FCC and ISED Test Report
Reelables, Inc.
Model: N-Label
In accordance with FCC 47 CFR Part 27, FCC CFR 47 Part 2 and ISED RSS-130 and ISED RSS-GEN (LTE NB-IOT)

Prepared for: Reelables Inc.
600 1st Ave Ste,
330-76660,
Seatle, WA, 2246
US

FCC ID: 2A7TQRN0001B IC: 33042-RN0001

COMMERCIAL-IN-CONFIDENCE

Document 75961990-09 Issue 02

SIGNATURE			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Matthew Russell	Chief Engineer	Authorised Signatory	22 December 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 27, FCC CFR 47 Part 2 and ISED RSS-130 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	Thomas Biddlecombe	22 December 2025	
Testing	Ahmad Javid	22 December 2025	
Testing	Wenceslao Acosta Carrazco	22 December 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 27: 2024, FCC CFR 47 Part 2: 2023, ISED RSS-130: Issue 2 (02-2019) and ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021) for the tests detailed in section 1.3.

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Contents

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	06-Oct-2025
2	FCC ID Updated	22-Dec-2025

Table 1

1.2 Introduction

Applicant	Reelables, Inc..
Manufacturer	Reelables, Inc..
Model Number(s)	N-Label
Serial Number(s)	60504
Hardware Version(s)	5.67
Software Version(s)	1.14
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 27: 2024 FCC CFR 47 Part 2: 2023 ISED RSS-130: Issue 2 (02-2019) ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)
Order Number	15018
Date	11-July-2024
Date of Receipt of EUT	10-September-2024 and 30-June-2025
Start of Test	21-August-2025
Finish of Test	05-September-2025
Name of Engineer(s)	Thomas Biddlecombe, Wenceslao Acosta Carrazco and Ahmad Javid
Related Document(s)	ANSI C63.26: 2015 KDB 971168 D01 v03r01

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 2, FCC CFR 47 Part 27 and ISED RSS-130 and ISED RSS-GEN is shown below.

Section	Specification Clause				Test Description	Result	Comments/Base Standard
	Part 2	Part 27	RSS-130	RSS-GEN			
Configuration and Mode: LTE FDD B13							
2.1	2.1046	27.50	4.6	6.12	Maximum Conducted Output Power	Pass	ANSI C63.26: 2015
2.2	2.1047(d)	-	4.2	-	Modulation Characteristics	Pass	
2.3	2.1049	-	-	6.7	Occupied Bandwidth	Pass	ANSI C63.26: 2015
2.4	2.1051	27.53	4.7	-	Spurious Emissions at Band Edge	Pass	ANSI C63.26: 2015
2.5	2.1053	27.53(c)(2), (4)	4.7.1 and 4.7.2	6.13	Radiated Spurious Emissions	Pass	ANSI C63.26: 2015
2.6	2.1055	27.54	4.5	6.11	Frequency Stability	Pass	ANSI C63.26: 2015

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 Reelables N-Label is an NB-IoT cellular device in the form factor of a thin 4x8" shipping label. It tracks the location of parcels and cargo using cell tower positioning and WiFi SSID scanning. The intended use is a stickable label to corrugated paper or other shippable containers. The N-Label comprises the following wireless technologies: NB-IoT, Bluetooth, WiFi (RX scan only) and NFC (passive).		
Manufacturer:	Reelables, Inc.		
Model:	N-Label		
Part Number:	RN0001		
Hardware Version:	5.67		
Software Version:	1.14		
FCC ID of the product under test – see guidance here		FCC:2A7TQRN0001B	
IC ID of the product under test – see guidance here		IC:33042-RN0001	
Device Category	Mobile ☐	Portable ☒	Fixed ☐
Equipment is fitted with an Audio Low Pass Filter		Yes ☐	No ☒

Table 3

Intentional Radiators

Technology	NB-IoT Band 13	NB-IoT Band 12	NB-IoT Band 5	Bluetooth Low Energy
Frequency Range (MHz to MHz)	777MHz-787MHz	698MHz-716MHz	824MHz-849MHz	2400MHz-2483.5MHz
Conducted Declared Output Power (dBm)	18dBm	18dBm	18dBm	2.5dBm
Antenna Gain (dBi)	-0.4	-0.43	-2.07	2.14
Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)	200KHz	200KHz	200KHz	1, 2
Modulation Scheme(s) (e.g. GFSK, QPSK etc)	QPSK BPSK	QPSK BPSK	QPSK BPSK	GFSK
ITU Emission Designator (see guidance here) (not mandatory for Part 15 devices)				1M00GXW, 2M00GXW
Bottom Frequency (MHz)	777.0	701.5	826.5	2402
Middle Frequency (MHz)	782.0	707.5	836.5	2440
Top Frequency (MHz)	787.0	713.5	846.5	2480

Table 4

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	2483.5MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	699MHz
Class A Digital Device (Use in commercial, industrial or business environment) ☒ Class B Digital Device (Use in residential environment only) ☐	

Table 5

AC Power Source

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

Table 6

DC Power Source

Nominal voltage:	NA	V
Extreme upper voltage:	NA	V
Extreme lower voltage:	NA	V
Max current:	NA	A

Table 7

Battery Power Source

Voltage:	4.5	V
End-point voltage:	2.2	V *(Point at which the battery will terminate)*
Alkaline ☐ Leclanche ☐ Lithium ☐ Nickel Cadmium ☐ Lead Acid* ☐ **(Vehicle regulated)*		
Other ☒ Zinc-carbon Please detail:	Zn-MnO2 coated battery	

Table 8

Charging

Can the EUT transmit whilst being charged	Yes ☐ No ☒

Table 9

Temperature

Minimum temperature:	-20	°C
Maximum temperature:	50	°C

Table 10

Cable Loss

Adapter Cable Loss (Conducted sample)	0.9	dB

Table 11

Antenna Characteristics

Antenna connector ☐			State impedance		Ohm
Temporary antenna connector ☐			State impedance		Ohm
Integral antenna ☒	Type:	PIFA	Gain	0	dBi
External antenna ☐	Type:		Gain		dBi
For external antenna only: Standard Antenna Jack ☐ If yes, describe how user is prohibited from changing antenna (if not professional installed): Equipment is only ever professionally installed ☐ Non-standard Antenna Jack ☐ 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:		Part Number:	
Model:		Country of Origin:	

Table 13

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

Name: Brian Krejcarek
Position held: CEO
Date: 27 July 2025

1.5 Product Information

1.5.1 Technical Description

The N-Label from Reelables is an NB-IoT cellular device in the form factor of a thin 4x8” shipping label. It tracks the location of parcels and cargo using cell tower positioning and WiFi SSID scanning only. The intended use is a stickable label to corrugated paper cartons or other shippable containers. The N-Label comprises the following wireless technologies: NB-IoT, Bluetooth, WiFi (RX scan only) and NFC (passive).

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: N-Label, Serial Number: CON 1			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: N-Label, Serial Number: DUT-0			
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 B13		
Maximum Conducted Output Power	Thomas Biddlecombe	UKAS
Occupied Bandwidth	Thomas Biddlecombe	UKAS
Spurious Emissions at Band Edge	Thomas Biddlecombe	UKAS
Frequency Stability	Wenceslao Acosta Carrazco	UKAS
Modulation Characteristics	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 27.50
FCC 47 CFR Part 2.1046
ISED RSS-130 Clause 4.6
ISED RSS-GEN Clause 6.12

2.1.2 Equipment Under Test and Modification State

N-Label, S/N CON 0: - Modification State 0

2.1.3 Date of Test

21-August-2025

2.1.4 Test Method

The test was performed in accordance with KDB 971168 D01 v03r01, Clause 5.2.2.

The EUT was powered with 3 batteries AAA (4.5 VDC), for the duration of the test.

As this test has been performed conducted, the following formula was used to convert the average conducted output power to an ERP value:

ERP = Average power (conducted) + antenna gain - 2.15 (EIRP to ERP conversion factor)

2.1.5 Environmental Conditions

Ambient Temperature	22.9 °C
Relative Humidity	42.4 %

2.1.6 Test Results

LTE FDD B13

UARFCN	Frequency (MHz)	Modulation	SCS (kHz)	Tone Number	Start Sub-Carrier	MCS	Average Power (dBm)	ERP (dBm)	PAPR (dB)
23205	779.5	π/2-BPSK	3.75	1	0	0	14.549	11.399	4.09
23205	779.5	π/2-BPSK	3.75	1	47	0	14.948	11.798	4.05
23205	779.5	π/2-BPSK	15	1	0	0	15.786	12.636	3.66
23205	779.5	π/2-BPSK	15	1	11	0	15.916	12.766	3.65
23205	779.5	π/4-QPSK	3.75	1	0	3	14.881	11.731	3.81
23205	779.5	π/4-QPSK	3.75	1	47	3	14.996	11.846	3.77
23205	779.5	π/4-QPSK	15	1	0	3	16.642	13.492	3.58
23205	779.5	π/4-QPSK	15	1	11	3	15.989	12.839	3.54
23205	779.5	QPSK	15	3	0	5	16.768	13.618	6.12
23205	779.5	QPSK	15	3	11	5	16.471	13.321	7.08
23205	779.5	QPSK	15	6	0	5	18.202	15.052	7.47
23205	779.5	QPSK	15	6	6	5	17.183	14.033	7.40
23205	779.5	QPSK	15	12	0	5	17.486	14.336	6.72

Table 16 - Maximum Conducted Output Power, Bottom Channel

UARFCN	Frequency (MHz)	Modulation	SCS (kHz)	Tone Number	Start Sub-Carrier	MCS	Average Power (dBm)	ERP (dBm)	PAPR (dB)
23255	784.5	π/2-BPSK	3.75	1	0	0	14.235	11.085	4.08
23255	784.5	π/2-BPSK	3.75	1	47	0	14.899	11.749	4.03
23255	784.5	π/2-BPSK	15	1	0	0	16.017	12.867	3.65
23255	784.5	π/2-BPSK	15	1	11	0	15.373	12.223	3.64
23255	784.5	π/4-QPSK	3.75	1	0	3	14.606	11.456	3.81
23255	784.5	π/4-QPSK	3.75	1	47	3	14.943	11.793	3.75
23255	784.5	π/4-QPSK	15	1	0	3	16.470	13.320	3.55
23255	784.5	π/4-QPSK	15	1	11	3	16.300	13.150	3.54
23255	784.5	QPSK	15	3	0	5	16.733	13.583	5.96
23255	784.5	QPSK	15	3	9	5	16.059	12.909	6.79
23255	784.5	QPSK	15	6	0	5	17.428	14.278	7.34
23255	784.5	QPSK	15	6	6	5	17.373	14.223	7.23
23255	784.5	QPSK	15	12	0	5	17.667	14.517	6.49

Table 17 - Maximum Conducted Output Power, Top Channel

FCC 47 CFR Part 27, Limit Clause 50

Clause	Requirement
27..50(b)(9)	Control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.

Table 18 - FCC Part 27 Limit

ISED RSS-130, Limit Clause 4.6

The transmitter output power shall be measured in terms of average power. In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

Clause	Requirement
4.6.3	The e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

Table 19 - RSS-130 Limit

2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Directional Coupler	Krytar	1850	58	-	TU
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Sep-2025
Cable (SMA to SMA 3m)	Junkosha	MWX221-03000AMSAMS/B	6000	12	12-Jun-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6376	12	06-Jun-2026
Cellular Test Set	Anritsu	MT8821C	6722	12	14-Oct-2025
MXA Signal Analyser	Keysight Technologies	N9020B	6876	24	31-Aug-2026
30dB 10W/18GHz F/M SMA bidirectional Attenuator	Weinschel	WA41-30-0102	7025	12	06-Jun-2026

Table 20

TU - Traceability Unscheduled

2.2 Modulation Characteristics

2.2.1 Specification Reference

FCC 47 CFR Part 2.1047 (d)
RSS-130 Clause 4.2

2.2.2 Equipment Under Test and Modification State

N-Label, S/N: CON 0 - Modification State 0

2.2.3 Date of Test

21-August-2025

2.2.4 Test Method

The test was performed in accordance with KDB 971168 D01 v03r01, Clause 3.

The EUT was powered with 3 batteries AAA (4.5 VDC), for the duration of the test.

2.2.5 Environmental Conditions

Ambient Temperature	22.9 °C
Relative Humidity	42.4 %

2.2.6 Test Results

LTE FDD B13

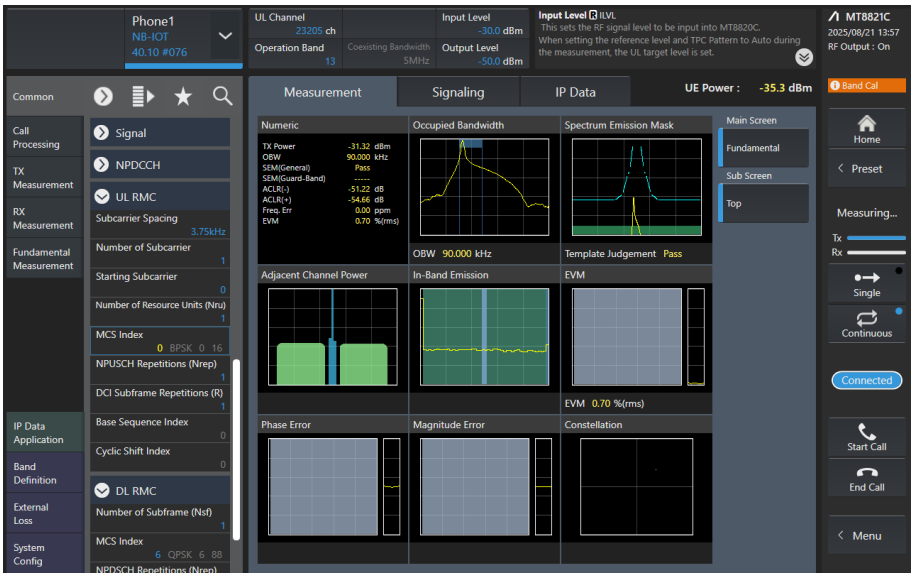

Figure 1 - LTE Demod - π/2BPSK

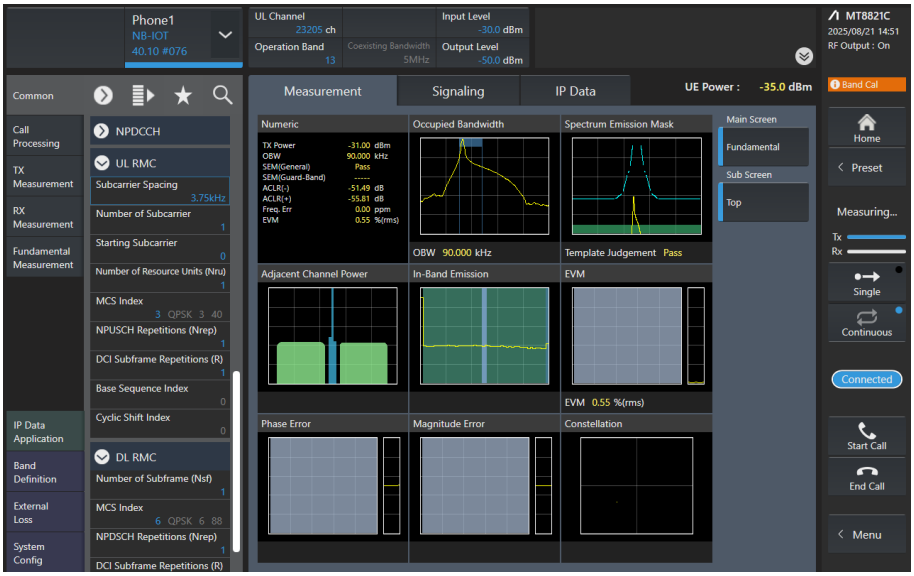

Figure 2 - LTE Demod - π/4QPSK

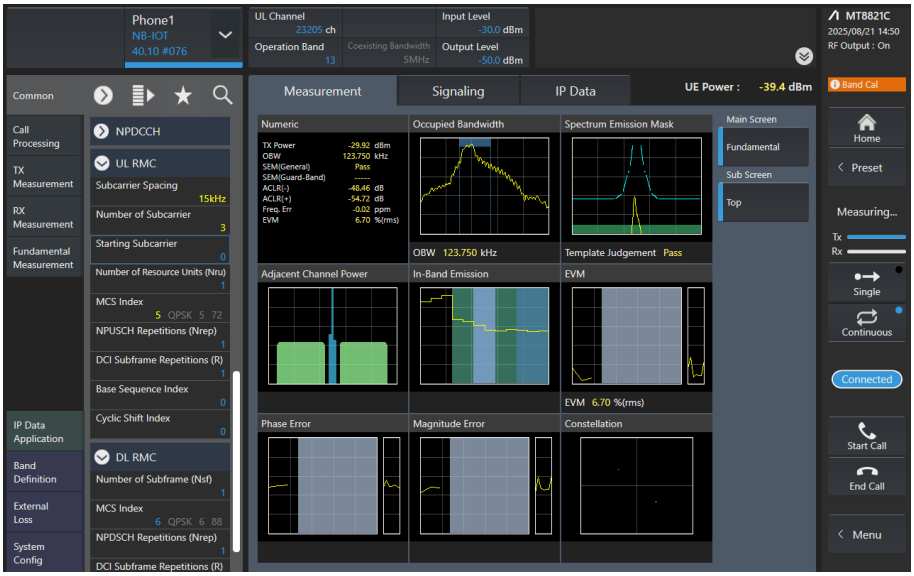

Figure 3 - LTE Demod - QPSK

FCC 47 CFR Part 2, Limit Clause 2.1047 (d)

A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

RSS-130 Limit Clause 4.2

Equipment certified under this standard shall employ digital modulation.

2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Directional Coupler	Krytar	1850	58	-	TU
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
Cable (SMA to SMA 3m)	Junkosha	MWX221-03000AMSAMS/B	6000	12	12-Jun-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6376	12	06-Jun-2026
Cellular Test Set	Anritsu	MT8821C	6722	12	14-Oct-2025
30dB 10W/18GHz F/M SMA bidirectional Attenuator	Weinschel	WA41-30-0102	7025	12	06-Jun-2026

Table 21

TU - Traceability Unscheduled

2.3 Occupied Bandwidth

2.3.1 Specification Reference

FCC 47 CFR Part 2.1049
ISED RSS-GEN 6.7

2.3.2 Equipment Under Test and Modification State

N-Label, S/N: CON 0 - Modification State 0

2.3.3 Date of Test

21-August-2025

2.3.4 Test Method

The test was performed in accordance with KDB 971168 D01 v03r01, Clause 4.1.

The EUT was powered with 3 batteries AAA (4.5 VDC), for the duration of the test.

2.3.5 Environmental Conditions

Ambient Temperature	22.9 °C
Relative Humidity	42.4 %

2.3.6 Test Results

LTE FDD B13

UARFCN	Frequency (MHz)	Modulation	SCS (kHz)	Tone Number	Start Sub-Carrier	MCS	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
23205	779.5	π/2-BPSK	15	1	0	0	0.1755	0.15114
23205	779.5	π/4-QPSK	15	1	0	3	0.1578	0.13722
23205	779.5	QPSK	15	12	0	5	0.2184	0.18951

Table 22 - Emission Bandwidth, Bottom Channel

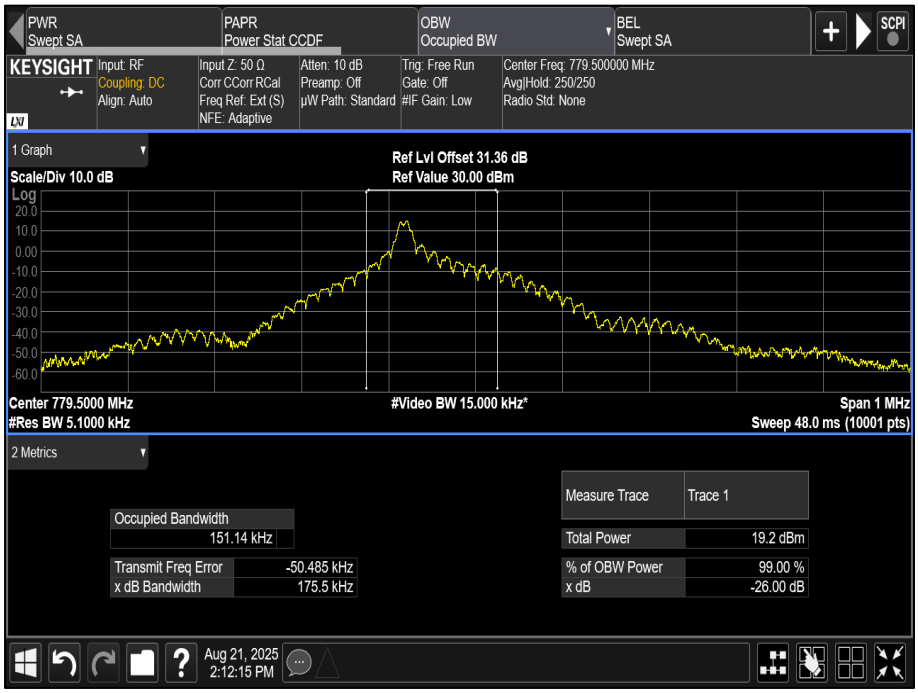

Figure 4 - Emission Bandwidth, 779.5 MHz, Modulation: π/2-BPSK, SCS: 15 kHz, Tone Number: 1, Start Sub-Carrier: 0

Figure 5 - Emission Bandwidth, 779.5 MHz, Modulation: π/4-QPSK, SCS: 15 kHz, Tone Number: 1, Start Sub-Carrier: 0

Figure 6 - Emission Bandwidth, 779.5 MHz, Modulation: QPSK, SCS: 15 kHz, Tone Number: 12, Start Sub-Carrier: 0

UARFCN	Frequency (MHz)	Modulation	SCS (kHz)	Tone Number	Start Sub-Carrier	MCS	26 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
23255	784.5	π/2-BPSK	15	1	0	0	0.1746	0.15813
23255	784.5	π/4-QPSK	15	1	0	3	0.1584	0.13724
23255	784.5	QPSK	15	12	0	5	0.2224	0.18828

Table 23 - Emission Bandwidth, Top Channel

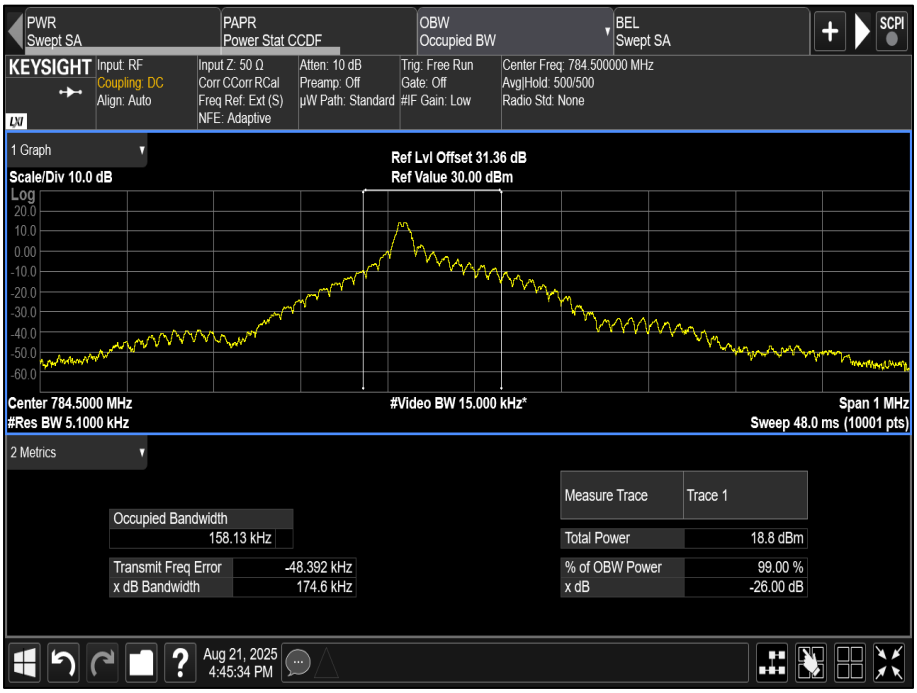

Figure 7 - Emission Bandwidth, 784.5 MHz, Modulation: π/2-BPSK, SCS: 15 kHz, Tone Number: 1, Start Sub-Carrier: 0

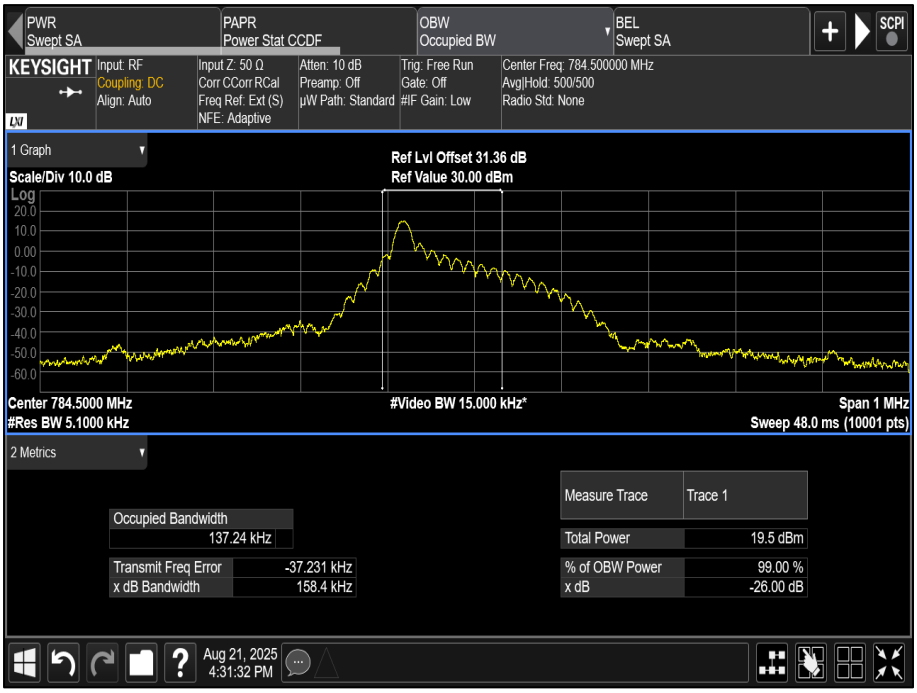

Figure 8 - Emission Bandwidth, 784.5 MHz, Modulation: π/4-QPSK, SCS: 15 kHz, Tone Number: 1, Start Sub-Carrier: 0

Figure 9 - Emission Bandwidth, 784.5 MHz, Modulation: QPSK, SCS: 15 kHz, Tone Number: 12, Start Sub-Carrier: 0

2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Directional Coupler	Krytar	1850	58	-	TU
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Sep-2025
Cable (SMA to SMA 3m)	Junkosha	MWX221-03000AMSAMS/B	6000	12	12-Jun-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6376	12	06-Jun-2026
Cellular Test Set	Anritsu	MT8821C	6722	12	14-Oct-2025
MXA Signal Analyser	Keysight Technologies	N9020B	6876	24	31-Aug-2026
30dB 10W/18GHz F/M SMA bidirectional Attenuator	Weinschel	WA41-30-0102	7025	12	06-Jun-2026

Table 24

TU - Traceability Unscheduled

2.4 Spurious Emissions at Band Edge

2.4.1 Specification Reference

FCC 47 CFR Part 27.53
FCC 47 CFR Part 2.1051
ISED RSS-130 Clause 4.7
ISED RSS-GEN Clause 6.13

2.4.2 Equipment Under Test and Modification State

N-Label, S/N: CON 0 - Modification State 0

2.4.3 Date of Test

21-August-2025

2.4.4 Test Method

The test was performed in accordance with KDB 971168 D01 v03r01, Clause 6.

The EUT was powered with 3 batteries AAA (4.5 VDC), for the duration of the test.

2.4.5 Environmental Conditions

Ambient Temperature	22.9 °C
Relative Humidity	42.4 %

2.4.6 Test Results

LTE FDD B13

UARFCN	Frequency (MHz)	Modulation	SCS (kHz)	Tone Number	Start Sub-Carrier	MCS	Level (dBm)
23205	779.5	π/2-BPSK	3.75	1	0	0	-38.93
23205	779.5	π/2-BPSK	15	1	0	0	-37.65
23205	779.5	QPSK	15	3	0	5	-37.71
23205	779.5	QPSK	15	12	0	5	-36.64

Table 25 - Lower Band Edge Results

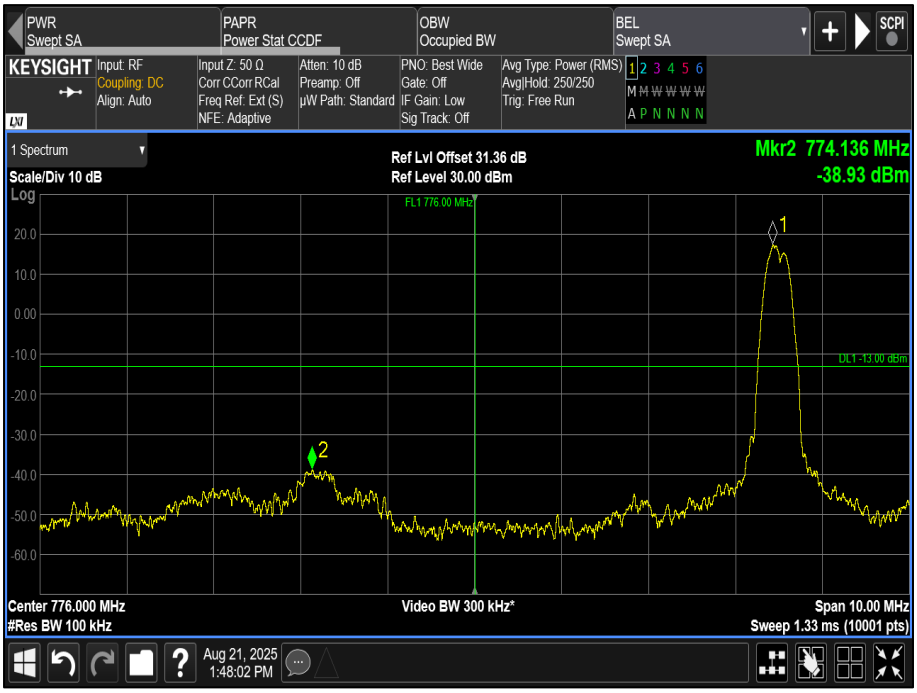

Figure 10 - Lower Band Edge, 779.5 MHz, Modulation: π/2-BPSK, SCS: 3.75 kHz, Tone Number: 1, Start Sub-Carrier: 0

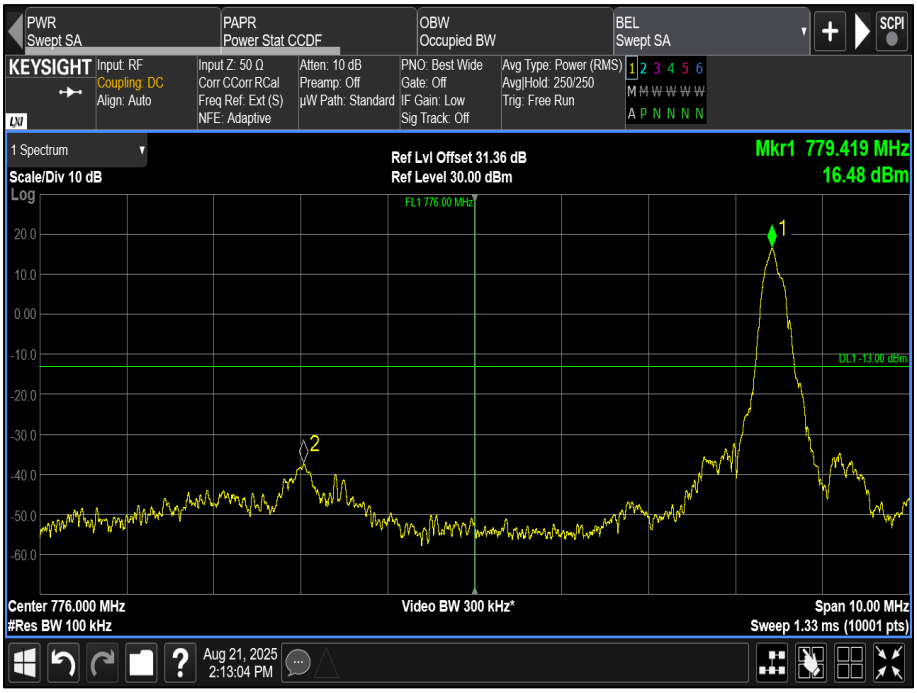

Figure 11 - Lower Band Edge, 779.5 MHz, Modulation: π/2-BPSK, SCS: 15 kHz, Tone Number: 1, Start Sub-Carrier: 0

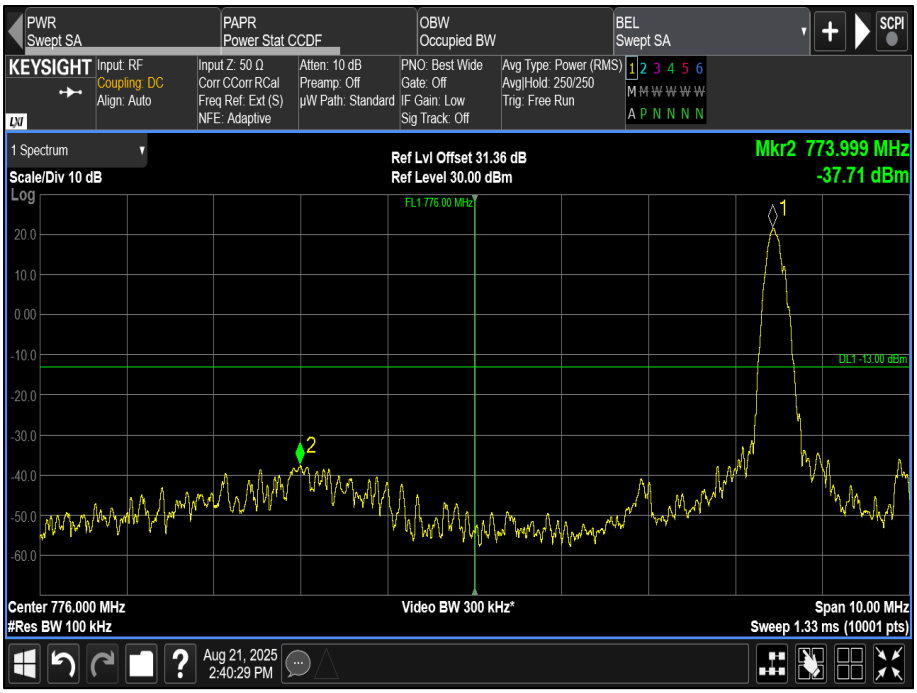

Figure 12 - Lower Band Edge, 779.5 MHz, Modulation: QPSK, SCS: 15 kHz, Tone Number: 3, Start Sub-Carrier: 0

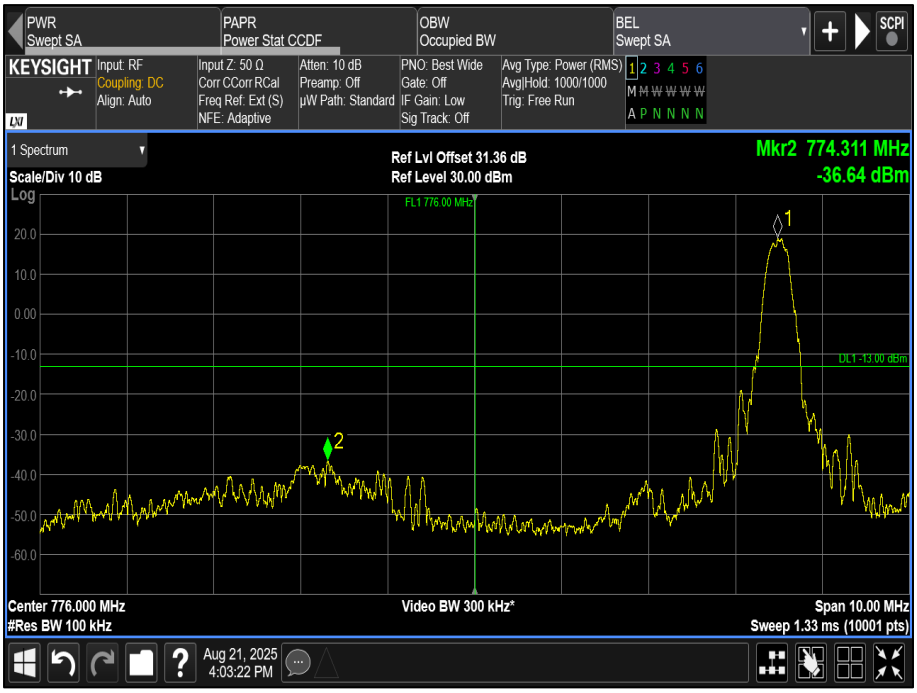

Figure 13 - Lower Band Edge, 779.5 MHz, Modulation: QPSK, SCS: 15 kHz, Tone Number: 12, Start Sub-Carrier: 0

UARFCN	Frequency (MHz)	Modulation	SCS (kHz)	Tone Number	Start Sub-Carrier	MCS	Level (dBm)
23255	784.5	π/2-BPSK	3.75	1	47	0	-39.14
23255	784.5	π/2-BPSK	15	1	11	0	-38.27
23255	784.5	QPSK	15	3	9	5	-37.16
23255	784.5	QPSK	15	12	0	5	-37.06

Table 26 - Upper Band Edge Results

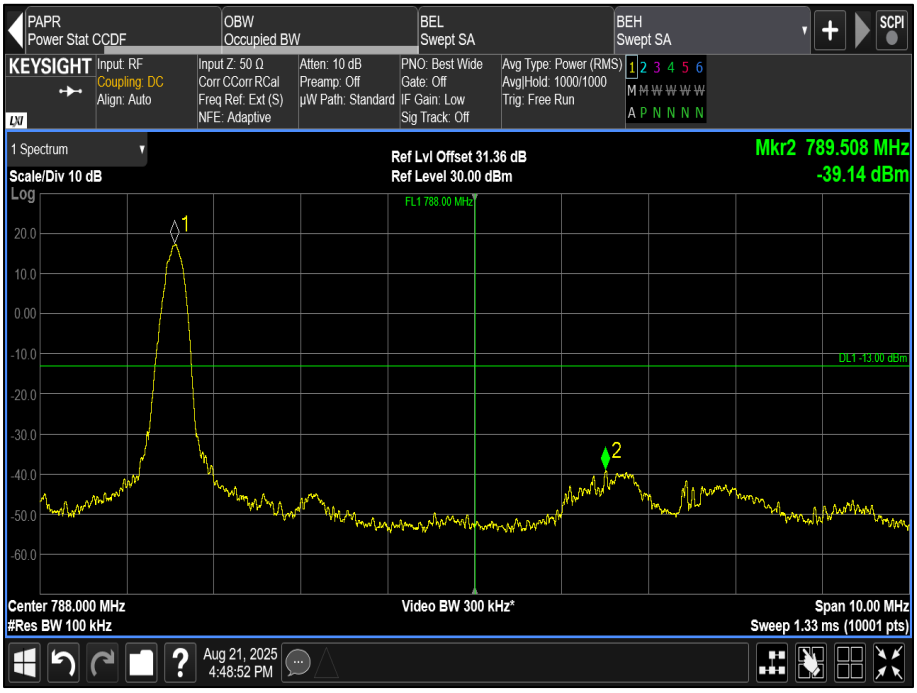

Figure 14 - Upper Band Edge, 784.5 MHz, Modulation: π/2-BPSK, SCS: 3.75 kHz, Tone Number: 1, Start Sub-Carrier: 47

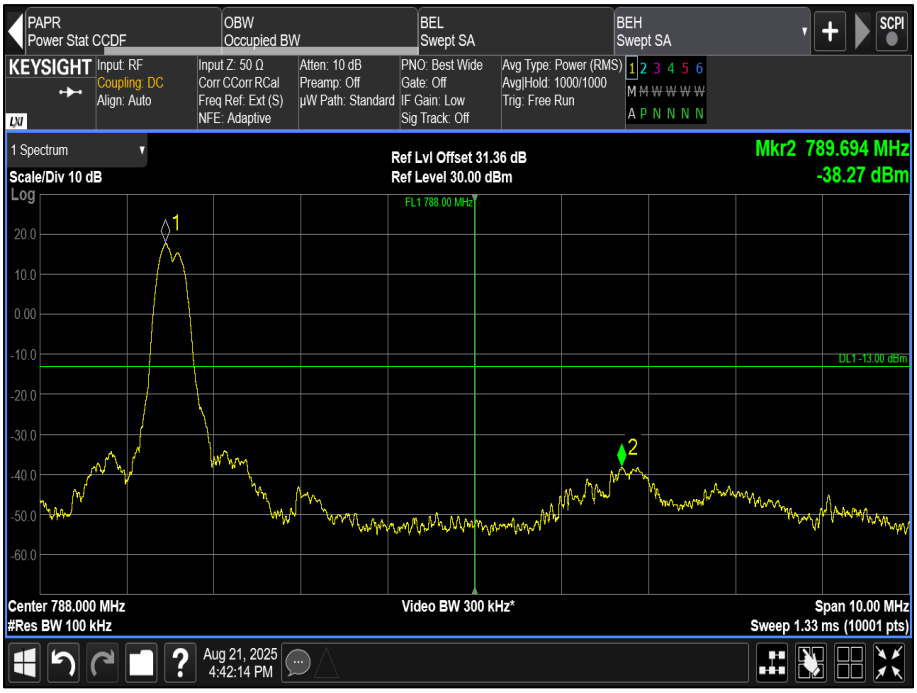

Figure 15 - Upper Band Edge, 784.5 MHz, Modulation: π/2-BPSK, SCS: 15 kHz, Tone Number: 1, Start Sub-Carrier: 11

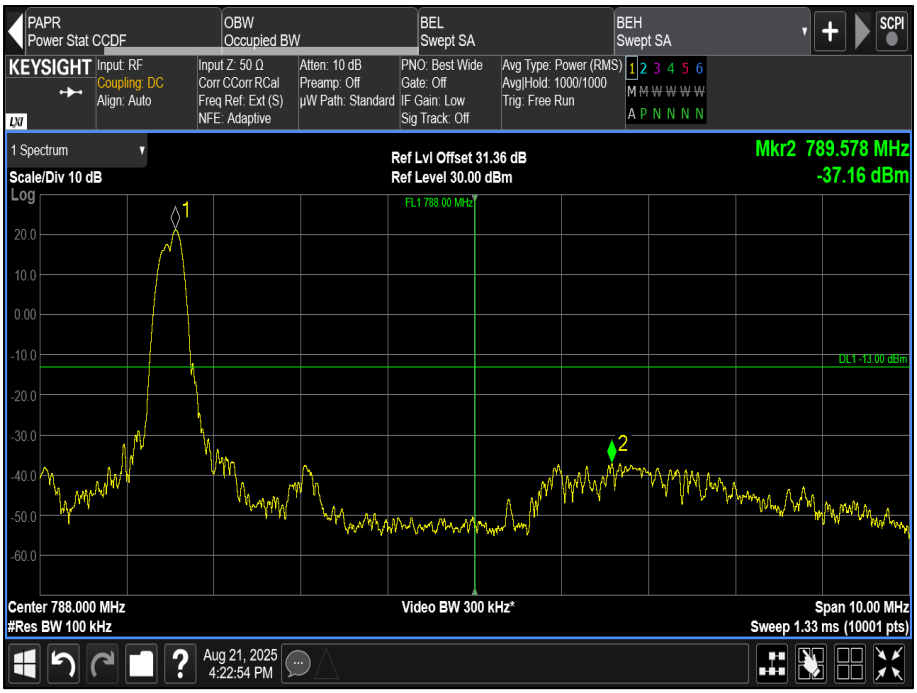

Figure 16 - Upper Band Edge, 784.5 MHz, Modulation: QPSK, SCS: 15 kHz, Tone Number: 3, Start Sub-Carrier: 9

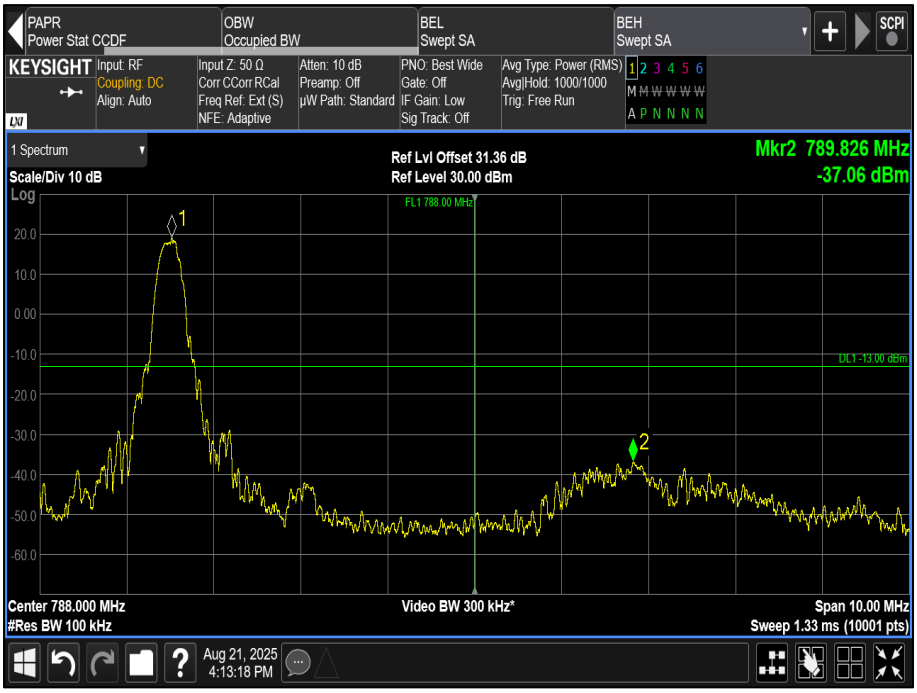

Figure 17 - Upper Band Edge, 784.5 MHz, Modulation: QPSK, SCS: 15 kHz, Tone Number: 12, Start Sub-Carrier: 0

FCC 47 CFR Part 27, Limit Clause 27.53

Clause	Requirement
27.53(c)(2)	On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB

Table 27 - FCC Part 27 Limit

Clause	Requirement
4.7.1 and 4.7.2	The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least: 76 + 10 log10 p (watts), dB, for base and fixed equipment and 65 + 10 log10 p (watts), dB, for mobile and portable equipment. The e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

Table 28 - ISED RSS-130 Limit

2.4.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Directional Coupler	Krytar	1850	58	-	TU
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Sep-2025
Cable (SMA to SMA 3m)	Junkosha	MWX221-03000AMSAMS/B	6000	12	12-Jun-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6376	12	06-Jun-2026
Cellular Test Set	Anritsu	MT8821C	6722	12	14-Oct-2025
MXA Signal Analyser	Keysight Technologies	N9020B	6876	24	31-Aug-2026
30dB 10W/18GHz F/M SMA bidirectional Attenuator	Weinschel	WA41-30-0102	7025	12	06-Jun-2026

Table 29

TU - Traceability Unscheduled

2.5 Radiated Spurious Emissions

2.5.1 Specification Reference

FCC 47 CFR Part 2.1053
FCC 47 CFR Part 27.53(c)(2), (4), (f)
ISED RSS-130, Clause 4.7.1 and 4.7.2
ISED RSS-GEN Clause 6.13

2.5.2 Equipment Under Test and Modification State

N-Label, S/N: DUT-0 - Modification State 0

2.5.3 Date of Test

04-September-2025 to 05-September-2025

2.5.4 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 EUT was powered with 3 batteries AAA (4.5 VDC), for the duration of the test.

In accordance with FCC 27.53(c)(4), The resolution bandwidth was lowered to 10kHz for measurements in the ranges 763-775 MHz and 793-805 MHz.

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)

2.5.5 Example Test Setup Diagram

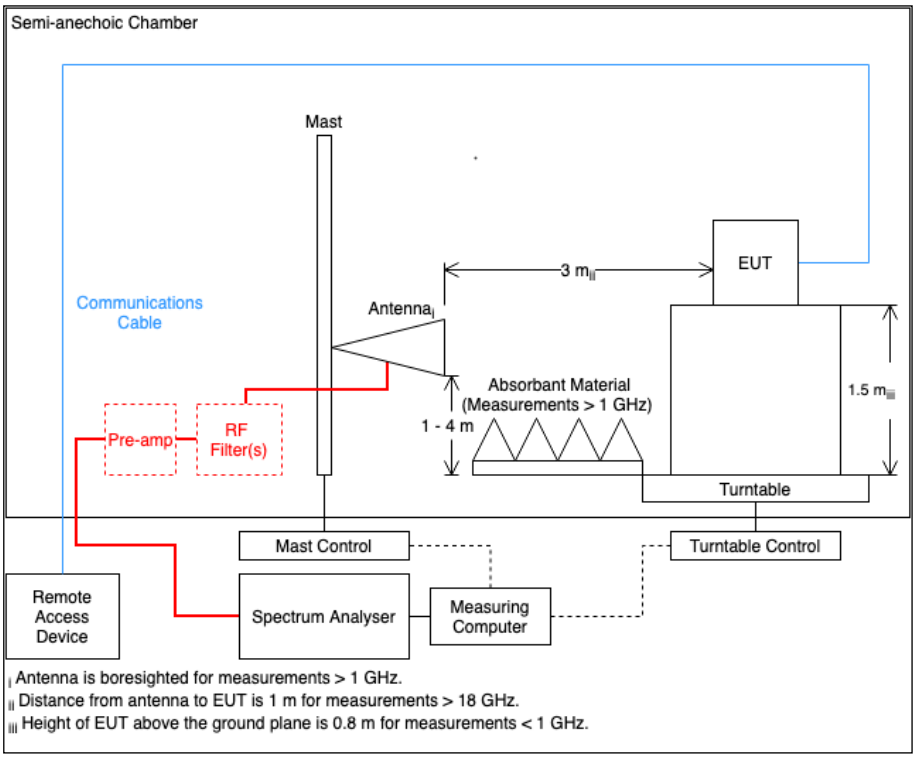

Figure 18

2.5.6 Environmental Conditions

Ambient Temperature	20.2 - 22.5 °C
Relative Humidity	50.9 - 57.3 %

2.5.7 Test Results

LTE FDD B13

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

Table 30 - B13_Bot_FDD_X, 779.5 MHz, 30 MHz to 8 GHz

*No emissions found within 6 dB of the limit.

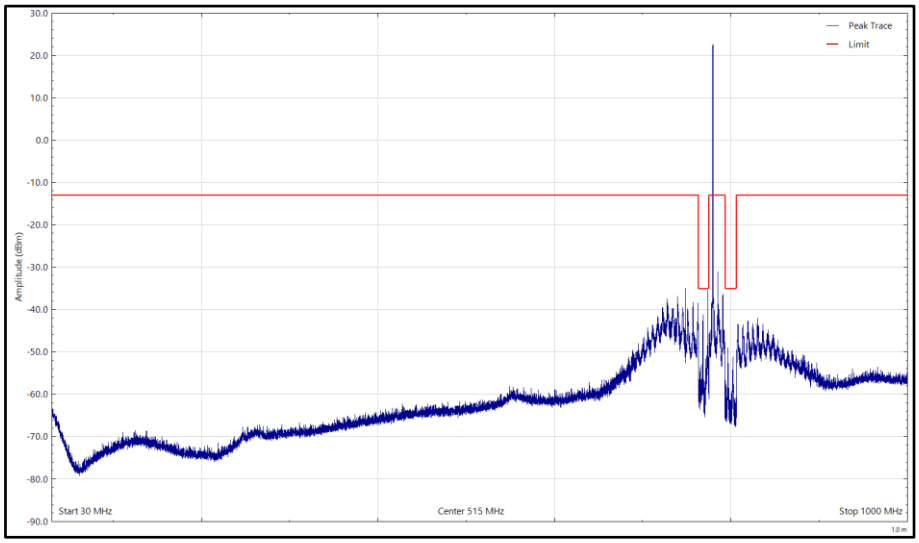

Figure 19 - B13_Bot_FDD_X, 779.5 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

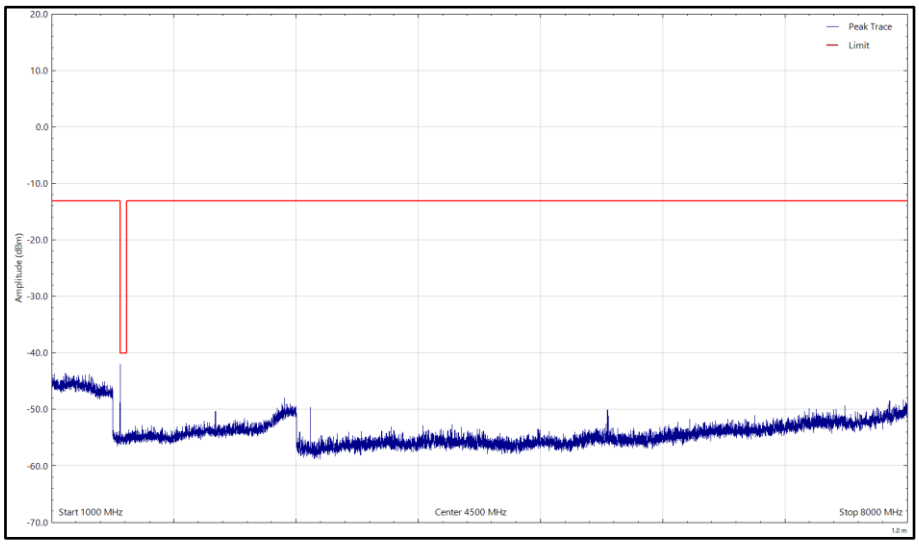

Figure 20 - B13_Bot_FDD_X, 779.5 MHz, 1 GHz to 8 GHz, Horizontal (Peak)

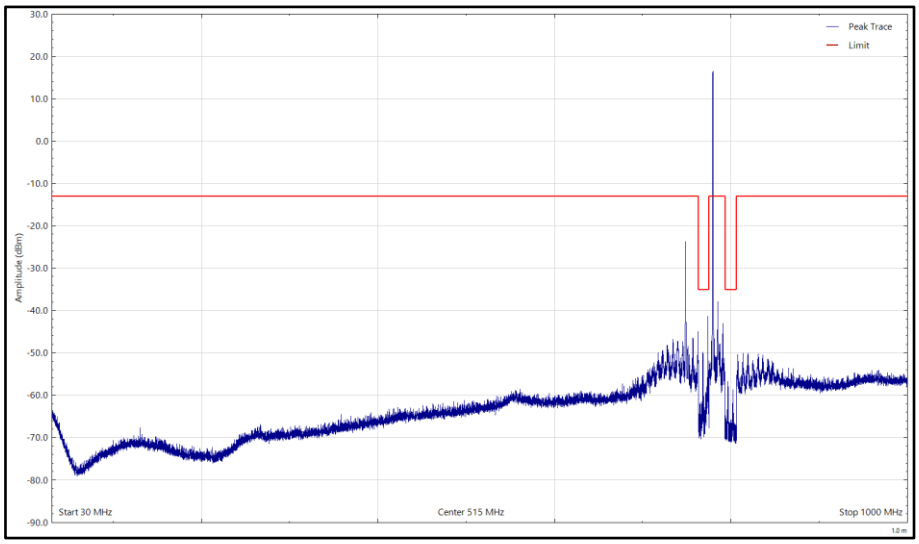

Figure 21 - B13_Bot_FDD_X, 779.5 MHz, 30 MHz to 1 GHz, Vertical (Peak)

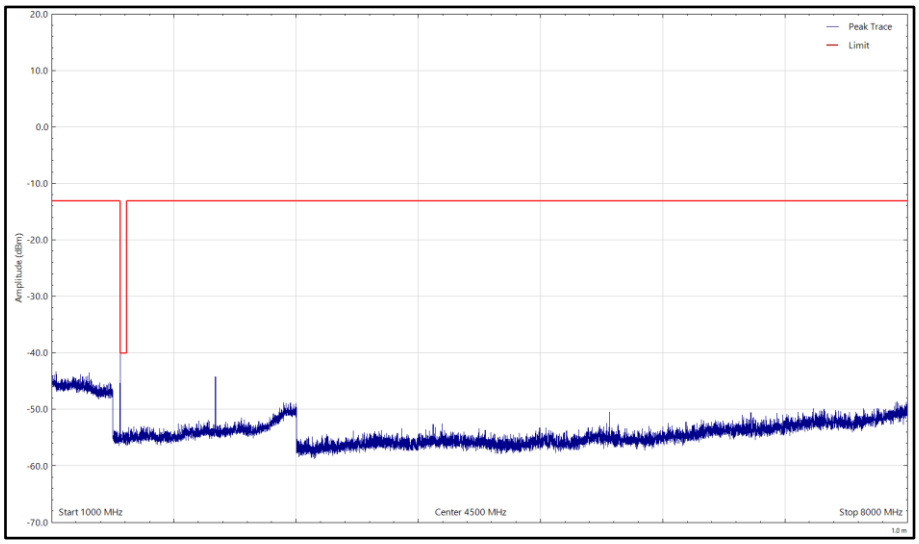

Figure 22 - B13_Bot_FDD_X, 779.5 MHz, 1 GHz to 8 GHz, Vertical (Peak)

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1568.835	-40.50	-40.00	-0.50	RMS	186	150	Vertical
1569.030	-40.27	-40.00	-0.27	RMS	133	241	Horizontal

Table 31 - B13_Top_FDD_X, 784.5 MHz, 30 MHz to 8 GHz

No other emissions found within 6 dB of the limit.

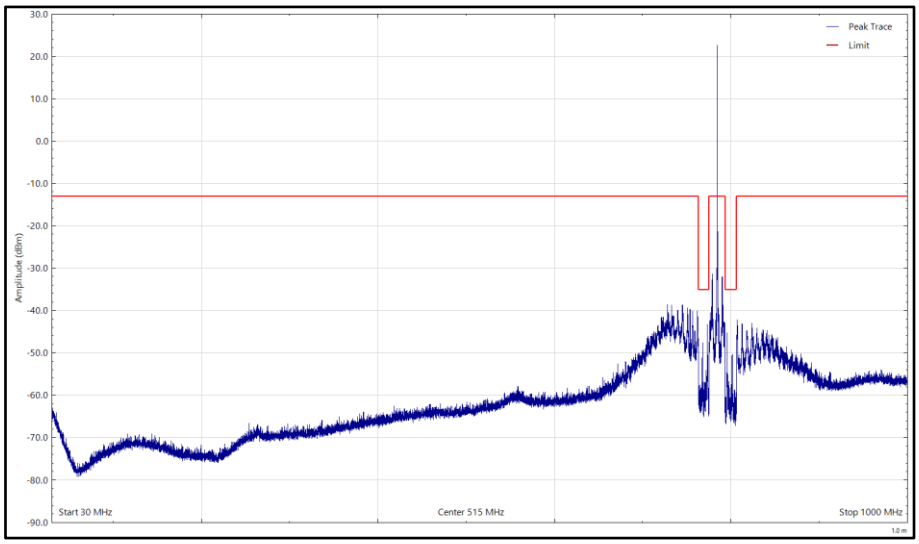

Figure 23 - B13_Top_FDD_X, 784.5 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

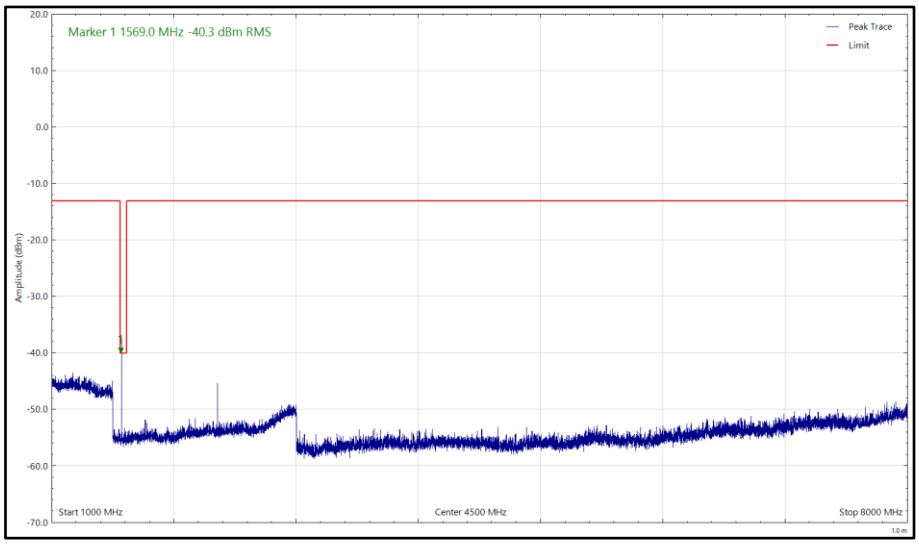

Figure 24 - B13_Top_FDD_X, 784.5 MHz, 1 GHz to 8 GHz, Horizontal (Peak)

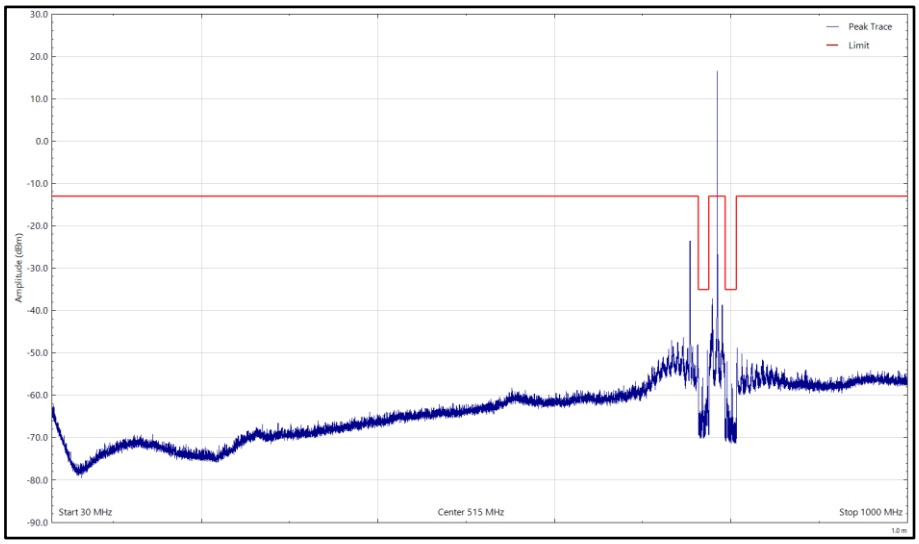

Figure 25 - B13_Top_FDD_X, 784.5 MHz, 30 MHz to 1 GHz, Vertical (Peak)

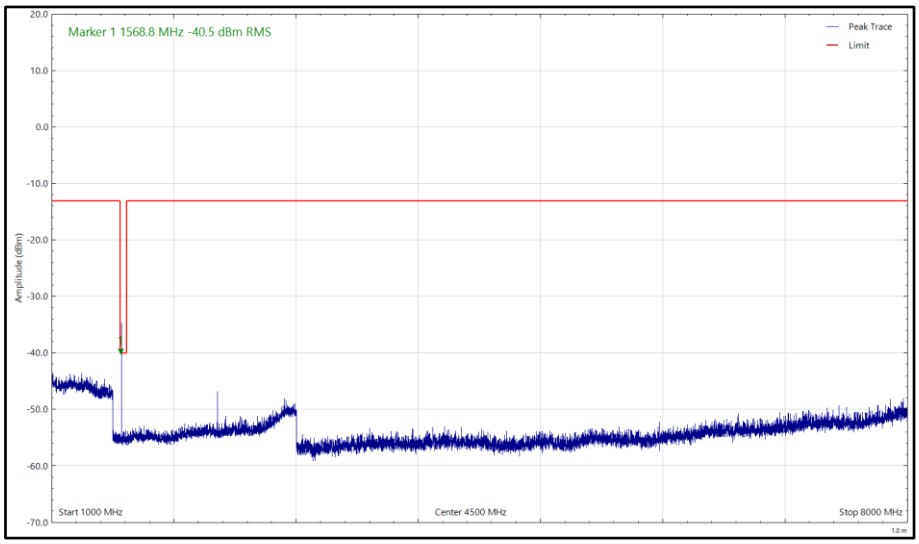

Figure 26 - B13_Top_FDD_X, 784.5 MHz, 1 GHz to 8 GHz, Vertical (Peak)

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

Table 32 - B13_Bot_FDD_Y, 779.5 MHz, 30 MHz to 8 GHz

*No emissions found within 6 dB of the limit.

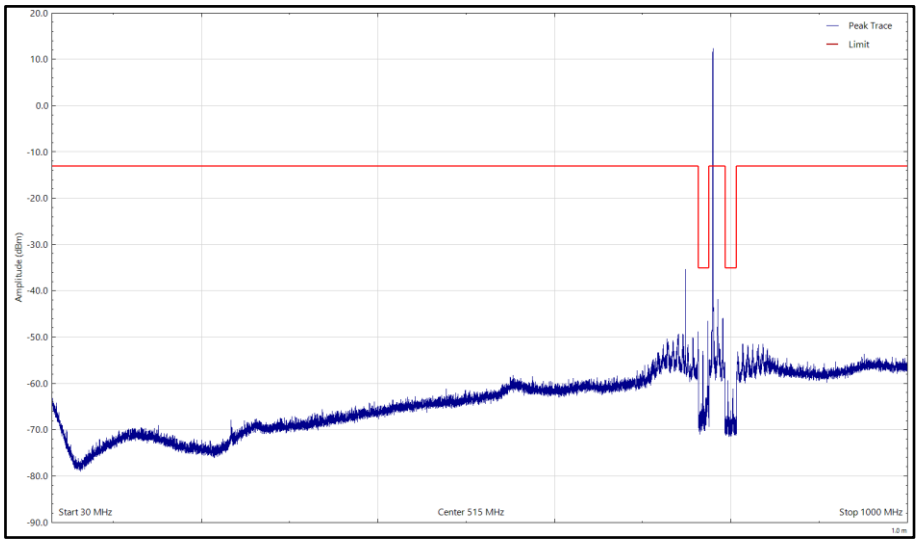

Figure 27 - B13_Bot_FDD_Y, 779.5 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

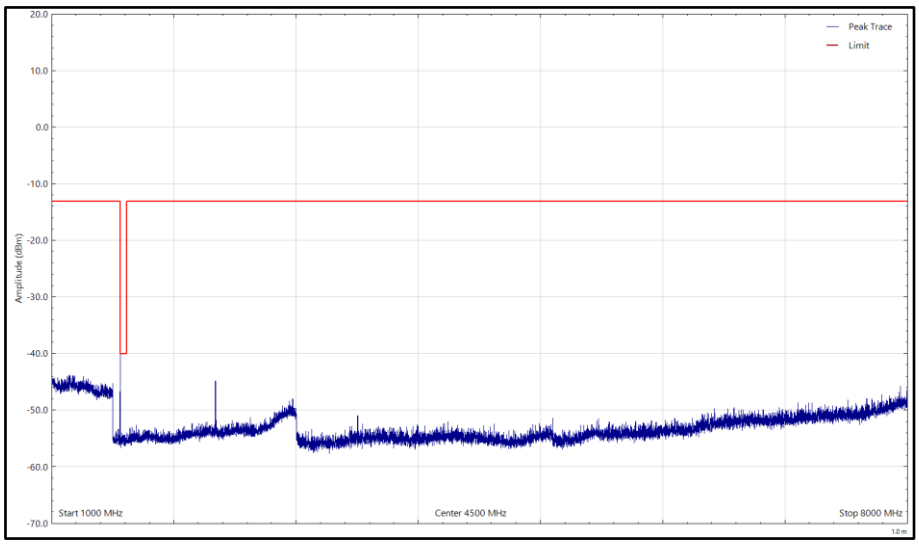

Figure 28 - B13_Bot_FDD_Y, 779.5 MHz, 1 GHz to 8 GHz, Horizontal (Peak)

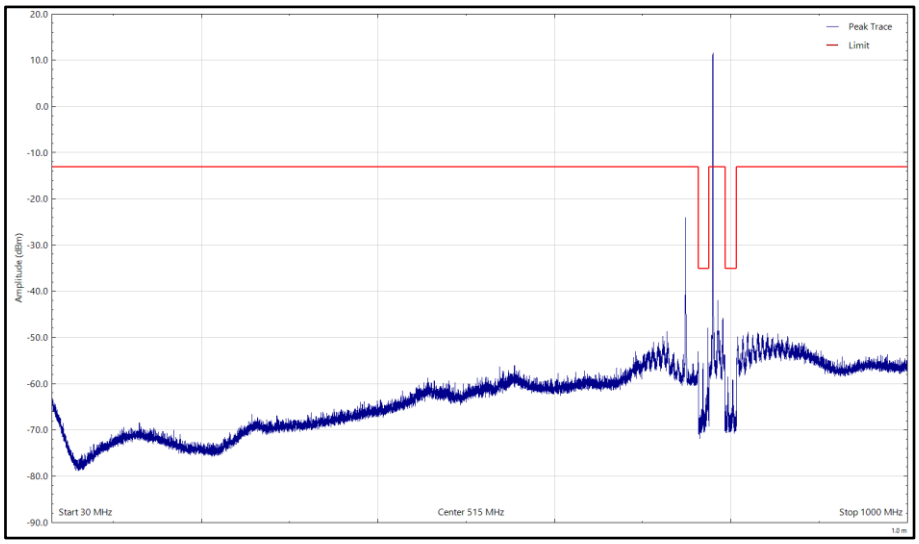

Figure 29 - B13_Bot_FDD_Y, 779.5 MHz, 30 MHz to 1 GHz, Vertical (Peak)

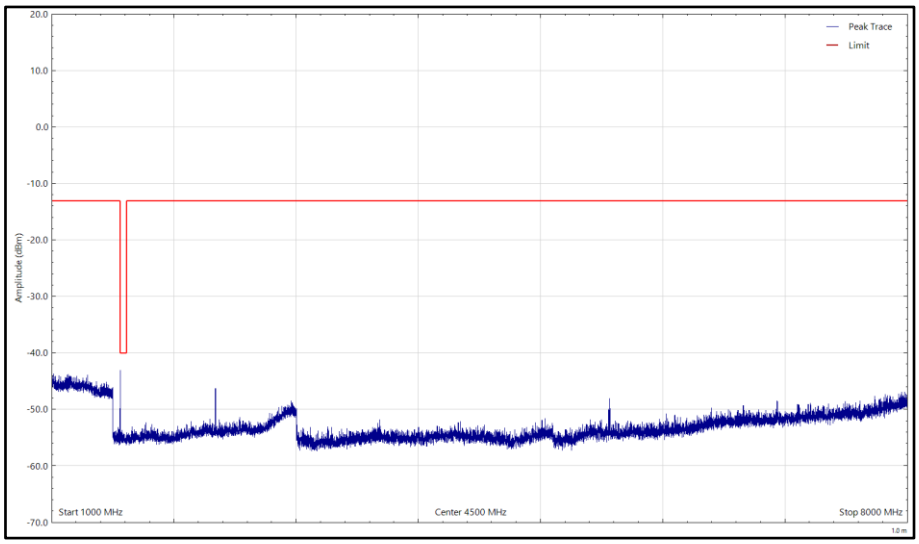

Figure 30 - B13_Bot_FDD_Y, 779.5 MHz, 1 GHz to 8 GHz, Vertical (Peak)

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1568.895	-40.49	-40.00	-0.49	RMS	8	156	Horizontal
1568.940	-44.46	-40.00	-4.46	RMS	118	150	Vertical

Table 33 - B13_Top_FDD_Y, 784.5 MHz, 30 MHz to 8 GHz

No other emissions found within 6 dB of the limit.

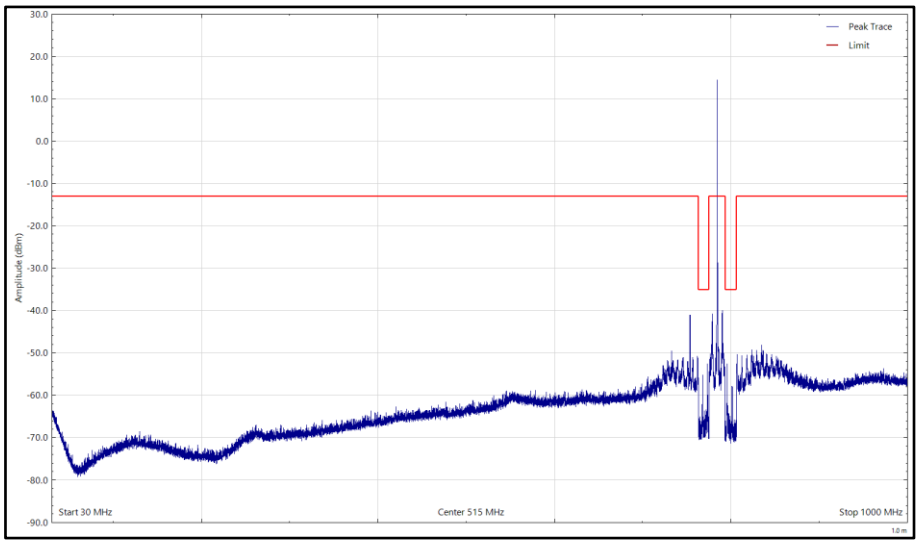

Figure 31 - B13_Top_FDD_Y, 784.5 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

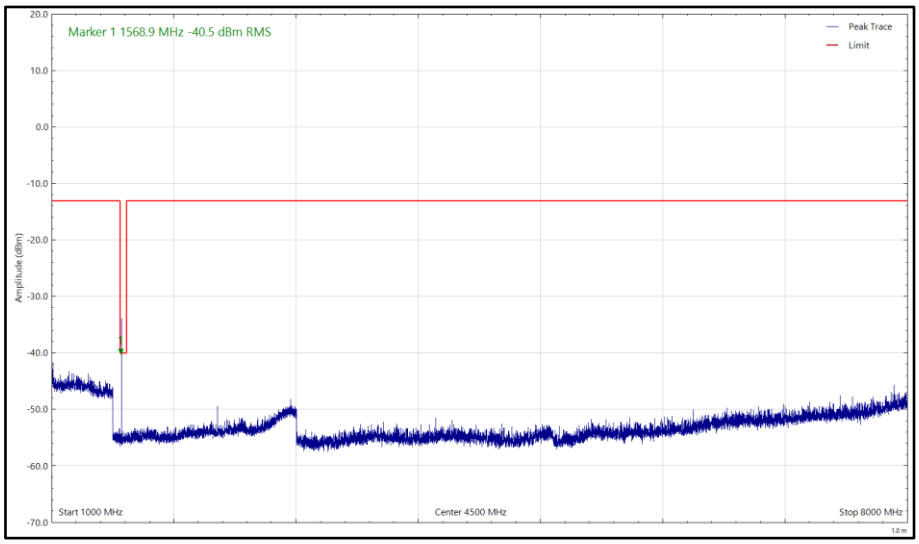

Figure 32 - B13_Top_FDD_Y, 784.5 MHz, 1 GHz to 8 GHz, Horizontal (Peak)

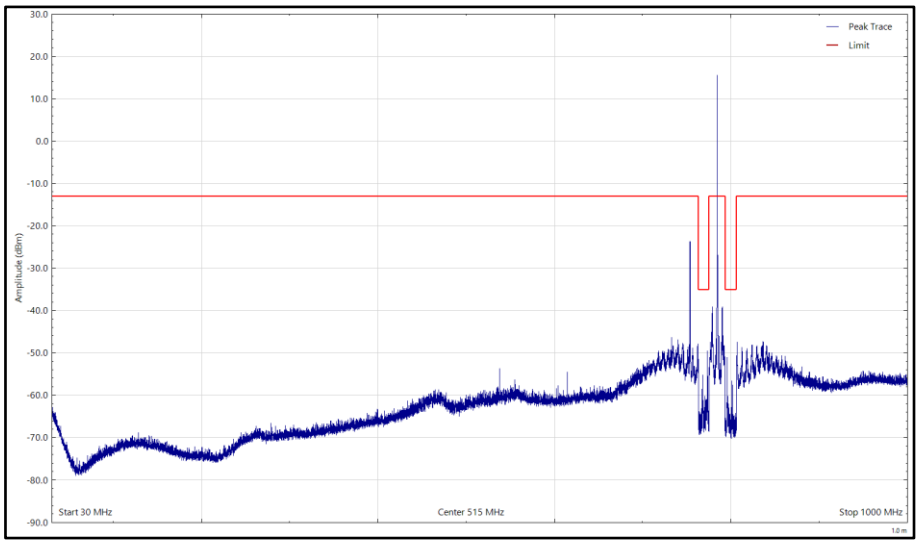

Figure 33 - B13_Top_FDD_Y, 784.5 MHz, 30 MHz to 1 GHz, Vertical (Peak)

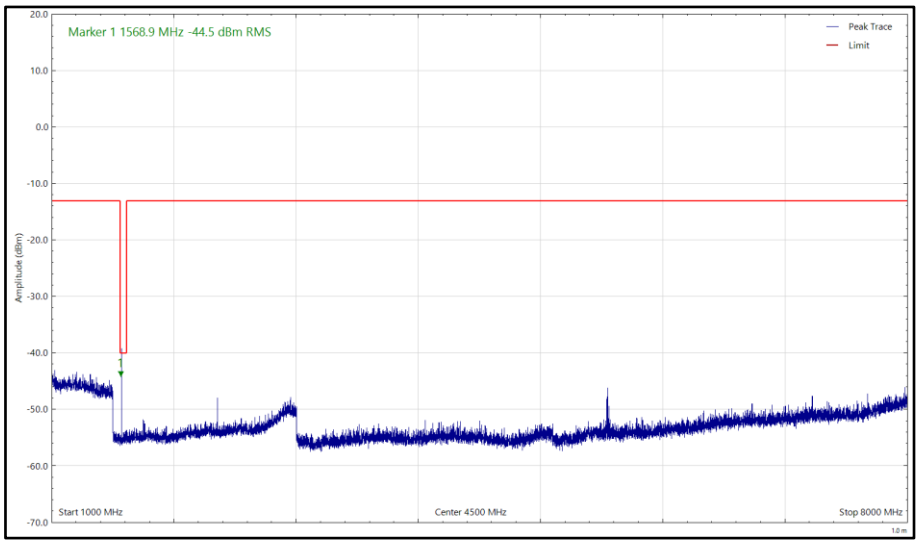

Figure 34 - B13_Top_FDD_Y, 784.5 MHz, 1 GHz to 8 GHz, Vertical (Peak)

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

Table 34 - B13_Bot_FDD_Z, 779.5 MHz, 30 MHz to 8 GHz

*No emissions found within 6 dB of the limit.

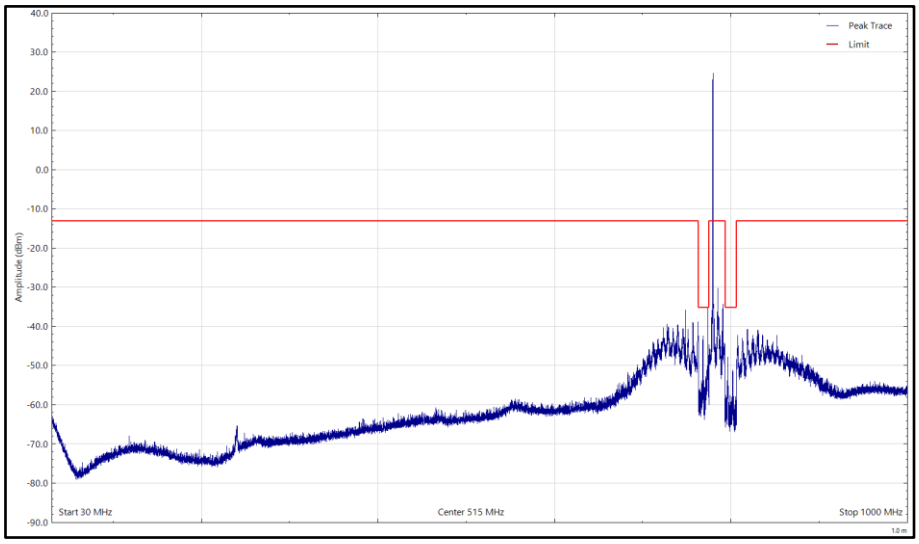

Figure 35 - B13_Bot_FDD_Z, 779.5 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

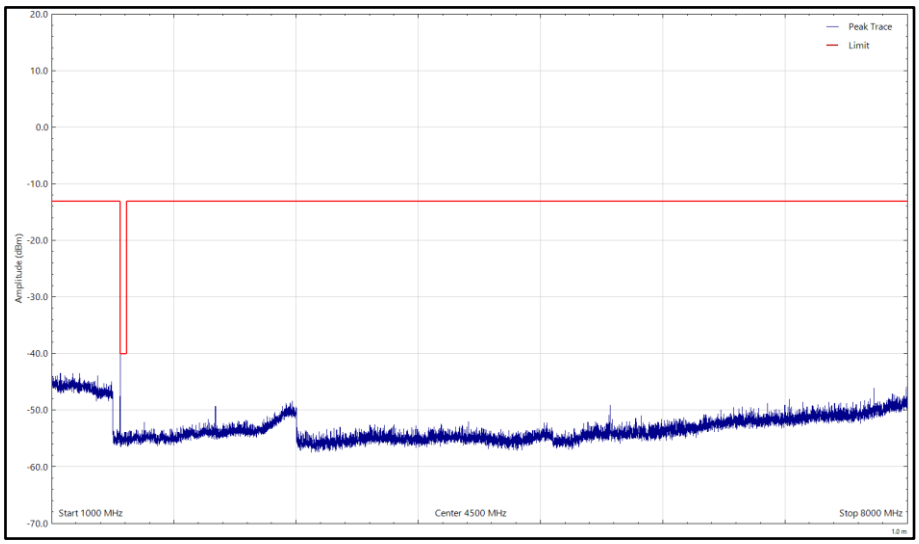

Figure 36 - B13_Bot_FDD_Z, 779.5 MHz, 1 GHz to 8 GHz, Horizontal (Peak)

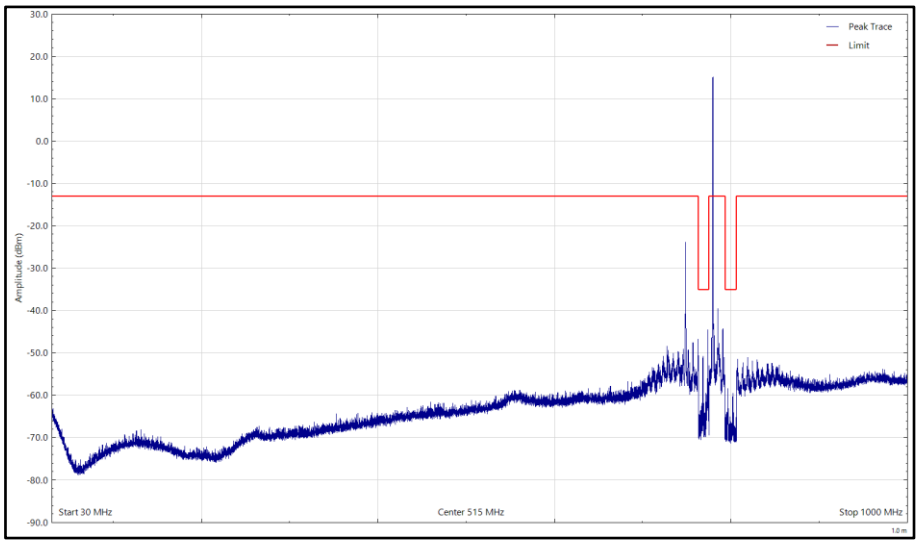

Figure 37 - B13_Bot_FDD_Z, 779.5 MHz, 30 MHz to 1 GHz, Vertical (Peak)

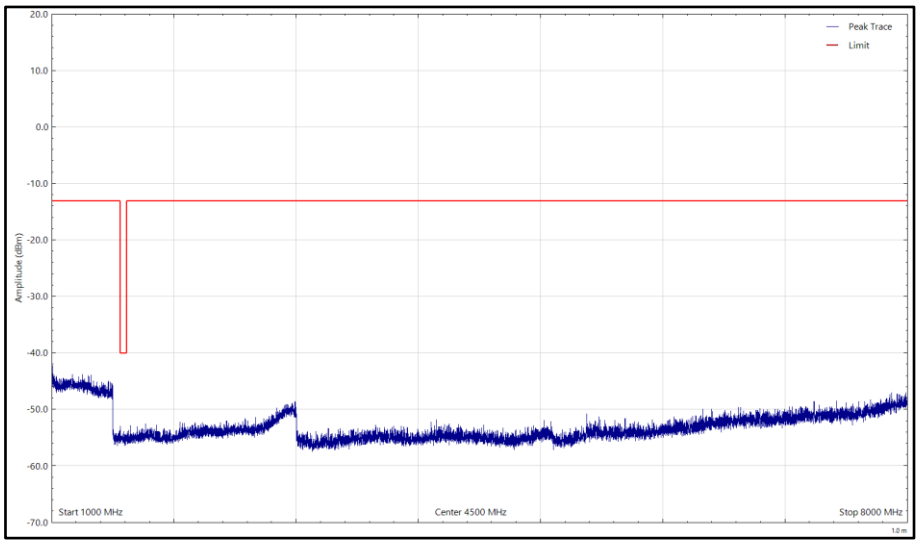

Figure 38 - B13_Bot_FDD_Z, 779.5 MHz, 1 GHz to 8 GHz, Vertical (Peak)

Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1568.910	-40.68	-40.00	-0.68	RMS	77	160	Horizontal

Table 35 - B13_Top_FDD_Z, 784.5 MHz, 30 MHz to 8 GHz

No other emissions found within 6 dB of the limit.

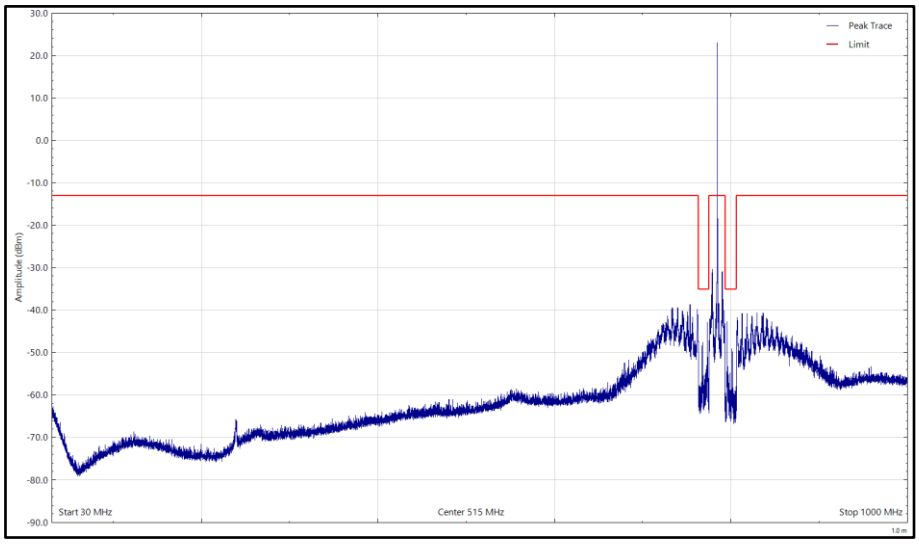

Figure 39 - B13_Top_FDD_Z, 784.5 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

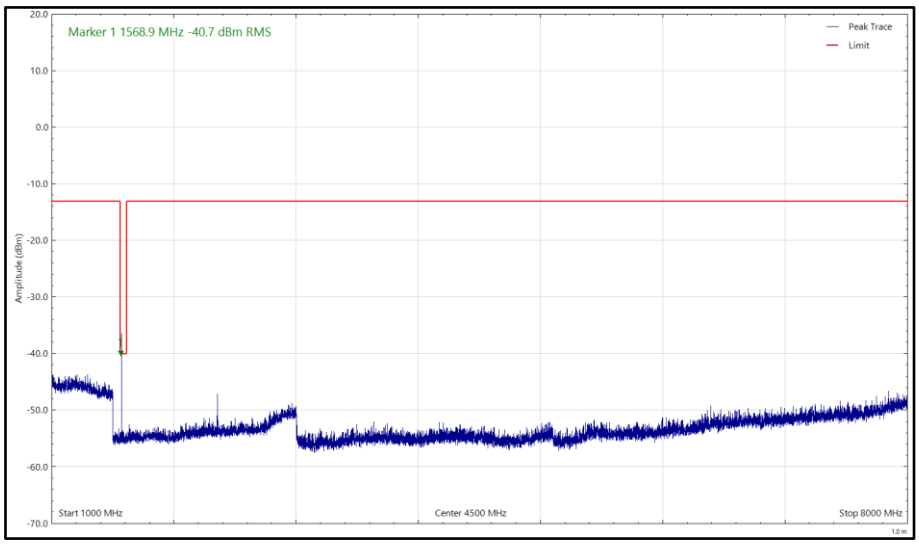

Figure 40 - B13_Top_FDD_Z, 784.5 MHz, 1 GHz to 8 GHz, Horizontal (Peak)

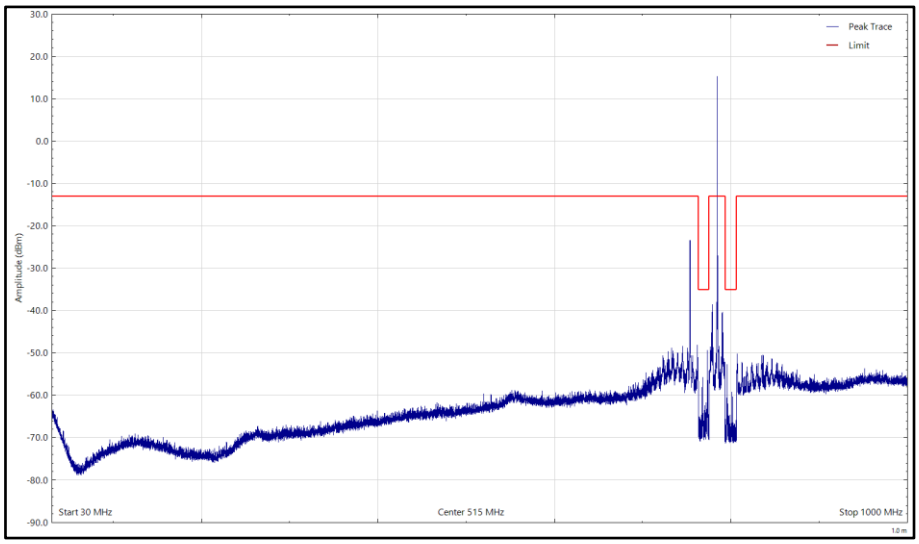

Figure 41 - B13_Top_FDD_Z, 784.5 MHz, 30 MHz to 1 GHz, Vertical (Peak)

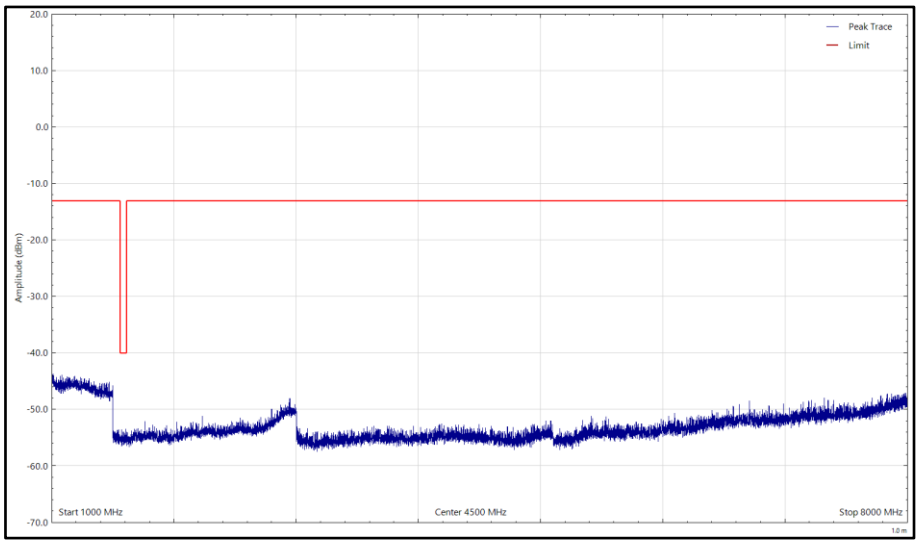

Figure 42 - B13_Top_FDD_Z, 784.5 MHz, 1 GHz to 8 GHz, Vertical (Peak)

FCC 47 CFR Part 27, Limit Clause 27.53

Clause	Requirement
27.53(c)(2)	On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB

Table 36 - FCC Part 27 Limit

Clause	Requirement
4.7.1 and 4.7.2	The unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed. the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least: 76 + 10 log10 p (watts), dB, for base and fixed equipment and 65 + 10 log10 p (watts), dB, for mobile and portable equipment. The e.i.r.p. in the band 1559-1610 MHz shall not exceed −70 dBW/MHz for wideband signal and −80 dBW for discrete emission with bandwidth less than 700 Hz.

Table 37 - ISED RSS-130 Limit

2.5.8 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
3m Semi-Anechoic Chamber	Rainford	RF Chamber 5	1545	36	23-Apr-2027
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygrometer	Rotronic	HP21	4741	12	29-May-2026
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	14-Jun-2026
Test Receiver	Rohde & Schwarz	ESW44	5084	12	13-Dec-2025
Emissions Software	TUV SUD	EmX V3.5.4	5125	-	Software
Antenna (DRG, 1 GHz to 10.5 GHz)	Schwarzbeck	BBHA9120B	5215	12	05-Jul-2026
Pre-amplifier (30 dB, 1GHz to 18GHz)	Schwarzbeck	BBV 9718 C	5261	12	17-Apr-2026
Cable (K-Type to K-Type, 1 m)	Junkosha	MWX241-01000KMSKMS/A	5512	12	06-Jun-2026
Cable (SMA to SMA, 2 m)	Junkosha	MWX221-02000AMSAMS/A	5517	12	06-Jun-2026
3 GHz High pass Filter	Wainwright	WHKX12-2580-3000-18000-80SS	5547	12	30-May-2026
Turntable	Maturo Gmbh	Turntable 1.5 SI-2t	5614	-	TU
Antenna (Bi-Log, 30 MHz to 1 GHz)	Teseq	CBL6111D	5615	24	24-Apr-2027
Radio Communications Analyser	Anritsu	MT8821C	5738	12	12-Aug-2026
Cable (SMA to SMA, 1 m)	Junkosha	MWX221/B	5998	12	23-Oct-2025
Wireless Connectivity Test Set	Anritsu	MT8862A-002	6524	12	14-Oct-2025
2m SMA Cable	Junkosha	MWX221-02000AMSAMS/B	6928	12	08-Dec-2025
Cable Assy 8m (N to N) 18GHz	Junkosha	MWX221-08000NMSNMS/B	7050	12	01-Jun-2026

Table 38

TU - Traceability Unscheduled

2.6 Frequency Stability

2.6.1 Specification Reference

FCC 47 CFR Part 27.54
FCC 47 CFR Part 2.1055
ISED RSS-130 Clause 4.5
ISED RSS-GEN Clause 6.11

2.6.2 Equipment Under Test and Modification State

N-Label, S/N: CON 0 - Modification State 0

2.6.3 Date of Test

27-August-2025 to 28-August-2025

2.6.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.6 and the provisions of RSS-GEN clause 6.11.

The EUT was powered with 3 batteries AAA (4.5 VDC), for the duration of the temperature variation test.

During the voltage variation test, the EUT was connected to a power supply unit (PSU) through the terminals in the battery holder.
The EUT was connected to a celullar base station to test band 13.

The measurement function of a spectrum analyser was used to measure the 99% occupied bandwidth as per ANSI C63.26 clause 5.4.4. The lower and upper boundaries were recorded to ensure the remained within the allocated frequency block.

2.6.5 Environmental Conditions

Ambient Temperature	22.6 - 23.1 °C
Relative Humidity	53.6 - 59.8 %

2.6.6 Test Results

LTE FDD B13

Voltage	779.5 MHz		784.5 MHz	
	F_{LOWER} (MHz)	F_{UPPER} (MHz)	F_{LOWER} (MHz)	F_{UPPER} (MHz)
2.2	779.381946	779.541085	787.381806	784.607981
4.5	779.382654	779.55552	784.381598	784.608279

Table 39 - Frequency Stability Under Voltage Variations

Temperature	779.5 MHz		784.5 MHz	
	F_{LOWER} (MHz)	F_{UPPER} (MHz)	F_{LOWER} (MHz)	F_{UPPER} (MHz)
50 °C	779.383441	779.538479	784.383556	784.607941
40 °C	779.382792	779.527611	784.381958	784.608334
30 °C	779.382827	779.540511	784.401272	784.607321
20 °C	779.382741	779.538181	784.380514	784.618158
10 °C	779.382668	779.538187	784.38331	784.608317
0 °C	779.383093	779.541086	784.381413	784.608558
-10 °C	779.382865	779.539465	784.382179	784.607791
-20 °C	779.383024	779.539783	784.383365	784.608181
-30 °C	779.281500	779.535438	784.381826	784.607839

Table 40 - Frequency Stability Under Temperature Variations

FCC 47 CFR Part 27, Limit Clause 27.54

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorised bands of operation.

ISED RSS-130, Limit Clause 4.5

For equipment that is capable of transmitting numerous channels simultaneously for different applications (e.g. LTE and narrowband – Internet of Things (IoT)), the occupied bandwidth shall be the bandwidth representing the sum of the occupied bandwidths of these channels.

The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency block range when tested at the temperature and supply voltage variations specified in RSS-GEN.

2.6.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 1.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Directional Coupler	Krytar	1850	58	-	TU
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Hygrometer	Rotronic	I-1000	2891	12	02-Dec-2025
Thermocouple Thermometer	Fluke	51	3173	12	17-Jun-2026
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	18-Sep-2025
Digital Multi-meter	Iso-tech	IDM93N	4435	12	06-Mar-2026
Quad Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P Mon
EXA Signal Analyser	Keysight Technologies	N9010B	4969	24	07-Feb-2026
Cable (SMA to SMA 3m)	Junkosha	MWX221-03000AMSAMS/B	6000	12	12-Jun-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6376	12	06-Jun-2026
Cellular Test Set	Anritsu	MT8821C	6722	12	14-Oct-2025
30dB 10W/18GHz F/M SMA bidirectional Attenuator	Weinschel	WA41-30-0102	7025	12	06-Jun-2026

Table 41

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment

3 Photographs

3.1 Test Setup Photographs

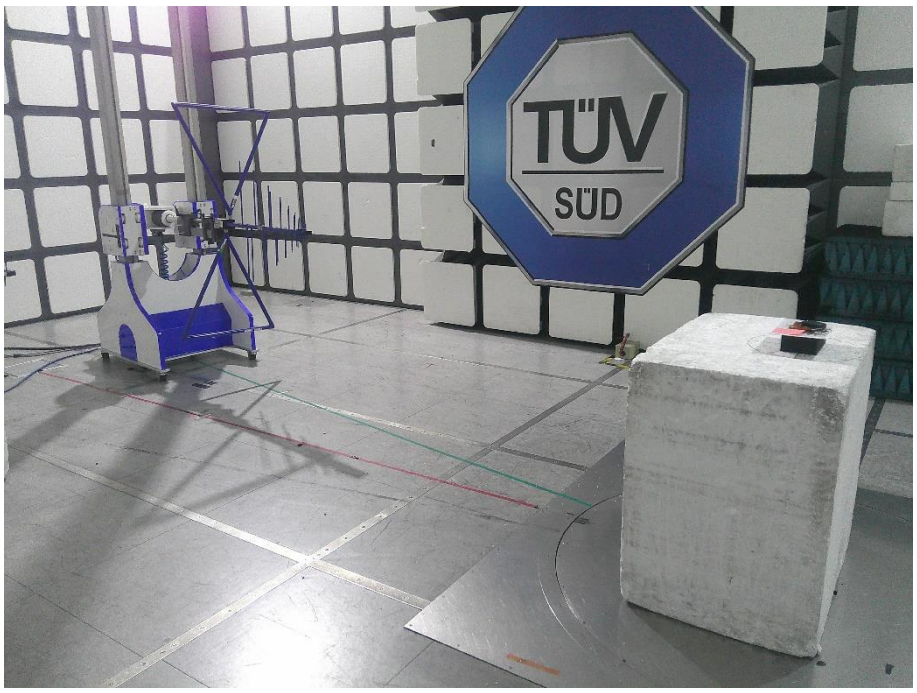

Figure 43 - 30 MHz to 1 GHz

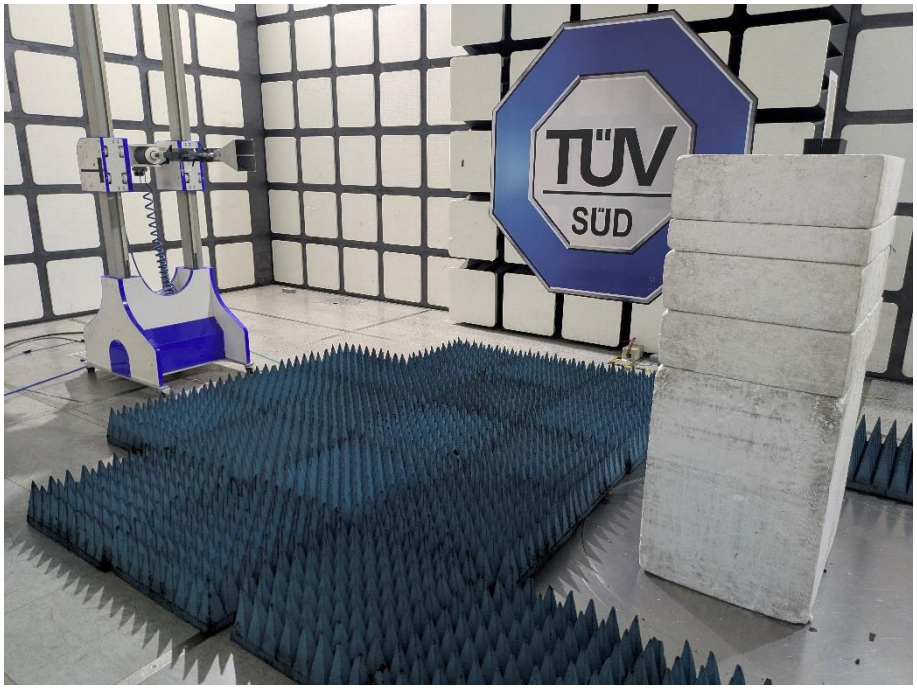

Figure 44 - 1GHz to 8 GHz

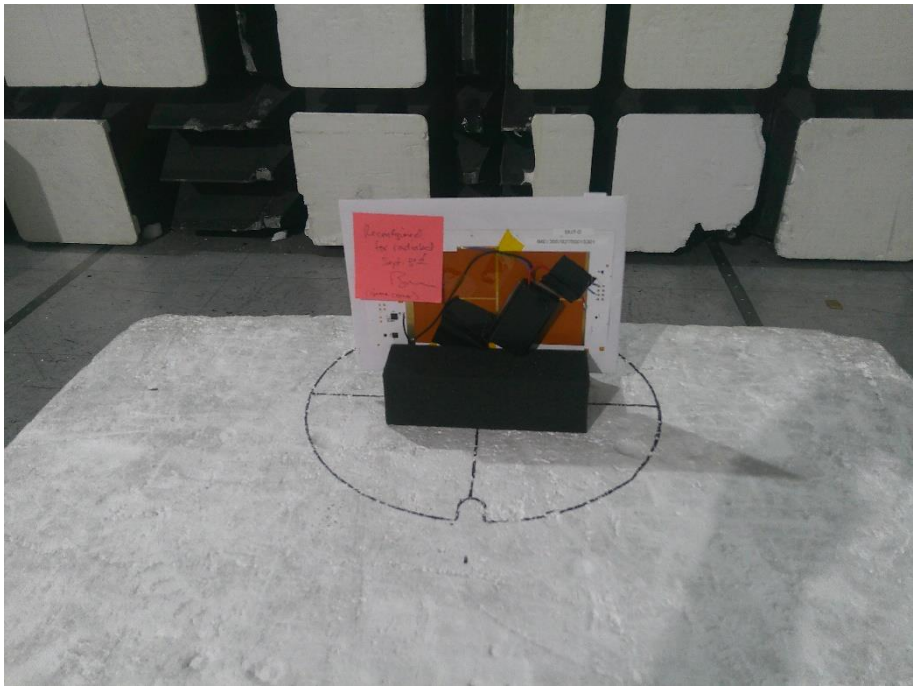

Figure 45 – EUT Orientation, X Plane

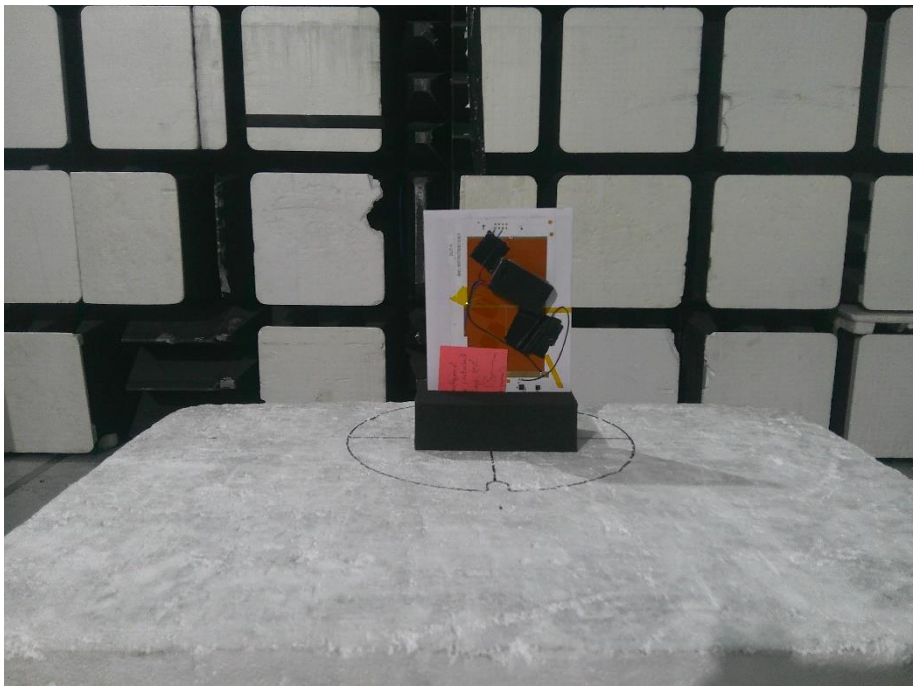

Figure 46 – EUT Orientation, Y Plane

Figure 47 – EUT Orientation, Z Plane

4 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Maximum Conducted Output Power	±3.2 dB
Occupied Bandwidth	±4.505 kHz
Spurious Emissions at Band Edge	±3.454 dB
Frequency Stability	±4.334 kHz
Modulation Characteristics	-
Radiated Spurious Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB

Table 42

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.