



## TEST REPORT nr. R15139801

### Federal Communication Commission (FCC)

#### Test item

Description .....: TRANSMITTER UNIT  
Trademark .....: REMDEVICE  
Model/Type .....: PA / TYPE: BPM6  
FCC ID .....: RTF-PABPM6

#### Test Specification

Standard .....: FCC Rules & Regulations, Title 47:2014  
Part 15 paragraph(s): 203, 204, 207, 209 and 247

**Client's name** .....: REMDEVICE S.r.l.

Address .....: Via Munari, 72 – 36055 Nove (VI) – ITALY

**Manufacturer's name** : Same as client

Address .....: --

#### Report

Tested by .....: A. Bertezolo – Technician

Approved by .....: R. Beghetto – Laboratory Manager

Date of issue .....: 22.06.16

Contents .....: 51 pages

This test report shall not be reproduced except in full without the written approval of CMC.  
The test results presented in this report relate only to the item tested.



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## 1. Summary

*Standard:*

FCC Rules & Regulations, Title 47:2014  
Part 15 paragraph(s): 203, 204, 207, 209 and 247

| Test specifications    | Environmental Phenomena                                                     | Tests sequence | Result   |
|------------------------|-----------------------------------------------------------------------------|----------------|----------|
| Part 15.203            | Antenna requirements                                                        | 1              | Complies |
| Part 15.207            | Conducted emissions                                                         | --             | N.A. (+) |
| Part 15.209            | Emissions in restricted frequency bands and in unrestricted frequency bands | 2              | Complies |
| Part 15.209            | DTS bandwidth                                                               | 3              | Complies |
| Part 15.247 (d)        | Band edge                                                                   | 4              | Complies |
| Part 15.209 and 15.247 | Fundamental emission output power                                           | 5              | Complies |
| Part 15.209 and 15.247 | Maximum power spectral density level in the fundamental emission            | 6              | Complies |
| Part 15.209            | Spurious emission                                                           | 7              | Complies |
| Part 1.1310            | Maximum permissible exposure                                                | 8              | Complies |

(+) Devices which only employ battery power. See FCC Part 15.207 (c)

The Test Report was given to the Client representatives for necessary documentation of ratification of the tested equipment and it is valid for the FCC certification

## 2. Description of Equipment under test (EUT)

Power supply ..... : 3,6 Vdc

Serial Number..... : M003214

Type of equipment ..... : ☒ Transmitter Unit  
                                              ☐ Receiver Unit

Type of station ..... : ☒ Fixed station  
                                              ☐ Portable station  
                                              ☐ Mobile station

Frequency band ..... : F<sub>L</sub>: 902,5 MHz      F<sub>M</sub>: 915,0 MHz      F<sub>H</sub>: 927,5 MHz

## 2.1 Test Site

Company..... : CMC Centro Misure Compatibilità S.r.l.  
Address ..... : Via della Fisica, 20  
36016 Thiene (VI) – ITALY  
Test site facility's FCC registration number ..... : 271947

### 3. Testing and sampling

Date of receipt of test item ..... : 07.07.15

Testing start date ..... : 01.10.15

Testing end date ..... : 29.10.15

Samples tested nr..... : 1

Sampling procedure. .... : Equipment used for testing was picked up by the manufacturer, at the end of the production process with random criterion

Internal identification ..... : adhesive label with the product number P150800

#### 4. Operative conditions

EUT exercising ..... : EUT in continuous transmission at maximum power



## 5. Photograph(s) of EUT

### 5.1 Photograph(s) of EUT





## 6. Equipment list

| <i>Id. number</i> | <i>Manufacturer</i> | <i>Model</i> | <i>Description</i>        | <i>Serial number</i> | <i>Last calibration</i> | <i>Due date calibration</i> |
|-------------------|---------------------|--------------|---------------------------|----------------------|-------------------------|-----------------------------|
| CMC S010          | Rohde & Schwarz     | ESH3-Z2      | Impulses Limiting Device  | ---                  | January '16             | January '17                 |
| CMC S108          | EMCO                | 3115         | Horn Antenna              | 9811-5622            | May '13                 | May '16                     |
| CMC S127          | Schaffner           | HLA6120      | Loop Antenna              | 1191                 | January '16             | January '19                 |
| CMC S129          | Rohde & Schwarz     | ESPI7        | Receiver                  | 836.914/004          | January '16             | January '17                 |
| CMC S136          | Schwarzbeck         | VULB 9163    | Broadband Antenna         | 9136-205             | May '13                 | May '16                     |
| CMC S164          | Rohde & Schwarz     | ESU26        | EMC interference receiver | 100052               | January '16             | January '17                 |
| CMC S200          | Schwarzbeck         | NSLK 8128    | V-LISN                    | 8128-273             | January '16             | January '17                 |
| CMC S227          | Rohde & Schwarz     | ESR7         | EMI Test Receiver 7GHz    | 101121               | January '16             | January '17                 |



## 7. Measurement uncertainty

| Test                                                                | Expanded Uncertainty | note |
|---------------------------------------------------------------------|----------------------|------|
| <b>Conducted Emission</b>                                           |                      |      |
| (50Ω/50μH AMN) - (9 kHz – 150 kHz)                                  | ±3.6 dB              | 1    |
| (50Ω/50μH AMN) - (150 kHz – 30 MHz)                                 | ±3.0 dB              | 1    |
| (Voltage probe) - (150 kHz – 30 MHz)                                | ±2.8 dB              | 1    |
| (50Ω/5μH AMN) - (150 kHz – 108 MHz)                                 | ±2.6 dB              | 1    |
| <b>Discontinuous Conducted Emission</b>                             |                      |      |
| Conducted Emission (50Ω/50μH AMN) - (150 kHz – 30 MHz)              | ±3.0 dB              | 1    |
| <b>Disturbance Power (30 MHz – 300 MHz)</b>                         |                      |      |
|                                                                     | ±3.7 dB              | 1    |
| <b>Radiated Emission</b>                                            |                      |      |
| (0,150 MHz – 30 MHz)                                                | ±4.0 dB              | 1    |
| (30 MHz – 1000 MHz)                                                 | ±4.3 dB              | 1    |
| (1 GHz – 6 GHz)                                                     | ±4.5 dB              | 1    |
| <b>Electromagnetic field EMF</b>                                    |                      |      |
|                                                                     | ±10.5 %              | 1    |
| <b>Harmonic current emissions test</b>                              |                      |      |
|                                                                     | ±1.8 %               | 1    |
| <b>Voltage fluctuation and flicker test</b>                         |                      |      |
|                                                                     | ±2.6 %               | 1    |
| <b>Insertion loss test</b>                                          |                      |      |
|                                                                     | ±2.0 dB              | 1    |
| <b>Radiated electromagnetic disturbance test (loop antenna)</b>     |                      |      |
|                                                                     | ±2.1 dB              | 1    |
| <b>Radiated electromagnetic field immunity test</b>                 |                      |      |
|                                                                     | 0.81 V/m at 3V/m     | 1    |
| <b>Pulse modulated radiated electromagnetic field immunity test</b> |                      |      |
|                                                                     | 0.81 V/m at 3V/m     | 1    |
| <b>Injected currents immunity test</b>                              |                      |      |
|                                                                     | 0.45 V at 3V         | 1    |
| <b>Bulk current</b>                                                 |                      |      |
|                                                                     | 3.7 mA at 60 mA      | 1    |
| <b>Power frequency magnetic field immunity test</b>                 |                      |      |
|                                                                     | 0.1 A/m at 10 A/m    | 1    |
| <b>Effective radiated power (F &lt; 1GHz)</b>                       |                      |      |
|                                                                     | ±4.3 dB              | 1    |
| <b>Effective radiated power (F &gt; 1GHz)</b>                       |                      |      |
|                                                                     | ±3.7 dB              | 1    |
| <b>Frequency error</b>                                              |                      |      |
|                                                                     | < 1x10 <sup>-7</sup> | 1    |
| <b>Modulation bandwidth</b>                                         |                      |      |
|                                                                     | < 1x10 <sup>-7</sup> | 1    |
| <b>Conducted RF power and spurious emission</b>                     |                      |      |
|                                                                     | ±0.7 dB              | 1    |
| <b>Adjacent channel power</b>                                       |                      |      |
|                                                                     | ±1.2 dB              | 1    |
| <b>Blocking</b>                                                     |                      |      |
|                                                                     | ±1.2 dB              | 1    |
| <b>Electrostatic discharge immunity test</b>                        |                      |      |
|                                                                     |                      | 2    |
| <b>Electrical fast transients / burst immunity test</b>             |                      |      |
|                                                                     |                      | 2    |
| <b>Surge immunity test</b>                                          |                      |      |
|                                                                     |                      | 2    |
| <b>Pulse magnetic field immunity test</b>                           |                      |      |
|                                                                     |                      | 2    |
| <b>Damped oscillatory magnetic field immunity test</b>              |                      |      |
|                                                                     |                      | 2    |
| <b>Short interruption immunity test</b>                             |                      |      |
|                                                                     |                      | 2    |
| <b>Voltage transient emission test</b>                              |                      |      |
|                                                                     | ±2.2 %               | 1    |
| <b>Transient immunity test</b>                                      |                      |      |
|                                                                     |                      | 2    |

Rev\_15\_01 date 04/05/2015

### Note 1:

The expanded uncertainty reported according to EN55016-4-2:2011 is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of p = 95%

### Note 2:

It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95% confidence, covering factor k = 2.



## 8. Reference documents

| Reference no.                                      | Description                                                                                                                                                      |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC Rules and Regulation Title 47 part 15:2014     | --                                                                                                                                                               |
| ANSI C63.4:2014                                    | American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz |
| ANSI C63.10:2013                                   | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                                                                   |
| KDB 558074 D01 DTS Meas Guidance v03r03            | Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247                                                    |
| Internal Procedure PM001 rev. 2.0 (Quality Manual) | Measure Procedure                                                                                                                                                |
| Internal procedure INC_M rev. 8.2 (Quality Manual) | Measurement uncertainty calculation                                                                                                                              |



## 9. Deviation from test specification

In agreement with the client, emission tests were performed with peak detector.

At the frequencies where the measures exceed the limit or within 6 dB from it, the test was repeated with quasi-peak detector and/or average detector.

## 10. Test case verdicts

Test case does not apply to the test object..... : N.A.

Test item does meet the requirement..... : Complies

Test item does not meet the requirement..... : Does not comply

Test not performed ..... : N.E.

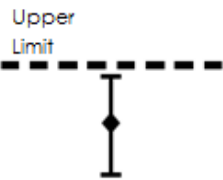
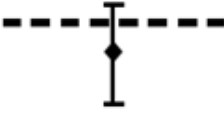
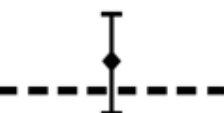


## 11. Results

In this clause tests results are reported.

Measurement uncertainty is in accordance with document CMC INC\_M rev. 8.2.

*Judgement of compliance:*

| Case 1                                                                                                            | Case 2                                                                                                                                                   | Case 3                                                                                                                                               | Case 4                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|                                  |                                                                         |                                                                    |                                 |
| The sample complies with the requirement.                                                                         | The sample complies with the requirement.                                                                                                                | The sample does not comply with the requirement.                                                                                                     | The sample does not comply with the requirement.                                                                   |
| The measurement results is within the specification limit when the measurement uncertainty is taken into account. | It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty although the measurement result is below the limit. | It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty also the measurement result is upper the limit. | The measurement results is outside the specification limit when the measurement uncertainty is taken into account. |

In agreement with ILAC-G8: 03/2009 Guidelines on the Reporting of Compliance with Specification.



## 11.1 Antenna requirements

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.203 and 15.204
- Internal procedure PM001
- See clause 4 of this test report

### Test configuration

Test site:  
Laboratory

Auxiliary equipment:  
See clause 4 of this test report

### EUT exercising

See clause 4 of this test report

### Test equipment used

--  
Measurement uncertainty: See clause 7 of this test report

### Test specification

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

### Environmental conditions

| Temperature<br>(°C) | Atmospheric pressure<br>(kPa) | Relative humidity<br>(%) |
|---------------------|-------------------------------|--------------------------|
| 23                  | 100                           | 42                       |

### Result

| Antenna Type     | External R.F.<br>power amplifier | Gain    | Remarks | Results  |
|------------------|----------------------------------|---------|---------|----------|
| Integral antenna | Not Present                      | 3,2 dBi | --      | Complies |

**Result:** The requirements are met



## 11.2 Emissions in restricted frequency bands and in unrestricted frequency bands

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.209
- Internal procedure PM001
- See clause 4 of this test report

### Test configuration

Test site:  
Semi-anechoic chamber

Auxiliary equipment:  
See clause 4 of this test report

### EUT exercising

See clause 4 of this test report

### Test equipment used

CMC S108, CMC S127, CMC S136, CMC S164,  
CMC S227  
Measurement uncertainty: See clause 7 of this  
test report

### Test specification

Port: Enclosure  
Frequency range: 0,009 MHz – 1000 MHz  
Antenna polarization: Horizontal (H) – Vertical (V)  
EUT – Antenna distance: 3 m

### Environmental conditions

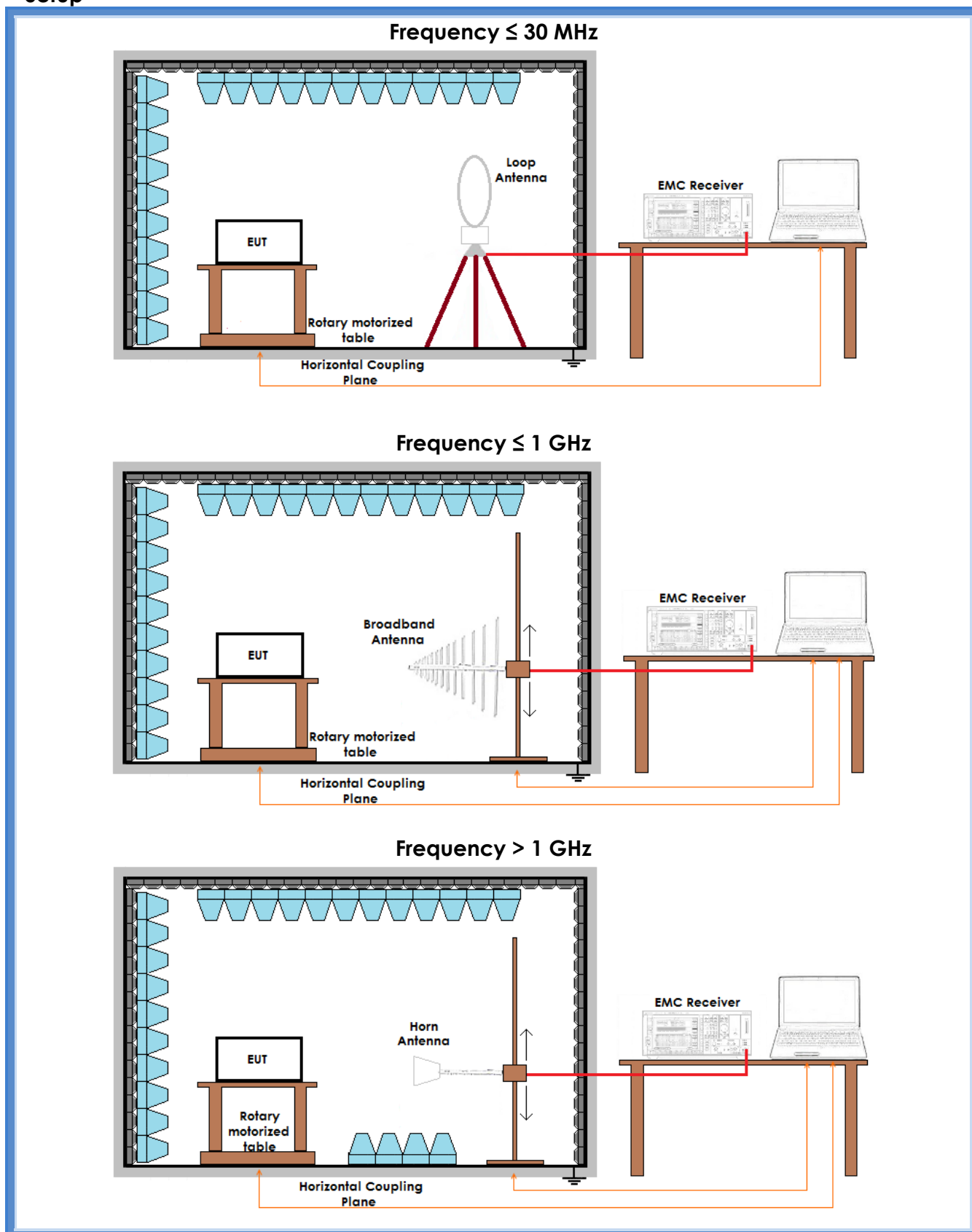
| Temperature<br>(°C) | Atmospheric pressure<br>(kPa) | Relative humidity<br>(%) |
|---------------------|-------------------------------|--------------------------|
| 22                  | 100                           | 42                       |

### Acceptance limits

| Frequency range<br>(MHz) | Limits<br>[dB(μV/m)]                  |                             |
|--------------------------|---------------------------------------|-----------------------------|
| 0,009 to 0,490           | 108,51 to 73,80                       |                             |
| 0,490 to 1,705           | 53,80 to 42,97                        |                             |
| 1,705 to 30              | 49,54                                 |                             |
| 30 to 88                 | 30                                    |                             |
| 88 to 216                | 33,52                                 |                             |
| 216 to 960               | 36,02                                 |                             |
| 960 to 1000              | 43,98                                 |                             |
|                          | Linear average<br>detector [dB(μV/m)] | Peak detector<br>[dB(μV/m)] |
| Above 1000               | 53,98                                 | 73,98                       |

**Remarks:** The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

## Setup





## Result

| Polarization | Frequency Range (MHz) | Graphs    | Remarks         | Result   |
|--------------|-----------------------|-----------|-----------------|----------|
| Loop         | 0,009 – 30            | G15139841 | Worst case      | Complies |
| V            | 30 – 1000             | G15139808 | Lowest channel  | Complies |
| H            | 30 – 1000             | G15139807 | Lowest channel  | Complies |
| V            | 30 – 1000             | G15139835 | Medium channel  | Complies |
| H            | 30 – 1000             | G15139836 | Medium channel  | Complies |
| V            | 30 – 1000             | G15139834 | Highest channel | Complies |
| H            | 30 – 1000             | G15139833 | Highest channel | Complies |
| V            | 1000 – 10000          | G15139818 | Worst case      | Complies |
| H            | 1000 – 10000          | G15139819 | Worst case      | Complies |

**Remarks:** Peaks above the limits are due to the main transmitting frequencies

### Graphs Legend

PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +

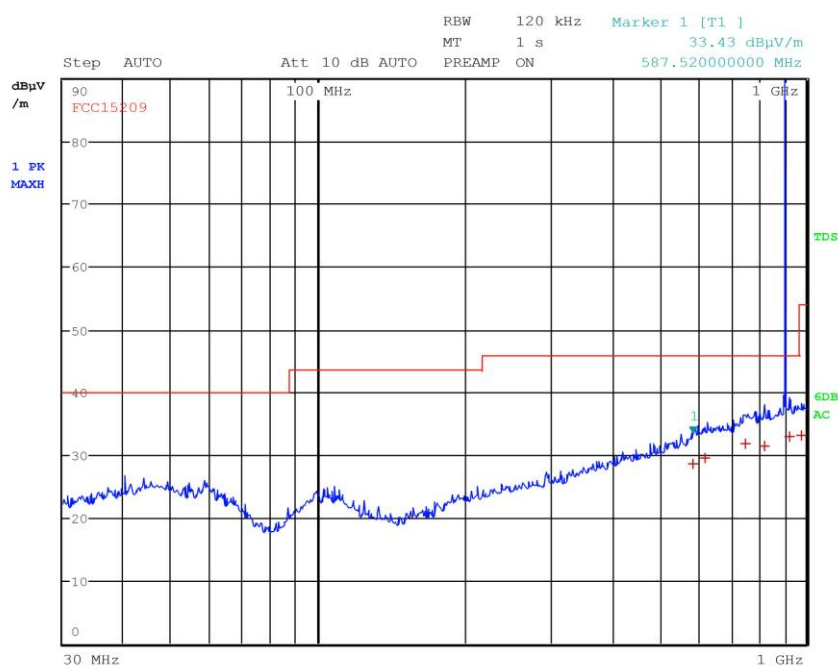
AV: Average; AV [1s] (average at 1 second) values are marked with a x



## Graphs

G15139807

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezzo 15139807  
Test Spec



### Final Measurement

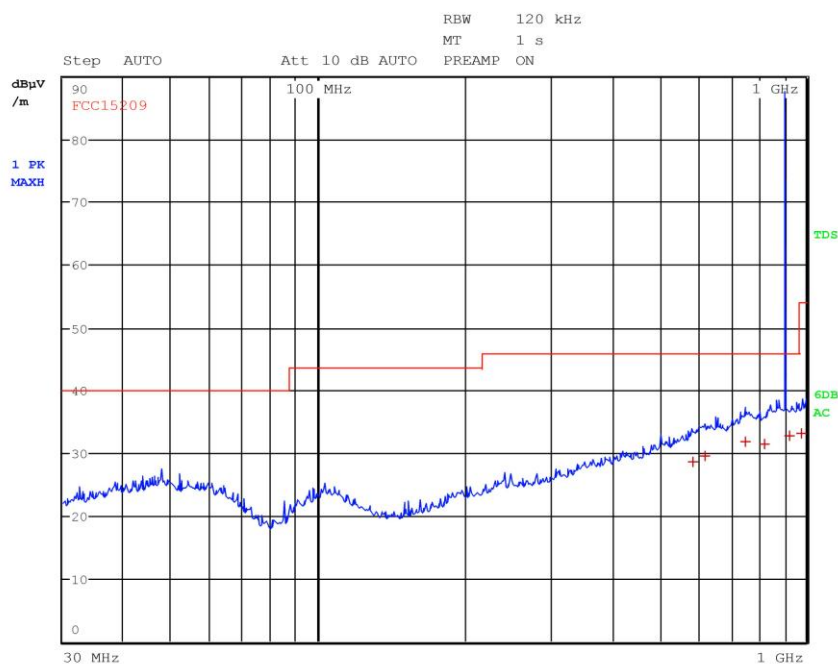
Meas Time: 1 s  
Margin: 30 dB  
Peaks: 6

| Trace | Frequency        | Level (dBμV/m) | Detector   | Delta Limit/dB |
|-------|------------------|----------------|------------|----------------|
| 1     | 587.52000000 MHz | 28.64          | Quasi Peak | -17.38         |
| 1     | 619.36000000 MHz | 29.63          | Quasi Peak | -16.39         |
| 1     | 751.60000000 MHz | 31.89          | Quasi Peak | -14.13         |
| 1     | 819.88000000 MHz | 31.56          | Quasi Peak | -14.46         |
| 1     | 922.28000000 MHz | 33.02          | Quasi Peak | -13.00         |
| 1     | 979.72000000 MHz | 33.13          | Quasi Peak | -20.85         |



G15139808

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezzo 15139808  
Test Spec



### Final Measurement

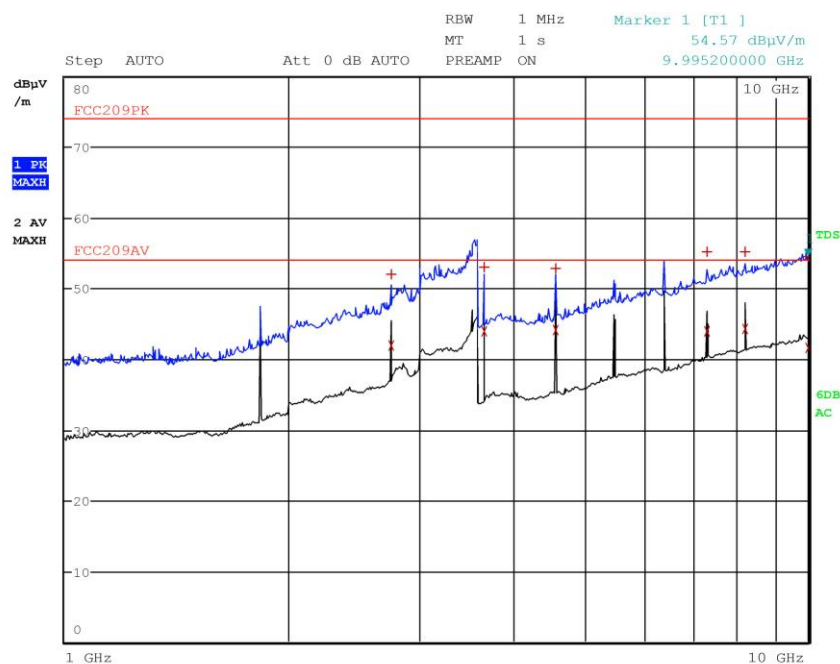
Meas Time: 1 s  
Margin: 30 dB  
Peaks: 6

| Trace | Frequency         | Level (dBμV/m) | Detector   | Delta Limit/dB |
|-------|-------------------|----------------|------------|----------------|
| 1     | 587.520000000 MHz | 28.60          | Quasi Peak | -17.42         |
| 1     | 619.360000000 MHz | 29.64          | Quasi Peak | -16.38         |
| 1     | 751.600000000 MHz | 31.86          | Quasi Peak | -14.16         |
| 1     | 819.880000000 MHz | 31.54          | Quasi Peak | -14.48         |
| 1     | 922.280000000 MHz | 32.78          | Quasi Peak | -13.24         |
| 1     | 979.720000000 MHz | 33.11          | Quasi Peak | -20.87         |



G15139818

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezolo 15139818  
Test Spec





Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezolo 15139818  
Test Spec

### Final Measurement

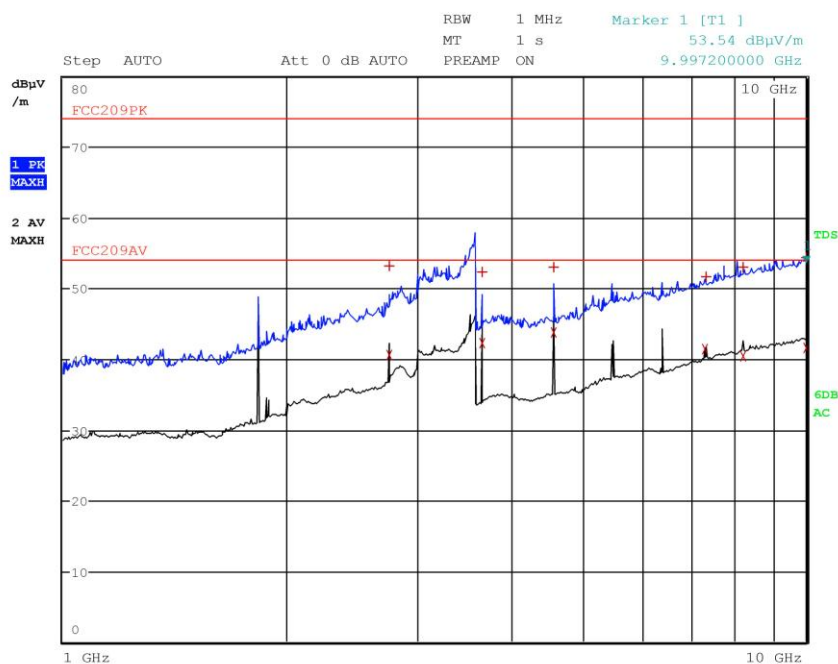
Meas Time: 1 s  
Margin: 6 dB  
Subranges: 12

| Trace | Frequency       | Level (dBµV/m) | Detector | Delta Limit/dB |
|-------|-----------------|----------------|----------|----------------|
| 2     | 2.744400000 GHz | 41.88          | Average  |                |
| 1     | 2.745200000 GHz | 51.98          | Max Peak | -2.02          |
| 1     | 3.660800000 GHz | 53.04          | Max Peak | -0.96          |
| 2     | 3.660800000 GHz | 44.03          | Average  |                |
| 1     | 4.574000000 GHz | 52.91          | Max Peak | -1.09          |
| 2     | 4.574400000 GHz | 44.17          | Average  |                |
| 1     | 7.318800000 GHz | 55.29          | Max Peak | -1.29          |
| 2     | 7.318800000 GHz | 43.97          | Average  |                |
| 2     | 8.233600000 GHz | 44.28          | Average  |                |
| 1     | 8.236400000 GHz | 55.18          | Max Peak | -1.18          |
| 2     | 9.986800000 GHz | 41.56          | Average  |                |
| 1     | 9.995200000 GHz | 54.59          | Max Peak | -0.59          |



G15139819

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezolo 15139819  
Test Spec





Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezolo 15139819  
Test Spec

### Final Measurement

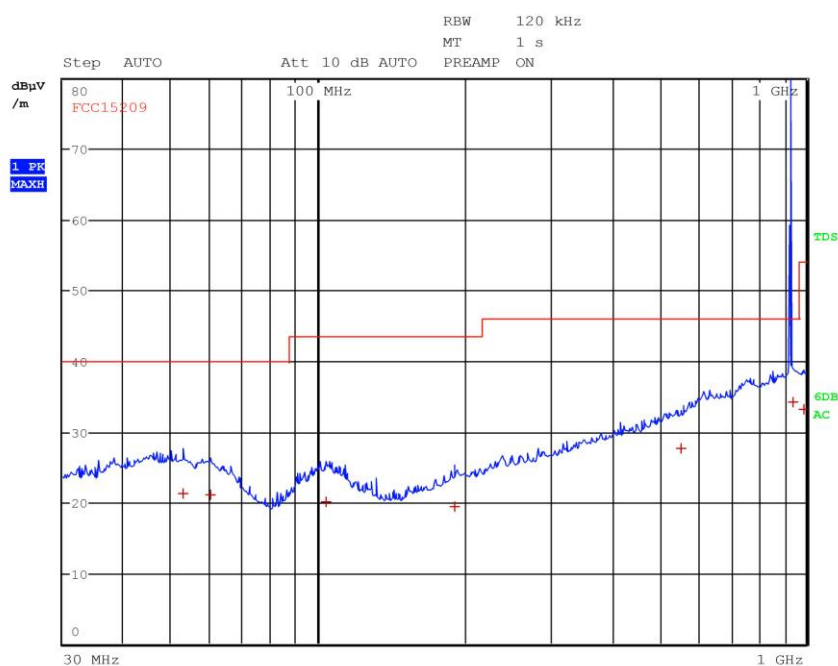
Meas Time: 1 s  
Margin: 6 dB  
Subranges: 12

| Trace | Frequency       | Level (dB $\mu$ V/m) | Detector | Delta Limit/dB |
|-------|-----------------|----------------------|----------|----------------|
| 1     | 2.744400000 GHz | 53.12                | Max Peak | -0.88          |
| 2     | 2.745600000 GHz | 40.51                | Average  |                |
| 1     | 3.660400000 GHz | 52.28                | Max Peak | -1.72          |
| 2     | 3.660800000 GHz | 42.33                | Average  |                |
| 1     | 4.574400000 GHz | 53.06                | Max Peak | -0.94          |
| 2     | 4.574400000 GHz | 43.72                | Average  |                |
| 2     | 7.318800000 GHz | 41.51                | Average  |                |
| 1     | 7.343200000 GHz | 51.71                | Max Peak | -2.29          |
| 1     | 8.226000000 GHz | 52.99                | Max Peak | -1.01          |
| 2     | 8.233600000 GHz | 40.44                | Average  |                |
| 2     | 9.991600000 GHz | 41.62                | Average  |                |
| 1     | 9.997200000 GHz | 54.41                | Max Peak | -0.41          |



G15139833

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Gandini 15139833  
Test Spec



### Final Measurement

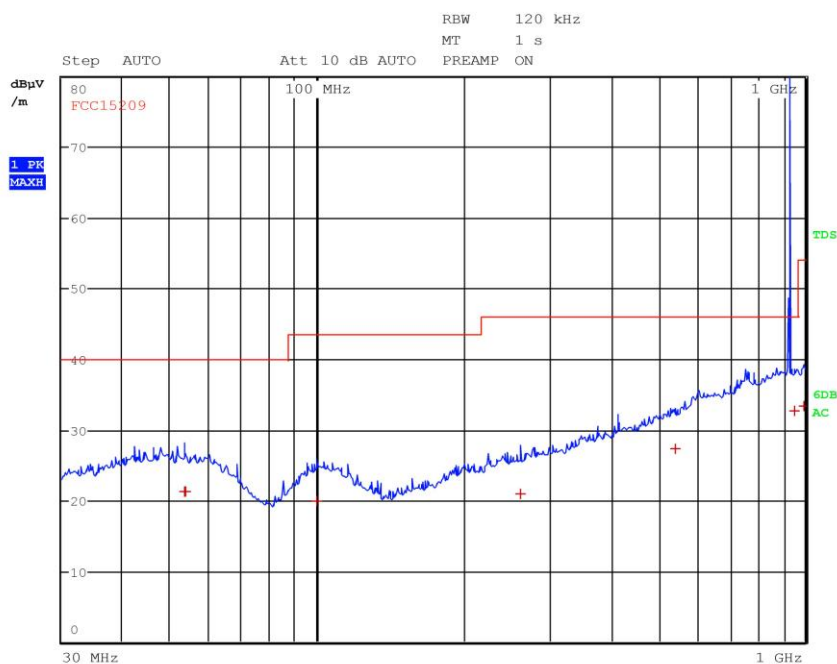
Meas Time: 1 s  
Margin: 30 dB  
Subranges: 7

| Trace | Frequency        | Level (dBμV/m) | Detector   | Delta Limit/dB |
|-------|------------------|----------------|------------|----------------|
| 1     | 53.00000000 MHz  | 21.26          | Quasi Peak | -18.74         |
| 1     | 60.08000000 MHz  | 21.16          | Quasi Peak | -18.84         |
| 1     | 103.72000000 MHz | 20.08          | Quasi Peak | -23.44         |
| 1     | 190.28000000 MHz | 19.45          | Quasi Peak | -24.07         |
| 1     | 555.80000000 MHz | 27.72          | Quasi Peak | -18.30         |
| 1     | 939.24000000 MHz | 34.17          | Quasi Peak | -11.85         |
| 1     | 987.80000000 MHz | 33.27          | Quasi Peak | -20.71         |



G15139834

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Gandini 15139834  
Test Spec



### Final Measurement

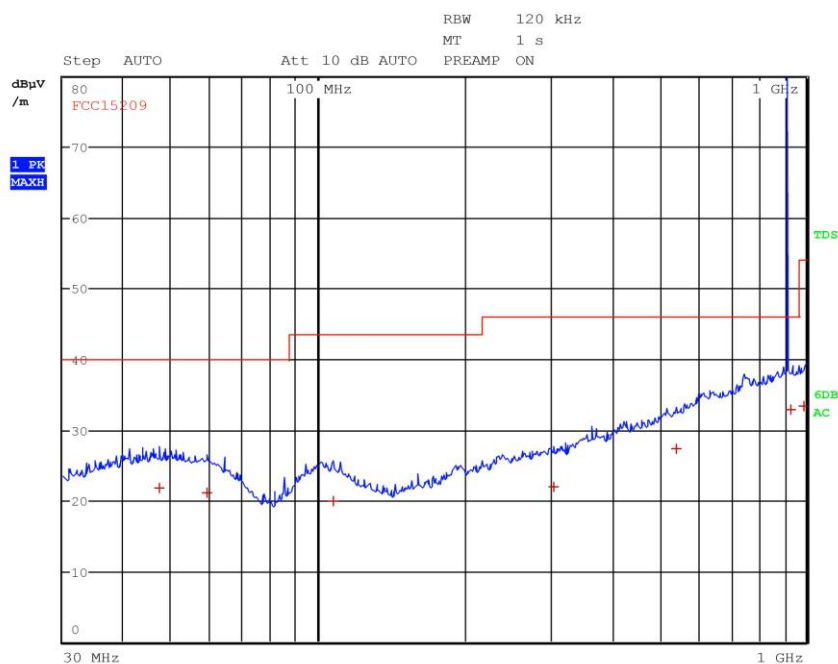
Meas Time: 1 s  
Margin: 30 dB  
Subranges: 7

| Trace | Frequency        | Level (dBμV/m) | Detector   | Delta Limit/dB |
|-------|------------------|----------------|------------|----------------|
| 1     | 53.40000000 MHz  | 21.27          | Quasi Peak | -18.73         |
| 1     | 53.84000000 MHz  | 21.23          | Quasi Peak | -18.77         |
| 1     | 99.56000000 MHz  | 19.92          | Quasi Peak | -23.60         |
| 1     | 261.00000000 MHz | 20.97          | Quasi Peak | -25.05         |
| 1     | 540.52000000 MHz | 27.35          | Quasi Peak | -18.67         |
| 1     | 949.04000000 MHz | 32.73          | Quasi Peak | -13.29         |
| 1     | 994.32000000 MHz | 33.34          | Quasi Peak | -20.64         |



G15139835

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Gandini 15139835  
Test Spec



### Final Measurement

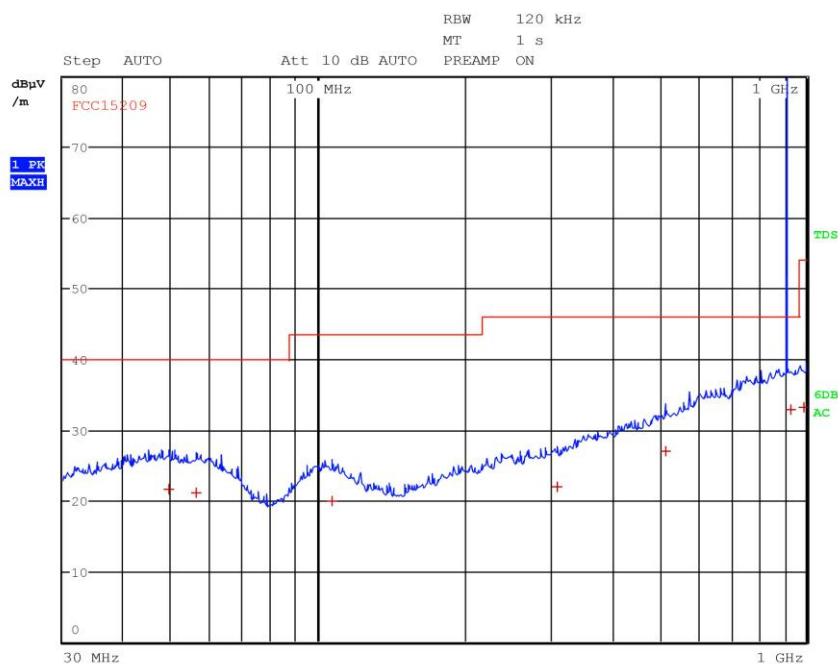
Meas Time: 1 s  
Margin: 30 dB  
Subranges: 7

| Trace | Frequency         | Level (dBμV/m) | Detector   | Delta Limit/dB |
|-------|-------------------|----------------|------------|----------------|
| 1     | 47.320000000 MHz  | 21.71          | Quasi Peak | -18.29         |
| 1     | 59.160000000 MHz  | 21.18          | Quasi Peak | -18.82         |
| 1     | 107.520000000 MHz | 19.86          | Quasi Peak | -23.66         |
| 1     | 303.520000000 MHz | 21.87          | Quasi Peak | -24.15         |
| 1     | 540.640000000 MHz | 27.36          | Quasi Peak | -18.66         |
| 1     | 928.920000000 MHz | 32.85          | Quasi Peak | -13.17         |
| 1     | 990.040000000 MHz | 33.31          | Quasi Peak | -20.67         |



G15139836

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Gandini 15139836  
Test Spec



### Final Measurement

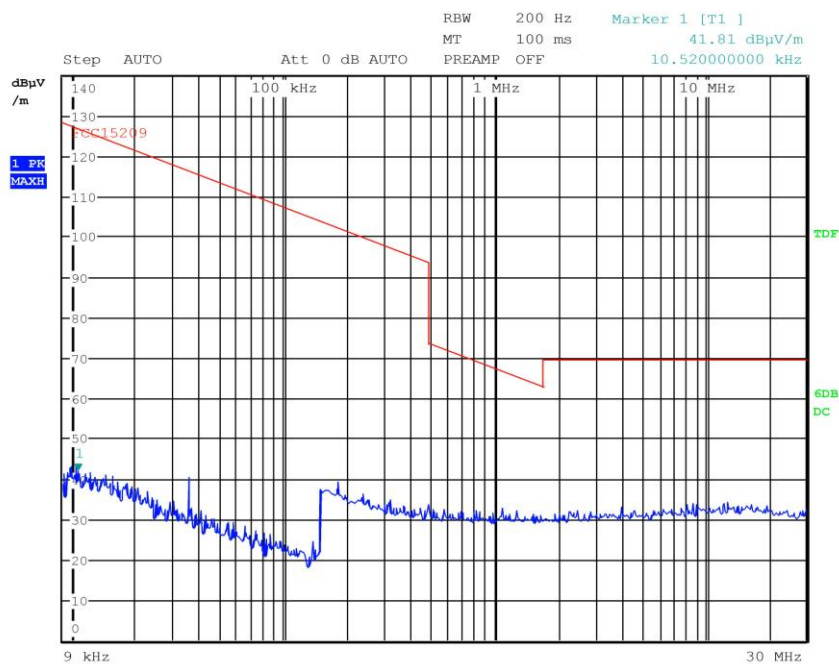
Meas Time: 1 s  
Margin: 30 dB  
Subranges: 7

| Trace | Frequency         | Level (dBμV/m) | Detector   | Delta Limit/dB |
|-------|-------------------|----------------|------------|----------------|
| 1     | 49.320000000 MHz  | 21.57          | Quasi Peak | -18.43         |
| 1     | 56.120000000 MHz  | 21.14          | Quasi Peak | -18.86         |
| 1     | 106.600000000 MHz | 19.96          | Quasi Peak | -23.56         |
| 1     | 308.920000000 MHz | 22.00          | Quasi Peak | -24.02         |
| 1     | 515.640000000 MHz | 27.02          | Quasi Peak | -19.00         |
| 1     | 927.480000000 MHz | 32.85          | Quasi Peak | -13.17         |
| 1     | 988.600000000 MHz | 33.24          | Quasi Peak | -20.74         |



G15139841

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezzo 15139841  
Test Spec



### Final Measurement

Meas Time: 1 s  
Margin: 30 dB  
Subranges: 0

**Result:** The requirements are met



### 11.3 DTS bandwidth

#### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r03 cl. 8.1
- Internal procedure PM001
- See clause 4 of this test report

#### EUT exercising

See clause 4 of this test report

#### Test specification

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz

#### Environmental conditions

| Temperature<br>(°C) | Atmospheric pressure<br>(kPa) | Relative humidity<br>(%) |
|---------------------|-------------------------------|--------------------------|
| 22                  | 100                           | 45                       |

#### Test configuration

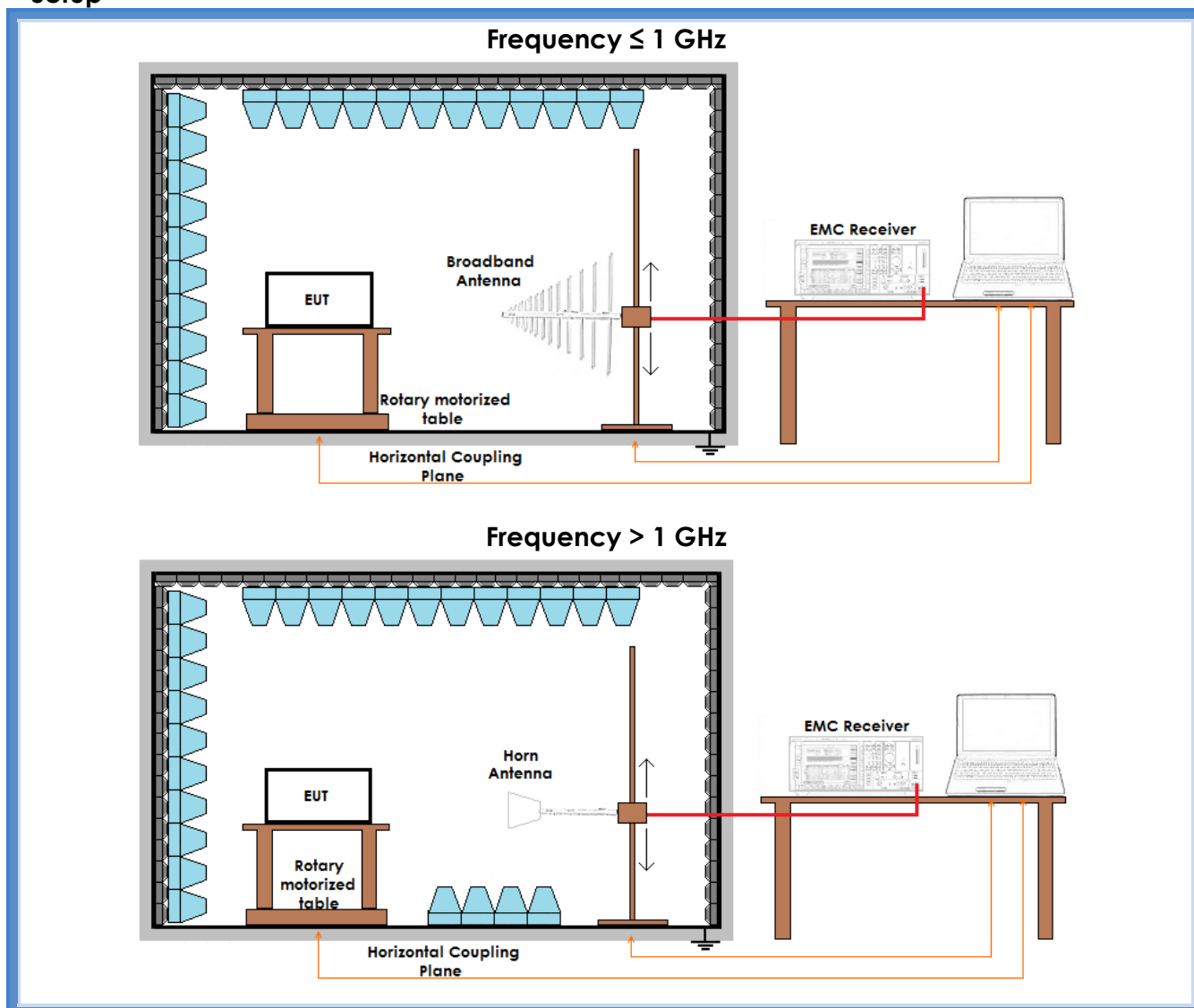
Test site:  
Semi-anechoic chamber

Auxiliary equipment:  
See clause 4 of this test report

#### Test equipment used

CMC S108, CMC S136, CMC S164  
Measurement uncertainty: See clause 7 of this test report

## Setup



## Result

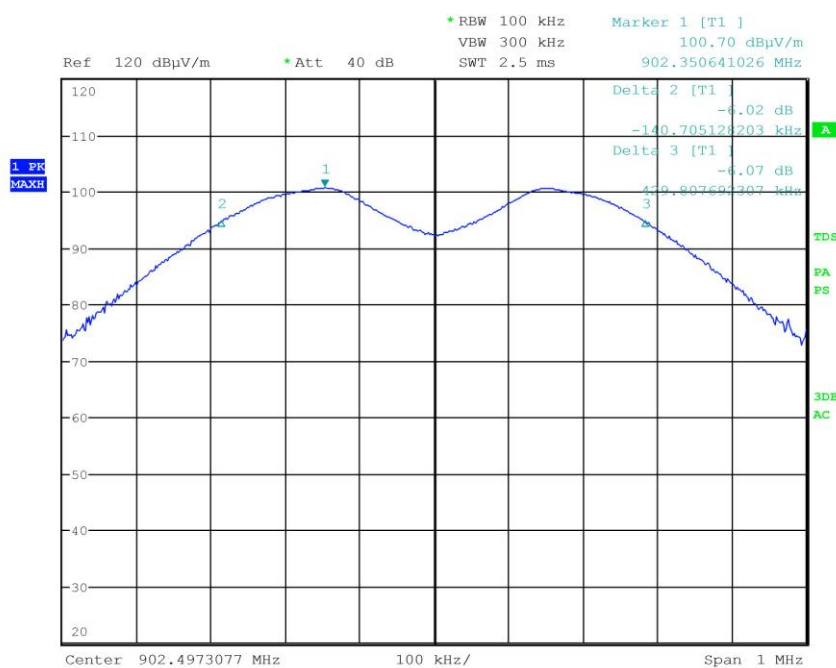
| Channel | Graphs    | 6 dB bandwidth (kHz) | Limits (kHz) | Results  |
|---------|-----------|----------------------|--------------|----------|
| Lowest  | G15139802 | 570,512              | At least 500 | Complies |
| Medium  | G15139820 | 548,076              | At least 500 | Complies |
| Highest | G15139827 | 556,088              | At least 500 | Complies |



## Graphs

G15139802

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezzo 15139802  
Test Spec





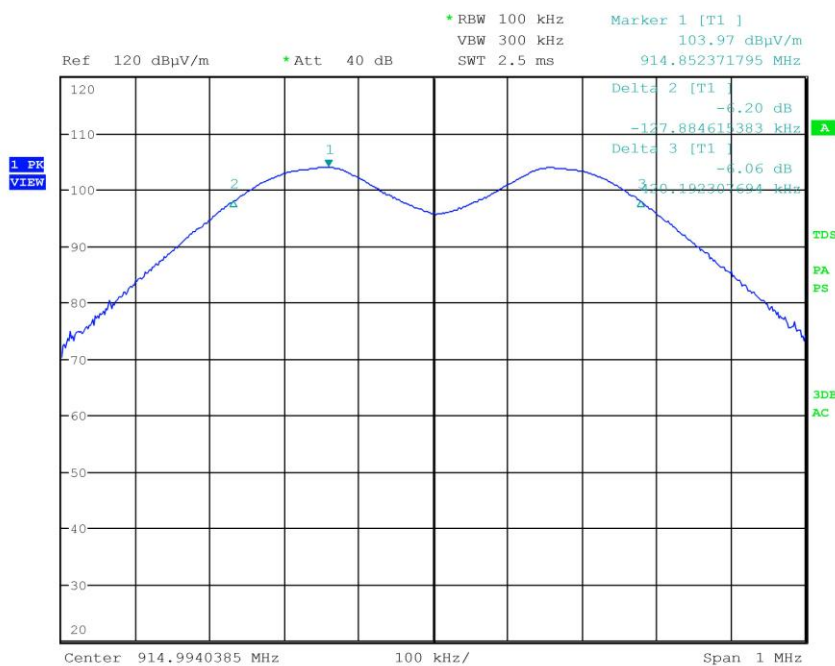
CMC  
Centro Misure Compatibilità S.r.l.  
Via della Fisica, 20  
36016 Thiene (VI)



LAB N° 0168

G15139820

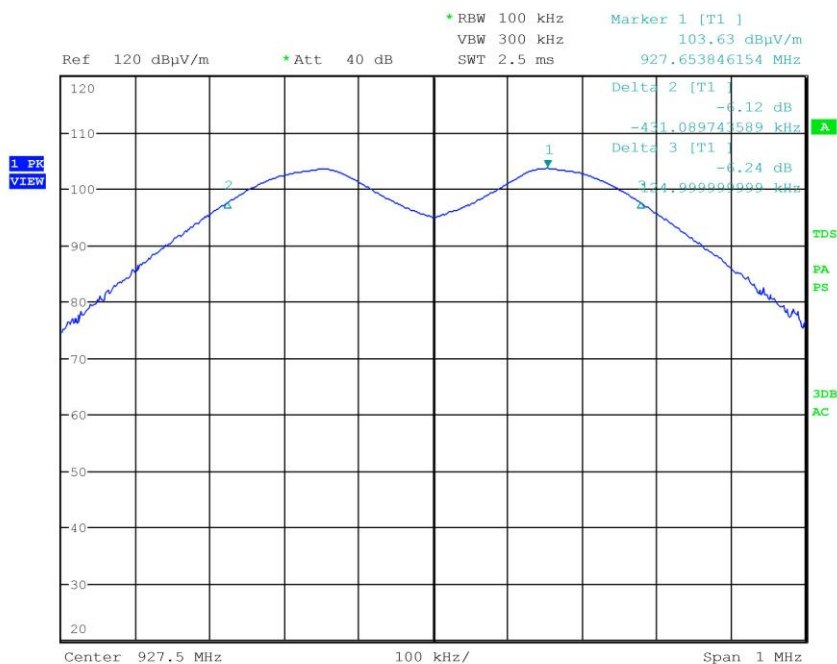
**Meas Type** Emission  
**Equipment under Test**  
**Manufacturer**  
**OP Condition**  
**Operator** Bertezolo 15139820  
**Test Spec**





G15139827

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezolo 15139827  
Test Spec



**Result:** The requirements are met



## 11.4 Band edge

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247 (d)
- KDB 558074 D01 DTS Meas Guidance v03r03 cl. 11.1(a) and 12.1
- Internal procedure PM001
- See clause 4 of this test report

### EUT exercising

See clause 4 of this test report

### Test specification

See FCC Part 15.247

### Environmental conditions

| Temperature<br>(°C) | Atmospheric pressure<br>(kPa) | Relative humidity<br>(%) |
|---------------------|-------------------------------|--------------------------|
| 21                  | 100                           | 45                       |

**Acceptance limits:** operation within the band 902 – 928 MHz

### Test configuration

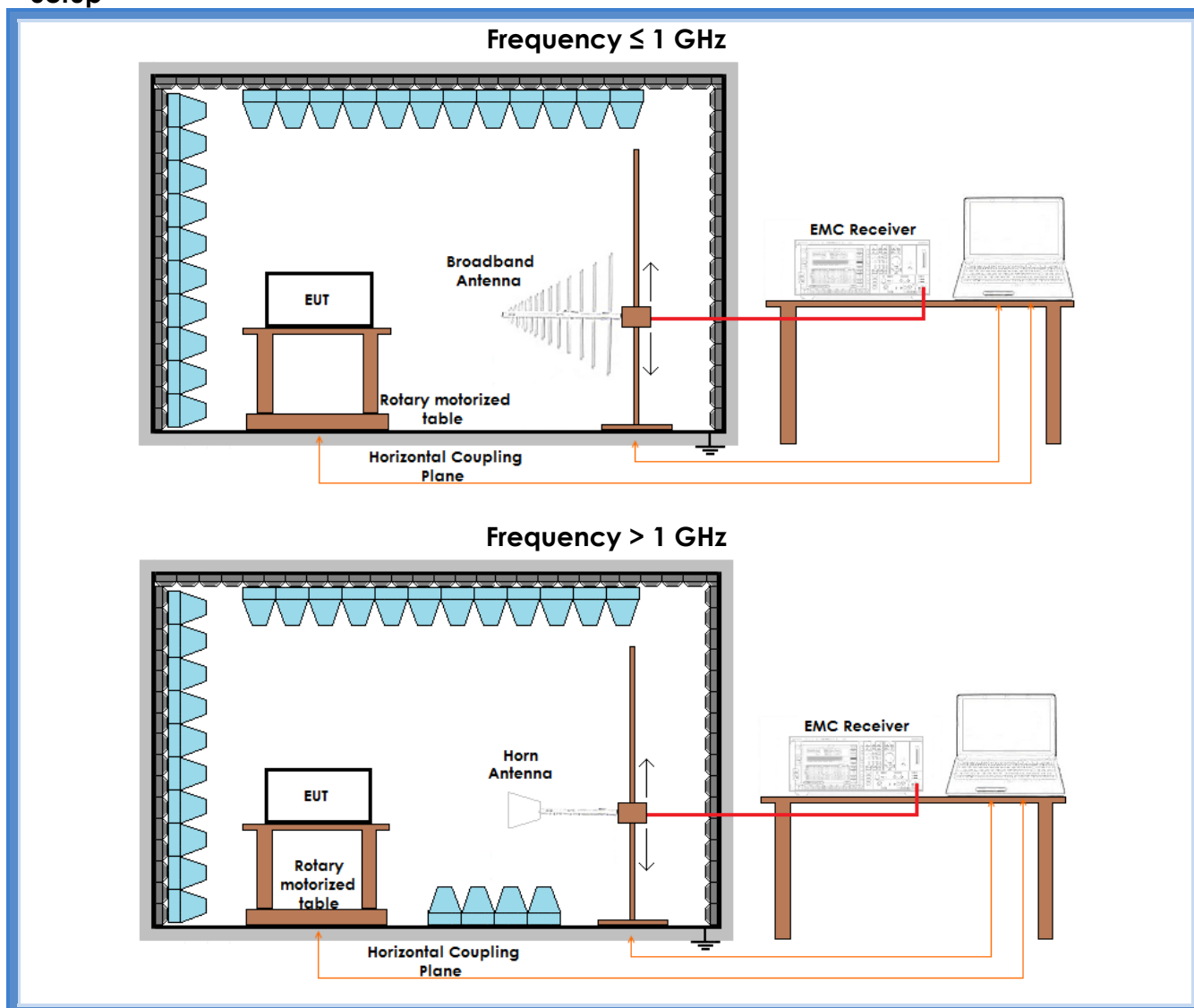
*Test site:*  
Semi-anechoic chamber

*Auxiliary equipment:*  
See clause 4 of this test report

### Test equipment used

CMC S108, CMC S136, CMC S164  
Measurement uncertainty: See clause 7 of this test report

## Setup



## Result

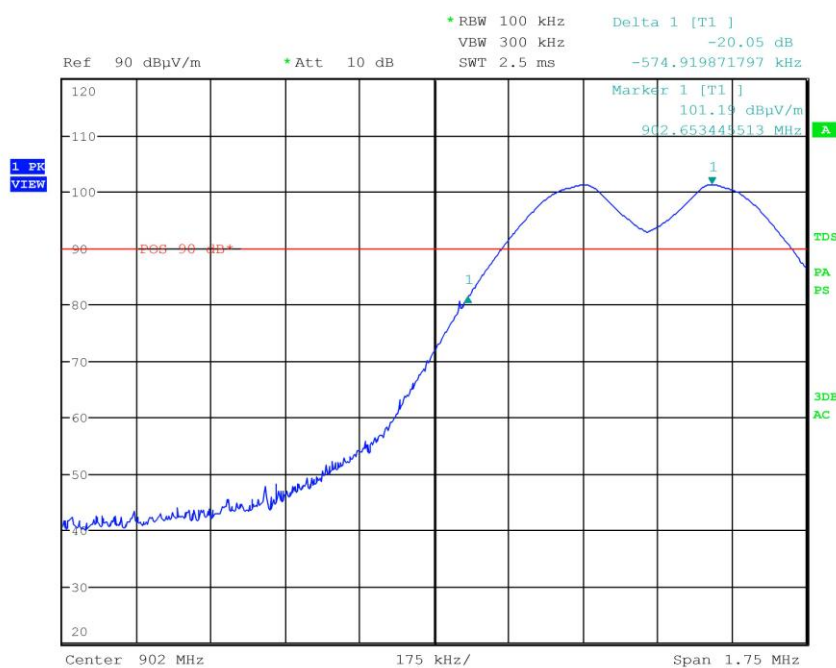
| Channel | Bandwidth | Graph(s)  | Results        |          |
|---------|-----------|-----------|----------------|----------|
| Lowest  | 100 kHz   | G15139811 | 902,078526 MHz | Complies |
| Highest | 100 kHz   | G15139832 | 927,935496 MHz | Complies |



## Graphs

G15139811

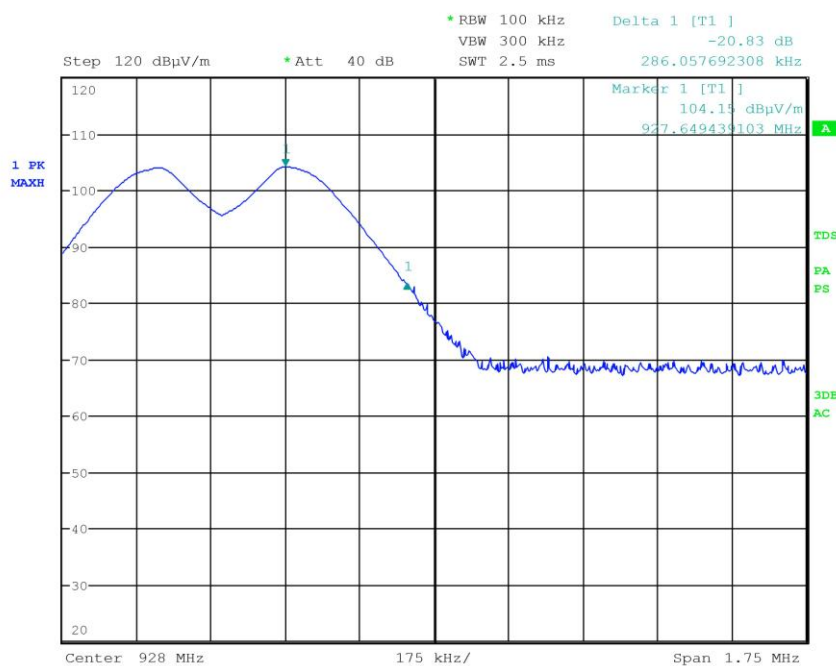
Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezzo 15139811  
Test Spec





G15139832

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Gandini 15139832  
Test Spec



**Result:** The requirements are met



## 11.5 Fundamental emission output power

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r03 cl. 3.0 and 9
- Internal procedure PM001
- See clause 4 of this test report

### Test configuration

Test site:  
Semi-anechoic chamber

Auxiliary equipment:  
See clause 4 of this test report

### EUT exercising

See clause 4 of this test report

### Test equipment used

CMC S108, CMC S136, CMC S164  
Measurement uncertainty: See clause 7 of this test report

### Test specification

Port: Enclosure (conducted measurements are not applicable because the antenna connector is not available, see also cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r02)  
Antenna polarization: Horizontal (H) – Vertical (V)  
EUT – Antenna distance: 3 m  
EUT height about the floor: 80 cm

### Environmental conditions

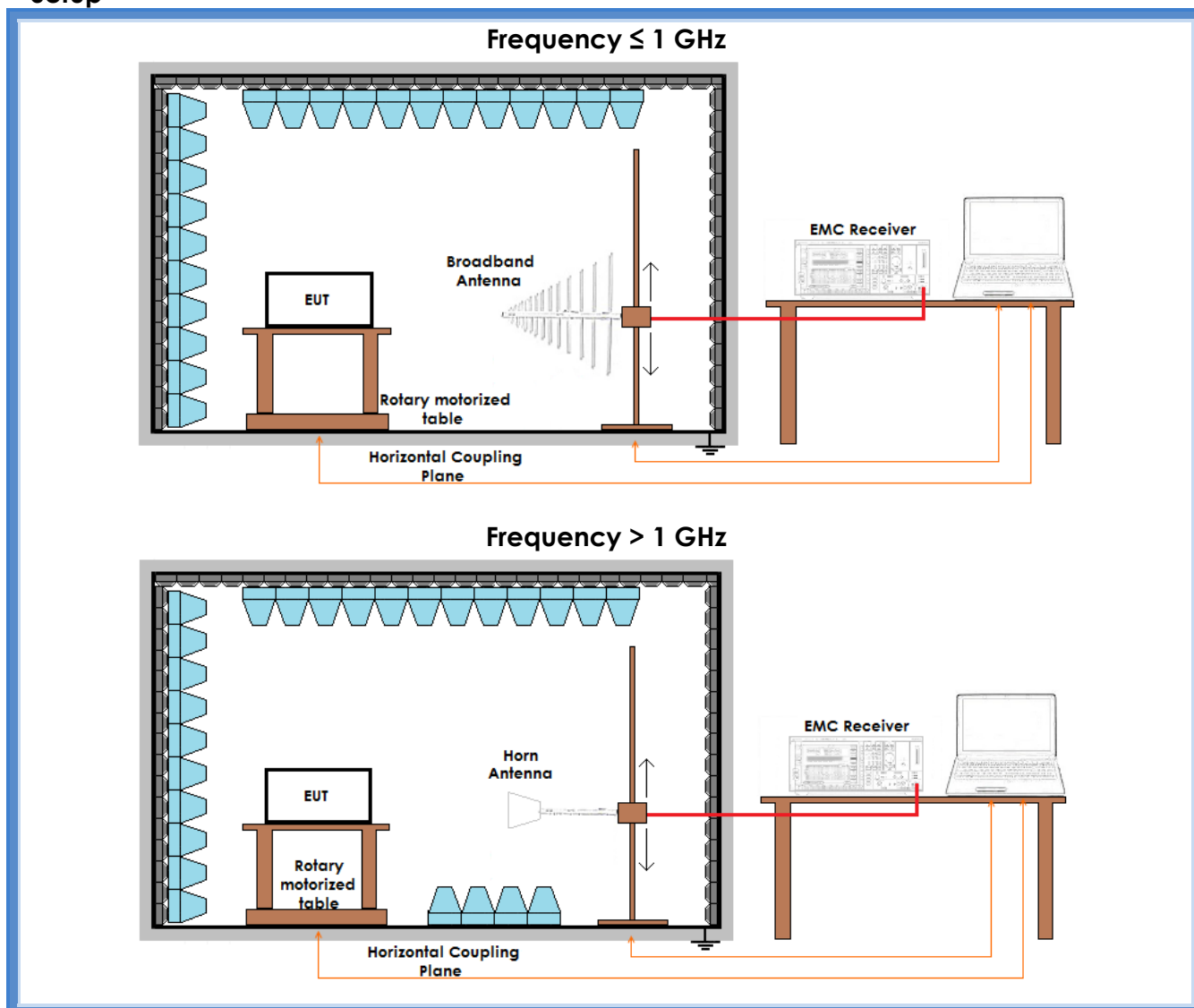
| Temperature<br>(°C) | Atmospheric pressure<br>(kPa) | Relative humidity<br>(%) |
|---------------------|-------------------------------|--------------------------|
| 22                  | 100                           | 42                       |

### Acceptance limits:

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt



## Setup





## Result

| Channel | Polarization | Graphs    | Measured PK level (dBμV/m) | Peak Output Conducted Power (mW) | Remarks |
|---------|--------------|-----------|----------------------------|----------------------------------|---------|
| Lowest  | Worst case   | G15139801 | 101,16                     | 1,88                             | --      |
| Medium  | Worst case   | G15139823 | 104,22                     | 3,79                             | --      |
| Highest | Worst case   | G15139826 | 104,04                     | 3,64                             | --      |

**Remarks:** the above table shows the results of radiated measurements, in agreement with cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r03.

Conducted measurements are not applicable because the antenna connector is not available.

The following formula, provided in document DA 00-705, has been used for the conversion between radiated to conducted values:

$$\text{Conducted value} = (E \times d)^2 / (30 \times G)$$

Where:

E =  $(10^{(\text{dB}\mu\text{V/m})/20})/1000000$ , the maximum measured fundamental field strength in V/m

G =  $10^{\text{dBi}/10}$ , the numeric gain of the transmitting antenna: 2,09 (3,2 dBi)

d = the distance in meters from which the field strength was measured (3 m)

P = the power in watts



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36016 Thiene (VI)

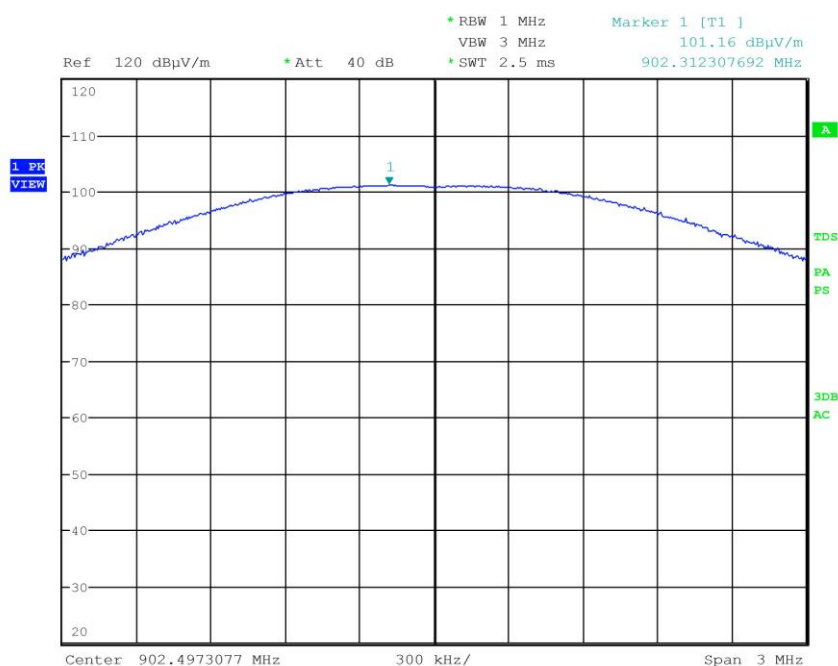


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## Graphs

G15139801

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezzo 15139801  
Test Spec





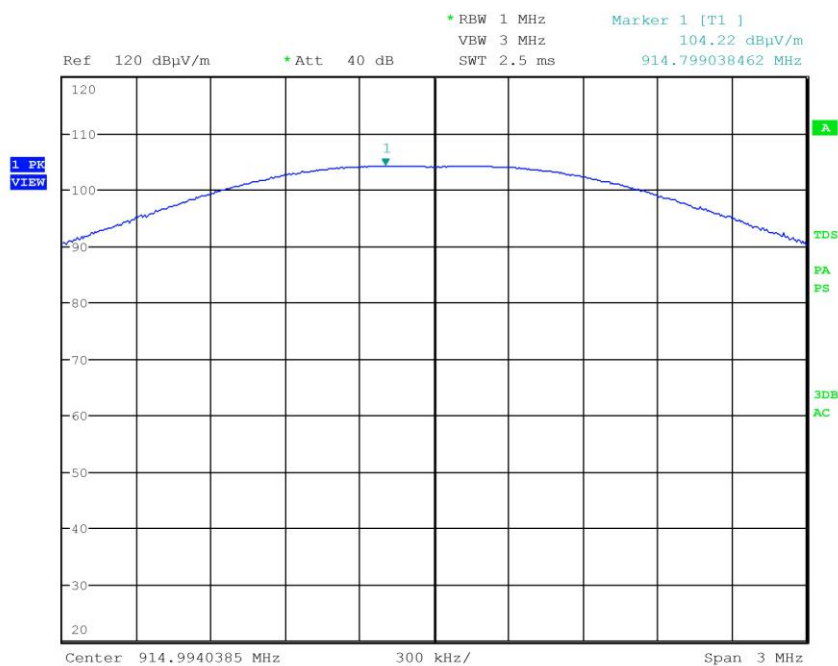
CMC  
Centro Misure Compatibilità S.r.l.  
Via della Fisica, 20  
36016 Thiene (VI)



LAB N° 0168

G15139823

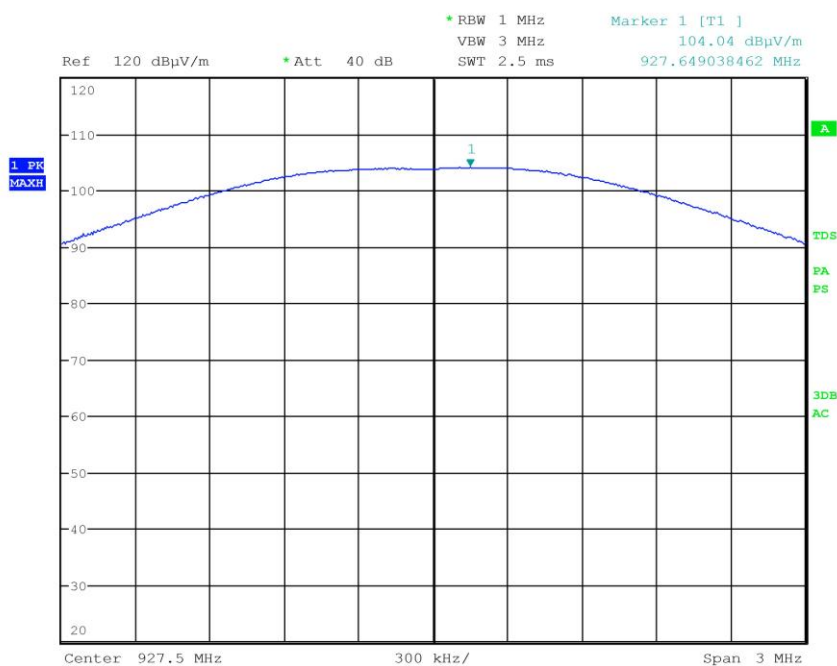
**Meas Type** Emission  
**Equipment under Test**  
**Manufacturer**  
**OP Condition**  
**Operator** Bertezzo 15139823  
**Test Spec**





G15139826

Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition  
Operator Bertezzo 15139826  
Test Spec



**Result:** The requirements are met



## 11.6 Maximum power spectral density level in the fundamental emission

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r03 cl. 10.2
- Internal procedure PM001
- See clause 4 of this test report

### Test configuration

Test site:  
Semi-anechoic chamber

Auxiliary equipment:  
See clause 4 of this test report

### EUT exercising

See clause 4 of this test report

### Test equipment used

CMC S108, CMC S136, CMC S164  
Measurement uncertainty: See clause 7 of this test report

### Test specification

Port: Enclosure  
Antenna polarization: Horizontal (H) – Vertical (V)  
EUT – Antenna distance: 3 m

### Environmental conditions

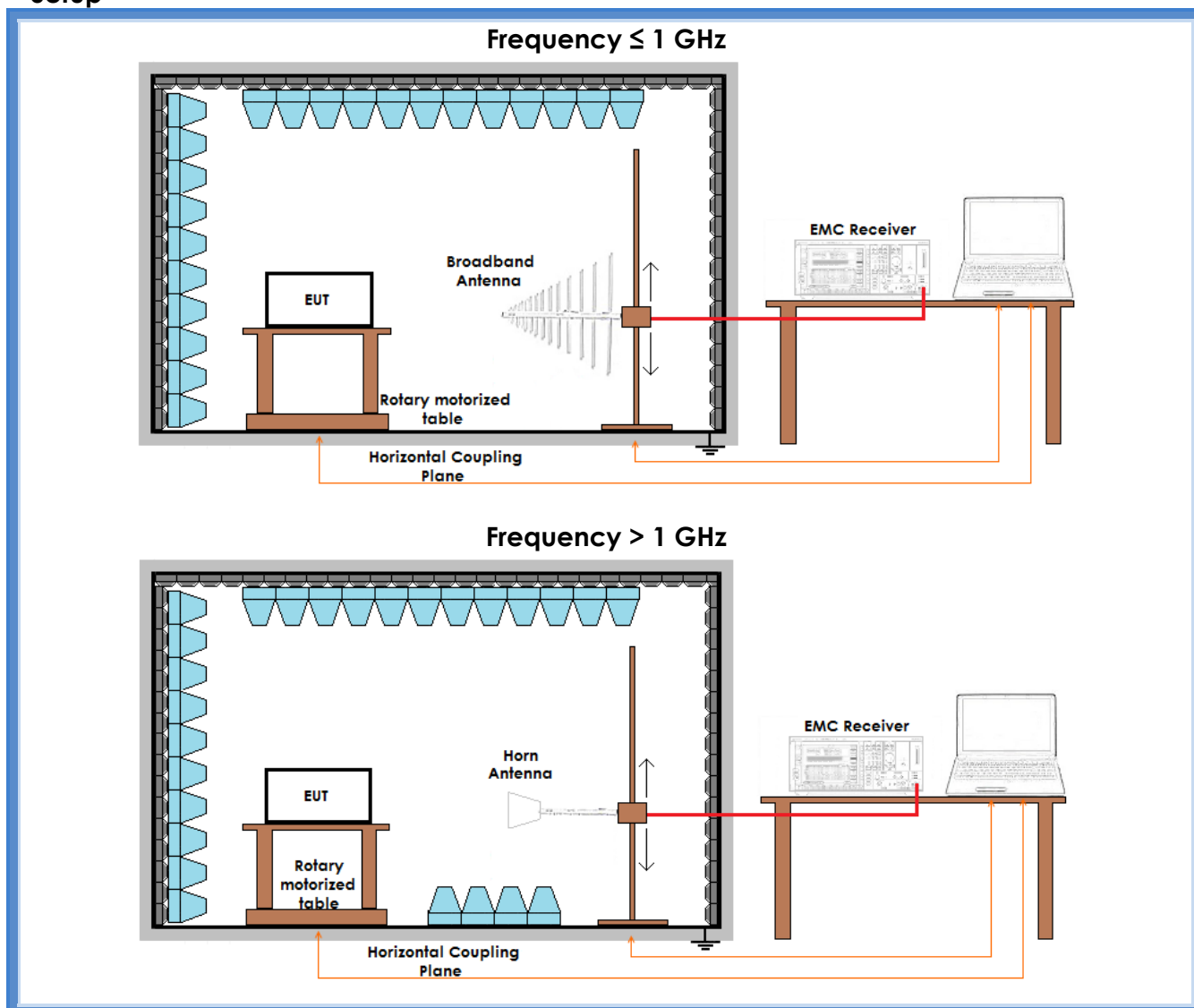
| Temperature<br>(°C) | Atmospheric pressure<br>(kPa) | Relative humidity<br>(%) |
|---------------------|-------------------------------|--------------------------|
| 22                  | 100                           | 42                       |

### Acceptance limits:

| Frequency Range | Power Spectral Density |
|-----------------|------------------------|
| 902 – 928 MHz   | 8 dBm / 6,31 mW        |



## Setup





## Result

| Channel | Polarization | Graphs    | Measured PK level (dBμV/m) | Power Spectral Density (mW) | Remarks |
|---------|--------------|-----------|----------------------------|-----------------------------|---------|
| Lowest  | Worst case   | G15139810 | 101,19                     | 1,89                        | --      |
| Medium  | Worst case   | G15139822 | 103,93                     | 3,55                        | --      |
| Highest | Worst case   | G15139828 | 103,58                     | 3,27                        | --      |

**Remarks:** the above table shows the results of radiated measurements, in agreement with cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r03.

Conducted measurements are not applicable because the antenna connector is not available.

The following formula, provided in document DA 00-705, has been used for the conversion between radiated to conducted values:

$$\text{Conducted value} = (E \times d)^2 / (30 \times G)$$

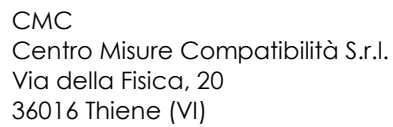
Where:

E =  $(10^{(\text{dB}\mu\text{V}/\text{m})/20})/1000000$ , the maximum measured fundamental field strength in V/m

G =  $10^{\text{dBi}/10}$ , the numeric gain of the transmitting antenna: 2,09 (3,2 dBi)

d = the distance in meters from which the field strength was measured (3 m)

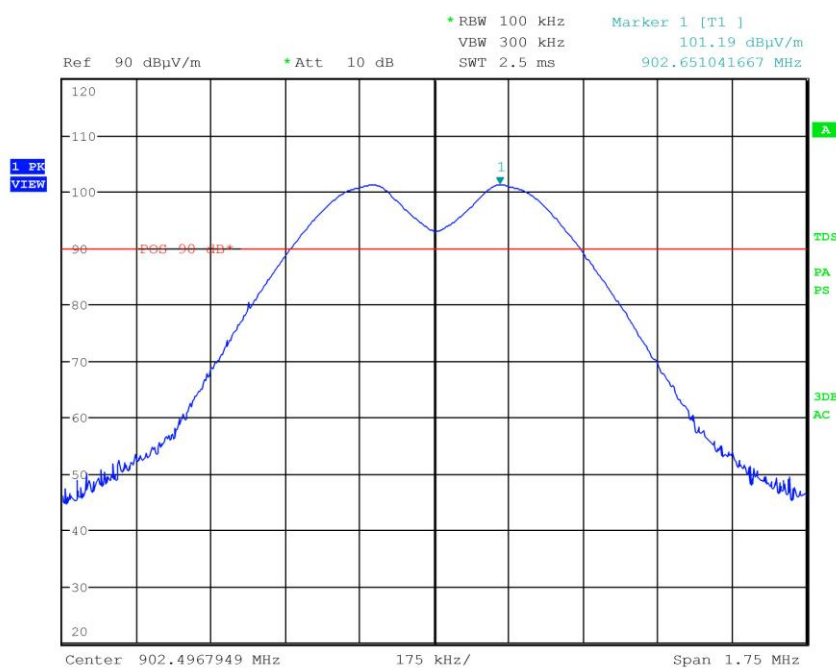
P = the power in watts



## Graphs

G15139810

|                      |                   |
|----------------------|-------------------|
| Meas Type            | Emission          |
| Equipment under Test |                   |
| Manufacturer         |                   |
| OP Condition         |                   |
| Operator             | Bertezzo 15139810 |
| Test Spec            |                   |





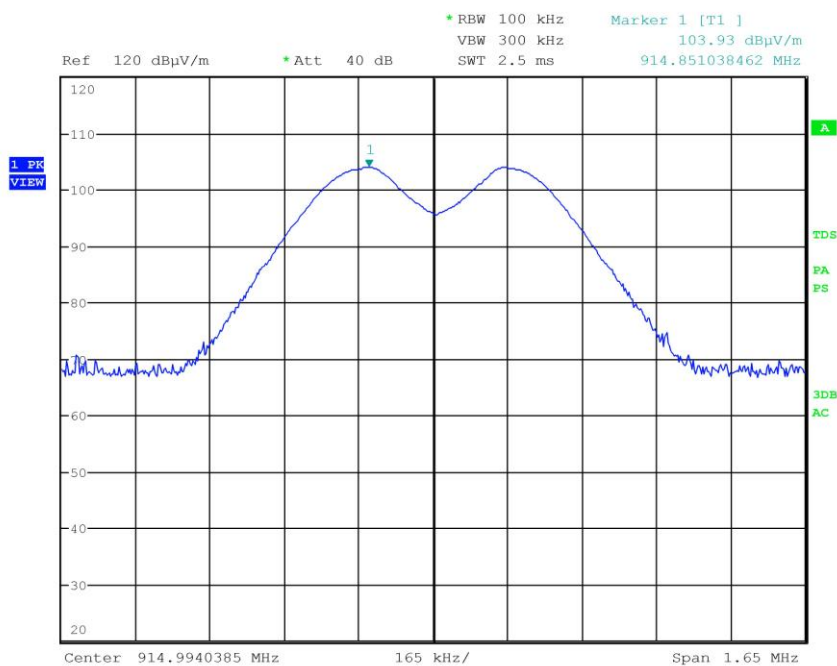
CMC  
Centro Misure Compatibilità S.r.l.  
Via della Fisica, 20  
36016 Thiene (VI)

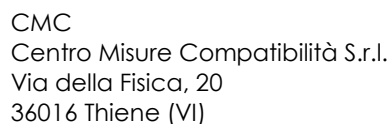


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G15139822

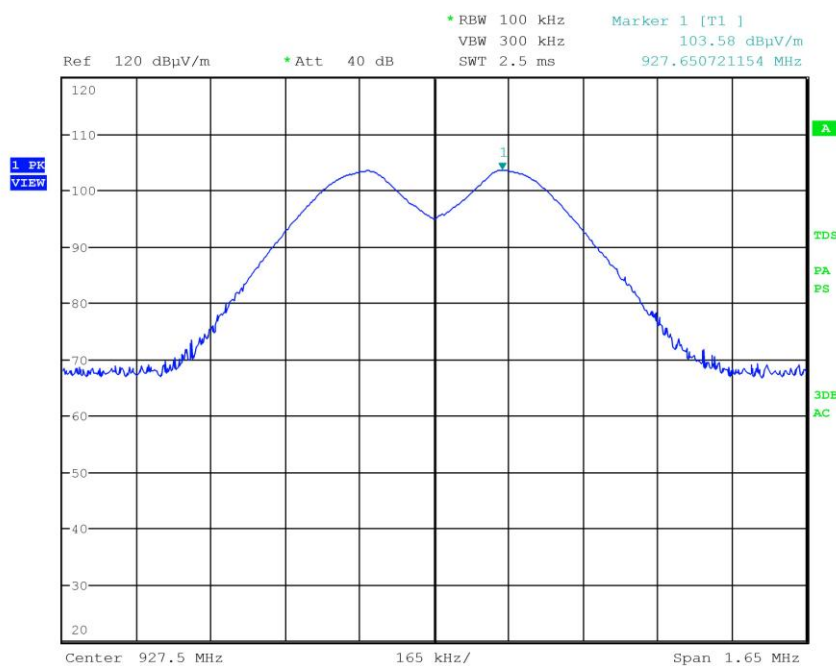
**Meas Type** Emission  
**Equipment under Test**  
**Manufacturer**  
**OP Condition**  
**Operator** Bertezolo 15139822  
**Test Spec**





**LAB N° 0168**

|                      |                   |
|----------------------|-------------------|
| Meas Type            | Emission          |
| Equipment under Test |                   |
| Manufacturer         |                   |
| OP Condition         |                   |
| Operator             | Bertezzo 15139828 |
| Test Spec            |                   |



**Result:** The requirements are met



## 11.7 Spurious Emission

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209
- Internal procedure PM001
- See clause 4 of this test report

### Test configuration

Test site:  
Semi-anechoic chamber

Auxiliary equipment:  
See clause 4 of this test report

### EUT exercising

See clause 4 of this test report

### Test equipment used

CMC S108, CMC S136, CMC S164  
Measurement uncertainty: See clause 7 of this test report

### Test specification

Port: Enclosure  
Antenna polarization: Horizontal (H) – Vertical (V)  
EUT – Antenna distance: 3 m  
EUT height about the floor: 80 cm  
Detector AV + Peak

### Environmental conditions

| Temperature<br>(°C) | Atmospheric pressure<br>(kPa) | Relative humidity<br>(%) |
|---------------------|-------------------------------|--------------------------|
| 22                  | 100                           | 45                       |

### Acceptance limits

| Acceptance limits for emissions in restricted frequency bands |                         |                           |
|---------------------------------------------------------------|-------------------------|---------------------------|
| Frequency<br>(MHz)                                            | AV limits<br>[dB(μV/m)] | Peak limits<br>[dB(μV/m)] |
| > 1000                                                        | 54                      | 74                        |



The restricted frequency bands are listed in the following table

| MHz                 | MHz                   | MHz             | GHz           |
|---------------------|-----------------------|-----------------|---------------|
| 0,090 – 0,110       | 16,42 – 16,423        | 399,9 – 410     | 4,5 – 5,15    |
| 0,495 – 0,505       | 16,69475 – 16,69525   | 608 – 614       | 5,35 – 5,46   |
| 2,1735 – 2,1905     | 16,80425 – 16,80475   | 960 – 1240      | 7,25 – 7,75   |
| 4,125 – 4,128       | 25,5 – 25,67          | 1300 – 1427     | 8,025 – 8,5   |
| 4,17725 – 4,17775   | 37,5 – 38,25          | 1435 – 1626,5   | 9,0 – 9,2     |
| 4,20725 – 4,20775   | 73 – 74,6             | 1645,5 – 1646,5 | 9,3 – 9,5     |
| 6,215 – 6,218       | 74,8 – 75,2           | 1660 – 1710     | 10,6 – 12,7   |
| 6,26775 – 6,26825   | 108 – 121,94          | 1718,8 – 1722,2 | 13,25 – 13,4  |
| 6,31175 – 6,31225   | 123 – 138             | 2200 – 2300     | 14,47 – 14,5  |
| 8,291 – 8,294       | 149,9 – 150,05        | 2310 – 2390     | 15,35 – 16,2  |
| 8,362 – 8,366       | 156,52475 – 156,52525 | 2483,5 – 2500   | 17,7 – 21,4   |
| 8,37625 – 8,38675   | 156,7 – 156,9         | 2690 – 2900     | 22,01 – 23,12 |
| 8,41425 – 8,41475   | 162,0125 – 167,17     | 3260 – 3267     | 23,6 – 24,0   |
| 12,29 – 12,293      | 167,72 – 173,2        | 3332 – 3339     | 31,2 – 31,8   |
| 12,51975 – 12,52025 | 240 – 285             | 3345,8 – 3358   | 36,43 – 36,5  |
| 12,57675 – 12,57725 | 322 – 335,4           | 3600 – 4400     | Above 38,6    |
| 13,36 – 13,41       |                       |                 |               |

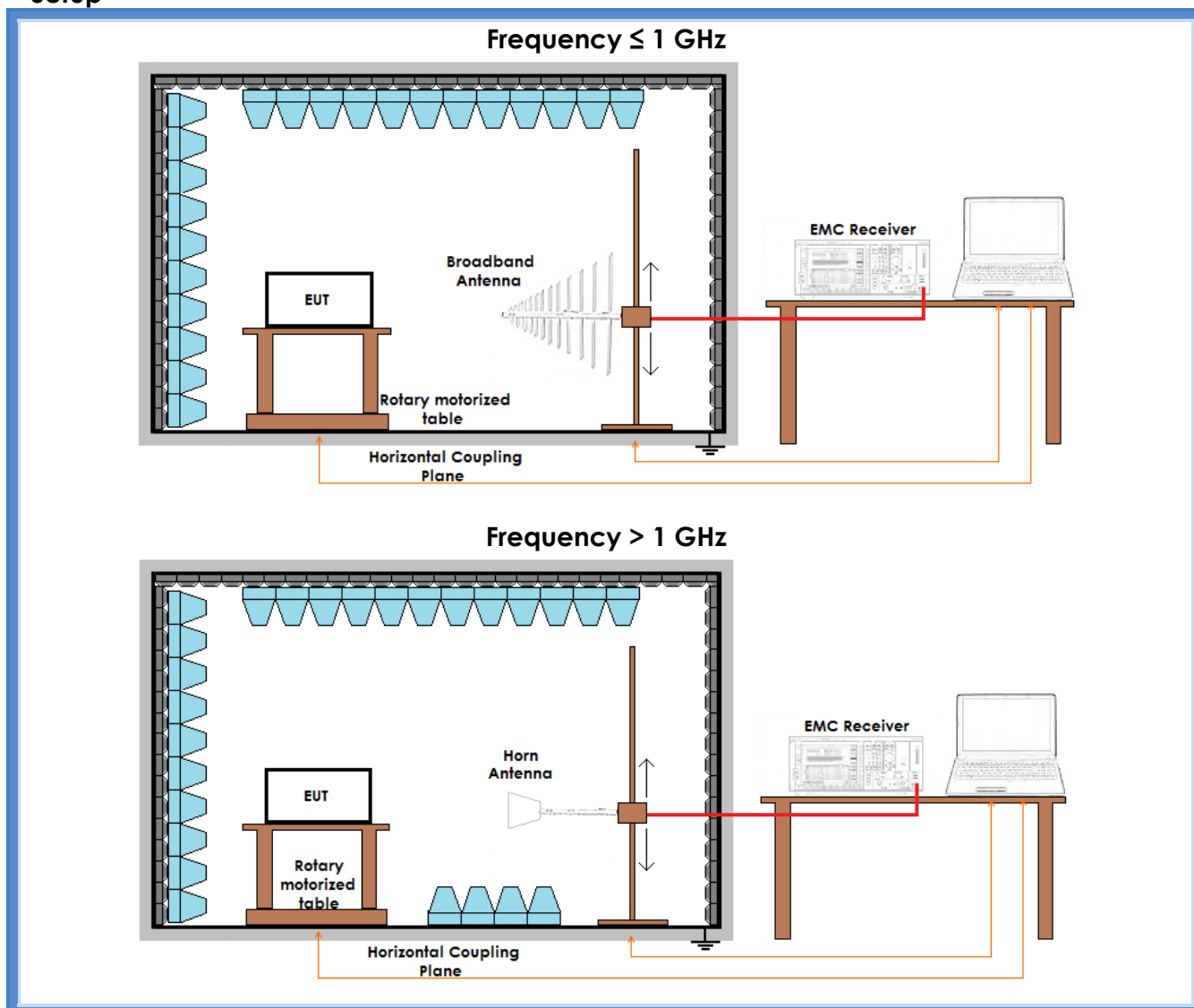
#### Acceptance limits for emissions in non-restricted frequency bands

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:

- If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz
- If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.
- In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required



## Setup





## Result – AV detector

| Harmonic | Lowest channel          |                          | Medium channel          |                          | Highest channel         |                          | Results  |
|----------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|----------|
|          | Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) |          |
| II       | 52,90*                  | 81,20                    | 53,40*                  | 83,90                    | 50,90*                  | 83,60                    | Complies |
| III      | 49,30*                  | 81,20                    | 49,20*                  | 83,90                    | 51,70*                  | 83,60                    | Complies |
| IV       | 51,20                   | 54,00                    | 51,10                   | 54,00                    | 53,90                   | 54,00                    | Complies |
| V        | 52,70                   | 54,00                    | 51,50                   | 54,00                    | 52,50                   | 54,00                    | Complies |
| VI       | 53,40                   | 54,00                    | 51,10*                  | 83,90                    | 51,80*                  | 83,60                    | Complies |
| VII      | 52,60*                  | 81,20                    | 53,20*                  | 83,90                    | 56,90*                  | 83,60                    | Complies |
| VIII     | 52,80*                  | 81,20                    | 49,70                   | 54,00                    | 51,30                   | 54,00                    | Complies |
| IX       | 50,80                   | 54,00                    | 50,30                   | 54,00                    | 49,30                   | 54,00                    | Complies |
| X        | 46,38                   | 54,00                    | 45,00                   | 54,00                    | 47,00*                  | 83,60                    | Complies |

**Remarks:** EUT was tested in 3 orthogonal planes. The results in this table show the highest values. The emission values marked with \* have been detected in non-restricted frequency bands

## Result – Peak detector

| Harmonic | Lowest channel          |                          | Medium channel          |                          | Highest channel         |                          | Results  |
|----------|-------------------------|--------------------------|-------------------------|--------------------------|-------------------------|--------------------------|----------|
|          | Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Level<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) |          |
| II       | 54,10*                  | 101,19                   | 54,90*                  | 103,93                   | 51,10*                  | 103,58                   | Complies |
| III      | 52,70*                  | 101,19                   | 52,80*                  | 103,93                   | 54,80*                  | 103,58                   | Complies |
| IV       | 54,30                   | 74,00                    | 54,10                   | 74,00                    | 56,80                   | 74,00                    | Complies |
| V        | 55,80                   | 74,00                    | 54,80                   | 74,00                    | 55,90                   | 74,00                    | Complies |
| VI       | 56,30                   | 74,00                    | 56,20*                  | 103,93                   | 52,80*                  | 103,58                   | Complies |
| VII      | 57,20*                  | 101,19                   | 57,90*                  | 103,93                   | 57,50*                  | 103,58                   | Complies |
| VIII     | 57,10*                  | 101,19                   | 56,40                   | 74,00                    | 57,40                   | 74,00                    | Complies |
| IX       | 56,70                   | 74,00                    | 57,20                   | 74,00                    | 57,00                   | 74,00                    | Complies |
| X        | 57,20                   | 74,00                    | 55,00                   | 74,00                    | 49,60*                  | 103,58                   | Complies |

**Remarks:** EUT was tested in 3 orthogonal planes. The results in this table show the highest values. The emission values marked with \* have been detected in non-restricted frequency bands

**Result:** The requirements are met



## 11.8 Maximum permissible exposure

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 1.1310
- Internal procedure PM001
- See clause 4 of this test report

### Test configuration

Test site:  
Laboratory

Auxiliary equipment:  
See clause 4 of this test report

### EUT exercising

See clause 4 of this test report

### Test equipment used

CMC S108, CMC S136, CMC S164  
Measurement uncertainty: See clause 7 of this test report

### Test specification

Port: Antenna

|                          |                                                                                                                                 |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Acceptance limits</b> | (max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · 30[√f(GHz)] ≤ 3.0 for 1-g SAR |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|

### Result

| Frequency (MHz) | Output Power (mW) | Test separation distance (mm) | SAR evaluation            |
|-----------------|-------------------|-------------------------------|---------------------------|
| 902,31          | 1,88              | 5,00                          | Not required, see remarks |
| 914,80          | 3,79              | 5,00                          | Not required, see remarks |
| 927,65          | 3,64              | 5,00                          | Not required, see remarks |

**Remarks:** minimum test separation distance is < 5 mm, a distance of 5 mm according to point 5 in section 4.1 of KDB 447498 is applied to determine SAR test exclusion. SAR evaluation is not required because the maximum output power (3,79 mW) is lower than the exclusion threshold for devices operating at 900 MHz (16 mW), see also Appendix A of KDB 447498

**Result:** The requirements are met