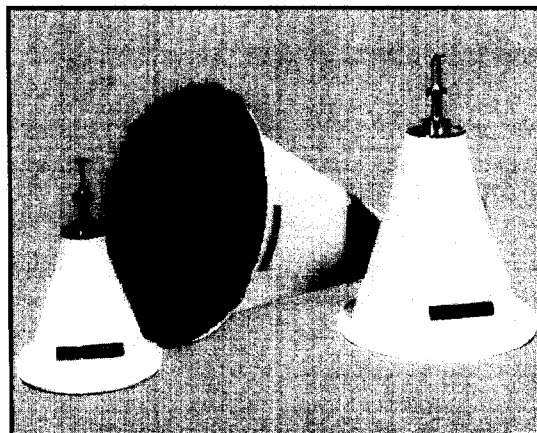


# Series 858 High Efficiency Horn Lens Antennas

## Features

- ▶ Compact and Rugged Scalar Horn with Lens Correction
- ▶ Low Sidelobes in all Planes
- ▶ High Beam Efficiency
- ▶ No Aperture Blockage
- ▶ No Spillover, Power Loss, or Feed Line Loss
- ▶ Equal E-Plane and H-Plane Beamwidths
- ▶ Efficiency Greater than 55%



## Description

Each Series 858 horn lens antenna consists of a Series 884 taper transition, a plano-convex dielectric lens, and a scalar feed horn with a circular input which is held at the focus position of the lens by a light-weight plastic housing. 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 feature optimized radiation patterns with negligible sidelobes and cross-polarized lobes.

The Series 858 antennas are available in 3, 6, 9, and 12-inch diameters to provide a variety of gain characteristics from 12.4 to 220 GHz. Tapered mounting holes are provided on each support housing for proper balanced mounting.

From C-Band to W-Band		
Frequency	5.4 GHz	94 GHz
Diameter	24 Inches	1.5 Inches
Beamwidth	6.5 Degrees	6 Degrees
Gain	28.5 dBi	29 dBi
Sidelobes	-20 to -29 dB	-22 to -28 dB
VSWR	1.4:1 Max	1.4: Max
Efficiency	55-60%	55-60%
Axial Ratio	< 1.0 dB	< 1.0 dB

## Applications

The Series 858 high-efficiency horn lens antenna has optimized radiation patterns with negligible sidelobes and cross-polarized lobes with low spillover characteristics, making this antenna useful for tracking, surveillance, and search radar applications. These antennas have been used in many millimeter wave applications that require efficient radiators with high beam efficiency. They can provide peak sidelobes 25 to 30 dB down with 90 to 98 percent of the radiated power in the main beam.

The Series 858 can also be used for radio astronomy, deep space telemetry, and satellite communication systems. Any application that includes a low noise preamplifier, paramp, maser, or varactor amplifier would benefit from its low noise characteristics.

The wide angle scanning properties with no aperture blockage make this antenna useful in EW and ELINT applications where system requirements demand the high performance of large antennas within small size constraints. They have also been used in conical scan and multibeam tracking systems up to 220 GHz.

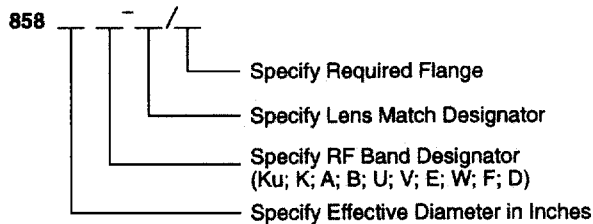
## Typical Specifications

Model Number	Effective Diameter	A		B	
		Inches	Millimeters	Inches	Millimeters
858Ku	-12	14.0	356	21.0	533
858K	-9	11.0	279	15.7	399
	-12	14.0	356	19.5	495
858A	-6	7.6	193	11.1	282
	-9	11.0	279	14.0	356
	-12	14.0	356	18.2	462
858B and 858U	-6	7.6	193	10.6	269
	-9	11.0	279	14.0	356
	-12	14.0	356	17.7	450
858V, 858E and 858W	-3	4.2	107	6.0	152
	-6	7.6	193	9.6	244
	-9	11.0	279	13.0	330
	-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.

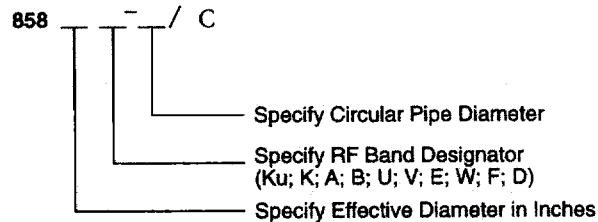
## Ordering Information

Linear Mode:



For example: Model number 858009U-2/383 is a Series 858 antenna with a 9 inch effective aperture operating in U-band at 50 GHz with a 383 type flange.

Circular Mode:

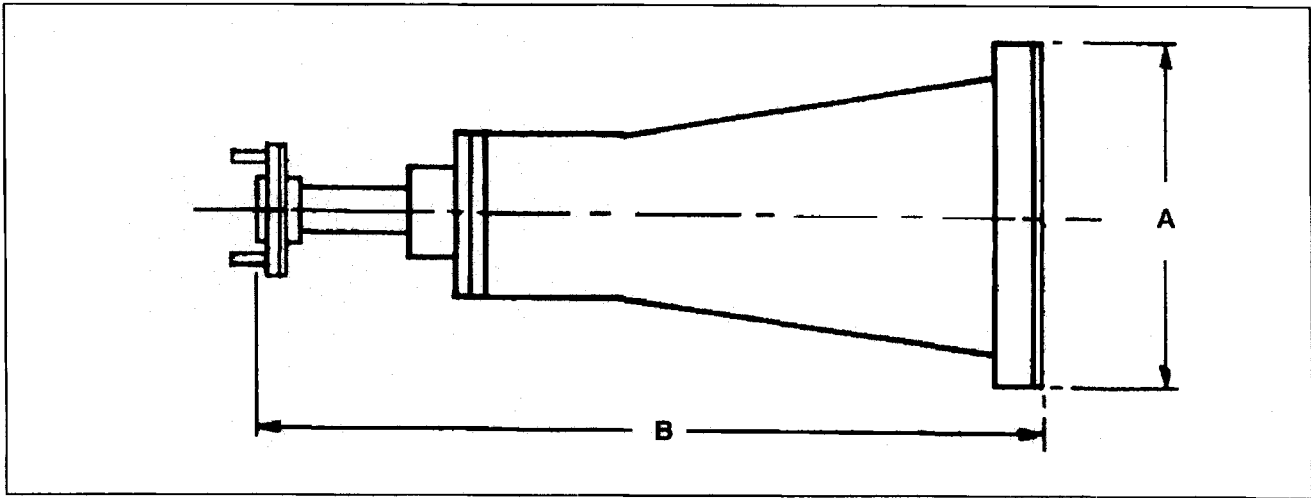


For example: Model number 858009U-165/C is a Series 858 antenna with a 9 inch effective aperture operating in U-band at 50 GHz with circular polarization.

The center frequency should be specified when ordering these antennas. Each antenna is tested at the customer's center frequency up to 100 GHz and optimum focal adjustments are made. Test data will include principal E and H plane radiation patterns at the designated frequency. These antennas are linearly-polarized, although either dual or circular polarization can be achieved using the circular mode components described later in this section.

Alpha has also developed a miniature version of the Series 858 horn lens antenna that can be designed for use from 35 to 220 GHz. A detailed technical note describes this high frequency miniature antenna in the following pages.

### Outline Drawing



### Typical Antenna Patterns

