

Pacific Wireless

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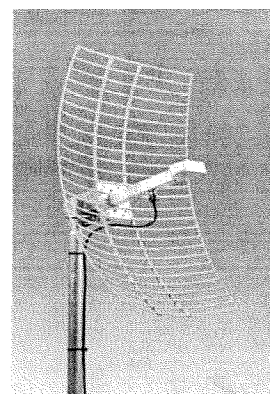
PMANT / PMPF DATA SHEET

Directional Antenna Systems

1700 to 2700 MHz Operation

Features

- 50 Ω Passive Feed Dipole
- Integrated N Female Connector or
Optional 24" pigtail with N Male or N Female Connector
- Horizontal or Vertical Polarity
- 15, 19, 21 or 24 dBi Antenna Gain
- Rugged, Lightweight and Waterproof
- Heavy Duty Adjustable Tilt Bracket



19 dBi Antenna System*

Applications

- 2.4 GHz ISM Band Applications
- Point to Point Repeaters
- Wireless Local Loop
- Point to Multipoint Receive Sites
- Wireless Internet Access
- Streaming Video
- Wireless Bridges
- MMDS Applications

Description

The directional antenna systems offered by Pacific Wireless incorporate parabolic grid type antenna reflectors with the PMPF, patented 50 ohm passive feed dipole. Dipoles come in 2 basic configurations, PMPF-xx with integral Female N type connector and PMPF-xxP with 24" pigtail equipped with an N Male or PMPF-xxPF with an N Female type connector. The antenna reflectors and PMPF dipole can be bought separately for maximum system flexibility. Installation is simple with the Pacific Wireless adjustable tilt "Heavy Duty" bracket which is standard on all antennas. The bracket accommodates poles from 1" up to 2.5" OD. Brackets are full galvanized for extreme corrosion protection and each reflector assembly comes complete with Stainless Steel hardware and complete assembly instructions.

Specifications

Parameter	Model	Min	Typ	Max	Units
<i>Frequency Range</i>	PMPF-1	2300		2500	MHz
	PMPF-2	2500		2685	
	PMPF-19	1880		1930	
	PMPF-18	1750		1850	
	PMPF-18S	1700		1850	
<i>Input Return Loss</i> (S_{11})			-12		dB
<i>VSWR</i>			1.5:1		
<i>Impedance</i>			50		OHM
<i>Input Power</i>			50		W
<i>Pole Diameter</i> (OD)		1		2.5	inch
		25		60	mm
<i>Operating Temperature</i>		-45		+70	Deg C

*Note: Pacific Wireless does not supply the mounting pole or coax cable. Antenna system assembly is required.

1700 – 2700 MHz

PMANT15

PMANT19

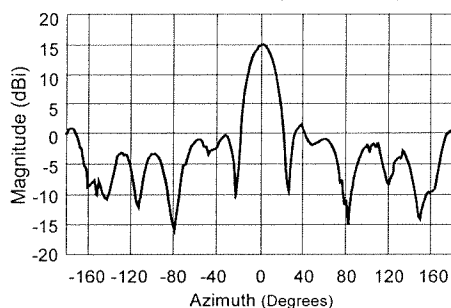
PMANT21

PMANT25

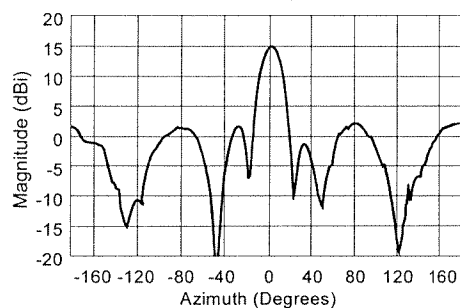
Gain		15 dB	19 dB	21 dB	24 dB
3dB Beam Angle		19 deg	17 deg	12 deg	8 deg
Cross Pole		21 dB	32 dB	26 dB	26 dB
Front to Back		> 19 dB	> 22 dB	>25 dB	> 24 dB
Side Lobe		-15 dB	-17 dB	-25 dB	-20 dB
Wind Loading	100MPH	8.2 Lbs	16.6 Lbs	22.7 Lbs	40 Lbs
	140MPH	16.1 Lbs	32.5 Lbs	40.6 Lbs	78 Lbs
	100MPH: ½" Radial Ice	33.2 Lbs	72.4 Lbs	136.8 Lbs	166 Lbs
Weight		2.6 Lbs	3.9 Lbs	4.2 Lbs	8.2 Lbs
Dimension (LxW)		14" x 11.5"	23.6" x 16.7"	30" x 22"	34" x 28"
Focal Length		7"	9.5"	11.5"	16"

Integrated Antenna Patterns

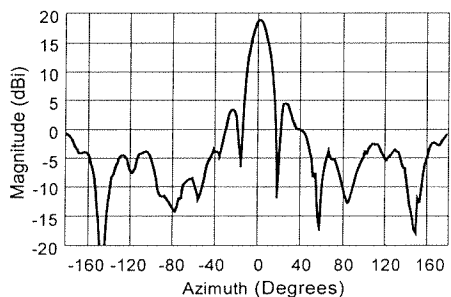
PMANT15 (Horizontal)



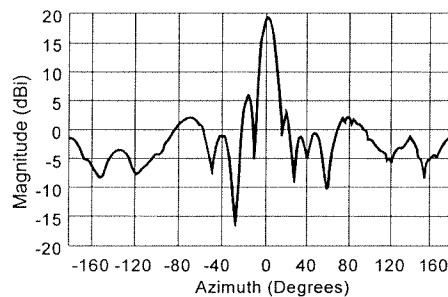
PMANT15 (Vertical)



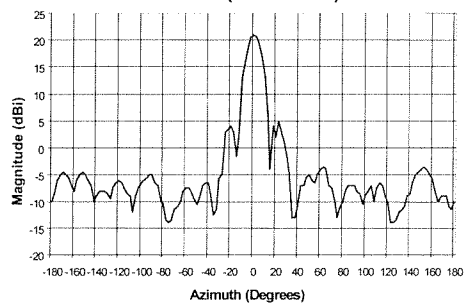
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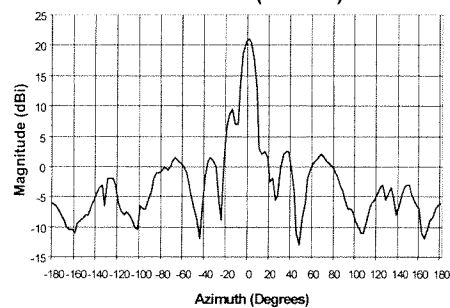
PMANT19 (Vertical)

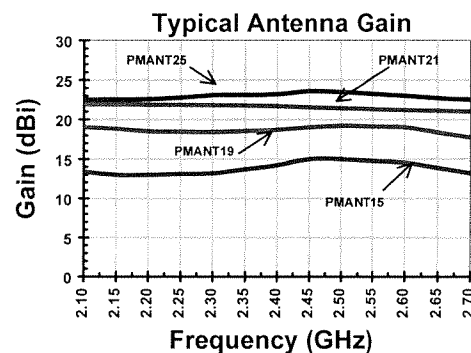
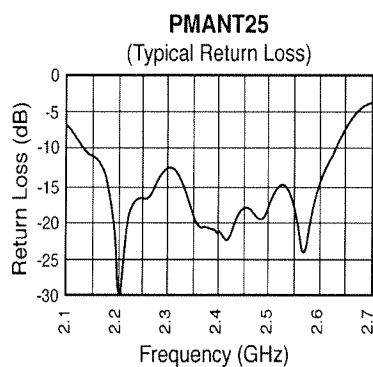
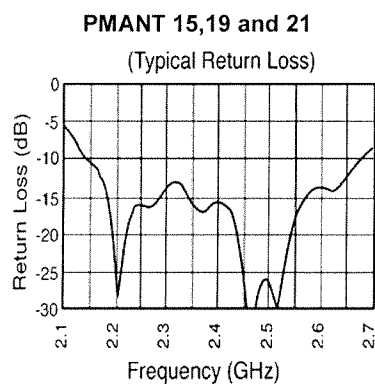
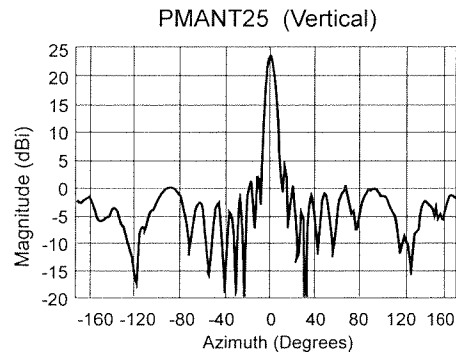
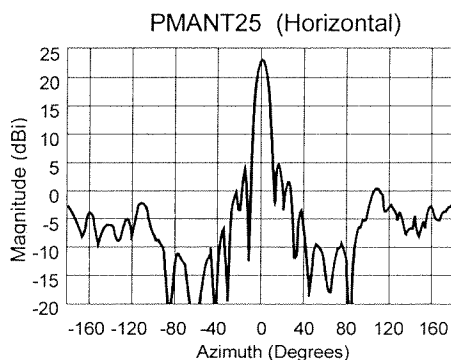


PMANT21 (Horizontal)



PMANT21 (Vertical)

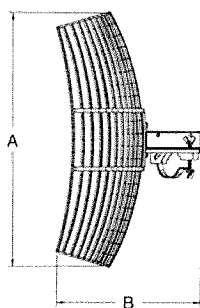




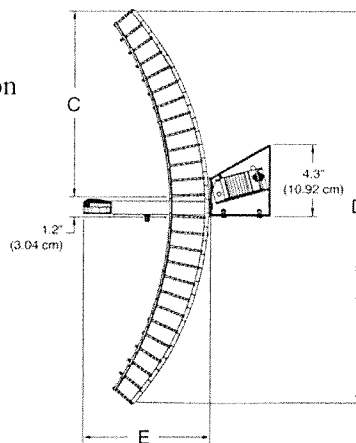
Note: Above are typical return loss and gain using PMPF-1 Dipole

Mechanical Specifications

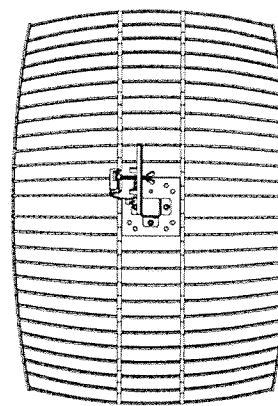
Antenna Reflector: Welded Wire Construction



Top View



Side View



Rear View

	A		B		C		D		E	
	in.	cm.	in.	cm.	in.	cm.	in.	cm.	in.	cm.
PMANT15	11.5	29.21	6.5	16.51	6.4	16.26	14.0	35.56	7.2	18.29
PMANT19	16.7	42.42	9.4	23.88	11.2	28.45	23.6	59.95	9.4	23.87
PMANT21	22	55.88	13.5	34.29	9.25	23.5	30.1	76.45	9.35	23.75
PMANT25	28.0	71.12	11.4	28.96	16.4	41.66	34.0	86.36	16.0	40.64

Approximate Installed Weight

- including PMPF Dipole

PMANT15	2.6 lbs (1.18 kg)
PMANT19	3.9 lbs (1.77 kg)
PMANT21	6.0 lbs (2.72 kg)
PMANT25	8.2 lbs (3.72 kg)

Instruction Sheet

OD24-9/12

Omni-directional Antennas

Step 1: Remove helix nut and washer from the N Female Connector.

Step 2: Slide connector through hole in mounting bracket.

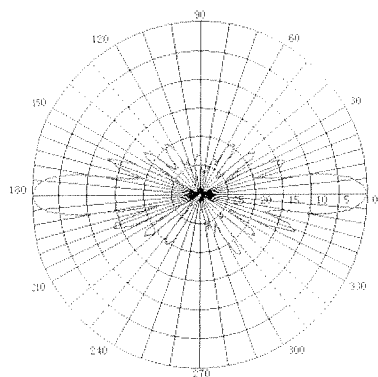
Step 3: Put washer and helix nut back on the N connector and tighten to 45 in lbs.

Step 4: Loosen nuts on the U-bolts so that it is big enough to fit pole diameter.

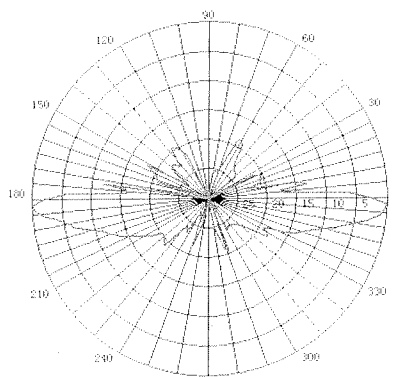
Step 5: Put U-bolts over the pole and tighten nuts to 35 in lbs.

Parameter	Min	Typ	Max	Units
Frequency Range	2400		2484	MHz
VSWR		1.5:1		
Impedance		50		OHM
Input Power			100	W
Pole Diameter (OD)	1 25		2 31.8	inch mm
Operating Temperature	-40		+60	Deg C

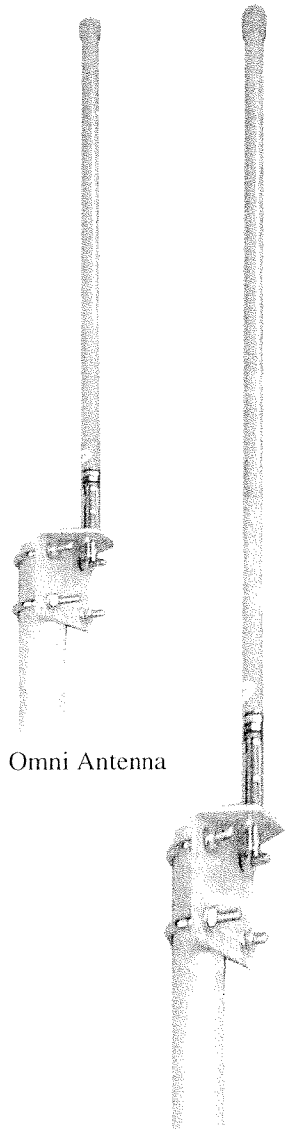
2400-2484 MHZ	OD24-9	OD24-12
Gain	9dB	12dB
Vertical Beam Width	14deg	7 deg
Rated Wind Velocity	125mph	125mph
Weight	1.1 Lbs	1.4 Lbs
Dimension (L)	20"	48"
Electrical Downtilt	-	3 Deg



9dB Vertical Antenna Pattern – E Plane



12dB Vertical Antenna Pattern – E Plane



9dB Omni Antenna

12dB Omni Antenna

- 25', 3' cables -

LMR-195

Flexible Communications Cable

Ideal for...

- Drop-in Replacement for RG-58/RG-142 (uses standard connectors)
- Jumper Assemblies in Wireless Communications Systems
- Short Antenna Feeder runs
- Any application (e.g. WLL, GPS, LMR, Mobile Antennas, 802.11, WLAN) requiring an easily routed, low loss RF cable



- **Flexible:** With a 1/2-inch minimum bend radius, LMR-195 cable is substantially more flexible than RG-142 and very comparable to RG-58, and affords much lower loss, greater shielding and lower cost.
- **Low Loss:** LMR-195 has lower loss than other RG58/RG142 'type' cables. This is achieved through the use of a high velocity gas-injected closed cell foam dielectric and bonded aluminum tape outer conductor.
- **Weatherproof:** The UV protected black polyethylene jacket makes the cable rugged and resistant to the full range of outdoor environments. Various jacket materials are available to address other indoor and outdoor requirements.
- **RF Shielding:** The bonded aluminum tape outer conductor is overlapped to provide 100% coverage, resulting in >90 dB RF shielding (>180 dB crosstalk) and excellent interference immunity (ingress and egress); a substantial improvement from RG58's 40 dB and RG142's 60 dB performance level.
- **Phase Stability:** The intimately bonded structure and foam dielectric of LMR cables provide excellent phase stability over temperature and with bending. The high velocity dielectric results in superior phase stability as compared with RG58 & RG142 solid dielectric cables.
- **Connectors and Assemblies:** Times Microwave provides jumper cable assemblies fabricated with LMR-195 cable and a variety of connector interface combinations. Custom assemblies with phase matching, insertion loss matching, and other special electrical or marking requirements can also be provided. Standard connectors designed for RG58 can be used on LMR-195.

Part Description

Part Number	Designation	Jacket	Stock Code
LMR-195	Standard Outdoor Cable	Polyethylene	54110
LMR-195-DB	Watertight Cable	Polyethylene	54113
LMR-195-PVC	Indoor & Mobile Antenna Cable	PVC	54105
LMR-195-FR-W	CMR/MPR (PCC FT4)	White FR- PVC	54158
LMR-195-LLPL-W	CMP/MPP (PCC FT6)	White Plenum	54159

Mechanical Specifications

Minimum Bend Radius	0.5 in	12.7 mm
Bending Moment	0.2 ft-lb	0.27 N-m
Weight	0.021 lb/ft	0.03 kg/m
Tensile Strength	40 lb	18.2 kG
Flat Plate Crush	15 lb/in	0.27 kG/mm



TIMES MICROWAVE SYSTEMS

A Smiths Group plc company

358 Hall Ave., Wallingford, CT, 06492-5039 U.S.A.
Phone: 203-949-8400 Fax: 203-949-8423

Construction Specifications

Part Designation	Material	Inches	mm
Inner Conductor	Solid BC	0.037	0.94
Dielectric	Foam Polyethylene	0.110	2.79
Outer Conductor	Aluminum Tape	0.116	2.95
Overall Braid	Tinned Copper	0.139	3.53
Standard Jacket	Black Polyethylene	0.195	4.95

Environmental Specifications

	°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

Cutoff Frequency	41 GHz*	
Velocity of Propagation	80%	
Voltage Withstand	1000 VDC	
Peak Power	2.5 kW	
DC Resistance		
Inner Conductor, ohms	7.6/1000'	24.94 /km
Outer Conductor, ohms)	4.9/1000'	16.08 /km
Jacket Spark	3000 VRMS	
Impedance	50 ohms	
Capacitance	24.3 pF/ft	79.70 pF/m
Inductance	0.064 uH/ft	0.21 uH/m
Shielding Effectiveness	>90 dB	
Phase Stability	< 10 ppm/C	

*Consult factory for applications over 6 GHz.

*Consult factory for applications over 6 GHz.

Frequency	Attenuation		Avg. Power
MHz	dB/100 ft	dB/100 m	kW
30 MHz	1.90	6.3	0.85
50 MHz	2.46	8.1	0.66
150 MHz	4.3	14.1	0.38
220 MHz	5.2	17.1	0.31
450 MHz	7.5	24.6	0.21
900 MHz	10.7	35.0	0.15
1500 MHz	13.4	45.6	0.12
1800 MHz	15.3	50.1	0.11
2000 MHz	16.1	53.0	0.10
2500 MHz	18.1	59.5	0.09
5800 MHz	28.3	93.1	0.06

Attenuation (db/100 ft) = (0.35686) • $\sqrt{\text{FMHz}}$ + (0.00047) • FMHz
(db/100 m) = (1.17086) • $\sqrt{\text{FMHz}}$ + (0.00154) • FMHz
(interactive calculator available at <http://www.timesmicrowave.com>)

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

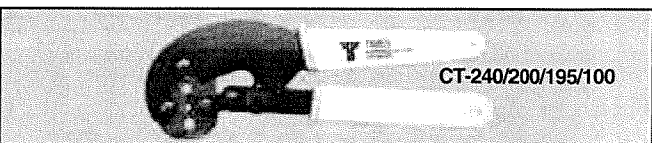
Attenuation (db/100 ft) = (0.35686) • √FMHz + (0.00047) • FMHz
(db/100 m) = (1.17086) • √FMHz + (0.00154) • FMHz
(interactive calculator available at <http://www.timesmicrowave.com>)

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

Accessories

Tool Type	Part Number	Stock Code	Description
Crimp Tool	CT-240/200/195/100	3190-667	Crimp tool for LMR 195 connectors



LMR-400

Flexible Communications Cable

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, Mobile Antennas, 802.11, WLAN) requiring an easily routed, low loss RF cable



• **Flexible:** With a 1-inch minimum bend radius, LMR-400 cable can be easily routed into and through tight spaces without kinking. The LMR bonded-tape outer conductor provides superior flexibility and ease of bending compared to corrugated copper or smooth wall copper hard-line cables.

• **Low Loss:** LMR-400 has the lowest loss of any RG8/RG213 'type' cable. This is achieved through the use of a high velocity gas-injected closed cell foam dielectric and bonded aluminum tape outer conductor.

• **Weatherproof:** The UV protected black polyethylene jacket makes the cable rugged and resistant to the full range of outdoor environments. The DB version of the cable includes a water blocking material within the braid to protect the cable from moisture ingress and eliminate any potential for corrosion in harsh environments or should the jacket become damaged. Various jacket materials are available to address other indoor and outdoor requirements.

• **RF Shielding:** The bonded aluminum tape outer conductor is overlapped to provide 100% coverage, resulting in >90 dB RF shielding (>180 dB crosstalk) and excellent interference immunity (ingress and egress).

• **Phase Stability:** The intimately bonded structure and foam dielectric of LMR cables provide excellent phase stability over temperature and with bending. The high velocity dielectric results in superior phase stability as compared with solid and air-spaced dielectric cables.

• **Connectors and Assemblies:** Times Microwave provides *FlexTech™* jumper cable assemblies fabricated with LMR-400-DB watertight cable and a variety of connector interface combinations (ref: FlexTech pages). Custom assemblies with phase matching, insertion loss matching, and other special electrical or marking requirements can also be provided. A full range of connectors, including 'EZ' install (non-solder) types, is available for

Part Description

Part Number	Designation	Jacket	Stock Code
LMR-400	Standard outdoor cable	Polyethylene	54001
LMR-400-DB	Watertight cable	Polyethylene	54091
LMR-400-FR	CMR/MPR (PCC-FT4)	Non-Halogen	54030
* LMR-400-LLPL	CMP/MPP (PCC-FT6)	Plenum	54070
LMR-400-PVC	Indoor cable (CATVR)	PVC	54073
LMR-400-UltraFlex	UltraFlex cable	TPE	54040
LMR-400-FR-W	CMR/MPR (PCC-FT4)	White Non-Halogen	54188
LMR-400-75	75 Ohm outdoor cable	Polyethylene	54147

* See LMR in-building communications catalog on web site for Plenum connectors.

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LMR-400 cable as shown on the next page.

- **LMR-LLPL Low Loss Plenum:** Refer to LMR In-Building Communications catalog on web site for details.

Mechanical Specifications

Minimum bend radius	1.0 in	25.4 mm
Bending moment	0.5 ft lb	0.68 N-m
Weight	0.068 lb/ft	0.10 kg/m
Tensile strength	160 lb	72.6 kG
Flat plate crush	40 lb/in	0.71 g/mm

Construction Specifications

Part Designation	Material	Inches	mm
Inner conductor	Solid BCCA1	0.108	2.74
Dielectric	Foam polyethylene	0.285	7.24
Outer conductor	Aluminum tape	0.291	7.39
Overall braid	Tinned copper	0.320	8.13
Standard jacket	Black polyethylene	0.405	10.29

Environmental Specifications

	°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

Cutoff frequency	16.2 GHz*	
Velocity of propagation	85%	
Voltage withstand	2,500 VDC	
Peak power	16 kW	
DC resistance		
Inner conductor, ohms	1.39/1,000'	4.56/km
Outer conductor, ohms	1.65 /1,000'	5.41/km
Jacket spark	8,000 VRMS	
Impedance	50 ohms	
Capacitance	23.9 pF/ft	78.40 pF/m
Inductance	0.060 uH/ft	0.20 uH/m
Shielding effectiveness	>90 dB	
Phase stability	<10 ppm/°C	

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Frequency MHz	Attenuation dB/100 ft	dB/100 m	Avg. Power kW
30 MHz	0.7	2.2	3.3
50 MHz	0.9	2.9	2.6
150 MHz	1.5	5.0	1.5
220 MHz	1.9	6.1	1.2
450 MHz	2.7	8.9	0.83
900 MHz	3.9	12.8	0.58
1500 MHz	5.1	16.8	0.44
1800 MHz	5.7	18.6	0.40
2000 MHz	6.0	19.6	0.37
2500 MHz	6.8	22.2	0.33
5800 MHz	10.8	35.5	0.21

Add 15% to tabulated attenuation for LMR-UltraFlex
Attenuation (db/100 ft) = (0.12229) • $\sqrt{\text{FMHz}}$ + (0.00026) • FMHz
 (db/100 m) = (0.40123) • $\sqrt{\text{FMHz}}$ + (0.00085) • FMHz
 (interactive calculator available at <http://www.timesmicrowave.com>)
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