QRC06001 Datasheet

5-GHz Compound-loop Antenna

Applications

- Wi-Fi modules
- Routers

Features

- Omnidirectional radiation pattern
- Standard low-cost FR4 material
- Remarkable efficiency in the 5.15GHz – 5.835GHz

Key Specifications

- Average total efficiency
  - 90 % (5 GHz)
- Peak gain
  - 5 dBi (5 GHz)

Overview

The QuantalRF QRC06001 is a high-efficiency 5-GHz PCB antenna for dynamic frequency selection Wi-Fi. This design is intended to provide omnidirectional radiation pattern, and even though it is realized on conventional low-cost FR-4 material with exceptionally compact form factor, it has proven a remarkable total efficiency of about 90% averaged across the 5.15GHz – 5.835GHz band. 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	5150 – 5835 MHz
Impedance	50 Ω
Polarization	Linear
Radiation Pattern	Omnidirectional

Table 2: Detailed specifications

Parameter	5150 – 5835 MHz
Maximum VSWR	1.4
Minimum return loss (dB)	15.8
Average efficiency (%)	89.7
Maximum peak gain (dBi)	5.0

1.2 Mechanical and Environmental Specifications

Parameter	Specification
Antenna dimensions	8 mm x 21.2 mm
Antenna type	Integrated on PCB
Material	FR4 ($\varepsilon r = 4.4$, $\tan\delta = 0.02$)
Operating temperature	-40C to +85C
Storage temperature	-40C to +85C

2 Antenna Performance

2.1 VSWR

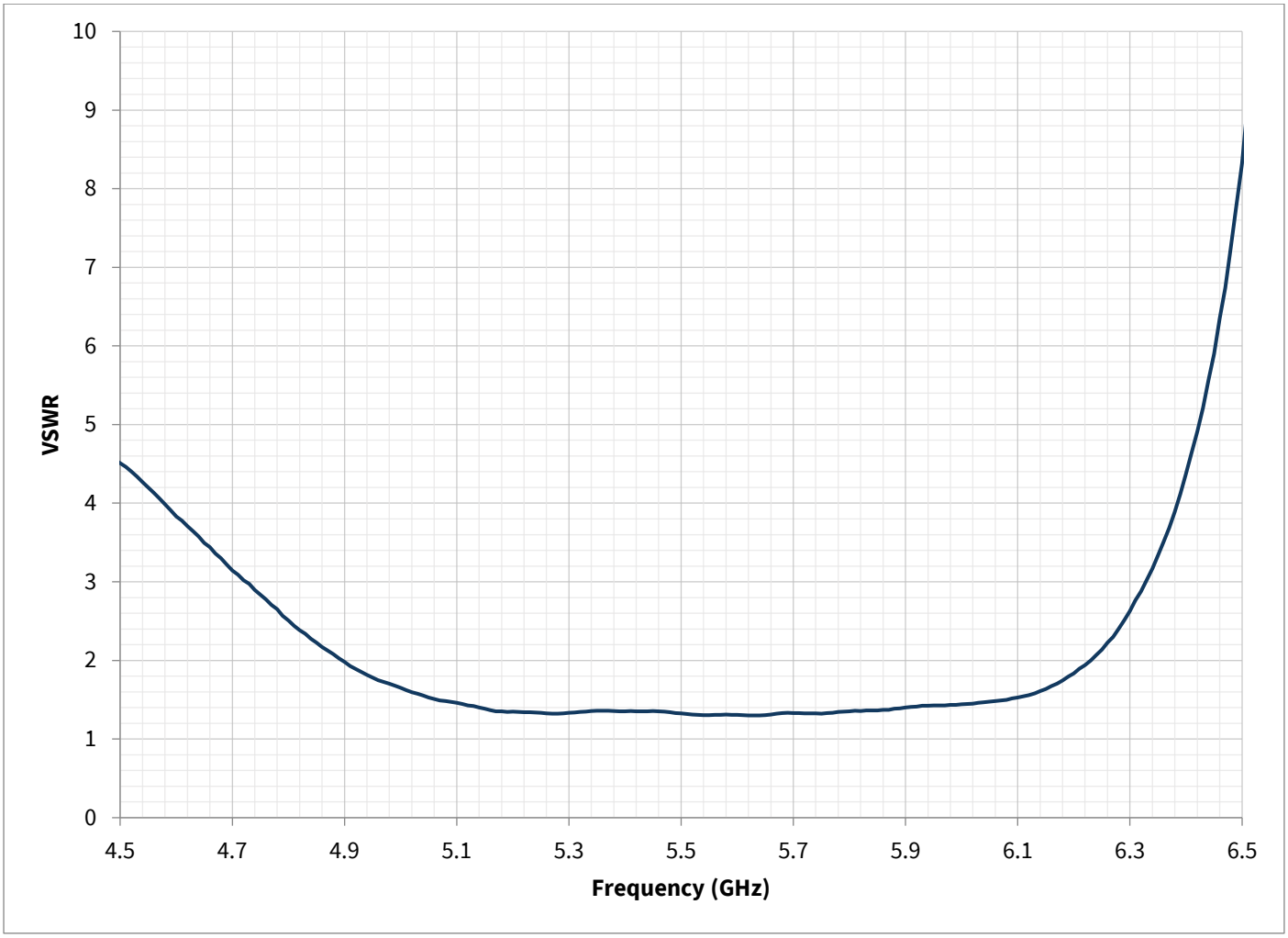


Table 3: 5 GHz VSWR

Frequency (MHz)	**5150**	**5200**	**5250**	**5300**	**5350**
VSWR	1.4	1.3	1.3	1.3	1.3
Frequency (MHz)	**5400**	**5450**	**5500**	**5550**	**5600**
VSWR	1.3	1.3	1.3	1.3	1.3
Frequency (MHz)	**5650**	**5700**	**5750**	**5800**	**5835**
VSWR	1.3	1.3	1.3	1.3	1.4

2.2 Return loss

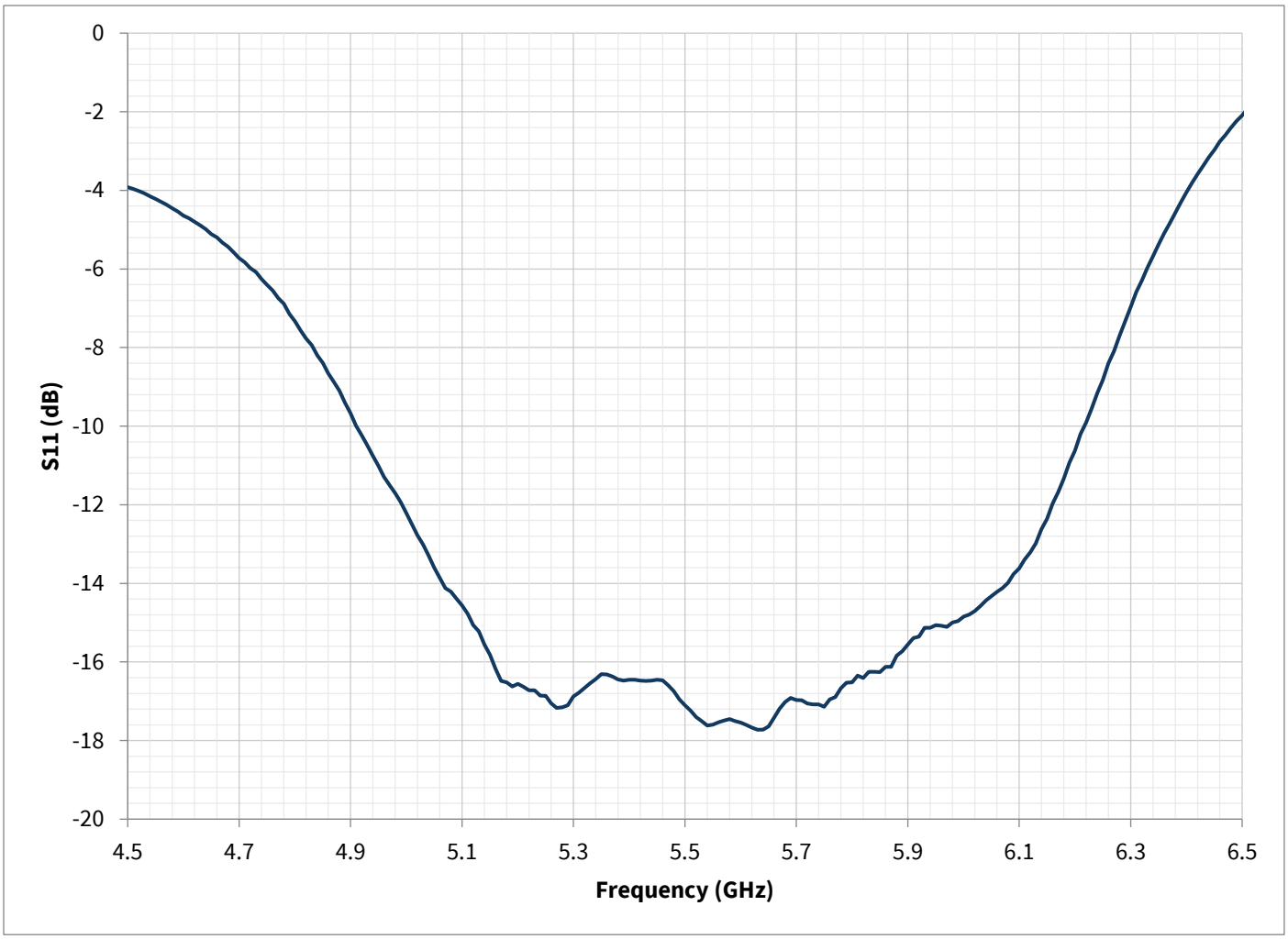


Table 4: 5 GHz Return loss (dB)

Frequency (MHz)	**5150**	**5200**	**5250**	**5300**	**5350**
Return loss (dB)	15.8	16.6	16.9	16.9	16.3
Frequency (MHz)	**5400**	**5450**	**5500**	**5550**	**5600**
Return loss (dB)	16.5	16.5	17.1	17.5	17.5
Frequency (MHz)	**5650**	**5700**	**5750**	**5800**	**5835**
Return loss (dB)	17.6	17.0	17.1	16.5	16.3

2.3 Efficiency

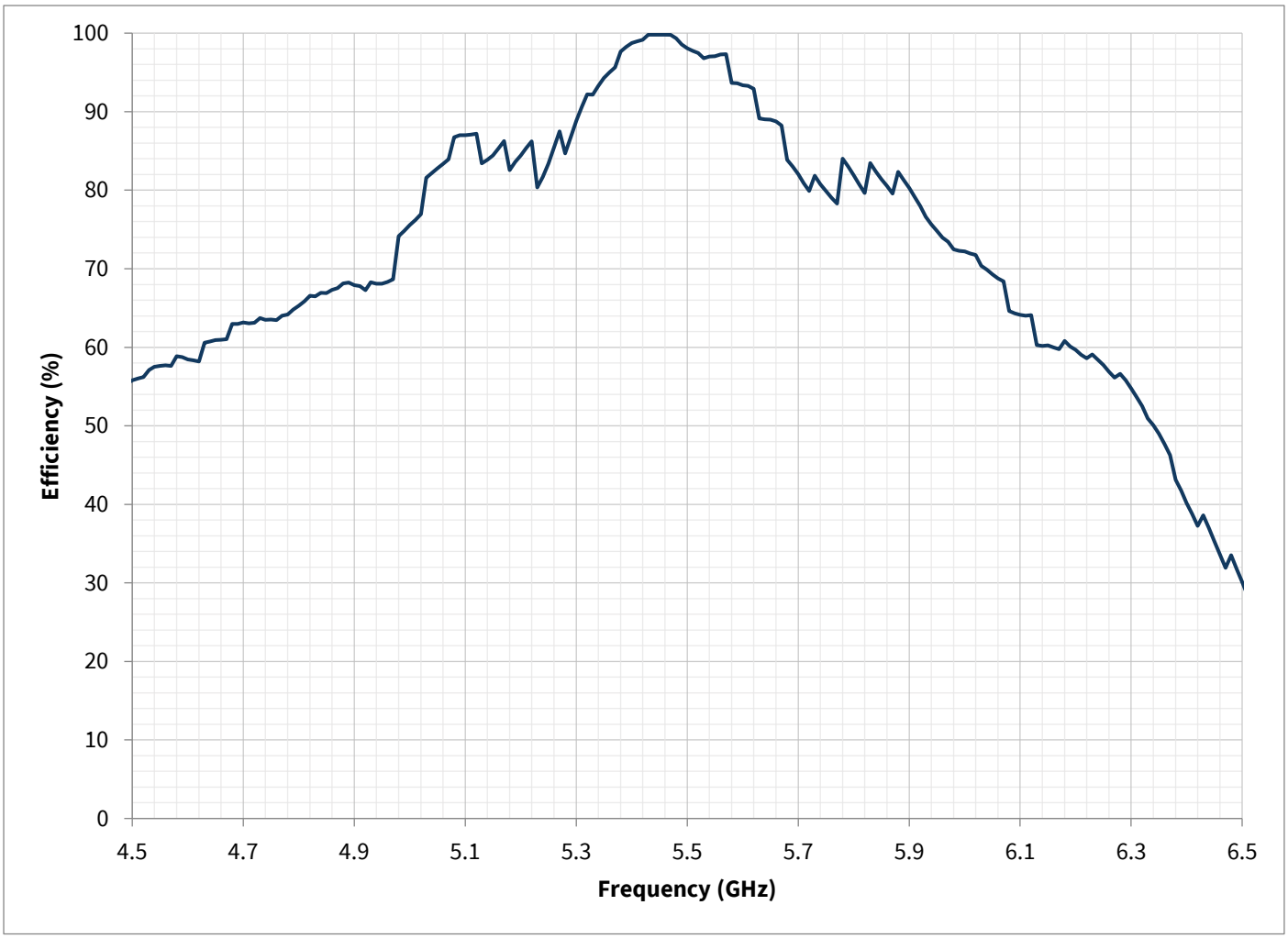


Table 5: 5 GHz Efficiency (%)

Frequency (MHz)	**5150**	**5200**	**5250**	**5300**	**5350**
Efficiency (%)	84.4	84.4	83.4	88.8	92.3
Frequency (MHz)	**5400**	**5450**	**5500**	**5550**	**5600**
Efficiency (%)	98.7	99.8	98.1	97.1	93.4
Frequency (MHz)	**5650**	**5700**	**5750**	**5800**	**5835**
Efficiency (%)	89.0	82.0	79.9	81.9	82.9

2.4 Peak gain

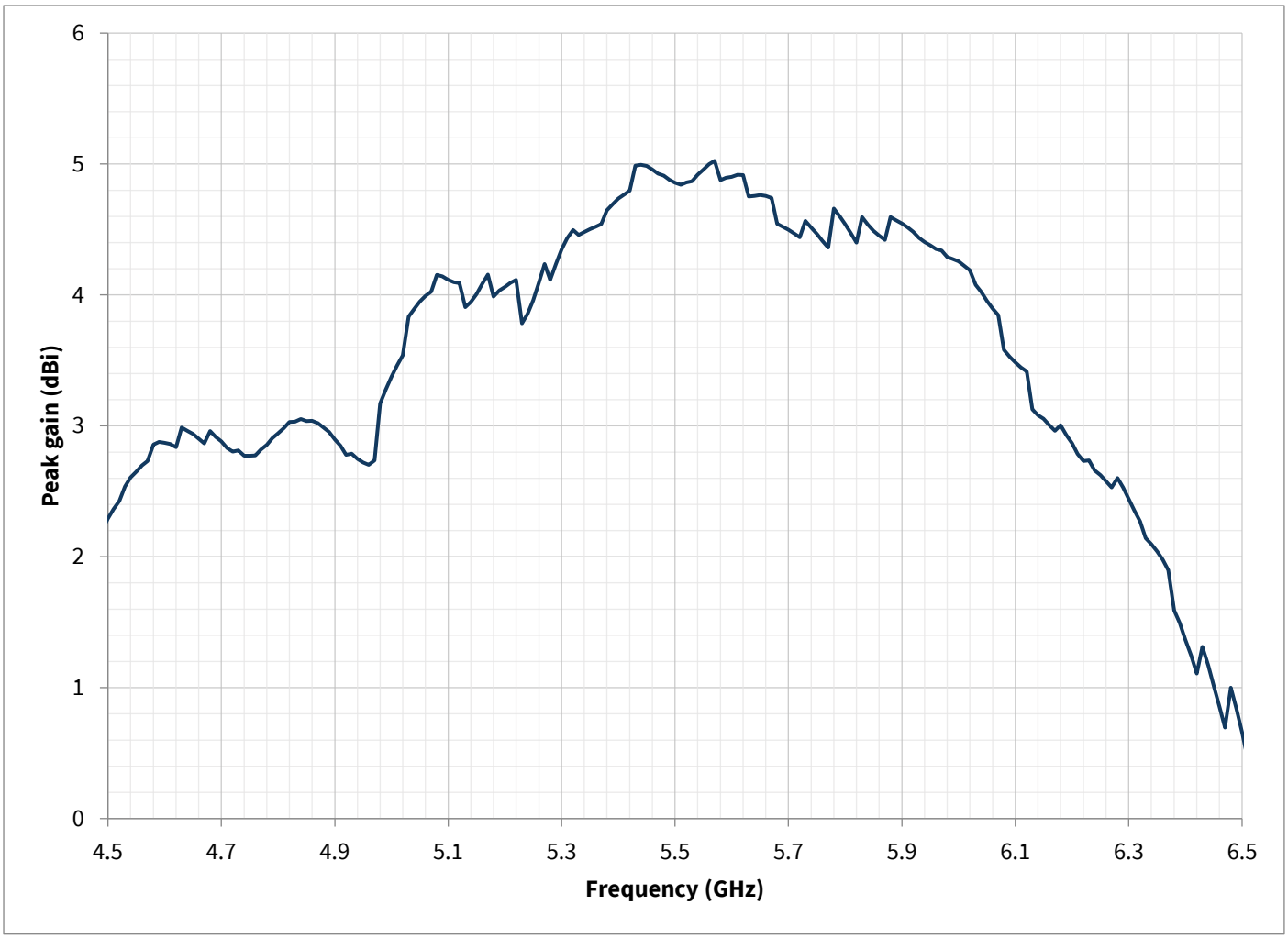


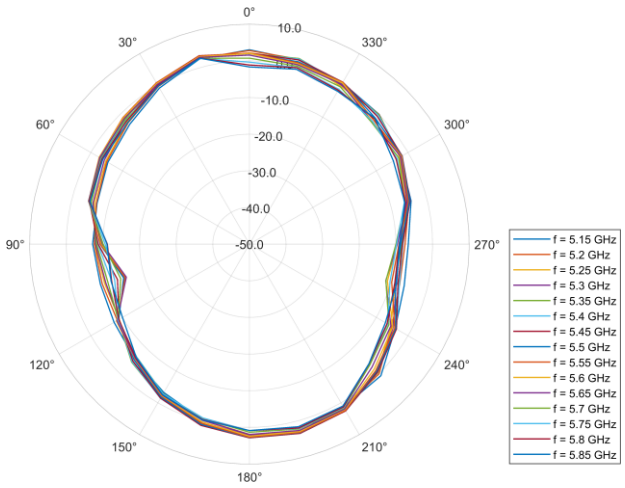
Table 6: 5 GHz Peak gain (dBi)

Frequency (MHz)	**5150**	**5200**	**5250**	**5300**	**5350**
Peak gain (dBi)	4.0	4.1	4.0	4.3	4.5
Frequency (MHz)	**5400**	**5450**	**5500**	**5550**	**5600**
Peak gain (dBi)	4.7	5.0	4.9	5.0	4.8
Frequency (MHz)	**5650**	**5700**	**5750**	**5800**	**5835**
Peak gain (dBi)	4.8	4.5	4.5	4.5	4.6

2.5 2D Radiation patterns

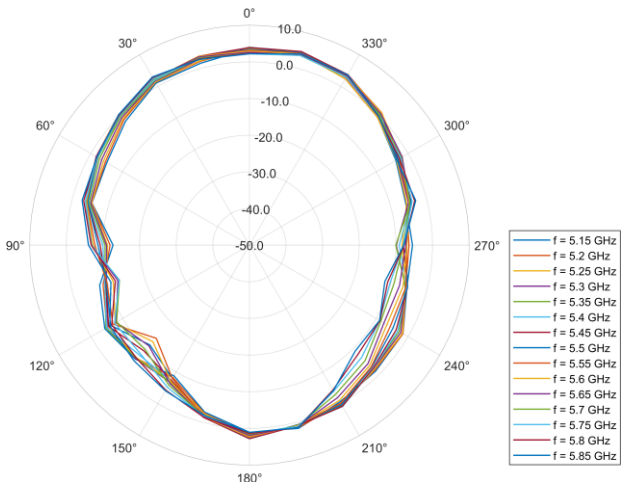
2.5.1 Azimuth plane

5 GHz azimuth plane



2.5.2 Elevation plane

5 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

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