

## W-2RD1

### Tri-Band WiFi Internal FPC Antenna

FPC

WIFI

The W-2RD1 is a compact, tri-band (2.4 GHz, 5.8 GHz and 6E) FPC antenna designed for use in IoT devices that require reliable and high-performance wireless communication. With an IPEX connector, the W-2RD1 is easy to integrate into various devices, and its low profile and small size make it an ideal choice for space-constrained applications. Operating in a wide frequency range from 2400MHz to 7125MHz, it offers exceptional performance for various Wi-Fi applications.

Its high gain and excellent radiation efficiency provide reliable and stable WiFi connectivity, making it suitable for a wide range of IoT applications. Overall, the W-2RD1 is an excellent choice for developers and designers who need a high-performance, compact, and easy-to-integrate tri-band WiFi antenna for their IoT devices.



41 x 13x 0.2 mm

## Document Information

|             |                                    |
|-------------|------------------------------------|
| Product     | W-2RD1                             |
| Part Number | W-2RD1                             |
| Description | Tri-Band WiFi Internal FPC Antenna |
| Version     | 2.0 (current)                      |
| Date        | 10-Aug-2023                        |
| Status      | Released                           |

## Revision History

| Version | Date        | Author   | Changes         |
|---------|-------------|----------|-----------------|
| 1.0     | 10-Aug-2023 | Ivy Liao | Initial Release |

# Product Overview

## Product Description

The W-2RD1 is a compact, tri-band (2.4 GHz, 5.8 GHz and 6E) FPC antenna designed for use in IoT devices that require reliable and high-performance wireless communication. With an IPEX connector, the W-2RD1 is easy to integrate into various devices, and its low profile and small size make it an ideal choice for space-constrained applications. Operating in a wide frequency range from 2400MHz to 7125MHz, it offers exceptional performance for various Wi-Fi applications.

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## Key Features

- Tri-band WiFi antenna
- Wide Application
- Vertical Polarization
- Easy integration
- RoHS Compliant

## Applications

- IoT
- Wearables
- Home automation
- Security
- Transportation
- Smart Agriculture

band WiFi antenna for their IoT devices.

## Electrical Specifications

| Frequency |             |     | VSWR | Peak Gain | Efficiency |
|-----------|-------------|-----|------|-----------|------------|
| Wi-Fi     | 2400 - 2500 | MHz | 1.6  | 2.1 d Bi  | 36%        |
| Wi-Fi     | 5150 - 7125 | MHz | 1.5  | 4.5 d Bi  | 62%        |

|                         |                 |                     |                      |
|-------------------------|-----------------|---------------------|----------------------|
| Frequency Range         | 2400 – 7125 MHz | Radiation           | Omnidirectional      |
| Impedance               | 50 $\Omega$     | Electrical Type     | Dipole               |
| Polarization            | Linear          | Lighting Protection | Direct Current earth |
| Power Handling Capacity | 50W             |                     |                      |

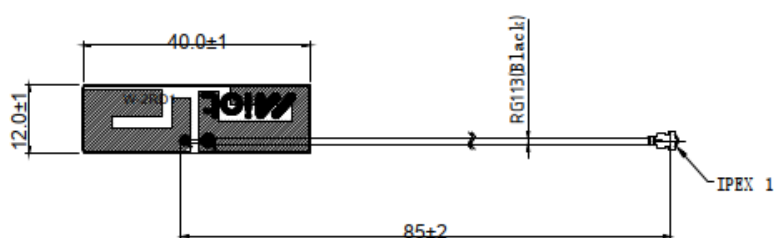
## Mechanical Specifications

|                         |                  |               |                 |
|-------------------------|------------------|---------------|-----------------|
| Type                    | Internal         | Mounting Type | Connector Mount |
| Dimensions              | 41 x 13 x 0.2 mm | Casing        | N/A             |
| Connector (Termination) | IPEX Plug        | Cable length  | 120 mm          |
| Cable type              | RG1.13           |               |                 |

### Caution:

1. Do not apply excess mechanical stress to the component body or terminations. Do not attempt to re-form or bend the components, as this will cause damage to the component.
2. Do not expose the component to an open flame.
3. This specification applies to the functionality of the component as a single unit. Please ensure the component is thoroughly evaluated in the application circuit.

## Product Image and Dimensions



## Radiation Pattern

A radiation pattern is a graphical representation of the directional properties of an antenna. It shows how electromagnetic waves are distributed in space in relation to the direction of propagation.

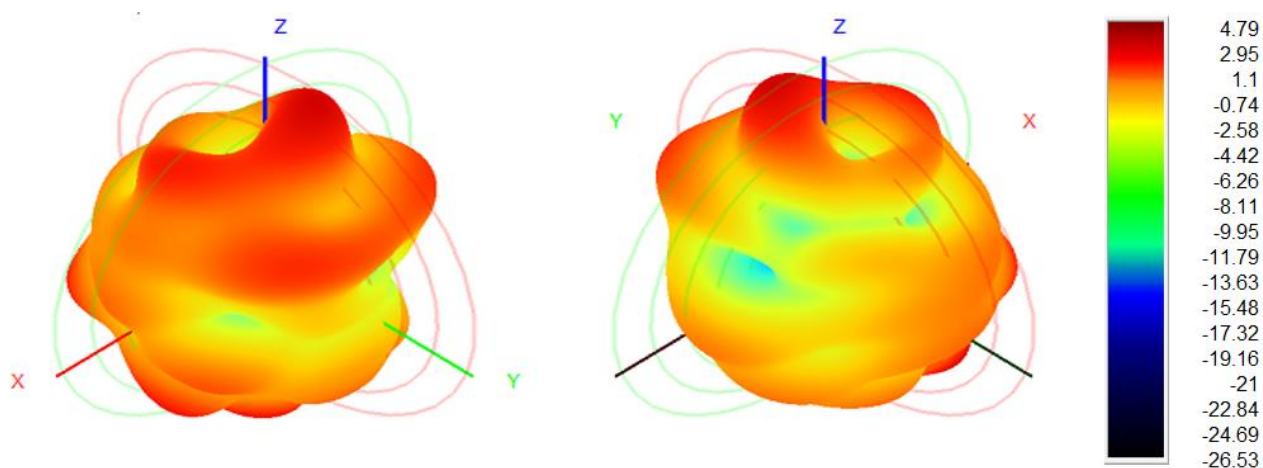
By understanding the information provided by a radiation pattern, it is possible to optimize the design and performance of an antenna for specific applications.

### Test Setup

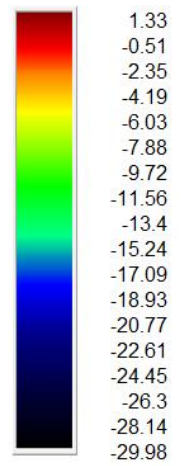
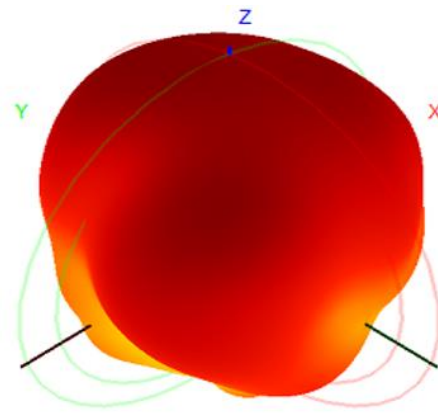
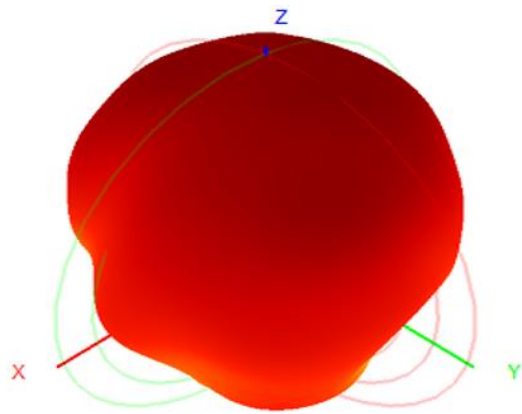
Equipment

XYZ Testing Machine

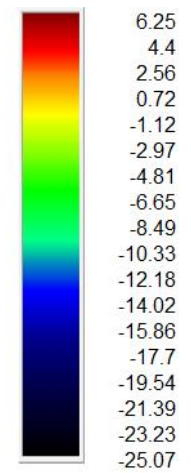
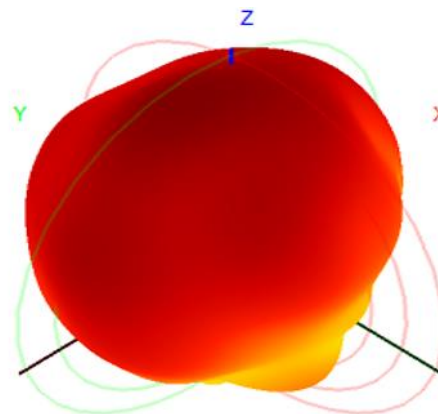
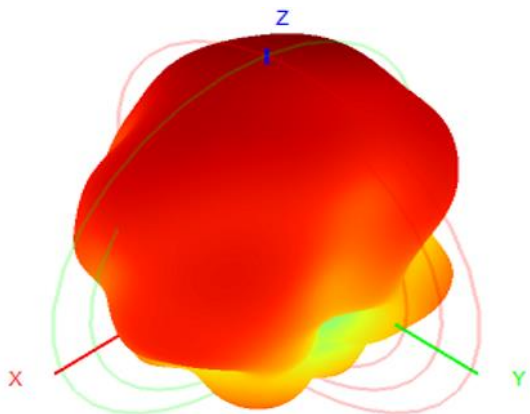
2410 MHz



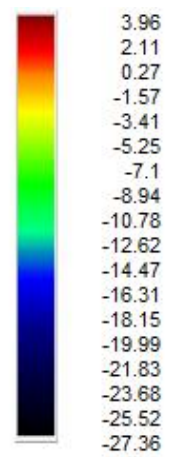
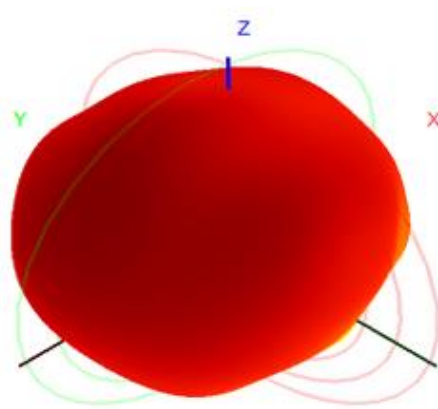
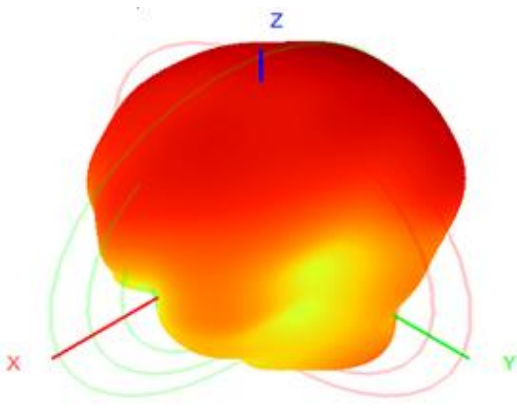
5150 MHz



6150 MHz



7200MHz



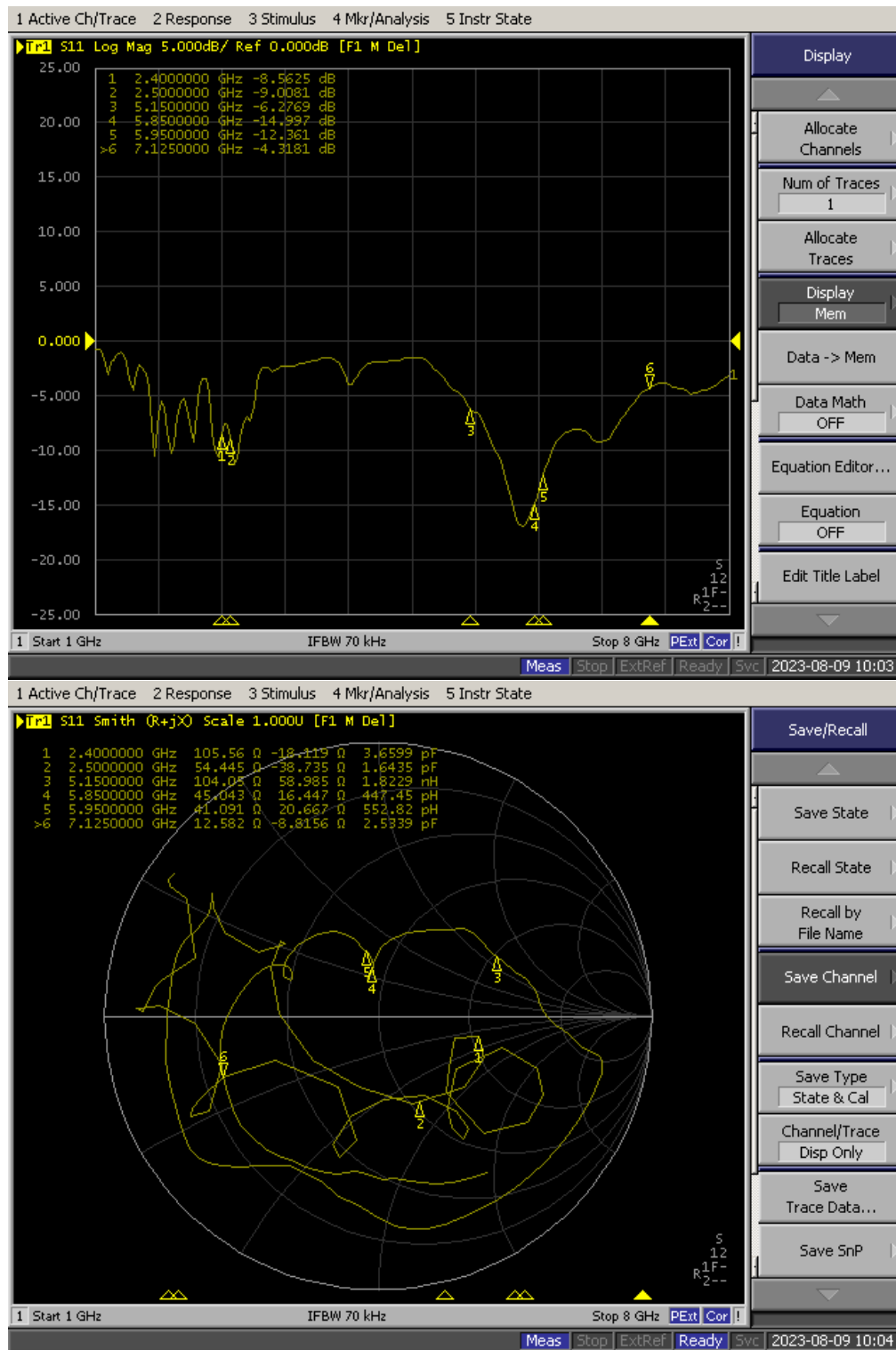
## Antenna Smith and VSWR

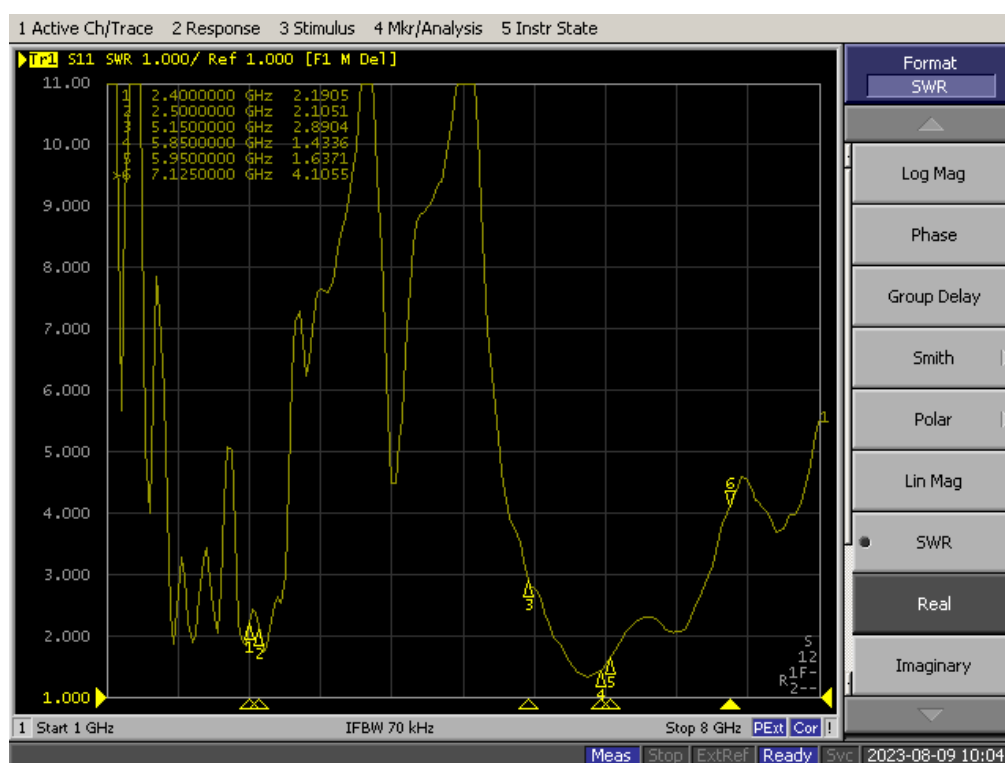
| Frequency | VSWR   |
|-----------|--------|
| 2400 MHz  | 2.1905 |

| Frequency | VSWR   |
|-----------|--------|
| 5850 MHz  | 1.4336 |

|      |     |        |
|------|-----|--------|
| 2500 | MHz | 2.1051 |
| 5150 | MHz | 2.8904 |

|      |     |        |
|------|-----|--------|
| 5900 | MHz | 1.6371 |
| 7125 | MHz | 4.1055 |





## Antenna Efficiency and Gain

| Frequency |     | Efficiency(%) | Gain |
|-----------|-----|---------------|------|
| 2400.0    | MHz | 36.60         | 3.92 |
| 2410.0    | MHz | 39.94         | 4.79 |
| 2420.0    | MHz | 37.22         | 4.34 |
| 2430.0    | MHz | 37.83         | 4.48 |
| 2440.0    | MHz | 38.85         | 4.17 |
| 2450.0    | MHz | 36.62         | 3.18 |
| 2460.0    | MHz | 36.55         | 2.67 |
| 2470.0    | MHz | 36.08         | 1.99 |
| 2480.0    | MHz | 35.80         | 1.47 |
| 2490.0    | MHz | 37.03         | 1.71 |
| 2500.0    | MHz | 35.88         | 1.39 |
| 5150.0    | MHz | 34.52         | 1.33 |
| 5200.0    | MHz | 41.36         | 2.80 |
| 5250.0    | MHz | 60.20         | 4.25 |
| 5300.0    | MHz | 58.07         | 4.08 |
| 5350.0    | MHz | 52.40         | 3.95 |

| Frequency |     | Efficiency(%) | Gain |
|-----------|-----|---------------|------|
| 5900.0    | MHz | 68.14         | 4.96 |
| 5949.0    | MHz | 64.99         | 5.11 |
| 5998.0    | MHz | 52.67         | 4.03 |
| 6047.0    | MHz | 57.92         | 4.61 |
| 6096.0    | MHz | 80.09         | 6.32 |
| 6145.0    | MHz | 75.93         | 6.25 |
| 6194.0    | MHz | 56.98         | 5.05 |
| 6243.0    | MHz | 51.14         | 4.28 |
| 6292.0    | MHz | 67.14         | 5.71 |
| 6341.0    | MHz | 71.42         | 6.13 |
| 6390.0    | MHz | 54.82         | 4.84 |
| 6439.0    | MHz | 45.76         | 4.23 |
| 6488.0    | MHz | 54.49         | 4.87 |
| 6537.0    | MHz | 62.04         | 5.48 |
| 6586.0    | MHz | 51.52         | 4.42 |
| 6635.0    | MHz | 43.25         | 3.67 |

|        |     |       |      |
|--------|-----|-------|------|
| 5400.0 | MHz | 58.69 | 4.68 |
| 5450.0 | MHz | 64.96 | 5.16 |
| 5500.0 | MHz | 66.50 | 5.43 |
| 5550.0 | MHz | 63.61 | 4.93 |
| 5600.0 | MHz | 57.32 | 4.80 |
| 5650.0 | MHz | 64.67 | 5.50 |
| 5700.0 | MHz | 68.68 | 5.59 |
| 5750.0 | MHz | 66.82 | 5.32 |
| 5800.0 | MHz | 49.98 | 3.94 |
| 5850.0 | MHz | 58.33 | 4.78 |

|        |     |       |      |
|--------|-----|-------|------|
| 6684.0 | MHz | 41.95 | 3.58 |
| 6733.0 | MHz | 60.20 | 5.12 |
| 6782.0 | MHz | 59.11 | 5.15 |
| 6831.0 | MHz | 50.07 | 4.23 |
| 6880.0 | MHz | 43.40 | 3.45 |
| 6929.0 | MHz | 56.98 | 4.66 |
| 6978.0 | MHz | 66.98 | 5.29 |
| 7027.0 | MHz | 43.66 | 3.31 |
| 7076.0 | MHz | 36.34 | 2.45 |
| 7125.0 | MHz | 47.46 | 3.84 |

## Environmental Data

Operating Temperature -45°C to +85°C

Storage Temperature -45°C to +85°C

RoHS Compliant Yes

## Ordering Information

### Product Variants

| Part Number | Description                        |
|-------------|------------------------------------|
| W-2RD1      | Tri-Band WiFi Internal FPC Antenna |

# About MIOT

Miot Wireless Solutions, headquartered in Suzhou, China, was established in 2017. It has subsidiaries in Canada, the United States, Brazil, and EMEA. MIOT is a professional designer and manufacturer of Antennas and IoT PCBA products, providing turn-key service to customers worldwide.

Our talented R&D team has experienced antenna, hardware, and software engineers who can participate in your new project, from something simple like antenna/selection and design, to complete turn-key services, which entails taking your concept and ideas through design, prototyping, debugging, certification, and manufacturing. Miot offers reliable products at reasonable prices with fast delivery times to help you get ahead in the market.

## Contact

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