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EMC Compliance Test Report

CFR 47, Chapter 1, Subpart A,
Part 15, Subpart B

Report Number: CE4774B

January 2026



TMEIC Process Technology Application Centre P/L
B0EMCB08 Real Time Ethernet
Model: PN912

The results detailed in this test report relate only to the specific sample/s tested. It is the Manufacturer's responsibility to ensure that all production units are manufactured with equivalent EMC characteristics. This report is not to be reproduced except in full, without written approval from Compliance Engineering



COMPLIANCE CERTIFICATE

Client Details:

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Phone: 03 5977 0722 / 0428 459 130
Email: rodolfo.sandonato@tmeic.com.au

Product Details:

Device: B0EMCB08 Real Time Ethernet
Model: PN912
Serial: PN912c-005
FCC ID: 2BUU2B0EMCB08

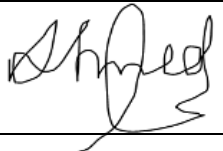
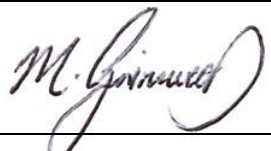
Reference Standard: **FCC Part 15 B**
 CFR 47 - Telecommunication
 Chapter I - Federal Communications Commission
 Subchapter A - General
 Part 15 - Radio Frequency Devices
 Subpart B Unintentional Radiators

Test Method: ANSI C63.4-2014:
 American National Standard for Methods of Measurement of Radio-Noise
 Emissions from Low-Voltage Electrical and Electronic Equipment in the range
 of 9 kHz to 40 GHz.

Test Dates: 13th December 2025

Tests Performed by: Ahmed Ibrahim
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The **B0EMCB08 Real Time Ethernet (Model: PN912)** complied with radiated RF emission requirements detailed in CFR 47, Chapter 1, Subpart A, Part 15, Subpart B (Class A) limits.

		23 rd January 2026
Prepared: Ahmed Ibrahim Test Engineer Compliance Engineering	Approved: Matthew Grimwood EMC Laboratory Manager Compliance Engineering	Date

Revision History			
Revision	Issue Date	Remarks	Revised by
0	23-01-2026	Initial release	-

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EMC Compliance Test Report

1. INTRODUCTION

Electromagnetic compatibility (EMC) measurements were performed on the B0EMCB08 Real Time Ethernet (Model: PN912) in accordance with the requirements detailed in CFR 47, Chapter 1, Subpart A, Part 15, Subpart B (Class A) limits.

2. RESULTS SUMMARY

CFR 47, Chapter 1, Subpart A, Part 15, Subpart B

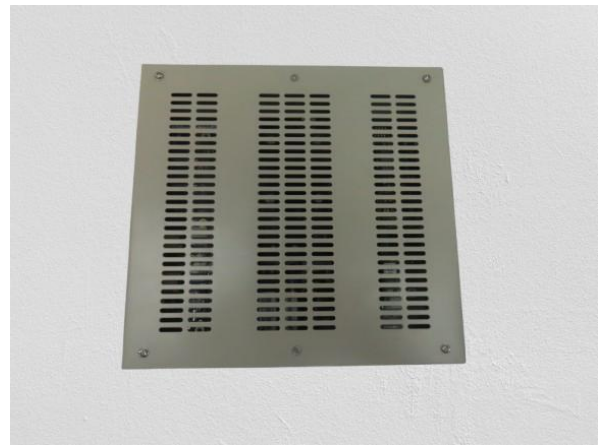
FCC Rule	Test Description	Class	Result
15.107	AC conducted emissions	Class A	N/A
15.109	Radiated emissions		Complied

N/A – Not Applicable

3. TEST SAMPLE

Equipment Under Test (Information supplied by client):	
Product Name	B0EMCB08 Real Time Ethernet
Model Number	PN912
Brand Name(s)	TMEIC
Serial Number	PN912c-005
Product Description	Real Time Ethernet Communications Gateway
Equipment type	Ethernet Gateway
Highest Clock Frequency (CPU)	1.3 GHz
Hardware Version	3.00
Software/Firmware Version	Rel: 2.1.8.7800/9.0.0.29.7771
Dimensions (mm)	220mm (W) x 210mm (D) x 45mm (H)
Weight	Net: 1450g
Power Ratings	8.5W / Typical
Operating Temperature	-20°C to +55°C
Interconnecting Cables	LAN1 Ethernet
	2x PROFINET – Real Time Ethernet
	2x Optical LC (TC-net)

The product information provided has been supplied by the client. Compliance Engineering does not verify the accuracy or completeness of this information and accepts no responsibility for errors or omissions. All testing and reporting are based solely on the data and samples provided.



4. MODIFICATIONS

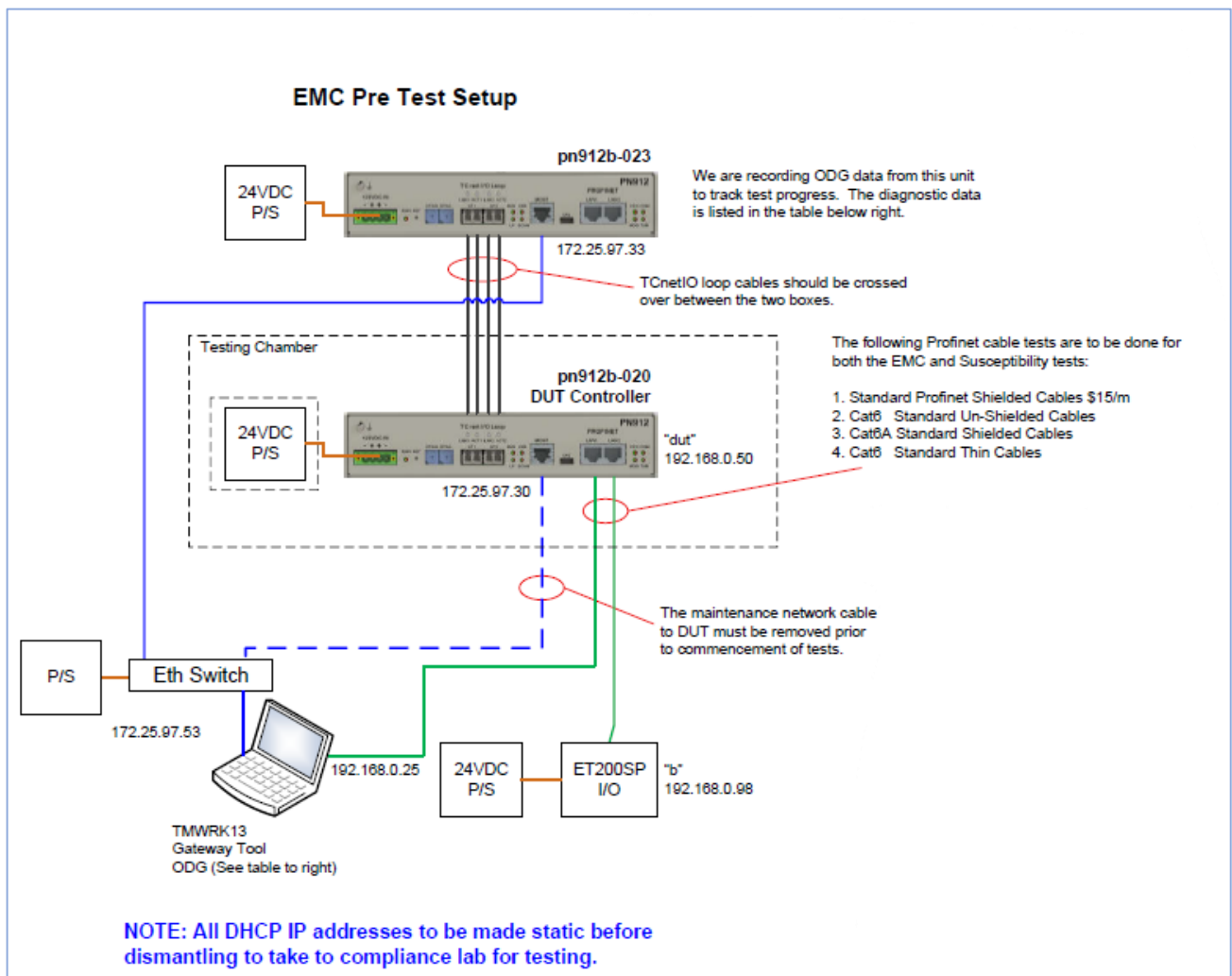
No modification was performed.

5. STANDARD DEVIATIONS

No deviations from the standard were made.

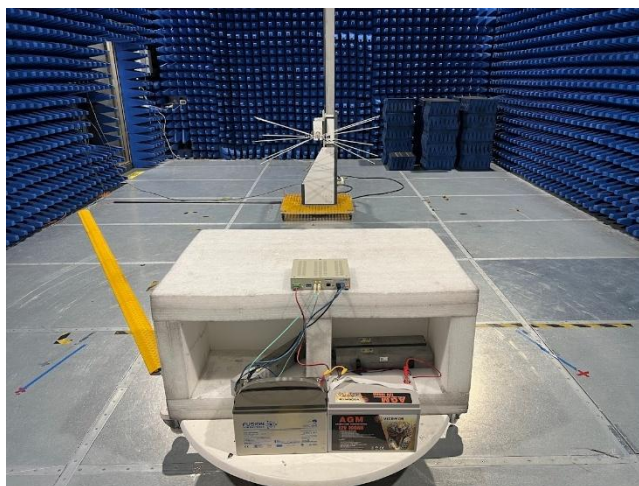
6. CONFIGURATION

The B0EMCB08 Real Time Ethernet (Model: PN912) was powered at 24VDC via two 12V batteries.



The EUT (Serial: PN912c-005) was communicating with a companion unit (Serial: PN912c-004). A datalogging server (ODG) was used to capture all the activity. All the parameters listed below in the table were captured and recorded.

RAS Data to Tcnet				TB=TCnetIO StnNumber										
Tcnet	Block	Word	Bit	Name	Type	Size	TcnetSpeed	Gateway	DeviceType	SubDevice	Instance	Word	Bit	Description
R	0	0	0	L PNTR_COUNTER	INT	1	MS	TRENZ	MetaData	0	0	0	0	16 bit Counter at 100msec rate
R	1	0	0	L PNTR_SPARE1	INT	1	MS	TRENZ	MetaData	0	0	0	0	Spare for future = 0
R	2	0	0	L PNTR_IU	WORD	1	MS	TRENZ	MetaData	U	U	U	U	Gateway PN912 IU (0x004E) = "PN"
R	3	0	0	L PNTR_MAJOR_REV	INT	1	MS	TRENZ	MetaData	0	0	0	0	Gateway TMGW Program major rev
R	4	0	0	L PNTR_MINOR_REV	INT	1	MS	TRENZ	MetaData	0	0	0	0	Gateway TMGW Program minor rev
R	5	0	0	L PNTR_PTEMP	INT	1	MS	TRENZ	MetaData	0	0	0	0	PL Core temperature [degC*10]
R	6	0	0	L PNTR_PSTEMP	INT	1	MS	TRENZ	MetaData	0	0	0	0	PS Core Temperature [degC*10]
R	7	0	0	L PNTR_TEMP_1	INT	1	MS	TRENZ	MetaData	0	0	0	0	Module temperature [degC*10]
R	8	0	0	L PNTR_TEMP_2	INT	1	MS	TRENZ	MetaData	0	0	0	0	Ambient Case Temperature [degC*10]
R	9	0	0	L PNTR_MVOLTS	INT	1	MS	TRENZ	MetaData	0	0	0	0	Trenz Module Voltage [Volts*1000]
R	10	0	0	L PNTR_MAMPS	INT	1	MS	TRENZ	MetaData	0	0	0	0	Trenz Module Current [Amps*1000]
R	11	0	0	L PNTR_MPOWER	INT	1	MS	TRENZ	MetaData	0	0	0	0	Trenz Module Power [Watts*1000]
R	12	0	0	L PNTR_SERIALNO	ARRAY[0..2] OF WORD	3	MS	TRENZ	MetaData	0	0	0	0	Main board serial number
R	15	0	0	L PNTR_FPGAFLW	WORD	1	MS	TRENZ	MetaData	0	0	0	0	FPGA Firmware version (low word)
R	16	0	0	L PNTR_FPGAFLWH	WORD	1	MS	TRENZ	MetaData	0	0	0	0	FPGA Firmware version (high word)
R	17	0	0	L PNTR_TYPEVER	WORD	1	MS	TRENZ	MetaData	0	0	0	0	Mainboard type/ver
R	18	0	0	L PNTR_IFJ	WORD	1	MS	TRENZ	MetaData	0	0	0	0	Daughterboard version(0=no dli)
R	19	0	0	L PNTR_SPARE2	WORD	1	MS	TRENZ	MetaData	0	0	0	0	Spare for future = 0
R	20	0	0	L PNCO_COFSTATE	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Communication Change of State
R	22	0	0	L PNCO_CSTATE	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Communication State
R	24	0	0	L PNCO_CERROR	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Communication Error
R	26	0	0	L PNCO_VERSION	WORD	1	MS	COMX_CS	MetaData	0	0	0	0	Version
R	27	0	0	L PNCO_WDTIMEOUT	WORD	1	MS	COMX_CS	MetaData	0	0	0	0	Watchdog Timeout
R	28	0	0	L PNCO_HOSTWD	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Host Watchdog
R	30	0	0	L PNCO_ERRCOUNT	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Error Count
R	32	0	0	L PNCO_ERRLOGIND	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Error Log Indicator
R	34	0	0	L PNCO_SLVSTATE	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Slave State
R	36	0	0	L PNCO_SLVERRLOGIND	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Slave Error Log Indicator
R	38	0	0	L PNCO_CFGSLAVES	DWORD	2	MS	COMX_CS	MetaData	U	U	U	U	Configured Slaves
R	40	0	0	L PNCO_ACTSLAVES	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Active Slaves
R	42	0	0	L PNCO_FLTSLAVES	DWORD	2	MS	COMX_CS	MetaData	0	0	0	0	Faulted Slaves
R	44	0	0	L PNMX_MVOLTS	INT	1	MS	COMX	MetaData	0	0	0	0	Netx Module Voltage [Volts*1000]
R	45	0	0	L PNMX_MAMPS	INT	1	MS	COMX	MetaData	0	0	0	0	Netx Module Current [Amps*1000]
R	46	0	0	L PNMX_MPOWER	INT	1	MS	COMX	MetaData	0	0	0	0	Netx Module Power [Watts*1000]
R	47	0	0	L PNMX_TIMESTRT	INT	1	MS	COMX	MetaData	0	0	0	0	Netx Module Time Since Start [Sec]
R	48	0	0	L PNMX_CPULD	INT	1	MS	COMX	MetaData	0	0	0	0	Netx Module CPU Load [Percent*10]
R	49	0	0	L PNMX_SPARE	INT	1	MS	COMX	MetaData	0	0	0	0	Spare for future = 0
R	50	0	0	L PNTC_RSRTM	FLOAT	2	MS	TCNETIO	MetaData	0	0	0	0	TCnetIO (0x09c) SYN orbit real time in units of msec
R	52	0	0	L PNTC_WAOKCT	DWORD	2	MS	TCNETIO	MetaData	0	0	0	0	TCnetIO (0x1b0) A circuit OK counter
R	54	0	0	L PNTC_WBOKCT	DWORD	2	MS	TCNETIO	MetaData	0	0	0	0	TCnetIO (0x1b4) B circuit OK counter
R	56	0	0	L PNTC_WANCDCCT	DWORD	2	MS	TCNETIO	MetaData	0	0	0	0	TCnetIO (0x1b8) A circuit LRR counter
R	58	0	0	L PNTC_WBNCDCCT	DWORD	2	MS	TCNETIO	MetaData	U	U	U	U	TCnetIO (0x1bc) B circuit LRR counter
R	60	0	0	L PNTC_WACRCCT	DWORD	2	MS	TCNETIO	MetaData	0	0	0	0	TCnetIO (0x1c0) A circuit error counter
R	62	0	0	L PNTC_WBRCRCCT	DWORD	2	MS	TCNETIO	MetaData	0	0	0	0	TCnetIO (0x1c4) B circuit error counter



6.1. Supporting Equipment Used During Testing

AE: Auxiliary/Associated Equipment				
Device	Manufacturer	Model No:	Serial	Comments
Real Time Ethernet Gateway	TMEIC	PN912	PN912c-004	Support Equipment for data logging
PC	N/A	N/A	TMWRK13	For ODG server data logging

7. TEST FACILITY

All measurements were performed at Compliance Engineering, 90 Indian Drive Keysborough, Victoria, Australia.

A2LA (ISO 17025-2017) – Certificate No: 2829.01

Compliance Engineering is accredited to ISO 17025-2017 by American Association for Laboratory Accreditation (A2LA) which is an ILAC member and has mutual recognition agreements with the National Voluntary Laboratory Accreditation Program (NVLAP)

All measurements within this report have been performed in accordance with Compliance Engineering's scope of A2LA accreditation.

The current full scope of accreditation can be found on the A2LA website: www.a2la.org

FCC – Registration No: 982700

Compliance Engineering has been recognized and is listed as an FCC part 47 CFR 2.948 measurement facility to perform compliance testing on equipment under Parts 15 and 18. The Designation Number is AU0006 and the Test Firm Registration Number is 982700.

Innovation, Science & Economic Development Canada (ISED) - Registration No: 27266

Compliance Engineering's 3m indoor semi-anechoic chamber (iOATS) has been accepted by Innovation, Science & Economic Development Canada (ISED) for performing radiated measurements in accordance with RSS-102, RSS-GEN, RSS-210, RSS-247, RSS-248 – ISED Canada Registration No: 27266

8. FIELD STRENGTH CALCULATION

All emission measurements are automatically calculated via the dedicated EMC software using the pre-stored calibration factors. The following equation simplifies the actual calculation performed;

$$\text{Corr.Ampl} = V_{\text{RAW}} + \text{AF} - \text{G} + \text{L}$$

Where:

Corr.Ampl = Corrected amplitude in dBμV/m (for radiated) & dBμV (for conducted)
V_{RAW} = Raw voltage receiver/analyser reading in dBμV
AF = Antenna Factor in dB (stored as a data array of factor vs frequency)
G = Preamplifier Factor in dB (stored as a data array of gain vs frequency)
L = Cable Loss Factor in dB (stored as a data array of insertion loss vs frequency)

Limit:

The FCC limits are given in units of μV/m. The following formula is used to convert the units of μV/m to dBμV/m.

$$\text{Limit (dBμV/m)} = 20 \cdot \log(\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example Calculation:

A peak emission is observed at 100 MHz at 21.5 dBμV. An antenna factor for that frequency is 10 dB. The preamplifier gain factor is 30 dB and the cable loss at that same frequency 1.5 dB. Hence the overall Correction Amplitude is as follows;

$$\begin{array}{lcl} V_{\text{RAW}} + \text{AF} - \text{G} + \text{L} & : & \text{Corr.Ampl} - \text{FCC Limit} = \text{Margin} \\ 31.5 + 10 - 20 + 1.5 & : & 23 \text{ dBμV/m} - 57.0 \text{ dBμV/m} = - 34 \text{ dB} \end{array}$$

9. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

Measurement	Frequency / Range	Uncertainty
Temperature (ANSI C63.4-2014)	10°C to 40°C	0.5°C
Humidity (ANSI C63.4-2014)	5% to 90%	2%
Conducted Emissions (using a 50Ω/50μH + 5μH LISN)	0.09 MHz to 30 MHz	± 4.79 dB
Conducted Emissions (using a Voltage Probe)	0.15 MHz to 30 MHz	± 5.07 dB
Conducted Emissions (using a 50Ω/50μH LISN)	0.15 MHz to 30 MHz	± 4.35 dB
Radiated Emissions (Horizontal Polarisation)	30 MHz to 200 MHz	± 4.98 dB
Radiated Emissions (Vertical Polarisation)	30 MHz to 200 MHz	± 5.23 dB
Radiated Emissions (Horizontal Polarisation)	200 MHz to 1000 MHz	± 5.24 dB
Radiated Emissions (Vertical Polarisation)	200 MHz to 1000 MHz	± 5.92 dB
Radiated Emissions (STLP)	1 GHz to 6 GHz	± 5.14 dB
Radiated Emissions (STLP)	6 GHz to 18 GHz	± 6.11 dB
Radiated Emissions (SGH)	18 GHz to 26 GHz	± 6.11 dB
Radiated Emissions (SGH)	26 GHz to 40 GHz	± 6.11 dB

These uncertainties represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

The reference uncertainty standard specifies that although the measurement uncertainty shall be documented within the test report, the actual determination of compliance shall be based on measurements without considering the measurement uncertainty.

10. AC CONDUCTED RF EMISSION MEASUREMENTS

Since the device is DC powered, this test is not applicable.

11. RADIATED RF EMISSION MEASUREMENTS

11.1. REQUIREMENTS

Frequency Range:	30 MHz to the 5 th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
Highest Operating Frequency:	1300 MHz
Measurement Distance:	3 metres
Limit:	FCC Part 15B (Class A) Limits

11.2. TEST EQUIPMENT

Asset No	Equipment	Model No	Serial No	Cal Due
937	ESR26 EMI Receiver	ESR26	101760	Aug 26
731	Biconical 0.03 - 0.2 GHz	VHBB 9124+BBA 9106	9124-1461	Jun 28
732	Log Periodic 0.2 - 7 GHz	USLP 9143 B	USLP 9143B 136	Jun 28
734	Log Periodic 1 - 18 GHz	STLP 9148	176	Nov 26
52	Pre-amp 40 dB	UTC10-212-1	9232SN02	Jul 26
278	Pre-amp 1 - 18 GHz	LA1018N4009	J1012090727001	Jul 26
760	iOATS (11 x 7 x 6 m)	CE-iOATS	2021	Jun 26
TER-S004	Measurement Software	RadiMation	Rev: 2024.1.4	-

11.3. ENVIRONMENTAL CONDITIONS

Environment	Typical Range	Actual
Temperature	15.5°C to 24°C	21.2°C
Humidity	15% to 60%	47%

11.4. PROCEDURE

In accordance with Compliance Engineering Test Procedure TP72.

Measurements were performed inside a semi-anechoic chamber at a distance of 3 m from the EUT. The EUT was supported 0.8 metres above the ground reference plane on a large polystyrene block, which in turn rested on top of a turntable.

The EUT was rotated 360° and the antenna height varied between 1 m and 4 m. The measuring antenna polarisation was rotated and measurements performed for horizontal and vertical antenna polarisations.

The receiver/spectrum analyser was configured to capture the highest peak emissions. Quasi-peak and or average detector measurements were performed at frequencies where peak emissions are close to or exceed the applicable limit.

Plots of the accumulated measurement data, including all transducer correction factors were produced and stored to file.

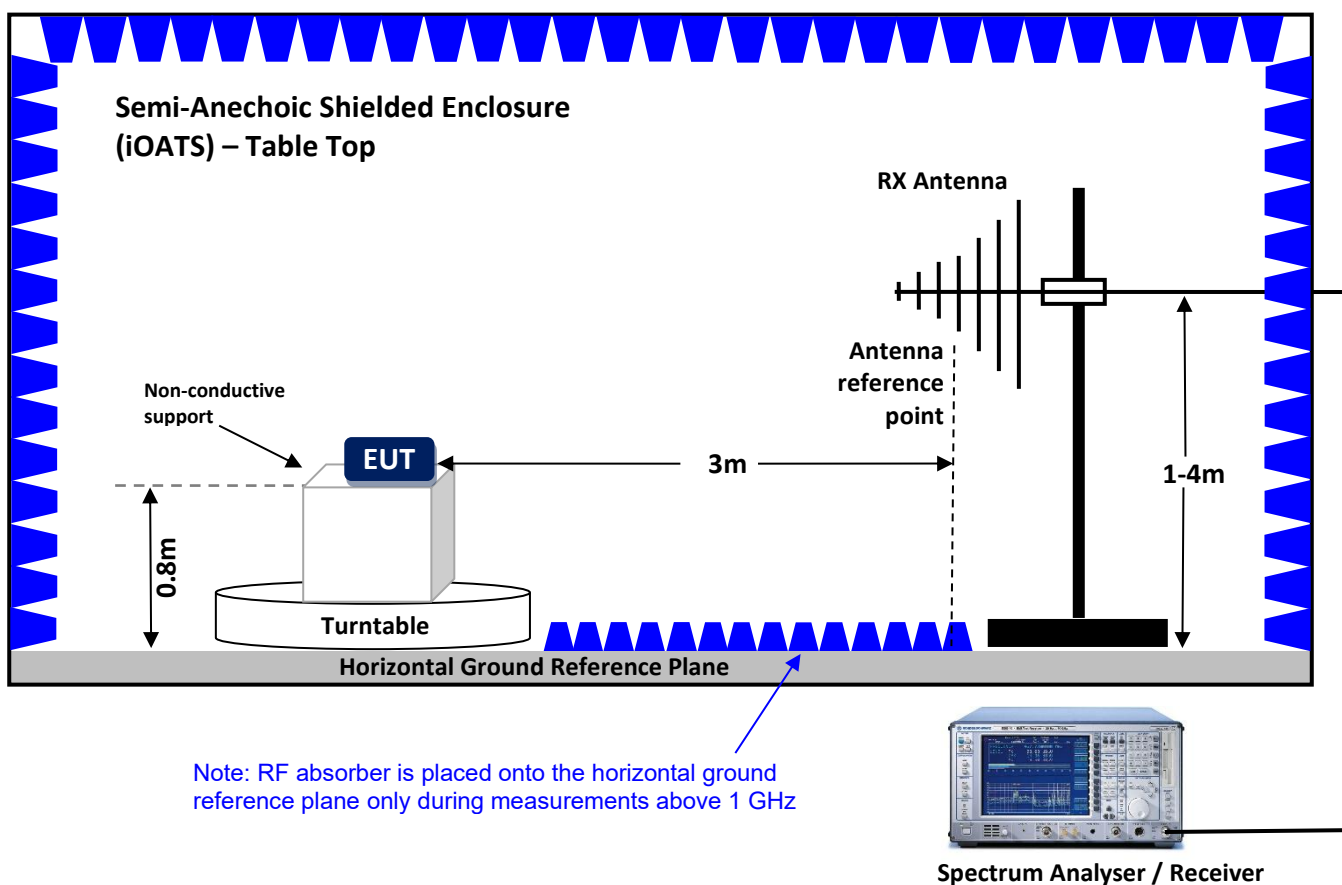
Measurements below 1 GHz:

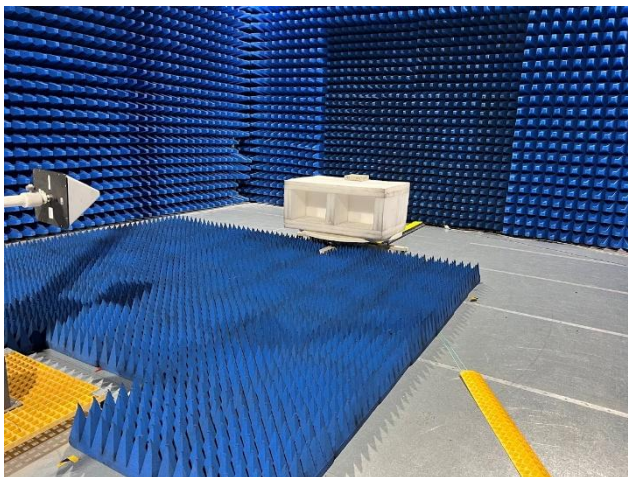
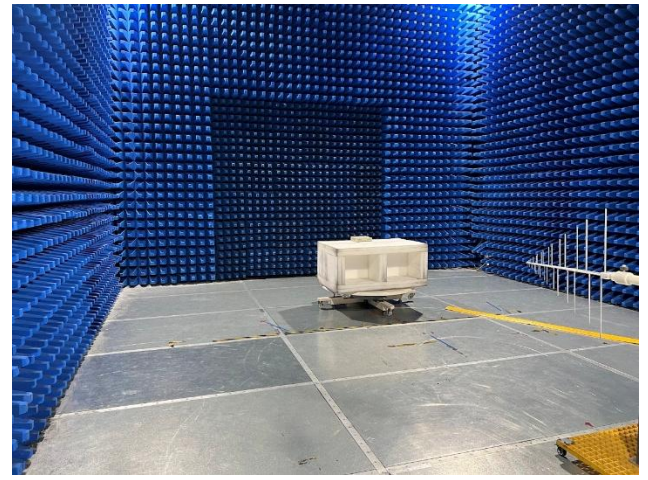
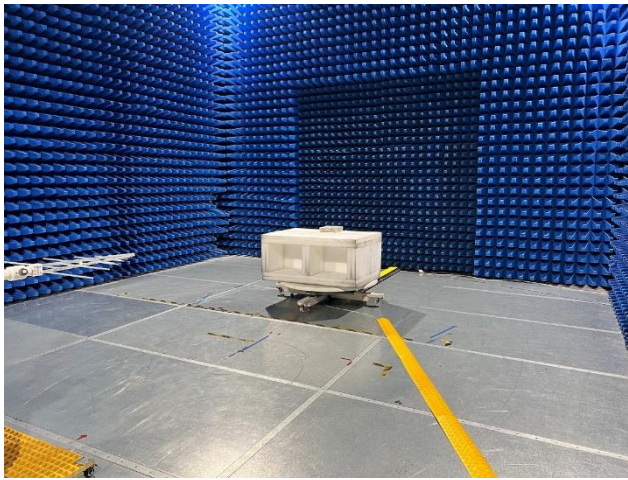
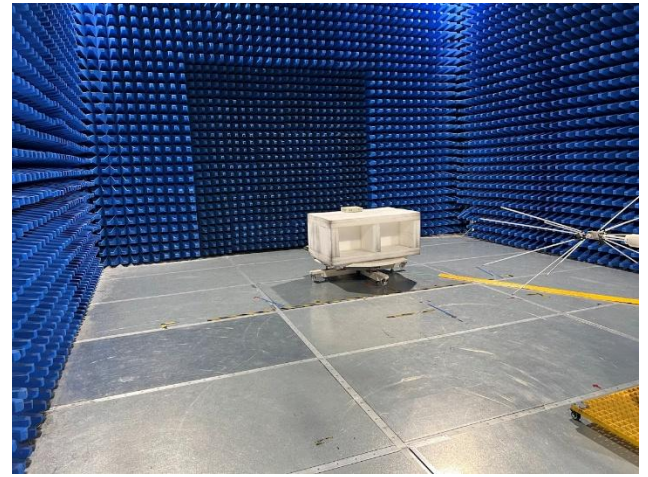
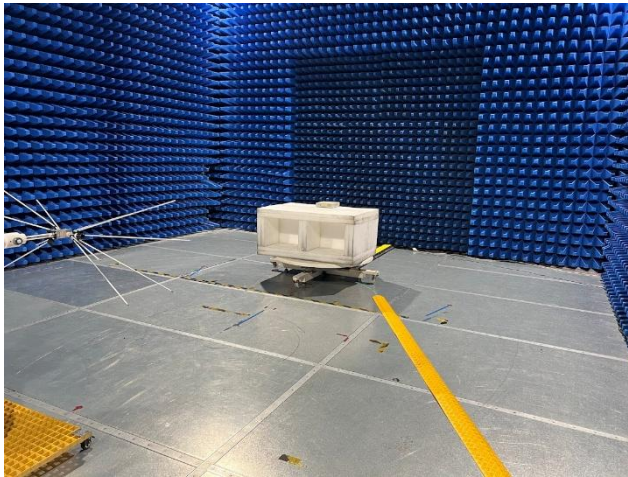
RWB = 120 kHz, VBW = 3 x RBW

Measurements above 1 GHz:

RF absorber is placed on the ground reference plane between the EUT and the measuring antenna and its location size should allow the test site area comply with the CISPR 16-1-4 requirements.

RWB = 1 MHz (minimum), VBW = 3 x RBW

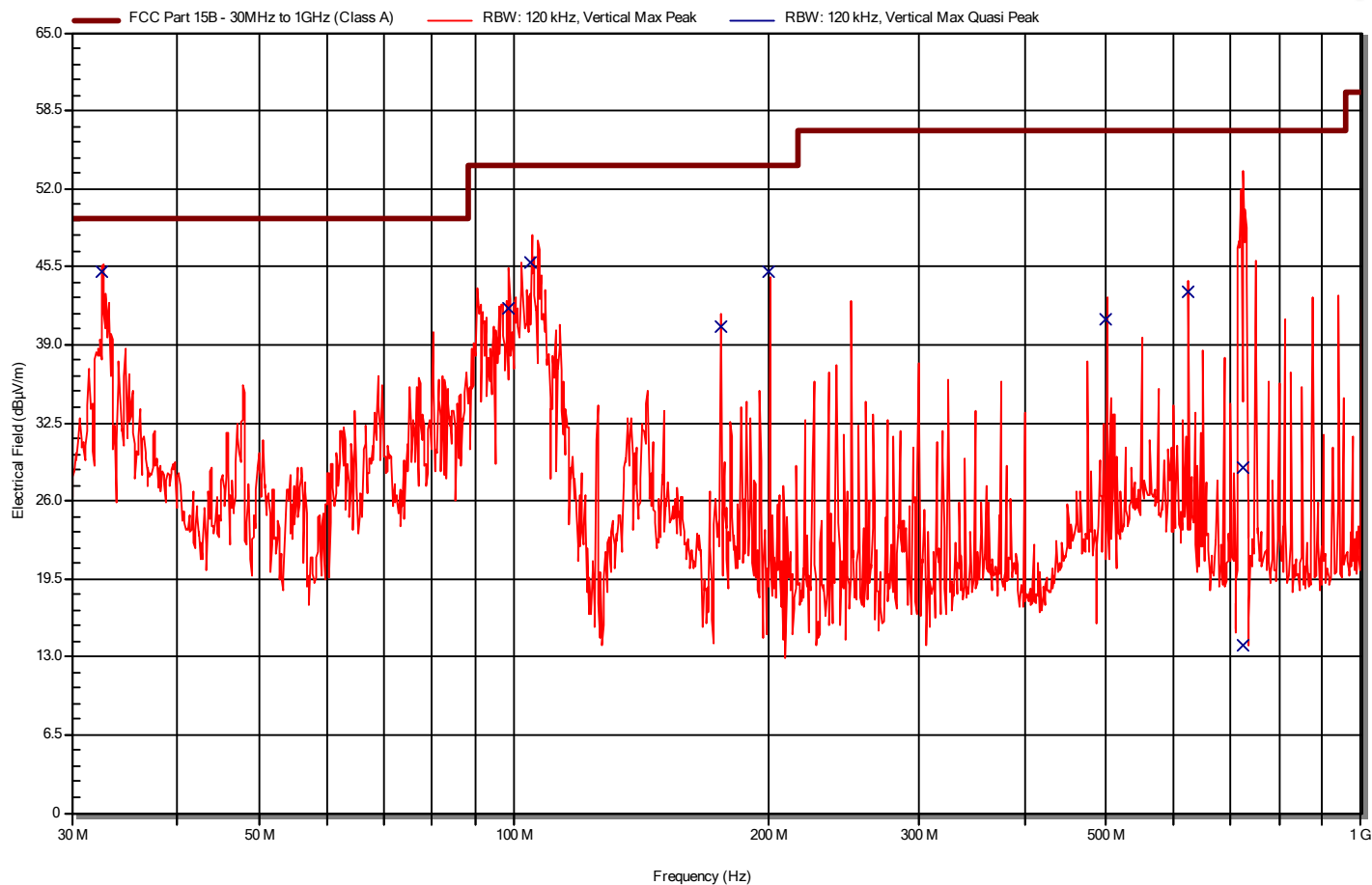




11.5. RESULTS

Radiated RF Emission Measurements – Vertical Polarisation – 30 MHz to 1GHz				
Frequency (MHz)	Quasi-Peak (dBµV/m)	Quasi-Peak Limit (dBµV/m)	Delta Limit (dB)	Result
32.611	45	49.5	-4.5	Pass
98.422	42	50	-8.0	Pass
104.73	45.9	50	-4.1	Pass
175.013	40.5	50	-9.5	Pass
199.996	45.1	50	-4.9	Pass
499.983	41.1	56.9	-15.8	Pass
625.005	43.5	56.9	-13.4	Pass
724.494	14	56.9	-42.9	Pass
725.013	28.7	56.9	-28.2	Pass

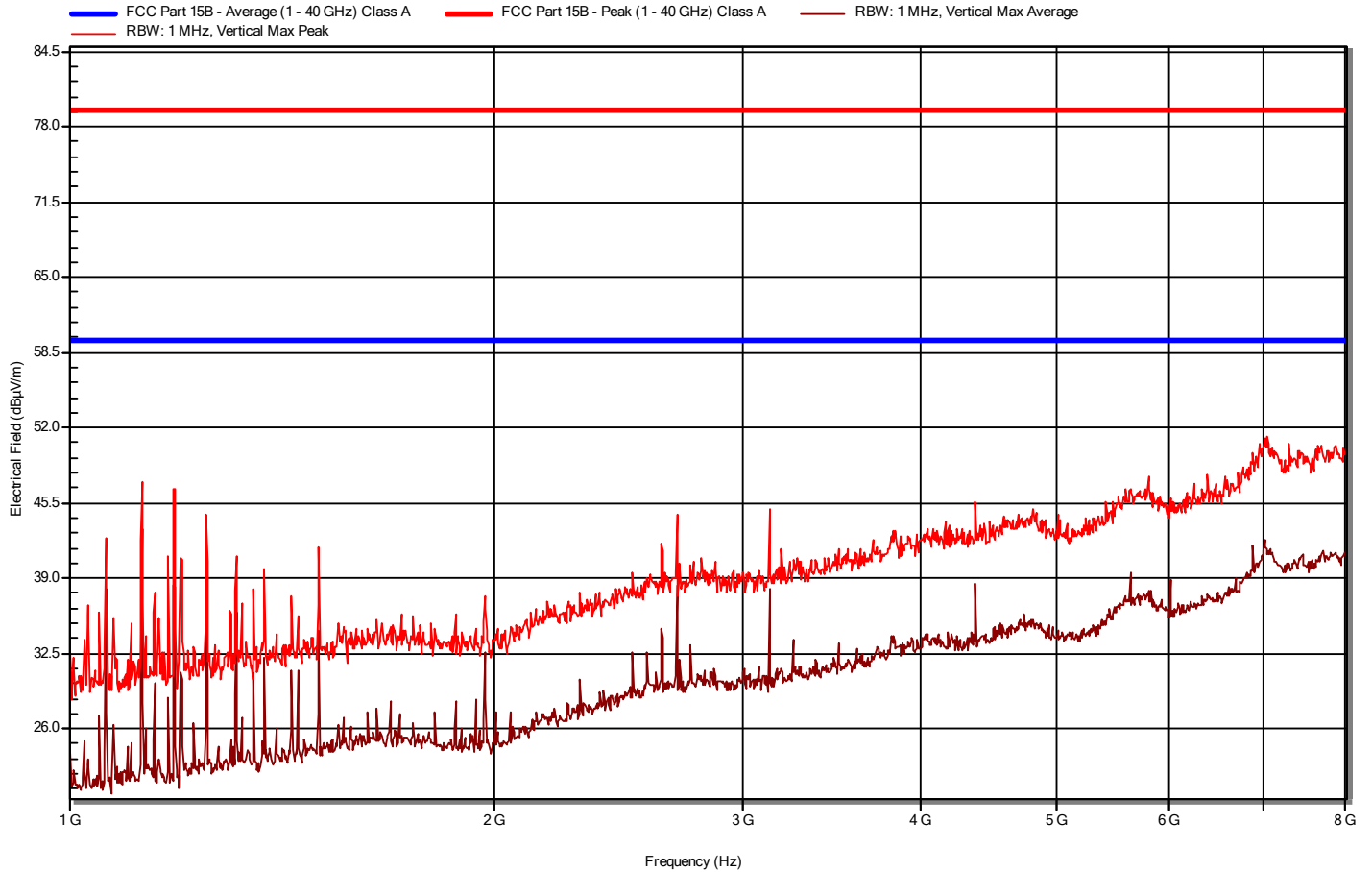
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Radiated RF Emission Measurements – Vertical Polarisation - 1 to 8 GHz

Frequency (GHz)	Peak (dBµV/m)	Peak Limit (dBµV/m)	Pk Delta Limit (dB)	Average (dBµV/m)	Average Limit (dBµV/m)	AV Delta Limit (dB)	Result
Peak and Average emissions were > 10 dB below the respective limits							Pass

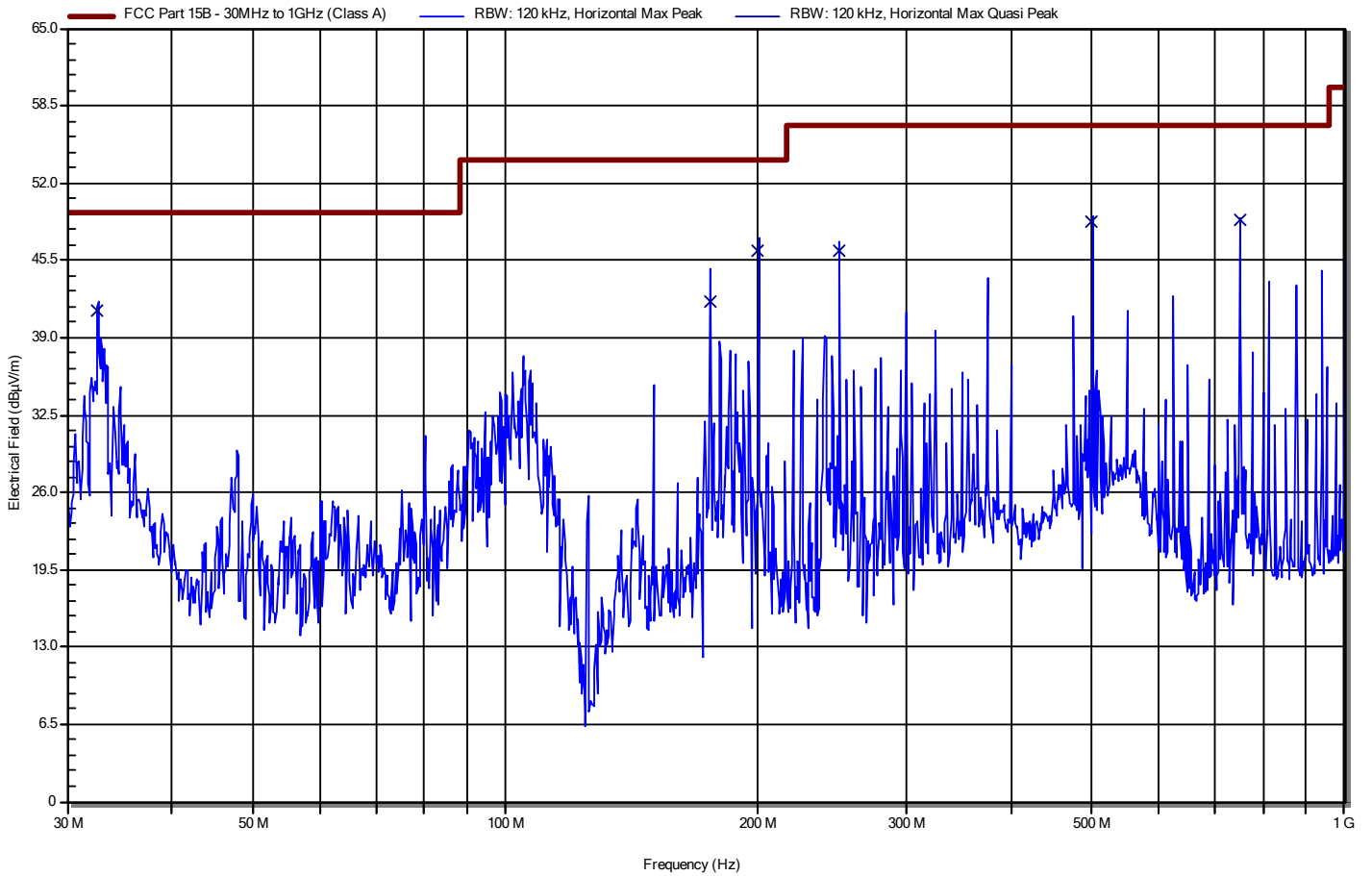
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Radiated RF Emission Measurements – Horizontal Polarisation – 30 MHz to 1GHz

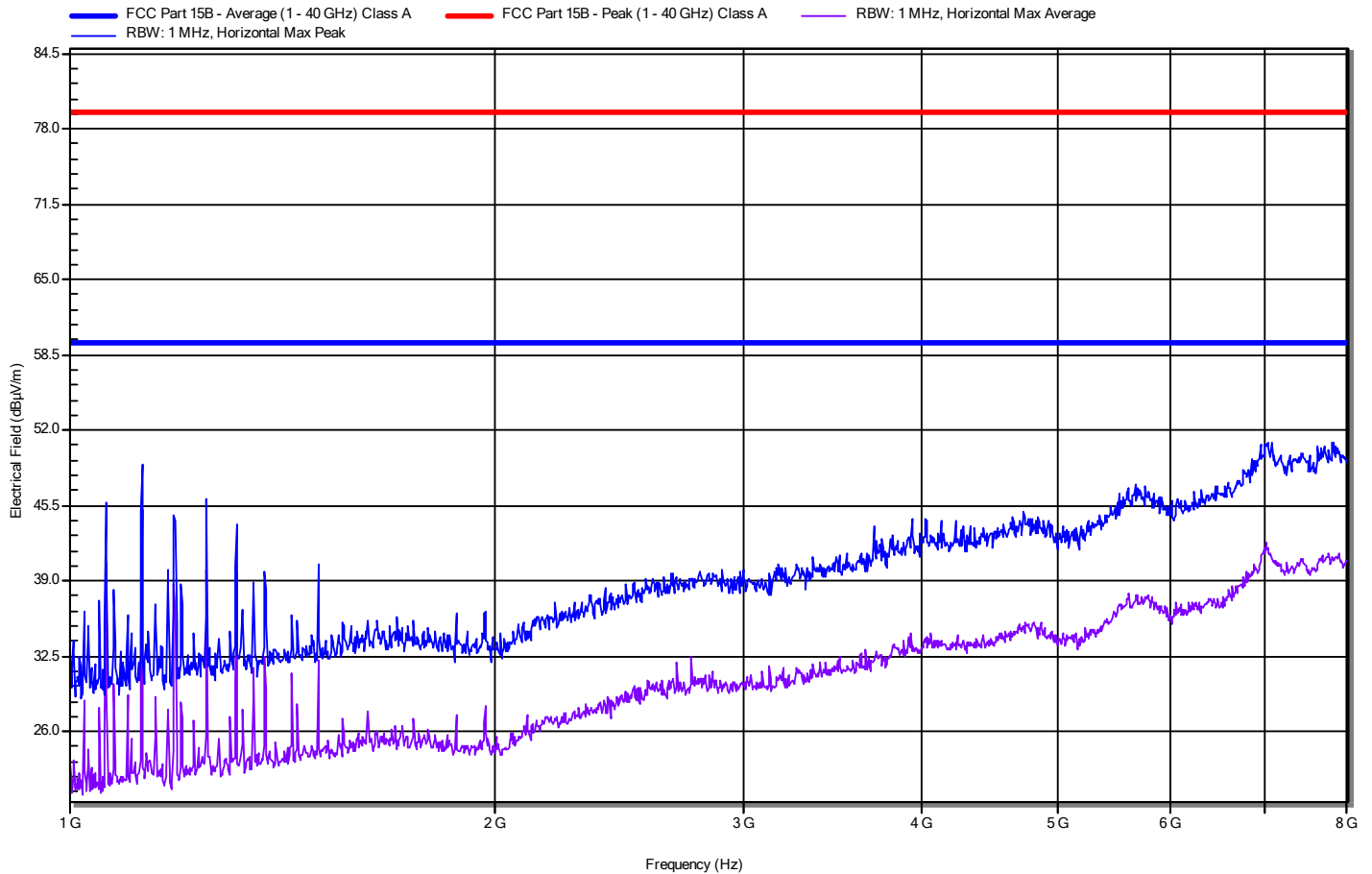
Frequency (MHz)	Quasi-Peak (dB μ V/m)	Quasi-Peak Limit (dB μ V/m)	Delta Limit (dB)	Result
32.602	41.2	49.5	-8.3	Pass
175.026	42.1	50	-7.9	Pass
200.018	46.2	50	-3.8	Pass
250.004	46.4	56.9	-10.5	Pass
500.004	48.8	56.9	-8.1	Pass
750.006	48.9	56.9	-8.0	Pass

RadiMation



Radiated RF Emission Measurements – Horizontal Polarisation - 1 to 8 GHz							
Frequency (GHz)	Peak (dBµV/m)	Peak Limit (dBµV/m)	Pk Delta Limit (dB)	Average (dBµV/m)	Average Limit (dBµV/m)	AV Delta Limit (dB)	Result
Peak and Average emissions were > 10 dB below the respective limits							Pass

RadiMation



11.6. ASSESSMENT

The B0EMCB08 Real Time Ethernet (Model: PN912) complies with the CFR 47, Chapter 1, Subpart A, Part 15, Subpart B (Class A) limits radiated RF emission requirements.

12. CONCLUSION

The **B0EMCB08 Real Time Ethernet (Model: PN912)** complied with the radiated RF emission requirements detailed in CFR 47, Chapter 1, Subpart A, Part 15, Subpart B (Class A) limits.