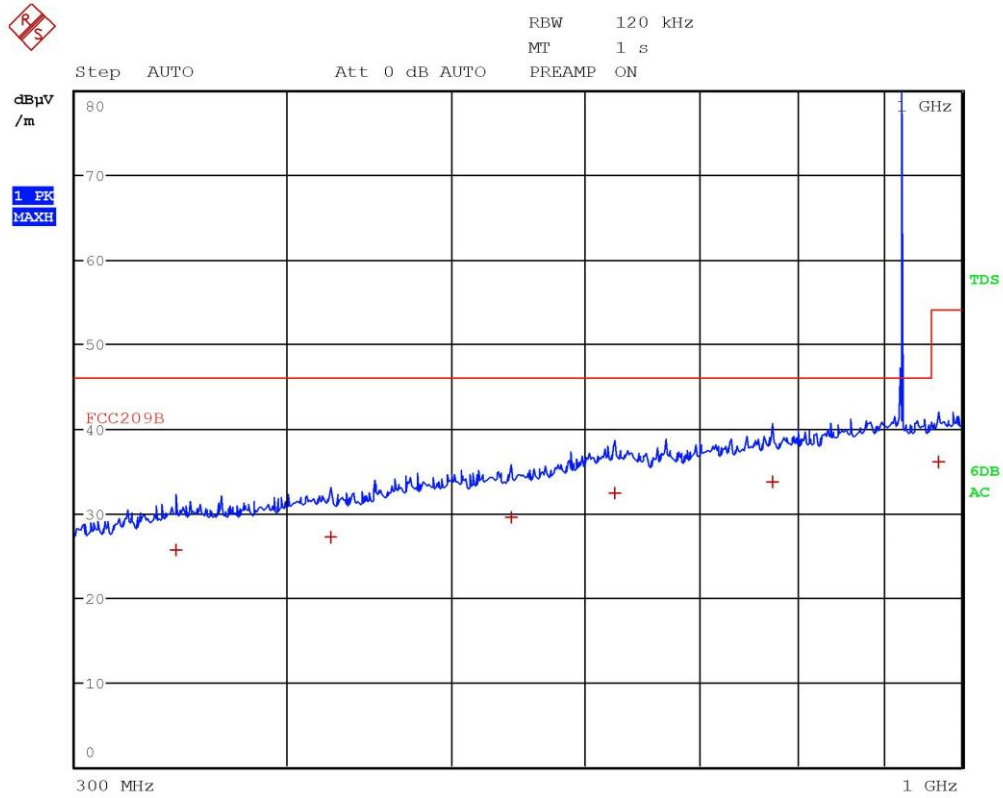




EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC209B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV/m	DELTA LIMIT dB
1 Quasi Peak	340.68 MHz	25.63	-20.38
1 Quasi Peak	430.52 MHz	27.10	-18.91
1 Quasi Peak	545.72 MHz	29.51	-16.50
1 Quasi Peak	601.32 MHz	32.21	-13.80
1 Quasi Peak	815.6 MHz	33.99	-12.02
1 Quasi Peak	882.08 MHz	35.50	-10.51
1 Quasi Peak	972.32 MHz	36.04	-17.93

Segalla 18231914



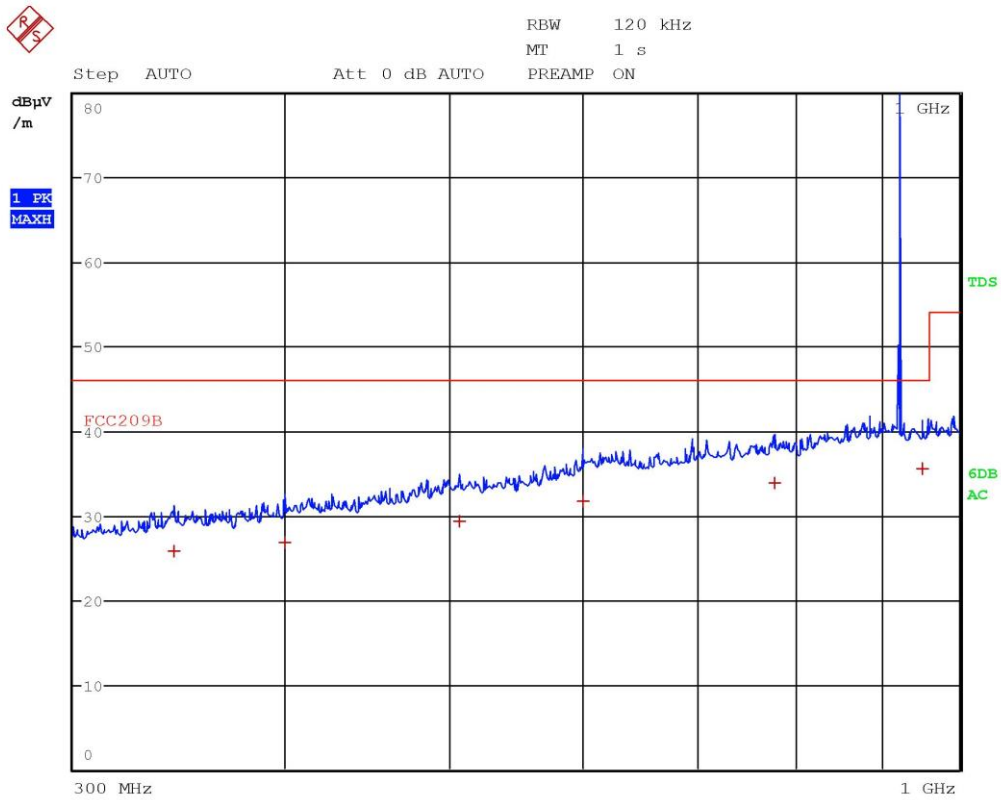
Segalla 18231915

CMC Centro Misure Compatibilità S.r.l.



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC209B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL d $\mu$ V/m	DELTA LIMIT dB
1 Quasi Peak	343.96 MHz	25.67	-20.34
1 Quasi Peak	424.8 MHz	27.22	-18.79
1 Quasi Peak	542.36 MHz	29.47	-16.54
1 Quasi Peak	624.08 MHz	32.35	-13.66
1 Quasi Peak	773.88 MHz	33.77	-12.24
1 Quasi Peak	969.08 MHz	36.04	-17.93

Segalla 18231915



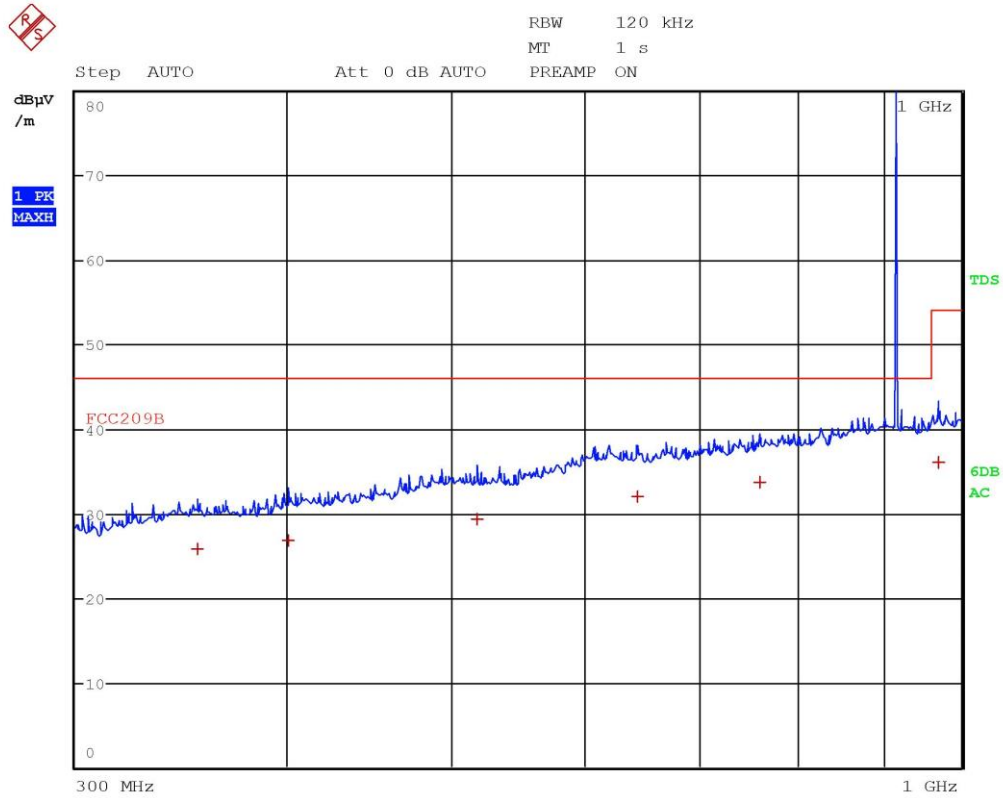
Segalla 18231916

CMC Centro Misure Compatibilità S.r.l.



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC209B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL d $\mu$ V/m	DELTA LIMIT dB
1 Quasi Peak	344.16 MHz	25.72	-20.29
1 Quasi Peak	399.6 MHz	26.83	-19.18
1 Quasi Peak	506.56 MHz	29.26	-16.75
1 Quasi Peak	599.24 MHz	31.60	-14.41
1 Quasi Peak	778.36 MHz	33.83	-12.18
1 Quasi Peak	950.2 MHz	35.60	-10.41

Segalla 18231916



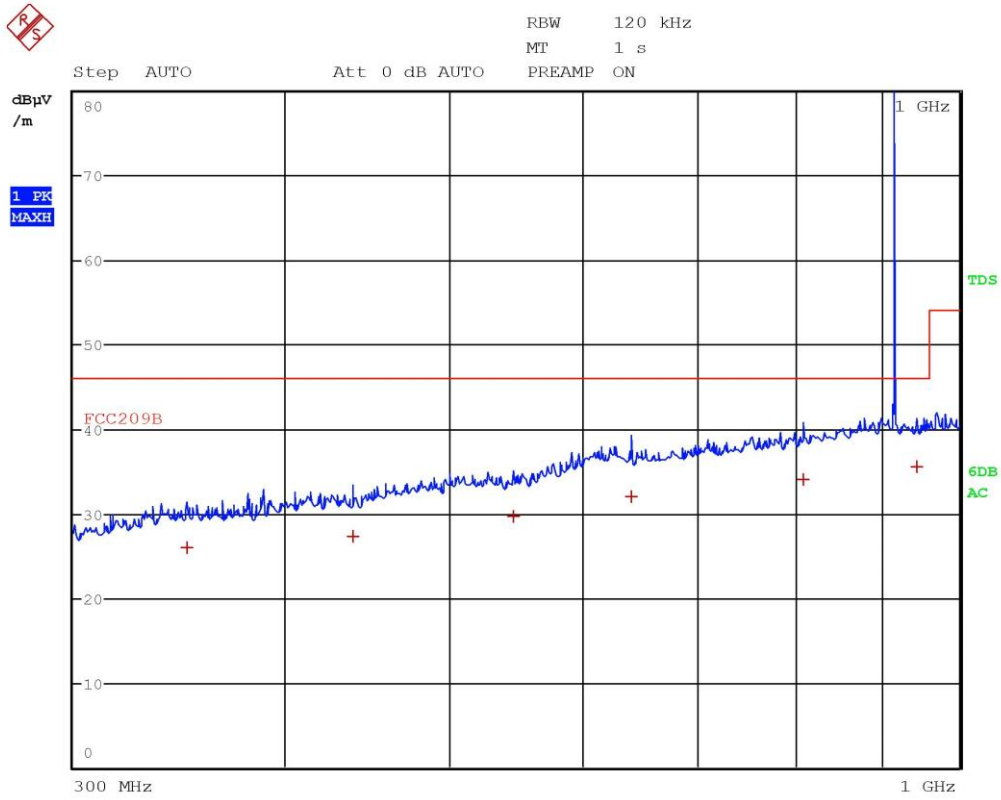
Segalla 18231917

CMC Centro Misure Compatibilità S.r.l.



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC209B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL d $\mu$ V/m	DELTA LIMIT dB
1 Quasi Peak	354.2 MHz	25.82	-20.19
1 Quasi Peak	401.04 MHz	26.81	-19.20
1 Quasi Peak	517.68 MHz	29.37	-16.65
1 Quasi Peak	643.8 MHz	31.96	-14.05
1 Quasi Peak	760.32 MHz	33.76	-12.25
1 Quasi Peak	969.84 MHz	36.04	-17.93

Segalla 18231917



Segalla 18231918

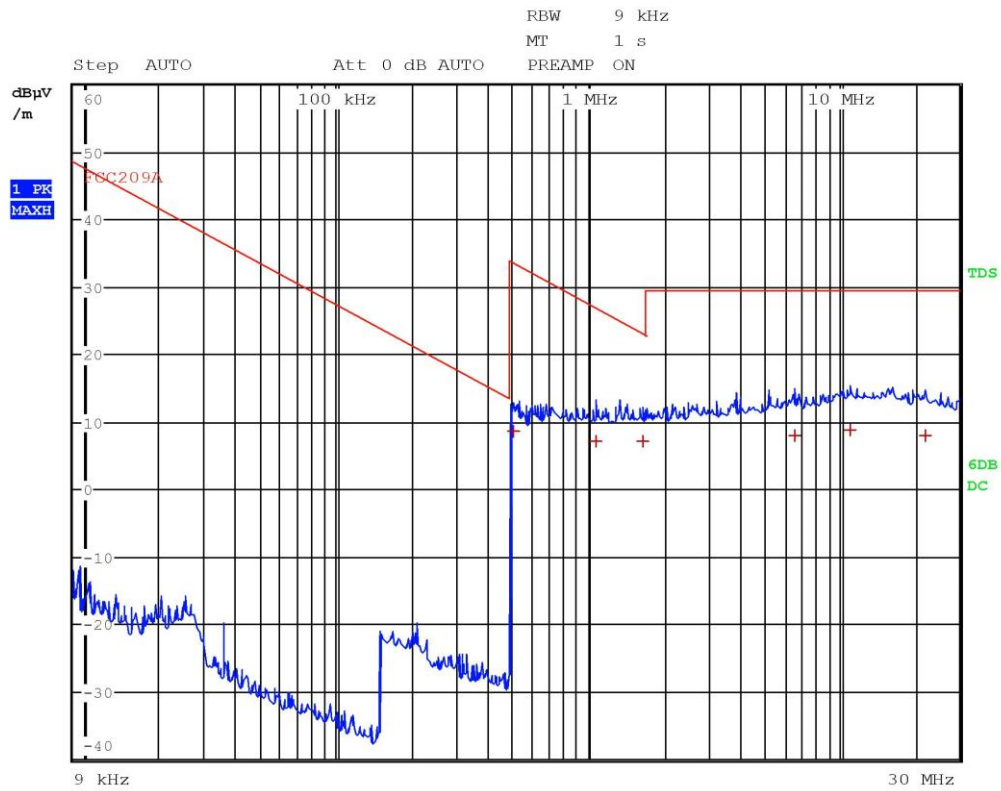
CMC Centro Misure Compatibilità S.r.l.





EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC209B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL d $\mu$ V/m	DELTA LIMIT dB
1 Quasi Peak	350.32 MHz	25.90	-20.11
1 Quasi Peak	438.68 MHz	27.34	-18.67
1 Quasi Peak	545.72 MHz	29.58	-16.43
1 Quasi Peak	640.72 MHz	32.06	-13.95
1 Quasi Peak	808.96 MHz	34.03	-11.98
1 Quasi Peak	943.92 MHz	35.57	-10.44

Segalla 18231918



Segalla 18231940

**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
- ANSI C63.10 cl. 7.8.7
- 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 S164, CMC S287  
 Measurement uncertainty: See clause 7 of this test report

#### Test specification

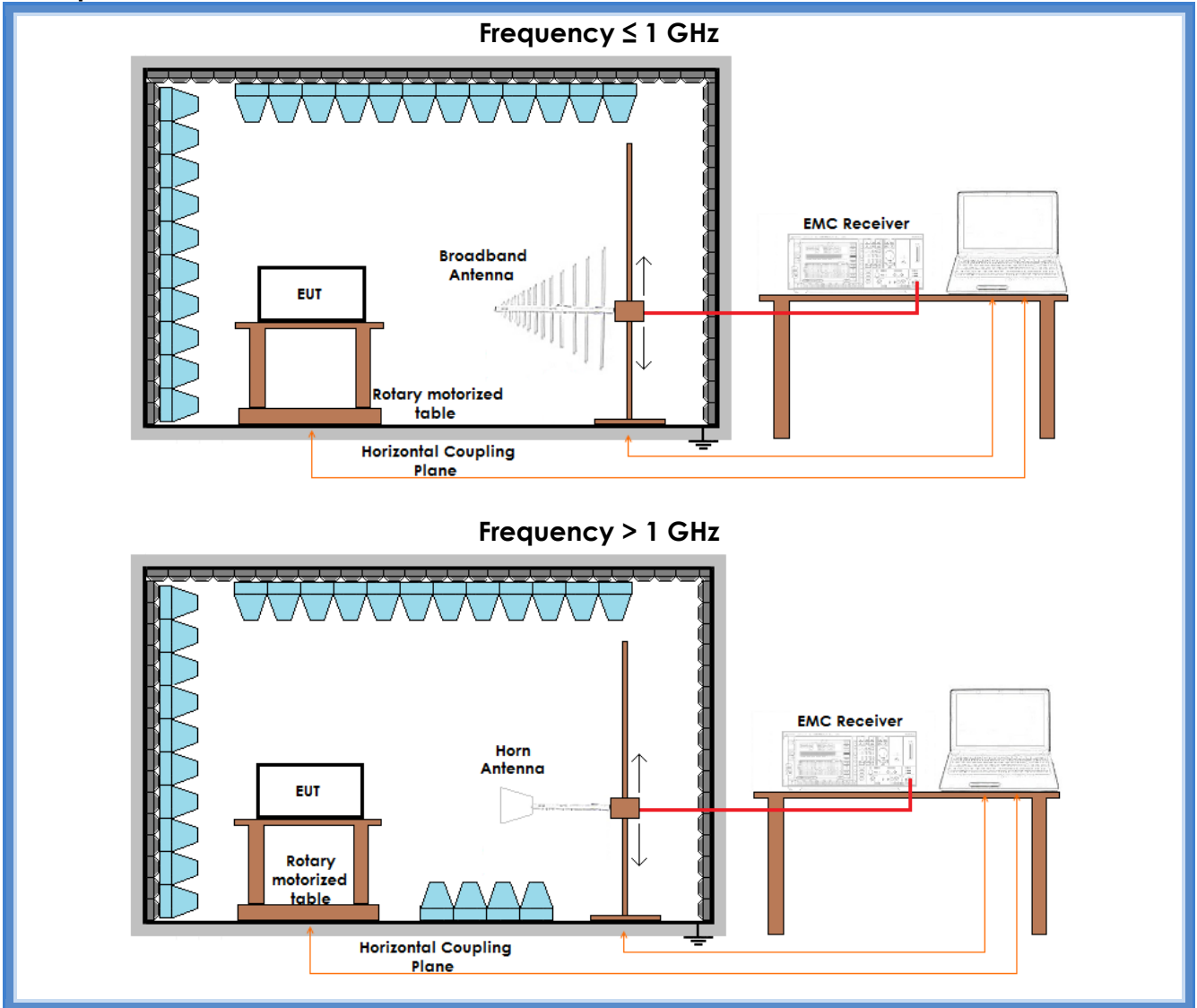
See FCC Part 15.247

#### 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

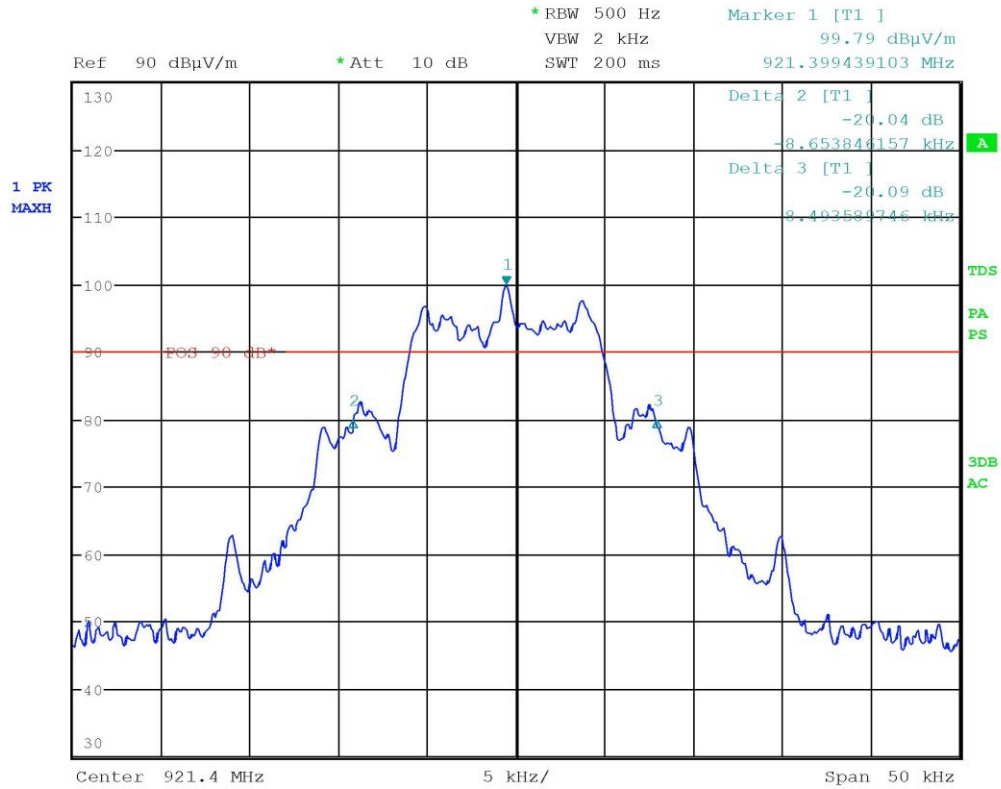


## Result

Frequency (MHz)	Graphs	20 dB bandwidth (kHz)	Maximum 20 dB bandwidth allowed (kHz)	Results
915,050	G18231920	17,2276	500	Complies
921,400	G18231925	17,1474	500	Complies
927,800	G18231929	16,6667	500	Complies

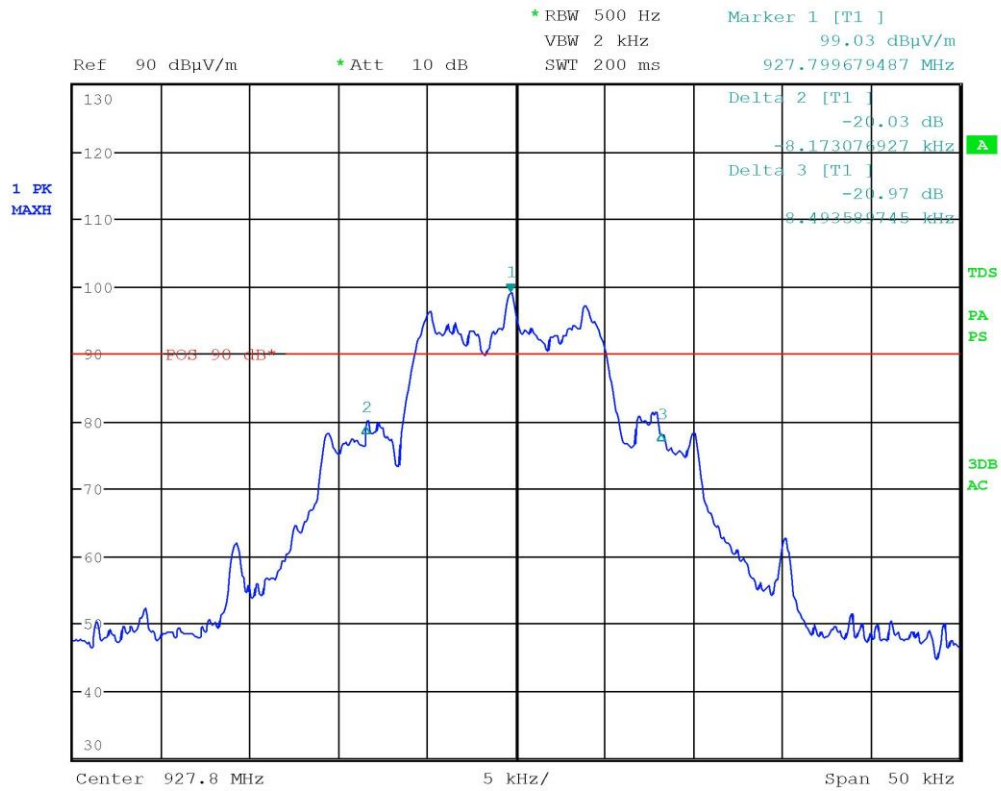
CMC Centro Misure Compatibilità S.r.l.





Segalla 18231925

CMC Centro Misure Compatibilità S.r.l.



Segalla 18231929

**Result:** The requirements are met

CMC Centro Misure Compatibilità S.r.l.



## 11.4 Channel separation

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 15.247 Meas Guidance v05 cl. 9 b)
- ANSI C63.10 cl. 7.8.2
- 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 S164, CMC S287  
 Measurement uncertainty: See clause 7 of this test report

### Test specification

See FCC Part 15.247

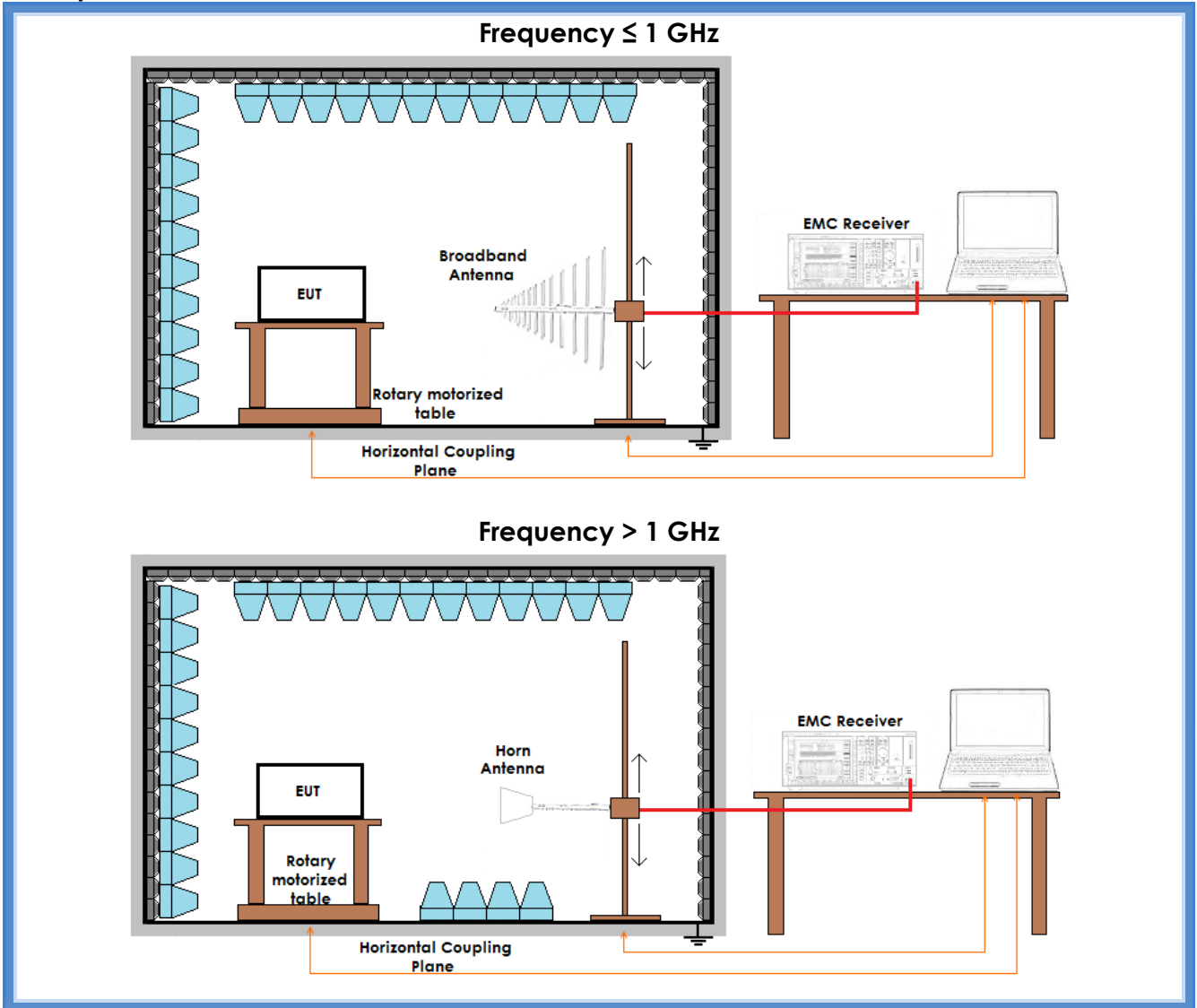
### Environmental conditions

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



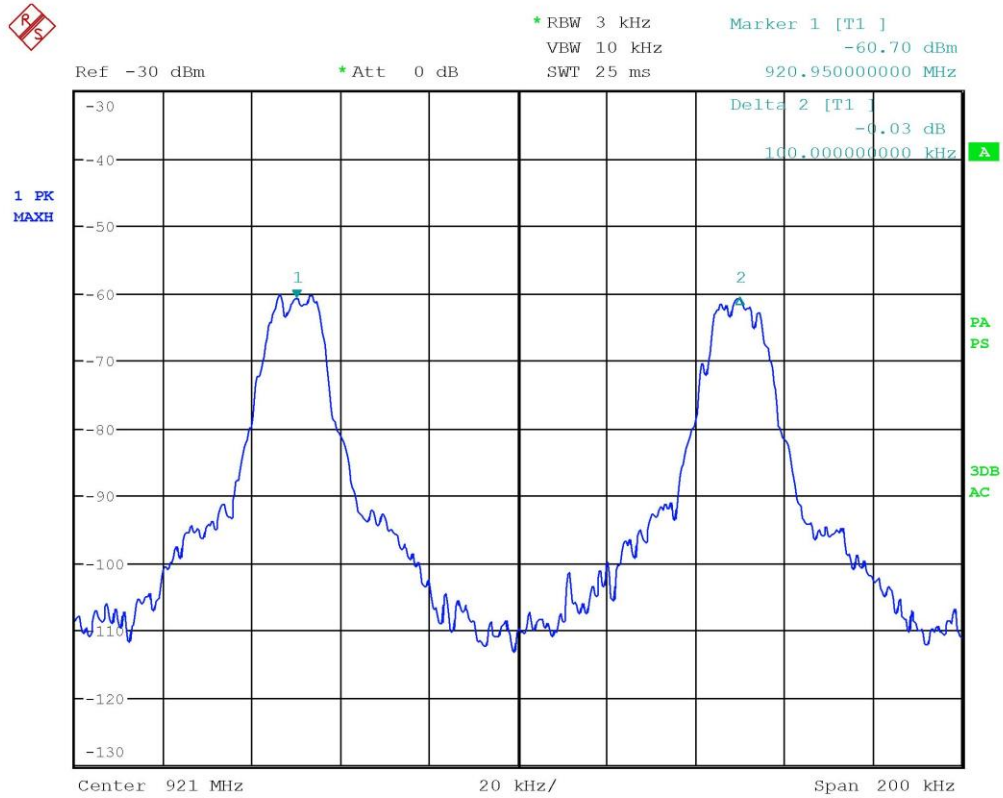
## Result

Frequency band (MHz)	Graphs	Channel separation (kHz)	Minimum channel separation required (kHz)	Results
902 – 928	G18231941	100	25	Complies

CMC Centro Misure Compatibilità S.r.l.



## Graphs



Segalla 18231941

**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
- KDB 558074 D01 15.247 Meas Guidance v05 cl. 9 b)
- ANSI C63.10 cl. 7.8.3
- 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 S164, CMC S287  
 Measurement uncertainty: See clause 7 of this test report

### Test specification

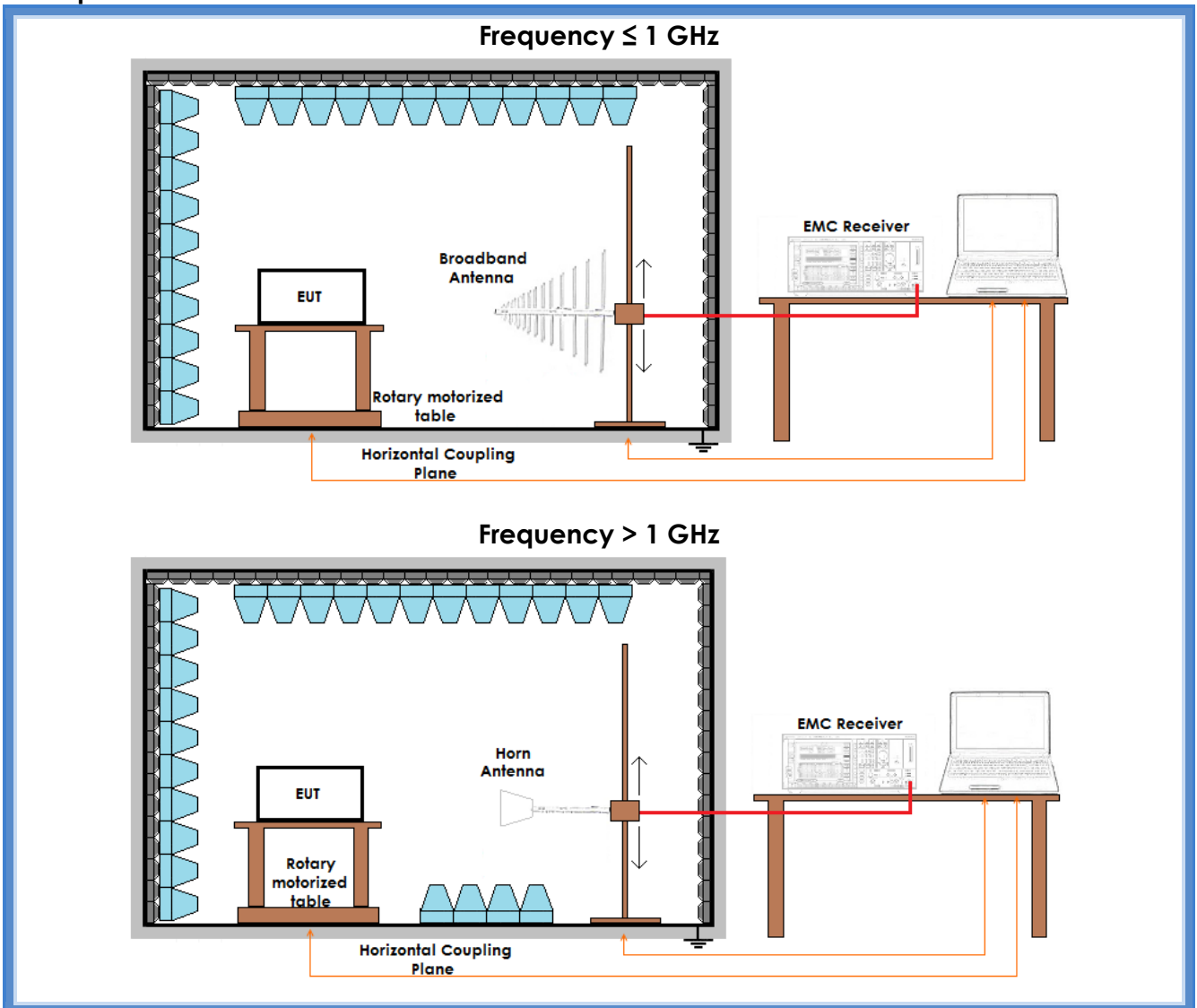
See FCC Part 15.247

### Environmental conditions

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

**Acceptance limits:** 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**

<i>Frequency band (MHz)</i>	<i>Graphs</i>	<i>Number of hopping channels</i>	<i>Minimum number of hopping channels required</i>	<i>Results</i>
902 – 928	G18231943, G18231944, G18231945	128	50	Complies

For laboratory tests at CMC, a special programming is provided; anyway we deem it representative of any real world hopping sequence that can be programmed into the devices.

First, special programming allows fixed frequency measurements at min, med and max operating frequency; this is not available for series production units, but is required for testing.

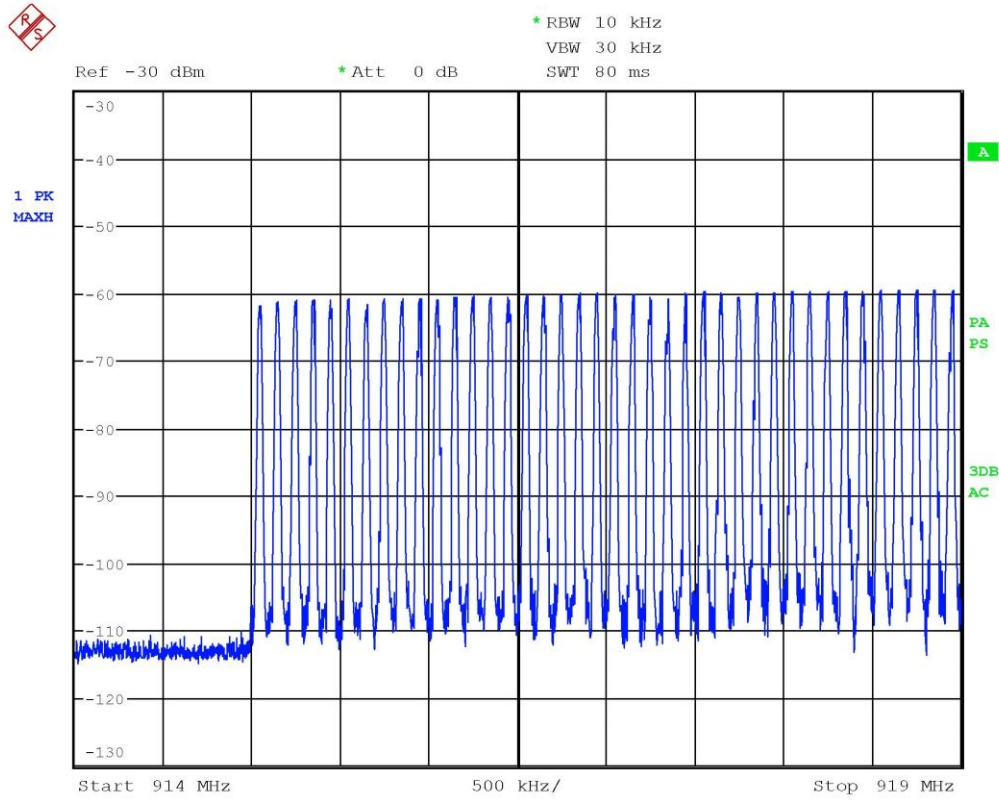
Then two evenly spaced hopping sequences of 64 channels are provided, one including the min freq channel at 915,050 MHz, the other including the max freq channel at 927.800 MHz. Although they are not available for series production units, both these hopping sequences are suitable for valid measurements of FH timing parameters. In fact, FH Timing parameters measurements is not dependent on channel positioning



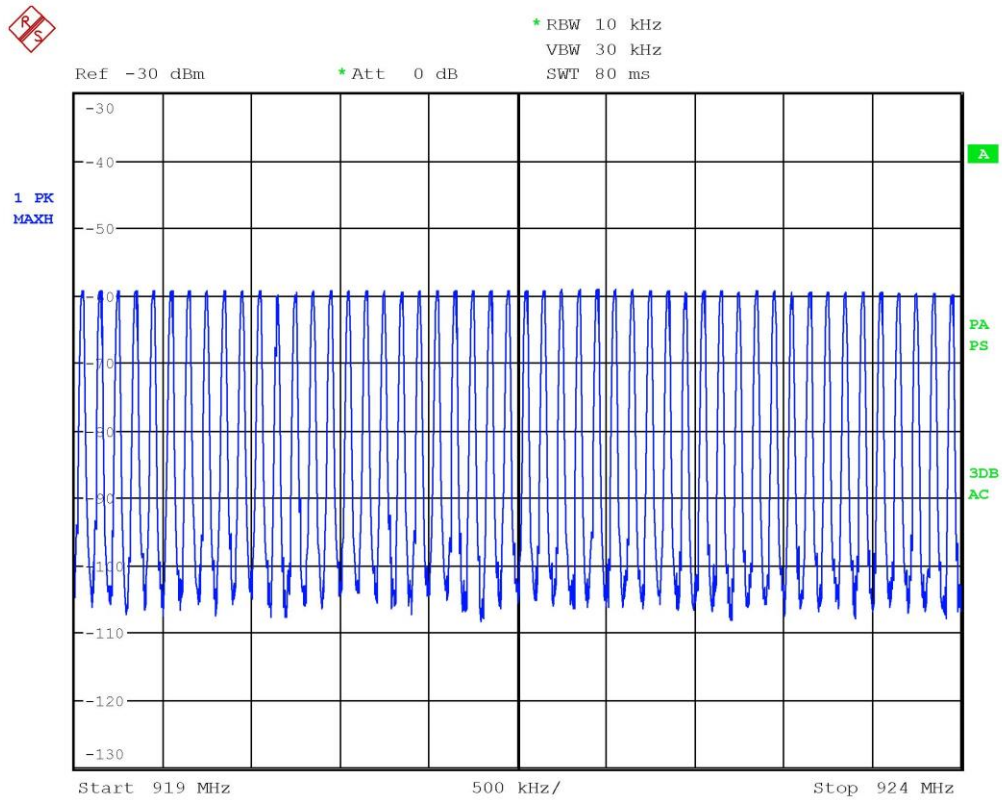
CMC Centro Misure Compatibilità S.r.l.



## Graphs

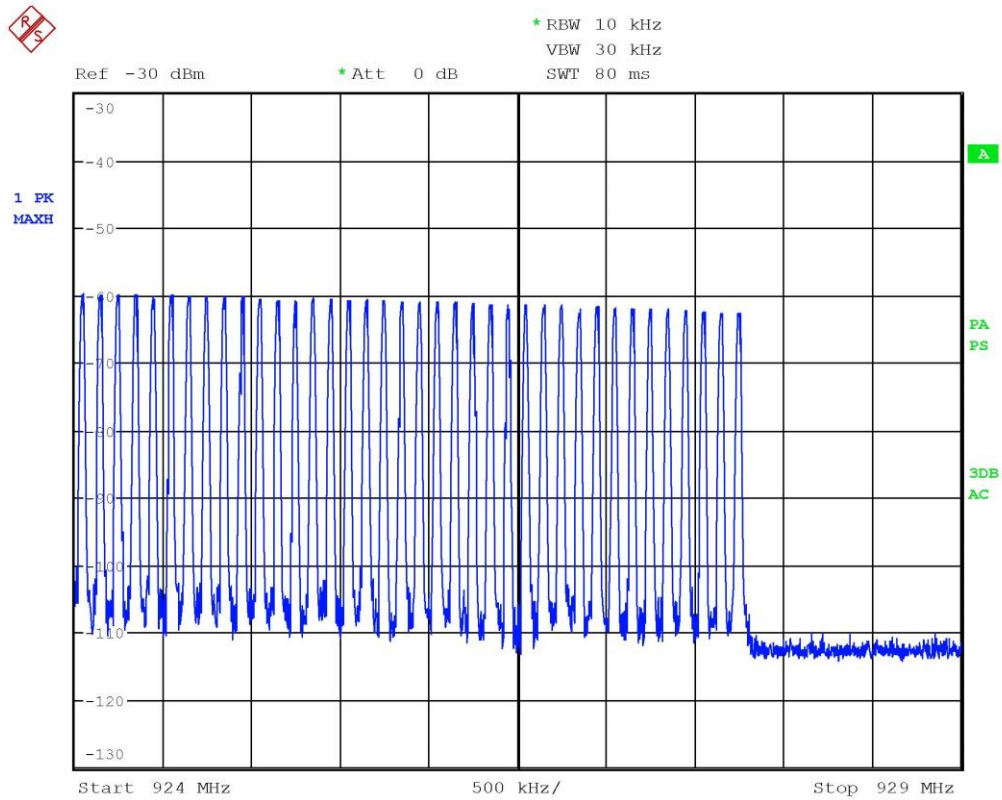


Segalla 18231943



Segalla 18231944

CMC Centro Misure Compatibilità S.r.l.



Segalla 18231945

**Result:** The requirements are met

CMC Centro Misure Compatibilità S.r.l.





## 11.6 Time of occupancy

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 15.247 Meas Guidance v05 cl. 9 b)
- ANSI C63.10 cl. 7.8.4
- 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 S164, CMC S287  
 Measurement uncertainty: See clause 7 of this test report

### Test specification

See FCC Part 15.247

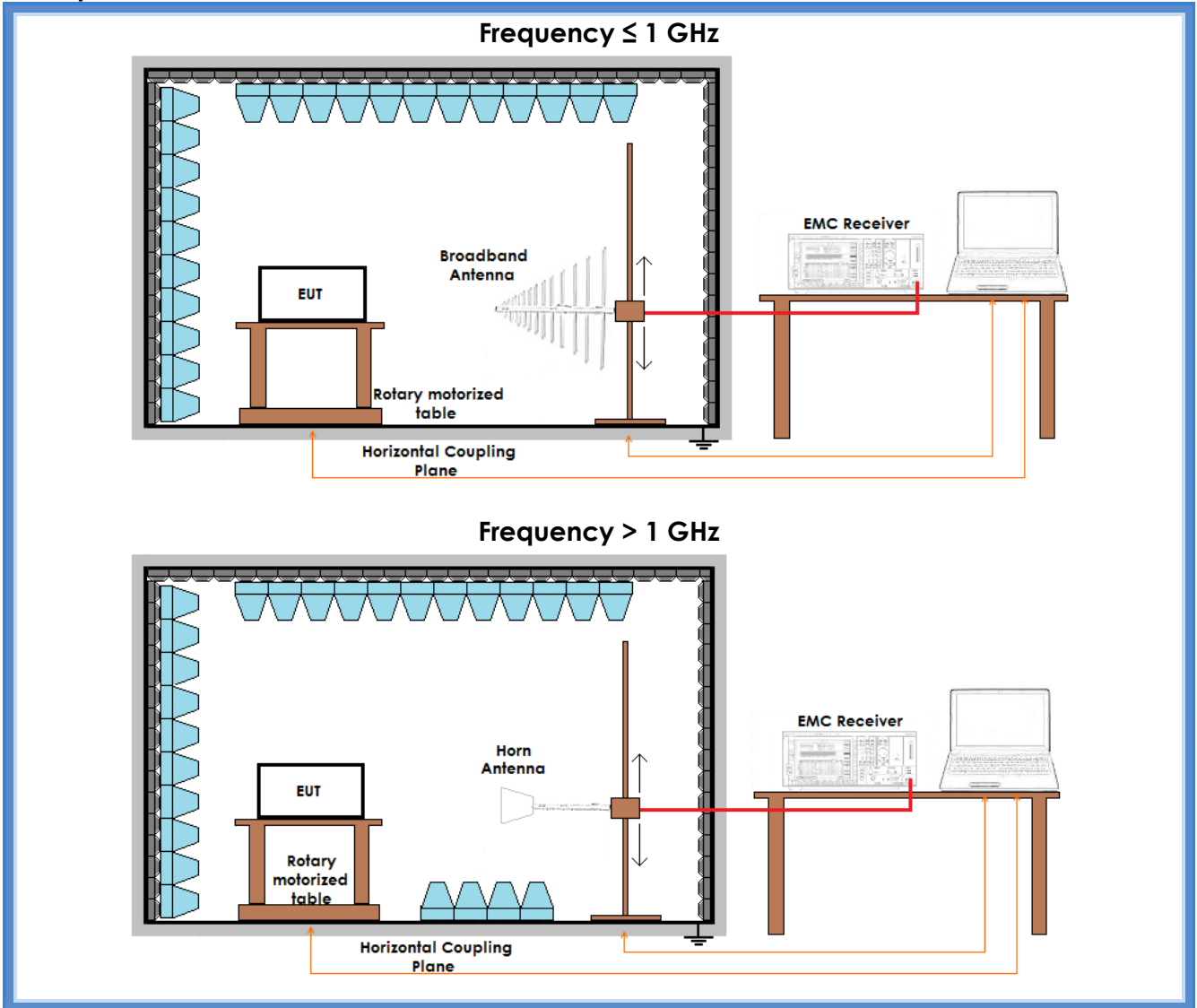
### Environmental conditions

<i>Temperature</i> (°C)	<i>Atmospheric pressure</i> (kPa)	<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)
924,051	G18231946	94,80

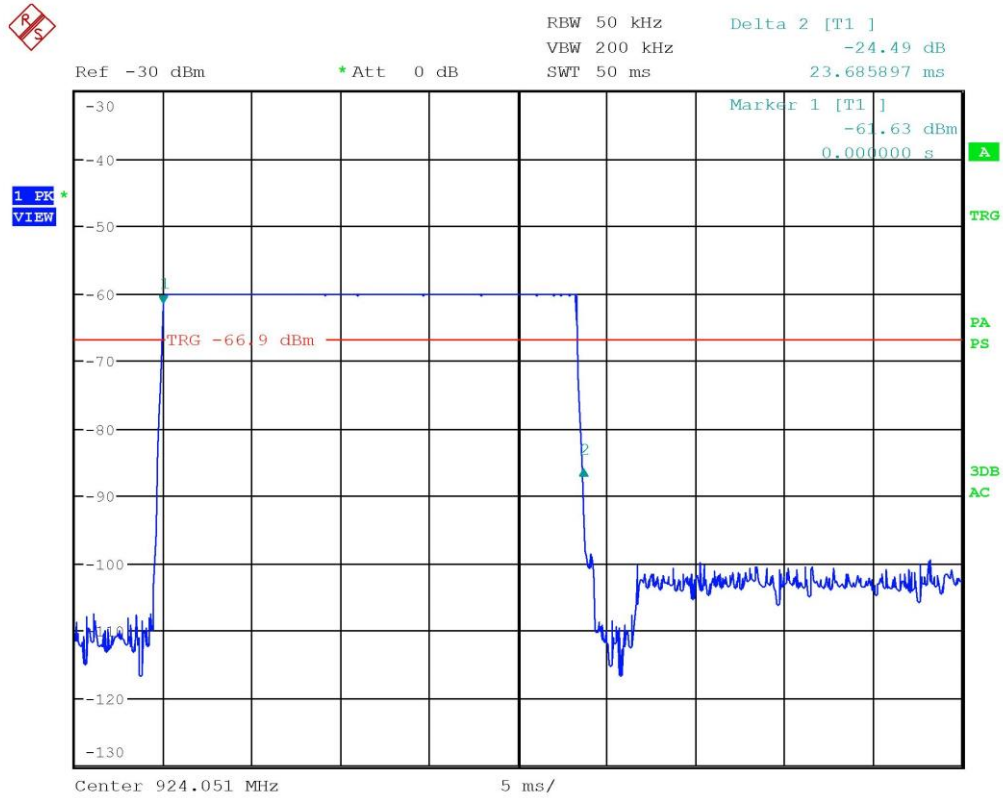
Frequency (MHz)	Graphs	Number of transmissions	Period
924,051	G18231947	4	20 s

**Remarks:** only the highest peaks have been considered. The lowest peaks are due to the auxiliary receiver unit

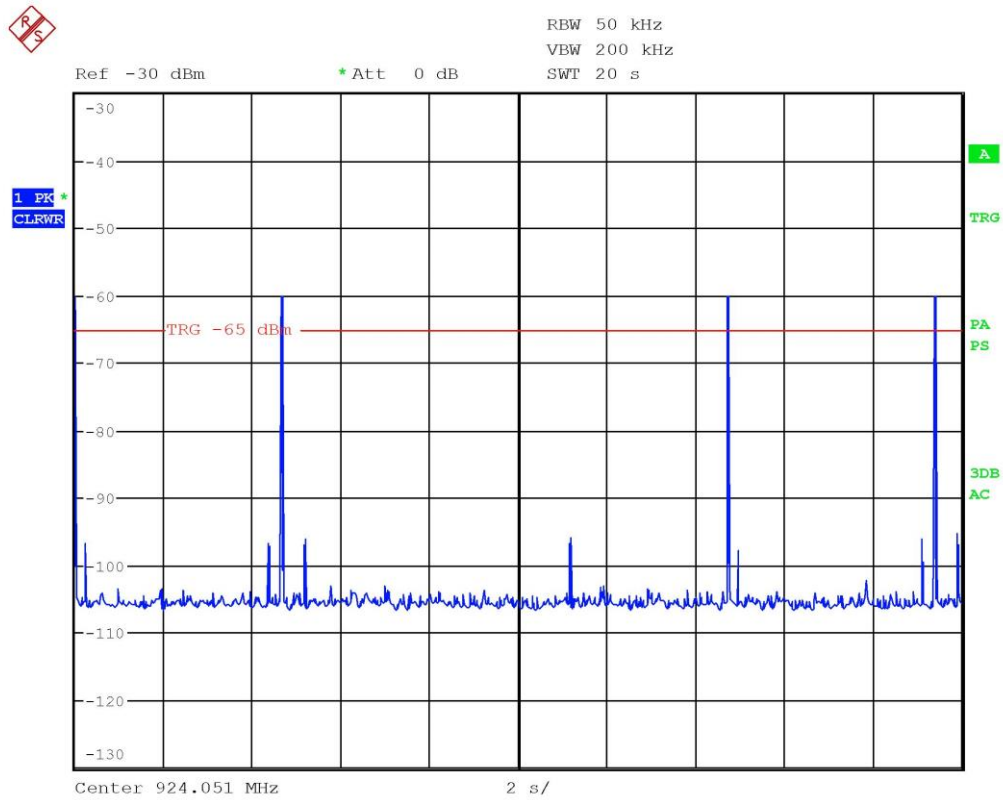
Time of occupancy (Dwell time x Nr. transmissions)	Maximum allowed time of occupancy	Results
379,20 ms	400 ms	Complies



## Graphs



Segalla 18231946



Segalla 18231947

**Result:** The requirements are met

CMC Centro Misure Compatibilità S.r.l.



## 11.7 Band edge

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- ANSI C63.10 cl. 7.8.6
- 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 S164, CMC S287  
 Measurement uncertainty: See clause 7 of this test report

### Test specification

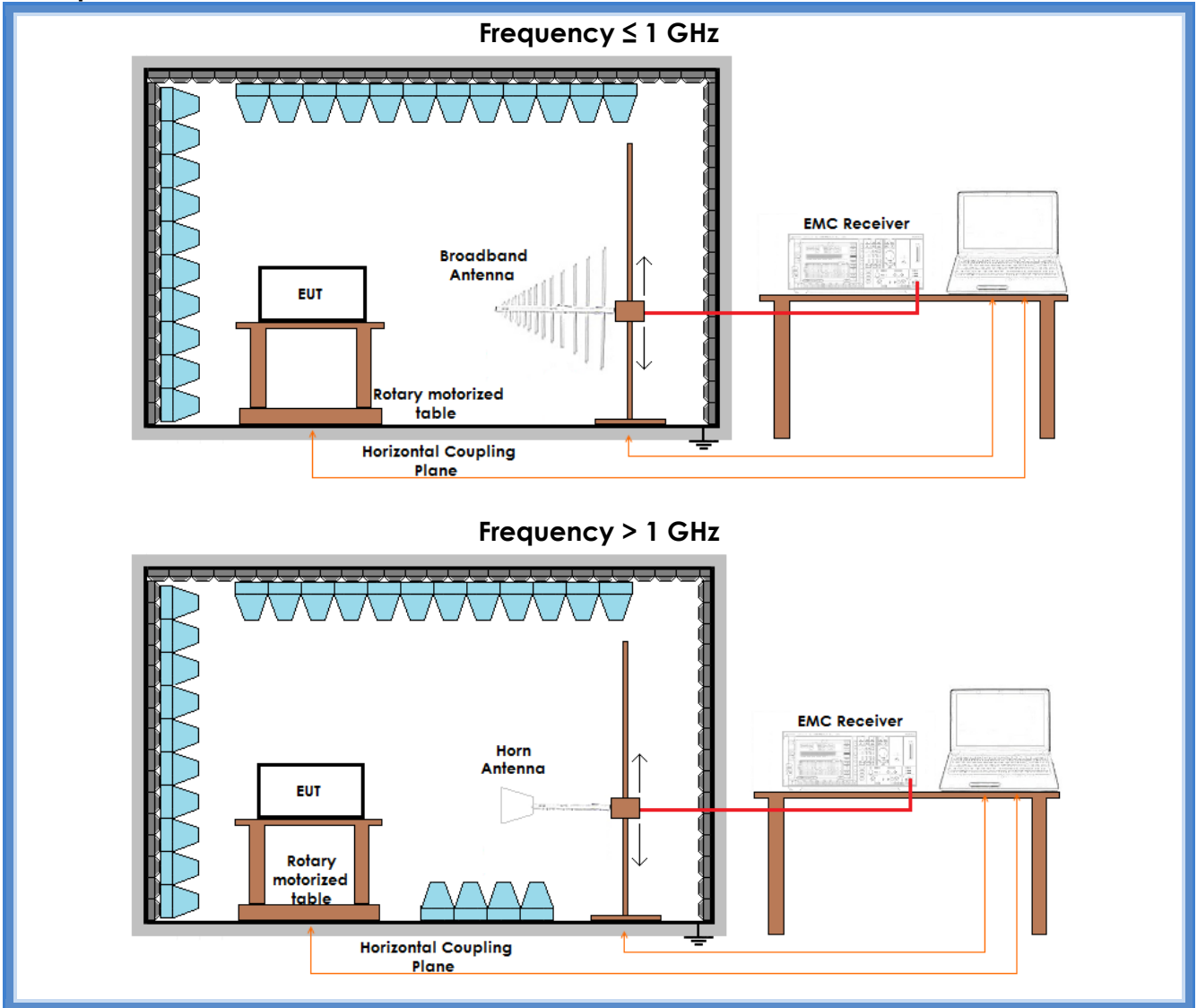
See FCC Part 15.247

### Environmental conditions

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

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

## Setup



## Result

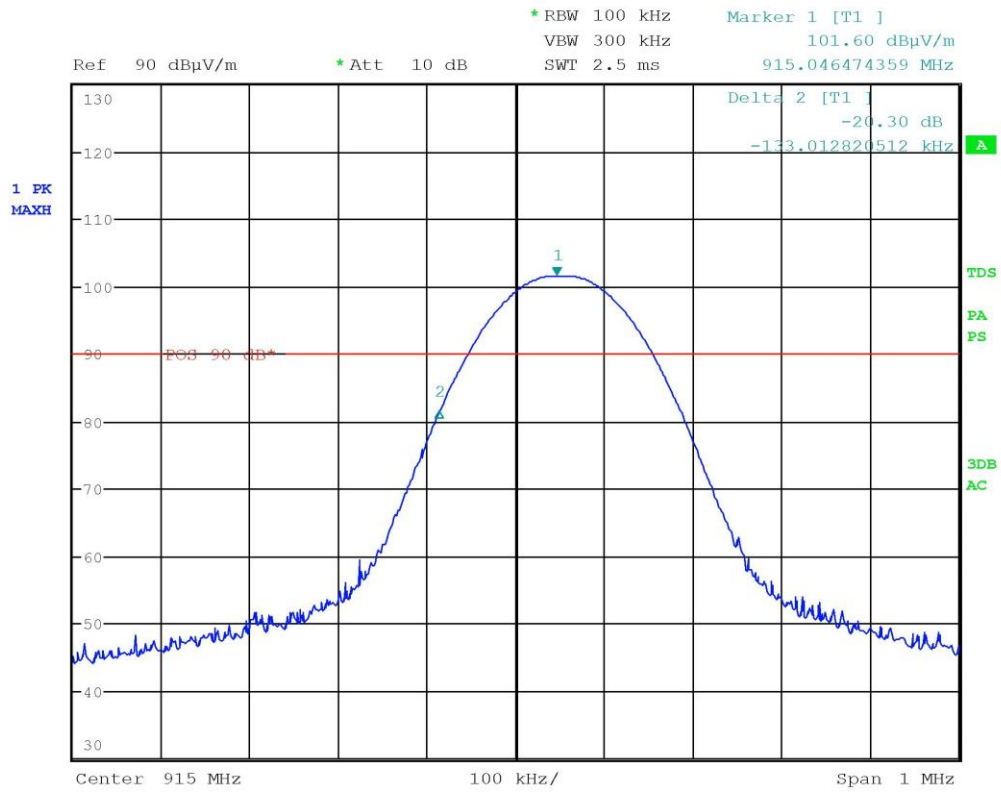
Frequency (MHz)	Graph(s) – Hopping	Results	
915,050	G18231935	F <sub>L</sub> : 914,9167 MHz	Complies
927,800	G18231938	F <sub>H</sub> : 927,9320 MHz	Complies

Frequency (MHz)	Graph(s) – No hopping	Results	
915,050	G18231922	F <sub>L</sub> : 914,9134 MHz	Complies
927,800	G18231931	F <sub>H</sub> : 927,9375 MHz	Complies

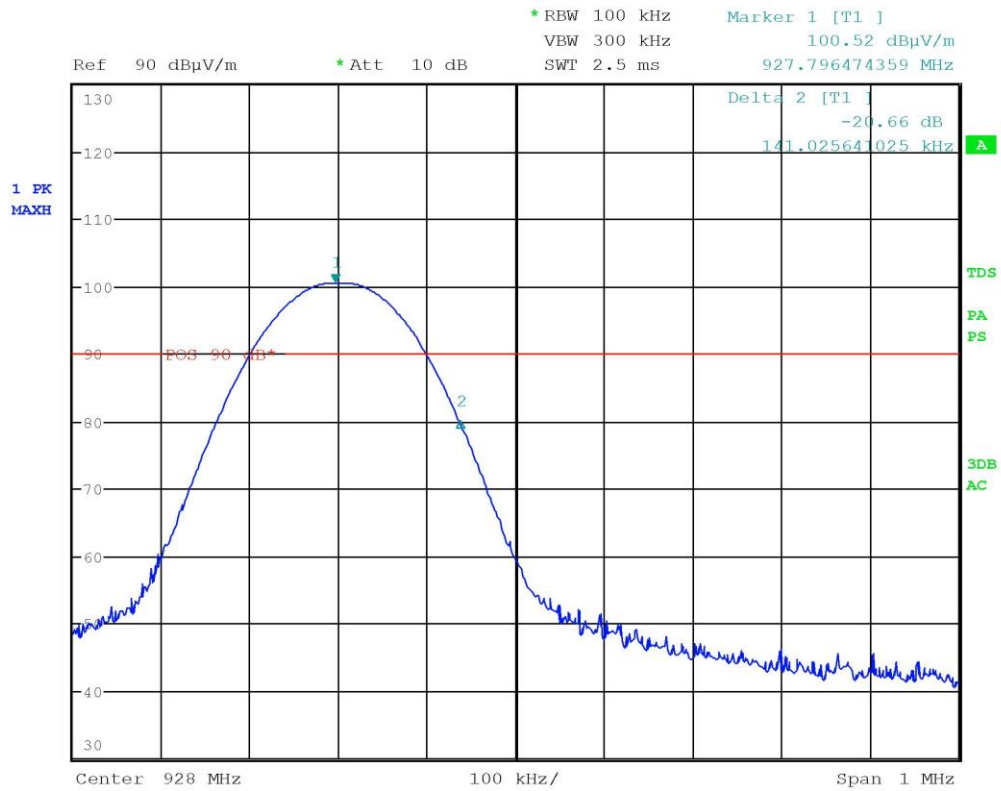
CMC Centro Misure Compatibilità S.r.l.



## Graphs



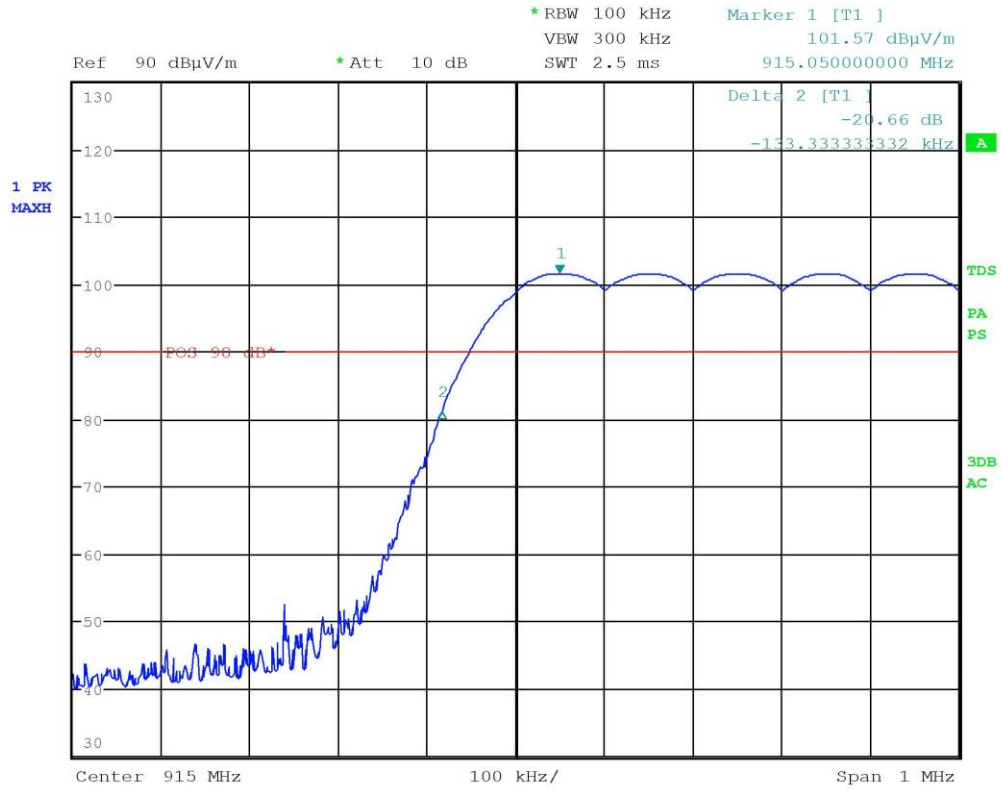
Segalla 18231922



Segalla 18231931

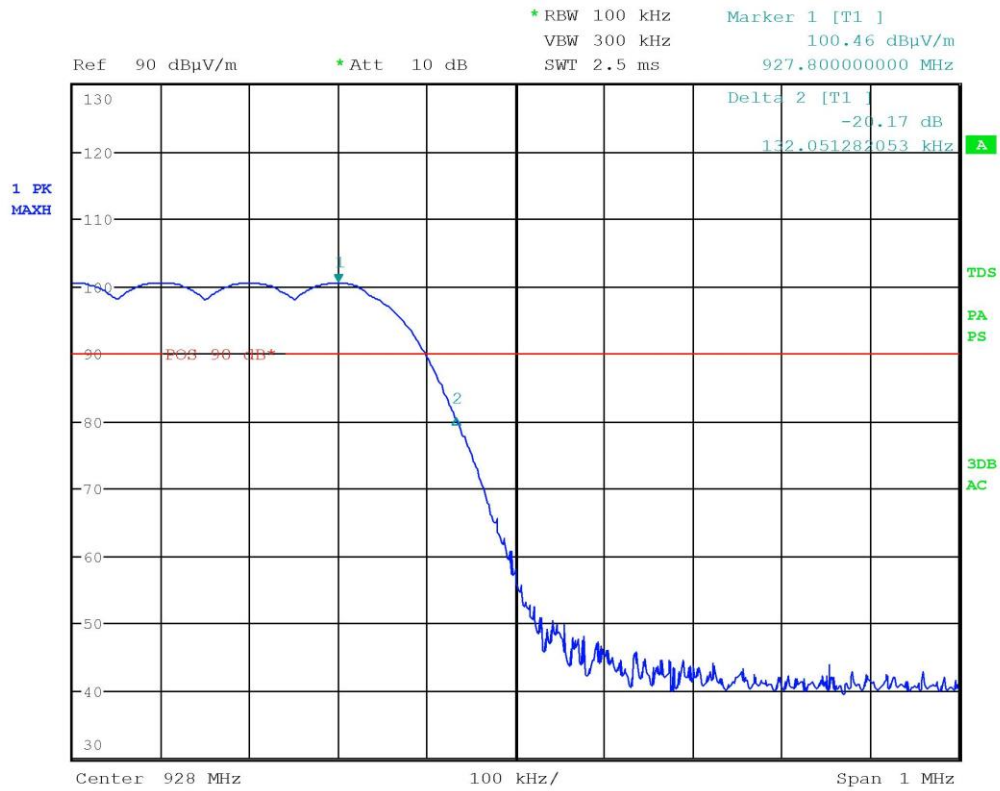
CMC Centro Misure Compatibilità S.r.l.





Segalla 18231935

CMC Centro Misure Compatibilità S.r.l.



Segalla 18231938

**Result:** The requirements are met

CMC Centro Misure Compatibilità S.r.l.



## 11.8 Peak Output Power

### Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 15.247 Meas Guidance v05 cl. 2.2
- ANSI C63.10 cl. 7.8.5
- 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 S164, CMC S287  
 Measurement uncertainty: See clause 7 of this test report

### Test specification

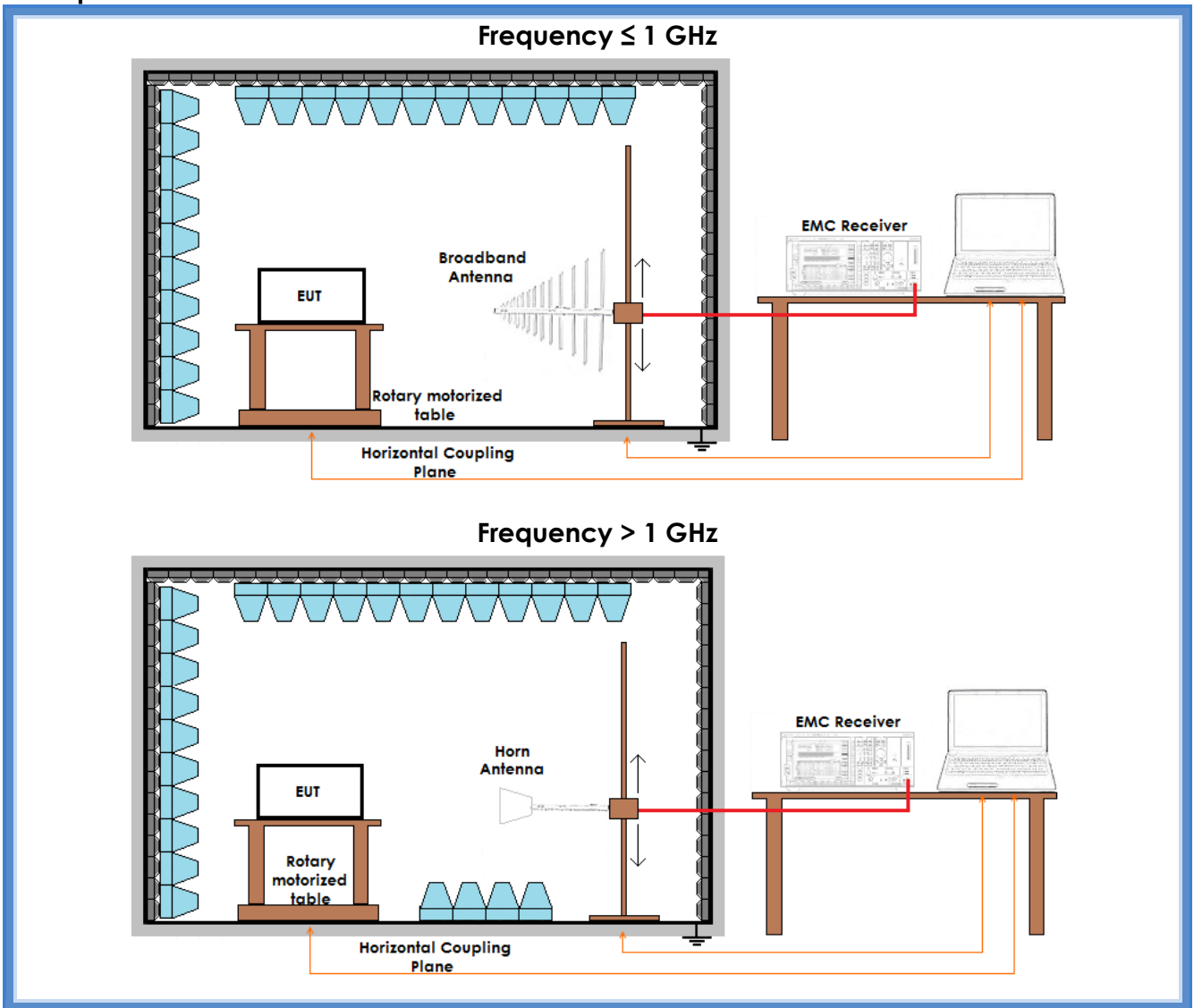
Port: Enclosure  
 Antenna polarization: Horizontal (H) – Vertical (V)  
 EUT – Antenna distance: 10 m

### 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)	Polarization	Graphs	Measured QP level (dBµV/m)	Peak Output Power (mW)	Remarks
915,050	Worst case	G18231919	101,70	49,304	--
921,400	Worst case	G18231924	101,30	44,965	--
927,800	Worst case	G18231928	100,60	38,272	--

## Remarks

$$P = (E \times d)^2 / (30 \times G)$$

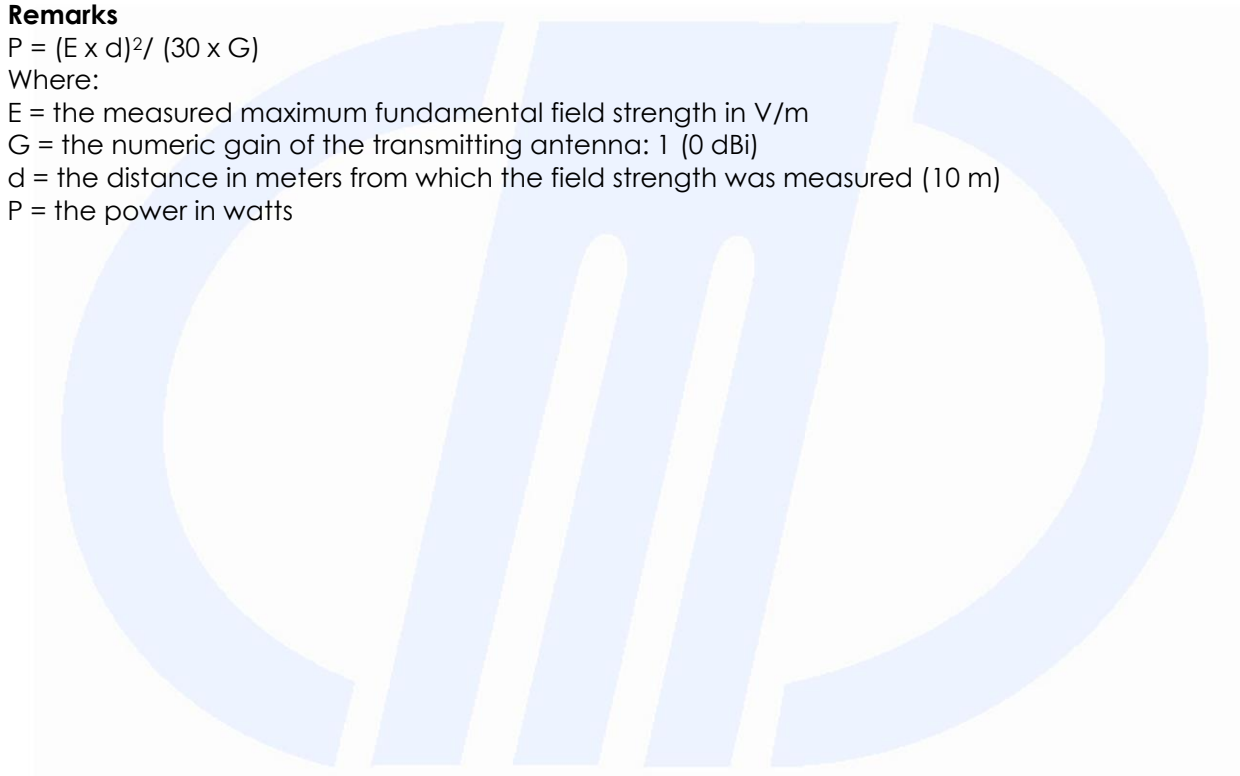
Where:

E = the measured maximum fundamental field strength in V/m

G = the numeric gain of the transmitting antenna: 1 (0 dBi)

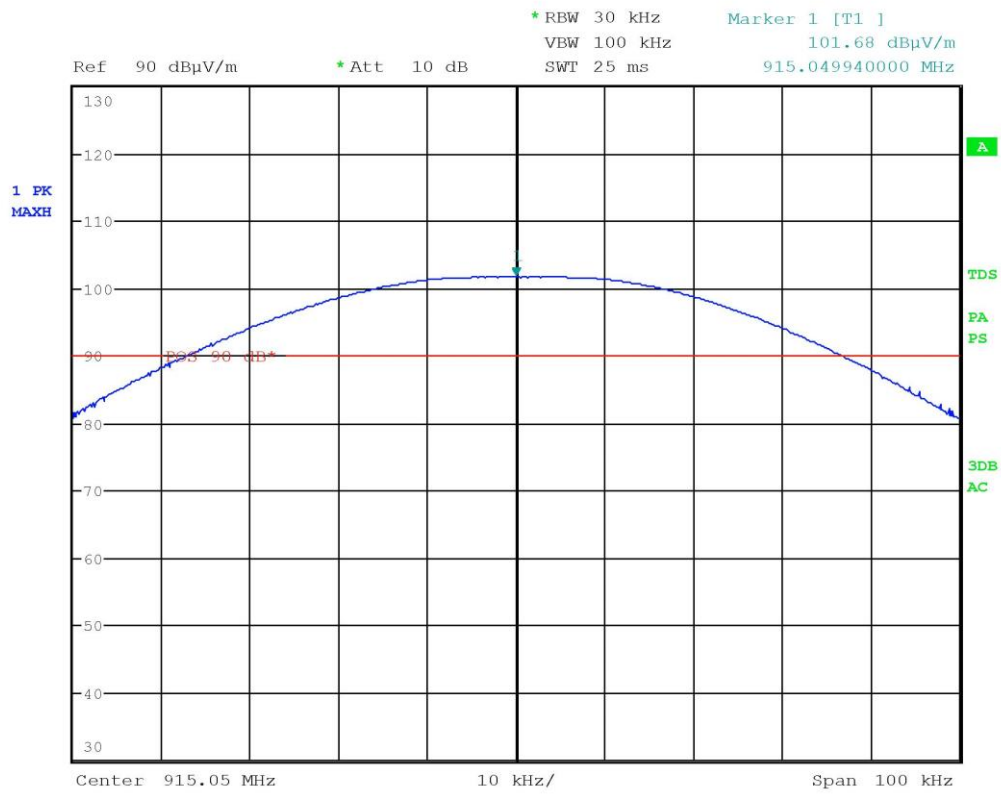
d = the distance in meters from which the field strength was measured (10 m)

P = the power in watts

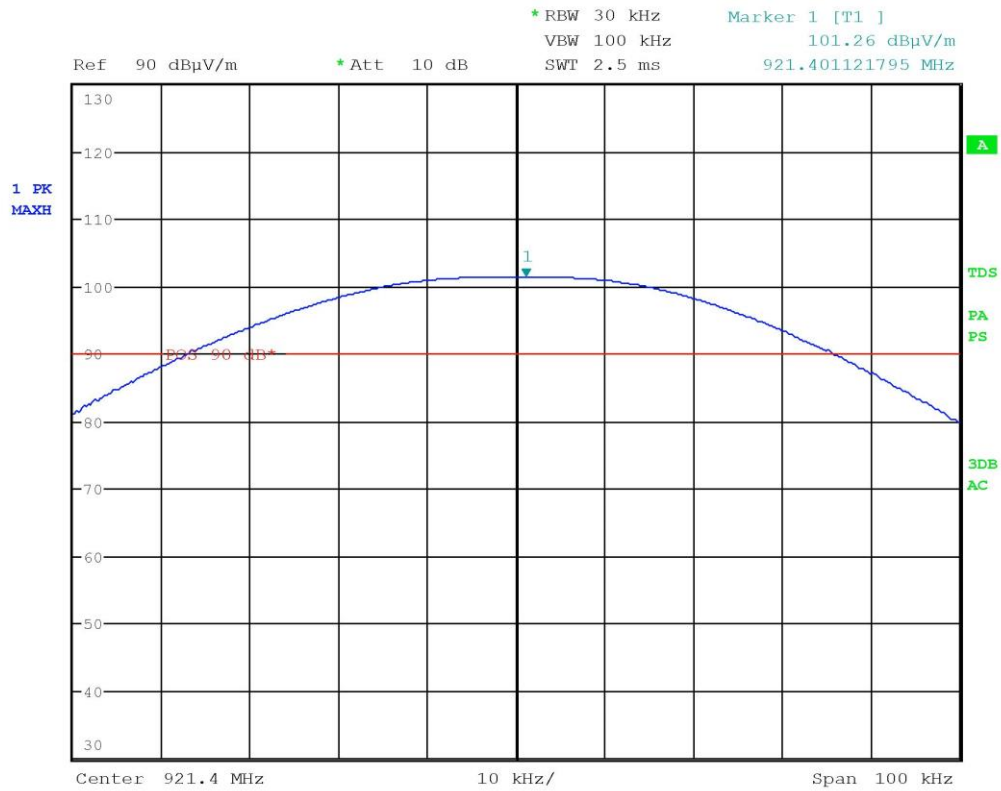




Graphs

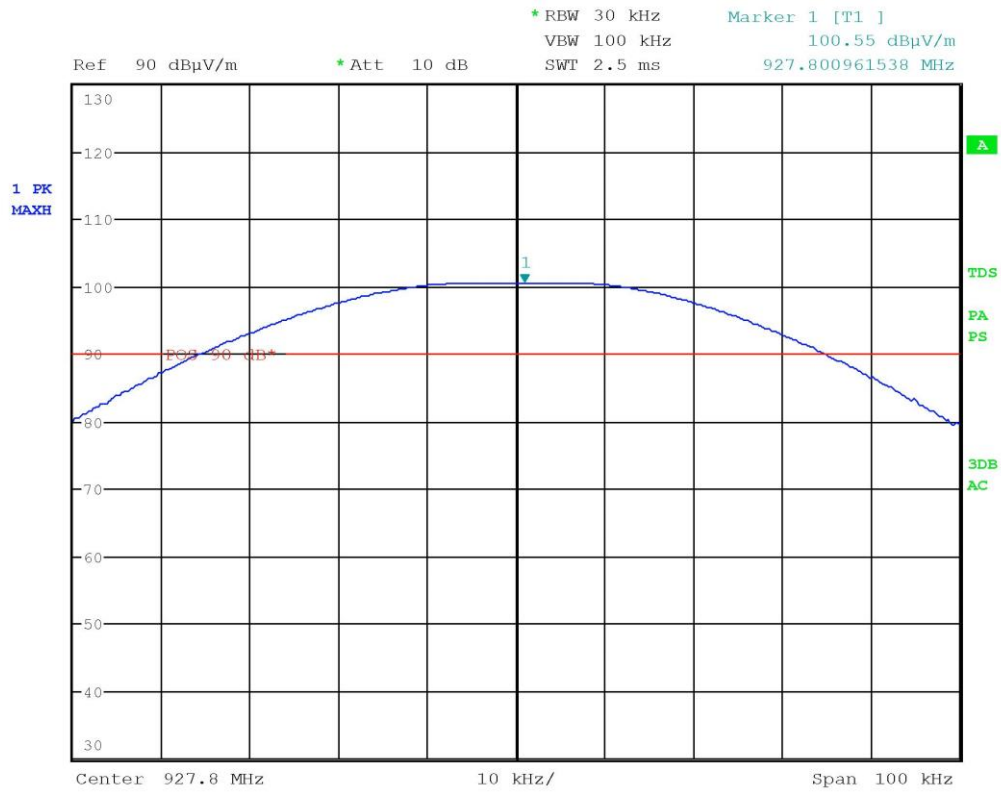


Segalla 18231919



Segalla 18231924

CMC Centro Misure Compatibilità S.r.l.



Segalla 18231928

**Result:** The requirements are met





## 11.9 Spurious Emission

### 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 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 ≤ 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(μV/m)]	Peak limits [dB(μV/m)]
> 1000	54	74



The restricted frequency bands are listed in the following table

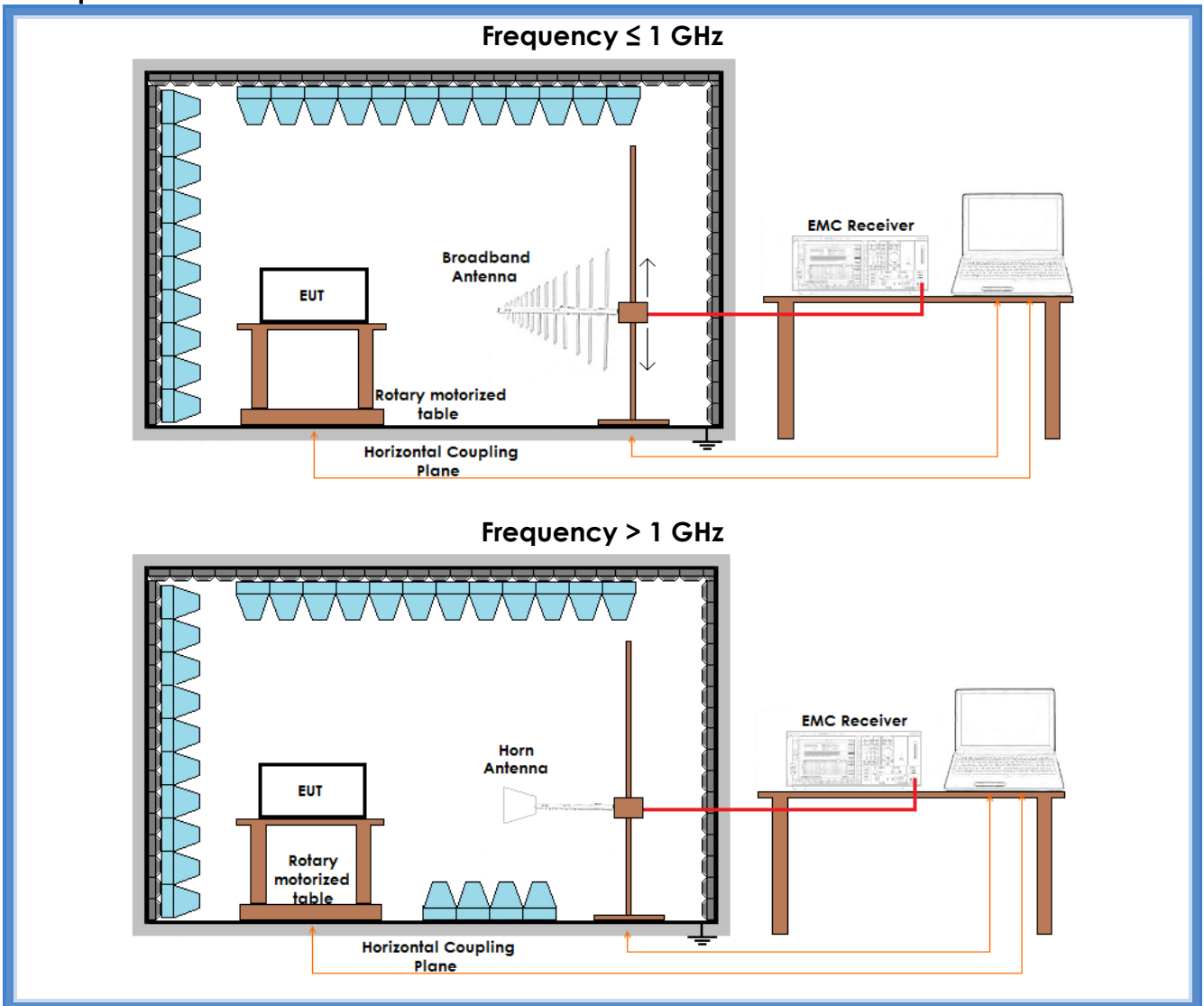
MHz	MHz	MHz	GHz
0,090 – 0,110	16,42 – 16,423	399,9 – 410	4,5 – 5,15
0,495 – 0,505	16,69475 – 16,69525	608 – 614	5,35 – 5,46
2,1735 – 2,1905	16,80425 – 16,80475	960 – 1240	7,25 – 7,75
4,125 – 4,128	25,5 – 25,67	1300 – 1427	8,025 – 8,5
4,17725 – 4,17775	37,5 – 38,25	1435 – 1626,5	9,0 – 9,2
4,20725 – 4,20775	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	52,70	54,00	53,40	54,00	53,00	54,00	Complies
III	49,80	54,00	48,20	54,00	49,80	54,00	Complies
IV	44,50	54,00	46,60	54,00	48,10	54,00	Complies
V	50,70	54,00	48,90	54,00	48,60	54,00	Complies
VI	47,60	54,00	47,50	54,00	46,30	54,00	Complies
VII	43,60	54,00	44,40	54,00	46,40	54,00	Complies
VIII	47,00	54,00	48,00	54,00	48,10	54,00	Complies
IX	46,40	54,00	46,60	54,00	46,20	54,00	Complies
X	45,70	54,00	47,60	54,00	47,10	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	60,00	74,00	61,20	74,00	59,30	74,00	Complies
III	58,90	74,00	58,20	74,00	58,30	74,00	Complies
IV	54,10	74,00	55,20	74,00	55,90	74,00	Complies
V	59,30	74,00	56,80	74,00	56,90	74,00	Complies
VI	57,60	74,00	57,00	74,00	56,80	74,00	Complies
VII	56,40	74,00	55,40	74,00	55,90	74,00	Complies
VIII	58,70	74,00	58,90	74,00	57,90	74,00	Complies
IX	58,80	74,00	57,40	74,00	58,10	74,00	Complies
X	57,60	74,00	58,30	74,00	58,30	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