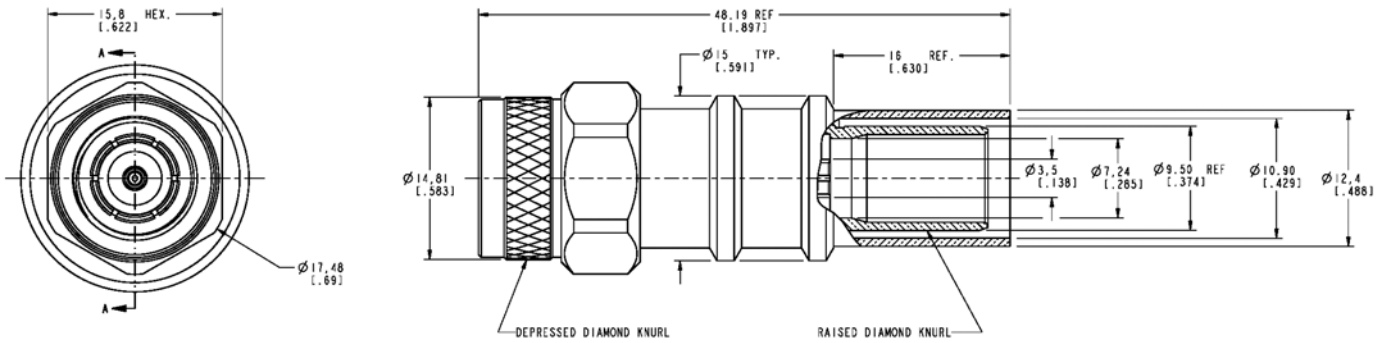


NOTICE OF PROPRIETARY RIGHTS THIS DOCUMENT CONTAINS CONFIDENTIAL TECHNICAL DATA, INCLUDING TRADE SECRETS, PROPRIETARY TO TIMES MICROWAVE SYSTEMS. DISCLOSURE OF THIS DATA IS EXPRESSLY CONDITIONED UPON YOUR ASSENT THAT ITS USE IS LIMITED TO USE WITHIN YOUR COMPANY ONLY. ANY OTHER USE IS STRICTLY PROHIBITED WITHOUT THE PRIOR WRITTEN CONSENT OF TIMES MICROWAVE SYSTEMS.

| SYM | REVISION DESCRIPTION | DFTM | DATE | APPD | DATE |
|-----|-------------------------|----------|---------|----------|---------|
| A | RELEASED FOR PRODUCTION | K. A. M. | 2/25/10 | J. D. B. | 3/11/10 |

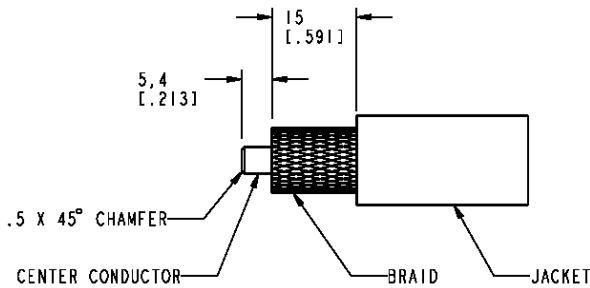


NOTES:

- MATERIALS AND FINISHES:**
 BODY : BRASS, WHITE BRONZE PLATE
 COUPLING NUT: BRASS, WHITE BRONZE PLATE
 CENTER CONTACT: BERYLLIUM COPPER, GOLD PLATE
 FERRULE: COPPER, WHITE BRONZE PLATE
- ELECTRICAL:**
 IMPEDANCE: 50 OHMS NOMINAL
 FREQUENCY: DC-11 GHz
 VSWR: 1.2 DC-8 GHz
 1.35 8-11 GHz
 DIELECTRIC WITHSTANDING VOLTAGE: 1,500 VOLTS RMS

MECHANICAL:
 DURABILITY: 500 CYCLES MIN.
 TEMPERATURE RANGE: -65°C TO +165°C

- CABLING INSTRUCTIONS:**
- SLIDE FERRULE OVER CABLE JACKET
 - TRIM CABLE TO DIMENSIONS SHOWN. MAKE SURE CUTS ARE SHARP AND SQUARE. DO NOT NICK BRAID OR CENTER CONDUCTOR.
 - FLAIR BRAID SLIGHTLY AND INSERT CABLE INTO BODY UNTIL BOTTOMED. (CONTACT SUPPLIED ASSEMBLED) SLIDE THE FERRULE UP THE CABLE AND OVER THE BRAID UNTIL BOTTOMED ON BODY. CRIMP FERRULE USING A .429 HEX.

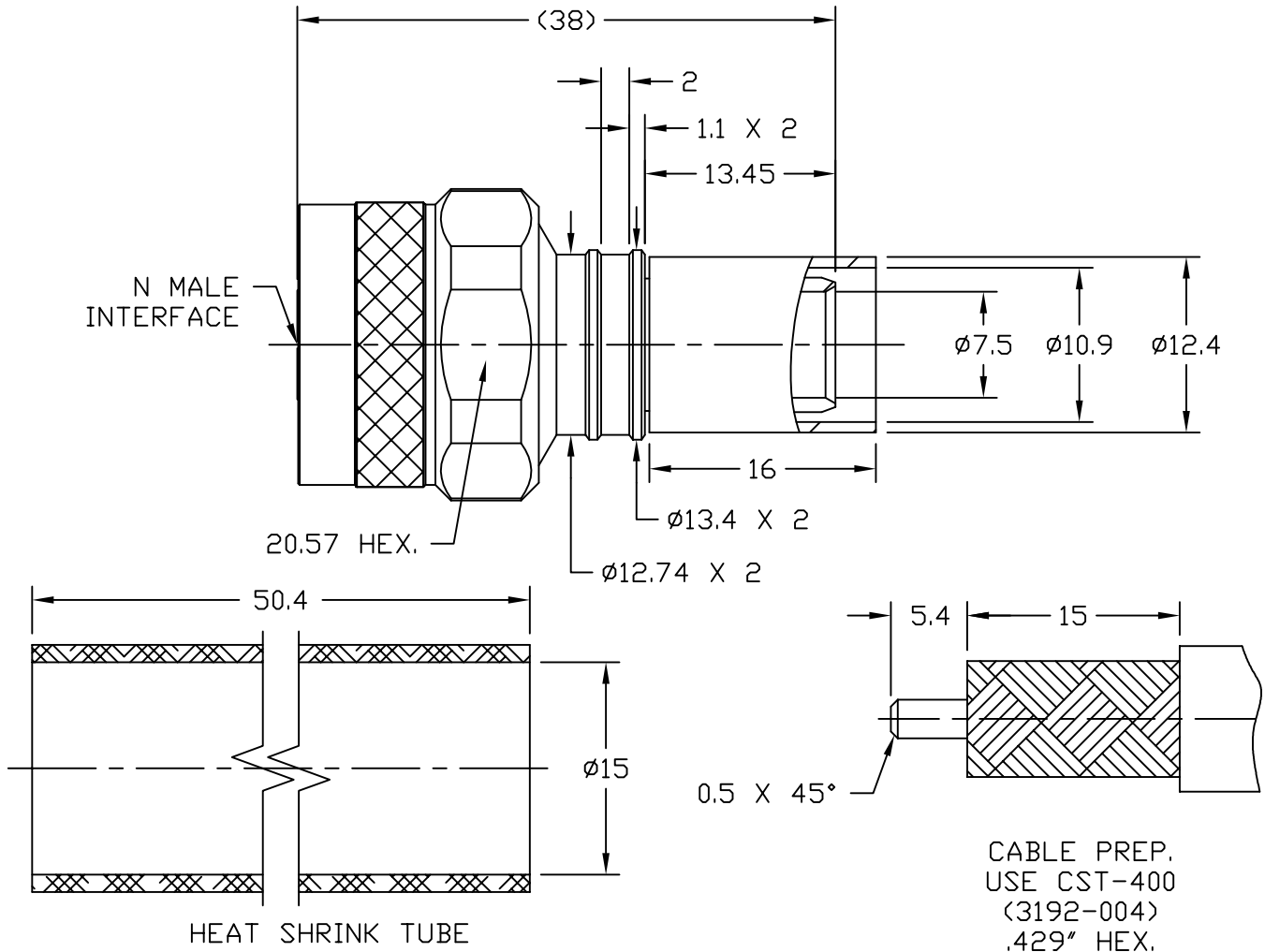


CABLE TRIMMING DIMENSIONS

| | | | | |
|------------|------------------------------------|-------------------------------------|----------------|------------------------------|
| MATERIAL: | UNLESS OTHERWISE SPECIFIED | | DFTM: K. A. M. | TIMES MICROWAVE SYSTEMS |
| | DIMENSIONS ARE IN mm | | DATE: 2/25/10 | |
| USED ON: 1 | Tolerances are: | | CHKD: J. D. B. | PLUG, TNC, EZ FOR LMR-400 |
| | 1 PLACE DECIMAL ± 0.3MM (.012") | 2 PLACE DECIMAL ± .10 MM (.004") | ANGLES ± 1° | |
| SCALE: ~ | DWG. SIZE: A | DO NOT SCALE DRAWING | APPD: J. D. B. | DATE: 3/11/10 |
| | | CODE IDENT: 68999 | DATE: 3/11/10 | REV: A |
| | | | DATE: 3/11/10 | REV: A |

NOTICE OF PROPRIETARY RIGHTS THIS DOCUMENT CONTAINS CONFIDENTIAL TECHNICAL DATA, INCLUDING TRADE SECRETS, PROPRIETARY TO TIMES MICROWAVE SYSTEMS. DISCLOSURE OF THIS DATA IS EXPRESSLY CONDITIONED UPON YOUR ASSENT THAT ITS USE IS LIMITED TO USE WITHIN YOUR COMPANY ONLY. ANY OTHER USE IS STRICTLY PROHIBITED WITHOUT THE PRIOR WRITTEN CONSENT OF TIMES MICROWAVE SYSTEMS.

| SYM | REVISION DESCRIPTION | DFTM | DATE | APPD | DATE |
|-----|-------------------------|----------|---------|----------|---------|
| A | RELEASED FOR PRODUCTION | D. J. H. | 6/13/11 | J. D. B. | 6/27/11 |
| B | CHANGED PER CDC #33920 | D. J. H. | 8/12/11 | J. D. B. | 8/15/11 |



| | | | |
|------------------------------|--|-----------------------------|--------------------------------|
| Reference standard | IEC60169-16 | III. Material and plating: | |
| I. Electric Performance | | Component | Material |
| Impedance(Ω): | 50 | inner conductor | Brass |
| Frequency Range: | DC-6GHz | outer conductor | Brass |
| VSWR: | ≤1.25 | tube | Copper |
| Insert Loss: (dB) | ≤ 0.05 | nut | Brass |
| Insulation resistance (MΩ) | >5000 | gasket | Silicone rubber |
| Work voltage (V) | 1500 | insulator | PTFE |
| Conductor resistance (mΩ) | outer conductor <0.2 inner conductor <0.8 | IV. Environment | |
| II. Mechanical Performance | | Temp.range | -55°C~+155°C |
| Nut torque | 25N.m | Weather standard | IEC 60068 55 / 155/ 56 |
| (Nut) Whorl pull | 1000N | Thermal shock | US MIL-STD 202,Meth.107,Cond.B |
| Tensile force(cable-connect) | 400N | Vibration | US MIL-STD 202,Meth.204,Cond.B |
| Torsion(cable-connect) | 2N.m | Shock | US MIL-STD 202,Meth.213,Cond.I |
| | | Waterproofing standard IP67 | |

V. Assembly: inner conductor installed and outer conductor crimped

| | | | | | | | |
|------------|---|----------------------|---|--------------|-------------|-------------|-------|
| MATERIAL: | UNLESS OTHERWISE SPECIFIED | DFTM. D. J. H. | TIMES MICROWAVE SYSTEMS | | | | |
| | | DATE 6/13/11 | | | | | |
| USED ON: 0 | ALL DIMENSIONS ARE IN mm MACHINED SURFACES FINISH N/A RMS MAX. REMOVE ALL BURRS N/A MAX. BREAK MACHINE CORNERS N/A MAX. FILLET R. TOLERANCES ON DECIMALS .XX ± N/A .XXX ± N/A ANGLES ± 1° FRACTIONS ± N/A | CHKD. J. D. B. | EZ-400-NMH-X "N" MALE FOR LMR-400 CABLE EZ/CRIMP/NO BRAID TRIM | | | | |
| | | DATE 6/27/11 | | | | | |
| | | APPD. J. D. B. | | | | | |
| SCALE: N/A | DWG. SIZE A | DO NOT SCALE DRAWING | CODE IDENT 68999 | DATE 6/27/11 | SHIT 1 of 1 | SD3190-2590 | REV B |

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 | 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

| Interface | Description | Part Number | Stock Code | VSWR** Freq. (GHz) | Coupling Nut | Inner Contact Attach | Outer Contact Attach | Finish* Body /Pin | Length in (mm) | Width in (mm) | Weight 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) |