

FCC and ISED Test Report

Apple Inc
Model: A3448



In accordance with FCC 47 CFR Part 15C,
ISED RSS-247 and ISED RSS-GEN
(Thread)

Prepared for: Apple Inc
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SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Tiago De Camargo Alves	Technical Support	Authorised Signatory	20 January 2026

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 15C, ISED RSS-247 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Report Generation	Rachael Watkins	20 January 2026	

FCC Accreditation

553713/UK2026 Concorde Park, Fareham Test Laboratory

ISED Accreditation

28798/UK0003 Concorde Park, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2024, ISED RSS-247: Issue 4 (2025-07), ISED RSS-GEN: Issue 5 (2018-04) + A2 (2021-02) 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	20-Jan-2026

Table 1

1.2 Introduction

Applicant	Apple Inc
Manufacturer	Apple Inc
EUT/Sample Identification	Refer to section 1.6
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)
Start of Test	20-November-2025
Finish of Test	20-November-2025
Name of Engineer(s)	Morsalin Hossain, Ian Hart, Dulanjan Witharamalage, Marius Vasii, Manohar Thota, Gridi Bilali, Nathan Ocom, Colin Brain, Tony Baby, Thilanka Savirunath Liyanage, Thomas Randall, Akhil Rajendran Bhaskaran Nair, Arjun Sasikumar, Ahmed Al Derdiri,
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, 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: Thread						
-	15.203	-	-	Antenna Requirement	N/T	The device complies with the provisions of this section, as it uses permanently attached integral antennas.
2.1	15.205	2.4	8.10	Restricted Band Edges	Pass	ANSI C63.10 (2020)
2.2	15.247 (a)(2)	6.3.1	6.7	Emission Bandwidth	Pass	ANSI C63.10 (2020)
2.3	15.247 (b)	6.3.2	6.12	Maximum Conducted Output Power	Pass	ANSI C63.10 (2020)
2.4	15.247 (d)	6.6	-	Authorised Band Edges	Pass	ANSI C63.10 (2020)
2.5	15.209 and 15.247 (d)	2.4 and 6.6	6.13 and 8.9	Spurious Radiated Emissions	Pass	ANSI C63.10 (2020)
2.6	15.247 (e)	6.3.1	6.12	Power Spectral Density	Pass	ANSI C63.10 (2020)

Table 2



1.4 Product Information

1.4.1 Technical Description

The equipment under test (EUT) was a portable laptop computer.

1.4.2 Test Modes

The EUT's 2.4 GHz Thread radio supports SISO operation on two different cores and has two power settings: "iPA" & "ePA"

The EUT uses different output power per core, and the antenna gains vary, resulting in a different radiated powers per core.

The EUT was tested in the following modes:

SISO modes:

iPA/ePA - Core 0

iPA/ePA - Core 1

1.4.3 Test Setup

For conducted tests the EUT antennas were disconnected and replaced with U. FL to SMA test cables to enable conducted testing on each core. The loss of these test cables were known and compensated for in any conducted measurements.

For all tests the EUT was put into a continuous transmit test mode with the chipset manufacturer's test commands to ensure the measured signals were representative.

All testing was performed with the EUT powered via a 120 V AC, 60 Hz source

1.4.4 Antenna Gain Table

Antenna Port	Frequency Range (MHz)	Peak Gain (dBi)	Conducted Cable Loss (dB)
Core 0	2412	4.8	0.71
	2442	5.2	0.71
	2472	5.2	0.71
Core 1	2412	4.6	0.71
	2442	4.7	0.71
	2472	4.8	0.71

Table 3

1.5 Deviations from the Standard

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



1.6 Identification of the EUT

The table below details identification of the EUT(s) that have been used to carry out the testing within this report.

Model: A3448		
Serial Number	Hardware Version	Software Version
C6FYGF3CX3L	REV1.0	25D21
C6XNYJP2FJ	REV1.0	25A12711g
C6N23Y607Y	REV1.0	25D21
C6YFMQX60V	REV1.0	25D21

Table 4

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: A3448, Serial Number: C6XNYJP2FJ			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3448, Serial Number: C6FYGF3CX3L			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3448, Serial Number: C6N23Y607Y			
0	As supplied by the customer	Not Applicable	Not Applicable
Model: A3448, Serial Number: C6YFMQX60V			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 5



1.8 Test Location

TÜV SÜD conducted the following tests at our Concorde Park Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Thread		
Restricted Band Edges	Morsalin Hossain, Ian Hart, Dulanjan Witharamalage, Marius Vasii, Manohar Thota, Gridi Bilali, Nathan Ocom, Colin Brain, Tony Baby, Thilanka Savirunath Liyanage, Thomas Randall, Akhil Rajendran Bhaskaran Nair	UKAS
Emission Bandwidth	Arjun Sasikumar	UKAS
Maximum Conducted Output Power	Arjun Sasikumar	UKAS
Authorised Band Edges	Morsalin Hossain, Ian Hart, Dulanjan Witharamalage, Marius Vasii, Manohar Thota, Gridi Bilali, Nathan Ocom, Colin Brain, Tony Baby, Thilanka Savirunath Liyanage, Thomas Randall, Akhil Rajendran Bhaskaran Nair	UKAS
Spurious Radiated Emissions	Marius Vasii, Colin Brain, Dulanjan Witharamalage, Ahmed Al Derdiri, Tony Baby	UKAS
Power Spectral Density	Arjun Sasikumar	UKAS

Table 6

Office Address:

TÜV SÜD
Concorde Park
Concorde Way
Fareham
Hampshire
PO15 5FG
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, Clause 2.4
ISED RSS-GEN, Clause 8.10

2.1.2 Equipment Under Test and Modification State

A3448, S/N: C6FYGFCX3L - Modification State 0
A3448, S/N: C6XNYJP2FJ - Modification State 0

2.1.3 Date of Test

27-August-2025

2.1.4 Test Method

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.

The following conversion can be applied to convert from dB μ V/m to μ V/m:

$10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$.

2.1.5 Environmental Conditions

Ambient Temperature	20.5 - 24.3 °C
Relative Humidity	24.3 - 57.4 %



2.1.6 Test Results

Thread

iPA - Core 0 (SISO)

Mode	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Thread	2405	2390.0	54.29	42.45
Thread	2475	2483.5	53.13	42.46

Table 7 - iPA, Core 0, SISO Restricted Band Edge Results

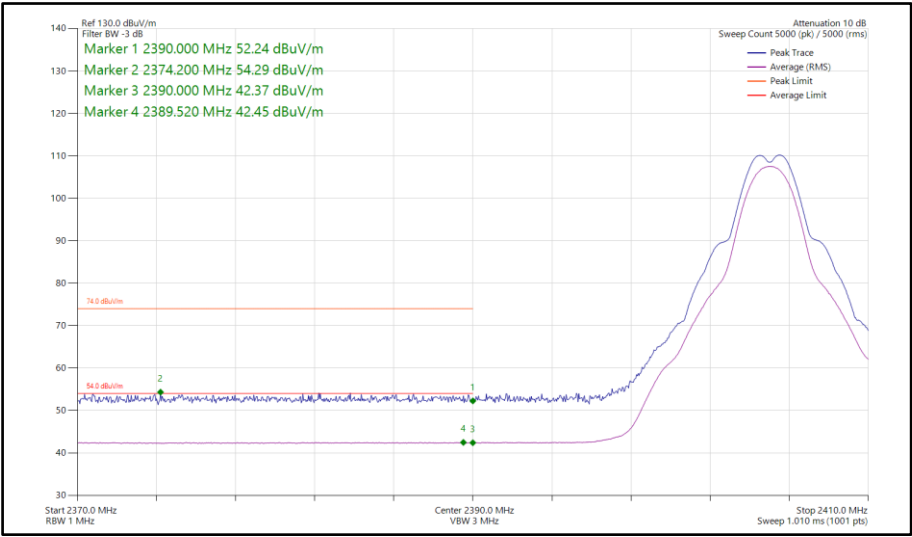


Figure 1 - Thread, iPA, SISO, Core 0 - 2405 MHz
Band Edge Frequency 2390 MHz

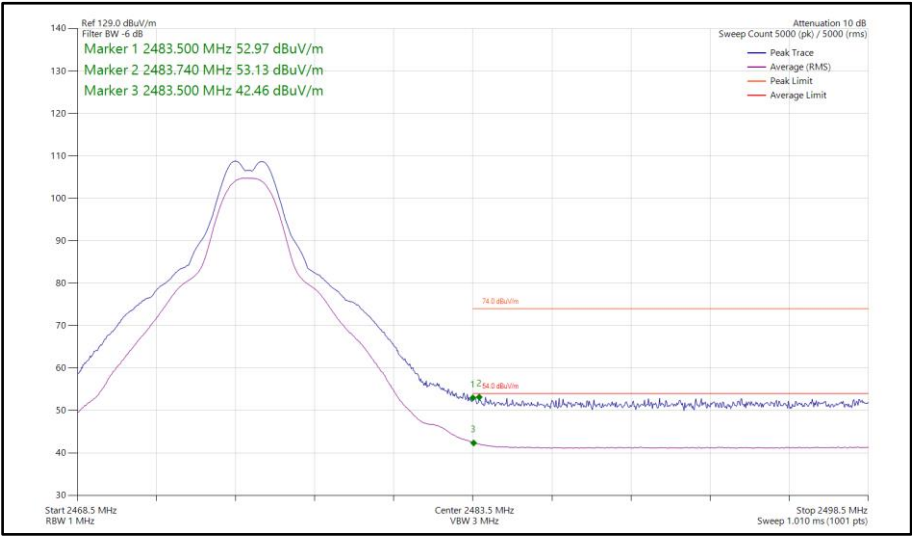
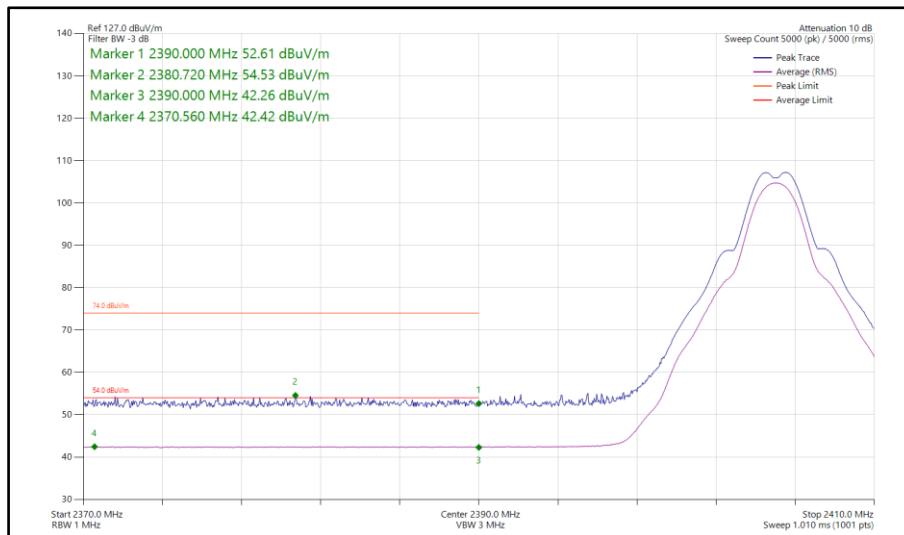


Figure 2 - Thread, iPA, SISO, Core 0 - 2475 MHz
Band Edge Frequency 2483.5 MHz

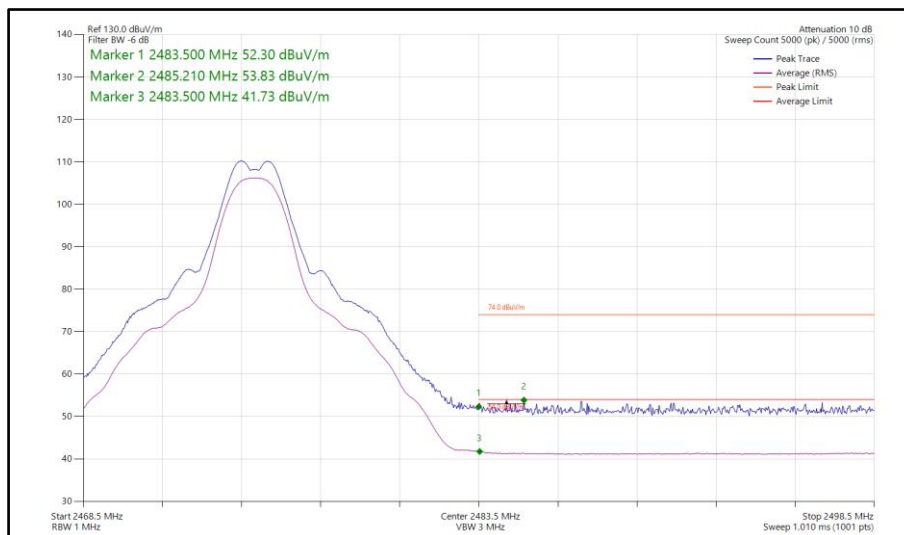
iPA - Core 1 (SISO)

Mode	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Thread	2405	2390.0	54.53	42.42
Thread	2475	2483.5	53.83	41.73

Table 8 - iPA, Core 1, SISO Restricted Band Edge Results



**Figure 3 - Thread, iPA, SISO, Core 1 - 2405 MHz
Band Edge Frequency 2390 MHz**

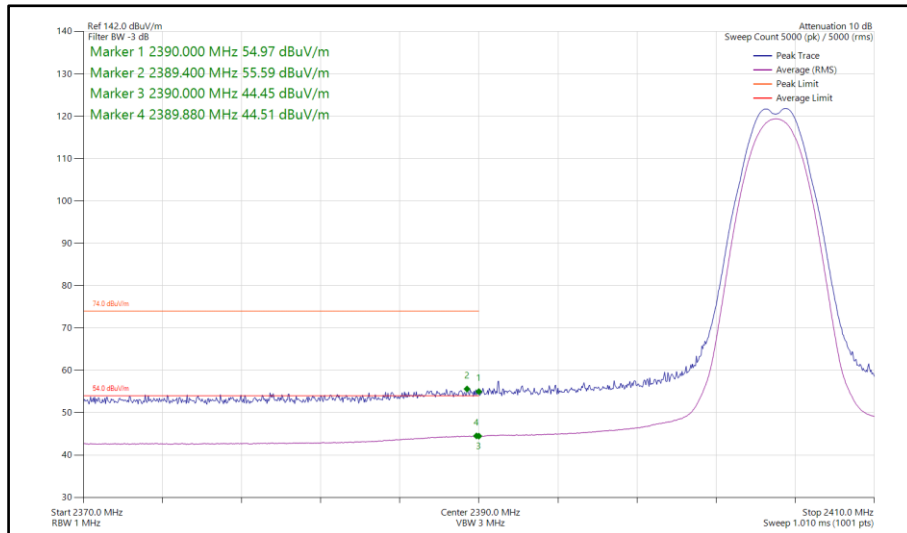


**Figure 4 - Thread, iPA, SISO, Core 1 - 2475 MHz
Band Edge Frequency 2483.5 MHz**

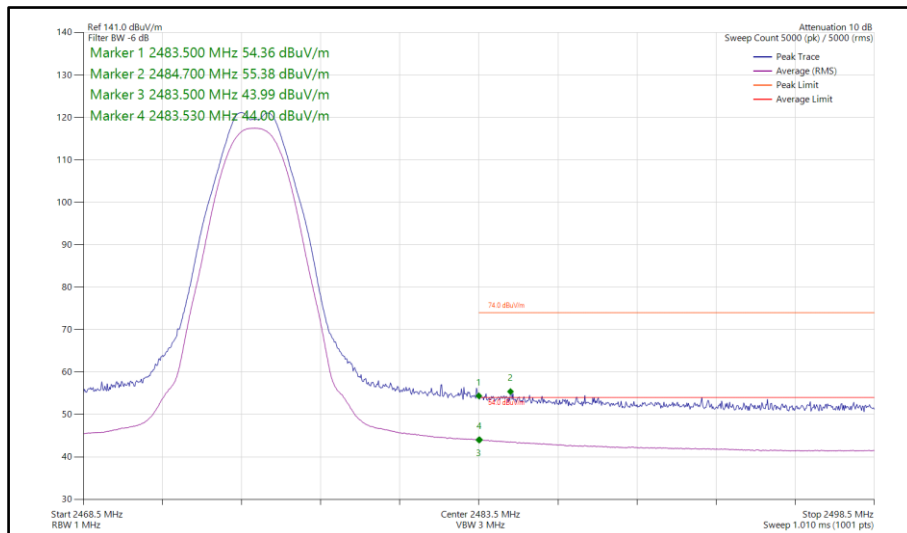
ePA - Core 0 (SISO)

Mode	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Thread	2405	2390.0	55.59	44.51
Thread	2475	2483.5	55.38	44.00

Table 9 - ePA, Core 0, SISO Restricted Band Edge Results



**Figure 5 - Thread, ePA, SISO, Core 0 - 2405 MHz
Band Edge Frequency 2390 MHz**



**Figure 6 - Thread, ePA, SISO, Core 0 - 2475 MHz
Band Edge Frequency 2483.5 MHz**



ePA - Core 1 (SISO)

Mode	TX Frequency (MHz)	Band Edge Frequency (MHz)	Peak Level (dBμV/m)	Average Level (dBμV/m)
Thread	2405	2390.0	55.22	43.69
Thread	2475	2483.5	55.06	44.19

Table 10 - ePA, Core 1, SISO Restricted Band Edge Results

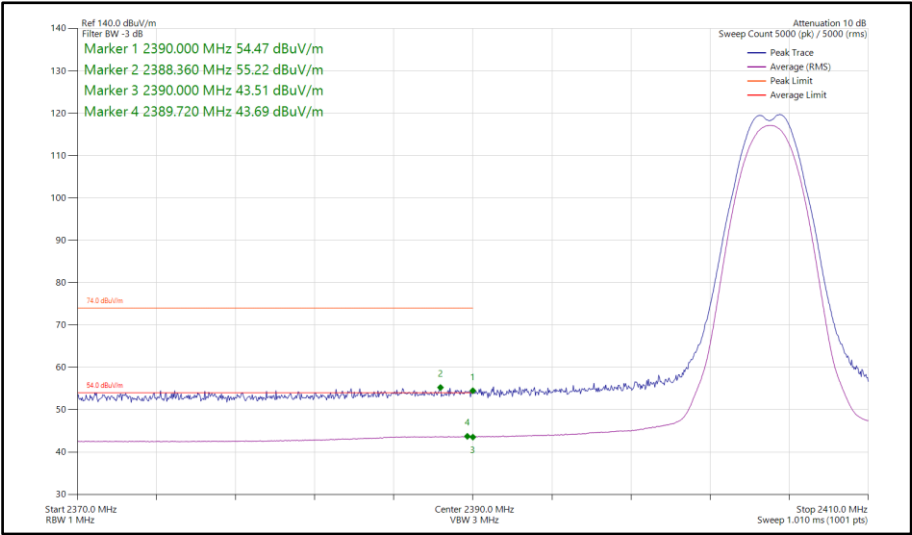


Figure 7 - Thread, ePA, SISO, Core 1 - 2405 MHz
Band Edge Frequency 2390 MHz

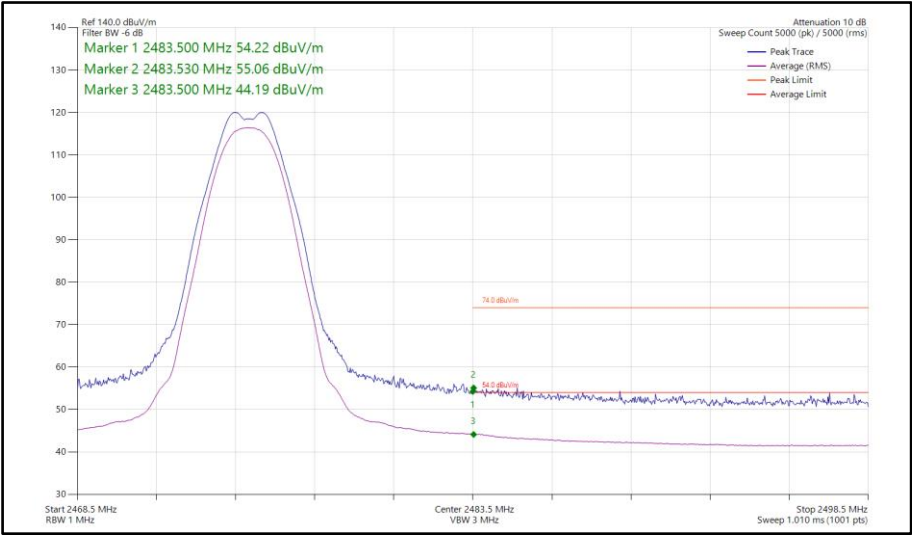


Figure 8 - Thread, ePA, SISO, Core 1 - 2475 MHz
Band Edge Frequency 2483.5 MHz



FCC 47 CFR Part 15, Limit Clause 15.209

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 11

ISED RSS-GEN, Limit Clause 8.9

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3 m)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960*	500

Table 12

*Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.



2.1.7 Test Location and Test Equipment Used

This test was carried out in RF Chamber 17.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Emissions Software	TUV SUD	EmX V3.5.5	5125	-	O/P Mon
EMI Test Receiver	Rohde & Schwarz	ESW44	6294	12	24-Feb-2026
USB Spectrum Analyser	Signal Hound	SA124B	6298	-	TU
Digital Multimeter	Fluke	115	6345	12	24-Jul-2026
Humidity and Temperature Meter	R.S Components	1364	6346	12	13-Mar-2026
SAC Switch Unit	TUV SUD	TUV_SSU_004 PLC	6349	12	16-May-2026
Horn Antenna (1–10.5 GHz)	Schwarzbeck	BBHA 9120 B	6457	12	18-May-2026
AC Power Supply	iTech	IT7324	6657	-	O/P Mon
3m Semi-Anechoic Chamber	Albatross Projects	RF Chamber 17	6658	36	07-May-2028
Mast and Turntable Controller	Maturo Gmbh	FCU3.0	6659	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	6660	-	TU
Turntable	Maturo Gmbh	TT1.5SI	6661	-	TU
1m SMA-Type Cable	Junkosha	MWX221-01000AMSAMS/B	6844	12	05-Sep-2025
8m SMA-Type Cable	Junkosha	MWX221-08000AMSAMS/B	6846	12	06-Nov-2025
Cable Assembly	SpecTech	PE300-60	6859	-	TU
Cable Assembly	SpecTech	PE300-60	6860	-	TU
RF Amplifier BROADBAND AMPL/SMA/RoHS	Mini-Circuits	ZX60-83LN12+	6979	12	05-Apr-2026

Table 13

TU - Traceability Unscheduled

O/P Mon - Output Monitored using calibrated equipment



2.2 Emission Bandwidth

2.2.1 Specification Reference

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

2.2.2 Equipment Under Test and Modification State

A3448, S/N: C6N23Y607Y - Modification State 0

2.2.3 Date of Test

25-October-2025

2.2.4 Test Method

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.

2.2.5 Environmental Conditions

Ambient Temperature	21.5 -
Relative Humidity	43.5 %



2.2.6 Test Results

Thread

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 6.9.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread iPA	Duty Cycle (%):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2405	1.648	-	-	-	≥500.0
2440	1.640	-	-	-	≥500.0
2475	1.640	-	-	-	≥500.0

Table 14 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2405	2.224	-	-	-	-
2440	2.232	-	-	-	-
2475	2.224	-	-	-	-

Table 15 - 99% Bandwidth Results

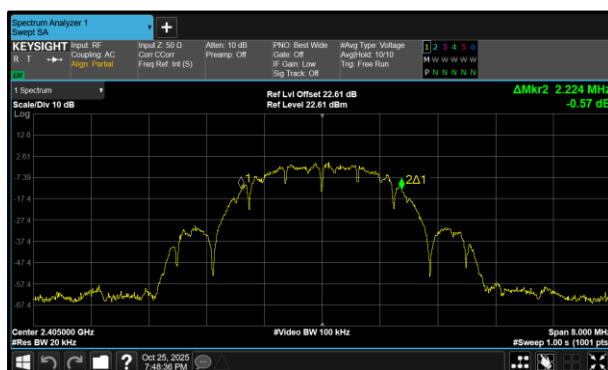


Figure 9 - Core 0 (A) 2405 MHz (CH11) 99% Bandwidth

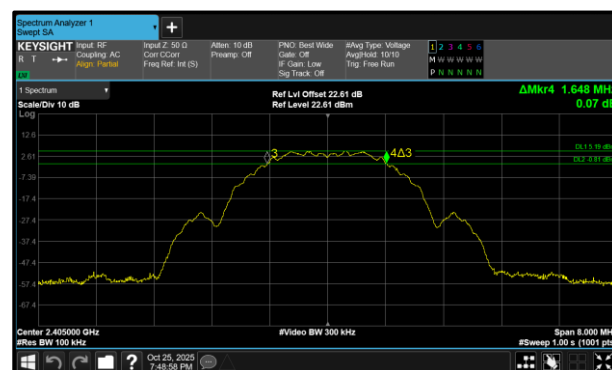


Figure 10 - Core 0 (A) 2405 MHz (CH11) 6 dB Bandwidth

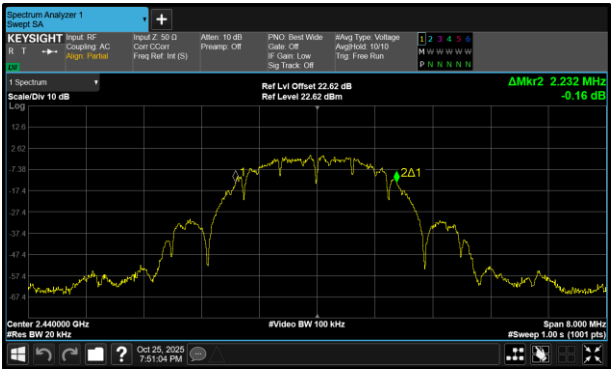


Figure 11 - Core 0 (A) 2440 MHz (CH18) 99% Bandwidth

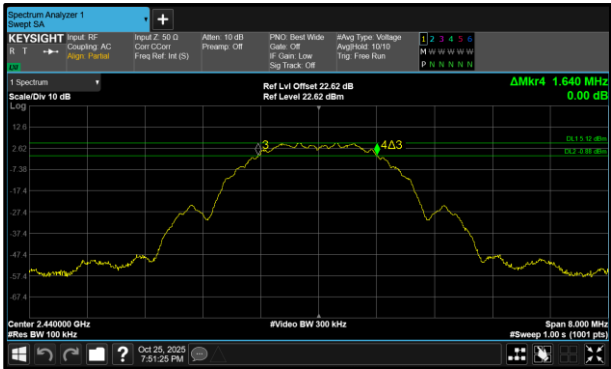


Figure 12 - Core 0 (A) 2440 MHz (CH18) 6 dB Bandwidth



Figure 13 - Core 0 (A) 2475 MHz (CH25) 99% Bandwidth

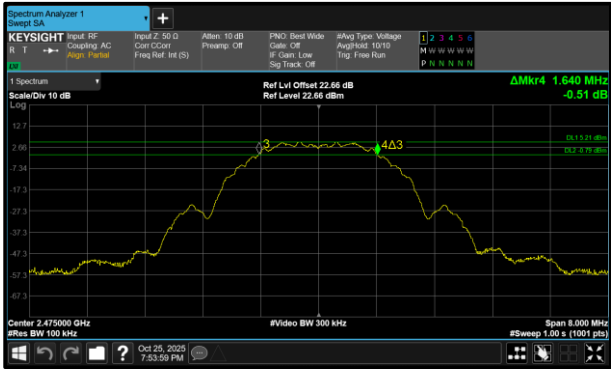


Figure 14 - Core 0 (A) 2475 MHz (CH25) 6 dB Bandwidth



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 6.9.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread ePA	Duty Cycle (%):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2405	1.616	-	-	-	≥500.0
2440	1.616	-	-	-	≥500.0
2475	1.616	-	-	-	≥500.0

Table 16 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2405	2.192	-	-	-	-
2440	2.192	-	-	-	-
2475	2.200	-	-	-	-

Table 17 - 99% Bandwidth Results

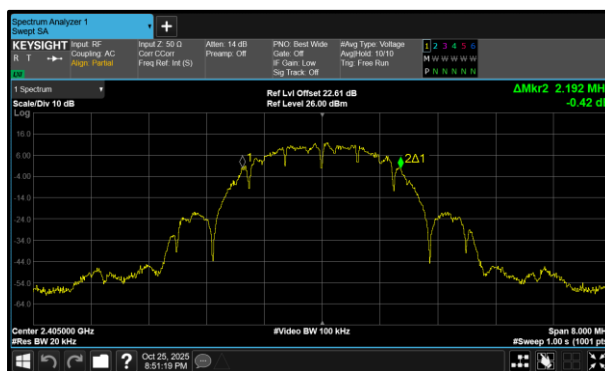


Figure 15 - Core 0 (A) 2405 MHz (CH11) 99% Bandwidth

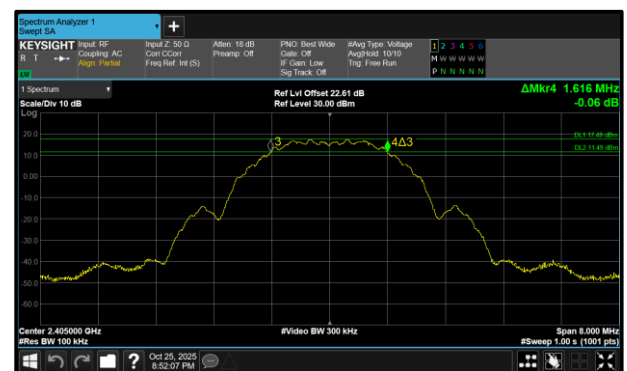


Figure 16 - Core 0 (A) 2405 MHz (CH11) 6 dB Bandwidth

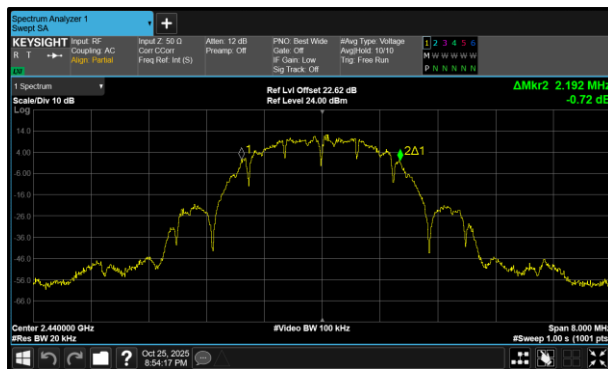


Figure 17 - Core 0 (A) 2440 MHz (CH18) 99% Bandwidth



Figure 18 - Core 0 (A) 2440 MHz (CH18) 6 dB Bandwidth

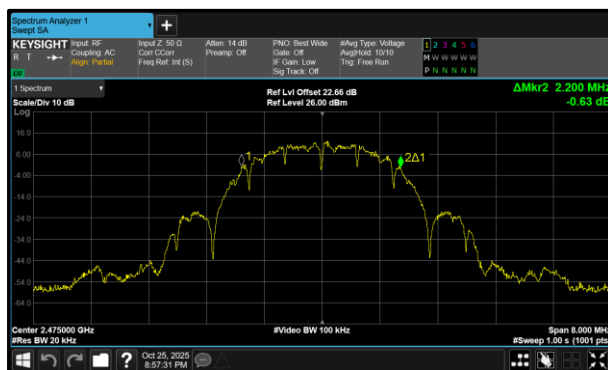


Figure 19 - Core 0 (A) 2475 MHz (CH25) 99% Bandwidth

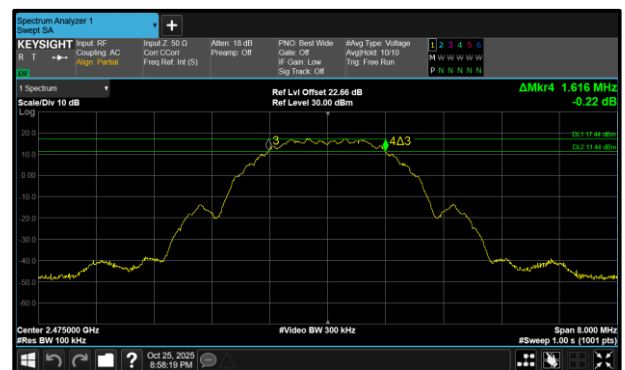


Figure 20 - Core 0 (A) 2475 MHz (CH25) 6 dB Bandwidth



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 6.9.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread iPA	Duty Cycle (%):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2405	-	1.640	-	-	≥500.0
2440	-	1.640	-	-	≥500.0
2475	-	1.640	-	-	≥500.0

Table 18 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2405	-	2.224	-	-	-
2440	-	2.224	-	-	-
2475	-	2.224	-	-	-

Table 19 - 99% Bandwidth Results

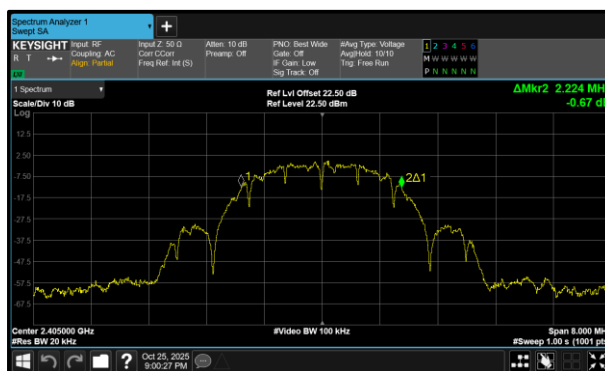


Figure 21 - Core 1 (B) 2405 MHz (CH11) 99% Bandwidth

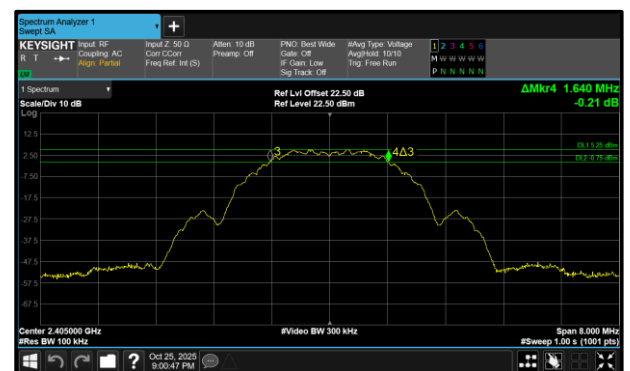


Figure 22 - Core 1 (B) 2405 MHz (CH11) 6 dB Bandwidth

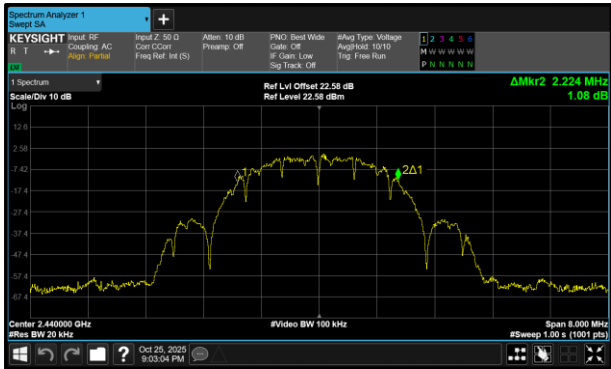


Figure 23 - Core 1 (B) 2440 MHz (CH18) 99% Bandwidth

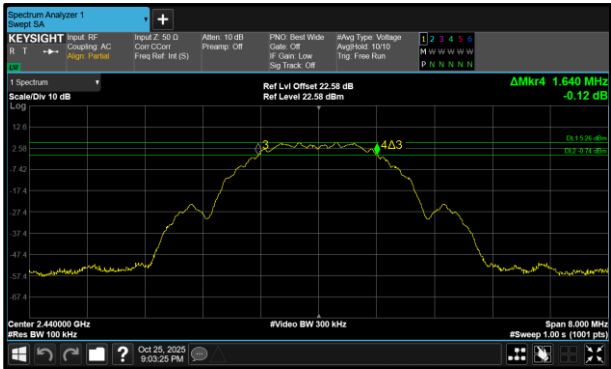


Figure 24 - Core 1 (B) 2440 MHz (CH18) 6 dB Bandwidth

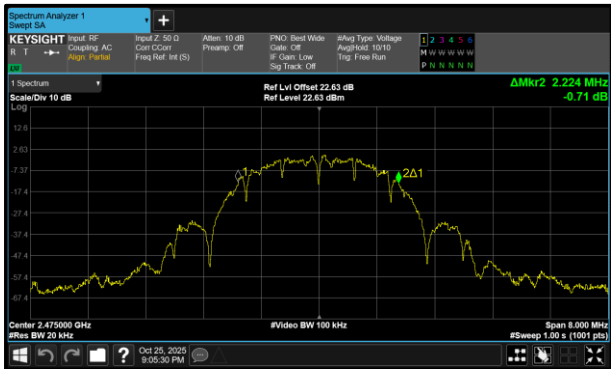


Figure 25 - Core 1 (B) 2475 MHz (CH25) 99% Bandwidth

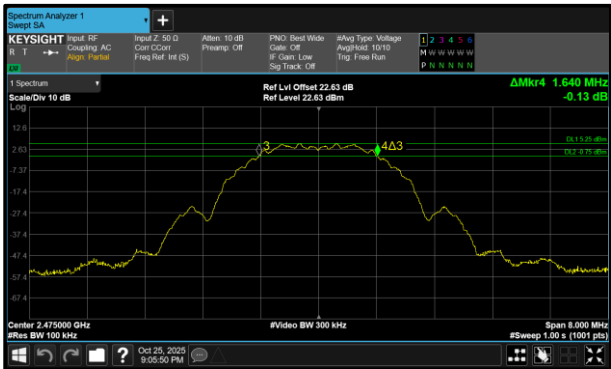


Figure 26 - Core 1 (B) 2475 MHz (CH25) 6 dB Bandwidth



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 6.9.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread ePA	Duty Cycle (%):	-
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	-
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	6 dB Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2405	-	1.608	-	-	≥500.0
2440	-	1.608	-	-	≥500.0
2475	-	1.616	-	-	≥500.0

Table 20 - 6 dB Bandwidth Results

Test Frequency (MHz)	99% Bandwidth (MHz)				Limit (kHz)
	A	B	C	D	
2405	-	2.192	-	-	-
2440	-	2.192	-	-	-
2475	-	2.200	-	-	-

Table 21 - 99% Bandwidth Results

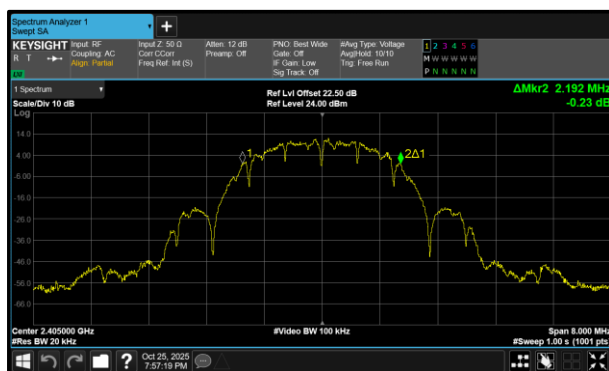


Figure 27 - Core 1 (B) 2405 MHz (CH11) 99% Bandwidth

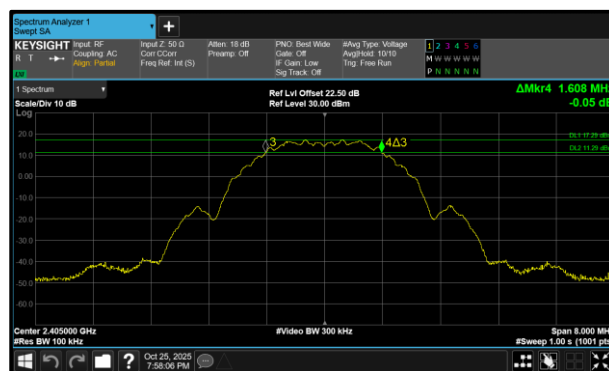


Figure 28 - Core 1 (B) 2405 MHz (CH11) 6 dB Bandwidth



Figure 29 - Core 1 (B) 2440 MHz (CH18) 99% Bandwidth

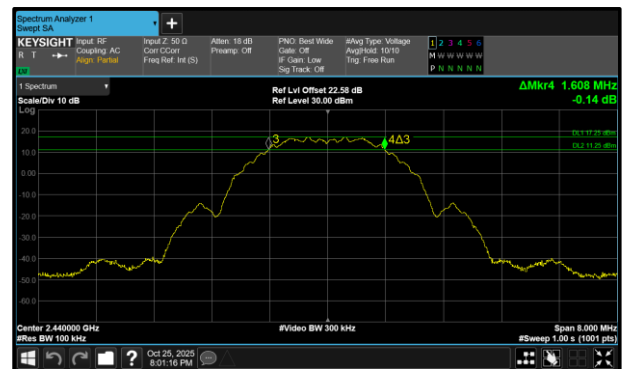


Figure 30 - Core 1 (B) 2440 MHz (CH18) 6 dB Bandwidth

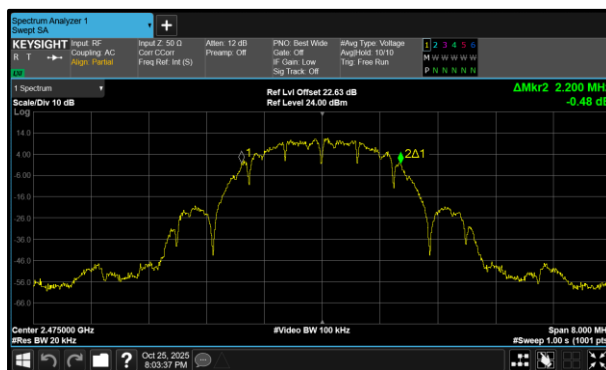


Figure 31 - Core 1 (B) 2475 MHz (CH25) 99% Bandwidth

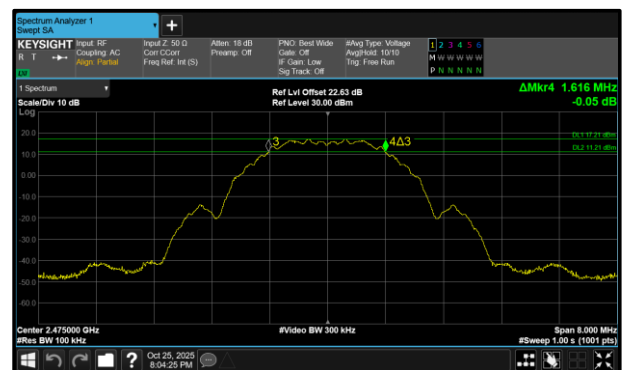


Figure 32 - Core 1 (B) 2475 MHz (CH25) 6 dB Bandwidth

FCC 47 CFR Part 15, Limit Clause 15.247(a)(2) and ISCED RSS-247 6.3.1

The minimum 6 dB Bandwidth shall be at least 500 kHz.



2.2.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon
MXA Signal Analyser	Keysight Technologies	N9020B	5529	24	02-Jan-2027
Digital Multimeter	Fluke	115	6145	12	06-Jun-2026
Humidity & Temperature meter	R.S Components	1364	6148	12	28-Aug-2026
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6426	12	12-Feb-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6752	12	12-Feb-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6753	12	12-Feb-2026

Table 22

O/P Mon - Output Monitored using calibrated equipment



2.3 Maximum Conducted Output Power

2.3.1 Specification Reference

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

2.3.2 Equipment Under Test and Modification State

A3448, S/N: C6N23Y607Y - Modification State 0

2.3.3 Date of Test

25-October-2025

2.3.4 Test Method

The test was performed in accordance with ANSI C63.10 clause 11.9.2.3.2 Method AVGPM-G

2.3.5 Environmental Conditions

Ambient Temperature	21.5 °C
Relative Humidity	43.5 %



2.3.6 Test Results

Thread

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 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread iPA	Duty Cycle (%):	100.0
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	5.2
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2405	8.67	-	-	-	8.67	30.00	-21.33
2440	8.51	-	-	-	8.51	30.00	-21.49
2475	8.65	-	-	-	8.65	30.00	-21.35

Table 23 - FCC Maximum Conducted (average) 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					
2405	8.67	-	-	-	8.67	30.00	-21.33	13.47	36.00	-22.53
2440	8.51	-	-	-	8.51	30.00	-21.49	13.71	36.00	-22.29
2475	8.65	-	-	-	8.65	30.00	-21.35	13.85	36.00	-22.15

Table 24 - ISED Maximum Conducted (average) Output Power Results



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 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread ePA	Duty Cycle (%):	100.0
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	5.2
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2405	20.84	-	-	-	20.84	30.00	-9.16
2440	20.57	-	-	-	20.57	30.00	-9.43
2475	20.82	-	-	-	20.82	30.00	-9.18

Table 25 - FCC Maximum Conducted (average) 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					
2405	20.84	-	-	-	20.84	30.00	-9.16	25.64	36.00	-10.36
2440	20.57	-	-	-	20.57	30.00	-9.43	25.77	36.00	-10.23
2475	20.82	-	-	-	20.82	30.00	-9.18	26.02	36.00	-9.98

Table 26 - ISSED Maximum Conducted (average) Output Power Results



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 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread iPA	Duty Cycle (%):	100.0
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	4.8
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2405	-	8.77	-	-	8.77	30.00	-21.23
2440	-	8.78	-	-	8.78	30.00	-21.22
2475	-	8.69	-	-	8.69	30.00	-21.31

Table 27 - FCC Maximum Conducted (average) 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					
2405	-	8.77	-	-	8.77	30.00	-21.23	13.37	36.00	-22.63
2440	-	8.78	-	-	8.78	30.00	-21.22	13.48	36.00	-22.52
2475	-	8.69	-	-	8.69	30.00	-21.31	13.49	36.00	-22.51

Table 28 - ISSED Maximum Conducted (average) Output Power Results



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 11.9.2.3.2
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread ePA	Duty Cycle (%):	100.0
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	4.8
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	Maximum Conducted Output Power (dBm)					Limit (dBm)	Margin (dB)
	A	B	C	D	Σ		
2405	-	20.83	-	-	20.83	30.00	-9.17
2440	-	20.76	-	-	20.76	30.00	-9.24
2475	-	20.64	-	-	20.64	30.00	-9.36

Table 29 - FCC Maximum Conducted (average) 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					
2405	-	20.83	-	-	20.83	30.00	-9.17	25.43	36.00	-10.57
2440	-	20.76	-	-	20.76	30.00	-9.24	25.46	36.00	-10.54
2475	-	20.64	-	-	20.64	30.00	-9.36	25.44	36.00	-10.56

Table 30 - ISED Maximum Conducted (average) 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 DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e) of the specification.



2.3.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon
USB Power Sensor	Boonton	RTP5008	5820	12	12-Feb-2026
USB Power Sensor	Boonton	RTP5008	5821	12	12-Feb-2026
Digital Multimeter	Fluke	115	6145	12	06-Jun-2026
Humidity & Temperature meter	R.S Components	1364	6148	12	28-Aug-2026
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6426	12	12-Feb-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6752	12	12-Feb-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6753	12	12-Feb-2026

Table 31

O/P Mon - Output Monitored using calibrated equipment



2.4 Authorised Band Edges

2.4.1 Specification Reference

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

2.4.2 Equipment Under Test and Modification State

A3448, S/N: C6FYGFCX3L - Modification State 0

2.4.3 Date of Test

27-August-2025

2.4.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.10.4.

2.4.5 Environmental Conditions

Ambient Temperature	23.6 °C
Relative Humidity	41.2 %



2.4.6 Test Results

Thread

iPA - Core 0 (SISO)

Mode	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
Thread	2405	2400	-44.88

Table 32 - iPA, Core 0, SISO Authorised Band Edge Results

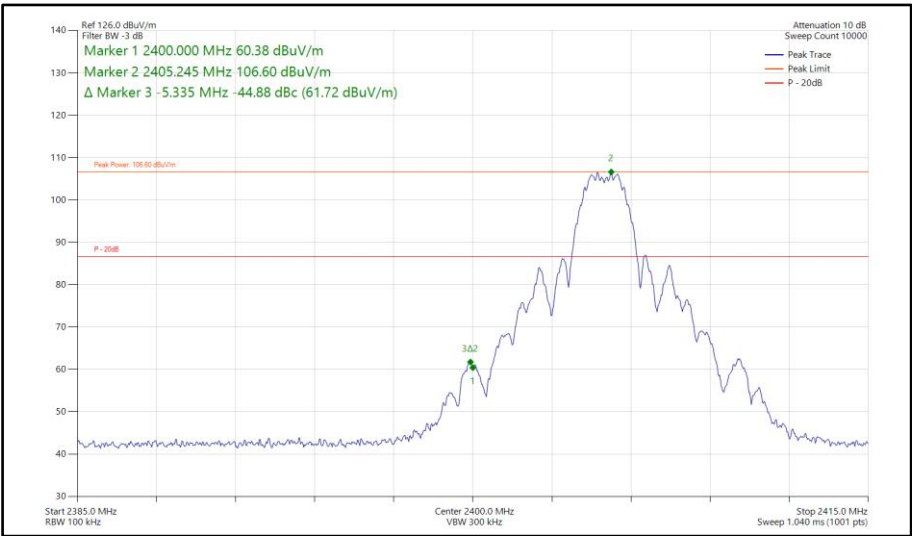


Figure 33 - Thread, iPA, SISO, Core 0 - 2405 MHz
Band Edge Frequency 2400 MHz



iPA - Core 1 (SISO)

Mode	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
Thread	2405	2400	-44.56

Table 33 - iPA, Core 1, SISO Authorised Band Edge Results

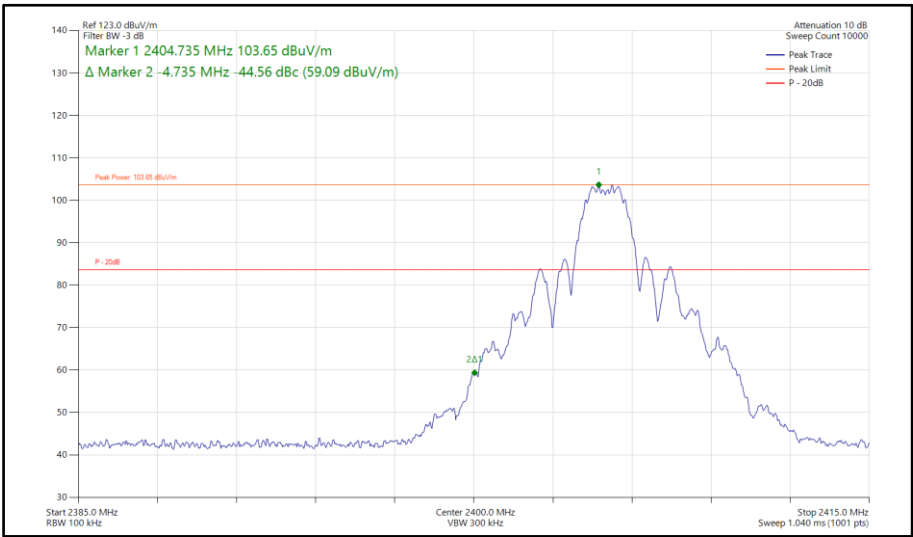


Figure 34 - Thread, iPA, SISO, Core 1 - 2405 MHz
Band Edge Frequency 2400 MHz



ePA - Core 0 (SISO)

Mode	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
Thread	2405	2400	-68.79

Table 34 - ePA, Core 0, SISO Authorised Band Edge Results

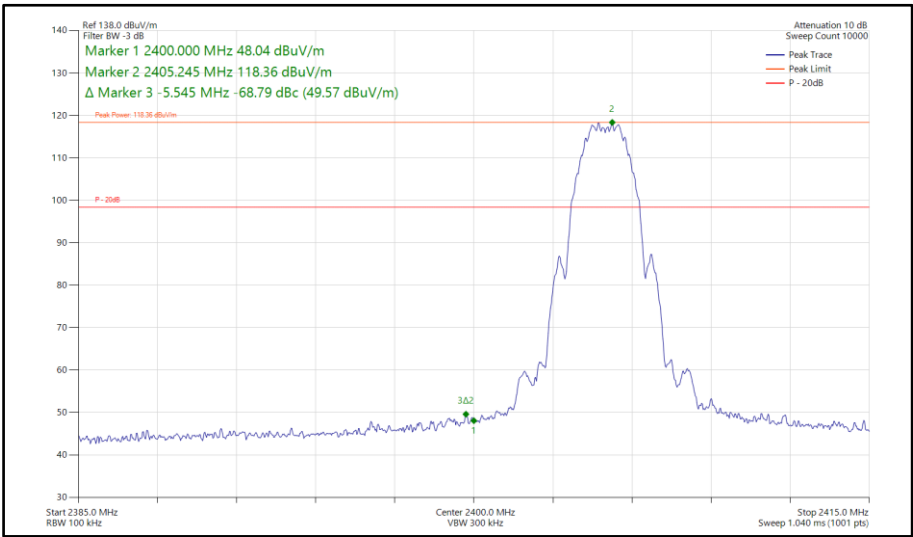
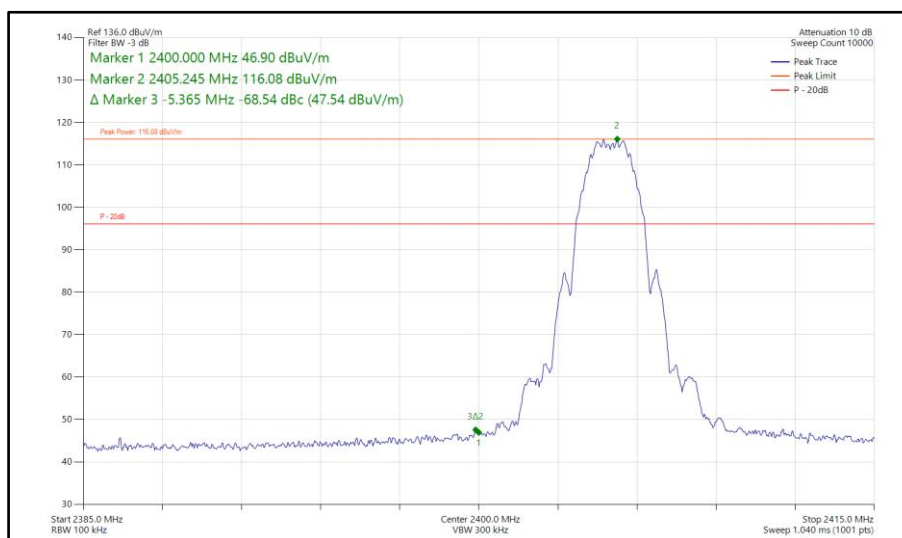


Figure 35 - Thread, ePA, SISO, Core 0 - 2405 MHz
Band Edge Frequency 2400 MHz

ePA - Core 1 (SISO)

Mode	TX Frequency (MHz)	Band Edge Frequency (MHz)	Level (dBc)
Thread	2405	2400	-68.54

Table 35 - ePA, Core 1, SISO Authorised Band Edge Results



**Figure 36 - Thread, ePA, SISO, Core 1 - 2405 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 RF Chamber 17.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Emissions Software	TUV SUD	EmX V3.5.5	5125	-	O/P Mon
EMI Test Receiver	Rohde & Schwarz	ESW44	6294	12	24-Feb-2026
USB Spectrum Analyser	Signal Hound	SA124B	6298	-	TU
Digital Multimeter	Fluke	115	6345	12	24-Jul-2026
Humidity and Temperature Meter	R.S Components	1364	6346	12	13-Mar-2026
SAC Switch Unit	TUV SUD	TUV_SSU_004 PLC	6349	12	16-May-2026
Horn Antenna (1–10.5 GHz)	Schwarzbeck	BBHA 9120 B	6457	12	14-Sep-2026
AC Power Supply	iTech	IT7324	6657	-	O/P Mon
3m Semi-Anechoic Chamber	Albatross Projects	RF Chamber 17	6658	36	07-May-2028
Mast and Turntable Controller	Maturo Gmbh	FCU3.0	6659	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	6660	-	TU
Turntable	Maturo Gmbh	TT1.5SI	6661	-	TU
1m SMA-Type Cable	Junkosha	MWX221-01000AMSAMS/B	6844	12	05-Sep-2025
8m SMA-Type Cable	Junkosha	MWX221-08000AMSAMS/B	6846	12	06-Nov-2025
Cable Assembly	SpecTech	PE300-60	6859	-	TU
Cable Assembly	SpecTech	PE300-60	6860	-	TU
RF Amplifier BROADBAND AMPL/SMA/RoHS	Mini-Circuits	ZX60-83LN12+	6979	12	05-Apr-2026

Table 36

TU - Traceability Unscheduled



2.5 Spurious Radiated Emissions

2.5.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.209 and 15.247 (d)
ISED RSS-247, Clause 3.3 and 6.6
ISED RSS-GEN, Clause 6.13 and 8.9

2.5.2 Equipment Under Test and Modification State

A3448, S/N: C6FYGFCX3L - Modification State 0
A3448, S/N: C6YFMQX60V - Modification State 0

2.5.3 Date of Test

16-November-2025 to 20-November-2025

2.5.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 6.3, 6.5 and 6.6.

Ports on the EUT were terminated with loads as described in ANSI C63.10 clause 6.2.3.

In the 30 MHz to 1 GHz range pre-scans were only performed on the mid channel (2440 MHz).

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 20 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 dBµV/m to µV/m:
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$

To determine the emission characteristic of the EUT above 18 GHz, the test antenna was swept over all faces of the EUT whilst observing a spectral display. The frequency of any emissions of interest was noted for formal measurement at the correct measurement distance of 1m. This procedure was repeated for all relevant transmit operating channels.

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.

Where formal measurements have been necessary, the results have been presented in the emissions table.

2.5.5 Example Test Setup Diagram

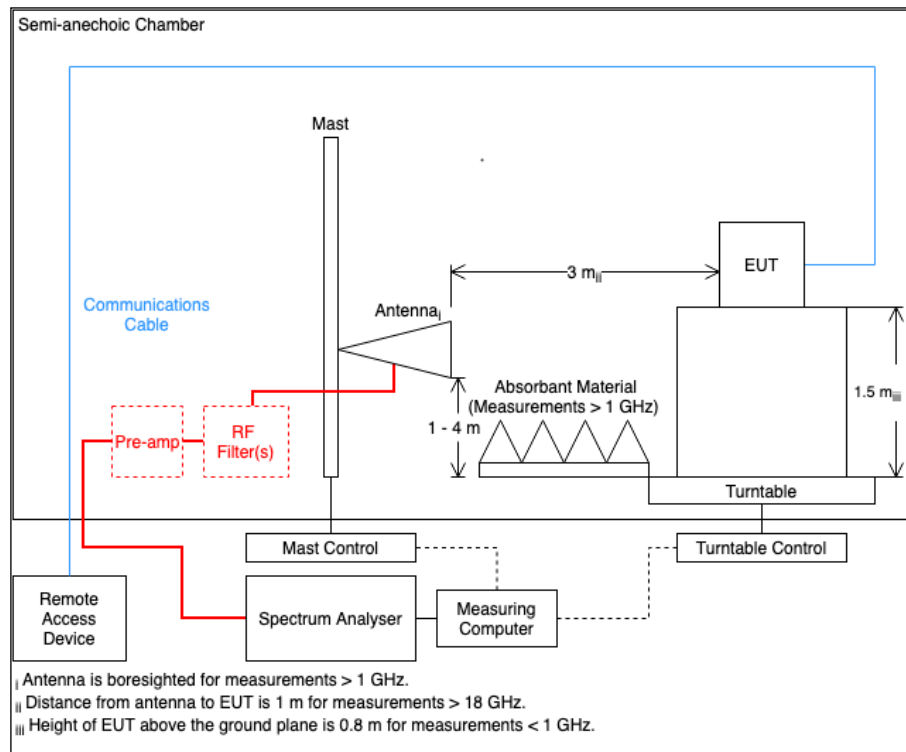


Figure 37

2.5.6 Environmental Conditions

Ambient Temperature	22.8 - 24.2 °C
Relative Humidity	36.5 - 46.7 %

2.5.7 Test Results

Thread

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.227	33.65	54.00	-20.35	RMS	10	148	Vertical
2483.783	34.26	54.00	-19.74	RMS	360	355	Vertical

Table 37 - 2405 MHz (CH11), Thread, ePA, Core 0, 1 GHz to 18 GHz

No other emissions found within 20 dB of the limit.

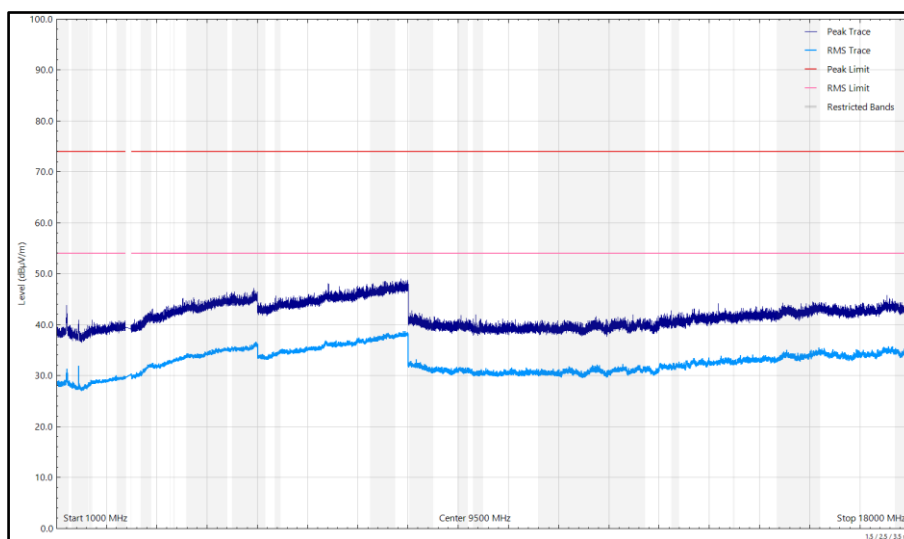


Figure 38 - 2405 MHz (CH11), Thread, ePA, Core 0, 1 GHz to 18 GHz, Horizontal

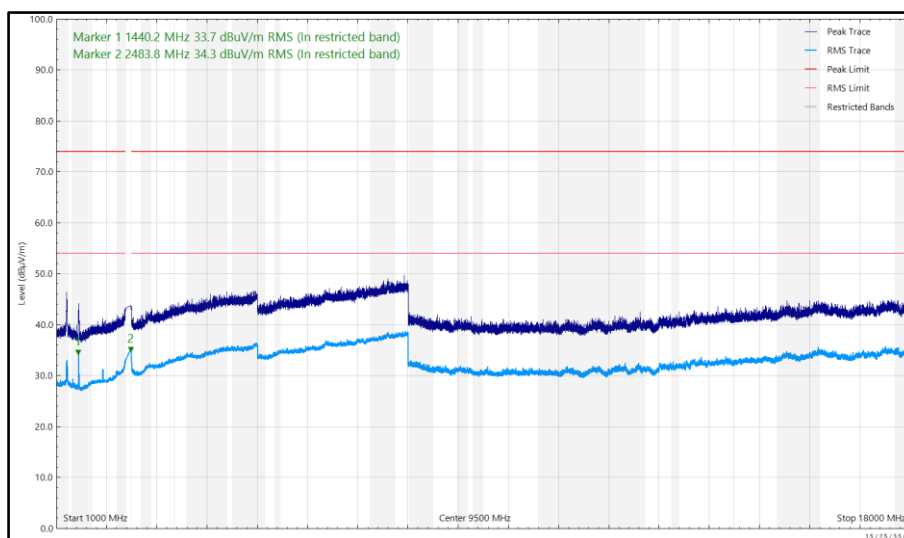


Figure 39 - 2405 MHz (CH11), Thread, ePA, Core 0, 1 GHz to 18 GHz, Vertical

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
37.721	21.34	40.00	-18.66	Q-Peak	11	334	Vertical
74.939	21.17	40.00	-18.83	Q-Peak	266	136	Vertical
74.971	19.25	40.00	-20.75	Q-Peak	0	386	Horizontal
112.800	18.71	43.50	-24.79	Q-Peak	226	289	Horizontal
171.463	21.04	43.50	-22.46	Q-Peak	0	353	Vertical
253.249	25.01	46.00	-20.99	Q-Peak	345	133	Horizontal
282.493	22.44	46.00	-23.56	Q-Peak	230	103	Vertical
1440.185	34.96	54.00	-19.04	RMS	0	290	Vertical
2389.563	36.59	54.00	-17.41	RMS	7	381	Vertical
2483.697	35.33	54.00	-18.67	RMS	2	324	Vertical

Table 38 - 2440 MHz (CH18), Thread, ePA, Core 0, 30 MHz to 26 GHz

No other emissions found within 20 dB of the limit.

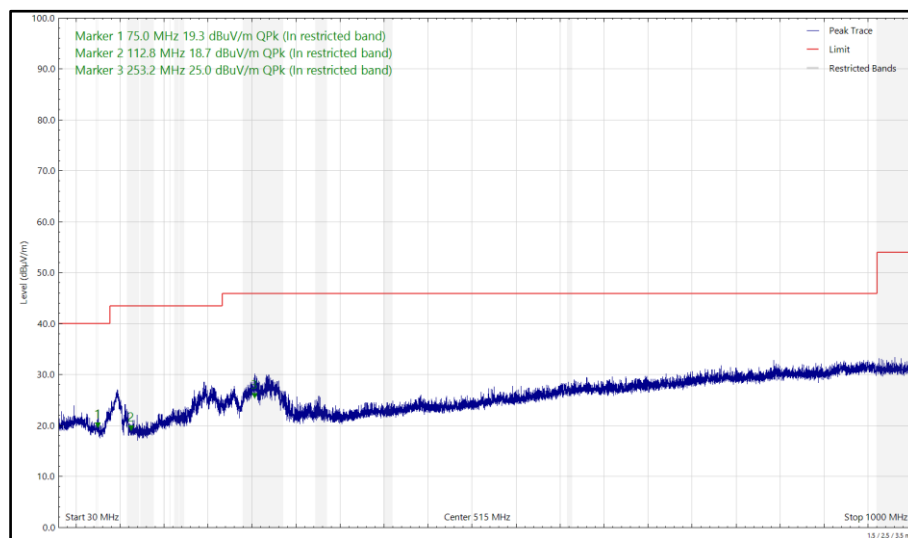


Figure 40 - 2440 MHz (CH18), Thread, ePA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

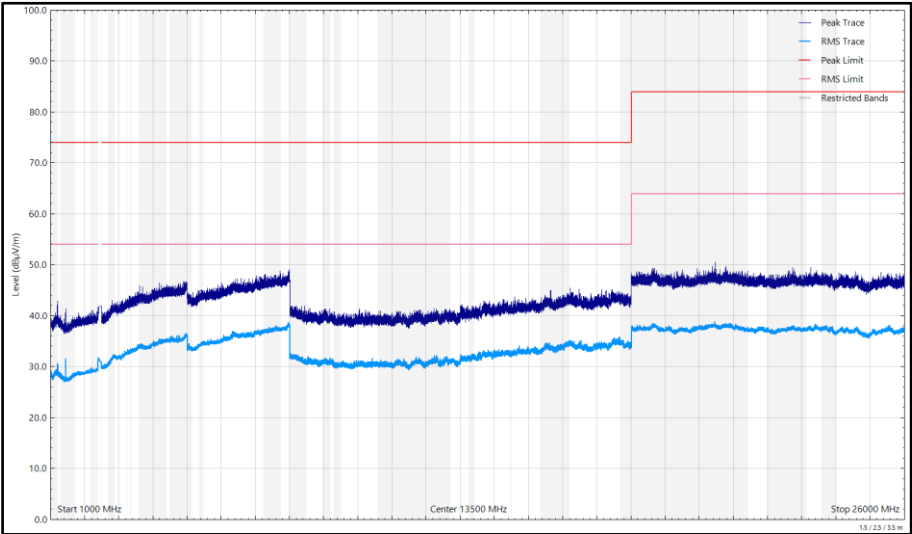


Figure 41 - 2440 MHz (CH18), Thread, ePA, Core 0, 1 GHz to 26 GHz, Horizontal

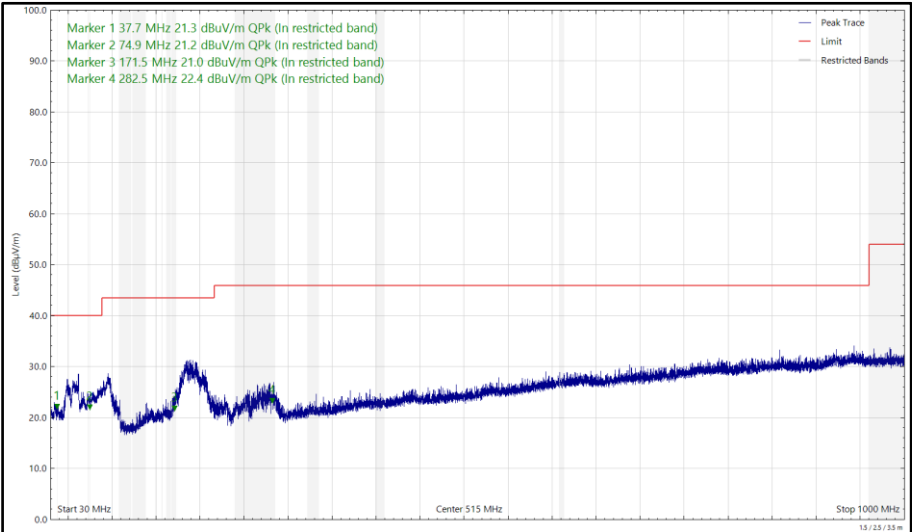


Figure 42 - 2440 MHz (CH18), Thread, ePA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

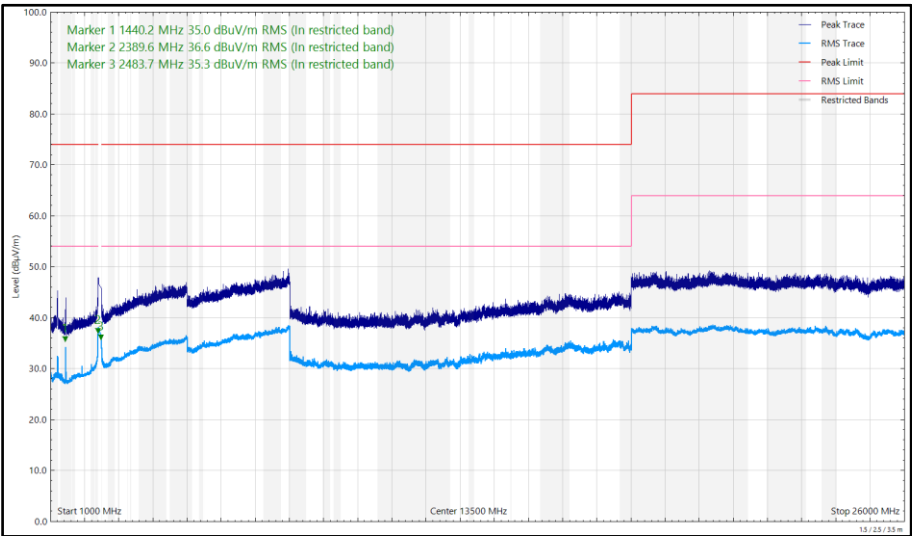


Figure 43 - 2440 MHz (CH18), Thread, ePA, Core 0, 1 GHz to 26 GHz, Vertical

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.053	35.74	54.00	-18.26	RMS	10	263	Vertical
2389.096	36.31	54.00	-17.69	RMS	360	296	Vertical

Table 39 - 2475 MHz (CH25), Thread, ePA, Core 0, 1 GHz to 18 GHz

No other emissions found within 20 dB of the limit.

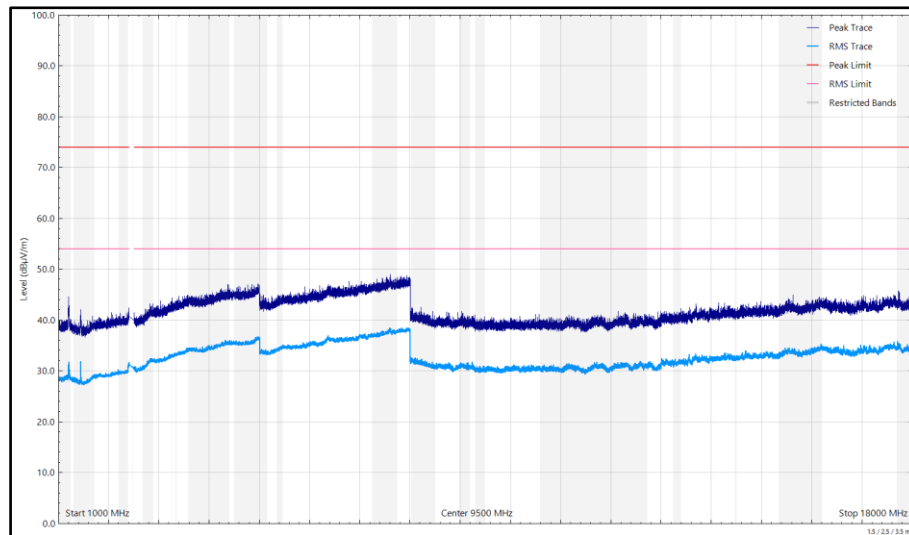


Figure 44 - 2475 MHz (CH25), Thread, ePA, Core 0, 1 GHz to 18 GHz, Horizontal

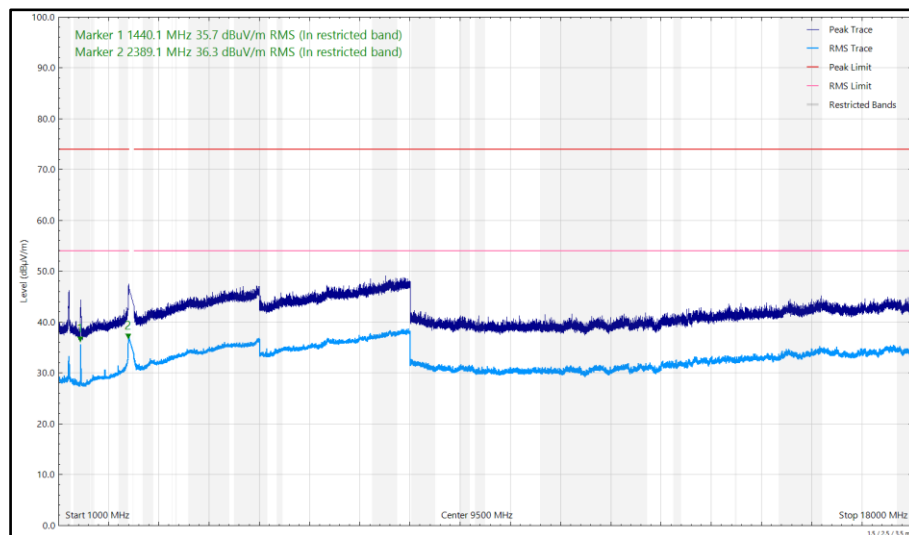


Figure 45 - 2475 MHz (CH25), Thread, ePA, Core 0, 1 GHz to 18 GHz, Vertical

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.108	36.26	54.00	-17.74	RMS	34	162	Vertical
2483.546	36.71	54.00	-17.29	RMS	350	352	Vertical

Table 40 - 2405 MHz (CH11), Thread, ePA, Core 1, 1 GHz to 18 GHz

No other emissions found within 20 dB of the limit.

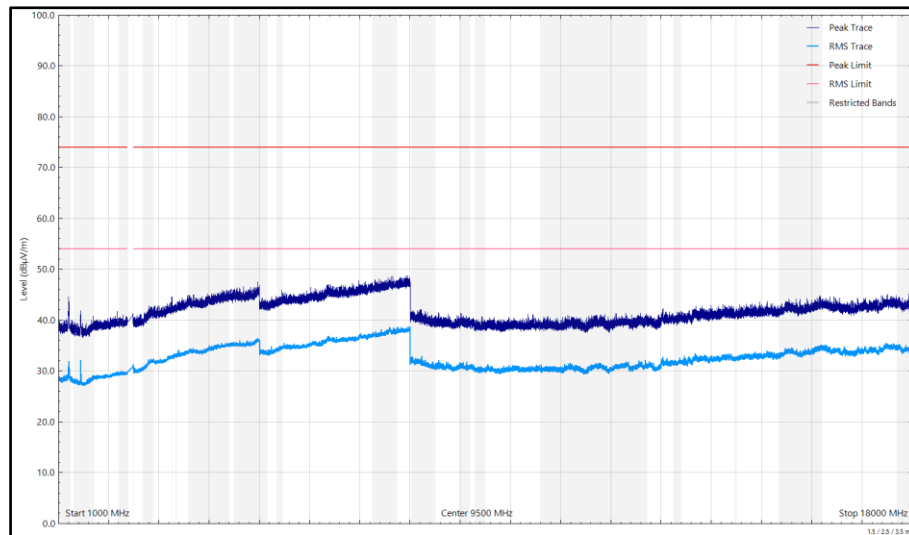


Figure 46 - 2405 MHz (CH11), Thread, ePA, Core 1, 1 GHz to 18 GHz, Horizontal

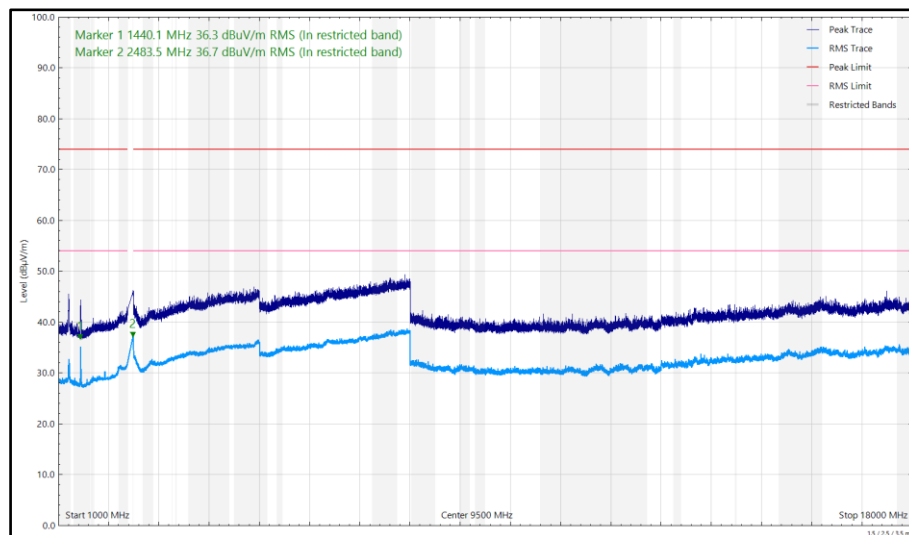


Figure 47 - 2405 MHz (CH11), Thread, ePA, Core 1, 1 GHz to 18 GHz, Vertical

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
108.559	23.84	43.50	-19.66	Q-Peak	19	290	Vertical
113.027	18.82	43.50	-24.68	Q-Peak	350	390	Horizontal
170.225	21.56	43.50	-21.94	Q-Peak	30	136	Vertical
252.723	25.54	46.00	-20.46	Q-Peak	350	137	Horizontal
276.762	22.08	46.00	-23.92	Q-Peak	286	100	Vertical
1440.161	34.42	54.00	-19.58	RMS	13	268	Vertical
2388.864	33.35	54.00	-20.65	RMS	10	311	Vertical
2483.519	37.62	54.00	-16.38	RMS	344	297	Vertical

Table 41 - 2440 MHz (CH18), Thread, ePA, Core 1, 30 MHz to 26 GHz

No other emissions found within 20 dB of the limit.

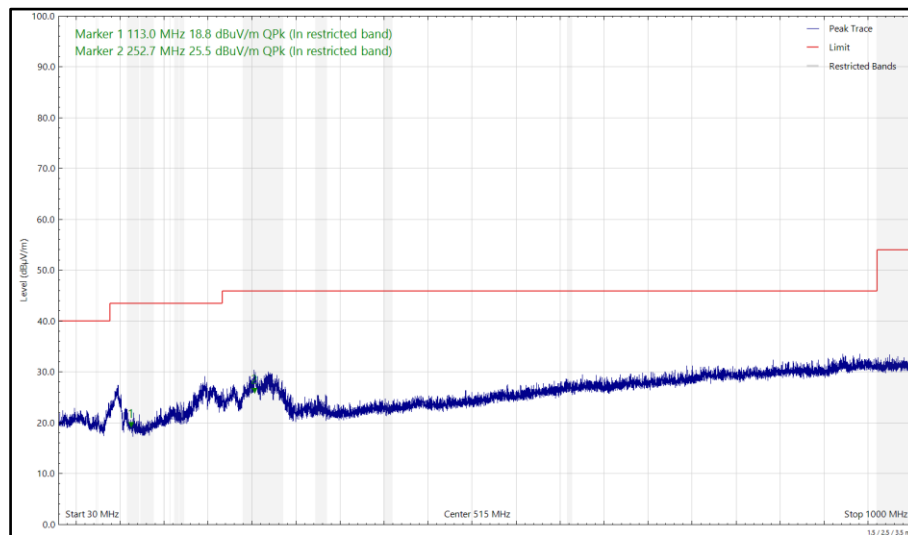


Figure 48 - 2440 MHz (CH18), Thread, ePA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

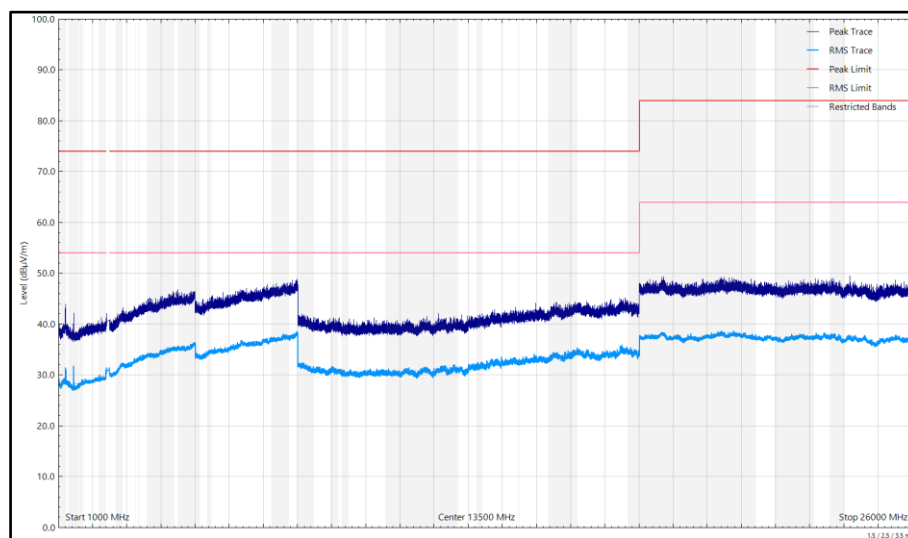


Figure 49 - 2440 MHz (CH18), Thread, ePA, Core 1, 1 GHz to 26 GHz, Horizontal

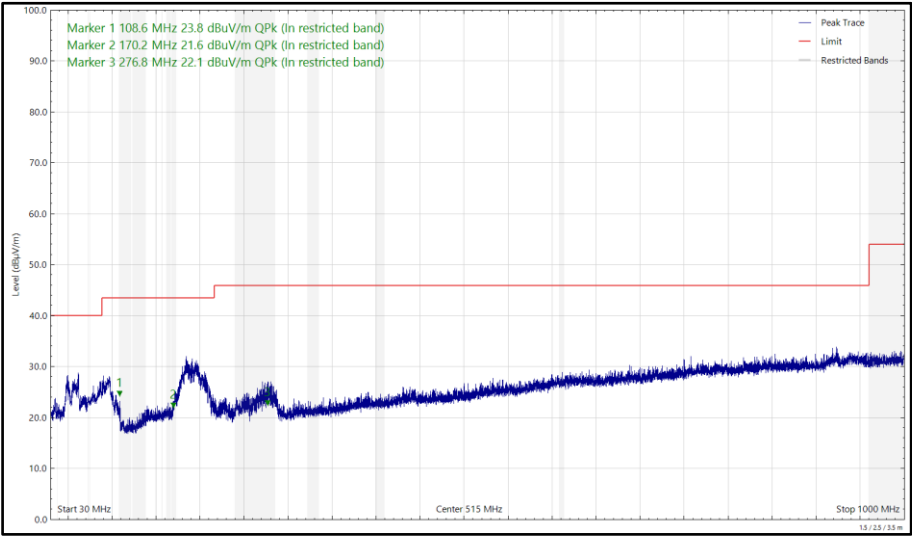


Figure 50 - 2440 MHz (CH18), Thread, ePA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

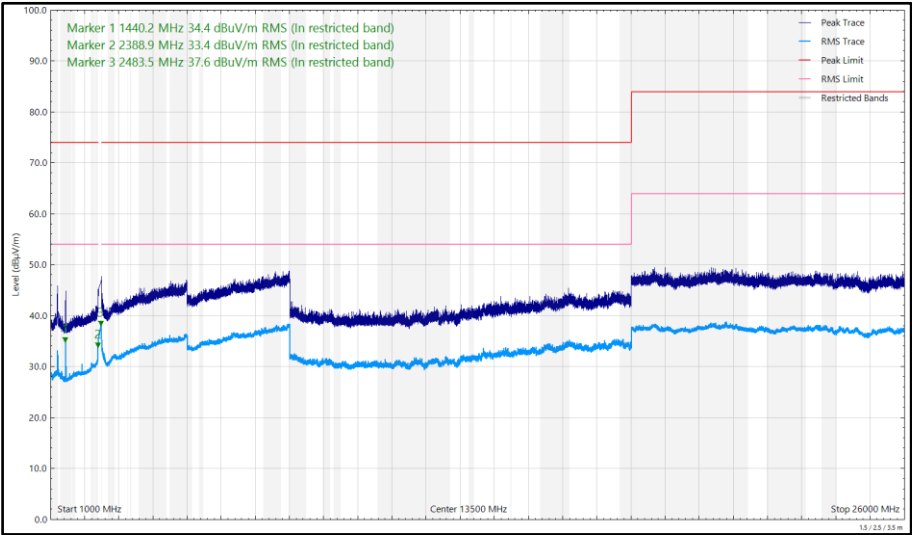


Figure 51 - 2440 MHz (CH18), Thread, ePA, Core 1, 1 GHz to 26 GHz, Vertical



Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.173	34.21	54.00	-19.79	RMS	28	172	Vertical
2498.562	33.53	54.00	-20.47	RMS	350	331	Vertical

Table 42 - 2475 MHz (CH25), Thread, ePA, Core 1, 1 GHz to 18 GHz

No other emissions found within 20 dB of the limit.

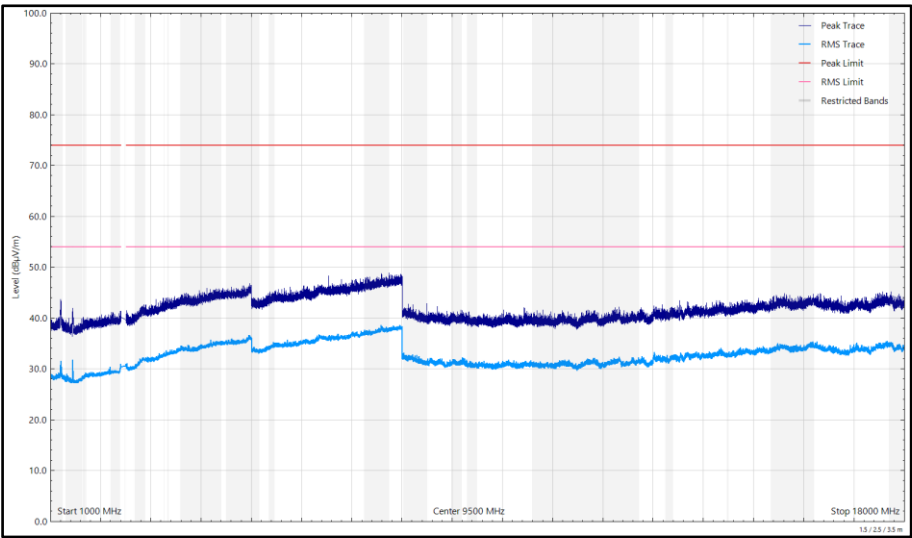


Figure 52 - 2475 MHz (CH25), Thread, ePA, Core 1, 1 GHz to 18 GHz, Horizontal

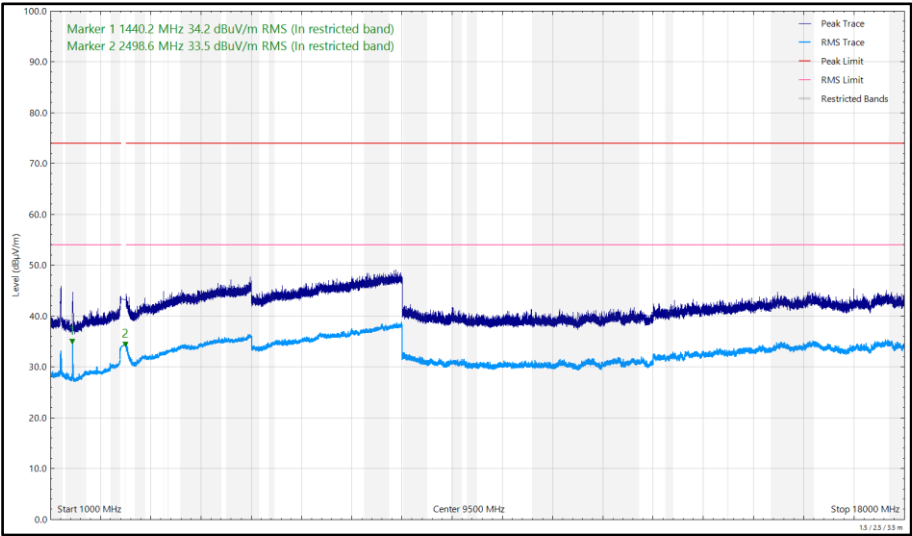


Figure 53 - 2475 MHz (CH25), Thread, ePA, Core 1, 1 GHz to 18 GHz, Vertical

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.238	35.81	54.00	-18.19	RMS	15	143	Vertical

Table 43 - 2405 MHz (CH11), Thread, iPA, Core 0, 1 GHz to 18 GHz

No other emissions found within 20 dB of the limit.

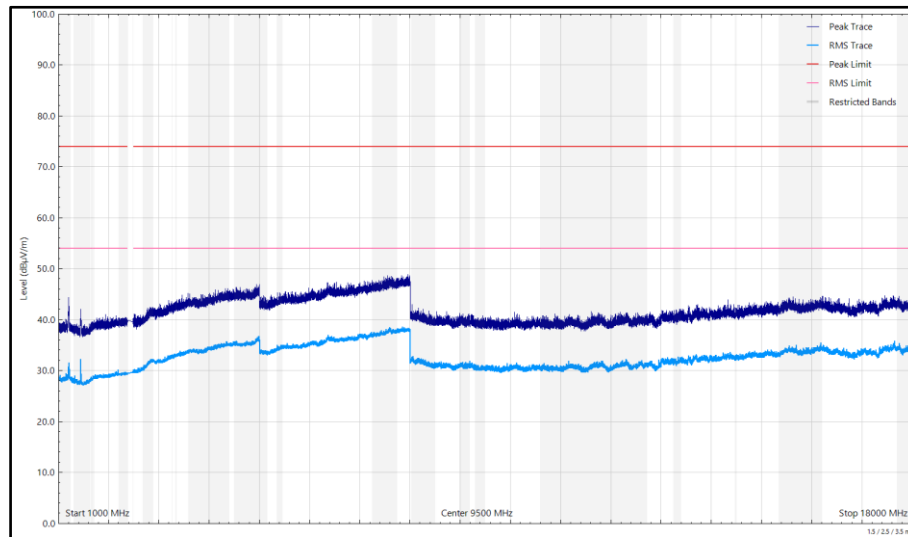


Figure 54 - 2405 MHz (CH11), Thread, iPA, Core 0, 1 GHz to 18 GHz, Horizontal

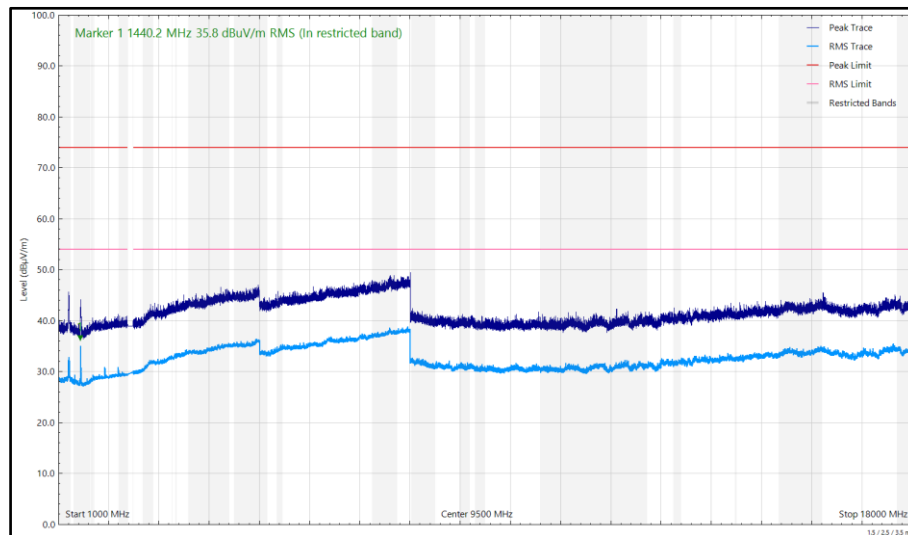


Figure 55 - 2405 MHz (CH11), Thread, iPA, Core 0, 1 GHz to 18 GHz, Vertical

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
73.019	18.72	40.00	-21.28	Q-Peak	245	362	Horizontal
73.136	19.77	40.00	-20.23	Q-Peak	0	205	Vertical
110.722	18.74	43.50	-24.76	Q-Peak	71	291	Vertical
111.619	18.77	43.50	-24.73	Q-Peak	348	387	Horizontal
171.589	21.11	43.50	-22.39	Q-Peak	0	389	Vertical
267.014	23.96	46.00	-22.04	Q-Peak	326	158	Horizontal
276.824	21.96	46.00	-24.04	Q-Peak	273	100	Vertical
1440.125	35.46	54.00	-18.54	RMS	2	260	Vertical

Table 44 - 2440 MHz (CH18), Thread, iPA, Core 0, 30 MHz to 26 GHz

No other emissions found within 20 dB of the limit.

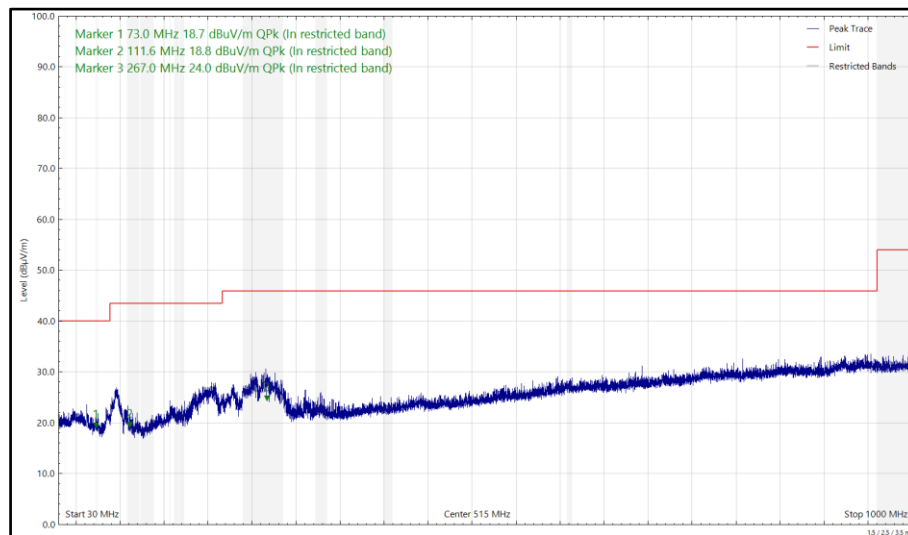


Figure 56 - 2440 MHz (CH18), Thread, iPA, Core 0, 30 MHz to 1 GHz, Horizontal (Peak)

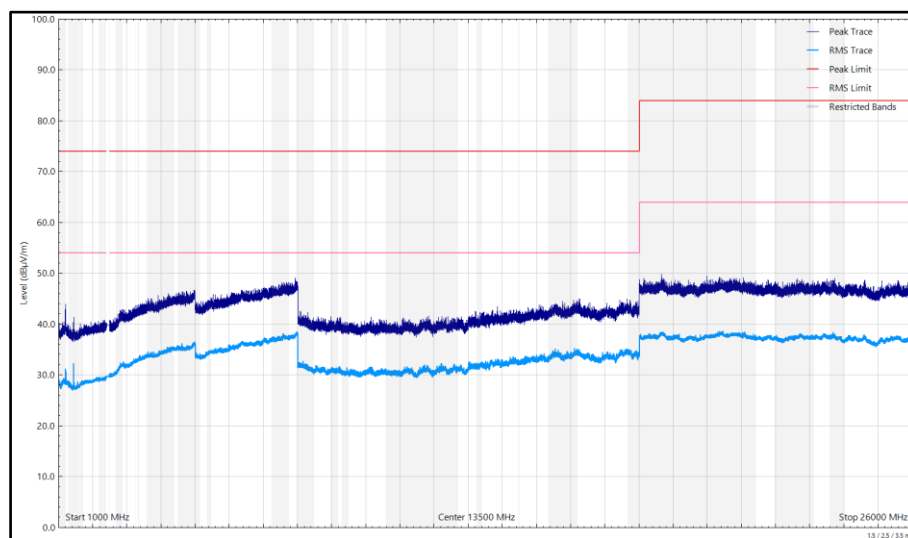


Figure 57 - 2440 MHz (CH18), Thread, iPA, Core 0, 1 GHz to 26 GHz, Horizontal

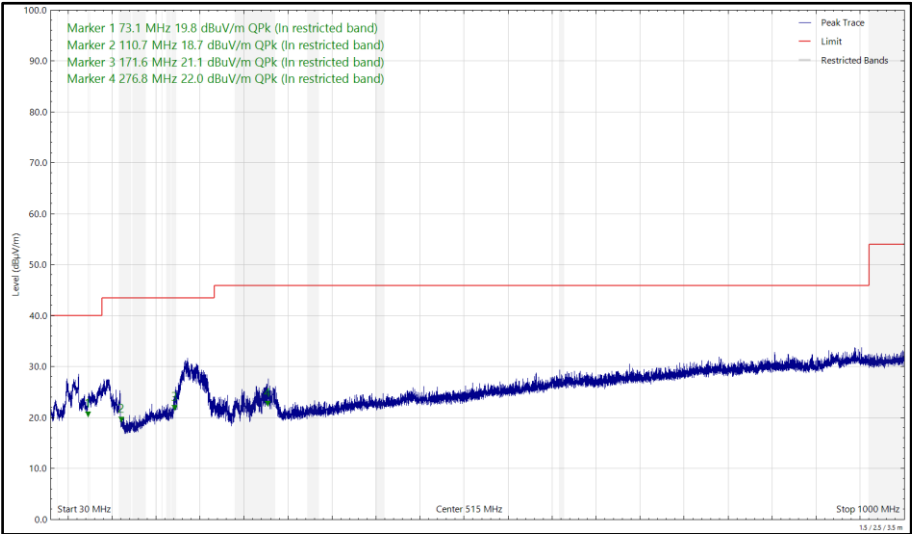


Figure 58 - 2440 MHz (CH18), Thread, iPA, Core 0, 30 MHz to 1 GHz, Vertical (Peak)

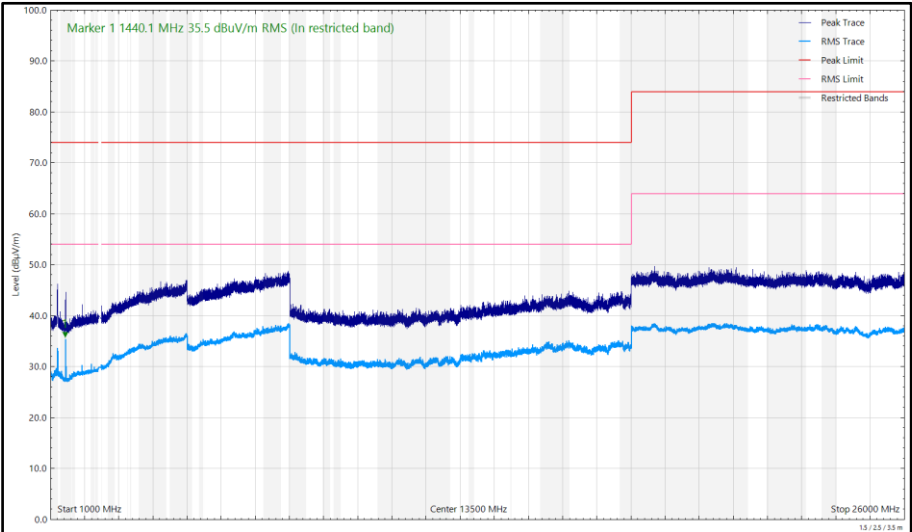


Figure 59 - 2440 MHz (CH18), Thread, iPA, Core 0, 1 GHz to 26 GHz, Vertical



Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.077	34.32	54.00	-19.68	RMS	24	333	Vertical

Table 45 - 2475 MHz (CH25), Thread, iPA, Core 0, 1 GHz to 18 GHz

No other emissions found within 20 dB of the limit.

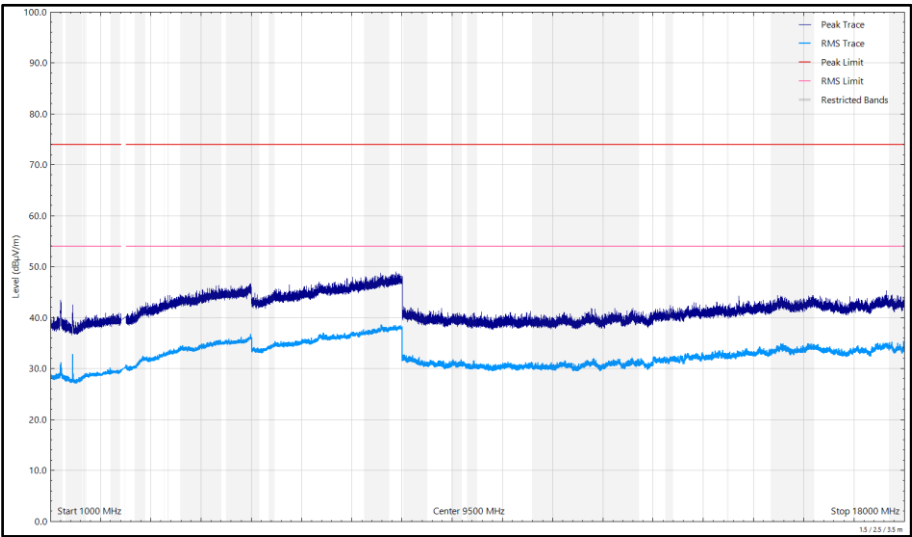


Figure 60 - 2475 MHz (CH25), Thread, iPA, Core 0, 1 GHz to 18 GHz, Horizontal

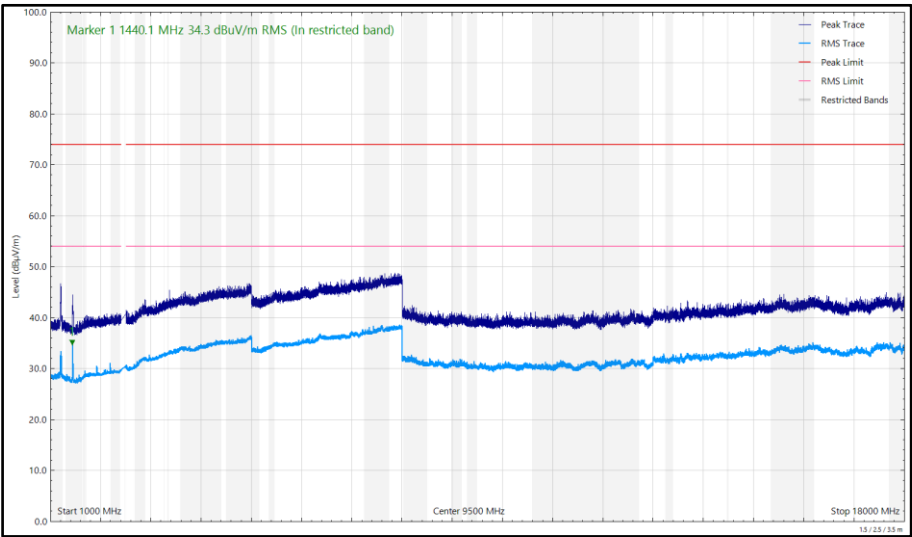


Figure 61 - 2475 MHz (CH25), Thread, iPA, Core 0, 1 GHz to 18 GHz, Vertical



Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.108	35.22	54.00	-18.78	RMS	2	260	Vertical

Table 46 - 2405 MHz (CH11), Thread, iPA, Core 1, 1 GHz to 18 GHz

No other emissions found within 20 dB of the limit.

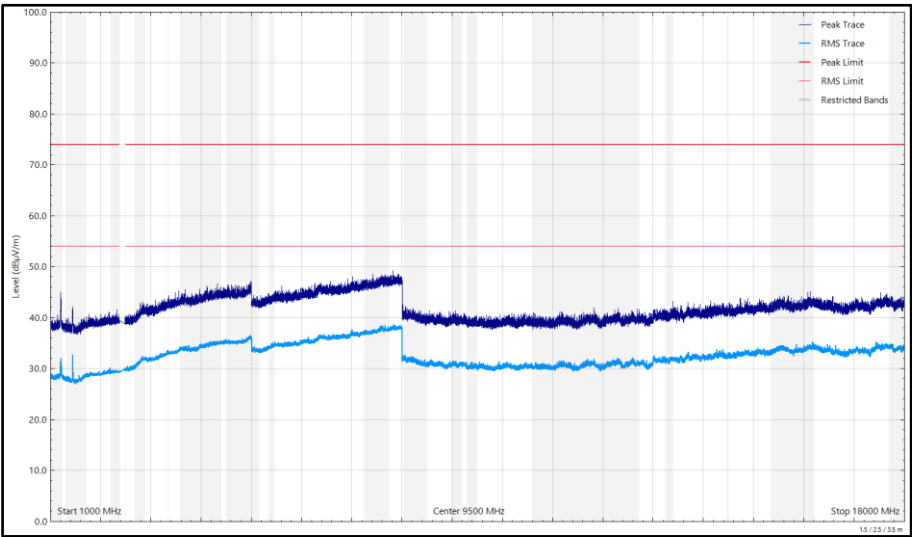


Figure 62 - 2405 MHz (CH11), Thread, iPA, Core 1, 1 GHz to 18 GHz, Horizontal

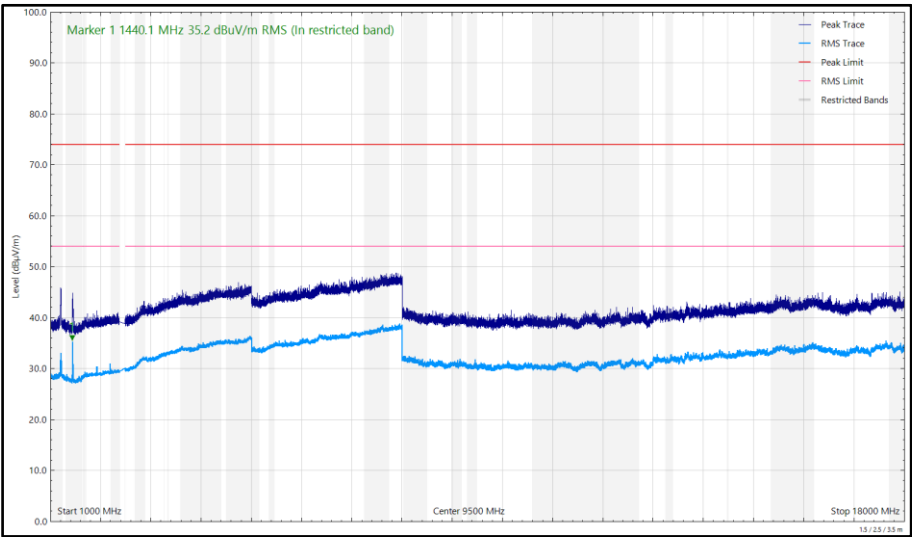


Figure 63 - 2405 MHz (CH11), Thread, iPA, Core 1, 1 GHz to 18 GHz, Vertical

Frequency (MHz)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
73.183	21.32	40.00	-18.68	Q-Peak	305	100	Vertical
73.410	18.67	40.00	-21.33	Q-Peak	92	303	Horizontal
108.519	22.07	43.50	-21.43	Q-Peak	334	285	Vertical
114.224	18.58	43.50	-24.92	Q-Peak	283	304	Horizontal
259.781	23.62	46.00	-22.38	Q-Peak	0	146	Horizontal
280.307	22.26	46.00	-23.74	Q-Peak	233	100	Vertical
1440.089	34.96	54.00	-19.04	RMS	12	145	Vertical

Table 47 - 2440 MHz (CH18), Thread, iPA, Core 1, 30 MHz to 26 GHz

No other emissions found within 20 dB of the limit.

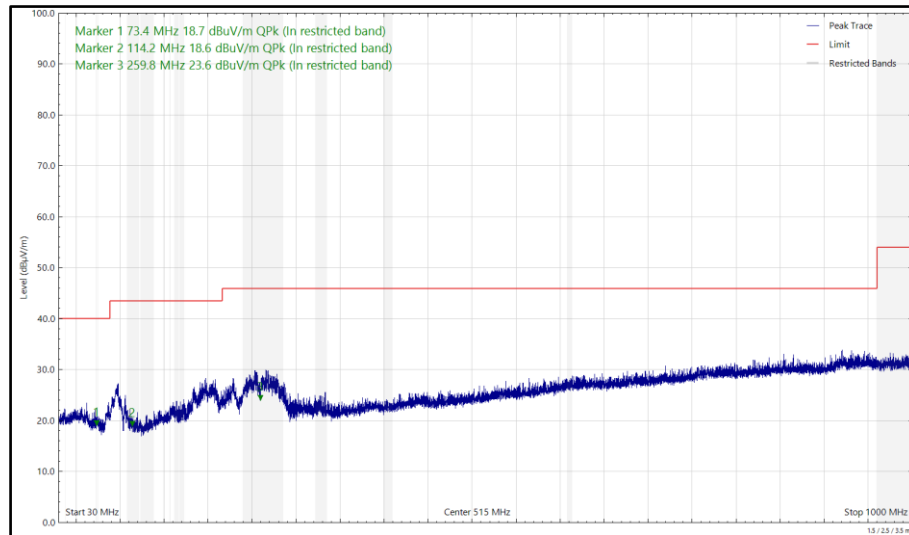


Figure 64 - 2440 MHz (CH18), Thread, iPA, Core 1, 30 MHz to 1 GHz, Horizontal (Peak)

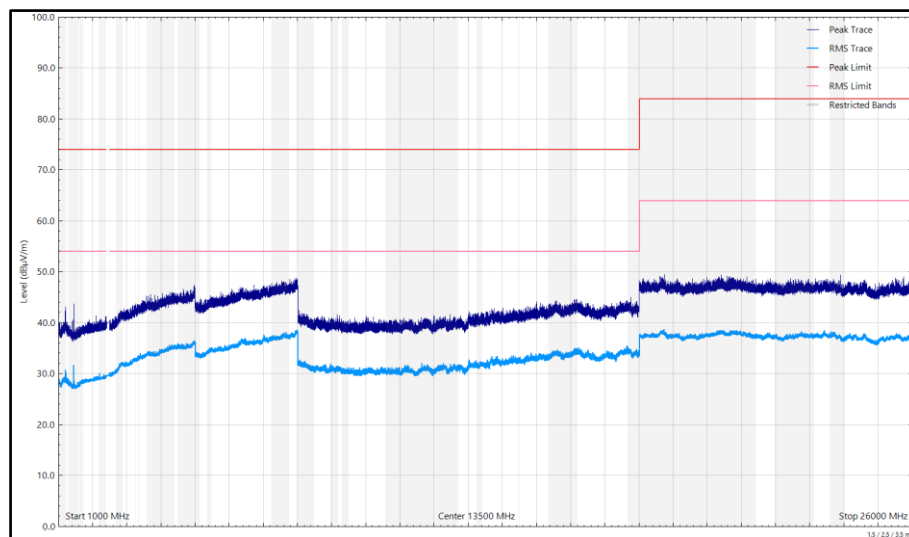


Figure 65 - 2440 MHz (CH18), Thread, iPA, Core 1, 1 GHz to 26 GHz, Horizontal

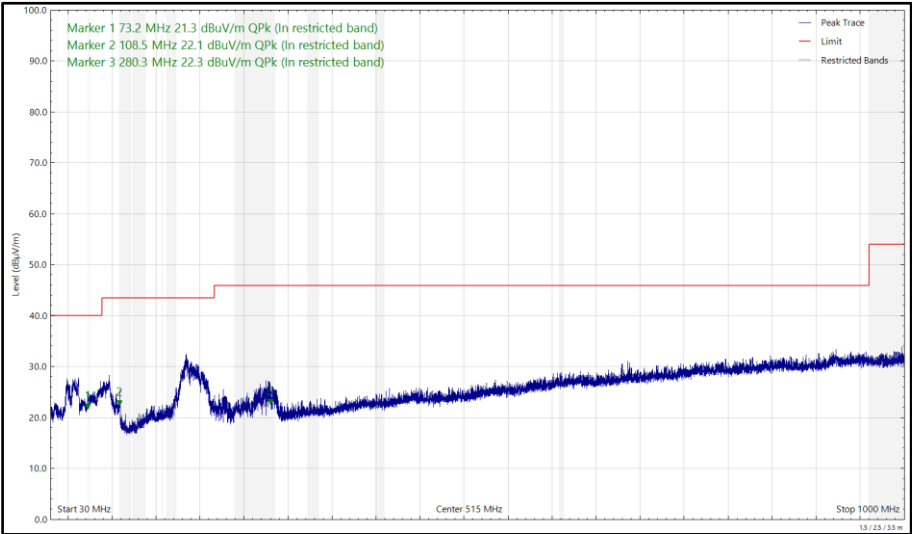


Figure 66 - 2440 MHz (CH18), Thread, iPA, Core 1, 30 MHz to 1 GHz, Vertical (Peak)

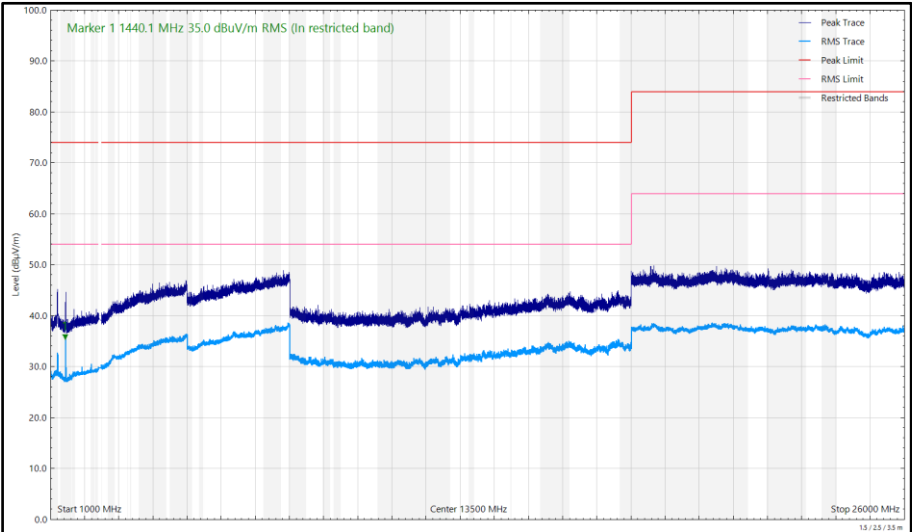


Figure 67 - 2440 MHz (CH18), Thread, iPA, Core 1, 1 GHz to 26 GHz, Vertical



Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
1440.077	35.63	54.00	-18.37	RMS	14	142	Vertical

Table 48 - 2475 MHz (CH25), Thread, iPA, Core 1, 1 GHz to 18 GHz

No other emissions found within 20 dB of the limit.

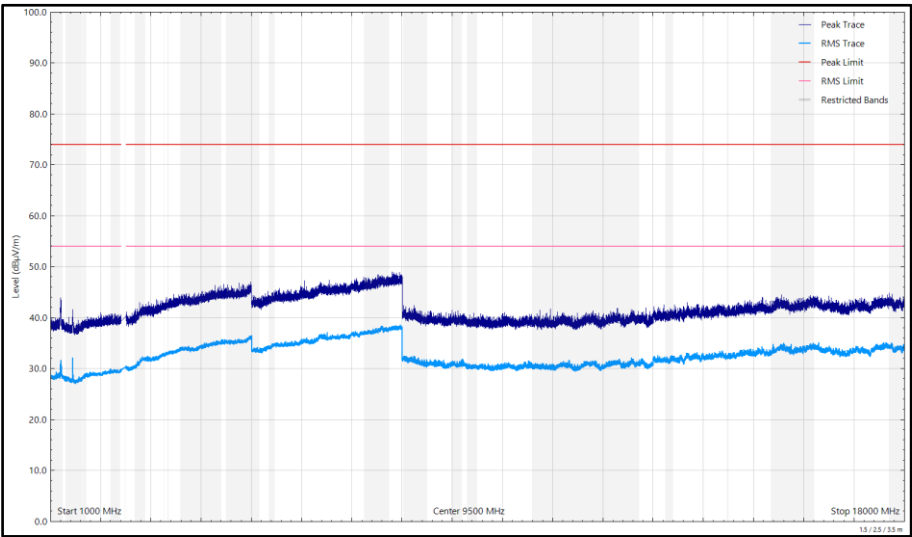


Figure 68 - 2475 MHz (CH25), Thread, iPA, Core 1, 1 GHz to 18 GHz, Horizontal

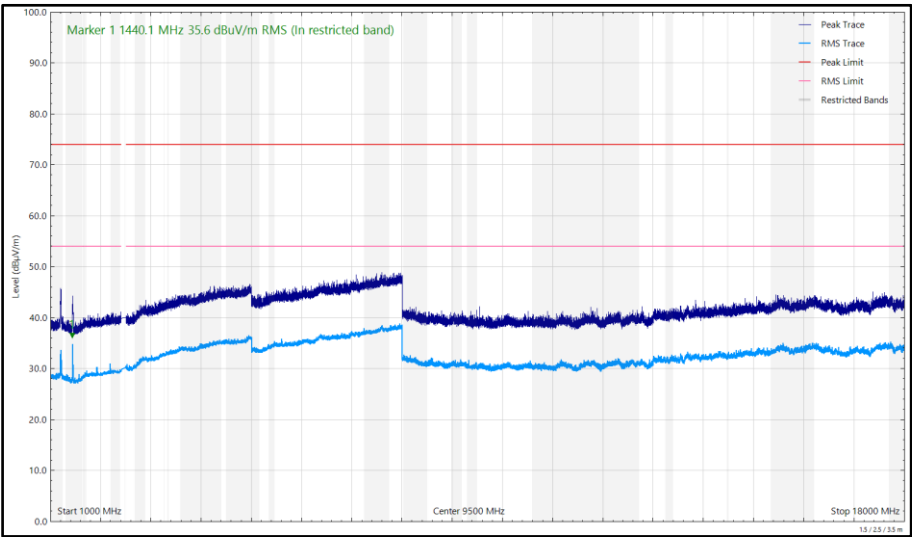


Figure 69 - 2475 MHz (CH25), Thread, iPA, Core 1, 1 GHz to 18 GHz, Vertical



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 RF Chamber 17 and RF Chamber 18

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Emissions Software	TUV SUD	EmX V3.5.5	5125	-	TU
EMI Test Receiver	Rohde & Schwarz	ESW44	5911	12	29-Oct-2026
DRG Horn Antenna (7.5-18GHz)	Schwarzbeck	HWRD750	5939	12	18-May-2026
TRILOG Super Broadband Test Antenna	Schwarzbeck	VULB 9168	5942	24	03-Jan-2027
Mast & Turntable Controller	Maturo Gmbh	FCU3.0	5960	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	5961	-	TU
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6007	12	06-Jun-2026
Cable (SMA to SMA 1m)	Junkosha	MWX221-01000AMSAMS/A	6018	12	12-Jun-2026
Digital Multimeter	Fluke	115	6145	12	06-Jun-2026
Humidity & Temperature meter	R.S Components	1364	6149	12	28-Aug-2026
Double Ridge Active Horn Antenna (18-40 GHz)	Com-Power	AHA-840	6188	24	31-Jul-2026
Attenuator (4 dB)	Pasternack	PE7074-4	6202	24	03-Jan-2027



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
EMI Test Receiver	Rohde & Schwarz	ESW44	6294	12	24-Feb-2026
USB Spectrum Analyser	Signal Hound	SA124B	6295	-	TU
USB Spectrum Analyser	Signal Hound	SA124B	6298	-	TU
Digital Multimeter	Fluke	115	6345	12	24-Jul-2026
Humidity and Temperature Meter	R.S Components	1364	6346	12	13-Mar-2026
SAC Switch Unit	TUV SUD	TUV_SSU_004 PLC	6349	12	16-May-2026
1m Coaxial Cable Assy	Junkosha	MWX221-01000AMSAMS/A	6354	12	15-Apr-2026
8 GHz High Pass Filter	Wainwright	WHKX 7150 8000 18000 50SS	6427	12	23-Apr-2026
Horn Antenna (1–10.5 GHz)	Schwarzbeck	BBHA 9120 B	6457	12	14-Sep-2026
3m Semi-Anechoic Chamber	Albatross Projects	Chamber 18	6597	36	08-May-2028
Coax cable sma to sma with N-Type adapter	TUV SUD	N/A	6637	12	23-Apr-2026
AC Power Supply	iTech	IT7324	6657	-	TU
3m Semi-Anechoic Chamber	Albatross Projects	RF Chamber 17	6658	36	07-May-2028
Mast and Turntable Controller	Maturo Gmbh	FCU3.0	6659	-	TU
Tilt Antenna Mast	Maturo Gmbh	BAM4.5-P	6660	-	TU
Turntable	Maturo Gmbh	TT1.5SI	6661	-	TU
2m Cable	Junkosha	MWX241-02000KMSKMS/B	6742	12	27-Apr-2026
Pre Amp 8 - 18 GHz	Wright Technologies	APS06-0061	6783	12	24-Apr-2026
Turntable	Maturo Gmbh	TT1.5SI	6797	-	TU
AC Programmable Power Supply	iTech	IT7324	6812	-	TU
8m SMA-Type Cable	Junkosha	MWX221-08000AMSAMS/B	6846	12	23-Oct-2026
8m SMA-Type Cable	Junkosha	MWX221-08000AMSAMS/B	6850	12	23-Oct-2026
Cable Assembly	SpecTech	PE300-60	6859	-	TU
Cable Assembly	SpecTech	PE300-60	6860	-	TU
Cable Assembly	SpecTech	PE300-60	6861	-	TU
Cable Assembly	SpecTech	PE300-60	6863	-	TU
SAC Switch Unit	TUV SUD	TUV_SSU_004 PLC	6886	12	02-Dec-2025
RF Amplifier BROADBAND AMPL/SMA/RoHS	Mini-Circuits	ZX60-83LN12+	6975	12	05-Apr-2026
RF Amplifier BROADBAND AMPL/SMA/RoHS	Mini-Circuits	ZX60-83LN12+	6979	12	05-Apr-2026

Table 49

TU - Traceability Unscheduled



2.6 Power Spectral Density

2.6.1 Specification Reference

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

2.6.2 Equipment Under Test and Modification State

A3448, S/N: C6N23Y607Y - Modification State 0

2.6.3 Date of Test

25-October-2025

2.6.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.10.5.

Where the EUT duty cycle was < 98 % and repeatable within 2 %, the spectrum analyser was set to trace (power) averaging and a duty cycle correction was added as calculated in the result tables below (Method AVGPSD-2).

2.6.5 Environmental Conditions

Ambient Temperature	21.5 °C
Relative Humidity	43.5 %



2.6.6 Test Results

Thread

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 11.10.5
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread iPA	Duty Cycle (%):	100.0
Data Rate	-	DCCF (dB):	0.00
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	5.20
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	Σ		
2405	3.0	-15.11	-	-	-	-15.11	8.00	-23.11
2440	3.0	-14.97	-	-	-	-14.97	8.00	-22.97
2475	3.0	-14.79	-	-	-	-14.79	8.00	-22.79

Table 50 - Maximum Power Spectral Density Results

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 11.10.5
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread ePA	Duty Cycle (%):	100.0
Data Rate	-	DCCF (dB):	0.00
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	5.2
Active Port(s):	A (Core 0)	Active Chain(s):	0

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	Σ		
2405	3.0	-3.14	-	-	-	-3.14	8.00	-11.14
2440	3.0	-3.06	-	-	-	-3.06	8.00	-11.06
2475	3.0	-2.91	-	-	-	-2.91	8.00	-10.91

Table 51 - Maximum Power Spectral Density Results



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 11.10.5
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread iPA	Duty Cycle (%):	100.0
Data Rate:	-	DCCF (dB):	0.00
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	4.80
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	Σ		
2405	3.0	-	-14.79	-	-	-14.79	8.00	-22.79
2440	3.0	-	-15.18	-	-	-15.18	8.00	-23.18
2475	3.0	-	-15.02	-	-	-15.02	8.00	-23.02

Table 52 - Maximum Power Spectral Density Results

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 11.10.5
Additional Reference(s):	-		

DUT Configuration			
Mode:	Thread ePA	Duty Cycle (%):	100.0
Data Rate:	-	DCCF (dB):	0.00
Antenna Configuration:	SISO	Peak Antenna Gain (dBi):	4.80
Active Port(s):	B (Core 1)	Active Chain(s):	1

Test Frequency (MHz)	RBW (kHz)	PSD (dBm/RBW)					Limit (dBm/3 kHz)	Margin (dB)
		A	B	C	D	Σ		
2405	3.0	-	-2.85	-	-	-2.85	8.00	-10.85
2440	3.0	-	-3.25	-	-	-3.25	8.00	-11.25
2475	3.0	-	-3.24	-	-	-3.24	8.00	-11.24

Table 53 - 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

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

2.6.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 14.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
AC Programmable Power Supply	iTech	IT7324	5225	-	O/P Mon
MXA Signal Analyser	Keysight Technologies	N9020B	5529	24	02-Jan-2027
Digital Multimeter	Fluke	115	6145	12	06-Jun-2026
Humidity & Temperature meter	R.S Components	1364	6148	12	28-Aug-2026
Signal Conditioning Unit	TUV SUD	SPECTRUM_SCU001	6426	12	12-Feb-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6752	12	12-Feb-2026
SCU Cable Assembly	TUV SUD	SPECTRUM_SCU_CA	6753	12	12-Feb-2026

Table 54

O/P Mon - Output Monitored using calibrated equipment

3 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Restricted Band Edges	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Emission Bandwidth	± 19.91 kHz
Maximum Conducted Output Power	Method PM: ± 0.65 dB Method SA: ± 1.05 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	± 1.00 dB

Table 55

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.