

LMR[®]-400-LLPL Flexible Low Loss Plenum Coax

Ideal for...

- Indoor Plenum Feeder runs
- UL/NEC/CSA rated CMP/FT6
- Any wireless application (e.g. LMDS, MMDS, WLL, GPS, LMR, WLAN, WISP, WiMax, SCADA, Cellular, PCS, Paging) requiring an easily routed, low loss RF cable for in-building systems



- **LMR[®]-LLPL** is an indoor highly fire retarded cable intended specifically for runs within return air handling plenums (e.g. dropped ceilings, raised floors). It has a UL/NEC & CSA rating of ‘CMP’ and ‘FT6’ respectively.
- **Flexibility** and bendability are hallmarks of the LMR-400-LLPL 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-LLPL. 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-LLPL cables are designed for indoor Plenum applications. Black jacketed LMR-LLPL versions can be supplied for applications that originate outdoors (e.g., rooftop) and subsequently enter the building.

- **Connectors:** A variety of connectors are available for LMR-400-LLPL cable, including the most common interface types. Most employ crimp outer attachment using standard hex crimp sizes.
- **Cable Assemblies:** All LMR-400-LLPL cable types are available as pre-terminated cable assemblies. Refer to the section on FlexTech for further details.

Part Description				
Part Number	Application	Jacket	Color	Stock Code
LMR-400-LLPL	Indoor Plenum CMP/FT6	FRPVC	Orange	54070

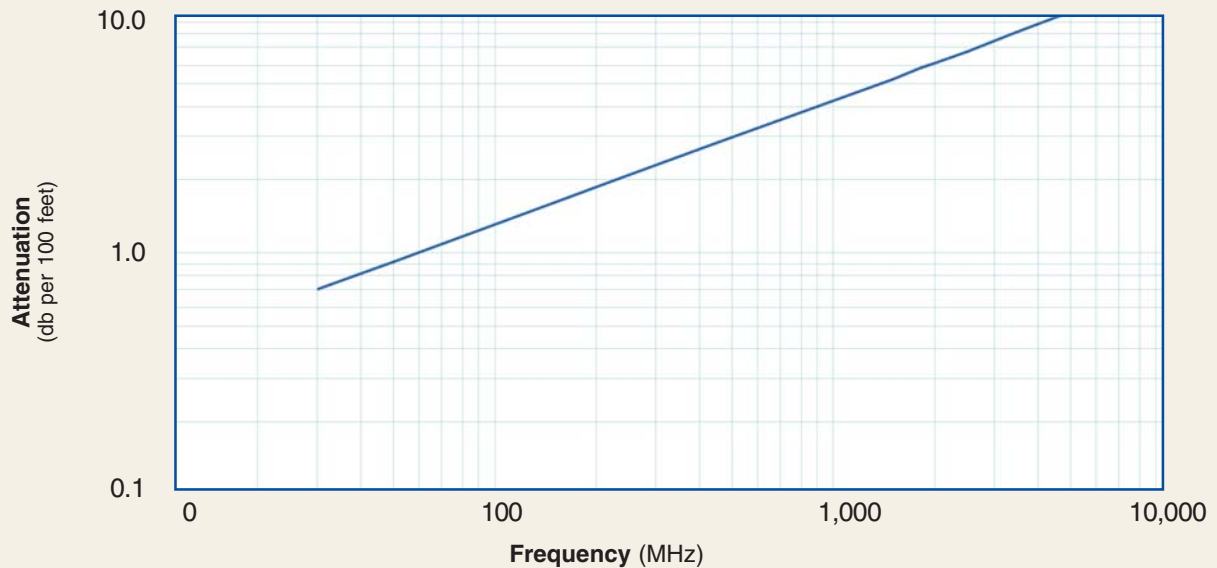
Construction Specifications			
Description	Material	In.	(mm)
Inner Conductor	Solid BCCAI	0.095	(2.41)
Dielectric	Low density PTFE	0.285	(7.24)
Outer Conductor	Aluminum Tape	0.291	(7.39)
Overall Braid	Tinned Copper	0.320	(8.13)
Jacket	Orange FRPVC	0.405	(10.29)

Mechanical Specifications			
Performance Property	Units	US	(metric)
Bend Radius: installation	in. (mm)	1.00	(25.4)
Bend Radius: repeated	in. (mm)	4.0	(101.6)
Bending Moment	ft-lb (N-m)	0.5	(0.68)
Weight	lb/ft (kg/m)	0.114	(0.17)
Tensile Strength	lb (kg)	120	(54.5)
Flat Plate Crush	lb/in. (kg/mm)	185	(3.31)

Environmental Specifications		
Performance Property	°F	°C
Installation Temperature Range	+23/+167	-5/+75
Storage Temperature Range	+23/+167	-5/+75
Operating Temperature Range	+23/+167	-5/+75

Electrical Specifications			
Performance Property	Units	US	(metric)
Cutoff Frequency	GHz	15	
Velocity of Propagation	%	76	
Dielectric Constant	NA	1.73	
Time Delay	nS/ft (nS/m)	1.34	(4.40)
Impedance	ohms	50	
Capacitance	pF/ft (pF/m)	26.7	(87.6)
Inductance	uH/ft (uH/m)	0.067	(0.22)
Shielding Effectiveness	dB	>90	
DC Resistance			
Inner Conductor	ohms/1000ft (/km)	1.8	(5.9)
Outer Conductor	ohms/1000ft (/km)	1.65	(5.4)
Voltage Withstand	Volts DC	2500	
Jacket Spark	Volts RMS	8000	
Peak Power	kW	16	

Attenuation vs. Frequency (typical)



Frequency (MHz)	30	50	150	220	450	900	1500	1800	2000	2500	3400	5800
Attenuation dB/100 ft	0.7	0.9	1.6	1.9	2.8	4.0	5.2	5.7	6.1	6.8	8.0	10.7
Attenuation dB/100 m	2.3	3.0	5.3	6.4	9.2	13.2	17.1	18.9	19.9	22.4	26.4	35.1
Avg. Power kW	3.33	2.57	1.48	1.22	0.84	0.59	0.45	0.41	0.39	0.34	0.29	0.22

Calculate Attenuation =
 $(0.129140) \cdot \sqrt{\text{FMHz}} + (0.000150) \cdot \text{FMHz}$ (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; Jacket = +75°C (167°F); Sea Level; dry air; atmospheric pressure; no solar loading

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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)
N Female	Straight Jack	TC-400-NF-PL	3190-964	<1.25:1 (2.5)	NA	Solder	Crimp	N/G	1.8 (45)	0.66 (16.8)	0.105 (47.6)
N Male	Straight Plug	EZ-400-NMH-PL-D	3190-602	<1.25:1 (2.5)	Hex/Knurled	Spring Finger	Crimp	A/G	1.5 (38)	0.89 (22.6)	0.113 (51.3)
	Straight Plug	TC-400-NMH-PL	3190-759	<1.25:1 (2.5)	Hex	Solder	Crimp	S/G	1.5 (38)	0.89 (22.6)	0.113 (51.3)
	Right Angle	TC-400-NMH-RA	3190-422	<1.35:1 (6)	Hex	Solder	Crimp	S/G	1.8 (46)	1.25 (31.8)	0.130 (59.0)

* 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-S400TT	GK-S400TT	Standard Grounding Kit (each)
Hoisting Grip	HG-400T	HG-400T	Laced Type (each)



Install Tools

Type	Part Number	Stock Code	Description
Crimp Tool	HX-4	3190-200	Crimp Handle
Crimp Dies	Y1719	3190-202	.429" Hex Dies
Crimp Tool	CT-400/300	3190-666	Crimp tool for LMR 400 connectors
Crimp Rings	CR-400	3190-830	Crimp rings for TC/EZ-400 connectors (package of 10)
Strip Tool	ST-400C	3190-228	For Clamp Connectors
Strip Tool	ST-400EZ	3190-401	For Crimp Connectors
Mid-Span Strip Tool	GST-400	3190-2174	For ground strap attachment
Deburr Tool	DBT-U	3190-406	Removes center conductor rough edges
Cutting Tool	CCT-01	3190-1544	Cable end flush cut tool
Replacement Blade	RB-01	3190-1609	Replacement blade for cutting tool
Tool Kit	TK-400EZ	3190-1602	Tool kit for LMR-400 Crimp Connectors (includes CCT-01, ST-400EZ, CT-400/300, DBT-U, Tool Pouch)