CMC Centro Misure Compatibilità S.r.l.
Via dell'Elettronica, 12/C
36016 Thiene (VI) – ITALY
Tel./Fax +39 0445 367702
www.cmclab.it - info@cmclab.it

Independent Testing Laboratory

TEST REPORT nr. R14116901
Federal Communication Commission (FCC)
Industry Canada (IC)

Test item

Description .....: Transceiver Unit
Trademark.....: DIXELL
Model/Type .....: XJ200-10000

Test Specification

Standard .....: FCC Rules & Regulations, Title 47:2013
Part 15 paragraph(s): 203, 204, 207, 209 and 247
RSS-210 (2010) – Annex 8

Client's name .....: DIXELL Spa
Address .....: Via dell'Industria, 27 – z.i. – 32010 Pieve d'Alpago (BL) - ITALY

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

Report

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

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

Date of issue .....: 16.09.14
Contents.....: 88 pages

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1. Summary

Standard:

FCC Rules & Regulations, Title 47:2013
Part 15 paragraph(s): 203, 204, 207, 209 and 247
RSS-210 (2010) – Annex 8

Test specifications	*Environmental Phenomena*	*Tests sequence*	*Result*
Part 15.203 IC – RSS-210	Antenna requirements	1	Complies
Part 15.207 IC – RSS-210 – Annex 8	Conducted emissions	2	Complies
Part 15.209 IC – RSS-210 – Annex 8	Emissions in restricted frequency bands and in unrestricted frequency bands	3	Complies
Part 15.209 IC – RSS-210 – Annex 8	20 dB bandwidth	4	Complies
Part 15.209 IC – RSS-210 – Annex 8	DTS bandwidth	5	Complies
IC – RSS-210 – Annex 8	Occupied bandwidth (99% BW)	6	Complies
Part 15.249 (d) IC – RSS-210 – Annex 8	Band edge	7	Complies
Part 15.209 and 15.249 IC – RSS-210 – Annex 8	Fundamental emission output power	8	Complies
Part 15.209 and 15.249 IC – RSS-210 – Annex 8	Maximum power spectral density level in the fundamental emission	9	Complies
Part 15.209 IC – RSS-210 – Annex 8	Spurious emission	10	Complies
Part 1.1310	Maximum permissible exposure	11	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 Industry Canada certification

2. Description of Equipment under test (EUT)

Power supply	:	5 Vdc from battery
Serial Number	:	--
Type of equipment	:	☑ Transmitter Unit
		☑ Receiver Unit
Type of station	:	❑ Fixed station
		❑ Portable station
		☑ Mobile station
Frequency band	:	906 – 924 MHz
FCC ID	:	ZG5XJ20010000
IC code	:	9741A-XJ20010000

2.1 Test Site

Company	:	CMC Centro Misure Compatibilità S.r.l.
Address	:	Via dell'Elettronica, 12/C
		36016 Thiene (VI) – ITALY
Test site facility's IC registration number	:	9055A

3. Testing and sampling

Date of receipt of test item	:	19.06.14
Testing start date	:	21.07.14
Testing end date	:	02.09.14
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 P140647

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

Id. number	*Manufacturer*	*Model*	*Description*	*Serial number*	*Last calibration*	*Due date calibration*
CMC S010	Rohde & Schwarz	ESH3-Z2	Impulses Limiting Device	- - -	January '14	January '15
CMC S108	EMCO	3115	Horn Antenna	9811-5622	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 '14	January '15
CMC S136	Schwarzbeck	VULB 9163	Broadband Antenna	9136-205	May '13	May '16
CMC S164	Rohde & Schwarz	ESU26	EMC interference receiver	100052	January '14	January '15
CMC S200	Schwarzbeck	NSLK 8128	V-LISN	8128-273	January '14	January '15
CMC S227	Rohde & Schwarz	ESR7	EMI Test Receiver 7GHz	101121	January '14	January '15

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
DiscontinuousConducted 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 demostrated 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 15:2013	--
RSS-210 Issue 8 – December 2010	Low-power licence-exempt radiocommunication devices (all frequency bands): Category I Equipment
RSS-GEN Issue 4 – November 2014	General Requirements for Compliance of Radio Apparatus
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 9 kHz – 40 GHz
KDB 558074 D01 DTS Meas Guidance v03r02	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

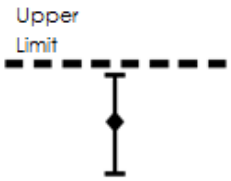
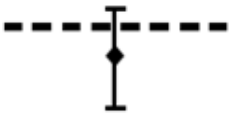
Test case does not apply to the test object ..... : N.A.
Test item does meet the requirement ..... : Complies
Test item does not meet the requirement..... : Does not comply
Test not performed ..... : N.E.

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 is Complies. The measurement results is within the specification limit when the measurement uncertainty is taken into account.	The sample is Complies. It is not possible to state compliance using a 95% coverage probability for the expanded uncertainty although the measurement result is below the limit.	The sample is Not Complies. 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 sample is Not Complies. 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
- RSS-210
- 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 (°C)	*Atmospheric pressure (kPa)*	*Relative humidity (%)*
22	99	52

Result

Antenna Type	*External R.F. power amplifier*	*Gain*	*Remarks*	*Results*
Integrated	Not Present	2,4 dBi	--	Complies

Result: The requirements are met

11.2 Conducted emissions

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 configuration

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: Main port
Frequency range: 150 kHz – 30 MHz

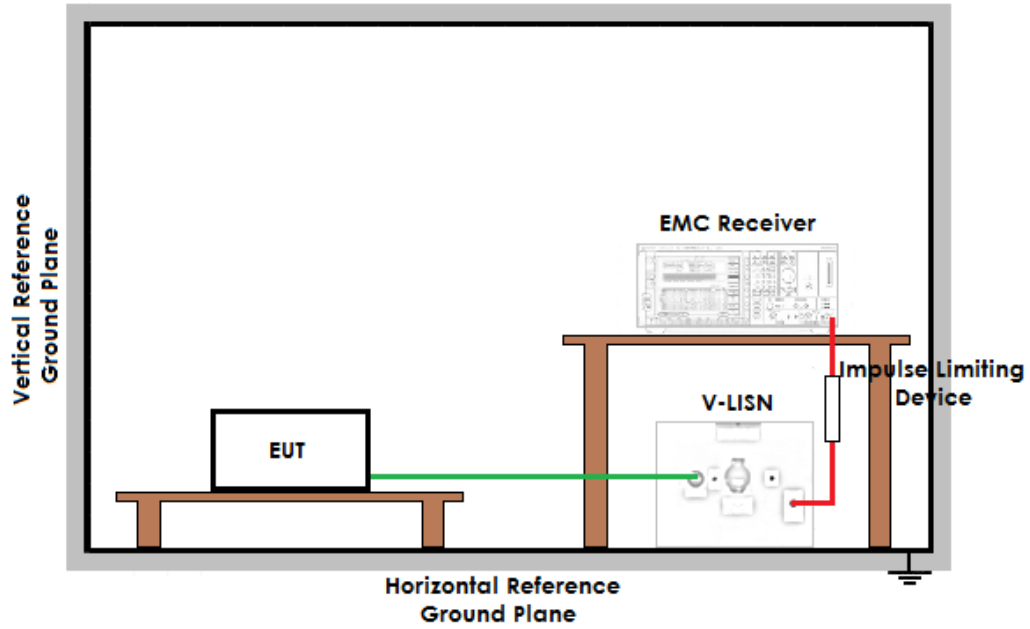
Environmental conditions

Temperature (°C)	*Atmospheric pressure (kPa)*	*Relative humidity (%)*
21	98	46

Acceptance limits

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

Setup

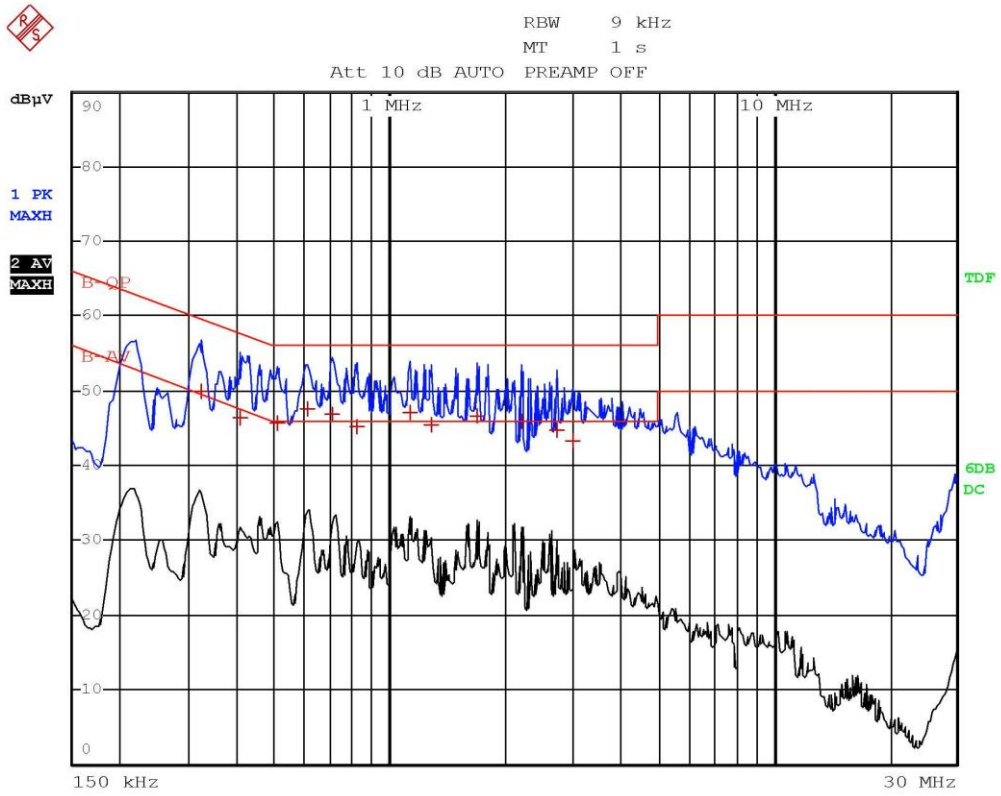


Result

Line	*Graphs*	*Remarks*	*Result*
+	G14116997	--	Complies
-	G14116998	--	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



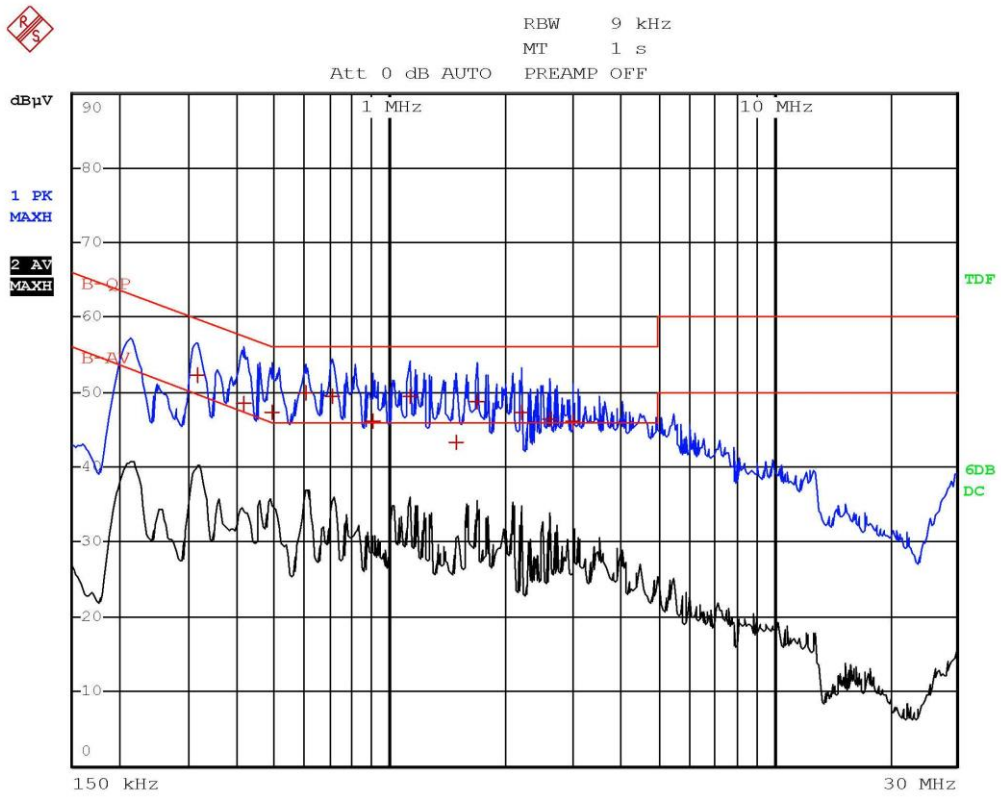
Bertezzolo 14116997 Line N

EDIT PEAK LIST (Final Measurement Results)

Trace1:	B-QP
Trace2:	B-AV
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	322 kHz	50.05	-9.60
1 Quasi Peak	406 kHz	46.41	-11.31
1 Quasi Peak	510 kHz	45.63	-10.36
1 Quasi Peak	610 kHz	47.49	-8.50
1 Quasi Peak	706 kHz	47.00	-8.99
1 Quasi Peak	818 kHz	45.18	-10.81
1 Quasi Peak	1.13 MHz	47.12	-8.87
1 Quasi Peak	1.286 MHz	45.37	-10.62
1 Quasi Peak	1.698 MHz	46.76	-9.23
1 Quasi Peak	2.206 MHz	46.03	-9.96
1 Quasi Peak	2.726 MHz	44.73	-11.26
1 Quasi Peak	3.014 MHz	43.32	-12.67

Bertezzolo 14116997 Line N



Bertezzolo 14116998 Line L

EDIT PEAK LIST (Final Measurement Results)

Trace1:	B-QP
Trace2:	B-AV
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	314 kHz	52.35	-7.50
1 Quasi Peak	414 kHz	48.49	-9.07
1 Quasi Peak	494 kHz	47.27	-8.82
1 Quasi Peak	606 kHz	49.96	-6.03
1 Quasi Peak	706 kHz	49.47	-6.52
1 Quasi Peak	906 kHz	46.13	-9.86
1 Quasi Peak	1.13 MHz	49.45	-6.54
1 Quasi Peak	1.49 MHz	43.41	-12.58
1 Quasi Peak	1.694 MHz	48.88	-7.11
1 Quasi Peak	2.206 MHz	47.46	-8.53
1 Quasi Peak	2.618 MHz	46.42	-9.57
1 Quasi Peak	3.01 MHz	46.19	-9.80

Bertezzolo 14116998 Line L

Result: The requirements are met

11.3 Emissions in restricted frequency bands and in unrestricted frequency bands

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.209
- RSS-210 – Annex 8
- 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
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

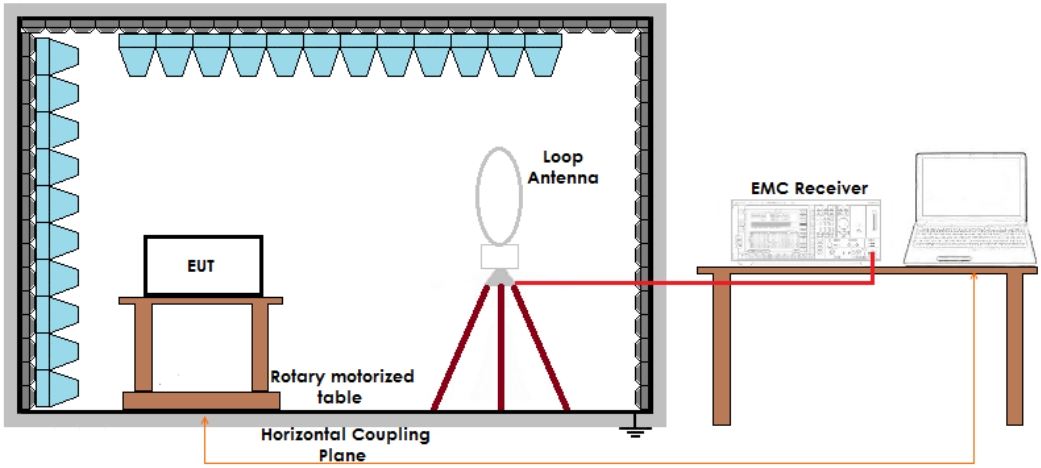
Temperature (°C)	*Atmospheric pressure (kPa)*	*Relative humidity (%)*
22	99	49

Acceptance limits

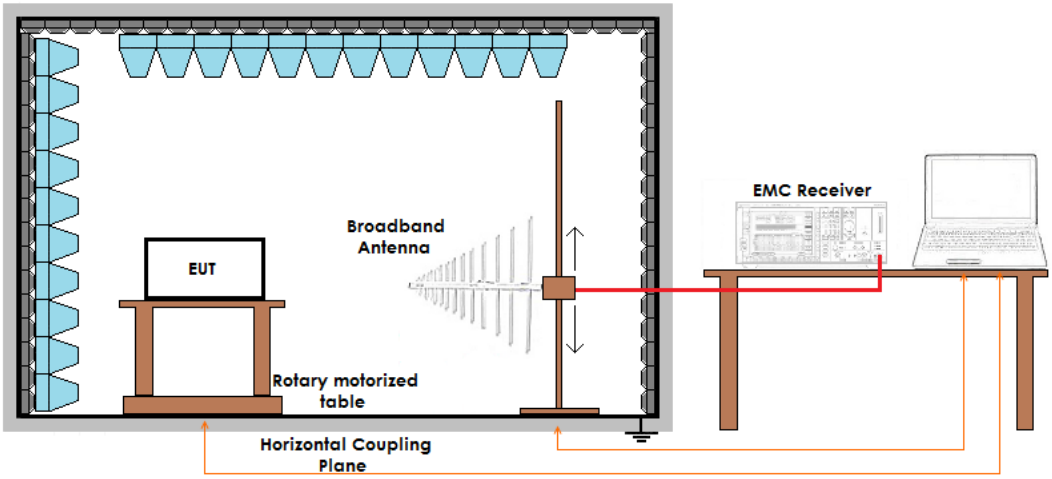
Frequency range (MHz)	*Limits [dB(µV/m)]*
0,009 to 0,490	128,51 to 93,80
0,490 to 1,705	73,80 to 62,97
1,705 to 30	69,54
30 to 88	40
88 to 216	43,52
216 to 960	46,02
Above 960	53,98
Remarks: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except 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

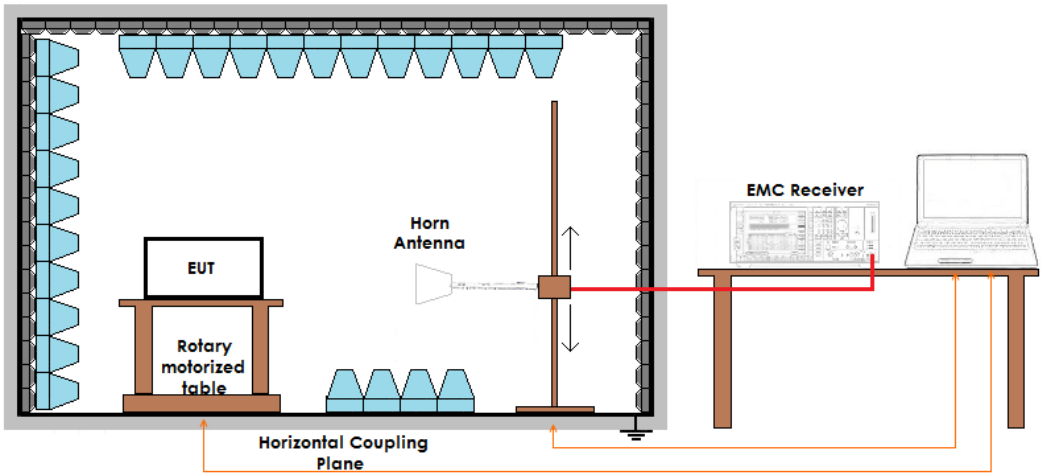
Frequency ≤ 30 MHz



Frequency ≤ 1 GHz



Frequency > 1 GHz



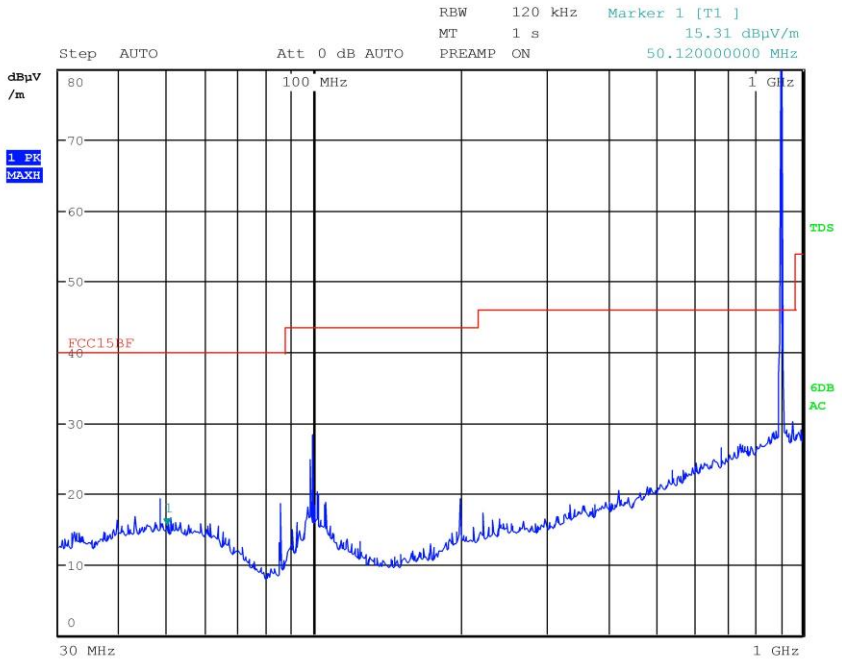
Result

Channel	*Polarization*	*Frequency Range (MHz)*	*Graphs*	*Remarks*	*Result*
--	Loop	0,009 – 30	G14116945	--	Complies
906	H	30 – 1000	G14116918	Tx	Complies
906	V	30 – 1000	G14116917	Tx	Complies
906	H	30 – 1000	G14116921	Rx	Complies
906	V	30 – 1000	G14116922	Rx	Complies
916	H	30 – 1000	G14116924	Tx	Complies
916	V	30 – 1000	G14116923	Tx	Complies
916	H	30 – 1000	G14116925	Rx	Complies
916	V	30 – 1000	G14116926	Rx	Complies
924	H	30 – 1000	G14116928	Tx	Complies
924	V	30 – 1000	G14116927	Tx	Complies
924	H	30 – 1000	G14116929	Rx	Complies
924	V	30 – 1000	G14116930	Rx	Complies
906	H	1000 – 10000	G14116969	Tx	Complies
906	V	1000 – 10000	G14116968	Tx	Complies
906	H	1000 – 10000	G14116970	Rx	Complies
906	V	1000 – 10000	G14116971	Rx	Complies
916	H	1000 – 10000	G14116964	Tx	Complies
916	V	1000 – 10000	G14116965	Tx	Complies
916	H	1000 – 10000	G14116967	Rx	Complies
916	V	1000 – 10000	G14116966	Rx	Complies
924	H	1000 – 10000	G14116961	Tx	Complies
924	V	1000 – 10000	G14116960	Tx	Complies
924	H	1000 – 10000	G14116962	Rx	Complies
924	V	1000 – 10000	G14116963	Rx	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

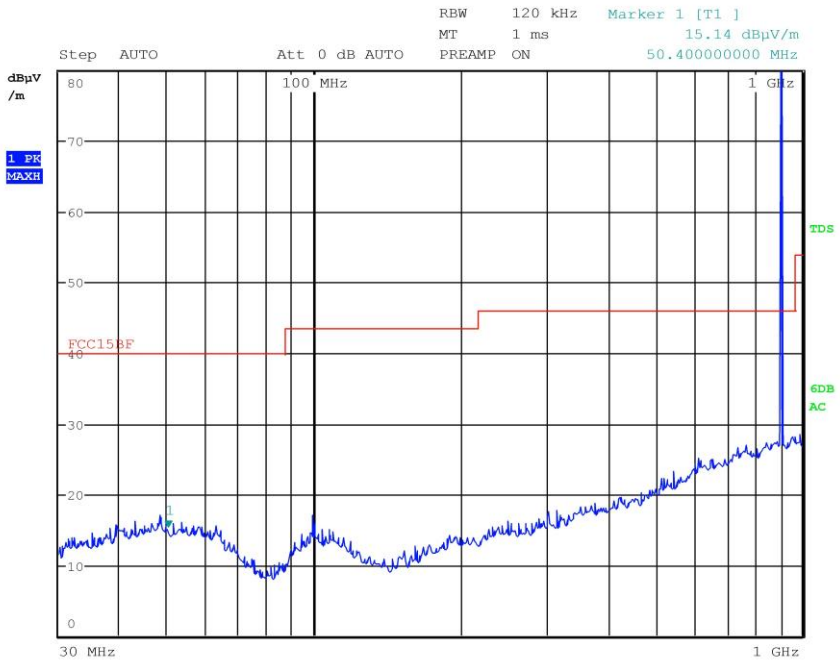
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition TX f min
Operator Bertezzolo 14116917
Test Spec
Vert



Final Measurement

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

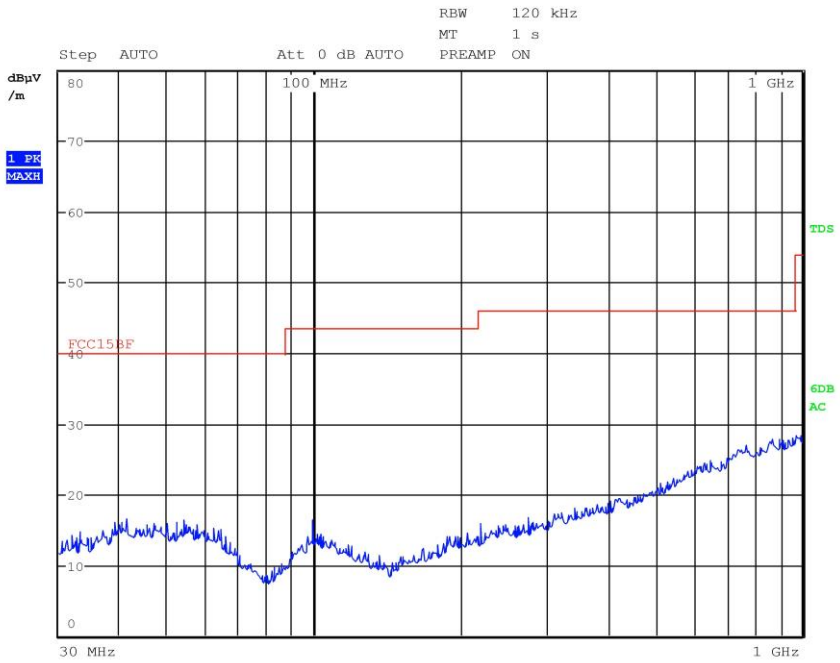
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition TX f min
Operator Bertezzolo 14116918
Test Spec
Horiz



Final Measurement

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

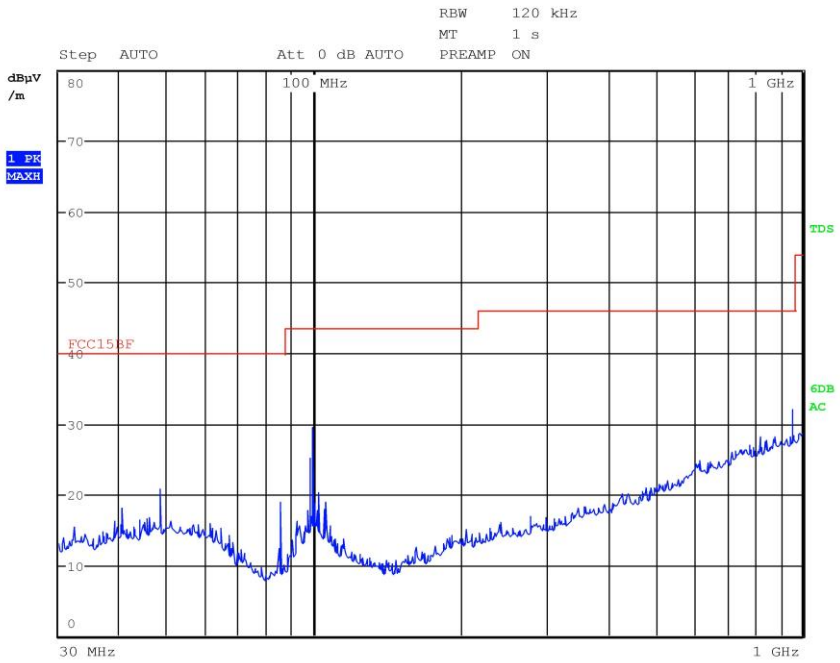
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition RX f min
Operator Bertezzolo 14116921
Test Spec
Horiz



Final Measurement

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

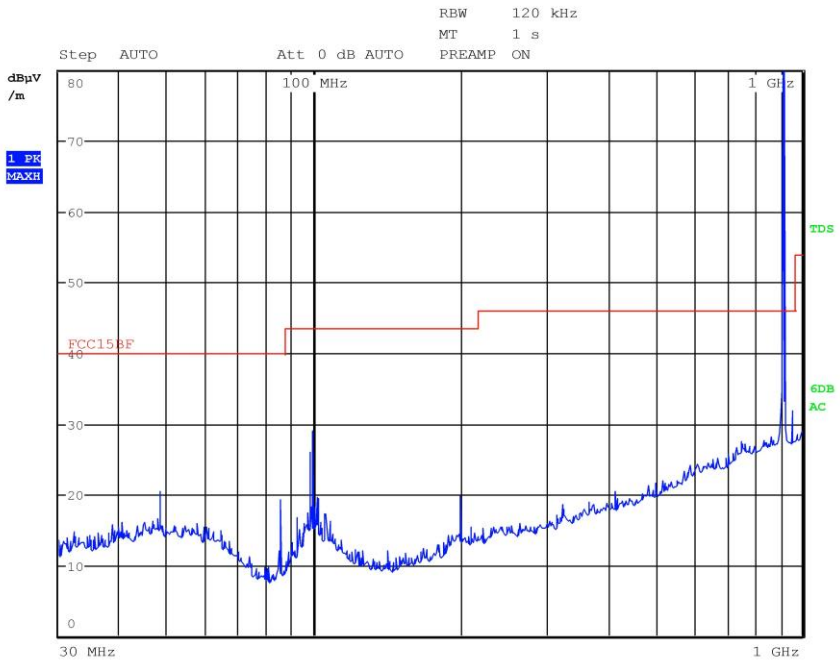
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition RX f min
Operator Bertezzolo 14116922
Test Spec
Vert



Final Measurement

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

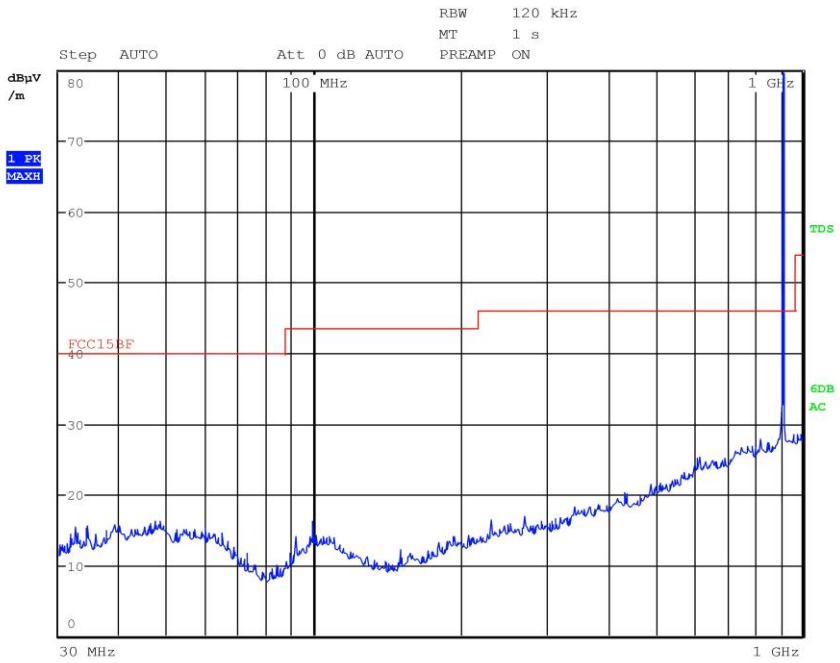
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition TX f med
Operator Bertezzolo 14116923
Test Spec
Vert



Final Measurement

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

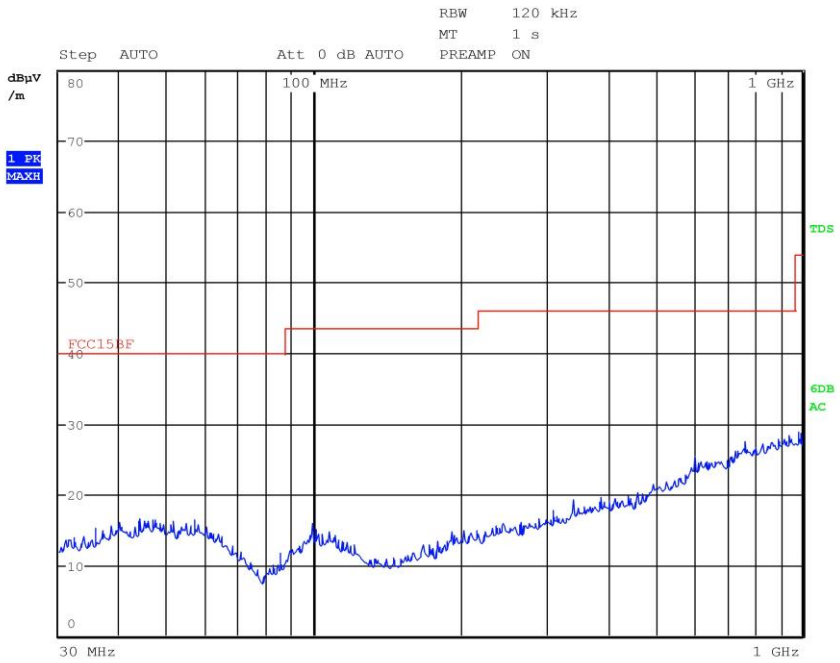
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition TX f med
Operator Bertezzolo 14116924
Test Spec
Horiz



Final Measurement

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

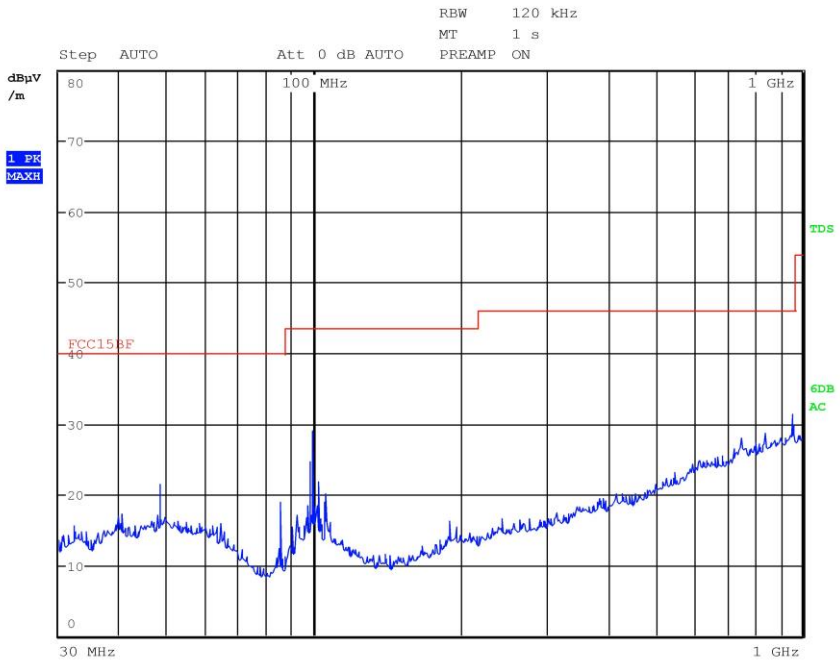
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition RX f med
Operator Bertezzolo 141169125
Test Spec
Horiz



Final Measurement

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

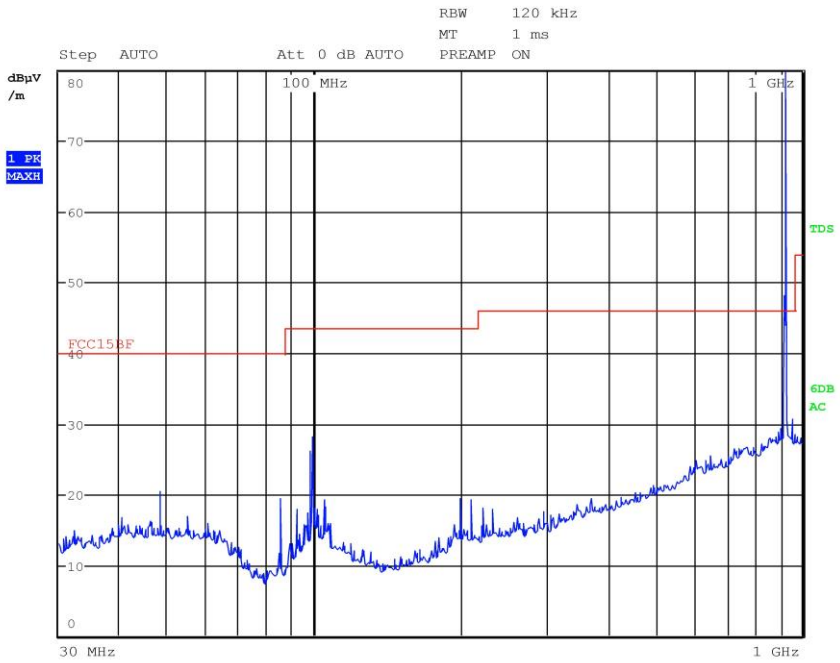
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition RX f med
Operator Bertezzolo 14116926
Test Spec
Vert



Final Measurement

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

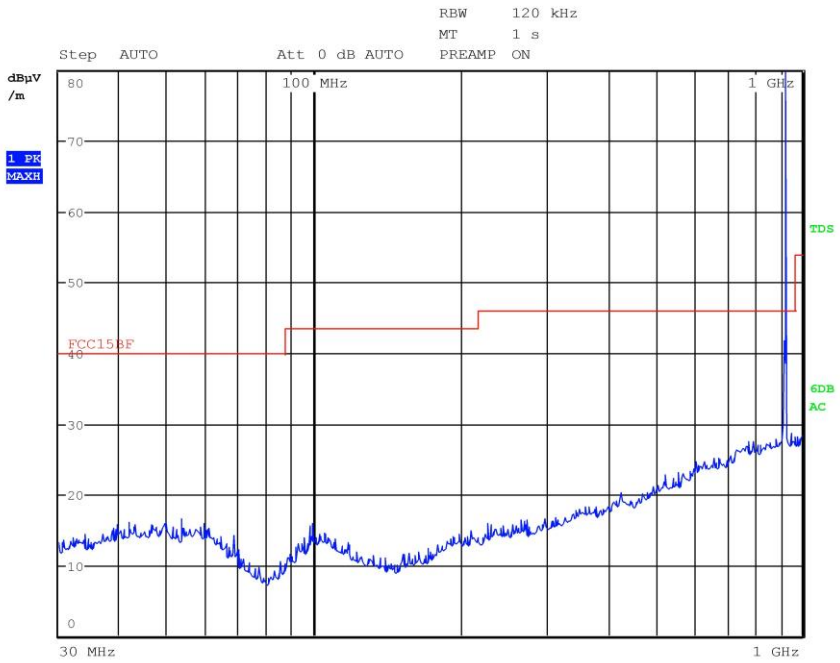
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition TX f max
Operator Bertezzolo 14116927
Test Spec
Vert



Final Measurement

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

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition TX f max
Operator Bertezzolo 14116928
Test Spec
Horiz



Final Measurement

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