



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 S108, CMC S136, CMC S227
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

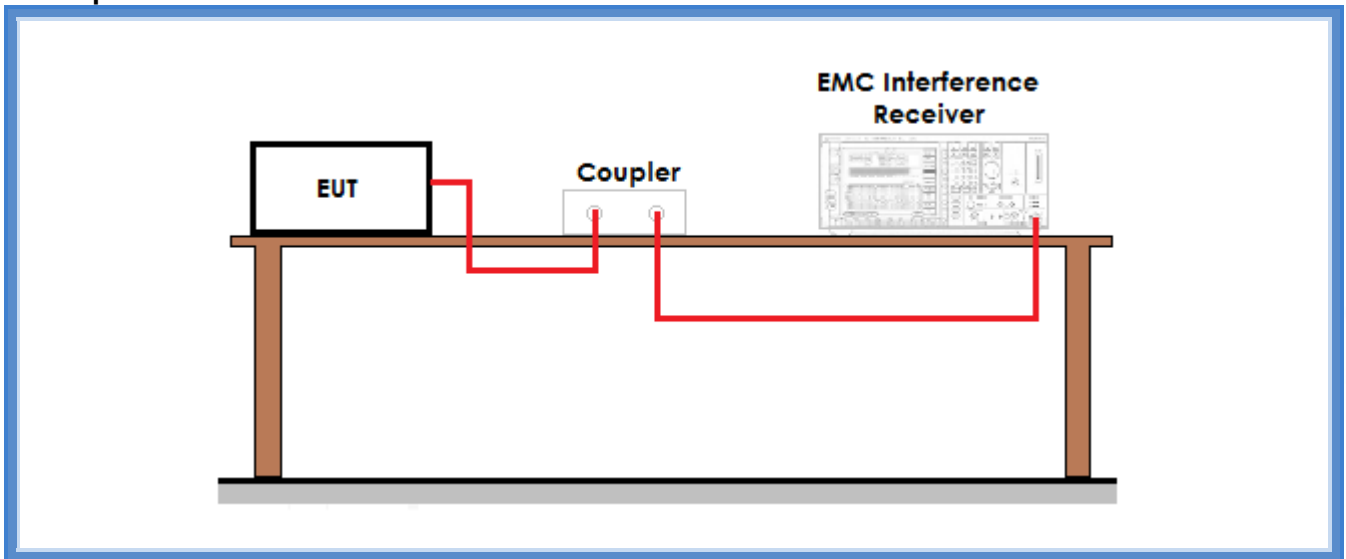
Environmental conditions

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

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



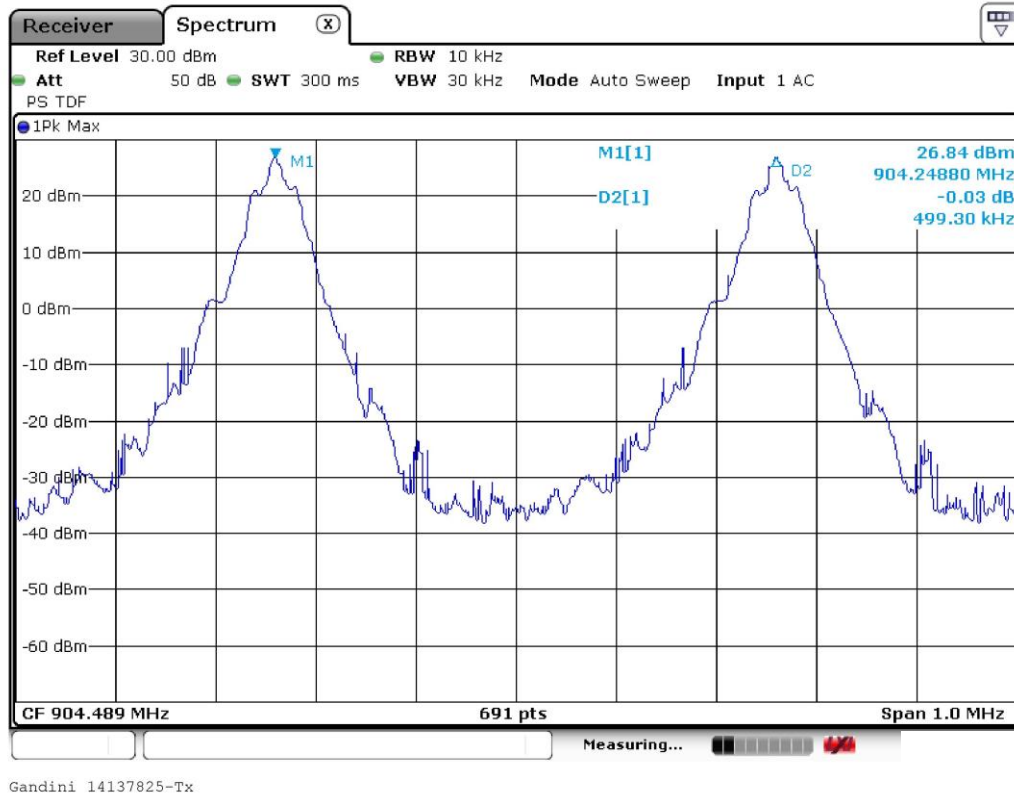
Result

Frequency band (MHz)	Graphs	Channel separation (kHz)	Results
902,75 – 927,25	G14137825	499,3	Complies



Graphs

G14137825



Result: The requirements are met



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 S108, CMC S136, CMC S227
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

Environmental conditions

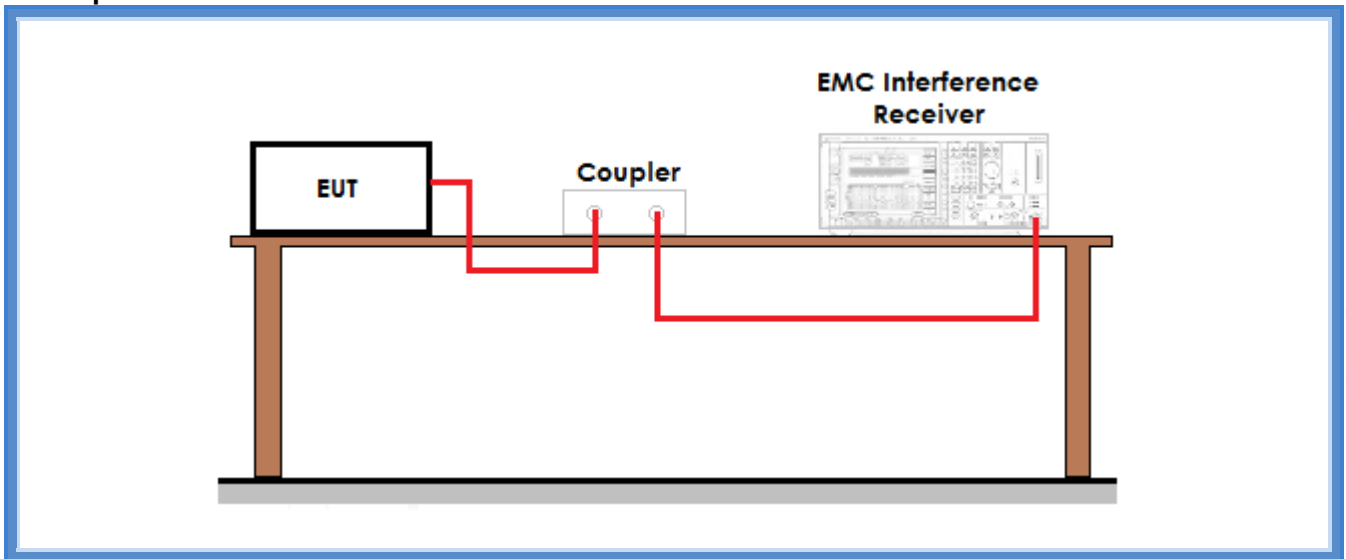
<i>Temperature (°C)</i>	<i>Atmospheric pressure (kPa)</i>	<i>Relative humidity (%)</i>
22	100	45

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



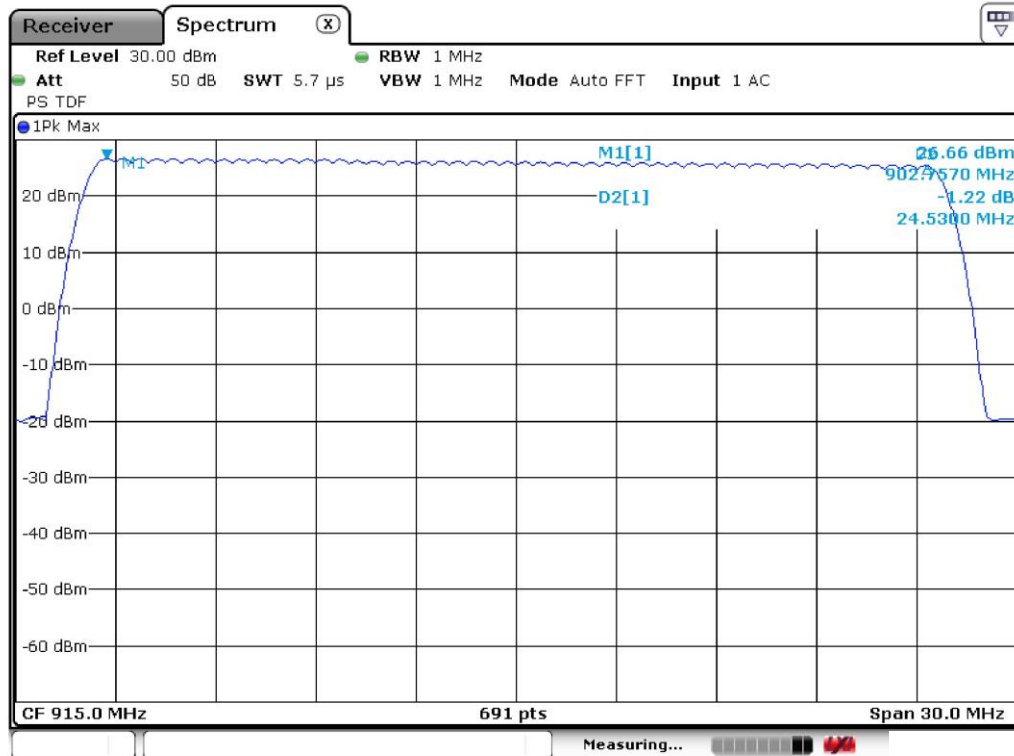
Result

<i>Graphs</i>	<i>Number of hopping channels</i>	<i>Results</i>
G14137809	50	Complies



Graphs

G14137809



Gandini 14137809-Tx-hopping

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 S108, CMC S136, CMC S227
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

Environmental conditions

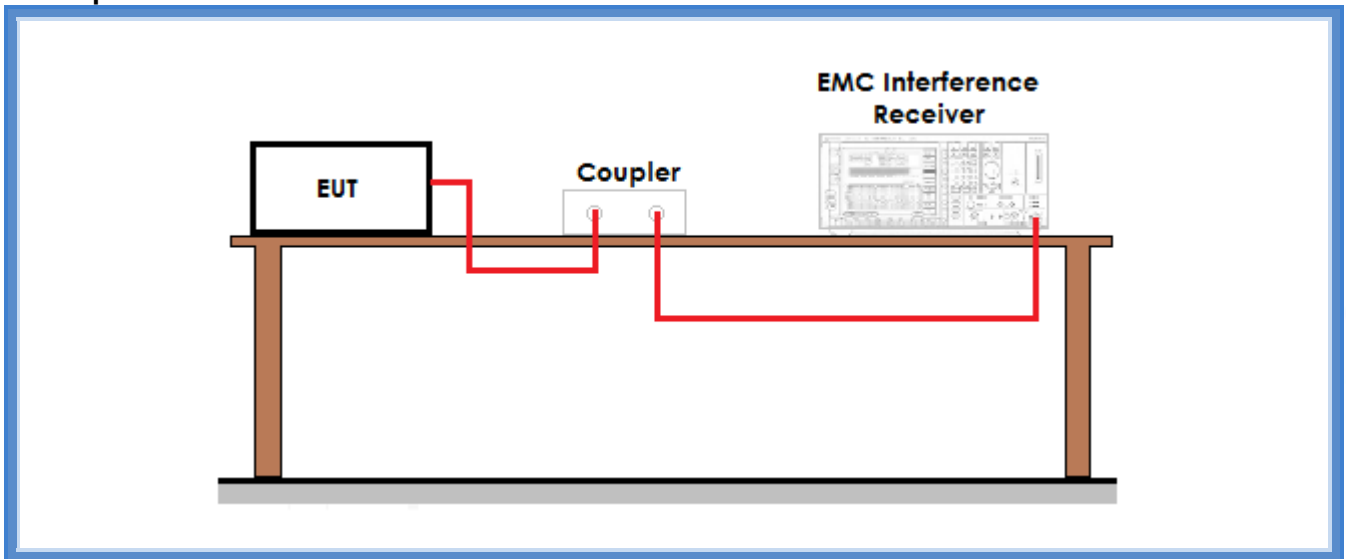
<i>Temperature (°C)</i>	<i>Atmospheric pressure (kPa)</i>	<i>Relative humidity (%)</i>
22	100	45

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
905,7510	G14137849	381,09 ms

Number of transmissions per period

Frequency (MHz)	Time between 2 transmission on different channels		Number of transmissions (20 s / 0,41763 s / 50)
905,7510	G14137848	417,63 ms	0,96

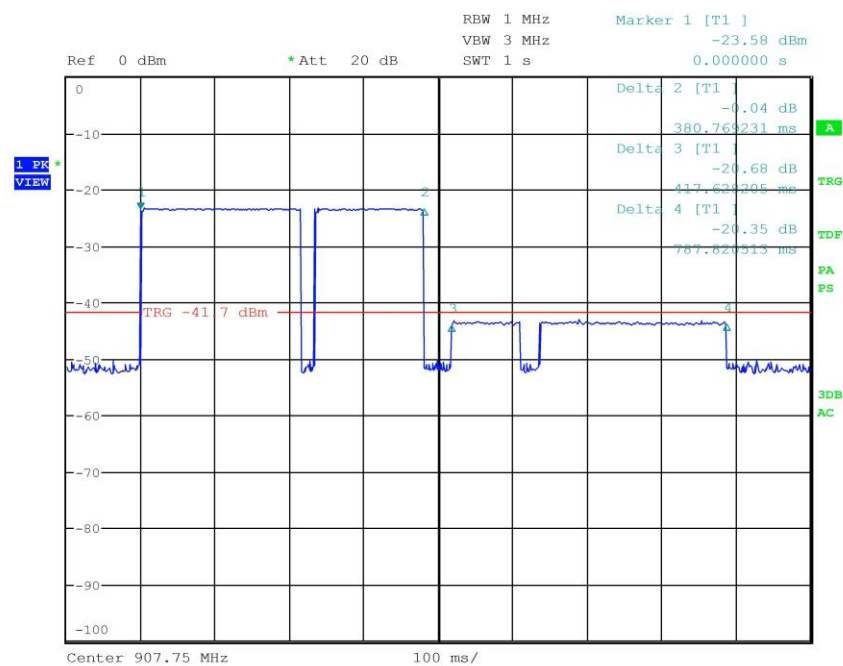
Time of occupancy (Dwell time x Number of transmission)	365,8 ms
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Graphs

G14137848

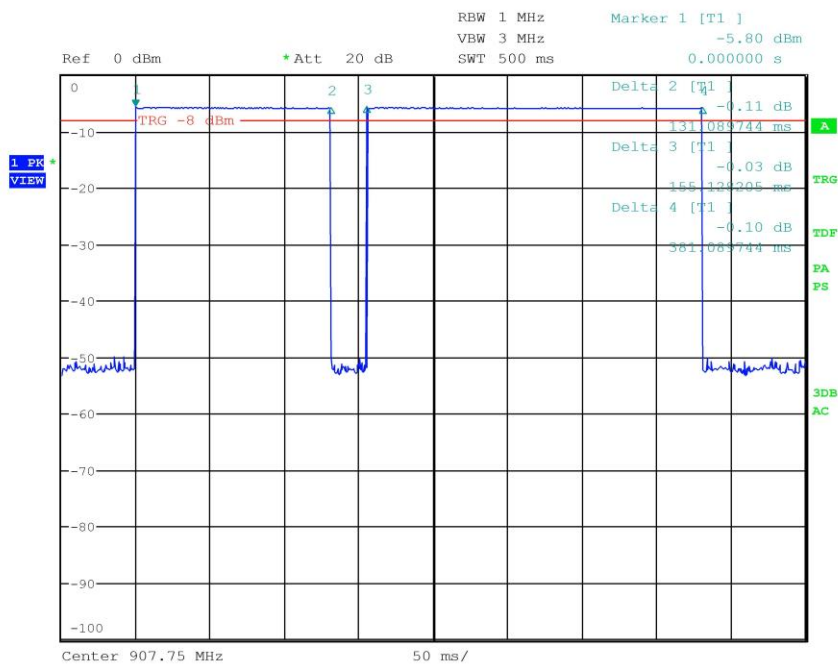
Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx Hopping
Operator Gandini 14137848
Test Spec





G14137849

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx Hopping
Operator Gandini 14137849
Test Spec



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 S108, CMC S136, CMC S227
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

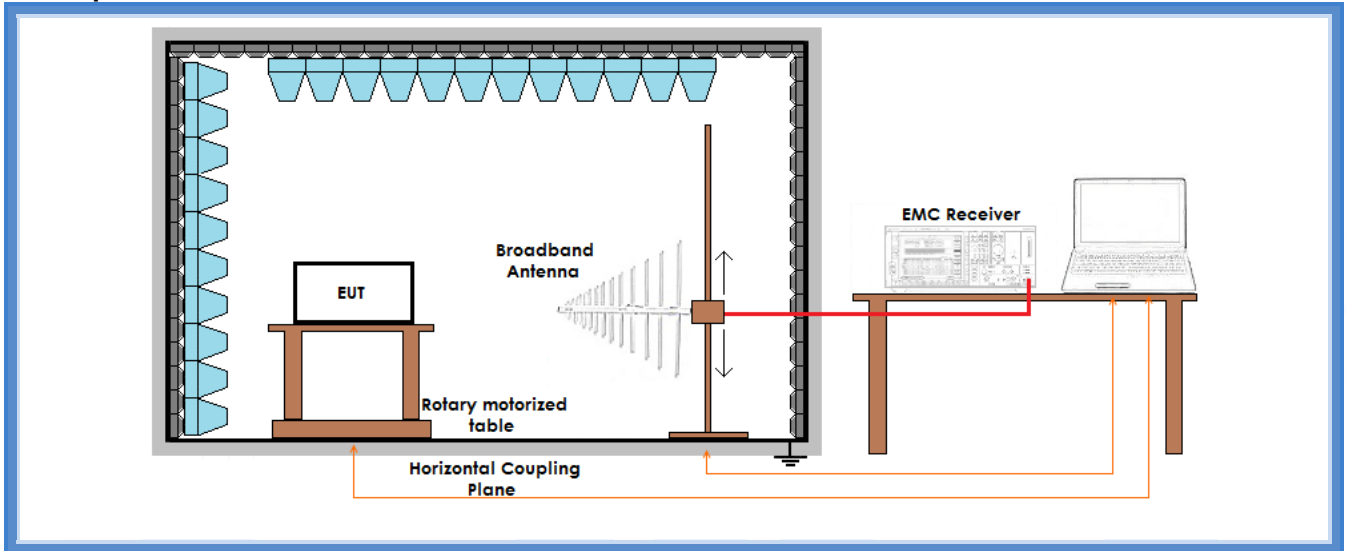
Environmental conditions

<i>Temperature (°C)</i>	<i>Atmospheric pressure (kPa)</i>	<i>Relative humidity (%)</i>
22	100	42

Acceptance limits: operation within the band 902 – 928 MHz



Setup



Result

Frequency (MHz)	Graph(s) – No hopping	Results	
902,75	G14137804	F _L : 902,3768 MHz	Complies
	G14137805		
927,25	G14137816	F _H : 927,6056 MHz	Complies
	G14137817		



Graphs

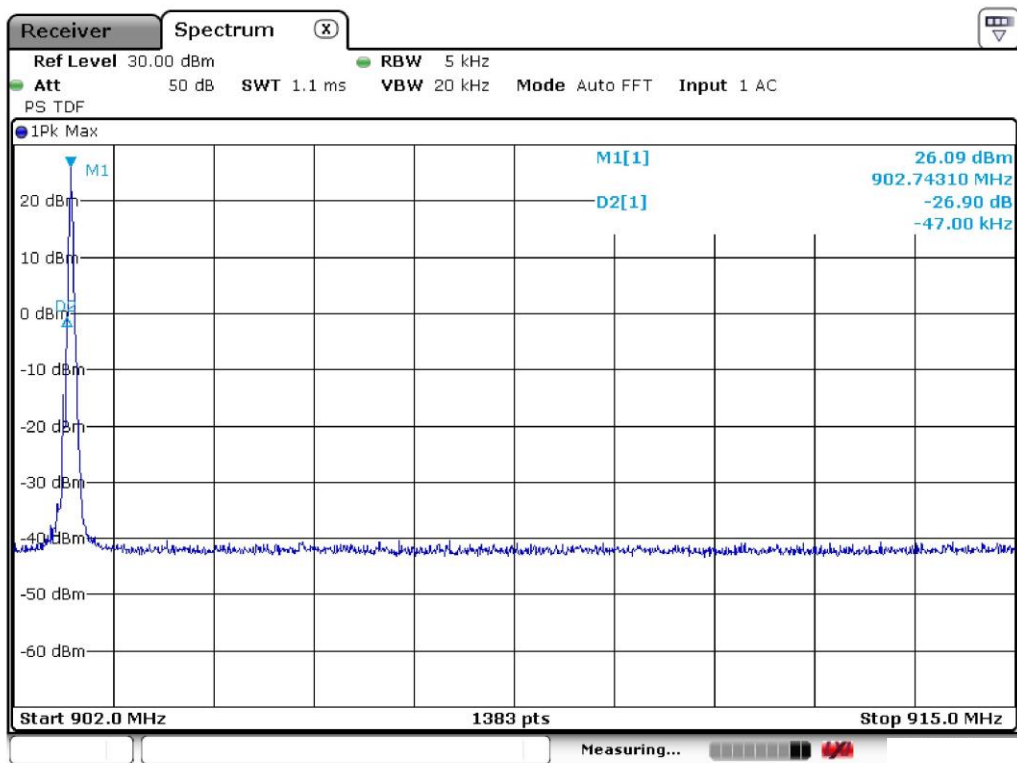
G14137804



Gandini 14137804-Tx-Fmin



G14137805

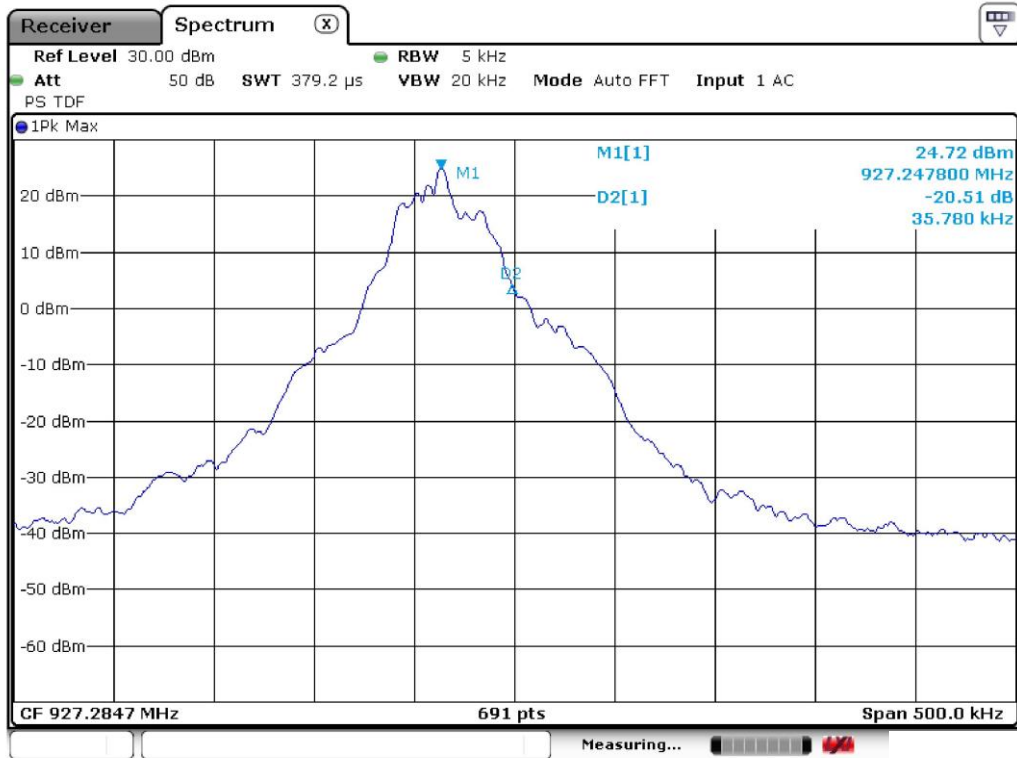


Gandini 14137805-Tx-Fmax

CMC Centro Misure Compatibilità S.r.l.



G14137816

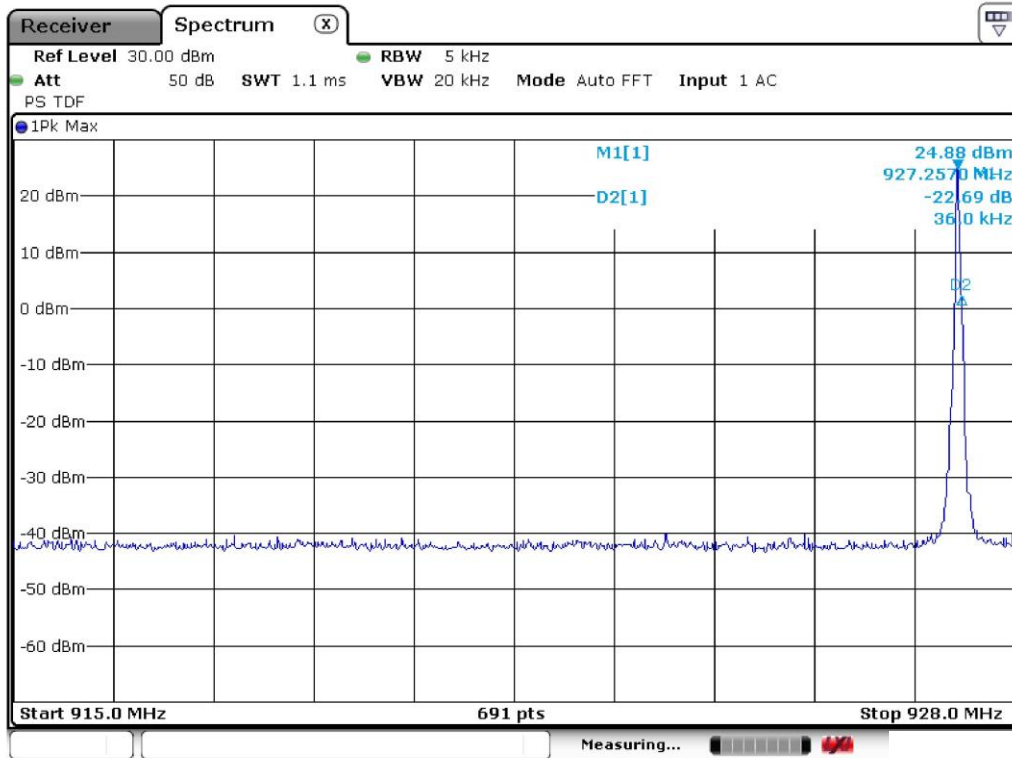


Gandini 14137816-Tx-Fmax

CMC Centro Misure Compatibilità S.r.l.



G14137817



Gandini 14137817-Tx-Fmax

Result: The requirements are met



11.9 Peak Output Power (conducted)

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:
 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 S164
 Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Antenna

Environmental conditions

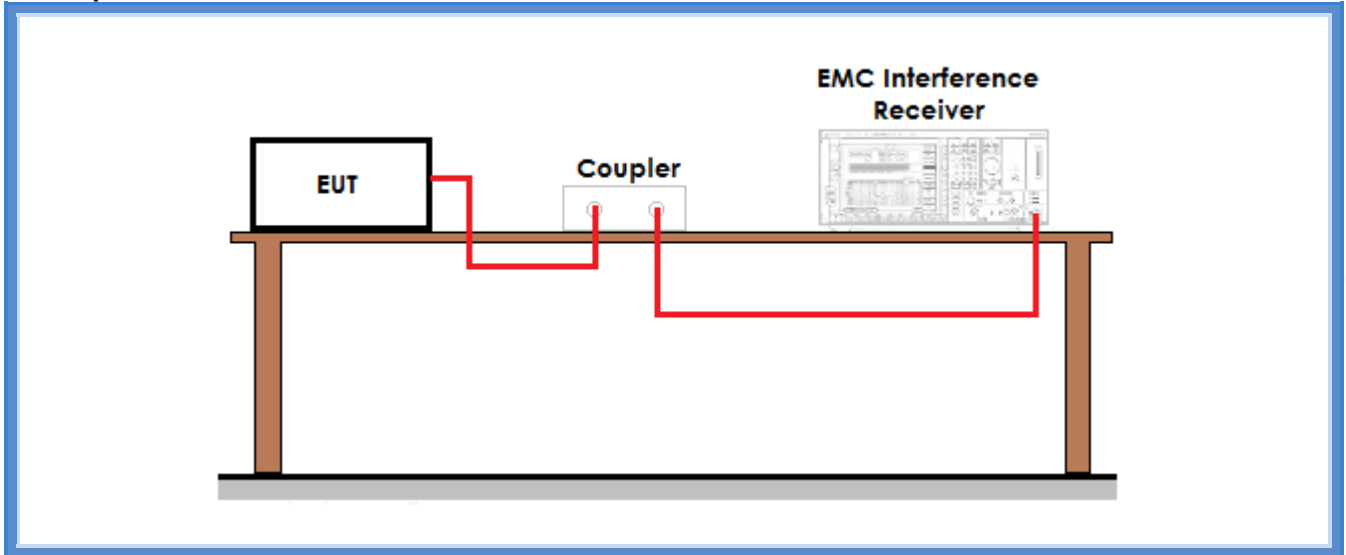
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	45

Acceptance limits:

Frequency range	RF power output
902 - 928 MHz	1 W



Setup



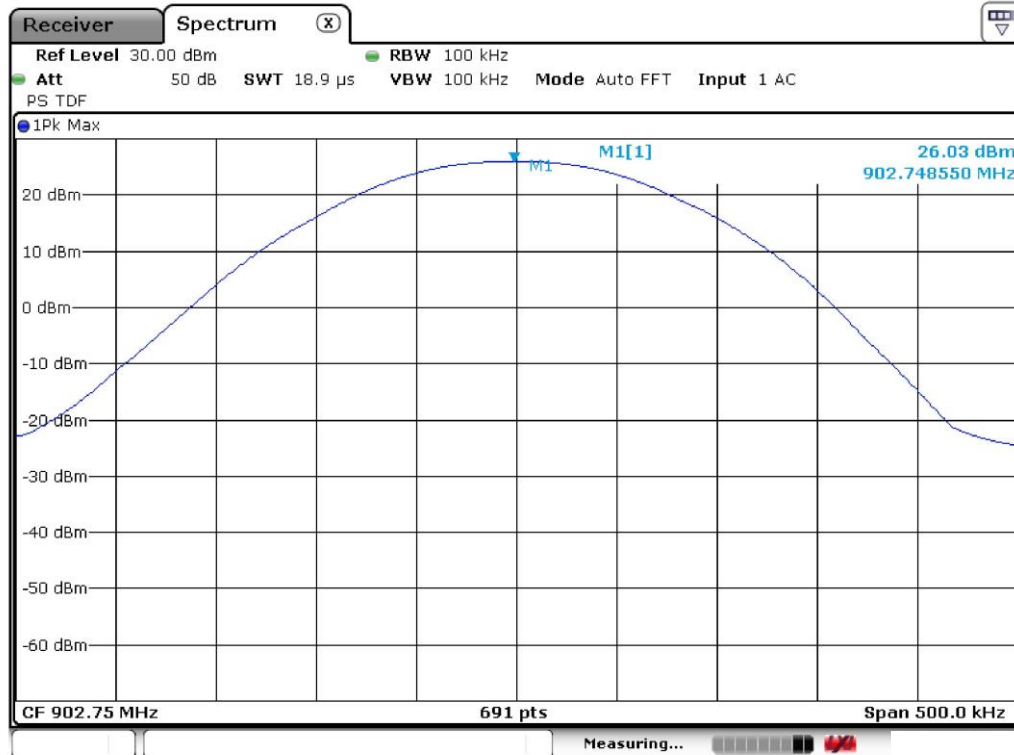
Result

Frequency (MHz)	Graphs	Measured Peak Output Power (dBm)	Attenuation cable (dB)	Total Peak Output Power (dBm)	Peak Output Power (mW)
902,74855	G14137803	26,03	0,1	26,13	410,12
914,74783	G14137808	25,10	0,1	25,20	331,13
927,24783	G14137813	25,37	0,1	25,47	352,37



Graphs

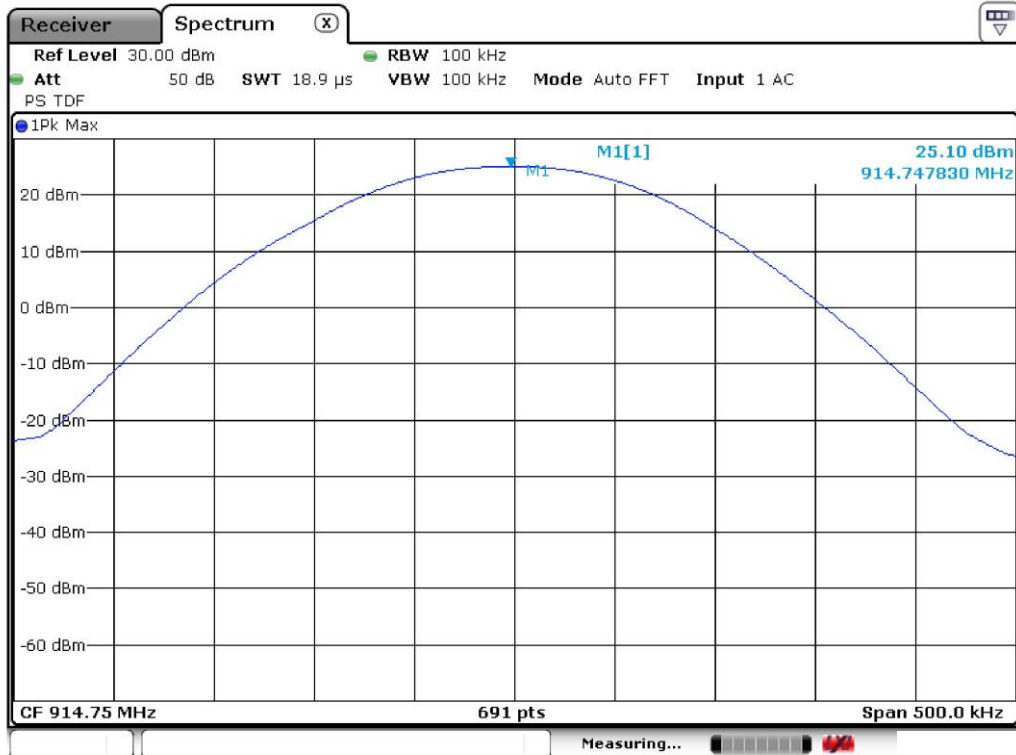
G14137803



Gandini 14137803-Tx-Fmin



G14137808

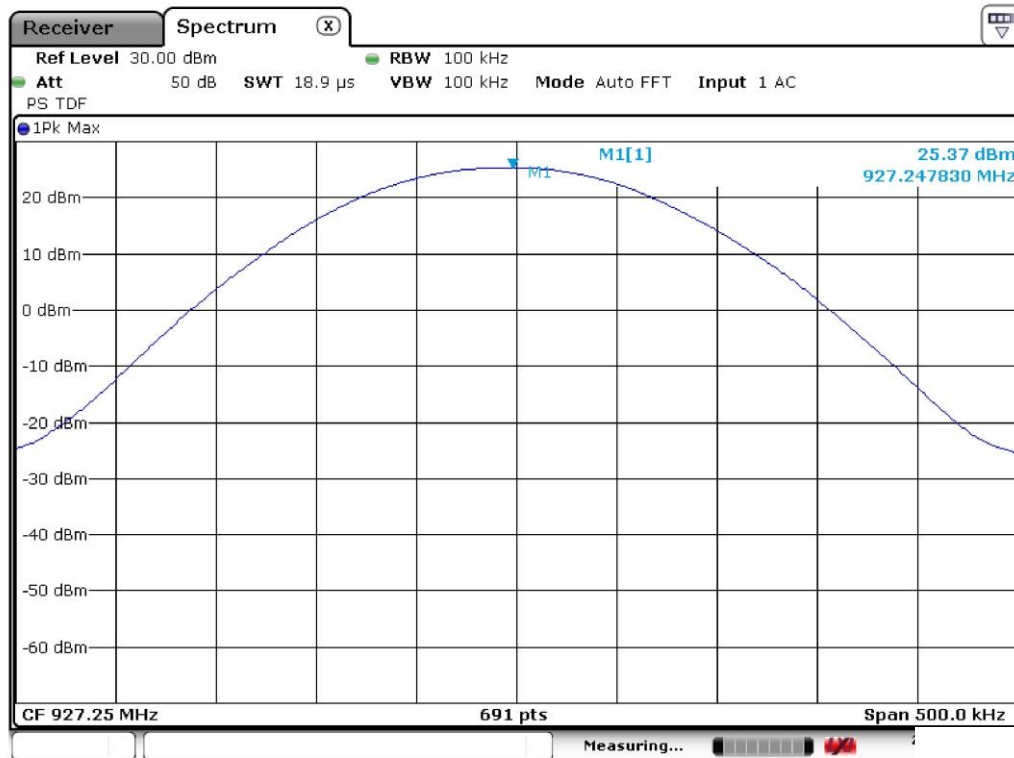


Gandini 14137808-Tx-Fmed

CMC Centro Misure Compatibilità S.r.l.



G14137813



Gandini 14137813-Tx-Fmax

Result: The requirements are met



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

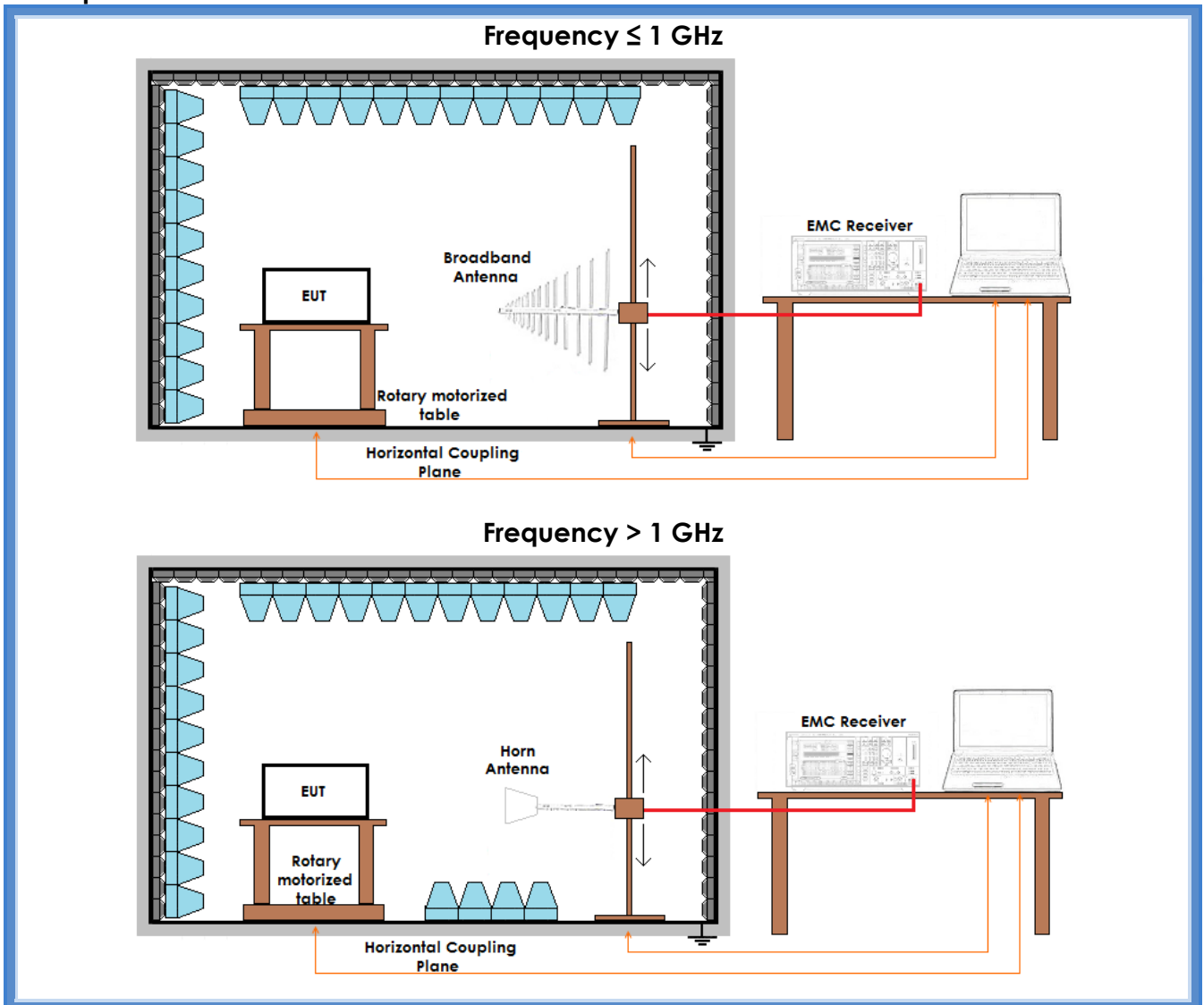
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	100	45

Acceptance limits

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



Setup



Graph:

G14137826



Result – AV detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		902,750 MHz	914,750 MHz	927,250 MHz	
II	54	41,8	41,9	43,9	Complies
III	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
IV	54	40,1	40,6	41,8	Complies
V	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VI	54	39,6	47,6	48,9	Complies
VII	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VIII	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
IX	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
X	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 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
		902,750 MHz	914,750 MHz	927,250 MHz	
II	74	41,9	42,2	44,1	Complies
III	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
IV	74	42,2	43,2	43,7	Complies
V	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VI	74	43,3	49,3	50,6	Complies
VII	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VIII	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
IX	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
X	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies

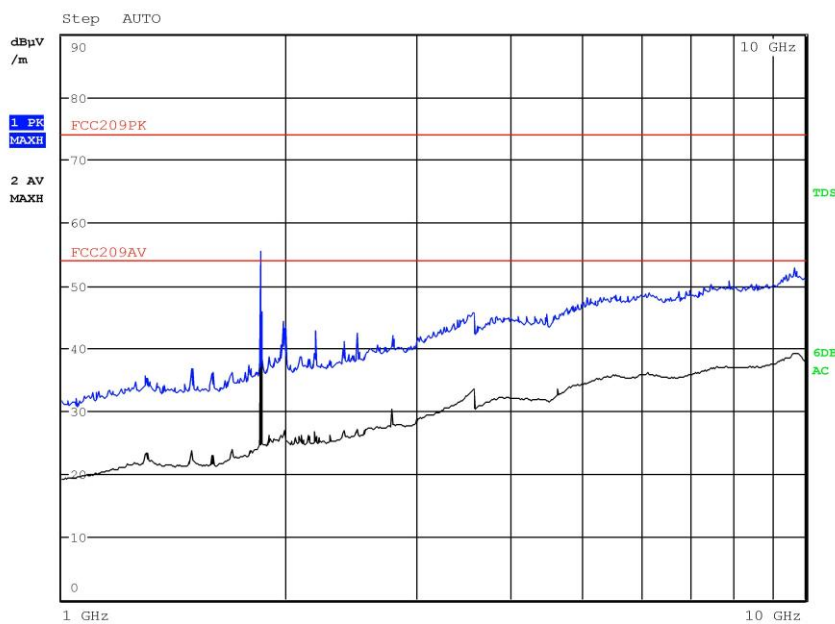
Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values



Graphs

G14137826

Meas Type Emission
Equipment under Test
Manufacturer
OP Condition Tx
Operator Gandini 14137826
Test Spec
Horiz



Final Measurement

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

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

Test specification

Port: Antenna

Acceptance limits	902/1500 mW/cm ² = 0,60 mW/cm ² max at 20cm of distance
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Result

Power Density Limit (mW/cm ²)	Output Power (mW)	Antenna Gain (G)	Power Density at 20cm (mW/cm ²)	Remarks
0,60	410,12	1,17 (0,7 dBi)	0,10	Measured
Remarks: Power Density = (P x G) / (4πR ²)				

Result: The requirements are met