



## TEST REPORT nr. R13068901

### Federal Communication Commission (FCC)

#### Test item

Description.....: Low power HF Direct Conversion Receiver

Trademark.....: ELAD

Model/Type.....: FDM-S1

#### Test Specification

Standard.....: FCC Rules & Regulations, Title 47 - Part 15.107 and Part 15.109:2012

**Client's name**.....: ELAD Srl

Address.....: Via Col de Rust, 11 – 38070 Sarone di Caneva (PN) – ITALY

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

Address.....: --

#### Report

Tested by.....: A. Bertezzo – Technician

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

Date of issue.....: 20.06.13

Contents.....: 20 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

### Emission Test:

FCC Rules & Regulations, Title 47 - Part 15.107 and Part 15.109:2012

Test specifications	Environmental Phenomena	Port	Tests sequence	Result
Part 15.107	Continuous disturbance voltage	Mains terminal	1	Complies
Part 15.109	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 ..... : From USB port

Power cable ..... : Unshielded

Serial Number ..... : --

### 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 ..... : 17.04.13

Testing start date ..... : 08.05.13

Testing end date ..... : 09.05.13

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 P130391

## 4. Operative conditions

EUT exercising ..... : Each tests was executed with EUT connected with PC by USB.

Full data rate used set through Elad's software

Auxiliary equipment ..... : None



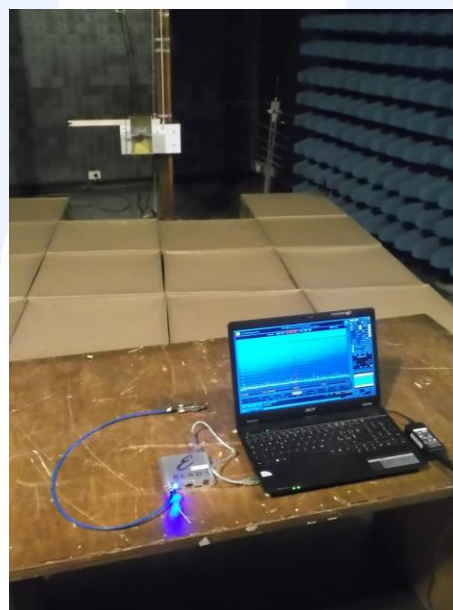
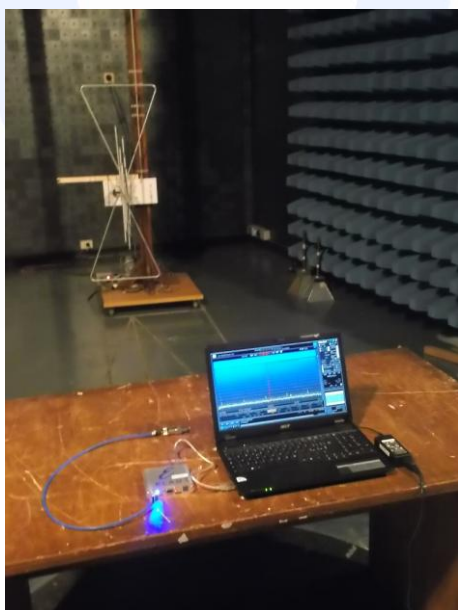
## 5. Photograph(s) of EUT

### 5.1 Photograph(s) of EUT





## 5.2 Photograph(s) of setup







## 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 '13	January '14
CMC S108	Emco	3115	Horn antenna	9811-5622	June '10	June '13
CMC S136	Schwarzbeck	VULB 9136	Broadband Antenna	9136-205	April '11	April '14
CMC S164	Rohde & Schwarz	ESU26	EMC interference receiver	100052	January '13	January '14
CMC S200	Schwarzbeck	NSLK 8128	V-LISN	8128-273	January '13	January '14
CMC S206	Rohde & Schwarz	ESCI 7	EMC Receiver	100781	January '13	January '14
CMC A013	CMC	TR01	Rotary motorized table	---	---	---
CMC A014	CMC	PM01	Antenna positioning Mast	---	---	---



## 7. Measurement uncertainty

Test	Expanded Uncertainty	note
<b>Conducted Emission</b>		
(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
<b>Discontinuous Conducted Emission</b>		
Conducted Emission (50Ω/50μH AMN) - (150 kHz – 30 MHz)	±3.4 dB	1
<b>Disturbance Power (30 MHz – 300 MHz)</b>		
	±3.8 dB	1
<b>Radiated Emission</b>		
(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
<b>Electromagnetic field EMF</b>		
	±15.0 %	1
<b>Harmonic current emissions test</b>		
	±2.7 %	1
<b>Voltage fluctuation and flicker test</b>		
	±2.9 %	1
<b>Insertion loss test</b>		
	±2.9 dB	1
<b>Radiated electromagnetic disturbance test (loop antenna)</b>		
	±2.8 dB	1
<b>Radiated electromagnetic field immunity test</b>		
	0.8 V/m at 3V/m	1
<b>Pulse modulated radiated electromagnetic field immunity test</b>		
	0.8 V/m at 3V/m	1
<b>Injected currents immunity test</b>		
	0.4 V at 3V	1
<b>Bulk current</b>		
	9.7 mA at 60 mA	1
<b>Power frequency magnetic field immunity test</b>		
	0.1 A/m at 10 A/m	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

### Notes

#### 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 15:2012	--
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 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. 8.1.



## 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

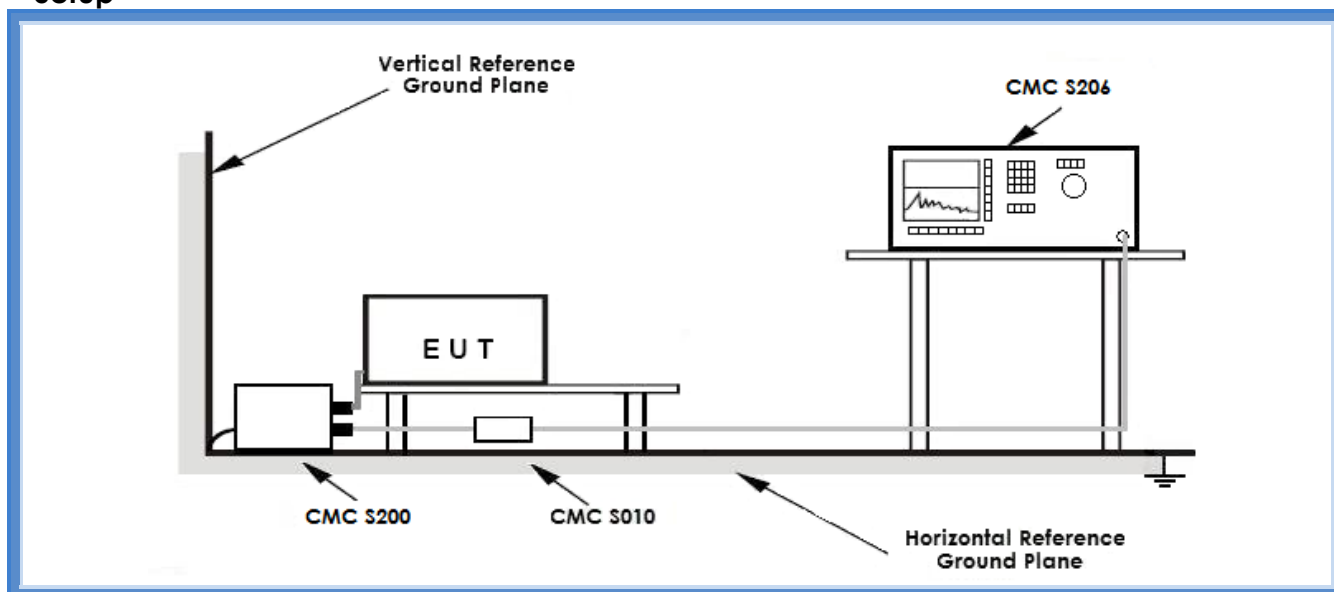
Port: Mains terminal  
Frequency range: 150 kHz – 30 MHz  
Class: B

### Acceptance limits

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

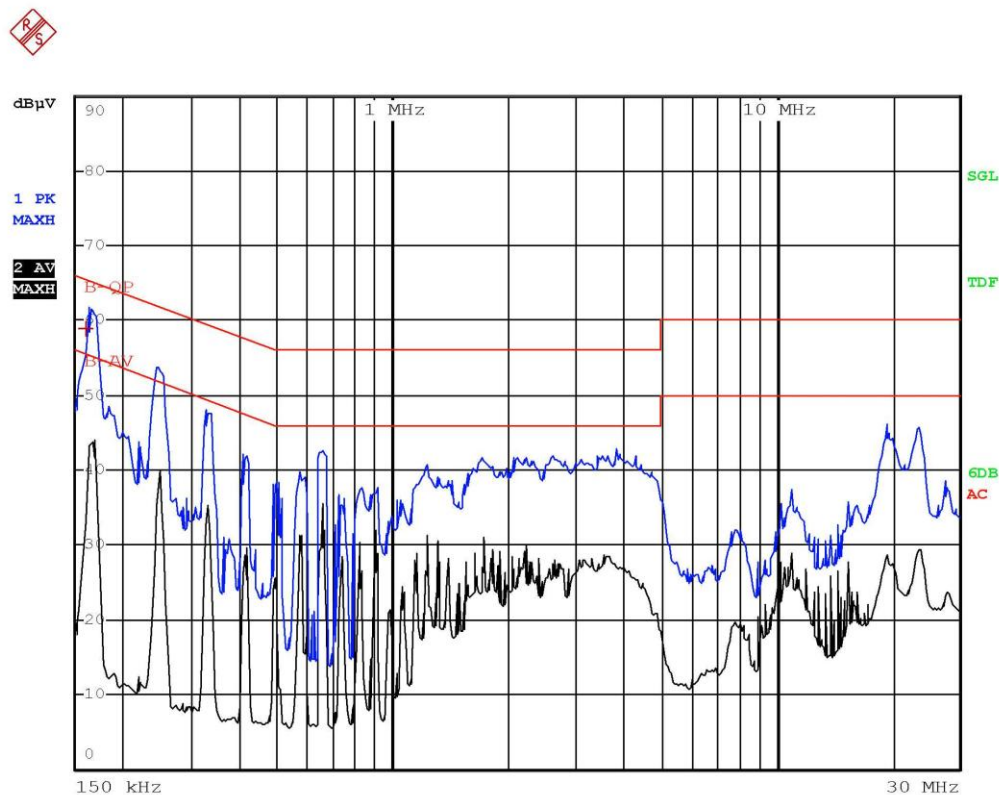
Line	Graphs	Remarks	Result
N	G13068901	--	Complies
L1	G13068902	--	Complies
Remarks: --			

### Graphs Legend

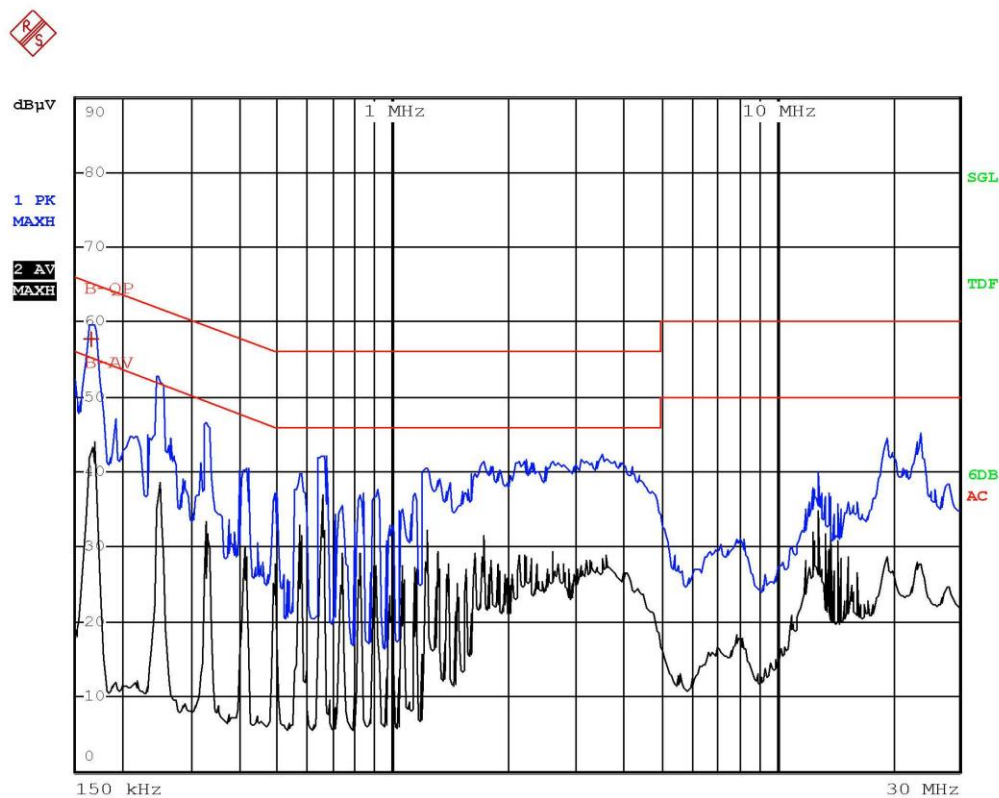
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +  
AV: Average; AV [1s] (average at 1 second) values are marked with a X



## Graphs



Bertezzo 13068901 Line N



Bertezzolo 13068902 Line NL

**Result:** The requirements are met





## 11.2 Radiated disturbance test (30 – 1000 MHz)

### 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, CMC A013,  
CMC A014  
Measurement uncertainty: See clause 7 of this  
test report

### Test specification

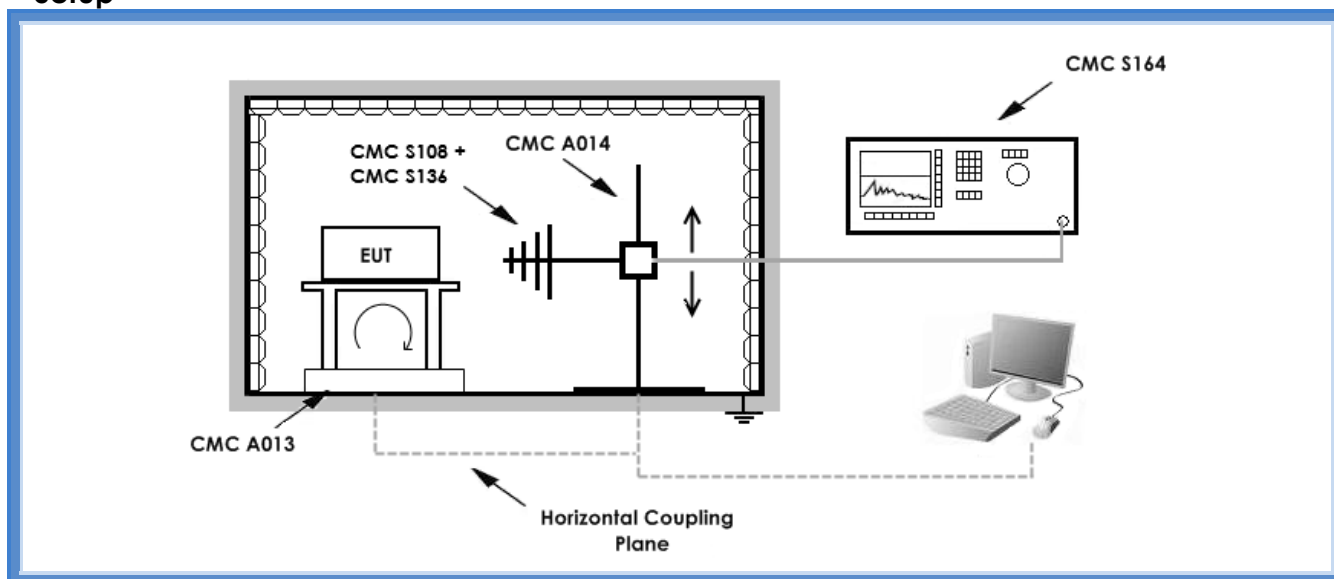
Port: Enclosure  
Frequency range: 30 MHz – 6000 MHz  
Antenna polarization: Horizontal (H) – Vertical (V)  
EUT – Antenna distance: 3 m  
Class: B

### Acceptance limits

Limits for class B equipment	
Frequency range (MHz)	Limits [dB(μV/m)]
30 to 88	40
88 to 216	43,52
216 to 960	46,02
Above 960	53,98



## Setup



## Result

Polarization	Frequency Range (MHz)	Graphs	Remarks	Result
V	30 – 1000	G13068903	--	Complies
H	30 – 1000	G13068904	--	Complies
H	1000 – 6000	G13068905	--	Complies
V	1000 – 6000	G13068906	--	Complies
Remarks: --				

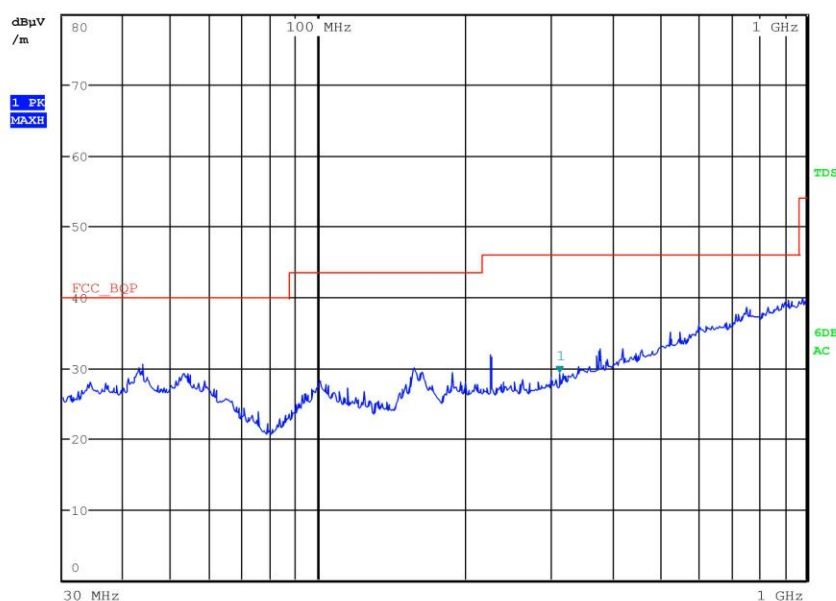
### Graphs Legend

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  
**Equipment under Test**  
**Manufacturer**  
**OP Condition** A regime  
**Operator** Bertezolo 13068903  
**Test Spec**  
Vert

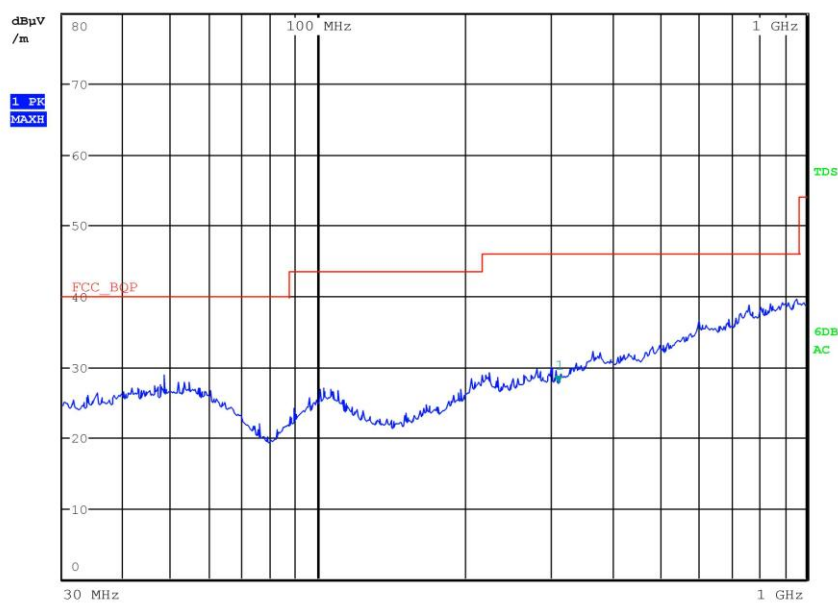


### Final Measurement

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



**Meas Type** Emission  
**Equipment under Test**  
**Manufacturer**  
**OP Condition** A regime  
**Operator** Bertezolo 1306894  
**Test Spec**  
Horiz

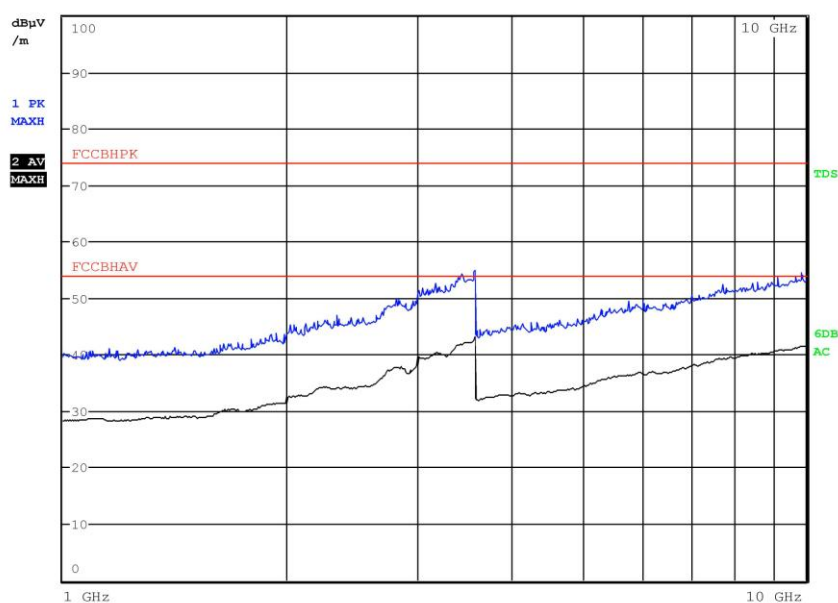


### Final Measurement

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



**Meas Type** Emission  
**Equipment under Test**  
**Manufacturer**  
**OP Condition** A regime  
**Operator** Bertezolo 13068905  
**Test Spec**  
Horiz

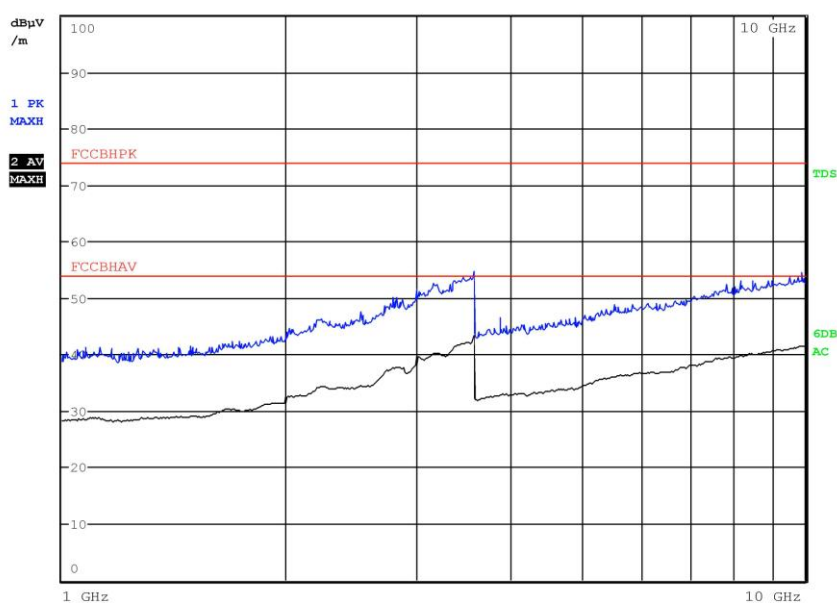


### Final Measurement

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



Meas Type Emission  
Equipment under Test  
Manufacturer  
OP Condition A regime  
Operator Bertezolo 13068906  
Test Spec  
Vert



### Final Measurement

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

**Result:** The requirements are met