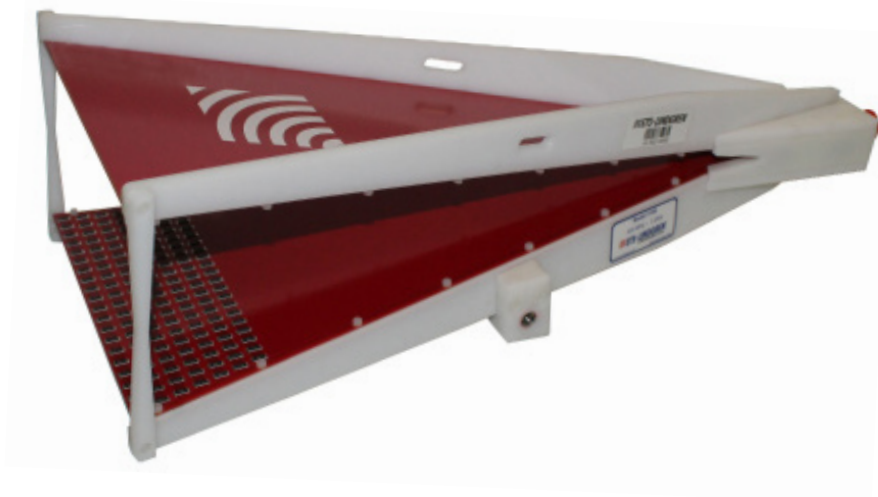


# TEM Horn Antennas

## Models 3166 and 3167

### User Manual





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**Revision Record**  
**MANUAL, 3166 and 3167 | Part # 399387 Rev B**

| <b>Revision</b> | <b>Description</b>   | <b>Date</b>   |
|-----------------|----------------------|---------------|
| A               | Initial Release      | October, 2018 |
| B               | Corrected dimensions | October, 2021 |






# TABLE OF CONTENTS





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|   |           |
|---|-----------|
| <b>NOTES, CAUTIONS, AND WARNINGS</b>                | <b>6</b>  |
| <b>SAFETY INFORMATION</b>                           | <b>6</b>  |
| <b>GENERAL SAFETY CONSIDERATIONS</b>                | <b>6</b>  |
| <b>INTRODUCTION</b>                                 | <b>7</b>  |
| Standard Configuration . . . . .                    | . 7       |
| Tripod . . . . .                                    | . 7       |
| ETS-Lindgren Product Information Bulletin . . . . . | . 7       |
| <b>MAINTENANCE</b>                                  | <b>8</b>  |
| Annual Calibration . . . . .                        | . 8       |
| Replacement and Optional Parts . . . . .            | . 8       |
| Service Procedures . . . . .                        | . 8       |
| <b>SPECIFICATIONS</b>                               | <b>9</b>  |
| 3166 Electrical Specifications . . . . .            | . 9       |
| 3166 Physical Specifications . . . . .              | . 9       |
| 3167 Electrical Specifications . . . . .            | . 9       |
| 3167 Physical Specifications . . . . .              | . 9       |
| <b>MOUNTING INSTRUCTIONS</b>                        | <b>10</b> |
| Using Included Mounting Adapters . . . . .          | 10        |
| 3166 Mounting Adapters. . . . .                     | 10        |
| 3167 Mounting Adapters. . . . .                     | 10        |
| <b>TYPICAL DATA</b>                                 | <b>11</b> |
| 3166 VSWR . . . . .                                 | 11        |
| 3167 VSWR . . . . .                                 | 11        |
| 3166 Forward Power . . . . .                        | 12        |
| 3167 Forward Power . . . . .                        | 12        |
| Field Uniformity . . . . .                          | 13        |
| Minimum Field Uniformity Grid Dimensions . . . . .  | 17        |

## NOTES, CAUTIONS, AND WARNINGS

|   |  |
|---|--|
|  | <p><b>Note:</b> Denotes helpful information intended to provide tips for better use of the product.</p>  |
|  | <p><b>Caution:</b> Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.</p>         |
|  | <p><b>Warning:</b> Denotes a hazard. Failure to follow instructions could result in <b>SEVERE</b> personal injury and/or property damage. Included text gives proper procedures.</p> |


## SAFETY INFORMATION

|   |   |
|---|---|
|    | <p><b>Refer to Manual:</b> When product is marked with this symbol, see the instruction manual for additional information. If the instruction manual has been misplaced, download it from <a href="http://www.ets-lindgren.com">www.ets-lindgren.com</a>, or contact ETS-Lindgren Customer Service.</p> |
|   | <p><b>High Voltage:</b> Indicates presence of hazardous voltage. Unsafe practice could result in severe personal injury or death.</p>   |
|  | <p><b>High Voltage:</b> Indicates presence of hazardous voltage. Unsafe practice could result in severe personal injury or death.</p>   |
|  | <p><b>Protective Earth Ground (Safety Ground):</b> Indicates protective earth terminal. You should provide uninterruptible safety earth ground from the main power source to the product input wiring terminals, power cord, or supplied power cord set.</p>  |



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

## GENERAL SAFETY CONSIDERATIONS

|   |   |
|---|---|
|  | <p>Only qualified personnel should operate (or service) this equipment.</p> |
|---|---|

# INTRODUCTION

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The ETS-Lindgren Model 3166 and 3167 TEM Horn Antennas generate homogeneous fields in the frequency range of 380 MHz to 6 GHz specifically for immunity testing in close proximity as per the IEC/EN 61000-4-39 standard. The 3166 model operates from 380 MHz to 3 GHz with less than 7:1 VSWR from 400 MHz to 700 MHz and 3:1 VSWR from 700 MHz and above. The 3167 operates from 3 GHz to 6 GHz with less than 2:1 VSWR.

## Standard Configuration

### Tripod

The 4-TR tripod is constructed of linen phenolic and delrin, designed with an adjustable center post for precise height adjustments.

|                       |                   |
|-----------------------|-------------------|
| <b>Maximum Height</b> | 2.0 m (80.0 in)   |
| <b>Minimum Height</b> | 94 cm (37.0 in)   |
| <b>Maximum Load</b>   | 11.8 kg (26.0 lb) |



## ETS-Lindgren Product Information Bulletin

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

- Warranty information
- 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 3166 and 3167 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 3166.

| Part Description      | Part Number |
|-----------------------|-------------|
| 4-TR Tripod           | 4-TR        |
| 4-TR Adjustable Mount | 123627      |

Following are the part numbers for ordering replacement or optional parts for the Model 3167.

| Part Description | Part Number |
|------------------|-------------|
| 4-TR Tripod      | 4-TR        |
| Post Mount       | 121268      |

## 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

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## 3166 Electrical Specifications

|                                 |  |
|---------------------------------|--|
| <b>Application</b>              | IEC / EN 61000-4-39                                |
| <b>Frequency Range</b>          | 380 MHz to 3 GHz                                   |
| <b>VSWR</b>                     | 7:1 (400 MHz to 700 MHz)<br>3:1 (700 MHz to 3 GHz) |
| <b>Maximum Continuous Power</b> | 250 W  |
| <b>Impedance (Nominal)</b>      | 50 $\Omega$  |
| <b>Connector</b>                | N type, female                                     |

## 3166 Physical Specifications

|                           |                    |
|---------------------------|--------------------|
| <b>Width</b>              | 21.6 cm (8.5 in)   |
| <b>Depth</b>              | 47.6 cm (18.75 in) |
| <b>Height</b>             | 13.2 cm (5.2 in)   |
| <b>Approximate Weight</b> | 3.6 kg (8 lb)      |

## 3167 Electrical Specifications

|                                 |                     |
|---------------------------------|---------------------|
| <b>Application</b>              | IEC / EN 61000-4-39 |
| <b>Frequency Range</b>          | 3 GHz to 6 GHz      |
| <b>VSWR</b>                     | 2:1                 |
| <b>Maximum Continuous Power</b> | 250 W               |
| <b>Impedance (Nominal)</b>      | 50 $\Omega$         |
| <b>Connector</b>                | N type, female      |

## 3167 Physical Specifications

|                           |                  |
|---------------------------|------------------|
| <b>Width</b>              | 7.9 cm (3.1 in)  |
| <b>Depth</b>              | 17.3 cm (6.8 in) |
| <b>Height</b>             | 6.4 cm (2.5 in)  |
| <b>Approximate Weight</b> | 0.2 kg (0.4 lb)  |

# MOUNTING INSTRUCTIONS

## CAUTION

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

## CAUTION

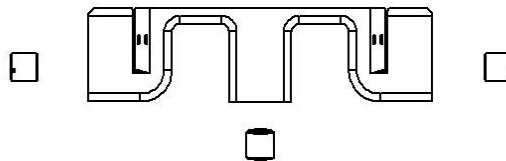
Model 3166 and Model 3167 are precision measurement devices. Handle with care.

## Using Included Mounting Adapters

### 3166 Mounting Adapters

The Model 3166 TEM Horn Antenna ships with this mounting adapter:

- 123627 4-TR Mount, 3166 Retro with 7/8 – 14 thread receptacle
- 105861B 1/4–20 Thread Insert



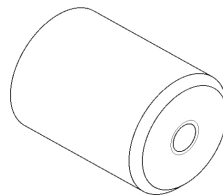
To use this adapter to mount the Model 3166 to a tripod:

1. Located on the bottom of the 4-TR Mount, 3166 Retro is a 7/8 – 14 thread receptacle; if you need to convert to a 1/4 - 20 receptacle, insert the 1/4 - 20 thread insert into the polarizing adapter.
2. Attach the 4-TR Mount, 3166 Retro to tripod.

### 3167 Mounting Adapters

The Model 3167 TEM Horn Antenna ships with 2 post mount adapters attached to the antenna:

- 121268 Post Mount with 1/4 - 20 Thread Receptacle



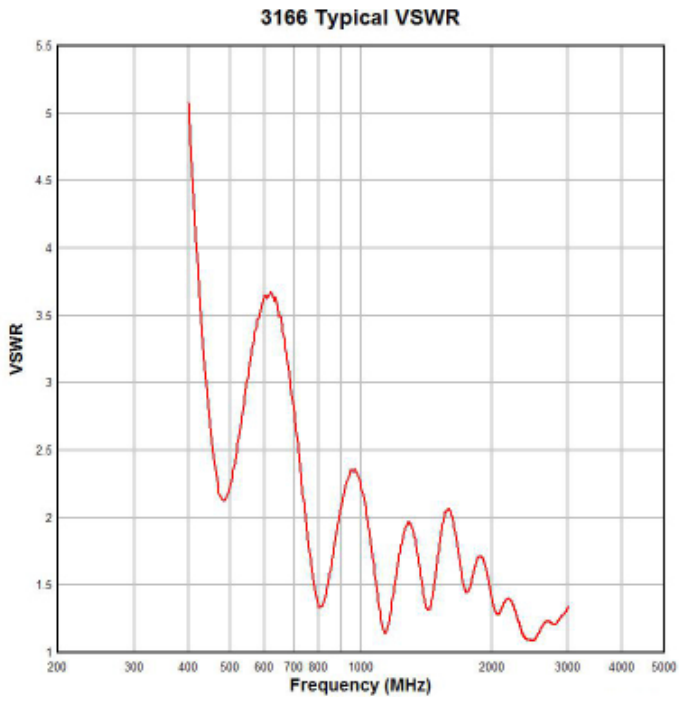
To use this adapter to mount the Model 3167 to a tripod:

1. 1/4 - 20 thread receptacles are located on the ends of each post mount.
2. Attach post mount to tripod.

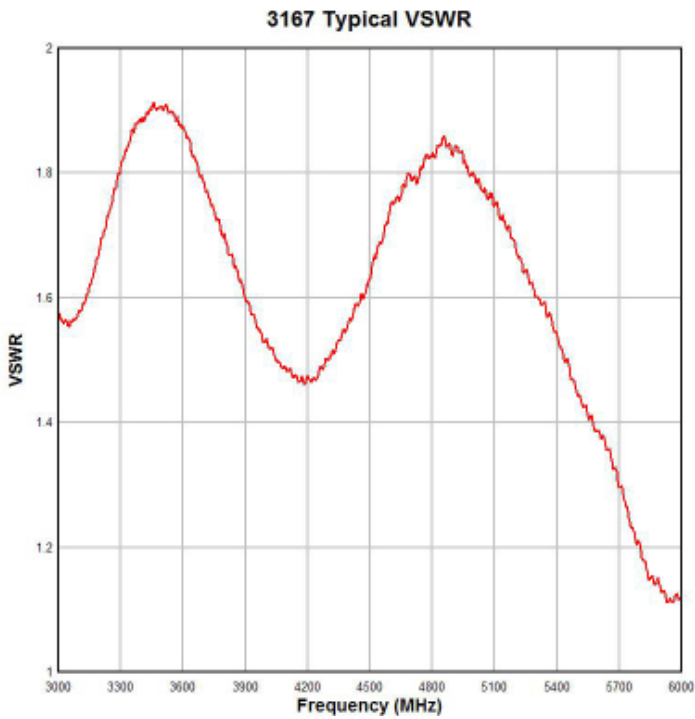
# TYPICAL DATA

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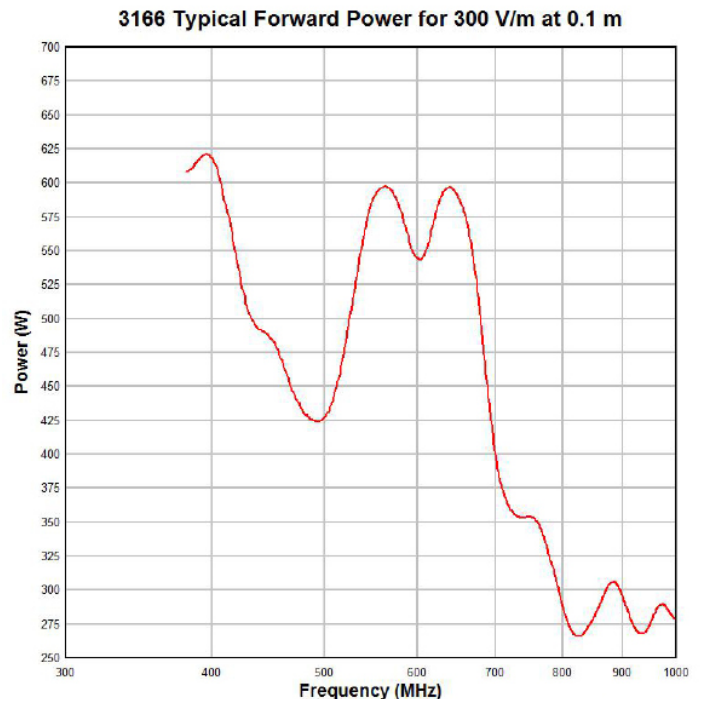
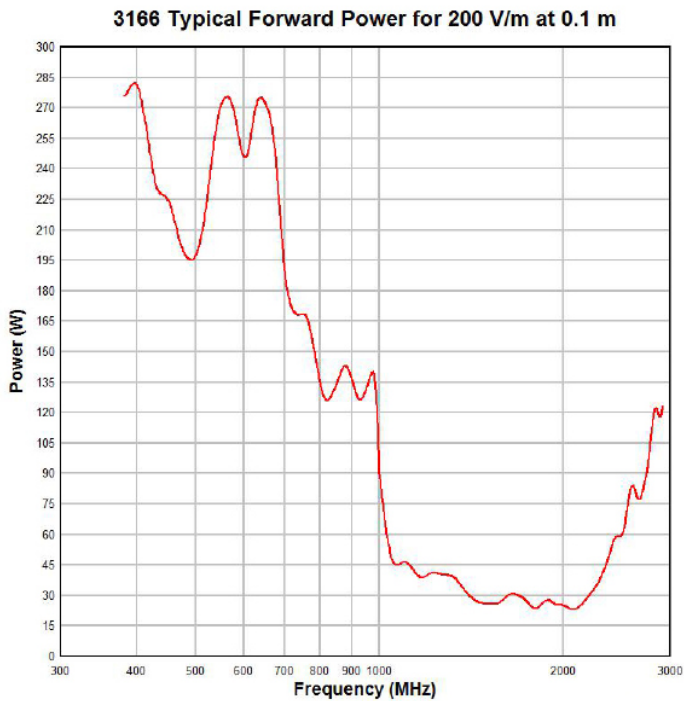
## 3166 VSWR



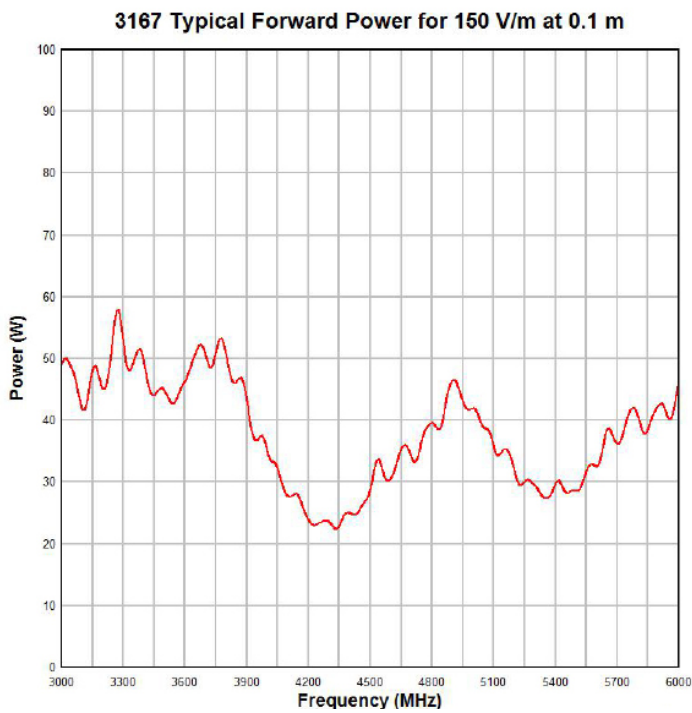
## 3167 VSWR



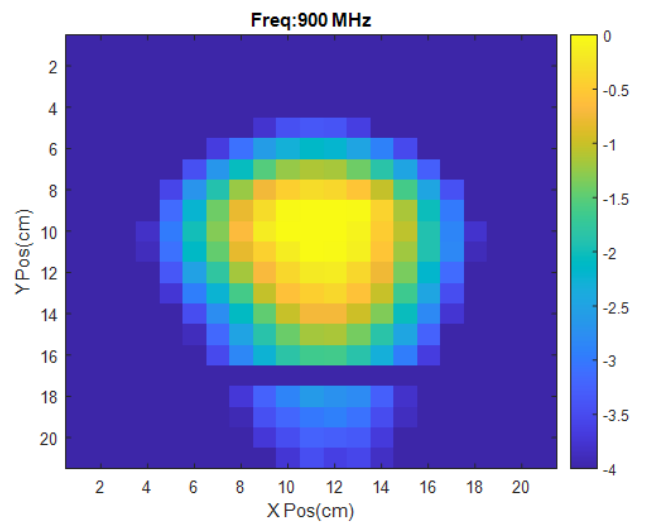
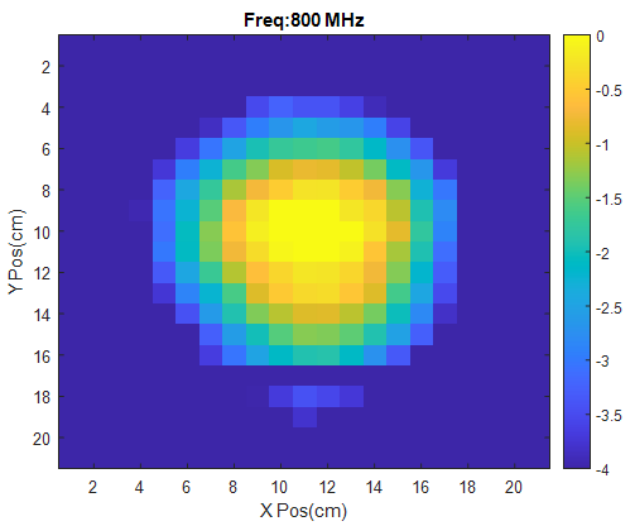
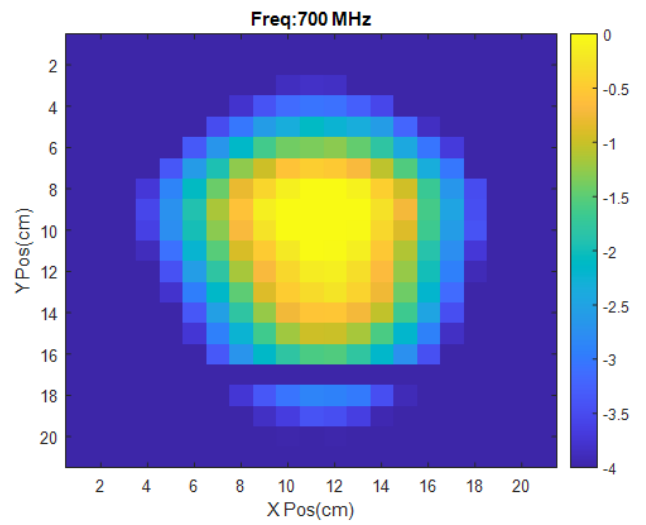
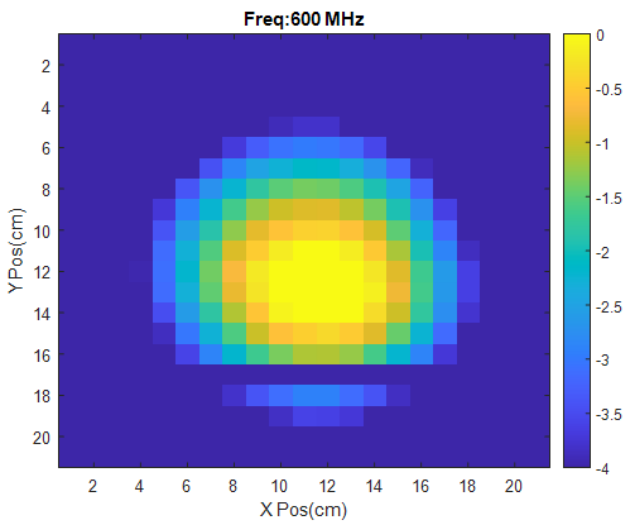
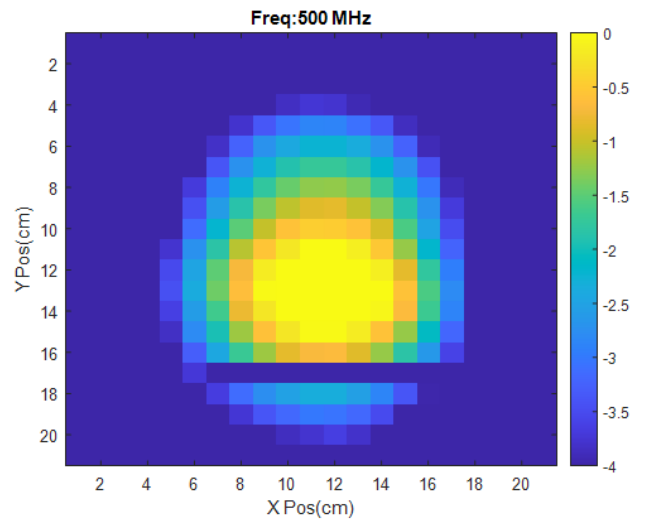
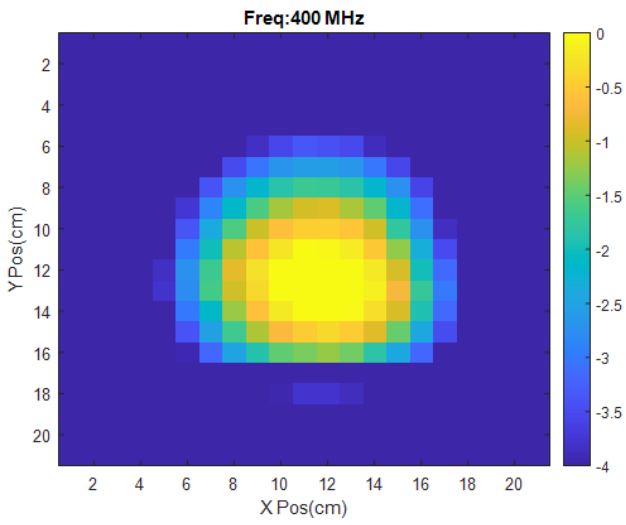
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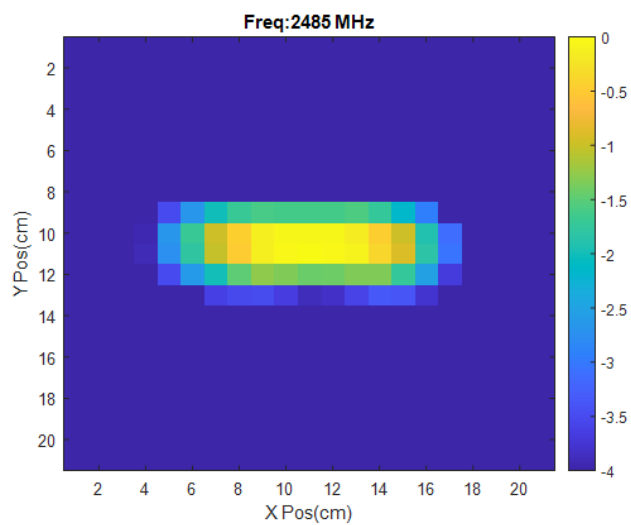
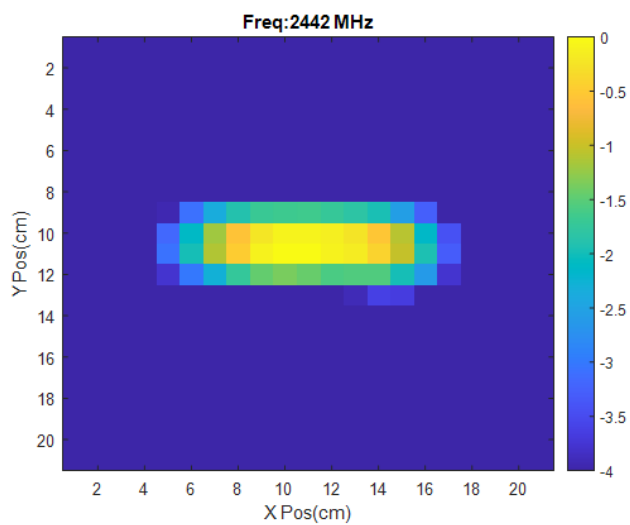
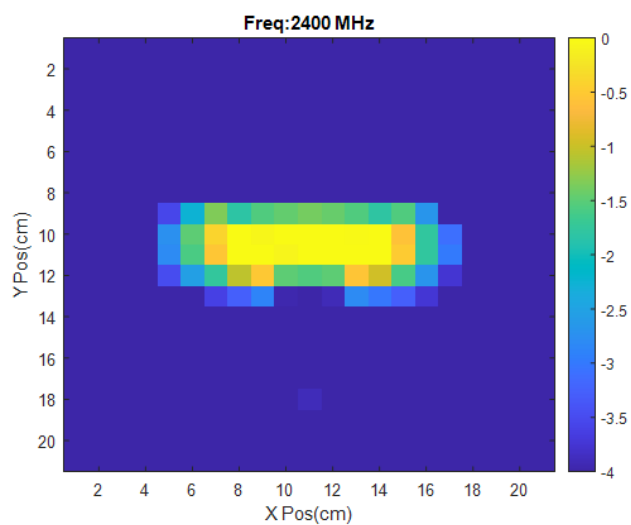
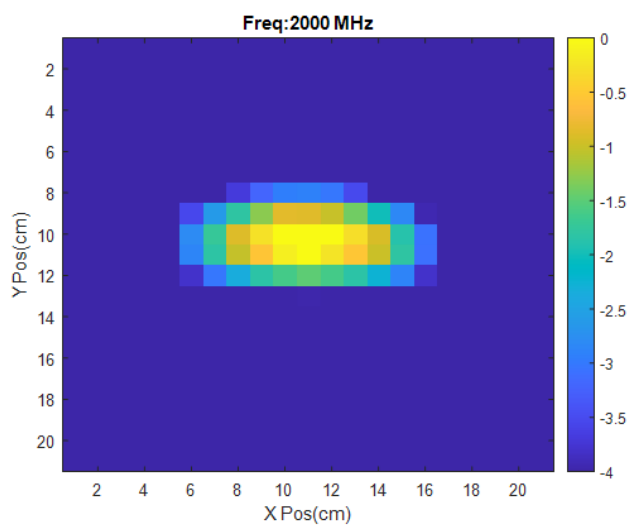
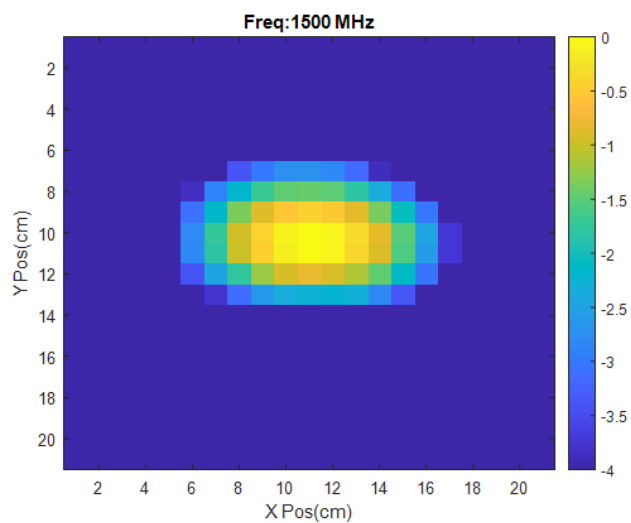
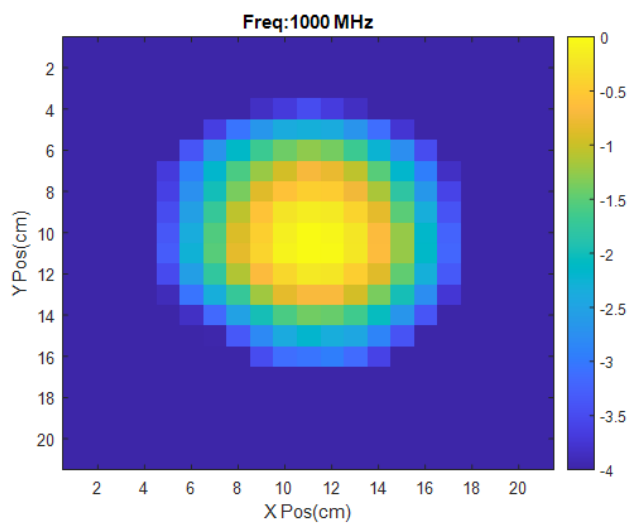


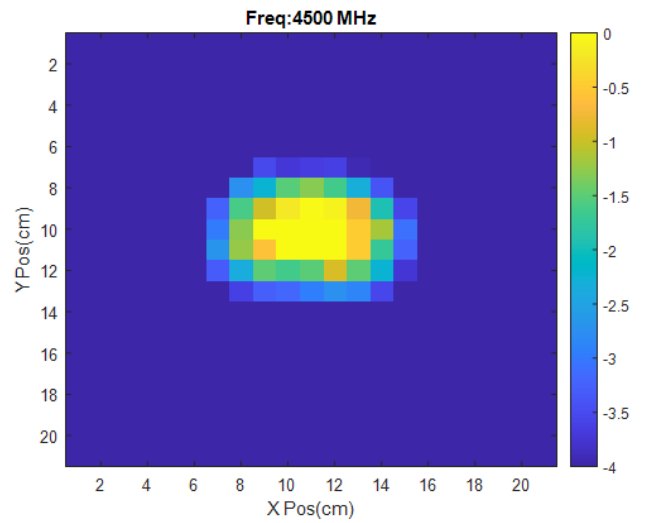
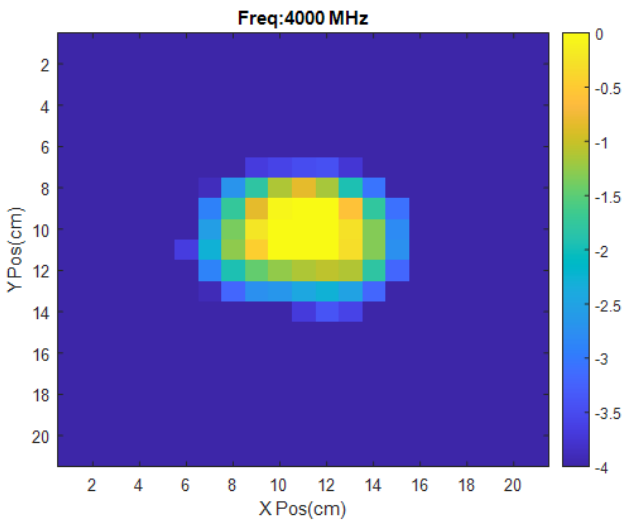
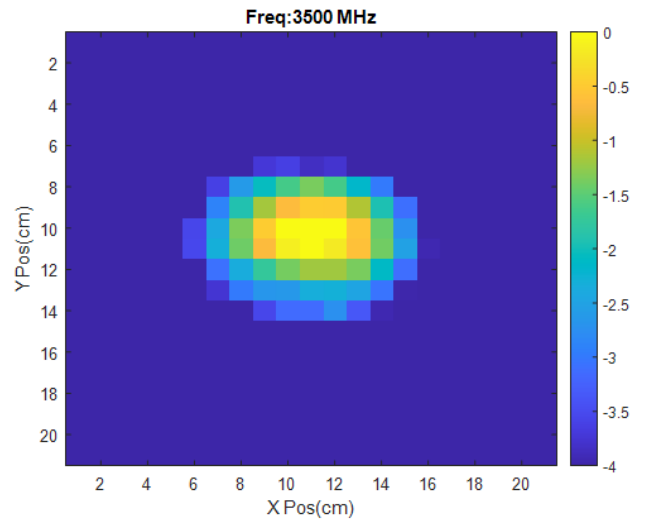
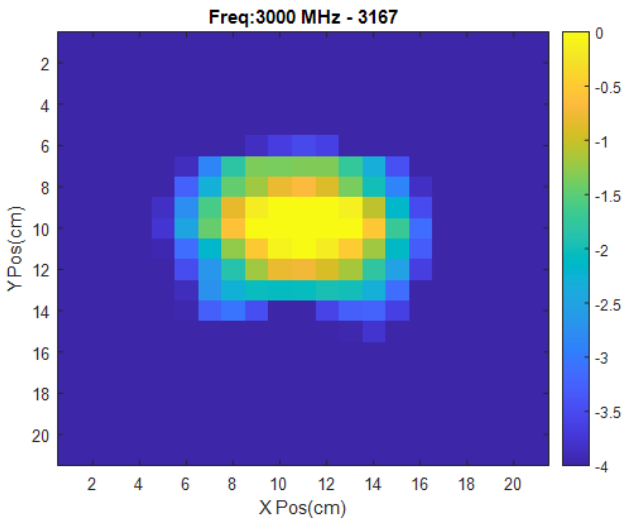
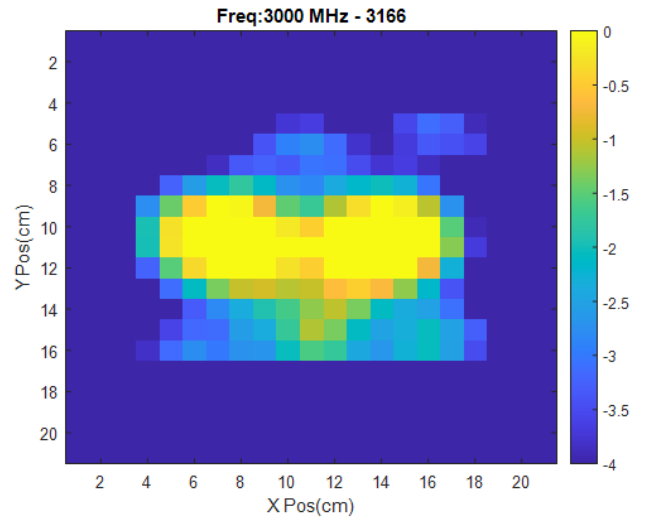
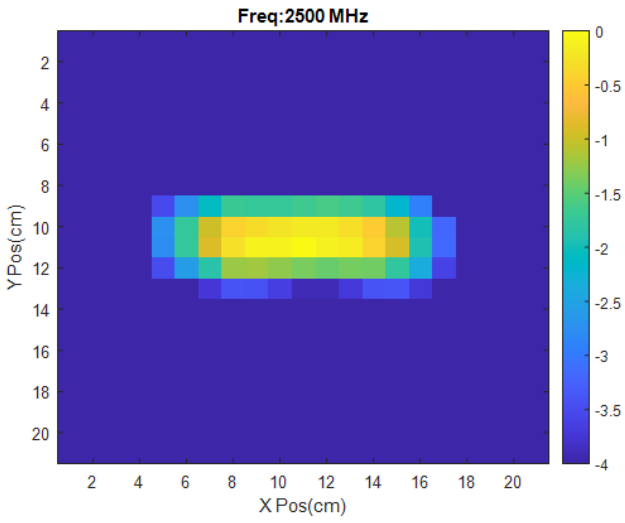
### 3167 Forward Power

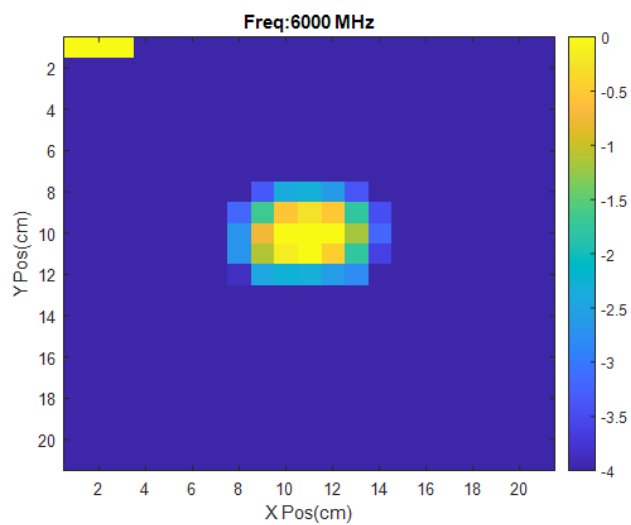
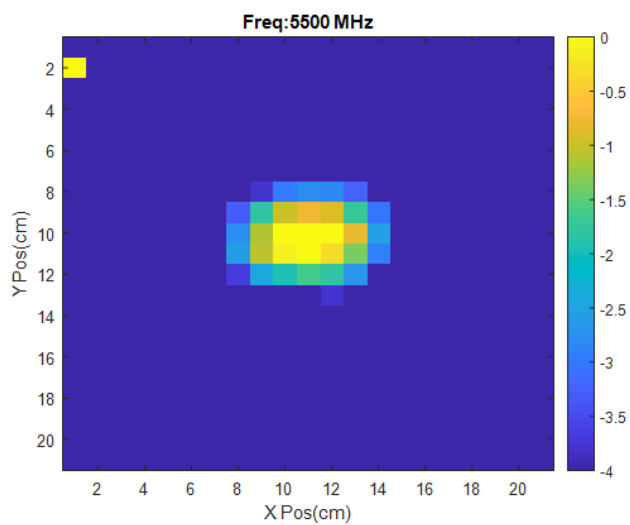
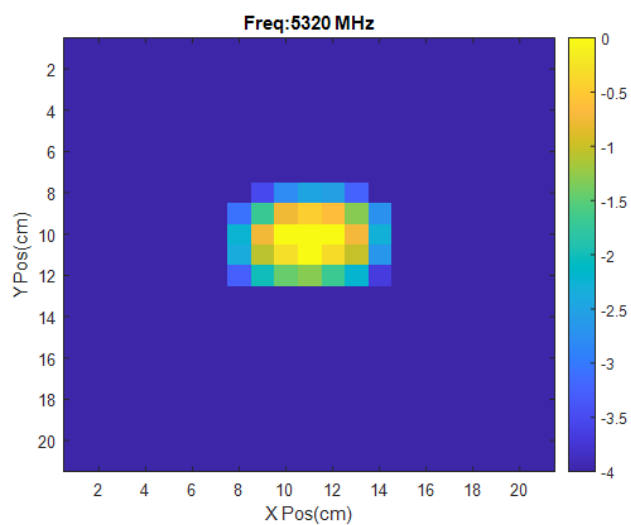
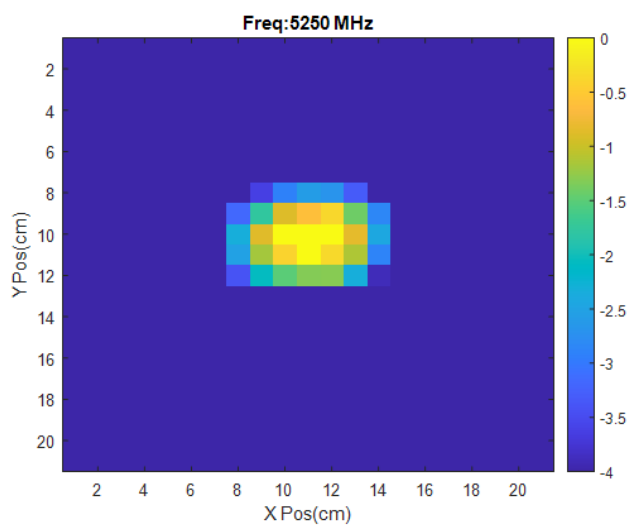
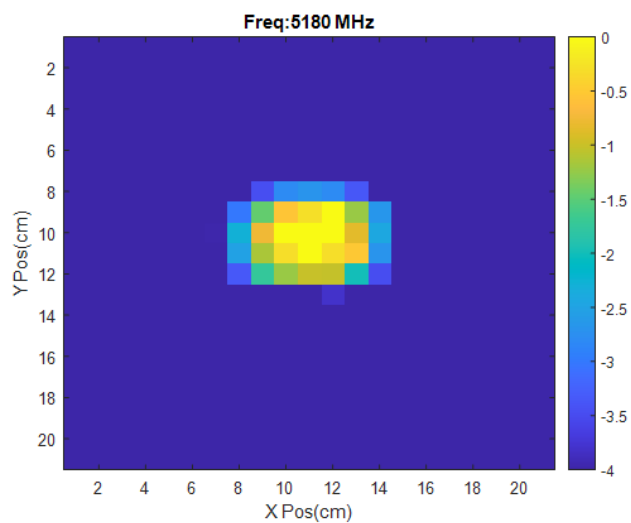
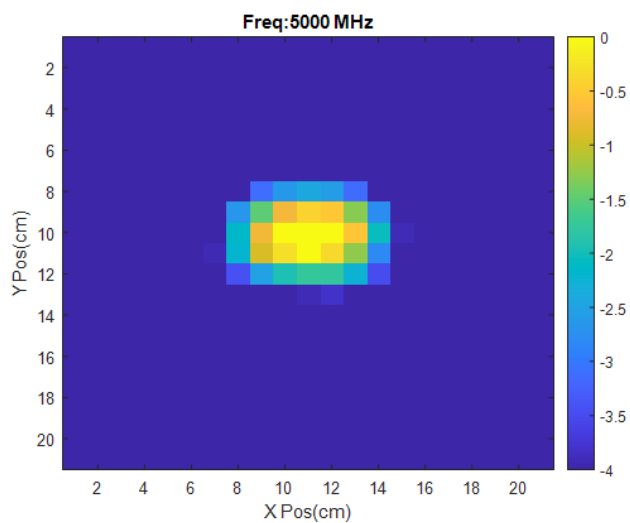


# Field Uniformity











## Minimum Field Uniformity Grid Dimensions

The following table lays out the minimum grid dimensions in x and y directions that will satisfy the -4 dB Field Uniformity requirement as per IEC / EN 61000-4-39 standard.

| Freq (MHz) | X (cm) | Y (cm) |
|------------|--------|--------|
| 400        | 27.5   | 12.5   |
| 500        | 27.5   | 20     |
| 600        | 25     | 20     |
| 700        | 27.5   | 22.5   |
| 800        | 25     | 20     |
| 900        | 25     | 20     |
| 1000       | 25     | 20     |
| 1500       | 22.5   | 10     |
| 2000       | 25     | 7.5    |
| 2400       | 27.5   | 7.5    |
| 2442       | 27.5   | 7.5    |
| 2485       | 27.5   | 7.5    |
| 2500       | 27.5   | 7.5    |
| 3000       | 25     | 20     |
| 3000       | 22.5   | 17.5   |
| 3500       | 20     | 10     |
| 4000       | 17.5   | 12.5   |
| 4500       | 17.5   | 10     |
| 5000       | 15     | 7.5    |
| 5180       | 15     | 7.5    |
| 5250       | 15     | 7.5    |
| 5320       | 15     | 7.5    |
| 5500       | 12.5   | 7.5    |
| 6000       | 12.5   | 7.5    |

