

Antenna Information

The requested information for antenna directionality is as follows:

Antenna 1 (primary antenna for fixed station):

- (a) Width of beam in degrees at the half-power point: 3 degrees
- (b) Orientation in horizontal plane (degrees from True North): varies over 360 degrees
- (c) Orientation in vertical plane (degrees from horizontal): 0 degrees

Antenna 2 (alternate antenna for fixed station):

- (a) Width of beam in degrees at the half-power point: 2.5 degrees
- (b) Orientation in horizontal plane (degrees from True North): varies over 360 degrees
- (c) Orientation in vertical plane (degrees from horizontal): 0 degrees

Antenna 3 (antenna for mobile station):

- (a) Width of beam in degrees at the half-power point: 360 degrees azimuth, 22 degrees elevation
- (b) Orientation in horizontal plane (degrees from True North): 360 degrees
- (c) Orientation in vertical plane (degrees from horizontal): 0 degrees

Additional technical specifications of each antenna are provided on the subsequent pages of this exhibit.

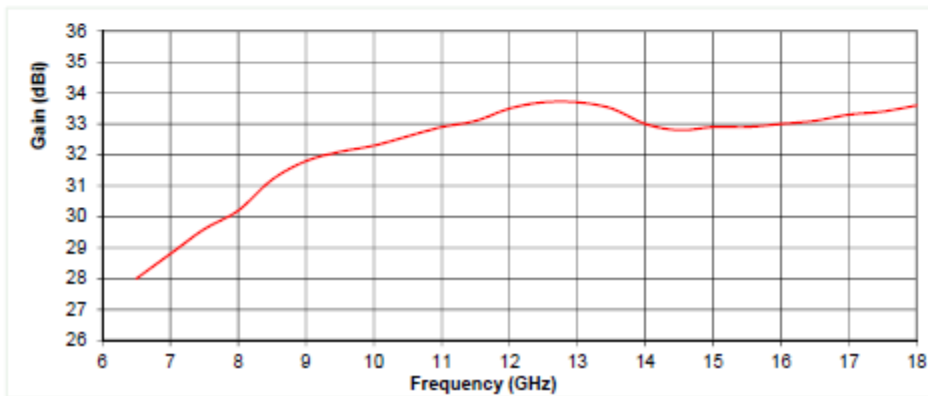
Antenna 1: 0.6 meter dish; Steatite QSR-600-A-228 & QWF-SL-6.5-18-N-R

Typical Specification

Frequency	6.5 to 18 GHz
Connector Type	N type jack
Power Handling	400 Watt c.w.
VSWR	Typically <2.0:1
Gain	28 to 33.7 dBi
Antenna Factor	17.5 to 21.7 dB/m
3dB Beamwidth	2 to 5 degrees
10dB Beamwidth	4 to 9 degrees
Weight	4.92 kg nominal
Maximum Size	Diameter 640 mm
Reflector F/D	0.38
Mounting	8 holes, tapped M6, 125 mm pitch circle diameter
Construction	Aluminium reflector, powdercoat finish. Composite brass / copper / plastic feed, with aluminium transition, painted.

Typical Antenna Gain / Factor

This is calculated by reference to standard gain horn antennas, and cross checked with reference to the antenna beamwidth, with an estimated error of +/- 0.8dB.



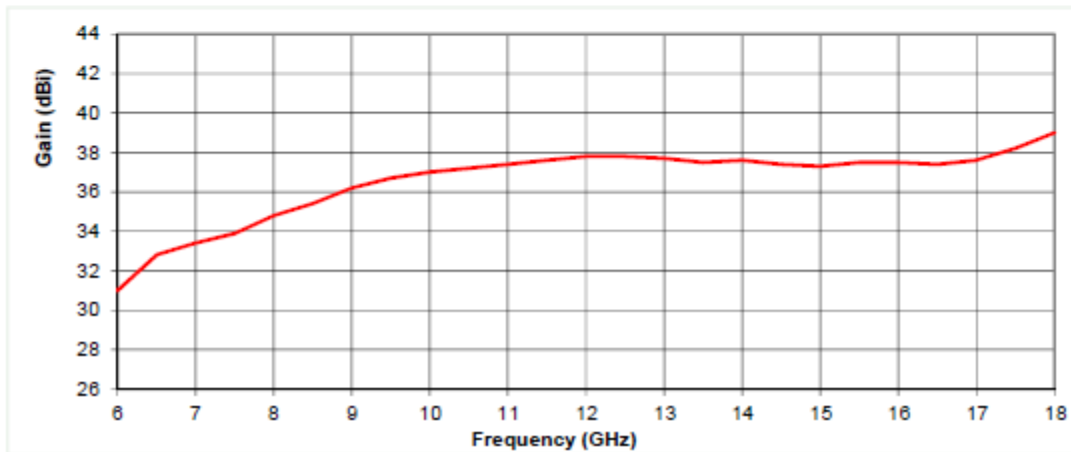
Antenna 2: Steatite QSR-900-A-337 & QWF-SL-6.5-18-N-R

Typical Specification

Frequency	6.5 to 18 GHz
Connector Type	N type jack
Power Handling	300 Watt c.w. (at 12 GHz)
VSWR	Typically < 2.0:1
Gain	32.8 to 39 dBi
Antenna Factor	13.1 to 17.2 dB/m
3dB Beamwidth	2 to 3 degrees
10dB Beamwidth	3 to 6 degrees
Weight	7.8 kg nominal
Maximum Size	Reflector diameter 930 mm
Mounting	8 holes, tapped M6, 125 mm pitch circle diameter
Construction	Aluminium reflector, powdercoat finish. Copper horn with aluminium transition and plastic radome feed, painted.

Typical Antenna Gain / Factor

This is calculated by reference to standard gain horn antennas, and cross checked with reference to the antenna beamwidth, with an estimated error of +/- 0.8dB.



Antenna 3 Steatite QOM-SL-0.8-40-k-SG-L

Typical Specification

Frequency	0.8 to 40 GHz
Connector type	K type (2.9mm) jack
Power Handling	40 Watt c.w.
VSWR	< 3.2:1 max , typically < 2.5:1
Gain	-2.2 to 6.9 dBi for 1 to 40 GHz
Azimuth Ripple	Typically < +/- 1dB on horizon
3dB Beamwidth	20 to 140 degrees
10dB Beamwidth	45 to 170 degrees
Weight	860 g (with bracket)
Size- max.	100 mm dia. x 108 mm long inc. connector (minus bracket)
Mounting	Pole mounting bracket. To suit pole up to 28 mm diameter.
Construction	Composite aluminium / plastic, painted. PTFE radome

Typical Antenna Gain on Horizon / Return Loss

This is calculated by reference to standard gain horn antennas, and cross checked with reference to the antenna beamwidth, with an estimated error of +/- 0.8dB.

