FCC and ISED Test Report

MiX Telematics International (Pty) Ltd Telematics Unit, Model: MiX 3400-B and BLE Remote, Model: Bluetooth Driver/HOS Driver ID

In accordance with FCC 47 CFR Part 15B and ICES-003

Add value.
Inspire trust.

Prepared for: MiX Telematics International (Pty) Ltd
Blaauwklip Office Park 2
Cnr Strand & Webersvalley Roads
Stellenbosch, South Africa

FCC ID: 2AFMS-3400XG IC: N/A

COMMERCIAL-IN-CONFIDENCE

Document 75952029-14 Issue 01

SIGNATURE			
(signature)			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Andrew Lawson	Chief Engineer, EMC	Authorised Signatory	04 August 2022

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

ENGINEERING STATEMENT
The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Michael Mawby	04 August 2022	*(signature)*

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

ISED Accreditation
12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15B 2020 and ICES-003: Issue 7: 2020 for the tests detailed in section 1.3.

Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	04 August 2022

Table 1

1.2 Introduction

Applicant	MiX Telematics International (Pty) Ltd
Manufacturer	MiX Telematics International (Pty) Ltd
Model Number(s)	MiX 3400-B Bluetooth Driver/HOS Driver ID (BLE Remote)
Manufacturer's Declared Variant(s)	MiX 3400-B (VZN) (U0142MT) MiX 3400-B (TLA) (U0140MT)
Serial Number(s)	33000050 17000059
Hardware Version(s)	1
Software Version(s)	5.2.x
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 15B: 2020 ICES-003: Issue 7: 2020
Order Number Date	P0094972 20-April-2021
Date of Receipt of EUT	30-May-2022
Start of Test	02-August-2022
Finish of Test	03-August-2022
Name of Engineer(s)	Michael Mawby
Related Document(s)	ANSI C63.4: 2014

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15B and ICES-003 is shown below.

Section	Specification Clause		Test Description	Modification State	Result	Comments/Base Standard
	FCC	ICES				
Configuration and Mode: DC Powered - MiX 3410-B and BLE Remote - IDLE + GNSS receiver operational						
2.2	15.109	3.2	Radiated Disturbance	0	Pass	ANSI C63.4: 2014

Table 2

1.4 Manufacturer's Declared Variant(s)

The below information was provided by the customer.

MiX 3400-B (VZN) (U0142MT)
MiX 3400-B (TLA) (U0140MT)

The MiX 3400-B and MiX 3400-B (VZN) use the same modem hardware, but the modem firmware is specific to the network operators (AT&T and Verizon).

1.5 Declaration of Build Status – MiX 3400-B

Technical Description: *(Please provide a brief description of the intended use of the equipment including the technologies the product supports)*	The MiX3000 series product, that is aimed on the easy-install and light fleet market. It consists mainly of an on-board-computer, modem, GNSS, accelerometer, Low Energy Bluetooth, 2 x analogue inputs, serial communication ports (3 x CAN, L & K-Line, LIN, J1850/J1708 and RS232), 3 x LED's, switchable positive-drive and an audible buzzer. The range includes variants with LTE CAT1/2G and CAT M1/2G modems. All variants make use of the same PCB with the integrated modem, as the only discernible difference with the variant modems populated at the same location on a compatible PCB land pattern. MiX 3400-B Electronic Unit (EU) with Backup Battery and Quectel BG96 modem. MiX 3410 Electronic Unit (EU) with Backup Battery and Quectel EG912Y-EU modem.	
Manufacturer:	MiX Telematics International (Pty) Ltd.	
Model:	MiX 3400-B	
Part Number:	U0051MT	
Hardware Version:	1	
Software Version:	5.2.x	
FCC ID of the product under test – see guidance here	2AFMS-3400XG	
IC ID of the product under test – see guidance here	-	

Intentional Radiators

Technology	LTE Band 2	LTE Band 3	LTE Band 4	LTE Band 5	LTE Band 12	LTE Band 13
Frequency Range (MHz to MHz)	1850-1910	1710-1785	1710-1755	824-849	699-716	777-787
Conducted Declared Output Power (dBm)	23	23	23	23	23	23
Antenna Gain (dBi)	2.07	1.46	1.46	0.21	0.76	1.39
Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)	1.4	1.4	1.4	1.4	1.4	1.4
Modulation Scheme(s) (e.g. GFSK, QPSK etc)	QPSK/ 16-QAM	QPSK/ 16-QAM	QPSK/ 16-QAM	QPSK/ 16-QAM	QPSK/ 16-QAM	QPSK/ 16-QAM
ITU Emission Designator (see guidance here) (not mandatory for Part 15 devices)	1M40W7D	1M40W7D	1M40W7D	1M40W7D	1M40W7D	1M40W7D
Bottom Frequency (MHz)	1850	1710	1710	824	699	777
Middle Frequency (MHz)	1880	1747.5	1747.5	836.5	707.5	782
Top Frequency (MHz)	1910	1785	1755	849	716	787

Technology	SRD2400
Frequency Band (MHz)	2400-2480
Conducted Declared Output Power (dBm)	4
Antenna Gain (dBi)	2.1
Supported Bandwidth(s) (MHz)	1
Modulation Scheme(s)	GFSK
ITU Emission Designator	1M00F1D
Bottom Frequency (MHz)	2402
Middle Frequency (MHz)	2440
Top Frequency (MHz)	2480

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	2690 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	699MHz
Class A Digital Device (Use in commercial, industrial or business environment) ☐ Class B Digital Device (Use in residential environment only) ☒	

AC Power Source

AC supply frequency:	N/A	Hz
Voltage	N/A	V
Max current:	N/A	A
Single Phase ☐ Three Phase ☐		

DC Power Source

Nominal voltage:	13.8/27.6	V
Extreme upper voltage:	32	V
Extreme lower voltage:	10.5	V
Max current:	0.5A typical ; 2.5A absolute max (7.5A Fused)	A

Battery Power Source

Voltage:	3.2	V
End-point voltage:	2.7	V *(Point at which the battery will terminate)*
Alkaline ☐ Leclanche ☐ Lithium ☒ Nickel Cadmium ☐ Lead Acid* ☐ **(Vehicle regulated)*		
Other ☐ Please detail:		

Charging

Can the EUT transmit whilst being charged	Yes ☒ No ☐

Temperature

Minimum temperature:	-20	°C
Maximum temperature:	60	°C

Cable Loss

Adapter Cable Loss (Conducted sample)		dB

Antenna Characteristics

Antenna connector ☒			State impedance	50	Ohm
Temporary antenna connector ☐			State impedance		Ohm
Integral antenna ☒	Type:	LTE BLE GNSS	Gain	3 2.1 4	dBi
External antenna ☐	Type:		Gain		dBi
For external antenna only: Standard Antenna Jack ☐ If yes, describe how user is prohibited from changing antenna (if not professional installed): Equipment is only ever professionally installed ☐ Non-standard Antenna Jack ☐					

Ancillaries (if applicable)

Manufacturer:	MiX Telematics	Part Number:	A0061MT
Model:	MiX 3000 Universal OBDII Plugin Harness for light vehicles	Country of Origin:	South Africa
Manufacturer:	MiX Telematics	Part Number:	A0062MT
Model:	MiX 3000 Universal J1939 Plugin Harness for heavy vehicles	Country of Origin:	South Africa
Manufacturer:	MiX Telematics	Part Number:	440FT0931
Model:	Serial Harness SR1	Country of Origin:	South Africa

I hereby declare that the information supplied is correct and complete.

Name: Ben van der Merwe
Position held: Senior Engineer
Date: 27 May 2022

1.6 Declaration of Build Status – BLE Remote

Technical Description: *(Please provide a brief description of the intended use of the equipment including the technologies the product supports)*	The Bluetooth Driver ID (BT DID) comprises: a) Green Button (upper): Transmit the Driver Identification message in order to identify the driver in the vehicle. b) Red Button (lower): Road Side Assist/Panic The product is designed with an RF range that limits it to in-cab use of the Driver ID and Roadside Assist/Panic buttons only. The BT DID forms part of the MiX6000, MiX 3000, and MiX 4000 range of products, and soon to be integrated with other products, such as MiX Vision. It communicates with the mobile host (e.g. MiX3000 or MiX4000) via a bi-directional Bluetooth LE RF link. There is also a variant with more memory that supports Hours of Service (HOS) functionality. Both product variants use the same PCB.
Manufacturer:	MiX Telematics International (Pty) Ltd.
Model:	Bluetooth Driver ID Bluetooth HOS Driver ID
Part Number:	P0022MT P0032MT
Hardware Version:	1
Software Version:	
FCC ID of the product under test – see guidance here	2AFMS-BLEDID
IC ID of the product under test – see guidance here	-

Intentional Radiators

Technology	SRD2400
Frequency Band (MHz)	2400-2480
Conducted Declared Output Power (dBm)	-5
Antenna Gain (dBi)	2.5
Supported Bandwidth(s) (MHz)	1
Modulation Scheme(s)	GFSK
ITU Emission Designator	1M00F1D
Bottom Frequency (MHz)	2400
Middle Frequency (MHz)	2440
Top Frequency (MHz)	2480

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	2480 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	2400 MHz
Class A Digital Device (Use in commercial, industrial or business environment) ☐ Class B Digital Device (Use in residential environment only) ☒	

AC Power Source

AC supply frequency:	N/A	Hz
Voltage	N/A	V
Max current:	N/A	A
Single Phase ☐ Three Phase ☐		

DC Power Source

Nominal voltage:	3	V
Extreme upper voltage:	3.1	V
Extreme lower voltage:	1.8	V
Max current:	0.018	A

Battery Power Source

Voltage:	3.0	V
End-point voltage:	2.0	V *(Point at which the battery will terminate)*
Alkaline ☐ Leclanche ☐ Lithium ☒ Nickel Cadmium ☐ Lead Acid* ☐ *(Vehicle regulated)*		
Other ☐ Please detail:		

Charging

Can the EUT transmit whilst being charged	Yes ☒ No ☐

Temperature

Minimum temperature:	-20	°C
Maximum temperature:	60	°C

Cable Loss

Adapter Cable Loss (Conducted sample)		dB

Antenna Characteristics

Antenna connector ☒			State impedance	50	Ohm
Temporary antenna connector ☐			State impedance		Ohm
Integral antenna ☒	Type:	BLE	Gain	2.2	dBi
External antenna ☐	Type:		Gain		dBi

For external antenna only:
Standard Antenna Jack ☐ If yes, describe how user is prohibited from changing antenna (if not professional installed):
Equipment is only ever professionally installed ☐
Non-standard Antenna Jack ☐

Ancillaries (if applicable)

Manufacturer:	MiX Telematics	Part Number:	A0061MT
Model:	MiX 3000 Universal OBDII Plugin Harness for light vehicles	Country of Origin:	South Africa
Manufacturer:	MiX Telematics	Part Number:	A0062MT
Model:	MiX 3000 Universal J1939 Plugin Harness for heavy vehicles	Country of Origin:	South Africa
Manufacturer:	MiX Telematics	Part Number:	440FT0931
Model:	Serial Harness SR1	Country of Origin:	South Africa

I hereby declare that the information supplied is correct and complete.

Name: Ben van der Merwe
Position held: Senior Engineer
Date: 27 May 2022

1.7 Product Information

1.7.1 Technical Description

The Equipment Under Test (EUT) was a MiX Telematics International (Pty) Ltd, Model: MiX 3410-B and BLE Remote.

The primary function of the EUT is for the use of Vehicle tracking and Fleet Management that incorporates the latest market trends. It consists mainly of an on-board computer, a modem, a GNSS, an accelerometer, Low Energy Bluetooth, 3 x analogue inputs, serial ports (3 x CAN, L & K-Line, LIN, J1850/J1708 and RS232), 3 x LED's, switchable positive-drive and an audible buzzer.

The BLE remote is a product that is designed with an RF range that limits it to in-cab use of the Driver ID and Roadside Assist/Panic buttons only. The BLE remote forms part of the MiX 6000, MiX 3000 and MiX 4000 range of product. It communicates with the mobile host via a bi-directional Bluetooth LE RF Link.

Figure 1 – EUT General View

Figure 2 - EUT Rating Plate

Figure 3 – BLE Remote Front

Figure 4 – BLE Remote Rear & Serial Label

1.7.2 EUT Port/Cable Identification

Port	Max Cable Length specified	Usage	Type	Screened
Configuration and Mode: DC Powered - MiX 3410-B and BLE Remote - IDLE + GNSS receiver operational				
DC Power Line	0.5 m	Power to EUT	24 V DC Power	No

Table 3

1.7.3 Test Configuration

Configuration	Description
DC Powered	The EUT was powered directly from a 24 V DC power supply and an internal battery. The EUT was connected to a test PC using a fibre optic cable.

Table 4

1.7.4 Modes of Operation

Mode	Description
IDLE + GNSS receiver operational	The test PC utilised a test software program to activate the EUT. The EUT was then monitored using a test receiver.

Table 5

1.8 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.9 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: MiX 3410-B & BLE Remote, Serial Number: 33000050			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 6

1.10 Test Location

TÜV SÜD conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: DC Powered - MiX 3410-B and BLE Remote - IDLE + GNSS receiver operational		
Radiated Disturbance	Michael Mawby	UKAS

Table 7

Office Address:

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 Radiated Disturbance

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109
ICES-003, Clause 3.2

2.1.2 Equipment Under Test and Modification State

MiX 3410-B & BLE Remote, S/N: 33000050 - Modification State 0

2.1.3 Date of Test

02-August-2022 to 03-August-2022

2.1.4 Test Method

The EUT was set up on a non-conductive table 0.8 m above a reference ground plane within a semi-anechoic chamber on a remotely controlled turntable.

A pre-scan of the EUT emissions profile using a peak detector was made at a 3 m antenna distance whilst varying the antenna-to-EUT azimuth and polarisation.

For an EUT which could reasonable be used in multiple planes, pre-scans were performed with the EUT orientated in X, Y and Z planes with reference to the ground plane.

Using a list of the highest emissions detected during the pre-scan along with their bearing and associated antenna polarisation, the EUT was then formally measured using a Quasi-Peak, Peak or CISPR Average detector as appropriate.

The readings were maximised by adjusting the antenna height, polarisation and turntable azimuth, in accordance with the specification.

2.1.5 Example Calculation

Below 1 GHz:

Quasi-Peak level (dBµV/m) = Receiver level (dBµV) + Correction Factor (dB/m)
Margin (dB) = Quasi-Peak level (dBµV/m) - Limit (dBµV/m)

Above 1 GHz:

CISPR Average level (dBµV/m) = Receiver level (dBµV) + Correction Factor (dB/m)
Margin (dB) = CISPR Average level (dBµV/m) - Limit (dBµV/m)

Peak level (dBµV/m) = Receiver level (dBµV) + Correction Factor (dB/m)
Margin (dB) = Peak level (dBµV/m) - Limit (dBµV/m)

2.1.6 Example Test Setup Diagram

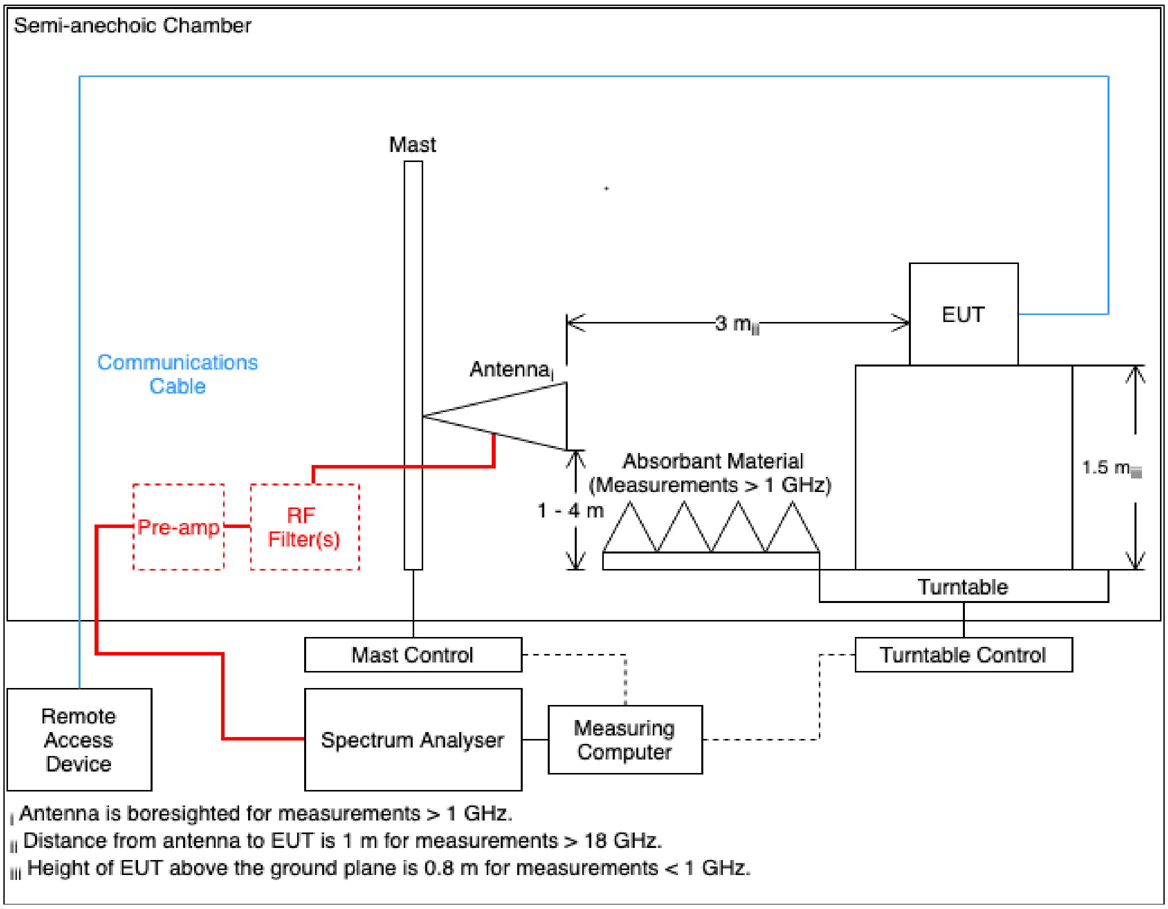

Figure 5

2.1.7 Environmental Conditions

Ambient Temperature 18.9 °C
Relative Humidity 56.3 %

2.1.8 Specification Limits

Required Specification Limits, Field Strength - Class B Test Limit at a 3 m Measurement Distance		
Frequency Range (MHz)	Test Limit (µV/m)	Test Limit (dBµV/m)
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

Supplementary information:
Note 1. A Quasi-peak detector is to be used for measurements below 1 GHz.
Note 2. A CISPR Average detector is to be used for measurements above 1 GHz.
Note 3. The Peak test limit above 1 GHz is 20 dB higher than the CISPR Average test limit.

Table 8

2.1.9 Test Results

Results for Configuration and Mode: DC Powered - MiX 3400-B and BLE Remote - IDLE + GNSS receiver operational.

This test was performed to the requirements of the Class B limits.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Highest frequency generated or used within the EUT: 2.69 GHz
Which necessitates an upper frequency test limit of: 13.50 GHz

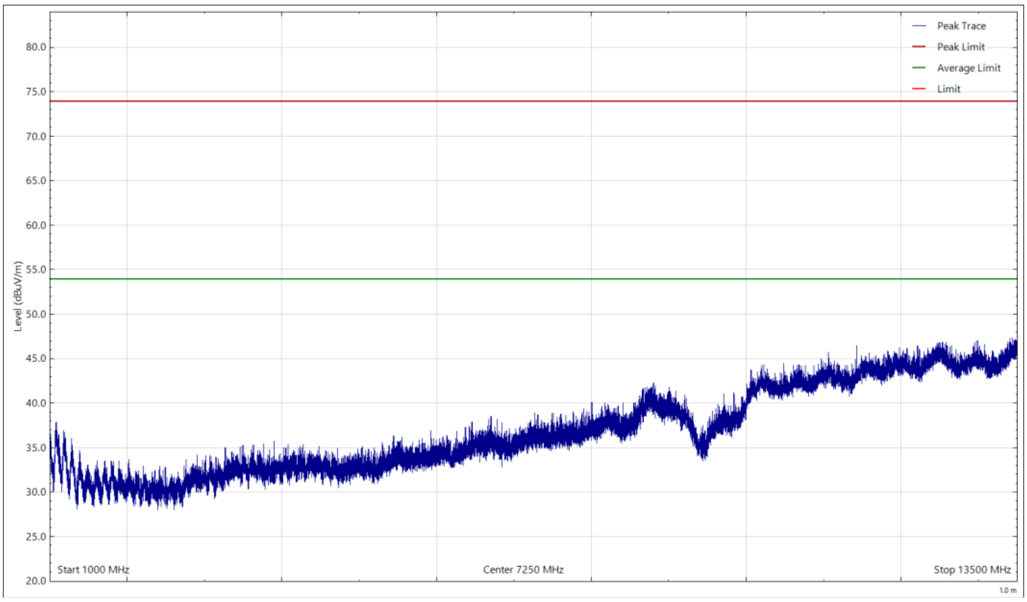

Figure 6 - 1 GHz to 13.5 GHz, Quasi-Peak, Horizontal - X Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 9

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

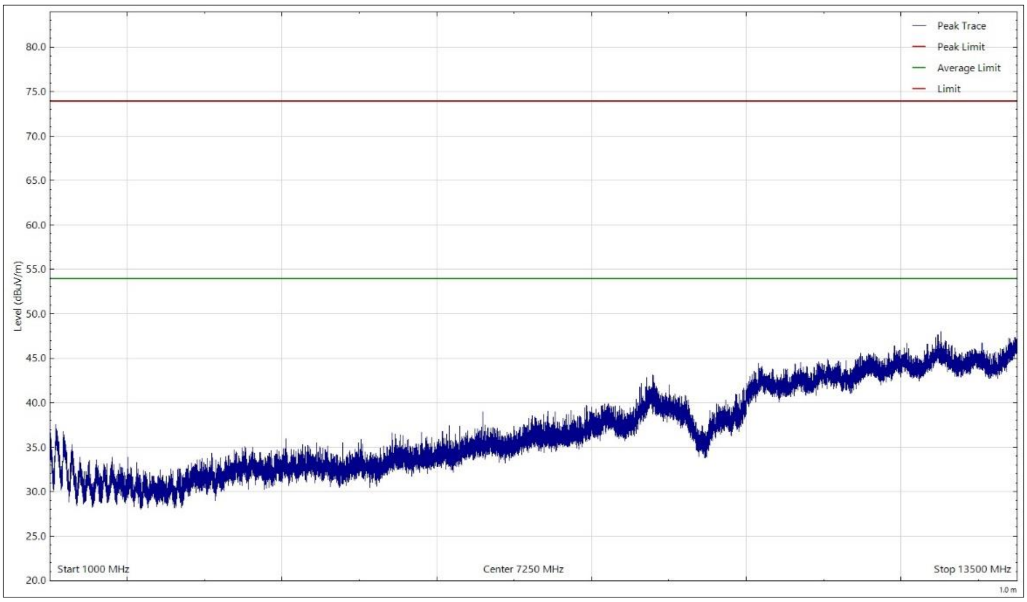

Figure 7 - 1 GHz to 13.5 GHz, Quasi-Peak, Vertical - X Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 10

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

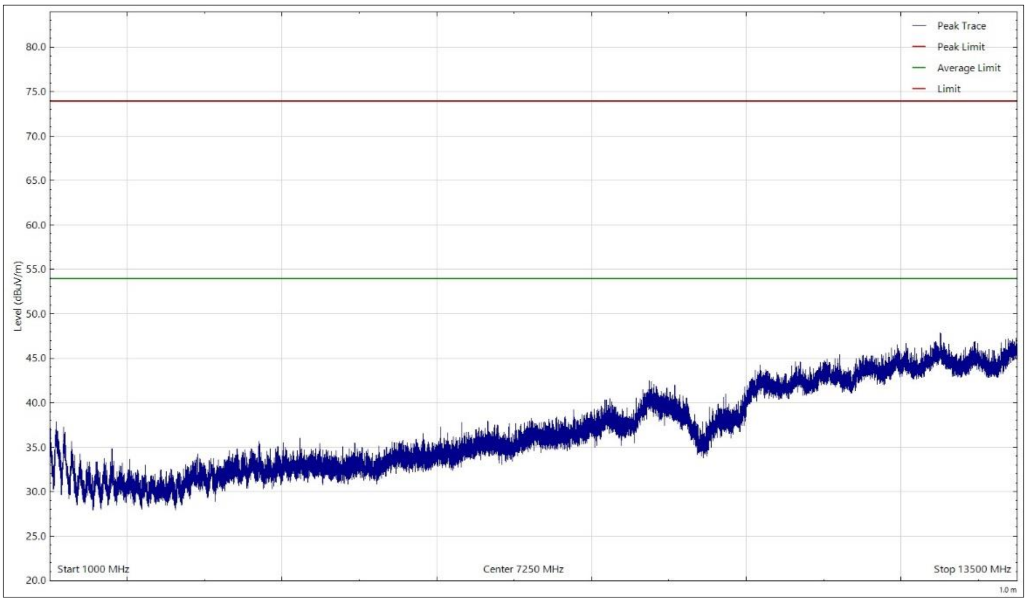

Figure 8 - 1 GHz to 13.5 GHz, Quasi-Peak, Horizontal - Y Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 11

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

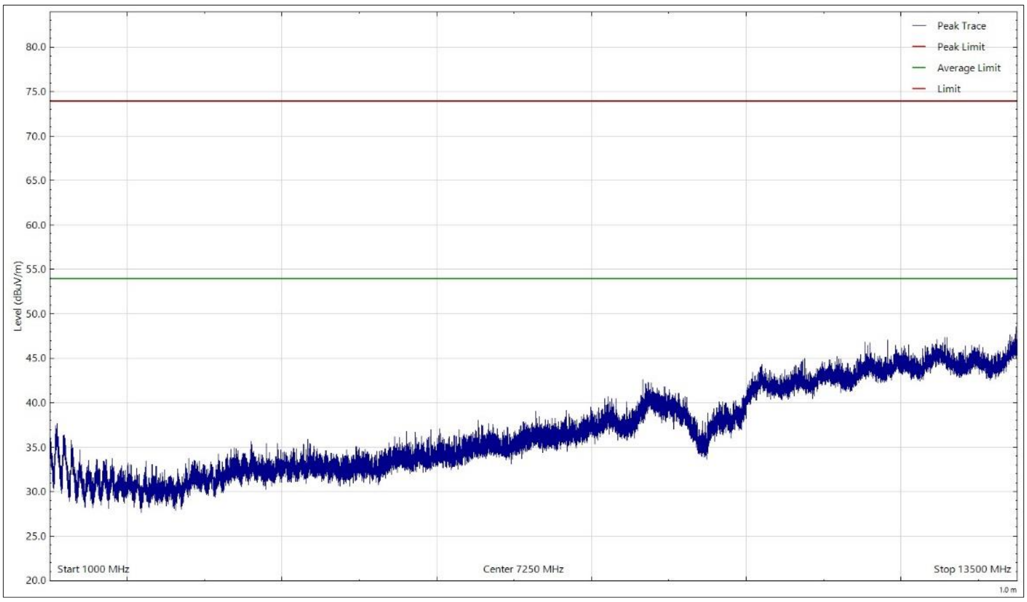

Figure 9 - 1 GHz to 13.5 GHz, Quasi-Peak, Vertical - Y Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 12

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

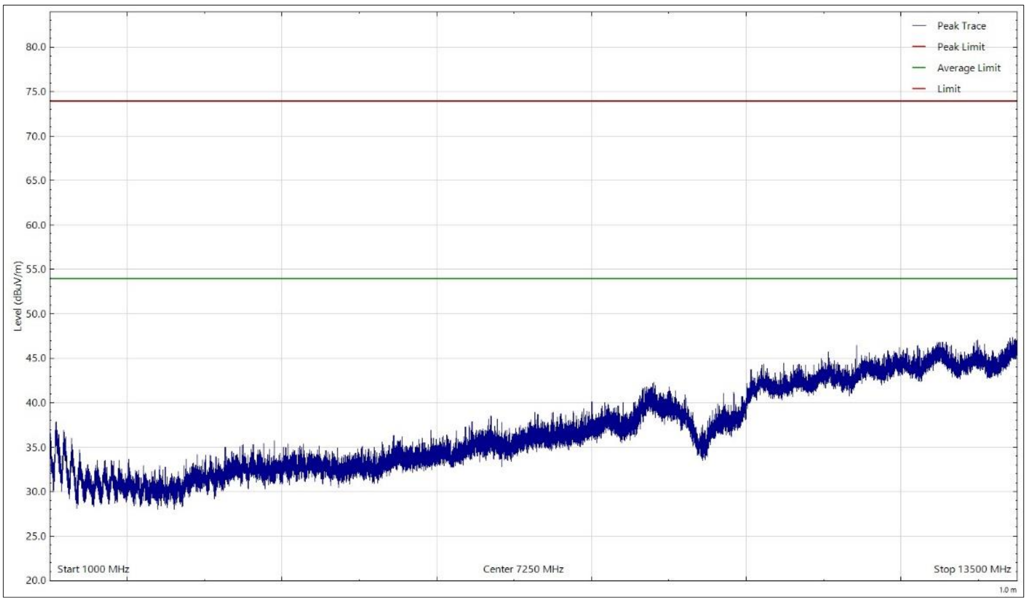

Figure 10 – 1 GHz to 13.5 GHz, Quasi-Peak, Horizontal - Z Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 13

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

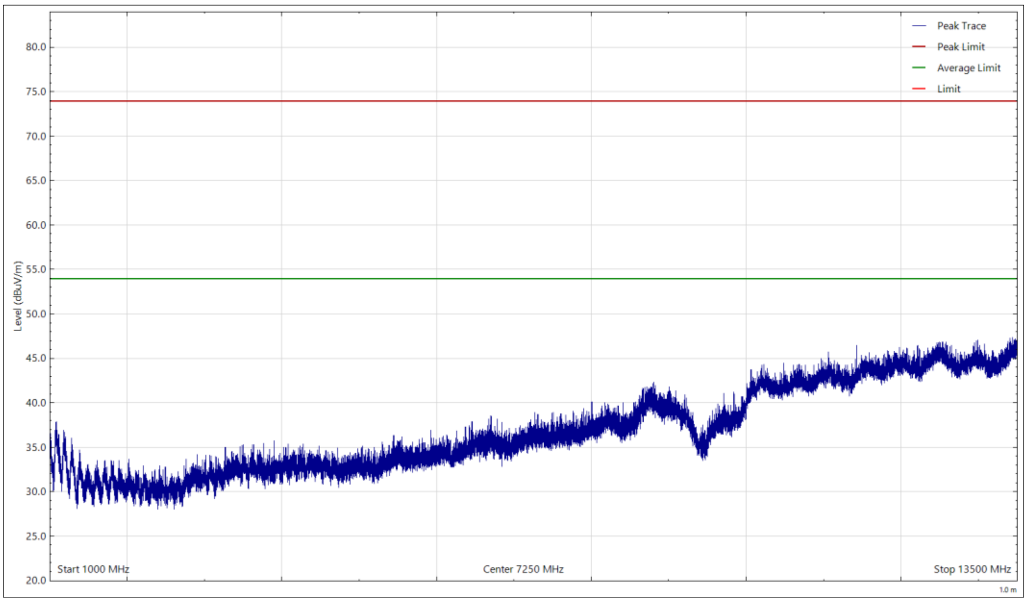

Figure 11 - 1 GHz to 13.5 GHz, Quasi-Peak, Vertical - Z Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 14

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

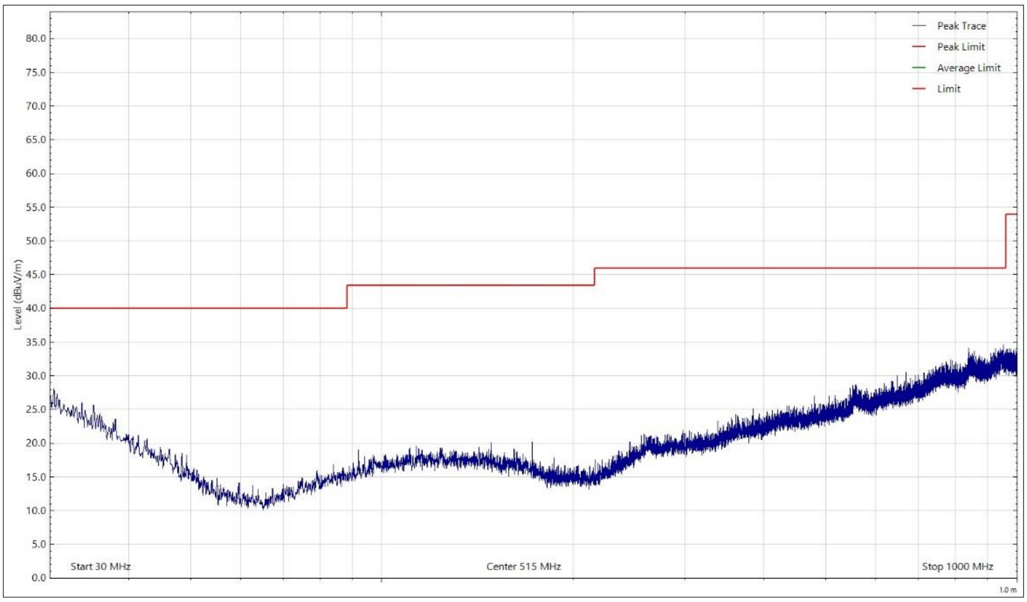

Figure 12 – 30 MHz to 1 GHz, Peak, Horizontal - X Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 15

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

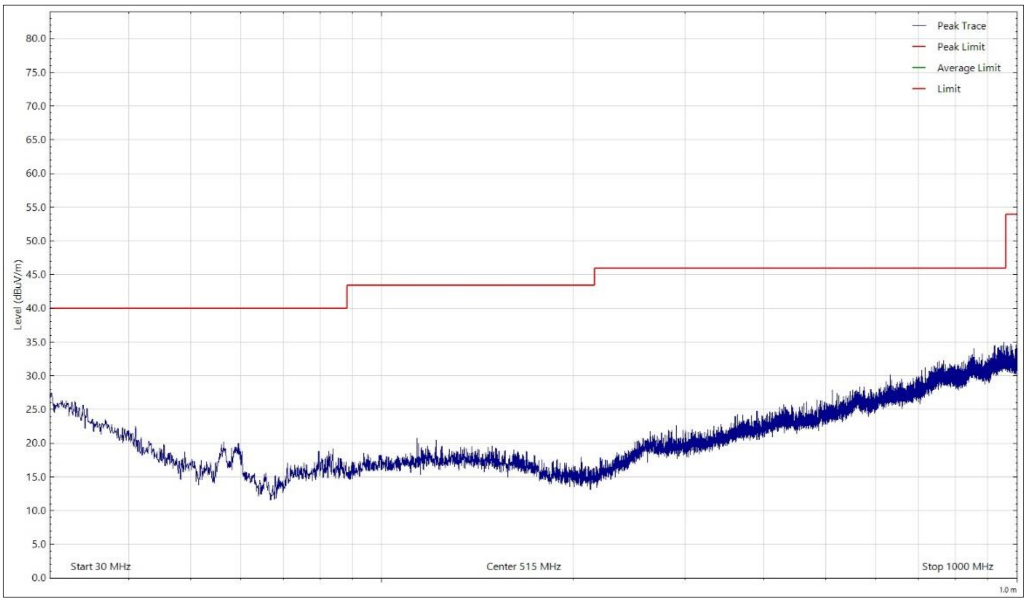

Figure 13 - 30 MHz to 1 GHz, Peak, Vertical - X Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 16

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

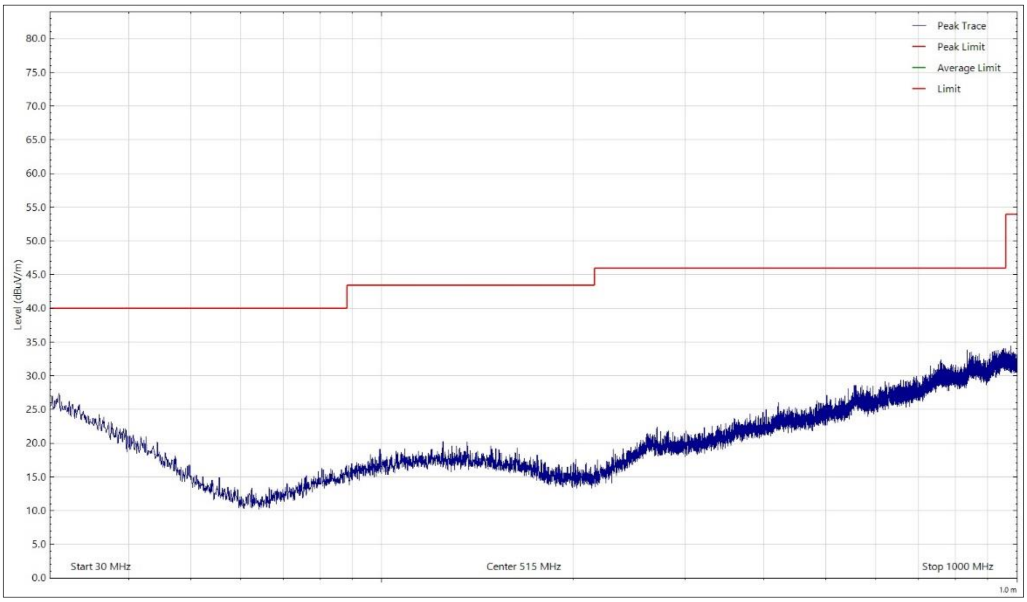

Figure 14 - 30 MHz to 1 GHz, Peak, Horizontal - Y Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 17

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

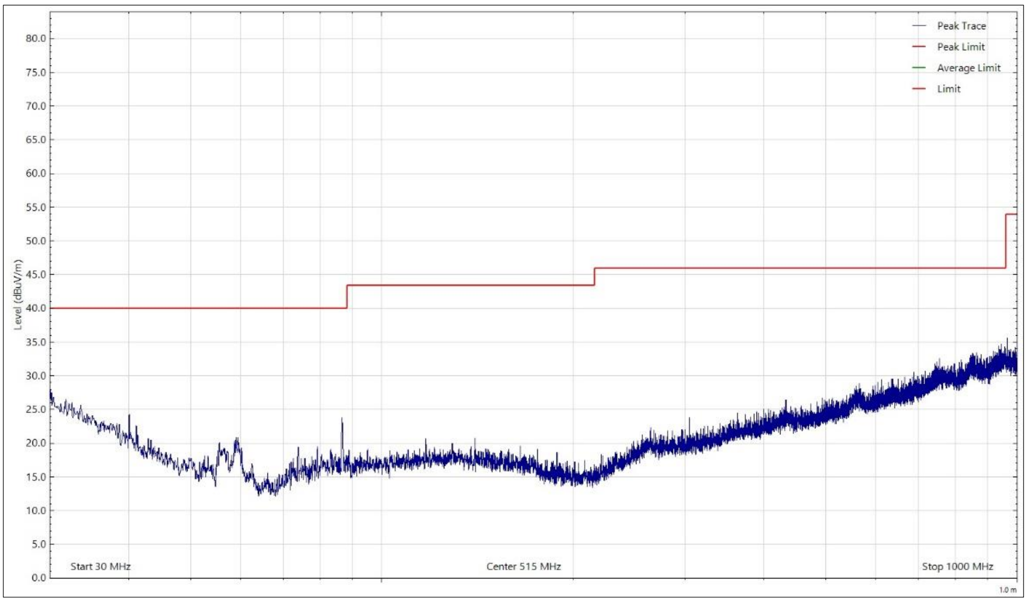

Figure 15 - 30 MHz to 1 GHz, Peak, Vertical - Y Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 18

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

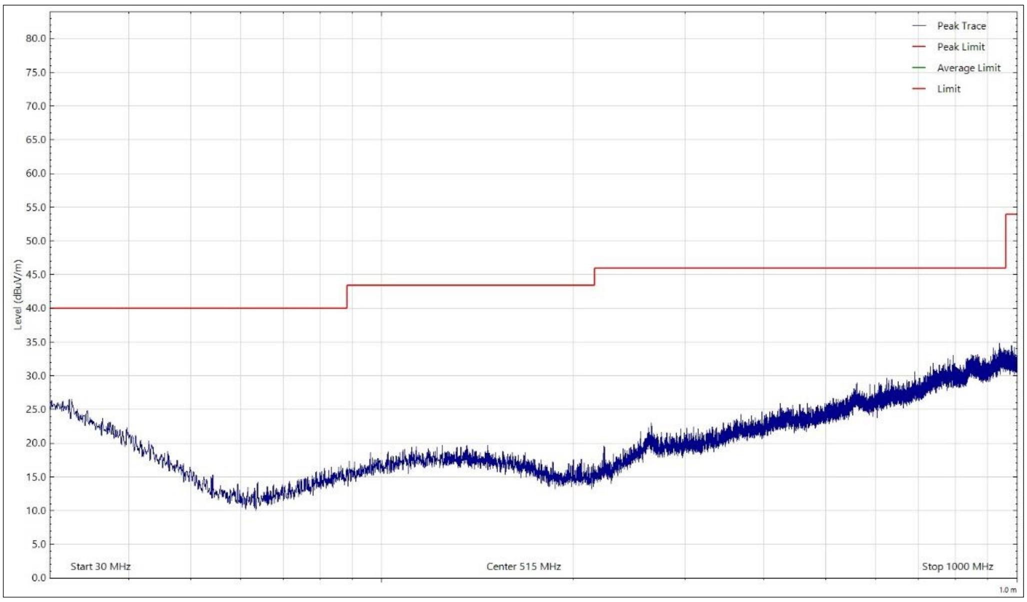

Figure 16 – 30 MHz to 1 GHz, Peak, Horizontal - Z Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 19

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

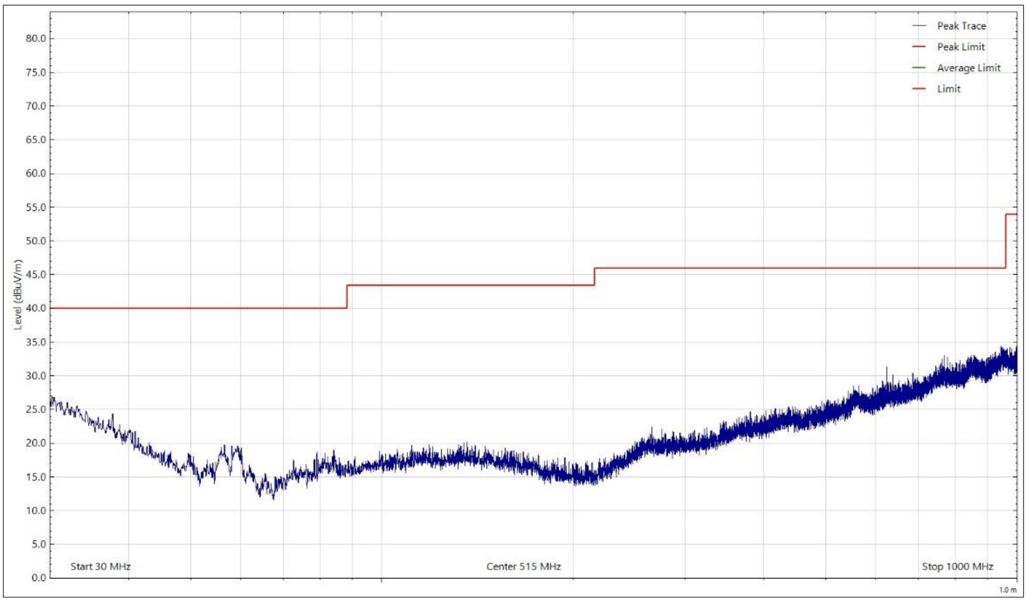

Figure 17 - 30 MHz to 1 GHz, Peak, Vertical - Z Orientation

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 20

*No final measurements were made as all peak emissions seen above the measurement system noise floor during the pre-scan were greater than 10 dB below the test limit.

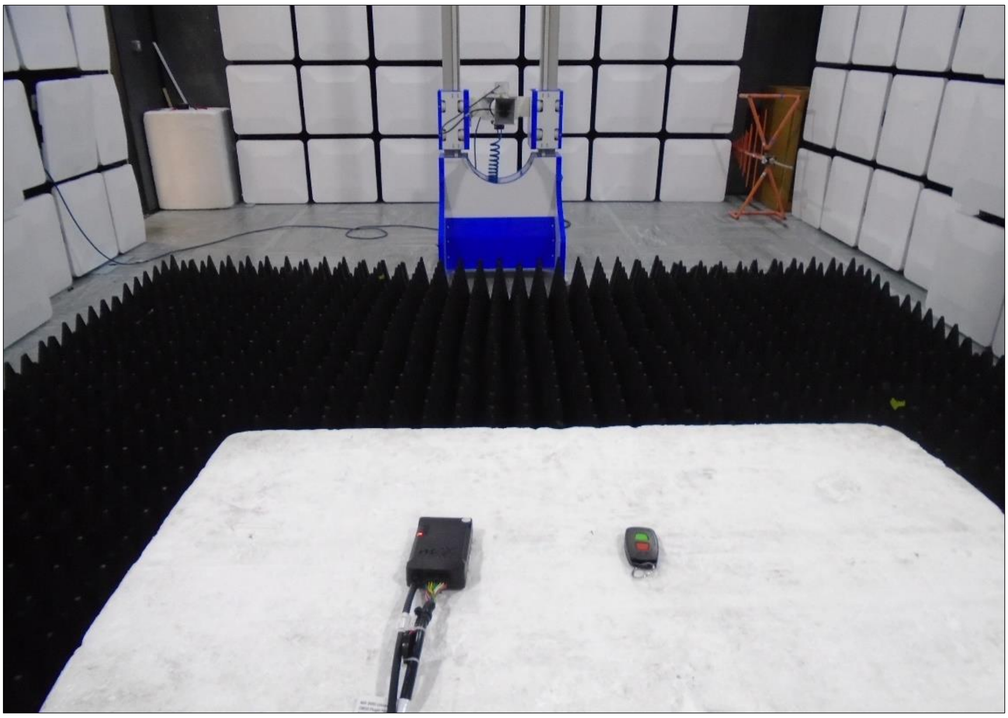

Figure 18 - Test Setup - 1 GHz to 13.5 GHz

Figure 19 - Test Setup - 30 MHz to 1 GHz

2.1.10 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Screened Room (12)	MVG	EMC-3	5621	36	11-Aug-2023
Emissions Software	TUV SUD	EmX V3.1.2	5125	-	N/A - Software
Test Receiver	Rohde & Schwarz	ESW44	5914	12	21-Feb-2023
Turntable & Mast Controller	Maturo Gmbh	NCD/498/2799.01	5612	-	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	5613	-	TU
Cable (SMA to SMA, 2 m)	Rhophase	3PS-1801A-2000-3PS	4113	12	27-Jan-2023
Cable (N-Type to N-Type, 8 m)	Teledyne	PR90-088-8MTR	5450	6	06-Oct-2022
Cable (K-Type to K-Type, 1 m)	Junkosha	MWX241-01000KMSKMS/A	5511	12	14-Apr-2023
Pre-Amplifier (8 GHz to 18 GHz)	Phase One	PS04-0086	1533	12	21-Feb-2023
Preamplifier (30dB 1GHz to 18GHz)	Schwarzbeck	BBV 9718 C	5261	12	08-Apr-2023
Antenna with attenuator (Bilog, 30 MHz to 3 GHz)	Schaffner	CBL6143	287	24	14-Oct-2022
Antenna (DRG, 1 GHz to 10.5 GHz)	Schwarzbeck	BBHA9120B	5611	12	15-Oct-2022
Antenna (DRG, 7.5 GHz to 18 GHz)	Schwarzbeck	HWRD750	5610	12	15-Oct-2022

Table 21

TU - Traceability Unscheduled

3 Test Equipment Information

3.1 General Test Equipment Used

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Comb Generator	Schaffner	RSG1000	3034	-	TU
Thermo-hygro-Barometer	PCE Instruments	PCE-THB-40	5472	12	25-Mar-2023

Table 22

4 Incident Reports

No incidents reports were raised.

5 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Radiated Disturbance	30 MHz to 1 GHz, Bilog Antenna, ±5.2 dB 1 GHz to 40 GHz, Horn Antenna, ±6.3 dB

Table 23

Worst case error for both Time and Frequency measurement 12 parts in 10^6.

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2007, Clause 4.4.3 and 4.5.1. (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.