Custom Horn Antennas

QRR

Characteristics

- Custom Performance
- Low Sidelobes
- High Gain
- Low VSWR

Product Description

QuinStar Technology offers a wide range of custom horns available in the 18-140 GHz frequency range. Products include conical and scalar (corrugated) horns and very wide beam pyramidal and sectoral horns. These horn antennas can be designed and produced to satisfy virtually any application or equipment requirement and can be fully tested at QuinStar to determine their precise radiation patterns and gain.

Beamwidth of the majority of conical and scalar horns is in the range of 6 to 40 degrees while broad beam pyramidal and sectoral horns range from 25 to 90 degrees at half-power full width points (3 dB beamwidth). The geometric design of the horns is carefully conducted to provide the best possible performance in a relatively compact size. The length of the antenna is determined by the beam pattern requirements and desired VSWR.

Horns provided by QuinStar are linearly polarized unless circular or dual polarization is requested. In addition, customized beam patterns, special materials and unique geometry can be provided. Some of the more commonly used horns are described below:

Conical Horn: Least expensive horn and well suited for the majority of general purpose applications. Beam patterns in the E- and H-planes are dissimilar and gain ranges from 10 to 26 dB for most frequencies depending on aperture (beamwidth) and frequency.

Pyramidal Horn: Relatively inexpensive and well suited for most general purpose applications. Beam patterns in the E- and H-planes are generally dissimilar and gain ranges from 10 to 27 dB depending on aperture and frequency.

Sectoral Horn: Radiates a fan-shaped beam which is broad in one plane and relatively narrow in the other for wide angular coverage. Typical beamwidths are in the range of 30 to 120 degrees in one plane and relatively narrow in the other plane. The narrow beam can be obtained in either of the two planes (E- or H-plane). The gain of these antennas is largely determined by their beam patterns, and is generally in the 9-24 dB range.

Scalar Horn: More expensive and highest performance horn. Beam shape is virtually independent of rotational angle (i.e., E- and H-plane radiation patterns are very similar). They are ideal when highly symmetrical antenna patterns are desired and well suited for reflector or lens antenna system feeds. Low VSWR and low sidelobes are also among the benefits of these horns.

Special Application Horns: A variety of system applications, such as plasma diagnostics, depth or range measurement and receiver/transmitter arrays, require specially designed and produced horns or antennas. QuinStar can custom design such antennas and provide detailed measurements on their radiation characteristics.

The following parameters are necessary to completely specify a horn. However, QuinStar can propose a solution for your application if only some of the parameters are provided:

- Horn type–conical, pyramidal, scalar, sectoral, or custom (if unspecified QuinStar will select the best type);
- Beam shape–beamwidth in E- and H-plane, beam symmetry and any special features;
- Aperture–size and length constraints, if any;
- VSWR requirements;
- Sidelobe levels and cross polarization isolation requirements.

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Specifications

CHARACTERISTIC	PYRAMIDAL	CONICAL	SCALAR	SECTORAL
Beamwidth Range (degrees typ)	7-60	7-60	7-60	Broadbeam plane: 30 to 120 Other: 8 to 40
Gain Range (dB typ)	10-27	10-26	10-27	9-24
First Sidelobe Level (dB typ)	-12 to -16	-12 to -16	-20 to -25	-12 to -16

Consult QuinStar for outline drawings and mechanical specifications.

Ordering Information

Model Number **QRR -** **ABC D EF**

waveguide input

For Circular: diameter in mils (thousandths of inch)

For Rectangular:

K00 = K-band
A00 = Ka-band
Q00 = Q-band
U00 = U-band
V00 = V-band
E00 = E-band
W00 = W-band
F00 = F-band
D00 = D-band
G00 = G-band

beamwidth in degrees

horn type

C = conical
P = pyramidal
S = sectoral
Y = scalar
Z = other

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