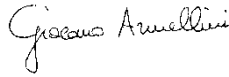
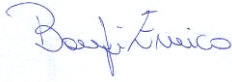


## TEST REPORT

|                                    |  |   |
|------------------------------------|--|---|
| <b>APPLICANT:</b>                  | <b>CARDIN ELETTRONICA SPA</b><br>VIA DEL LAVORO 73, 31013 CODOGNE' FRAZ. CIMETTA (TV) ITALY<br>Phone : 0438-404011       |   |
| <b>APPLICANT REFEREE:</b>          | Mr. Lavina (e.lavina@cardin.it)<br>Mr. Fiorotto (a.fiorotto@cardin.it)   |   |
| <b>EUT DESCRIPTION</b>             | <b>REMOTE CONTROL</b>  |   |
| <b>EUT MODEL</b>                   | <b>TXQ504C4</b>  |   |
| <b>EUT TRADEMARK</b>               | CARDIN   |   |
| <b>MANUFACTURER</b>                | CARDIN ELETTRONICA SPA   |   |
| <b>REFERENCE STANDARDS</b>         | <b>47 CFR FCC part 15.231</b>  |   |
| <b>TEST REPORT NUMBER</b>          | FCCTR_152191-0   |   |
| <b>TEST REPORT ISSUE DATE</b>      | 15/11/2016   |   |
| <b>TESTING LABORATORY</b>          | Prima Ricerca & Sviluppo S.r.l.<br>Via Campagna, 92 -22020 Faloppio (Co) – Italy<br>FCC test registration number: 421808 |   |
| <b>TESTING LOCATION</b>            | As Above   |   |
| <b>DATE OF TEST SAMPLE RECEIPT</b> | 05/09/2016   |   |
| <b>NUMBER OF TESTED SAMPLES</b>    | 1  |   |
| <b>DATE OF TEST</b>                | 05/09/2016, 27/09/2016, 07/11/2016   |   |
| <b>TESTED BY</b>                   | Giacomo ARMELLINI<br>Responsabile Laboratorio EMC e<br>RADIO/ EMC and RADIO Laboratory<br>Manager                        |  |
| <b>APPROVED BY</b>                 | Enrico Banfi<br>Laboratory Manager   |  |

The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.  
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**1. RELEASE CONTROL RECORD**

| TEST REPORT NUMBER | REASON OF CHANGE | DATE OF ISSUE |
|--------------------|------------------|---------------|
| FCCTR_152191-0     | Original release | 15/11/2016    |

## 2. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

### 2.1 Identification

|                                 |                        |
|---------------------------------|------------------------|
| <b>Trademark:</b>               | CARDIN                 |
| <b>Manufacturer:</b>            | CARDIN ELETTRONICA SPA |
| <b>Type of Equipment :</b>      | REMOTE CONTROL         |
| <b>Model name:</b>              | TXQ504C4               |
| <b>Serial number :</b>          | Prototype              |
| <b>Country of manufacturer:</b> | ITALY                  |

### 2.2 Technical data

|  |   |
|--|---|
| <b>Product type:</b>                     | Radio Equipment   |
| <b>Radio type:</b>                       | Intentional radiators   |
| <b>Product description / application</b> | The EUT is a remote control using the 433MHz frequency for opening / closing automatic doors, fence and similar |
| <b>Power supply requirements :</b>       | 3V lithium battery (CR2032 type)  |
| <b>Operating Frequency:</b>              | 433.92MHz   |
| <b>Channel bandwidth (20dB)</b>          | 54.48kHz  |
| <b>Channel spacing</b>                   | NA  |
| <b>Number of Channel</b>                 | 1   |
| <b>Modulation Type</b>                   | FM  |
| <b>Antenna Type</b>                      | Integral Antenna  |



### 2.3 Ports identification

This section contains descriptions of all signal ports and AC/DC power input/output ports, the length and the type of the cable provided by manufacturer needed for the tests. Moreover it is specified if the ports are ever or optionally connected.

| Port |                 | Description   | Connection    |
|------|-----------------|---|---------------|
| 1    | Enclosure       | Plastic / Metal                                     | Snaps & screw |
| 2    | AC Power Supply | Port not present                                    | ---           |
| 3    | DC power supply | Port not present (powered by 3Vdc internal battery) | ---           |
| 4    | Signal lines    | Port not present                                    | ---           |
| 5    | Telecomm. Lines | Port not present                                    | ---           |
| 6    | Antenna port    | Port not present                                    | ---           |

*Note: During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.*

### 2.4 Auxiliary equipment

- None

### 3. OPERATING TEST MODES AND CONDITIONS

In the following table there are the operating conditions adopted during tests identified by an indicator (#..) at which has been referred the item "Operating condition of the equipment under test"

| Operating condition | Description   |
|---------------------|---|
| #1                  | Sample 1: Continuous transmission, modulated carrier, duty cycle 100% (see note 1)      |
| #2                  | Sample 2: Standard operating condition, manually operated, duty cycle 100% (see note 1) |

Note:

<sup>1</sup> The timing of the continuous transmission and the usual standard operating condition is the same and it is illustrated in the following measurement:

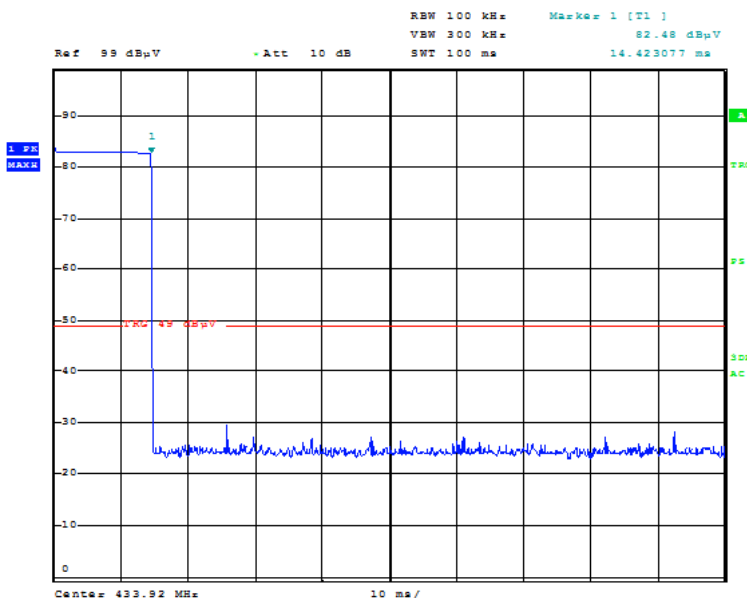
According to CFR 47 Part 15.35 c) *Unless otherwise specified, e.g., §§15.255(b), and 15.256(l)(5), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds*

Starting from the measurement below the duty cycle used to calculate the correction factor for field strength measurements results:

DUTY CYCLE (DC):  $14,42\text{ms}/100\text{ms} = 0,1442 = 14,42\%$

and so the correction factor results:

CORRECTION FACTOR:  $20\text{Log}(1/\text{DC}) = 16,82 \text{ dB}$



**Special Test Software:** Special software and hardware by the Applicant to operate the EUT at channel frequency continuously.

**Transmitter Test Antenna:** The EUT has been tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment as described with the test results.

#### 4. REFERENCE STANDARD / DOCUMENT FOR PERFORMED TESTS

|                                   |  |
|-----------------------------------|--|
| <b>CFR 47, Part 15, Subpart C</b> | Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15:<br>General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies |
| <b>ANSI C63.10:2013</b>           | American National Standard for Testing Unlicensed Wireless Devices   |

#### 5. SUMMARY OF TEST RESULTS

| Phenomena  | Basic standard              | Operating condition | Result                                       |
|--|-----------------------------|---------------------|--|
| Antenna Requirements                                 | FCC Part 15<br>§15.203      | ---                 | Compliant                                    |
| Conducted Emission                                   | FCC Part 15<br>§15.207      | ---                 | Not applicable<br>The EUT is battery powered |
| Periodic Operation Characteristics                   | FCC Part 15<br>§15.231 (a)  | #2                  | Compliant                                    |
| Field Strength of Fundamental and Spurious Emissions | FCC Part 15<br>§ 15.231 (b) | #1                  | Compliant                                    |
| 20 dB Bandwidth                                      | FCC Part 15<br>§ 15.231 (c) | #1                  | Compliant                                    |

#### 6. TEST RESULTS

|  |    |
|--|----|
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**TEST  
1.**

**ANTENNA REQUIREMENTS**

---

**REFERENCE  
DOCUMENT**

According to §15.203 / 15.204

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

**Antenna requirement**

The **TXQ504C4** have an integrated PCB antenna

**RESULT: COMPLIANT**

**TEST  
2.**

**PERIODIC OPERATION CHARACTERISTICS**

**REFERENCE  
DOCUMENT**

According to 15.231 (a): The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal. The following conditions shall be met to comply with the provisions for this periodic operation:

- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.
- (4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition
- (5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data

|                            |  |
|----------------------------|--|
| <b>TEST SETUP</b>          | In according to ref std  |
| <b>TEST LOCATION</b>       | Radio test area  |
| <b>TYPE OF MEASUREMENT</b> | RADIATED   |
| <b>TEST EQUIPMENT</b>      | Spectrum Analyzer Rohde&Schwarz mod. FSP40<br>SYSTEM DC POWER SUPPLY HP mod. 6623A |
| <b>TEST PERFORMED BY</b>   | Giacomo Armellini  |
| <b>TESTING DATE</b>        | 28 April 2015  |
| <b>TESTED SAMPLE</b>       | Sample 2   |
| <b>UNCERTAINTY</b>         |  |

| <b>TEST CONDITIONS:</b>                        | <b>MEASURED</b> |
|--|-----------------|
| Ambient temperature : 23°C ± 5°C               | 24°C            |
| Ambient humidity : 25 – 75 %rH                 | 45%             |
| Pressure : 85 – 106 kPa (860 mbar – 1060 mbar) | 960mbar         |

|                            |    |
|----------------------------|----|
| <b>OPERATING CONDITION</b> | #2 |
|----------------------------|----|

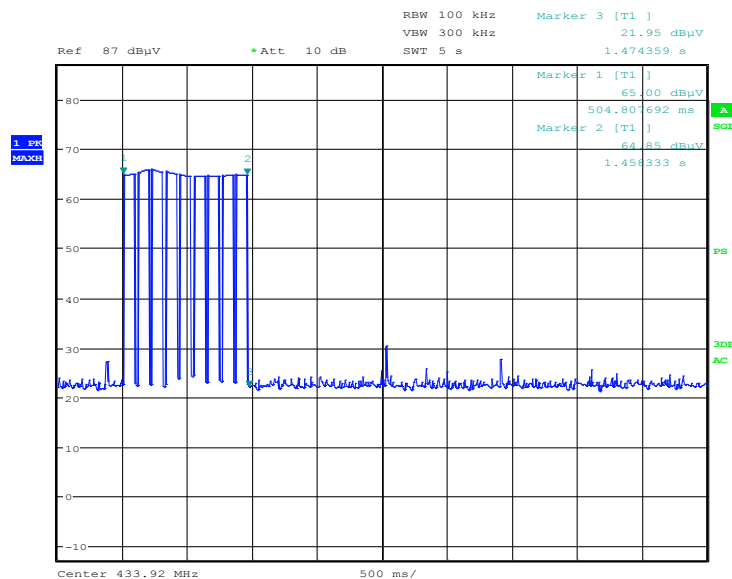
|                    |                  |
|--------------------|------------------|
| <b>TEST RESULT</b> | <b>COMPLIANT</b> |
|--------------------|------------------|



15.231 (a) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

**COMPLIANT** the EUT is immediately deactivated after the release of the push button

Marker 1: push button pressed (start of transmission)  
 Marker 2: push button released  
 Marker 3: transmitter deactivation



15.231 (a) (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

**NOT APPLICABLE:** The EUT is a manually operated transmitter

15.231 (a) (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

**NOT APPLICABLE:** The EUT is a manually operated transmitter

15.231 (a) (4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition

**NOT APPLICABLE:** The EUT is not employed for radio control purposes during emergencies involving fire, security, and safety of life

(5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmissions are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data

**NOT APPLICABLE:** The EUT is not employed for security systems

**TEST  
3.**

**20dB BANDWIDTH**

**REFERENCE  
DOCUMENT**

According to 15.231©: The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

|                            |  |
|----------------------------|--|
| <b>TEST SETUP</b>          | In according to ref std  |
| <b>TEST LOCATION</b>       | Radio test area  |
| <b>TYPE OF MEASUREMENT</b> | RADIATED   |
| <b>TEST EQUIPMENT</b>      | Spectrum Analyzer Rohde&Schwarz mod. FSP40<br>SYSTEM DC POWER SUPPLY HP mod. 6623A |
| <b>TEST PERFORMED BY</b>   | Giacomo Armellini  |
| <b>TESTING DATE</b>        | 05/09/2016   |
| <b>TESTED SAMPLE</b>       | Sample 1   |
| <b>UNCERTAINTY</b>         | ±1 KHz   |

| <b>TEST CONDITIONS:</b>                        | <b>MEASURED</b> |
|--|-----------------|
| Ambient temperature : 23°C ± 5°C               | 24°C            |
| Ambient humidity : 25 - 75 %rH                 | 45%             |
| Pressure : 85 - 106 kPa (860 mbar - 1060 mbar) | 960mbar         |

|                            |    |
|----------------------------|----|
| <b>OPERATING CONDITION</b> | #1 |
|----------------------------|----|

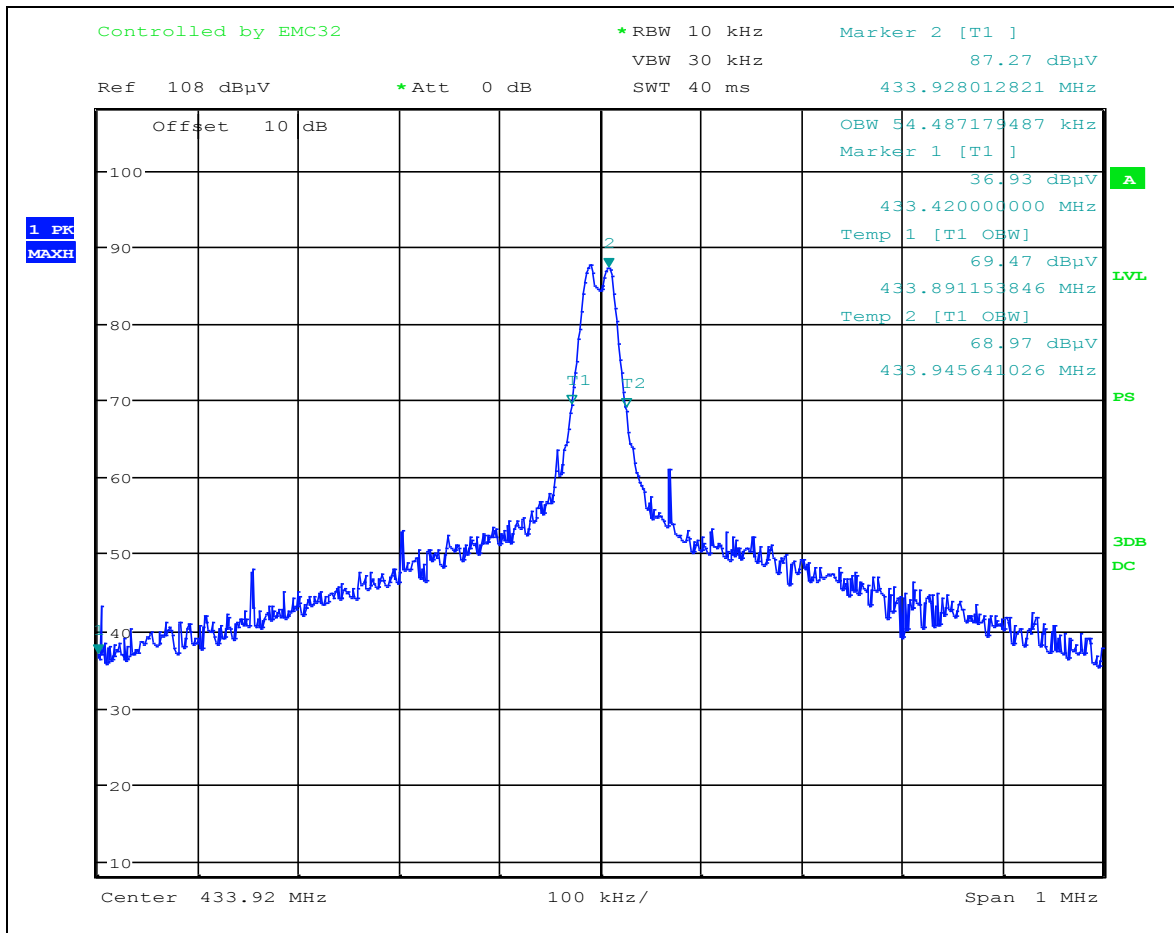
|                    |                  |
|--------------------|------------------|
| <b>TEST RESULT</b> | <b>COMPLIANT</b> |
|--------------------|------------------|



**Measurement Result**

| Channel | Frequency (MHz) | 20dB Bandwidth (kHz) | Limit 0.0025* Frequency (kHz) | Result            |
|---------|-----------------|----------------------|-------------------------------|-------------------|
| NA      | 433.92          | 54.487               | 1084.8                        | WITHIN THE LIMITS |

Incertezza di misura / Measurement Uncertainty : ±1 KHz



**TEST  
4.**

**FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSIONS**

**REFERENCE DOCUMENT**

According to 15.231 (b) In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

| Fundamental frequency (MHz) | Field strength of fundamental (microvolts/meter) | Field strength of spurious emissions (microvolts/meter) |
|-----------------------------|--|---|
| 40.66-40.70                 | 2,250  | 225   |
| 70-130                      | 1,250  | 125   |
| 130-174                     | 11,250 to 3,750                                  | 1125 to 375   |
| 174-260                     | 3,750  | 375   |
| 260-470                     | 13,750 to 12,500                                 | 1375 to 1,250   |
| Above 470                   | 12,500   | 1,250   |

<sup>1</sup>Linear interpolations.

|                                |  |
|--------------------------------|--|
| <b>TEST SETUP</b>              | In according to ref std  |
| <b>TEST LOCATION</b>           | Semi Anechoic Chamber  |
| <b>TYPE OF MEASUREMENT</b>     | RADIATED   |
| <b>TEST EQUIPMENT</b>          | EMI receiver Rohde & Schwarz Mod, ESU 40<br>Spectrum Analyzer Rohde & Schwarz Mod, FSP40<br>Chase Antenna Mod, CBL 6111 C<br>Antenna Rohde & Schwarz mod, HL050<br>High pass filter Wainwright WHNX 1,3/18G-10SS |
| <b>TEST PERFORMED BY</b>       | Giacomo Armellini  |
| <b>TESTING DATE</b>            | 07/11/2016   |
| <b>TESTED SAMPLE</b>           | Sample 1   |
| <b>UNCERTAINTY OF MEASURE:</b> | Combined uncertainty = $\pm 1,75$ dB<br>Total uncertainty = (k=2) $\pm 3,5$ dB   |

| TEST CONDITIONS:                               | MEASURED |
|--|----------|
| Ambient temperature : 23°C $\pm$ 5°C           | 24°C     |
| Ambient humidity : 25 - 75 %rH                 | 45%      |
| Pressure : 85 - 106 kPa (860 mbar - 1060 mbar) | 960mbar  |

|                            |    |
|----------------------------|----|
| <b>OPERATING CONDITION</b> | #1 |
|----------------------------|----|

|                    |                  |
|--------------------|------------------|
| <b>TEST RESULT</b> | <b>COMPLIANT</b> |
|--------------------|------------------|

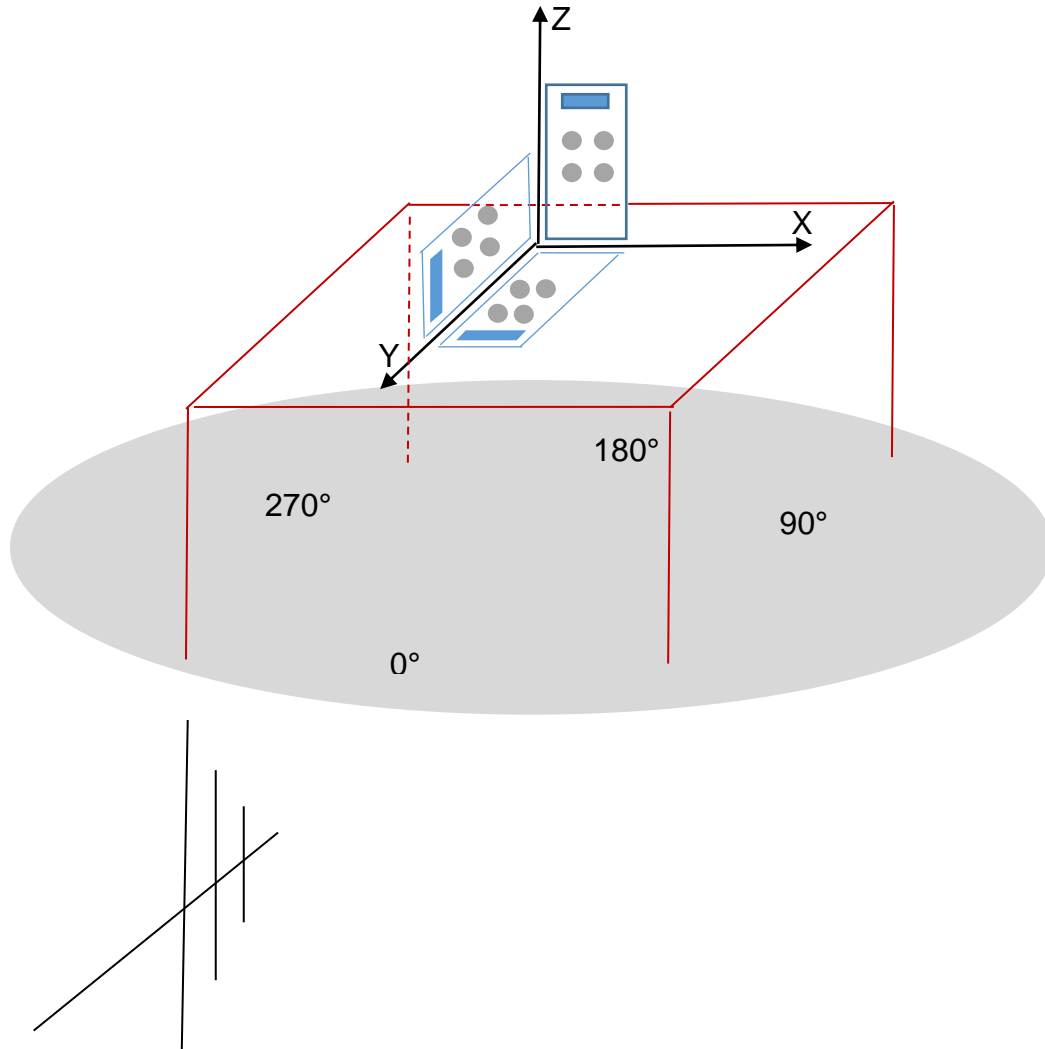


**PRIMA**

RICERCA & SVILUPPO

FCCTR\_152191-0

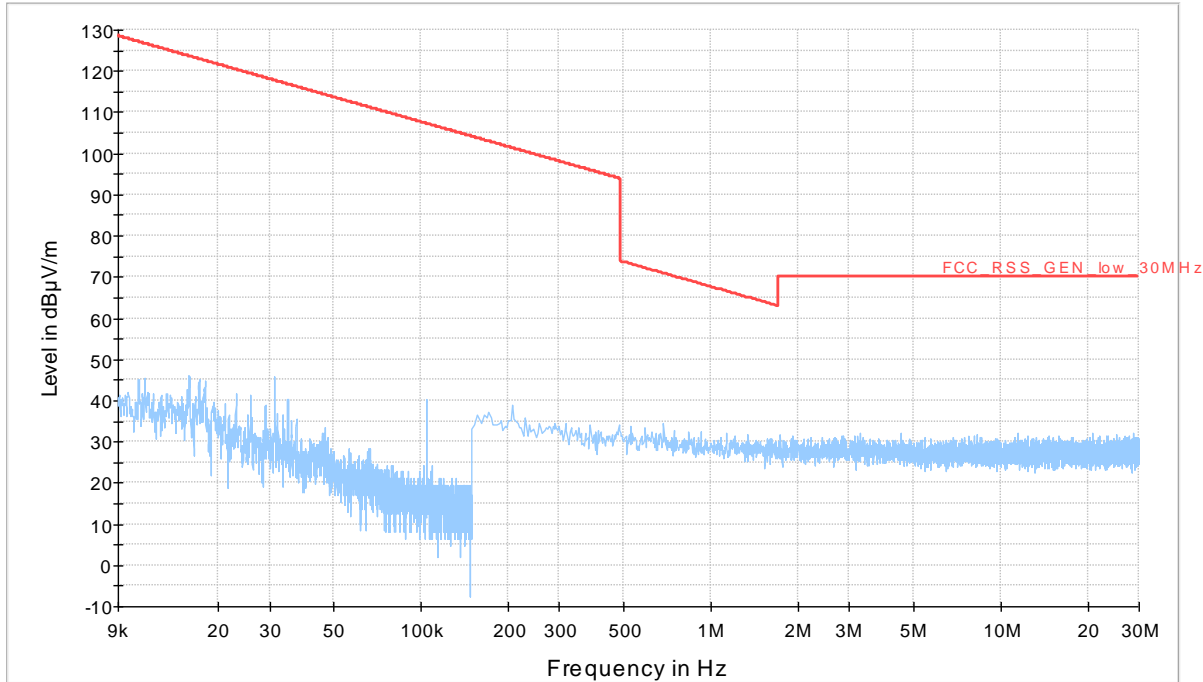
**Field Strength of Fundamental and Spurious Emissions Setup**



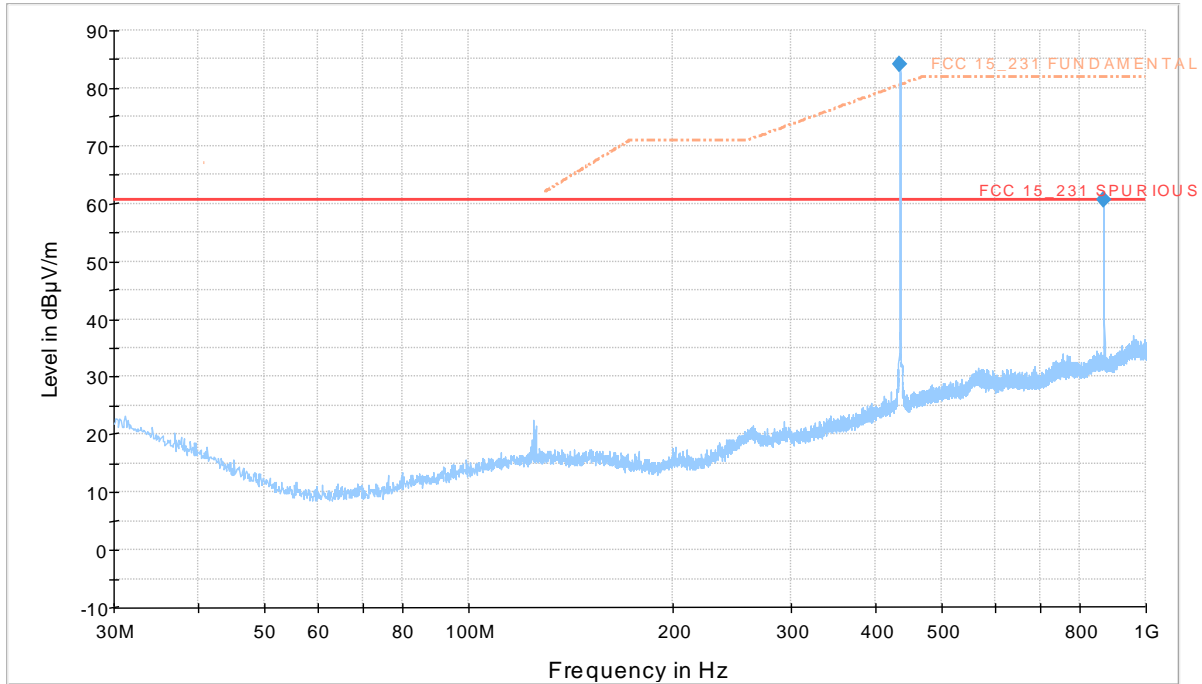
### RADIATED MEASUREMENT

|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | XY PLANE     |
| <b>FREQUENCY RANGE</b>      | 9kHz – 30MHz |
| <b>ANTENNA POLARIZATION</b> | VERTICAL     |

EMI\_RAD\_9k\_30M\_sweep\_dBuVm



|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | XY PLANE     |
| <b>FREQUENCY RANGE</b>      | 30MHz – 1GHz |
| <b>ANTENNA POLARIZATION</b> | VERTICAL     |



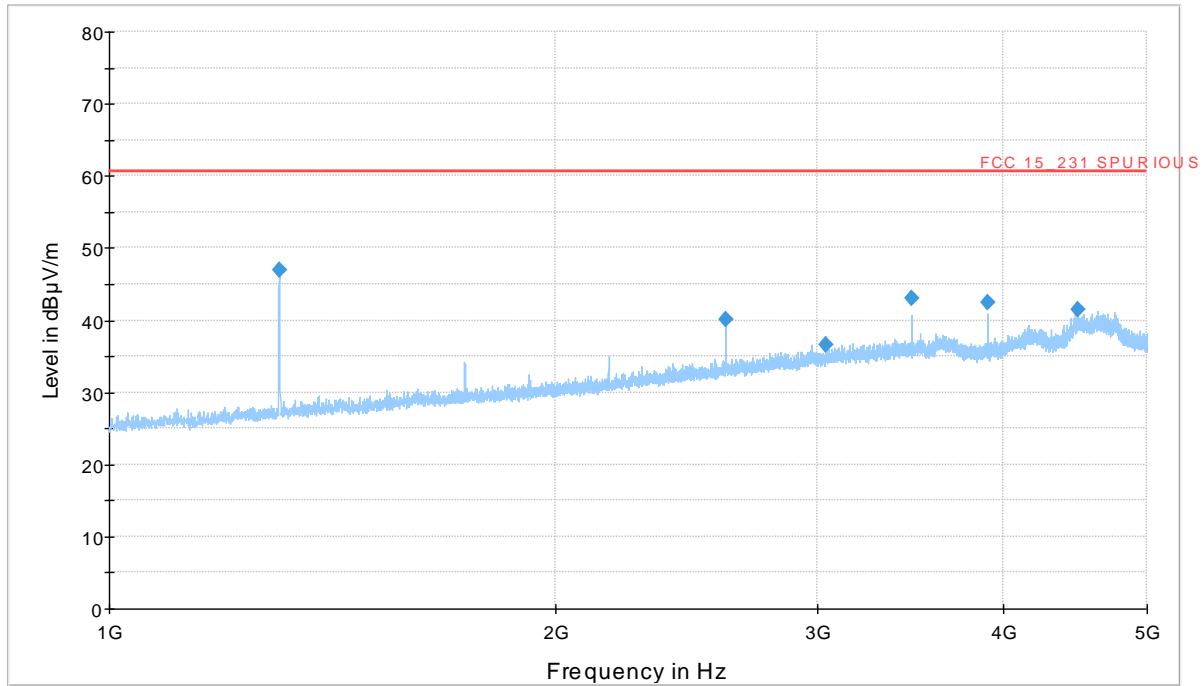
Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 433.908000      | 84.0              | 100.000         | 103.0       | V    | 1.0           | 16.82                      | 67.18            | 80.58          | 13.4        | PASS   |
| 867.886000      | 60.8              | 100.000         | 103.0       | V    | 1.0           | 16.82                      | 43.98            | 60.58          | 16.6        | PASS   |



|                             |          |
|-----------------------------|----------|
| <b>EUT POSITION</b>         | XY PLANE |
| <b>FREQUENCY RANGE</b>      | 1-5GHz   |
| <b>ANTENNA POLARIZATION</b> | VERTICAL |



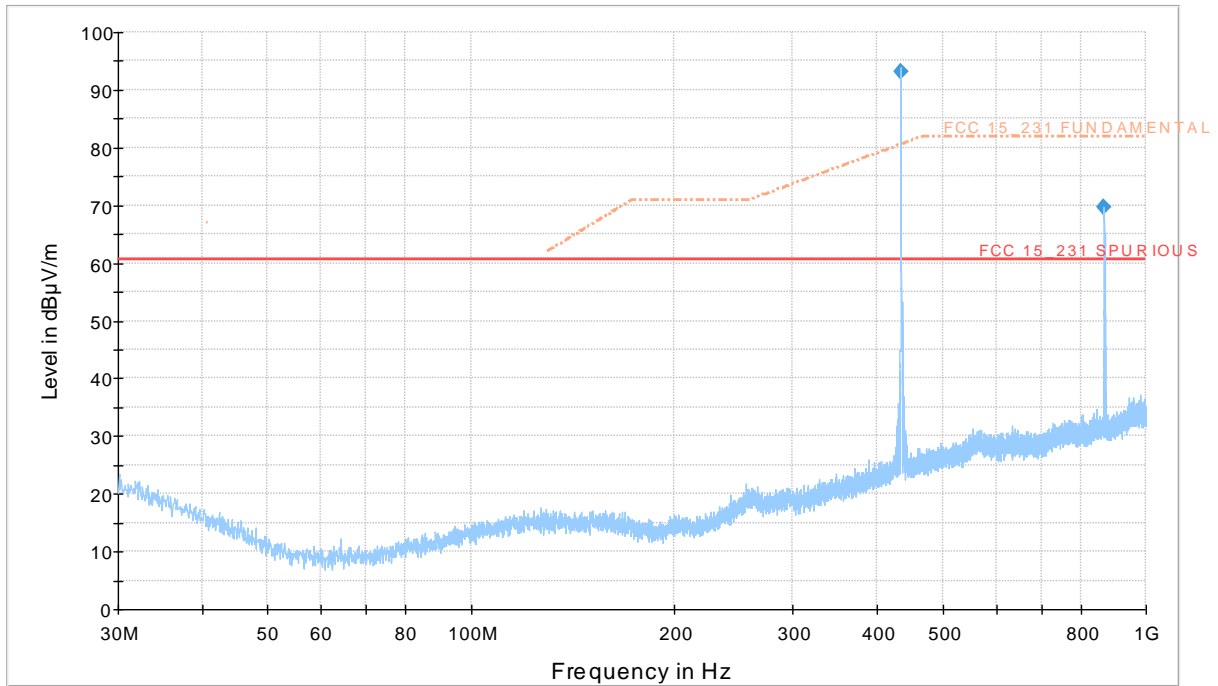
Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 1301.60000      | 46.9              | 100.000         | 103.0       | V    | 2.0           | 16.82                      | 30.08            | 60.58          | 30.5        | PASS   |
| 2603.60000      | 40.2              | 100.000         | 102.0       | V    | 269.0         | 16.82                      | 23.38            | 60.58          | 37.2        | PASS   |
| 3037.60000      | 36.5              | 100.000         | 256.0       | V    | 179.0         | 16.82                      | 19.68            | 60.58          | 40.9        | PASS   |
| 3471.60000      | 43.1              | 100.000         | 100.0       | V    | 179.0         | 16.82                      | 26.28            | 60.58          | 34.3        | PASS   |
| 3905.20000      | 42.4              | 100.000         | 100.0       | V    | 179.0         | 16.82                      | 25.58            | 60.58          | 35.0        | PASS   |
| 4491.20000      | 41.5              | 100.000         | 255.0       | V    | 2.0           | 16.82                      | 24.68            | 60.58          | 35.9        | PASS   |



|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | XY PLANE     |
| <b>FREQUENCY RANGE</b>      | 30MHz – 1GHz |
| <b>ANTENNA POLARIZATION</b> | HORIZONTAL   |



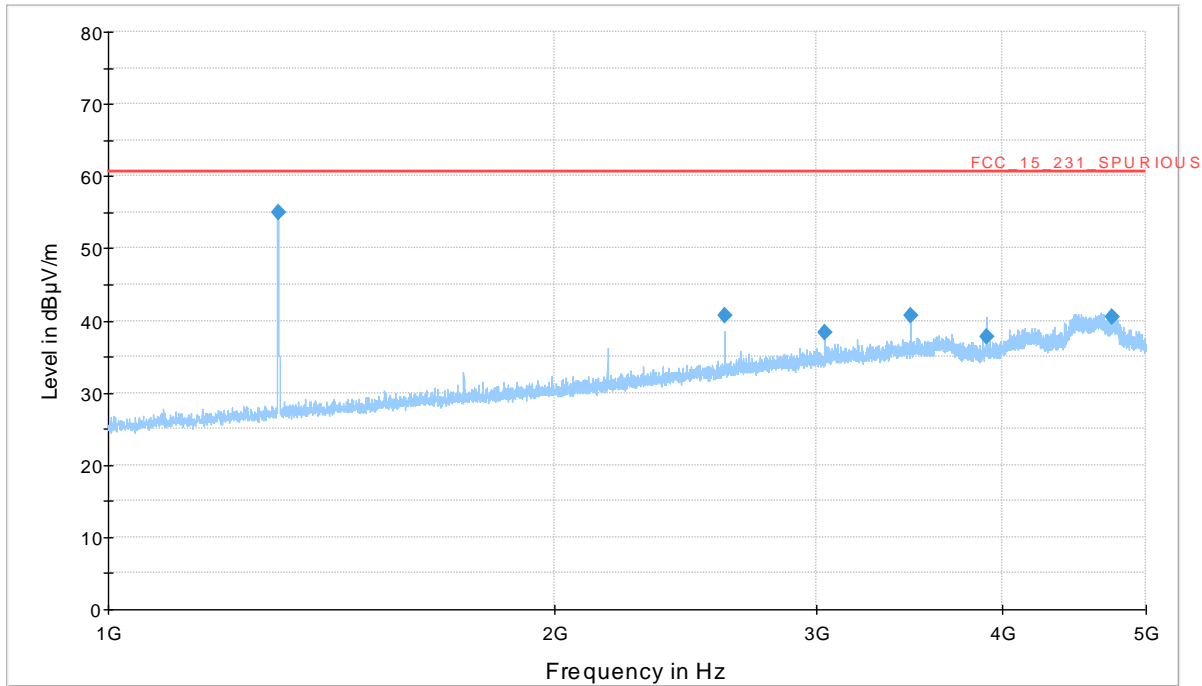
Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 433.908000      | 93.2              | 100.000         | 259.0       | H    | 90.0          | 16.82                      | 76.38            | 80.58          | 4.2         | PASS   |
| 867.789000      | 69.7              | 100.000         | 101.0       | H    | 90.0          | 16.82                      | 52.88            | 60.58          | 7.7         | PASS   |



|                             |            |
|-----------------------------|------------|
| <b>EUT POSITION</b>         | XY PLANE   |
| <b>FREQUENCY RANGE</b>      | 1-5GHz     |
| <b>ANTENNA POLARIZATION</b> | HORIZONTAL |



Blue trace Peak detector, Blue Marker Peak detector

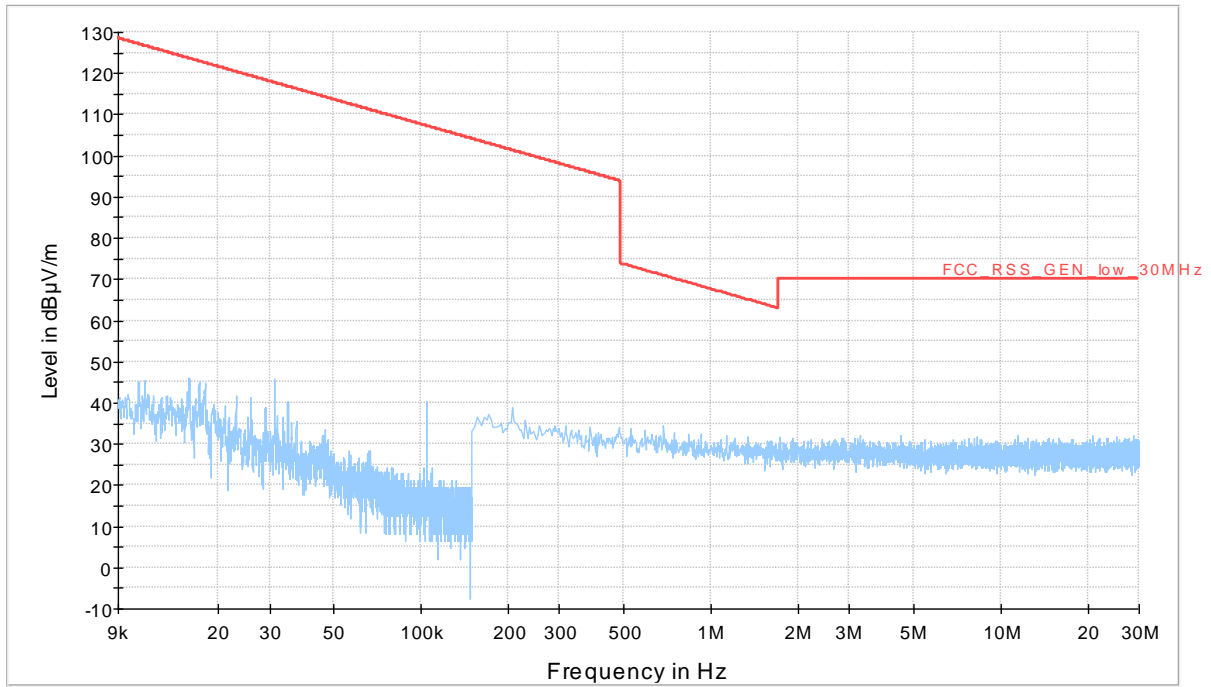
## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 1301.60000      | 55.0              | 100.000         | 102.0       | H    | 90.0          | 16.82                      | 38.18            | 60.58          | 22.4        | PASS   |
| 2603.60000      | 40.7              | 100.000         | 102.0       | H    | 270.0         | 16.82                      | 23.88            | 60.58          | 36.7        | PASS   |
| 3037.60000      | 38.4              | 100.000         | 102.0       | H    | 270.0         | 16.82                      | 21.58            | 60.58          | 39.0        | PASS   |
| 3471.20000      | 40.8              | 100.000         | 257.0       | H    | 270.0         | 16.82                      | 23.98            | 60.58          | 36.6        | PASS   |
| 3905.20000      | 37.7              | 100.000         | 102.0       | H    | 179.0         | 16.82                      | 20.88            | 60.58          | 39.7        | PASS   |
| 4746.80000      | 40.5              | 100.000         | 259.0       | H    | 2.0           | 16.82                      | 23.68            | 60.58          | 36.9        | PASS   |



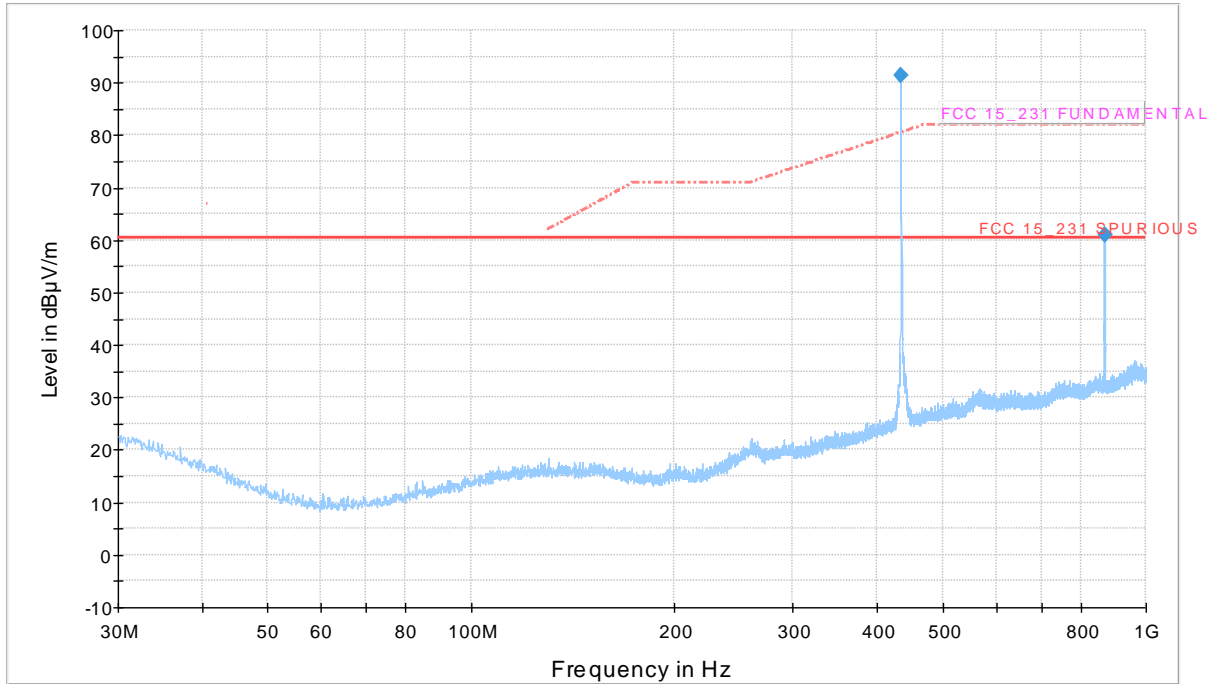
|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | XZ PLANE     |
| <b>FREQUENCY RANGE</b>      | 9kHz – 30MHz |
| <b>ANTENNA POLARIZATION</b> | VERTICAL     |

EMI\_RAD\_9k\_30M\_sweep\_dBuVm





|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | XZ PLANE     |
| <b>FREQUENCY RANGE</b>      | 30MHz – 1GHz |
| <b>ANTENNA POLARIZATION</b> | VERTICAL     |



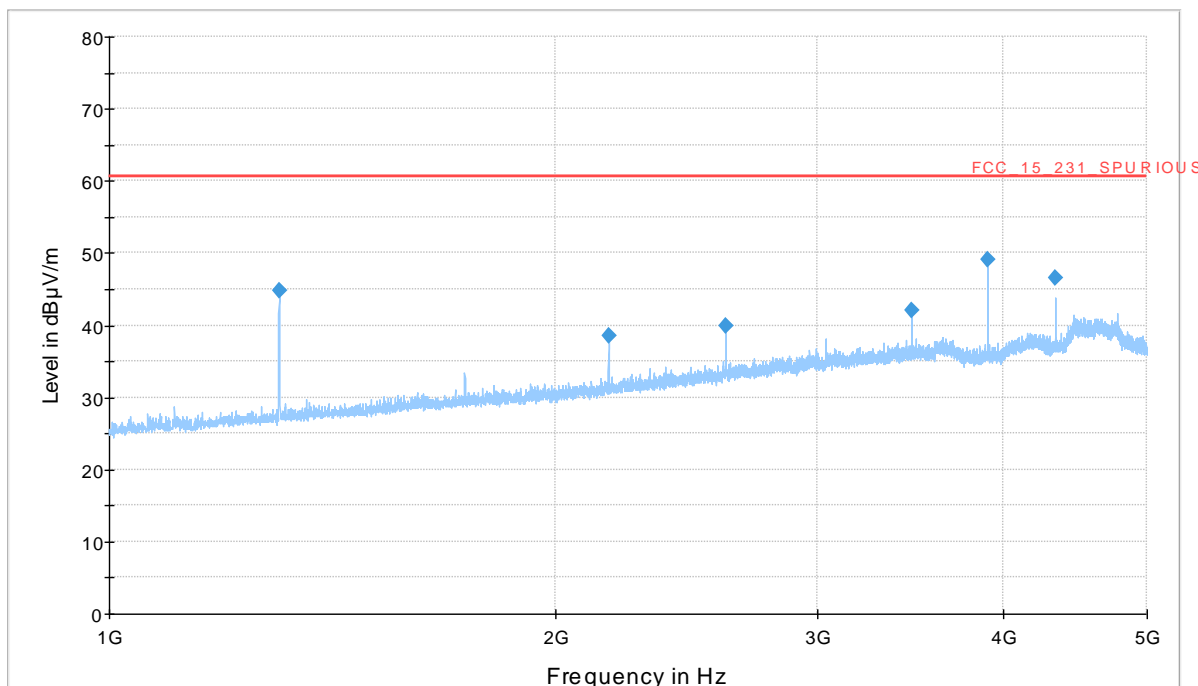
Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 433.908000      | 91.4              | 100.000         | 103.0       | V    | 180.0         | 16.82                      | 74.58            | 80.58          | 6.0         | PASS   |
| 867.886000      | 60.9              | 100.000         | 103.0       | V    | 269.0         | 16.82                      | 44.08            | 60.58          | 16.5        | PASS   |



|                             |          |
|-----------------------------|----------|
| <b>EUT POSITION</b>         | XZ PLANE |
| <b>FREQUENCY RANGE</b>      | 1-5GHz   |
| <b>ANTENNA POLARIZATION</b> | VERTICAL |

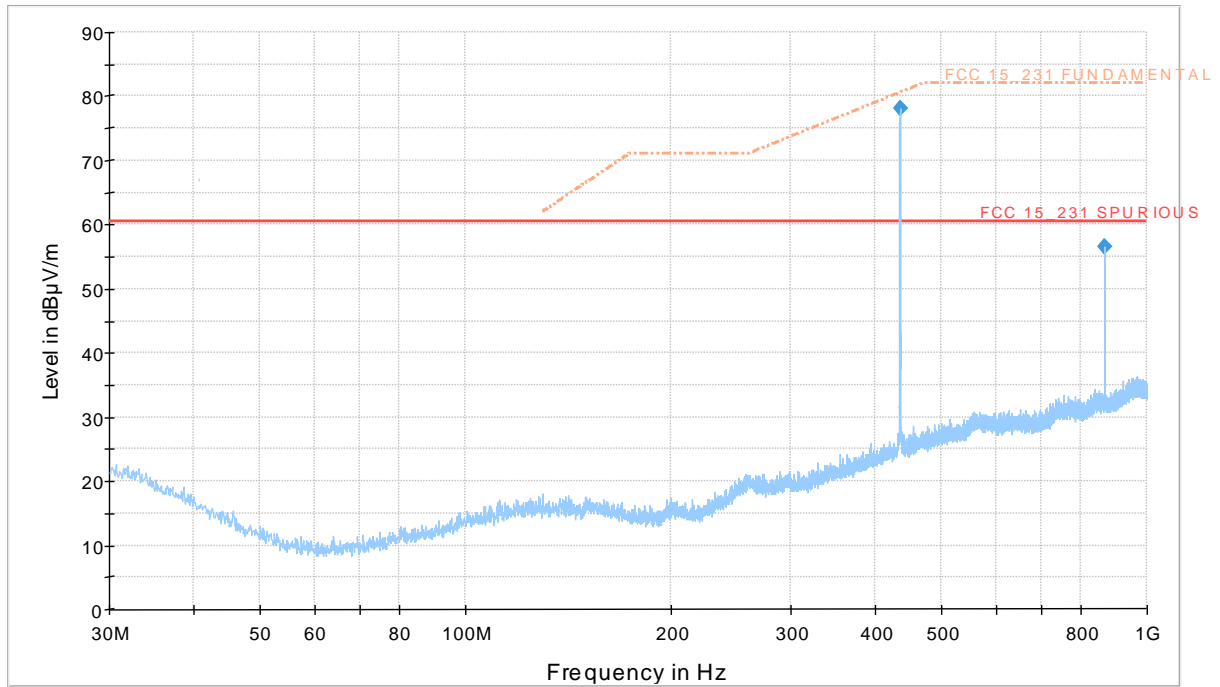


Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 1301.60000      | 44.8              | 100.000         | 259.0       | V    | 179.0         | 16.82                      | 27.98            | 60.58          | 32.6        | PASS   |
| 2169.60000      | 38.5              | 100.000         | 105.0       | V    | 2.0           | 16.82                      | 21.68            | 60.58          | 38.9        | PASS   |
| 2603.60000      | 39.8              | 100.000         | 102.0       | V    | 179.0         | 16.82                      | 22.98            | 60.58          | 37.6        | PASS   |
| 3471.60000      | 42.1              | 100.000         | 259.0       | V    | 179.0         | 16.82                      | 25.28            | 60.58          | 35.3        | PASS   |
| 3905.20000      | 49.0              | 100.000         | 102.0       | V    | 179.0         | 16.82                      | 32.18            | 60.58          | 28.4        | PASS   |
| 4339.20000      | 46.6              | 100.000         | 103.0       | V    | 269.0         | 16.82                      | 29.78            | 60.58          | 30.8        | PASS   |

|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | XZ PLANE     |
| <b>FREQUENCY RANGE</b>      | 30MHz – 1GHz |
| <b>ANTENNA POLARIZATION</b> | HORIZONTAL   |



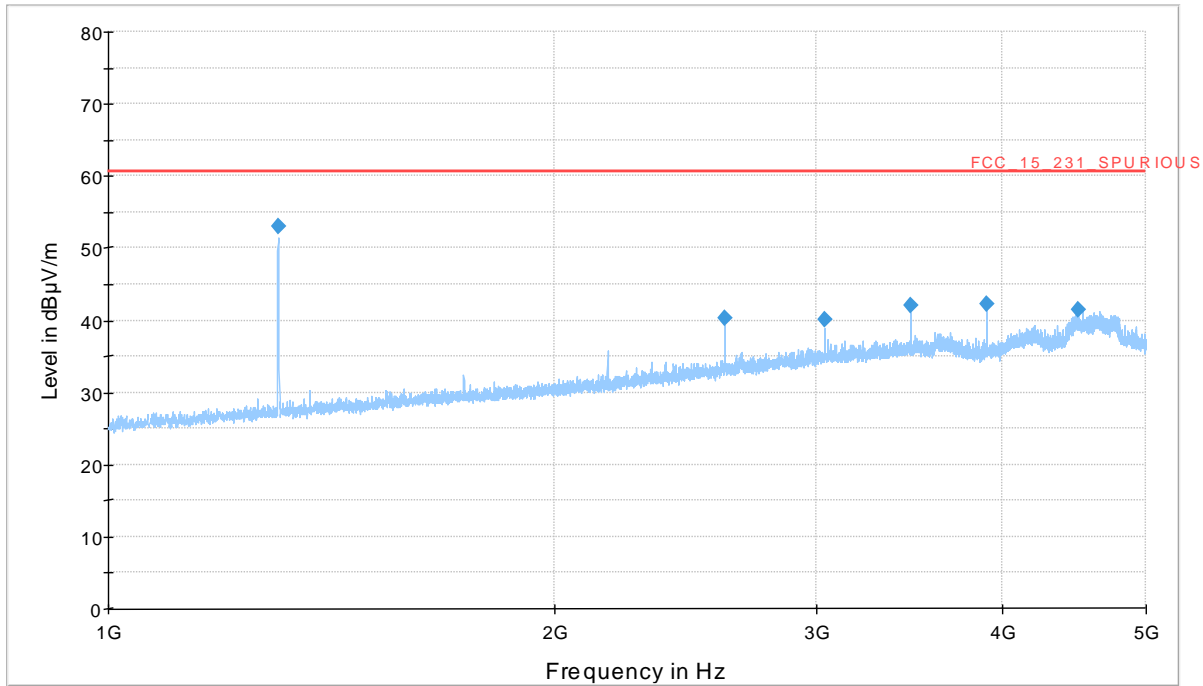
Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 433.908000      | 78.0              | 100.000         | 100.0       | H    | 90.0          | 16.82                      | 61.18            | 80.58          | 19.4        | PASS   |
| 867.886000      | 56.6              | 100.000         | 258.0       | H    | 180.0         | 16.82                      | 39.78            | 60.58          | 20.8        | PASS   |



|                             |            |
|-----------------------------|------------|
| <b>EUT POSITION</b>         | XZ PLANE   |
| <b>FREQUENCY RANGE</b>      | 1-5GHz     |
| <b>ANTENNA POLARIZATION</b> | HORIZONTAL |



Blue trace Peak detector, Blue Marker Peak detector

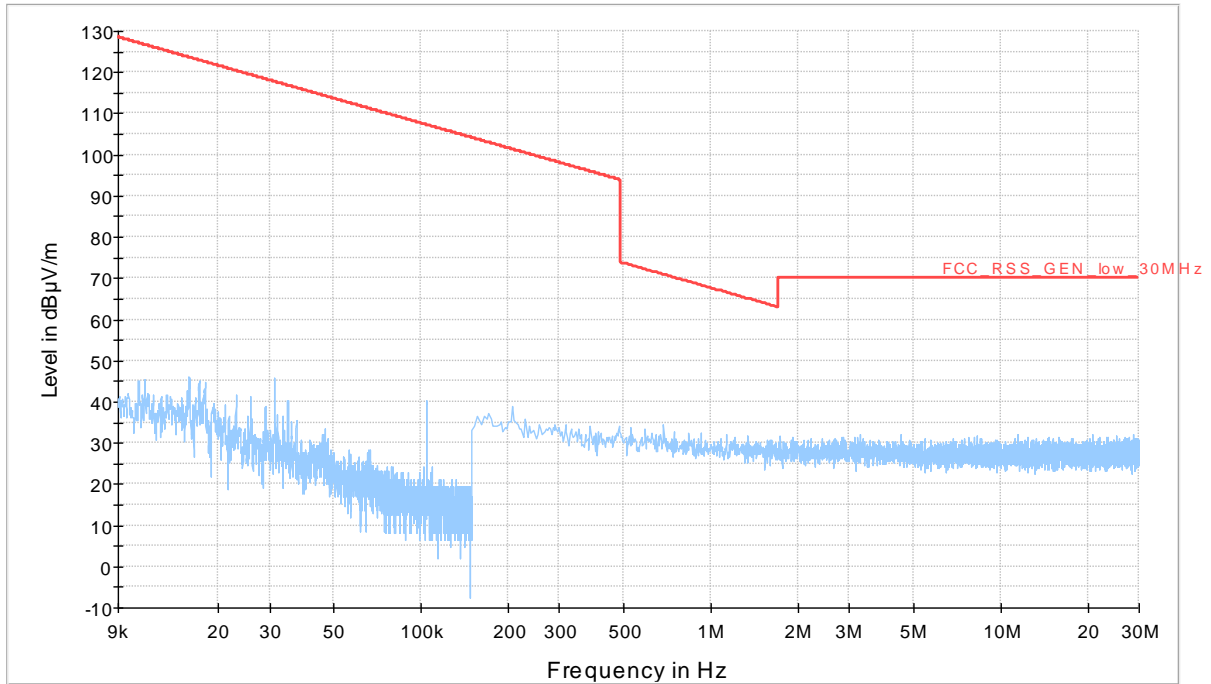
## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 1301.60000      | 53.1              | 100.000         | 103.0       | H    | 89.0          | 16.82                      | 36.28            | 60.58          | 24.3        | PASS   |
| 2603.60000      | 40.4              | 100.000         | 100.0       | H    | 269.0         | 16.82                      | 23.58            | 60.58          | 37.0        | PASS   |
| 3037.60000      | 40.1              | 100.000         | 258.0       | H    | 269.0         | 16.82                      | 23.28            | 60.58          | 37.3        | PASS   |
| 3471.20000      | 42.0              | 100.000         | 258.0       | H    | 269.0         | 16.82                      | 25.18            | 60.58          | 35.4        | PASS   |
| 3905.60000      | 42.3              | 100.000         | 259.0       | H    | 179.0         | 16.82                      | 25.48            | 60.58          | 35.1        | PASS   |
| 4499.20000      | 41.5              | 100.000         | 103.0       | H    | 89.0          | 16.82                      | 24.68            | 60.58          | 35.9        | PASS   |



|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | YZ PLANE     |
| <b>FREQUENCY RANGE</b>      | 9kHz – 30MHz |
| <b>ANTENNA POLARIZATION</b> | VERTICAL     |

EMI\_RAD\_9k\_30M\_sweep\_dBuVm





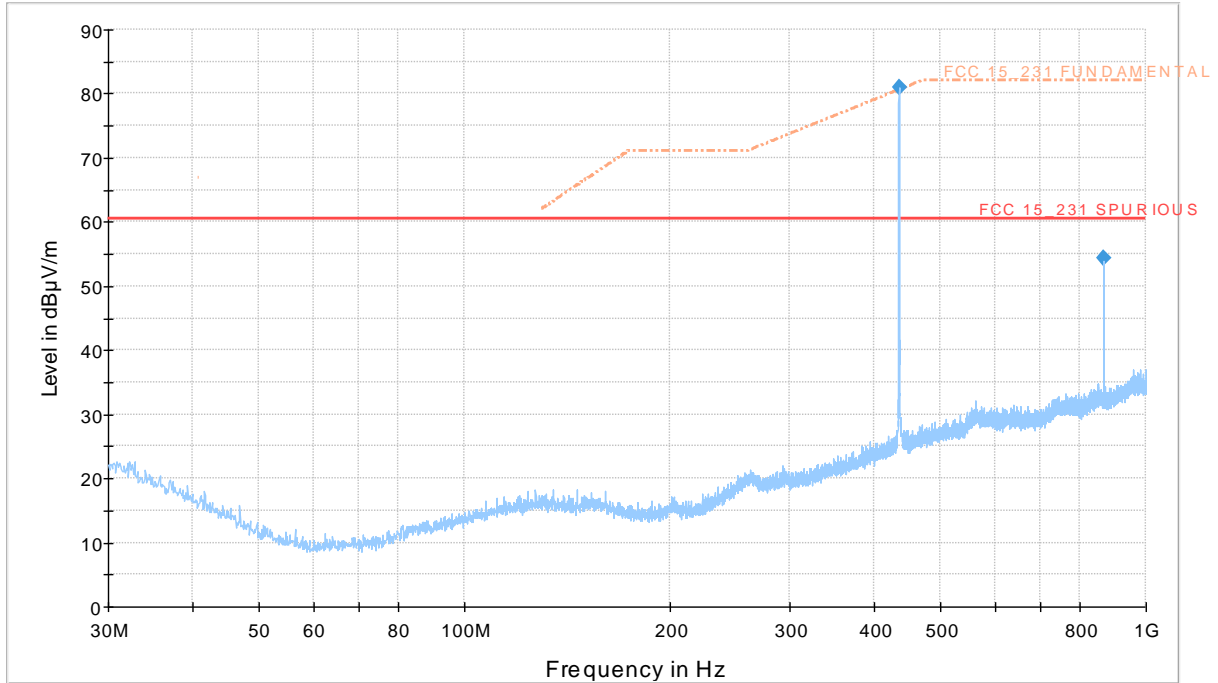


**PRIMA**

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|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | YZ PLANE     |
| <b>FREQUENCY RANGE</b>      | 30MHz – 1GHz |
| <b>ANTENNA POLARIZATION</b> | VERTICAL     |



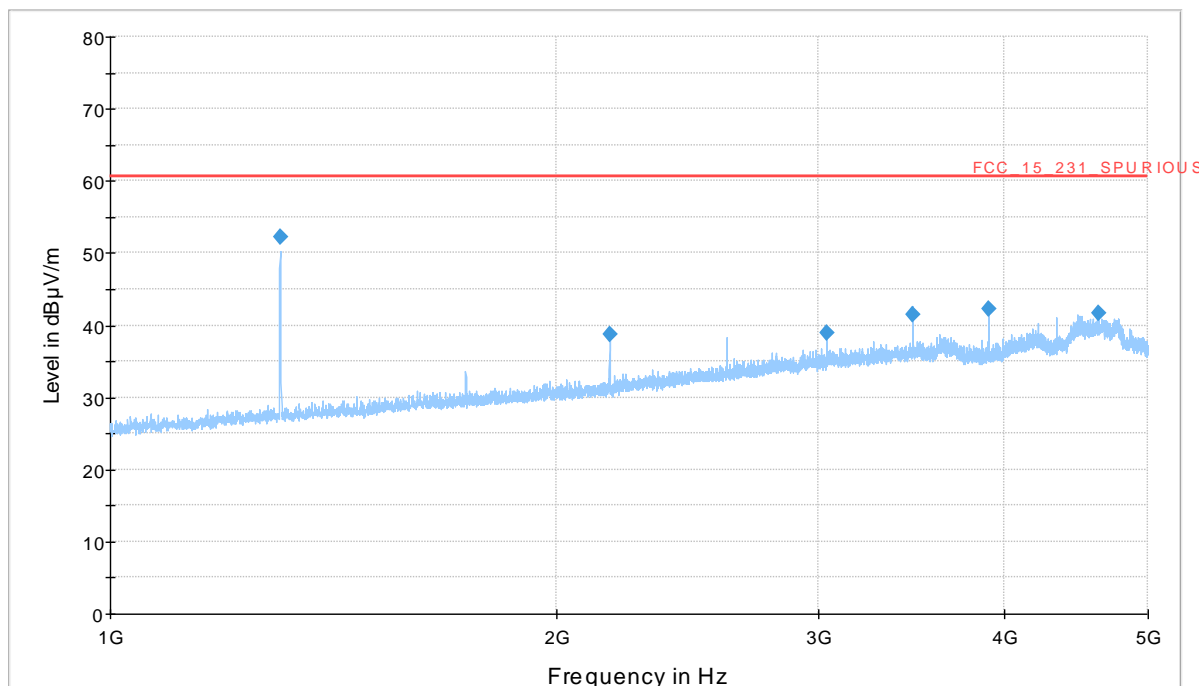
Blue trace Peak detector, Blue Marker Peak detector

### Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 433.908000      | 81.1              | 100.000         | 259.0       | V    | 0.0           | 16.82                      | 64.28            | 80.58          | 16.3        | PASS   |
| 867.886000      | 54.3              | 100.000         | 100.0       | V    | 179.0         | 16.82                      | 37.48            | 60.58          | 23.1        | PASS   |



|                             |          |
|-----------------------------|----------|
| <b>EUT POSITION</b>         | YZ PLANE |
| <b>FREQUENCY RANGE</b>      | 1-5GHz   |
| <b>ANTENNA POLARIZATION</b> | VERTICAL |

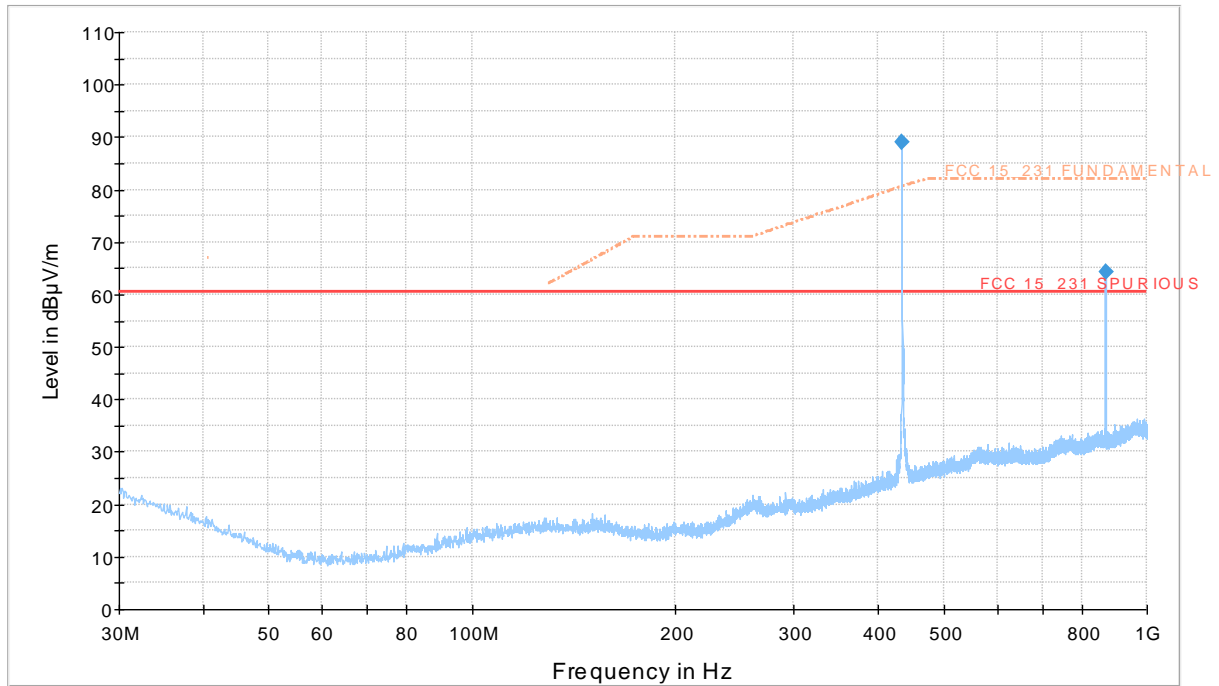


Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 1301.60000      | 52.2              | 100.000         | 103.0       | V    | 179.0         | 16.82                      | 35.38            | 60.58          | 25.2        | PASS   |
| 2169.60000      | 38.8              | 100.000         | 103.0       | V    | 179.0         | 16.82                      | 21.98            | 60.58          | 38.6        | PASS   |
| 3037.20000      | 39.0              | 100.000         | 103.0       | V    | 2.0           | 16.82                      | 22.18            | 60.58          | 38.4        | PASS   |
| 3471.60000      | 41.4              | 100.000         | 103.0       | V    | 90.0          | 16.82                      | 24.58            | 60.58          | 36.0        | PASS   |
| 3905.60000      | 42.3              | 100.000         | 103.0       | V    | 179.0         | 16.82                      | 25.48            | 60.58          | 35.1        | PASS   |
| 4634.40000      | 41.6              | 100.000         | 259.0       | V    | 270.0         | 16.82                      | 24.78            | 60.58          | 35.8        | PASS   |

|                             |              |
|-----------------------------|--------------|
| <b>EUT POSITION</b>         | YZ PLANE     |
| <b>FREQUENCY RANGE</b>      | 30MHz – 1GHz |
| <b>ANTENNA POLARIZATION</b> | HORIZONTAL   |



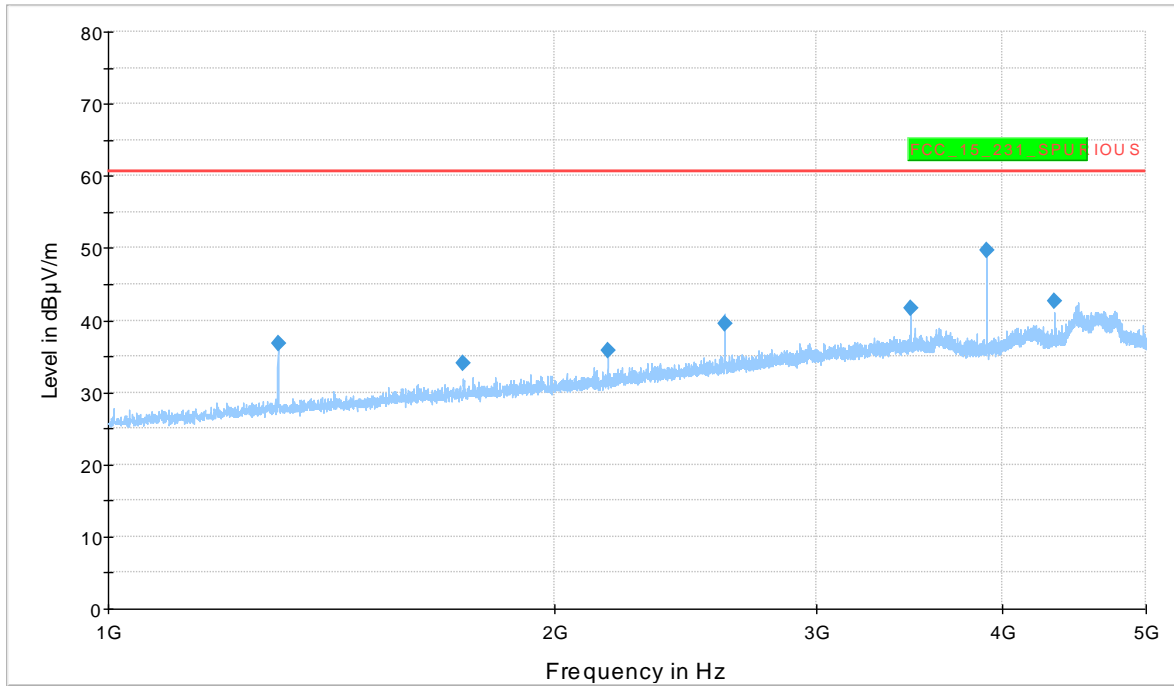
Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 433.908000      | 88.9              | 100.000         | 102.0       | H    | 90.0          | 16.82                      | 72.08            | 80.58          | 8.5         | PASS   |
| 867.886000      | 64.3              | 100.000         | 102.0       | H    | 90.0          | 16.82                      | 47.48            | 60.58          | 13.1        | PASS   |



|                             |            |
|-----------------------------|------------|
| <b>EUT POSITION</b>         | YZ PLANE   |
| <b>FREQUENCY RANGE</b>      | 1-5GHz     |
| <b>ANTENNA POLARIZATION</b> | HORIZONTAL |



Blue trace Peak detector, Blue Marker Peak detector

## Final Result

| Frequency (MHz) | Max Peak (dBµV/m) | Bandwidth (kHz) | Height (cm) | Pol. | Azimuth (deg) | Duty Cycle correction (dB) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Result |
|-----------------|-------------------|-----------------|-------------|------|---------------|----------------------------|------------------|----------------|-------------|--------|
| 1301.60000      | 36.8              | 100.000         | 100.0       | H    | 88.0          | 16.82                      | 19.98            | 60.58          | 40.6        | PASS   |
| 1735.60000      | 34.0              | 100.000         | 258.0       | H    | 180.0         | 16.82                      | 17.18            | 60.58          | 43.4        | PASS   |
| 2169.60000      | 35.8              | 100.000         | 259.0       | H    | 0.0           | 16.82                      | 18.98            | 60.58          | 41.6        | PASS   |
| 2603.60000      | 39.5              | 100.000         | 258.0       | H    | 180.0         | 16.82                      | 22.68            | 60.58          | 37.9        | PASS   |
| 3471.60000      | 41.7              | 100.000         | 100.0       | H    | 180.0         | 16.82                      | 24.88            | 60.58          | 35.7        | PASS   |
| 3905.20000      | 49.7              | 100.000         | 103.0       | H    | 0.0           | 16.82                      | 32.88            | 60.58          | 27.7        | PASS   |

## 7. LIST OF EQUIPMENT USED

| EQUIPMENT                                       | MANUFACTURER    | MODEL                 | SERIAL Nr.          | CAL. DUE |
|---|-----------------|-----------------------|---------------------|----------|
| EMI TEST RECEIVER<br>20Hz - 40GHz               | Rohde & Schwarz | ESU40                 | 100111              | MAY 2017 |
| RF SEMI-ANECHOIC CHAMBER<br>(CSSA)              | Siemens         | B83117-D6019-<br>T232 | 003-005-<br>134/94C | JAN 2017 |
| BILOG ANTENNA                                   | Chase           | CBL6111C              | 2717                | MAY 2017 |
| LOG PERIODIC ANTENNA<br>BROAD BAND<br>1-26,5GHz | Rohde & Schwarz | HL050                 | 100437              | APR 2017 |
| SPECTRUM ANALYZER                               | Rohde & Schwarz | FSP40                 | 100038              | JAN 2017 |
| SYSTEM DC POWER SUPPLY                          | HP              | 6623A                 | 3448A04501          | JAN 2017 |
| HIGH PASS FILTER                                | Wainwright      | WHNX 1,3/18G-<br>10SS | 1                   | NOV 2017 |