

Radio Test Report

LB Foster Railway Technologies
Flood Master Node, Model: FLD-A-021-001

In accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 15, FCC 47 CFR Part 22, FCC 47 CFR Part 24 and FCC 47 CFR Part 27 (LoRa)

Prepared for: LB Foster Railway Technologies
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Lenton
Nottingham, Nottinghamshire
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FCC ID: 2BDI4FLDA021

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Document 75959548-02 Issue 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	07 December 2023

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 FCC 47 CFR Part 2, FCC 47 CFR Part 15, FCC 47 CFR Part 22, FCC 47 CFR Part 24 and FCC 47 CFR Part 27. The sample tested was found to comply with the requirements defined in the applied rules.

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 15: 2021, FCC 47 CFR Part 22: 2022, FCC 47 CFR Part 24: 2022 and FCC 47 CFR Part 27: 2022 for the tests detailed in section 1.3.



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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	07-December-2023

Table 1

1.2 Introduction

Applicant	LB Foster Railway Technologies
Manufacturer	LB Foster Railway Technologies
Model Number(s)	FLD-A-021-001
Serial Number(s)	08FEF845
Hardware Version(s)	A
Software Version(s)	4.1.0
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 2: 2021 FCC 47 CFR Part 15: 2021 FCC 47 CFR Part 22: 2022 FCC 47 CFR Part 24: 2022 FCC 47 CFR Part 27: 2022
Order Number	P15072CND - QAF
Date	09-October-2023
Date of Receipt of EUT	26-October-2023
Start of Test	01-November-2023
Finish of Test	03-November-2023
Name of Engineer(s)	Aakash Rawal
Related Document(s)	ANSI C63.26 (2015) ANSI C63.4 (2014) KDB 996369 D04 v02



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 15, FCC 47 CFR Part 22, FCC 47 CFR Part 24 and FCC 47 CFR Part 27, is shown below.

Section	Specification Clause					Test Description	Result	Comments/Base Standard
	Part 2	Part 15	Part 22	Part 24	Part 27			
Configuration and Mode: LTE FDD B2 + 915 MHz								
2.1	2.1051	15.247 (d)	-	24.238 (a)	-	Radiated Spurious Emissions	Pass	ANSI C63.26 (2015) ANSI C63.4 (2014) Limited testing performed in accordance with KDB 996369 D04 clause 3.2
Configuration and Mode: LTE FDD B4 + 915MHz								
2.1	2.1051	15.247 (d)	-		27.53 (h) (1)	Radiated Spurious Emissions	Pass	ANSI C63.26 (2015) ANSI C63.4 (2014) Limited testing performed in accordance with KDB 996369 D04 clause 3.2
Configuration and Mode: LTE FDD B5 + 915MHz								
2.1	2.1051	15.247 (d)	22.917 (a)	-	-	Radiated Spurious Emissions	Pass	ANSI C63.26 (2015) ANSI C63.4 (2014) Limited testing performed in accordance with KDB 996369 D04 clause 3.2
Configuration and Mode: LTE FDD B13 + 915MHz								
2.1	2.1051	15.247 (d)	-	-	27.53 (c) (2) (4)	Radiated Spurious Emissions	Pass	ANSI C63.26 (2015) ANSI C63.4 (2014) Limited testing performed in accordance with KDB 996369 D04 clause 3.2
Configuration and Mode: LTE FDD B71 + 915MHz								
2.1	2.1051	15.247 (d)	-	27.53(g)	-	Radiated Spurious Emissions	Pass	ANSI C63.26 (2015) ANSI C63.4 (2014) Limited testing performed in accordance with KDB 996369 D04 clause 3.2

Table 2



1.4 Application Form

Equipment Description

Technical Description: <i>(Please provide a brief description of the intended use of the equipment including the technologies the product supports)</i>		Master node unit which provides connectivity & live camera footage for the inline flood monitoring system in remote locations powered by battery with solar back up.	
Manufacturer:		LB Foster	
Model:		North America	
Part Number:		FLD-A-021-001	
Hardware Version:		A	
Software Version:		4.1.0	
FCC ID of the product under test – see guidance here		HopeRF RFM95CW-915S2R FCC id: 2ASEORFM95C Teltonika RUT955 - FCC id: 2AET4RUT955AF	
IC ID of the product under test – see guidance here			
Device Category	Mobile <input type="checkbox"/>	Portable <input type="checkbox"/>	Fixed <input checked="" type="checkbox"/>
Equipment is fitted with an Audio Low Pass Filter		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Table 3

Intentional Radiators

Technology	LoRa	RUT956 Cellular	RUT956 LTE Bands
Frequency Range (MHz to MHz)	137-1020		Band 2 – 1850 – 1910 (UL), 1930-1990 (DL) Band 4 – 1710 – 1755 (UL), 2110-2155 (DL) Band 5 – 824 849 (UL), 869 – 894 (DL) Band 13 – 777 – 787 (UL), 746 – 756 (DL) Band 71 – 663 – 698 (UL), 617 – 652 (DL)
Conducted Declared Output Power (dBm)	20	Wi-Fi: 17.88 GSM900: 33 GSM1800: 30 WCDMA: 24 LTE: 23	23
Antenna Gain (dBi)	1.5	2	2
Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)	500kHz		Band 2 – 60 Band 4 – 45 Band 5 – 25 Band 13 – 10 Band 71 – 35
Modulation Scheme(s) (e.g. GFSK, QPSK etc)	LoRa/(G)FSK		Band 2 – FDD Band 4 – FDD Band 5 – FDD Band 13 – FDD Band 71 – FDD
ITU Emission Designator (see guidance here) (not mandatory for Part 15 devices)			



Bottom Frequency (MHz)	137		Band 2 – 1850 Band 4 – 1710 Band 5 – 824 Band 13 – 777 Band 71 – 663
Middle Frequency (MHz)	578.5		Band 2 – 1900 Band 4 – 1700 Band 5 – 850 Band 13 – 700 Band 71 – 600
Top Frequency (MHz)	1020		Band 2 – 1990 Band 4 – 2155 Band 5 – 894 Band 13 – 756 Band 71 – 652

Table 4



Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	48MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	DC
Class A Digital Device (Use in commercial, industrial or business environment) <input checked="" type="checkbox"/>	
Class B Digital Device (Use in residential environment only) <input type="checkbox"/>	

Table 5

AC Power Source

AC supply frequency:		Hz
Voltage		V
Max current:		A
Single Phase <input type="checkbox"/> Three Phase <input type="checkbox"/>		

Table 6

DC Power Source

Nominal voltage:		
Extreme upper voltage:		
Extreme lower voltage:		
Max current:		

Table 7

Battery Power Source

Voltage:	12	V
End-point voltage:	11.1	V (Point at which the battery will terminate)
Alkaline <input type="checkbox"/> Leclanche <input type="checkbox"/> Lithium <input type="checkbox"/> Nickel Cadmium <input type="checkbox"/> Lead Acid* <input checked="" type="checkbox"/> *(Vehicle regulated)		
Other <input type="checkbox"/>	Please detail:	

Table 8

Charging

Can the EUT transmit whilst being charged	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

Table 9

Temperature

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

Table 10



Cable Loss

Adapter Cable Loss (Conducted sample)		dB
--	--	----

Table 11

Antenna Characteristics

Antenna connector <input checked="" type="checkbox"/>		State impedance	50	Ohm
Temporary antenna connector <input type="checkbox"/>		State impedance		Ohm
Integral antenna <input type="checkbox"/>	Type:		Gain	dBi
External antenna <input checked="" type="checkbox"/>	Type:	FWTR35292-SM-KR	Gain	1.5
External antenna <input checked="" type="checkbox"/>	Type:	2111520.80	Gain	2
<p>For external antenna only: Standard Antenna Jack <input type="checkbox"/> If yes, describe how user is prohibited from changing antenna (if not professional installed): Equipment is only ever professionally installed <input checked="" type="checkbox"/> Non-standard Antenna Jack <input type="checkbox"/> 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.</p>				

Table 12

Ancillaries (if applicable)

Manufacturer:		Part Number:	
Model:		Country of Origin:	

Table 13

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

Name: Michael Cane
 Position held: Senior Electronics Systems Engineer
 Date: 25 October 2023



1.5 Product Information

1.5.1 Technical Description

The two units under test are the Master Node and the Flood Pole.

The Master node unit provides connectivity & live camera footage for the inline flood monitoring system in remote locations powered by battery with solar back up.

The Flood pole, normally in low power mode, wakes on time interval or water presence. It takes a water level reading and reports back to the master node via LoRa.

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: FLD-A-021-001, Serial Number: 08FEF845			
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: LTE FDD B2 + 915 MHz		
Radiated Spurious Emissions	Aakash Rawal	UKAS
Configuration and Mode: LTE FDD B4 + 915MHz		
Radiated Spurious Emissions	Aakash Rawal	UKAS
Configuration and Mode: LTE FDD B5 + 915MHz		
Radiated Spurious Emissions	Aakash Rawal	Non-UKAS*
Configuration and Mode: LTE FDD B13 + 915MHz		
Radiated Spurious Emissions	Aakash Rawal	UKAS
Configuration and Mode: LTE FDD B71 + 915MHz		
Radiated Spurious Emissions	Aakash Rawal	UKAS

Table 15

Office Address:

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



2 Test Details

2.1 Radiated Spurious Emissions (Simultaneous Transmission)

2.1.1 Specification Reference

FCC 47 CFR Part 2, Clause 1.051
FCC 47 CFR Part 15, Clause 15.247 (d)
FCC 47 CFR Part 22, Clause 22.917 (a)
FCC 47 CFR Part 24, Clause 24.238 (a)
FCC 47 CFR Part 27, Clause 27.53 (c)(2)(4), 27.53 (g) and 27.53 (h)(1)

2.1.2 Equipment Under Test and Modification State

FLD-A-021-001, S/N: 08FEF845 - Modification State 0

2.1.3 Date of Test

01-November-2023 to 03-November-2023

2.1.4 Test Method

A preliminary profile of the Radiated Spurious Emissions was obtained up to the 5th harmonic of the lowest intentional transmitter, as required by KDB 996369 D04, clause 3.2, by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber.

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:

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

$82.2 \text{ (dBuV/m)} + 20\log(3) - 104.8 = \text{EIRP (dBm)}$

$-13.0 = \text{EIRP (dBm)}$

2.1.5 Example Test Setup Diagram

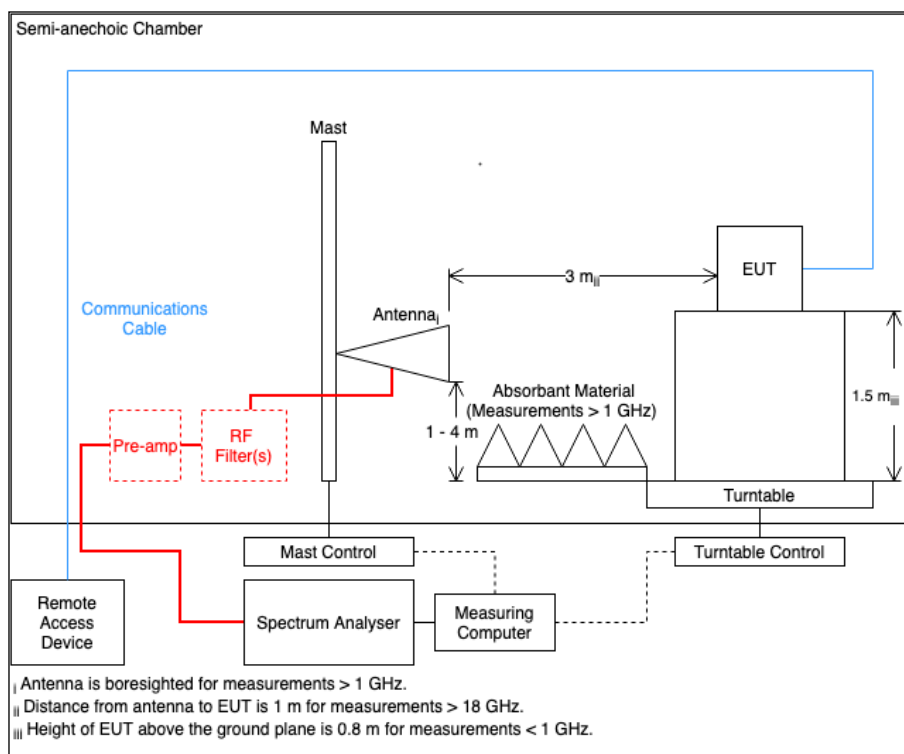


Figure 1

2.1.6 Environmental Conditions

Ambient Temperature 22.7 - 28.1 °C
 Relative Humidity 37.6 - 52.9 %



2.1.7 Test Results

LTE FDD B2 + 915 MHz

The EUT was configured for simultaneous transmission in the following mode of operation:

Technology	Frequency Band	Channel Frequency (MHz)
LTE	FDD 2	1880
SRD	902 MHz to 928 MHz	915

Table 16 - Modes of Operation

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 17 -30 MHz to 1 GHz - Horizontal

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 18 -1 GHz to 10 GHz - Horizontal

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 19 -30 MHz to 1 GHz - Vertical

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 20 -1 GHz to 10 GHz - Vertical

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

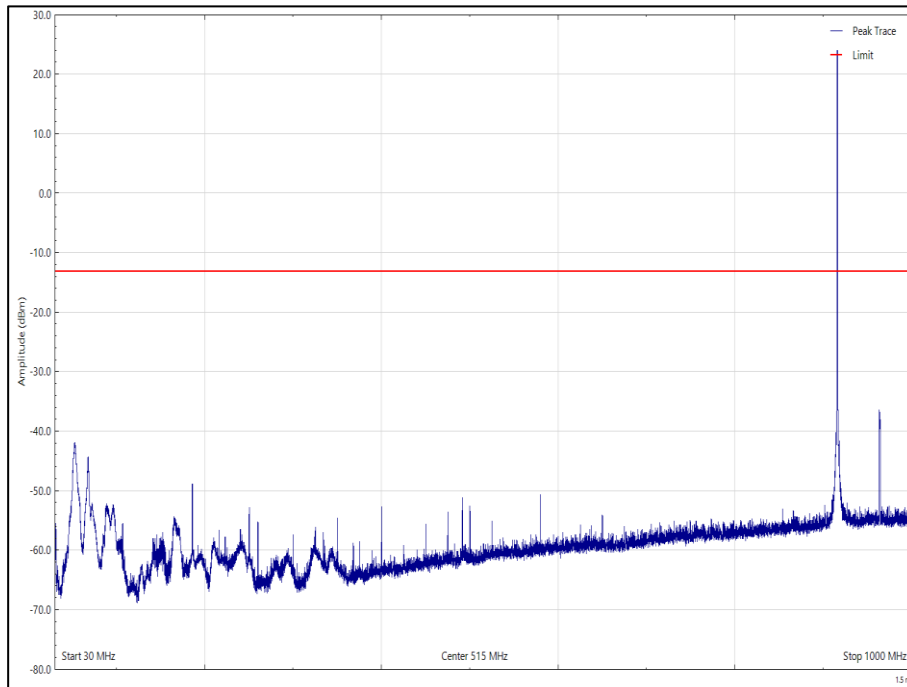


Figure 2 - 30 MHz to 1 GHz, Peak, Horizontal

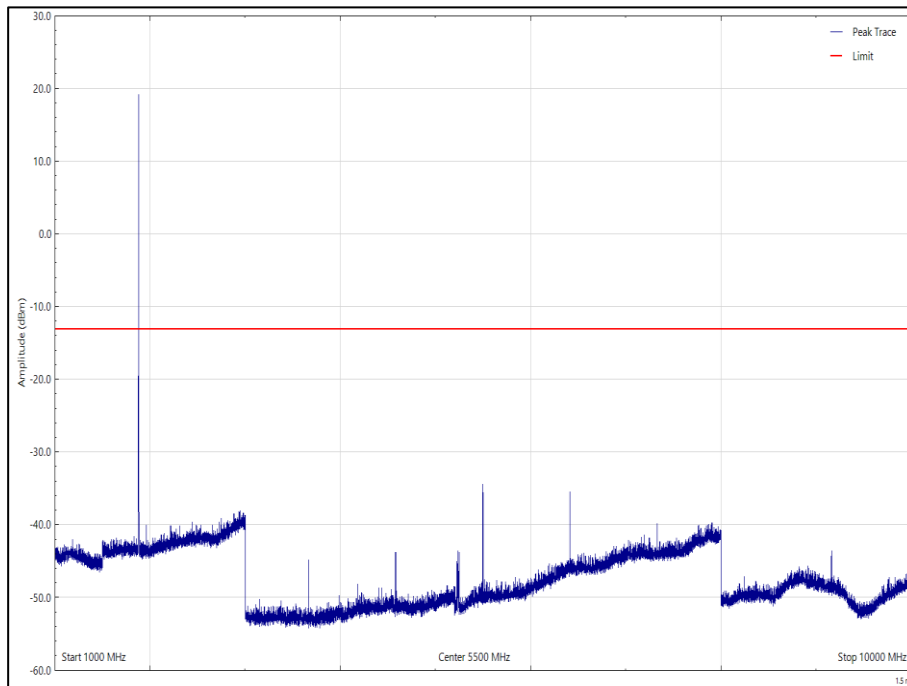


Figure 3 - 1 GHz to 10 GHz, Peak, Horizontal

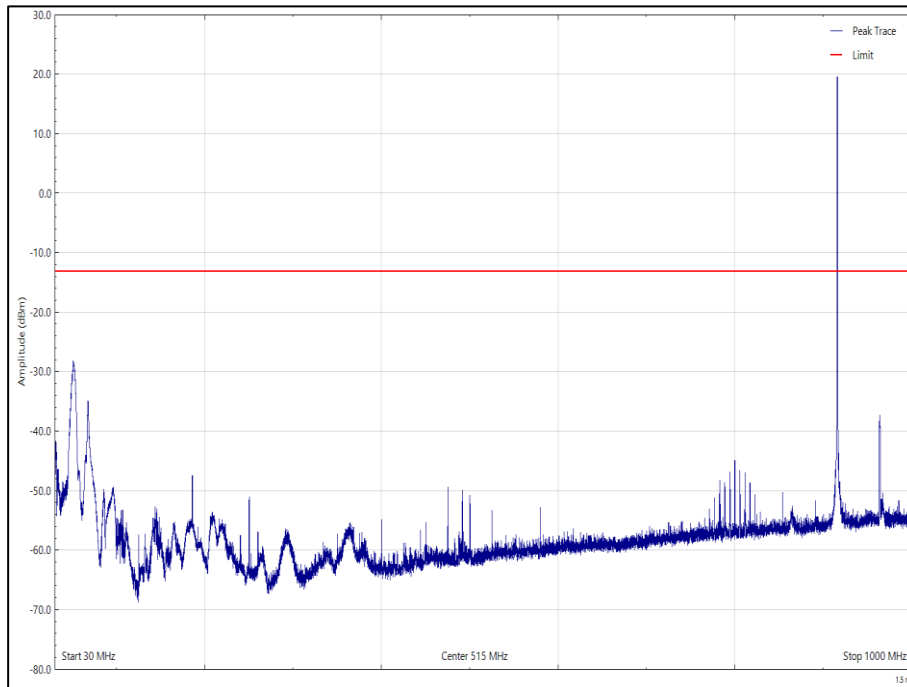


Figure 4 - 30 MHz to 1 GHz, Peak, Vertical

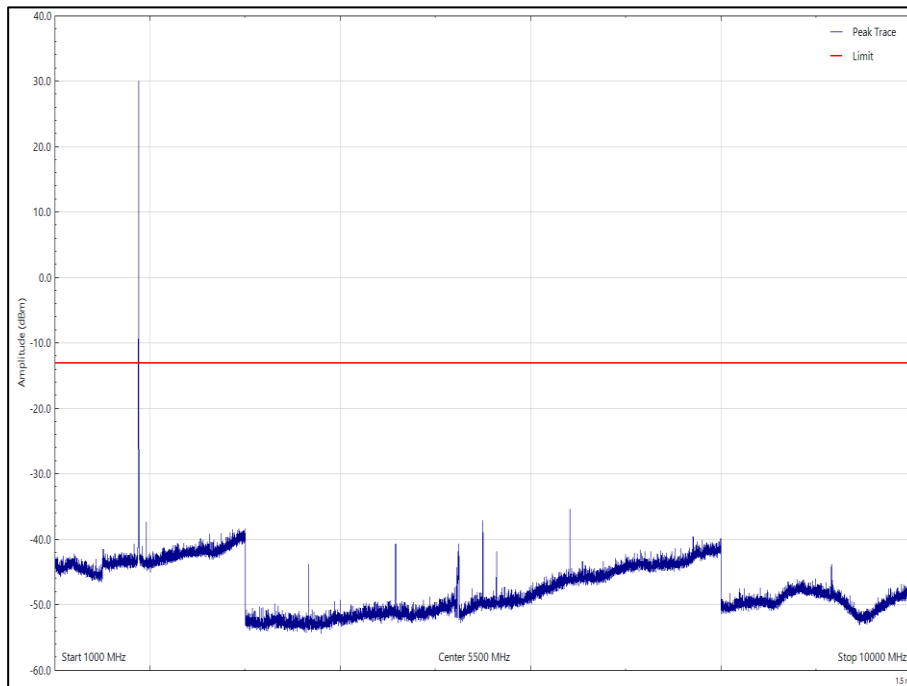


Figure 5 - 1 GHz to 10 GHz, Peak, Vertical



FCC 47 CFR Part 15 and Part 24

The least stringent limit from the applicable rule parts was used to determine compliance for Radiated Emissions testing of multiple transmission sources.

The least stringent applicable limit was:

Clause	Limit
Part 24.238 (a)	-13 dBm (EIRP) / 82 dB μ V/m at 3m.
Part 15 247 (d)	-20 dBc / -30 dBc

Table 21



LTE FDD B4 + 915MHz

The EUT was configured for simultaneous transmission in the following mode of operation:

Technology	Frequency Band	Channel Frequency (MHz)
LTE	FDD 4	1745
SRD	902 MHz to 928 MHz	915

Table 22 - Modes of Operation

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 23 -30 MHz to 1 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 24 -1 GHz to 10 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 25 -30 MHz to 1 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 26 -1 GHz to 10 GHz

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

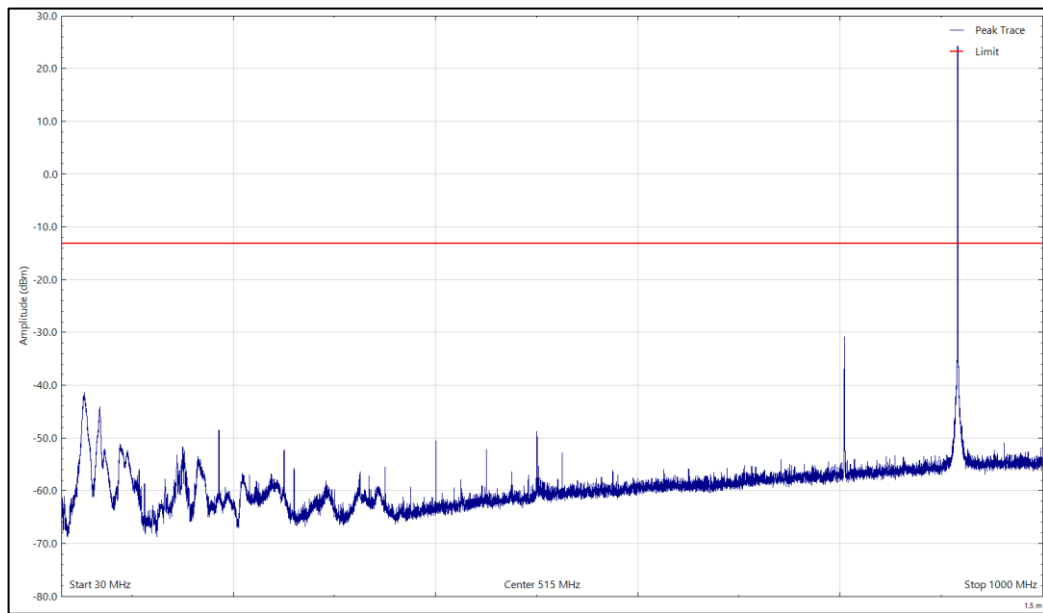


Figure 6 - 30 MHz to 1 GHz, Peak, Horizontal

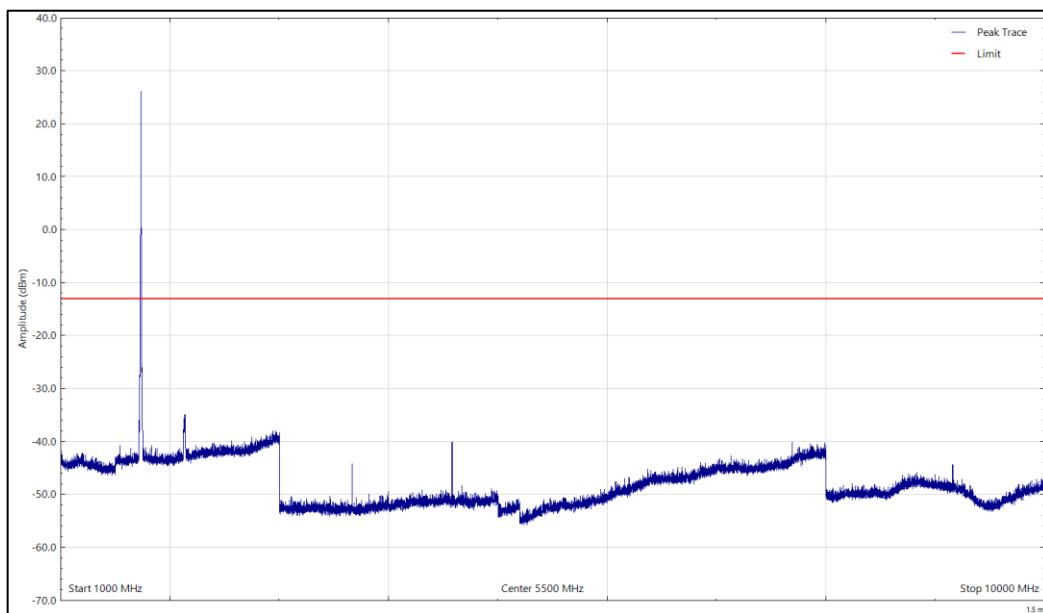


Figure 7 - 1 GHz to 10 GHz, Peak, Horizontal

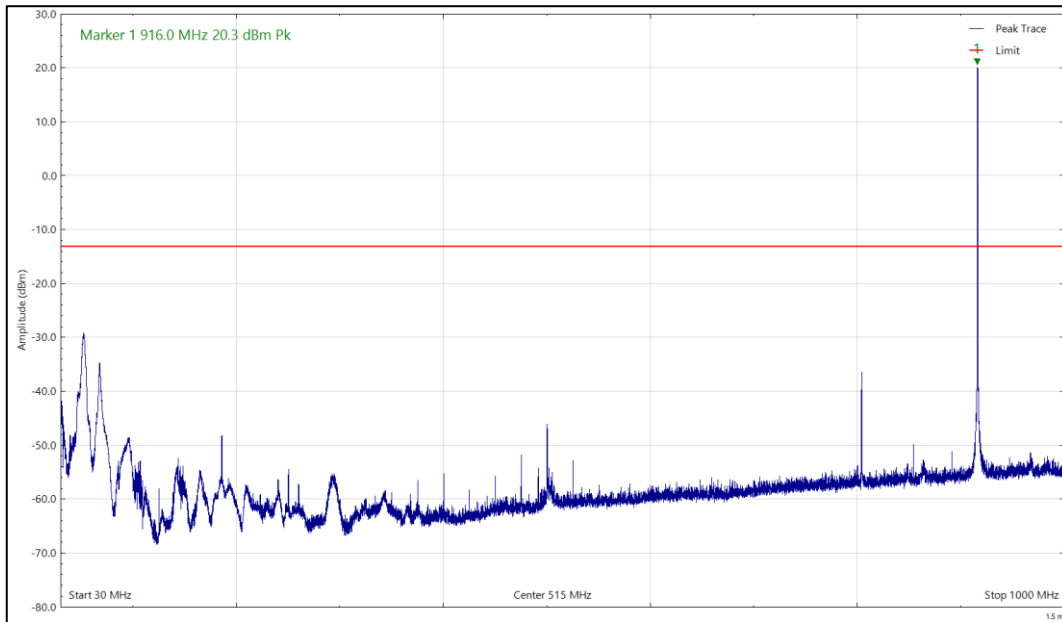


Figure 8 – 30 MHz to 1 GHz, Peak, Vertical

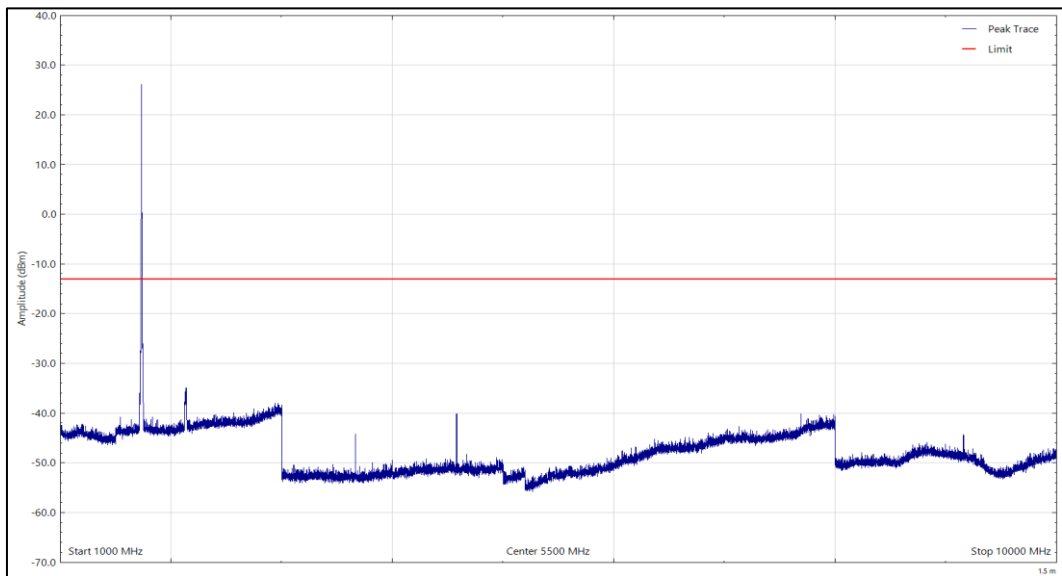


Figure 9 – 1 GHz to 10 GHz, Peak, Vertical



FCC 47 CFR Part 15 and Part 27

The least stringent limit from the applicable rule parts was used to determine compliance for Radiated Emissions testing of multiple transmission sources.

The least stringent applicable limit was:

Clause	Limit
Part 27.53 (h)	-13 dBm (EIRP) / 82 dB μ V/m at 3m.
Part 15 247 (d)	-20 dBc / -30 dBc

Table 27



LTE FDD B5 + 915MHz

The EUT was configured for simultaneous transmission in the following mode of operation:

Technology	Frequency Band	Channel Frequency (MHz)
LTE	FDD 5	836.5
SRD	902 MHz to 928 MHz	915

Table 28 - Modes of Operation

Polarisation	Angle	Height	Frequency (MHz)	Level	Limit	
*						

Table 29 -30 MHz to 1 GHz

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

Polarisation	Angle	Height	Frequency (MHz)	Level	Limit	
*						

Table 30 -1 GHz to 5 GHz

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

Polarisation	Angle	Height	Frequency (MHz)	Level	Limit	
*						

Table 31 -30 MHz to 1 GHz

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

Polarisation	Angle	Height	Frequency (MHz)	Level	Limit	
*						

Table 32 -1 GHz to 5 GHz

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

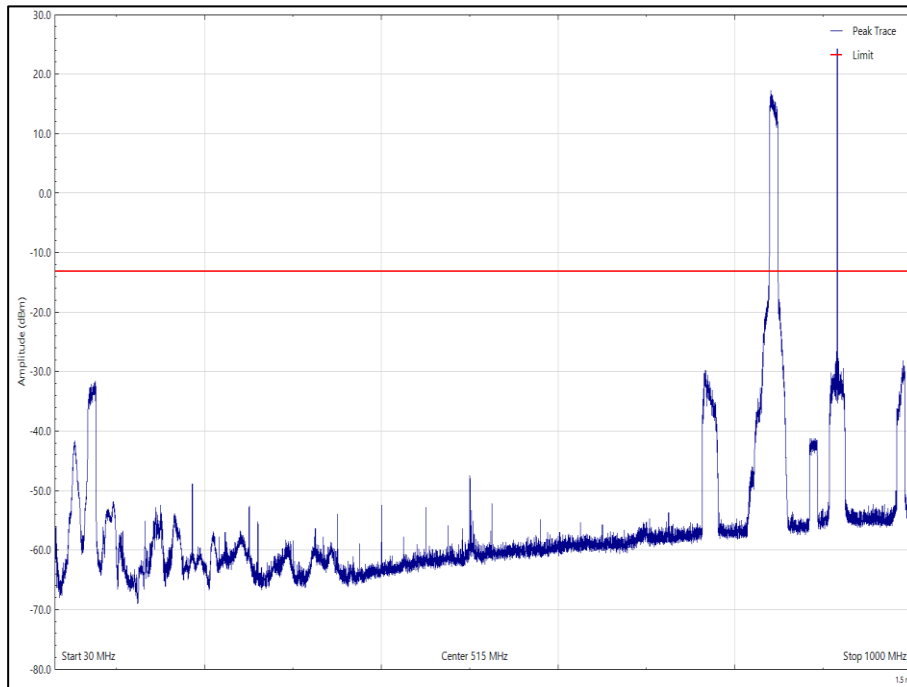


Figure 10 - 30 MHz to 1 GHz, Peak, Horizontal

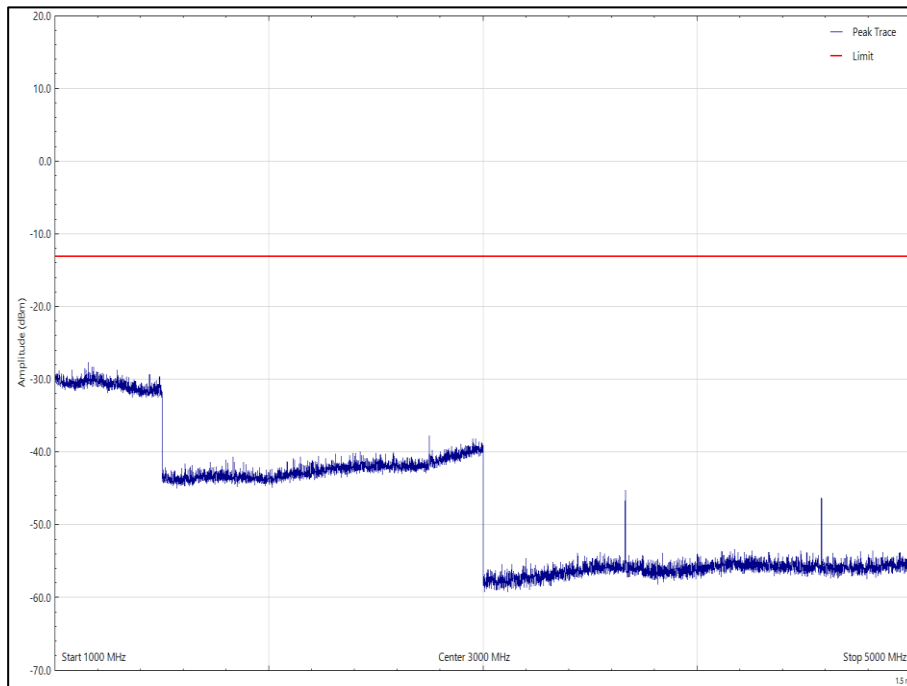


Figure 11 - 1 GHz to 5 GHz, Peak, Horizontal

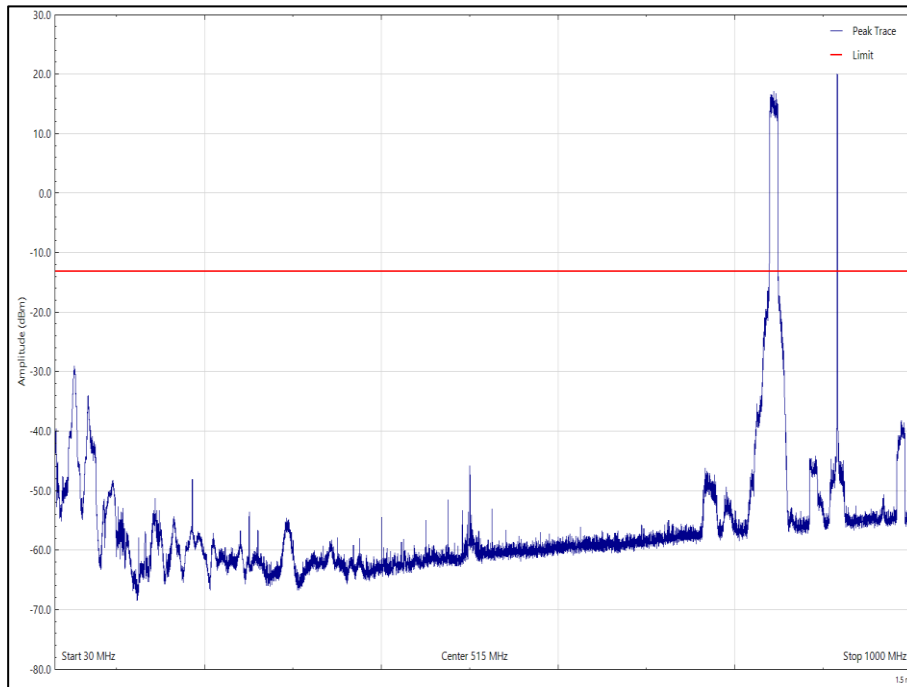


Figure 12 - 30 MHz to 1 GHz, Peak, Vertical

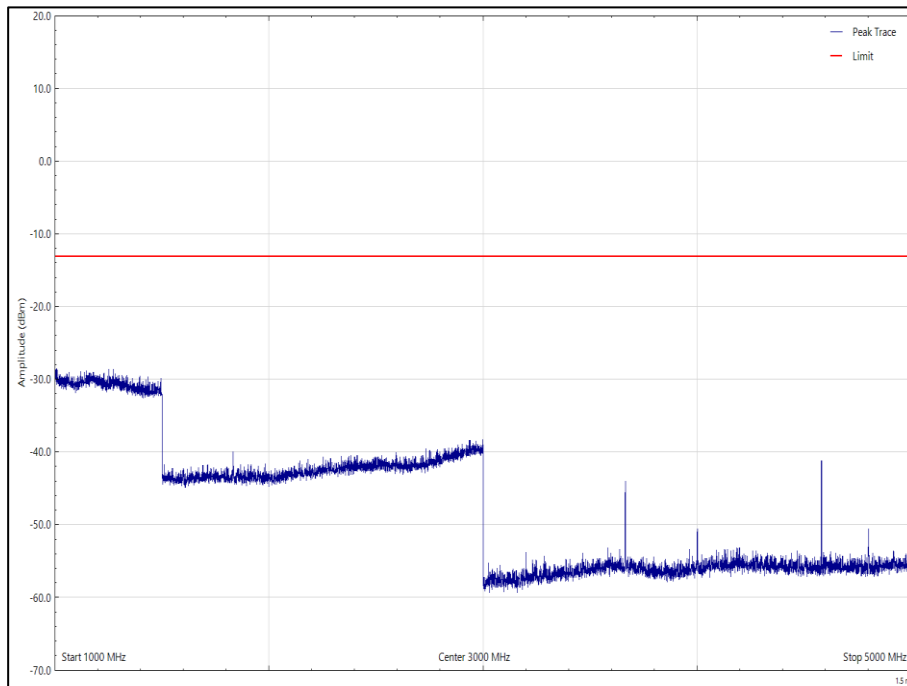


Figure 13 - 1 GHz to 5 GHz, Peak, Vertical



FCC 47 CFR Part 15 and Part 22

The least stringent limit from the applicable rule parts was used to determine compliance for Radiated Emissions testing of multiple transmission sources.

The least stringent applicable limit was:

Clause	Limit
Part 22.917 (a)	-13 dBm (EIRP) / 82 dB μ V/m at 3m.
Part 15 247 (d)	-20 dBc / -30 dBc

Table 33



LTE FDD B13 + 915MHz

The EUT was configured for simultaneous transmission in the following mode of operation:

Technology	Frequency Band	Channel Frequency (MHz)
LTE	FDD 13	782
SRD	902 MHz to 928 MHz	915

Table 34 - Modes of Operation

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
795.210	-42.47	-35	dBm	Peak	308	108	Horizontal

Table 35 -30 MHz to 1 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 36 -1 GHz to 5 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
795.206	-42.34	-35	dBm	Peak	218	117	Vertical

Table 37 -30 MHz to 1 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 38 -1 GHz to 5 GHz

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

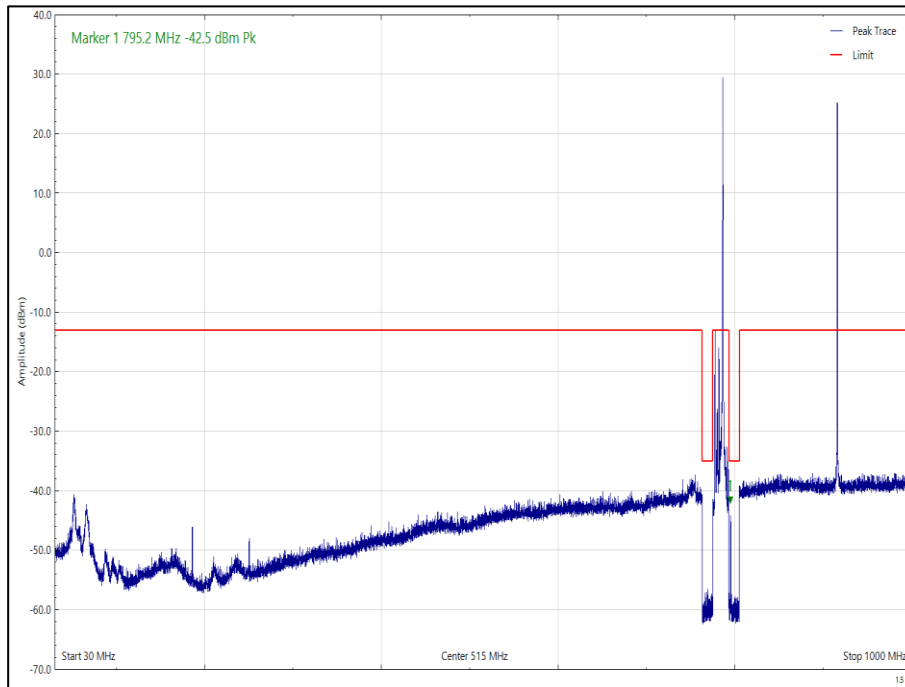


Figure 14 - 30 MHz to 1 GHz, Peak, Horizontal

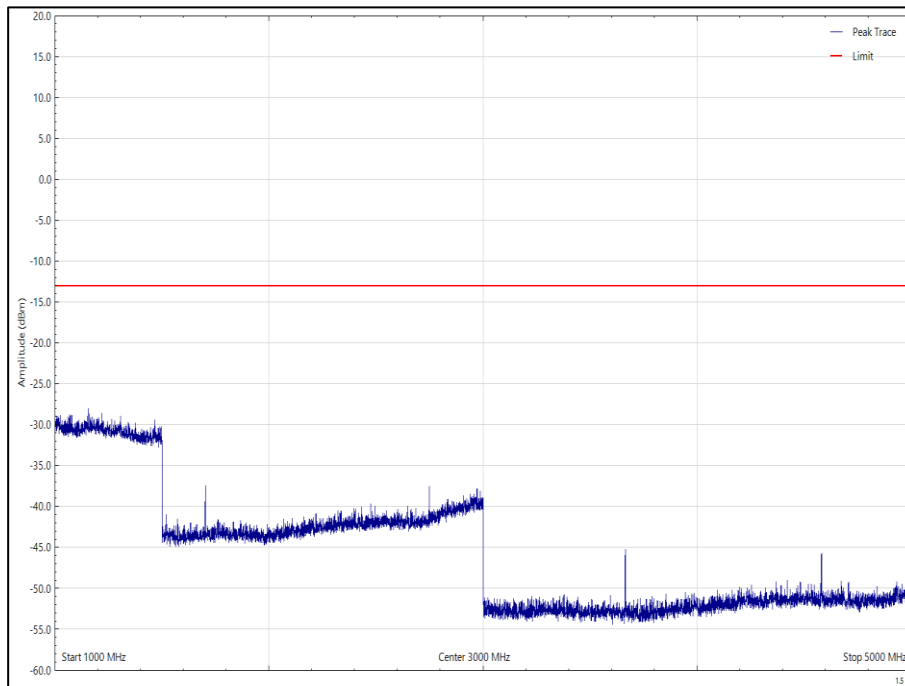


Figure 15 - 1 GHz to 5 GHz, Peak, Horizontal

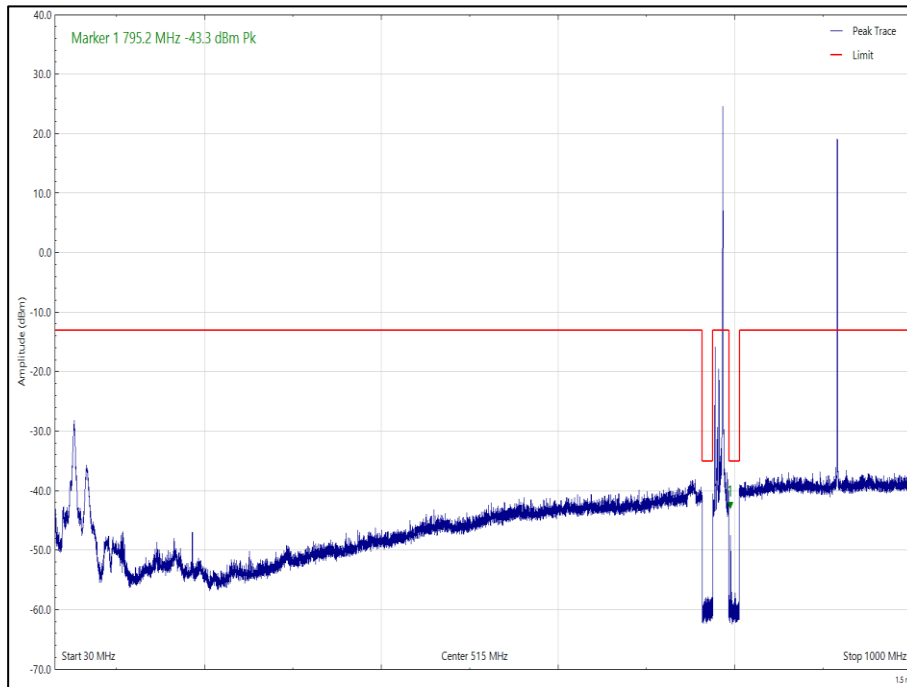


Figure 16 - 30 MHz to 1 GHz, Peak, Vertical

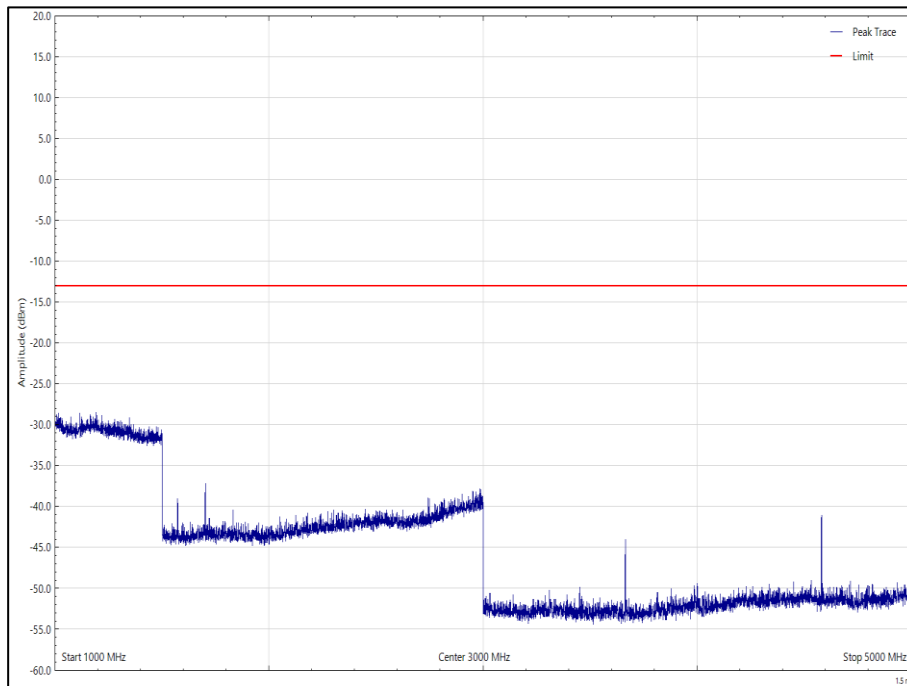


Figure 17 - 1 GHz to 5 GHz, Peak, Vertical



FCC 47 CFR Part 15 and Part 27

The least stringent limit from the applicable rule parts was used to determine compliance for Radiated Emissions testing of multiple transmission sources.

The least stringent applicable limit was:

Clause	Limit
Part 15 247 (d)	-20 dBc / -30 dBc
Part 27.53 (c)	-13 dBm (EIRP) / 82 dB μ V/m at 3m. (Outside 776 – 788) -25 dBm (EIRP) / 70.2 dBuV/m at 3m (Between 763 -775 and 793 -805)

Table 39



LTE FDD B71 + 915MHz

The EUT was configured for simultaneous transmission in the following mode of operation:

Technology	Frequency Band	Channel Frequency (MHz)
LTE	663 MHz to 698 MHz	680.5 MHz
SRD	902 MHz to 928 MHz	915 MHz

Table 40 - Modes of Operation

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
244.848	-19	-13	-6	Peak	338	107	Horizontal

Table 41 -30 MHz to 1 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 42 -1 GHz to 5 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 43 -30 MHz to 1 GHz

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

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Table 44 -1 GHz to 5 GHz

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

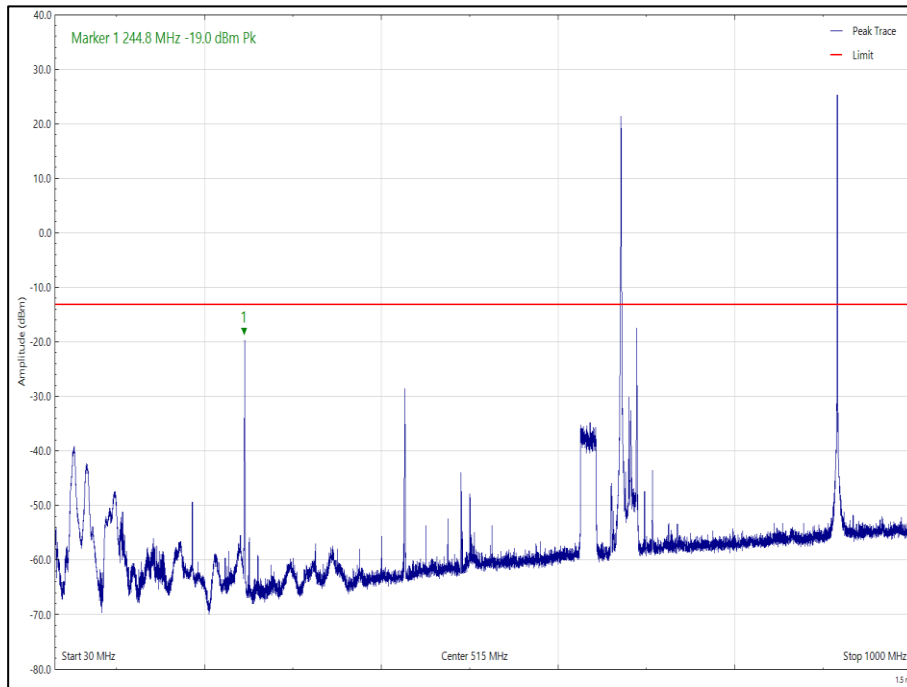


Figure 18 - 30 MHz to 1 GHz, Peak, Horizontal

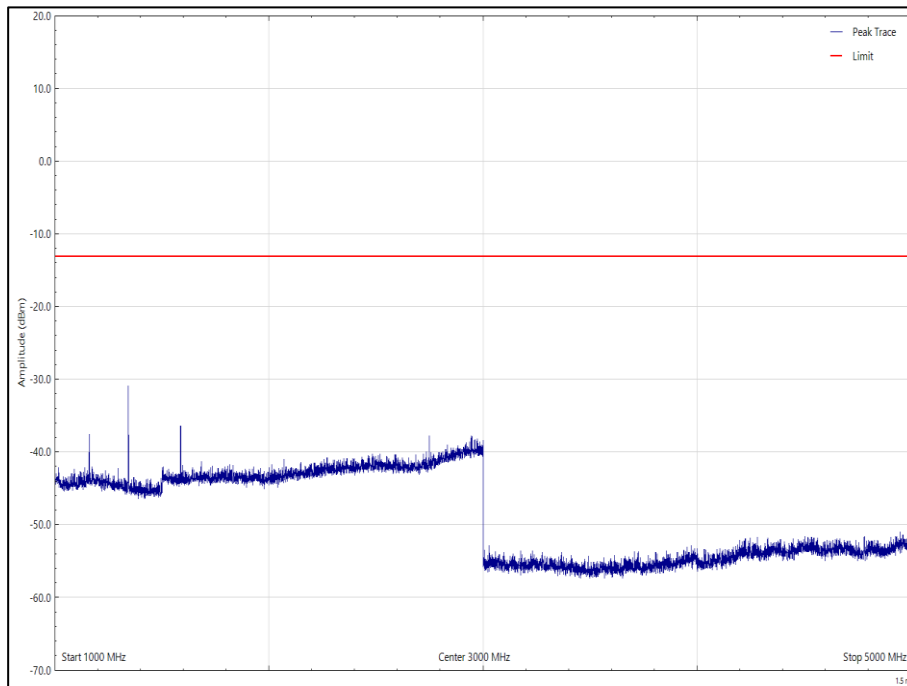


Figure 19 - 1 GHz to 5 GHz, Peak, Horizontal

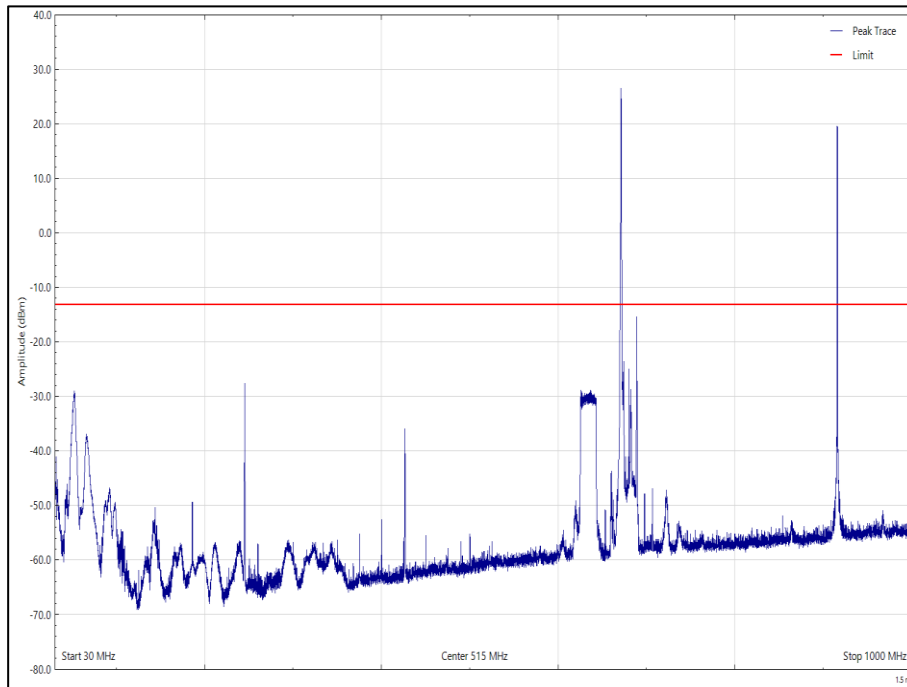


Figure 20 - 30 MHz to 1 GHz, Peak, Vertical

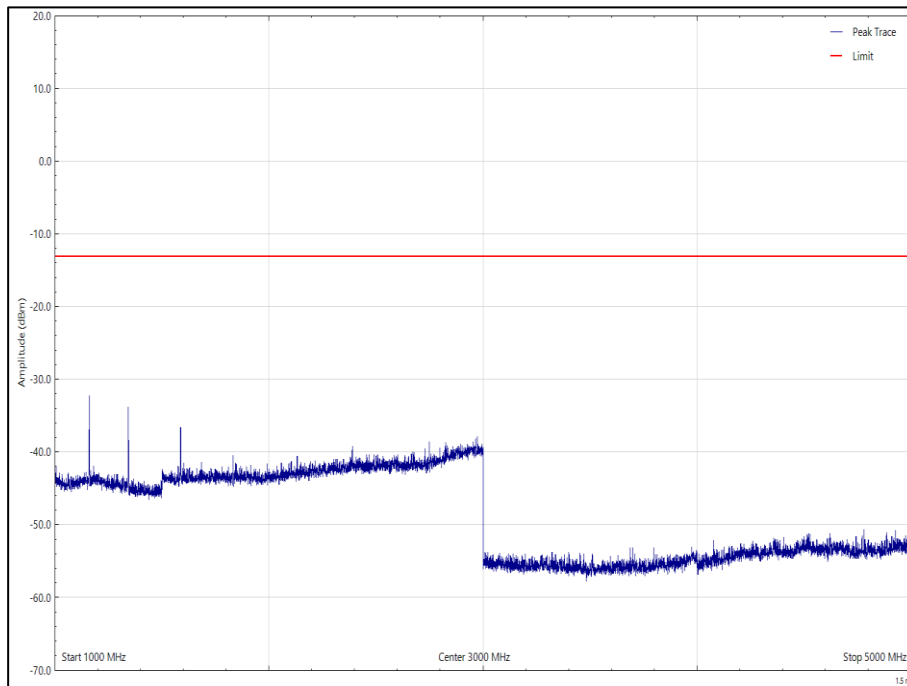


Figure 21 - 1 GHz to 5 GHz, Peak, Vertical



FCC 47 CFR Part 15 and Part 27

The least stringent limit from the applicable rule parts was used to determine compliance for Radiated Emissions testing of multiple transmission sources.

The least stringent applicable limit was:

Clause	Limit
Part 27.53 (g)	-13 dBm (EIRP) / 82 dB μ V/m at 3m.
Part 15 247 (d)	-20 dBc / -30 dBc

Table 45



2.1.8 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
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
Wideband Radio Test Set	Rohde & Schwarz	CMW500	4546	12	24-Oct-2024
Mast Controller	Maturo GmbH	NCD	4810	-	TU
4dB Attenuator	Pasternack	PE7047-4	4935	12	20-Jul-2024
High Pass Filter (1.5GHz)	Wainwright	WHKX12-1290-1500-18000-80SS	4962	12	14-Jun-2024
Emissions Software	TUV SUD	EmX V3.1.12	5125	-	-
Pre-amplifier (30dB, 1GHz to 18GHz)	Schwarzbeck	BBV9718 C	5261	12	14-Apr-2024
Cable (SMA to SMA, 2m)	Junkosha	MWX221-02000AMSAMS/A	5517	12	21-May-2024
Cable (N-Type to N-Type, 8m)	Junkosha	MWX221-08000NMSNMS/B	5521	12	05-May-2024
High Pass Filter (3 GHz)	Wainwright	WHKX12-2580-3000-18000-80SS	5547	12	30-Nov-2024
DVM - Digital Multimeter	IDM101	Iso-tech	5601	12	20-Feb-2024
Antenna (DRG, 7.5 GHz to 18 GHz)	Schwarzbeck	HWRD750	5610	12	15-Oct-2024
Antenna (DRG, 1 GHz to 10.5 GHz)	Schwarzbeck	BBHA9120B	5611	12	15-Oct-2024
Cable (K-Type to K – Type, 2m)	Junkosha	MWX241-02000KMSKMS/B	5934	12	18-Jun-2024
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9168	6635	25	13-Jun-2025

Table 46

TU -Traceability Unscheduled

3 Photographs

3.1 Equipment Under Test (EUT)



Figure 22 - Test Setup - 30 MHz to 1 GHz

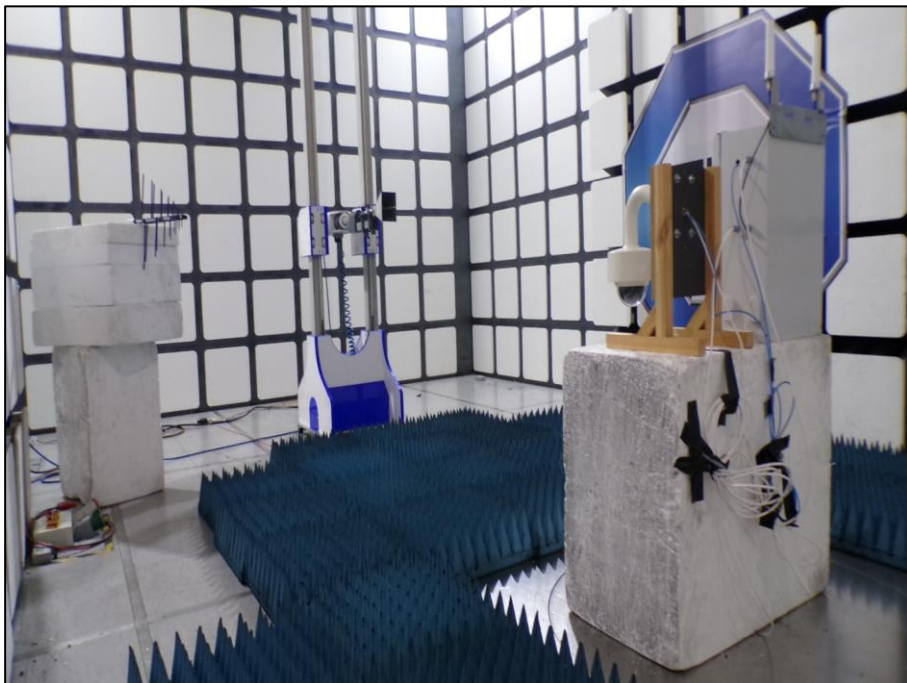


Figure 23 - Test Setup - 1 GHz to 10 GHz



4 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Radiated Spurious Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB

Table 47

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.