FCC and ISED Test Report

Sepura Limited
TETRA Radio, Model: SC2328

In accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 90, ISED RSS-119 and ISED RSS-GEN (TETRA)

Prepared for: Sepura Limited
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United Kingdom

FCC ID: XX6SC2328X IC: 8739A-SC2328X

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Document 75959251-01 Issue 01

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	05 February 2024

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 2, FCC 47 CFR Part 90, ISED RSS-119 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Roscoe Harrison	05 February 2024	
	Ahmad Javid	05 February 2024	
	Thomas Biddlecombe	05 February 2024	

FCC Accreditation
492497/UK2010 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 2: 2021, FCC 47 CFR Part 90: 2022, ISED RSS-119: Issue 12 (05-2015) and ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) for the tests detailed in section 1.3.

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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	05-February-2024

Table 1

1.2 Introduction

Applicant	Sepura Limited
Manufacturer	Sepura Limited
Model Number(s)	SC2328
Serial Number(s)	1PR002336GKM4HR
Hardware Version(s)	PLX-2516505-02 (mod state 12)
Software Version(s)	1807 018 07367
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 90: 2022 FCC 47 CFR Part 2: 2021 ISED RSS-119: Issue 12 (05-2015) ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)
Order Number	PLC-PO026657-1
Date	24-August-2023
Date of Receipt of EUT	13-October-2023
Start of Test	17-October-2023
Finish of Test	16-November-2023
Name of Engineer(s)	Roscoe Harrison, Ahmad Javid and Thomas Biddlecombe
Related Document(s)	ANSI C63.26: 2015

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 90, ISED RSS-119 and ISED RSS-GEN is shown below.

Section	Specification Clause				Test Description	Result	Comments/Base Standard
	Part 2	Part 90	RSS-119	RSS-GEN			
Configuration and Mode: Tetra - 806-824 MHz							
2.1	2.1046	90.205	5.4	6.12	Maximum Conducted Output Power	Pass	ANSI C63.26: 2015
2.2	2.1053	90.210	5.8	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015
2.3	2.1051	90.210	5.8	6.13	Spurious Emissions at Antenna Terminals	Pass	
Configuration and Mode: Tetra - 851-869 MHz							
2.1	2.1046	90.205	5.4	6.12	Maximum Conducted Output Power	Pass	ANSI C63.26: 2015
2.2	2.1053	90.210	5.8	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015
2.3	2.1051	90.210	5.8	6.13	Spurious Emissions at Antenna Terminals	Pass	

Table 2

1.4 Application Form

Equipment Description

Technical Description: *(Please provide a brief description of the intended use of the equipment including the technologies the product supports)*	The SC2328 is a portable TETRA radio with GNSS functionality. It has TETRA transmit frequency ranges of 806-825 MHz and 851-870 MHz, and a TETRA receive frequency range of 851-870 MHz.		
Manufacturer:	Sepura Limited		
Model:	SC2328		
Part Number:	SC2328		
Hardware Version:	PLX-2516505-02 (mod state 12)		
Software Version:	1807 018 07367		
FCC ID of the product under test – see guidance here		XX6SC2328X	
IC ID of the product under test – see guidance here		8739A-SC2328X	
Device Category	Mobile ☐	Portable ☒	Fixed ☐
Equipment is fitted with an Audio Low Pass Filter		Yes ☒	No ☐

Table 3

Intentional Radiators

Technology	TETRA	TETRA				
Frequency Range (MHz to MHz)	806-824	851-869				
Conducted Declared Output Power (dBm)	34	34				
Antenna Gain (dBi)	1. 1.05 2. 7	1. 0.56 2. 7				
Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)	25 kHz	25 kHz				
Modulation Scheme(s) (e.g. GFSK, QPSK etc)	π/4 DQPSK	π/4 DQPSK				
ITU Emission Designator (see guidance here) (not mandatory for Part 15 devices)	22K0DXW	22K0DXW				
Bottom Frequency (MHz)	806.025	851.025				
Middle Frequency (MHz)	815	860				
Top Frequency (MHz)	823.975	868.975				

Table 4

Two antenna gains are given:

1. The maximum free space dBi for the specified frequency range of antennas used in a handheld system using the top antenna connector.
2. The maximum dBi provided by the antenna manufacturer for antennas used in a vehicle system using the rear connector.

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	1610 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	32.768 kHz
Class A Digital Device (Use in commercial, industrial or business environment) ☒ Class B Digital Device (Use in residential environment only) ☐	

Table 5

AC Power Source

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

Table 6

DC Power Source

Nominal voltage:	7.4	V
Extreme upper voltage:	7.4	V
Extreme lower voltage:	6.29	V
Max current:	2	A

Table 7

Battery Power Source

Voltage:	7.4	V
End-point voltage:	6.2	V *(Point at which the battery will terminate)*
Alkaline ☐ Leclanche ☐ Lithium ☒ Nickel Cadmium ☐ Lead Acid* ☐ **(Vehicle regulated)*		
Other ☐ Please detail:		

Table 8

Charging

Can the EUT transmit whilst being charged	Yes ☒ No ☐

Table 9

Temperature

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

Table 10

Cable Loss

Adapter Cable Loss (Conducted sample)	N/A	dB

Table 11

Antenna Characteristics

Antenna connector ☒			State impedance	50	Ohm
Temporary antenna connector ☐			State impedance		Ohm
Integral antenna ☐	Type:		Gain		dBi
External antenna ☒	Type:	300-00498 Quarter wave whip	Gain	1.05	dBi
External antenna ☒	Type:	9525-800-41021 ⅝ Wave (vehicle system)	Gain	7	dBi
External antenna ☒	Type:	350-00005 Whip (vehicle system)	Gain	5	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 ☐ All part 15 applications will need to show how the antenna gain was derived either from a manufacturer data sheet or a measurement. Where the gain of the antenna is inherently accounted for as a result of the measurement, such as field strength measurements on a part 15.249 or 15.231 device, so the gain does not necessarily need to be verified. However, enough information regarding the construction of the antenna shall be provided. Such information maybe photographs, length of wire antenna etc. The antenna port on top of the radio is 50 Ohm impendence and can be used for conducted tests					

Table 12

Ancillaries (if applicable)

Manufacturer:	Sepura	Part Number:	300-01384
Model:	Programming lead	Country of Origin:	Unknown
Manufacturer:	Sepura	Part Number:	300-01852
Model:	Standard Battery	Country of Origin:	Unknown
Manufacturer:	Sepura	Part Number:	300-01853
Model:	High Power Battery	Country of Origin:	Unknown
Manufacturer:	Sepura	Part Number:	300-02064
Model:	High Retention Battery	Country of Origin:	Unknown
Manufacturer:	Sepura	Part Number:	300-01930
Model:	1+1 Charger	Country of Origin:	Unknown
Manufacturer:	Sepura	Part Number:	300-00389
Model:	RSM	Country of Origin:	Unknown

Table 13

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

Name: Chris Beecham
Position held: Conformance Engineer
Date: 28 September 2023

1.5 Product Information

1.5.1 Technical Description

The SC2328 is a portable TETRA radio with GNSS functionality.

It has TETRA transmit frequency ranges of 806-825 MHz and 851-870 MHz, and a TETRA receive frequency range of 851-870 MHz.

1.6 Deviations from the Standard

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

1.7 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: SC2328, Serial Number: 1PR002336GKM4HR			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 14

1.8 Test Location

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Tetra - 806-824 MHz		
Spurious Emissions at Antenna Terminals	Thomas Biddlecombe	UKAS
Radiated Spurious Emissions	Ahmad Javid	UKAS
Maximum Conducted Output Power	Roscoe Harrison	UKAS
Configuration and Mode: Tetra - 851-869 MHz		
Maximum Conducted Output Power	Roscoe Harrison	UKAS
Spurious Emissions at Antenna Terminals	Thomas Biddlecombe	UKAS
Radiated Spurious Emissions	Ahmad Javid	UKAS

Table 15

Office Address:

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

2 Test Details

2.1 Maximum Conducted Output Power

2.1.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1046
FCC 47 CFR Part 90, Clause 90.205
ISED RSS-119, Clause 5.4
ISED RSS-GEN, Clause 6.12

2.1.2 Equipment Under Test and Modification State

SC2328, S/N: 1PR002336GKM4HR - Modification State 0

2.1.3 Date of Test

18-October-2023

2.1.4 Test Method

The test was applied in accordance with the test method requirements of Industry Canada RSS-119, and ISED RSS-GEN with reference to ANSI C63.26, clause 5.2.4.3.2

The EUT was configured to transmit on maximum power on the bottom, middle and top channels in burst mode. The EUT was connected to a spectrum analyser via a coaxial cable and 30 dB of attenuation. The path loss was calculated from calibration data, summed with the Duty Cycle Correction Factor and entered as a reference level offset in the spectrum analyser.

The RBW of the spectrum analyser was set to 30 kHz and the video bandwidth to 100 kHz with the trace set to average using an RMS detector and the result was recorded.

2.1.5 Environmental Conditions

Ambient Temperature	21.1 - 21.7 °C
Relative Humidity	38.7 - 53.9 %

2.1.6 Test Results

Tetra - 806-824 MHz

Parameter	806.025 MHz	815.000 MHz	823.975 MHz
Conducted Output Power (dBm)	34.25	34.25	34.28
Manufacturer Declared Power (dBm)	34.00	34.00	34.00
Δ from manufacturer Power (dB)	0.25	0.25	0.28
Antenna Gain (dBi)	7.00	7.00	7.00
ERP (dBm)	39.10	39.1	39.13

Table 16 - ERP

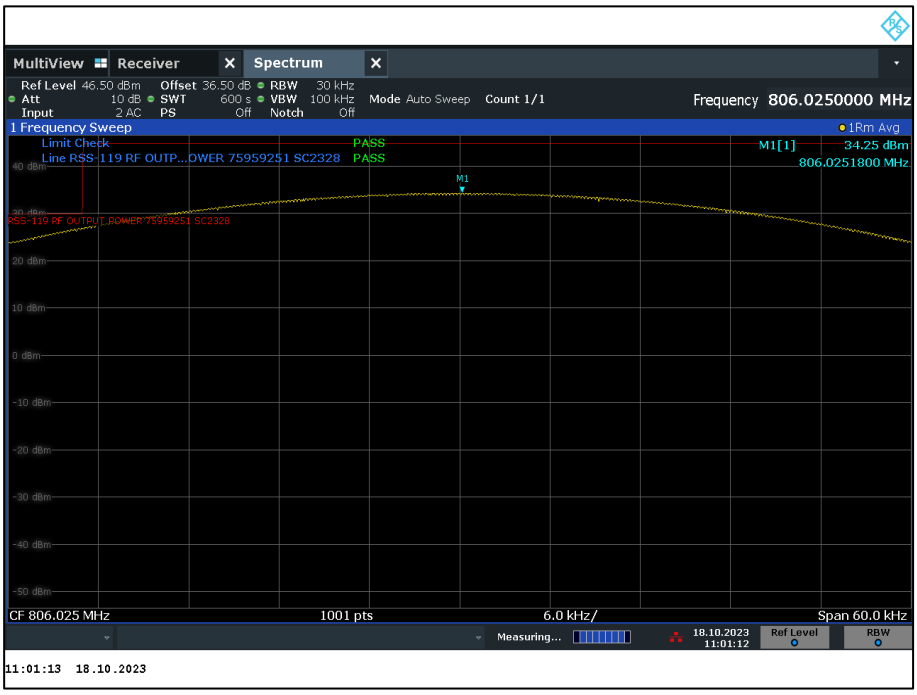


Figure 1 - 806.025 MHz

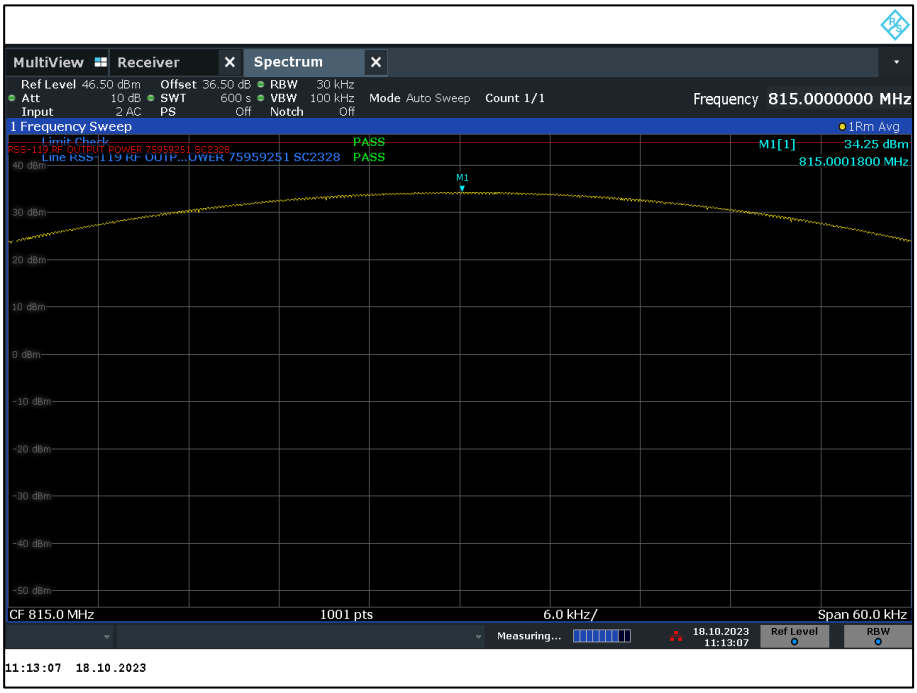


Figure 2 – 815.000 MHz

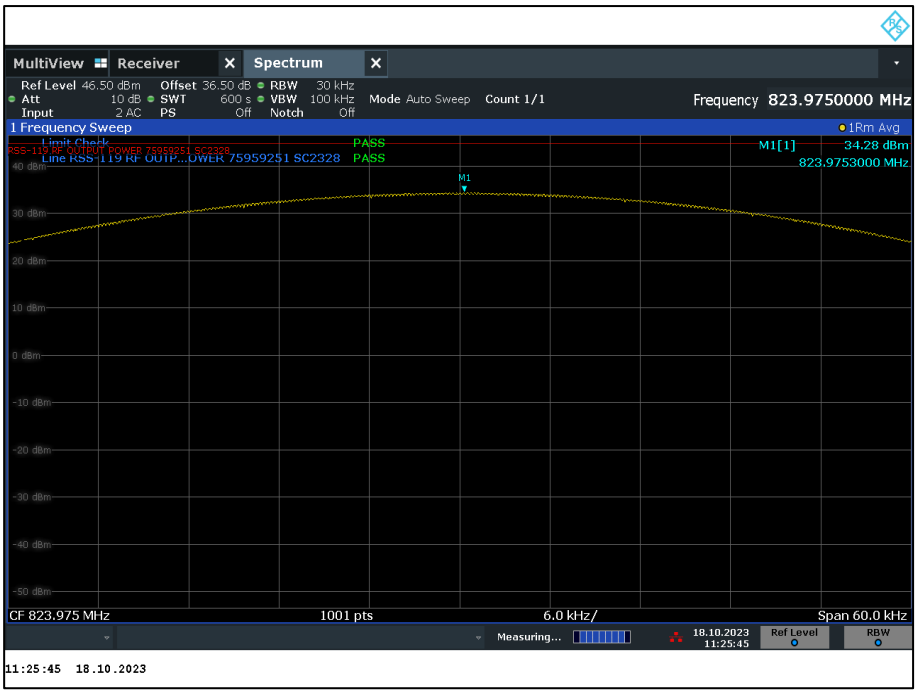


Figure 3 - 823.975 MHz

Tetra - 851-869 MHz

Parameter	851.025 MHz	860.000 MHz	868.975 MHz
Conducted Output Power (dBm)	34.13	34.05	33.95
Manufacturer Declared Power (dBm)	34.00	34.00	34.00
Δ from manufacturer Power (dB)	0.13	0.05	-0.05
Antenna Gain (dBi)	7.00	7.00	7.00
ERP (dBm)	38.98	38.90	38.80

Table 17 - ERP

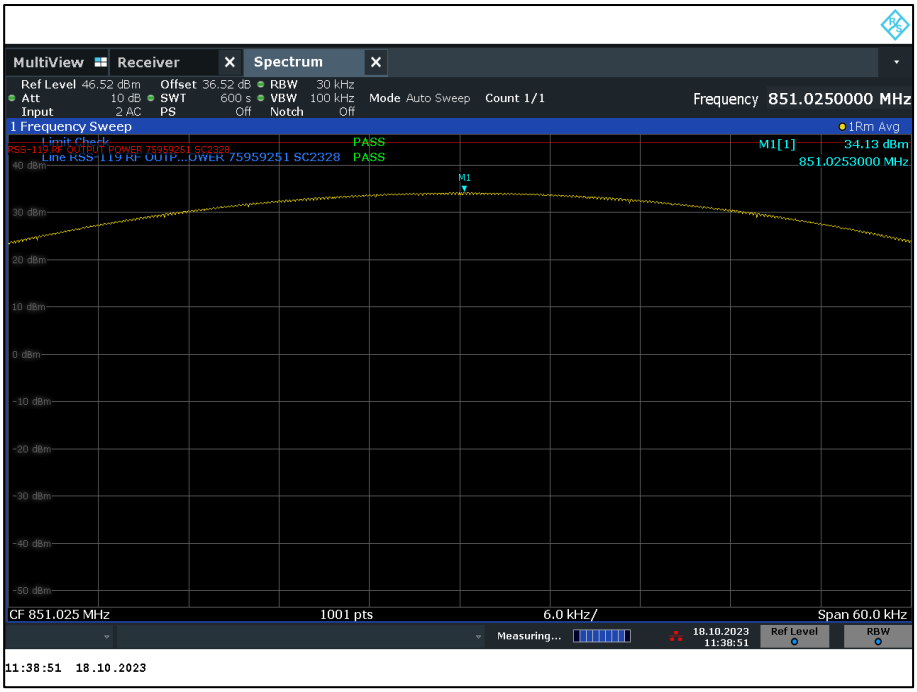


Figure 4 - 851.025 MHz

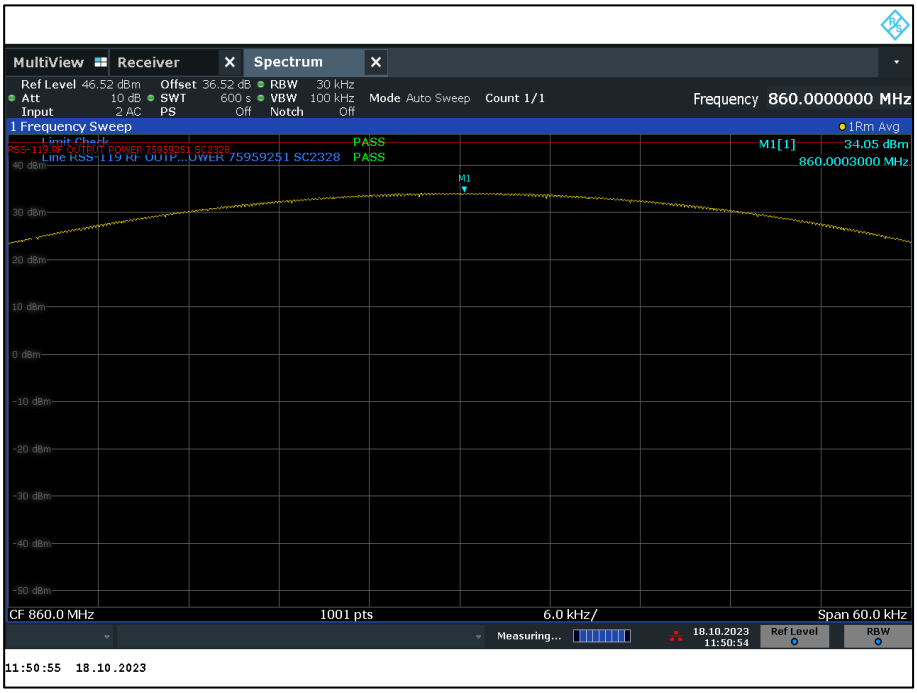


Figure 5 – 860.000 MHz

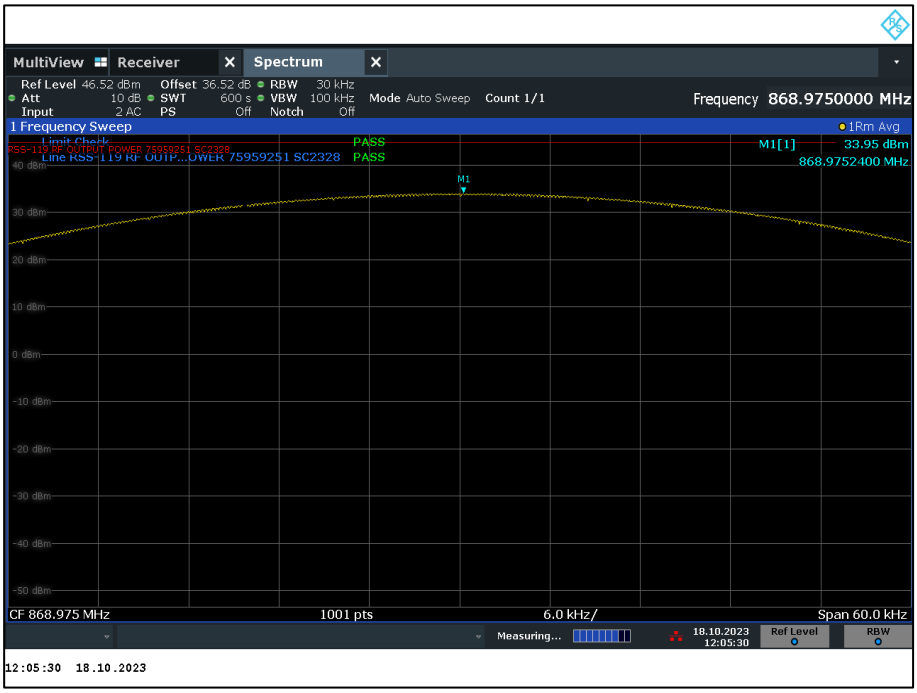


Figure 6 - 868.975 MHz

FCC 47 CFR Part 90, Limit Clause 90.205

Frequency (MHz)	Limit
< 25	1000 W
25 to 50	300 W
72 to 76	300 W
150 to 174	Refer to 90.205 (d) of the specification
217 to 220	Refer to 90.259 of the specification
220 to 222	Refer to 90.729 of the specification
421 to 430	Refer to 90.279 of the specification
450 to 470	Refer to 90.205 (h) of the specification
470 to 512	Refer to 90.307 and 90.309 of the specification
758 to 775 and 788 to 805	Refer to 90.541 and 90.542 of the specification
806 to 824, 851 to 869, 869 to 901 and 935 to 940	Refer to 90.635 of the specification
902 to 927.25	LMS systems operating pursuant to subpart M of the specification : 30 W
927.25 to 928	LMS equipment: 300 W
929 to 930	Refer to 90.494 of the specification
1427 to 1429.5 and 1429.5 to 1432	Refer to 90.259 of the specification
2450 to 2483.5	5 W
4940 to 4990	Refer to 90.1215 of the specification
5850 to 5925	Refer to subpart M of the specification
All other frequency bands	On a case by case basis

Table 18 - FCC Limits for Maximum ERP

ISED RSS-119, Limit Clause 5.4

The output power shall be within ±1 dB of the manufacturer's rated power listed in the equipment specifications.

Frequency (MHz)	Transmitter Output Power (W)	
	Base/Fixed Equipment	Mobile Equipment
27.41 to 28 and 29.7 to 50	300	30
72 to 76	No Limit	1
138 to 174	111100	60
217 to 217 and 219 to 220	See SRSP-512 for ERP limit	30*
220 to 222	110	50
406.1 to 430 and 450 to 470	See SRSP-511 for ERP limit	60
768 to 776 and 798 to 806	110	30 3 W ERP for portable equipment
806 to 821, 851 to 866, 821 to 824 and 866 to 869	110	30
896 to 901 and 935 to 940	110	60
929 to 930 and 931 to 932	110	30
928 to 929, 952 to 953, 932 to 932.5 and 941 to 941.5	110	30
932.5 to 935 ad 941.5 to 944	110	30
*Equipment is generally authorised for effective radiated power (ERP) of less than 5 W.		

Table 19 - ISED Limits for Transmitter Output Power

2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Power Supply Unit	Hewlett Packard	6282A	132	-	TU
Screened Room (5)	Rainford	Rainford	1545	36	15-Apr-2024
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	13-Mar-2024
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	08-Aug-2024
Cable (40 GHz)	Rosenberger	LU1-001-1000	5022	12	29-Jan-2024
EMI Test Receiver	Rohde & Schwarz	ESW44	5527	12	15-Jun-2024
DVM - Digital Multimeter	Iso-tech	IDM101	5601	12	20-Feb-2024

Table 20

TU - Traceability Unscheduled

2.2 Radiated Spurious Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.210
FCC 47 CFR Part 2, Clause 2.1053
ISED RSS-119, Clause 5.8
ISED RSS-GEN, Clause 6.13

2.2.2 Equipment Under Test and Modification State

SC2328, S/N: 1PR002336GKM4HR - Modification State 0

2.2.3 Date of Test

28-October-2023 to 29-October-2023

2.2.4 Test Method

A preliminary profile of the Radiated Spurious Emissions was obtained up to the 5th harmonic by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Testing was performed in accordance with ANSI C63.26, Clause 5.5.

Prescans and final measurements were performed using the direct field strength method.

Field strength measurements were performed and then converted to Equivalent Power Measurements in accordance with ANSI C63.26, Clause 5.2.7 equation c)

Example calculation:

E (dBuV/m) + 20log(d) - 104.8 = EIRP (dBm) where (d) is the measurement distance.

82.2 (dBuV/m) + 20log(3) – 104.8 = EIRP (dBm)

-13.0 = EIRP (dBm)

2.2.5 Example Test Setup Diagram

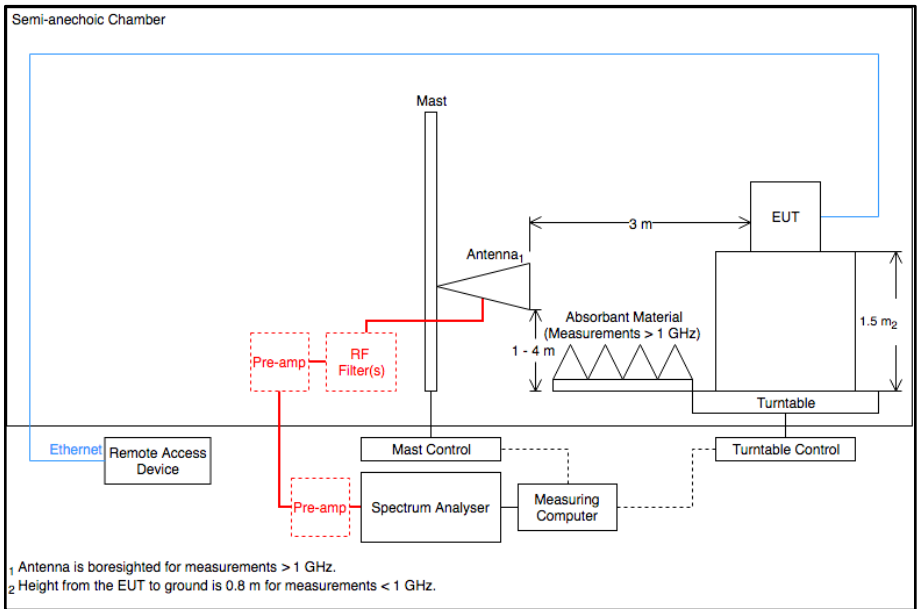


Figure 7 – Test Setup Diagram

2.2.6 Environmental Conditions

Ambient Temperature	20.1 - 20.5 °C
Relative Humidity	47.6 - 49.8 %

2.2.7 Test Results

Tetra - 806-824 MHz

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

Table 21 - 806.025 MHz

*No emissions were detected within 10 dB of the limit.

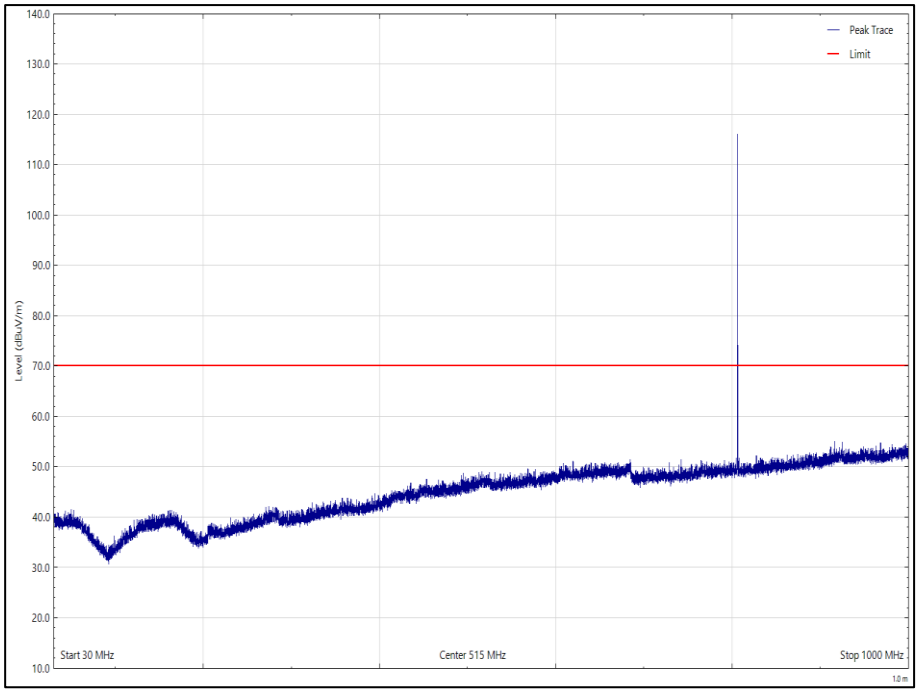


Figure 8 - 806.025 MHz - 30 MHz to 1 GHz, EUT Orientation X Horizontal

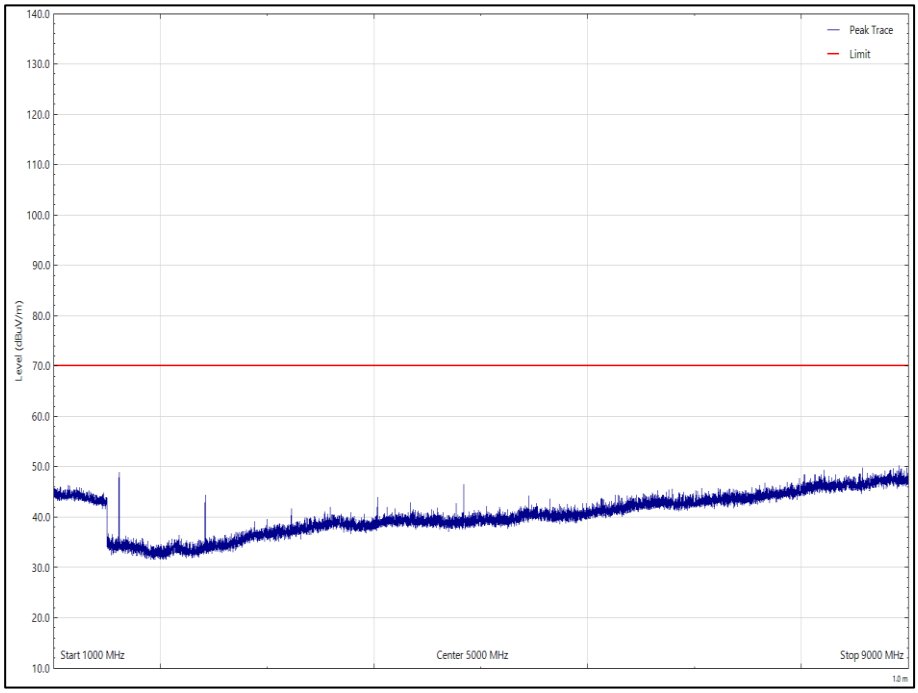


Figure 9 - 806.025 MHz - 1 GHz to 9 GHz, EUT Orientation X Horizontal

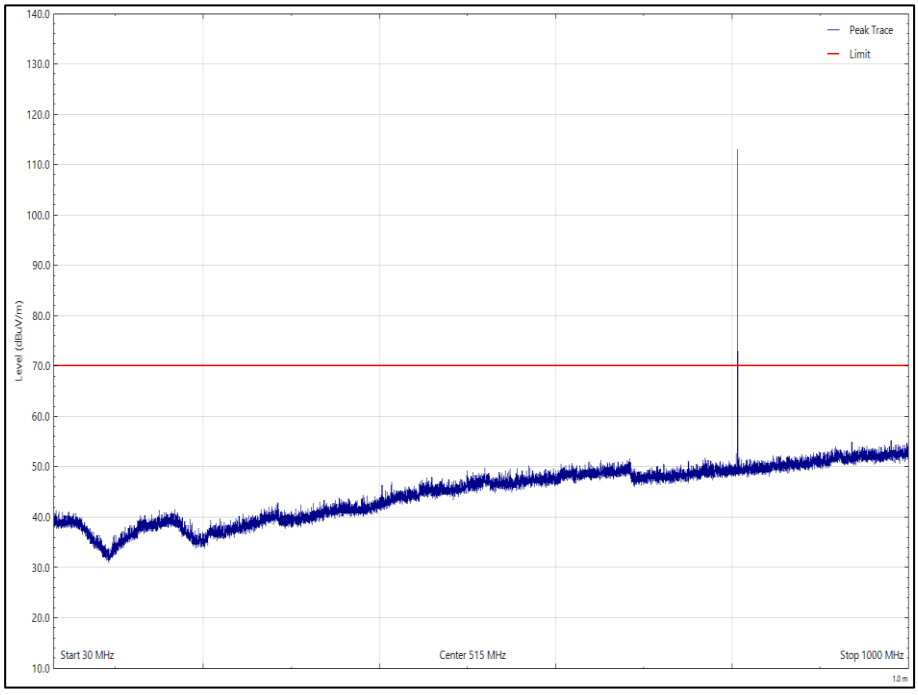


Figure 10 - 806.025 MHz - 30 MHz to 1 GHz, EUT Orientation X Vertical

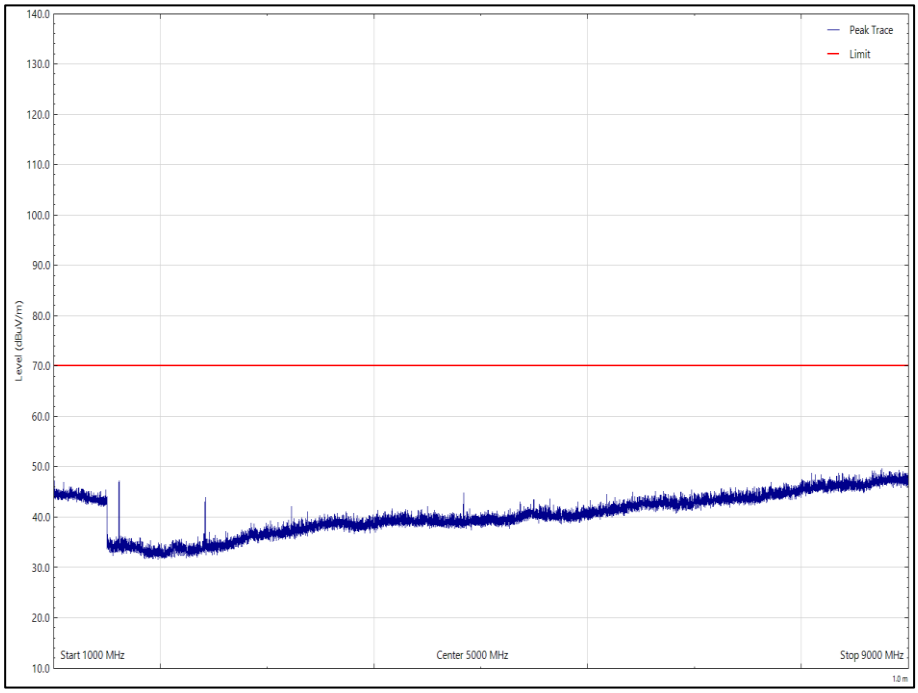


Figure 11 - 806.025 MHz - 1 GHz to 9 GHz, EUT Orientation X Vertical

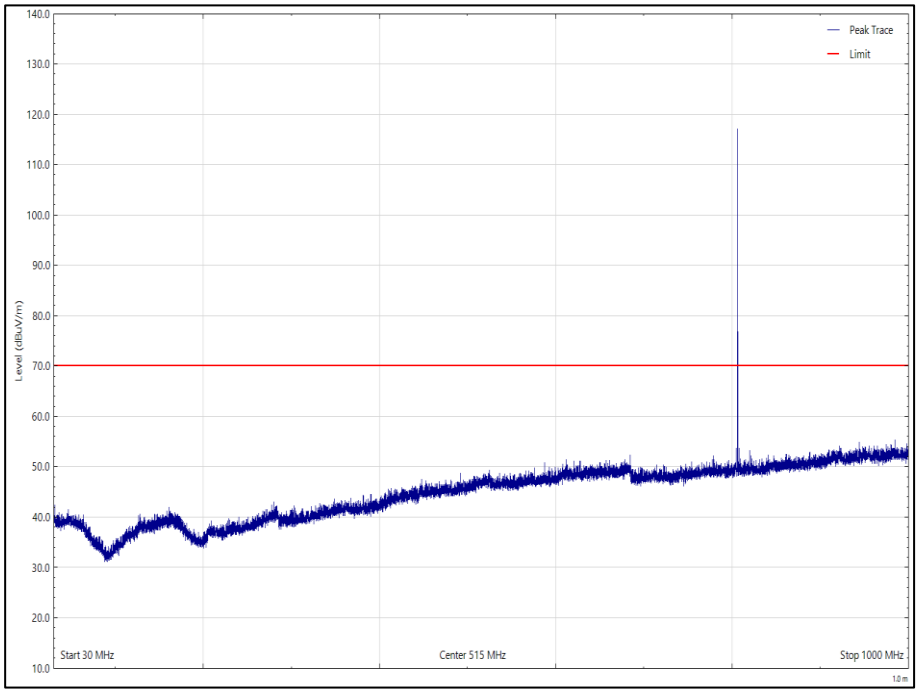


Figure 12 - 806.025 MHz - 30 MHz to 1 GHz, EUT Orientation Y Horizontal

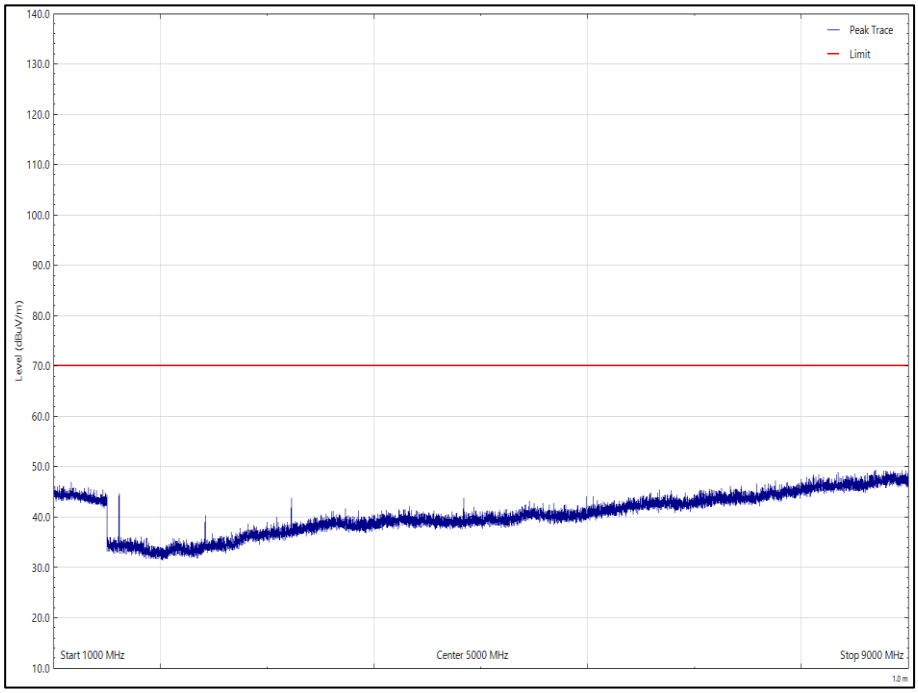


Figure 13 - 806.025 MHz - 1 GHz to 9 GHz, EUT Orientation Y Horizontal

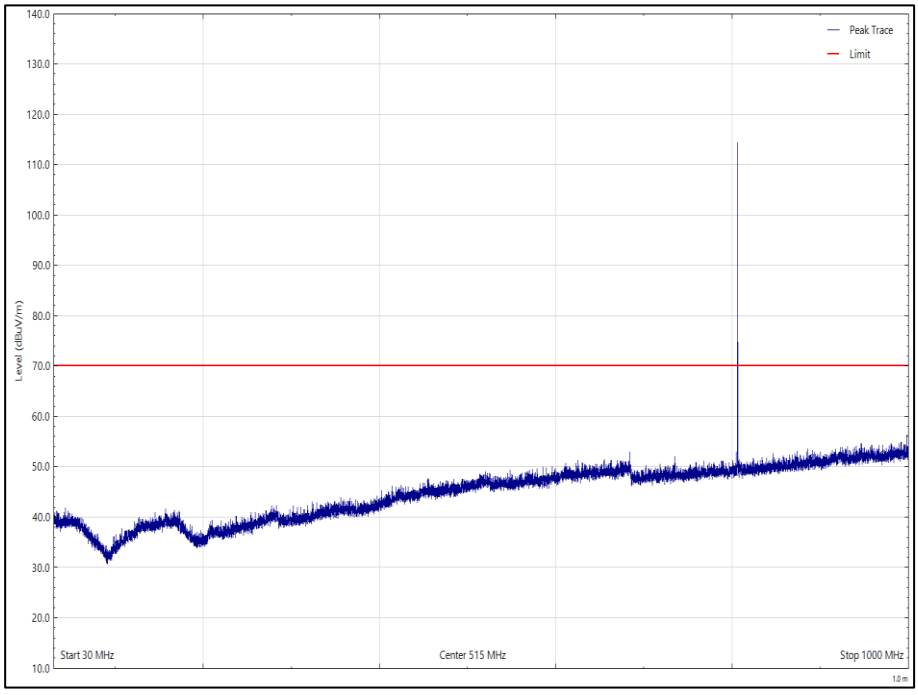


Figure 14 - 806.025 MHz - 30 MHz to 1 GHz, EUT Orientation Y Vertical

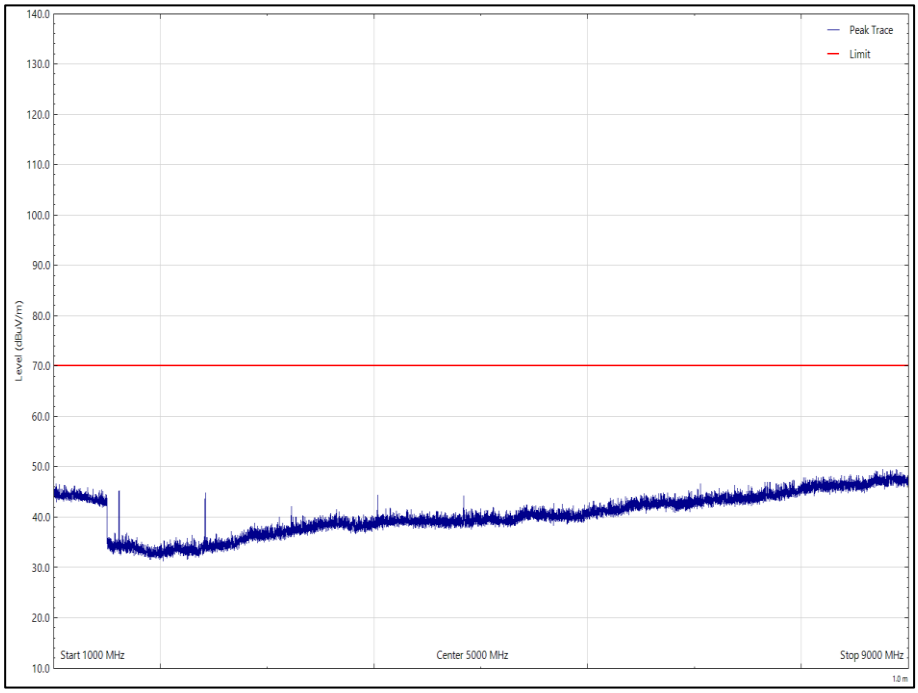


Figure 15 - 806.025 MHz - 1 GHz to 9 GHz, EUT Orientation Y Vertical

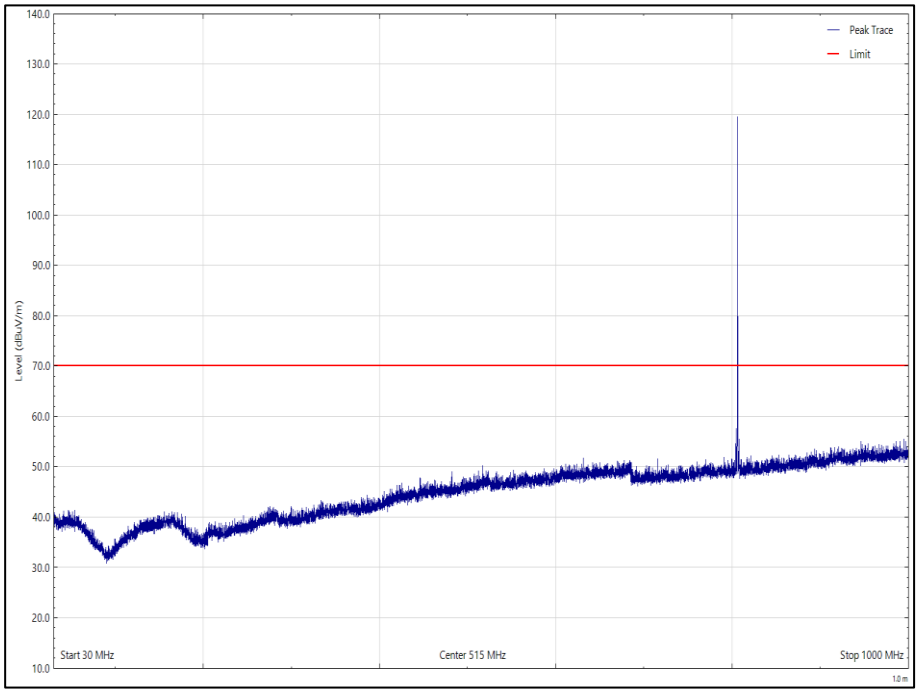


Figure 16 - 806.025 MHz - 30 MHz to 1 GHz, EUT Orientation Z Horizontal

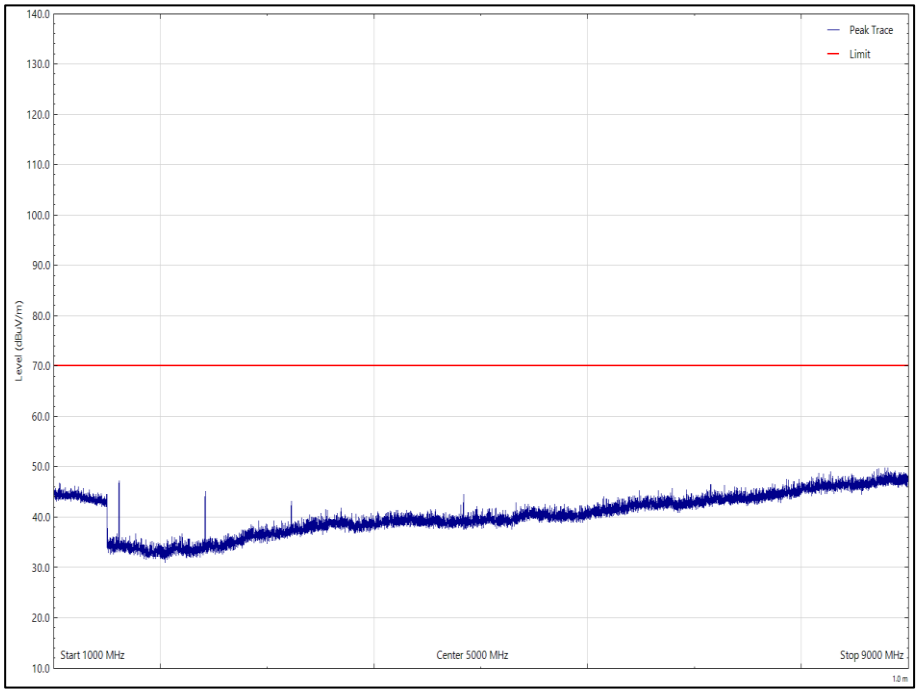


Figure 17 - 806.025 MHz - 1 GHz to 9 GHz, EUT Orientation Z Horizontal

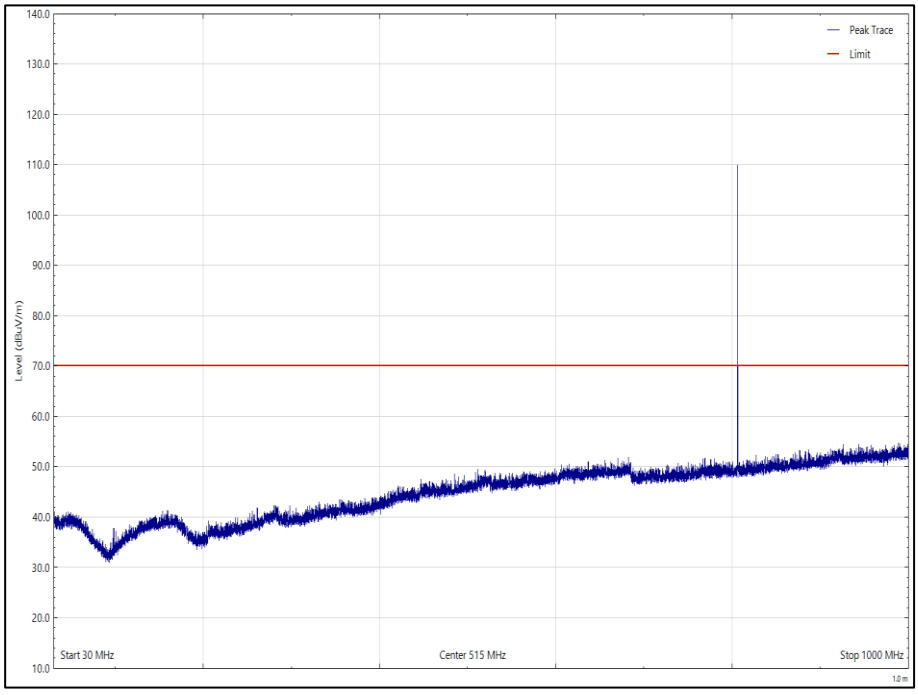


Figure 18 - 806.025 MHz - 30 MHz to 1 GHz, EUT Orientation Z Vertical

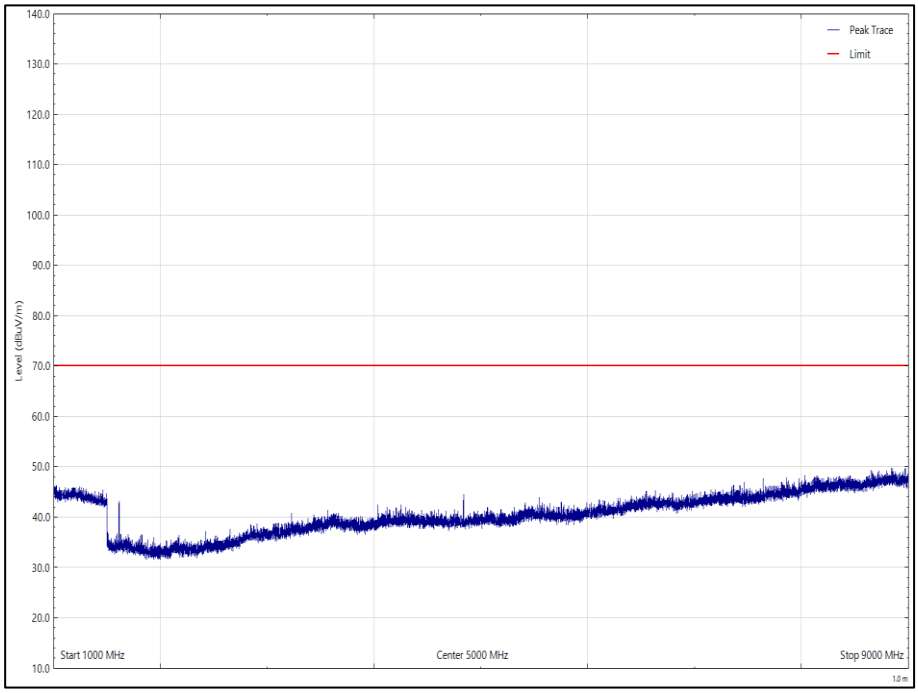


Figure 19 - 806.025 MHz - 1 GHz to 9 GHz, EUT Orientation Z Vertical

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

Table 22 - 815 MHz

*No emissions were detected within 10 dB of the limit.

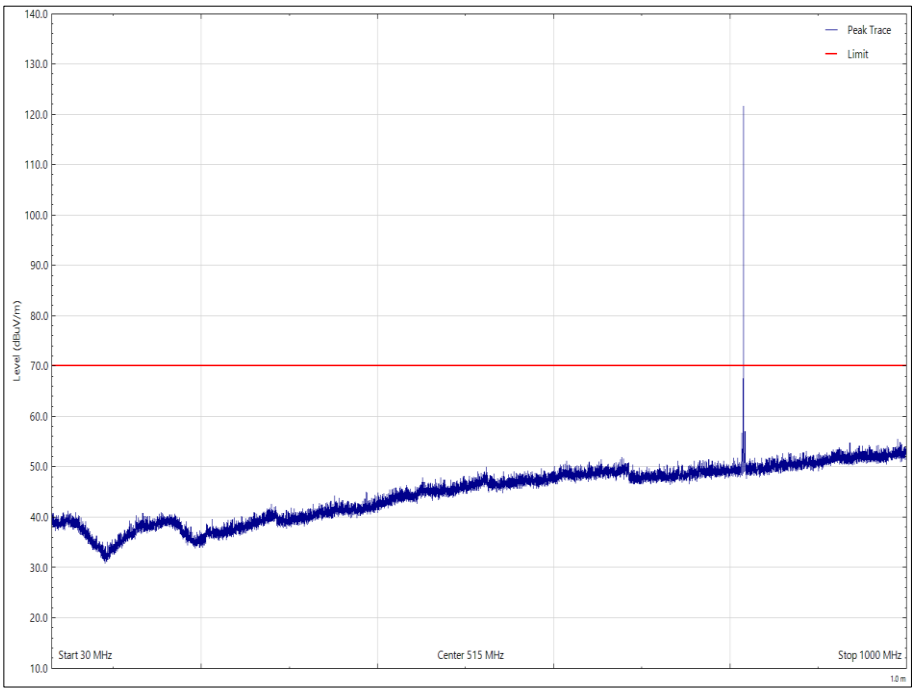


Figure 20 - 815 MHz - 30 MHz to 1 GHz, EUT Orientation X Horizontal

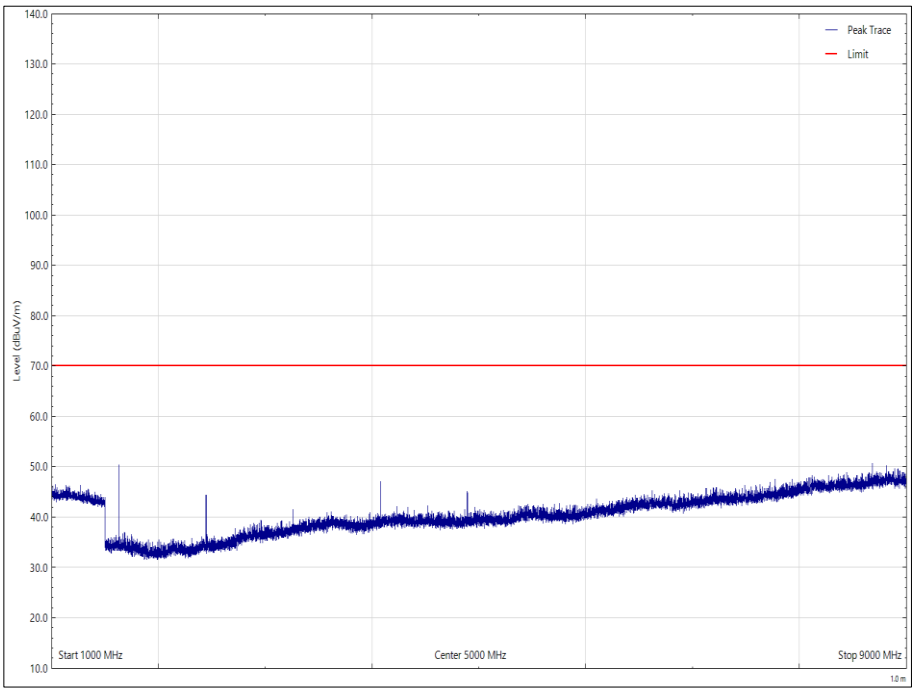


Figure 21 - 815 MHz - 1 GHz to 9 GHz, EUT Orientation X Horizontal

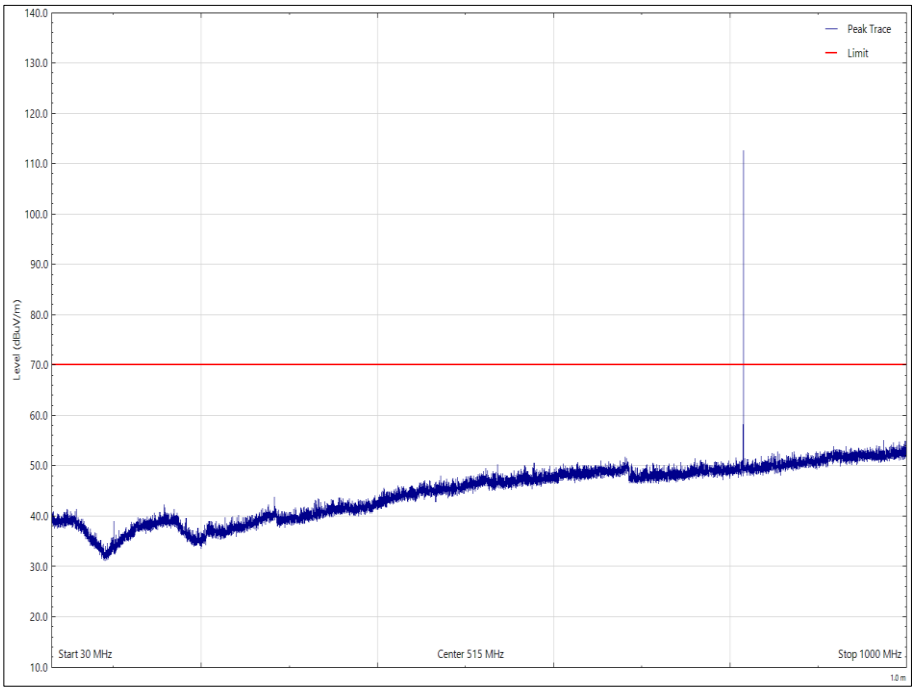


Figure 22 - 815 MHz - 30 MHz to 1 GHz, EUT Orientation X Vertical

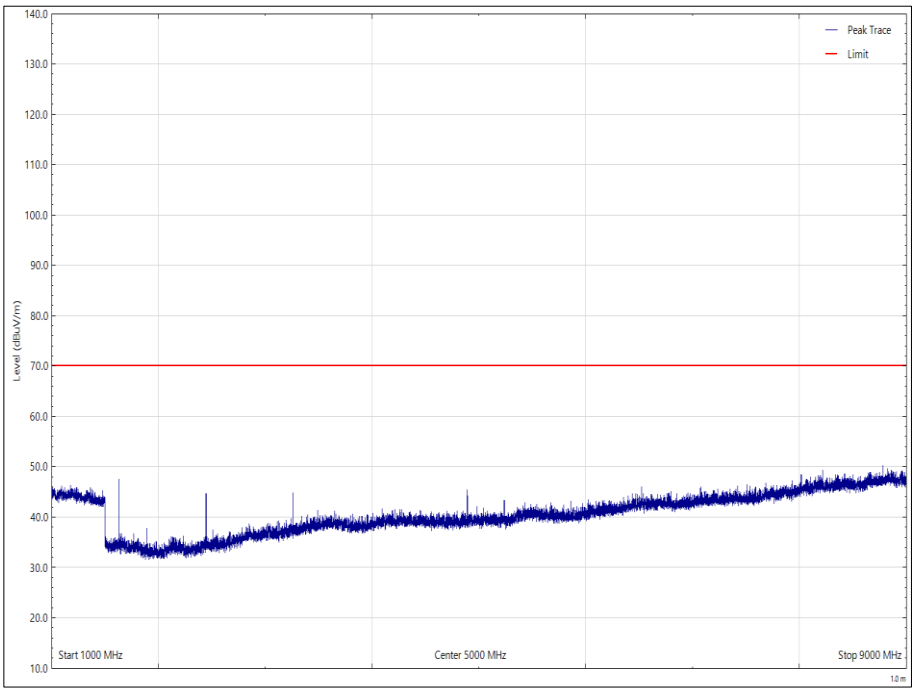


Figure 23 - 815 MHz - 1 GHz to 9 GHz, EUT Orientation X Vertical

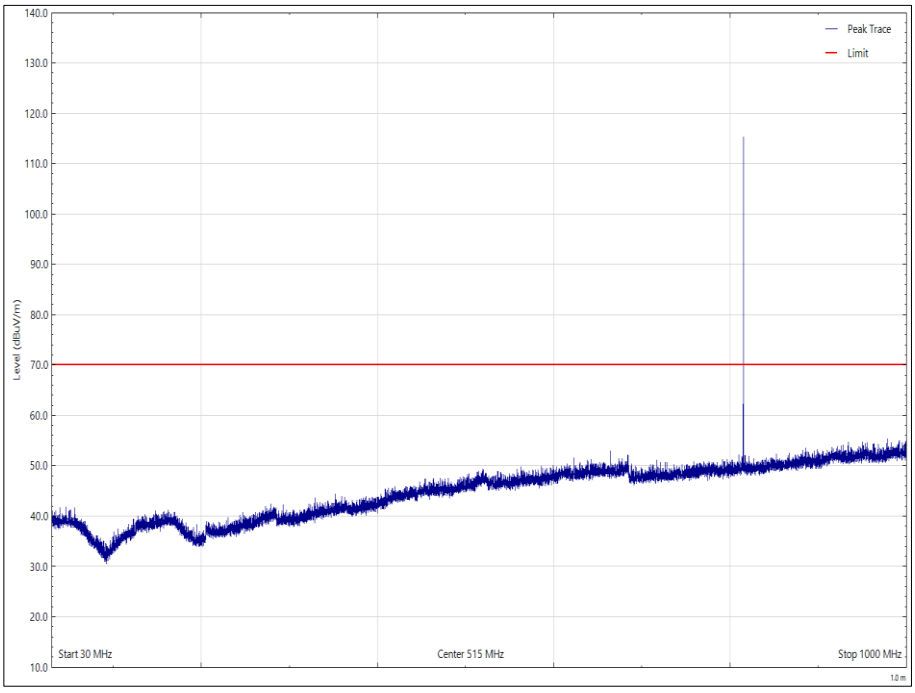


Figure 24 - 815 MHz - 30 MHz to 1 GHz, EUT Orientation Y Horizontal

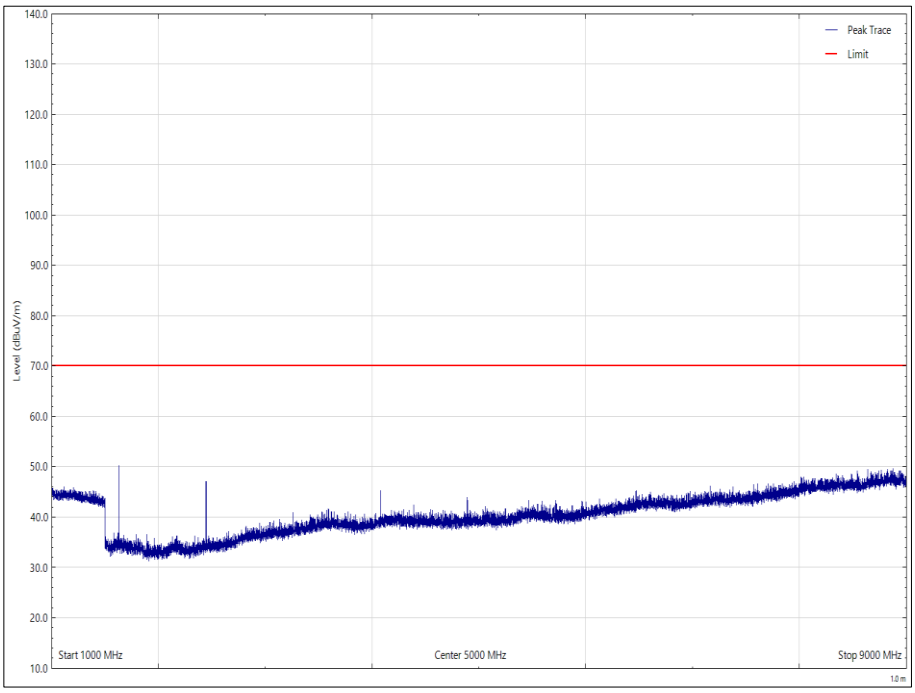


Figure 25 - 815 MHz - 1 GHz to 9 GHz, EUT Orientation Y Horizontal

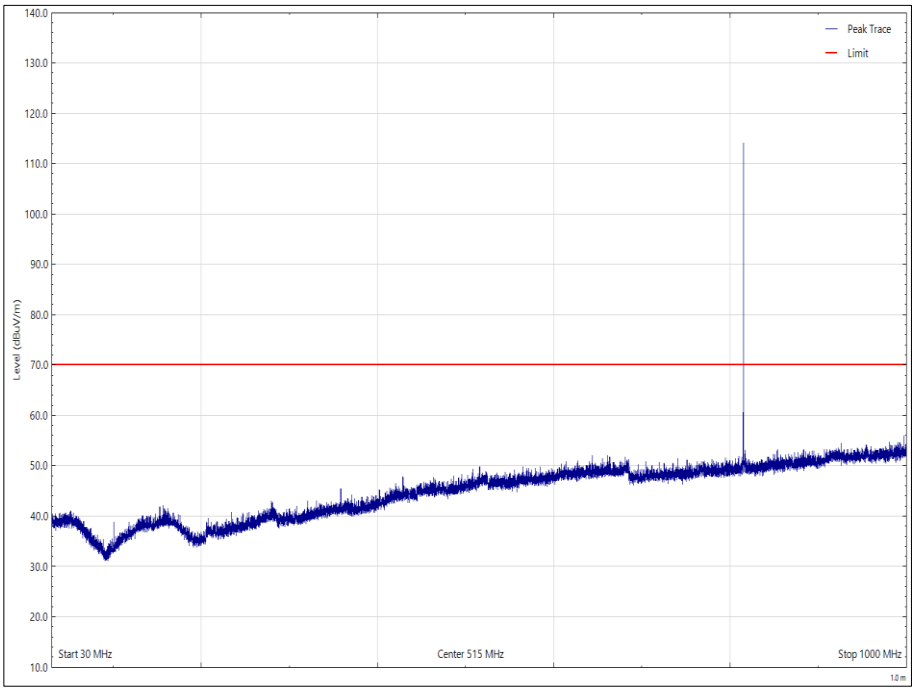


Figure 26 - 815 MHz - 30 MHz to 1 GHz, EUT Orientation Y Vertical

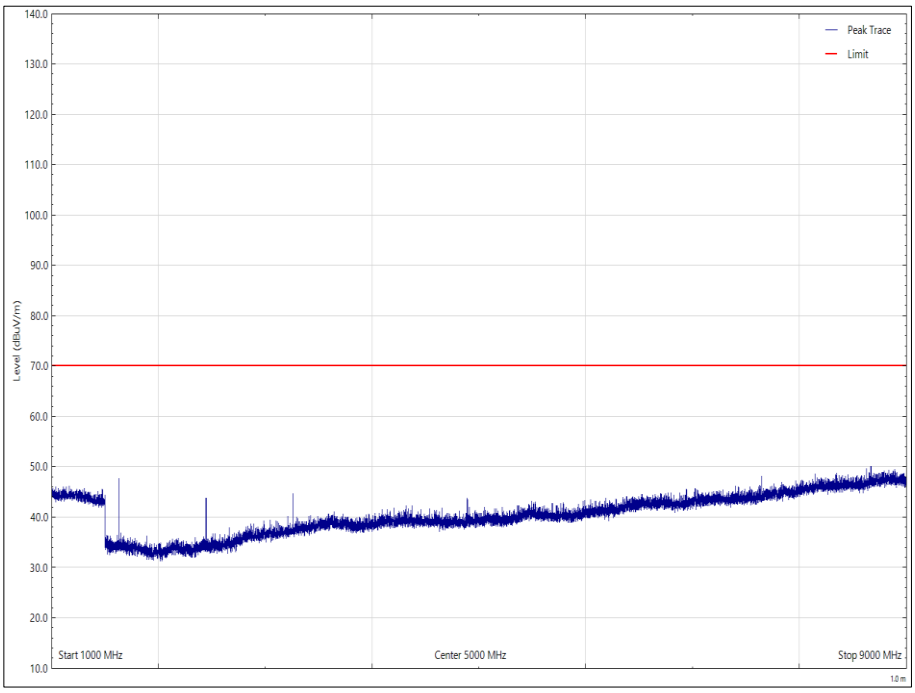


Figure 27 - 815 MHz - 1 GHz to 9 GHz, EUT Orientation Y Vertical

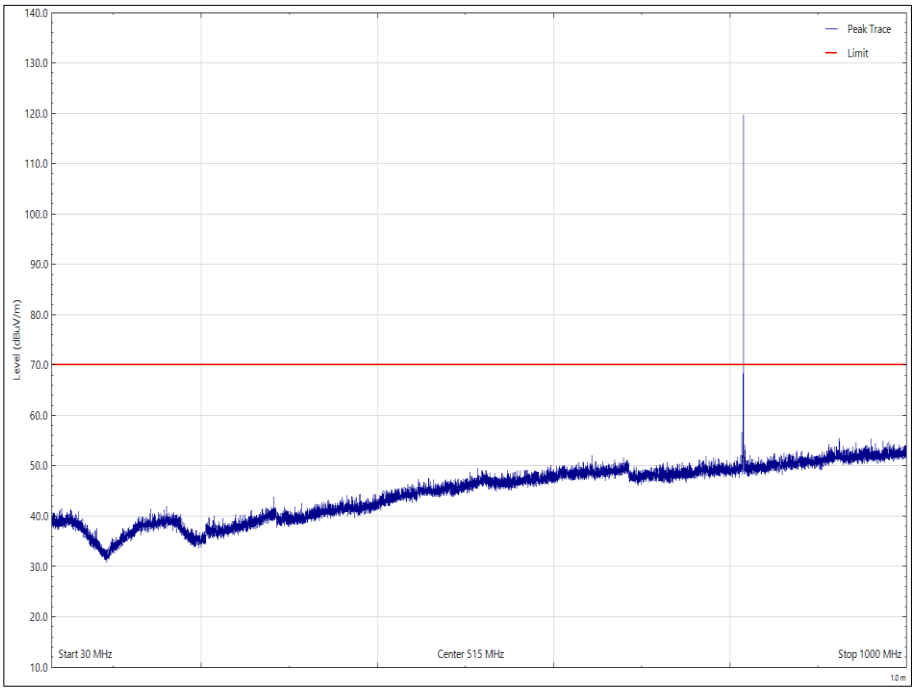


Figure 28 - 815 MHz - 30 MHz to 1 GHz, EUT Orientation Z Horizontal

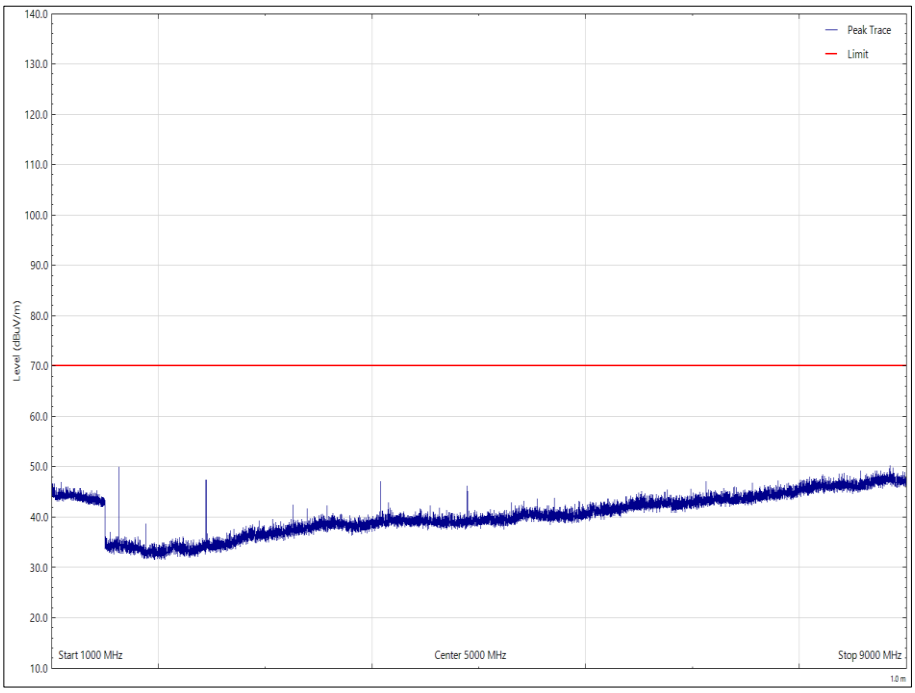


Figure 29 - 815 MHz - 1 GHz to 9 GHz, EUT Orientation Z Horizontal

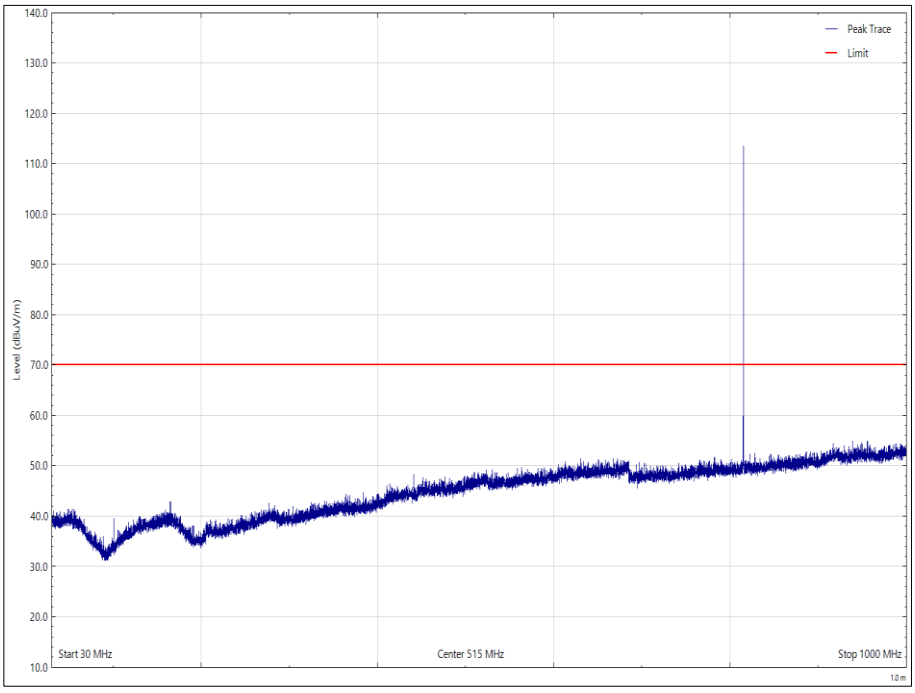


Figure 30 - 815 MHz - 30 MHz to 1 GHz, EUT Orientation Z Vertical

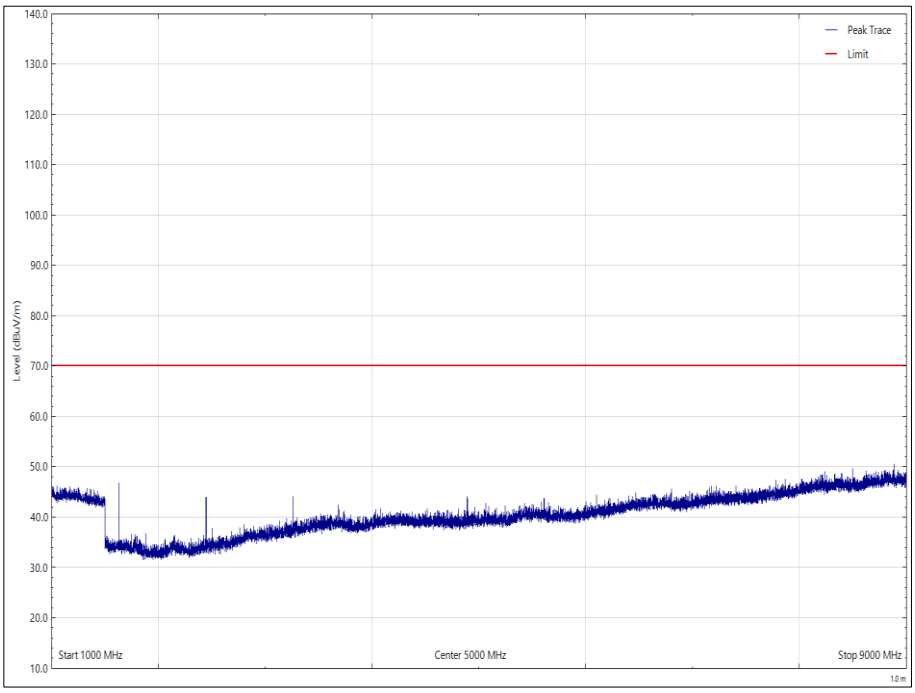


Figure 31 - 815 MHz - 1 GHz to 9 GHz, EUT Orientation Z Vertical

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

Table 23 - 823.975 MHz

*No emissions were detected within 10 dB of the limit.

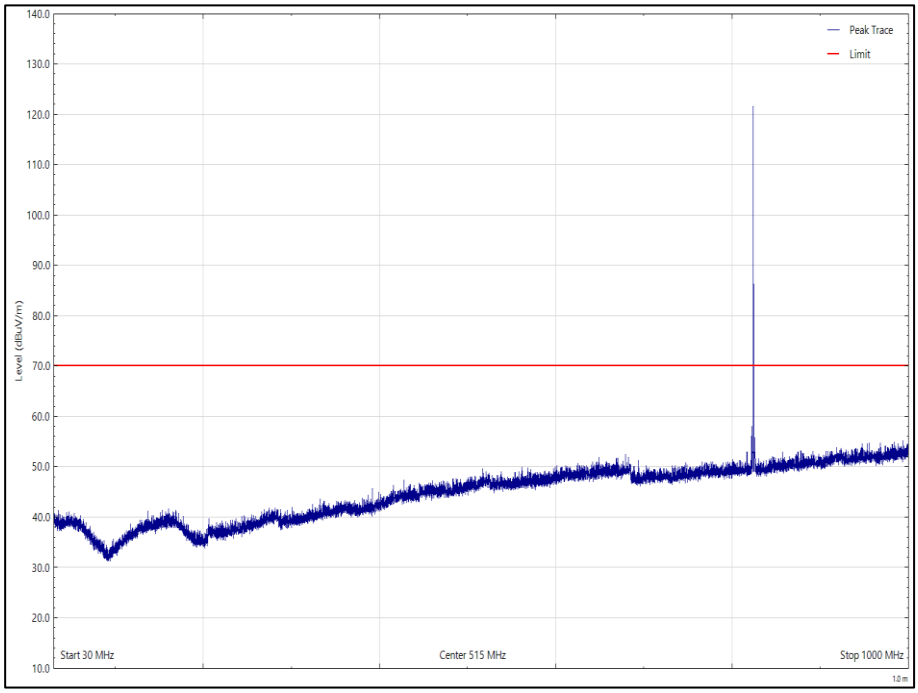


Figure 32 - 823.975 MHz - 30 MHz to 1 GHz, EUT Orientation X Horizontal

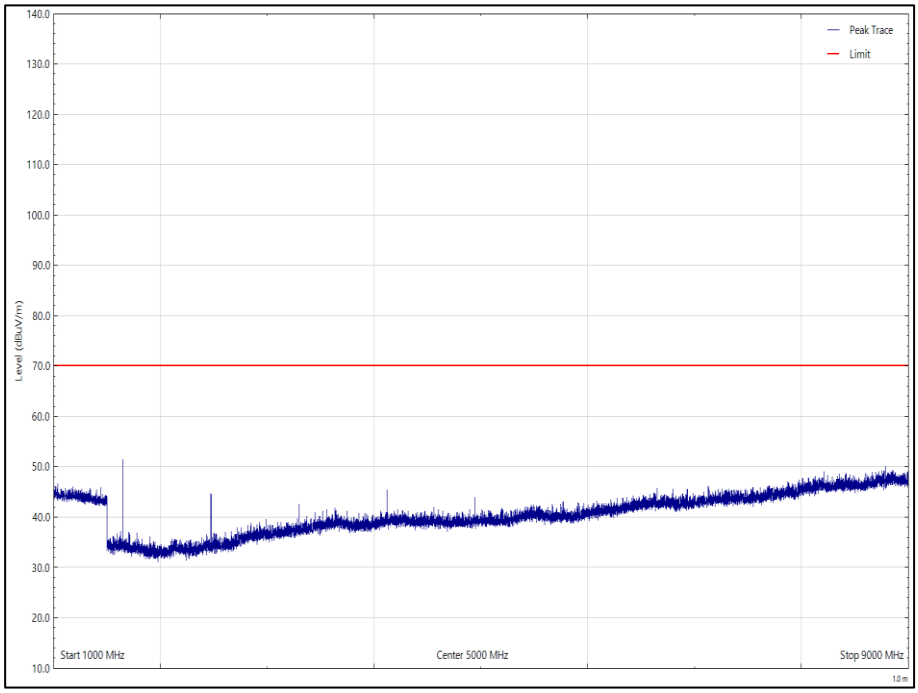


Figure 33 - 823.975 MHz - 1 GHz to 9 GHz, EUT Orientation X Horizontal

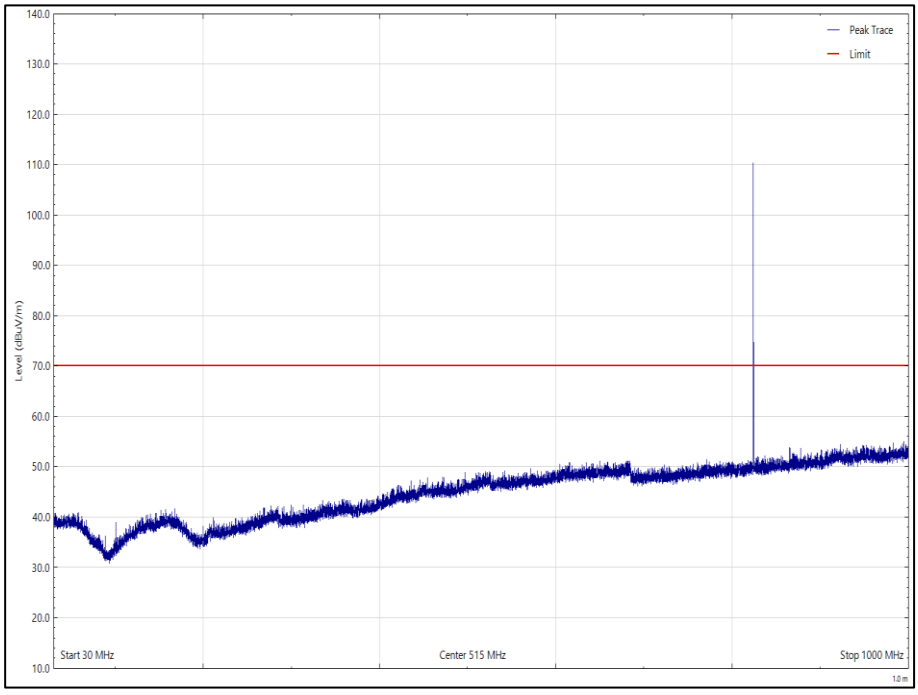


Figure 34 - 823.975 MHz - 30 MHz to 1 GHz, EUT Orientation X Vertical

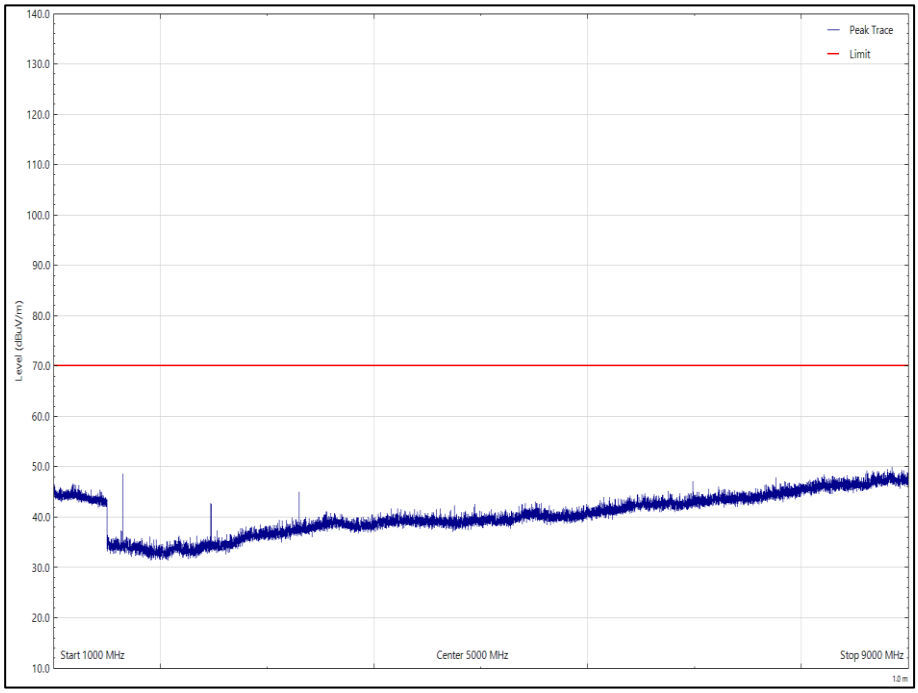


Figure 35 - 823.975 MHz - 1 GHz to 9 GHz, EUT Orientation X Vertical

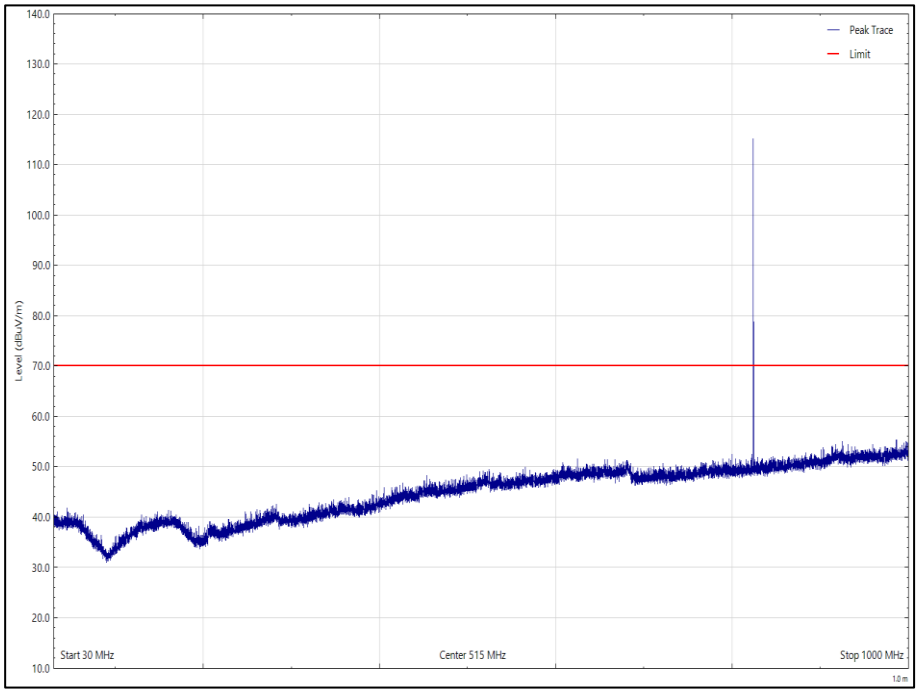


Figure 36 - 823.975 MHz - 30 MHz to 1 GHz, EUT Orientation Y Horizontal

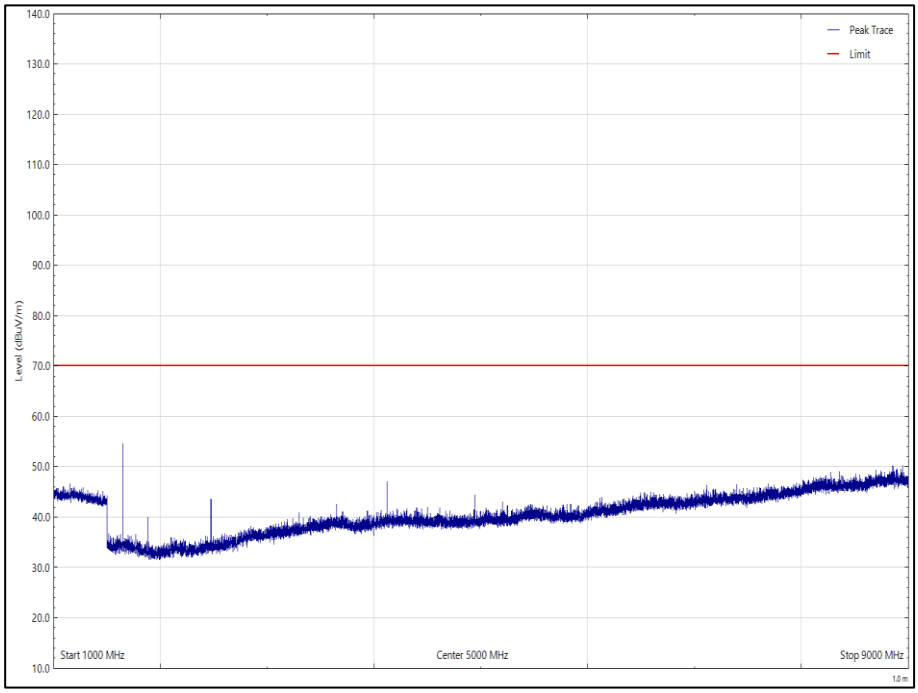


Figure 37 - 823.975 MHz - 1 GHz to 9 GHz, EUT Orientation Y Horizontal

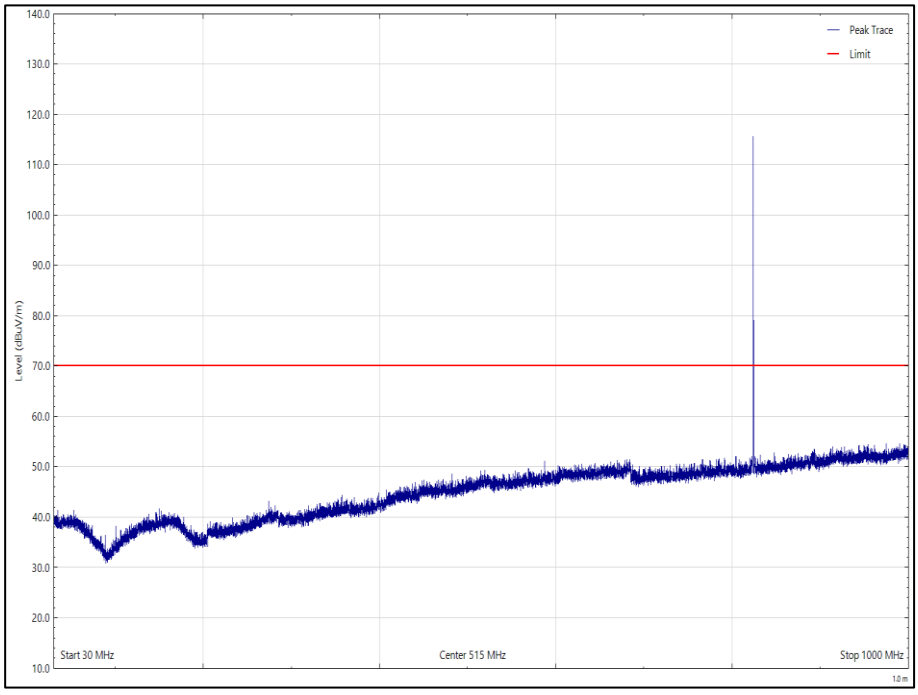


Figure 38 - 823.975 MHz - 30 MHz to 1 GHz, EUT Orientation Y Vertical

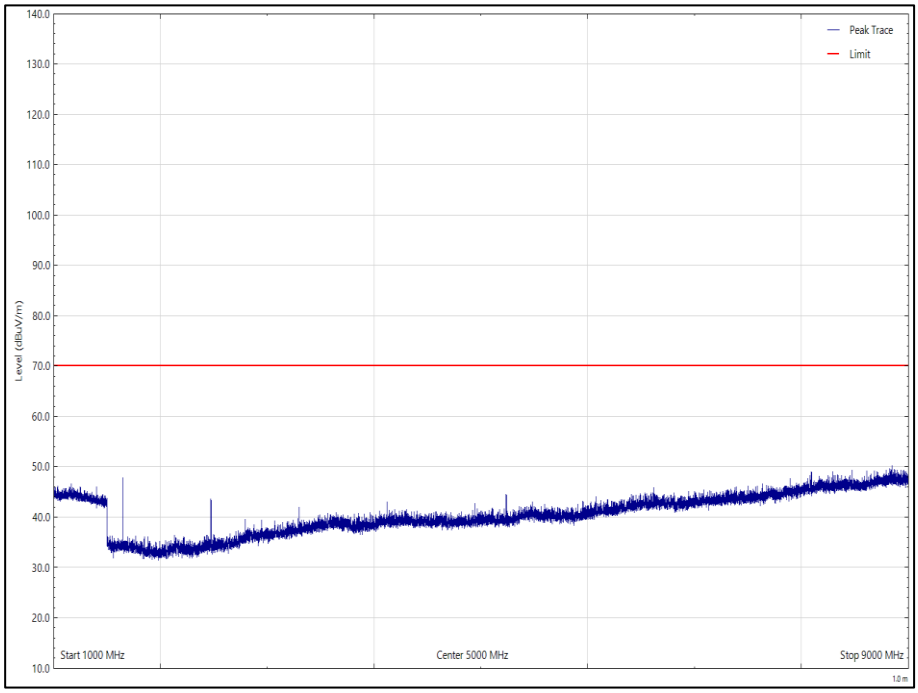


Figure 39 - 823.975 MHz - 1 GHz to 9 GHz, EUT Orientation Y Vertical

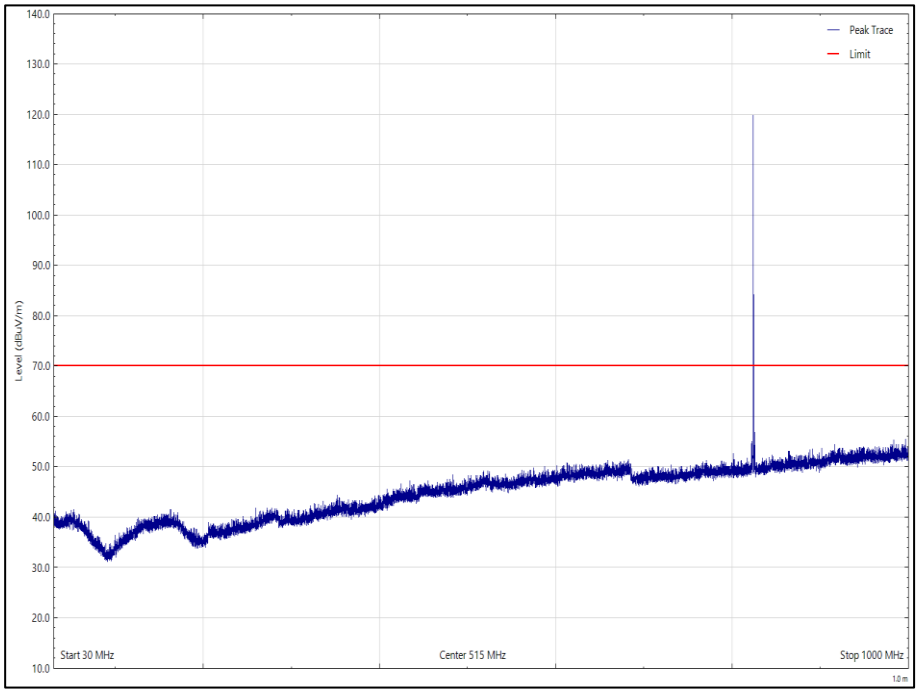


Figure 40 - 823.975 MHz - 30 MHz to 1 GHz, EUT Orientation Z Horizontal

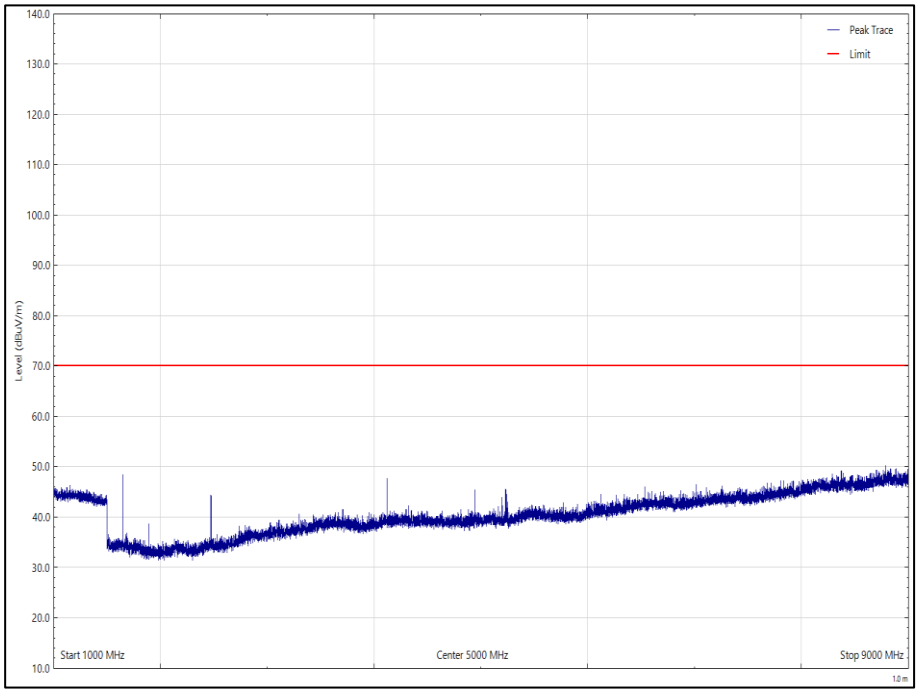


Figure 41 - 823.975 MHz - 1 GHz to 9 GHz, EUT Orientation Z Horizontal

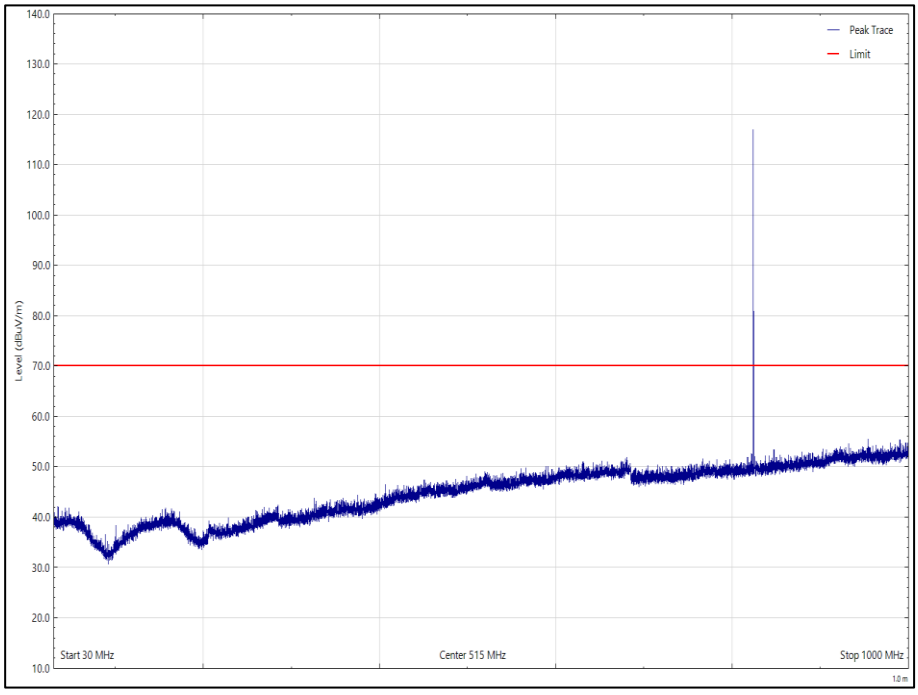


Figure 42 - 823.975 MHz - 30 MHz to 1 GHz, EUT Orientation Z Vertical

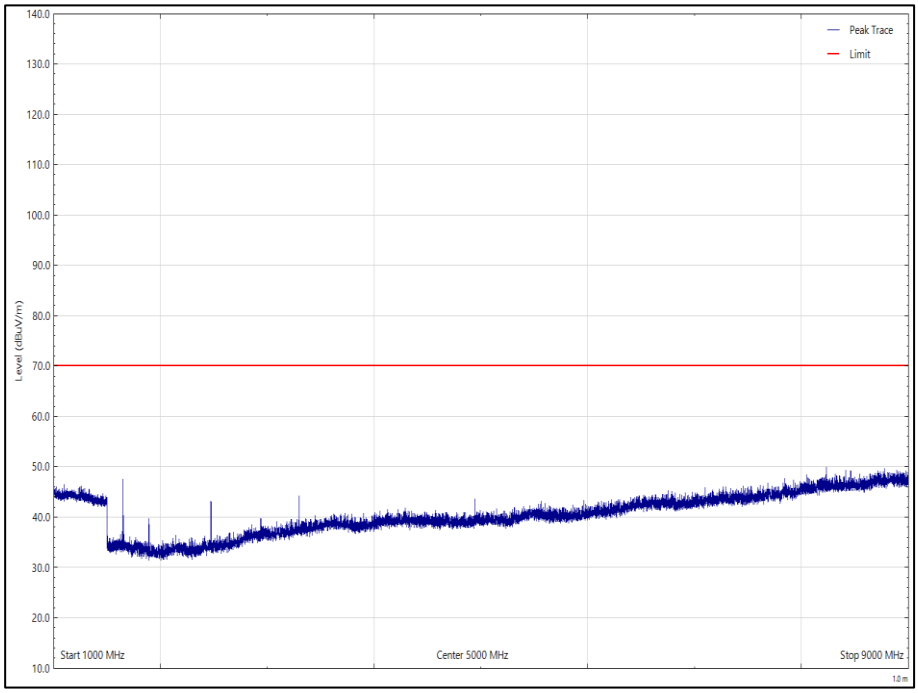


Figure 43 - 823.975 MHz - 1 GHz to 9 GHz, EUT Orientation Z Vertical

Tetra - 851-869 MHz

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

Table 24 - 851.025 MHz

*No emissions were detected within 10 dB of the limit.

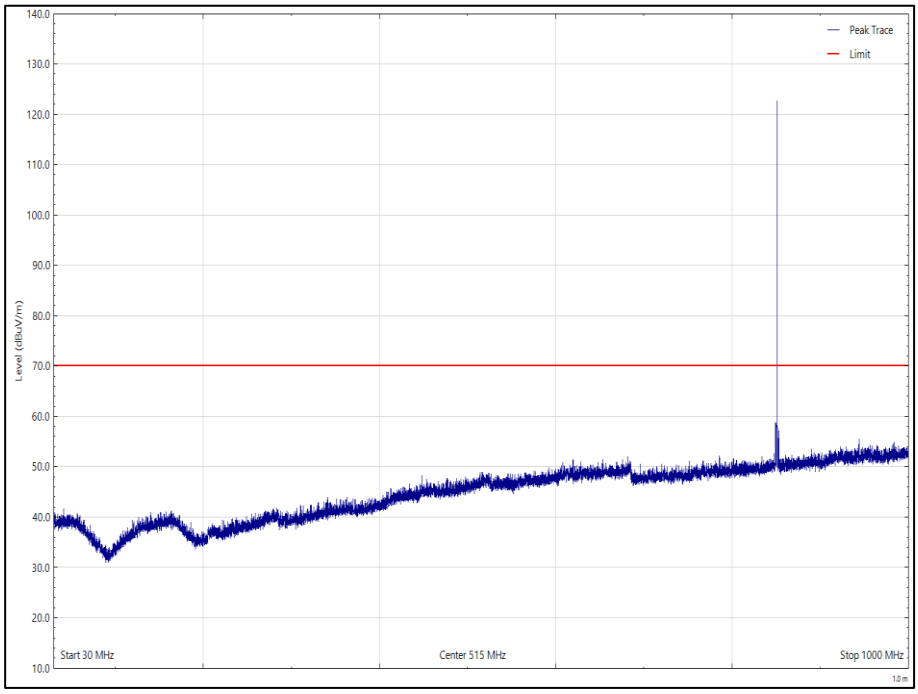


Figure 44 - 851.025 MHz - 30 MHz to 1 GHz, EUT Orientation X Horizontal

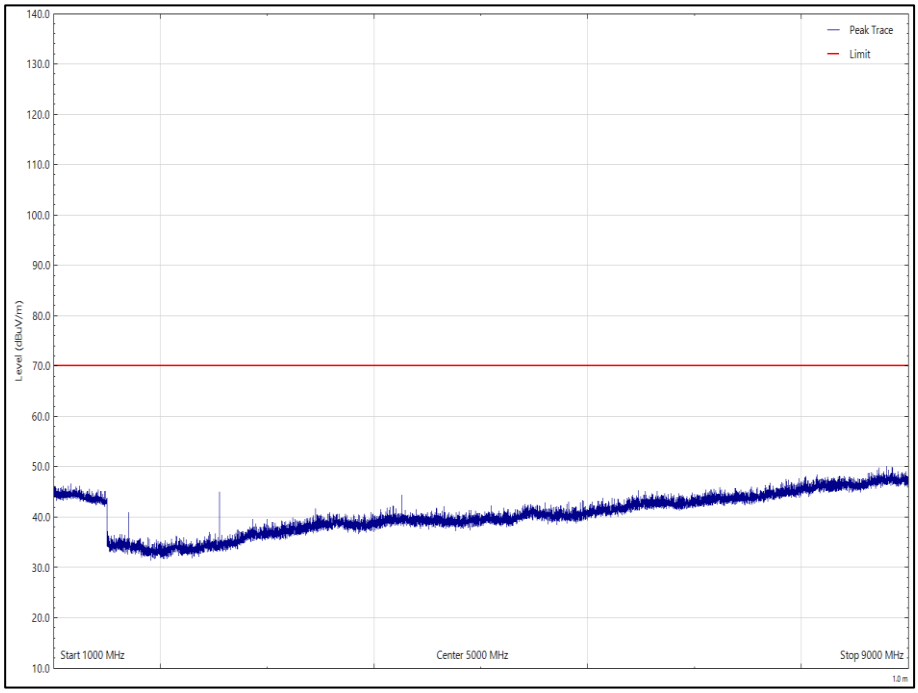


Figure 45 - 851.025 MHz - 1 GHz to 9 GHz, EUT Orientation X Horizontal

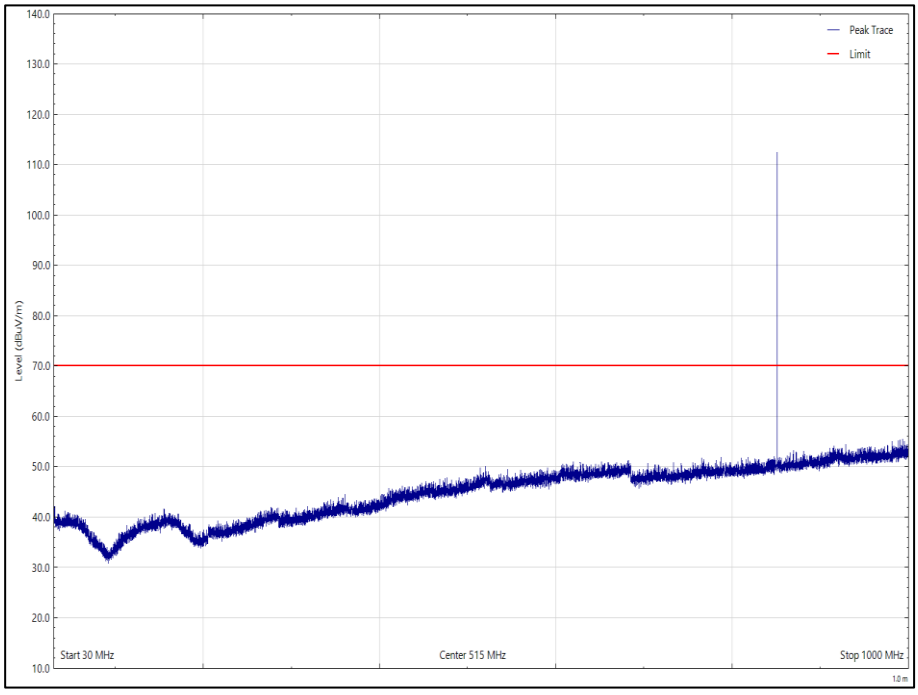


Figure 46 - 851.025 MHz - 30 MHz to 1 GHz, EUT Orientation X Vertical

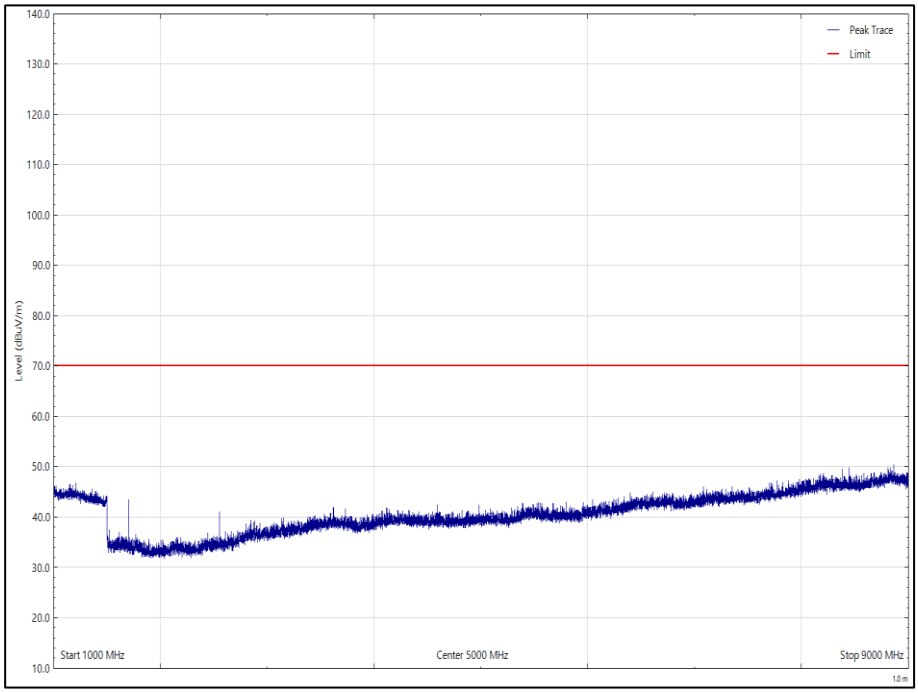


Figure 47 - 851.025 MHz - 1 GHz to 9 GHz, EUT Orientation X Vertical

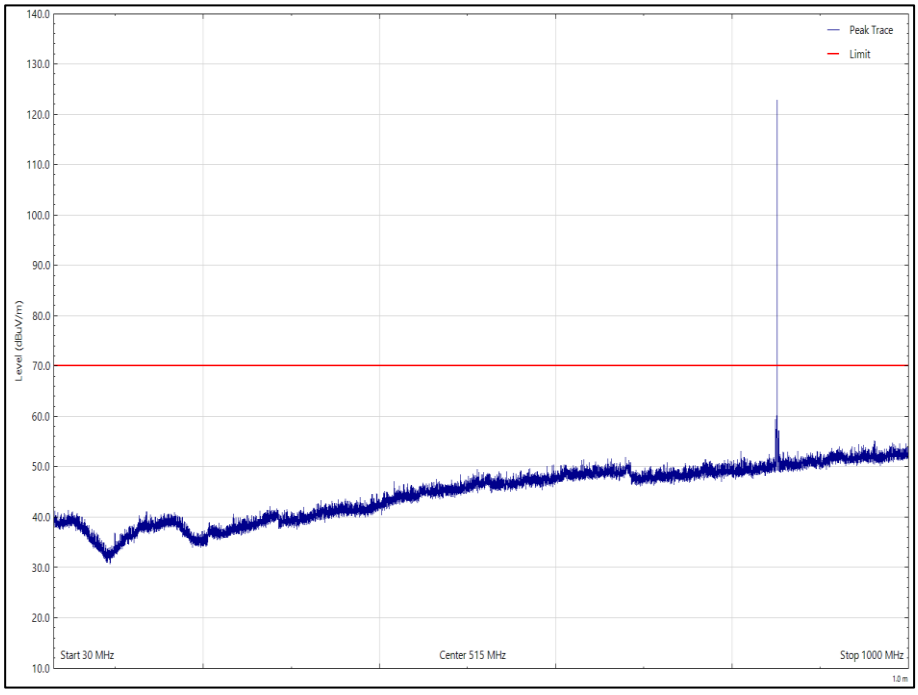


Figure 48 - 851.025 MHz - 30 MHz to 1 GHz, EUT Orientation Y Horizontal

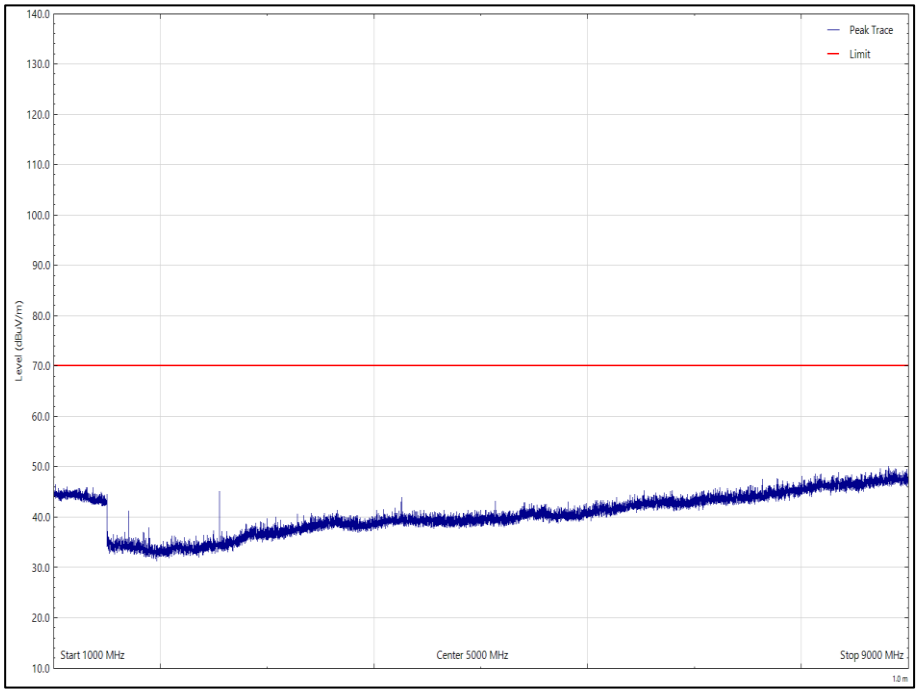


Figure 49 - 851.025 MHz - 1 GHz to 9 GHz, EUT Orientation Y Horizontal

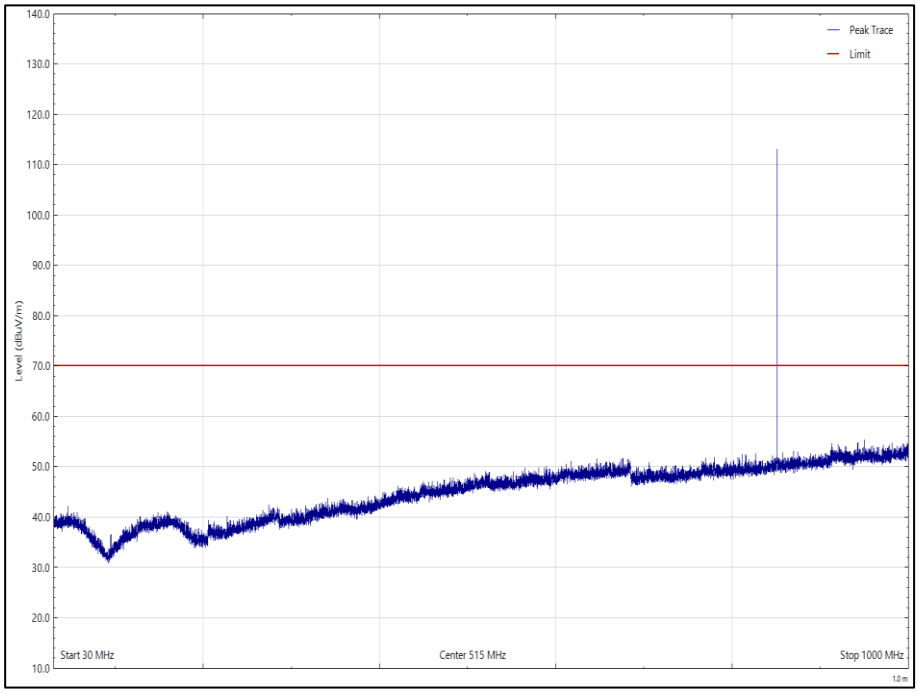


Figure 50 - 851.025 MHz - 30 MHz to 1 GHz, EUT Orientation Y Vertical

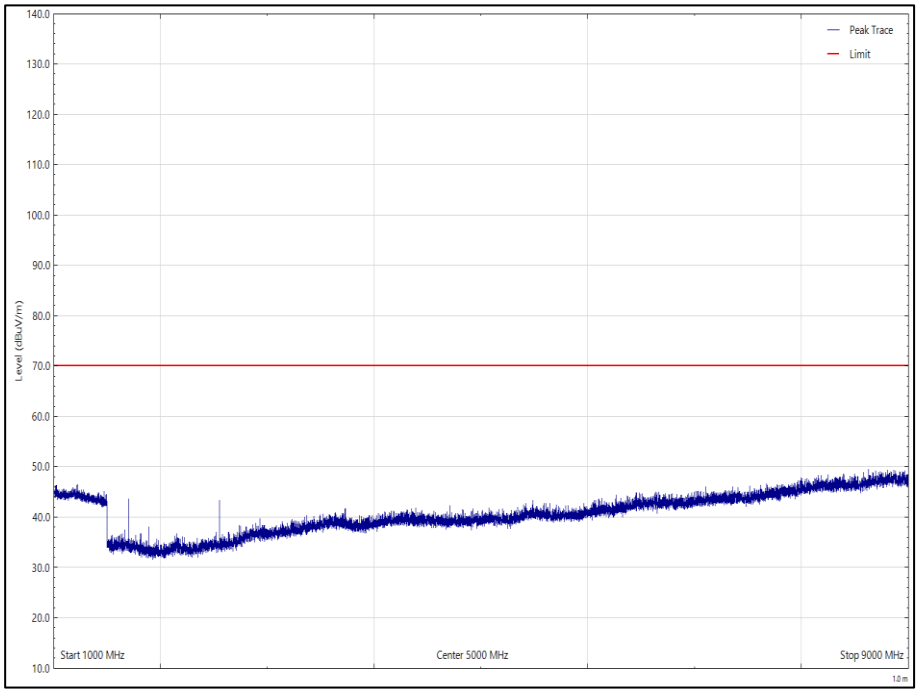


Figure 51 - 851.025 MHz - 1 GHz to 9 GHz, EUT Orientation Y Vertical

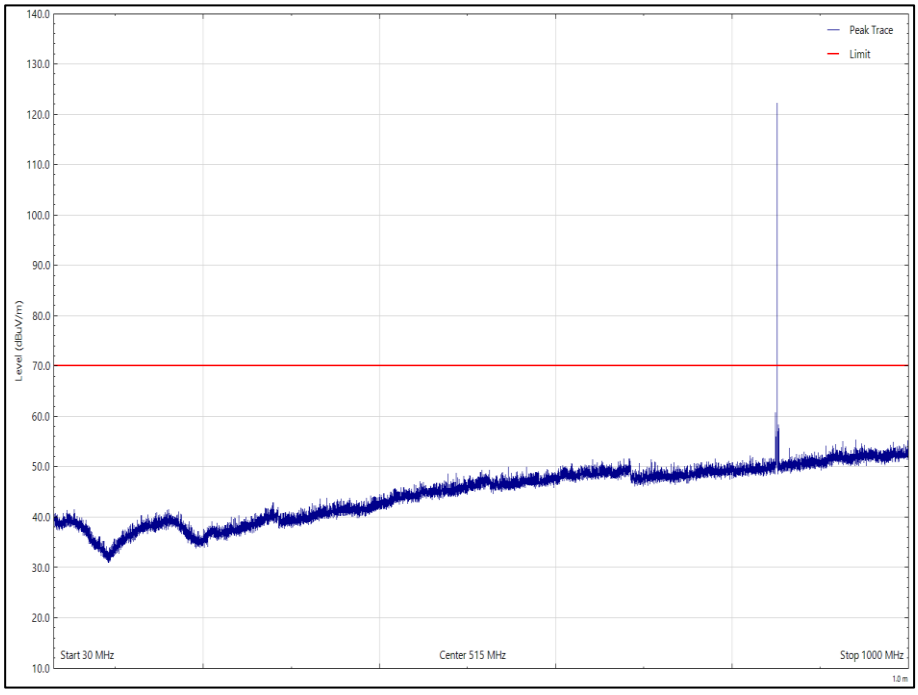


Figure 52 - 851.025 MHz - 30 MHz to 1 GHz, EUT Orientation Z Horizontal

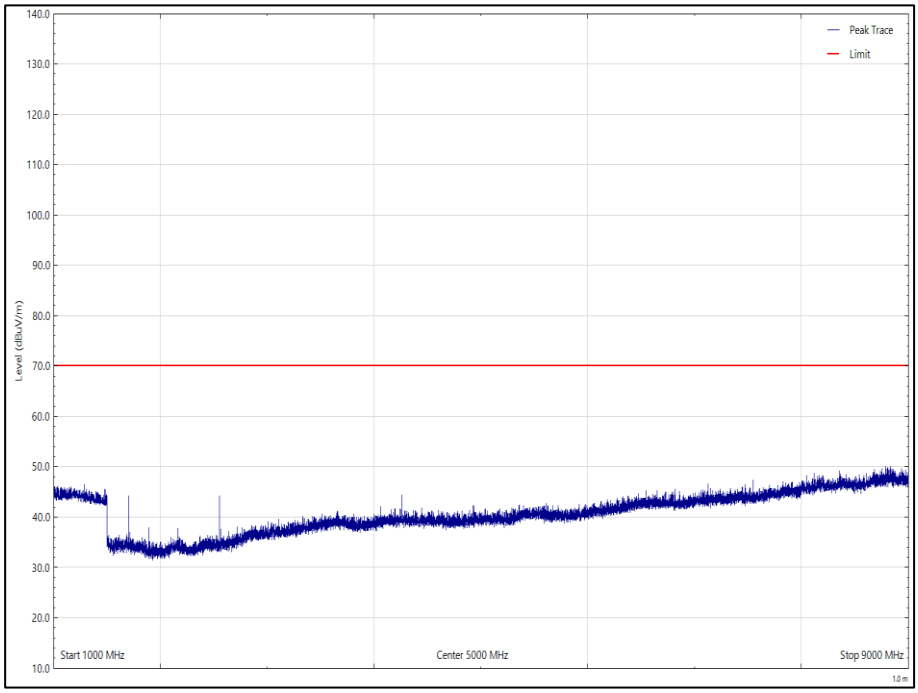


Figure 53 - 851.025 MHz - 1 GHz to 9 GHz, EUT Orientation Z Horizontal

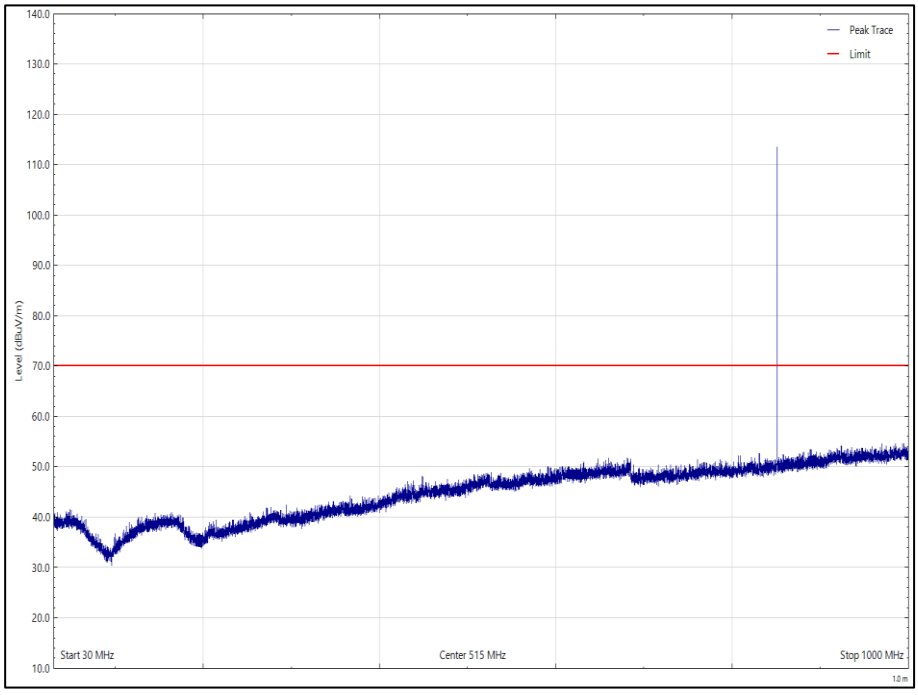


Figure 54 - 851.025 MHz - 30 MHz to 1 GHz, EUT Orientation Z Vertical

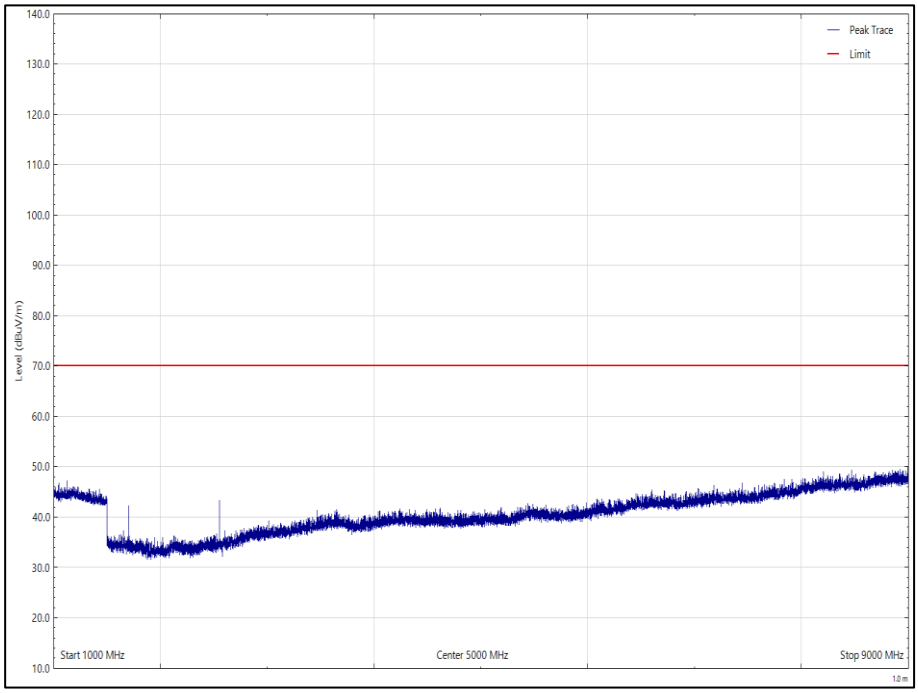


Figure 55 - 851.025 MHz - 1 GHz to 9 GHz, EUT Orientation Z Vertical

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

Table 25 - 860 MHz

*No emissions were detected within 10 dB of the limit.

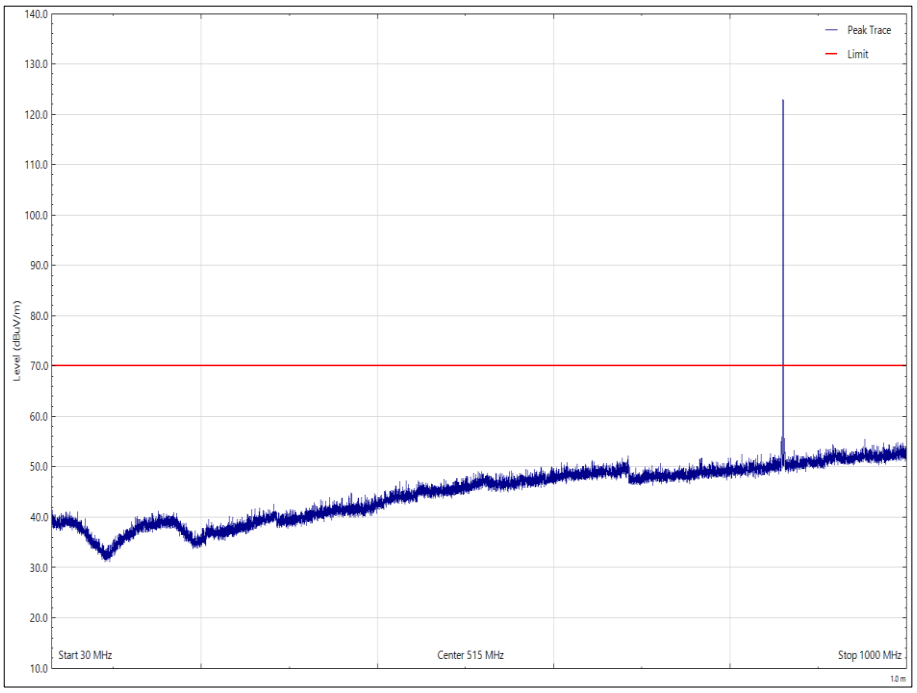


Figure 56- 860 MHz - 30 MHz to 1 GHz, EUT Orientation X Horizontal

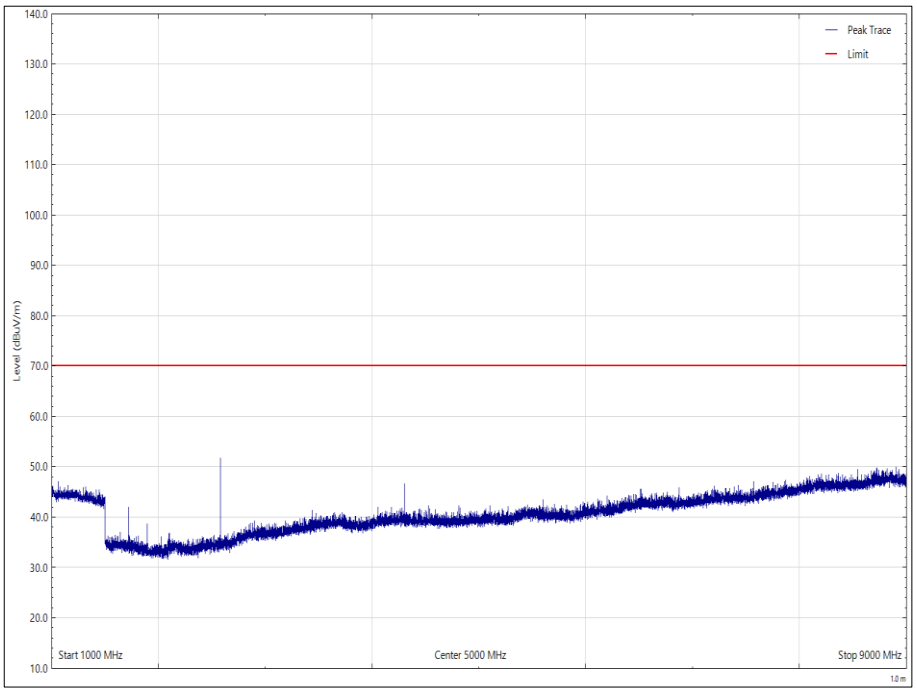


Figure 57 - 860 MHz - 1 GHz to 9 GHz, EUT Orientation X Horizontal

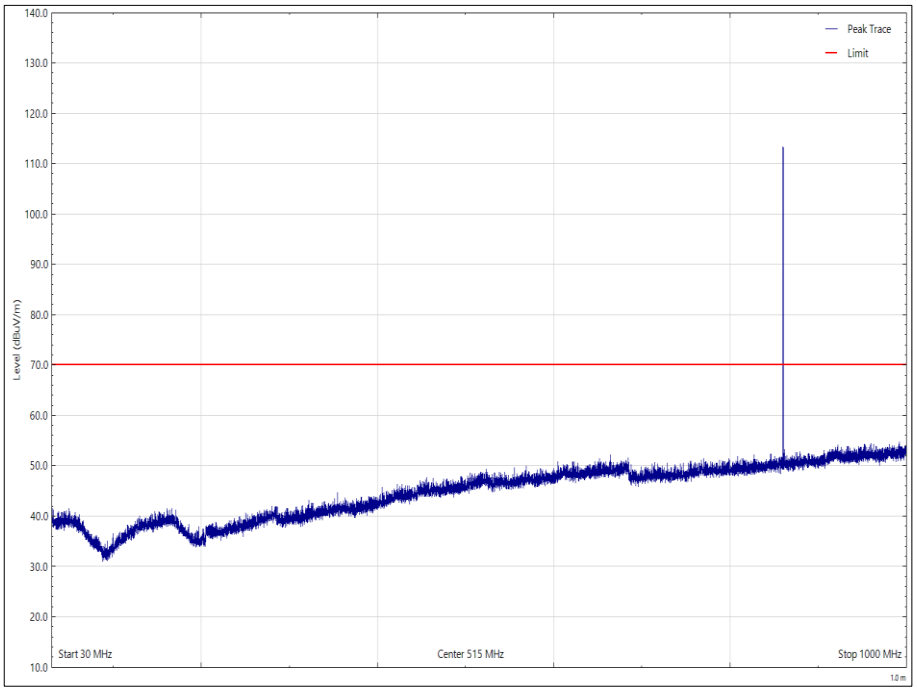


Figure 58 - 860 MHz - 30 MHz to 1 GHz, EUT Orientation X Vertical

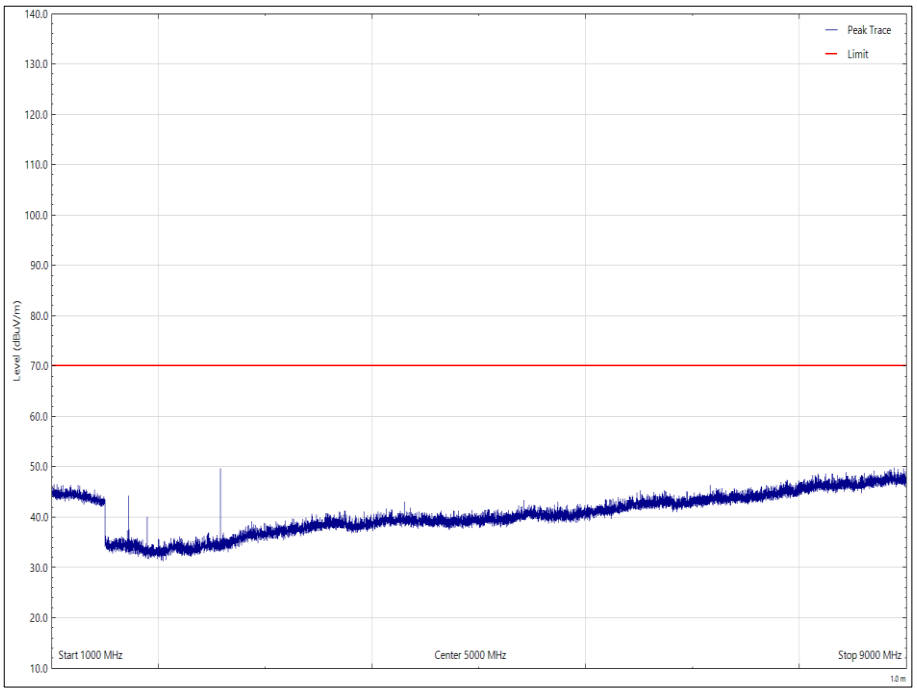


Figure 59 - 860 MHz - 1 GHz to 9 GHz, EUT Orientation X Vertical

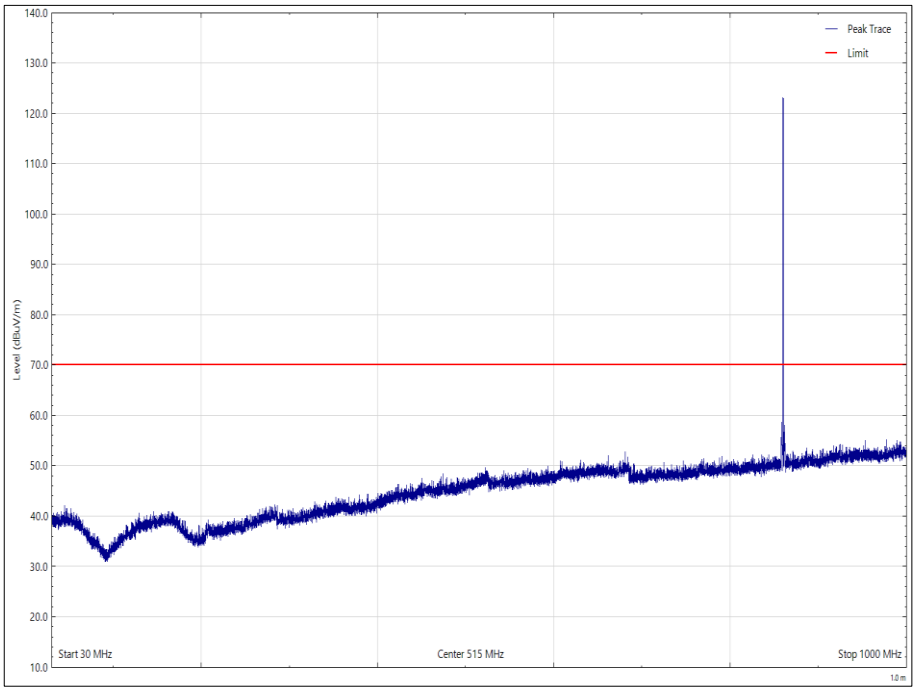


Figure 60 - 860 MHz - 30 MHz to 1 GHz, EUT Orientation Y Horizontal

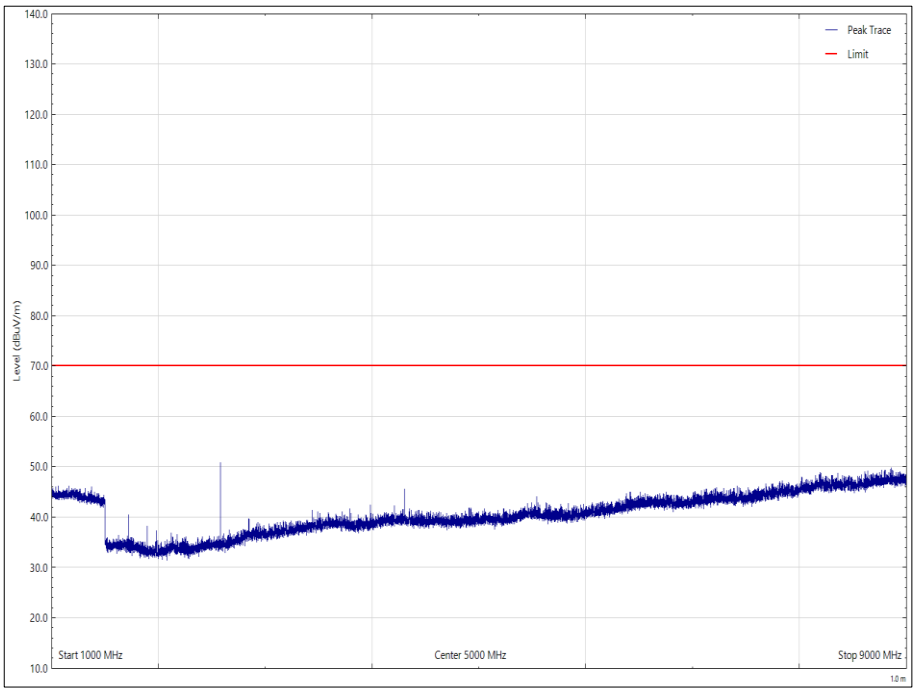


Figure 61 - 860 MHz - 1 GHz to 9 GHz, EUT Orientation Y Horizontal

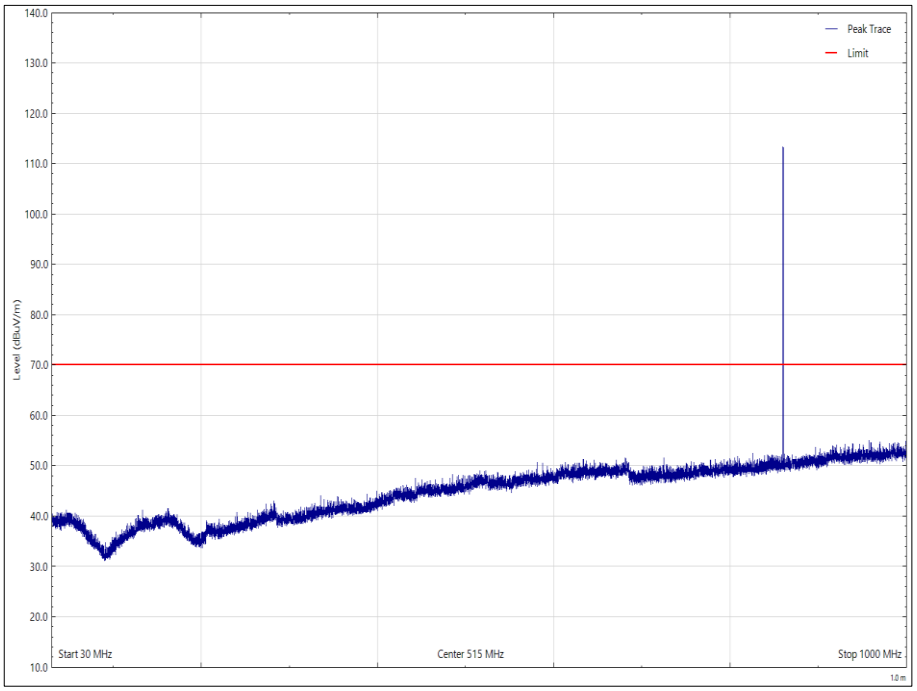


Figure 62 - 860 MHz - 30 MHz to 1 GHz, EUT Orientation Y Vertical

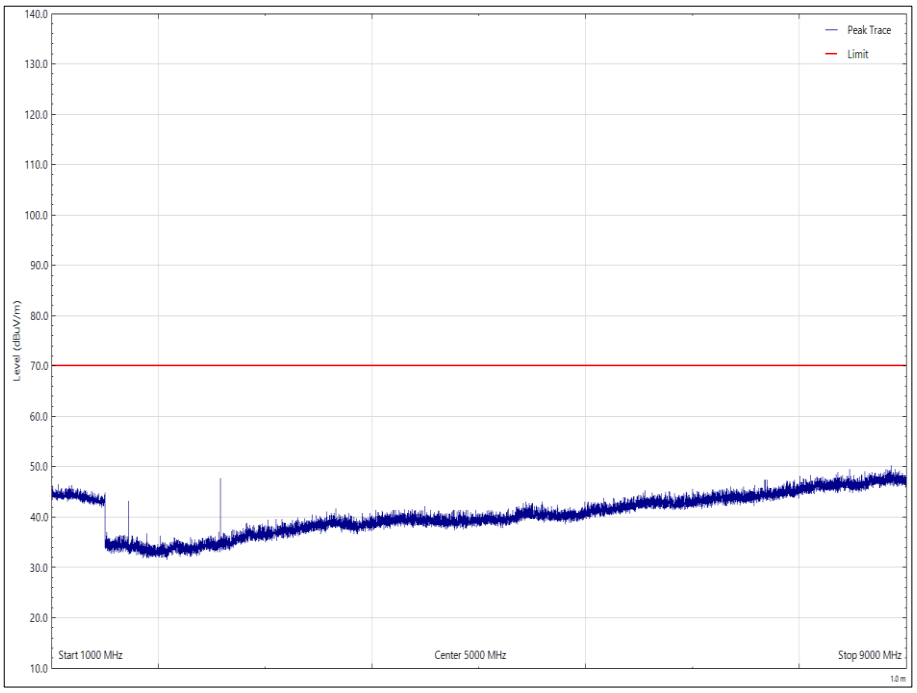


Figure 63 - 860 MHz - 1 GHz to 9 GHz, EUT Orientation Y Vertical

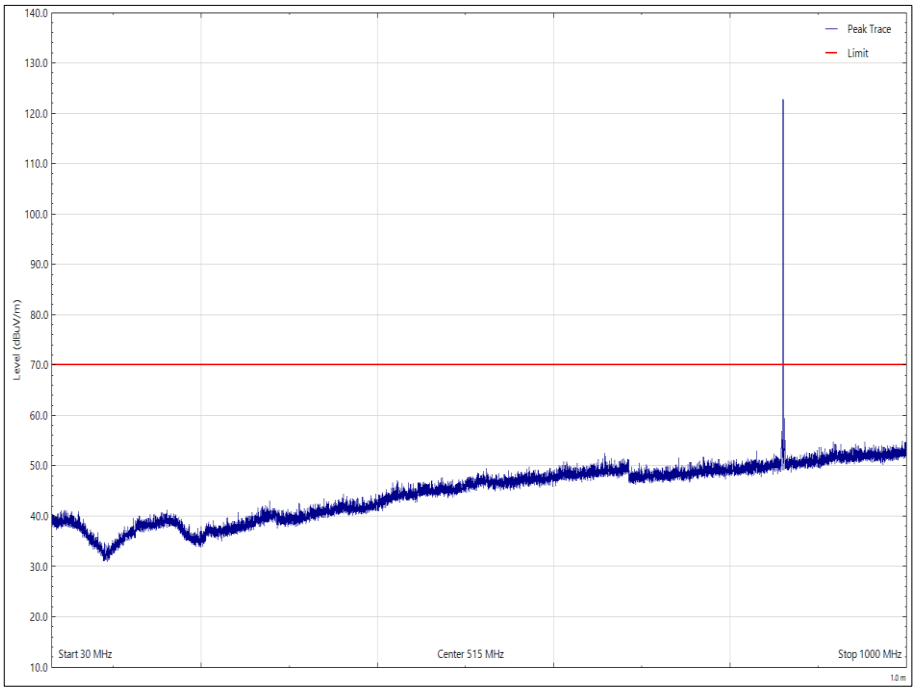


Figure 64 - 860 MHz - 30 MHz to 1 GHz, EUT Orientation Z Horizontal

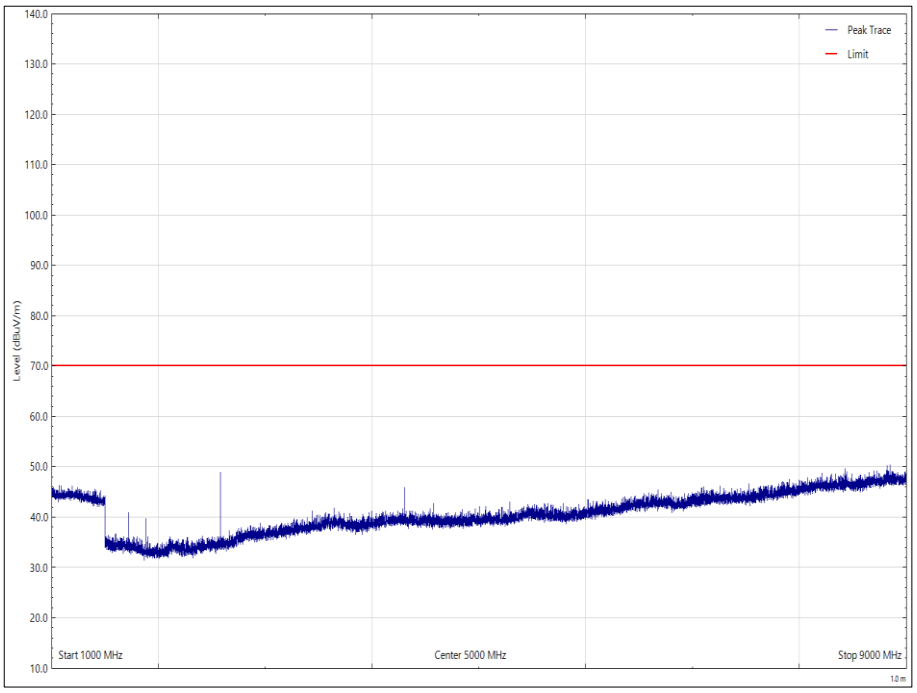


Figure 65 - 860 MHz - 1 GHz to 9 GHz, EUT Orientation Z Horizontal

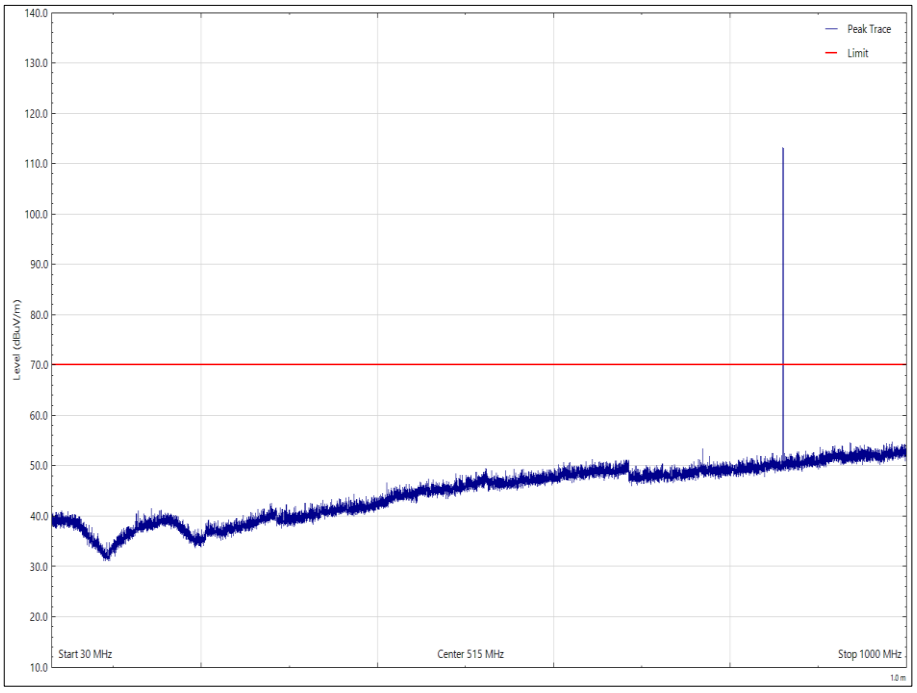


Figure 66 - 860 MHz - 30 MHz to 1 GHz, EUT Orientation Z Vertical

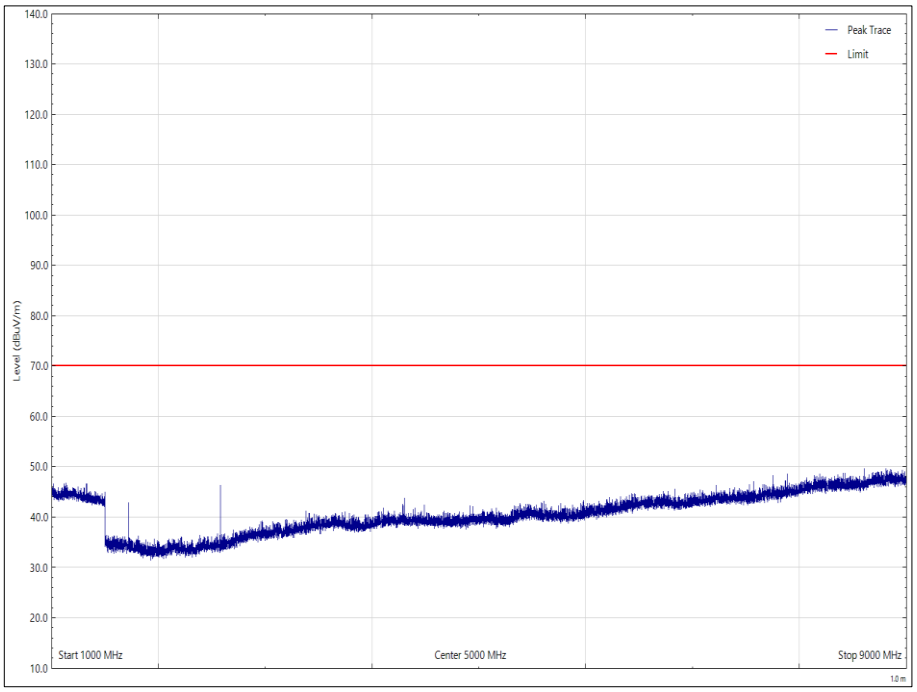


Figure 67 - 860 MHz - 1 GHz to 9 GHz, EUT Orientation Z Vertical

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

Table 26 - 868.975 MHz

*No emissions were detected within 10 dB of the limit.

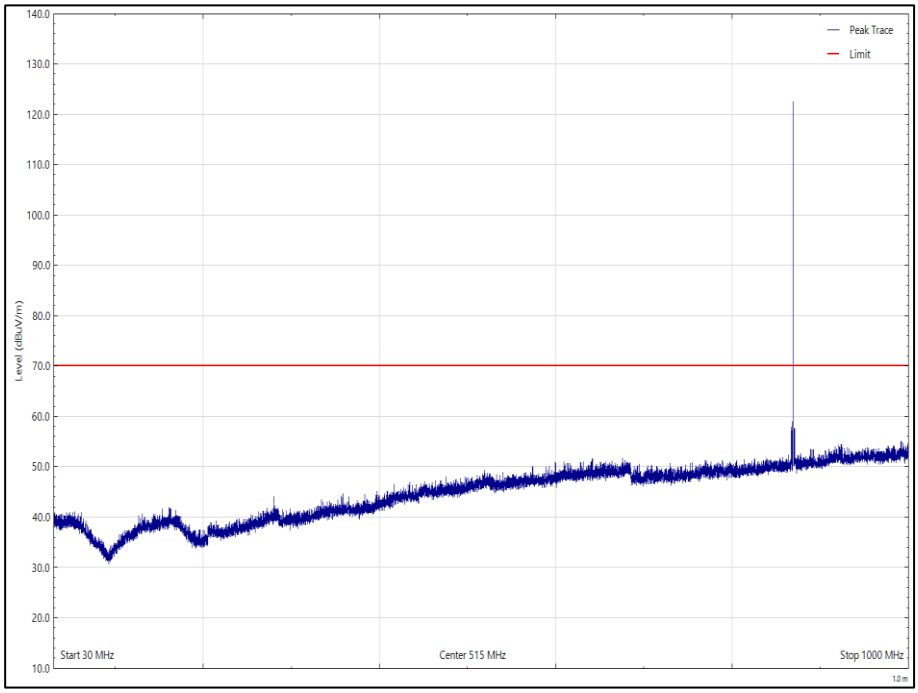


Figure 68 - 868.975 MHz - 30 MHz to 1 GHz, EUT Orientation X Horizontal

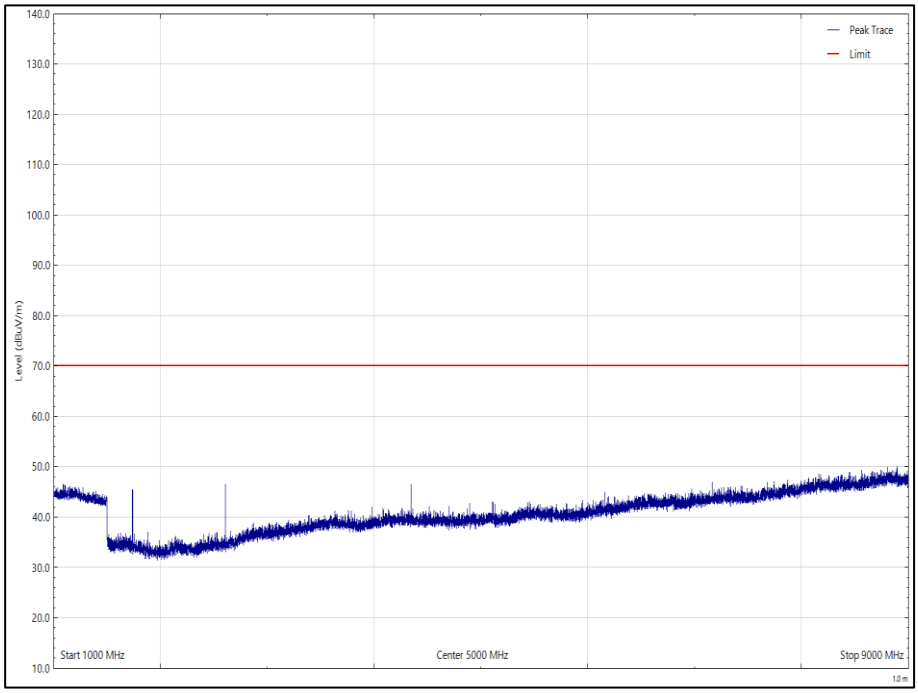


Figure 69 - 868.975 MHz - 1 GHz to 9 GHz, EUT Orientation X Horizontal

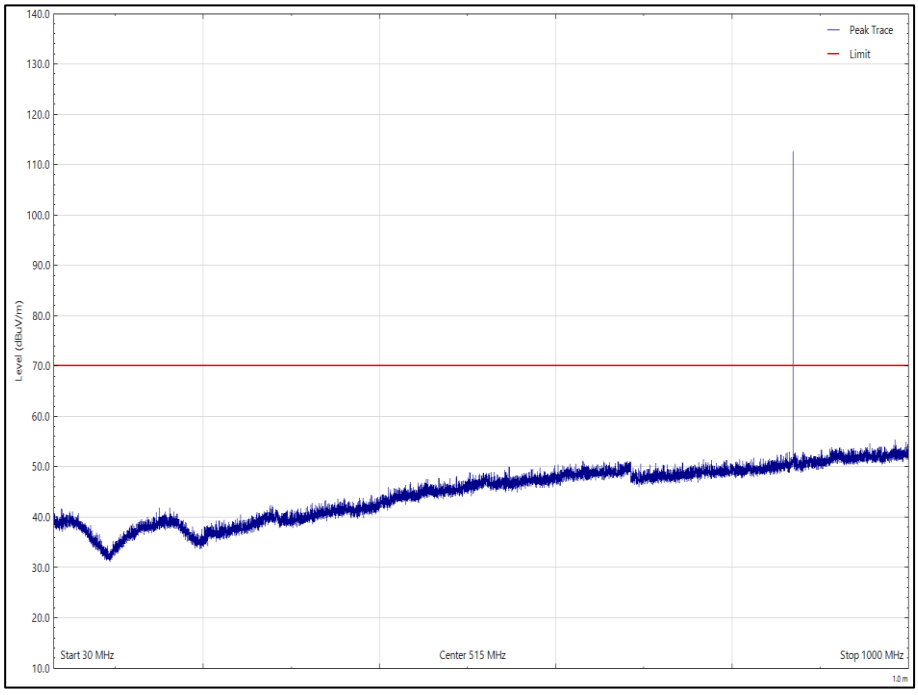


Figure 70 - 868.975 MHz - 30 MHz to 1 GHz, EUT Orientation X Vertical

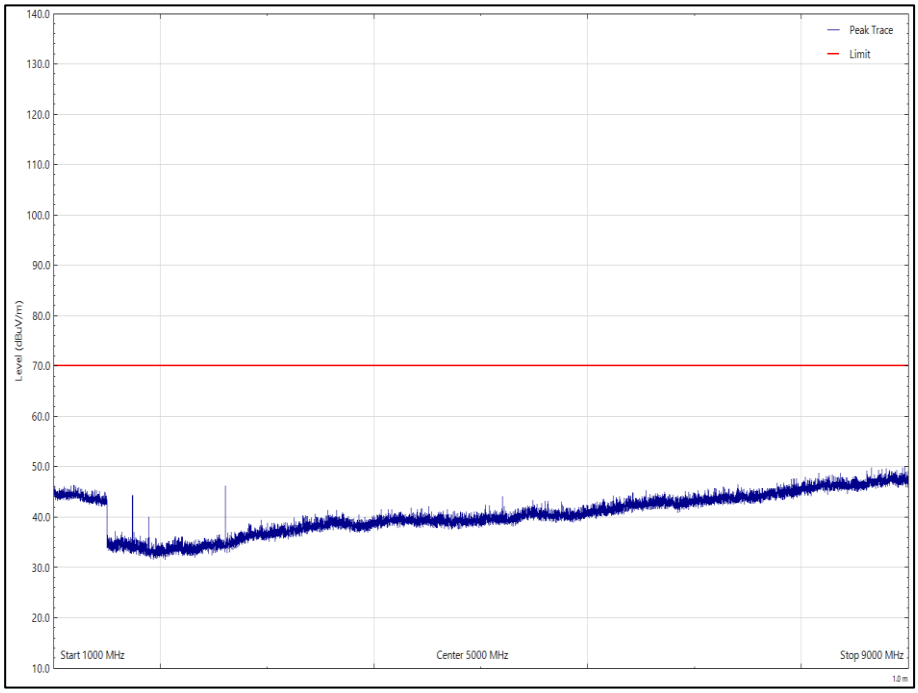


Figure 71 - 868.975 MHz - 1 GHz to 9 GHz, EUT Orientation X Vertical

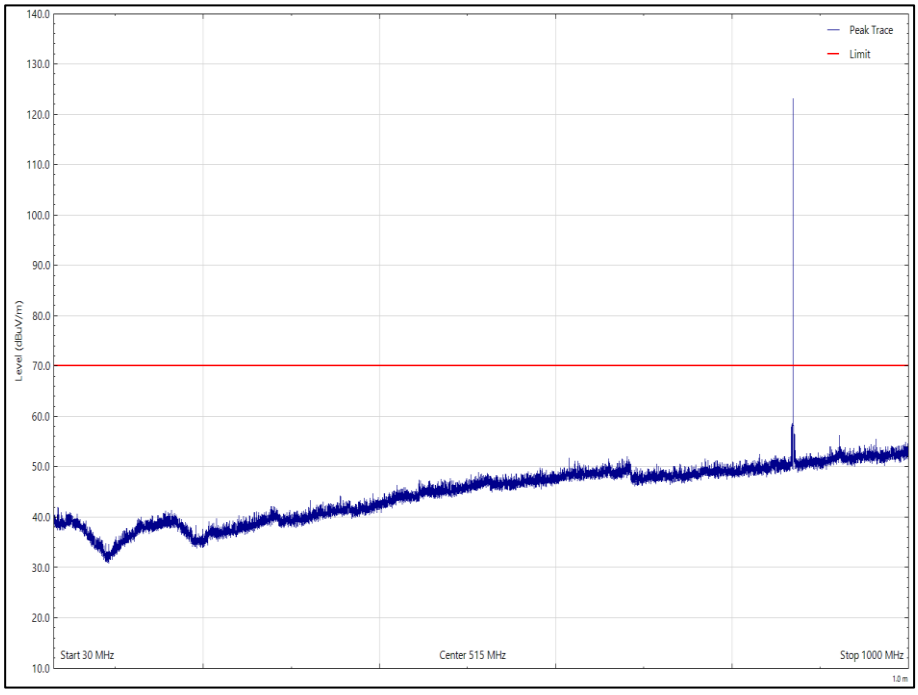


Figure 72 - 868.975 MHz - 30 MHz to 1 GHz, EUT Orientation Y Horizontal

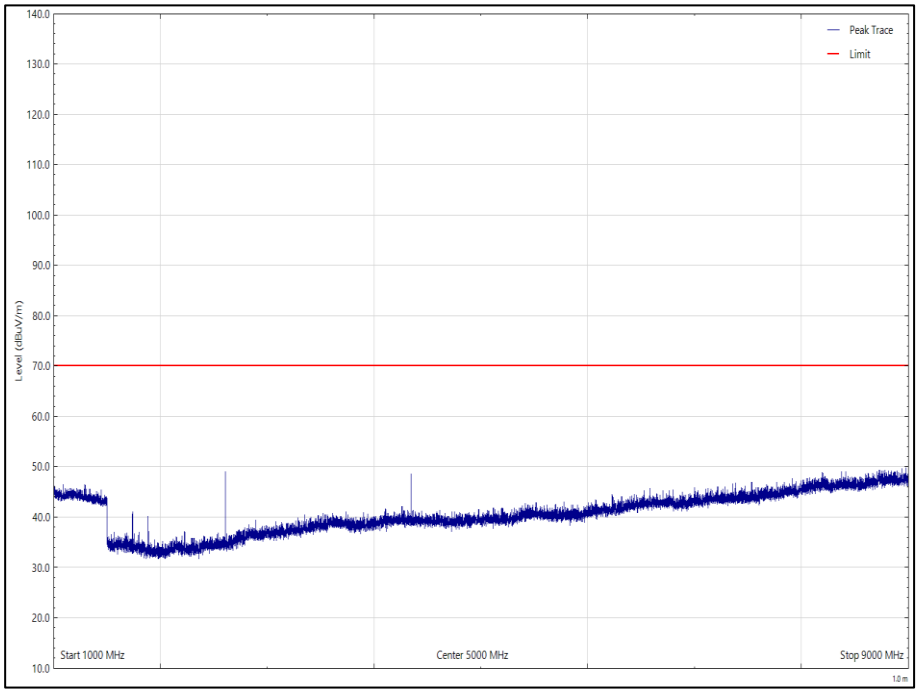


Figure 73 - 868.975 MHz - 1 GHz to 9 GHz, EUT Orientation Y Horizontal

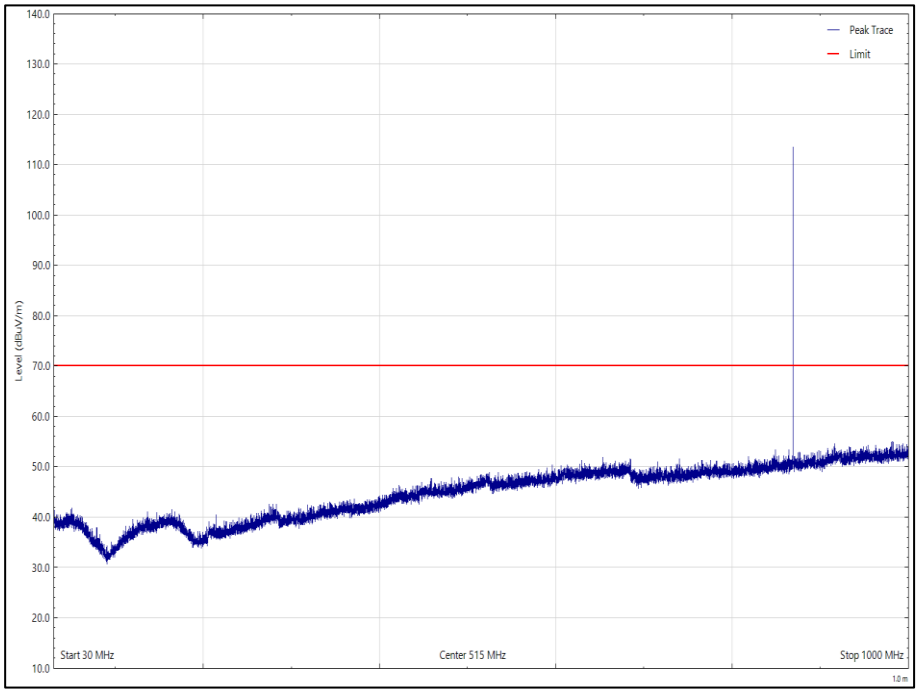


Figure 74 - 868.975 MHz - 30 MHz to 1 GHz, EUT Orientation Y Vertical

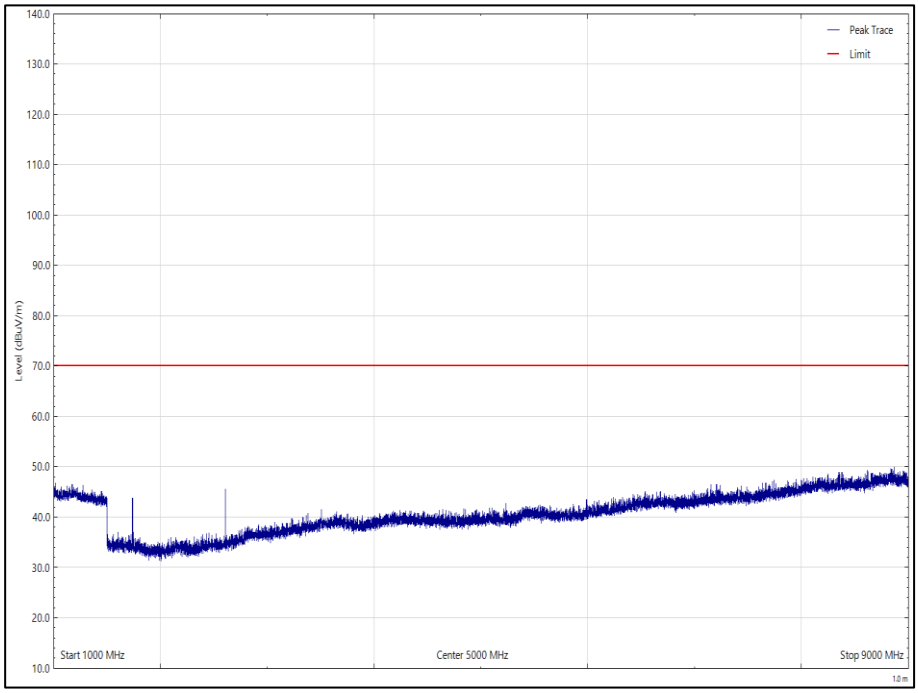


Figure 75 - 868.975 MHz - 1 GHz to 9 GHz, EUT Orientation Y Vertical

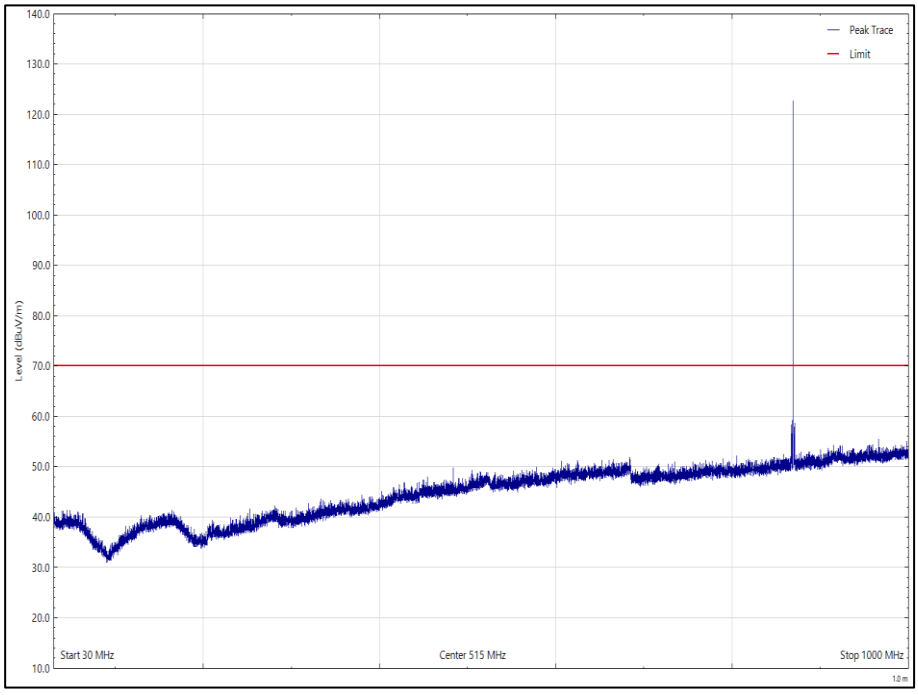


Figure 76 - 868.975 MHz - 30 MHz to 1 GHz, EUT Orientation Z Horizontal

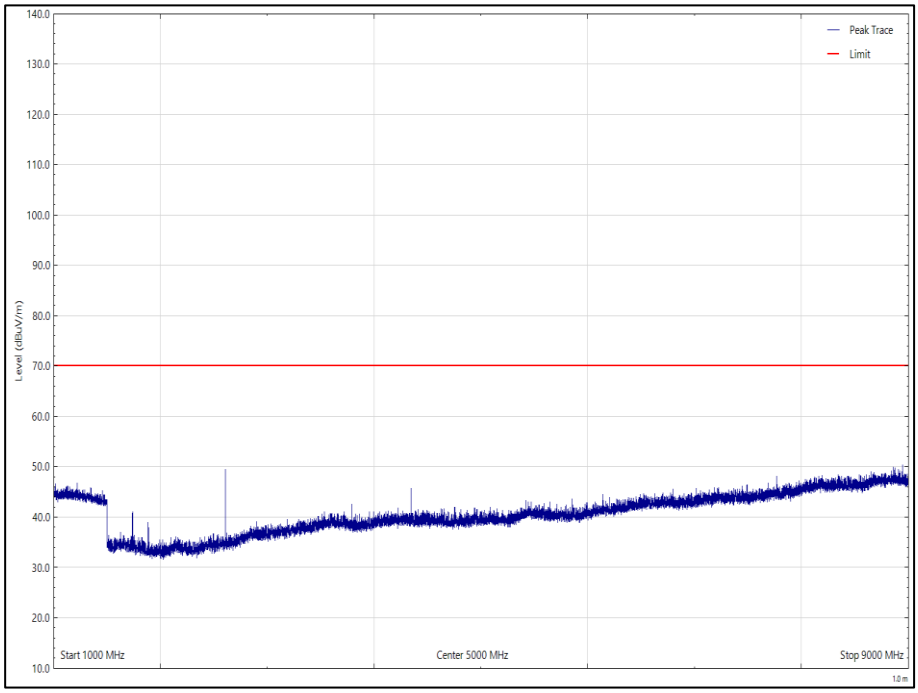


Figure 77 - 868.975 MHz - 1 GHz to 9 GHz, EUT Orientation Z Horizontal

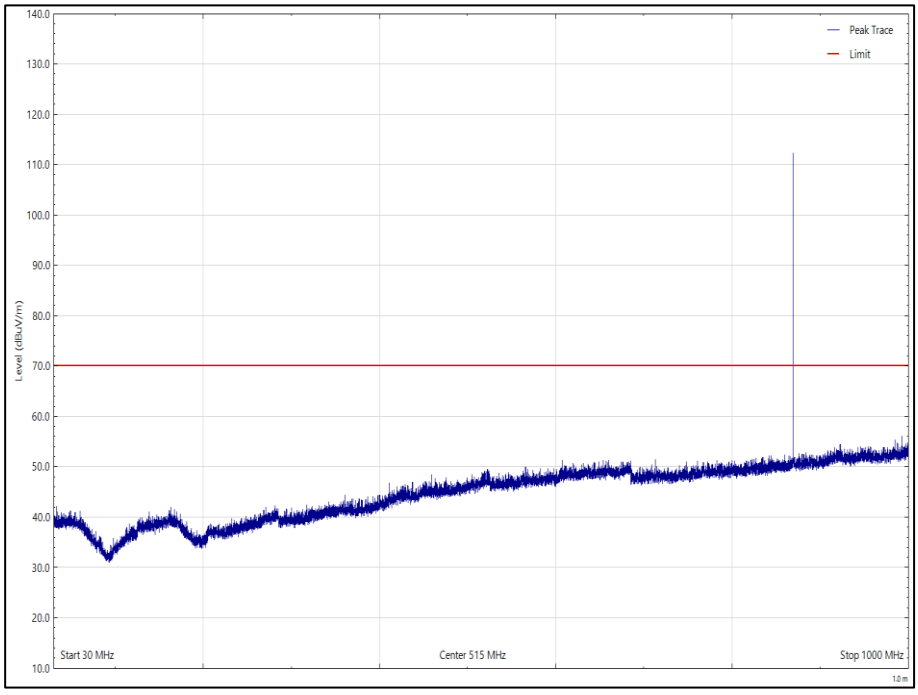


Figure 78 - 868.975 MHz - 30 MHz to 1 GHz, EUT Orientation Z Vertical

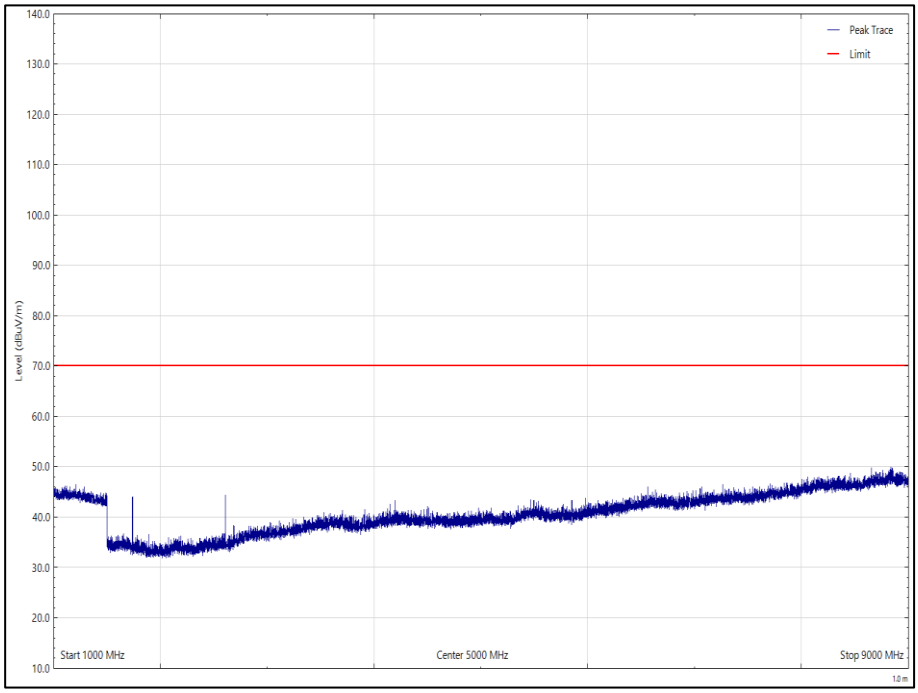


Figure 79 - 868.975 MHz - 1 GHz to 9 GHz, EUT Orientation Z Vertical

FCC 47 CFR Part 90, Limit Clause 90.210

The EUT shall comply with emission mask B as per FCC 47 CFR Part 90, clause 90.210.

ISED RSS-119, Limit Clause 5.8

The EUT shall comply with emission mask Y as per ISED RSS-119. clause 5.8.

2.2.8 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Power Supply Unit	Hewlett Packard	6282A	132	-	TU
Screened Room (5)	Rainford	Rainford	1545	36	15-Apr-2024
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygropalm Temperature and Humidity Meter	Rotronic	HP21	4410	12	08-Aug-2024
Mast Controller	Maturo Gmbh	NCD	4810	-	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	4811	-	TU
High Pass filter	Wainwright	WHKX12-1290-1500-18000-80SS	4961	12	30-May-2024
Emissions Software	TUV SUD	EmX V3.1.12	5125	-	Software
Pre-amplifier (30 dB, 1GHz to 18GHz)	Schwarzbeck	BBV 9718 C	5261	12	14-Apr-2024
Cable (SMA to SMA, 2 m)	Junkosha	MWX221-02000AMSAMS/A	5517	12	21-May-2024
Cable (N-Type to N-Type, 8 m)	Junkosha	MWX221-08000NMSNMS/B	5521	12	05-Jun-2024
EMI Test Receiver	Rohde & Schwarz	ESW44	5527	12	15-Jun-2024
3 GHz High pass Filter	Wainwright	WHKX12-2580-3000-18000-80SS	5548	12	16-Aug-2024
DVM - Digital Multimeter	Iso-tech	IDM101	5601	12	20-Feb-2024
Antenna (DRG, 1 GHz to 10.5 GHz)	Schwarzbeck	BBHA9120B	5611	12	15-Oct-2024
Cable (K-Type to K-Type, 2 m)	Junkosha	MWX241-02000KMSKMS/B	5934	12	18-Jun-2024
Coaxial Fixed Attenuator DC-18GHz 5W 10dB	RF-Lambda	RFS5G18B10SMP	6179	12	11-Oct-2024
Attenuator 4dB	Pasternack	PE7074-4	6201	24	16-Jul-2024
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9168	6635	24	13-Jun-2025

Table 27

TU - Traceability Unscheduled

2.3 Spurious Emissions at Antenna Terminals

2.3.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1051
FCC 47 CFR Part 90, Clause 90.210
ISED RSS-119, Clause 5.8
ISED RSS-GEN, Clause 6.13

2.3.2 Equipment Under Test and Modification State

SC2328, S/N: 1PR002336GKM4HR - Modification State 0

2.3.3 Date of Test

15-November-2023 to 16-November-2023

2.3.4 Test Method

For emissions where the frequency is removed less than 250 % of the authorised bandwidth measurements were performed conducted as follows:

The EUT was connected to a spectrum analyser via a cable and attenuator. The path loss between the EUT and analyser was calibrated using a network analyser and entered into the spectrum analyser as a reference level offset. The reference level for the mask was established with an RBW approximately 2 or 3 times the emission bandwidth. The RBW was then reduced to at least 1 % of the emission bandwidth, with a VBW of 3 times RBW. The mask as per FCC 47 CFR Part 90.210 (b) emission mask B was applied to the FCC plot, and the mask as per RSS-119 5.8.10 emission mask Y was applied to the ISEDC plot.

For emissions where the frequency is removed more than 250 % of the authorized bandwidth measurements were performed both conducted and radiated as follows:

Conducted: A network analyser was used to measure the path loss and the worst case was entered as a reference level offset in to the spectrum analyser. The EUT was connected to a spectrum analyser via an attenuator, filter and cable. Between 1 GHz and 3 GHz a 1 GHz high pass filter was used. Between 3 GHz and 5 GHz a 3 GHz high pass filter was used. The spectrum analyser was configured with an RBW of 100 kHz below 1 GHz and 1 MHz for frequencies greater than 1 GHz with the trace set to max hold using a peak detector.

2.3.5 Environmental Conditions

Ambient Temperature	19.1 - 19.7 °C
Relative Humidity	47.8 - 50.1 %

2.3.6 Test Results

Tetra - 806-824 MHz

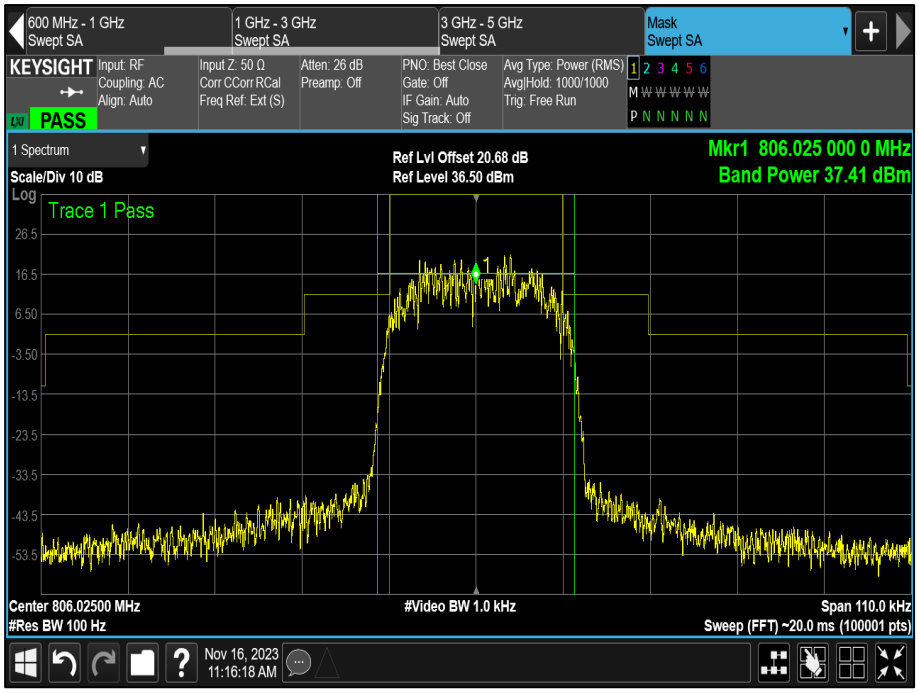


Figure 80 - 806.025 MHz, FCC Part 90 Transmitter Mask B

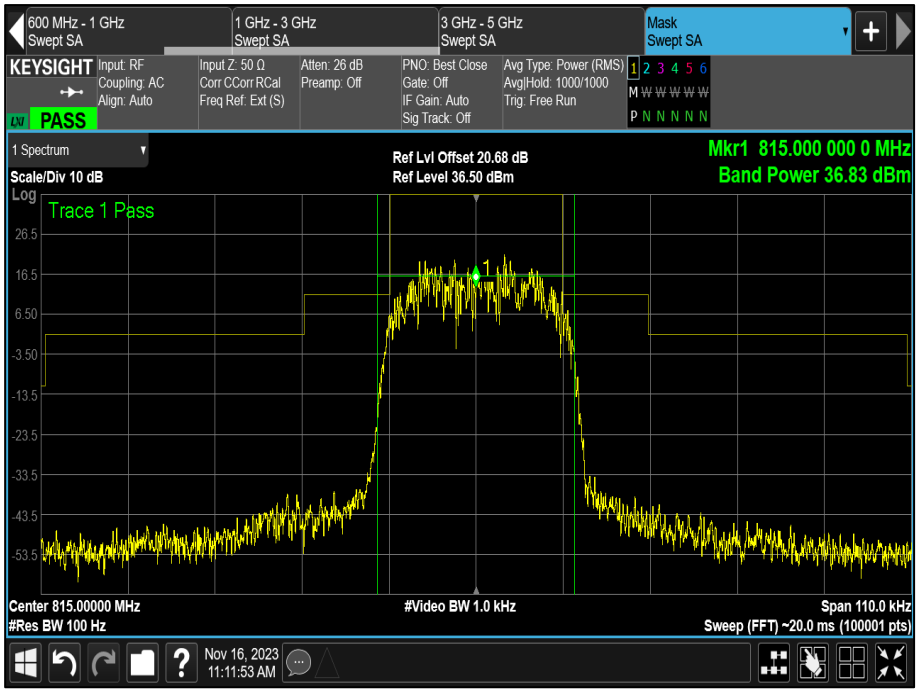


Figure 81 – 815.000 MHz, FCC Part 90 Transmitter Mask B

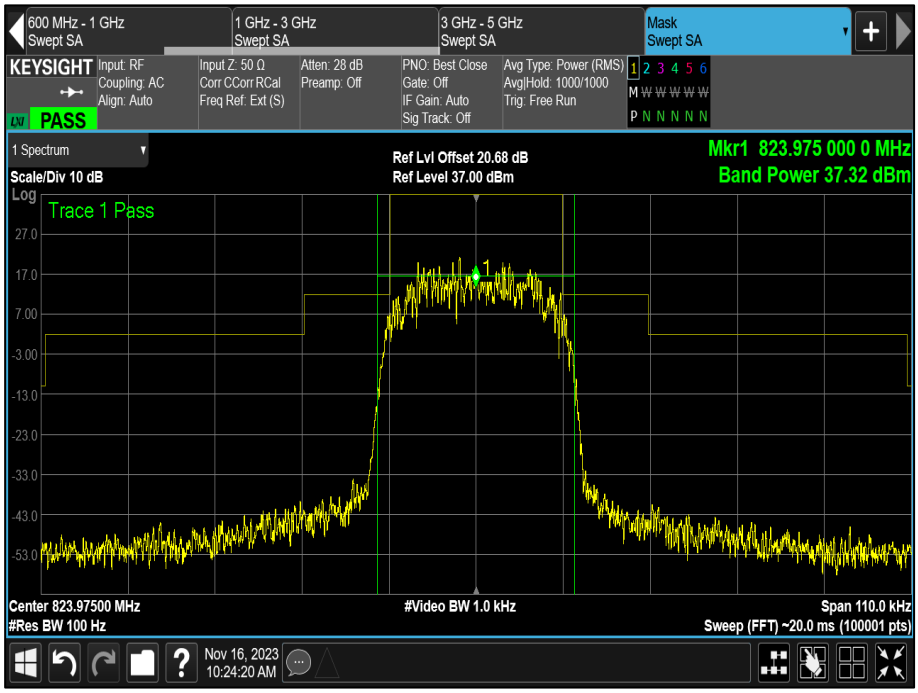


Figure 82 - 823.975 MHz, FCC Part 90 Transmitter Mask B

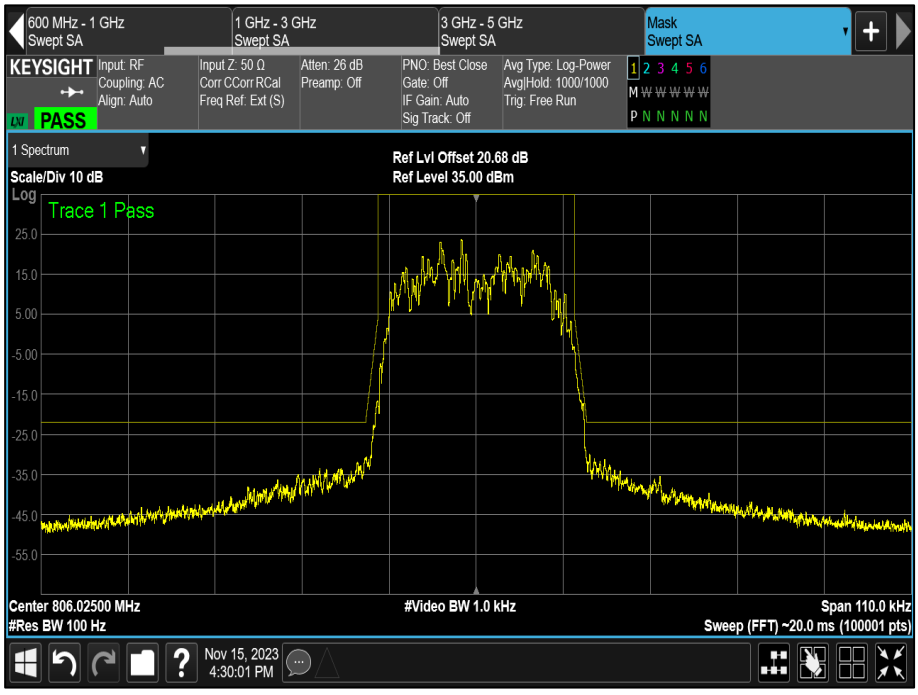


Figure 83 - 806.025 MHz, RSS-119 Transmitter Mask Y

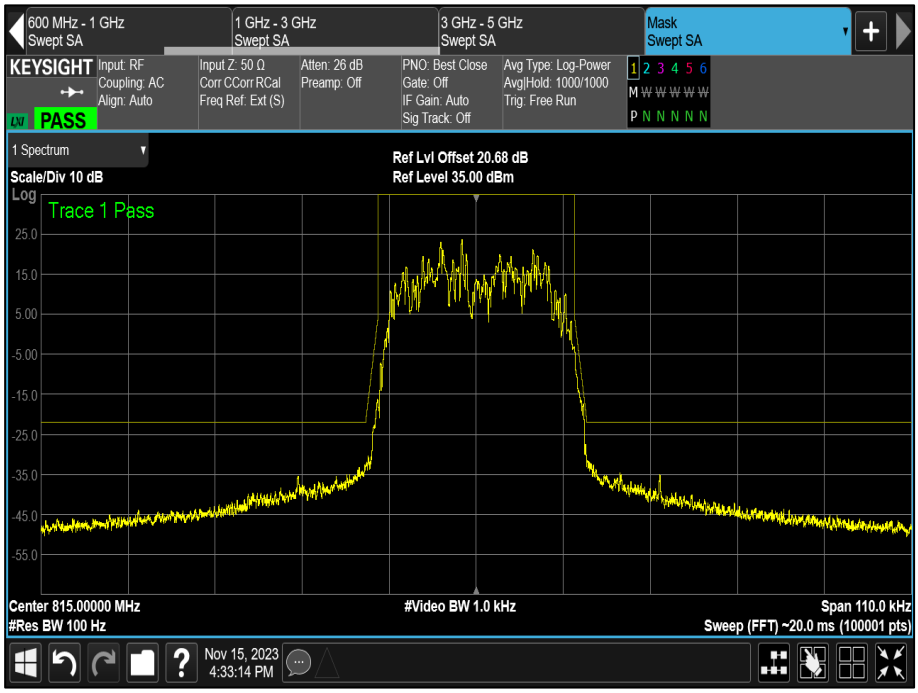


Figure 84 – 815.000 MHz, RSS-119 Transmitter Mask Y

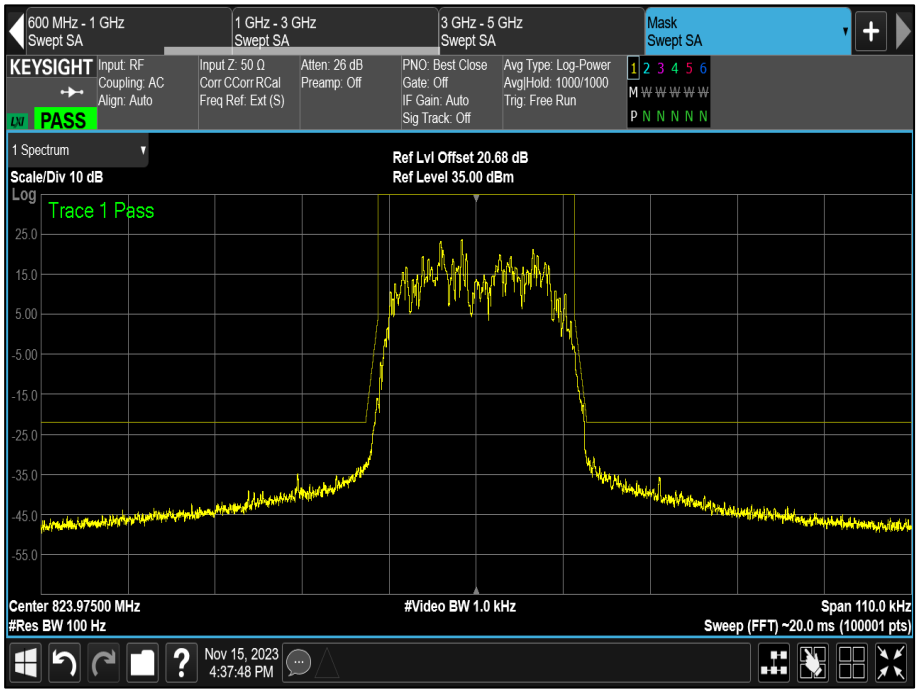


Figure 85 - 823.975 MHz, RSS-119 Transmitter Mask Y

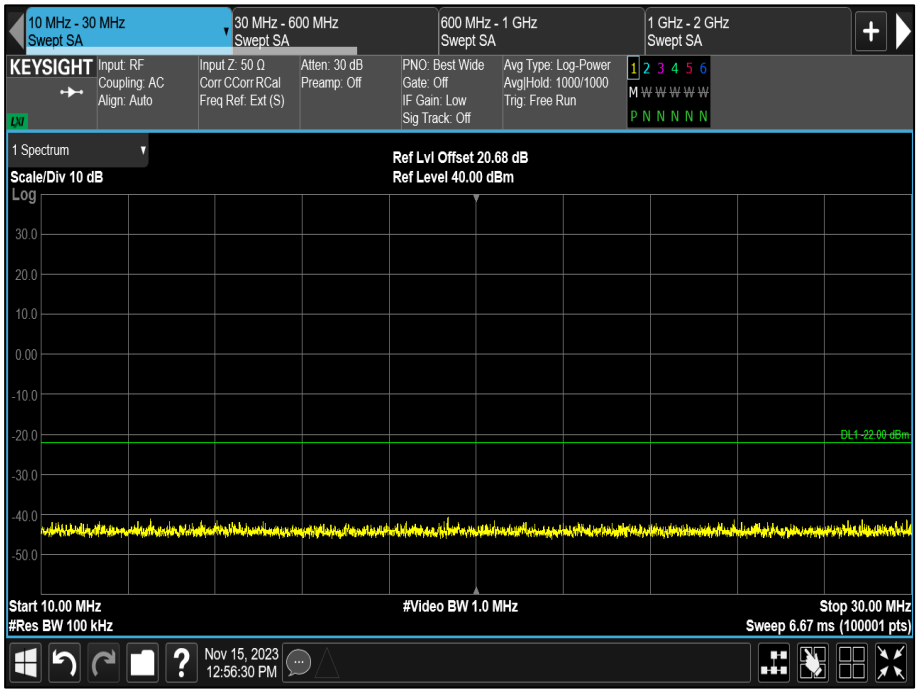


Figure 86 - 806.025 MHz, 10 MHz to 30 MHz RSS-119 Mask Y

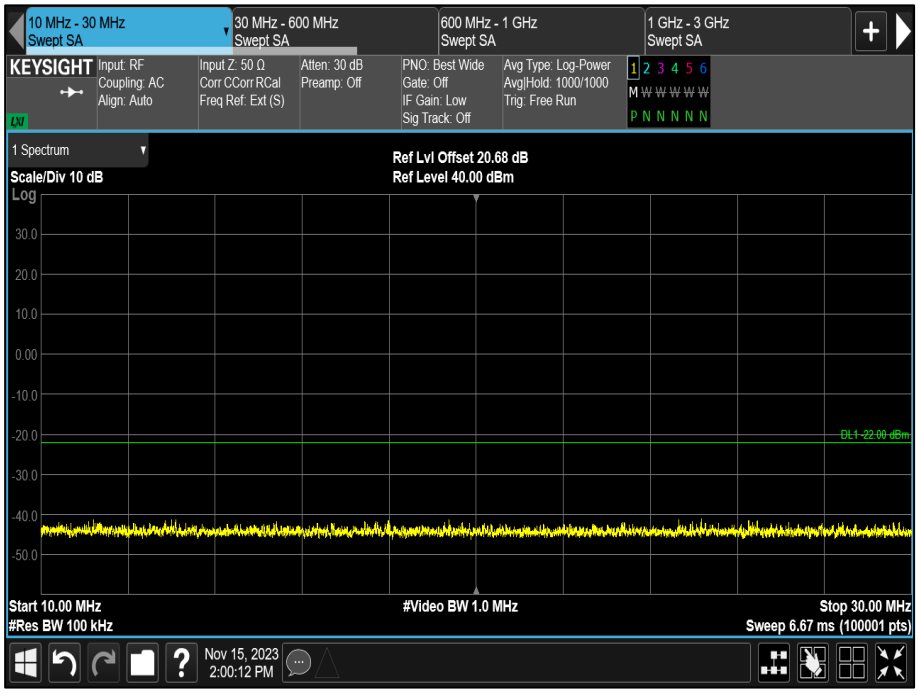


Figure 87 – 815.000 MHz, 10 MHz to 30 MHz RSS-119 Mask Y*

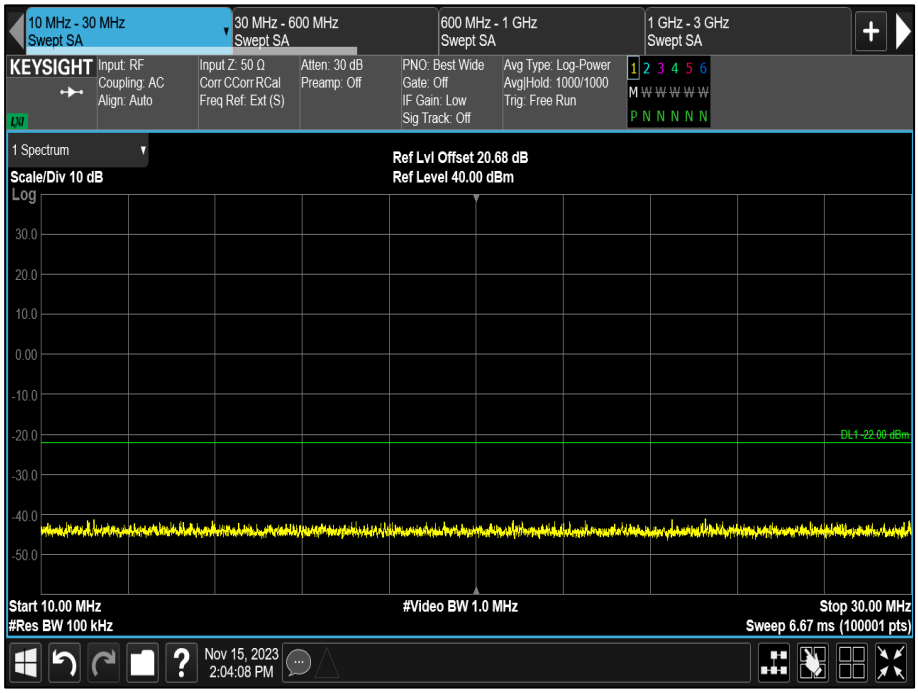


Figure 88 - 823.975 MHz - 10 MHz to 30 MHz RSS-119 Mask Y*

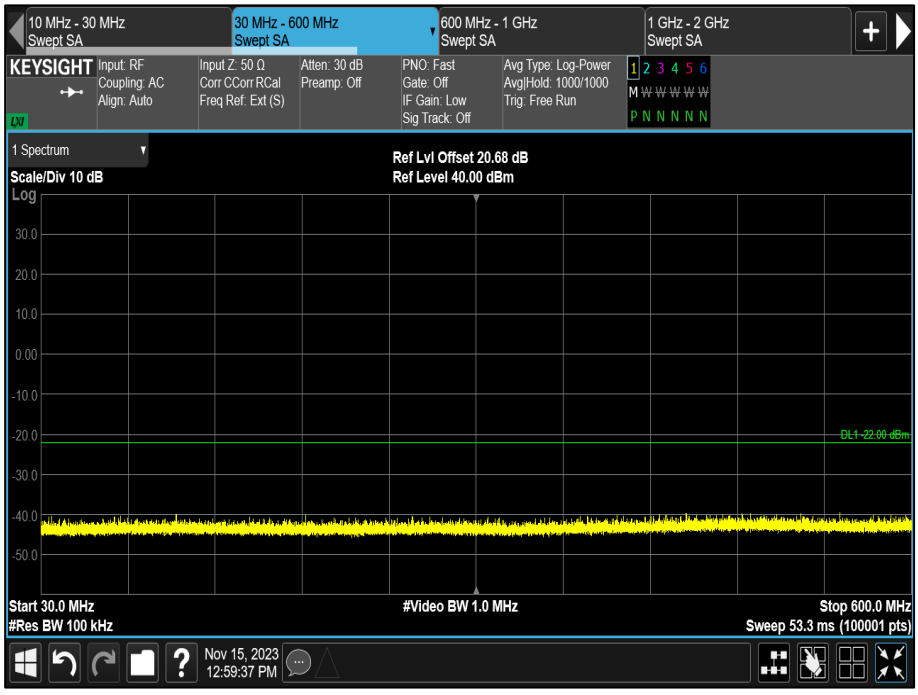


Figure 89 - 806.025 MHz, 30 MHz to 600 MHz RSS-119 Mask Y*

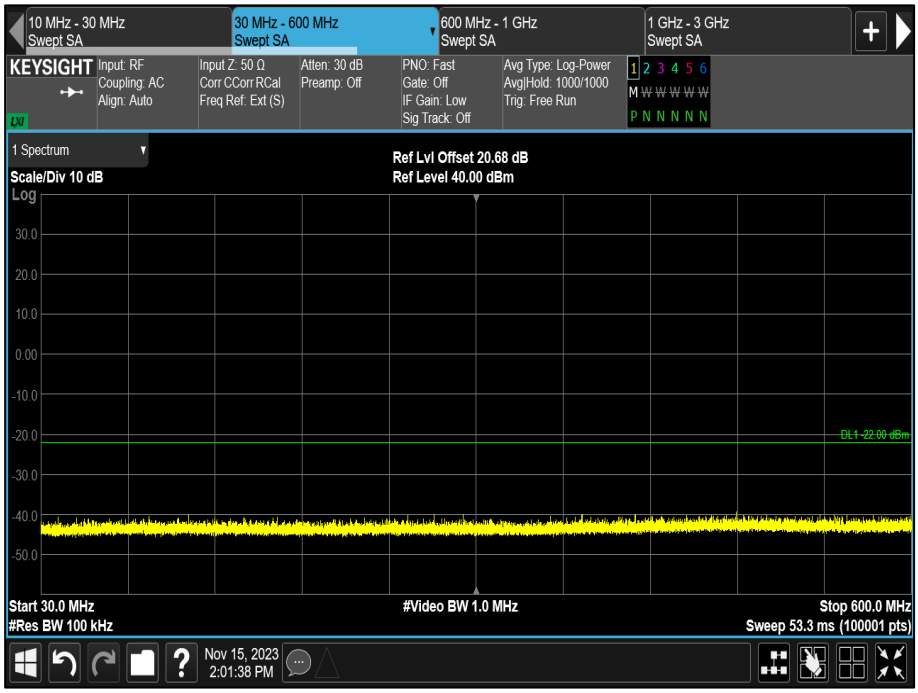


Figure 90 – 815.000 MHz, 30 MHz to 600 MHz RSS-119 Mask Y*

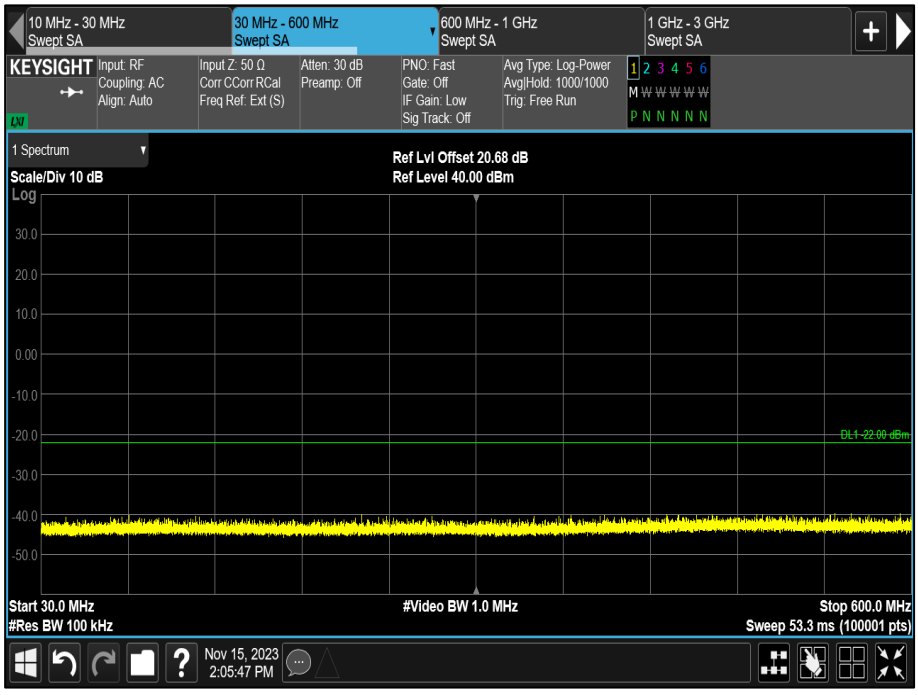


Figure 91 - 823.975 MHz - 30 MHz to 600 MHz RSS-119 Mask Y*

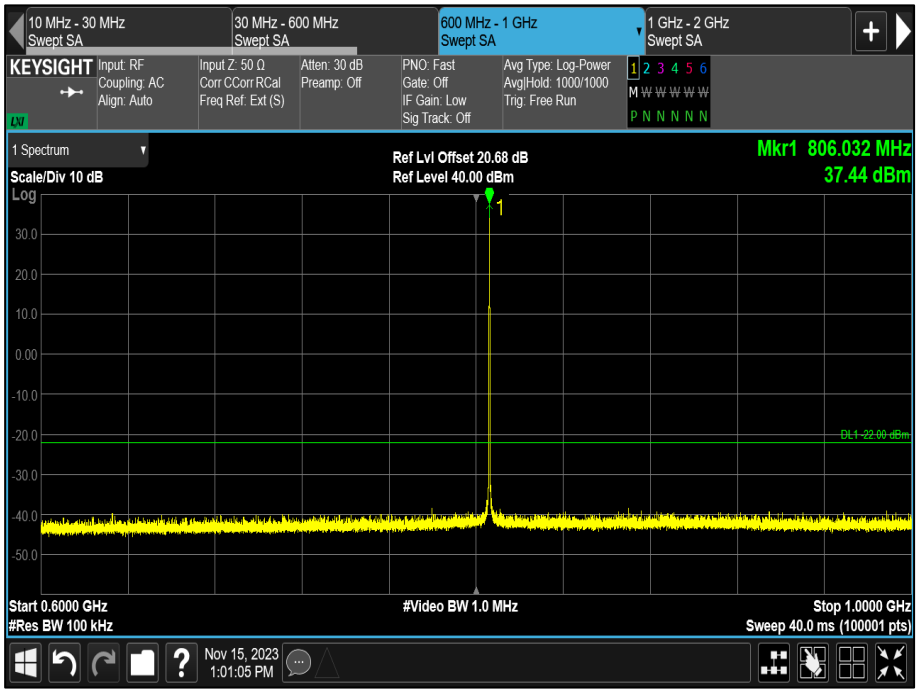


Figure 92 - 806.025 MHz, 600 MHz to 1 GHz RSS-119 Mask Y*

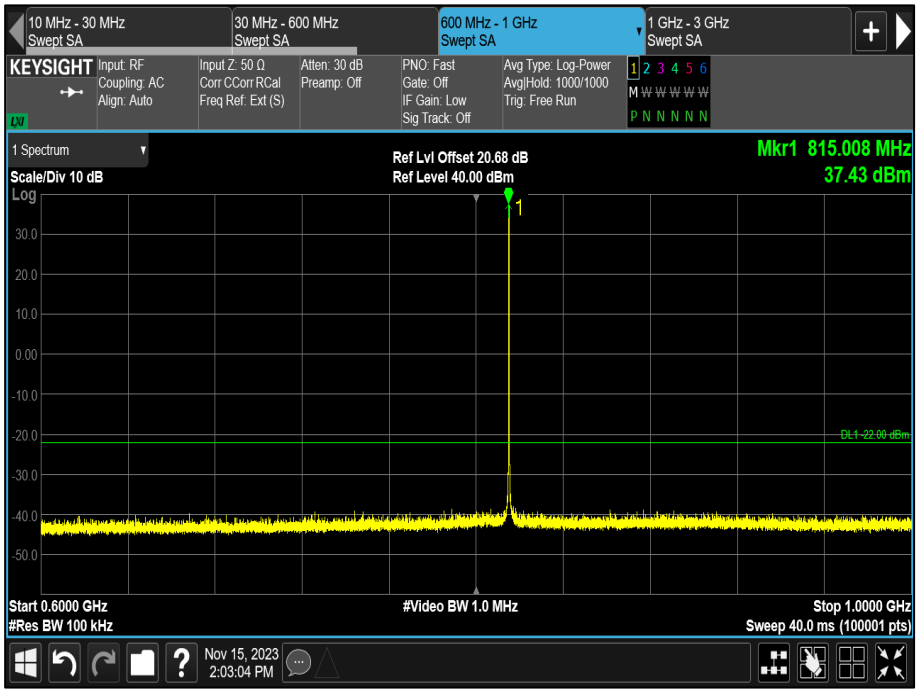


Figure 93 – 815.000 MHz, 600 MHz to 1 GHz RSS-119 Mask Y*

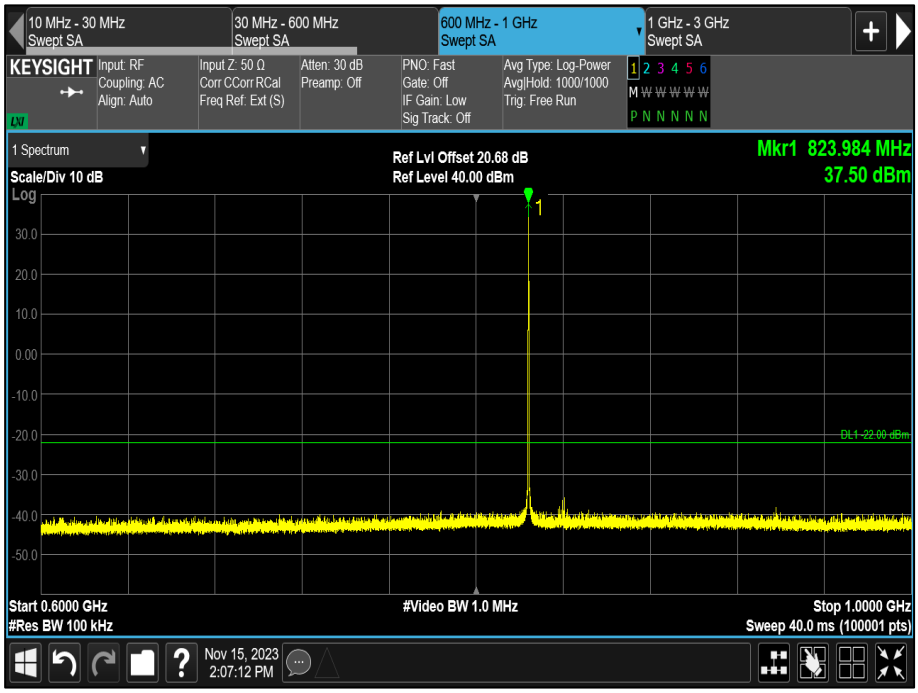


Figure 94 - 823.975 MHz - 600 MHz to 1 GHz RSS-119 Mask Y*

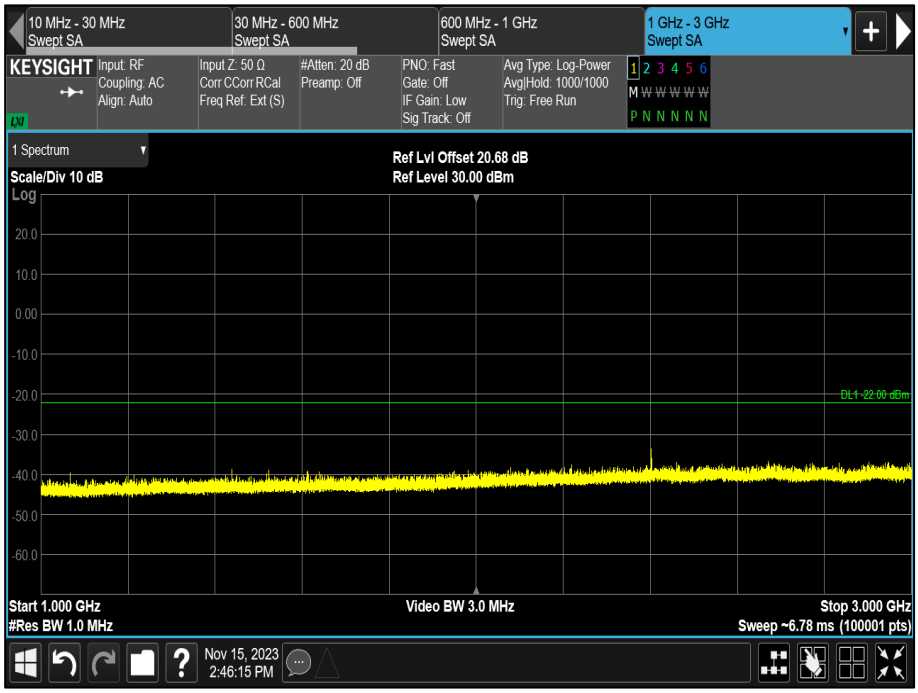


Figure 95 - 806.025 MHz,1 GHz to 3 GHz RSS-119 Mask Y*

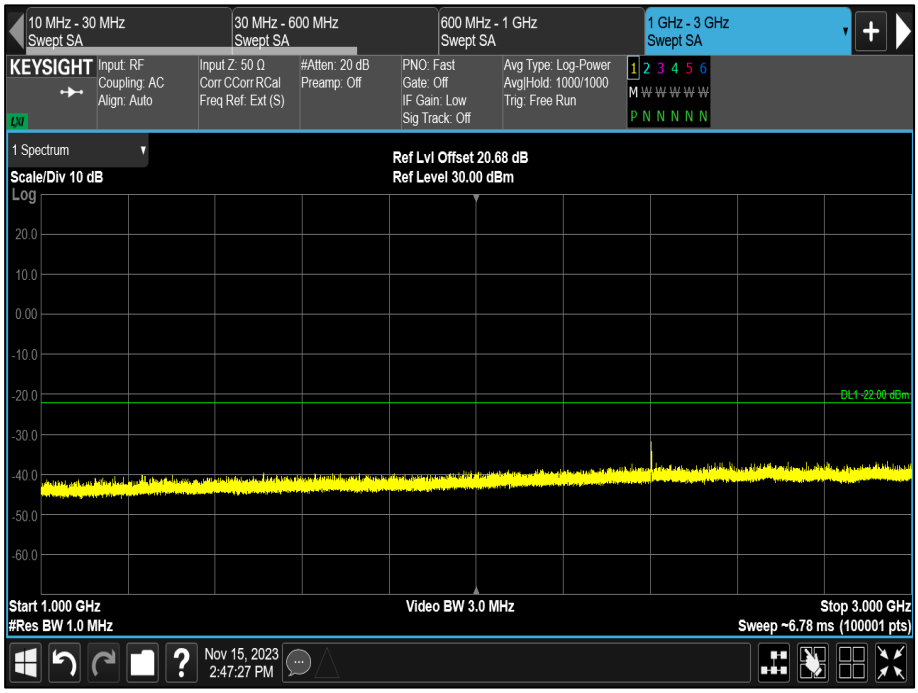


Figure 96 – 815.000 MHz, 1 GHz to 3 GHz RSS-119 Mask Y*

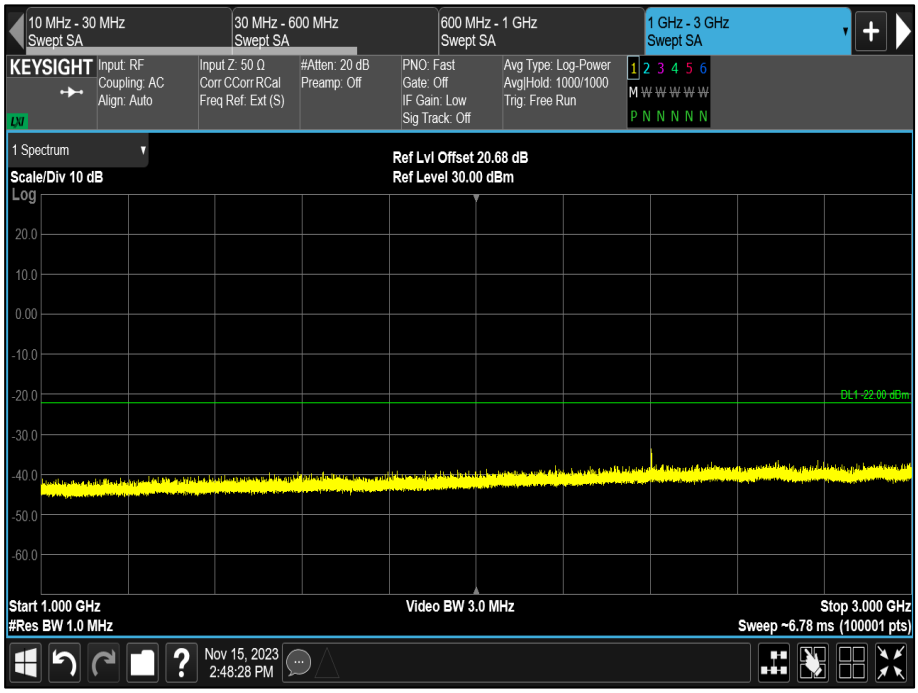


Figure 97 - 823.975 MHz - 1 GHz to 3 GHz RSS-119 Mask Y*

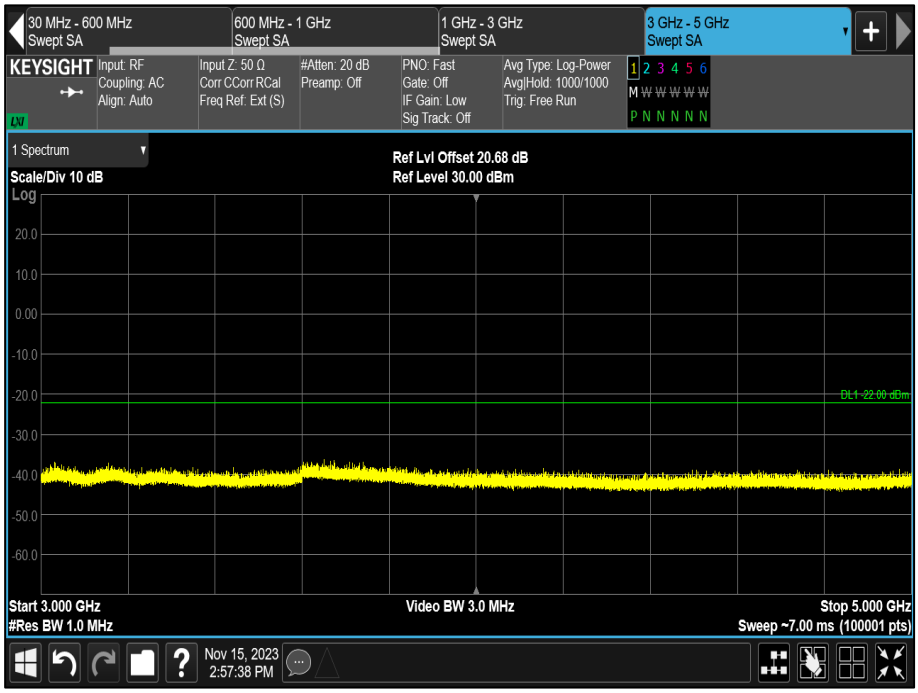


Figure 98 - 806.025 MHz, 3 GHz to 5 GHz RSS-119 Mask Y*

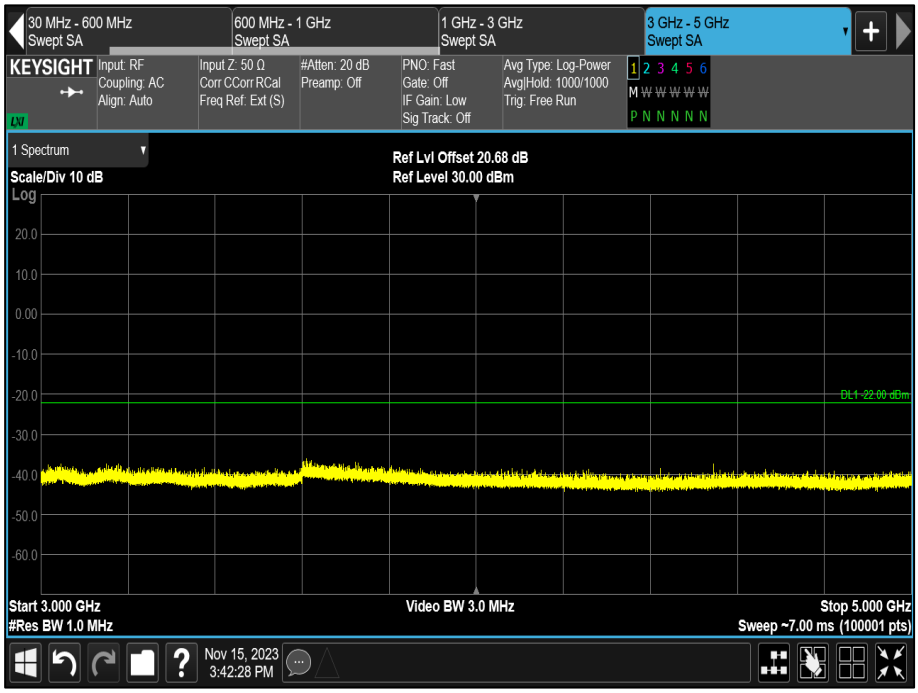


Figure 99 – 815.000 MHz, 3 GHz to 5 GHz RSS-119 Mask Y*

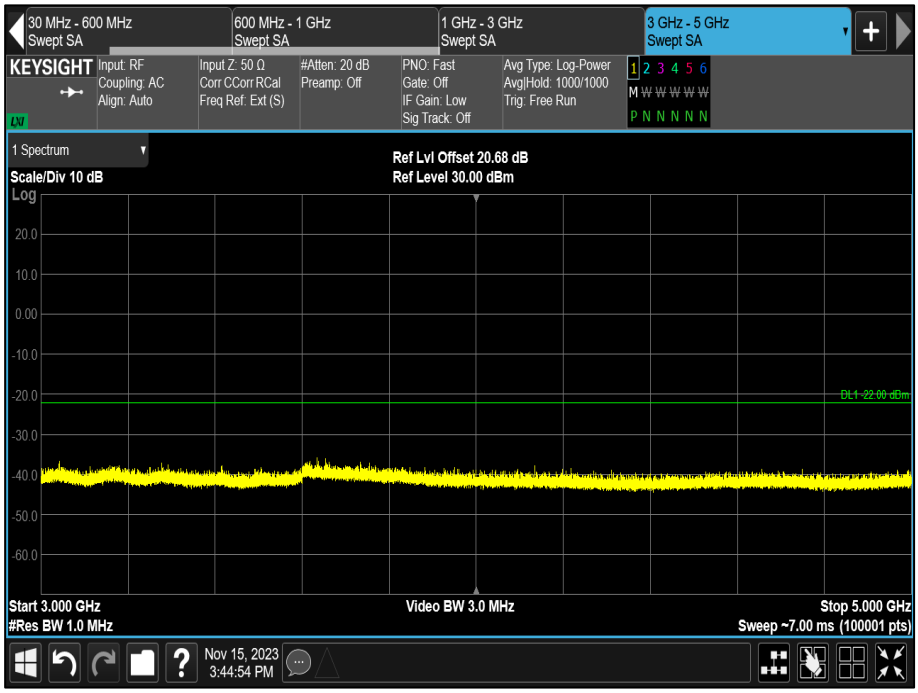


Figure 100 - 823.975 MHz - 3 GHz to 5 GHz RSS-119 Mask Y*

Tetra - 851-869 MHz

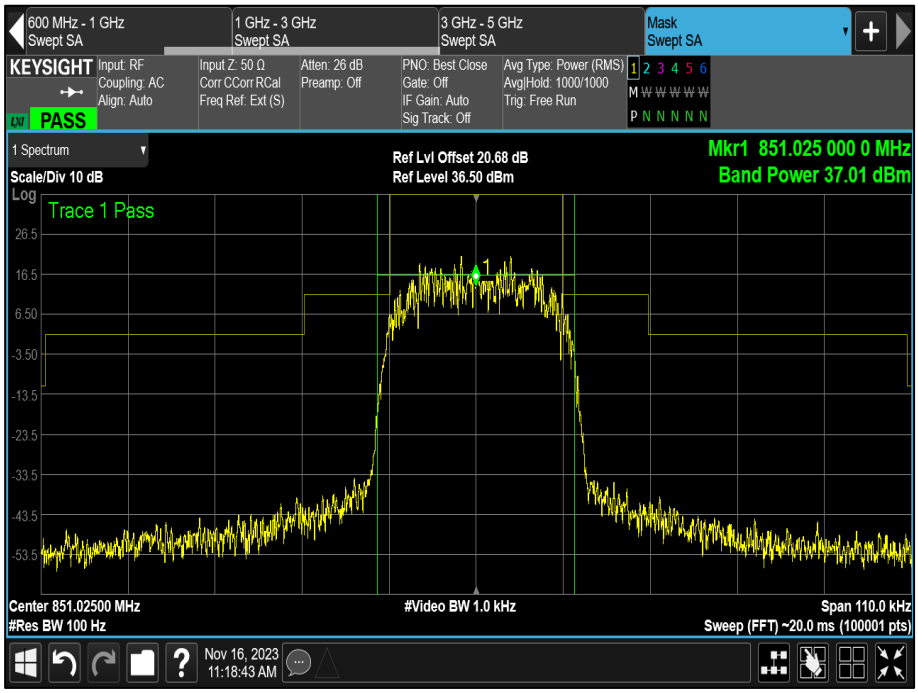


Figure 101 - 851.025 MHz, FCC Part 90 Transmitter Mask B

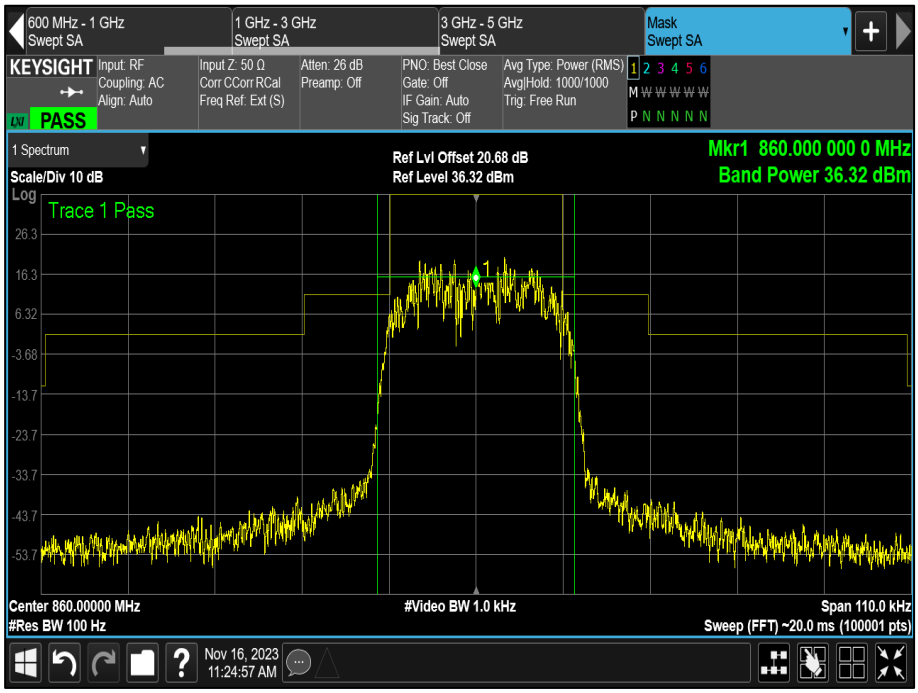


Figure 102 – 860.000 MHz, FCC Part 90 Transmitter Mask B

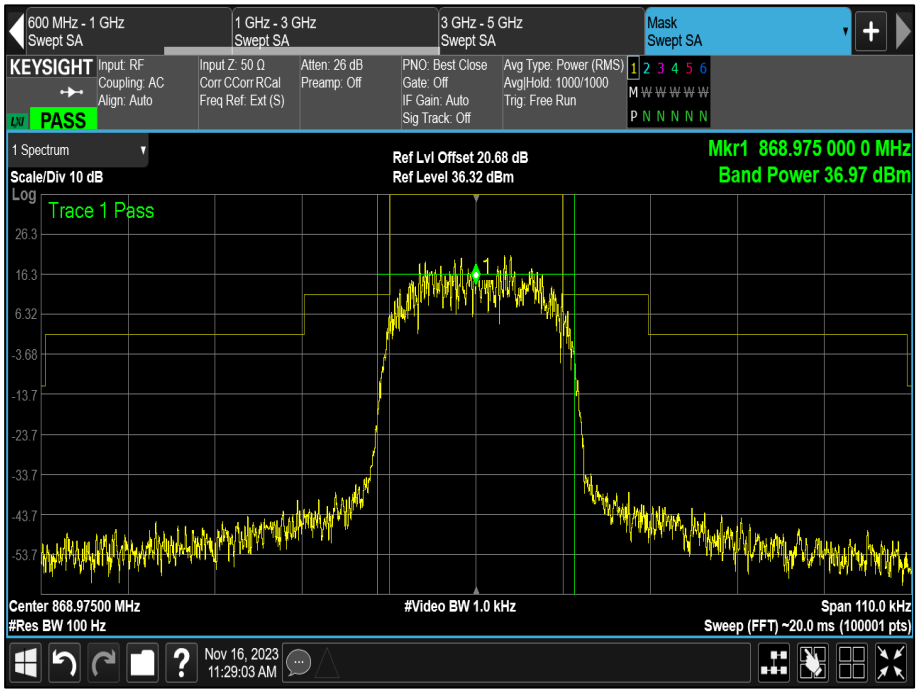


Figure 103 - 868.975 MHz, FCC Part 90 Transmitter Mask B

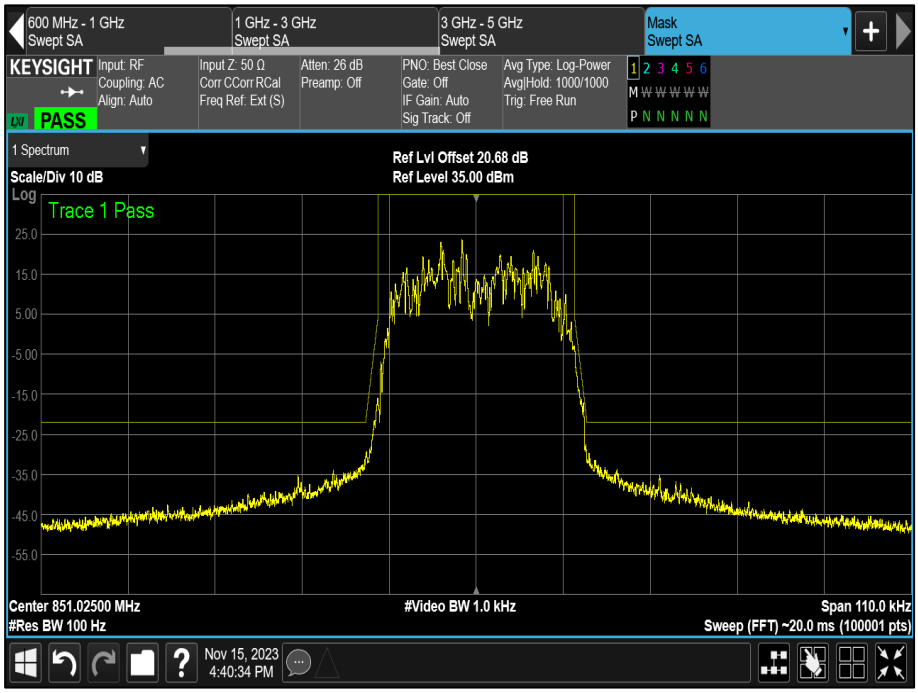


Figure 104 - 851.025 MHz, RSS-119 Transmitter Mask Y

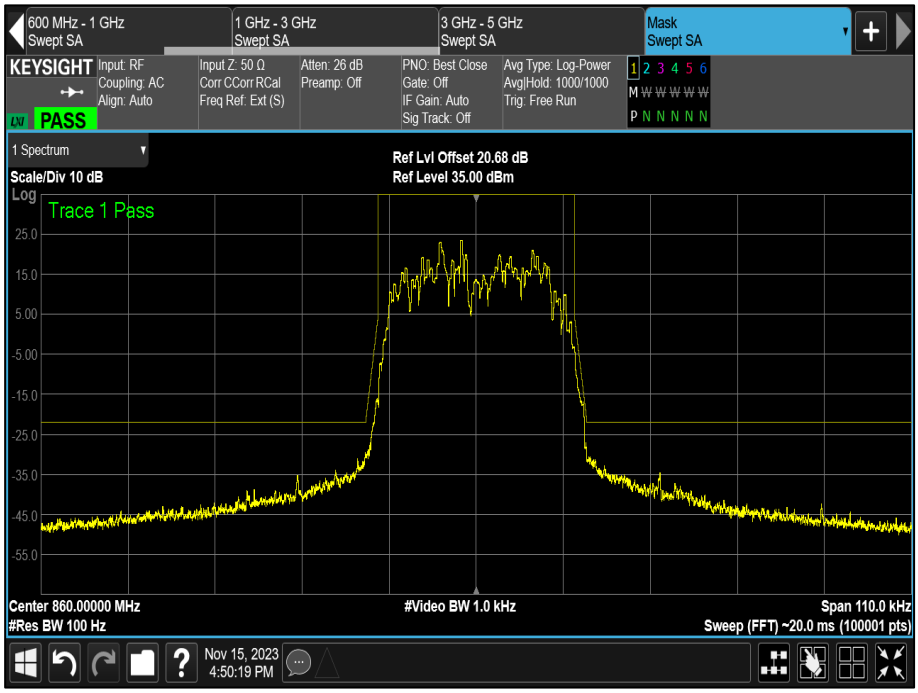
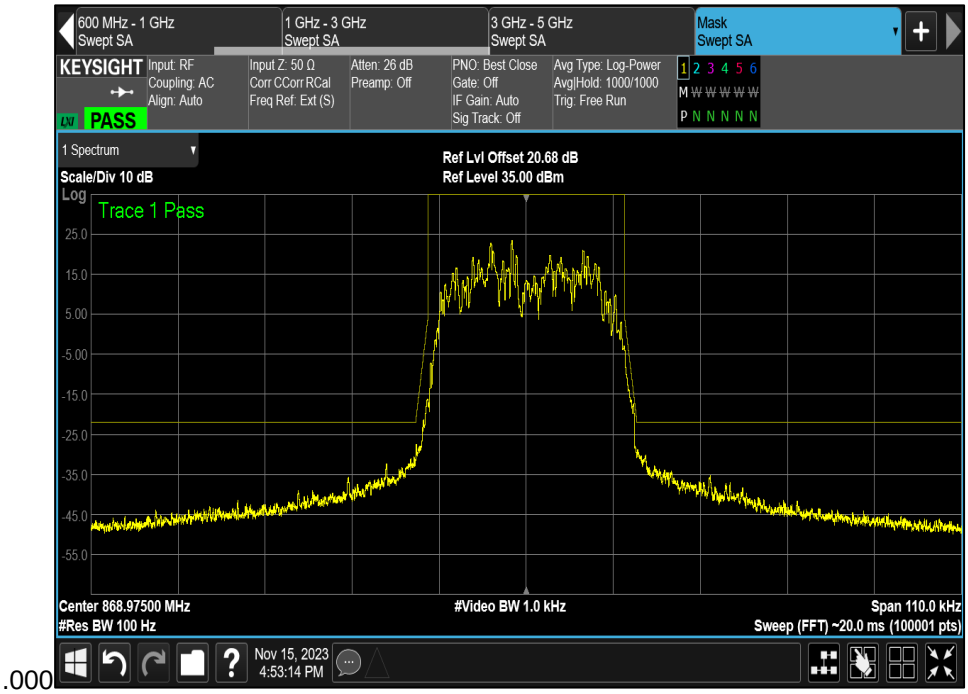


Figure 105 – 860.000 MHz, RSS-119 Transmitter Mask Y



.000

Figure 106 - 868.975 MHz, RSS-119 Transmitter Mask Y

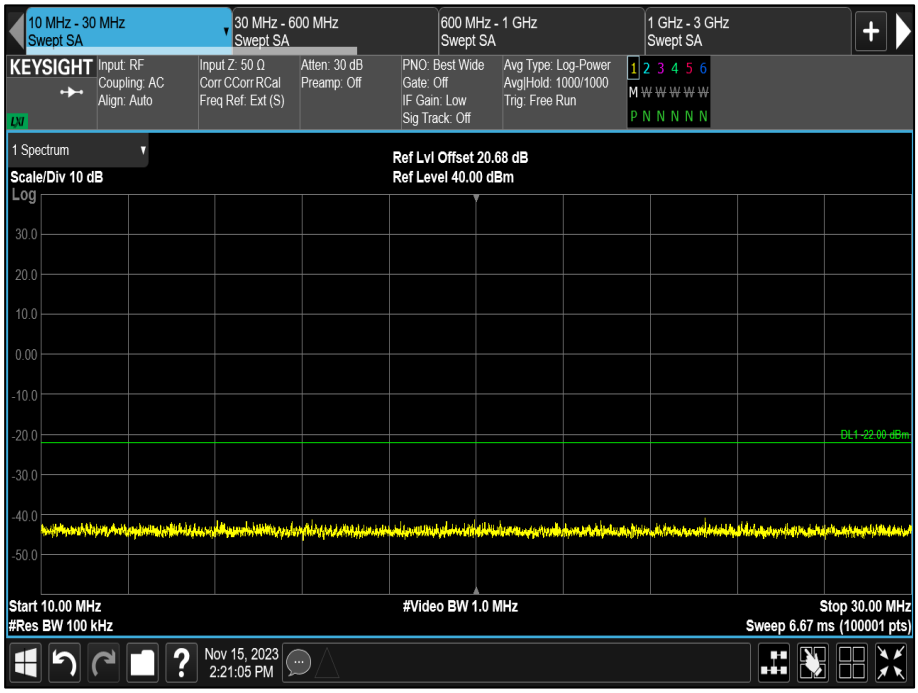


Figure 107 - 851.025 MHz,10 MHz to 30 MHz RSS-119 Mask Y*

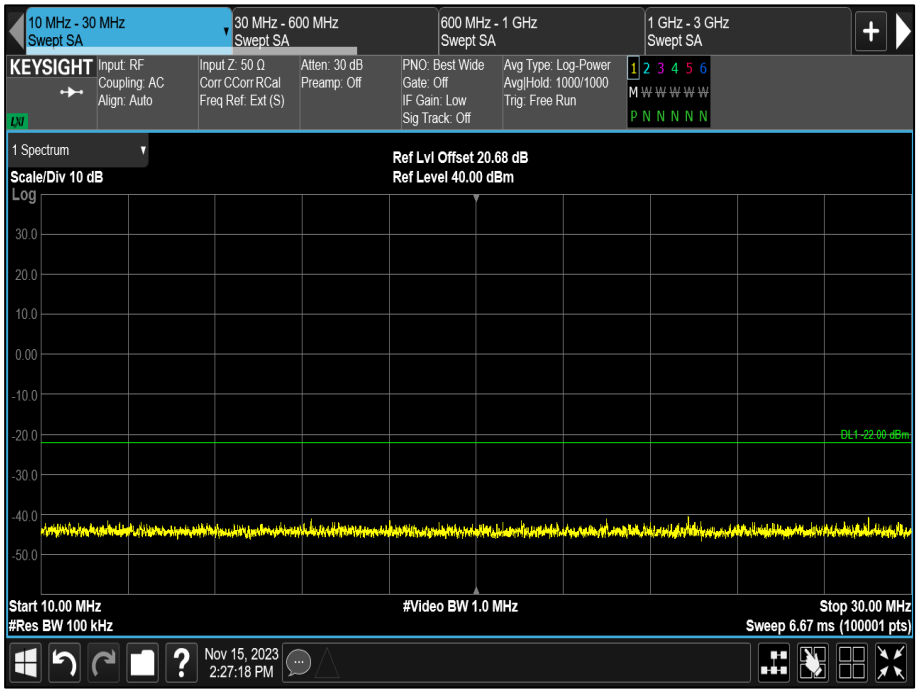


Figure 108 – 860.000 MHz, 10 MHz to 30 MHz RSS-119 Mask Y*

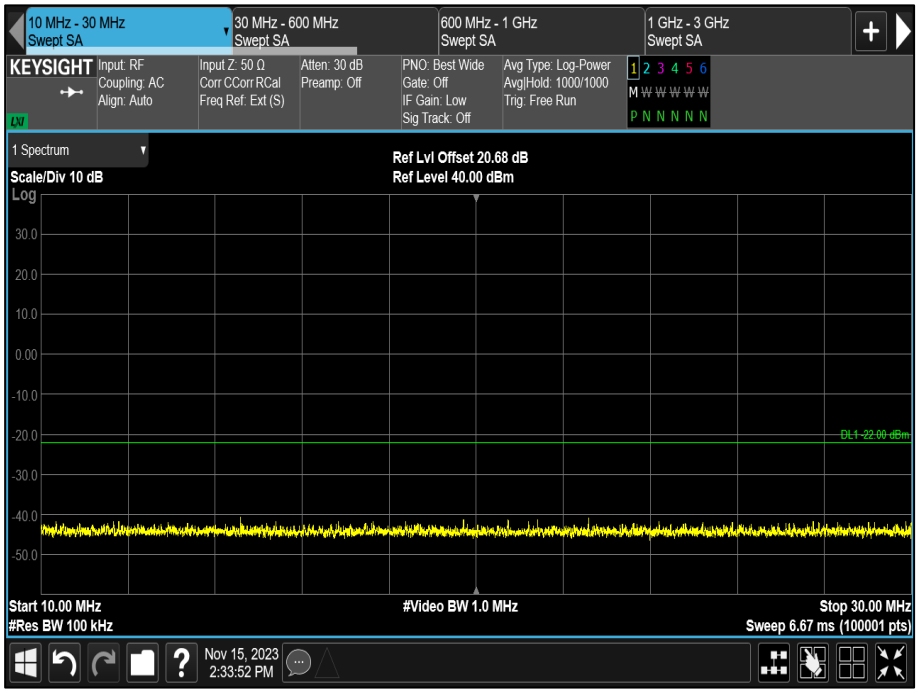


Figure 109 - 868.975 MHz - 10 MHz to 30 MHz RSS-119 Mask Y*

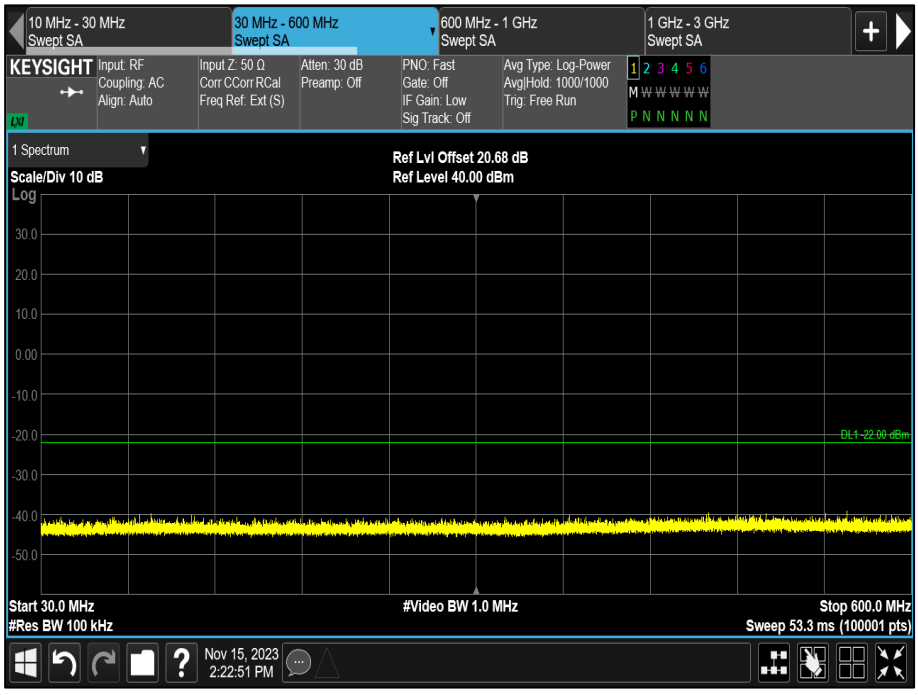


Figure 110 - 851.025 MHz, 30 MHz to 600 MHz RSS-119 Mask Y*