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.
# Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

## Monopole 1.575 GHz

Typical performance

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Case #1 11x40mm</td>
<td>1565 – 1585</td>
<td>-3.5 (Peak)</td>
<td>0.1 (Peak)</td>
<td>50/-3 (Peak)</td>
<td>-12</td>
<td></td>
<td>-40 to +85</td>
</tr>
<tr>
<td>Case #2 20x30mm</td>
<td>-4.1 (Band edges)</td>
<td>-3.9 (Band edges)</td>
<td>0.2 (Band edges)</td>
<td>45/-3.5 (Band edges)</td>
<td></td>
<td></td>
<td>-15</td>
</tr>
<tr>
<td>Case #3 37x80mm</td>
<td>-2.9 (Band edges)</td>
<td>-2.7 (Peak)</td>
<td>2.0 (Peak)</td>
<td>70/-1.55 (Peak)</td>
<td>-18</td>
<td></td>
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</tr>
</tbody>
</table>

## Monopole 2.4 GHz

Typical performance

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Case #1 11x40mm</td>
<td>2400 – 2483.5</td>
<td>-4.1 (Peak)</td>
<td>2.5 (Peak)</td>
<td>65/-0.3 (Peak)</td>
<td>-18</td>
<td>50</td>
<td>-40 to +85</td>
</tr>
<tr>
<td>Case #2 20x30mm</td>
<td>-4.3 (Band edges)</td>
<td>-3.7 (Band edges)</td>
<td>2.1 (Band edges)</td>
<td>55/-0.6 (Band edges)</td>
<td></td>
<td></td>
<td>-12</td>
</tr>
</tbody>
</table>

## ISM 868 MHz

Typical performance

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Case #1 20x40mm Vertical</td>
<td>858 – 878</td>
<td>-6.5 (Peak)</td>
<td>-1.8 (Peak)</td>
<td>29/-5.4 (Peak)</td>
<td>-10</td>
<td>50</td>
<td>-40 to +85</td>
</tr>
<tr>
<td>Case #2 20x40mm Horizontal</td>
<td>-6.8 (Band edges)</td>
<td>-6.5 (Peak)</td>
<td>-1.4 (Peak)</td>
<td>30/-5.3 (Peak)</td>
<td></td>
<td></td>
<td>-15</td>
</tr>
</tbody>
</table>
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

Terminal Configuration and Dimensions

<table>
<thead>
<tr>
<th>Antenna features</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

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

Ground cleared under antenna. Pulse Part Number: W3000

Packing Form

- 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.

<table>
<thead>
<tr>
<th>BOX H85-00128 (182x182x125)</th>
<th>1 pcs</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABEL</td>
<td>1 pcs/BOX</td>
</tr>
<tr>
<td>REEL H85-00164 (D180,W28)</td>
<td>6 pcs</td>
</tr>
<tr>
<td>REEL LABEL</td>
<td>1 pcs/REEL</td>
</tr>
</tbody>
</table>

| MATERIAL HANDLINGS |  |  |  |  |  |  |
| PRODUCT           |  |  |  |  |  |  |
| H90-0Y838         |  |  |  |  |  |  |
| PACKING FORM      |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

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Ceramic Monopole Antenna
Ground cleared under antenna. Pulse Part Number: W3000

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.
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

PWB Pad Dimensions

All metallization should be removed from all PWB layers on ground clearance area.
Ceramic Monopole Antenna
Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #1

Board Size 40 x 11 mm
Recommended antenna position on PWB for W3000 MONOPOLE Antenna
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.
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #1

Typical Free Space Radiation Patterns
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #2

Board Size 20x30
Recommended antenna position on PWB for W3000 MONOPOLE Antenna
Ceramic Monopole Antenna

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 position 1 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 12:06:33

CH1 S11MLOG 5 dB/REF 0 dB

| CENTER 1.575 GHz | SPAN 400 MHz |

**GPS 1.575 GHz #2**

24 Feb 2009 12:06:26

CH1 S11MLOG 5 dB/REF 0 dB

| CENTER 1.575 GHz | SPAN 400 MHz |
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
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
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.
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

GPS Antenna Case #3

Typical Free Space Radiation Patterns

XZ-PLANE

ZY-PLANE

XY-PLANE
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
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 position 1 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

CH1 S11 LOG 6 dBREF 0 dB

PRm Cor

Freq [MHz] START 2140.000 000 MHz STOP 2740.000 000 MHz

5 dB/REF 0 dB CH1 S11&MLOG

2.4 GHz WiFi #1


CH1 S11 1 U FS

Cor

Freq [MHz] START 2140.000 MHz STOP 2740.000 MHz

PRm Cor

1. 58.187 Ω 1.8516 Ω 2.40000 GHz

58.187 Ω 1.8516 Ω 2.40000 GHz

40 % 20 % 70 % 80 % 90 % 100 %

Rad Eff [ % ]

CH1Markers

1. 21.743 dB 2.40000 GHz

2. 20.781 dB 2.48000 GHz

1550 1555 1560 1565 1570 1574 1575 1576 1580 1585 1590 1595 1600

Freq [MHz]

Rad Eff [ dB ]

2.4 GHz WiFi Case #1

2.4 GHz WiFi Case #1

2.4 GHz WiFi Case #1

2.4 GHz WiFi Case #1
Ceramic Monopole Antenna
Ground cleared under antenna. Pulse Part Number: W3000

WiFi Antenna Case #1

Typical Free Space Radiation Patterns
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
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 position 1 on PWB layout, see previous page. Typical Return Loss S11/ impedance, free space efficiency and gain.
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
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.
Ceramic Monopole Antenna

Ground cleared under antenna. Pulse Part Number: W3000

ISM 868 MHz Antenna Case #1

Typical Free Space Radiation Patterns

XZ-PLANE

ZY-PLANE

XY-PLANE

Z+ θ (theta) = 0°
X+ φ (phi) = 0°
Y+ φ (phi) = +90°
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
**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 S11MLOG 5 dB/REF 0 dB

CH1Markers

1. -13.086 dB 868 MHz
2. -23.108 dB 868 MHz
3. -12.987 dB 876 MHz

**ISM 868 MHz Case #2**

24 Mar 2009 16:07:23

CH1S11M 1 U FS

Ch1Markers

1. 57.971 Q -23.721 Q 868 MHz
2. 45.375 Q -6.0918 Q 868 MHz
3. 35.385 Q -11.084 Q 876 MHz

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Ceramic Monopole Antenna

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ISM 868 MHz Antenna Case #2

Typical Free Space Radiation Patterns
Ceramic Monopole Antenna
Ground cleared under antenna. Pulse Part Number: W3000

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