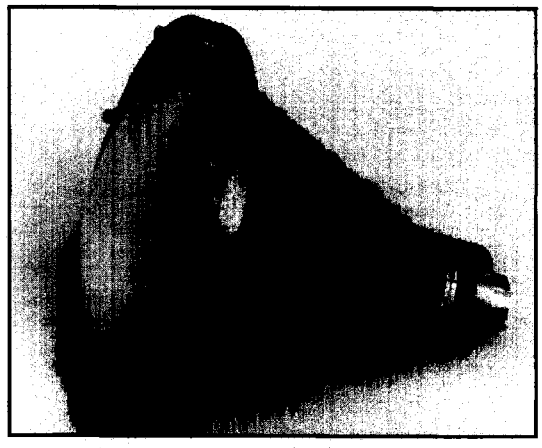
Series 857 Spot-Focusing Horn Lens Antenna

Features

- Focus to a Wavelength Spot / Size
- Far-Field Focusing Ability
- Compact and Rugged Horn-Lens Combinations
- Stable Electrical Operation



Description

The Series 857 antenna consists of a conical feed horn and two equal plano-convex dielectric lenses mounted back to back. This combination of lenses refracts the microwave signal in either direction. The dielectric constant and the loss tangent of the lens material at millimeter wave frequencies are 2.53 and approximately 0.001, respectively.

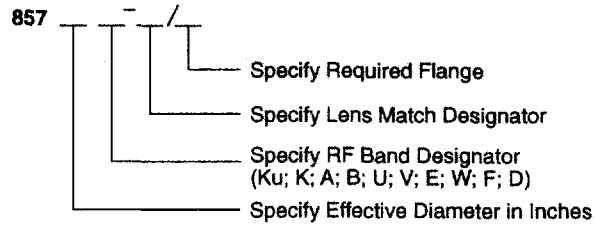
These antennas are designed for high performance transmission and reception of RF signals occurring in the near-field. Advantages of the spot-focus design include pressurization, weather proofing, small spot size for concentration of energy, and near-field operation. The spotwidth at the 3 dB points is approximately one wavelength and the depth of focus is approximately 10 wavelengths. The spot is located in front of the lens at a distance equal to the diameter of the lens (i.e., F/D = 1.0).

Applications

The Series 857 antennas are designed for nearfield signal operation, although they can be modified for far-field operation. By removing the second refracting lens, the antenna can be refocused for the far field. These precision antennas are used for measuring bulk dielectric materials, plasma densities, and temperature.

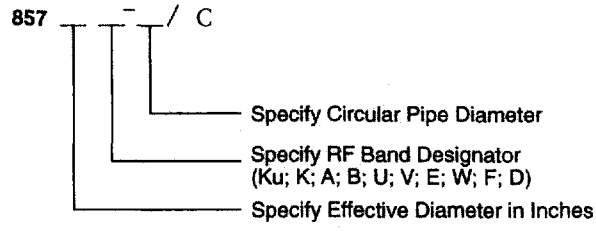
Ordering Information

Linear Mode:



For example: Model number 856009U-2/383 is a Series 857 antenna with a 9 inch effective aperture operating in U-band at 50 GHz with a 383 type flange.

Circular Mode:



For example: Model number 857009U-165/C is a Series 856 antenna with a 9 inch effective aperture operating in U-band at 50 GHz with circular polarization.

The center frequency should be specified when ordering these antennas. Each antenna is tested at the customer's center frequency up to 100 GHz. Higher frequency units (F, D, and G-band) are also available without testing, which is quoted separately due to the limited availability of test sources in these band ranges.

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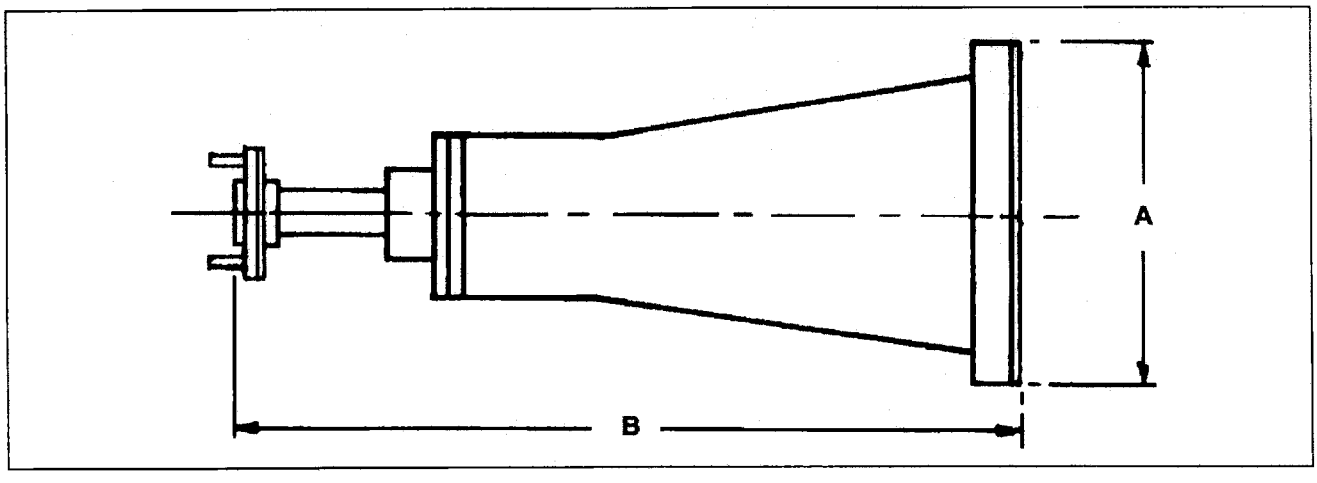
Test data will include principal E and H plane radiation patterns at the designated frequency. The Series 857 horn lens antennas are linearly polarized, although either dual or circular polarization can be achieved using the circular mode components described later in this section.

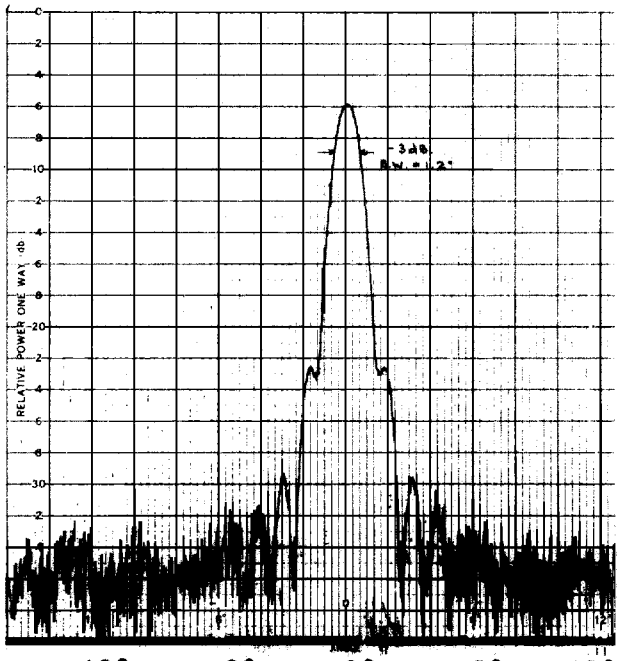
Typical Specifications

Model Number	Effective Diameter	A		B	
		Inches	Millimeters	Inches	Millimeters
857 Ku through 857 W	–3	4.2	107	4.6	117
	–6	7.4	188	8.7	221
	–9	10.6	269	12.7	323
	–12	14.0	356	16.7	424
Note: Final dimensions are subject to variations from the tabulated data due to tuning, focusing, and mechanical tolerances.					

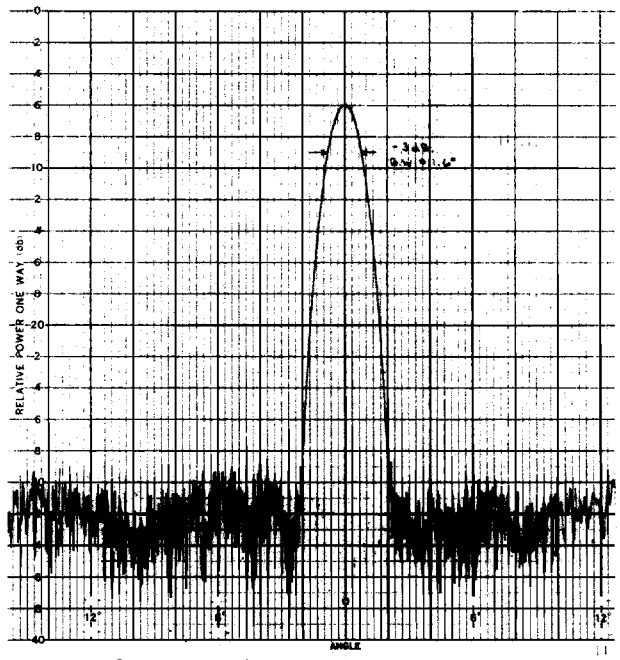
Outline Drawing



Typical Antenna Patterns



E-Plane — W-Band (6" Dia.)



H-Plane — W-Band (6" Dia.)