



TEST REPORT nr. R13150201

Federal Communication Commission (FCC)

Test item

Description.....: REMOTE CONTROL

Trademark.....: SIT LA PRECISA

Model/Type.....: 058404300

Test Specification

Standard: FCC Rules & Regulations, Title 47 (2012)
Part 15 paragraph(s) : 203, 204, 207, 209 and 231

Client's name.....: SIT LA PRECISA S.p.A.

Address: Viale dell'industria, 31/33 - 35129 Padova (PD) - ITALY

Manufacturer's name.: Same as client

Address: --

Report

Tested by.....: A. Bertezzolo - Technician

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

Date of issue.....: 27.01.13

Contents: 25 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.



Index

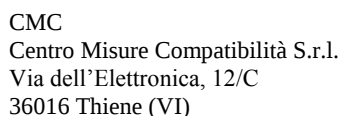
1.	SUMMARY	3
2.	DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	4
2.1	TEST SITE	4
3.	TESTING AND SAMPLING	4
4.	OPERATIVE CONDITIONS	4
5.	PHOTOGRAPH(S) OF EUT	5
6.	EQUIPMENT LIST	6
7.	MEASUREMENT UNCERTAINTY	7
8.	REFERENCE DOCUMENTS	8
9.	DEVIATION FROM TEST SPECIFICATION	9
10.	TEST CASE VERDICTS	9
11.	RESULTS	9
11.1	ANTENNA REQUIREMENTS	10
11.2	RADIATED EMISSION 0,009-4000 MHz	11
11.3	FOUNDAMENTAL AND SPURIOUS EMISSION (≤ 1 GHz)	12
11.4	SPURIOUS EMISSION (> 1 GHz)	13
11.5	20dB BANDWIDTH OF EMISSION	14
11.6	PERIODIC OPERATION CHARACTERISTICS	15
12.	GRAPHS AND TABLES	16



1. Summary			
Emission: FCC Rules & Regulations, Title 47 (2011)			
Test specifications	Environmental Phenomena	Tests sequence	Result
Part 15.203 and 15.204	Antenna Requirement	1	Complies
Part 15.207	Conducted Emission	--	N.A. (+)
Part 15.209 and 15.231	Radiated Emission	2	Complies
Part 15.209 and 15.231	Bandwidth of emission	3	Complies

(+) Apparatus with 4,5Vdc of power supply from internal battery

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.



Power supply..... : 4,5Vdc from internal battery (3 x 1,5Vdc)

Type of equipment : ☒ Transmitter Unit ☐ Receiver Unit
 : ☐ Fixed station ☒ Portable station ☐ Mobile station

Receiver class : --

Working Frequency : 315 MHz

Number of channels : --

Channel separation..... : --

Modulation : --

Extreme conditions : --

Maximum transmitter output power..... : --

FCC ID : T99058404300

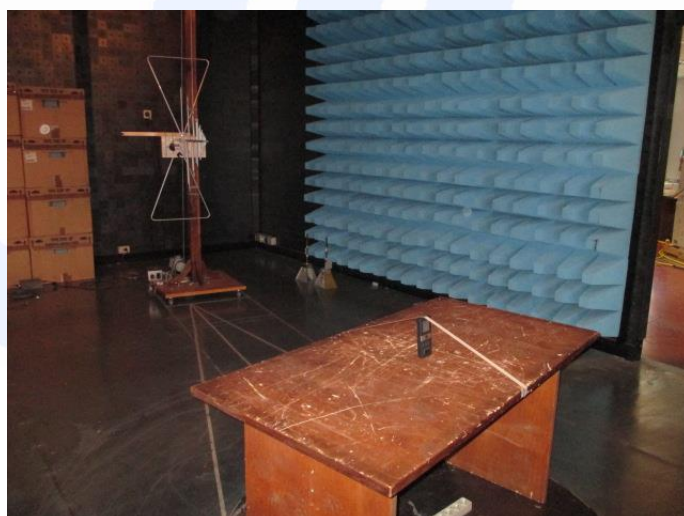
Company: CMC Centro Misure Compatibilità S.r.l.
Address: Via dell'Elettronica, 12/C – 36016 Thiene (VI) – ITALY

Date of receipt of test item	26.07.13
Testing start date.....	09.08.13
Testing end date.....	18.12.13
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 P130778

—



5. 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 S108	EMCO	3115	Horn Antenna	9811-5622	May '13	May '16
CMC S127	Schaffner	HLA6120	Loop Antenna	1191	January '13	January '16
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 S129	Rohde & Schwarz	ESPI7	Receiver	836.914/004	January '13	January '14



7. Measurement uncertainty

Test	Expanded Uncertainty	note
Conducted Emission		
(50Ω/50μH AMN) - (9 kHz – 150 kHz)	±3.8 dB	1
(50Ω/50μH AMN) - (150 kHz – 30 MHz)	±3.3 dB	1
(Voltage probe) - (150 kHz – 30 MHz)	±3.3 dB	1
(50Ω/5μH AMN) - (150 kHz – 108 MHz)	±2.8 dB	1
Discontinuous Conducted Emission		
Conducted Emission (50Ω/50μH AMN) - (150 kHz – 30 MHz)	±3.3 dB	1
Disturbance Power (30 MHz – 300 MHz)		
	±3.9 dB	1
Radiated Emission		
(0.150 MHz – 30 MHz)	±4.3 dB	1
(30 MHz – 1000 MHz)	±4.4 dB	1
(1 GHz – 6 GHz)	±4.6 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		
	±2.7 dB	1
Radiated electromagnetic disturbance test (loop antenna)		
	±2.7 dB	1
Radiated electromagnetic field immunity test		
	0.77 V/m at 3V/m	1
Pulse modulated radiated electromagnetic field immunity test		
	0.77 V/m at 3V/m	1
Injected currents immunity test		
	0.48 V at 3V	1
Bulk current		
	5.3 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)		
	±4.4 dB	1
Effective radiated power (F > 1GHz)		
	±3.9 dB	1
Frequency error		
	< 1x10 ⁻⁷	1
Modulation bandwidth		
	< 1x10 ⁻⁷	1
Adjacent channel power		
	±2.6 dB	1
Blocking		
	±2.6 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

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. eference documents

Reference no.	Description
FCC Rules and Regulation Title 47 part 15 (2012)	--
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.

All measurements are done in accordance with the Filling and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems DA-705

Measurement uncertainty is in accordance with document CMC INC_M rev. 8.1.



11.1 Antenna Requirements

Test configuration and test method

Test site

Auxiliary equipment

Laboratory

See clause 4 of this test report

Environmental conditions

Temperature 20 °C Atmospheric pressure 98 kPa Relative humidity 52 %

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 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 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.

Test specification

Port: Antenna.

EUT exercising

See clause 4 of this test report

Result

<i>Antenna Type</i>	<i>External R.F. power amplifier</i>	<i>Remarks</i>	<i>Results</i>
Integral antenna	Not Present	--	Complies

Remarks

//////////

Reference documents

See clause 8 of this test report

Result

The requirements are met



11.2 Radiated Emission 0,009-4000 MHz

Test configuration and test method

Test site

Laboratory

Auxiliary equipment

See clause 4 of this test report

Environmental conditions

Temperature 21 °C

Atmospheric pressure 98 kPa

Relative humidity 48 %

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 specification

Port: Enclosure.

EUT exercising

See clause 4 of this test report

Result

Antenna	Frequency Range (MHz)	Graph(s)	Remarks	Result
Loop Antenna	9kHz – 30MHz	G13150211	--	Complies

Polarization	Frequency Range (MHz)	Graph(s)	Remarks	Result
Vertical	30 – 1000	G13150209	--	Complies
Horizontal	30 – 1000	G13150210	--	Complies
Horizontal	1000 – 4000	G13150220	--	Complies
Vertical	1000 – 4000	G13150221	--	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 S127, CMC S136, CMC S164

Measurement uncertainty: See clause 7 of this test report

Result The requirements are met



11.3 Fundamental and Spurious Emission ($\leq 1\text{GHz}$)

Test configuration and test method

Test site

Laboratory

Auxiliary equipment

See clause 4 of this test report

Environmental conditions

Temperature 21 °C

Atmospheric pressure 98 kPa

Relative humidity 48 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209 and Part 15.231
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

EUT exercising

See clause 4 of this test report

Result

Frequency (MHz)	Final Measurement QP level (dB μ V/m)	Limit (dB μ V/m)	Results
315 (Fundamental)	65,5	67,6	Complies
630	44,2	47,6	Complies
945	42,5	47,6	Complies

Remarks EUT was tested in 3 orthogonal planes. In results table are reported the worst case. The graphs G13150205 and G13150206

Reference documents See clause 8 of this test report

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

CMC S136, CMC S164

Measurement uncertainty: See clause 7 of this test report

Result The requirements are met



11.4 Spurious Emission (> 1GHz)

Test configuration and test method

Test site

Laboratory

Auxiliary equipment

See clause 4 of this test report

Environmental conditions

Temperature 21 °C Atmospheric pressure 98 kPa Relative humidity 48 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209 and Part 15.231
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Antenna;

EUT exercising

See clause 4 of this test report

Result

Nr. Harmonics	Final Measurement AV level (dBμV/m)	AV Limits (dBμV/m)	Remarks
IV Harmonic	42,5	54,0	--
V Harmonic	More than 15dB below limit	54,0	--
VI Harmonic	More than 15dB below limit	54,0	--
VII Harmonic	More than 15dB below limit	54,0	--
VIII Harmonic	More than 15dB below limit	54,0	--
IX Harmonic	More than 15dB below limit	54,0	--
X Harmonic	49,5	54,0	--

Nr. Harmonics	Final Measurement PK level (dBμV/m)	PK Limits (dBμV/m)	Remarks
IV Harmonic	More than 15dB below limit	74,0	--
V Harmonic	More than 15dB below limit	74,0	--
VI Harmonic	More than 15dB below limit	74,0	--
VII Harmonic	More than 15dB below limit	74,0	--
VIII Harmonic	More than 15dB below limit	74,0	--
IX Harmonic	More than 15dB below limit	74,0	--
X Harmonic	More than 15dB below limit	74,0	--

Remarks EUT was tested in 3 orthogonal planes. In results table are reported the worst case. The graphs G13150220 and G13150221

Reference documents See clause 8 of this test report

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

CMC S108, CMC S164

Measurement uncertainty: See clause 7 of this test report

Result The requirements are met



11.5 20dB Bandwidth of emission

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 50 %

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209 and 15.231c
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

Port: Enclosure.

EUT exercising

See clause 4 of this test report

Acceptance limits

LIMITS
0.25% of the center frequency

Result

Port	Bandwidth	Graphs	Results
Enclosure	8,48 kHz	G13150212	Complies

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

Reference documents See clause 8 of this test report

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

CMC S136, CMC S164

Result The requirements are met



11.6 Periodic Operation Characteristics

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.231
- Internal Procedure PM001
- See clause 4 of this test report

Test specification

15.231 (e) In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

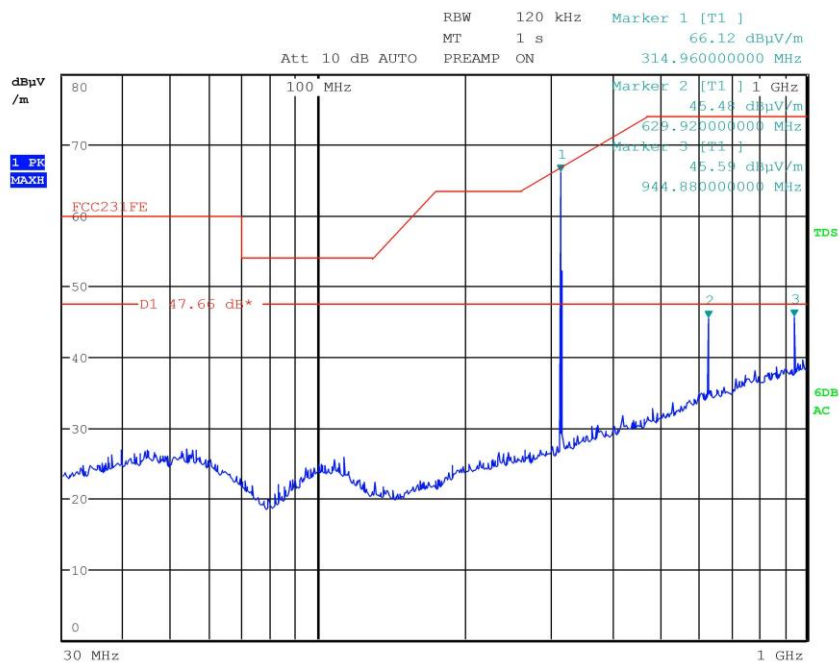
Result: Complies. As declared in SIT LA PRECISA's Operational Description OD130070_10 (Operational Description), the transmission during is 400 ms every 10 minutes (graphs nr. G13150216 and G113150217)



12. Graphs and Tables

G13150205

Meas Type Emission 30-1000MHz
Equipment under Test
Manufacturer
OP Condition Tx
Operator Gandini 13150205
Test Spec
Vert



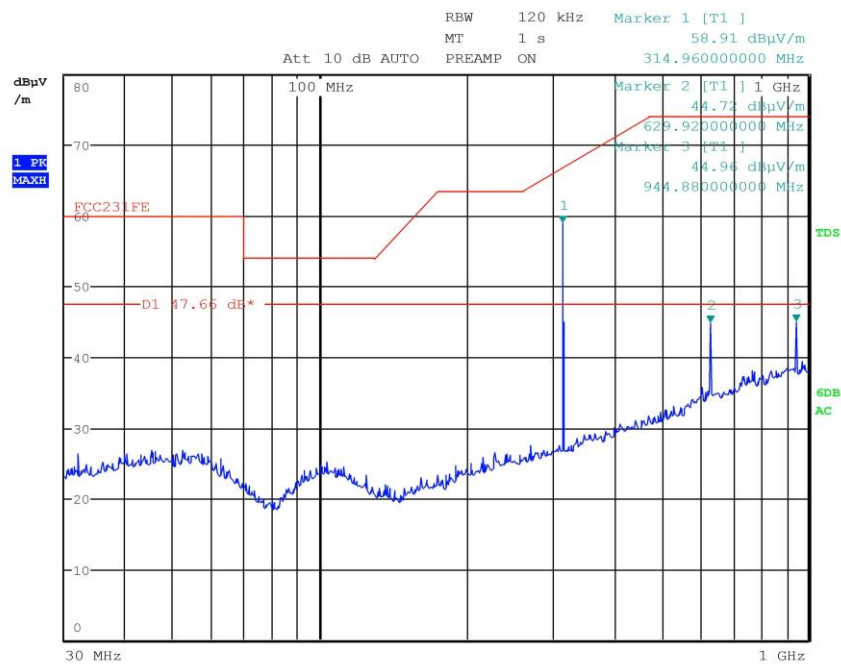
Final Measurement

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



G13150206

Meas Type Emission 30-1000MHz
Equipment under Test
Manufacturer
OP Condition Tx
Operator Gandini 13150206
Test Spec
Horiz

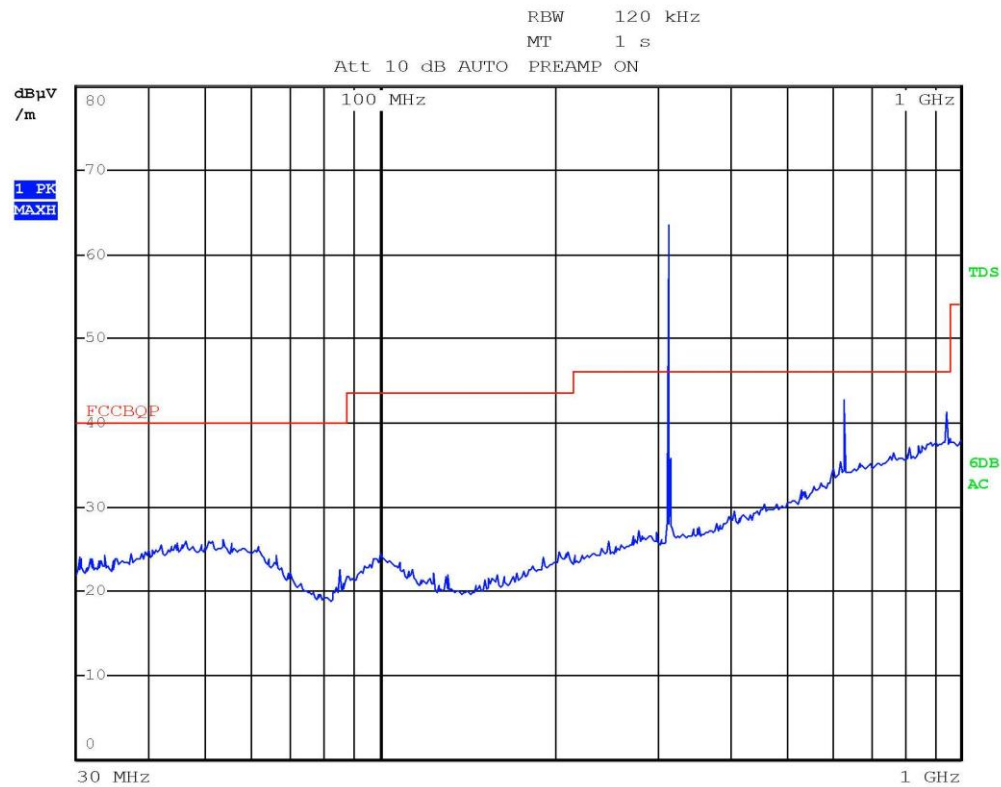


Final Measurement

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



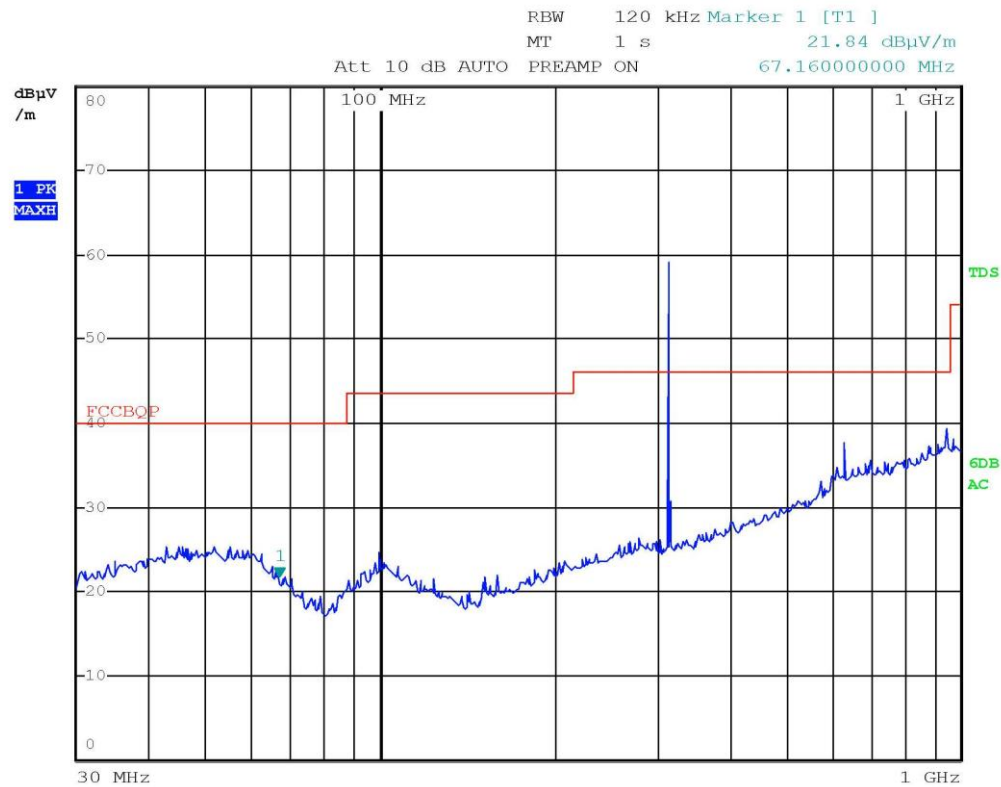
G13150209



Gandini 13150209-Vert-Tx



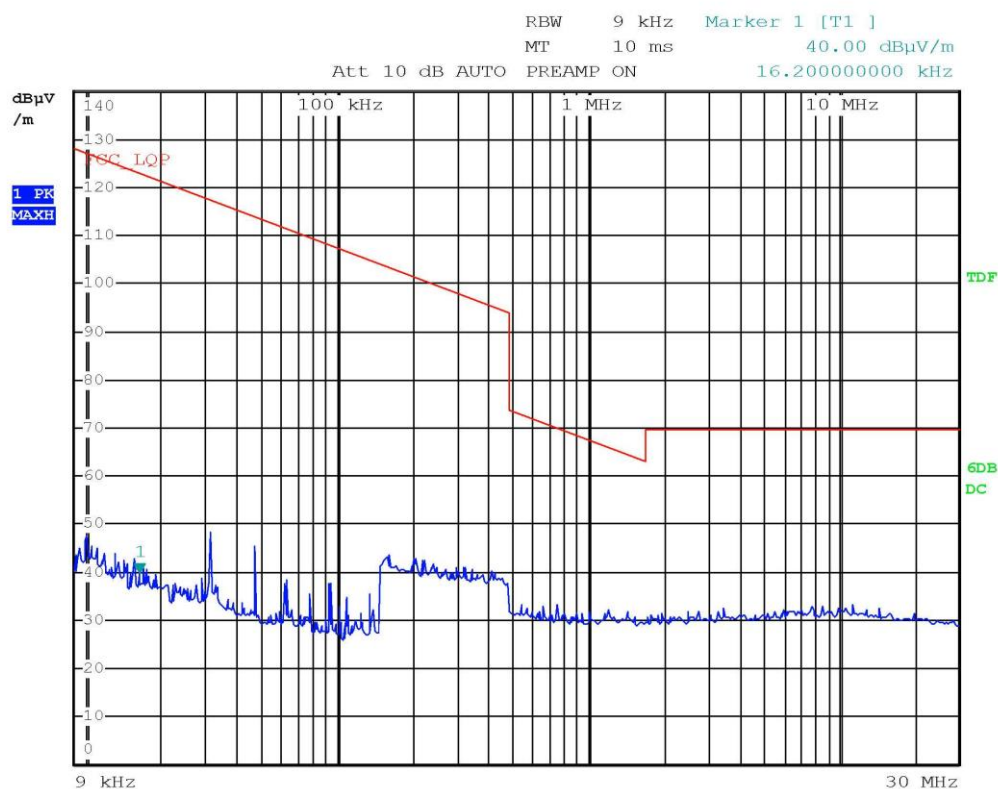
G13150210



Gandini 13150210-Horiz-Tx



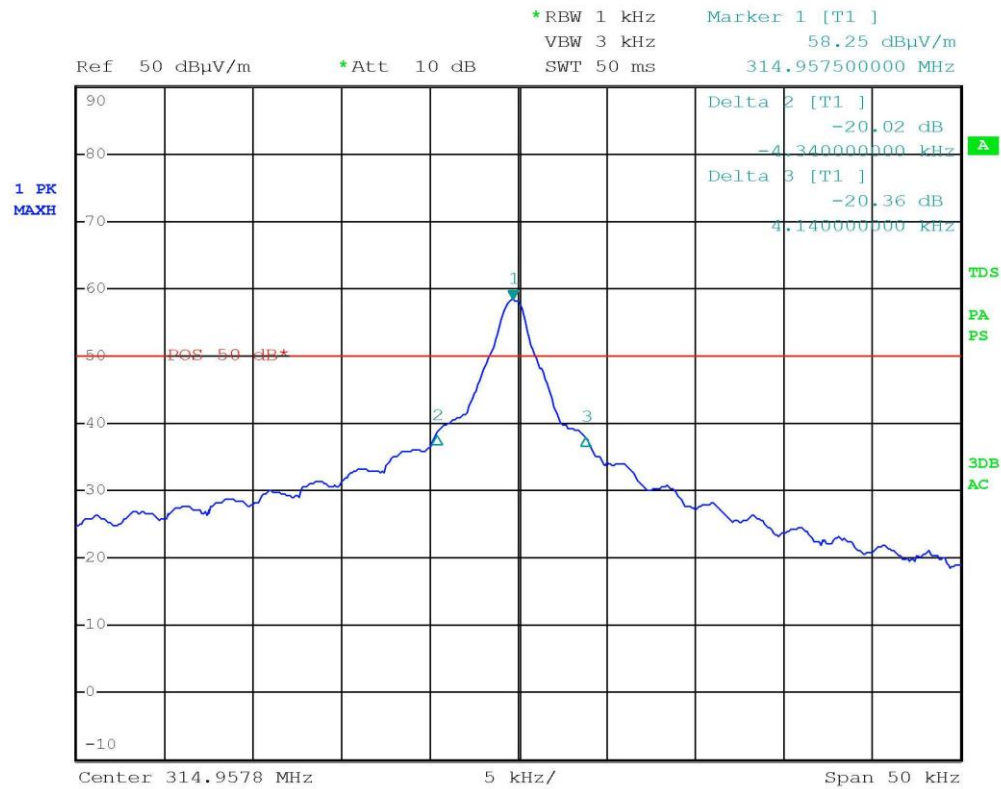
G13150211



Gandini 13150211-Loop-Tx



G13150212



Gandini 13150212-Horiz-Tx



G13150216

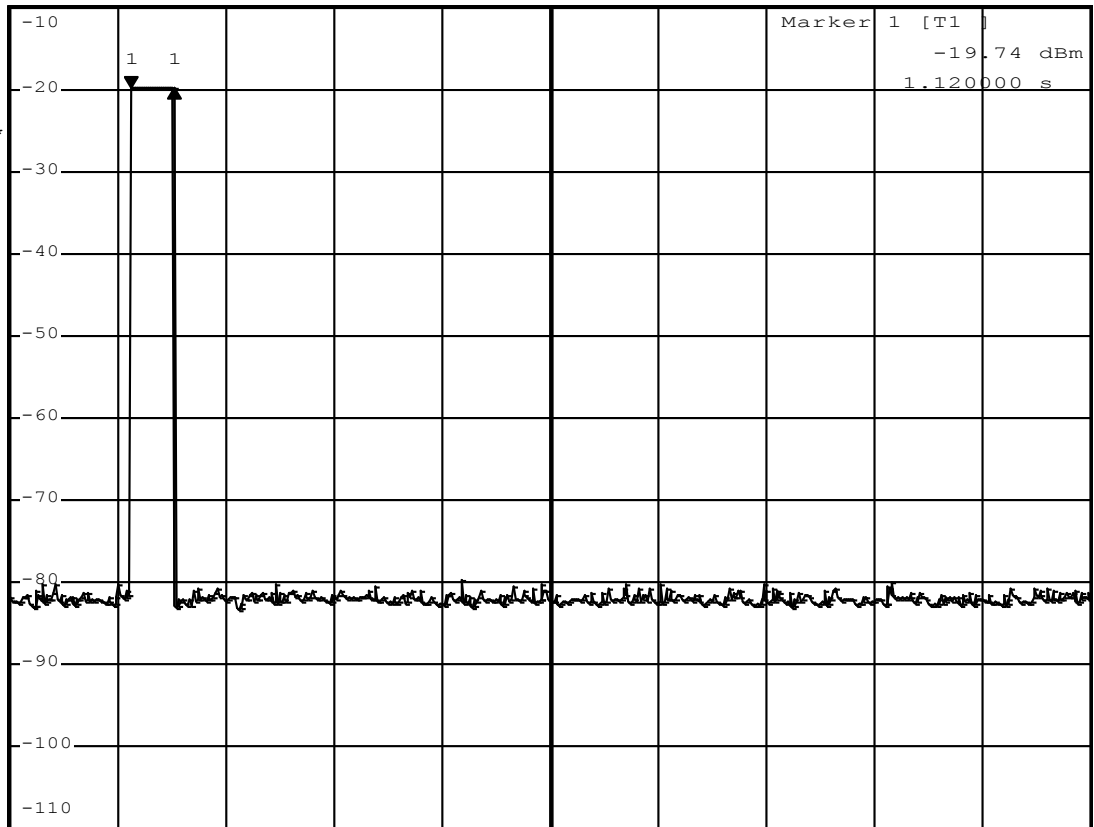


RBW 100 kHz Delta 1 [T1]
VBW 300 kHz -0.04 dB
SWT 10 s 400.000000 ms

Ref -10 dBm

★ Att 0 dB

1 PK ★
VIEW



Center 314.88 MHz

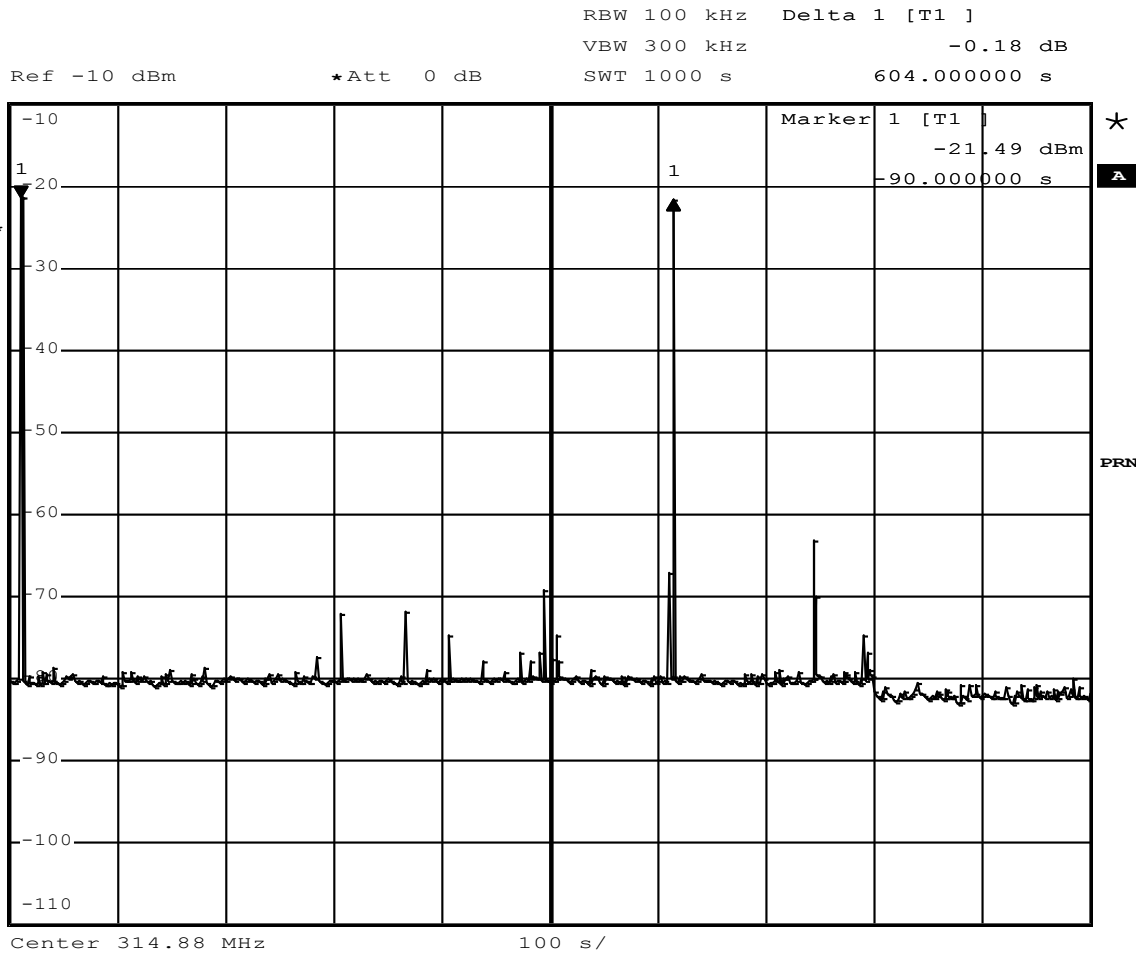
1 s/

★

PRN

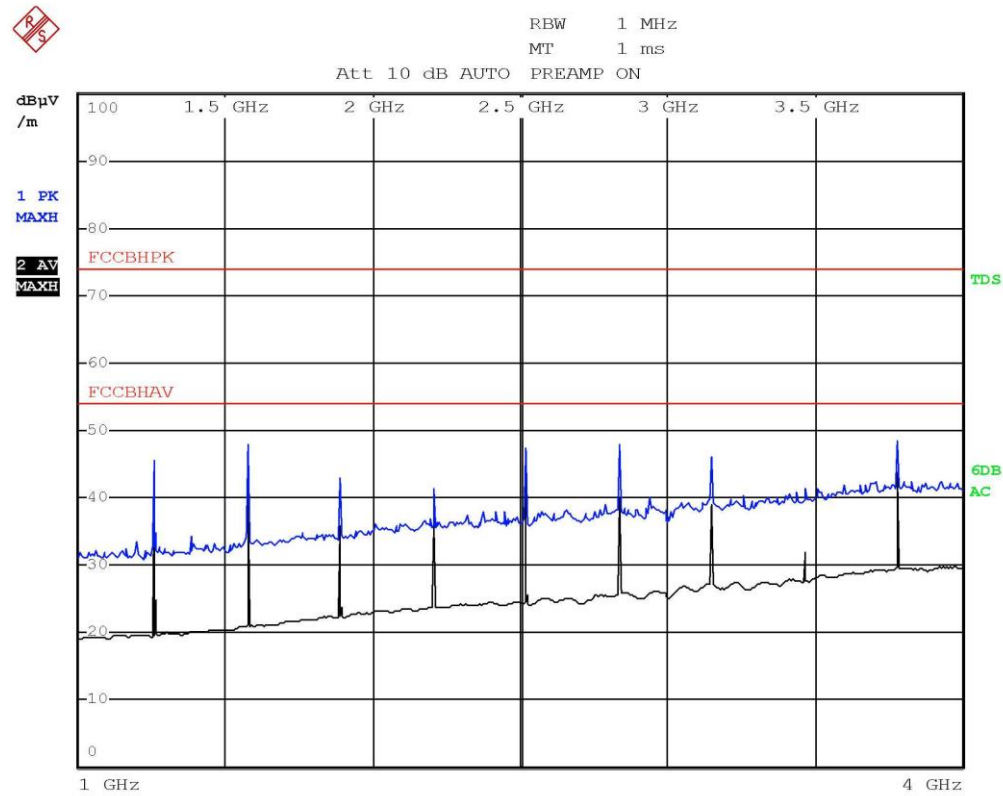


G13150217





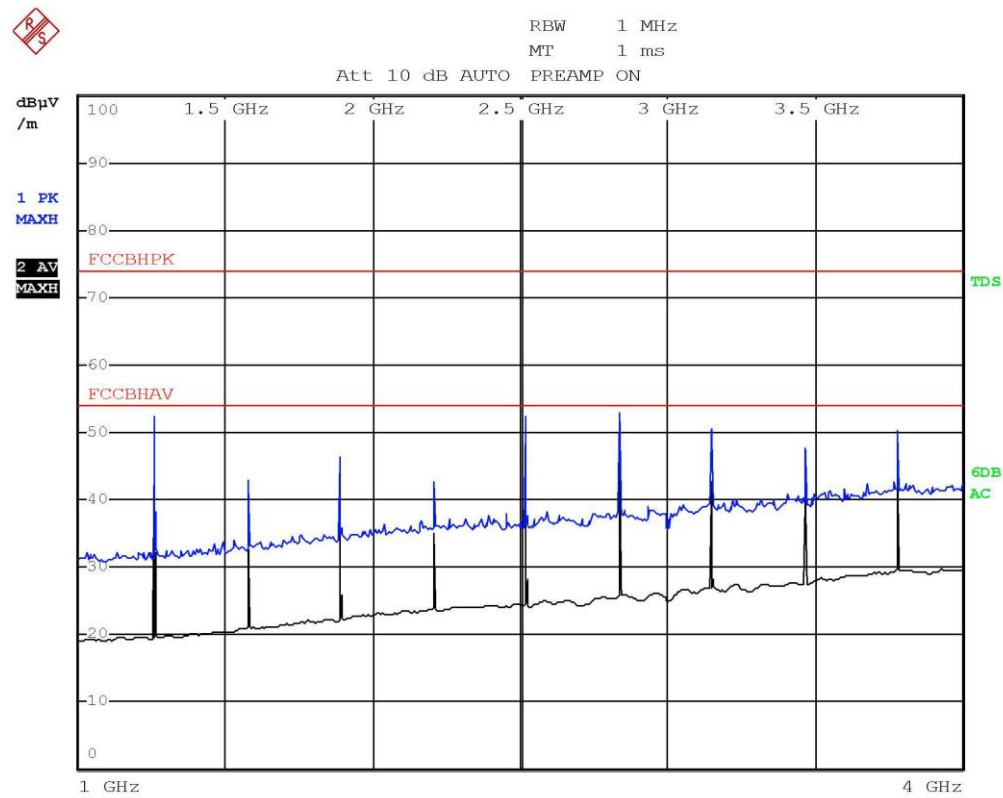
G13150220



Bertezzo 13150220 Horiz



G13150221



Bertezzo 13150221 Vert