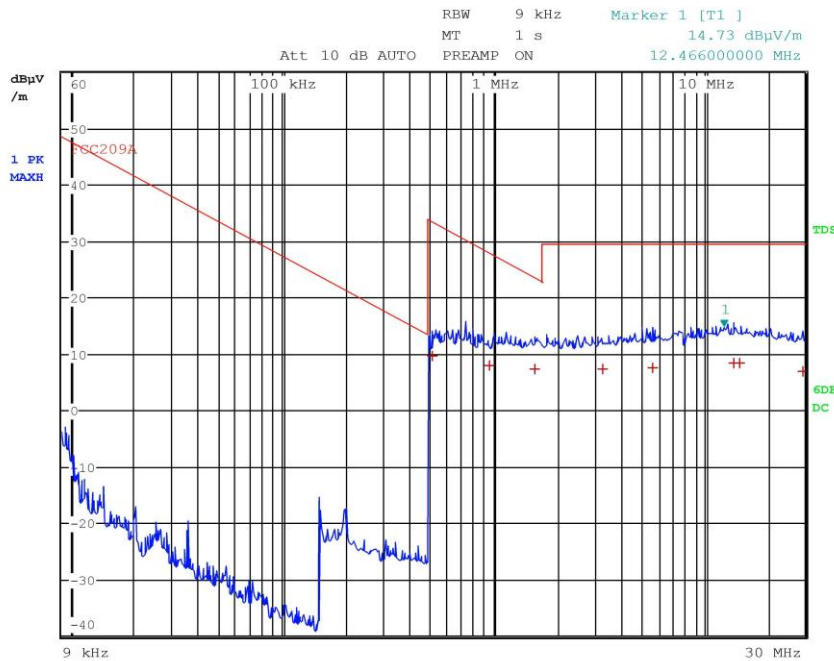




**Meas Type**  
**Equipment under Test**  
**Manufacturer**  
**OP Condition**  
**Operator** Panozzo 17115819  
**Test Spec**



**Final Measurement**

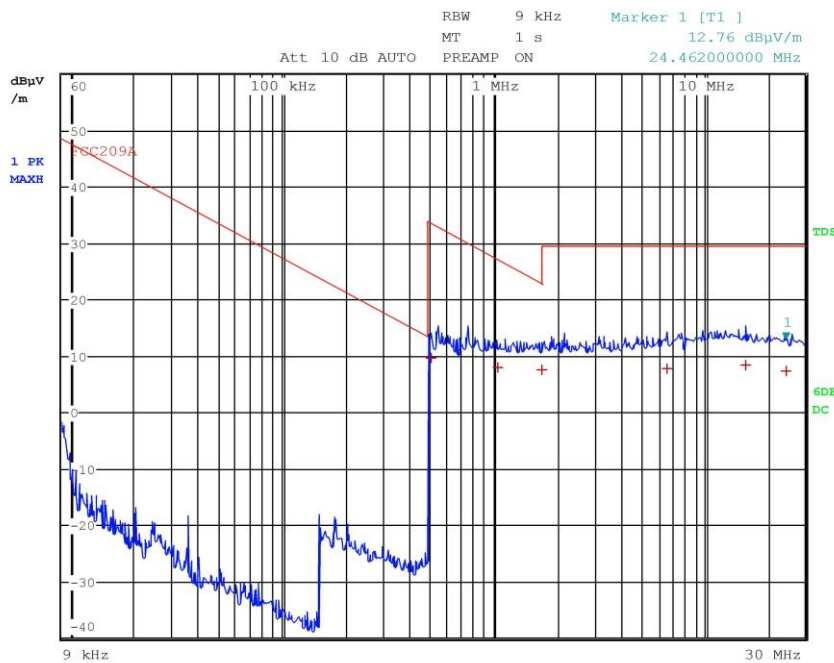
Meas Time: 1 s  
 Margin: 20 dB  
 Subranges: 8

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	510.000000000 kHz	9.68	Quasi Peak	-23.78
1	954.000000000 kHz	8.08	Quasi Peak	-19.94
1	1.574000000 MHz	7.47	Quasi Peak	-16.19
1	3.270000000 MHz	7.33	Quasi Peak	-22.21
1	5.654000000 MHz	7.58	Quasi Peak	-21.96
1	13.666000000 MHz	8.51	Quasi Peak	-21.03
1	14.590000000 MHz	8.39	Quasi Peak	-21.15
1	29.342000000 MHz	6.96	Quasi Peak	-22.58

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**Meas Type**  
**Equipment under Test**  
**Manufacturer**  
**OP Condition**  
**Operator** Panozzo 17115820  
**Test Spec**



**Final Measurement**

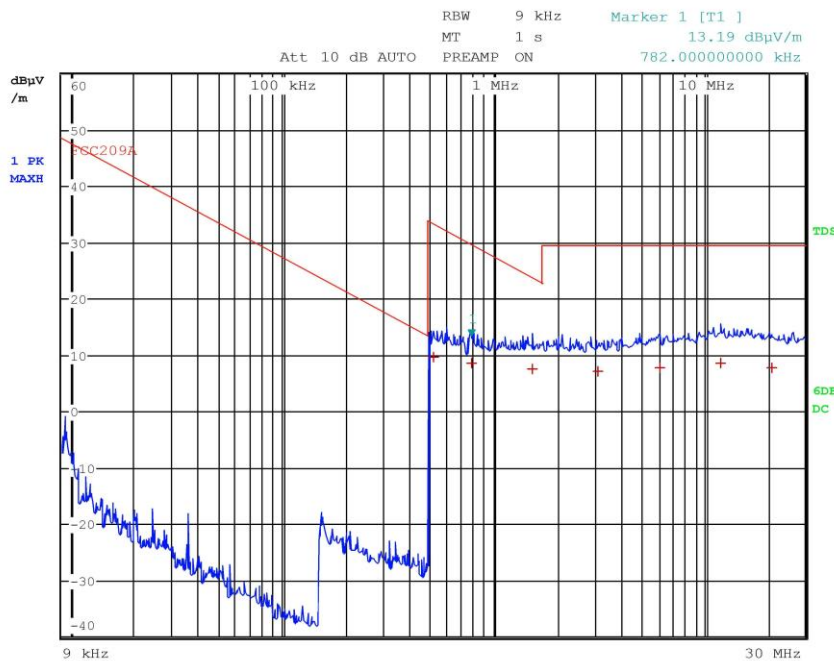
Meas Time: 1 s  
 Margin: 20 dB  
 Subranges: 6

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	502.00000000 kHz	9.58	Quasi Peak	-24.01
1	1.050000000 MHz	8.06	Quasi Peak	-19.12
1	1.698000000 MHz	7.52	Quasi Peak	-15.49
1	6.678000000 MHz	7.88	Quasi Peak	-21.66
1	15.570000000 MHz	8.35	Quasi Peak	-21.19
1	24.462000000 MHz	7.30	Quasi Peak	-22.24

CMC Centro Misure Compatibilità S.r.l.



**Meas Type**  
**Equipment under Test**  
**Manufacturer**  
**OP Condition**  
**Operator** Panozzo 17115821  
**Test Spec**



**Final Measurement**

Meas Time: 1 s  
 Margin: 20 dB  
 Subranges: 7

Trace	Frequency	Level (dBµV/m)	Detector	Delta Limit/dB
1	514.000000000 kHz	9.63	Quasi Peak	-23.76
1	782.000000000 kHz	8.54	Quasi Peak	-21.20
1	1.518000000 MHz	7.56	Quasi Peak	-16.42
1	3.102000000 MHz	7.24	Quasi Peak	-22.30
1	6.166000000 MHz	7.71	Quasi Peak	-21.83
1	11.942000000 MHz	8.60	Quasi Peak	-20.94
1	20.914000000 MHz	7.87	Quasi Peak	-21.67

**Result:** The requirements are met

CMC Centro Misure Compatibilità S.r.l.



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

#### Test specification

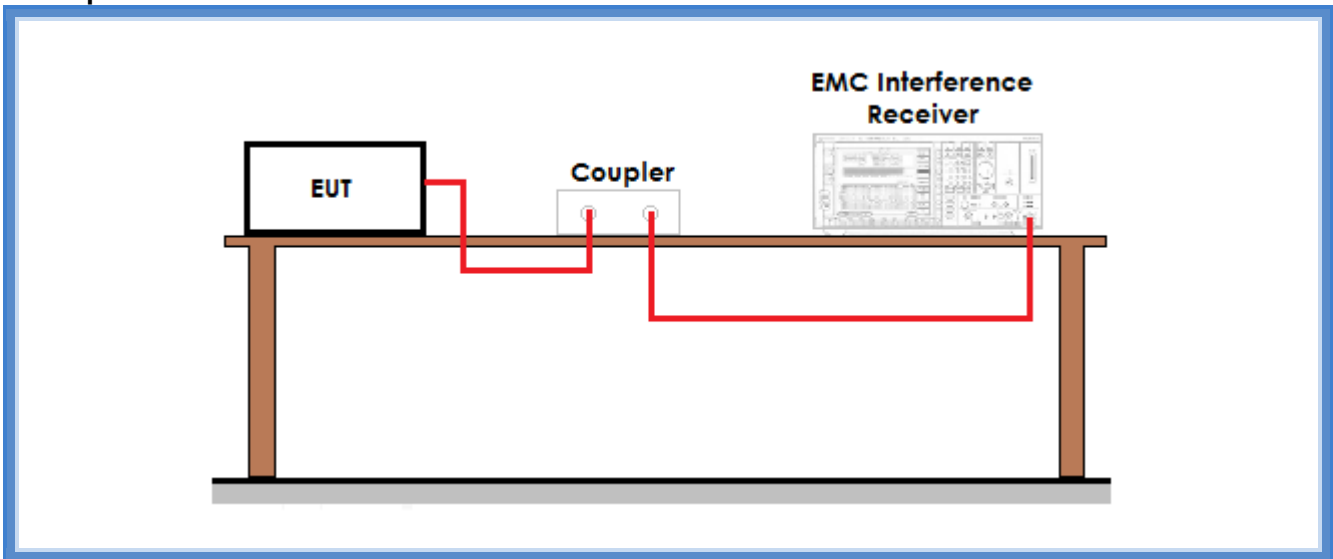
See FCC Part 15.247

#### Environmental conditions

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

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

## Setup



## Result

Frequency (MHz)	Graphs	20 dB bandwidth (kHz)	Maximum 20 dB bandwidth allowed (kHz)	Results
915,15	G17115837	23,526	500	Complies
921,50	G17115834	23,620	500	Complies
927,85	G17115822	23,601	500	Complies



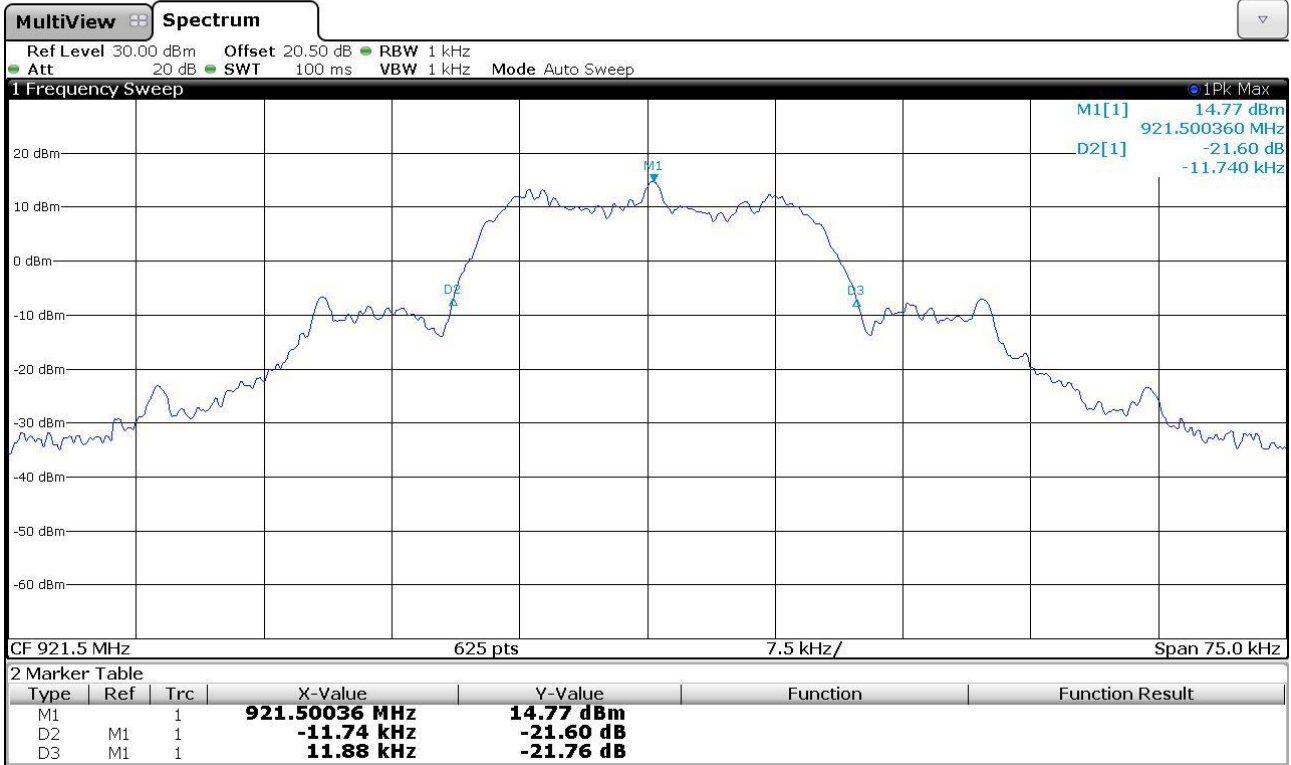
## Graphs

Gandini 17115822



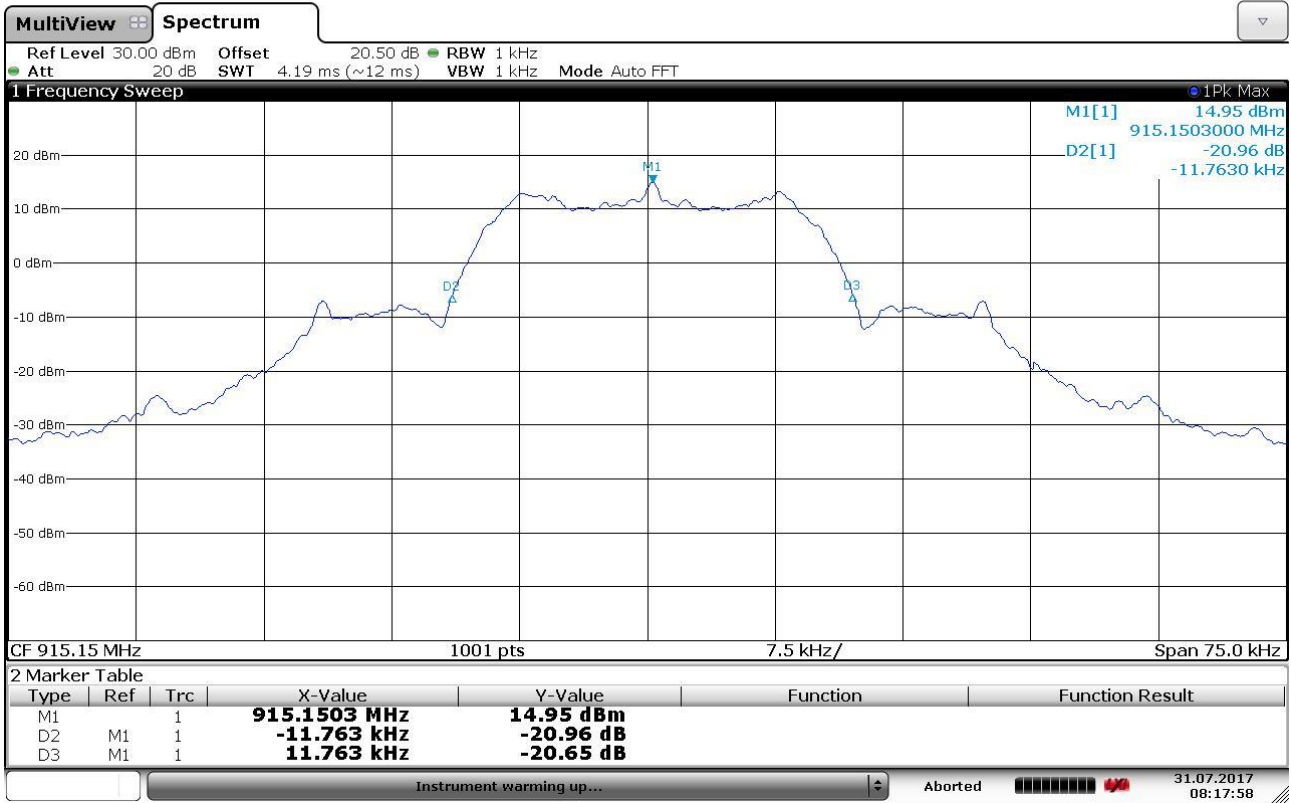


Gandini 17115834





Gandini 17115837



**Result:** The requirements are met





## 11.4 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

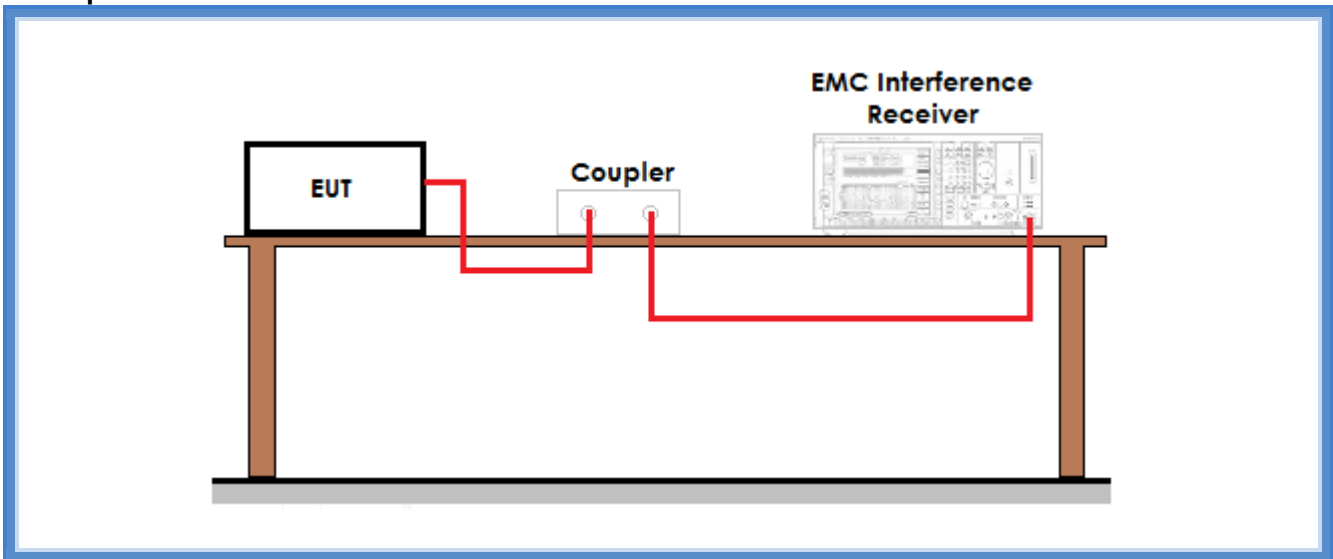
See FCC Part 15.247

### Environmental conditions

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



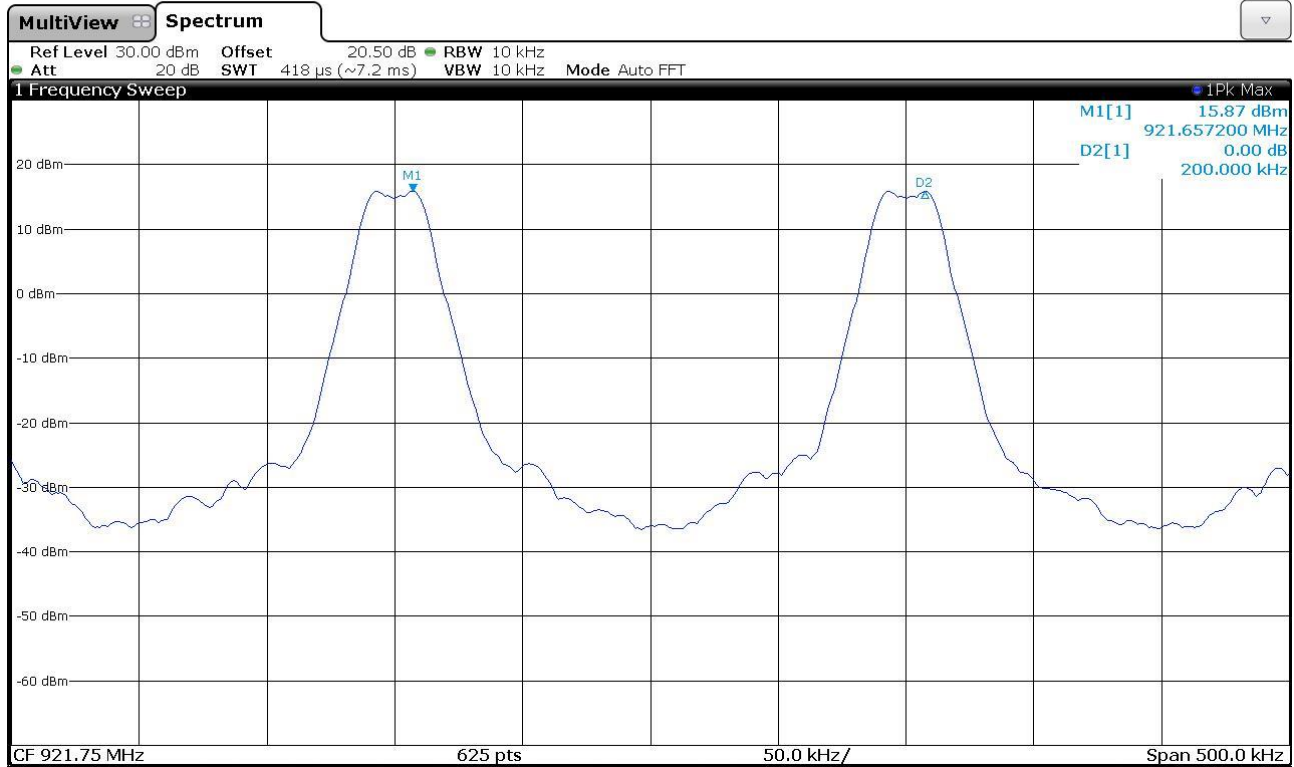
## Result

Frequency band (MHz)	Graphs	Channel separation (kHz)	Minimum channel separation required (kHz)	Results
902 – 928	G17115831	200	25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater	Complies



## Graphs

Gandini 17115831



**Result:** The requirements are met



## 11.5 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

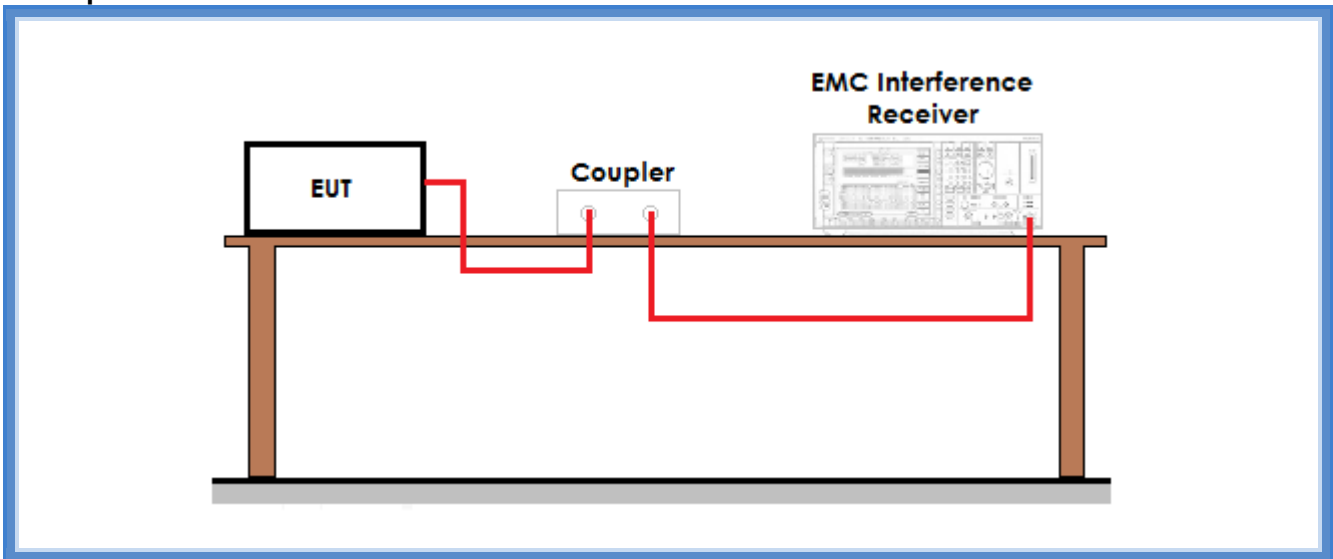
See FCC Part 15.247

### Environmental conditions

<i>Temperature (°C)</i>	<i>Atmospheric pressure (kPa)</i>	<i>Relative humidity (%)</i>
20	100	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. Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

## Setup



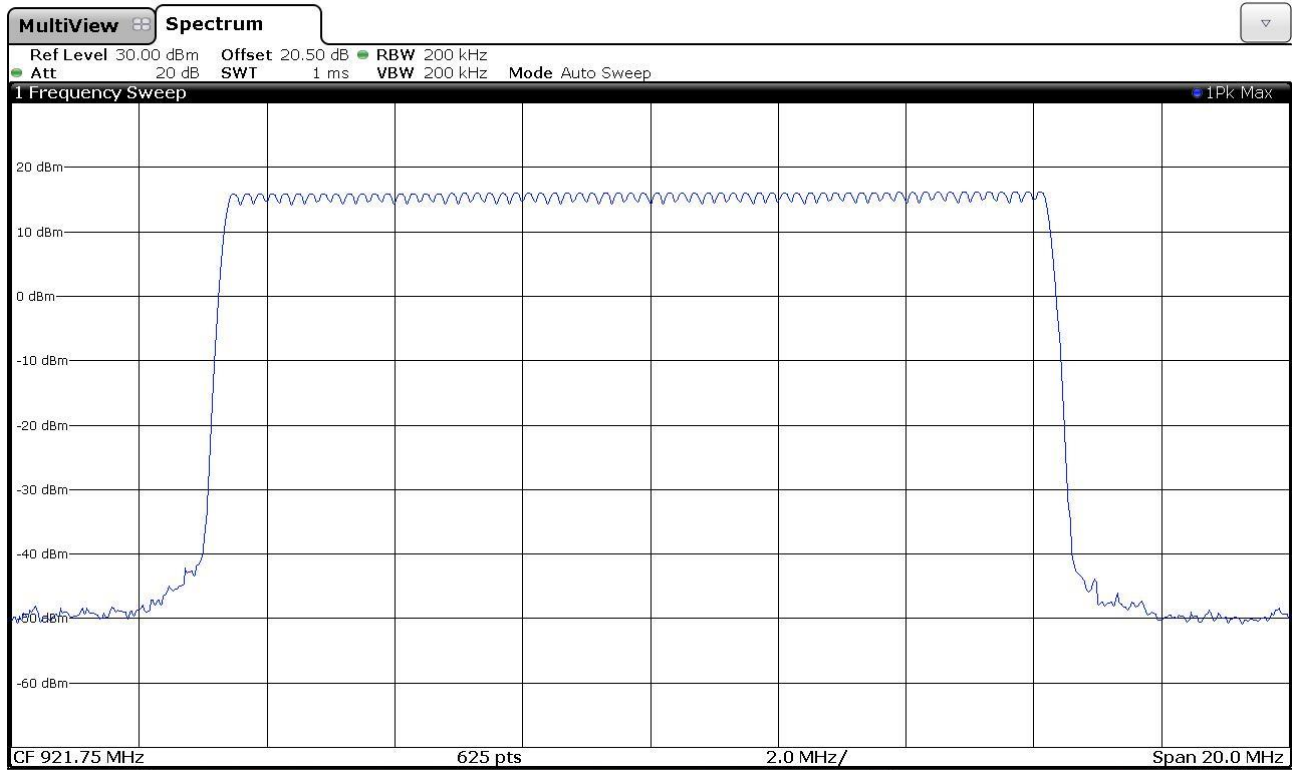
## Result

Frequency band (MHz)	Graphs	Number of hopping channels	Minimum number of hopping channels required	Results
902 – 928	G17115829 and G17115830	64	50 if the 20 dB bandwidth is less than 250 kHz 25 if the 20 dB bandwidth is 250 kHz or greater	Complies



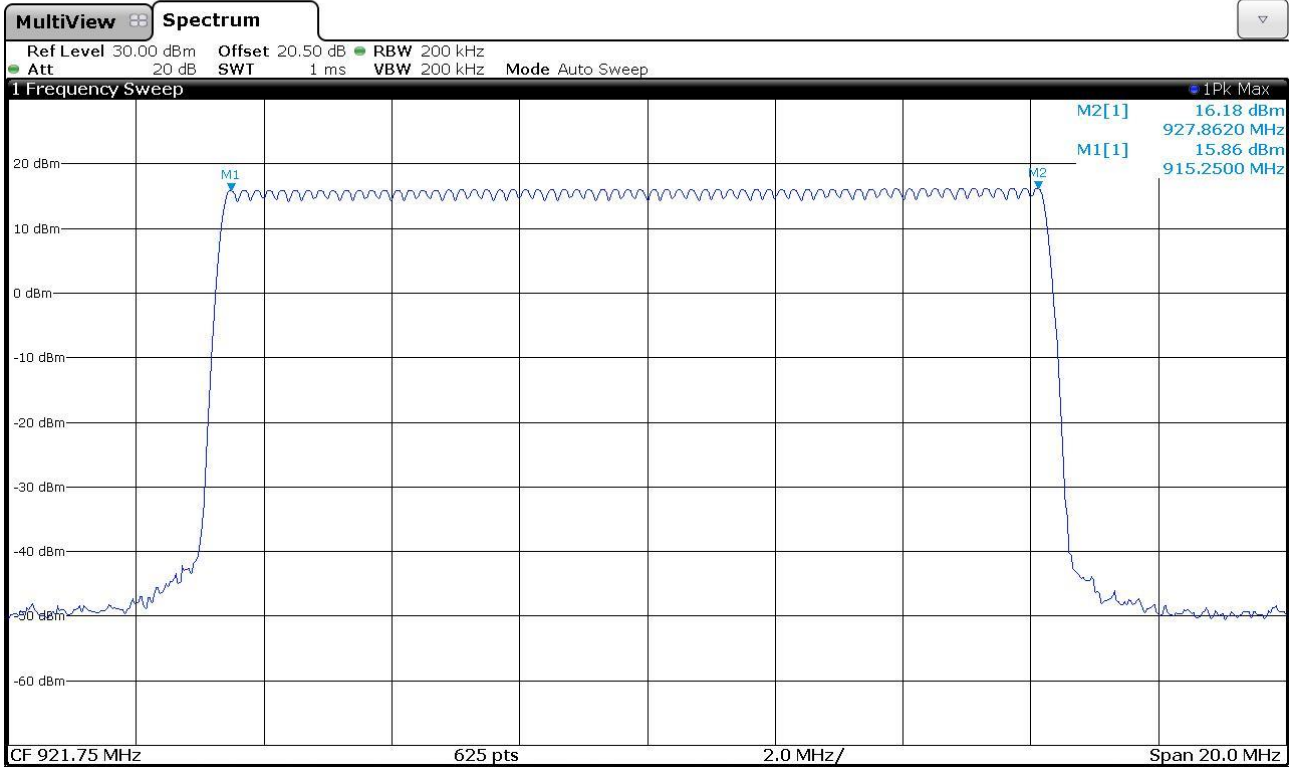
## Graphs

Gandini 17115829





Gandini 17115830



**Result:** The requirements are met



## 11.6 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

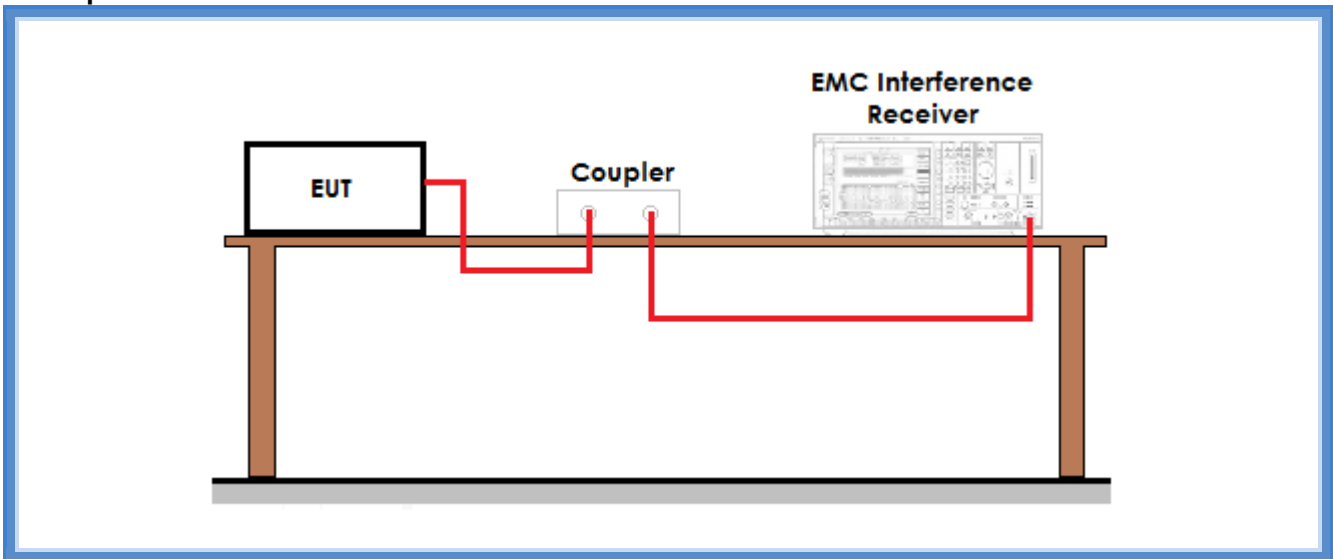
<i>Temperature (°C)</i>	<i>Atmospheric pressure (kPa)</i>	<i>Relative humidity (%)</i>
22	100	42

### 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

Frequency (MHz)	Graphs	Dwell time (ms)
921,65	G17115832	20,5929

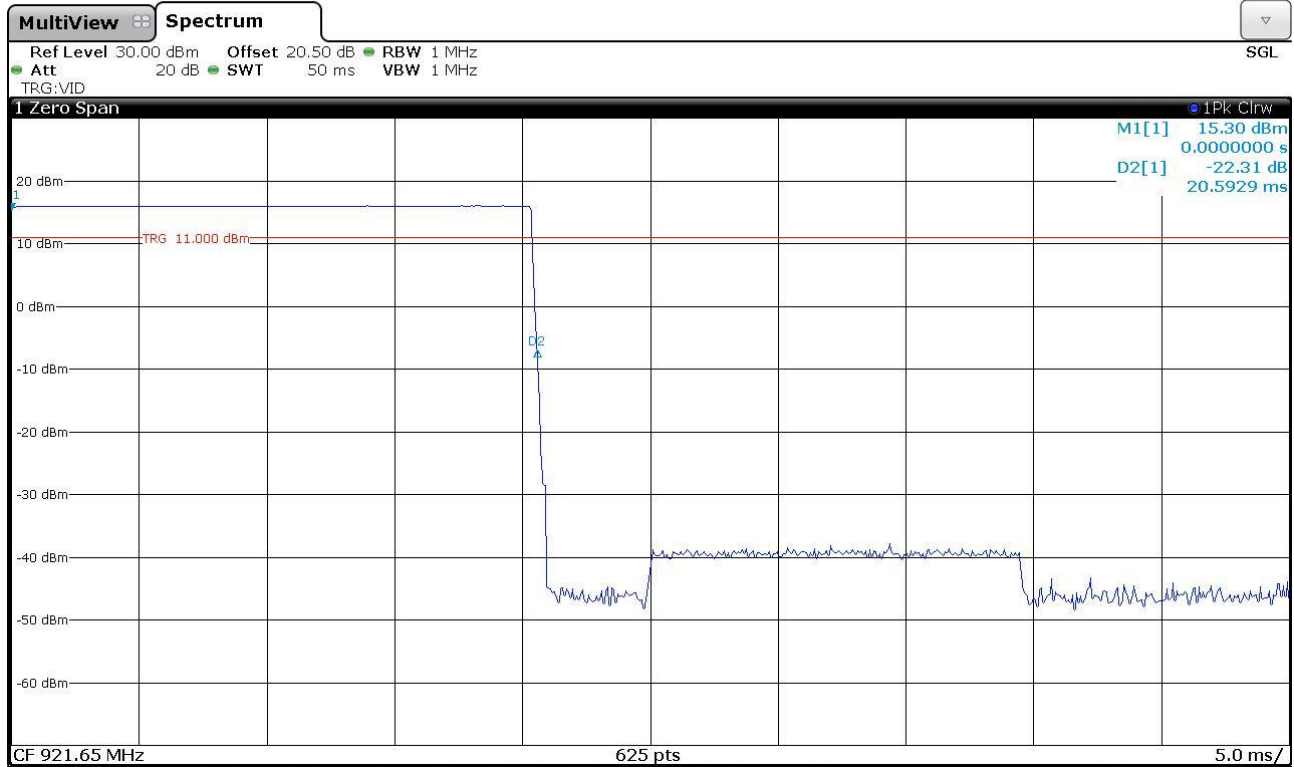
Frequency (MHz)	Time between 2 transmission on different channels	Number of transmissions on a period of 20 s
921,65	G17115833      50	20 s / 50 ms / 64 = 6,25

Time of occupancy (Dwell time x Nr. transmissions)	Maximum time of occupancy	Results
128,71 ms	0,4 s	Complies



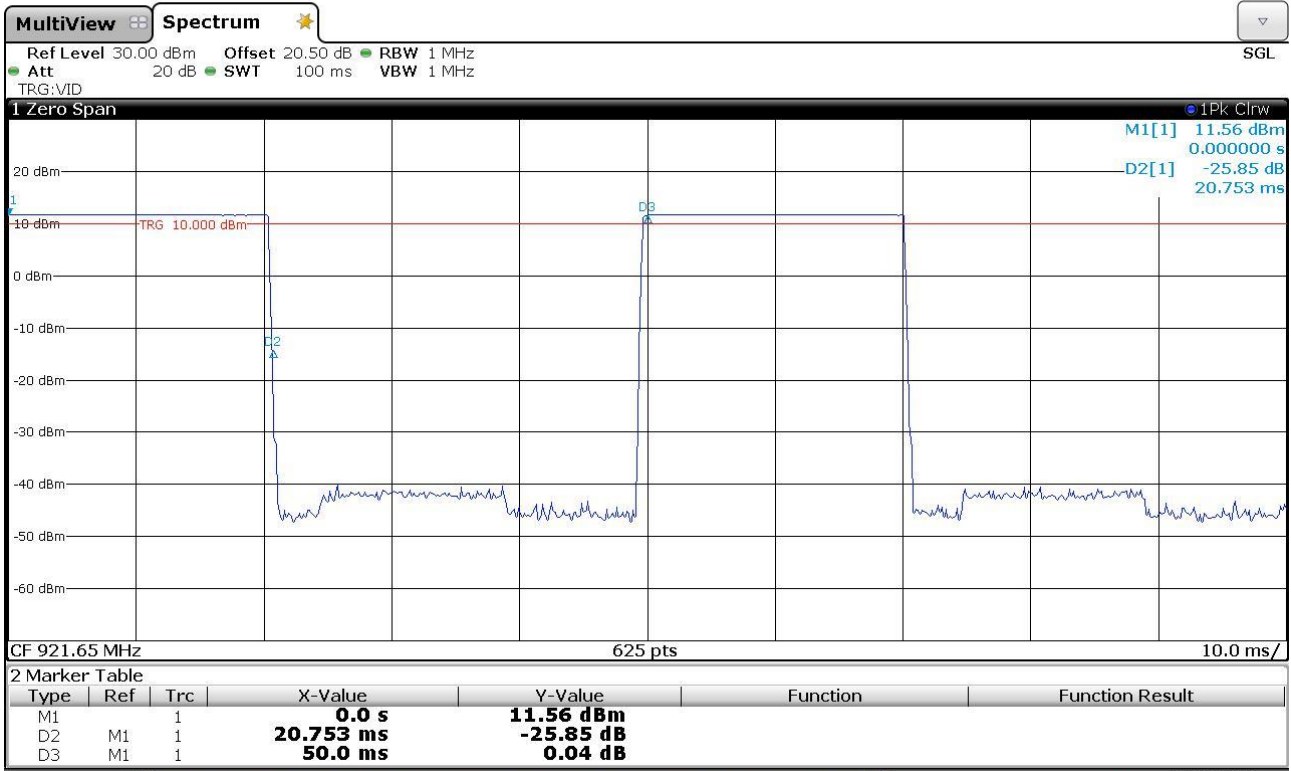
## Graphs

Gandini 17115832





Gandini 17115833



**Result:** The requirements are met



## 11.7 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

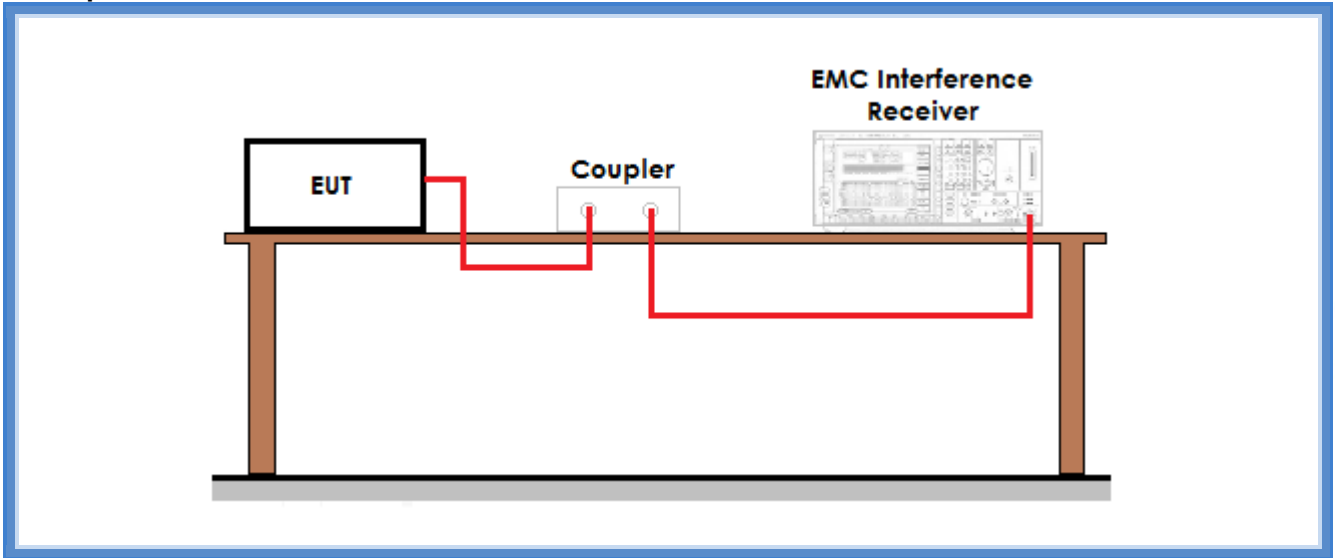
### Environmental conditions

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

**Acceptance limits:** operation within the band 902 – 928 MHz

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### Setup



### Result

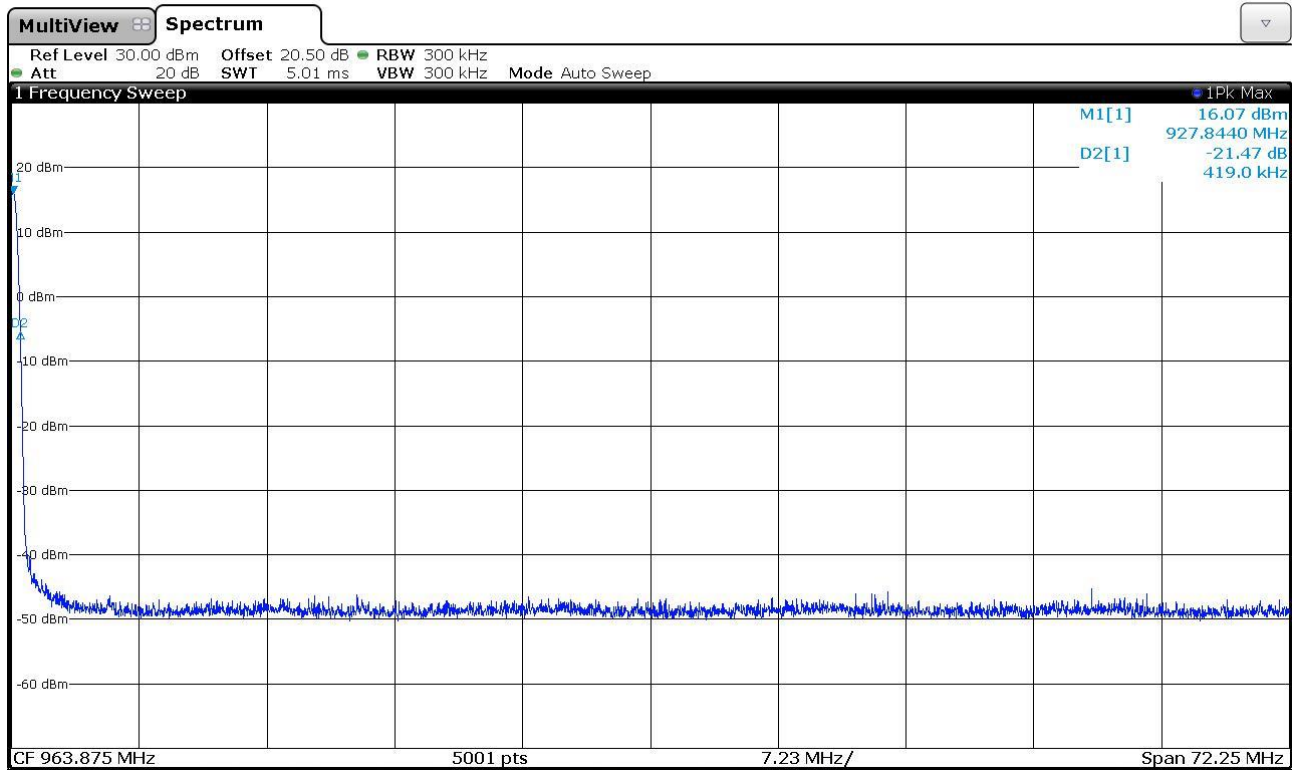
Frequency (MHz)	Graph(s) – Hopping	Results	
915,15	G17115842	F <sub>L</sub> : 915,1033 MHz	Complies
	G17115843		
927,85	G17115827	F <sub>H</sub> : 927,8844 MHz	Complies
	G17115828		

Frequency (MHz)	Graph(s) – No hopping	Results	
915,15	G17115840	F <sub>L</sub> : 915,1272 MHz	Complies
	G17115841		
927,85	G17115825	F <sub>H</sub> : 927,8746 MHz	Complies
	G17115826		



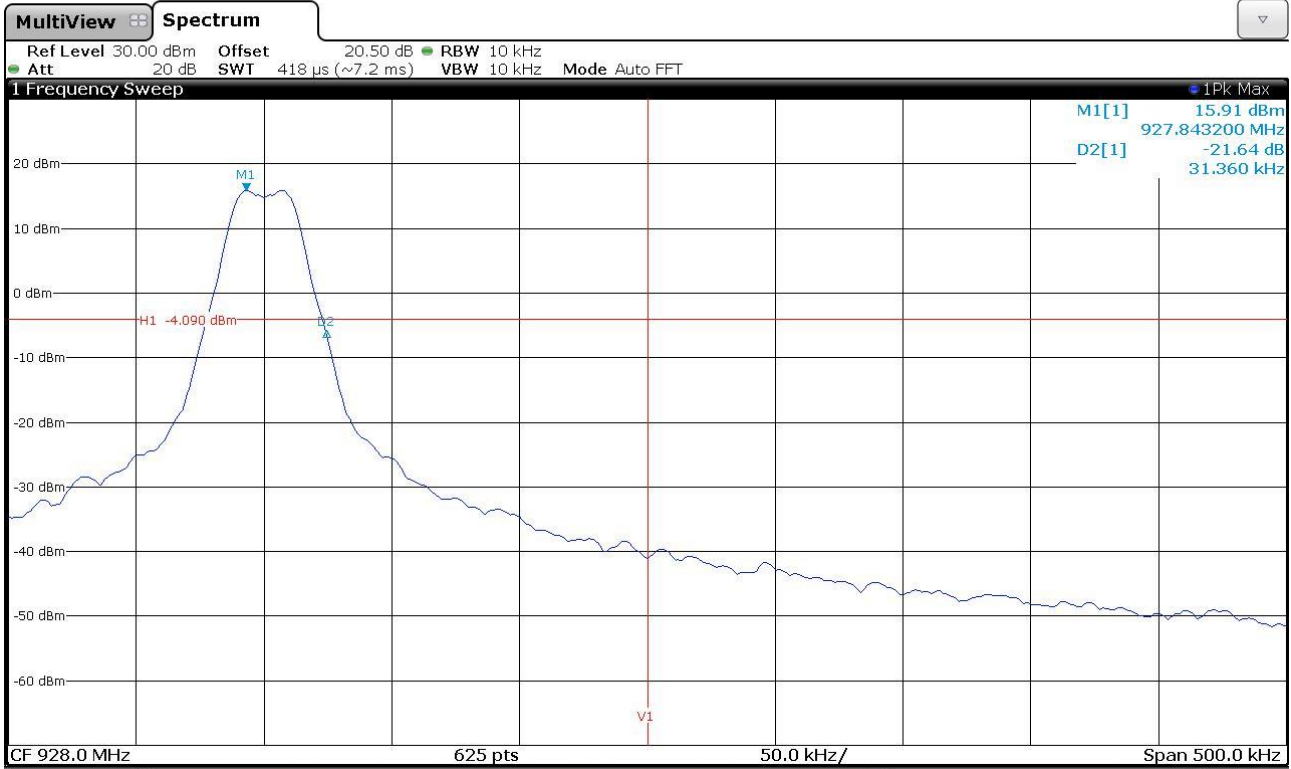
## Graphs

Gandini 17115825





Gandini 17115826

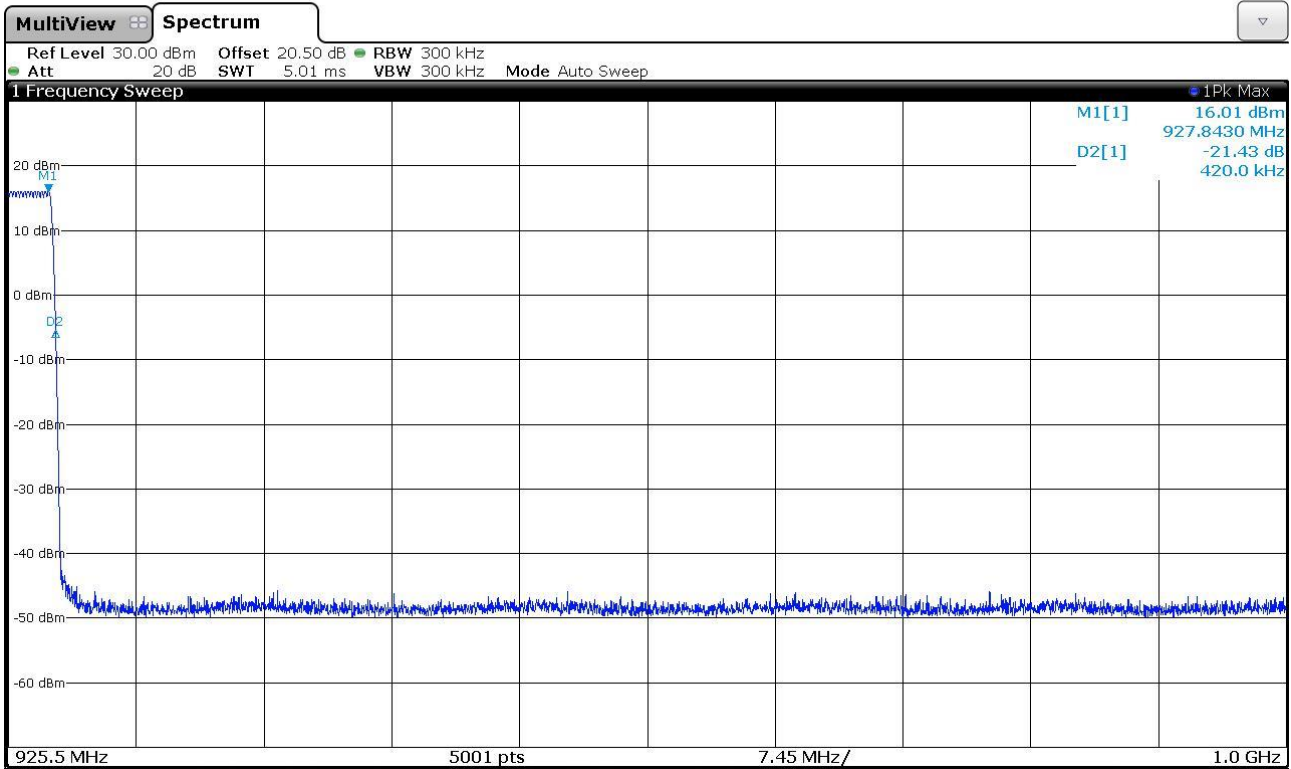






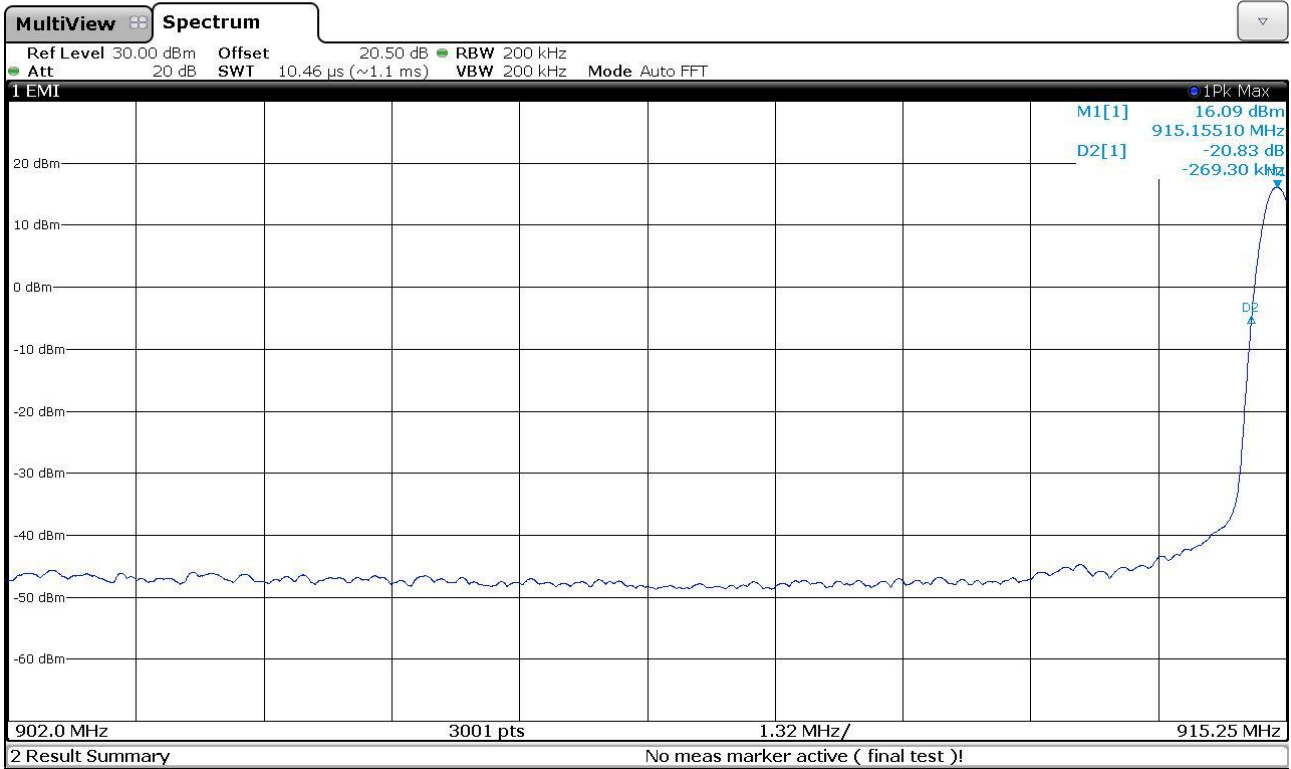


Gandini 17115828



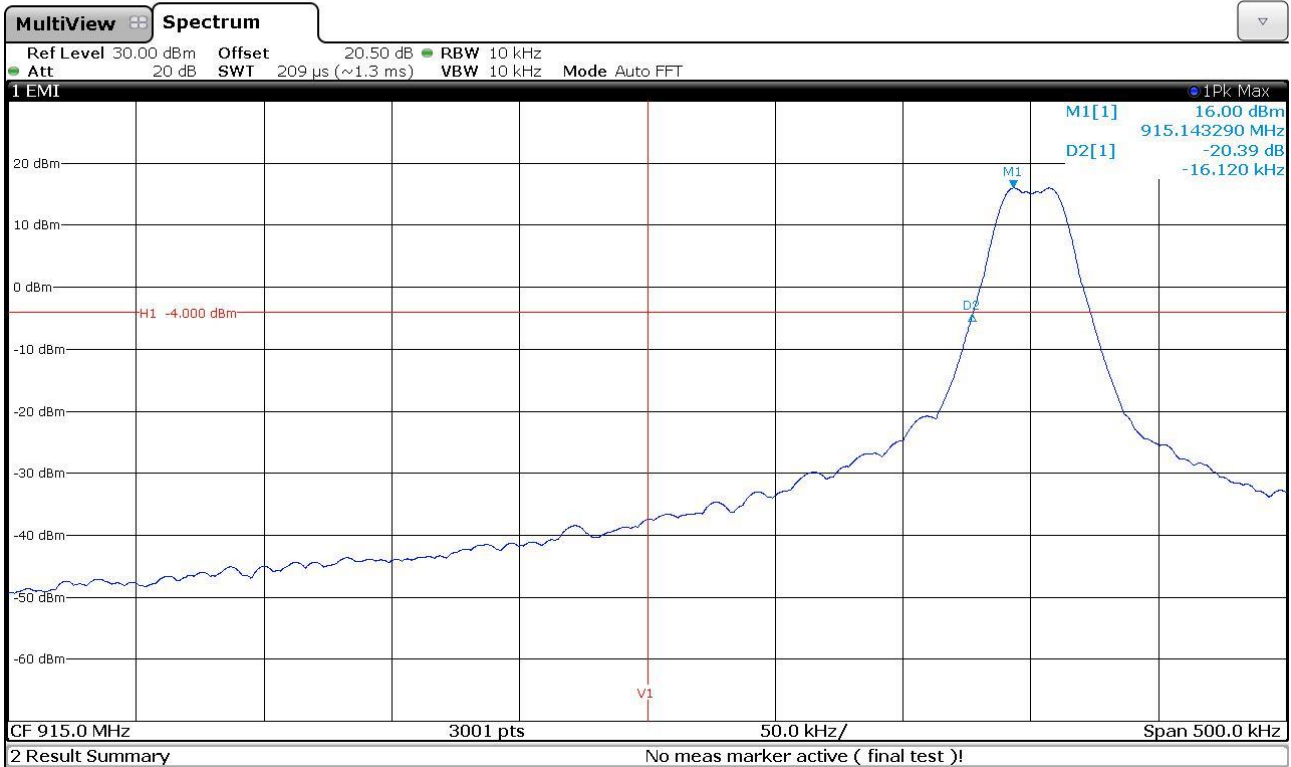


Gandini 17115840





Gandini 17115841



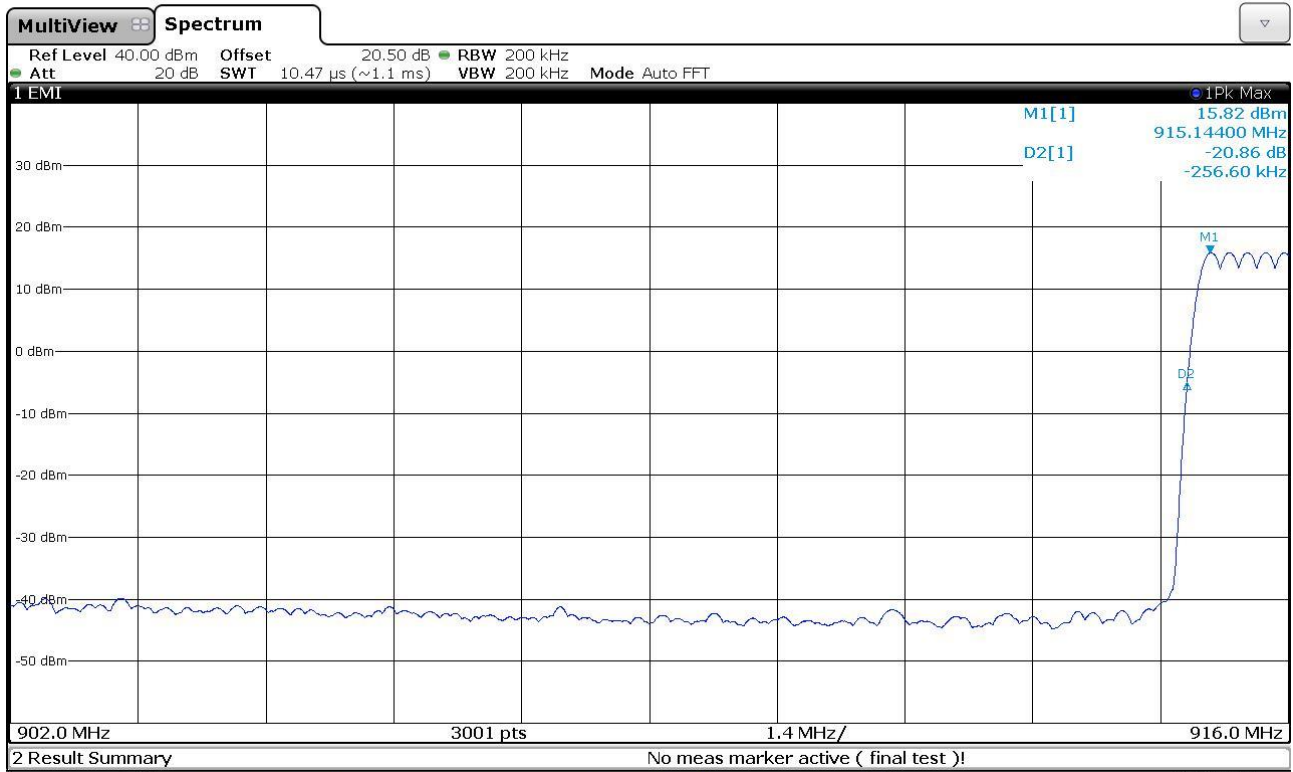


Gandini 17115842





Gandini 17115843



**Result:** The requirements are met



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

### Test specification

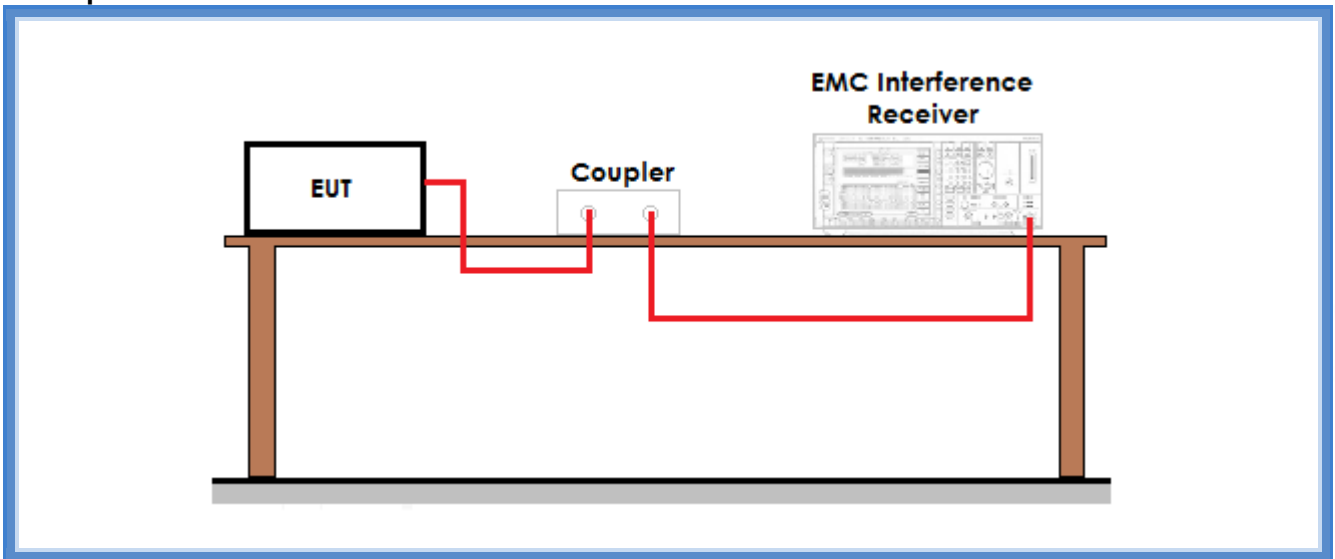
Port: Antenna

### Environmental conditions

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

For frequency hopping systems operating in the 2400–2483,5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483,5 MHz band: 0,125 watts.  
 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



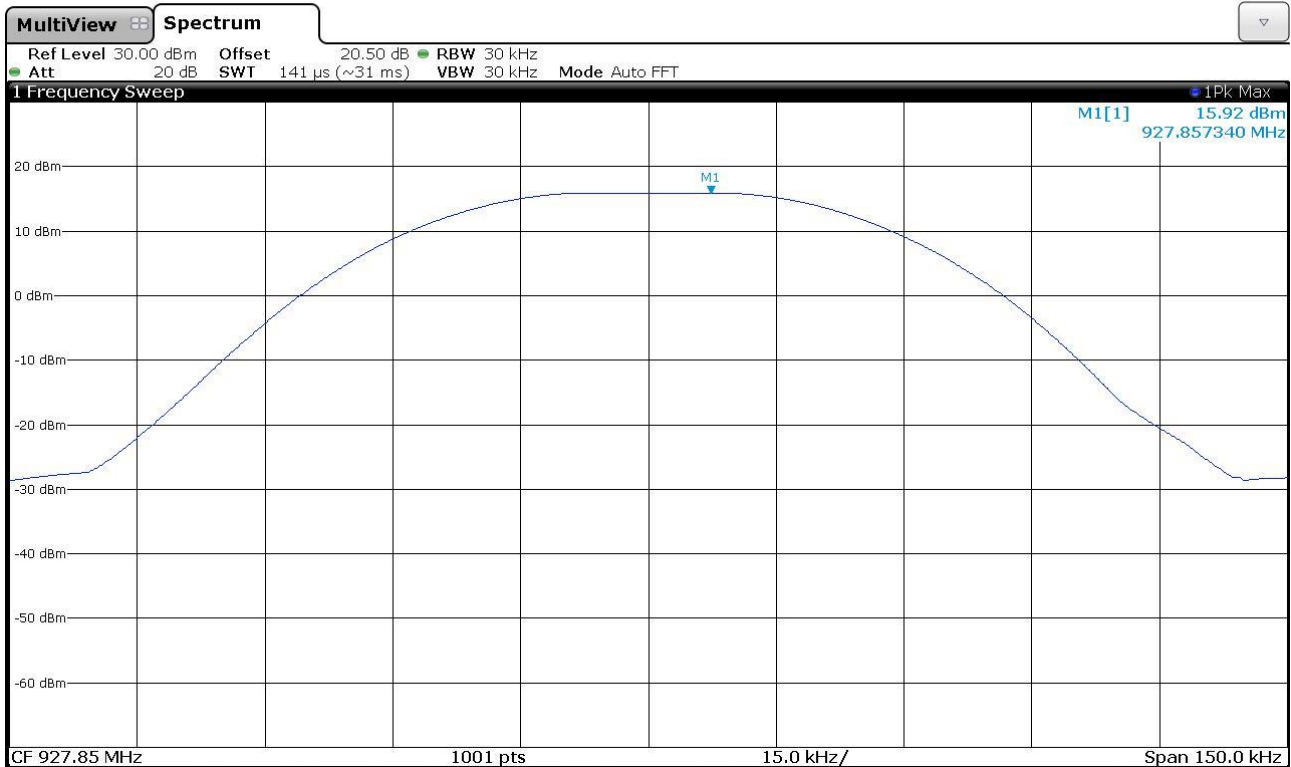
### Result

Frequency (MHz)	Graphs	Conducted measured level (dBm)	Conducted power level (mW)	Calculated radiated level (dB $\mu$ V/m)
915,14311	G17115839	16,18	41,50	113,41
921,49328	G17115836	15,87	38,64	113,10
927,85734	G17115824	15,92	39,08	113,15



## Graphs

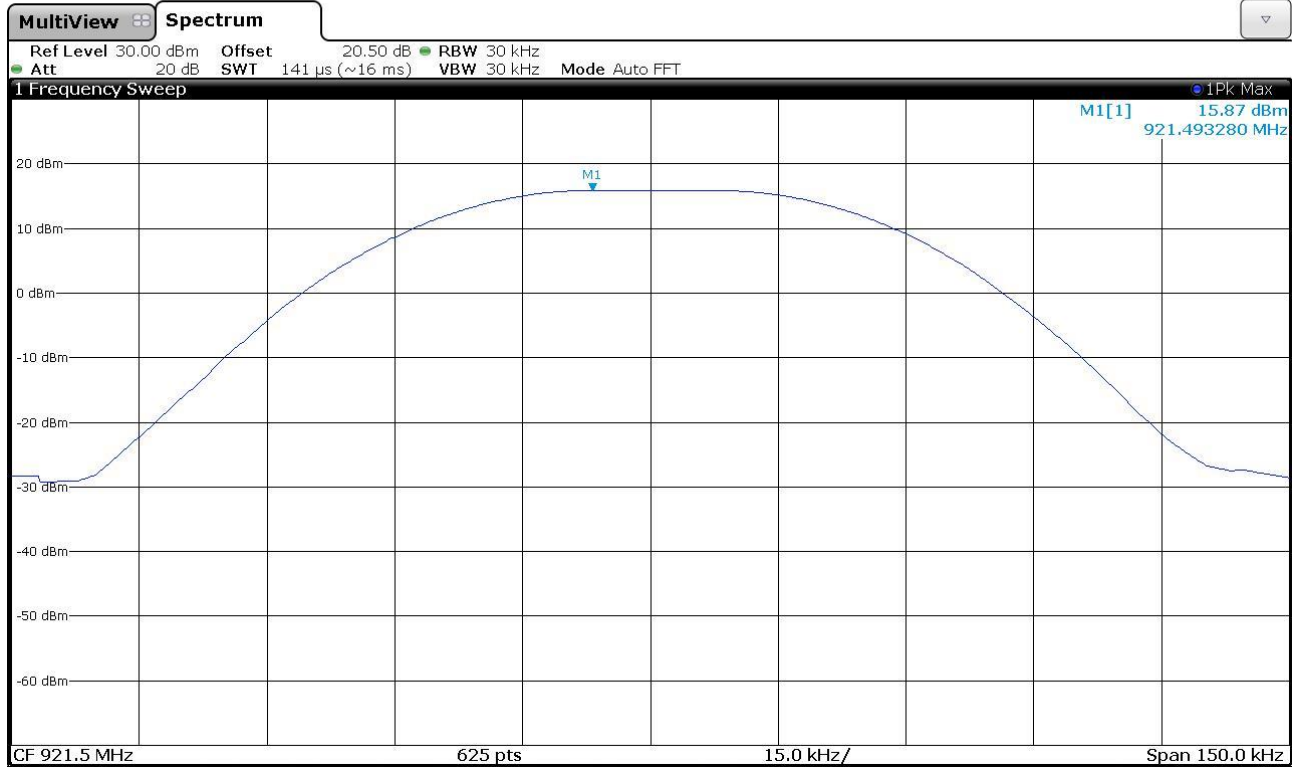
Gandini 17115824







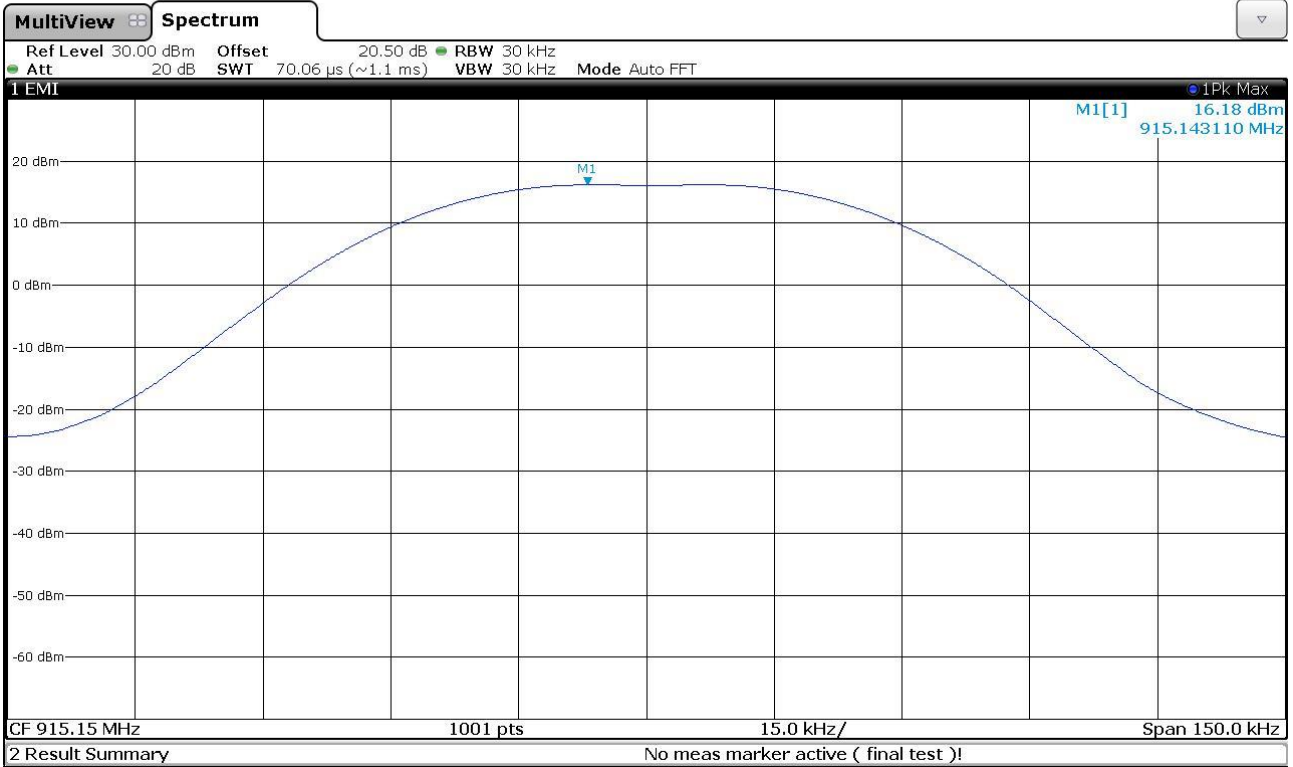
Gandini 17115836



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Gandini 17115839



**Result:** The requirements are met

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## 11.9 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  
Frequency range: 0,009 MHz – 10000 MHz  
Antenna polarization: Horizontal (H) – Vertical (V)  
10 m for frequencies  $\leq$  30 MHz  
3 m for frequencies  $>$  30 MHz

### Environmental conditions

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

### Acceptance limits

Acceptance limits for emissions in restricted frequency bands		
Frequency (MHz)	AV limits [dB( $\mu$ V/m)]	Peak limits [dB( $\mu$ V/m)]
$>$ 1000	54	74



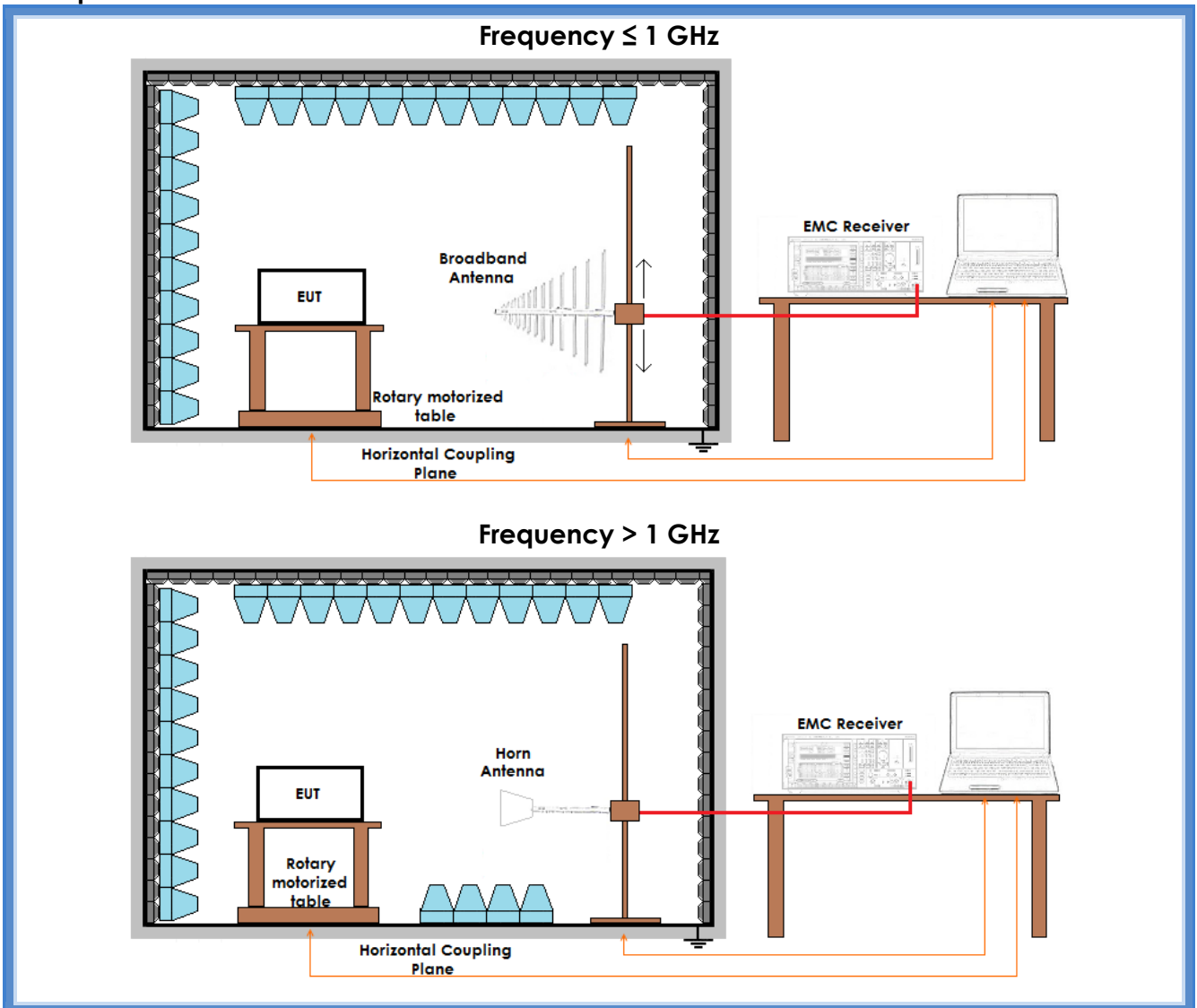
The restricted frequency bands are listed in the following table

MHz	MHz	MHz	GHz
0,090 – 0,110	16,42 – 16,423	399,9 – 410	4,5 – 5,15
0,495 – 0,505	16,69475 – 16,69525	608 – 614	5,35 – 5,46
2,1735 – 2,1905	16,80425 – 16,80475	960 – 1240	7,25 – 7,75
4,125 – 4,128	25,5 – 25,67	1300 – 1427	8,025 – 8,5
4,17725 – 4,17775	37,5 – 38,25	1435 – 1626,5	9,0 – 9,2
4,20725 – 4,20775	73 – 74,6	1645,5 – 1646,5	9,3 – 9,5
6,215 – 6,218	74,8 – 75,2	1660 – 1710	10,6 – 12,7
6,26775 – 6,26825	108 – 121,94	1718,8 – 1722,2	13,25 – 13,4
6,31175 – 6,31225	123 – 138	2200 – 2300	14,47 – 14,5
8,291 – 8,294	149,9 – 150,05	2310 – 2390	15,35 – 16,2
8,362 – 8,366	156,52475 – 156,52525	2483,5 – 2500	17,7 – 21,4
8,37625 – 8,38675	156,7 – 156,9	2690 – 2900	22,01 – 23,12
8,41425 – 8,41475	162,0125 – 167,17	3260 – 3267	23,6 – 24,0
12,29 – 12,293	167,72 – 173,2	3332 – 3339	31,2 – 31,8
12,51975 – 12,52025	240 – 285	3345,8 – 3358	36,43 – 36,5
12,57675 – 12,57725	322 – 335,4	3600 – 4400	Above 38,6
13,36 – 13,41			

#### Acceptance limits for emissions in non-restricted frequency bands

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

## Setup





### Result – AV detector

Harmonic	Lowest channel		Medium channel		Highest channel		Results
	Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	
II	43,62	54,00	42,95	54,00	40,78	54,00	Complies
III	41,42	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
IV	40,05	54,00	39,37	54,00	More than 20 dB below limit	54,00	Complies
V	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
VI	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
VII	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
VIII	39,86	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
IX	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies
X	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	More than 20 dB below limit	54,00	Complies

**Remarks:** EUT was tested in 3 orthogonal planes. The results in this table show the highest values. No spurious other than harmonics have been found. The results have been extrapolated to the specified distance using an extrapolation factor. For all harmonics it was considered the limit of 54 dB $\mu$ V/m as a worse case.



### Result – Peak detector

Harmonic	Lowest channel		Medium channel		Highest channel		Results
	Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	
II	49,77	74,00	49,89	74,00	46,27	74,00	Complies
III	52,28	74,00	More than 20 dB below limit	74,00	51,82	74,00	Complies
IV	49,08	74,00	47,68	74,00	More than 20 dB below limit	74,00	Complies
V	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies
VI	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies
VII	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies
VIII	54,34	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies
IX	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies
X	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	More than 20 dB below limit	74,00	Complies

**Remarks:** EUT was tested in 3 orthogonal planes. The results in this table show the highest values. No spurious other than harmonics have been found. The results have been extrapolated to the specified distance using an extrapolation factor. For all harmonics it was considered the limit of 74 dB $\mu$ V/m as a worse case.

**Result:** The requirements are met



## 11.10 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

<b>Acceptance limits</b>	1 mW/cm <sup>2</sup> max at 20 cm of distance
--------------------------	---

### Result

Power Density Limit (mW/cm <sup>2</sup> )	Maximum Output Power (mW)	Antenna Gain (G)	Power Density at 20 cm (mW/cm <sup>2</sup> )	Remarks
1,00	41,50	1,585 (2 dBi)	1,31E-02	--

**Remarks:** Power Density = (P x G) / (4πR<sup>2</sup>)

**Result:** The requirements are met