

TECHNICAL DATA SHEET Description: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM



### **Features:**

- 2x 617-960/1710-6000MHz
  - 4G (LTE) / 5G-FR1
  - Includes Band 71 (617-698 MHz)
- 2x 2400-2500/5150-5925MHz WiFi
- 1x GNSS Active:
  - Beidou, GPS, Glonass
  - RHCP polarization
  - Amplifier Gain 30dBi
- Omni radiation pattern
- Size: L x W x H 202.3 x 88.5 x 45mm
- IP67



## **Applications:**

- 2G/3G/4G/5G radios
- CBRS Band 42 and 48 (3.4-3.7GHz)
- Vehicular use
- Utility boxes
- Smart metering
- IoT Devices

#### Issue: 2111

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 34<sup>th</sup> St Bldg 2 Suite 250 Vancouver, WA 98683 USA Tel: 1-360-944-7551 Europe Headquarters Pulse GmbH & Do, KG Zeppelinstrasse 15 Herrenberg, Germany Tel: 49 7032 7806 0 Pulse (Suzhou) Wireless Products Co, Inc. 99 Huo Ju Road(#29 Bldg,4<sup>th</sup> Phase Suzhou New District Jiangsu Province, Suzhou 215009 PR China Tel: 86 512 6807 9998





Series: ARMADILLO

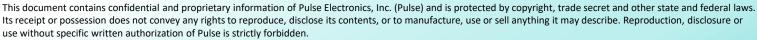
**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### This document covers all product variants of the following product family

Product	Total Cable Leads	LTE Cable Leads	WiFi Cable Leads	GPS Cable Leads	Housing Color	Cable Length	Mounting
ARM5G62311DM	6	2 (with SMA Male)	3 (with RP-SMA Male)	1 (with SMA Male)	Black	17 FT or 5181mm	<ol> <li>Direct Mount; 7/8" Hole Required</li> <li>Mounting Surface thickness &lt; 0.25"</li> </ol>
ARM5G62312DM	6	2 (with SMA Male)	3 (with RP-SMA Male)	1 (with SMA Male)	White		
ARM5G52211DM	5	2 (with SMA Male)	2 (with RP-SMA Male)	1 (with SMA Male)	Black		
ARM5G52212DM	5	2 (with SMA Male)	2 (with RP-SMA Male)	1 (with SMA Male)	White		
ARM5G42111DM	4	2 (with SMA Male)	1 (with RP-SMA Male)	1 (with SMA Male)	Black		
ARM5G42112DM	4	2 (with SMA Male)	1 (with RP-SMA Male)	1 (with SMA Male)	White		
ARM5G32011DM	3	2 (with SMA Male)	0	1 (with SMA Male)	Black		
ARM5G32012DM	3	2 (with SMA Male)	0	1 (with SMA Male)	White		

#### Issue: 2111

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



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 34<sup>th</sup> St Bldg 2 Suite 250 Vancouver, WA 98683 USA Tel: 1-360-944-7551 Europe Headquarters Pulse GmbH & Do, KG Zeppelinstrasse 15 Herrenberg, Germany Tel: 49 7032 7806 0 Pulse (Suzhou) Wireless Products Co, Inc. 99 Huo Ju Road(#29 Bldg,4<sup>th</sup> Phase Suzhou New District Jiangsu Province, Suzhou 215009 PR China Tel: 86 512 6807 9998





Product Numbering

**TECHNICAL DATA SHEET Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

PART NUMBER: ARM5GXXXXDM

This document covers all product variants of the following product family

#### Vehicular Multiband Antenna with Direct Mount ARM 5G X X X X X DM (Part Number) Product ID: ARMADILLO ۲ Total Number of Cable leads ۲ Total Number of LTE Cable Leads **@** Total Number of WiFi Cable Leads ۲ Total Number of GPS Cable Leads ٠ The Color of the Plastic Housing 1=Black; 2= White Mounting: Direct Mount; 7/8" Hole Required

#### Issue: 2111

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 34<sup>th</sup> St Bldg 2 Suite 250 Vancouver, WA 98683 USA Tel: 1-360-944-7551 Europe Headquarters Pulse GmbH & Do, KG Zeppelinstrasse 15 Herrenberg, Germany Tel: 49 7032 7806 0 Pulse (Suzhou) Wireless Products Co, Inc. 99 Huo Ju Road(#29 Bldg,4<sup>th</sup> Phase Suzhou New District Jiangsu Province, Suzhou 215009 PR China Tel: 86 512 6807 9998



Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

PART NUMBER: ARM5GXXXXDM

### **ELECTRICAL SPECIFICATIONS**

Frequency 5G-FR1/LTE Frequency WiFi Nominal Impedance VSWR*	617-960MHz, 1710-6000MHz 2400-2500MHz, 5150-5925MHz 50 Ω
617-960MHz	<2.5
1710-6000MHz	<2.2
2400-2500MHz	<2
5150-5925MHz	<2
Isolation*	
617-960MHz, 1710-6000MHz	-8dB
2400-2500MHz, 5150-5925MHz	-10dB
Average Peak Gain**	
617-960MHz;	2.2dBi
1710-6000MHz	4.6dBi
2400-2500MHz	5.4dBi
5150-5925MHz	6.3dBi
Polarization	Vertical

\*Test on 500mm ground plane with 17ft(5.2m) LMR195 cable \*\*Test on 500mm ground plane with 1ft(304.8mm) LMR195 cable

Issue: 2111

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



4



Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### **ELECTRICAL SPECIFICATIONS**

GPS Antenna	
Frequency	1561.098±2.046MHz/ 1575.42±1.023MHz/ 1602.5625±4MHz
Nominal Impedance	50 Ω
VSWR	<2
Gain (Radiating Element)	-1 dBic±1 dB
Gain (LNA Gain)	30 dB± 2 dB
Polarization	RHCP
Out of Band Rejection	
617 MHz	>70 dB
960 MHz	>65 dB
1710 MHz	>60 dB
6000 MHz	>60 dB
2400 MHz	>65 dB
2700 MHz	>65 dB
Noise Figure	<2.4 dB
Operating Voltage	3.3 – 5 Vdc
Current Consumption	<15mA
RF-chain line-up	Ant-Filter1-LNA1-Filter2-LNA2

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



5



Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

#### **MECHANICAL SPECIFICATIONS**

Overall Length Weight Antenna Color / Material Connector type Cable type Cable length 202.3mm X 88.5mm X 45mm 1.15 kg Black or White Refer to Page 2 Refer to Page 2 Refer to Page 2

#### **ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature Storage Temperature Ingress Protection RoHS Compliant

Issue: 2111

-40 ~ +85° C -40 ~ +85° C IP67 Yes

### **OTHER SPECIFICATIONS**

Total cable assembly loss for 5.2m (17') LMR-195 @850MHz	2.1dB
Total cable assembly loss for 5.2m (17') LMR-100 @1575MHz	5.9dB
Total cable assembly loss for 5.2m (17') LMR-195 @1930MHz	3.2dB
Total cable assembly loss for 5.2m (17') LMR-195 @2450MHz	3.6dB
Total cable assembly loss for 5.2m (17') LMR-195 @2500MHz	3.7dB
Total cable assembly loss for 5.2m (17') LMR-195 @5350MHz	5.5dB



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

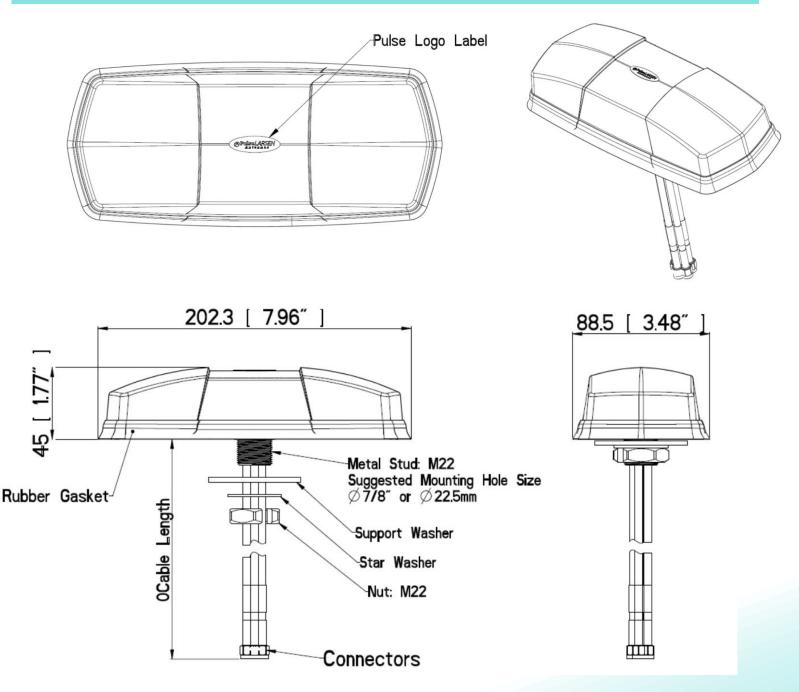


**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

## Series: ARMADILLO

PART NUMBER: ARM5GXXXXDM

### **MECHANICAL DRAWING**



#### Issue: 2111

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



7

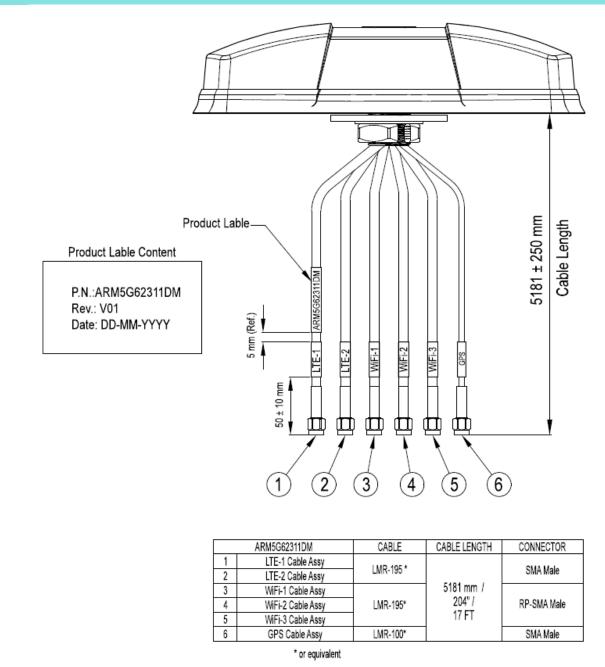


**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

## Series: ARMADILLO

PART NUMBER: ARM5GXXXXDM

### **MECHANICAL DRAWING**



Issue: 2111

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



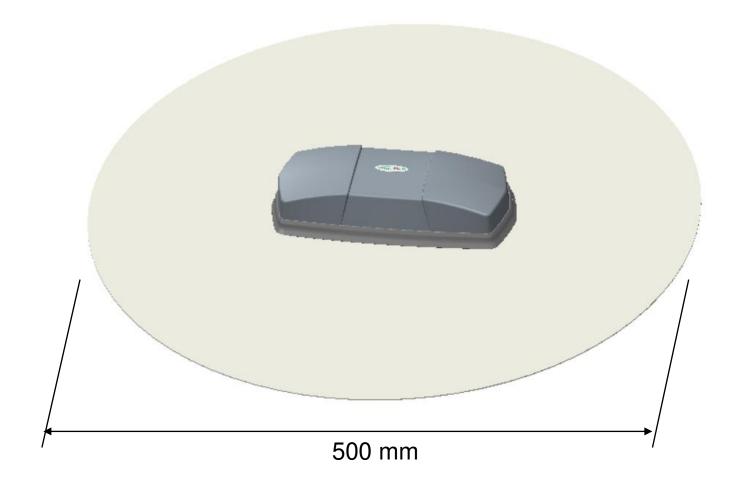
8



TECHNICAL DATA SHEET Description: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

## **TEST SETUP**

Antenna tested on a Ø500mm ground plane.



#### Issue: 2111

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



9

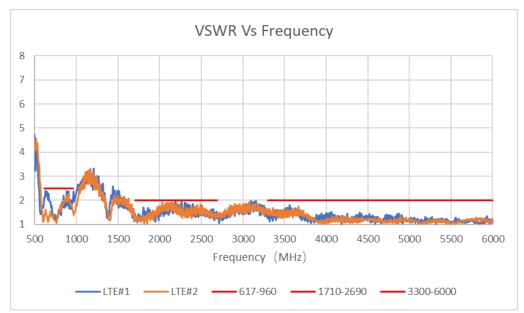


**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

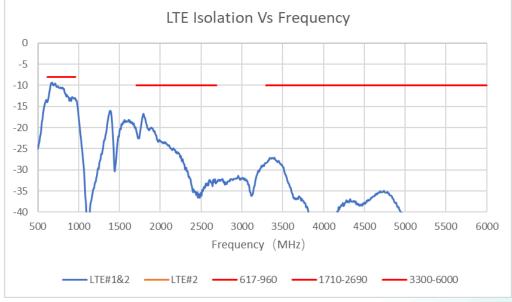
## Series: ARMADILLO

PART NUMBER: ARM5GXXXXDM

# **CHARTS** VSWR (LTE)



# Isolation (LTE)



#### Note : Antenna tested with 5m cable on 500mm (dia) ground plane

#### Issue: 2111

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

CONFIDENTIAL AND PROPRIETARY INFORMATION



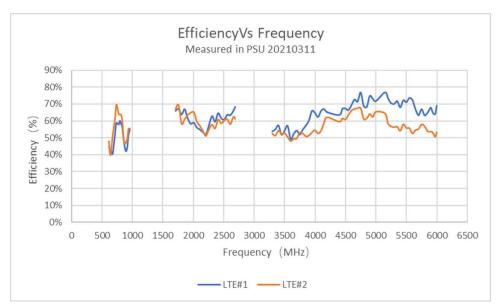


Series: ARMADILLO

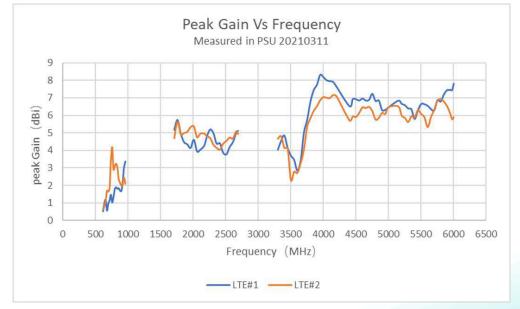
**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

#### PART NUMBER: ARM5GXXXXXDM

## CHARTS Radiation Efficiency (LTE)



Peak Gain (LTE)



#### Note : Antenna tested with 1ft(304.8mm) cable on 500mm (dia) ground plane

#### Issue: 2111

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

CONFIDENTIAL AND PROPRIETARY INFORMATION



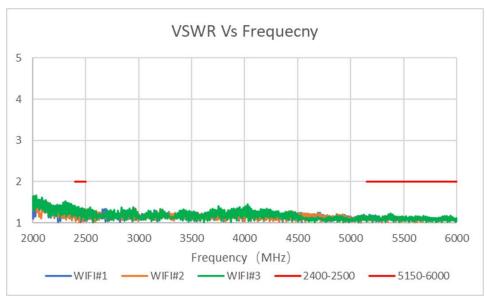


Series: ARMADILLO

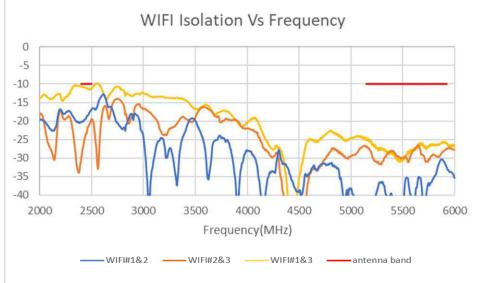
**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

#### PART NUMBER: ARM5GXXXXXDM

# CHARTS VSWR (WIFI)



# Isolation (WIFI)



#### Note : Antenna tested with 5m cable on 500mm (dia) ground plane

#### Issue: 2111

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

CONFIDENTIAL AND PROPRIETARY INFORMATION





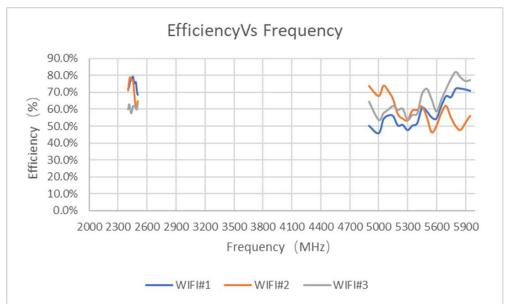
Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

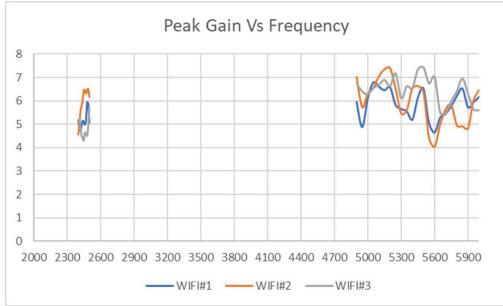
#### PART NUMBER: ARM5GXXXXXDM

### CHARTS

## Radiation Efficiency (WIFI)



# Peak Gain (WIFI)



#### Note : Antenna tested with 1ft(304.8mm) cable on 500mm (dia) ground plane

#### Issue: 2111

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

CONFIDENTIAL AND PROPRIETARY INFORMATION

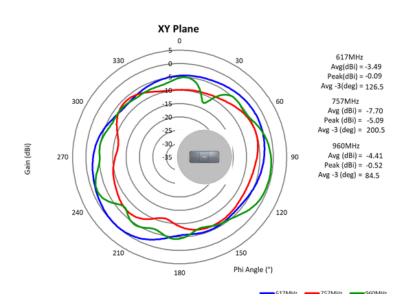
ROHS 13



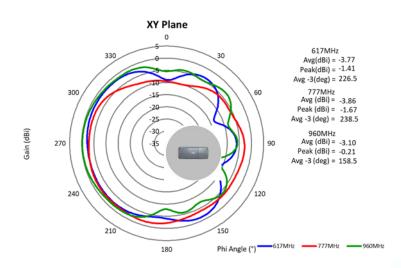
### Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### CHARTS



## LTE1 XY plane radiation pattern



## LTE2 XY plane radiation pattern

#### Issue: 2111

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

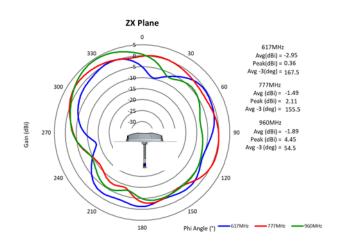




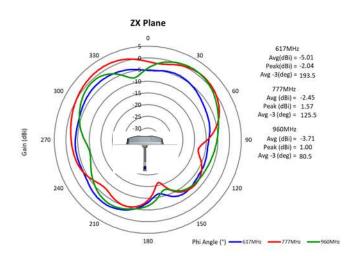
Description: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXXDM

TECHNICAL DATA SHEET

## **CHARTS**



# LTE1 ZX plane radiation pattern



## LTE2 ZX plane radiation pattern

#### Issue: 2111

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



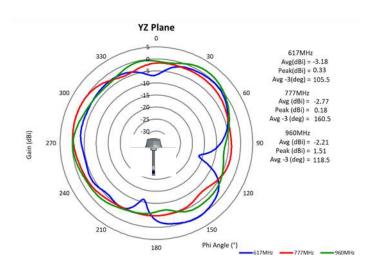
15



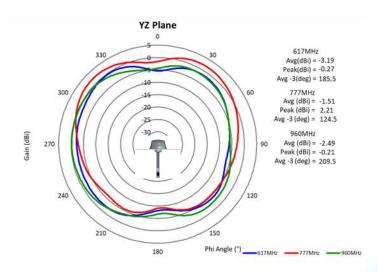
Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### CHARTS



## LTE1 YZ plane radiation pattern



## LTE2 YZ plane radiation pattern

#### Issue: 2111

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

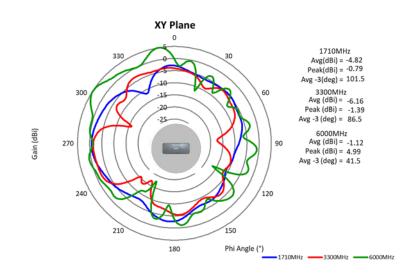




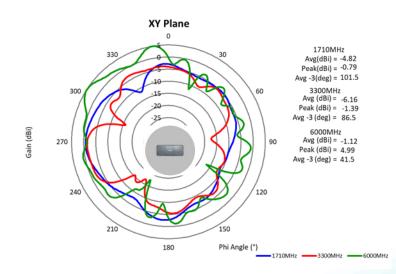
### Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### CHARTS



LTE1 XY plane radiation pattern



## LTE2 XY plane radiation pattern

#### Issue: 2111

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



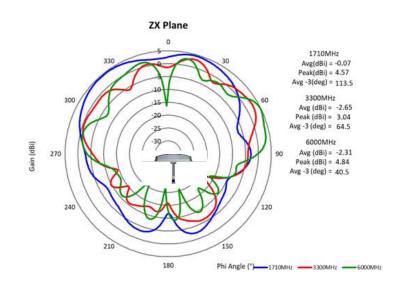
17



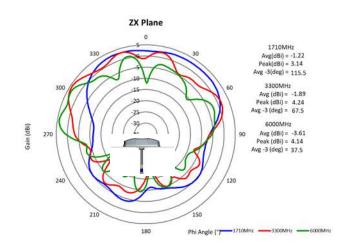
Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### CHARTS



LTE1 ZX plane radiation pattern



## LTE2 ZX plane radiation pattern

Issue: 2111

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

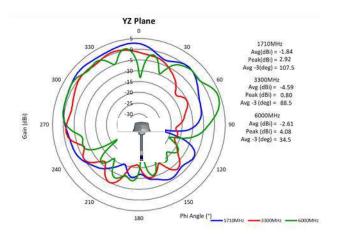




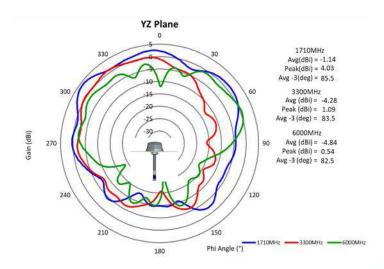
Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### CHARTS



# LTE1 YZ plane radiation pattern



## LTE2 YZ plane radiation pattern

#### Issue: 2111

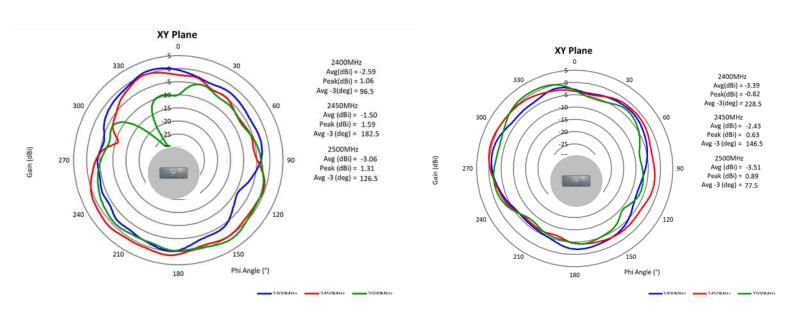
In the effort to improve our products, we reserve the right to make changes judged to be necessary. CONFIDENTIAL AND PROPRIETARY INFORMATION





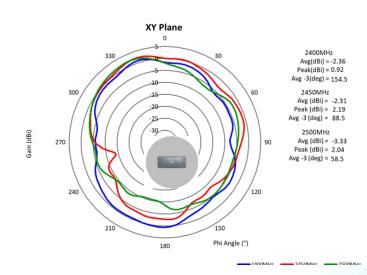
TECHNICAL DATA SHEET Description: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### CHARTS



# WiFi1 XY plane radiation pattern

WiFi2 XY plane radiation pattern



## WiFi3 XY plane radiation pattern

#### Issue: 2111

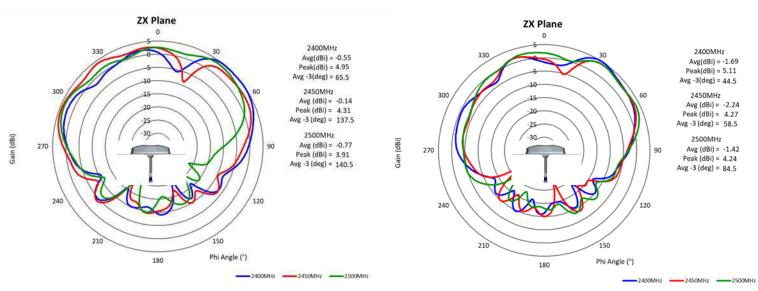
In the effort to improve our products, we reserve the right to make changes judged to be necessary. CONFIDENTIAL AND PROPRIETARY INFORMATION





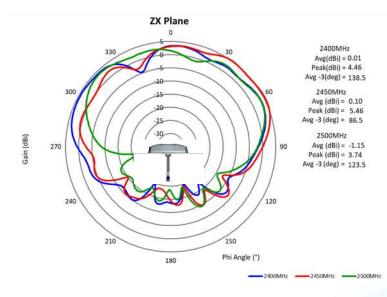
TECHNICAL DATA SHEET Description: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### CHARTS



WiFi1 ZX plane radiation pattern

WiFi2 ZX plane radiation pattern



## WiFi3 ZX plane radiation pattern

#### Issue: 2111

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

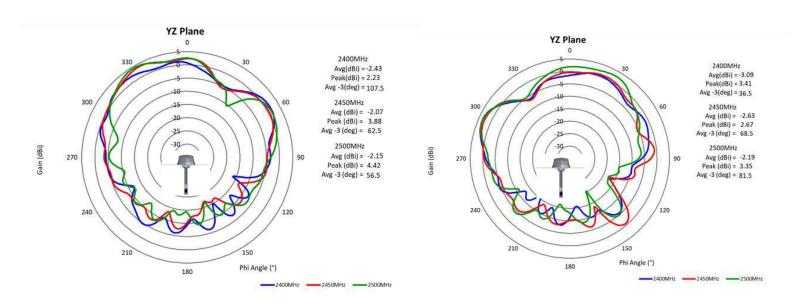


21



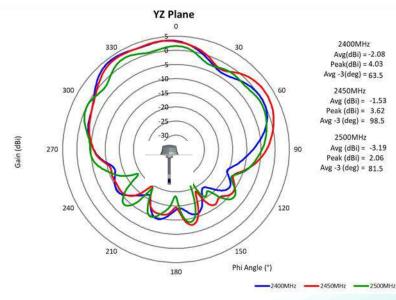
TECHNICAL DATA SHEET Description: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### CHARTS



WiFi1 YZ plane radiation pattern

WiFi2 YZ plane radiation pattern



## WiFi3 YZ plane radiation pattern

#### Issue: 2111

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



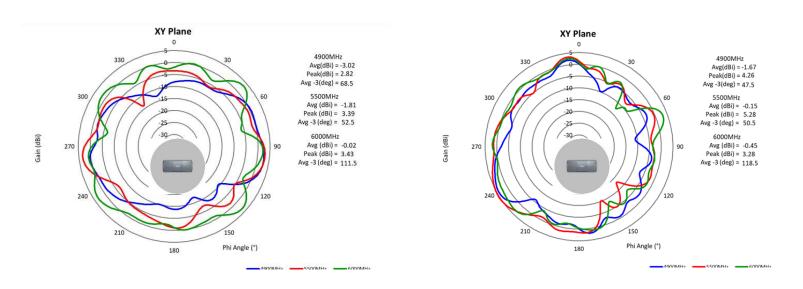
22



**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXXDM

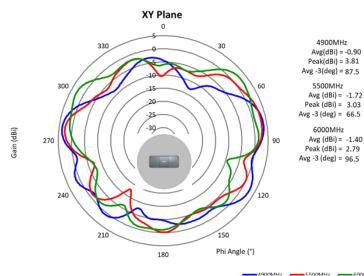
TECHNICAL DATA SHEET

### CHARTS



# WiFi1 XY plane radiation pattern

WiFi2 XY plane radiation pattern



## WiFi3 XY plane radiation pattern

#### Issue: 2111

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



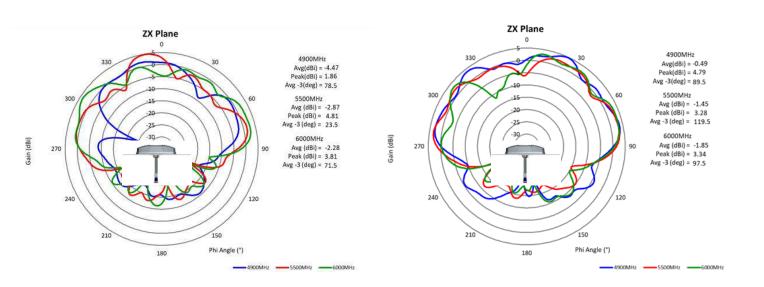
23



**TECHNICAL DATA SHEET Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

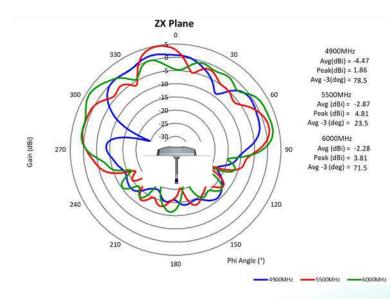
#### PART NUMBER: ARM5GXXXXDM

### **CHARTS**



# WiFi1 ZX plane radiation pattern

WiFi2 ZX plane radiation pattern



## WiFi3 ZX plane radiation pattern

#### Issue: 2111

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



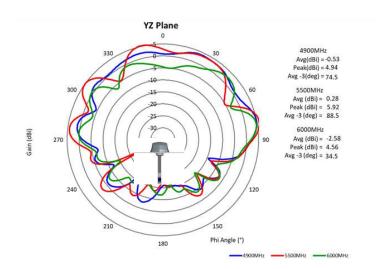
24

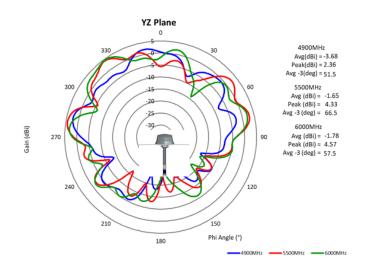


**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXXDM

TECHNICAL DATA SHEET

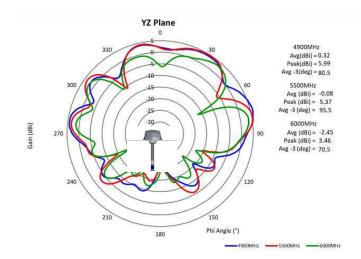
### **CHARTS**





# WiFi1 YZ plane radiation pattern

WiFi2 YZ plane radiation pattern



## WiFi3 YZ plane radiation pattern

#### Issue: 2111

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



25

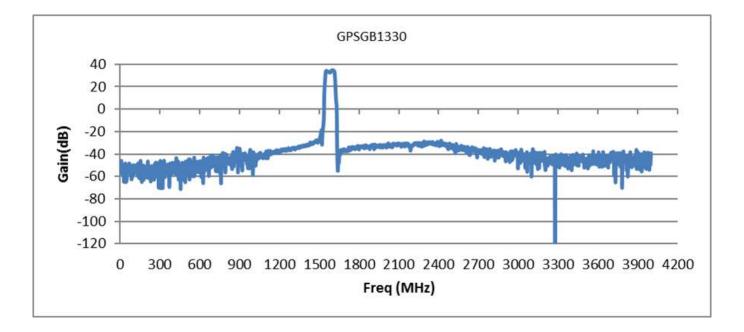


Series: ARMADILLO

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### **CHARTS**

# LNA Gain and out-of-band rejection



## WiFi3 YZ plane radiation pattern

Issue: 2111

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



26



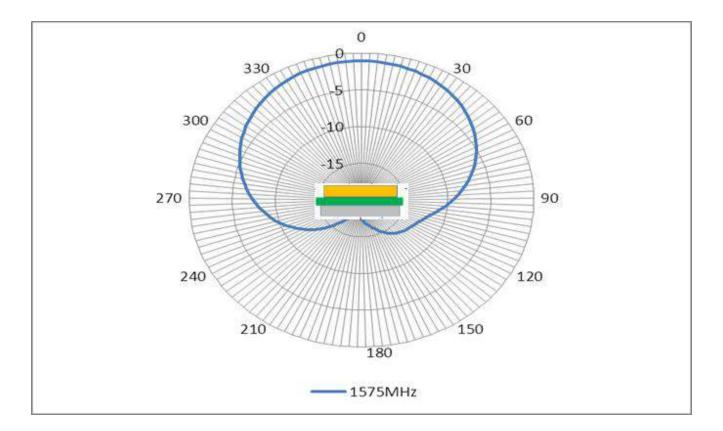
**TECHNICAL DATA SHEET Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna

### Series: ARMADILLO

#### PART NUMBER: ARM5GXXXXXDM

### **CHARTS**

Radiation Pattern (70mm x 70mm ground plane ) GPS & Galileo



# WiFi3 YZ plane radiation pattern

#### Issue: 2111

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



27



TECHNICAL DATA SHEET Description: 5G-FR1/WiFi/GNSS Low Profile

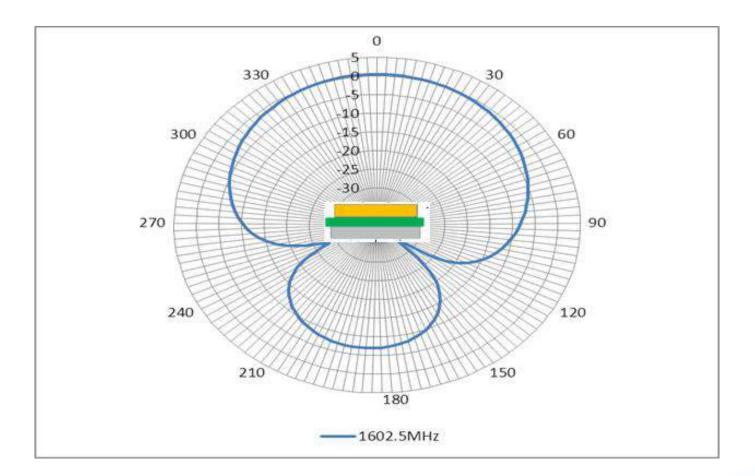
Series: ARMADILLO

PART NUMBER: ARM5GXXXXDM

Vehicular Multiband Antenna

### **CHARTS**

# Radiation Pattern (70mm x 70mm ground plane ) GLONASS



## WiFi3 YZ plane radiation pattern

#### Issue: 2111

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



28



TECHNICAL DATA SHEET

**Description**: 5G-FR1/WiFi/GNSS Low Profile Vehicular Multiband Antenna PART NUMBER: ARM5GXXXXDM

### PACKAGING

Each antennas packed in Bubble Bag

- 6 bags of antennas (Total 6pcs) packed in a cardboard box
- 1 label on each box with quantity, part number, date code.

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



29