

ProCurve Networking

J8448A

14 dBi Yagi Antenna



Specifications

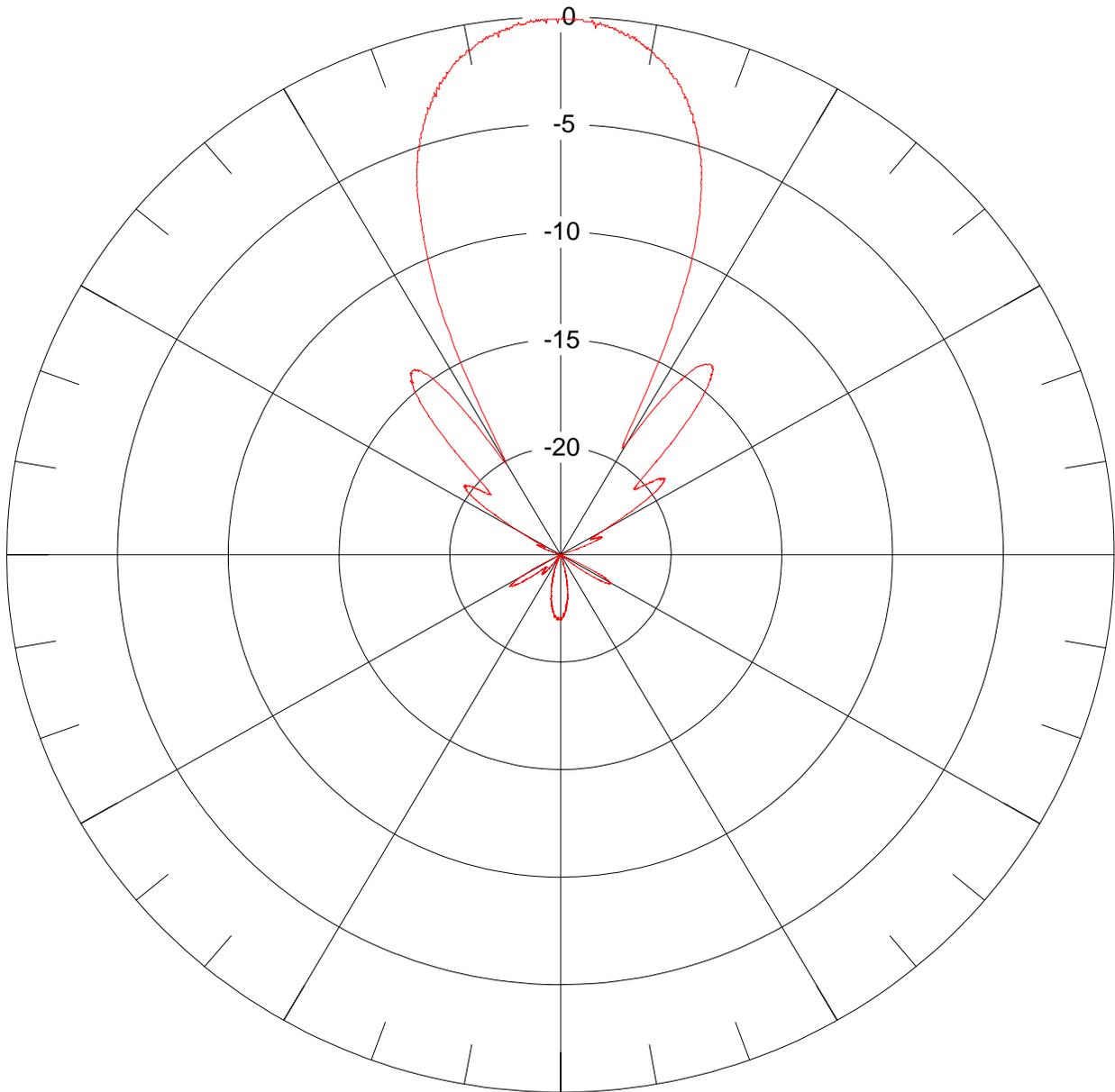


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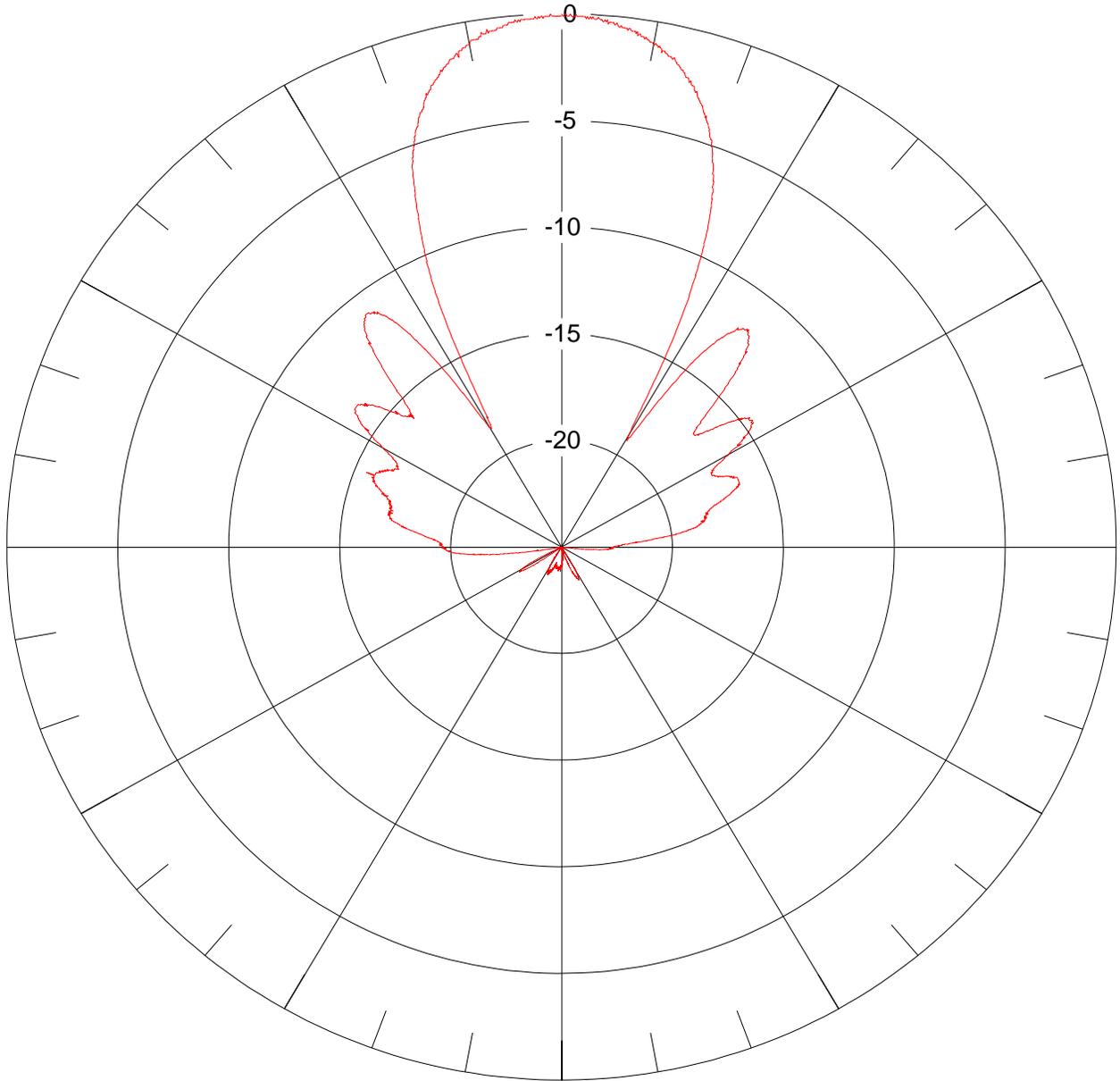
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## Antenna Specifications – J8448A

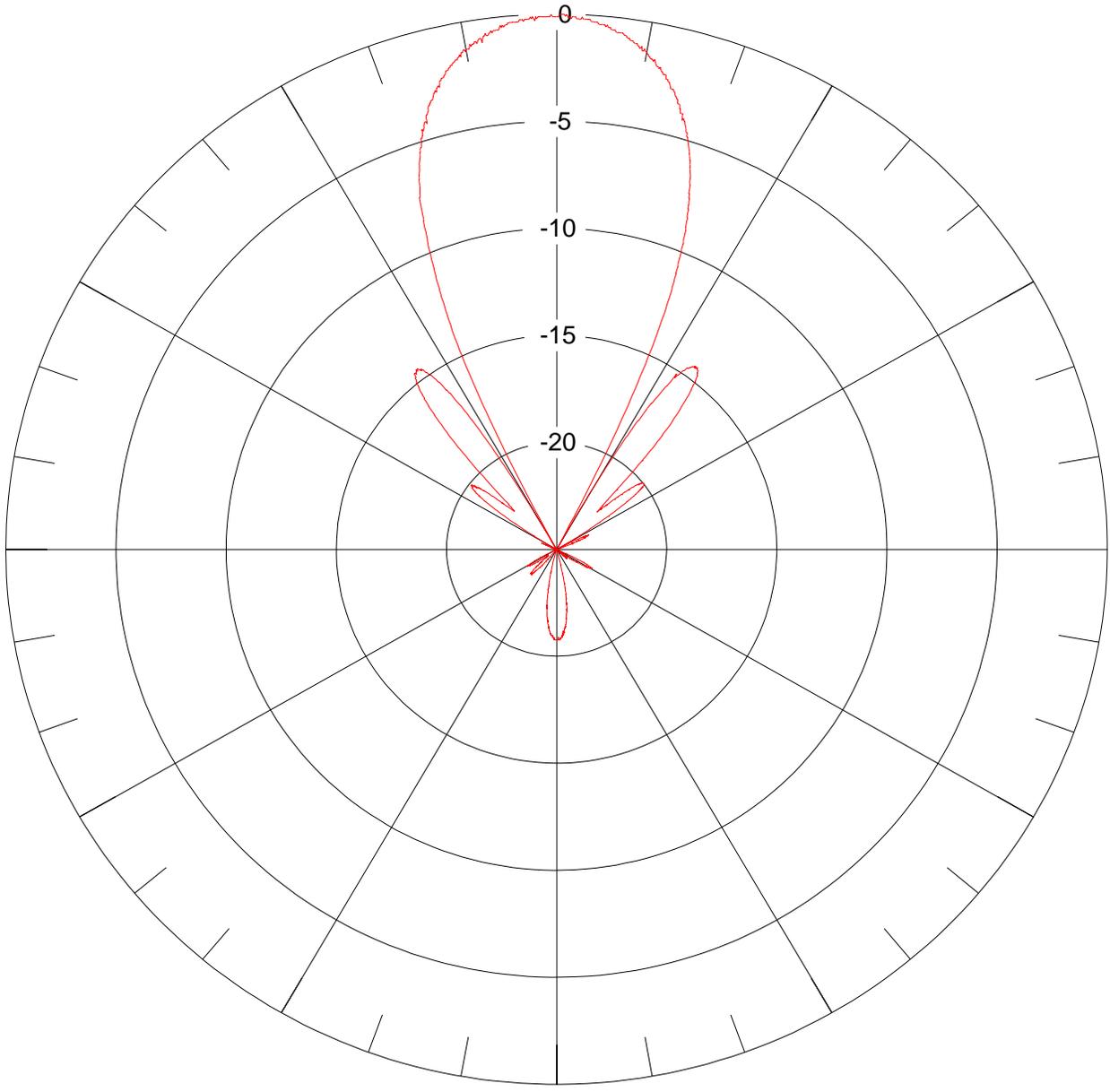
Item	Specification
HP Product Number	J8448A
Cushcraft Part Number	PC2415HNAK
Frequency (MHz)	2400-2500
Gain w/specified cable (dBi)	13.8
VSWR max	1.7:1
E-Plane (3dB beamwidth)	30°
H-Plane (3dB beamwidth)	34°
Polarization	Linear
Impedance (Ohms)	50
Front to back ratio (dB)	18
Weight lb. (kg)	1.25 (0.56)
Dimensions in. (cm)	26.5 x 3.75 x 1.5 (67.3 x 9.5 x 3.8)
Height in. (cm)	29.875 (75.9)
Mounting Style	Wall, mast
Wind Surface Area ft <sup>2</sup> (m <sup>2</sup> )	0.70 (0.07)
Wind Survival mph (km/hr)	100 (160)
Enclosure	Polycarbonate
RF Connector	N (f)
Pigtail	20-inch RG-303 type cable w/N(f)
Storage Temperature (min/max)	-40° to +65°C
Operating Temperature (min/max)	-30° to +55°C



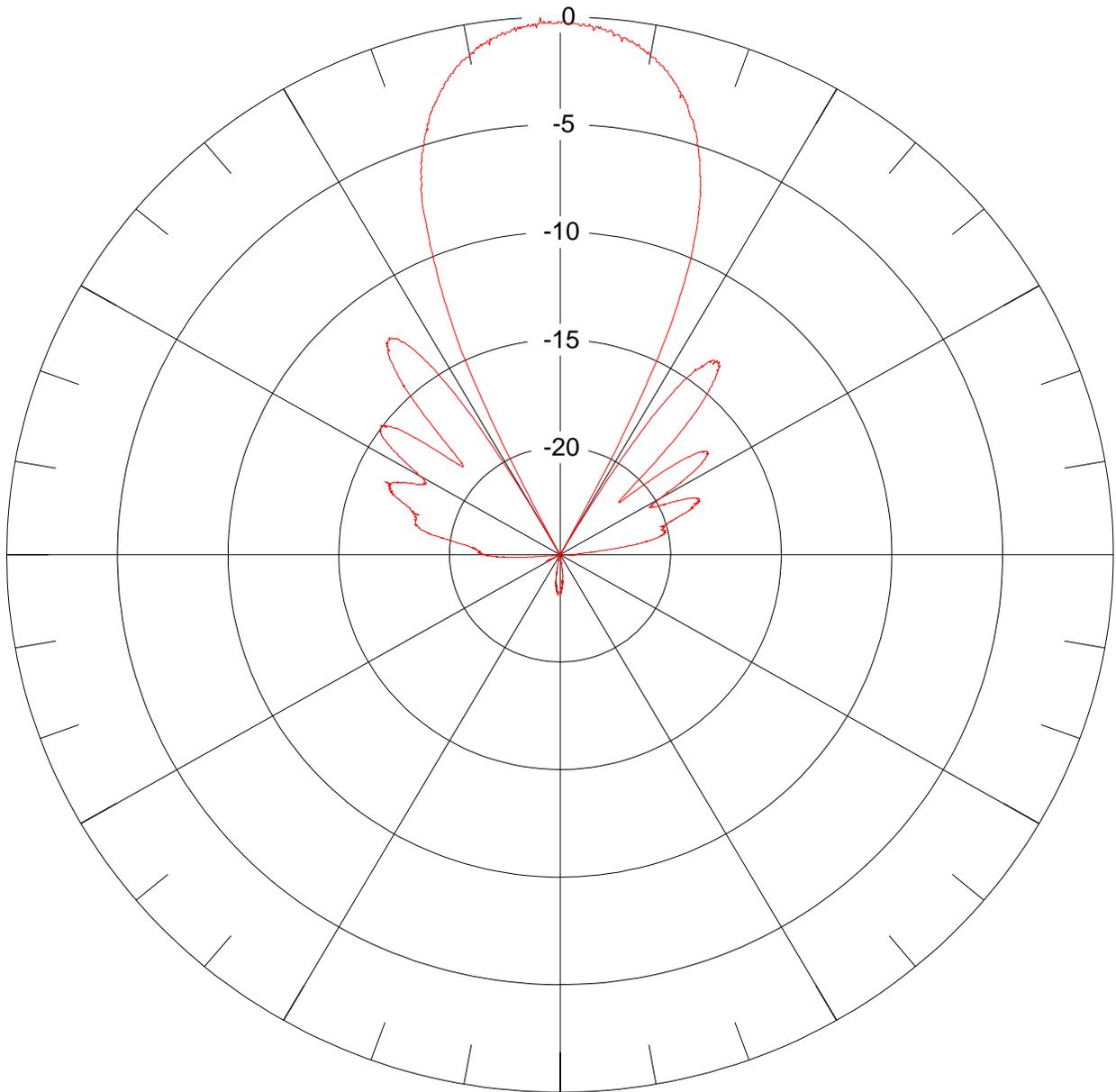
**MODEL-PC2415HNAK**  
**2.4 GHz**  
**E-PLANE**



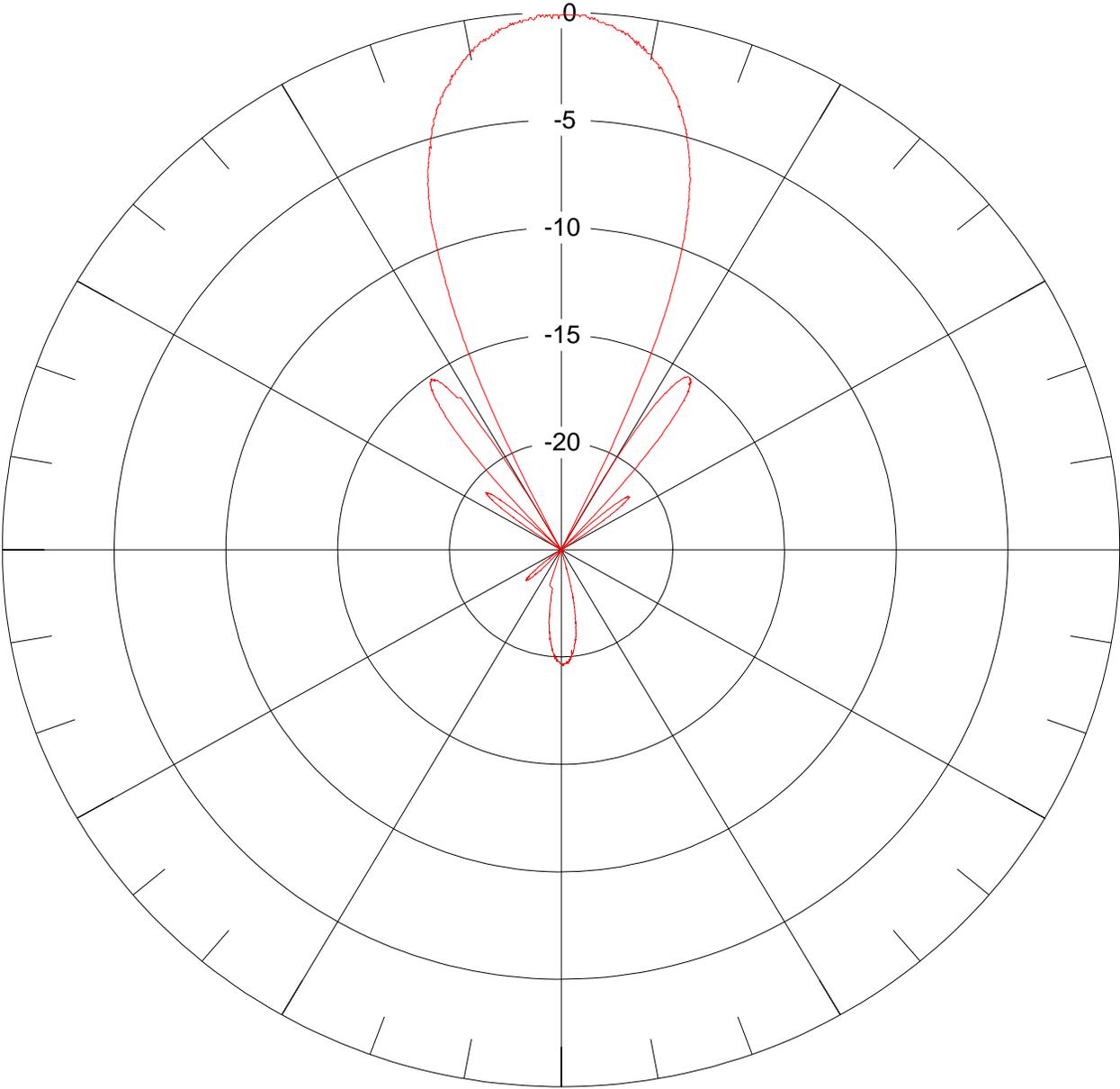
**MODEL-PC2415HNAK**  
**2.4 GHz**  
**H-PLANE**



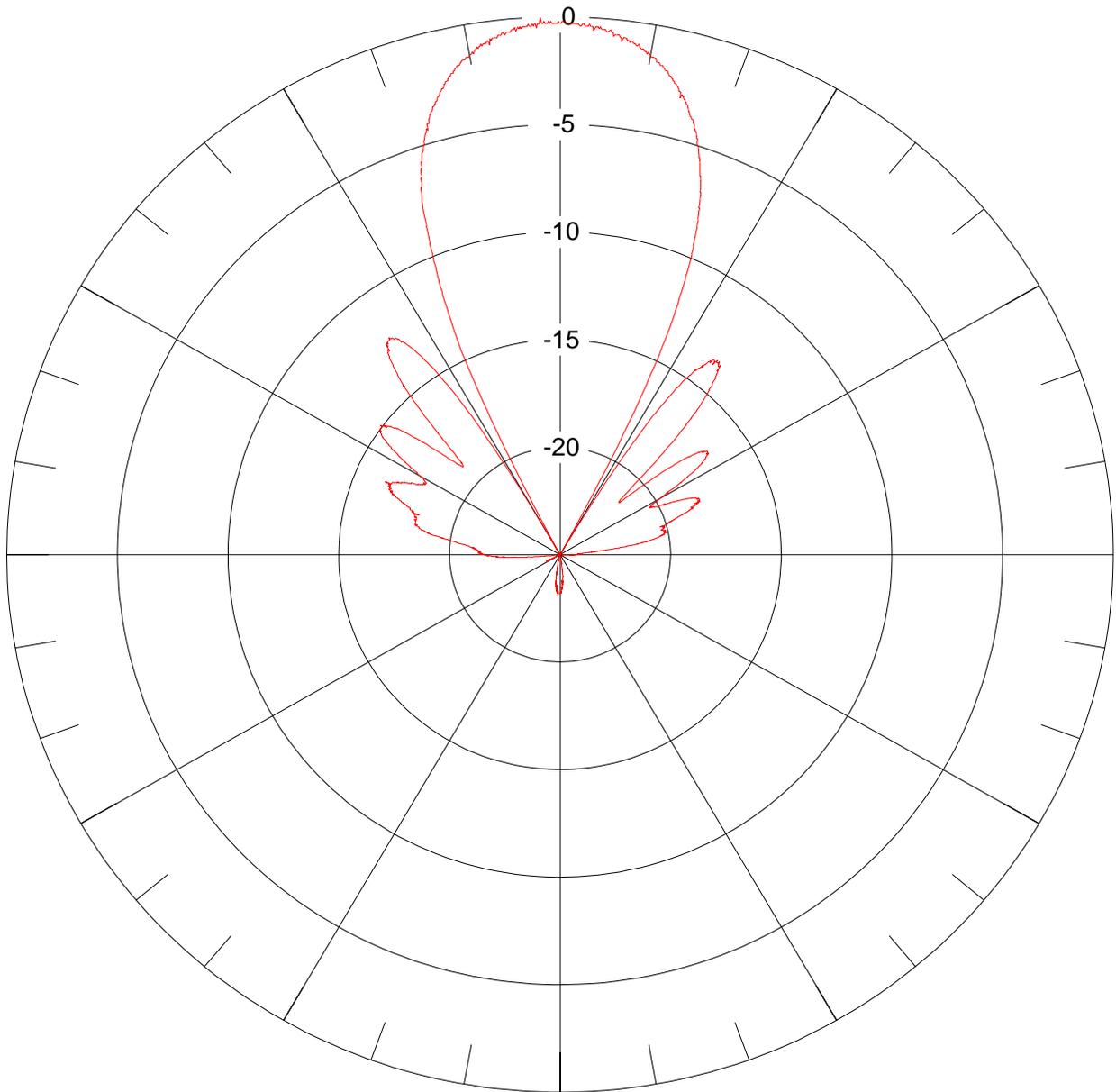
**MODEL-PC2415HNAK**  
**2.45 GHz**  
**E-PLANE**



**MODEL-PC2415HNAK**  
**2.45 GHz**  
**H-PLANE**

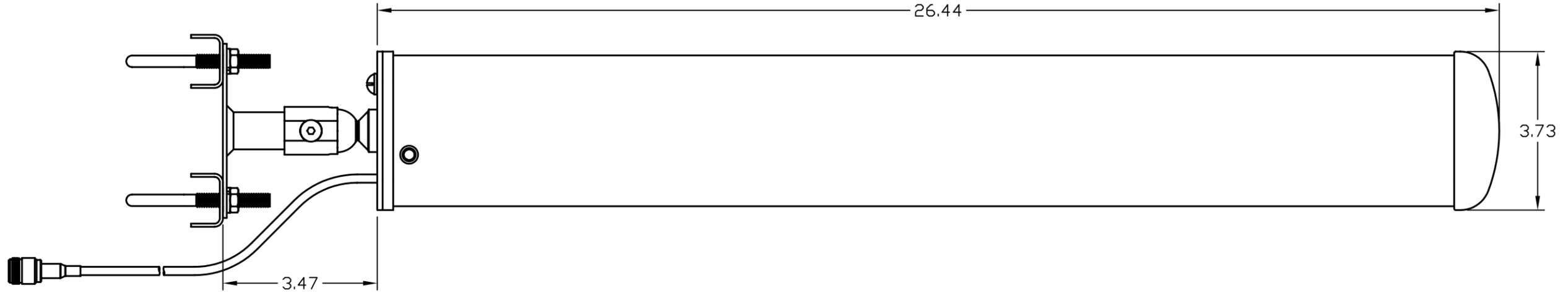
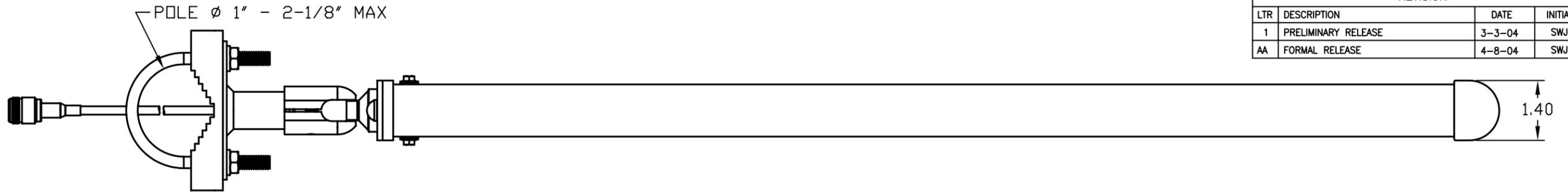


**MODEL-PC2415HNAK**  
**2.5 GHz**  
**E-PLANE**

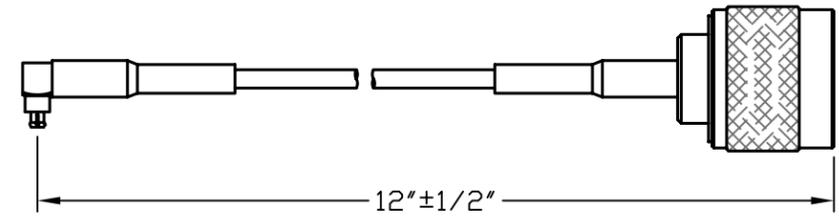


**MODEL-PC2415HNAK**  
**2.45 GHz**  
**H-PLANE**

REVISION			
LTR	DESCRIPTION	DATE	INITIAL
1	PRELIMINARY RELEASE	3-3-04	SWJ
AA	FORMAL RELEASE	4-8-04	SWJ



Parameter	Performance
HP Part Number	J8448A
Cushcraft Part Number	(PC2415HNAK)
Frequency (MHz)	2400-2500
Gain dBi (w/12" cable)	14
Gain dBi (w/specified cable)	13.8
VSWR max	1.7:1
E-Plane (3 dB beamwidth)	30°
H-Plane (3 dB beamwidth)	34°
Polarization	Linear
Impedance (Ohms)	50
Weight lb./kg	1.25 (0.56)
Mounting Style	Articulating Wall or Mast Mount
Front to Back Ratio (dB)	18
Wind Surface Area ft <sup>2</sup> (m <sup>2</sup> )	0.70 (0.07)
Wind Survival mph (km/hr)	100 (160)
Enclosure	Polycarbonate, White
RF Connector	N (f)
Pigtail	20" Cable w/N(f)
Adapter Cable	12" N(m) to MC Card R/A
Storage Temp min/max	-40 to +65 C
Operating Temp min/max	-30 to +55 C



MATERIAL:	DRAWN S JOHNSON	DATE 3-3-04	<b>CUSHCRAFT</b> 48 PERIMETER ROAD MANCHESTER NH. 03108
	ENGINEER R LITTLEFIELD	DATE 4-8-04	
DO NOT SCALE DRAWING	ENGINEERING MGR A ALEVY	DATE 4-8-04	TITLE: <b>PC2415HNAK          MOUNTING &amp; OUTLINE</b>
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE: ANGLES ± 2° FRACTIONS ± 1/16" .XX ± 0.060" .XXX ± 0.015"	FINISH:		DRAWING NO. <b>PC2415HNAKMO</b>
			REV <b>AA</b>
			SCALE NONE SIZE B SHEET 1 OF 1

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ProCurve Networking

# J8996A Lightning Arrester



Specifications

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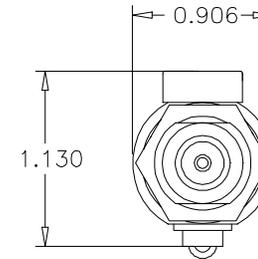
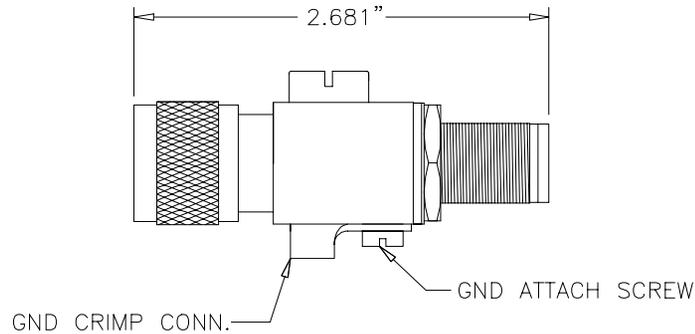
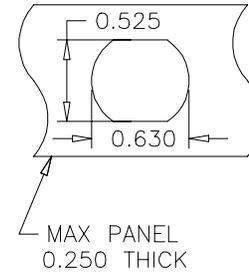
## Lightning Arrester Specifications – J8996A

Item	Specification
HP Product Number	J8996A
Cushcraft Part Number	LAC6NMF
Frequency (MHz)	100-6000
Max Power (W)	200
VSWR (50 ohm)	1.4:1 (max)
Insertion Loss (dB)	0.4 (max)
DC Breakdown Voltage (V)	230 (nominal)
Insulation Resistance (M-ohms)	50
Impulse Breakdown Voltage (V) 1 kV/ms max	700 (nominal)
Impulse Discharge Current (A)	5000
Connectors	Type N (female) – N (male)
Weight oz (g)	4.5 (128)
Finish	Nickel Body
Operating Temperature (min/max)	-40° to +85°C

Parameter	Performance
Frequency	100–6000 MHz
Max Power	200 W
VSWR (50 ohm)	1.4:1 Max
Insertion Loss	0.4 dB Max
DC Breakdown Voltage	230 V Nom.
Insulation Resistance	50 M–ohms
Impulse Breakdown Voltage (1 kV/ms Max.)	700 V Nom.
Impulse Discharge Current	5000 Amps
Connectors	Type N (f)–N (m)
Weight	4.5 oz.
Finish	Nickel Body
Operations Temp.	–40° to 85°C

REVISION			
LTR	DESCRIPTION	DATE	INITIAL
AA	ORIGINAL	10/27/05	

### MOUNTING



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MATERIAL:	DRAWN S. DAMBOISE	DATE 10/27/05	<b>CUSHCRAFT</b> 48 PERIMETER ROAD MANCHESTER NH. 03108
	ENGINEER J. MORROW	DATE 11/02/05	
DO NOT SCALE DRAWING	ENGINEERING MGR A. ALEVY	DATE 11/02/05	TITLE: <b>LAC6NMF            MOUNTING &amp; OUTLINE</b>
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE:	FINISH:	DRAWING NO. LAC6NMFMO	REV AA
ANGLES ±0.5° FRACTIONS ±1/64" .XX ±0.010" .XXX ±0.005"		SCALE 1:1	SIZE A SHEET 1 OF 1

# 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) 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,

### 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/MPP (PCC-FT4)	Non-Halogen	54030
LMR-400-PVC	Indoor cable (CATVR)	PVC	54073
LMR-400-UltraFlex	UltraFlex cable	TPE	54040
LMR-400-LLPL	CMP/MPP (PCC-FT6)	Plenum	54070

NOTE: See LMR-LLPL catalog on web site for Plenum connectors.

## TIMES MICROWAVE SYSTEMS

A Smiths Industries company

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

is available for LMR-400 cable as shown on the next page.

- **LMR-LLPL LowLoss 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 lbs	0.68 N-m
Weight	0.068 lbs/ft	0.10 kg/m
Tensile strength	160 lbs	72.6 kG
Flat plate crush	40 lb/in	0.71 g/mm

### Construction Specifications

Part Designation	Material	Inches	mm
Inner conductor	Solid BCCAl	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	

\*Consult factory for applications over 6 GHz.

Frequency MHz	Attenuation		Avg. Power kW
	dB/100 ft	dB/100 m	
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  
**Calculate Attenuation** = (0.12229) • √FMHz + (0.00026) • 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