CMC Centro Misure Compatibilità S.r.l.
Via della Fisica, 20
36016 Thiene (VI) – ITALY
Tel./Fax +39 0445 367702
www.cmclab.it - info@cmclab.it

LAB N° 0168

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

TEST REPORT nr. R19014801

Federal Communication Commission (FCC)

Test item

Description .....: NFC/BLE (Gymkit) 5V RS232 board

Trademark .....: ELETTRONICA GF

Model/Type .....: 0615E

FCC ID .....: 2ARDN0615E

Test Specification

Standard.....: FCC Rules & Regulations, Title 47:2017
Part 15 paragraph(s): 203, 204, 205, 207, 209 and 225

Client's name ..... : ELETTRONICA GF S.r.l.

Address .....: Via Vittori, 63 – 48018 Faenza (RA) – ITALY

Manufacturer's name : Same as client

Address .....: --

Report

Tested by .....: G. Gandini .....

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

Date of issue .....: 10.07.19

Contents.....: 47 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 47:2017
Part 15 paragraph(s): 203, 204, 205, 207, 209 and 225

Test specifications	*Environmental Phenomena*	*Tests sequence*	*Result*
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

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2. Description of Equipment under test (EUT)

Power supply ..... :	5 Vdc
Serial Number ..... :	--
Type of equipment ..... :	☑ Transmitter Unit
	❑ Receiver Unit
Type of station ..... :	☑ Fixed station
	❑ Portable station
	❑ 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 ..... :	182474

3. Testing and sampling

Date of receipt of test item ..... :	17.01.19
Testing start date ..... :	07.02.19
Testing end date ..... :	27.03.19
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 P190067

4. Operative conditions

EUT exercising ..... :	EUT in continuous transmission at maximum power
Auxiliary equipment ..... :	Companion equipment to operate the EUT

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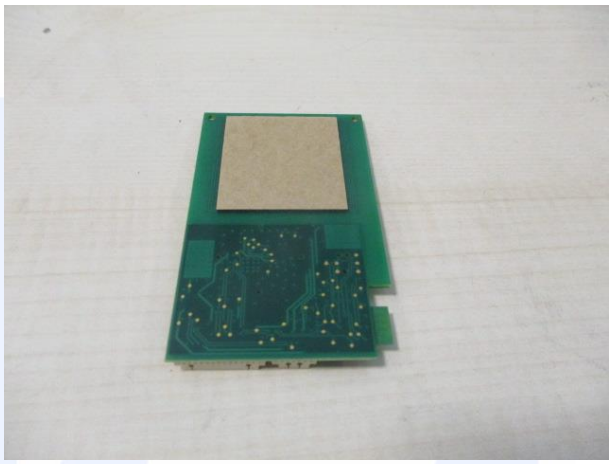
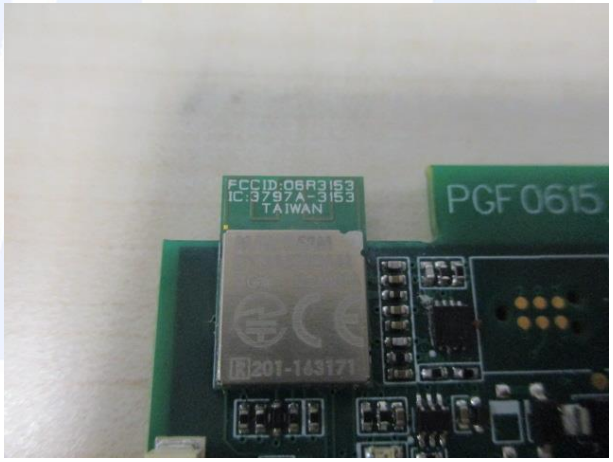
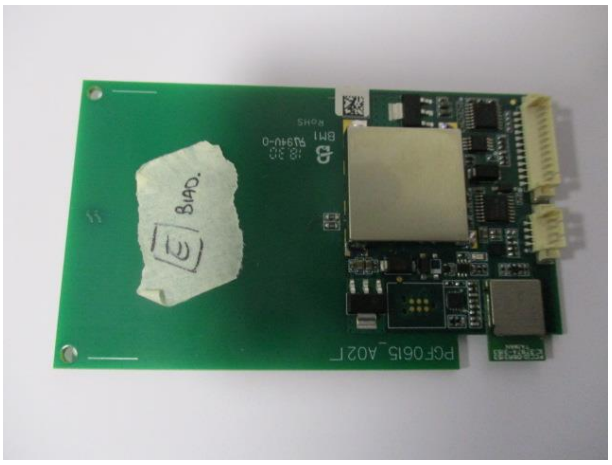
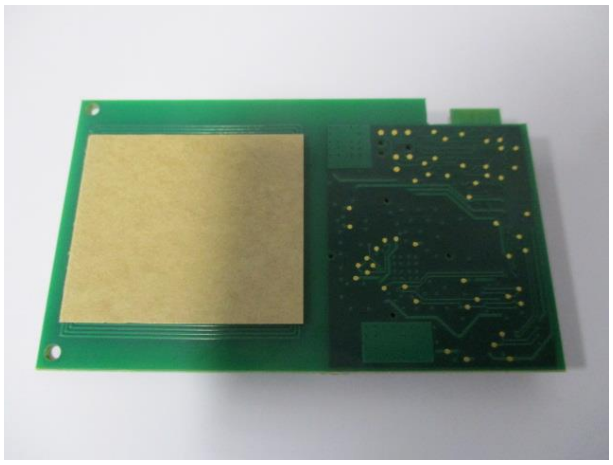
5. Photograph(s) of EUT

5.1 Photograph(s) of EUT









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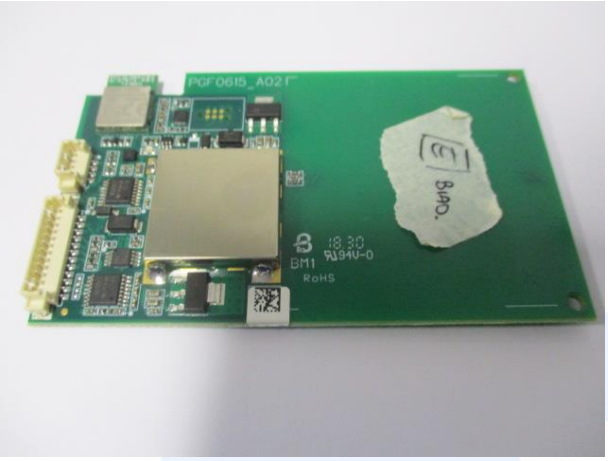
PGF0615_A02
RoHS

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 '19	January '20
CMC S108	EMCO	3115	Horn Antenna	9811-5622	June '16	June '19
CMC S127	Schaffner	HLA6120	Loop Antenna	1191	March '17	March '20
CMC S164	Rohde & Schwarz	ESU26	EMC interference receiver	100052	January '19	January '20
CMC S227	Rohde & Schwarz	ESR7	EMI Test Receiver 7GHz	101121	January '19	January '20
CMC S260	CMC	Wfr_N	Shielded Cable	Wfr_ant10-1	November '18	November '19
CMC S261	CMC	Wfr_N	Shielded Cable	Wfr_ant20-1	November '18	November '19
CMC S262	CMC	Wfr_N_fix	Shielded Cable	Wfr_fix32-1	November '18	November '19
CMC S263	CMC	Wfr_N_fix	Shielded Cable	Wfr_fix31-1	November '18	November '19
CMC S264	CMC	Wfr_N	Shielded Cable	Wfr_ext03-1	November '18	November '19
CMC S271	Schwarzbeck	BBA 9106 + VHBB 9124	Biconical Antenna (30-300MHz)	831	June '16	June '19
CMC S288	CMC	W_sma_white	Joint Shielded Cable	W_001	November '18	November '19
CMC S295	Rohde & Schwarz	FSW43	Spectrum Analyzer 43GHz	104059	November '16	November '19
CMC B026	Angelantoni	UY 245 IU	Climatic chamber	1059.78	September '16	September '19

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7. Measurement uncertainty

Test	Test Setup	Expanded uncertainty	Note
Conducted emission CISPR 16 LISN 50uH 0,009-0,0150MHz	PE001_01	3,4 dB	1
Conducted emission CISPR 16 LISN 50uH 0,150-30,0MHz	PE001_01	3,0 dB	1
Conducted emission CISPR 16 Voltage Probe 0,15-30MHz	PE001_02	2,9 dB	1
Conducted emission CISPR 16 Current Probe 0,15-30MHz	PE001_03	2,6 dB	1
Conducted emission CISPR 16 ISN 0,15-30MHz	PE001_04	4,7 dB	1
Clic CISPR 16 LISN 50uH 0,150-30,0MHz	PE001_05	3,1 dB	1
Disturbance Power 30-300 MHz	PE002_01	3,6 dB	1
Radiated Emission LAS 0,15-30MHz	PE003_01	2,0 dB	1
Radiated Emission CISPR 16 Loop Ant. 0,15-30MHz	PE004_01	4,0 dB	1
Radiated Emission CISPR 16 Bicon. Ant. 30-300MHz	PE004_02	3,9 dB	1
Radiated Emission CISPR 16 LogP. Ant. 300-1000MHz	PE004_03	3,8 dB	1
Radiated Emission CISPR 16 Horn Ant. 1-18GHz	PE004_04	4,2 dB	1
Human Exposure to electromagnetic fields	PE005_01	23,6 %	1
Harmonic current emissions test	PE006_01	10 mA + 2,6 %	1
Voltage fluctuation and flicker test	PE007_01	4,8 %	1
Radiated Immunity 80MHz-6GHz	PE102_XX	2,1 dB 0,82 V/m a 3V/m	1
Conducted Immunity 0,15-230MHz	PE105_XX	1,2 dB 0,44 V a 3V	1
AC Magnetic field	PE106_01	1,55 % 0,15 A/m a 10A/m	1
Pulse Magnetic field	PE107_01	6,25 % 18,7 A/m a 300A/m	1
Dumped Magnetic field	PE108_01	6,25 % 1,87 A/m a 30A/m	1
Common mode conducted immunity	PE112_01	2,21 % 0,22 V a 10V	1

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Test	Test Setup	Expanded uncertainty	Note
Power/Spurious 9kHz-30MHz	PR001_01	4,0 dB	1
Power/Spurious ERP 30-1000MHz d=10m	PR001_02+03	4,7 dB	1
Misura della potenza EiRP 1-18GHz d=3m	PR001_04	4,7 dB	1
Misura della potenza EiRP 18-40GHz d=3m	PR001_05	5,4 dB	1
Frequency error	PR002_01+02	< 1x10-7	1
Timing zero span (1001pts.)	PR002_01+02	0,2 % SWT	1
Modulation bandwidth	PR002_01+02	< 1x10-7	1
Conducted RF power and spurious emission	PR002_01+02	1,1 dB	1
Adjacent channel power	PR002_01+02	1,1 dB	1
Blocking	PR002_01+02	1,1 dB	1

Test	Test Setup	Expanded uncertainty	Note
Electrostatic discharge immunity test	PE101_0X		2
Electrical fast transients / burst immunity test	PE103_0X		2
Surge immunity test	PE104_0X		2
Short interruption immunity test	PE109_01		2
Rev_19_01 date 14/01/2019			

Note 1:
The expanded uncertainty reported according to the document EA-4-02 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

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8. Reference documents

Reference no.	*Description*
FCC Rules and Regulation Title 47 part 15:2017	--
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
ANSI C63.10:2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Internal Procedure PM001 rev. 3.0 (Quality Manual)	Measure Procedure
Internal procedure INC_M rev. 9.1 (Quality Manual)	Measurement uncertainty calculation

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9. Deviation from test specification

None

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.

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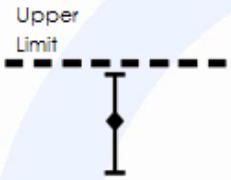
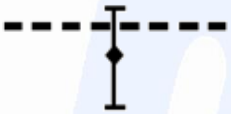
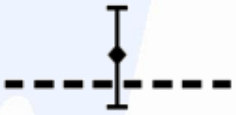
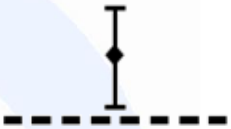
11. Results

In this clause tests results are reported.

Measurement uncertainty is in accordance with document CMC INC_M rev. 9.1.

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.

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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	101	45

Result

Antenna Type	*External R.F. power amplifier*	*Remarks*	*Results*
Integral antenna	Not Present	--	Complies

Result: The requirements are met

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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

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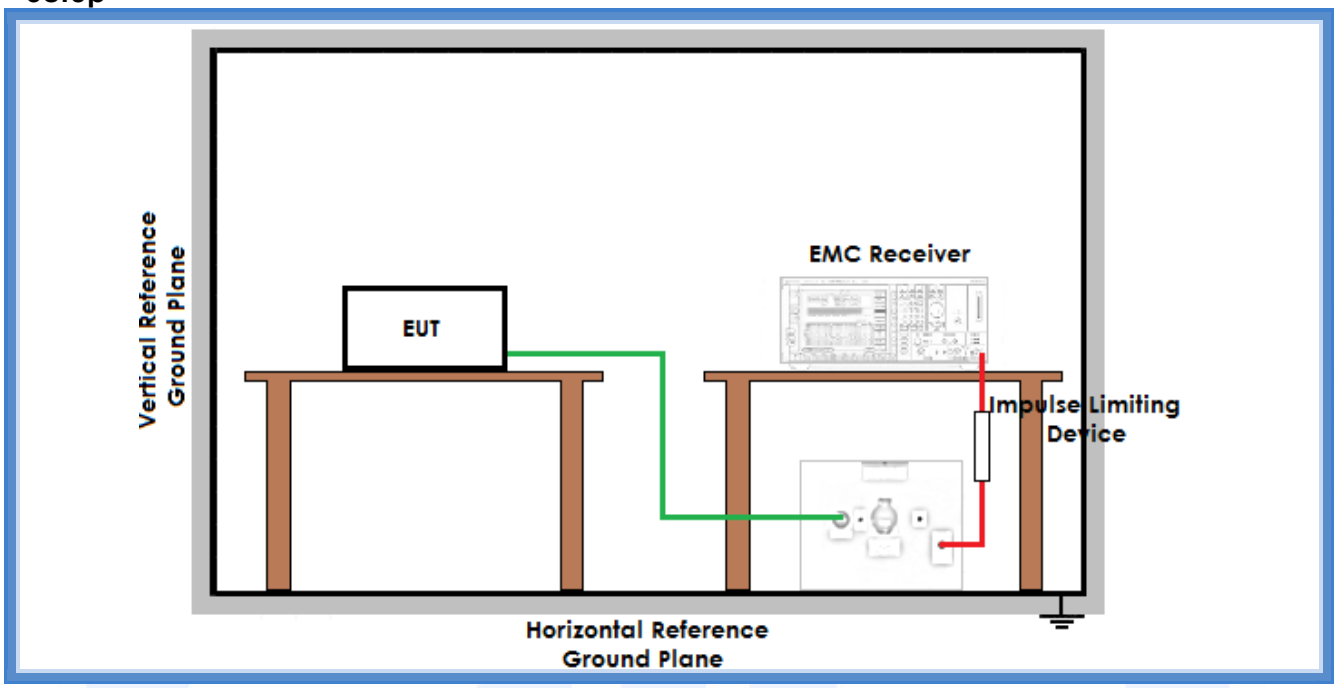
Setup



Result

Line	Graphs	Remarks	Result
+5 Vdc	G19014812	--	Complies
-5 Vdc	G19014813	--	Complies
Remarks: --			

Line	Graphs	Remarks	Result
-5 Vdc	G19014814	--	Complies
+5 Vdc	G19014815	--	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

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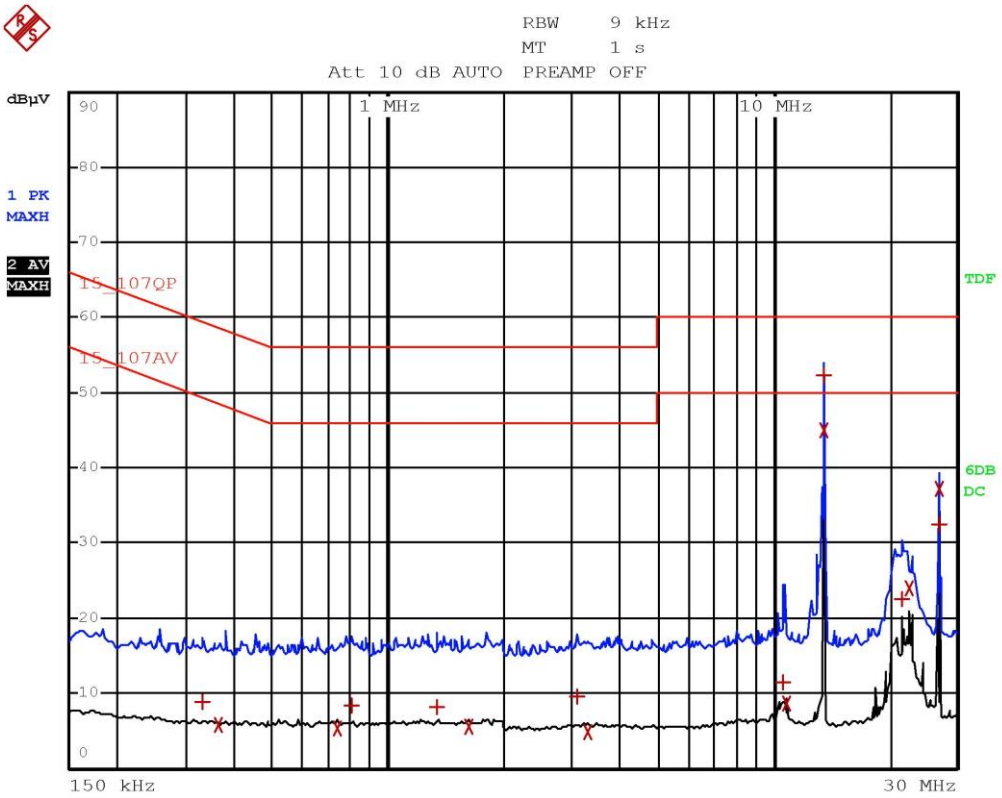
Graphs



Gandini 19014812

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EDIT PEAK LIST (Final Measurement Results)

Trace1:	15_107QP
Trace2:	15_107AV
Trace3:	---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	330 kHz	8.75	-50.69
2	Average	362 kHz	5.68	-43.00
2	Average	738 kHz	5.41	-40.59
1	Quasi Peak	802 kHz	8.40	-47.59
1	Quasi Peak	1.334 MHz	8.22	-47.77
2	Average	1.618 MHz	5.52	-40.47
1	Quasi Peak	3.102 MHz	9.67	-46.32
2	Average	3.31 MHz	4.84	-41.15
1	Quasi Peak	10.598 MHz	11.42	-48.57
2	Average	10.79 MHz	8.67	-41.32
2	Average	13.554 MHz	45.06	-4.93
1	Quasi Peak	13.56 MHz	52.22	-7.77
1	Quasi Peak	21.666 MHz	22.50	-37.49
2	Average	22.526 MHz	24.00	-25.99
2	Average	27.122 MHz	37.25	-12.74
1	Quasi Peak	27.122 MHz	32.41	-27.58

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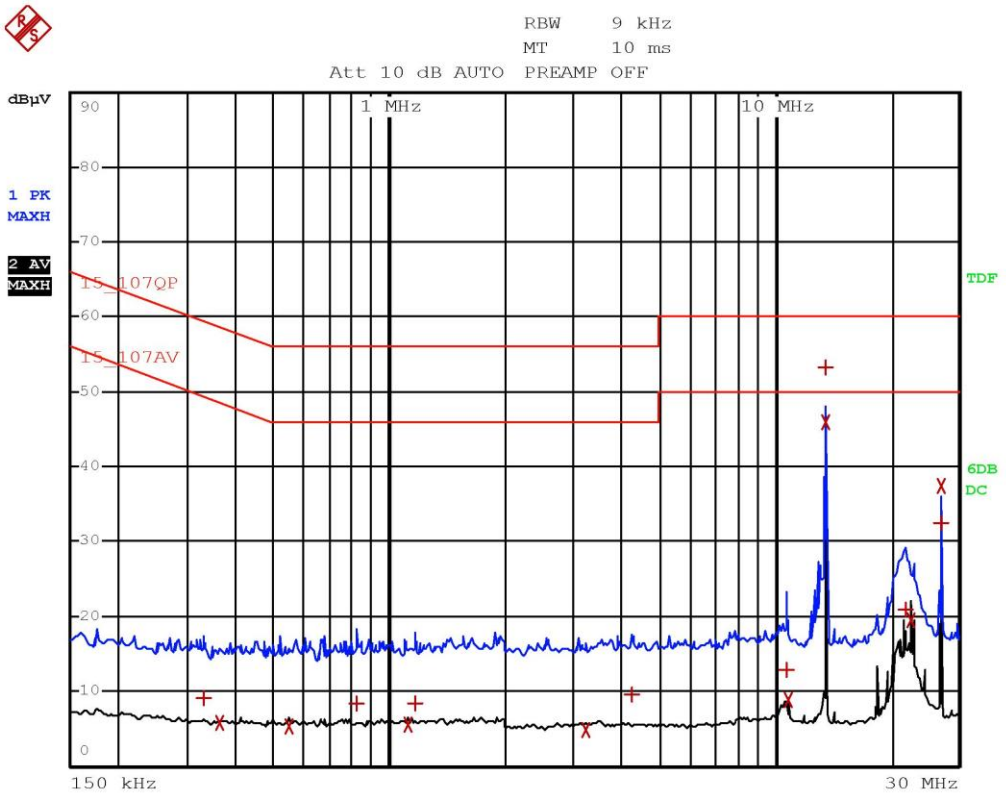

Gandini 19014813

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EDIT PEAK LIST (Final Measurement Results)

Trace1:	15_107QP
Trace2:	15_107AV
Trace3:	---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	330 kHz	9.08	-50.36
2	Average	362 kHz	5.72	-42.95
2	Average	546 kHz	5.39	-40.60
1	Quasi Peak	822 kHz	8.31	-47.68
2	Average	1.122 MHz	5.47	-40.52
1	Quasi Peak	1.174 MHz	8.49	-47.50
2	Average	3.238 MHz	4.91	-41.08
1	Quasi Peak	4.27 MHz	9.60	-46.39
1	Quasi Peak	10.674 MHz	12.92	-47.07
2	Average	10.794 MHz	8.79	-41.20
2	Average	13.554 MHz	46.06	-3.93
1	Quasi Peak	13.56 MHz	53.15	-6.84
1	Quasi Peak	21.726 MHz	20.81	-39.18
2	Average	22.526 MHz	19.55	-30.44
1	Quasi Peak	27.12 MHz	32.47	-27.52
2	Average	27.12 MHz	37.34	-12.65

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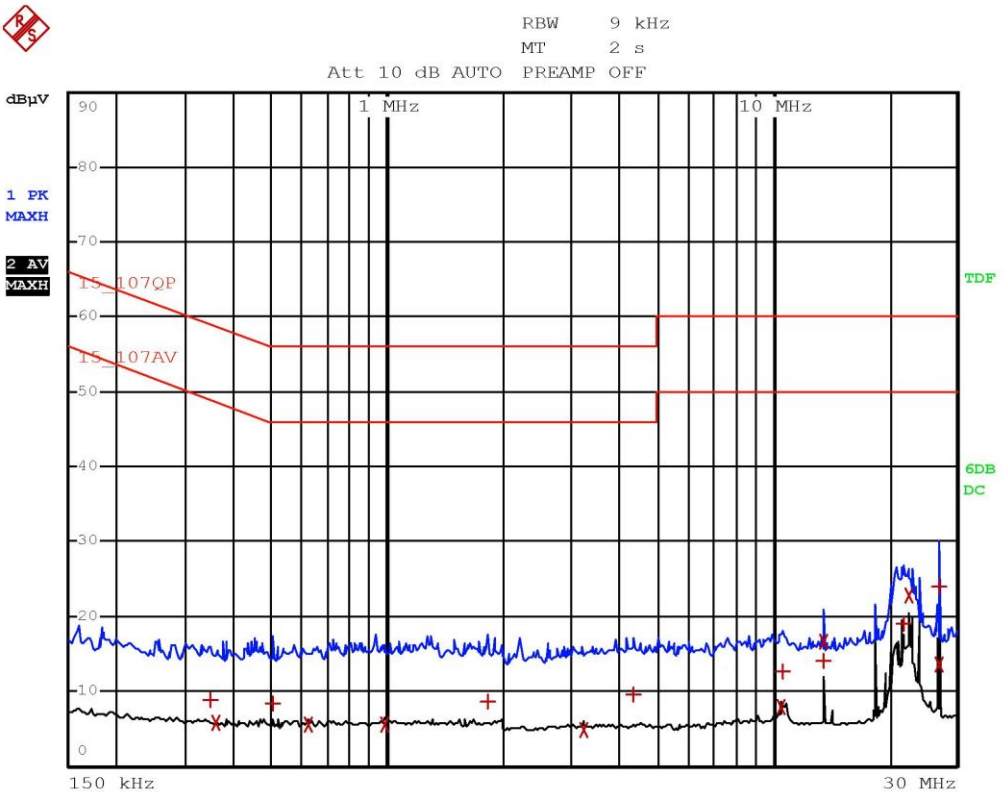

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EDIT PEAK LIST (Final Measurement Results)

Trace1:	15_107QP
Trace2:	15_107AV
Trace3:	---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	346 kHz	8.84	-50.21
2	Average	358 kHz	5.73	-43.03
1	Quasi Peak	502 kHz	8.49	-47.50
2	Average	622 kHz	5.48	-40.51
2	Average	990 kHz	5.49	-40.50
1	Quasi Peak	1.818 MHz	8.58	-47.41
2	Average	3.226 MHz	4.91	-41.08
1	Quasi Peak	4.35 MHz	9.57	-46.42
2	Average	10.506 MHz	7.85	-42.14
1	Quasi Peak	10.65 MHz	12.69	-47.31
2	Average	13.562 MHz	16.60	-33.39
1	Quasi Peak	13.562 MHz	14.07	-45.92
1	Quasi Peak	21.722 MHz	18.99	-41.00
2	Average	22.526 MHz	22.73	-27.26
1	Quasi Peak	27.122 MHz	23.88	-36.11
2	Average	27.122 MHz	13.59	-36.40

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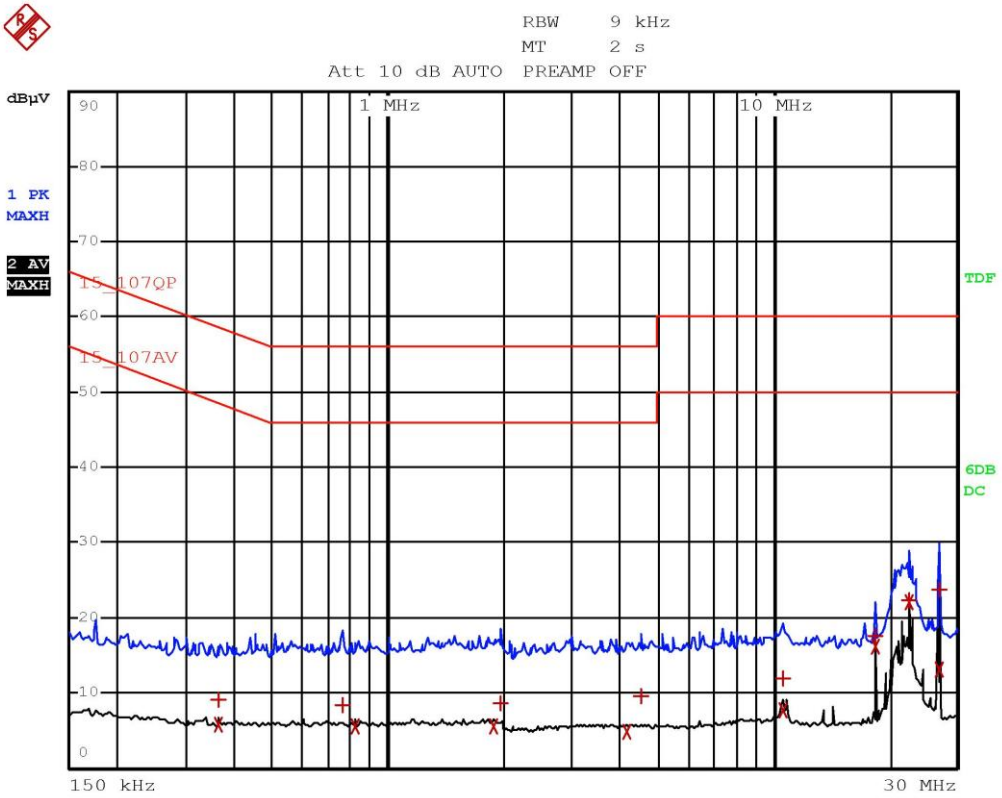

Gandini 19014815

CMC Centro Misure Compatibilità S.r.l.

EDIT PEAK LIST (Final Measurement Results)

Trace1:	15_107QP
Trace2:	15_107AV
Trace3:	---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	362 kHz	9.00	-49.67
2	Average	362 kHz	5.67	-43.00
1	Quasi Peak	762 kHz	8.49	-47.50
2	Average	826 kHz	5.45	-40.54
2	Average	1.874 MHz	5.49	-40.50
1	Quasi Peak	1.966 MHz	8.67	-47.33
2	Average	4.154 MHz	4.88	-41.11
1	Quasi Peak	4.558 MHz	9.57	-46.42
1	Quasi Peak	10.586 MHz	11.82	-48.17
2	Average	10.654 MHz	7.77	-42.22
2	Average	18.43 MHz	16.24	-33.75
1	Quasi Peak	18.434 MHz	17.55	-42.45
2	Average	22.526 MHz	22.04	-27.95
1	Quasi Peak	22.53 MHz	22.40	-37.59
1	Quasi Peak	27.122 MHz	23.80	-36.19
2	Average	27.122 MHz	13.17	-36.82

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Result: The requirements are met

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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 S164, CMC S271, CMC S287
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
Frequency range: 0,009 MHz – 300 MHz
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 10 m
EUT height about the floor: 80 cm

Environmental conditions

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

Acceptance limits

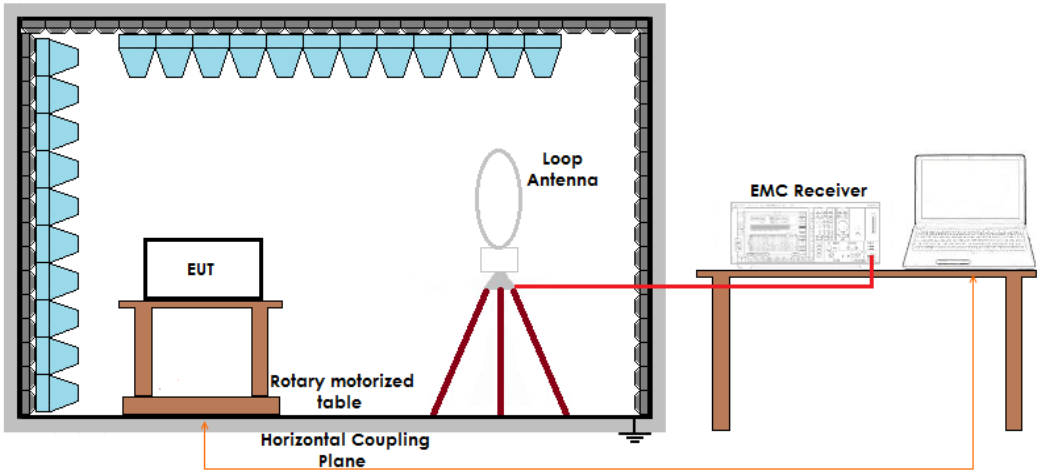
Frequency range (MHz)	*Test distance (m)*	*Limits [dB(µV/m)]*	
0,009 to 0,490	300	48,5 to 13,8	
0,490 to 1,705	30	33,8 to 22,9	
1,705 to 30	30	29,5	
30 to 88	3	40	
88 to 216	3	43,5	
216 to 960	3	46,0	
Above 960	3	53,9	
	Test distance (m)	*Linear average detector [dB(µV/m)]*	*Peak detector [dB(µV/m)]*
Above 1000	3	53,9	73,9

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.

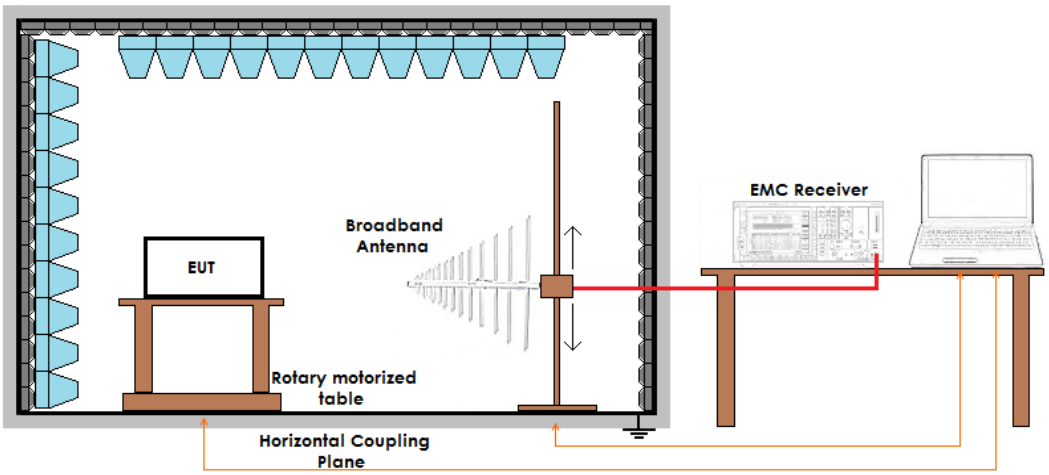
CMC Centro Misure Compatibilità S.r.l.

Setup

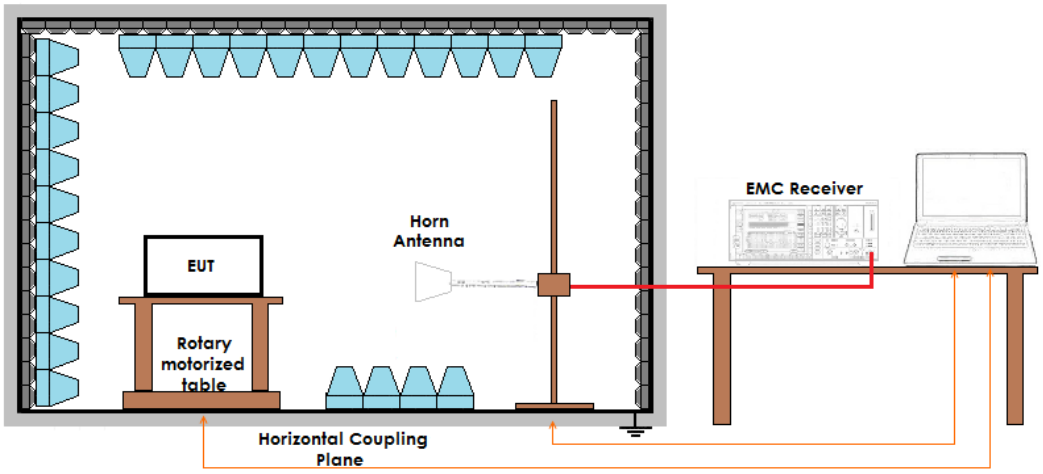
Frequency ≤ 30 MHz



Frequency ≤ 1 GHz



Frequency > 1 GHz



CMC Centro Misure Compatibilità S.r.l.

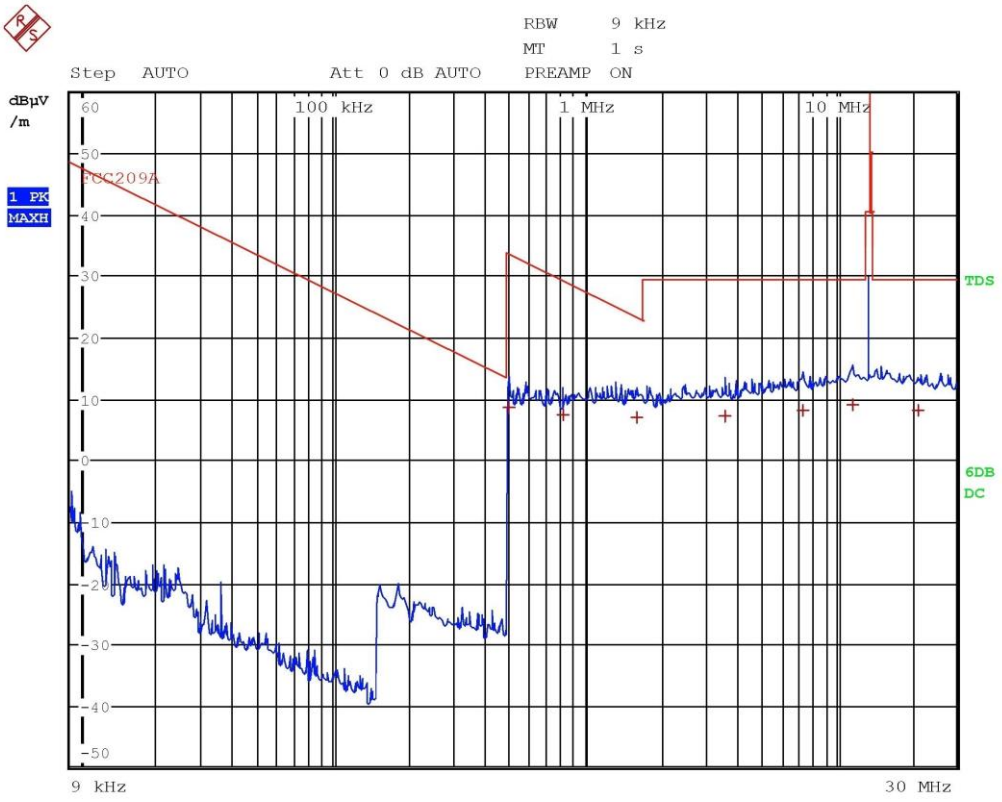
Result

Polarization	*Frequency Range (MHz)*	*Graphs*	*Remarks*	*Result*
Loop	0,009 – 30	G19014803	--	Complies
V	30 – 300	G19014808	--	Complies
H	30 – 300	G19014809	--	Complies
H	300 – 1000	G19014810	--	Complies
V	300 – 1000	G19014811	--	Complies

Remarks: Measurements at frequencies lower than 1000 MHz have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with different conversion factors, based on the measuring distance provided by the standard.
Tests on frequency range 0,009 – 30 MHz have been performed in 3 orthogonal planes. The results in this table show the highest value.
Peaks above the limits are caused by the nominal transmitting frequencies

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



Gandini 19014803

CMC Centro Misure Compatibilità S.r.l.

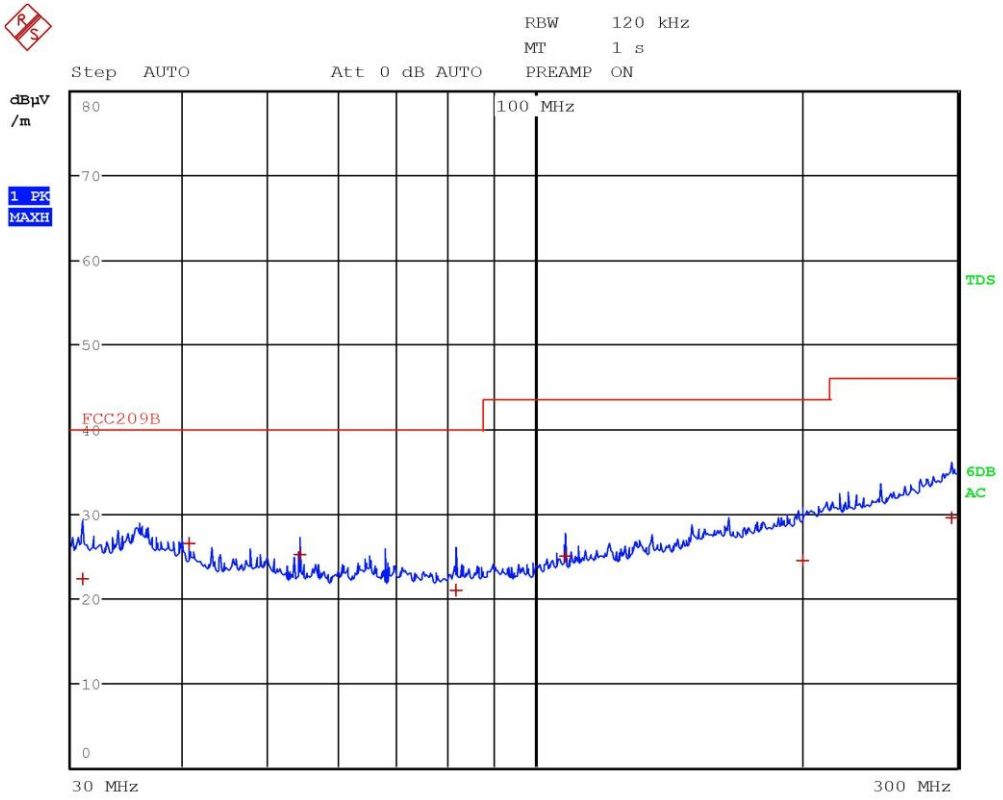
EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209A
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	498 kHz	8.65	-25.00
1 Quasi Peak	810 kHz	7.35	-22.07
1 Quasi Peak	1.602 MHz	7.01	-16.49
1 Quasi Peak	3.614 MHz	7.10	-22.43
1 Quasi Peak	7.382 MHz	8.17	-21.36
1 Quasi Peak	11.654 MHz	9.03	-20.50
1 Quasi Peak	21.208 MHz	8.15	-21.39

Gandini 19014803

CMC Centro Misure Compatibilità S.r.l.



Gandini 19014808

CMC Centro Misure Compatibilità S.r.l.

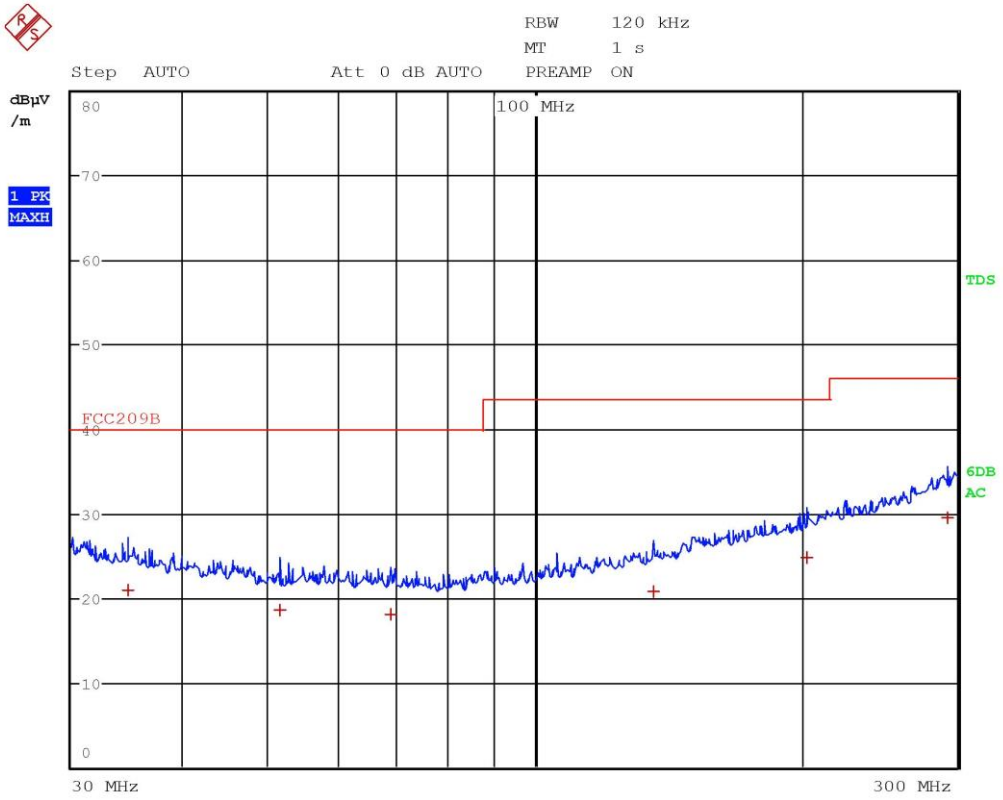
EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209B
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.88 MHz	22.22	-17.77
1 Quasi Peak	40.68 MHz	26.47	-13.52
1 Quasi Peak	54.24 MHz	25.14	-14.85
1 Quasi Peak	81.36 MHz	20.88	-19.11
1 Quasi Peak	108.48 MHz	25.00	-18.51
1 Quasi Peak	200.92 MHz	24.50	-19.01
1 Quasi Peak	295.72 MHz	29.55	-16.46

Gandini 19014808

CMC Centro Misure Compatibilità S.r.l.



Gandini 19014809

CMC Centro Misure Compatibilità S.r.l.

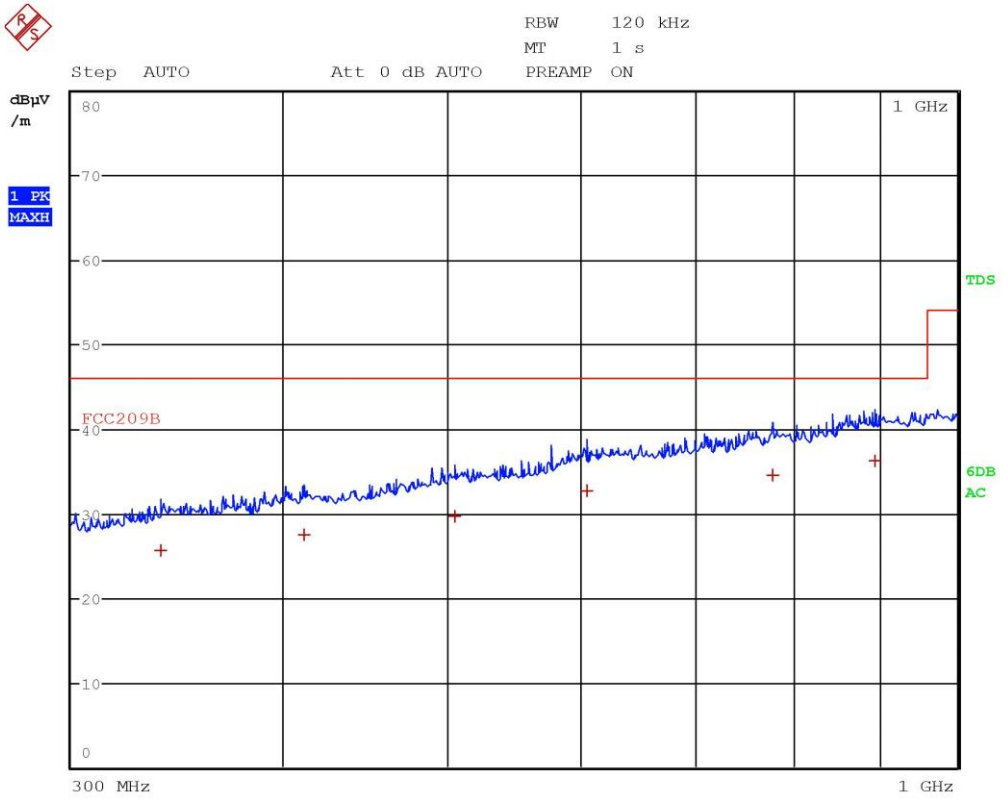
EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209B
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	34.68 MHz	20.97	-19.02
1 Quasi Peak	51.48 MHz	18.52	-21.48
1 Quasi Peak	68.68 MHz	18.09	-21.90
1 Quasi Peak	136.24 MHz	20.71	-22.80
1 Quasi Peak	203.16 MHz	24.82	-18.70
1 Quasi Peak	292.6 MHz	29.53	-16.48

Gandini 19014809

CMC Centro Misure Compatibilità S.r.l.



Gandini 19014810

CMC Centro Misure Compatibilità S.r.l.

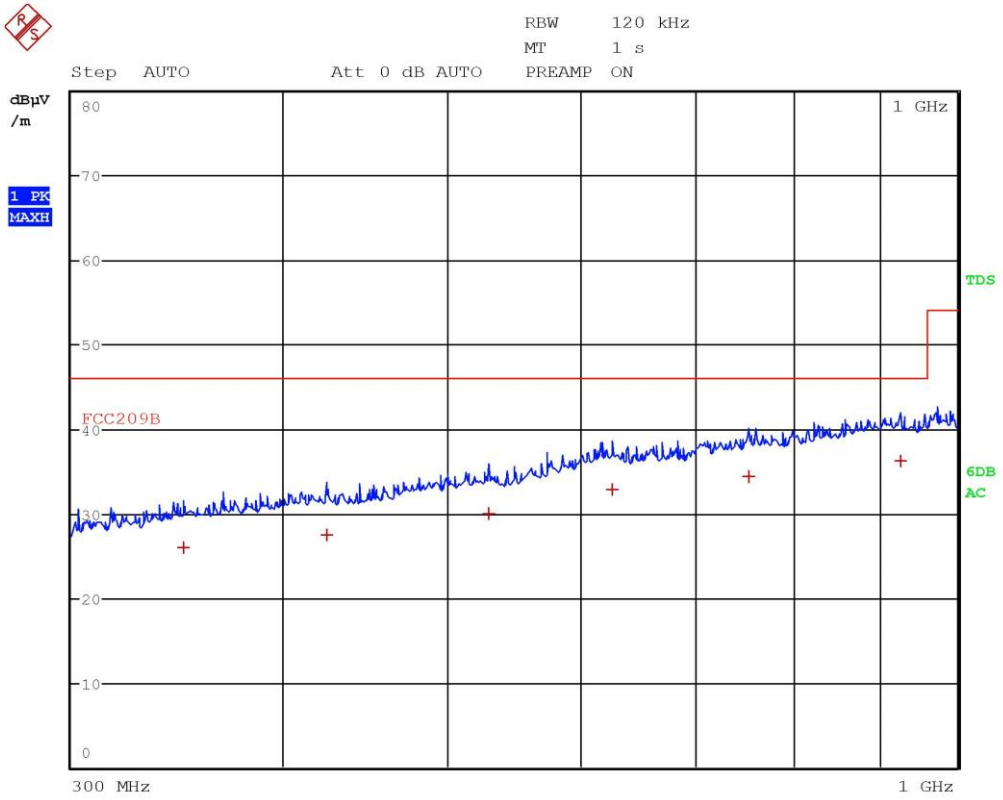
EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209B
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	338.8 MHz	25.63	-20.38
1 Quasi Peak	411.64 MHz	27.51	-18.50
1 Quasi Peak	505.04 MHz	29.62	-16.39
1 Quasi Peak	604.44 MHz	32.69	-13.32
1 Quasi Peak	778.32 MHz	34.45	-11.56
1 Quasi Peak	893.56 MHz	36.26	-9.75

Gandini 19014810

CMC Centro Misure Compatibilità S.r.l.



Gandini 19014811

CMC Centro Misure Compatibilità S.r.l.

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC209B
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	349.36 MHz	25.97	-20.04
1 Quasi Peak	424.84 MHz	27.48	-18.53
1 Quasi Peak	528.72 MHz	29.94	-16.07
1 Quasi Peak	625.28 MHz	32.90	-13.11
1 Quasi Peak	753.52 MHz	34.29	-11.73
1 Quasi Peak	926.24 MHz	36.19	-9.82

Gandini 19014811

Result: The requirements are met

CMC Centro Misure Compatibilità S.r.l.

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
EUT – Antenna distance: 10 m

Environmental conditions

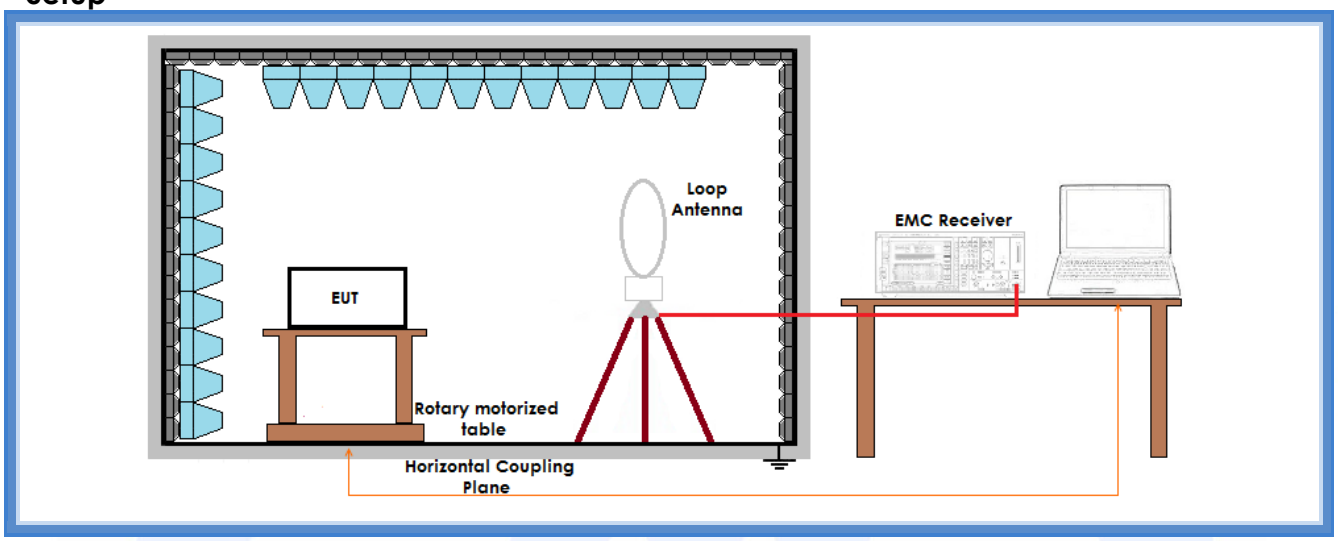
Temperature (°C)	*Atmospheric pressure (kPa)*	*Relative humidity (%)*
22	100	45

Acceptance limits

Limits			
cl.	*Frequency range (MHz)*	*dB(µV/m) Quasi-peak*	*Test distance (m)*
15.225 (a)	13,553 to 13,567	84,00	30
15.225 (b)	13,410 to 13,553 and 13,567 to 13,710	50,47	30
15.225 (c)	13,110 to 13,410 and 13,710 to 14,010	40,51	30
15.225 (d)	outside of the 13,110 – 14,010 MHz band	FCC 15.209	

CMC Centro Misure Compatibilità S.r.l.

Setup



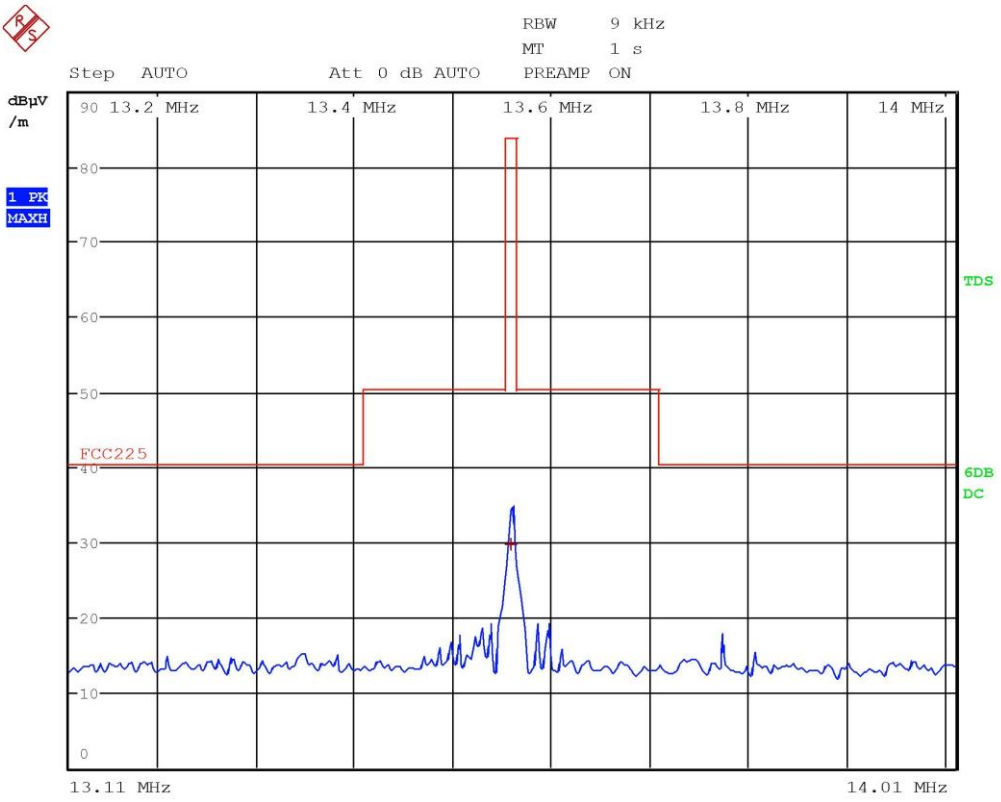
Result

Graphs	*Limits (dBµV/m)*	*Level (dBµV/m)*	*Results*
G19014804	84,00	30,23	Complies
G19014805			

Remarks: Measurements have been performed with an EUT – antenna distance of 10 m. Measured values have been corrected with different conversion factors, based on the measuring distance provided by the standard. EUT was tested in 3 orthogonal planes. The results in this table show the highest value.

CMC Centro Misure Compatibilità S.r.l.

Graphs



Gandini 19014804

CMC Centro Misure Compatibilità S.r.l.

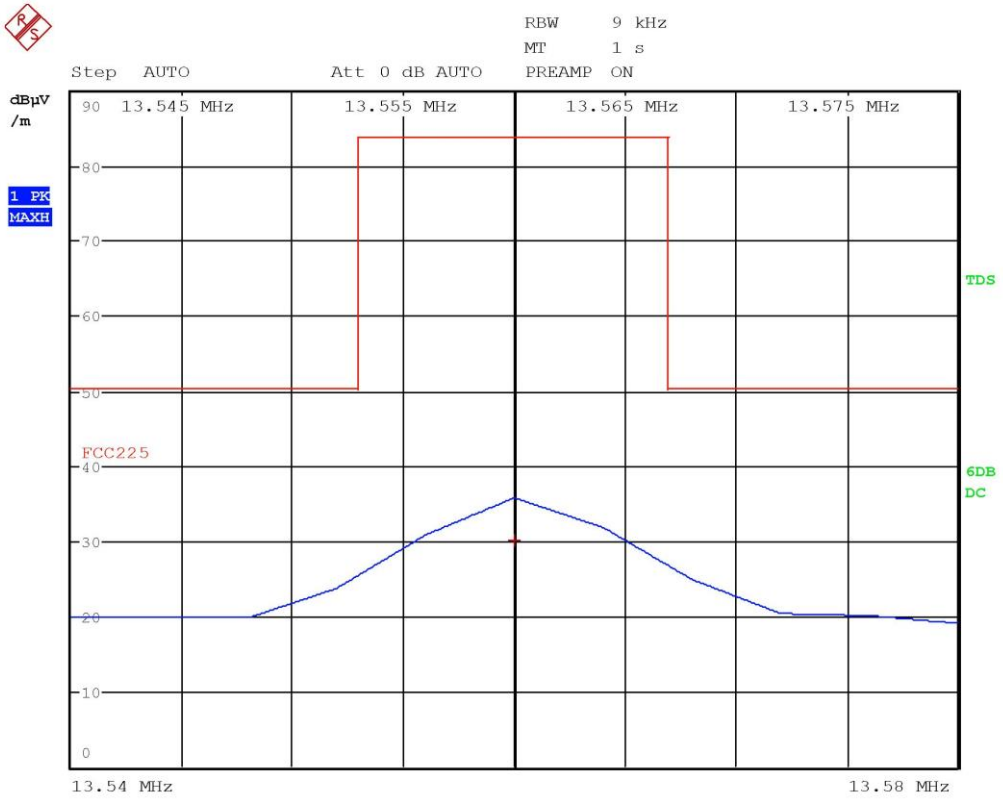
EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC225
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	13.5587948718 MHz	29.79	-54.21

Gandini 19014804

CMC Centro Misure Compatibilità S.r.l.



Gandini 19014805

CMC Centro Misure Compatibilità S.r.l.

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC225
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	13.56 MHz	30.23	-53.76

Gandini 19014805

Result: The requirements are met

CMC Centro Misure Compatibilità S.r.l.

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 S295
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
EUT – Antenna distance: 3 m

Environmental conditions

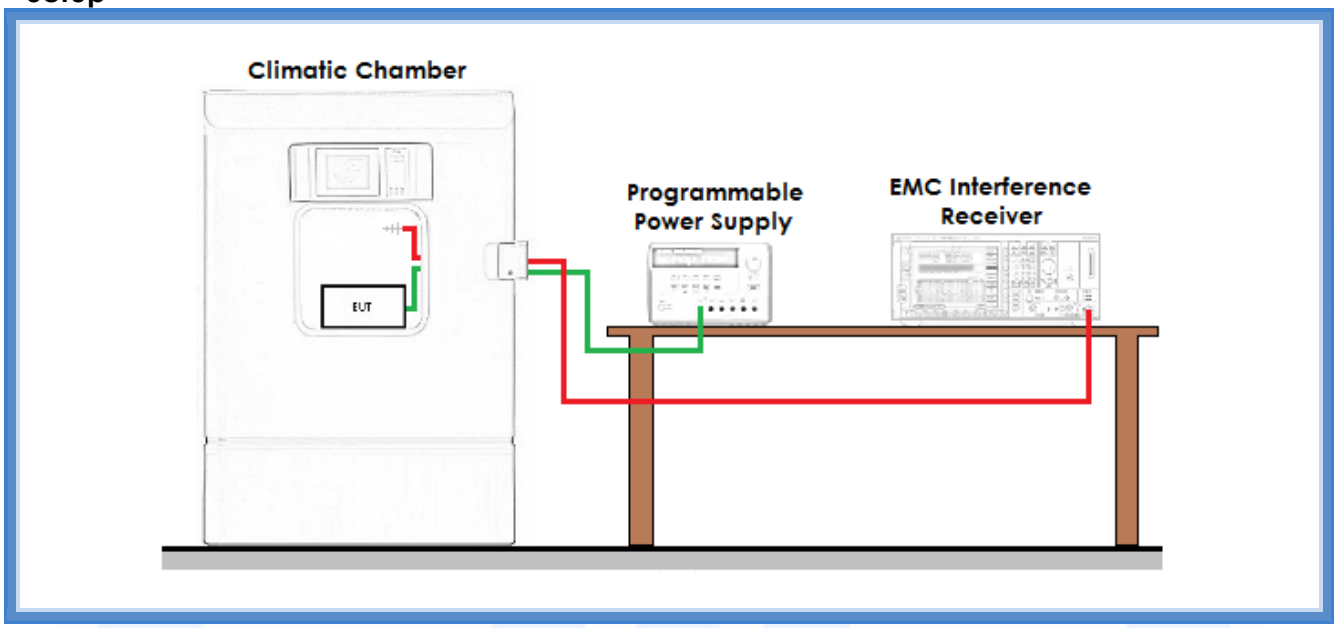
Temperature (°C)	*Atmospheric pressure (kPa)*	*Relative humidity (%)*
23	100	55

Acceptance limits:

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

CMC Centro Misure Compatibilità S.r.l.

Setup



Result

Test conditions		Measured frequency	Frequency limits
Temperature (°C)	*Voltage level (V)*	*(MHz)*	*(MHz)*
-20	Normal supply voltage	13,5608	13,55864 – 13,56136
-10	Normal supply voltage	13,5612	13,55864 – 13,56136
0	Normal supply voltage	13,5612	13,55864 – 13,56136
10	Normal supply voltage	13,5612	13,55864 – 13,56136
20	Normal supply voltage	13,5612	13,55864 – 13,56136
30	Normal supply voltage	13,5612	13,55864 – 13,56136
40	Normal supply voltage	13,5604	13,55864 – 13,56136
50	Normal supply voltage	13,5604	13,55864 – 13,56136

Test conditions			Measured frequency	Frequency limits
Temperature (°C)	*Voltage level (%)*	*Voltage level (V)*	*(MHz)*	*(MHz)*
20	85	4,25	13,5612	13,55864 – 13,56136
20	90	4,50	13,5612	13,55864 – 13,56136
20	95	4,75	13,5608	13,55864 – 13,56136
20	100	5,00	13,5612	13,55864 – 13,56136
20	105	5,25	13,5612	13,55864 – 13,56136
20	110	5,50	13,5612	13,55864 – 13,56136
20	115	5,75	13,5608	13,55864 – 13,56136

Result: The requirements are met

CMC Centro Misure Compatibilità S.r.l.

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

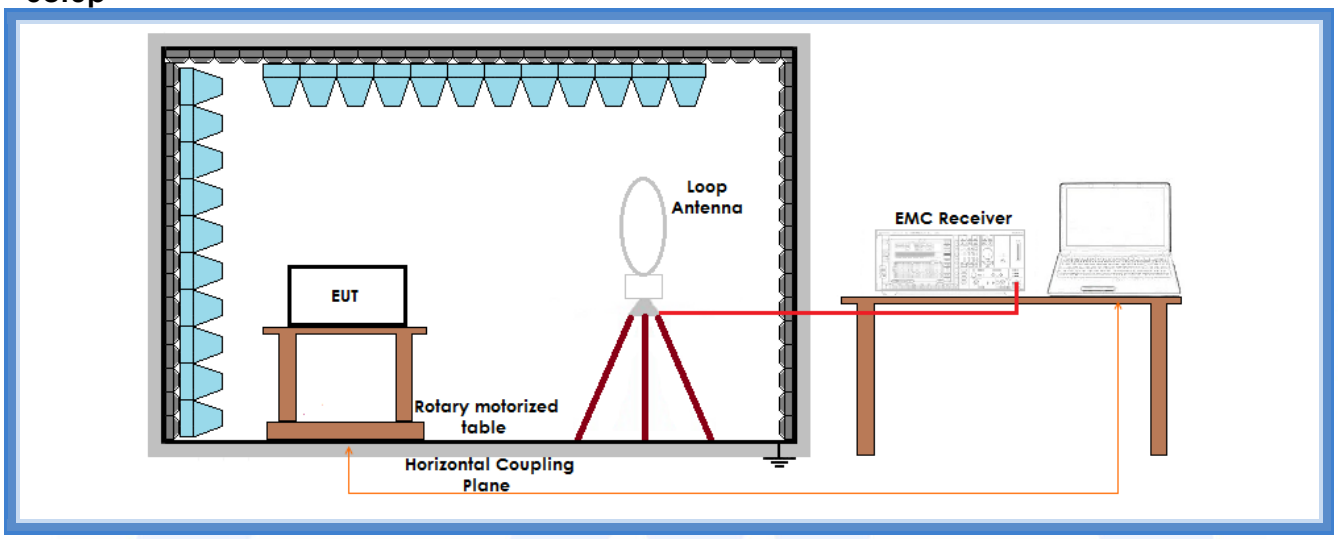
Environmental conditions

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

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

CMC Centro Misure Compatibilità S.r.l.

Setup

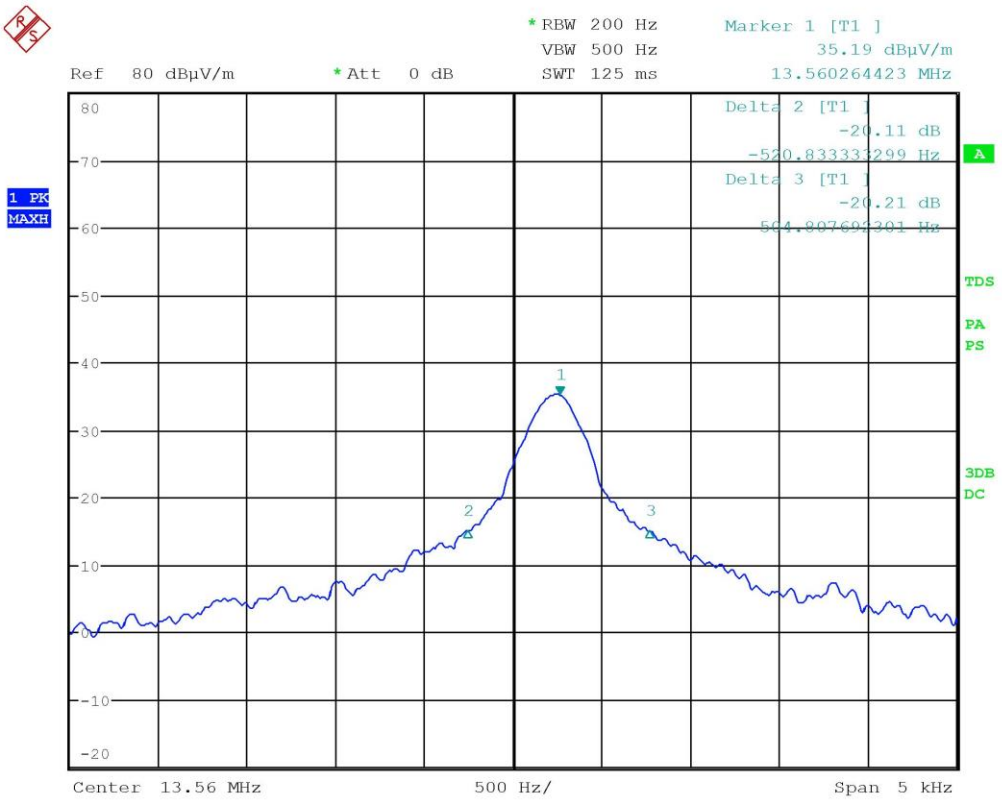


Result

f (MHz)	*20 dB bandwidth (MHz)*		*Graph*	*Results*
	FL	FH		
13,560264423	13,039431	14,065072	G19014807	Complies

CMC Centro Misure Compatibilità S.r.l.

Graphs



Gandini 19014807

Result: The requirements are met

CMC Centro Misure Compatibilità S.r.l.