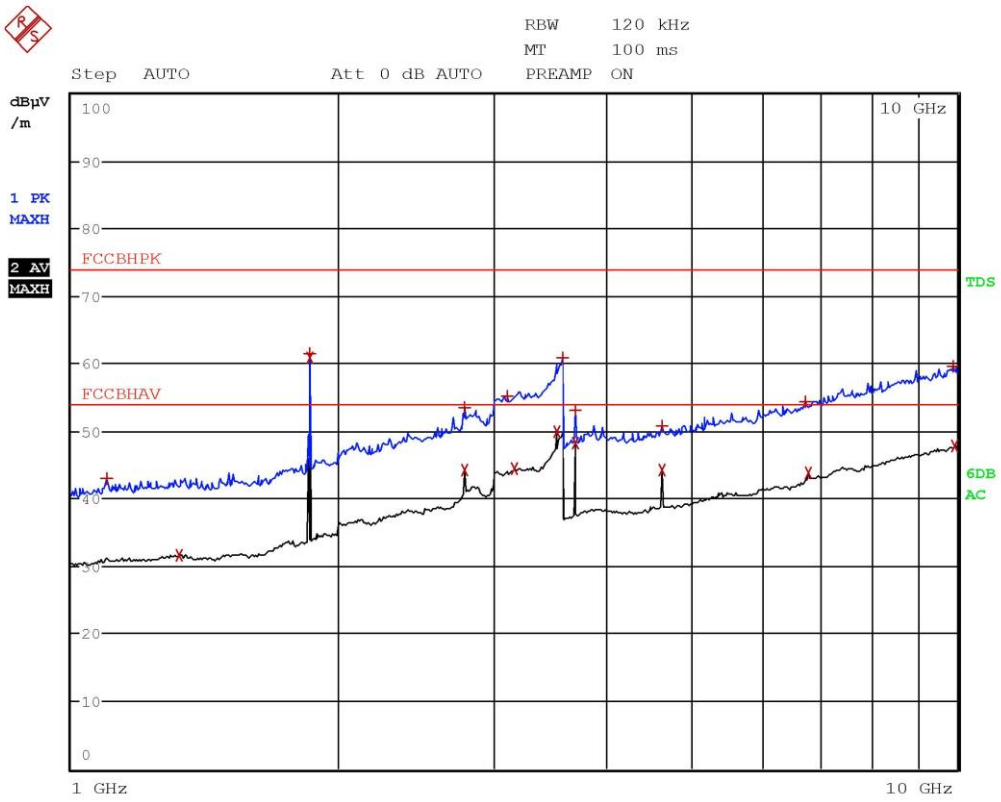
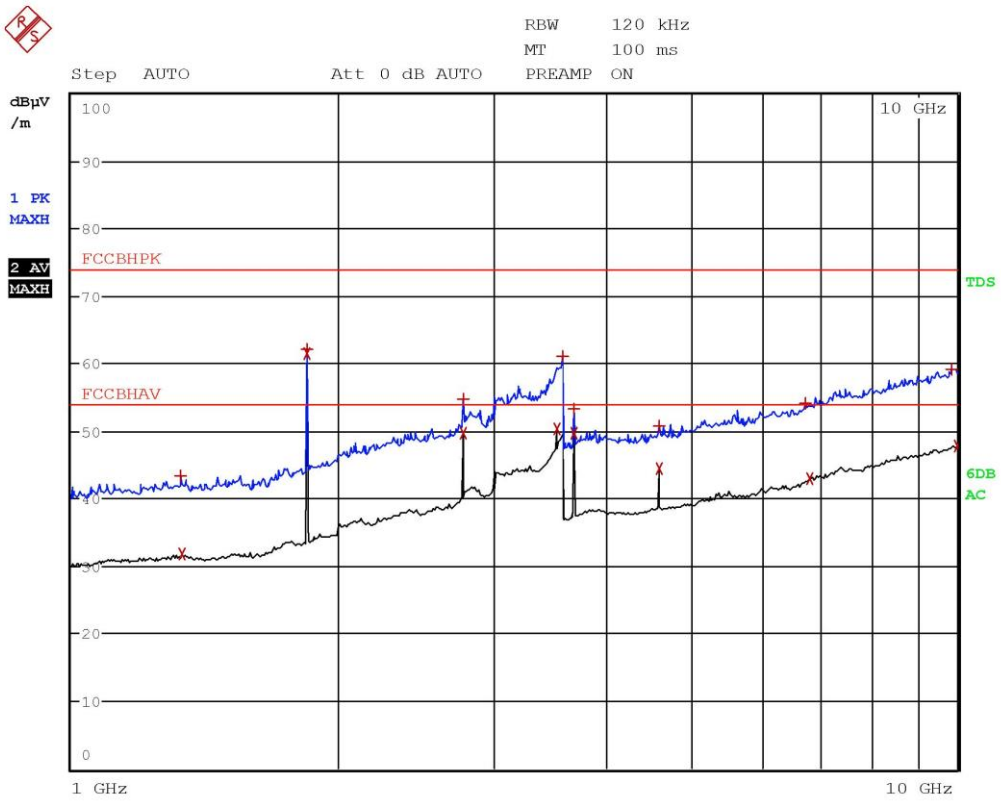


Segalla 18231315

EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Max Peak	1.0964 GHz	42.96	-31.02
2 Average	1.3224 GHz	31.66	-22.32
1 Max Peak	1.8556 GHz	61.52	-12.45
2 Average	1.8556 GHz	60.86	6.88
1 Max Peak	2.7832 GHz	53.36	-20.61
2 Average	2.7832 GHz	44.21	-9.76
1 Max Peak	3.1012 GHz	55.18	-18.79
2 Average	3.1608 GHz	44.40	-9.57
2 Average	3.5256 GHz	49.97	-4.00
1 Max Peak	3.586 GHz	60.77	-13.20
2 Average	3.7112 GHz	48.19	-5.78
1 Max Peak	3.7112 GHz	53.02	-20.95
1 Max Peak	4.6388 GHz	50.70	-23.27
2 Average	4.6392 GHz	44.16	-9.81
1 Max Peak	6.7296 GHz	54.34	-19.63
2 Average	6.7952 GHz	43.75	-10.22
1 Max Peak	9.8736 GHz	59.63	-14.34
2 Average	9.9444 GHz	47.77	-6.20

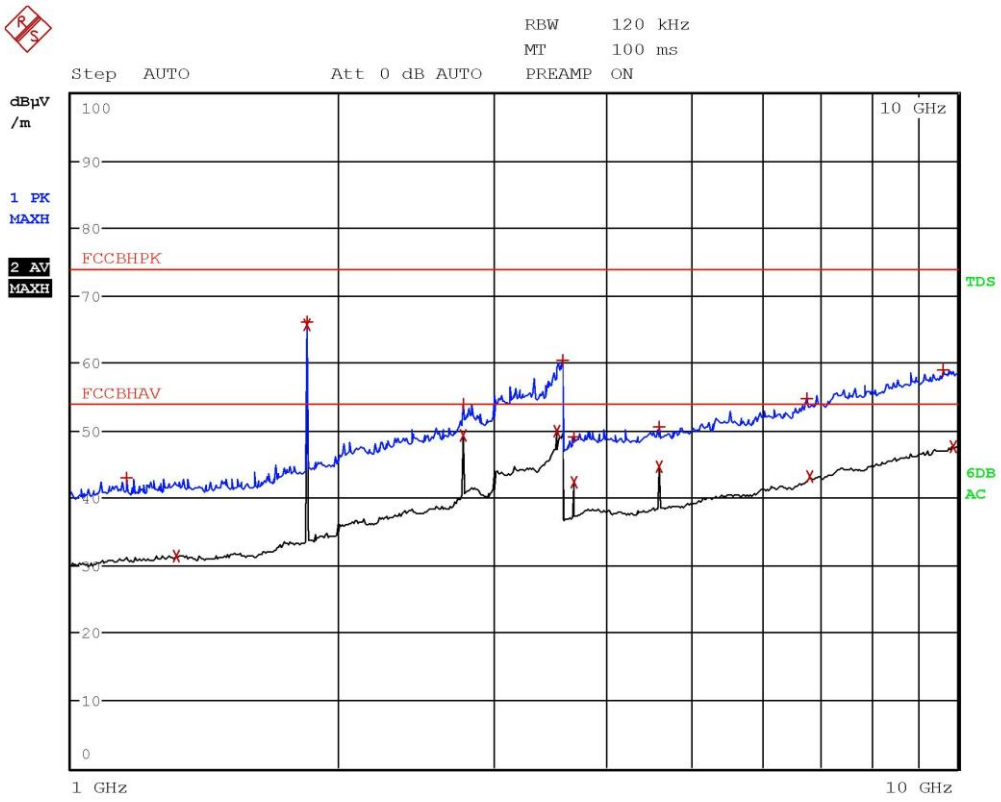
Segalla 18231315



Segalla 18231316

EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Max Peak	1.3272 GHz	43.42	-30.56
2 Average	1.3348 GHz	31.73	-22.24
1 Max Peak	1.8428 GHz	61.99	-11.99
2 Average	1.8428 GHz	61.37	7.39
2 Average	2.764 GHz	49.65	-4.32
1 Max Peak	2.7644 GHz	54.74	-19.23
2 Average	3.5256 GHz	50.26	-3.72
1 Max Peak	3.5948 GHz	61.02	-12.95
2 Average	3.6856 GHz	49.74	-4.23
1 Max Peak	3.6856 GHz	53.30	-20.67
1 Max Peak	4.6068 GHz	50.77	-23.21
2 Average	4.6072 GHz	44.36	-9.61
1 Max Peak	6.73 GHz	54.13	-19.84
2 Average	6.81 GHz	42.88	-11.09
1 Max Peak	9.862 GHz	59.16	-14.81
2 Average	9.99 GHz	47.85	-6.12

Segalla 18231316



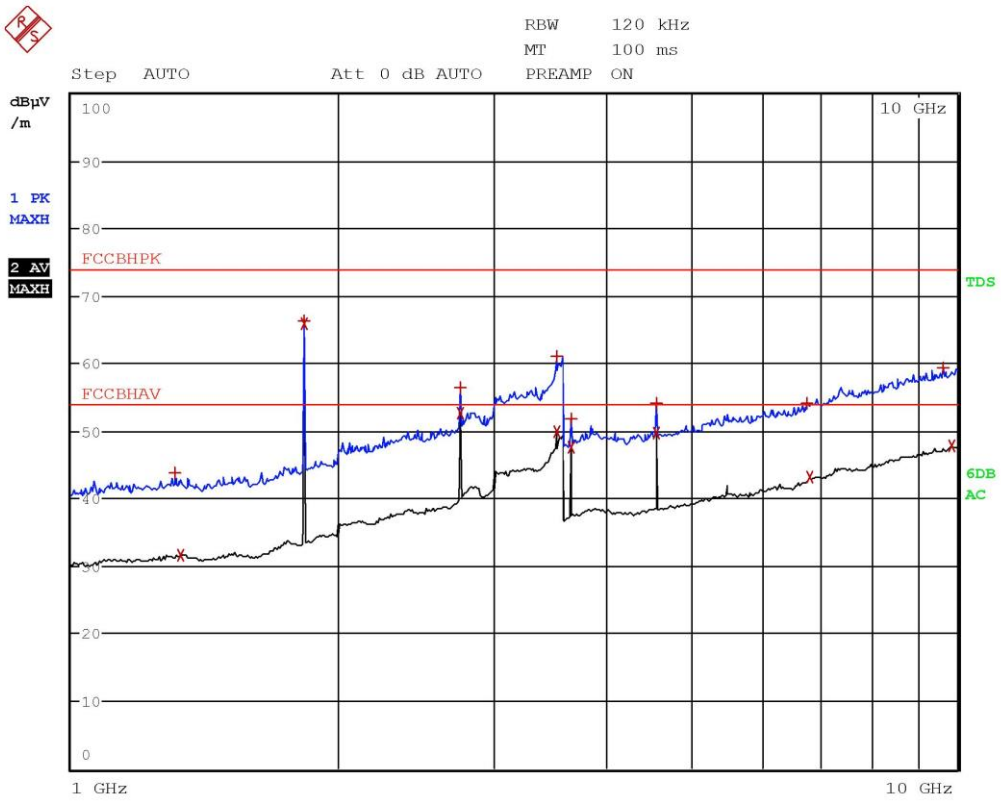
Segalla 18231317

EDIT PEAK LIST (Prescan Results)

Trace1:	FCCBHPK
Trace2:	FCCBHAV
Trace3:	---

TRACE		FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1	Max Peak	1.154 GHz	43.02	-30.95
2	Average	1.3124 GHz	31.50	-22.47
1	Max Peak	1.8428 GHz	66.11	-7.86
2	Average	1.8428 GHz	65.68	11.70
2	Average	2.764 GHz	49.26	-4.71
1	Max Peak	2.764 GHz	53.94	-20.03
2	Average	3.5256 GHz	49.80	-4.17
1	Max Peak	3.5908 GHz	60.42	-13.56
2	Average	3.6856 GHz	42.40	-11.58
1	Max Peak	3.6856 GHz	48.97	-25.01
2	Average	4.6068 GHz	44.72	-9.25
1	Max Peak	4.6068 GHz	50.45	-23.52
1	Max Peak	6.7736 GHz	54.80	-19.17
2	Average	6.8044 GHz	43.11	-10.86
1	Max Peak	9.6196 GHz	58.86	-15.11
2	Average	9.882 GHz	47.66	-6.31

Segalla 18231317



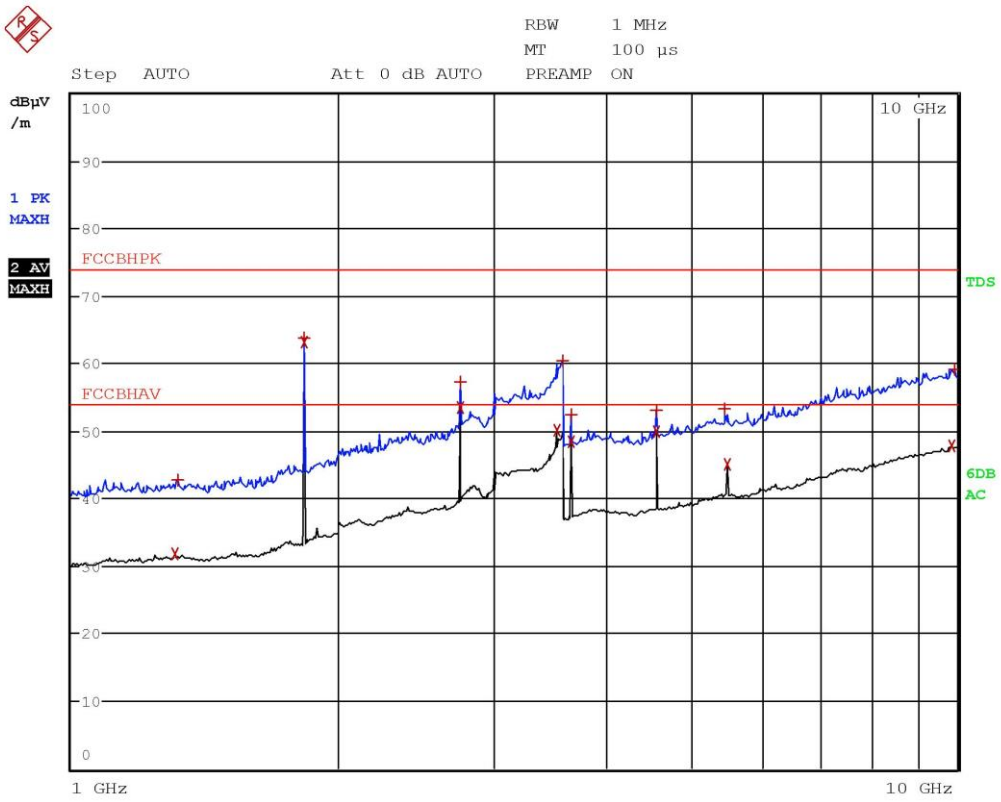
Segalla 18231318

EDIT PEAK LIST (Prescan Results)

Trace1:	FCCBHPK
Trace2:	FCCBHAV
Trace3:	---

TRACE		FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1	Max Peak	1.3084 GHz	43.81	-30.16
2	Average	1.3304 GHz	31.67	-22.30
1	Max Peak	1.83 GHz	66.29	-7.68
2	Average	1.83 GHz	65.83	11.85
1	Max Peak	2.7452 GHz	56.39	-17.58
2	Average	2.7452 GHz	52.69	-1.28
1	Max Peak	3.5256 GHz	60.98	-12.99
2	Average	3.5256 GHz	49.92	-4.05
1	Max Peak	3.66 GHz	51.72	-22.25
2	Average	3.66 GHz	47.58	-6.39
1	Max Peak	4.5752 GHz	54.00	-19.97
2	Average	4.5752 GHz	49.70	-4.27
1	Max Peak	6.7624 GHz	54.15	-19.82
2	Average	6.8088 GHz	43.22	-10.75
1	Max Peak	9.6232 GHz	59.33	-14.64
2	Average	9.8436 GHz	47.86	-6.11

Segalla 18231318



Segalla 18231319

EDIT PEAK LIST (Prescan Results)			
Trace1:	FCCBHPK		
Trace2:	FCCBHAV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
2 Average	1.3088 GHz	31.74	-22.23
1 Max Peak	1.3208 GHz	42.82	-31.15
1 Max Peak	1.83 GHz	63.68	-10.29
2 Average	1.83 GHz	63.07	9.09
1 Max Peak	2.7452 GHz	57.26	-16.71
2 Average	2.7452 GHz	53.43	-0.54
2 Average	3.5256 GHz	50.20	-3.77
1 Max Peak	3.5996 GHz	60.49	-13.48
2 Average	3.6604 GHz	48.52	-5.45
1 Max Peak	3.6604 GHz	52.47	-21.50
2 Average	4.5752 GHz	49.88	-4.09
1 Max Peak	4.5756 GHz	52.97	-21.00
1 Max Peak	5.4608 GHz	53.21	-20.77
2 Average	5.4904 GHz	44.97	-9.00
2 Average	9.852 GHz	47.81	-6.16
1 Max Peak	9.9336 GHz	59.14	-14.83

Segalla 18231319

Result: The requirements are met

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

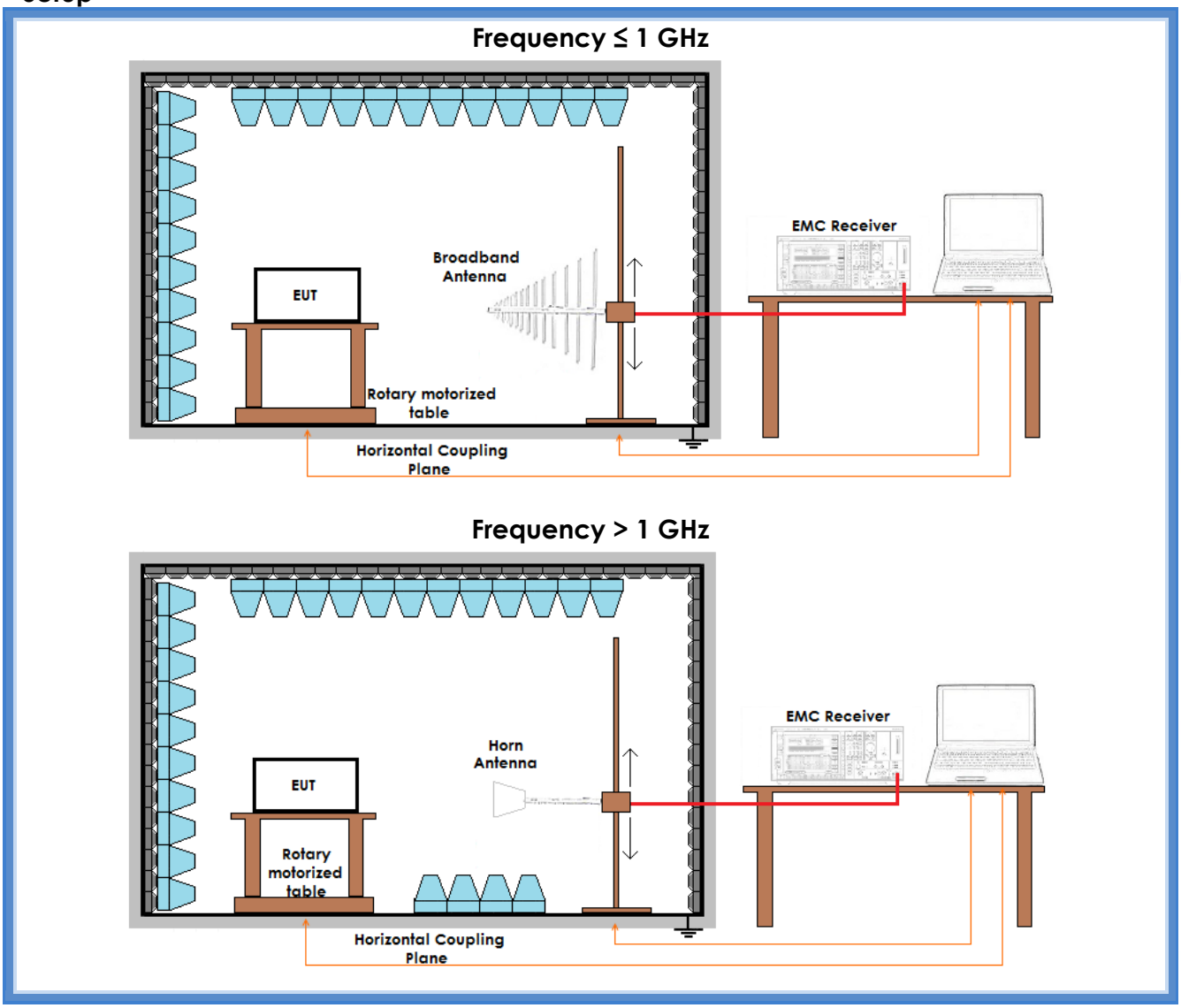
See FCC Part 15.247

Environmental conditions

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

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

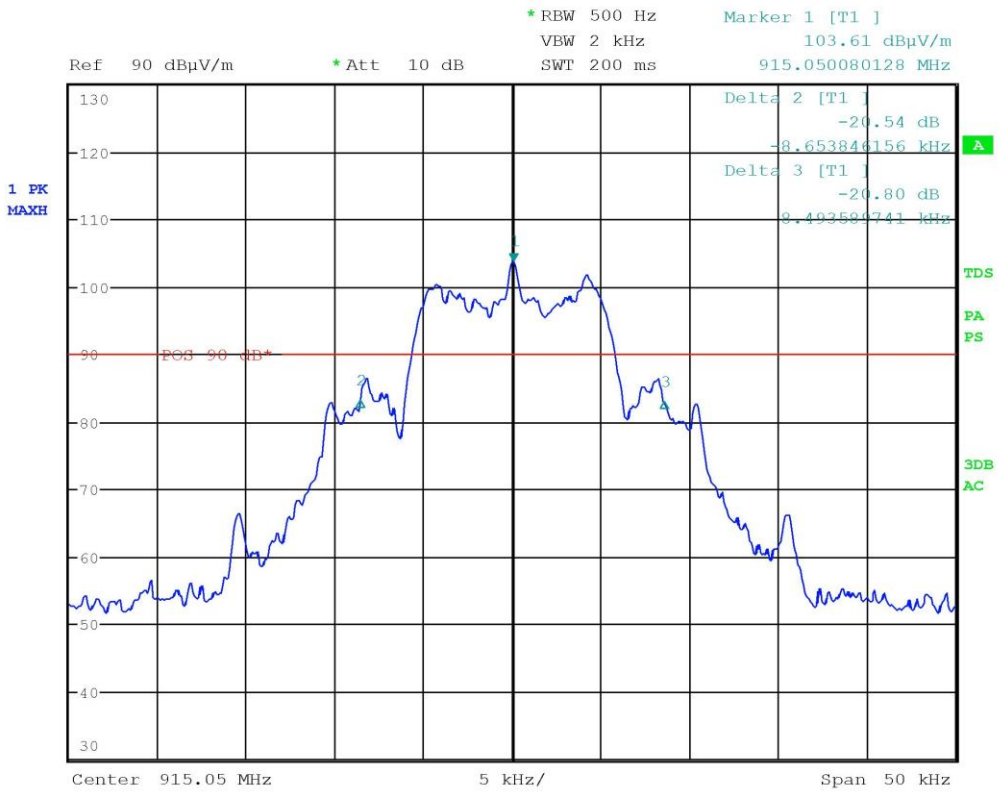
Setup



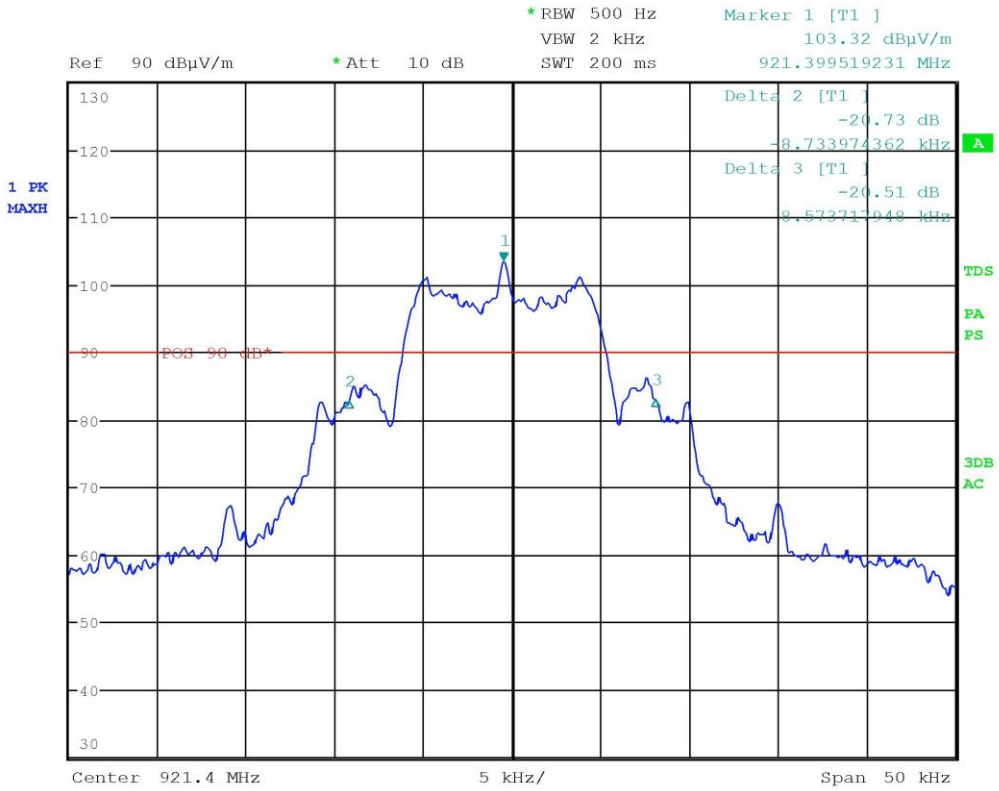
Result

Frequency (MHz)	*Graphs*	*20 dB bandwidth (kHz)*	*Maximum 20 dB bandwidth allowed (kHz)*	*Results*
915,050	G18231320	17,148	500	Complies
921,400	G18231326	17,308	500	Complies
927,800	G18231330	17,548	500	Complies

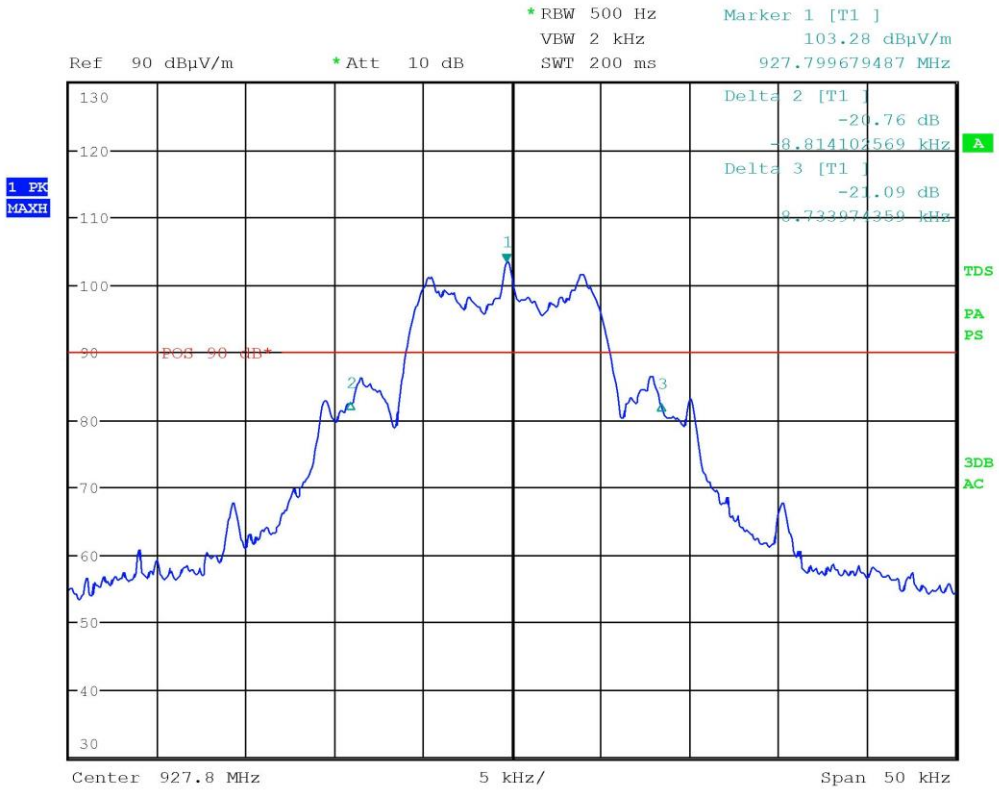
Graphs



Segalla 18231320



Segalla 18231326



Segalla 18231330

Result: The requirements are met

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

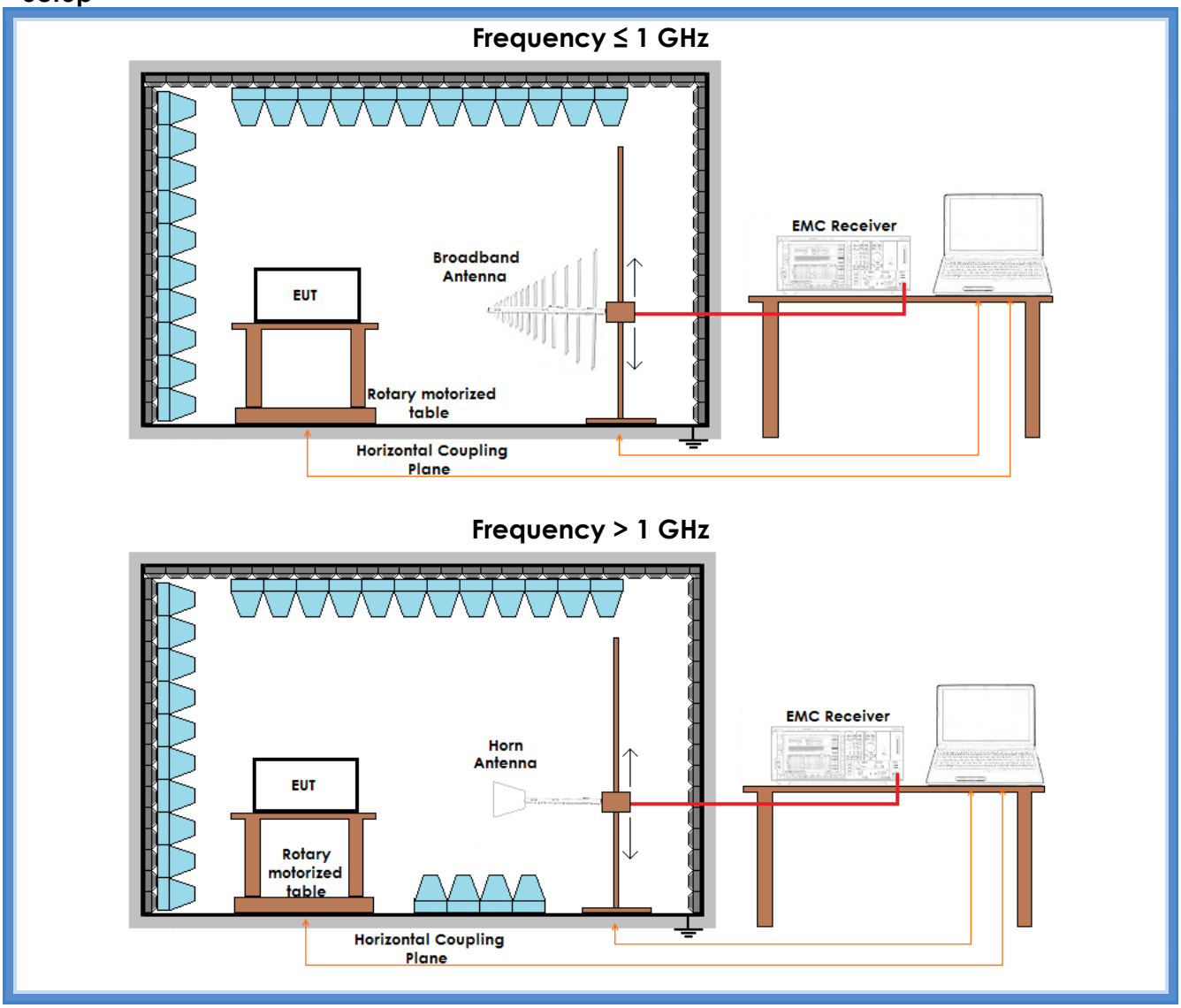
See FCC Part 15.247

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

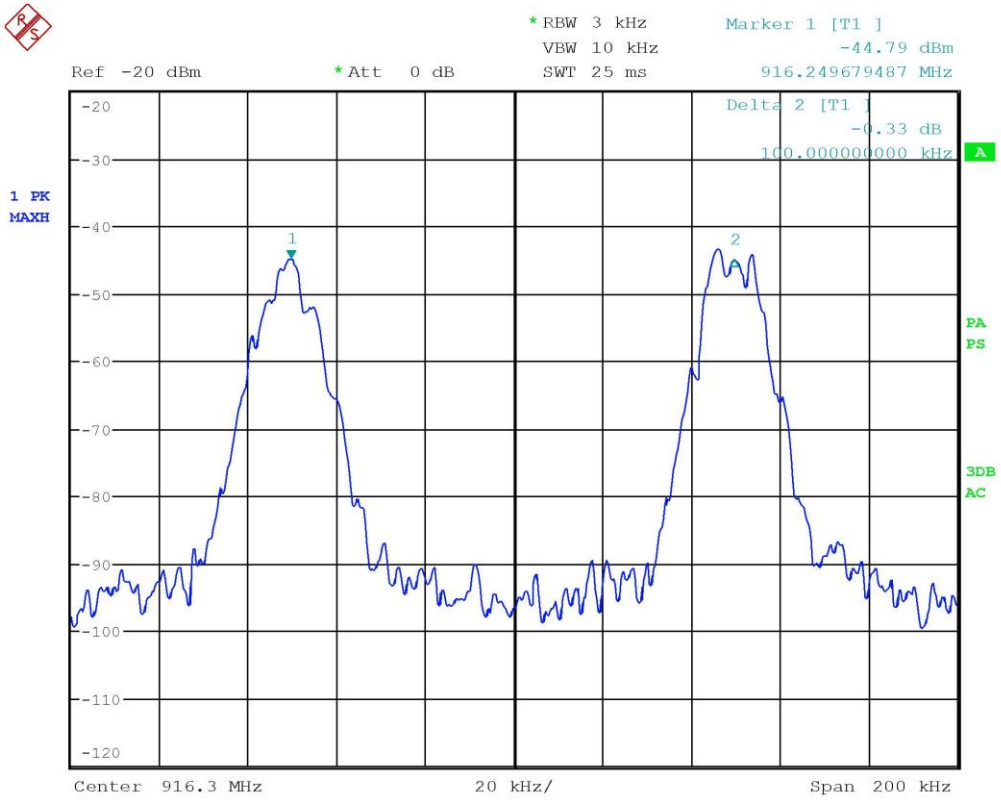
Setup



Result

Frequency band (MHz)	*Graphs*	*Channel separation (kHz)*	*Minimum channel separation required (kHz)*	*Results*
902 – 928	G18231345	100	25	Complies

Graphs



Segalla 18231345

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

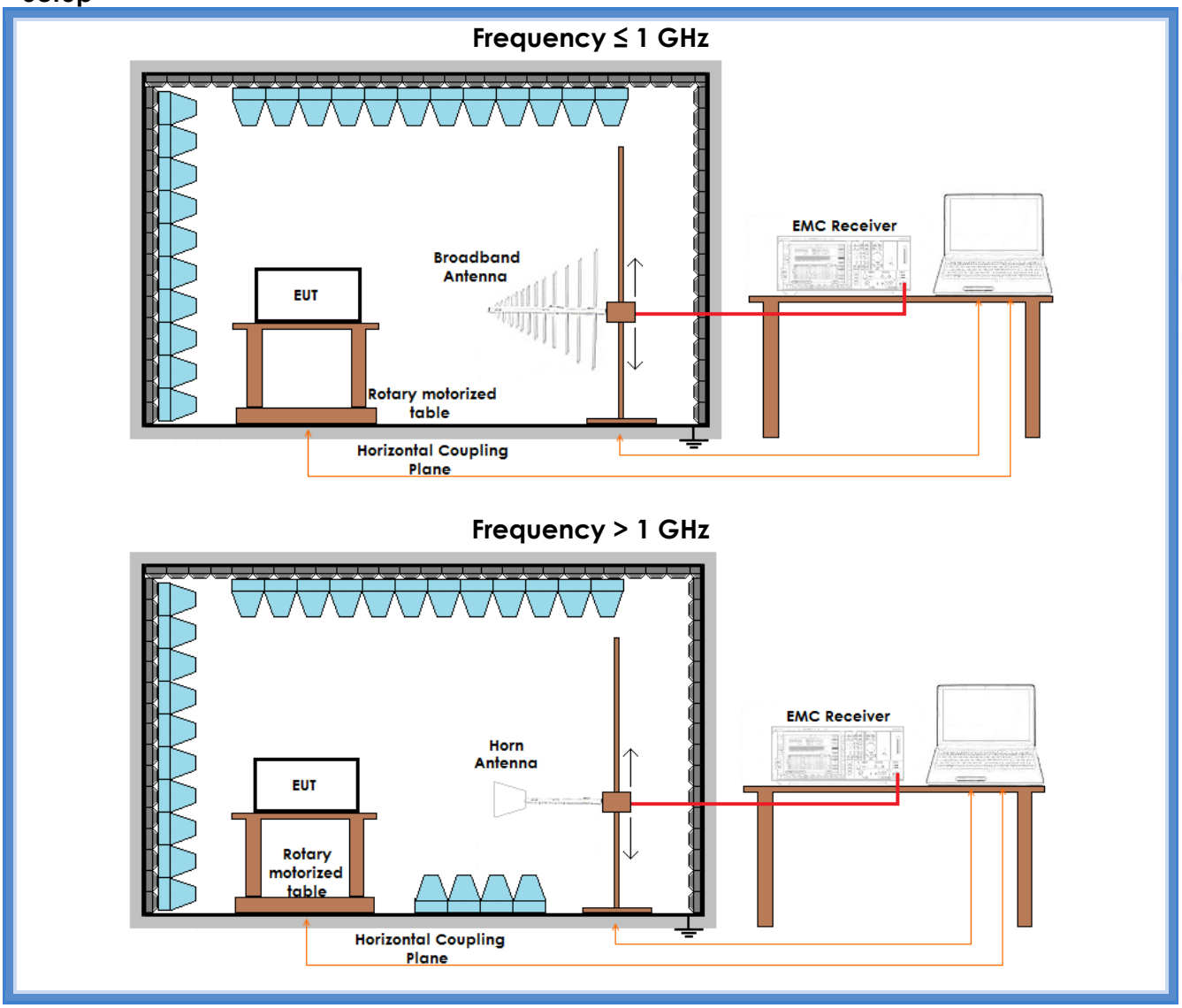
See FCC Part 15.247

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

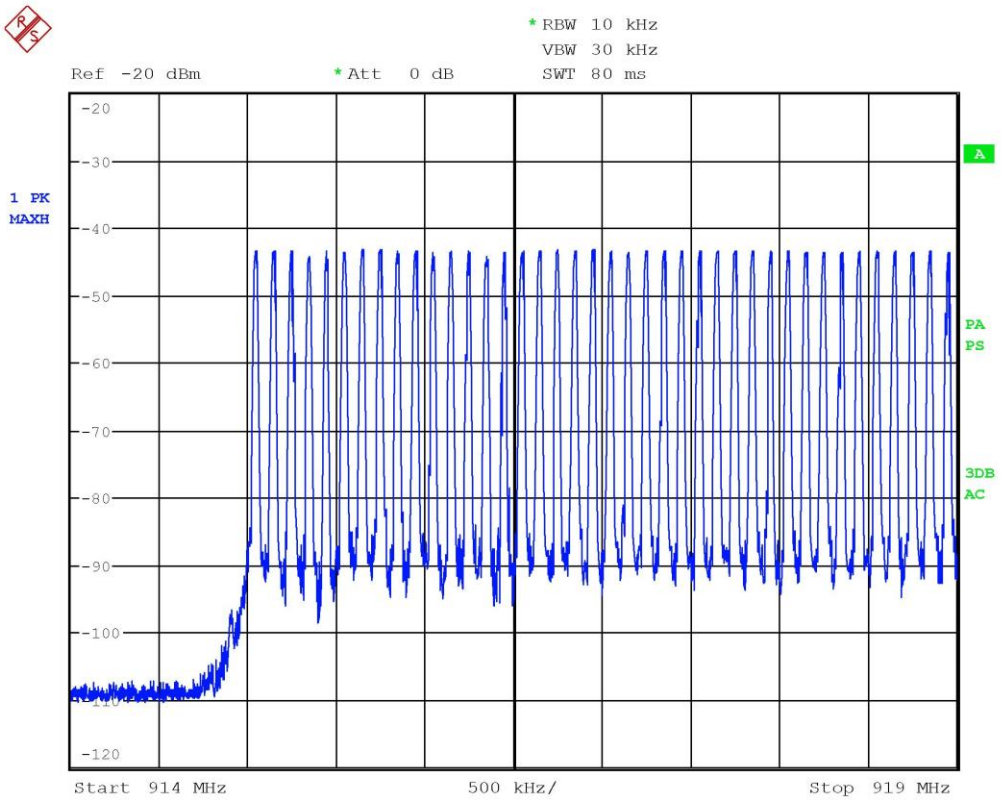


Result

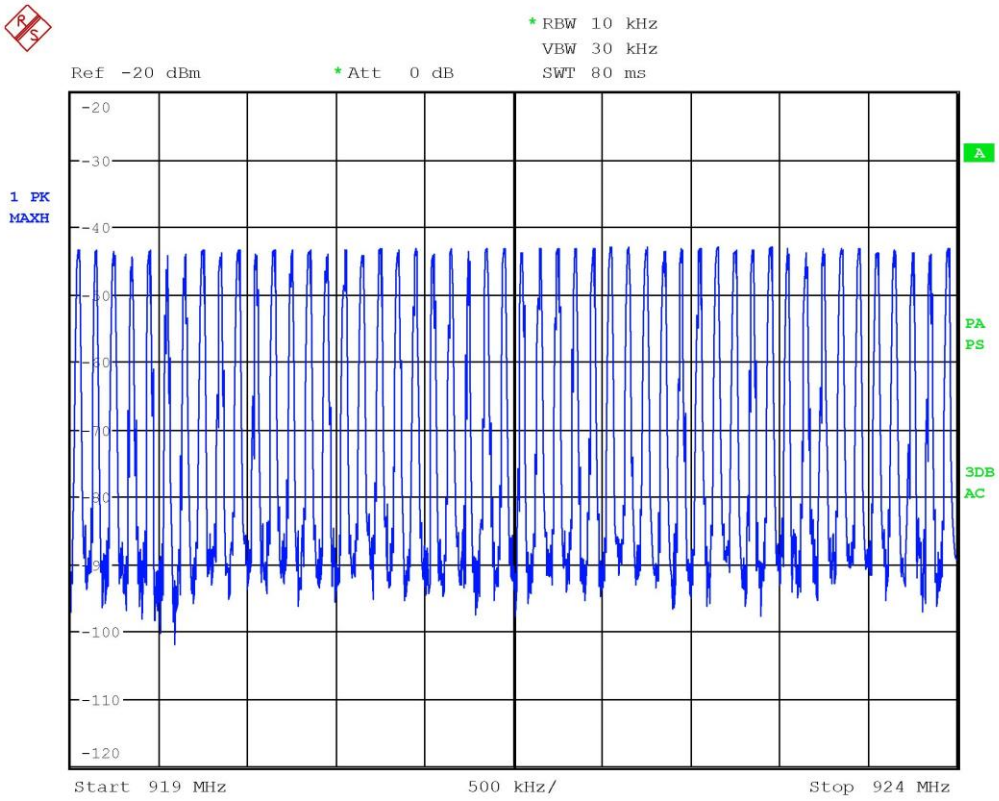
Frequency band (MHz)	*Graphs*	*Number of hopping channels*	*Minimum number of hopping channels required*	*Results*
902 – 928	G18231342, G18231343, G18231344	128	50	Complies

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

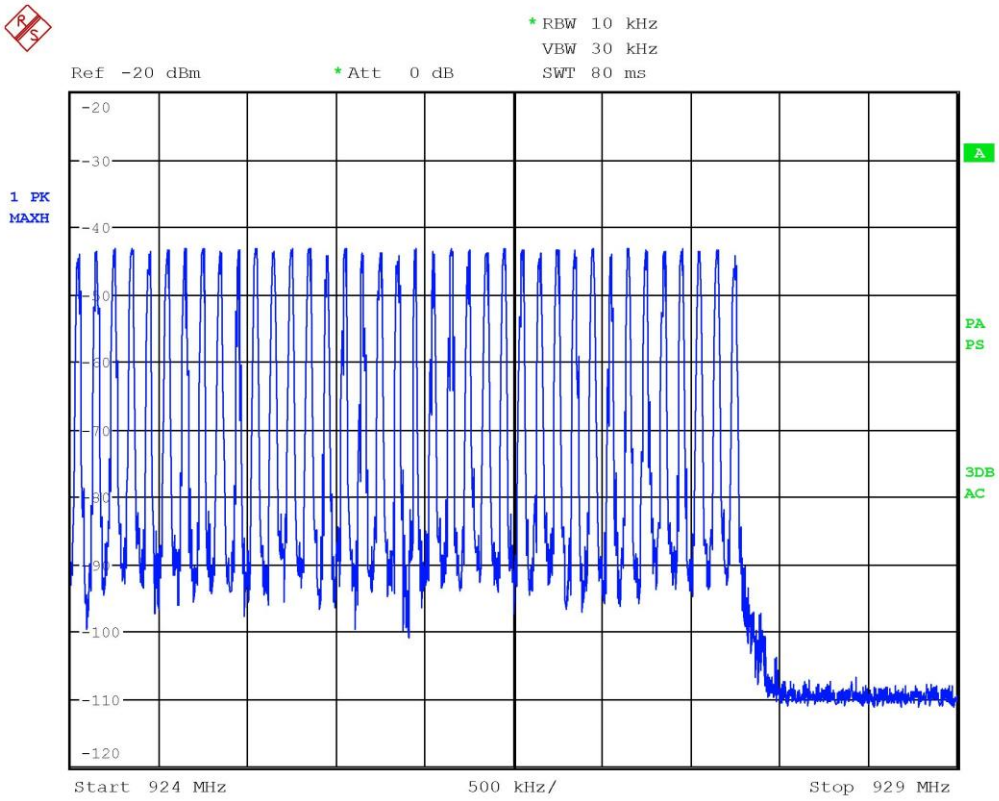
Graphs



Segalla 18231342



Segalla 18231343



Segalla 18231344

Result: The requirements are met

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

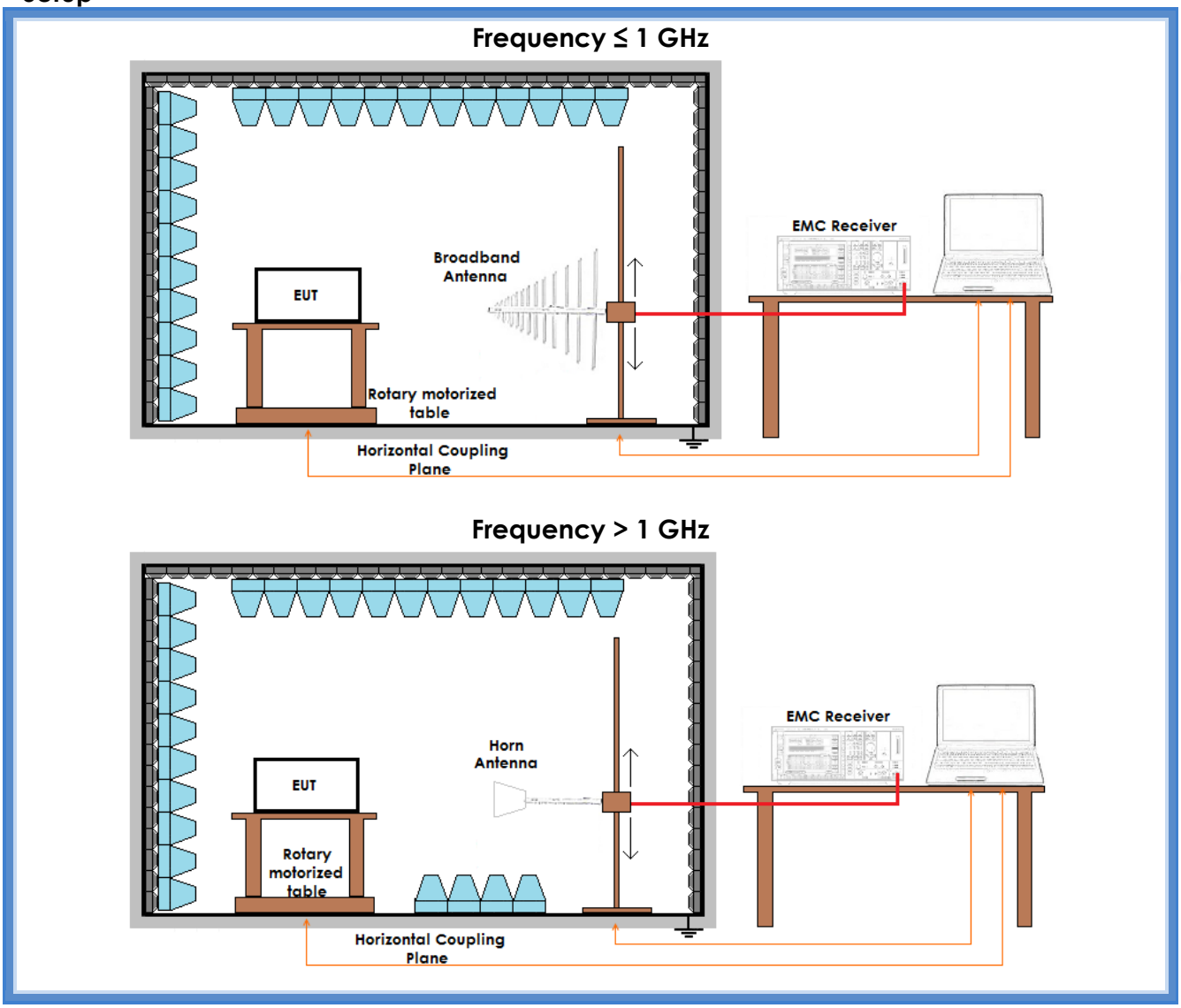
See FCC Part 15.247

Environmental conditions

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

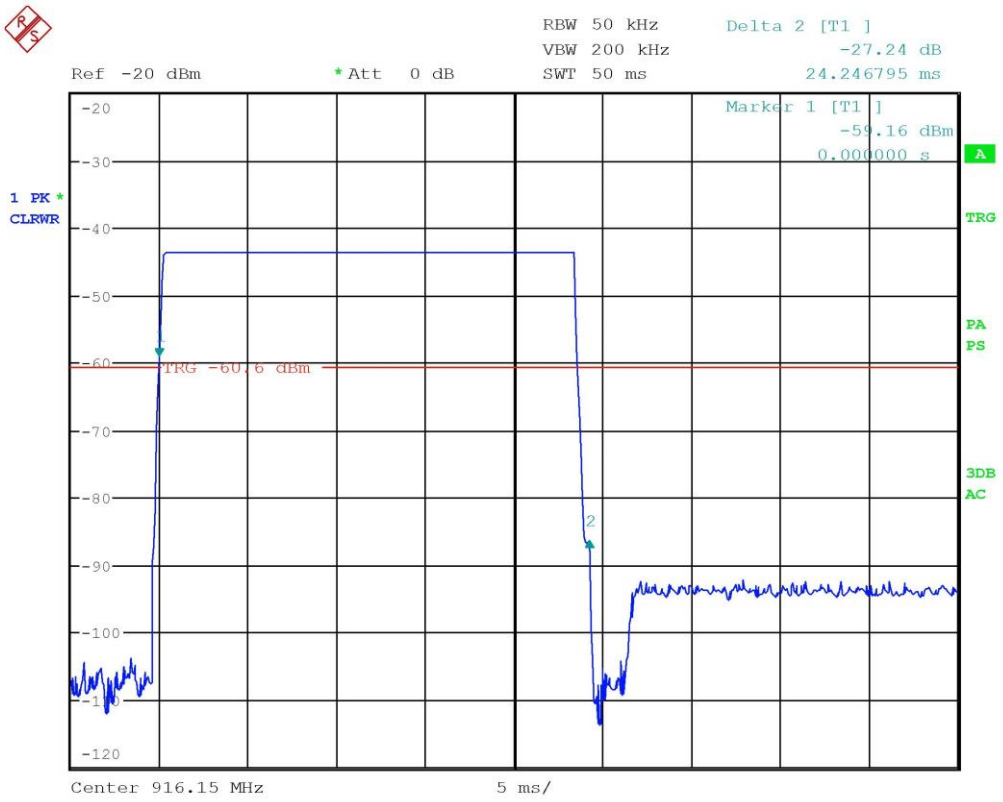
Frequency (MHz)	*Graphs*	*Dwell time (ms)*
924,051	G18231346	24,25

Frequency (MHz)	*Graphs*	*Number of transmissions*	*Period*
924,051	G18231347	4	20 s

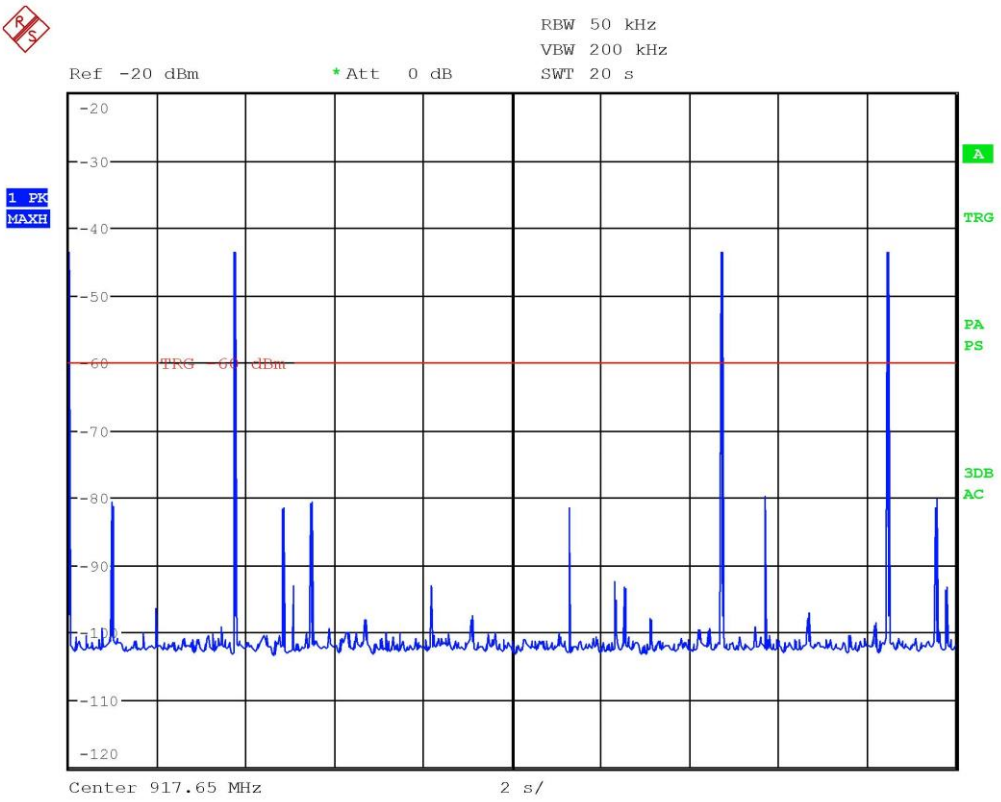
Remarks: only the highest peaks have been considered. The lowest peaks are due to the auxiliary receiver unit

Time of occupancy (Dwell time x Nr. transmissions)	***Maximum allowed time of occupancy***	***Results***
97 ms	400 ms	Complies

Graphs



Segalla 18231346



Segalla 18231347

Result: The requirements are met

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

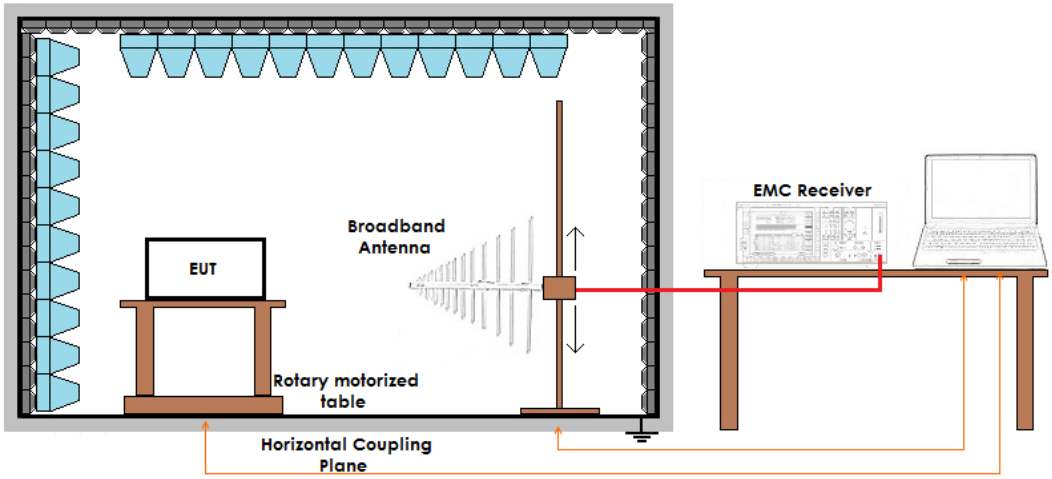
Environmental conditions

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

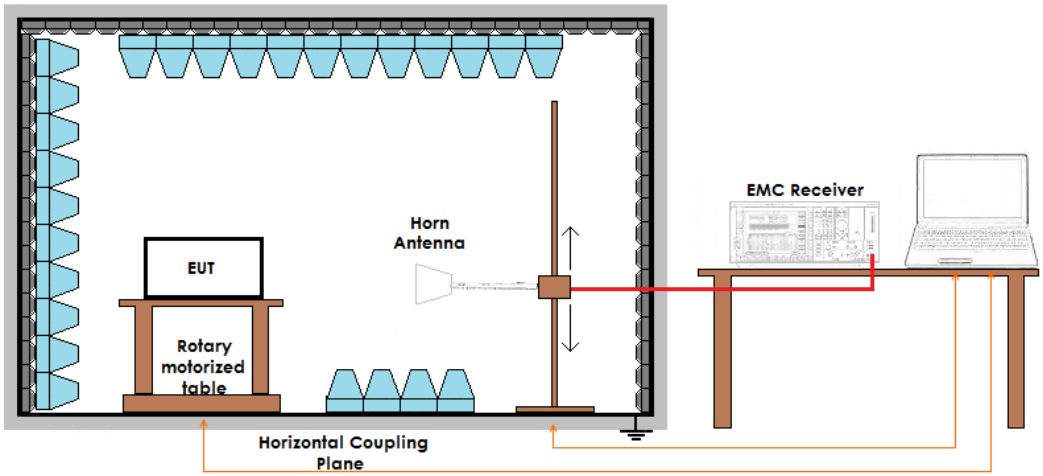
Acceptance limits: operation within the band 902 – 928 MHz

Setup

Frequency ≤ 1 GHz



Frequency > 1 GHz

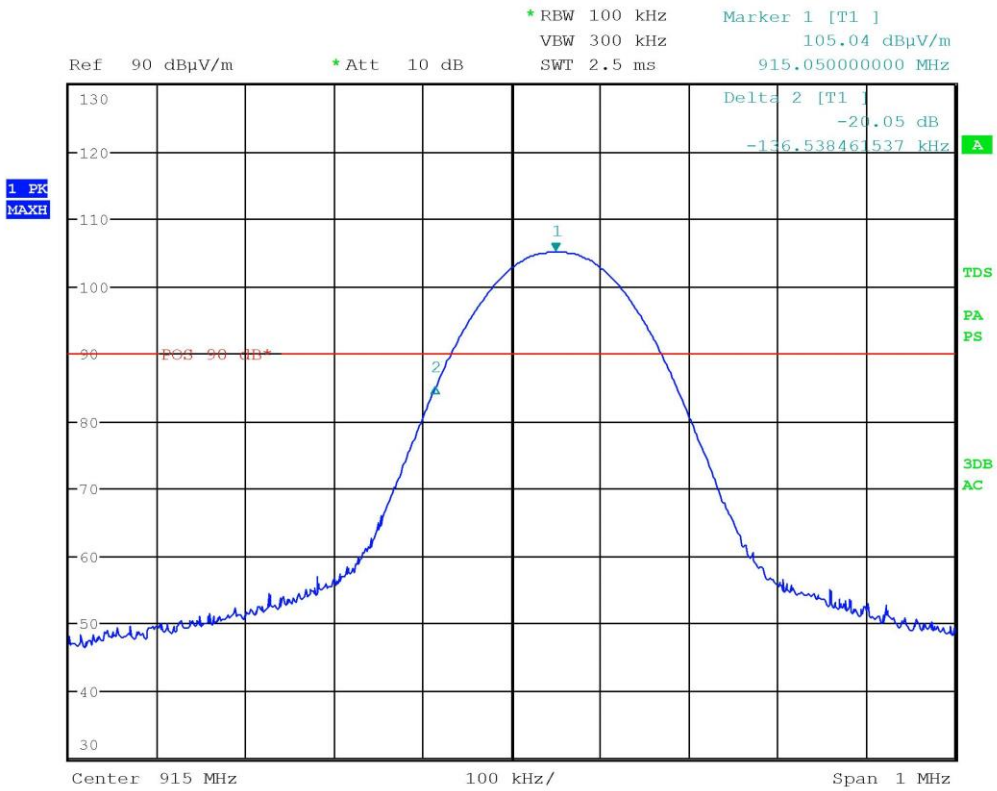


Result

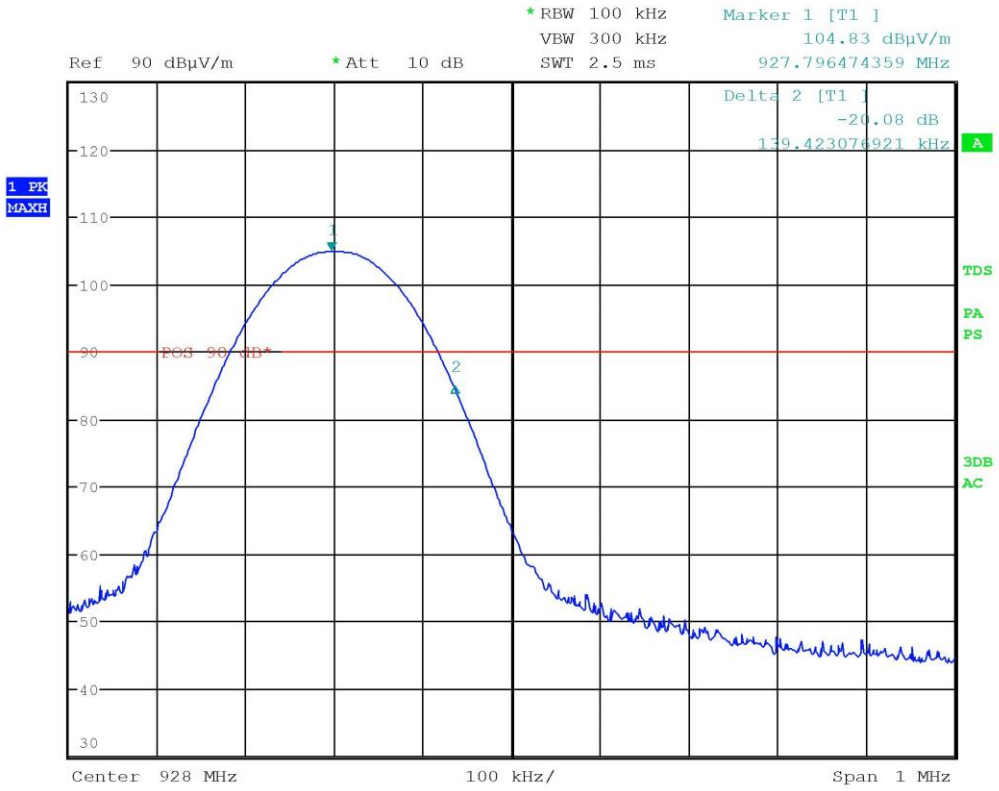
Frequency (MHz)	*Graph(s) – Hopping*	*Results*	
915,050	G18231336	F_L: 914,91346 MHz	Complies
927,800	G18231339	F_H: 927,93365 MHz	Complies

Frequency (MHz)	*Graph(s) – No hopping*	*Results*	
915,050	G18231323	F_L: 914,91346 MHz	Complies
927,800	G18231332	F_H: 927,93942 MHz	Complies

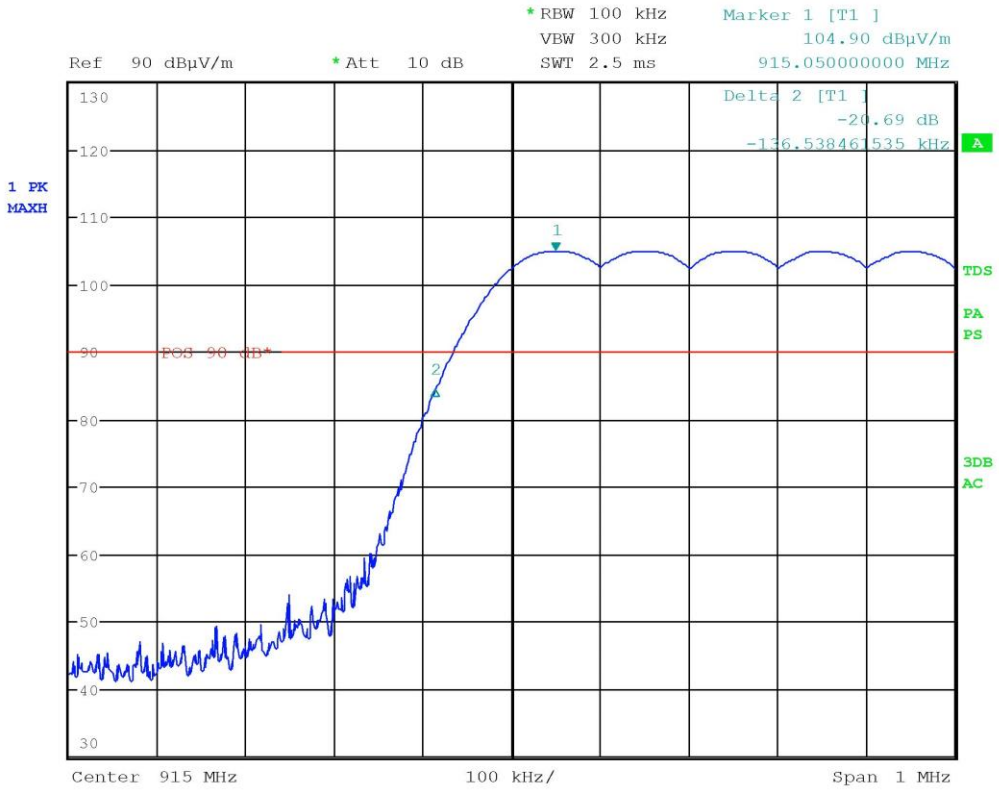
Graphs



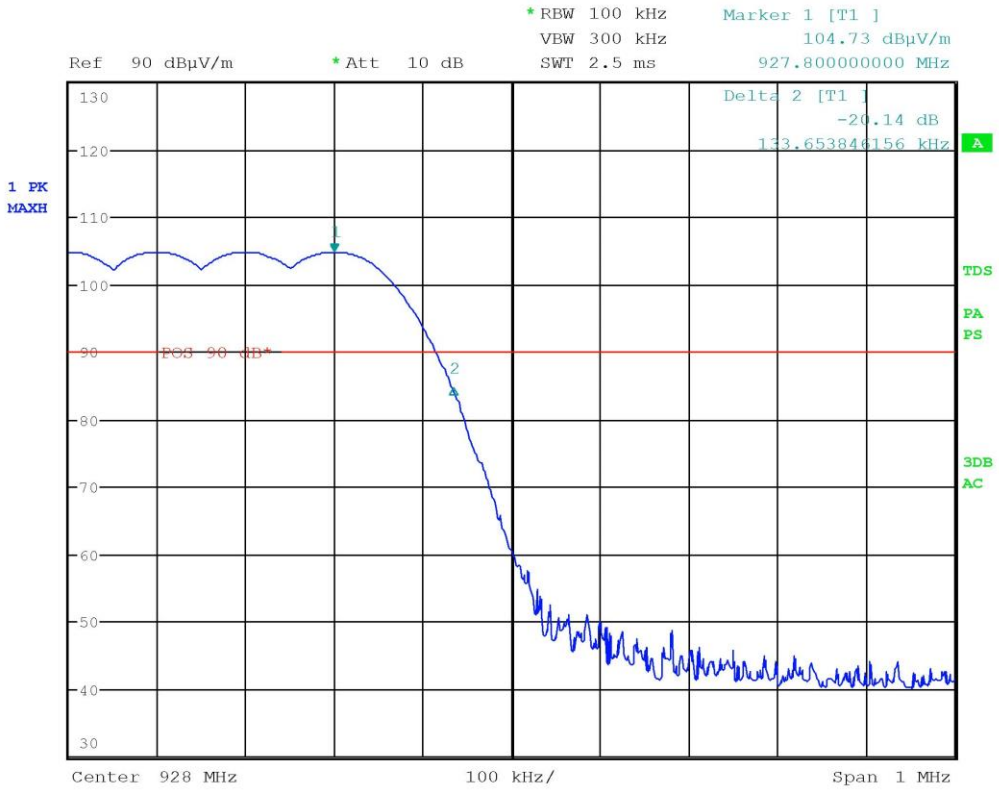
Segalla 18231323



Segalla 18231332



Segalla 18231336



Segalla 18231339

Result: The requirements are met

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

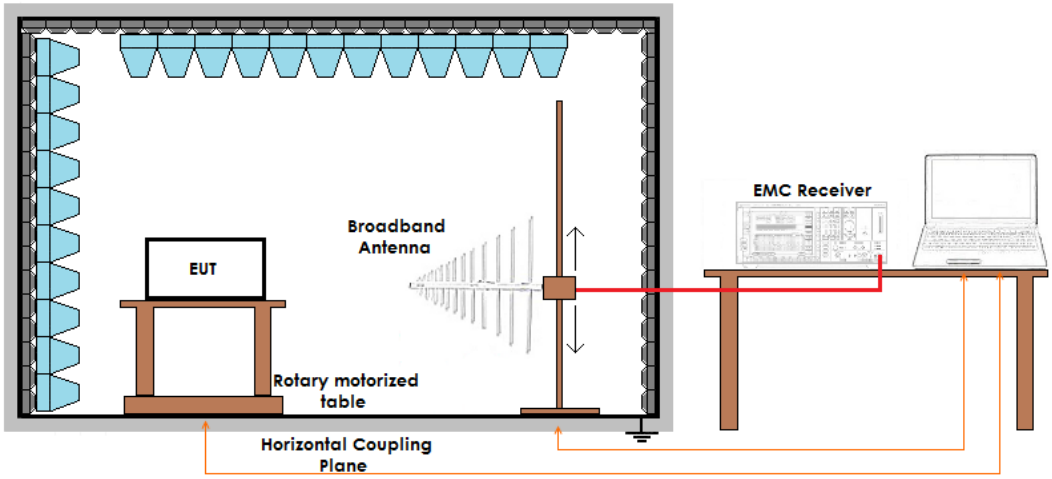
Environmental conditions

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

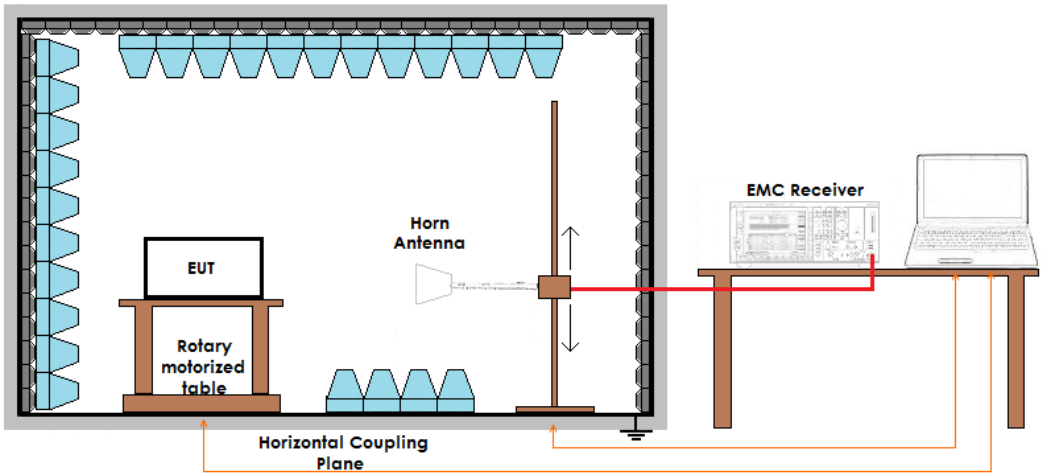
For frequency hopping systems operating in the 2400–2483,5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483,5 MHz band: 0,125 watts.
For frequency hopping systems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

Frequency ≤ 1 GHz



Frequency > 1 GHz



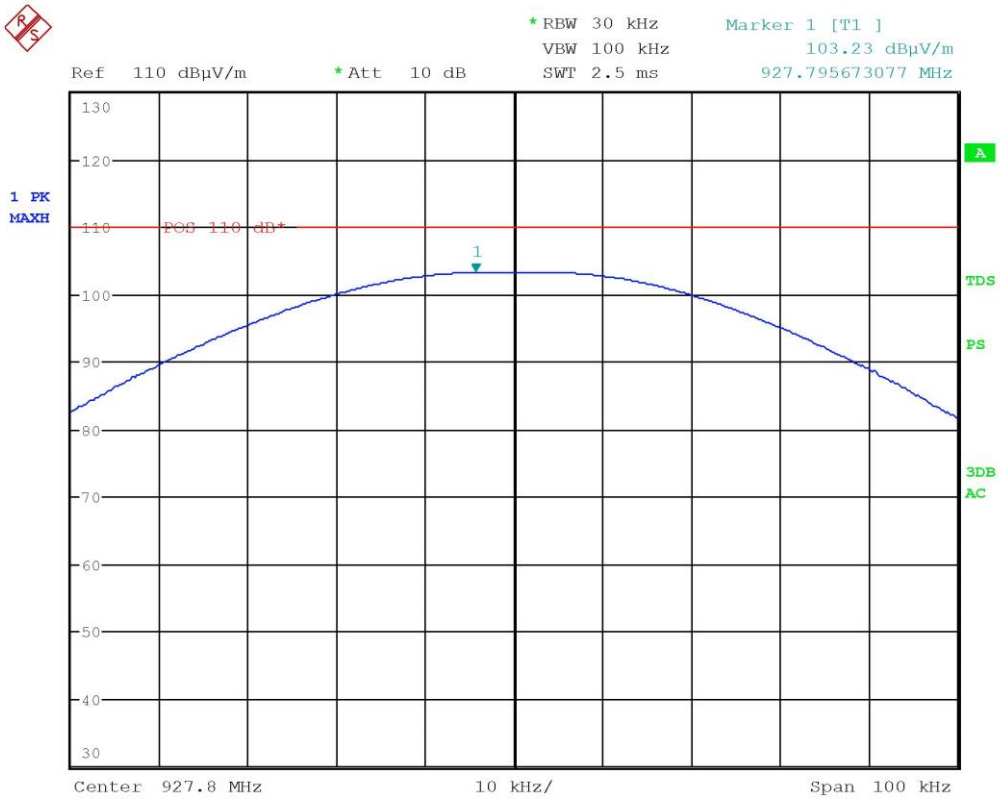
Result

Frequency (MHz)	*Polarization*	*Graphs*	*Measured Peak level (dBµV/m)*	*Peak Output Power (mW)*	*Remarks*
915,050	Worst case	G18231352	103,45	73,77	--
921,400	Worst case	G18231351	103,72	78,50	--
927,800	Worst case	G18231350	103,23	70,13	--

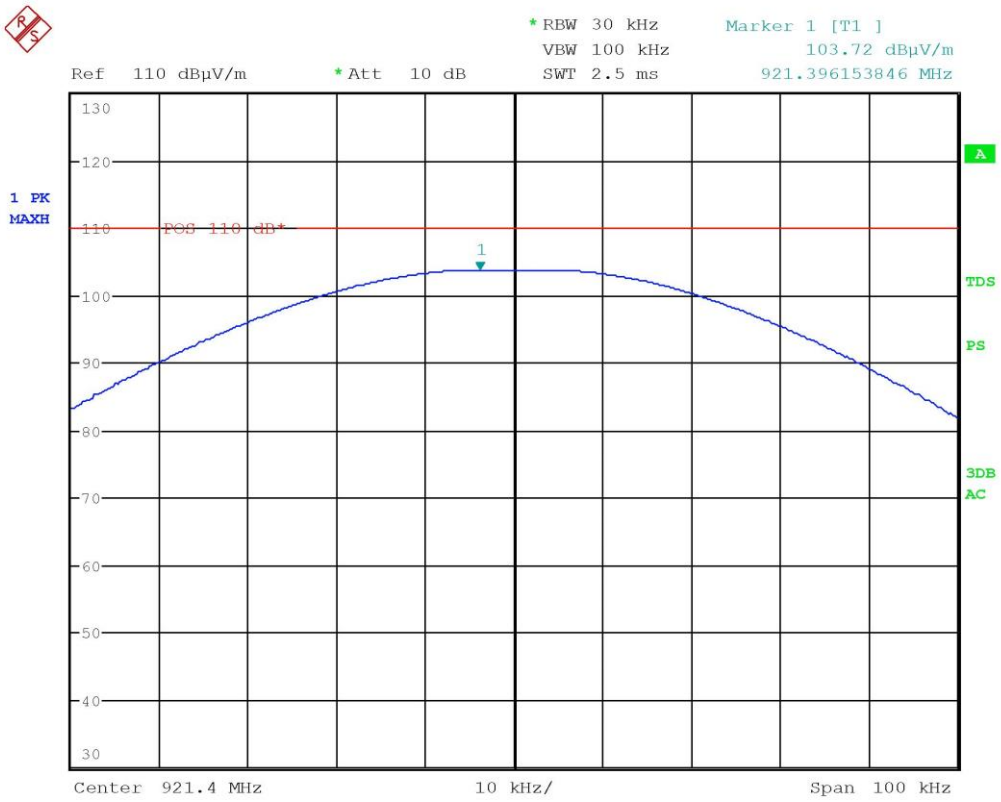
Remarks: the output power level of EUT has been decreased by software during the test

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

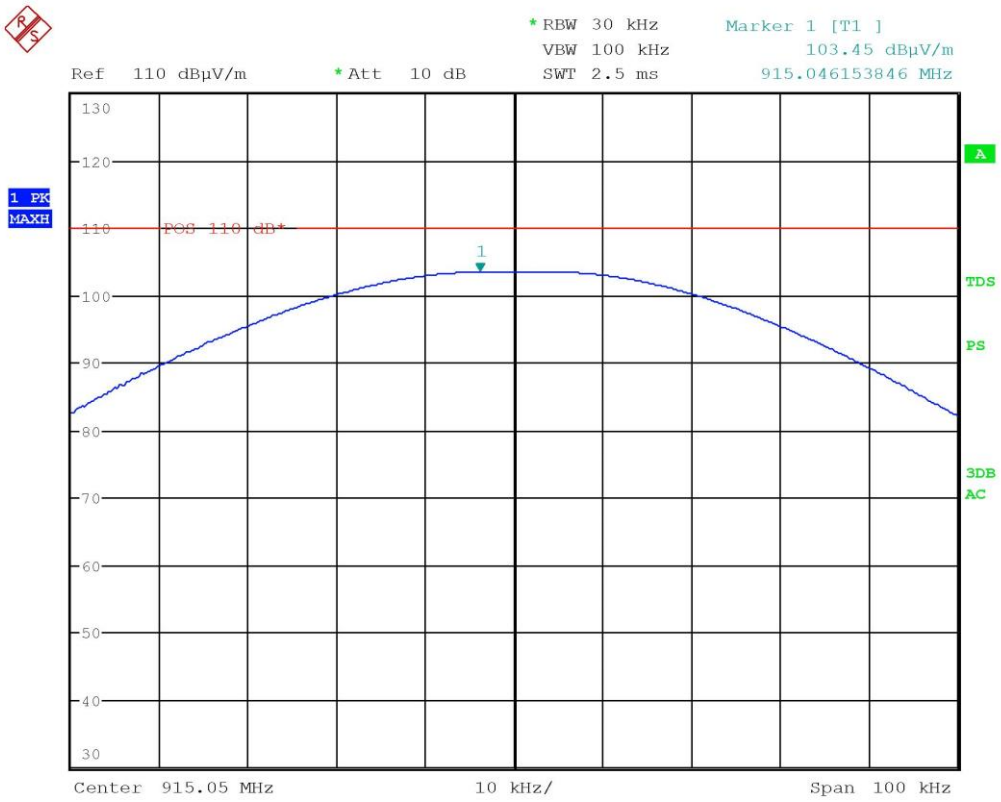
Graphs



Gandini 18231350



Gandini 18231351



Gandini 18231352

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

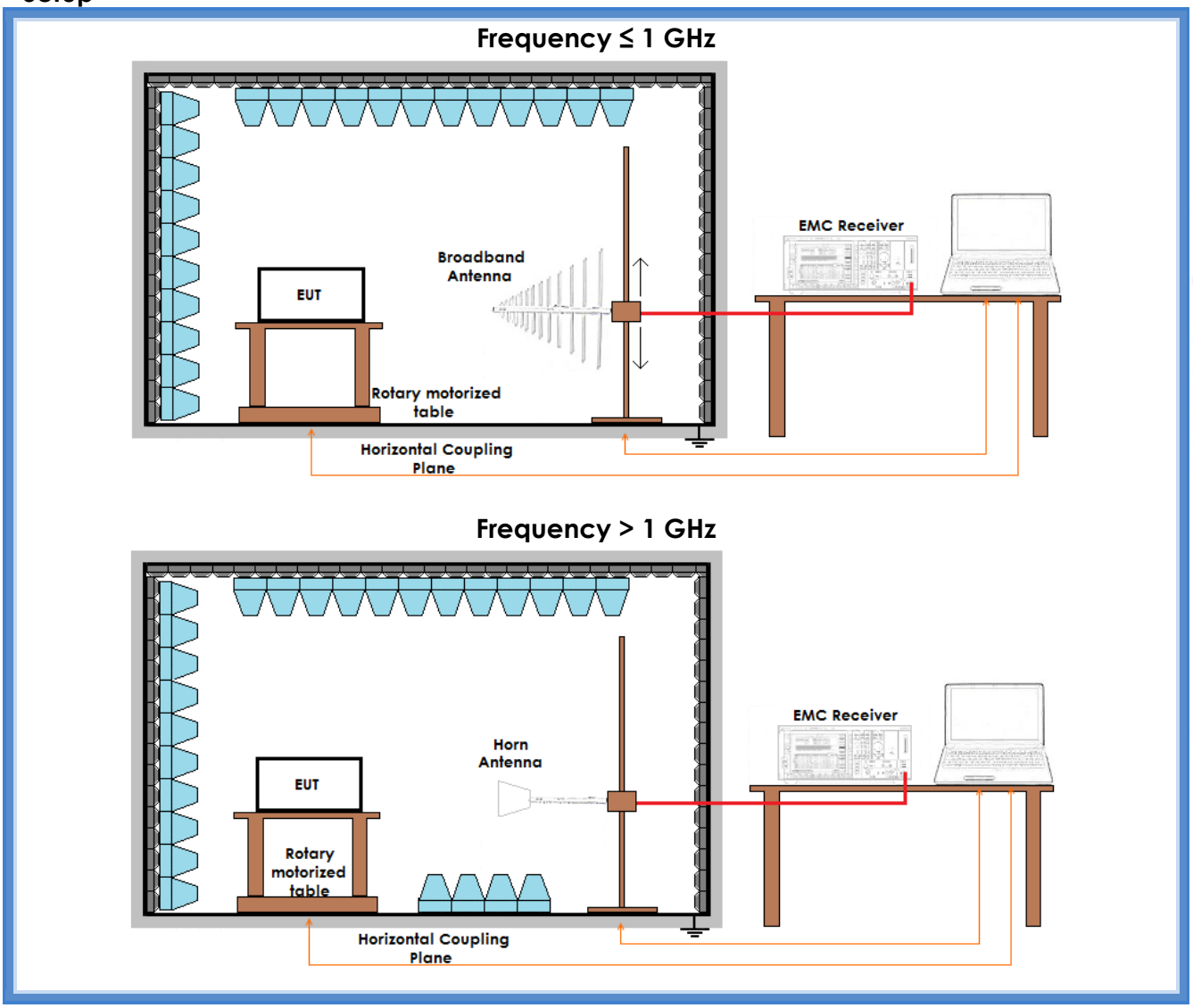
Acceptance limits for emissions in restricted frequency bands		
Frequency (MHz)	*AV limits [dB(µV/m)]*	*Peak limits [dB(µV/m)]*
> 1000	54	74

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 (dBµV/m)	Limits (dBµV/m)	Level (dBµV/m)	Limits (dBµV/m)	Level (dBµV/m)	Limits (dBµV/m)	
II	65,83	85,08	65,68	84,80	66,30	84,88	Complies
III	53,43	54,00	49,65	54,00	44,21	54,00	Complies
IV	48,52	54,00	49,74	54,00	48,19	54,00	Complies
V	49,88	54,00	44,72	54,00	44,16	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	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
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 then harmonics have been found. The results have been extrapolated to the specified distance using an extrapolation factor.
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.

Result – Peak detector

Harmonic	Lowest channel		Medium channel		Highest channel		Results
	Level (dBµV/m)	Limits (dBµV/m)	Level (dBµV/m)	Limits (dBµV/m)	Level (dBµV/m)	Limits (dBµV/m)	
II	66,29	74,00	66,11	74,00	66,69	74,00	Complies
III	57,26	74,00	54,74	74,00	53,36	74,00	Complies
IV	52,47	74,00	53,30	74,00	53,02	74,00	Complies
V	54,00	74,00	50,77	74,00	50,70	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	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
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 then 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 dBµV/m as a worse case.

Result: The requirements are met