

# GTECH Theory of Operation

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The GTECH radio module uses a TI CC2530 system-on-chip consisting of a 2.4 GHz IEEE 802.15.4 compliant RF transceiver and a low-power 8051 microcontroller. To improve the link budget, a TI CC2591 RF front end is used. The CC2591 consists of a power amplifier (PA), low noise amplifier (LNA), switches and balun.

The radio's frequency stability is controlled by a 32.000 MHz crystal and the microcontroller timing is controlled by a 32.768 kHz crystal. Through the PA/LNA Control lines, the PA is enabled (LNA disabled) in transmit mode and the LNA is enabled (PA disabled) in receive mode. In addition, the microcontroller also controls whether the on-board chip antenna or an external antenna is selected.

Both a pushbutton and a status indicator are used to facilitate pairing or associating the transceiver with another transceiver on the same network. Power is intended to be supplied from a host board and there also exists a set of input/output lines that provide a microcontroller interface to a host board.

## 2.4 GHz – 2.5 GHz Dipole 2dBi Antenna for Reverse Polarity SMA



### ORDERING INFORMATION

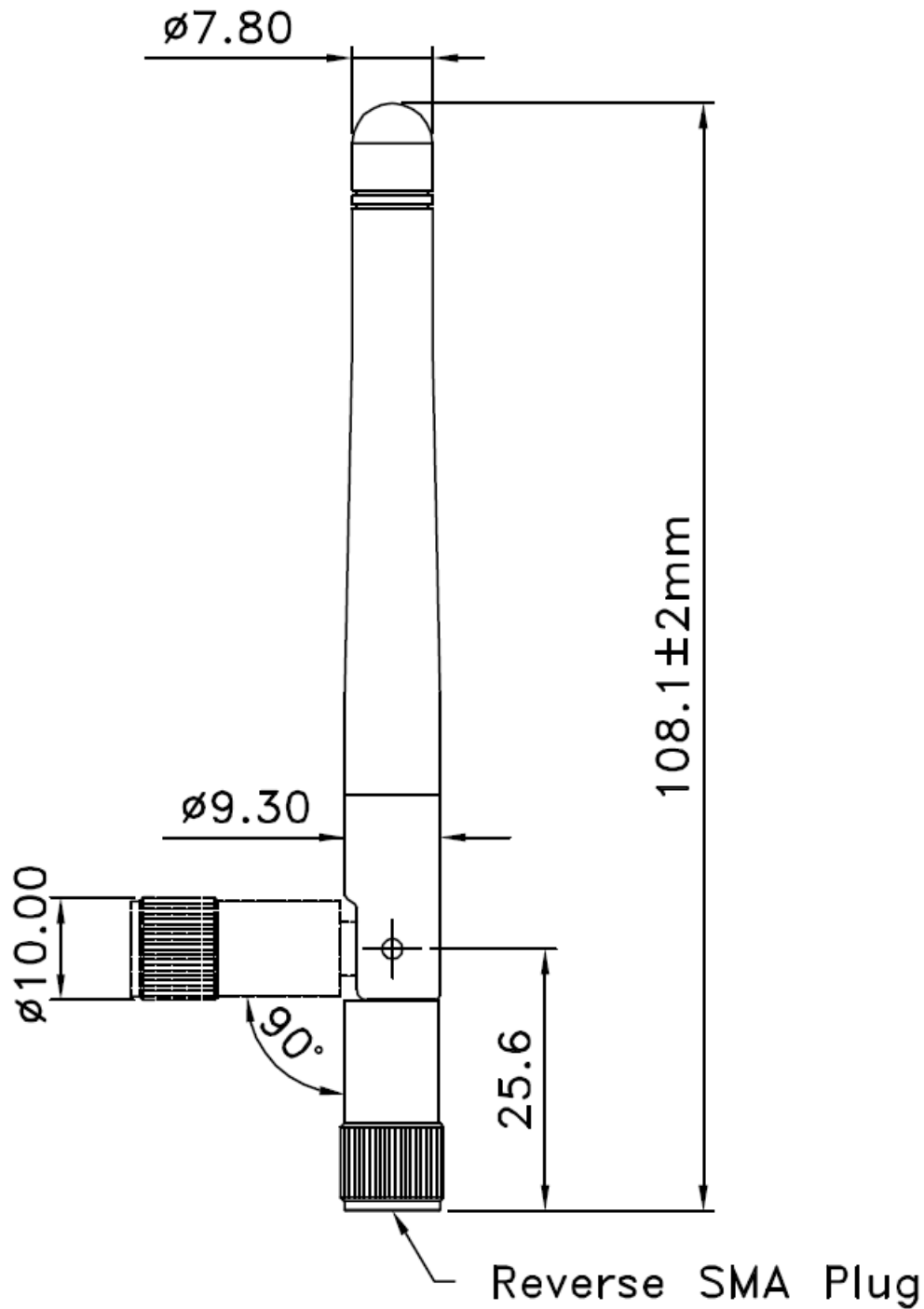
Order Number	Description
001-0001	2.4 GHz dipole antenna for reverse polarity SMA connector.

### SPECIFICATIONS

Specification	Value
Gain	+2 dBi
Impedance	50 ohms, Nominal
Type	Dipole
Polarization	Linear Vertical
VSWR	≤2.5 : 1, Maximum
Frequency	2400-2500MHz
Weight	13g
Size	105x10 mm
Antenna Color	Black

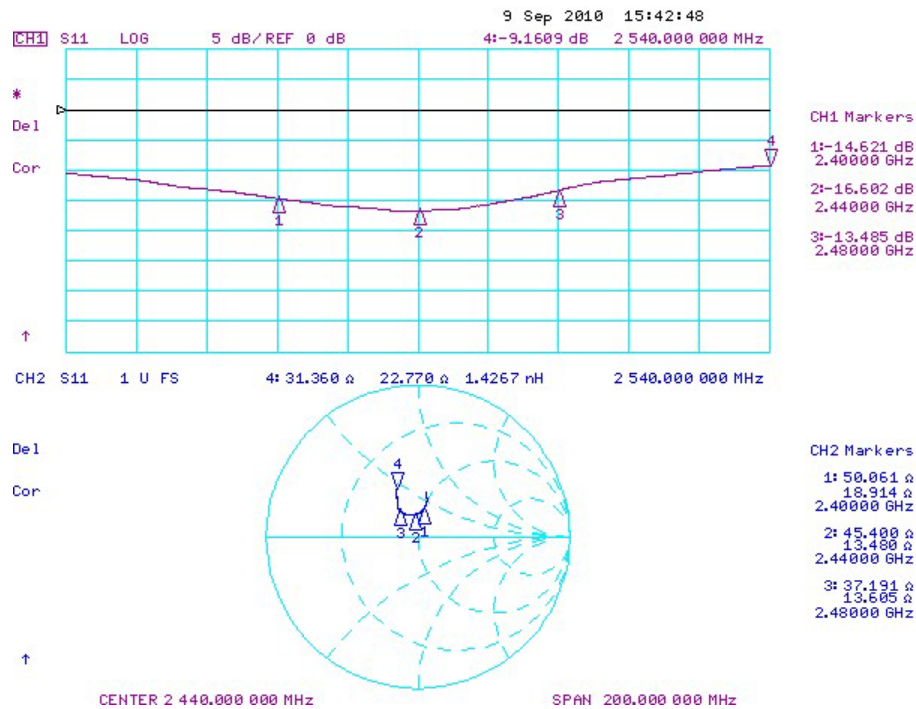
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**PHYSICAL DIMENSIONS (MM)**

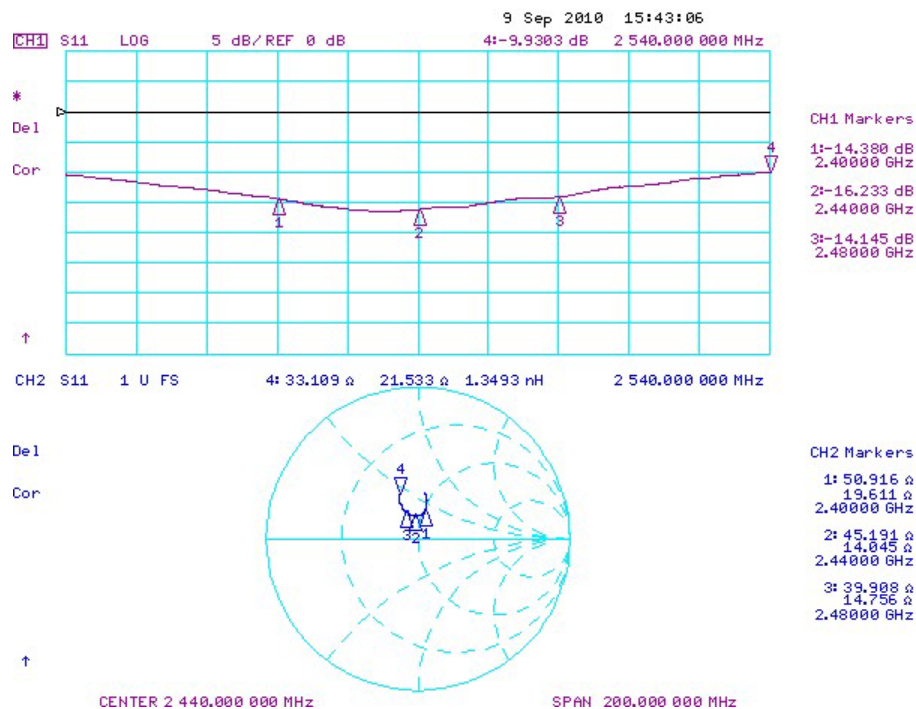


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**TYPICAL ANTENNA REFLECTION PERFORMANCE**



**Figure 1 Reflection Parameters for Extended Configuration (S11)**

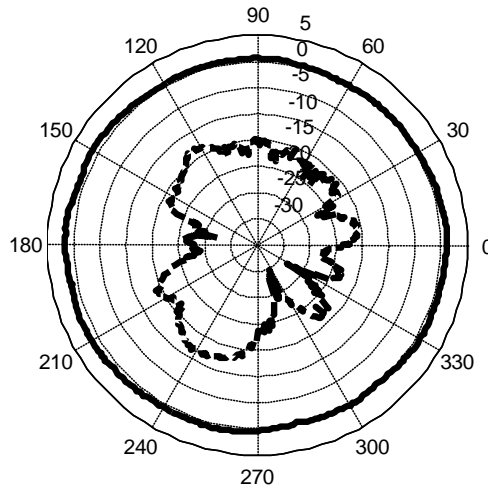


**Figure 2 Reflection Parameters for Folded Configuration (S11)**

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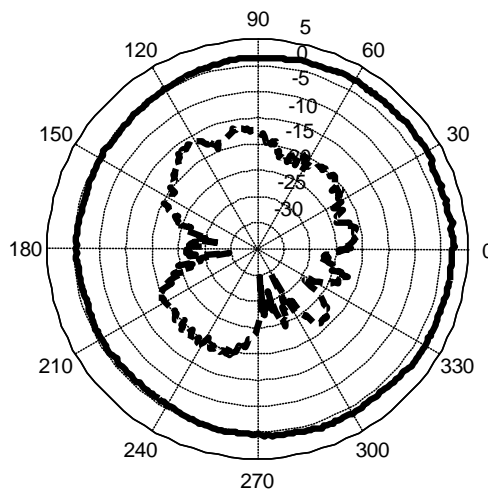
**TYPICAL ANTENNA RADIATION PERFORMANCE**

**LSR ANTENNA STRAIGHT 2405 MHz**



— Vertical Polarization Gain (dBi)  
----- Horizontal Polarization Gain (dBi)

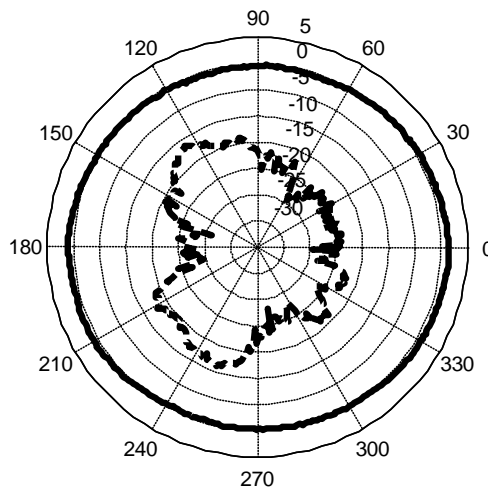
**LSR ANTENNA STRAIGHT 2440 MHz**



— Vertical Polarization Gain (dBi)  
----- Horizontal Polarization Gain (dBi)

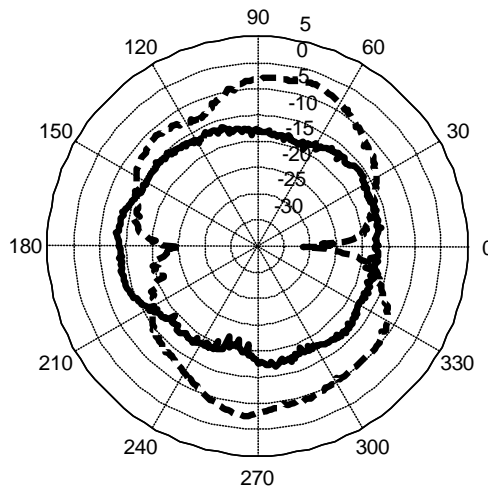
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**LSR ANTENNA STRAIGHT 2480 MHZ**



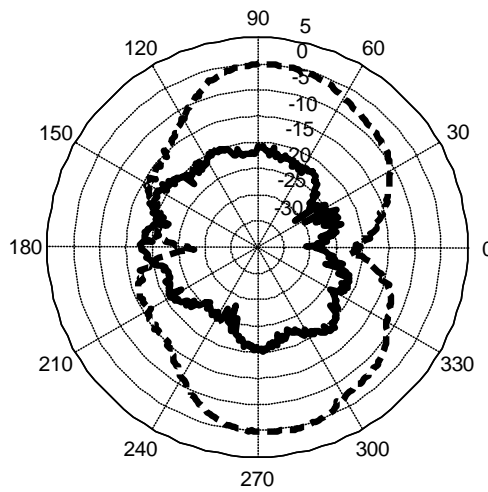
\_\_\_\_ Vertical Polarization Gain (dBi)  
----- Horizontal Polarization Gain (dBi)

**LSR ANTENNA BENT 2405 MHZ**



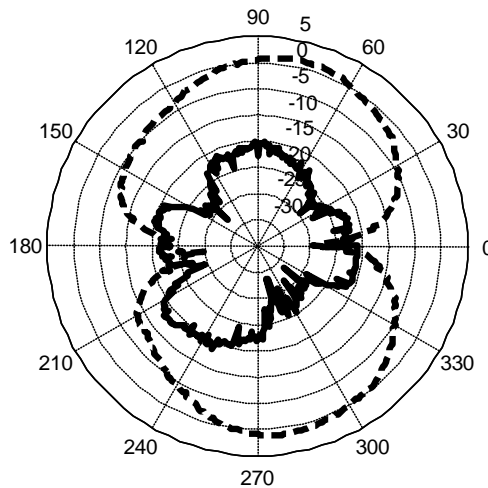
\_\_\_\_ Vertical Polarization Gain (dBi)  
----- Horizontal Polarization Gain (dBi)

### LSR ANTENNA BENT 2440 MHz



\_\_\_\_ Vertical Polarization Gain (dBi)  
----- Horizontal Polarization Gain (dBi)

### LSR ANTENNA BENT 2480 MHz



\_\_\_\_ Vertical Polarization Gain (dBi)  
----- Horizontal Polarization Gain (dBi)

## CONTACTING LS RESEARCH

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# "High Frequency Ceramic Solutions"

## 2.45 GHz Antenna

P/N 2450AT18A100

Detail Specification: 09/03/03

Page 1 of 3

### General Specifications

Part Number	2450AT18A100
Frequency Range	2400 - 2500 Mhz
Peak Gain	0.5 dBi typ. (XZ-V)
Average Gain	-0.5 dBi typ. (XZ-V)
Return Loss	9.5 dB min.

Input Power	500mW max.
Impedance	50 Ω
Operating Temperature	-40 to +85°C
Reel Quantity	3,000

No.	Function	Terminal Configuration
1	Feeding Point	
2	NC	

### Mechanical Dimensions

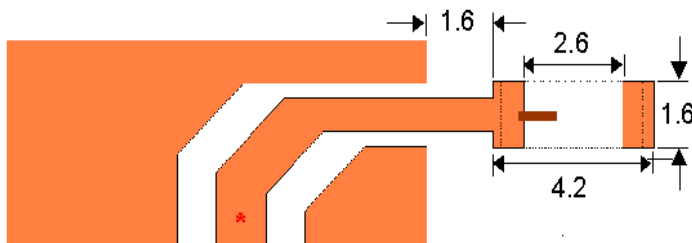
	In	mm
L	0.126 ± 0.008	3.20 ± 0.20
W	0.063 ± 0.008	1.60 ± 0.20
T	0.051 +.004/-.008	1.30 +0.1/-0.2
a	0.020 ± 0.012	0.50 ± 0.30

### Mounting Considerations

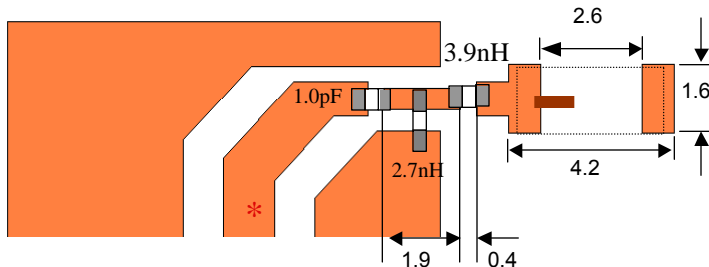
Mount these devices with brown mark facing up. Units: mm

Line width should be designed to provide 50Ω impedance matching characteristics.

#### a) Without Matching Circuits



#### b) With Matching Circuits



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# "High Frequency Ceramic Solutions"

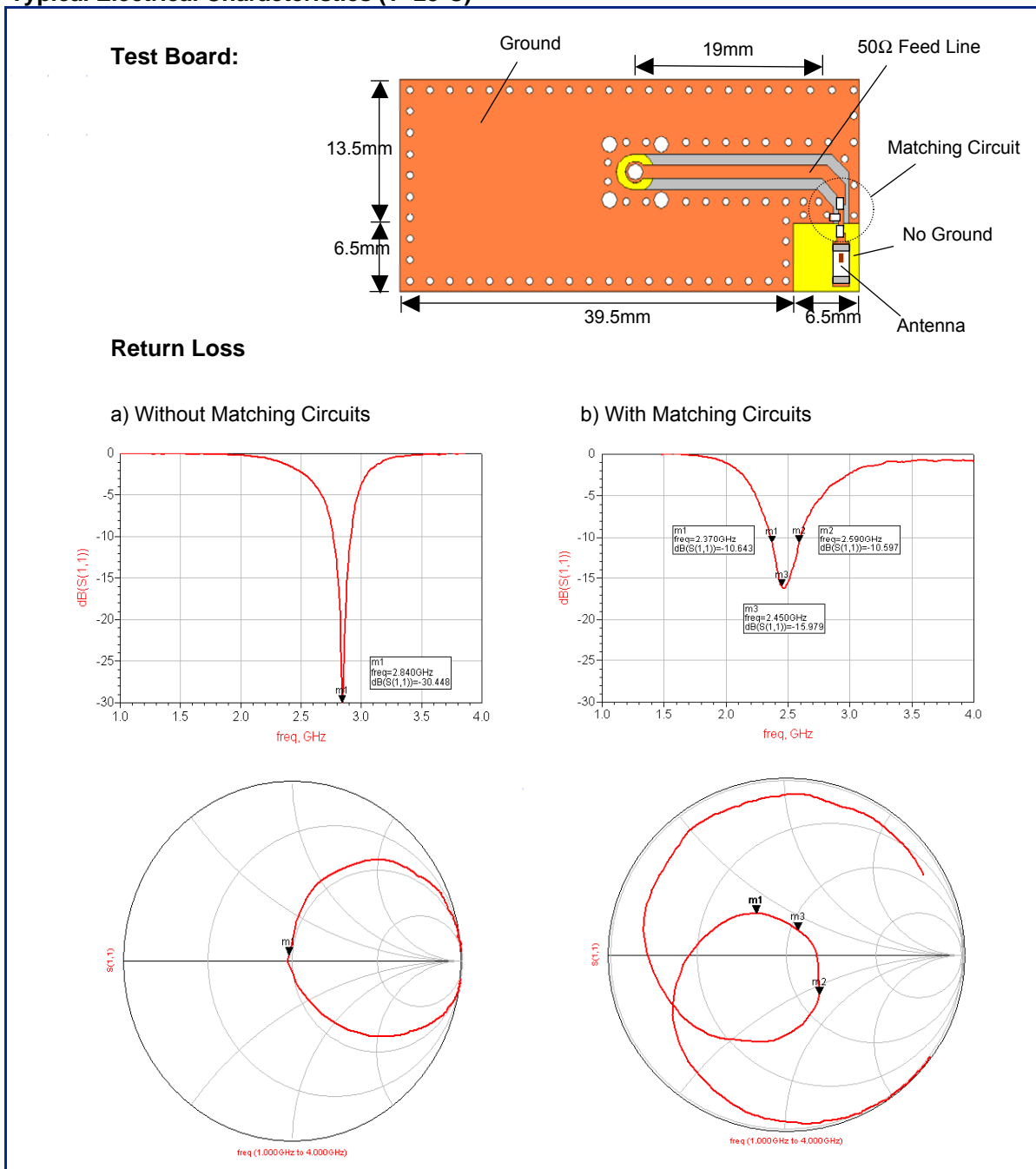
## 2.45 GHz Antenna

P/N 2450AT18A100

Detail Specification: 09/03/03

Page 2 of 3

### Typical Electrical Characteristics (T=25°C)



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# "High Frequency Ceramic Solutions"

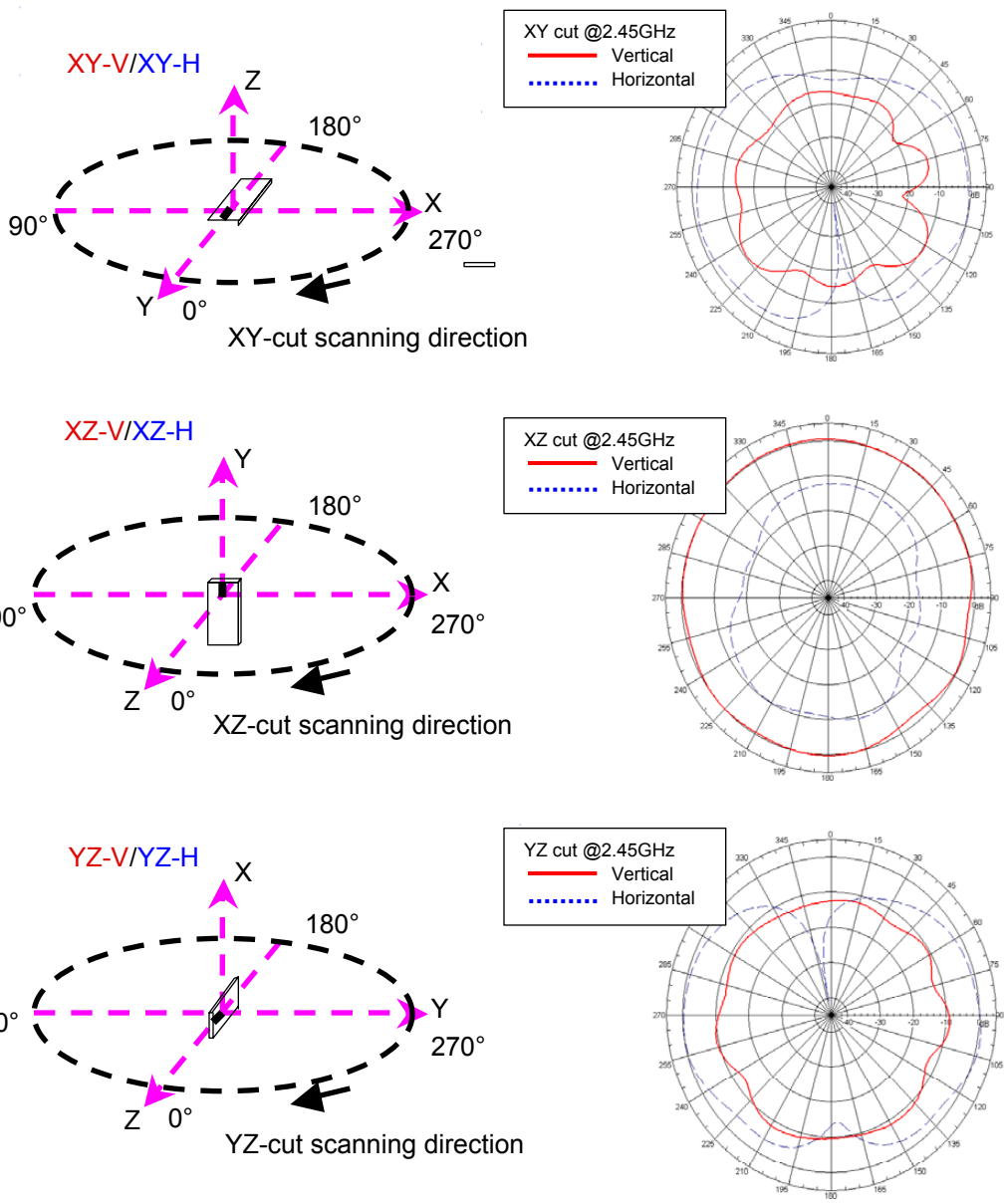
**2.45 GHz Antenna**

**P/N 2450AT18A100**

Detail Specification: 09/03/03

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## Typical Radiation Patterns



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