FCC and ISED Test Report

Sepura Limited
Hand Portable Radio, Model: STP8X040

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
9000 Cambridge Research Park
Beach Drive
Waterbeach
Cambridge, CB25 9TL
United Kingdom

FCC ID: XX6STP8X040B IC: 8739A-STP8X040B

COMMERCIAL-IN-CONFIDENCE

Document 75960173-01 Issue 02

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Steve Marshall	Senior Engineer	Authorised Signatory	07 January 2025

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	Neil Rousell	07 January 2025	
	Roscoe Harrison	07 January 2025	
	Aakash Rawal	07 January 2025	

FCC Accreditation
492497/UK2010 Octagon House, Fareham Test Laboratory

ISED Accreditation
12669A/UK0003 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: 2022, 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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TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuvsud.com/en

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

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	24-July-2024
2	Additional wording added to Radiated Spurious Emission test method Test Setup photos removed	07-January-2025

Table 1

1.2 Introduction

Applicant	Sepura Limited
Manufacturer	Sepura Limited
Model Number(s)	STP8X040
Serial Number(s)	1PR902412G9Y2BE
Hardware Version(s)	PLX-11016M10-01 (mod state 9)
Software Version(s)	181301302937
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 2: 2022 FCC 47 CFR Part 90: 2022 ISED RSS-119: Issue 12 (05-2015) ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)
Order Number	PLC-PO027821
Date	29-December-2023
Date of Receipt of EUT	30-April-2024
Start of Test	10-May-2024
Finish of Test	03-June-2024
Name of Engineer(s)	Neil Rousell, Roscoe Harrison, Aakash Rawal
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 - 407 - 430 MHz							
2.1	-	-	5.4	6.12	Maximum Conducted Output Power	Pass	ANSI C63.26: 2015
2.2	-	-	5.5	6.7	Bandwidth Limitations	Pass	ANSI C63.26: 2015
2.3	-	-	5.8	6.13	Spurious Emissions at Antenna Terminals	Pass	
2.4	-	-	5.8	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015
2.5	-	-	5.3	6.11	Frequency Stability	Pass	ANSI C63.26: 2015
2.6	-	-	5.9	-	Transient Frequency Behaviour	Pass	
2.8	-	-	5.2	-	Types of Emissions	Pass	
Configuration and Mode: TETRA - 450 - 470 MHz							
2.1	2.1046	90.205	5.4	6.12	Maximum Conducted Output Power	Pass	ANSI C63.26: 2015
2.2	2.1049	90.209	5.8	6.7	Bandwidth Limitations	Pass	ANSI C63.26: 2015
2.3	2.1051	90.210	5.8	6.13	Spurious Emissions at Antenna Terminals	Pass	
2.4	2.1053	90.210	5.8	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015
2.5	2.1055	90.213	5.3	6.11	Frequency Stability	Pass	ANSI C63.26: 2015
2.6	-	90.214	5.9	-	Transient Frequency Behaviour	Pass	
2.7	-	90.221	5.8.9.1	-	Adjacent Channel Power	Pass	
2.8	2.1047	90.207	5.2	-	Types of Emissions	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)*	STP8X is a TETRA Hand Portable Radio with GPS and optional Bluetooth, compliant with IECEx/ATEX standards.		
Manufacturer:	Sepura Limited		
Model:	STP8X040		
Part Number:	STP8X040		
Hardware Version:	PLX-11016M10-01 (mod state 9)		
Software Version:	Main: 181301302937		
FCC ID of the product under test – see guidance here	XX6STP8X040B		
IC ID of the product under test – see guidance here	8739A-STP8X040B		
Device Category	Mobile ☐	Portable ☒	Fixed ☐
Equipment is fitted with an Audio Low Pass Filter		Yes ☐	No☒

Table 3

Intentional Radiators

Technology	**TETRA – ISED**	**TETRA – ISED**	**TETRA – FCC**	Bluetooth	
Frequency Range (MHz to MHz)	407 - 430	450-470	450-470	2402 – 2480	
Conducted Declared Output Power (dBm)	29 dBm	29 dBm	29 dBm	3 dBm	
Antenna Gain (dBi) (pls see the section below of antenna characteristics for TETRA antennas)	1.86	0.67	0.67	-2.9	
Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)	25 kHz	25 kHz	25 kHz	1 Mhz	
Modulation Scheme(s) (e.g. GFSK, QPSK etc)	*π/4 DQPSK*	*π/4 DQPSK*	*π/4 DQPSK*	GFSK	
ITU Emission Designator (see guidance here) (not mandatory for Part 15 devices)	22K0DXW	22K0DXW	20K0DXW 22K0DXW	1M00F1D	
Bottom Frequency (MHz)	407.0125	450.0125	450.0125	2402	
Middle Frequency (MHz)	418.05000	460.025	460.025	2441	
Top Frequency (MHz)	429.9875	469.9875	469.9875	2480	

Table 4

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	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:	7.6	V
Extreme upper voltage:	8.4	V
Extreme lower voltage:	7	V
Max current:	2	A

Table 7

Battery Power Source

Voltage:	7.6V	V
End-point voltage:		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:	55	°C

Table 10

Cable Loss

Adapter Cable Loss (Conducted sample)		dB

Table 11

Antenna Characteristics

Antenna connector ☐			State impedance		Ohm
Temporary antenna connector ☐			State impedance		Ohm
External antenna ☒	Type:	310-00008	Gain	1.77	dBi
External antenna ☒	Type:	300-00882	Gain	1.22	dBi
External antenna ☒	Type:	300-00883	Gain	1.86	dBi
External antenna ☒	Type:	300-00884	Gain	0.67	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.					

Table 12

Ancillaries (if applicable)

Manufacturer:	Sepura	Part Number:	300-00904
Model:	STP8X Desktop Charger	Country of Origin:	Romania
Manufacturer:	Sepura	Part Number:	300-00879
Model:	STP8X Programming Lead	Country of Origin:	Romania
Manufacturer:	Panorama	Part Number:	310-00008
Model:	TETRA Antenna	Country of Origin:	UK
Manufacturer:	Panorama	Part Number:	300-00882
Model:	TETRA Antenna	Country of Origin:	UK
Manufacturer:	Panorama	Part Number:	300-00883
Model:	TETRA Antenna	Country of Origin:	UK
Manufacturer:	Panorama	Part Number:	300-00884
Model:	TETRA Antenna	Country of Origin:	UK

Table 13

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

Name: Chris Beecham
Position held: Conformance Engineer
Date: 12/03/2024

1.5 Product Information

1.5.1 Technical Description

STP8X040 is a TETRA Hand Portable Radio with GPS and optional Bluetooth, compliant with IECEx/ATEX standards.

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: STP8X040, Serial Number: 1PR902412G9Y2BE			
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 - 407 - 430 MHz		
Maximum Conducted Output Power	Neil Rousell	UKAS
Bandwidth Limitations	Roscoe Harrison	UKAS
Spurious Emissions at Antenna Terminals	Neil Rousell	UKAS
Radiated Spurious Emissions	Aakash Rawal	UKAS
Frequency Stability	Neil Rousell	UKAS
Transient Frequency Behaviour	Neil Rousell	UKAS
Types of Emissions	Roscoe Harrison	UKAS
Configuration and Mode: TETRA - 450 - 470 MHz		
Maximum Conducted Output Power	Neil Rousell	UKAS
Bandwidth Limitations	Roscoe Harrison	UKAS
Spurious Emissions at Antenna Terminals	Neil Rousell	UKAS
Radiated Spurious Emissions	Aakash Rawal	UKAS
Frequency Stability	Neil Rousell	UKAS
Transient Frequency Behaviour	Neil Rousell	UKAS
Adjacent Channel Power	Neil Rousell	UKAS
Types of Emissions	Roscoe Harrison	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

STP8X040, S/N: 1PR902412G9Y2BE - Modification State 0

2.1.3 Date of Test

21-May-2024

2.1.4 Test Method

The EUT was configured to transmit using the 30 dBm TX power setting on the bottom, middle and top channels in burst mode.

The EUT was connected to a spectrum analyser via a cable and attenuation. The path loss was measured using a network analyser and entered as a reference level offset in the spectrum analyser. The average power over the burst was measured and the result recorded.

The test was applied in accordance with the test method requirements of FCC 47 CFR Part 90, ISED RSS-119, and ISED RSS-GEN with reference to ANSI C63.26, clause 5.2.4.3.2

2.1.5 Environmental Conditions

Ambient Temperature	23.5 °C
Relative Humidity	41.7 %

2.1.6 Test Results

TETRA - 407 - 430 MHz

Parameter	407.0125 MHz	418.05 MHz	429.9875 MHz
Conducted Output Power (dBm)	28.67	28.39	28.81
Manufacturer Declared Power (dBm)	29	29	29
Δ from manufacturer Power (dB)	-0.3	-0.6	-0.2
Antenna Gain (dBi)	1.86	1.86	1.86
ERP (dBm)	28.38	28.10	28.52

Table 16 - ERP

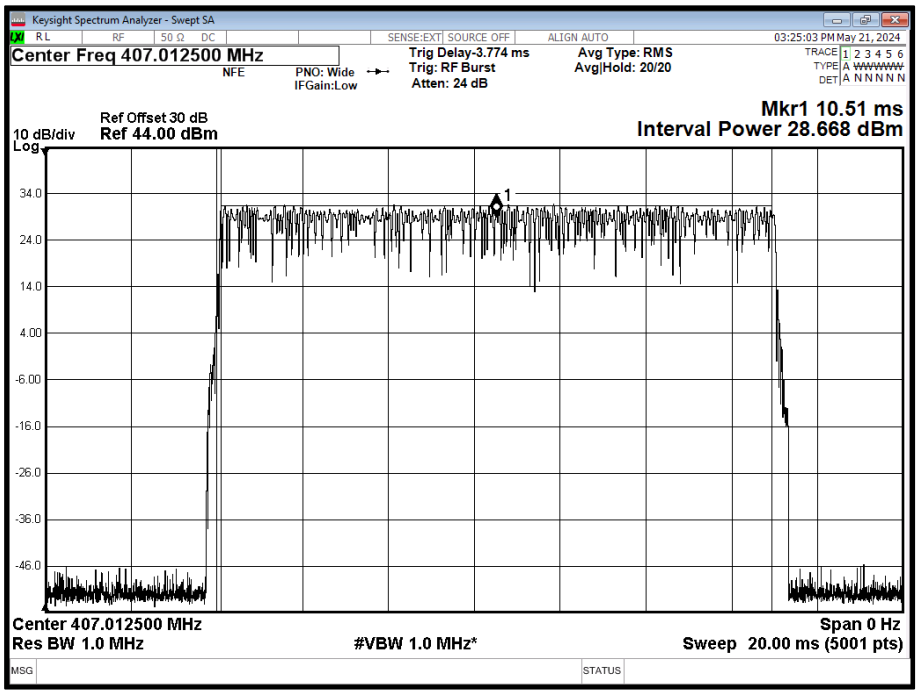

Figure 1 - 407.0125 MHz

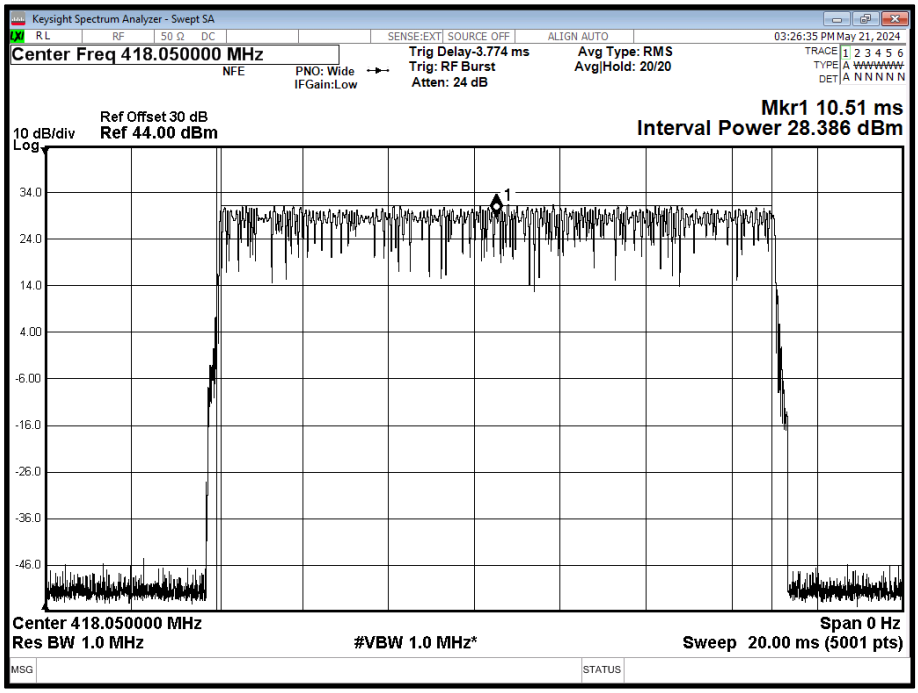

Figure 2 - 418.05 MHz

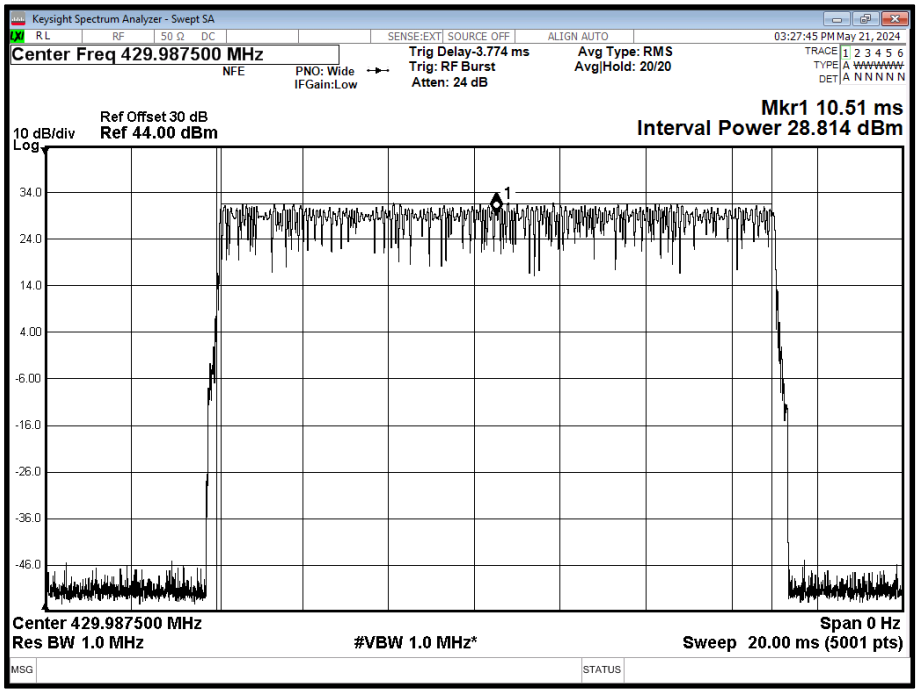

Figure 3 - 429.9875 MHz

TETRA - 450 - 470 MHz

Parameter	450.0125 MHz	460.025 MHz	469.9875 MHz
Conducted Output Power (dBm)	28.68	28.81	28.90
Manufacturer Declared Power (dBm)	29	29	29
Δ from manufacturer Power (dB)	-0.3	-0.2	-0.1
Antenna Gain (dBi)	0.67	0.67	0.67
ERP (dBm)	27.20	27.33	27.42

Table 17 - ERP

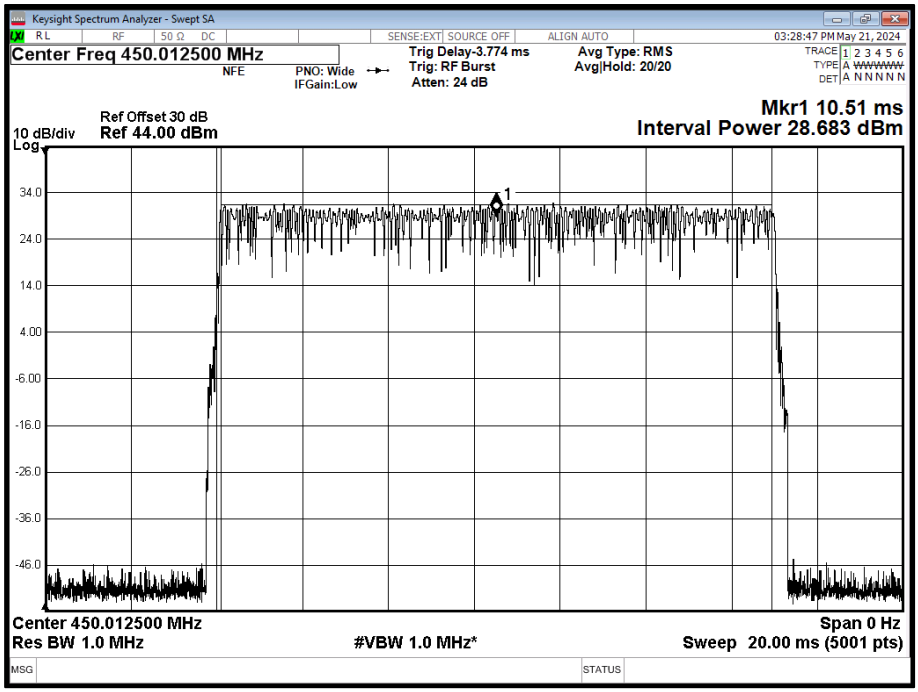

Figure 4 - 450.0125 MHz

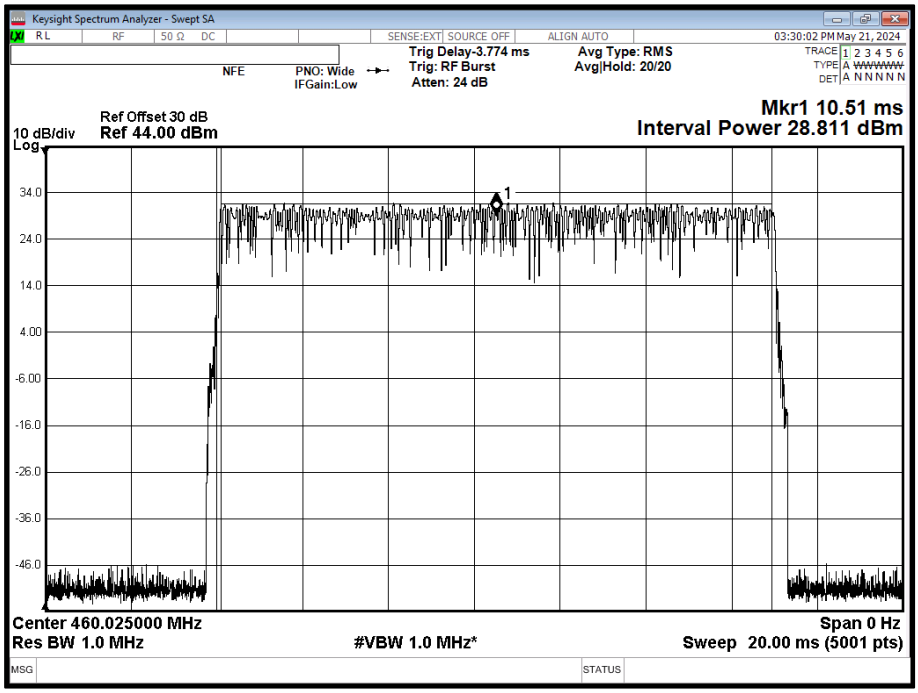

Figure 5 - 460.025 MHz

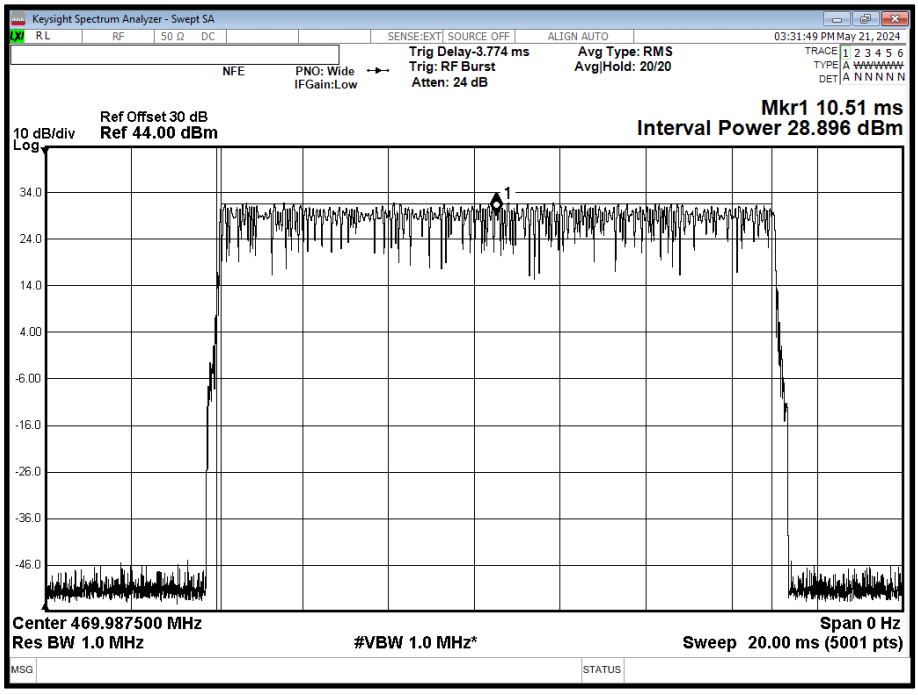

Figure 6 - 469.9875 MHz

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

Industry Canada 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 - Industry Canada Limits for Transmitter Output Power

2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Multimeter	Iso-tech	IDM101	2421	12	08-Nov-2024
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	12-Mar-2025
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	20-Feb-2025
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	26-Feb-2025
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	23-Jan-2025
Quad Power Supply	Rohde & Schwarz	HMP4040	4955	-	O/P Mon
Cable (40 GHz)	Rosenberger	LU1-001-1000	5022	12	04-Feb-2025
3.5 mm 2m Cable	Junkosha	MWX221-02000DMS	5423	12	18-Feb-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 20

O/P Mon – Output Monitored using calibrated equipment

2.2 Bandwidth Limitations

2.2.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1049
FCC 47 CFR Part 90, Clause 90.209
ISED RSS-119, Clause 5.5
ISED RSS-GEN, Clause 6.7

2.2.2 Equipment Under Test and Modification State

STP8X040, S/N: 1PR902412G9Y2BE - Modification State 0

2.2.3 Date of Test

10-May-2024 to 23-May-2024

2.2.4 Test Method

The test was applied in accordance with the test method requirements of FCC 47 CFR Part 90, Industry Canada RSS-119, and ISED RSS-GEN with reference to ANSI C63.26, Clause 5.4.

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 cable and 30 dB of attenuation. The path loss was measured using a network analyser and entered as a reference level offset in the spectrum analyser including the manufacturers declared maximum antenna gain. The RBW of the spectrum analyser was set to 300 Hz and the video bandwidth to 1 kHz with the trace set to max hold using a peak detector and the result was recorded.

2.2.5 Environmental Conditions

Ambient Temperature	21.7 - 21.9 °C
Relative Humidity	48.7 - 52.2 %

2.2.6 Test Results

TETRA - 407 - 430 MHz

407.0125 MHz	418.05 MHz	429.9875 MHz
20.442245369 kHz	20.439621765 kHz	20.437390235 kHz

Table 21

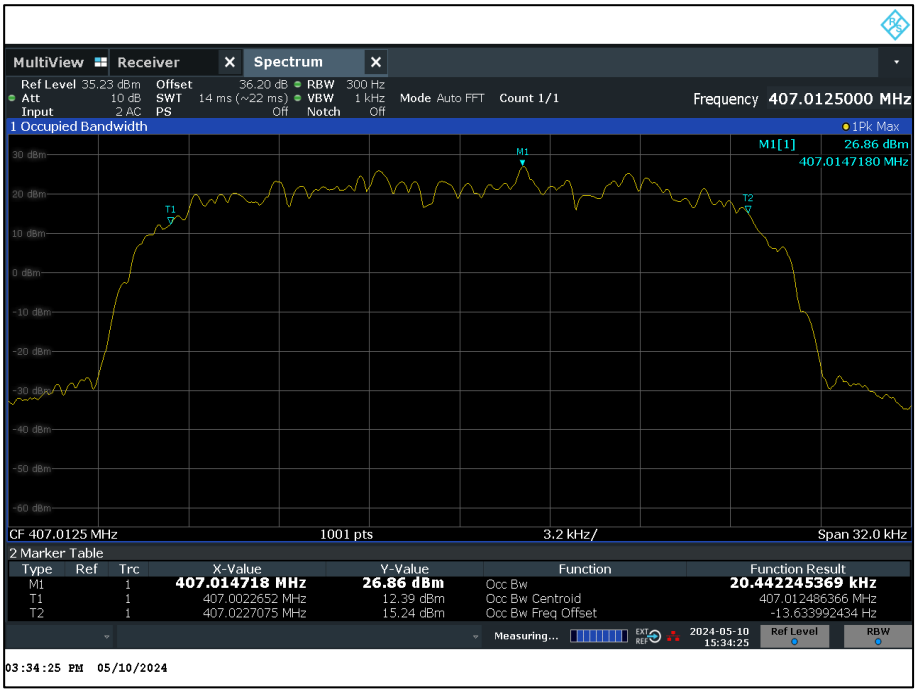

Figure 7 - 407.0125 MHz

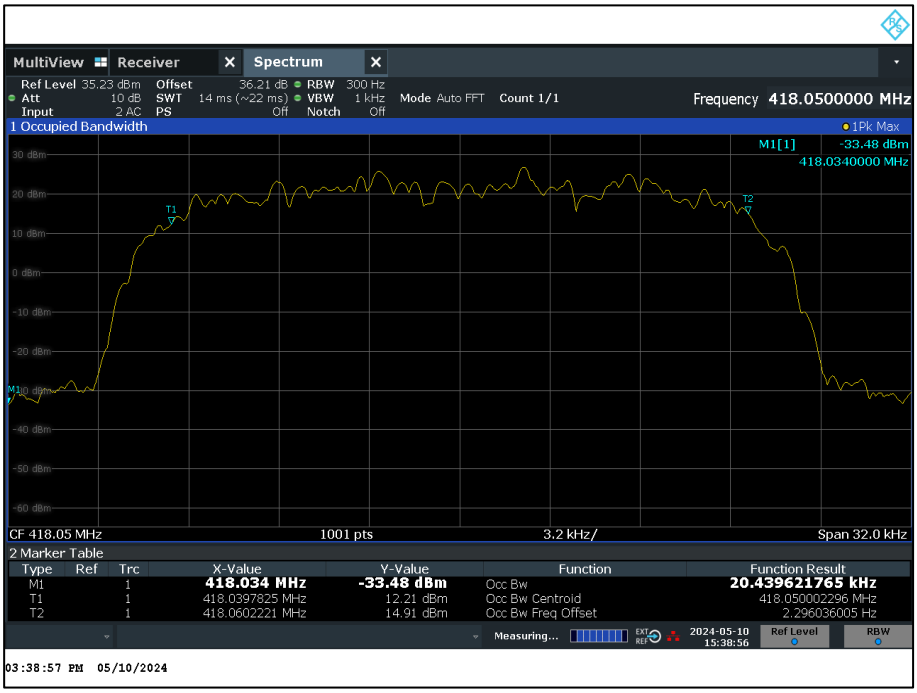

Figure 8- 418.05 MHz

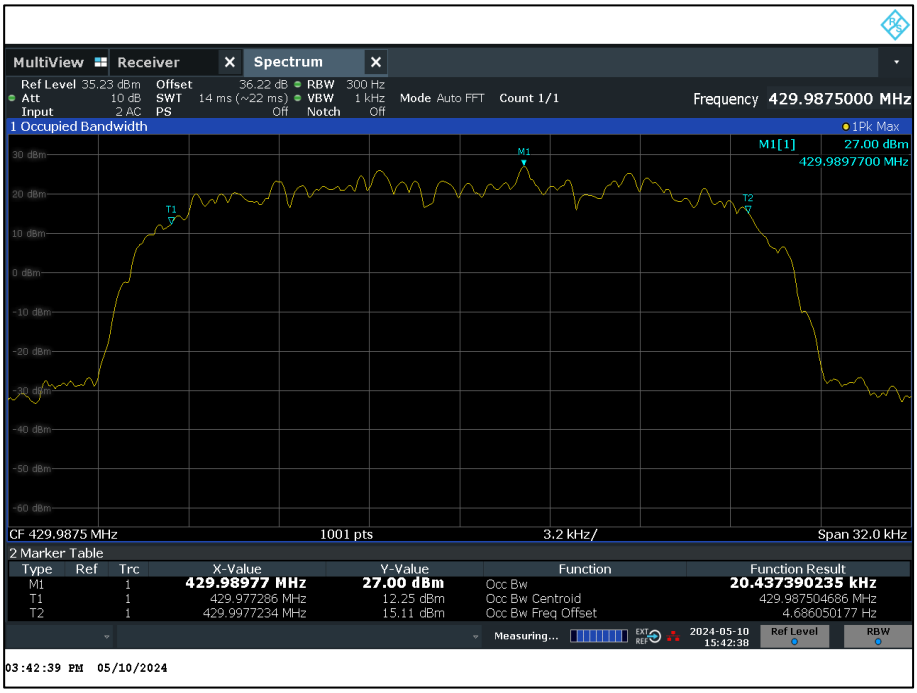

Figure 9- 429.9875 MHz

TETRA - 450 - 470 MHz

450.0125 MHz	460.025 MHz	469.9875 MHz
20.43795257 kHz	20.441220487 kHz	20.440004439 kHz

Table 22

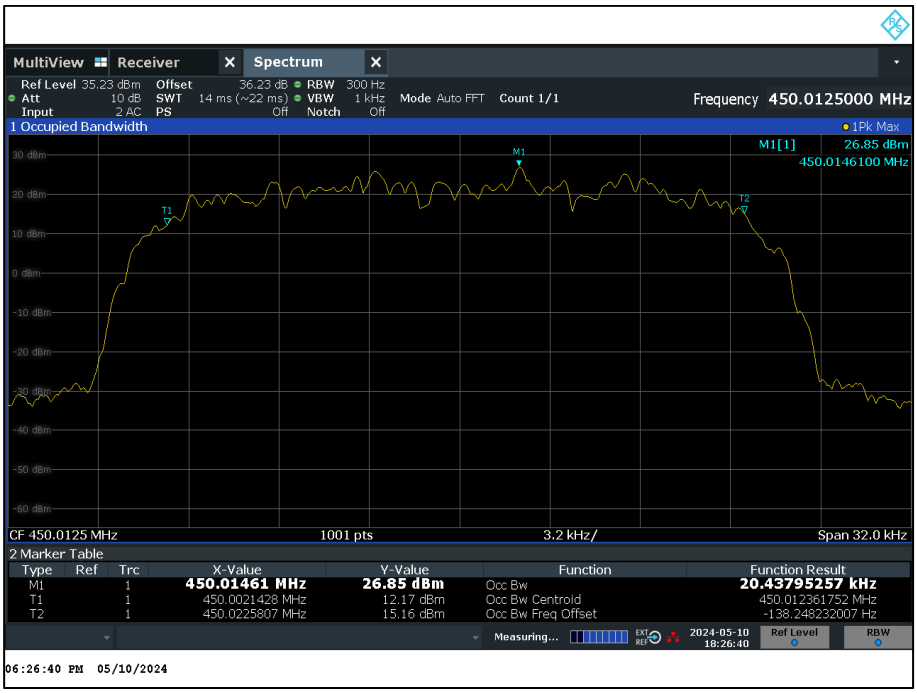

Figure 10 - 450.0125 MHz

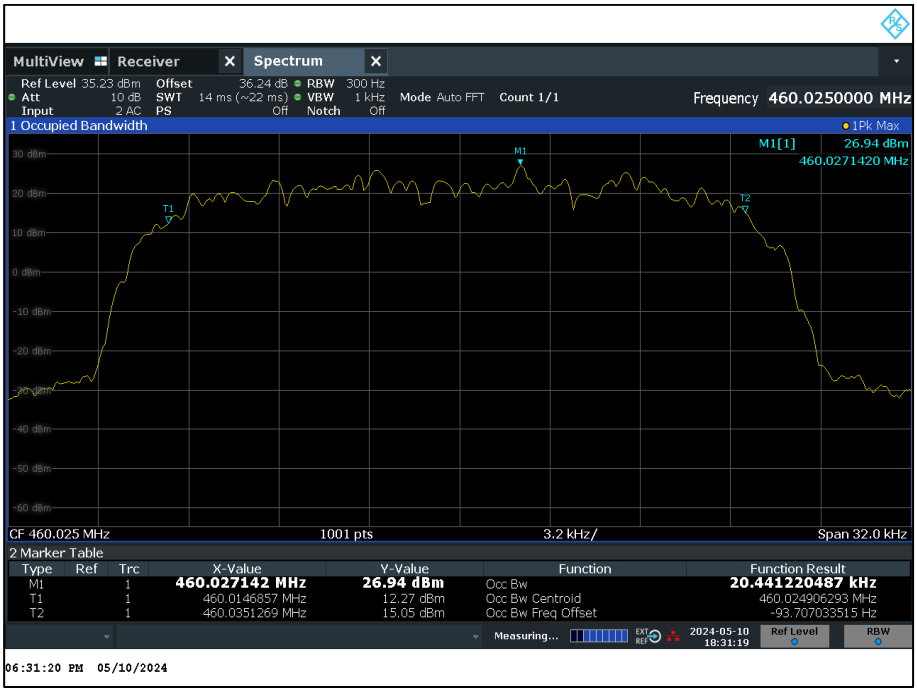

Figure 11- 460.025 MHz

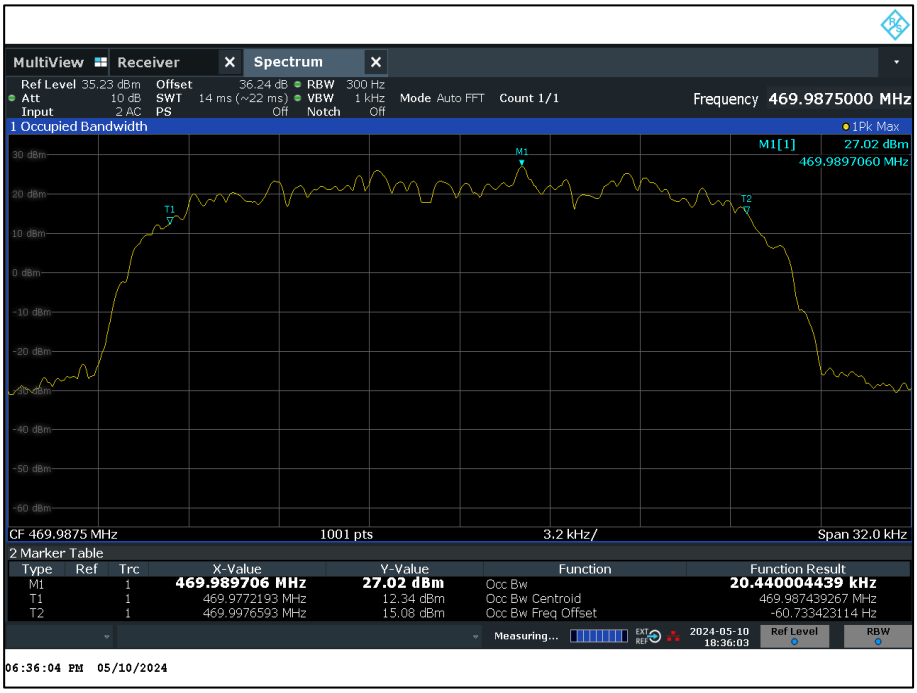

Figure 12- 469.9875 MHz

FCC 47 CFR Part 90, Limit Clause 90.209

22 kHz

Industry Canada RSS-119, Limit Clause 5.5

The maximum permissible occupied bandwidth shall not exceed the authorized bandwidth specified in table 3 of the test specification for the equipment's frequency band as specified below.

22 kHz

2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Multimeter	Iso-tech	IDM101	2421	12	08-Nov-2024
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	12-Mar-2025
Quad Power Supply	Rohde & Schwarz	HMP4040	4955	-	O/P Mon
Cable (40 GHz)	Rosenberger	LU1-001-1000	5022	12	04-Feb-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
EMC Test Receiver	Rohde & Schwarz	ESW44	5808	12	10-Apr-2025
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024

Table 23

O/P Mon – Output Monitored using calibrated equipment

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

STP8X040, S/N: 1PR902412G9Y2BE - Modification State 0

2.3.3 Date of Test

22-May-2024

2.3.4 Test Method

TETRA - 407 - 430 MHz
This test was performed in accordance with RSS-119, clause 4.2.2.

TETRA - 450 - 470 MHz
This test was performed in accordance with RSS-119, clause 4.2.2.

FCC emission mask - 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 the measured average power over the burst. The RBW was set to at least 1 % of the emission bandwidth. The mask as per FCC 47 CFR Part 90.210 (b) was applied.

2.3.5 Environmental Conditions

Ambient Temperature	24.2 °C
Relative Humidity	45.9 %

2.3.6 Test Results

TETRA - 407 - 430 MHz

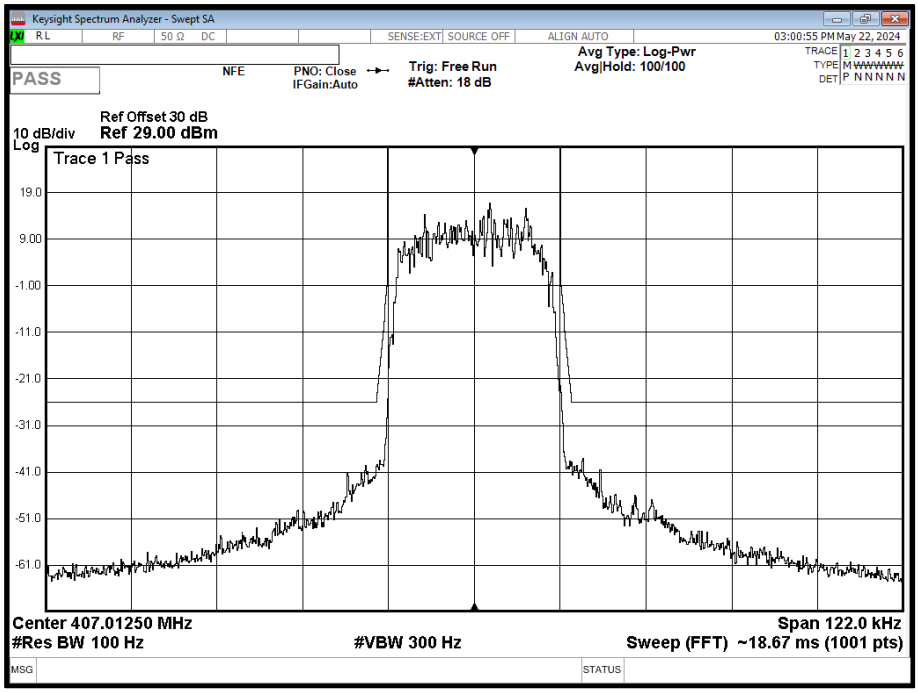

Figure 13 - 407.0125 MHz, ISED Transmitter Mask Y

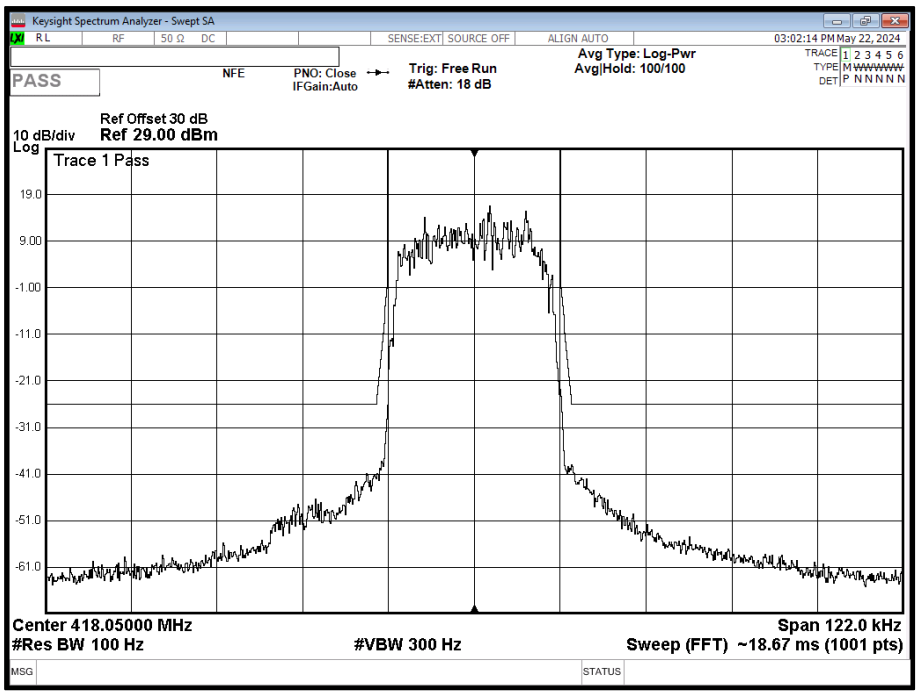

Figure 14 - 418.05 MHz, ISED Transmitter Mask Y

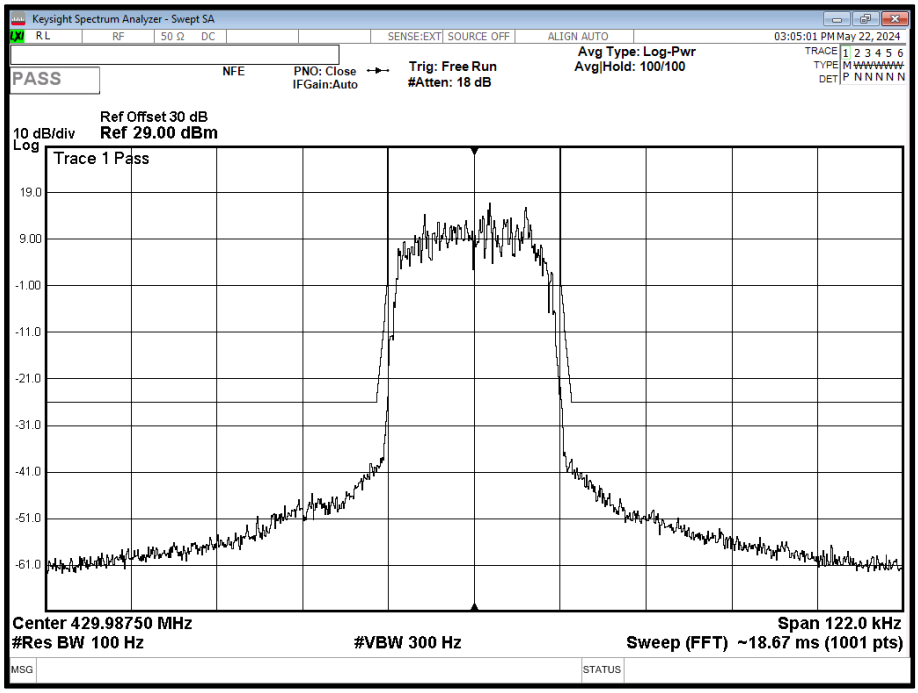

Figure 15 - 429.9875 MHz, ISED Transmitter Mask Y

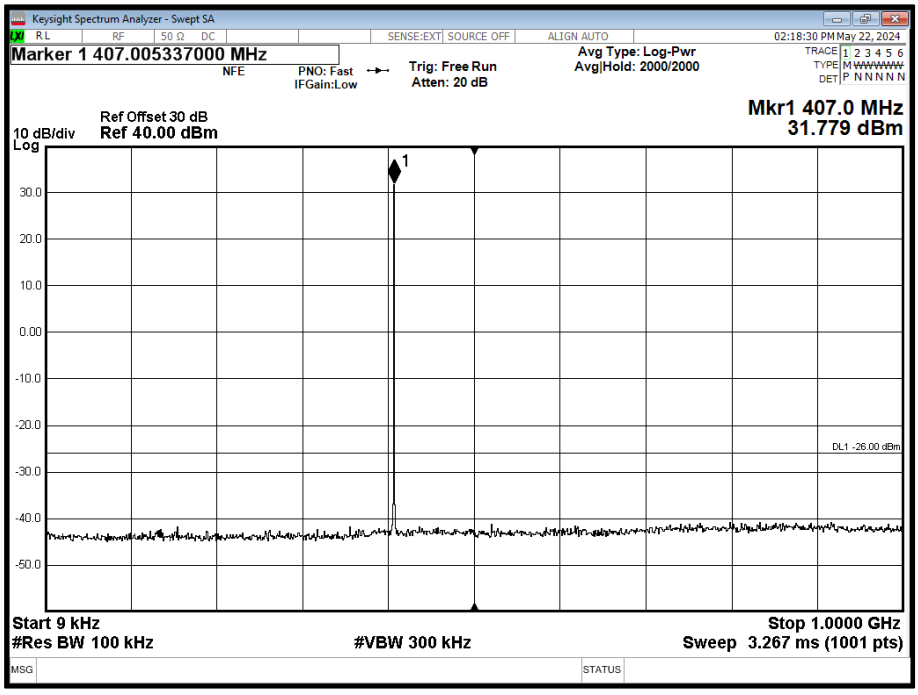

Figure 16 - 407.0125 MHz, 9 kHz to 1 GHz

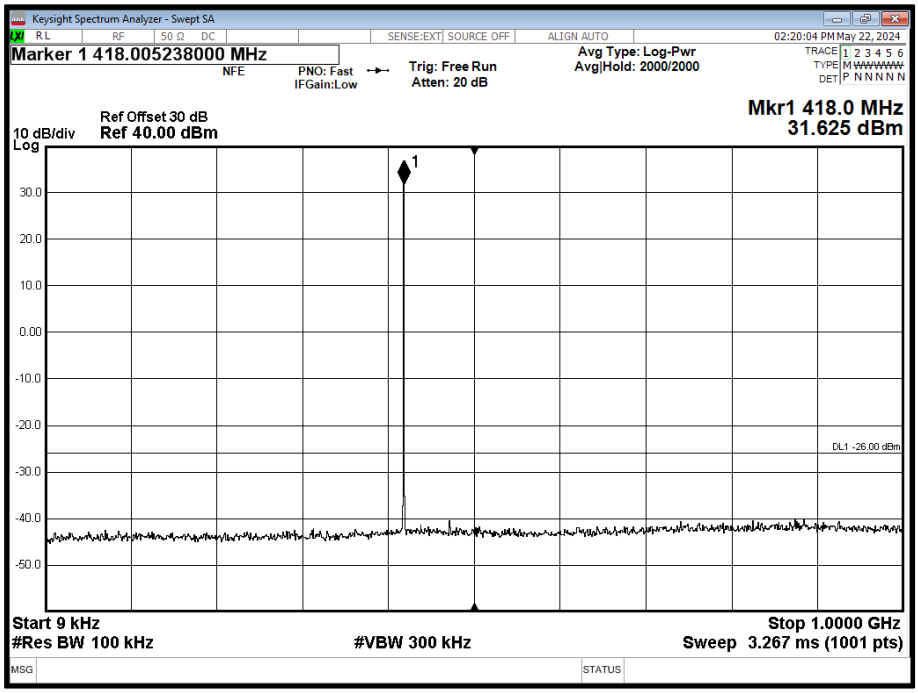

Figure 17 - 418.05 MHz, 9 kHz to 1 GHz

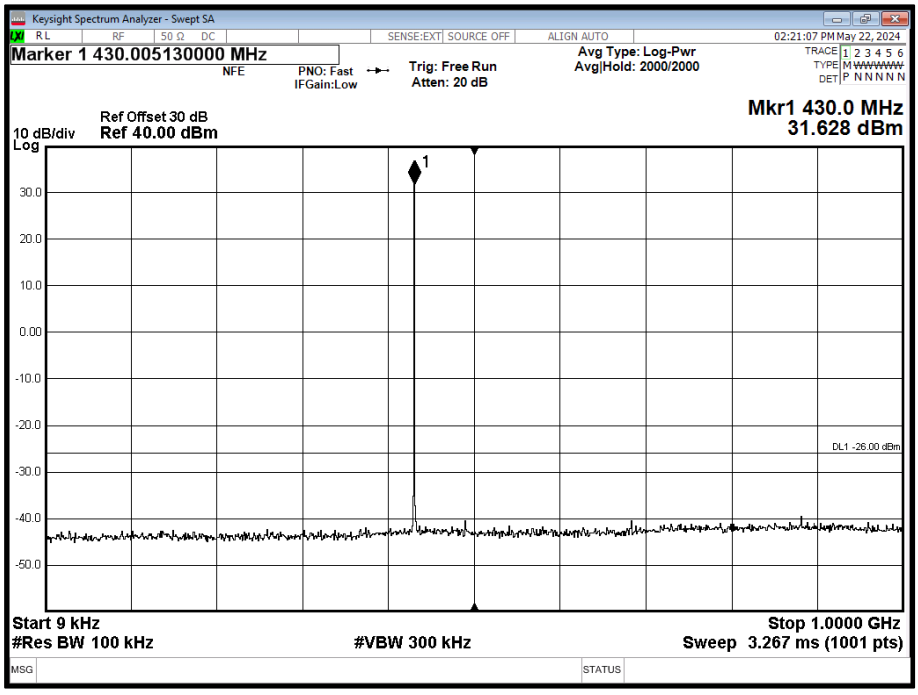

Figure 18 - 429.9875 MHz - 9 kHz to 1 GHz

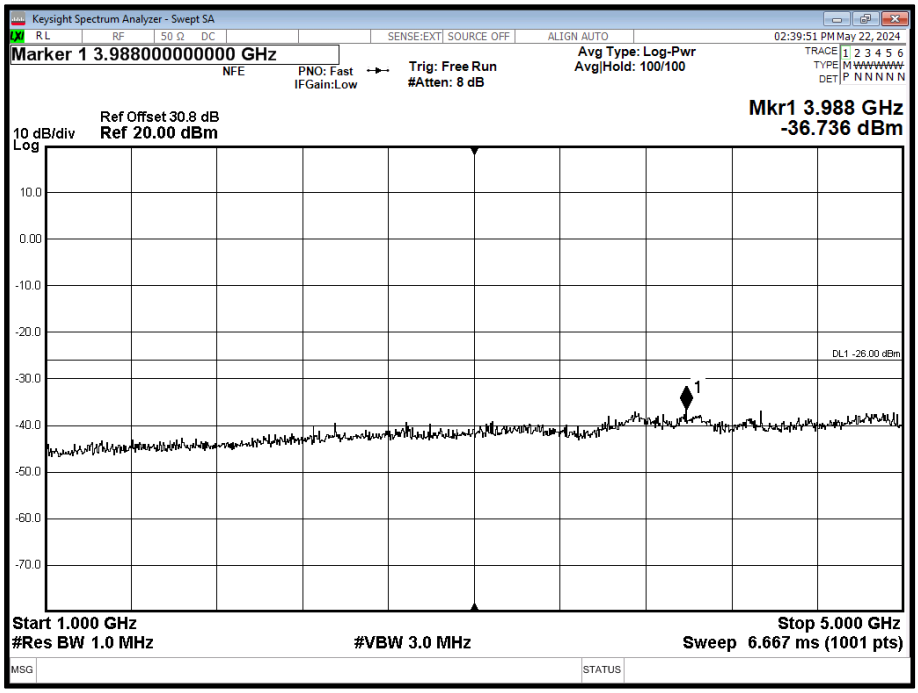

Figure 19 - 407.0125 MHz,1 GHz to 5 GHz

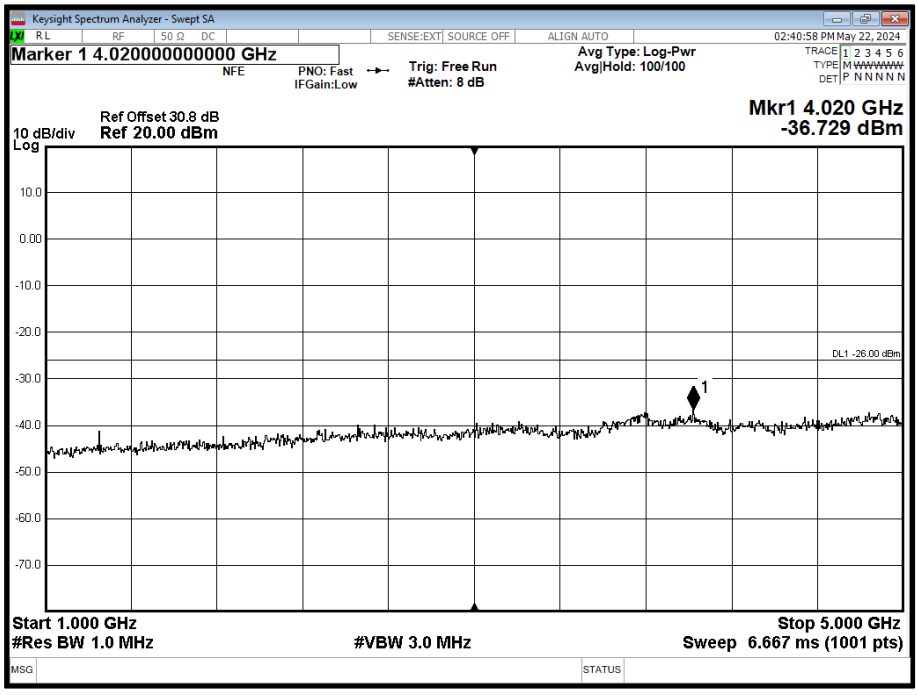

Figure 20 - 418.05 MHz, 1 GHz to 5 GHz

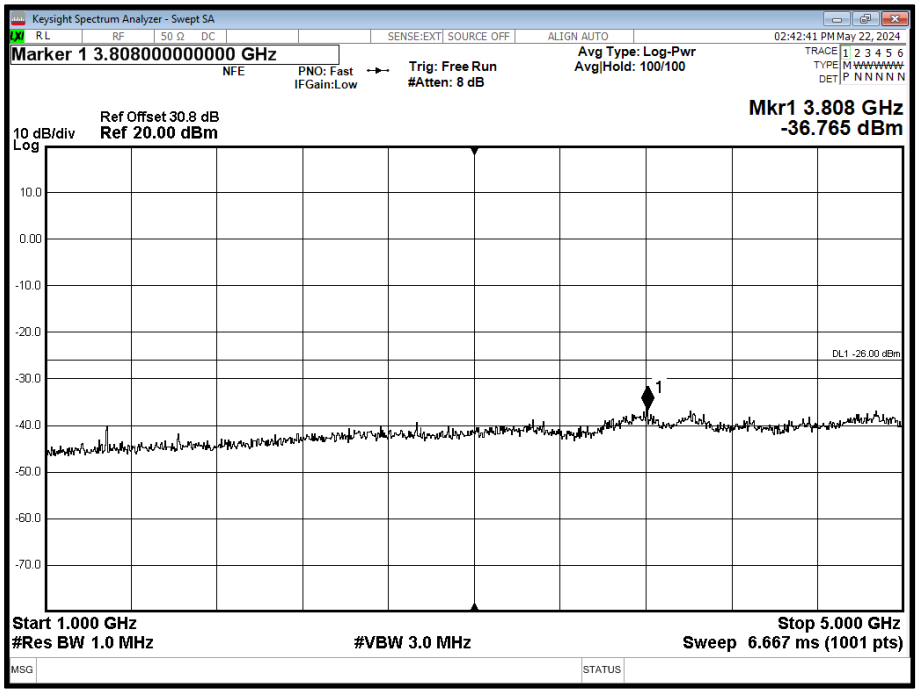

Figure 21 - 429.9875 MHz - 1 GHz to 5 GHz

TETRA - 450 - 470 MHz

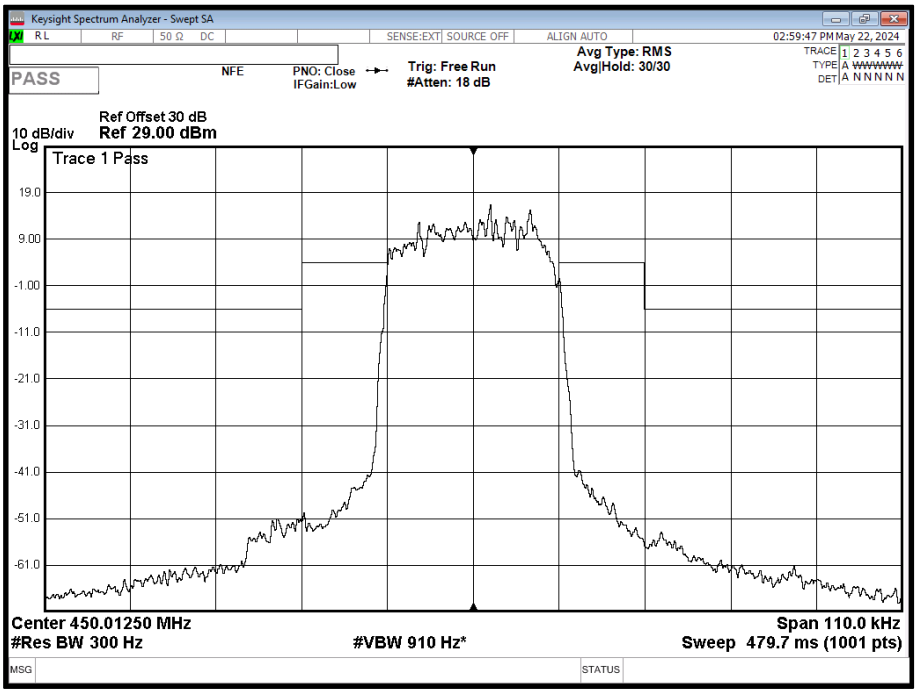

Figure 22 - 450.0125 MHz, FCC Transmitter Mask B

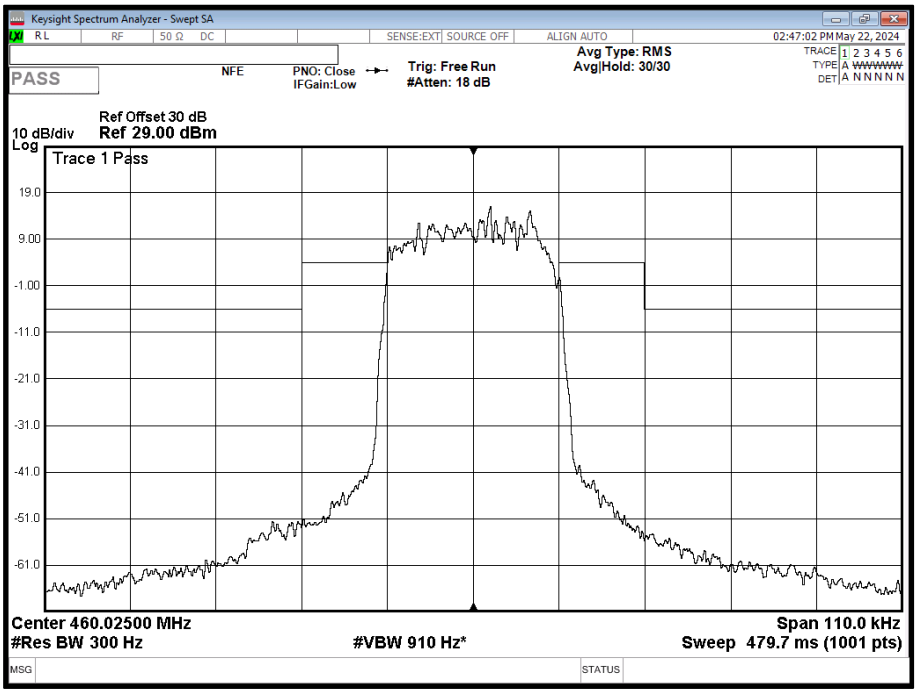

Figure 23 - 460.025 MHz, FCC Transmitter Mask B

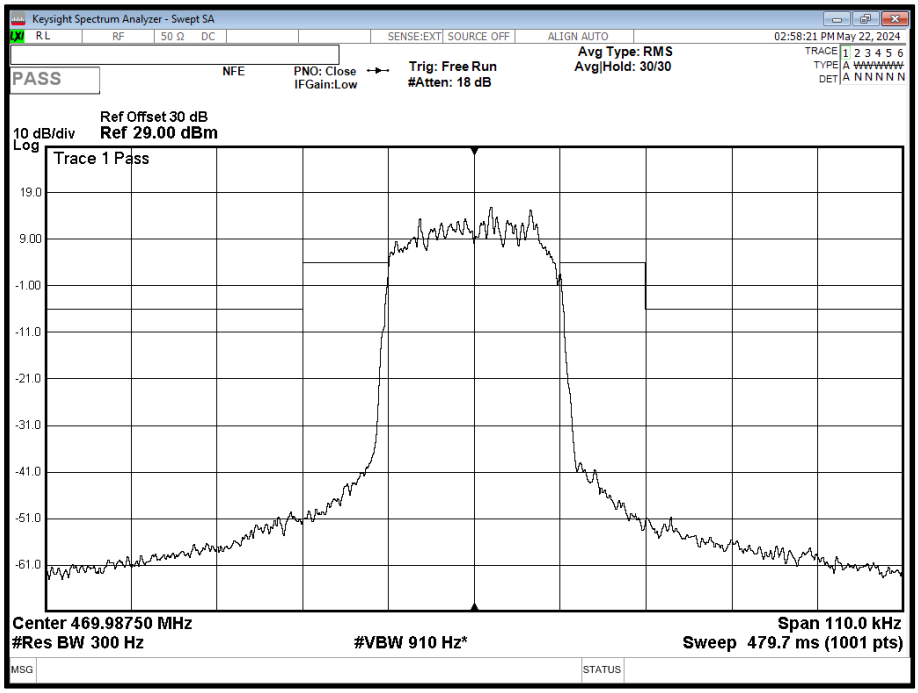

Figure 24 - 469.9875 MHz, FCC Transmitter Mask B

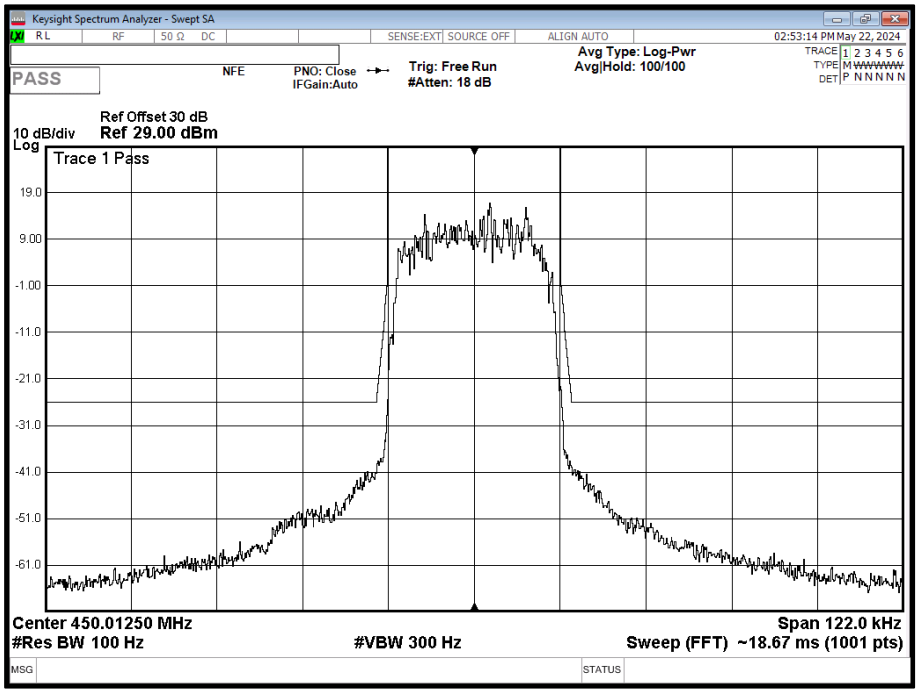

Figure 25 - 450.0125 MHz, ISED Transmitter Mask Y

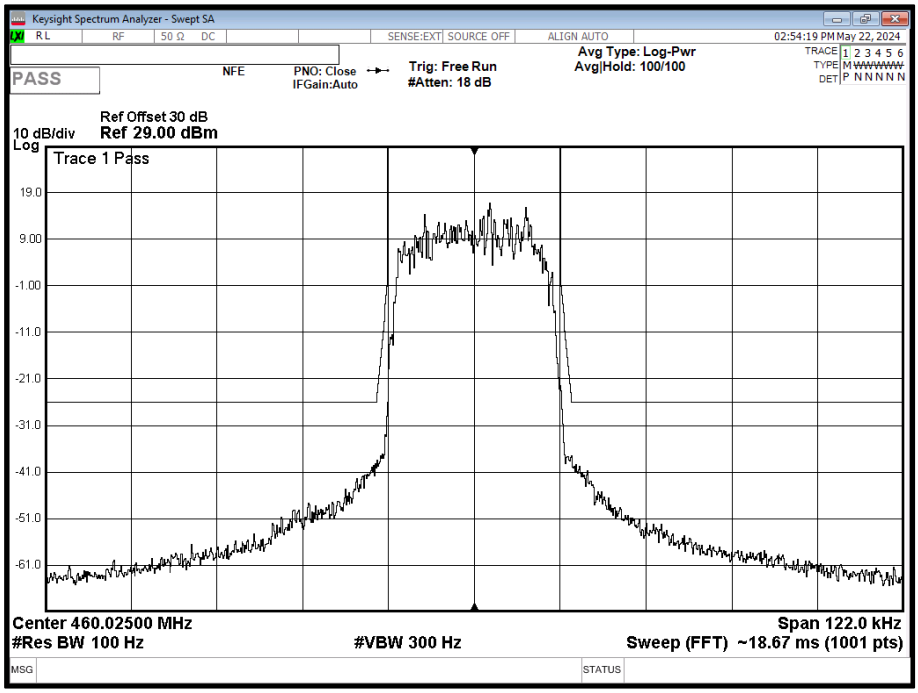

Figure 26 - 460.025 MHz, ISED Transmitter Mask Y

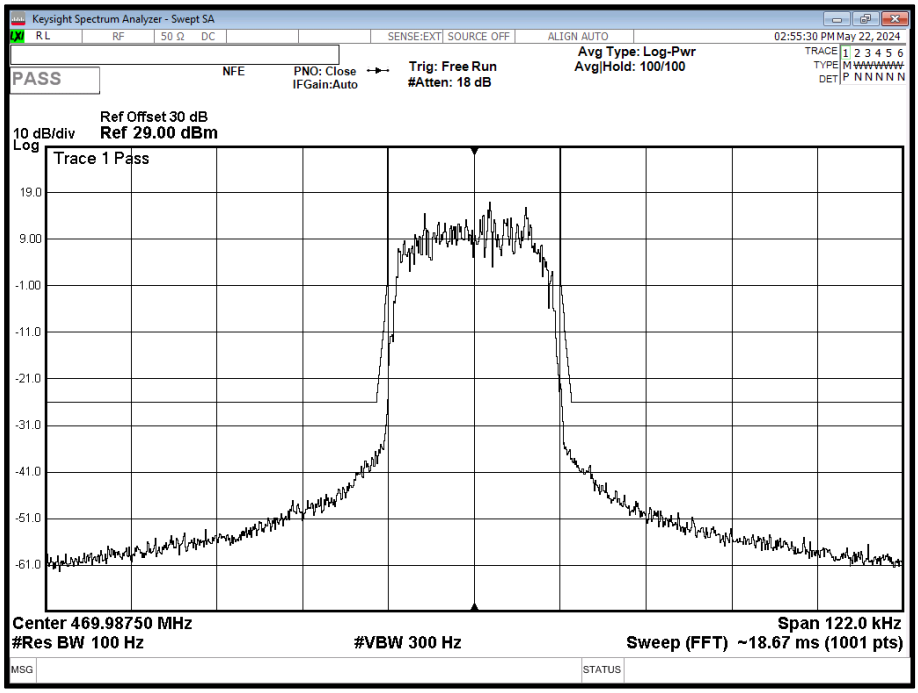

Figure 27 - 469.9875 MHz, ISED Transmitter Mask Y

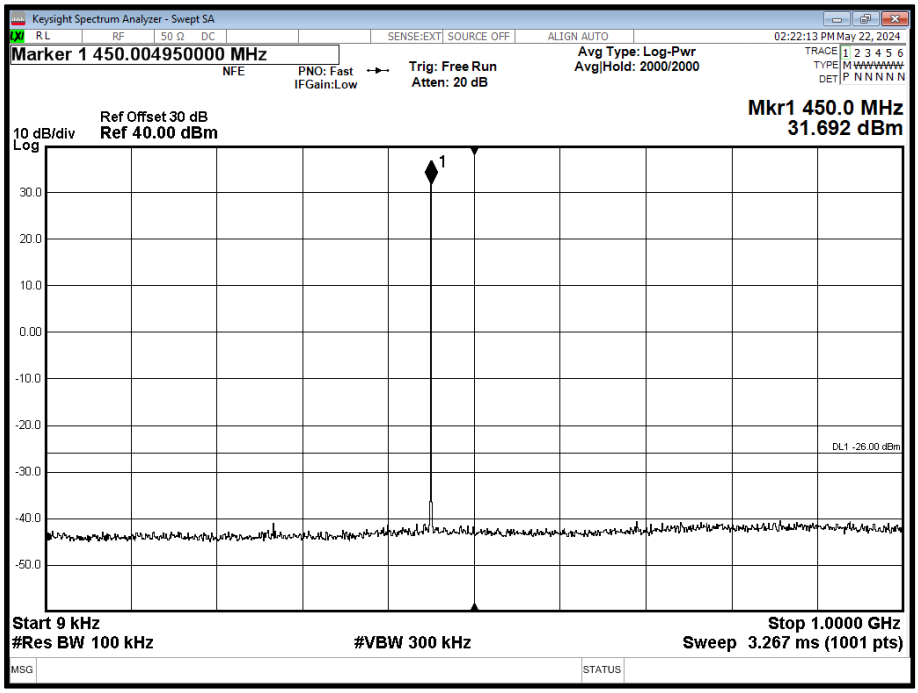

Figure 28 - 450.0125 MHz, 9 kHz to 1 GHz

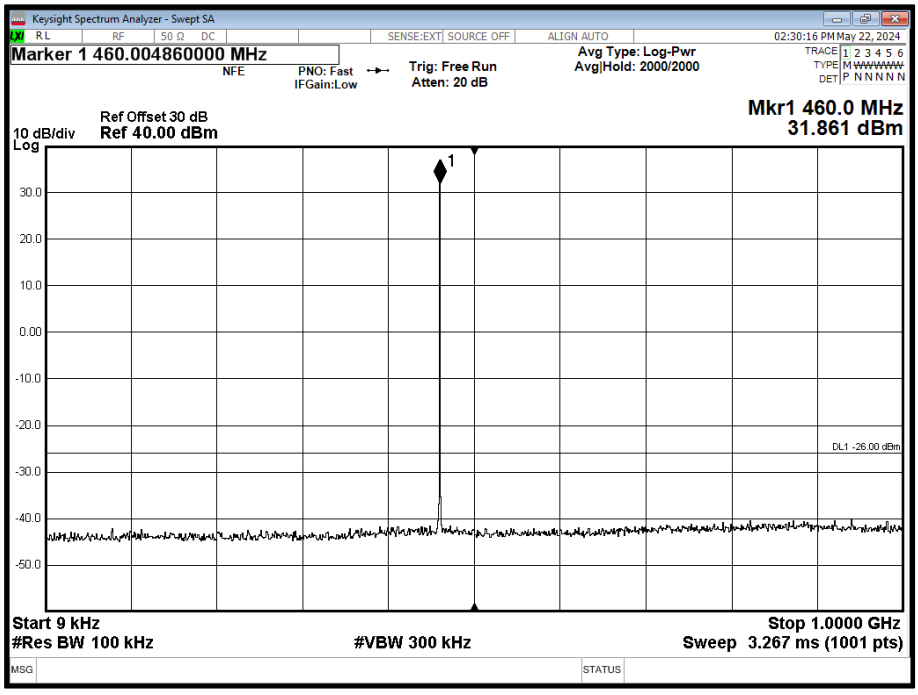

Figure 29 - 460.025 MHz, 9 kHz to 1 GHz

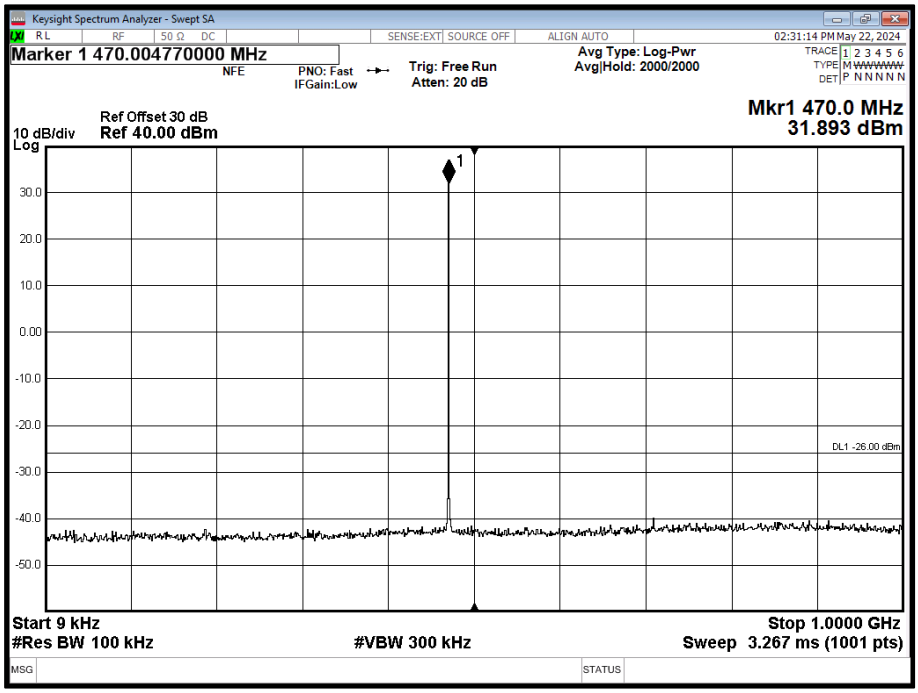

Figure 30 - 469.9875 MHz - 9 kHz to 1 GHz

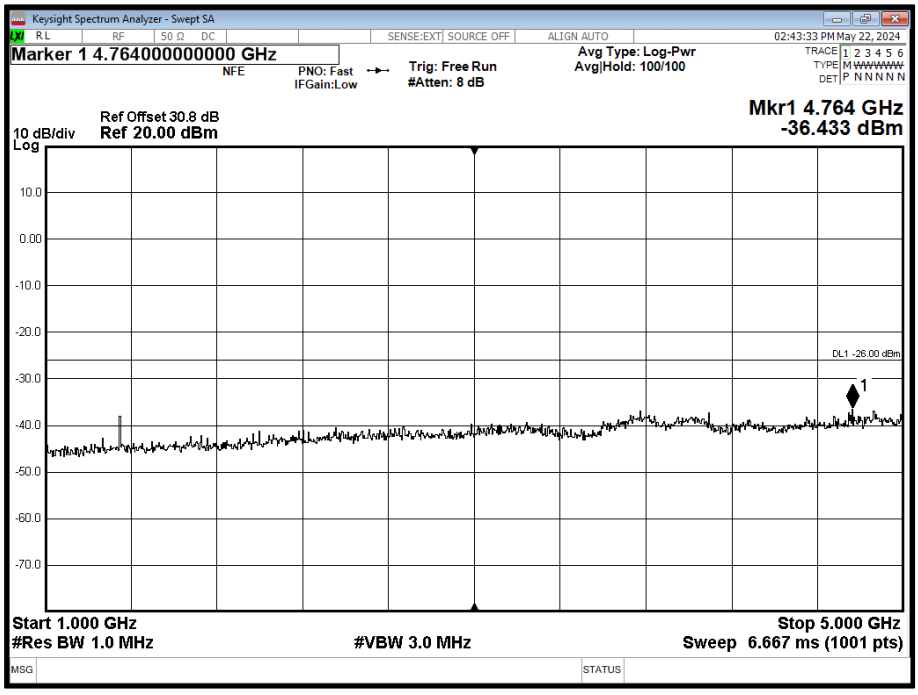

Figure 31 - 450.0125 MHz,1 GHz to 5 GHz

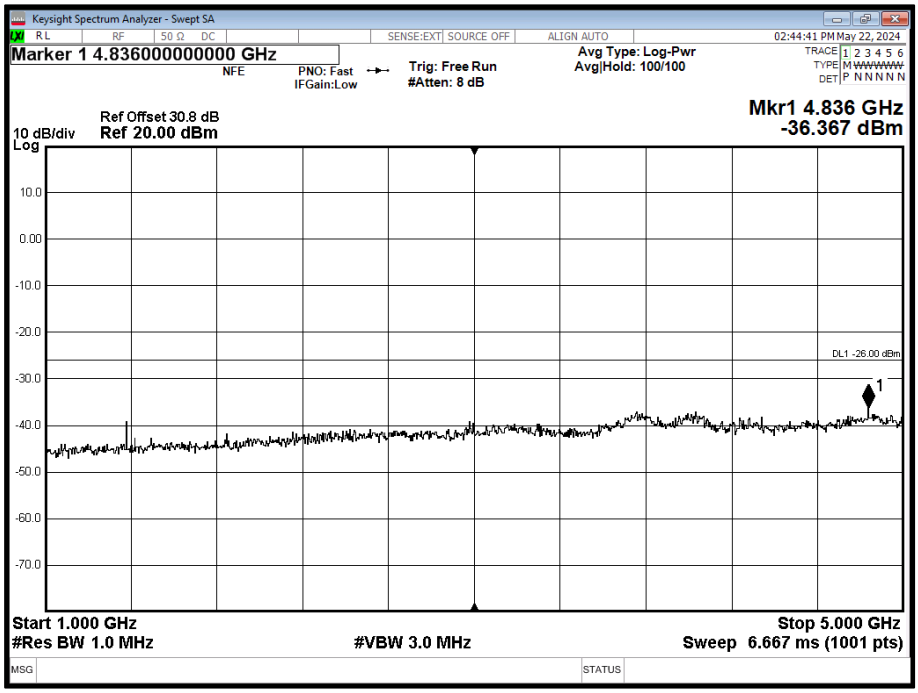

Figure 32 - 460.025 MHz, 1 GHz to 5 GHz

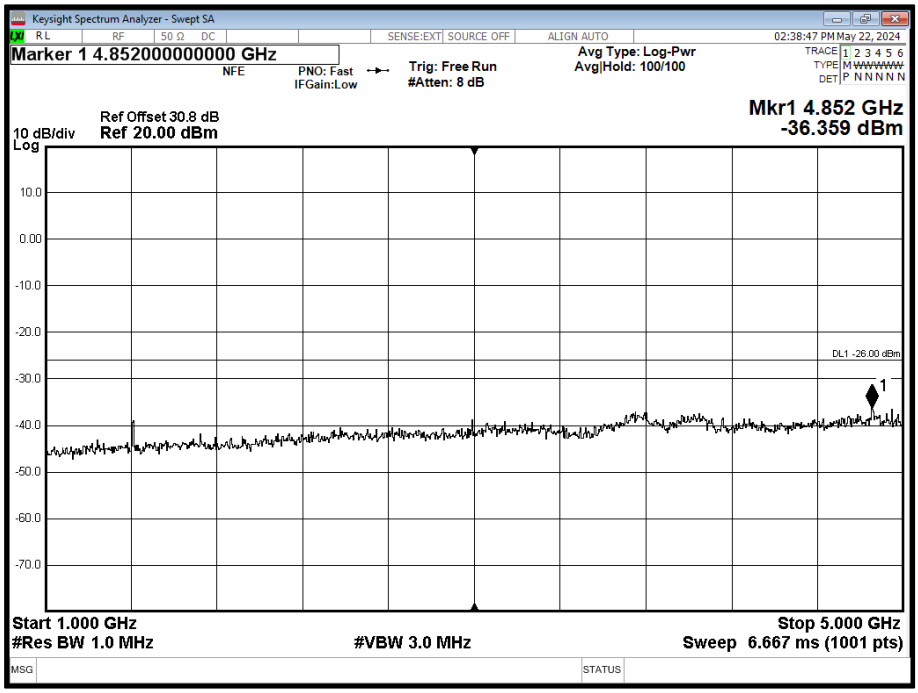

Figure 33 - 469.9875 MHz - 1 GHz to 5 GHz

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.

Industry Canada RSS-119, Limit Clause 5.8

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

2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	20-Feb-2025
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	26-Feb-2025
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	23-Jan-2025
3.5 mm 2m Cable	Junkosha	MWX221-02000DMS	5423	12	18-Feb-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 24

2.4 Radiated Spurious Emissions

2.4.1 Specification Reference

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

2.4.2 Equipment Under Test and Modification State

STP8X040, S/N: 1PR902412G9Y2BE - Modification State 0

2.4.3 Date of Test

15-May-2024 to 16-May-2024

2.4.4 Test Method

A preliminary profile of the Radiated Spurious Emissions was obtained up to the 10th 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.

The test was applied in accordance with the test method requirements of FCC 47 CFR Part 90, ISED RSS-119, and ISED RSS-GEN with reference to ANSI C63.26, 5.5 and clause 5.2.3.3

The spectrum analyser was configured with a peak detector and max-hold trace. Below 1 GHz the RBW was set to 100 kHz and VBW to 300 kHz. Above 1 GHz the RBW was set to 1 MHz and VBW to 3 MHz.

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)

The EUT was tested against emission Mask Y from RSS 119, Clause - 5.8.10 as this is the most stringent limit applicable to the test.

The EUT was powered by its 7.6V Li-Polymer battery.

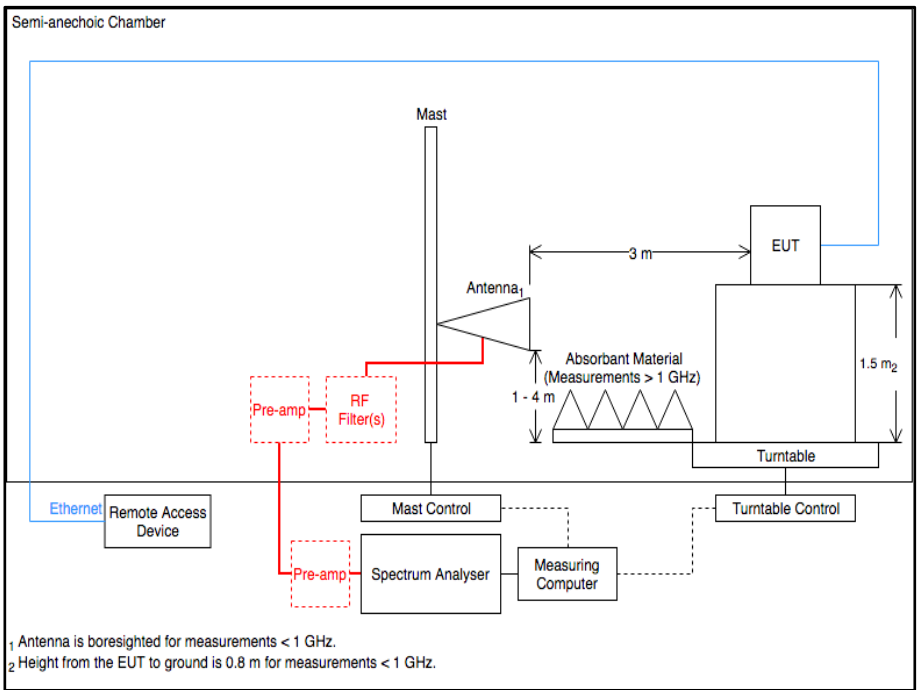

Figure 34 - Radiated Emissions Test Setup Diagram

2.4.5 Environmental Conditions

Ambient Temperature	19.8 °C
Relative Humidity	60.1 %

2.4.6 Test Results

TETRA - 407 - 430 MHz

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

Table 25 - 407.0125 MHz

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

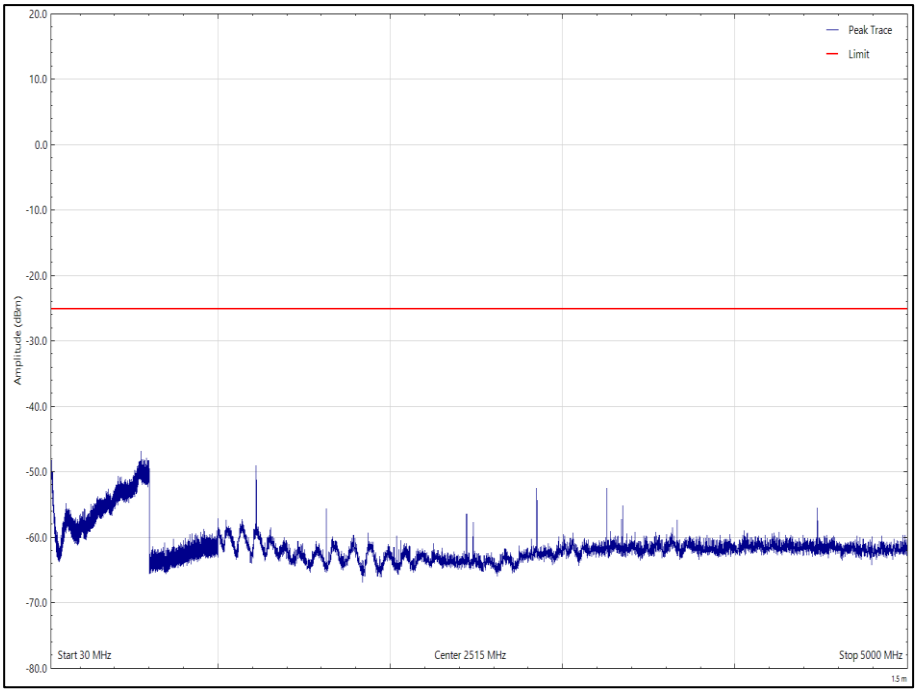

Figure 35 - 407.0125 MHz, 30 MHz to 5 GHz, EUT Orientation X, Horizontal

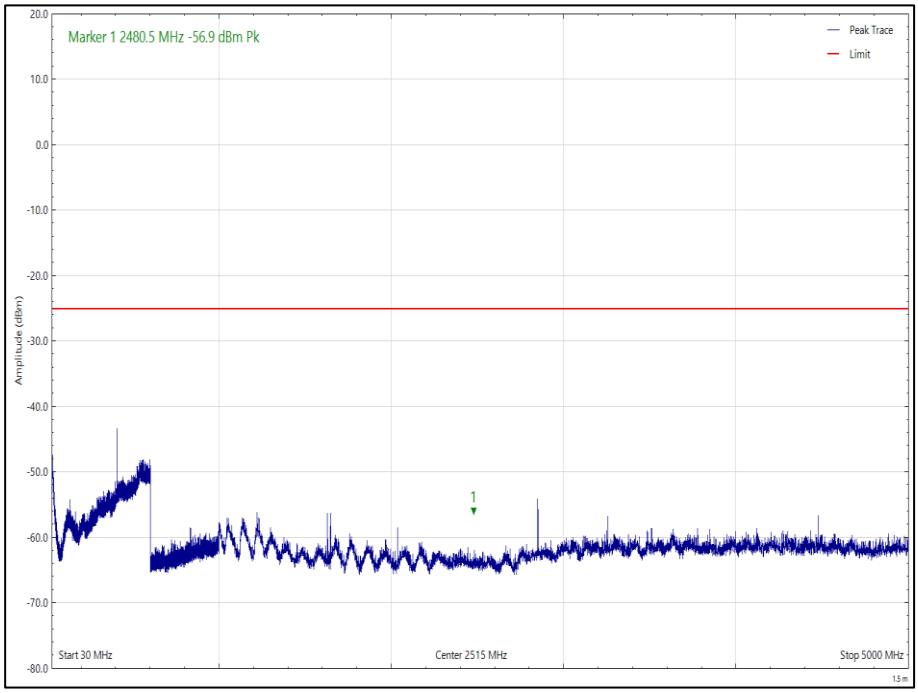

Figure 36 - 407.0125 MHz, 30 MHz to 5 GHz. EUT Orientation X, Vertical

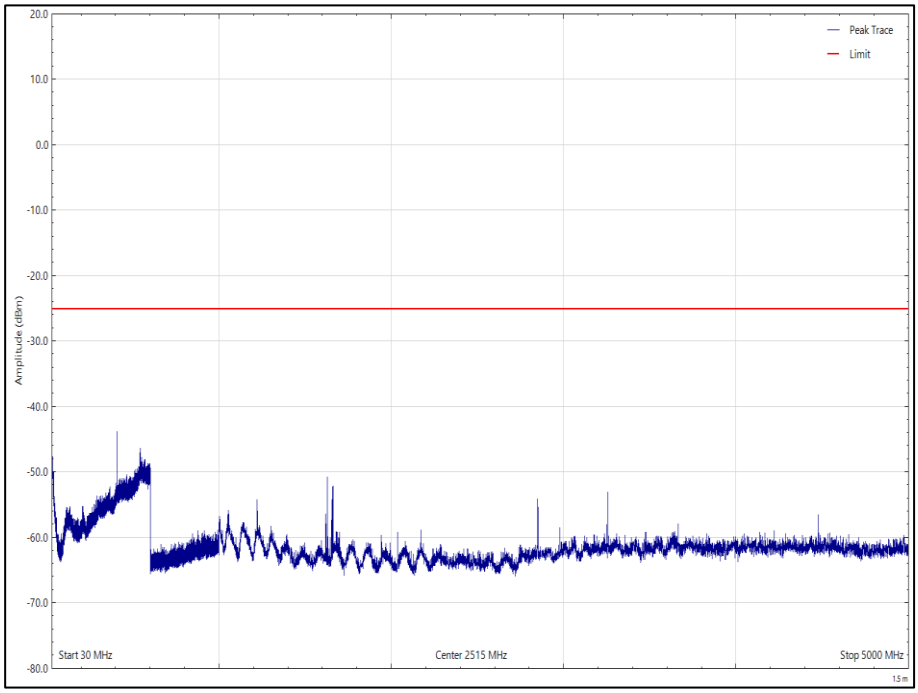

Figure 37 - 407.0125 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Horizontal

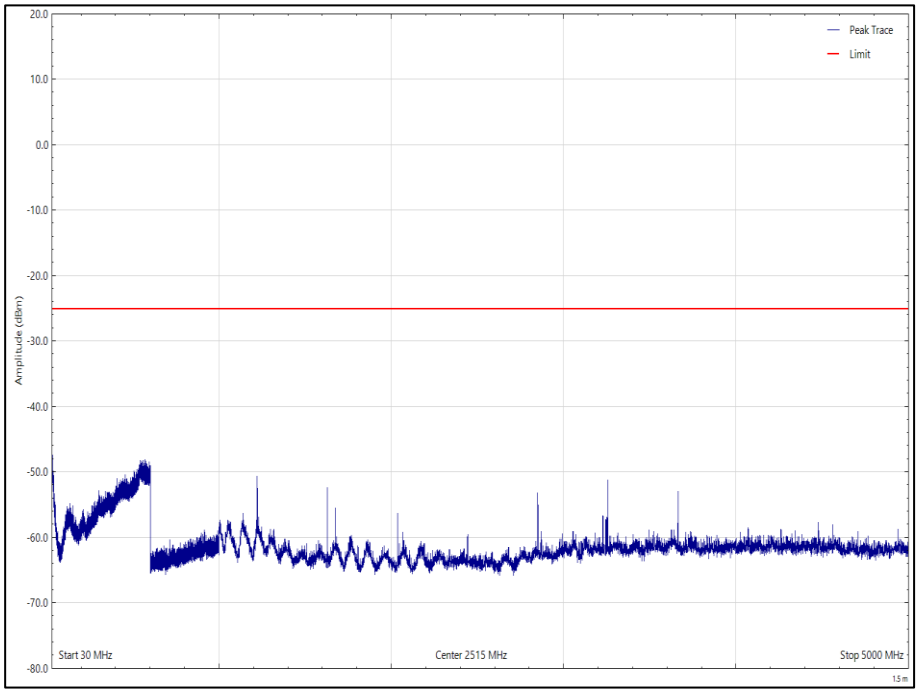

Figure 38 - 407.0125 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Vertical

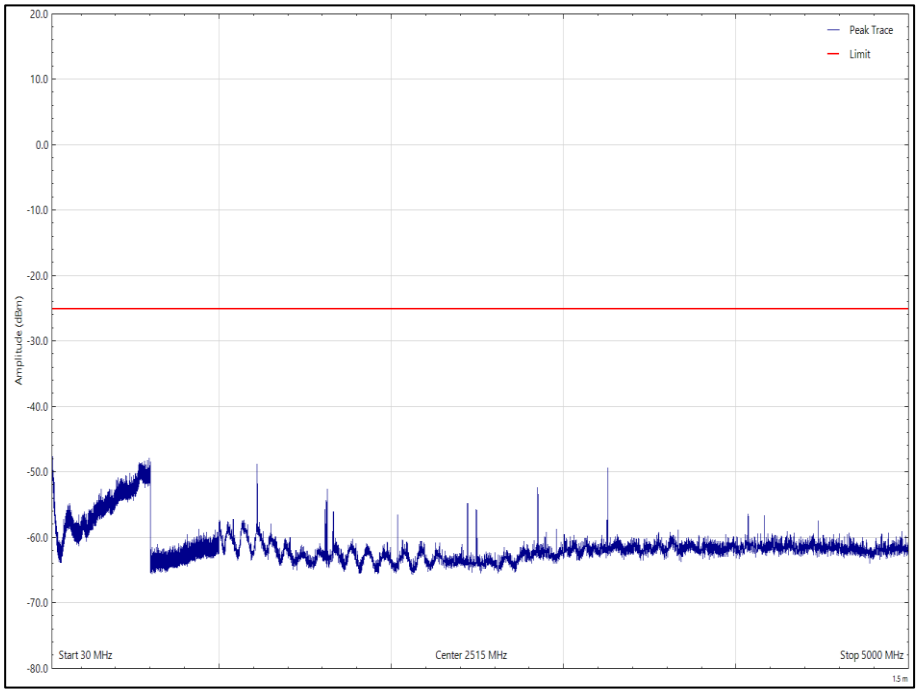

Figure 39 - 407.0125 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Horizontal

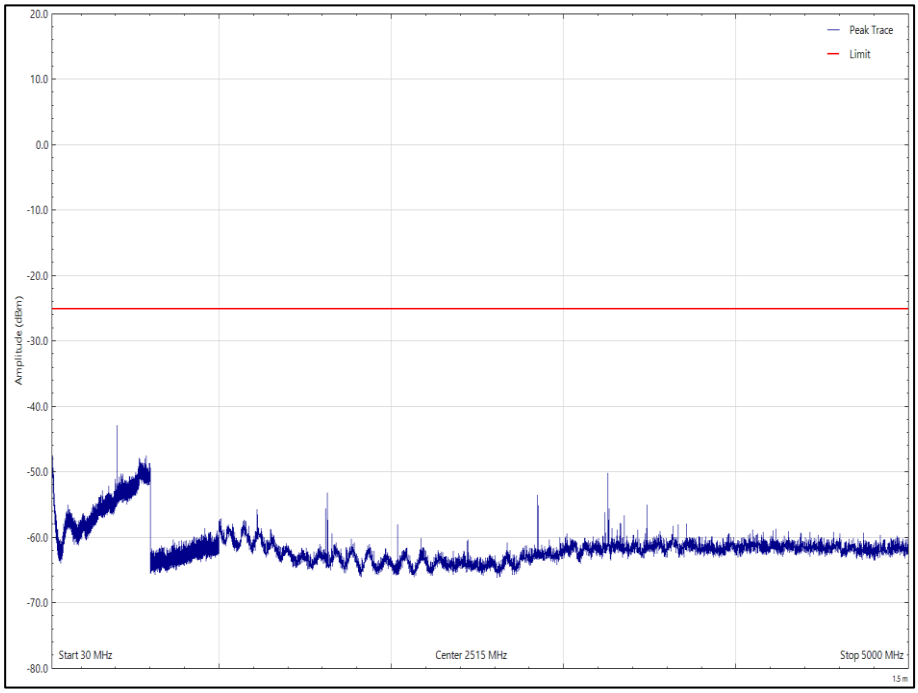

Figure 40 - 407.0125 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Vertical

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

Table 26 - 418.05 MHz

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

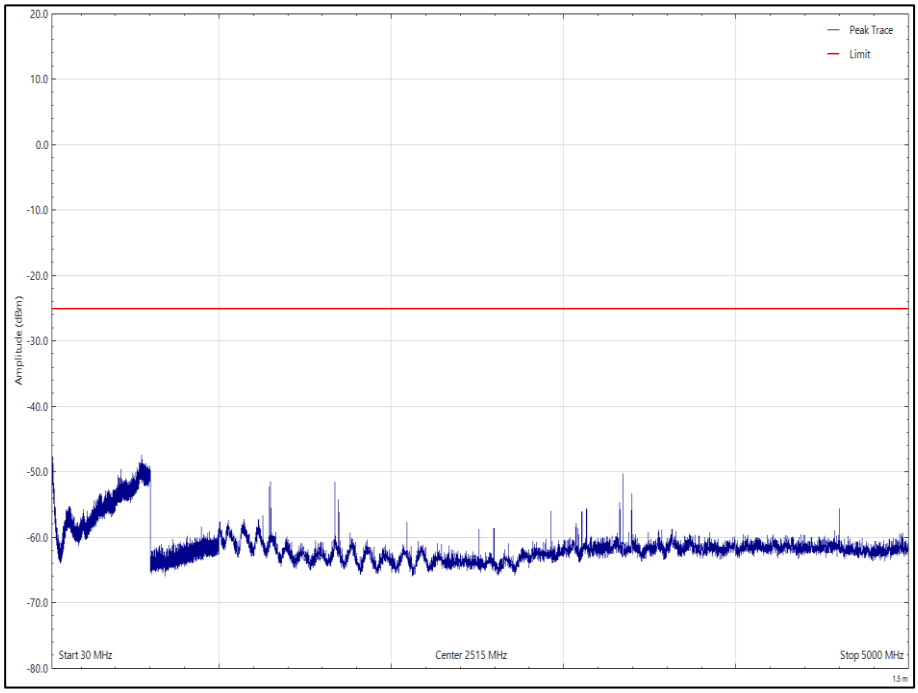

Figure 41 - 418.05 MHz, 30 MHz to 5 GHz, EUT Orientation X, Horizontal

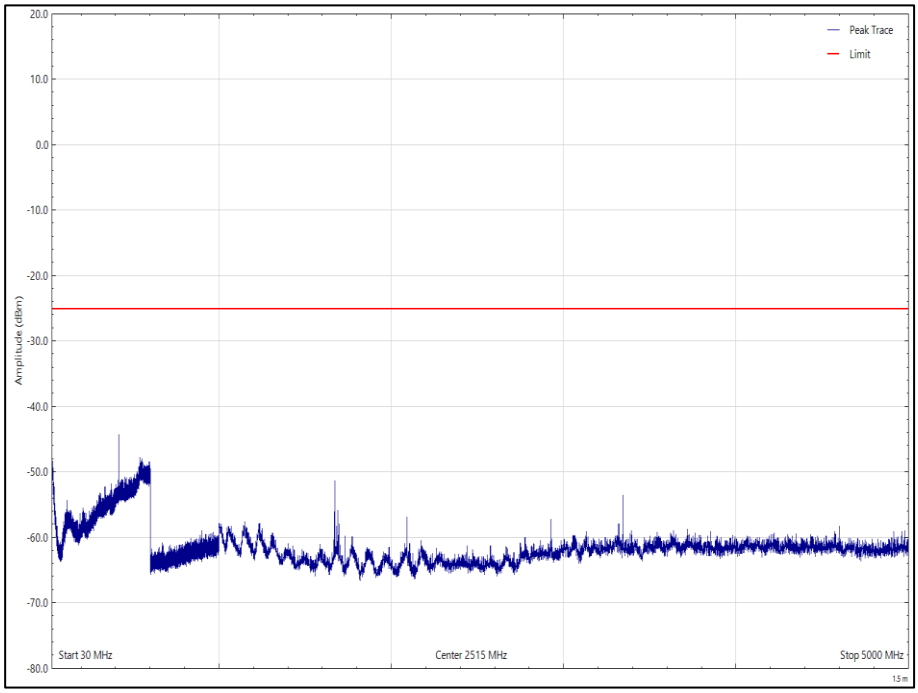

Figure 42 - 418.05 MHz, 30 MHz to 5 GHz, EUT Orientation X, Vertical

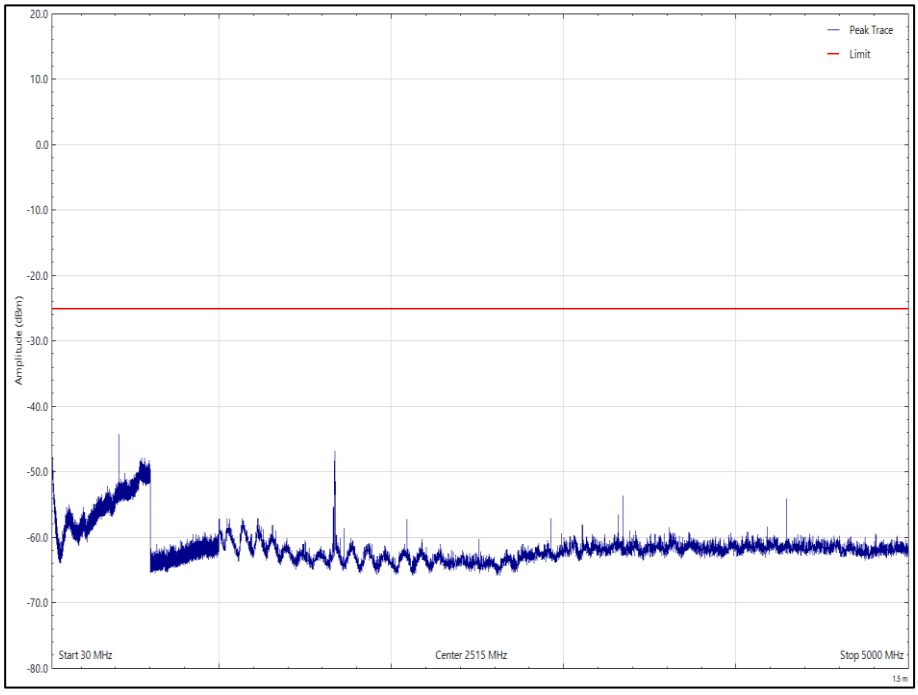

Figure 43 - 418.05 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Horizontal

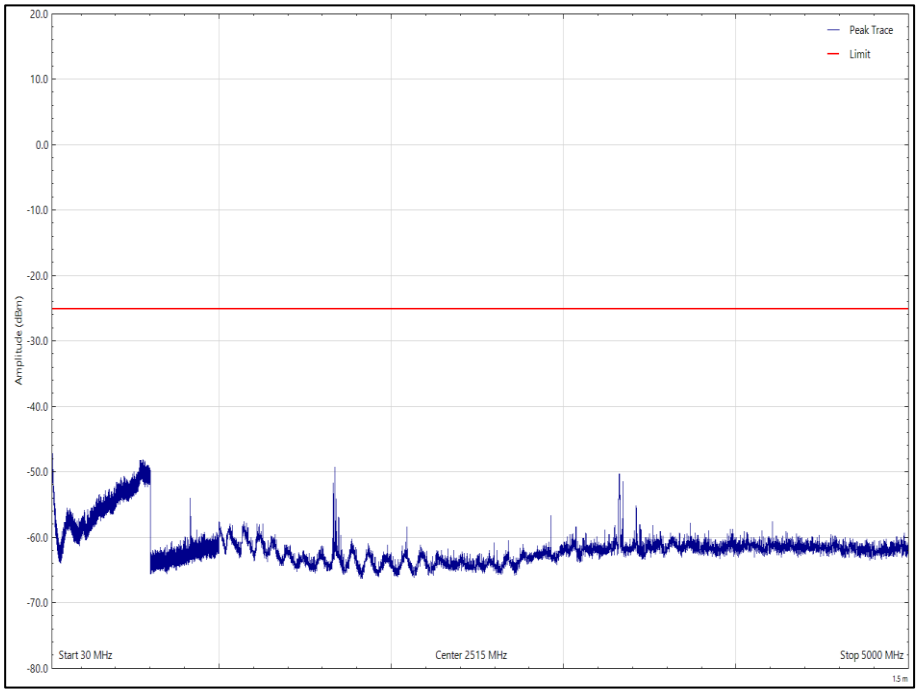

Figure 44 - 418.05 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Vertical

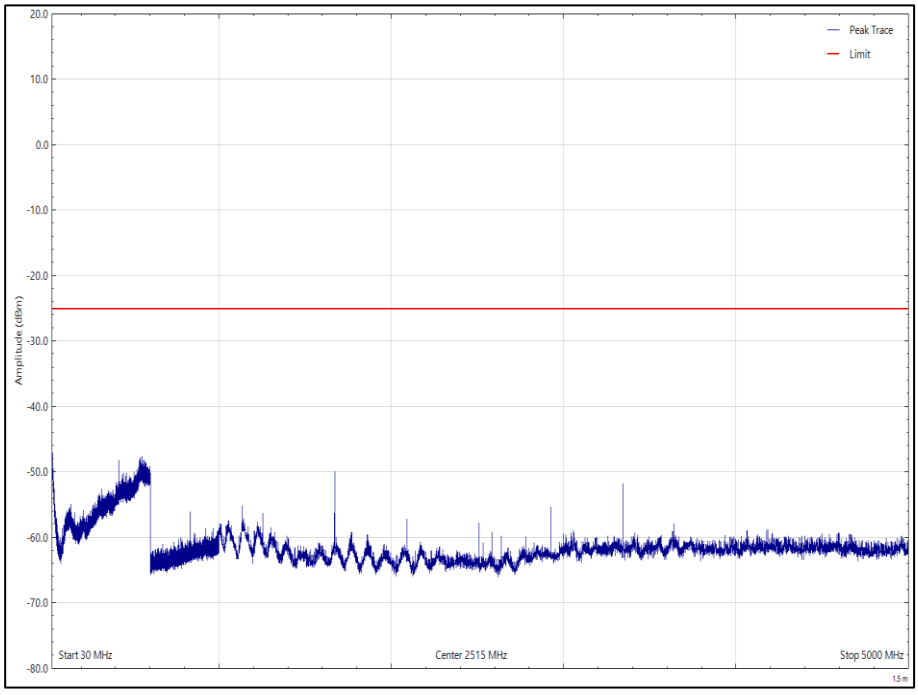

Figure 45 - 418.05 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Horizontal

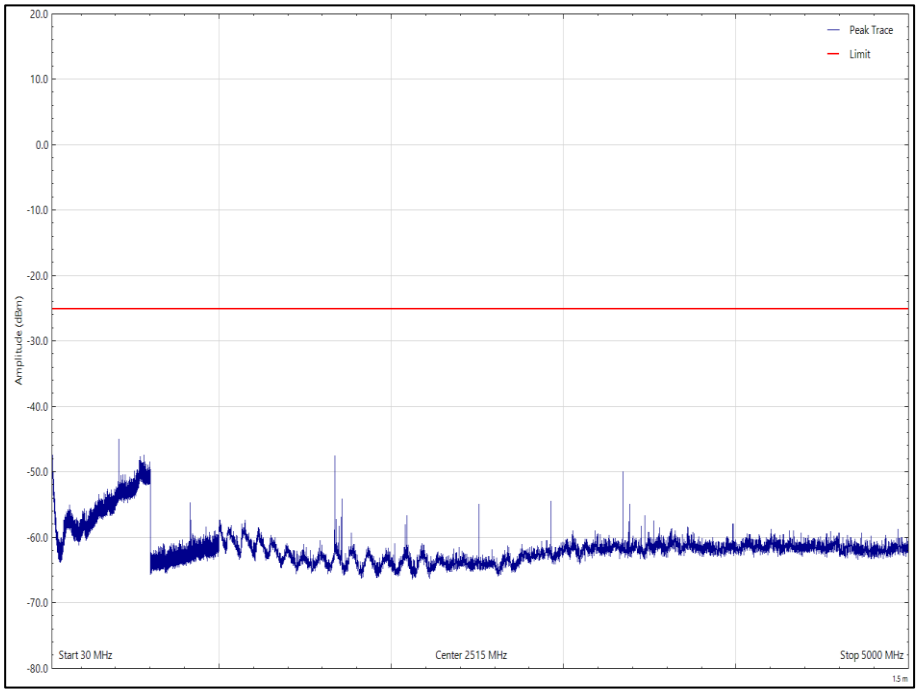

Figure 46 - 418.05 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Vertical

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

Table 27 - 429.9875 MHz

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

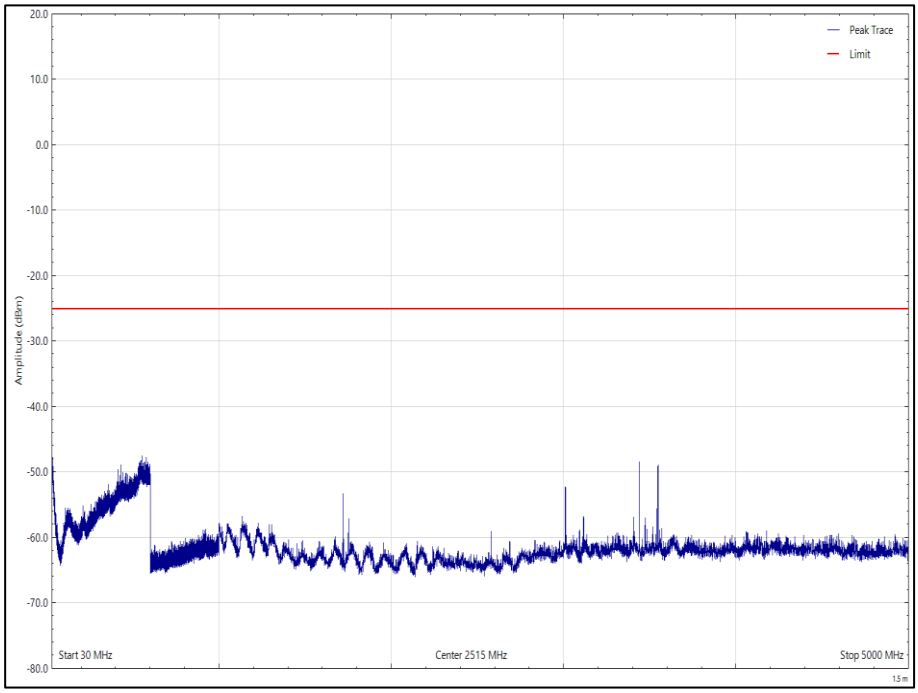

Figure 47 - 429.9875 MHz, 30 MHz to 5 GHz, EUT Orientation X, Horizontal

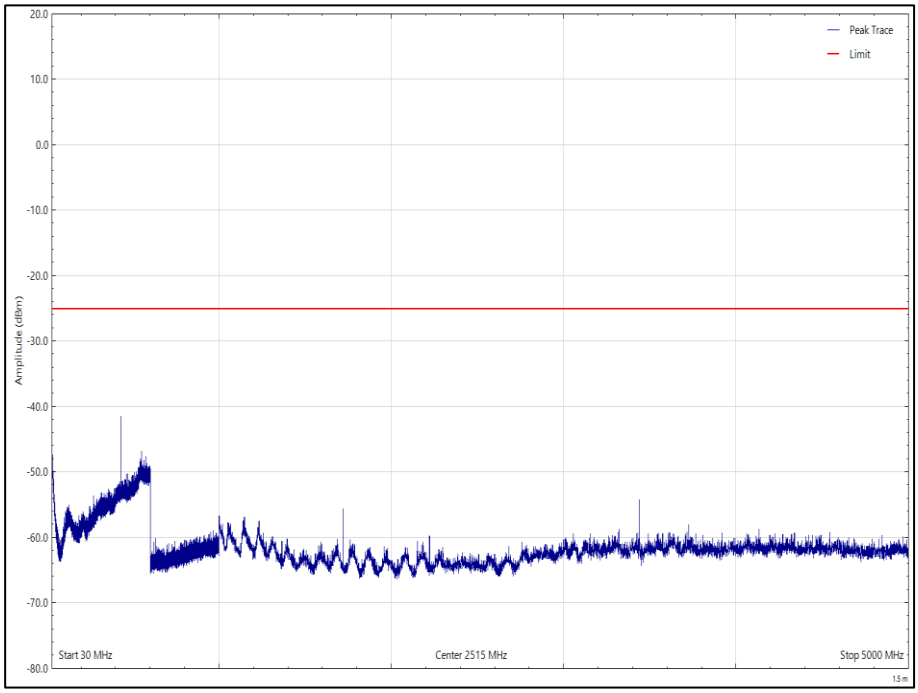

Figure 48 - 429.9875 MHz, 30 MHz to 5 GHz, EUT Orientation X, Vertical

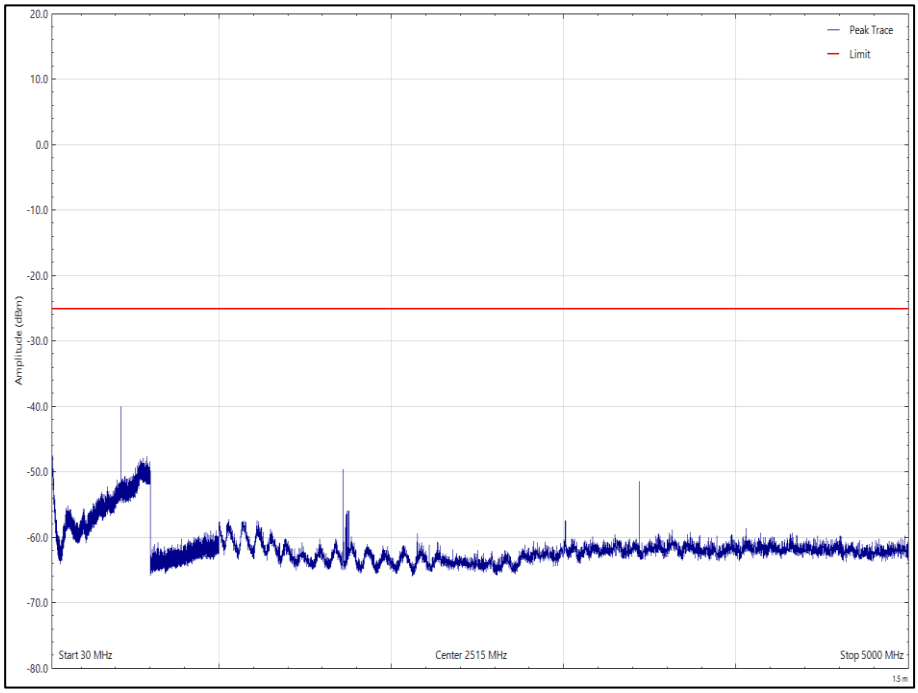

Figure 49 - 429.9875 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Horizontal

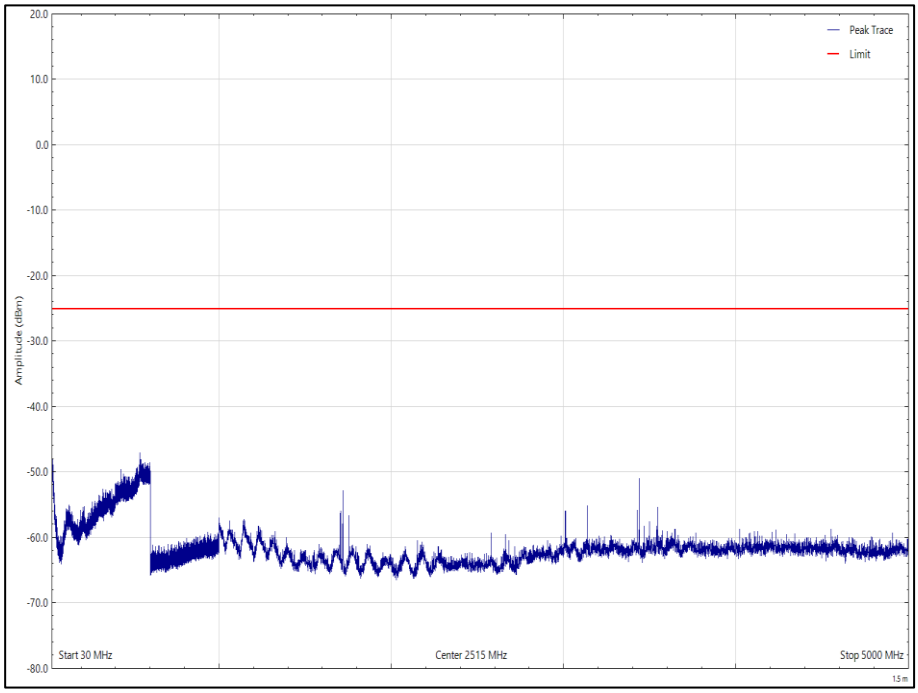

Figure 50 - 429.9875 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Vertical

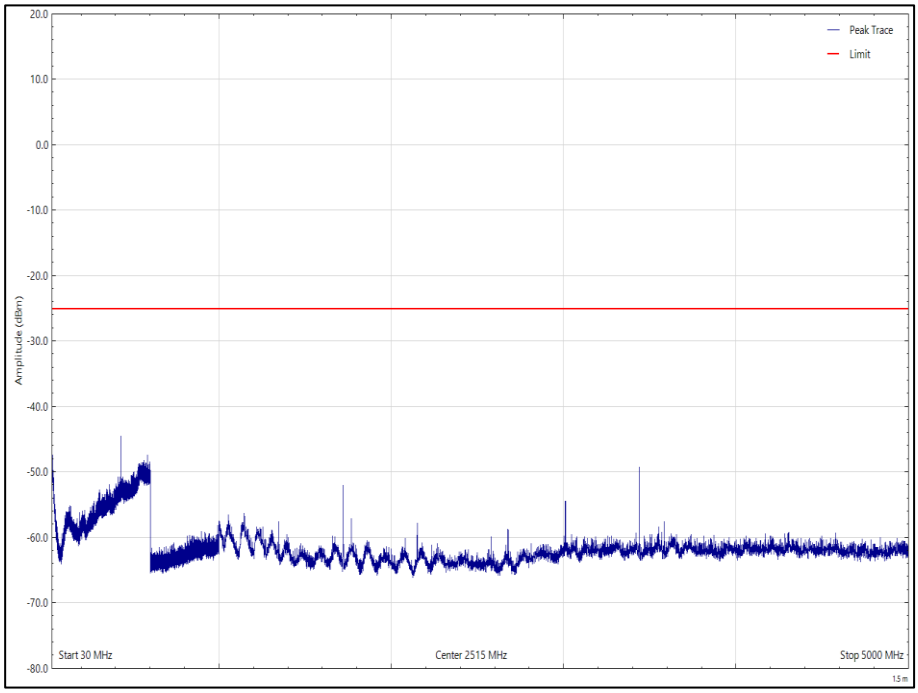

Figure 51 - 429.9875 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Horizontal

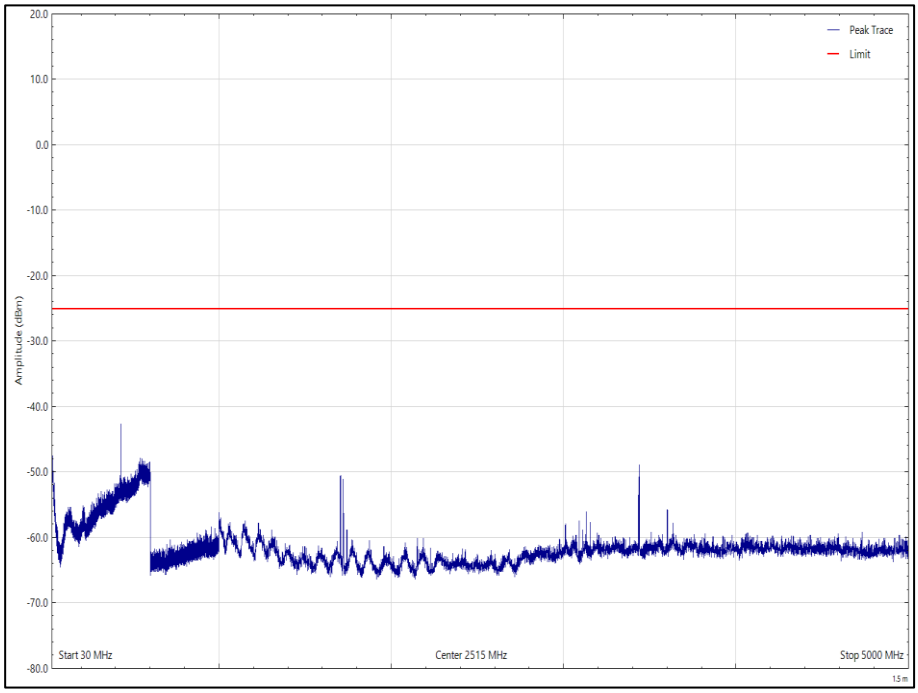

Figure 52 - 429.9875 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Vertical

TETRA - 450 - 470 MHz

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

Table 28 - 450.0125 MHz

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

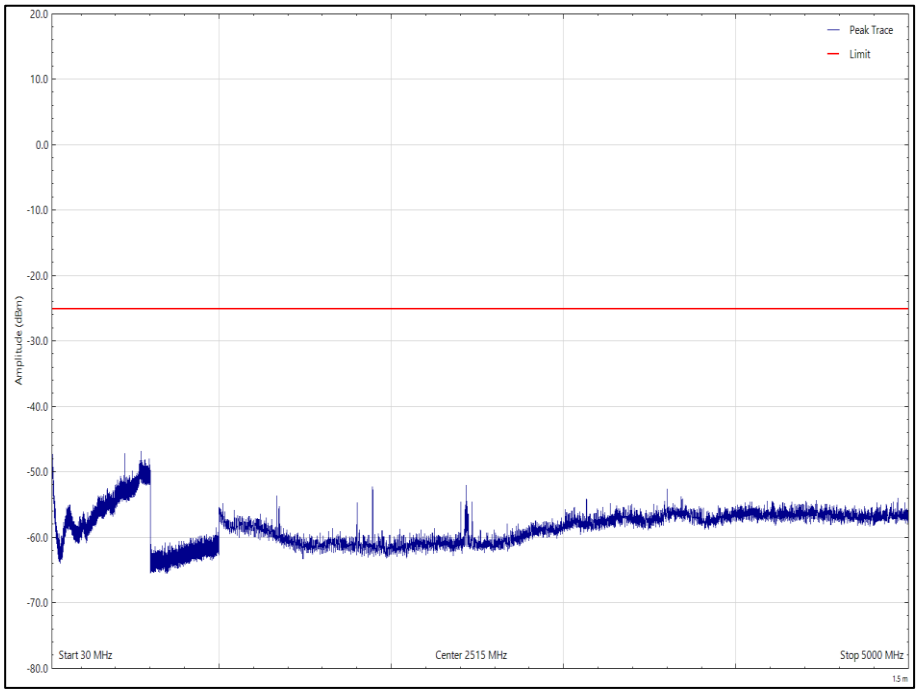

Figure 53 - 450.0125 MHz, 30 MHz to 5 GHz, EUT Orientation X, Horizontal

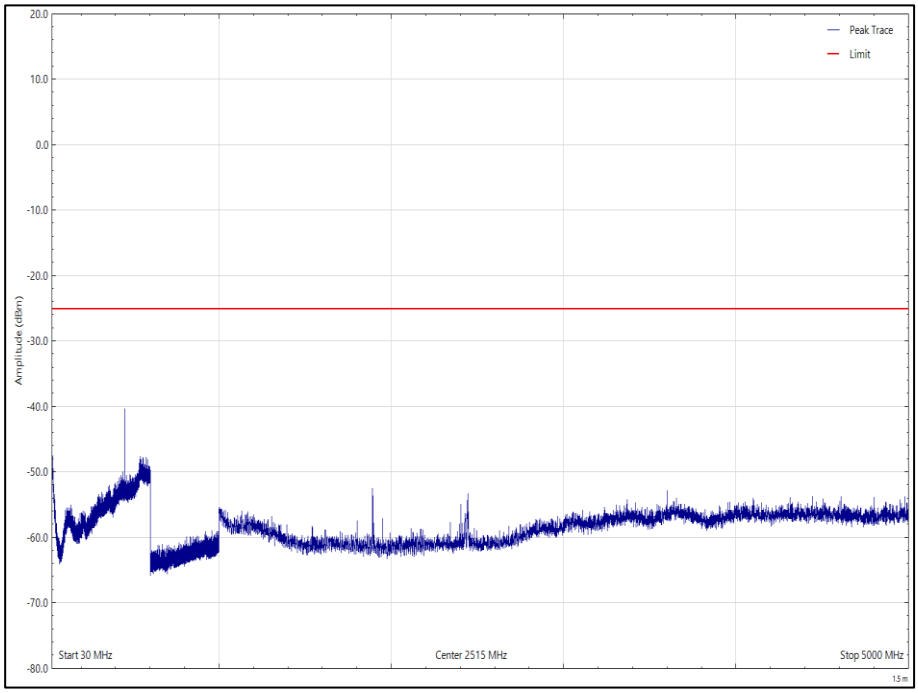

Figure 54 - 450.0125 MHz, 30 MHz to 5 GHz, EUT Orientation X, Vertical

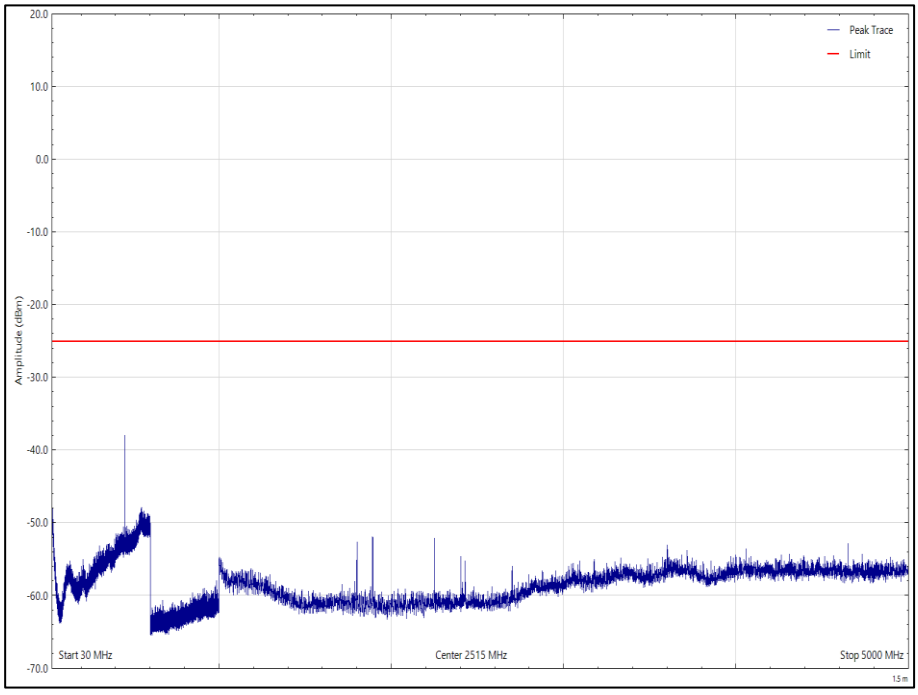

Figure 55 - 450.0125 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Horizontal

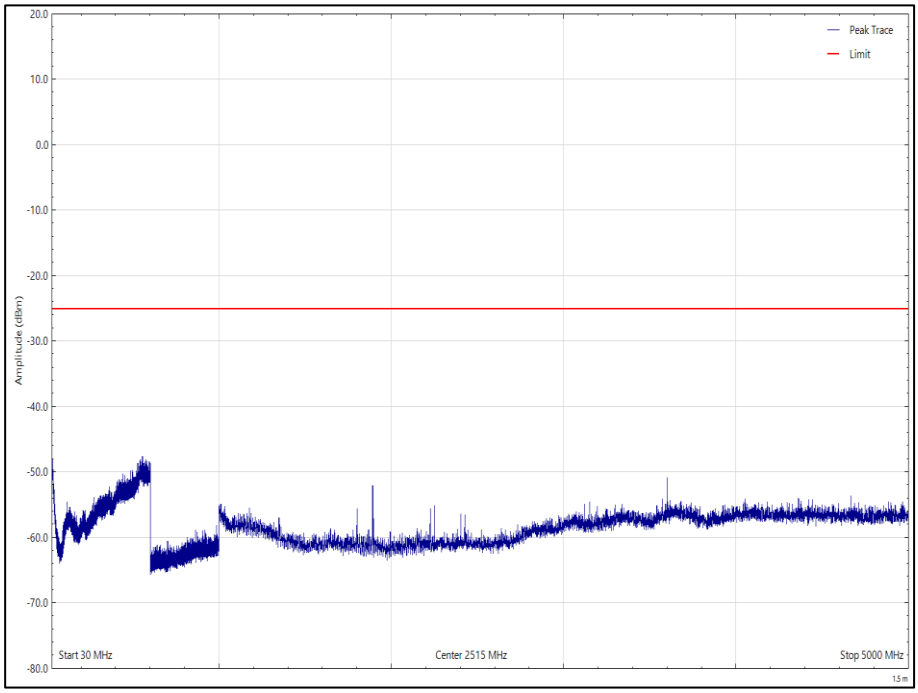

Figure 56 - 450.0125 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Vertical

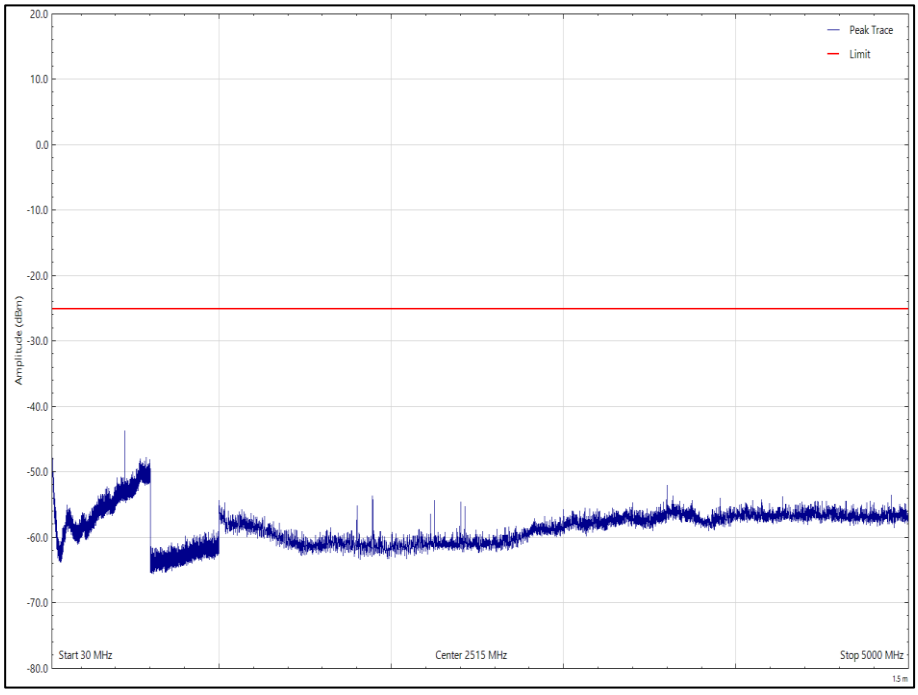

Figure 57 - 450.0125 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Horizontal

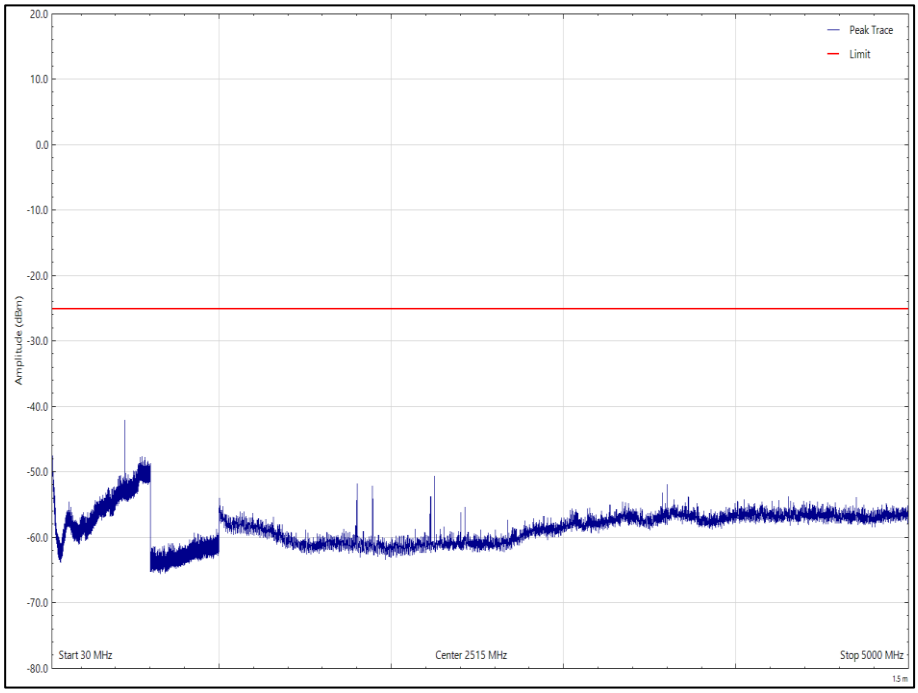

Figure 58 - 450.0125 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Vertical

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

Table 29 - 460.025 MHz

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

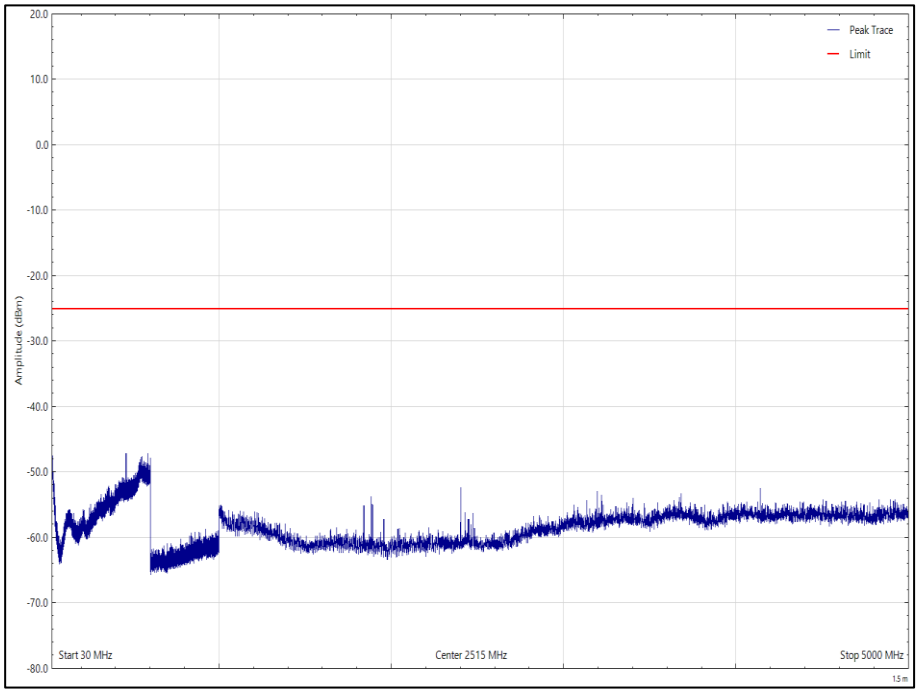

Figure 59 - 460.025 MHz, 30 MHz to 5 GHz, EUT Orientation X, Horizontal

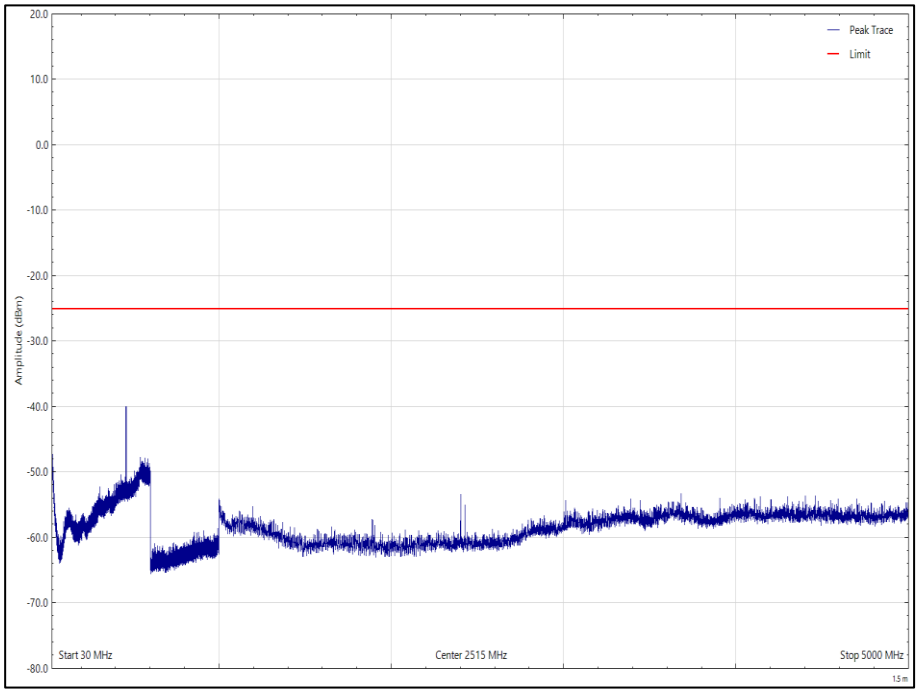

Figure 60 - 460.025 MHz, 30 MHz to 5 GHz, EUT Orientation X, Vertical

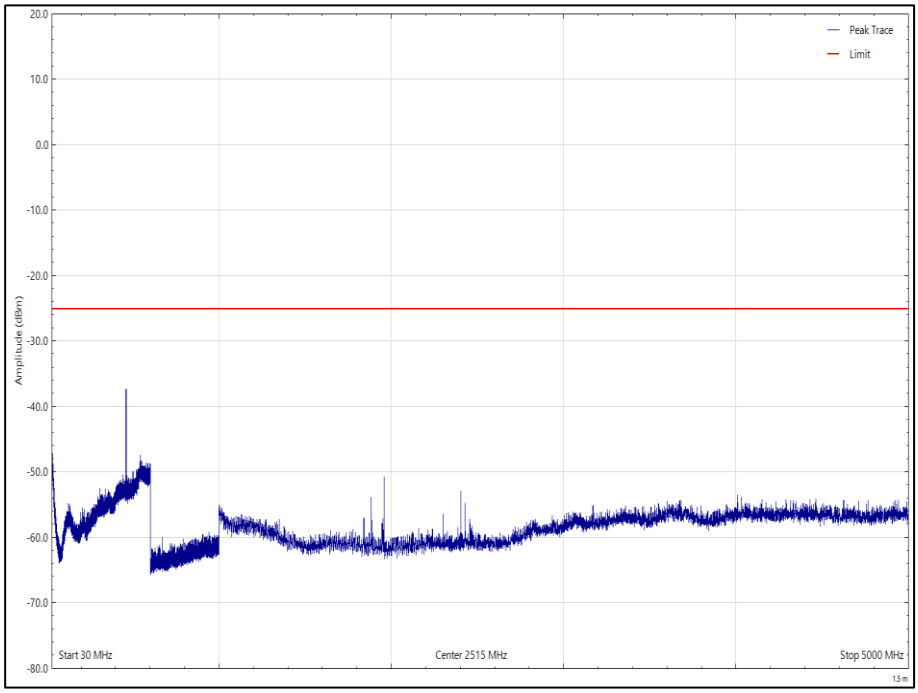

Figure 61 - 460.025 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Horizontal

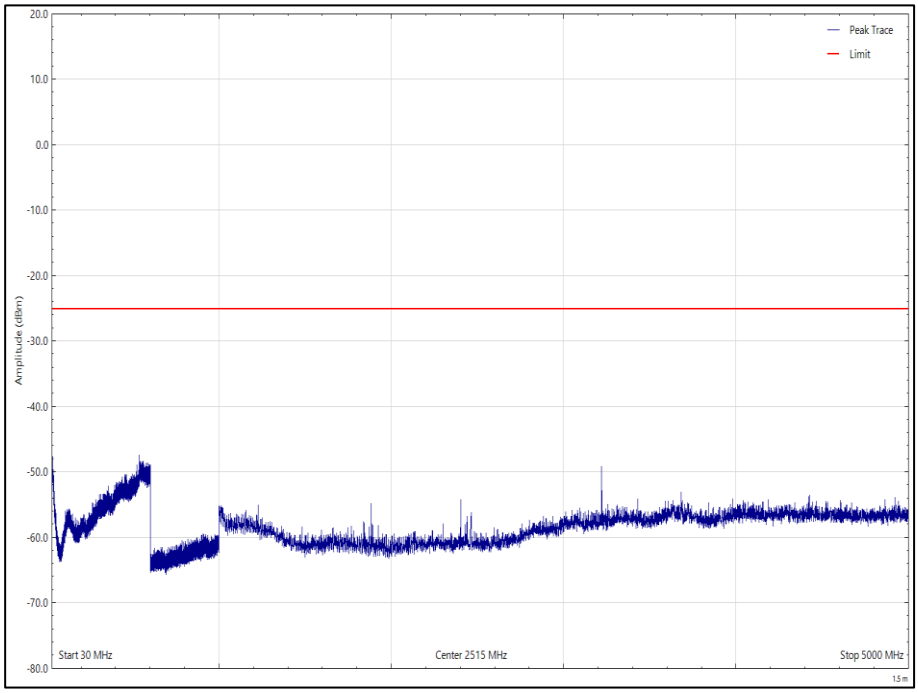

Figure 62 - 460.025 MHz, 30 MHz to 5 GHz, EUT Orientation Y, Vertical

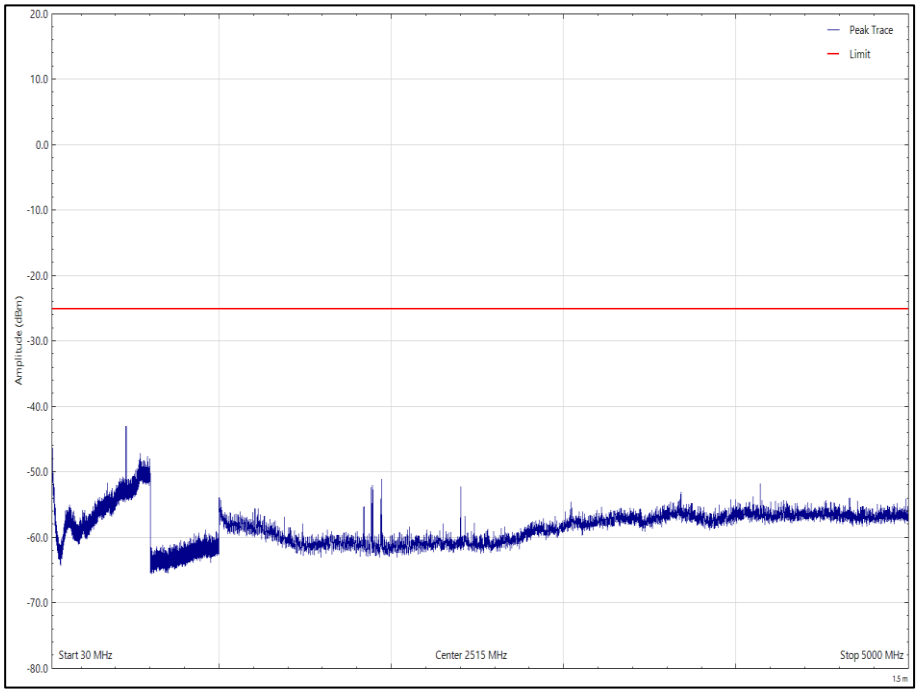

Figure 63 - 460.025 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Horizontal

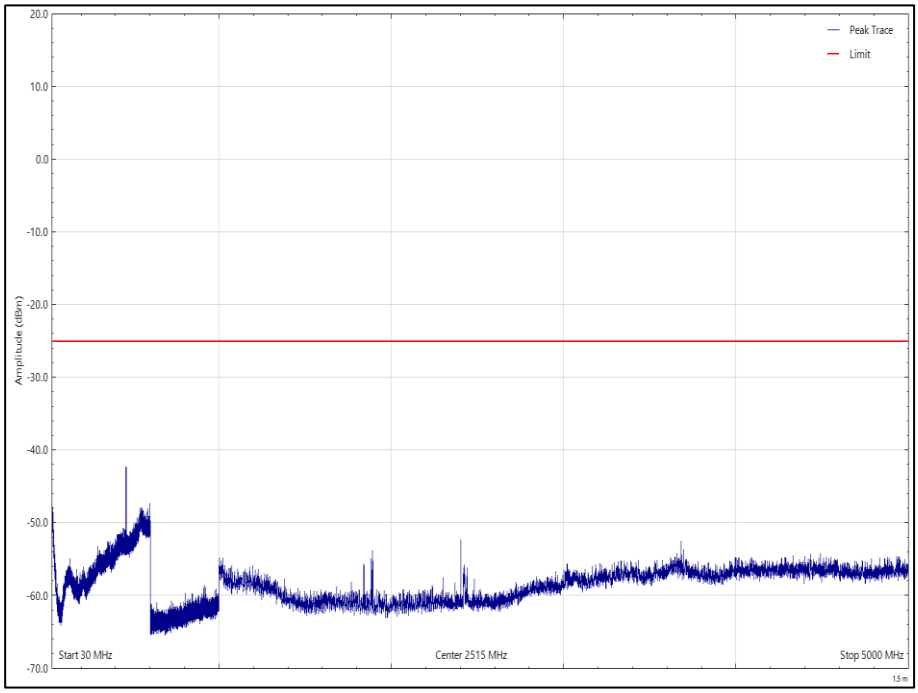

Figure 64 - 460.025 MHz, 30 MHz to 5 GHz, EUT Orientation Z, Vertical

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

Table 30 - 469.9875 MHz

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

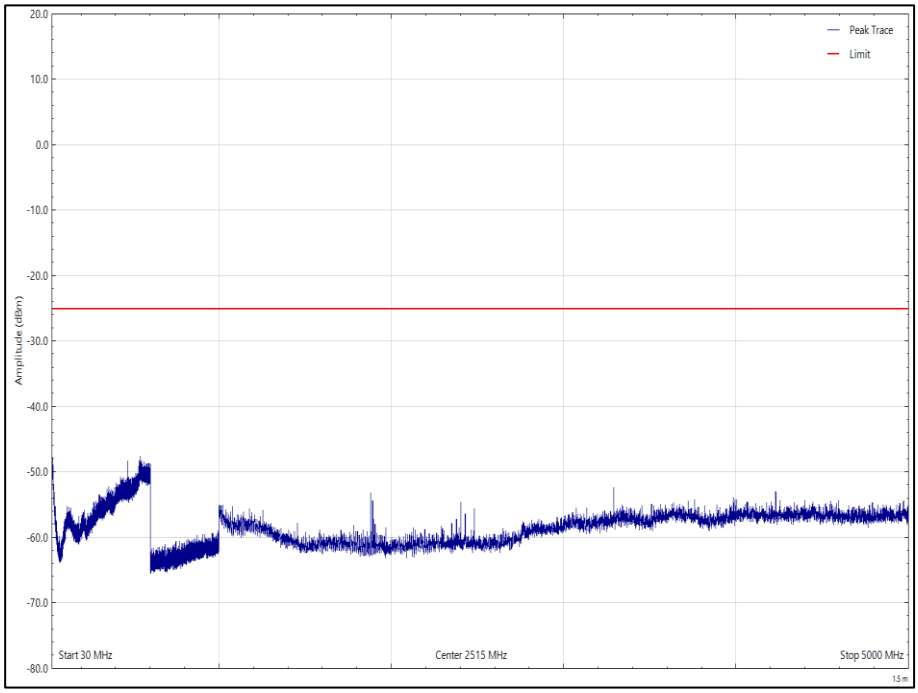

Figure 65 - 469.9875MHz, 30 MHz to 5 GHz, EUT Orientation X, Horizontal

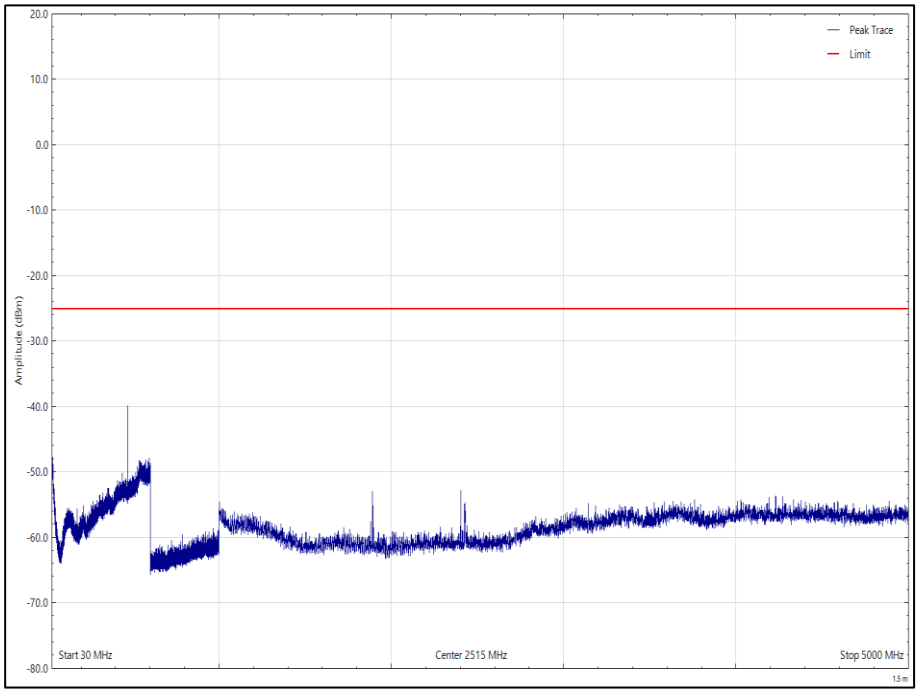

Figure 66 - 469.9875MHz, 30 MHz to 5 GHz, EUT Orientation X, Vertical

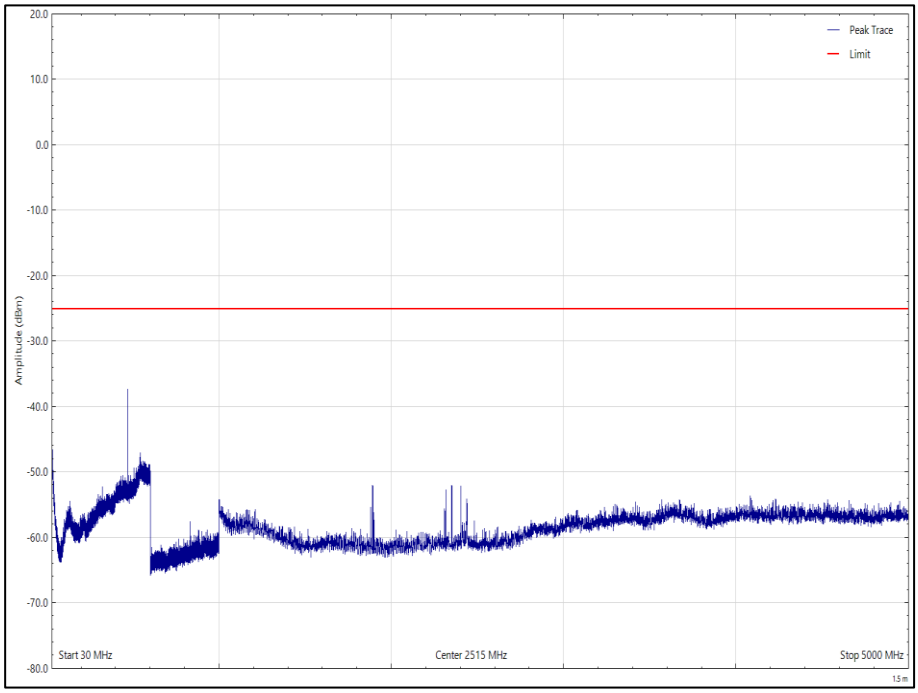

Figure 67 - 469.9875MHz, 30 MHz to 5 GHz, EUT Orientation Y, Horizontal

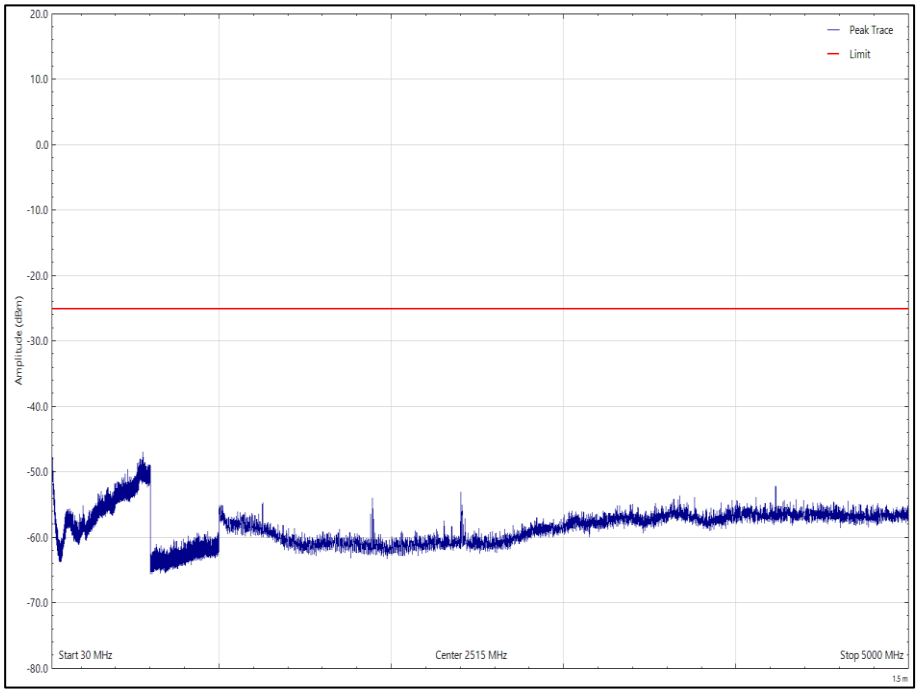

Figure 68 - 469.9875MHz, 30 MHz to 5 GHz, EUT Orientation Y, Vertical

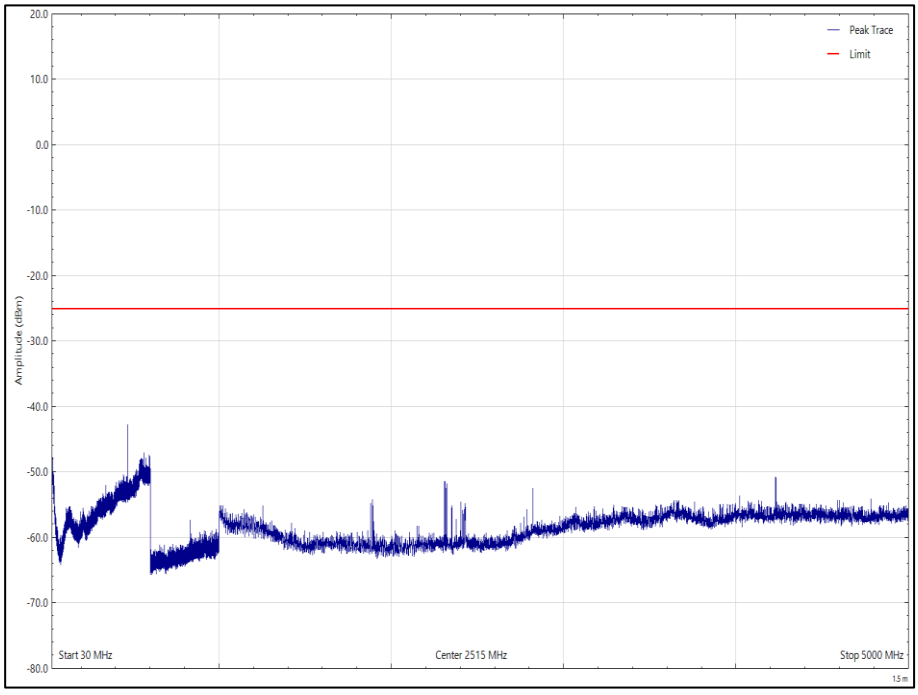

Figure 69 - 469.9875MHz, 30 MHz to 5 GHz, EUT Orientation Z, Horizontal

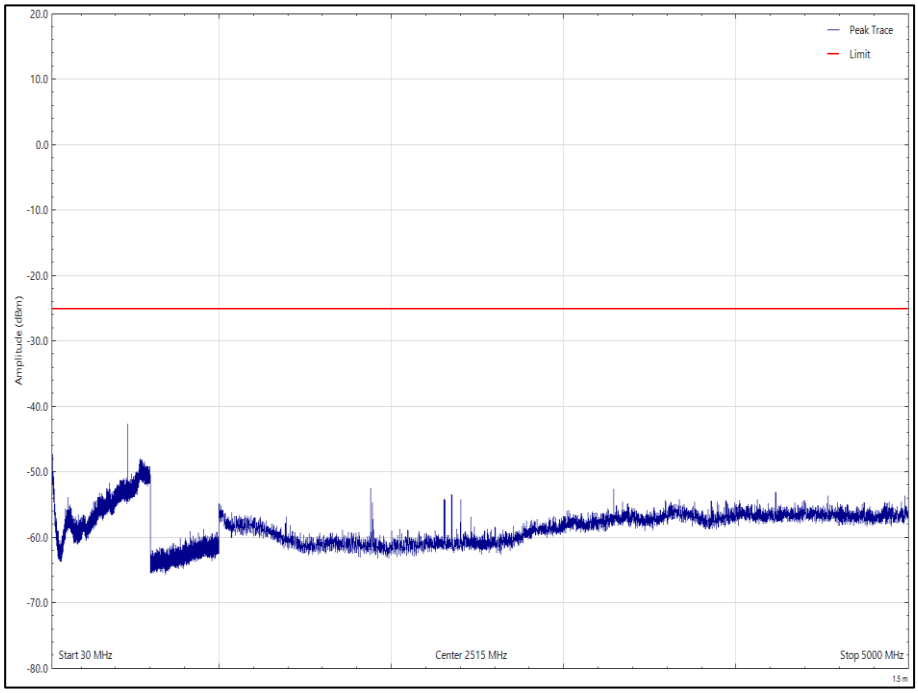

Figure 70 - 469.9875MHz, 30 MHz to 5 GHz, EUT Orientation Z, Vertical

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.

Industry Canada RSS-119, Limit Clause 5.8

The EUT shall comply with emission mask Y as per ISED RSS-119. clause 5.8.10

2.4.7 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
Antenna (Bilog with attenuator, 30 MHz to 3 GHz)	Schaffner	CBL6143	287	24	02-Dec-2024
3m Semi-Anechoic Chamber	Rainford	RF Chamber 5	1545	36	23-Apr-2027
3.5mm - 3.5mm RF Cable (1m)	Rhophase	3PS-1803-1000-3PS	3696	12	05-Jun-2024
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
Antenna (DRG 1-10.5GHz)	Schwarzbeck	BBHA9120B	4848	12	09-Jul-2024
Emissions Software	TUV SUD	EmX V3.2.0	5125	-	Software
1 GHz High Pass Filter	Mini-Circuits	NHP 1000+	5260	12	24-Aug-2024
Pre-amplifier (30 dB, 1GHz to 18GHz)	Schwarzbeck	BBV 9718 C	5261	12	09-Apr-2025
Test Receiver	Rohde & Schwarz	ESW44	5379	12	12-Dec-2024
Cable (SMA to SMA, 2 m)	Junkosha	MWX221-02000AMSAMS/A	5517	12	21-May-2024
3 GHz High pass Filter	Wainwright	WHKX12-2580-3000-18000-80SS	5548	12	16-Aug-2024
Cable (N to N 8m)	Junkosha	MWX221-08000NMSNMS/B	6331	12	17-Feb-2025
Attenuator 5W 10dB DC-18GHz	Aaren	AT40A-4041-D18-10	6553	12	18-Jun-2024

Table 31

TU - Traceability Unscheduled

2.5 Frequency Stability

2.5.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1055
FCC 47 CFR Part 90, Clause 90.213
ISED RSS-119, Clause 5.3
ISED RSS-GEN, Clause 6.11

2.5.2 Equipment Under Test and Modification State

STP8X040, S/N: 1PR902412G9Y2BE - Modification State 0

2.5.3 Date of Test

23-May-2024

2.5.4 Test Method

This test was performed in accordance with ANSI C63.26, Clause 5.6. and the requirements of FCC 47 CFR Part 2, Clause 2.1055 (a)(2), (d)(1).

The EUT was set to transmit on maximum power with an unmodulated carrier on bottom, middle and top channels. The EUT was connected to a frequency counter using an external 10 MHz frequency reference. The difference between the frequency of the fundamental and the frequency of the assigned channel in accordance with the manufacturer's documentation was recorded. In accordance with FCC 47 CFR, Clause 2.1055, the temperature was varied from -30 °C to +50 °C in 10 ° steps at nominal voltage and at ambient temperature for both minimum and maximum voltage extremes.

2.5.5 Environmental Conditions

Ambient Temperature	21.7 °C
Relative Humidity	52.9 %

2.5.6 Test Results

TETRA - 407 - 430 MHz

Voltage	Frequency Error (ppm)		
	407.0125 MHz	418.05 MHz	429.9875 MHz
7.0	-0.49	-0.40	-0.34
8.4	-0.46	-0.42	-0.32

Table 32 - Frequency Stability Under Voltage Variations

Temperature	Frequency Error (ppm)		
	407.0125 MHz	418.05 MHz	429.9875 MHz
+50.0 °C	0.22	0.21	0.14
+40.0 °C	0.05	0.10	0.14
+30.0 °C	-0.23	-0.17	-0.06
+20.0 °C	-0.54	-0.38	-0.36
+10.0 °C	-0.79	-0.74	-0.63
0 °C	-0.62	-0.72	-0.77
-10.0 °C	-0.19	-0.25	-0.32
-20.0 °C	0.22	-0.05	-0.24
-30.0 °C	0.63	0.56	0.50

Table 33 - Frequency Stability Under Temperature Variations

TETRA - 450 - 470 MHz

Voltage	Frequency Error (ppm)		
	450.0125 MHz	460.025 MHz	469.9875 MHz
7.0	-0.3	-0.26	-0.22
8.4	-0.33	-0.24	-0.24

Table 34 - Frequency Stability Under Voltage Variations

Temperature	Frequency Error (ppm)		
	450.0125 MHz	460.025 MHz	469.9875 MHz
+50.0 °C	0.12	0.10	0.07
+40.0 °C	0.21	0.21	0.22
+30.0 °C	0.02	0.01	0.03
+20.0 °C	-0.29	-0.27	-0.21
+10.0 °C	-0.69	-0.66	-0.59
0 °C	-0.77	-0.78	-0.78
-10.0 °C	-0.48	-0.48	-0.48
-20.0 °C	-0.20	-0.19	-0.31
-30.0 °C	0.32	0.26	0.32

Table 35 - Frequency Stability Under Temperature Variations

FCC 47 CFR Part 90, Limit Clause 90.213

5 ppm

Industry Canada RSS-199, Limit Clause 5.3

1 ppm

2.5.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Counter	Hewlett Packard	53181A	159	12	03-Aug-2024
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Meter & T/C	R.S Components	Meter 615-8206 & Type K T/C	3612	12	14-Sep-2024
True RMS Multimeter	Fluke	179	4007	12	17-Nov-2024
Quad Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P Mon
3.5 mm 2m Cable	Junkosha	MWX221-02000DMS	5423	12	18-Feb-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 36

O/P Mon – Output Monitored using calibrated equipment

2.6 Transient Frequency Behaviour

2.6.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.214
ISED RSS-119, Clause 5.9

2.6.2 Equipment Under Test and Modification State

STP8X040, S/N: 1PR902412G9Y2BE - Modification State 0

2.6.3 Date of Test

23-May-2024

2.6.4 Test Method

This test was performed on bottom, middle and top frequencies using an unmodulated carrier output from the EUT and measured on a spectrum analyser in accordance with TIA Standard 603 (Referenced in Industry Canada RSS-119, Clause 5.9).

The EUT configuration application used to transmit an unmodulated signal was 2.25 kHz higher than the nominal centre frequency of the channel. Therefore, the trace plots recorded were centred on 2.25 kHz higher than the bottom, middle and top nominal centre frequencies.

2.6.5 Environmental Conditions

Ambient Temperature	21.7 °C
Relative Humidity	52.9 %

2.6.6 Test Results

TETRA - 407 - 430 MHz

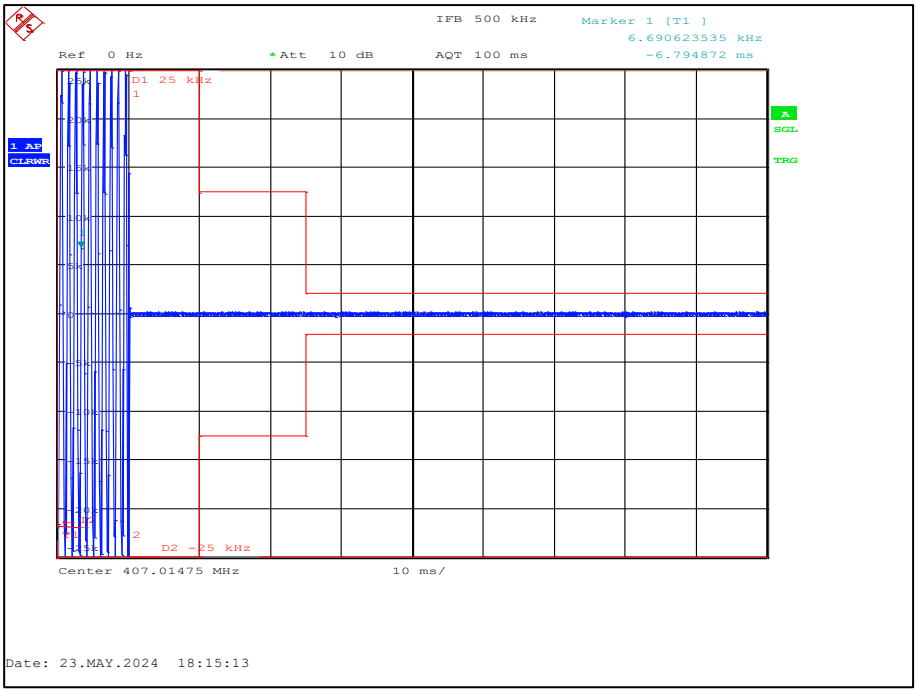

Figure 71 - 407.0125 MHz, Switch On Transients

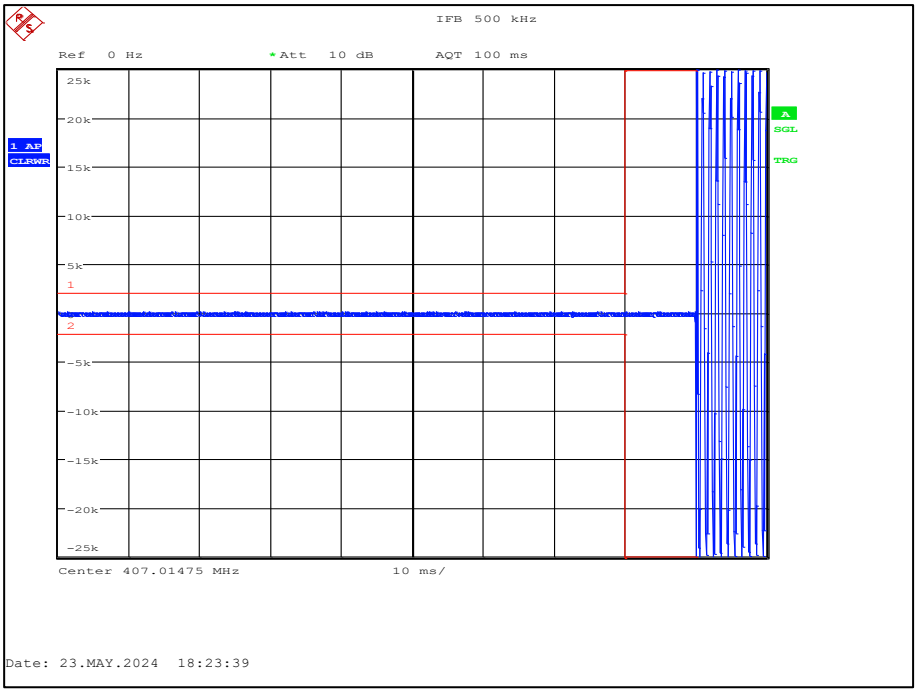

Figure 72- 407.0125 MHz, Switch Off Transients

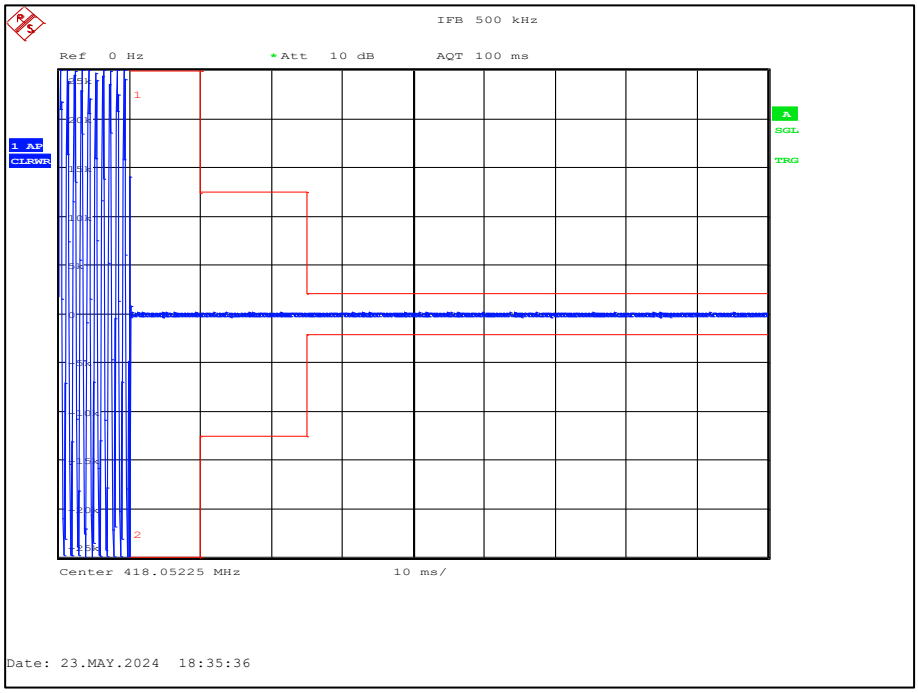

Figure 73 - 418.05 MHz, Switch On Transients

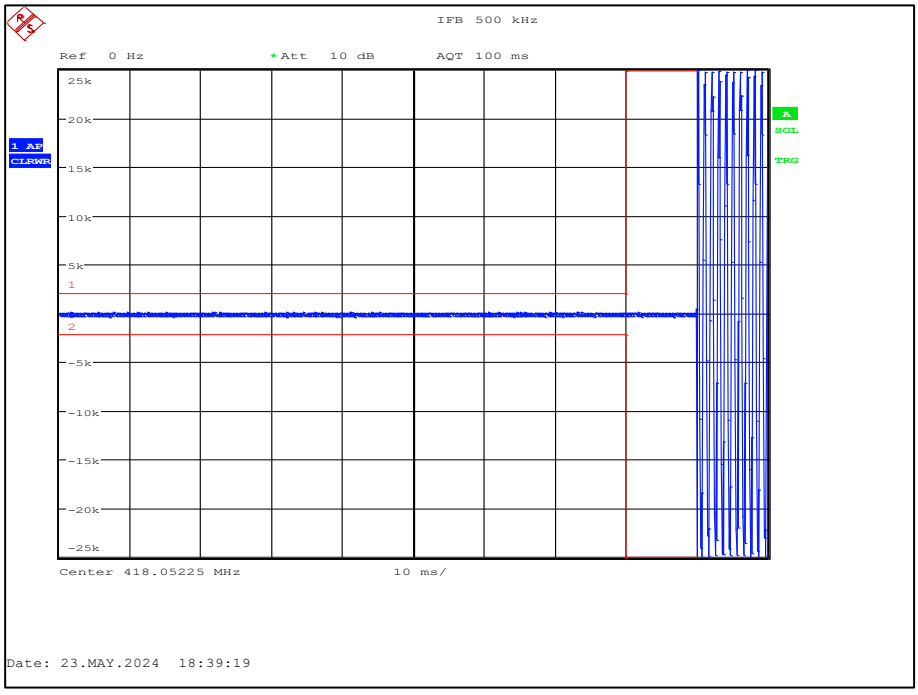

Figure 74- 418.05 MHz, Switch Off Transients

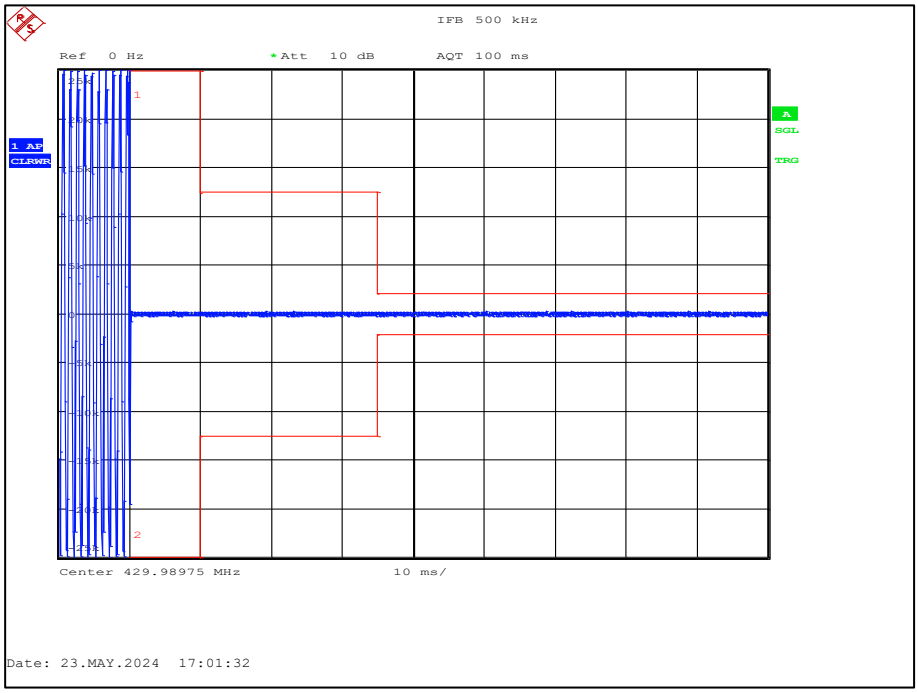

Figure 75 - 429.9875 MHz, Switch On Transients

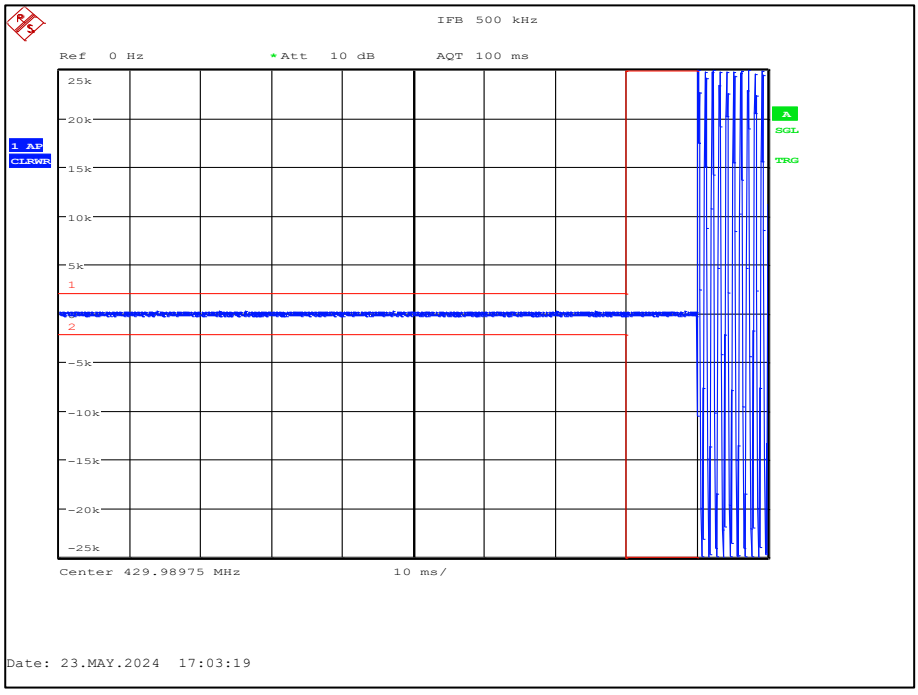

Figure 76- 429.9875 MHz, Switch Off Transients

TETRA - 450 - 470 MHz

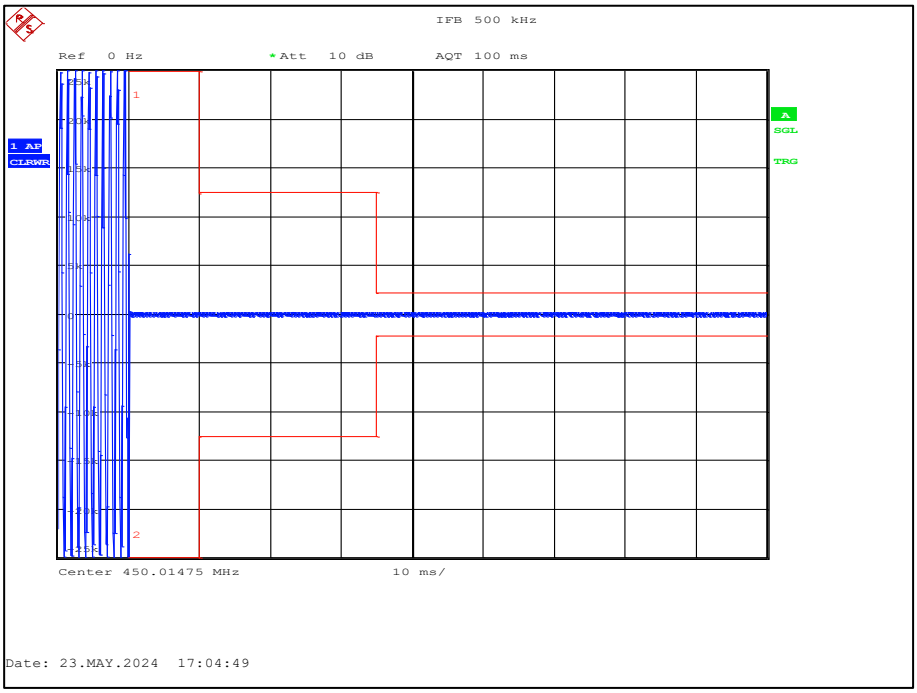

Figure 77 - 450.0125 MHz, Switch On Transients

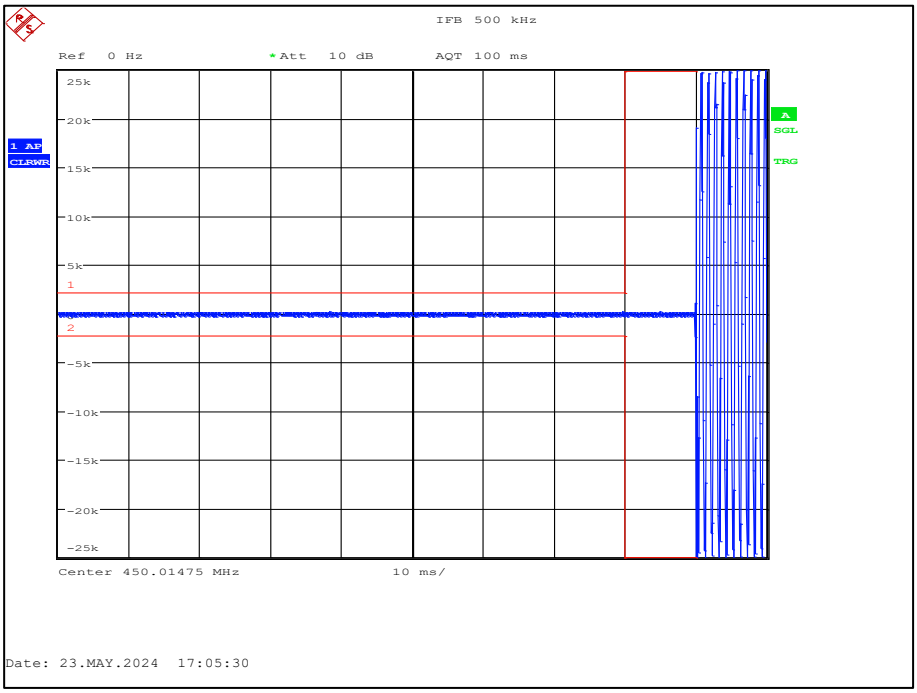

Figure 78- 450.0125 MHz, Switch Off Transients

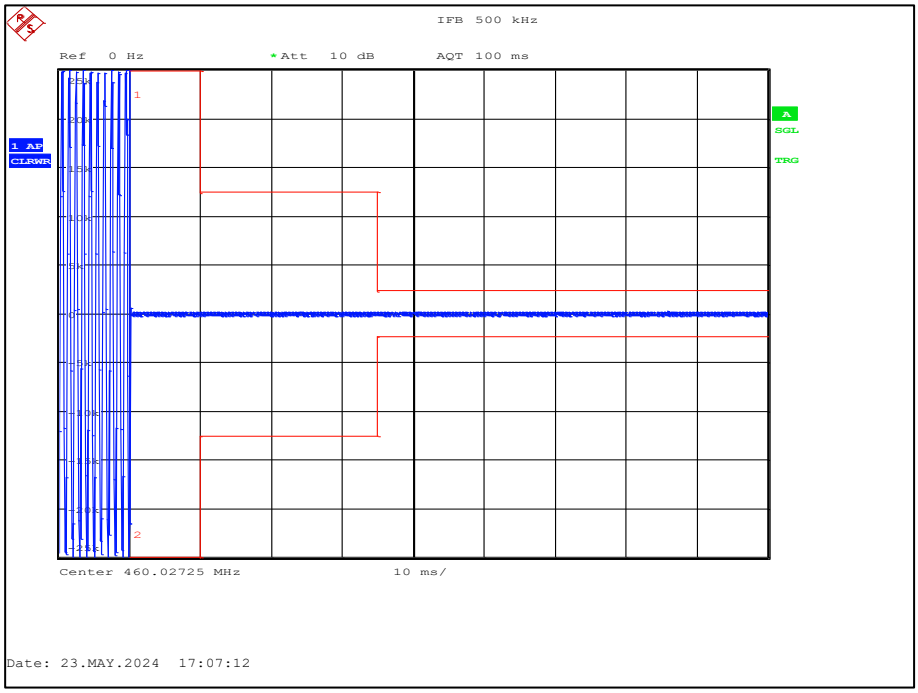

Figure 79 - 460.025 MHz, Switch On Transients

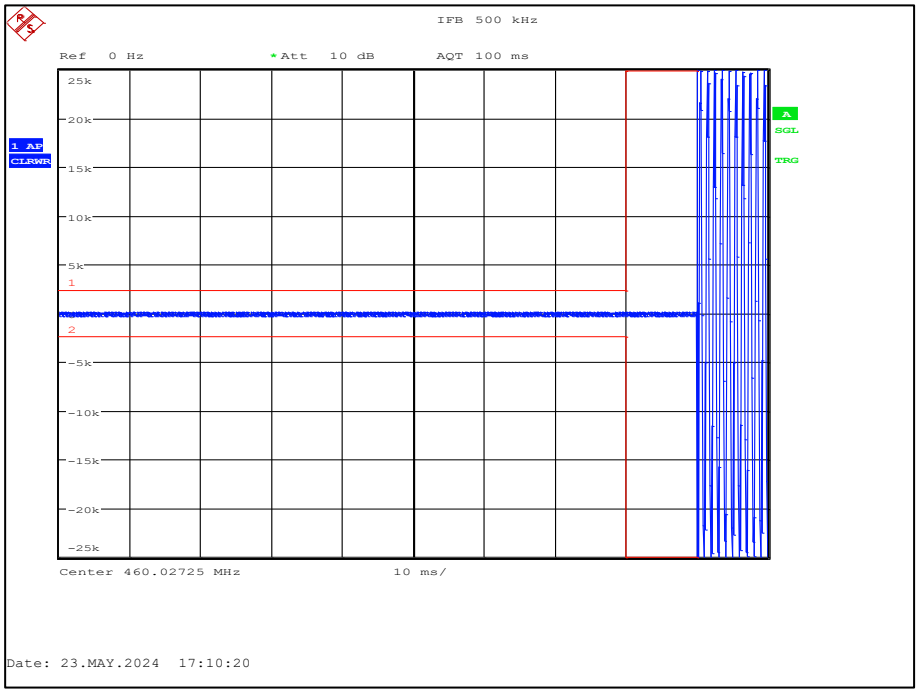

Figure 80- 460.025 MHz, Switch Off Transients

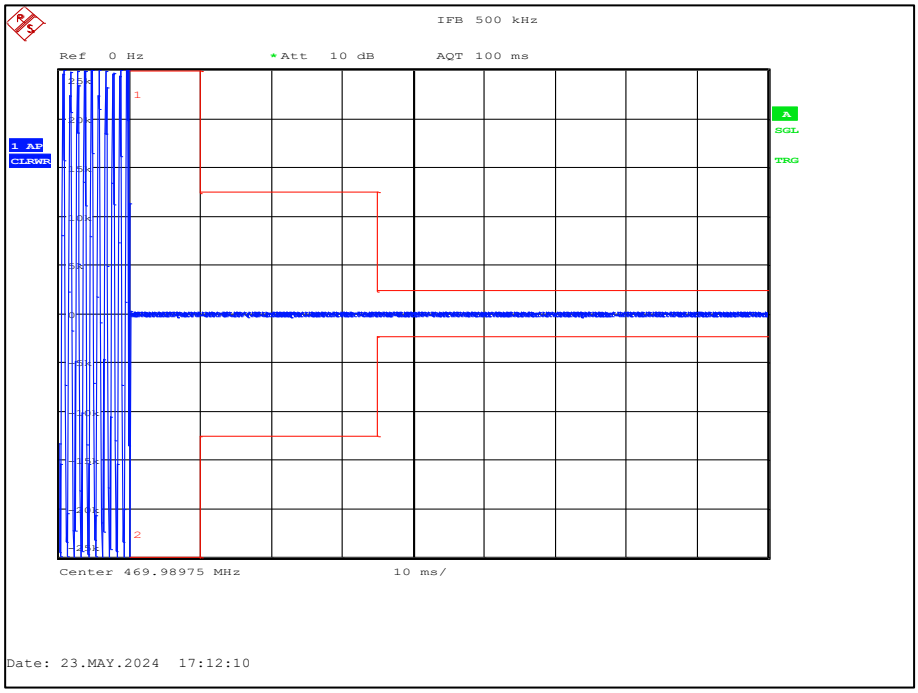

Figure 81 - 469.9875 MHz, Switch On Transients

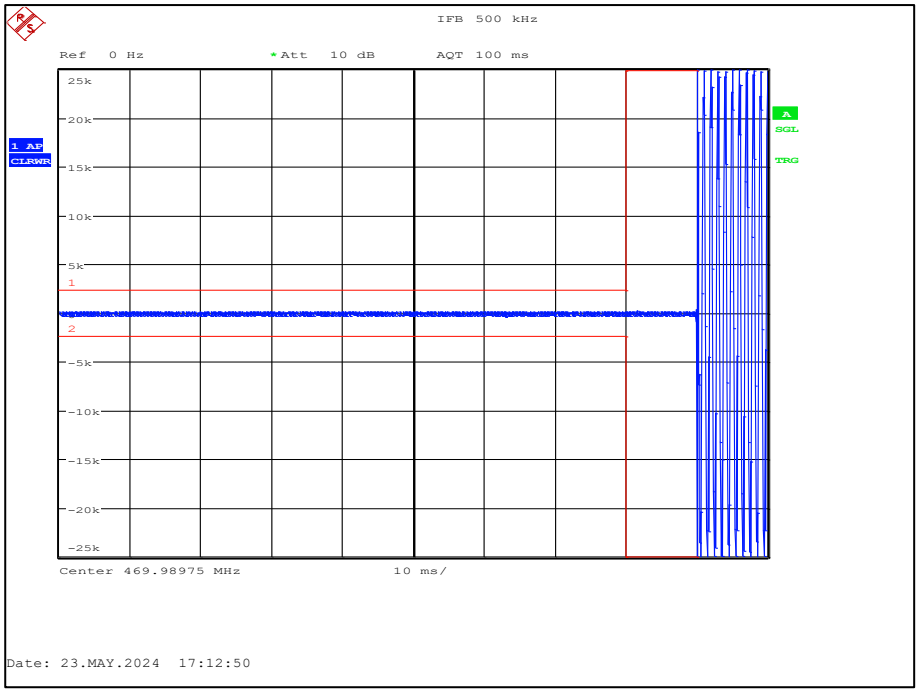

Figure 82- 469.9875 MHz, Switch Off Transients

FCC 47 CFR Part 90, Limit Clause 90.214

Time Interval	Maximum Frequency Difference	150 to 174 MHz	421 to 512 MHz
Transient Frequency Behaviour for Equipment Designed to Operate on 25 kHz Channels			
T_1	± 25.0 kHz	5.0 ms	10.0 ms
T_2	± 12.5 kHz	20.0 ms	25.0 ms
T_3	± 25.0 kHz	5.0 ms	10.0 ms
Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels			
T_1	± 12.5 kHz	5.0 ms	10.0 ms
T_2	± 6.25 kHz	20.0 ms	25.0 ms
T_3	± 12.5 kHz	5.0 ms	10.0 ms
Transient Frequency Behaviour for Equipment Designed to Operate on 6.25 kHz Channels			
T_1	± 6.25 kHz	5.0 ms	10.0 ms
T_2	± 3.125 kHz	20.0 ms	25.0 ms
T_3	± 6.25 kHz	5.0 ms	10.0 ms

Table 37

Industry Canada RSS-119, Limit Clause 5.9

Channel Bandwidth (kHz)	Time Intervals	Maximum Frequency Difference (kHz)	Transient Duration Limit (ms)	
			138 to 174 MHz	406.1 to 512 MHz
25.0	t_1	± 25.0	5	10
	t_2	±12.5	20	25
	t_3	± 25.0	5	10
12.5	t_1	± 12.5	5	10
	t_2	± 6.25	20	25
	t_3	± 12.5	5	10
6.25	t_1	± 6.25	5	10
	t_2	± 3.125	20	25
	t_3	± 6.25	5	10

Table 38

2.6.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Power Divider	Weinschel	1506A	603	12	14-Dec-2024
Signal Generator, 9kHz - 3GHz	Rohde & Schwarz	SMA 100A	3504	12	24-Oct-2024
Signal Analyser	Rohde & Schwarz	FSQ 26	3545	12	09-May-2024
3.5 mm 2m Cable	Junkosha	MWX221-02000DMS	5423	12	18-Feb-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 39

2.7 Adjacent Channel Power

2.7.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.221
ISED RSS-119, Clause 5.8.9.1

2.7.2 Equipment Under Test and Modification State

STP8X040, S/N: 1PR902412G9Y2BE - Modification State 0

2.7.3 Date of Test

22-May-2024

2.7.4 Test Method

This test was performed in accordance with FCC 90.221 (a) using the Adjacent Channel Power function of a spectrum analyser.

2.7.5 Environmental Conditions

Ambient Temperature	21.7 °C
Relative Humidity	52.5 %

2.7.6 Test Results

TETRA - 450 - 470 MHz

Offset (kHz)	Adjacent Channel Power (dB)		
	450.0125 MHz	460.025 MHz	469.9875 MHz
-25	-63.8	-63.4	-62.0
+25	-64.8	-64.2	-62.3
-50	-77.4	-76.0	-72.8
+50	-77.0	-75.8	-72.4
-75	-81.1	-80.1	-77.0
+75	-81.0	-80.1	-77.0

Table 40

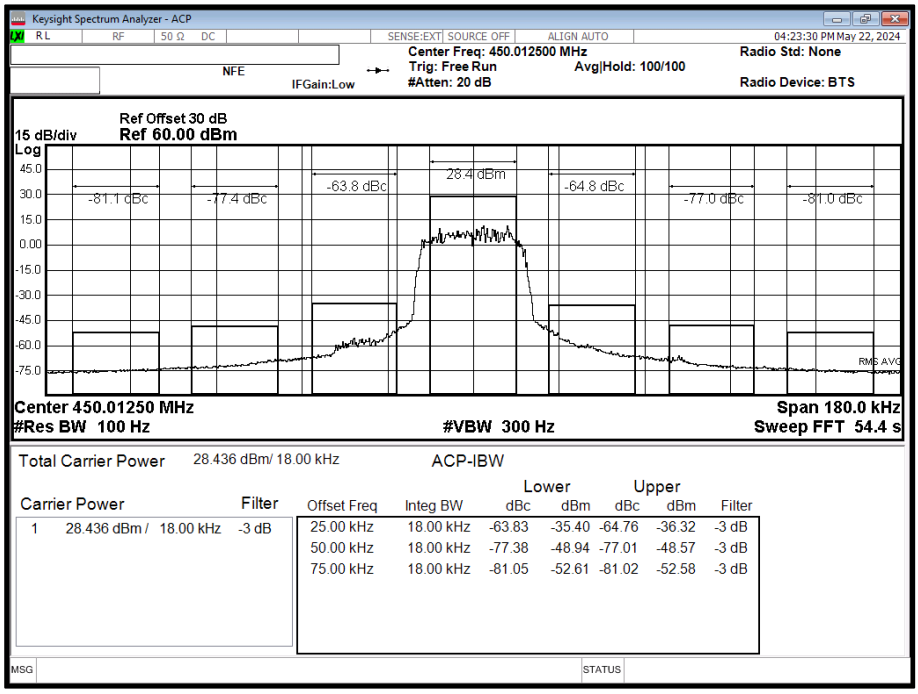

Figure 83 - 450.0125 MHz

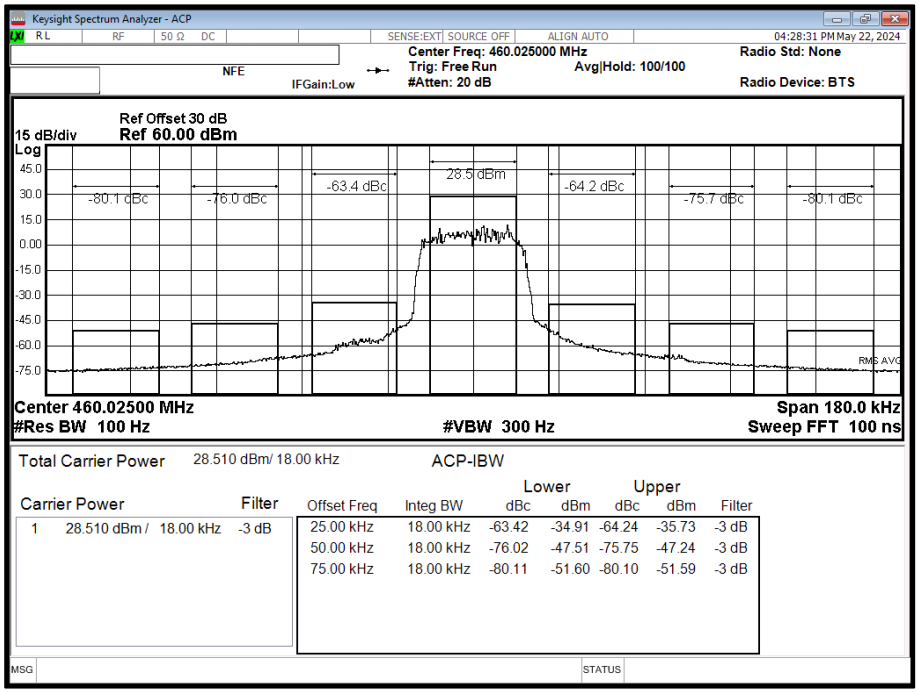

Figure 84 - 460.025 MHz

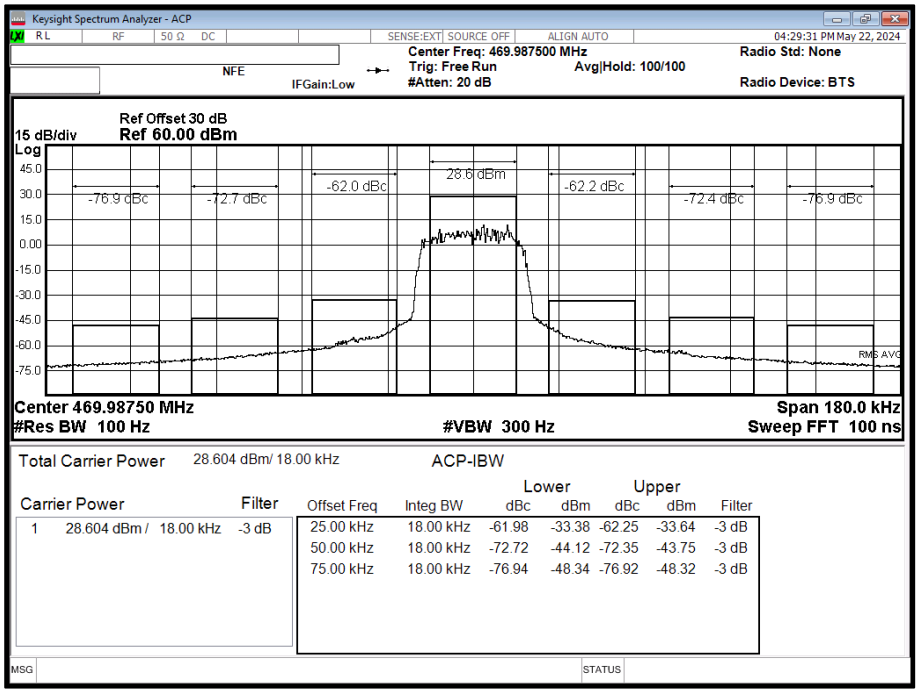

Figure 85 - 469.9875 MHz

FCC Part 90, Limit Clause 90.221(b)

Frequency Offset	Maximum ACP (dBc) for devices ≤ 1W	Maximum ACP (dBc) for devices > 1W
25 kHz	-55	-60
50 kHz	-70	-70
75 kHz	-70	-70

Table 41

NOTE: In any case, no requirement in excess of -36 dBm shall apply.

Industry Canada RSS-119. Limit Clause 5.8.9.1

The ACP of transmitters operating in the bands 768-776 MHz and 798-806 MHz shall comply with the requirements for various transmitter channel sizes provided in tables 13 to 16 of the specification.

2.7.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	20-Feb-2025
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	26-Feb-2025
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	23-Jan-2025
3.5 mm 2m Cable	Junkosha	MWX221-02000DMS	5423	12	18-Feb-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 42

2.8 Types of Emissions

2.8.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1047
FCC 47 CFR Part 90, Clause 90.207
ISED RSS-119, Clause 5.2

2.8.2 Equipment Under Test and Modification State

STP8X040, S/N: 1PR902412G9Y2BE - Modification State 0

2.8.3 Date of Test

30-May-2024 to 03-June-2024

2.8.4 Test Method

This test was performed on middle frequency using a modulated carrier output from the EUT and measured on a spectrum analyser. The path loss was measured using a network analyser and entered as a reference level offset in the spectrum analyser including the manufacturers declared maximum antenna gain. The spectrum analyser was set to the transmit frequency. The burst measurements were made in zero span mode and the frequency spectrum with a span sufficient to show the transmitters response. The signal was maximised and stabilised for >1 minute and the marker function of the spectrum analyser was used. The trace plots were recorded.

2.8.5 Environmental Conditions

Ambient Temperature	20.0 - 21.6 °C
Relative Humidity	42.0 - 57.8 %

2.8.6 Test Results

TETRA - 407 - 430 MHz

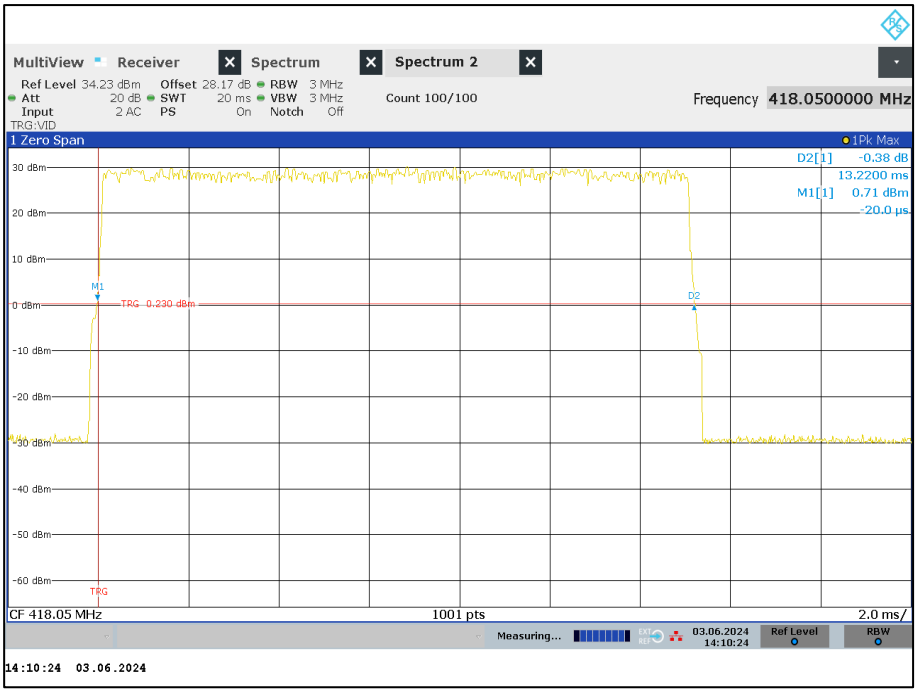

Figure 86-Burst Length

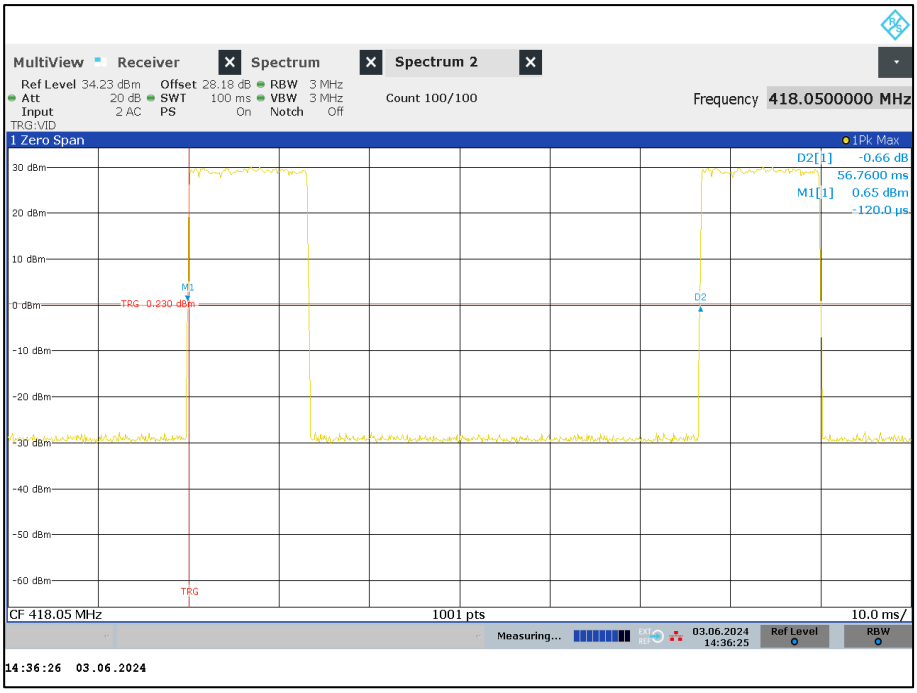

Figure 87-Burst Period

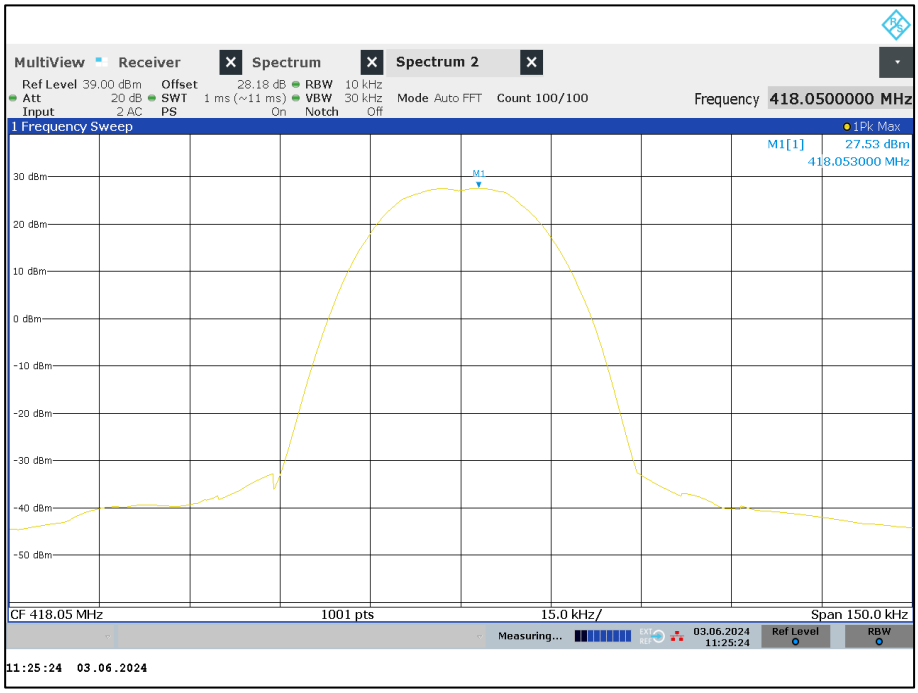

Figure 88-Frequency Spectrum

TETRA - 450 - 470 MHz

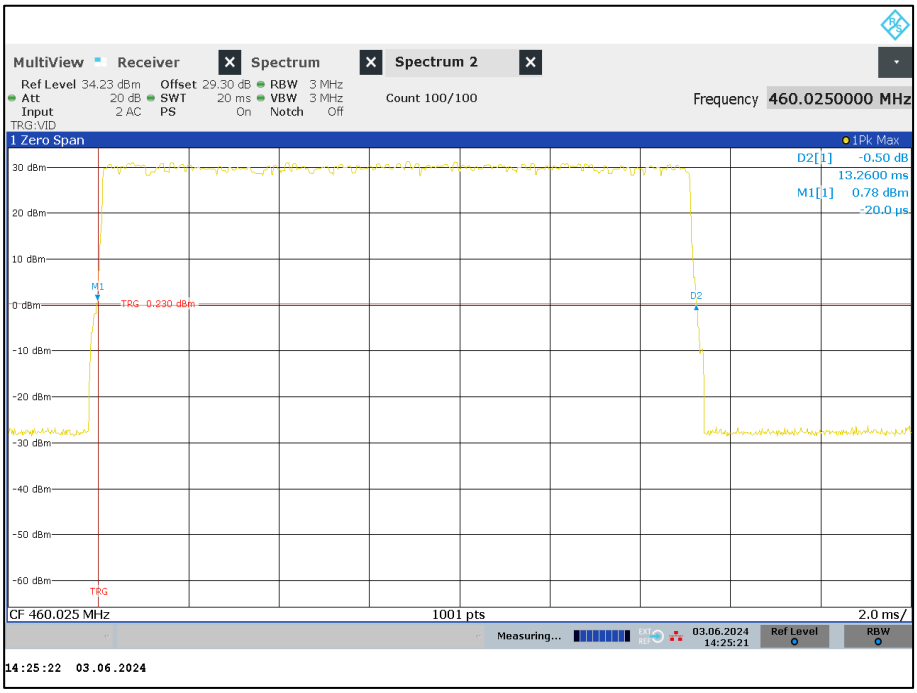

Figure 89-Burst Length

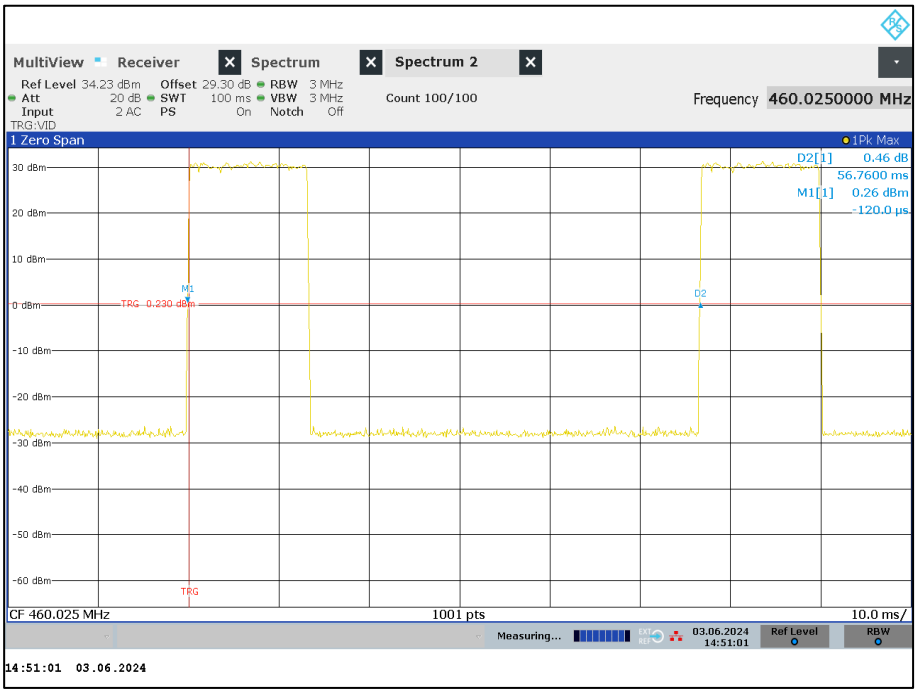

Figure 90-Burst Period

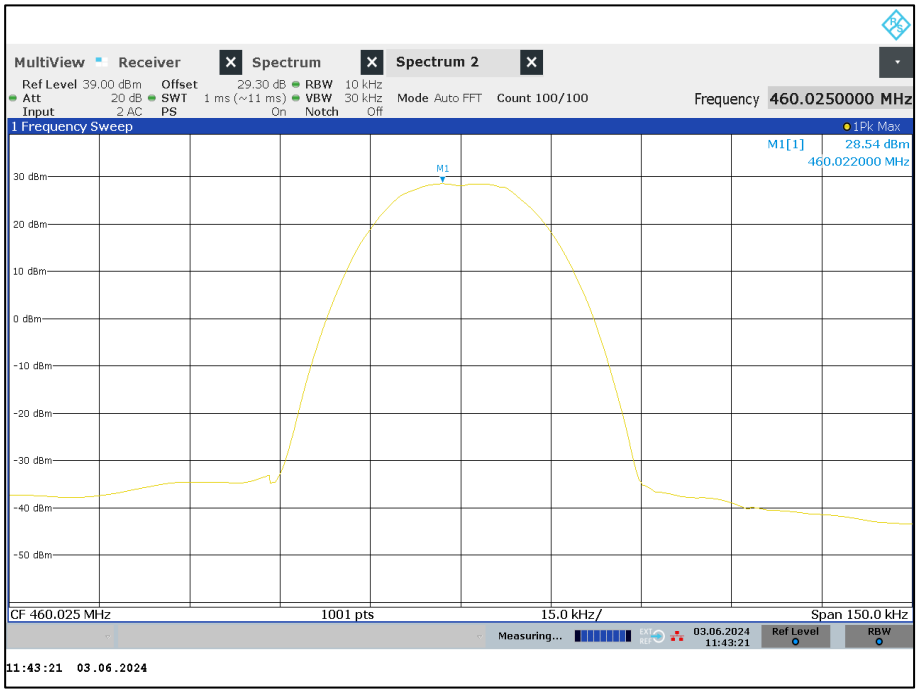

Figure 91-Spectrum

FCC 47 CFR Part 90, Limit Clause 90.207

As per FCC Part 90.207 (b) through (n).

FCC 47 CFR Part 2, Limit Clause 2.1047

Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.

Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.

Industry Canada RSS-119, Limit Clause 5.3

Equipment that operates in the bands 768-776 MHz and 798-806 MHz shall use digital modulation. Mobile and portable transmitters that operate in these bands may have analogue modulation capability only as a secondary mode in addition to their primary digital mode. However, mobile and portable transmitters that operate only on the low-power channels as defined in SRSP-511 may employ any type of modulation.

2.8.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Attenuator (30dB/50W)	Aeroflex / Weinschel	47-30-34	3164	12	12-Mar-2025
True RMS Multimeter	Fluke	179	4007	12	17-Nov-2024
Quad Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P Mon
Cable (40 GHz)	Rosenberger	LU1-001-1000	5022	12	04-Feb-2025
Test Receiver	Rohde & Schwarz	ESW44	5379	12	12-Dec-2024
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024

Table 43

O/P Mon – Output Monitored using calibrated equipment

3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Types of Emissions	-
Maximum Conducted Output Power	± 3.2 dB
Bandwidth Limitations	± 58.05 Hz
Spurious Emissions at Antenna Terminals	± 3.45 dB
Radiated Spurious Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 18 GHz: ± 6.3 dB
Frequency Stability	± 11 Hz
Transient Frequency Behaviour	± 0.2 Hz
Adjacent Channel Power	± 3.0 dB

Table 44

Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (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.