

Antenna Information



11/27/2024

Digi International Inc.

XBLR

FCC: MQC-XBLR

IC: 1846A-XBLR

The device is tested to be compliant with multiple antennas. The antennas are listed below, with datasheets attached at the end of this document:

Antenna 1:

Part Number - FXP895.07.0200C

Manufacturer - Taoglas

Peak gain for 868MHz - 1.92 dBi

Peak gain for 915MHz - 2.83 dBi

Type - Embedded FPC antenna

Antenna 2:

Part Number - ANT-916-CW-HWR-SMA

Manufacturer – TE Connectivity

Peak gain for 915MHz – 1.2 dBi

Type - Whip, Dipole

Antenna 3:

Part Number - W1063M

Manufacturer – Pulse Electronics

Peak gain - 1 dBi

Type - Whip, Dipole



TAOGLAS®



Datasheet

868/915MHz ISM/LoRA Flexible PCB Antenna

Part No:
FXP895.07.0200C

Description

860-928MHz ISM/LoRA Compact Flexible PCB Antenna

Features:

- Compact ISM/LoRA antenna
- Embedded FPC Antenna Supporting 860 to 928MHz
- Dimensions: 69mm * 20mm * 0.2mm
- Mini coaxial cable 200mm 1.37 IPEX MHFI U.FL Compatible connector
- Custom Cables and Connectors Available
- RoHS & Reach Compliant

1.	Introduction	3
2.	Specification	4
3.	Antenna Characteristics	5
4.	Radiation Patterns	8
5.	Mechanical Drawing	11
6.	Packaging	12
	Changelog	16

Taoglas makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Taoglas reserves all rights to this document and the information contained herein. Reproduction, use or disclosure to third parties without express permission is strictly prohibited.

Ireland & USA
ISO 9001:2015
Certified



Taiwan
ISO 9001:2015
Certified



1. Introduction



The Taoglas FXP895 is an ISM/LoRA compact flexible PCB antenna designed to fit into small devices. This antenna has been expertly designed to cover frequencies used in different regions for ISM/LoRA applications, incorporating a wideband design is rare for ISM/LoRA products and with the FXP895 frequencies from 860-928MHz can be covered so one SKU can be used for global ISM/LoRA applications.

The FXP895 has been designed to be extremely compact compared to other ISM/LoRA Flexible PCB antennas meaning it can be placed in areas where other products cannot. It can be adhered via 3M tape on to a customer's device with care taken to ensure the antenna is placed as far away from metal components as possible.

Typical Applications Include:

- Remote Monitoring
- Mesh Networks
- Security

The FXP895's cables and connectors are fully customizable, please contact your regional Taoglas customer support team for further information.

2. Specification

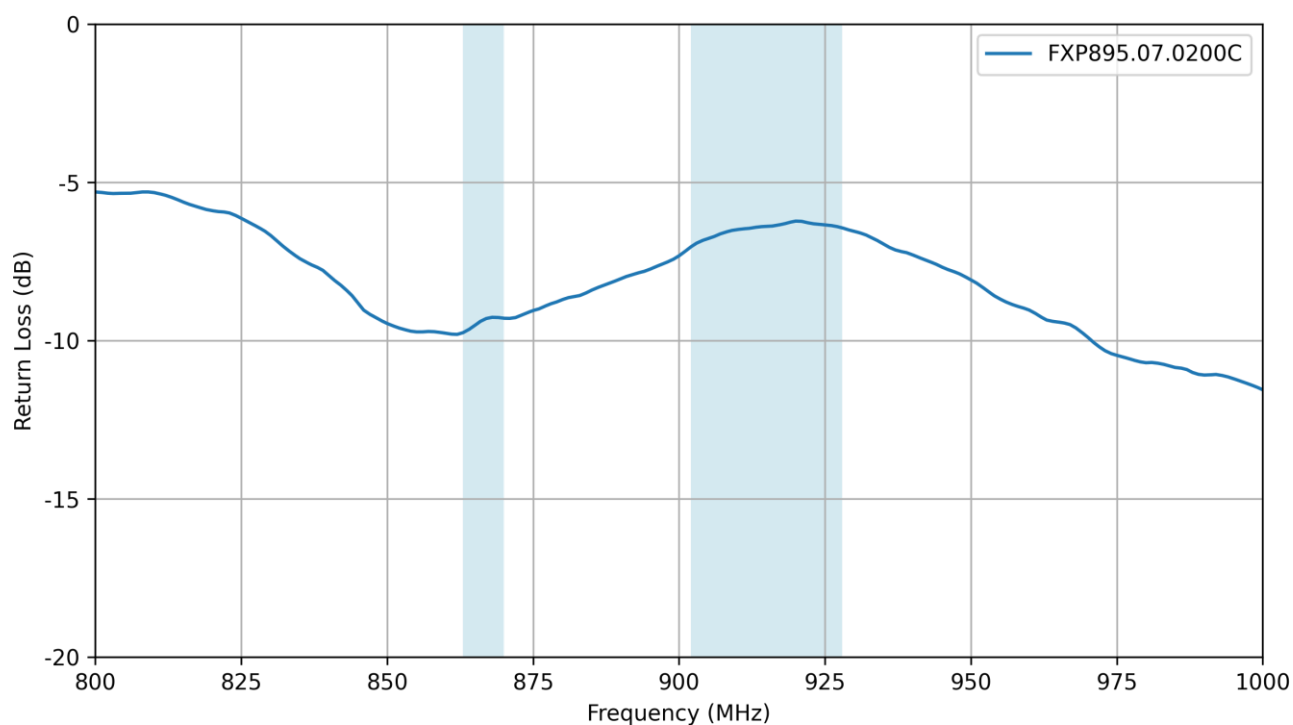
LTE Electrical								
Band	Frequency (MHz)	Efficiency (%)	Average Gain (dB)	Peak Gain (dBi)	Impedance	Polarization	Radiation Pattern	Max. input power
868MHz	863-870	51.6	-2.87	1.92	50 Ω	Linear	Omni	2W
915MHz	902-928	58.3	-2.34	2.83				

Mechanical	
Dimensions	69.3 x 20 x 0.2mm
Weight	2g
Material	Polymer
Connector	IPEX MHFI U.FL compatible
Cable	1.37mm Coaxial

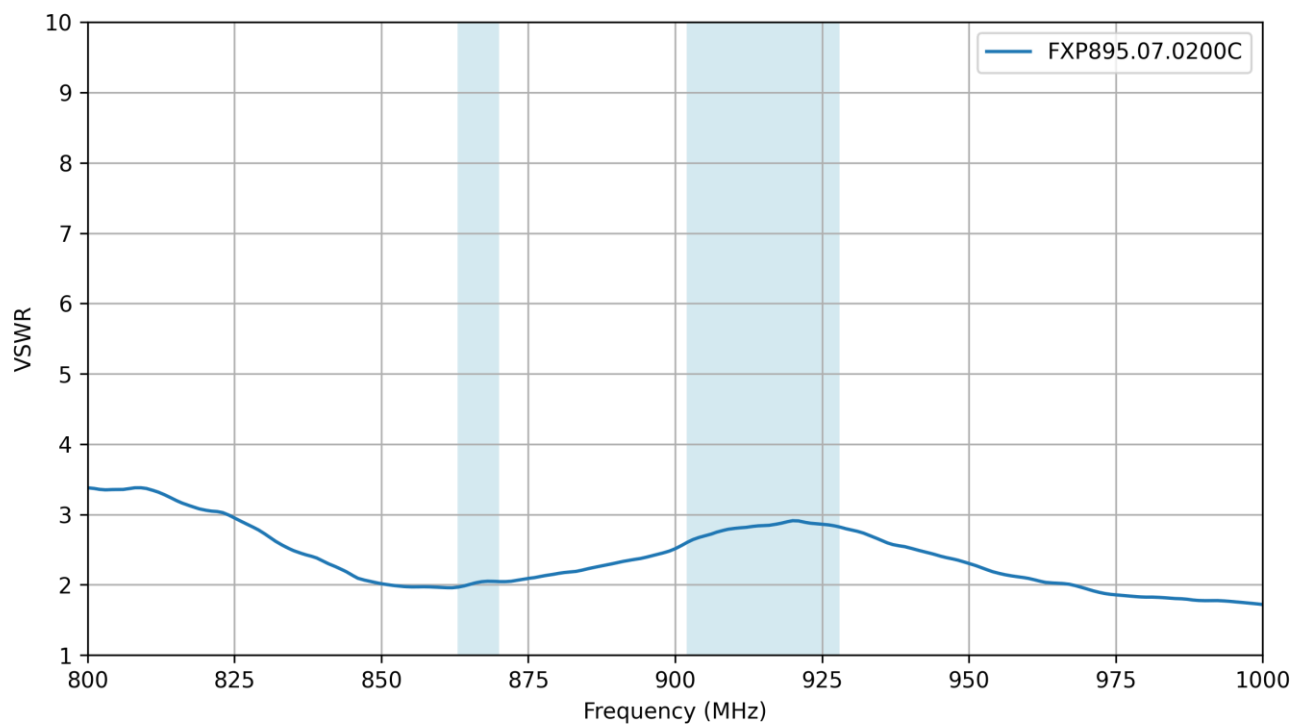
Environmental	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Relative Humidity	40% to 95%
RoHs & REACH Compliant	Yes

3. Antenna Characteristics

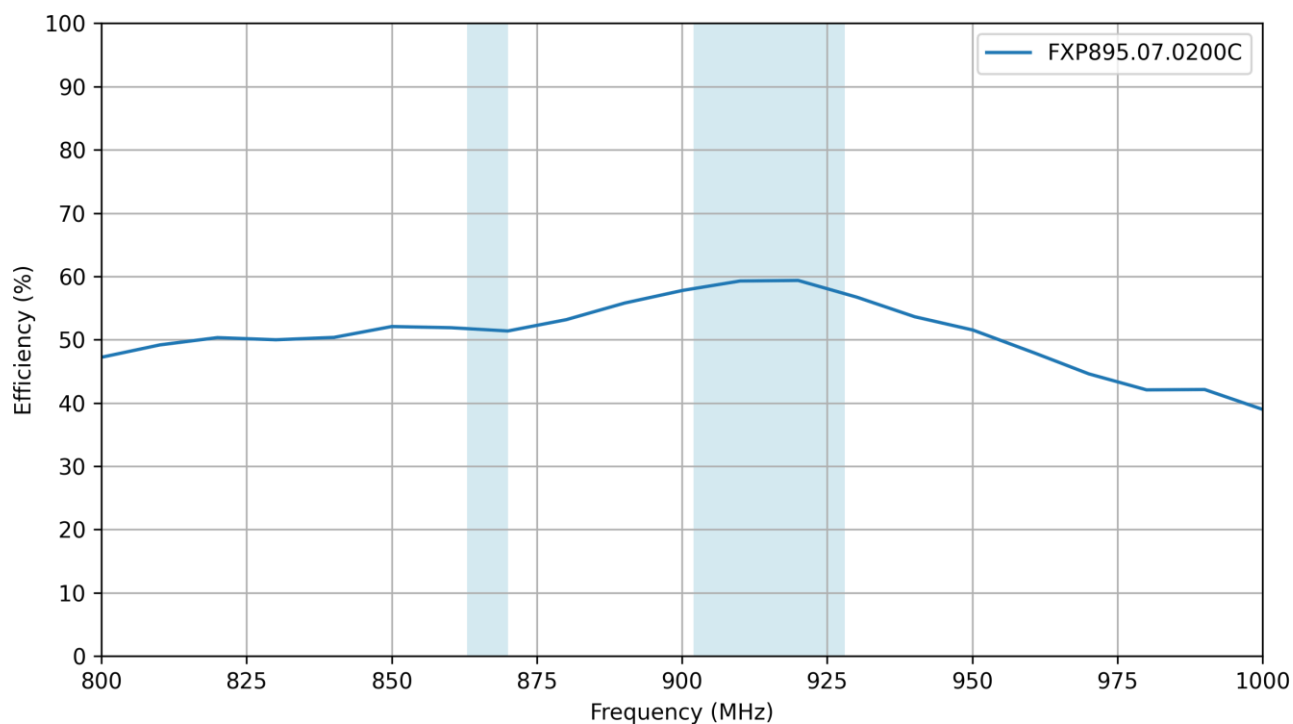
3.1 Return Loss



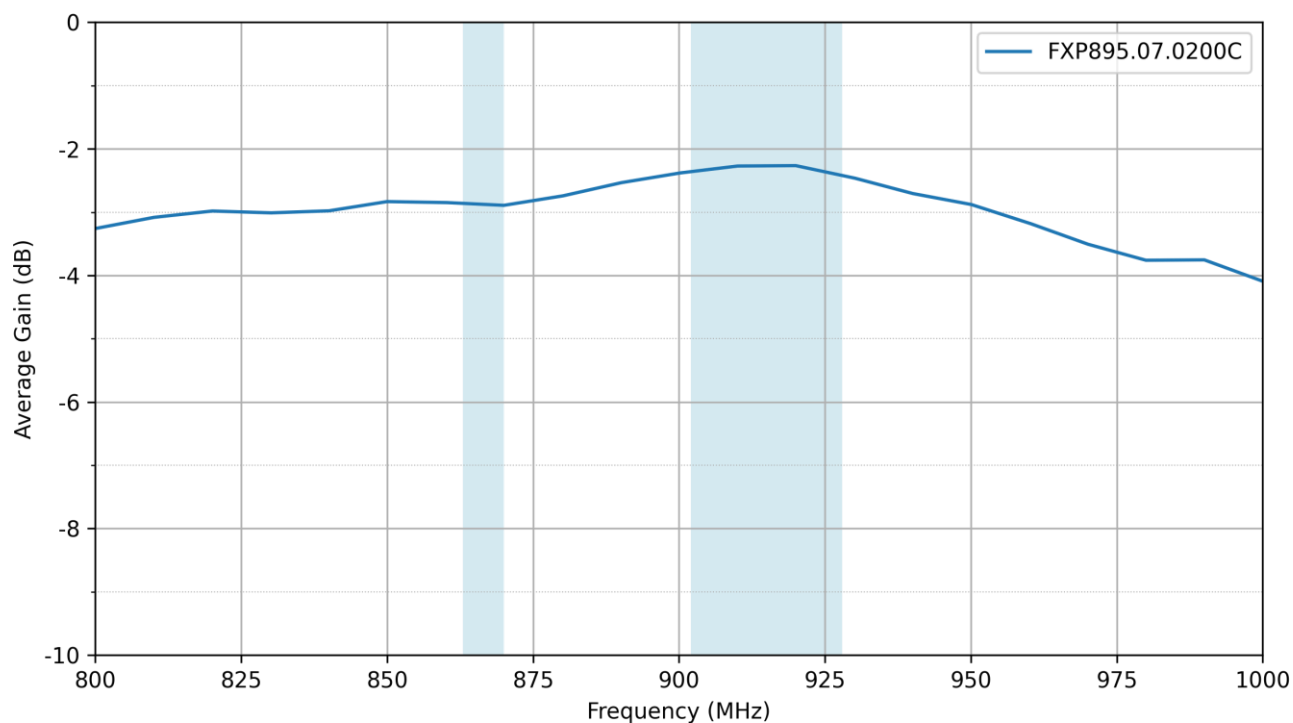
3.2 VSWR



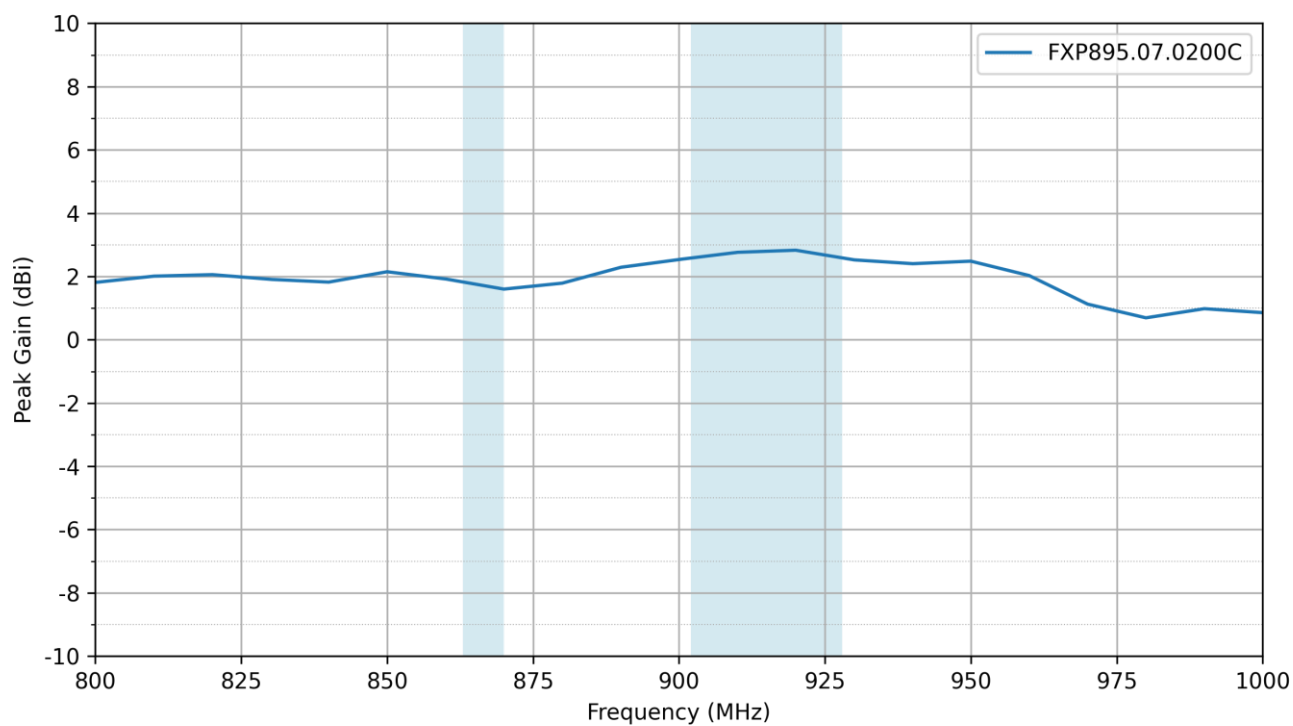
3.3 Efficiency



3.4 Average Gain

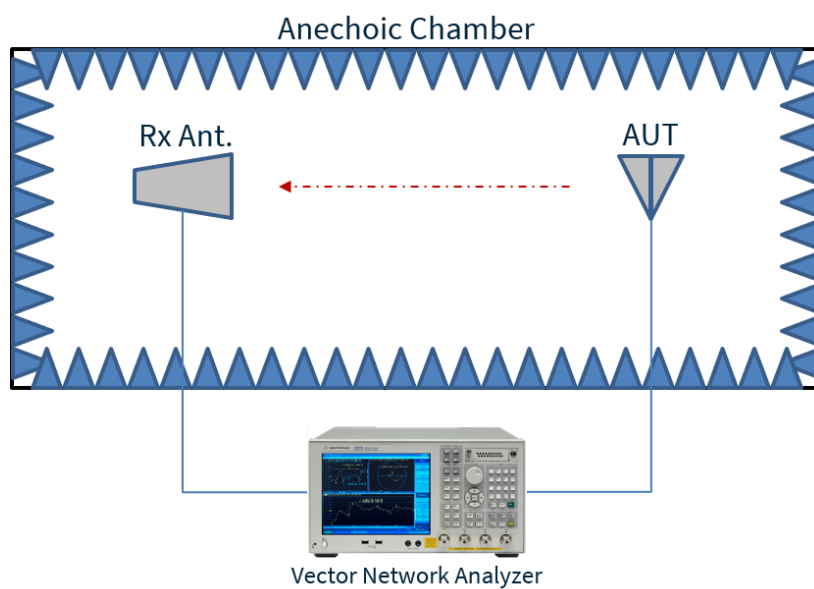


3.5 Peak Gain



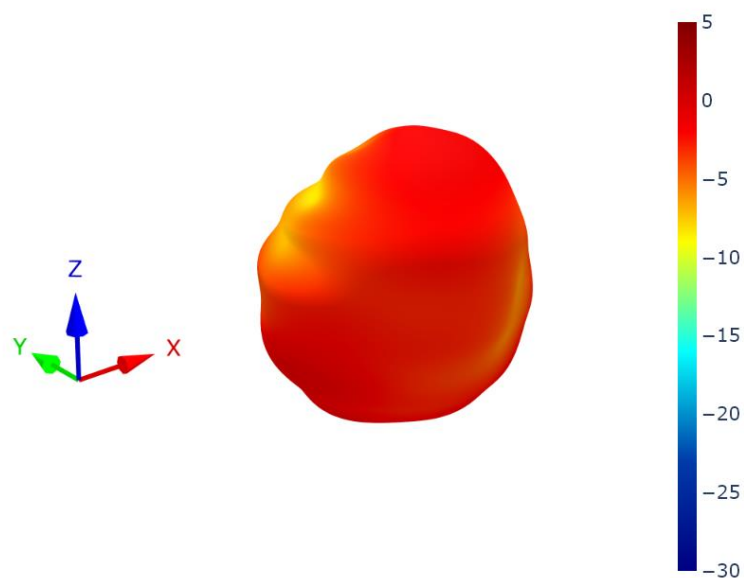
4. Radiation Patterns

4.1 Test Setup

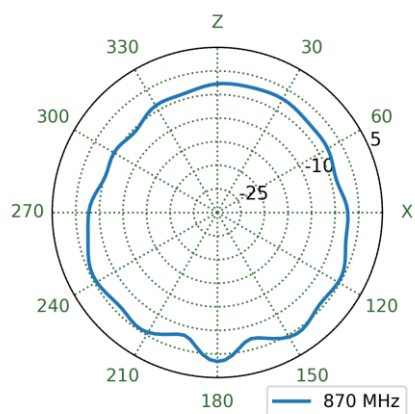


Chamber Test Setup on plastic

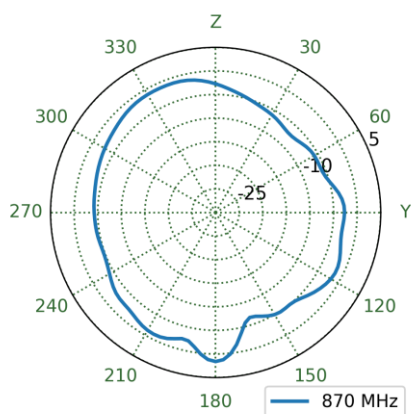
4.2 FXP895.07.0200C Patterns at 868 MHz



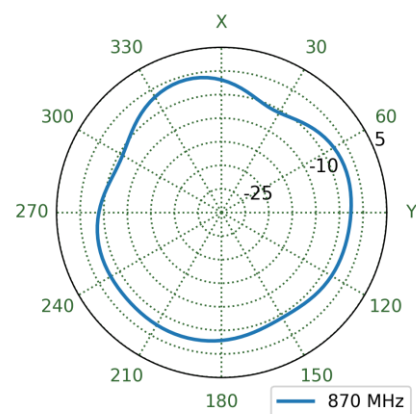
XZ Plane



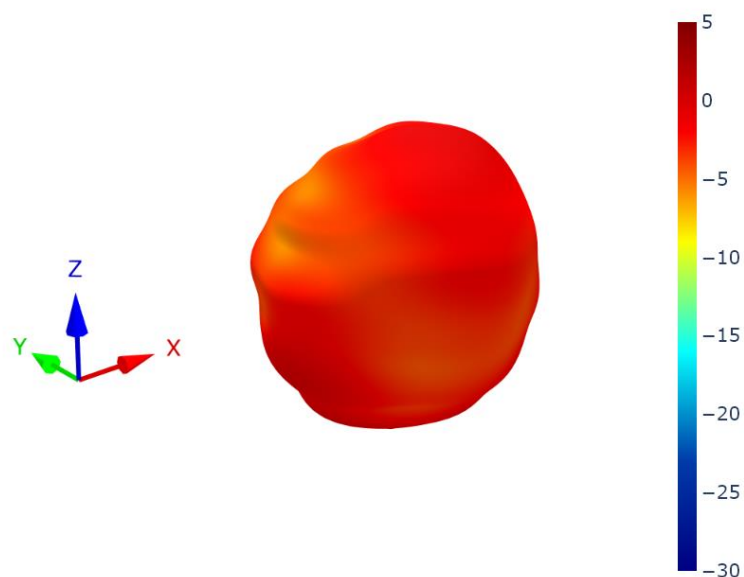
YZ Plane



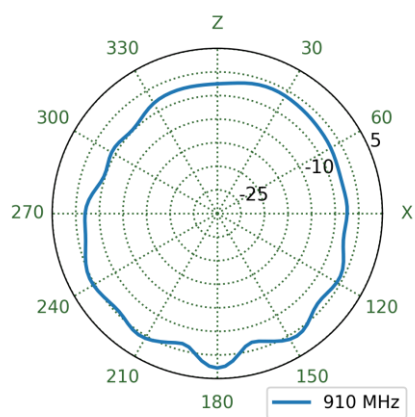
XY Plane



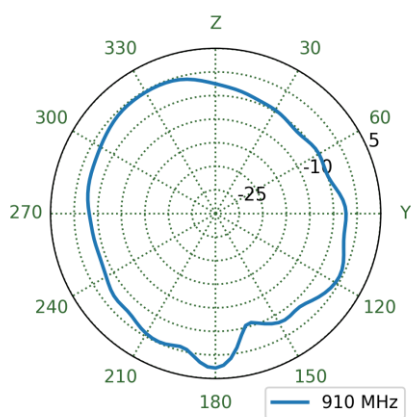
4.3 FXP895.07.0200C Patterns at 915 MHz



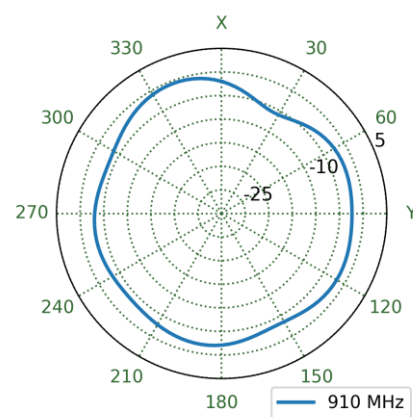
XZ Plane



YZ Plane



XY Plane



5. Mechanical Drawing

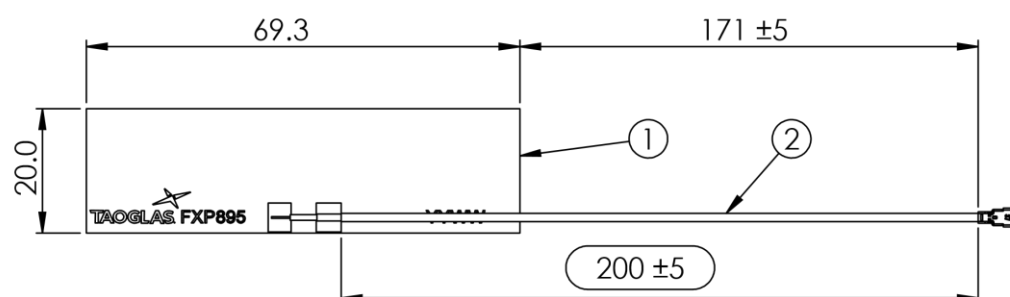
ISO NO.: EDW.000034

STATE: Release

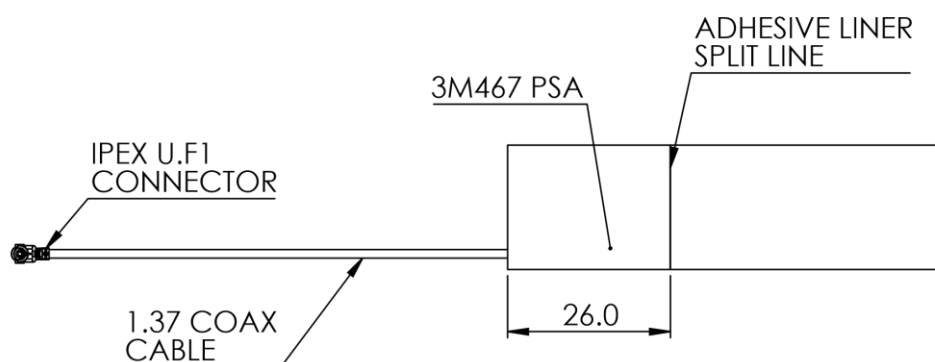
NOTES:

1. All material must be RoHS compliant.
2. The connector orientation has a fixed position to the antenna as per drawing.
3. Critical dimensions are marked with an inspection symbol $\square$.

REV	ZONE	DESCRIPTION	ENG	APPROVED	DATE
D01	All	Initial design	Z. Walji	P. Frank	08/03/2023



OVERALL THICKNESS
WITH ADHESIVE
LINER 1.6



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	PCB.000006	FXP895 FPCB 69.3x20mm	1
2	ASY.000019	IpeX.MHF1(U.FL) to Stripped 3.9/4.3/3.2 200mm Igl 1.37 Cable Assembly	1

APPROVED BY: P. Frank	 TW Design Centre This drawing and its inherent design concepts are property of Taoglas. Not to be copied or given to third parties without the written consent of Taoglas.
CHECK BY: G. Samson	
DRAWN BY: Z. Walji	
DATE: 8/3/2023	
UNLESS OTHERWISE SPECIFIED TOLERANCES ON:	TITLE: 860-928 MHz Flex PCB Antenna with 200mm 1.37 I-PEX MHF1(U.FL)
XX ±0.5	PART NO.: FXP895.07.0200C
X ±0.3	
XX ±0.2	
XXX ±0.1	
XXX ±0.05	
THIRD ANGLE PROJECTION	UNIT: mm SCALE: 1:1 PAGES: 1/1 REV: D01

6. Packaging

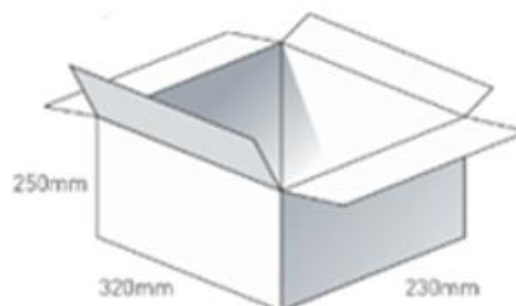
100pcs FXP895.07.0200C per PE Bag
Dimensions 300*100mm
Weight – 150g



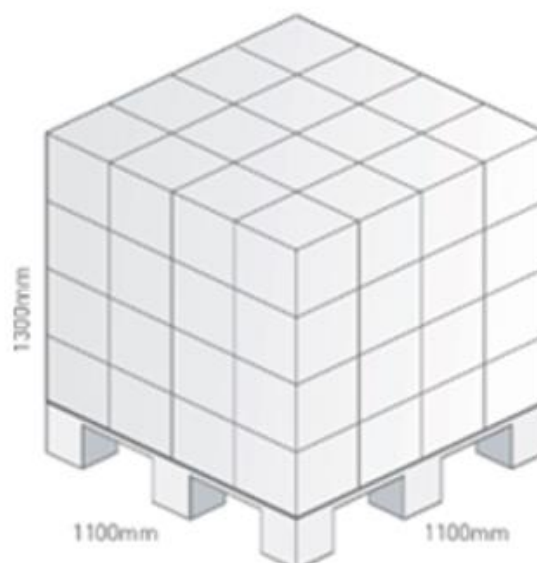
1000pcs FXP895.07.0200C per Large PE Bag
Dimensions 450*280mm
Weight – 1.5Kg



5000pcs FXP895.07.0200C per carton
Dimensions 320*250*230mm
Weight – 6Kg



Pallet Dimensions 1100*1100*1300mm
65 Cartons per pallet
13 Cartons per layer
5 Layers



Changelog for the datasheet

SPE-24-8-015 – FXP895.07.0200C

Revision: A (Original First Release)	
Date:	2024-08-26
Notes:	Updated specifications
Author:	Cesar Sousa

Previous Revisions

Revision: A (Original First Release)	
Date:	2024-01-19
Notes:	First Release
Author:	Gary West



www.taoglas.com



ANT-916-CW-HWR-ccc

Data Sheet

Product Description

HWR Series 1/2-wave center-fed dipole antennas deliver outstanding performance in a rugged and cosmetically attractive package. The articulating base allows the antenna to tilt 90 degrees and rotate 360 degrees. The antenna's internal counterpoise eliminates external ground plane dependence and maximizes performance. HWR Series antennas attach via a standard SMA or Part 15 compliant RP-SMA connector. Custom colors and connectors are available for volume OEM customers.

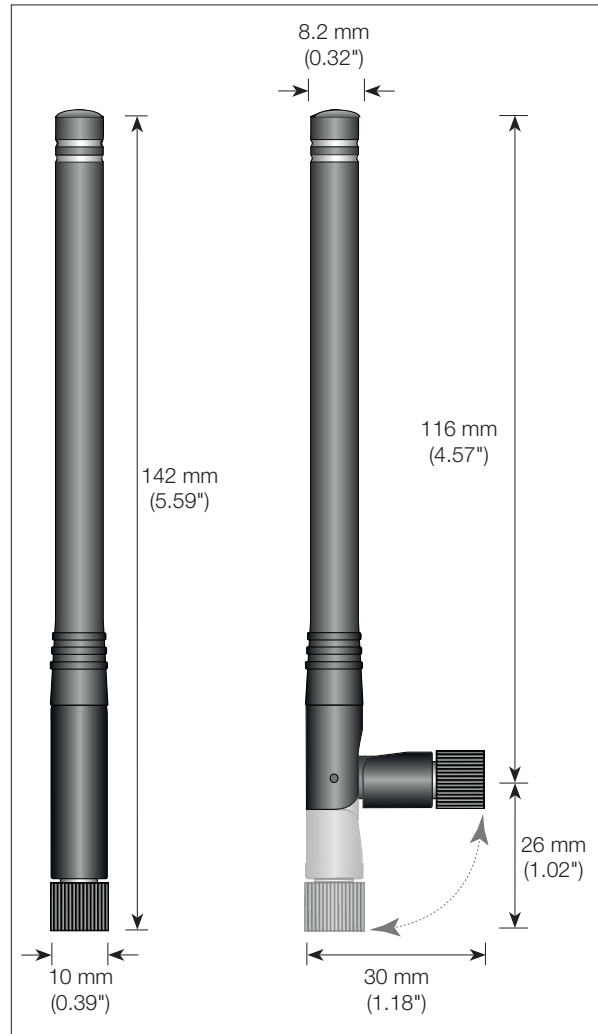
Features

- Internal counterpoise
- Low cost
- Tilts and rotates
- Omni-directional pattern
- Outstanding VSWR
- Rugged & damage-resistant
- Standard SMA or Part 15 compliant RP-SMA connector
- Custom colors and terminations for volume OEMs
- Internal O-ring seal on connector

Electrical Specifications

Center Frequency:	916MHz
Recom. Freq. Range:	900–930MHz
Bandwidth:	30MHz
Wavelength:	1/2-wave
VSWR:	≤ 2.0 typical
Peak Gain:	1.2dBi
Impedance:	50-ohms
Connection:	RP-SMA or SMA
Oper. Temp. Range:	–30°C to +80°C

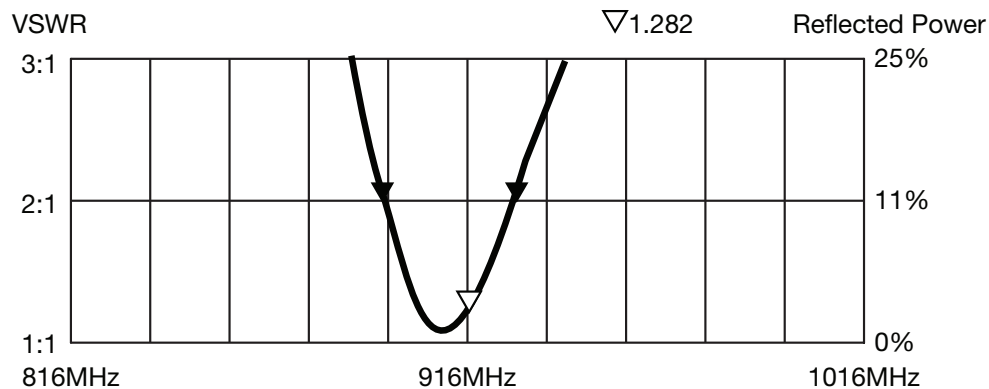
Electrical specifications and plots measured with a 10.16 cm x 10.16 cm (4.00" x 4.00") reference ground plane



Ordering Information

ANT-916-CW-HWR-RPS (with RP-SMA connector)
ANT-916-CW-HWR-SMA (with SMA connector)

VSWR Graph



What is VSWR?

The Voltage Standing Wave Ratio (VSWR) is a measurement of how well an antenna is matched to a source impedance, typically 50-ohms. It is calculated by measuring the voltage wave that is headed toward the load versus the voltage wave that is reflected back from the load. A perfect match has a VSWR of 1:1. The higher the first number, the worse the match, and the more inefficient the system. Since a perfect match cannot ever be obtained, some benchmark for performance needs to be set. In the case of antenna VSWR, this is usually 2:1. At this point, 88.9% of the energy sent to the antenna by the transmitter is radiated into free space and 11.1% is either reflected back into the source or lost as heat on the structure of the antenna. In the other direction, 88.9% of the energy recovered by the antenna is transferred into the receiver. As a side note, since the “:1” is always implied, many data sheets will remove it and just display the first number.

How to Read a VSWR Graph

VSWR is usually displayed graphically versus frequency. The lowest point on the graph is the antenna’s operational center frequency. In most cases, this is different than the designed center frequency due to fabrication tolerances. The VSWR at that point denotes how close to 50-ohms the antenna gets. Linx specifies the recommended bandwidth as the range where the typical antenna VSWR is less than 2:1.

TE TECHNICAL SUPPORT CENTER

USA:	+1 (800) 522-6752
Canada:	+1 (905) 475-6222
Mexico:	+52 (0) 55-1106-0800
Latin/S. America:	+54 (0) 11-4733-2200
Germany:	+49 (0) 6251-133-1999
UK:	+44 (0) 800-267666
France:	+33 (0) 1-3420-8686
Netherlands:	+31 (0) 73-6246-999
China:	+86 (0) 400-820-6015

te.com

TE Connectivity, TE, TE connectivity (logo), Linx and Linx Technologies are trademarks owned or licensed by the TE Connectivity Ltd. family of companies. All other logos, products and/or company names referred to herein might be trademarks of their respective owners.

The information given herein, including drawings, illustrations and schematics which are intended for illustration purposes only, is believed to be reliable. However, TE Connectivity makes no warranties as to its accuracy or completeness and disclaims any liability in connection with its use. TE Connectivity's obligations shall only be as set forth in TE Connectivity's Standard Terms and Conditions of Sale for this product and in no case will TE Connectivity be liable for any incidental, indirect or consequential damages arising out of the sale, resale, use or misuse of the product. Users of TE Connectivity products should make their own evaluation to determine the suitability of each such product for the specific application.

TE Connectivity warrants to the original end user customer of its products that its products are free from defects in material and workmanship. Subject to conditions and limitations TE Connectivity will, at its option, either repair or replace any part of its products that prove defective because of improper workmanship or materials. This limited warranty is in force for the useful lifetime of the original end product into which the TE Connectivity product is installed. Useful lifetime of the original end product may vary but is not warranted to exceed one (1) year from the original date of the end product purchase.

©2023 TE Connectivity. All Rights Reserved.

04/23 Original



Features:

- Frequency 868-928MHz
- Gain 1dBi
- Efficiency 70%
- Length 195mm straight
- Connectors:
 - W1063 RP-SMA Male
 - W1063M SMA Male
- RoHS Compliant

Applications:

- Indoor use
- 868MHz and 915MHz ISM band radios
- IoT devices
- Security
- Sensors
- Monitoring

All dimensions are in mm

Issue: 1837

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

For more information:

Pulse Worldwide Headquarters
15255 Innovation Drive #100
San Diego, CA 92128
USA
Tel: 1-858-674-8100

Pulse/Larsen Antennas
18110 SE 34th St Bldg 2 Suite 250
Vancouver, WA 98683
USA
Tel: 1-360-944-7551

Europe Headquarters
Pulse GmbH & Co, KG
Zeppelinstrasse 15
Herrenberg, Germany
Tel: 49 7032 7806 0

Pulse (Suzhou) Wireless Products Co, Inc.
99 Huo Ju Road(#29 Bldg, 4th Phase
Suzhou New District
Jiangsu Province, Suzhou 215009 PR China
Tel: 86 512 6807 9998



ELECTRICAL SPECIFICATIONS

Frequency	863-928 MHz
Nominal Impedance	50 Ω
VSWR	2 Maximum
Radiation Pattern	Omni
Gain	1 dBi
Efficiency	70 %
Polarization	Linear
Power Withstanding	1 W

MECHANICAL SPECIFICATIONS

Overall Length	195+/-2 mm
Weight	23.5 g
Antenna Color / Material	Black
Connector type	W1063 RP SMA Male W1063M SMA Male
IP Rating	IP20, Indoor use

ENVIRONMENTAL SPECIFICATIONS

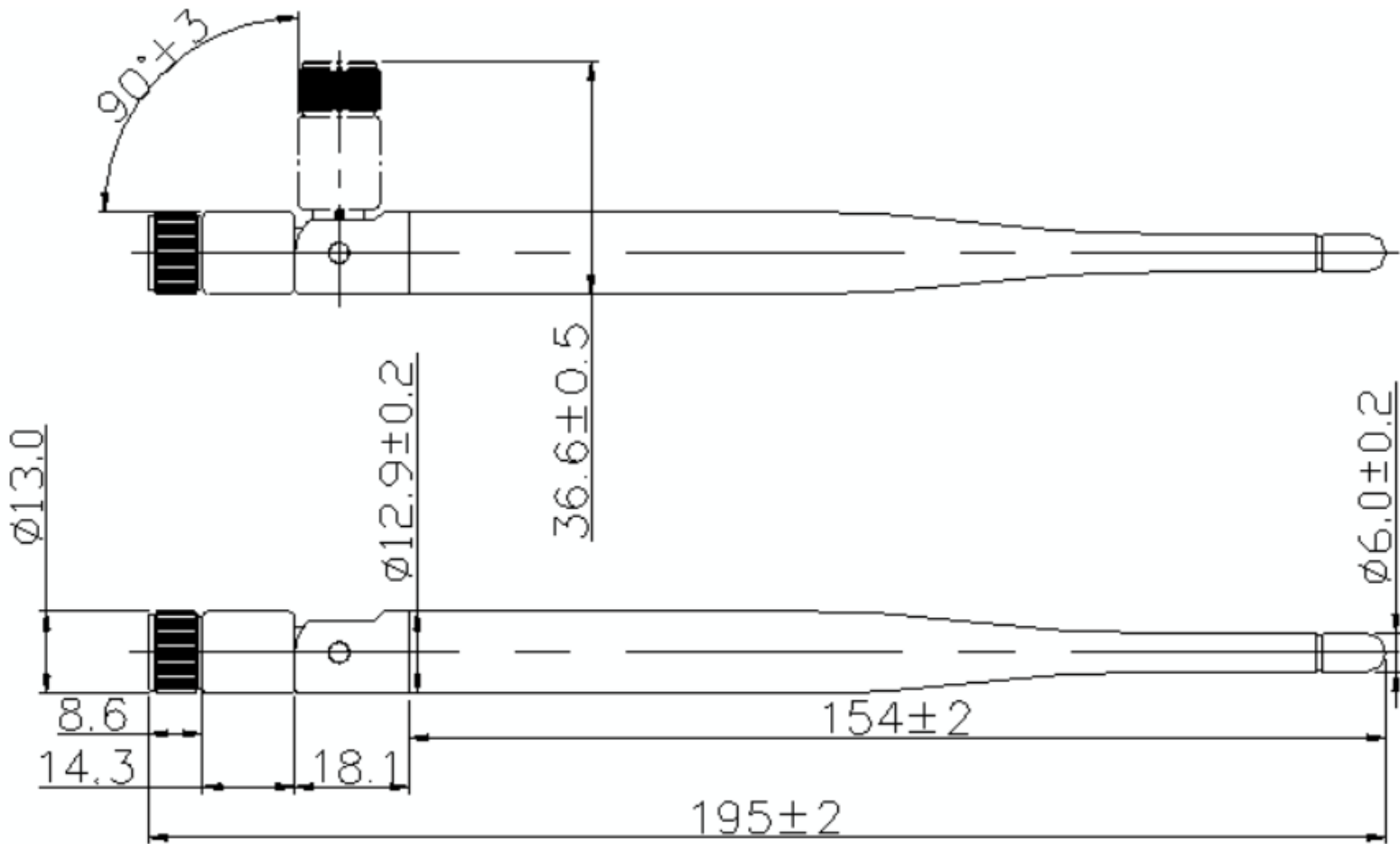
Operating Temperature	-20 °C /+65 ° C
Storage Temperature	-30 °C /+75 ° C

Description: 868-928MHz Swivel Type
dipole antenna

Series: Stick Antenna

PART NUMBER: W1063/ W1063M

MECHANICAL DRAWING



All dimensions are in mm

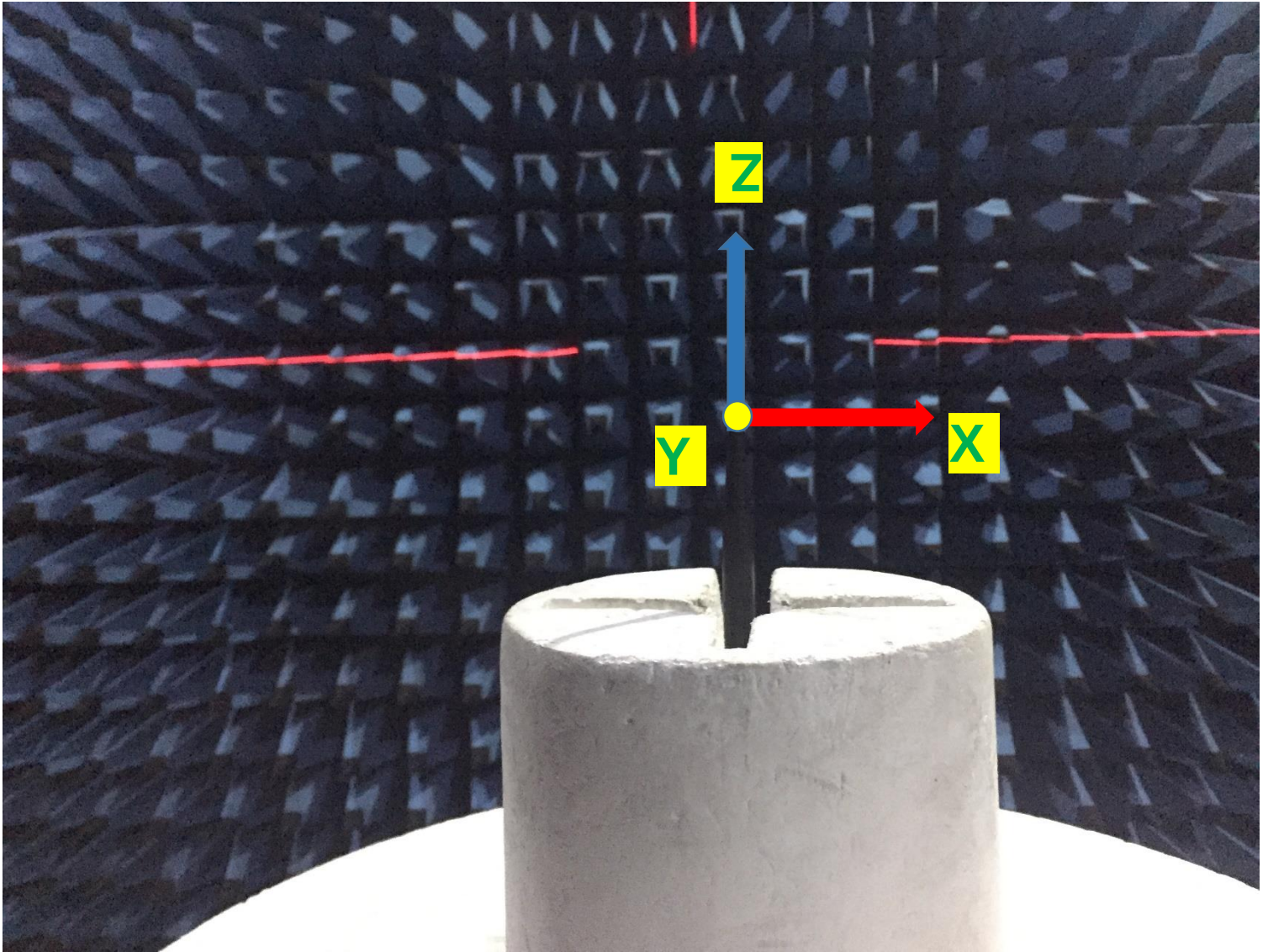
Issue: 1837

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

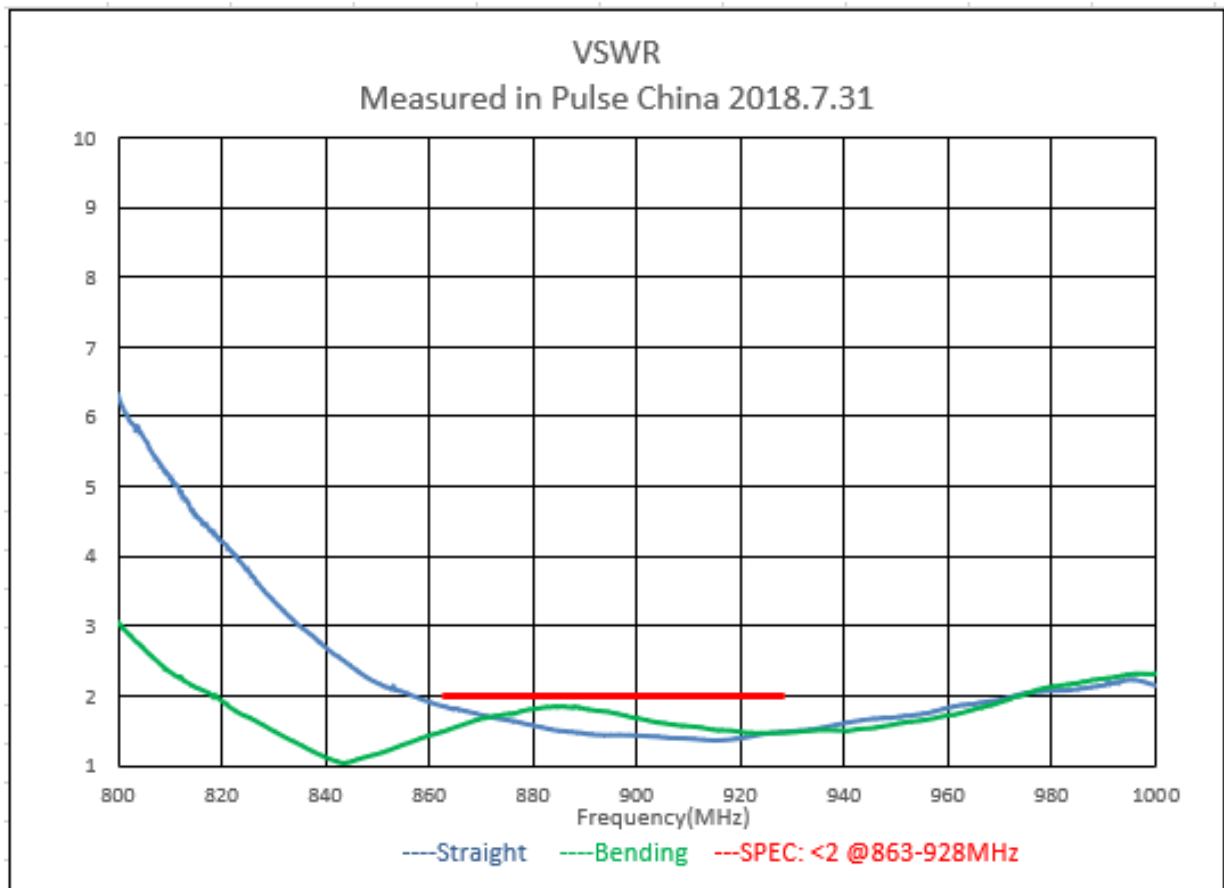
This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

TEST SETUP



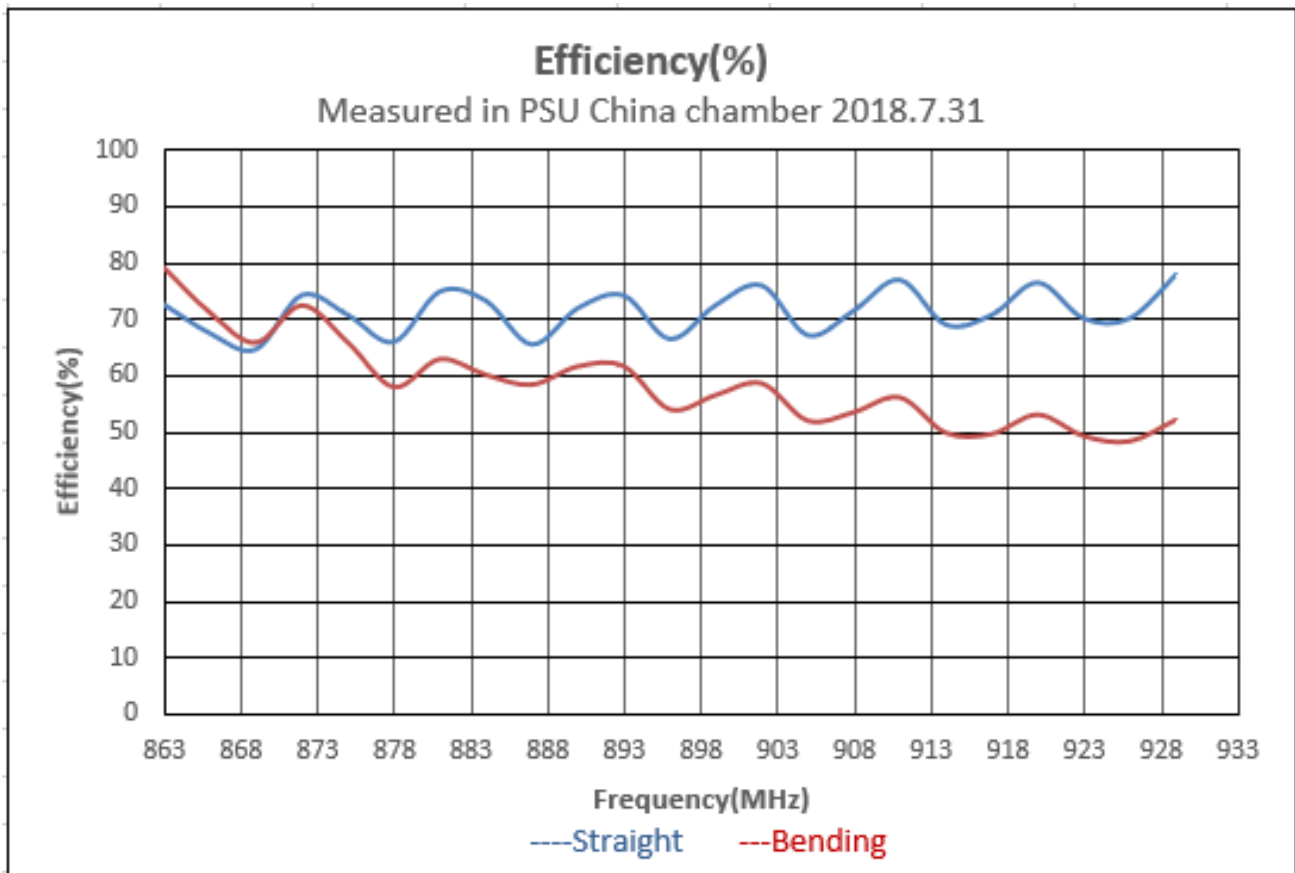
CHARTS

VSWR



CHARTS

Efficiency(%)



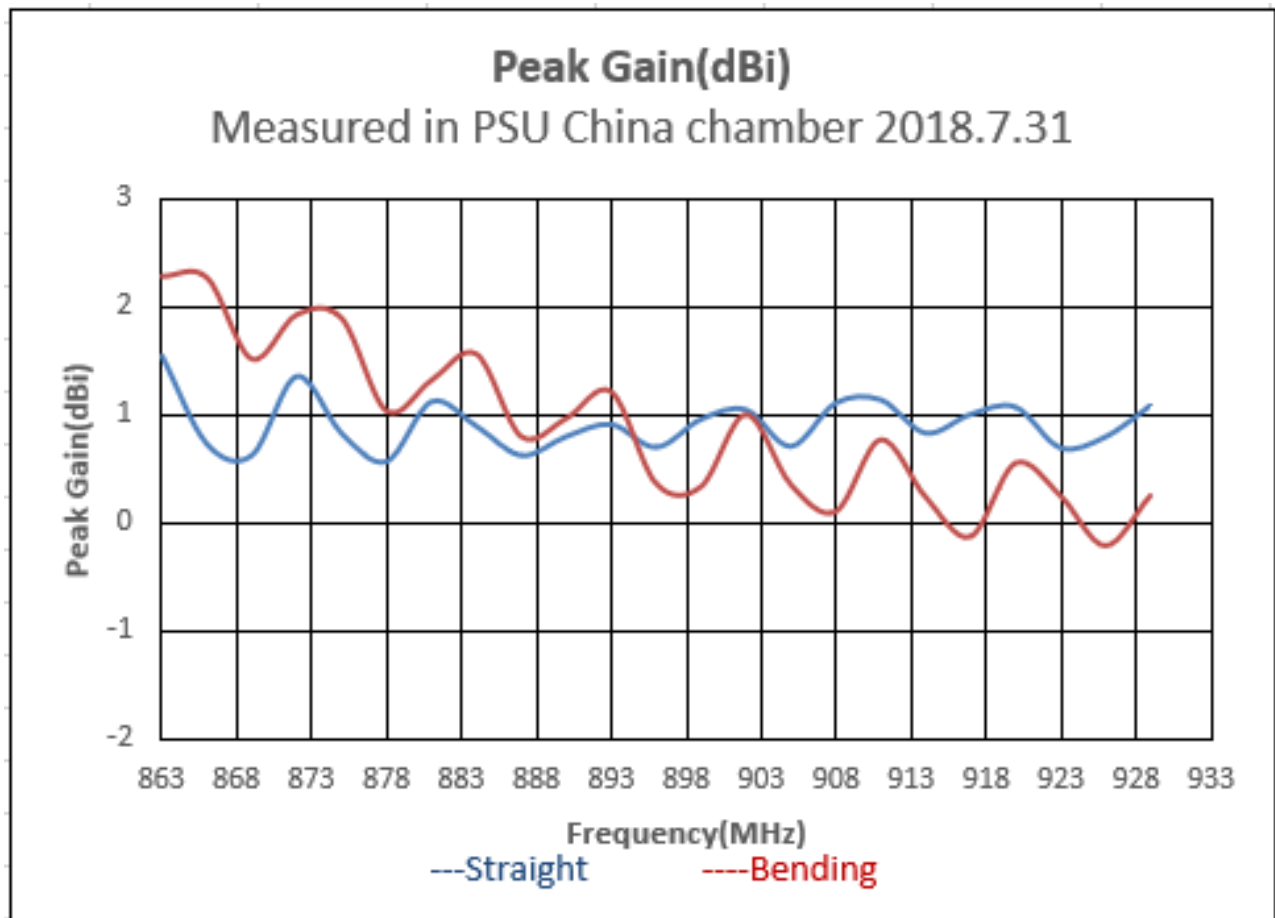
Series: Stick Antenna

Description: 868-928MHz Swivel Type dipole antenna

PART NUMBER: W1063/ W1063M

CHARTS

Peak Gain (dBi)



Issue: 1837

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

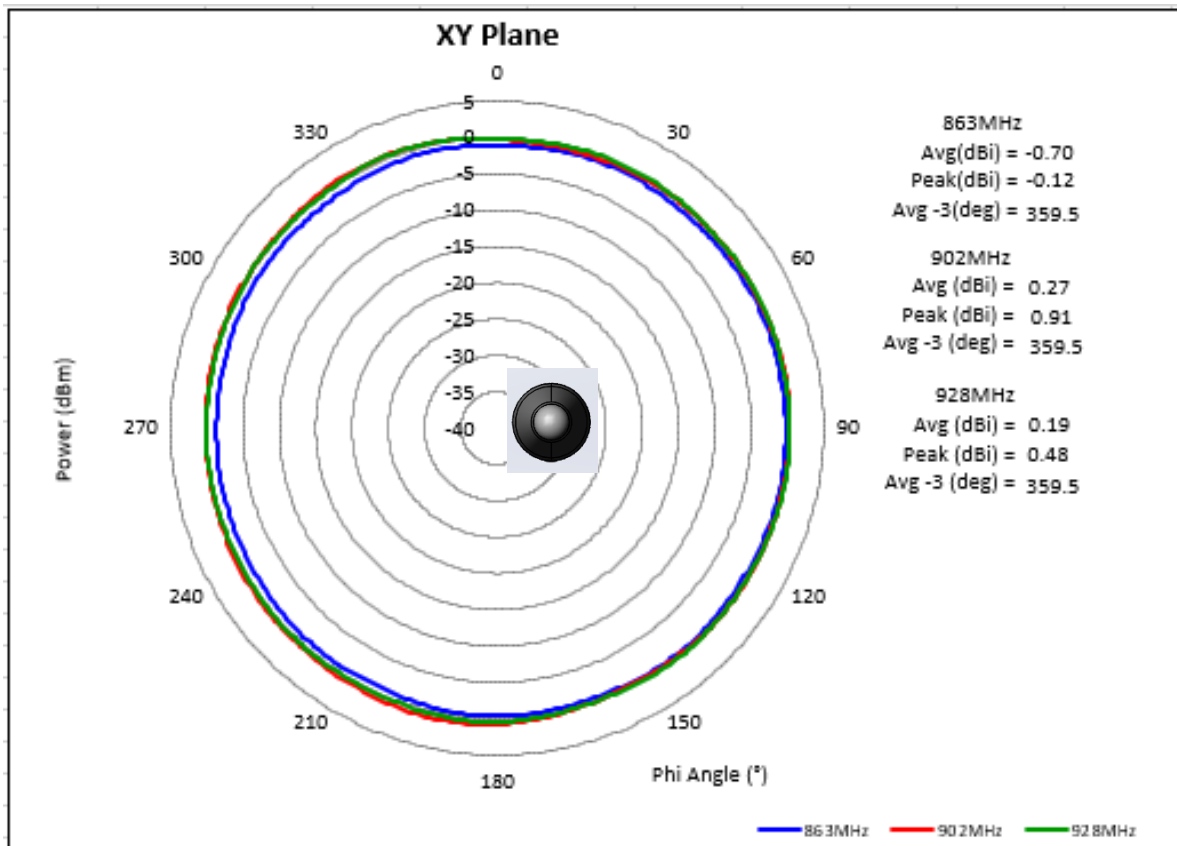
Series: Stick Antenna

Description: 868-928MHz Swivel Type dipole antenna

PART NUMBER: W1063/ W1063M

CHARTS

Free space radiation pattern



Issue: 1837

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

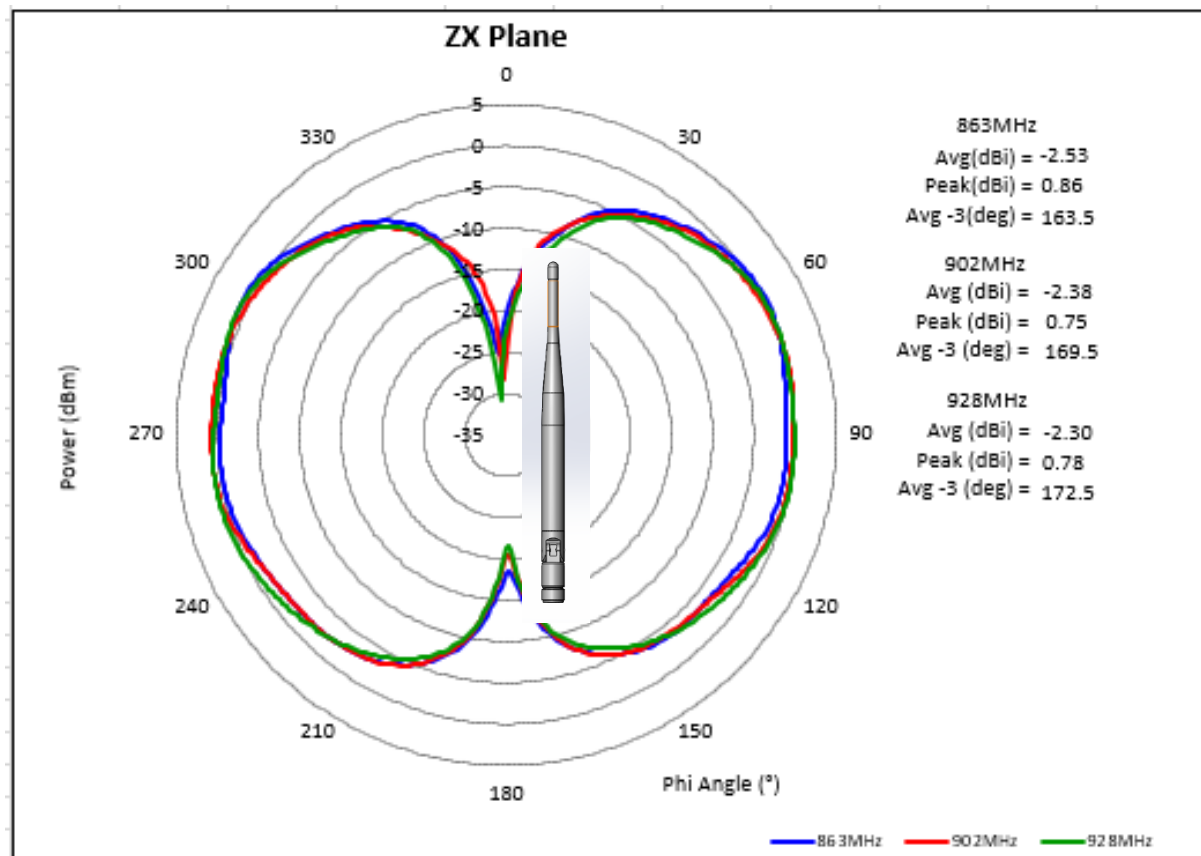
Description: 868-928MHz Swivel Type dipole antenna

Series: Stick Antenna

PART NUMBER: W1063/ W1063M

CHARTS

Free space radiation pattern



Issue: 1837

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

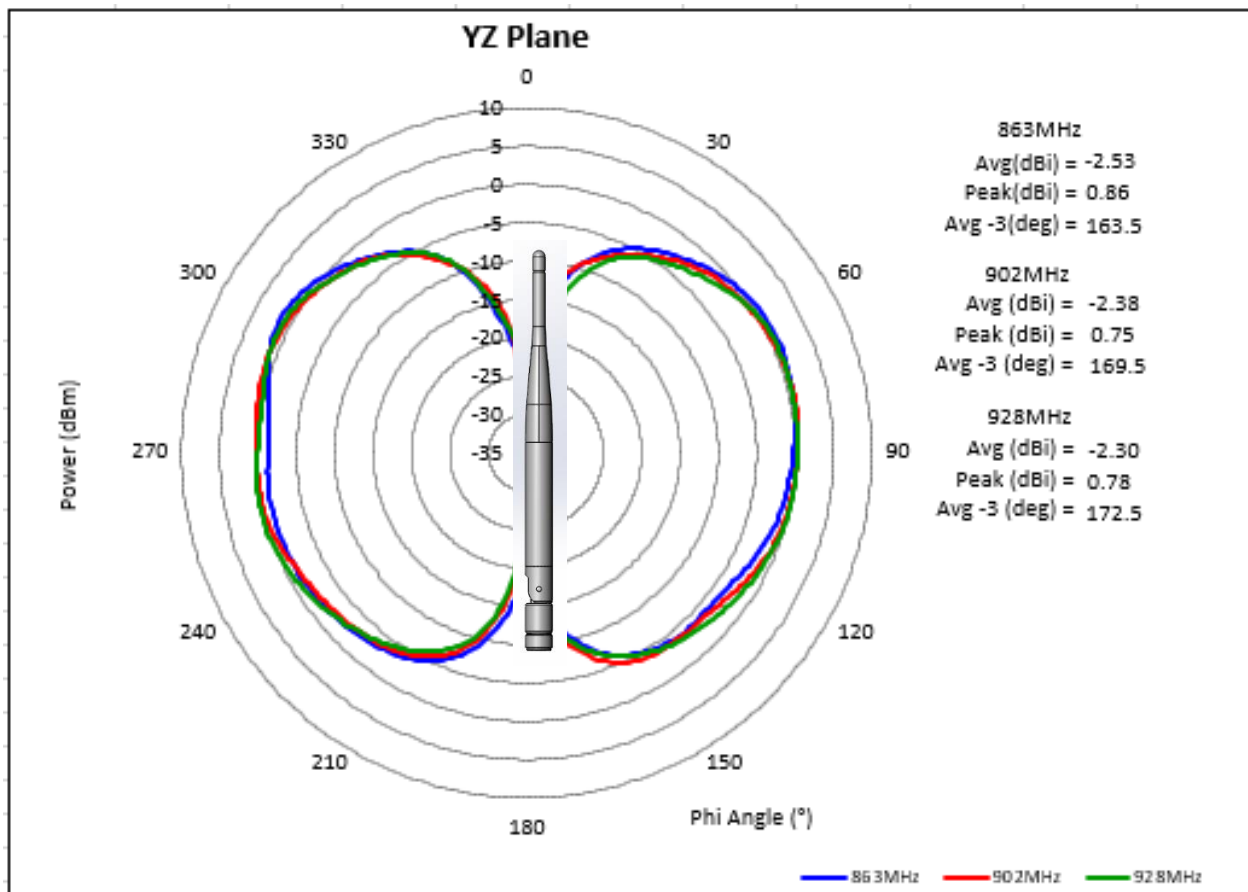
Description: 868-928MHz Swivel Type dipole antenna

Series: Stick Antenna

PART NUMBER: W1063/ W1063M

CHARTS

Free space radiation pattern



Issue: 1837

In the effort to improve our products, we reserve the right to make changes judged to be necessary.

CONFIDENTIAL AND PROPRIETARY INFORMATION

This document contains confidential and proprietary information of Pulse Electronics, Inc. (Pulse) and is protected by copyright, trade secret and other state and federal laws. Its receipt or possession does not convey any rights to reproduce, disclose its contents, or to manufacture, use or sell anything it may describe. Reproduction, disclosure or use without specific written authorization of Pulse is strictly forbidden.

Series: Stick Antenna

Description: 868-928MHz Swivel Type
dipole antenna

PART NUMBER: W1063/ W1063M

PACKAGING

1PCS/PE BAG

250PCS/ carton box

Carton box dimensions (MM): 460x235x140