

# Report on the FCC and IC Testing of the XTRONIC GmbH Model: MBAC BM V001

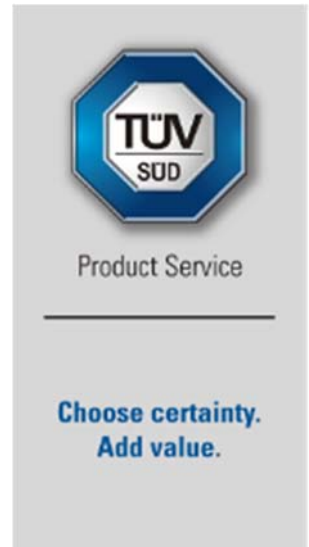
In accordance with FCC 47 CFR Part 15C and  
ISED Canada RSS-247 and ISED Canada RSS-  
GEN

Prepared for: XTRONIC GmbH  
Herrenberger Straße 56  
71034 Böblingen  
Germany

FCC ID: 2ASIZ-00001  
IC: 24737-00001

## COMMERCIAL-IN-CONFIDENCE

Date: 2020-03-31  
Document Number: TR-17231-75283-03 Issue: 05



| RESPONSIBLE FOR      | NAME            | DATE       | SIGNATURE          |
|----------------------|-----------------|------------|--------------------|
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| Authorised Signatory | Matthias Stumpe | 2020-03-31 | <br>SIGN-ID 344464 |

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

### ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C and ISED Canada RSS-247 and ISED Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

| RESPONSIBLE FOR | NAME           | DATE       | SIGNATURE          |
|-----------------|----------------|------------|--------------------|
| Testing         | Michael Ingerl | 2020-03-31 | <br>SIGN-ID 344134 |

Laboratory Accreditation  
DAkkS Reg. No. D-PL-11321-11-02

Laboratory recognition  
Registration No. BNetzA-CAB-16/21-15

ISED Canada test site registration  
3050A-2

### EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C, ISED Canada RSS-247 and ISED Canada RSS-GEN:2016, Issue 2 (2016) and Issue 5 (2019).

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# 1 Report Summary

## 1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

| Issue | Description of Change                                                                                                                            | Date of Issue |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 1     | First Issue                                                                                                                                      | 2019-12-17    |
| 2     | Added the antenna (A177 905 29 02 / 002)<br>Tested Spurious Emissions.<br>Added Software Version, Test Plan/Manual, Description of Modification. | 2020-01-17    |
| 3     | Added at chapter 3.6.4 "This test was performed conducted"                                                                                       | 2020-01-24    |
| 4     | Changed IC and FCC ID.<br>Changed Marking Plate.                                                                                                 | 2020-02-05    |
| 5     | Changed RSS GEN from Issue 4 to Issue 5.                                                                                                         | 2020-03-31    |

**Table 1**

## 1.2 Introduction

|                               |                                                                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Applicant                     | XTRONIC GmbH                                                                                                                        |
| Manufacturer                  | XTRONIC GmbH                                                                                                                        |
| Model Number(s)               | MBAC BM V001                                                                                                                        |
| Serial Number(s)              | XD10201011                                                                                                                          |
| Hardware Version(s)           | A910 901 03 00 ZGS 004                                                                                                              |
| Software Version(s)           | SW-GW: A910 902 04 00<br>SW-IO: A910 902 13 00<br>SW-PC: A910 902 12 00<br>SW-BT: 19/47/03                                          |
| Number of Samples Tested      | 1                                                                                                                                   |
| Test Specification/Issue/Date | FCC 47 CFR Part 15C Section 15.207 and 15.209, ISED Canada RSS-247 and ISED Canada RSS-GEN:2016, Issue 2 (2016) and Issue 5 (2019). |
| Test Plan/Manual              | 20191010_ACU_technical_description_02.pdf<br>DO403-05_PRJ592_Funkzulassung_BLE_Anleitung_20191126.pdf                               |
| Order Number                  | BE-2019-0706                                                                                                                        |
| Date                          | 2019-10-29                                                                                                                          |
| Date of Receipt of EUT        | 2019-11-21                                                                                                                          |
| Start of Test                 | 2019-12-05                                                                                                                          |
| Finish of Test                | 2020-01-16                                                                                                                          |
| Name of Engineer(s)           | Matthias Stumpe, Agnieszka Hruszcz, Michael Ingerl                                                                                  |
| Related Document(s)           | ANSI C63.10 (2013)<br>KDB 662911 D01 v02r02                                                                                         |



### 1.3 Brief Summary of Results

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

| Section                                                                            | Specification Clause             | Test Description                  | Result | Comments/Base Standard                      |
|------------------------------------------------------------------------------------|----------------------------------|-----------------------------------|--------|---------------------------------------------|
| Configuration and Mode: Continuously Transmitting – 2402 MHz / 2440 MHz / 2480 MHz |                                  |                                   |        |                                             |
| 3.1                                                                                | 15.247 (d), 15.205, 5.5 and 6.13 | Spurious Radiated Emissions       | Pass   | ANSI C63.10 (2013)                          |
| 3.2                                                                                | 15.247 (d) and 5.5               | Spurious Conducted Emissions      | Pass   | ANSI C63.10 (2013)                          |
| 3.3                                                                                | 15.205 N/A and 8.10              | Restricted Band Edges             | Pass   | ANSI C63.10 (2013)                          |
| 3.4                                                                                | 15.247 (d), 5.5 and N/A          | Authorised Band Edges             | Pass   | ANSI C63.10 (2013)                          |
| 3.5                                                                                | 15.247 (a)(2), 5.2 and 6.6       | Emission Bandwidth                | Pass   | ANSI C63.10 (2013)                          |
| 3.6                                                                                | 15.247 (e), 5.2 and 6.12         | Power Spectral Density            | Pass   | ANSI C63.10 (2013)<br>KDB 662911 D01 v02r02 |
| 3.7                                                                                | 15.247 (b), 5.4 and 6.12         | Maximum Conducted Output Power    | Pass   | ANSI C63.10 (2013)<br>KDB 662911 D01 v02r02 |
| 3.8                                                                                | 15.207, N/A and 8.8              | AC Power Line Conducted Emissions | Pass   | ANSI C63.10 (2013)                          |
| 3.9                                                                                | RSS-Gen, Issue 5                 | Transmitter frequency stability   | Pass   | RSS-Gen, Issue 5 (2019), chapter 6.11       |
| 3.10                                                                               | RSS-Gen, Issue 5                 | Exposure of Humans to RF Fields   | Pass   | RSS-Gen, Issue 5 (2019), chapter 3.4        |

**Table 2**



Product Service

## **1.4 Product Information**

### **1.4.1 Technical Description**

Control Unit for Digitalization, Integration and User Interface - Type "BM" is an Advanced Control Unit operating within the 2.4 GHz Bluetooth Band. The EUT is DC - powered with nominal power supply voltage 13,5 V DC.

Channels Verified:

|      |            |
|------|------------|
| Low  | (2402 MHz) |
| Mid  | (2440 MHz) |
| High | (2480 MHz) |

Antenna Models:      A205 905 11 17 / 002 with 1,5 dBi  
                                 A177 905 29 02 / 002 with 2,0 dBi

EUT Technical Parameters relevant for testing in acc. with FCC 47 CFR Part 15C and ISED Canada RSS-247 and ISED Canada RSS-GEN:

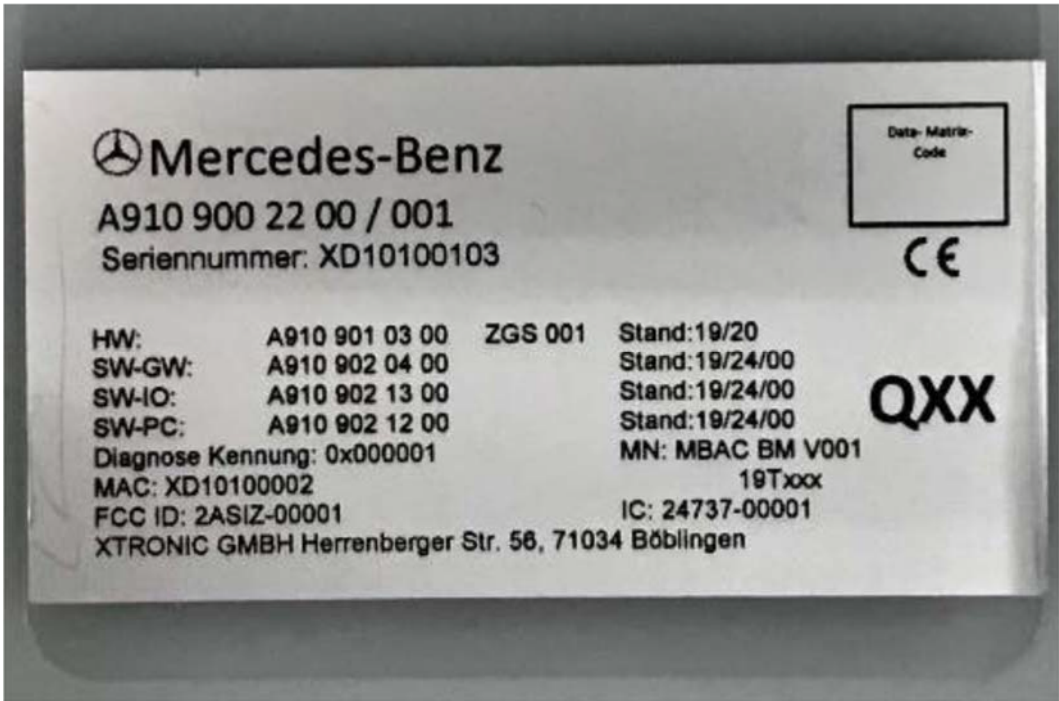


| Equipment characteristics:                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                |                                                                       |                                                                                             |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Type of equipment:                                                                                           | Advanced Control Unit                                                                                                                                                                                                                                                                                                                                                                          |                                                                       |                                                                                             |
| Type designation*:                                                                                           | Control Unit for: <ul style="list-style-type: none"> <li>• Digitalization</li> <li>• Integration</li> <li>• User Interface</li> </ul>                                                                                                                                                                                                                                                          |                                                                       |                                                                                             |
| *Please consider:                                                                                            | If the type designation has to be changed in the report the whole test of the product has to be repeated!<br>More Info:<br>Only available in german language:<br><a href="http://www.dakks.de/sites/default/files/dokumente/71_sd_0_019_beschluesse_horizonta_l_20160914_v1.0.pdf">http://www.dakks.de/sites/default/files/dokumente/71_sd_0_019_beschluesse_horizonta_l_20160914_v1.0.pdf</a> |                                                                       |                                                                                             |
| Parts of the system:                                                                                         | ---                                                                                                                                                                                                                                                                                                                                                                                            |                                                                       |                                                                                             |
| Commercial value:                                                                                            | ---                                                                                                                                                                                                                                                                                                                                                                                            |                                                                       |                                                                                             |
| Version of EUT:<br>In case of already tested products please describe the differences to the original sample | ---                                                                                                                                                                                                                                                                                                                                                                                            |                                                                       |                                                                                             |
| Serial number:                                                                                               | ---                                                                                                                                                                                                                                                                                                                                                                                            |                                                                       |                                                                                             |
| Power supply:                                                                                                | <input type="checkbox"/> AC<br>Nominal: V<br>Minimum: V<br>Maximum: V<br>Nominal frequency: Hz                                                                                                                                                                                                                                                                                                 | <input type="checkbox"/> DC<br>Nominal: V<br>Minimum: V<br>Maximum: V | <input checked="" type="checkbox"/> Battery<br>Nominal: 12 V<br>Minimum: 6V<br>Maximum: 16V |
| highest frequency generated or used within the EUT                                                           | 2.4 GHz radio frequency (Bluetooth)<br><br>16 MHz CPU clock (internal)<br><br><input type="checkbox"/> < 108 MHz                                                                                                                                                                                                                                                                               |                                                                       |                                                                                             |
| operating temperature range                                                                                  | Nominal: (23 ± 5) °C<br>Minimum: -40 °C<br>Maximum: 80°C                                                                                                                                                                                                                                                                                                                                       |                                                                       |                                                                                             |

### Marking Plate



Product Service



Provided by applicant

## 1.5 Deviations from the Standard

none

## 1.6 EUT Modification Record

The table below details modifications made to the EUT during the test programme.  
The modifications incorporated during each test are recorded on the appropriate test pages.

| Modification State | Description of Modification still fitted to EUT                                                                                                                                                                                                                                                  | Modification Fitted By | Date Modification Fitted |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------|
| 0                  | As supplied by the customer:<br>-R20, R639 and R640 removed<br>-JP1, JP2 and J19 assembled<br>- For operation, only the vehicle battery is connected to reach the test state. Test state:<br>Only the BT module is operated, all other components are powerless.<br>-BT-Version: SW-BT: 19/47/03 | Not Applicable         | Not Applicable           |

**Table 3**

## 1.7 Test Location

TÜV SÜD Product Service conducted the following tests at our Straubing Test Laboratory.

| Test Name                                         | Name of Engineer(s)             |
|---------------------------------------------------|---------------------------------|
| Configuration and Mode: Continuously Transmitting |                                 |
| Spurious Radiated Emissions                       | Matthias Stumpe, Michael Ingerl |
| Spurious Conducted Emissions                      | Matthias Stumpe                 |
| Restricted Band Edges                             | Matthias Stumpe                 |
| Authorised Band Edges                             | Matthias Stumpe                 |
| Emission Bandwidth                                | Matthias Stumpe                 |
| Power Spectral Density                            | Matthias Stumpe                 |
| Maximum Conducted Output Power                    | Matthias Stumpe                 |
| AC Power Line Conducted Emissions                 | Matthias Stumpe                 |
| Transmitter frequency stability                   | Matthias Stumpe                 |
| Exposure of Humans to RF Fields                   | Matthias Stumpe                 |

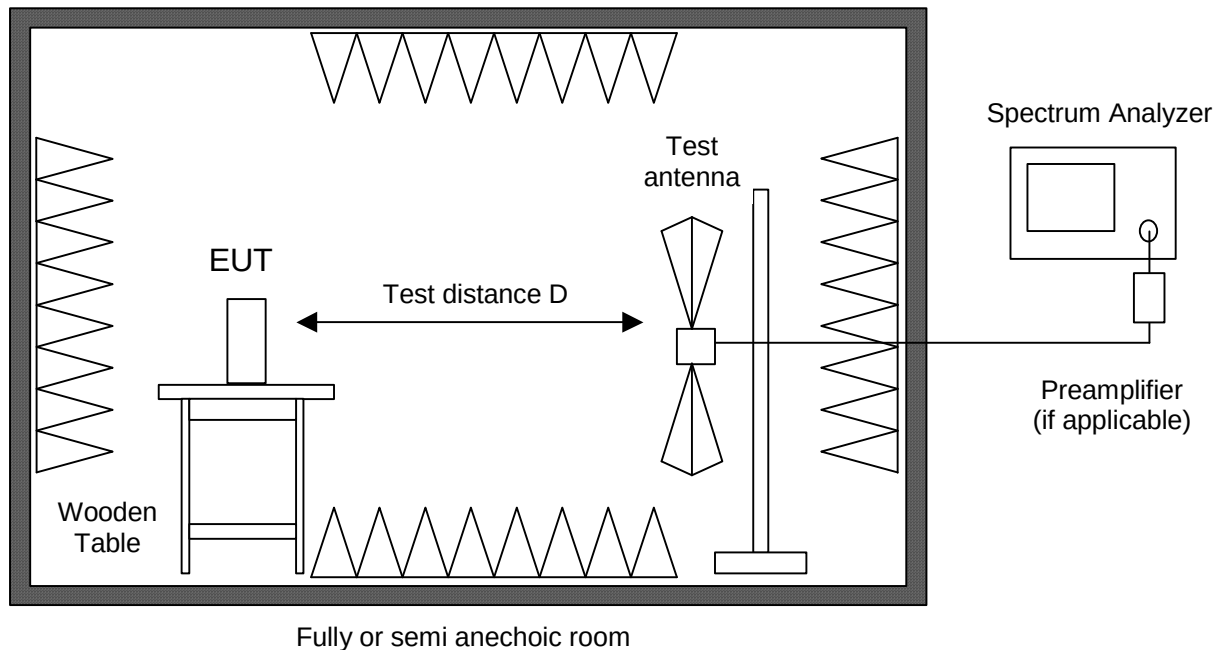
**Table 4**

Office Address:

Äußere Frühlingstraße 45  
94315 Straubing  
Germany

## 2 Test Setups

### 2.1.1.1 Radiated Emission in Fully or Semi Anechoic Room



Radiated emission in fully or semi anechoic room is measured in the frequency range from 30 MHz to the maximum frequency as specified in CFR 47 Part 15 section 15.33.

Measurements are made in both the horizontal and vertical planes of polarization using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 100 kHz (below 1 GHz) or 1 MHz (above 1 GHz).

Testing up to 1 GHz is performed with a linear polarized logarithmic periodic antenna combined with a 4:1 broadband dipole ("Trilog broadband antenna"). For testing above 1 GHz horn antennas are used.

All tests below 8.2 GHz are performed at a test distance  $D$  of 3 meters. For higher frequencies the test distance may be reduced (e.g. to 1 meter) due to the sensitivity of the measuring instrument(s) and the test results are calculated according to CFR 47 Part 15 section 15.31(f)(1) using an extrapolation factor of 20 dB/decade. If required, preamplifiers are used for the whole frequency range. Special care is taken to avoid overload, using appropriate attenuators and filters, if necessary.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.

Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

During testing the EUT is rotated all around to find the maximum levels of emissions. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

For final testing below 1 GHz a semi anechoic room complying with the NSA requirements of ANSI C63.4 for alternative test sites is used (see 2.1.1.2). If prescans are recorded in fully anechoic room they are indicated appropriately.



According to section 13 of KDB558074 the requirement for radiated emissions on the band edges was performed with a reduced bandwidth of 100 kHz instead of 1 MHz.

Radiated emission in the frequency range 9 kHz to 30 MHz is measured using an active loop antenna. First the whole spectrum of emission caused by the equipment is recorded at a distance of 3 meters in a fully or semi anechoic room with the detector of the spectrum analyzer or EMI receiver set to peak. This configuration is also used for recording the spectrum of intentional radiators.

Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

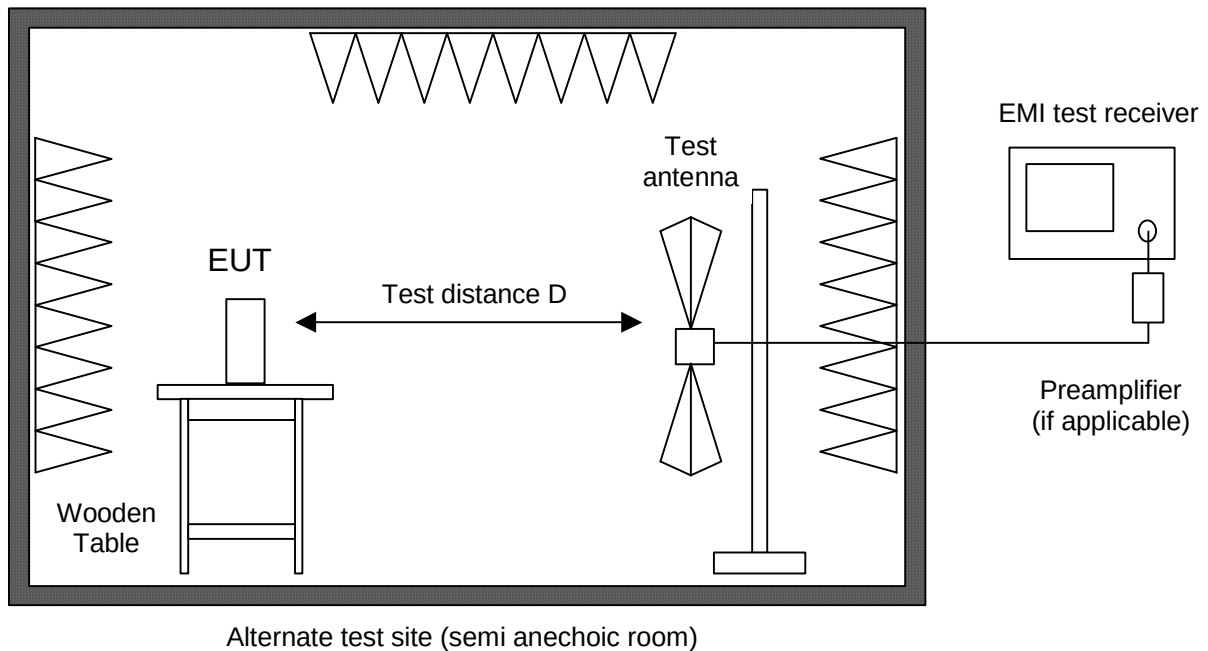
EUT is rotated all around to find the maximum levels of emissions. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

If worst case emission of the EUT cannot be recorded with EUT in standard position and loop antenna in vertical polarization the EUT (or the radiating part of the EUT) is rotated by 90 degrees instead of changing the loop antenna to horizontal polarization. This procedure is selected to minimize the influence of the environment (e.g. effects caused by the floor especially with longer distances).

Final measurement is performed at a test distance D of 30 meters using an open field test site. In case the regulation requires testing at other distances, the result is extrapolated by either making measurements at an additional distance D of 10 meters to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). In cases of very low emissions measurements are performed at shorter distances and results are extrapolated to the required distance. The provisions of CFR 47 Part 15 sections 15.31(d) and (f)(2) apply. According to CFR 47 Part 15 section 15.209(d) final measurement is performed with detector function set to quasi-peak except for the frequency bands 9 to 90 kHz and 110 to 490 kHz where, for non-pulsed operation, average detector is employed.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.

### 2.1.1.2 Radiated Emission at Alternative Test Site



Radiated emission in the frequency range 30 MHz to 1 GHz is measured within a semi-anechoic room with groundplane complying with the NSA requirements of ANSI C63.4 for alternative test sites. A linear polarized logarithmic periodic antenna combined with a 4:1 broadband dipole ("Trilog broadband antenna") is used. The measurement bandwidth of the test receiver is set to 120 kHz with quasi-peak detector selected.

If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.

Hand-held or body-worn devices are tested in the position producing the highest emission relative to the limit as verified by prescans in fully anechoic room.

If no prescan in a fully anechoic room is used first a peak scan is performed in four positions to get the whole spectrum of emission caused by EUT with the measuring antenna raised and lowered from 1 to 4 m to find table position, antenna height and antenna polarization for the maximum emission levels. Data reduction is applied to these results to select those levels having less margin than 10 dB to or exceeding the limit using subranges and limited number of maximums. Further maximization is following.

With detector of the test receiver set to quasi-peak final measurements are performed immediately after frequency zoom (for drifting disturbances) and maximum adjustment.

Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

In cases where prescans in a fully anechoic room are taken (e. g. if EUT is operating for a short time only or battery is discharged quickly) final measurements with quasi-peak detector are performed manually at frequencies indicated by prescan with EUT rotating all around and receiving antenna raising and lowering within 1 meter to 4 meters to find the maximum levels of emission.

Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.



Product Service

For measuring emissions of intentional radiators and receivers a test distance D of 3 meters is selected. Testing of unintentional radiators is performed at a distance of 10 meters. If limits specified for 3 meters shall be used for measurements performed at 10 meters distance the limits are calculated according to CFR 47 Part 15 section 15.31(d) and (f)(1) using an inverse linear-distance extrapolation factor of 20 dB/decade.

## 3 Test Details

### 3.1 Spurious Emissions

#### 3.1.1 Specification Reference

FCC 47 CFR Part 15C, ISED Canada RSS-247 and ISED Canada RSS-GEN, Clause 15.247 (d), 15.205, 5.5 and 6.13

#### 3.1.2 Equipment Under Test and Modification State

MBAC BM V001, S/N: XD10201011 - Modification State 0

#### 3.1.3 Date of Test

2019-12-05 to 2019-12-09 and 2020-01-16

#### 3.1.4 Test Method

Plots for average measurements were taken in accordance with ANSI C63.10-2013 clause 4.1.4.2.3 to characterize the EUT. Where emissions were detected, final average measurements were taken in accordance with ANSI C63.10-2013 clause 4.1.4.2.2.

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

The following conversion can be applied to convert from dBμV/m to μV/m:  
 $10^{(\text{Field Strength in dB}\mu\text{V/m}/20)}$

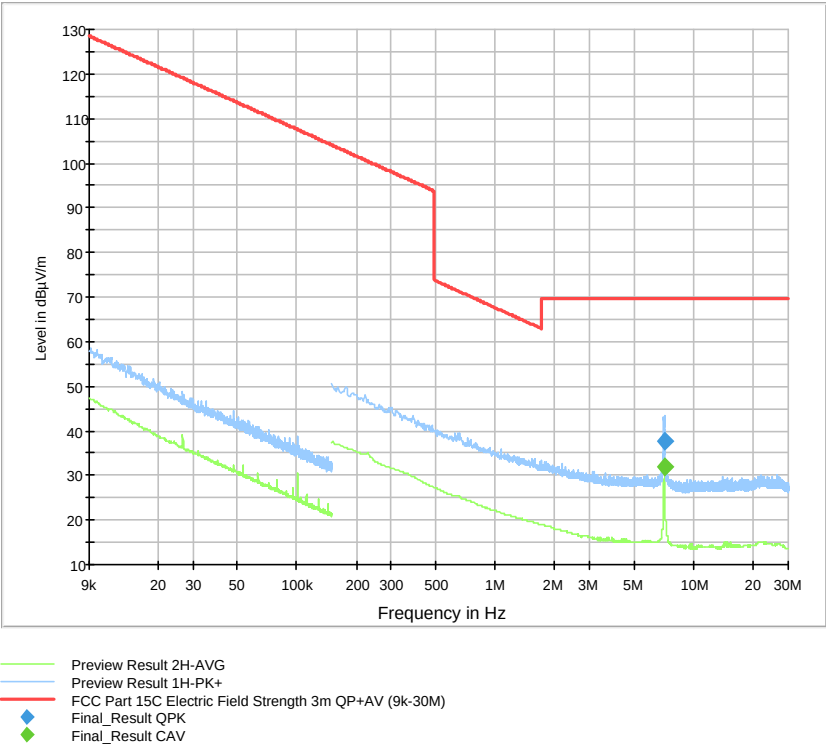
#### 3.1.5 Environmental Conditions

|                     |         |
|---------------------|---------|
| Ambient Temperature | 22.0 °C |
| Relative Humidity   | 29.0 %  |

3.1.6 Test Results

With Antenna A205 905 11 17 / 002

Spurious Emissions at Lowest Channel (2402 MHz)

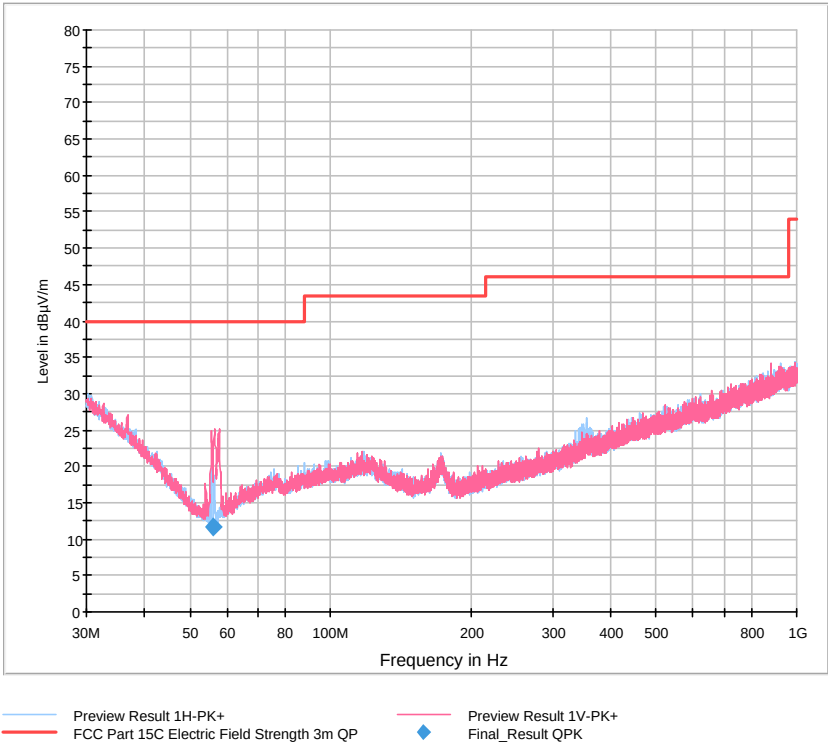


Final Results:

| Frequency | QuasiPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-----------|-----------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz       | dBµV/m    | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 7.118250  | ---       | 31.75    | ---    | ---    | 1000.0     | 9.000     | 100.0  | H   | 68.0    | 19.7  |
| 7.118250  | 37.72     | ---      | 69.54  | 31.82  | 1000.0     | 9.000     | 100.0  | H   | 68.0    | 19.7  |



Product Service

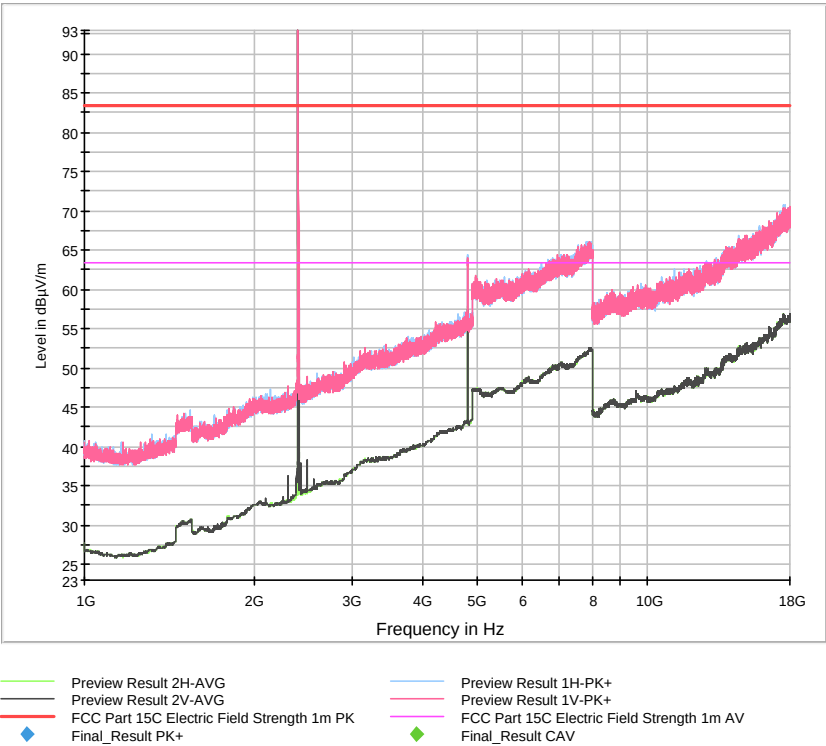


Final Results:

| Frequency | QuasiPeak | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-----------|-----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz       | dBµV/m    | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 56.190000 | 11.60     | 40.00  | 28.40  | 1000.0     | 120.000   | 100.0  | V   | 60.0    | 11.8  |



Product Service



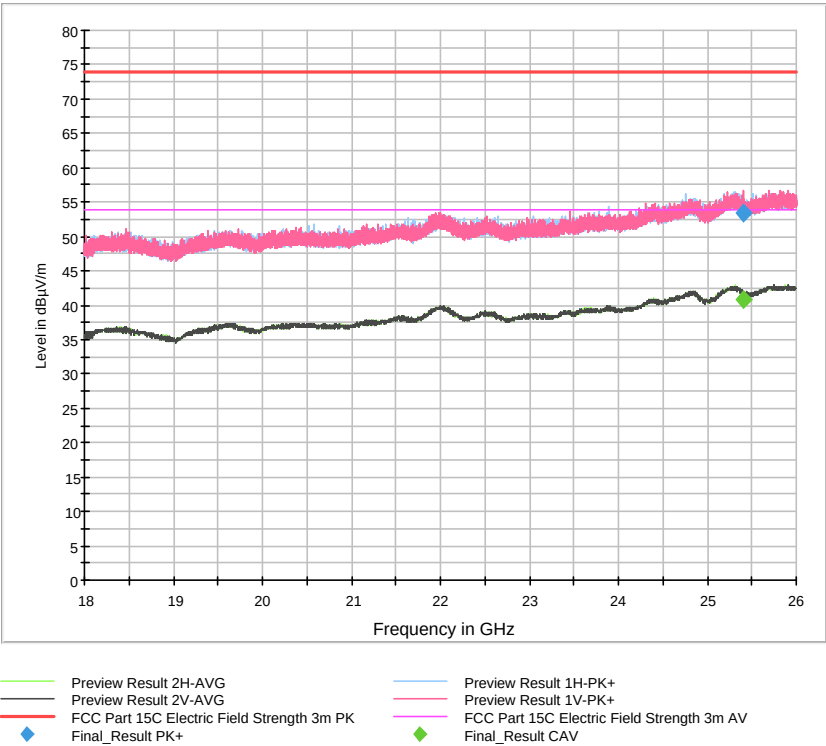
Final Results:

| Frequency   | MaxPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-------------|---------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz         | dBµV/m  | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB    |
| 2401.750000 | ---     | 102.83   | #1     | #1     | 1000.0     | 1000.000  | 108.0  | V   | 4.0     | 32.3  |
| 2401.750000 | 104.51  | ---      | #1     | #1     | 1000.0     | 1000.000  | 108.0  | V   | 4.0     | 32.3  |

#1 Intentional Radiator



Product Service

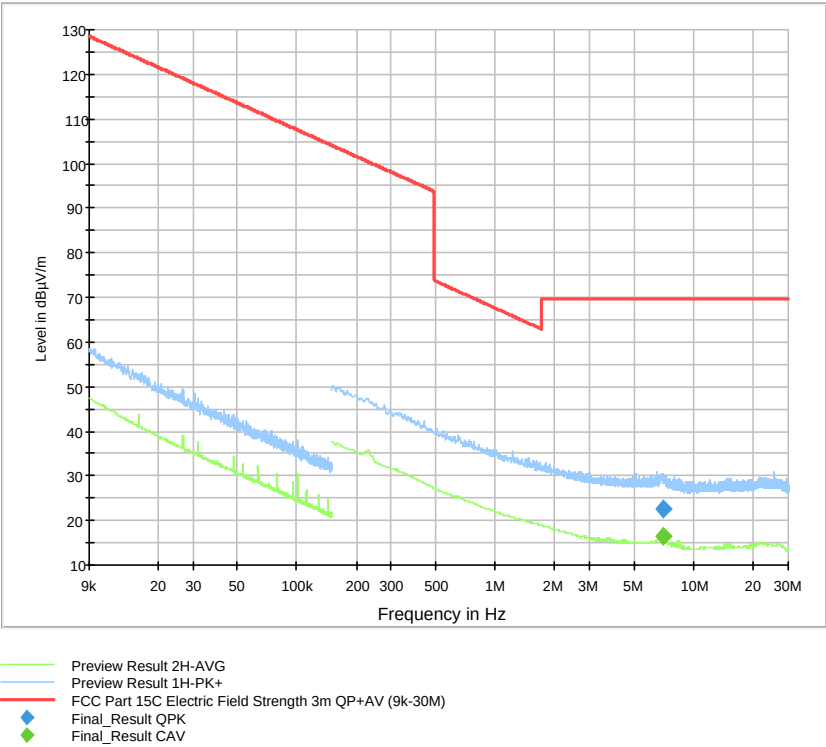


Final Results:

| Frequency    | MaxPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|--------------|---------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz          | dBµV/m  | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 25411.750000 | ---     | 40.76    | 53.98  | 13.22  | 1000.0     | 1000.000  | 225.0  | V   | 43.0    | 22.1  |
| 25411.750000 | 53.40   | ---      | 73.98  | 20.58  | 1000.0     | 1000.000  | 225.0  | V   | 43.0    | 22.1  |



Spurious Emissions at Middle Channel (2440 MHz)

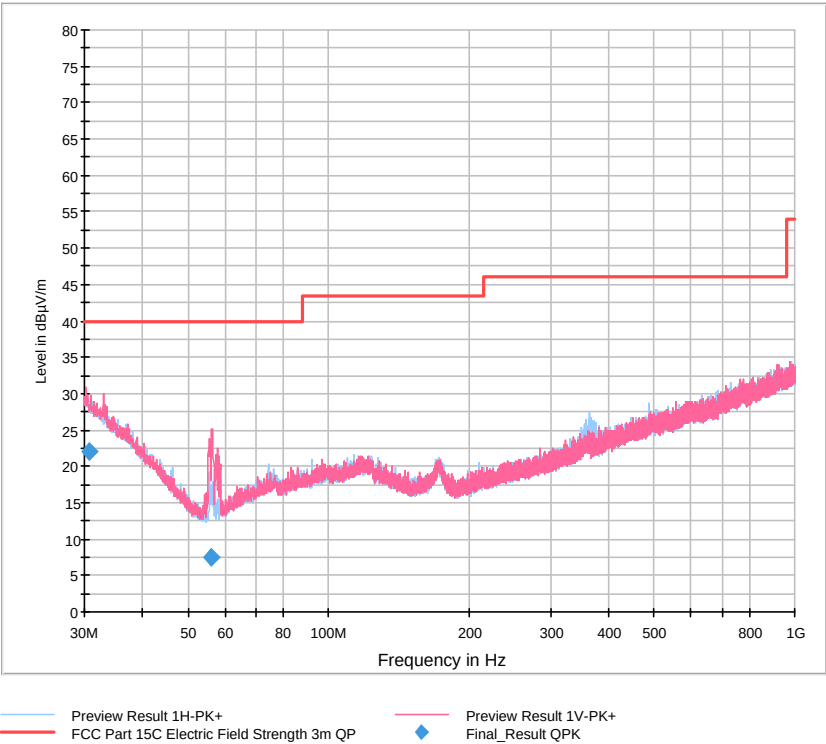


Final Results:

| Frequency | QuasiPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-----------|-----------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz       | dBµV/m    | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 7.039500  | ---       | 16.56    | ---    | ---    | 1000.0     | 9.000     | 100.0  | H   | 130.0   | 19.7  |
| 7.039500  | 22.75     | ---      | 69.54  | 46.79  | 1000.0     | 9.000     | 100.0  | H   | 130.0   | 19.7  |



Product Service

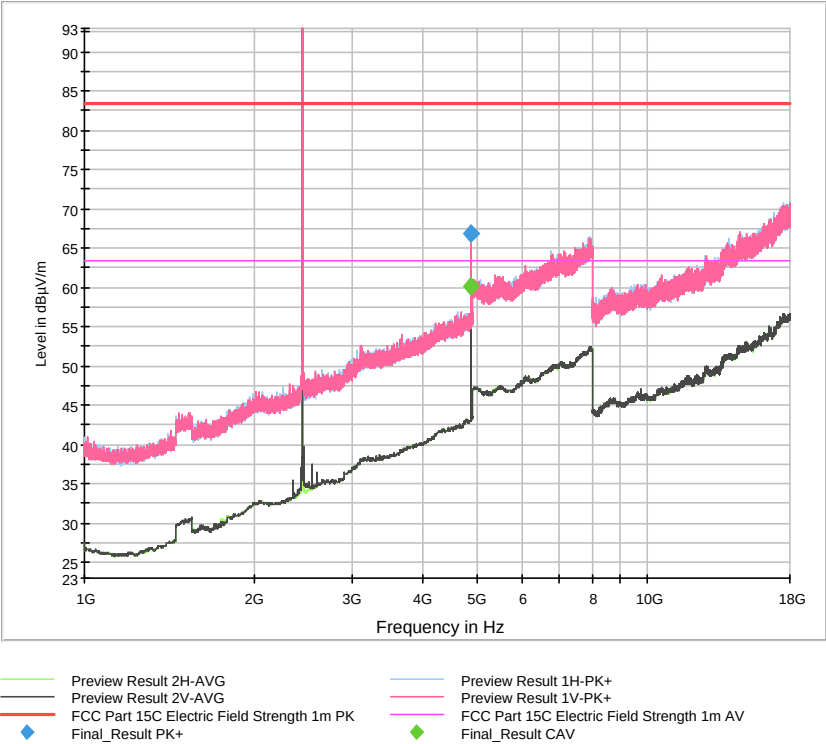


Final Results:

| Frequency | QuasiPeak | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-----------|-----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz       | dBµV/m    | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 30.720000 | 22.11     | 40.00  | 17.89  | 1000.0     | 120.000   | 390.0  | V   | -153.0  | 25.4  |
| 55.950000 | 7.59      | 40.00  | 32.41  | 1000.0     | 120.000   | 103.0  | V   | -7.0    | 11.8  |



Product Service



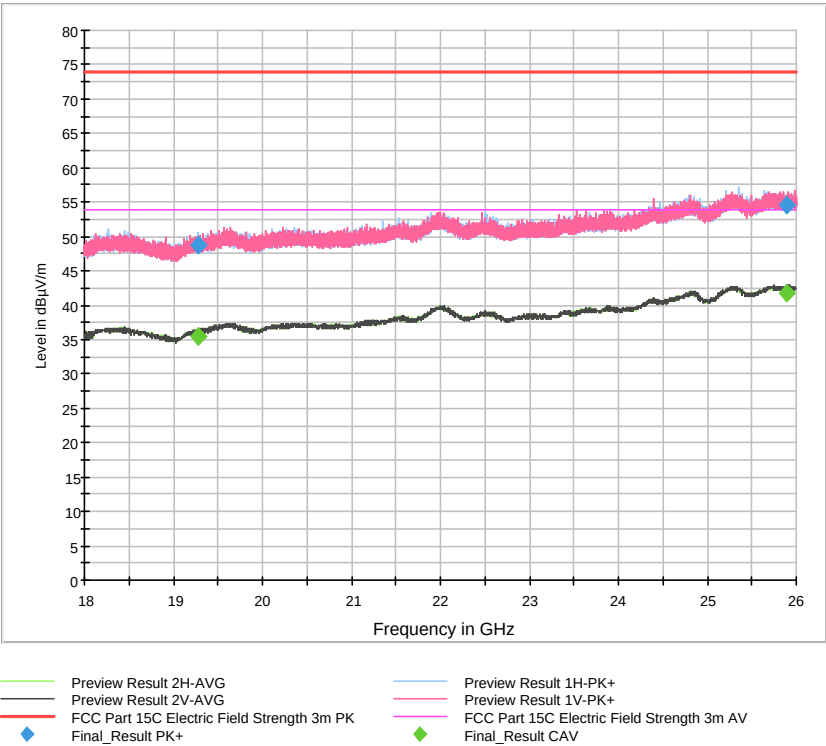
Final Results:

| Frequency   | MaxPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-------------|---------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz         | dBµV/m  | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB    |
| 2440.250000 | 103.08  | ---      | #1     | #1     | 1000.0     | 1000.000  | 108.0  | V   | -6.0    | 32.6  |
| 2440.250000 | ---     | 100.27   | #1     | #1     | 1000.0     | 1000.000  | 108.0  | V   | -6.0    | 32.6  |
| 4879.500000 | ---     | 60.21    | 63.50  | 3.29   | 1000.0     | 1000.000  | 187.0  | V   | -3.0    | 39.9  |
| 4879.500000 | 66.85   | ---      | 83.50  | 16.65  | 1000.0     | 1000.000  | 187.0  | V   | -3.0    | 39.9  |

#1 Intentional Radiator



Product Service

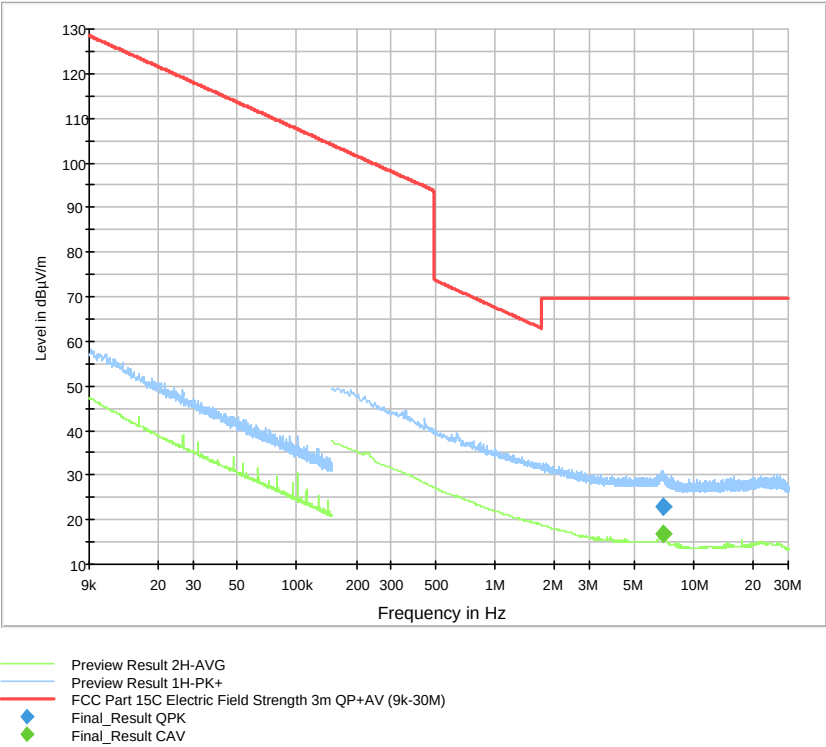


Final Results:

| Frequency    | MaxPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|--------------|---------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz          | dBµV/m  | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 19280.500000 | ---     | 35.57    | 53.98  | 18.41  | 1000.0     | 1000.000  | 197.0  | H   | -174.0  | 17.9  |
| 19280.500000 | 48.70   | ---      | 73.98  | 25.28  | 1000.0     | 1000.000  | 197.0  | H   | -174.0  | 17.9  |
| 25899.500000 | ---     | 41.68    | 53.98  | 12.30  | 1000.0     | 1000.000  | 100.0  | H   | -10.0   | 22.5  |
| 25899.500000 | 54.61   | ---      | 73.98  | 19.37  | 1000.0     | 1000.000  | 100.0  | H   | -10.0   | 22.5  |



Spurious Emissions at Highest Channel (2480 MHz)

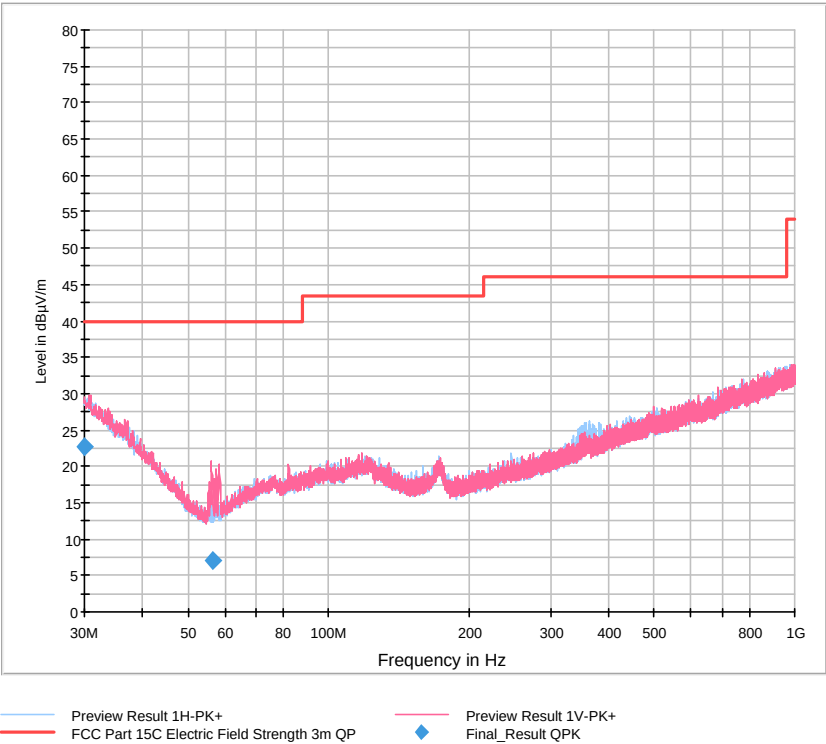


Final Results:

| Frequency | QuasiPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-----------|-----------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz       | dBµV/m    | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 6.978750  | ---       | 16.88    | ---    | ---    | 1000.0     | 9.000     | 100.0  | H   | -155.0  | 19.7  |
| 6.978750  | 22.90     | ---      | 69.54  | 46.64  | 1000.0     | 9.000     | 100.0  | H   | -155.0  | 19.7  |



Product Service

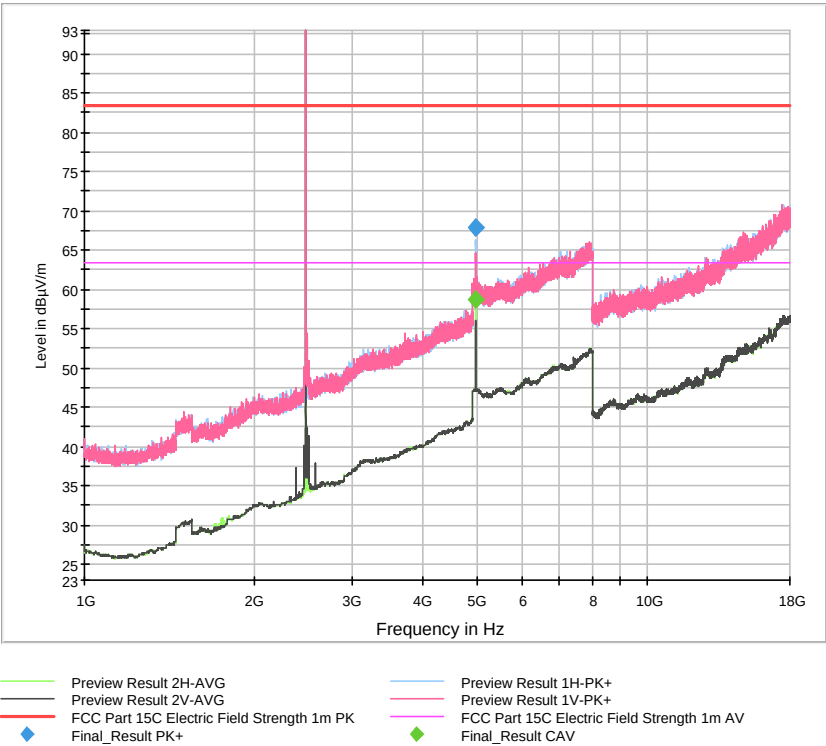


Final Results:

| Frequency | QuasiPeak | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-----------|-----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz       | dBµV/m    | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 30.090000 | 22.74     | 40.00  | 17.26  | 1000.0     | 120.000   | 150.0  | V   | -22.0   | 25.8  |
| 56.550000 | 7.03      | 40.00  | 32.97  | 1000.0     | 120.000   | 100.0  | V   | -148.0  | 11.9  |



Product Service



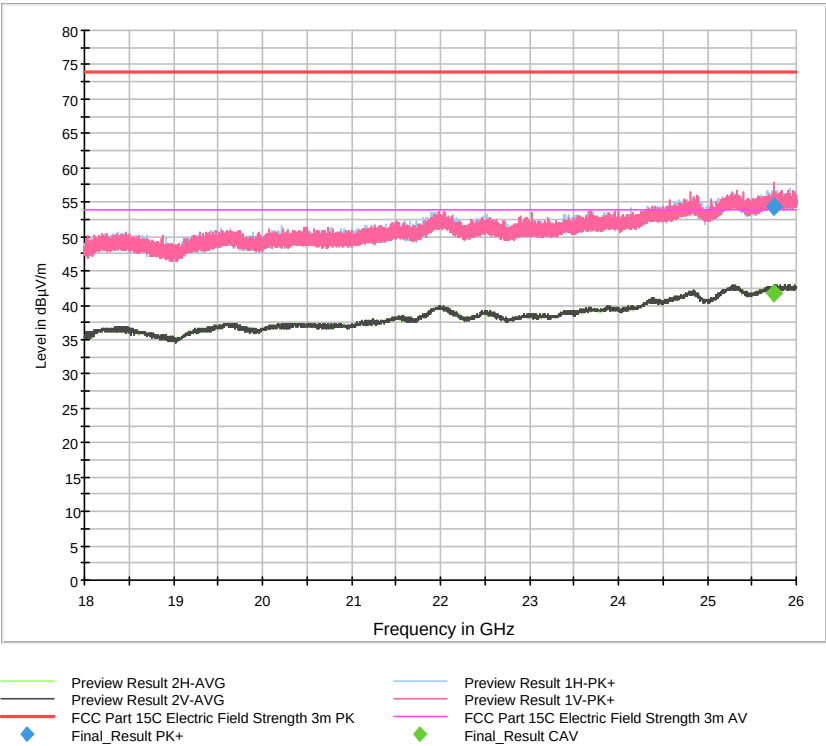
Final Results:

| Frequency   | MaxPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-------------|---------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz         | dBµV/m  | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB    |
| 2480.250000 | 106.31  | ---      | #1     | #1     | 1000.0     | 1000.000  | 103.0  | V   | 0.0     | 32.9  |
| 2480.250000 | ---     | 103.44   | #1     | #1     | 1000.0     | 1000.000  | 103.0  | V   | 0.0     | 32.9  |
| 4959.250000 | ---     | 58.67    | 63.50  | 4.83   | 1000.0     | 1000.000  | 125.0  | H   | -4.0    | 40.1  |
| 4959.250000 | 67.93   | ---      | 83.50  | 15.57  | 1000.0     | 1000.000  | 125.0  | H   | -4.0    | 40.1  |

#1 Intentional Radiator



Product Service



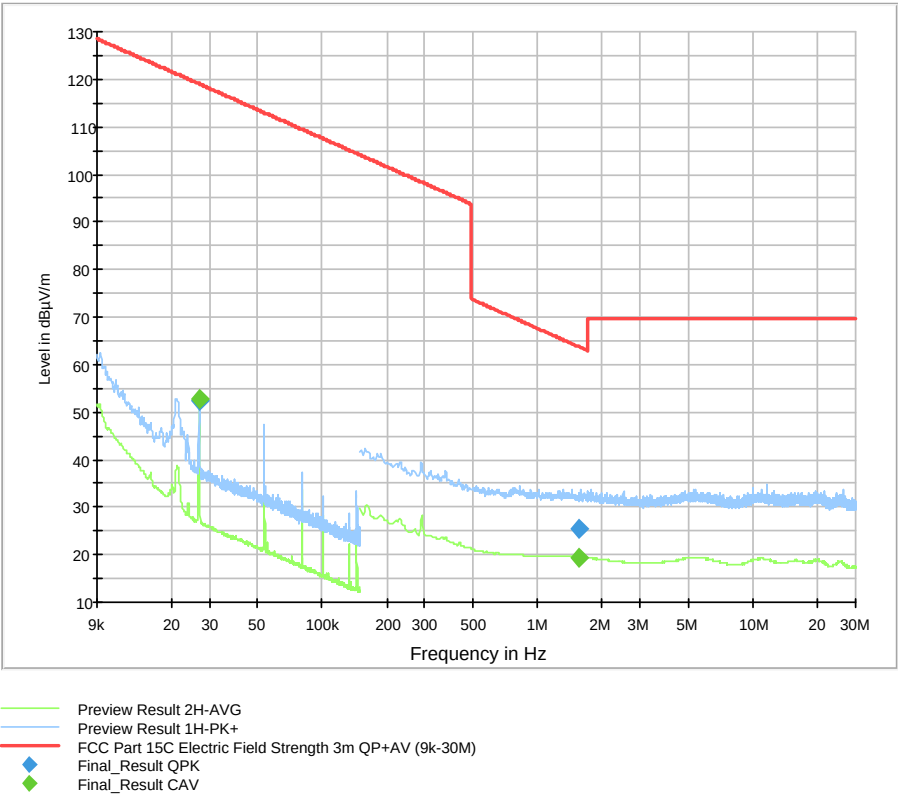
Final Results:

| Frequency    | MaxPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|--------------|---------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz          | dBµV/m  | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB/m  |
| 25748.750000 | ---     | 41.68    | 53.98  | 12.30  | 1000.0     | 1000.000  | 184.0  | V   | -15.0   | 22.0  |
| 25748.750000 | 54.42   | ---      | 73.98  | 19.56  | 1000.0     | 1000.000  | 184.0  | V   | -15.0   | 22.0  |



With Antenna A177 905 29 02 / 002

Spurious Emissions at Lowest Channel (2402 MHz)



Final Results 1:

| Frequency | QuasiPeak | CAverage | Limit  | Margin | Meas. Time | Bandwidth | Height | Pol | Azimuth | Corr. |
|-----------|-----------|----------|--------|--------|------------|-----------|--------|-----|---------|-------|
| MHz       | dBµV/m    | dBµV/m   | dBµV/m | dB     | ms         | kHz       | cm     |     | deg     | dB    |
| 0.026850  | ---       | 52.77    | ---    | ---    | 1000.0     | 0.200     | 100.0  | H   | -120.0  | 20.6  |
| 0.026850  | 52.22     | ---      | 119.03 | 66.81  | 1000.0     | 0.200     | 100.0  | H   | -120.0  | 20.6  |
| 1.549500  | ---       | 19.47    | ---    | ---    | 1000.0     | 9.000     | 100.0  | H   | 120.0   | 19.8  |
| 1.549500  | 25.50     | ---      | 63.80  | 38.30  | 1000.0     | 9.000     | 100.0  | H   | 120.0   | 19.8  |