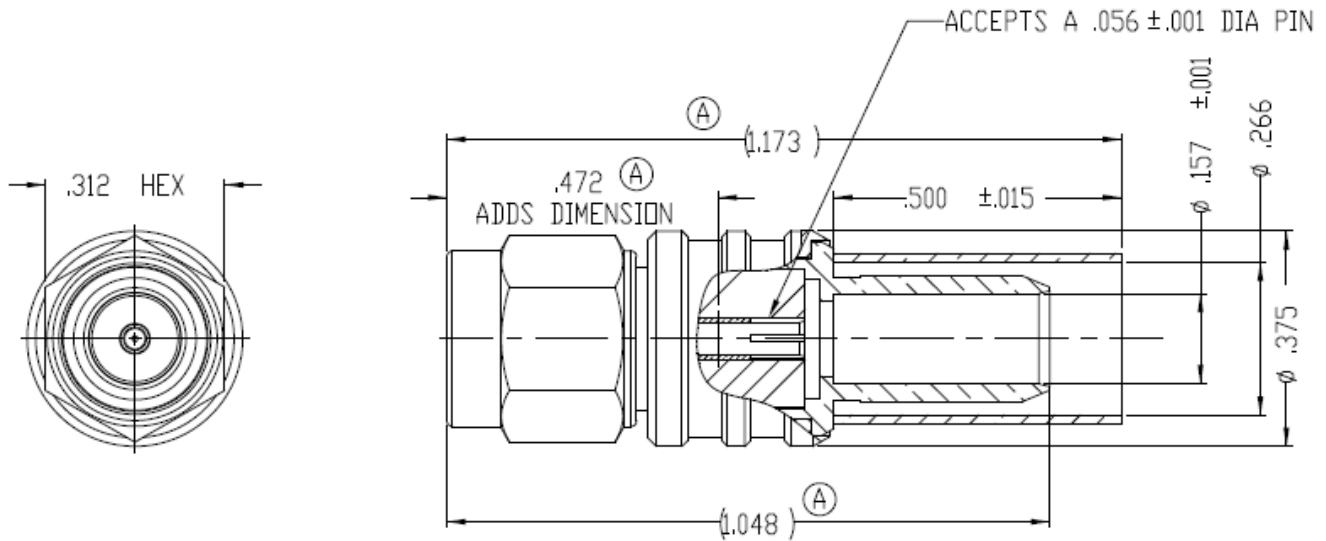


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| SYM | REVISION DESCRIPTION    | DFTM  | DATE    | APPD   | DATE    |
|-----|-------------------------|-------|---------|--------|---------|
| A   | RELEASED FOR PRODUCTION | N.N.N | 8/21/13 | J.D.B. | 9/10/13 |



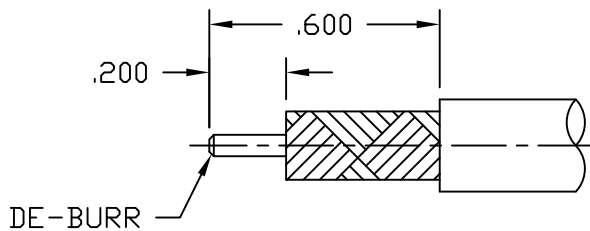
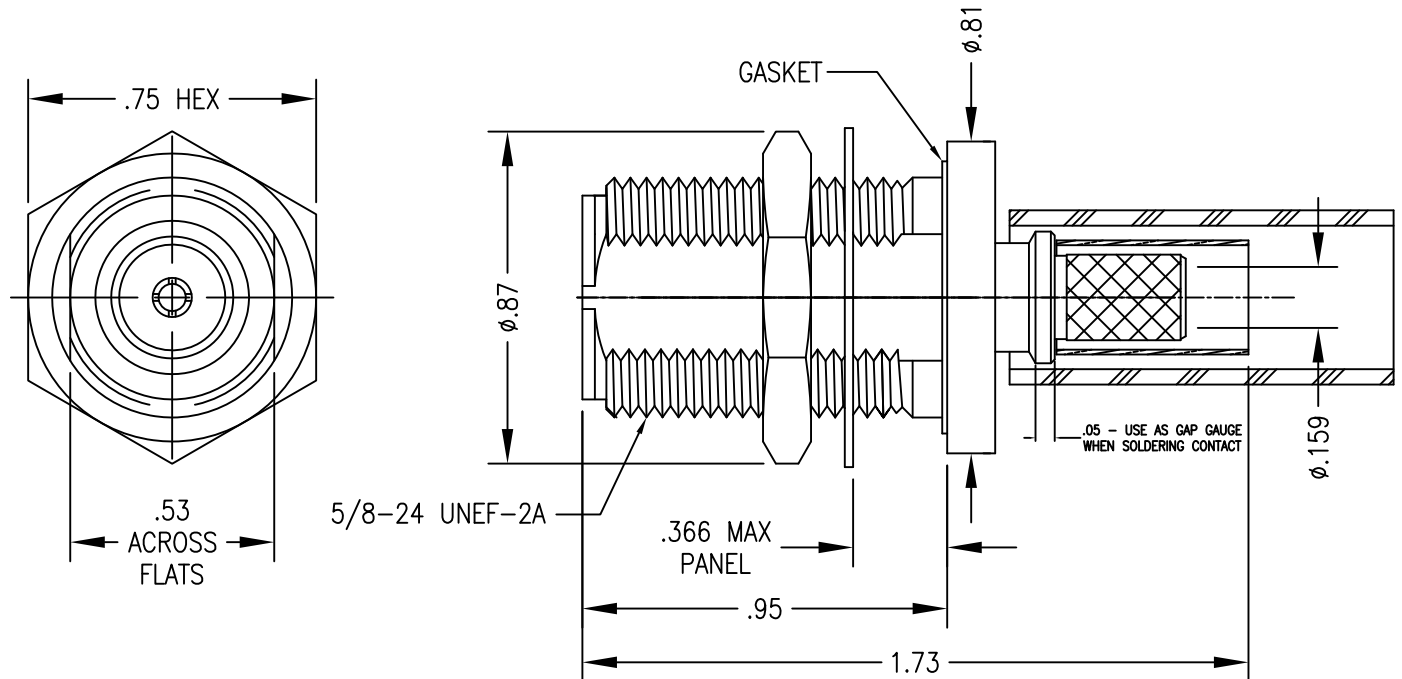
#### NOTES:

- ASSEMBLED CONNECTOR INTERFACE IS DESIGNED IN ACCORDANCE WITH MIL-STD-348
- MATERIAL:  
 BODY, NUT, CLAMP - BRASS PER ASTM B16, C36000 ALLOY, TEMPER H02  
 INSULATOR - TEFLON PER ASTM D1710, TYPE 1, GRADE 1, CLASS A  
 GASKET - SILICONE RUBBER PER A-A-59588, 50-75 DUROMETER  
 SHRINK SLEEVE - HEAT SHRINKABLE ATUM PER MIL-I-23053/4 (NOT SHOWN)  
 CRIMP SLEEVE - D.H.P. COPPER CDA, ALLOY #122, TEMPER HARD  
 CONTACT & LOCKING RING - BERYLLIUM COPPER PER ASTM B196, C17300 ALLOY, CONDITION HT
- FINISH:  
 CONTACT - GOLD PLATE PER ASTM B488  
 CRIMP SLEEVE - SULFAMATE NICKEL PER MIL-P-27418  
 ALL OTHER METAL PARTS - ALBALOY PLATE PER DELTA SPEC. 111197

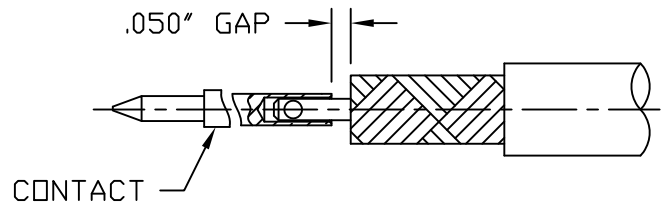
|             |                                                                                                                                                                                                                                |                      |                  |                                                       |                             |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------|-------------------------------------------------------|-----------------------------|
| MATL:       | UNLESS OTHERWISE SPECIFIED                                                                                                                                                                                                     | DFTM. N. N. N        |                  | TIMES MICROWAVE SYSTEMS                               |                             |
|             |                                                                                                                                                                                                                                | DATE 8/21/13         | CHKD. J. D. B.   |                                                       |                             |
| USED ON: A  | ALL DIMENSIONS ARE IN INCHES<br>MACHINED SURFACES FINISH 63 RMS MAX.<br>REMOVE ALL BURRS .004 MAX. BREAK<br>MACHINE CORNERS .005 MAX. FILLET R.<br>TOLERANCES ON DECIMALS<br>.XX ±.01 .XXX ±.005<br>ANGLES ±1° FRACTIONS ±1/64 | DATE 9/10/13         | APPD. J. D. B.   | EZ-240-SM-X<br>CONNECTOR ASSEMBLY<br>SMAM for LMR-240 |                             |
|             |                                                                                                                                                                                                                                | DATE 9/10/13         | DATE 9/10/13     |                                                       |                             |
| SCALE: NONE | DWG. SIZE A                                                                                                                                                                                                                    | DO NOT SCALE DRAWING | CODE IDENT 68999 | DATE 9/10/13                                          | SH 1 of 1 SD3190-2897 REV A |

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| SYM | REVISION DESCRIPTION    | DFTM  | DATE     | APPD   | DATE    |
|-----|-------------------------|-------|----------|--------|---------|
| A   | RELEASED FOR PRODUCTION | N.N.N | 10/30/13 | J.D.B. | 11/1/13 |



CABLE PREPARATION  
USE CST-240A (3192-152)  
STRAIGHT SETTING.  
CRIMP .255" HEX.



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

- 1.0 PERFORMANCE  
1.1 FREQUENCY RANGE: DC-6 GHz  
1.2 NOMINAL IMPEDANCE: 50 OHMS  
1.3 DWV: 750 VRMS @ 60 Hz (SEA LEVEL)  
1.4 TEMPERATURE RANGE: -65°C TO +165°C

- 2.0 MATERIALS  
2.1 DIELECTRIC: PTFE  
2.2 CONTACTS: BERYLLIUM COPPER & BRASS  
2.3 WASHER: PHOSPHOR BRONZE  
2.4 CRIMP FERRULE: SOFT COPPER  
2.5 OTHER METAL PARTS: BRASS  
2.6 GASKET: SILICONE RUBBER  
2.7 HEAT SHRINK: POLYOLEFIN THICK WALL

- 3.0 FINISHES: SEE TABLE  
4.0 MECHANICAL  
4.1 INTERFACE PER MIL-STD-348

|            |  |                                                                                                                                                                                                                                                                       |                      |                  |                                                          |              |             |       |
|------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------|----------------------------------------------------------|--------------|-------------|-------|
| MATL:      |  | UNLESS OTHERWISE SPECIFIED<br><br>ALL DIMENSIONS ARE IN INCHES<br>MACHINED SURFACES FINISH N/A RMS MAX.<br>REMOVE ALL BURRS .005 MAX. BREAK<br>MACHINE CORNERS .005 MAX. FILLET R.<br>TOLERANCES ON DECIMALS<br>.XX ± .03 .XXX ± .005<br>ANGLES ± 1° FRACTIONS ± 1/32 |                      | DFTM. N, N, N    | TIMES MICROWAVE SYSTEMS                                  |              |             |       |
|            |  |                                                                                                                                                                                                                                                                       |                      | DATE 10/30/13    |                                                          |              |             |       |
| USED ON: A |  |                                                                                                                                                                                                                                                                       |                      | CHKD. J, D, B,   | TC-240-NF-BH-X<br>N FEMALE BULKHEAD<br>FOR LMR-240 CABLE |              |             |       |
|            |  |                                                                                                                                                                                                                                                                       |                      | DATE 11/1/13     |                                                          |              |             |       |
|            |  |                                                                                                                                                                                                                                                                       |                      | APPD. J, D, B,   |                                                          |              |             |       |
| SCALE: N/A |  | DWG. SIZE A                                                                                                                                                                                                                                                           | DO NOT SCALE DRAWING | CODE IDENT 68999 | DATE 11/1/13                                             | SHEET 1 of 1 | SD3190-2888 | REV A |

# LMR®-240-UF UltraFlex Communications Coax

## Ideal for...

- Jumper Assemblies in Wireless Communications Systems
- Short Antenna Feeder runs (e.g. WLL, GPS, LMR, Mobile Antennas)
- 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-240-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-240-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-240-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-240-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-240-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                   | 0.056 | (1.42) |
| Dielectric                  | Foam Polyethylene             | 0.150 | (3.81) |
| Outer Conductor             | Aluminum Tape                 | 0.155 | (3.94) |
| Overall Braid               | Tinned Copper                 | 0.178 | (4.52) |
| Jacket                      | Black Thermoplastic Elastomer | 0.240 | (6.10) |

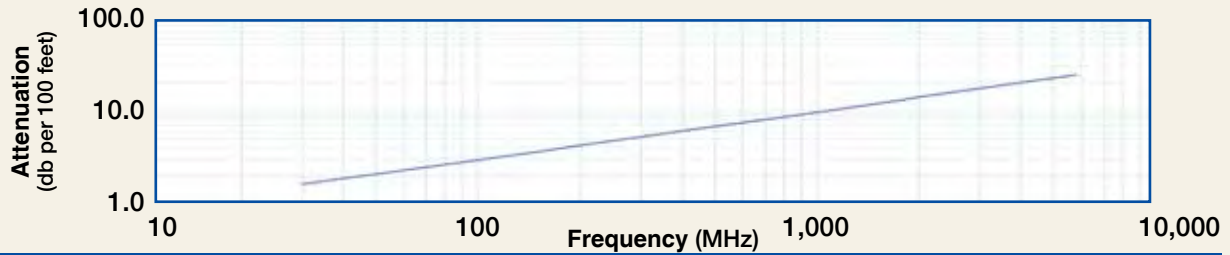
| Mechanical Specifications |                |       |          |
|---------------------------|----------------|-------|----------|
| Performance Property      | Units          | US    | (metric) |
| Bend Radius: installation | in. (mm)       | 0.75  | (19.1)   |
| Bend Radius: repeated     | in. (mm)       | 2.5   | (63.5)   |
| Bending Moment            | ft-lb (N-m)    | 0.125 | (0.17)   |
| Weight                    | lb/ft (kg/m)   | 0.034 | (0.05)   |
| Tensile Strength          | lb (kg)        | 80    | (36.3)   |
| Flat Plate Crush          | lb/in. (kg/mm) | 13    | (0.23)   |

| 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   | %                 | 84    |          |
| Dielectric Constant       | NA                | 1.42  |          |
| Time Delay                | nS/ft (nS/m)      | 1.21  | (3.97)   |
| Impedance                 | ohms              | 50    |          |
| Capacitance               | pF/ft (pF/m)      | 24.2  | (79.4)   |
| Inductance                | uH/ft (uH/m)      | 0.060 | (0.20)   |
| Shielding Effectiveness   | dB                | >90   |          |
| DC Resistance             |                   |       |          |
| Inner Conductor           | ohms/1000ft (/km) | 4.28  | (14.1)   |
| Outer Conductor           | ohms/1000ft (/km) | 3.89  | (12.8)   |
| Voltage Withstand         | Volts DC          | 1500  |          |
| Jacket Spark              | Volts RMS         | 5000  |          |
| Peak Power                | kW                | 5.6   |          |

| Part Description |                |        |       |            |
|------------------|----------------|--------|-------|------------|
| Part Number      | Application    | Jacket | Color | Stock Code |
| LMR-240-UF       | Indoor/Outdoor | TPE    | Black | 54041      |

### Attenuation vs. Frequency (typical)



| Frequency (MHz)       | 30   | 50   | 150  | 220  | 450  | 900  | 1500 | 1800 | 2000 | 2500 | 5800 |
|-----------------------|------|------|------|------|------|------|------|------|------|------|------|
| Attenuation dB/100 ft | 1.6  | 2.1  | 3.6  | 4.4  | 6.3  | 9.1  | 11.8 | 13.0 | 13.8 | 15.5 | 24.4 |
| Attenuation dB/100 m  | 5.3  | 6.8  | 11.9 | 14.4 | 20.8 | 29.8 | 38.9 | 42.8 | 45.2 | 50.9 | 80.1 |
| Avg. Power kW         | 1.24 | 0.96 | 0.55 | 0.45 | 0.31 | 0.22 | 0.17 | 0.15 | 0.14 | 0.13 | 0.08 |

Calculate Attenuation =  $(0.290501) \cdot \sqrt{\text{FMHz}} + (0.000396) \cdot \text{FMHz}$  (interactive calculator available at [http://www.timesmicrowave.com/cable\\_calculators](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) |
|-------------|------------------|-----------------|------------|--------------------|--------------|----------------------|----------------------|-------------------|----------------|---------------|---------------|
| 1. BNC Male | Straight Plug    | TC-240-BMC      | 3190-242   | <1.25:1 (2.5)      | Knurl        | Solder               | Clamp                | S/G               | 1.7 (43)       | 0.56(14.2)    | 0.040 (18.1)  |
| 2. Mini-UHF | Straight Plug    | TC-240-MUHF     | 3190-445   | <1.25:1 (2.5)      | Knurl        | Solder               | Crimp                | N/G               | 1.1 (28)       | 0.45(11.4)    | 0.014 (6.4)   |
| 3. N Female | Bulkhead Jack    | TC-240-NF-BH    | 3190-419   | <1.25:1 (2.5)      | NA           | Solder               | Crimp                | A/G               | 1.7 (44)       | 0.88(22.2)    | 0.115 (52.2)  |
| 4. N Male   | Straight Plug    | TC-240-NMH-D    | 3190-382   | <1.25:1 (2.5)      | Hex          | Solder               | Crimp                | N/S               | 1.5 (38)       | 0.75(19.1)    | 0.086 (39.0)  |
| 5. N Male   | Straight Plug    | TC-240-NMC      | 3190-244   | <1.25:1 (2.5)      | Knurl        | Solder               | Clamp                | S/G               | 1.5 (38)       | 0.75(19.1)    | 0.082 (37.2)  |
| 6. SMA Male | Straight Plug    | TC-240-SM       | 3190-380   | <1.25:1 (10)       | Hex          | Solder               | Crimp                | SS/G              | 1.0 (25)       | 0.32(8.1)     | 0.016 (7.3)   |
| 7. SMA Male | Reverse Polarity | TC-240-SM-RP    | 3190-326   | <1.25:1 (2.5)      | Hex          | Solder               | Crimp                | SS/G              | 1.0 (25)       | 0.32(8.1)     | 0.016 (7.3)   |
| 8. TNC Male | Straight Plug    | TC-240-TM       | 3190-275   | <1.25:1 (2.5)      | Knurl        | Solder               | Crimp                | N/S               | 1.7 (43)       | 0.59(15.0)    | 0.043 (19.5)  |
| 9. N Male   | Right Angle      | TC-240-NMH-RA-D | 3190-2426  | <1.35:1 (6)        | Hex/Knurl    | Solder               | Crimp                | A/G               | 1.2 (32.4)     | 1.22 (31.0)   | 0.091 (41.7)  |

\* 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-S240TT   | GK-S240TT  | 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                  |

