



TEST REPORT nr. R13051501 Federal Communication Commission (FCC) Industry Canada (IC)	
Test item	
Description.....:	Transceiver Unit
Trademark.....:	AUTEC
Model/Type.....:	Model RLB Type HA00M
Test Specification	
Standard	FCC Rules & Regulations, Title 47 (2012) - Part 15 paragraph(s) : 207, 209, 215 and 249 RSS-210 (2010) – Annex 2 (A2.9)
Client's name.....: AUTEC S.r.l.	
Address	
Via Pomaroli, 65 - 36030 Caldogno (VI) - ITALY	
Manufacturer's name.: Same ad client	
Address	
--	
Report	
Tested by.....:	G. Gandini - <i>Technician</i>
Approved by.....:	R. Beghetto - <i>Laboratory Manager</i>
Date of issue.....:	31.07.13
Contents	83 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.

CMC Centro Misura Compatibilità S.r.l.



Index

1. SUMMARY	3
2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	4
2.1 TEST SITE.....	4
3. TESTING AND SAMPLING	4
4. OPERATIVE CONDITIONS.....	4
5. PHOTOGRAPH(S) OF EUT	5
6. EQUIPMENT LIST	6
7. MEASUREMENT UNCERTAINTY	7
8. REFERENCE DOCUMENTS	8
9. DEVIATION FROM TEST SPECIFICATION	9
10. TEST CASE VERDICTS.....	9
11. RESULTS.....	9
11.1 ANTENNA REQUIREMENTS	10
11.2 20DB BANDWIDTH	11
11.3 OCCUPIED BANDWIDTH (99% BW).....	12
11.4 PEAK OUTPUT POWER	13
11.5 BAND EDGE.....	15
11.6 RADIATED SPURIOUS (TRANSMITTER).....	16
11.7 RADIATED SPURIOUS (RECEIVER).....	20
11.8 EMISSION OF MAINS TERMINAL DISTURBANCE VOLTAGE (CONTINUOUS DISTURBANCE).....	21
12. GRAPHS AND TABLES.....	22



1. Summary			
Standard: FCC Rules & Regulations, Title 47 RSS-210 (2010) – Annex 2 (A2.9)			
Test specifications	Environmental Phenomena	Tests sequence	Result
FCC – Title 47 Part 15.203 and 15.204 IC – RSS-210	Antenna Requirement	1	Complies
Part 15.215 IC – RSS-210 Annex 2 (A2.9)	20 Bandwidth	2	Complies
IC – RSS-210 Annex 2 (A2.9)	Occupied Bandwidth (99% BW)	3	Complies
Part 15.249 IC – RSS-210 Annex 2 (A2.9)	Peak Output Power	4	Complies
Part 15.215 IC – RSS-210 Annex 2 (A2.9)	Band Edge	5	Complies
Part 15.209 IC – RSS-210 Annex 2 (A2.9)	Radiated Spurious	6	Complies
Part 15.207	Conducted Emission	7	Complies

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 and IC certification.

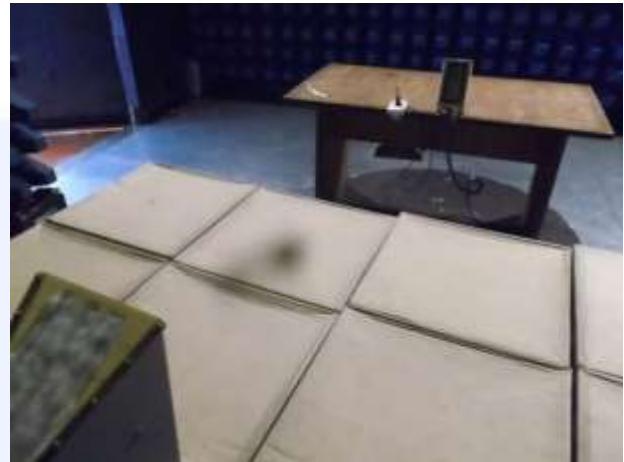


2. Description of Equipment under test (EUT)	
Power supply.....	: 110Vac 60Hz
Type of equipment	: <input checked="" type="checkbox"/> Transmitter Unit <input checked="" type="checkbox"/> Receiver Unit <input checked="" type="checkbox"/> Fixed station <input type="checkbox"/> Portable station <input type="checkbox"/> Mobile station
Alignment range.....	: 902 – 928 MHz
Switching frequency	: 902 – 928 MHz
Modulation	: Up to 19300 Baud RC-FSK
Information on antenna.....	: - Embedded - External antenna: $\lambda/4$ stylus antenna Type: A0ANTE00E0040
FCC ID	: OQA-RLBHA00M
IC number	: 9061A-RLBHA00M
2.1 Test Site	
Company.....	: CMC Centro Misure Compatibilità S.r.l.
Address	: Via dell' Elettronica, 12/C – 36016 Thiene (VI) – ITALY
3. Testing and sampling	
Date of receipt of test item	: 25.03.13
Testing start date.....	: 25.03.13
Testing end date.....	: 09.04.13
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 P130295
4. Operative conditions	
--	

CMC Centro Misure Compatibilità S.r.l.



5. Photograph(s) of EUT



CMC Centro Misure Compatibilità S.r.l.



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 S108	Emco	3115	Horn antenna	9811-5622	April '13	April '16
CMC S124	Spin	AMTP42-20	Horn Antenna 18-26GHz	103	May '13	May '16
CMC S127	Schaffner	HLA6120	Loop Antenna	1191	January '13	January '16
CMC S129	Rohde & Schwarz	ESPI7	Receiver	836.914/004	January '13	January '14
CMC S136	Schwarzbeck	VULB 9163	Broadband Antenna	9136-205	May '13	May '16
CMC S164	Rohde & Schwarz	ESU26	EMC interference receiver	100052	January '13	January '14
CMC S207	Rohde & Schwarz	ESCI 7	EMI receiver	100781	January '13	January '14

CMC Centro Misure Compatibilità S.r.l.



7. Measurement uncertainty

Test	Expanded Uncertainty	note
Conducted Emission		
(50Ω/50μH AMN) - (9 kHz – 150 kHz)	±3.9 dB	1
(50Ω/50μH AMN) - (150 kHz – 30 MHz)	±3.4 dB	1
(Voltage probe) - (150 kHz – 30 MHz)	±3.4 dB	1
(50Ω/5μH AMN) - (150 kHz – 108 MHz)	±2.8 dB	1
DiscontinuousConducted Emission		
Conducted Emission (50Ω/50μH AMN) - (150 kHz – 30 MHz)	±3.4 dB	1
Disturbance Power (30 MHz – 300 MHz)		
	±3.8 dB	1
Radiated Emission		
(0.150 MHz – 30 MHz)	±4.3 dB	1
(30 MHz – 1000 MHz)	±4.6 dB	1
(1 GHz – 6 GHz)	±4.7 dB	1
Electromagnetic field EMF		
	±15.0 %	1
Harmonic current emissions test		
	±2.7 %	1
Voltage fluctuation and flicker test		
	±2.9 %	1
Insertion loss test		
	±2.9 dB	1
Radiated electromagnetic disturbance test (loop antenna)		
	±2.8 dB	1
Radiated electromagnetic field immunity test		
	0.8 V/m at 3V/m	1
Pulse modulated radiated electromagnetic field immunity test		
	0.8 V/m at 3V/m	1
Injected currents immunity test		
	0.4 V at 3V	1
Bulk current		
	9.7 mA at 60 mA	1
Power frequency magnetic field immunity test		
	0.1 A/m at 10 A/m	1
Electrostatic discharge immunity test		
		2
Electrical fast transients / burst immunity test		
		2
Surge immunity test		
		2
Pulse magnetic field immunity test		
		2
Damped oscillatory magnetic field immunity test		
		2
Short interruption immunity test		
		2
Voltage transient emission test		
	±2.2 %	1
Transient immunity test		
		2

Notes

Note 1:

The expanded uncertainty reported according to EN55016-4-2(2004-10) 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

<i>Reference no.</i>	<i>Description</i>
FCC Rules and Regulation Title 47 part 15 (2012)	--
RSS-210 Issue 8 – December 2010	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment
ANSI C63.4	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz – 40GHz
Internal Procedure PM001 rev. 2.0 (Quality Manual)	Measure Procedure
Internal procedure INC_M rev. 8.1 (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 6dB 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 / N.A.
Test item does meet the requirement..... : P / Pass / Complies
Test item does not meet the requirement..... : F / Fail / Does not comply
Test not performed : NE / Not Executed

11. Results

In this clause tests results are reported.
Measurement uncertainty is in accordance with document CMC INC_M rev. 8.1.



11.1 Antenna Requirements

Test configuration and test method

Test site Laboratory
 Auxiliary equipment See clause 4 of this test report

Environmental conditions

Temperature 21 °C Atmospheric pressure 99 kPa Relative humidity 48 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.203 and 15.204
- RSS-210
- Internal Procedure PM001
- See clause 4 of this test report

Test Requirements

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 unique coupling to the intentional radiator shall be considered sufficient 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 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.

Test specification

Port: Antenna.

EUT exercising

See clause 4 of this test report

Result

<i>Antenna Type</i>	<i>Gain</i>	<i>Remarks</i>	<i>Results</i>
Embedded	0 dBi	--	Complies
External	0 dBi	--	Complies

Remarks ////////////////

Reference documents

See clause 8 of this test report

Result

The requirements are met



11.2 20dB Bandwidth

Test configuration and test method

Test site Laboratory
 Auxiliary equipment See clause 4 of this test report

Environmental conditions

Temperature 21 °C Atmospheric pressure 99 kPa Relative humidity 45 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.215
- RSS-210 Annex 2 (A2.9)
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

EUT exercising

See clause 4 of this test report

Result

<i>Frequency (MHz)</i>	<i>Graph(s)</i>	<i>Bandwidth (kHz)</i>	<i>Remark</i>
915,250	G130515A10	19,23	Antenna: Embedded
921,500	G130515A11	19,34	
927,750	G130515A12	19,23	
915,250	G130515A13	19,23	Antenna: External
921,500	G130515A14	19,23	
927,750	G130515A15	19,23	
Measurement uncertainty: ±1 kHz			

Remarks ////////////////

Reference documents

See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report)

CMC S129

Result

The requirements are met



11.3 Occupied Bandwidth (99% BW)

Test configuration and test method

Test site Laboratory
 Auxiliary equipment See clause 4 of this test report

Environmental conditions

Temperature 21 °C Atmospheric pressure 99 kPa Relative humidity 45 %

Test set-up and execution

- RSS-210 Annex 2 (A2.9)
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

EUT exercising

See clause 4 of this test report

Result

<i>Frequency (MHz)</i>	<i>Graph(s)</i>	<i>Bandwidth (kHz)</i>	<i>Remark</i>
915,250	G130515A16	15,94	Antenna: Embedded
921,500	G130515A17	16,02	
927,750	G130515A18	15,95	
915,250	G130515A19	15,86	Antenna: External
921,500	G130515A20	15,94	
927,750	G130515A21	16,03	

Measurement uncertainty: ±1 kHz

Remarks

//////////

Reference documents

See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report)

CMC S129

Result

The requirements are met



11.4 Peak Output Power

Test configuration and test method

Test site Laboratory
 Auxiliary equipment See clause 4 of this test report

Environmental conditions

Temperature 24 °C Atmospheric pressure 99 kPa Relative humidity 50 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209 and 15.249
- RSS-210 Annex 2 (A2.9)
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;
 Antenna distance: 3m

EUT exercising

See clause 4 of this test report

Acceptance limits

Frequency range	RF power output
902-928 MHz	50mV/m (94dB μ V/m)

Result

Frequency (MHz)	Polarization	Graphs	Measured QP level (dB μ V/m)	Peak Output Power (mW)	Remark
915,250	Horizontal	G13051580	86,88	0,12	Antenna: Embedded
915,250	Vertical	G13051581	87,62	0,12	
921,000	Horizontal	G13051579	82,77	0,03	
921,000	Vertical	G13051578	85,11	0,03	
927,750	Horizontal	G13051574	83,56	0,12	
927,750	Vertical	G13051575	85,57	0,03	
Measurement uncertainty: ± 3 dBm					



<i>Frequency (MHz)</i>	<i>Polarization</i>	<i>Graphs</i>	<i>Measured QP level (dBμV/m)</i>	<i>Peak Output Power (mW)</i>	<i>Remark</i>
915,250	Horizontal	G13051556	88,15	0,27	Antenna: External
915,250	Vertical	G13051557	92,16	0,48	
921,000	Horizontal	G13051555	88,27	0,27	
921,000	Vertical	G13051554	92,81	0,48	
927,750	Horizontal	G13051551	88,00	0,27	
927,750	Vertical	G13051550	92,99	0,48	
Measurement uncertainty: ±3dBm					

Remarks

$$P = (E \times d)^2 / (30 \times G)$$

Where:

E = the measured maximum fundamental field strength in V/m

G = the numeric gain of the transmitting antenna: 1 (0dBi)

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

P = the power in watts

Reference documents

See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report)

CMC S164

Result

The requirements are met



11.5 Band Edge

Test configuration and test method

Test site Laboratory
 Auxiliary equipment See clause 4 of this test report

Environmental conditions

Temperature 23 °C Atmospheric pressure 98 kPa Relative humidity 51 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.215
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

EUT exercising

See clause 4 of this test report

Acceptance limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Result

Frequency (MHz)	Graph(s)	Remark
915,250	G13051582	Antenna: Embedded
	G13051583	
927,750	G13051576	
	G13051577	
915,250	G13051558	Antenna: External
	G13051559	
927,750	G13051552	
	G13051553	
Measurement uncertainty: ±1dB		

Remarks //////////////

Reference documents See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report) CMC S129

Result The requirements are met



11.6 Radiated Spurious (Transmitter)

Test configuration and test method

Test site Semi-anechoic chamber
 Auxiliary equipment None

Environmental conditions

Temperature 23 °C Atmospheric pressure 98 kPa Relative humidity 51 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209
- RSS-210 Annex 2 (A2.9)
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;
 For measurements below 1GHz the resolution bandwidth is set to 100kHz.
 For measurements above 1GHz the resolution bandwidth is set to 1MHz.

EUT exercising

See clause 4 of this test report

Acceptance limits

In any 100kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in cl. 15.205(a), must also comply with the radiated emission limits specified in cl. 15.209(a) (see cl.15.205(c)).

Result

Channel	Polarization	Frequency Range (MHz)	Graph(s) (peak measurements)	Result	Remarks
915,250	Horizontal	30 – 1000	G131051569	Complies	Antenna: Embedded
915,250	Vertical	30 – 1000	G131051568	Complies	
921,500	Horizontal	30 – 1000	G131051570	Complies	
921,500	Vertical	30 – 1000	G131051571	Complies	
927,750	Horizontal	30 – 1000	G131051573	Complies	
927,750	Vertical	30 – 1000	G131051572	Complies	

Antenna	Frequency Range (MHz)	Graph(s)	Result	Remarks
Loop Antenna	9kHz – 30MHz	G131051567	Complies	Antenna: Embedded



Nr. Harmonics	AV level (dB μ V/m)						AV Limits (dB μ V/m)	Remark
	915,250MHz		921,500 MHz		927,750 MHz			
	Frequency	(dB μ V/m)	Frequency	(dB μ V/m)	Frequency	(dB μ V/m)		
II Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	Antenna: Embedded
III Harmonic	2745,8178	46,2	2764,5738	47,3	2783,3872	47,2	54,00	
IV Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
V Harmonic	4576,3701	43,8	4607,6189	44,2	4638,8775	43,9	54,00	
VI Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
VII Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
VIII Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
IX Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
X Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	

Measurement Uncertainty: ± 4 dB

Nr. Harmonics	PK level (dB μ V/m)						PK Limits (dB μ V/m)	Remark
	915,250MHz		921,500 MHz		927,750 MHz			
	Frequency	(dB μ V/m)	Frequency	(dB μ V/m)	Frequency	(dB μ V/m)		
II Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	Antenna: Embedded
III Harmonic	2745,8178	48,7	2764,5738	40,3	2783,3872	49,9	74,00	
IV Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
V Harmonic	4576,3701	47,2	4607,6189	48,4	4638,8775	47,9	74,00	
VI Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
VII Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
VIII Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
IX Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
X Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	

Measurement Uncertainty: ± 4 dB



<i>Channel</i>	<i>Polarization</i>	<i>Frequency Range (MHz)</i>	<i>Graph(s) (peak measurements)</i>	<i>Result</i>	<i>Remarks</i>
915,250	Horizontal	30 – 1000	G131051561	Complies	Antenna: External
915,250	Vertical	30 – 1000	G131051560	Complies	
921,500	Horizontal	30 – 1000	G131051562	Complies	
921,500	Vertical	30 – 1000	G131051563	Complies	
927,750	Horizontal	30 – 1000	G131051565	Complies	
927,750	Vertical	30 – 1000	G131051564	Complies	

<i>Antenna</i>	<i>Frequency Range (MHz)</i>	<i>Graph(s)</i>	<i>Result</i>	<i>Remarks</i>
Loop Antenna	9kHz – 30MHz	G131051566	Complies	Antenna: External



Nr. Harmonics	AV level (dB μ V/m)						AV Limits (dB μ V/m)	Remark
	915,250MHz		921,500 MHz		927,750 MHz			
	Frequency	(dB μ V/m)	Frequency	(dB μ V/m)	Frequency	(dB μ V/m)		
II Harmonic	1830,4870	44,1	1842,9871	46,2	1855,4871	43,2	54,00	Antenna: External
III Harmonic	2745,8193	48,3	2764,5705	47,9	2783,3212	48,8	54,00	
IV Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
V Harmonic	4576,3687	43,9	4607,6259	51,2	4638,8933	44,4	54,00	
VI Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
VII Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
VIII Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
IX Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
X Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	54,00	
Measurement Uncertainty: ± 4 dB								

Nr. Harmonics	PK level (dB μ V/m)						PK Limits (dB μ V/m)	Remark
	915,250MHz		921,500 MHz		927,750 MHz			
	Frequency	(dB μ V/m)	Frequency	(dB μ V/m)	Frequency	(dB μ V/m)		
II Harmonic	1830,4870	48,2	1842,9871	46,2	1855,4871	47,3	74,00	Antenna: External
III Harmonic	2745,8193	50,6	2764,5705	51,8	2783,3212	53,3	74,00	
IV Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
V Harmonic	4576,3687	50,8	4607,6259	51,2	4638,8933	50,8	74,00	
VI Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
VII Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
VIII Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
IX Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
X Harmonic	--	More than 15dB below limit	--	More than 15dB below limit	--	More than 15dB below limit	74,00	
Measurement Uncertainty: ± 4 dB								

Remarks

EUT was tested in 3 orthogonal planes. In results table are reported the worst case.

Reference documents

See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report)

CMC S108, CMC S124, CMC S136, CMC S164

Measurement uncertainty: See clause 7 of this test report

Result

The requirements are met



11.7 Radiated Spurious (Receiver)

Test configuration and test method

Test site Semi-anechoic chamber
 Auxiliary equipment See clause 4 of this test report

Environmental conditions

Temperature 22 °C Atmospheric pressure 99 kPa Relative humidity 50 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209
- RSS-210 Annex 2 (A2.9)
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

EUT exercising

See clause 4 of this test report

Acceptance limits

In any 100kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in cl. 15.205(a), must also comply with the radiated emission limits specified in cl. 15.209(a) (see cl.15.205(c)).

Result

Channel	Polarization	Frequency Range (MHz)	Graph(s) (peak measurements)	Result	Remarks
915,250	Horizontal	1000 – 10000	G130515A2	Complies	Antenna: Embedded
915,250	Vertical	1000 – 10000	G130515A3	Complies	
921,500	Horizontal	1000 – 10000	G130515A5	Complies	
921,500	Vertical	1000 – 10000	G130515A4	Complies	
927,750	Horizontal	1000 – 10000	G130515A6	Complies	
927,750	Vertical	1000 – 10000	G130515A7	Complies	
915,250	Horizontal	1000 – 10000	G13051597	Complies	Antenna: Embedded
915,250	Vertical	1000 – 10000	G13051596	Complies	
921,500	Horizontal	1000 – 10000	G13051598	Complies	
921,500	Vertical	1000 – 10000	G13051599	Complies	
927,750	Horizontal	1000 – 10000	G130515A1	Complies	
927,750	Vertical	1000 – 10000	G130515A0	Complies	

Remarks

EUT was tested in 3 orthogonal planes. In results table are reported the worst case.

Reference documents

See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report)

CMC S108, CMC S124, CMC S127, CMC S136, CMC S164

Measurement uncertainty: See clause 7 of this test report

Result The requirements are met



11.8 Emission of mains terminal disturbance voltage (continuous disturbance)

Test configuration and test method

Test site Laboratory
 Auxiliary equipment See clause 4 of this test report

Environmental conditions

Temperature 20 °C Atmospheric pressure 99 kPa Relative humidity 45 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.207
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: AC mains

EUT exercising

See clause 4 of this test report

Acceptance limits

<i>Limits</i>		
<i>Frequency range (MHz)</i>	<i>dB(µV) Quasi-peak</i>	<i>dB(µV) Average</i>
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

Result

<i>Line</i>	<i>Graphs</i>	<i>Result</i>	<i>Remarks</i>
N	G13051520	Complies	Antenna: External Worst case condition
L1	G13051521	Complies	

Graphs Legend

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

Remarks ////////////////

Reference documents

See clause 8 of this test report

Test equipment used (Id number – see clause 6 of this test report)

CMC S206

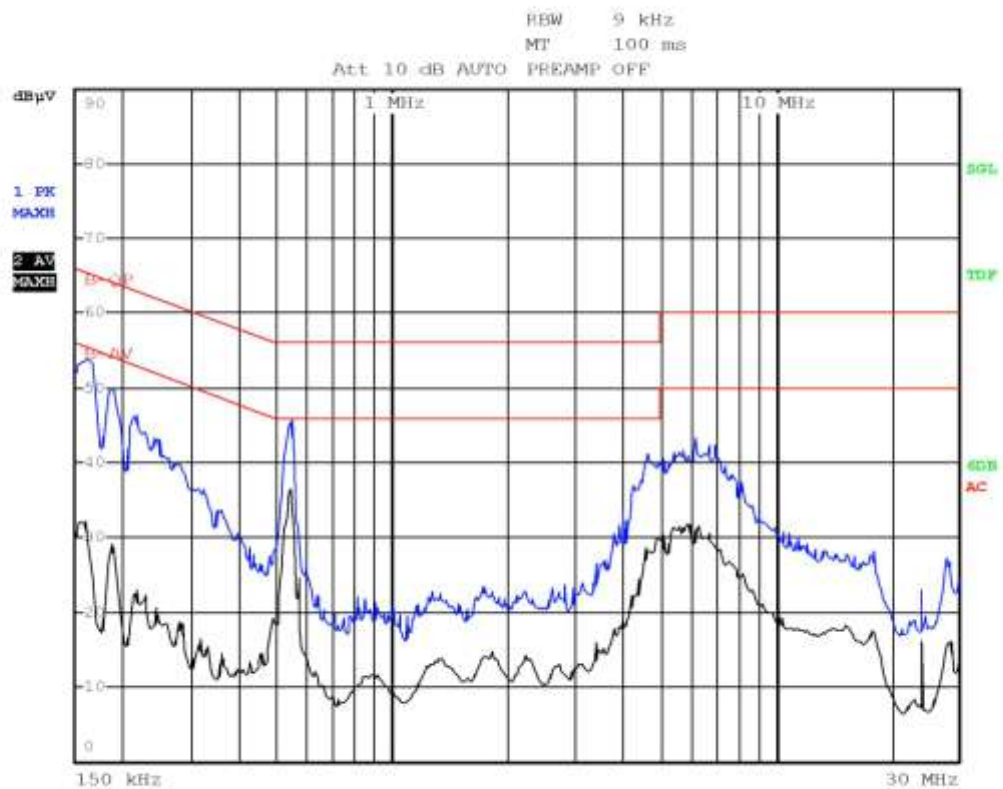
Measurement uncertainty: See clause 7 of this test report

Result The requirements are met



12. Graphs and Tables

G13051520

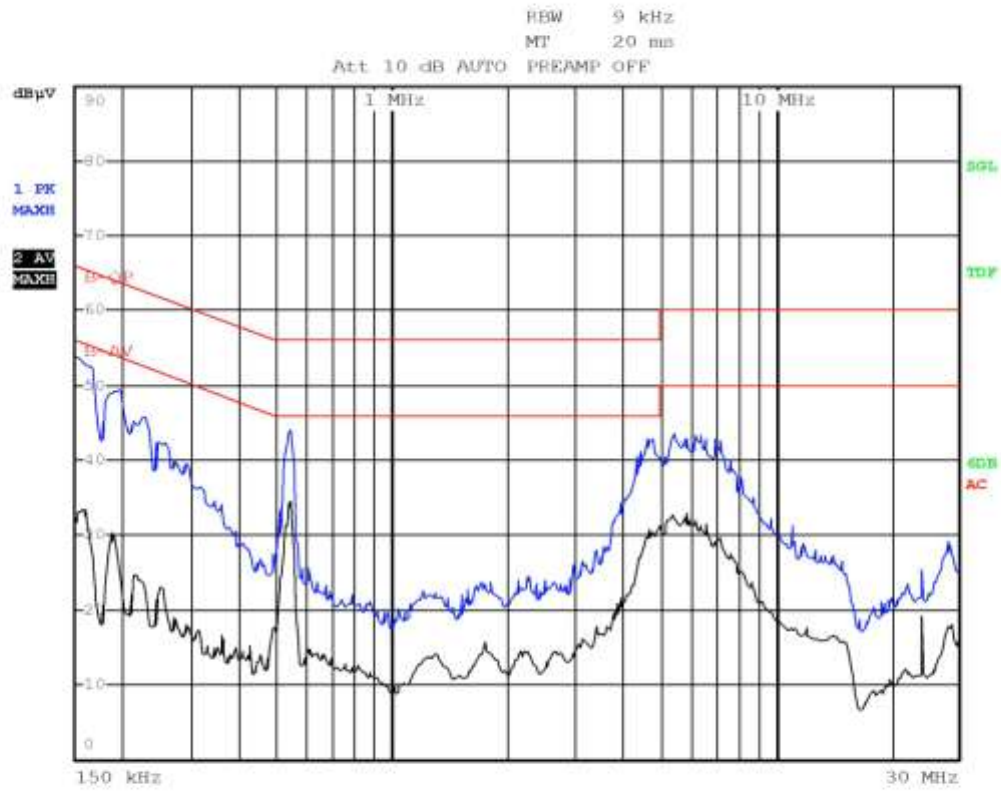


Bertezzolo 13051520 Line N

CMC Centro Misure Compatibilità S.r.l.



G13051521

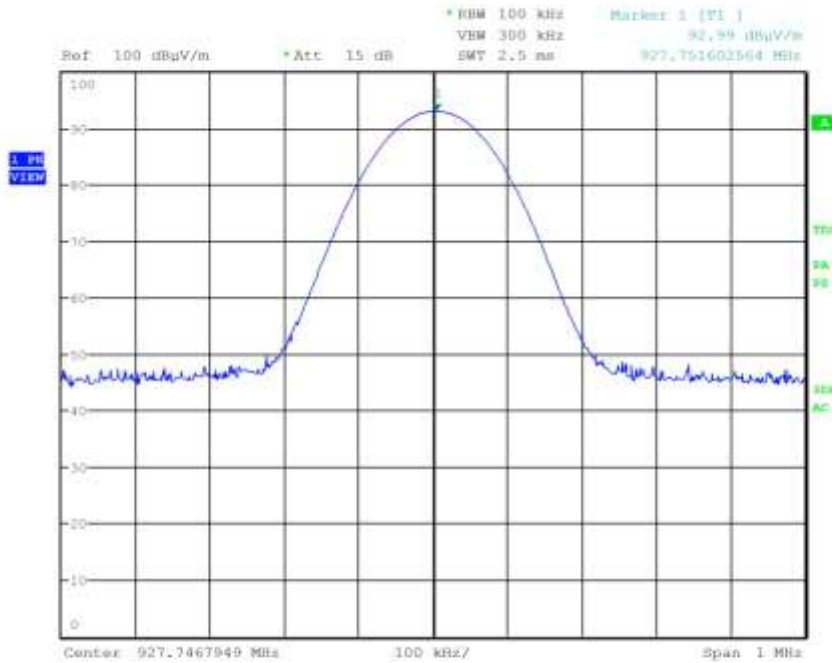


Bertezzo 13051521 Line 1



G13051550

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezolo 13051550
Test Spec
Vert

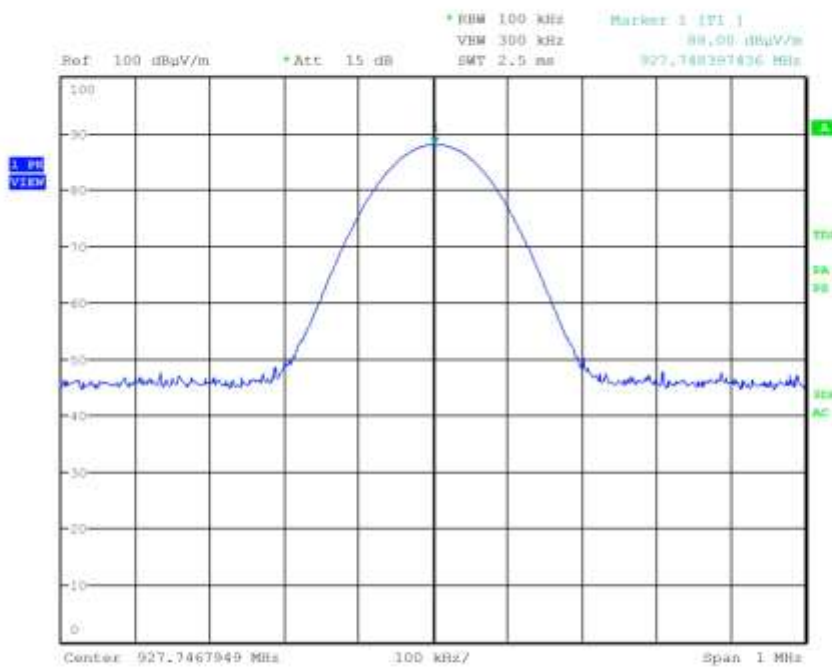


CMC Centro Misure Compatibilità S.r.l.



G13051551

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezolo 13051551
Test Spec
Horiz

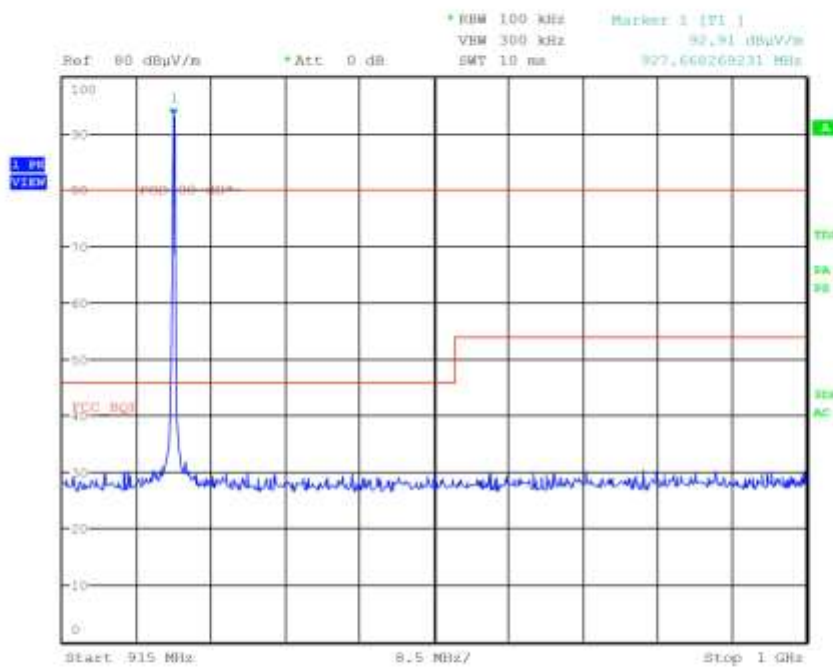


CMC Centro Misure Compatibilità S.r.l.



G13051553

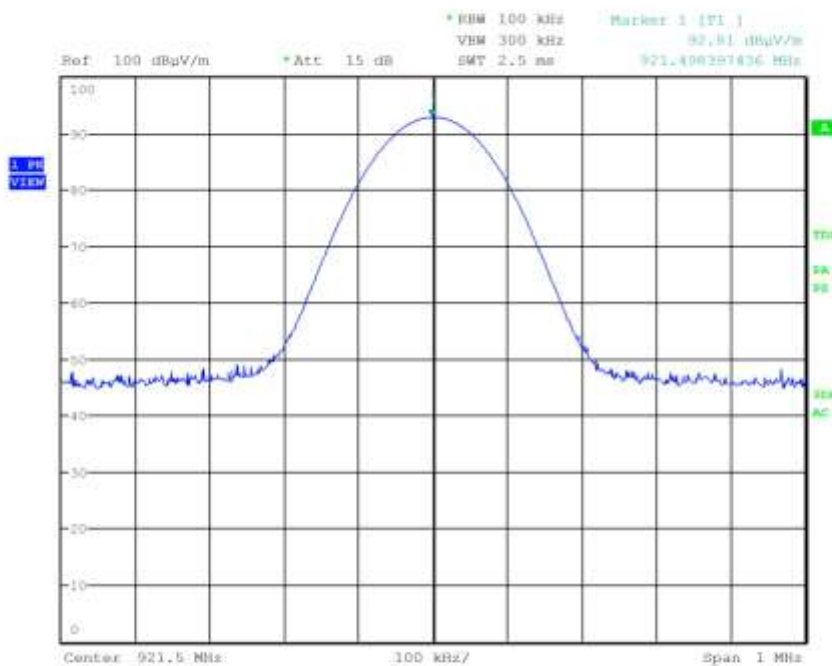
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezolo 13051553
Test Spec





G13051554

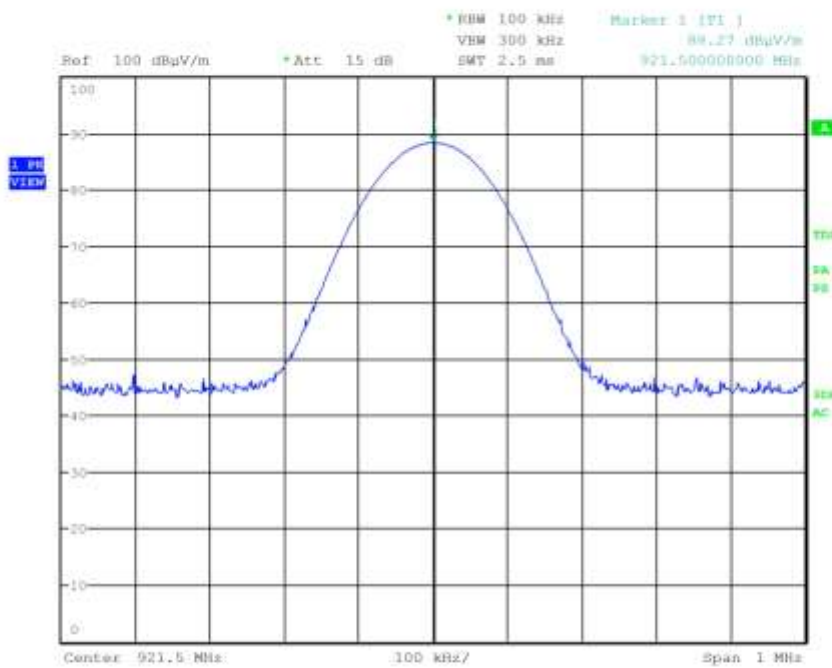
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F med
Operator Bertezolo 13051554
Test Spec





G13051555

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F med
Operator Bertezolo 13051555
Test Spec
Horiz

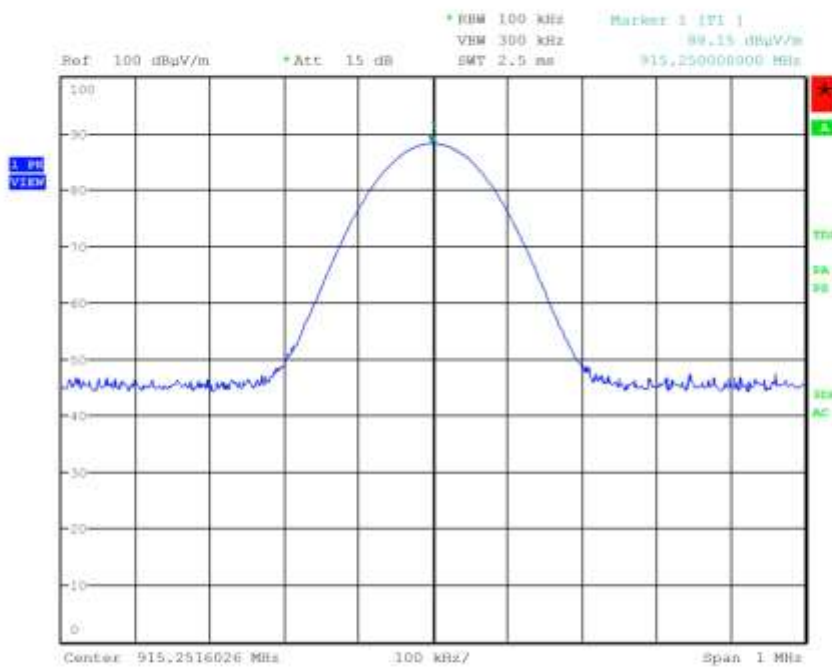


CMC Centro Misure Compatibilità S.r.l.



G13051556

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051556
Test Spec
Horiz

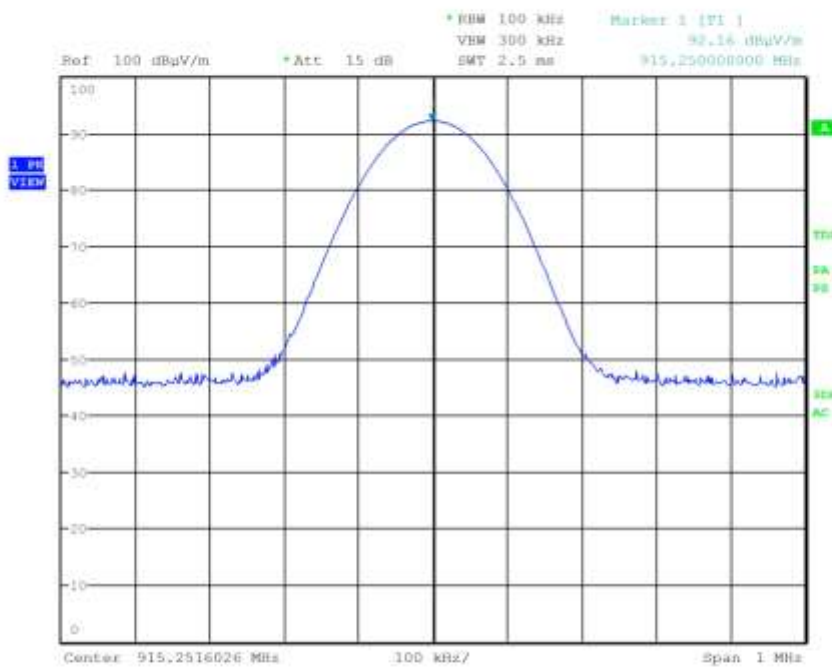


CMC Centro Misure Compatibilità S.r.l.



G13051557

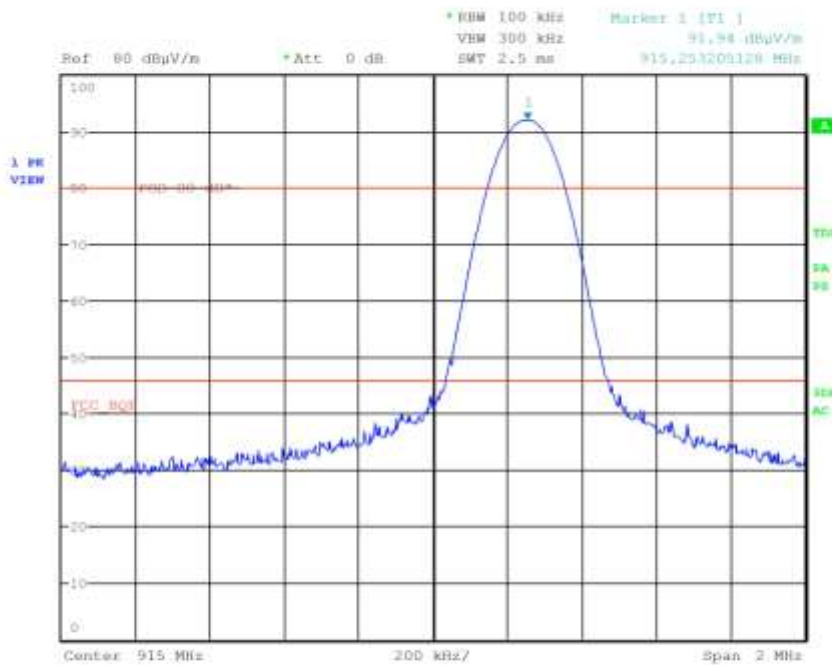
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051557
Test Spec
Vert





G13051558

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051558
Test Spec

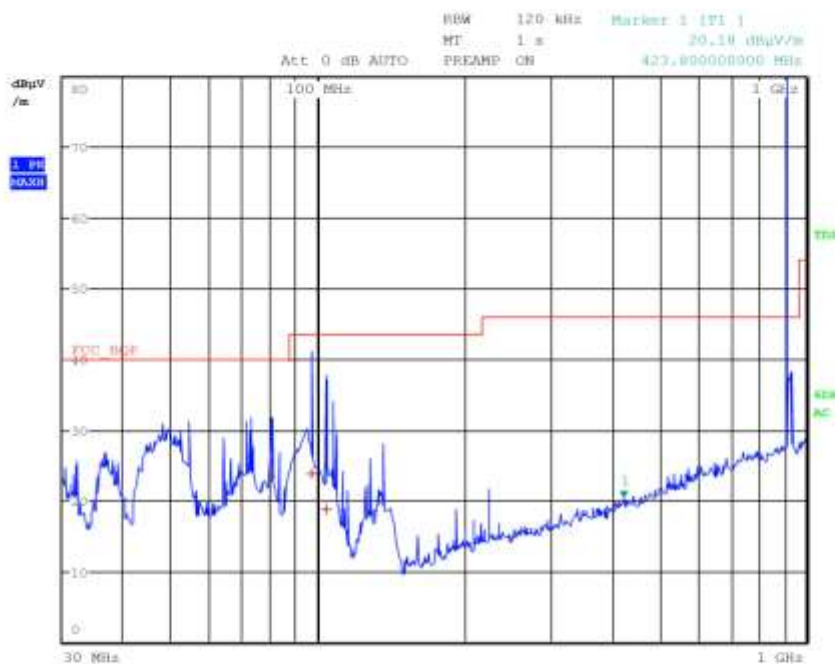


CMC Centro Misure Compatibilità S.r.l.



G13051560

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051560
Test Spec
Vert



Final Measurement

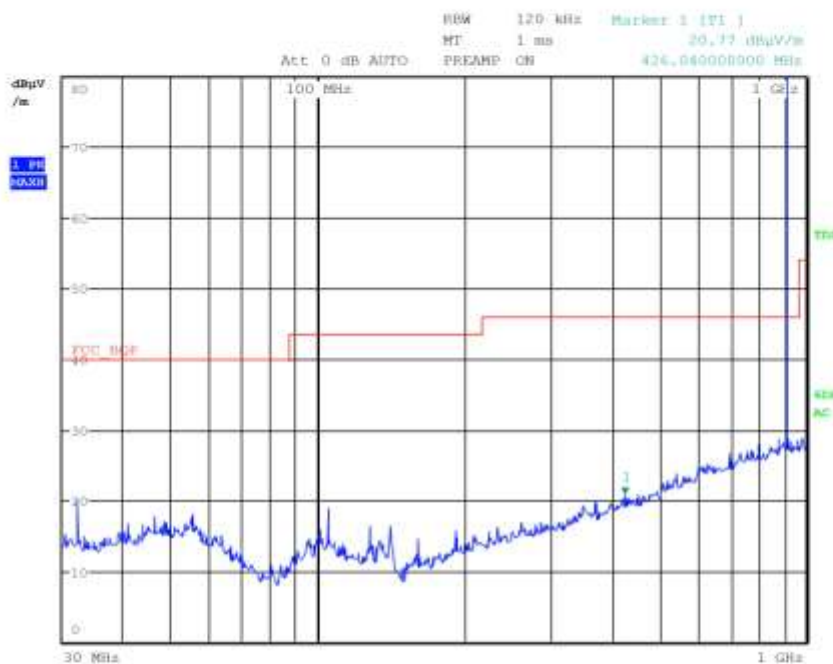
Meas Time: 1 s
Margin: 6 dB
Subranges: 2

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	96.800000000 MHz	23.79	Quasi Peak	-19.73
1	103.880000000 MHz	18.76	Quasi Peak	-24.76



G13051561

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051561
Test Spec
Horiz



Final Measurement

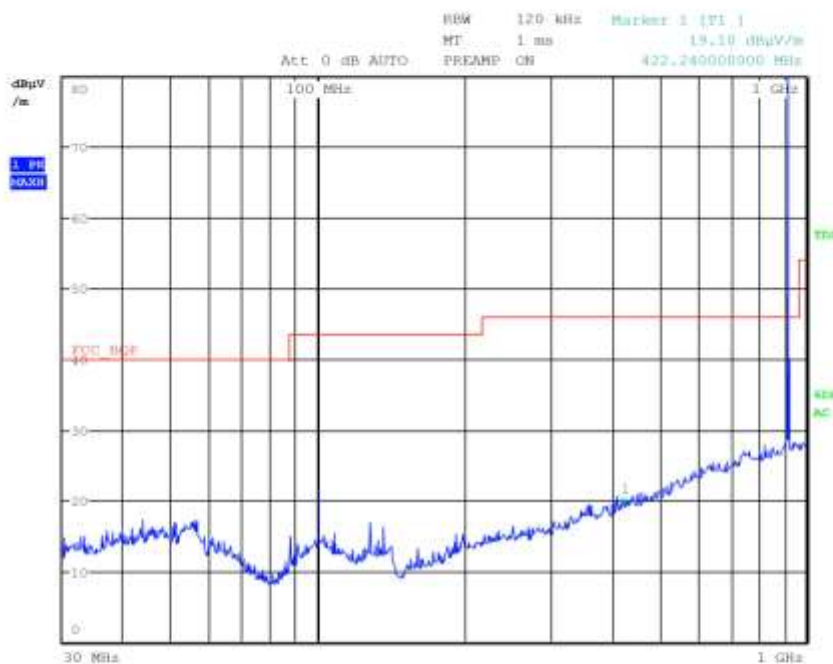
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051562

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F med
Operator Bertezolo 13051562
Test Spec
Horiz



Final Measurement

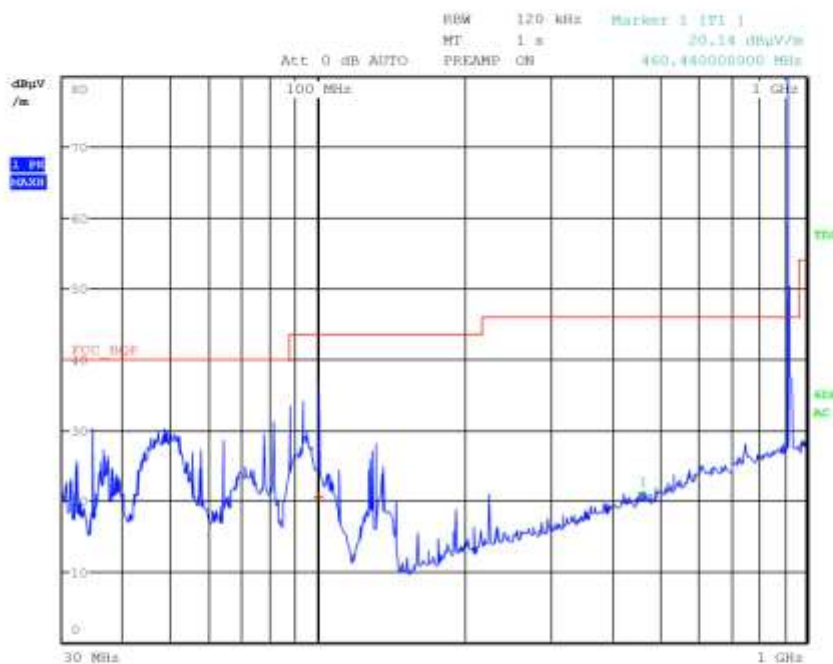
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051563

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F med
Operator Bertezolo 13051563
Test Spec
Vert



Final Measurement

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

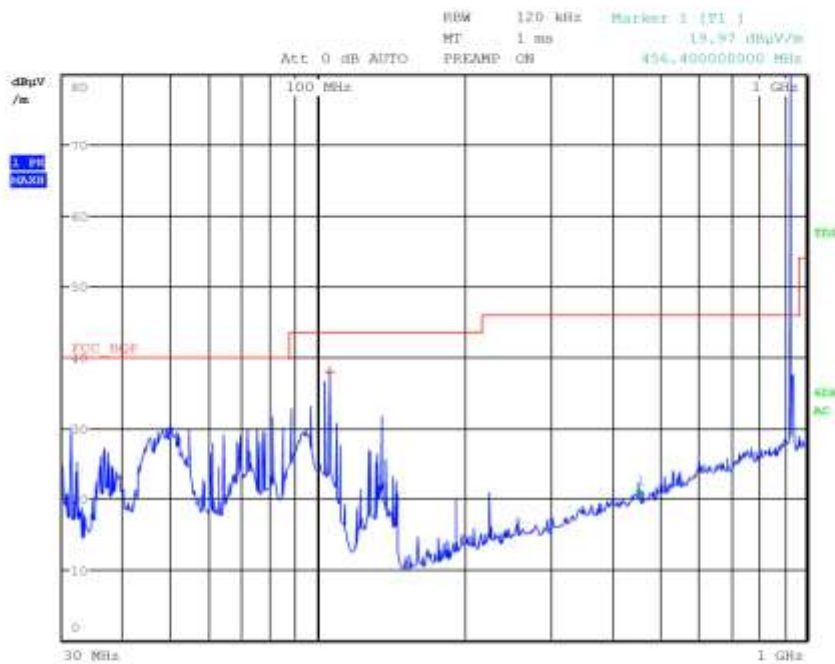
Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	100.520000000 MHz	20.47	Quasi Peak	-23.05

CMC Centro Misure Compatibilità S.r.l.



G13051564

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezolo 13051564
Test Spec
 Vert



Final Measurement

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

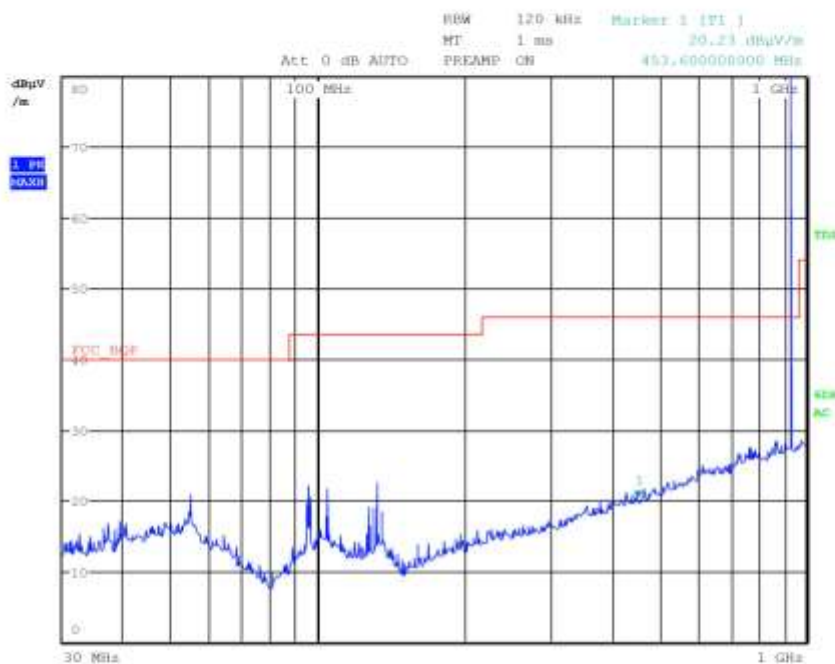
Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	105.880000000 MHz	37.83	Max Peak	-5.70

CMC Centro Misure Compatibilità S.r.l.



G13051565

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezolo 13051565
Test Spec
Horiz



Final Measurement

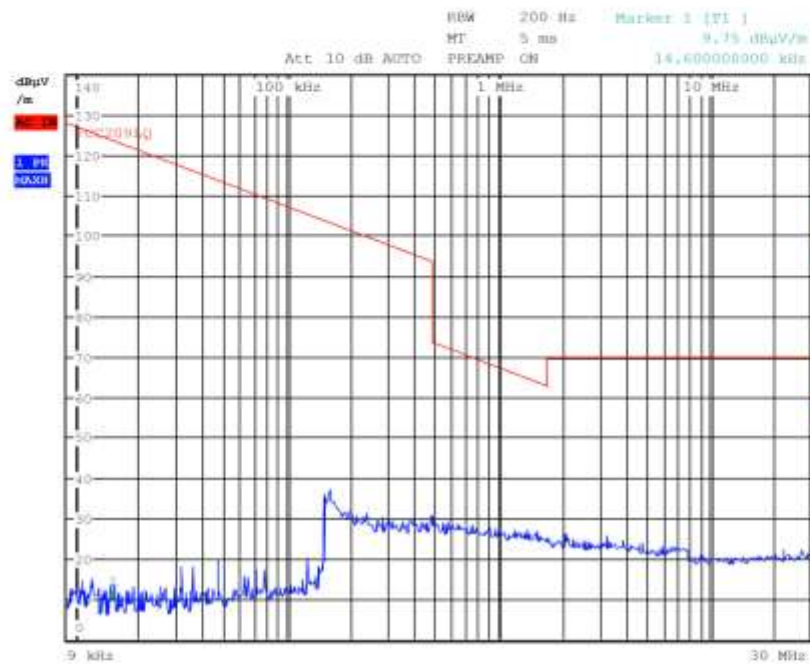
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051566

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 13051566
Test Spec
Loop



Final Measurement

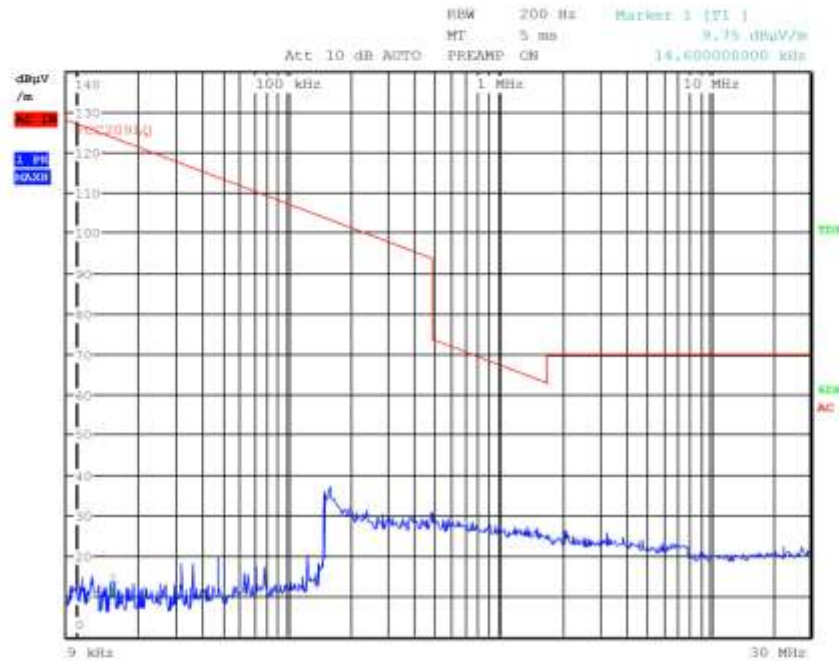
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051567

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition
Operator Bertezolo 13051567
Test Spec
Loop



Final Measurement

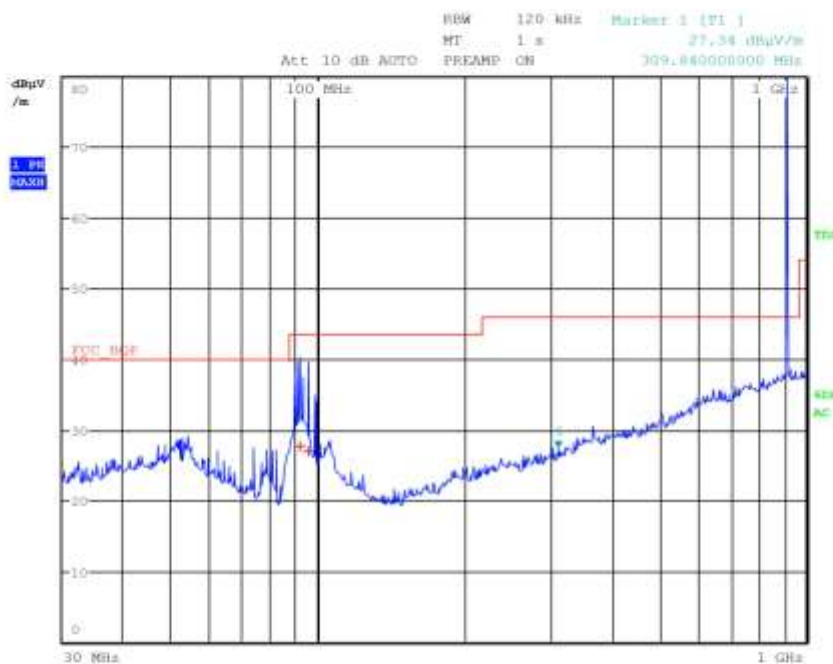
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051568

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051568
Test Spec
Vert



Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 2

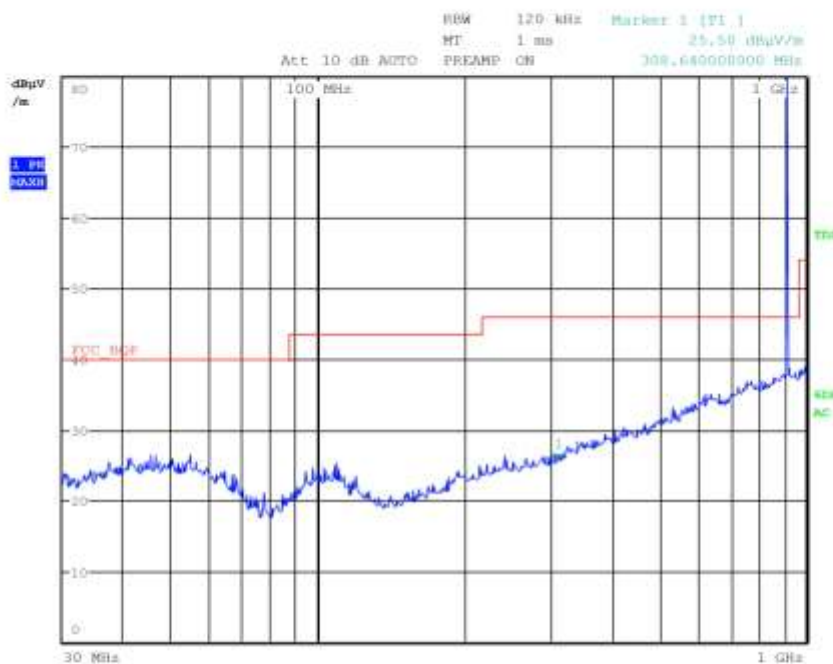
Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	91.640000000 MHz	27.67	Quasi Peak	-15.85
1	95.200000000 MHz	26.99	Quasi Peak	-16.53

CMC Centro Misure Compatibilità S.r.l.



G13051569

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051569
Test Spec
Horiz



Final Measurement

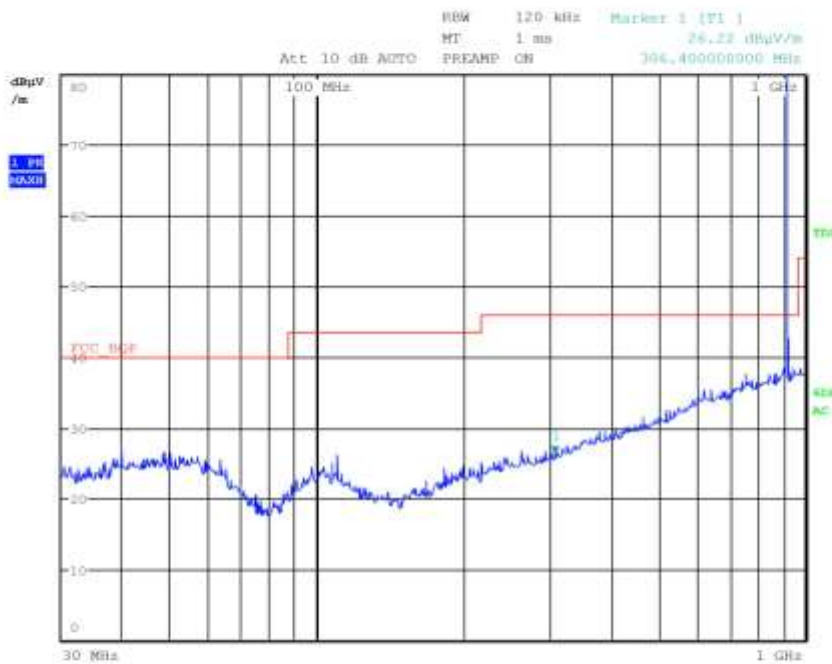
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051570

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F med
Operator Bertezolo 13051570
Test Spec
Horiz



Final Measurement

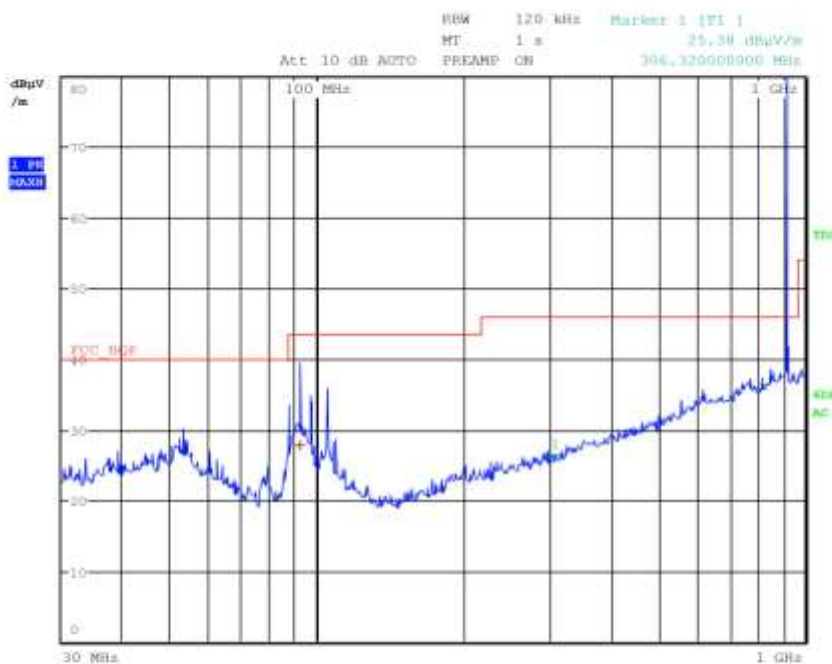
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051571

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F med
Operator Bertezolo 13051571
Test Spec
Vert



Final Measurement

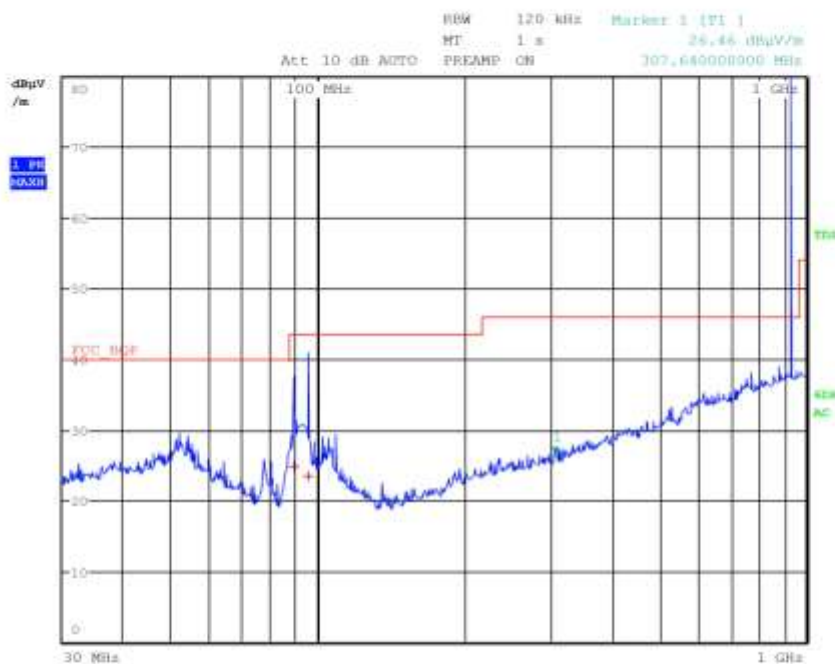
Meas Time: 1 s
Margin: 6 dB
Subranges: 1

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	92.360000000 MHz	27.81	Quasi Peak	-15.71



G13051572

Meas Type Emission
 Equipment under Test
 Manufacturer
 OP Condition F max
 Operator Bertezolo 13051572
 Test Spec
 Vert



Final Measurement

Meas Time: 1 s
 Margin: 6 dB
 Subranges: 2

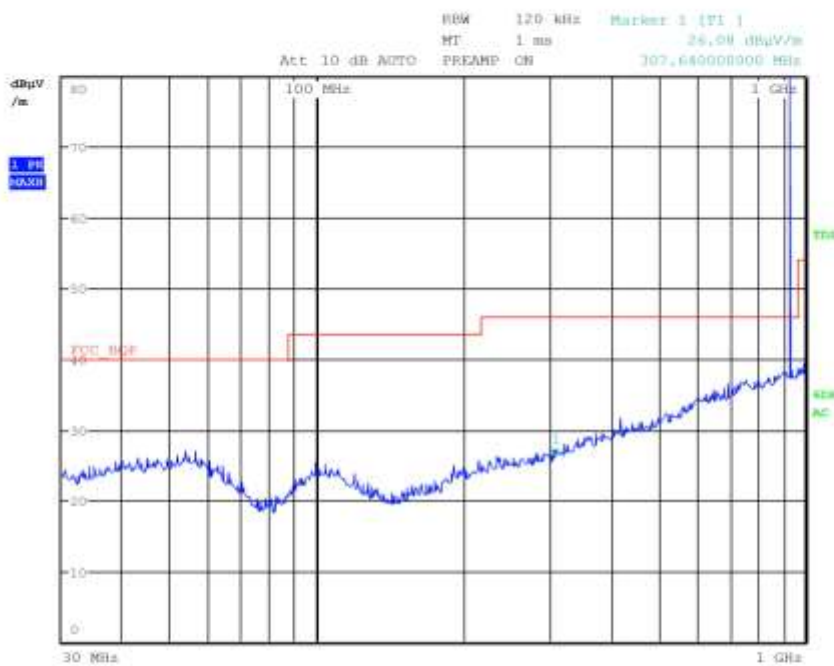
Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	69.200000000 MHz	24.79	Quasi Peak	-18.73
1	95.560000000 MHz	23.39	Quasi Peak	-20.13

CMC Centro Misure Compatibilità S.r.l.



G13051573

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezolo 13051573
Test Spec
Horiz



Final Measurement

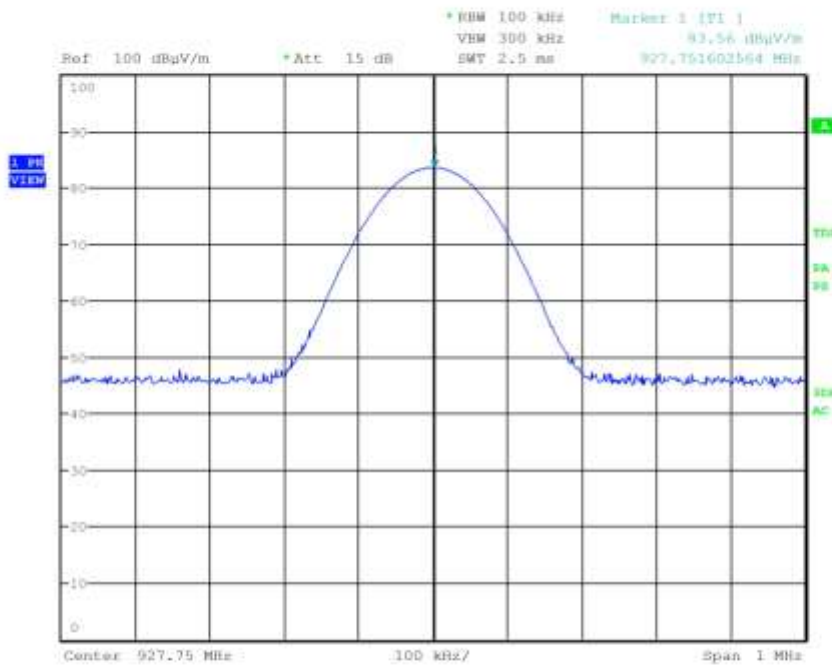
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051574

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezzolo 13051574
Test Spec
Horiz

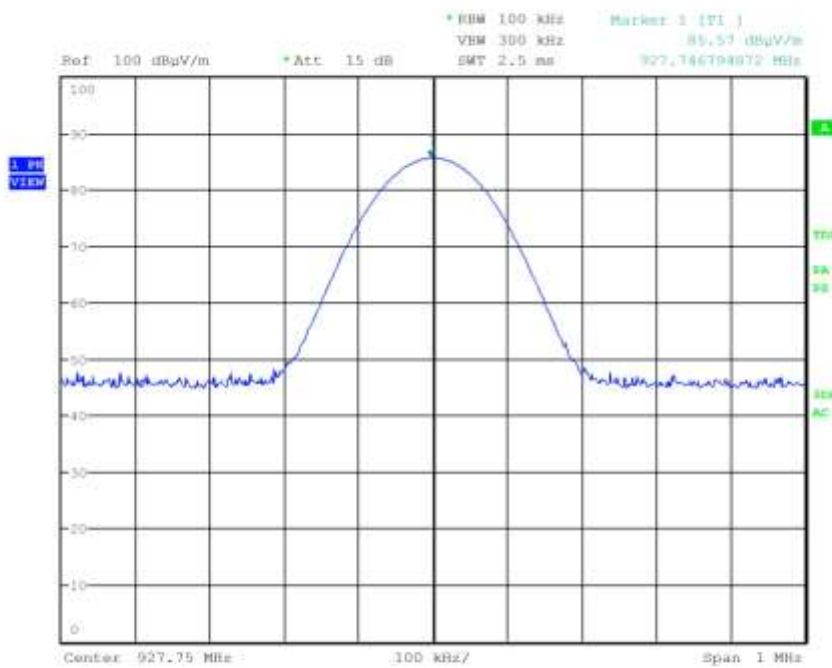


CMC Centro Misure Compatibilità S.r.l.



G13051575

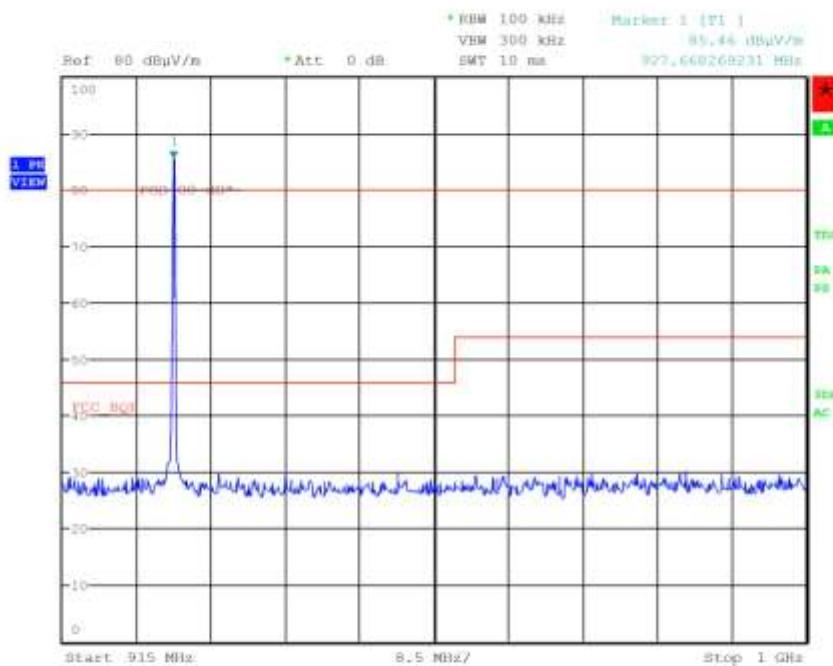
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezolo 13051575
Test Spec
Vert





G13051577

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F max
Operator Bertezolo 13051577
Test Spec

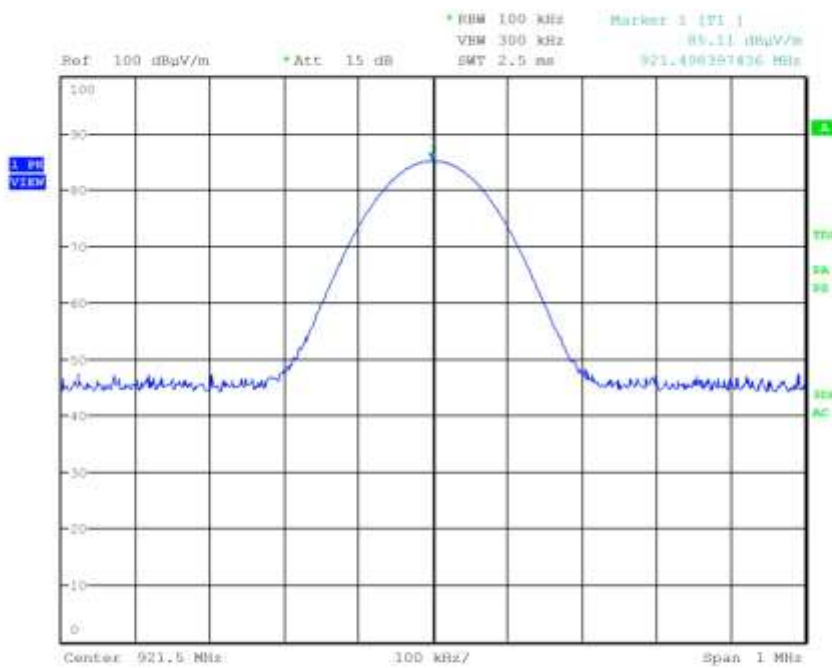


CMC Centro Misure Compatibilità S.r.l.



G13051578

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F med
Operator Bertezolo 13051578
Test Spec
Vert

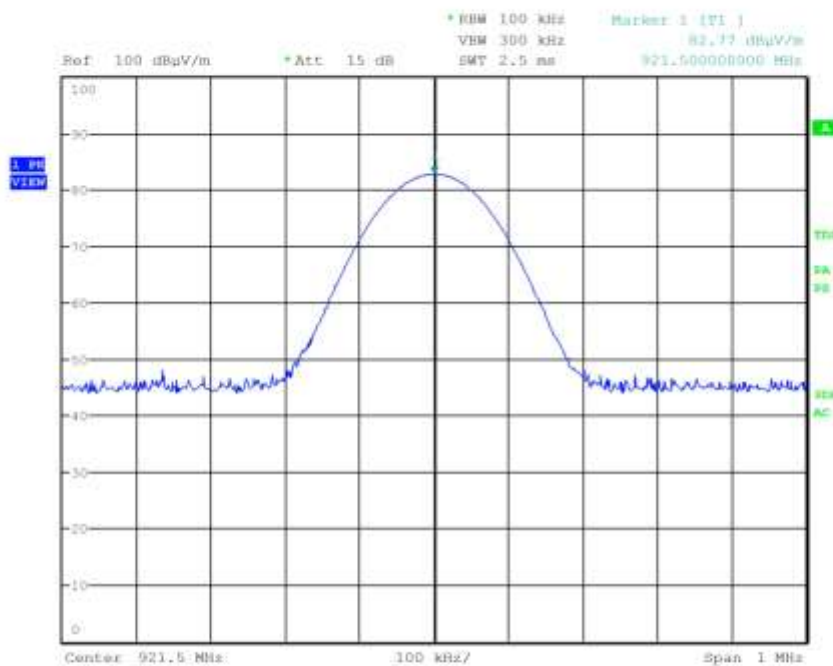


CMC Centro Misure Compatibilità S.r.l.



G13051579

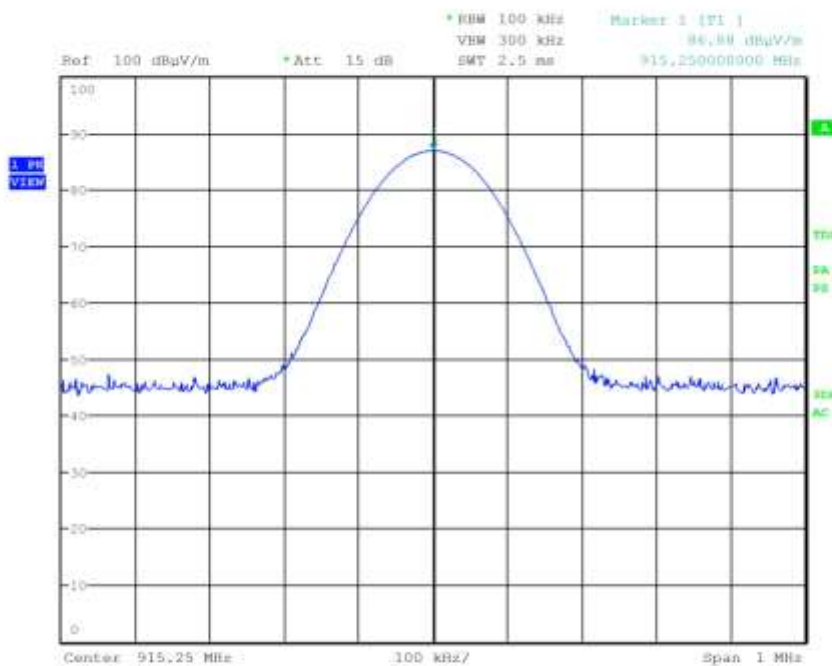
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F med
Operator Bertezolo 13051579
Test Spec
Horiz





G13051580

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051580
Test Spec
Horiz

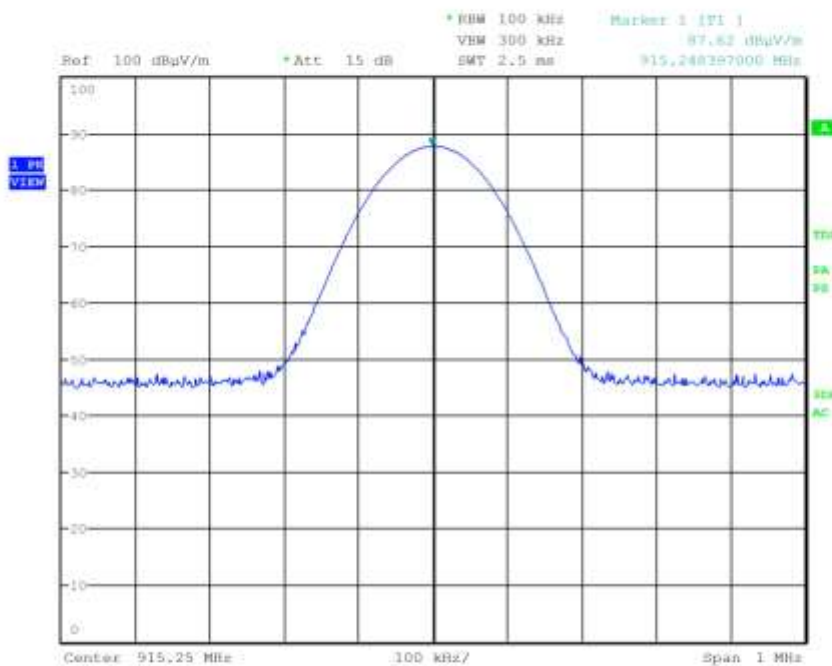


CMC Centro Misure Compatibilità S.r.l.



G13051581

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051581
Test Spec
Vert

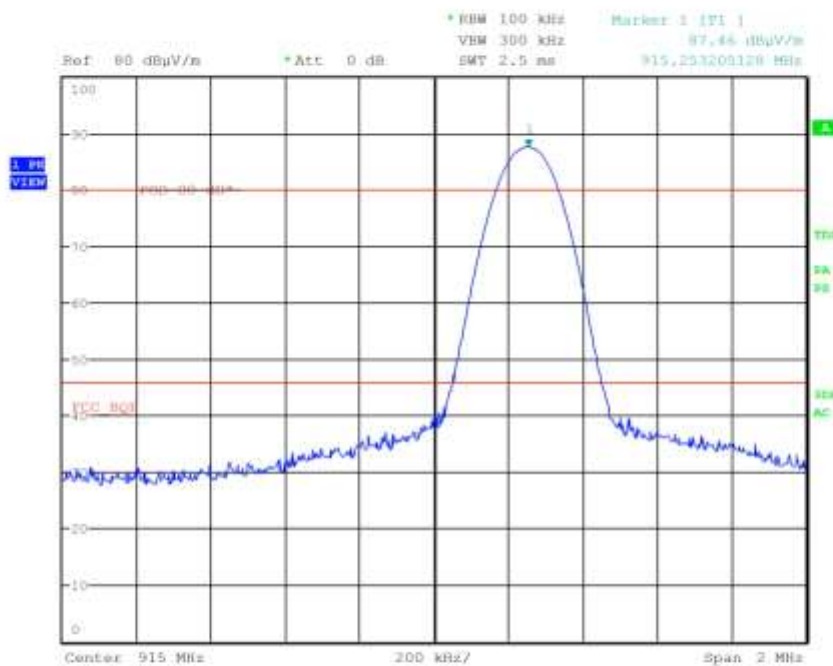


CMC Centro Misure Compatibilità S.r.l.



G13051582

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051582
Test Spec

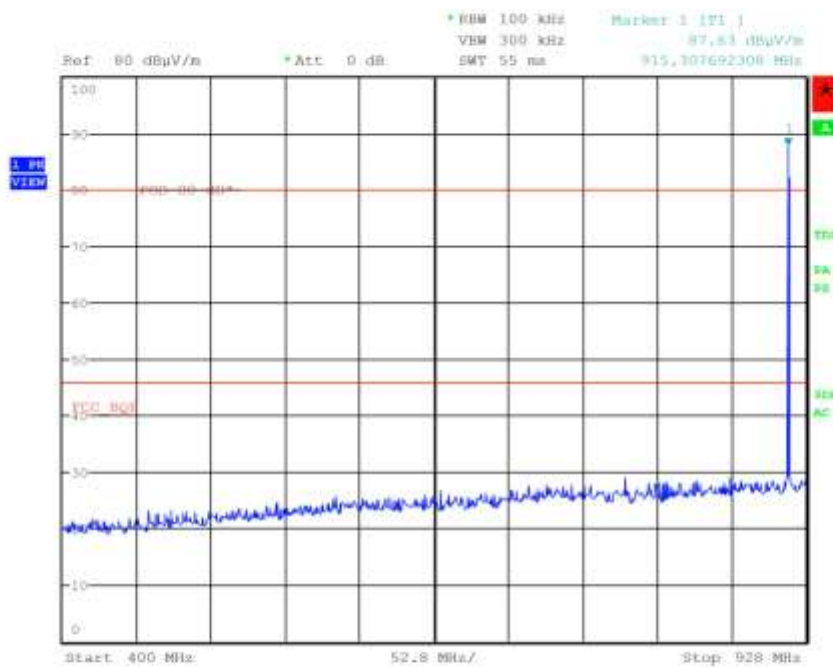


CMC Centro Misure Compatibilità S.r.l.



G13051583

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition F min
Operator Bertezolo 13051583
Test Spec



CMC Centro Misure Compatibilità S.r.l.



G130515

G130515

G130515





G13051587

G13051588

G13051589

G13051590

G13051591

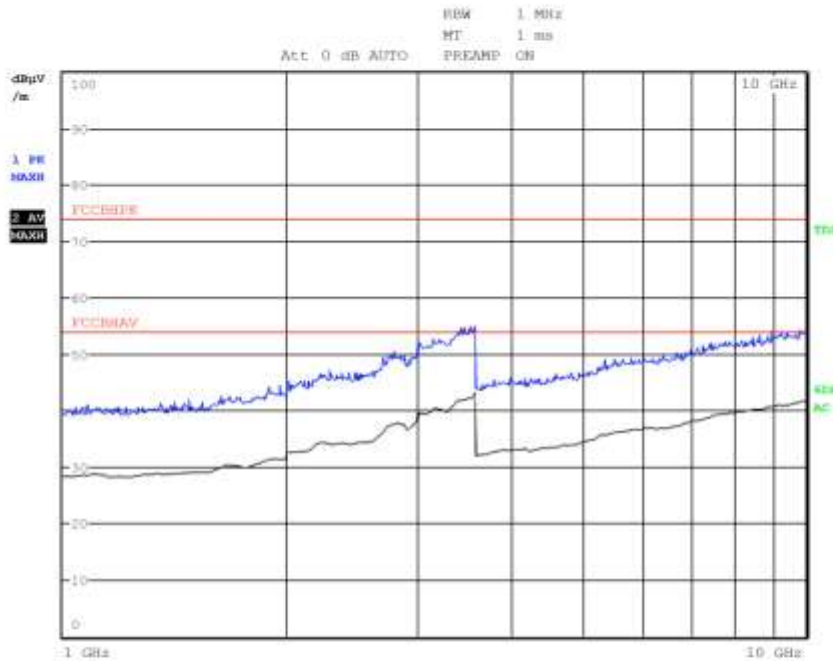
G13051592





G13051596

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f min RX
Operator Bertezzo 13051596
Test Spec
Vert



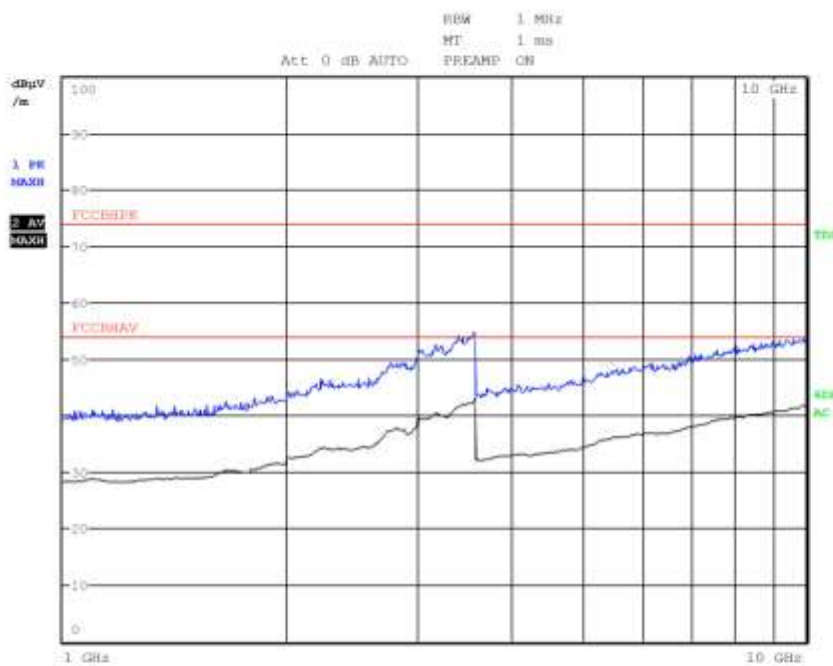
Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 0



G13051597

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f min RX
Operator Bertezolo 13051597
Test Spec
Horiz



Final Measurement

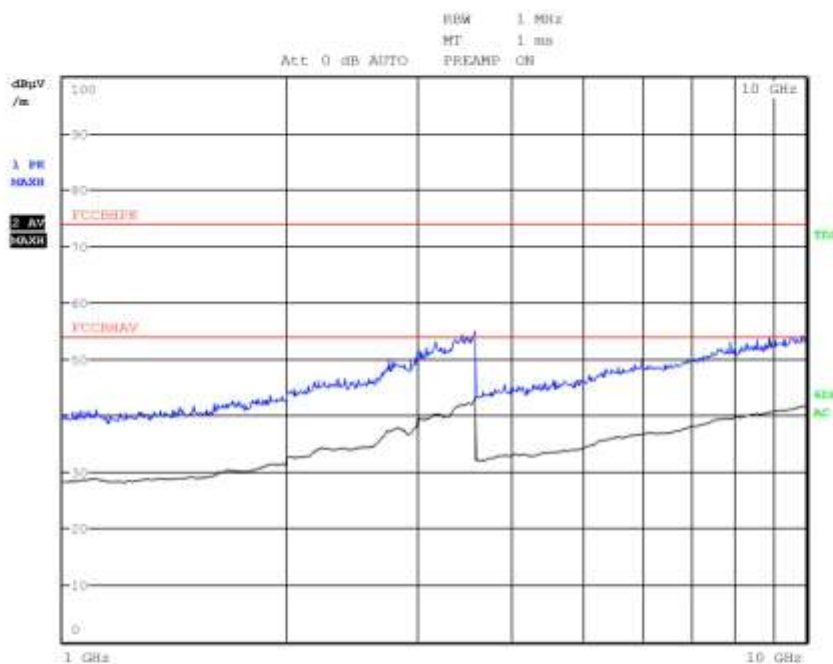
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051598

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f med RX
Operator Bertezolo 13051598
Test Spec
Horiz



Final Measurement

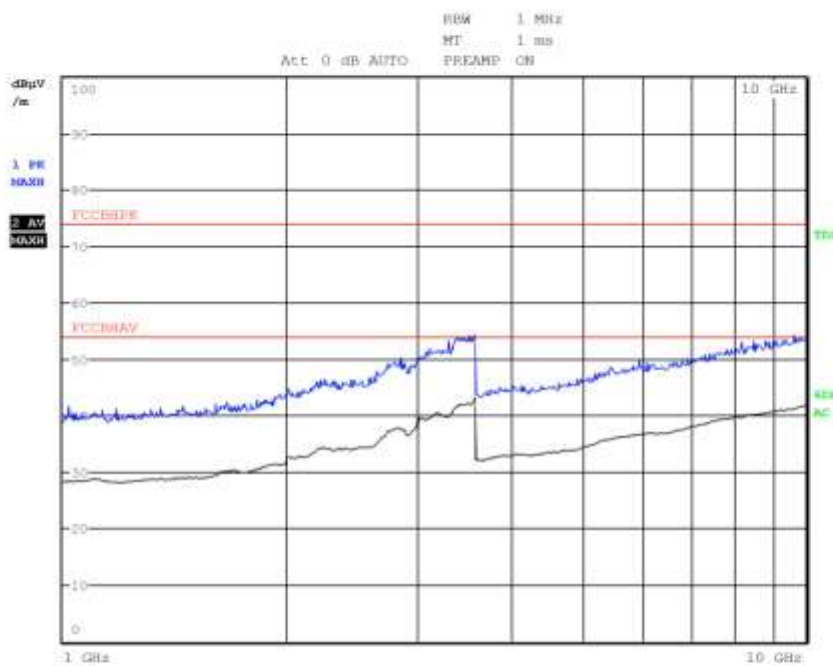
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G13051599

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f med RX
Operator Bertezolo 13051599
Test Spec
Vert



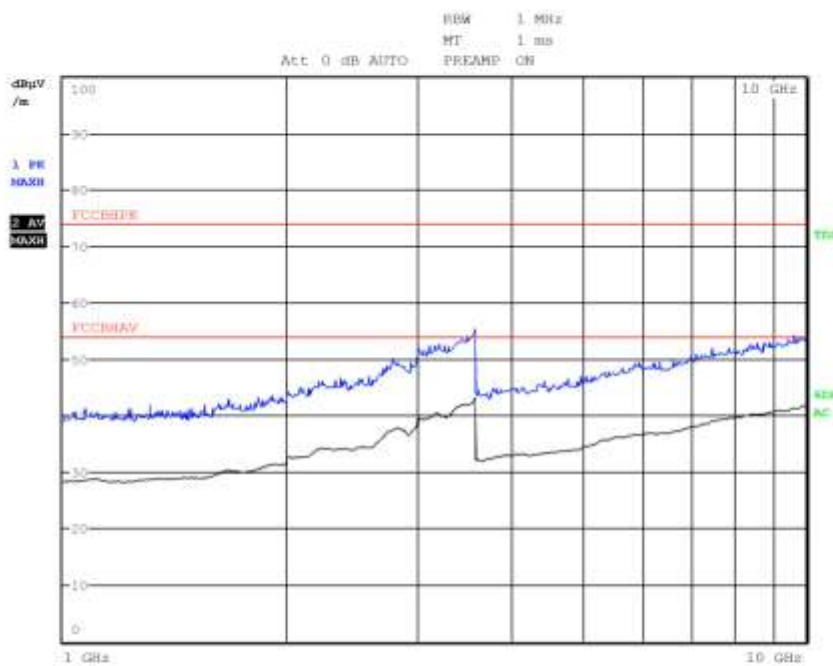
Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 0



G130515A0

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f max RX
Operator Bertezolo 130515A0
Test Spec
Vert



Final Measurement

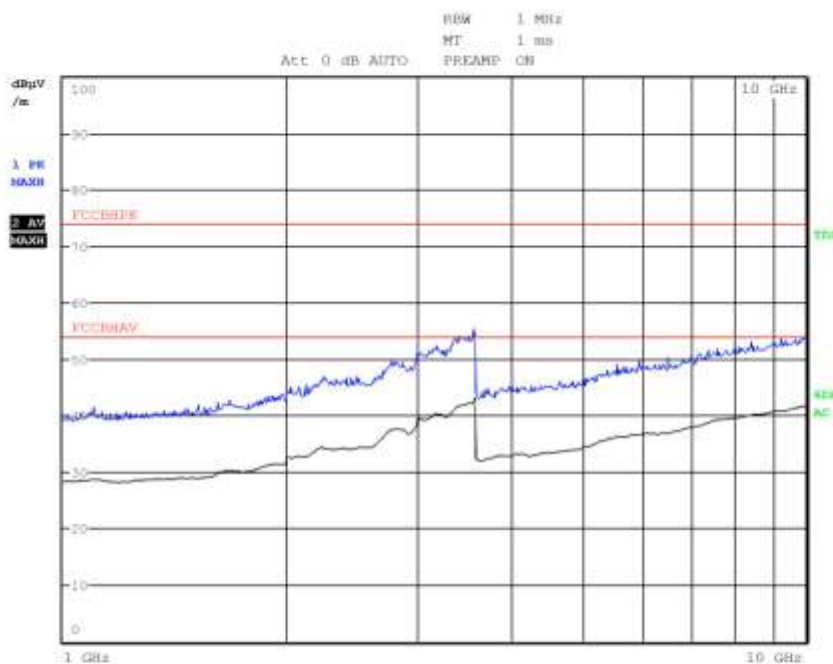
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G130515A1

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f max RX
Operator Bertezolo 130515A1
Test Spec
Horiz



Final Measurement

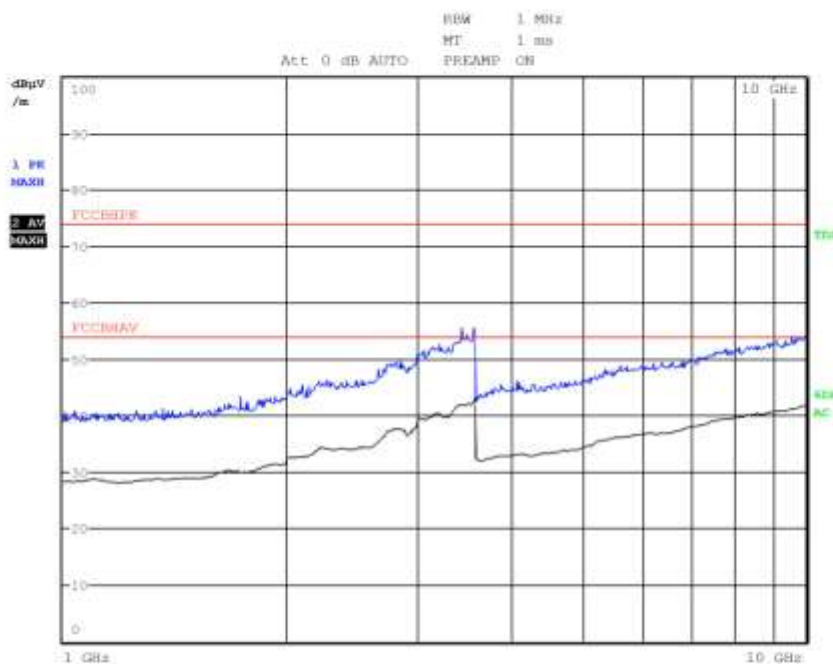
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G130515A2

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f min RX
Operator Bertezolo 130515A2
Test Spec
Horiz



Final Measurement

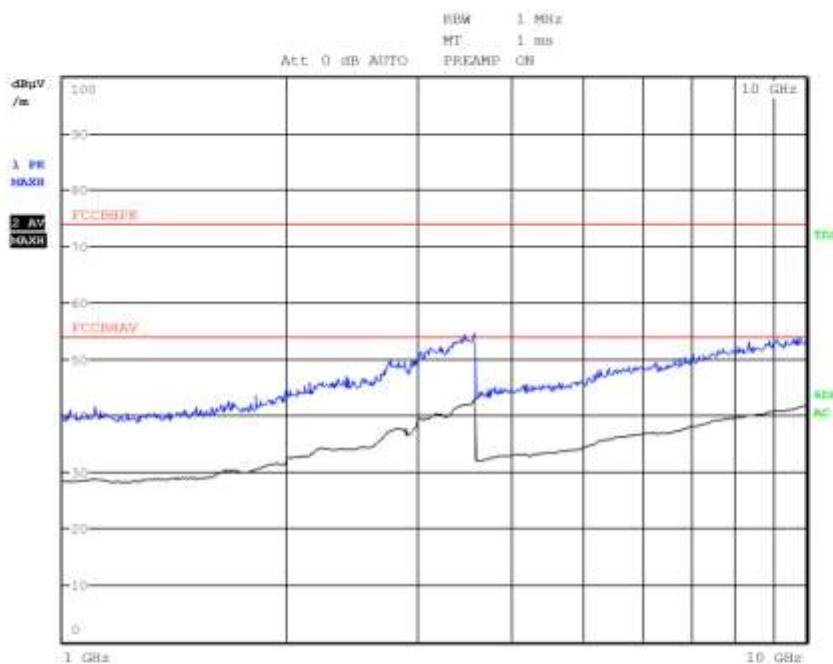
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G130515A3

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f min RX
Operator Bertezolo 130515A3
Test Spec
Vert



Final Measurement

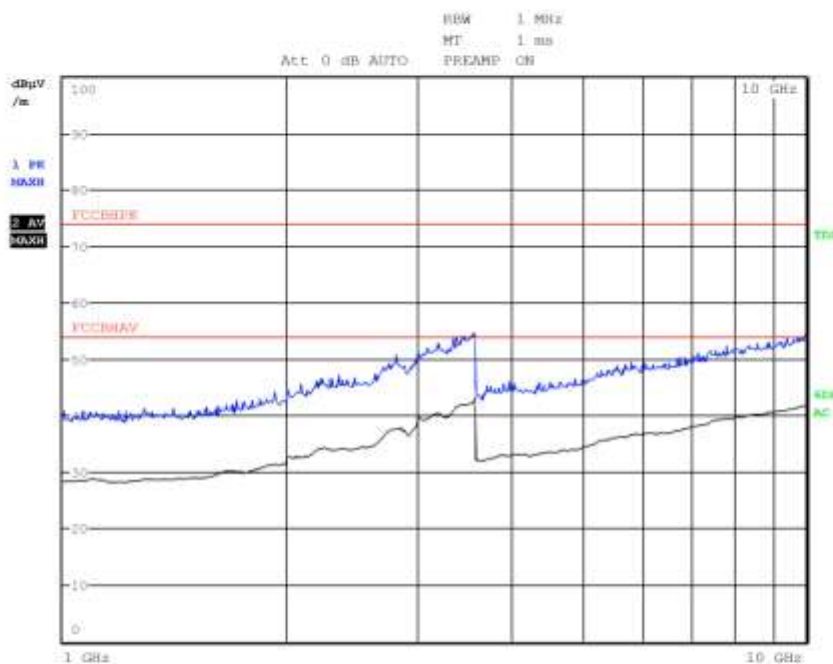
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G130515A4

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f med RX
Operator Bertezolo 130515A4
Test Spec
Vert



Final Measurement

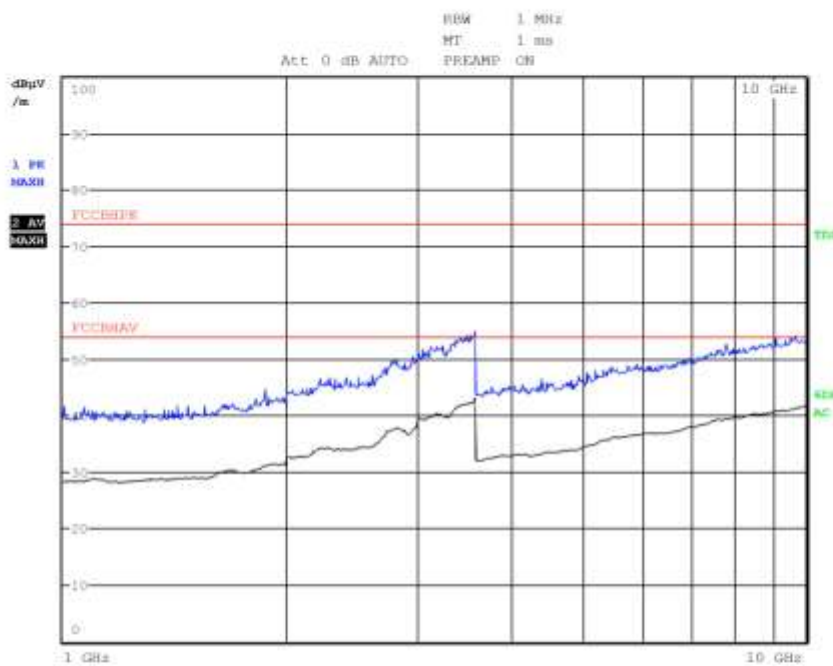
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G130515A5

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f med RX
Operator Bertezolo 130515A5
Test Spec
Horiz



Final Measurement

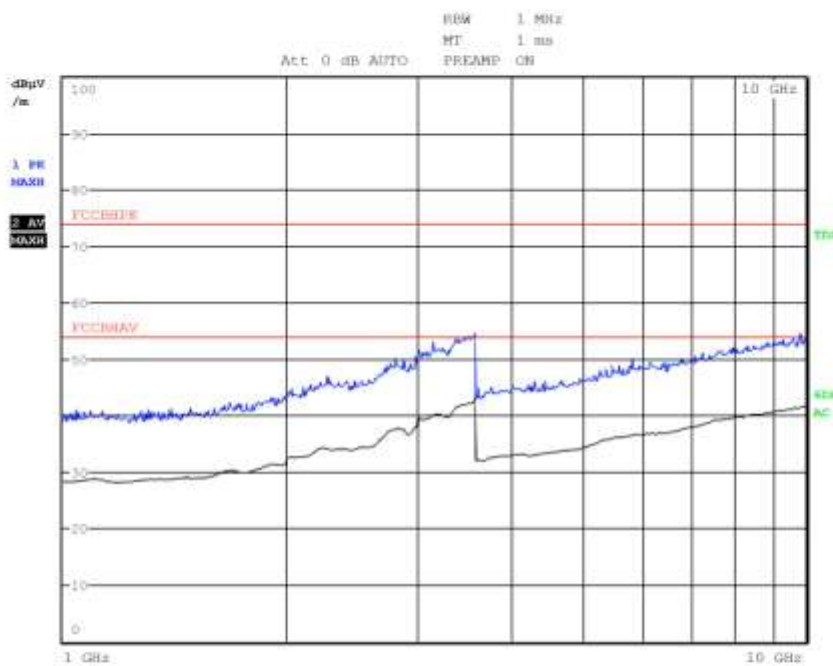
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G130515A6

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f max RX
Operator Bertezolo 130515A6
Test Spec
Horiz



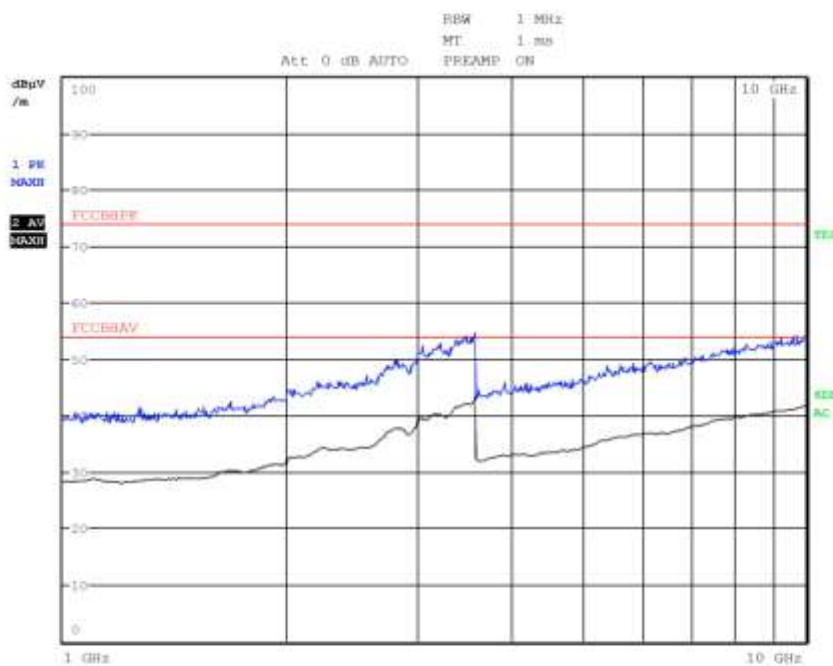
Final Measurement

Meas Time: 1 s
Margin: 6 dB
Subranges: 0



G130515A7

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition f max RX
Operator Bertezolo 130515A7
Test Spec
Vert



Final Measurement

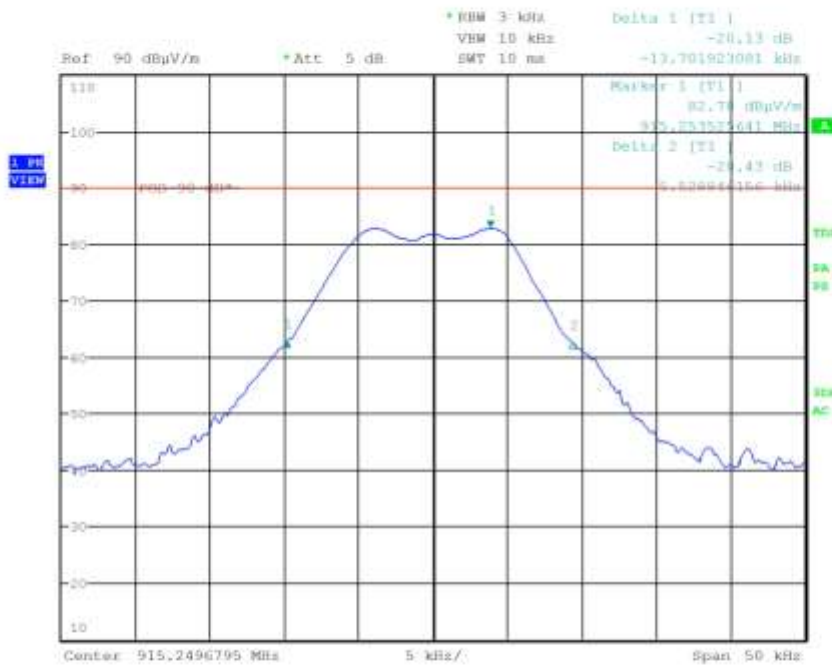
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G130515A10

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmin-ANT. INT.
Operator Gandini
Test Spec

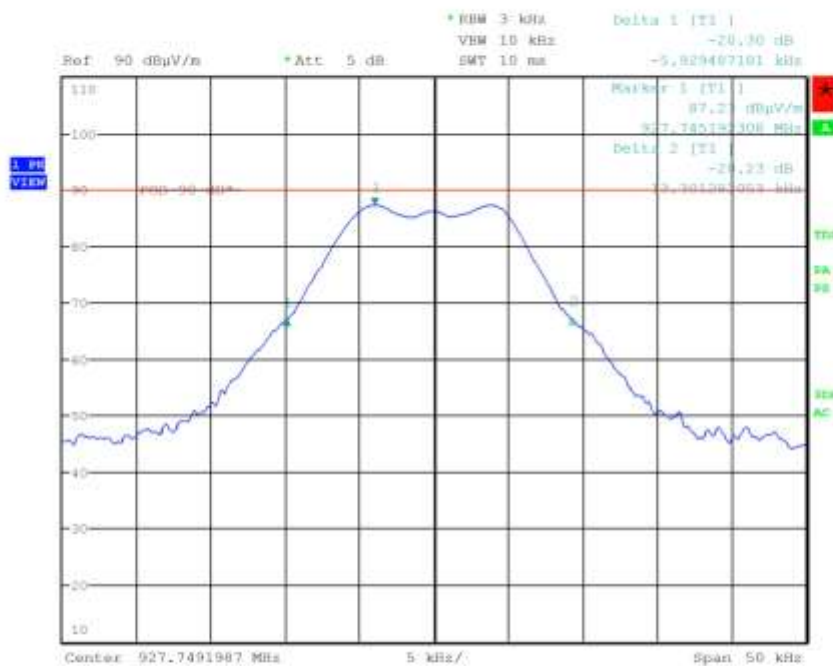


CMC Centro Misure Compatibilità S.r.l.



G130515A12

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmax-ANT. INT.
Operator Gandini
Test Spec

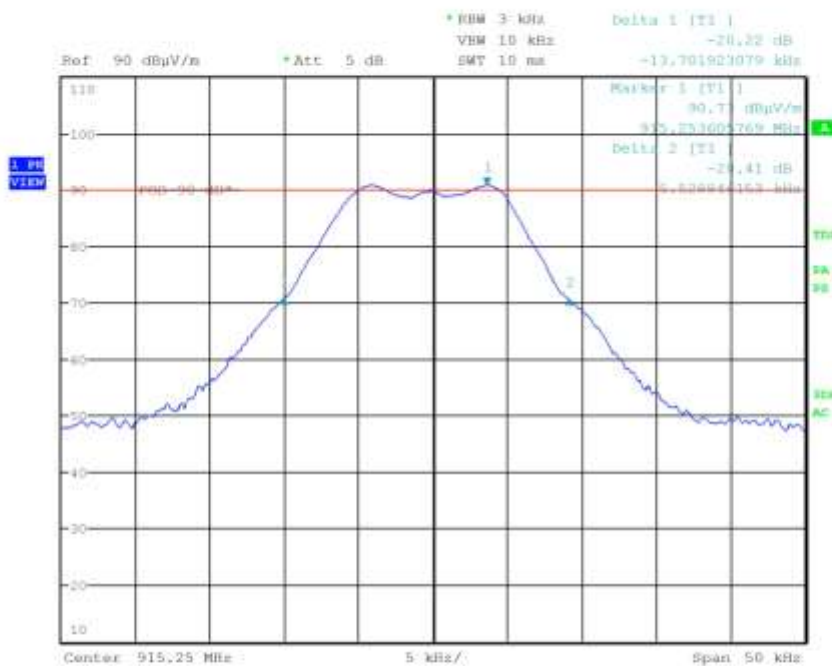


CMC Centro Misure Compatibilità S.r.l.



G130515A13

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmin-ANT. EXT.
Operator Gandini
Test Spec

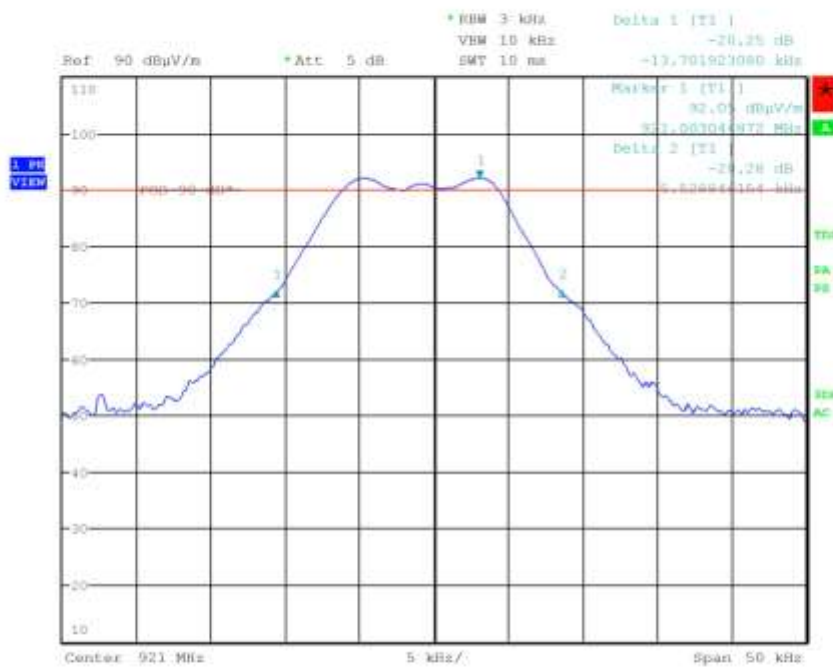


CMC Centro Misure Compatibilità S.r.l.



G130515A14

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmed-ANT. EXT.
Operator Gandini
Test Spec

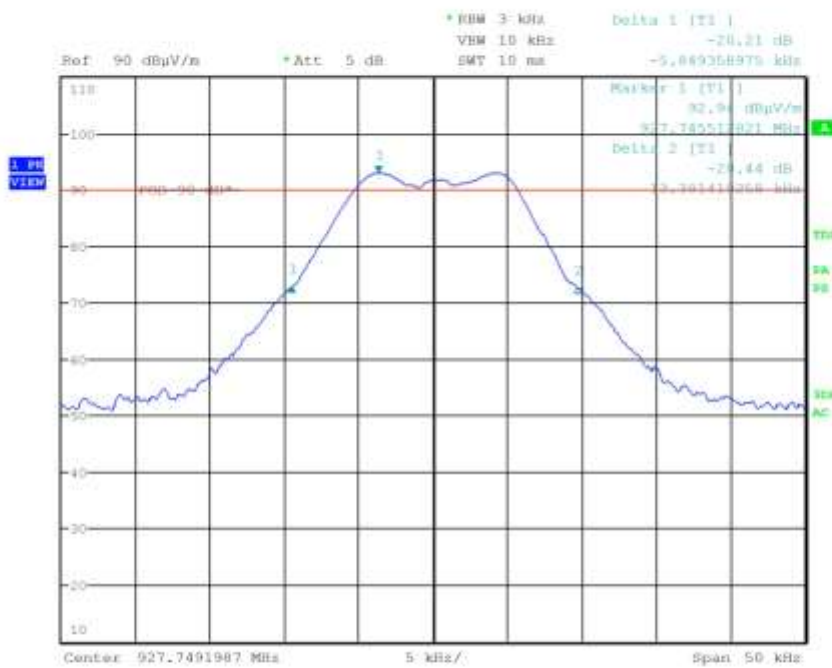


CMC Centro Misure Compatibilità S.r.l.



G130515A15

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmax-ANT. EXT.
Operator Gandini
Test Spec

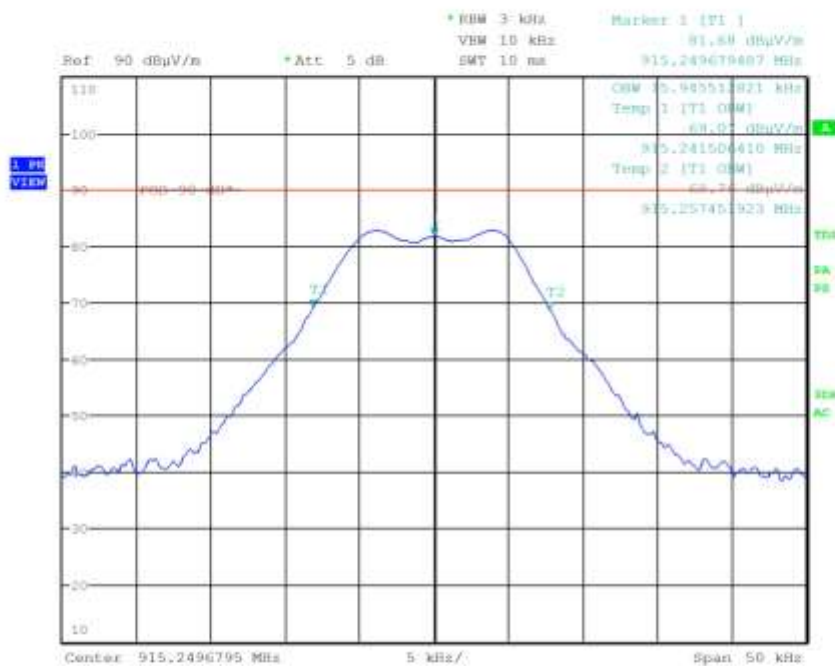


CMC Centro Misure Compatibilità S.r.l.



G130515A16

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmin-ANT. INT.
Operator Gandini
Test Spec

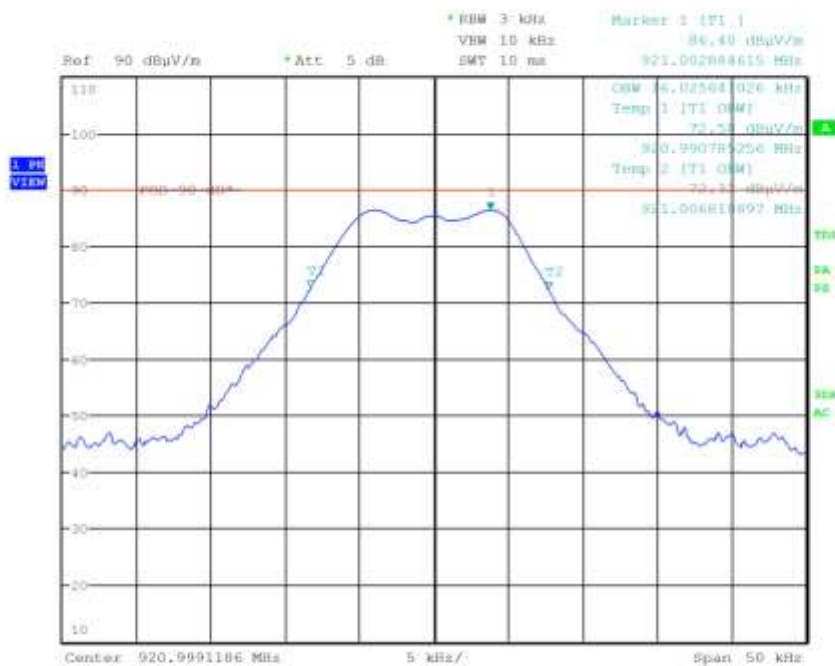


CMC Centro Misure Compatibilità S.r.l.



G130515A17

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmed-ANT. INT.
Operator Gandini
Test Spec

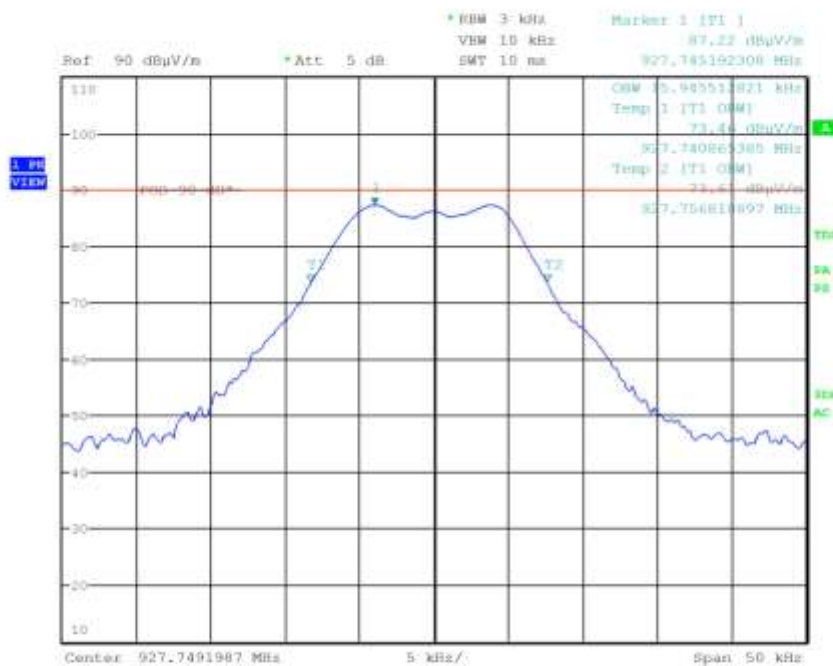


CMC Centro Misure Compatibilità S.r.l.



G130515A18

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmax-ANT. INT.
Operator Gandini
Test Spec

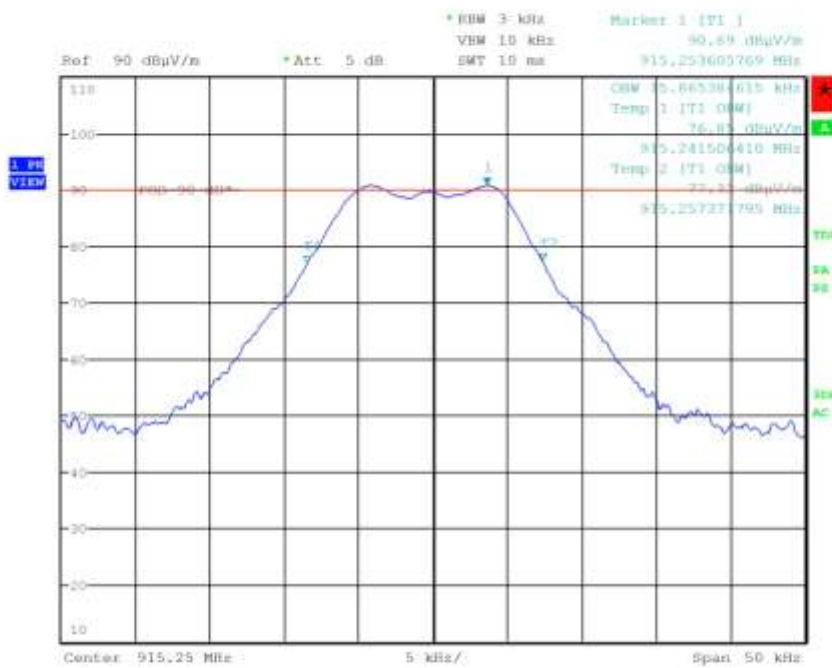


CMC Centro Misure Compatibilità S.r.l.



G130515A19

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmin-ANT. EXT.
Operator Gandini
Test Spec

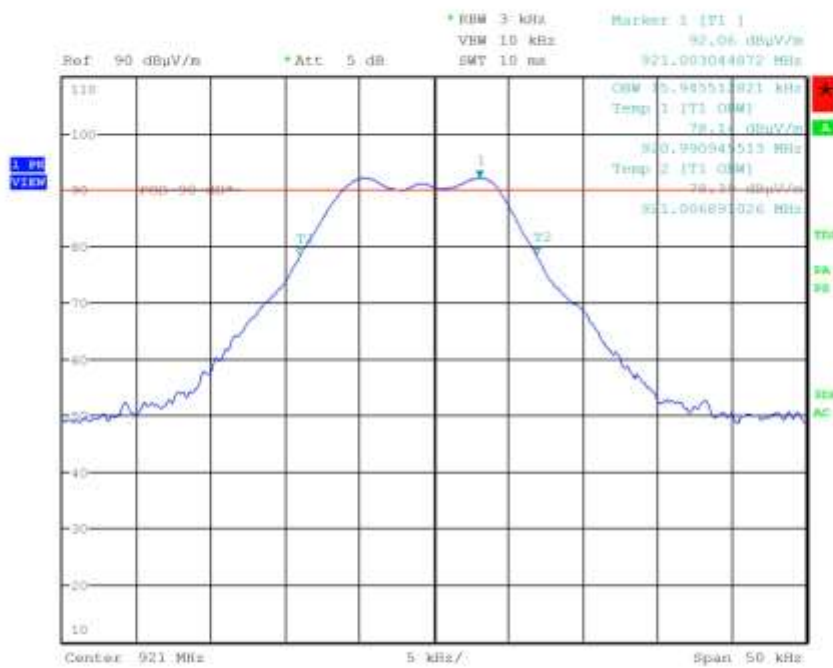


CMC Centro Misure Compatibilità S.r.l.



G130515A20

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmed-ANT. EXT.
Operator Gandini
Test Spec

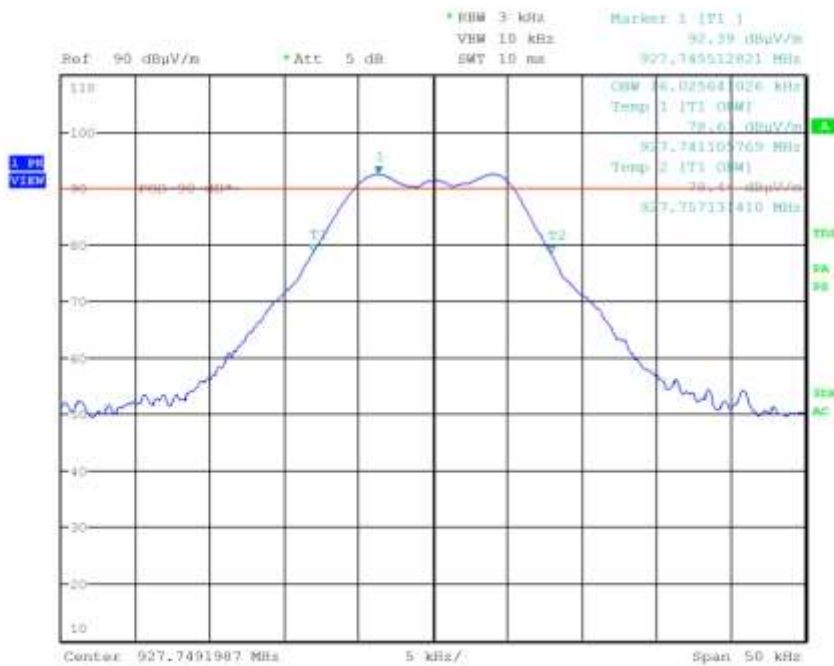


CMC Centro Misure Compatibilità S.r.l.



G130515A21

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Fmax-ANT. EXT.
Operator Gandini
Test Spec



CMC Centro Misure Compatibilità S.r.l.