



TEST REPORT nr. R14189801
Federal Communication Commission (FCC)

Test item

Description.....: TRANSCEIVER UNIT
Trademark.....: AUTEK
Model/Type: Model CRX
Type NH021
FCC ID.....: OQA-CRXNH022



Test Specification

Standard.....: FCC Rules & Regulations, Title 47:2014
Part 15 paragraph(s): 203, 204, 207, 209 and 247

Client's name: AUTEK S.r.l.
Address: Via Pomaroli, 65 – 36030 Caldogno (VI) – ITALY

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

Report

Tested by: G. Gandini – Technician 
Approved by: R. Beghetto – Laboratory Manager 
Date of issue: 30.06.15
Contents.....: 68 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 and 247

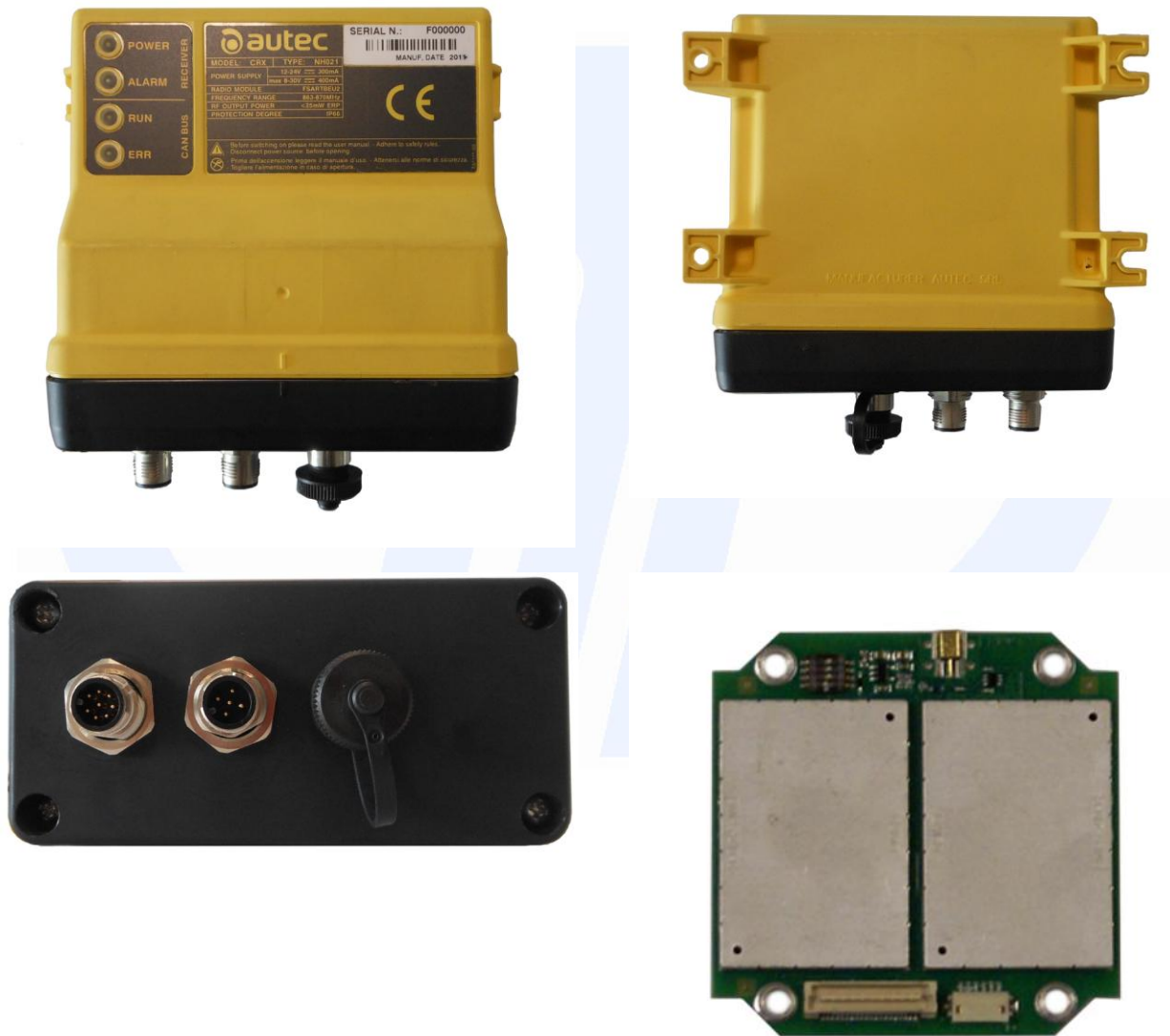
<i>Test specifications</i>	<i>Environmental Phenomena</i>	<i>Tests sequence</i>	<i>Result</i>
Part 15.203	Antenna requirements	1	Complies
Part 15.207	Conducted emissions	2	Complies
Part 15.209	Radiated emissions	3	Complies
Part 15.247	20dB Bandwidth	4	Complies
Part 15.247	Channel Separation	6	Complies
Part 15.247	Number of Hopping Channel	7	Complies
Part 15.247	Time of occupancy	8	Complies
Part 15.247	Band edge	9	Complies
Part 15.209 and 15.247	Peak Output Power	10	Complies
Part 15.209	Spurious emission	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 certification



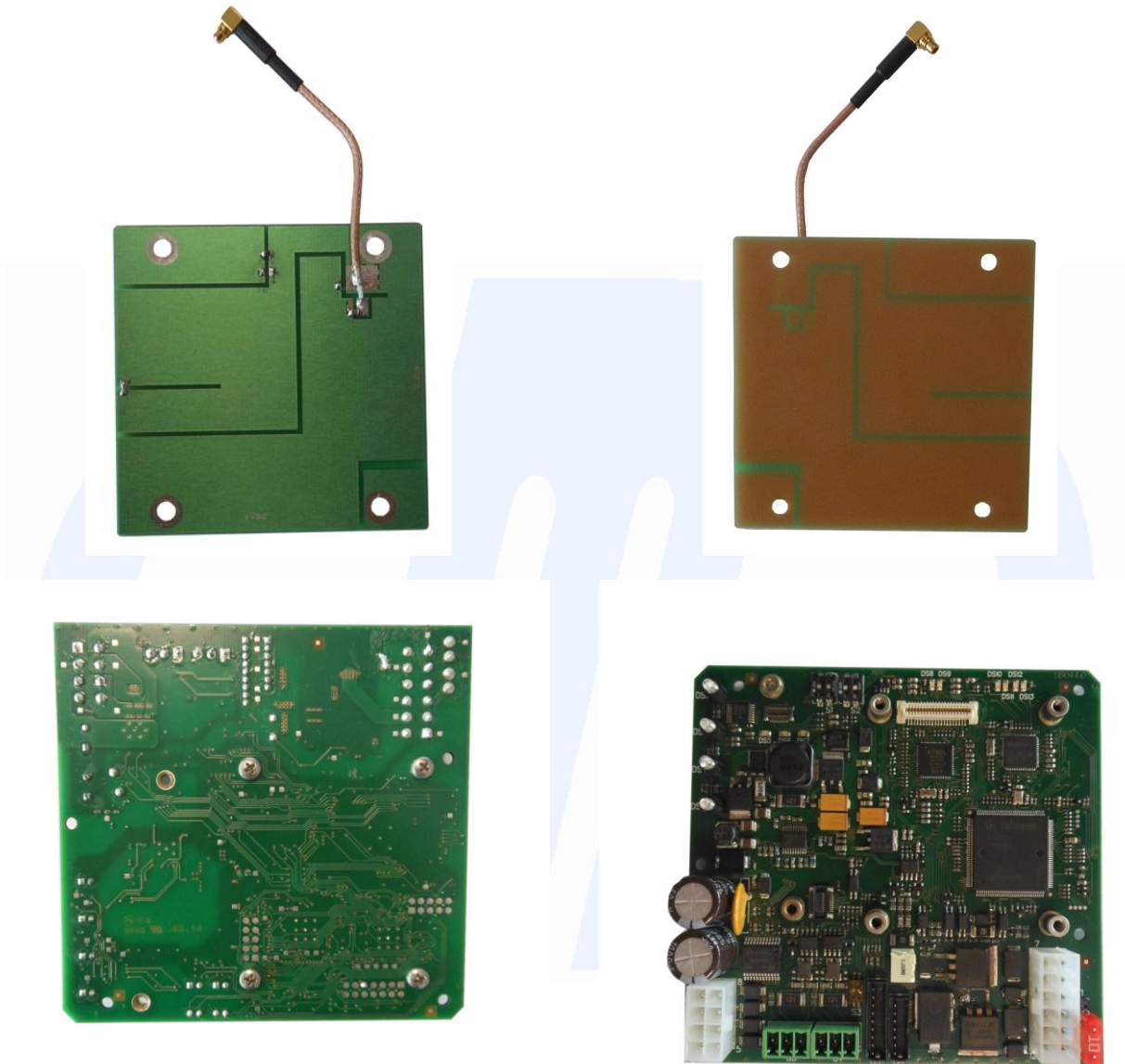
5. Photograph(s) of EUT

5.1 Photograph(s) of EUT





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



CMC Centro Misure Compatibilità S.r.l.



5.2 Photograph(s) of setup





6. Equipment list

<i>Id. number</i>	<i>Manufacturer</i>	<i>Model</i>	<i>Description</i>	<i>Serial number</i>	<i>Last calibration</i>	<i>Due date calibration</i>
CMC S010	Rohde & Schwarz	ESH3-Z2	Impulses Limiting Device	---	January '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
Adjacent channel power		
	±1.9 dB	1
Blocking		
	±1.9 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	--
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.

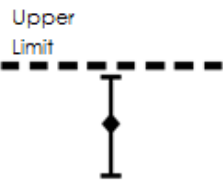
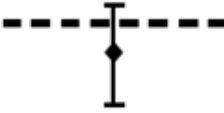
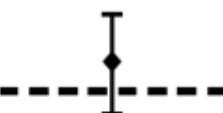



11. Results

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
- DA 00-705
- 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 (%)
18	100	42

Result

Antenna Type	External R.F. power amplifier	Gain	Remarks	Results
External antenna	Not Present	2 dBi	External antenna with cable of 5 m length	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

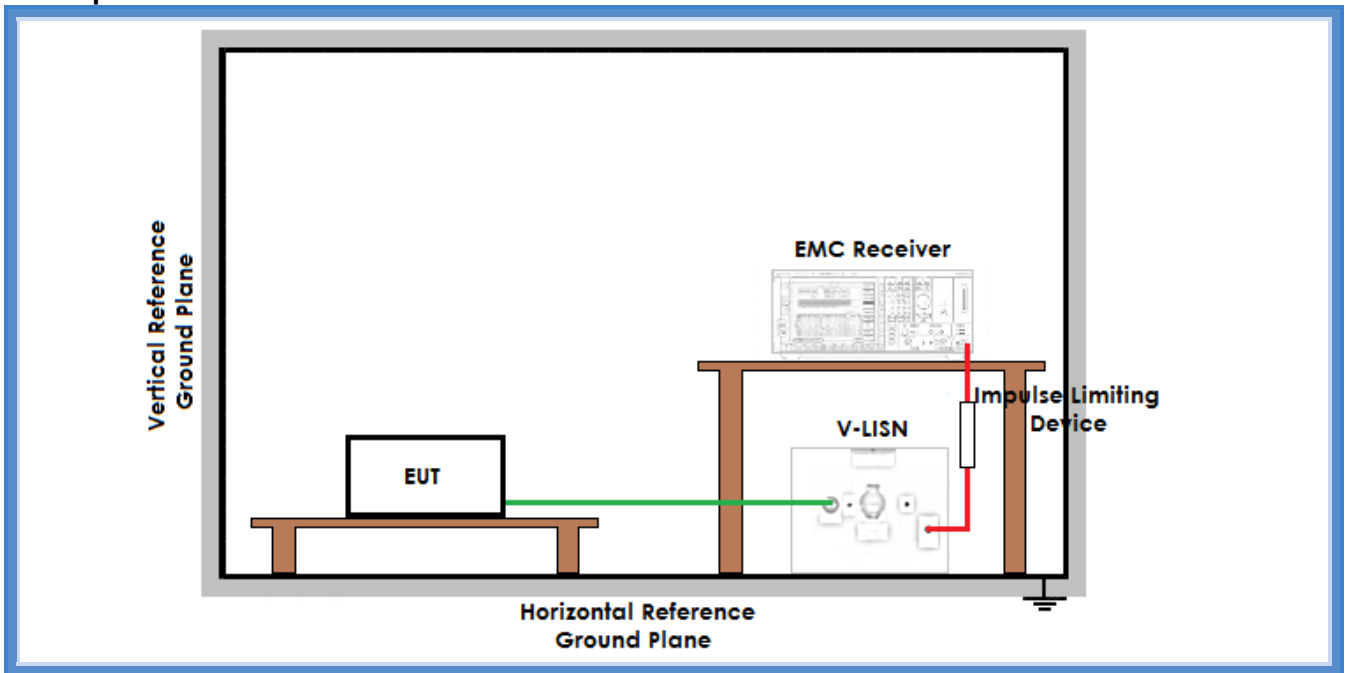
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
21	98	46

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
+	G14189801	--	Complies
-	G14189802	--	Complies
Remarks: --			

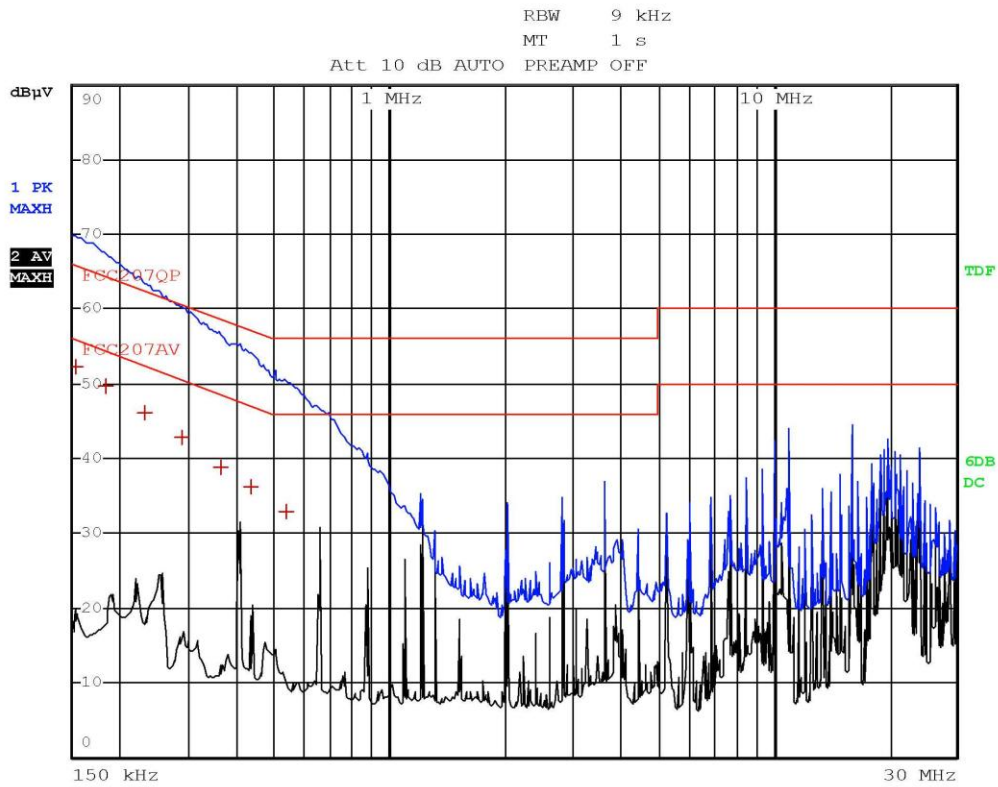
Graphs Legend

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

G14189801



Gandini 14189801-Line (+)-Tx-Rx Ant.Ext 5m

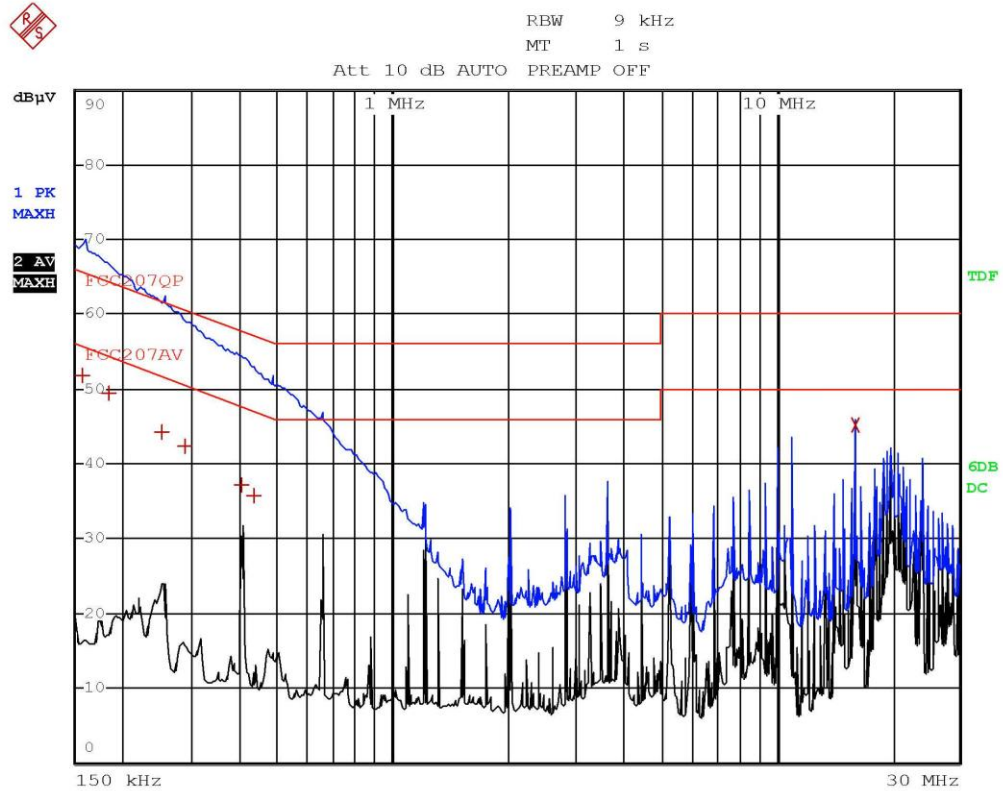


EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC207QP		
Trace2:	FCC207AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dB μ V	DELTA LIMIT dB
1 Quasi Peak	154 kHz	52.43	-13.35
1 Quasi Peak	186 kHz	49.77	-14.43
1 Quasi Peak	230 kHz	46.12	-16.32
1 Quasi Peak	286 kHz	42.90	-17.73
1 Quasi Peak	362 kHz	38.89	-19.78
1 Quasi Peak	434 kHz	36.37	-20.80
1 Quasi Peak	538 kHz	32.97	-23.02

Gandini 14189801-Line (+)-Tx-Rx Ant.Ext 5m



G14189802



Gandini 14189802-Line (-)-Tx-Rx Ant.Ext 5m



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC207QP		
Trace2:	FCC207AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dB μ V	DELTA LIMIT dB
1 Quasi Peak	158 kHz	51.81	-13.75
1 Quasi Peak	186 kHz	49.46	-14.75
1 Quasi Peak	254 kHz	44.35	-17.26
1 Quasi Peak	286 kHz	42.47	-18.16
1 Quasi Peak	402 kHz	37.26	-20.55
1 Quasi Peak	434 kHz	35.84	-21.33
2 Average	16.002 MHz	45.22	-4.77

Gandini 14189802-Line (-)-Tx-Rx Ant.Ext 5m

Result: The requirements are met



11.3 Radiated emissions

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part. 15.209
- DA 00-705
- 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 (%)

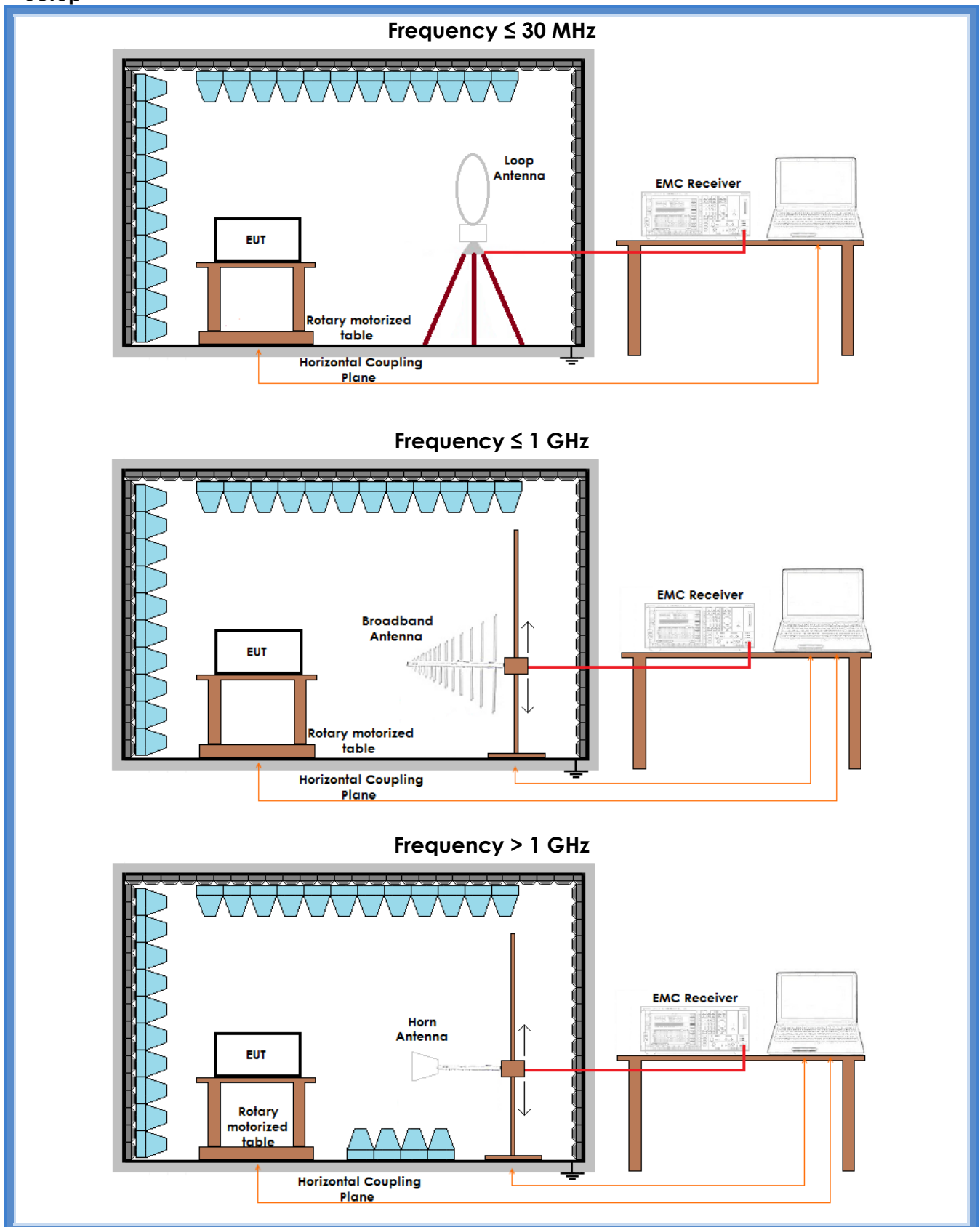
Acceptance limits

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	G14189824	Worst case	Complies
V	30 – 1000	G14198916	Lowest channel	Complies
H	30 – 1000	G14198917	Lowest channel	Complies
V	30 – 1000	G14198918	Medium channel	Complies
H	30 – 1000	G14198919	Medium channel	Complies
V	30 – 1000	G14198920	Highest channel	Complies
H	30 – 1000	G14198921	Highest channel	Complies
V	1000 – 10000	G14198922	Worst case	Complies
H	1000 – 10000	G14198923	Worst case	Complies

Remarks: Peaks above the limits are caused by the nominal transmitting frequency

Graphs Legend

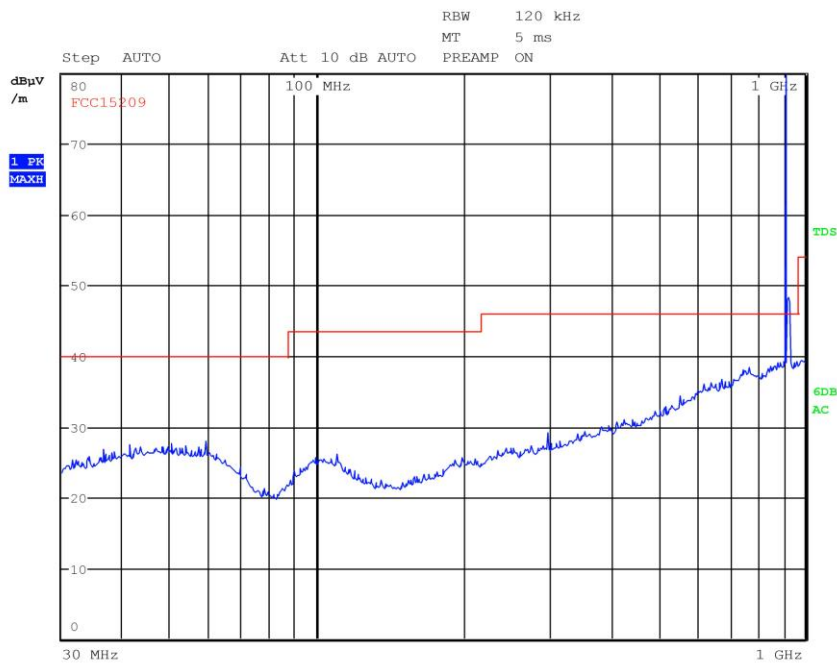
PK: Peak; QP [1s] (quasi-peak at 1 second) values are marked with a +
AV: Average; AV [1s] (average at 1 second) values are marked with a x



Graphs

G14189816

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx - Fmin - Ant. Ext. 5m
Operator Gandini 14189816
Test Spec
Vert



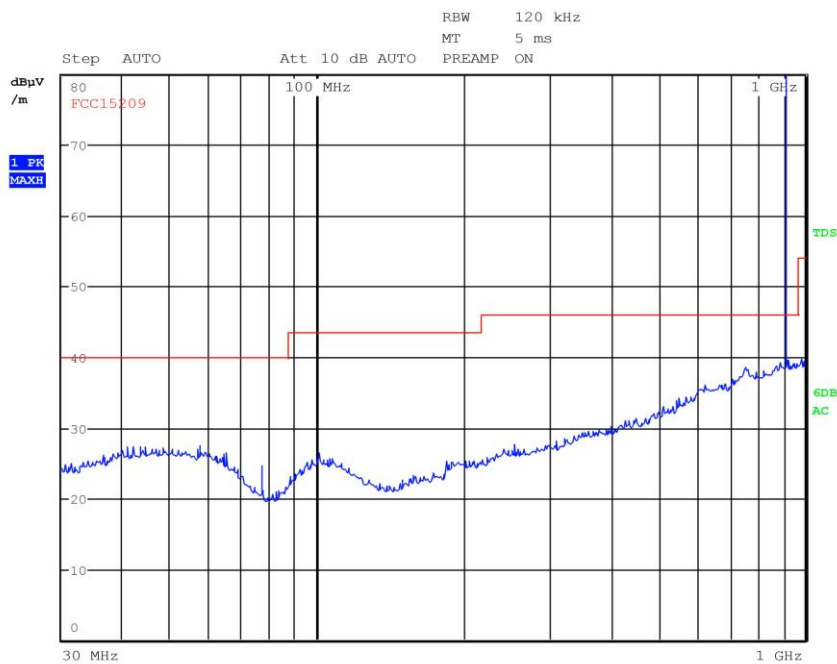
Final Measurement

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



G14189817

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx - Filocomando
Operator Gandini 14189817
Test Spec
Horiz



Final Measurement

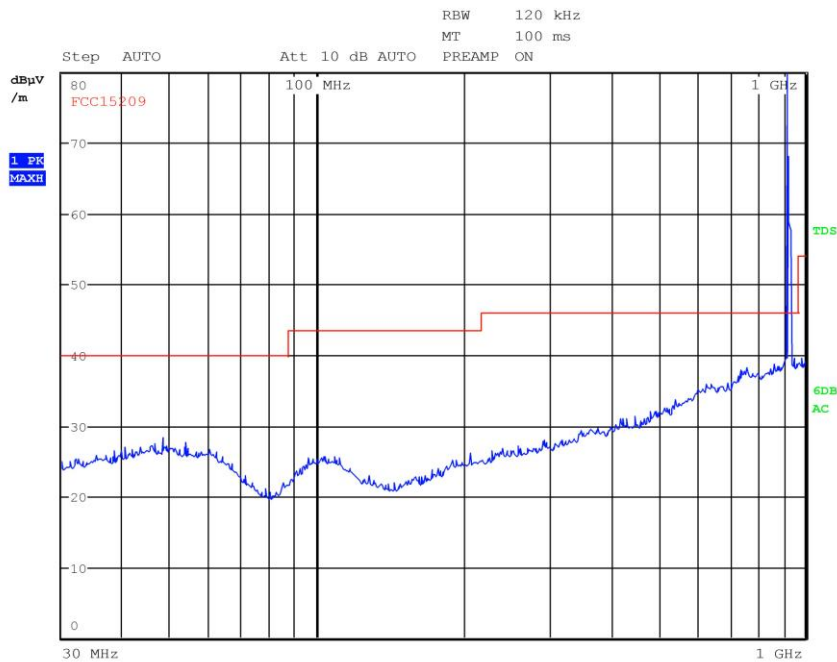
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G14189818

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx - Fmed - Ant. Ext. 5m
Operator Gandini 14189818
Test Spec
Vert



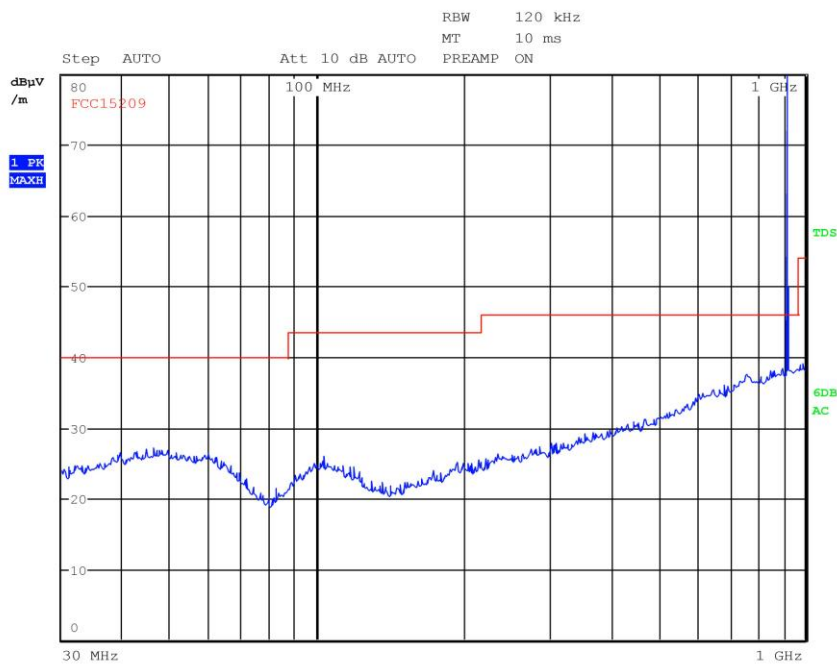
Final Measurement

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



G14189819

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx - Fmed - Ant. Ext. 5m
Operator Gandini 14189819
Test Spec
Horiz



Final Measurement

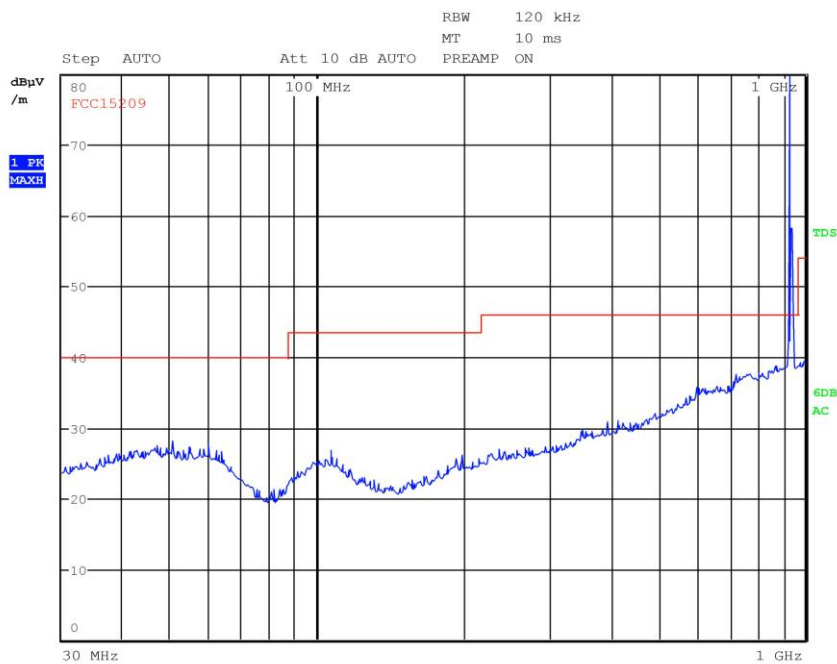
Meas Time: 1 s
Margin: 6 dB
Subranges: 0

CMC Centro Misure Compatibilità S.r.l.



G14189821

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx - Fmax -ant Ext 5 m
Operator Panozzo 14189821
Test Spec
Horiz.



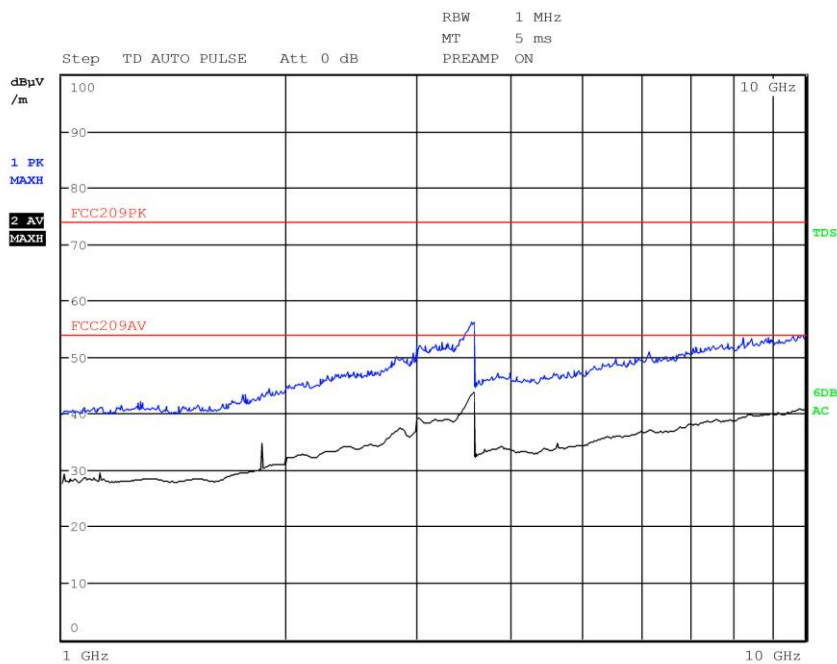
Final Measurement

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



G14189822

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx - Fmax -ant Ext 5 m
Operator Panozzo 14189822
Test Spec
Vert.



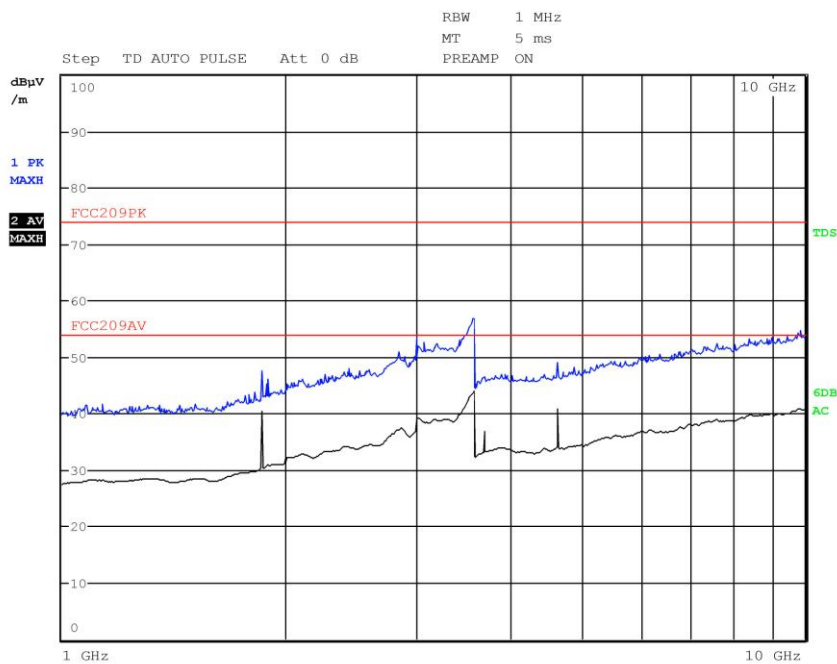
Final Measurement

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



G14189823

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx - Fmax -ant Ext 5 m
Operator Panozzo 14189823
Test Spec
Horiz.



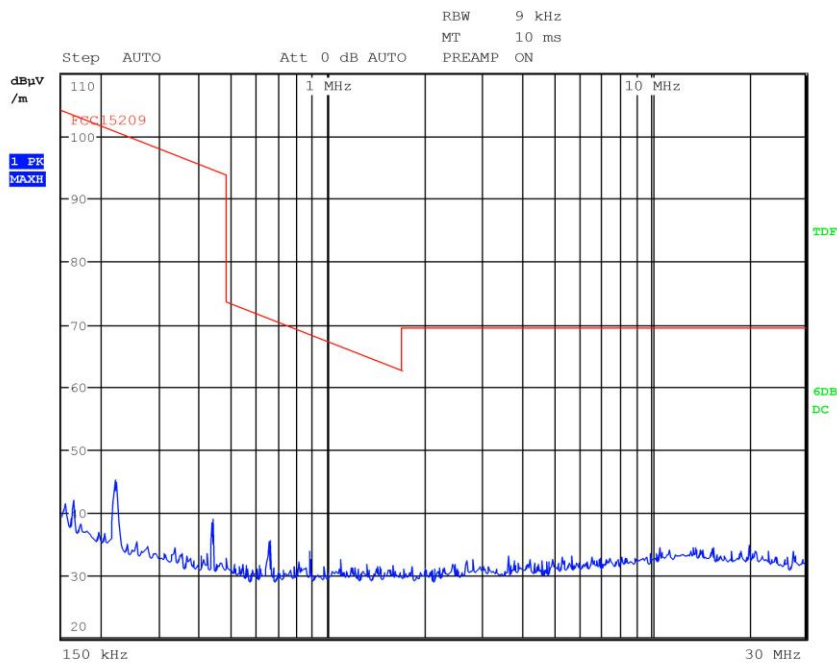
Final Measurement

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



G14189824

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx-Rx - Fmax -ant Ext 5 m
Operator Panozzo 14189824
Test Spec
Loop



Final Measurement

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

Result: The requirements are met



11.4 20 dB bandwidth

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- 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 S227
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

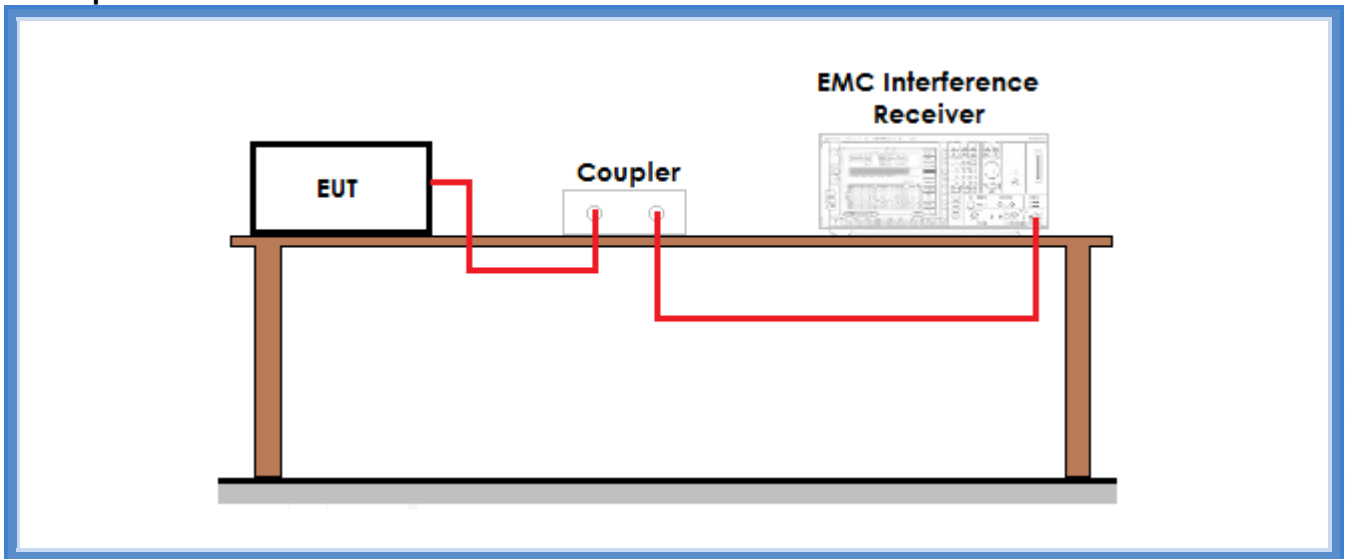
Environmental conditions

<i>Temperature (°C)</i>	<i>Atmospheric pressure (kPa)</i>	<i>Relative humidity (%)</i>
20	100	42

Acceptance limits: The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz



Setup



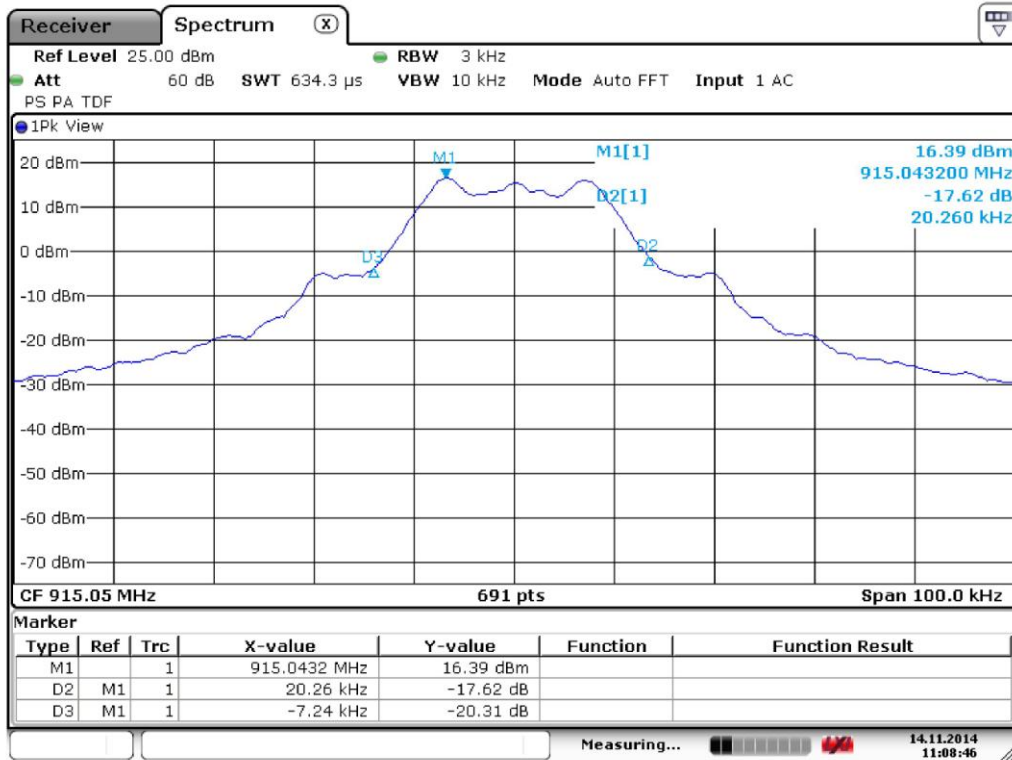
Result

Frequency (MHz)	Graphs	20 dB bandwidth (kHz)	Results
915,05	G14189804	27,50	Complies
921,50	G14189814	27,64	Complies
927,95	G14189809	29,52	Complies



Graphs

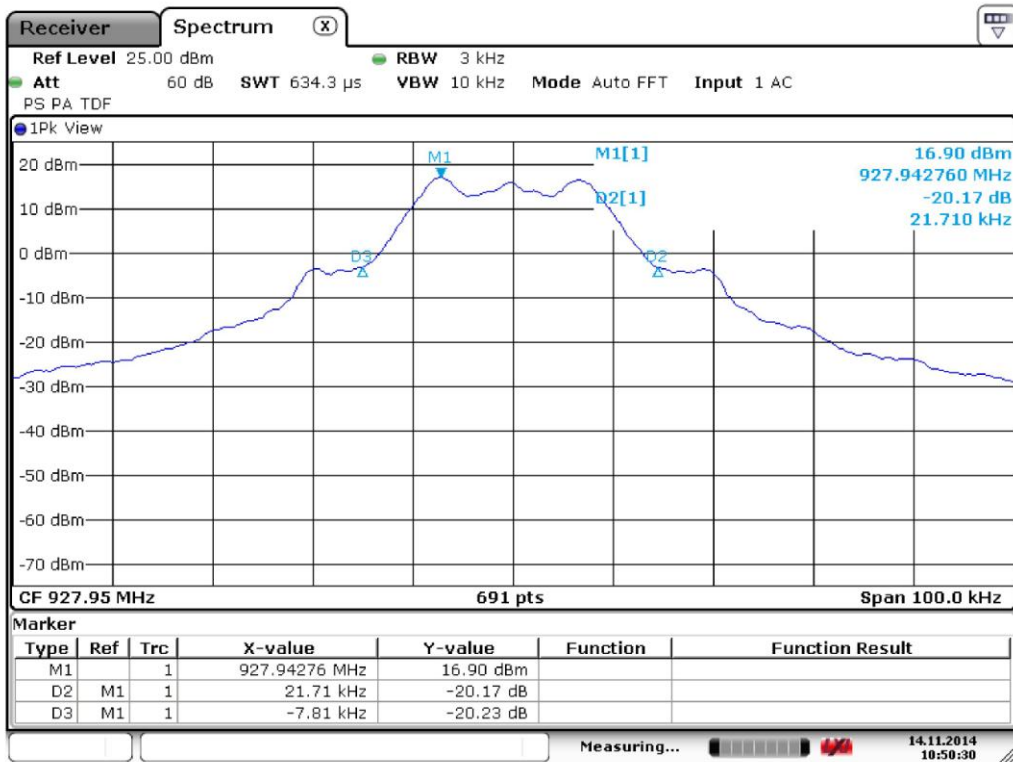
G14189804



Gandini 14189804-Tx - Fmin



G14189809

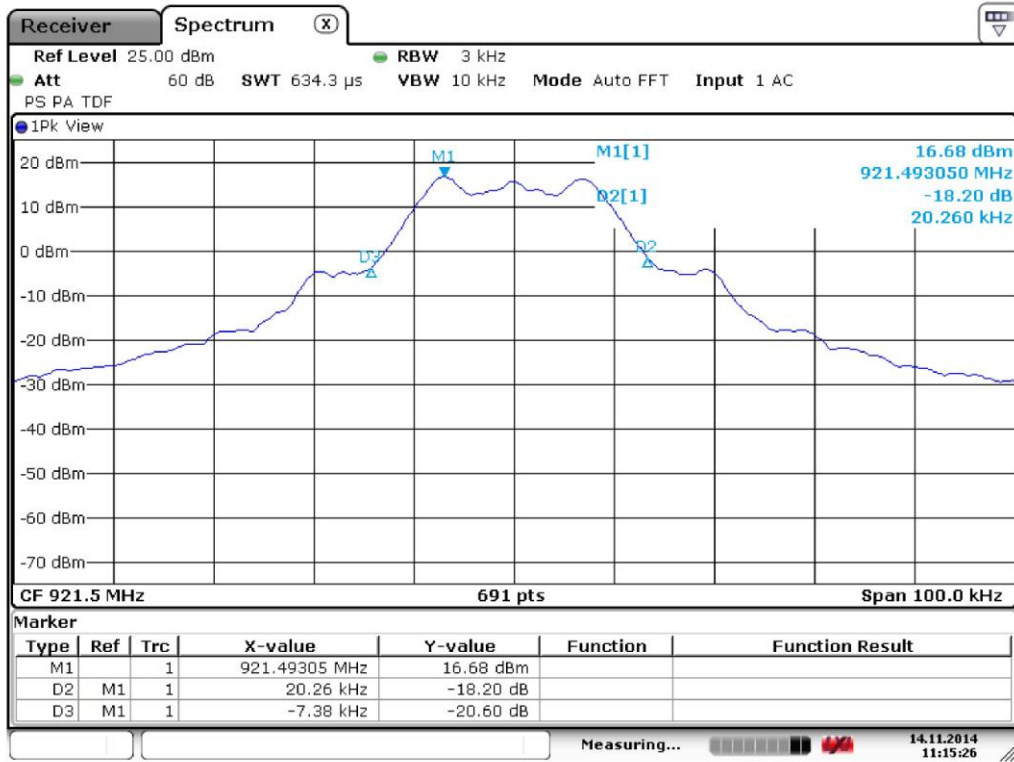


Gandini 14189809-Tx - Fmax

CMC Centro Misure Compatibilità S.r.l.



G14189814



Gandini 14189814-Tx - Fmed

Result: The requirements are met

CMC Centro Misure Compatibilità S.r.l.



11.5 Channel separation

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- 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 S206
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

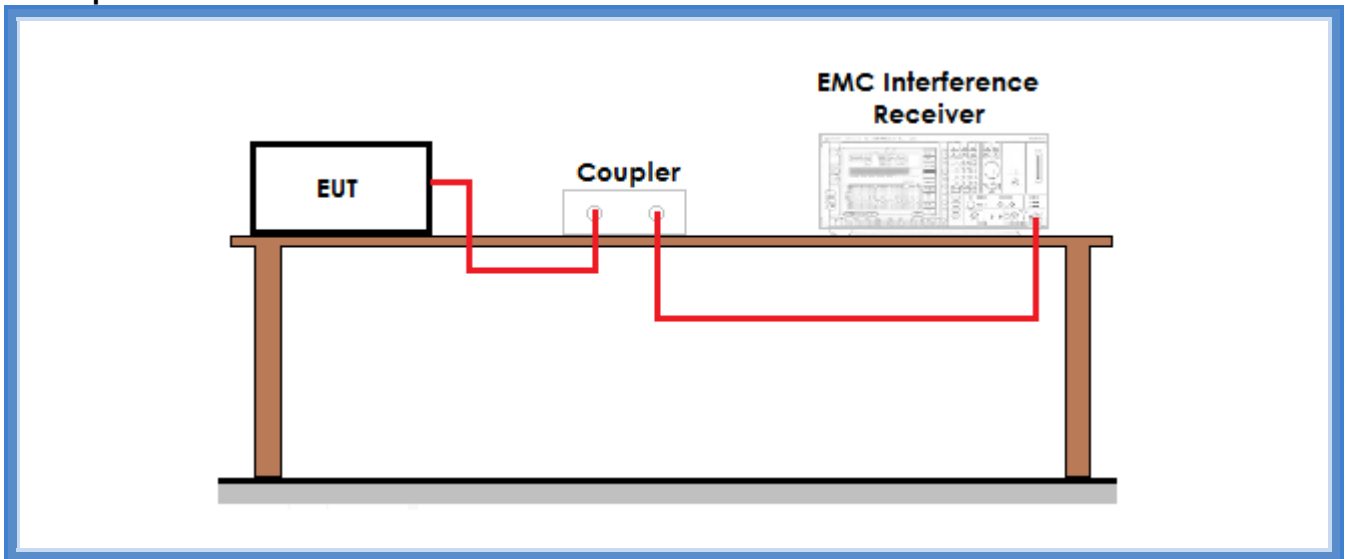
Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
20	100	42

Acceptance limits: Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483,5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW



Setup

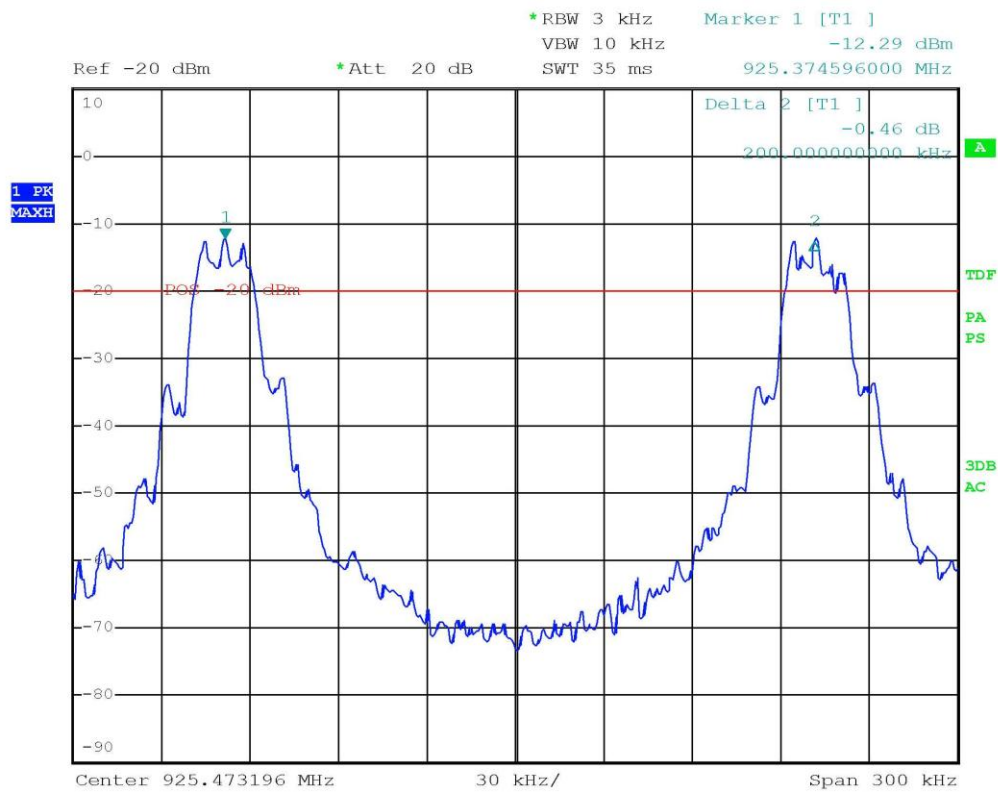


Result

Frequency band (MHz)	Graphs	Channel separation (kHz)	Results
915,05	G14189832	200	Complies
927,95	G14189833		



G14189833



Gandini 14189833-Tx-Rx - Fhop

Result: The requirements are met

CMC Centro Misure Compatibilità S.r.l.



11.6 Number of hopping channels

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- 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 S206
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

Environmental conditions

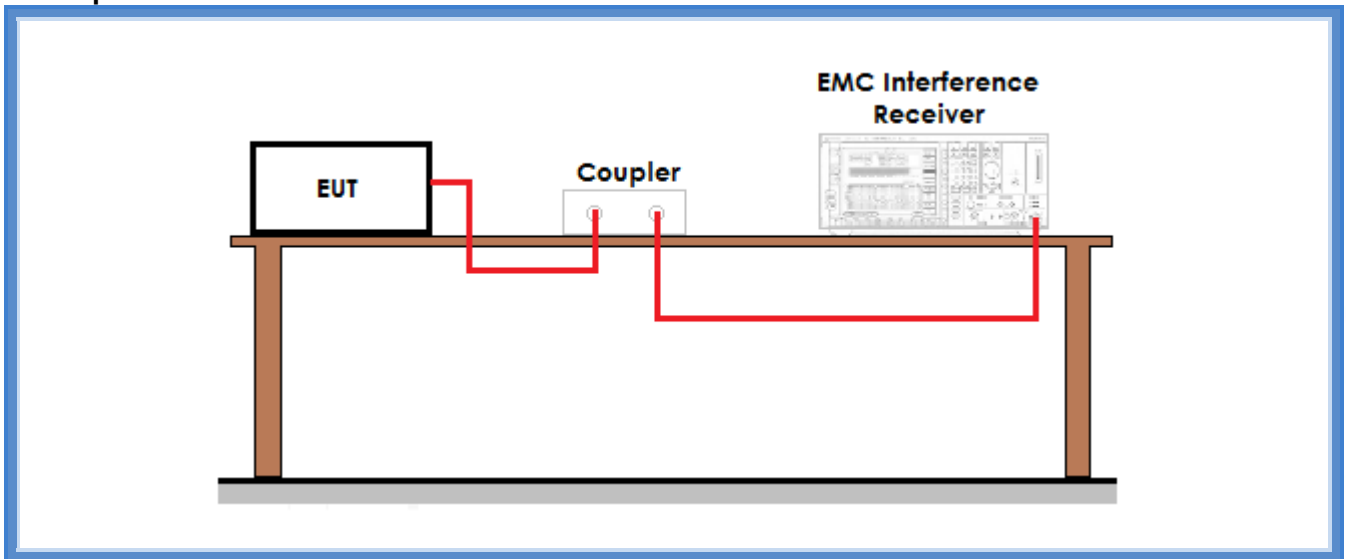
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
20	101	42

Acceptance limits:

For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies. If the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies.



Setup



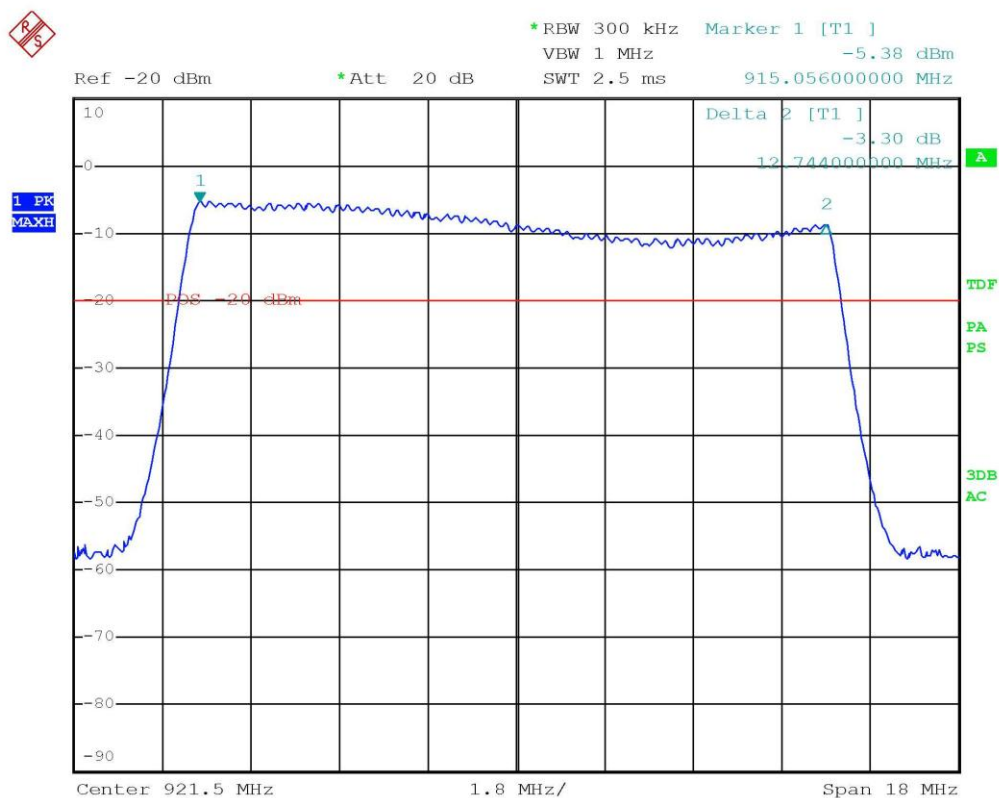
Result

Graphs	Number of hopping channels	Results
G14189831	64	Complies



Graphs

G14189831



Gandini 14189831-Tx-Rx - Fhop

Result: The requirements are met



11.7 Time of occupancy

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- 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 S206
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

Environmental conditions

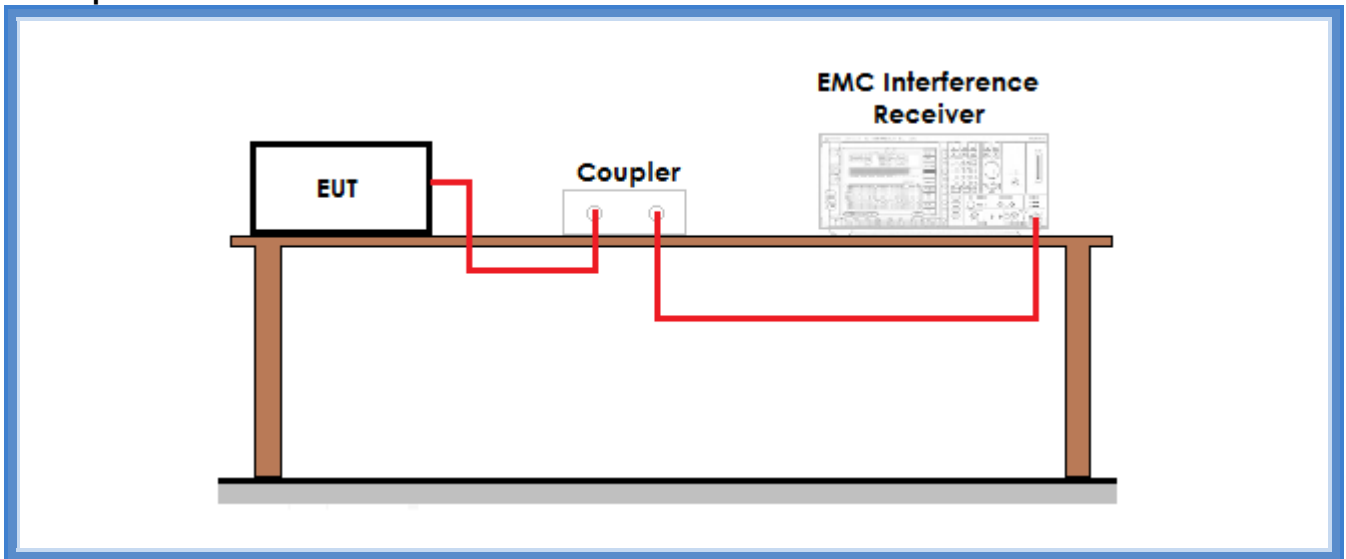
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
20	101	42

Acceptance limits:

For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period



Setup



Result

Dwell time of transmission

Frequency (MHz)	Graphs	Dwell time (ms)
915,45	G14189834	14,08

Number of transmissions per period

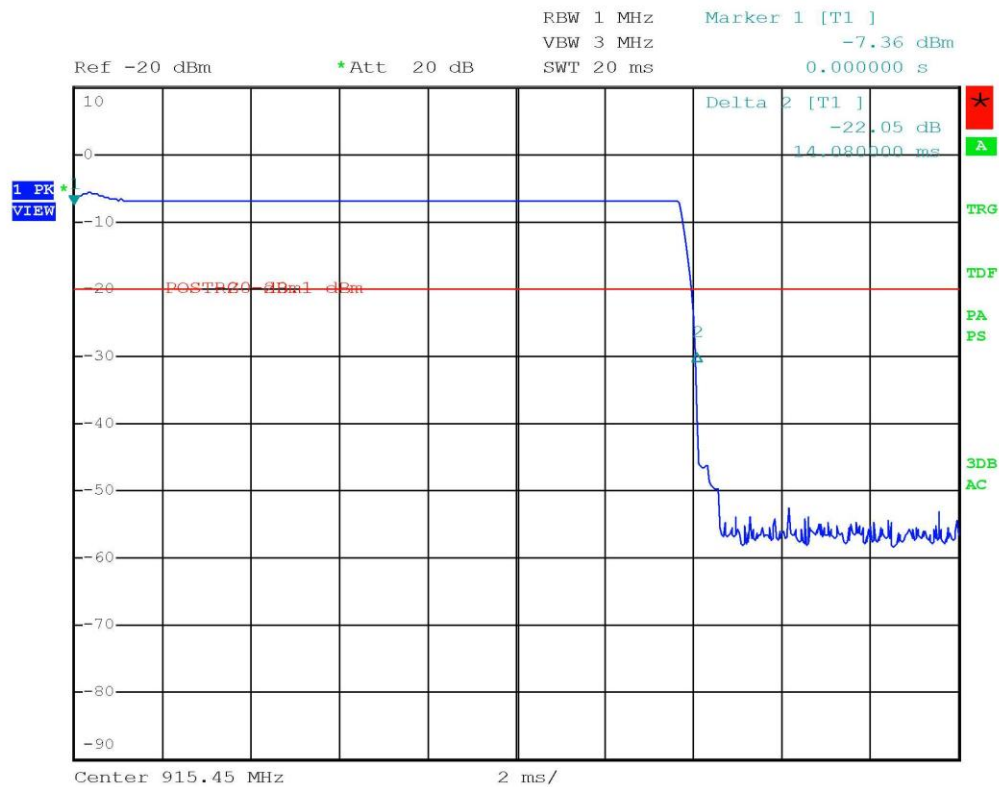
Frequency (MHz)	Time between 2 transmission on different channels		Number of transmissions (20 s / 0,0504 s / 64)
915,45	G14189835	50,4 ms	6,20

Time of occupancy (Dwell time x Number of transmissions)	87,296 ms
---	-----------



Graphs

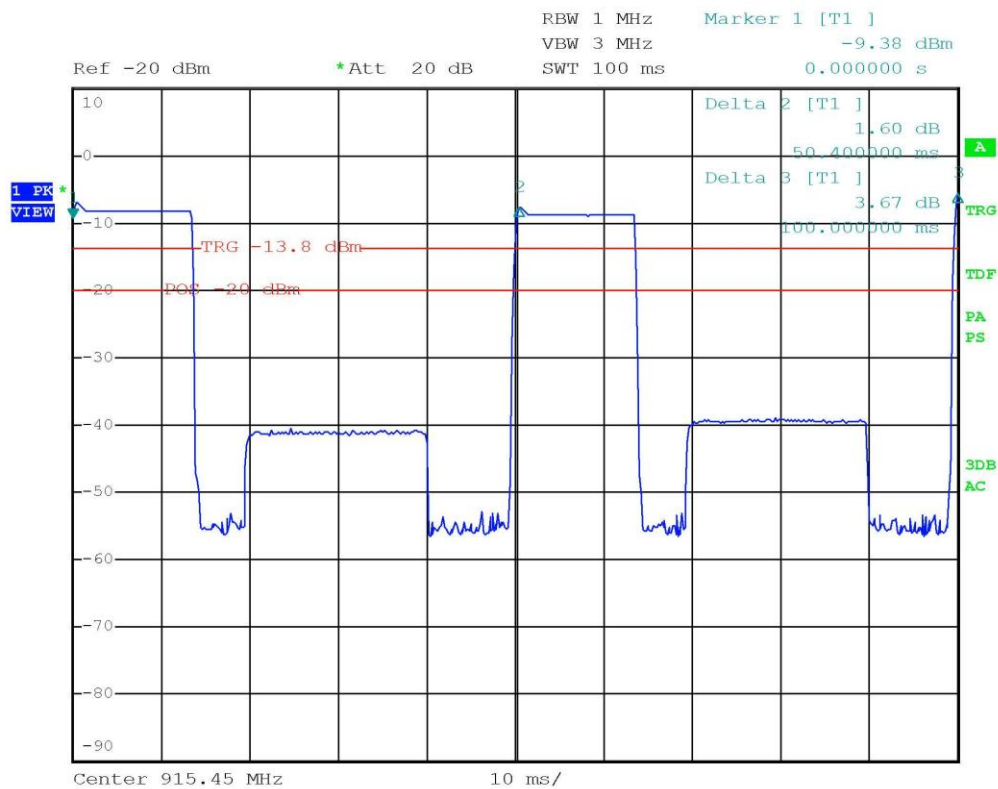
G14189834



Gandini 14189834-Tx-Rx - Fhop



G14189835



Gandini 14189835-Tx-Rx - Fhop

Result: The requirements are met



11.8 Band edge

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- 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 S206, CMC S227
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

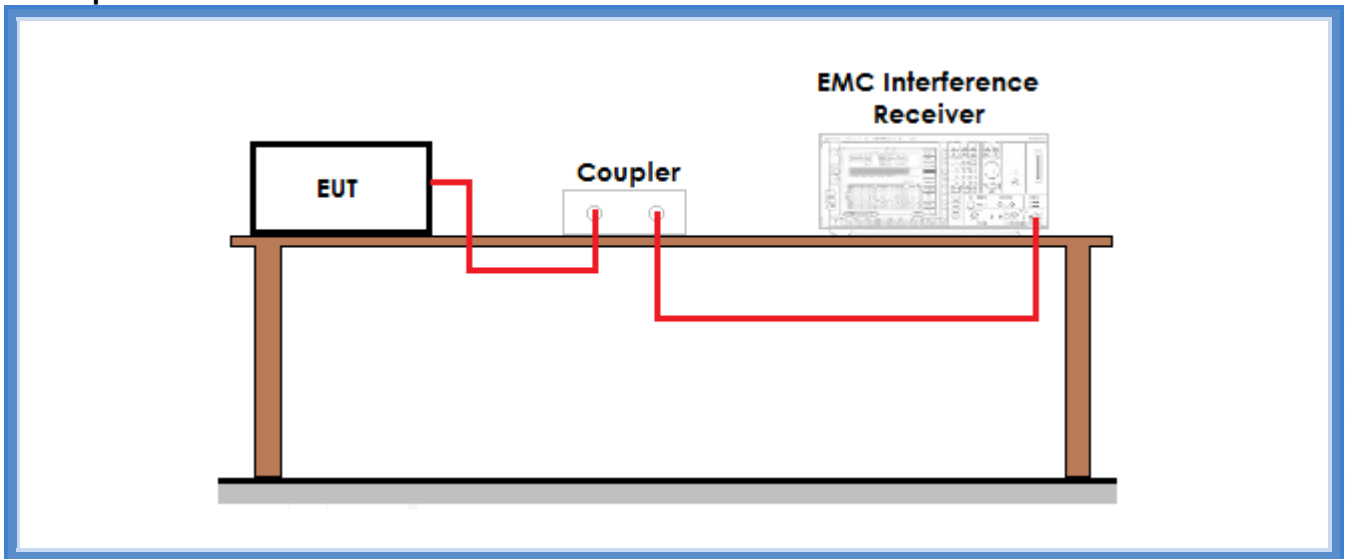
Environmental conditions

<i>Temperature (°C)</i>	<i>Atmospheric pressure (kPa)</i>	<i>Relative humidity (%)</i>
20	101	40

Acceptance limits: operation within the band 902 – 928 MHz



Setup



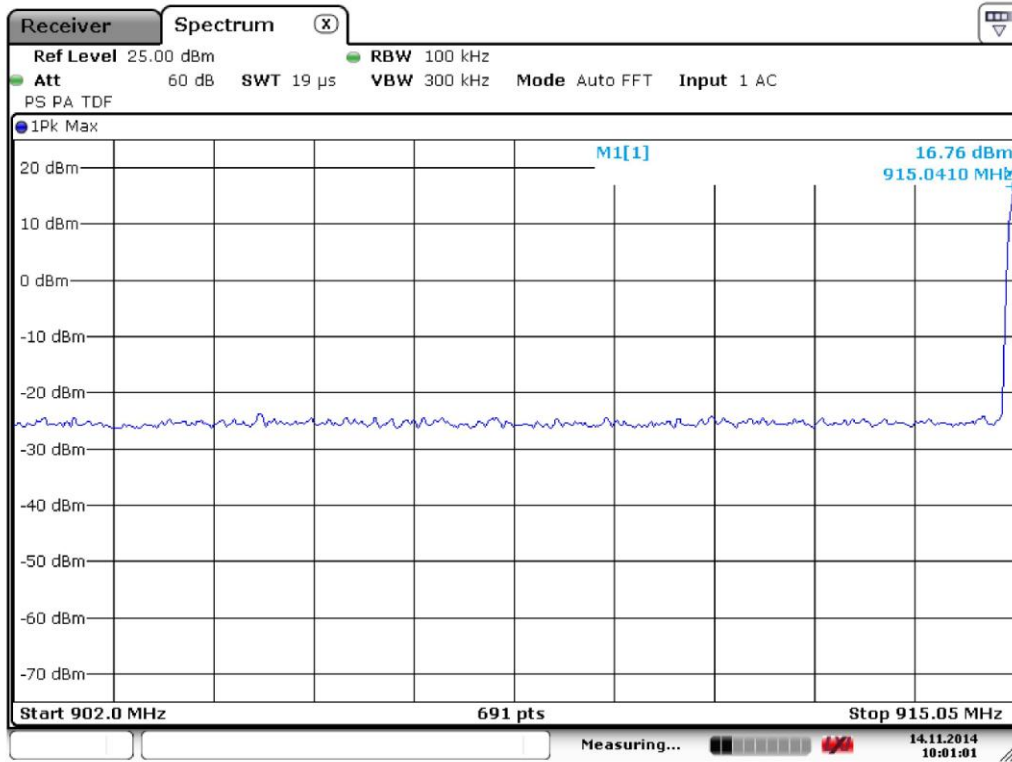
Result

Frequency (MHz)	Graph(s) – Hopping	Results	
915,05	G14189836	F _L : 915,4556 MHz	Complies
	G14189837		
	G14189838		
927,95	G14189840	F _H : 927,9641 MHz	Complies
	G14189841		
	G14189842		

Frequency (MHz)	Graph(s) – No hopping	Results	
915,05	G14189806	F _L : 915,0356 MHz	Complies
	G14189807		
927,95	G14189811	F _H : 927,9650 MHz	Complies
	G14189812		



G14189807

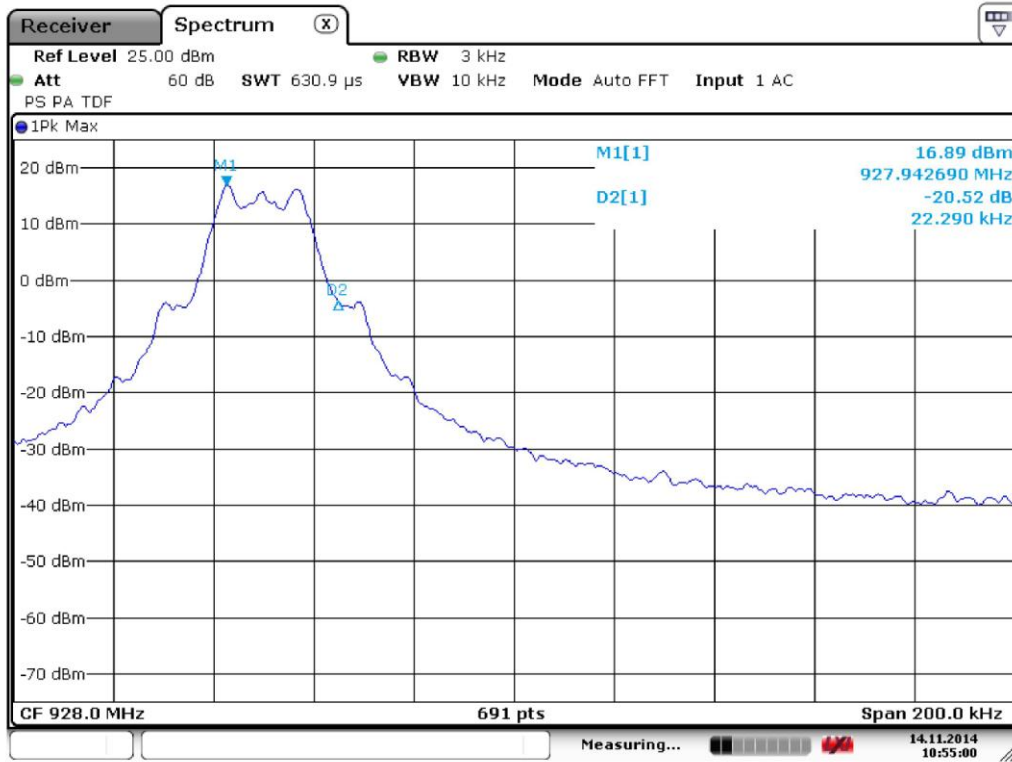


Gandini 14189807-Tx - Fmin

CMC Centro Misure Compatibilità S.r.l.



G14189811

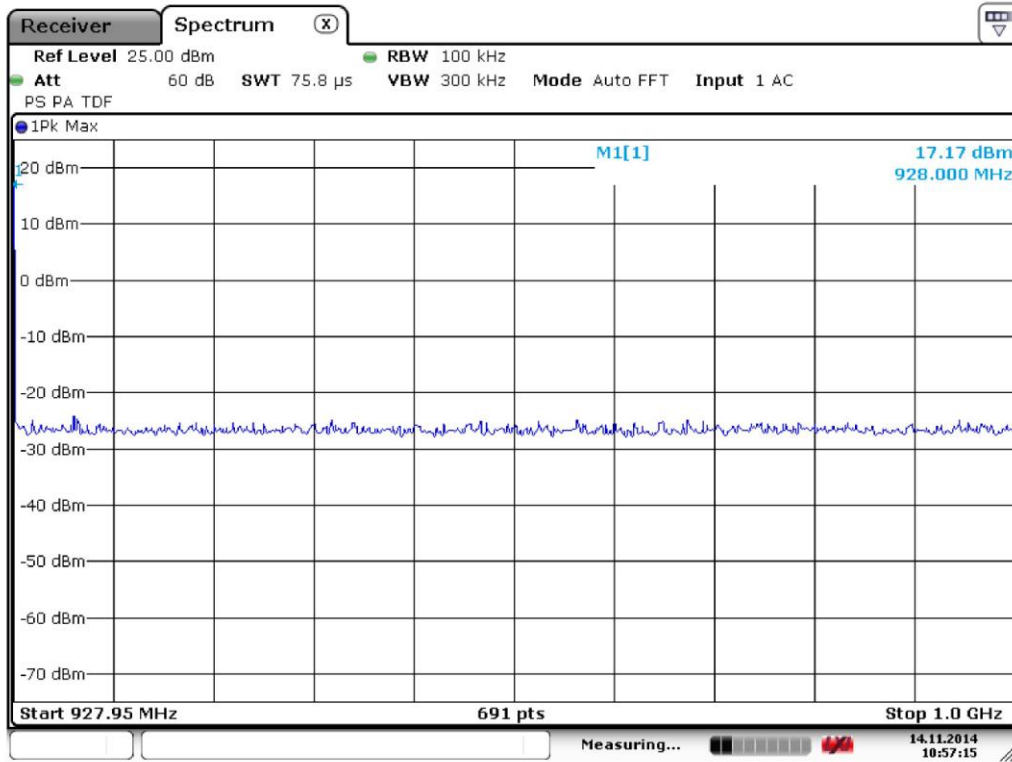


Gandini 14189811-Tx - Fmax

CMC Centro Misure Compatibilità S.r.l.



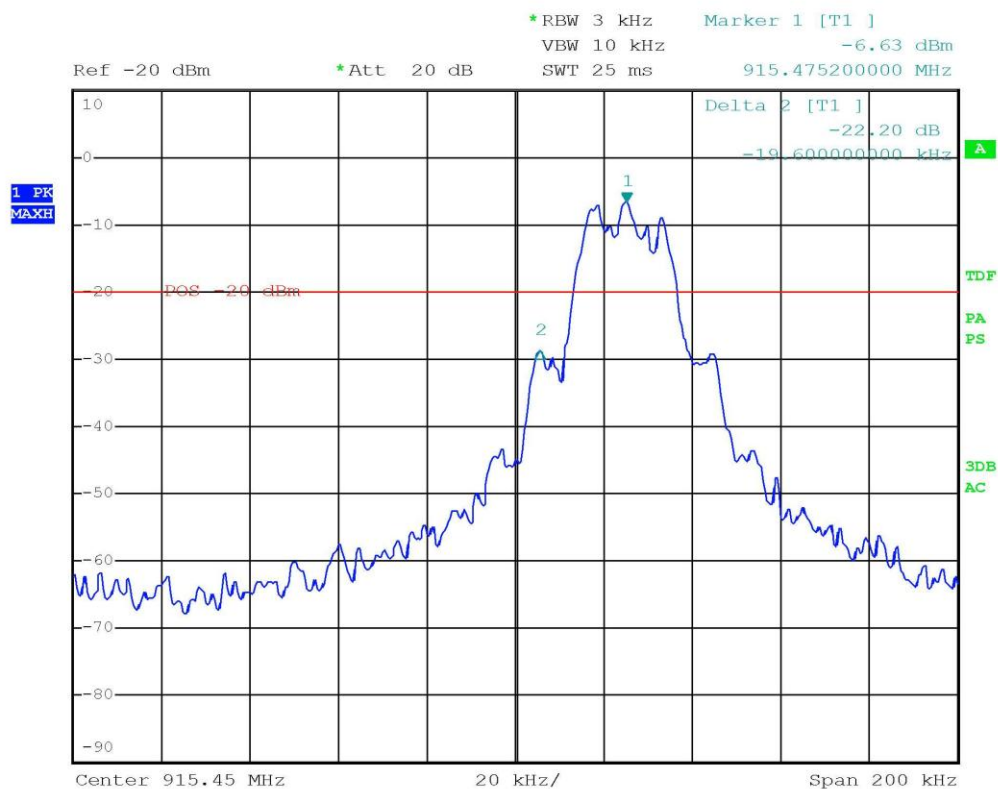
G14189812



Gandini 14189812-Tx - Fmax



G14189836

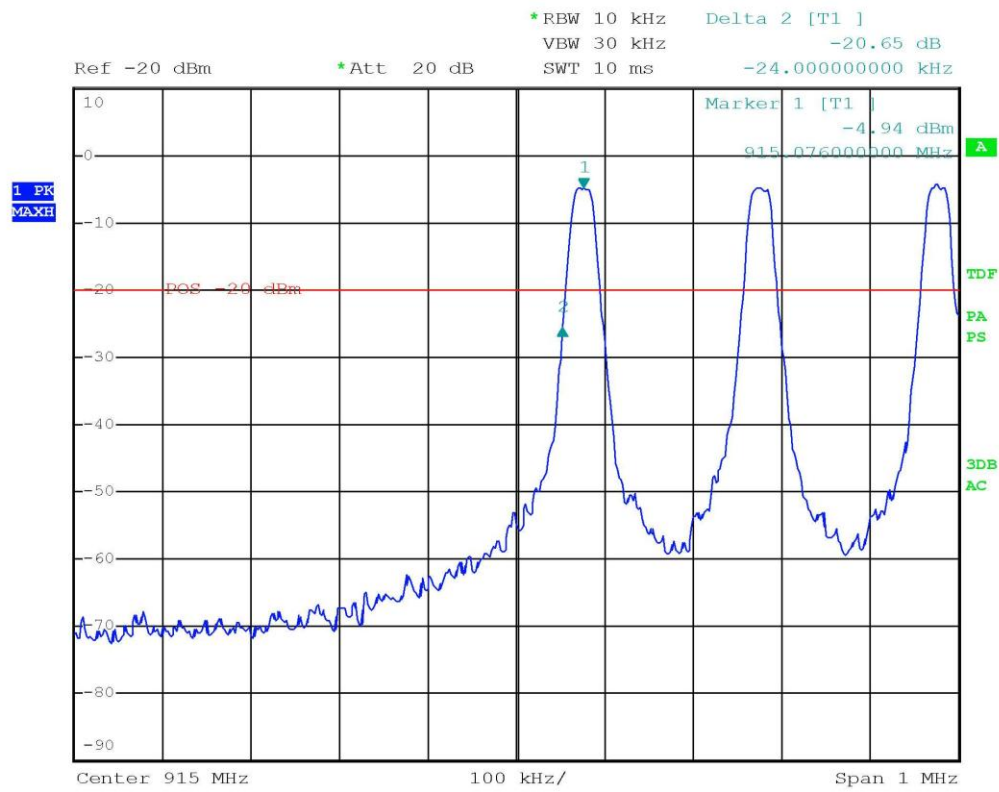


Gandini 14189836-Tx-Rx - Fhop

CMC Centro Misure Compatibilità S.r.l.



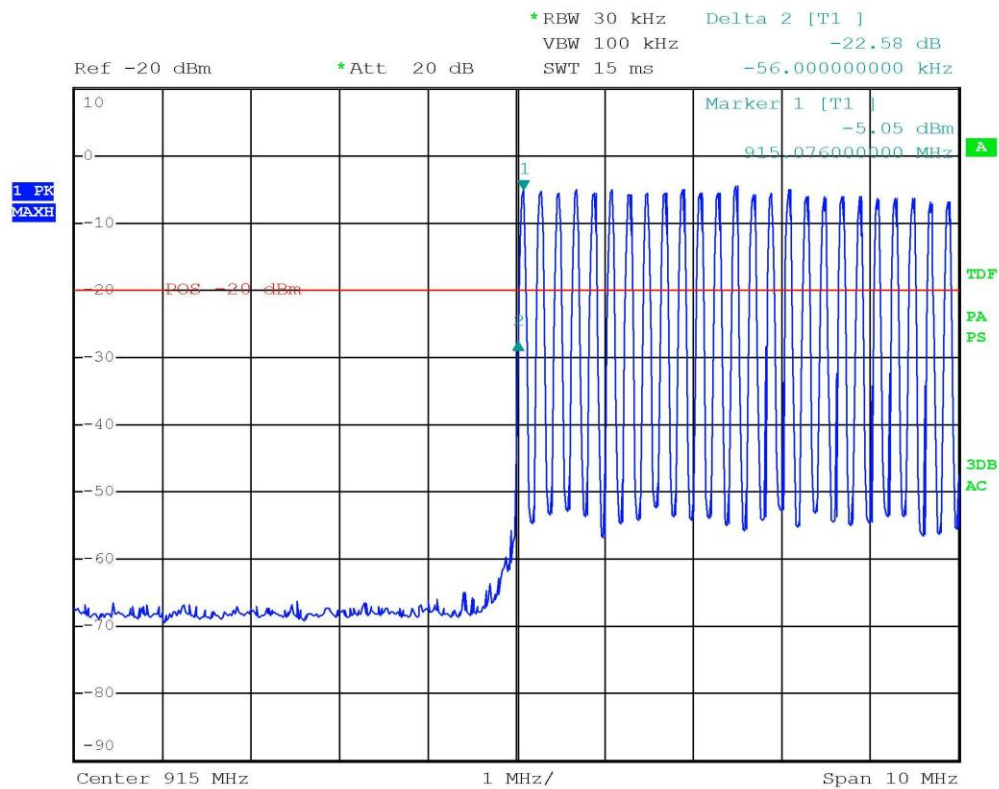
G14189837



Gandini 14199837-Tx-Rx Fhop



G14189838

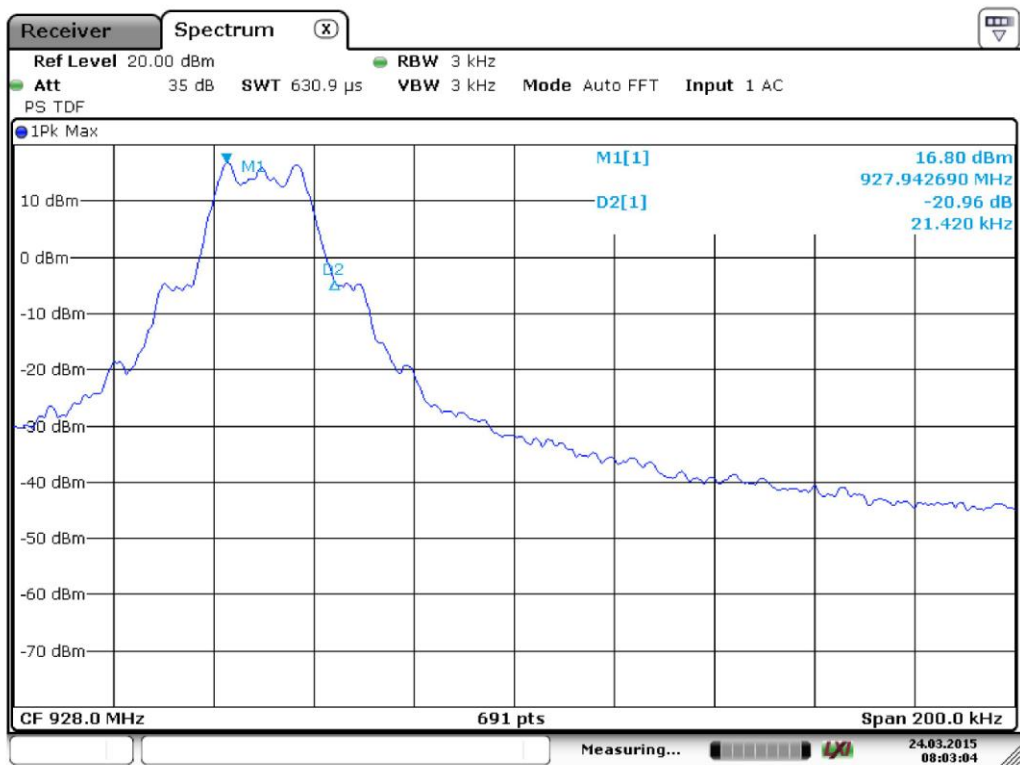


Gandini 14199838-Tx-Rx Fhop

CMC Centro Misure Compatibilità S.r.l.



G14189840

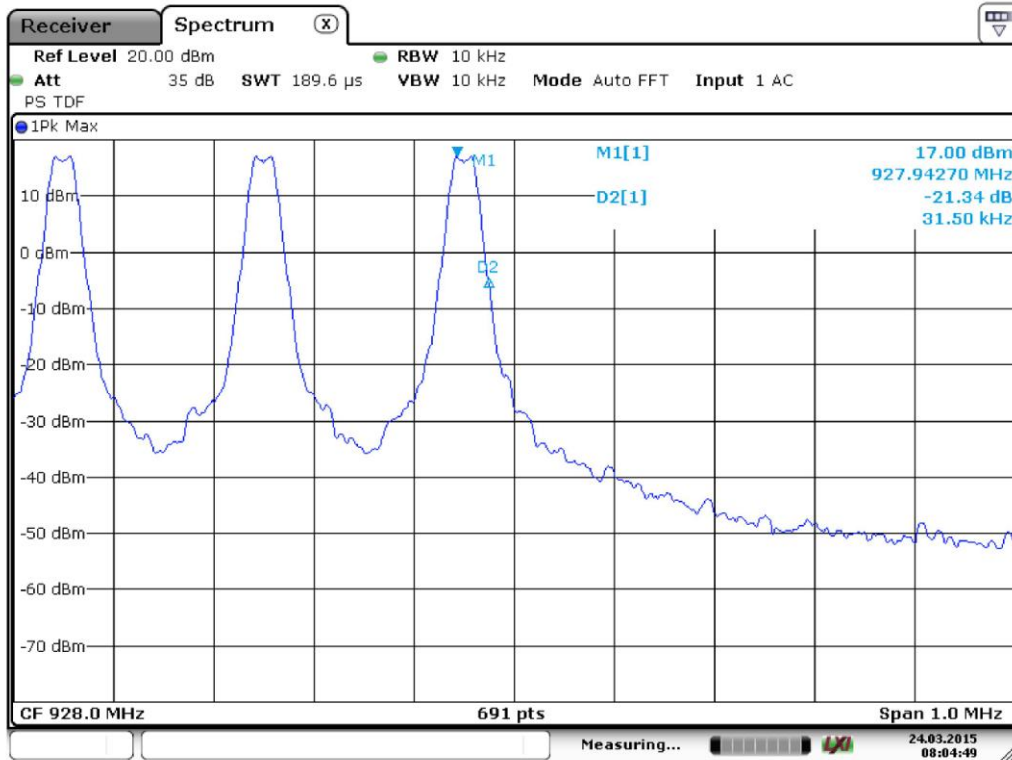


Gandini 14189840-TxRx Fhop

CMC Centro Misure Compatibilità S.r.l.



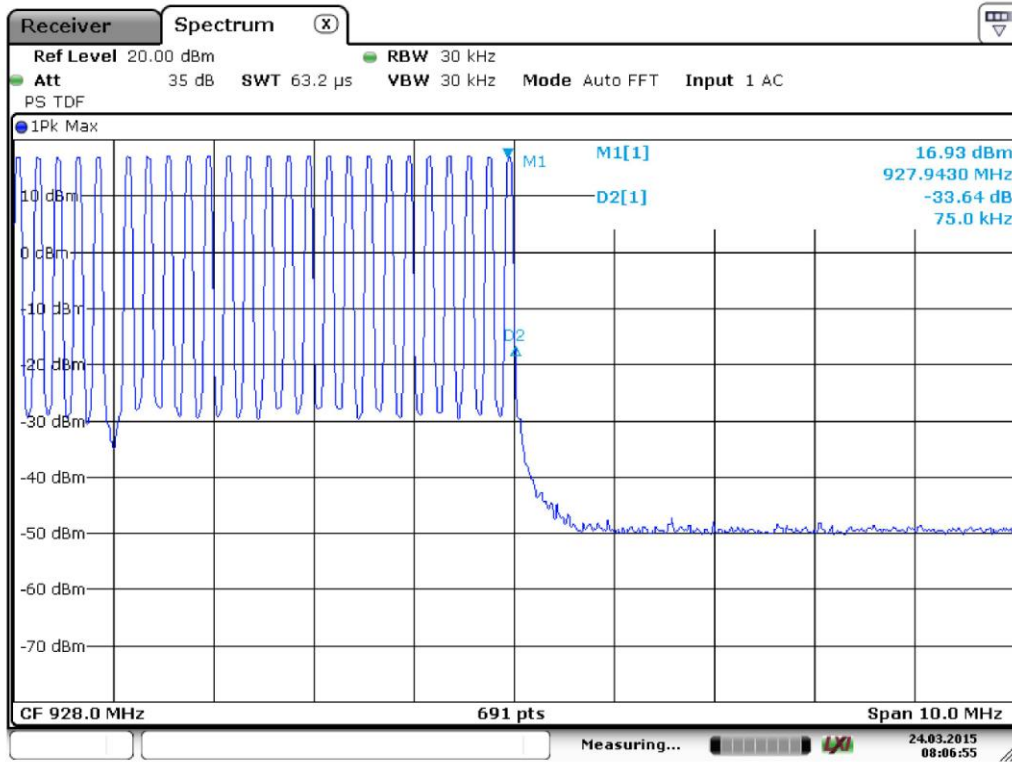
G14189841



Gandini 14189841-TxRx Fhop



G14189842



Gandini 14189842-TxRx Fhop

Result: The requirements are met



11.9 Peak Output Power

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- DA 00-705
- 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 S227
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Antenna

Environmental conditions

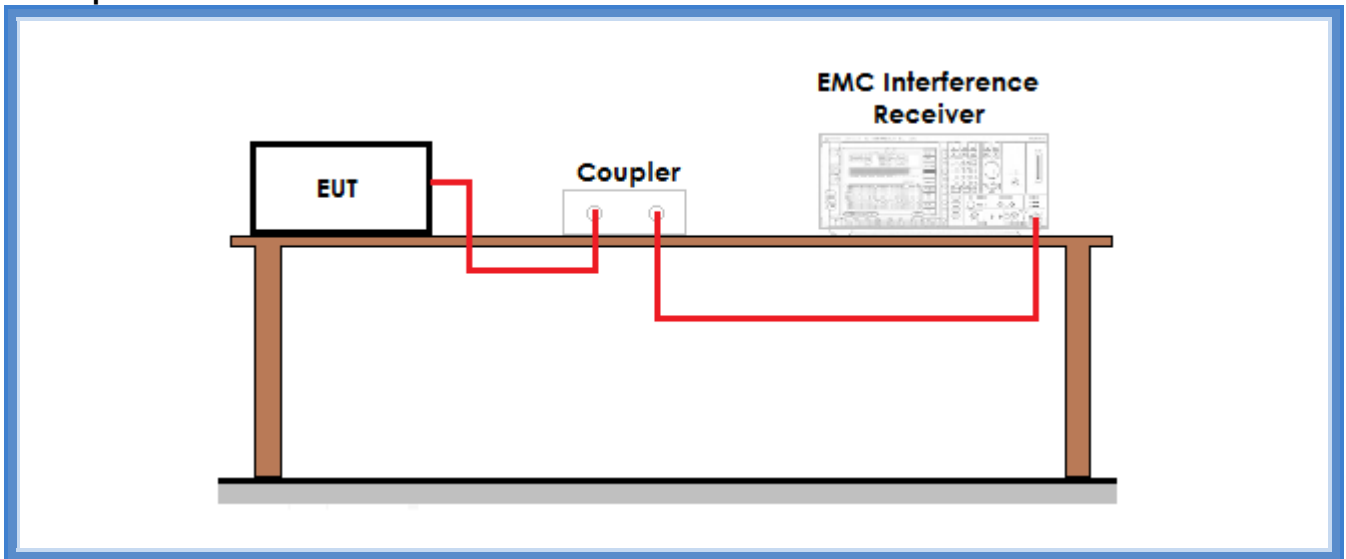
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
20	101	40

Acceptance limits:

For frequency hopping systems operating in the 902–928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0,25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels



Setup



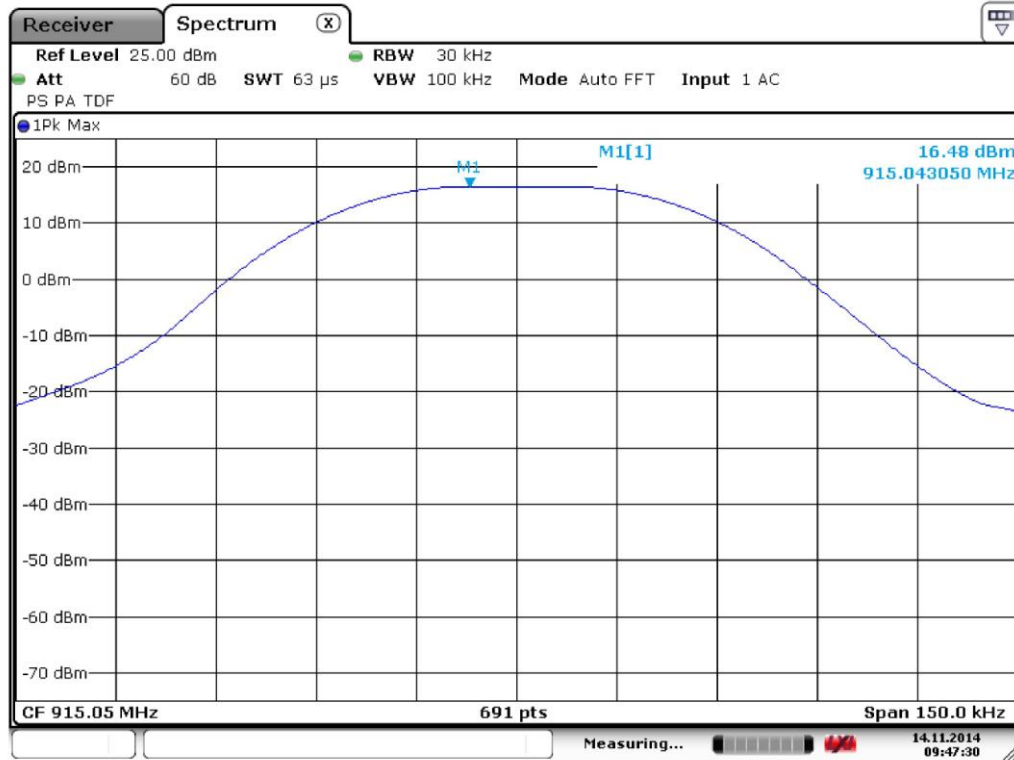
Result

Frequency (MHz)	Graphs	Measured QP level (dBm)	Peak Output Power (mW)	Remarks
915,043490	G14189805	16,49	44,57	--
921,492840	G14189815	16,81	47,97	--
927,942840	G14189810	17,01	50,23	--



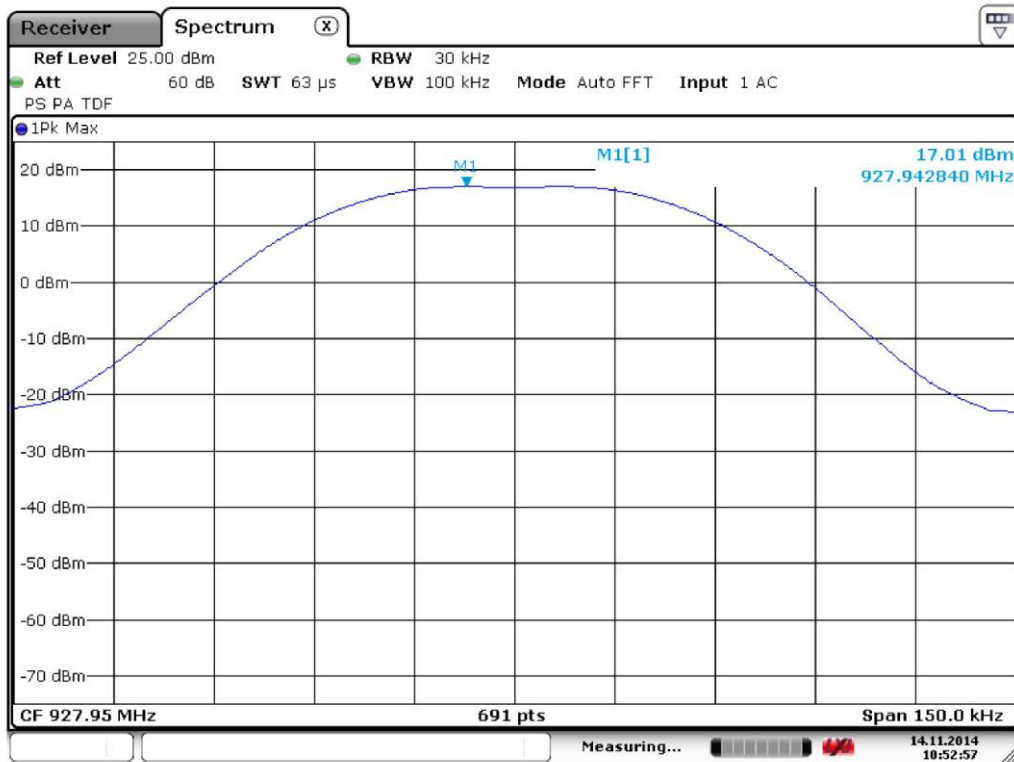
Graphs

G14189805





G14189810

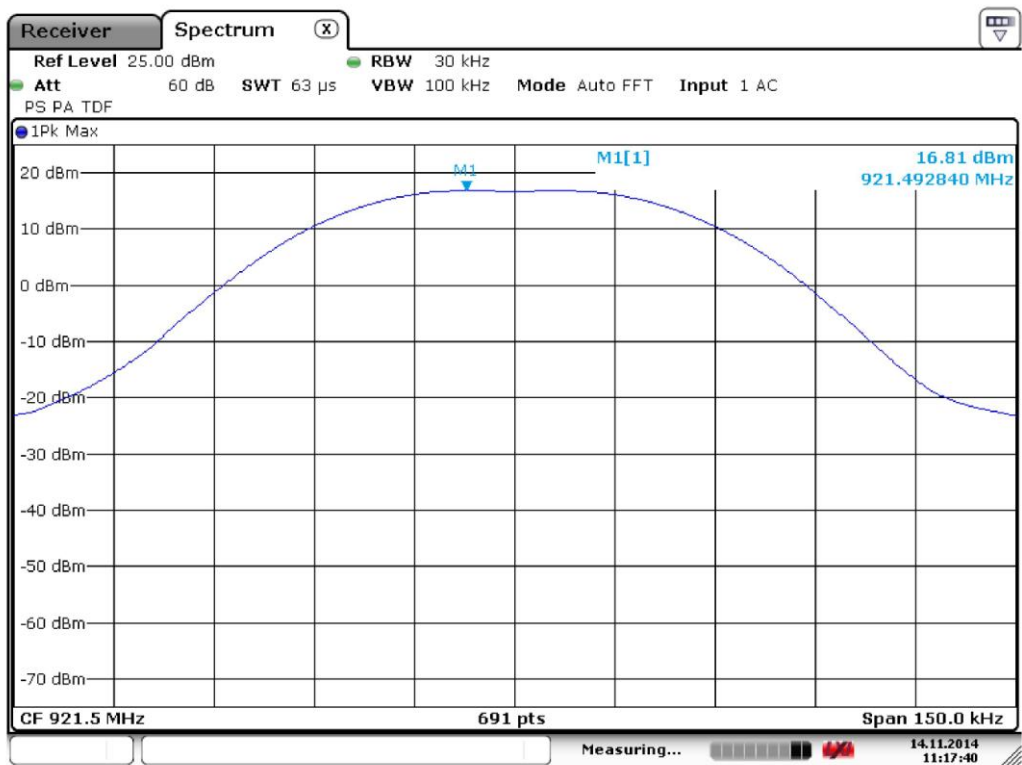


Gandini 14189810-Tx - Fmax

CMC Centro Misure Compatibilità S.r.l.



G14189815



Gandini 14189815-Tx - Fmed

Result: The requirements are met

CMC Centro Misure Compatibilità S.r.l.



11.10 Spurious Emission

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209
- DA 00-705
- Internal procedure PM001
- See clause 4 of this test report

Test configuration and test method

Test site:
 Semi-anechoic chamber

Auxiliary equipment:
 See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
 Measurement uncertainty: See clause 7 of this test report

Test specification

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

Environmental conditions

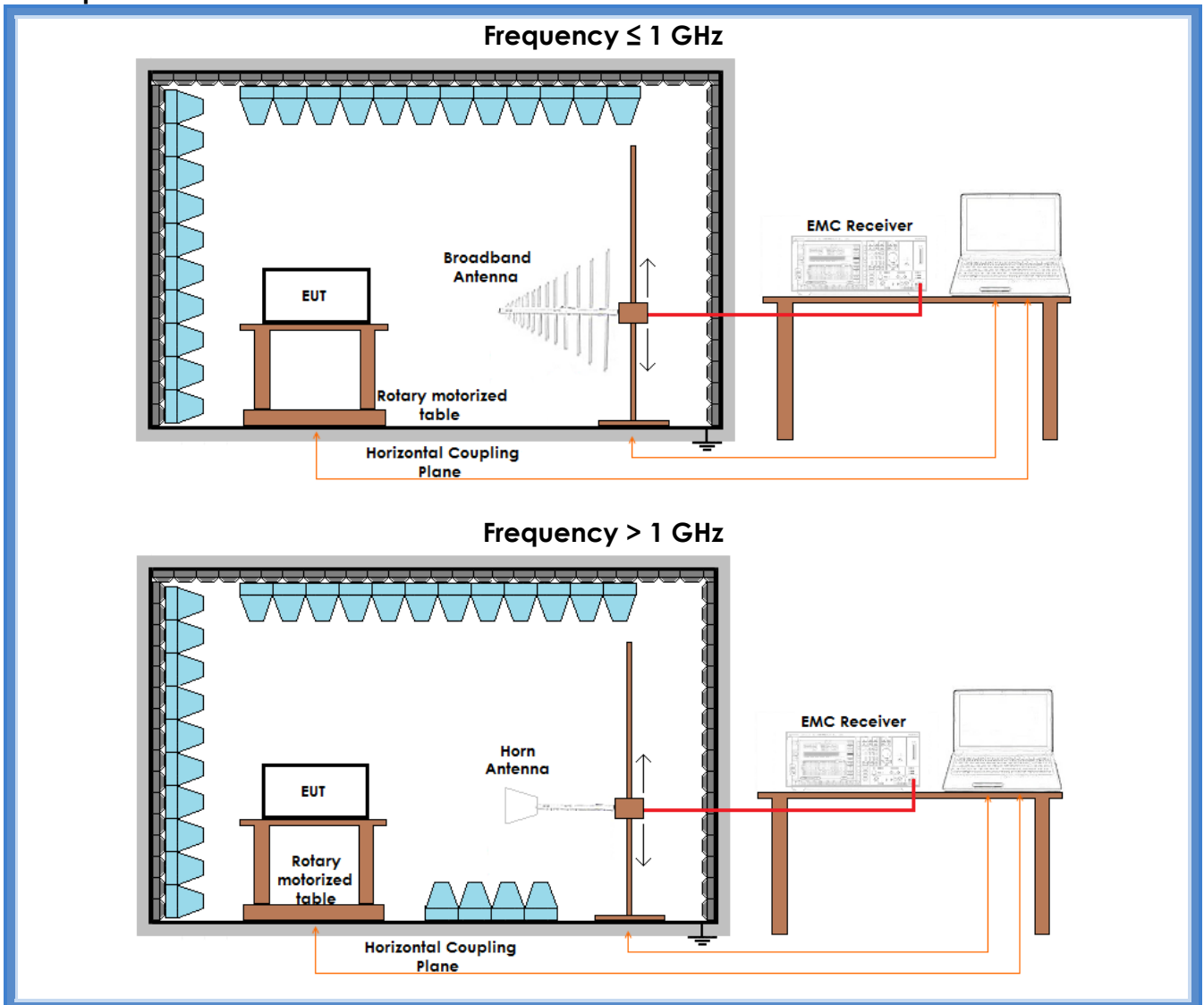
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
20	100	42

Acceptance limits

Frequency (MHz)	AV limits [dB(μV/m)]	Peak limits [dB(μV/m)]
> 1000	54	74



Setup





Result – AV detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		915,05 MHz	921,50 MHz	927,95 MHz	
II	54	46,7	46,4	46,9	Complies
III	54	42,0	41,4	41,6	Complies
IV	54	48,7	46,4	47,0	Complies
V	54	42,3	43,1	43,3	Complies
VI	54	44,1	42,4	44,0	Complies
VII	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
VIII	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
IX	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
X	54	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies

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

Result – Peak detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		915,05 MHz	921,50 MHz	927,95 MHz	
II	74	47,9	47,7	47,8	Complies
III	74	44,4	44,8	44,6	Complies
IV	74	51,3	50,0	51,0	Complies
V	74	48,2	49,4	49,0	Complies
VI	74	51,7	49,9	51,6	Complies
VII	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
VIII	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
IX	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies
X	74	More than 20 dB below limit	More than 20 dB below limit	More than 20 dB below limit	Complies

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

Result: The requirements are met



11.11 Maximum permissible exposure

Test set-up and execution

- FCC Rules and Regulation;
Titles 47 Part 1.1310
- 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

CMC S108, CMC S136, CMC S164
 Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Antenna

Acceptance limits	906/1500 mW/cm ² = 0,60 mW/cm ² max at 20 cm of distance
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Result

Power Density Limit (mW/cm ²)	Output Power (mW)	Antenna Gain (G)	Power Density at 20 cm (mW/cm ²)	Remarks
0,60	50,23	1,58 (2 dBi)	0,016	Measured
Remarks: Power Density = (P x G) / (4πR ²)				

Result: The requirements are met