

FCC and ISED Test Report

Reelables, Inc
Model: RA0002



In accordance with FCC 47 CFR Part 15C and ISED RSS-247 and ISED RSS-GEN

Prepared for: Reelables, Inc.
600 1st Ave Ste 330-76660
Seattle, WA
98104-2246, US

FCC ID: 2A7TQRA0002 IC: 33042-RA0002

COMMERCIAL-IN-CONFIDENCE

Document 75967623-05 Issue 01

SIGNATURE			
NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	09 June 2026
Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.			
RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Wenceslao Acosta Carrazco	09 June 2026	
	Joshua Peploe-Williams	09 June 2026	
	Ahmad Javid	09 June 2026	

FCC Accreditation: 492497/UK2010 Octagon House, Fareham Test Laboratory
ISED Accreditation: 12669A/UK0003 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY / ENGINEERING STATEMENT
The measurements shown in this report were made in accordance with the procedures described on the test pages A sample of this product was tested to demonstrate limited compliance with FCC 47 CFR Part 15C 2024, ISED RSS-247 Issue 4 (2025-07) and ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) for the tests detailed in section 1.3. The sample tested was found to comply with the requirements defined in the applied rules.

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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
01	First version	09 June 2026

Table 1

1.2 Introduction

Applicant	Reelables, Inc. 600 1st Ave Ste 330-76660 Seattle, WA 98104-2246, US
Manufacturer	Reelables Europe, Ltd. 14 Windsor St. London N1 8QG UK.
Product Marketing Name (PMN) or Host Marketing Name (HMN)	A-Label
Hardware Version Identification Number (HVIN)	RA0002
Serial Number(s)	Not Serialised (FAR-1023223-002) Not Serialised (FAR-1023223-003) Not Serialised (FAR-1023223-004) Not Serialised (FAR-1023223-005) Not Serialised (FAR-1023223-006)
Firmware Version Identification Number (FVIN)	4.00
Number of Samples Tested	5
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2024 ISED RSS-247: Issue 4 (2025-07) ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02)
Order Number	PO-0022
Date	14-April-2026
Date of Receipt of EUT	16-April-2026
Start of Test	16-April-2026



Finish of Test	17-April-2026
Name of Engineer(s)	Wenceslao Acosta Carrazco, Joshua Peploe-Williams Ahmad Javid
Related Document(s)	ANSI C63.10-2020 +Cor.1-2023+C63.10a-2024



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C and ISED RSS-247 and ISED RSS-GEN is shown below.

Section	Specification Clause			Test Description	Result	Comments/Base Standard
	Part 15C	RSS-247	RSS-GEN			
Configuration and Mode: DC Powered - BLE						
-	15.203	-	-	Antenna Requirement	N/T	The EUT meets the requirements of 15.203 as it uses permanently attached integral antennas
2.1	15.205	2.4	8.10	Restricted Band Edges	Pass	ANSI C63.10-2020 +Cor.1-2023+C63.10a-2024
2.2	15.247 (a)(2)	6.3.1	6.7	Emission Bandwidth	Pass	ANSI C63.10-2020 +Cor.1-2023+C63.10a-2024
2.3	15.247 (b)	6.3.2	6.12	Maximum Conducted Output Power	Pass	ANSI C63.10-2020 +Cor.1-2023+C63.10a-2024
2.4	15.247 (d),	6.6	-	Authorised Band Edges	Pass	ANSI C63.10-2020 +Cor.1-2023+C63.10a-2024
2.5	15.247 (d) and 15.209	2.4 & 6.6	6.13 & 8.9	Spurious Radiated Emissions	Pass	ANSI C63.10-2020 +Cor.1-2023+C63.10a-2024
2.6	15.247 (e),	6.3.1	6.12	Power Spectral Density	Pass	ANSI C63.10-2020 +Cor.1-2023+C63.10a-2024

Table 2



The following information is required for RSP-100 Form B:

Requirement	Band 1	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7	Band 8
RSS # and Issue #								
Frequency Minimum (MHz)	2400							
Frequency Maximum (MHz)	2483.5							
RF Peak Conducted Output Power EIRP (W)	0.0033							
Measured BW (kHz) (99%)	1251							
Measured BW (kHz) (6dB)	1005							
Calculated BW	N/A							
Modulation Type	N/A							
Emission Classification	N/A							
Spurious emissions (dBμV/m at 3m)	50.03							

Table 3



1.4 Customer Supplied 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>		RA0002 is a Bluetooth Low Energy transmitter in the form factor of a thin shipping label/tag for asset and parcel identification. The device transmits Bluetooth LE advertisements only. The Bluetooth radio is TX-only, implemented at chipset level (no radio module), and configured for LE 1M PHY only	
Manufacturer:		Reelables Europe, Ltd.	
Product Marketing Name (PMN) or Host Marketing Name (HMN): (If Applicable; HMN is applicable for devices integrating pre-approved modules, otherwise use PMN)		A-Label	
Hardware Version Identification Number (HVIN): (Formally Model Number)		RA0002	
Firmware Version Identification Number (FVIN)		4.00	
FCC ID of the product under test – see guidance here		2A7TQRA0002	
IC ID of the product under test – see guidance here		33042-RA0002	
Device Category	Mobile ☐	Portable ☒	Fixed ☐
Equipment is fitted with an Audio Low Pass Filter		Yes ☐	No ☒

Intentional Radiators

Technology	Bluetooth Low Energy					
Frequency Range (MHz to MHz)	2400-2483.5					
Conducted Declared Output Power (dBm)	2.5					
Antenna Gain (dBi)	3.41					
Supported Bandwidth(s) (MHz) (e.g. 1 MHz, 20 MHz, 40 MHz)	1					
Modulation Scheme(s) (e.g. GFSK, QPSK etc)	GFSK					
ITU Emission Designator (see guidance here) (not mandatory for Part 15 devices)	1M00GXW					
Bottom Frequency (MHz)	2402					
Middle Frequency (MHz)	2440					
Top Frequency (MHz)	2480					



Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	2483.5 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	2402 MHz
Class A ☒ Class B ☐	

AC Power Source

AC supply frequency:	N/A	Hz
Voltage	N/A	V
Max current:	N/A	A
N/A		

DC Power Source

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

Battery Power Source

Voltage:	3.0	V
End-point voltage:	1.2	V (Point at which the battery will terminate)
Alkaline ☐ Leclanche ☐ Lithium ☐ Nickel Cadmium ☐ Lead Acid* ☐ *(Vehicle regulated)		
Other ☒	Please detail:	Zinc-Manganese

Charging

Can the EUT transmit whilst being charged	Yes ☐ No ☒
---	---

Temperature

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



Cable Loss

Adapter Cable Loss (Conducted sample)	0.54	dB
--	------	----

Antenna Characteristics

Antenna connector ☐			State impedance		Ohm
Temporary antenna connector ☐			State impedance		Ohm
Integral antenna ☒	Type:	Internal	Gain	3.41	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.

Ancillaries (if applicable)

Manufacturer:		Part Number:	
Model:		Country of Origin:	

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

Name: Brian Krejcarek
 Position held: CTO
 Date: April 24, 2026



1.5 Product Information

1.5.1 Technical Description

RA0002 is a Bluetooth Low Energy transmitter in the form factor of a thin shipping label/tag for asset and parcel identification. The device transmits Bluetooth LE advertisements only. The Bluetooth radio is TX-only, implemented at chipset level (no radio module), and configured for LE 1M PHY only

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
Conducted RF Sample, Model: RA0002, Serial Number: Not Serialised (FAR-1023223-002)			
0	As supplied by the customer	Not Applicable	Not Applicable
Conducted RF Sample, Model: RA0002, Serial Number: Not Serialised (FAR-1023223-003)			
0	As supplied by the customer	Not Applicable	Not Applicable
Radiated RF Sample - Low Channel, Model: RA0002, Serial Number: Not Serialised (FAR-1023223-004)			
0	As supplied by the customer	Not Applicable	Not Applicable
Radiated RF Sample - High Channel, Model: RA0002, Serial Number: Not Serialised (FAR-1023223-005)			
0	As supplied by the customer	Not Applicable	Not Applicable
Radiated RF Sample - Middle Channel, Model: RA0002, Serial Number: Not Serialised (FAR-1023223-006)			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4



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: DC Powered - BLE		
Restricted Band Edges	Wenceslao Acosta Carrazco	UKAS
Emission Bandwidth	Joshua Peploe-Williams	UKAS
Maximum Conducted Output Power	Joshua Peploe-Williams	UKAS
Authorised Band Edges	Wenceslao Acosta Carrazco	UKAS
Spurious Radiated Emissions	Ahmad Javid	UKAS
Power Spectral Density	Joshua Peploe-Williams	UKAS

Table 5

Laboratory Address: TÜV SÜD, Octagon House,
Concorde Way, Fareham, Hampshire,
PO15 5RL, United Kingdom



2 Test Details

2.1 Restricted Band Edges

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205
ISED RSS-247, 2.4
ISED RSS-GEN, 8.10

2.1.2 Equipment Under Test and Modification State

RA0002, S/N: Not Serialised (FAR-1023223-004) - Modification State 0
RA0002, S/N: Not Serialised (FAR-1023223-005) - Modification State 0

2.1.3 Date of Test

17-April-2026

2.1.4 Test Method

DC Powered - BLE

This test was performed in accordance with ANSI C63.10, clause 6.10.5 and 11.12.1.
Plots for average measurements were taken in accordance with ANSI C63.10, clause 11.12.2.5.2.
EUT was powered with 3 VDC (2 x AA battery) for the duration of the measurement.
The following conversion can be applied to convert from dBµV/m to µV/m:
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$

2.1.5 Environmental Conditions

Ambient Temperature	22.4 °C
Relative Humidity	47.2 %

2.1.6 Test Results

DC Powered - BLE

Mode	Data Rate/MCS	Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
BLE	LE1M	2402	2390	50.19	37.20
BLE	LE1M	2480	2483.5	55.87	38.75

Table 6 - Restricted Band Edge Frequency Results

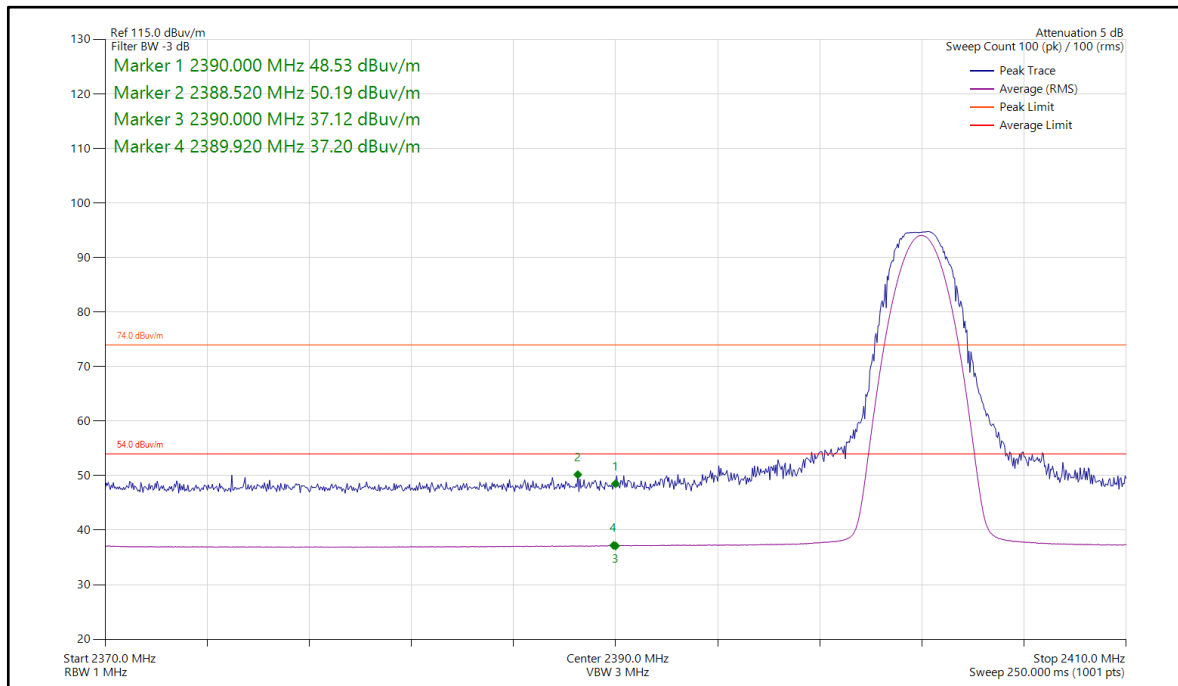


Figure 1 - BOT_RBE, 2402 MHz, Band Edge Frequency 2390 MHz

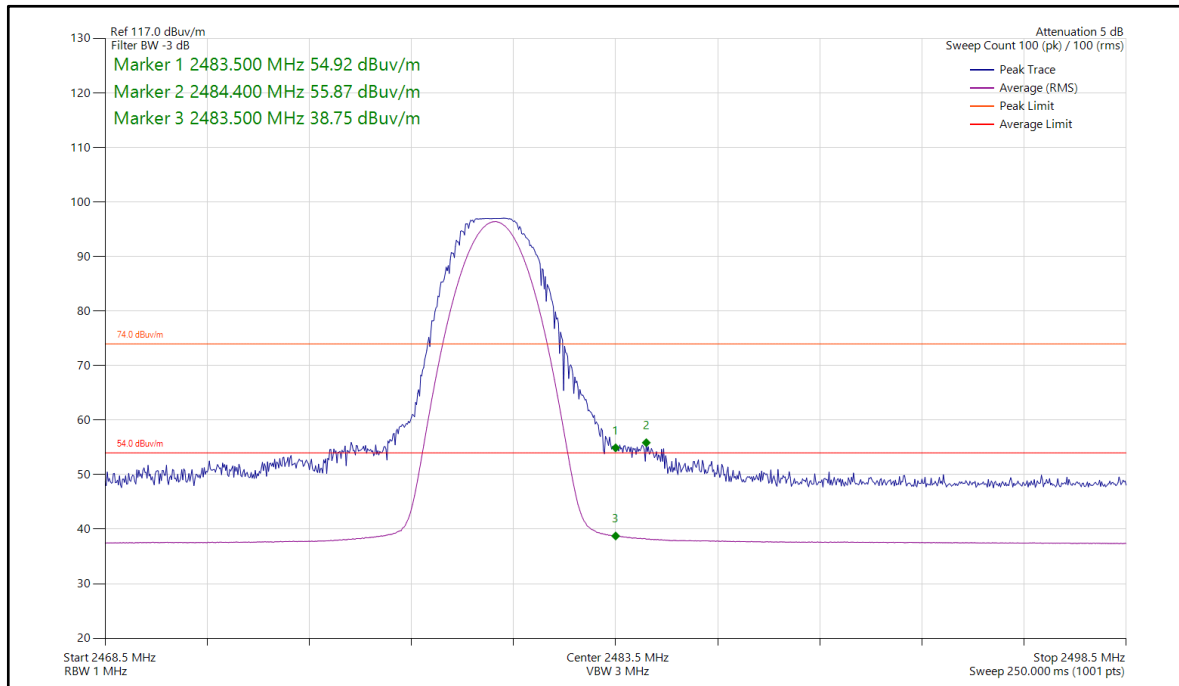


Figure 2 - TOP_RBE, 2480 MHz, Band Edge Frequency 2483.5 MHz

2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
3m Semi-Anechoic Chamber	Rainford	RF Chamber 5	1545	36	23-Apr-2027
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Mast Controller	Maturo GmbH	NCD	4810	-	TU
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	4811	-	TU
Antenna (DRG, 1 GHz to 10.5 GHz)	Schwarzbeck	BBHA9120B	4848	12	05-Jul-2026
Test Receiver	Rohde & Schwarz	ESW44	5084	12	08-Jan-2027
Emissions Software	TUV SUD	EmX V3.6.1	5125	-	Software
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5481	12	14-May-2026
Cable (SMA to SMA, 2 m)	Junkosha	MWX221-02000AMSAMS/A	5517	12	06-Jun-2026
Cable Assy 8m (N to N) 18GHz	Junkosha	MWX221-08000NMSNMS/B	7050	12	03-Oct-2026

Table 7

TU - Traceability Unscheduled

2.2 Emission Bandwidth

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)
ISED RSS-247, 6.3.1
ISED RSS-GEN, 6.7

2.2.2 Equipment Under Test and Modification State

RA0002, S/N: Not Serialised (FAR-1023223-002) - Modification State 0

2.2.3 Date of Test

16-April-2026

2.2.4 Test Method

DC Powered - BLE

This test was performed in accordance with ANSI C63.10, clause 11.8.1 for 6 dB BW and 6.9.3 for 99% occupied bandwidth measurements.

The EUT was battery powered for the duration of the test.

2.2.5 Example Test Setup Diagrams

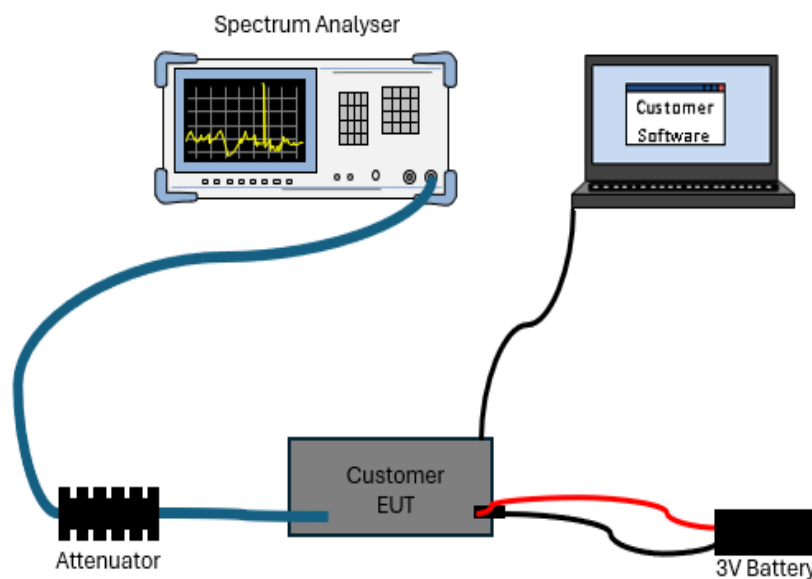


Figure 3

2.2.6 Environmental Conditions

Ambient Temperature	27.7 °C
Relative Humidity	48.8 %



2.2.7 Test Results

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (a)(2) RSS-247 6.3.1	Test Method(s):	C63.10 6.9.3 C63.10 11.8.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	BLE GFSK (LE 1M)	Duty Cycle (%):	-
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	Soldered SMA	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	1.005	-	-	-	≥500.0
2440	0.961	-	-	-	≥500.0
2480	0.982	-	-	-	≥500.0

Table 8 – 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2402	1.182	-	-	-	-
2440	1.251	-	-	-	-
2480	1.247	-	-	-	-

Table 9 – 99% Bandwidth Results

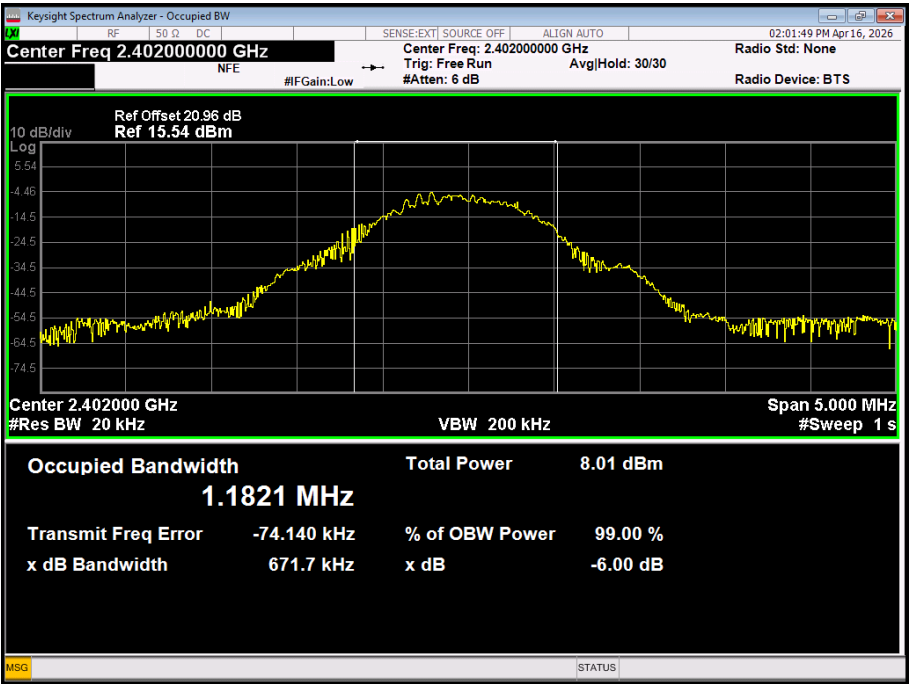


Figure 4 - 2402 MHz (CH37) 99% Bandwidth

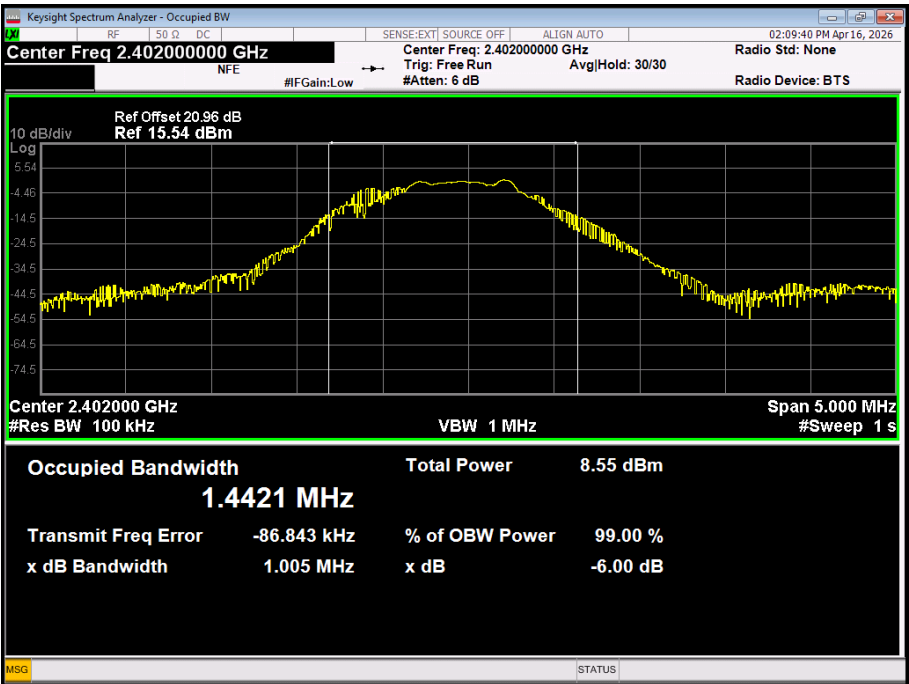


Figure 5 - 2402 MHz (CH37) 6 dB Bandwidth

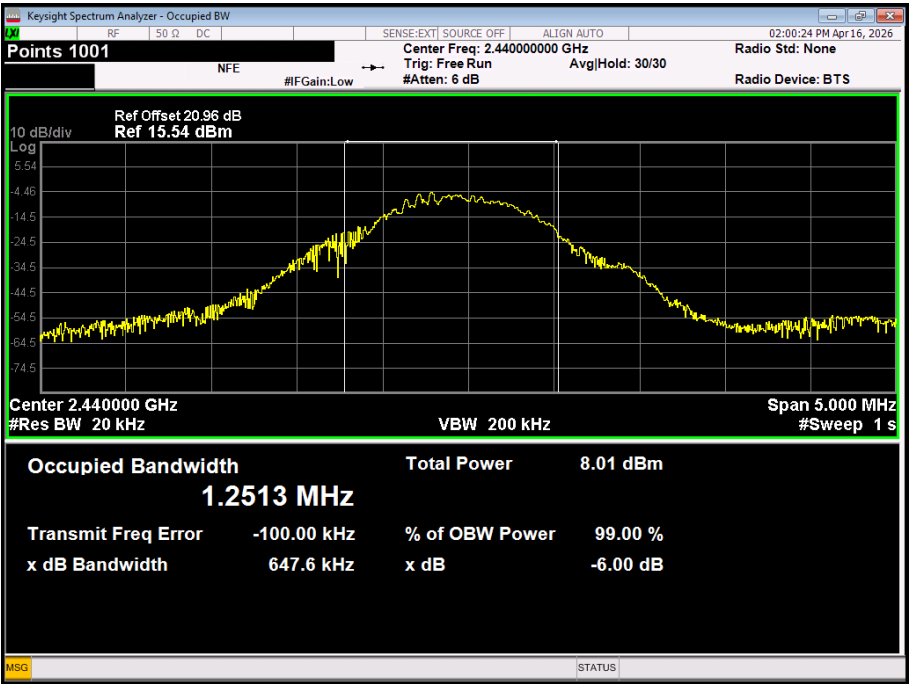


Figure 6 - 2440 MHz (CH17) 99% Bandwidth

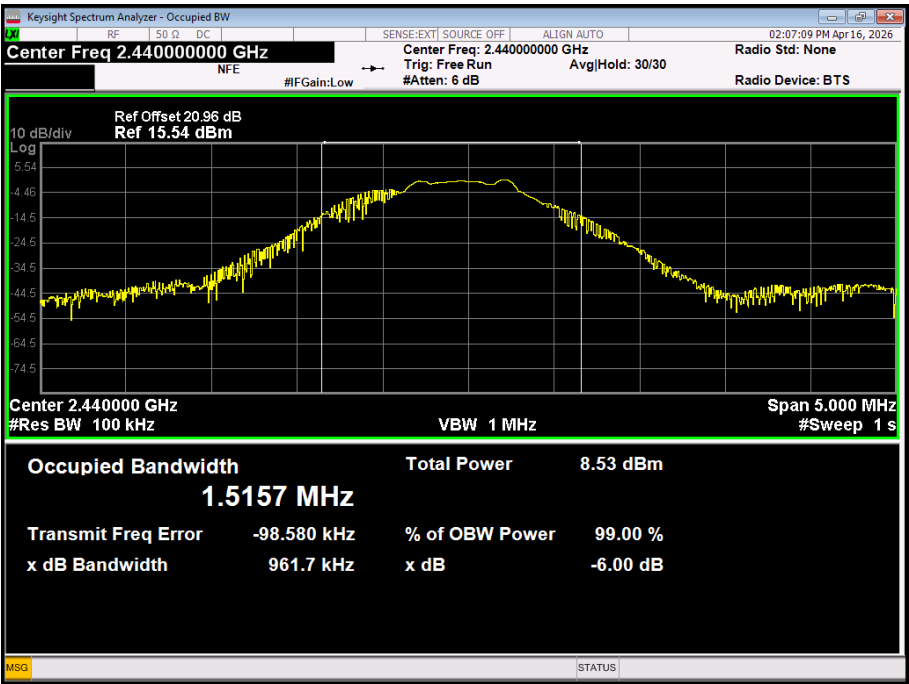


Figure 7 - 2440 MHz (CH17) 6 dB Bandwidth

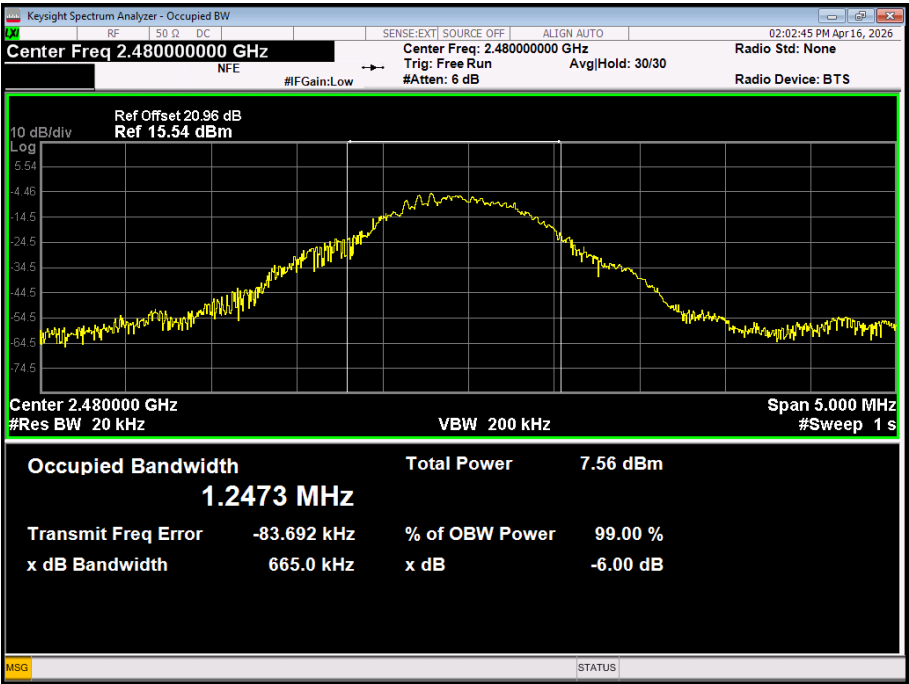


Figure 8 - 2480 MHz (CH39) 99% Bandwidth

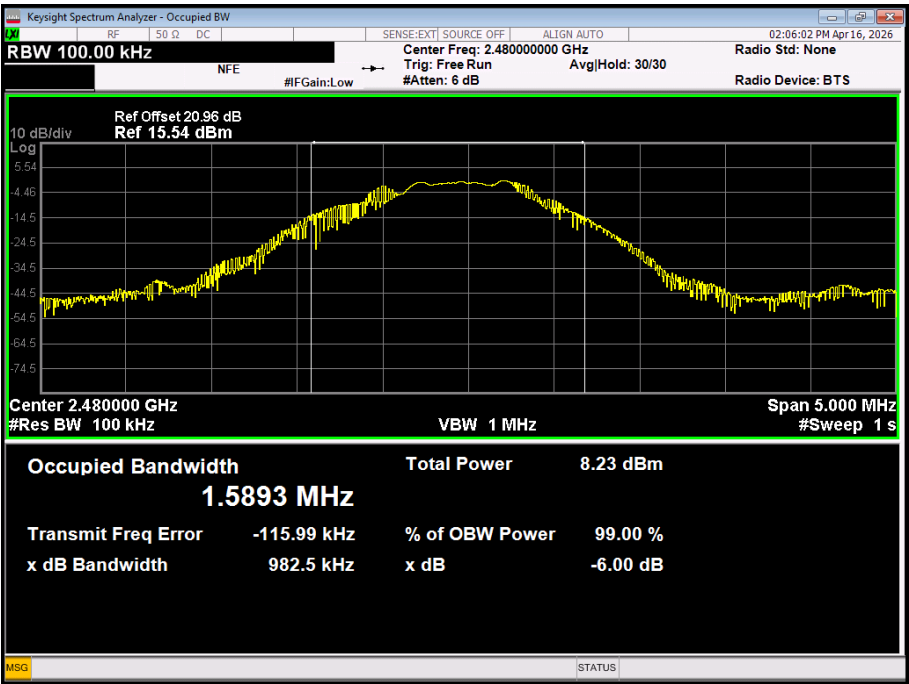


Figure 9 - 2480 MHz (CH39) 6 dB Bandwidth



2.2.8 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
Hygrometer	Rotronic	I-1000	2891	12	23-Dec-2026
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	17-Sep-2026
PXA Signal Analyser	Keysight Technologies	N9030A	4653	12	06-May-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6377	12	06-Sep-2026
20dB 10W/18GHz F/M SMA bidirectional Attenuator	Weinschel	WA41-20-0102	7027	12	06-Jun-2026

Table 10

2.3 Maximum Conducted Output Power

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (b)
ISED RSS-247, 6.3.2
ISED RSS-GEN, 6.12

2.3.2 Equipment Under Test and Modification State

RA0002, S/N: Not Serialised (FAR-1023223-003) - Modification State 0

2.3.3 Date of Test

17-April-2026

2.3.4 Test Method

DC Powered - BLE

The test was performed in accordance with ANSI C63.10 clause 11.9.1.2 Method PKPM1.
The EUT was battery powered for the duration of the test.

2.3.5 Example Test Setup Diagram

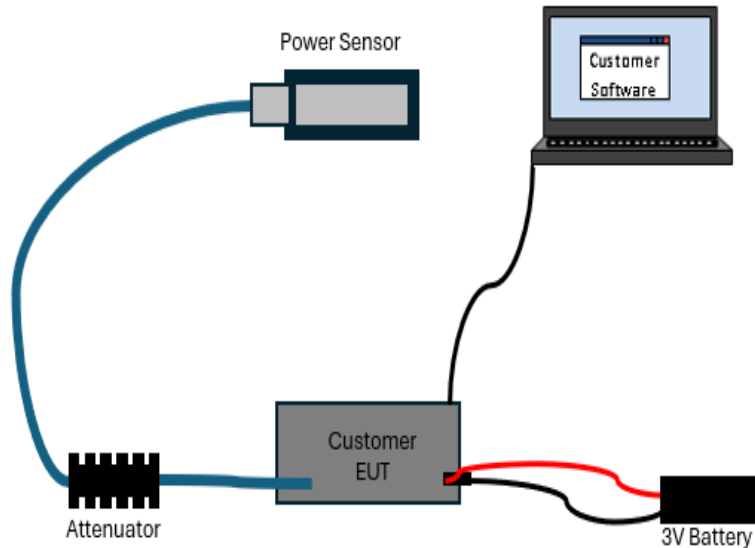


Figure 10

2.3.6 Environmental Conditions

Ambient Temperature	21.0 °C
Relative Humidity	47.2 %



2.3.7 Test Results

DC Powered - BLE

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (b)(3) RSS-247 6.3.2	Test Method(s):	C63.10 11.9.1.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	BLE GFSK (LE 1M)	Duty Cycle (%):	100
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	Soldered SMA	Peak Antenna Gain (dBi):	3.41

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2402	2.298	-	-	-	-	30.00	-27.702
2440	2.163	-	-	-	-	30.00	-27.837
2480	1.785	-	-	-	-	30.00	-28.215

Table 11 - FCC Maximum Conducted (peak) Output Power Results

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)	EIRP (dBm)	EIRP Limit (dBm)	EIRP Margin (dB)
	A	B	C	D	Σ					
2402	2.298	-	-	-	-	30.00	-27.702	5.708	36.00	-30.292
2440	2.163	-	-	-	-	30.00	-27.837	5.573	36.00	-30.427
2480	1.785	-	-	-	-	30.00	-28.215	5.195	36.00	-30.805

Table 12 - ISED Maximum Conducted (peak) Output Power Results

FCC 47 CFR Part 15, Limit Clause 15.247 (b)(3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

ISED RSS-247, Limit Clause 6.3.2

For DTS operating in the band 902-928 MHz, the maximum peak conducted output power shall not exceed 1W, and the e.i.r.p. shall not exceed 4 W.

For DTS operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W, and the e.i.r.p. shall not exceed 4 W, except as provided in RSS-247 section 6.5 a) and b).

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power.



2.3.8 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
Hygrometer	Rotronic	I-1000	2891	12	23-Dec-2026
USB Power Sensor	Boonton	RTP5008	5831	12	05-Feb-2027
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6377	12	06-Sep-2026
20dB 10W/18GHz F/M SMA bidirectional Attenuator	Weinschel	WA41-20-0102	7027	12	06-Jun-2026

Table 13



2.4 Authorised Band Edges

2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d)
ISED RSS-247, 6.6
ISED RSS-GEN, N/A

2.4.2 Equipment Under Test and Modification State

RA0002, S/N: Not Serialised (FAR-1023223-004) - Modification State 0

2.4.3 Date of Test

17-April-2026

2.4.4 Test Method

DC Powered - BLE

The test was performed in accordance with ANSI C63.10, clause 6.10.4.
EUT was powered with 3 VDC (2 x AA Battery) for the duration of the measurement.

2.4.5 Environmental Conditions

Ambient Temperature 22.4 °C
Relative Humidity 47.2 %

2.4.6 Test Results

DC Powered - BLE

Mode	Data Rate/MCS	Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
BLE	LE1M	2402	2400.0	-44.10

Table 14 - Authorized Band Edge Results



DC Powered - BLE

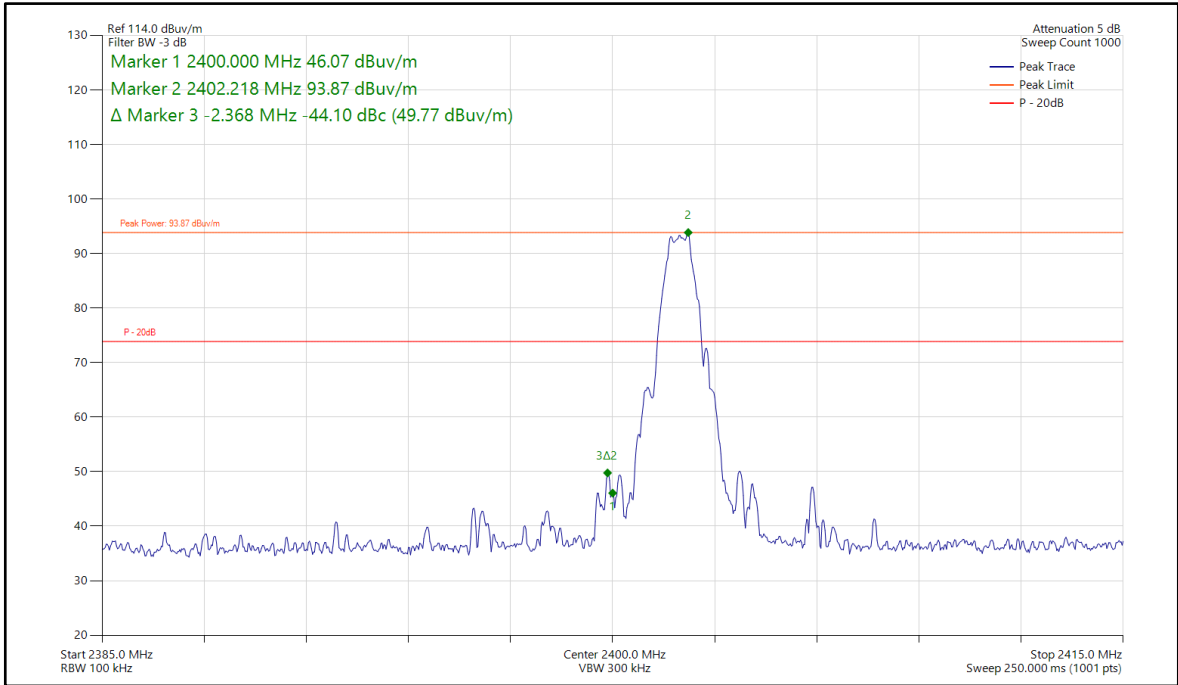


Figure 11 - BOT_ABE, 2402 MHz, Band Edge Frequency 2400 MHz

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

ISED RSS-247, Limit Clause 6.6

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

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
3m Semi-Anechoic Chamber	Rainford	RF Chamber 5	1545	36	23-Apr-2027
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Mast Controller	Maturo GmbH	NCD	4810	-	TU
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	4811	-	TU
Antenna (DRG, 1 GHz to 10.5 GHz)	Schwarzbeck	BBHA9120B	4848	12	05-Jul-2026
Test Receiver	Rohde & Schwarz	ESW44	5084	12	08-Jan-2027
Emissions Software	TUV SUD	EmX V3.6.1	5125	-	Software
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5481	12	14-May-2026
Cable (SMA to SMA, 2 m)	Junkosha	MWX221-02000AMSAMS/A	5517	12	06-Jun-2026
Cable Assy 8m (N to N) 18GHz	Junkosha	MWX221-08000NMSNMS/B	7050	12	03-Oct-2026

Table 15

TU - Traceability Unscheduled



2.5 Spurious Radiated Emissions

2.5.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d) and 15.209
ISED RSS-247, 2.4 and 6.6
ISED RSS-GEN, 6.13 and 8.9

2.5.2 Equipment Under Test and Modification State

RA0002, S/N: Not Serialised (FAR-1023223-004) - Modification State 0
RA0002, S/N: Not Serialised (FAR-1023223-005) - Modification State 0
RA0002, S/N: Not Serialised (FAR-1023223-006) - Modification State 0

2.5.3 Date of Test

16-April-2026 to 17-April-2026

2.5.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.5 and 6.6.
For frequencies > 1 GHz, plots for average measurements were taken in accordance with ANSI C63.10, clause 11.12.2.5.2.

The EUT was placed on the non-conducting platform in a manner typical of a normal installation. As the EUT was considered mobile/portable and therefore reasonable to be used in multiple planes, pre-scans were performed with the EUT orientated in X, Y and Z planes with reference to the ground plane.

The plots shown are the characterisation of the EUT. The limits on the plots represent the most stringent case for restricted bands, (74/54 dBuV/m) when compared to 20 dBc outside restricted bands. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBuV/m to uV/m:
 $10^{(\text{Field Strength in dBuV/m}/20)}$

Above 18 GHz, the measurement distance was reduced to 1 m. The limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54$ dB.

At a measurement distance of 1 meter the limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54$ dB. Where formal measurements have been necessary, the results have been presented in the emissions table.

The DUT was powered by two AA (1.5V) batteries.

2.5.5 Example Test Setup Diagram

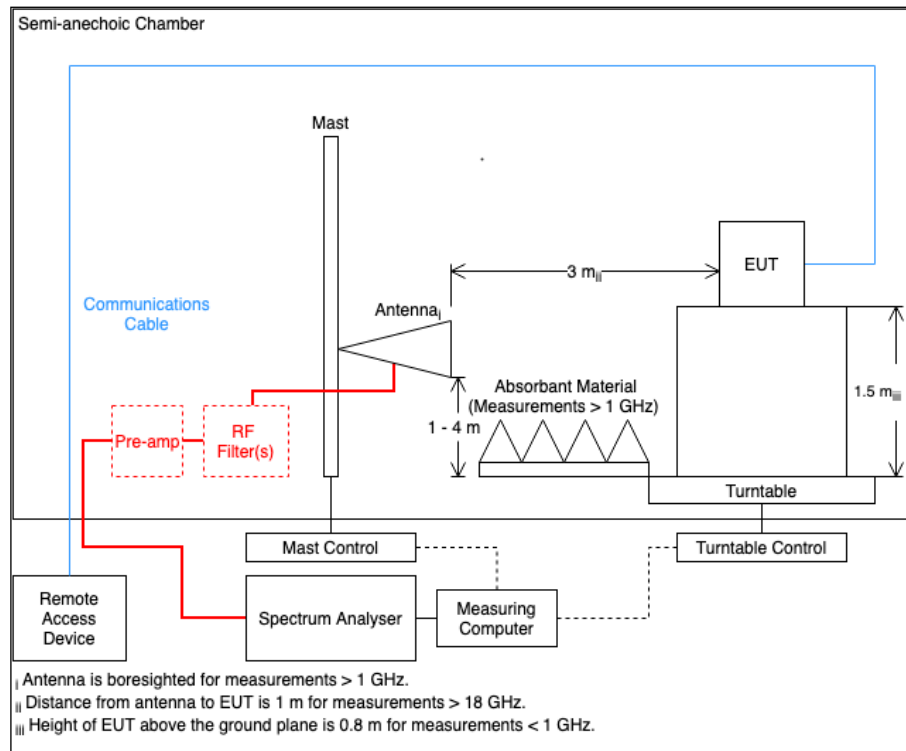


Figure 12

2.5.6 Environmental Conditions

Ambient Temperature	22.4 - 23.1 °C
Relative Humidity	46.8 - 47.2 %

2.5.7 Test Results

DC Powered - BLE

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
7440.512	45.17	54.00	-8.83	CISPR Avg	dBuv/m	214	154	Vertical
7440.650	50.03	54.00	-3.97	CISPR Avg	dBuv/m	302	400	Horizontal

Table 16 - Ch39_BLE_LE1M - X, 2480 MHz, 30 MHz to 25 GHz

No other emissions found within 10 dB of the limit.

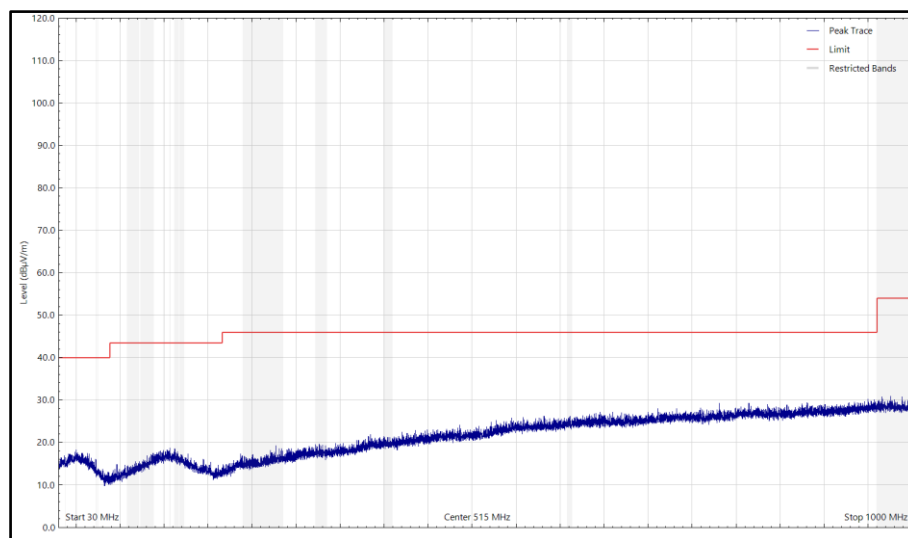


Figure 13 - Ch39_BLE_LE1M - X, 2480 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

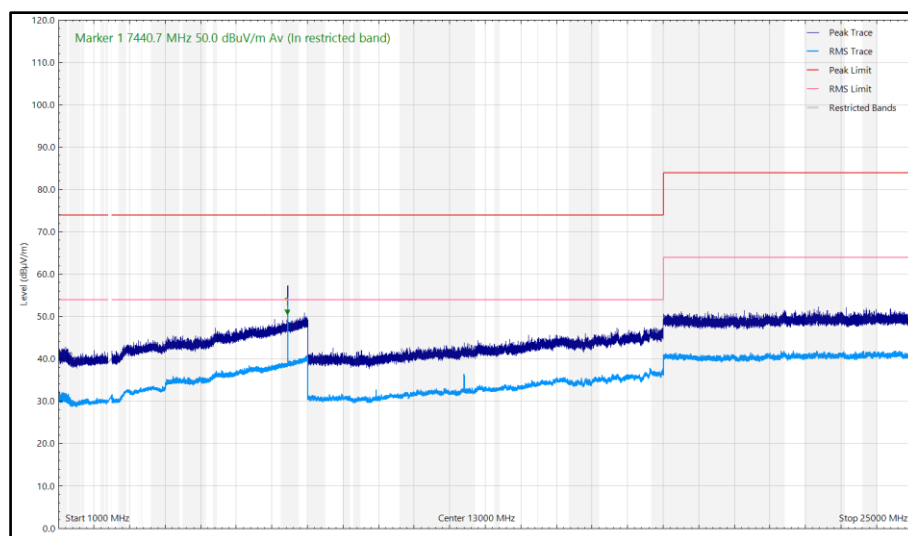


Figure 14 - Ch39_BLE_LE1M - X, 2480 MHz, 1 GHz to 25 GHz, Horizontal

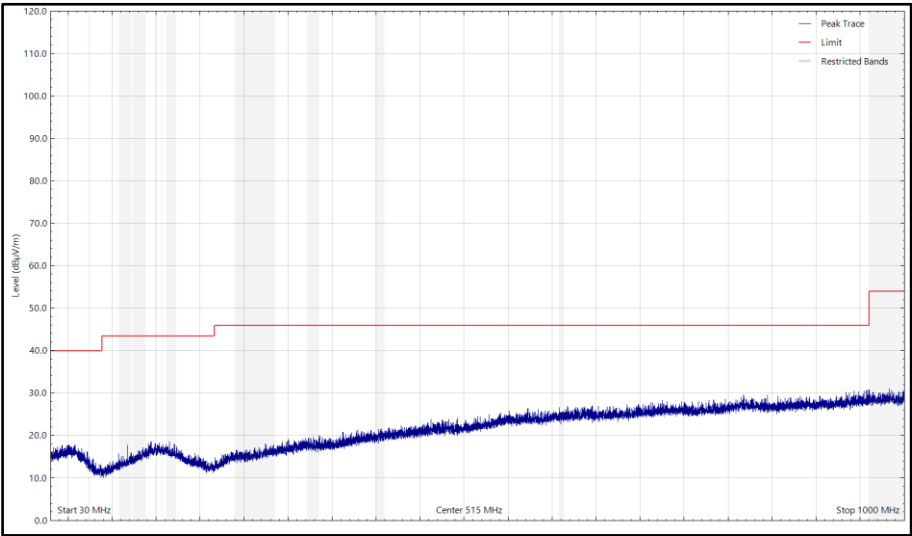


Figure 15 - Ch39_BLE_LE1M - X, 2480 MHz, 30 MHz to 1 GHz, Vertical (Peak)

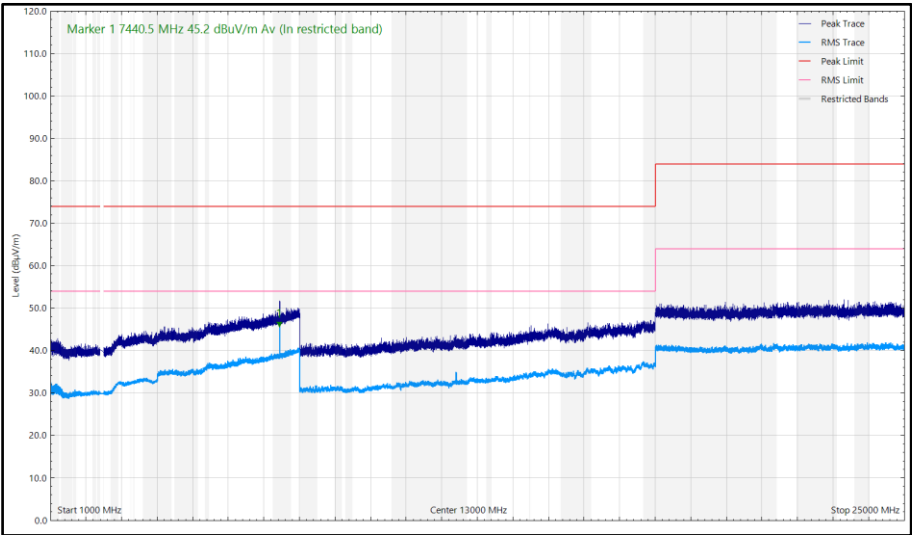


Figure 16 - Ch39_BLE_LE1M - X, 2480 MHz, 1 GHz to 25 GHz, Vertical

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
7439.003	45.54	54.00	-8.46	CISPR Avg	dBuv/m	93	155	Horizontal
7439.050	45.57	54.00	-8.43	CISPR Avg	dBuv/m	198	150	Vertical

Table 17 - Ch39_BLE_LE1M - Y, 2480 MHz, 30 MHz to 25 GHz

No other emissions found within 10 dB of the limit.

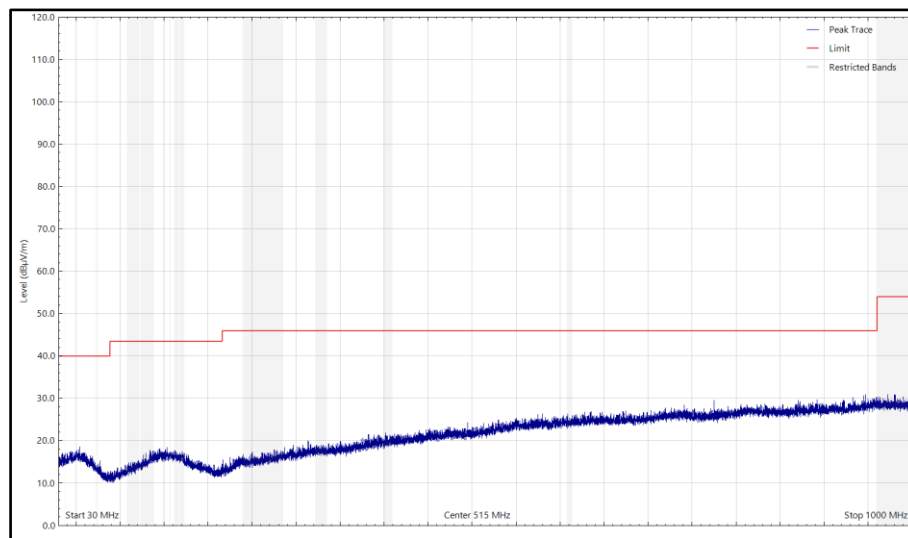


Figure 17 - Ch39_BLE_LE1M - Y, 2480 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

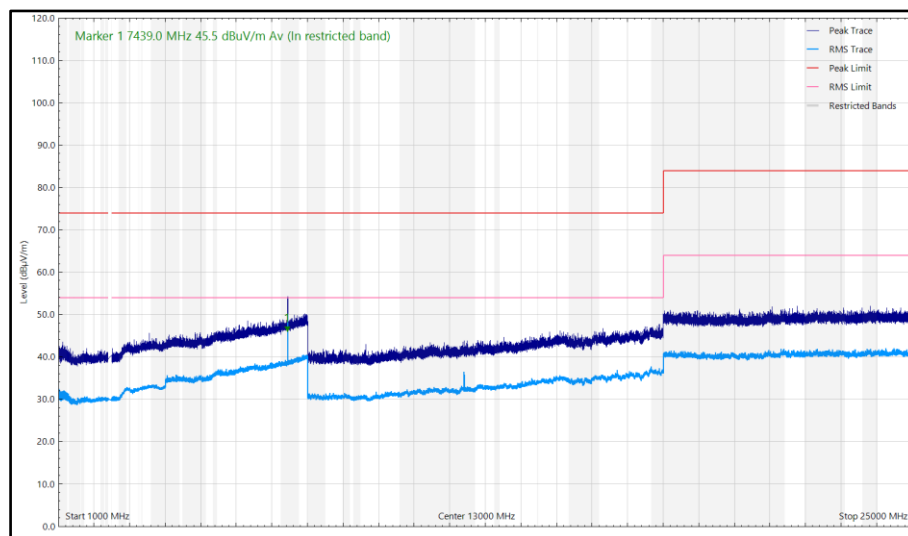


Figure 18 - Ch39_BLE_LE1M - Y, 2480 MHz, 1 GHz to 25 GHz, Horizontal

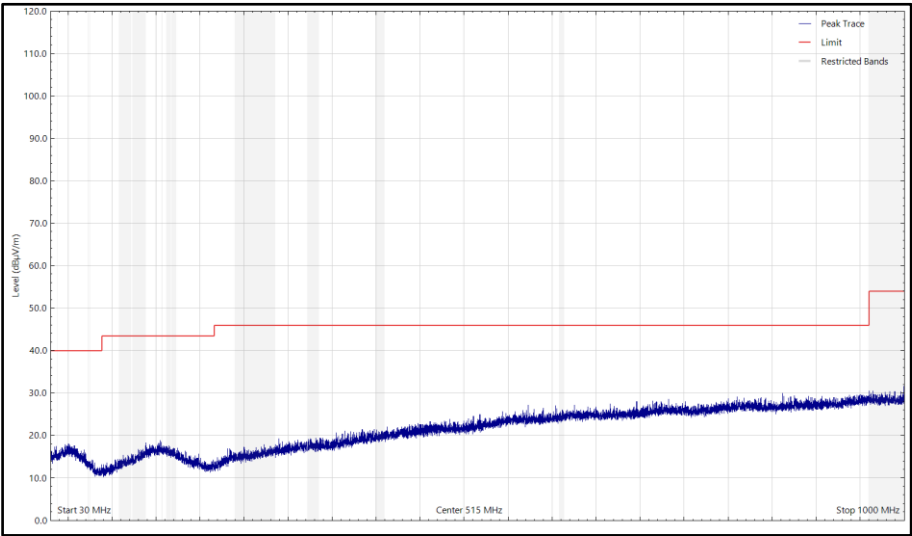


Figure 19 - Ch39_BLE_LE1M - Y, 2480 MHz, 30 MHz to 1 GHz, Vertical (Peak)

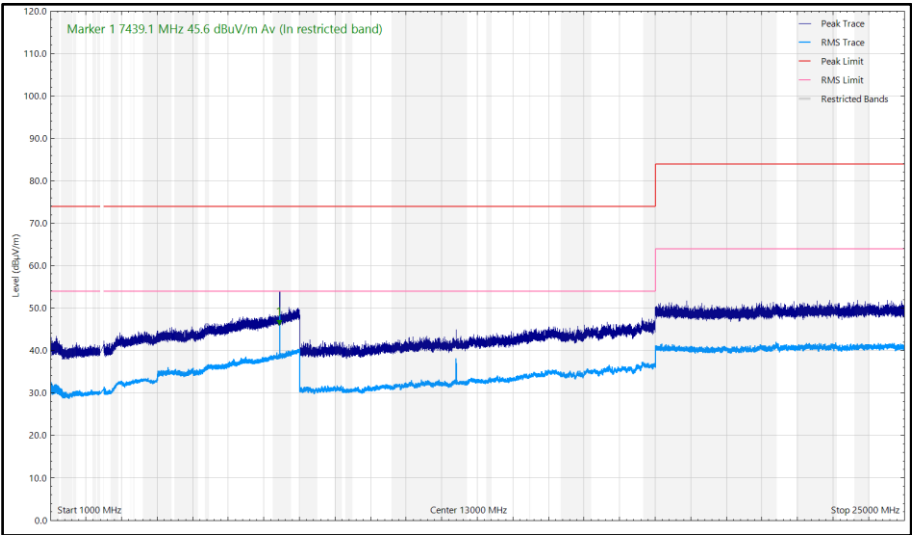


Figure 20 - Ch39_BLE_LE1M - Y, 2480 MHz, 1 GHz to 25 GHz, Vertical

Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
7439.105	47.24	54.00	-6.76	CISPR Avg	dBuV/m	262	163	Vertical
7440.420	44.83	54.00	-9.17	CISPR Avg	dBuV/m	215	198	Horizontal

Table 18 - Ch39_BLE_LE1M - Z, 2480 MHz, 30 MHz to 25 GHz

No other emissions found within 10 dB of the limit.

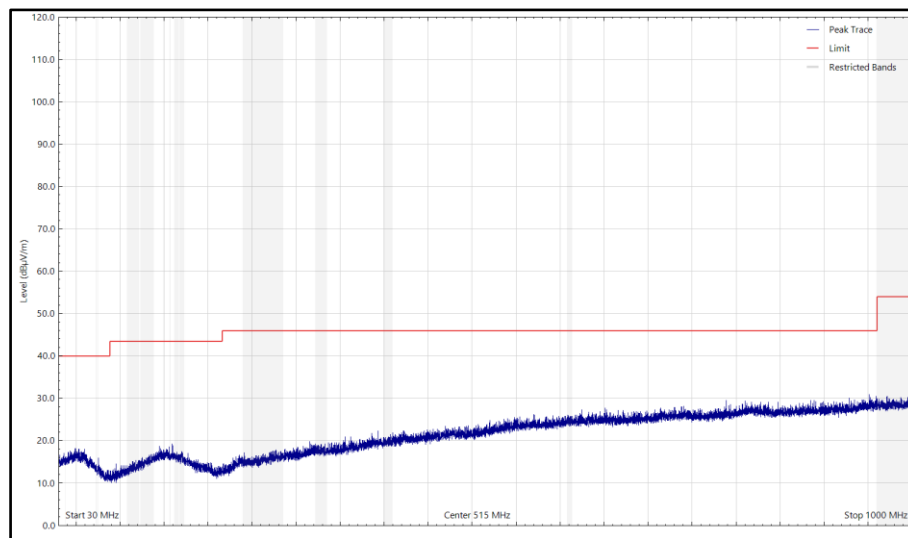


Figure 21 - Ch39_BLE_LE1M - Z, 2480 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

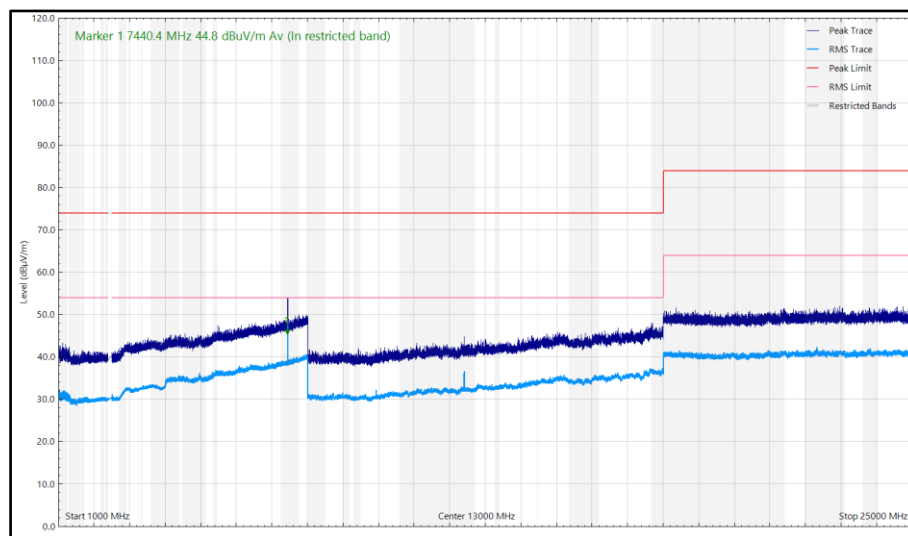


Figure 22 - Ch39_BLE_LE1M - Z, 2480 MHz, 1 GHz to 25 GHz, Horizontal

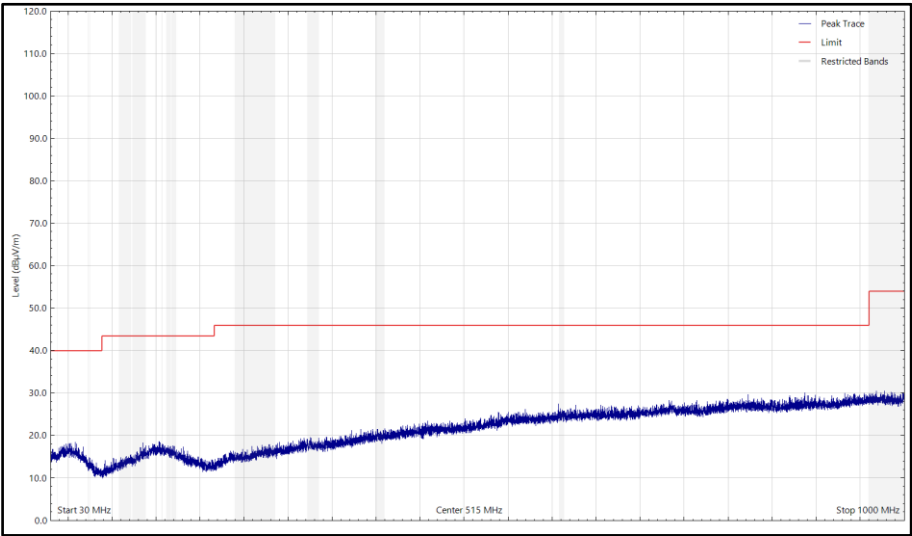


Figure 23 - Ch39_BLE_LE1M - Z, 2480 MHz, 30 MHz to 1 GHz, Vertical (Peak)

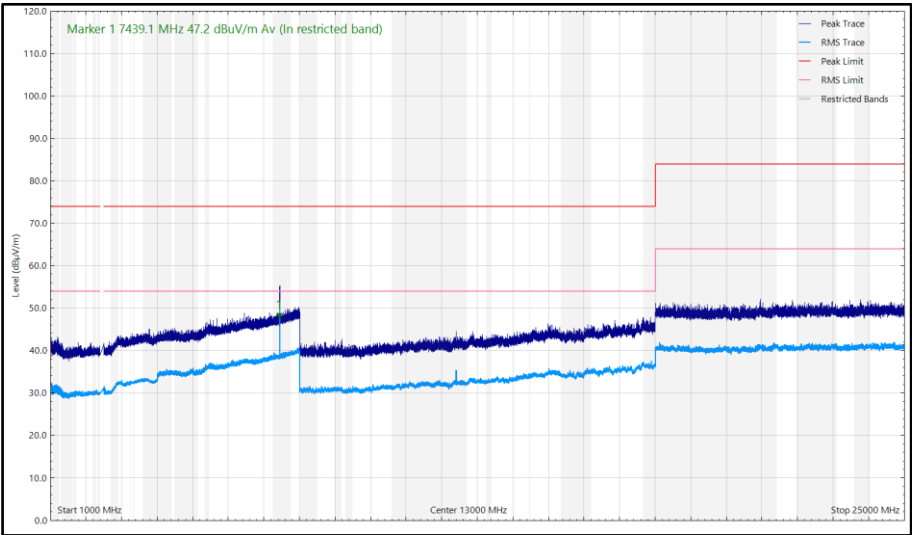


Figure 24 - Ch39_BLE_LE1M - Z, 2480 MHz, 1 GHz to 25 GHz, Vertical



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

Table 19 - CH17_BLE_LE1M - Z, 2440 MHz, 30 MHz to 25 GHz

*No emissions found within 10 dB of the limit.

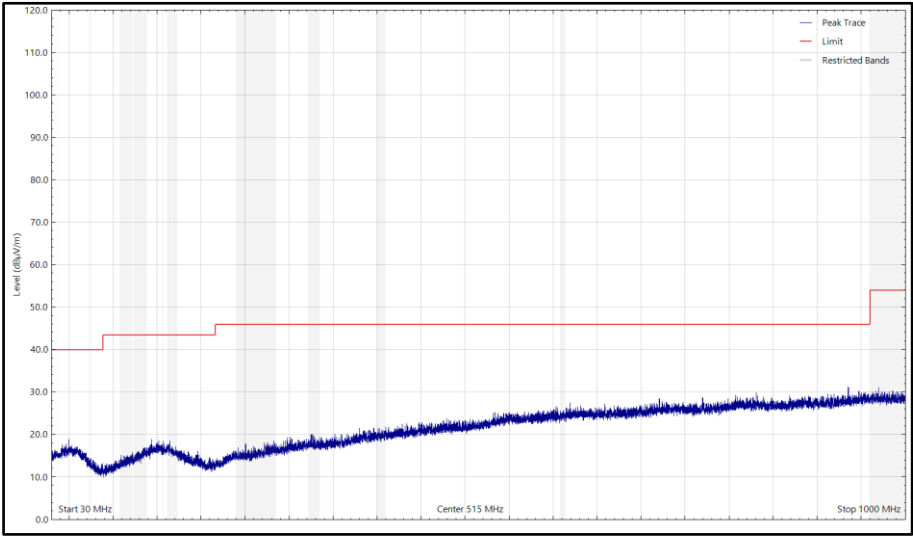


Figure 25 - CH17_BLE_LE1M - Z, 2440 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

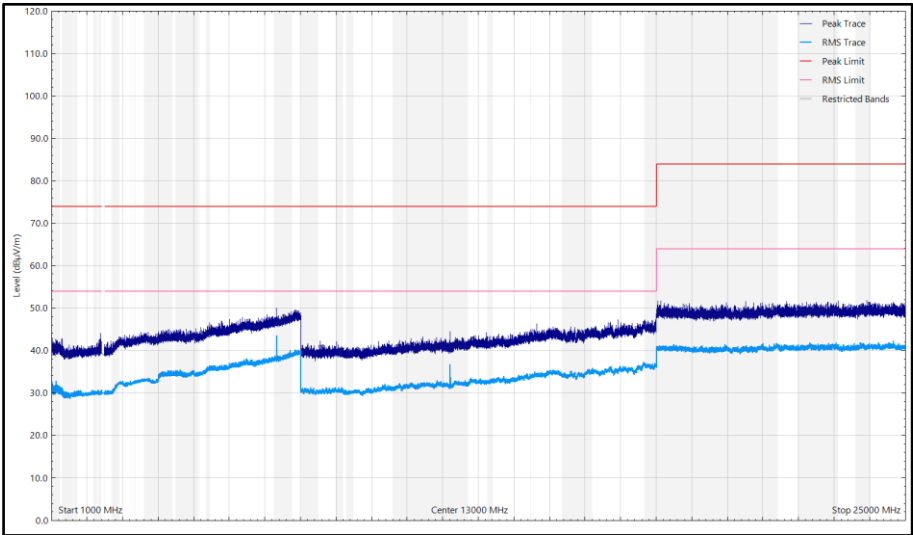


Figure 26 - CH17_BLE_LE1M - Z, 2440 MHz, 1 GHz to 25 GHz, Horizontal

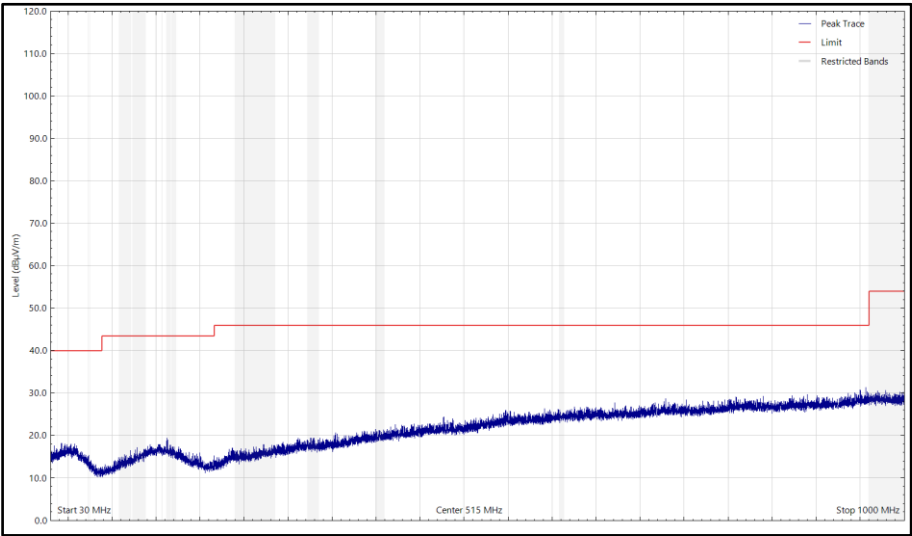


Figure 27 - CH17_BLE_LE1M - Z, 2440 MHz, 30 MHz to 1 GHz, Vertical (Peak)

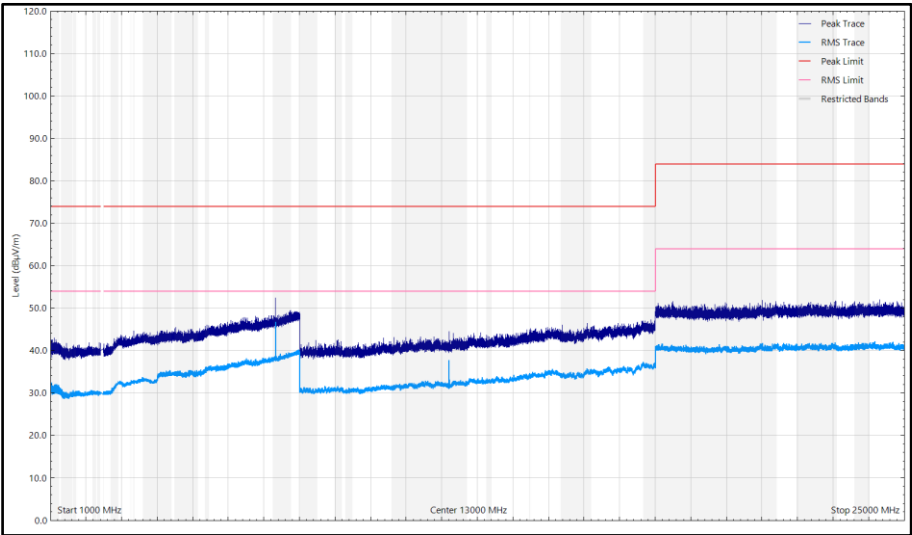


Figure 28 - CH17_BLE_LE1M - Z, 2440 MHz, 1 GHz to 25 GHz, Vertical



Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
7319.143	45.51	54.00	-8.49	CISPR Avg	dBuv/m	78	150	Vertical
7320.560	44.57	54.00	-9.43	CISPR Avg	dBuv/m	59	150	Horizontal

Table 20 - CH17_BLE_LE1M - Y, 2440 MHz, 30 MHz to 25 GHz

No other emissions found within 10 dB of the limit.

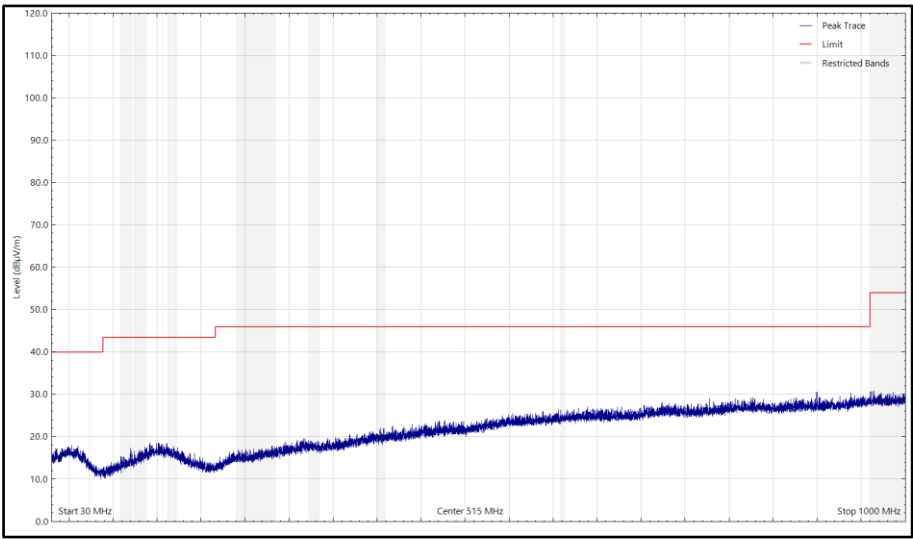


Figure 29 - CH17_BLE_LE1M - Y, 2440 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

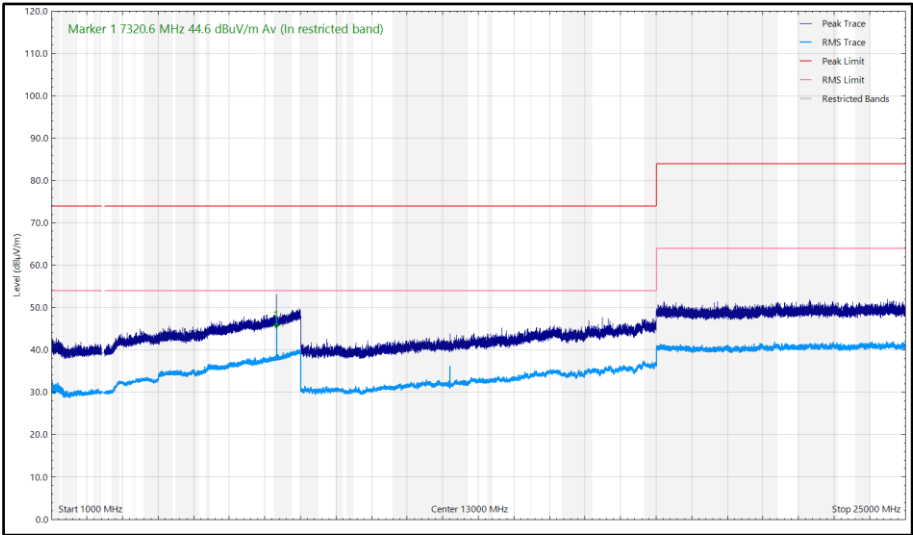


Figure 30 - CH17_BLE_LE1M - Y, 2440 MHz, 1 GHz to 25 GHz, Horizontal

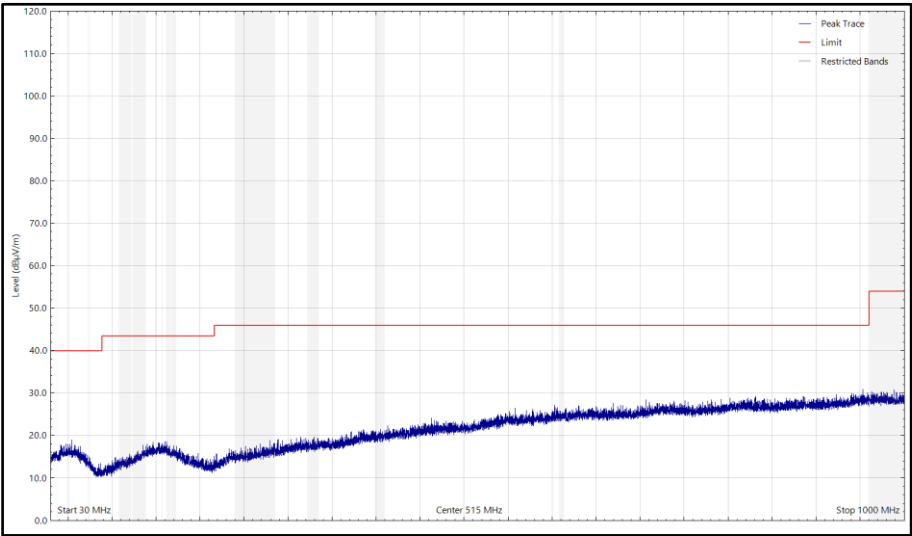


Figure 31 - CH17_BLE_LE1M - Y, 2440 MHz, 30 MHz to 1 GHz, Vertical (Peak)

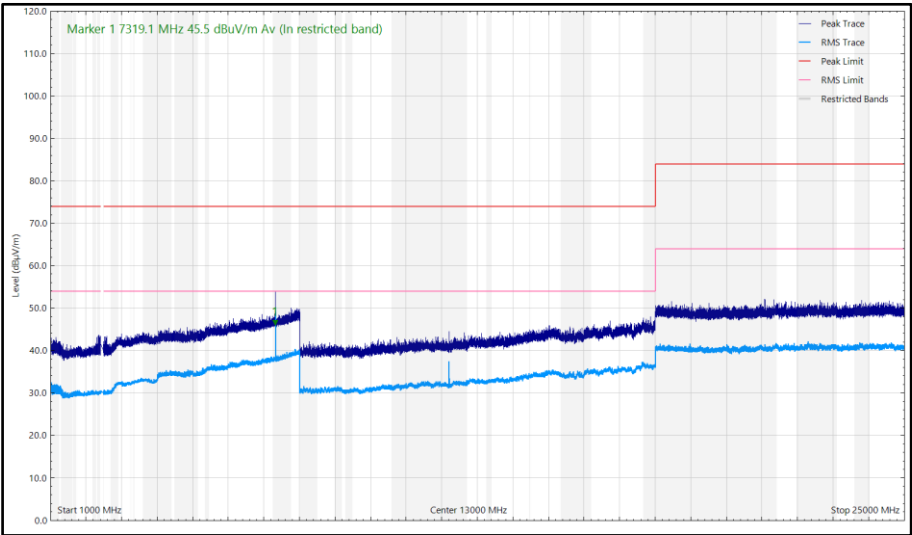


Figure 32 - CH17_BLE_LE1M - Y, 2440 MHz, 1 GHz to 25 GHz, Vertical



Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
7318.993	45.19	54.00	-8.81	CISPR Avg	dBuv/m	82	150	Horizontal

Table 21 - CH17_BLE_LE1M - X, 2440 MHz, 30 MHz to 25 GHz

No other emissions found within 10 dB of the limit.

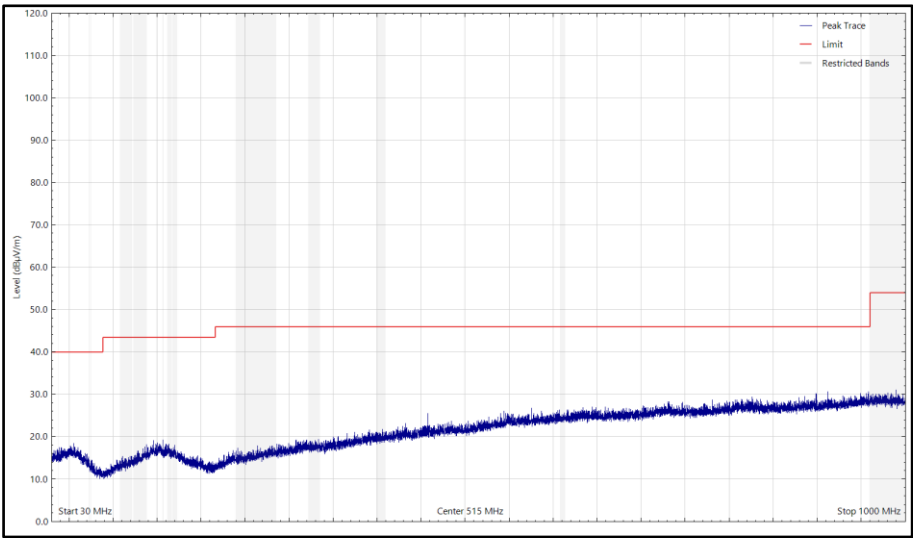


Figure 33 - CH17_BLE_LE1M - X, 2440 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

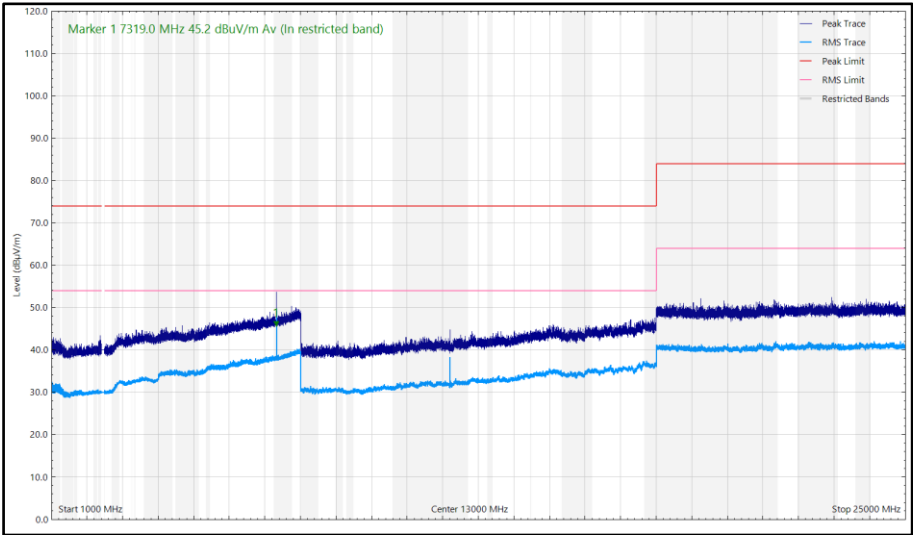


Figure 34 - CH17_BLE_LE1M - X, 2440 MHz, 1 GHz to 25 GHz, Horizontal

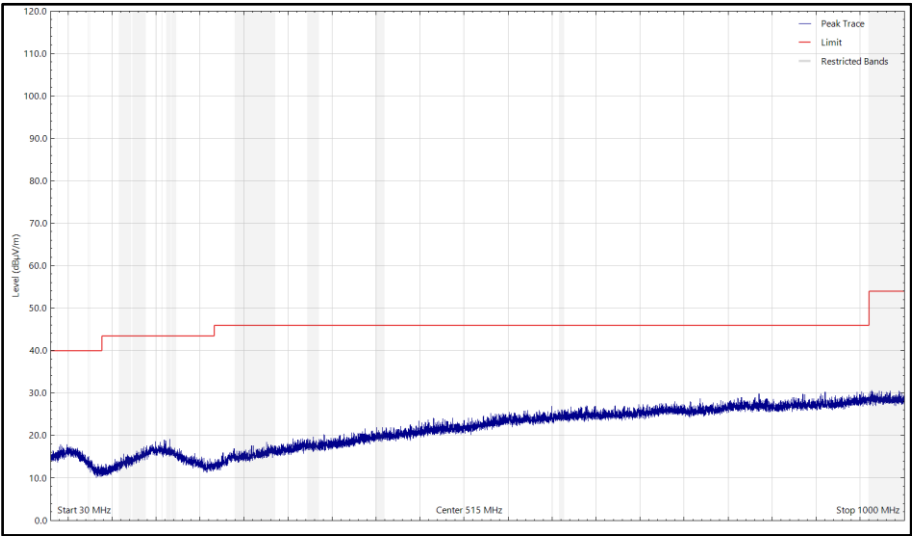


Figure 35 - CH17_BLE_LE1M - X, 2440 MHz, 30 MHz to 1 GHz, Vertical (Peak)

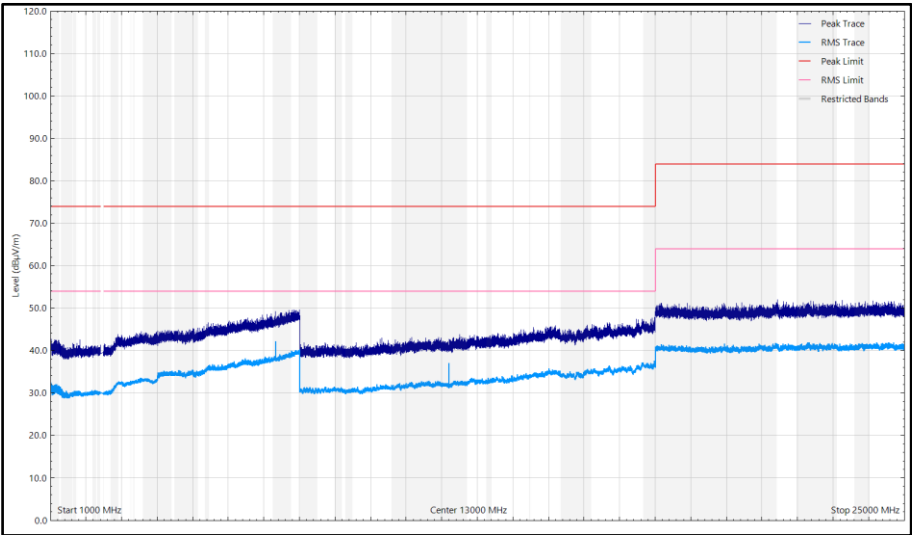


Figure 36 - CH17_BLE_LE1M - X, 2440 MHz, 1 GHz to 25 GHz, Vertical



Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
7206.460	49.32	54.00	-4.68	RMS	dBuv/m	202	158	Horizontal

Table 22 - Ch37_BLE_LE1M - X, 2402 MHz, 30 MHz to 25 GHz

No other emissions found within 10 dB of the limit.

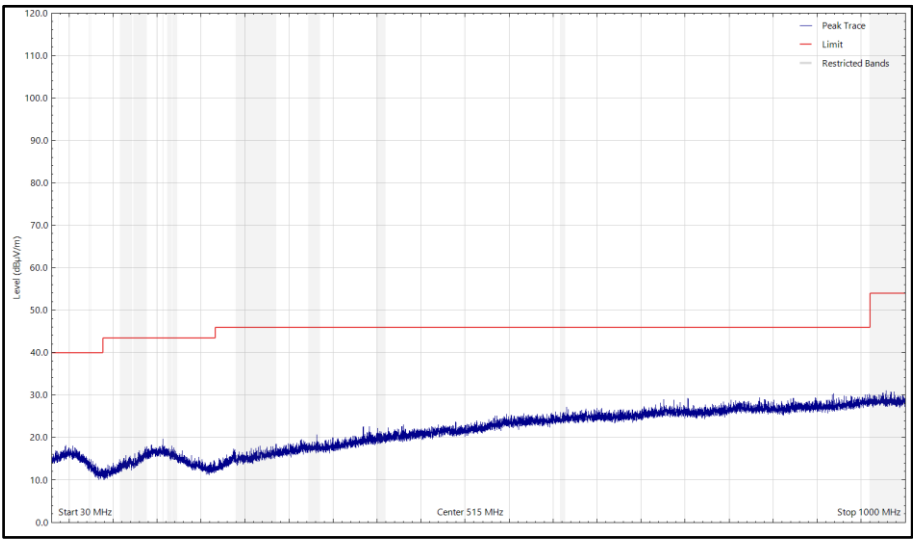


Figure 37 - Ch37_BLE_LE1M - X, 2402 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

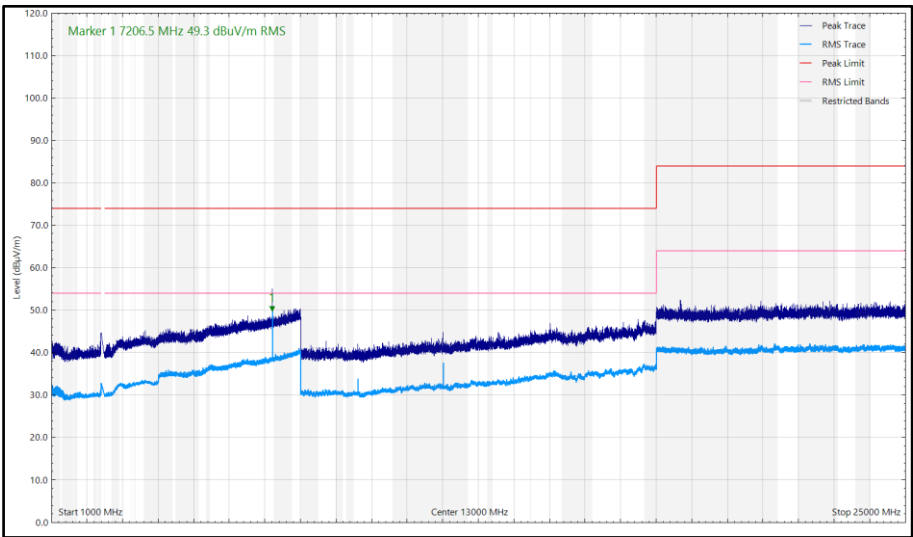


Figure 38 - Ch37_BLE_LE1M - X, 2402 MHz, 1 GHz to 25 GHz, Horizontal

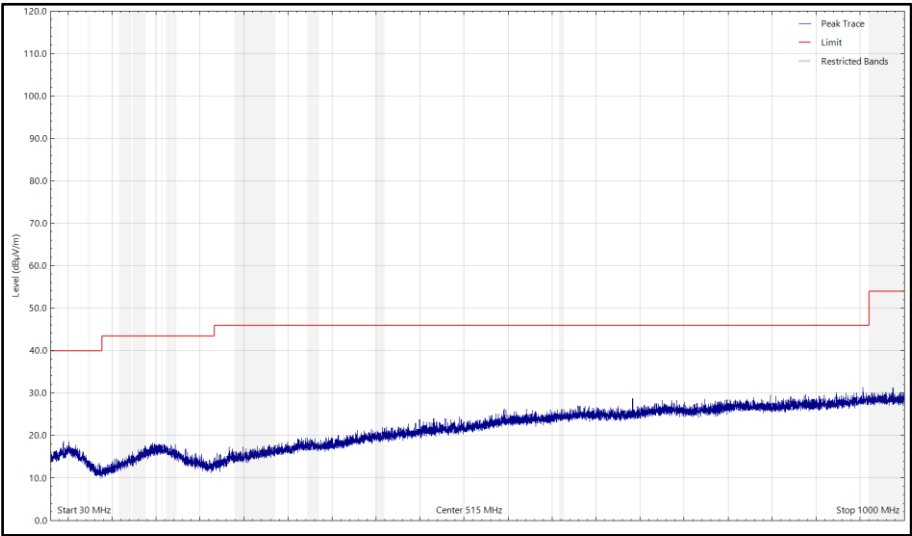


Figure 39 - Ch37_BLE_LE1M - X, 2402 MHz, 30 MHz to 1 GHz, Vertical (Peak)

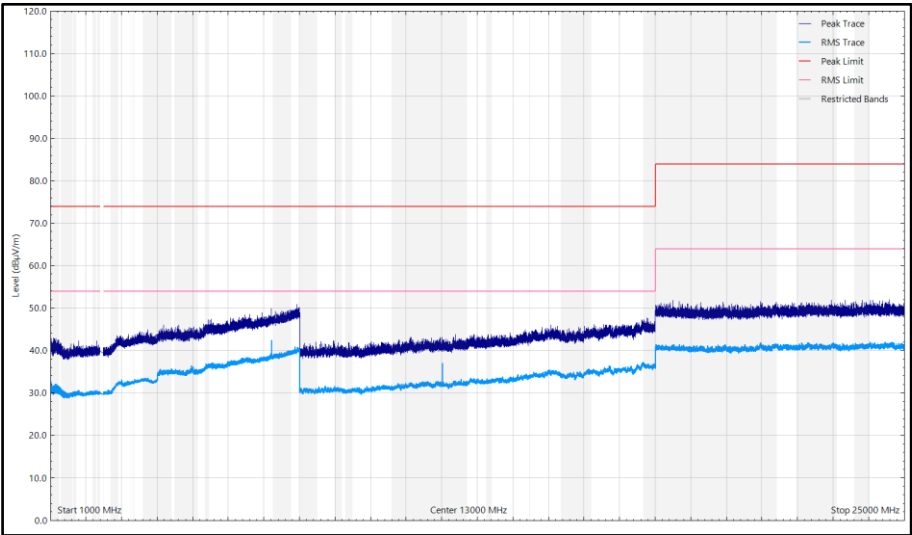


Figure 40 - Ch37_BLE_LE1M - X, 2402 MHz, 1 GHz to 25 GHz, Vertical



Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
7206.481	47.16	54.00	-6.84	RMS	dBuv/m	277	185	Vertical
7206.579	49.12	54.00	-4.88	RMS	dBuv/m	201	160	Horizontal

Table 23 - Ch37_BLE_LE1M - Y, 2402 MHz, 30 MHz to 25 GHz

No other emissions found within 10 dB of the limit.

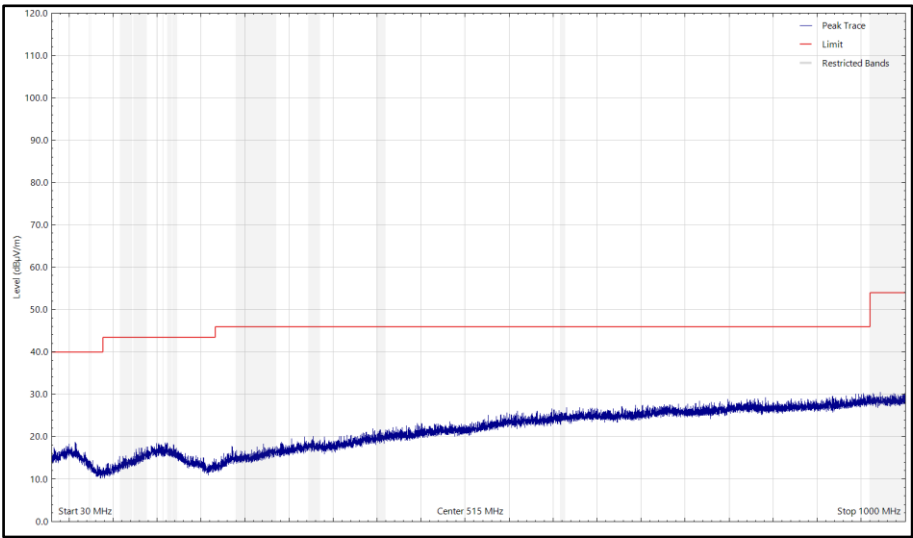


Figure 41 - Ch37_BLE_LE1M - Y, 2402 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

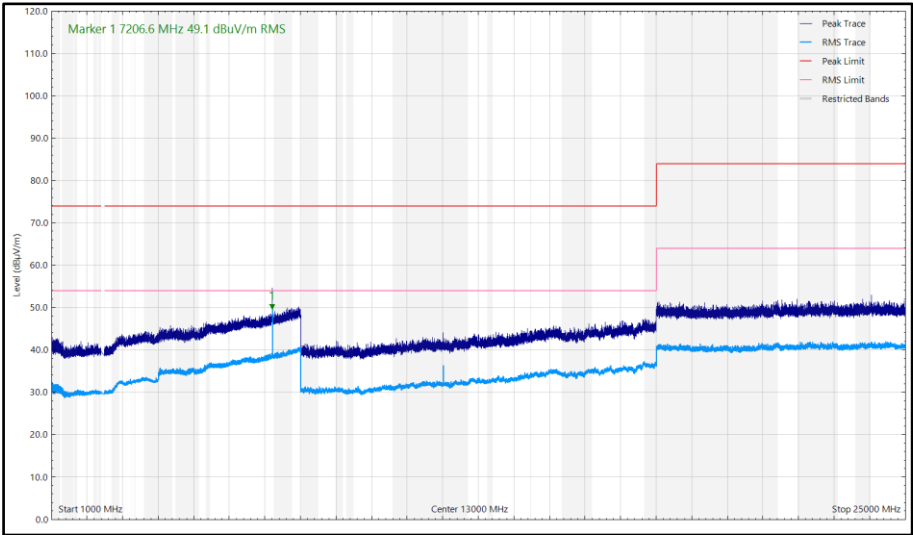


Figure 42 - Ch37_BLE_LE1M - Y, 2402 MHz, 1 GHz to 25 GHz, Horizontal

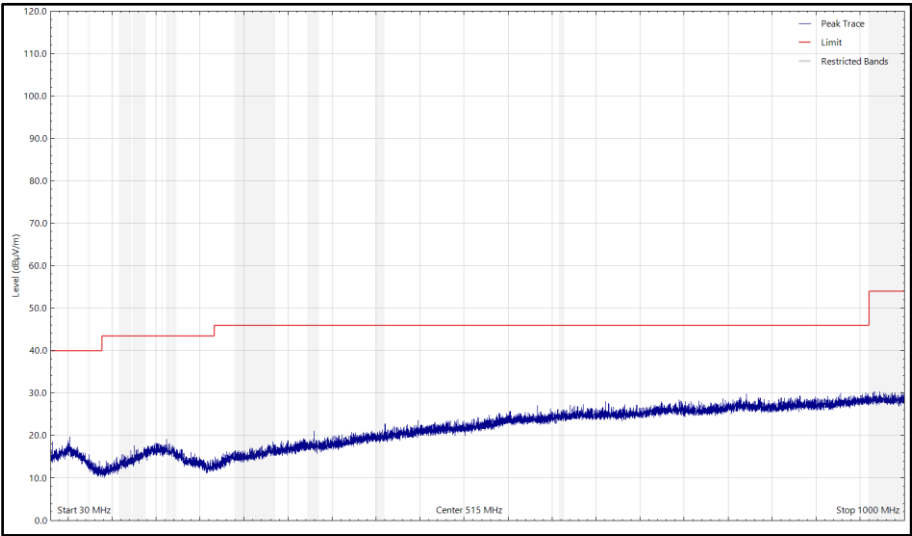


Figure 43 - Ch37_BLE_LE1M - Y, 2402 MHz, 30 MHz to 1 GHz, Vertical (Peak)

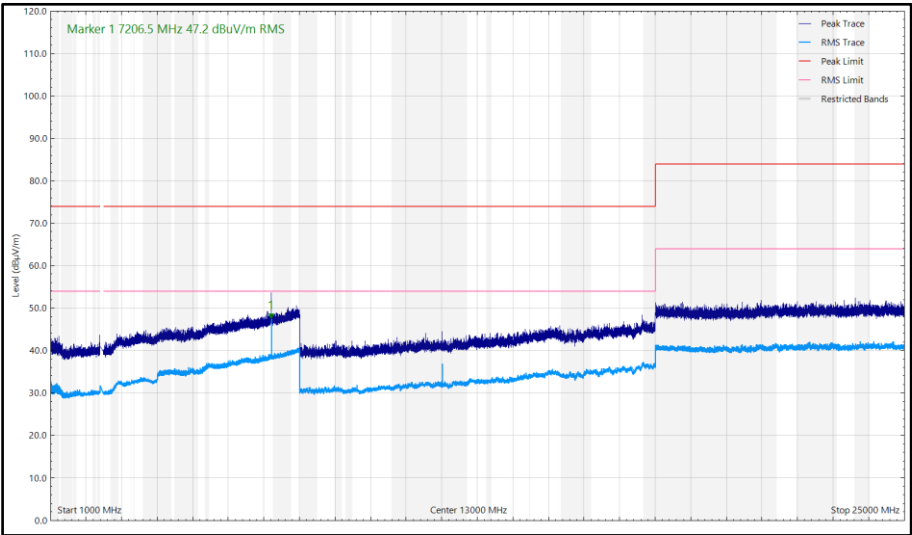


Figure 44 - Ch37_BLE_LE1M - Y, 2402 MHz, 1 GHz to 25 GHz, Vertical



Frequency (MHz)	Level	Limit	Margin (dB)	Detector	Unit	Angle (°)	Height (cm)	Polarisation
7205.300	48.36	54.00	-5.64	RMS	dBuv/m	0	150	Vertical
7206.500	44.82	54.00	-9.18	RMS	dBuv/m	222	166	Horizontal

Table 24 - Ch37_BLE_LE1M - Z, 2402 MHz, 30 MHz to 25 GHz

No other emissions found within 10 dB of the limit.

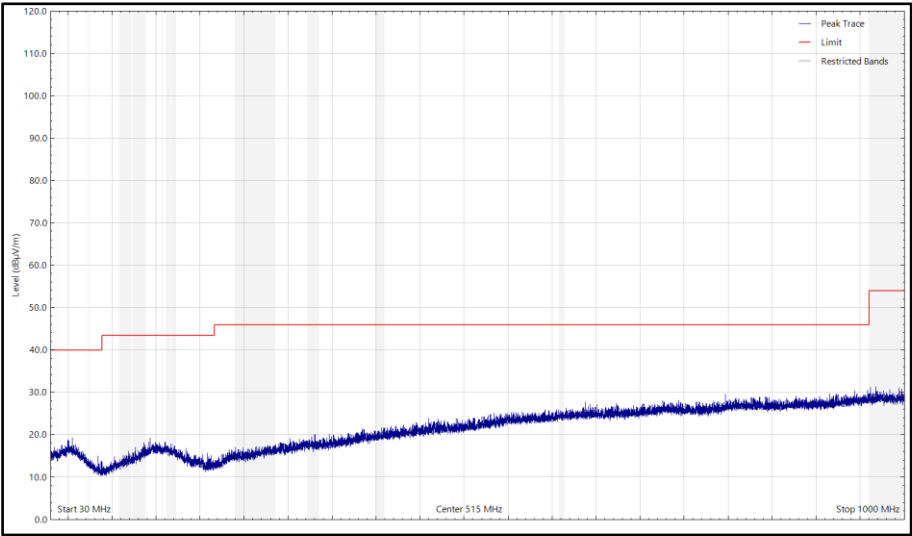


Figure 45 - Ch37_BLE_LE1M - Z, 2402 MHz, 30 MHz to 1 GHz, Horizontal (Peak)

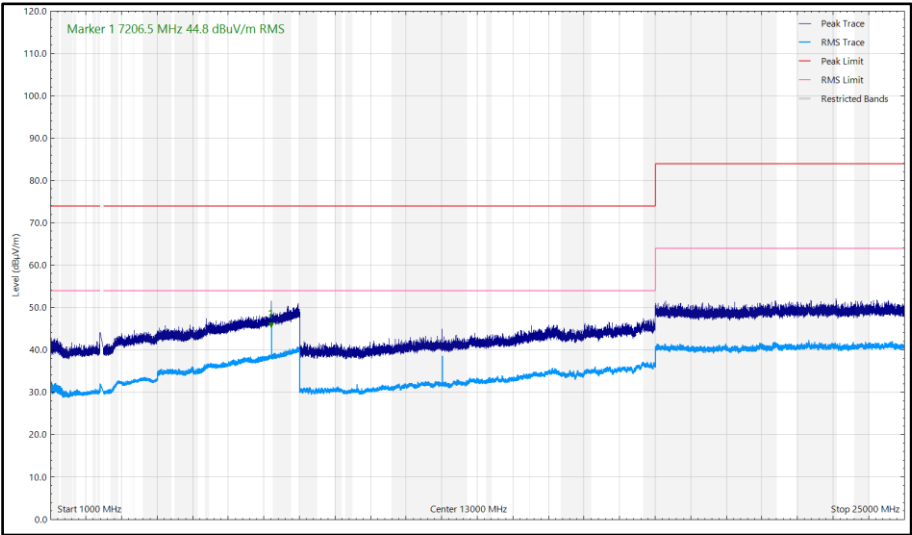


Figure 46 - Ch37_BLE_LE1M - Z, 2402 MHz, 1 GHz to 25 GHz, Horizontal

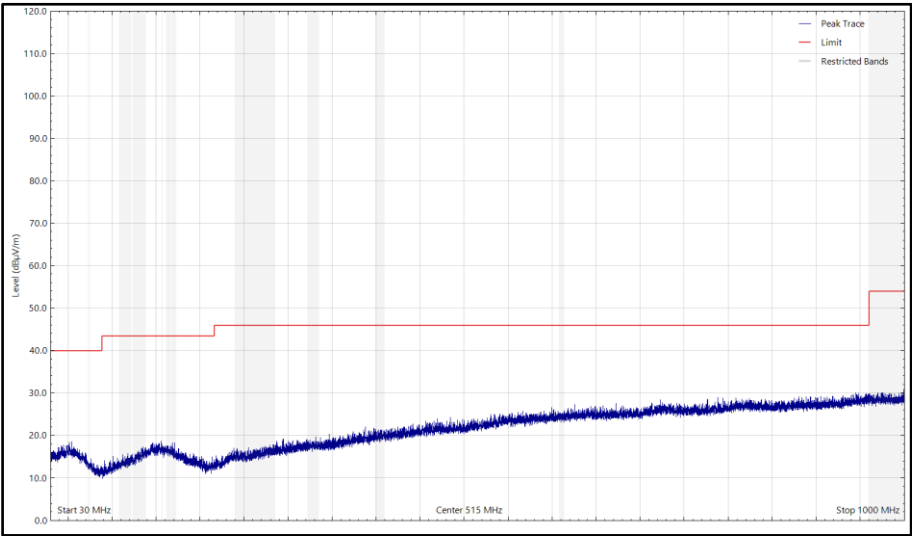


Figure 47 - Ch37_BLE_LE1M - Z, 2402 MHz, 30 MHz to 1 GHz, Vertical (Peak)

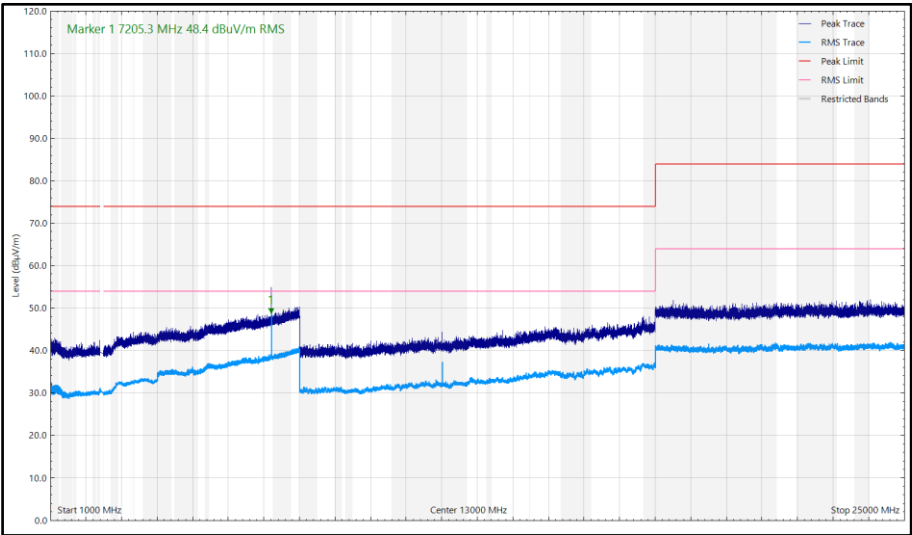


Figure 48 - Ch37_BLE_LE1M - Z, 2402 MHz, 1 GHz to 25 GHz, Vertical



FCC 47 CFR Part 15, Limit Clause 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

ISED RSS-247, Limit Clause 6.6

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in RSS-GEN, clause 8.10, must also comply with the radiated emission limits specified in RSS-GEN clause 8.9.

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
Antenna (DRG, 18 GHz to 40 GHz)	Link Microtek Ltd	AM180HA-K-TU2	230	24	08-Oct-2026
Power Supply Unit	Farnell	H60-25	1092		O/P Mon
Pre-Amplifier (18 GHz to 40 GHz)	Phase One	PSO4-0087	1534	12	20-Oct-2026
3m Semi-Anechoic Chamber	Rainford	RF Chamber 5	1545	36	23-Apr-2027
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Multimeter	Fluke	177	3832	12	26-Sep-2026
Mast Controller	Maturo GmbH	NCD	4810	-	TU
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	4811	-	TU
Antenna (DRG, 1 GHz to 10.5 GHz)	Schwarzbeck	BBHA9120B	4848	12	05-Jul-2026
Test Receiver	Rohde & Schwarz	ESW44	5084	12	08-Jan-2027
Emissions Software	TUV SUD	EmX V3.6.1	5125	-	Software
Pre-Amplifier (1 GHz to 26.5 GHz)	Agilent Technologies	8449B	5445	12	10-Jul-2026
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5481	12	14-May-2026
Cable (K-Type to K-Type, 1 m)	Junkosha	MWX241-01000KMSKMS/A	5511	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
7 GHz High pass Filter	Wainwright	WHKX12-5850-6800-18000-80SS	5549	12	31-Aug-2026
Pre-Amplifier (8 GHz to 18 GHz)	Wright Technologies	APS06-0061	5596	12	28-Oct-2026
Antenna (DRG, 7.5 GHz to 18 GHz)	Schwarzbeck	HWRD750	5610	12	29-Nov-2026
Cable (K-Type to K-Type, 2 m)	Junkosha	MWX241-02000KMSKMS/B	5934	12	12-Jun-2026
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9168	6635	24	25-Jul-2027
Cable Assy 8m (N to N) 18GHz	Junkosha	MWX221-08000NMSNMS/B	7050	12	03-Oct-2026

Table 25

TU - Traceability Unscheduled



O/P Mon – Output Monitored using calibrated equipment

2.6 Power Spectral Density

2.6.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (e)
ISED RSS-247, 6.3.1
ISED RSS-GEN, 6.12

2.6.2 Equipment Under Test and Modification State

RA0002, S/N: Not Serialised (FAR-1023223-002) - Modification State 0

2.6.3 Date of Test

16-April-2026

2.6.4 Test Method

DC Powered - BLE

This test was performed in accordance with ANSI C63.10, clause 11.10.2
The EUT was battery powered for the duration of the test.

2.6.5 Example Test Setup Diagram

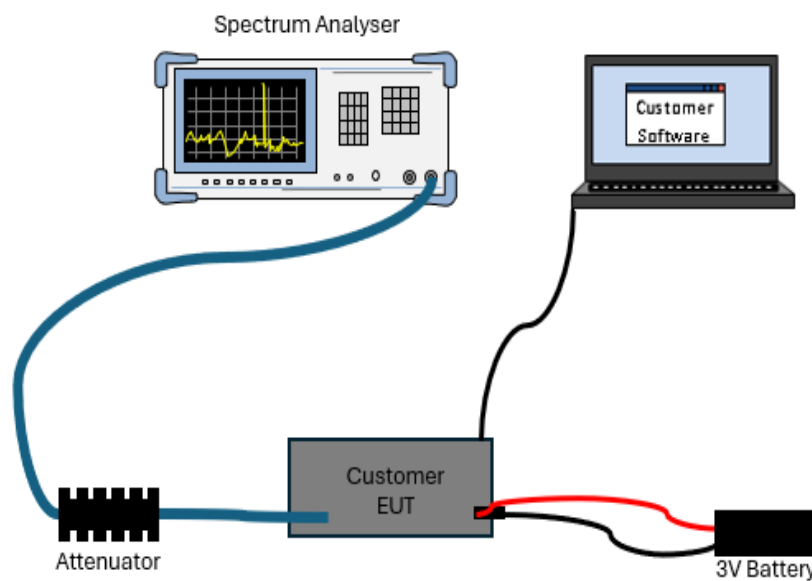


Figure 49

2.6.6 Environmental Conditions

Ambient Temperature	21.7 °C
Relative Humidity	48.8 %



2.6.7 Test Results

DC Powered - BLE

Test Configuration			
Frequency Range:	2400-2483.5 MHz	Band:	2.4 GHz
Limit Clause(s):	15.247 (e) RSS-247 6.3.1	Test Method(s):	C63.10 11.10.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	BLE GFSK (LE 1M)	Duty Cycle (%):	100
Antenna Configuration:	SISO	DCCF (dB):	-
Active Port(s):	Soldered SMA	Peak Antenna Gain (dBi):	-

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	Σ		
2402	100	0.683	-	-	-	-	8.00	-7.317
2442	100	0.670	-	-	-	-	8.00	-7.330
2480	100	0.161	-	-	-	-	8.00	-7.839

Table 26 - Maximum Power Spectral Density Results

FCC 47 CFR Part 15, Limit Clause 15.247 (e)

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

ISED RSS-247, Limit Clause 6.3.1(b)

The transmitter power spectral density conducted from the transmitter to the antenna(s) shall not be greater than 8 dBm/3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of RSS-247 clause 6.3.2. The power spectral density shall be determined using the same method as is used to determine the maximum conducted output power.



2.6.8 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
Hygrometer	Rotronic	I-1000	2891	12	23-Dec-2026
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	02-Jul-2026
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	02-Jul-2026
GPSDR Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	17-Sep-2026
PXA Signal Analyser	Keysight Technologies	N9030A	4653	12	06-May-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6377	12	06-Sep-2026
20dB 10W/18GHz F/M SMA bidirectional Attenuator	Weinschel	WA41-20-0102	7027	12	06-Jun-2026

Table 27

3 Photographs

3.1 Test Setup Photographs

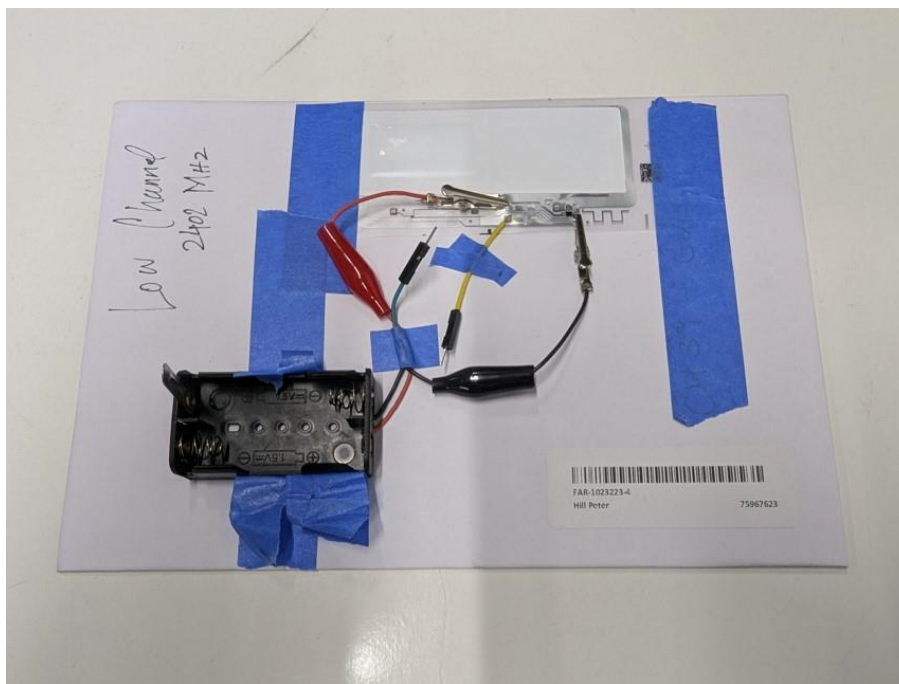


Figure 50 – EUT – General View

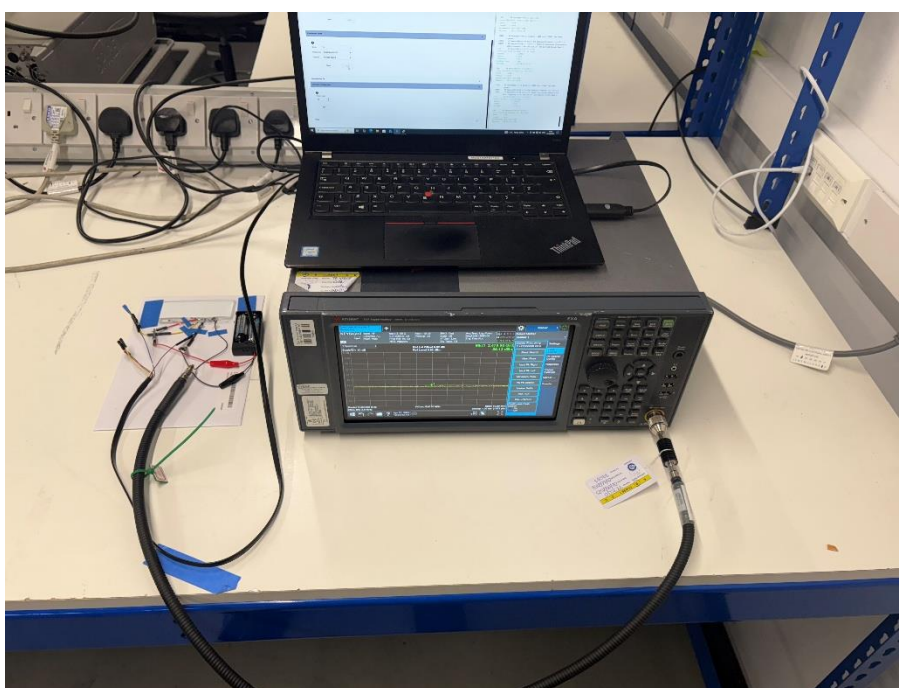


Figure 51 – Test Setup Conducted



Figure 52 – Radiated 30 MHz to 1 GHz Set up

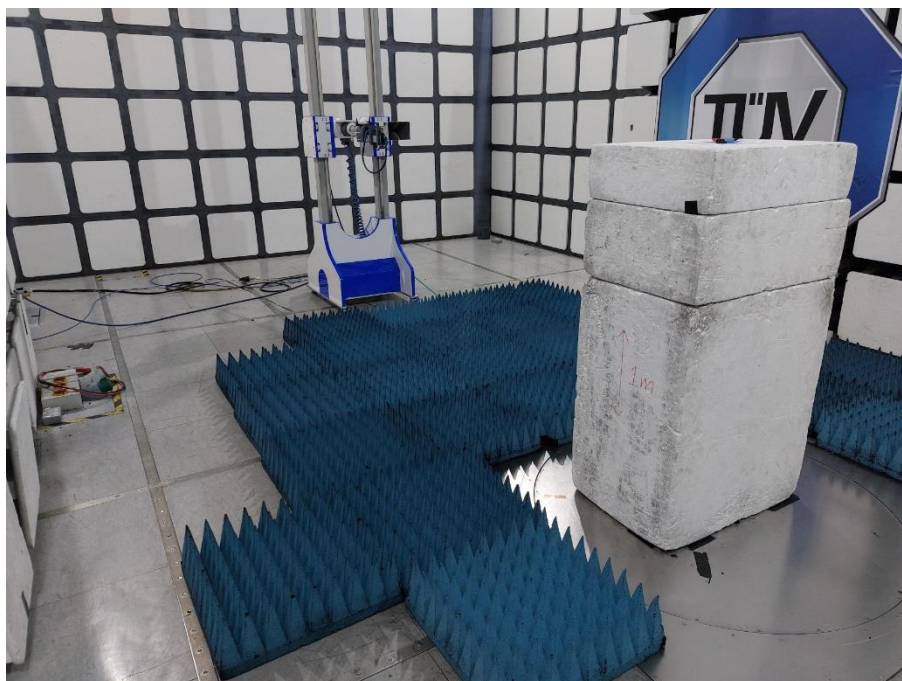


Figure 53 – Radiated 1 GHz to 8 GHz Set up

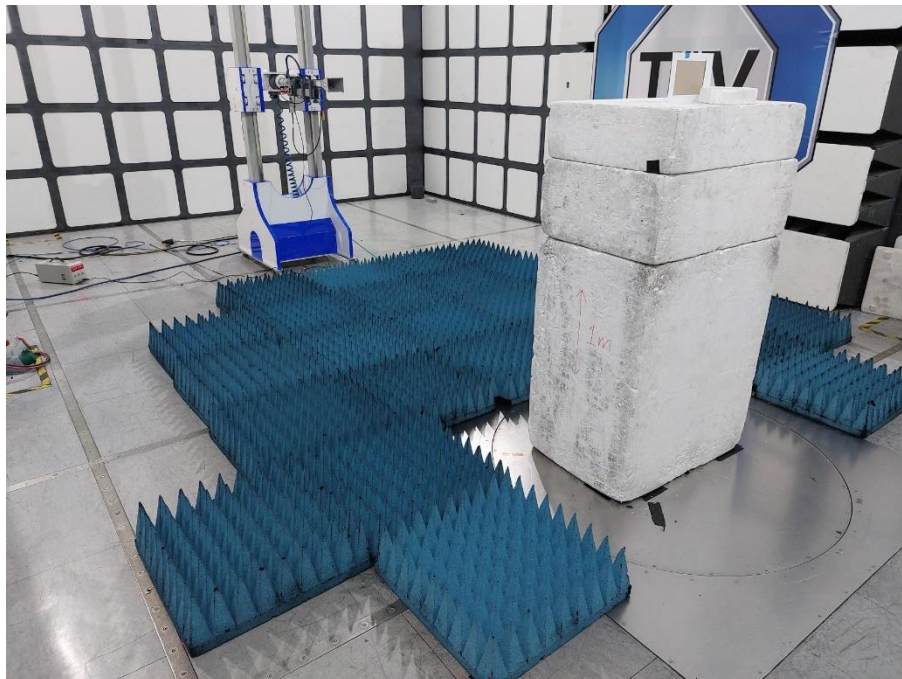


Figure 54 – Radiated 8 GHz to 18 GHz Set up

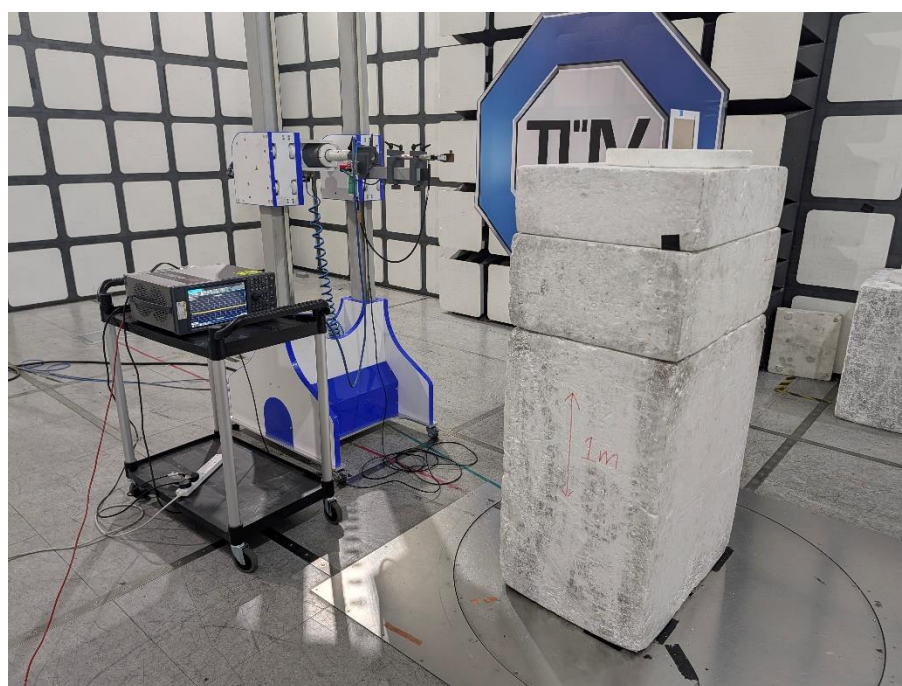


Figure 55 – Radiated 18 GHz to 25 GHz Set up

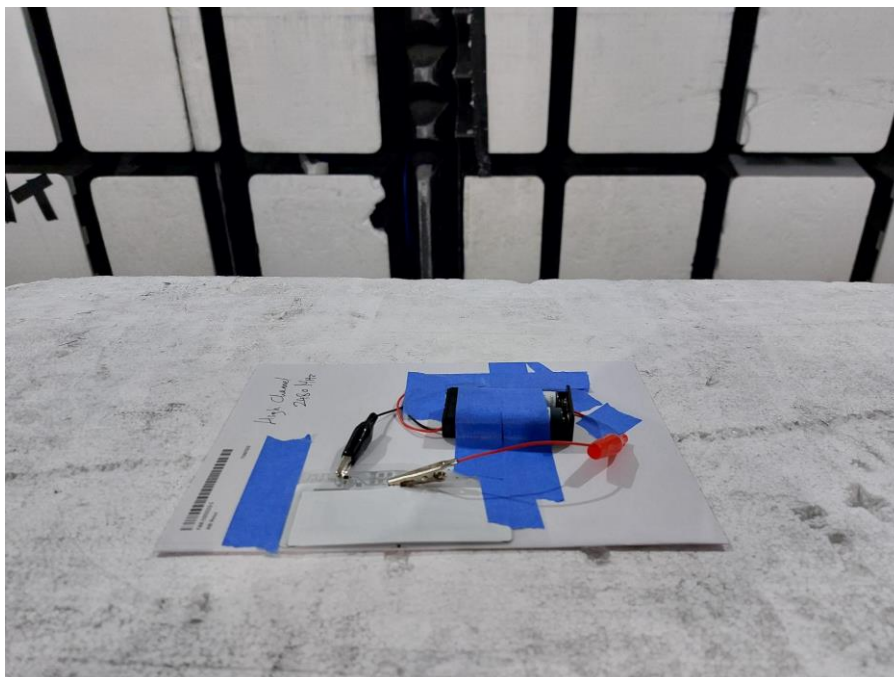


Figure 56 – Radiated X Orientation

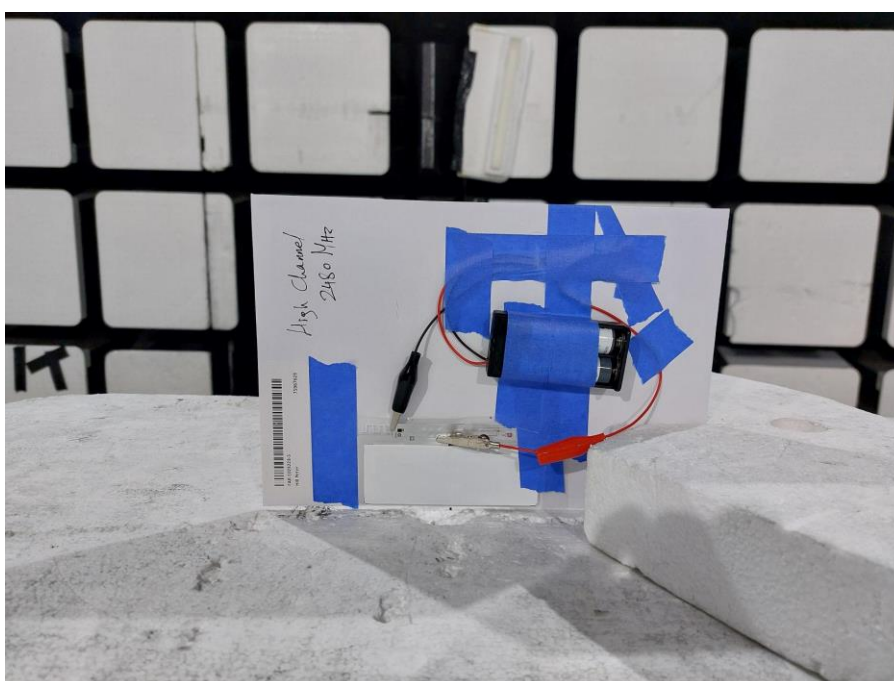


Figure 57 – Radiated Y Orientation

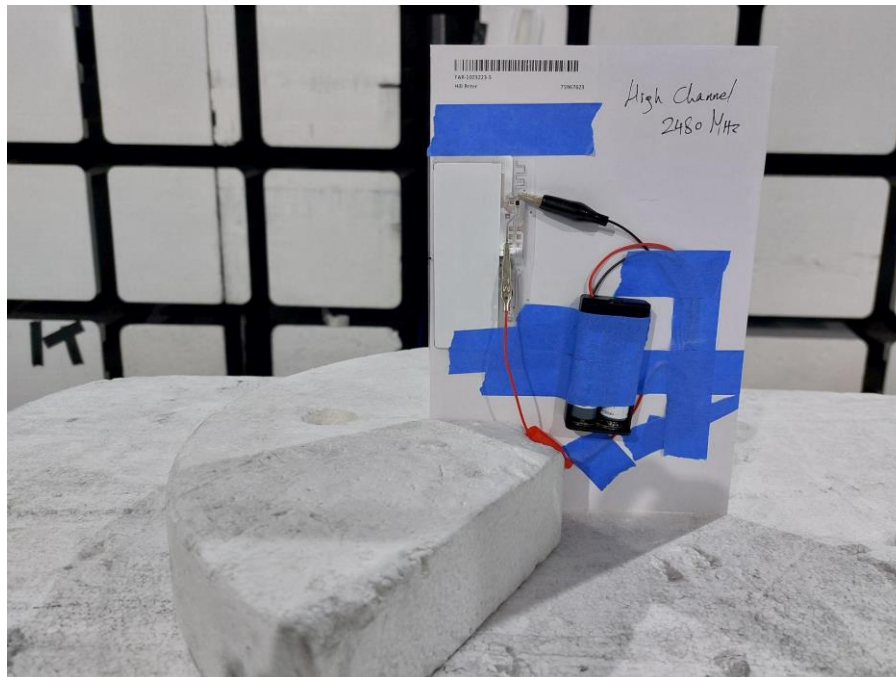


Figure 58 – Radiated Z Orientation

4 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Restricted Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Emission Bandwidth	± 58.63 kHz
Maximum Conducted Output Power	± 1.38 dB
Authorised Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Spurious Radiated Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Power Spectral Density	± 1.49 dB

Table 28

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2023, Clause 4.3.4 (Simple Acceptance). 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.