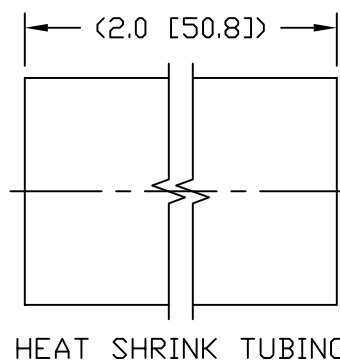
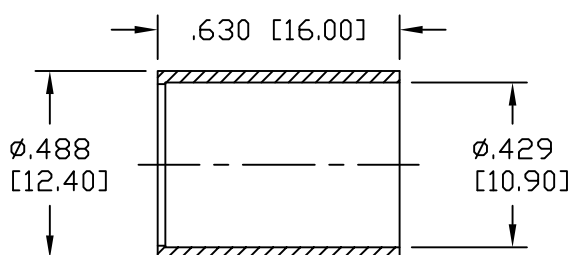
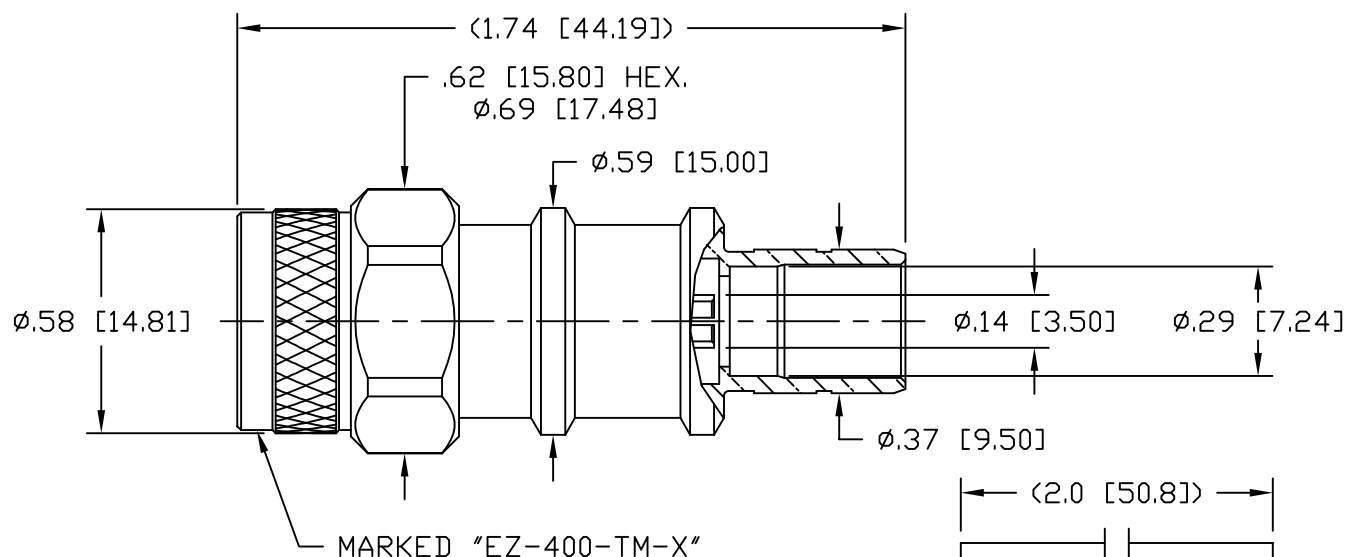
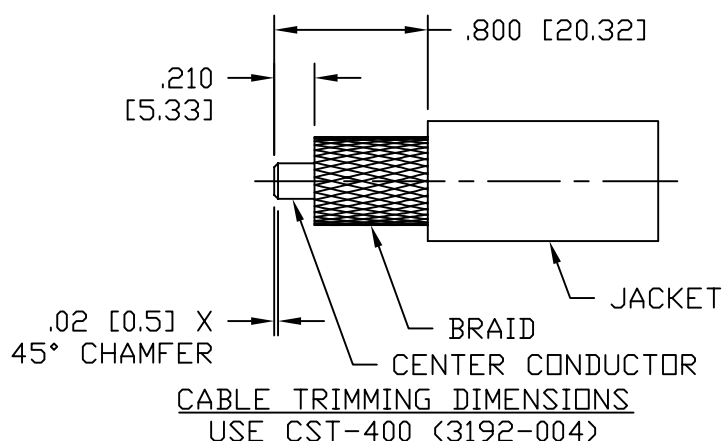


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| SYM | REVISION DESCRIPTION    | DFTM   | DATE     | APPD   | DATE     |
|-----|-------------------------|--------|----------|--------|----------|
| A   | RELEASED FOR PRODUCTION | K.A.M. | 2/25/10  | J.D.B. | 3/11/10  |
| B   | CHANGED PER CDC #34322  | D.J.H. | 10/12/11 | J.D.B. | 10/27/11 |
| C   | CHANGED PER CDC #36607  | D.J.H. | 11/16/12 | J.D.B. | 11/19/12 |



HEAT SHRINK TUBING



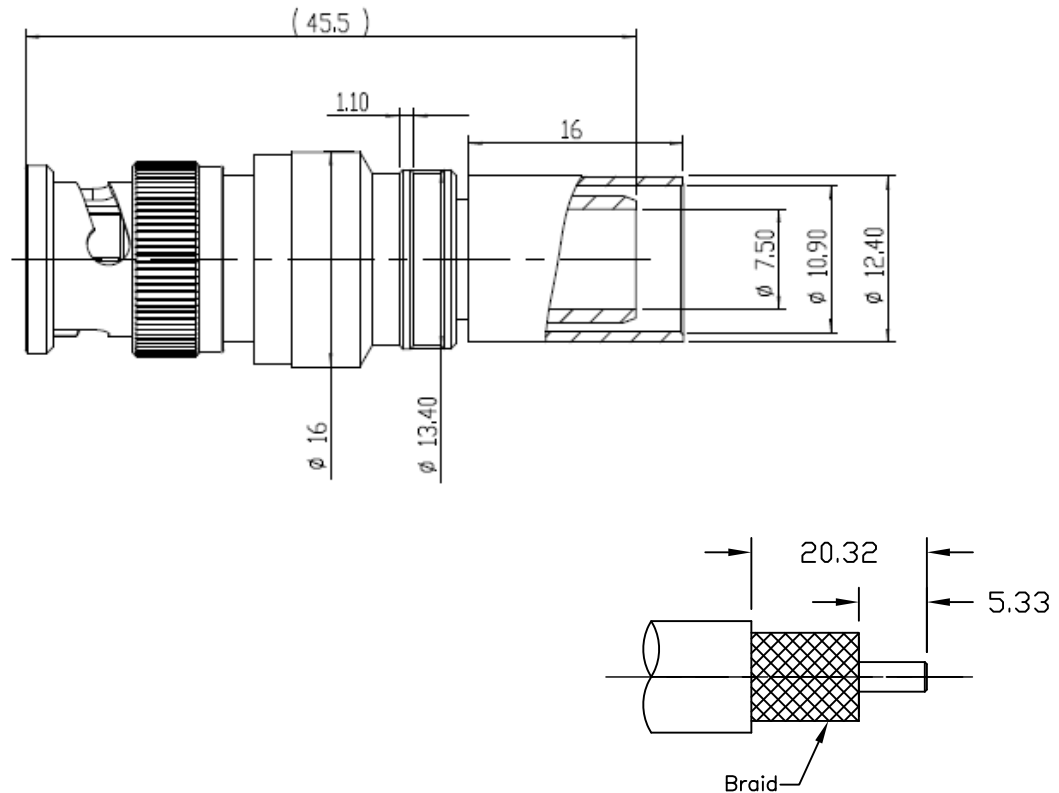
NOTES:

- MATERIALS AND FINISHES:  
BODY: BRASS, ALBALOY PLATING  
COUPLING NUT: BRASS, ALBALOY PLATING  
CENTER CONTACT: BERYLLIUM COPPER, GOLD PLATING  
FERRULE: COPPER, ALBALOY PLATING
- ELECTRICAL:  
IMPEDANCE: 50 OHMS NOMINAL  
FREQUENCY: DC-6 GHz  
VSWR: 1.2 DC-6 GHz  
DIELECTRIC WITHSTANDING VOLTAGE: 1,000 VOLTS RMS
- MECHANICAL:  
DURABILITY: 500 CYCLES MIN.  
TEMPERATURE RANGE: -65°C TO +165°C
- CABLING INSTRUCTIONS:  
A. SLIDE FERRULE OVER CABLE JACKET  
B. TRIM CABLE TO DIMENSIONS SHOWN. MAKE SURE CUTS ARE SHARP AND SQUARE. DO NOT NICK BRAID OR CENTER CONDUCTOR.  
C. FLAIR BRAID SLIGHTLY AND INSERT CABLE INTO BODY UNTIL BOTTOMED. SLIDE THE FERRULE UP THE CABLE AND OVER THE BRAID UNTIL BOTTOMED ON BODY. CRIMP FERRULE USING A .429 HEX.  
5. RECOMMENDED COUPLING NUT TORQUE: 4-6 IN-LBS.

|            |  |                                                                                                                                                                                                                                                                                                                |  |                      |                                             |                |              |             |       |
|------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------|---------------------------------------------|----------------|--------------|-------------|-------|
| MATL:      |  | UNLESS OTHERWISE SPECIFIED<br><br>ALL DIMENSIONS ARE IN INCHES<br>MACHINED SURFACES FINISH 32 RMS MAX.<br>REMOVE ALL BURRS .005 MAX. BREAK<br>MACHINE CORNERS .005 MAX. FILLET R.<br>TOLERANCES ON DECIMALS<br>.XX ± .01                      .XXX ± .005<br>ANGLES ± 1°                      FRACTIONS ± 1/64 |  | DFTM. K. A. M.       | TIMES MICROWAVE SYSTEMS                     |                |              |             |       |
|            |  |                                                                                                                                                                                                                                                                                                                |  | DATE 2/25/10         |                                             |                |              |             |       |
| USED ON: B |  |                                                                                                                                                                                                                                                                                                                |  | CHKD. J. D. B.       | EZ-400-TM-X<br>PLUG, TNC, EZ<br>FOR LMR-400 |                |              |             |       |
|            |  |                                                                                                                                                                                                                                                                                                                |  | DATE 3/11/10         |                                             |                |              |             |       |
| SCALE: ~   |  | DWG. SIZE A                                                                                                                                                                                                                                                                                                    |  | DO NOT SCALE DRAWING | CODE IDENT 68999                            | DATE 3/11/10   | SHEET 1 of 1 | SD3190-2533 | REV C |
|            |  |                                                                                                                                                                                                                                                                                                                |  |                      |                                             | APPD. J. D. B. |              |             |       |

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| SYM | REVISION DESCRIPTION    | DFTM  | DATE   | APPD   | DATE   |
|-----|-------------------------|-------|--------|--------|--------|
| A   | RELEASED FOR PRODUCTION | N.N.N | 8/6/13 | J.D.B. | 8/9/13 |



Reference standard IEC60169-8

**I. Electric Performance**

Nominal Impedance( $\Omega$ ): 50  
Frequency Range: DC-4GHz  
VSWR:  $\leq 1.35$   
Insert Loss:  $\leq 0.1$   
Insulation resistance ( $M\Omega$ ):  $\geq 5000$   
Withstand voltage (V): 1500  
Conductor resistance ( $m\Omega$ ):  
outer conductor  $< 0.4$   
inner conductor  $< 1.5$

**II. Mechanical Performance**

Tensile force(cable-connect) 400N  
Torsion(cable-connect) 2N.m

**III. Material and plating:**

Component  
inner conductor Material Spring copper  
outer conductor Brass  
insulator PTFE  
o-ring Silicone rubber

Plating  
Au 1.27um  
Copper-tin-zinc 2um

**IV. Environment**

Temp.range -55°C~+155°C  
Weather standard IEC 60068 55 / 155/ 56  
Thermal shock US MIL-STD 202,Meth.107,Cond.B  
Vibration US MIL-STD 202,Meth.204,Cond.B  
Shock US MIL-STD 202,Meth.213,Cond.I  
ROHS compliant

V. Assemble: inner conductor installed and outer conductor crimped

|            |                                                                                                                                                                                                                                                |                      |                                           |             |                                 |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------------------|-------------|---------------------------------|
| MATL:      | UNLESS OTHERWISE SPECIFIED                                                                                                                                                                                                                     | DFTM. N. N. N        | TIMES MICROWAVE SYSTEMS                   |             |                                 |
|            |                                                                                                                                                                                                                                                | DATE 8/6/13          |                                           |             |                                 |
| USED ON: ~ | ALL DIMENSIONS ARE IN mm<br>MACHINED SURFACES FINISH N/A RMS MAX.<br>REMOVE ALL BURRS N/A MAX. BREAK<br>MACHINE CORNERS N/A MAX. FILLET R.<br>TOLERANCES ON DECIMALS<br>. XX $\pm$ N/A . XXX $\pm$ N/A<br>ANGLES $\pm$ N/A FRACTIONS $\pm$ N/A | CHKD. J. D. B.       | <b>EZ-400-BM-X</b><br>BNCM<br>for LMR-400 |             |                                 |
|            |                                                                                                                                                                                                                                                | DATE 8/9/13          |                                           |             |                                 |
| SCALE: N/A | DWG. SIZE A                                                                                                                                                                                                                                    | DO NOT SCALE DRAWING | CODE IDENT 68999                          | DATE 8/9/13 | SH T 1 of 1 SD3190-2852 R E V A |

# LMR®-400 Flexible Low Loss Communications Coax

## Ideal for...

- Drop-in replacement for RG-8/9913 Air-Dielectric type Cable
- Jumper Assemblies in Wireless Communications Systems
- Short Antenna Feeder runs
- Any application (e.g. WLL, GPS, LMR, WLAN, WISP, WiMax, SCADA, Mobile Antennas) requiring an easily routed, low loss RF cable



• **LMR®** standard is a UV Resistant Polyethylene jacketed cable designed for 20-year service outdoor use. The bending and handling characteristics are significantly better than air-dielectric and corrugated hard-line cables.

• **LMR®-DB** is identical to standard LMR plus has the advantage of being watertight. The addition of waterproofing compound in and around the foil/braid insures continuous reliable service should the jacket be inadvertently damaged during installation or in the future.

• **LMR®-FR** is a non-halogen (non-toxic), low smoke, fire retardant cable designed for in-building runs that can be routed anywhere except air handling plenums. LMR-FR is UL/NEC & CSA rated 'CMR' and 'FT4' respectively, meets FAA FAR25 requirements and is MSHA-P for mining applications.

• **LMR®-FR-PVC** is a general-purpose indoor cable and has a UL/NEC & CSA rating of 'CMR' and 'FT4' respectively. It is less expensive than LMR-FR, however it emits toxic fumes (HCL) and greater smoke density when burned.

• **LMR®-PVC** is designed for low loss general-purpose applications and is somewhat more flexible than the standard polyethylene jacketed LMR.

• **LMR®-PVC-W** is a white-jacketed version of LMR-PVC for marine and other applications where color compatibility is desired.

• **Flexibility** and bendability are hallmarks of the LMR-400 cable design. The flexible outer conductor enables the tightest bend radius available for any cable of similar size and performance.

• **Low Loss** is another hallmark feature of LMR-400.

Size for size LMR has the lowest loss of any flexible cable and comparable loss to semirigid hard-line cables.

• **RF Shielding** is 50 dB greater than typical single shielded coax (40 dB). The multi-ply bonded foil outer conductor is rated conservatively at > 90 dB (i.e. >180 dB between two adjacent cables).

• **Weatherability:** LMR-400 cables designed for outdoor exposure incorporate the best materials for UV resistance and have life expectancy in excess of 20 years.

• **Connectors:** A wide variety of connectors are available for LMR-400 cable, including all common interface types, reverse polarity, and a choice of solder or non-solder center pins. Most LMR connectors employ crimp outer attachment using standard hex crimp sizes.

• **Cable Assemblies:** All LMR-400 cable types are available as pre-terminated cable assemblies. Refer to the section on FlexTech for further details.

| Part Description |                      |           |       |  | Stock |
|------------------|----------------------|-----------|-------|--|-------|
| Part Number      | Application          | Jacket    | Color |  | Code  |
| LMR-400          | Outdoor              | PE        | Black |  | 54001 |
| LMR-400-DB       | Outdoor/Watertight   | PE        | Black |  | 54091 |
| LMR-400-FR       | Indoor/Outdoor Riser | CMR FRPE  | Black |  | 54030 |
| LMR-400-FR-PVC   | Indoor/Outdoor Riser | CMR FRPVC | Black |  | 54073 |
| LMR-400-PVC      | General Purpose      | PVC       | Black |  | 54218 |
| LMR-400-PVC-W    | General Purpose      | PVC       | White |  | 54204 |

| Construction Specifications |                   |       |         |
|-----------------------------|-------------------|-------|---------|
| Description                 | Material          | In.   | (mm)    |
| Inner Conductor             | Solid BCCAI       | 0.108 | (2.74)  |
| Dielectric                  | Foam PE           | 0.285 | (7.24)  |
| Outer Conductor             | Aluminum Tape     | 0.291 | (7.39)  |
| Overall Braid               | Tinned Copper     | 0.320 | (8.13)  |
| Jacket                      | (see table above) | 0.405 | (10.29) |

# LMR®-400 Flexible Low Loss Communications Coax



## Connectors

|           |                 |                  |                   |                       |                 |           | Inner         | Outer   | Finish*   |                   |                  |                 |  |  |  |
|-----------|-----------------|------------------|-------------------|-----------------------|-----------------|-----------|---------------|---------|-----------|-------------------|------------------|-----------------|--|--|--|
| Interface | Description     | Part Number      | Stock Code        | VSWR**<br>Freq. (GHz) | Coupling<br>Nut | Contact   | Contact       | Contact | Body /Pin | Length<br>in (mm) | Width<br>in (mm) | Weight<br>lb(g) |  |  |  |
|           | 7-16 DIN Female | Straight Jack    | TC-400-716-FC     | 3190-376              | <1.25:1 (2.5)   | NA        | Solder        | Clamp   | S/S       | 1.6 (41)          | 1.13 (28.7)      | 0.281 (127.5)   |  |  |  |
|           | 7-16 DIN Male   | Straight Plug    | EZ-400-716M-X     | 3190-2524             | <1.25:1 (6)     | Hex       | Spring Finger | Crimp   | A/G       | 1.6 (39.5)        | 1.38 (35)        | 0.277 (126.0)   |  |  |  |
|           | 7-16 DIN Male   | Straight Plug    | TC-400-716-MC     | 3190-279              | <1.25:1 (2.5)   | Hex       | Solder        | Clamp   | S/S       | 1.4 (36)          | 1.40 (35.6)      | 0.268 (121.6)   |  |  |  |
|           | 7-16 DIN Male   | Right Angle      | TC-400-716MC-RA   | 3190-1671             | <1.25:1 (<3)    | Hex       | Solder        | Clamp   | A/S       | 2.4 (61.5)        | 1.88 (47.8)      | 0.35 (159)      |  |  |  |
|           | 7-16DIN Male    | Right Angle      | EZ-400-716M-RA-X  | 3190-2545             | <1.35:1 (6)     | Hex       | Spring Finger | Crimp   | A/G       | 1.6 (41.7)        | 1.75 (44.3)      | 0.374 (0.17)    |  |  |  |
|           | BNC Male        | Straight Plug    | TC-400-BM         | 3190-318              | <1.25:1 (2.5)   | Knurl     | Solder        | Crimp   | N/S       | 1.7 (43)          | 0.56 (14.2)      | 0.063 (28.6)    |  |  |  |
|           | HN Male         | Straight Plug    | TC-400-HNM        | 3190-923              | <1.25:1 (<1)    | Knurl     | Solder        | Clamp   | S/G       | 2.3 (59.2)        | 0.88 (22.4)      | 0.25 (113.4)    |  |  |  |
|           | HN Male         | Right Angle      | TC-400-HNM-RA     | 3190-2541             | <1.25:1 (2.5)   | Hex       | Solder        | Crimp   | A/G       | 1.6 (41.4)        | 1.56 (39.6)      | 0.198 (90.0)    |  |  |  |
|           | QDS Male        | Straight Plug    | TC-400-QDSM       | 3190-620              | <1.25:1 (<3)    | Knurl     | Solder        | Clamp   | A/G       | 1.8 (46.6)        | 1.00 (25.4)      | 0.25 (113.4)    |  |  |  |
|           | Mini-UHF        | Straight Plug    | TC-400-MUHF       | 3190-520              | <1.25:1 (2.5)   | Knurl     | Solder        | Crimp   | N/G       | 1.1 (28)          | 0.50 (12.7)      | 0.020 (9.1)     |  |  |  |
|           | N Female        | Straight Jack    | TC-400-NFC        | 3190-299              | <1.25:1 (2.5)   | NA        | Solder        | Clamp   | N/S       | 1.6 (41)          | 0.75 (19.1)      | 0.119 (54.0)    |  |  |  |
|           |                 | Straight Jack    | EZ-400-NF         | 3190-956              | <1.25:1 (2.5)   | NA        | Spring Finger | Crimp   | N/G       | 1.8 (45)          | 0.66 (16.8)      | 0.105 (47.6)    |  |  |  |
|           |                 | Straight Jack    | TC-400-NF         | 3190-2255             | <1.25:1 (2.5)   | NA        | Solder        | Crimp   | N/G       | 1.8 (45)          | 0.66 (16.8)      | 0.105 (47.6)    |  |  |  |
|           |                 | Bulkhead Jack    | EZ-400-NF-BH      | 3190-518*             | <1.25:1 (2.5)   | NA        | Spring Finger | Crimp   | N/G       | 1.8 (46)          | 0.88 (22.4)      | 0.102 (46.3)    |  |  |  |
|           |                 | Bulkhead Jack    | TC-400-NFC-BH (A) | 3190-872              | <1.25:1 (2.5)   | NA        | Solder        | Clamp   | A/G       | 1.8 (46)          | 0.88 (22.4)      | 0.145 (65.8)    |  |  |  |
|           | N Male          | Straight Plug    | SC-400-NM         | 3190-1454             | <1.25:1 (2.5)   | Knurl     | Solder        | Crimp   | N/G       | 1.5 (38)          | 0.75 (19.1)      | 0.090 (40.8)    |  |  |  |
|           |                 | Straight Plug    | TC-400-NMC        | 3190-277              | <1.25:1 (2.5)   | Knurl     | Solder        | Clamp   | N/G       | 1.5 (38)          | 0.70 (17.8)      | 0.121 (54.9)    |  |  |  |
|           |                 | Straight Plug    | EZ-400-NMC-2      | 3190-2640             | <1.25:1 (2.5)   | Hex/Knurl | Spring Finger | Crimp   | N/G       | 1.5 (38)          | 0.75 (19.1)      | 0.121 (54.9)    |  |  |  |
|           |                 | Straight Plug    | EZ-400-NMH-X      | 3190-2590             | <1.25:1 (10)    | Hex/Knurl | Spring Finger | Crimp   | A/G       | 1.5 (38)          | 0.89 (22.6)      | 0.103 (46.8)    |  |  |  |
|           |                 | Straight Plug    | TC-400-NMH-X      | 3190-2626             | <1.25:1 (10)    | Hex/Knurl | Solder        | Crimp   | A/G       | 1.5 (38)          | 0.89 (22.6)      | 0.113 (51.3)    |  |  |  |
|           |                 | Straight Plug    | EZ-400-NMK        | 3190-661              | <1.25:1 (10)    | Knurl     | Spring Finger | Crimp   | S/G       | 1.5 (38)          | 0.75 (22.6)      | 0.113 (51.3)    |  |  |  |
|           |                 | Right Angle      | EZ-400-NMH-RA-X   | 3190-2638             | <1.35:1 (6)     | Hex/Knurl | Spring Finger | Crimp   | A/G       | 1.87 (47)         | 1.42 (36.0)      | 0.177 (80.2)    |  |  |  |
|           |                 | Right Angle      | TC-400-NMH-RA-D   | 3190-2293*            | <1.35:1 (6)     | Hex/Knurl | Solder        | Crimp   | A/G       | 1.8 (46)          | 1.25 (31.8)      | 0.130 (59.0)    |  |  |  |
|           |                 | Right Angle      | TC-400-NMC-RA (A) | 3190-870              | <1.35:1 (2.5)   | Hex       | Solder        | Clamp   | A/G       | 1.8 (46)          | 1.25 (31.8)      | 0.150 (68.0)    |  |  |  |
|           |                 | Reverse Polarity | TC-400-NM-RP      | 3190-960              | <1.25:1 (2.5)   | Knurl     | Solder        | Crimp   | N/G       | 1.5 (38)          | 0.75 (19.1)      | 0.090 (40.8)    |  |  |  |
|           | SMA Male        | Straight Plug    | TC-400-SM         | 3190-439              | <1.25:1 (8)     | Hex       | Solder        | Crimp   | N/G       | 1.2 (29)          | 0.50 (12.7)      | 0.032 (14.5)    |  |  |  |
|           | TNC Female      | Reverse Polarity | TC-400-TF-RP      | 3190-1063             | <1.25:1 (2.5)   | NA        | Solder        | Crimp   | N/G       | 1.8 (46)          | 0.55 (14.0)      | 0.074 (33.6)    |  |  |  |
|           |                 | Reverse Polarity | EZ-400-TF-RP      | 3190-795              | <1.25:1 (2.5)   | NA        | Spring Finger | Crimp   | A/G       | 1.8 (46)          | 0.55 (14.0)      | 0.074 (33.6)    |  |  |  |
|           | TNC Male        | Straight Plug    | TC-400-TM-X       | 3190-2532             | <1.25:1 (6)     | Hex/Knurl | Solder        | Crimp   | A/G       | 1.9 (48)          | 0.67 (17.5)      | 0.075 (34.3)    |  |  |  |
|           |                 | Straight Plug    | EZ-400-TM-X       | 3190-2533             | <1.25:1 (6)     | Hex/Knurl | Spring Finger | Crimp   | A/G       | 1.9 (48)          | 0.67 (17.5)      | 0.075 (34.3)    |  |  |  |
|           |                 | Right Angle      | TC-400-TM-RA      | 3190-442*             | <1.35:1 (2.5)   | Knurl     | Solder        | Crimp   | N/G       | 1.7 (43)          | 0.59 (15.0)      | 0.085 (38.6)    |  |  |  |
|           |                 | Reverse Polarity | TC-400-TM-RP      | 3190-1062             | <1.25:1 (2.5)   | Knurl     | Solder        | Crimp   | N/G       | 1.7 (43)          | 0.59 (15.0)      | 0.074 (33.6)    |  |  |  |
|           |                 | Reverse Polarity | EZ-400-TM-RP      | 3190-794              | <1.25:1 (2.5)   | Knurl     | Spring Finger | Crimp   | A/G       | 1.7 (43)          | 0.59 (15.0)      | 0.074 (33.6)    |  |  |  |