CMC Centro Misure Compatibilità S.r.l.
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LAB N° 0168

Independent Testing Laboratory
Accredited by ACCREDIA according to UNI CEI EN ISO/IEC 17025 cert. nr. 0168

TEST REPORT nr. R16027901

Federal Communication Commission (FCC)

Test item

Description .....: WITTY RFID
Trademark .....: MICROGATE
Model/Type .....: WIT006
FCC ID .....: 2ADEOWIT006

Test Specification

Standard.....: FCC Rules & Regulations, Title 47:2014
Part 15 paragraph(s): 107 and 109

Client's name .....: MICROGATE S.r.l.
Address .....: Via Stradivari, 4 – 39100 Bolzano (BZ) – ITALY

Manufacturer's name : Same as client
Address .....: --

Report

Tested by .....: A. Bertezzolo – *Technician*

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

Date of issue .....: 18.02.16
Contents.....: 19 pages

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1. Summary

Emission Test:

FCC Rules & Regulations, Title 47:2014
Part 15 paragraph(s): 107 and 109

Test specifications	*Environmental Phenomena*	*Port*	*Tests sequence*	*Result*
Part 15.107 Class B	Continuous disturbance voltage	Mains terminal	1	Complies
Part 15.109 Class B	Radiated disturbance	Enclosure	2	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 certification.

2. Description of Equipment under test (EUT)

Power supply	:	3,7 Vdc from battery Tests performed on 110 V ~ 60 Hz single-phase + earth power supply of auxiliary PC
Power cable	:	Unshielded
Serial Number	:	--

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	:	12.05.15
Testing start date	:	11.02.16
Testing end date	:	12.02.16
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 P150535

4. Operative conditions

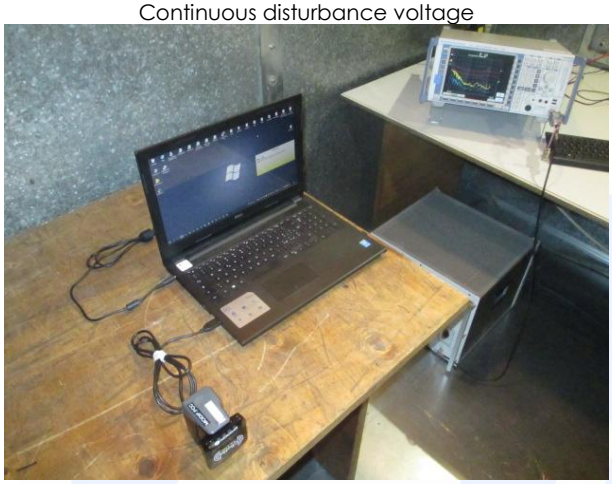
EUT exercising	:	EUT in continuous transmission at maximum power
Auxiliary equipment	:	PC

5. Photograph(s) of EUT

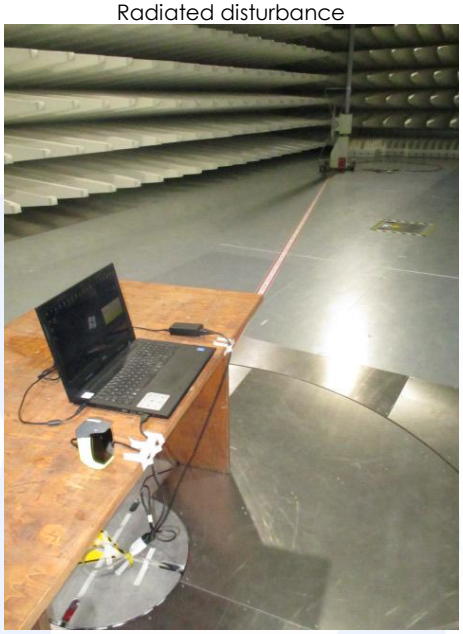
5.1 Photograph(s) of EUT

5.2 Photograph(s) of setup

Continuous disturbance voltage



Radiated disturbance



6. Equipment list

Id. number	*Manufacturer*	*Model*	*Description*	*Serial number*	*Last Calibration*	*Due Date Calibration*
CMC S010	Rohde & Schwarz	ESH3-Z2	Impulses Limiting Device	- - -	Jan-16	Jan-17
CMC S108	Emco	3115	Horn Antenna	9811-5622	May-13	May-16
CMC S136	Schwarzbeck	VULB 9136	Broadband Antenna	9136-205	May-13	May-16
CMC S164	Rohde & Schwarz	ESU26	EMC interference receiver	100052	Jan-16	Jan-17
CMC S200	Schwarzbeck	NSLK 8128	V-LISN	8128-273	Jan-16	Jan-17
CMC S206	Rohde & Schwarz	ESCI 7	EMC Receiver	100781	Jan-16	Jan-17
CMC A001	Sispe	F5123	Shield chamber	- - -	N.C.R.	N.C.R.
CMC A070	Frankonia	SAC10	Semi-anechoic chamber	F159003	Nov-15	Nov-16

7. Measurement uncertainty

Test	Expanded Uncertainty	note
Conducted Emission		
(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
Discontinuous Conducted Emission		
Conducted Emission (50Ω/50µH AMN) - (150 kHz – 30 MHz)	±3.0 dB	1
Disturbance Power (30 MHz – 300 MHz)	±3.7 dB	1
Radiated Emission		
(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
Electromagnetic field EMF	±10.5 %	1
Harmonic current emissions test	±1.8 %	1
Voltage fluctuation and flicker test	±2.6 %	1
Insertion loss test	±2.0 dB	1
Radiated electromagnetic disturbance test (loop antenna)	±2.1 dB	1
Radiated electromagnetic field immunity test	0.81 V/m at 3V/m	1
Pulse modulated radiated electromagnetic field immunity test	0.81 V/m at 3V/m	1
Injected currents immunity test	0.45 V at 3V	1
Bulk current	3.7 mA at 60 mA	1
Power frequency magnetic field immunity test	0.1 A/m at 10 A/m	1
Effective radiated power (F < 1GHz)	±4.3 dB	1
Effective radiated power (F > 1GHz)	±3.7 dB	1
Frequency error	< 1x10-7	1
Modulation bandwidth	< 1x10-7	1
Conducted RF power and spurious emission	±0.7 dB	1
Adjacent channel power	±1.2 dB	1
Blocking	±1.2 dB	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
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
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

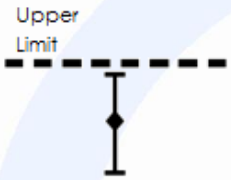
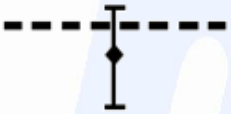
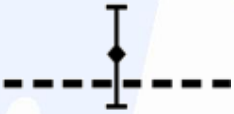
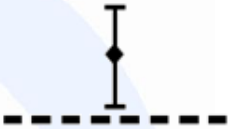
Test case does not apply to the test object ..... : N.A.
Test item does meet the requirement ..... : Complies
Test item does not meet the requirement..... : Does not comply
Test not performed ..... : N.E.

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 Continuous disturbance voltage test (150 kHz – 30 MHz)

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.107
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Shielded chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S010, CMC S200, CMC S206
Measurement uncertainty: See clause 7 of this test report

Test specification

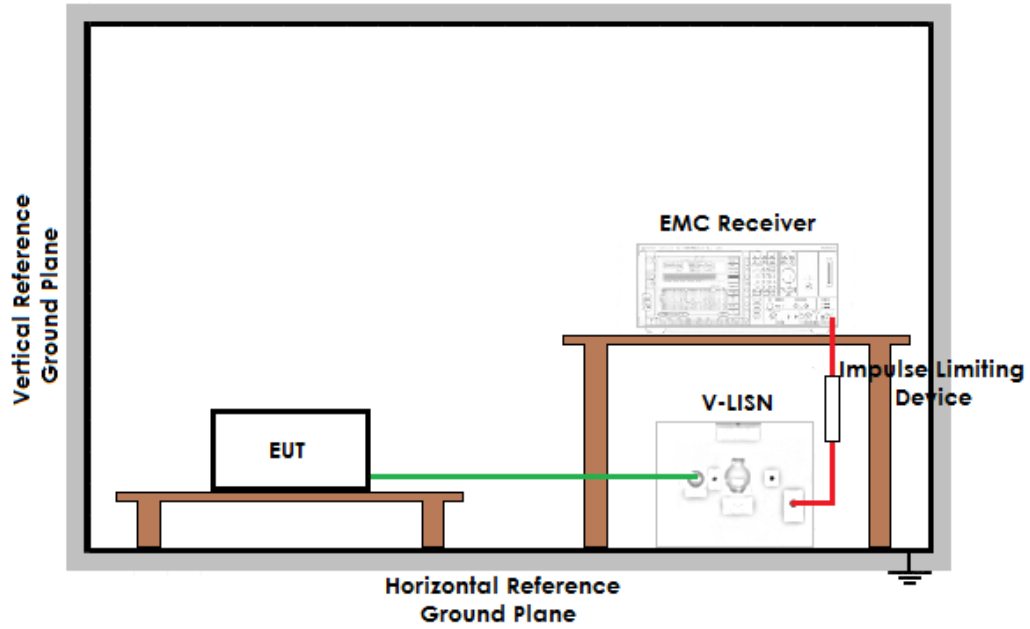
Port: Mains terminal
Frequency range: 150 kHz – 30 MHz

Acceptance limits

Limits for class A equipment		
Frequency range (MHz)	*dB(µV) Quasi-peak*	*dB(µV) Average*
0,15 to 0,50	79	66
0,5 to 5	73	60
5 to 30	73	60

Limits for class B equipment		
Frequency range (MHz)	*dB(µV) Quasi-peak*	*dB(µV) Average*
0,15 to 0,50	66 to 56	56 to 46
0,5 to 5	56	46
5 to 30	60	50

Setup

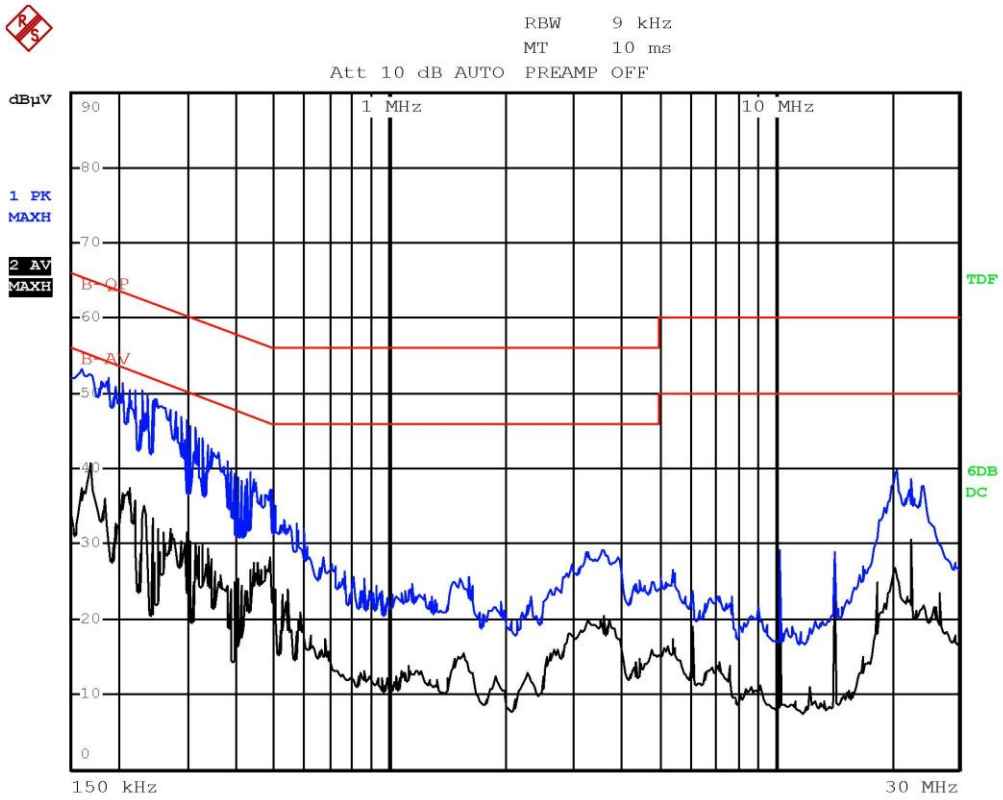


Result

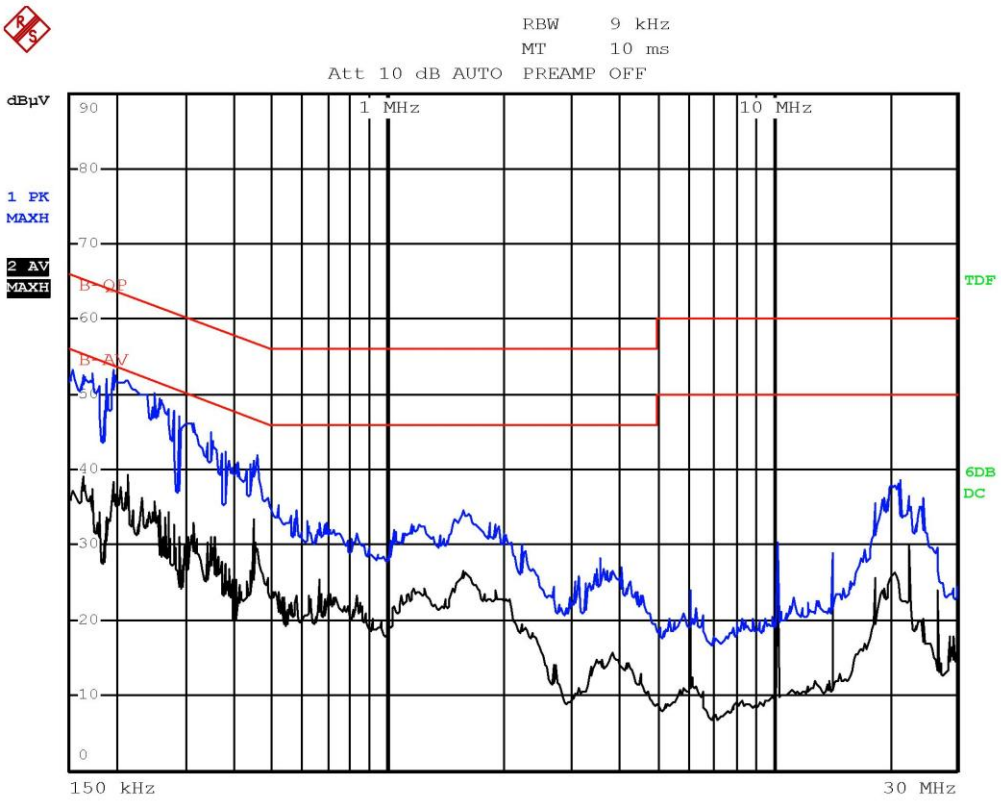
Line	*Graphs*	*Remarks*	*Result*
N	G16027901	--	Complies
L1	G16027902	--	Complies
Remarks: --			

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



Bertezzolo 16027901 Line N 110V



Bertezzolo 16027902 Line L 110V

Result: The requirements are met

11.2 Radiated disturbance test

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.109
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

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

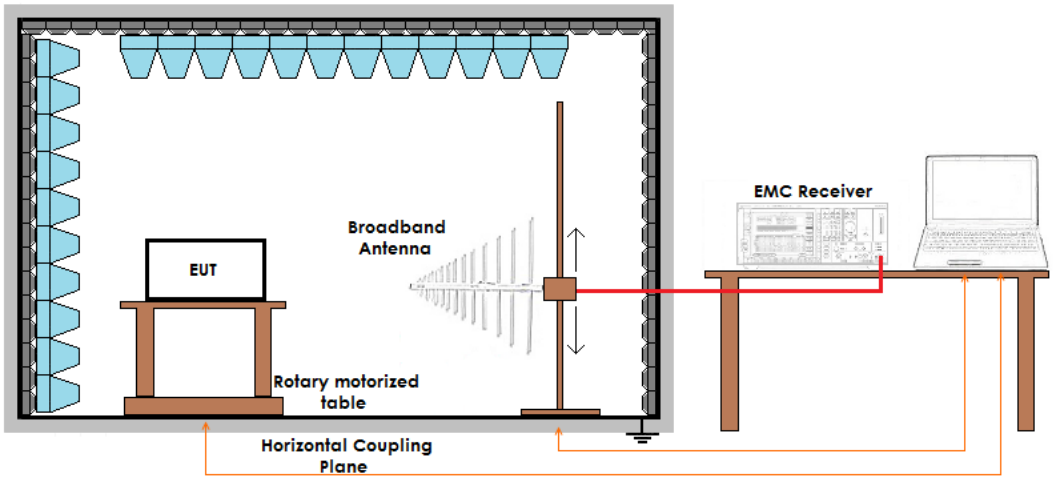
Port: Enclosure
Frequency range: 30 MHz – 6000 MHz
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance:
10 m for frequencies ≤ 1000 MHz
3 m for frequencies > 1000 MHz

Acceptance limits

Class A radiated limits		
Frequency range (MHz)	*Limits [dB(µV/m)]*	
30 to 88	39,08	
88 to 216	43,52	
216 to 960	46,44	
960 to 1000	49,54	
	Linear average detector [dB(µV/m)]	*Peak detector [dB(µV/m)]*
Above 1000	59,54	79,54

Class B radiated limits		
Frequency range (MHz)	*Limits [dB(µV/m)]*	
30 to 88	30	
88 to 216	33,52	
216 to 960	36,02	
960 to 1000	43,98	
	Linear average detector [dB(µV/m)]	*Peak detector [dB(µV/m)]*
Above 1000	53,98	73,98

Setup



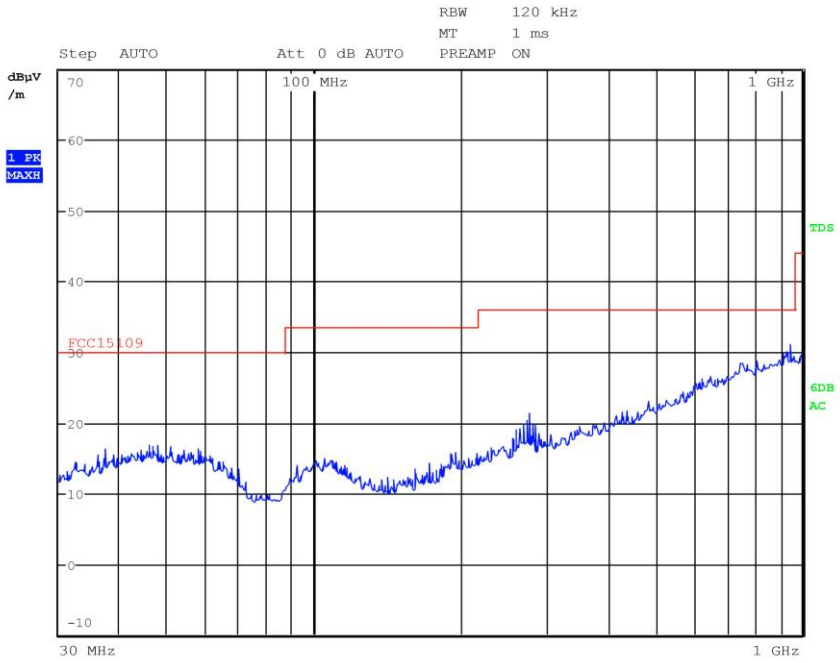
Result

Polarization	*Frequency Range (MHz)*	*Graphs*	*Remarks*	*Result*
H	30 – 1000	G16027903	--	Complies
V	30 – 1000	G16027904	--	Complies
Remarks: --				

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

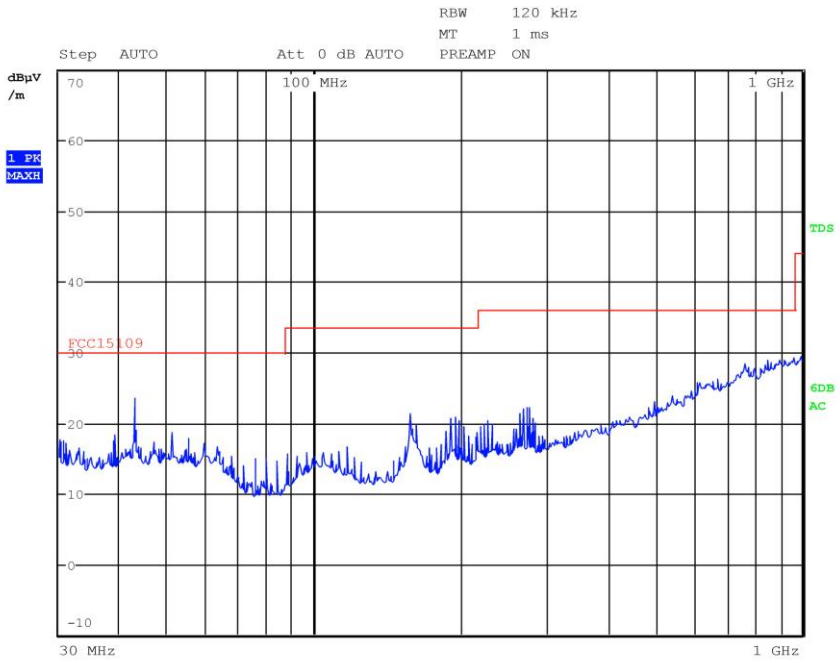
Meas Type Emission 10m
Equipment under Test
Manufacturer
OP Condition
Operator Bertezzolo 16027903
Test Spec
Horiz



Final Measurement

Meas Time: 1 s
Margin: 5 dB
Subranges: 0

Meas Type Emission 10m
Equipment under Test
Manufacturer
OP Condition
Operator Bertezzolo 16027904
Test Spec
Vert



Final Measurement

Meas Time: 1 s
Margin: 5 dB
Subranges: 0

Result: The requirements are met