

Mini-Bicon Antenna

Model 3180D

User Manual



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TABLE OF CONTENTS

Notes, Cautions, and Warnings	4
Introduction	5
Tripod Options	6
ETS-Lindgren Product Information Bulletin	6
Maintenance	7
Annual Calibration	7
Replacement and Optional Parts	7
Service Procedures	7
Specifications	8
Electrical Specifications	8
Physical Specifications	8
Conical Elements	8
Cage Elements	9
Dimensional Drawings	10
Assembly Instructions	11
Parts to Assemble	11
Conical Elements	11
Cage Elements	11
Steps to Assemble	12
Mounting Instructions	13
Using Included Mounting Adapters	13
Using the Stinger Mount	14
Additional Mounting Options	14
4-TR Mounting Options	14
7-TR And Mast Mounting Options	15
2x2 Boom Mounting Options	16
Application	17
Typical Data	18
Typical Antenna Factor & Gain	18
Typical VSWR	18
Typical Radiation Patterns	19
Model 3180D, Conical Elements	19
Model 3180D, Cage Elements	20

Notes, Cautions, and Warnings



Note: Denotes helpful information intended to provide tips for better use of the product.

CAUTION

Caution: Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.

WARNING

Warning: Denotes a hazard. Failure to follow instructions could result in **SEVERE** personal injury and/or property damage. Included text gives proper procedures.



See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

Introduction

The ETS-Lindgren Model 3180D Mini-Bicon Antenna is designed for optimal performance across a frequency range of 30 MHz to 1 GHz or 30 MHz to 3 GHz, depending on the elements:



With cage elements:

30MHz to 1 GHz



With conical elements:

30MHz to 3 GHz

The Model 3180D ships with both sets of elements. The antenna is designed to have a radiation pattern that is omnidirectional in the H-plane and maintains a single lobe in the E-plane across the range. The elements have been optimized to avoid splitting of the main radiation beam in the elevation cut.

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

In addition to covering the traditional frequency range EMC measurements, the Model 3180D covers all the VHF and part of the UHF bands, making it ideal for spectrum monitoring of FM, TV, and some cellular phones.

The Model 3180D includes a stinger mount and standard mounting hardware. For the variety of mounting options available for the Model 3180D, see Mounting Instructions on page 13.

Tripod Options

ETS-Lindgren offers the following nonmetallic, non-reflective tripods for use at both indoor and outdoor EMC test sites.

4-TR Tripod—Constructed of linen phenolic and delrin, designed with an adjustable center post for precise height adjustments.

- Maximum height is 2.0 m (80.0 in), and minimum height is 94 cm (37.0 in).
- This tripod can support up to an 11.8 kg (26.0 lb) load.



7-TR Tripod—Constructed of PVC and fiberglass components, providing increased stability for physically large antennas. The unique design allows for quick assembly, disassembly, and convenient storage.

- Allows several different configurations, including options for manual or pneumatic polarization.
- Quick height adjustment and locking wheels provide ease of use during testing.
- Maximum height is 2.17 m (85.8 in), with a minimum height of 0.8 m (31.8 in).
- This tripod can support a 13.5 kg (30 lb) load.



ETS-Lindgren Product Information Bulletin

See the ETS-Lindgren *Product Information Bulletin* included with your shipment for the following:

- Safety, regulatory, and other product marking information
- Steps to receive your shipment
- Steps to return a component for service
- ETS-Lindgren calibration service
- ETS-Lindgren contact information

Maintenance

CAUTION

Before performing any maintenance, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.



Maintenance of the Model 3180D is limited to external components such as cables or connectors.

If you have any questions concerning maintenance, contact ETS-Lindgren Customer Service.

Annual Calibration

See the Product Information Bulletin included with your shipment for information on ETS-Lindgren calibration services.

Replacement and Optional Parts



ETS-Lindgren may substitute a similar part or new part number with the same functionality for another part/part number. Contact ETS-Lindgren for questions about part numbers and ordering parts.

Following are the part numbers for ordering replacement or optional parts for the Model 3180D Mini-Bicon Antenna.

Part Description	Part Number
Clamp Block	102108
Support Base	101942B
Support Rod White	100733



For additional mounting hardware, see Mounting Instructions.

Service Procedures

For the steps to return a system or system component to ETS-Lindgren for service, see the Product Information Bulletin included with your shipment.

Specifications

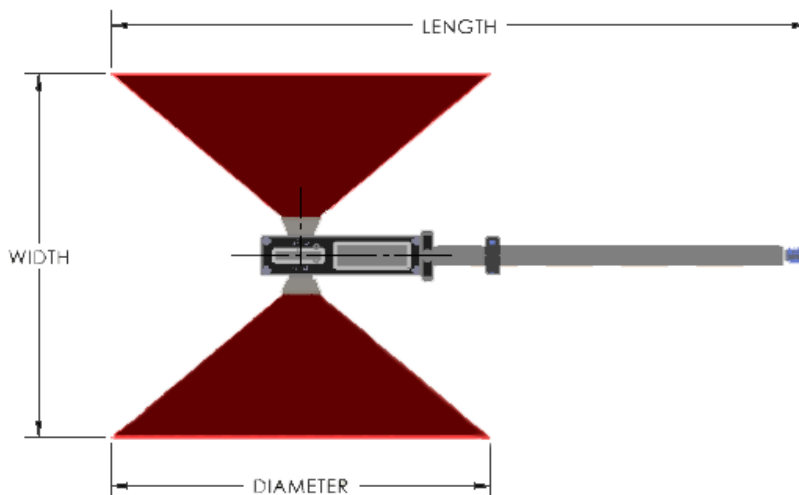
Electrical Specifications

	Model 3180D, Conical Elements	Model 3180D, Cage Elements
Frequency Range:	30 MHz–3 GHz	30 MHz–1 GHz
VSWR Ratio (Average):	~3:1	~3:1
Maximum Continuous Power:	250 mW	250 mW
Impedance:	50 Ω	50 Ω
Connector:	Type N female	Type N female

Physical Specifications

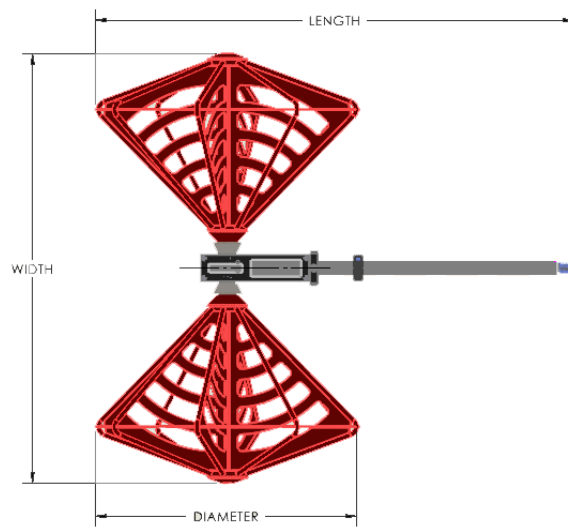
Conical Elements

	Model 3180D, Conical Elements
Width (Element, tip-to-tip):	37.5 cm 14.8 in
Length:	71.71 cm 28.2 in
Diameter:	39.1 cm 15.4 in

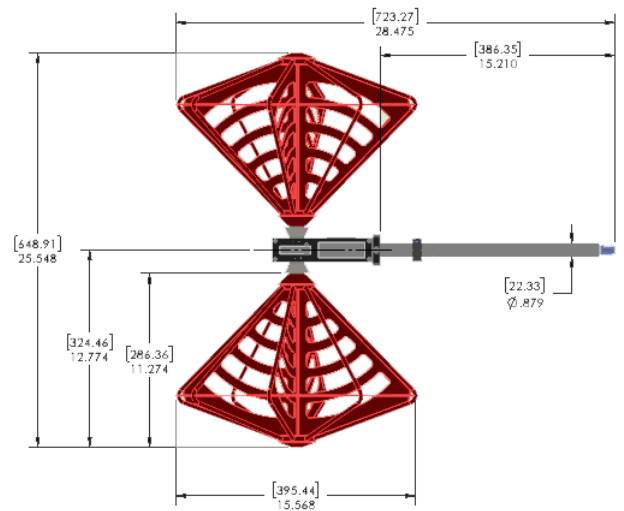
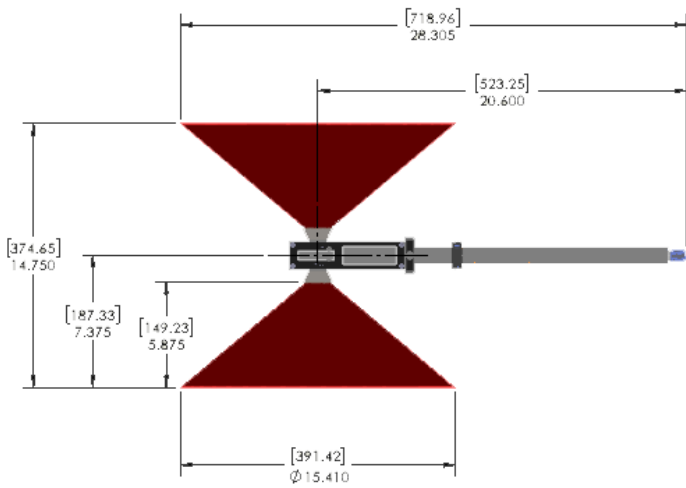
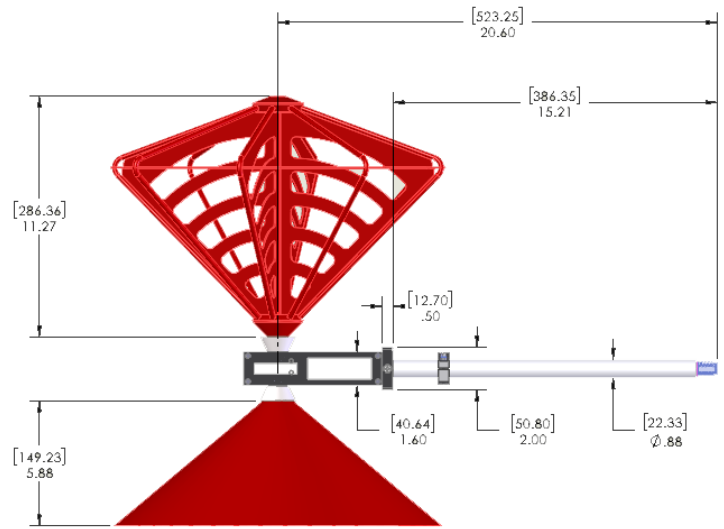
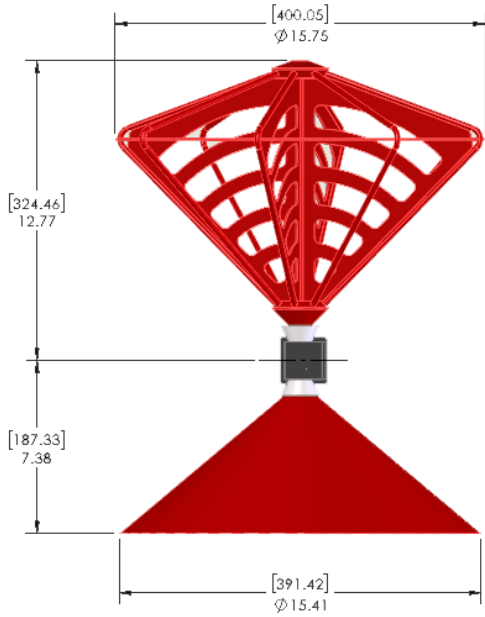


Cage Elements

Model 3180D, Cage Elements	
Width (Element, tip-to-tip):	64.9 cm
	25.5 in
Length:	72.4 cm
	28.5 in
Diameter:	40.0 cm
	15.7 in



Dimensional Drawings



Assembly Instructions

CAUTION

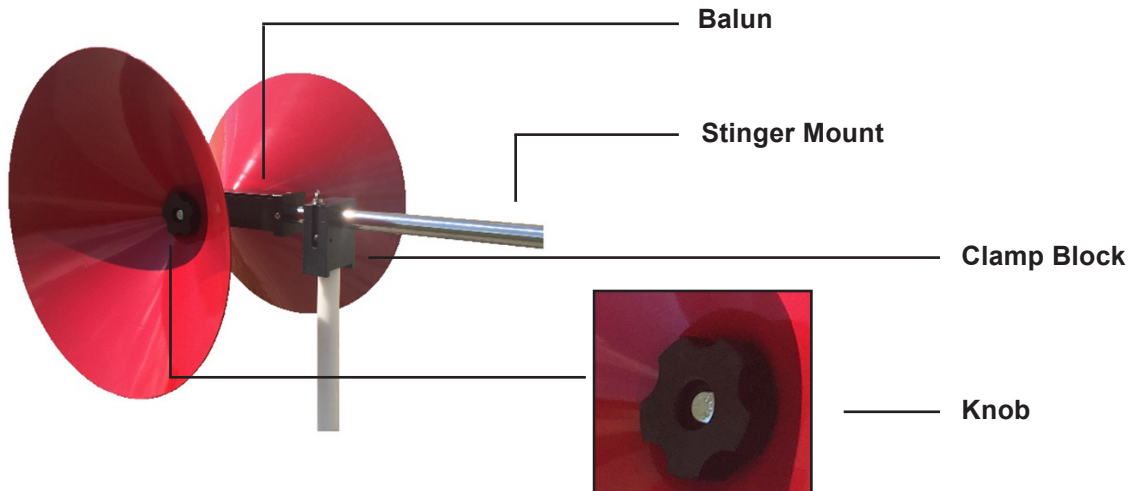
Before performing any maintenance, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.

Parts to Assemble

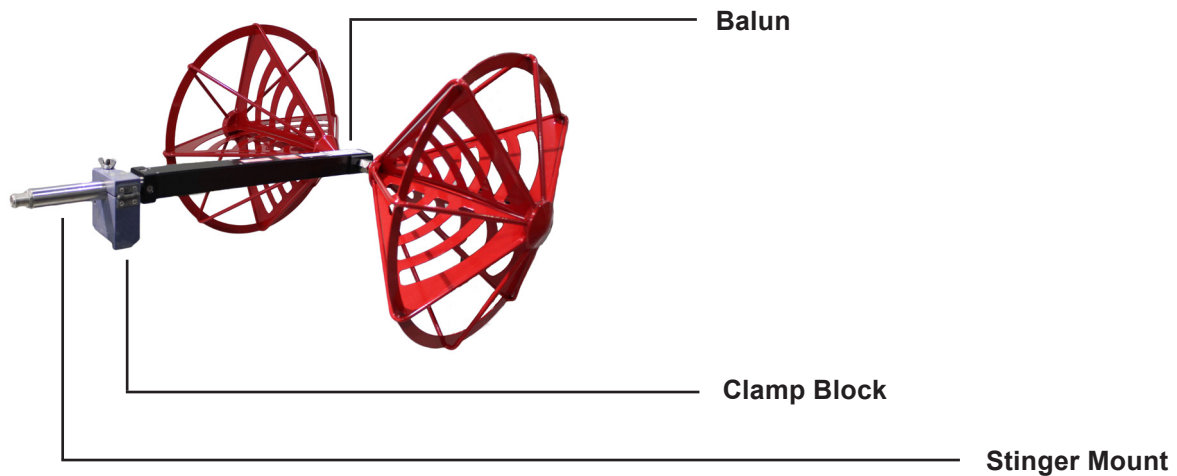
The Model 3180D Mini-Bicon Antenna is shipped unassembled, and includes these parts:

- Balun—includes attached stinger mount
- Element (2)
- Knob (for use on cone assembly only)
- Clamp block
- Support rod and base

Conical Elements



Cage Elements



Steps to Assemble

1. **Cage Assembly:** Line up the screw threads with the receptacle hole on the element nipple attached to the balun and turn the element until it is firmly secured.
2. **Cone Assembly:** Place Knob into cone and through clearance hole in cone then repeat step 1.

CAUTION

Before performing any maintenance, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.

Mounting Instructions

CAUTION

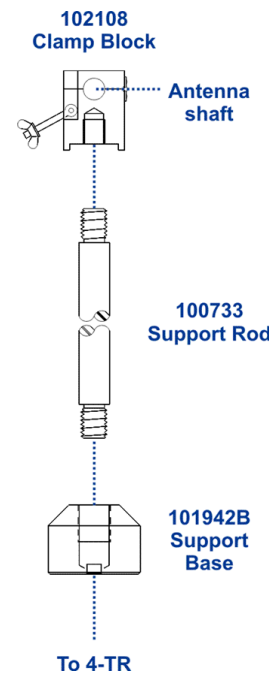
Before connecting any components, follow the safety information in the ETS-Lindgren Product Information Bulletin included with your shipment.

The Model 3180D is a precision measurement device. Handle with care.

Using Included Mounting Adapters

The Model 3180D Mini-Bicon Antenna ships with mounting adapters, used to mount the antenna to a 4-TR tripod:

- 102108 Clamp Block—Uses standard 7/8–14 threads and comes with a 1/4–20 thread adapter for mounting to an ETS-Lindgren tripod or most other tripods.
- 100733 Support Rod
- 101942B Support Base



To use these adapters to mount the Model 3180D to a 4-TR tripod:

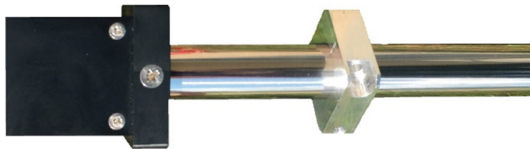
1. Assemble the clamp block, support base, and support rod, and attach the support base to the 4-TR tripod.
2. Unscrew the clamp block latch and open the top.
3. Insert the balun into the clamp block and close the top over the balun.
4. Move the latch to the closed position and tighten so the balun is held securely.
5. Attach the cable to the output connector on the antenna.

Using the Stinger Mount

The stinger on the Model 3180D enables you to mount to antenna directly to an ETS-Lindgren 7-TR Tripod Positioner with the stinger tube block (PN 113138).



Additional hardware is required to use the stinger to mount the Model 3180C to a mast. For information on ordering optional mounting hardware, contact the ETS-Lindgren Sales Department.

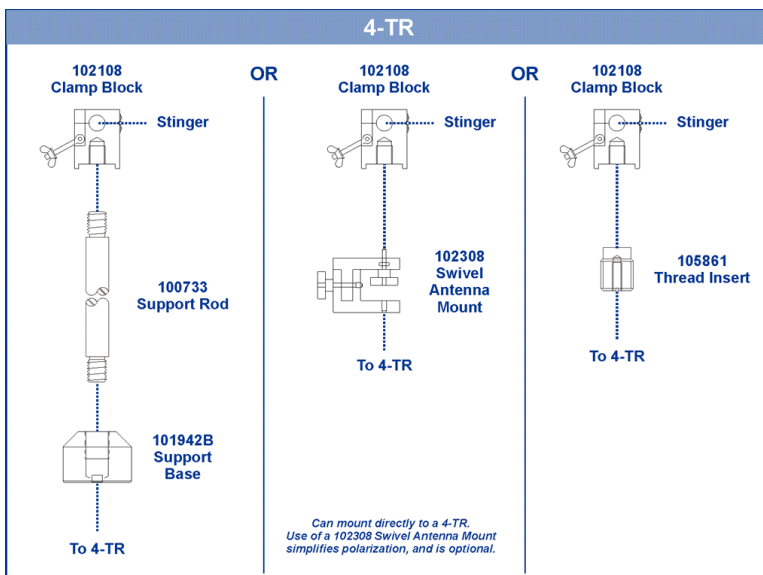


Do not use the stinger to mount the Model 3180D onto a 4-TR tripod.

Additional Mounting Options

4-TR Mounting Options

Following are additional options for mounting the Model 3180D onto an ETS-Lindgren 4-TR tripod. Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



7-TR And Mast Mounting Options

The stinger on the Model 3180D enables you to mount to antenna directly to an ETS-Lindgren 7-TR Tripod Positioner. Following are additional options for mounting the Model 3180D onto an ETS-Lindgren 7-TR Tripod Positioner.



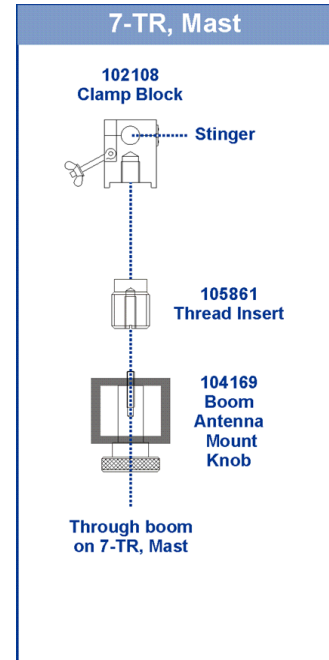
The mast can be used independently. However, the 7-TR must be used in conjunction with the mast.

Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



Mast refers to 2070 Series, 2075, and 2175 Antenna Towers.
7-TR refers to 109042, 108983, and 108507 booms:

- 109042 boom—Straight boom; for general antenna mounting on a 7 TR.
- 108983 boom—Offset boom; for general antenna mounting on a 7 TR with pneumatic or manual polarization. Can also be used to mount stinger type antennas.
- 108507 boom—For Model 3106 Series antennas only. When changing polarization, maintains centerline rotation.

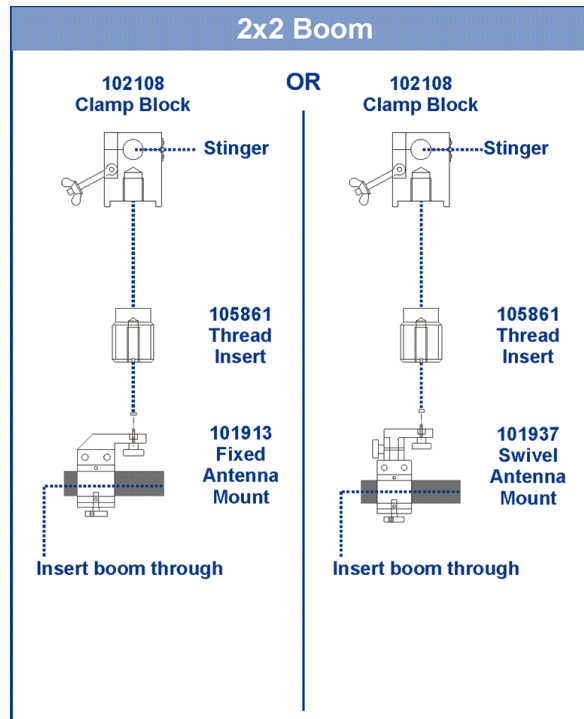


2x2 Boom Mounting Options

Following are additional options for mounting the Model 3180D onto a 2x2 boom. Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



The mast can be used independently. However, the 7-TR must be used in conjunction with the mast.



Application

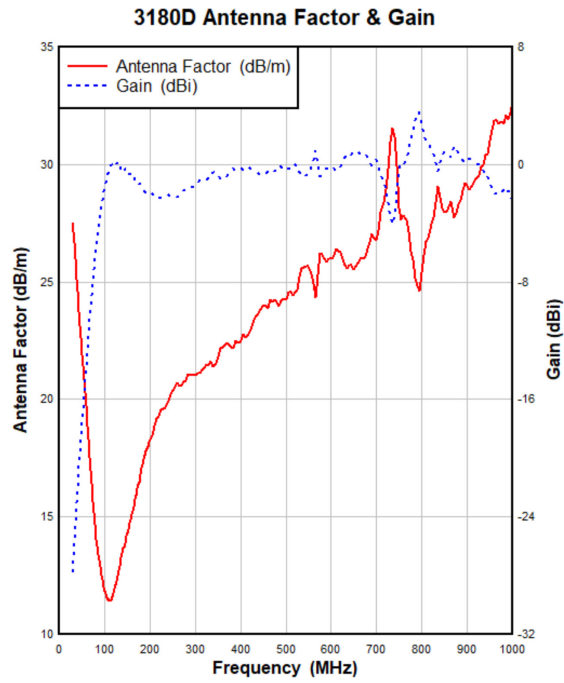
The Model 3180D Mini-Bicon Antenna is ideally suited for swept site attenuation measurements per ANSI and FCC specifications. The Model 3180D can be used for horizontal and vertical site attenuation measurements. The maximum continuous input power for the Model 3180D is 250 mW when using the conical elements and the cage elements.

Each antenna is calibrated during manufacturing. The results of the calibration are tabulated as gain and antenna factor vs. frequency for use in Specification Compliance Testing. Typical data for the Model 3180D is provided in the next section.

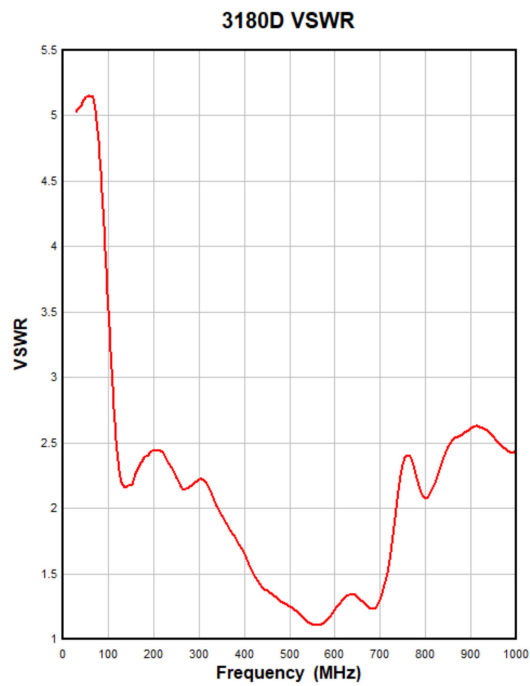
The Model 3180D is also ideal to measure the amplifier harmonics during immunity testing per IEC61000 4-3. The antenna is placed at the location of the immunity plane and the output is connected to a spectrum analyzer. The rest of the test set up is left exactly as-is during the normal immunity test. In this way the level of the harmonics measured take into account the antenna, chamber, and amplifier.

Typical Data

Typical Antenna Factor & Gain



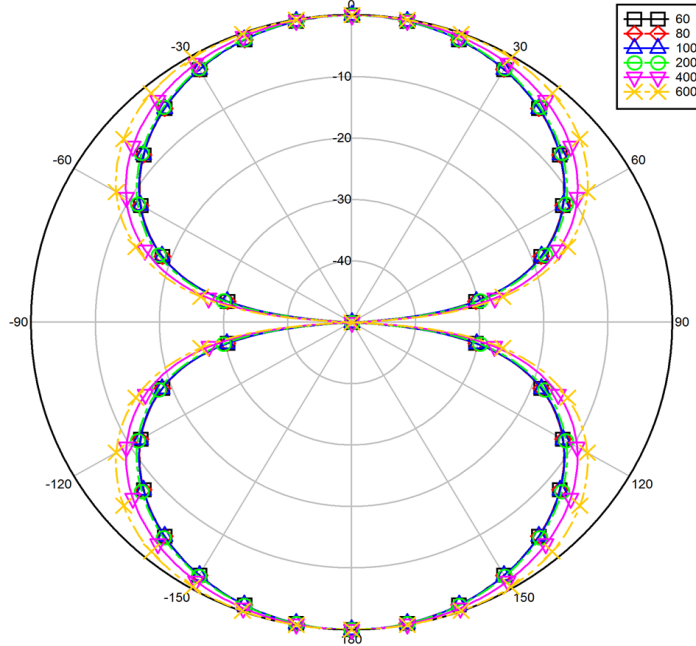
Typical VSWR



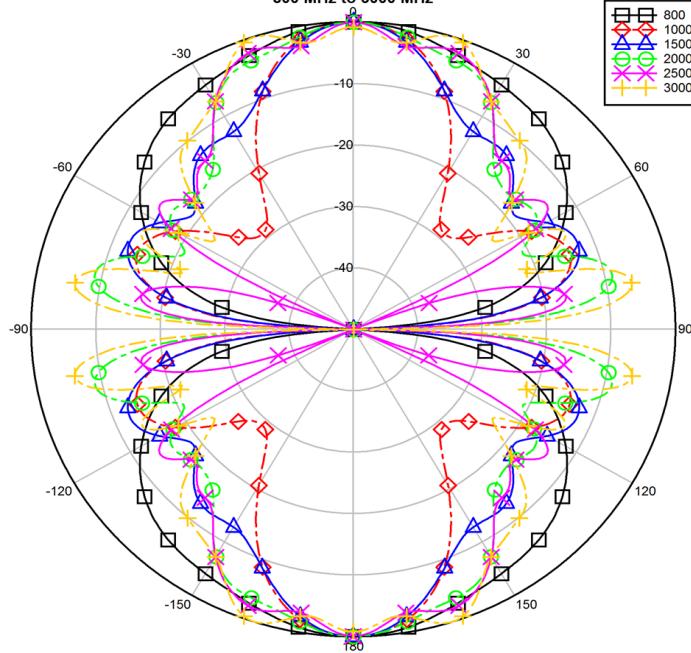
Typical Radiation Patterns

Model 3180D, Conical Elements

3180D E-plane Pattern Cone Elements
60 MHz to 600 MHz

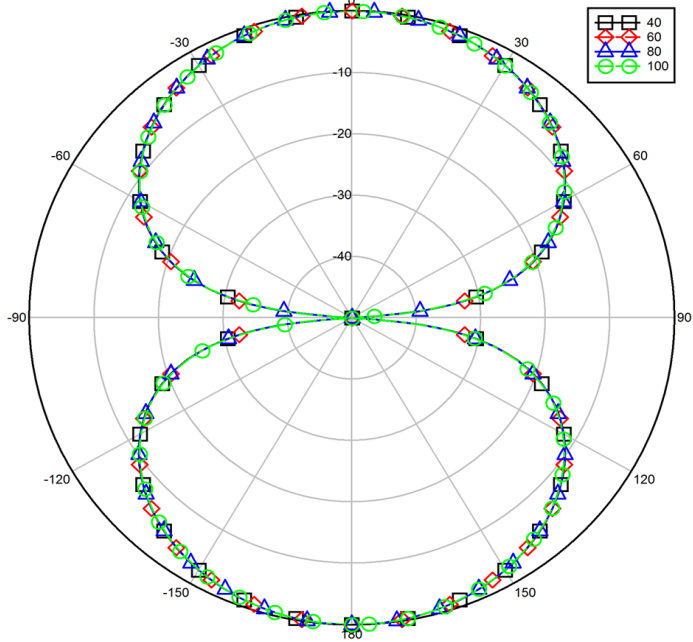


3180D E-plane Pattern Cone Elements
800 MHz to 3000 MHz

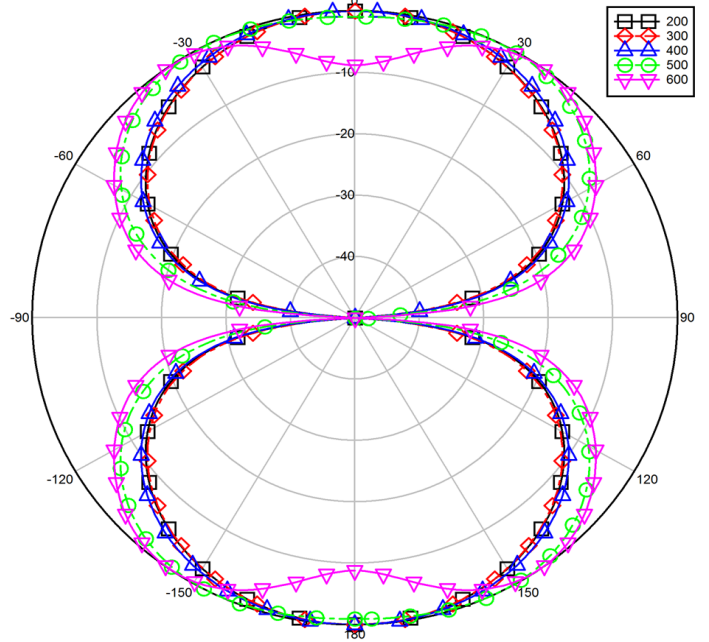


Model 3180D, Cage Elements

3180D E-plane Pattern Birdcage Elements 40 MHz to 100 MHz



3180D E-plane Pattern Birdcage Elements 200 MHz to 600 MHz



3180D E-plane Pattern Birdcage Elements 700 MHz to 1000 MHz

