

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	D. J. H.	3/15/11	J. D. B.	8/16/11



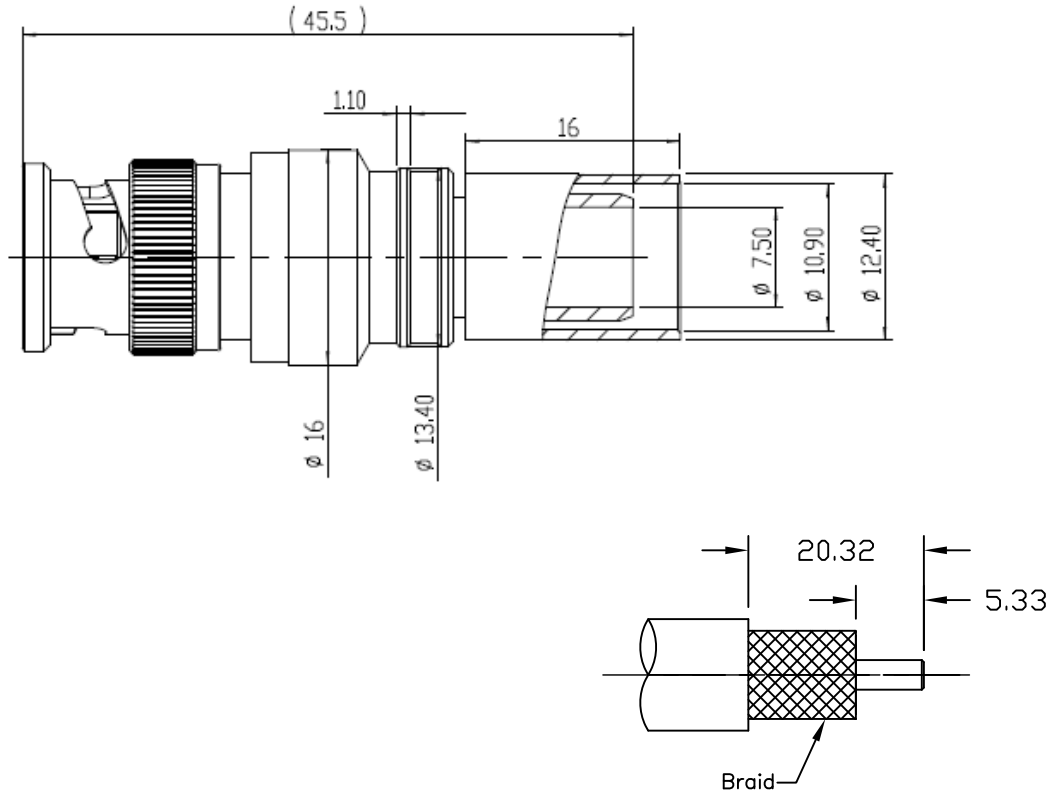
CABLE PREP.
USE CST-400
(3192-004)
.429" HEX.

Reference standard	IEC60169-16	III. Material and plating:	
I. Electric Performance		<u>Component</u>	<u>Material</u>
Impedance(Ω):	50	inner conductor	Brass
Frequency Range:	DC-6GHz	outer conductor	Brass
VSWR:	≤ 1.25	tube	Copper
Insert Loss: (dB)	≤ 0.1	nut	Brass
Insulation resistance (M Ω)	>5000	gasket	Silicone rubber
Work voltage (V)	1500	insulator	PTFE
Conductor resistance (m Ω)	outer conductor <0.2 inner conductor <0.8	IV. Environment	
II. Mechanical Performance		Temp. range	-55°C~+155°C
Nut torque	25N.m	Weather standard	IEC 60068 55 / 155/ 56
(Nut) Whorl pull	1000N	Thermal shock	US MIL-STD 202, Meth.107, Cond.B
Tensile force (cable-connect)	400N	Vibration	US MIL-STD 202, Meth.204, Cond.B
Torsion (cable-connect)	2N.m	Shock	US MIL-STD 202, Meth.213, Cond.I
		Waterproofing standard	IP67
		V. Assembly:	inner conductor soldered and outer conductor crimped.

MATERIAL:	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	

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SYM	REVISION DESCRIPTION	DFTM	DATE	APPD	DATE
A	RELEASED FOR PRODUCTION	N. N. N	8/6/13	J. D. B.	8/9/13



Reference standard IEC60169-8

I. Electric Performance

Nominal Impedance(Ω): 50
 Frequency Range: DC-4GHz
 VSWR: ≤ 1.35
 Insert Loss: ≤ 0.1
 Insulation resistance ($M\Omega$): 25000
 Withstand voltage (V): 1500
 Conductor resistance ($m\Omega$):
 outer conductor < 0.4
 inner conductor < 1.5

II. Mechanical Performance

Tensile force(cable-connect) 400N
 Torsion(cable-connect) 2N.m

III. Material and plating:

Component	Material	Plating
inner conductor	Spring copper	Au 1.27um
outer conductor	Brass	Copper-tin-zinc 2um
insulator	PTFE	
o-ring	Silicone rubber	

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
 ROHS compliant

V. Assemble: inner conductor installed and outer conductor crimped

MATL:	UNLESS OTHERWISE SPECIFIED		DFTM. N. N. N	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 N/A FRACTIONS \pm N/A		DATE 8/6/13		
USED ON: ~			CHKD. J. D. B.	EZ-400-BM-X BNCM for LMR-400	
			DATE 8/9/13		
SCALE: N/A	DWG. SIZE A	DO NOT SCALE DRAWING	CODE IDENT 68999	APPD. J. D. B.	SHEET 1 of 1
			DATE 8/9/13	DATE 8/9/13	
					REV. A

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)