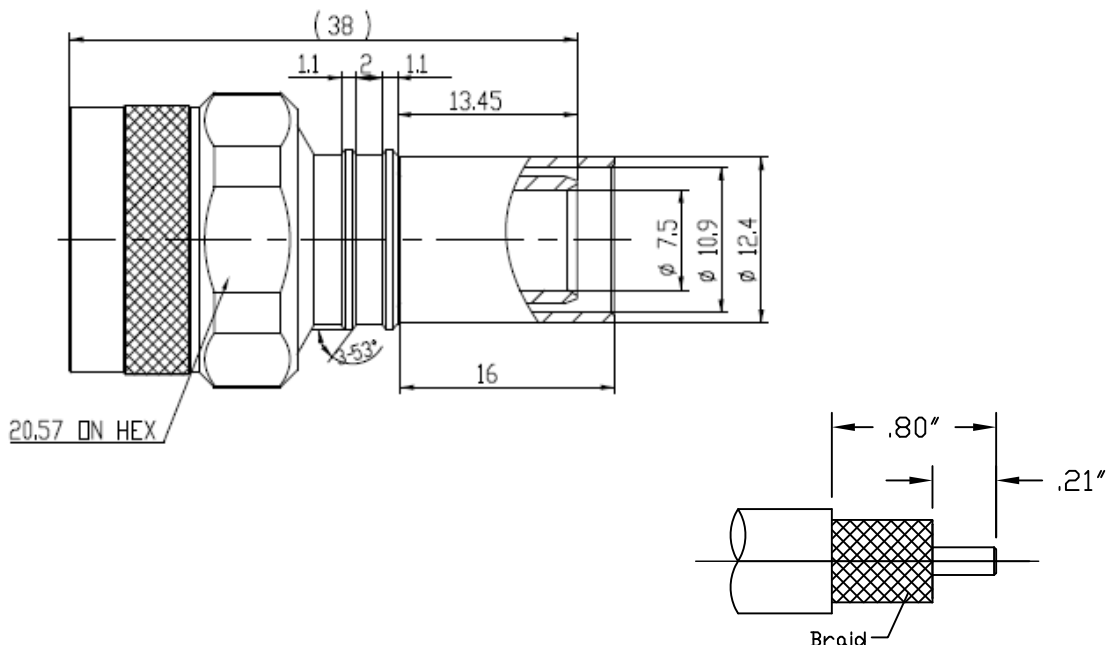


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SYM	REVISION DESCRIPTION	DFTM	DATE	APPD	DATE
A	RELEASED FOR PRODUCTION	N.N.N	11/18/13	J.D.B.	12/3/13



Reference standard

IEC60169-16

I. Electric Performance

Impedance(Ω):

Frequency Range:

VSWR:

Insert Loss: (dB)

Insulation resistance (M Ω)

Proof voltage (V)

Conductor resistance (m Ω)

50

DC-6GHz

≤ 1.3

≤ 0.05

> 5000

1500

outer conductor < 0.4
inner conductor < 0.8

IV. Environment

Temprange

Weather standard

Thermal shock

Vibration

Shock

Waterproofing standard

-40 $^{\circ}$ ~+85 $^{\circ}$ C

IEC 60068 40 / 085/ 21

US MIL-STD 202,Meth.107,Cond.B

US MIL-STD 202,Meth.204,Cond.B

US MIL-STD 202,Meth.213,Cond.I

IP67

V. Assemble: inner conductor installed and outer conductor crimped

II. Mechanical Performance

Nut torque

(Nut)Whorl pull

Tensile force(cable-connector)

Torsion(cable-connector)

5N.m

500N

400N

2N.m

III. Material and plating:

Component

Inner conductor

Outer conductor

Tube:

Nut:

Gasket:

Insulator:

Material

Beryllium Bronze

Brass

copper

Brass

Silicone rubber

PTFE

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

MATL:

UNLESS OTHERWISE SPECIFIED

DFTM. N. N. N

USED ON:

O-O

ALL DIMENSIONS ARE IN mm

DATE 11/18/13

CHKD. J. D. B.

DATE 12/3/13

APPD. J. D. B.

SCALE: ~

DWG. SIZE A

DO NOT SCALE DRAWING

CODE IDENT

68999

DATE 12/3/13

TIMES MICROWAVE SYSTEMS

EZ-400-NMH-PL-X

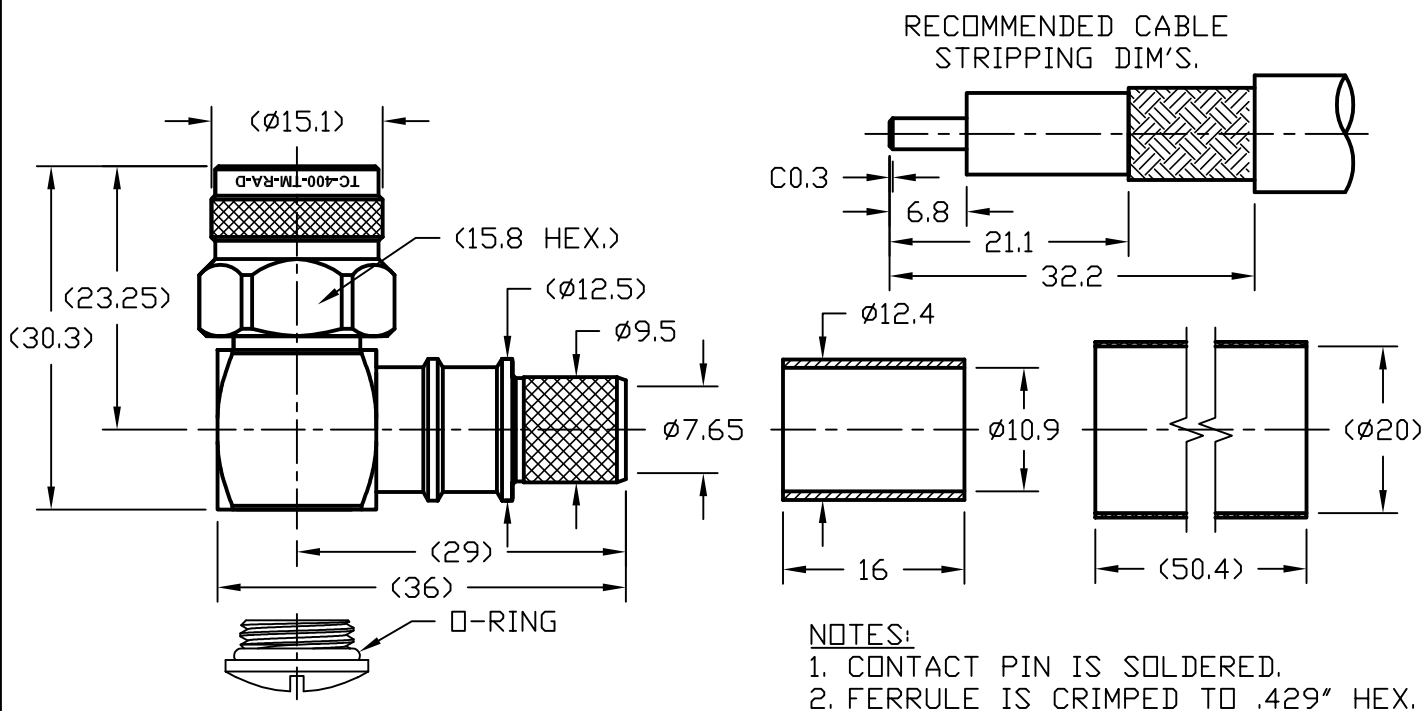
CONNECTOR, NM

FOR LMR400-LLPL

1 of 1 SD3190-2961 A

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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



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 $\leq 3 \text{ m}\Omega$
	Outer contact $\leq 2 \text{ m}\Omega$
Insulation resistance	$\geq 5000 \text{ M}\Omega$
Insertion loss	According to the cable
RF-leakage	N/A
VSWR	$\leq 1.35 \text{ MAX@0-6GHz}$

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

MATL:	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN mm MACHINED SURFACES FINISH 1.6 RMS MAX. REMOVE ALL BURRS 0.15X45° MAX. BREAK MACHINE CORNERS 0.15X45°D MAX. FILLET R. TOLERANCES ON DECIMALS .X ± 0.3 .XX ± 0.2 ANGLES $\pm 1^\circ$ FRACTIONS $\pm \text{N/A}$		DFTM. K. A. M.	TIMES MICROWAVE SYSTEMS	
			DATE 6/3/11		
USED ON: 0-4			CHKD. J. D. B.	TC-400-TM-RA-D 90° TNC MALE FOR LMR400 CABLE	
			DATE 6/3/11		
SCALE: N/A	DWG. SIZE A		APPD. J. D. B.	1 of 1 SD3190-2671	
			DATE 6/3/11		
DO NOT SCALE DRAWING		CODE IDENT 68999	DATE 6/3/11	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
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

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