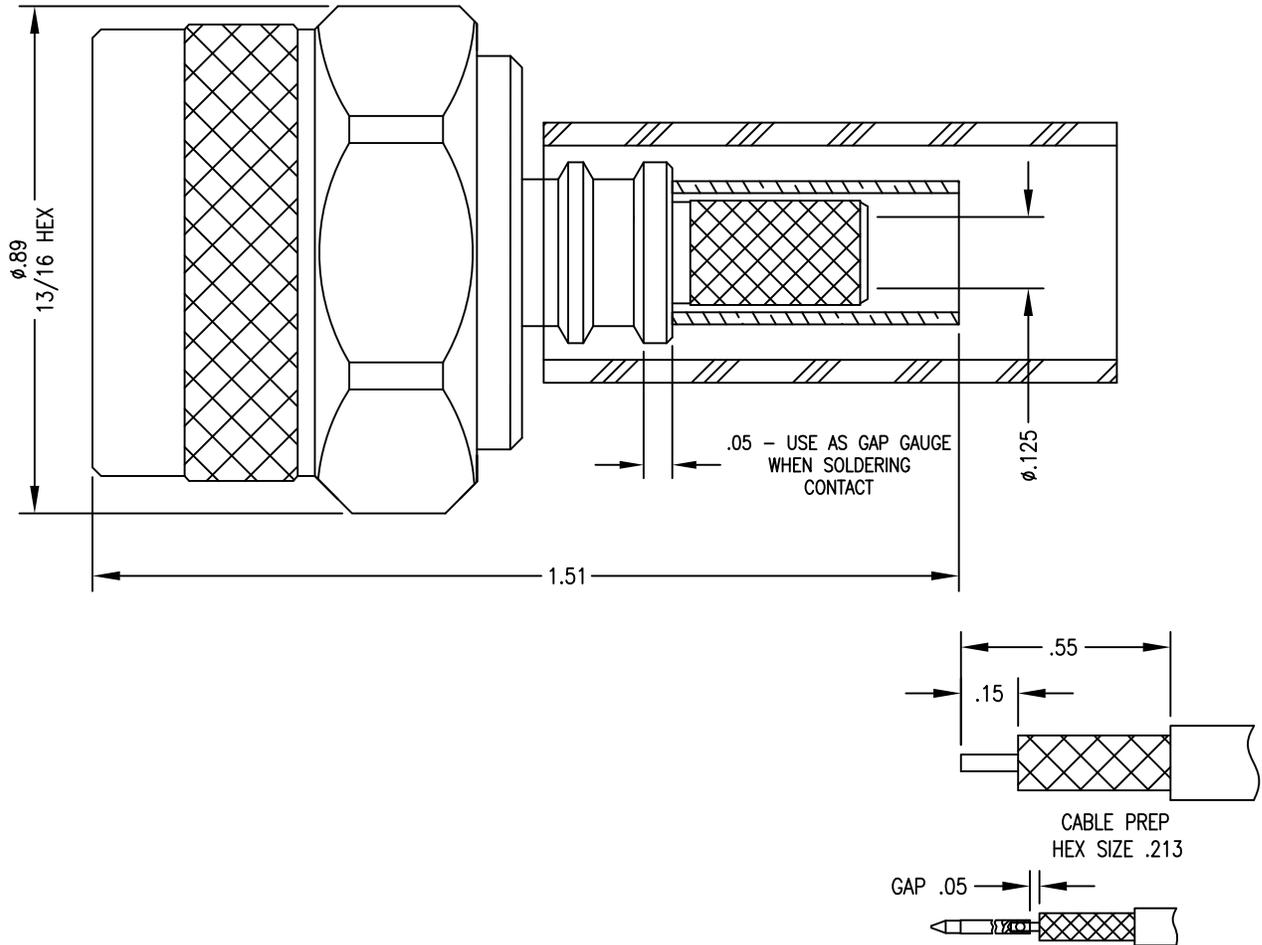


NOTICE OF PROPRIETARY RIGHTS THIS DOCUMENT CONTAINS CONFIDENTIAL TECHNICAL DATA, INCLUDING TRADE SECRETS, PROPRIETARY TO TIMES MICROWAVE SYSTEMS. DISCLOSURE OF THIS DATA IS EXPRESSLY CONDITIONED UPON YOUR ASSENT THAT ITS USE IS LIMITED TO USE WITHIN YOUR COMPANY ONLY. ANY OTHER USE IS STRICTLY PROHIBITED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

| SYM | REVISION DESCRIPTION | DFTM | DATE | APPD | DATE |
|-----|-------------------------|-------|---------|--------|---------|
| A | RELEASED FOR PRODUCTION | N.N.N | 2/13/14 | J.D.B. | 2/14/14 |
| B | CHANGED PER CDC #40047 | N.N.N | 6/6/14 | J.D.B. | 6/6/14 |



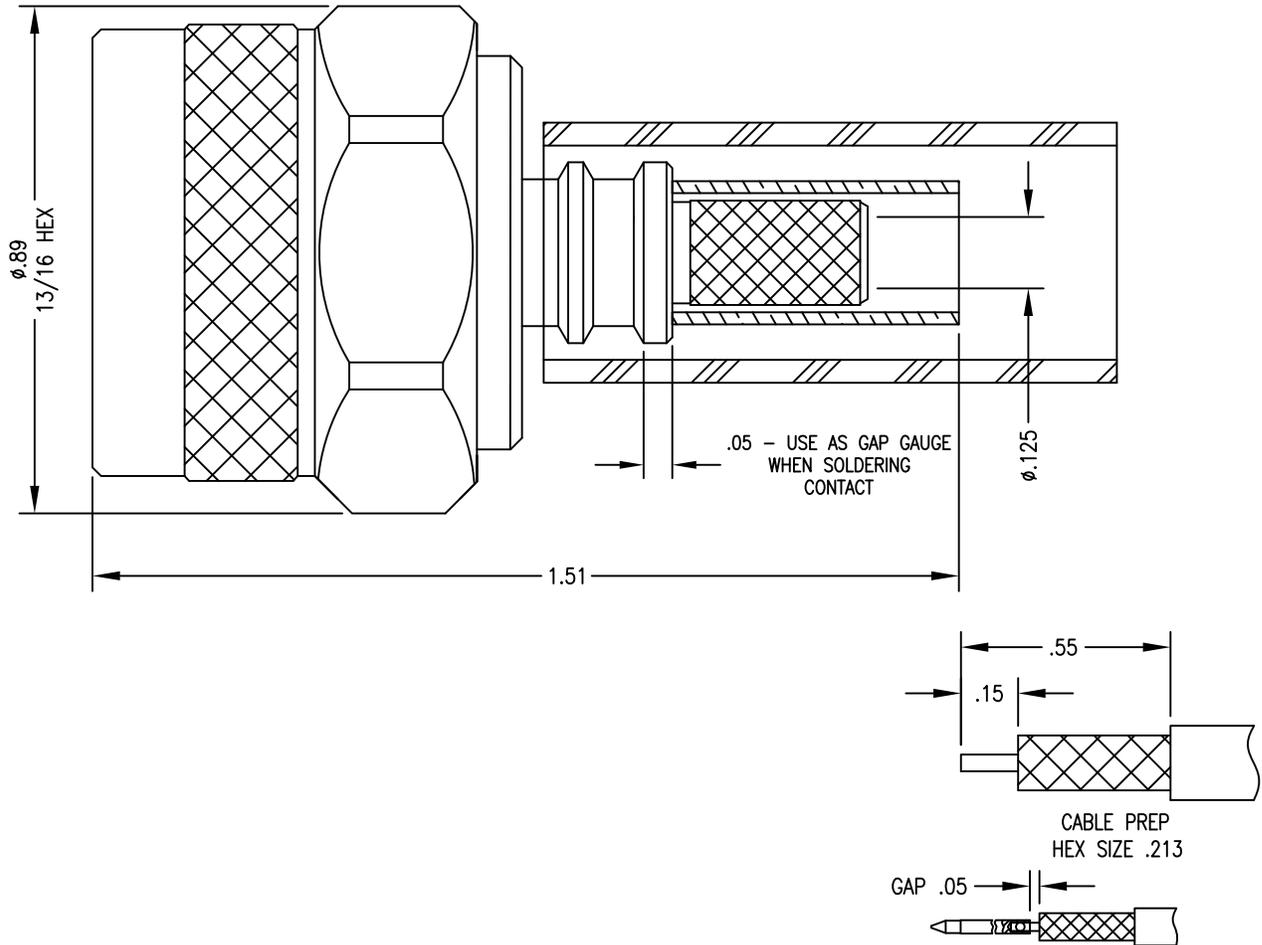
- | | | |
|---|--|-------------------------------|
| 1.0 PERFORMANCE | 2.0 MATERIALS | 3.0 FINISHES: SEE TABLE |
| 1.1 FREQUENCY RANGE: DC-6 GHz | 2.1 DIELECTRIC: PTFE | 4.0 MECHANICAL |
| 1.2 NOMINAL IMPEDANCE: 50 OHMS | 2.2 CONTACT: BRASS | 4.1 INTERFACE PER MIL-STD-348 |
| 1.3 DWV: 1,000 VRMS @ 60 Hz (SEA LEVEL) | 2.3 LOCKING RING: PHOSPHOR BRONZE | |
| 1.4 TEMPERATURE RANGE: -65°C TO +165°C | 2.4 CRIMP FERRULE: SOFT COPPER | |
| | 2.5 OTHER METAL PARTS: BRASS | |
| | 2.6 GASKET: SILICONE RUBBER | |
| | 2.7 HEAT SHRINK: POLYOLEFIN THICK WALL | |

| | |
|---------|---------|
| BODY | CONTACT |
| ALBALOY | GOLD/NI |

| | | | |
|------------|---|----------------|--|
| MATL: | UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES MACHINED SURFACES FINISH N/A RMS MAX. REMOVE ALL BURRS .005 MAX. BREAK MACHINE CORNERS .005 MAX. FILLET R. TOLERANCES ON DECIMALS .XX ± .03 .XXX ± .005 ANGLES ± 1° FRACTIONS ± 1/32 | DFTM. N. N. N | TIMES MICROWAVE SYSTEMS |
| | | DATE 2/13/14 | |
| USED ON: D | DO NOT SCALE DRAWING | CHKD. J. D. B. | TC-200-NMH-X NM FOR LMR-200 CABLE |
| | | DATE 2/14/14 | |
| SCALE: N/A | DWG. SIZE A | APPD. J. D. B. | SHEET 1 of 1 SD3190-2882 REV B |
| | CODE IDENT 68999 | DATE 2/14/14 | |

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 | N.N.N | 2/13/14 | J.D.B. | 2/14/14 |
| B | CHANGED PER CDC #40047 | N.N.N | 6/6/14 | J.D.B. | 6/6/14 |



- | | | |
|---|--|-------------------------------|
| 1.0 PERFORMANCE | 2.0 MATERIALS | 3.0 FINISHES: SEE TABLE |
| 1.1 FREQUENCY RANGE: DC-6 GHz | 2.1 DIELECTRIC: PTFE | 4.0 MECHANICAL |
| 1.2 NOMINAL IMPEDANCE: 50 OHMS | 2.2 CONTACT: BRASS | 4.1 INTERFACE PER MIL-STD-348 |
| 1.3 DWV: 1,000 VRMS @ 60 Hz (SEA LEVEL) | 2.3 LOCKING RING: PHOSPHOR BRONZE | |
| 1.4 TEMPERATURE RANGE: -65°C TO +165°C | 2.4 CRIMP FERRULE: SOFT COPPER | |
| | 2.5 OTHER METAL PARTS: BRASS | |
| | 2.6 GASKET: SILICONE RUBBER | |
| | 2.7 HEAT SHRINK: POLYOLEFIN THICK WALL | |

| | |
|---------|---------|
| BODY | CONTACT |
| ALBALOY | GOLD/NI |

| | | | | |
|----------------------|---|----------------|--|--|
| MATL: | UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES MACHINED SURFACES FINISH N/A RMS MAX. REMOVE ALL BURRS .005 MAX. BREAK MACHINE CORNERS .005 MAX. FILLET R. TOLERANCES ON DECIMALS .XX ± .03 .XXX ± .005 ANGLES ± 1° FRACTIONS ± 1/32 | DFTM. N. N. N | TIMES MICROWAVE SYSTEMS | |
| | | DATE 2/13/14 | | |
| USED ON: D | | CHKD. J. D. B. | TC-200-NMH-X NM FOR LMR-200 CABLE | |
| | | DATE 2/14/14 | | |
| SCALE: N/A | DWG. SIZE A | APPD. J. D. B. | 1 of 1 SD3190-2882 REV B | |
| | | DATE 2/14/14 | | |
| DO NOT SCALE DRAWING | CODE IDENT 68999 | | | |

LMR[®]-200-UF UltraFlex Communications Coax

Ideal for...

- Jumper Assemblies in Wireless Communications Systems
- Short Antenna Feeder runs
- Any application that requires periodic/repeated flexing



• **LMR[®] - UltraFlex** has a stranded center conductor and rubber outer jacket designed for multiple bending/flexing cycles. It is used for both indoor and outdoor applications.

• **Flexibility** and bendability are hallmarks of the LMR-200-UF 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-200-UF. 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-200-UF cables are designed for outdoor exposure and have a life expectancy in excess of 10 years.

• **Connectors:** A wide variety of connectors are available for LMR-200-UF cable, including all common interface types, reverse polarity, and solder-on center pins. Most LMR connectors employ crimp outer attachment using standard hex crimp sizes.

• **Cable Assemblies:** All LMR-200-UF cable types are available as pre-terminated cable assemblies. Refer to the section on FlexTech for further details.

| Construction Specifications | | | |
|-----------------------------|-------------------------------|-------|--------|
| Description | Material | In. | (mm) |
| Inner Conductor | Stranded BC | 0.044 | (1.12) |
| Dielectric | Foam Polyethylene | 0.116 | (2.95) |
| Outer Conductor | Aluminum Tape | 0.121 | (3.07) |
| Overall Braid | Tinned Copper | 0.144 | (3.66) |
| Jacket | Black Thermoplastic Elastomer | 0.195 | (4.95) |

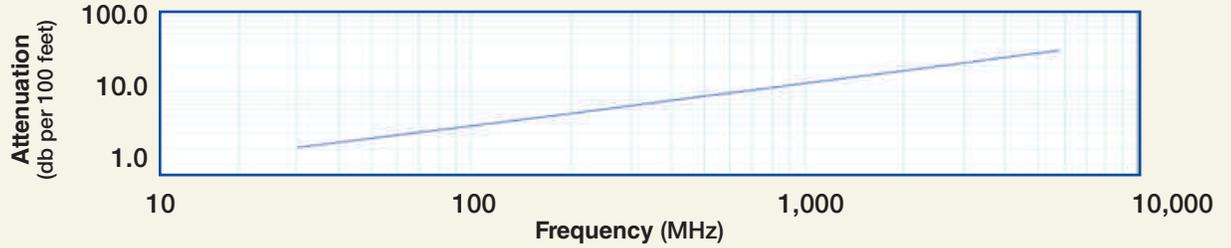
| Mechanical Specifications | | | |
|---------------------------|----------------|-------|----------|
| Performance Property | Units | US | (metric) |
| Bend Radius: installation | in. (mm) | 0.5 | (12.7) |
| Bend Radius: repeated | in. (mm) | 2 | (50.8) |
| Bending Moment | ft-lb (N-m) | 0.1 | (0.14) |
| Weight | lb/ft (kg/m) | 0.022 | (0.03) |
| Tensile Strength | lb (kg) | 40 | (18.2) |
| Flat Plate Crush | lb/in. (kg/mm) | 10 | (0.18) |

| Environmental Specifications | | |
|--------------------------------|----------|---------|
| Performance Property | °F | °C |
| Installation Temperature Range | -40/+185 | -40/+85 |
| Storage Temperature Range | -94/+185 | -70/+85 |
| Operating Temperature Range | -40/+185 | -40/+85 |

| Electrical Specifications | | | |
|---------------------------|-------------------|-------|----------|
| Performance Property | Units | US | (metric) |
| Velocity of Propagation | % | 83 | |
| Dielectric Constant | NA | 1.45 | |
| Time Delay | nS/ft (nS/m) | 1.22 | (4.02) |
| Impedance | ohms | 50 | |
| Capacitance | pF/ft (pF/m) | 24.5 | (80.3) |
| Inductance | uH/ft (uH/m) | 0.061 | (0.20) |
| Shielding Effectiveness | dB | >90 | |
| DC Resistance | | | |
| Inner Conductor | ohms/1000ft (/km) | 7.5 | (24.6) |
| Outer Conductor | ohms/1000ft (/km) | 4.9 | (16.1) |
| Voltage Withstand | Volts DC | 1000 | |
| Jacket Spark | Volts RMS | 3000 | |
| Peak Power | kW | 2.5 | |

| Part Description | | | | |
|------------------|----------------|--------|-------|------------|
| Part Number | Application | Jacket | Color | Stock Code |
| LMR-200-UF | Indoor/Outdoor | TPE | Black | 54042 |

Attenuation vs. Frequency (typical)



| Frequency (MHz) | 30 | 50 | 150 | 220 | 450 | 900 | 1500 | 1800 | 2000 | 2500 | 5800 |
|-----------------------|------|------|------|------|------|------|------|------|------|------|-------|
| Attenuation dB/100 ft | 2.1 | 2.7 | 4.8 | 5.8 | 8.3 | 11.9 | 15.5 | 17.1 | 18.0 | 20.2 | 31.6 |
| Attenuation dB/100 m | 7.0 | 9.0 | 15.7 | 19.0 | 27.4 | 39.1 | 50.9 | 55.9 | 59.1 | 66.4 | 103.8 |
| Avg. Power kW | 0.95 | 0.73 | 0.42 | 0.35 | 0.24 | 0.17 | 0.13 | 0.12 | 0.11 | 0.10 | 0.06 |

Calculate Attenuation = $(0.385082) \cdot \sqrt{\text{FMHz}} + (0.000396) \cdot \text{FMHz}$ (interactive calculator available at http://www.timesmicrowave.com/cable_calculators)
 Attenuation: VSWR=1.0 ; Ambient = +25°C (77°F) Power: VSWR=1.0; Ambient = +40°C; Inner Conductor = 100°C (212°F);
 Sea Level; dry air; atmospheric pressure; no solar loading



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) |
|------------|------------------|--------------|------------|-----------------------|--------------|----------------------|----------------------|----------------------|-------------------|------------------|------------------|
| BNC male | Straight Plug | TC-200-BM | 3190-225 | <1.25:1 (2.5) | Knurl | Solder | Crimp | S/G | 1.7 (43.2) | 0.56(14.2) | 0.045 (20.4) |
| Mini-UHF | Straight Plug | TC-200-MUHF | 3190-444 | <1.25:1 (2.5) | Knurl | Solder | Crimp | NG | 1.1 (27.9) | 0.45(11.4) | 0.015 (6.8) |
| N male | Straight Plug | TC-200-NM | 3190-224 | <1.25:1 (2.5) | Knurl | Solder | Crimp | S/G | 1.5 (38.1) | 0.75(19.1) | 0.073 (33.1) |
| SMA male | Straight Plug | TC-200-SM | 3190-612 | <1.25:1 (8) | Hex | Solder | Crimp | SS/G | 1.0 (25.4) | 0.32(8.1) | 0.015(6.8) |
| SMA male | Reverse Polarity | TC-200-SM-RP | 3190-327 | <1.25:1 (2.5) | Hex | Solder | Crimp | SS/G | 1.0 (25.4) | 0.32(8.1) | 0.015(6.8) |
| TNC male | Straight Plug | TC-200-TMC | 3190-240 | <1.25:1 (2.5) | Knurl | Solder | Clamp | S/G | 1.7 (43.2) | 0.59(15.0) | 0.045 (20.4) |
| TNC female | Straight Jack | TC-200-TF | 3190-263 | <1.25:1 (2.5) | NA | Solder | Crimp | N/G | 1.3 (33.0) | 0.57(14.5) | 0.033 (15.0) |

* Finish metals: N=Nickel, S=Silver, G=Gold, SS=Stainless Steel, A=Alballoy **VSWR spec based on 3 foot cable with a connector pair

Hardware Accessories

| Type | Part Number | Stock Code | Description |
|------------|-------------|------------|----------------------------|
| Ground Kit | GK-S200TT | GK-S200TT | Standard Ground Kit (each) |



Install Tools

| Type | Part Number | Stock Code | Description |
|-------------------|--------------------|------------|---|
| Crimp Tool | CT-240/200/195/100 | 3190-667 | Crimp tool for LMR-100, 195, 200 and 240 connectors |
| Cutting Tool | CCT-01 | 3190-1544 | Cable end flush cut tool |
| Replacement Blade | RB-01 | 3190-1609 | Replacement blade for cutting tool |

