

Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000



Features

- Multipurpose for various frequencies
- Omni directional radiation
- Low profile
- Compact size W x L x H (7 x 1.6 x 1.6 mm)
- Low weight (86 mg)
- Lead free materials
- Fully SMD compatible
- Lead free soldering compatible
- Tape and reel packing
- RoHS compliant product

Applications

- Bluetooth, WLAN, WiFi
- IEEE 802.11b/g
- ZigBee IEEE 802.15.4
- 2.4 GHz WLAN
- 2.4 GHz ISM Band System
- 868 MHz ISM Band Systems
- GPS 1.575 GHz

Electrical specifications @ +25 °C

Note: Electrical characteristics depend on test board (GP) size and antenna positioning on GP and ground clearance area size. Matching and tuning circuit component values are case depended.

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Monopole 1.575 GHz

Typical performance

Board	Frequency Range [MHz]	Avg Gain [dBi]	Max Gain [dBi]	Efficiency [%] / [dB]	Return loss min. [dB]	Impedance [Ω]	Operating Temperature [° C]
Case #1 11x40mm	1565 – 1585	-3.5 (Peak) -3.9 (Band edges)	0.1 (Peak) -0.2 (Band edges)	50/-3 (Peak) 45/-3.5 (Band edges)	-12	50	-40 to +85
Case #2 20x30mm		-3.9 (Peak) -4.1 (Band edges)	0.3 (Peak) 0 (Band edges)	50/-3 (Peak) 45/-3.5 (Band edges)	-15		
Case #3 37x80mm		-2.7 (Peak) -2.9 (Band edges)	2.0 (Peak) 1.7 (Band edges)	70/-1.55 (Peak) 65/-1.9 (Band edges)	-18		

Monopole 2.4 GHz

Typical performance

Board	Frequency Range [MHz]	Avg Gain [dBi]	Max Gain [dBi]	Efficiency [%] / [dB]	Return loss min. [dB]	Impedance [Ω]	Operating Temperature [° C]
Case #1 11x40mm	2400 – 2483.5	-4.1 (Peak) -3.7 (Band edges)	1.4 (Peak) 1.9 (Band edges)	65/-0.3 (Peak) 55/-0.6 (Band edges)	-18	50	-40 to +85
Case #2 20x30mm		-4.0 (Peak) -4.3 (Band edges)	2.2 (Peak) 1.5 (Band edges)	52/-2.9 (Peak) 46/-3.4 (Band edges)	-12		

ISM 868 MHz

Typical performance

Board	Frequency Range [MHz]	Avg Gain [dBi]	Max Gain [dBi]	Efficiency [%] / [dB]	Return loss min. [dB]	Impedance [Ω]	Operating Temperature [° C]
Case #1 20x40mm Vertical	858 – 878	-6.5 (Peak) -7 (Band edges)	-1.8 (Peak) -2.5 (Band edges)	29/-5.4 (Peak) 25/-6 (Band edges)	-10	50	-40 to +85
Case #2 20x40mm Horizontal		-6.5 (Peak) -6.8 (Band edges)	-1.4 (Peak) -2 (Band edges)	30/-5.3 (Peak) 28/-5.55 (Band edges)			

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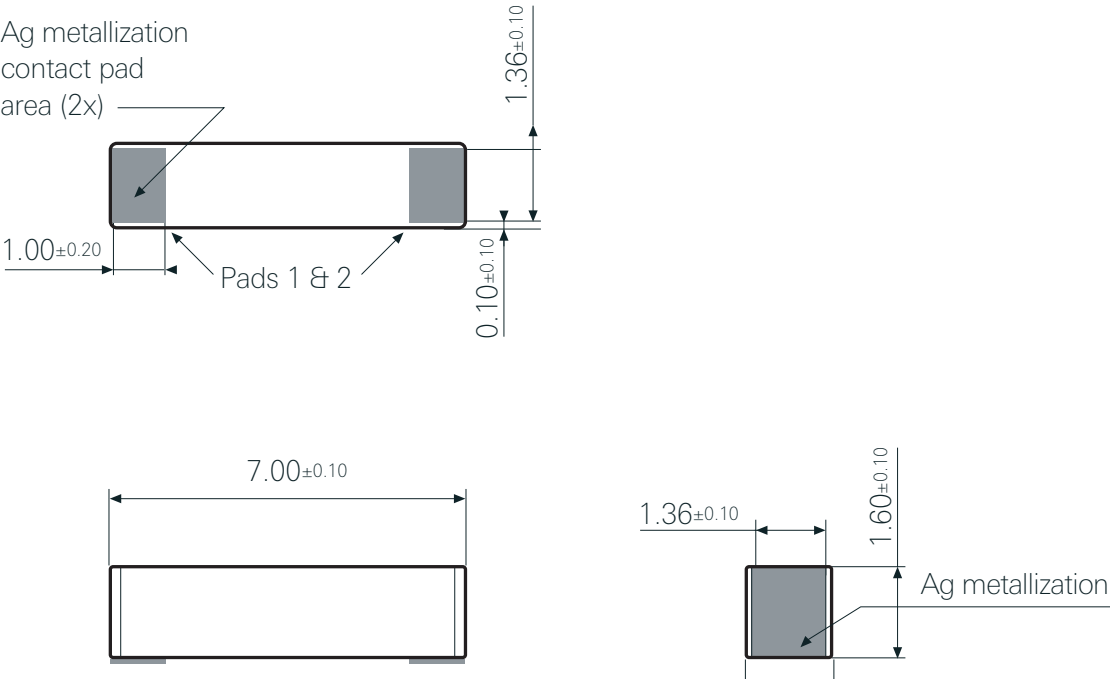
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Terminal Configuration and Dimensions



Antenna features

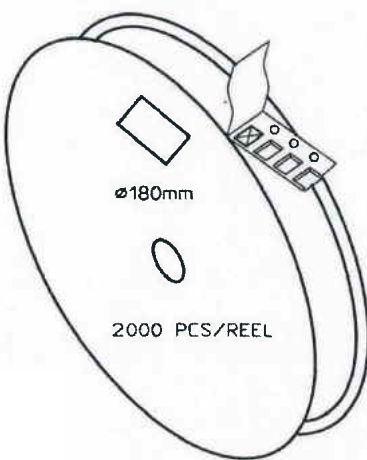
No.	Terminal name	Terminal Dimensions
1	Feed / GND	1.00 x 1.36 mm
2	Feed / GND	1.00 x 1.36 mm

Antenna is symmetrical.
Either of terminals 1 or 2 can be feed / GND

Ceramic Monopole Antenna

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Packing Form



Ø180mm

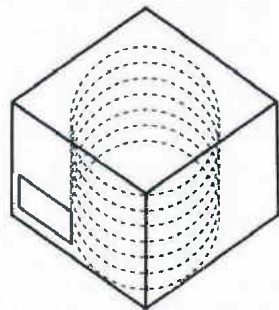
2000 PCS/REEL

CARRIER TAPE H85-00192
width=16,00 depth=1.70
COVER TAPE H85-00193
width=13.40

LENGTH OF TAPE:

- Leader section: min 350 mm before component section
- Trailer section: min 40 mm after component section.

Empty part cavities at leader and trailer section of the tape must be sealed with top cover tape.

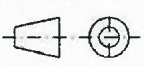


BOX H85-00128 1 pcs
(182x182x125)

- LABEL 1 pcs/BOX

REEL H85-00164 6 pcs
(D180,W28)

- REEL LABEL 1 pcs/REEL

MATERIAL							
HANDLINGS							
		RATIO	DRWN	161007 PeHa	H		
			OGNER		G		
			CHKD		F		
			APPRD		E		
			APPRD BY		D		
PRODUCT			H90-OY838			C	
DENOMINATION			PACKING FORM			B	
						A	
			VERSION			MOD/DATE/NAME	

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Antenna PWB Layout Specifications

Ground cleared under antenna, clearance area 11.00 x 6.00 mm

Matching and tuning component values depend on application and surrounding mechanics / materials.

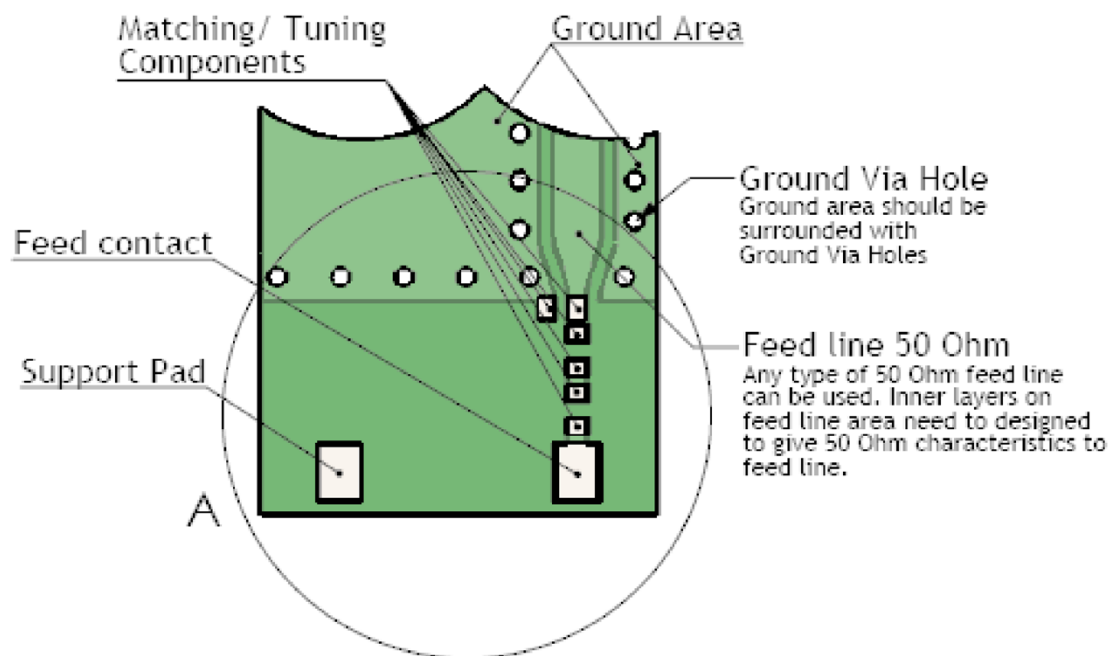
Feed line should be designed to match 50 Ω characteristic impedance, depending on PWB material and thickness.

Recommended test board layout for electrical characteristic measurement, test board outline size 11 x 40 mm.

Recommended PWB manufacturing tolerances according to standard: IPC-A-600, revision G

PWB layout for W3000 Monopole Antenna

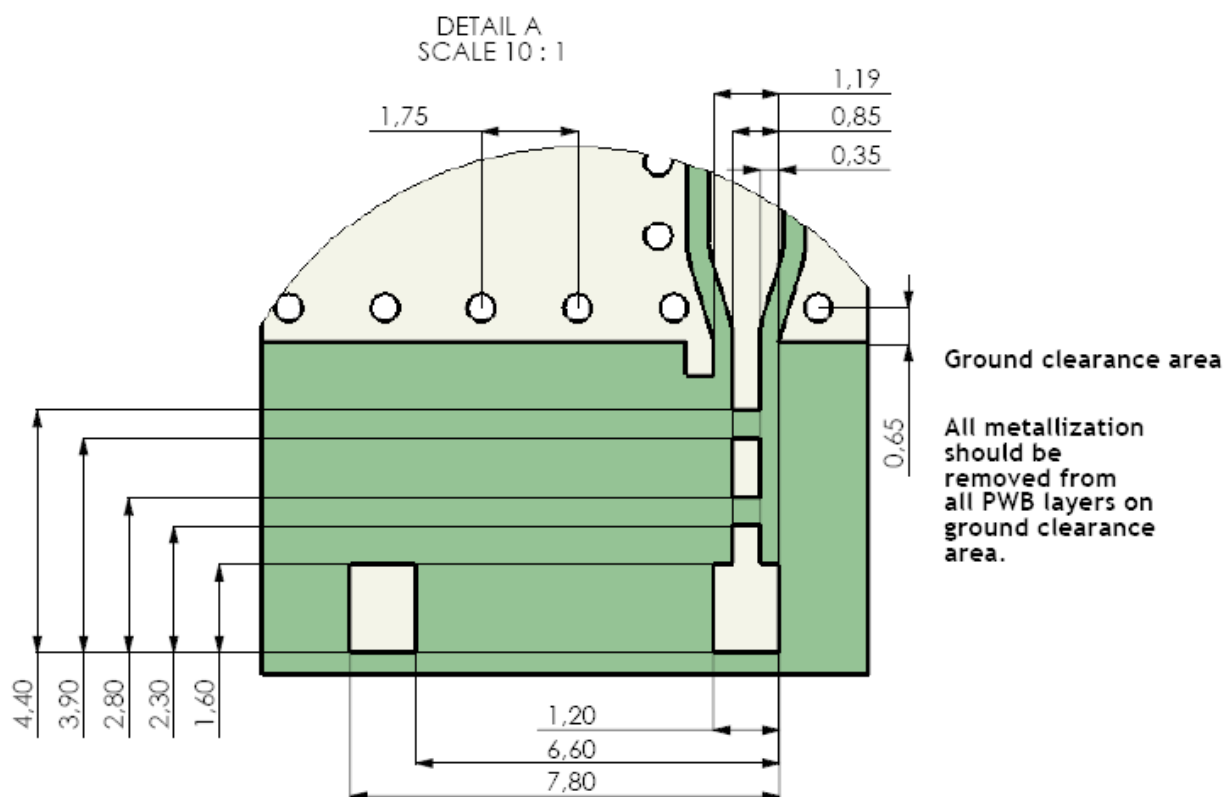
Note: All dimensions are in metric system.



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PWB Pad Dimensions



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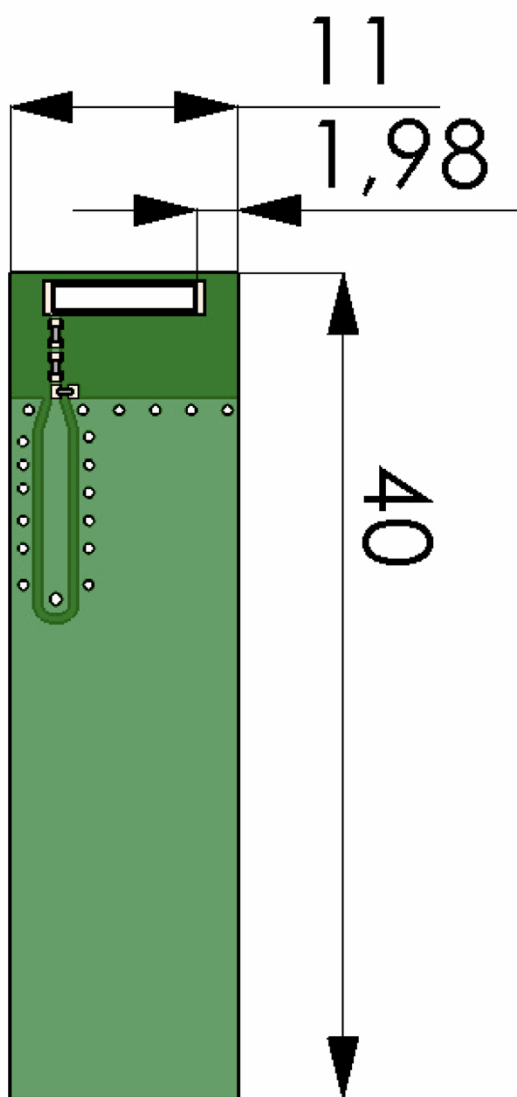
Ceramic Monopole Antenna

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GPS Antenna Case #1

Board Size 40 x 11 mm

Recommended antenna position on PWB for W3000 MONOPOLE Antenna



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Ceramic Monopole Antenna

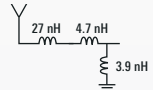
Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #1, Test Set Up and Measurement Performance

Ground cleared under antenna, clearance area 11.00 x 6.00 mm.

Typical Electrical Characteristics (T=25 °C)

Measured on the 11 x 40 mm test board with matching circuit. Measured in antenna position1 on PWB layout, see previous page. Typical Return Loss S11/ impedance, free space efficiency and gain.



GPS 1.575 GHz Case #1

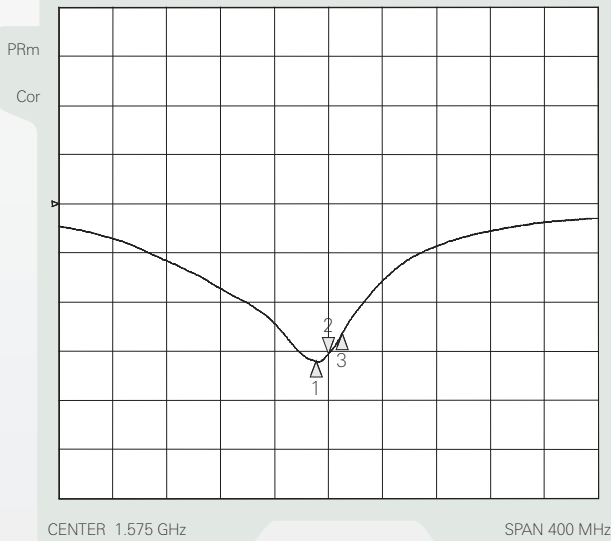
11 Feb 2009 11:44:05

CH1 S11&MLOG

5 dB/REF 0 dB

CH1 Markers

1. -16.052 dB 1.56550 GHz
2. -15.252 dB 1.57500 GHz
3. -13.199 dB 1.58500 GHz

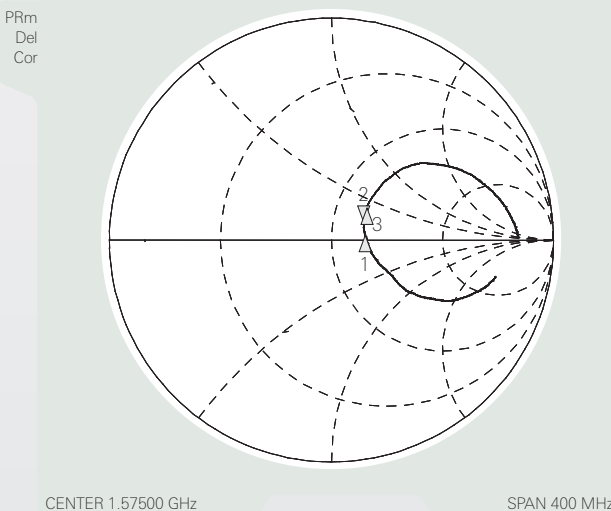


GPS 1.575 GHz #1

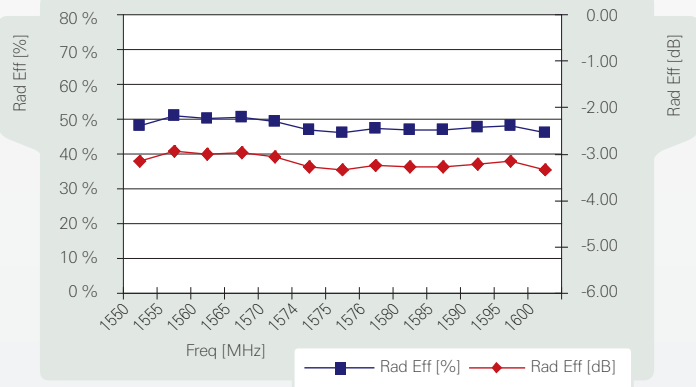
24 Feb 2009 12:55:57

CH1 S11&M 1 U FS

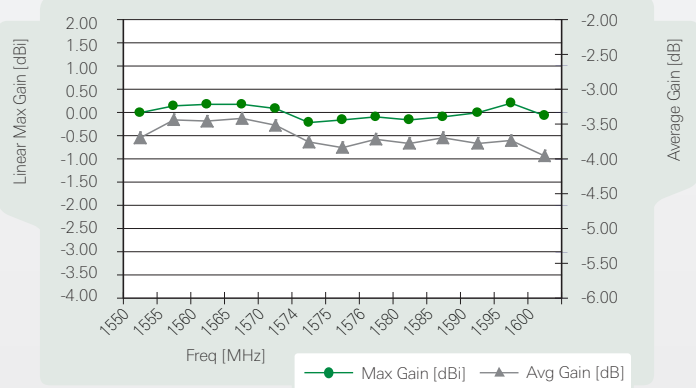
- | | | |
|-------------|----------|-------------|
| 1. 68.535 Ω | 3.1875 Ω | 1.56550 GHz |
| 2. 66.637 Ω | 11.031 Ω | 1.57500 GHz |
| 3. 65.742 Ω | 20.102 Ω | 1.58500 GHz |



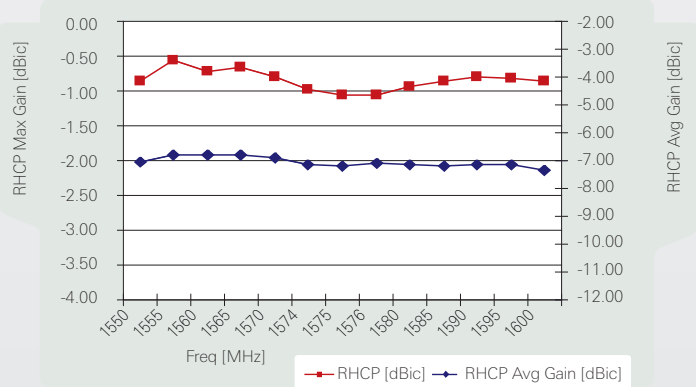
GPS 1.575 GHz Case #1



GPS 1.575 GHz Case #1



GPS 1.575 GHz Case #1



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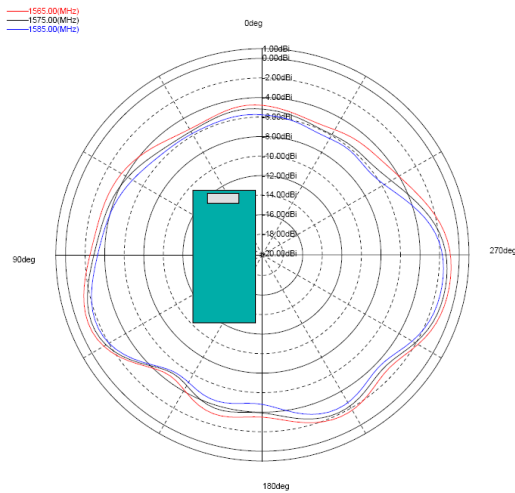
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

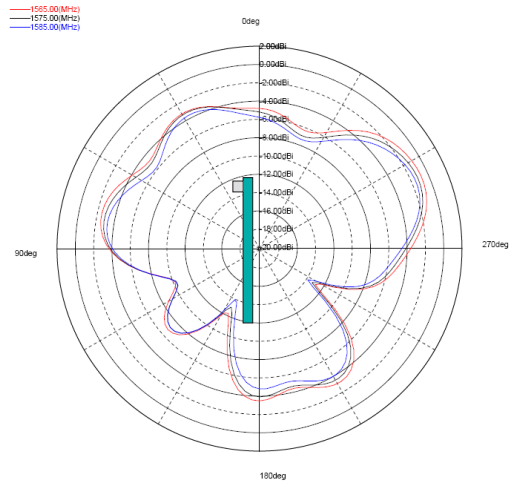
GPS Antenna Case #1

Typical Free Space Radiation Patterns

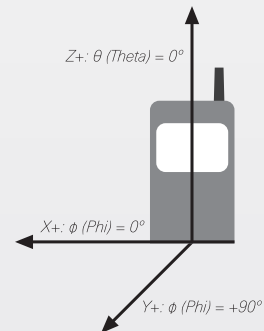
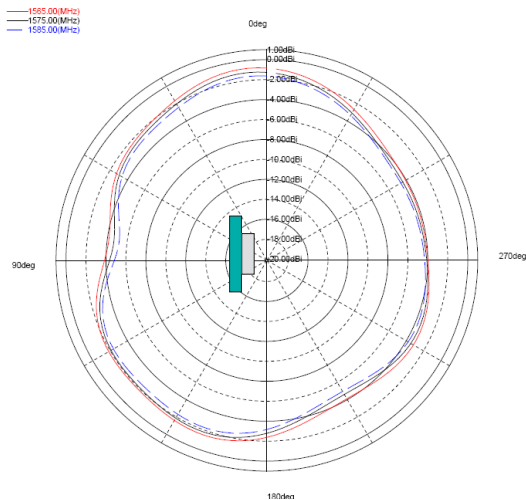
XZ-PLANE



ZY-PLANE



XY-PLANE



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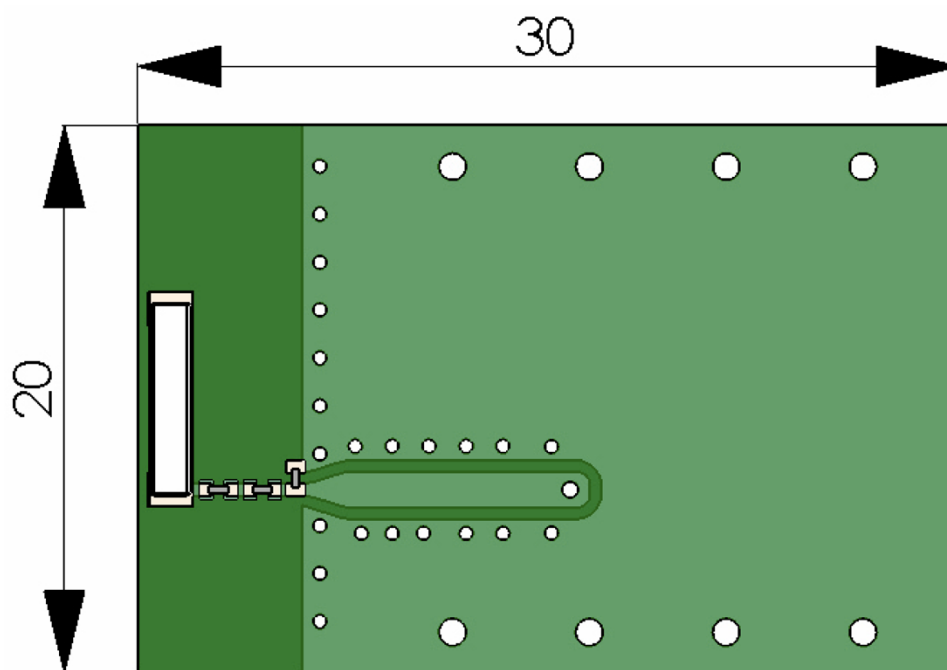
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Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #2

Board Size 20x30

Recommended antenna position on PWB for W3000 MONOPOLE Antenna



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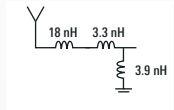
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Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #2, Test Set Up and Measurement Performance

Ground cleared under antenna, clearance area 20.00 x 6.00 mm.



Typical Electrical Characteristics (T=25 °C)

Measured on the 30 x 20 mm test board with matching circuit. Measured in antenna position1 on PWB layout, see previous page. Typical Return Loss S11/ impedance, free space efficiency and gain.

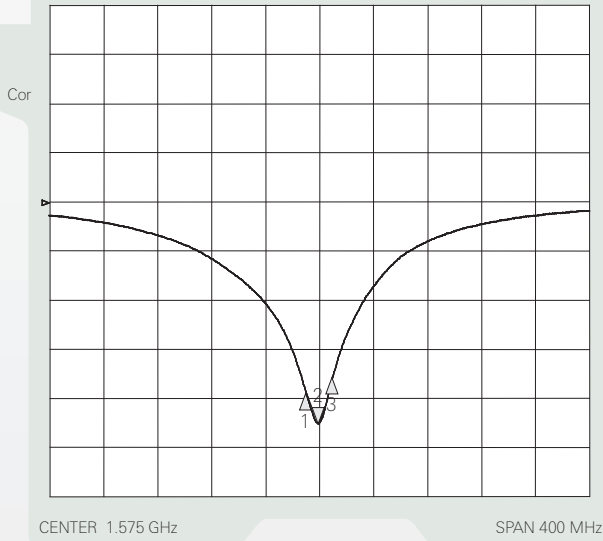
GPS 1.575 GHz Case #2

24 Feb 2009 12:56:26

CH1 S11&MLOG 5 dB/REF 0 dB

CH1Markers

- | | |
|---------------|-------------|
| 1. -19.333 dB | 1.56550 GHz |
| 2. -22.352 dB | 1.57500 GHz |
| 3. -17.667 dB | 1.58500 GHz |

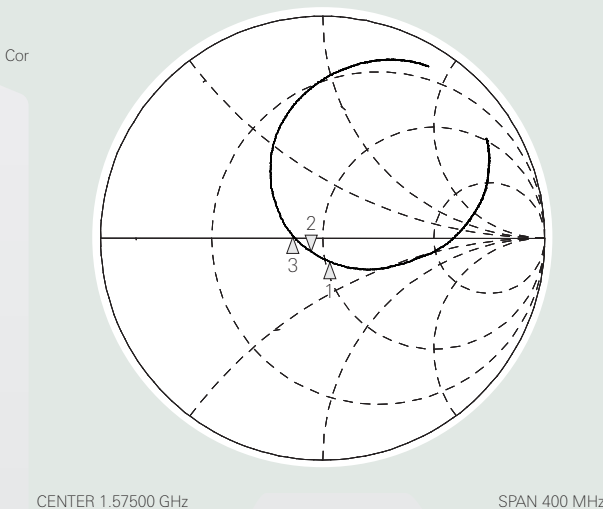


GPS 1.575 GHz #2

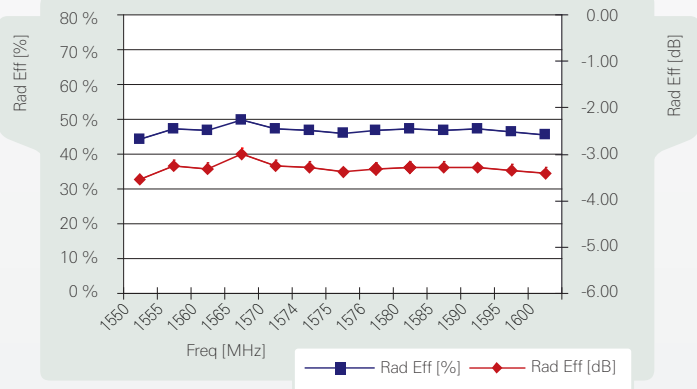
24 Feb 2009 12:56:33

CH1 S11&M 1 U FS

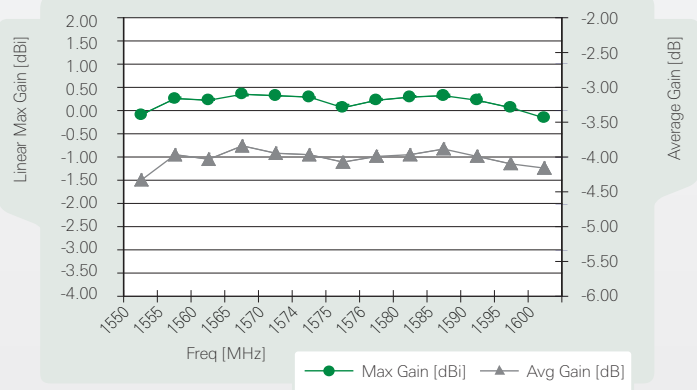
- | | | |
|-------------|-----------|-------------|
| 1. 52.109 Ω | -11.057 Ω | 1.56550 GHz |
| 2. 44.865 Ω | -5.4199 Ω | 1.57500 GHz |
| 3. 38.271 Ω | 0.7773 Ω | 1.58500 GHz |



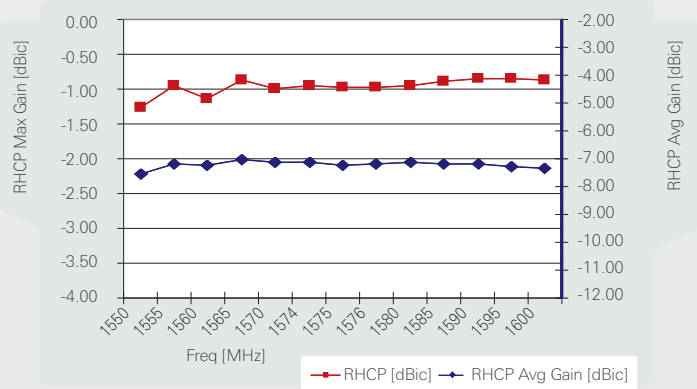
GPS 1.575 GHz Case #2



GPS 1.575 GHz Case #2



GPS 1.575 GHz Case #2



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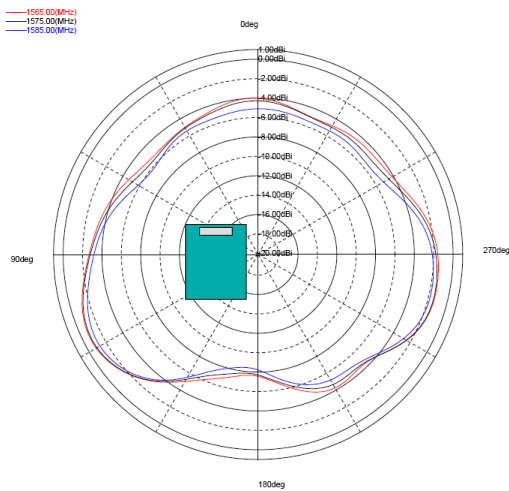
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

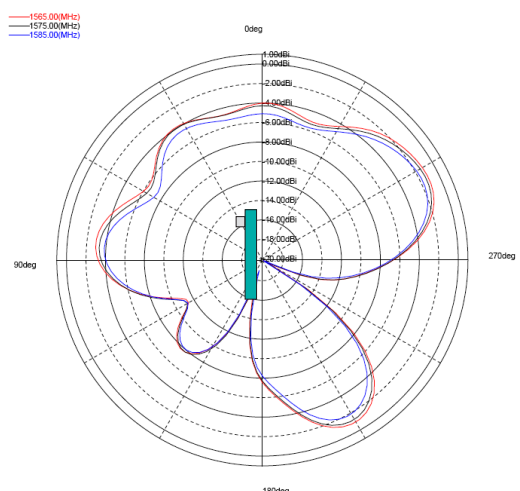
GPS Antenna Case #2

Typical Free Space Radiation Patterns

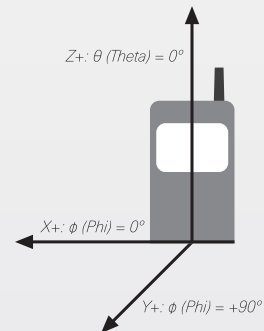
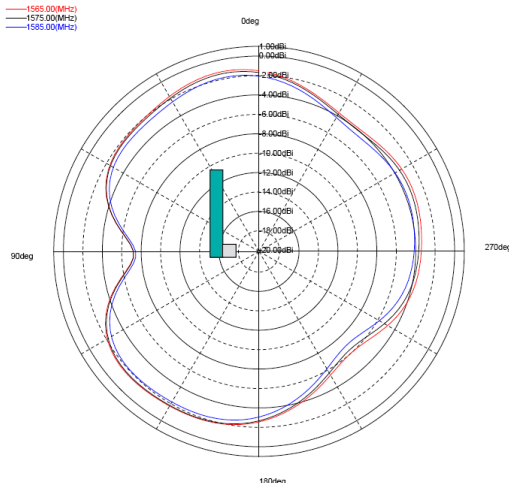
XZ-PLANE



ZY-PLANE



XY-PLANE



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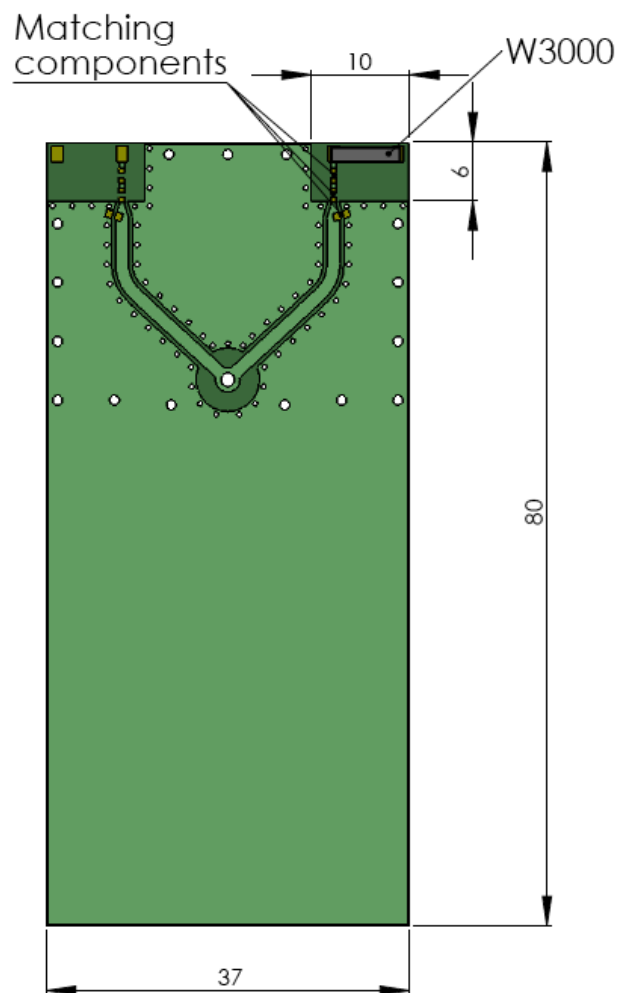
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #3

Board Size 37 x 80 mm

Recommended antenna position on PWB for W3000 MONOPOLE Antenna



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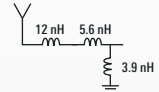
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Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #3, Test Set Up and Measurement Performance

Ground cleared under antenna, clearance area 20.00 x 6.00 mm.



Typical Electrical Characteristics (T=25 °C)

Measured on the 30 x 20 mm test board with matching circuit. Measured in antenna position1 on PWB layout, see previous page. Typical Return Loss S11/ impedance, free space efficiency and gain.

GPS 1.575 GHz Case #3

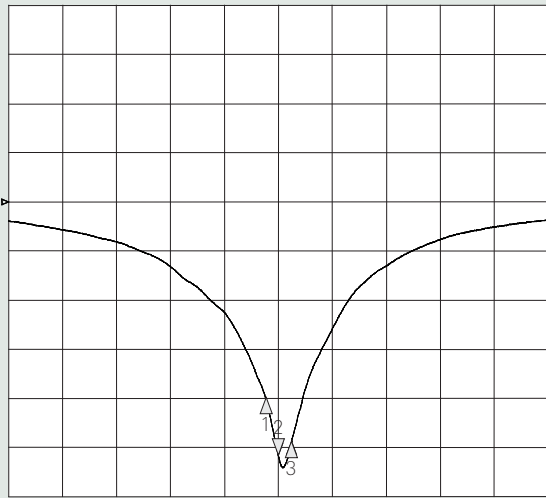
24 Feb 2009 12:57:25

CH1 Markers

- | | |
|---------------|-------------|
| 1. -19.931 dB | 1.56550 GHz |
| 2. -25.898 dB | 1.57500 GHz |
| 3. -24.453 dB | 1.58500 GHz |

CH1 S11dB MLOG

5 dB/REF 0 dB



CENTER 1.575 GHz

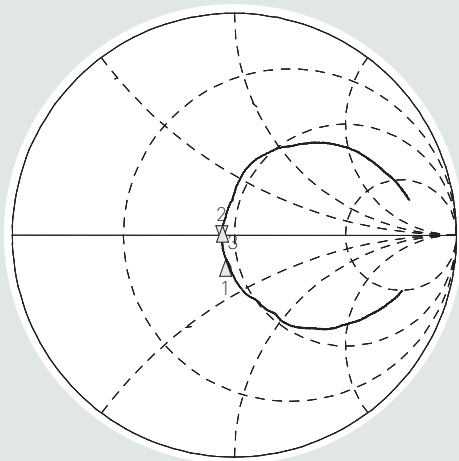
SPAN 400 MHz

GPS 1.575 GHz #3

24 Feb 2008 12:55:57

- | | | |
|-------------|-----------|-------------|
| 1. 45.469 Ω | -9.8496 Ω | 1.56550 GHz |
| 2. 44.766 Ω | -3.0801 Ω | 32.808 pF |
| | | 1.57500 GHz |
| 3. 65.742 Ω | 20.102 Ω | 1.58500 GHz |

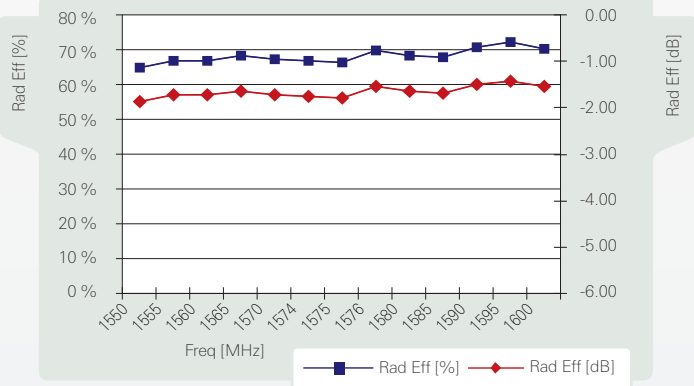
CH1 S11dB M 1 U FS



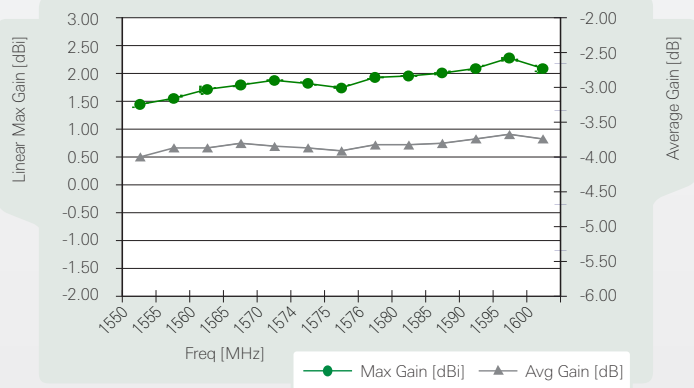
CENTER 1.57500 GHz

SPAN 400 MHz

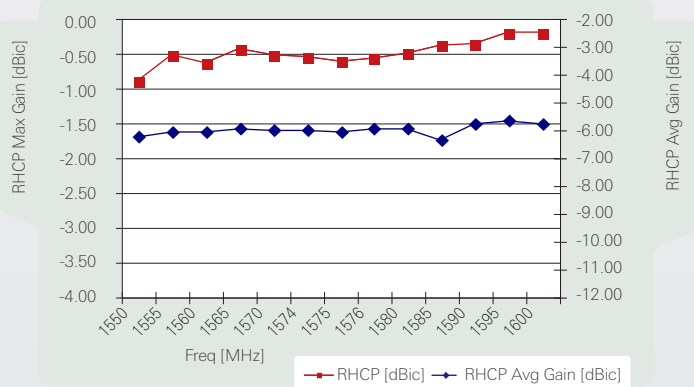
GPS 1.575 GHz Case #3



GPS 1.575 GHz Case #3



GPS 1.575 GHz Case #3



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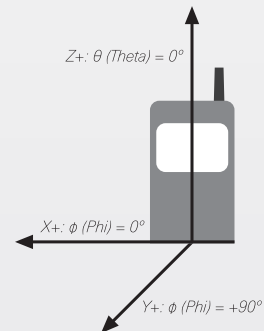
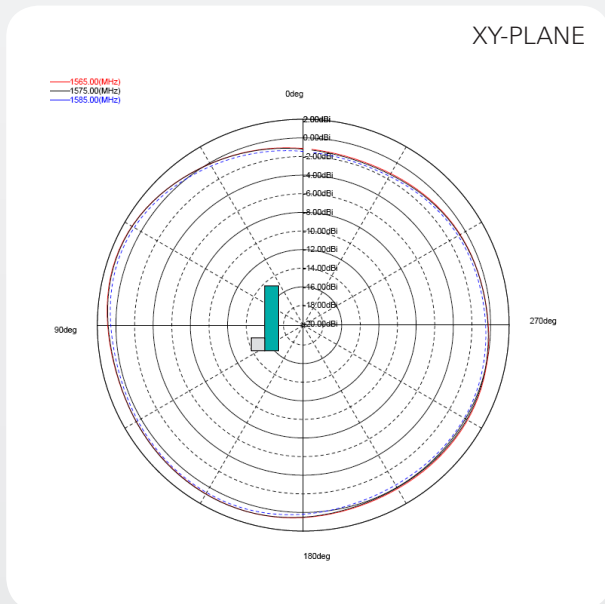
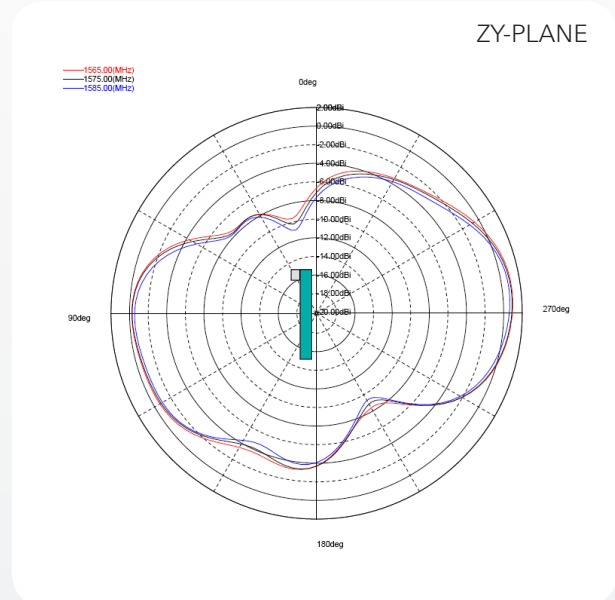
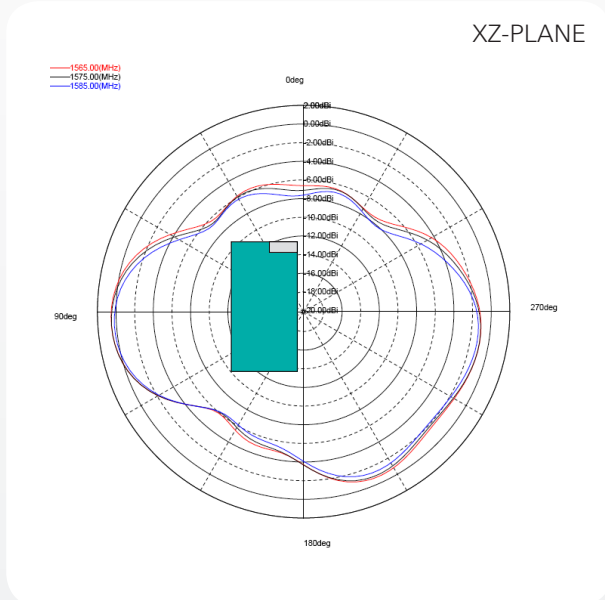


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GPS Antenna Case #3

Typical Free Space Radiation Patterns



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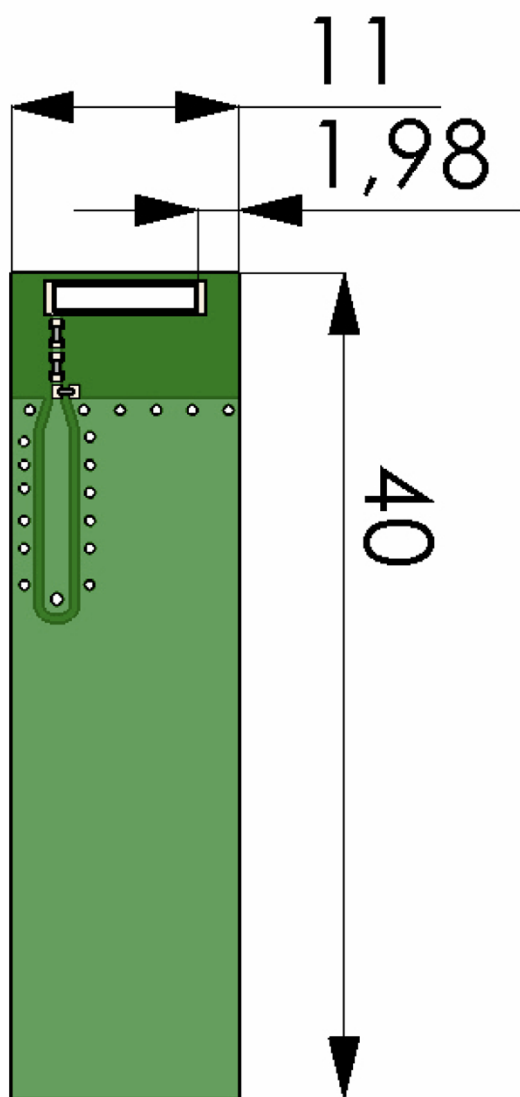
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

WiFi Antenna Case #1

Board Size 40 x 11 mm

Recommended antenna position on PWB for W3000 MONOPOLE Antenna



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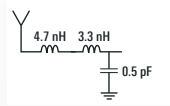
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Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

WiFi Antenna Case #1, Test Set Up and Measurement Performance

Ground cleared under antenna, clearance area 11.00 x 6.00 mm.



Typical Electrical Characteristics (T=25 °C)

Measured on the 11 x 40 mm test board with matching circuit. Measured in antenna position1 on PWB layout, see previous page. Typical Return Loss S11/ impedance, free space efficiency and gain.

2.4 GHz WiFi Case #1

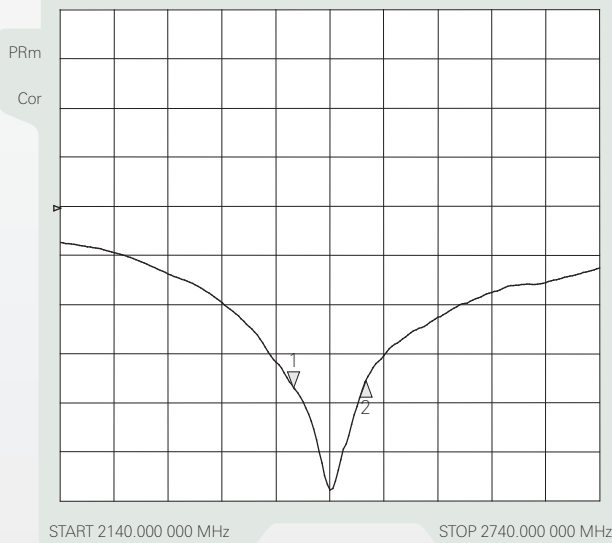
19 Oct 2008 23:52:24

CH1Markers

1. -21.743 dB 2.40000 GHz
2. -20.781 dB 2.48000 GHz

CH1 S11 LOG

6 dB/REF 0 dB



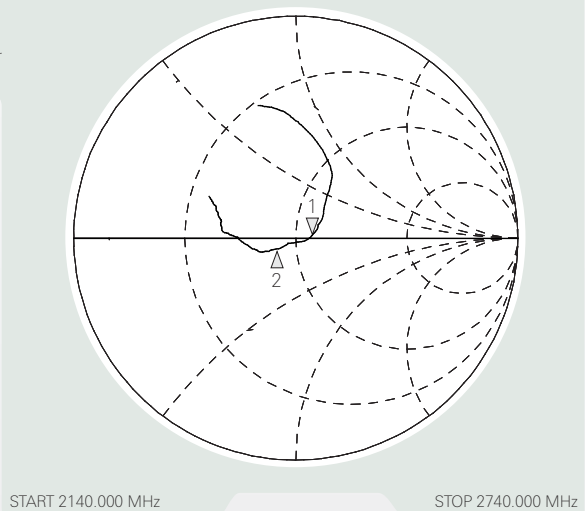
2.4 GHz WiFi #1

11 Oct 2008 23:52:35

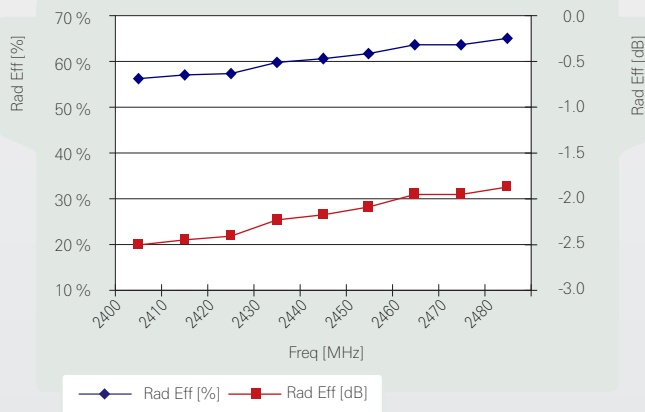
1. 58.187 Ω 1.8516 Ω 2.40000 GHz
 2. 42.477 Ω -4.0078 Ω 2.48000 GHz
- 122.79 pH

CH1 S11 1 U FS

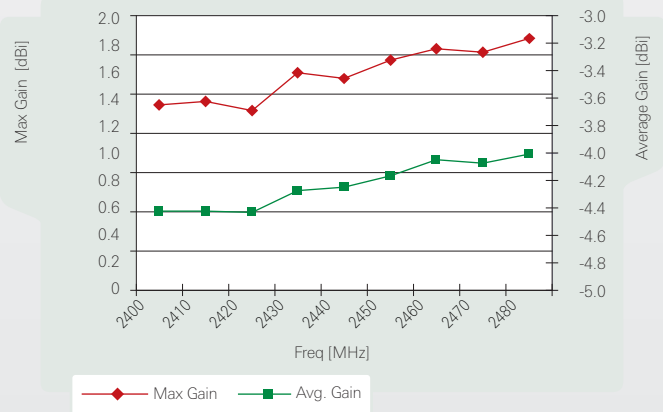
Cor



2.4 GHz WiFi Case #1



2.4 GHz WiFi Case #1



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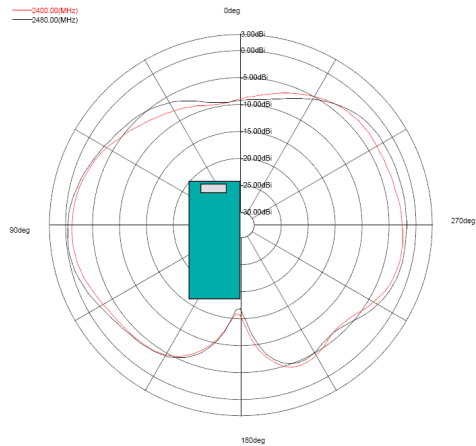
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

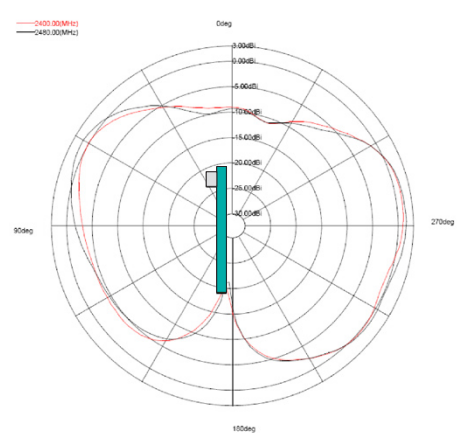
WiFi Antenna Case #1

Typical Free Space Radiation Patterns

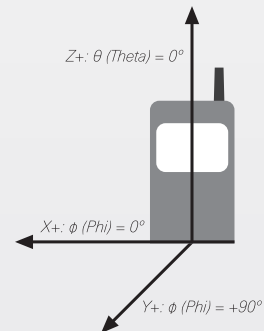
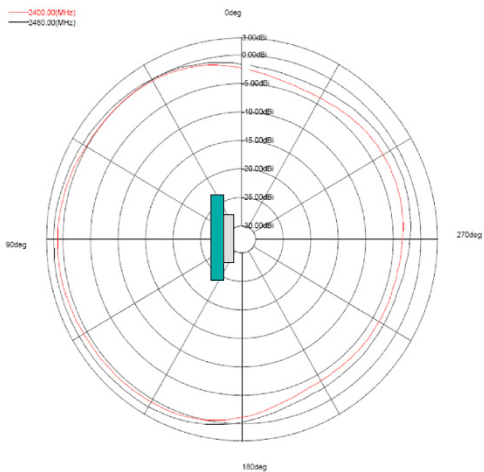
XZ-PLANE



ZY-PLANE



XY-PLANE



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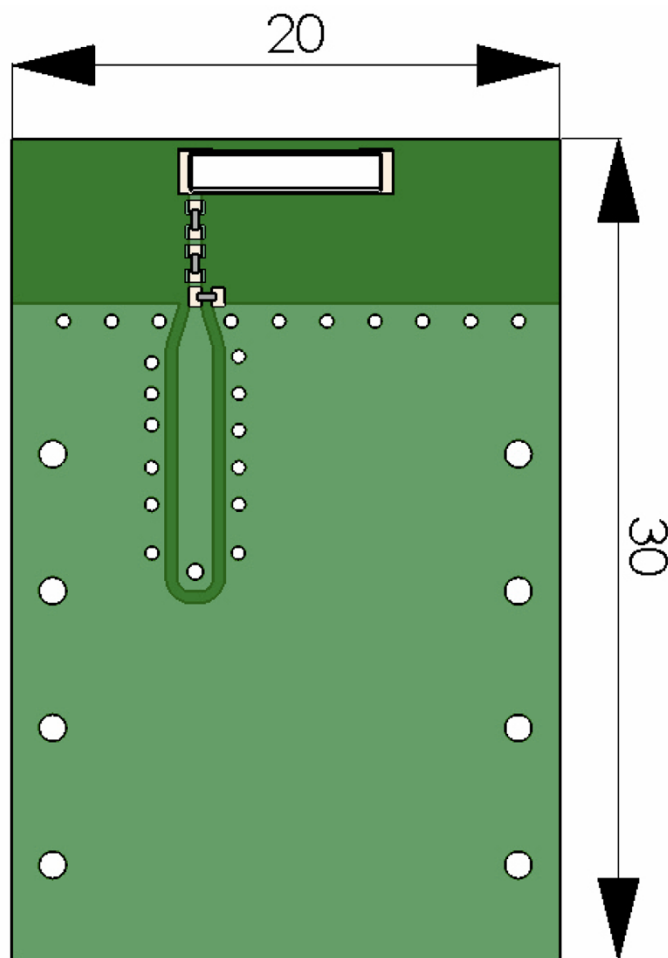
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

WiFi Antenna Case #2

Board Size 20 x 30 mm

Recommended antenna position on PWB for W3000 MONOPOLE Antenna



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Ceramic Monopole Antenna

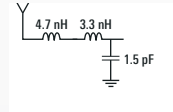
Ground cleared under antenna. Pulse Part Number: W3000

WiFi Antenna Case #2, Test Set Up and Measurement Performance

Ground cleared under antenna, clearance area 20.00 x 6.00 mm.

Typical Electrical Characteristics (T=25 °C)

Measured on the 30 x 20 mm test board with matching circuit. Measured in antenna position1 on PWB layout, see previous page. Typical Return Loss S11/ impedance, free space efficiency and gain.



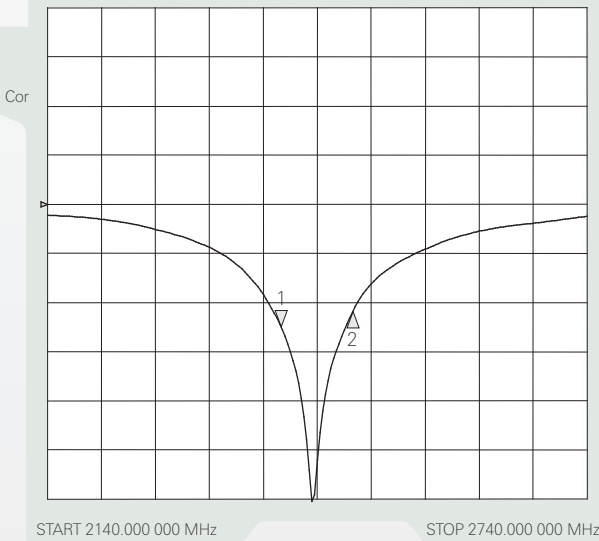
2.4 GHz WiFi Case #2

19 Oct 2008 23:48:18

CH1Markers

1. -15.093 dB 2.400 GHz
2. -12.933 dB 2.480 GHz

CH1 MLOG 6 dB/REF 0 dB



2.4 GHz WiFi #2

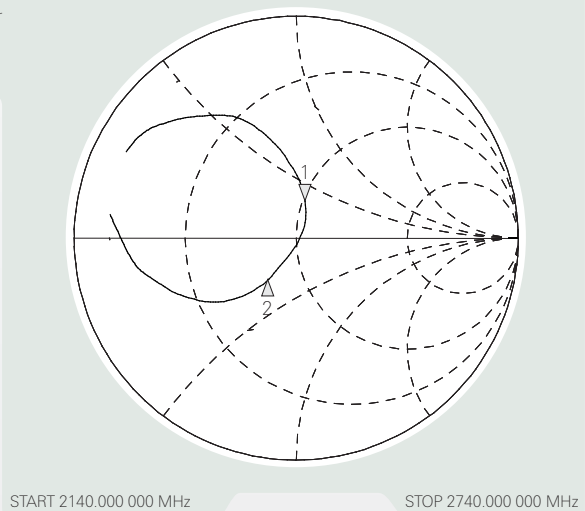
11 Feb 2008 11:47:36

CH1Markers

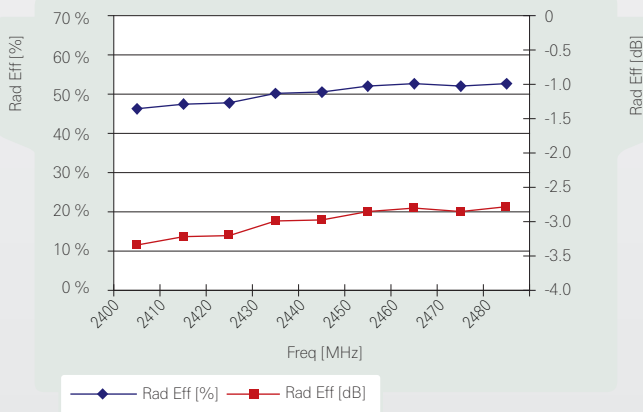
1. 51.129 Ω 18.035 Ω 2.40000 GHz
2. 36.529 Ω -14.525 Ω 2.48000 GHz
1.1960 nH

CH1 S11 1 U FS

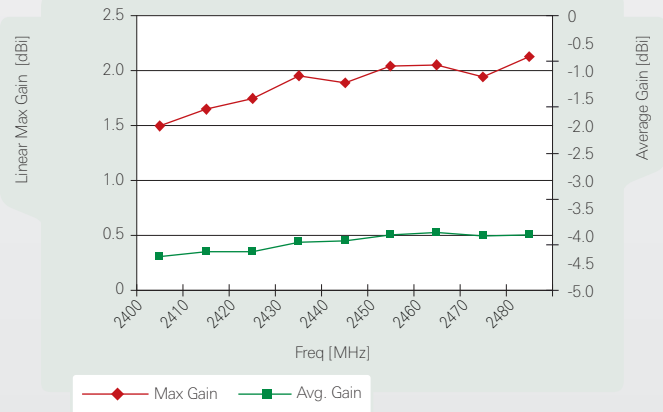
Cor



2.4 GHz WiFi Case #2



2.4 GHz WiFi Case #2



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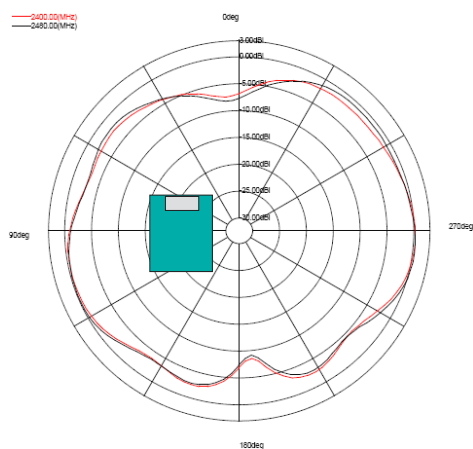
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

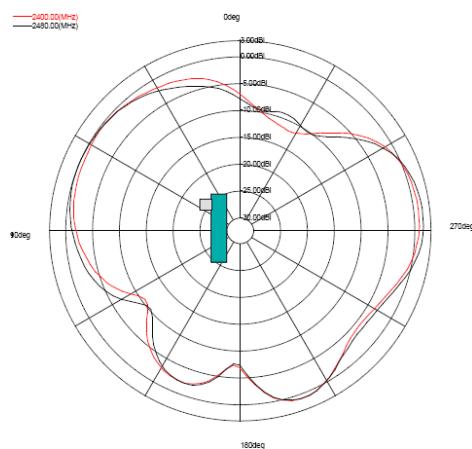
WiFi Antenna Case #2

Typical Free Space Radiation Patterns

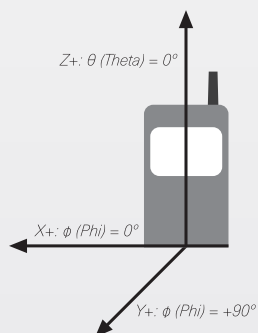
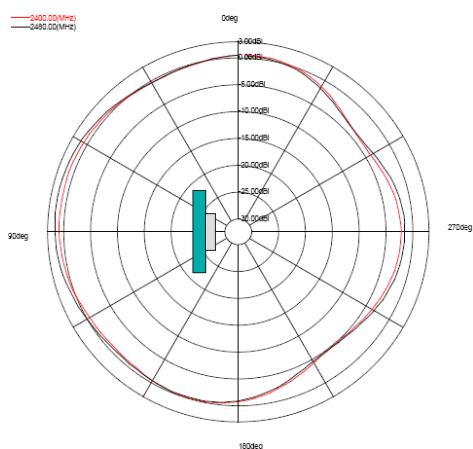
XZ-PLANE



ZY-PLANE



XY-PLANE



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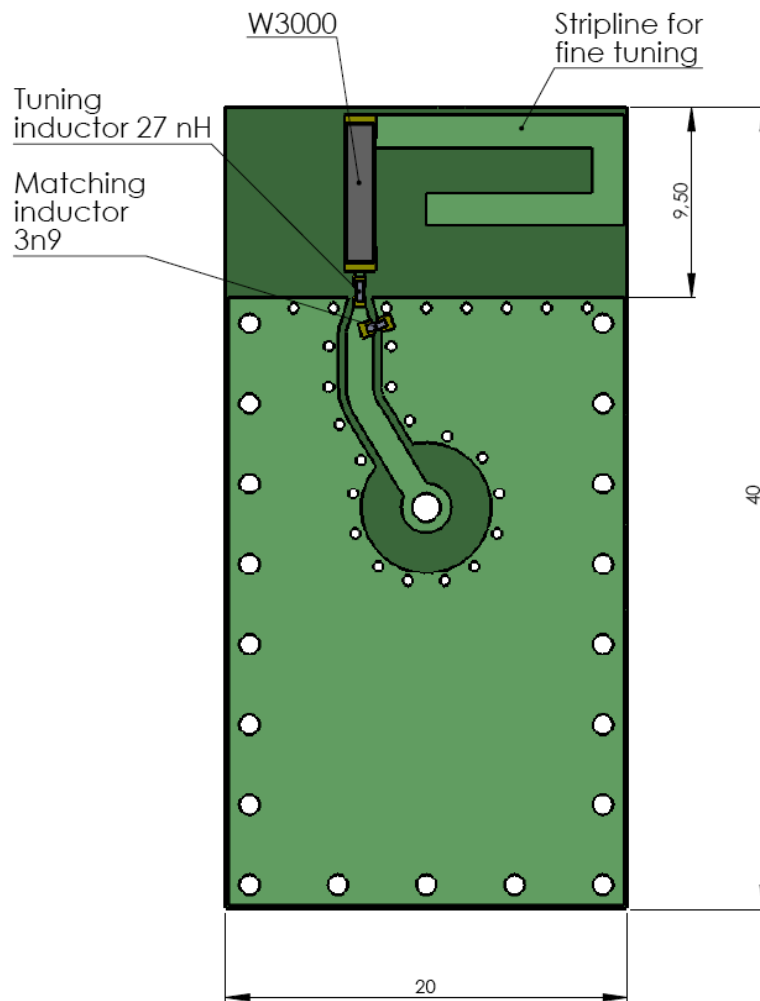
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

ISM 868 MHz Antenna Case #1

Board Size 20 x 40 mm

Recommended antenna position on PWB for W3000 MONOPOLE Antenna



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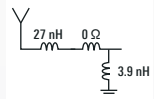
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

ISM 868 MHz Antenna Case #1, Test Set Up and Measurement Performance

Typical Electrical Characteristics (T=25 °C)

Measured on the 20 x 40 mm test board with matching circuit. Measured in antenna position1 on PWB layout, see previous page. Typical Return Loss S11/ impedance, free space efficiency and gain.



ISM 868 MHz Case #1

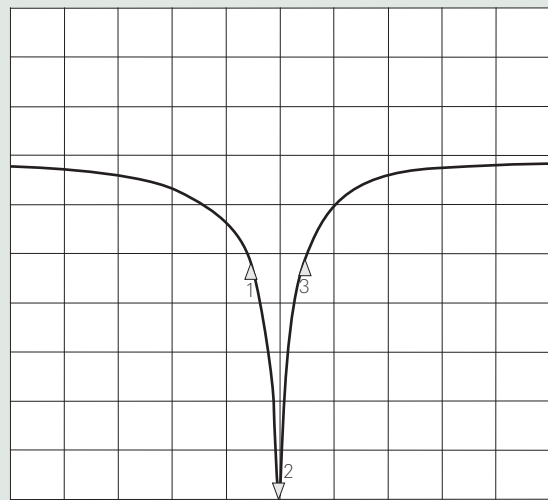
24 Mar 2009 16:05:57

CH1 S11&MLOG 5 dB/REF 0 dB

CH1Markers

1. -10.887 dB 858 MHz
2. -35.538 dB 868 MHz
3. -10.836 dB 878 MHz

PRm
Del
Cor



CENTER 869 MHz

SPAN 200 MHz

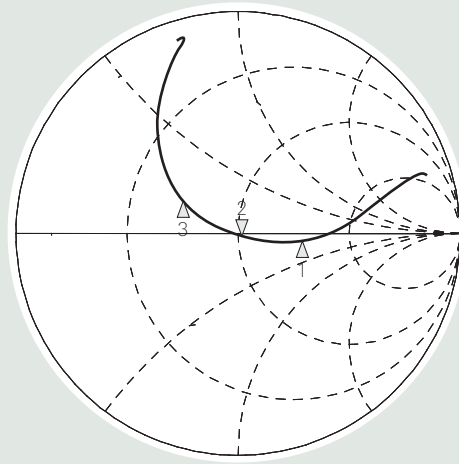
ISM 868 MHz #1

24 Mar 2009 16:06:06

CH1 S11&M 1 U FS

- | | | |
|-------------|-----------|-------------------|
| 1. 90.109 Ω | -5.8008 Ω | 858 MHz |
| 2. 51.600 Ω | -1.2168 Ω | 150.69 pF 868 MHz |
| 3. 29.132 Ω | -9.9443 Ω | 878 MHz |

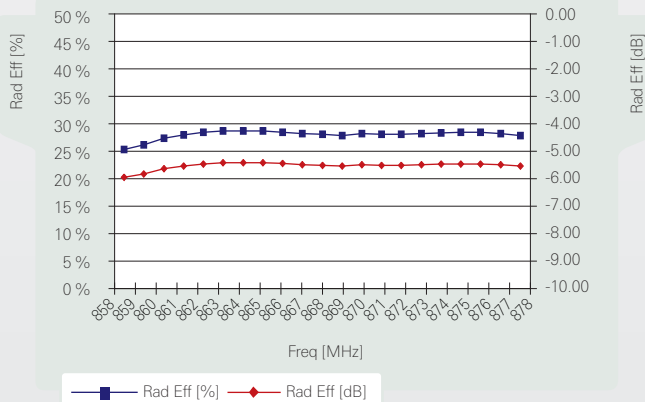
PRm
Del
Cor



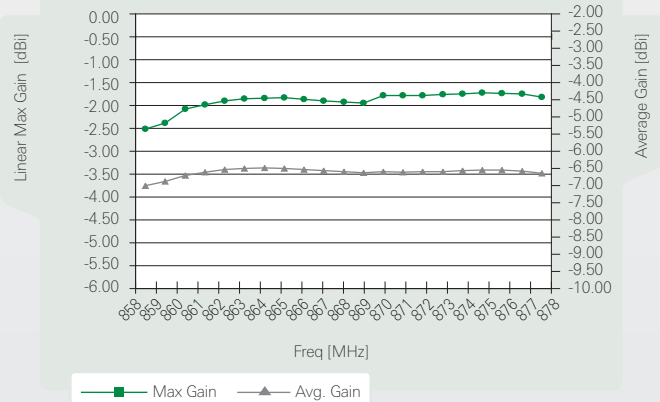
CENTER 869 MHz

SPAN 200 MHz

ISM 868 MHz Case #1



ISM 868 MHz Case #1



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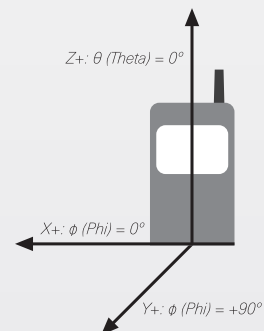
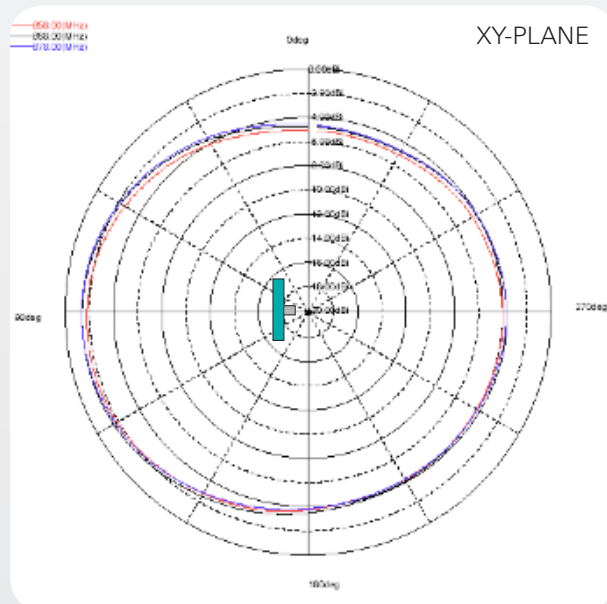
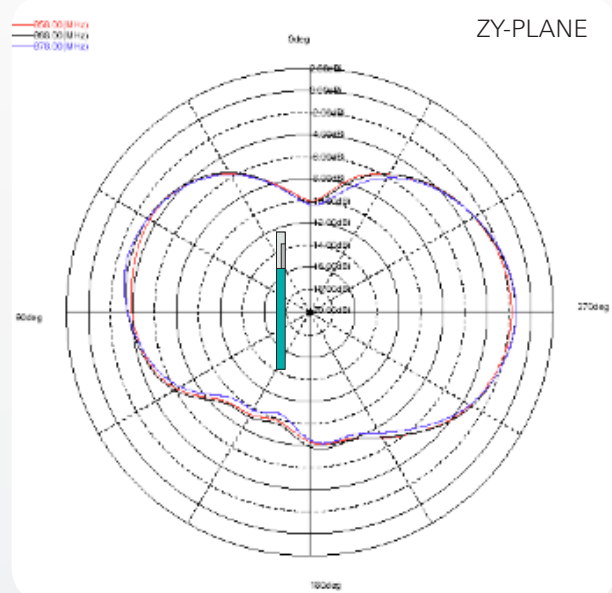
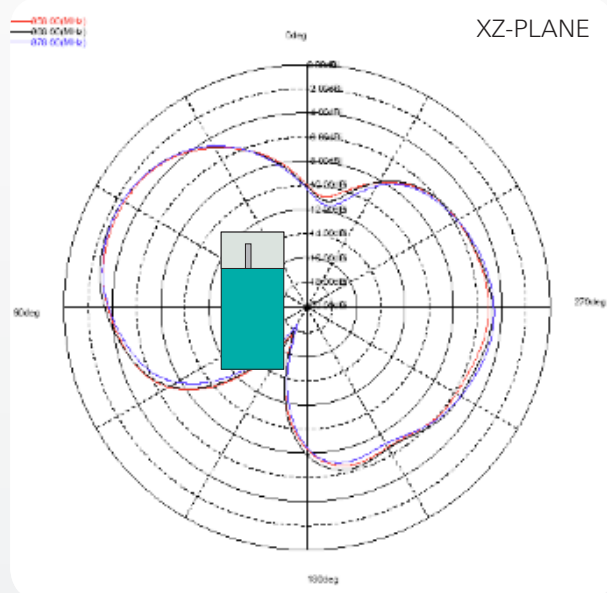


Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

ISM 868 MHz Antenna Case #1

Typical Free Space Radiation Patterns



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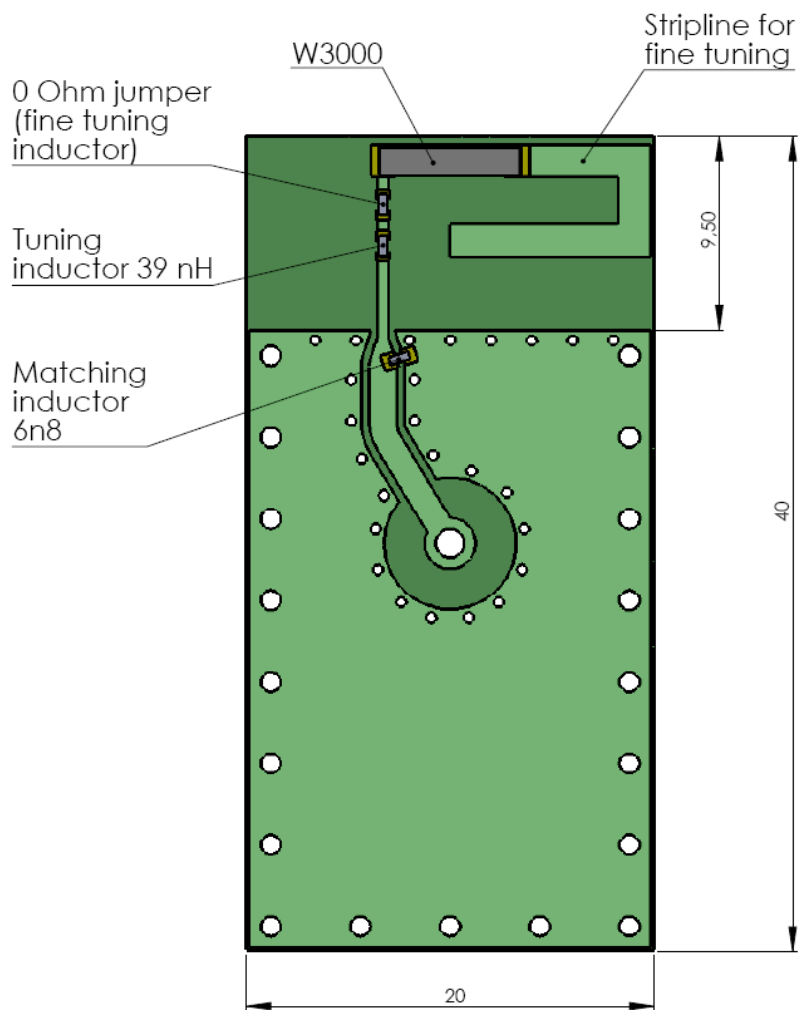
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

ISM 868 MHz Antenna Case #2

Board Size 20 x 40 mm

Recommended antenna position on PWB for W3000 MONOPOLE Antenna



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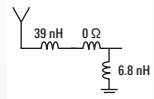
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

ISM 868 MHz Antenna Case #2, Test Set Up and Measurement Performance

Typical Electrical Characteristics (T=25 °C)

Measured on the 20 x 40 mm test board with matching circuit. Measured in antenna position1 on PWB layout, see previous page. Typical Return Loss S11/ impedance, free space efficiency and gain



ISM 868 MHz Case #2

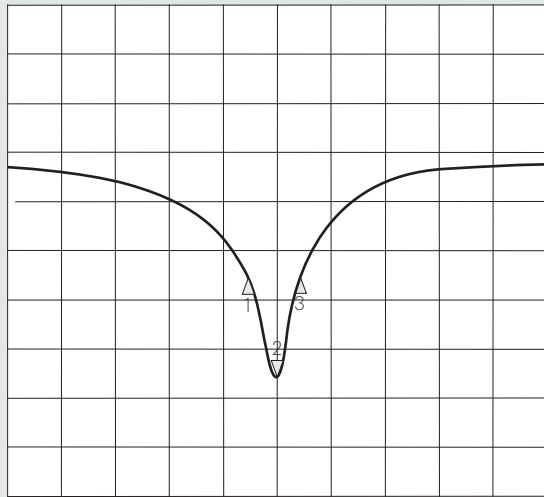
24 Mar 2009 16:07:15

CH1 S11&MLOG 5 dB/REF 0 dB

CH1Markers

1. -13.086 dB 858 MHz
2. -23.108 dB 868 MHz
3. -12.887 dB 878 MHz

PRm
Del
Cor



CENTER 440.000 000 MHz

SPAN 800.000 000 MHz

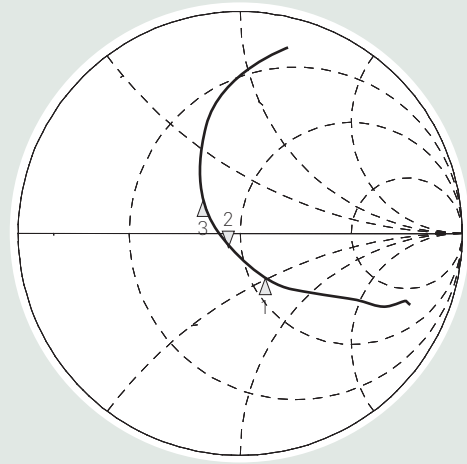
ISM 868 MHz #2

24 Mar 2009 16:07:23

CH1 S11&M 1 U FS

- | | | |
|-------------|-----------|---------|
| 1. 57.971 Ω | -23.721 Ω | 858 MHz |
| 2. 45.375 Ω | -5.0918 Ω | 868 MHz |
| 3. 35.385 Ω | -11.094 Ω | 878 MHz |

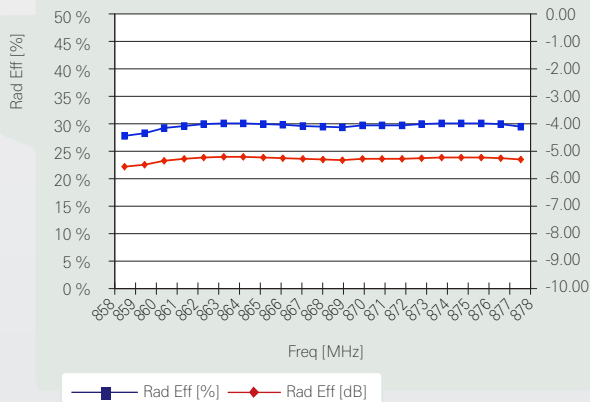
PRm
Del
Cor



CENTER 440.000 000 MHz

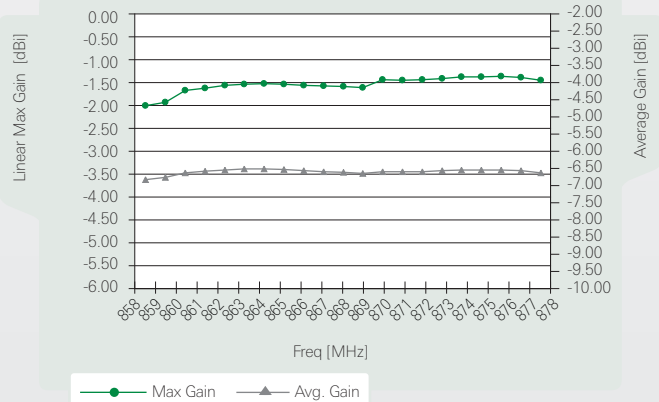
SPAN 800.000 000 MHz

ISM 868 MHz Case #2



Rad Eff [%] Rad Eff [dB]

ISM 868 MHz Case #2



Max Gain Avg. Gain

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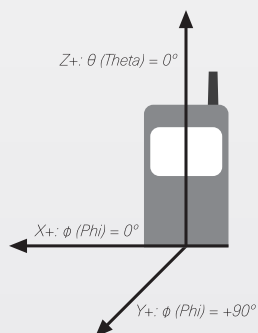
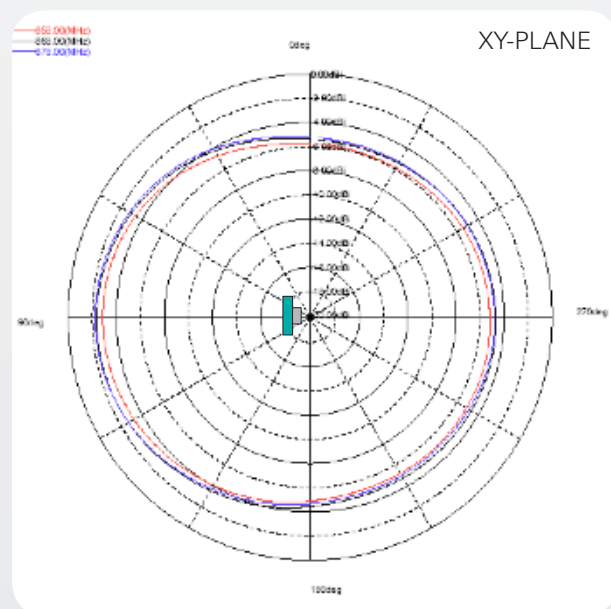
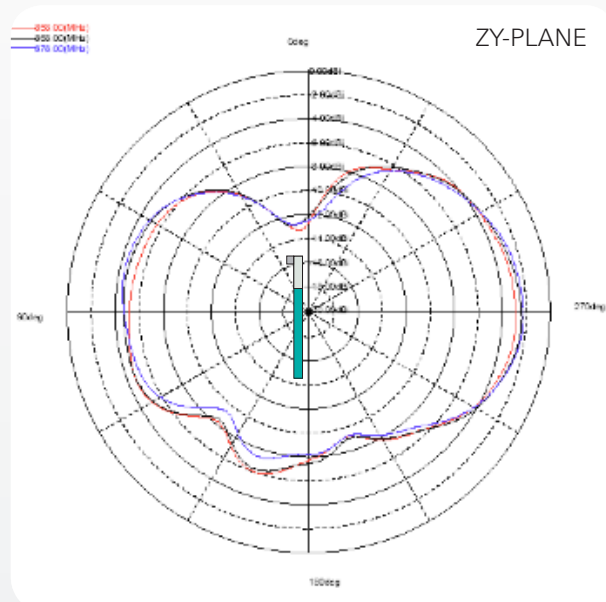
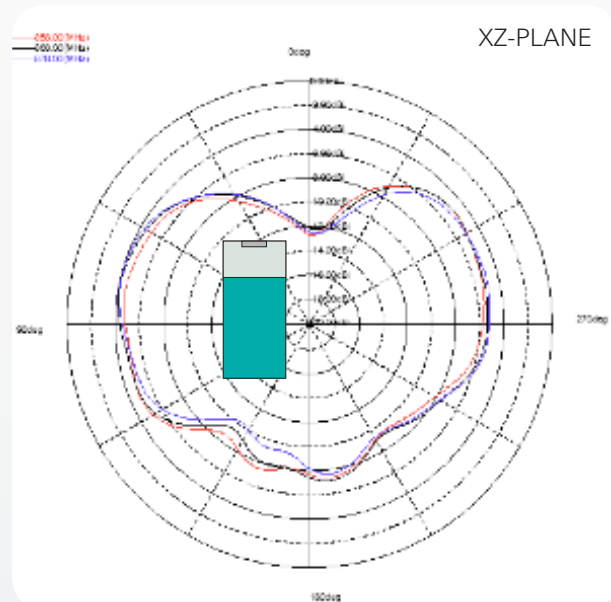


Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

ISM 868 MHz Antenna Case #2

Typical Free Space Radiation Patterns



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Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

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