

QRC07004 Datasheet

6-GHz Compound-loop Antenna

Applications

- Wi-Fi IoT modules
- Routers

Key Specifications

- Average total efficiency
 - 90+ % (6 GHz)

Features

- Omnidirectional radiation pattern
 - Very compact form factor
 - Standard low-cost FR4 material
 - Significant isolation in the 5.825GHz – 5.945GHz
- Peak gain
 - 3.4 dBi (6GHz)

Overview

The QuantalRF QRC07004 is a compact high-efficiency 6-GHz PCB antenna for Wi-Fi 4, Wi-Fi 5, Wi-Fi 6 and Wi-Fi 7. While providing an omnidirectional radiation pattern in the 6G band, this design is intended to provide a significant isolation in-between the 5G and 6G bands i.e., 5.835GHz – 5.945GHz when combined with the QRB06001 antenna. This combination could be ideal for applications where several 5G and 6G antennas are placed in close proximity of each other. The base design which is specified in this data sheet can be customized to specific use cases and applications to ensure that all customer demands are met.

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1 Antenna Specifications

1.1 Electrical Specifications

Table 1: General specifications

Parameter	Specification
Frequency range	5945 MHz – 7125 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omnidirectional

Table 2: Detailed specifications

Parameter	5945 – 7125 MHz
Maximum VSWR	1.6
Minimum return loss (dB)	13.2
Average efficiency (%)	90+
Maximum peak gain (dBi)	3.4

1.2 Mechanical and Environmental Specifications

Parameter	Specification
Antenna dimensions	13.7 mm x 12.3 mm
Antenna type	Integrated on PCB
Material	FR4 ($\epsilon_r = 4.4$, $\tan\delta = 0.02$)
Operating temperature	-40C to +85C
Storage temperature	-40C to +85C

2 Antenna Performance

2.1 VSWR

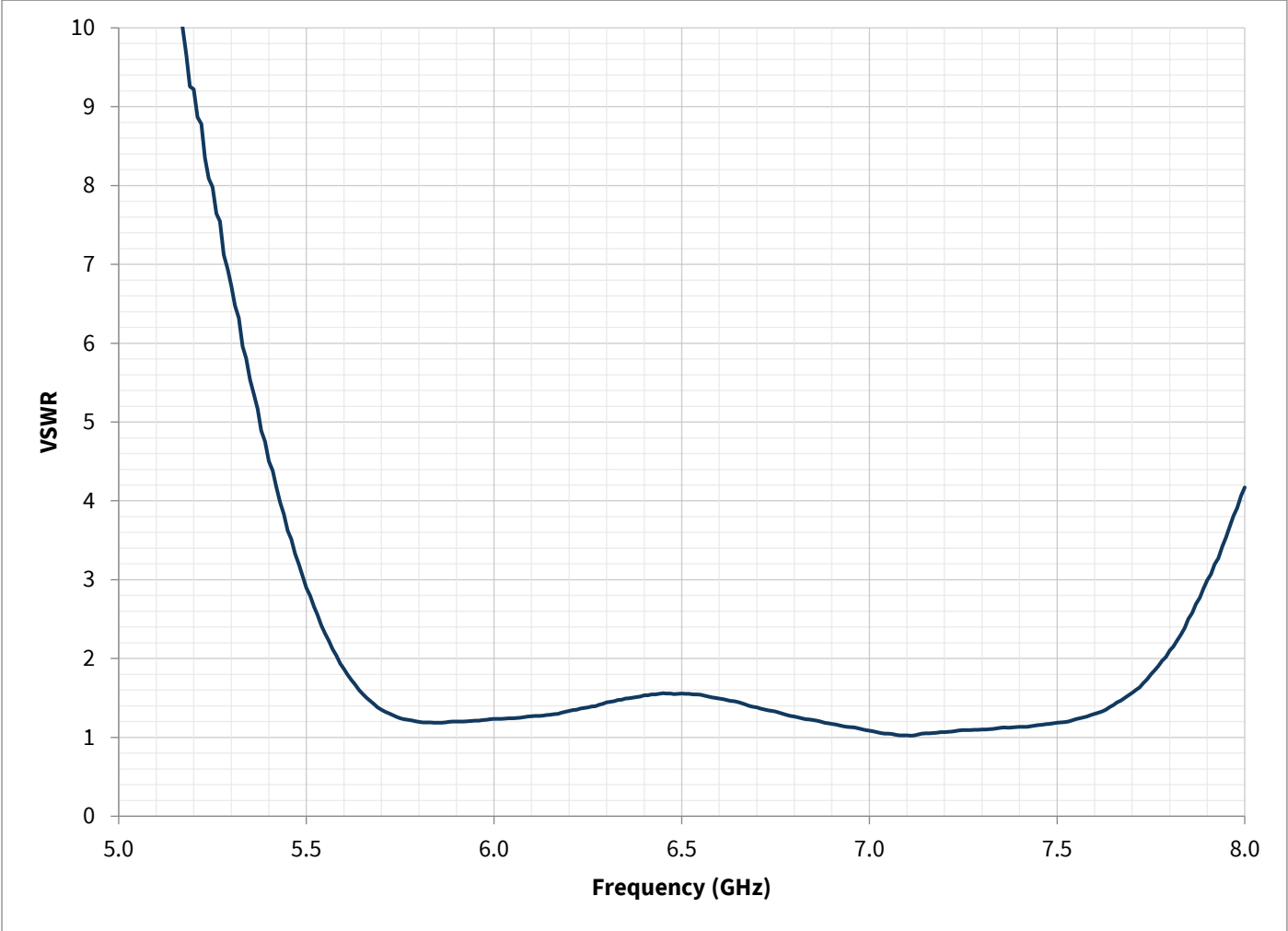


Table 3: 6 GHz VSWR

Frequency (MHz)	5950	6050	6150	6250	6350
VSWR	1.2	1.2	1.3	1.4	1.5
Frequency (MHz)	6450	6550	6650	6750	6850
VSWR	1.6	1.5	1.5	1.3	1.2
Frequency (MHz)	6950	7050	7125		
VSWR	1.1	1.0	1.0		

2.2 Return loss

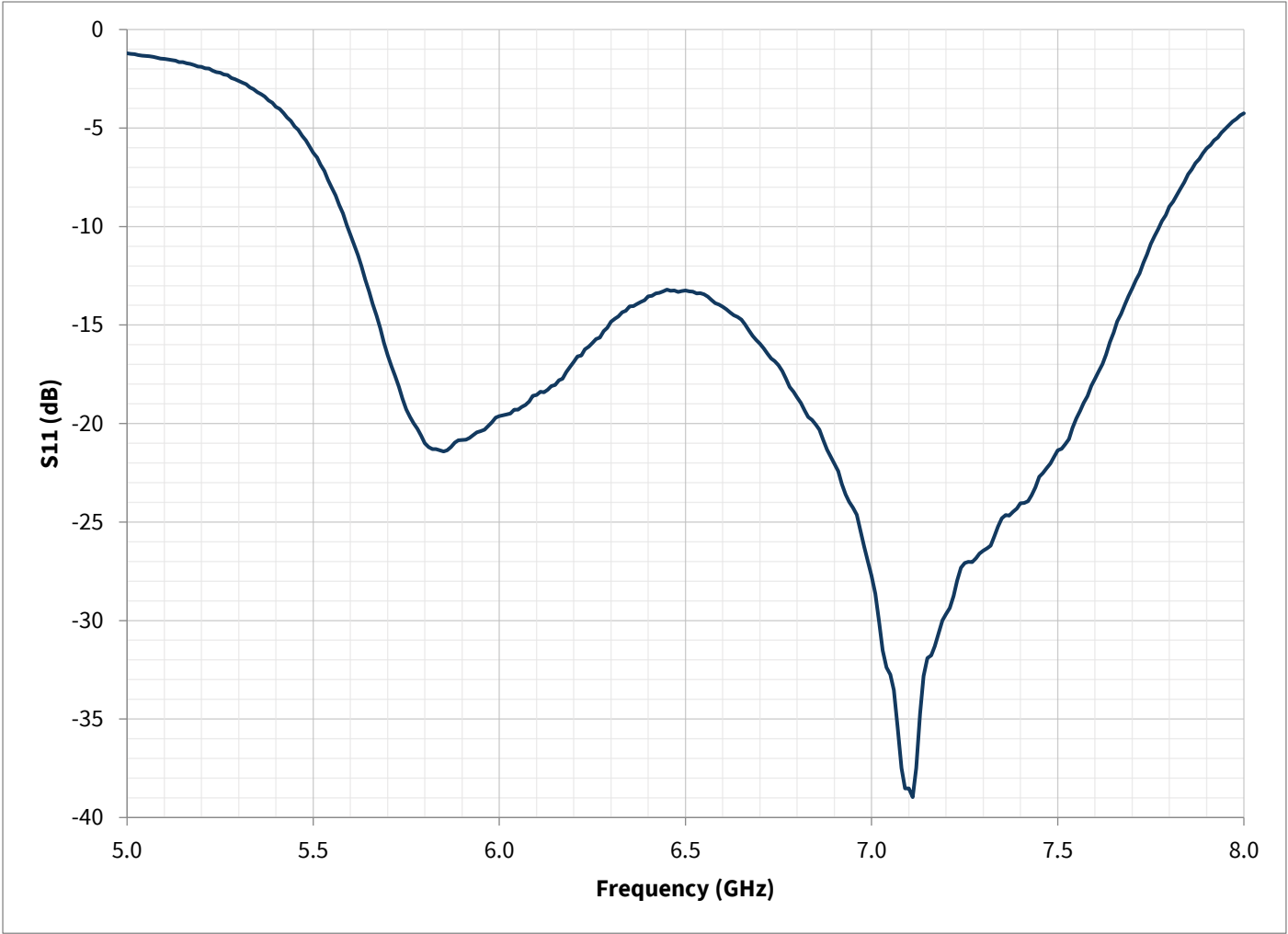


Table 4: 6 GHz Return loss (dB)

Frequency (MHz)	5950	6050	6150	6250	6350
VSWR	20.4	19.3	18.0	15.9	14.1
Frequency (MHz)	6450	6550	6650	6750	6850
VSWR	13.2	13.4	14.7	17.0	20.1
Frequency (MHz)	6950	7050	7125		
VSWR	24.3	32.7	36.1		

2.3 Efficiency

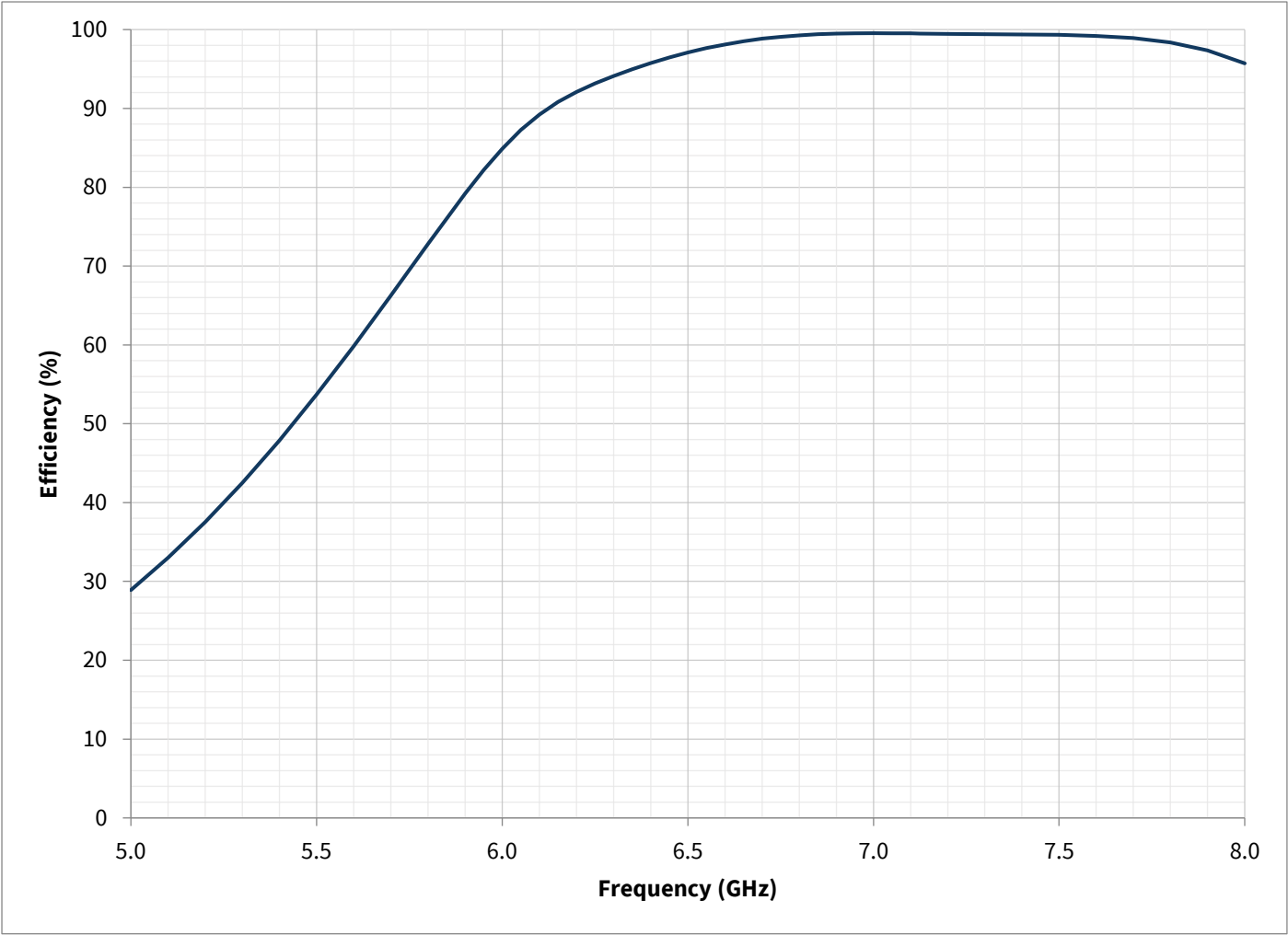


Table 5: 6 GHz Efficiency (%)

Frequency (MHz)	5950	6050	6150	6250	6350
Efficiency (%)	82.2	87.2	90.8	93.2	95.0
Frequency (MHz)	6450	6550	6650	6750	6850
Efficiency (%)	96.4	97.6	98.5	99.1	99.4
Frequency (MHz)	6950	7050	7125		
Efficiency (%)	99.5	99.5	99.5		

2.4 Peak gain

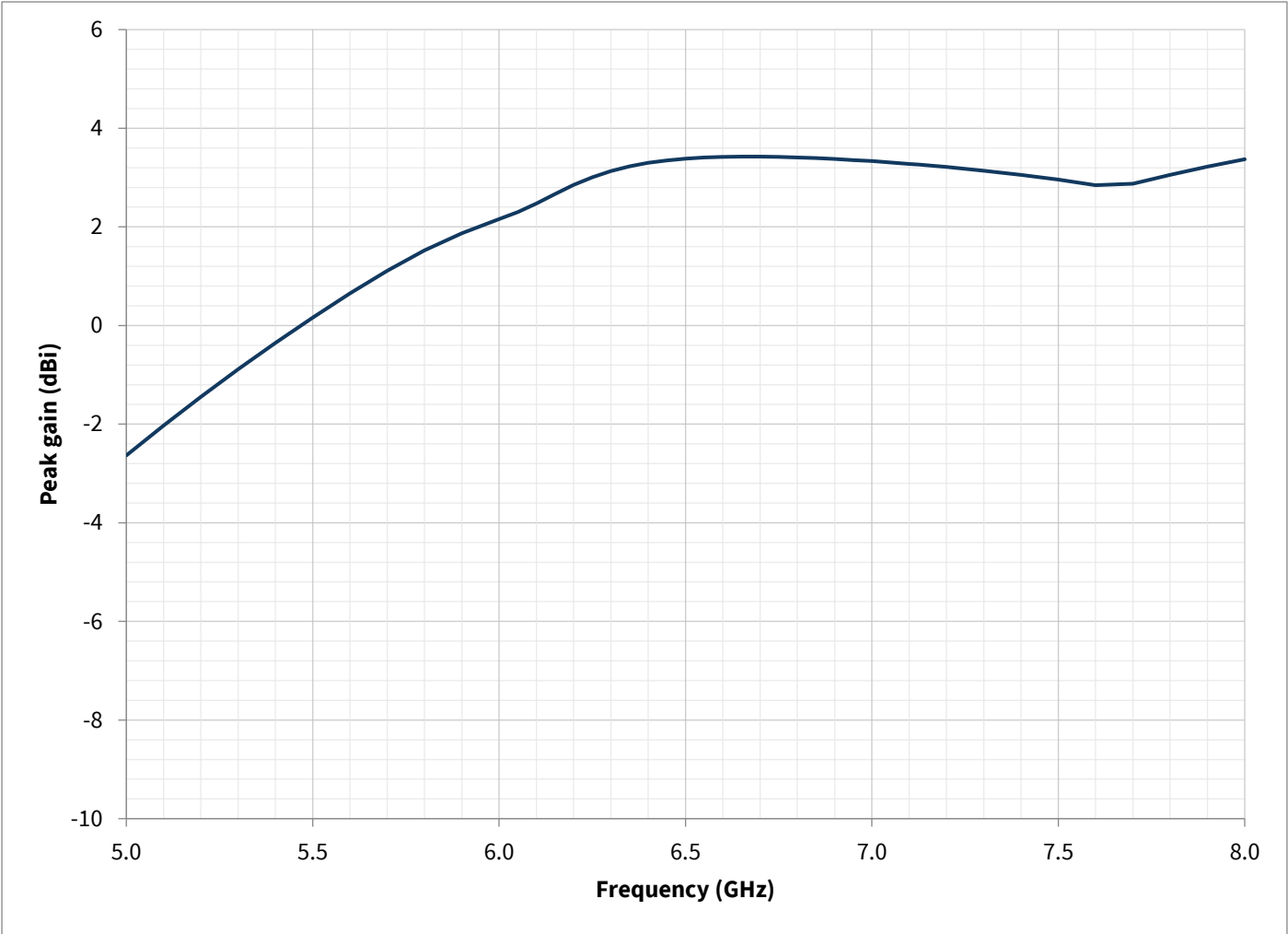


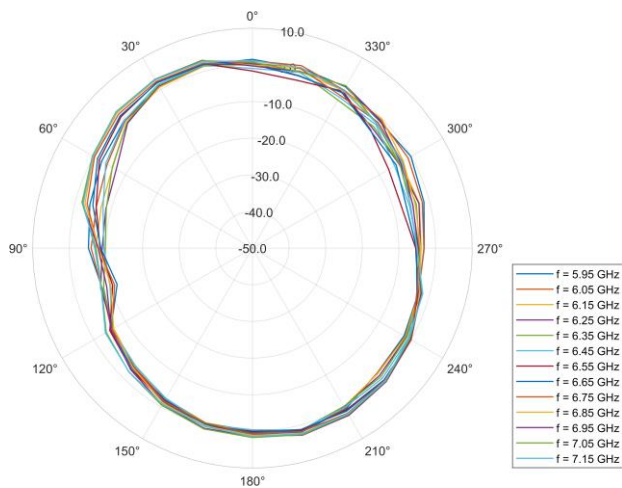
Table 6: 6 GHz Peak gain (dBi)

Frequency (MHz)	5950	6050	6150	6250	6350
Peak gain (dBi)	2.0	2.3	2.7	3.0	3.2
Frequency (MHz)	6450	6550	6650	6750	6850
Peak gain (dBi)	3.3	3.4	3.4	3.4	3.4
Frequency (MHz)	6950	7050	7125		
Peak gain (dBi)	3.3	3.3	3.3		

2.5 2D Radiation patterns

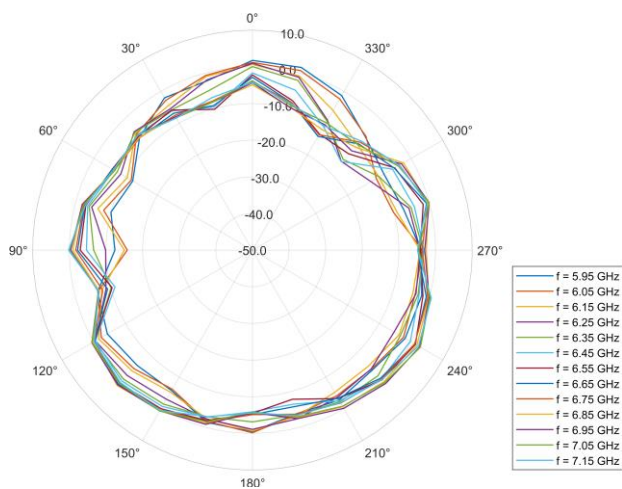
2.5.1 Azimuth plane

6 GHz azimuth plane



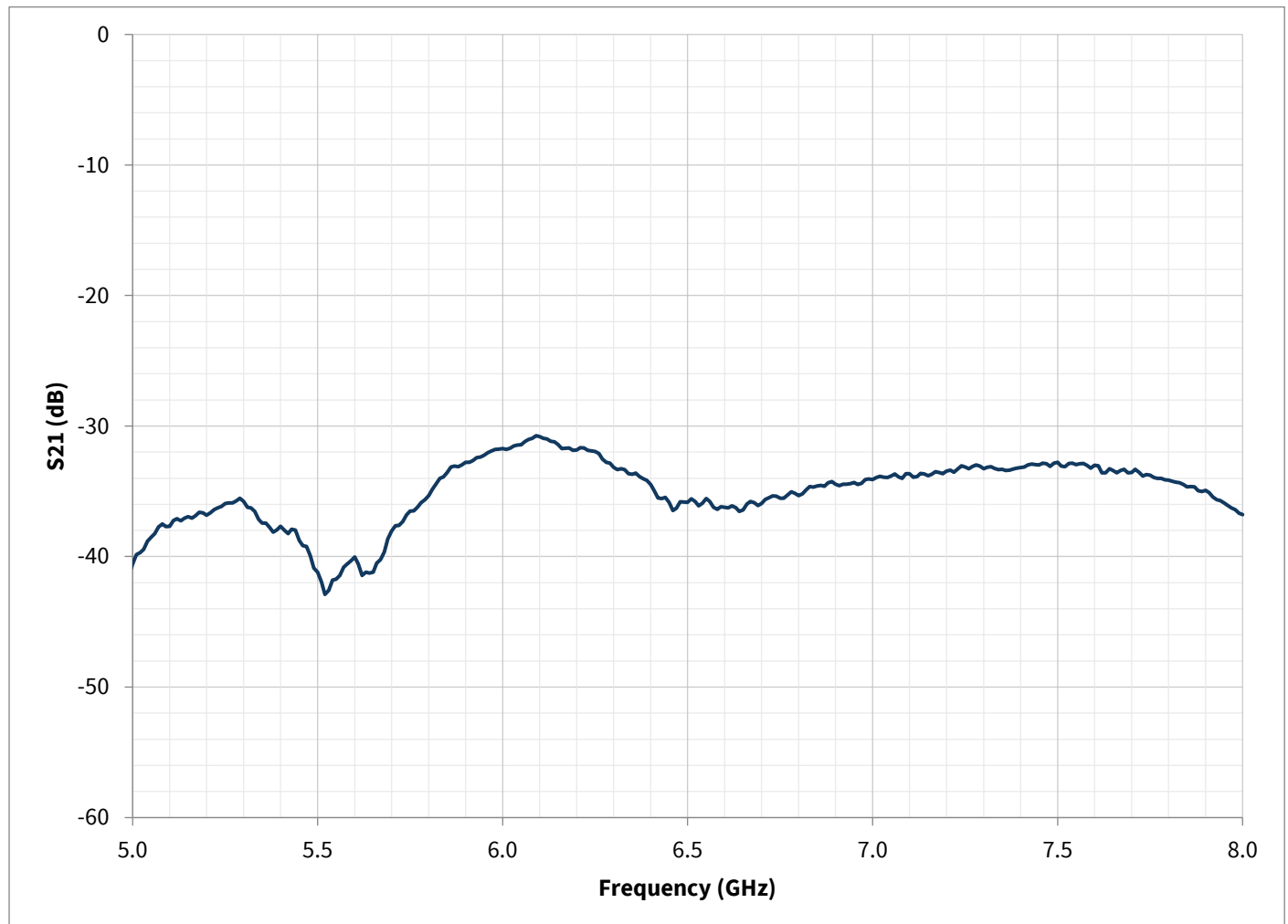
2.5.2 Elevation plane

6 GHz elevation plane



2.6 Isolation (in proximity of the QRB06001 2.4/5G antenna)

Measured at a center-to-center distance of 40mm between the two antennas.



RoHS Compliance

The part is compliant with the 2011/65/EU RoHS directive, as amended by Directive 2015/863/EU.

Contact Information

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Learn more at quantalrf.com

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