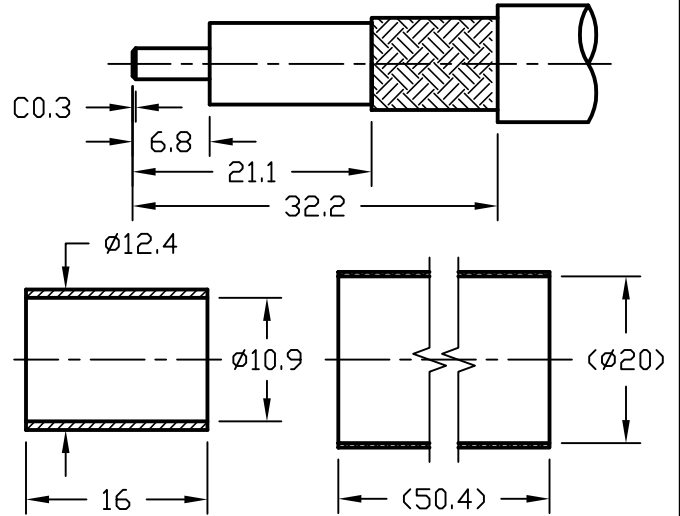
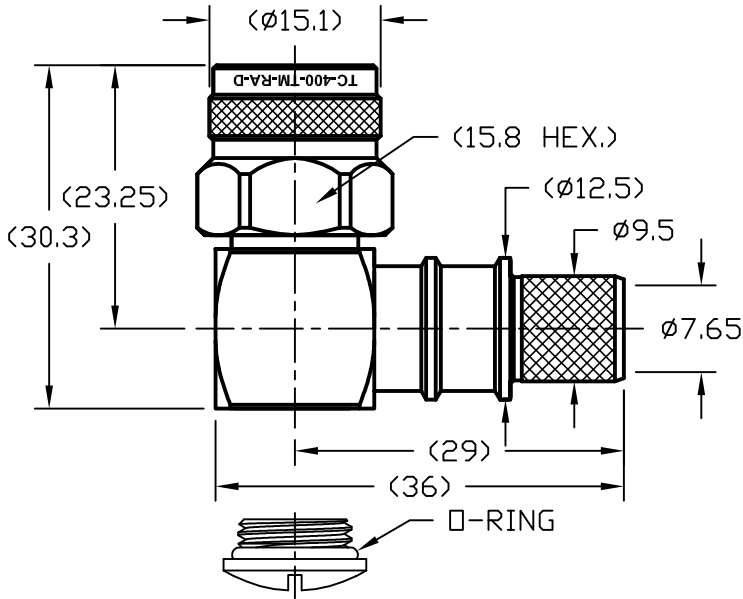


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| SYM | REVISION DESCRIPTION | DFTM | DATE | APPD | DATE |
|-----|------------------------------|--------|---------|--------|---------|
| A | RELEASED FOR PRODUCTION | K.A.M. | 6/3/11 | J.D.B. | 6/3/11 |
| B | CHANGED PER CDC #34607/36250 | D.J.H. | 9/24/12 | J.D.B. | 9/25/12 |

RECOMMENDED CABLE STRIPPING DIM'S.



NOTES:

- CONTACT PIN IS SOLDERED.
- FERRULE IS CRIMPED TO .429" HEX.

ALL PARTS SATISFIED ROHS REQUIREMENTS

| MATERIALS AND PLATING | | UNIT: MICRO-INCHES |
|-----------------------|--------------------|---------------------------|
| BODY/SHELL | BRASS C3604 | ALBALOY 80 MIN/COPPER |
| CONTACT PIN | BRASS C3604 | GOLD 50 MIN/NICKEL/COPPER |
| INSULATOR | TEFLON MIL-P-19468 | N/A |
| GASKET | SILICONE | RED |
| FERRULE | BRASS | ALBALOY 80 MIN/COPPER |
| SHRINK TUBING | PO | BLACK |

| ELECTRICAL CHARACTERISTICS | |
|---------------------------------|------------------------|
| Impedance | 50 Ω |
| Frequency range | 0~11GHz |
| Voltage rating | 500V(rms) |
| Dielectric withstanding voltage | 1000V |
| Contact resistance | Center contact ≤ 3 mΩ |
| | Outer contact ≤ 2 mΩ |
| Insulation resistance | ≥ 5000MΩ |
| Insertion loss | According to the cable |
| RF-leakage | N/A |
| VSWR | ≤ 1.35 MAX@0-6GHz |

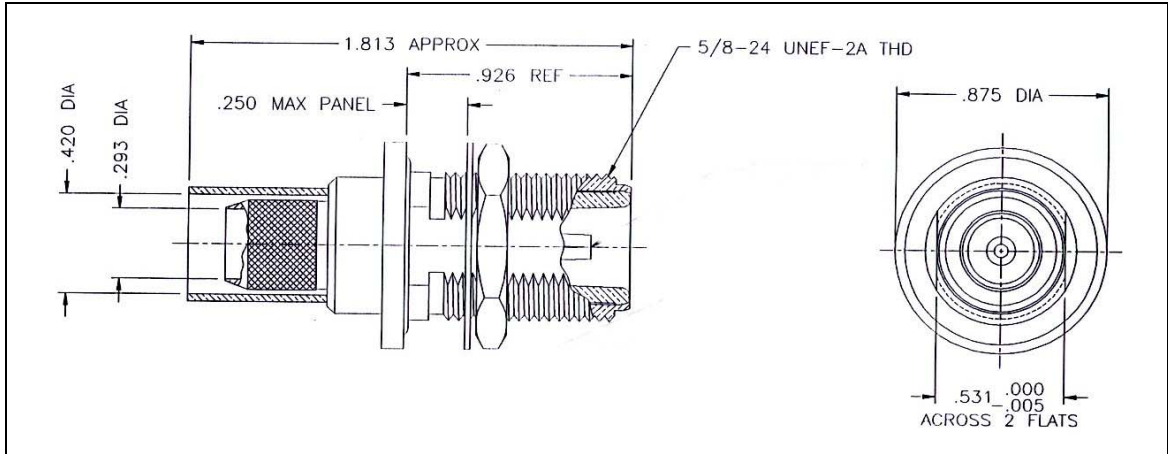
| MECHANICAL CHARACTERISTICS | |
|--------------------------------|---------------|
| Force to engage and disengage | N/A |
| Center contact retention force | 6 lbs Min |
| Coupling torque | 15 in-lbs Min |
| Coupling nut retention force | 60 lbs Min |
| Durability | ≥ 500 cycles |

| ENVIRONMENTAL CHARACTERISTICS | |
|-------------------------------|---------------------------------|
| Temperature range | -55°C - +125°C |
| Thermal Shock | MIL-STD-202, Method 107, Cond B |
| Vibration | MIL-STD-202, Method 204, Cond B |
| Shock | MIL-STD-202, Method 213, Cond I |
| Climatic Class | IEC 60068 55/155/56 |

| | | |
|--------------------------------------|----------------------|----------------------------------|
| MATERIAL: UNLESS OTHERWISE SPECIFIED | DFTM: K. A. M. | TIMES MICROWAVE SYSTEMS |
| | DATE: 6/3/11 | |
| USED ON: 0-4 | CHKD: J. D. B. | TC-400-TM-RA-D |
| | DATE: 6/3/11 | |
| SCALE: N/A | APPD: J. D. B. | 90° TNC MALE FOR LMR400 CABLE |
| | DATE: 6/3/11 | |
| DWG. SIZE: A | DO NOT SCALE DRAWING | CODE IDENT: 68999 |
| | | DATE: 6/3/11 |
| | | HT: 1 of 1 |
| | | SD3190-2671 |
| | | REV: B |

THE REVISION STATUS OF ALL SHEETS OF THIS DRAWING IS THE SAME AS SHEET 1

| LTR | DESCRIPTION | DATE | BY |
|-----|---------------------|---------|-----|
| - | Released | 3/25/96 | JCL |
| A | Redrawn and Updated | 7/8/04 | JCL |



I. MATERIALS & FINISHES

- center contact: Gold Plated Beryllium Copper
- outer contact: Nickel Plated Brass
- body: Nickel Plated Brass
- crimp sleeve: Nickel Plated Copper
- dielectric: Teflon® PTFE
- gasket: Silicone Rubber
- shrink sleeve: Adhesive Lined Polyolefin
- attachment: braid crimp .429" hex

II. ELECTRICAL PROPERTIES

- impedance: 50 ohms
- working voltage: 1000 vrms (max)
- vswr: 1.25:1 (max) up to 2 GHz
- insertion loss: 0.15 x √Fghz

Unless otherwise specified, dimensions are in inches. Tolerances are applicable when specified.

These drawings and specifications contain proprietary information which is the property of Times Microwave Systems.

| Approvals | | |
|-----------|-----|---------|
| Drawn | JCL | 3/25/96 |
| | | |
| | | |
| | | |

TIMES MICROWAVE SYSTEMS
 Wallingford, CT 06492
 (203) 949-8400; (203) 949-8423.Fax
 www.timesmicrowave.com

EZ-400-NF-BH
 Type-N female Bulkhead
 for LMR-400 Cable

| | | |
|-----------|---------------------------|---------------------------------|
| Size A | CAGE CODE 68999 | Drawing No.: 3190-518 |
| Scale: NA | Rev. (A) | Sheet: 1 of 1 |

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) |