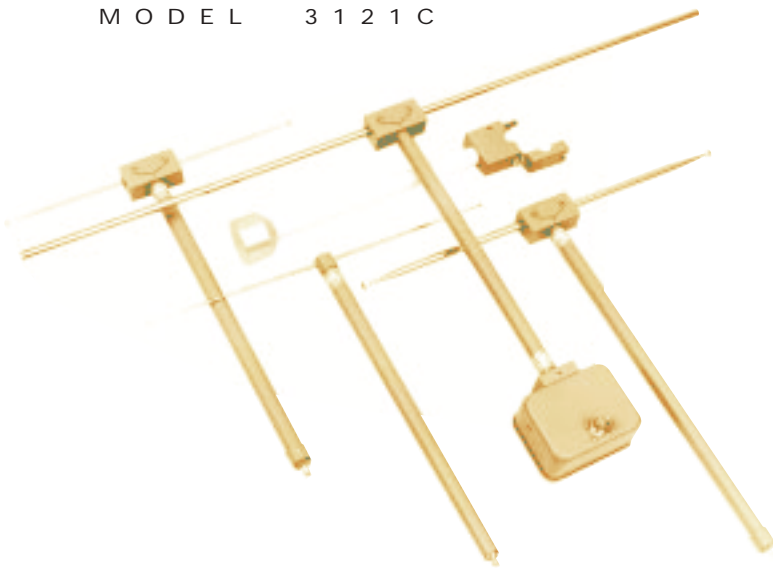


MODEL 3121C



Model 3121C
30 MHz – 1 GHz

- FCC Design
- Low VSWR and Balun Loss
- Appropriate for EMI Testing and Site Attenuation
- Quality Construction Complete with Accessories



Tuned Dipole

EMCO'S MODEL 3121C TUNED DIPOLE ANTENNA is virtually identical to the optimally matched, compensated balun design used by Willmar K. Roberts while he was Assistant Chief Engineer at the FCC laboratory. EMCO has made select physical improvements to the original design assuring optimal performance and years of trouble-free use. For example, Type N connectors are used for both balun and cable connections instead of less secure BNC connectors.

EMCO's dipole offers an accurate standard for precise EMI measurements including FCC and EN compliance testing, site attenuation as described in EN55022 and ANSI C63.4, and antenna calibration as described in ANSI C63.5. The Model 3121C tuned dipole antenna covers a frequency range of 30 MHz to 1 GHz and its behavior approaches to the theoretically perfect lossless half-wavelength resonant dipole.

Each EMCO dipole is individually calibrated at 3 and 10 meters per ANSI C63.5, using the preferred three antenna method. All measurement equipment used is NIST traceable. These measurements are made without the use of attenuators, so antenna factors are a true presentation of actual performance. A printout of the calibration data of each antenna is included with the Manual and is also archived. Individual calibration and actual antenna factors are preferred over typical or theoretical factors and provide confidence of test data.

EMCO Tuned Dipole Antenna Features

FCC Design

EMCO has incorporated contemporary materials, precision manufacturing and select improvements (such as Type N connectors for balun and cable connections) to the optimally matched, compensated balun design used by Willmar K. Roberts at the FCC laboratory. The result is a quality product that provides years of use.

Low VSWR and Balun Loss

The Model 3121C tuned dipole antenna has an average VSWR of less than 1.6:1 and a balun loss of less than .5 dB throughout its frequency range of 30 MHz to 1 GHz.

Appropriate for EMI Testing and Site Attenuation

EMCO's tuned dipole antenna is suitable for both commercial and military EMI emissions and immunity testing. The Model 3121 also can be used to perform site attenuation per EN55022 and ANSI C63.4.

Quality Construction Complete with Accessories

EMCO's tuned dipole is constructed of lightweight corrosion-resistant elements, providing years of trouble-free indoor and outdoor service. A clamp block, delrin support rod, and aluminum mounting base are included in the set. The aluminum mounting base accepts standard 1/4 in x 20 threads from an EMCO tripod or most other tripods. All components, including a tape measure, and ruler which shows corresponding frequency, are included in a shock-resistant carrying case.

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Standard Configuration

- ▶ Four element extension rods
- ▶ Two low-frequency adjustable elements
- ▶ Two medium frequency adjustable elements
- ▶ Four baluns: DB1 - 4 (*Orders for individual balun models include elements. Mounting assembly PN 101947 must be ordered separately for tripod mounting.*)
- ▶ Clamp block
- ▶ Support rod
- ▶ Base drilled to accept EMCO or other tripod mount with standard 1/4 in x 20 threads
- ▶ One 5 meter tape measure
- ▶ One high frequency ruler for DB4
- ▶ 7.6 m cable (25 ft) with Type N connectors
- ▶ Actual individual calibration factors and signed Certificate of Conformance included in a user manual
- ▶ Carrying case

t e c h

Tunable dipole antennas are the reference antenna for E-Field measurements, since the amplitude and pattern are fully calculable under controlled conditions such as use over a ground plane. A tunable dipole antenna is used to make the most precise measurements and is the antenna of choice for reference measurements.

Dipole input impedance is dependent on the length-to-diameter ratio of the elements. For accurate and repeatable results, maintain a consistent length-to-diameter ratio of the elements at their tuned frequency. Always fully extend the telescoping elements then retract the inner (or smallest diameter) elements first, following EMCO calibration practice.

Options

None

Applications

| MODEL | FCC-15 | FCC-18 | IEC/CISPR/EN | SAE J551 | MIL-STD-1541 | MIL-STD-285 | IEEESTD 299 | NACSIM | VCCI |
|--------------|--------|--------|--------------|----------|--------------|-------------|-------------|--------|------|
| 3121C | RE | RE | RE | RE | RE | PW | PW | RE | RE |

RE = Radiated Emissions PW = Plane Wave Other:Site attenuation per EN 55022 and ANSI C63.4

Electrical Specifications

| MODEL | FREQUENCY RANGE | VSWR RATIO (AVG) | MAXIMUM CONTINUOUS POWER | IMPEDANCE (NOMINAL) | CONNECTOR |
|----------------|--------------------------------|------------------|--------------------------|---------------------|---------------|
| 3121C | 30 MHz – 1000 MHz ¹ | < 1.6:1 | | 50 Ω | Type N female |
| Balun 1 | 30 MHz – 60 MHz | | 260 W | | Type N female |
| Balun 2 | 60 MHz – 140 MHz | | 160 W | | Type N female |
| Balun 3 | 140 MHz – 400 MHz | | 80 W | | Type N female |
| Balun 4 | 400 MHz – 1000 MHz | | 50 W | | Type N female |

¹Special calibrations available to 25 MHz.

Physical Specifications

| MODEL | WIDTH ² | DEPTH | BALUN THICKNESS | BOOM THICKNESS | WEIGHT |
|--------------|--------------------|--------------------|-------------------|-------------------|-------------------|
| 3121C | 5.2 m 17.0 ft | 55.0 cm 21.6 in | 7.0 cm 2.75 in | 3.5 cm 1.38 in | 9.5 kg 21.0 lb |

² Maximum extension, with elements attached.

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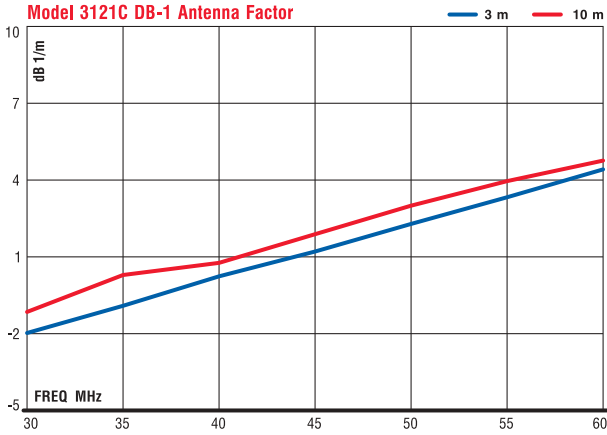
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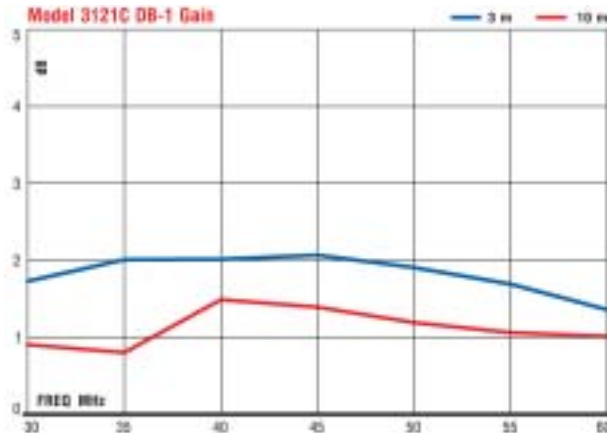
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Model 3121C DB-1 Technical Data

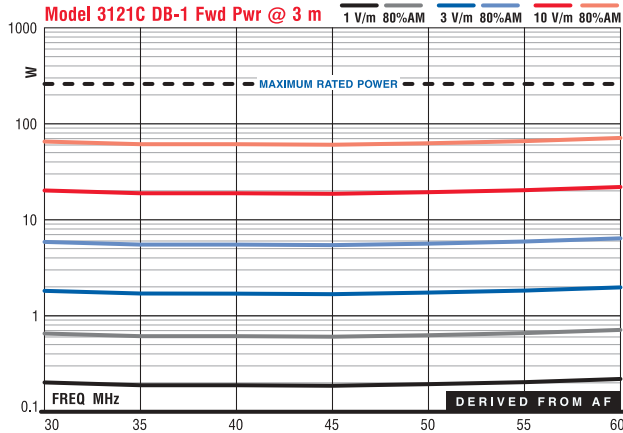
Model 3121C DB-1 Antenna Factor



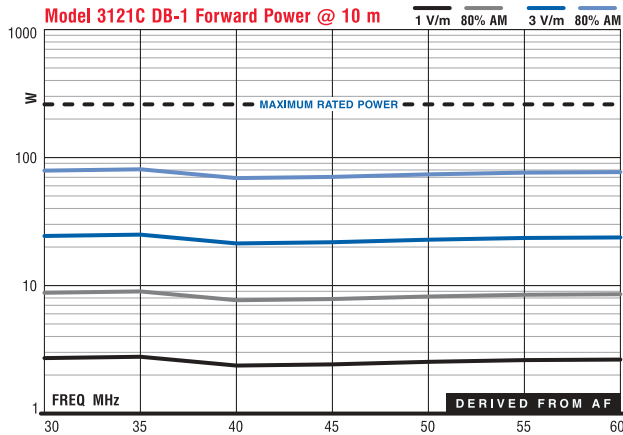
Model 3121C DB-1 Gain



Model 3121C DB-1 Fwd Pwr @ 3 m

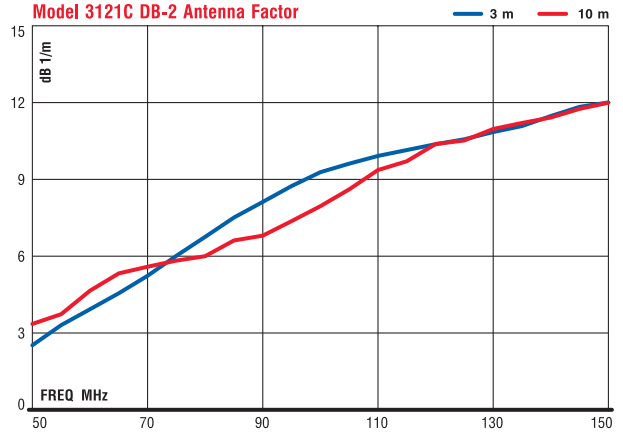


Model 3121C DB-1 Forward Power @ 10 m

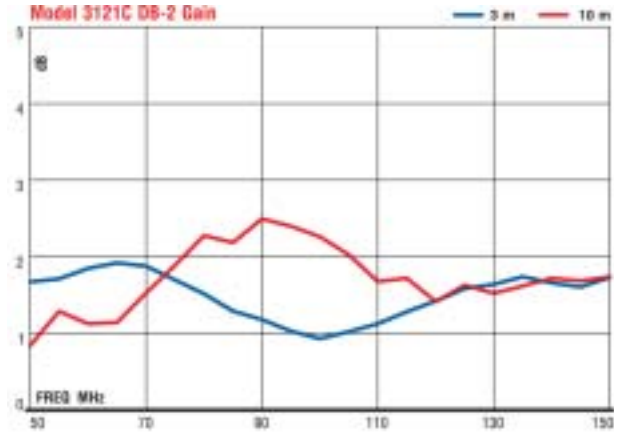


Model 3121C DB-2 Technical Data

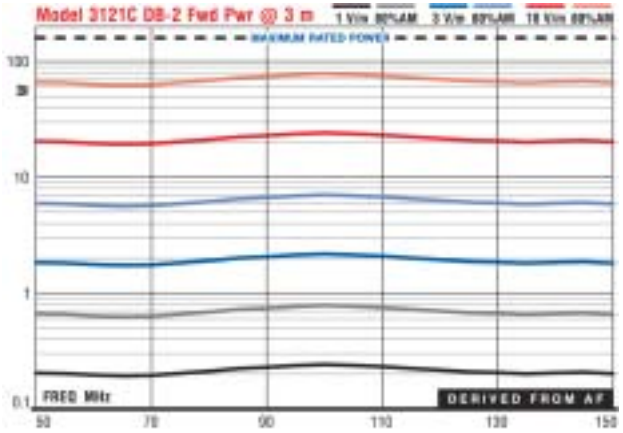
Model 3121C DB-2 Antenna Factor



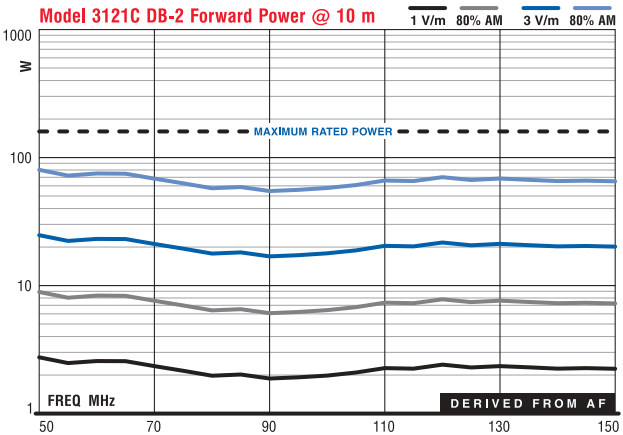
Model 3121C DB-2 Gain



Model 3121C DB-2 Fwd Pwr @ 3 m

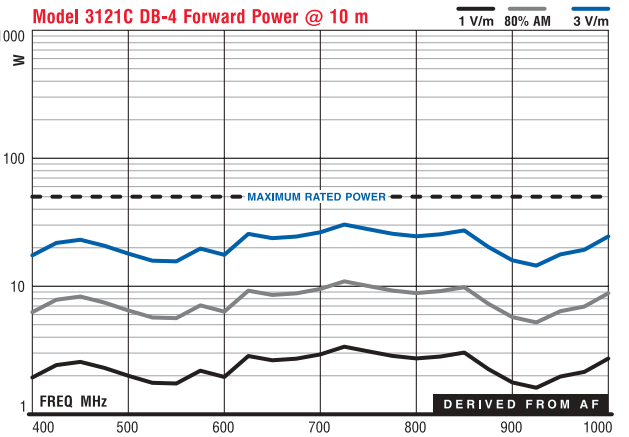
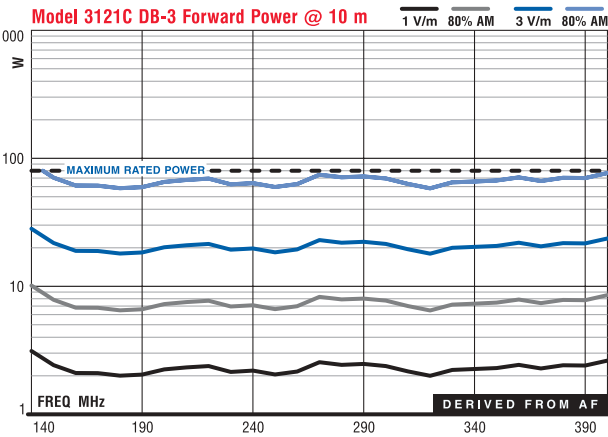
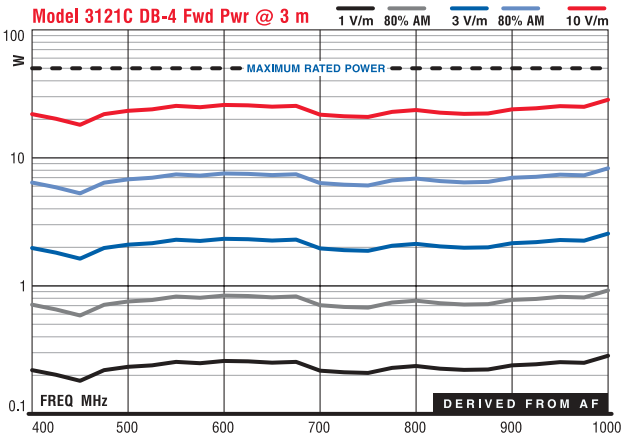
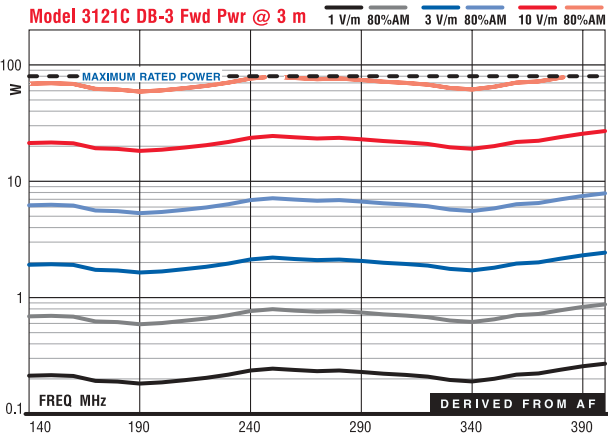
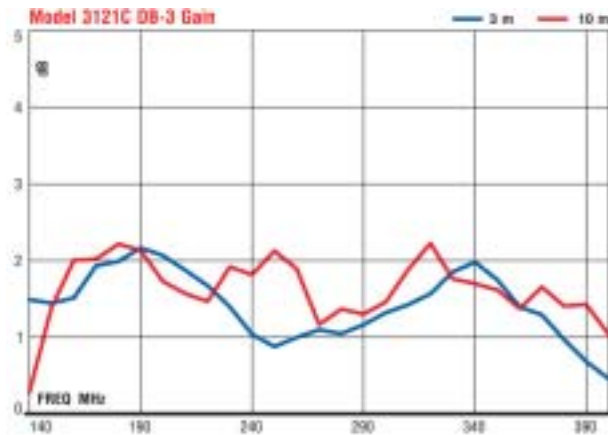
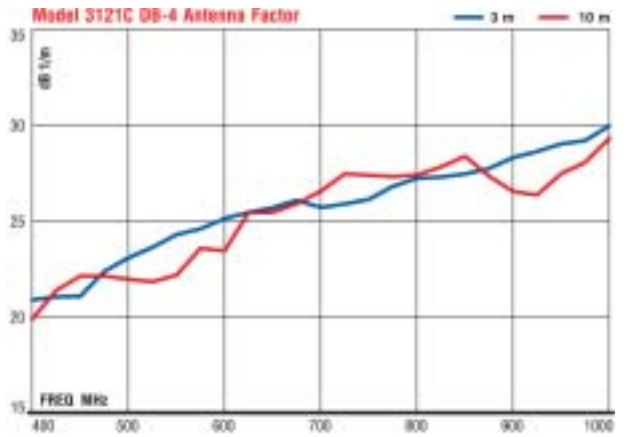
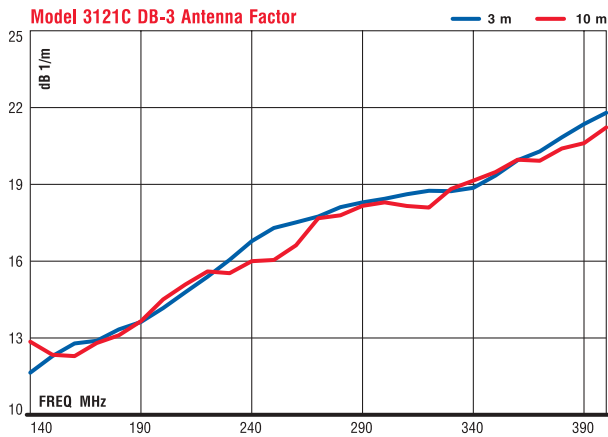


Model 3121C DB-2 Forward Power @ 10 m



Model 3121C DB-3 Technical Data

Model 3121C DB-4 Technical Data



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M O D E L 3 1 2 5

Model 3125-450

440 MHz - 460 MHz

Model 3125-600

590 MHz - 610 MHz

Model 3125-870

824 MHz - 915 MHz

Model 3125-950

935 MHz - 960 MHz

Model 3125-1610

1600 MHz - 1620 MHz

Model 3125-1750

1710 MHz - 1785 MHz

Model 3125-1840

1805 MHz - 1880 MHz

Model 3125-1880

1850 MHz - 1910 MHz

Model 3125-2450

2440 MHz - 2460 MHz

Model 3125-3000

2990 MHz - 3010 MHz

- IEEE SC 34 Design
- For AAMI & FDA Test Requirements
- Frequency Matched to Wireless Device Frequencies

Fixed Dipoles



EMCO'S MODEL 3125 BALANCED DIPOLE SETS for electromagnetic field testing are an omni-directional emissions source for immunity testing. These dipoles are designed with frequencies that match the operating frequencies of cellular phones and other wireless devices. In typical use, a chosen dipole is substituted for a wireless device of the same frequency. The substituted dipole then allows the test to be performed with greater repeatability and lower measurement uncertainty. Applications include immunity testing of pacemakers, hearing aids and defibrillators.

The dipoles are tuned half-wave length resonant with a series-parallel coaxial stub balun. Each antenna has fixed length dipole elements mounted in a Teflon support block. The coaxial balun is terminated into a type "SMA" receptacle.

EMCO Tuned Dipole Antenna Features

IEEE SC 34 DESIGN

EMCO's Balanced Dipole Sets are manufactured in accordance with a design specified in IEEE SC 34.

FOR AAMI & FDA TEST REQUIREMENTS

The dipoles are designed for testing products according to the requirements established by the American Association of Medical Instrumentation (AAMI) and the Federal Drug Administration (FDA).

Choosing Your Model

EMCO's Model 3125 Balanced Dipole Series covers a frequency range of 440 MHz to 3 GHz. Each dipole frequency is matched to the frequency used by a wireless device. Requests for dipoles with custom frequencies can be accommodated. Please contact our Sales Department to discuss your needs.

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Standard Configuration

- ▶ Antenna assembly
- ▶ Manual
- ▶ Actual individual calibration factors and signed Certificate of Conformance

Options

- ▶ Antenna mount drilled to accept EMCO or other tripod mount with standard 1/4 in x 20 threads

Electrical Specifications

| MODEL | FREQUENCY RANGE | VSWR RATIO (AVG) | MAXIMUM CONTINUOUS POWER | IMPEDANCE (NOMINAL) | CONNECTOR |
|-----------|---------------------|------------------|--------------------------|---------------------|-----------|
| 3125-450 | 440 MHz – 460 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-600 | 590 MHz – 610 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-870 | 824 MHz – 915 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-950 | 935 MHz – 960 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-1610 | 1600 MHz – 1620 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-1750 | 1710 MHz – 1785 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-1840 | 1805 MHz – 1880 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-1880 | 1850 MHz – 1910 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-2450 | 2440 MHz – 2460 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |
| 3125-3000 | 2990 MHz – 3010 MHz | < 1.7:1 | 1 W | 50 Ω | SMA |

Physical Specifications

| MODEL | WIDTH | DEPTH | HEIGHT |
|-----------|---------------------|------------------|--------------------|
| 3125-450 | 31.24 cm 12.3 in | 3.3 cm 1.3 in | 20.32 cm 8.0 in |
| 3125-600 | 23.62 cm 9.3 in | 3.3 cm 1.3 in | 16.51 cm 6.5 in |
| 3125-870 | 18.2 cm 7.6 in | 3.3 cm 1.3 in | 12.7 cm 5.0 in |
| 3125-950 | 14.99 cm 5.91 in | 3.3 cm 1.3 in | 10.67 cm 4.2 in |
| 3125-1610 | 8.63 cm 3.4 in | 3.3 cm 1.3 in | 8.4 cm 3.3 in |
| 3125-1750 | 8.4 cm 3.31 in | 3.3 cm 1.3 in | 8.13 cm 3.2 in |
| 3125-1840 | 8.2 cm 3.23 in | 3.3 cm 1.3 in | 7.87 cm 3.1 in |
| 3125-1880 | 8.1 cm 3.19 in | 3.3 cm 1.3 in | 7.6 cm 3.0 in |
| 3125-2450 | 5.59 cm 2.2 in | 3.3 cm 1.3 in | 6.1 cm 2.4 in |
| 3125-3000 | 4.57 cm 1.8 in | 3.3 cm 1.3 in | 5.6 cm 2.2 in |

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