Standard Antenna Datasheet

CReSIS Anechoic Chamber
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Last updated: 11/15/2012
The Model 3117 Double Ridged Waveguide is a the latest addition to a family of double ridge waveguides for microwave and EMC measurement from ETS-Lindgren. This model corrects the lower gain at the upper end of the frequency range, commonly found in ridged waveguide antennas. Users of this antenna benefit from uniform illumination of target surfaces and accurate gain measurement. In addition, the Model 3117 exhibits high gain and low VSWR across its operational frequency band, accepting moderate power input of 300 watts.

The electrical characteristics of this antenna were designed and modeled using powerful workstations running electromagnetic simulation software. Equally important, experienced RF engineers worked with our manufacturing team to produce a practical and affordable realization of the modeling process. All production units are individually calibrated at our A2LA accredited lab.

**FEATURES**

**Single Lobe Radiation Pattern**
The Model 3117 maintains a single main lobe pattern in the direction of the horn axis over its frequency range. This characteristic is essential for even distribution of electromagnetic energy on a target surface, and accurate measurement of gain and vector information. The Model 3117’s unique design suppresses the propagation of high order modes. The result is an antenna with a well-defined single lobe radiation pattern that outperforms other antennas in its class.

**Ultra Broadband**
The Model 3117 sweeps from 1 GHz to 18 GHz without stopping for band breaks, making it ideal
for automated testing. It has the widest usable frequency range of any antenna in its class, with no performance degradation from high order modes.

**Power Input**
The Model 3117 uses a Type N connector and accepts up to 300 watts of continuing input power with up to 400 watts of peak power. The antenna’s high gain and low VSWR over its operating frequency translates into efficient amplifier use and high field strengths.

**Uniform Gain, Low VSWR**
The Model 3117 has a more uniform gain and antenna factor because of the better behavior of its radiation pattern. Since the pattern is stable over frequency, the gain and the AF also remain stable. Similar antennas of this class exhibit large variations of the gain and the AF as the frequency increases.

**Flexible Mounting System**
The Model 3117 antenna includes both an EMCO classic mount and a rear “stinger” mount.

**Standard Configuration**
- **Antenna Assembly**
- **Mounting bracket drilled to accept ETS-Lindgren or other tripod mounts with 1/4 in x 20 threads**
- **Rear “stinger” Mount**
- **Individually calibrated at 1 m per SAE ARP 958 at our A2LA accredited lab. 3 m calibration per ANSI C63.5 available at additional cost. Actual antenna factors and a signed Certificate of Calibration Conformance included with manual.**

**Options**
- **Antenna Mast**
- **Antenna Tripod**

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**Electrical Specifications**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FREQUENCY RANGE</th>
<th>VSWR (AVG)</th>
<th>MAXIMUM CONTINUOUS POWER</th>
<th>PEAK POWER</th>
<th>IMPEDANCE (NOMINAL)</th>
<th>CONNECTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3117</td>
<td>1 GHz - 18 GHz</td>
<td>3.5:1 max</td>
<td>300 W</td>
<td>400 W</td>
<td>50 Ω</td>
<td>Type N</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;2:1 above 1.5 GHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Physical Specifications**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>WIDTH</th>
<th>DEPTH</th>
<th>HEIGHT</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3117</td>
<td>17.5 cm</td>
<td>17.5 cm + 15.5 cm mount</td>
<td>15.5 cm</td>
<td>1.13 kg</td>
</tr>
<tr>
<td></td>
<td>6.9 in</td>
<td>6.9 in + 6.1 in mount</td>
<td>6.1 in</td>
<td>2.5 lb</td>
</tr>
</tbody>
</table>

www.ets-lindgren.com
Model 3117 (1 GHz - 4 GHz)

Model 3117 (5 GHz - 8 GHz)
EMC Antennas
Double-Ridged Waveguide Horn
Model 3117

Model 3117 (9 GHz - 12 GHz)

Model 3117 (13 GHz - 16 GHz)
Model 3117 (17 GHz - 18 GHz)
ETS-Lindgren’s EMCO Model 3142C BiConiLog Antenna is a hybrid antenna that combines innovative design, compact size, and excellent performance. This antenna enables users to measure a frequency range of 26 MHz to 3.0 GHz in one sweep, negating the need for multiple antennas and time-consuming equipment setup. This single sweep capability removes the need for multiple antennas and additional equipment, which improves accuracy and saves time and money.

This BiConiLog is designed as a dual-purpose antenna that can be used for both immunity and emission testing. From 26 MHz to 60 MHz, the Model 3142C antenna with optional end plates exhibits an average 5.5 dB gain improvement vs. typical hybrid antennas. At some frequencies, a 10 dB gain improvement is achieved.

This model replaces the EMCO Model 3142 and 3142B, and when used with optional end plates, is identical to the former Model 3141. The optional end plates are available to improve gain for immunity testing. These plates can easily be attached and detached by hand using screw knobs. Individual antenna calibration data—without the end plates attached—is provided for emission testing.

Standard Configuration

- **Antenna**
- **Individually calibrated:**
  - 1m per SAE ARP 958
  - 3m and 10m per ANSI C63.5
- **Actual antenna factors and a signed Certificate of Calibration Conformance included in manual**
- **Manual**

**Options**

- Optional T Bow-Tie end plates (shown below)
- **ETS-Lindgren offers several non-metallic, non-reflective tripods for use at EMC test sites. For easy horizontal and vertical polarization changes, the Model 7-TR tripod is recommended.**

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**Features:**

- 26 MHz - 3 GHz Frequency Range
- Emissions Testing:
  - ANSI C63.4
  - FCC-15 and FCC-18
  - EN 55022
- Individually Calibrated:
  - 1m per SAE ARP 958
  - 3m and 10m per ANSI C63.5
- Avg. 2:1 VSWR Above 80 MHz
- Fits Compact Chambers
- Tough Powder Coat Finish
- Two Year Warranty
**Electrical Specifications**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FREQUENCY RANGE</th>
<th>VSWR RATIO (AVG)</th>
<th>MAXIMUM CONTINUOUS POWER</th>
<th>IMPEDANCE (NOMINAL)</th>
<th>CONNECTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3142C</td>
<td>26 MHz – 60 MHz</td>
<td>2:1</td>
<td>500 W</td>
<td>50Ω</td>
<td>Type-N female [1]</td>
</tr>
<tr>
<td></td>
<td>60 MHz – 600 MHz</td>
<td>2:1</td>
<td>1 kW</td>
<td>50Ω</td>
<td>Type-N female [1]</td>
</tr>
<tr>
<td></td>
<td>600 MHz – 1 GHz</td>
<td>2:1</td>
<td>500 W</td>
<td>50Ω</td>
<td>Type-N female [1]</td>
</tr>
<tr>
<td></td>
<td>1 GHz – 3 GHz</td>
<td>2:1</td>
<td>200 W</td>
<td>50Ω</td>
<td>Type-N female [1]</td>
</tr>
</tbody>
</table>

**Physical Specifications**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>WIDTH</th>
<th>DEPTH</th>
<th>HEIGHT</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3142C without optional end plates</td>
<td>135.0 cm</td>
<td>124.5 cm</td>
<td>75.0 cm</td>
<td>4.0 kg</td>
</tr>
<tr>
<td></td>
<td>53.1 in</td>
<td>49.0 in</td>
<td>29.5 in</td>
<td>8.8 lb</td>
</tr>
<tr>
<td>3142C with optional end plates</td>
<td>137.4 cm</td>
<td>132.1 cm</td>
<td>76.2 cm</td>
<td>6.7 kg</td>
</tr>
<tr>
<td></td>
<td>54.1 in</td>
<td>51.2 in</td>
<td>30.2 in</td>
<td>14.7 lb</td>
</tr>
</tbody>
</table>
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<td>50Ω</td>
<td>Type-N female [1]</td>
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<tr>
<td></td>
<td>60 MHz – 600 MHz</td>
<td>2:1</td>
<td>1 kW</td>
<td>50Ω</td>
<td>Type-N female [1]</td>
</tr>
<tr>
<td></td>
<td>600 MHz – 1 GHz</td>
<td>2:1</td>
<td>500 W</td>
<td>50Ω</td>
<td>Type-N female [1]</td>
</tr>
<tr>
<td></td>
<td>1 GHz – 3 GHz</td>
<td>2:1</td>
<td>200 W</td>
<td>50Ω</td>
<td>Type-N female [1]</td>
</tr>
</tbody>
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<td>75.0 cm</td>
<td>4.0 kg</td>
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<tr>
<td></td>
<td>53.1 in</td>
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<td>29.5 in</td>
<td>8.8 lb</td>
</tr>
<tr>
<td>3142C</td>
<td>137.4 cm</td>
<td>132.1 cm</td>
<td>76.2 cm</td>
<td>5.7 kg</td>
</tr>
<tr>
<td></td>
<td>54.1 in</td>
<td>32.0 in</td>
<td>30.0 in</td>
<td>14.7 lb</td>
</tr>
</tbody>
</table>
Dual-Polarized Log-Periodic Dipole Array

Model 3145BDP

FEATURES:
- 100 MHz - 1.1 GHz Frequency Range
- 1.5:1 VSWR Average
- 800 W Max. Continuous Input
- Stainless Steel Construction
- Dual Linearly Polarized
- Individually Calibrated

ETS-LINDGREN’S Model 3145BDP
Dual-Polarized Log-Periodic Array is a dual linearly polarized, broadband antenna designed to operate over the frequency range of 100 MHz to 1.1 GHz.

The choice of scaling factors, the various diameters of each element, and the center-to-center spacing of the booms result in excellent VSWR characteristics throughout the operating frequency range.

The precise design of the feed and positioning of the elements on the boom yields optimum phase relationship. This causes the active region, at any given frequency, to propagate RF energy towards the smaller elements, leaving the elements behind it inactive and operating as reflectors to improve the gain. The constant gain of the antenna yields an antenna factor which varies linearly with frequency. The variation is smooth; therefore, accurate interpolation of performance between specified frequency points is simple.

FEATURES
The Model 3145BDP frequency range of 100 MHz - 1.1 GHz makes it ideal for spectrum monitoring over a wide band. Its stainless steel construction allows for operation outdoors for prolonged periods of time.

The 3145BDP can also be used for antenna pattern measurement, including outdoor ranges.

Manufactured of rugged stainless steel, the Model 3145BDP is designed for prolonged outdoor use and harsh operating environments. For indoor use, a custom-designed aluminum antenna is also available.

Calibrated at 10 m per ANSI C63.5, the Model 3145BDP has actual Antenna Factors and a signed Certificate of Conformance included with the antenna.

STANDARD CONFIGURATION
- Antenna Including Mounting Flange
- Individually Calibrated at 10 m per ANSI C63.5-1988. Actual antenna factors gain uncertainty values and a signed Certificate of Calibration Conformance included in manual.

OPTIONS
- Custom indoor configuration featuring aluminum construction.

www.ets-lindgren.com/3145BDP
**Dual-Polarized Log-Periodic Dipole Array**

**Model 3145BDP Typical Antenna Factor**

**Model 3145BDP Typical Antenna Gain**

**Model 3145BDP Typical VSWR**

### Electrical Specifications

<table>
<thead>
<tr>
<th>MODEL #</th>
<th>FREQUENCY RANGE</th>
<th>INPUT IMPEDANCE</th>
<th>VSWR</th>
<th>MAXIMUM RF INPUT POWER</th>
<th>RF CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3145BDP</td>
<td>100 MHz - 1.1 GHz</td>
<td>50 Ω</td>
<td>1.5:1 average, 3.5:1 maximum</td>
<td>800 W</td>
<td>(2) Female N Type Connectors</td>
</tr>
</tbody>
</table>

### Physical Specifications

<table>
<thead>
<tr>
<th>MODEL #</th>
<th>HEIGHT (OVERALL)</th>
<th>WIDTH (OVERALL)</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3145BDP</td>
<td>1.33 m</td>
<td>1.62 m</td>
<td>18.20 kg</td>
</tr>
<tr>
<td></td>
<td>4.35 ft.</td>
<td>5.32 ft.</td>
<td>40.14 lb.</td>
</tr>
</tbody>
</table>
Features:

- Better than 20 dB Cross Polarization Rejection below 1 GHz
- Meets CISPR 16-1 Requirements
- 200 MHz - 2 GHz Frequency Range
- 1.2:1 VSWR
- 1kW Max. Continuous Input
- Tough Powder Coat Finish
- Individually Calibrated
- Furnished with Uncertainty Values
- Two Year Warranty

The ETS-EMCO Model 3148 Log Periodic Antenna is specifically designed for making CISPR 16-1 measurements which require a 20 dB difference in the cross polarization rejection. This is achieved using an engineering design and manufacturing process that offsets all of the elements in a precision pattern. The excellent cross-polarization property ensures minimum measurement uncertainty for radiated emissions and normalized site attenuation measurement.

The precision construction of the assembly of the boom and elements result in excellent VSWR and optimal phase relationship. This antenna features relatively constant linear gain (measures in far field without any sudden “dips” or “bumps”).

A Type N connector is provided. The antenna mount accepts a standard ¼ in x 20 thread used by most tripods.

Standard Configuration

- Antenna
- Individually Calibrated at 1 m per SAE ARP 958 and 3 and 10 m per ANSI C63.5-1988. Actual antenna factors, uncertainty values, and a signed Certificate of Calibration Conformance included in manual.

Options

- ETS-EMCO Tripod, ETS-EMCO offers several non-metallic, non-reflective tripods for use at EMC test sites.
- Support Rod
Applications

<table>
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<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3148</td>
<td>RE</td>
<td>RE</td>
<td>RE, RI</td>
<td>RE, RI</td>
<td>RE, RI</td>
<td>RE, RI</td>
<td>RE, RI</td>
<td>TX, RX</td>
<td>RE</td>
<td>RE</td>
</tr>
</tbody>
</table>

RE = Radiated Emissions  
RI = Radiated Immunity (Susceptibility)  
TX = Transmit  
RX = Receive

Electrical Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FREQUENCY RANGE</th>
<th>VSWR RATIO (AVG)</th>
<th>MAXIMUM CONTINUOUS POWER</th>
<th>PEAK POWER</th>
<th>IMPEDANCE (NOMINAL)</th>
<th>CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3148</td>
<td>200 MHz – 2 GHz</td>
<td>1.2:1</td>
<td>1 kW</td>
<td>1.3 kW</td>
<td>50 Ω</td>
<td>Type N female</td>
</tr>
</tbody>
</table>

Physical Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>WIDTH *</th>
<th>DEPTH</th>
<th>HEIGHT</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3148</td>
<td>85.6 cm</td>
<td>73.7 cm</td>
<td>6.4 cm</td>
<td>2.0 kg</td>
</tr>
<tr>
<td></td>
<td>33.7 in</td>
<td>29.0 in</td>
<td>2.5 in</td>
<td>4.5 lb</td>
</tr>
</tbody>
</table>

* At widest point

Model 3148 with optional 4-TR tripod

Information presented is subject to change as product enhancements are made. Contact ETS Sales Department for current specifications.
Standard Antenna Mount

- 100989 Log Periodic Antenna Adaptor
- 105861B Thread Insert

Optional Antenna Mount

- 101942B Support Base

Optional 4-TR Tripod

100733 Support Rod
Features:

● 2 GHz - 18 GHz Frequency Range
● Flat Gain For Upper 2/3 of Range
● Low Side Lobes
● Linear or Circular Polarization (With Hybrid)
● Compact Design
● Flexible Mounting Schemes
  -- Flange for Wall Mounting
  -- Bracket for Tripod Mounting

The Model 3164-05 Open Boundary Quadridge Horn is the newest in a series of quadridge horns from ETS-Lindgren. The “open boundary” design with its absence of side plates makes this antenna unique in both appearance and performance. Numerically modeled, the Model 3164’s open boundary design is similar to two Vivaldi PCB antennas placed orthogonally to each other. The antenna’s surprisingly compact size offers improved pattern and gain when compared with enclosed quadridge horns of similar dimensions. The compact size also means there is only small shift on the Model 3164’s phase center as frequency changes.

The Model 3164-05 has exceptional bandwidth. While the frequency band for optimum performance is 2 GHz to 18 GHz, the antenna is usable from 1.5 GHz. Two orthogonally placed input feeds allow this antenna to generate both linear and circular polarized measurements across the entire frequency band.

### Electrical Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FREQUENCY RANGE</th>
<th>CROSS-POLARIZATION ISOLATION</th>
<th>IMPEDENCE (NORMAL)</th>
<th>CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3164-05</td>
<td>2 GHz - 18 GHz</td>
<td>&gt; 24 dB</td>
<td>50 Ω</td>
<td>SMA Female (2)</td>
</tr>
</tbody>
</table>

### Physical Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>LENGTH (OVERALL)</th>
<th>WIDTH (APERTURE)</th>
<th>HEIGHT (APERTURE)</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3164-05</td>
<td>18.4 cm</td>
<td>17.1 cm</td>
<td>17.1 cm</td>
<td>0.71 kg</td>
</tr>
<tr>
<td></td>
<td>7.3 in</td>
<td>6.7 in</td>
<td>6.7 in</td>
<td>1.56 lb</td>
</tr>
</tbody>
</table>

USA: Tel +1.512.531.6400 Fax +1.512.531.6500
FINLAND: Tel +358.2.8383.300 Fax +358.2.8651.233
UK: Tel +44.(0)1438.730700 Fax +44.(0)1438.730751
FRANCE: Tel +33.1.48.65.34.03 Fax +33.1.48.65.43.69
CHINA: Tel +8610.8275.5086 Fax +8610.8275.5537
JAPAN: Tel +81.3.3813.7100 Fax +81.3.3813.8068
ONLINE: info@ets-lindgren.com www.ets-lindgren.com

Information presented is subject to change as product enhancements are made. Contact ETS-Lindgren Sales Department for current specifications.
Wireless Antennas

Open Boundary Quadridge Horn

Model 3164-05
Wireless Antennas

Open Boundary Quadridge Horn

Model 3164-05
**Features:**
- 300 MHz - 6 GHz Frequency Range
- Flat Gain For Upper 2/3 of Range
- Linear or Circular Polarization (With Hybrid Coupler)
- Compact Design
- Maintains Shielding Integrity When Wall Mounted

The Model 3164-06 Open Boundary Quad-Ridged Horn is the newest in a series of quad-ridged horns from ETS-Lindgren. The “open boundary” design with its absence of side plates makes this antenna unique in both appearance and performance.

Numerically modeled, the Model 3164’s open boundary design is similar to double-ridged waveguide antennas placed orthogonally to each other. The antenna’s compact size offers improved pattern and gain when compared with enclosed quad-ridged horns of similar dimensions. The Model 3164-06 has exceptional bandwidth. With an operating frequency band for optimum performance from 300 MHz to 6 GHz. Two orthogonally placed input feeds allow this antenna to be used for both linearly and circularly polarized measurements across the entire frequency band, without manual polarization.

### Electrical Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FREQUENCY RANGE</th>
<th>CROSS-POLARIZATION ISOLATION</th>
<th>IMPEDENCE (NORMAL)</th>
<th>CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3164-06</td>
<td>300 MHz - 6 GHz</td>
<td>&gt;25 dB</td>
<td>50 Ω</td>
<td>SMA Female (2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODEL</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>3164-06</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Wireless Antennas

Open Boundary Quad-Ridged Horn

Model 3164-06

3164-06 cross port isolation

3164-06 VSWR

3164-06 Gain

3164-06 3dB beamwidth

USA: Tel +1.512.531.6400 Fax +1.512.531.6500
FINLAND: Tel +358.2.8383.300 Fax +358.2.8651.233
UK: Tel +44.(0)1438.730700 Fax +44.(0)1438.730751
FRANCE: Tel +33.1.48.65.34.03 Fax +33.1.48.65.43.69
CHINA: Tel +8610.8275.5086 Fax +8610.8275.5537
JAPAN: Tel +81.3.3813.7100 Fax +81.3.3813.8068
ONLINE: info@ets-lindgren.com

www.ets-lindgren.com

Information presented is subject to change as product enhancements are made. Contact ETS-Lindgren Sales Department for current specifications.
3/07 - 3K W/RE © 2007 ETS-Lindgren REV A
The ETS-Lindgren Model 3180B Broadband Mini-Bicon Antenna has been designed for optimal performance across the frequency range of 30 MHz – 1 GHz (cage elements) and 30 MHz – 3 GHz (cone elements). The Model 3180B’s uniquely designed elements provide an omnidirectional pattern, without the beam splitting.

The Model 3180B is ideal for the free space NSA (FSNSA) test for fully anechoic rooms. Its small size allows for harmonic monitoring when testing per the IEC 61000-4-3.

FEATURES

Frequency Range
The Model 3180B covers the traditional frequency range EMC measurements. Additionally, the Model 3180B covers all of the VHF and UHF bands, making it ideal for spectrum monitoring of FM, TV and some cellular phones.

With the small cone elements in place, the 3180B can be used up to 3 GHz.

Radiation Pattern
The Model 3180B has been designed to have a radiation pattern that is omnidirectional. The elements have been optimized to avoid any splitting of the main radiation beam in the elevation cut.

Flexible Mounting System
The Model 3180B antenna includes both an EMCO block mount and a rear “stinger” mount.

APPLICATIONS

- Fully Anechoic Room Testing
- Harmonic Level Measurements
- Spectrum Monitoring
- CISPR 16-1-4

STANDARD CONFIGURATION

- Antenna Includes:
  -- Balun
  -- One Pair of Cage Elements
  -- One Pair of Cone Elements
- Manual
- Individually calibrated. Actual factors and a signed Certificate of Calibration Conformance included.
**Electrical Specifications**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FREQUENCY RANGE</th>
<th>VSWR RATIO (AVG)</th>
<th>MAXIMUM CONTINUOUS POWER</th>
<th>IMPEDANCE (NOMINAL)</th>
<th>CONNECTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3180B (Cage Elements)</td>
<td>30 MHz - 1 GHz</td>
<td>~ 5:1</td>
<td>200 W</td>
<td>50 Ω</td>
<td>Type N (F)</td>
</tr>
<tr>
<td>3180B (Cone Elements)</td>
<td>30 MHz - 3 GHz</td>
<td>~ 5:1</td>
<td>50 W</td>
<td>50 Ω</td>
<td>Type N (F)</td>
</tr>
</tbody>
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**Physical Specifications**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>LENGTH</th>
<th>HEIGHT</th>
<th>WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>3180B (Cage Elements)</td>
<td>72.16 cm</td>
<td>40.00 cm</td>
<td>66.34 cm</td>
</tr>
<tr>
<td></td>
<td>28.41 in</td>
<td>15.75 in</td>
<td>26.12 in</td>
</tr>
<tr>
<td>3180B (Cone Elements)</td>
<td>60.45 cm</td>
<td>16.50 cm</td>
<td>30.07 cm</td>
</tr>
<tr>
<td></td>
<td>23.80 in</td>
<td>6.50 in</td>
<td>11.84 in</td>
</tr>
</tbody>
</table>

**Model 3180B VSWR Typical Performance**

![3180B VSWR Graph](image)

**Model 3180B Gain and Antenna Factor Typical Performance**

![3180B Gain and AF Graph](image)
Model 3180B Cage Elements
Typical Measured Pattern

Model 3180B Cone Elements
Typical Measured Pattern
ETL Lindgren’s Model 3183 Mini-Bicon Antenna

**FEATURES:**
- 1 GHz - 18 GHz Frequency Range
- Radiation Pattern Conforms to CISPR 16 Specifications
- Ideal for:
  -- Chamber Characterization per CISPR 16
  -- Harmonic Measurements per IEC 61000-4-3

**THE ETS-LINDGREN MODEL 3183 BROADBAND MINI-BICON ANTENNA** was designed for CISPR 16 chamber characterization. The antenna has a broadband frequency range of 1 GHz - 18 GHz. Its omnidirectional pattern conforms to CISPR 16 specifications.

**FEATURES**
**Frequency Range**
The Model 3183 is designed to have the lowest possible VSWR across its range of operation. The antenna exhibits an average 2:1 VSWR.

**Radiation Pattern**
The radiation pattern of the Model 3183 is omnidirectional in the H-plane. This means the antenna can receive signals from every direction around its axis.

**CISPR 16 Conformance**
The radiation pattern closely conforms to the CISPR 16 requirements for chamber validation. Because of its small size, the antenna can also be used for amplifier harmonic measurements when performing tests per the IEC 61000-4-3.

**Spectrum Monitoring**
The Model 3183 can be used for EM Field surveying and spectrum monitoring. The low weight design allows use as a field surveying tool, in conjunction with a portable spectrum analyzer.

**STANDARD CONFIGURATION**
- Antenna
- Antenna Mount for Tripod
- Manual
- Individually Calibrated at 1 m per SAE ARP 958 at our A2LA accredited lab. Actual Antenna Factors and a Signed Certificate of Calibration Conformance Included with Manual

**OPTIONAL CONFIGURATION**
- ETS-Lindgren offers several non-metallic, non-reflective tripods
Electrical Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FREQUENCY RANGE</th>
<th>VSWR RATIO (AVG)</th>
<th>MAXIMUM CONTINUOUS POWER</th>
<th>IMPEDANCE (NOMINAL)</th>
<th>CONNECTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3183</td>
<td>1 GHz - 18 GHz</td>
<td>2.1</td>
<td>50 watts @ 1 GHz</td>
<td>50 Ω</td>
<td>SMA (F)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>25 watts @ 18 GHz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Physical Specifications

<table>
<thead>
<tr>
<th>MODEL</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>STINGER LENGTH</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3183</td>
<td>36.2 cm</td>
<td>7.0 cm</td>
<td>17.8 cm</td>
<td>.5 kg</td>
</tr>
<tr>
<td></td>
<td>14.25 in</td>
<td>2.76 in</td>
<td>7.0 in</td>
<td>1.1 lbs</td>
</tr>
</tbody>
</table>

Gain/Antenna Factor Typical Performance

Model 3183 Typical Elevation Pattern
2 GHz - 7 GHz

Model 3183 Typical Elevation Pattern
8 GHz - 13 GHz

Model 3183 Typical Elevation Pattern
14 GHz - 18 GHz

Model 3183 Typical Azimuth Pattern
2 GHz - 18 GHz

VSWR Typical Performance

Model 3183 VSWR

2 GHz - 18 GHz
### 1.12-40 GHz

**STANDARD GAIN HORNS**

- Primary Standard of Antenna Gain
- 10 Models Cover from 1.12 GHz to 40 GHz

### SPECIFICATIONS

<table>
<thead>
<tr>
<th>FREQUENCY RANGE (GHz)</th>
<th>MODEL</th>
<th>BAND</th>
<th>WAVEGUIDE SIZE</th>
<th>INPUT COVER FLANGE EQUIVALENT</th>
<th>VSWR (Max)</th>
<th>WEIGHT lbs.</th>
<th>WEIGHT Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.12-1.7</td>
<td>646</td>
<td>L</td>
<td>WR-650</td>
<td>UG-418A/U</td>
<td>1.25</td>
<td>42</td>
<td>19.1</td>
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<tr>
<td>1.70-2.6</td>
<td>645</td>
<td>LS</td>
<td>WR-430</td>
<td>UG-437A/U</td>
<td>1.25</td>
<td>11</td>
<td>5</td>
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<td>2.60-3.95</td>
<td>644</td>
<td>S</td>
<td>WR-284</td>
<td>UG-584/U</td>
<td>1.15</td>
<td>6</td>
<td>2.8</td>
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<tr>
<td>3.95-5.85</td>
<td>643</td>
<td>C</td>
<td>WR-187</td>
<td>UG-407/U</td>
<td>1.15</td>
<td>2.3</td>
<td>1.1</td>
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<tr>
<td>5.4-8.20</td>
<td>642</td>
<td>XN</td>
<td>WR-137</td>
<td>UG-441/U</td>
<td>1.15</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>7.05-10</td>
<td>641</td>
<td>XB</td>
<td>WR-112</td>
<td>UG-138/U</td>
<td>1.15</td>
<td>0.5</td>
<td>0.23</td>
</tr>
<tr>
<td>8.20-12.4</td>
<td>640</td>
<td>X</td>
<td>WR-90</td>
<td>UG-135/U</td>
<td>1.15</td>
<td>0.5</td>
<td>0.23</td>
</tr>
<tr>
<td>12.4-18</td>
<td>639</td>
<td>KU</td>
<td>WR-62</td>
<td>UG-419/U</td>
<td>1.15</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>18-26.5</td>
<td>638</td>
<td>K</td>
<td>WR-42</td>
<td>UG-595/U</td>
<td>1.15</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>26.5-40</td>
<td>V637</td>
<td>V</td>
<td>WR-28</td>
<td>UG-599/U</td>
<td>1.15</td>
<td>0.1</td>
<td>0.05</td>
</tr>
</tbody>
</table>

*For a complete listing of all band letters and codes in use, refer to Band Designation Table on page 386.

Patterns for all models in this series conform to the following description: Beam width in E and H plane varies from 23° at the highest frequency to 34° at the lowest frequency. Side lobes in the H plane are all more than 20 dB down. First side lobes in the E plane are 13 dB down, second side lobes are 18 dB down and all other E plane lobes are more than 20 dB down.

Gain at Mid Frequency: 16.5 dB (with reference to isotropic radiation) variation is 1.5 dB over total band about the mid band value.

See Waveguide Flange Data on page 397.
### OUTLINE DRAWING

#### Standard Gain Horn

<table>
<thead>
<tr>
<th>MODEL</th>
<th>A MAX</th>
<th>B MAX</th>
<th>C MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>V637</td>
<td>1.76</td>
<td>1.06</td>
<td>.82</td>
</tr>
<tr>
<td>638</td>
<td>2.57</td>
<td>1.51</td>
<td>1.16</td>
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<tr>
<td>639</td>
<td>3.48</td>
<td>2.20</td>
<td>1.73</td>
</tr>
<tr>
<td>640</td>
<td>5.06</td>
<td>3.09</td>
<td>3.34</td>
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<tr>
<td>641</td>
<td>6.31</td>
<td>3.83</td>
<td>2.87</td>
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<tr>
<td>642</td>
<td>7.76</td>
<td>4.67</td>
<td>3.53</td>
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<tr>
<td>643</td>
<td>10.47</td>
<td>6.34</td>
<td>4.80</td>
</tr>
<tr>
<td>644</td>
<td>15.82</td>
<td>9.52</td>
<td>7.16</td>
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<tr>
<td>645</td>
<td>16.91</td>
<td>14.24</td>
<td>10.43</td>
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<tr>
<td>646</td>
<td>24.91</td>
<td>21.31</td>
<td>15.88</td>
</tr>
</tbody>
</table>

Dimensions in parentheses are in millimeters and for reference only.

All dimensions Max. unless otherwise specified.
## REFERENCE GUIDE

### WAVEGUIDE TO COAXIAL ADAPTERS FOR STANDARD GAIN HORN

<table>
<thead>
<tr>
<th>STANDARD GAIN HORN MODEL</th>
<th>WAVEGUIDE TO COAXIAL TYPE N - FEMALE MODEL</th>
<th>ADAPTER SMA/3.5/2.9 FEMALE MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>646</td>
<td>616</td>
<td>—</td>
</tr>
<tr>
<td>645</td>
<td>615</td>
<td>—</td>
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<tr>
<td>644</td>
<td>614A</td>
<td>—</td>
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<td>643</td>
<td>613A</td>
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<td>642</td>
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<td>611</td>
<td>—</td>
</tr>
<tr>
<td>640</td>
<td>601A</td>
<td>4601</td>
</tr>
<tr>
<td>639</td>
<td>609</td>
<td>4609</td>
</tr>
<tr>
<td>638</td>
<td>—</td>
<td>4608B</td>
</tr>
<tr>
<td>V637</td>
<td>—</td>
<td>V4607</td>
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### Waveguide Flange Data

#### LS Band

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<thead>
<tr>
<th>Band</th>
<th>Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Hole Dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>UG-39/U</td>
<td>.640</td>
<td>.610</td>
<td>1.625</td>
<td>.813</td>
<td>.169</td>
</tr>
<tr>
<td>XB</td>
<td>UG-51/U</td>
<td>.737</td>
<td>.676</td>
<td>1.875</td>
<td>.938</td>
<td>.169</td>
</tr>
<tr>
<td>K</td>
<td>UG-595/U</td>
<td>.320</td>
<td>.335</td>
<td>.875</td>
<td>.438</td>
<td>.116</td>
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<tr>
<td>KU</td>
<td>UG-419/U</td>
<td>.478</td>
<td>.497</td>
<td>.313</td>
<td>.656</td>
<td>.144</td>
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<tr>
<td>V</td>
<td>UG-599/U</td>
<td>.250</td>
<td>.265</td>
<td>.750</td>
<td>.375</td>
<td>.116</td>
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</tbody>
</table>

#### L Band

<table>
<thead>
<tr>
<th>Band</th>
<th>Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Hole Dia.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>UG-53/U</td>
<td>.937</td>
<td>.311</td>
<td>.331</td>
<td>.257</td>
<td>.199</td>
</tr>
<tr>
<td>C</td>
<td>UG-149A/U</td>
<td>.937</td>
<td>.311</td>
<td>.331</td>
<td>.257</td>
<td>.199</td>
</tr>
<tr>
<td>M</td>
<td>UF-385/U</td>
<td>.75</td>
<td>.562</td>
<td>.199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>UF-387/U</td>
<td>.75</td>
<td>.562</td>
<td>.199</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### X Band

- Hole Dia. = .4 Holes

#### XB Band

- Hole Dia. = .4 Holes

#### K Band

- Hole Dia. = .4 Holes

#### KU Band

- Hole Dia. = .4 Holes

#### V Band

- Hole Dia. = .4 Holes

#### XN, C, S Band

- Hole Dia. = .4 Holes

### Notes

* For a complete listing of all band letters and codes in use, refer to Band Designation Table on page 386.
## Item # pn-2102, Scientific Atlanta Horns

Click to view item details

### SPECIFICATIONS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Freq. GHz</td>
<td>1.12-1.7</td>
</tr>
<tr>
<td>GAIN</td>
<td>15.5</td>
</tr>
<tr>
<td>BW</td>
<td>30-27</td>
</tr>
<tr>
<td>MODEL</td>
<td>12-1.1</td>
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</tbody>
</table>
### Item # pn-2106, Scientific Atlanta Horns

Click to view item details

#### SPECIFICATIONS

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<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Freq. GHz</td>
<td>3.9-5.85</td>
</tr>
<tr>
<td>GAIN</td>
<td>18</td>
</tr>
<tr>
<td>BW</td>
<td>23-22</td>
</tr>
<tr>
<td>MODEL</td>
<td>12-3.9</td>
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</table>
Item # pn-2107, Scientific Atlanta Horns

SPECIFICATIONS

<table>
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<tr>
<th>Spec</th>
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<tbody>
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<td>Freq. GHz</td>
<td>5.85-8.2</td>
</tr>
<tr>
<td>GAIN</td>
<td>22</td>
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<tr>
<td>BW</td>
<td>12-13</td>
</tr>
<tr>
<td>MODEL</td>
<td>12-5.8</td>
</tr>
</tbody>
</table>
Standard Gain Horns 2.60 to 40 GHz

**Features**
- Primary Standard of Antenna Gain
- 7 Models Cover from 2.60 GHz to 40 GHz

**Models**
- 644, 643, 642, 640, 639, 638, V637

<table>
<thead>
<tr>
<th>Model</th>
<th>644</th>
<th>643</th>
<th>642</th>
<th>640</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Frequency (GHz)</td>
<td>2.6</td>
<td>3.95</td>
<td>5.4</td>
<td>8.2</td>
</tr>
<tr>
<td>High Frequency (GHz)</td>
<td>3.95</td>
<td>5.9</td>
<td>8.2</td>
<td>12.4</td>
</tr>
<tr>
<td>Band</td>
<td>S*</td>
<td>C*</td>
<td>XN*</td>
<td>X*</td>
</tr>
<tr>
<td>Waveguide Size</td>
<td>WR-284</td>
<td>WR-187</td>
<td>WR-137</td>
<td>WR-90</td>
</tr>
<tr>
<td>Input Cover Flange Equivalent</td>
<td>UG-584/U</td>
<td>UG-407/U</td>
<td>UG-441/U</td>
<td>UG-135/U</td>
</tr>
<tr>
<td>VSWR (max)</td>
<td>1.15</td>
<td>1.15</td>
<td>1.15</td>
<td>1.15</td>
</tr>
<tr>
<td>Weight (max) in lbs</td>
<td>6</td>
<td>2.30</td>
<td>1</td>
<td>0.50</td>
</tr>
<tr>
<td>Weight (max) in kg</td>
<td>2.80</td>
<td>1.10</td>
<td>0.50</td>
<td>0.23</td>
</tr>
<tr>
<td>Special Notes:</td>
<td>A, B</td>
<td>A, B</td>
<td>A, B</td>
<td>A, B</td>
</tr>
</tbody>
</table>

Special Notes:
A: *For a complete listing of all band letters and codes in use, refer to Band Designation Table.

Patterns for all models in this series conform to the following description: Beam width in E and H plane varies from 23° at the highest frequency to 34° at the lowest frequency. Side lobes in the H plane are all more than 20 dB down. First side lobes in the E plane are 13 dB down, second side lobes are 18 dB down and all other E plane lobes are more than 20 dB down.

Gain at Mid Frequency: 16.5 dB (with reference to isotropic radiation) variation is 1.5 dB over total band about the mid band value.

Gain at Mid Frequency: 16.5 dB (with reference to isotropic radiation) variation is 1.5 dB over total band about the mid band value.

See Waveguide Flange Data on the following pages for flange detail.

B: See Standard Gain Horns Charts at the end of this section.
### Standard Gain Horns 2.60 to 40 GHz

<table>
<thead>
<tr>
<th>Model</th>
<th>Low Frequency (GHz)</th>
<th>High Frequency (GHz)</th>
<th>Band</th>
<th>Waveguide Size</th>
<th>Input Cover Flange Equivalent</th>
<th>VSWR (max)</th>
<th>Weight (max) in lbs</th>
<th>Weight (max) in kg</th>
<th>Special Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>639</td>
<td>12.4</td>
<td>18.0</td>
<td>KU*</td>
<td>WR-62</td>
<td>UG-419/U</td>
<td>1.15</td>
<td>0.20</td>
<td>0.10</td>
<td>A, B</td>
</tr>
<tr>
<td>638</td>
<td>18.0</td>
<td>26.5</td>
<td>K*</td>
<td>WR-42</td>
<td>UG-595/U</td>
<td>1.15</td>
<td>0.20</td>
<td>0.10</td>
<td>A, B</td>
</tr>
<tr>
<td>V637</td>
<td>26.5</td>
<td>40.0</td>
<td>V*</td>
<td>WR-28</td>
<td>UG-599/U</td>
<td>1.15</td>
<td>0.10</td>
<td>0.05</td>
<td>A</td>
</tr>
</tbody>
</table>

Special Notes:

A: *For a complete listing of all band letters and codes in use, refer to Band Designation Table.

Patterns for all models in this series conform to the following description: Beam width in E and H plane varies from 23° at the highest frequency to 34° at the lowest frequency. Side lobes in the H plane are all more than 20 dB down. First side lobes in the E plane are 13 dB down, second side lobes are 18 dB down and all other E plane lobes are more than 20 dB down.

Gain at Mid Frequency; 16.5 dB (with reference to isotropic radiation) variation is 1.5 dB over total band about the mid band value.

See Waveguide Flange Data on the following pages for flange detail.

B: See Standard Gain Horns Charts at the end of this section.

### Band Designation Table

<table>
<thead>
<tr>
<th>Band (GHz)</th>
<th>Waveguide Size</th>
<th>Band Letters And Codes In Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.12-1.7</td>
<td>WR-650</td>
<td>D, L</td>
</tr>
<tr>
<td>1.7-2.6</td>
<td>WR-430</td>
<td>D, LS, M, R</td>
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<tr>
<td>2.6-3.95</td>
<td>WR-284</td>
<td>S</td>
</tr>
<tr>
<td>3.95-5.85</td>
<td>WR-187</td>
<td>C, G, H</td>
</tr>
<tr>
<td>5.4-8.2</td>
<td>WR-137</td>
<td>A, C, G, J, XB, XN</td>
</tr>
<tr>
<td>7.05-10</td>
<td>WR-112</td>
<td>B, H, W, XB, XL</td>
</tr>
<tr>
<td>8.2-12.4</td>
<td>WR-90</td>
<td>X, XS</td>
</tr>
<tr>
<td>12.4-18</td>
<td>WR-62</td>
<td>G, Ku, P, U, Y</td>
</tr>
<tr>
<td>18.2-26.5</td>
<td>WR-42</td>
<td>K</td>
</tr>
<tr>
<td>26.5-40</td>
<td>WR-28</td>
<td>A, ,Ka, R, T, U, Y</td>
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</table>
Standard Gain Horns 2.60 to 40 GHz

<table>
<thead>
<tr>
<th>BAND*</th>
<th>TYPE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>HOLEDIA.</th>
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<tbody>
<tr>
<td>X</td>
<td>UG-39/U</td>
<td>.640</td>
<td>.610</td>
<td>1.625</td>
<td>.813</td>
<td>.169</td>
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<tr>
<td>XB</td>
<td>UG-51/U</td>
<td>.737</td>
<td>.676</td>
<td>1.875</td>
<td>.938</td>
<td>.199</td>
</tr>
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Waveguide Flange Data.
For a complete listing of all band letters and codes in use, refer to the Band Designation Table.
## Standard Gain Horns 2.60 to 40 GHz

### Outline Drawings For Models: 644, 643, 642, 640, 639, 638, V637

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### Notes:
Dimensions are maximum and for reference only. Contact the factory for detailed specifications and outline drawing.
Standard Gain Horns 2.60 to 40 GHz
Standard Gain Horns 2.60 to 40 GHz
Standard Gain Horns 2.60 to 40 GHz

ABSOLUTE GAIN CALIBRATION
NARDA MODEL 642 STANDARD GAIN HORN

ABSOLUTE GAIN CALIBRATION
NARDA MODEL 645 STANDARD GAIN HORN
Standard Gain Horns 2.60 to 40 GHz
Product Features

- Standard Waveguide Sizes
- 1.70-40 GHZ
- Gain 10, 15, & 20 dB
- 15 Octave bands

Specifications

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(1) Pasternack reserves the right to change specifications or information without notice.

(2) All Specifications “typical”
### Standard Gain Horns

*N Female Connectors

#### Specifications & Ordering Information

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