

ANT Gain
RAK7240CV2

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3 dBi Fiberglass Antenna (RAKARG12)

Datasheet

Features

- Frequency Range: 860 ~ 930 MHz
- One antenna to suit both 868 MHz and 915 MHz bands
- Max Gain: 3 dBi
- High efficiency
- Vertically polarized monopole

Specifications

Parameter	Value
Model	RAKARG12
Frequency Range (MHz)	860 - 930
Gain (dBi)	2.6 - 3.1
VSWR	≤ 2.5
Efficiency	60%
Radiation	360°
Impedance (Ohms)	50 Ω
Polarization	Vertical
Radome Body	Fiberglass
Connector	N-Type Male
Dimensions (mm)	Φ 25 x L 360 ±10 mm
Operation Temp (°C)	-20 ~ +65
Storage Temp (°C)	-30 ~ +75

VSWR and Return Loss

Frequency (MHz)	VSWR	Return loss (dB)
860	1.7657	-11.20
870	1.4305	-15.04
896	1.2643	-18.78
910	1.4393	-15.04
920	1.6967	-11.91
930	1.5974	-12.73

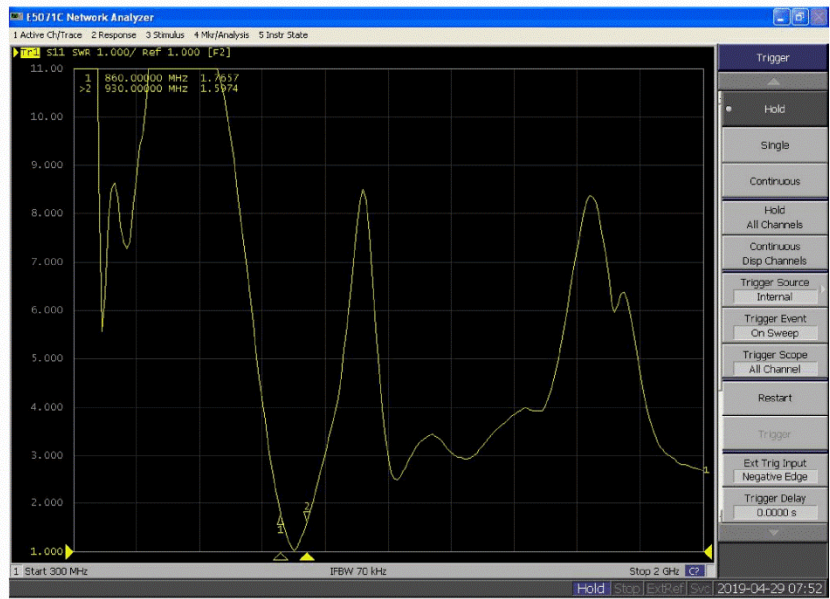
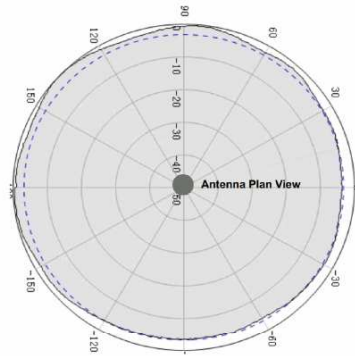
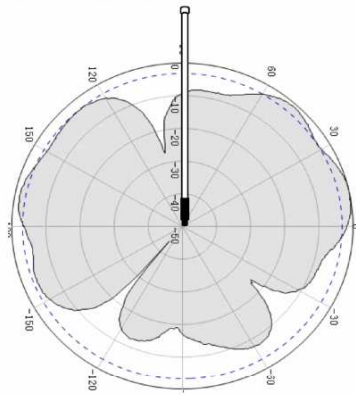


Figure 2: RAKARL01 VSWR graph # Peak Gain & Efficiency

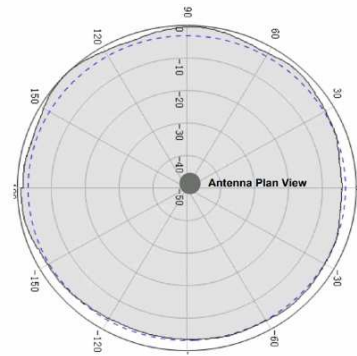
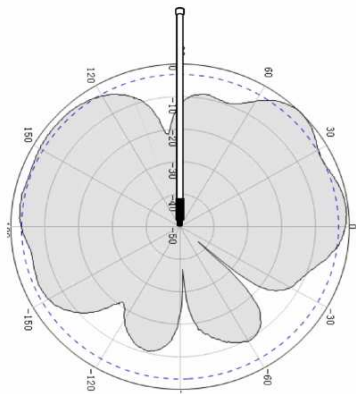
Frequency (MHz)	Efficiency (%)	Gain (dBi)
860	56.1	2.6
865	59.2	2.8
870	60.6	2.8
875	66.4	2.9
880	63.8	2.9
885	65.2	3.0
890	66.7	3.0
895	69.2	3.1
900	70.1	2.8
905	77.5	2.9
910	70.4	2.9
915	69.6	2.9
920	66.0	2.7
925	64.9	2.8
930	60.4	2.7

Radiation Patterns

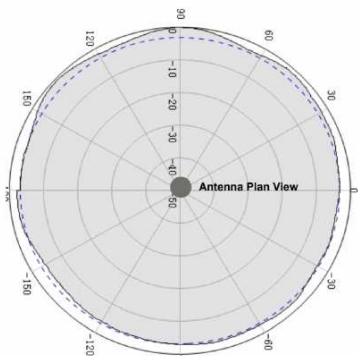
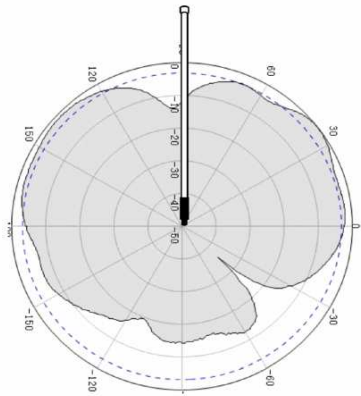
860MHz



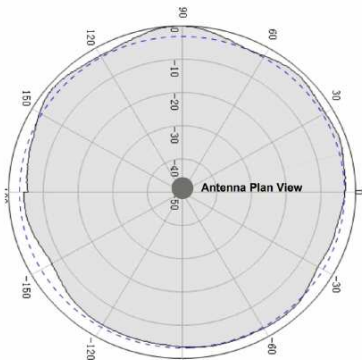
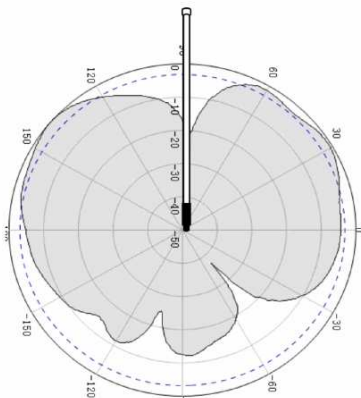
870MHz



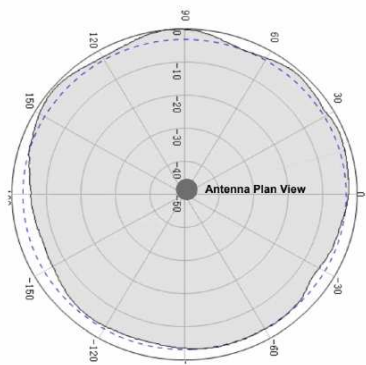
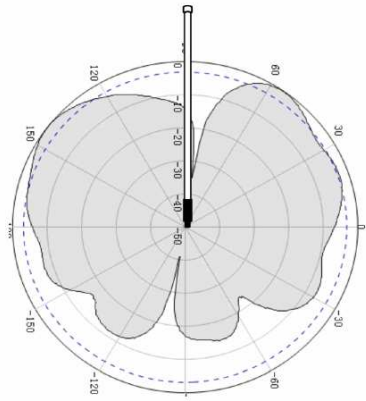
880MMHz



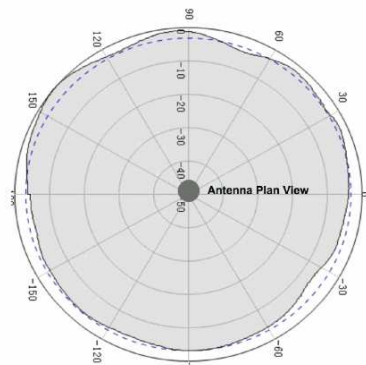
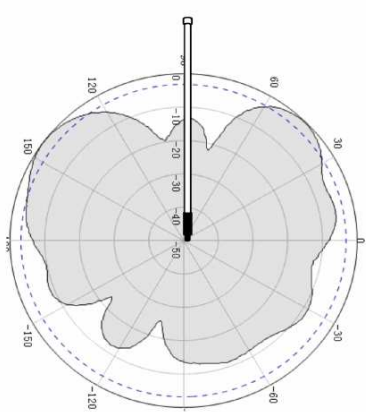
890MMHz



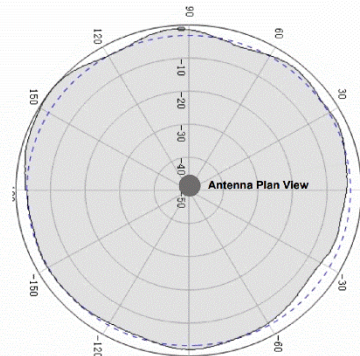
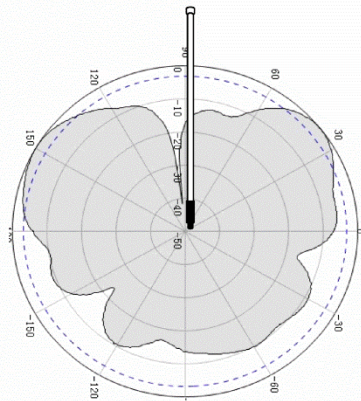
900MMHz



910MMHz



920MMHz



930MMHz

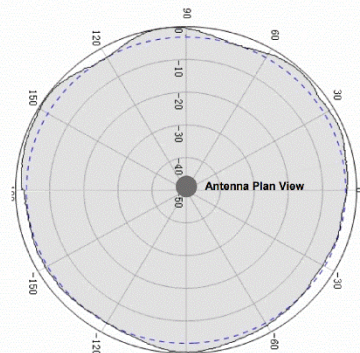
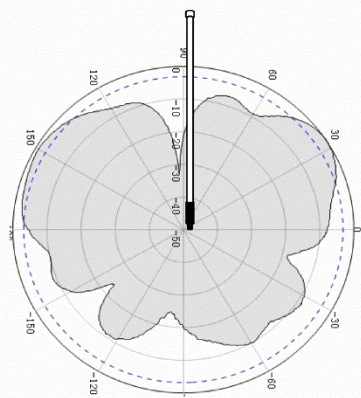


Figure 3: RAKARL01 radiation patterns

902-928 MHz 5.1 dBi Fiberglass Antenna Datasheet

Overview

The 5.1 dBi Fiberglass antenna is an outdoor, high-performance antenna, designed to withstand harsh outdoor conditions. It is specially designed for LoRa in the 902-928 MHz band – US915, AU915, AS923, and KR920. The antenna connector is one with the antenna body - this design further increases the resistance of the antenna to external conditions. With a length of only 480 mm, this antenna will be the best fit for your LPWAN gateway or outdoor deployed RAK Hotspot.

NOTE:

This antenna is designed to be directly mounted on the enclosure of the Gateway. It is suitable for the following RAK products:

- [RAK7240](#) 
- [RAK7249](#) 

The antenna is also compatible with the following:

- [Outdoor Enclosure for RAK Hotspot](#) 
- [Bobcat Outdoor Enclosure Kit](#) 
- [Antenna Magnetic Base](#) 

Features

- Frequency: 902-928 MHz
- Gain: 5.1 dBi
- VSWR: ≤ 1.47
- Beamwidth: 360°
- Impedance: 50 Ω
- Polarization: Vertical
- Radome Body: Fiberglass
- Connector: N-Type Male
- Dimensions: Φ 27.0 mm x 480.0 mm
- Operation Temperature: -40 °C ~ +75 °C
- Storage Temperature: -40 °C ~ +85 °C
- IP67 rated

Specifications

Parameter	Value
Model	RAKARG19
Frequency Range	902 ~ 928 MHz
Peak Gain	5.1 dBi
VSWR	≤ 1.47
Efficiency	≤ 84%
Feed Impedance	50 Ω
Radiation Pattern	Omnidirectional
Polarization	Vertical
Cover Material (Color)	Fiberglass (White)
Connector Type	N-type male
Dimensions (mm)	Φ 27.0 mm x 480.0 mm
Operation Temp (°C)	-40 °C ~ +75 °C
Storage Temperature	-40 °C ~ +85 °C
Humidity Range	5% ~ 95%

VSWR and Return Loss

Frequency (MHz)	VSWR	Return Loss (dB)
902 MHz	1.47	-14.4
928 MHz	1.46	-14.5

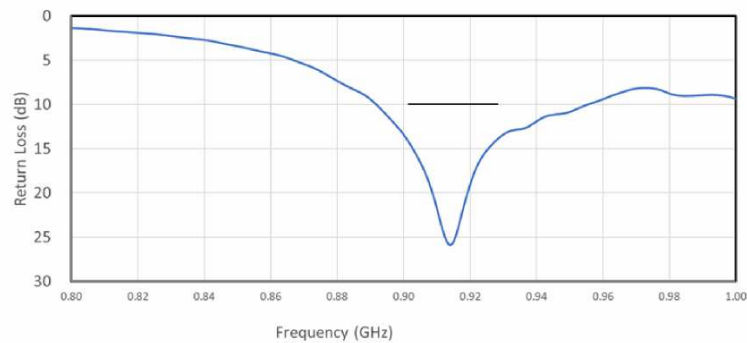


Figure 1: RAKARG19 VSWR Graph

Peak Gain & Efficiency

Frequency (MHz)	Gain (dBi)	Efficiency (%)
902	4.8	82
904	4.9	83
906	5.0	83
908	5.0	83
910	5.0	84
912	5.0	84
914	5.1	84
916	5.1	84
918	5.1	84
920	5.1	84
922	5.1	84
924	5.0	84
926	5.0	84
928	5.0	84
Average:		83.64

Radiation Patterns

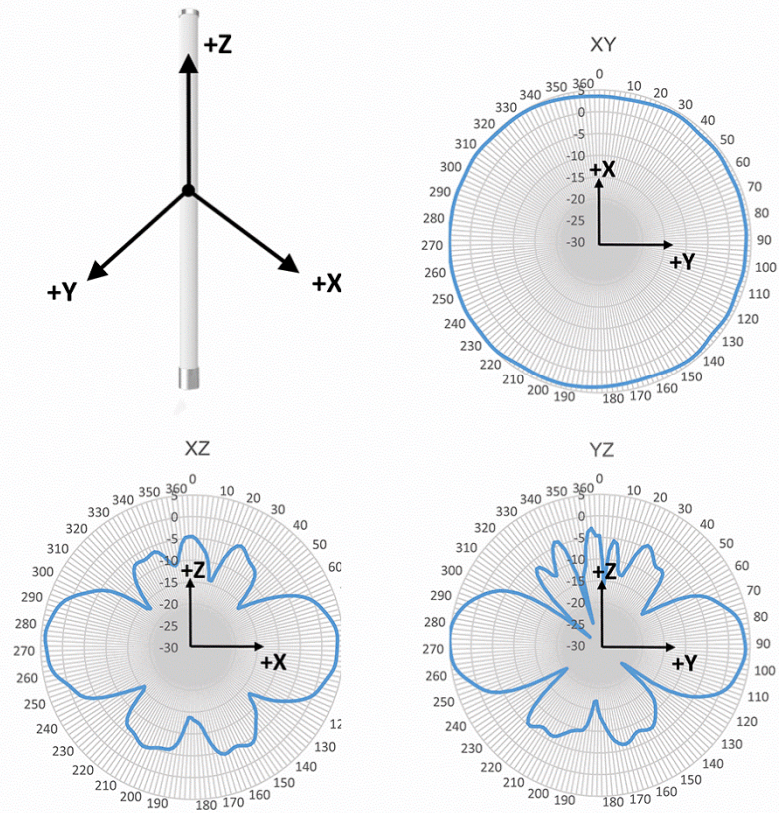


Figure 2: RAKARG19 Radiation Patterns

902-928MHz 5.8dBi Fiberglass Antenna Datasheet

Features

- Frequency range: 902 ~ 930 MHz
- Max gain: 5.8 dBi
- VSWR: ≤ 2.0
- High Efficiency
- Radome Body: **Fiberglass**
- Vertically Polarized Dipole
- Omnidirectional
- Easy to mount with the included Installation kit
- Outdoor use

Specifications

Hardware

Electrical Characteristics

Parameter	Value
Model	RAKARG14
Frequency Range	902 ~ 930 MHz
Peak Gain	5.8 dBi
VSWR	≤ 2.0
Efficiency	$\leq 79\%$
Feed Impedance	50 Ω
Radiation Pattern	Omnidirectional
Polarization	Vertical
Cover Material (color)	Fiberglass (white)
Connector Type	N-type male
Dimensions (mm)	Φ 29.8 mm x 800.0 mm

Environmental Characteristics

Operation Environment

Parameter	Value
Temperature	-20 °C ~ +65 °C
Humidity	5% ~ 95%

Storage environment

Parameter	Value
Temperature	-30 °C ~ +75 °C
Humidity	5% ~ 95%

VSWR

Frequency (MHz)	VSWR
900 MHz	1.32
902 MHz	1.33
930 MHz	1.47

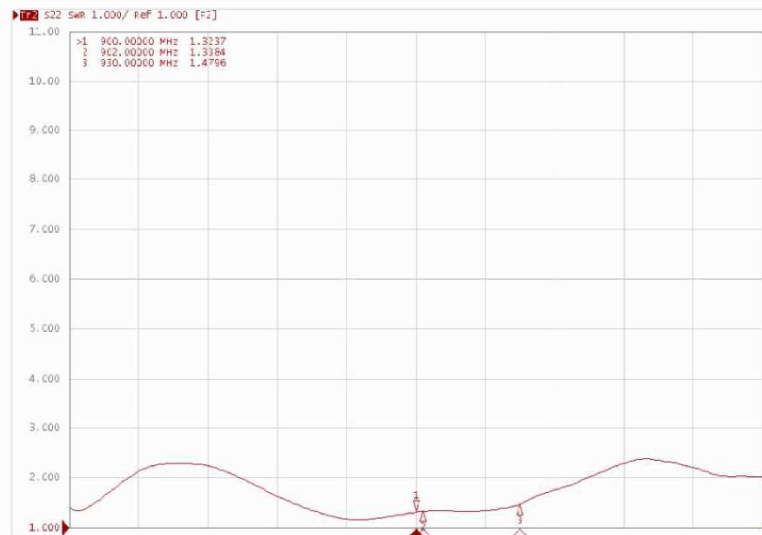


Figure 2: RAKARG14 VSWR Graph

Peak Gain & Efficiency

Frequency (MHz)	Gain (dBi)	Efficiency (%)
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Frequency (MHz)	Gain (dBi)	Efficiency (%)
902	5.4	74.02
904	5.6	76.58
906	5.6	76.34
908	5.6	74.85
910	5.5	74.11
912	5.6	74.09
914	5.7	76.16
916	6.0	78.27
918	6.1	79.42
920	6.0	79.10
922	5.9	77.99
924	5.8	76.85
926	5.8	76.56
928	5.7	77.45
930	5.7	78.16
Average:		71.73

Radiation Patterns

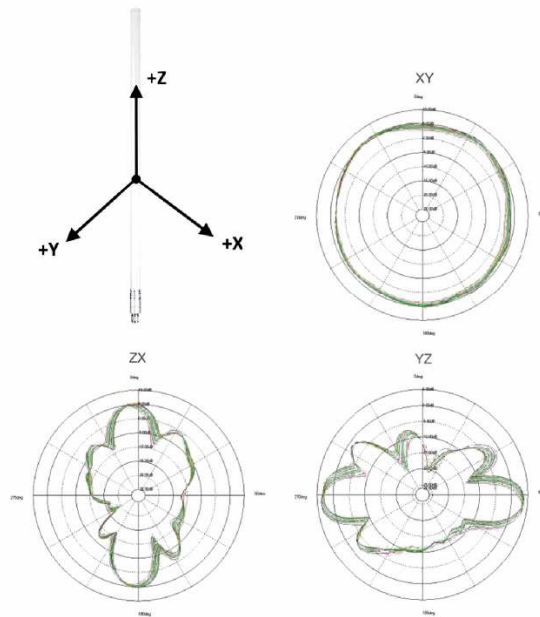


Figure 3: RAKARG14 Radiation Patterns

900-930MHz 8dBi Fiber Glass Antenna

Overview

Features

- Frequency Range: 900~930 MHz
- Max Gain: 8.0 dBi
- VSWR: ≤ 1.5
- High efficiency
- Vertically polarized dipole
- Easy to mount with the included Installation kit

Specifications

Model	RAKARG15
Frequency Range	900 MHz~930 MHz
Peak Gain	8.0 dBi
VSWR	≤ 1.5
Efficiency	$\leq 65\%$
Feed Impedance	50 Ω
Polarization	Vertical
Cover material(color)	Fiber glass (White)
Connector type	N-type male
Dimensions (mm)	$\Phi 25.0$ mm x 900.0 mm
Operation Temp (°C)	-30 °C ~ +65 °C
Humidity range	5%~95%

VSWR

Frequency(MHz)	VSWR
902MHZ	1.28
910MHZ	1.20
928MHz	1.17

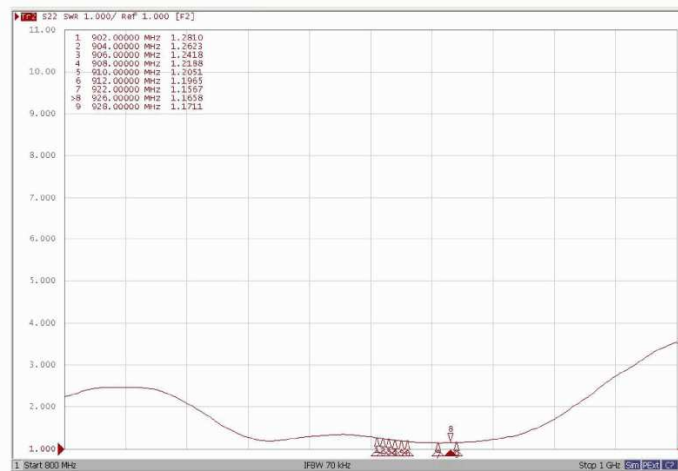


Figure 2: RAKARG15 VSWR graph

Peak Gain & Efficiency

Frequency (MHz)	Gain (dBi)	Efficiency (%)
900	6.3	43.3
905	6.6	47.1
910	7.6	50.4
915	7.3	52.6
920	7.4	52.4
925	7.6	52.7
930	8.3	50.9
Average:		50.0

Radiation Patterns

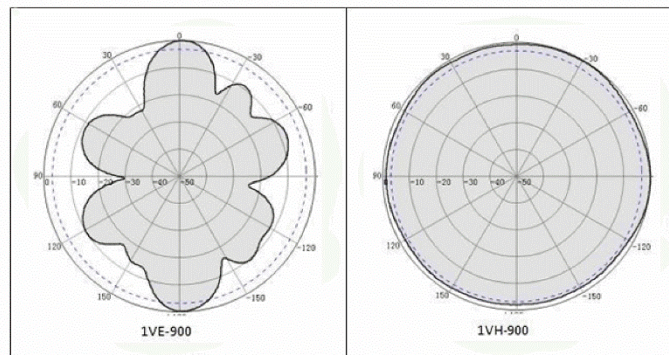


Figure 3: Radiation pattern at 900MHz

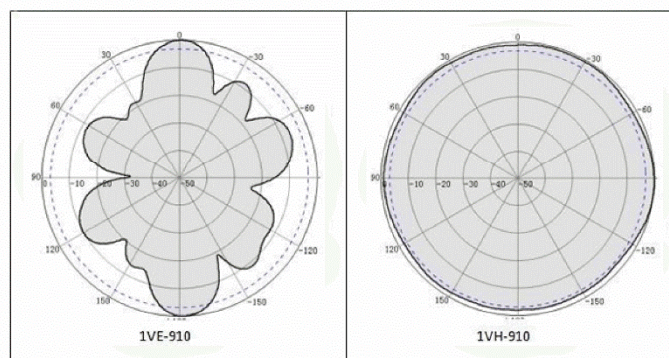


Figure 4: Radiation pattern at 910MHz

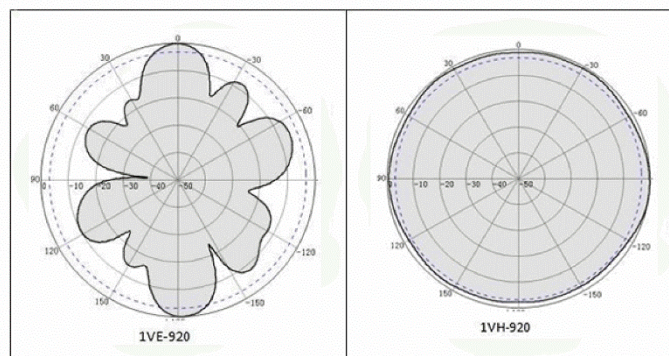


Figure 5: Radiation pattern at 920MHz

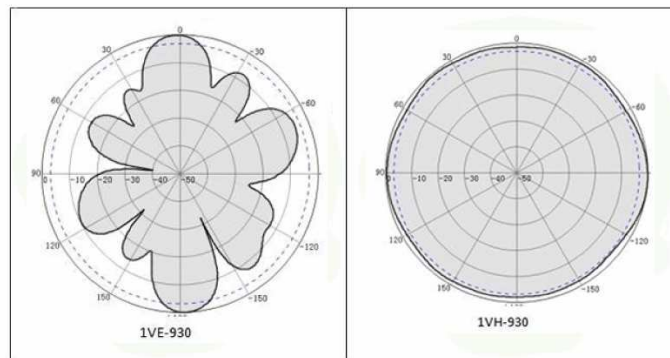


Figure 6: Radiation pattern at 930MHz

2.4 GHz Wi-Fi Fiberglass Antenna (K7ABLG2G4ML400) Datasheet

Features

- Frequency range: 2400 - 2500 MHz
- Max gain: 2 dBi
- VSWR: ≤ 2
- High efficiency
- N-type male connector
- IP67 rated

Specifications

Parameter	Value
Model	K7ABLG2G4ML400
Frequency range	2400 - 2500 MHz
Peak gain	2 dBi
VSWR	≤ 2
Efficiency	≤ 60%
Feed impedance	50 Ohms
Radiation pattern	Omni-directional
Beam width	360°
Cover material (color)	Fiberglass (white)
Connector type	N-type male
Dimensions (mm)	Φ 20.0 mm x 215.0 mm
Operation temp (°C)	-20° C ~ +65° C
Storage temperature	-30° C ~ +75° C
Humidity range	5% ~ 95%

VSWR and Return Loss

Frequency (MHz)	VSWR	Return loss (dB)
2400 MHz	1.55	-13.45
2500 MHz	1.56	-13.20

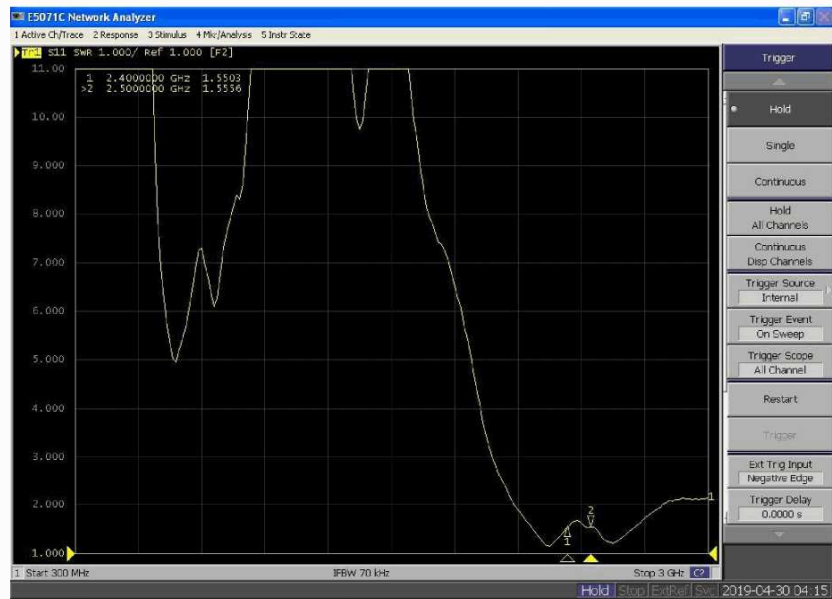


Figure 2: K7ABLG2G4ML400 VSWR graph

Peak Gain & Efficiency

Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	2.3	60.5
2410	2.0	59.5
2420	2.2	57.9
2430	2.0	57.2
2440	2.1	58.2
2450	2.2	59.7
2460	2.1	62.0
2470	2.4	65.7
2480	3.0	67.7
2490	3.5	68.0
2500	3.5	68.2
Average:		62.24

Radiation Patterns

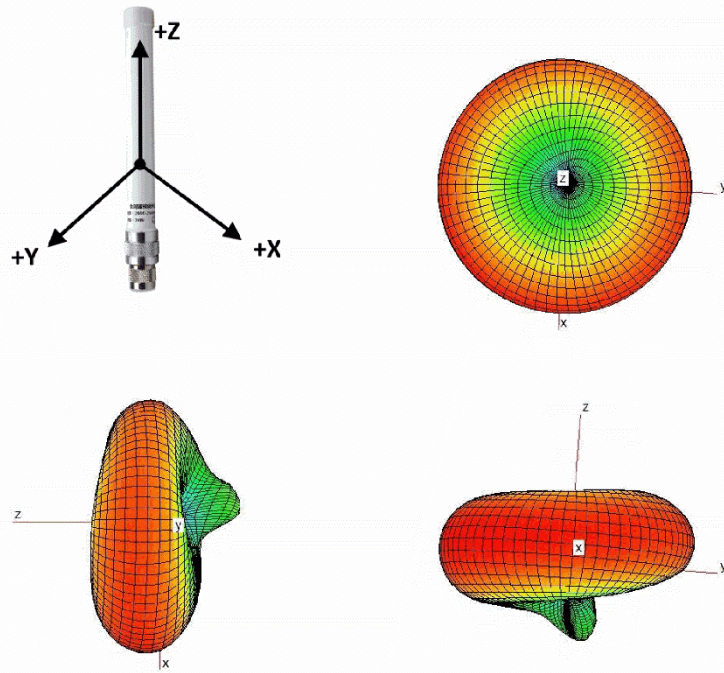


Figure 3: K7ABLG2G4ML400 radiation patterns

LTE Fiber Glass Antenna (RAKARL01)

Datasheet

Features

- Frequency range: 698 ~ 960 MHz / 1710 ~ 2690 MHz
- Max gain: 3 dBi
- VSWR: ≤ 3.00
- High efficiency
- Vertically polarized dipole
- IP67 rated

Specifications

Parameter	Value
Model	RAKARL01
Frequency range	698 ~ 960 MHz / 1710 ~ 2690 MHz
Peak gain	3.00 dBi
VSWR	≤ 3.00
Efficiency	$\leq 60\%$
Feed impedance	50 Ohms
Max input power	20 W
Radiation pattern	Omni-directional
Polarization	Vertical

Parameter	Value
Radome body (color)	Fiberglass (white)
Connector type	N-type male
Dimensions (mm)	Φ 20.0 mm x 215.0 mm
Operation temp (°C)	-40° C ~ +85° C
Storage temperature	-40° C ~ +85° C
Humidity range	5% ~ 95% RH

VSWR and Return Loss

Frequency (MHz)	VSWR	Return loss (dB)
698 MHz	2.47	-7.36
960 MHz	1.95	-9.90
1710 MHz	2.97	-6.24
2690 MHz	1.36	-16.32

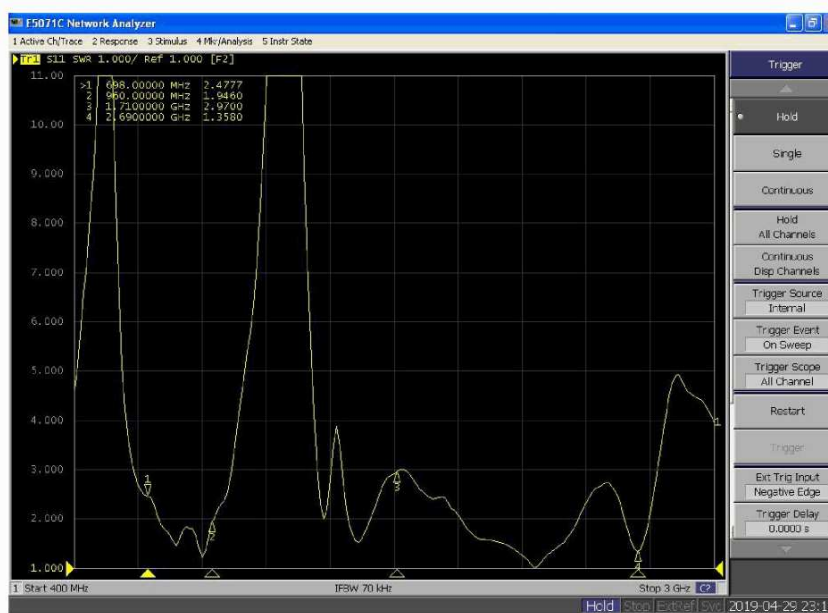


Figure 2: RAKARL01 VSWS graph

Peak Gain & Efficiency

Frequency	Efficiency	Peak Gain
680	45%	-1.4
700	44%	-1.4
720	41%	-1.1
740	44%	-1.0
760	44%	-0.9
780	43%	-0.8
800	45%	-0.4
820	37%	-1.1
840	36%	-1.1
860	36%	-1.0
880	36%	-0.7
900	36%	-0.3
920	34%	0.1
940	33%	0.3
960	31%	0.2
1700	53%	0.1
1720	54%	0.0
1740	53%	0.2
1760	49%	0.8
1780	48%	0.9
1800	49%	0.7
1820	48%	0.6
1840	49%	0.4
1860	54%	0.4
1880	51%	0.3
1900	49%	0.5
1920	52%	0.3
1940	48%	0.8

Frequency	Efficiency	Peak Gain
1960	47%	1.1
1980	46%	1.4
2000	55%	0.4
2020	56%	0.5
2040	61%	0.5
2060	64%	0.9
2080	66%	1.3
2100	67%	1.5
2120	71%	1.8
2140	70%	1.9
2160	74%	2.2
2180	78%	2.5
2200	81%	2.8
2220	81%	2.9
2240	82%	3.0
2260	83%	3.0
2280	88%	3.3
2300	88%	3.3
2320	83%	3.0
2340	80%	2.8
2360	78%	2.7
2380	79%	2.8
2400	78%	2.7
2420	79%	2.9
2440	70%	2.4
2460	68%	2.4
2480	68%	2.5
2500	69%	2.6
2520	69%	2.7
2540	67%	2.6

Frequency	Efficiency	Peak Gain
2560	61%	2.2
2580	63%	2.4
2600	60%	2.2
2620	62%	2.2
2640	64%	2.1
2660	65%	2.0
2680	66%	1.8
2700	67%	1.4

Radiation Patterns

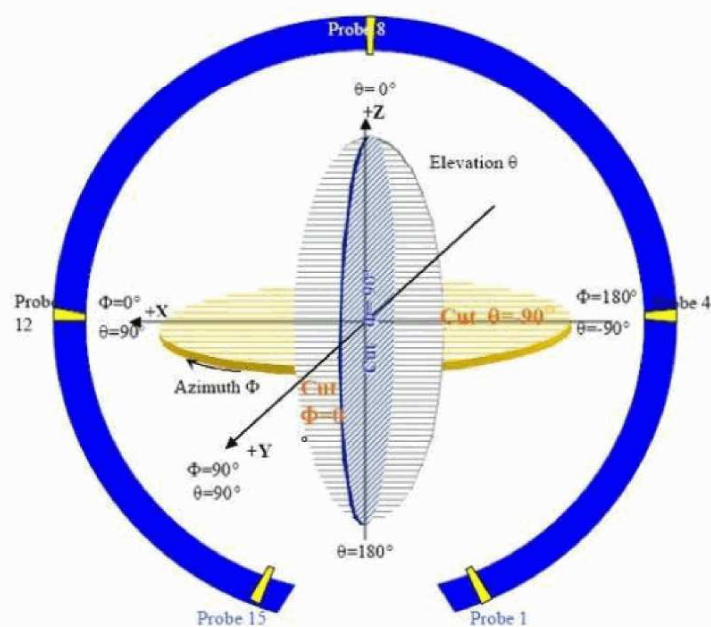


Figure 3: RAKARL01 radiation patterns