

Vibby Hub ANTENNAS

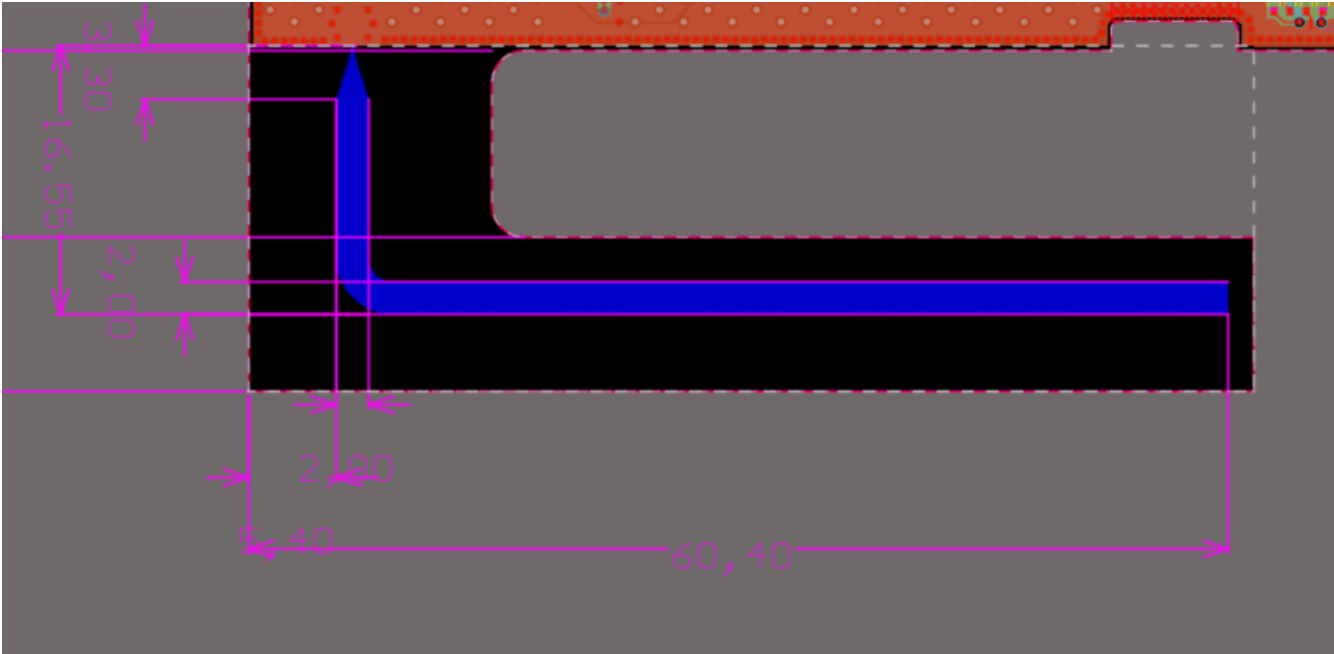
1. SRD/ISM L3LAN ANTENNA

1.1. Electrical specifications

Emitter class	F1D
Frequency range:	850 to 950MHz
Peak gain:	0 dBi
Wavelength:	¼ wave
Impedance:	50 Ohm
Polarization:	Linear
Radiation:	Omnidirectional

1.2. Antenna Manufacturer

Manufacturer
Telecom Design



2. BLE/WIFI ANTENNA

The BLE/WIFI antenna is part of a certified module ESP32S3-WROOM1 integrated into our product.

2.1. Espressif module specifications

WIFI Emitter class	D7W
BLE Emitter class	F1D
FCC-ID	2AC7Z-ESPS3WROOM1
IC	21098-ESPS3WROOM1

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b : 22.77 dBm (0.1892 W) 802.11g : 25.56 dBm (0.3597 W) 802.11n HT20 : 25.32 dBm (0.3404 W) 802.11n HT40 : 25.22 dBm (0.3327 W)
99% Occupied Bandwidth	802.11b : 13.19MHz 802.11g : 18.78MHz 802.11n HT20 : 19.13MHz 802.11n HT40 : 34.67MHz
Antenna Type / Gain	PCB Antenna type with gain 3.26 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)



3. FM ANTENNA

The Vibby Hub has a simple internal free wire antenna photo below :

General spécification:

Emitter class	None RX only
Type	FM 50cm soldered wire
Frequency bands	VFM VHF Band II 87,5- 108MHz

Mechanical:

The white wire below



4. LTE ANTENNA

Emitter class	W7W
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Antenna Datasheet

Product OC: YF0028AA
Version: 2.1
Date: 2023-11-29
Status: Released

Product Name: 4G FPC Antenna
Key Features:
Frequency Band: 698–2690 MHz
Dimensions: 94 mm × 21 mm
Efficiency: Up to 77.1 %
RoHS and REACH Compliant

Overview

This Quectel embedded 4G FPC antenna covers main 4G LTE bands and is compatible with 3G/2G/LPWA bands. Featuring high efficiency and gain, it is an ideal antenna for a smooth and stable connection with high-efficiency data transmission even under the influence of the device's internal structure. Ground plane independent, it's designed to be mounted directly to the underside of either a plastic or non-metallic enclosure. Ease of integration with a cable and connector which can be customized to meet your product design and RF module.

1.1. Electrical

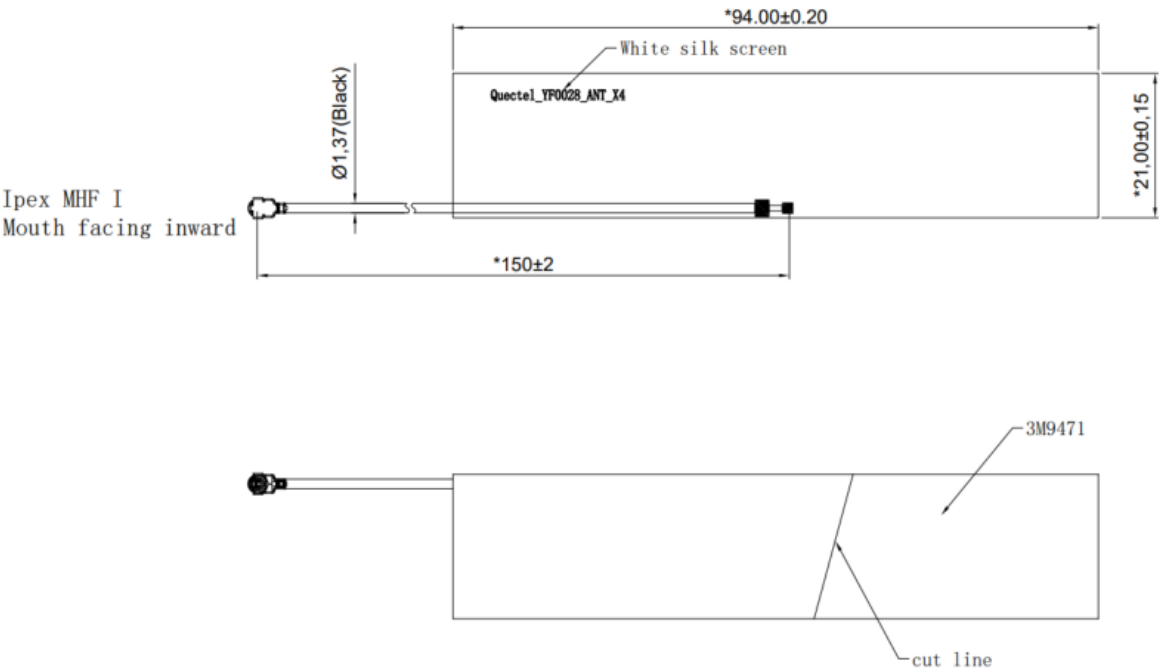
Electrical	
Frequency Range	698–960 MHz, 1710–2690 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omni-directional

Electrical - Detail													
SPEC	Band	Band	B71	B12 /B13 /B28	B5 /B8 /B26	N74 /N75 /N76	B1 /B2 /B3	B40	Wi-Fi 2G	B38 /B41	B42 /B48 /N77	N79	Wi-Fi 5G
	Freq. (MHz)	600– 700	700– 810	820– 960	1420– 1520	1700– 2170	2300– 2400	2400– 2500	2500– 2690	3300– 4200	4400– 5000	5150– 5850	
Max. VSWR			-	5.2	6.4	-	2.0	1.8	1.4	1.6	-	-	-
Max. Return Loss (dB)			-	-3.4	-2.7	-	-9.6	-10.6	-16.4	-12.8	-	-	-
AVG Eff. (%)			-	50.2	59.5	-	69.5	68.8	69.2	68.6	-	-	-
AVG AVG Gain (dB)			-	-3.0	-2.4	-	-1.6	-1.6	-1.6	-1.6	-	-	-
Max. Peak Gain (dBi)			-	0.9	1.9	-	3.6	2.7	3.5	3.9	-	-	-
VSWR							≤ 6.4						
Return Loss							≤ -2.7 dB						
Peak Gain							≤ 3.9 dBi						

1.2. Mechanical & Environmental

Mechanical	
Antenna Dimensions	94 × 21 mm
Antenna Material & Color	FPC & Black
Cable Type & Color & Length	Φ 1.37 & Black & 150 mm
Connector Type	IPEX MHF 1
Mounting Type	Adhesive
Weight	Typ. 1.5 g
Environmental	
Operation Temperature	-40 °C to +85 °C
Storage Temperature	-40 °C to +85 °C
RoHS and REACH Compliant	Yes

2 Drawing

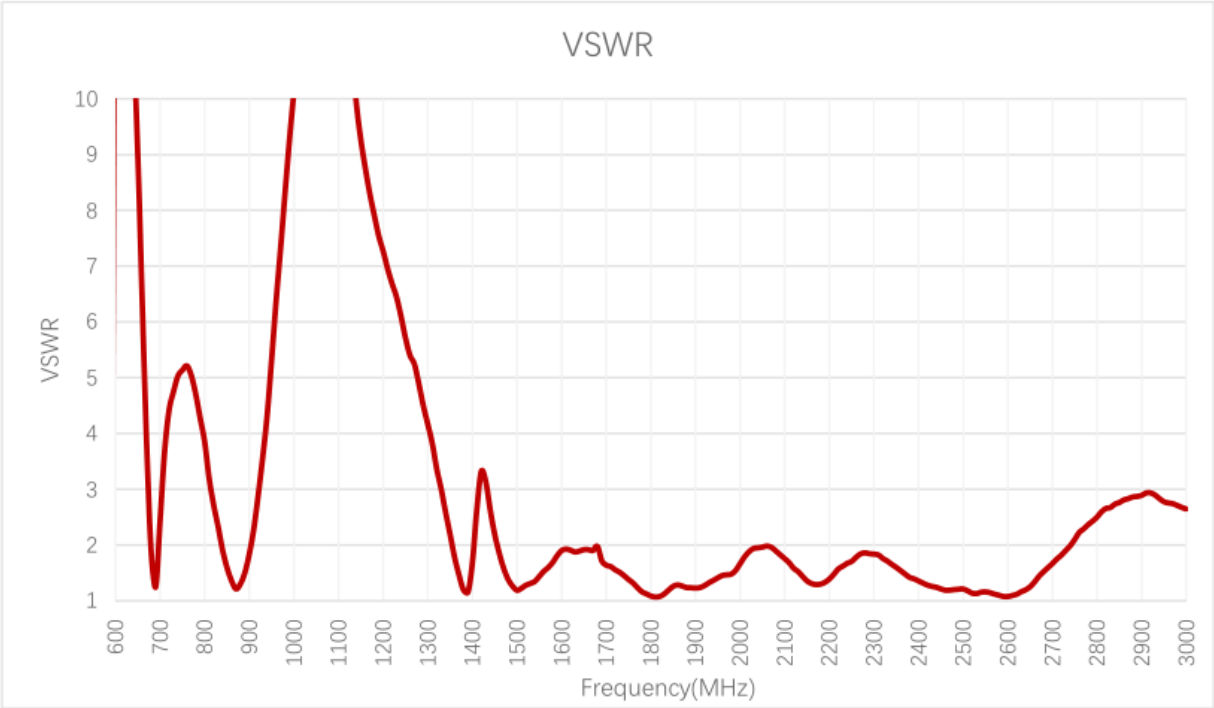


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Detailed Performance

3.1. S-Parameter Test

3.1.1. VSWR



VSWR

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
VSWR	-	-	3.7	2.3	1.8	6.4	-	1.6	1.5	1.2
Frequency (MHz)	1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
VSWR	1.4	1.4	1.6	1.2	1.1	1.6	-	-	-	-

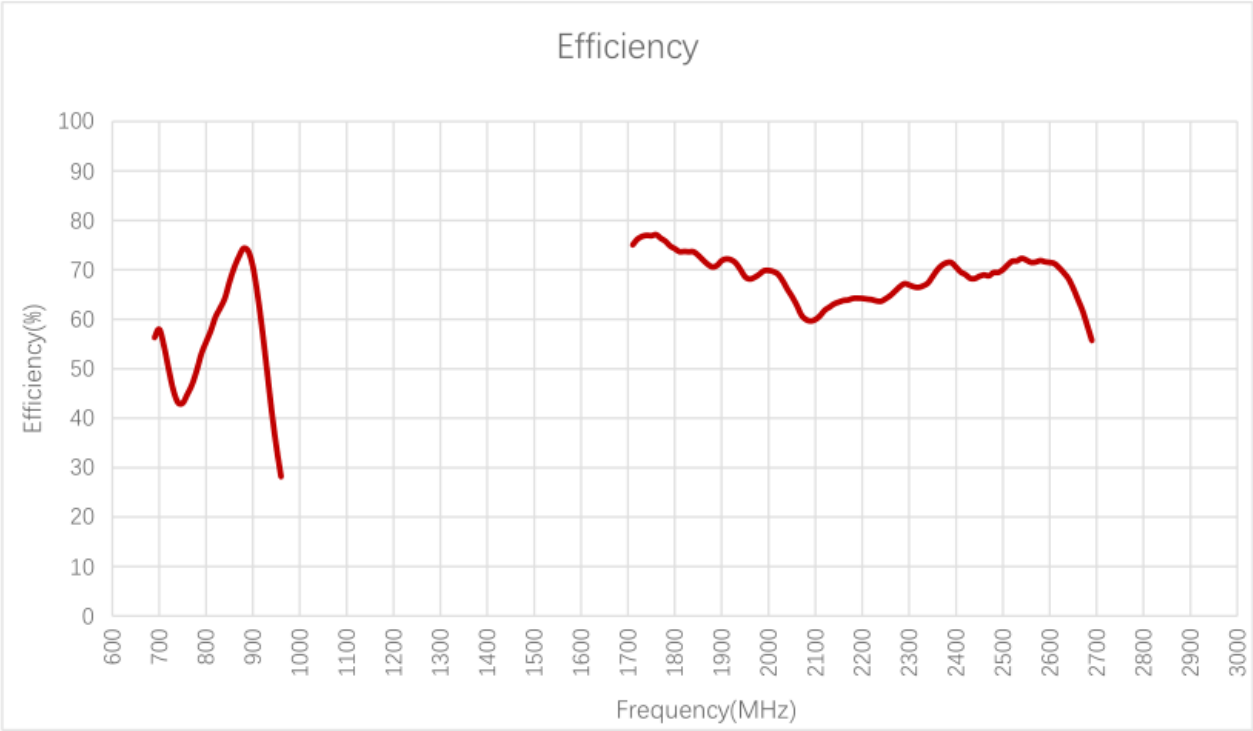
3.1.2. Return Loss



Return Loss (dB)										
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Return Loss (dB)	-	-	-4.8	-8.0	-10.5	-2.7	-	-12.6	-14.7	-19.5
Frequency (MHz)	1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
Return Loss (dB)	-15.3	-14.9	-12.7	-20.3	-28.6	-12.8	-	-	-	-

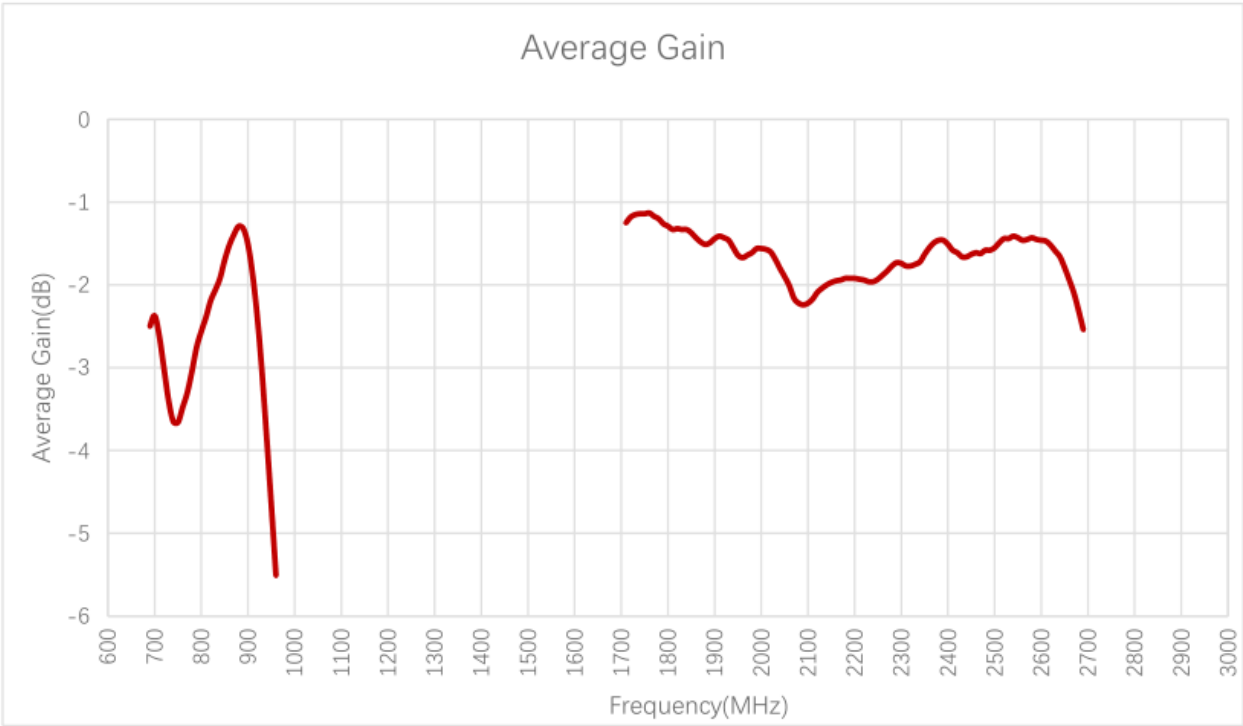
3.2. Radiation Performance Test

3.2.1. Efficiency



Efficiency (%)										
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Efficiency (%)	-	-	54.7	62.3	70.6	28.1	-	75.0	77.0	70.6
Frequency (MHz)	1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
Efficiency (%)	68.6	63.1	68.7	68.7	71.5	55.7	-	-	-	-

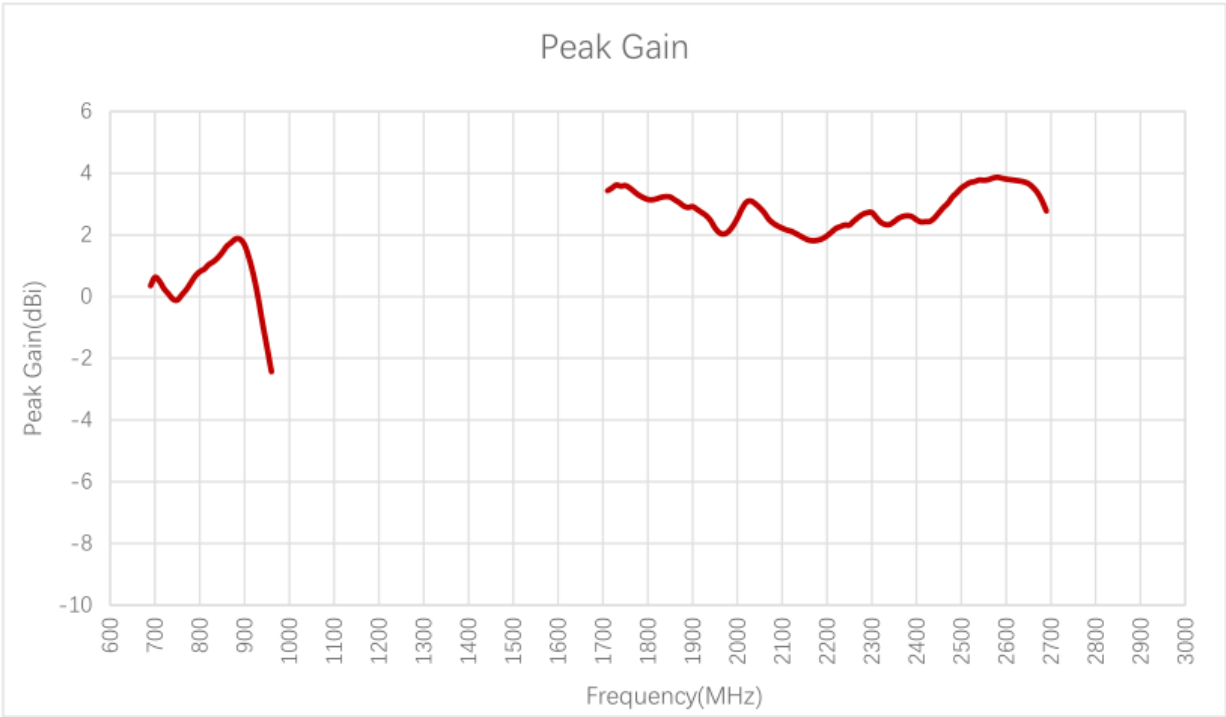
3.2.2. Average Gain



Average Gain (dB)

Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Average Gain (dB)	-	-	-2.6	-2.1	-1.5	-5.5	-	-1.3	-1.1	-1.5
Frequency (MHz)	1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
Average Gain (dB)	-1.6	-2.0	-1.6	-1.6	-1.5	-2.5	-	-	-	-

3.2.3. Peak Gain

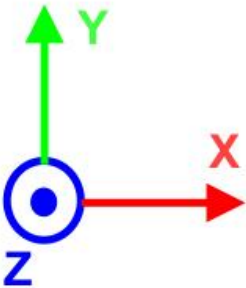
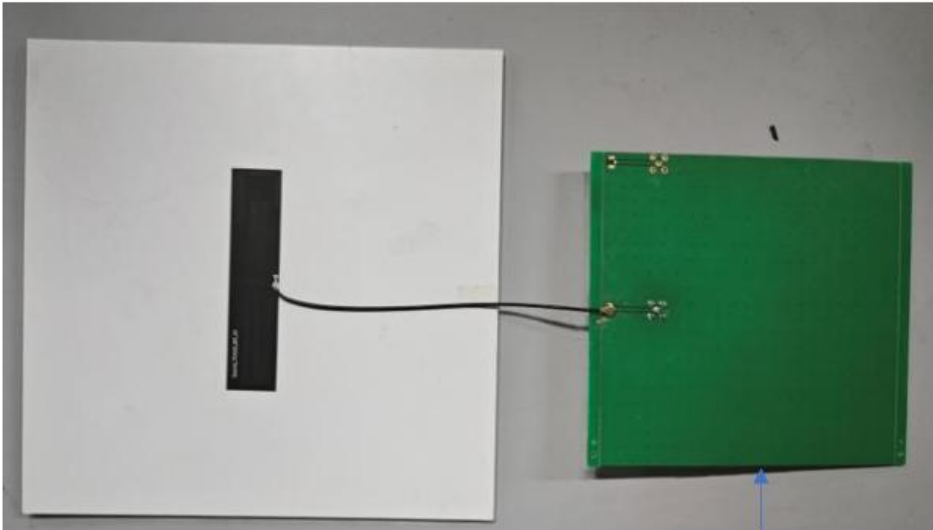


Peak Gain (dBi)										
Frequency (MHz)	600	630	710	830	900	960	1440	1710	1740	1880
Peak Gain (dBi)	-	-	0.5	1.1	1.7	-2.4	-	3.4	3.6	2.9
Frequency (MHz)	1950	2140	2350	2450	2600	2690	4700	5000	5500	6000
Peak Gain (dBi)	2.2	2.0	2.4	2.7	3.8	2.8	-	-	-	-

telecom design_	VBHOM-GWY3	Ver. / Rev. 0
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3.2.4. 3D & 2D Radiation Pattern

- Test Condition: Stick to ABS board on 130 mm × 130 mm EVB board
- Test Chamber: GL-S-1



130 × 130 mm EVB

