

Model 3164 Series

Diagonal Dual Polarized Horns

User Manual



 **ETS·LINDGREN**™
An ESCO Technologies Company

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Revision Record

MANUAL, DIAG POLARIZED HORN 3164 SERIES | Part #399261, Rev. D




Revision	Description	Date
A	Initial Release	January, 2001
B	Updates / edits	December, 2002
C	Updates / edits	April, 2005
D	Remove 3164-05 content; rebrand	January, 2009

Table of Contents

Notes, Cautions, and Warnings.....	v
1.0 Introduction	7
ETS-Lindgren Product Information Bulletin	8
2.0 Maintenance	9
Annual Calibration	9
Service Procedures	9
3.0 Specifications.....	11
Electrical Specifications	11
Physical Specifications	11
4.0 Mounting the Model 3164 Series	13
Mounting Illustrations for Model 3164-03.....	14
3164-03 Panel/Chamber Wall Mount	14
3164-03 Back View.....	15
Mounting Illustrations for Model 3164-04.....	16
3164-04 Panel/Chamber Wall Mount	16
3164-04 Back View.....	17
5.0 Application	19
6.0 Typical Data.....	21
Model 3164-03 Typical Data.....	21
3164-03 Gain Characteristics	21
3164-03 Cross Polarization Isolation.....	22
3164-03 VSWR Data at the Input Ports.....	23
Model 3164-04 Typical Data.....	24
3164-04 Gain Characteristics	24
3164-04 Cross Polarization Isolation.....	25
3164-04 VSWR Data at the Input Ports.....	26
Appendix A: Warranty	27

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Notes, Cautions, and Warnings

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

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1.0 Introduction

The **ETS-Lindgren Model 3164 Series Diagonal Dual Polarized Horns** include the 3164-03 and 3164-04 antennas. The Model 3164 Series was designed primarily for wireless communications test and measurement applications. Together the Model 3164-03 and Model 3164-04 cover the frequency range of 400 MHz to 6 GHz, with the 3164-03 covering the entire frequency range, and the 3164-04 operating between 700 MHz and 6 GHz.



While intended as receive antennas, the Model 3164 Series also can be used as low power radiators, with a maximum continuous power handling capability of 200 W for the 3164-03, and 10 W for the 3164-04.

The Model 3164 Series are precision machined from aluminum and polycarbonate. Two orthogonally-placed input connectors permit simultaneous measurements for horizontal and vertical polarizations for linearly polarized electromagnetic waves. By using an additional 90-degree hybrid phase shifter, the antennas may be used to transmit or receive circularly polarized electromagnetic waves.

Tests show that the isolation level between the two orthogonal test ports in the specified operating frequency range is better than 25 dB for the 3164-03 and 20 dB for the 3164-04. The port isolation is the limiting factor in the cross-polarization levels of the antenna.

When the Model 3164 Series antennas are installed in a free-space environment such as a rectangular shielded anechoic chamber, the Equipment Under Test (EUT) must be at a test distance meeting the far field requirements to operate either antenna within the full frequency range.

In a quasi free-space test environment such as a tapered anechoic chamber, the Models 3164 Series horns are ideal plane-wave transmit/receive antennas, with the 3164-03 operating in the frequency range of 400 MHz to 2 GHz and the 3164-04 from 700 MHz to 6 GHz. Because the field tapers in the test region may be too high for operational frequencies above 2.5 GHz, consider using the 3164-04 with its smaller cross-sectional profile in the operating frequency range of 700 MHz to 6 GHz.

For mounting information, see *Mounting the Model 3164 Series* on page 13.

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

2.0 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 3164 Series 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.

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.

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3.0 Specifications

Electrical Specifications

	Model 3164-03	Model 3164-04
Frequency Range:	400 MHz–6 GHz	700 MHz–6 GHz
VSWR (Max):	$\leq 3.5:1$	$\leq 3.5:1$
Gain Over Operating Frequency:	5 dBi–12 dBi	3 dBi–12 dBi
Maximum Continuous Power:	200 W	10 W
Impedance (Nominal):	50 Ω	50 Ω
Cross Polarization Isolation:	> 25 dB	> 20 dB
Dual Polarization Symmetry:	± 0.1 dB < 2 GHz ± 0.25 dB 2–6 GHz	± 0.1 dB < 3 GHz ± 0.25 dB 3–6 GHz
Connector:	SMA (2)	SMA (2)

Physical Specifications

	Model 3164-03	Model 3164-04
Height:	33.0 cm 13.0 in	22.3 cm 8.8 in
Width:	33.0 cm 13.0 in	22.3 cm 8.8 in
Depth:	50.8 cm 20.0 in	35.6 cm 14.0 in
Weight:	9.0 kg 20.0 lb	3.9 kg 8.7 lb

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4.0 Mounting the Model 3164 Series

CAUTION

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

CAUTION

The Model 3164 Series antennas are precision measurement devices. Handle your antenna with care.

The Model 3164 Series Diagonal Dual Polarized Horns are designed to mount directly on the shield line of a shielded anechoic chamber. Mounting features include:

- **Circular mounting plate—**
The circular mounting plate is provided as the primary interface to the shielded enclosure mount panel.

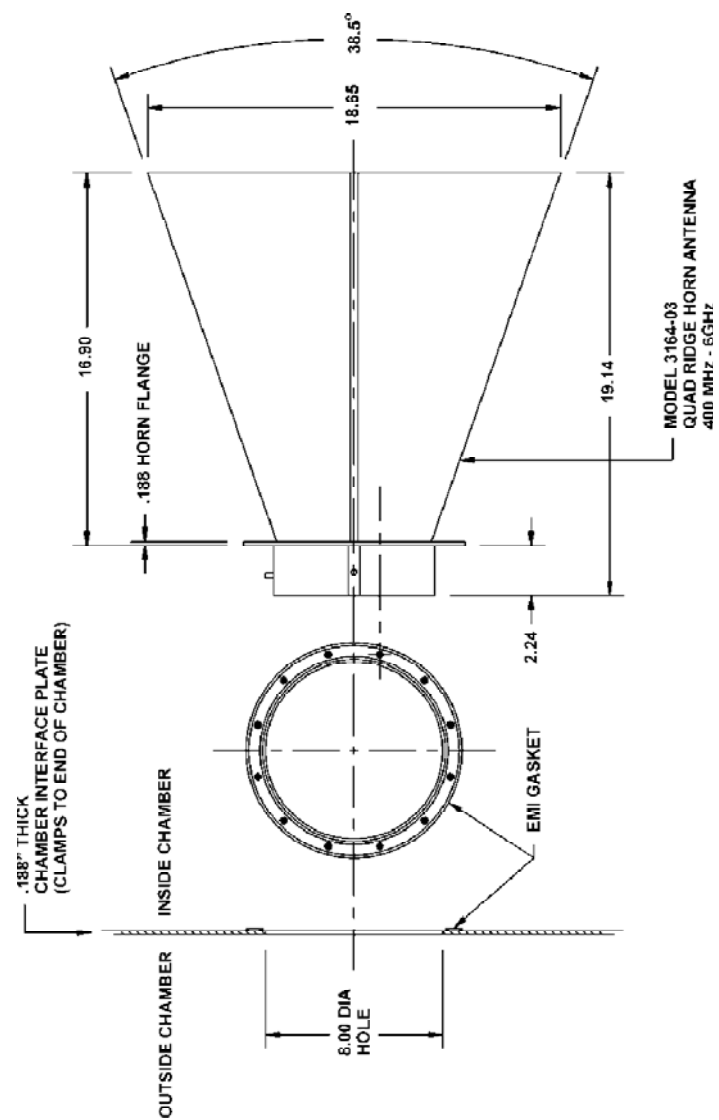


- **Easy access to SMA connectors—**By fastening the mounting plate to the shielded enclosure, the two SMA connectors are on the outside of the enclosure, providing easy access.

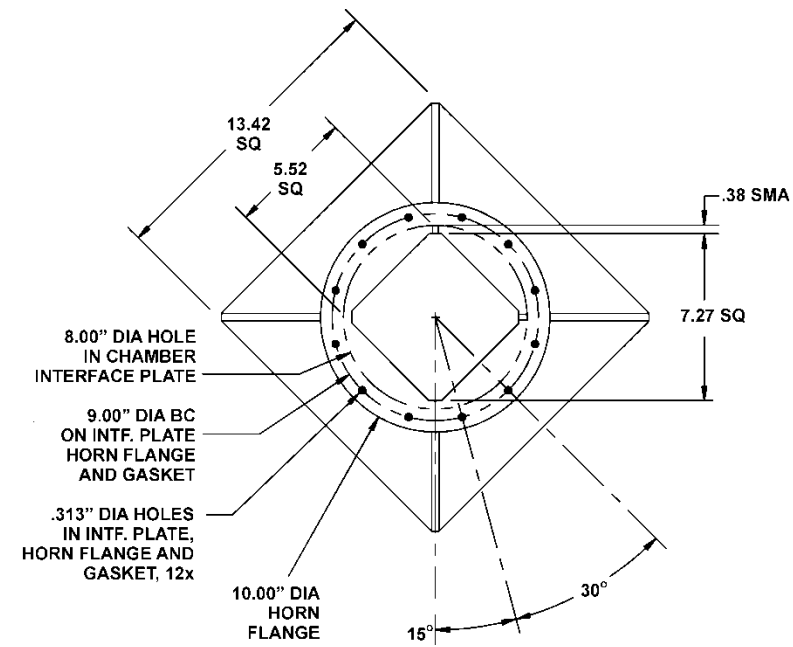
This also places the cables outside the enclosure, reducing the effect of the cables on the measurement.

Mounting Illustrations for Model 3164-03

3164-03 PANEL/CHAMBER WALL MOUNT

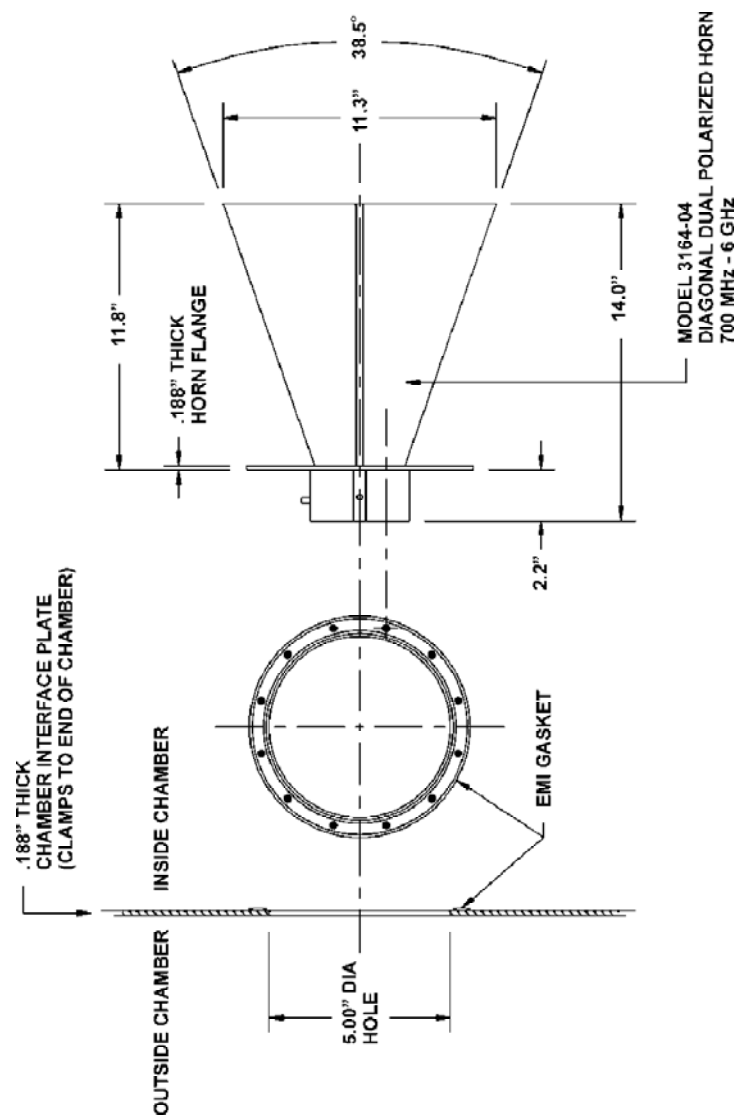


3164-03 BACK VIEW

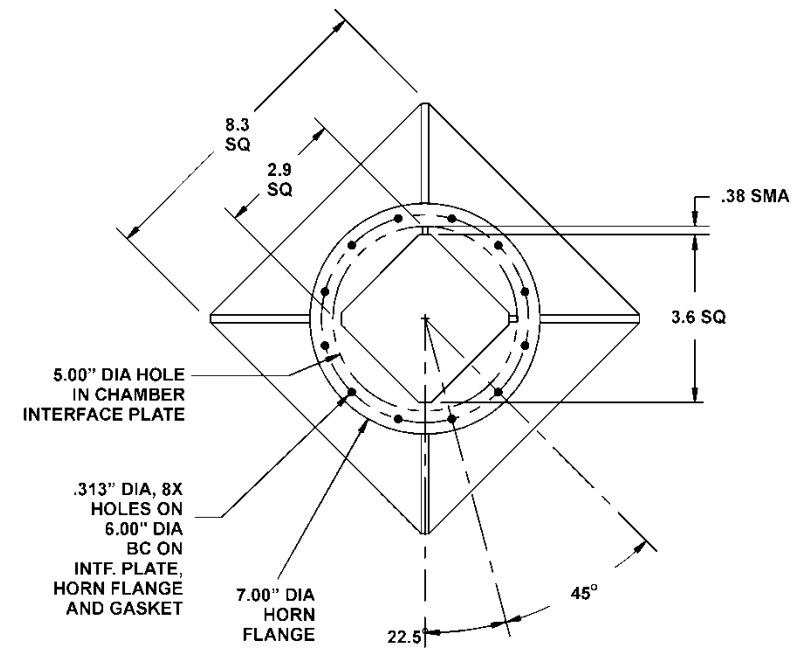


Mounting Illustrations for Model 3164-04

3164-04 PANEL/CHAMBER WALL MOUNT



3164-04 BACK VIEW



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5.0 Application

The Model 3164 Series Diagonal Dual Polarized Horns can be used as transmit or receive antennas for measuring all wireless telecommunications devices, such as cell phones and Internet devices.

When an antenna is configured for receive mode, it can be used to measure far field antenna patterns for the two orthogonal polarizations simultaneously. When an antenna is configured for transmit mode, it can be used to transmit signals from a base station simulator. Many intrinsic RF properties of wireless handsets can be measured at these two configurations. You may also configure the same system to measure the RF interaction between a wireless handset and the operator.

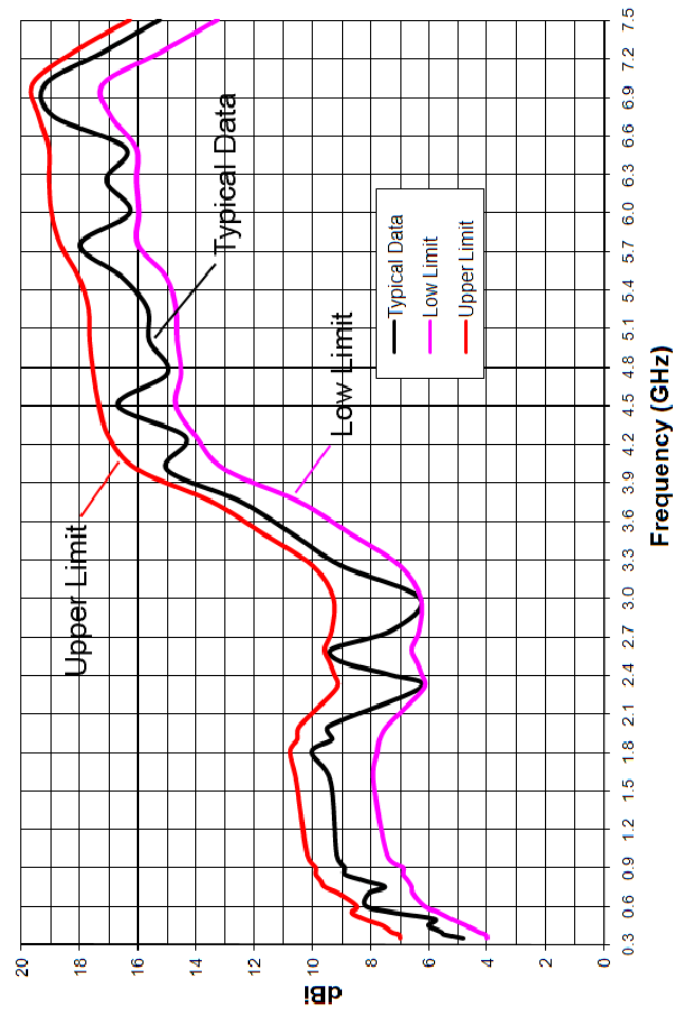
The Model 3164 Series can also be configured to transmit or receive circularly polarized signals for testing antennas or receiving devices for Global Positioning Systems.

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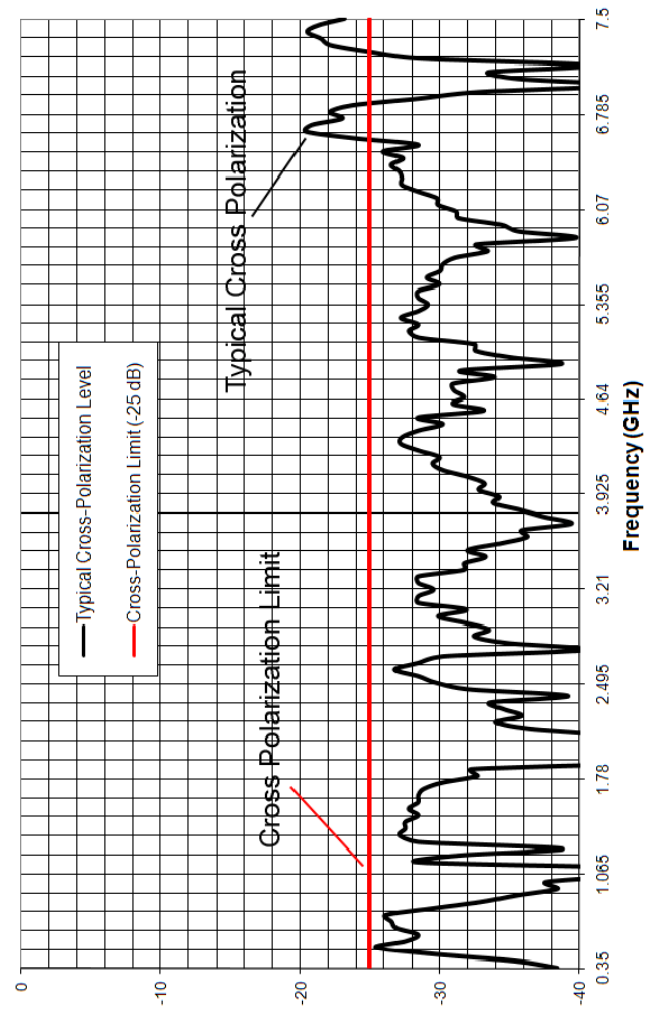
6.0 Typical Data

Model 3164-03 Typical Data

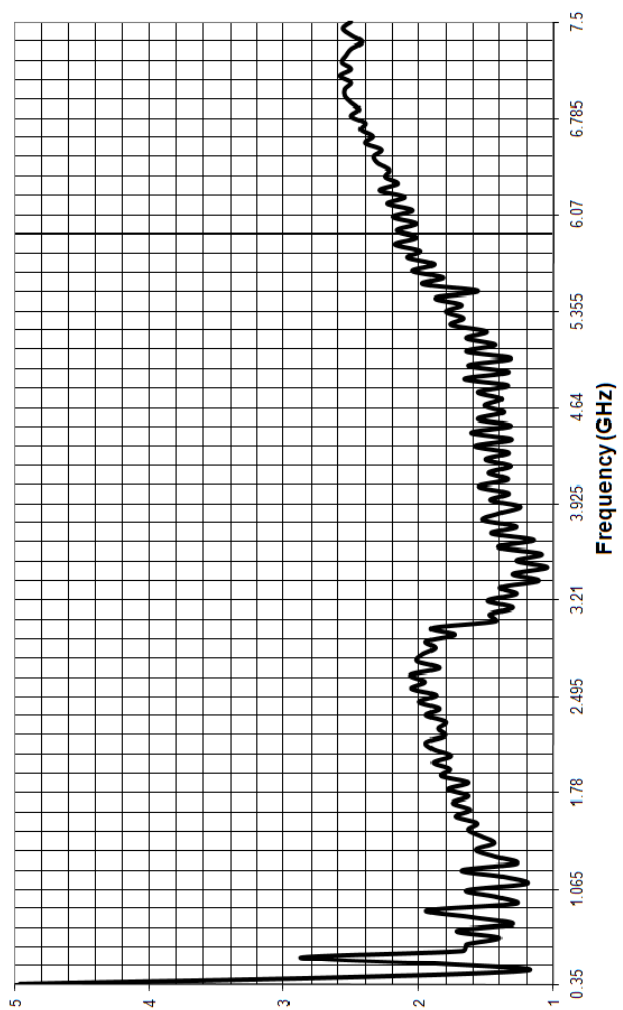
3164-03 GAIN CHARACTERISTICS



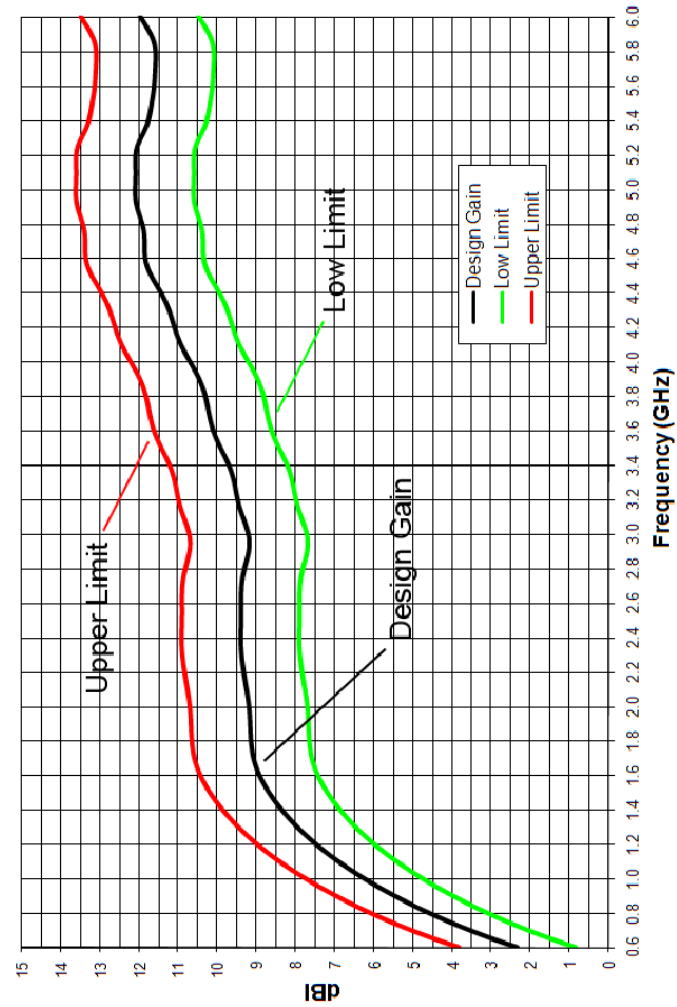
3164-03 CROSS POLARIZATION ISOLATION



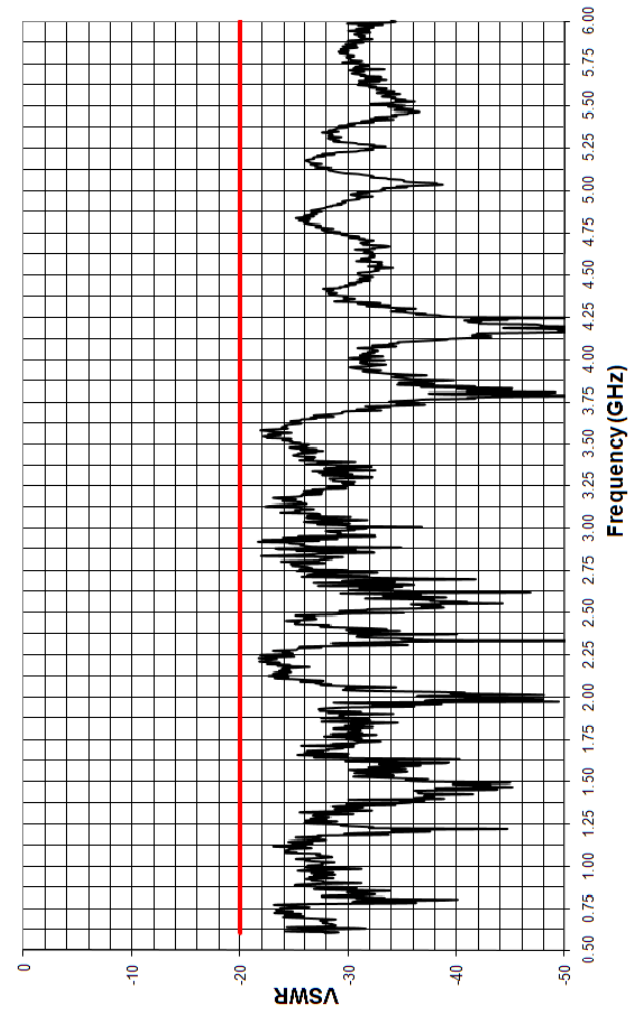
3164-03 VSWR DATA AT THE INPUT PORTS



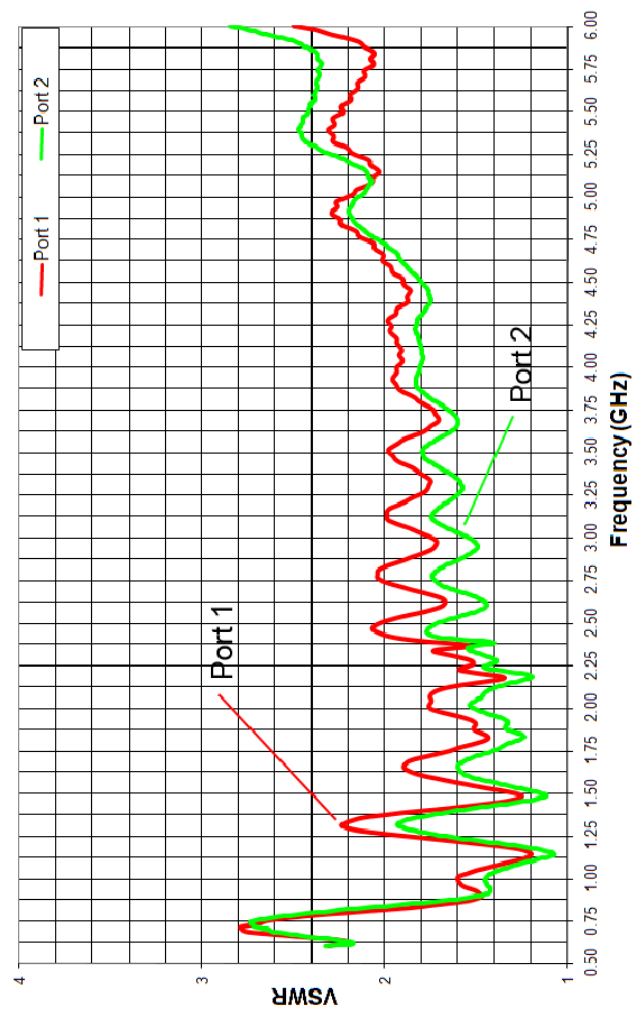
3164-04 GAIN CHARACTERISTICS



3164-04 CROSS POLARIZATION ISOLATION



3164-04 VSWR DATA AT THE INPUT PORTS



Appendix A: Warranty



See the *Product Information Bulletin* included with your shipment for the complete ETS-Lindgren warranty for your Model 3164 Series antennas.

DURATION OF WARRANTIES FOR MODEL 3164 SERIES ANTENNAS

All product warranties, except the warranty of title, and all remedies for warranty failures are limited to two years.

Product Warranted	Duration of Warranty Period
Model 3164 Series Diagonal Dual Polarized Horns: <ul style="list-style-type: none">• 3164-03• 3164-04	2 Years