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TEST REPORT

N°: 21019537-796750-D(FILE#6633628)

Version: 03

Subject

Radio spectrum tests according to the standards:
FCC CFR 47 Part 15.247 & ANSI C63.10
RSS-247 & RSS-Gen

Issued to

MICROPORT CRM
4 AVENUE REAUMUR
92140 - CLAMART
FRANCE

Apparatus under test

Product

Defibrillator

Trade mark

MICROPORT CRM

Manufacturer

MICROPORT CRM s.r.l

Family range

ENERGYA CRT-D 3711

TALENTIA VR 3210

TALENTIA DR 3510

ENERGYA VR 3110

ENERGYA DR 3410

Model under test

TALENTIA SonR CRT-D 3811

Serial number

Q19JX014 , Q19D4003

FCCID

YSGIS1BLE

Conclusion

See Test Program chapter

Test date

January 16, 2024 to February 01, 2024

Test location

LCIE Grenoble

FCC Test site

FR0008 - 918017 (MOI)

ISED Test site

6500A (MOI)

Sample receipt date

January 15, 2024

Composition of document

50 pages

Document issued on

July 01, 2024

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PUBLICATION HISTORY

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|---------|----------------|---------------|---|
| 01 | March 20, 2024 | Akram HAKKARI | Creation of the document |
| 02 | March 28, 2024 | Akram HAKKARI | Add informations on tables equipment list |
| 03 | July 01, 2024 | Akram HAKKARI | Correction limit PSD on page 24 |

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 (2023)
- RSS 247 Issue 3
- RSS Gen Issue 5
- KDB 558074 D01 DTS Meas Guidance v05r02 [🔗](#)
- KDB 662911 D01 Multiple Transmitter Output v02r01 [🔗](#)
- ANSI C63.10 (2013)

Radio requirement:

| | | |
|---|------------|------|
| 6dB Bandwidth | FCC & ISED | PASS |
| Maximum Conducted Output Power | FCC & ISED | PASS |
| Power Spectral Density | FCC & ISED | PASS |
| Unwanted Emissions in Non-Restricted Frequency Bands | FCC & ISED | PASS |
| Unwanted Emissions in Restricted Frequency Bands | FCC & ISED | PASS |
| 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

Tests are performed on the most complete product **MICROPORT CRM IS1 TALENTIA SonR CRT-D 38111**, SN: **Q19JX014 for radiated test & Q19D4003 for conducted test**.

See Table below for difference between products.

For radiated test:

| | |
|---------------------------------|--|
| TALENTIA SonR CRT-D 3811 | ENERGYA CRT-D 3711 ENERGYA VR 3110 TALENTIA VR 3210 ENERGYA DR 3410 TALENTIA DR 3510 |
| Tested product. | Embedded Software is slightly different between TALENTIA and ENERGYA. However, these differences do not affect the radio functionality of the implant. The hardware is strictly the same. Mechanical structure is slightly different between TALENTIA DR & VR, ENERGYA DR & VR, ENERGYA CRT-D and TALENTIA SonR CRT-D; but it does not affect the radio functionality of the implant. Same telemetry Antenna T277 Same telemetry BLE Antenna G440E |

For conducted test:

| | |
|---------------------------------|--|
| Hybrid IS1 SN : Q19D4003 | ENERGYA VR 3110 TALENTIA VR 3210 ENERGYA VR 3140 TALENTIA VR 3240 ENERGYA DR 3410 TALENTIA DR 3510 ENERGYA DR 3440 TALENTIA DR 3540 ENERGYA CRT-D 3711 ENERGYA CRT-D 3741 |
| Tested product | The radio circuit of hybrid IS1 tested product is strictly the same for all IS1 products. |

2.2. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):

| | | | |
|-------------------|--|--|--|
| Model under test: | TALENTIA SonR CRT-D 3811/IS1 Hybrid | | |
| Serial Number: | Q19JX014 , Q19D4003 | | |
| |  | | |
| | | |  |
| Dimensions: | 5.5cm x 7.2 cm x 0.7cm (Length x Width x Height) | | |
| Type: | Table-Top | | |

Power supply:

| Name | Type | Rating | Reference / Sn | Comments |
|---------|---------|----------|----------------|----------|
| Supply1 | Battery | 3.24 VDC | - | - |

NC: Not communicated by provider



Auxiliary equipment used during test:

| Type | Reference | Sn | Comments |
|--------------------------|-----------|------------|----------|
| Laptop | DELL | - | - |
| Inductive telemetry Head | CPR3 | CM1610029S | - |
| USB adapter to RS232 | Sorin | XA1311038E | - |

NC: Not communicated by provider



Equipment information (declaration of provider):

| | |
|------------------------------|---|
| Bluetooth Low Energy: | v4.2 |
| Chipset / RF Module | Nordic nRF52832 |
| Frequency band: | [2400 – 2483.5] MHz |
| Spectrum Modulation: | DSSS (Tested like it – international agreements) |
| Number of Channel: | 40 |
| Spacing channel: | 2MHz |
| Channel bandwidth: | 1MHz |
| Antenna Type: | Internal |
| Antenna connector: | Temporary for tests |
| 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) | Channel | Frequency (MHz) |
| Cmin: 0 | 2402 | Cmid: 20 | 2442 |
| 1 | 2404 | 21 | 2444 |
| 2 | 2406 | 22 | 2446 |
| 3 | 2408 | 23 | 2448 |
| 4 | 2410 | 24 | 2450 |
| 5 | 2412 | 25 | 2452 |
| 6 | 2414 | 26 | 2454 |
| 7 | 2416 | 27 | 2456 |
| 8 | 2418 | 28 | 2458 |
| 9 | 2420 | 29 | 2460 |
| 10 | 2422 | 30 | 2462 |
| 11 | 2424 | 31 | 2464 |
| 12 | 2426 | 32 | 2466 |
| 13 | 2428 | 33 | 2468 |
| 14 | 2430 | 34 | 2470 |
| 15 | 2432 | 35 | 2472 |
| 16 | 2434 | 36 | 2474 |
| 17 | 2436 | 37 | 2476 |
| 18 | 2438 | 38 | 2478 |
| 19 | 2440 | Cmax: 39 | 2480 |

| DATA RATE | | | |
|-------------------------------------|------------------|-----------------|-------------------------------------|
| Available | Data Rate (Mbps) | Modulation Type | Worst Case Modulation |
| <input type="checkbox"/> | 0.25 | GFSK (1MHz) | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | 1 | GFSK (1MHz) | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | 2 | GFSK (2MHz) | <input type="checkbox"/> |



| Antenna Characteristic | | | |
|------------------------|------------|----------------------|-----------------------|
| Antenna reference | Gain (dBi) | Frequency Band (MHz) | Impedance(Ω) |
| G440E | -23.7 | [2400 – 2483.5] MHz | 50 |

| Hardware information | | | | |
|---|-------------------------------|------------------------|------------------|-----|
| Highest internal frequency (PLL, Quartz, Clock, Microprocessor...): | | F _{Highest} : | NC | MHz |
| Firmware (if applicable): | | V: | Platinum V 2.8.1 | |
| Software (if applicable): | | V: | NC | |
| Equipment intended: | Mobile | | | |
| Type of equipment: | Stand-alone | | | |
| Equipment sample: | Production model | | | |
| Duty cycle: | Continuous duty | | | |
| Operating temperature range: | T _{min} : | 32 °C | | |
| | T _{nom} : | 37°C | | |
| | T _{max} : | 42 °C | | |
| Operating voltage: | V _{min} (85% Vnom): | 2.62 VDC | | |
| | V _{nom} : | 3.24 VDC | | |
| | V _{max} (115% Vnom): | 3.3 VDC | | |

NC: Not communicated by provider

2.3. ***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. Refer to : PLAN 15076C |
| Test mode 2 | Permanent reception Refer to : PLAN 15076C |

| Test | Running mode |
|--|--------------|
| 6dB Bandwidth | Test mode 1 |
| Maximum Conducted Output Power | Test mode 1 |
| Power Spectral Density | Test mode 1 |
| Conducted Spurious Emission at the Band Edge | Test mode 1 |
| Unwanted Emissions in Non-Restricted Frequency Bands | Test mode 1 |
| Unwanted Emissions in Restricted Frequency Bands | Test mode 1 |

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

2.4. ***EQUIPMENT LABELLING***

| Label |
|--|
|  |

2.5. ***EQUIPMENT MODIFICATIONS DURING THE TESTS***

None

2.6. 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.

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

2.7. TEST DISTANCE EXTRAPOLATION – FCC/ISED

The field strength is extrapolated to the new measurement distance using formula from FCC Part15.31 (f) and §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

2.8. CALIBRATION DATE

The calibration intervals are extended at 12+2 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.

2.9. METHOD TO DETERMINATE THE SPURIOUS RADIATED EMISSION

The Normalized Site Attenuation (NSA) is added to the maximum values observed during the azimuth search in order to obtain the spurious radiated emission. For spurious above -6dB from the limit found with the NSA, the Substitution Method is applied.

The substitution antenna replaces the equipment under test (EUT) for Effective Radiated Power (ERP) or Effective Isotropically Radiated Power (EIRP) measurement following the standard. Power is measured for a high level and calculated for the same level of radiated field strength obtained on the measuring antenna and EUT.

3. 6dB BANDWIDTH

3.1. TEST CONDITIONS

Date of test : January 24, 2024
Test performed by : Akram HAKKARI
Relative humidity (%) : 33
Ambient temperature (°C) : 21

3.2. TEST SETUP

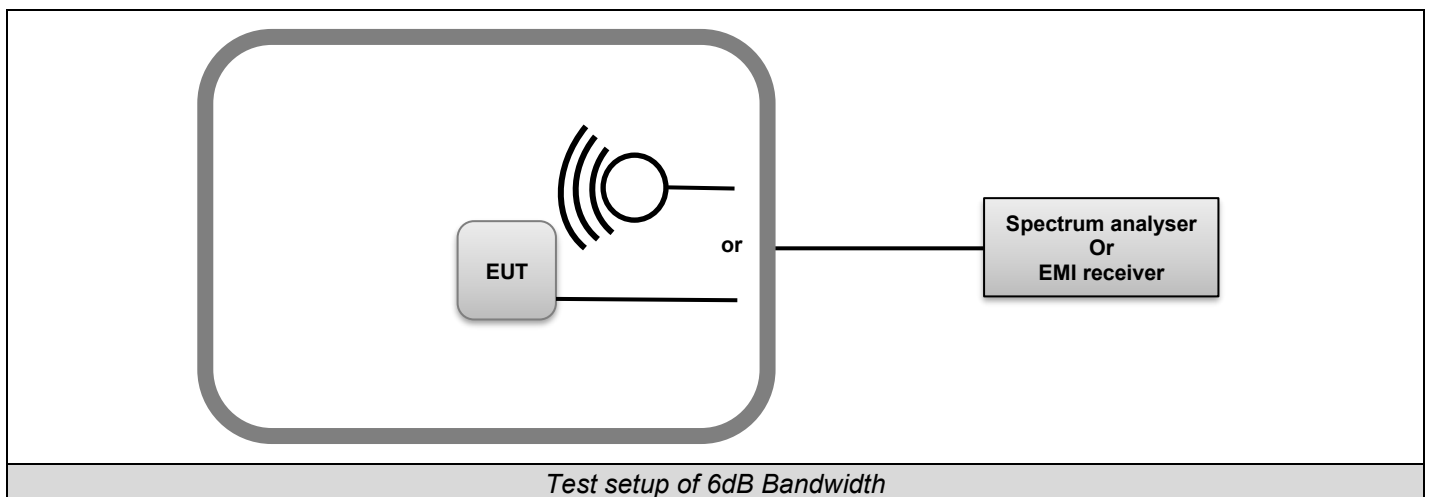
The Equipment Under Test is installed in an anechoic chamber.
Measurement is performed with a spectrum analyzer in conducted method.

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.



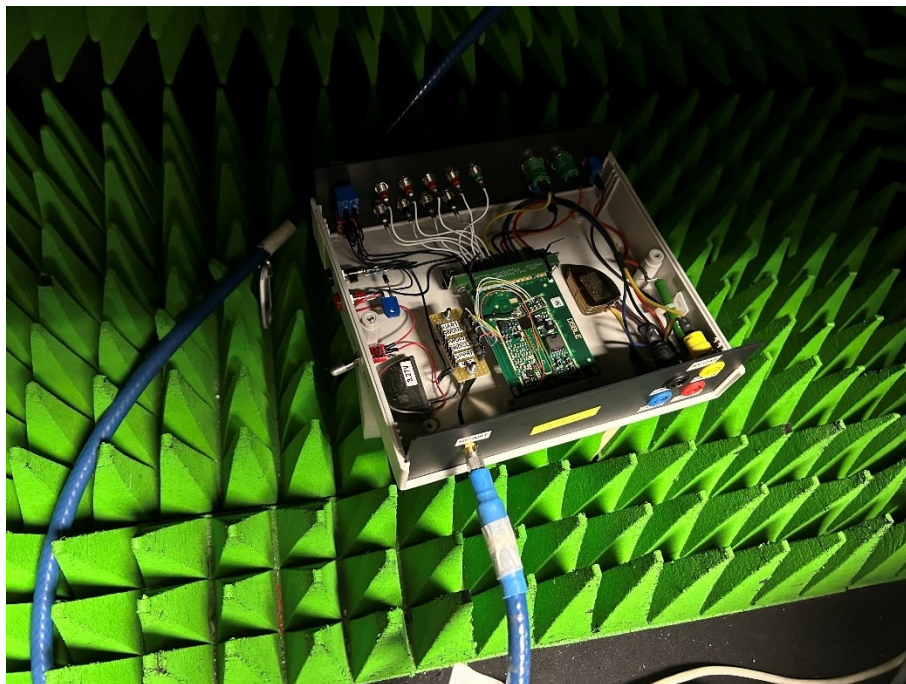


Photo of 6dB bandwidth

3.3. **LIMIT**

| Frequency range | 6dB bandwidth |
|---|----------------------|
| 902-928MHz 2400MHz to 2483.5MHz 5725-5850 MHz | $\geq 500\text{kHz}$ |



3.4. TEST EQUIPMENT LIST

| TEST EQUIPMENT USED | | | | | |
|-------------------------|-----------------|---------|------------|----------|---------|
| Description | Manufacturer | Model | Identifier | Cal_Date | Cal_Due |
| Attenuator 10dB | AEROFLEX | — | A7122267 | 10/23 | 10/25 |
| DC Power Supply | RS PRO | RS3005P | A7042314 | N/A | N/A |
| Multimeter - CEM | FLUKE | 87 | A1240251 | 10/23 | 10/25 |
| Emission Cable (SMA 1m) | TELEDYNE | 26GHz | A5329874 | 08/22 | 08/25 |
| Full Anechoic Room | SIEPEL | — | D3044024 | N/A | N/A |
| SMA 1.5m | SUCOFLEX | 18GHz | A5329864 | 10/23 | 10/24 |
| Spectrum analyzer | ROHDE & SCHWARZ | FSV 40 | A4060059 | 11/21 | 03/24* |
| Thermo-hygrometer | TESTO | 608-H1 | B4204120 | 03/23 | 03/25 |

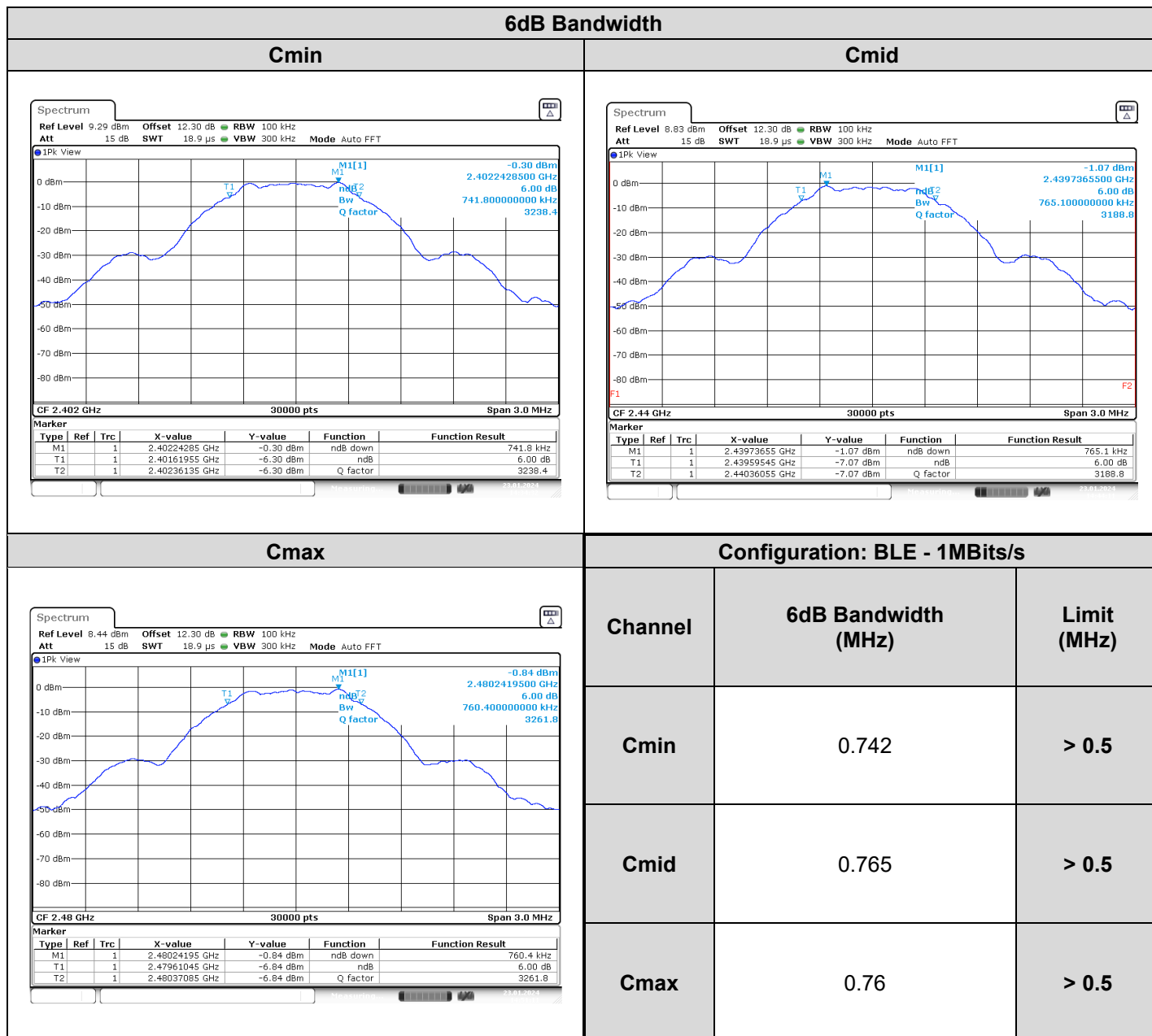
N/A: Not applicable

*: Under derogation

3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

3.6. RESULTS



3.7. CONCLUSION

6dB Bandwidth measurement performed on the sample of the product **TALENTIA SonR CRT-D 3811**, Sn: **Q19JX014** , **Q19D4003**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.



4. MAXIMUM CONDUCTED OUTPUT POWER

4.1. TEST CONDITIONS

Date of test : January 24, 2024
Test performed by : Akram HAKKARI
Relative humidity (%) : 33
Ambient temperature (°C) : 21

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 used: KDB 558074 D01 DTS Meas Guidance v05r02 § 8.3.1.1

KDB 558074 D01 DTS Meas Guidance v05r02 § 8.3.1.1

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

- Set the RBW \geq DTS bandwidth.
- Set VBW $\geq 3 \times$ RBW.
- Set span $\geq 3 \times$ RBW
- Sweep time = auto couple.
- Detector = peak.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude level.

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

KDB 558074 D01 DTS Meas Guidance v05r02 § 8.3.2.2(Method AVGSA-1)

Subclause 11.9.2.2 of ANSI C63.10 is applicable, Method AVGSA-1 uses trace averaging with the EUT transmitting at full power throughout each sweep.

- a) Set span to at least 1.5 times the OBW.
- b) Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
- c) Set VBW $\geq [3 \times$ RBW].
- d) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- e) Sweep time = auto.

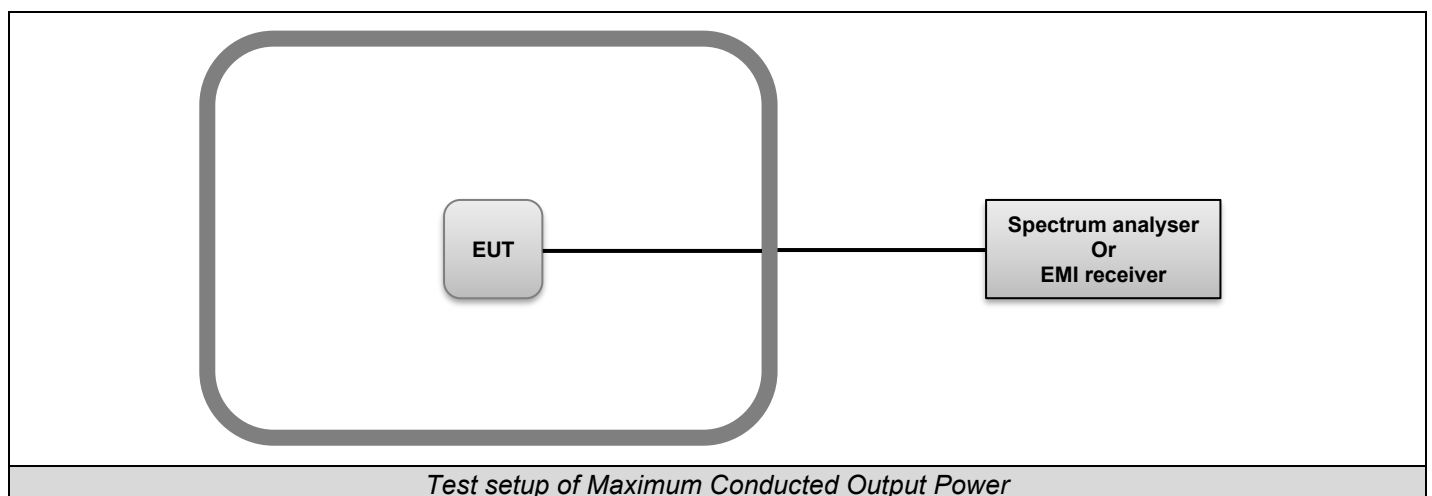
- f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- g) If transmit duty cycle < 98%, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at the maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle $\geq 98\%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."
- h) Trace average at least 100 traces in power averaging (rms) mode.
- i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

KDB 558074 D01 DTS Meas Guidance v05r02 § 8.3.2.2(Method AVGSA-2)

Subclause 11.9.2.2 of ANSI C63.10 is applicable.

Method AVGSA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

- a) Measure the duty cycle D of the transmitter output signal as described in 11.6.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
- d) Set VBW $\geq [3 \times \text{RBW}]$.
- e) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- f) Sweep time = auto.
- g) Detector = RMS (i.e., power averaging), if available. Otherwise, use the sample detector mode.
- h) Do not use sweep triggering. Allow the sweep to "free run."
- i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.
- j) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
- k) Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1/0.25)] = 6 \text{ dB}$ if the duty cycle is 25%.



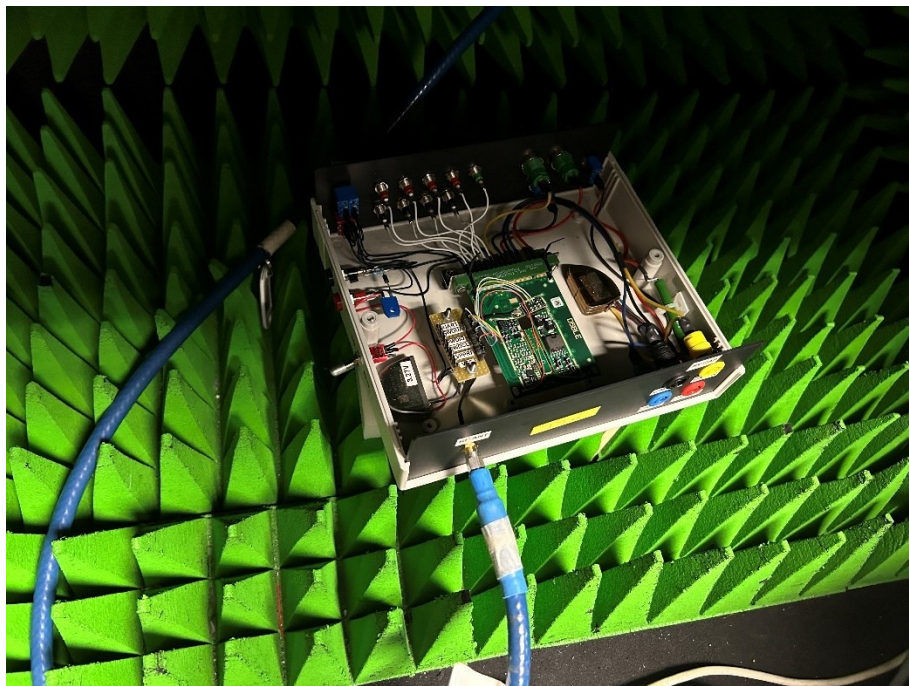


Photo of Maximum Conducted Output Power



4.3. 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

4.4. TEST EQUIPMENT LIST

| TEST EQUIPMENT USED | | | | | |
|-------------------------|-----------------|---------|------------|----------|---------|
| Description | Manufacturer | Model | Identifier | Cal_Date | Cal_Due |
| Attenuator 10dB | AEROFLEX | — | A7122267 | 10/23 | 10/25 |
| DC Power Supply | RS PRO | RS3005P | A7042314 | N/A | N/A |
| Multimeter - CEM | FLUKE | 87 | A1240251 | 10/23 | 10/25 |
| Emission Cable (SMA 1m) | TELEDYNE | 26GHz | A5329874 | 08/22 | 08/25 |
| Full Anechoic Room | SIEPEL | — | D3044024 | N/A | N/A |
| SMA 1.5m | SUCOFLEX | 18GHz | A5329864 | 10/23 | 10/24 |
| Spectrum analyzer | ROHDE & SCHWARZ | FSV 40 | A4060059 | 11/21 | 03/24* |
| Thermo-hygrometer | TESTO | 608-H1 | B4204120 | 03/23 | 03/25 |

N/A: Not applicable

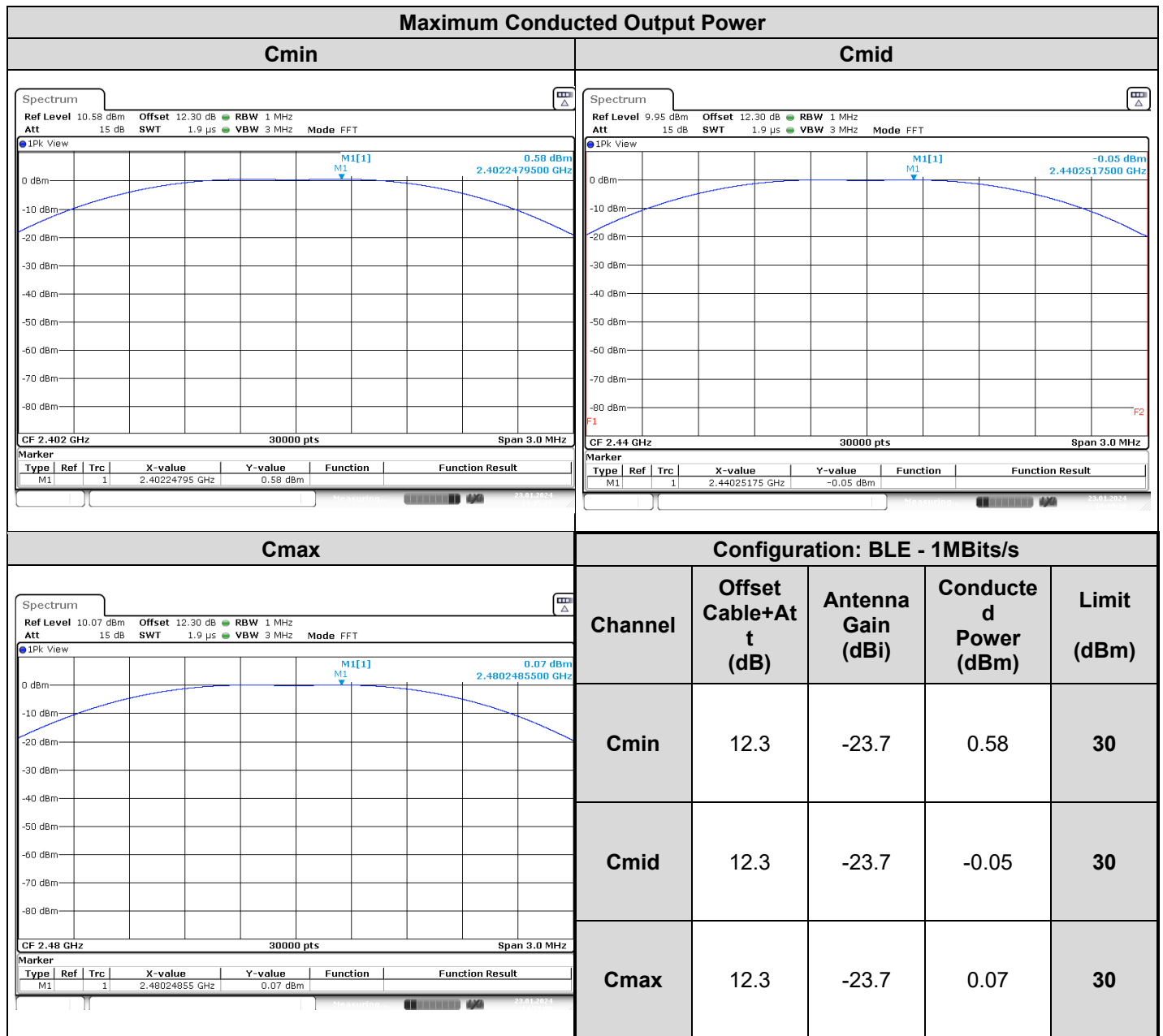
*: Under derogation

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None



4.6. RESULTS



4.7. CONCLUSION

Maximum Output Conducted Power measurement performed on the sample of the product **TALENTIA SonR CRT-D 3811**, Sn: **Q19JX014** , **Q19D4003**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.



5. POWER SPECTRAL DENSITY

5.1. TEST CONDITIONS

Date of test : January 25, 2024
Test performed by : Akram HAKKARI
Relative humidity (%) : 33
Ambient temperature (°C) : 22

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

Subclause 11.10 of ANSI C63.10 is applicable

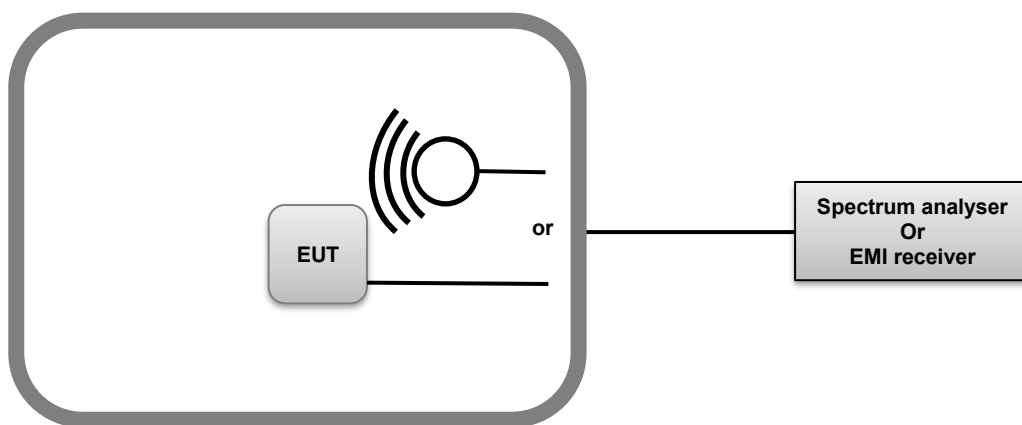
- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: 3 kHz.
- Set the VBW $\geq 3 \times$ RBW.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function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

KDB 558074 D01 DTS Meas Guidance v05r02 § 8.4 (Method AVGPS-1)

Subclause 11.10 of ANSI C63.10 is applicable

Method AVGPS-1 uses trace averaging with EUT transmitting at full power throughout each sweep. The following procedure may be used when the maximum (average) conducted output power was used to determine compliance to the fundamental output power limit. This is the baseline method for determining the maximum (average) conducted PSD level. If the instrument has a power averaging (rms) detector, then it must be used; otherwise, use the sample detector. The EUT must be configured to transmit continuously ($D \geq 98\%$), or else sweep triggering/signal gating must be implemented to ensure that measurements are made only when the EUT is transmitting at its maximum power control level (no transmitter OFF time to be considered):

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set span to at least 1.5 times the OBW.
- c) Set RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set VBW $\geq [3 \times \text{RBW}]$.
- e) Detector = power averaging (rms) or sample detector (when rms not available).
- f) Ensure that the number of measurement points in the sweep $\geq [2 \times \text{span} / \text{RBW}]$.
- g) Sweep time = auto couple.
- h) Employ trace averaging (rms) mode over a minimum of 100 traces.
- i) Use the peak marker function to determine the maximum amplitude level.
- j) If the measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).



Test setup of Power Spectral Density

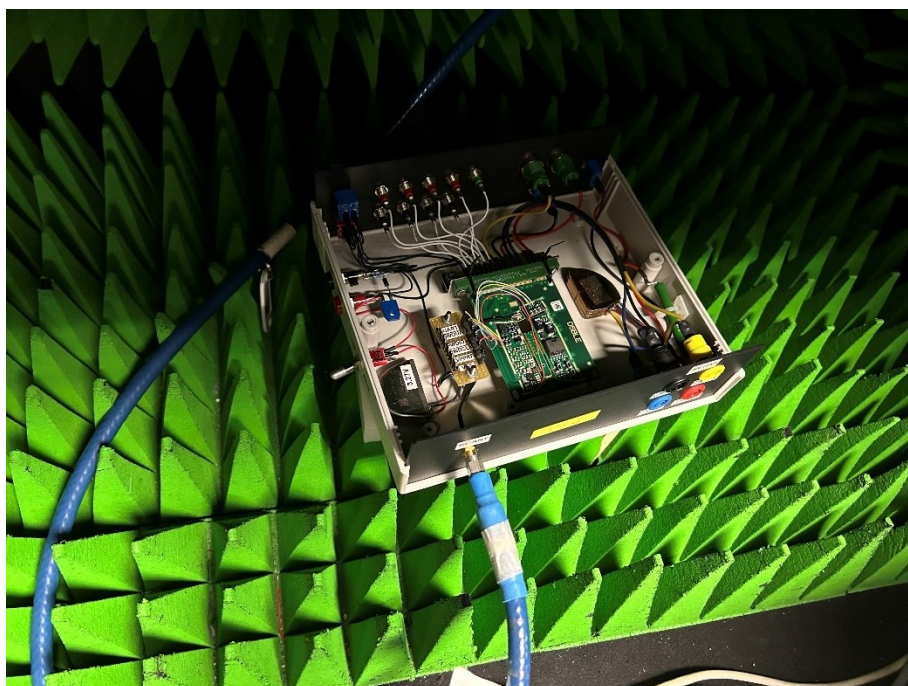


Photo of Power Spectral Density



5.3. 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

5.4. TEST EQUIPMENT LIST

| TEST EQUIPMENT USED | | | | | |
|-------------------------|-----------------|---------|------------|----------|---------|
| Description | Manufacturer | Model | Identifier | Cal_Date | Cal_Due |
| Attenuator 10dB | AEROFLEX | — | A7122267 | 10/23 | 10/25 |
| DC Power Supply | RS PRO | RS3005P | A7042314 | N/A | N/A |
| Multimeter - CEM | FLUKE | 87 | A1240251 | 10/23 | 10/25 |
| Emission Cable (SMA 1m) | TELEDYNE | 26GHz | A5329874 | 08/22 | 08/25 |
| Full Anechoic Room | SIEPEL | — | D3044024 | N/A | N/A |
| SMA 1.5m | SUCOFLEX | 18GHz | A5329864 | 10/23 | 10/24 |
| Spectrum analyzer | ROHDE & SCHWARZ | FSV 40 | A4060059 | 11/21 | 03/24* |
| Thermo-hygrometer | TESTO | 608-H1 | B4204120 | 03/23 | 03/25 |

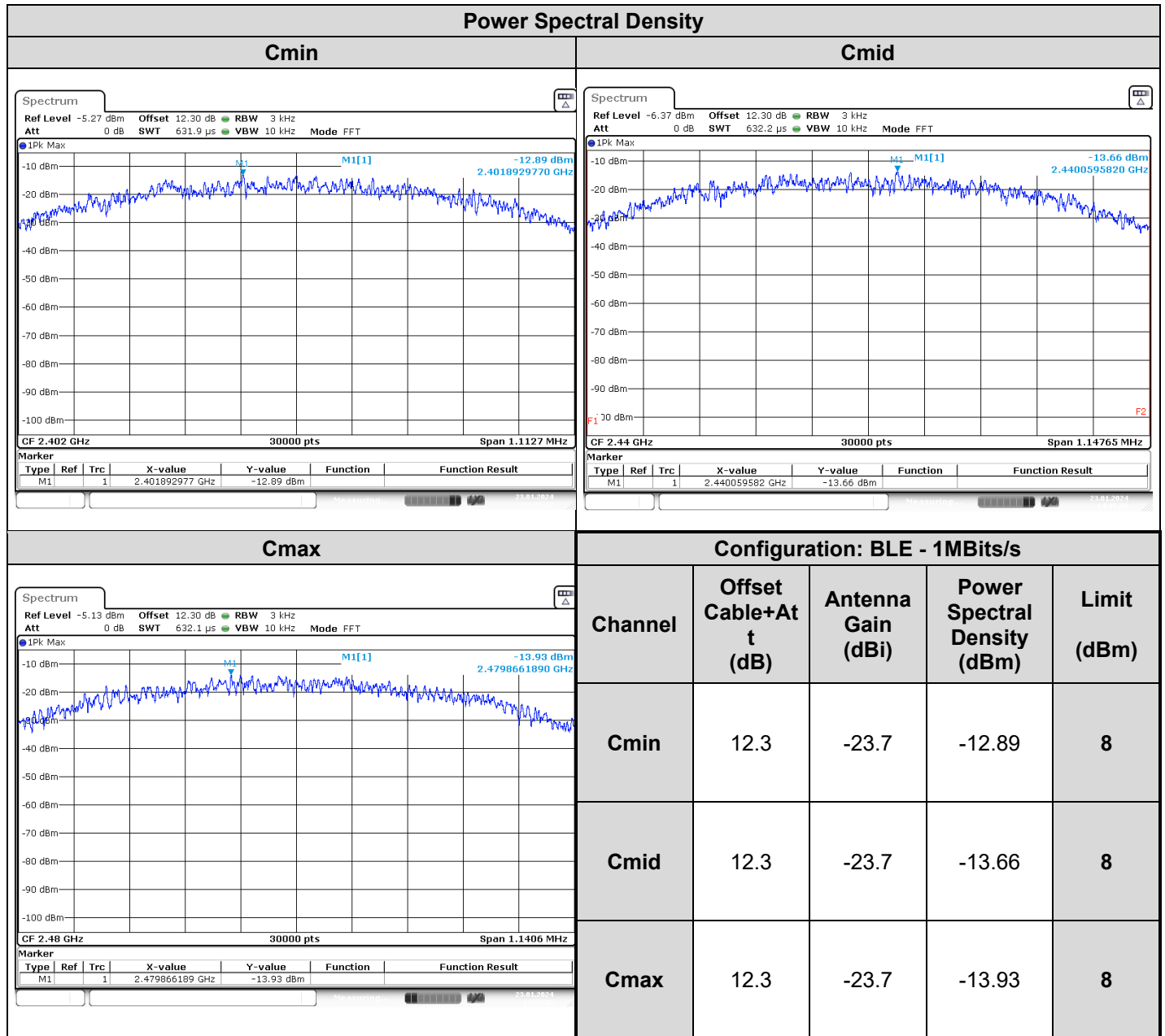
N/A: Not applicable

*: Under derogation

5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

5.6. RESULTS



5.7. CONCLUSION

Power Spectral Density measurement performed on the sample of the product **TALENTIA SonR CRT-D 3811**, Sn: **Q19JX014** , **Q19D4003**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.

6. UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

6.1. TEST CONDITIONS

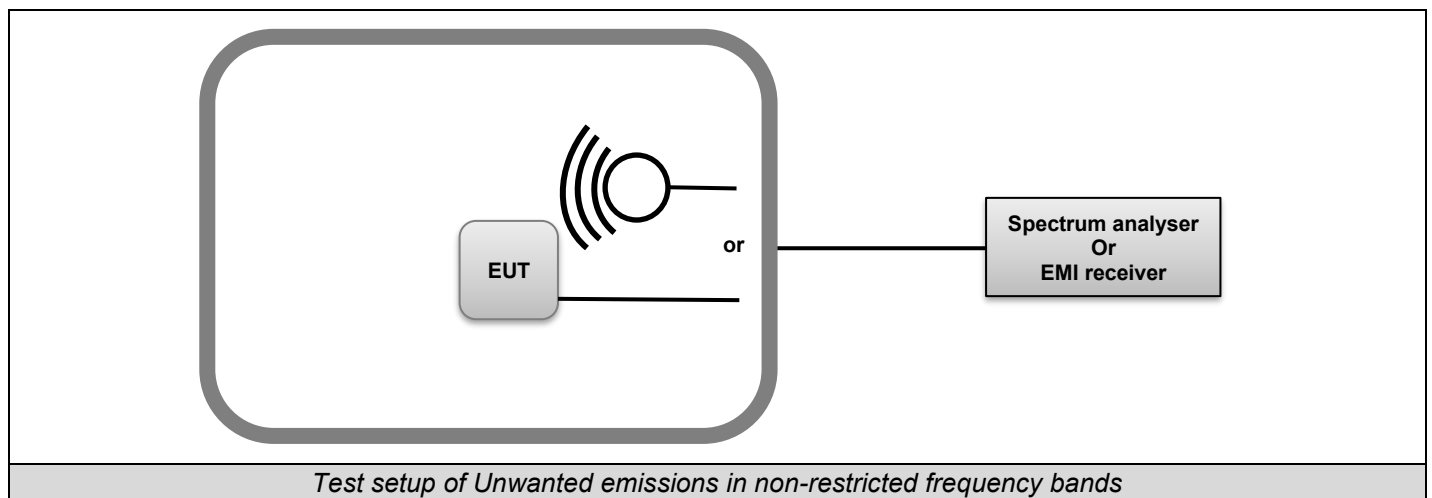
Date of test : January 23, 2024
Test performed by : Akram HAKKARI
Relative humidity (%) : 32
Ambient temperature (°C) : 22

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 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



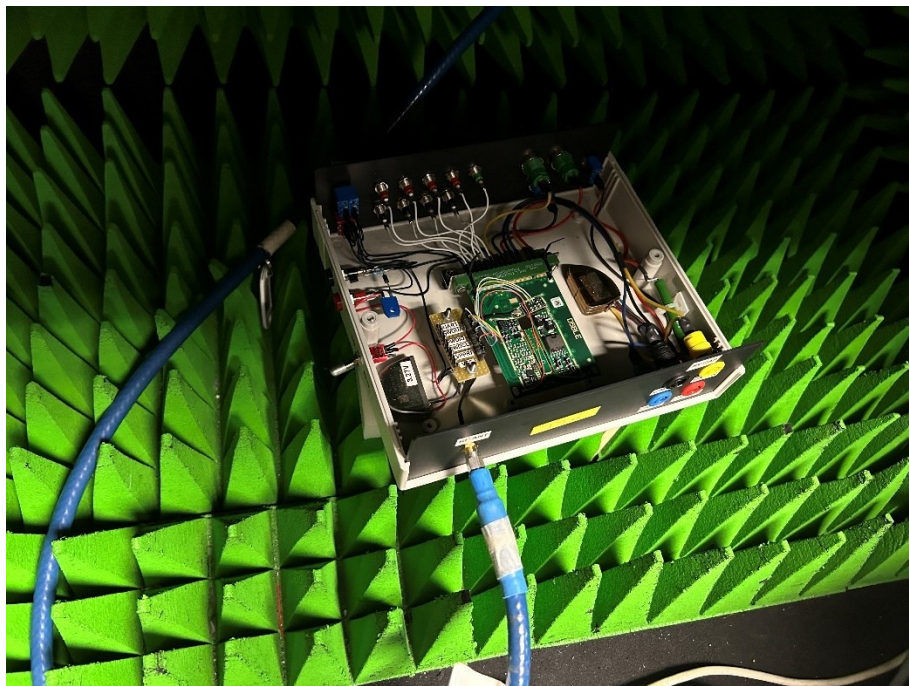


Photo of Unwanted emissions in non-restricted frequency bands



6.3. 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.

6.4. TEST EQUIPMENT LIST

| TEST EQUIPMENT USED | | | | | |
|-------------------------|-----------------|---------|------------|----------|---------|
| Description | Manufacturer | Model | Identifier | Cal_Date | Cal_Due |
| Attenuator 10dB | AEROFLEX | — | A7122267 | 10/23 | 10/25 |
| DC Power Supply | RS PRO | RS3005P | A7042314 | N/A | N/A |
| Multimeter - CEM | FLUKE | 87 | A1240251 | 10/23 | 10/25 |
| Emission Cable (SMA 1m) | TELEDYNE | 26GHz | A5329874 | 08/22 | 08/25 |
| Full Anechoic Room | SIEPEL | — | D3044024 | N/A | N/A |
| SMA 1.5m | SUCOFLEX | 18GHz | A5329864 | 10/23 | 10/24 |
| Spectrum analyzer | ROHDE & SCHWARZ | FSV 40 | A4060059 | 11/21 | 03/24* |
| Thermo-hygrometer | TESTO | 608-H1 | B4204120 | 03/23 | 03/25 |

N/A: Not applicable

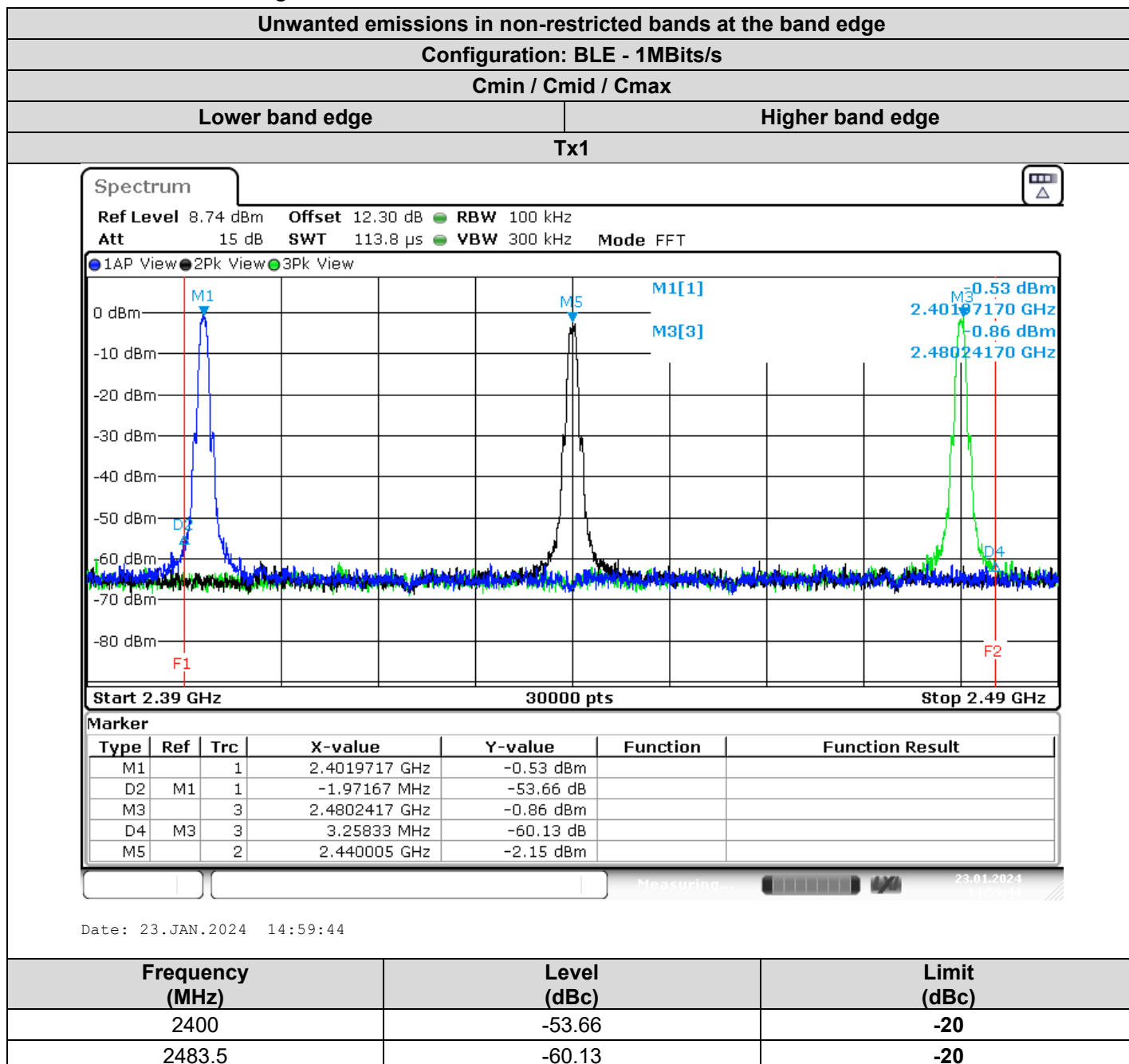
*: Under derogation

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

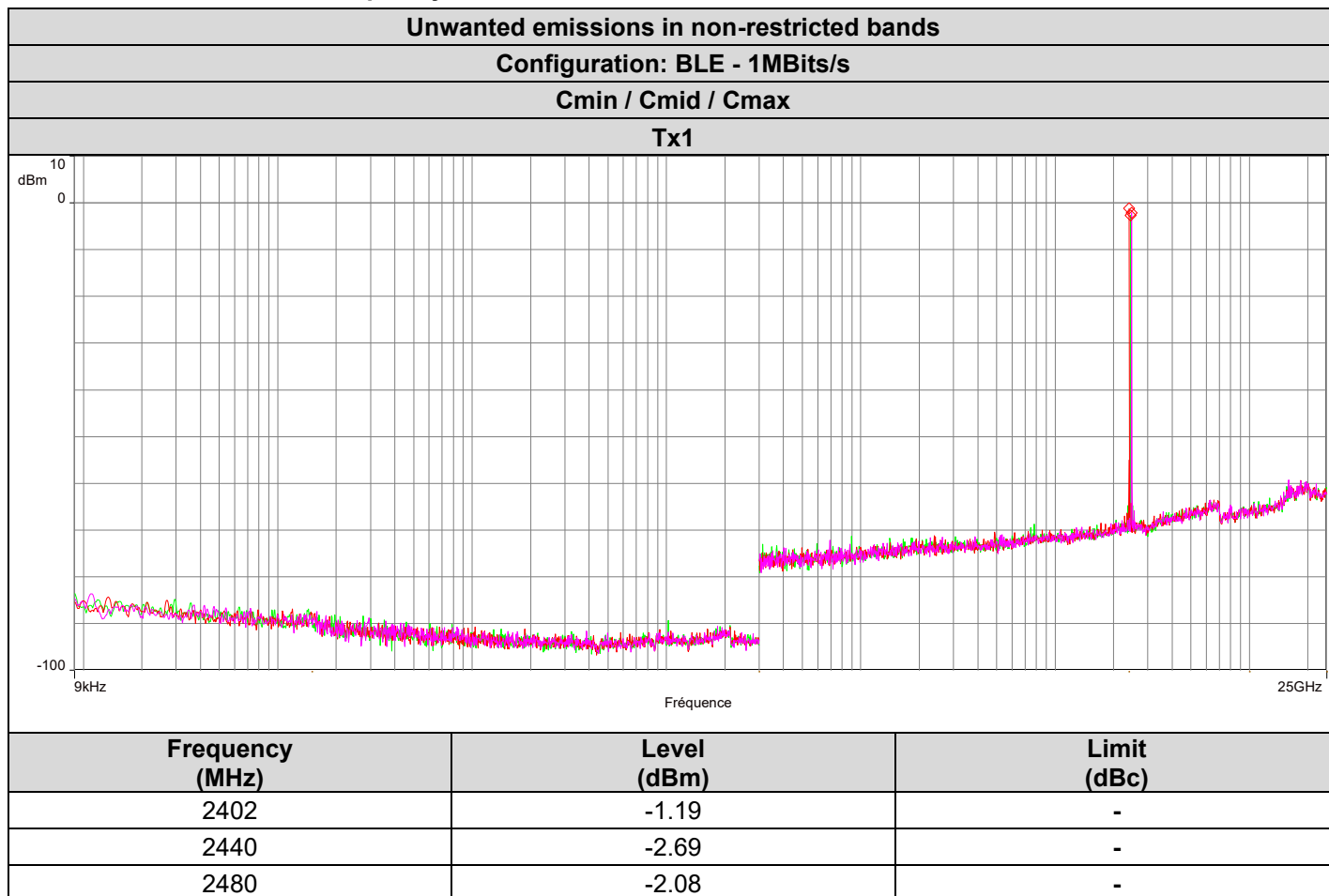
None

6.6. RESULTS

6.6.1. At the band edge



6.6.2. Non restricted frequency bands



6.7. CONCLUSION

Unwanted emissions in non-restricted bands and at the band edge measurement performed on the sample of the product **TALENTIA SonR CRT-D 3811**, Sn: **Q19JX014** , **Q19D4003**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.



7. UNWANTED EMISSIONS IN RESTRICTED FREQUENCY BANDS

7.1. TEST CONDITIONS

Date of test : January 24, 2024
Test performed by : Akram HAKKARI
Relative humidity (%) : 33
Ambient temperature (°C) : 22

7.2. 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:

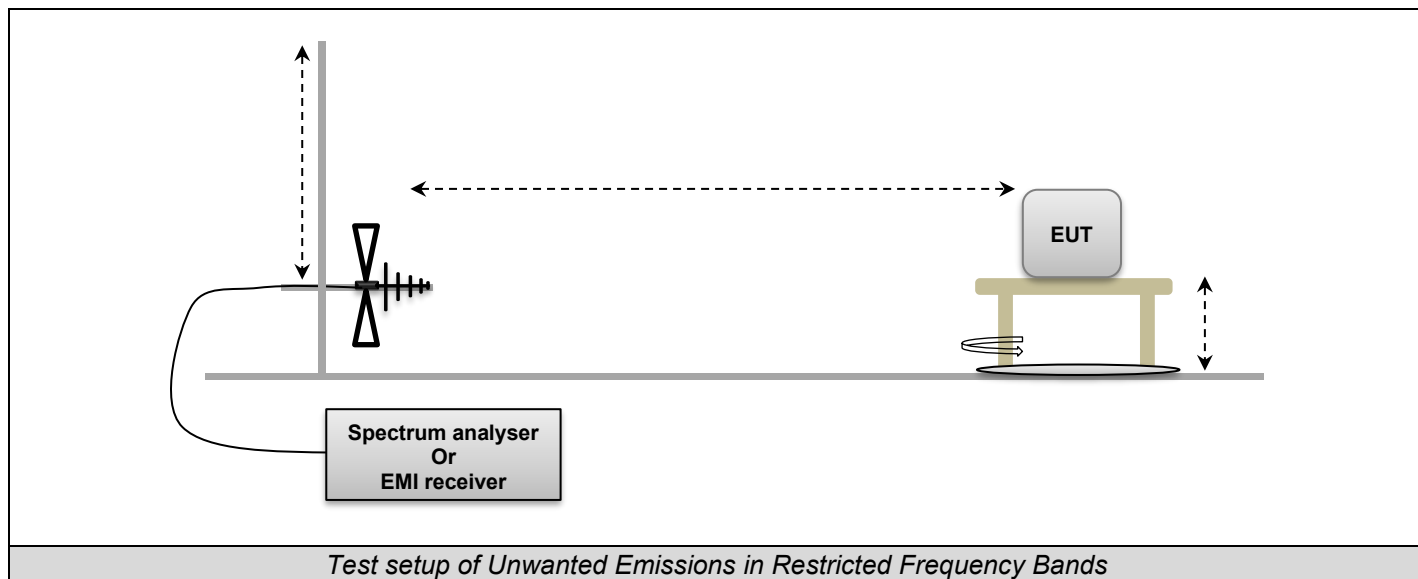
| Frequency range: | 9kHz to 30MHz | |
|-------------------------|---|---------------------|
| Test: | Pre-Characterization | Qualification |
| Antenna Polarization: | Parallel, Perpendicular and Ground parallel | |
| Antenna Height: | 1m | 1m |
| Antenna Type: | Loop | |
| RBW Filter: | 200Hz below 150kHz / 9kHz above 150kHz | |
| Maximization: | Turntable rotation of 360 degrees range | |
| EUT height: | 1.5m | 1.0m |
| 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 | |
| EUT height: | 1.5m | 0.8m |
| Test site: | Full Anechoic Chamber | Open Aera Test Site |
| Distance EUT - Antenna: | 3m | 3m |
| 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 | |
| EUT height: | 1.5m | 1.5m |
| Test site: | Full Anechoic Chamber | Full Anechoic Chamber |
| Distance EUT - Antenna: | 3m | 3m |
| Detector: | Peak & Average | 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 | |
| EUT height: | 1.5m | 1.5m |
| Test site: | Full Anechoic Chamber | Full Anechoic Chamber |
| Distance EUT - Antenna: | 1m | 1m |
| Detector: | Peak & Average | Peak & Average |





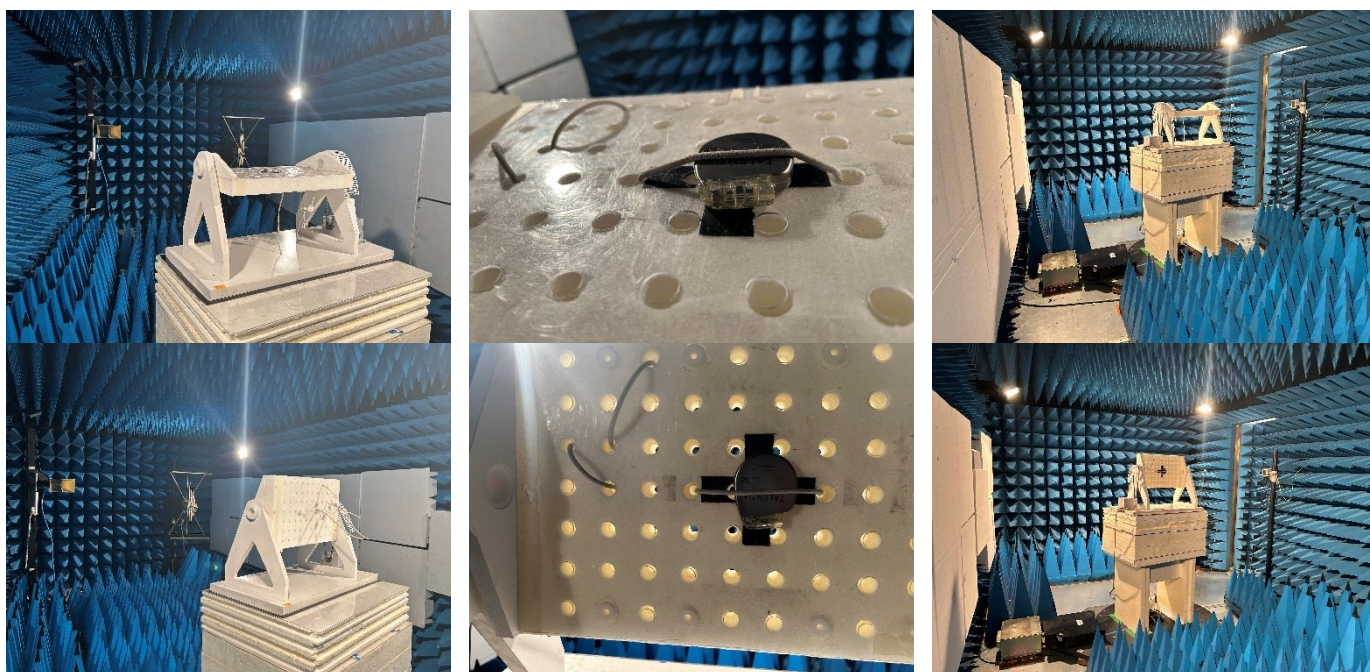


Photo of Unwanted Emissions in Restricted Frequency Bands

7.3. 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 |



7.4. TEST EQUIPMENT LIST

| TEST EQUIPMENT USED | | | | | |
|---|-----------------|-----------------------|---------------|----------|---------|
| Description | Manufacturer | Model | Identifier | Cal_Date | Cal_Due |
| Amplifier 10MHz - 18GHz | LCIE SUD EST | — | A7102082 | 05/22 | 05/24 |
| Antenna Bi-log | AH System | SAS-521-7 | C2040180 | 05/23 | 05/25 |
| Antenna horn 18GHz | EMCO | 3115 | C2042029 | 03/22 | 03/25 |
| BAT EMC | NEXIO | v3.21.0.32 | L1000115 | N/A | N/A |
| Cable 0.75m | - | 18GHz | A5329900 | 08/22 | 08/24 |
| Comb EMR HF | YORK | CGE01 | A3169114 | N/A | N/A |
| CONTROLLER | INNCO | CO3000 | D3044034 | N/A | N/A |
| Filter Matrice | LCIE SUD EST | Combined filters | A7484078 | 03/23 | 03/25 |
| Multimeter - CEM | FLUKE | 87 | A1240251 | 10/23 | 10/25 |
| Rehausse Table C3 | LCIE | — | F2000507 | N/A | N/A |
| Rehausse Table C3 | LCIE | — | F2000511 | N/A | N/A |
| Semi-Anechoic chamber #3 (BF) | SIEPEL | — | D3044017_BF | 04/22 | 04/25 |
| Semi-Anechoic chamber #3 (VSWR) | SIEPEL | — | D3044017_VSWR | 04/22 | 04/25 |
| SMA Cable 18GHz 0.5m | TELEDYNE | 18GHz | A5330059 | 02/23 | 02/24 |
| SMA Cable 18GHz 0.5m | TELEDYNE | 18GHz | A5330060 | 02/23 | 02/24 |
| SMA Cable 18GHz 0.6m | TELEDYNE | 18GHz | A5330055 | 02/23 | 02/24 |
| SMA Cable 18GHz 3.5m | TELEDYNE | 18GHz | A5330058 | 02/23 | 02/24 |
| SMA Cable 18GHz 6m | TELEDYNE | 18GHz | A5330057 | 02/23 | 02/24 |
| Spectrum analyzer | ROHDE & SCHWARZ | FSU 26 | A4060058 | 09/23 | 09/25 |
| Table C3 | LCIE | — | F2000461 | N/A | N/A |
| Thermo-hygrometer (PM1/2/3) | KIMO | HQ 210 | B4206022 | 05/23 | 05/25 |
| TILT | INNCO | TILT | D3044033 | N/A | N/A |
| Turntable chamber (Cage#3) | ETS Lingren | Model 2165 | F2000371 | N/A | N/A |
| Turntable controller (Cage#3) | ETS Lingren | Model 2090 | F2000444 | N/A | N/A |
| Antenna horn 40GHz | SCHWARZBECK | BBHA 9170 | C2042028 | 06/22 | 06/25 |
| Cable 1m 40GHz | INTELLICONNECT | C-KPKP-1503-1M | A5329987 | 04/21 | 04/24 |
| Emission Cable 0.5m (Ampl <-> receptor) | INTELLICONNECT | C-KPKP-1503-500MM | A5329988 | 04/23 | 04/26 |
| Emission Cable 0.6m (Ampl <-> receptor) | TELEDYNE | A90-010-0.6MTR | A5330056 | 04/23 | 04/24 |
| PRE-AMPLIFIER | LCIE SUD EST | PRE-AMPLIFIER (40GHz) | A7080078 | 09/22 | 09/24 |
| SMK 1.2m (Ampl <-> chamber) | HUBER-SUHNER | SUCOFLEX 102 | A5330062 | 04/23 | 04/26 |
| SMK 1.2m Emission Cable 0.5m (Ampl <-> Chamber) | HUBER-SUHNER | SUCOFLEX 102 | A5330063 | 04/23 | 04/24 |
| Spectrum analyzer | ROHDE & SCHWARZ | FSV 40 | A4060059 | 11/21 | 11/23 |



| | | | | | |
|------------------------------------|-----------------|------------|----------|-------|-------|
| Antenna loop | ELECTRO-METRICS | EM-6879 | C2040294 | 08/22 | 08/24 |
| Antenna Mat (OATS) | ETS Lingren | 2071-2 | F2000392 | N/A | N/A |
| Biconic Antenna | EATON | 94455-1 | C2040234 | 05/23 | 05/25 |
| Cable (OATS) | — | 1GHz | A5329623 | 09/23 | 09/24 |
| Emission Cable | MICRO-COAX | 1GHz | A5329656 | 09/23 | 09/24 |
| Emission Cable | RADIALEX | | A5329061 | 07/23 | 07/24 |
| Emission Cable | CABELTEL | 6GHz | A5329069 | 05/22 | 09/23 |
| OATS | — | — | F2000409 | 08/23 | 08/24 |
| Rehausse Table C1/OATS | LCIE | — | F2000512 | N/A | N/A |
| Table C1/OATS | LCIE | — | F2000445 | N/A | N/A |
| Turntable (OATS) | ETS Lingren | Model 2187 | F2000403 | N/A | N/A |
| Turntable / Mast controller (OATS) | ETS Lingren | Model 2066 | F2000372 | N/A | N/A |

N/A: Not applicable

7.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None



7.6. RESULTS

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

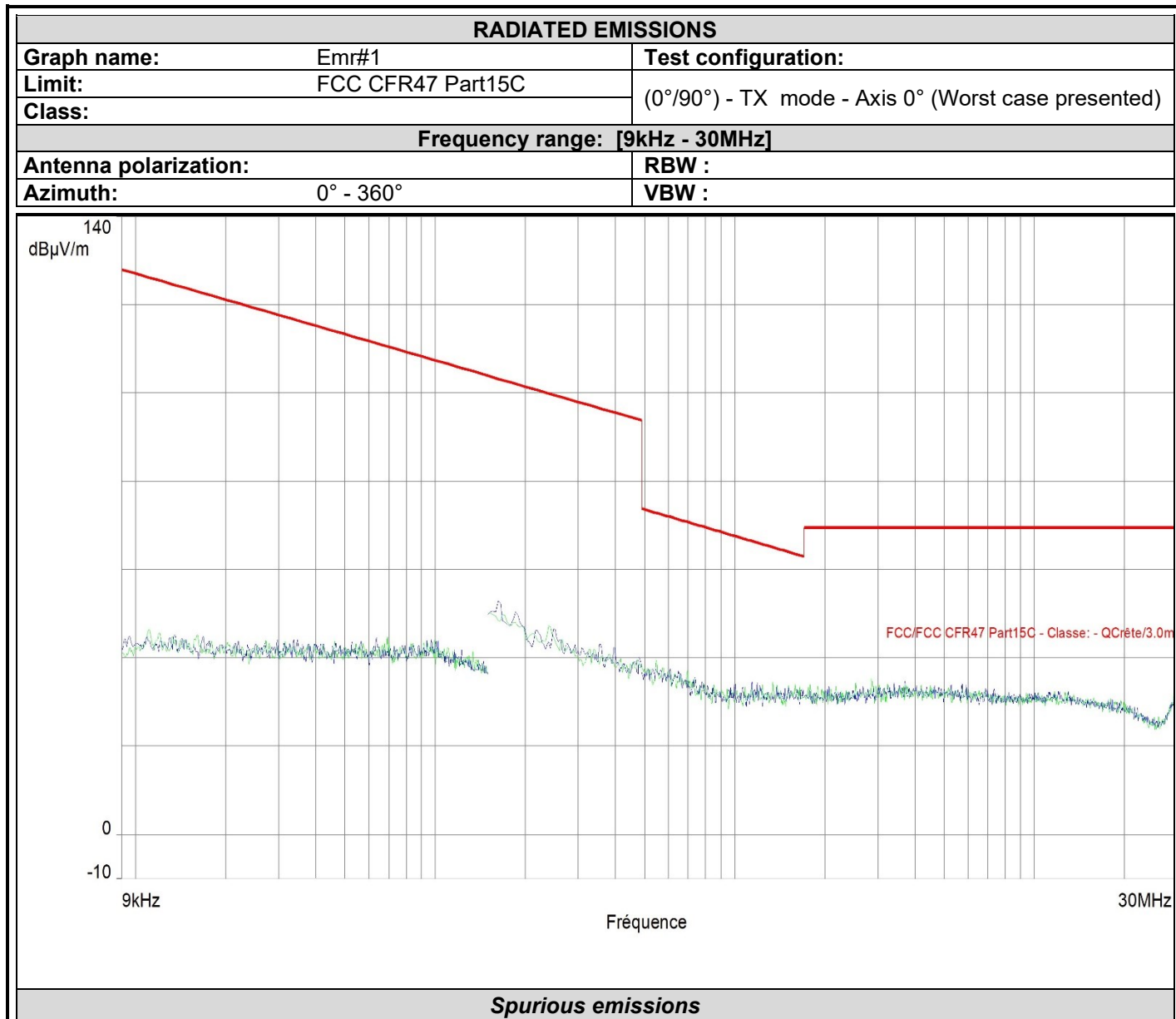
7.6.1. 9kHz to 26GHz

Graphs – Pre characterization:

| Graph identifier | | Polarization | Mode | Channel | EUT position | Comments |
|------------------|---|--------------|------|---------|--------------|----------------|
| Emr# | 1 | 0°/90° | TX | Single | Axis XY/Z | 9KHz – 30MHz |
| Emr# | 2 | 180° | TX | Single | Axis XY/Z | 9KHz – 30MHz |
| Emr# | 3 | H/V | TX | Cmin | Axis XY/Z | 30MHz - 14 GHZ |
| Emr# | 4 | H/V | TX | Cmid | Axis XY/Z | 30MHz - 14 GHZ |
| Emr# | 5 | H/V | TX | Cmax | Axis XY/Z | 30MHz - 14 GHZ |
| Emr# | 6 | H/V | TX | Cmin | Axis XY/Z | 14 GHZ – 26GHz |
| Emr# | 7 | H/V | TX | Cmid | Axis XY/Z | 14 GHZ – 26GHz |
| Emr# | 8 | H/V | TX | Cmax | Axis XY/Z | 14 GHZ – 26GHz |



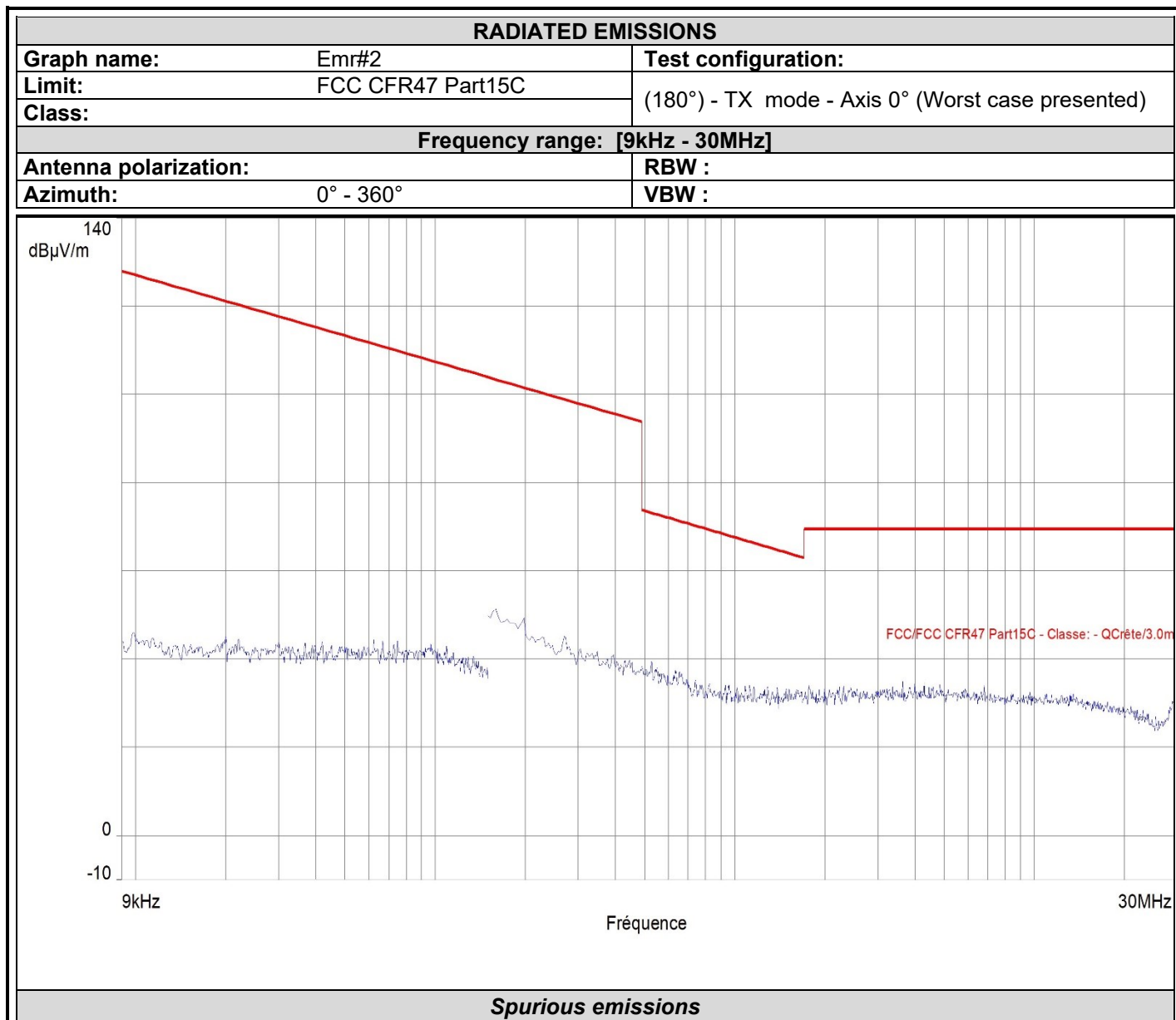
L C I E



No significative frequency observed



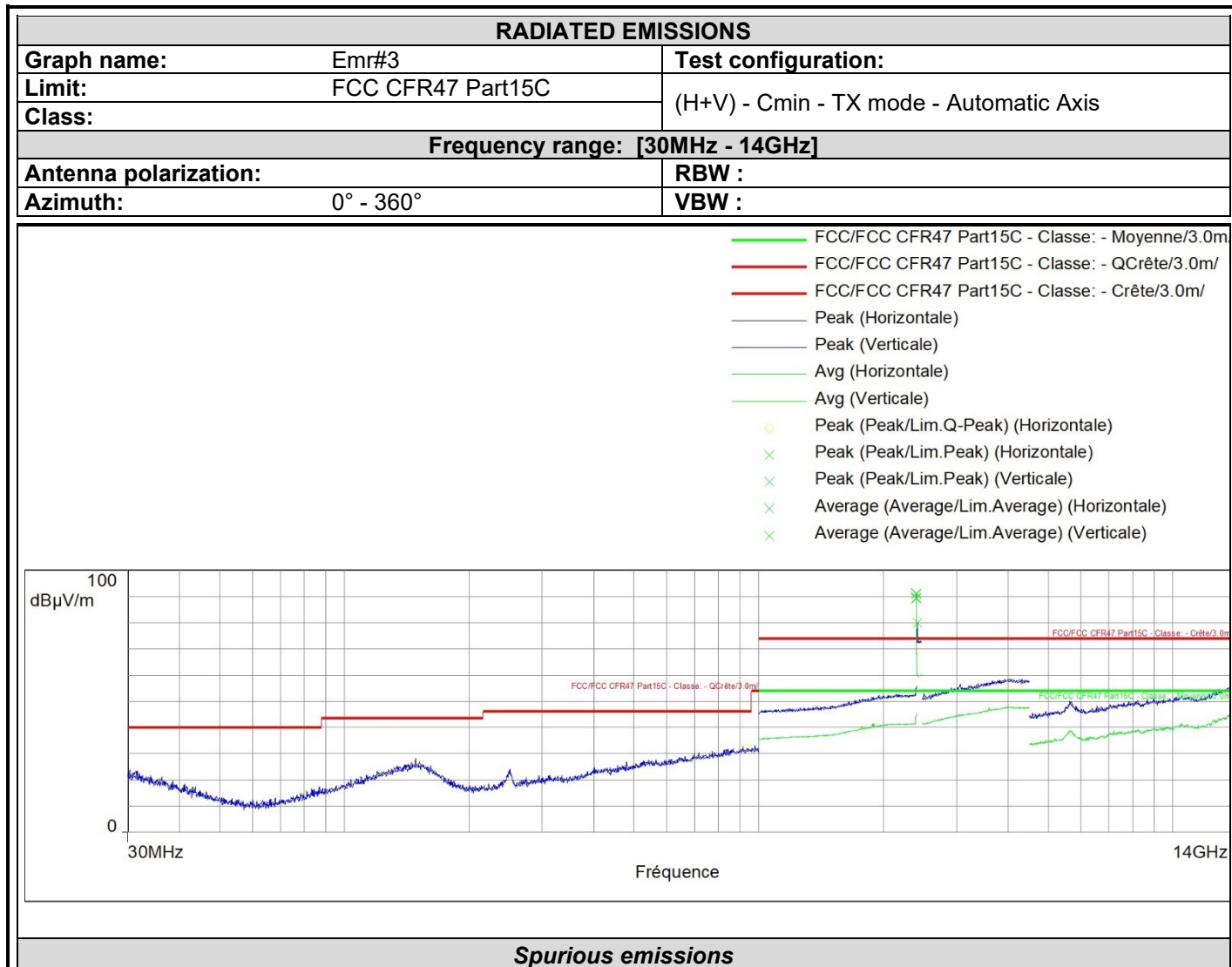
L C I E



No significative frequency observed



L C I E

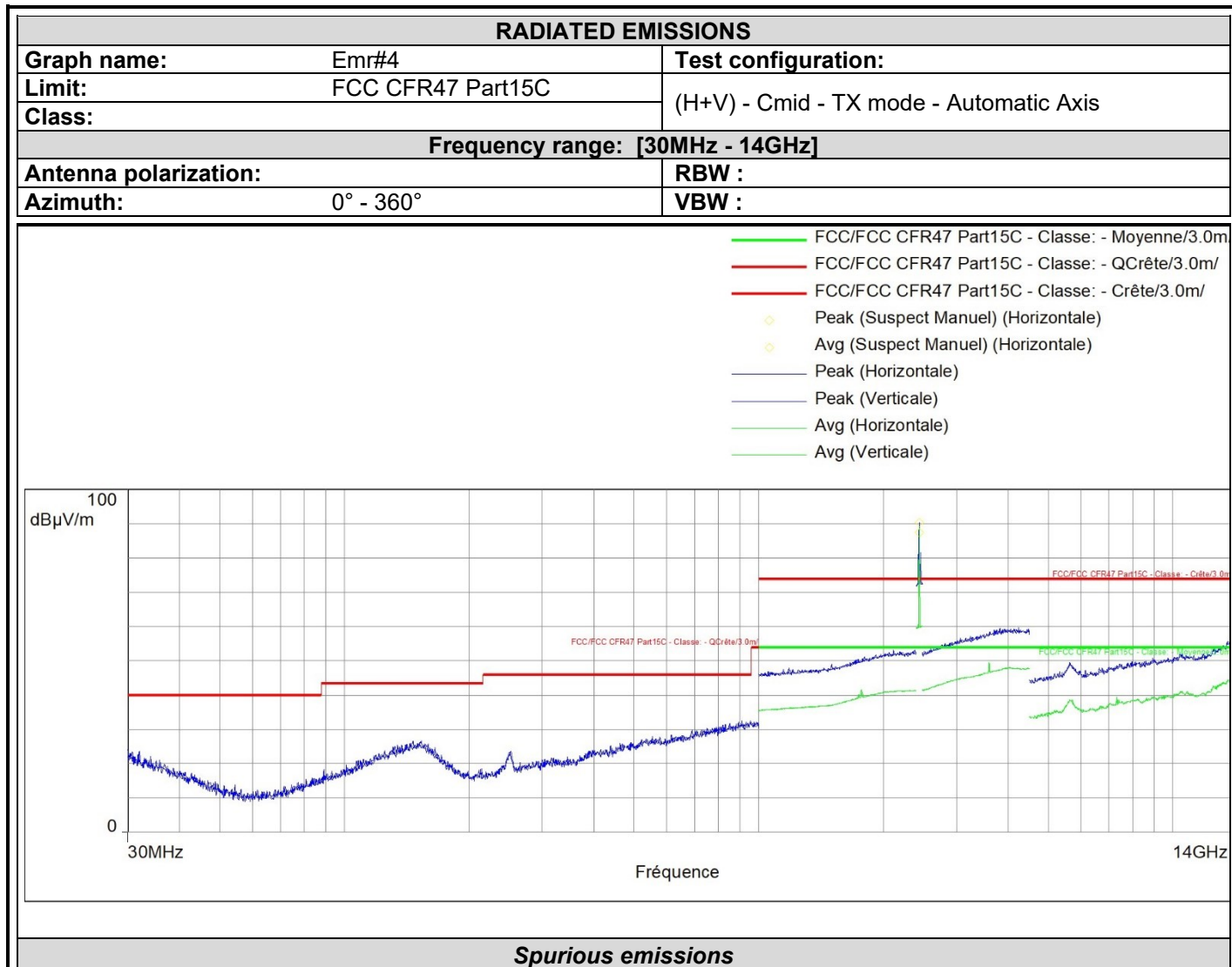


| Frequency (MHz) | Average (dBμV/m) | Lim.Average (dBμV/m) | Peak (dBμV/m) | Lim.Peak (dBμV/m) | Polarization |
|-----------------|------------------|----------------------|---------------|-------------------|--------------|
| 2401.962* | 89.5 | 54.0 | 91.1 | 74.0 | Horizontal |
| 2402.046* | 89.2 | 54.0 | 80.0 | 74.0 | Vertical |

*Carrier frequency
No significant frequency observed



L C I E

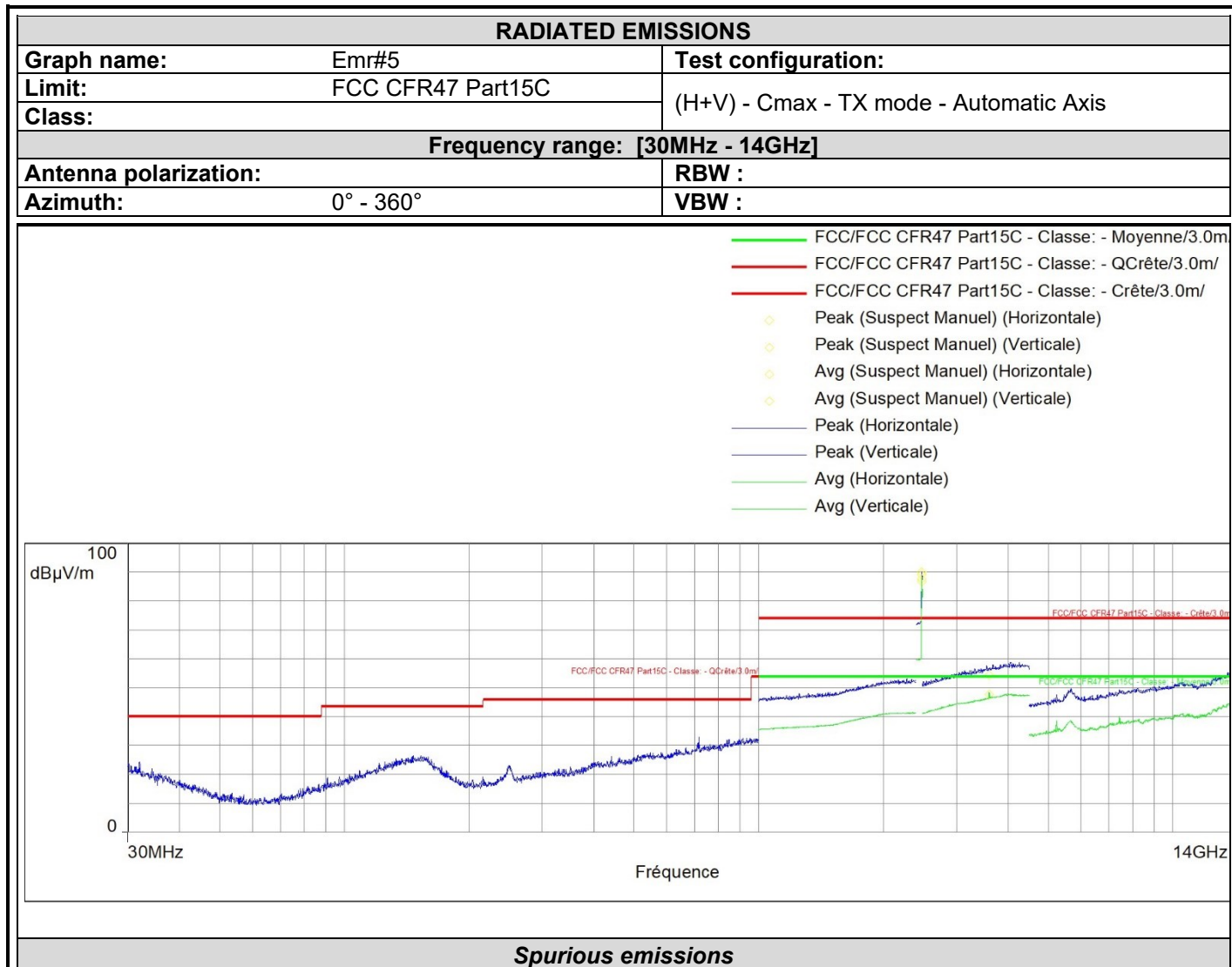


| Frequency (MHz) | Peak (dBμV/m) | Lim.Peak (dBμV/m) | Avg (dBμV/m) | Lim.Avg (dBμV/m) | Lim.Q-Peak (dBμV/m) | Polarization | Correction (dB) |
|--------------------|------------------|----------------------|-----------------|---------------------|------------------------|--------------|--------------------|
| 2439.746* | 90.4 | 74.0 | 87.3 | 54.0 | | Horizontal | 35.1 |

*Carrier frequency
No significant frequency observed



L C I E

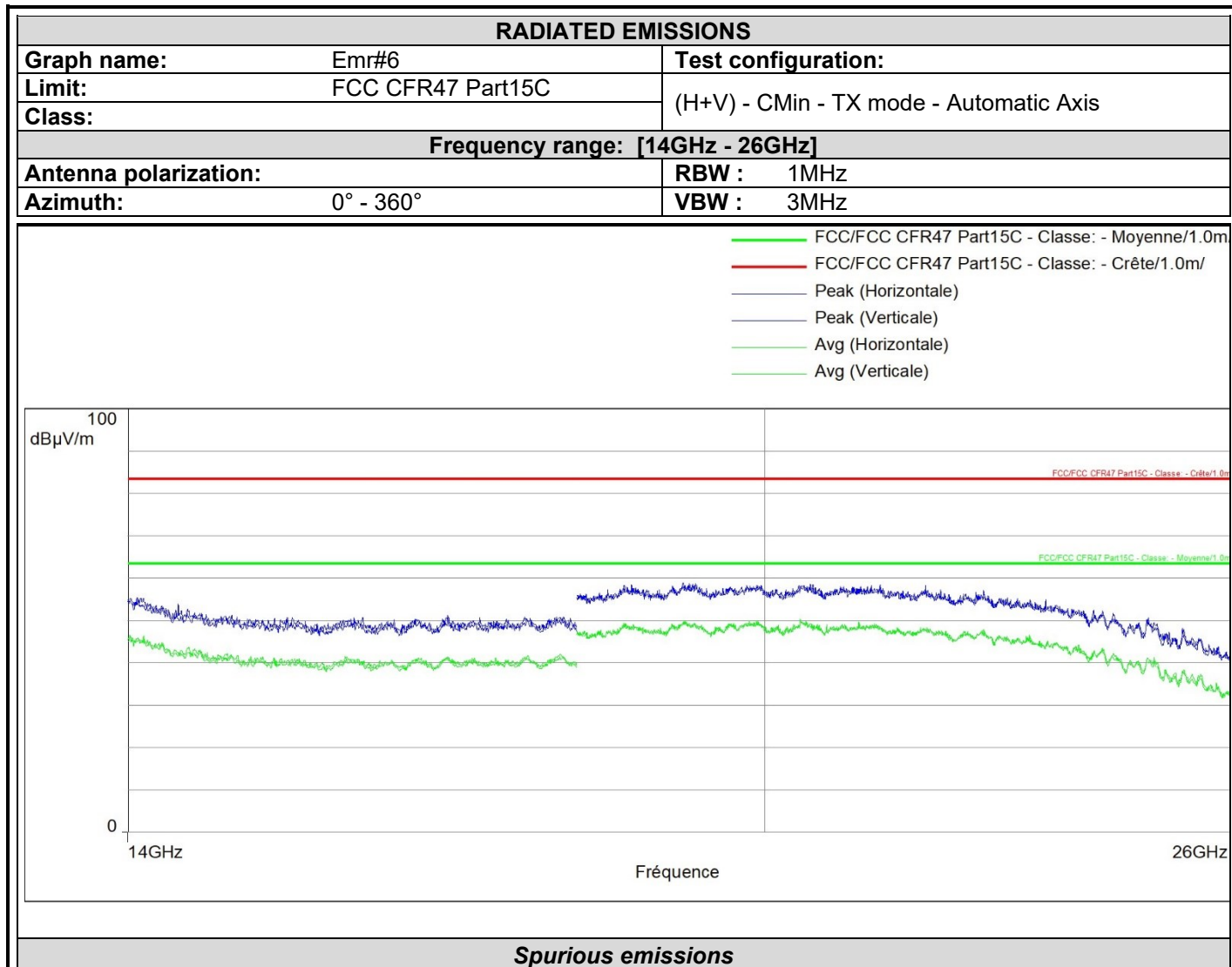


| Frequency (MHz) | Peak (dBμV/m) | Lim.Peak (dBμV/m) | Avg (dBμV/m) | Lim.Avg (dBμV/m) | Lim.Q-Peak (dBμV/m) | Polarization | Correction (dB) |
|-----------------|---------------|-------------------|--------------|------------------|---------------------|--------------|-----------------|
| 2480.285* | 90.0 | 74.0 | 86.8 | 54.0 | | Horizontal | 35.1 |
| 3599.834 | 54.3 | 74.0 | 47.7 | 54.0 | | Vertical | 39.5 |
| 2480.076* | 89.2 | 74.0 | 87.8 | 54.0 | | Vertical | 35.1 |

*Carrier frequency
No significant frequency observed



L C I E

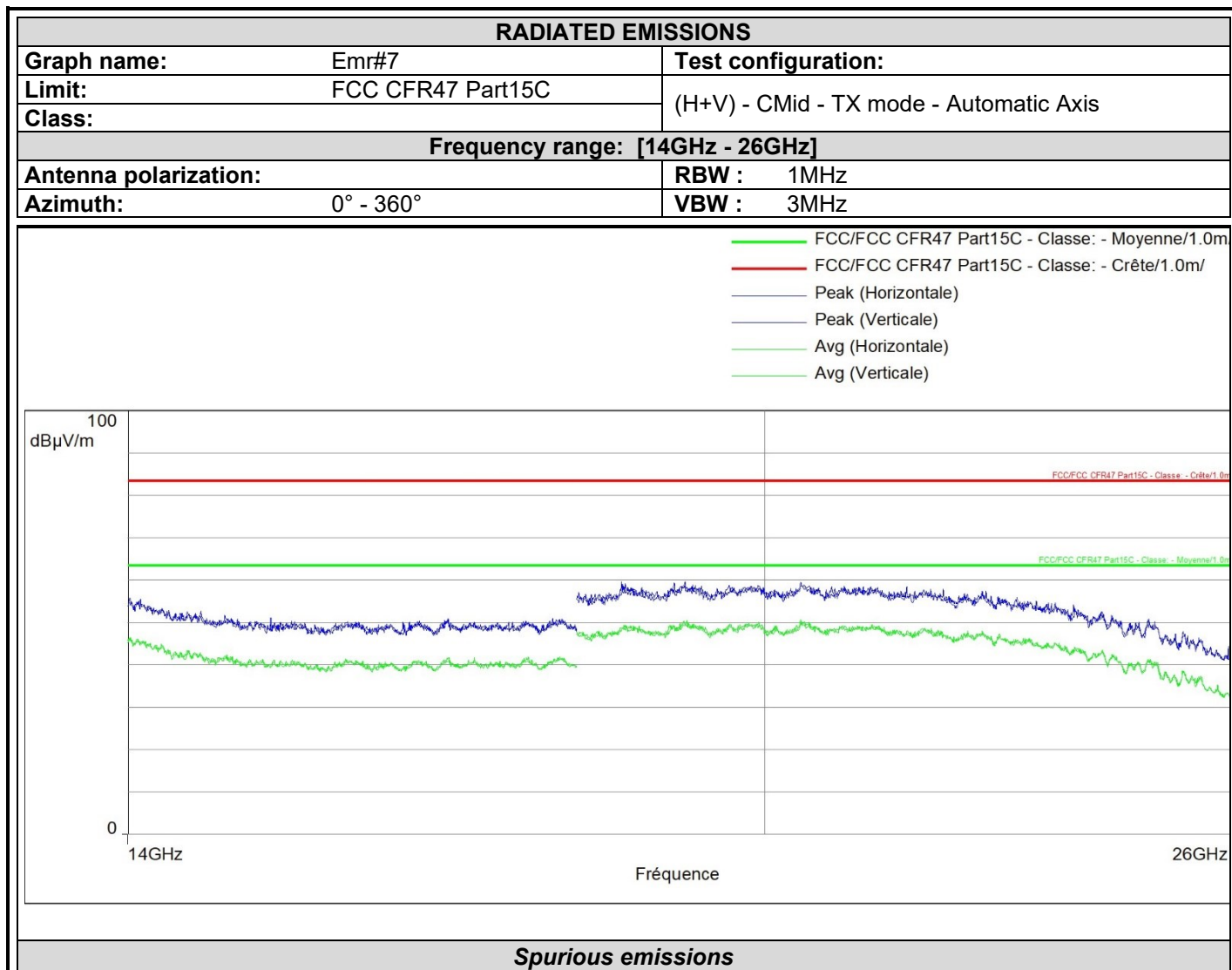


Spurious emissions

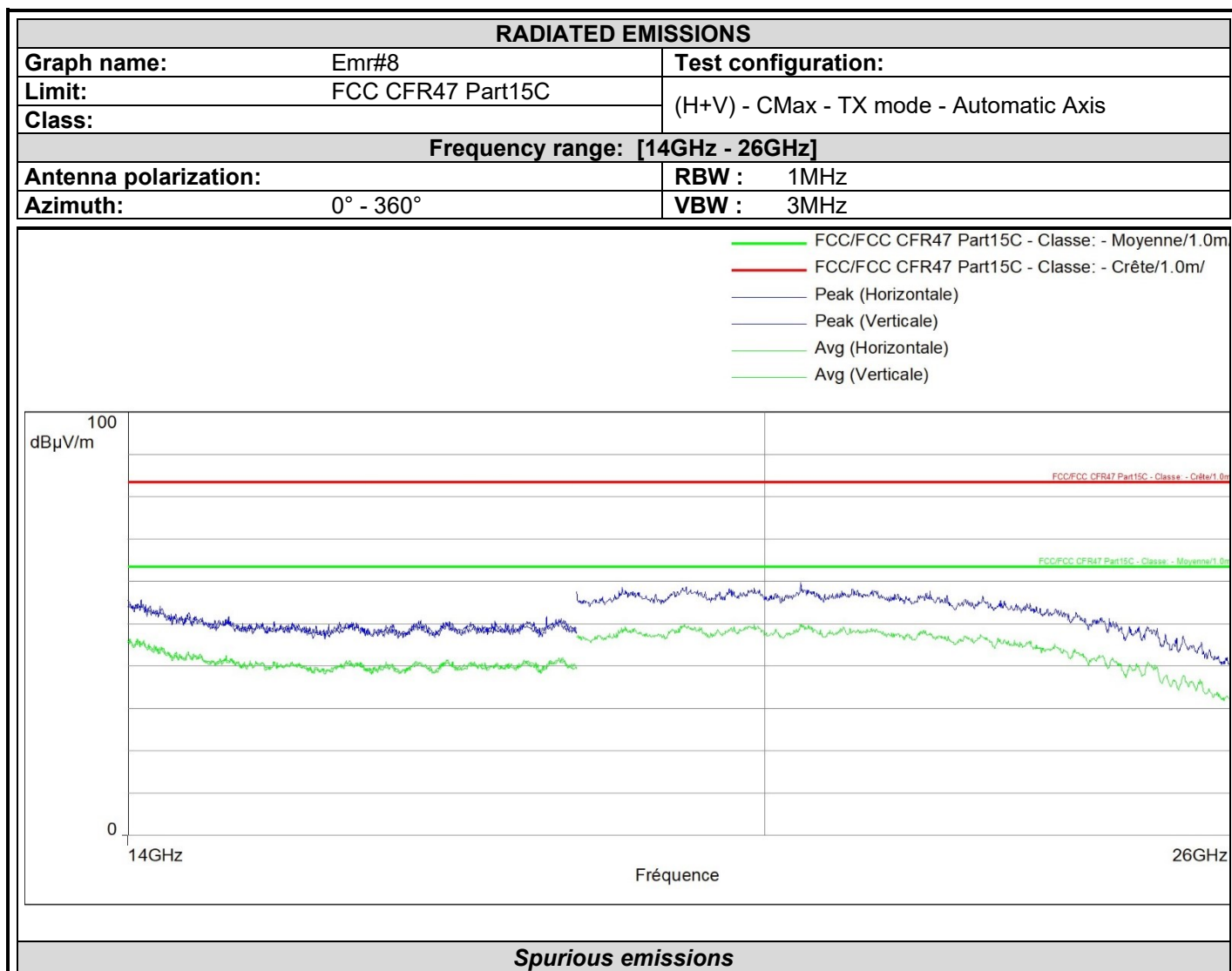
No significant frequency observed



L C I E



No significant frequency observed



No significant frequency observed

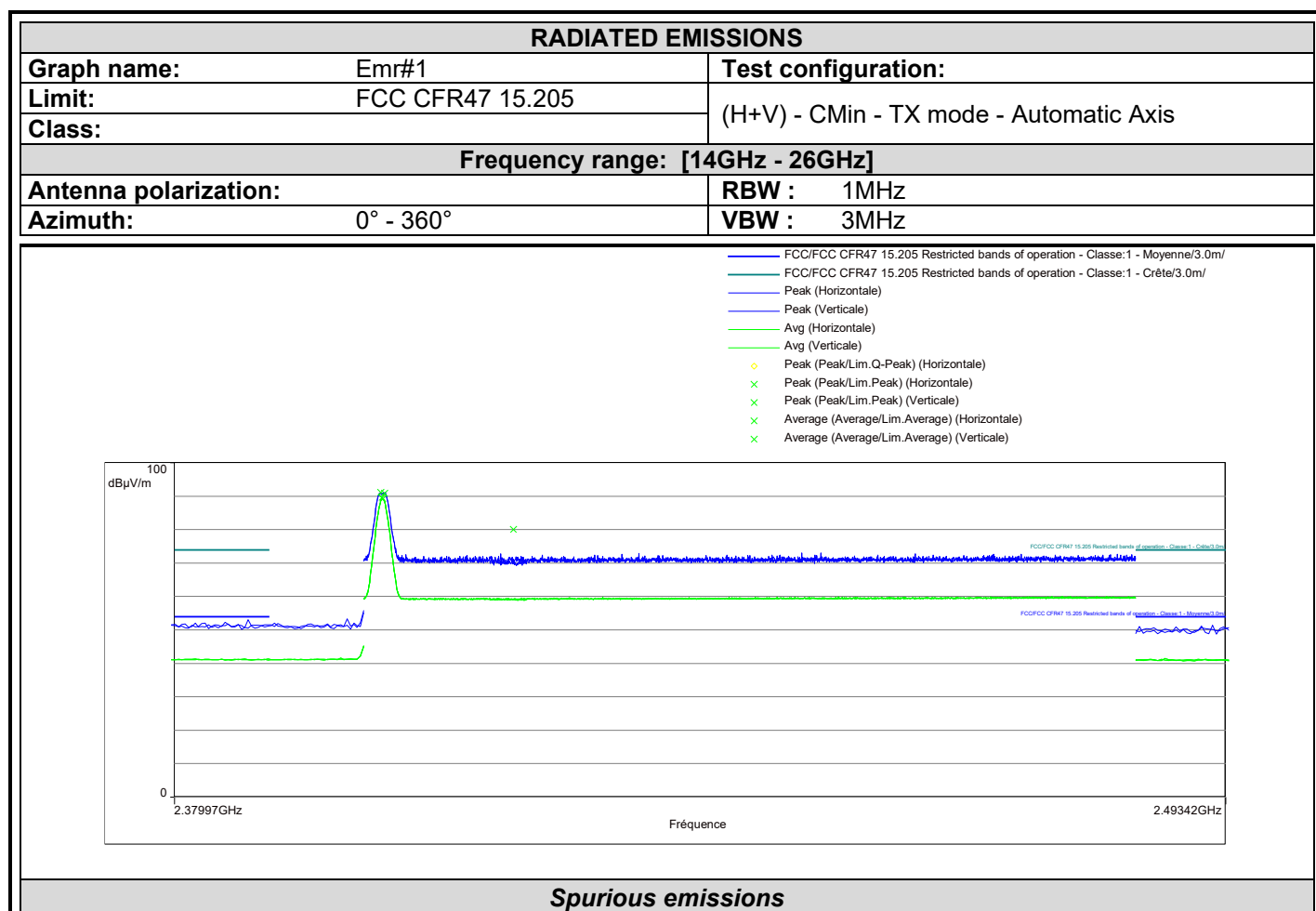
Final measurement :

| Carrier Frequency (MHz) | Mode | Frequency (MHz) | Power | Limit | Unit |
|-------------------------|------|-----------------|-------|-------|------|
| 3599.800 | TX | 3599.800 | 51.38 | 54 | dBm |

7.6.2. Restricted Band

Graphs – Pre characterization:

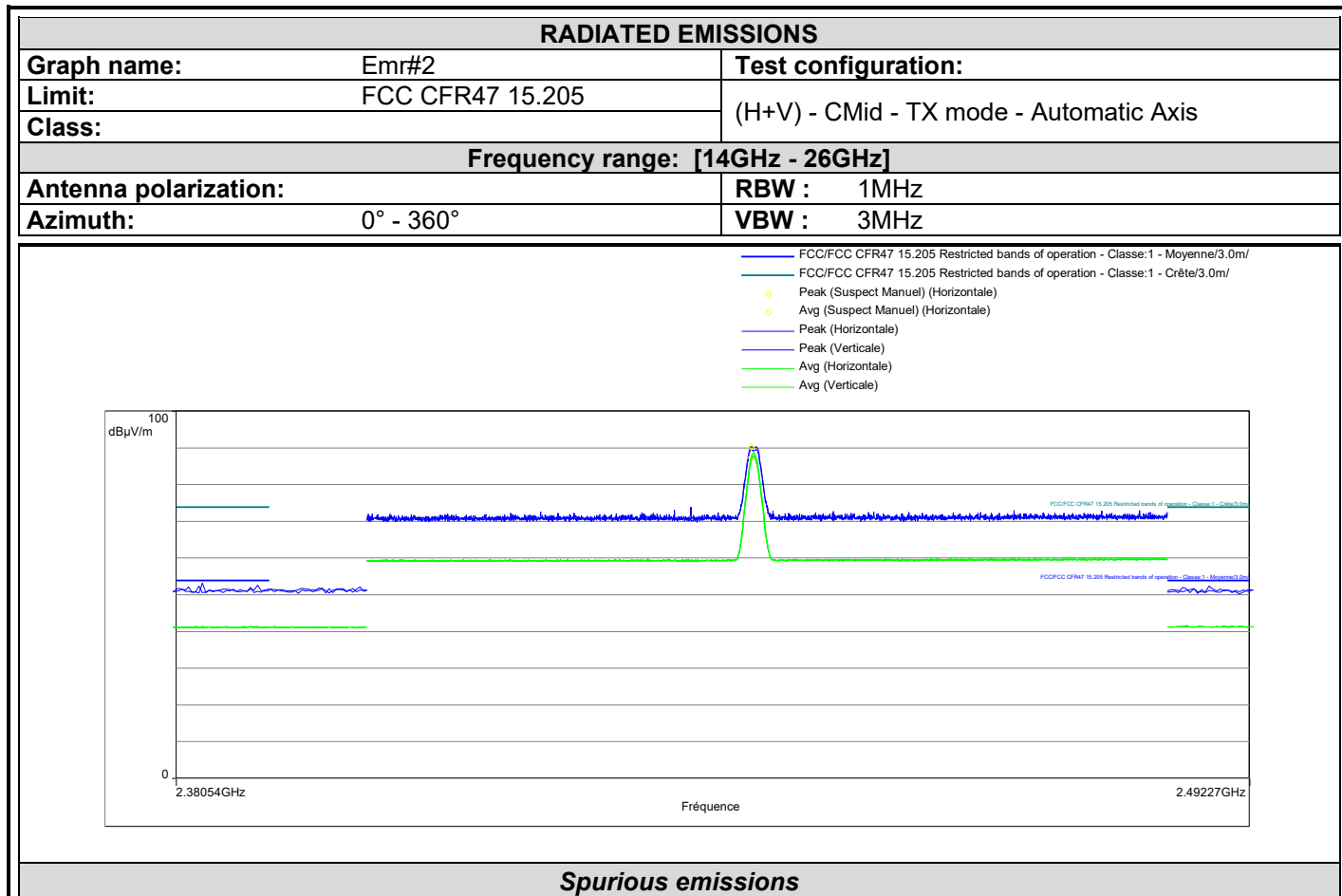
| Graph identifier | Polarization | Mode | Channel | EUT position | Comments |
|------------------|--------------|------|---------|--------------|----------|
| Emr# 1 | H/V | TX | Cmin | Axis XY/Z | - |
| Emr# 2 | H/V | TX | Cmid | Axis XY/Z | - |
| Emr# 3 | H/V | TX | Cmax | Axis XY/Z | - |



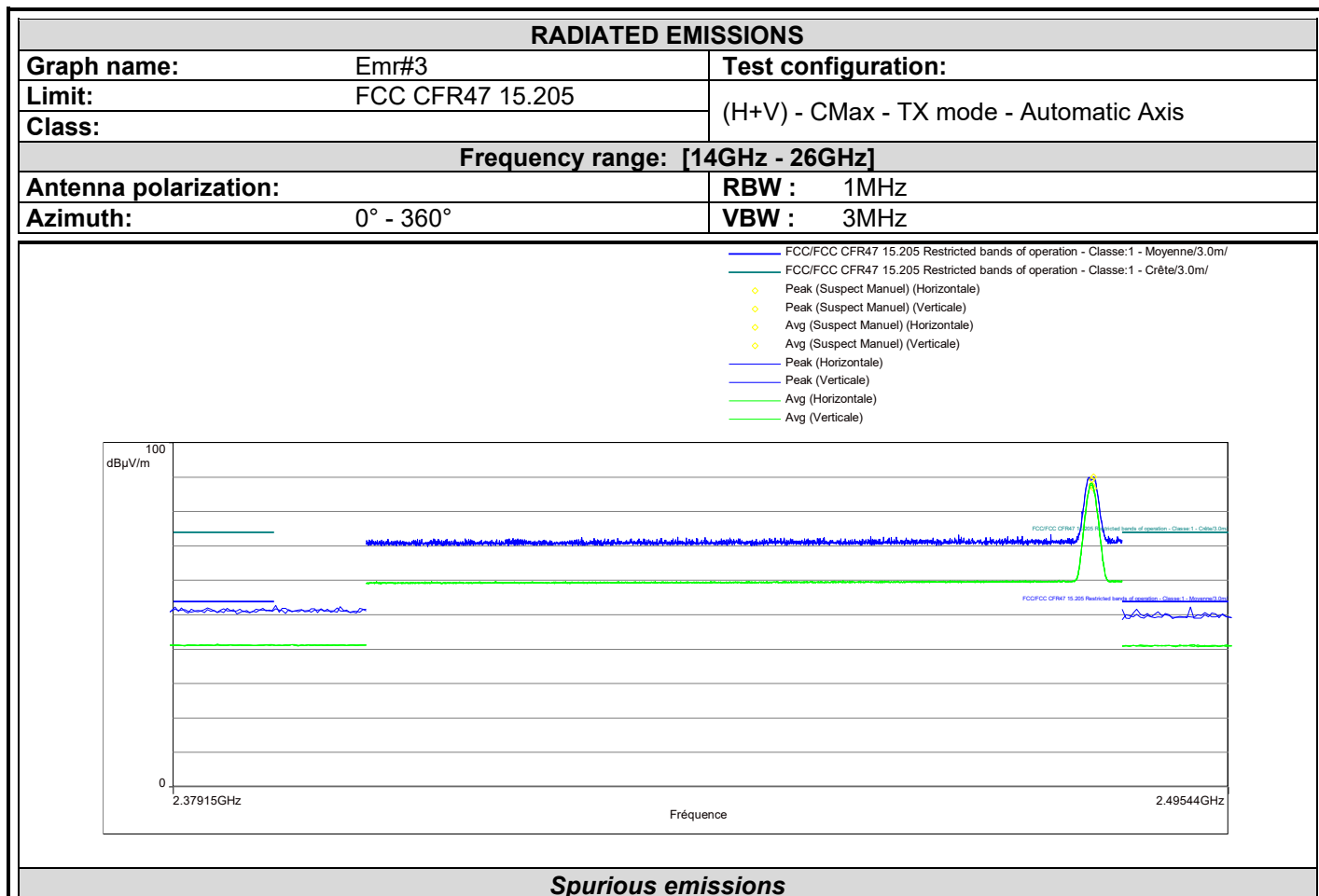
No significant frequency observed



L C I E



No significative frequency observed



NO SIGNIFICATIVE FREQUENCY OBSERVED

7.7. CONCLUSION

Unwanted emissions in non-restricted bands measurement performed on the sample of the product **TALENTIA SonR CRT-D 3811**, Sn: **Q19JX014** , **Q19D4003**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.247 & RSS 247** limits.



8. UNCERTAINTIES CHART

| <i>Kind of measurement</i> | <i>Wide uncertainty laboratory</i> |
|--|---|
| Occupied Channel Bandwidth | ±2.8 % |
| Humidity | ±3.2 % |
| Power Spectral Density, Conducted | ±1.7 dB |
| Radio frequency | ±0.3 ppm |
| RF power, conducted | ±1.2 dB |
| RF power, radiated (Full anechoic chamber above 1GHz) | ±3.7 dB |
| RF power, radiated (Semi anechoic chamber & open test site) | ±5.6 dB |
| Spurious emission, conducted | ±2.3 dB |
| Spurious emission, radiated (Full anechoic chamber above 1GHz) | ±3.8 dB |
| Spurious emission, radiated (Semi anechoic chamber & open test site) | ±5.7 dB |
| Temperature | ±0.75 °C |
| Time | ±2.3 % |
| Voltage | ±1.7 % |

The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the standard. The conformity of the sample is directly established by the applicable limit values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report.