MODEL 3101

Model 3101
200 MHz – 1 GHz

Model 3102
1 GHz – 10 GHz

Model 3103
100 MHz – 1 GHz

- Circular Polarization
- Extremely Low VSWR
- Compact Size
- Unique Applications
- Quality Construction

Conical Log Spiral

EMCO'S BROADBAND CONICAL LOG SPIRAL ANTENNAS show minimal pattern change over their wide operating frequency range of 100 MHz to 10 GHz. All antennas in this series have moderate gain and low VSWR. Three models offer you a choice in size, frequency range, and polarization.

Once used exclusively for MIL-STD and SAE testing, conical log spiral antennas are effective for other types of measurements too. For example they can be used for close-in "quick-looks" to find the spectral characteristics of RF emissions. For immunity testing , conical log spirals generate reasonable field strengths with modest power input. By placing conical log spiral antennas in a vertical position with respect to the ground plane, they also can be used as omni-directional, horizontally polarized antennas for electromagnetic site surveys.

EMCO Conical Log Spiral Antenna Features

Circular or Linear Polarization
EMCO's conical log spiral antennas will receive both circular polarized and linear polarized fields (with a 3 dB variance for linear fields) under normal operating conditions.

Low VSWR
Average VSWR for the Model 3101 is 2.4:1. The Model 3102 averages a 1.6:1 VSWR and the Model 3103 averages 1.9:1 VSWR.

Compact Size
The compact size of EMCO's conical log spiral antennas makes them ideal for use in anechoic chambers and shielded enclosures where space is limited and proximity effects must be minimized.

Quality Construction
EMCO's conical log spiral antennas are made with spiral windings of coaxial cable attached to the outside of a fiberglass cone. Outside windings improve heat dissipation. This cone is attached to a delrin rod equipped with an aluminum base. The antenna mounting base accepts standard 1/4 in x 20 threads from an EMCO tripod or most other tripods.

Choosing Your Model: Three Models with Frequency Ranges of 100 MHz to 10 GHz

100 MHz to 1 GHz
The Model 3103 conical log spiral antenna is similar to Models 3101 and 3102 except that it has the lowest frequency range and it is largest in size. Length is 102.0 cm (40 in) diameter is 66.0 cm (26.0 in). The design is patterned on NASA drawings.

200 MHz to 1 GHz
The Model 3101 conical log spiral antenna was designed by the Department of Defense for MIL-STD-461E measurements. The original drawings provide the basis for our Model 3101. Length is 81.3 cm (32.0 in) and diameter is 33.0 cm (13.0 in).

1 to 10 GHz
The Model 3102 conical log spiral antenna is similar to the Model 3101 but has a higher frequency range and is smaller in size. Length is 38.1 cm (15 in) and diameter is 12.7 cm (5.0 in).

Standard Configuration

- Left-hand circular polarization
- Support rod
- Base drilled to accept EMCO or other tripod mount with standard 1/4 in x 20 threads
- Individually calibrated at 1 m per SAE ARP 958. Actual factors and a signed Certificate of Calibration Conformance included in Manual.

Options

Right-hand circular polarization
This option reverses the antenna windings for right-hand polarization.

Custom cases
Custom cases are available on request.

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

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The Conical Log Spiral antenna first came to the attention of the EMC community when it was listed as the preferred antenna for radiated emissions measurement in MIL-STD-826A, 20 Jan. 1964. At the time, this antenna was right-hand circularly polarized, following to the definitions in standards of the day. Per modern definitions, the original Model 3101 is left-hand circularly polarized (e.g. when observed along the direction of propagation, the rotation of the wave is counterclockwise, while the wave is left-hand circularly polarized). By modern definitions, EMCO's optional Model 3101L is right-hand circularly polarized. The current model numbers remain unchanged for reasons of continuity, but the description of their performance has changed to reflect modern definitions.

Applications

MODEL	SAE J1113	MIL-STD-461E	MIL-STD-1541
3101[1]	RI	RE, RI	RE
3102[1]	RI	RE, RI	RE
3103[1]	RI	RE, RI	RE

RE = Radiated Emissions RI = Radiated Immunity (Susceptibility)

Electrical Specifications

MODEL	FREQUENCY RANGE	VSWR RATIO (AVG)	MAXIMUM CONTINUOUS POWER	PEAK POWER	IMPEDANCE	CONNECTOR
3101[1]	200 MHz – 1 GHz	2.4:1	100 W	150 W	50 Ω	Type N female
3102[1]	1 GHz – 10 GHz	1.6:1	50 W	100 W	50 Ω	Type N female
3103[1]	100 MHz – 1 GHz	1.9:1	100 W	150 W	50 Ω	Type N female

Physical Specifications

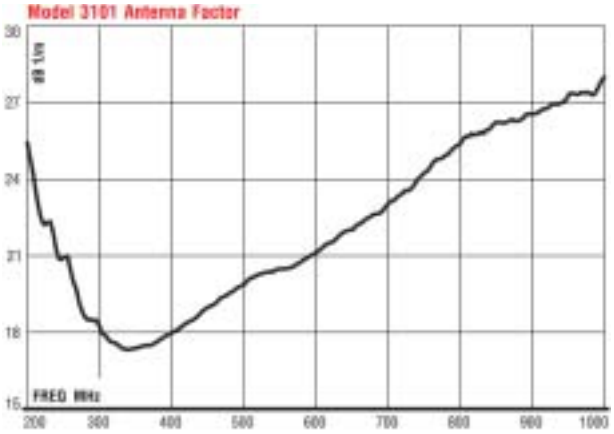
MODEL	DEPTH	DIAMETER	WEIGHT
3101[1]	81.3 cm 32.0 in	33.0 cm 13.0 in	4.5 kg 10.0 lb
3102[1]	38.1 cm 15.0 in	12.7 cm 5.0 in	3.6 kg 8.0 lb
3103[1]	102.0 cm 40.0 in	66.0 cm 26.0 in	10.0 kg 22.0 lb

[1] Speciality Item. Call EMCO for lead time and pricing.

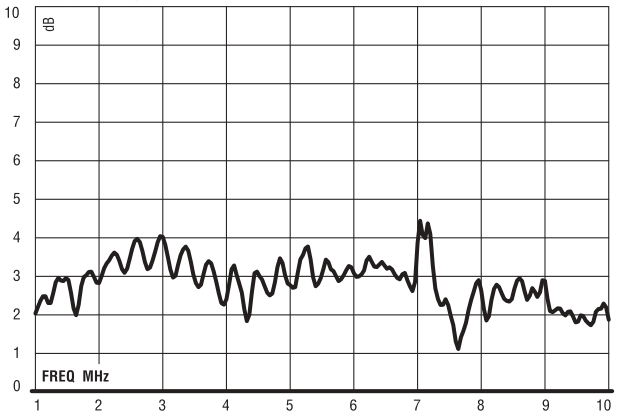
Conical Log Spiral

Model 3101 Technical Data

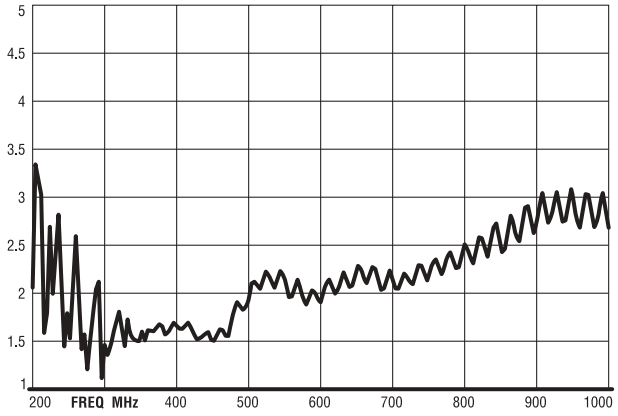
Model 3101 Antenna Factor



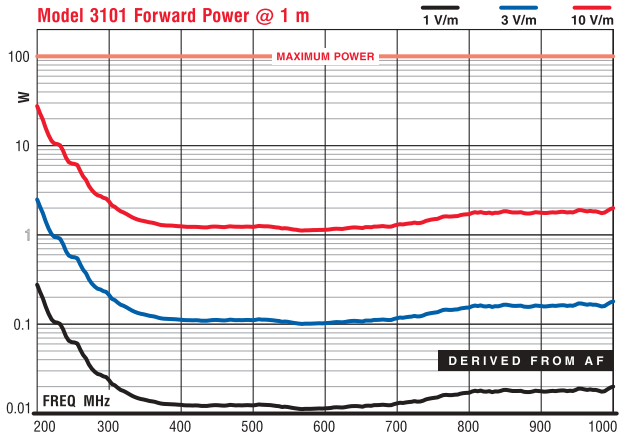
Model 3101 Gain



Model 3101 VSWR

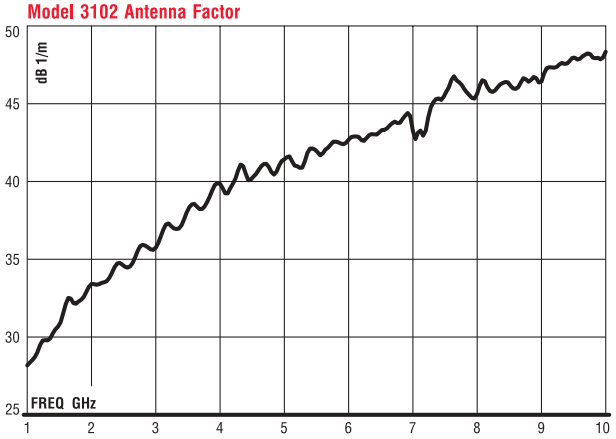


Model 3101 Forward Power @ 1 m

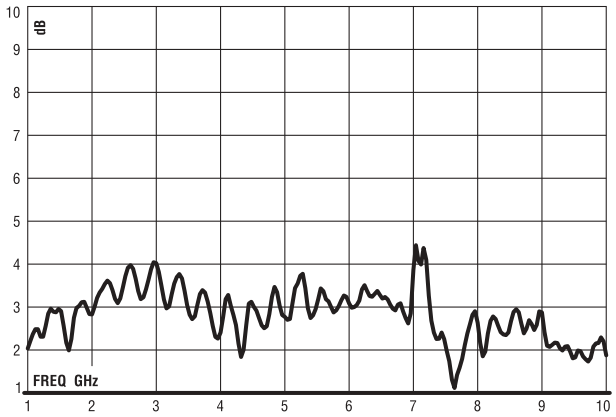


Model 3102 Technical Data

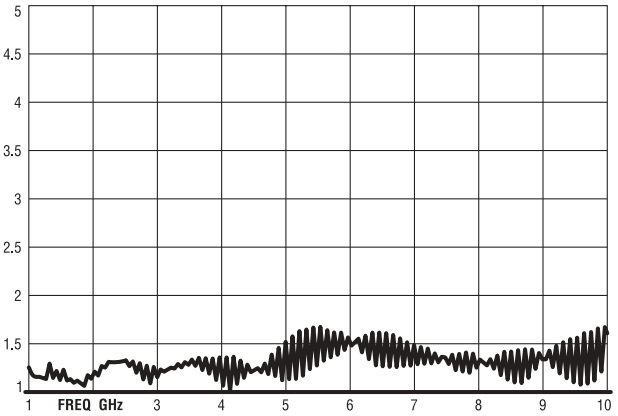
Model 3102 Antenna Factor



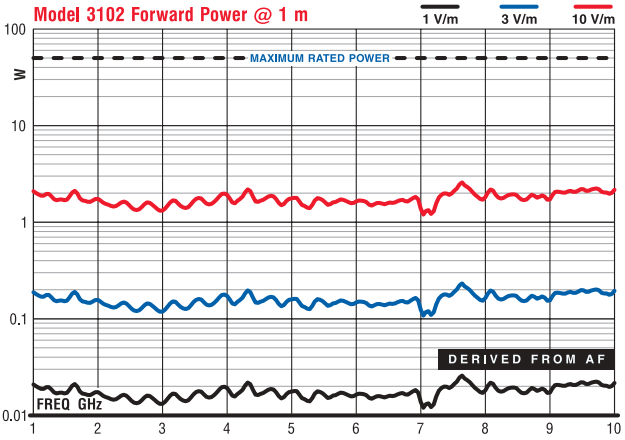
Model 3102 Gain



Model 3102 VSWR

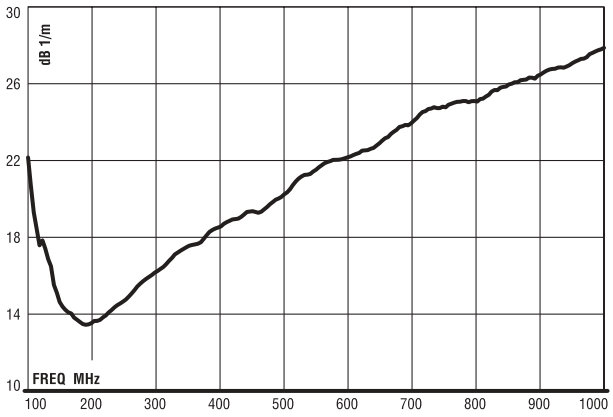


Model 3102 Forward Power @ 1 m

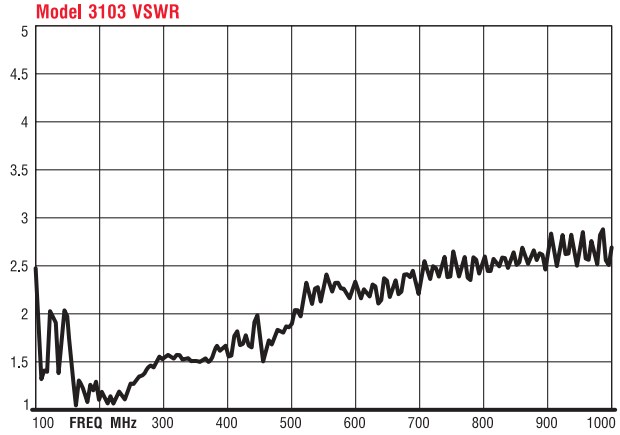


Model 3103 Technical Data

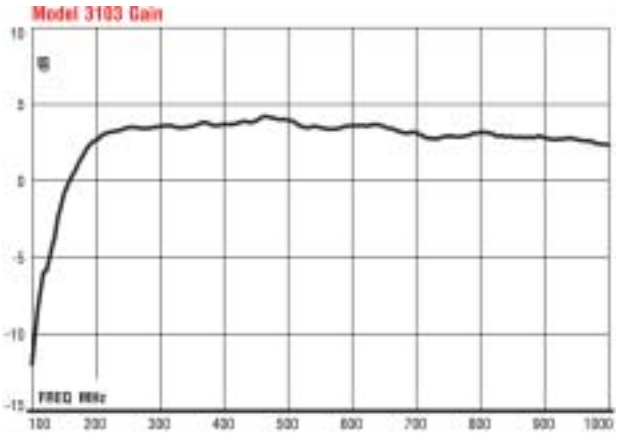
Model 3103 Antenna Factor



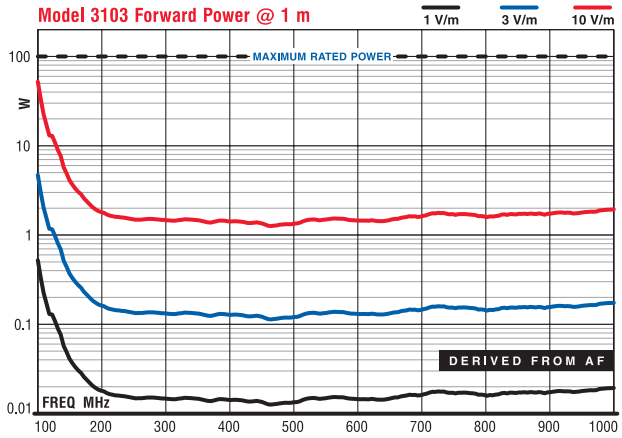
Model 3103 VSWR



Model 3103 Gain



Model 3103 Forward Power @ 1 m



Model 3103 Conical Log Spiral

Model 3102 Conical Log Spiral