100<br>(0.30/100)                       | 0.69/100<br>(1.04/100)                          | 1.83/100<br>(2.75/100)                       |       |
| <b>Electrical Characteristics</b>                                      |  |   |  |       |
| Characteristic Impedance Ω   | 50.0 ± 2.0                                   | 50.0 ± 2.0                                      | 50.0 ± 2.0                                   |       |
| Capacitance <i>pF/ft (pF/m)</i>  | 26.5<br>(86.8)                               | 26.5<br>(86.8)                                  | 26.5<br>(86.8)                               |       |
| Velocity of Propagation  | 77%  | 77%   | 77%  |       |
| Corona Extinction Voltage @ 60 Hz                                      | 1000 VRMS                                    | 1500 VRMS                                       | 1900 VRMS                                    |       |
| Voltage Withstanding @ 60 Hz   | 2700 VRMS                                    | 4800 VRMS                                       | 8400 VRMS                                    |       |
| Higher Order Mode Frequency  | 116 GHz                                      | 65 GHz  | 37 GHz                                       |       |
| Attenuation<br>(dB/100 ft, Typical)                                    | @ 0.5 GHz                                    | 23.7  | 13.4   | 7.6   |
|  | @ 1.0 GHz                                    | 33.6  | 19.0   | 10.8  |
|  | @ 5.0 GHz                                    | 75.9  | 43.1   | 24.8  |
|  | @ 10.0 GHz                                   | 108.0   | 61.7   | 35.7  |
|  | @ 18.0 GHz                                   | 146.1   | 83.9   | 49.1  |
|  | @ 26.5 GHz                                   | 178.4   | 102.9  | 60.7  |
|  | @ 40.0 GHz                                   | 220.9   | 128.3  | -     |
|  | @ 50.0 GHz                                   | 248.3   | 144.7  | -     |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)                                | @ 0.5 GHz                                    | 92.7  | 262.7  | 642.5 |
|  | @ 1.0 GHz                                    | 65.4  | 185.2  | 452.1 |
|  | @ 5.0 GHz                                    | 29.1  | 81.9   | 198.1 |
|  | @ 10.0 GHz                                   | 20.5  | 57.4   | 138.0 |
|  | @ 18.0 GHz                                   | 15.2  | 42.4   | 101.1 |
|  | @ 26.5 GHz                                   | 12.4  | 34.6   | 82.2  |
|  | @ 40.0 GHz                                   | 10.1  | 27.9   | -     |
|  | @ 50.0 GHz                                   | 9.0   | 24.8   | -     |
| @ 65.0 GHz   | 7.8  | 21.5  | -  |       |
| @ 90.0 GHz   | 6.6  | -   | -  |       |

## Ultra-Low-Loss 50 Ω Copper

Ultra-low-loss semi-rigid cables provide the lowest attenuation, better phase stability with temperature, and a higher operating temperature compared to traditional semi-rigid cables. Due to their compact size and minimum bend radius, these cables are ideal for tight configurations where low insertion loss is critical.

| CarlisleIT Description   | UT-047C-ULL                          | UT-085C-ULL                          | UT-141C-ULL                          |       |
|--|--------------------------------------|--------------------------------------|--------------------------------------|-------|
| CarlisleIT Description (Tin-Plated)                                    | UT-047C-TP-ULL                       | UT-085C-TP-ULL                       | UT-141C-TP-ULL                       |       |
| <b>Dimensions</b>  |                                      |                                      |                                      |       |
| Outer Conductor Diameter<br>(+0.001 inch for tin plate) <i>in (mm)</i> | 0.047 ± 0.001<br>(1.194 ± 0.025)     | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   | 0.141 ± 0.001<br>(3.581 ± 0.025)     |       |
| Center Conductor Diameter <i>in (mm)</i>                               | 0.0142 ± 0.0005<br>(0.3607 ± 0.0127) | 0.0253 ± 0.0005<br>(0.6426 ± 0.0127) | 0.0453 ± 0.0005<br>(1.1506 ± 0.0127) |       |
| Maximum Straight Length <i>ft (m)</i>                                  | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            |       |
| <b>Materials</b>   |                                      |                                      |                                      |       |
| Outer Conductor  | Copper                               | Copper                               | Copper                               |       |
| Outer Conductor Plating  | None or Tin                          | None or Tin                          | None or Tin                          |       |
| Dielectric   | ULD PTFE                             | ULD PTFE                             | ULD PTFE                             |       |
| Center Conductor   | SPCW                                 | SPC                                  | SPCW                                 |       |
| RoHS-Compliant   | Yes                                  | Yes                                  | Yes                                  |       |
| <b>Mechanical Characteristics</b>                                      |                                      |                                      |                                      |       |
| Outer Conductor Integrity Temperature                                  | 250 °C                               | 250 °C                               | 250 °C                               |       |
| Maximum Operating Temperature  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  | 250 <sup>1</sup> °C                  |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                              | 0.25<br>(6.35)                       | 0.375<br>(9.525)                     | 0.5<br>(12.7)                        |       |
| Weight <i>lbs/ft (kg/m)</i>  | 0.36/100<br>(0.54/100)               | 1.27/100<br>(1.91/100)               | 2.53/100<br>(3.80/100)               |       |
| 1 225 °C for tin-plated outer conductor                                |                                      |                                      |                                      |       |
| <b>Electrical Characteristics</b>                                      |                                      |                                      |                                      |       |
| Characteristic Impedance Ω   | 50.0 ± 2.0                           | 50.0 ± 2.0                           | 50.0 ± 1.0                           |       |
| Capacitance <i>pF/ft (pF/m)</i>  | 24.5<br>(80.5)                       | 24.5<br>(80.5)                       | 24.5<br>(80.5)                       |       |
| Velocity of Propagation  | 83%                                  | 83%                                  | 83%                                  |       |
| Corona Extinction Voltage @ 60 Hz                                      | 700 VRMS                             | 1400 VRMS                            | 2500 VRMS                            |       |
| Voltage Withstanding @ 60 Hz   | 2100 VRMS                            | 3300 VRMS                            | 7500 VRMS                            |       |
| Higher Order Mode Frequency  | 119 GHz                              | 66 GHz                               | 36 GHz                               |       |
| Attenuation<br>(dB/100 ft, Typical)                                    | @ 0.5 GHz                            | 20.2                                 | 11.2                                 | 6.1   |
|  | @ 1.0 GHz                            | 28.6                                 | 15.9                                 | 8.7   |
|  | @ 5.0 GHz                            | 64.5                                 | 36.1                                 | 19.9  |
|  | @ 10.0 GHz                           | 91.8                                 | 51.5                                 | 28.6  |
|  | @ 18.0 GHz                           | 124.0                                | 70.0                                 | 39.2  |
|  | @ 26.5 GHz                           | 151.2                                | 85.7                                 | 48.4  |
|  | @ 40.0 GHz                           | 187.1                                | 106.6                                | -     |
|  | @ 50.0 GHz                           | 210.1                                | 120.1                                | -     |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)                                | @ 65.0 GHz                           | 241.0                                | 138.3                                | -     |
|  | @ 90.0 GHz                           | 285.9                                | -                                    | -     |
|  | @ 0.5 GHz                            | 131.7                                | 358.3                                | 888.5 |
|  | @ 1.0 GHz                            | 93.0                                 | 252.8                                | 625.5 |
|  | @ 5.0 GHz                            | 41.4                                 | 111.9                                | 274.6 |
|  | @ 10.0 GHz                           | 29.1                                 | 78.6                                 | 191.6 |
|  | @ 18.0 GHz                           | 21.6                                 | 58                                   | 140.6 |
|  | @ 26.5 GHz                           | 20.5                                 | 55                                   | 132.9 |
| @ 40.0 GHz   | 14.4                                 | 38.3                                 | -                                    |       |
| @ 50.0 GHz   | 12.8                                 | 34.1                                 | -                                    |       |
| @ 65.0 GHz   | 11.2                                 | 29.6                                 | -                                    |       |
| @ 90.0 GHz   | 9.4                                  | -                                    | -                                    |       |

# Semi-Rigid Coaxial Cable Cont'd.

## 50 Ω Stainless Steel

Stainless steel 50 Ω semi-rigid cables are designed for applications where low thermal heat transfer is required, such as cryogenic feed cables. Because these cables also utilize a solid PTFE dielectric, they are often the first choice for highly corrosive environments.

| CarlisleIT Description                    | UT-085-SS                            | UT-085SS-SS                          | UT-047-SS                           |       |
|---|--------------------------------------|--------------------------------------|-------------------------------------|-------|
| <b>Dimensions</b>                         |                                      |                                      |                                     |       |
| Outer Conductor Diameter <i>in (mm)</i>   | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   | 0.47 ± 0.001<br>(1.195 ± 0.025)     |       |
| Center Conductor Diameter <i>in (mm)</i>  | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0113 ± 0.0005<br>(0.287 ± 0.0127) |       |
| Maximum Straight Length <i>ft (m)</i>     | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                           |       |
| <b>Materials</b>                          |                                      |                                      |                                     |       |
| Outer Conductor                           | 304 SS                               | 304 SS                               | 304 SS                              |       |
| Outer Conductor Plating                   | None                                 | None                                 | None                                |       |
| Dielectric                                | PTFE                                 | PTFE                                 | PTFE                                |       |
| Center Conductor                          | SPCW                                 | 304 SS                               | SPCW                                |       |
| RoHS-Compliant                            | Yes                                  | Yes                                  | Yes                                 |       |
| <b>Mechanical Characteristics</b>         |                                      |                                      |                                     |       |
| Outer Conductor Integrity Temperature     | 225 °C                               | 225 °C                               | 200 °C                              |       |
| Maximum Operating Temperature             | 200 °C                               | 200 °C                               | 200 °C                              |       |
| Minimum Inside Bend Radius <i>in (mm)</i> | 0.125<br>(3.175)                     | 0.25<br>(6.35)                       | 0.25<br>(6.35)                      |       |
| Weight <i>lbs/ft (kg/m)</i>               | 1.30/100<br>(1.95/100)               | 1.30/100<br>(1.95/100)               | 0.37/100<br>(0.55/100)              |       |
| <b>Electrical Characteristics</b>         |                                      |                                      |                                     |       |
| Characteristic Impedance Ω                | 50.0 ± 1.0                           | 50.0 ± 1.0                           | 50.0 ± 2.5                          |       |
| Capacitance <i>pF/ft (pF/m)</i>           | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                      |       |
| Velocity of Propagation                   | 70%                                  | 70%                                  | 70%                                 |       |
| Corona Extinction Voltage @ 60 Hz         | 1500 VRMS                            | 1500 VRMS                            | 1000 VRMS                           |       |
| Voltage Withstanding @ 60 Hz              | 5400 VRMS                            | 5400 VRMS                            | 3000 VRMS                           |       |
| Higher Order Mode Frequency               | 61 GHz                               | 61 GHz                               | 100 GHz                             |       |
| Attenuation<br>(dB/100 ft, Typical)       | @ 0.5 GHz                            | 31.2                                 | 88.9                                | 55.4  |
|   | @ 1.0 GHz                            | 44.4                                 | 126.0                               | 78.6  |
|   | @ 5.0 GHz                            | 101.5                                | 284.0                               | 178.1 |
|   | @ 10.0 GHz                           | 146.0                                | 404.1                               | 254.3 |
|   | @ 18.0 GHz                           | 199.7                                | 545.9                               | 345.0 |
|   | @ 26.5 GHz                           | 246.2                                | 666.3                               | 422.5 |
|   | @ 40.0 GHz                           | 308.7                                | 824.8                               | 525.3 |
|   | @ 50.0 GHz                           | 349.5                                | 926.5                               | 591.7 |
| Power<br>(Watts CW @ 20 °C,<br>Maximum)   | @ 0.5 GHz                            | 142.7                                | 49.2                                | 57.7  |
|   | @ 1.0 GHz                            | 100.5                                | 34.7                                | 36.5  |
|   | @ 5.0 GHz                            | 44.2                                 | 15.4                                | 16.2  |
|   | @ 10.0 GHz                           | 30.9                                 | 10.9                                | 11.3  |
|   | @ 18.0 GHz                           | 22.7                                 | 8.1                                 | 8.4   |
|   | @ 26.5 GHz                           | 18.5                                 | 6.6                                 | 6.9   |
|   | @ 40.0 GHz                           | 14.8                                 | 5.4                                 | 5.5   |
|   | @ 50.0 GHz                           | 13.1                                 | 4.8                                 | 4.9   |
|   | @ 65.0 GHz                           | -                                    | -                                   | 4.3   |
|   | @ 90.0 GHz                           | -                                    | -                                   | 3.6   |

| CarlisleIT Description  | UT-085B-SS                           | UT-141-SS                            | UT-141B-SS                           |       |
|---|--------------------------------------|--------------------------------------|--------------------------------------|-------|
| <b>Dimensions</b>   |                                      |                                      |                                      |       |
| Outer Conductor Diameter<br>(+0.001 inch for tin plate) <i>in (mm)</i>    | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.141 ± 0.001<br>(3.581 ± 0.025)     |       |
| Center Conductor Diameter <i>in (mm)</i>                                  | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0359 ± 0.0010<br>(0.9119 ± 0.0254) | 0.0362 ± 0.0007<br>(0.9195 ± 0.0178) |       |
| Maximum Straight Length <i>ft (m)</i>                                     | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            |       |
| <b>Materials</b>  |                                      |                                      |                                      |       |
| Outer Conductor   | 304 SS                               | 304 SS                               | 304 SS                               |       |
| Outer Conductor Plating   | None                                 | None                                 | None                                 |       |
| Dielectric  | PTFE                                 | PTFE                                 | PTFE                                 |       |
| Center Conductor  | SP BeCu                              | SP BeCu                              | SP BeCu                              |       |
| RoHS-Compliant  | Yes                                  | Yes                                  | Yes                                  |       |
| <b>Mechanical Characteristics</b>   |                                      |                                      |                                      |       |
| Outer Conductor Integrity Temperature                                     | 225 °C                               | 225 °C                               | 225 °C                               |       |
| Maximum Operating Temperature   | 200 °C                               | 200 °C                               | 200 °C                               |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                                 | 0.25<br>(6.35)                       | 0.25<br>(6.35)                       | 0.5<br>(12.7)                        |       |
| Weight <i>lbs/ft (kg/m)</i>   | 1.31/100<br>(1.97/100)               | 3.05/100<br>(4.58/100)               | 3.06/100<br>(4.59/100)               |       |
| <b>Electrical Characteristics</b>   |                                      |                                      |                                      |       |
| Characteristic Impedance $\Omega$   | 50.0 ± 1.5                           | 50.0 ± 1.0                           | 50.0 ± 1.0                           |       |
| Capacitance <i>pF/ft (pF/m)</i>   | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       | 29.0<br>(95.2)                       |       |
| Velocity of Propagation   | 70%                                  | 70%                                  | 70%                                  |       |
| Corona Extinction Voltage @ 60 Hz   | 1900 VRMS                            | 1900 VRMS                            | 1900 VRMS                            |       |
| Voltage Withstanding @ 60 Hz  | 5400 VRMS                            | 9600 VRMS                            | 9600 VRMS                            |       |
| Higher Order Mode Frequency   | 61 GHz                               | 34 GHz                               | 34 GHz                               |       |
| Attenuation<br>(dB/100 ft, Typical)                                       | @ 0.5 GHz                            | 31.2                                 | 17.7                                 | 17.8  |
|   | @ 1.0 GHz                            | 44.4                                 | 25.3                                 | 25.4  |
|   | @ 5.0 GHz                            | 101.5                                | 58.9                                 | 59.2  |
|   | @ 10.0 GHz                           | 146.0                                | 85.8                                 | 86.1  |
|   | @ 18.0 GHz                           | 199.7                                | 118.9                                | 119.4 |
|   | @ 26.5 GHz                           | 246.2                                | 148.2                                | 148.7 |
|   | @ 40.0 GHz                           | 308.7                                | -                                    | -     |
|   | @ 50.0 GHz                           | 349.5                                | -                                    | -     |
| Power<br>(Watts CW @ 20 °C,<br>Maximum for non-plated<br>outer conductor) | @ 0.5 GHz                            | 142.7                                | 347.1                                | 346.2 |
|   | @ 1.0 GHz                            | 100.5                                | 243.6                                | 243.1 |
|   | @ 5.0 GHz                            | 44.2                                 | 105.7                                | 105.5 |
|   | @ 10.0 GHz                           | 30.9                                 | 73.1                                 | 73.0  |
|   | @ 18.0 GHz                           | 22.7                                 | 53.1                                 | 53.0  |
|   | @ 26.5 GHz                           | 18.5                                 | 42.9                                 | 42.8  |
|   | @ 40.0 GHz                           | 14.8                                 | -                                    | -     |
|   | @ 50.0 GHz                           | 13.1                                 | -                                    | -     |
| @ 65.0 GHz  | -                                    | -                                    | -                                    |       |
| @ 90.0 GHz  | -                                    | -                                    | -                                    |       |

# Semi-Rigid Coaxial Cable Cont'd.

## Non-50 Ω

Our ODD impedance semi-rigid cables are the right solution for any impedance matching requirement and are available with impedances from 10 to 100 Ω and diameters from 0.020" to 0.250".

| CarlisleIT Description  | UT-034C-10                           | UT-043C-10                           | UT-070C-10                           | UT-075C-10                           | UT-044-12                            |          |
|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|----------|
| CarlisleIT Description (Tin-Plated)                                       | UT-034C-10-TP                        | UT-043C-10-TP                        | UT-070C-10-TP                        | UT-075C-10-TP                        | UT-044-12-TP                         |          |
| <b>Dimensions</b>   |                                      |                                      |                                      |                                      |                                      |          |
| Outer Conductor Diameter <i>in (mm)</i>                                   | 0.034 ± 0.001<br>(0.864 ± 0.025)     | 0.043 ± 0.001<br>(1.092 ± 0.025)     | 0.070 ± 0.001<br>(1.778 ± 0.025)     | 0.075 ± 0.001<br>(1.905 ± 0.025)     | 0.044 ± 0.002<br>(1.118 ± 0.051)     |          |
| Center Conductor Diameter <i>in (mm)</i>                                  | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0285 ± 0.0005<br>(0.7239 ± 0.0127) | 0.0403 ± 0.0005<br>(1.0236 ± 0.0127) | 0.0453 ± 0.0010<br>(1.1506 ± 0.0254) | 0.0226 ± 0.0005<br>(0.5740 ± 0.0127) |          |
| Maximum Straight Length <i>ft (m)</i>                                     | 15 (4.57)                            | 15 (4.57)                            | 20 (6.10)                            | 20 (6.10)                            | 15 (4.57)                            |          |
| <b>Materials</b>  |                                      |                                      |                                      |                                      |                                      |          |
| Outer Conductor   | Copper                               | Copper                               | Copper                               | Copper                               | Copper                               |          |
| Outer Conductor Plating   | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          |          |
| Dielectric  | PFA                                  | PFA                                  | PFA                                  | PFA                                  | PFA                                  |          |
| Center Conductor  | SPC                                  | SPC                                  | SPC                                  | SPC                                  | SPCW                                 |          |
| RoHS-Compliant  | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes                                  |          |
| <b>Mechanical Characteristics</b>   |                                      |                                      |                                      |                                      |                                      |          |
| Outer Conductor Integrity Temperature                                     | 175 °C                               | 175 °C                               | 200 °C                               | 225 °C                               | 225 °C                               |          |
| Maximum Operating Temperature   | 150 °C                               | 150 °C                               | 175 °C                               | 200 °C                               | 200 °C                               |          |
| Minimum Inside Bend Radius <i>in (mm)</i>                                 | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     |          |
| Weight <i>lbs/ft (kg/m)</i>   | 0.32/100<br>(0.48/100)               | 0.47/100<br>(0.71/100)               | 1.35/100<br>(2.03/100)               | 1.50/100<br>(2.25/100)               | 0.51/100<br>(0.77/100)               |          |
| <b>Electrical Characteristics</b>   |                                      |                                      |                                      |                                      |                                      |          |
| Characteristic Impedance Ω  | 10.0 ± 1.5                           | 10.0 ± 1.5                           | 10.0 ± 2.0                           | 10.0 ± 1.0                           | 12.0 ± 2.0                           |          |
| Capacitance <i>pF/ft (pF/m)</i>   | 145.1<br>(476.0)                     | 145.1<br>(476.0)                     | 145.1<br>(476.0)                     | 145.1<br>(476.0)                     | 120.9<br>(396.6)                     |          |
| Velocity of Propagation   | 70%                                  | 70%                                  | 70%                                  | 70%                                  | 70%                                  |          |
| Corona Extinction Voltage   | @ 60 Hz                              | 200 VRMS                             | 200 VRMS                             | 500 VRMS                             | 500 VRMS                             | 150 VRMS |
| Voltage Withstanding  | @ 60 Hz                              | 600 VRMS                             | 900 VRMS                             | 1200 VRMS                            | 1500 VRMS                            | 900 VRMS |
| Higher Order Mode Frequency   | 117 GHz                              | 82 GHz                               | 58 GHz                               | 51 GHz                               | 100 GHz                              |          |
| Attenuation<br>(dB/100 ft, Typical)                                       | @ 0.5 GHz                            | 100.2                                | 65.7                                 | 50.7                                 | 42.2                                 | 66.9     |
|   | @ 1.0 GHz                            | 142.0                                | 93.2                                 | 72.0                                 | 59.9                                 | 94.9     |
|   | @ 5.0 GHz                            | 320.3                                | 211.3                                | 163.3                                | 136.2                                | 215.0    |
|   | @ 10.0 GHz                           | 456.0                                | 301.9                                | 233.4                                | 195.1                                | 307.1    |
|   | @ 18.0 GHz                           | 616.6                                | 409.8                                | 316.9                                | 265.6                                | 416.7    |
|   | @ 26.5 GHz                           | 752.9                                | 502.0                                | 388.4                                | 326.1                                | 510.5    |
|   | @ 40.0 GHz                           | 932.8                                | 624.5                                | 483.4                                | 406.8                                | 634.9    |
|   | @ 50.0 GHz                           | 1,048.4                              | 703.7                                | 544.8                                | 459.2                                | 715.3    |
| Power<br>(Watts CW @ 20 °C,<br>Maximum for non-plated<br>outer conductor) | @ 0.5 GHz                            | 15.0                                 | 27.6                                 | 43.2                                 | 55.0                                 | 27.6     |
|   | @ 1.0 GHz                            | 10.6                                 | 19.5                                 | 30.5                                 | 38.8                                 | 19.5     |
|   | @ 5.0 GHz                            | 4.7                                  | 8.6                                  | 13.5                                 | 17.1                                 | 8.6      |
|   | @ 10.0 GHz                           | 3.3                                  | 6.0                                  | 9.5                                  | 12.0                                 | 6.0      |
|   | @ 18.0 GHz                           | 2.4                                  | 4.5                                  | 7.0                                  | 8.8                                  | 4.5      |
|   | @ 26.5 GHz                           | 2.0                                  | 3.6                                  | 5.7                                  | 7.2                                  | 3.7      |
|   | @ 40.0 GHz                           | 1.6                                  | 2.9                                  | 4.6                                  | 5.8                                  | 2.9      |
|   | @ 50.0 GHz                           | 1.4                                  | 2.6                                  | 4.1                                  | 5.1                                  | 2.6      |
| @ 65.0 GHz  | 1.3                                  | 2.3                                  | -                                    | -                                    | 2.3                                  |          |
| @ 90.0 GHz  | 1.1                                  | -                                    | -                                    | -                                    | 1.9                                  |          |



| CarlisleIT Description  | UT-020-13                            | UT-085C-15                           | UT-141C-15                           | UT-034C-17                           | UT-062-18                            |           |
|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-----------|
| CarlisleIT Description (Tin-Plated)                                       | UT-020-13-TP                         | UT-085C-15-TP                        | UT-141C-15-TP                        | UT-034C-17-TP                        | UT-062-18-TP                         |           |
| <b>Dimensions</b>   |                                      |                                      |                                      |                                      |                                      |           |
| Outer Conductor Diameter <i>in (mm)</i>                                   | 0.023 ± 0.001<br>(0.584 ± 0.025)     | 0.0865 ± 0.0010<br>(2.197 ± 0.025)   | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.034 ± 0.001<br>(0.864 ± 0.025)     | 0.062 ± 0.001<br>(1.575 ± 0.025)     |           |
| Center Conductor Diameter <i>in (mm)</i>                                  | 0.0126 ± 0.0005<br>(0.3200 ± 0.0127) | 0.0453 ± 0.0005<br>(1.1506 ± 0.0127) | 0.0800 ± 0.0010<br>(2.0320 ± 0.0254) | 0.0159 ± 0.0005<br>(0.4039 ± 0.0127) | 0.0320 ± 0.0005<br>(0.8128 ± 0.0127) |           |
| Maximum Straight Length <i>ft (m)</i>                                     | 10 (3.05)                            | 20 (6.10)                            | 20 (6.10)                            | 15 (4.57)                            | 20 (6.10)                            |           |
| <b>Materials</b>  |                                      |                                      |                                      |                                      |                                      |           |
| Outer Conductor   | Copper                               | Copper                               | Copper                               | Copper                               | Copper                               |           |
| Outer Conductor Plating   | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          |           |
| Dielectric  | PTFE                                 | PFA                                  | PTFE                                 | PTFE                                 | PTFE                                 |           |
| Center Conductor  | SPCW                                 | SPC                                  | SPC                                  | SPC                                  | SPCW                                 |           |
| RoHS-Compliant  | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes                                  |           |
| <b>Mechanical Characteristics</b>   |                                      |                                      |                                      |                                      |                                      |           |
| Outer Conductor Integrity Temperature                                     | 125 °C                               | 150 °C                               | 175 °C                               | 175 °C                               | 150 °C                               |           |
| Maximum Operating Temperature   | 100 °C                               | 125 °C                               | 150 °C                               | 150 °C                               | 125 °C                               |           |
| Minimum Inside Bend Radius <i>in (mm)</i>                                 | 0.05<br>(1.27)                       | 0.25<br>(6.35)                       | 0.188<br>(4.775)                     | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     |           |
| Weight <i>lbs/ft (kg/m)</i>   | 0.13/100<br>(0.20/100)               | 1.83/100<br>(2.75/100)               | 4.74/100<br>(7.12/100)               | 0.28/100<br>(0.42/100)               | 0.87/100<br>(1.31/100)               |           |
| <b>Electrical Characteristics</b>   |                                      |                                      |                                      |                                      |                                      |           |
| Characteristic Impedance $\Omega$   | 13.0 ± 3.0                           | 15.0 ± 1.0                           | 15.0 ± 1.0                           | 17.0 ± 1.0                           | 18.0 ± 2.0                           |           |
| Capacitance <i>pF/ft (pF/m)</i>   | 111.6<br>(366.1)                     | 96.7<br>(317.3)                      | 96.7<br>(317.3)                      | 85.3<br>(280.0)                      | 80.6<br>(264.4)                      |           |
| Velocity of Propagation   | 70%                                  | 70%                                  | 70%                                  | 70%                                  | 70%                                  |           |
| Corona Exinction Voltage  | @ 60 Hz                              | 150 VRMS                             | 850 VRMS                             | 750 VRMS                             | 200 VRMS                             | 1100 VRMS |
| Voltage Withstanding  | @ 60 Hz                              | 60 VRMS                              | 2400 VRMS                            | 3900 VRMS                            | 1200 VRMS                            | 2100 VRMS |
| Higher Order Mode Frequency   |                                      | 178 GHz                              | 47 GHz                               | 27 GHz                               | 129 GHz                              | 65 GHz    |
| Attenuation<br>(dB/100 ft, Typical)                                       | @ 0.5 GHz                            | 112.2                                | 24.4                                 | 15.0                                 | 55.5                                 | 29.8      |
|   | @ 1.0 GHz                            | 158.9                                | 34.7                                 | 21.4                                 | 78.7                                 | 42.4      |
|   | @ 5.0 GHz                            | 357.5                                | 79.9                                 | 50.2                                 | 178.3                                | 97.0      |
|   | @ 10.0 GHz                           | 508.0                                | 115.5                                | 73.4                                 | 254.6                                | 139.6     |
|   | @ 18.0 GHz                           | 685.4                                | 158.7                                | 102.2                                | 345.4                                | 191.1     |
|   | @ 26.5 GHz                           | 835.5                                | 196.4                                | 127.9                                | 422.9                                | 235.8     |
|   | @ 40.0 GHz                           | 1,032.7                              | 247.5                                | -                                    | 525.8                                | 295.9     |
|   | @ 50.0 GHz                           | 1,159.0                              | -                                    | -                                    | 592.2                                | 335.2     |
| Power<br>(Watts CW @ 20 °C,<br>Maximum for non-plated<br>outer conductor) | @ 0.5 GHz                            | 6.2                                  | 106.9                                | 320.6                                | 27.0                                 | 66.7      |
|   | @ 1.0 GHz                            | 4.4                                  | 75.2                                 | 224.7                                | 19.0                                 | 46.9      |
|   | @ 5.0 GHz                            | 2.0                                  | 32.8                                 | 96.8                                 | 8.4                                  | 20.6      |
|   | @ 10.0 GHz                           | 1.4                                  | 22.8                                 | 66.6                                 | 5.9                                  | 14.3      |
|   | @ 18.0 GHz                           | 1.0                                  | 16.7                                 | 48.2                                 | 4.4                                  | 10.5      |
|   | @ 26.5 GHz                           | 0.8                                  | 13.5                                 | 38.7                                 | 3.6                                  | 8.6       |
|   | @ 40.0 GHz                           | 0.7                                  | 10.8                                 | -                                    | 2.9                                  | 6.8       |
|   | @ 50.0 GHz                           | 0.6                                  | -                                    | -                                    | 2.6                                  | 6.1       |
| @ 65.0 GHz  | 0.5                                  | -                                    | -                                    | 2.2                                  | 5.2                                  |           |
| @ 90.0 GHz  | 0.4                                  | -                                    | -                                    | 1.9                                  | -                                    |           |

# Semi-Rigid Coaxial Cable Cont'd.

## Non-50 Ω

| CarlisleIT Description  | UT-062C-18                           | UT-034-25                            | UT-038C-25                           | UT-070C-25                           |       |
|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------|
| CarlisleIT Description (Tin-Plated)                                       | UT-062C-18-TP                        | UT-034-25-TP                         | UT-038C-25-TP                        | UT-070C-25-TP                        |       |
| <b>Dimensions</b>   |                                      |                                      |                                      |                                      |       |
| Outer Conductor Diameter <i>in (mm)</i>                                   | 0.062 ± 0.001<br>(1.575 ± 0.025)     | 0.034 ± 0.001<br>(0.864 ± 0.025)     | 0.038 ± 0.002<br>(0.965 ± 0.051)     | 0.070 ± 0.001<br>(1.778 ± 0.025)     |       |
| Center Conductor Diameter <i>in (mm)</i>                                  | 0.0320 ± 0.0005<br>(0.8128 ± 0.0127) | 0.0126 ± 0.0005<br>(0.3200 ± 0.0127) | 0.0159 ± 0.0005<br>(0.4039 ± 0.0127) | 0.0314 ± 0.0005<br>(0.7976 ± 0.0127) |       |
| Maximum Straight Length <i>ft (m)</i>                                     | 20 (6.10)                            | 15 (4.57)                            | 15 (4.57)                            | 20 (6.10)                            |       |
| <b>Materials</b>  |                                      |                                      |                                      |                                      |       |
| Outer Conductor   | Copper                               | Copper                               | Copper                               | Copper                               |       |
| Outer Conductor Plating   | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          |       |
| Dielectric  | PTFE                                 | PTFE                                 | PTFE                                 | PFA                                  |       |
| Center Conductor  | SPC                                  | SPCW                                 | SPC                                  | SPC                                  |       |
| RoHS-Compliant  | Yes                                  | Yes                                  | Yes                                  | Yes                                  |       |
| <b>Mechanical Characteristics</b>   |                                      |                                      |                                      |                                      |       |
| Outer Conductor Integrity Temperature                                     | 150 °C                               | 175 °C                               | 175 °C                               | 150 °C                               |       |
| Maximum Operating Temperature   | 125 °C                               | 150 °C                               | 150 °C                               | 125 °C                               |       |
| Minimum Inside Bend Radius  | 0.125<br>(3.175)                     | 0.05<br>(1.27)                       | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     |       |
| Weight <i>lbs/ft (kg/m)</i>   | 0.89/100<br>(1.34/100)               | 0.28/100<br>(0.42/100)               | 0.33/100<br>(0.50/100)               | 1.04/100<br>(1.56/100)               |       |
| <b>Electrical Characteristics</b>   |                                      |                                      |                                      |                                      |       |
| Characteristic Impedance Ω  | 18.0 ± 2.0                           | 25.0 ± 2.0                           | 25.0 ± 3.0                           | 25.0 ± 1.5                           |       |
| Capacitance <i>pF/ft (pF/m)</i>   | 80.6<br>(264.4)                      | 58.0<br>(190.4)                      | 58.0<br>(190.4)                      | 58.0<br>(190.4)                      |       |
| Velocity of Propagation   | 70%                                  | 70%                                  | 70%                                  | 70%                                  |       |
| Corona Extinction Voltage @ 60 Hz   | 1100 VRMS                            | 200 VRMS                             | 200 VRMS                             | 1500 VRMS                            |       |
| Voltage Withstanding @ 60 Hz  | 2100 VRMS                            | 1200 VRMS                            | 1500 VRMS                            | 3000 VRMS                            |       |
| Higher Order Mode Frequency   | 65 GHz                               | 148 GHz                              | 120 GHz                              | 60 GHz                               |       |
| Attenuation<br>(dB/100 ft, Typical)                                       | @ 0.5 GHz                            | 29.8                                 | 49.9                                 | 42.6                                 | 21.2  |
|   | @ 1.0 GHz                            | 42.4                                 | 70.7                                 | 60.5                                 | 30.3  |
|   | @ 5.0 GHz                            | 97.0                                 | 160.5                                | 137.6                                | 70.0  |
|   | @ 10.0 GHz                           | 139.6                                | 229.4                                | 197.1                                | 101.4 |
|   | @ 18.0 GHz                           | 191.1                                | 311.6                                | 268.2                                | 139.8 |
|   | @ 26.5 GHz                           | 235.8                                | 382.0                                | 329.3                                | 173.5 |
|   | @ 40.0 GHz                           | 295.9                                | 475.5                                | 410.7                                | 219.4 |
|   | @ 50.0 GHz                           | 335.2                                | 536.0                                | 463.6                                | 249.7 |
| Power<br>(Watts CW @ 20 °C,<br>Maximum for non-plated<br>outer conductor) | @ 0.5 GHz                            | 66.7                                 | 30.0                                 | 38.4                                 | 103.2 |
|   | @ 1.0 GHz                            | 46.9                                 | 21.2                                 | 27.1                                 | 72.5  |
|   | @ 5.0 GHz                            | 20.6                                 | 9.4                                  | 12.0                                 | 31.5  |
|   | @ 10.0 GHz                           | 14.3                                 | 6.6                                  | 8.4                                  | 21.9  |
|   | @ 18.0 GHz                           | 10.5                                 | 4.8                                  | 6.2                                  | 15.9  |
|   | @ 26.5 GHz                           | 8.6                                  | 4.0                                  | 5.0                                  | 12.9  |
|   | @ 40.0 GHz                           | 6.8                                  | 3.2                                  | 4.0                                  | 10.2  |
|   | @ 50.0 GHz                           | 6.1                                  | 2.8                                  | 3.6                                  | 9.0   |
|   | @ 65.0 GHz                           | 5.2                                  | 2.5                                  | 3.1                                  | -     |
|   | @ 90.0 GHz                           | -                                    | 2.1                                  | 2.6                                  | -     |

| CarlisleIT Description  | UT-090C-25                           | UT-141C-25                          | UT-064SS-SS-30                               | UT-047C-35                           | UT-090C-35                           |           |
|---|--------------------------------------|-------------------------------------|--|--------------------------------------|--------------------------------------|-----------|
| CarlisleIT Description (Tin-Plated)                                       | UT-090C-25-TP                        | UT-141C-25-TP                       | -  | UT-047C-35-TP                        | UT-090C-35-TP                        |           |
| <b>Dimensions</b>   |                                      |                                     |  |                                      |                                      |           |
| Outer Conductor Diameter <i>in (mm)</i>                                   | 0.090 ± 0.001<br>(2.286 ± 0.025)     | 0.141 ± 0.001<br>(3.581 ± 0.025)    | 0.064 +0.002/-0.001<br>(1.626 +0.051/-0.025) | 0.047 ± 0.001<br>(1.194 ± 0.025)     | 0.090 ± 0.001<br>(2.286 ± 0.025)     |           |
| Center Conductor Diameter <i>in (mm)</i>                                  | 0.0403 ± 0.0010<br>(1.0236 ± 0.0254) | 0.0640 ± 0.0010<br>(.6256 ± 0.0254) | 0.0201 ± 0.0010<br>(1.6256 ± 0.0254)         | 0.0159 ± 0.0005<br>(0.4039 ± 0.0127) | 0.0320 ± 0.0010<br>(0.8128 ± 0.0254) |           |
| Maximum Straight Length <i>ft (m)</i>                                     | 20 (6.10)                            | 20 (6.10)                           | 20 (6.10)                                    | 20 (6.10)                            | 20 (6.10)                            |           |
| <b>Materials</b>  |                                      |                                     |  |                                      |                                      |           |
| Outer Conductor   | Copper                               | Copper                              | 304 SS                                       | Copper                               | Copper                               |           |
| Outer Conductor Plating   | None or Tin                          | None or Tin                         | None   | None or Tin                          | None or Tin                          |           |
| Dielectric  | PFA                                  | PFA                                 | PTFE   | PTFE                                 | PTFE                                 |           |
| Center Conductor  | SPC                                  | SPCW                                | 304 SS                                       | SPC                                  | SPC                                  |           |
| RoHS-Compliant  | Yes                                  | Yes                                 | Yes  | Yes                                  | Yes                                  |           |
| <b>Mechanical Characteristics</b>   |                                      |                                     |  |                                      |                                      |           |
| Outer Conductor Integrity Temperature                                     | 175 °C                               | 175 °C                              | 225 °C                                       | 175 °C                               | 150 °C                               |           |
| Maximum Operating Temperature   | 125 °C                               | 125 °C                              | 200 °C                                       | 150 °C                               | 125 °C                               |           |
| Minimum Inside Bend Radius <i>in (mm)</i>                                 | 0.125<br>(3.175)                     | 0.188<br>(4.775)                    | 0.25<br>(6.35)                               | 0.125<br>(3.175)                     | 0.125<br>(3.175)                     |           |
| Weight <i>lbs/ft (kg/m)</i>   | 1.69/100<br>(2.54/100)               | 4.02/100<br>(6.04/100)              | 0.88/100<br>(1.31/100)                       | 0.43/100<br>(0.65/100)               | 1.51/100<br>(2.27/100)               |           |
| <b>Electrical Characteristics</b>   |                                      |                                     |  |                                      |                                      |           |
| Characteristic Impedance Ω  | 25.0 ± 1.0                           | 25.0 ± 1.0                          | 30.0 ± 4.0                                   | 35.0 ± 1.5                           | 35.0 ± 1.0                           |           |
| Capacitance <i>pF/ft (pF/m)</i>   | 58.0<br>(190.4)                      | 58.0<br>(190.4)                     | 48.4<br>(158.7)                              | 41.5<br>(136.0)                      | 41.5<br>(136.0)                      |           |
| Velocity of Propagation   | 70%                                  | 70%                                 | 70%  | 70%                                  | 70%                                  |           |
| Corona Extinction Voltage   | @ 60 Hz                              | 750 VRMS                            | 1000 VRMS                                    | 900 VRMS                             | 850 VRMS                             | 1500 VRMS |
| Voltage Withstanding  | @ 60 Hz                              | 3900 VRMS                           | 6300 VRMS                                    | 2700 VRMS                            | 2400 VRMS                            | 4800 VRMS |
| Higher Order Mode Frequency   |                                      | 46 GHz                              | 29 GHz                                       | 85 GHz                               | 100 GHz                              | 50 GHz    |
| Attenuation<br>(dB/100 ft, Typical)                                       | @ 0.5 GHz                            | 16.1                                | 10.1   | 161.7                                | 26.2                                 | 13.3      |
|   | @ 1.0 GHz                            | 23.0                                | 14.6   | 228.9                                | 37.3                                 | 19.1      |
|   | @ 5.0 GHz                            | 53.8                                | 38.8   | 514.1                                | 85.7                                 | 45.1      |
|   | @ 10.0 GHz                           | 78.5                                | 51.7   | 729.5                                | 123.6                                | 66.2      |
|   | @ 18.0 GHz                           | 109.2                               | 73.2   | 982.6                                | 169.7                                | 92.6      |
|   | @ 26.5 GHz                           | 136.3                               | 92.7   | 1196.1                               | 209.8                                | 116.2     |
|   | @ 40.0 GHz                           | 173.7                               | -  | 1475.7                               | 263.9                                | 148.9     |
|   | @ 50.0 GHz                           | -                                   | -  | 1654.3                               | 299.4                                | 170.9     |
| Power<br>(Watts CW @ 20 °C,<br>Maximum for non-plated<br>outer conductor) | @ 0.5 GHz                            | 205.1                               | 472.5  | 23.5                                 | 74.1                                 | 200.7     |
|   | @ 1.0 GHz                            | 143.8                               | 329.7  | 16.6                                 | 52.1                                 | 140.4     |
|   | @ 5.0 GHz                            | 62.1                                | 139.7  | 7.4                                  | 22.8                                 | 60.2      |
|   | @ 10.0 GHz                           | 42.8                                | 95.0   | 5.2                                  | 15.9                                 | 41.3      |
|   | @ 18.0 GHz                           | 31.0                                | 67.8   | 3.9                                  | 11.6                                 | 29.7      |
|   | @ 26.5 GHz                           | 25.0                                | 54.0   | 3.2                                  | 9.4                                  | 23.8      |
|   | @ 40.0 GHz                           | 19.7                                | -  | 2.6                                  | 7.5                                  | 18.7      |
|   | @ 50.0 GHz                           | -                                   | -  | 2.3                                  | 6.7                                  | 16.4      |
| @ 65.0 GHz  | -                                    | -                                   | 2.0  | 5.8                                  | -                                    |           |
| @ 90.0 GHz  | -                                    | -                                   | -  | 4.8                                  | -                                    |           |

# Semi-Rigid Coaxial Cable Cont'd.

## Non-50 Ω

| CarlisleIT Description  | UT-141C-35                           | UT-047-70                            | UT-141-70                            | UT-141C-70                           | UT-085-75                                    | UT-141-75                            |       |
|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--|--------------------------------------|-------|
| CarlisleIT Description (Tin Plated)                                       | UT-141C-35-TP                        | UT-047-70-TP                         | UT-141-70-TP                         | UT-141C-70-TP                        | UT-085-75-TP                                 | UT-141-75-TP                         |       |
| <b>Dimensions</b>   |                                      |                                      |                                      |                                      |  |                                      |       |
| Outer Conductor Diameter <i>in (mm)</i>                                   | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.047 ± 0.001<br>(1.194 ± 0.025)     | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.085 +0.002/-0.001<br>(2.159 +0.051/-0.025) | 0.141 ± 0.001<br>(3.581 ± 0.025)     |       |
| Center Conductor Diameter <i>in (mm)</i>                                  | 0.0508 ± 0.0010<br>(1.2903 ± 0.0254) | 0.0071 ± 0.0005<br>(0.1803 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0226 ± 0.0005<br>(0.5740 ± 0.0127) | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127)         | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) |       |
| Maximum Straight Length <i>ft (m)</i>                                     | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                                    | 20 (6.10)                            |       |
| <b>Materials</b>  |                                      |                                      |                                      |                                      |  |                                      |       |
| Outer Conductor   | Copper                               | Copper                               | Copper                               | Copper                               | Copper                                       | Copper                               |       |
| Outer Conductor Plating   | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                                  | None or Tin                          |       |
| Dielectric  | PTFE                                 | PTFE                                 | PTFE                                 | PTFE                                 | PTFE   | PTFE                                 |       |
| Center Conductor  | SPC                                  | SPCW                                 | SPCW                                 | SPC                                  | SPCW   | SPCW                                 |       |
| RoHS-Compliant  | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes  | Yes                                  |       |
| <b>Mechanical Characteristics</b>   |                                      |                                      |                                      |                                      |  |                                      |       |
| Outer Conductor Integrity Temperature                                     | 175 °C                               | 175 °C                               | 150 °C                               | 150 °C                               | 150 °C                                       | 175 °C                               |       |
| Maximum Operating Temperature   | 125 °C                               | 150 °C                               | 125 °C                               | 125 °C                               | 125 °C                                       | 125 °C                               |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                                 | 0.25<br>(6.35)                       | 0.05<br>(1.27)                       | 0.188<br>(4.775)                     | 0.188<br>(4.775)                     | 0.125<br>(3.175)                             | 0.075<br>(1.905)                     |       |
| Weight <i>lbs/ft (kg/m)</i>   | 3.66/100<br>(5.49/100)               | 0.37/100<br>(0.56/100)               | 3.87/100<br>(5.81/100)               | 3.13/100<br>(4.70/100)               | 1.25/100<br>(1.88/100)                       | 3.09/100<br>(4.64/100)               |       |
| <b>Electrical Characteristics</b>   |                                      |                                      |                                      |                                      |  |                                      |       |
| Characteristic Impedance Ω  | 35.0 ± 2.0                           | 70.0 ± 1.5                           | 70.0 ± 1.0                           | 70.0 ± 1.0                           | 75.0 ± 1.0                                   | 75.0 ± 1.5                           |       |
| Capacitance <i>pF/ft (pF/m)</i>   | 41.5<br>(136.0)                      | 20.7<br>(68.0)                       | 20.7<br>(68.0)                       | 20.7<br>(68.0)                       | 19.3<br>(63.5)                               | 19.3<br>(63.5)                       |       |
| Velocity of Propagation   | 70%                                  | 70%                                  | 70%                                  | 70%                                  | 70%  | 70%                                  |       |
| Corona Extinction Voltage   | @ 60 Hz<br>1500 VRMS                 | 1000 VRMS                            | 2000 VRMS                            | 1500 VRMS                            | 1200 VRMS                                    | 2000 VRMS                            |       |
| Voltage Withstanding  | @ 60 Hz<br>7800 VRMS                 | 3600 VRMS                            | 9600 VRMS                            | 11100 VRMS                           | 6600 VRMS                                    | 11400 VRMS                           |       |
| Higher Order Mode Frequency   | 31 GHz                               | 117 GHz                              | 43 GHz                               | 38 GHz                               | 67 GHz                                       | 38 GHz                               |       |
| Attenuation<br>(dB/100 ft, Typical)                                       | @ 0.5 GHz                            | 8.6                                  | 24.6                                 | 9.2                                  | 8.2  | 14.5                                 | 8.4   |
|   | @ 1.0 GHz                            | 12.4                                 | 35.0                                 | 13.3                                 | 11.8   | 20.7                                 | 12.1  |
|   | @ 5.0 GHz                            | 30.1                                 | 80.5                                 | 32.0                                 | 28.7   | 48.7                                 | 29.4  |
|   | @ 10.0 GHz                           | 45.0                                 | 116.2                                | 47.7                                 | 43.0   | 71.3                                 | 44.1  |
|   | @ 18.0 GHz                           | 64.1                                 | 159.8                                | 67.8                                 | 61.5   | 99.4                                 | 62.9  |
|   | @ 26.5 GHz                           | 81.7                                 | 197.7                                | 86.2                                 | 78.5   | 124.5                                | 80.2  |
|   | @ 40.0 GHz                           | -                                    | 249.1                                | 112.1                                | -  | 159.1                                | -     |
|   | @ 50.0 GHz                           | -                                    | 282.9                                | -                                    | -  | 182.3                                | -     |
| Power<br>(Watts CW @ 20 °C,<br>Maximum for non-plated<br>outer conductor) | @ 0.5 GHz                            | 552.5                                | 78.1                                 | 409.5                                | 463.2  | 144.0                                | 549.1 |
|   | @ 1.0 GHz                            | 384.6                                | 55.0                                 | 285.4                                | 322.2  | 100.8                                | 382.3 |
|   | @ 5.0 GHz                            | 161.5                                | 24.0                                 | 120.2                                | 134.7  | 43.4                                 | 160.6 |
|   | @ 10.0 GHz                           | 109.2                                | 16.7                                 | 81.5                                 | 90.9   | 29.8                                 | 108.6 |
|   | @ 18.0 GHz                           | 77.5                                 | 12.2                                 | 57.9                                 | 64.3   | 21.5                                 | 77.1  |
|   | @ 26.5 GHz                           | 61.3                                 | 9.9                                  | 46.0                                 | 50.8   | 17.3                                 | 61.0  |
|   | @ 40.0 GHz                           | -                                    | 7.9                                  | 35.7                                 | -  | 13.6                                 | -     |
|   | @ 50.0 GHz                           | -                                    | 7.0                                  | -                                    | -  | 11.9                                 | -     |
| @ 65.0 GHz  | -                                    | 6.0                                  | -                                    | -                                    | 10.2   | -                                    |       |
| @ 90.0 GHz  | -                                    | 5.0                                  | -                                    | -                                    | -  | -                                    |       |

| CarlisleIT Description  | UT-141C-75                           | UT-250-75                            | UT-085-93                            | UT-130-93                            | UT-034-95                            | UT-141-100                           |       |
|---|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------|
| CarlisleIT Description (Tin-Plated)                                       | UT-141C-75-TP                        | UT-250-75-TP                         | UT-085-93-TP                         | UT-130-93-TP                         | UT-034-95-TP                         | UT-141-100-TP                        |       |
| <b>Dimensions</b>   |                                      |                                      |                                      |                                      |                                      |                                      |       |
| Outer Conductor Diameter <i>in (mm)</i>                                   | 0.141 ± 0.001<br>(3.581 ± 0.025)     | 0.250 ± 0.001<br>(6.350 ± 0.025)     | 0.085 ± 0.001<br>(2.159 ± 0.025)     | 0.130 ± 0.001<br>(3.302 ± 0.025)     | 0.034 ± 0.001<br>(0.864 ± 0.025)     | 0.141 ± 0.001<br>(3.581 ± 0.025)     |       |
| Center Conductor Diameter <i>in (mm)</i>                                  | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0359 ± 0.0010<br>(0.9119 ± 0.0254) | 0.0080 ± 0.0005<br>(0.2032 ± 0.0127) | 0.0113 ± 0.0005<br>(0.2870 ± 0.0127) | 0.0028 ± 0.0005<br>(0.0711 ± 0.0127) | 0.0100 ± 0.0005<br>(0.2540 ± 0.0127) |       |
| Maximum Straight Length <i>ft (m)</i>                                     | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            | 20 (6.10)                            | 15 (6.10)                            | 20 (6.10)                            |       |
| <b>Materials</b>  |                                      |                                      |                                      |                                      |                                      |                                      |       |
| Outer Conductor   | Copper                               | Copper                               | Copper                               | Copper                               | Copper                               | Copper                               |       |
| Outer Conductor Plating   | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          | None or Tin                          |       |
| Dielectric  | PTFE                                 | PTFE                                 | PTFE                                 | PTFE                                 | PTFE                                 | PTFE                                 |       |
| Center Conductor  | SPC                                  | SPCW                                 | SPCW                                 | SPCW                                 | SPCW                                 | SPCW                                 |       |
| RoHS-Compliant  | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes                                  |       |
| <b>Mechanical Characteristics</b>   |                                      |                                      |                                      |                                      |                                      |                                      |       |
| Outer Conductor Integrity Temperature                                     | 175 °C                               | 150 °C                               | 150 °C                               | 175 °C                               | 150 °C                               | 150 °C                               |       |
| Maximum Operating Temperature   | 125 °C                               | 100 °C                               | 125 °C                               | 125 °C                               | 125 °C                               | 125 °C                               |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                                 | 0.25<br>(6.35)                       | 0.5<br>(12.7)                        | 0.125<br>(3.175)                     | 0.188<br>(4.775)                     | 0.05<br>(1.27)                       | 0.25<br>(6.35)                       |       |
| Weight <i>lbs/ft (kg/m)</i>   | 3.10/100<br>(4.65/100)               | 9.15/100<br>(13.74/100)              | 1.03/100<br>(1.55/100)               | 2.86/100<br>(4.29/100)               | 0.19/100<br>(0.29/100)               | 3.03/100<br>(4.55/100)               |       |
| <b>Electrical Characteristics</b>   |                                      |                                      |                                      |                                      |                                      |                                      |       |
| Characteristic Impedance $\Omega$   | 75.0 ± 1.5                           | 75.0 ± 1.5                           | 93.0 ± 2.0                           | 93.0 ± 1.5                           | 95.0 ± 4.0                           | 100.0 ± 4.0                          |       |
| Capacitance <i>pF/ft (pF/m)</i>   | 19.3<br>(63.5)                       | 19.3<br>(63.5)                       | 15.6<br>(51.2)                       | 15.6<br>(51.2)                       | 15.3<br>(50.1)                       | 14.5<br>(47.6)                       |       |
| Velocity of Propagation   | 70%                                  | 70%                                  | 70%                                  | 70%                                  | 70%                                  | 70%                                  |       |
| Corona Extinction Voltage @ 60 Hz   | 2000 VRMS                            | 3000 VRMS                            | 1200 VRMS                            | 1500 VRMS                            | 1000 VRMS                            | 1500 VRMS                            |       |
| Voltage Withstanding @ 60 Hz  | 11400 VRMS                           | 20700 VRMS                           | 7500 VRMS                            | 10800 VRMS                           | 2700 VRMS                            | 12600 VRMS                           |       |
| Higher Order Mode Frequency   | 38 GHz                               | 21 GHz                               | 65 GHz                               | 46 GHz                               | 177 GHz                              | 41 GHz                               |       |
| Attenuation<br>(dB/100 ft, Typical)                                       | @ 0.5 GHz                            | 8.4                                  | 4.8                                  | 15.6                                 | 11.2                                 | 42.5                                 | 11.1  |
|   | @ 1.0 GHz                            | 12.1                                 | 7.1                                  | 22.3                                 | 16.1                                 | 60.4                                 | 15.9  |
|   | @ 5.0 GHz                            | 29.4                                 | 18.1                                 | 52.2                                 | 38.2                                 | 137.4                                | 37.9  |
|   | @ 10.0 GHz                           | 44.1                                 | 28.1                                 | 76.3                                 | 56.4                                 | 196.7                                | 56.0  |
|   | @ 18.0 GHz                           | 62.9                                 | 41.4                                 | 106.1                                | 79.5                                 | 267.7                                | 79.0  |
|   | @ 26.5 GHz                           | 80.2                                 | -                                    | 132.6                                | 100.4                                | 328.7                                | 99.7  |
|   | @ 40.0 GHz                           | -                                    | -                                    | 169.2                                | 129.5                                | 410.1                                | 128.7 |
|   | @ 50.0 GHz                           | -                                    | -                                    | 193.5                                | -                                    | 462.8                                | -     |
|   | @ 65.0 GHz                           | -                                    | -                                    | 227.3                                | -                                    | 534.4                                | -     |
| Power<br>(Watts CW @ 20 °C,<br>Maximum for non-plated<br>outer conductor) | @ 0.5 GHz                            | 549.1                                | 1,234.0                              | 159.4                                | 380.6                                | 28.2                                 | 332.3 |
|   | @ 1.0 GHz                            | 382.3                                | 849.1                                | 111.8                                | 266.1                                | 19.9                                 | 232.2 |
|   | @ 5.0 GHz                            | 160.6                                | 341.0                                | 48.2                                 | 113.5                                | 8.8                                  | 98.9  |
|   | @ 10.0 GHz                           | 108.6                                | 224.0                                | 33.2                                 | 77.6                                 | 6.1                                  | 67.5  |
|   | @ 18.0 GHz                           | 77.1                                 | 154.2                                | 24.0                                 | 55.7                                 | 4.5                                  | 48.4  |
|   | @ 26.5 GHz                           | 61.0                                 | -                                    | 19.3                                 | 44.5                                 | 3.7                                  | 38.6  |
|   | @ 40.0 GHz                           | -                                    | -                                    | 15.3                                 | 34.9                                 | 3.0                                  | 30.2  |
|   | @ 50.0 GHz                           | -                                    | -                                    | 13.4                                 | -                                    | 2.6                                  | -     |
|   | @ 65.0 GHz                           | -                                    | -                                    | 11.5                                 | -                                    | 2.3                                  | -     |
| @ 90.0 GHz  | -                                    | -                                    | -                                    | -                                    | 1.9                                  | -                                    |       |

# Semi-Rigid Coaxial Cable Cont'd.

## Cable Preconditioning

[Per MIL-DTL-17]

The electromechanical performance specified for semi-rigid cables is achieved by a compression fit between the outer conductor and the dielectric core which, in turn, necessitates manufacturing processes that cause core deformation by compression and elongation. The resulting stress, which is initially nonuniform, tends to equalize by cold flow within a few weeks after manufacturing, and will cause the core to withdraw 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-conductor interface may cause VSWR increases. 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. Cable bending, which is usually involved with the manufacture of cable assemblies, tends to introduce nonuniform core stresses; therefore, CarlisleIT recommends preconditioning after bending 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 0.25" length on each cable end 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 and maintain for a minimum of one hour.
- » Step 2 — Return specimen to room-ambient temperature. Trim protruding core, if any, and flush with the edge of the outer conductor.
- » Step 3 — Maintain the specimen at room temperature for a minimum of one hour.
- » Step 4 — Cool the specimen to -45 °C and maintain for a minimum of one hour.
- » Step 5 — Return the specimen to room temperature and maintain for a minimum of one hour.

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

*Special preconditioning requirements can be obtained by consulting the engineering staff at CarlisleIT.*

## Phase vs. Temperature Characteristics

### 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 10X 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.

### Recommended Maximum Operating Temperature

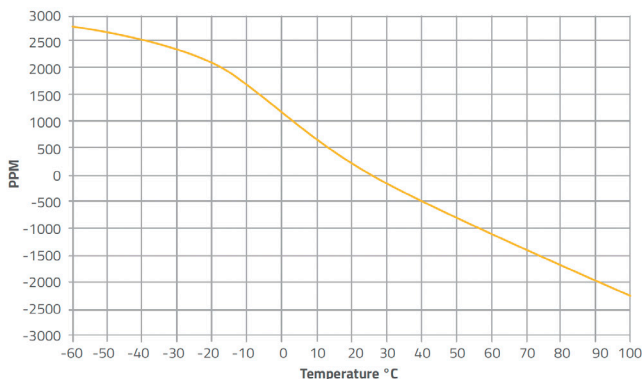
The first significant effect on cable characteristics occurs as the expansive forces on the core material exceed the yield strength of the outer conductor material, resulting in a permanent increase in impedance, and a permanent decrease in capacitance, core adhesion, and corona extinction potential. The temperature at which such changes begin is

the maximum recommended operating temperature. This has been determined by testing one-foot-long specimens until a discernible increase in outer conductor OD was measured on 30% of the number of test specimens.

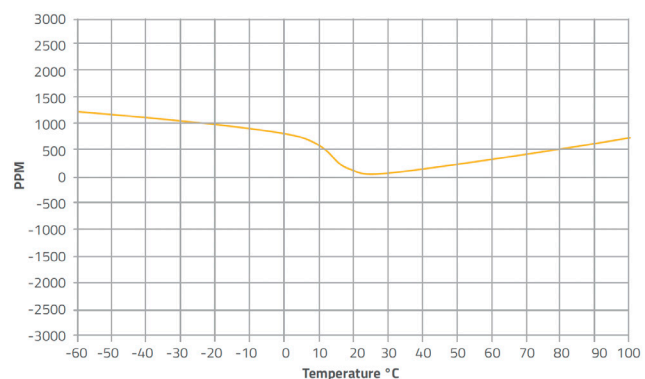
### Outer Conductor Integrity Test Temperature

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 the outer conductor integrity test temperature, which has been determined by testing two-foot-long specimens, with no failures allowed at the rated temperature. (For test details, refer to MIL-DTL-17.)

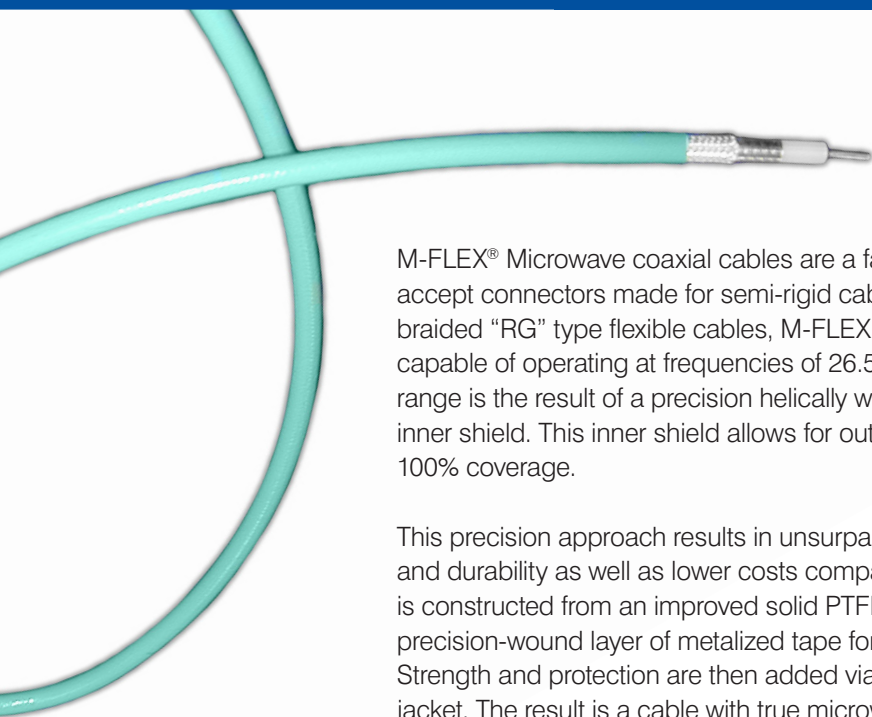
Typical Phase Change vs. Temperature Solid PTFE Cables



Typical Phase Change vs. Temperature Low Loss PTFE Cables



# M-FLEX® Flexible Cable



M-FLEX® Microwave coaxial cables are a family of flexible cables designed to accept connectors made for semi-rigid cable. Unlike other single- or double-braided “RG” type flexible cables, M-FLEX cables are true microwave cables capable of operating at frequencies of 26.5 GHz. The extended frequency range is the result of a precision helically wrapped silver-plated copper foil inner shield. This inner shield allows for outstanding flexibility while providing 100% coverage.

This precision approach results in unsurpassed improvements in shielding and durability as well as lower costs compared to similar products. M-FLEX is constructed from an improved solid PTFE dielectric core underneath a precision-wound layer of metalized tape for nearly ideal microwave shielding. Strength and protection are then added via a round wire braid and FEP outer jacket. The result is a cable with true microwave performance and excellent mechanical characteristics. M-FLEX is also easy to use since it strips with standard tools and accepts standard solder-on connectors designed for semi-rigid cable.

## Features & Benefits

### High Performance

- » Helical shield for improved loss and phase stability
- » Same line size as semi-rigid cable to optimize assembly loss and VSWR
- » RF shielding greater than 90 dB to minimize cross-talk and maximize system performance

### Easy to Use

- » Fully flexible for ease of installation
- » Uses standard machines for cutting and stripping with no added investment in time or equipment
- » Designed for standard solder-on connectors, which are readily available and easy to use

### Availability

- » Stock
- » Packaged on spools in lengths of 50' to 1000' to meet a wide variety of volume requirements
- » Metric lengths available for added flexibility
- » Low-smoke, zero-halogen jacket options to meet specific requirements
- » Preassembled with connectors upon request for added convenience



| CarlisleIT Description  | TGE055D                             | HFE100D                              | HFE160D                              |       |
|---|-------------------------------------|--------------------------------------|--------------------------------------|-------|
| <b>Dimensions</b>   |                                     |                                      |                                      |       |
| Cable Diameter <i>in (mm)</i>   | 0.055 ± 0.004<br>(1.397 ± 0.102)    | 0.100 ± 0.004<br>(2.540 ± 0.102)     | 0.160 ± 0.004<br>(4.064 ± 0.102)     |       |
| Outer Shell Diameter <i>in (mm)</i>                                       | 0.044 ± 0.003<br>(1.118 ± 0.076)    | 0.082 ± 0.003<br>(2.083 ± 0.076)     | 0.138 ± 0.003<br>(3.505 ± 0.076)     |       |
| Dielectric Diameter <i>in (mm)</i>  | 0.034 ± 0.001<br>(0.864 ± 0.025)    | 0.066 ± 0.002<br>(1.676 ± 0.051)     | 0.118 ± 0.002<br>(2.997 ± 0.051)     |       |
| Center Conductor Diameter <i>in (mm)</i>                                  | 0.0113 ± 0.0005<br>(0.287 ± 0.0127) | 0.0201 ± 0.0005<br>(0.5105 ± 0.0127) | 0.0359 ± 0.0005<br>(0.9119 ± 0.0127) |       |
| Maximum Continuous Length <i>ft(m)</i>                                    | 25 (7.6)                            | 25 (7.6)                             | 25 (7.6)                             |       |
| <b>Materials</b>  |                                     |                                      |                                      |       |
| Outer Jacket  | Blue PFA                            | Light Aqua FEP                       | Light Aqua FEP                       |       |
| Outer Shield  | SPC                                 | SPC                                  | SPC                                  |       |
| Inner Shield  | SPC                                 | SPC                                  | SPC                                  |       |
| Dielectric  | PTFE                                | PTFE                                 | PTFE                                 |       |
| Center Conductor  | SPCW                                | SPCW                                 | SPCW                                 |       |
| RoHS-Compliant  | Yes                                 | Yes                                  | Yes                                  |       |
| <b>Mechanical Characteristics</b>   |                                     |                                      |                                      |       |
| Temperature Range   | -65 °C to 125 °C                    | -65 °C to 125 °C                     | -65 °C to 125 °C                     |       |
| Minimum Inside Bend Radius <i>in (mm)</i>                                 | 0.125 (3.175)                       | 0.250 (6.35)                         | 0.500 (12.7)                         |       |
| Weight <i>lbs/ft (kg/m)</i>   | 0.35/100 (0.53/100)                 | 1.14/100 (1.71/100)                  | 2.90/100 (4.35/100)                  |       |
| <b>Electrical Characteristics</b>   |                                     |                                      |                                      |       |
| Characteristic Impedance $\Omega$   | 50                                  | 50                                   | 50                                   |       |
| Capacitance <i>pF/ft (pF/m)</i>   | 29 (95)                             | 29 (95)                              | 29 (95)                              |       |
| Velocity of Propagation   | 70%                                 | 70%                                  | 70%                                  |       |
| Shielding Effectiveness   | >70 dB                              | >90 dB                               | >90 dB                               |       |
| Maximum Voltage   | 1000 VRMS                           | 1500 VRMS                            | 1900 VRMS                            |       |
| Signal, Delay <i>ns/ft (ns/m)</i>   | 1.45 (4.76)                         | 1.45 (4.76)                          | 1.45 (4.76)                          |       |
| Frequency Range   | DC - 26.5 GHz                       | DC - 18 GHz                          | DC - 18 GHz                          |       |
| Attenuation<br>(dB/100 ft, Typical)                                       | @ 0.5 GHz                           | 25.9                                 | 13.4                                 | 7.6   |
|   | @ 1.0 GHz                           | 37.0                                 | 19.2                                 | 10.9  |
|   | @ 5.0 GHz                           | 84.8                                 | 45.2                                 | 26.8  |
|   | @ 10.0 GHz                          | 122.5                                | 66.4                                 | 40.4  |
|   | @ 18.0 GHz                          | 168.1                                | 92.9                                 | 58.0  |
| Power<br>(Watts CW @ 20 °C,<br>Maximum for non-plated<br>outer conductor) | @ 0.5 GHz                           | 98.1                                 | 307.6                                | 788.3 |
|   | @ 1.0 GHz                           | 59.0                                 | 215.5                                | 548.5 |
|   | @ 5.0 GHz                           | 30.2                                 | 92.7                                 | 229.8 |
|   | @ 10.0 GHz                          | 21.0                                 | 53.8                                 | 155.1 |
|   | @ 18.0 GHz                          | 15.4                                 | 46.0                                 | 109.8 |
|   | @ 26.5 GHz                          | 12.5                                 | 37.0                                 | 86.9  |



# Ordering & 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:*

### **Carlisle Interconnect Technologies**

206 Jones Boulevard  
Pottstown, PA 19464-3465

**Phone:** 610-495-0110

**Fax:** 610-495-6656

**Email:** [Pottstown.Sales@CarlisleIT.com](mailto:Pottstown.Sales@CarlisleIT.com)

**Web:** [CarlisleIT.com/Micro-Coax](http://CarlisleIT.com/Micro-Coax)

## Terms

Formal price quotations remain in effect for thirty (30) days unless otherwise agreed upon. Terms of payment are net thirty (30) days, subject to approval of credit. Estimated shipment is based on material availability and factory capacity at the time of quote and, as such, is subject to prior sale.

## Sample Policy

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

## 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.

## Shipments

Unless specific instructions accompany the order, shipment is made FOB Pottstown, PA. CarlisleIT will use its judgment as to the best method of shipment. CarlisleIT 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 (10) days after receipt of material from CarlisleIT.

## Return Policy

Please contact us for an RMA number before returning products. The RMA number should be referenced on the packing container and all associated paperwork.

## Nonrecurring Engineering Charges

Nonrecurring engineering charges, if any, reimburse CarlisleIT 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 the CarlisleIT plant or to have a 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 the order, CarlisleIT may dispose of said tools and fixtures as it sees fit.

# Equations & Symbols

## Characteristic Impedance

$$Z_0 = \frac{138}{\sqrt{\epsilon}} \cdot \log \left( \frac{D}{d} \right) (\Omega)$$

$$Z_0 = \frac{138}{\sqrt{\epsilon}} \cdot \log \left( \frac{D}{d} \right) (\Omega)$$

## Delay

English

$$T = 1.017 \cdot \sqrt{\epsilon} \text{ ns/ft}$$

$$L = \frac{0.984 \cdot T}{\sqrt{\epsilon}} \text{ ft}$$

Metric

$$T = 3.336 \cdot \sqrt{\epsilon} \text{ ns/m}$$

$$L = \frac{0.300 \cdot T}{\sqrt{\epsilon}} \text{ m}$$

## Cutoff Frequency

$$F_{co} = \frac{7.514}{\sqrt{\epsilon} \cdot (D+d)} \text{ GHz}$$

## Velocity of Propagation

$$VP = \frac{1}{\sqrt{\epsilon}} \cdot 100 \text{ \% of Free Space Velocity}$$

## Cable Rise Time (10% to 90% Amplitude)

$$T_r = 1.315 \cdot A^2 \cdot L^2 \cdot 10^{-2} \text{ ps}$$

## Attenuation (Theoretical) at 20 °C

$$\alpha = \frac{0.434 \cdot \sqrt{f}}{Z_0} \left( \frac{\sqrt{R_1}}{d} + \frac{\sqrt{R_2}}{D} \right) + 2.78 \cdot f \cdot \sqrt{\epsilon} \cdot F_p \text{ dB/100 ft}$$

## Symbol Key

|            |                                     |       |  |
|------------|-------------------------------------|-------|--|
| $\alpha$   | Attenuation                         | $L$   | Length   |
| $A$        | Attenuation in db/100 feet at 1 GHz | $ps$  | Picoseconds                                      |
| $d$        | Center conductor diameter, inches   | $R_1$ | Ratio of center conductor conductivity to copper |
| $D$        | Dielectric diameter, inches         | $R_2$ | Ratio of outer conductor conductivity to copper  |
| $\epsilon$ | Dielectric constant                 | $T$   | Time in nanoseconds (ns)                         |
| $f$        | Frequency in MHz                    | $T_r$ | Rise time in picoseconds (ps)                    |
| $f_{co}$   | Cutoff frequency in GHz             | $VP$  | Velocity of propagation                          |
| $F_p$      | Dielectric power factor             | $Z_0$ | Characteristics impedance                        |

## Cable Rise Time (10% to 90% Amplitude)



EAST  
COAST  
MICROWAVE  

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