



TEST REPORT nr. R15148001

Federal Communication Commission (FCC)

Test item

Description.....: MIFARE/NFC READER

Trademark.....: GLOBAL DISPLAY SOLUTIONS

Model/Type: BRD02311

FCC ID.....: XZR0WQ00536

Test Specification

Standard: FCC Rules & Regulations, Title 47:2014
Part 15 paragraph(s): 203, 204, 207, 209, 215 and 225

Client's name: GLOBAL DISPLAY SOLUTIONS S.p.A.

Address: Via Tezze, 20/A – 36073 Cornedo Vicentino (VI) – ITALY

Manufacturer's name : Same as client

Address: --

Report

Tested by: G. Gandini – Technician

Approved by: R. Beghetto – Laboratory Manager

Date of issue: 01.10.15

Contents.....: 38 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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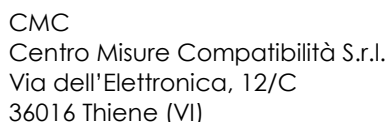
1. Summary

Standard:

FCC Rules & Regulations, Title 47:2014
Part 15 paragraph(s): 203, 204, 207, 209, 215 and 225

<i>Test specifications</i>	<i>Environmental Phenomena</i>	<i>Tests sequence</i>	<i>Result</i>
Part 15.203	Antenna requirements	1	Complies
Part 15.207	Conducted emissions	2	Complies
Part 15.209	Radiated emissions	3	Complies
Part 15.225	Field strength with the assigned band	4	Complies
Part 15.225 (e)	Frequency tolerance	5	Complies
Part 15.215	20 dB bandwidth	6	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



Type of station	<input type="checkbox"/> Receiver only
	<input type="checkbox"/> Fixed station
	<input type="checkbox"/> Portable station
	<input checked="" type="checkbox"/> Mobile station
Nominal frequency	13,56 MHz

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 FCC registration number	271947

3. Testing and sampling

Date of receipt of test item	23.07.15
------------------------------------	----------

Testing start date	: 23.07.15
Testing end date	: 29.09.15
Samples tested nr.....	: 1
Sampling procedure.	: Equipment used for testing was picked up the manufacturer, at the end of the production process with random criterion
Internal identification	: adhesive label with the product number P150865



5. Photograph(s) of EUT

5.1 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 S010	Rohde & Schwarz	ESH3-Z2	Impulses Limiting Device	- - -	January '15	January '16
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 '15	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 '15	January '16
CMC S200	Schwarzbeck	NSLK 8128	V-LISN	8128-273	January '15	January '16
CMC S227	Rohde & Schwarz	ESR7	EMI Test Receiver 7GHz	101121	January '15	January '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

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 15:2014	--
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.

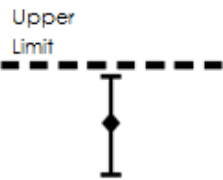
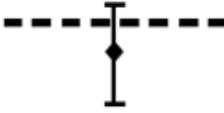
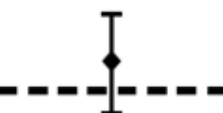



11. Results

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 Antenna requirements

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 configuration and test method

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	100	42

Result

Antenna Type	External R.F. power amplifier	Remarks	Results
Integral antenna	Not Present	--	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 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: Main port
Frequency range: 150 kHz – 30 MHz

Environmental conditions

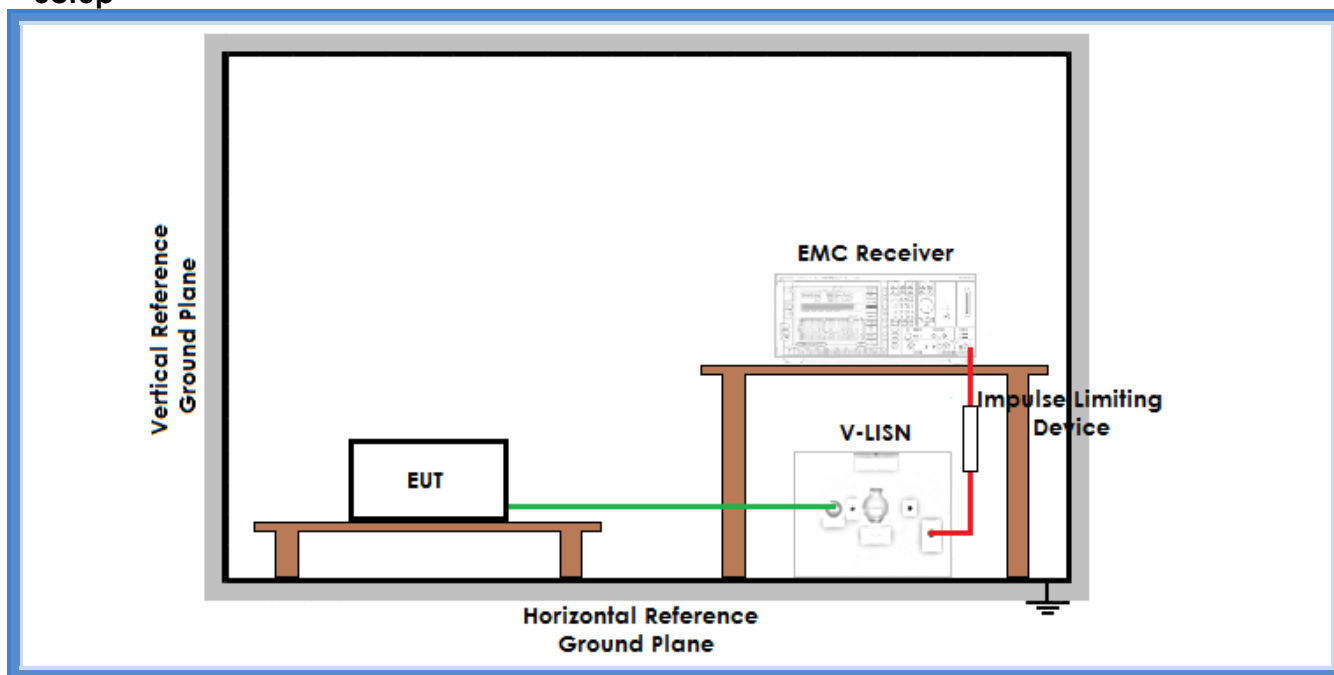
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	101	45

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
+5 Vdc	G15148012	--	Complies
-5 Vdc	G15148013	--	Complies
Remarks: Peaks above the limits are due to the main transmitting frequency			

Line	Graphs	Remarks	Result
-5 Vdc	G15148014	--	Complies
+5 Vdc	G15148015	--	Complies
Remarks: Tests repeated closing the RF output with 50 Ω resistance instead of antenna			

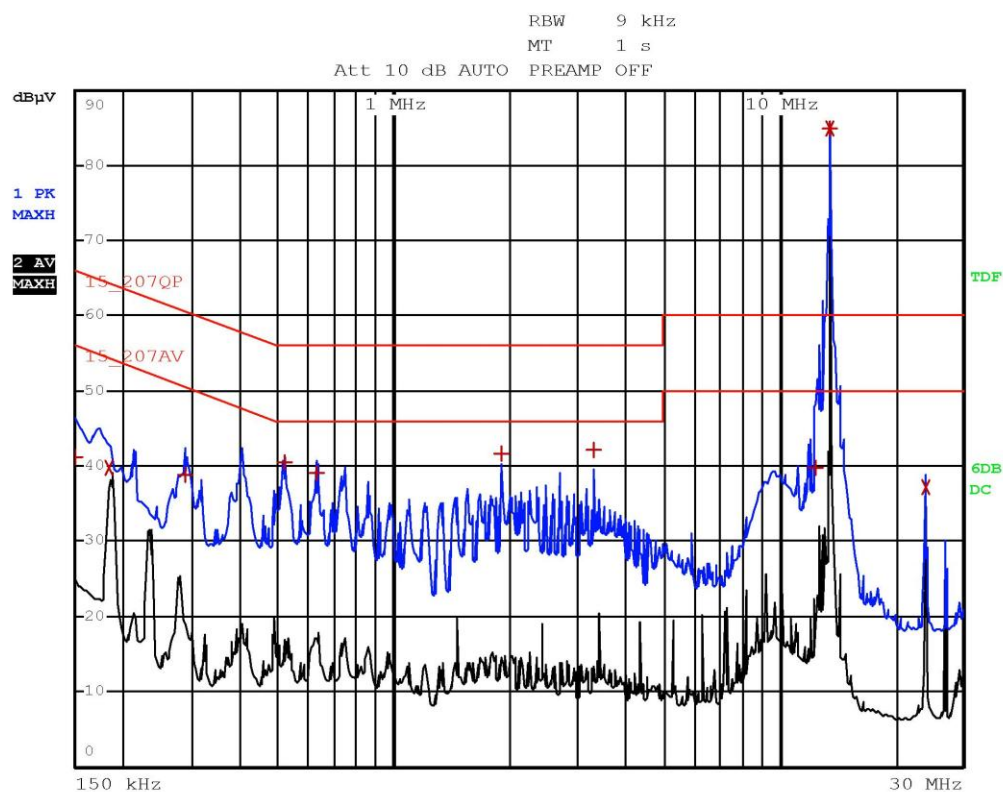
Graphs Legend

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

G15148012



Gandini 15148012-Line (+)-Tx-Rx

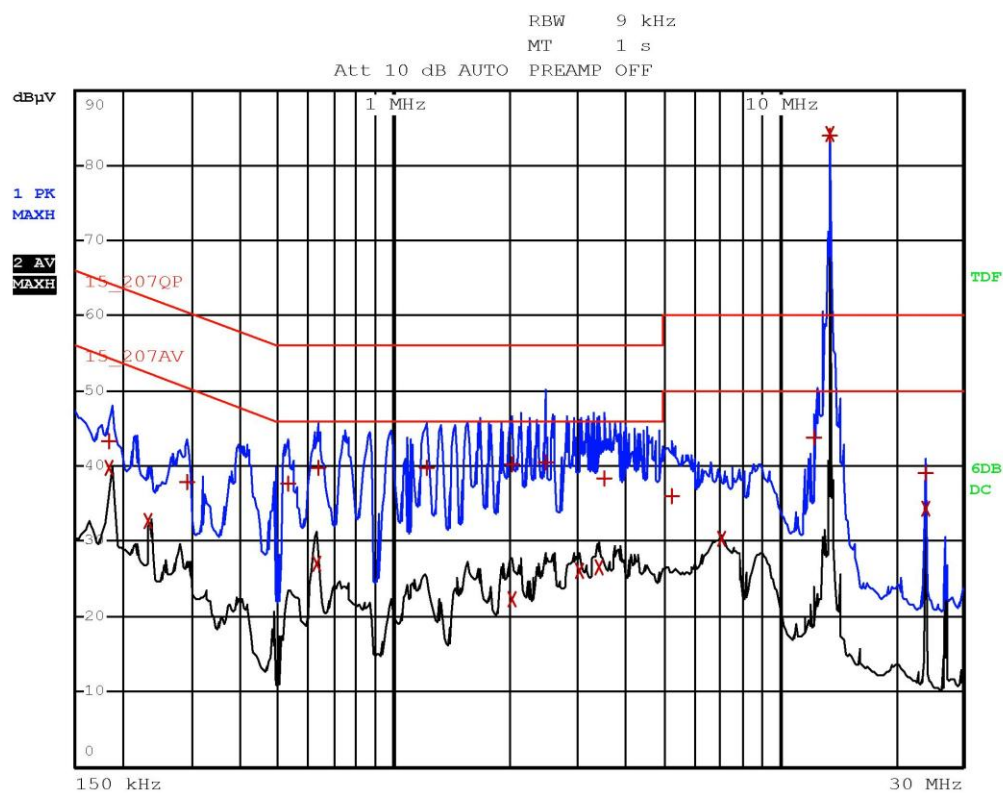


EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_207QP		
Trace2:	15_207AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	150 kHz	41.23	-24.77
2 Average	186 kHz	39.86	-14.35
1 Quasi Peak	286 kHz	38.76	-21.87
1 Quasi Peak	518 kHz	40.47	-15.52
1 Quasi Peak	630 kHz	39.16	-16.83
1 Quasi Peak	1.902 MHz	41.59	-14.40
1 Quasi Peak	3.29 MHz	42.04	-13.95
1 Quasi Peak	12.394 MHz	39.88	-20.11
1 Quasi Peak	13.562 MHz	84.89	24.89
2 Average	13.562 MHz	85.02	35.02
2 Average	24.002 MHz	37.10	-12.90

Gandini 15148012-Line (+)-Tx-Rx



G15148013

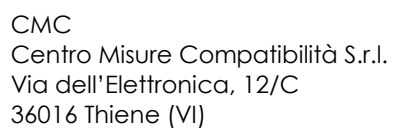


Gandini 15148013-Line (-)-Tx-Rx



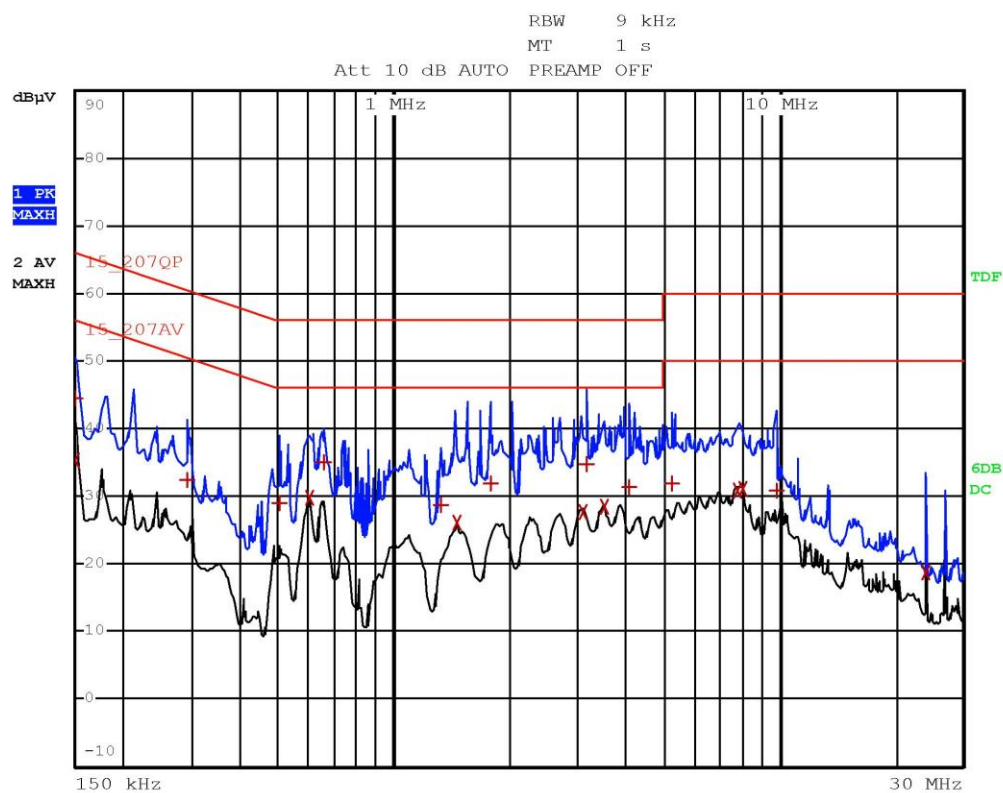
EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_207QP		
Trace2:	15_207AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	186 kHz	43.25	-20.95
2 Average	186 kHz	39.89	-14.31
2 Average	234 kHz	32.68	-19.62
1 Quasi Peak	290 kHz	38.02	-22.50
1 Quasi Peak	530 kHz	37.68	-18.32
2 Average	630 kHz	27.14	-18.85
1 Quasi Peak	634 kHz	39.86	-16.13
1 Quasi Peak	1.214 MHz	39.76	-16.23
1 Quasi Peak	2.022 MHz	40.37	-15.62
2 Average	2.03 MHz	22.33	-23.66
1 Quasi Peak	2.478 MHz	40.61	-15.38
2 Average	3.05 MHz	26.11	-19.88
2 Average	3.414 MHz	26.47	-19.52
1 Quasi Peak	3.526 MHz	38.38	-17.61
1 Quasi Peak	5.254 MHz	35.97	-24.02
2 Average	7.094 MHz	30.37	-19.62
1 Quasi Peak	12.29 MHz	43.80	-16.19
1 Quasi Peak	13.562 MHz	84.08	24.08
2 Average	13.562 MHz	84.25	34.25
2 Average	23.998 MHz	34.29	-15.70

Gandini 15148013-Line (-)-Tx-Rx





G15148014



Gandini 15148014-Line (+)-Tx-Rx

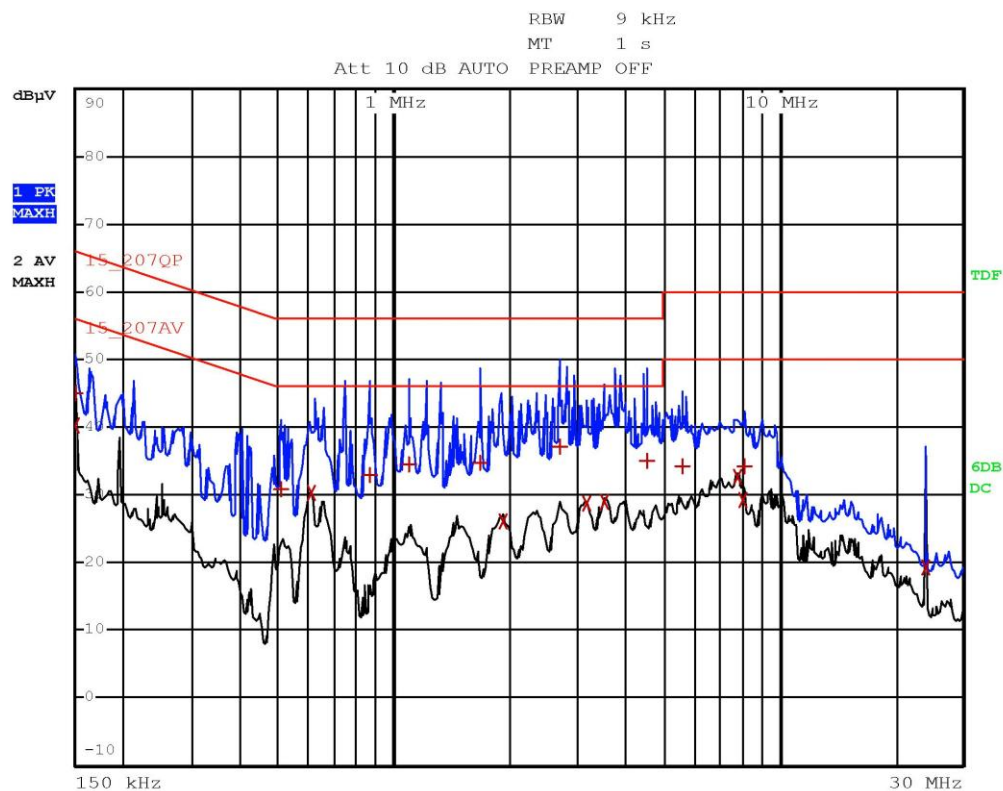


EDIT PEAK LIST (Final Measurement Results)				
Trace1:	15_207QP			
Trace2:	15_207AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB	
1 Quasi Peak	150 kHz	44.36	-21.63	
2 Average	150 kHz	35.27	-20.73	
1 Quasi Peak	290 kHz	32.35	-28.17	
1 Quasi Peak	502 kHz	28.99	-27.00	
2 Average	602 kHz	29.79	-16.20	
1 Quasi Peak	658 kHz	35.09	-20.90	
1 Quasi Peak	1.326 MHz	28.78	-27.22	
2 Average	1.458 MHz	26.05	-19.94	
1 Quasi Peak	1.79 MHz	31.81	-24.19	
2 Average	3.09 MHz	27.55	-18.44	
1 Quasi Peak	3.174 MHz	34.63	-21.36	
2 Average	3.506 MHz	28.40	-17.59	
1 Quasi Peak	4.094 MHz	31.38	-24.61	
1 Quasi Peak	5.25 MHz	31.95	-28.04	
2 Average	7.774 MHz	30.89	-19.10	
2 Average	8.062 MHz	31.04	-18.95	
1 Quasi Peak	9.866 MHz	30.83	-29.16	
2 Average	24.012 MHz	18.66	-31.33	

Gandini 15148014-Line (+)-Tx-Rx



G15148015



Gandini 15148015-Line (-)-Tx-Rx



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	15_207QP		
Trace2:	15_207AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	150 kHz	44.88	-21.11
2 Average	150 kHz	40.15	-15.84
1 Quasi Peak	510 kHz	30.73	-25.26
2 Average	610 kHz	30.24	-15.75
1 Quasi Peak	866 kHz	32.97	-23.02
1 Quasi Peak	1.098 MHz	34.43	-21.56
1 Quasi Peak	1.674 MHz	34.85	-21.14
2 Average	1.918 MHz	26.04	-19.95
1 Quasi Peak	2.71 MHz	37.17	-18.82
2 Average	3.162 MHz	28.61	-17.39
2 Average	3.542 MHz	28.85	-17.14
1 Quasi Peak	4.558 MHz	35.05	-20.94
1 Quasi Peak	5.594 MHz	34.22	-25.77
2 Average	7.818 MHz	32.73	-17.26
2 Average	8.062 MHz	29.20	-20.79
1 Quasi Peak	8.134 MHz	34.22	-25.77
2 Average	24.012 MHz	19.32	-30.67

Gandini 15148015-Line (-)-Tx-Rx

Result: The requirements are met



11.3 Radiated emissions

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 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 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	100	42

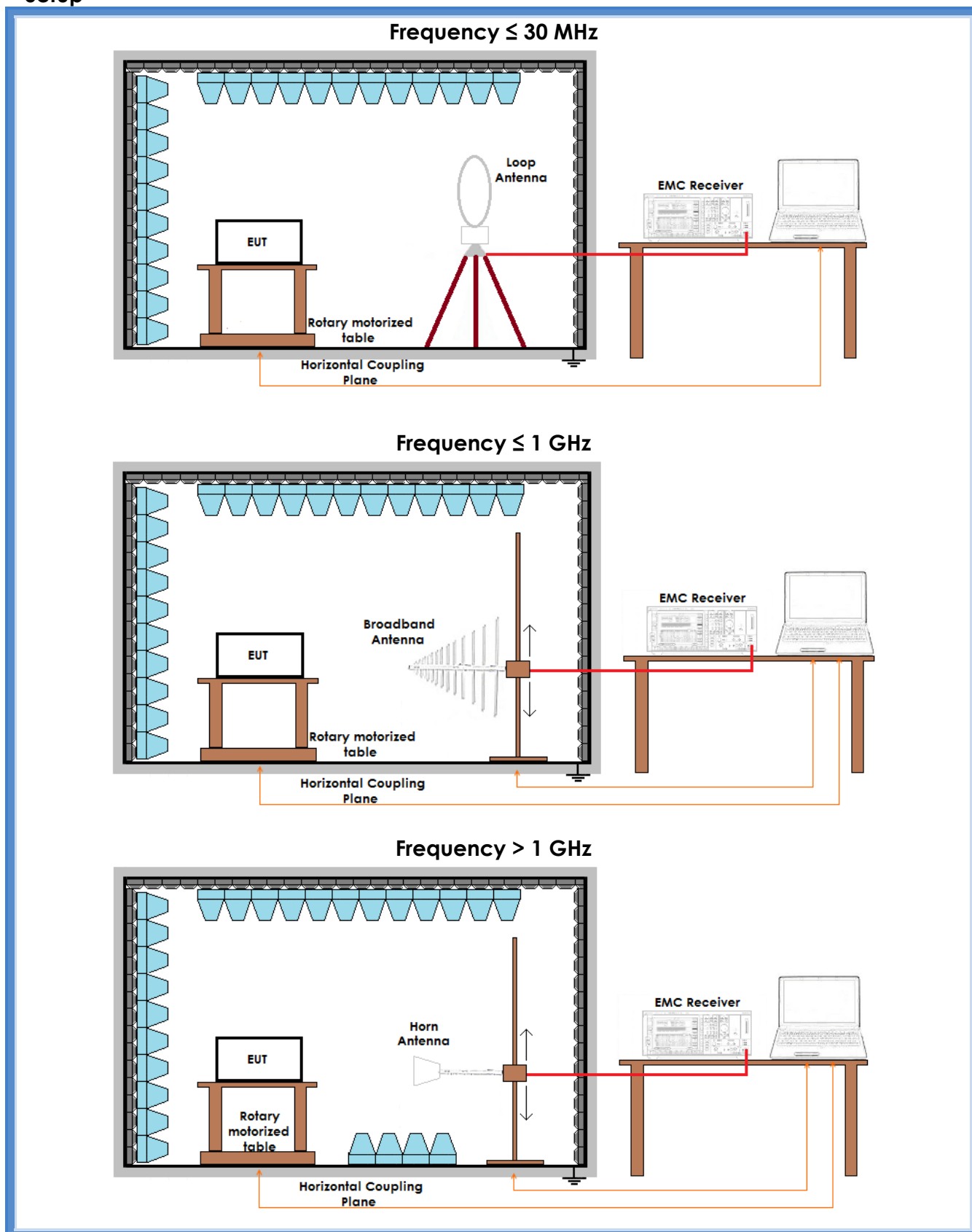
Acceptance limits

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





Result

Polarization	Frequency Range (MHz)	Graphs	Remarks	Result
Loop	0,009 – 30	G15148005	--	Complies
V	30 – 1000	G15148001	--	Complies
H	30 – 1000	G15148002	--	Complies
V	1000 – 10000	G15148004	--	Complies
H	1000 – 10000	G15148003	--	Complies
Remarks: --				

Graphs Legend

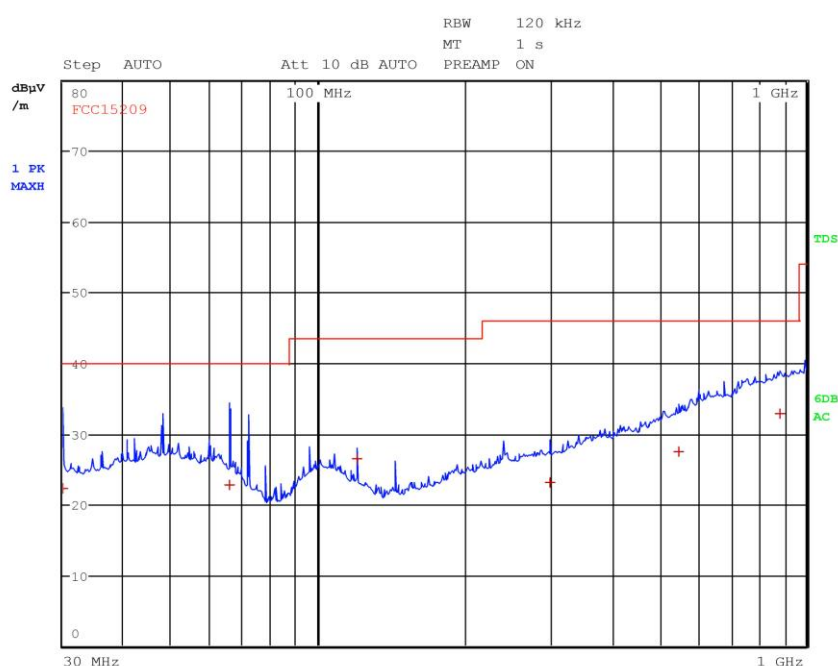
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a x



Graphs

G15148001

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 15148001
Test Spec
Vert



Final Measurement

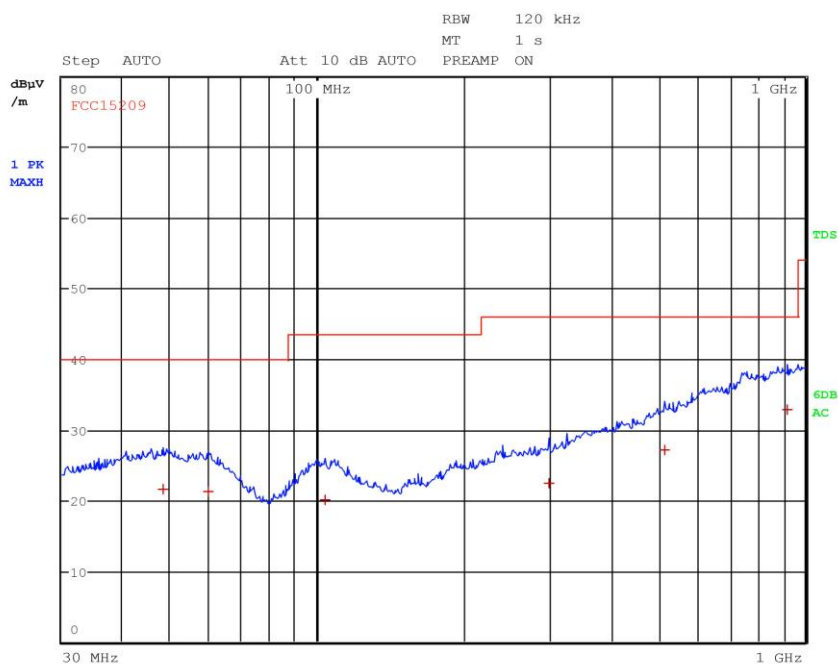
Meas Time: 1 s
Margin: 20 dB
Subranges: 6

Trace	Frequency	Level (dBμV/m)	Detector	Delta Limit/dB
1	30.000000000 MHz	22.28	Quasi Peak	-17.72
1	66.000000000 MHz	22.78	Quasi Peak	-17.22
1	120.000000000 MHz	26.52	Quasi Peak	-17.00
1	298.360000000 MHz	23.09	Quasi Peak	-22.93
1	547.760000000 MHz	27.55	Quasi Peak	-18.47
1	884.360000000 MHz	32.78	Quasi Peak	-13.24



G15148002

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 15148002
Test Spec
Horiz



Final Measurement

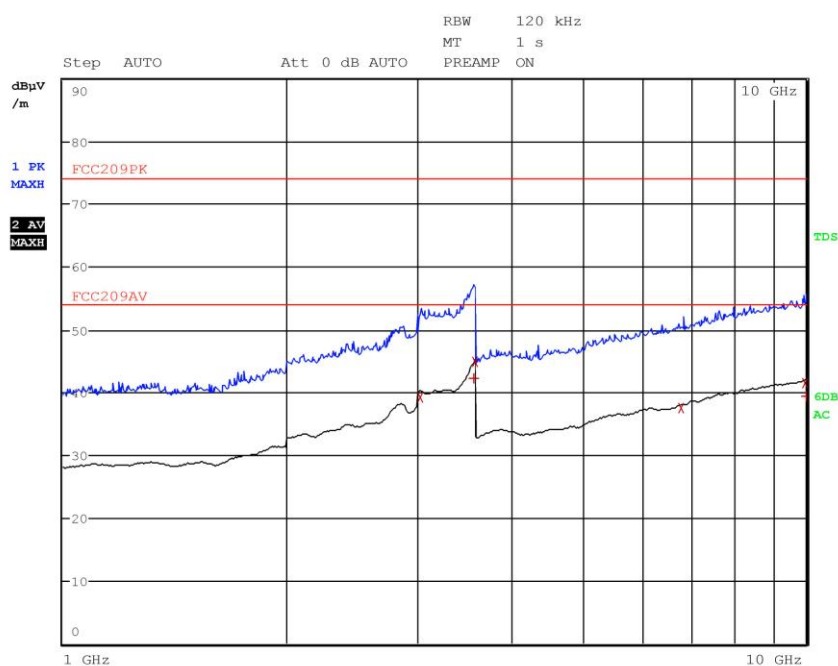
Meas Time: 1 s
Margin: 20 dB
Subranges: 6

Trace	Frequency	Level (dBμV/m)	Detector	Delta Limit/dB
1	48.360000000 MHz	21.65	Quasi Peak	-18.35
1	60.000000000 MHz	21.18	Quasi Peak	-18.82
1	104.080000000 MHz	20.11	Quasi Peak	-23.41
1	298.320000000 MHz	22.43	Quasi Peak	-23.59
1	515.480000000 MHz	27.10	Quasi Peak	-18.92
1	916.600000000 MHz	32.91	Quasi Peak	-13.11



G15148003

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 15148003
Test Spec
Horiz



Final Measurement

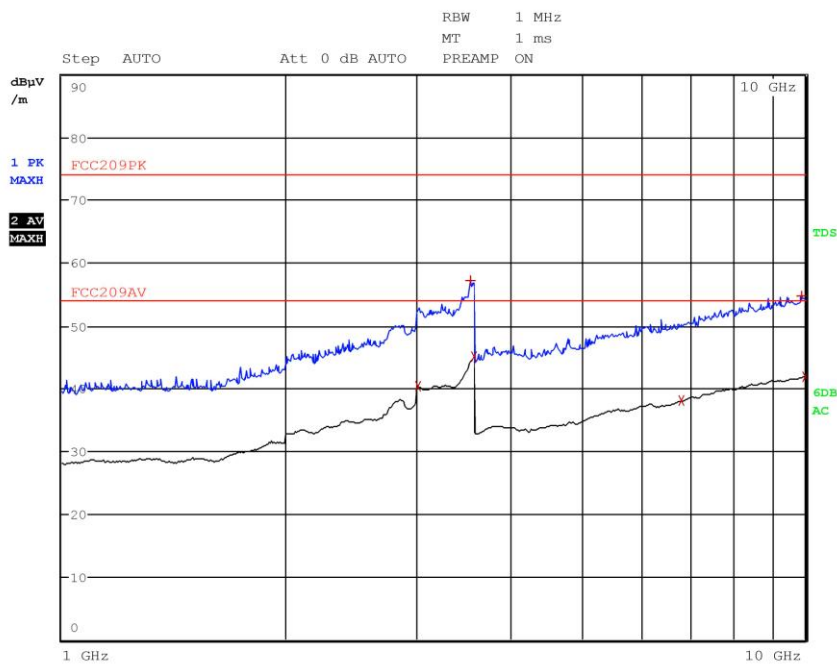
Meas Time: 1 s
Margin: 20 dB
Subranges: 6

Trace	Frequency	Level (dBμV/m)	Detector	Delta Limit/dB
2	3.021600000 GHz	39.30	Average	-14.70
1	3.577200000 GHz	42.17	Quasi Peak	-31.83
2	3.600000000 GHz	44.98	Average	-9.02
2	6.776800000 GHz	37.62	Average	-16.38
2	9.978000000 GHz	41.41	Average	-12.59
1	9.999200000 GHz	39.36	Quasi Peak	-34.64



G15148004

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 15148004
Test Spec
Vert



Final Measurement

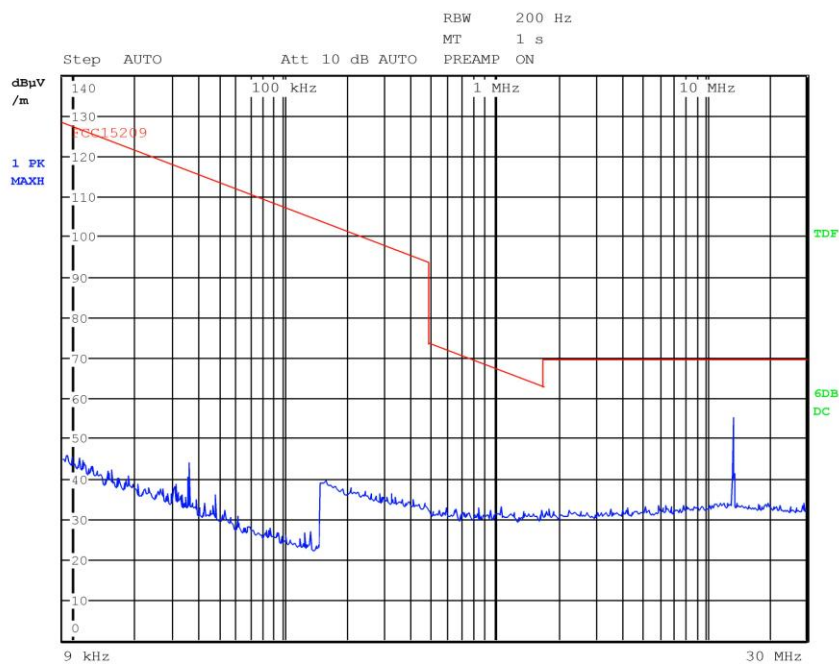
Meas Time: 1 s
Margin: 20 dB
Subranges: 6

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
2	3.012000000 GHz	40.31	Average	-13.69
1	3.543600000 GHz	57.18	Max Peak	-16.82
2	3.596800000 GHz	45.18	Average	-8.82
2	6.809600000 GHz	38.13	Average	-15.87
1	9.899600000 GHz	54.79	Max Peak	-19.21
2	9.990400000 GHz	41.92	Average	-12.08



G15148005

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 15148005
Test Spec
Loop



Final Measurement

Meas Time: 1 s
Margin: 20 dB
Subranges: 0

Result: The requirements are met



11.4 Field strength within the assigned band

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209 and Part 15.225
- 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 S127, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 3 m

Environmental conditions

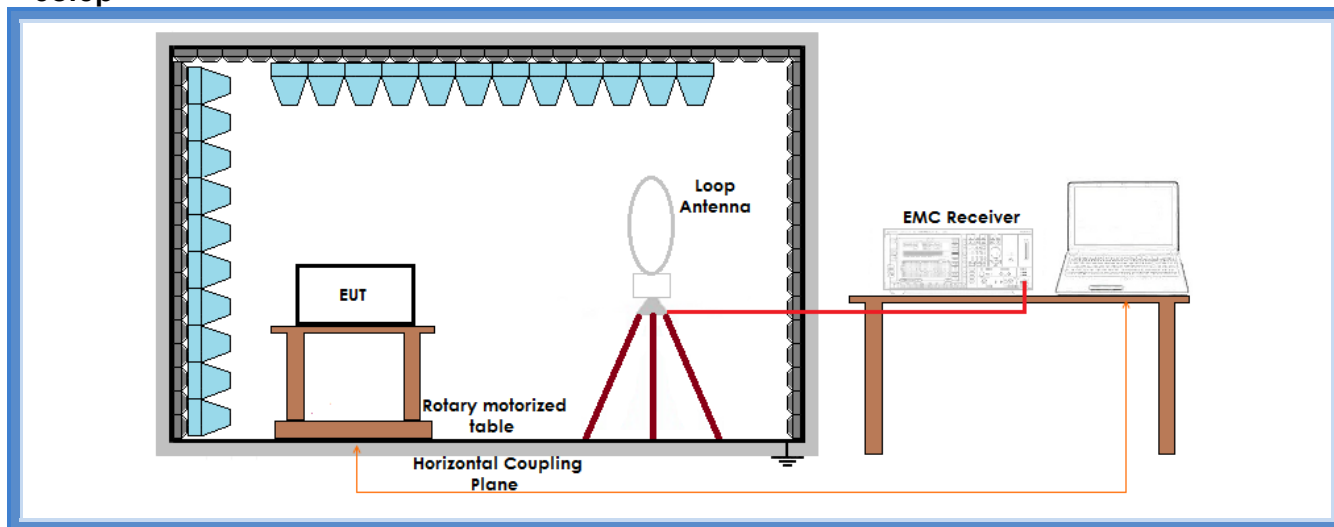
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
20	100	45

Acceptance limits

Limits (with antenna distance 3 m)		
cl.	Frequency range (MHz)	dB(μV/m) Quasi-peak
15.225 (a)	13,553 to 13,567	124
15.225 (b)	13,410 to 13,553 and 13,567 to 13,710	90,5
15.225 (c)	13,110 to 13,410 and 13,710 to 14,010	80,5
15.225 (d)	outside of the 13,110 – 14,010 MHz band	FCC 15.209



Setup



Result

Graph	Limits (dB μ V/m)	Level (dB μ V/m)	Results
G15148008	124	69,67	Complies

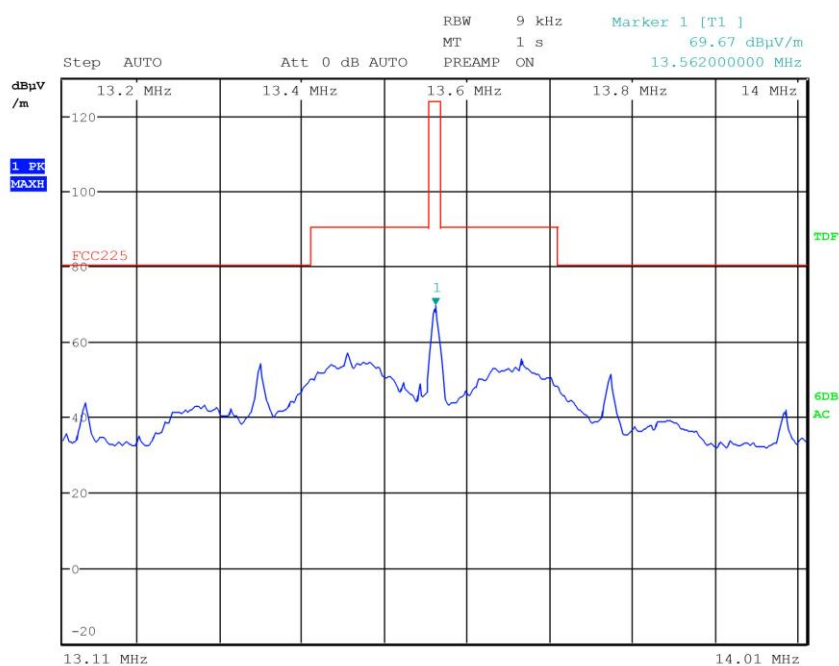
Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest value.



Graph

G15148008

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 15148008
Test Spec
Loop - EUT Vert1



Final Measurement

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

Result: The requirements are met



11.5 Frequency tolerance

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.225 (e)
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
Climatic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC B026, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
EUT – Antenna distance: 3 m

Environmental conditions

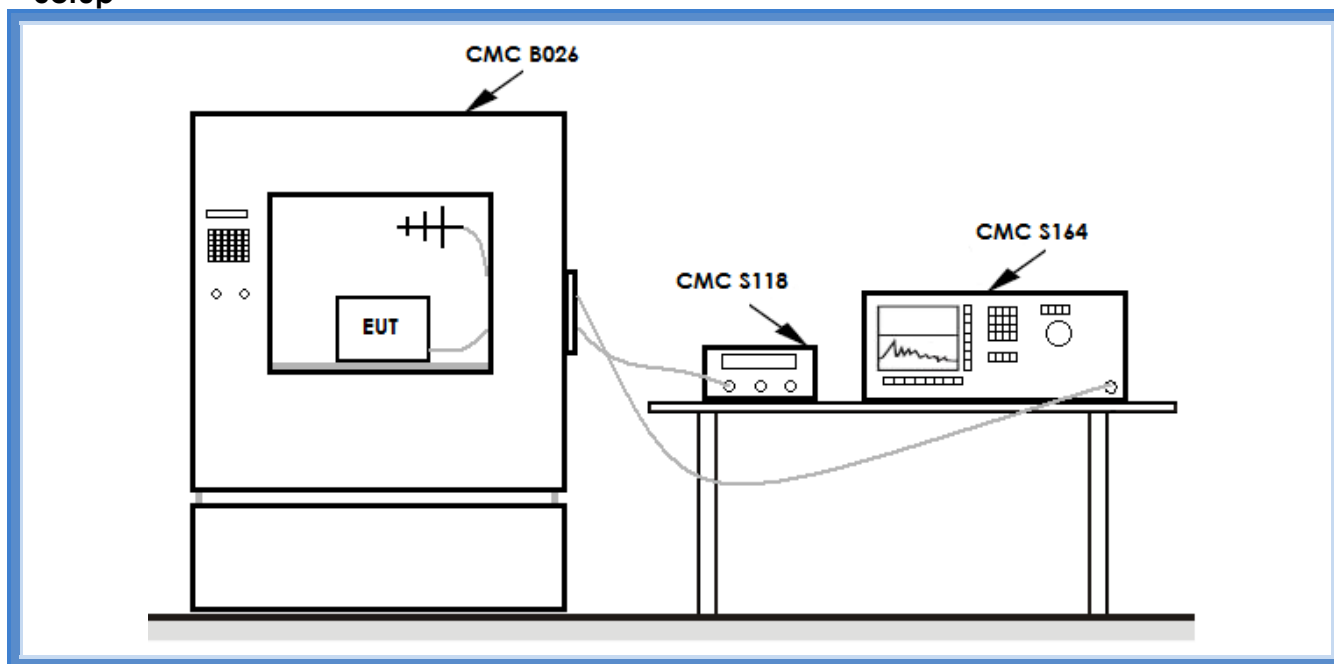
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	101	42

Acceptance limits:

The frequency tolerance of the carrier signal shall be maintained within $\pm 0,01\%$ of the operating frequency ($\pm 1,36$ kHz)



Setup



Result

Test conditions		Measured frequency
Temperature (°C)	Voltage level (V)	(MHz)
-20	Normal supply voltage	13,560823
-10	Normal supply voltage	13,561023
0	Normal supply voltage	13,561023
10	Normal supply voltage	13,560903
20	Normal supply voltage	13,560900
30	Normal supply voltage	13,560943
40	Normal supply voltage	13,560823
50	Normal supply voltage	13,560823

Temperature (°C)	Test conditions		Measured frequency
	Voltage level (%)	Voltage level (V)	
20	85	4,25	13,560980
20	90	4,50	13,560980
20	95	4,75	13,560980
20	100	5,00	13,560900
20	105	5,25	13,560900
20	110	5,50	13,560940
20	115	5,75	13,560940

Result: The requirements are met



11.6 20 dB bandwidth

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 configuration and test method

Test site:
Laboratory

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S127, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

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

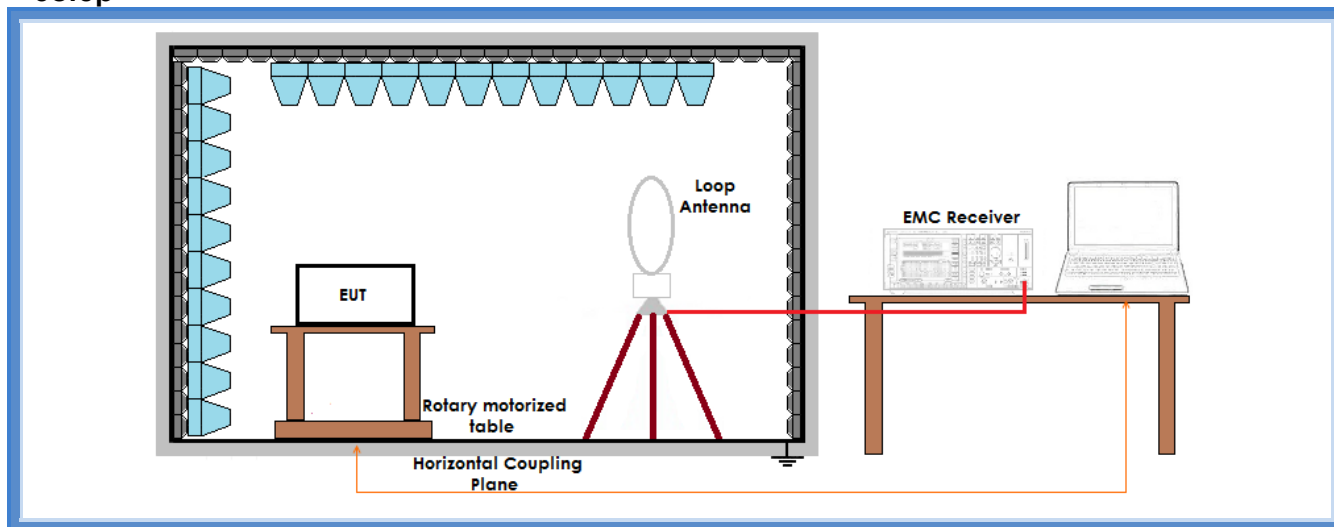
Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	45

Acceptance limits: operation within the band 13,110 – 14,010 MHz



Setup



Result

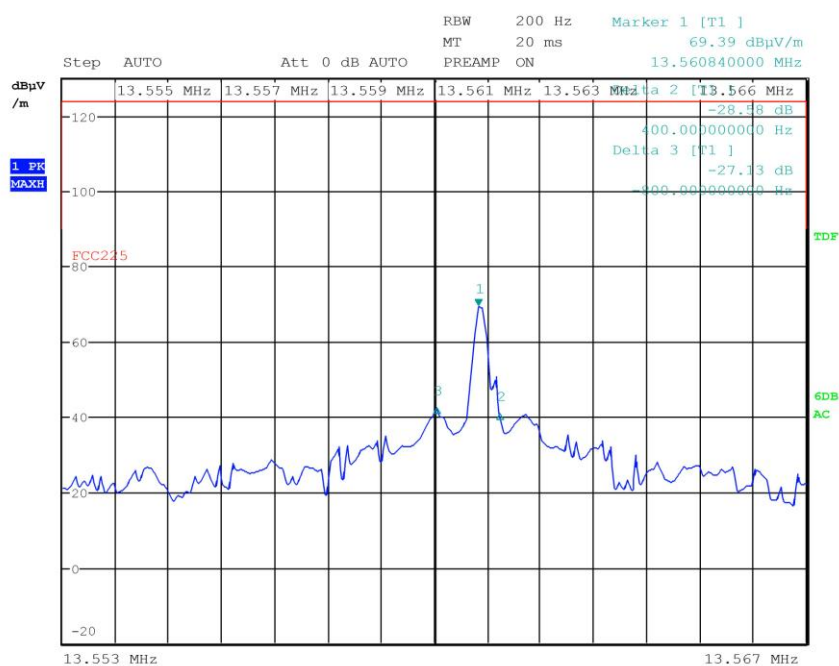
f (MHz)	20 dB bandwidth (MHz)		Graph	Results
	FL	FH		
13,56084	13,56004	13,56124	G15148011	Complies



Graphs

G15148011

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx
Operator Gandini 15148011
Test Spec
Loop - EUT Vert1



Final Measurement

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

Result: The requirements are met