Open Boundary Quad-Ridge Horns

Main features

Technical performance
- Dual linear polarization with high polarization purity and isolation
- Low return loss / VSWR
- Wide bandwidth

Design
- Unique design preventing the excitation of unwanted higher order modes in the aperture
- Well-defined smooth radiation pattern throughout the operational bandwidth
- Lightweight for easy handling

Surface treatment
- Surtec 650 according to MIL-C 5541E class 3
- Polyurethane paint

Repeatability
- Stiff and robust mechanical design
- Standard MVG circular interface for precision centering
- Precision pins for accurate polarization alignment
- Precision machined
- High reliability coaxial connector

Delivered documents
- Typical performance data (TYMEDA™)
- Measured return loss data and port-to-port coupling

Product configuration

Equipment
- Mounting flange
- Integrated coaxial transition with high precision connector
  - Circular polarization available with external hybrid coupler
  - Protective radome for outdoor installation

Related services
- Calibration and maintenance
- Customization

SOLUTION FOR
- Low frequency PNF/CNF measurements
- Wideband antenna measurements in SNF and CATR systems
- Reflector feeds for high gain applications

Typical 3D co-polarization radiation pattern
Typical 3D cross-polarization radiation pattern
### Electrical characteristics

<table>
<thead>
<tr>
<th>Part number</th>
<th>QH100</th>
<th>QH400</th>
<th>QH800</th>
<th>QH1400</th>
<th>QH2000</th>
<th>QH4000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of antenna</td>
<td>Open boundary quad-ridge horn</td>
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<td>Open boundary quad-ridge horn</td>
<td>Open boundary quad-ridge horn</td>
</tr>
<tr>
<td>Frequency range</td>
<td>0.1 – 1.5 GHz</td>
<td>0.4 – 6 GHz</td>
<td>0.8 – 12 GHz</td>
<td>1.4 – 22 GHz</td>
<td>2 – 32 GHz</td>
<td>4 – 40 GHz</td>
</tr>
<tr>
<td>Gain</td>
<td>4.5 – 15.8 dBi</td>
<td>4 – 15 dBi</td>
<td>5 – 15 dBi</td>
<td>2 – 15 dBi</td>
<td>3 – 16 dBi</td>
<td>5 – 16 dBi</td>
</tr>
<tr>
<td>VSWR</td>
<td>&lt; 1.9</td>
<td>&lt; 1.9</td>
<td>&lt; 1.9</td>
<td>&lt; 3.5 [1.4 – 3 GHz]</td>
<td>&lt; 2.5 [2 – 4 GHz]</td>
<td>&lt; 3.5 [4 – 5 GHz]</td>
</tr>
<tr>
<td>Polarization</td>
<td>Dual linear</td>
<td>Dual linear</td>
<td>Dual linear</td>
<td>Dual linear</td>
<td>Dual linear</td>
<td>Dual linear</td>
</tr>
<tr>
<td>Cross-polar discrimination</td>
<td>&gt; 30 dB [0.8 – 10.8 GHz]</td>
<td>&gt; 30 dB [1.4 – 2 GHz]</td>
<td>&gt; 25 dB [10.8 – 12.0 GHz]</td>
<td>&gt; 30 dB</td>
<td>&gt; 30 dB</td>
<td>&gt; 30 dB</td>
</tr>
<tr>
<td>Port-to-port isolation</td>
<td>&gt; 30 dB [0.8 – 10.8 GHz]</td>
<td>&gt; 30 dB</td>
<td>&gt; 25 dB [10.8 – 12.0 GHz]</td>
<td>&gt; 30 dB</td>
<td>&gt; 30 dB</td>
<td>&gt; 30 dB</td>
</tr>
<tr>
<td>Impedance</td>
<td>50 Ohms</td>
<td>50 Ohms</td>
<td>50 Ohms</td>
<td>50 Ohms</td>
<td>50 Ohms</td>
<td>50 Ohms</td>
</tr>
</tbody>
</table>

#### QH400 electrical performance

**Boresight gain**

- Lower Port
- Upper Port

**Return loss and port-to-port isolation**

- Return Loss - Lower Port
- Return Loss - Upper Port
- Port-to-Port Isolation

**Radiation pattern - upper port - 3 GHz**

- E plane copol
- E plane crosspol
- H plane copol
- H plane crosspol

**Radiation pattern - lower port - 3 GHz**

- H plane copol
- E plane copol
- E plane crosspol
- H plane crosspol
QH800 electrical performance

Boresight gain

Return loss and port-to-port isolation

Radiation pattern - upper port - 3 GHz

Return Loss and Lower Port

Return Loss and Upper Port

Port-to-Port Isolation

Radiation pattern - lower port - 3 GHz

QH2000 electrical performance

Boresight gain

Return Loss and port-to-port isolation

Radiation pattern - upper port - 3 GHz

Radiation pattern - lower port - 3 GHz
### Mechanical characteristics

<table>
<thead>
<tr>
<th>Part number</th>
<th>QH100</th>
<th>QH400</th>
<th>QH800</th>
<th>QH1400</th>
<th>QH2000</th>
<th>QH4000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions [mm]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(H x W x L)</td>
<td>1950 x 1950 x 1680</td>
<td>527 x 527 x 462</td>
<td>264 x 264 x 245</td>
<td>151 x 151 x 168</td>
<td>105 x 105 x 110</td>
<td>90 x 90 x 110</td>
</tr>
<tr>
<td><strong>Weight (approx.)</strong></td>
<td>60 Kg</td>
<td>5 Kg</td>
<td>1.2 Kg</td>
<td>0.62 Kg</td>
<td>0.24 Kg</td>
<td>0.24 Kg</td>
</tr>
<tr>
<td><strong>RF connector</strong></td>
<td>N Female(4)</td>
<td>3.5 mm Female(5)</td>
<td>3.5 mm Female(6)</td>
<td>3.5 mm Female(7)</td>
<td>3.5 mm Female(8)</td>
<td>2.92 mm Female(2)</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
<td>Aluminum</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Surtec 650(3)</td>
<td>Surtec 650(5)</td>
<td>Surtec 650(5)</td>
<td>Surtec 650(7)</td>
<td>Surtec 650(7)</td>
<td>Surtec 650(7)</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>Circular Ø 450 mm</td>
<td>Circular Ø 110 mm</td>
<td>Circular Ø 110 mm</td>
<td>Circular Ø 60 mm</td>
<td>Circular Ø 60 mm</td>
<td>Circular Ø 60 mm</td>
</tr>
</tbody>
</table>

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(1) Huber & Suhner type 23 PC35-50-0-51/199 UE
(2) Southwest Microwave type 1012-16SF
(3) Equivalent to MIL-C 5541E class 3
(4) Southwest 312-04SF

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**Dimensional drawing**

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**QH100 interface**

- Ø 10.2 (12x)
- Ø 450
- Ø 8H7 (2x)
- Ø 425

**QH400, QH800 interface**

- Ø 60
- Ø 6H7
- Ø 4H7
- Ø 425
- Ø 450
- Ø 8H7

**QH1400, QH2000, QH4000 interface**

- Ø 80
- Ø 6H7
- Ø 60
The MVG protective radomes are designed to fit Open Boundary Quad-Ridge Horns, allowing outdoor installation with minimum impact on electrical performance. The materials and coating employed provide hydrophobic properties and good UV stability, low relative permittivity and low dielectric loss, therefore offering an effective protection in outdoor conditions and good RF transparency. The radome enclosures are also equipped with pressure equalizing vents to reduce condensation caused by rapid changes in temperature, while preventing water and dust ingress.

**Mechanical characteristics**

<table>
<thead>
<tr>
<th>Part number</th>
<th>R430</th>
<th>R175</th>
</tr>
</thead>
<tbody>
<tr>
<td>Featured quad-ridge horn</td>
<td>QH800</td>
<td>QH2000, QH4000</td>
</tr>
<tr>
<td>Dimensions (H x W x L)</td>
<td>430 x 430 x 369 mm</td>
<td>199 x 199 x 190 mm</td>
</tr>
<tr>
<td>Weight (approx.)</td>
<td>4 Kg</td>
<td>0.9 Kg</td>
</tr>
<tr>
<td>Materials</td>
<td>Aluminum, PVC, GFRP</td>
<td>Aluminum, Dyneema™</td>
</tr>
<tr>
<td>Color</td>
<td>White</td>
<td>White</td>
</tr>
<tr>
<td>Connector</td>
<td>N-type Female – sealed(^{(1)})</td>
<td>2.92 mm Female(^{(2)})</td>
</tr>
<tr>
<td>Interface</td>
<td>Circular Ø 110 mm</td>
<td>Circular Ø 60 mm</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP67</td>
<td>IP67</td>
</tr>
<tr>
<td>Wind rating(^{(3)})</td>
<td>160 km/h</td>
<td>160 km/h</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Inmet/Aeroflex 5217  
\(^{(2)}\) H&S 34-SK-50-0-54-199_NE  
\(^{(3)}\) Based on FE (Finite Element) analysis in accordance to UNI EN 1991-1-4 EUROCODE 1