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N° 1-7429
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Template : February 2nd, 2026

TEST REPORT

N°: 32173710-823886-A(FILE#13683292)

Version: 02

Subject

Radio spectrum tests according to the standards:

FCC CFR 47 Part 15.247 

ANSI C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024
RSS-247 & RSS-Gen

Issued to

Schneider Electric USA Inc
3700 6TH ST SW
Cedar Rapids Iowa
United State

Apparatus under test

-  Product
-  Trade mark
-  Manufacturer
-  Family range
-  Model under test
-  Serial number
-  FCCID
-  IC

Energy Intelligence Control Unit
SCHNEIDER ELECTRIC
SCHNEIDE ELECTRIC INDUSTRIES SAS
Intelligence Hub
Energy Intelligence Control Unit
EP142
2BWOYSAH211111
36030-SAH211111

Conclusion

See Test Program chapter

Test date
Test location
FCC Test site
ISED Test site
Sample receipt date
Composition of document
Document issued on

May 12, 2026 to May 18, 2026
LCIE Grenoble
FR0008 - 918017 (MOI)
6500A – FR0008 (MOI)
May 12, 2026
53 pages
September 14, 2026

Written by :

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Tests operator



Approved by :

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Technical manager



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PUBLICATION HISTORY

Version	Date	Author	Modification
01	September 02, 2026	Majid MOURZAGH / Marlon BOUBY	Creation of the document
02	September 14, 2026	Marlon BOUBY	In §2.1, add the FCC ID and IC number of the Wi-Fi module.

Each new edition of this test report replaces and cancels the previous edition. The control of the old editions of report is under responsibility of client.



SUMMARY

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1. TEST PROGRAM

References

- 47 CFR Part 15.247 (April 16, 2026)[Pb](#)
- RSS 247 Issue 4
- RSS Gen Issue 5
- KDB 558074 D01 DTS Meas Guidance v05r02[Pb](#)
- KDB 662911 D01 Multiple Transmitter Output v02r01[Pb](#)
- ANSI C63.10-2020 + Cor. 1-2023 + C63.10a-2024 + Errata to C63.10a-2024

Radio requirement:

Clause - Test Description		Test result - Comments
Occupied Bandwidth	<i>ISED</i>	PASS
6dB Bandwidth	<i>FCC & ISED</i>	PASS
Maximum Conducted Output Power	<i>FCC & ISED</i>	PASS
Power Spectral Density	<i>FCC & ISED</i>	PASS
Unwanted Emissions in Non-Restricted Frequency Bands	<i>FCC & ISED</i>	PASS
Unwanted Emissions in Restricted Frequency Bands	<i>FCC & ISED</i>	PASS
Receiver Radiated Emissions	<i>ISED</i>	PASS(2)
This table is a summary of test report, see conclusion of each clause of this test report for detail.		

(1) Limited program

(2) Testing covered the receive mode, and receiver spurious emissions are considered to be the same as transmitter.

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed

2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. INFORMATION

Energy Intelligence Control Unit Contains FCC ID ID QQQWFM200 and contains IC 5123A-WFM200

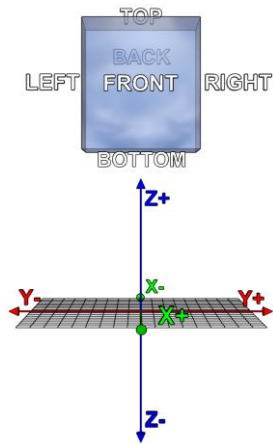
2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

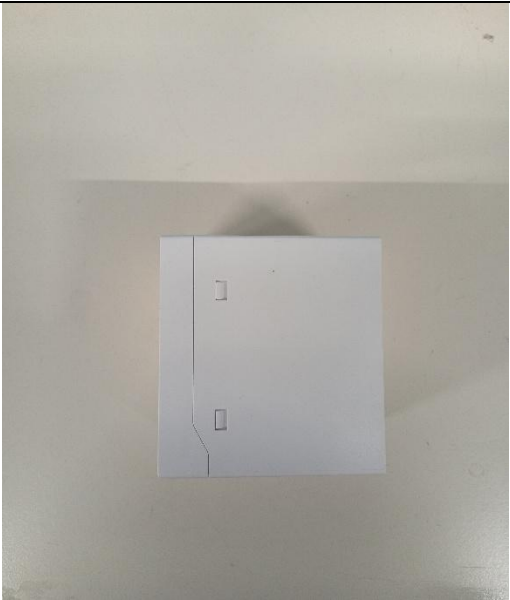
Equipment under test (EUT):

Model under test:	Energy Intelligence Control Unit	
Serial Number:	EP142	







 		
Dimensions:	6.3cm x 8.5cm x 7cm (Length x Width x Height)	
Type:	Table-Top	



Power supply:

Name	Type	Rating	Reference / Sn	Comments
Supply1	DC	5V	I.T.E POWER SUPPLY MU05C2050100-A1	AC/DC Adapter

NC: Not communicated by provider

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Comments
Supply1	USB-C	1	Yes	No	/
LAN1	RJ45	10	No	Yes	/
Up Link/WAN	RJ45	10	No	Yes	/

NC: Not communicated by provider

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop	/	/	Provided by Schneider Electric
Dongle 802.15.4	USB CC2531	WCT JavaTools Wiser FW	Provided by Schneider Electric

NC: Not communicated by provider

Equipment information (declaration of provider):

802.15.4:	Thread
Chipset / RF Module	EFR32MG24A410F1536IM48-B
Frequency band:	[2400 – 2483.5] MHz
Spectrum Modulation:	DSSS
Number of Channel:	16
Spacing channel:	5MHz
Channel bandwidth:	2MHz
Antenna Type:	Internal Note: The uFL connector present and the pcba are only for R&D internal testing (like testing conducted RF) but are not available to final customer, Production FW only support internal PCB antenna and FW are signed and backed by Secureboot
Antenna connector:	No connector internal PCB antenna only
Antenna requirements §15.203	The transmitter uses an integral antenna and it permanently connected
Transmit chains:	1
Receiver chains	1



CHANNEL PLAN	
Channel	Frequency (MHz)
Cmin: 11	2405
12	2410
13	2415
14	2420
15	2425
16	2430
17	2435
Cmid: 18	2440
19	2445
20	2450
21	2455
22	2460
23	2465
24	2470
25	2475
Cmax: 26	2480

DATA RATE		
Data Rate (Mbps)	Modulation Type	Worst Case Modulation
0.25	O-QPSK	☒

Antenna Characteristic			
Antenna reference	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
Pcb Antenna	2.9	2400	50

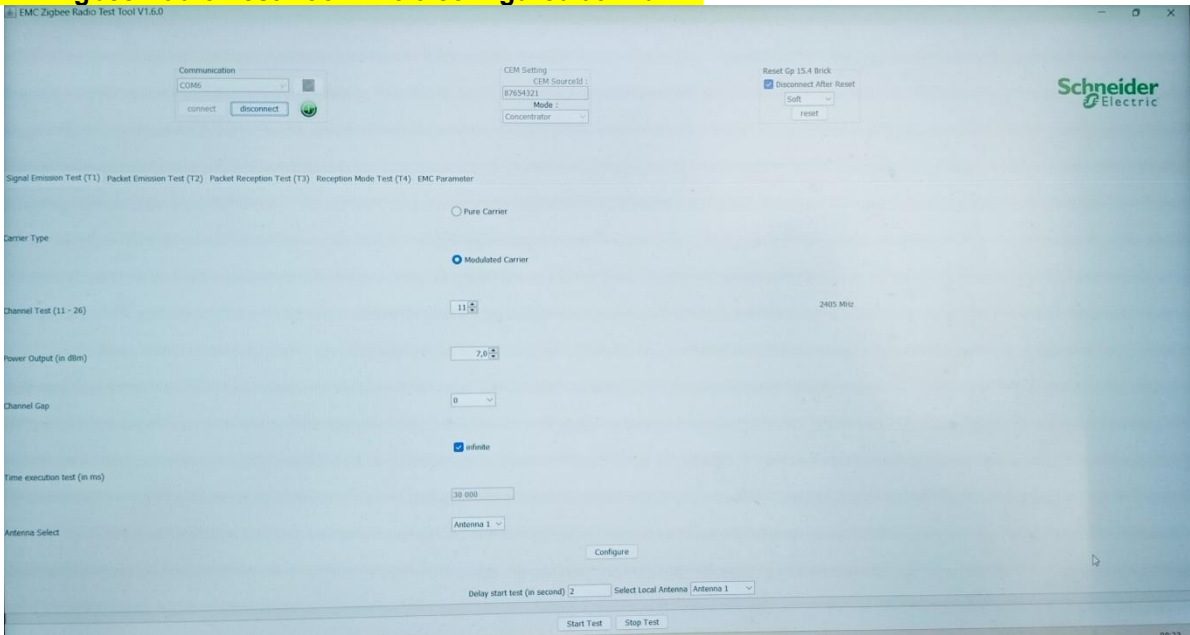
Hardware information			
Highest internal frequency (PLL, Quartz, Clock, Microprocessor...):		F _{Highest} :	1000 MHz
Firmware (if applicable):		V:	Wiser Edge HW FW 08.2
Software (if applicable):		V:	N/A
Equipment intended:	Fixed		
Type of equipment:	Stand-alone		
Equipment sample:	Prototype		
Duty cycle:	Continuous duty		
Operating temperature range:	T _{min} :	0 °C	
	T _{nom} :	20°C	
	T _{max} :	40 °C	
Operating voltage:	V _{nom} :	5VDC	

NC: Not communicated by provider

2.3. EQUIPMENT LABELLING

Label		

2.4. RUNNING MODE

Test mode	Description of test mode
Test mode 1	Permanent emission with modulation on a fixed channel in the data rate that produced the highest power. EMC Zigbee Radio Test Tool V1.6.0 configured at +7dBm 
Test mode 2	Permanent reception



Test	Running mode
Occupied Bandwidth	Test mode 1
6dB Bandwidth	Test mode 1
Maximum Conducted Output Power	Test mode 1
Power Spectral Density	Test mode 1
Unwanted Emissions in Non-Restricted Frequency Bands	Test mode 1
Unwanted Emissions in Restricted Frequency Bands	Test mode 1
Receiver Radiated Emissions	Test mode 2 (1)

(1) Testing covered the receive mode, and receiver spurious emissions are considered to be the same as transmitter.

2.5. EQUIPMENT MODIFICATIONS DURING THE TESTS

None



3. LABORATORY EQUIPMENT AND METHODOLOGY

3.1. CALIBRATION DATE

The calibration intervals are extended at +4 months. This extended interval is based on the fact that there is sufficient calibration data to statistically establish a trend or based on experience of use of the test equipment to assure good measurement results for a longer period. The symbol -/- replaces the date for equipment checking before test or that have none impact on the test or that have no calibration required by the standard.

3.2. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

$$FS = RA + AF + CF - AG$$

Where:

FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Factor

AG = Amplifier Gain

Example:

Assume a receiver reading of 52.5dBμV is obtained. The antenna factor of 7.4 and a cable factor of 1.1 are added. The amplifier gain of 29dB is subtracted, giving a field strength of 32 dBμV/m.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dB}\mu\text{V/m}$$

The 32 dBμV/m value can be mathematically converted to its corresponding level in μV/m.

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}.$$

3.3. TEST DISTANCE EXTRAPOLATION – FCC

The field strength is extrapolated to the new measurement distance using formula from §6.4.4 de l'ANSI C63.10 and FCC Part15.31 (p), the choice of equation is made according to the distances of the limit and the measurement,

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{near field}}}{d_{\text{measure}}} \right) - 20 \log \left(\frac{d_{\text{limit}}}{d_{\text{near field}}} \right) \quad (2)$$

$$FS_{\text{limit}} = FS_{\text{max}} - 20 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right) \quad (3)$$

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right) \quad (4)$$

where

FS_{limit}	is the calculation of field strength at the limit distance, expressed in dBμV/m
FS_{max}	is the measured field strength, expressed in dBμV/m
$d_{\text{near field}}$	is the $\lambda/2\pi$ distance
d_{measure}	is the distance of the measurement point from the EUT
d_{limit}	is the reference limit distance

3.4. TEST DISTANCE EXTRAPOLATION – ISED

The field strength is extrapolated to the new measurement distance using formula from §6.5-6.6 RSS-GEN:

Below 30MHz,

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

Above 30MHz,

$$FS_{\text{limit}} = FS_{\text{max}} - 20 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

Where:

FS_{limit} is the calculation of field strength at the limit distance, expressed in dBμV/m
 FS_{max} is the measured field strength, expressed in dBμV/m
 d_{measure} is the distance of the measurement point from the EUT
 d_{limit} is the reference limit distance

4. OCCUPIED BANDWIDTH

4.1. TEST CONDITIONS

Date of test : May 18, 2026
Test performed by : Majid MOURZAGH / Marlon BOUBY
Relative humidity (%) : 44%
Ambient temperature (°C) : 20°C

4.2. TEST SETUP

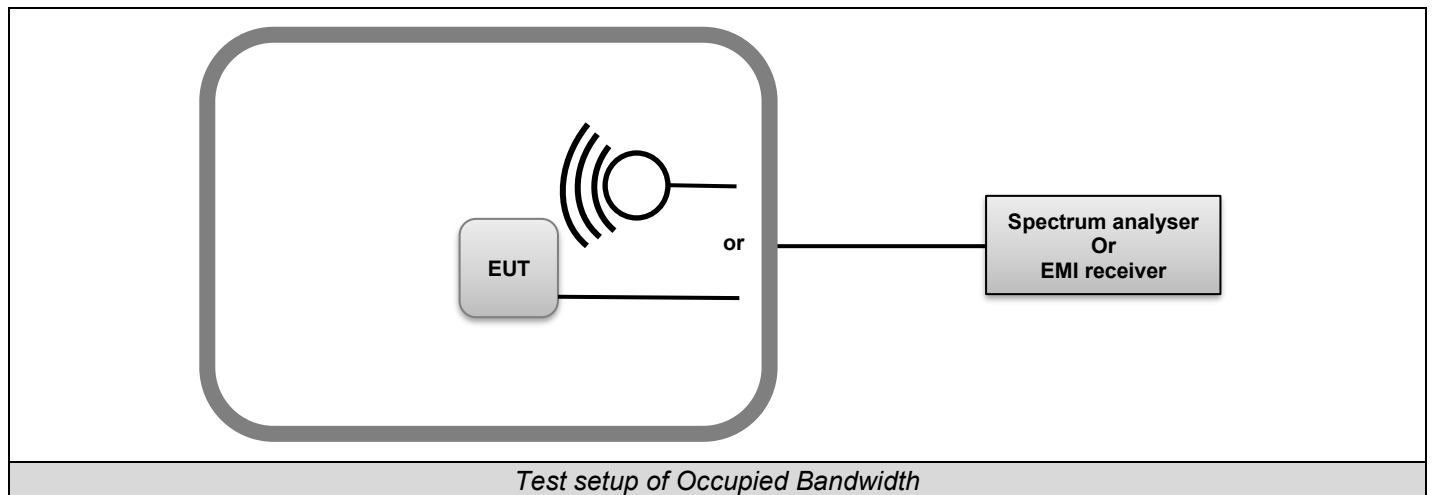
The Equipment Under Test is installed in an anechoic chamber.
Measurement is performed with a spectrum analyzer in conducted method.

The EUT is turned ON, the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

Test Procedure:

ANSI C63.10 § 6.9.2 and RSS-Gen Issue 5 § 6.7

- RBW used in the range of 1% to 5% of the anticipated emission bandwidth
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = Max Hold.
- Sweep = Auto couple.
- Allow the trace to stabilize.
- OBW 99% function of spectrum analyzer used



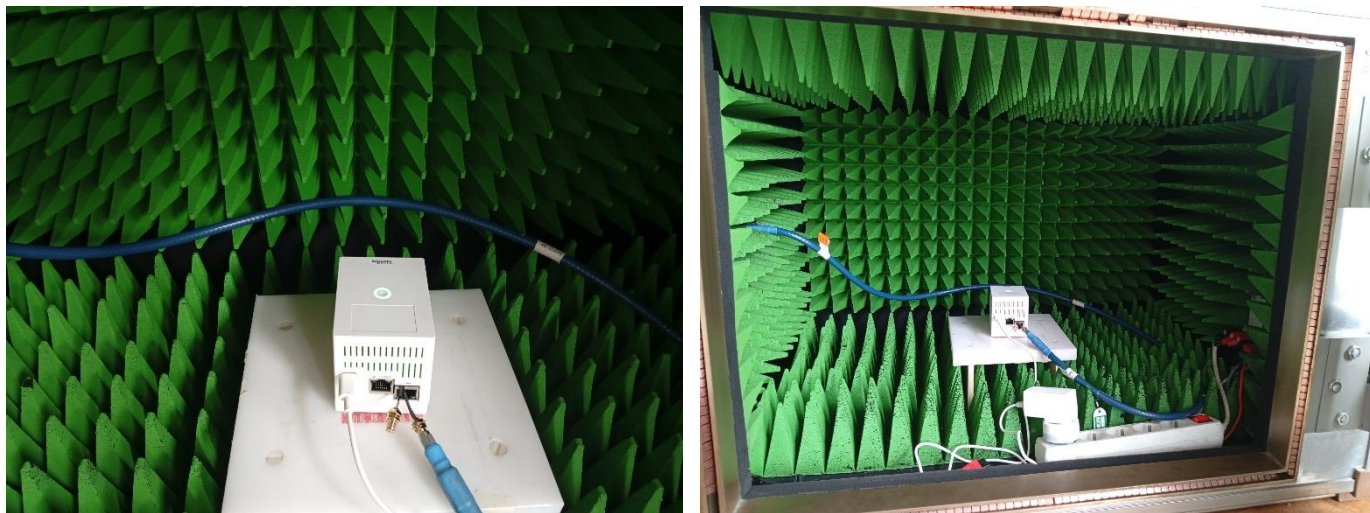


Photo of Occupied bandwidth

4.3. LIMIT

None



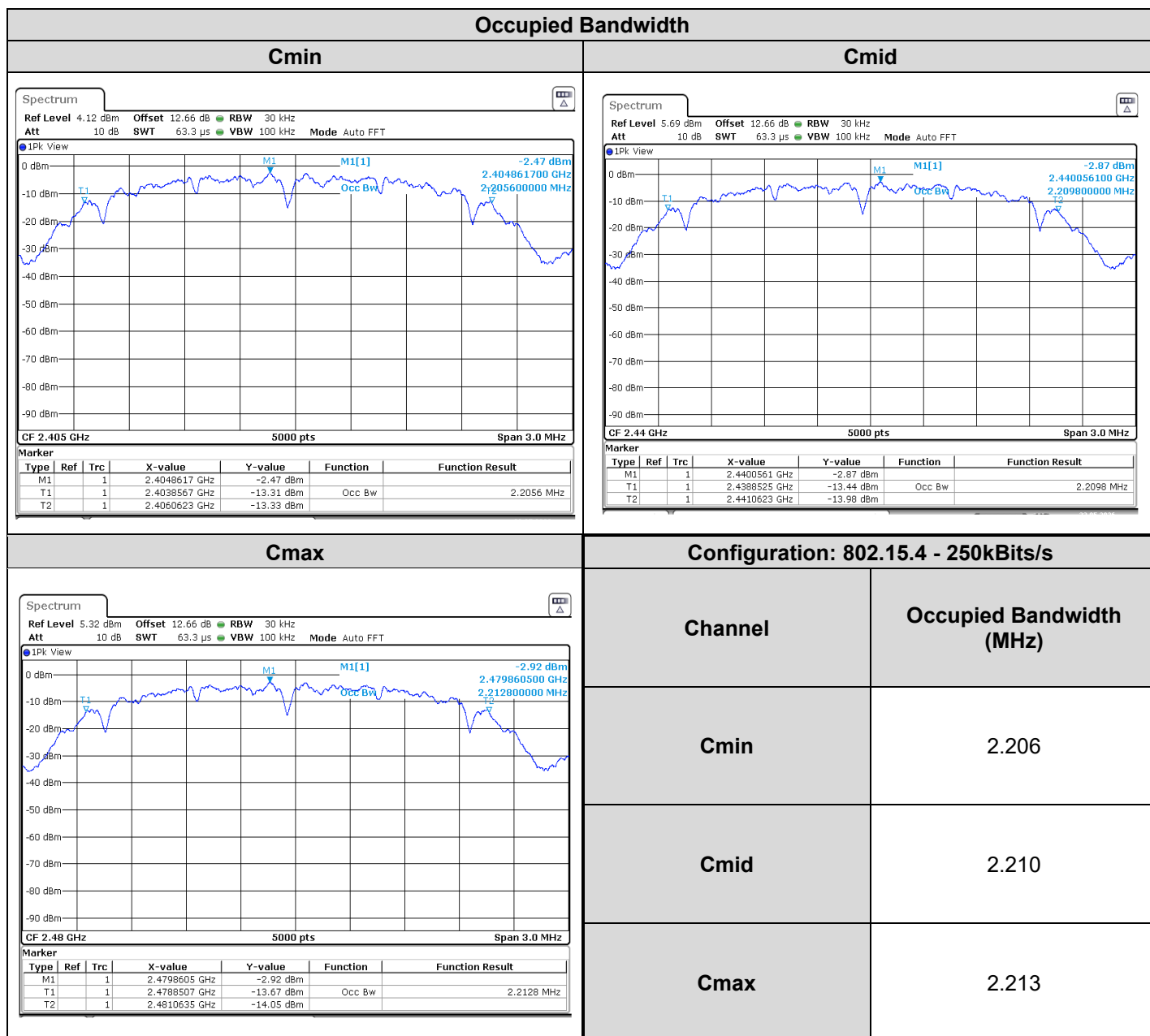
4.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/2024	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/2025	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/2025	06/2026
Attenuator 10dB	AEROFLEX	—	A7122268	08/2025	08/2027
Full Anechoic Room	SIEPEL	—	D3044024	-/-	-/-
Mesure_DTS_FCC-ISED	LCIE SUD EST	Mesure_DTS_FCC-ISED v1.4	L2000060	-/-	-/-
Multimeter	FLUKE	289	A1241119	05/2025	05/2027
Thermo-hygrometer	TESTO	608-H2	B4204121	05/2025	05/2027

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

4.6. RESULTS



4.7. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **Energy Intelligence Control Unit**, Sn: **EP142**, in configuration and description presented in this test report, show levels **compliant** to the **RSS-GEN** limits.

5. 6dB BANDWIDTH

5.1. TEST CONDITIONS

Date of test : May 18, 2026
Test performed by : Majid MOURZAGH / Marlon BOUBY
Relative humidity (%) : 44%
Ambient temperature (°C) : 20°C

5.2. TEST SETUP

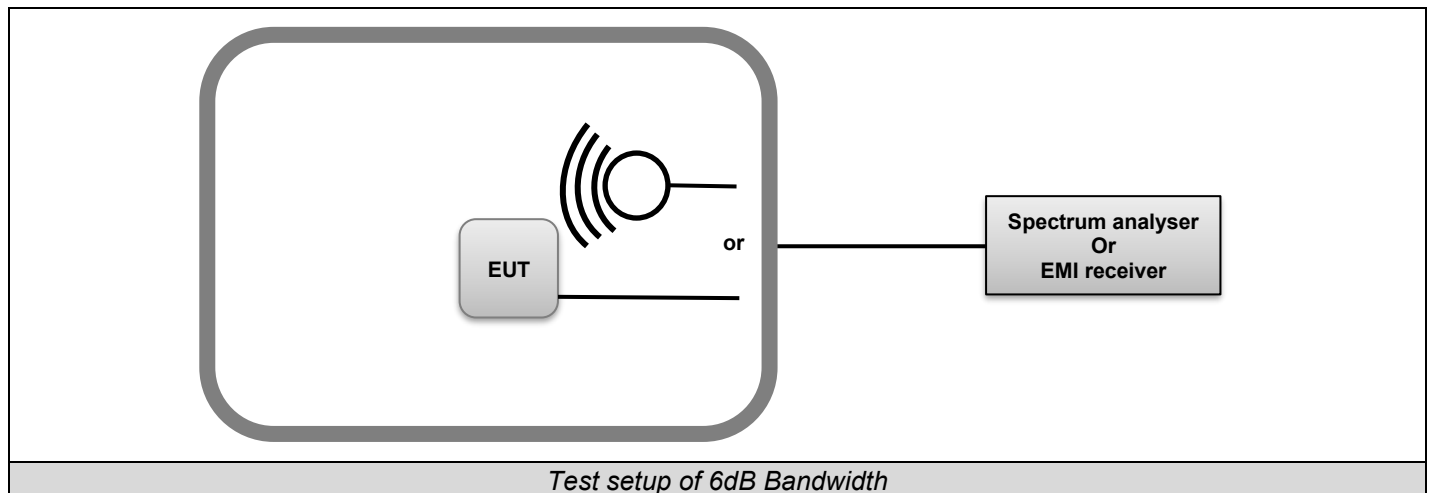
The Equipment Under Test is installed in an anechoic chamber.
Measurement is performed with a spectrum analyzer in conducted method.

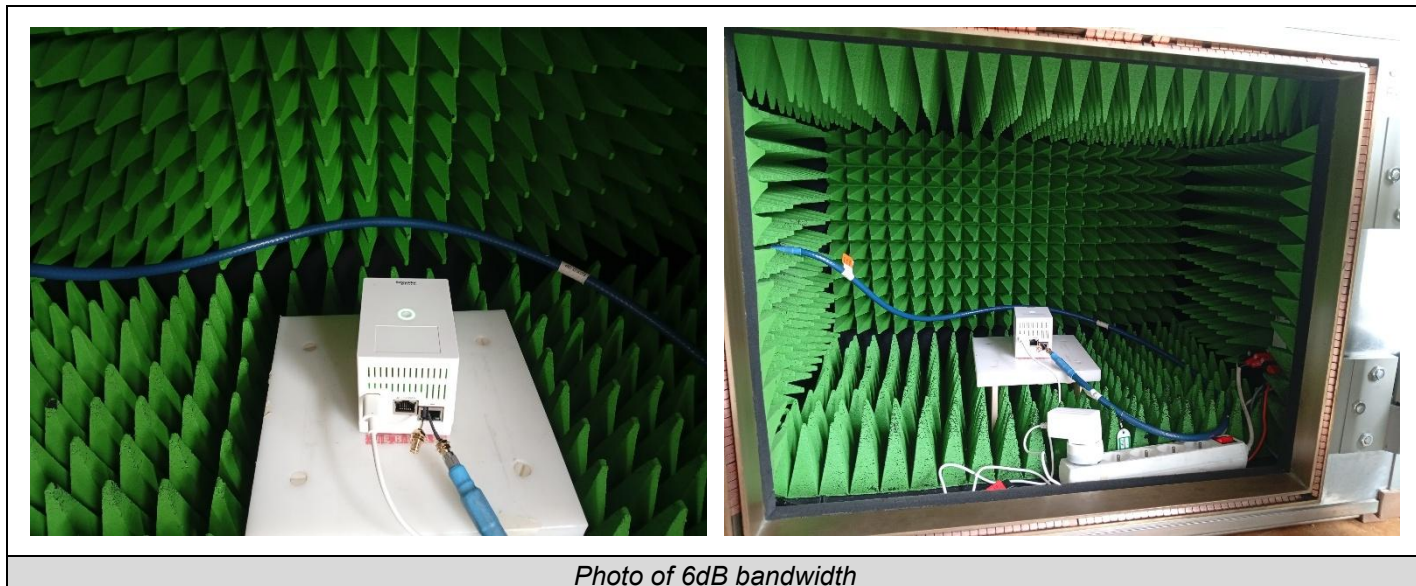
The EUT is turned ON, the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

Test Procedure:

KDB 558074 D01 DTS Meas Guidance v05r02 § 8.2

- Set resolution bandwidth (RBW) = 100kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer.





5.3. *LIMIT*

Frequency range	6dB bandwidth
902-928MHz 2400MHz to 2483.5MHz 5725-5850 MHz	≥500kHz



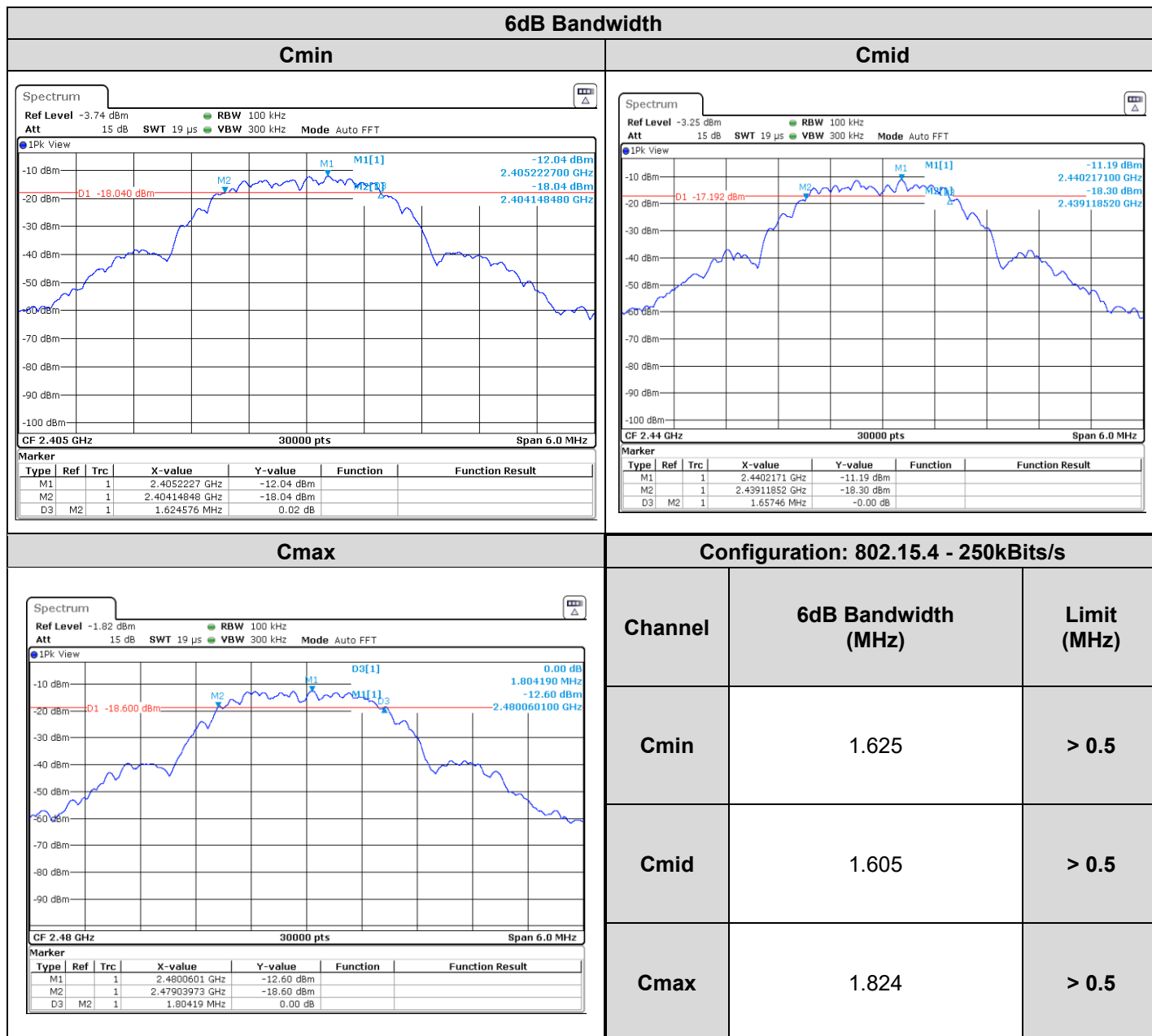
5.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/2024	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/2025	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/2025	06/2026
Attenuator 10dB	AEROFLEX	—	A7122268	08/2025	08/2027
Full Anechoic Room	SIEPEL	—	D3044024	-/-	-/-
Mesure_DTS_FCC-ISED	LCIE SUD EST	Mesure_DTS_FCC-ISED v1.4	L2000060	-/-	-/-
Multimeter	FLUKE	289	A1241119	05/2025	05/2027
Thermo-hygrometer	TESTO	608-H2	B4204121	05/2025	05/2027

5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

5.6. RESULTS



5.7. CONCLUSION

6dB Bandwidth measurement performed on the sample of the product **Energy Intelligence Control Unit**, Sn: **EP142**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.

6. MAXIMUM CONDUCTED OUTPUT POWER

6.1. TEST CONDITIONS

Date of test : May 18, 2026
Test performed by : Majid MOURZAGH / Marlon BOUBY
Relative humidity (%) : 44%
Ambient temperature (°C) : 22°C

6.2. TEST SETUP

The Equipment Under Test is installed in an anechoic chamber.
Measurement is performed with a spectrum analyzer in conducted method.

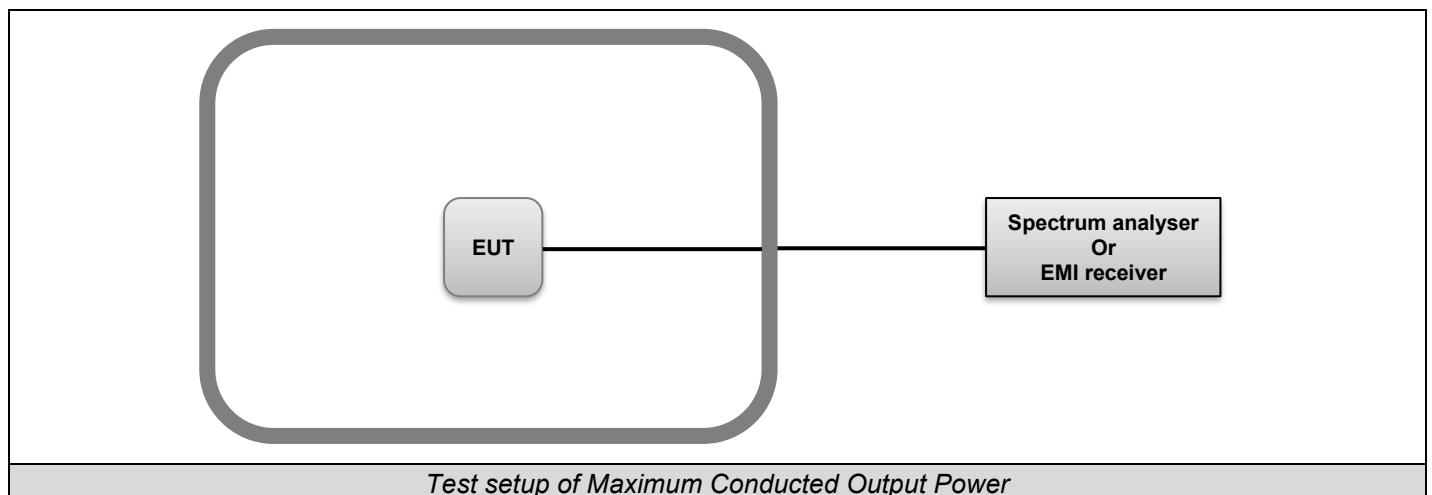
The EUT is turned ON, the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

Test Procedure used: KDB 558074 D01 DTS Meas Guidance v05r02 § 8.3.2.2 (Method AVGSA-1)

KDB 558074 D01 DTS Meas Guidance v05r02 § 8.3.1.2

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

- Set the RBW = 1 MHz.
- Set the VBW $\geq 3 \times$ RBW
- Set the span $\geq 1.5 \times$ DTS bandwidth.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges



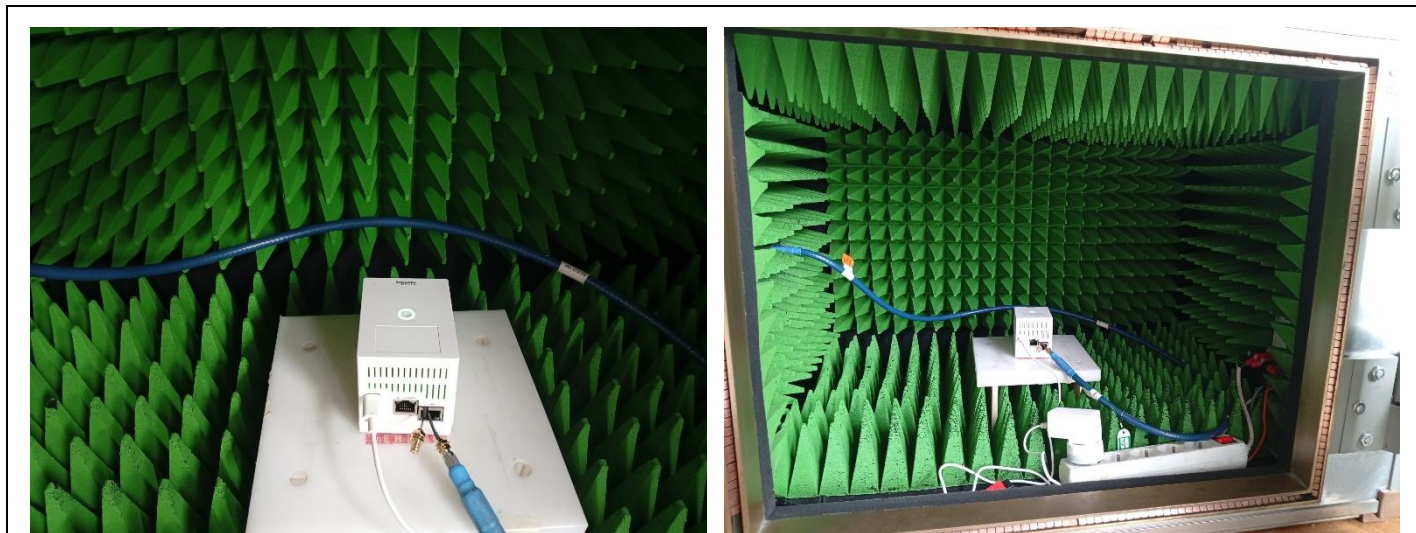


Photo of Maximum Conducted Output Power



6.3. LIMIT

Frequency range	Maximum Conducted Output Power
902-928MHz 2400MHz to 2483.5MHz 5725-5850 MHz	≤30dBm*

*Remark: Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

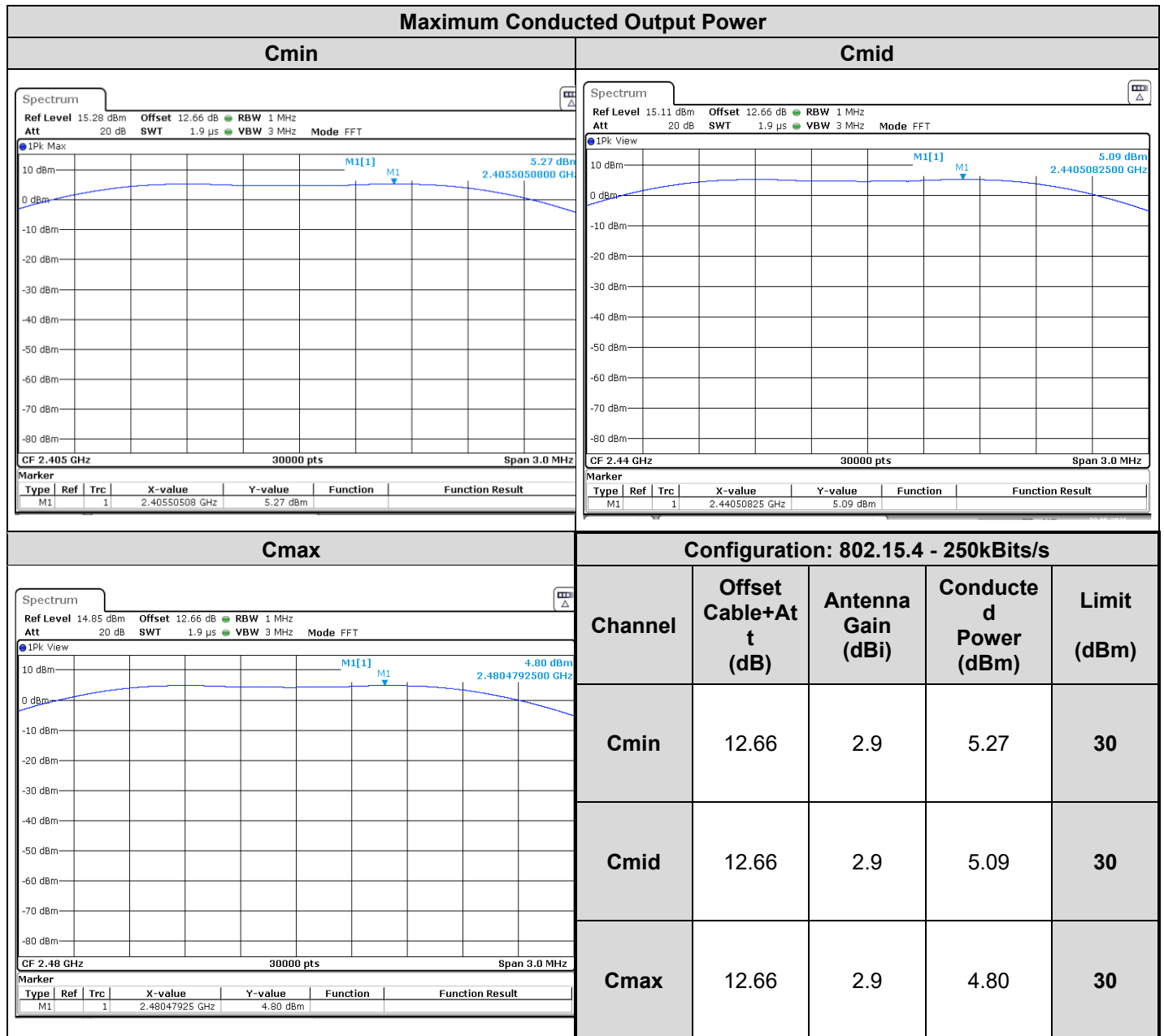
6.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/2024	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/2025	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/2025	06/2026
Attenuator 10dB	AEROFLEX	—	A7122268	08/2025	08/2027
Full Anechoic Room	SIEPEL	—	D3044024	-/-	-/-
Mesure_DTS_FCC-ISED	LCIE SUD EST	Mesure_DTS_FCC-ISED v1.4	L2000060	-/-	-/-
Multimeter	FLUKE	289	A1241119	05/2025	05/2027
Thermo-hygrometer	TESTO	608-H2	B4204121	05/2025	05/2027

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

6.6. RESULTS



6.7. CONCLUSION

Maximum Output Conducted Power measurement performed on the sample of the product **Energy Intelligence Control Unit**, Sn: **EP142**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.

7. POWER SPECTRAL DENSITY

7.1. TEST CONDITIONS

Date of test : May 18, 2026
 Test performed by : Majid MOURZAGH / Marlon BOUBY
 Relative humidity (%) : 44%
 Ambient temperature (°C) : 20°C

7.2. TEST SETUP

The Equipment Under Test is installed in an anechoic chamber.
 Measurement is performed with a spectrum analyzer in conducted method.

The EUT is turned ON, the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

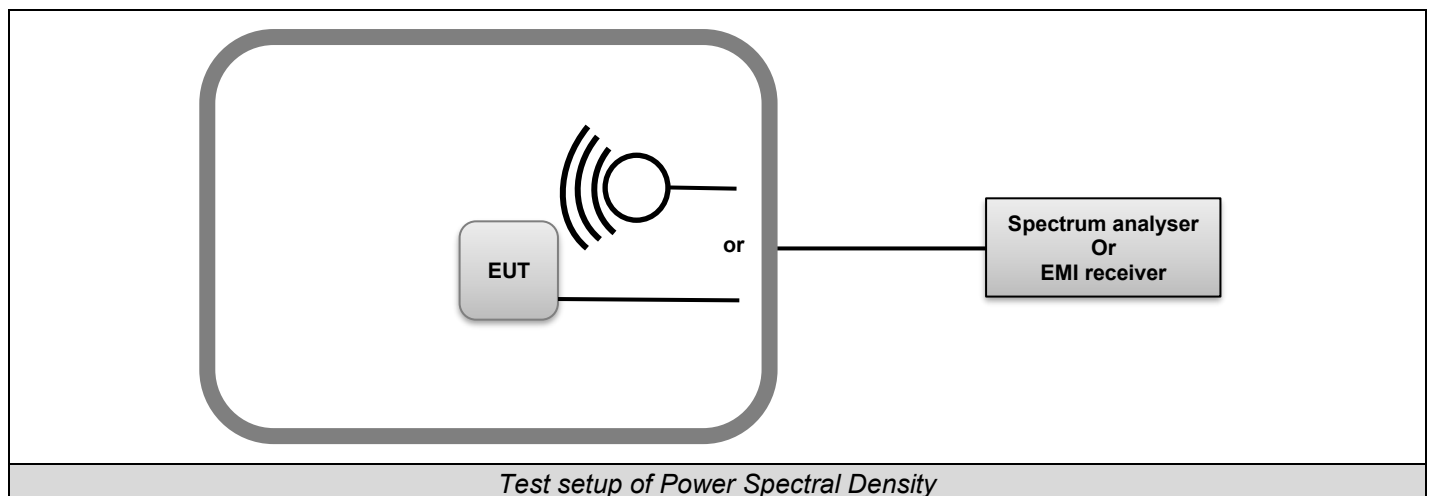
Test Procedure used: KDB 558074 D01 DTS Meas Guidance v05r02 § 8.4 (Method AVGPSD-1)

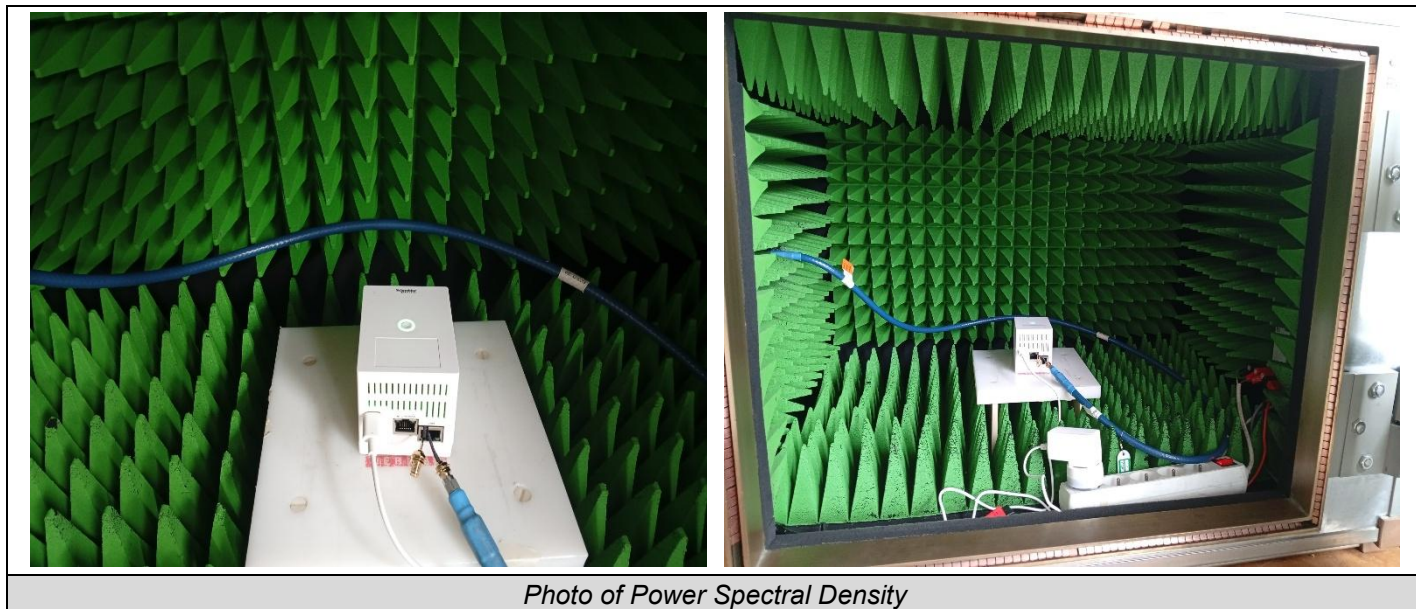
Garder uniquement le KDB choisit ci-dessus

KDB 558074 D01 DTS Meas Guidance v05r02 § 8.4 (Method PKPSD)

Subclause 11.10 of ANSI C63.10 is applicable

- Set analyzer center frequency to DTS channel center frequency.
- Set the span > 1.5 times the DTS bandwidth.
- Set the RBW to: 3 kHz.
- Set the VBW $\geq 3 \times$ RBW.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.







7.3. LIMIT

Frequency range	Power Spectral Density
902-928MHz 2400MHz to 2483.5MHz 5725-5850 MHz	≤8dBm / 3kHz *

*Remark: Limits are reduced by G-6dBi if Overall Antenna Gain above 6dBi

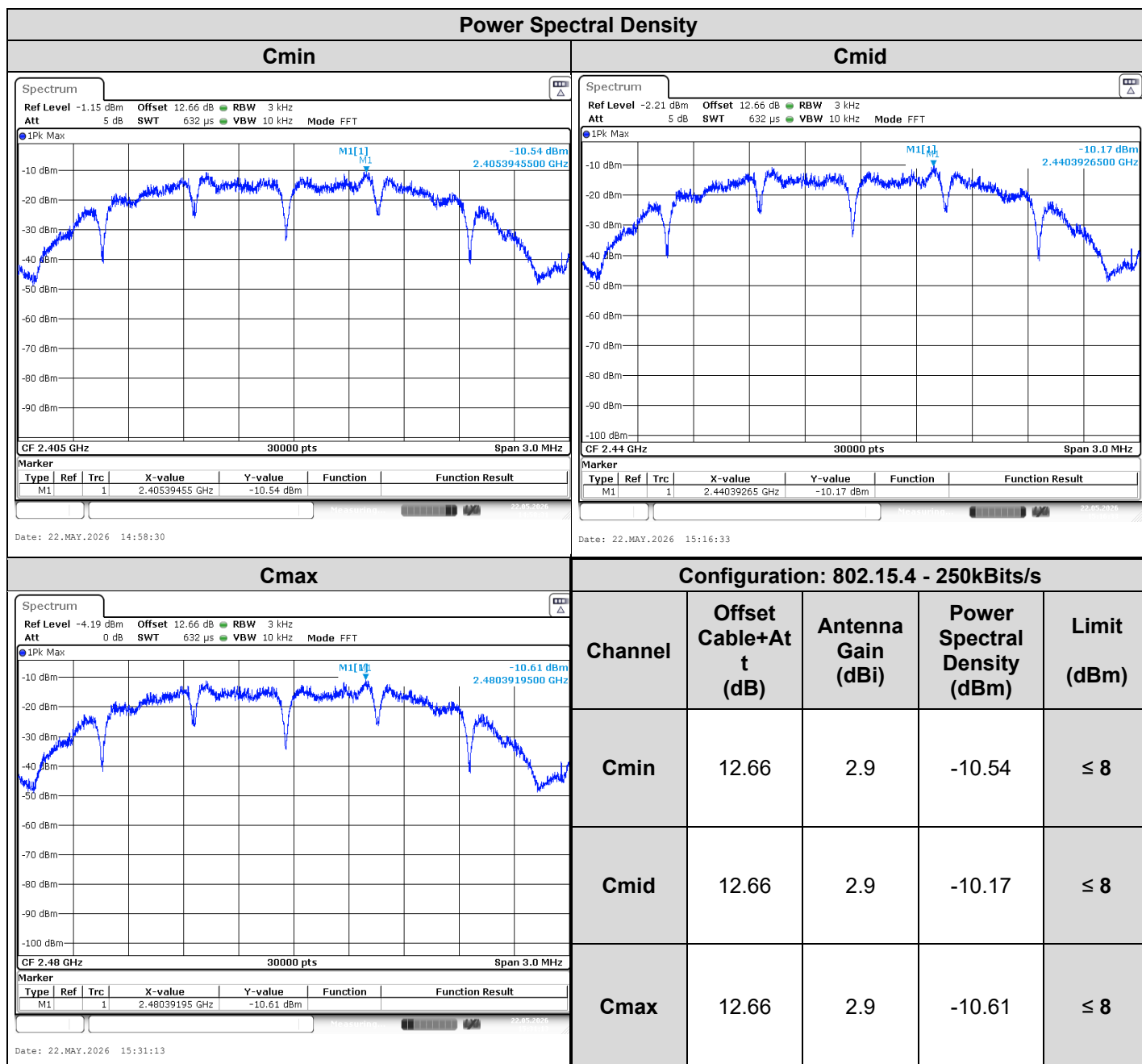
7.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/2024	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/2025	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/2025	06/2026
Attenuator 10dB	AEROFLEX	—	A7122268	08/2025	08/2027
Full Anechoic Room	SIEPEL	—	D3044024	-/-	-/-
Mesure_DTS_FCC-ISED	LCIE SUD EST	Mesure_DTS_FCC-ISED v1.4	L2000060	-/-	-/-
Multimeter	FLUKE	289	A1241119	05/2025	05/2027
Thermo-hygrometer	TESTO	608-H2	B4204121	05/2025	05/2027

7.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

7.6. RESULTS



7.7. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **Energy Intelligence Control Unit**, Sn: **EP142**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.

8. UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

8.1. TEST CONDITIONS

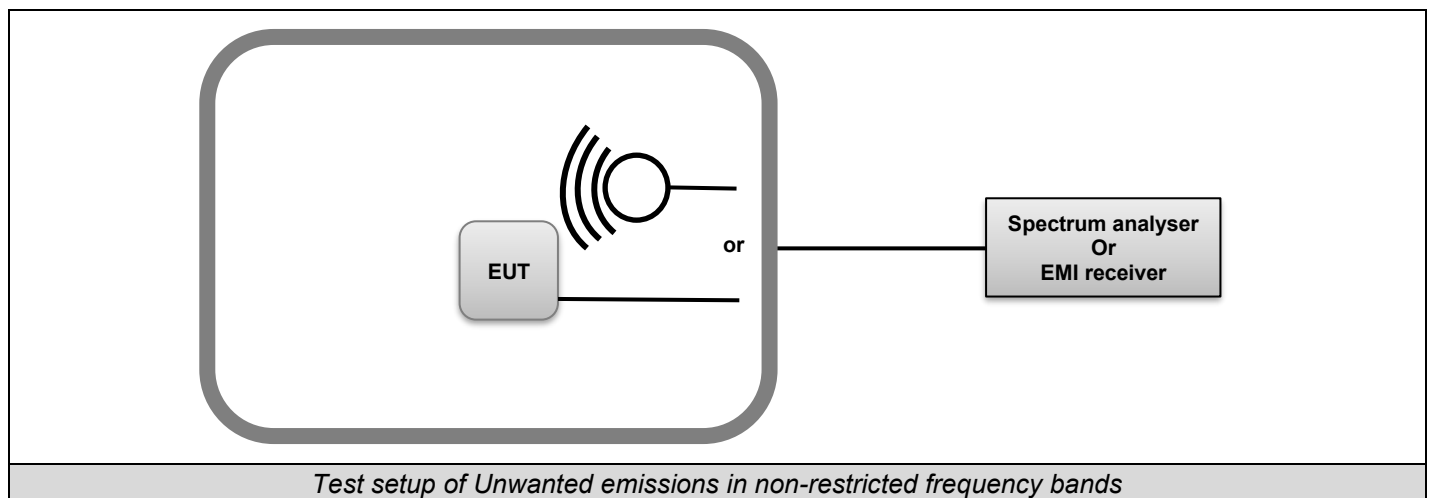
Date of test : May 18, 2026
Test performed by : Majid MOURZAGH / Marlon BOUBY
Relative humidity (%) : 44%
Ambient temperature (°C) : 20°C

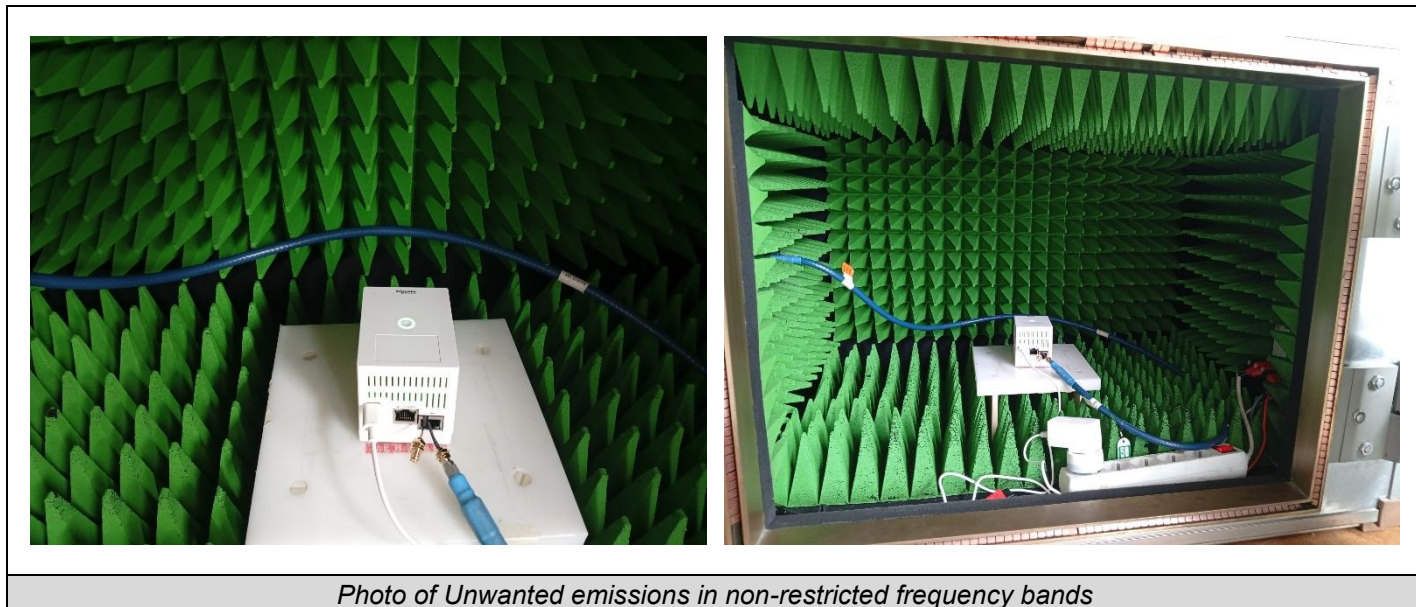
8.2. TEST SETUP

The Equipment Under Test is installed in an anechoic chamber.
Measurement is performed with a spectrum analyzer in conducted method.

The EUT is turned ON, the captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

Test Procedure:
KDB 558074 D01 DTS Meas Guidance v05r02 § 8.5







8.3. LIMIT

All Spurious Emissions must be at least 20dB below the Fundamental Radiator Level at the Band Edge of operating frequency band and in non-restricted bands.

8.4. TEST EQUIPMENT LIST

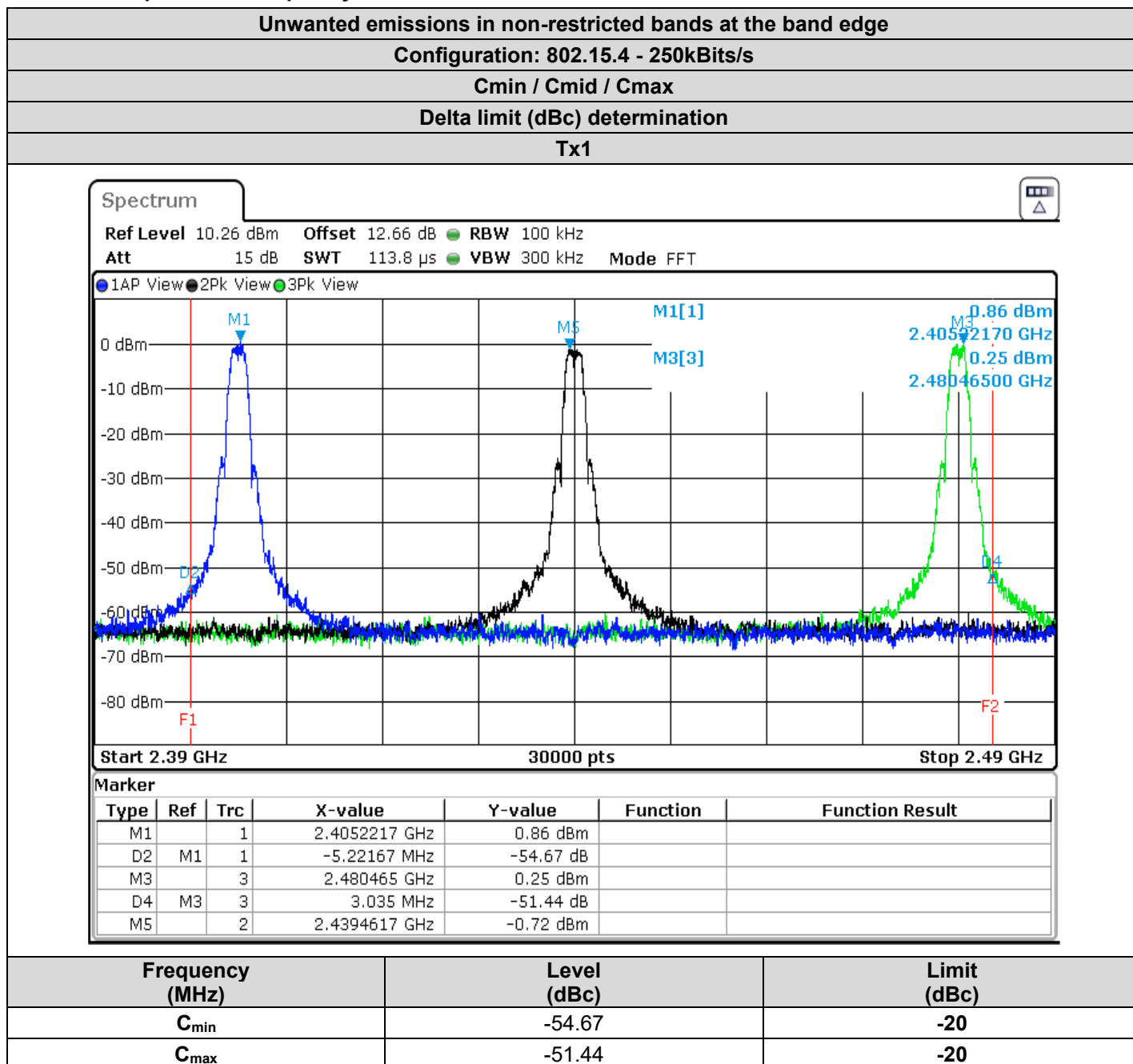
Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Spectrum analyzer	ROHDE & SCHWARZ	FSV 40	A4060059	04/2024	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329863	08/2025	08/2026
SMA 1.5m	SUCOFLEX	18GHz	A5329864	01/2025	06/2026
Attenuator 10Db	AEROFLEX	—	A7122268	08/2025	08/2027
Full Anechoic Room	SIEPEL	—	D3044024	-/-	-/-
Mesure_DTS_FCC-ISED	LCIE SUD EST	Mesure_DTS_FCC-ISED v1.4	L2000060	-/-	-/-
Multimeter	FLUKE	289	A1241119	05/2025	05/2027
Thermo-hygrometer	TESTO	608-H2	B4204121	05/2025	05/2027

8.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

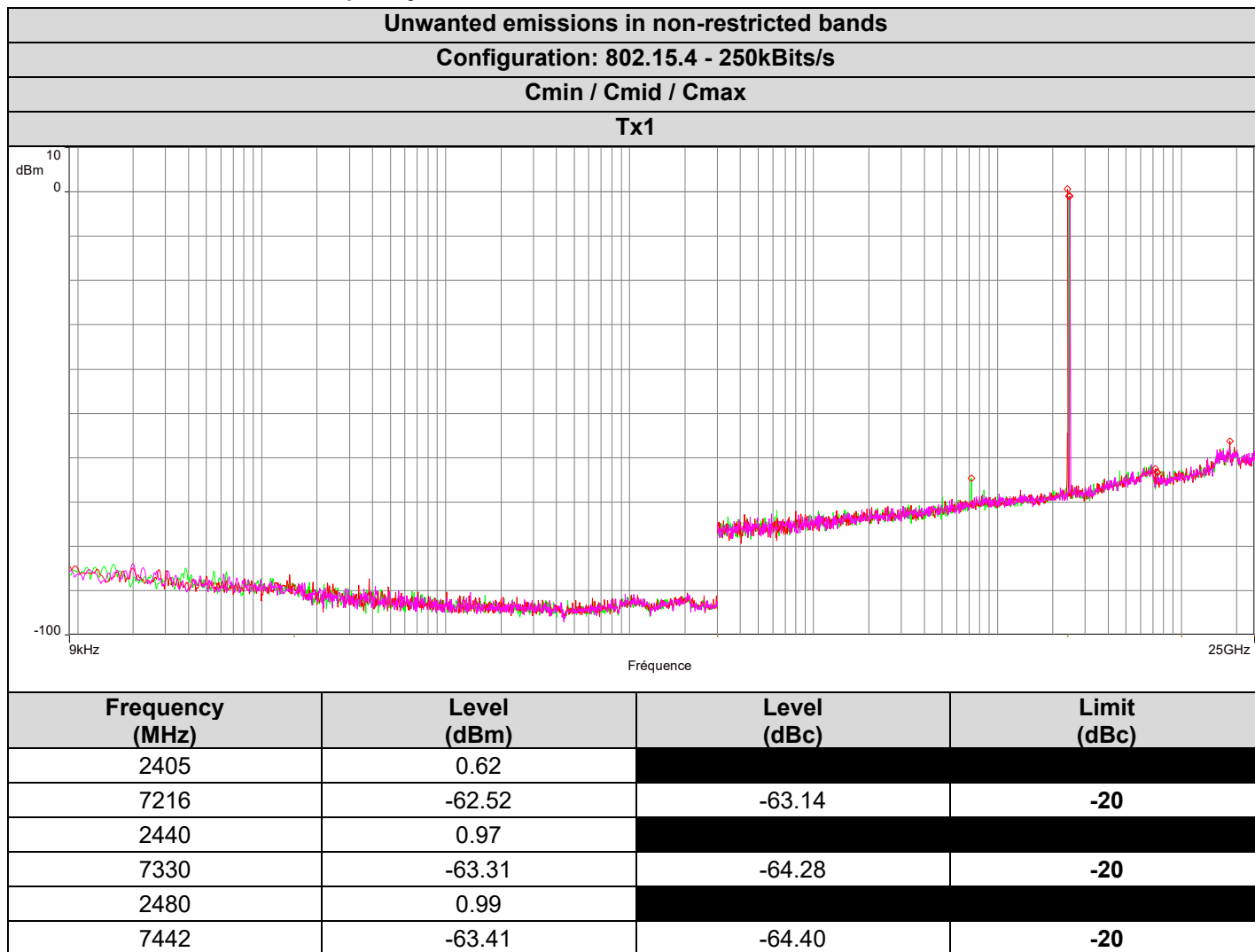
None

8.6. RESULTS

8.6.1. Operational frequency band



8.6.2. Non restricted frequency bands



8.7. CONCLUSION

Unwanted emissions in non-restricted bands and at the band edge measurement performed on the sample of the product **Energy Intelligence Control Unit**, Sn: **EP142**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.



9. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

9.1. TEST CONDITIONS

Date of test : May 12, 2026
 Test performed by : Majid MOURZAGH / Marlon BOUBY
 Relative humidity (%) : 42%
 Ambient temperature (°C) : 24°C

9.2. TEST SETUP

Test procedure:
 ANSI C63.10 & FCC Part 15 subpart C

Following frequency ranges, test setup parameters are different and specified in this table:

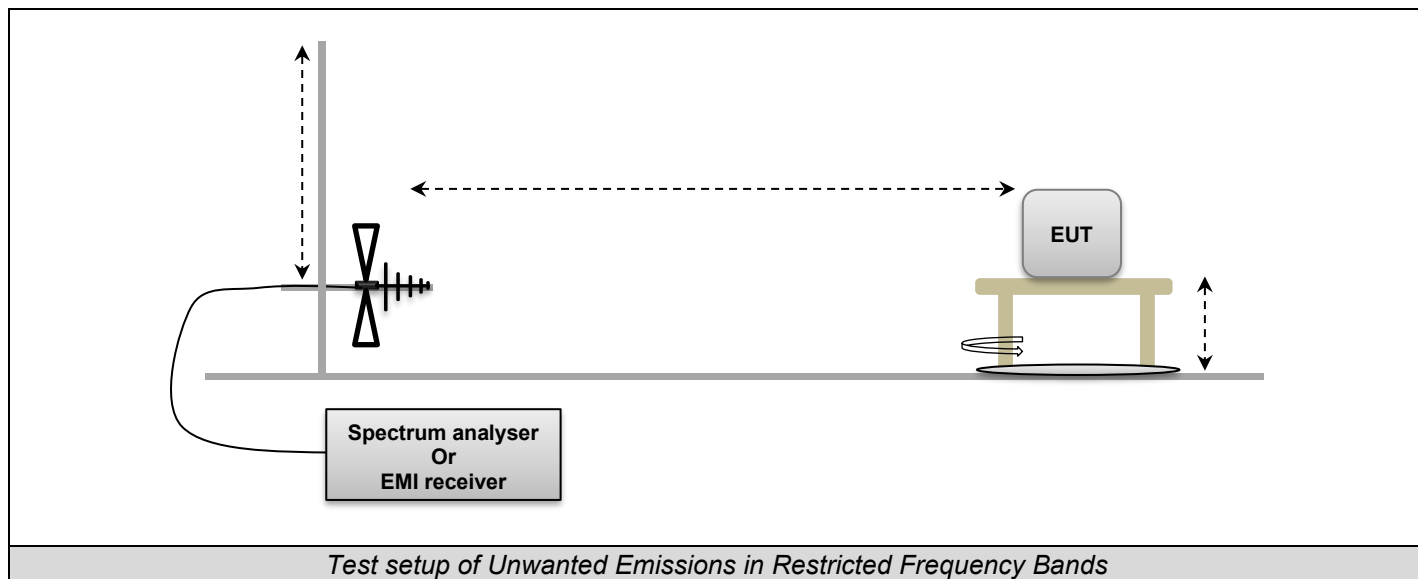
Frequency range:	9kHz to 30MHz	
Test:	Pre-Characterization	Qualification
Antenna Polarization:	Parallel, Perpendicular and Ground parallel	
Antenna Height:	Centered on EUT (§6.6.5 ANSI C63-10)	1m
Antenna Type:	Loop	
RBW Filter:	200Hz below 150kHz / 9kHz above 150kHz	
Maximization:	Turntable rotation of 360 degrees range and all axis of EUT used in normal configuration	
EUT height:	1.5m	1.5m
Test site:	Full Anechoic Chamber	Open Aera Test Site
Distance EUT - Antenna:	3m	10m
Detector:	Peak	QPeak

Frequency range:	30MHz to 1GHz	
Test:	Pre-Characterization	Qualification
Antenna Polarization:	Horizontal and Vertical	
Antenna Height:	Centered on EUT (§6.6.5 ANSI C63-10)	Varied from 1m to 4m
Antenna Type:	Bi-Log	
RBW Filter:	120kHz	
Maximization:	Turntable rotation of 360 degrees range and all axis of EUT used in normal configuration	
EUT height:	1.5m	1.5m
Test site:	Full Anechoic Chamber	Open Aera Test Site
Distance EUT - Antenna:	3m	10m
Detector:	Peak	QPeak



Frequency range:	1GHz to 14GHz	
Test:	Pre-Characterization	Qualification
Antenna Polarization:	Horizontal and Vertical	
Antenna Height:	Centered on EUT (§6.6.5 ANSI C63-10)	Centered on EUT (§6.6.5 ANSI C63-10)
Antenna Type:	Horn	
RBW Filter:	1MHz	
Maximization:	Turntable rotation of 360 degrees range and all axis of EUT used in normal configuration	
EUT height:	1.5m	1.5m
Test site:	Full Anechoic Chamber	Open Aera Test Site
Distance EUT - Antenna:	3m	10m
Detector:	Peak	Peak & Average

Frequency range:	14GHz to 25GHz	
Test:	Pre-Characterization	Qualification
Antenna Polarization:	Horizontal and Vertical	
Antenna Height:	Centered on EUT (§6.6.5 ANSI C63-10)	Centered on EUT (§6.6.5 ANSI C63-10)
Antenna Type:	Horn	
RBW Filter:	1MHz	
Maximization:	Turntable rotation of 360 degrees range and all axis of EUT used in normal configuration	
EUT height:	1.5m	1.5m
Test site:	Full Anechoic Chamber	Full Anechoic Chamber
Distance EUT - Antenna:	1m	1m
Detector:	Peak	Peak & Average



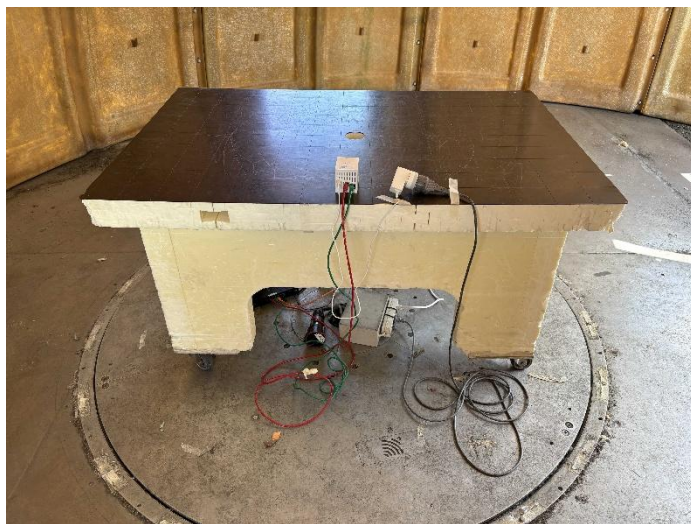
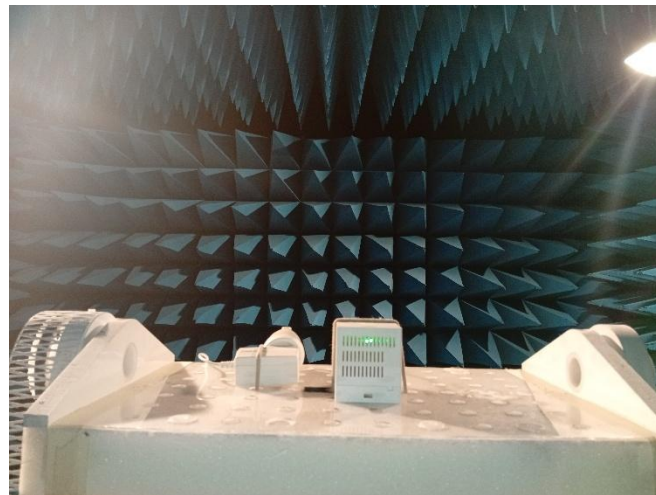
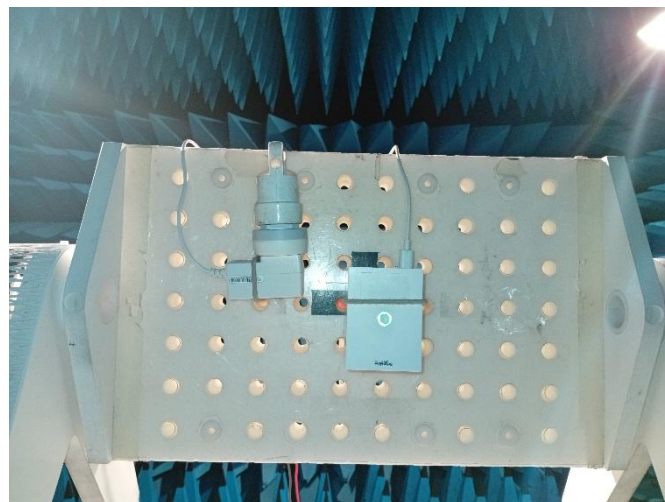


Photo of Transmitter unwanted emissions in the spurious domain on OATS



Axis XY on FAR



Axis Z on FAR

Photo of Transmitter unwanted emissions in the spurious domain

9.3. LIMIT

Measure at 300m		
Frequency range	Level	Detector
9kHz-490kHz	67.6dB μ V/m /F(kHz)	QPeak
Measure at 30m		
Frequency range	Level	Detector
490kHz-1.705MHz	87.6dB μ V/m /F(kHz)	QPeak
1.705MHz-30MHz	29.5dB μ V/m	QPeak
Measure at 10m		
Frequency range	Level	Detector
30MHz to 88MHz	29.5dB μ V/m	QPeak
88MHz to 216MHz	33dB μ V/m	QPeak
216MHz to 960MHz	35.5B μ V/m	QPeak
960MHz to 1000MHz	43.5dB μ V/m	QPeak
Above 1000MHz	63.5dB μ V/m	Peak
	43.5dB μ V/m	Average
Measure at 3m		
Frequency range	Level	Detector
30MHz to 88MHz	40dB μ V/m	QPeak
88MHz to 216MHz	43.5dB μ V/m	QPeak
216MHz to 960MHz	46B μ V/m	QPeak
960MHz to 1000MHz	54dB μ V/m	QPeak
Above 1000MHz	74dB μ V/m	Peak
	54dB μ V/m	Average



9.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Cal_Date	Cal_Due
Multimeter	FLUKE	289	A1241119	05/2025	05/2027
EMR comb generator	BARDET	—	A3169050	NA	NA
HF EMR comb generator	LCIE SUD EST	—	A3169088	NA	NA
Spectrum analyzer	ROHDE & SCHWARZ	FSU 26	A4060058	01/2026	01/2028
Cable 0.75m	-	18GHz	A5329900	08/2025	08/2026
SMA Cable 18GHz 0.6m	TELEDYNE	18GHz	A5330055	08/2025	08/2026
SMA Cable 18GHz 3.5m	TELEDYNE	18GHz	A5330058	08/2025	08/2026
SMA Cable 18GHz 0.5m	TELEDYNE	18GHz	A5330059	01/2025	06/2026
Pre-Amplifier	LCIE SUD EST	1-13GHz	A7085029	08/2025	08/2027
Amplifier 10MHz - 18GHz	LCIE SUD EST	—	A7102082	03/2025	03/2027
Filter Matrice	LCIE SUD EST	Combined filters	A7484078	08/2025	08/2027
Thermo-hygrometer	TESTO	608-H1	B4204120	05/2025	05/2027
Horn Antenna	ELECTRO-METRICS	EM-6969	C2040286	06/2025	06/2028
Antenna horn 18GHz	AINFO	LB	C2042055	11/2024	11/2027
Semi-Anechoic chamber #3 (BF)	SIEPEL	—	D3044017_BF	09/2025	09/2026
Semi-Anechoic chamber #3 (VSWR)	SIEPEL	—	D3044017_VSWR	09/2025	09/2028
Turntable chamber (Cage#3)	ETS Lingren	Model 2165	F2000371	-/-	-/-
Turntable controller (Cage#3)	ETS Lingren	Model 2090	F2000444	-/-	-/-
Table C3	LCIE	—	F2000461	-/-	-/-
Rehausse Table C3	LCIE	—	F2000507	-/-	-/-
Rehausse Table C3	LCIE	—	F2000511	-/-	-/-
Mat Controler	LCIE	MAT Controler	F2000523	-/-	-/-
Cable SMA 40cm	WITHWAVE	W101-SM1-0.4M	A5329979	03/2025	07/2026
SMA Cable 18GHz 6m	TELEDYNE	18GHz	A5330057	01/2025	06/2026
BAT EMC	NEXIO	v3.21.0.32	L1000115-MOI	-/-	-/-
Antenna Bi-log	AH System	SAS-521-7	C2040180	11/2025	11/2027
SMA Cable 18GHz 0.5m	TELEDYNE	18GHz	A5330060	01/2025	06/2026

9.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

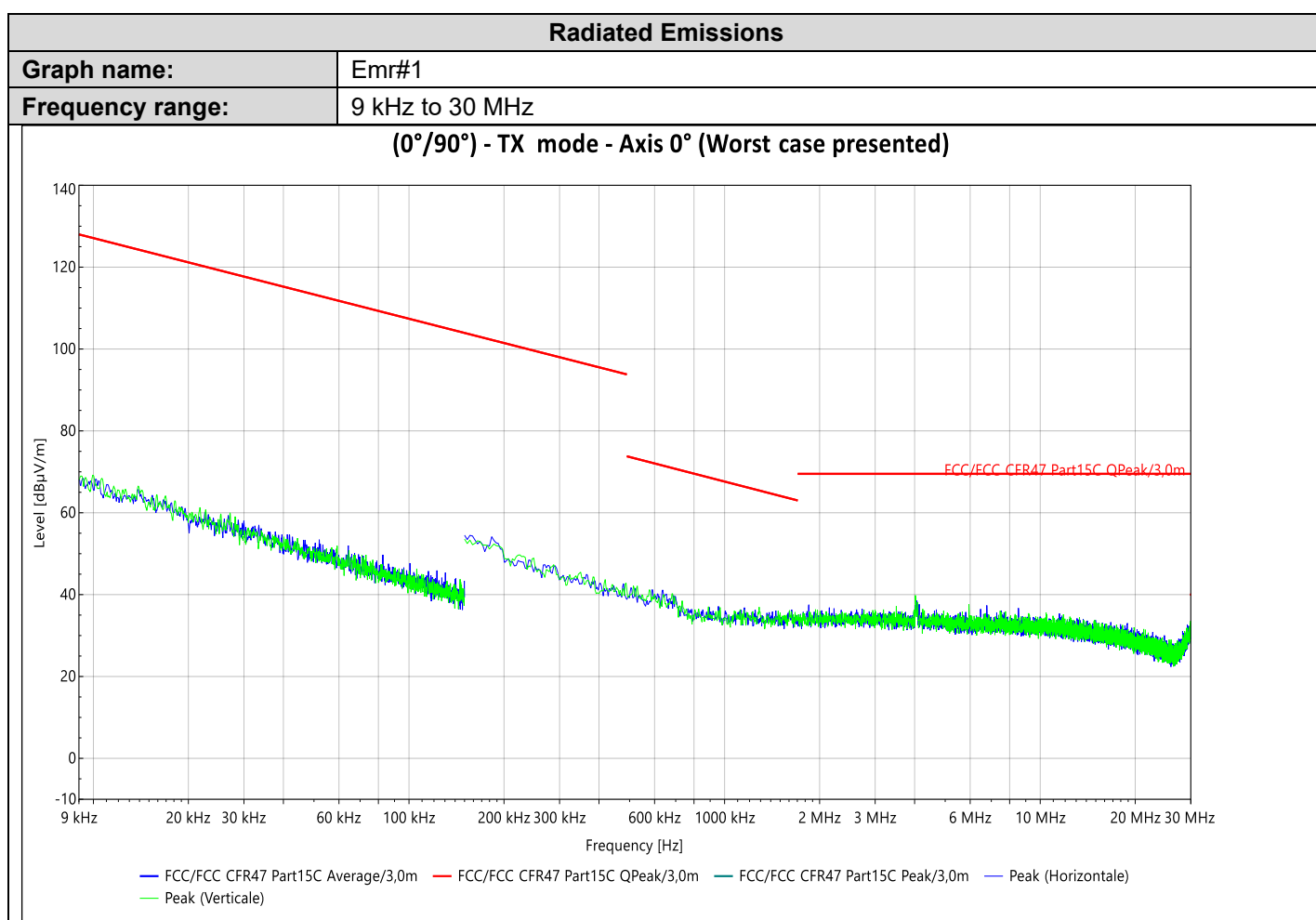
9.6. RESULTS

For all following measurements, worst case is presented with different configurations and modulations of EUT.

9.6.1. 9kHz to 30MHz

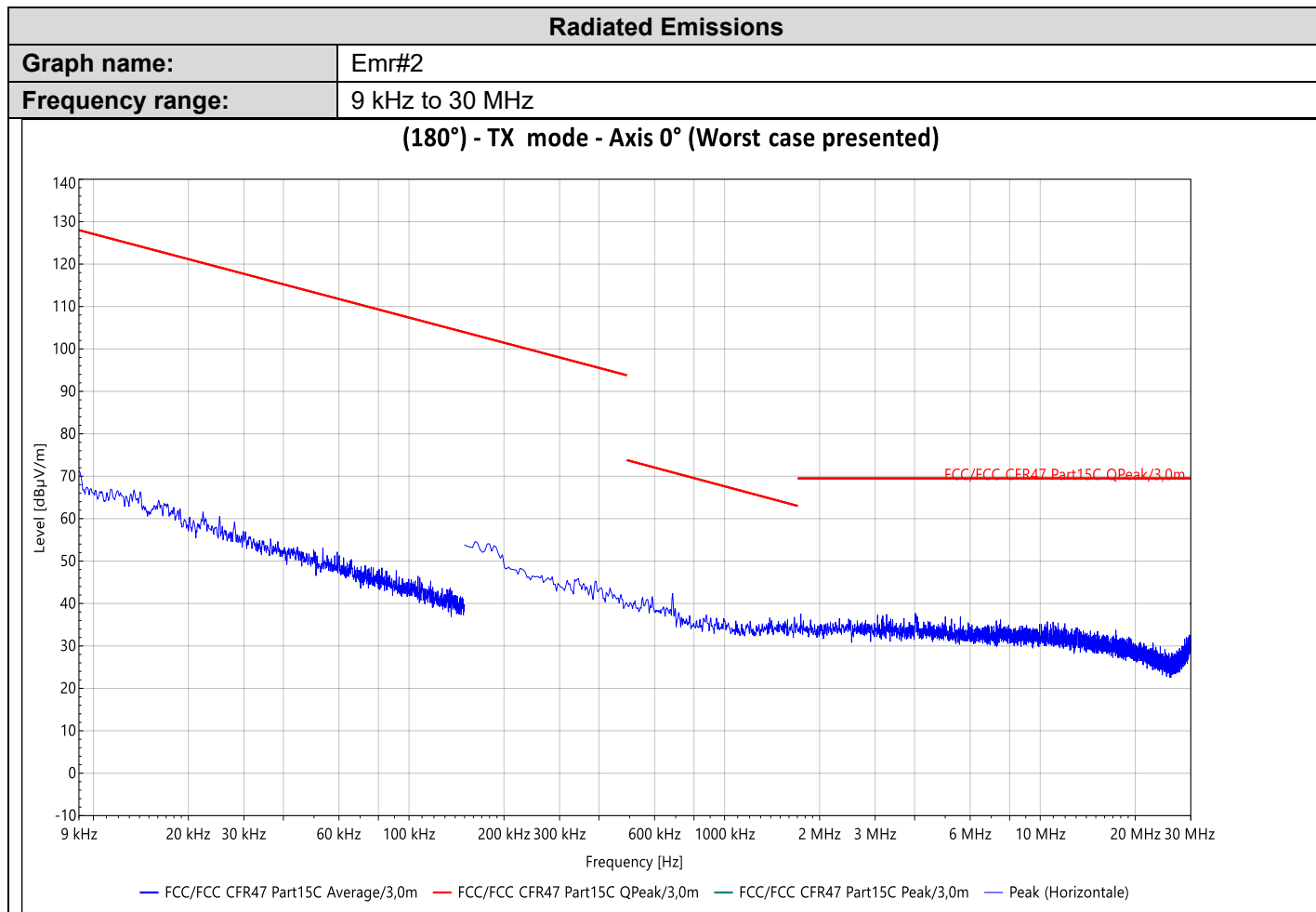
Graphs – Pre characterization: (worst case presented)

Graph identifier	Polarization	Mode	Channel	EUT position	Comments
Emr# 1	H/V	TX	Cmid	Axis XY/Z	See the following results
Emr# 2	H/V	TX	Cmid	Axis XY/Z	See the following results



Pre-Characterization:

Frequency



Pre-Characterization:

Frequency

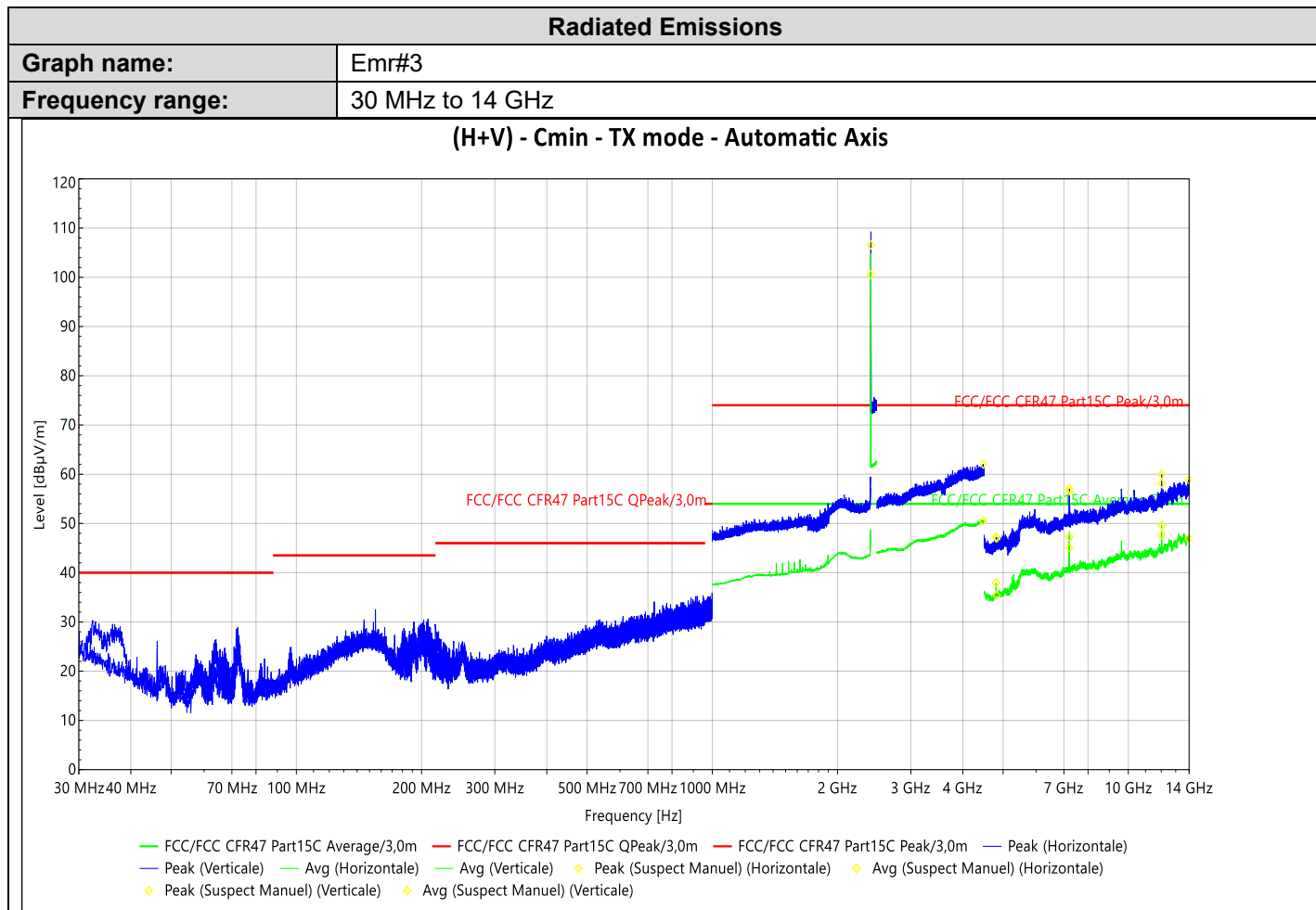
Final measurement:

No significant frequency observed

9.6.2. 30MHz to 14GHz

Graphs – Pre characterization:

Graph identifier	Polarization	Mode	Channel	EUT position	Comments
Emr# 1	H/V	TX	Cmin	Axis XY/Z	See the following results
Emr# 2	H/V	TX	Cmid	Axis XY/Z	See the following results
Emr# 3	H/V	TX	Cmax	Axis XY/Z	See the following results



Pre-Characterization:

Frequency	PK Level (dBµV/m)	Lim.PK (dBµV/m)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Lim.QP (dBµV/m)	Angle (°)	Polar.	Correct. (dB)
2.404 GHz	106.54	/	100.55	/	/	171	H	37.25
4.480 GHz	62.04	74.00	50.49	54.00	/	57	H	43.38
4.825 GHz	47.04	74.00	35.44	54.00	/	350	H	-14.01
7.213 GHz	56.64	74.00	47.25	54.00	/	249	H	-7.54
12.028 GHz	59.92	74.00	49.61	54.00	/	3	H	-2.91
13.972 GHz	58.90	74.00	46.92	54.00	/	200	H	1.76
2.404 GHz	109.22	/	100.55	/	/	256	V	37.25
4.811 GHz	47.26	74.00	37.92	54.00	/	0	V	-14.06
7.217 GHz	57.06	74.00	45.07	54.00	/	305	V	-7.53
12.023 GHz	58.14	74.00	47.69	54.00	/	353	V	-2.90

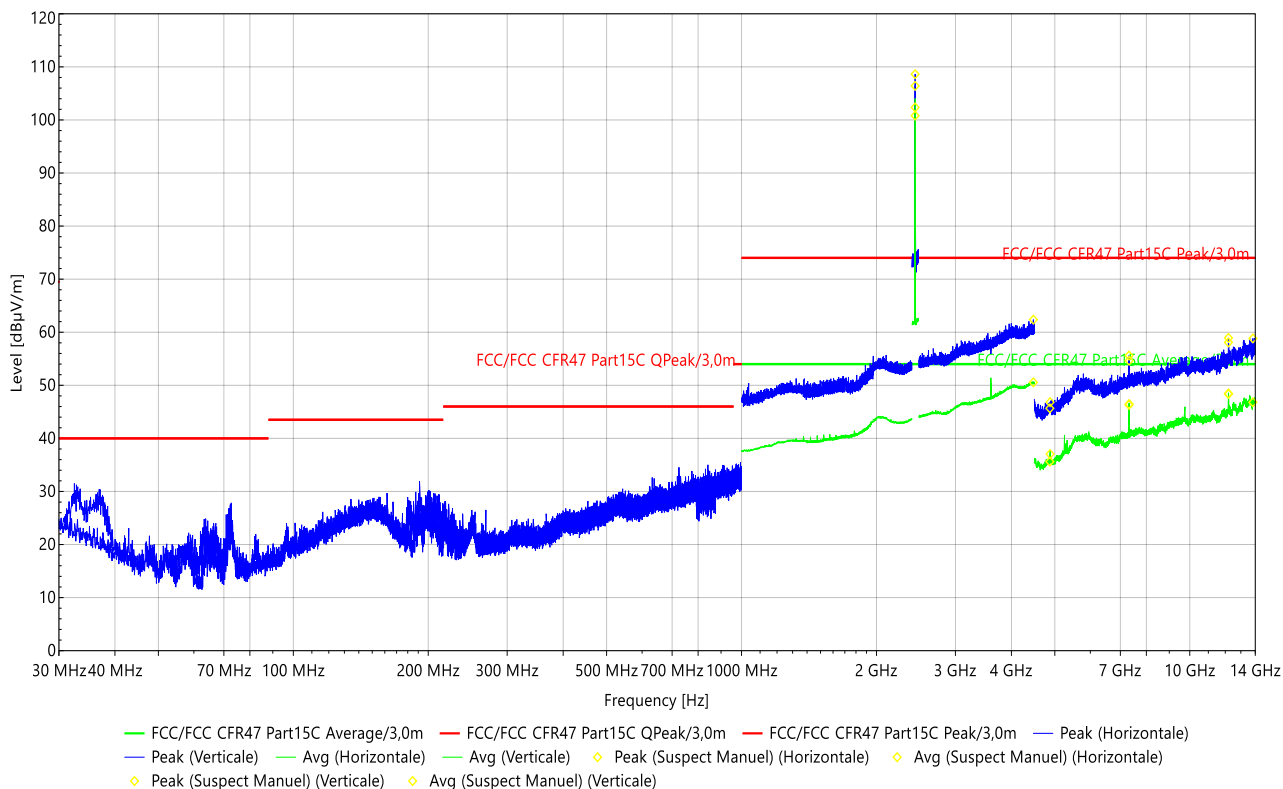


L C I E

Radiated Emissions

Graph name: Emr#4
Frequency range: 30 MHz to 14 GHz

(H+V) - Cmid - TX mode - Automatic Axis



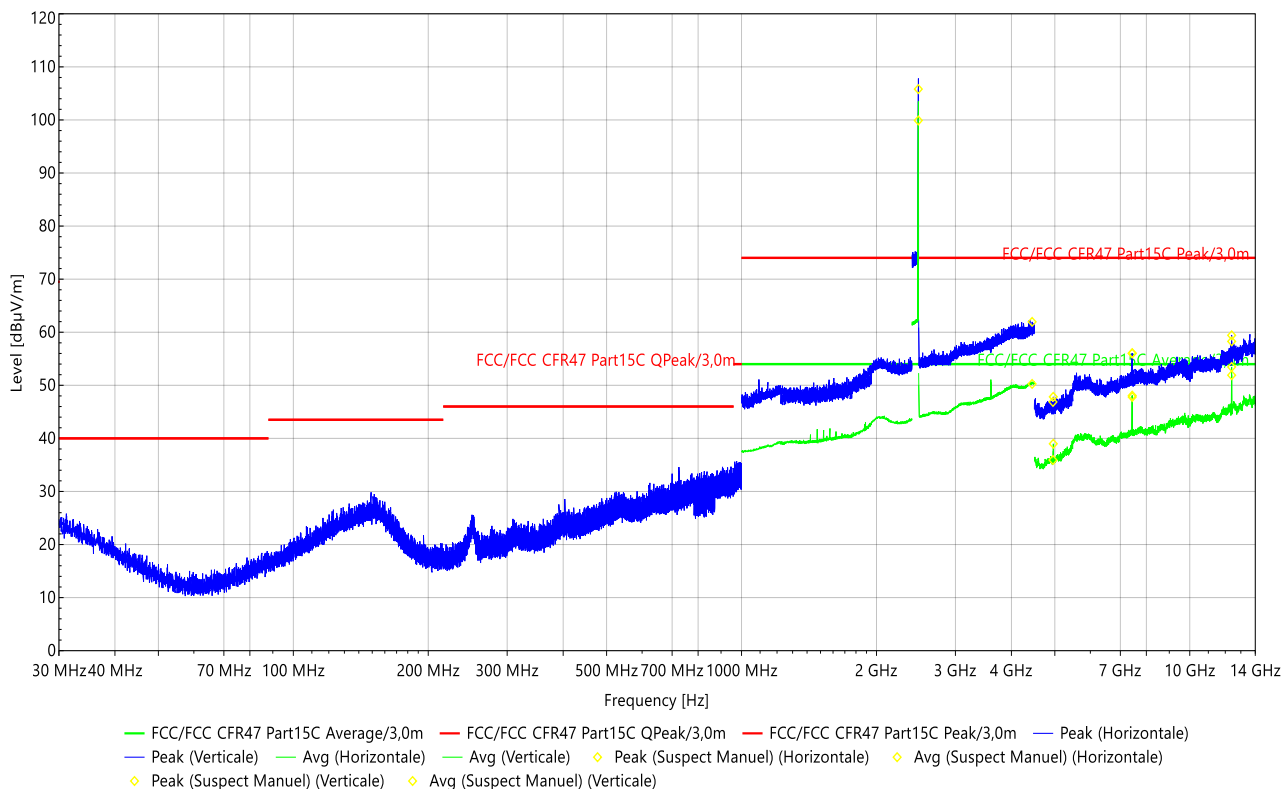
Pre-Characterization:

Frequency	PK Level (dBμV/m)	Lim.PK (dBμV/m)	Avg (dBμV/m)	Lim.Avg (dBμV/m)	Lim.QP (dBμV/m)	Angle (°)	Polar.	Correct. (dB)
2.439 GHz	106.41	/	100.81	/	/	76	H	37.37
4.879 GHz	46.82	74.00	37.05	54.00	/	343	H	-13.98
7.322 GHz	54.64	74.00	46.47	54.00	/	247	H	-7.37
12.198 GHz	58.93	74.00	48.45	54.00	/	3	H	-3.12
4.873 GHz	45.66	74.00	35.61	54.00	/	243	V	-13.98
7.319 GHz	55.60	74.00	46.31	54.00	/	296	V	-7.37
12.198 GHz	58.08	74.00	48.37	54.00	/	12	V	-3.12
13.831 GHz	58.83	74.00	46.81	54.00	/	230	V	1.40
4.478 GHz	62.37	74.00	50.55	54.00	/	170	V	43.38
2.439 GHz	108.63	/	102.35	/	/	24	V	37.37

Radiated Emissions

Graph name: Emr#5
Frequency range: 30 MHz to 14 GHz

(H+V) - Cmax - TX mode - Automatic Axis



Pre-Characterization:

Frequency	PK Level (dBμV/m)	Lim.PK (dBμV/m)	Avg (dBμV/m)	Lim.Avg (dBμV/m)	Lim.QP (dBμV/m)	Angle (°)	Polar.	Correct. (dB)
2.479 GHz	105.81	/	99.90	/		166	H	37.55
4.960 GHz	47.83	74.00	38.98	54.00		327	H	-13.94
7.439 GHz	56.00	74.00	47.79	54.00		357	H	-7.44
12.400 GHz	59.42	74.00	53.46	54.00		29	H	-2.78
4.952 GHz	46.86	74.00	35.92	54.00		64	V	-13.93
7.440 GHz	56.06	74.00	48.06	54.00		314	V	-7.44
12.400 GHz	58.27	74.00	51.90	54.00		20	V	-2.78
4.449 GHz	61.95	74.00	50.26	54.00		105	V	43.37
2.479 GHz	101.68	/	97.32	/		32	V	37.55

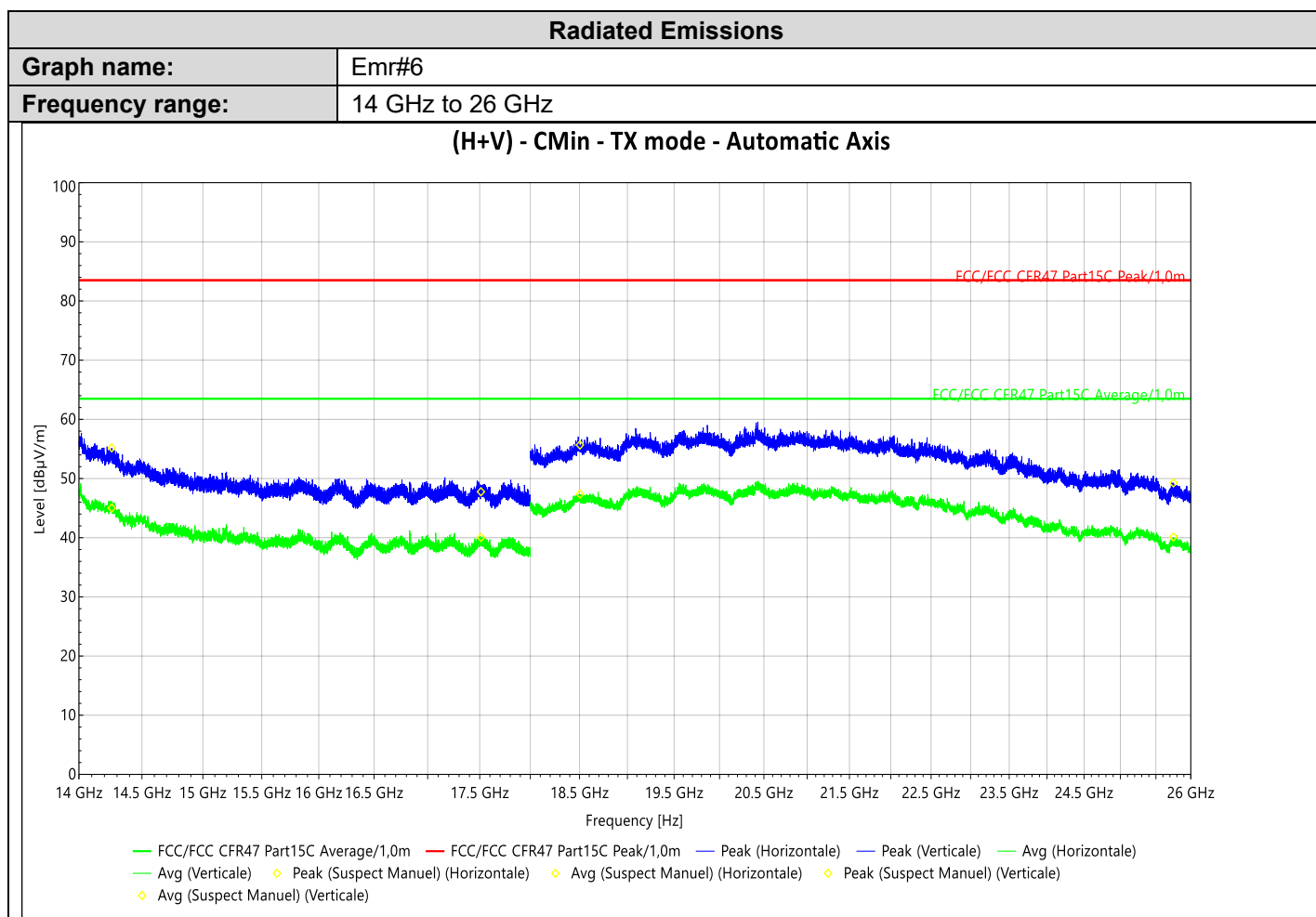
Final measurement:

No significant frequency observed

9.6.3. 14GHz to 25GHz

Graphs – Pre characterization:

Graph identifier	Polarization	Mode	Channel	EUT position	Comments
Emr# 6	H/V	TX	Cmin	Axis XY/Z	See the following results
Emr# 7	H/V	TX	Cmid	Axis XY/Z	See the following results
Emr# 8	H/V	TX	Cmax	Axis XY/Z	See the following results



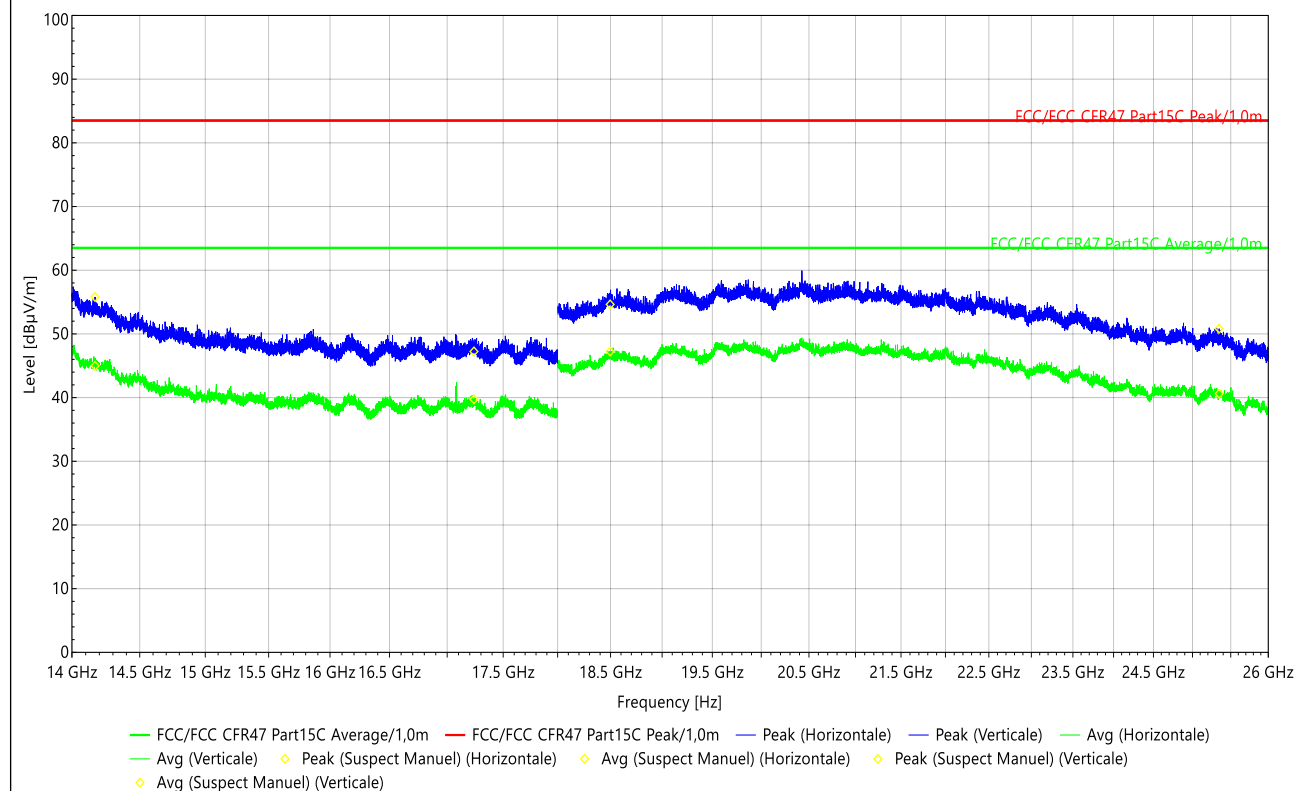
Pre-Characterization:

Frequency	PK Level (dBµV/m)	Lim.PK (dBµV/m)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Angle (°)	Polar.	Correct. (dB)
14.258 GHz	55.18	83.50	45.02	63.50	274	H	3.48
25.750 GHz	49.27	83.50	40.11	63.50	276	H	7.64
17.512 GHz	47.76	83.50	40.04	63.50	228	V	-3.49
18.504 GHz	55.67	83.50	47.36	63.50	95	V	5.42

Radiated Emissions

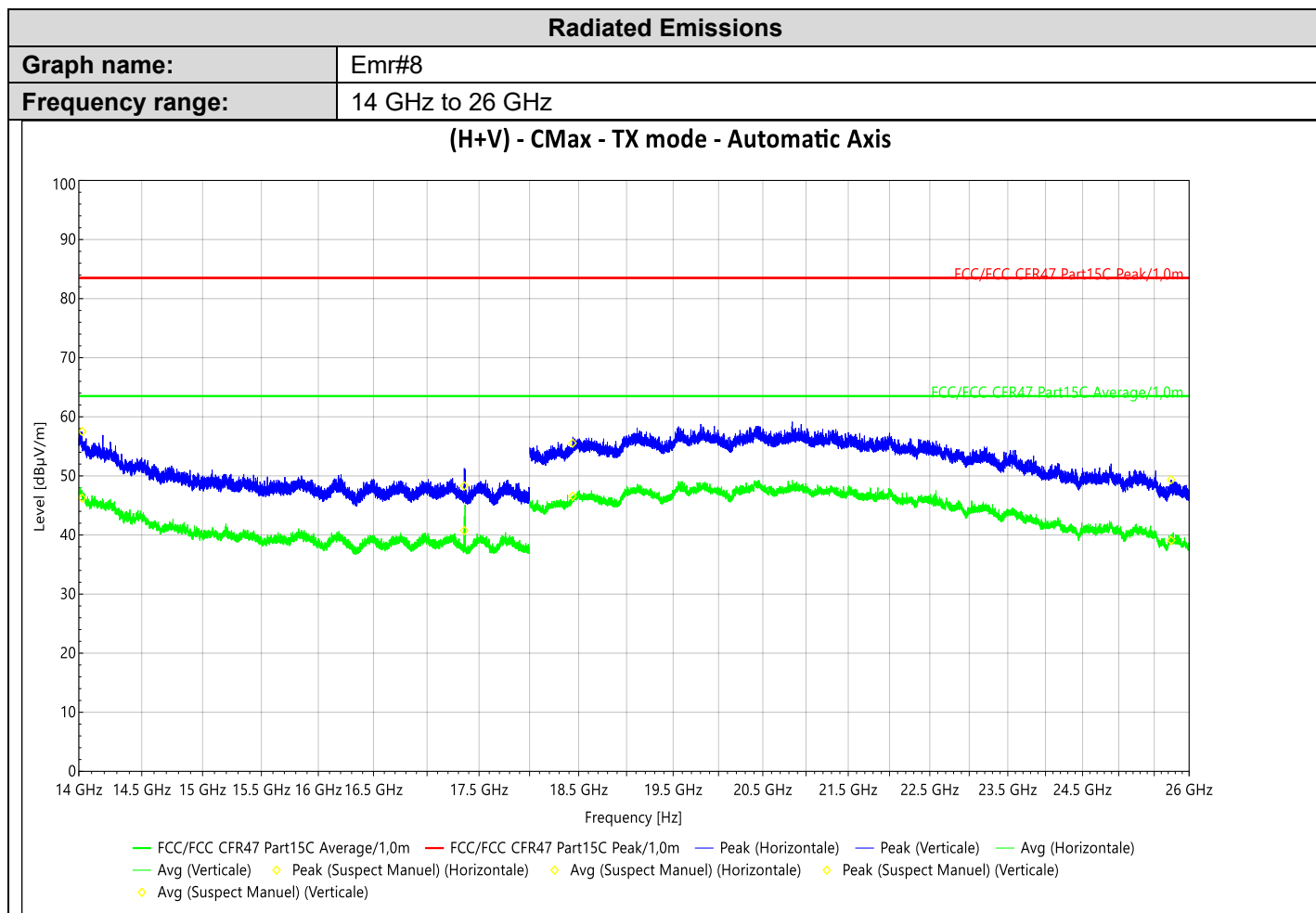
Graph name: Emr#7
Frequency range: 14 GHz to 26 GHz

(H+V) - CMid - TX mode - Automatic Axis



Pre-Characterization:

Frequency	PK Level (dBμV/m)	Lim.PK (dBμV/m)	Avg (dBμV/m)	Lim.Avg (dBμV/m)	Angle (°)	Polar.	Correct. (dB)
14.168 GHz	55.81	83.50	44.98	63.50	15	H	4.03
25.347 GHz	50.82	83.50	40.61	63.50	40	H	7.48
17.238 GHz	47.24	83.50	39.73	63.50	191	V	-2.55
18.496 GHz	54.63	83.50	47.24	63.50	92	V	5.44



Pre-Characterization:

Frequency	PK Level (dBµV/m)	Lim.PK (dBµV/m)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Angle (°)	Polar.	Correct. (dB)
14.026 GHz	57.52	83.50	46.24	63.50	290	H	5.50
25.741 GHz	49.36	83.50	39.08	63.50	244	H	7.62
17.356 GHz	48.31	83.50	40.75	63.50	93	V	-3.15
18.437 GHz	55.54	83.50	46.56	63.50	83	V	5.23

Final measurement:

No significant frequency observed

9.6.4. At the band edge

Unwanted emissions at the band edge

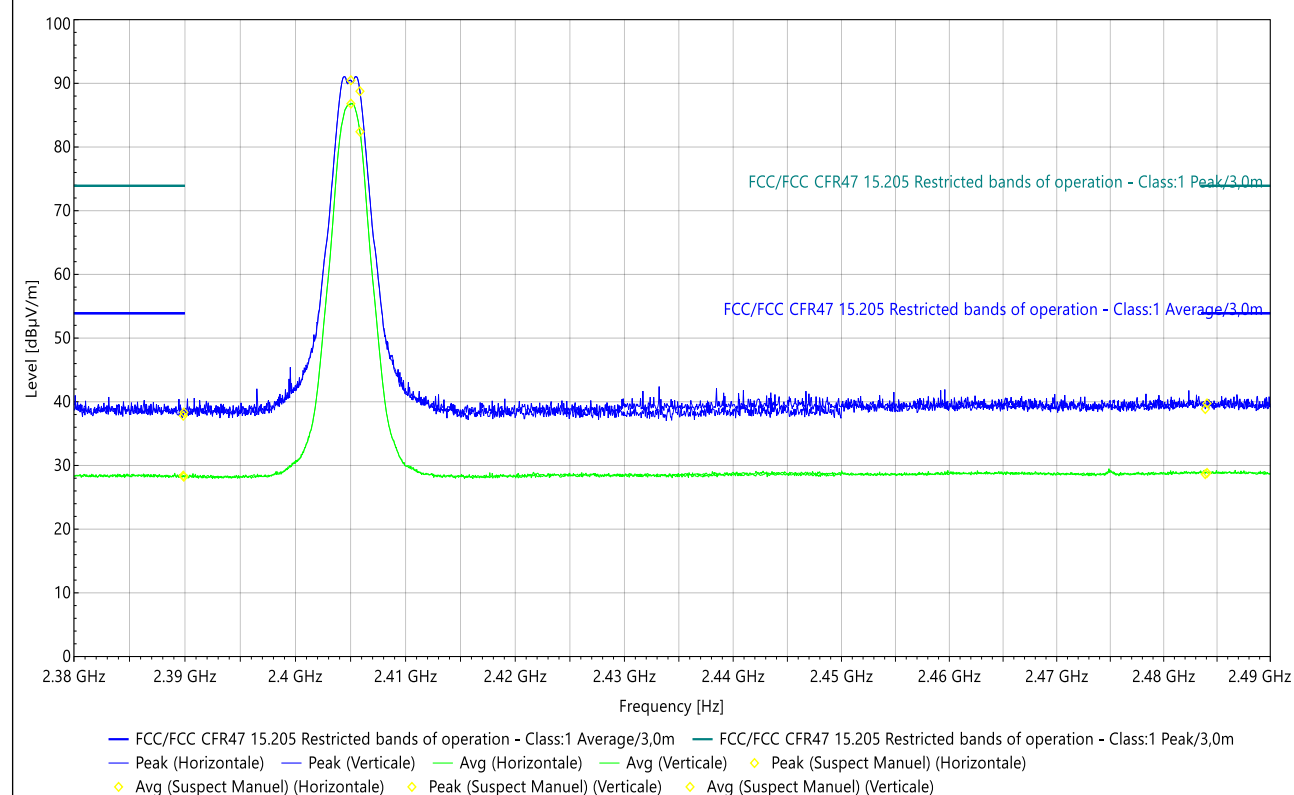
Configuration: 802.15.4 - 250kBits/s

Radiated Emissions

Graph name: Emr#9

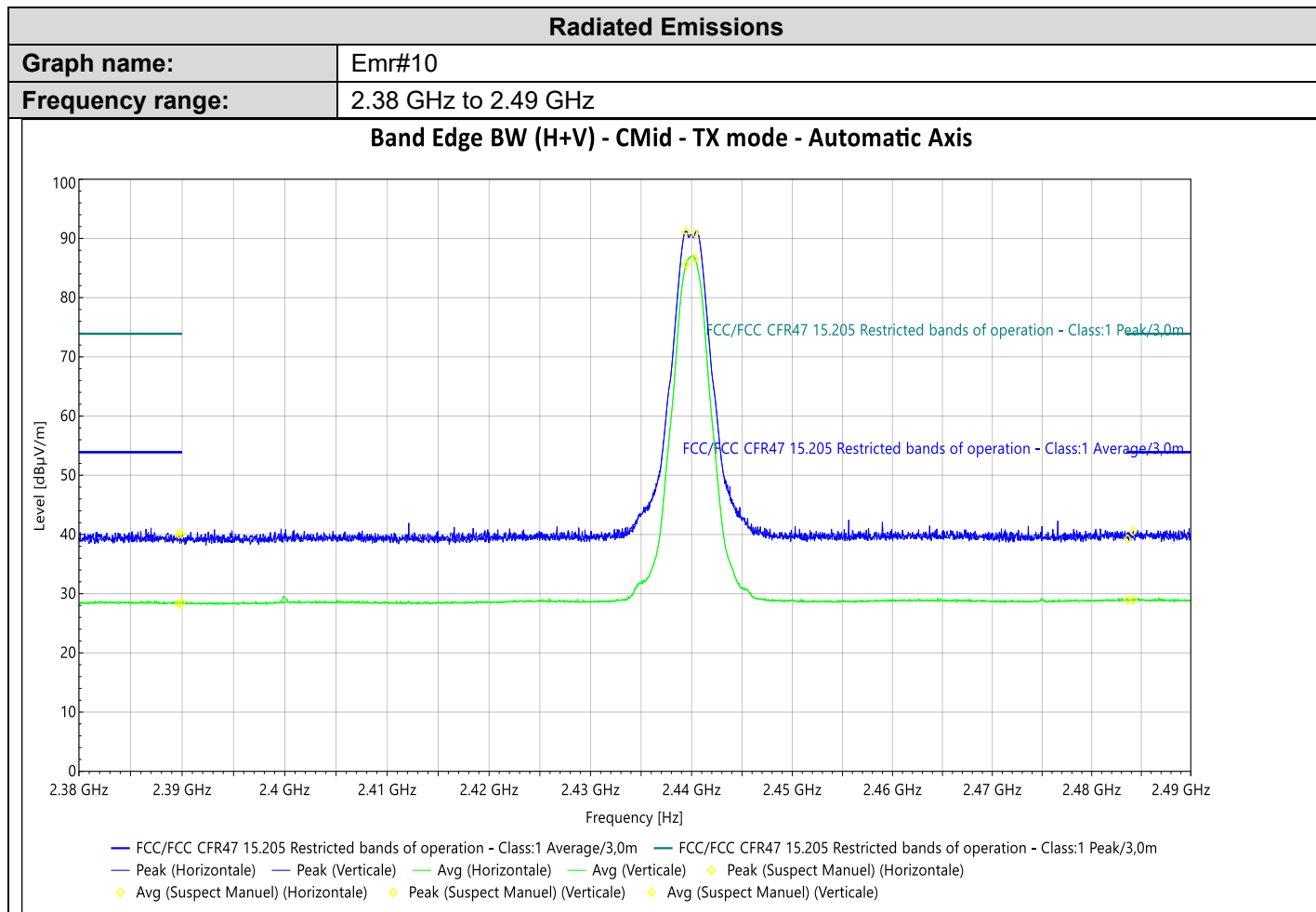
Frequency range: 2.38 GHz to 2.49 GHz

Band Edge BW (H+V) - CMin - TX mode - Automatic Axis



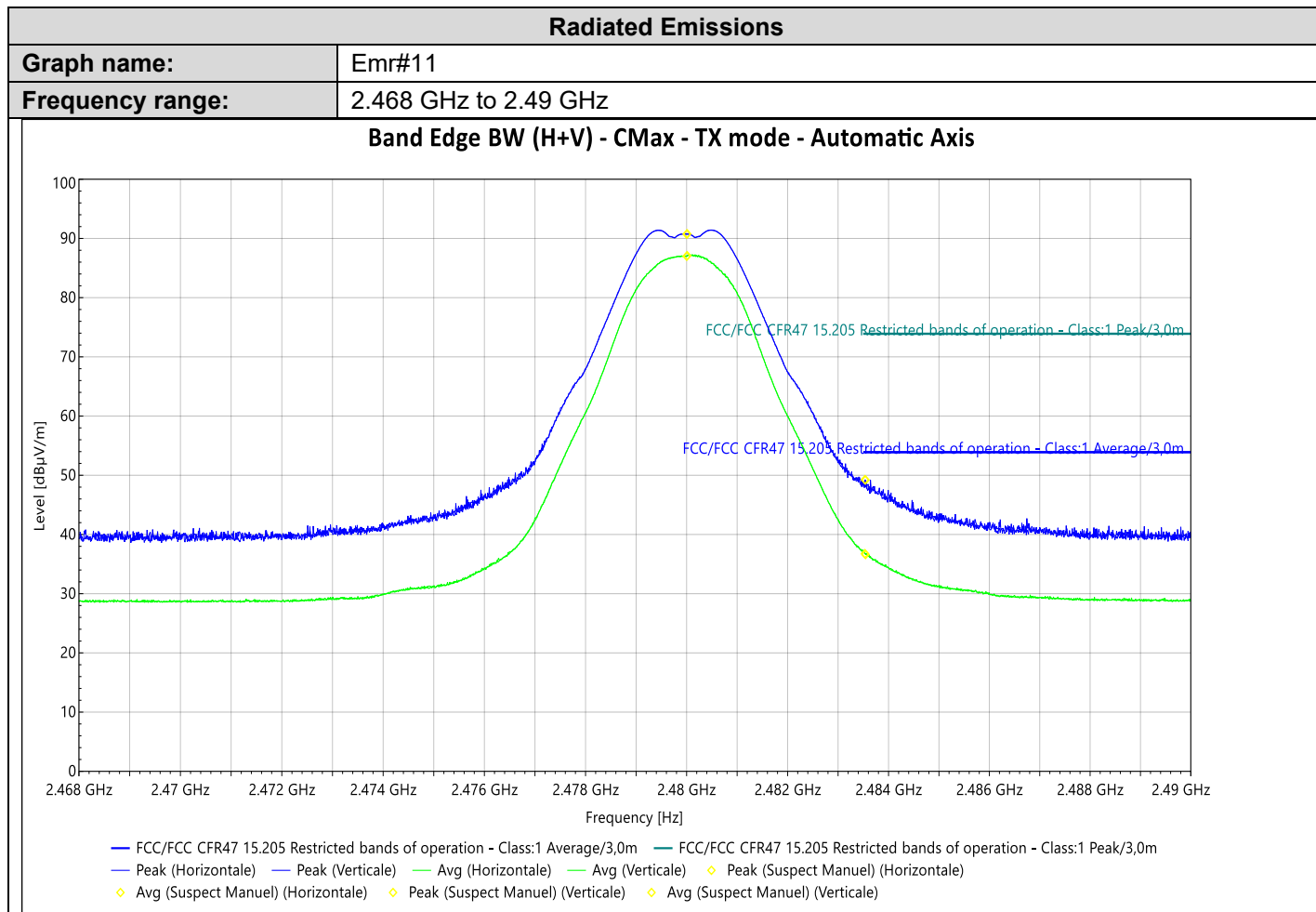
Pre-Characterization:

Frequency	PK Level (dBµV/m)	Lim.PK (dBµV/m)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Angle (°)	Polar.	Correct. (dB)
2.390 GHz	37.80	74.00	28.40	54.00	108	H	-23.07
2.484 GHz	38.86	74.00	28.63	54.00	290	H	-22.63
2.390 GHz	38.32	74.00	28.23	54.00	92	V	-23.07
2.405 GHz	90.48	/	86.81	/	73	V	-23.01
2.406 GHz	88.76	/	82.40	/	340	V	-23.00
2.484 GHz	39.75	74.00	28.83	54.00	246	V	-22.63



Pre-Characterization:

Frequency	PK Level (dBµV/m)	Lim.PK (dBµV/m)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Angle (°)	Polar.	Correct. (dB)
2.390 GHz	40.07	74.00	28.53	54.00	42	H	-23.07
2.439 GHz	91.22	/	85.66	/	331	H	-22.86
2.484 GHz	40.53	74.00	28.94	54.00	223	H	-22.63
2.390 GHz	40.04	74.00	28.28	54.00	201	V	-23.07
2.440 GHz	90.84	/	86.68	/	325	V	-22.86
2.484 GHz	39.26	74.00	28.86	54.00	170	V	-22.63



Pre-Characterization:

Frequency	PK Level (dBµV/m)	Lim.PK (dBµV/m)	Avg (dBµV/m)	Lim.Avg (dBµV/m)	Angle (°)	Polar.	Correct. (dB)
2.480 GHz	90.72		86.99		176	H	-22.65
2.484 GHz	49.20	74.00	36.60	54.00	0	H	-22.63
2.480 GHz	90.78		87.08		29	V	-22.65
2.484 GHz	49.26	74.00	36.77	54.00	306	V	-22.63

9.7. CONCLUSION

Unwanted emissions in non-restricted bands measurement performed on the sample of the product **Energy Intelligence Control Unit**, Sn: **EP142**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.

10. UNCERTAINTIES CHART

Kind of test	Wide uncertainty laboratory ($k=1.96$) $\pm x (y)$
Occupied Bandwidth	1.35 %
Humidity	4.84 %
Power Spectral Density, Conducted	1.95 dB
Radio frequency until 30MHz	0.09 ppm
Radio frequency from 30MHz	0.31 ppm
RF power, conducted	1.49 dB
RF power, radiated (Full Anechoic Chamber)	4.84 dB
RF power, radiated (Semi Anechoic Chamber)	5.65 dB
RF power, radiated (Open Area Test Site)	5.27 dB
Spurious emission, conducted	2.47 dB
Spurious emission radiated (Full Anechoic Chamber)	4.84 dB
Spurious emission radiated (Semi Anechoic Chamber)	5.65 dB
Spurious emission radiated (Open Area Test Site)	5.27 dB
Generated signal levels, conducted	2.94 dB
Generated signal levels, radiated	Not used in laboratory
Adaptivity & Dynamic Frequency Selection	3.59 dB, 2.77 %, 2.53 %
Receiver blocking or desensitization	3.59 dB
RF level uncertainty for a given BER	1.49 dB
Temperature	0.75 °C
Time	4.08 %
Voltage	0.91 %
Conducted disturbances in voltage on the power port - 9kHz - 150kHz	3.64 dB
Conducted disturbances in voltage on the power port - 150kHz - 30MHz	3.21 dB
Radiated disturbances OATS & SAC @3m - 9kHz - 30MHz, Loop antenna	4.90 dB
Radiated disturbances OATS & SAC @3m - 30MHz - 200MHz, Biconical antenna	5.74 dB
Radiated disturbances OATS & SAC @3m - 30MHz - 1GHz, Hybrid antenna	5.65 dB
Radiated disturbances OATS @10m - 9kHz - 30MHz, Loop antenna	4.90 dB
Radiated disturbances OATS @10m - 30MHz - 200MHz, Biconical antenna	5.72 dB
Radiated disturbances OATS @10m - 30MHz - 1GHz, Hybrid antenna	5.91 dB
Radiated disturbances FAC @3m - 1GHz - 6GHz, Horn or hybrid antenna	5.02 dB
Radiated disturbances FAC @3m - 6GHz - 18GHz, Horn antenna	5.41 dB
Radiated disturbances FAC @3m - 18GHz - 40GHz, Horn antenna	7.81 dB

Ce tableau regroupe l'ensemble des incertitudes maximales pour les essais réalisables dans le laboratoire, qu'ils aient été ou non réalisés dans le cadre du présent rapport. / This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report.

Note - L'incertitude de mesure instrumentale est déterminée selon la CISPR 16-4-2, les ETSI TR 100 028 et les ETSI TR 102 273. / The instrumentation measurement uncertainty is determined according to CISPR16-4-2, ETSI TR 100 028 and ETSI TR 102 273.



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