


# High Power RF Cables, Connectors & Assemblies



- Semi-Conductor Manufacturing Equipment
- Flat Panel Manufacturing Equipment
- Solar Panel Manufacturing Equipment
- High Power Lasers
- High Power Radars
- TV/FM Broadcast
- Magnetic Resonance Imaging
- Other High Power RF Applications

 **TIMES**  
MICROWAVE SYSTEMS  
An Amphenol Company

## High Power Coaxial Cable, Connectors & Assemblies

Times offers a broad range of cables, connectors and assemblies for high power RF transmission. Applications such as magnetic resonance imaging (MRI), semi-conductor manufacturing equipment, flat panel manufacturing equipment, broadcast and high power lasers and radar each have their own electrical and mechanical requirements. With our broad range of solutions and capability of producing custom cables and connectors, Times is uniquely positioned to help with all of your high power RF transmission applications.

Although Times Microwave Systems is known for providing precision cable assemblies for microwave applications up to 40 GHz, we are also the leading provider of cables and assemblies for high power, low frequency applications. Our broad range of manufacturing capabilities enables us to offer rugged, flexible cables and cable assemblies, that can operate in high ambient temperatures and provide environmental resistance, while handling both high average and peak powers. Constructions are available to meet requirements for low loss, high RF shielding, and low VSWR.

Since each application requires a different set of performance characteristics, having a wide range of cables to choose from allows the trade-offs to be considered and the best cable for the application to be chosen. We produce cables with dielectrics of solid PE and PTFE, foam PE and expanded PTFE; outer conductors of round wire, flat wire and composite constructions; and jackets of PE, FEP, PVC, Urethane, Nomex®, Kapton® and other materials.

## Connector Selection

At the relatively low frequencies and high powers typically encountered in these applications, considerations for the best interface selection are very different than in microwave applications. Impedance uniformity through the interface is not as critical, but high contact forces, low contact resistance and a large interface diameter are very important. From a performance point of view, EIA flange connectors are the ideal choice with their bolt-together outer contacts and inside spring finger center-contacts. Their disadvantages include large size, high cost and time-consuming installation. Other good choices include LC's and 7/16 DIN's. Frequently, the equipment being connected to dictates the interface. Some interfaces that Times Microwave Systems provide include:

- C
- N
- HN
- 7-16 DIN
- 1-5/8" EIA
- Proprietary LC quick disconnect interface
- SC
- QDS
- LC
- 7/8" EIA
- 3-1/8" EIA

## Cable Assemblies

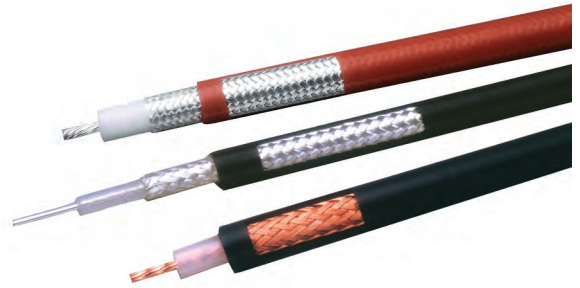
Our capability to manufacture cables and connectors and our expertise in assembling and testing them enable us to design custom cable assemblies for your application. Built to exacting standards, we design our cable assemblies for reliability in the most extreme operating conditions. Assemblies can be matched in phase length or supplied in specific electrical lengths with customer required markings added. Complete test data on VSWR, insertion loss, corona and other parameters can be provided as required.



# HP Cables

## Cable Feature:

|                        |           |
|------------------------|-----------|
| Flexibility            | Very Good |
| Cost                   | High      |
| Attenuation            | Medium    |
| Power Handling         | Very High |
| Temperature            | High      |
| Connector Availability | Good      |



|   | HP-393        | HP-226        | HP-600A       | HP-218        | HP-900        | HP-1200       |
|---|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>AA Drawing Number</b>  | AA-9963       | AA-9021       | AA-11441      | AA-9290       | AA-11229      | AA-11419      |
| <b>Part Number</b>  | 510-0019      | 51848         | 510-0070      | 51928         | 54262         | 54359         |
| <b>Physical Specifications</b>                                  |               |               |               |               |               |               |
| Description   | in (mm)       | in (mm)       | in (mm)       | in (mm)       | in (mm)       | in (mm)       |
| Center Conductor  | SC            | SC            | SC            | SC            | BC Tube       | BC Tube       |
|   | 0.094 (2.39)  | 0.126 (3.20)  | 0.152 (3.86)  | 0.230 (5.84)  | 0.227 (5.77)  | 0.308 (7.82)  |
| Dielectric  | PTFE          | PTFE          | PTFE          | PTFE          | PTFE          | PTFE          |
|   | 0.285 (7.24)  | 0.370 (9.40)  | 0.455 (11.56) | 0.680 (17.27) | 0.680 (17.27) | 0.920 (23.27) |
| Inner Shield  | TC            | TC            | TC            | TC            | MT            | APA           |
|   | 0.295 (7.49)  | 0.400 (10.13) | 0.488 (12.40) | 0.710 (18.11) | 0.686 (17.42) | 0.932 (23.67) |
| Interlayer  | /             | /             | /             | /             | /             | /             |
| Outer Shield  | TC            | TC            | TC            | TC            | TC            | TC            |
|   | 0.330 (8.38)  | 0.430 (10.87) | 0.520 (13.23) | 0.740 (18.95) | 0.732 (18.59) | 0.980 (24.89) |
| Jacket  | FEP           | FEP           | FEP           | Nomex/PTFE    | Nomex/Kapton  | PTFE          |
|   | 0.390 (9.91)  | 0.490 (12.32) | 0.590 (14.99) | 0.790 (19.94) | 0.775 (19.69) | 1.050 (26.67) |
| <b>Mechanical Specifications</b>                                |               |               |               |               |               |               |
| Bend Radius   | 2.0 (50.8)    | 5.0 (127.0)   | 2.8 (69.9)    | 8.0 (203.0)   | 4.0 (101.6)   | 8.0 (203.2)   |
| Weight  | 0.175 lb/ft   | 0.240 lb/ft   | 0.325 lb/ft   | 0.375 lb/ft   | 0.475 lb/ft   | 0.740 lb/ft   |
| Operating Temperature Range                                     | -55/+200 °C   | -55/+200 °C   | -55/+200 °C   | -55/+200 °C   | -55/+200 °C   | -40/+125 °C   |
| <b>Electrical Specifications</b>                                |               |               |               |               |               |               |
| Impedance   | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       |
| Shielding Effectiveness   | 60 dB         | 60 dB         | 60 dB         | 60 dB         | 90 dB         | 60 dB         |
| Dielectric Constant   | 1.98          | 1.98          | 1.98          | 1.73          | 1.73          | 1.73          |
| Velocity of Propagation   | 0.71          | 0.71          | 0.71          | 0.76          | 0.76          | 0.76          |
| Capacitance   | 28.6pF/ft     | 28.6pF/ft     | 29.0pF/ft     | 26.7pF/ft     | 26.7pF/ft     | 26.7pF/ft     |
| DC Voltage (kV)   | 1.875         | 6.9           | 8.3           | 9.45          | 9.45          | 12.5          |
| <b>Attenuation: dB/100ft (100m) (+25 °C Ambient; Sea Level)</b> |               |               |               |               |               |               |
| 13.56 MHz   | 0.76 (2.48)   | 0.61 (1.99)   | 0.50 (1.63)   | 0.34 (1.11)   | 0.21 (0.70)   | 0.16 (0.51)   |
| 50 MHz  | 1.48 (4.87)   | 1.18 (3.88)   | 0.98 (3.23)   | 0.66 (2.15)   | 0.41 (1.36)   | 0.31 (1.00)   |
| 100 MHz   | 2.14 (7.02)   | 1.70 (5.56)   | 1.43 (4.68)   | 0.93 (3.06)   | 0.59 (1.94)   | 0.44 (1.43)   |
| 1000 MHz  | 7.64 (25.07)  | 5.90 (19.34)  | 5.31 (17.43)  | 3.07 (10.08)  | 1.99 (6.54)   | 1.50 (4.93)   |
| 1500 MHz  | 9.72 (31.88)  | 7.44 (24.39)  | 6.83 (22.40)  | 3.81 (12.51)  | 2.49 (8.17)   | 1.89 (6.21)   |
| 2000 MHz  | 11.57 (37.95) | 8.80 (28.86)  | 8.20 (26.89)  | 4.45 (14.61)  | 2.92 (9.59)   | 2.23 (7.33)   |
| 2500 MHz  | 13.28 (43.56) | 10.04 (32.94) | 9.48 (31.08)  | 5.03 (16.49)  | 3.32 (10.88)  | 2.55 (8.35)   |
| 3000 MHz  | 14.89 (48.83) | 11.21 (36.75) | 10.69 (35.05) | 5.55 (18.22)  | 3.68 (12.08)  | 2.83 (9.30)   |
| K1  | 0.200595      | 0.161700      | 0.131000      | 0.091400      | 0.057220      | 0.041900      |
| K2  | 0.001300      | 0.000783      | 0.001170      | 0.000183      | 0.000183      | 0.000180      |
| <b>Power (Watts) (+25 °C Ambient; Sea Level)</b>                |               |               |               |               |               |               |
| 13.56 MHz   | 18401         | 27153         | 32938         | 66034         | 80110         | 126762        |
| 50 MHz  | 9389          | 13926         | 16674         | 34170         | 41284         | 65095         |
| 100 MHz   | 6526          | 9720          | 11513         | 24030         | 28932         | 45482         |
| 1000 MHz  | 1836          | 2809          | 3106          | 7306          | 8586          | 13225         |
| 1500 MHz  | 1447          | 2231          | 2421          | 5891          | 6872          | 10521         |
| 2000 MHz  | 1218          | 1889          | 2020          | 5049          | 5854          | 8919          |
| 2500 MHz  | 1064          | 1657          | 1750          | 4476          | 5162          | 7831          |
| 3000 MHz  | 951           | 1487          | 1554          | 4053          | 4653          | 7033          |

\* SC = Silver Plated Copper

\* BC = Bare Copper

\* TC = Tinned Copper

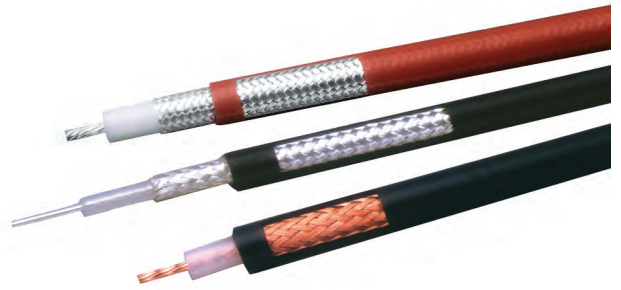
\* MT = Metallized Composite Tapes

Note: HP-393 is marked RG-393-NPP-SN

# HPL Cables

## Cable Feature:

|                        |             |
|------------------------|-------------|
| Flexibility            | Very Good   |
| Cost                   | Medium/High |
| Attenuation            | Medium      |
| Power Handling         | High        |
| Temperature            | Medium      |
| Connector Availability | Good        |



|   | HPL-393       | HPL-226       | HPL-600       | HPL-218       | HPL-1200      |
|---|---------------|---------------|---------------|---------------|---------------|
| <b>AA Drawing Number</b>  | AA-11461      | AA-11460      | AA-11458      | AA-11459      | AA-11475      |
| <b>Part Number</b>  | 510-0079      | 510-0078      | 510-0080      | 510-0077      | 54367         |
| <b>Physical Specifications</b>                                  |               |               |               |               |               |
| Description   | in (mm)       | in (mm)       | in (mm)       | in (mm)       | in (mm)       |
| Center Conductor  | Stranded BC   | Stranded BC   | Stranded BC   | Stranded BC   | Stranded BC   |
|   | 0.094 (2.39)  | 0.117 (2.97)  | 0.152 (3.86)  | 0.235 (5.97)  | 0.314 (7.98)  |
| Dielectric  | PTFE          | PTFE          | PTFE          | PTFE          | PTFE          |
|   | 0.285 (7.24)  | 0.370 (9.40)  | 0.455 (11.56) | 0.68 (17.27)  | 0.920 (23.37) |
| Inner Shield  | TC            | TC            | TC            | TC            | TC            |
|   | 0.314 (7.98)  | 0.400 (10.16) | 0.488 (12.40) | 0.714 (18.14) | 0.966 (24.54) |
| Interlayer  | /             | /             | /             | /             | /             |
| Outer Shield  | TC            | TC            | TC            | TC            | TC            |
|   | 0.340 (8.64)  | 0.427 (10.85) | 0.520 (13.21) | 0.745 (18.92) | 1.012 (25.70) |
| Jacket  | TPV           | TPV           | TPV           | TPV           | TPV           |
|   | 0.430 (10.92) | 0.515 (13.08) | 0.610 (15.49) | 0.845 (21.46) | 1.200 (30.48) |
| <b>Mechanical Specifications</b>                                |               |               |               |               |               |
| Bend Radius   | 2.3 (57.2)    | 2.8 (69.9)    | 3.0 (76.2)    | 4.3 (108.0)   | 9.0 (228.6)   |
| Weight  | 0.185 lb/ft   | 0.240 lb/ft   | 0.310 lb/ft   | 0.610 lb/ft   | 1.188 lb/ft   |
| Operating Temperature Range                                     | -55/+125 °C   | -55/+125 °C   | -55/+125 °C   | -55/+125 °C   | -55/+125 °C   |
| <b>Electrical Specifications</b>                                |               |               |               |               |               |
| Impedance   | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       |
| Shielding Effectiveness   | 60 dB         | 60 dB         | 60 dB         | 60 dB         | 60 dB         |
| Dielectric Constant   | 1.98          | 1.98          | 1.98          | 1.73          | 1.73          |
| Velocity of Propagation   | 0.71          | 0.71          | 0.71          | 0.76          | 0.76          |
| Capacitance   | 28.8pF/ft     | 28.8pF/ft     | 28.9pF/ft     | 26.8pF/ft     | 29.0pF/ft     |
| DC Voltage (kV)   | 5.1           | 6.4           | 8.3           | 9.45          | 12.5          |
| <b>Attenuation: dB/100ft (100m) (+25 °C Ambient; Sea Level)</b> |               |               |               |               |               |
| 13.56 MHz   | 0.84 (2.74)   | 0.59 (1.94)   | 0.51 (1.66)   | 0.29 (0.96)   | 0.25 (0.82)   |
| 50 MHz  | 1.62 (5.33)   | 1.15 (3.79)   | 1.00 (3.27)   | 0.56 (1.85)   | 0.48 (1.59)   |
| 100 MHz   | 2.32 (7.61)   | 1.65 (5.43)   | 1.45 (4.74)   | 0.80 (2.63)   | 0.69 (2.26)   |
| 1000 MHz  | 7.87 (25.82)  | 5.77 (18.92)  | 5.37 (17.62)  | 2.63 (8.63)   | 2.30 (7.56)   |
| 1500 MHz  | 9.86 (32.33)  | 7.28 (23.88)  | 6.90 (22.64)  | 3.26 (10.70)  | 2.87 (9.42)   |
| 2000 MHz  | 11.59 (38.01) | 8.62 (28.26)  | 8.28 (27.17)  | 3.81 (12.49)  | 3.37 (11.04)  |
| 2500 MHz  | 13.16 (43.18) | 9.84 (32.28)  | 9.57 (31.39)  | 4.30 (14.09)  | 3.81 (12.51)  |
| 3000 MHz  | 14.63 (47.97) | 10.98 (36.03) | 10.79 (35.39) | 4.74 (15.56)  | 4.22 (13.86)  |
| K1  | 0.224140      | 0.157660      | 0.132920      | 0.078590      | 0.067100      |
| K2  | 0.000783      | 0.000783      | 0.001170      | 0.000146      | 0.000183      |
| <b>Power (Watts) (+25 °C Ambient; Sea Level)</b>                |               |               |               |               |               |
| 13.56 MHz   | 13663         | 19232         | 25403         | 65129         | 87899         |
| 50 MHz  | 7039          | 9859          | 12865         | 33718         | 45371         |
| 100 MHz   | 4932          | 6879          | 8886          | 23722         | 31840         |
| 1000 MHz  | 1463          | 1983          | 2403          | 7234          | 9539          |
| 1500 MHz  | 1171          | 1574          | 1874          | 5838          | 7657          |
| 2000 MHz  | 998           | 1332          | 1564          | 5007          | 6538          |
| 2500 MHz  | 880           | 1168          | 1355          | 4441          | 5777          |
| 3000 MHz  | 793           | 1048          | 1204          | 4024          | 5216          |

\* SC = Silver Plated Copper

\* BC = Bare Copper

\* TC = Tinned Copper

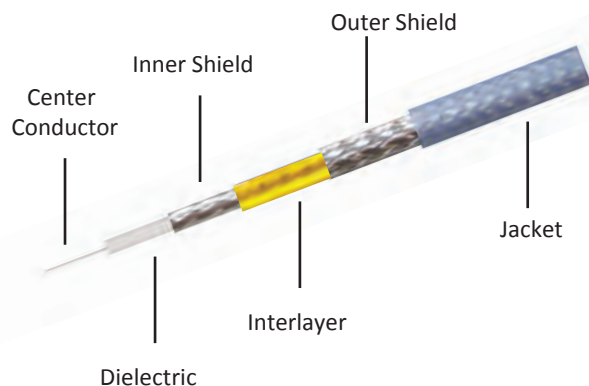
\* MT = Metallized Composite Tapes

Note: HP-393 is marked RG-393-NPP-SN

# SFT Cables

## Cable Feature:

|                        |                |
|------------------------|----------------|
| Flexibility            | Good/Very Good |
| Cost                   | Very High      |
| Attenuation            | Low            |
| Power Handling         | Very High      |
| Temperature            | High           |
| Connector Availability | Good           |

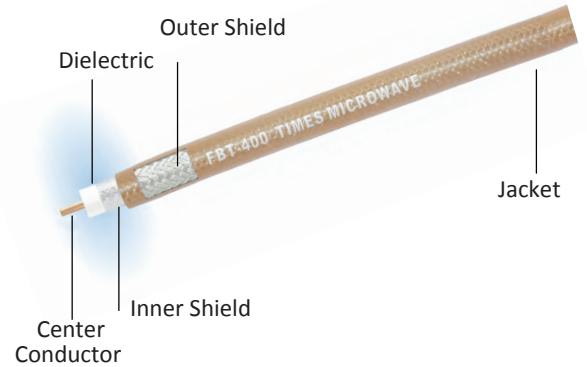


|  | SFT-393       | SFT-226       | SFT-500       | SFT-600       |
|--|---------------|---------------|---------------|---------------|
| <b>AA Drawing Number</b>                                       | AA-8653       | AA-8654       | AA-11168      | AA-9649       |
| <b>Part Number</b>   | 51800         | 51803         | 510-0037      | 51963         |
| <b>Physical Specifications</b>                                 |               |               |               |               |
| Description  | in (mm)       | in (mm)       | in (mm)       | in (mm)       |
| Center Conductor   | Solid SC      | Solid SC      | Stranded SC   | Stranded SC   |
|  | 0.096 (2.44)  | 0.131 (3.33)  | 0.145 (3.68)  | 0.160 (4.06)  |
| Dielectric   | PTFE          | PTFE          | PTFE          | PTFE          |
|  | 0.285 (7.24)  | 0.370 (9.40)  | 0.408 (10.36) | 0.455 (11.56) |
| Inner Shield   | SC Flat Braid | SC Flat Braid | SC Flat Braid | SC Flat Braid |
|  | 0.295 (7.49)  | 0.380 (9.65)  | 0.420 (10.67) | 0.465 (11.81) |
| Interlayer   | MT            | MT            | NA            | MT            |
|  | 0.301 (7.65)  | 0.385 (9.78)  |               | 0.471 (11.96) |
| Outer Shield   | SC            | SC            | SC            | SC            |
|  | 0.330 (8.38)  | 0.399 (10.14) | 0.448 (11.38) | 0.500 (12.70) |
| Jacket   | FEP           | FEP           | FEP           | FEP           |
|  | 0.390 (9.91)  | 0.485 (12.32) | 0.490 (12.45) | 0.555 (14.10) |
| <b>Mechanical Specifications</b>                               |               |               |               |               |
| Bend Radius  | 2.0 (50.8)    | 2.5 (63.5)    | 2.5 (63.5)    | 2.75 (69.9)   |
| Weight   | 0.126 lb/ft   | 0.235 lb/ft   | 0.230 lb/ft   | 0.240 lb/ft   |
| Operating Temperature Range                                    | -55/+200 °C   | -55/+200 °C   | -55/+200 °C   | -55/+200 °C   |
| <b>Electrical Specifications</b>                               |               |               |               |               |
| Impedance  | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       |
| Shielding Effectiveness  | 100 dB        | 100 dB        | 80 dB         | 100 dB        |
| Dielectric Constant  | 1.73          | 1.73          | 1.73          | 1.73          |
| Velocity of Propagation  | 0.76          | 0.76          | 0.76          | 0.76          |
| Capacitance  | 26.7pF/ft     | 26.7pF/ft     | 26.7pF/ft     | 26.7pF/ft     |
| DC Voltage (kV)  | 5             | 6             | 7             | 8             |
| <b>Attenuation: dB/100ft (100m) (+25°C Ambient; Sea Level)</b> |               |               |               |               |
| 13.56 MHz  | 0.50 (1.65)   | 0.45 (1.49)   | 0.43 (1.43)   | 0.37 (1.21)   |
| 50 MHz   | 0.97 (3.18)   | 0.87 (2.87)   | 0.84 (2.75)   | 0.71 (2.34)   |
| 100 MHz  | 1.38 (4.52)   | 1.24 (4.07)   | 1.19 (3.91)   | 1.01 (3.32)   |
| 1000 MHz   | 4.48 (14.69)  | 4.04 (13.24)  | 3.90 (12.78)  | 3.30 (10.84)  |
| 1500 MHz   | 5.53 (18.15)  | 4.99 (16.37)  | 4.82 (15.82)  | 4.09 (13.40)  |
| 2000 MHz   | 6.44 (21.12)  | 5.81 (19.04)  | 5.62 (18.43)  | 4.76 (15.61)  |
| 2500 MHz   | 7.25 (23.77)  | 6.54 (21.43)  | 6.33 (20.76)  | 5.36 (17.58)  |
| 3000 MHz   | 7.99 (26.19)  | 7.20 (23.62)  | 6.98 (22.90)  | 5.91 (19.38)  |
| K1   | 0.135930      | 0.122500      | 0.117433      | 0.099850      |
| K2   | 0.000180      | 0.000164      | 0.000183      | 0.000146      |
| <b>Power (Watts) (+25°C Ambient; Sea Level)</b>                |               |               |               |               |
| 13.56 MHz  | 27605         | 37095         | 42102         | 51888         |
| 50 MHz   | 14319         | 19241         | 21820         | 26900         |
| 100 MHz  | 10090         | 13558         | 15366         | 18948         |
| 1000 MHz   | 3113          | 4182          | 4717          | 5826          |
| 1500 MHz   | 2522          | 3388          | 3815          | 4715          |
| 2000 MHz   | 2169          | 2915          | 3278          | 4053          |
| 2500 MHz   | 1929          | 2592          | 2912          | 3601          |
| 3000 MHz   | 1752          | 2354          | 2642          | 3268          |

# FBT Cables

## Cable Feature:

|                        |             |
|------------------------|-------------|
| Flexibility            | Fair        |
| Cost                   | Medium/High |
| Attenuation            | Low         |
| Power Handling         | High        |
| Temperature            | High        |
| Connector Availability | Very Good   |



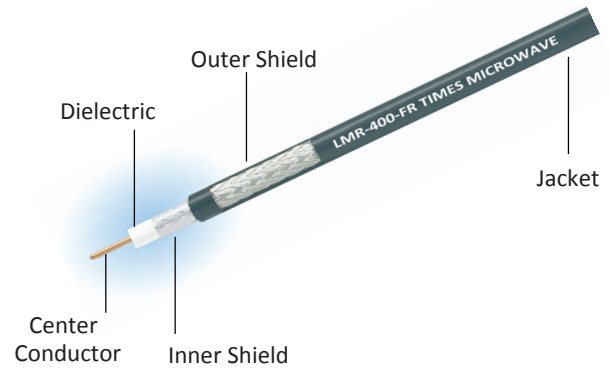
|   | FBT-400      | FBT-500       | FBT-600       |
|---|--------------|---------------|---------------|
| <b>AA Drawing Number</b>  | AA-8957      | AA-8958       | AA-8959       |
| <b>Part Number</b>  | 54171        | 54172         | 54173         |
| <b>Physical Specifications</b>                                  |              |               |               |
| Description   | in (mm)      | in (mm)       | in (mm)       |
| Center Conductor  | Solid BCCAl  | Solid BCCAl   | Solid BCCAl   |
|   | 0.095 (2.14) | 0.123 (3.12)  | 0.150 (3.81)  |
| Dielectric  | PTFE         | PTFE          | PTFE          |
|   | 0.285 (7.24) | 0.370 (9.40)  | 0.455 (11.56) |
| Inner Shield  | MT           | MT            | MT            |
|   | 0.291 (7.39) | 0.376 (9.55)  | 0.461 (11.71) |
| Interlayer  | /            | /             | /             |
| Outer Shield  | TC           | TC            | TC            |
|   | 0.320 (8.13) | 0.405 (10.29) | 0.490 (12.45) |
| Jacket  | FEP          | FEP           | FEP           |
|   | 0.370 (9.40) | 0.465 (11.81) | 0.565 (14.35) |
| <b>Mechanical Specifications</b>                                |              |               |               |
| Bend Radius   | 4.0 (101.6)  | 5.0 (127.0)   | 6.0 (152.4)   |
| Weight  | 0.104 lb/ft  | 0.168 lb/ft   | 0.210 lb/ft   |
| Operating Temperature Range                                     | -55/+150 °C  | -55/+150 °C   | -55/+150 °C   |
| <b>Electrical Specifications</b>                                |              |               |               |
| Impedance   | 50 ohms      | 50 ohms       | 50 ohms       |
| Shielding Effectiveness   | 90 dB        | 90 dB         | 90 dB         |
| Dielectric Constant   | 1.73         | 1.73          | 1.73          |
| Velocity of Propagation   | 0.76         | 0.76          | 0.76          |
| Capacitance   | 26.7pF/ft    | 26.7pF/ft     | 26.7pF/ft     |
| DC Voltage (kV)   | 5            | 7             | 8             |
| <b>Attenuation: dB/100ft (100m) (+25 °C Ambient; Sea Level)</b> |              |               |               |
| 13.56 MHz   | 0.48 (1.57)  | 0.37 (1.22)   | 0.30 (0.99)   |
| 50 MHz  | 0.92 (3.02)  | 0.72 (2.35)   | 0.58 (1.91)   |
| 100 MHz   | 1.31 (4.28)  | 1.02 (3.34)   | 0.83 (2.72)   |
| 1000 MHz  | 4.23 (13.87) | 3.32 (10.88)  | 2.72 (8.92)   |
| 1500 MHz  | 5.22 (17.12) | 4.10 (13.45)  | 3.37 (11.06)  |
| 2000 MHz  | 6.07 (19.90) | 4.78 (15.66)  | 3.93 (12.90)  |
| 2500 MHz  | 6.82 (22.38) | 5.38 (17.64)  | 4.43 (14.55)  |
| 3000 MHz  | 7.51 (24.64) | 5.93 (19.45)  | 4.90 (16.06)  |
| K1  | 0.129138     | 0.100255      | 0.081389      |
| K2  | 0.000146     | 0.000146      | 0.000146      |
| <b>Power (Watts) (+25 °C Ambient; Sea Level)</b>                |              |               |               |
| 13.56 MHz   | 31011        | 44385         | 56975         |
| 50 MHz  | 16096        | 23010         | 29501         |
| 100 MHz   | 11350        | 16208         | 20758         |
| 1000 MHz  | 3516         | 4984          | 6336          |
| 1500 MHz  | 2852         | 4033          | 5115          |
| 2000 MHz  | 2456         | 3467          | 4388          |
| 2500 MHz  | 2186         | 3080          | 3893          |
| 3000 MHz  | 1987         | 2796          | 3528          |

\* BCCAl = Bare Copper Clad Aluminum

# LMR-FR Cables

## Cable Feature:

|                        |           |
|------------------------|-----------|
| Flexibility            | Fair      |
| Cost                   | Low       |
| Attenuation            | Low       |
| Power Handling         | Medium    |
| Temperature            | Medium    |
| Connector Availability | Very Good |

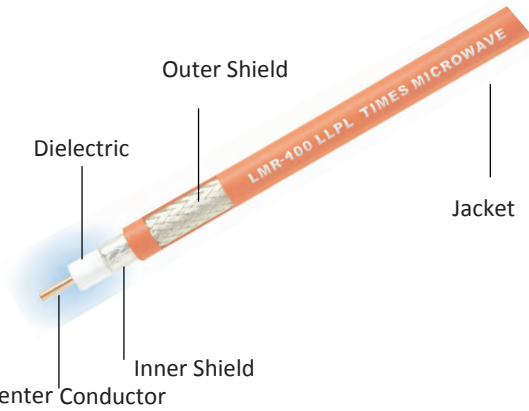


|   | LMR-400-FR    | LMR-500-FR    | LMR-600-FR    | LMR-900-FR    | LMR-1200-FR   |
|---|---------------|---------------|---------------|---------------|---------------|
| <b>AA Drawing Number</b>  | AA-8120       | AA-8121       | AA-8122       | AA-8123       | AA-8124       |
| <b>Part Number</b>  | 54030         | 54031         | 54032         | 54033         | 54034         |
| <b>Physical Specifications</b>                                  |               |               |               |               |               |
| Description   | in (mm)       | in (mm)       | in (mm)       | in (mm)       | in (mm)       |
| Center Conductor  | Solid BCCAl   | Solid BCCAl   | Solid BCCAl   | BC Tube       | BC Tube       |
|   | 0.108 (2.74)  | 0.142 (3.61)  | 0.176 (4.47)  | 0.262 (6.65)  | 0.349 (8.86)  |
| Dielectric  | PE            | PE            | PE            | PE            | PE            |
|   | 0.285 (7.24)  | 0.370 (9.40)  | 0.455 (11.56) | 0.680 (17.27) | 0.920 (23.37) |
| Inner Shield  | MT            | MT            | MT            | MT            | MT            |
|   | 0.291 (7.39)  | 0.376 (9.55)  | 0.461 (11.71) | 0.686 (17.42) | 0.926 (23.52) |
| Interlayer  | /             | /             | /             | /             | /             |
| Outer Shield  | TC            | TC            | TC            | TC            | TC            |
|   | 0.320 (8.13)  | 0.405 (10.29) | 0.490 (12.45) | 0.732 (18.59) | 0.972 (24.69) |
| Jacket  | FRPE          | FRPE          | FRPE          | FRPE          | FRPE          |
|   | 0.405 (10.29) | 0.500 (12.70) | 0.590 (14.99) | 0.870 (22.10) | 1.200 (30.48) |
| <b>Mechanical Specifications</b>                                |               |               |               |               |               |
| Bend Radius   | 1.0 (25.4)    | 1.3 (31.8)    | 1.5 (38.1)    | 3.0 (76.2)    | 6.5 (165.1)   |
| Weight  | 0.068 lb/ft   | 0.097 lb/ft   | 0.131 lb/ft   | 0.266 lb/ft   | 0.448 lb/ft   |
| Operating Temperature Range                                     | -40/+85 °C    | -40/+85 °C    | -40/+85 °C    | -40/+85 °C    | -40/+85 °C    |
| <b>Electrical Specifications</b>                                |               |               |               |               |               |
| Impedance   | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       |
| Shielding Effectiveness   | 90 dB         | 90 dB         | 90 dB         | 90 dB         | 90 dB         |
| Dielectric Constant   | 1.38          | 1.35          | 1.32          | 1.32          | 1.29          |
| Velocity of Propagation   | 0.85          | 0.86          | 0.87          | 0.87          | 0.88          |
| Capacitance   | 23.9pF/ft     | 23.6pF/ft     | 23.4pF/ft     | 23.4pF/ft     | 23.1pF/ft     |
| DC Voltage (kV)   | 5             | 7             | 8             | 5             | 6             |
| <b>Attenuation: dB/100ft (100m) (+25 °C Ambient; Sea Level)</b> |               |               |               |               |               |
| 13.56 MHz   | 0.46 (1.51)   | 0.36 (1.17)   | 0.29 (0.95)   | 0.19 (0.64)   | 0.14 (0.46)   |
| 50 MHz  | 0.89 (2.92)   | 0.69 (2.26)   | 0.56 (1.85)   | 0.38 (1.24)   | 0.27 (0.89)   |
| 100 MHz   | 1.27 (4.15)   | 0.98 (3.22)   | 0.80 (2.63)   | 0.54 (1.77)   | 0.39 (1.28)   |
| 1000 MHz  | 4.17 (13.68)  | 3.28 (10.77)  | 2.69 (8.82)   | 1.84 (6.03)   | 1.34 (4.39)   |
| 1500 MHz  | 5.17 (16.97)  | 4.09 (13.42)  | 3.36 (11.01)  | 2.31 (7.56)   | 1.68 (5.52)   |
| 2000 MHz  | 6.04 (19.81)  | 4.79 (15.73)  | 3.93 (12.91)  | 2.72 (8.91)   | 1.99 (6.51)   |
| 2500 MHz  | 6.82 (22.36)  | 5.43 (17.81)  | 4.46 (14.62)  | 3.09 (10.13)  | 2.26 (7.42)   |
| 3000 MHz  | 7.53 (24.71)  | 6.01 (19.73)  | 4.94 (16.21)  | 3.44 (11.27)  | 2.52 (8.26)   |
| K1  | 0.124100      | 0.095640      | 0.077990      | 0.051869      | 0.037474      |
| K2  | 0.000245      | 0.000259      | 0.000224      | 0.000198      | 0.000155      |
| <b>Power (Watts) (+25 °C Ambient; Sea Level)</b>                |               |               |               |               |               |
| 13.56 MHz   | 12611         | 18784         | 26034         | 49886         | 81747         |
| 50 MHz  | 6527          | 9703          | 13433         | 25658         | 41991         |
| 100 MHz   | 4591          | 6813          | 9423          | 17951         | 29346         |
| 1000 MHz  | 1398          | 2050          | 2816          | 5267          | 8547          |
| 1500 MHz  | 1128          | 1648          | 2259          | 4202          | 6803          |
| 2000 MHz  | 967           | 1408          | 1928          | 3570          | 5769          |
| 2500 MHz  | 858           | 1246          | 1702          | 3140          | 5067          |
| 3000 MHz  | 777           | 1126          | 1537          | 2825          | 4552          |

\* BCCAl = Bare Copper Clad Aluminum

# LMR-LLPL Cables

## Cable Feature:



|                        |             |
|------------------------|-------------|
| Flexibility            | Fair/Good   |
| Cost                   | Medium      |
| Attenuation            | Low         |
| Power Handling         | Medium/High |
| Temperature            | Medium      |
| Connector Availability | Very Good   |

|   | LMR-400-LLPL  | LMR-500-LLPL  | LMR-600-LLPL  | LMR-900-LLPL  | LMR-1200-LLPL |
|---|---------------|---------------|---------------|---------------|---------------|
| <b>AA Drawing Number</b>  | AA-8317       | AA-8278       | AA-8279       | AA-8280       | AA-8281       |
| <b>Part Number</b>  | 54070         | 54060         | 54061         | 54062         | 54063         |
| <b>Physical Specifications</b>                                  |               |               |               |               |               |
| Description   | in (mm)       | in (mm)       | in (mm)       | in (mm)       | in (mm)       |
| Center Conductor  | Solid BCCAl   | Solid BCCAl   | Solid BCCAl   | BC Tube       | BC Tube       |
|   | 0.095 (2.41)  | 0.123 (3.12)  | 0.150 (3.81)  | 0.227 (5.77)  | 0.310 (7.87)  |
| Dielectric  | PTFE          | PTFE          | PTFE          | PTFE          | PTFE          |
|   | 0.285 (7.24)  | 0.370 (9.40)  | 0.455 (11.56) | 0.680 (17.27) | 0.920 (23.37) |
| Inner Shield  | MT            | MT            | MT            | MT            | MT            |
|   | 0.291 (7.39)  | 0.376 (9.55)  | 0.461 (11.71) | 0.686 (17.42) | 0.926 (23.52) |
| Interlayer  | /             | /             | /             | /             | /             |
| Outer Shield  | TC            | TC            | TC            | TC            | TC            |
|   | 0.320 (8.13)  | 0.405 (10.29) | 0.490 (12.45) | 0.732 (18.59) | 0.972 (24.69) |
| Jacket  | FRPVC         | FRPVC         | FRPVC         | FRPVC         | FRPVC         |
|   | 0.405 (10.28) | 0.500 (12.70) | 0.590 (14.99) | 0.870 (22.10) | 1.200 (30.48) |
| <b>Mechanical Specifications</b>                                |               |               |               |               |               |
| Bend Radius   | 4.0 (101.6)   | 5.0 (127.0)   | 6.0 (152.4)   | 9.0 (228.6)   | 12.0 (304.8)  |
| Weight  | 0.114 lb/ft   | 0.194 lb/ft   | 0.240 lb/ft   | 0.542 lb/ft   | 0.700 lb/ft   |
| Operating Temperature Range                                     | -5/+75 °C     | -5/+75 °C     | -5/+75 °C     | -5/+75 °C     | -5/+75 °C     |
| <b>Electrical Specifications</b>                                |               |               |               |               |               |
| Impedance   | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       |
| Shielding Effectiveness   | 90 dB         | 90 dB         | 90 dB         | 90 dB         | 90 dB         |
| Dielectric Constant   | 1.73          | 1.73          | 1.73          | 1.73          | 1.73          |
| Velocity of Propagation   | 0.76          | 0.76          | 0.76          | 0.76          | 0.76          |
| Capacitance   | 26.7pF/ft     | 26.7pF/ft     | 26.7pF/ft     | 26.7pF/ft     | 26.7pF/ft     |
| DC Voltage (kV)   | 5             | 7             | 8             | 5             | 9             |
| <b>Attenuation: dB/100ft (100m) (+25 °C Ambient; Sea Level)</b> |               |               |               |               |               |
| 13.56 MHz   | 0.47 (1.55)   | 0.38 (1.25)   | 0.32 (1.05)   | 0.20 (0.67)   | 0.16 (0.52)   |
| 50 MHz  | 0.91 (2.99)   | 0.74 (2.42)   | 0.62 (2.03)   | 0.40 (1.30)   | 0.31 (1.02)   |
| 100 MHz   | 1.29 (4.25)   | 1.05 (3.44)   | 0.88 (2.89)   | 0.57 (1.86)   | 0.44 (1.45)   |
| 1000 MHz  | 4.22 (13.83)  | 3.45 (11.30)  | 2.91 (9.55)   | 1.92 (6.30)   | 1.51 (4.95)   |
| 1500 MHz  | 5.21 (17.09)  | 4.27 (14.01)  | 3.62 (11.86)  | 2.40 (7.88)   | 1.89 (6.20)   |
| 2000 MHz  | 6.06 (19.89)  | 4.98 (16.34)  | 4.22 (13.85)  | 2.82 (9.26)   | 2.22 (7.29)   |
| 2500 MHz  | 6.83 (22.39)  | 5.62 (18.43)  | 4.77 (15.65)  | 3.20 (10.51)  | 2.53 (8.29)   |
| 3000 MHz  | 7.53 (24.68)  | 6.20 (20.34)  | 5.27 (17.30)  | 3.56 (11.67)  | 2.81 (9.21)   |
| K1  | 0.127694      | 0.103100      | 0.086250      | 0.054930      | 0.042798      |
| K2  | 0.000177      | 0.000185      | 0.000183      | 0.000183      | 0.000155      |
| <b>Power (Watts) (+25 °C Ambient; Sea Level)</b>                |               |               |               |               |               |
| 13.56 MHz   | 10052         | 14391         | 19407         | 38959         | 58185         |
| 50 MHz  | 5212          | 7452          | 10038         | 20069         | 29945         |
| 100 MHz   | 3672          | 5244          | 7057          | 14060         | 20962         |
| 1000 MHz  | 1131          | 1602          | 2140          | 4163          | 6172          |
| 1500 MHz  | 915           | 1294          | 1725          | 3330          | 4929          |
| 2000 MHz  | 787           | 1110          | 1477          | 2835          | 4191          |
| 2500 MHz  | 700           | 985           | 1309          | 2499          | 3689          |
| 3000 MHz  | 635           | 893           | 1184          | 2251          | 3320          |

\* BCCAl = Bare Copper Clad Aluminum



# RG Cables

## Cable Feature:

|                        |                |
|------------------------|----------------|
| Flexibility            | Good/Very Good |
| Cost                   | Medium/Low     |
| Attenuation            | Medium         |
| Power Handling         | Medium/High    |
| Temperature            | Medium         |
| Connector Availability | Medium         |



|  | RG-393        | RG-217        | RG-177        | RG-218        | RG-220        |
|--|---------------|---------------|---------------|---------------|---------------|
| <b>AA Drawing Number</b>                                       | AA-3420       | AA-3410       | AA-3404       | AA-3411       | AA-6002       |
| <b>Part Number</b>   | 51509         | 41511         | 41506         | 41512         | 41579         |
| <b>Physical Specifications</b>                                 |               |               |               |               |               |
| Description  | in (mm)       | in (mm)       | in (mm)       | in (mm)       | in (mm)       |
| Center Conductor   | SC            | BC            | BC            | BC            | BC            |
|  | 0.094 (2.39)  | 0.106 (2.69)  | 0.195 (4.95)  | 0.195 (4.95)  | 0.260 (6.60)  |
| Dielectric   | PTFE          | PE            | PE            | PE            | PE            |
|  | 0.285 (7.24)  | 0.370 (9.40)  | 0.680 (17.27) | 0.680 (17.27) | 0.910 (23.11) |
| Inner Shield   | SC            | BC            | SC            | BC            | BC            |
|  | 0.295 (7.49)  | 0.403 (10.24) | 0.709 (18.01) | 0.726 (18.44) | 0.956 (24.28) |
| Interlayer   | /             | /             | /             | /             | /             |
| Outer Shield   | SC            | BC            | SC            | /             | /             |
|  | 0.330 (8.38)  | 0.436 (11.07) | 0.738 (18.75) |               |               |
| Jacket   | FEP           | PVC           | PVC           | PVC           | PVC           |
|  | 0.390 (9.91)  | 0.545 (13.84) | 0.895 (22.73) | 0.870 (22.10) | 1.120 (28.45) |
| <b>Mechanical Specifications</b>                               |               |               |               |               |               |
| Bend Radius  | 2.0 (50.8)    | 5.5 (139.7)   | 9.0 (228.6)   | 9.0 (228.6)   | 12.0 (304.8)  |
| Weight   | 0.175 lb/ft   | 0.230 lb/ft   | 0.470 lb/ft   | 0.460 lb/ft   | 0.820 lb/ft   |
| Operating Temperature Range                                    | -55/+200 °C   | -40/+80 °C    | -40/+80 °C    | -40/+80 °C    | -40/+80 °C    |
| <b>Electrical Specifications</b>                               |               |               |               |               |               |
| Impedance  | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       |
| Shielding Effectiveness  | 60 dB         | 60 dB         | 60 dB         | 40 dB         | 40 dB         |
| Dielectric Constant  | 1.98          | 2.3           | 2.3           | 2.3           | 2.3           |
| Velocity of Propagation  | 0.71          | 0.659         | 0.659         | 0.659         | 0.659         |
| Capacitance  | 28.6pF/ft     | 30.8pF/ft     | 30.8pF/ft     | 30.8pF/ft     | 30.8pF/ft     |
| DC Voltage (kV)  | 1.9           | 5.8           | 8             | 8             | 10.5          |
| <b>Attenuation: dB/100ft (100m) (+25°C Ambient; Sea Level)</b> |               |               |               |               |               |
| 13.56 MHz  | 0.76 (2.48)   | 0.61 (1.99)   | 0.35 (1.14)   | 0.35 (1.14)   | 0.24 (0.79)   |
| 50 MHz   | 1.48 (4.86)   | 1.19 (3.90)   | 0.71 (2.31)   | 0.71 (2.31)   | 0.50 (1.63)   |
| 100 MHz  | 2.13 (6.99)   | 1.71 (5.60)   | 1.05 (3.43)   | 1.05 (3.43)   | 0.74 (2.43)   |
| 1000 MHz   | 7.64 (25.05)  | 5.97 (19.59)  | 4.46 (14.63)  | 4.46 (14.63)  | 3.23 (10.60)  |
| 1500 MHz   | 9.71 (31.85)  | 7.55 (24.75)  | 5.93 (19.44)  | 5.93 (19.44)  | 4.32 (14.16)  |
| 2000 MHz   | 11.56 (37.92) | 8.94 (29.32)  | 7.30 (23.93)  | 7.30 (23.93)  | 5.33 (17.49)  |
| 2500 MHz   | 13.27 (43.53) | 10.22 (33.51) | 8.60 (28.22)  | 8.60 (28.22)  | 6.30 (20.68)  |
| 3000 MHz   | 14.88 (48.80) | 11.41 (37.43) | 9.86 (32.35)  | 9.86 (32.35)  | 7.25 (23.77)  |
| K1   | 0.200407      | 0.162200      | 0.087800      | 0.087800      | 0.061105      |
| K2   | 0.001300      | 0.000842      | 0.001685      | 0.001685      | 0.001300      |
| <b>Power (Watts) (+25°C Ambient; Sea Level)</b>                |               |               |               |               |               |
| 13.56 MHz  | 19909         | 7230          | 16686         | 16888         | 28800         |
| 50 MHz   | 10158         | 3704          | 8196          | 8295          | 14061         |
| 100 MHz  | 7060          | 2582          | 5525          | 5592          | 9434          |
| 1000 MHz   | 1985          | 741           | 1302          | 1317          | 2168          |
| 1500 MHz   | 1564          | 588           | 981           | 993           | 1625          |
| 2000 MHz   | 1317          | 497           | 799           | 808           | 1317          |
| 2500 MHz   | 1149          | 435           | 678           | 687           | 1115          |
| 3000 MHz   | 1027          | 390           | 593           | 600           | 971           |

\* SC = Silver Plated Copper

\* BC = Bare Copper

# Some Other Cables I

|   | HFlex-142     | AA-11406      | QEAM-810      | HP-1200-PUR   | SFT-600-BCCAL-PUR |
|---|---------------|---------------|---------------|---------------|-------------------|
| <b>AA Drawing Number</b>  | AA-9406       | AA-11406      | AA-8848       | AA-11470      | AA-9593           |
| <b>Part Number</b>  | 51929         | 510-0063      | 51816         | 54365         | 51956             |
| <b>Physical Specifications</b>                                  |               |               |               |               |                   |
| Description   | in (mm)       | in (mm)       | in (mm)       | in (mm)       | in (mm)           |
| Center Conductor  | SC            | SC            | SC            | BC Tube       | BCCAI             |
|   | 0.038 (0.01)  | 0.097 (2.46)  | 0.228 (5.79)  | 0.308 (7.82)  | 0.150 (3.81)      |
| Dielectric  | PTFE          | PTFE          | PTFE          | PTFE          | PTFE              |
|   | 0.105 (2.67)  | 0.285 (7.24)  | 0.620 (15.75) | 0.920 (23.37) | 0.455 (11.45)     |
| Inner Shield  | SC            | SC            | FSC           | MT            | FSC               |
|   | 0.123 (3.12)  | 0.306 (7.77)  | 0.630 (16.00) | 0.932 (23.67) | 0.465 (11.81)     |
| Interlayer  | /             | /             | MT            | /             | MT                |
|   |               |               | 0.636 (16.15) |               | 0.469 (11.91)     |
| Outer Shield  | SC            | SC            | TC            | TC            | TC                |
|   | 0.141 (3.58)  | 0.328 (8.33)  | 0.665 (16.89) | 0.980 (24.89) | 0.508 (12.90)     |
| Jacket  | FEP           | PUR           | PUR           | PUR           | PUR               |
|   | 0.170 (4.32)  | 0.400 (10.16) | 0.810 (20.57) | 1.200 (30.48) | 0.560 (14.22)     |
| <b>Mechanical Specifications</b>                                |               |               |               |               |                   |
| Bend Radius   | 1.5 (38.1)    | 2.0 (50.8)    | 8.0 (203.2)   | 7.0 (177.8)   | 2.5 (63.5)        |
| Weight  | 0.030 lb/ft   | 0.135 lb/ft   | 0.400 lb/ft   | 0.950 lb/ft   | 0.220 lb/ft       |
| Operating Temperature Range                                     | -55/+200 °C   | -55/+105 °C   | -55/+80 °C    | -40/+105 °C   | -55/+90 °C        |
| <b>Electrical Specifications</b>                                |               |               |               |               |                   |
| Impedance   | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms           |
| Shielding Effectiveness   | 60 dB         | 60 dB         | 100 dB        | 90 dB         | 100 dB            |
| Dielectric Constant   | 1.73          | 1.73          | 1.56          | 1.73          | 1.73              |
| Velocity of Propagation   | 0.76          | 0.76          | 0.8           | 0.76          | 0.76              |
| Capacitance   | 26.8pF/ft     | 26.9pF/ft     | 25.4pF/ft     | 26.7pF/ft     | 26.7pF/ft         |
| DC Voltage (kV)   | 2             | 5             | 9.2           | 12.5          | 7.5               |
| <b>Attenuation: dB/100ft (100m) (+25 °C Ambient; Sea Level)</b> |               |               |               |               |                   |
| 13.56 MHz   | 1.59 (5.23)   | 0.71 (2.34)   | 0.27 (0.89)   | 0.16 (0.51)   | 0.32 (1.06)       |
| 50 MHz  | 3.08 (10.12)  | 1.38 (4.51)   | 0.53 (1.73)   | 0.30 (0.99)   | 0.62 (2.05)       |
| 100 MHz   | 4.39 (14.40)  | 1.95 (6.39)   | 0.75 (2.46)   | 0.43 (1.42)   | 0.89 (2.91)       |
| 1000 MHz  | 14.56 (47.76) | 6.25 (20.51)  | 2.47 (8.09)   | 1.50 (4.92)   | 2.93 (9.62)       |
| 1500 MHz  | 18.10 (59.38) | 7.69 (25.23)  | 3.06 (10.03)  | 1.89 (6.19)   | 3.64 (11.95)      |
| 2000 MHz  | 21.17 (69.43) | 8.92 (29.25)  | 3.57 (11.71)  | 2.23 (7.31)   | 4.26 (13.96)      |
| 2500 MHz  | 23.93 (78.48) | 10.00 (32.81) | 4.03 (13.21)  | 2.54 (8.34)   | 4.81 (15.76)      |
| 3000 MHz  | 26.47 (86.82) | 10.99 (36.05) | 4.47 (14.59)  | 2.83 (9.29)   | 5.31 (17.43)      |
| K1  | 0.429235      | 0.193622      | 0.073588      | 0.041586      | 0.086948          |
| K2  | 0.000986      | 0.000129      | 0.000139      | 0.000185      | 0.000183          |
| <b>Power (Watts) (+25 °C Ambient; Sea Level)</b>                |               |               |               |               |                   |
| 13.56 MHz   | 6052          | 11120         | 28865         | 98786         | 24515             |
| 50 MHz  | 3133          | 5783          | 14942         | 50709         | 12681             |
| 100 MHz   | 2204          | 4084          | 10511         | 35419         | 8916              |
| 1000 MHz  | 672           | 1280          | 3203          | 10277         | 2706              |
| 1500 MHz  | 543           | 1042          | 2584          | 8170          | 2180              |
| 2000 MHz  | 466           | 900           | 2216          | 6922          | 1868              |
| 2500 MHz  | 414           | 803           | 1965          | 6076          | 1655              |
| 3000 MHz  | 375           | 732           | 1780          | 5454          | 1498              |

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\* BCCAI = Bare Copper Clad Aluminum

\* RSC = Rope Stranded Silver Plated Copper

\* FSC = Silver Plated Copper Flat Strip Braid

\* TC = Tinned Copper

# Some Other Cables II

|   | AA-11222      | AA-11223      | AA-9193       | SFT-600-BCCAL | LMR-1700-DB-TPV |
|---|---------------|---------------|---------------|---------------|-----------------|
| <b>AA Drawing Number</b>  | AA-11222      | AA-11223      | AA-9193       | AA-8980       | AA-11629        |
| <b>Part Number</b>  | 510-0042      | 510-0043      | 51887         | 51839         | 54376           |
| <b>Physical Specifications</b>                                  |               |               |               |               |                 |
| Description   | in (mm)       | in (mm)       | in (mm)       | in (mm)       | in (mm)         |
| Center Conductor  | RSC           | RSC           | RSC           | BC            | BC Tube         |
|   | 0.160 (4.06)  | 0.160 (4.06)  | 0.160 (4.06)  | 0.150 (3.81)  | 0.516 (13.11)   |
| Dielectric  | PTFE          | PTFE          | PTFE          | PTFE          | PE              |
|   | 0.455 (11.56) | 0.455 (11.56) | 0.455 (11.56) | 0.455 (11.56) | 1.35 (34.29)    |
| Inner Shield  | FSC           | SC            | SC            | SC            | APA             |
|   | 0.465 (11.81) | 0.478 (12.14) | 0.478 (12.14) | 0.465 (11.81) | 1.356 (34.44)   |
| Interlayer  | MT            | /             | /             | APT           | /               |
|   | 0.469 (11.91) |               |               | 0.469 (11.91) |                 |
| Outer Shield  | TC            | SC            | SC            | TC            | TC              |
|   | 0.508 (12.90) | 0.501 (12.73) | 0.501 (12.73) | 0.508 (12.90) | 1.402 (35.61)   |
| Jacket  | PUR           | PUR           | FEP           | FEP           | TPV             |
|   | 0.560 (14.22) | 0.560 (14.22) | 0.555 (14.10) | 0.560 (14.22) | 1.600 (40.64)   |
| <b>Mechanical Specifications</b>                                |               |               |               |               |                 |
| Bend Radius   | 2.5 (63.5)    | 2.5 (63.5)    | 2.5 (63.5)    | 2.5 (63.5)    | 13.5 (342.9)    |
| Weight  | 0.300 lb/ft   | 0.285 lb/ft   | 0.260 lb/ft   | 0.235 lb/ft   | 0.68 lb/ft      |
| Operating Temperature Range                                     | -55/+105 °C   | -55/+105 °C   | -55/+200 °C   | -55/+200 °C   | -50/+105 °C     |
| <b>Electrical Specifications</b>                                |               |               |               |               |                 |
| Impedance   | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms       | 50 ohms         |
| Shielding Effectiveness   | 100 dB        | 60 dB         | 60 dB         | 100 dB        | 90 dB           |
| Dielectric Constant   | 1.73          | 1.73          | 1.73          | 1.73          | 1.26            |
| Velocity of Propagation   | 0.76          | 0.76          | 0.76          | 0.76          | 0.89            |
| Capacitance   | 26.7pF/ft     | 26.7pF/ft     | 26.7pF/ft     | 26.7pF/ft     | 22.8pF/ft       |
| DC Voltage (kV)   | 8             | 8             | 8             | 6             | 9               |
| <b>Attenuation: dB/100ft (100m) (+25 °C Ambient; Sea Level)</b> |               |               |               |               |                 |
| 13.56 MHz   | 0.38 (1.24)   | 0.46 (1.51)   | 0.46 (1.51)   | 0.32 (1.06)   | 0.10 (0.33)     |
| 50 MHz  | 0.73 (2.39)   | 0.89 (2.91)   | 0.89 (2.91)   | 0.62 (2.05)   | 0.20 (0.64)     |
| 100 MHz   | 1.04 (3.40)   | 1.26 (4.14)   | 1.26 (4.14)   | 0.89 (2.91)   | 0.28 (0.93)     |
| 1000 MHz  | 3.40 (11.17)  | 4.11 (13.49)  | 4.11 (13.49)  | 2.93 (9.62)   | 0.99 (3.27)     |
| 1500 MHz  | 4.22 (13.84)  | 5.09 (16.69)  | 5.09 (16.69)  | 3.64 (11.95)  | 1.26 (4.14)     |
| 2000 MHz  | 4.92 (16.14)  | 5.92 (19.44)  | 5.93 (19.44)  | 4.26 (13.96)  | 1.50 (4.91)     |
| 2500 MHz  | 5.55 (18.21)  | 6.67 (21.89)  | 6.67 (21.89)  | 4.81 (15.76)  | 1.71 (5.62)     |
| 3000 MHz  | 6.13 (20.10)  | 7.36 (24.13)  | 7.36 (24.13)  | 5.31 (17.43)  | 1.91 (6.28)     |
| K1  | 0.101875      | 0.124310      | 0.124310      | 0.086948      | 0.026741        |
| K2  | 0.000183      | 0.000183      | 0.000183      | 0.000183      | 0.000150        |
| <b>Power (Watts) (+25 °C Ambient; Sea Level)</b>                |               |               |               |               |                 |
| 13.56 MHz   | 26221         | 21996         | 46760         | 61389         | 81965           |
| 50 MHz  | 13579         | 11404         | 24242         | 31756         | 41916           |
| 100 MHz   | 9555          | 8033          | 17076         | 22326         | 29185           |
| 1000 MHz  | 2919          | 2471          | 5253          | 6775          | 8293            |
| 1500 MHz  | 2357          | 2000          | 4251          | 5460          | 6553            |
| 2000 MHz  | 2022          | 1719          | 3654          | 4677          | 5525            |
| 2500 MHz  | 1794          | 1528          | 3248          | 4144          | 4830            |
| 3000 MHz  | 1626          | 1387          | 2948          | 3751          | 4320            |

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# Connectors

We offer a broad range of high power connectors. Below are some of them for reference. Please consult our factory for more details.

| Cable Category | Series | Stock Code | Part Number         | Cable Attachment |
|----------------|--------|------------|---------------------|------------------|
| RG-217         | HNM    | 3190-6358  | TC-217-HNMC         | Clamp            |
|                | HNMRA  | 3190-6359  | TC-217-HNMC-RA      | Clamp            |
| HP-218         | 158EIA | 3190-2473  | EZ-218-158EIA-CL    | C-S-C            |
|                | LCMRA  | 3190-2587  | TC-218-LCM-RA-CL    | C-S-C            |
|                | 158EIA | 3190-6415  | TC-218-158EIA-RA-CL | C-S-C            |
| HPL-218        | 716M   | 3190-6194  | TC-218-716M-CL      | C-S-C            |
|                | 78EIA  | 3190-6118  | TC-218-78EIA-CL     | C-S-C            |
|                | 158EIA | 3190-6415  | TC-218-158EIA-RA-CL | C-S-C            |
|                | 318EIA | 3190-6256  | TC-218-318EIA-RA    | Clamp            |
|                | 318EIA | 3190-6262  | TC-218-318EIA-CL    | Clamp            |
| RG-218         | LCMRA  | 3190-2587  | TC-218-LCM-RA-CL    | C-S-C            |
| HP-226         | 716M   | 3190-2624  | TC-226-716M-CL      | C-S-C            |
|                | 716MRA | 3190-2625  | TC-226-716M-RA-CL   | C-S-C            |
|                | LCM    | 3190-2665  | TC-226-LCM-CL       | C-S-C            |
|                | LCMRA  | 3190-2666  | TC-226-LCM-RA-CL    | C-S-C            |
| RG-393         | 716M   | 3190-2692  | TC-393-716M-CL      | C-S-C            |
|                | 716MRA | 3190-2693  | TC-393-716M-RA-CL   | C-S-C            |
|                | HNM    | 3190-2663  | TC-393-HNM-CL       | C-S-C            |
|                | HNMRA  | 3190-2559  | TC-393-HNM-RA-CL    | C-S-C            |
|                | LCM    | 3190-2565  | TC-393-LCM-CL       | C-S-C            |
|                | LCMRA  | 3190-2561  | TC-393-LCM-RA-CL    | C-S-C            |
|                | NM     | 3190-2745  | TC-393-NM-CL        | C-S-C            |
|                | NMRA   | 3190-2754  | TC-393-NM-RA-CL     | C-S-C            |
|                | SCM    | 3190-2569  | TC-393-SCM-CL       | C-S-C            |
|                | SCMRA  | 3190-2570  | TC-393-SCM-RA-CL    | C-S-C            |
| SFT-320        | HNM    | 3190-2563  | TC-320T-HNM-CL      | C-S-C            |
|                | LCM    | 3190-2664  | TC-320T-LCM-CL      | C-S-C            |
| SFT-500        | 716M   | 3190-2730  | TC-500T-716MC       | Clamp            |
|                | 716MRA | 3190-2729  | TC-500T-716MC-RA    | Clamp            |
|                | HNM    | 3190-2732  | TC-500T-HNMC        | Clamp            |
|                | HNMRA  | 3190-2731  | TC-500T-HNMC-RA     | Clamp            |

# Connectors

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| Cable Category | Series    | Stock Code       | Part Number                            | Cable Attachment                |  |
|----------------|-----------|------------------|--|---------------------------------|--|
| SFT-600        | 58EIA     | 3190-2485        | EZ-600T-158EIA-CL                      | C-S-C                           |  |
|                | 716M      | 3190-2636        | TC-600T-716MC                          | Clamp                           |  |
|                | 716MCL    | 3190-2595        | TC-600T-716M-CL                        | C-S-C                           |  |
|                | 716MRA    | 3190-2637        | TC-600T-716MC-RA                       | Clamp                           |  |
|                | 716MRA    | 3190-2594        | TC-600T-716M-RA-CL                     | C-S-C                           |  |
|                | 78EIA     | 3190-2755        | EZ-600T-78EIA-CL                       | C-S-C                           |  |
|                | 78EIA     | 3190-6163        | TC-600T-78EIA-RA-CL                    | C-S-C                           |  |
|                | 158EIA    | 3190-2568        | EZ-600T-158EIA-CL (.59")               | C-S-C                           |  |
|                | 158EIA    | 3190-6229        | TC-600T-158EIA-RA-CL                   | C-S-C                           |  |
|                | HNM       | 3190-2564        | TC-600T-HNM-CL                         | C-S-C                           |  |
|                | HNMRA     | 3190-2560        | TC-600T-HNM-RA-CL                      | C-S-C                           |  |
|                | LCM       | 3190-2566        | TC-600T-LCM-CL                         | C-S-C                           |  |
|                | LCMRA     | 3190-2562        | TC-600T-LCM-RA-CL                      | C-S-C                           |  |
|                | NM        | 3190-2583        | TC-600T-NM-CL                          | C-S-C                           |  |
|                | SCM       | 3190-2971        | TC-600T-SCM-CL                         | C-S-C                           |  |
|                | NMRA      | 3190-2757        | TC-600T-NM-RA-CL                       | C-S-C                           |  |
| 13-30M         | 3190-6333 | TC-600T-1330M-CL | C-S-C                                  |                                 |  |
| QEAM-810       | LCM       | 3190-2631        | LC Male for QEAM-810                   | C-S-C                           |  |
| LMR-900-LLPL   | NF        | 3190-1586        | EZ-900-NFC-PL-2                        | Clamp                           |  |
|                | NM        | 3190-1585        | EZ-900-NMC-PL-2                        | Clamp                           |  |
|                | 716M      | 3190-1549        | EZ-900-716MC-PL-2                      | Clamp                           |  |
| LMR-1200-LLPL  | NF        | 3190-912         | EZ-1200-NFC-PL                         | Clamp                           |  |
|                | NM        | 3190-911         | EZ-1200-NMC-PL                         | Clamp                           |  |
|                | NM        | 3190-6021        | EZ-1200-NMC-PL-2                       | Clamp                           |  |
| HP-1200        | 158EIA    | 3190-2724        | EZ-HP1200-158EIA                       | Clamp                           |  |
|                | 318EIA    | 3190-2915        | EZ-HP1200-318EIA                       | Clamp                           |  |
| Receptacle     | QDSF      | 3191-296         | QDSF-PM w/threaded pin                 |                                 |  |
|                | QDLCF     |                  | 3191-274                               | QDLCF-RA-PM w/threaded pin      |  |
|                |           |                  | 3191-293                               | QDLCF-PM(1.25SQ) w/threaded pin |  |
|                |           |                  | 3191-294                               | QDLCF-RA-PM w/spring pin        |  |
|                |           |                  | 3191-295                               | QDLCF-PM w/spring pin           |  |
|                |           |                  | 3191-297                               | QDLCF-PM(2SQ) w/threaded pin    |  |
|                |           |                  | 3191-300                               | QDLCF-PM w/solder cup pim       |  |
| Adapter        | HNF-HNF   | 3191-360         | HN Female to HN Female                 |                                 |  |
|                | 716M-716F | 3191-361         | 7-16 DIN Male to n Female              |                                 |  |
|                | QDLCF-LCM | 3191-302         | QDLC Female to LC male                 |                                 |  |
|                | QDLCM-LCF | 3191-303         | QDLC Male to LC Female                 |                                 |  |
|                | 158EIA    | 3191-6001        | Threaded 1-5/8" EIA Male to 1-5/8" EIA |                                 |  |
|                | NF-1330F  | 3191-6029        | Type N Female to 13-30 Female          |                                 |  |

\* "C-S-C" = Clam Shell Clamp

## Threaded EIA connectors

EIA Flange connectors are rugged and are often the optimal choice when working with very high power levels. If there is a disadvantage to the EIA flange, it's the large outer diameter of the flange which may result in a routing challenge when installing a finished assembly. In the case of the 1 5/8" EIA, we've addressed this issue by developing both a threaded 1 5/8" connector as well as a separate 1 5/8" flange adapter. The combined assembly will handle all of the power of the typical 1 5/8" connector and will allow the assembly to be routed through a bulkhead hole/knockout having a diameter which is only a fraction of that required by the standard 1 5/8" connector. This new 1 5/8" EIA connector combination is currently available for our HP-1200-PUR cable.



3191-6001  
Adaptor Threaded 1-5/8" EIA Male  
to 1-5/8" EIA



3190-6069  
Connector Threaded 1-5/8" EIA Female  
for HP-1200-PUR

## Quick Disconnect - QDLC & QDS

Times Microwave Systems provides a few types of quick disconnect connectors including QDLC and QDS.

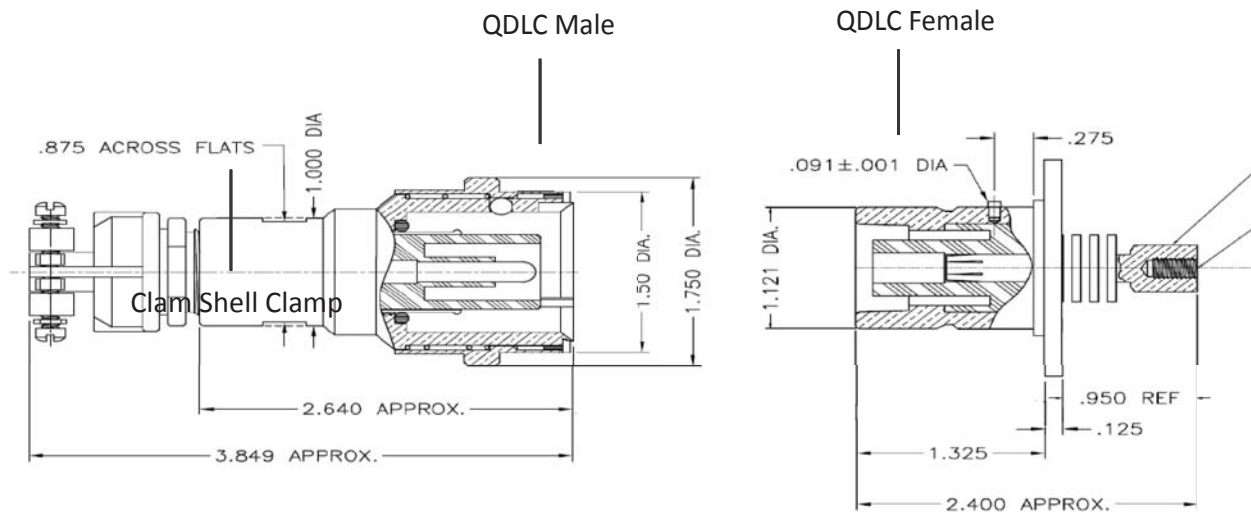
The interface is a proprietary Times developed specifically for high power applications. Based on LC interface, it includes an overlapping dielectric and a quick disconnect mechanism to allow quick installation and removal. We also supply mating female connectors.



TC-400-QDSM



TC-600-QDSM-RA

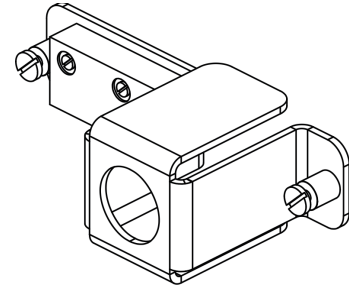
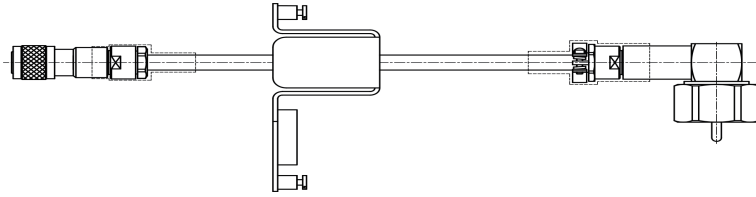


## Clam Shell Clamp Strain Relief

Many high power applications in semi-conductor and flat panel manufacturing require periodically moving cables for maintenance and cleaning operations. This places a great deal of strain on the cable to connector interface. The use of a secondary clam-shell style clamp to secure the connector to the cable is an effective way to provide strain relief and prevent cable to connector failures. Although there may be some distortion of the cable shape, at frequencies below 100 MHz or so, this does not cause a performance issue.

# Custom Interlock Bracket

Times Microwave Systems offers the customized brackets to allow mounting of interlock switches.



# Selection of RF Coaxial Cable by Power Handling

Electrical losses in a coaxial cable result in the generation of heat in the center and outer conductors, as well as in the dielectric core. The power handling capability of a cable is related to the ability of the cable to dissipate this heat. The ultimate limiting factor in power handling is the maximum allowable operating temperature of the materials used in the cable, especially the dielectric. This is because most of the heat is generated at the center conductor of the cable. In general, the power handling capability of a given cable is inversely proportional to its attenuation, and directly related to its size. The other factor is the heat transfer properties of the cable, especially the dielectric.

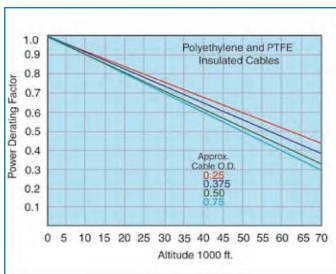
Cable power ratings must be derated by correction factors for the ambient temperature, altitude and VSWR encountered in a particular application. High ambient temperature and high altitude reduce the power rating of a cable by impeding heat transfer out of the cable, VSWR reduces power rating by causing localized hot spots in the cable.

To select the cable construction for a particular requirement, determine the average input power at the highest frequency from system requirements. Then determine the effective average input power as follows:

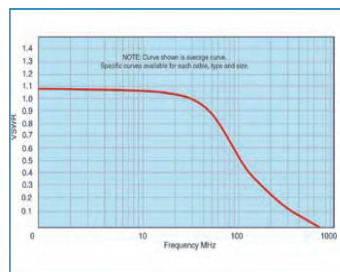
$$\text{Effective Power} = \frac{\text{Average Power} \times (\text{VSWR correction})}{(\text{Temp. correction}) \times (\text{Alt. correction})}$$

Temperature and altitude corrections are shown as:

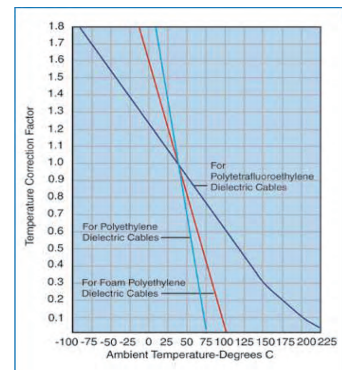
Power Altitude Correction Factor:



VSWR Correction Factor Multiplier K



Power Temperature Correction Factor:



VSWR correction factor =

$$1/2 \left( \text{VSWR} + \frac{1}{\text{VSWR}} \right) + 1/2 k \left( \text{VSWR} - \frac{1}{\text{VSWR}} \right)$$

Where k, is shown in the second Figure. Select a cable from the Attenuation and Power charts rated at this effective power level. Note that the peak power handling capability of a cable is related to the maximum operating voltage rating.

