

QRC03001 Datasheet

2.4-GHz Compound-loop Antenna

Applications

- IoT/BLE modules
- Routers

Features

- Omnidirectional radiation pattern
- Standard low-cost FR4 material
- Superior efficiency across the 2.4GHz – 2.5GHz band

Key Specifications

- Average total efficiency
 - 86 % (2.4 GHz)
- Peak gain
 - 3.6 dBi (2.4 GHz)

Overview

The QuantalRF QRC03001 is a high-efficiency 2.4-GHz PCB antenna for IoT/BLE applications. This design is intended to provide omnidirectional radiation pattern with linear polarization and superior efficiency across the 2.4G band. It's a versatile design and can be used either as an external antenna or an embedded solution. 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.

Contents

1 Antenna Specifications 3

 1.1 Electrical Specifications 3

 1.2 Mechanical and Environmental Specifications 3

2 Antenna Performance 4

 2.1 VSWR 4

 2.2 Return loss 5

 2.3 Efficiency 6

 2.4 Peak gain 7

 2.5 2D Radiation patterns 8

 2.5.1 Azimuth plane 8

 2.5.2 Elevation plane 8

1 Antenna Specifications

1.1 Electrical Specifications

Table 1: General specifications

Parameter	Specification
Frequency range	2400 – 2500 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omnidirectional

Table 2: Detailed specifications

Parameter	2400 – 2500 MHz
Maximum VSWR	1.4
Minimum return loss (dB)	16.3
Average efficiency (%)	86
Maximum peak gain (dBi)	3.6

1.2 Mechanical and Environmental Specifications

Parameter	Specification
Antenna dimensions	32.8 mm x 15.7 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

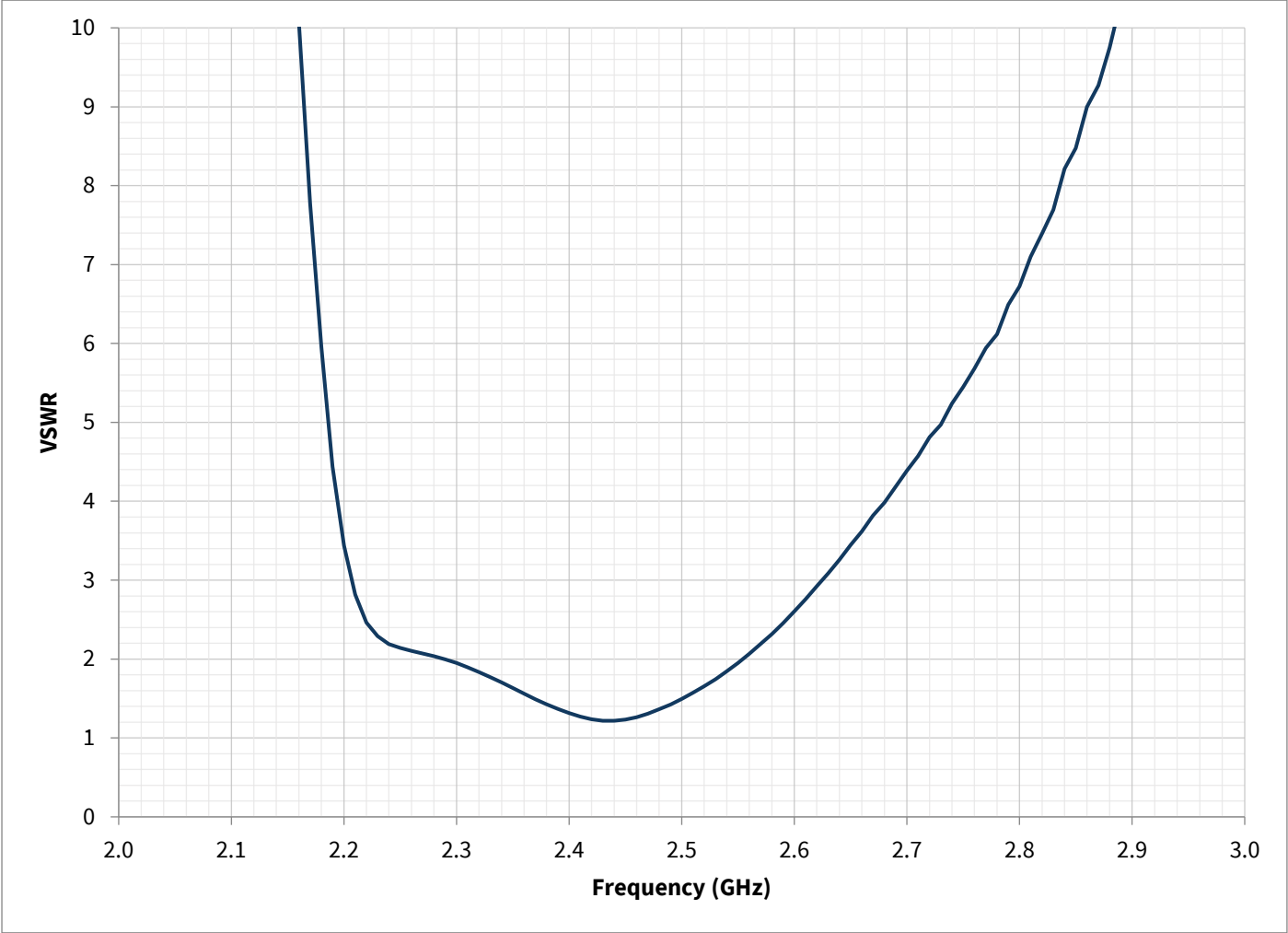


Table 3: 2.4 GHz VSWR

Frequency (MHz)	2400	2420	2440	2460	2480
VSWR	1.3	1.2	1.2	1.3	1.4

2.2 Return loss

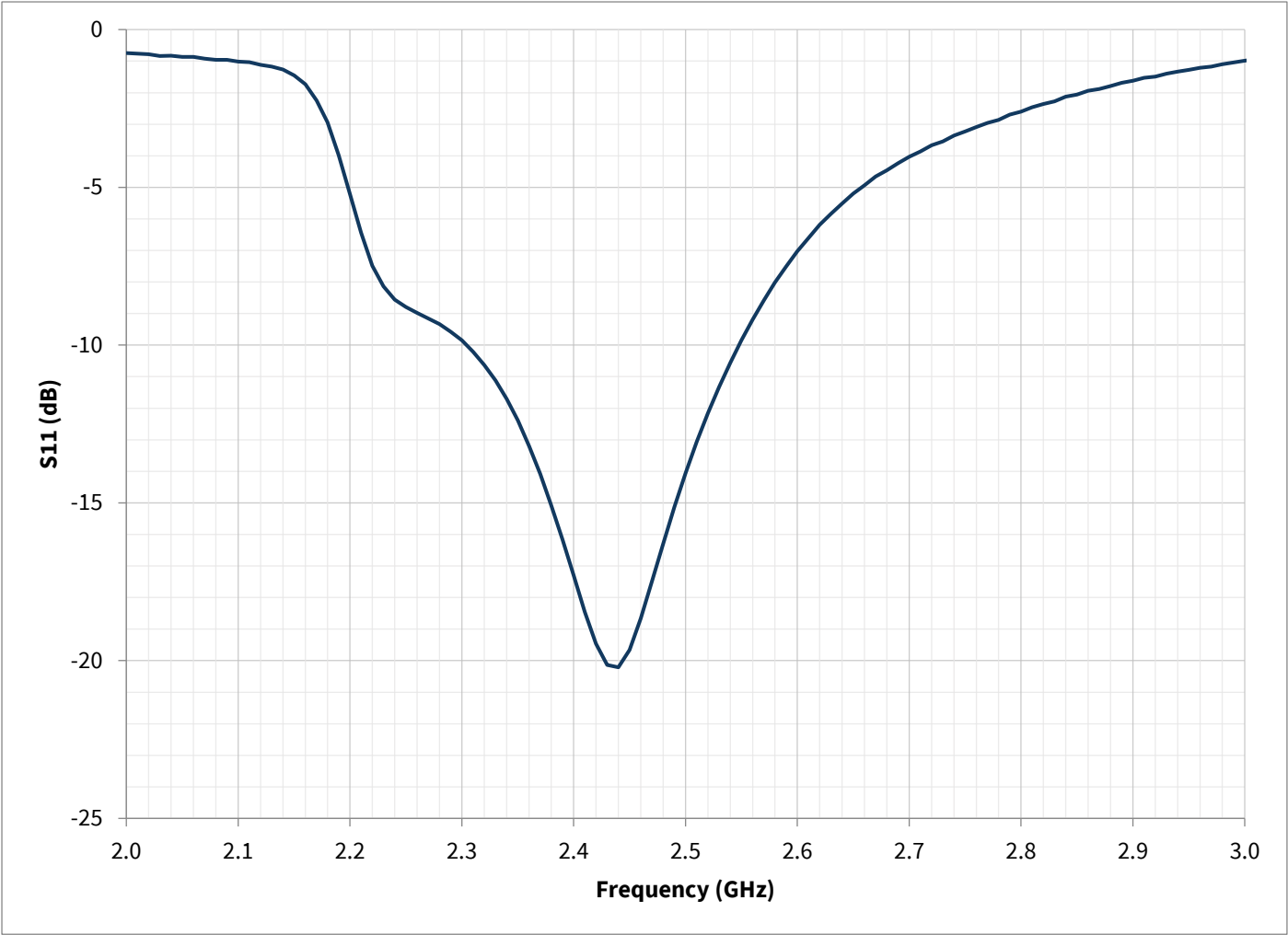


Table 4: 2.4 GHz Return loss (dB)

Frequency (MHz)	2400	2420	2440	2460	2480
Return loss (dB)	17.3	19.5	20.2	18.7	16.3

2.3 Efficiency

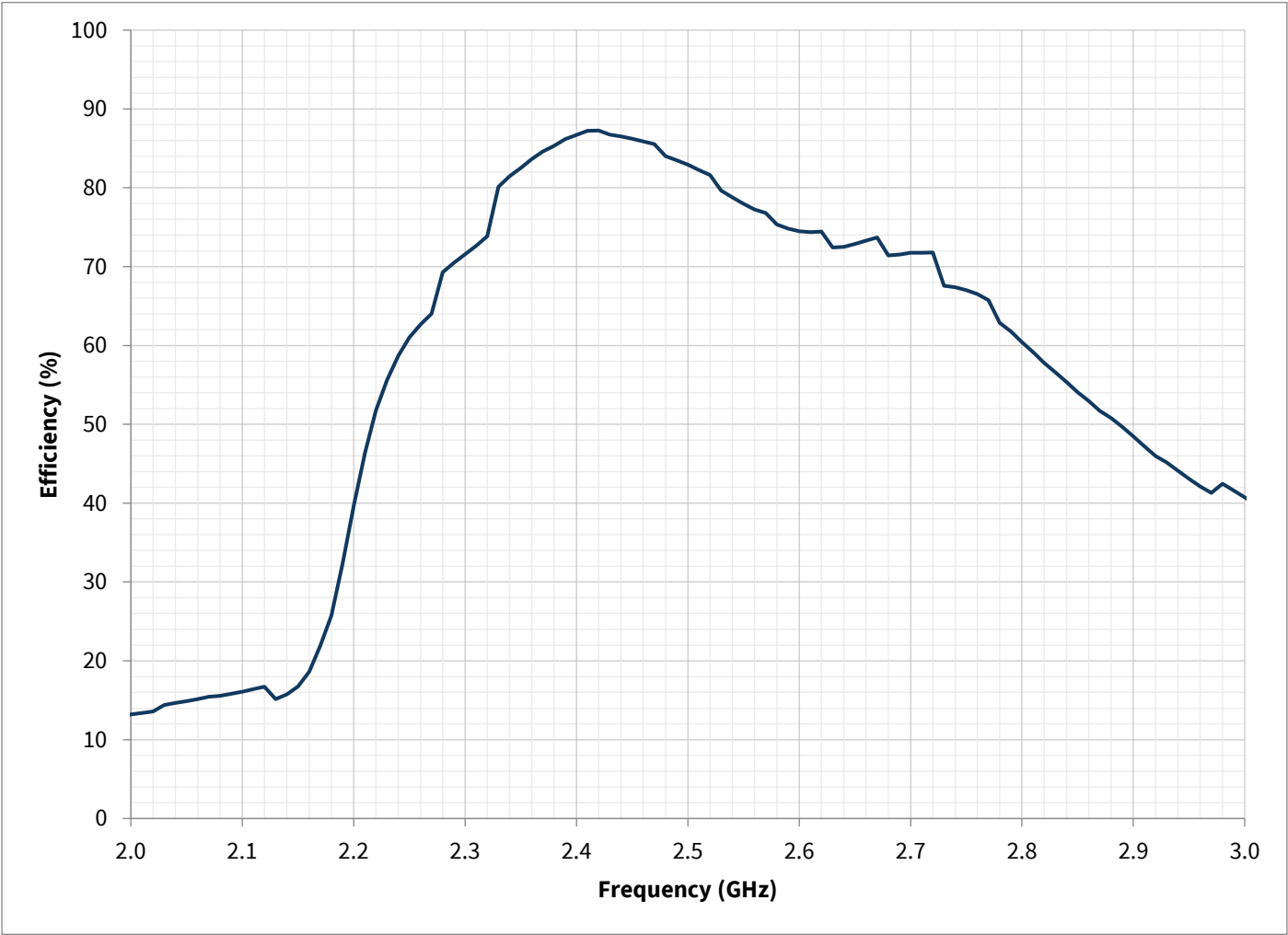


Table 5: 2.4 GHz Efficiency (%)

Frequency (MHz)	2400	2420	2440	2460	2480
Efficiency (%)	86.7	87.2	86.5	85.9	84.0

2.4 Peak gain

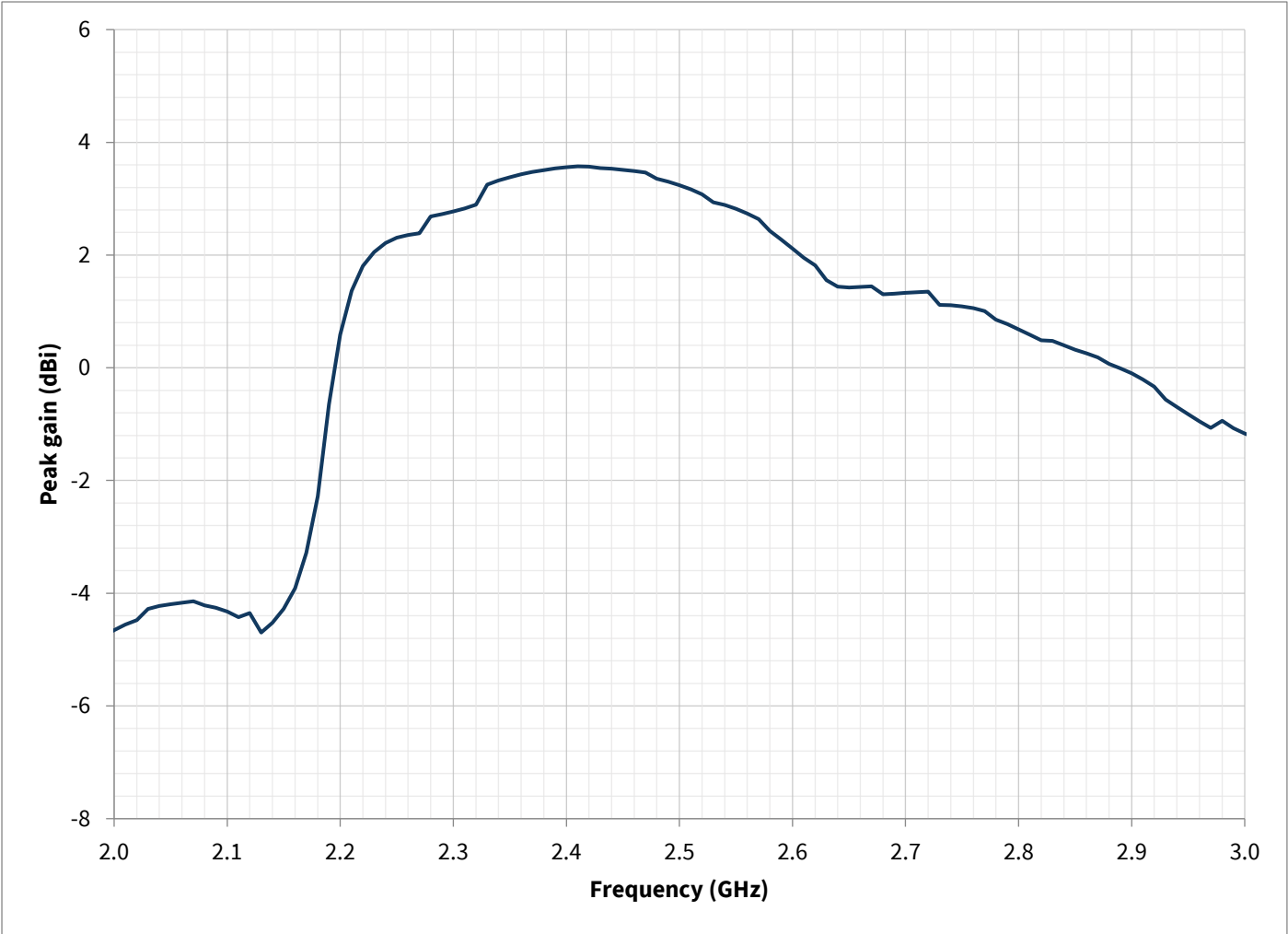


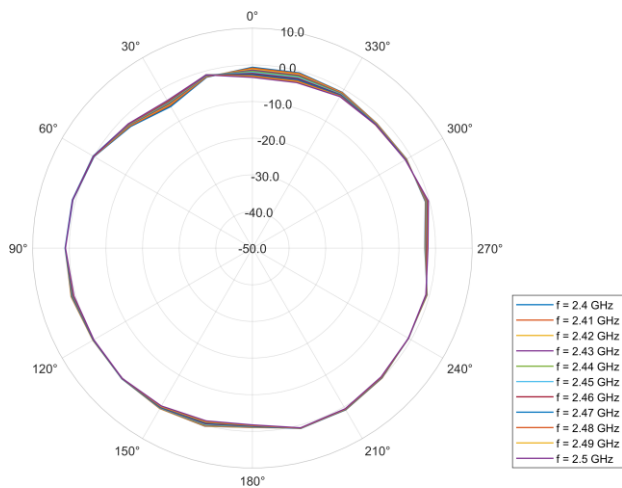
Table 6: 2.4 GHz Peak gain (dBi)

Frequency (MHz)	2400	2420	2440	2460	2480
Peak gain (dBi)	3.6	3.6	3.5	3.5	3.3

2.5 2D Radiation patterns

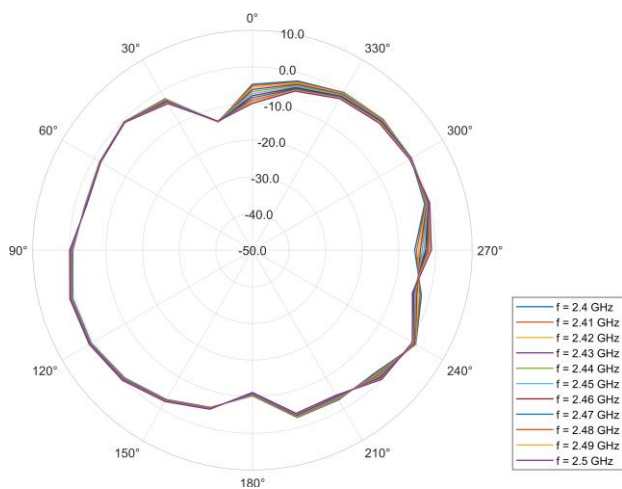
2.5.1 Azimuth plane

2.4 GHz azimuth plane



2.5.2 Elevation plane

2.4 GHz elevation plane



RoHS Compliance

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

Contact Information

For the latest specifications, additional product information and support:

sales@quantalrf.com

Learn more at quantalrf.com

Disclaimer

Limited warranty and liability Information in this document is believed to be accurate and reliable. However, QuantalRF does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of the use of such information.

Right to make changes QuantalRF reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.