RoHS COMPLIANT

Wireless External Antennas

March 2008

Pulse
A TECHNITROL COMPANY

Wireless External Antennas

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External Antennas
Sales Contacts

USA	858 674 8100	Shanghai	86 21 32181071
UK	44 1483 401 700	China	86 769 5538070
France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		

Pulse A TECHNITROL COMPANY

Wireless External Antennas

Product Line Overview

These antennas offer superior transmission and reception between wireless access points and devices on a WLAN (wireless local area network). Wireless networks, especially those that are indoors, often have physical barriers that inhibit communication between wireless devices. These barriers cause blind spots, intermittent signal quality and interference. Selecting the correct external antenna can improve range and the reliability of wireless networks.

Pulse's line of wireless antennas offers flexible and economical solutions for OEMs of wireless devices. The antennas are compatible with IEEE 802.11a/b/g/n, Bluetooth® and ZigBee™ applications, as well as with other devices that utilize ISM frequency bands. Single-band antennas are available in 900MHz and 2.4GHz nominal frequencies. The dual-band antennas cover the 2.4GHz and 5.0GHz frequencies plus 5.15GHz and 5.85GHz. The 900MHz antenna is a 1/8 wavelength dipole, while all other models are 1/4 wavelength dipole.

Pulse's Wireless External Antennas Offer These Standard Features:

- WiFi, Bluetooth, ZigBee and other ISM band applications
- Omni-directional
- 50 Ω impedance
- Vertical polarization
- Uniform 360-degree radiation patterns
- RoHS compatible

Antennas can be ordered with a variety of connector and cabling options. The industry-standard SMA connector has an articulated swivel-mount (including a reverse polarity version for FCC Part 15 compliance). Connector options include panel mount, TNC, I-PEX, MMCX, or configurations with cabling. The desktop antenna W1045 has a magnetic base and 1500mm cable so that users can easily move the antenna for best reception/transmission.

RoHS Compliance

All Pulse wireless products, including these wireless antennas, are lead-free and RoHS compliant. The antenna part numbers shown in this catalog designate the lead-free RoHS compliant models, and no additional suffix or identifier is required. Please contact Pulse for further details.

Custom External Antenna Solutions

In addition to the antennas shown in this catalog, Pulse can customize antenna designs for high-volume wireless OEMs. This includes alternative frequencies and a variety of cables/connectors for antenna assemblies. Pulse also manufactures build-to-print embedded antennas featuring:

- Stamped metal (variety of platings available)
- Stamped metal on plastic carriers
- PCB assemblies with cabling
- High-frequency production testing, up to 8GHz

Pulse Wireless Antenna Product Range

In addition to the external wireless antennas, Pulse offers a large range of main and complementary antenna solutions for mobile phones and other wireless devices. Combining our openness to new ideas with extensive R&D has made us the technology leader in our field. Please see www.pulseeng.com/antennas for further information about the antenna product range.

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Wireless External Antennas

Selection Guide

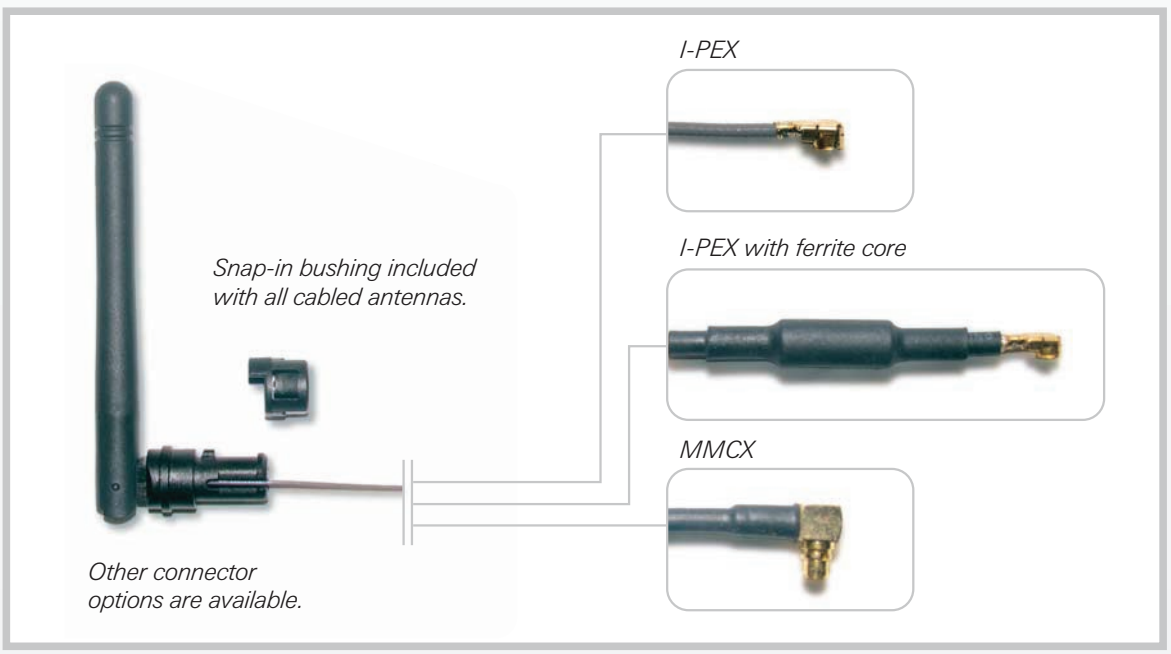
Model	Ferquency	Gain [dBi]	Mechanical Length[2]	Application/ Standard	Catalog Page No.
Single-band Antennas					
W1063	900 MHz	3.0	6.65" (169 mm)	ISM 900 MHz	6
W1038ES	900 MHz	3.0	6.57" (167 mm)	ISM 900 MHz	8
W1010	2.4 GHz	2.0	3.25" (82.5 mm)	802.11b/g, Bluetooth, ZigBee	10
W1049B	2.4 GHz	2.0	3.25" (82.5 mm)	802.11b/g, Bluetooth, ZigBee	12
W1030	2.4 GHz	2.0	3.25" (82.5 mm)	802.11b/g, Bluetooth, ZigBee	14
W1034	2.4 GHz	2.0	4.21" (107 mm)	802.11b/g, Bluetooth, ZigBee	16
W1037	2.4 GHz	3.2	6.65" (169 mm)	802.11b/g, Bluetooth, ZigBee	18
W1038	2.4 GHz	4.9	6.65" (169 mm)	802.11b/g, Bluetooth, ZigBee	20
W1027	2.4 GHz	3.2	4.88" (124 mm)	802.11b/g, Bluetooth, ZigBee	22
Dual-band Antennas					
W1043	2.4 & 5.0 GHz	2.0	4.59" (117 mm)	802.11b/g, Bluetooth, ZigBee	24
W1045	2.4 & 5.0 GHz	2.0	4.134" (105 mm)	802.11b/g, Bluetooth, ZigBee	26
W1028	5.15 & 5.85 GHz	2.0	4.88" (124 mm)	802.11a, ISM 5.8 GHz900 MHz	28

1. Antennas come standard with R-SMA connectors.

2. Mechanical length from connector pivot to tip of antenna. See dimension details on following pages.

Connector Options

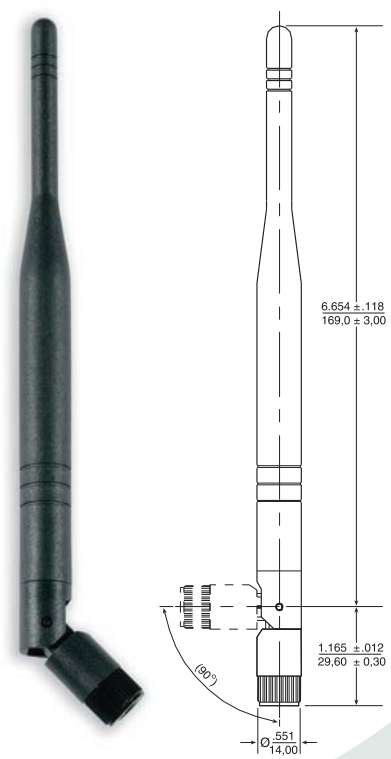
The standard connector is an R-SMA connector, but antennas can be ordered with a variety of cabling and connector options. Ask your representative for details.



Connector photos are enlarged to show details and are not to scale.

Wireless External Antenna for 900 MHz Applications

Pulse Part Number: W1063



Features

- Ideal for lower frequency wireless applications in the ISM 900 MHz band
- Omni-directional radiation pattern provides broad 360° coverage
- One-eighth wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

Color Options

- Black*
- Gray (Pantone cool gray 8C)
- Gray (Pantone 429C)
- Gray (Pantone cool gray 7C)

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....25.6 grams
Carton.....20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [MHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1063	868 – 928	3.0	50 Ω	≤ 2.0	Vertical	1/4 dipole	Omni	Black

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Wireless External Antenna for 900 MHz Applications

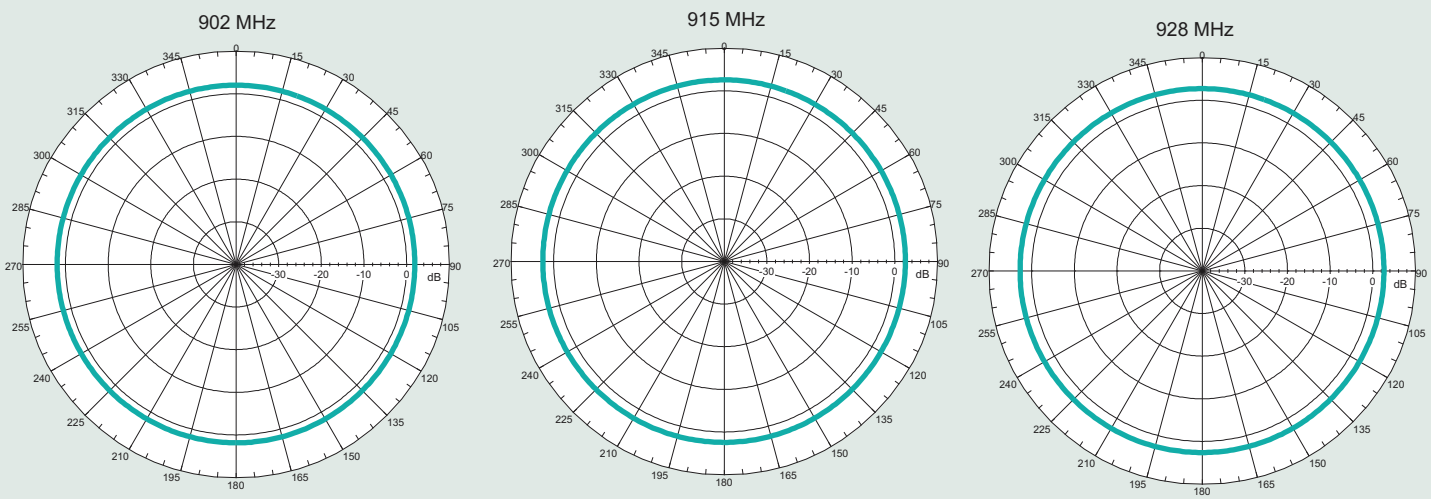
Pulse Part Number: W1063

Application Notes

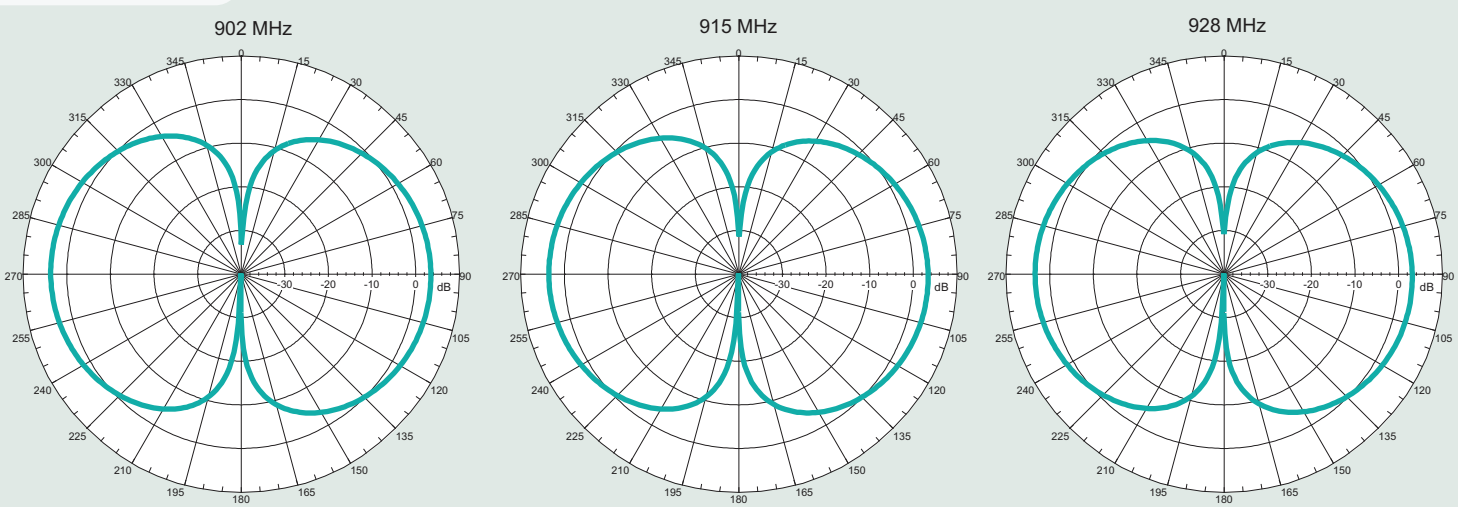
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1063

Horizontal Position



Vertical Position



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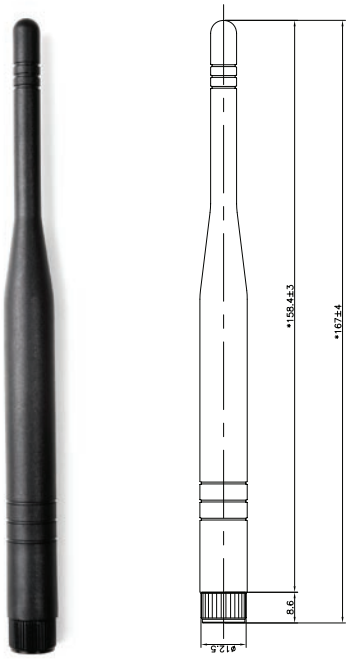
Wireless External Antenna for 900 MHz Application

Pulse Part Number: W1038ES



Features

- Ideal for lower frequency wireless applications in the ISM 900 MHz band
- Omnidirectional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration

Connector

- Reverse SMA (Male)

Weight 24.7 grams
Carton 20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± 0.10 / 0.25

Electrical Specifications @ +25 °C

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation
868 – 928	3.0	50 Ω	≤ 2.0	Vertical	¼, dipole	Omni

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Wireless External Antenna for 900 MHz Application

Pulse Part Number: W1038ES

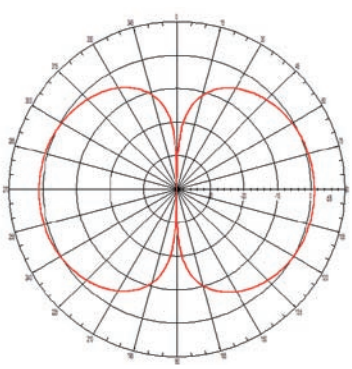
Application Notes

Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications withing the spec ified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

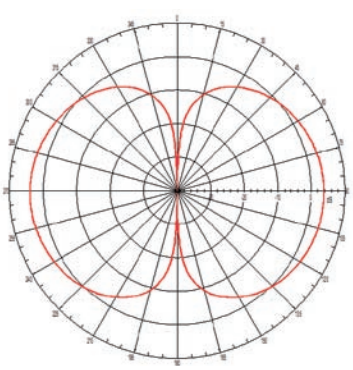
Gain Performance W1038ES

EPLANE

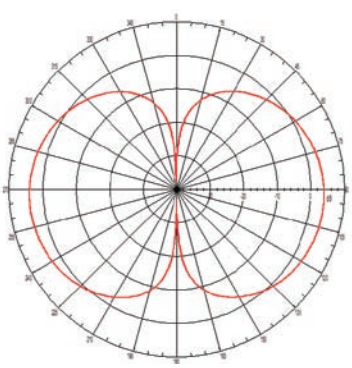
860MHz 1.16997 dBi



895MHz 3.5901 dBi

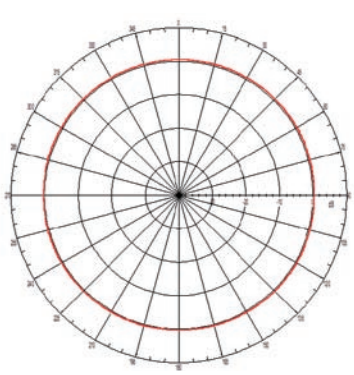


928MHz 3.60473 dBi

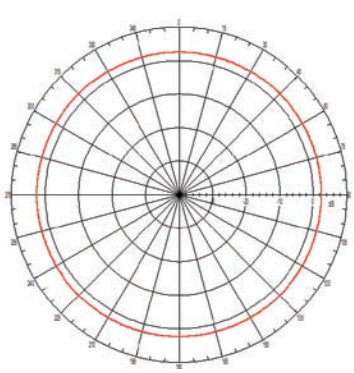


H-PLANE

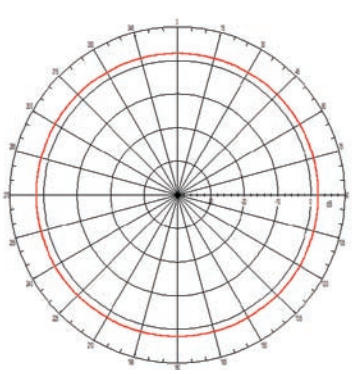
860MHz 0.51331 dBi



895MHz 2.52676 dBi

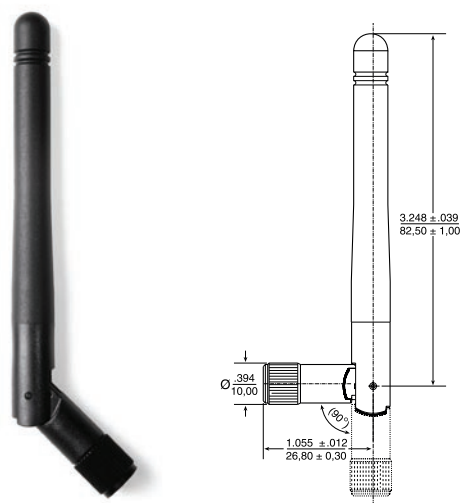


928MHz 2.20749 dBi



Wireless External Antenna for 2.4 GHz Application

Pulse Part Number: W1010



Features

- Shortest antennas in product line Omnidirectional radiation
- For WLAN devices using WiFi (802.11b/g), Bluetooth®, ZigBee™ and other applications in the ISM 2.4GHz band
- Omnidirectional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

Connector

- SMA (Male)

Weight 6.3 grams
Carton 20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± 0.10 / 0.25

Electrical Specifications @ +25 °C

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation
2.4 – 2.5	2.0	50 Ω	≤ 2.0	Vertical	¼, dipole	Omni

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Wireless External Antenna for 2.4 GHz Application

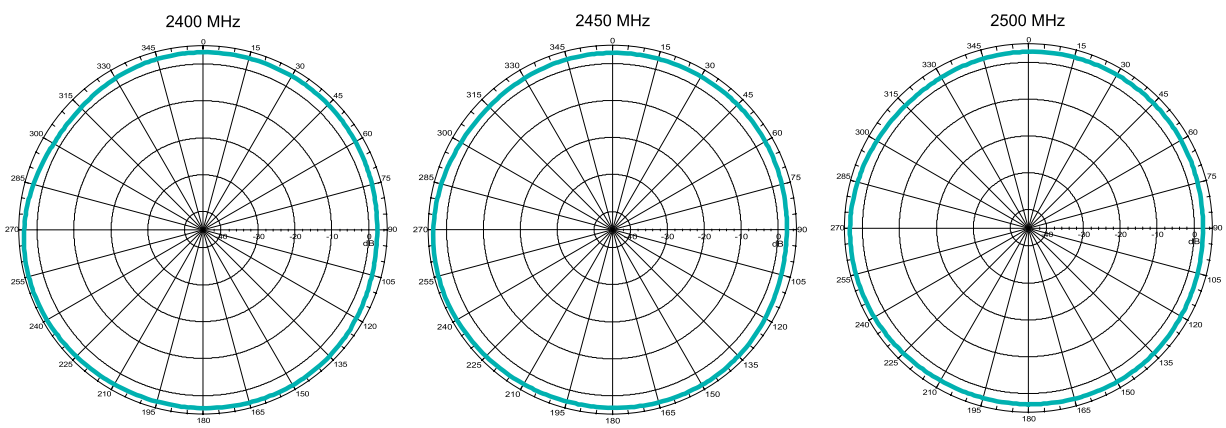
Pulse Part Number: W1010

Application Notes

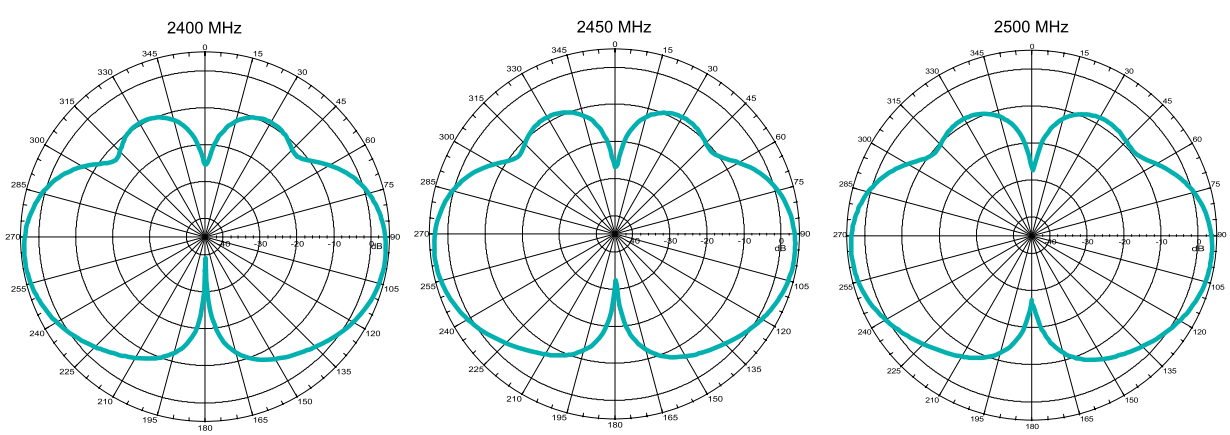
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications withing the spec ified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1010

Horizontal Position



Vertical Position



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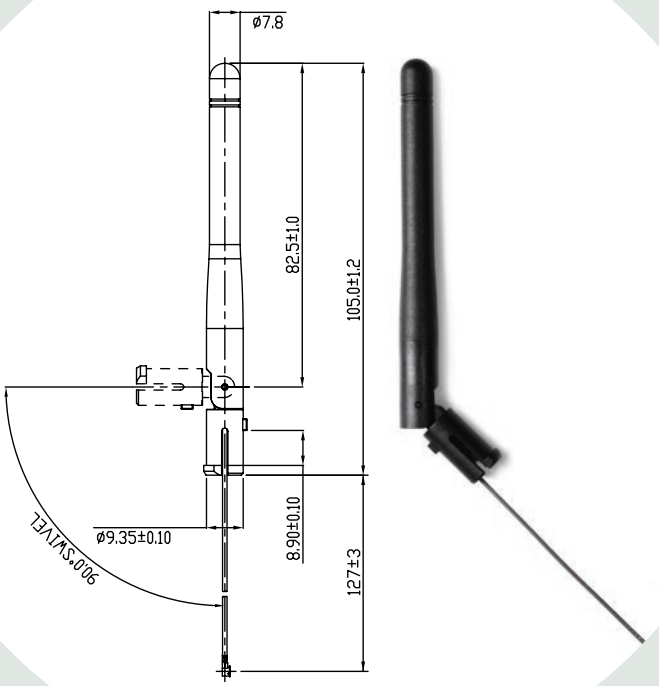
Wireless External Antenna for 2.4 GHz Application

Single-Band Antenna with I-PEX Cable Assembly. Pulse Part Number: W1049B



Antennas DO NOT come with bushing holders.
Order separately if required. Part Number : P4208-02A202

Features

- Shortest antennas in product line
  Omni-directional radiation
- For WLAN devices using WiFi (802.11b/g), Bluetooth®, ZigBee™ and other applications in the ISM 2.4GHz band
- Omnidirectional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Various cable length from 3 to 12 inch (76-305mm)

Connector

- I-PEX

Pansize 20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± 0.10 / 0.25

Electrical Specifications @ +25 °C

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Part Number	Frequency [GHz]	Max Gain [dBi]	Impedance [Ω]	Mechanical Length (in/mm)	Cable Length (in/mm)
W1049B030	2.4	2.0	50	3.25/82.5	3/76
W1049B050	2.4	2.0	50	3.25/82.5	5/127
W1049B070	2.4	2.0	50	3.25/82.5	7/178
W1049B090	2.4	2.0	50	3.25/82.5	9/229
W1049B120	2.4	2.0	50	3.25/82.5	12/305

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Wireless External Antenna for 2.4 GHz Application

Single-Band Antenna with I-PEX Cable Assembly. Pulse Part Number: W1049B

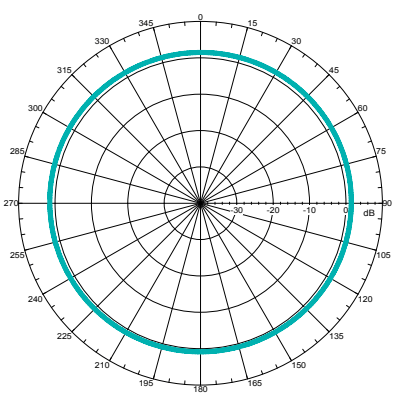
Application Notes

Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications withing the spec ified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

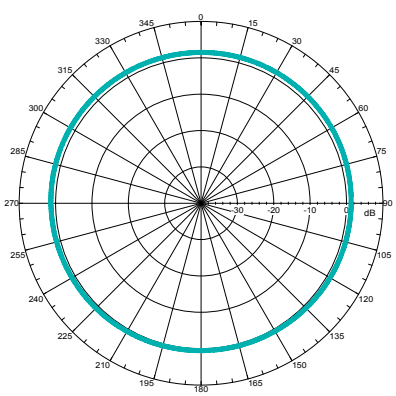
Gain Performance W1049B030

H-PLANE

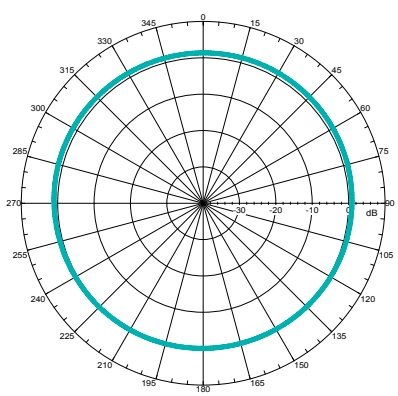
2.4GHz 1.55524dBi



2.45GHz 1.51154dBi

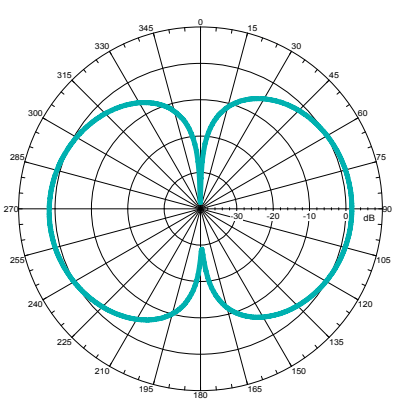


2.5GHz 1.38176dBi

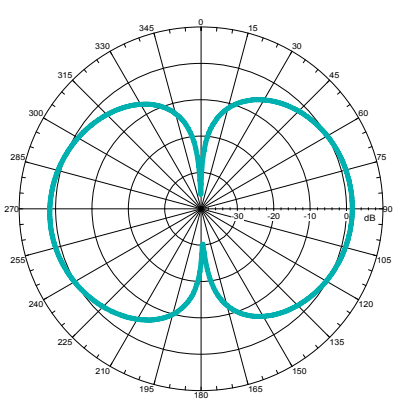


E-PLANE

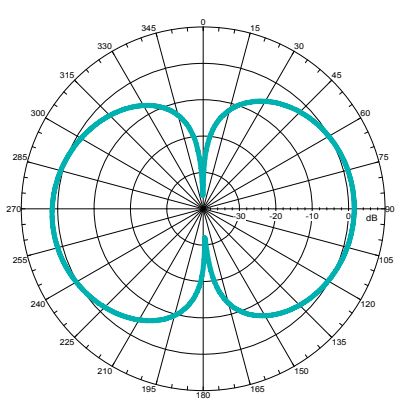
2.4GHz 1.61476dBi



2.45GHz 1.6233dBi

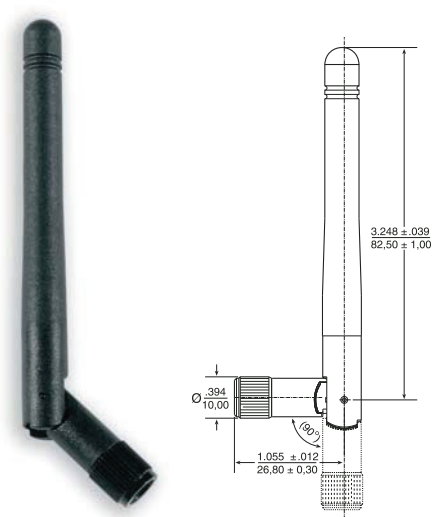


2.5GHz 1.59034dBi



Wireless External Antenna for 2.4 GHz Applications

Pulse Part Number: W1030



Features

- Shortest antennas in product line
- For WLAN devices using WiFi (802.11b/g), Bluetooth® and ZigBee™
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....6.3 grams
Carton.....20/bag; 500/carton

Dimensions: $\frac{\text{Inches}}{\text{mm}}$

Unless otherwise specified, all tolerances are ± $\frac{.010}{0.25}$

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1030	2.4 – 2.5	2.0	50 Ω	≤ 2.0	Vertical	1/4, dipole	Omni	Black

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Singapore	65 6287 8998		

Wireless External Antenna for 2.4 GHz Applications

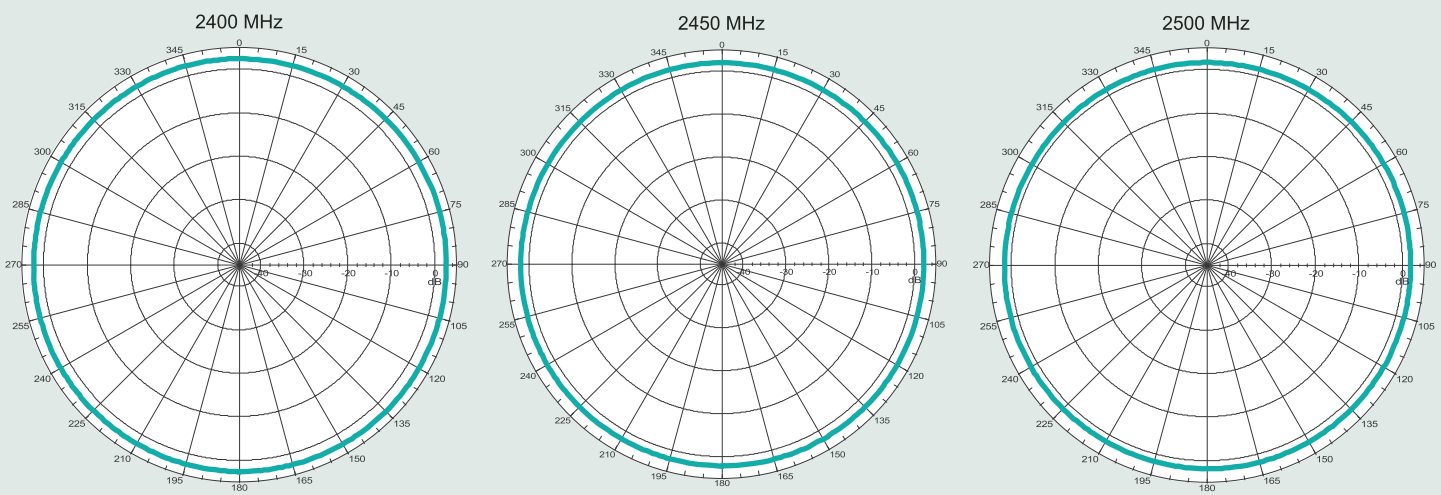
Pulse Part Number: W1030

Application Notes

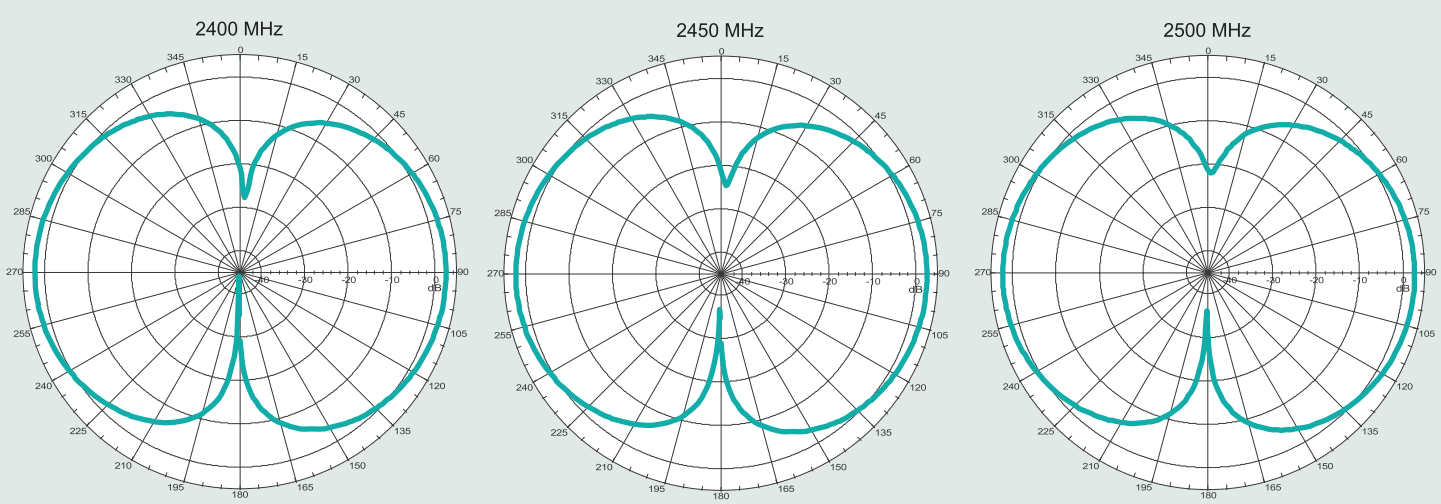
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1030

Horizontal Position



Vertical Position



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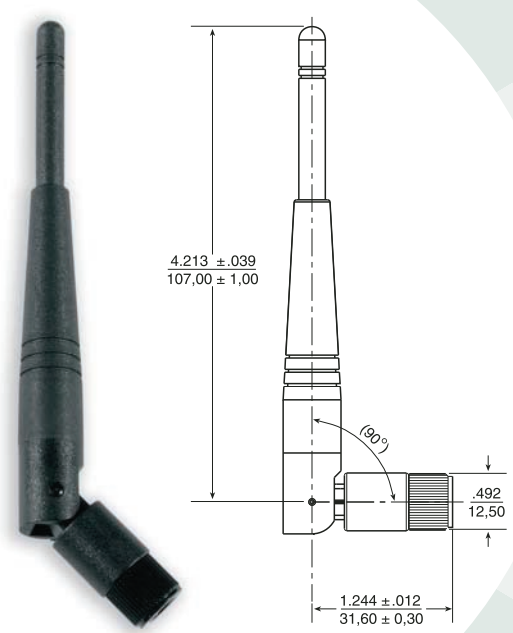
Wireless External Antenna for 2.4 GHz Applications, Tapered Design

Pulse Part Number: W1034



Features

- Attractive, tapered design
- For WLAN devices using WiFi (802.11b/g), Bluetooth® and ZigBee™
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

Color Options

- Black*
- Gray (Pantone cool gray 8C)
- Gray (Pantone 429C)
- Gray (Pantone cool gray 7C)

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....19.5 grams
Carton.....20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1034	2.4 – 2.5	2.0	50 Ω	≤ 2.0	Vertical	1/4, dipole	Omni	Black

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UK	44 1483 401 700	China	86 769 5538070
France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		

Wireless External Antenna for 2.4 GHz Applications, Tapered Design

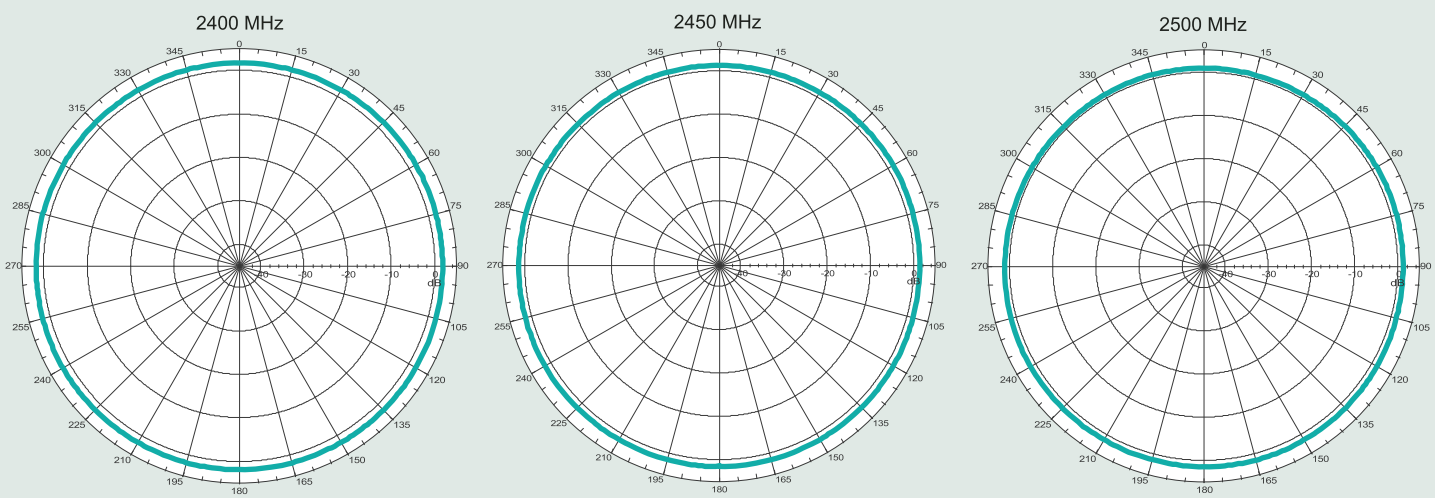
Pulse Part Number: W1034

Application Notes

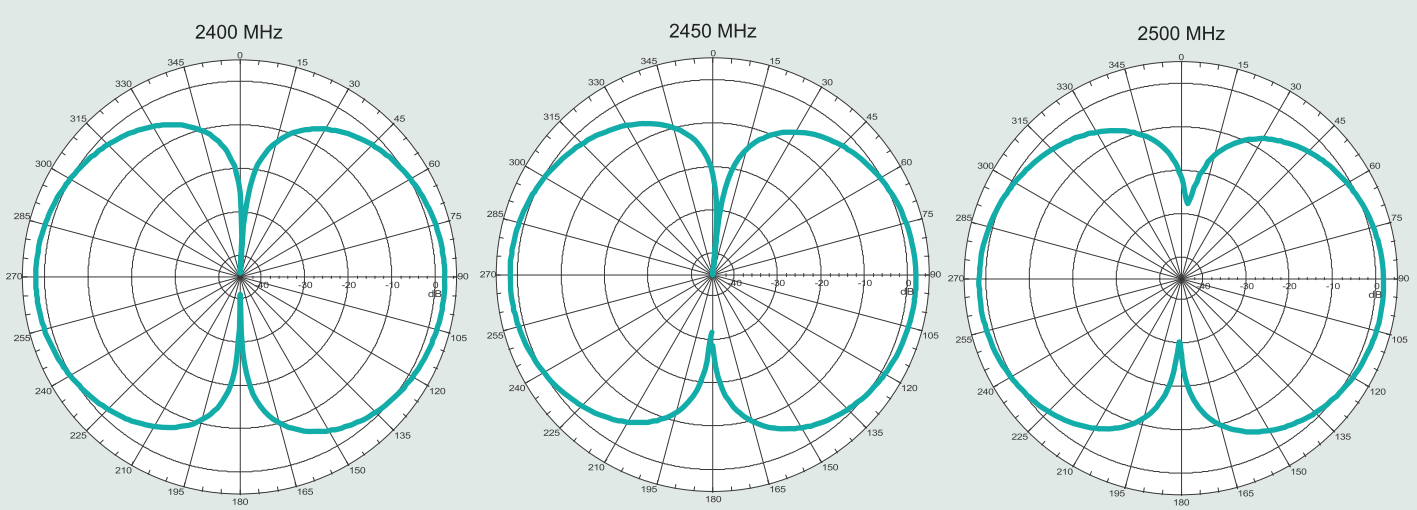
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1034

Horizontal Position



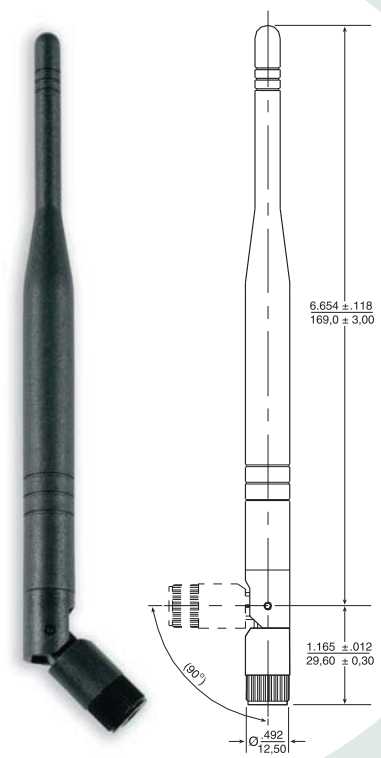
Vertical Position



Pulse
A TECHNITROL COMPANY

Wireless External Antenna for 2.4 GHz Applications

Pulse Part Number: W1037



Features

- High gain performance
- For WLAN devices using WiFi (802.11b/g), Bluetooth® and ZigBee™
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

Color Options

- Black*
- Gray (Pantone cool gray 8C)
- Gray (Pantone 429C)
- Gray (Pantone cool gray 7C)

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....25.1 grams

Carton.....20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1037	2.4 – 2.5	3.2	50 Ω	≤ 2.0	Vertical	1/4, dipole	Omni	Black

Pulse Antennas
Takatie 6
90440 Kempele, Finland
Tel: +358 207 935 500
Fax: +358 207 935 501
www.pulseeng.com/antennas

External Antennas Sales Contacts

USA	858 674 8100	Shanghai	86 21 32181071
UK	44 1483 401 700	China	86 769 5538070
France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		

Wireless External Antenna for 2.4 GHz Applications

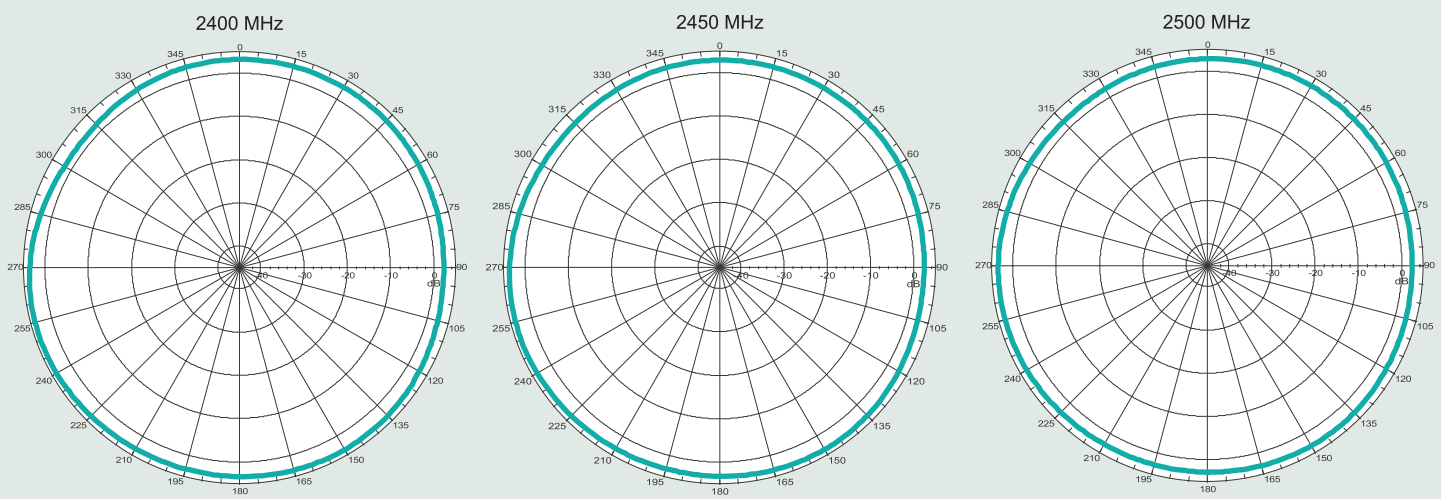
Pulse Part Number: W1037

Application Notes

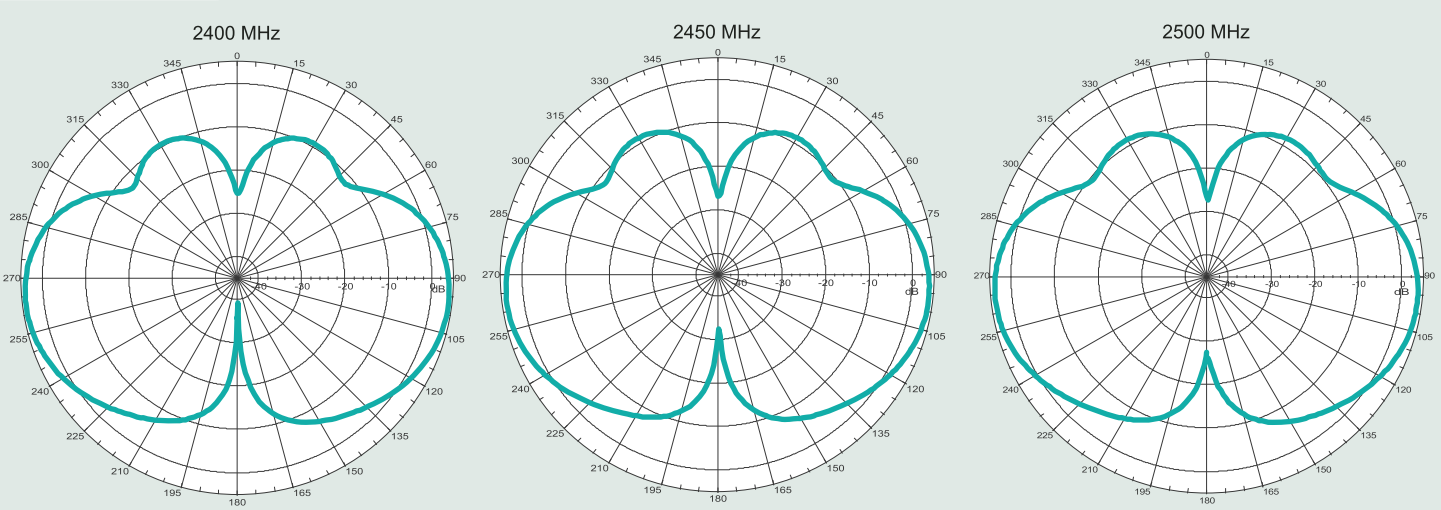
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1037

Horizontal Position



Vertical Position



Pulse
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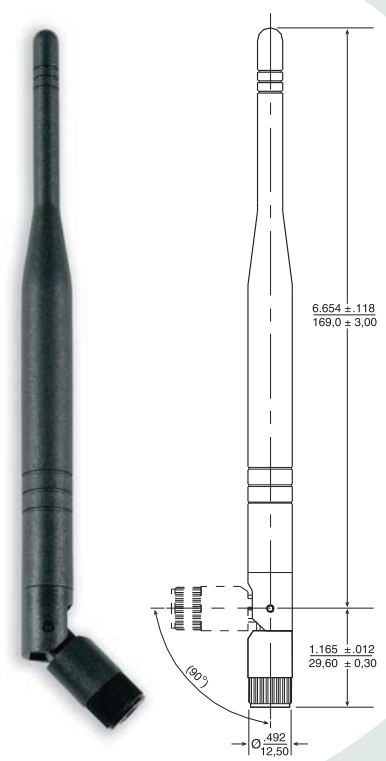
Wireless External Antenna for 2.4 GHz Applications

Pulse Part Number: W1038



Features

- High gain performance
- For WLAN devices using WiFi (802.11b/g), Bluetooth® and ZigBee™
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

Color Options

- Black*
- Gray (Pantone cool gray 8C)
- Gray (Pantone 429C)
- Gray (Pantone cool gray 7C)

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....25.1 grams
Carton.....20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1038	2.4 – 2.5	4.9	50 Ω	≤ 2.0	Vertical	1/4, dipole	Omni	Black

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External Antennas Sales Contacts

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UK	44 1483 401 700	China	86 769 5538070
France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		

Wireless External Antenna for 2.4 GHz Applications

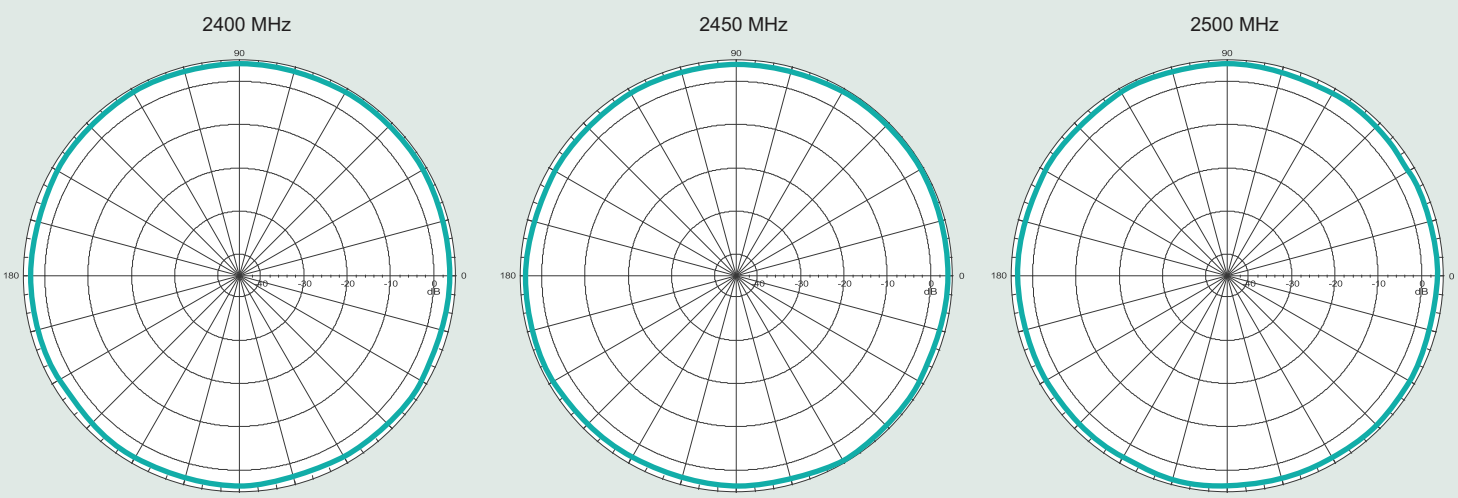
Pulse Part Number: W1038

Application Notes

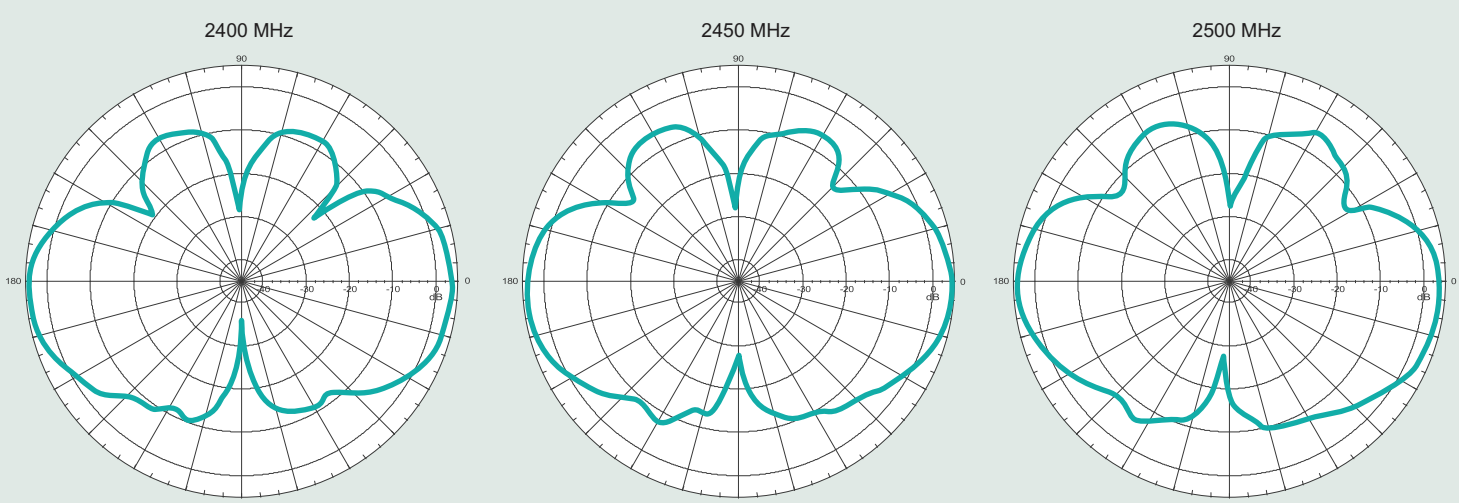
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1038

Horizontal Position

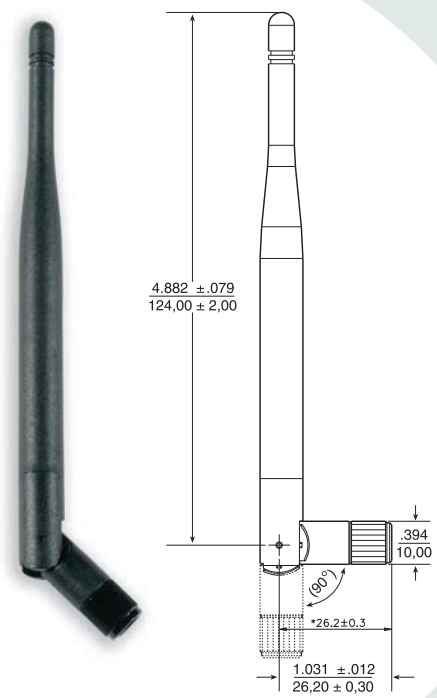


Vertical Position



Wireless External Antenna for 2.4 GHz Applications

Pulse Part Number: W1027



Features

- High gain antenna
- For WLAN devices using WiFi (802.11b/g), Bluetooth® and ZigBee™
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

Color Options

- Black*
- Gray (Pantone cool gray 8C)

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....13.9 grams
Carton.....20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1027	2.4 – 2.5	3.2	50 Ω	≤ 1.9	Vertical	1/4, dipole	Omni	Black

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France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		

Wireless External Antenna for 2.4 GHz Applications

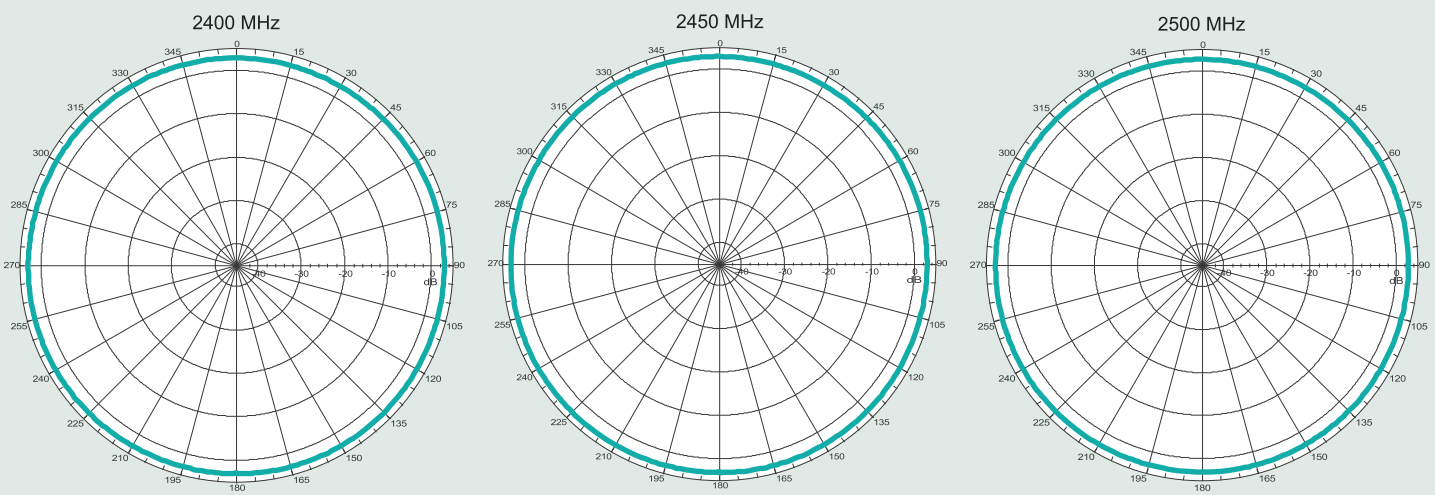
Pulse Part Number: W1027

Application Notes

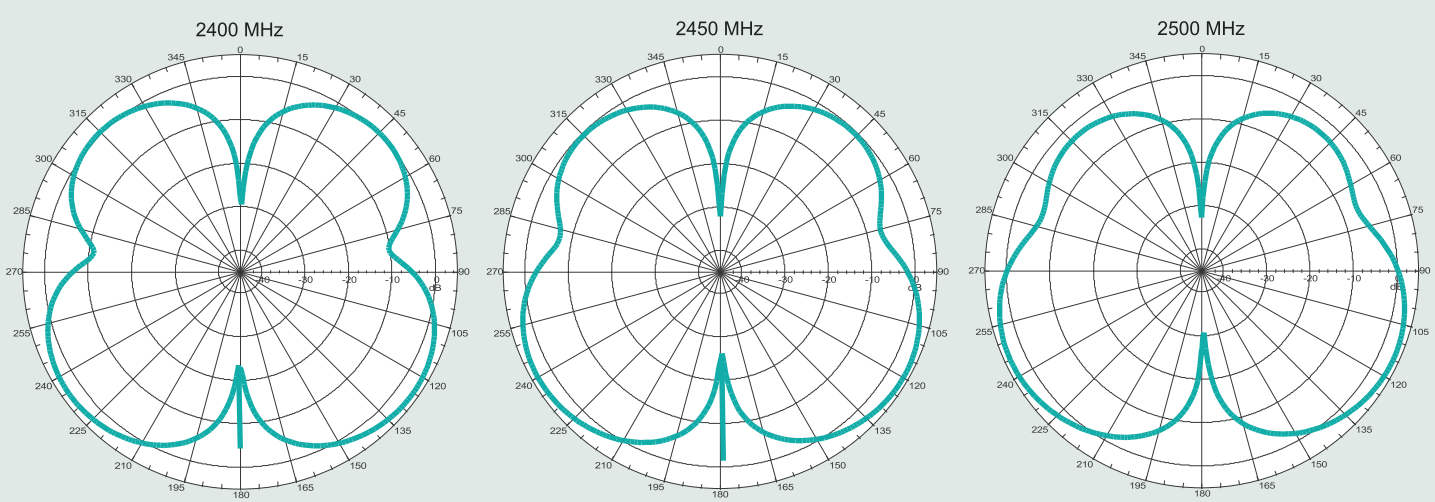
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1027

Horizontal Position



Vertical Position



Pulse
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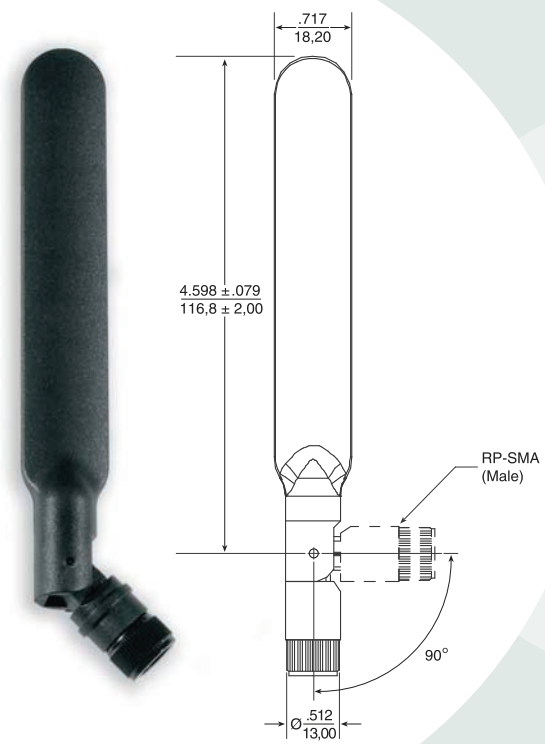
Wireless External Dual-Band Antenna for 2.4 GHz & 5.0 GHz Applications

Pulse Part Number: W1043



Features

- Dual-band, blade style antenna
- For WLAN devices using WiFi (802.11a/b/g), Bluetooth® and ZigBee™
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM designs

Color Options

- Black*
- Gray (Pantone cool gray 8C)

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....18.0 grams
Carton.....20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1043	2.4 & 5.0	2.0	50 Ω	≤ 2.0	Vertical	1/4, dipole	Omni	Black

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Fax: +358 207 935 501
www.pulseeng.com/antennas

External Antennas Sales Contacts

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UK	44 1483 401 700	China	86 769 5538070
France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		

Wireless External Dual-Band Antenna for 2.4 GHz & 5.0 GHz Applications

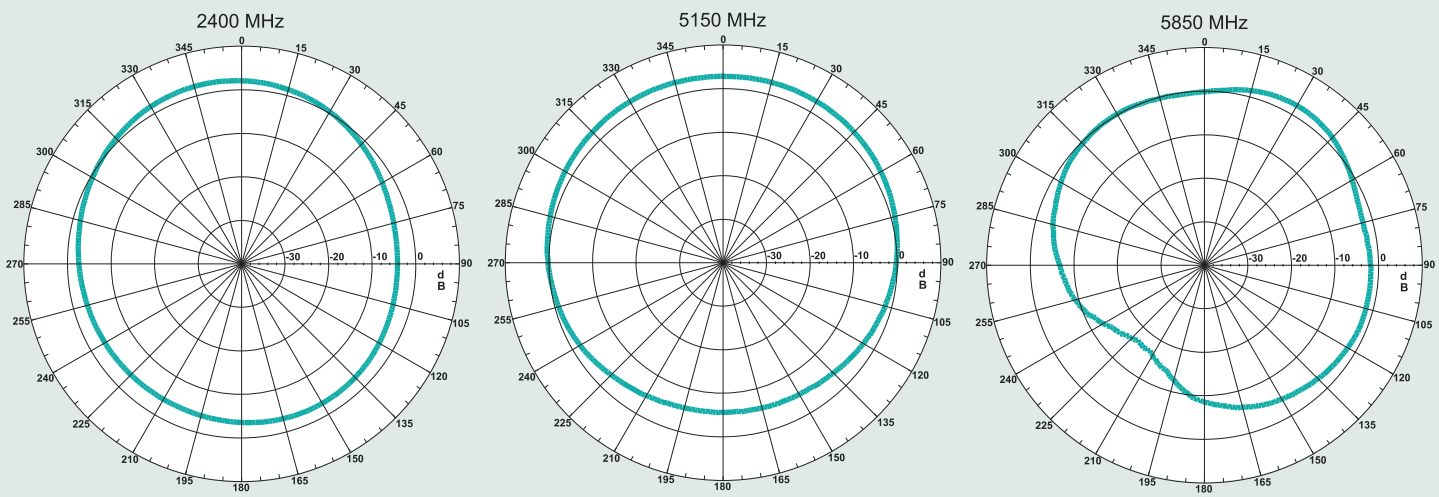
Pulse Part Number: W1043

Application Notes

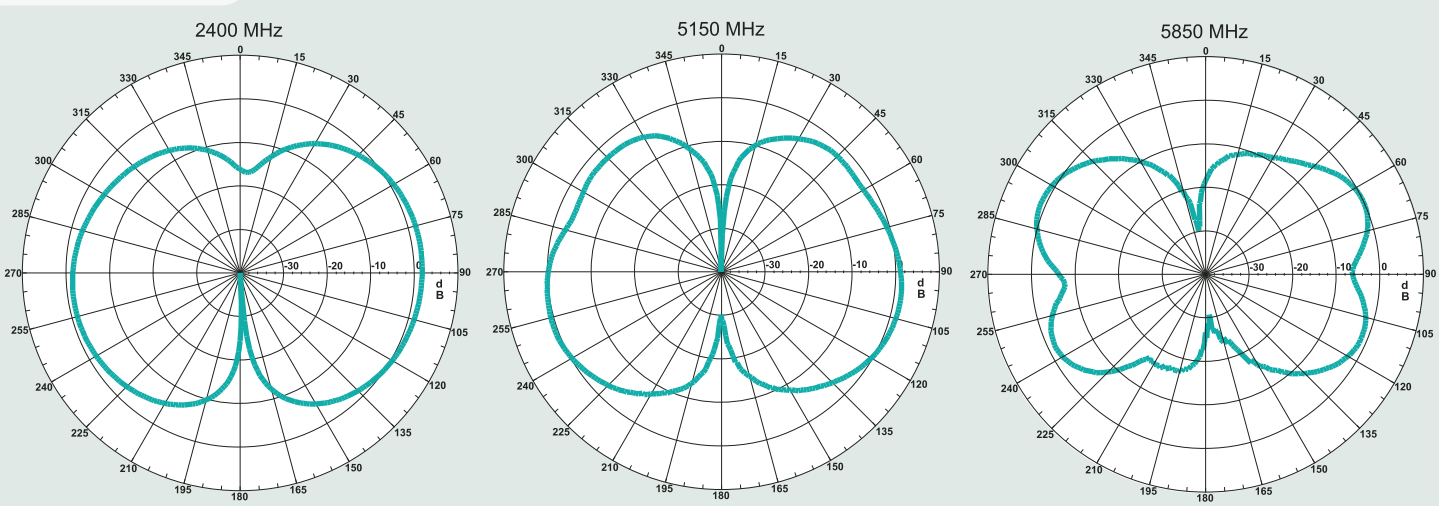
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1043

Horizontal Position



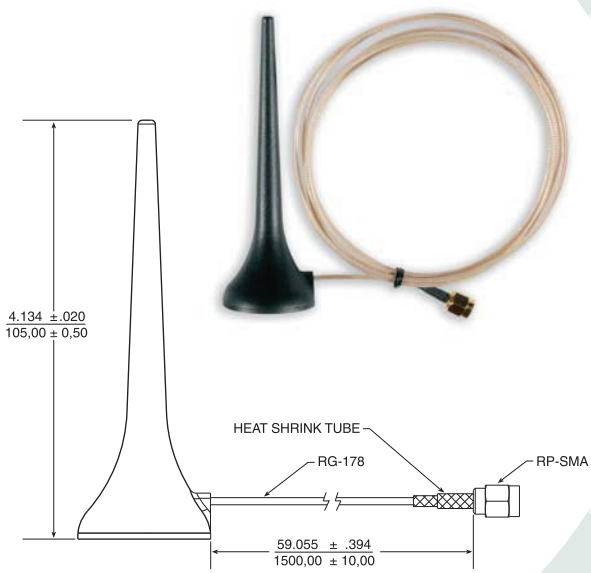
Vertical Position



Pulse
A TECHNITROL COMPANY

Wireless External Dual-Band Antenna for 2.4 GHz & 5.0 GHz Applications

Pulse Part Number: W1045



Features

- Dual-band antenna
- Magnetic, weighted base for use on desktop or metal surface
- 1500 mm flexible cable for remote placement (alternate lengths and configurations available)
- For WLAN devices using WiFi (802.11a/b/g), Bluetooth® and ZigBee™
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration

Color Options

- Black*

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....38.5 grams
Carton.....20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1045	2.4 & 5.0	2.0	50 Ω	≤ 2.0	Vertical	1/4, dipole	Omni	Black

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90440 Kempele, Finland
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www.pulseeng.com/antennas

External Antennas Sales Contacts

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UK	44 1483 401 700	China	86 769 5538070
France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		

Wireless External Dual-Band Antenna for 2.4 GHz & 5.0 GHz Applications

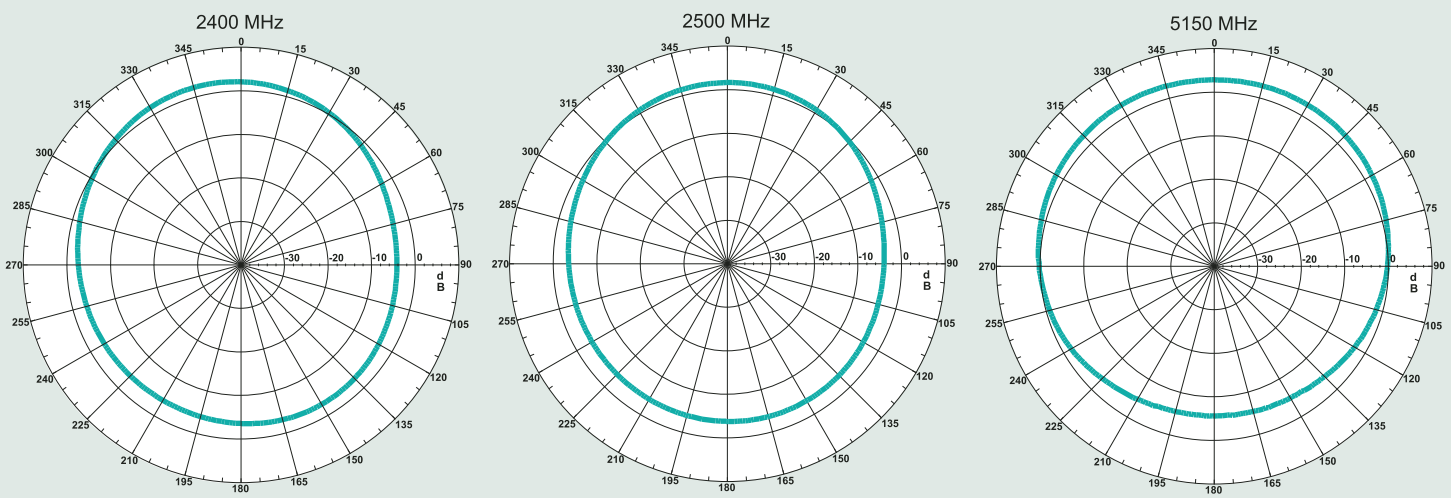
Pulse Part Number: W1045

Application Notes

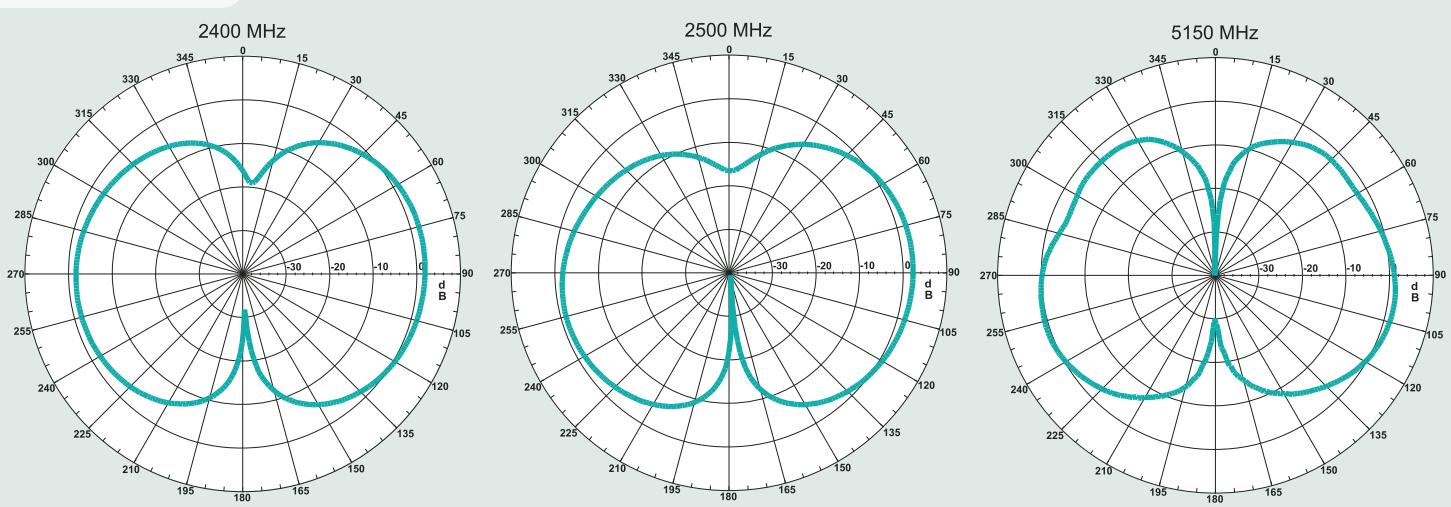
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1045

Horizontal Position

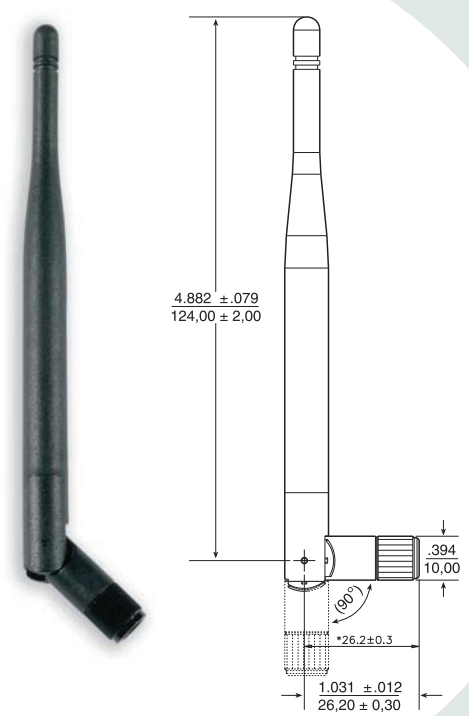


Vertical Position



Wireless External Dual-Band Antenna for 5.15 GHz & 5.85 GHz Applications

Pulse Part Number: W1028



Features

- High frequency and high gain antenna
- For WLAN devices using WiFi (802.11a) and ISM 5.8 GHz band
- Omni-directional radiation pattern provides broad 360° coverage
- One-quarter wavelength dipole configuration
- Connection and color options easily integrate with OEM design

Color Options

- Black*
- Gray (Pantone cool gray 8C)

Connector Options

- Reverse SMA (Male)*
- SMA (Male)

** Default Configuration – Please contact Pulse Applications Engineering for assistance in ordering colors and connectors*

Weight.....12.9 grams
Carton.....20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0.25

Electrical Specifications @ 25 ºC

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Antenna Part No.	Frequency [GHz]	Gain [dBi]	Impedance [Nom]	VSWR	Polarization	Electrical Length	Radiation	Color
W1028	5.15 – 5.85	2.0	50 Ω	≤ 1.9	Vertical	1/4, dipole	Omni	Black

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90440 Kempele, Finland
Tel: +358 207 935 500
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www.pulseeng.com/antennas

External Antennas Sales Contacts

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UK	44 1483 401 700	China	86 769 5538070
France	33 3 84 35 04 04	Taiwan	886 2 26980228
Singapore	65 6287 8998		

Wireless External Dual-Band Antenna for 5.15 GHz & 5.85 GHz Applications

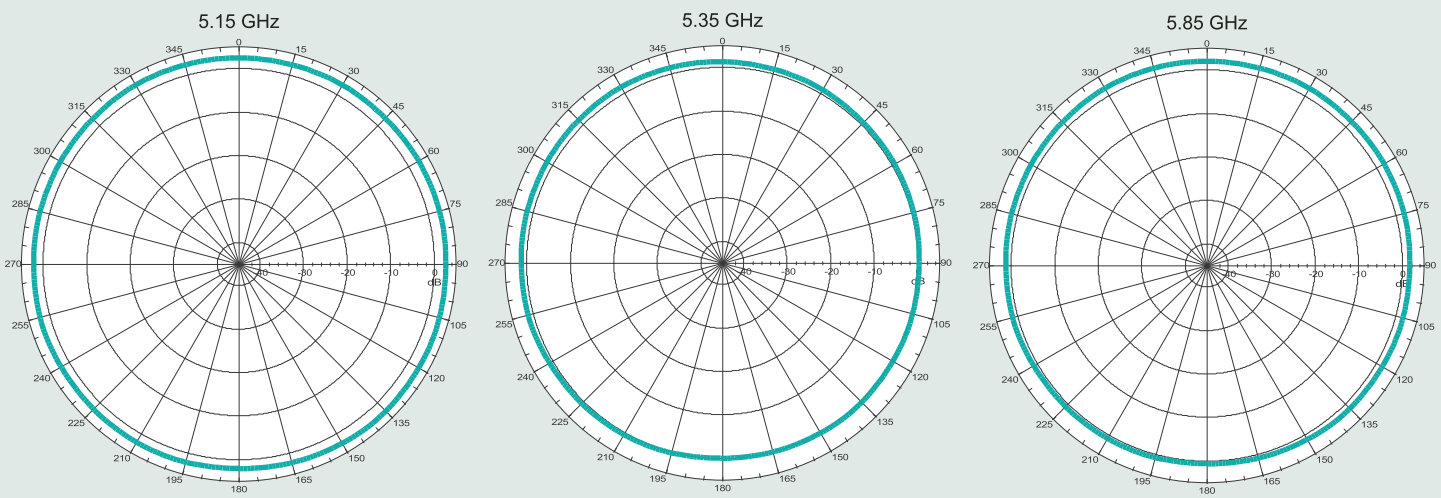
Pulse Part Number: W1028

Application Notes

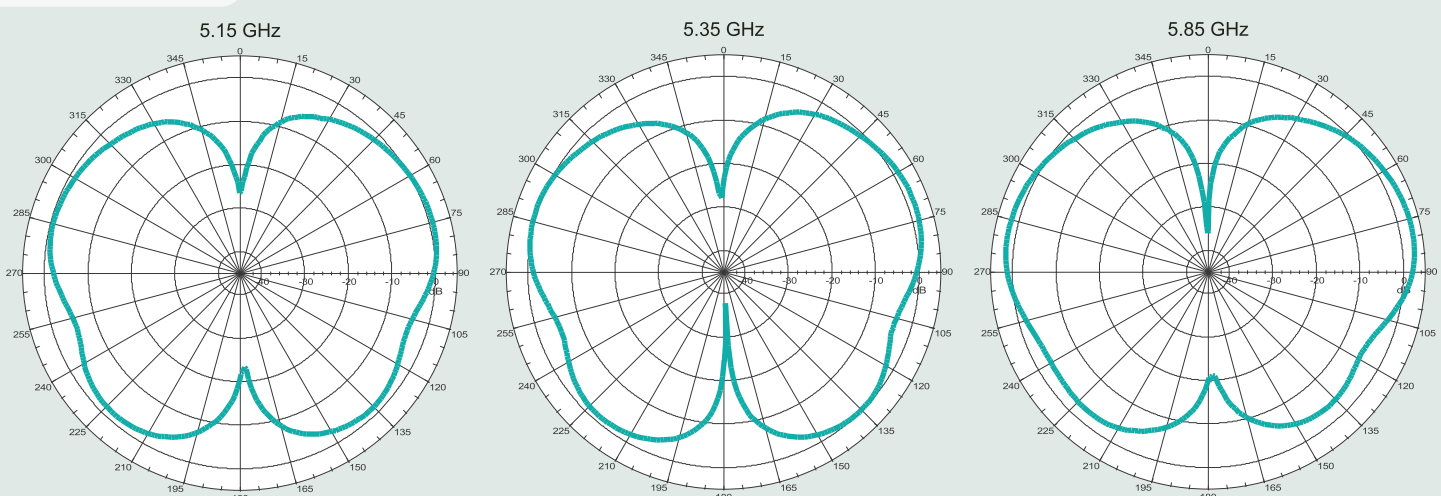
Omni-directional antennas provide a uniform, donut-shaped, 360° radiation pattern. The omni-directional pattern is suitable for point-to-multipoint broadcasting in all directions. This antenna is primarily used for WLAN applications. However, it can also be used for a variety of other applications within the specified frequency range. When used as an access point, the antenna is ideally located at the center of the coverage area.

Gain Performance W1028

Horizontal Position



Vertical Position



Pulse
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Cable Assembly for Wireless Application

Pulse Part Numbers: W9003, W9006M, W9009, W9011M, & W9063B170

Features

- Low Insertion Loss and low VSWR
- Various connector type
- Various cable length from 3 to 17 inch (76-431mm)

Pansize 20/bag; 500/carton

Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± 0.10 / 0.25

Electrical Specifications @ +25 °C

Note: This part number is lead-free and RoHS compliant. No additional suffix or identifier is required.

Part Number	VSWR 2.4 GHz / 6 GHz	Insertion Loss 2.4 GHz / 6 GHz	Cable Length (in/mm)	Connector Types
W9003	1.2 / 1.3	0.4 dB / 0.8 dB	3/76	R-SMA Female to I-PEX
W9006M	1.1 / 1.3	0.6 dB / 1.1 dB	6/150	SMA Female to I-PEX
W9009	1.2 / 1.4	0.8 dB / 1.4 dB	9/229	R-SMA Female to I-PEX
W9011M	1.2 / 1.2	0.9 dB / 1.8 dB	11/280	SMA Female to I-PEX
W9063B170	1.1 / 1.9	1.3 dB / 2.4 dB	17/431	I-PEX to R-TNC Female

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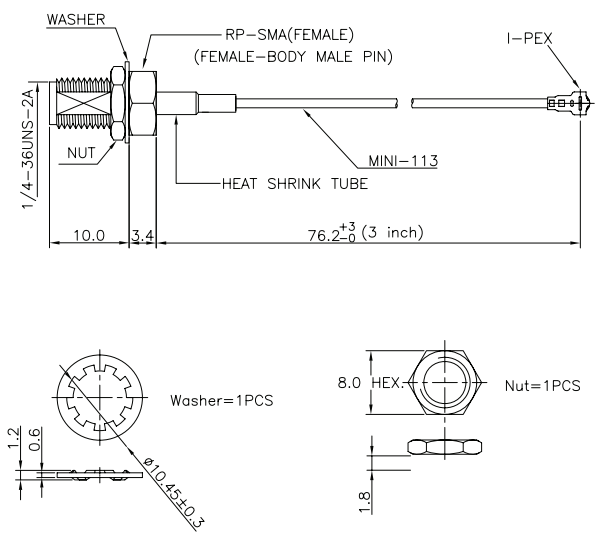
Cable Assembly for Wireless Application

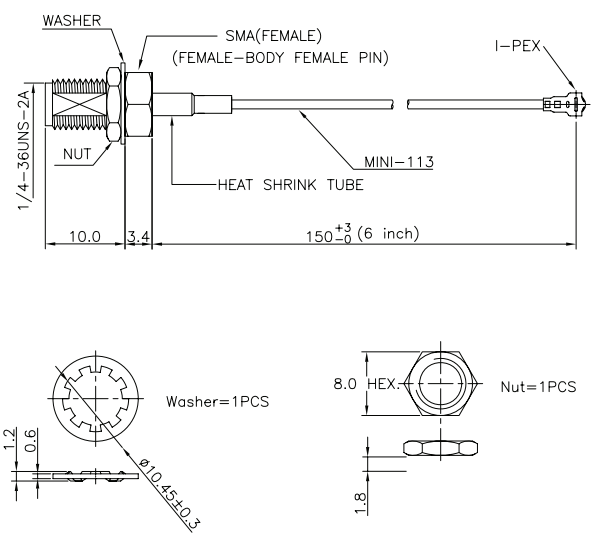
Pulse Part Numbers: W9003, W9006M, W9009, W9011M, & W9063B170

Mechanical Dimensions

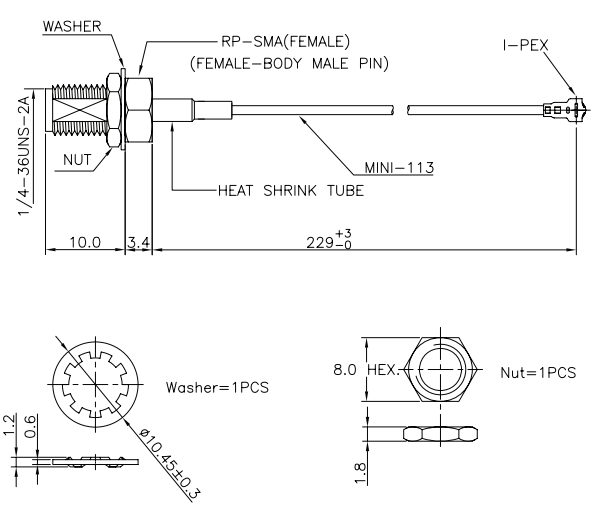
W9003



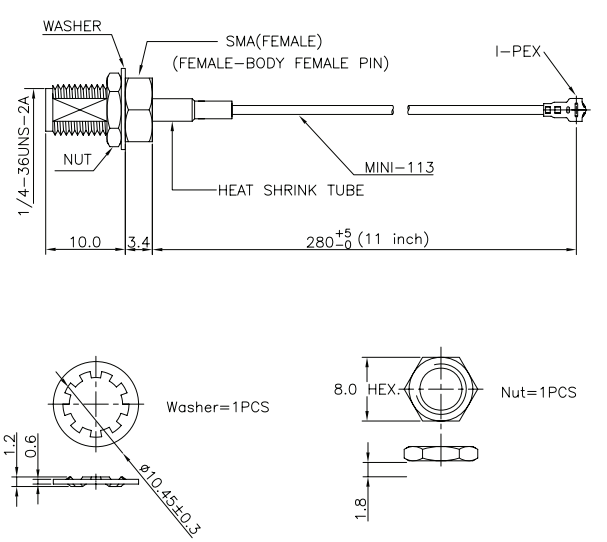
W9006M



W9009



W90011M

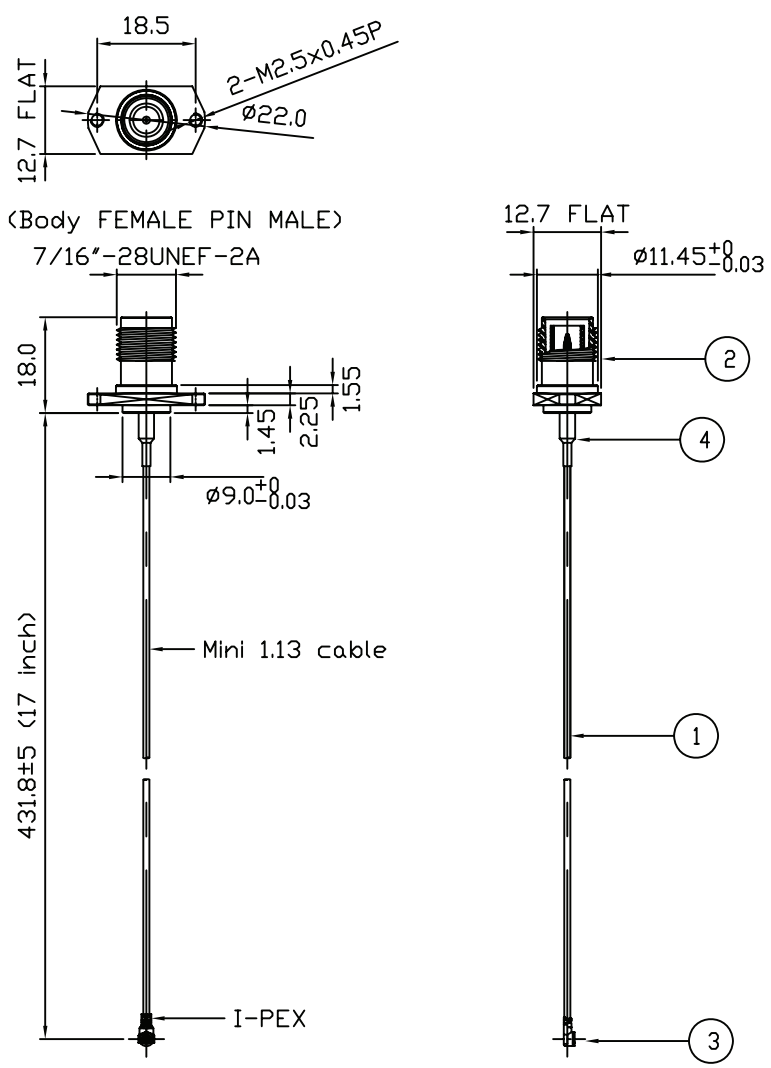


Cable Assembly for Wireless Application

Pulse Part Numbers: W9003, W9006M, W9009, W9011M, & W9063B170

Mechanical Dimensions

W9063B170



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Wireless External Antennas

Antenna Terminology

802.11
802.11 is a group of technology specifications for wireless local area networks (WLANs) developed by the Institute of Electrical and Electronics Engineers (IEEE). 802.11a provides 54MBps using OFDM encoding scheme in the 5GHz frequency range. 802.11b provides 11MBps using DSSS encoding in the 2.4GHz frequency range. 802.11g provides 54MBps using OFDM encoding in the 2.4GHz frequency band. 802.11n is a new technology promising over 100MBps using MIMO technology (see below).

Access Point
A wireless transceiver that acts as the hub of a local area network. Users with wireless antennas/receivers must be in physical proximity to the transmitter in order to access the network. An access point connects users within the network and can serve as the point of interconnection between the WLAN and a fixed wire network.

Bandwidth
Frequency over which an antenna can be used. For example, between 2.4-2.5GHz.

Bluetooth®
A short-range (approx. 10 meters) wireless protocol used for interconnectivity between mobile phones, computers, PDA's and other devices. Operates within the ISM Band of 2.4GHz.

dBi
Stands for "decibel relative to isotropic" which defines the gain of a real-life antenna relative to an isotropic radiator. An isotropic radiator is a theoretical ideal device that transmits energy in a spherical shape equally in all directions in 3-dimensional space.

Dipole
A balanced radio antenna consisting of two parts. The parts are symmetrical (equal length) and extend in opposite directions from the feed line at the center point. The lowest frequency at which a dipole is resonant is known as its fundamental resonance, and is measured in wavelengths (one-quarter, one-half, etc). A dipole works best at and above its fundamental resonance.

Directivity
Directivity is the ability of an antenna to receive energy better from a particular direction when receiving, or the ability of an antenna to focus energy in a particular direction when transmitting.

FCC Standards (for emitted power)
The Federal Communications Commission (FCC) has issued a series of guidelines related to human exposure to radiofrequency electromagnetic fields (OET Bulletin 65). The guidelines incorporate limits for transmitters operating at 30kHz to 100GHz.

Gain
A measure of the efficiency of an antenna as well as its ability to focus energy in a particular direction relative to a standard antenna. Expressed as a decibel (dB) or a decibel relative to isotropic (dBi). Gain is proportional; an increase in one direction is a decrease in the other (i.e. squeezing a ball in the middle increases its width). Typically higher gain is desirable however FCC safety regulations for emitted power often limit the antenna gain required for a given application. See FCC standards above.

Gain Performance
A graphical representation of the electromagnetic radiation of a given antenna. A "top-down" 360° view is often used (sometimes called a "polar" representation).

ISM Band
Industrial, Scientific and Medical wavebands that can be used without license.

MIMO
Multiple input, multiple output technology. Uses special algorithms and multiple antennas at both the receiving and transmitting devices to increase data throughput.

Omni-Directional
A type of antenna radiation pattern that extends equally in all horizontal directions. It provides point-to-multipoint transmission/reception. In WLAN applications, an omni-directional antenna is ideally placed at the center of the coverage area.

Polarization
The orientation of lines of electric flux of an electromagnetic wave. Can be horizontal, vertical or circular. Unmatched polarizations can lead to signal loss.

VSWR
Stands for Voltage Standing Wave Ratio and defines impedance match of an antenna to the RF circuit within the bandwidth of operation. Poor VSWR results in power loss. A ratio 2:1 is typical for most wireless applications. Lower is considered better.

ZigBee™
A wireless network used for control and automation in residential and commercial applications. It conforms to the IEEE 802.15.4 wireless standard for low data rate networks. ZigBee is slower than WiFi and Bluetooth, with a maximum speed of 250Kbps at 2.4 GHz. It is designed for low power, so batteries can last for months and even years. The typical transmission range is approximately 50 meters.

Pulse
A TECHNITROL COMPANY

Antenna Anechoic Chamber

Successful antenna design requires an understanding of performance and system effects in a controlled environment. Our anechoic chambers and other testing facilities allow our engineering teams to quickly verify and optimize antenna designs, saving development time and costs.

Far Field Antenna Measurement System Used for External Antenna Testing

Inner Space Dimensions
(excludes absorbers)
- Width: 2.33 m
- Height: 2.33 m
- Length: 5.90 m

Quiet Zone Size
- 78cm @ 0.9GHz
- 55cm @ 1.8GHz
- 48cm @ 2.4GHz
- 31cm @ 5.8GHz
- 17cm @18GHz

Amplitude Ripple
(in testing quiet zone region)
- 0.9-1.2GHz: <±0.75dB
- 1.5-2.2GHz: <±0.5dB
- 2.4-18GHz: <±0.25dB

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