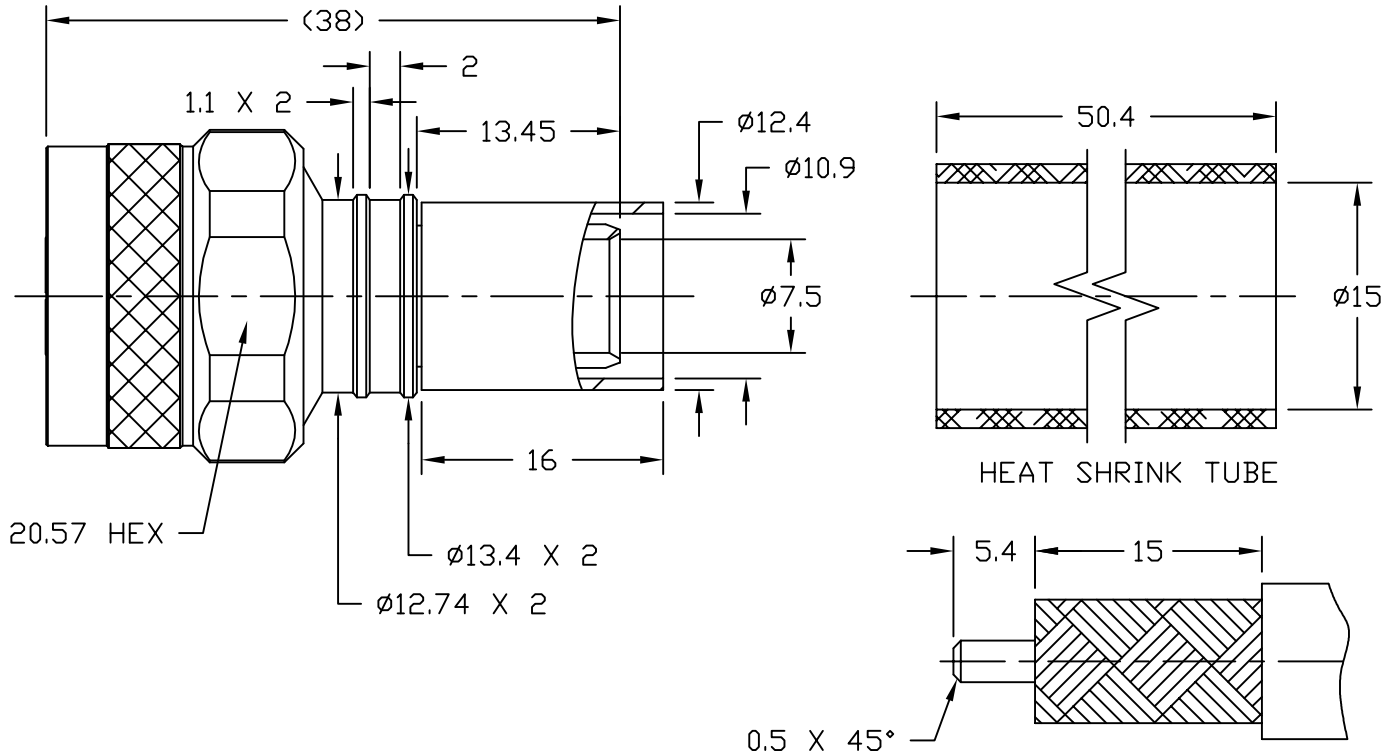


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SYM	REVISION DESCRIPTION	DFTM	DATE	APPD	DATE
A	RELEASED FOR PRODUCTION	D. J. H.	3/15/11	J. D. B.	8/16/11



Reference standard	IEC60169-16
I. Electric Performance	
Impedance(Ω):	50
Frequency Range:	DC-6GHz
VSWR:	≤ 1.25
Insert Loss: (dB)	≤ 0.1
Insulation resistance (M Ω)	> 5000
Work voltage (V)	1500
Conductor resistance (m Ω)	outer conductor < 0.2 inner conductor < 0.8

II. Mechanical Performance	
Nut torque	25N.m
(Nut) Whorl pull	1000N
Tensile force (cable-connect)	400N
Torsion (cable-connect)	2N.m

III. Material and plating:	
Component	Material
inner conductor	Brass
outer conductor	Brass
tube	Copper
nut	Brass
gasket	Silicone rubber
insulator	PTFE

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
Waterproofing standard	IP67

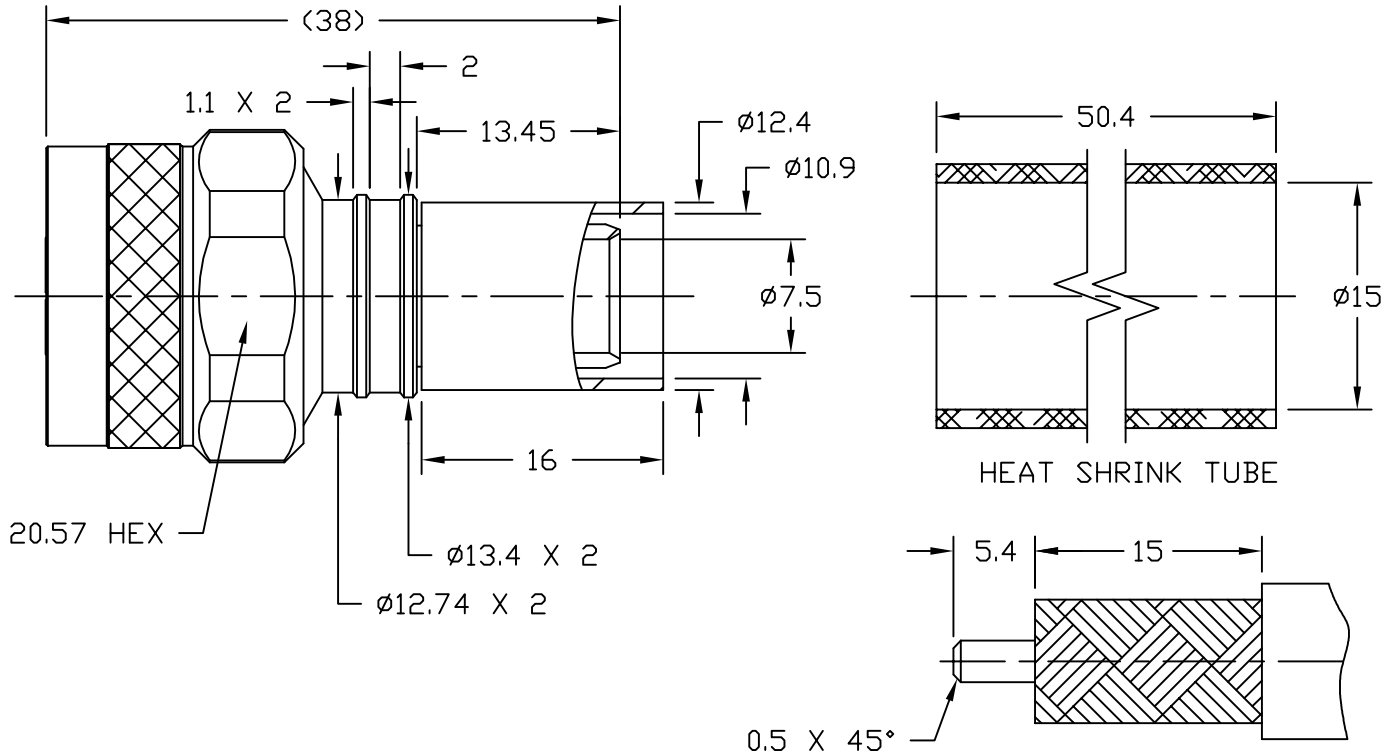
Plating	
Au50 micro inches over nickel 100 over copper	
copper tin-zinc 100-150 micro inches	
copper tin-zinc 100-150 micro inches	
copper tin-zinc 100-150 micro inches	

V. Assembly: inner conductor soldered and outer conductor crimped.

MATL:	UNLESS OTHERWISE SPECIFIED	DFTM. D. J. H.	TIMES MICROWAVE SYSTEMS		
	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 $\pm$ N/A . XXX $\pm$ N/A ANGLES $\pm 1^\circ$ FRACTIONS $\pm$ N/A	DATE 3/15/11			
USED ON: 0		CHKD. J. D. B.	TC-400-NMH-X		
		DATE 8/16/11			
SCALE: N/A	DWG. SIZE A	APPD. J. D. B.	"N" MALE FOR LMR-400 CABLE SOLDER/CRIMP/NO BRAID TRIM		
DO NOT SCALE DRAWING	CODE IDENT 68999	DATE 8/16/11			
			SHEET 1 of 1	SD3190-2626	REV A

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SYM	REVISION DESCRIPTION	DFTM	DATE	APPD	DATE
A	RELEASED FOR PRODUCTION	D. J. H.	3/15/11	J. D. B.	8/16/11



Reference standard IEC60169-16

I. Electric Performance

Impedance(Ω): 50

Frequency Range: DC-6GHz

VSWR: ≤ 1.25

Insert Loss: (dB) ≤ 0.1

Insulation resistance (M Ω) > 5000

Work voltage (V) 1500

Conductor resistance (m Ω) outer conductor < 0.2
inner conductor < 0.8

II. Mechanical Performance

Nut torque 25N.m

(Nut) Whorl pull 1000N

Tensile force (cable-connect) 400N

Torsion (cable-connect) 2N.m

III. Material and plating:

Component	Material	Plating
inner conductor	Brass	Au50 micro inches over nickel 100 over copper
outer conductor	Brass	copper tin-zinc 100-150 micro inches
tube	Copper	copper tin-zinc 100-150 micro inches
nut	Brass	copper tin-zinc 100-150 micro inches
gasket	Silicone rubber	
insulator	PTFE	

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

Waterproofing standard IP67

V. Assembly: inner conductor soldered and outer conductor crimped.

MATL:	UNLESS OTHERWISE SPECIFIED	DFTM. D. J. H.	TIMES MICROWAVE SYSTEMS
		DATE 3/15/11	
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 $\pm$ N/A . XXX $\pm$ N/A ANGLES $\pm 1^\circ$ FRACTIONS $\pm$ N/A	CHKD. J. D. B.	TC-400-NMH-X "N" MALE FOR LMR-400 CABLE SOLDER/CRIMP/NO BRAID TRIM
		DATE 8/16/11	
SCALE: N/A	DWG. SIZE A	APPD. J. D. B.	SHEET 1 of 1 SD3190-2626 REV A
DO NOT SCALE DRAWING	CODE IDENT 68999	DATE 8/16/11	

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

CONNECTOR															
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)			