

Document No: PD-7262-9021	Issue: 1	Effective date: 10/10/2025
---------------------------	----------	----------------------------

Document Title:

RMM-QE Antenna Performance

Summary / Scope:

This document provides all the details required by Type Approval Authorities in order to process our application.

Reason for Issue / Nature of Change:		
Issue	Date	Details – reason for issue / nature of change
01	October 2025	First Issue
02		
03		

Distribution:			
Author	10/10/2025 X Myint Khin Myint Khin Lead Electronics Design Engineer Signed by: Myint Khin	Author	X
Reviewer		Approver / Owner	10/10/2025 X John Styles John Styles MPD Electronics Design Manager Signed by: John Styles

Copyright Statement

© 2025 Renishaw plc

This document is the property of Renishaw plc and the information contained herein is confidential. The contents of the document must not be reproduced or disclosed wholly or in part, or used for purposes other than that for which it has been supplied, without the prior written permission of Renishaw plc, or, if it has been furnished under a contract with another party, as expressly authorised under that contract.

Table of Contents

RMM-QE Antenna Design3

RMM-QE Antenna Electrical Characteristics5

 VSWR5

 H-Plane Polar Plot.....6

Test Equipment7

RMM-QE Antenna Design

The RMM-QE uses two PCB patch antennas on a high-dielectric substrate. This PCB is fitted within the removable front cover of the RMM-QE and is connected to the main PCB via two pairs of spring pins. See Figure 1. The drive between the radio transceiver and the antenna consists of microstrip transmission line. See Figure 2. The patch antennas are relatively high-Q and offer good forward gain.

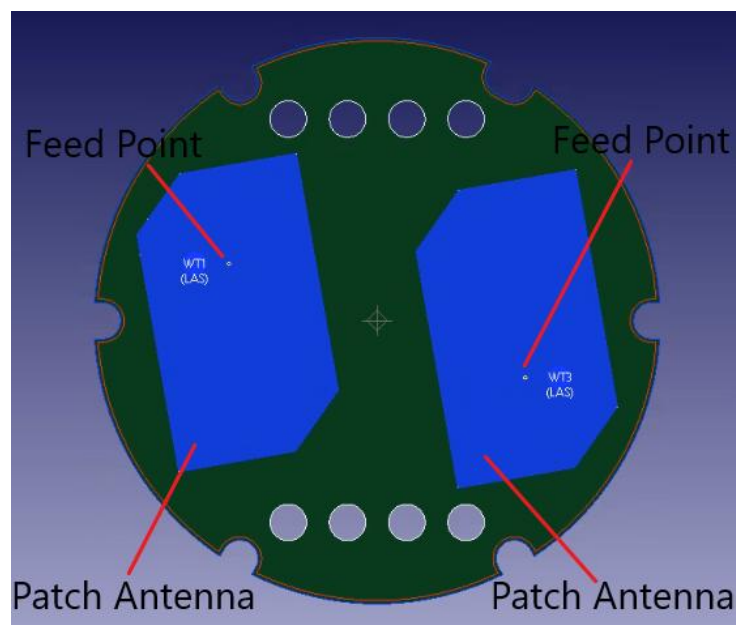


Figure 1. RMM-QE Antenna PCB.

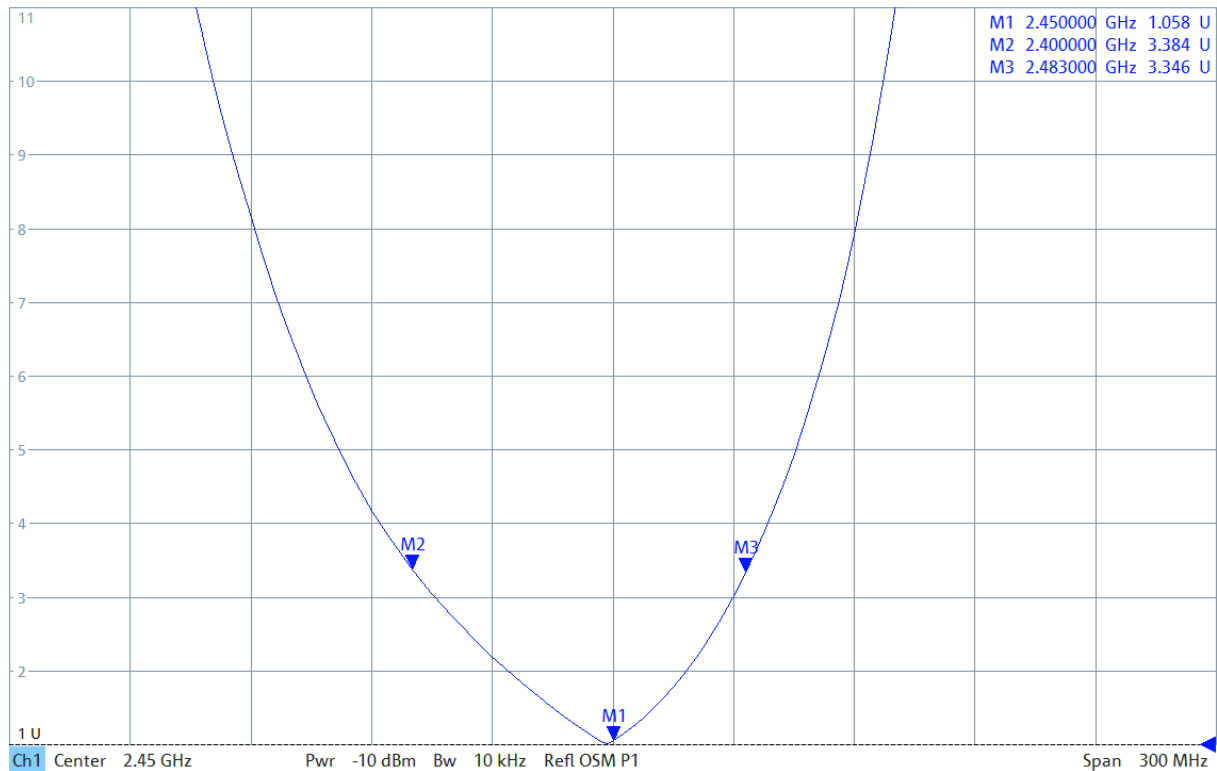
The Antenna PCB is produced using a specialist dielectric (RO4360G2) with a value (ϵ_r) of approximately 6.15.



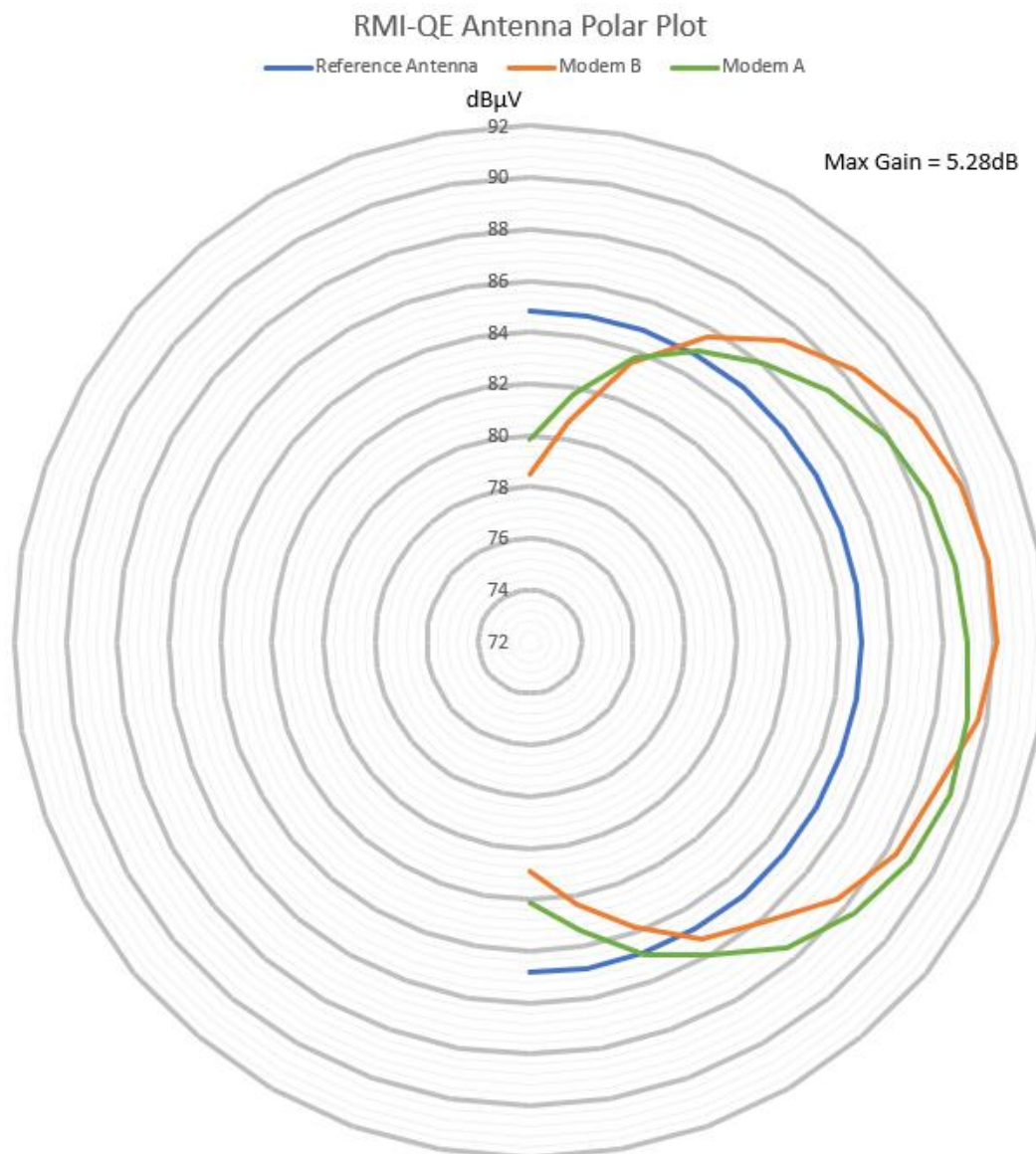
Figure 2. Main PCB showing Transceiver and Spring Pin positions

RMM-QE Antenna Electrical Characteristics

VSWR



H-Plane Polar Plot



The antenna has a peak gain¹ of 4.43 dBi.

¹ The measured gain values are relative to the reference antenna (3.0dBd).

(2.15 – 3.0dBd + 5.28 = +4.43 dBi)

Test Equipment

R&S ESR 26 EMI Test Receiver - Serial Number: RUK21686

R&S ZNLE6 Vector Network Analyser – Serial Number 1323.0012K56-101490-GL

Teseq Bilog antenna : Model CBL 6144 (26MHz-3GHz) - Serial Number 24722

MTP Small Turntable

2.4GHz $\lambda/4$ Reference Antenna

RF Anechoic Chamber