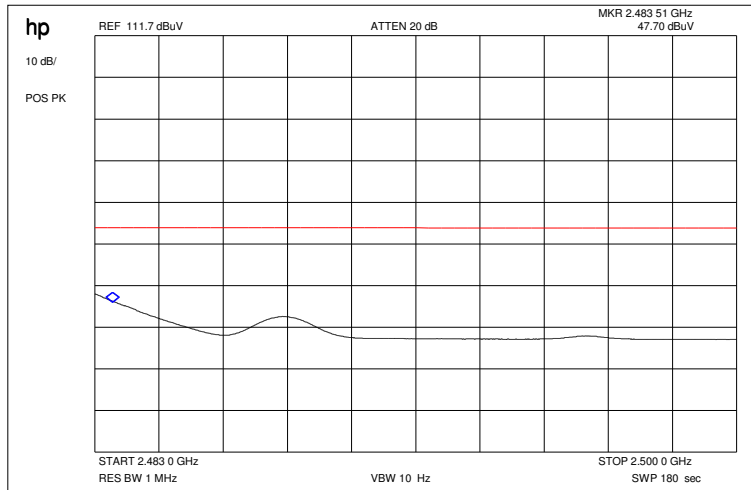


## Plot 5: Restricted Bands high



## Results & Limits:

### Radiated field strength

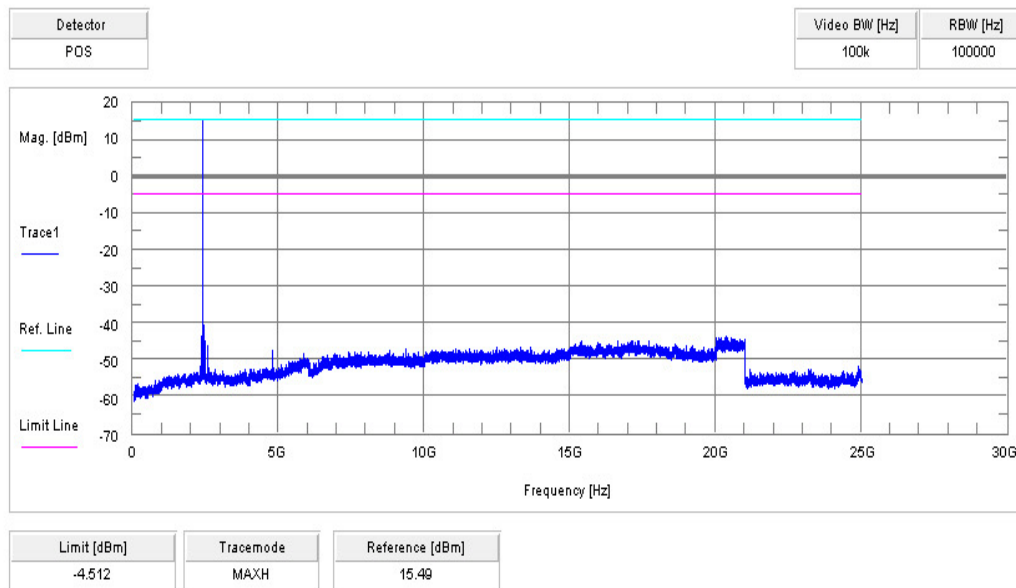
The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	113 dB $\mu$ V/m	-3.6	109.4 dB $\mu$ V/m
Max. average value	Calculated with duty cycle correction factor	dB $\mu$ V/m peak	- 1.58 dB duty cycle correction factor (worst case DH5)	107.82 dB $\mu$ V/m
Delta value	Peak 30 kHz RBW/VBW	59.6 dB (single carrier) 58.7 dB (hopping mode)	-	-
Value at band edge	limit 54 dB $\mu$ V/m			48,22 dB $\mu$ V/m (single carrier) 49,12 dB $\mu$ V/m (hopping mode)
Statement:				Complies

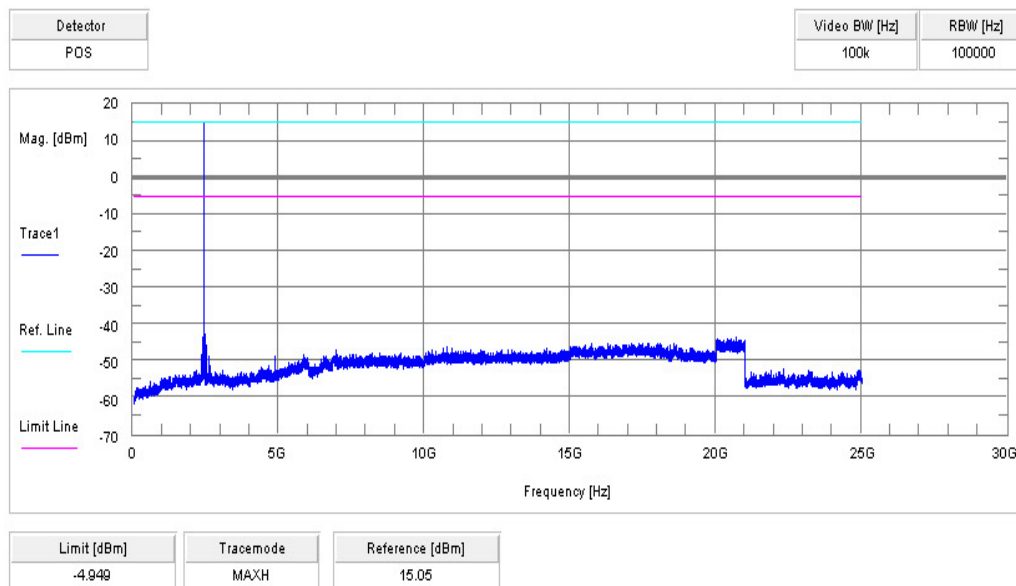
## 3.14 Spurious Emissions - conducted (Transmitter) § 15.247 (c)(1)

Modulation: GFSK

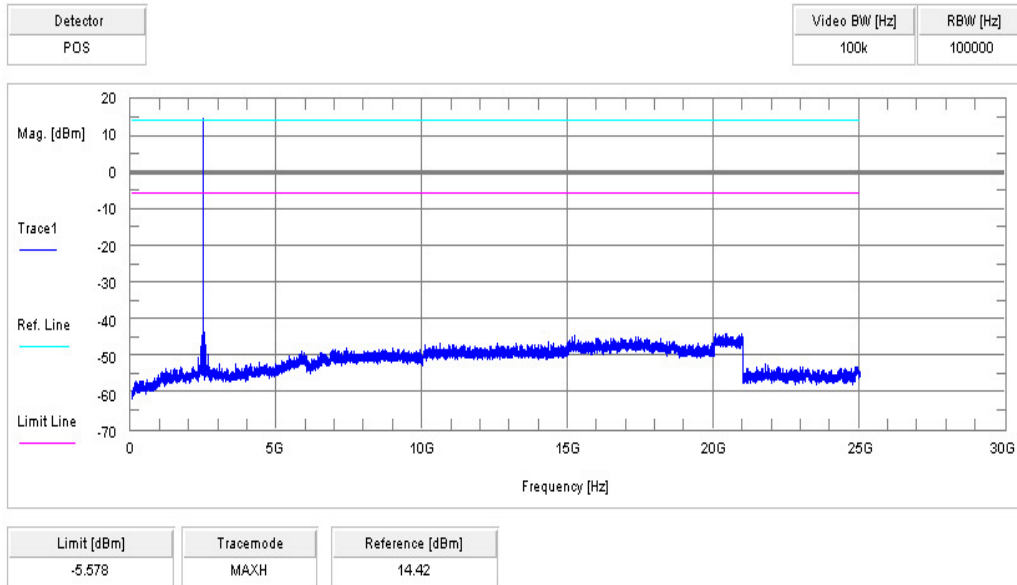
Plot 1 of 3: lowest channel



Plot 2 of 3: middle channel



Plot 3 of 3: highest channel



Result & Limits:

Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emmission power	actual attenuation below frequency of operation [dB]	results
2402		15.49	30 dBm		Operating frequency
			-20 dBc	--	complies
				--	complies
2441		15.05	30 dBm		Operating frequency
			-20 dBc	--	complies
				--	complies
2480		14.42	30 dBm		Operating frequency
			-20 dBc	--	complies
				--	complies
Measurement uncertainty		± 3dB			

RBW : 100 kHz VBW: 100 MHz

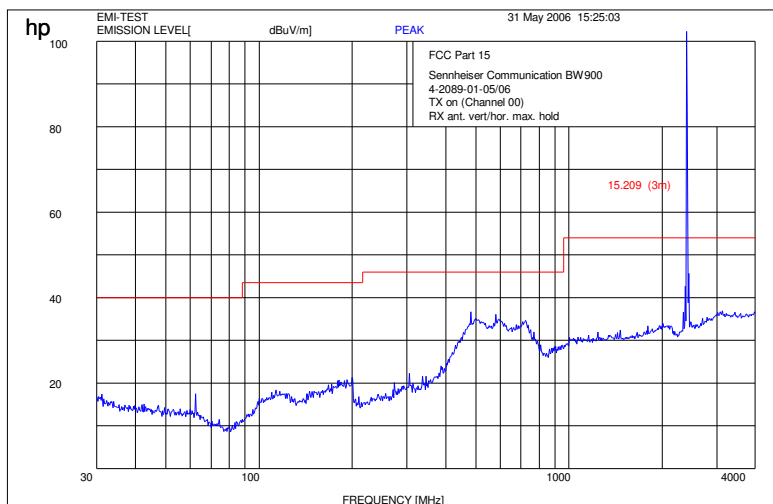
Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
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Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

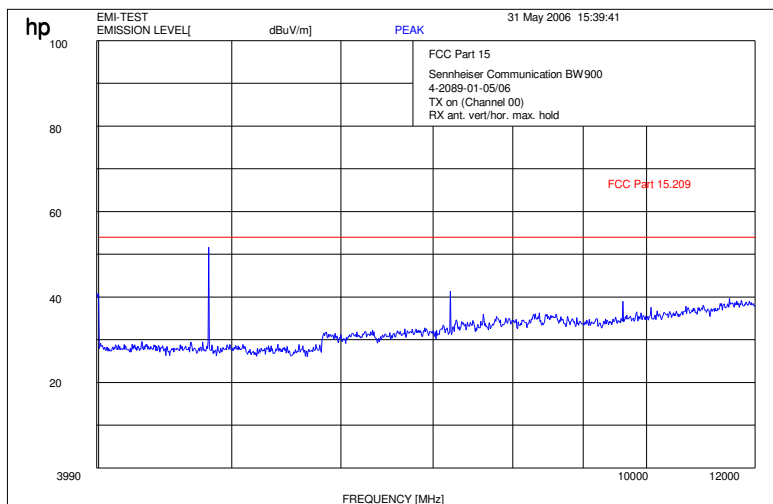
### 3.15 Spurious Emissions > 30 MHz- radiated (Transmitter) § 15.247 (c)(1)

Modulation: GFSK

Plot : 0.03 - 4 GHz vertical/horizontal (lowest channel)

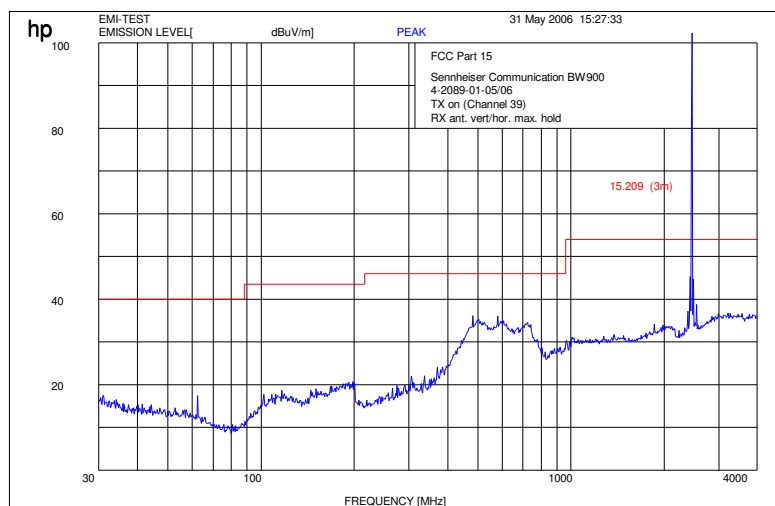


Plot : 4- 12 GHz vertical/horizontal (lowest channel)

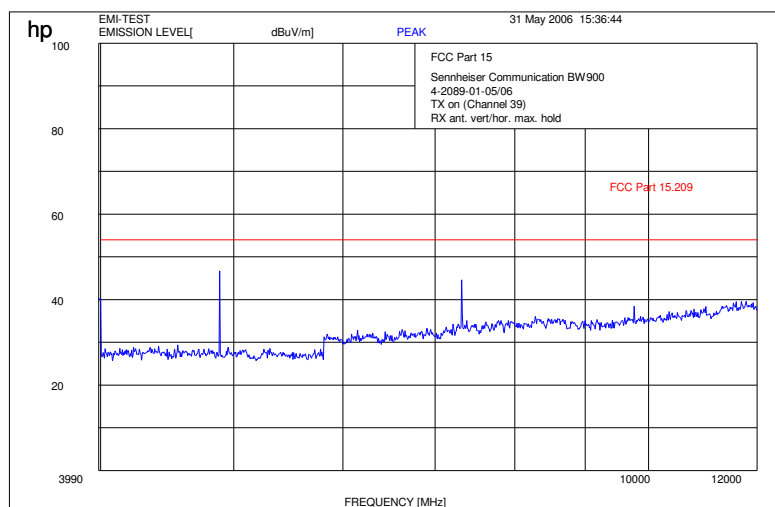


Plot : 12- 25 GHz vertical/horizontal (lowest channel)

Plot : 0.03 - 4 GHz vertical/horizontal (middle channel)

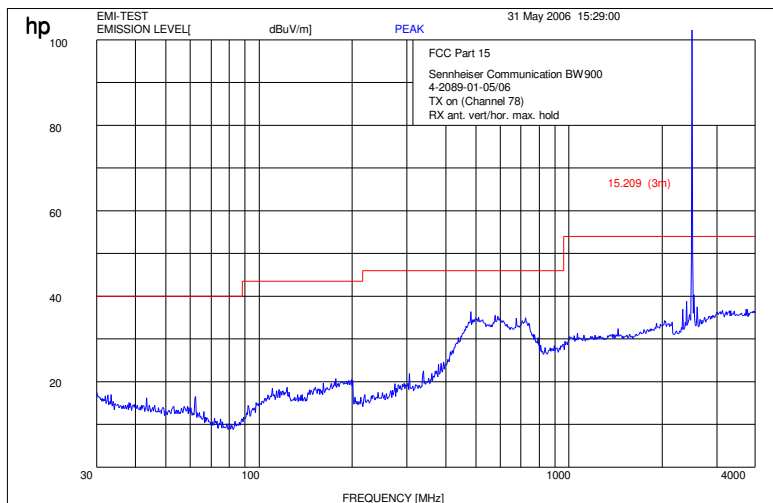


Plot : 4- 12 GHz vertical/horizontal (middle channel)

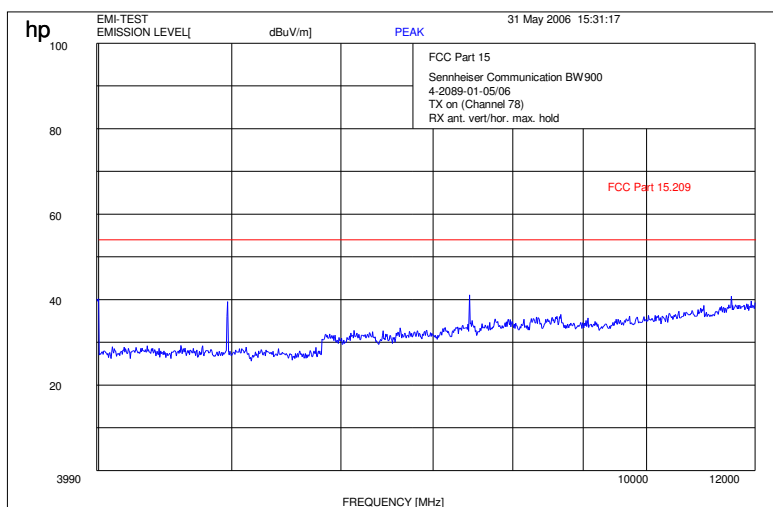


Plot : 12- 25 GHz vertical/horizontal (middle channel)

Plot : 0.03 - 4 GHz vertical/horizontal (highest channel)



Plot : 4- 12 GHz vertical/horizontal (highest channel)



Plot : 12- 25 GHz vertical/horizontal (highest channel)

Results:

SPURIOUS EMISSIONS LEVEL (dB $\mu$ V/m)								
2402 MHz			2441 MHz			2480 MHz		
F [MHz]	Detector	Level [dB $\mu$ V/m]	F [MHz]	Detector	Level [dB $\mu$ V/m]	F [MHz]	Level [dB $\mu$ V/m]	Level [ $\mu$ V/m]
4805	Peak	48,03	4882	Peak	47,45	4960	Peak	40,01
7208	Peak	46,19	7319	Peak	46,02	7439	Peak	42,12
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

Limits: § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Limits: § 15.209

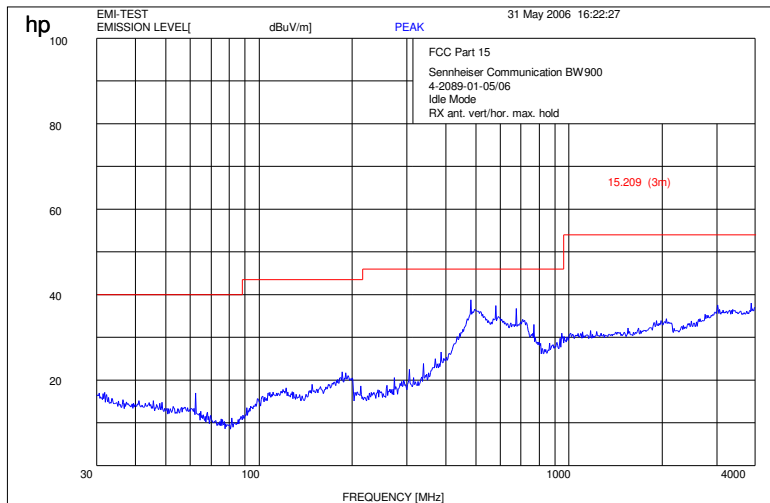
Frequency [MHz]	Field strength [ $\mu$ V/m]	Measurement distance (m)
30 - 88	100 (40 dB $\mu$ V/m)	3
88 - 216	150 (43.5 dB $\mu$ V/m)	3
216 - 960	200 (46 dB $\mu$ V/m)	3
above 960	500 (54 dB $\mu$ V/m)	3



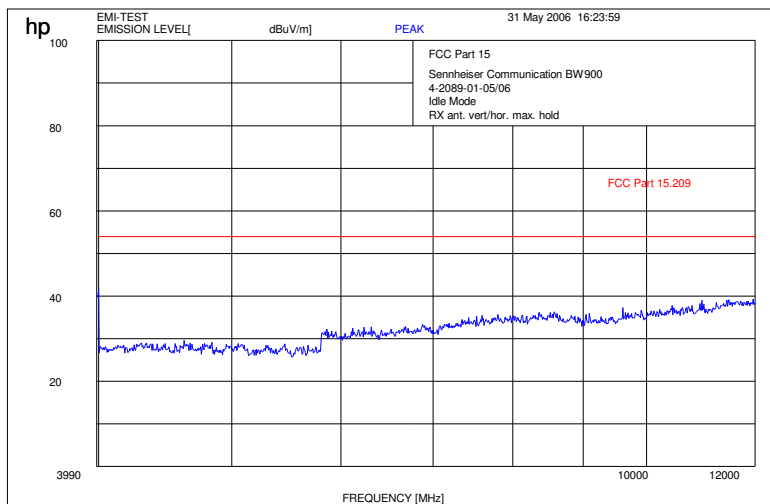
### 3.16 Spurious Emissions - radiated (Receiver) § 15.109

Modulation: GFSK

Plot : 0.03 - 4 GHz vertical/horizontal (receiver)



Plot : 4- 12 GHz vertical/horizontal (receiver)



Plot : 12- 25 GHz vertical/horizontal (receiver)

--no traceable peaks found --

Spurious Emissions level [dB $\mu$ V/m]								
Receiving Mode								
f[MHz]	Detector	Level [dB $\mu$ V/m]	f[MHz]	Detector	Level [dB $\mu$ V/m]	f[MHz]	Detector	Level [dB $\mu$ V/m]
No critical peaks found, small peaks between 450 MHz and 900 MHz								
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz  
see above plots

f ≥ 1GHz : RBW/VBW: 1 MHz

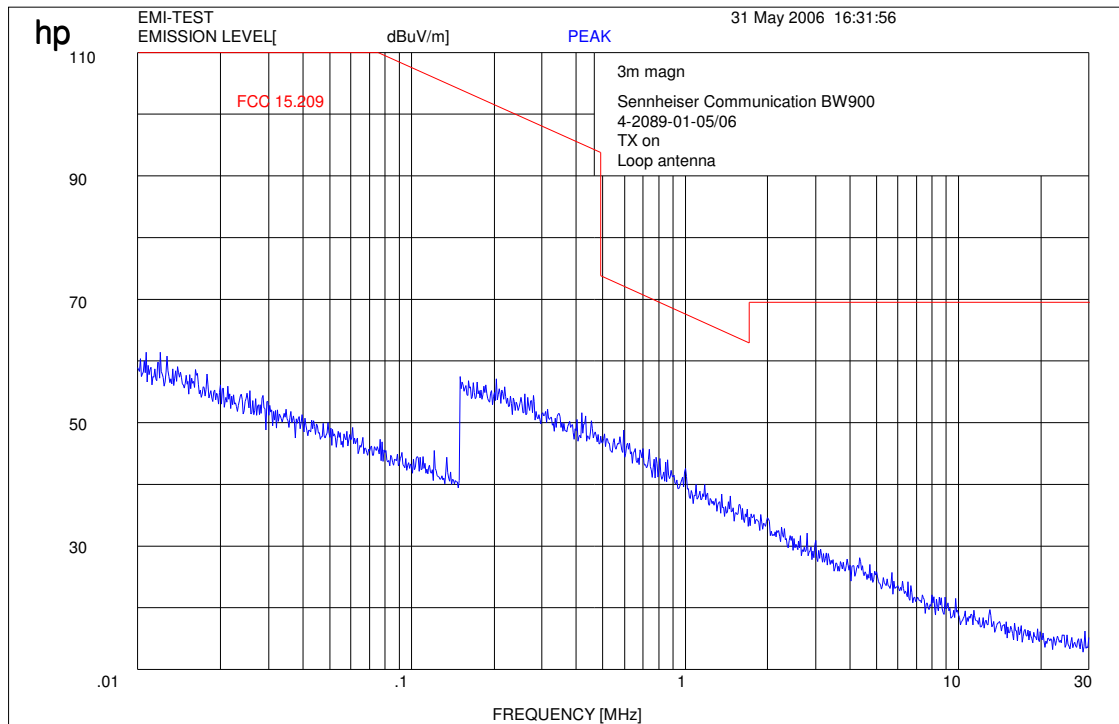
Measurement distance see table

Limits : § 15.109

Frequency (MHz)	Field strength ( $\mu$ V/m)	Measurement distance (m)
30 - 88	100 (40 dB $\mu$ V/m)	3
88 - 216	150 (43.5 dB $\mu$ V/m)	3
216 - 960	200 (46 dB $\mu$ V/m)	3
above 960	500 (54 dB $\mu$ V/m)	3

### 3.17 Spurious Emissions < 30 MHz - Transmitter radiated § 15.209

Modulation: GFSK



Measured at 10 m distance.  
Values recalculated with 40 dB/decade according to FCC rules.

Plot 1:

Limits:

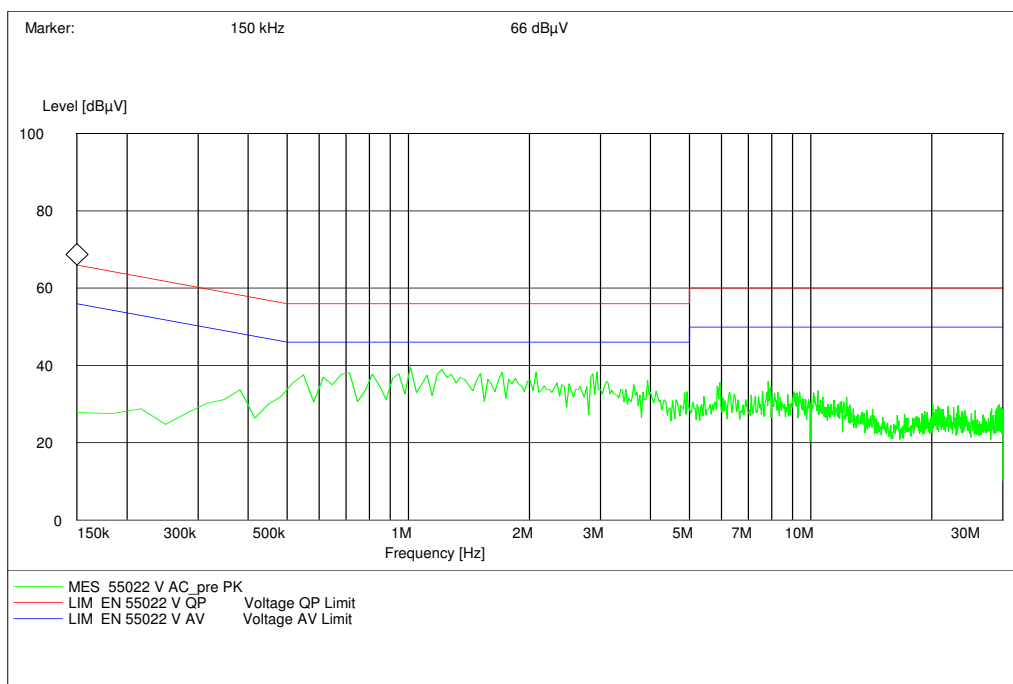
Frequency (MHz)	Field strength ( $\mu\text{V}/\text{m}$ )	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dB $\mu\text{V}/\text{m}$	30

### 3.18 Conducted Emissions <30 MHz § 15.107/207

Modulation: GFSK

Plot 1:

EUT can only be charged with Basestation (see Basestation Testreport Cetecom 4-2089-1-19\_06)



Limits :

Under normal test conditions only	See plots
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## 3.19 Used Testequipment

### Anechoic chamber C:

Device	Manufacturer	Type	S/N Number	Inv. No. Cetecom
Spektrum Analyser	HP	8566B	2747A05306	300001000
Spektrum Analyser Display	HP	85662A	2816A16541	300002297
Quasi-Peak-Adapter	HP	85650A	2811A01131	300000999
Power Supply	HP	6032A	2818A03450	300001040
Power Attenuator	Byrd	8325	1530	300001595
Biconical Antenna	EMCO	3104	3758	300001602
Log. Period. Antenna	EMCO	3146	2130	300001603
Double Ridged Antenna	EMCO	HP 3115P	3088	300001032
Active Loop Antenna	EMCO	6502	2210	300001015
Antenna VDE/FCC		HP11965B		300002298
SRM-Drive	HP	9144A	2823e46556	300001044
Software	HP	EMI		300000983
Busisolator	Kontron			300001056
Absorberhalle	MWB		87400/02	300000996
Salzsäule	Kontron			300001055
Antenna	R&S	HMO20	832211/003	300002243
Indukt.Tast Antenna	R&S	HFH 2 Z4	881468/026	300001464
System-Rack	HP I.V.	85900	*	300000222
Spectrum Analyzer	HP	8566B	2747A05275	300000219
Quasi-Peak-Adapter	HP	85650A	2811A01135	300000216
RF-Preselector	HP	85685A	2837A00779	300000218
Rahmen Antenne	R&S	HFH2-Z2	891847-35	300001169
Leitungsteiler	HP	11850C		300000997
Breitband-Hornantenne EMI	HP	35155P		300002300
PC	HP	Vectra VL		300001688
VHF Meßantenne	Schwarzbeck	VHA 9103		300001778
Spectrum Analyzer Display	HP	85662A	2816A16497	300001690
VHF Meßantenna	Schwarzbeck	VHA 9103		300001780
Biconical Antenna	EMCO	3104 C	9909-4868	300002590

### SRD Laboratory: (Bluetooth System)

No	Equipment/Type	Manufact.	Serial Nr.	Inv. No. Cetecom
1	System Controller PSM 12	R&S	835259/007	3000002681
2	Memory Extension PSM-K10	R&S	To 1	3000002681
3	Operating Software PSM-B2	R&S	To 1	3000002681
4	19'' Monitor		22759020-ED	3000002681
5	Mouse		LZE 0095/6639	3000002681
6	Keyboard		G00013834L461	3000002681
7	Spectrum Analyser FSIQ 26	R&S	835540/018	3000002681
8	Tracking Generator FSIQ-B10	R&S	835107/015	3000002681
10	RF-Generator SMIQ03 (B1 Signal)	R&S	835541/056	3000002681
11	Modulation Coder SMIQ-B20	R&S	To 10	3000002681
12	Data Generator SMIQ-B11	R&S	To 10	3000002681
13	RF Rear Connection SMIQ-B19	R&S	To 10	3000002681
14	Fast CPU SM-B50	R&S	To 10	3000002681
15	FM Modulator SM-B5	R&S	835676/033	3000002681
16	RF-Generator SMIQ03 (B2 Signal)	R&S	835541/055	3000002681

17	Modulation Coder SMIQ-B20	R&S	To 16	3000002681
18	Data Generator SMIQ-B11	R&S	To 16	3000002681
19	RF Rear Connection SMIQ-B19	R&S	To 16	3000002681
20	Fast CPU SM-B50	R&S	To 16	3000002681
21	FM Modulator SM-B5	R&S	836061/022	3000002681
22	RF-Generator SMP03 (B3 Signal)	R&S	835133/011	3000002681
23	Attenuator SMP-B15	R&S	835136/014	3000002681
24	RF Rear Connection SMP-B19	R&S	834745/007	3000002681
25	Power Meter NRVD	R&S	835430/044	3000002681
26	Power Sensor NRVD-Z1	R&S	833894/012	3000002681
27	Power Sensor NRVD-Z1	R&S	833894/011	3000002681
28	Rubidium Standard RUB	R&S	6197	3000002681
29	Switching and Signal Conditioning Unit SSCU	R&S	338864/003	3000002681
30	Laser Printer HP Deskjet 2100	HP	N/A	3000002681
31	19'' Rack	R&S	11138363000004	3000002681
32	RF-cable set	R&S	N/A	3000002681
33	IEEE-cables	R&S	N/A	3000002681
34	Sampling System FSIQ-B70	R&S	835355/009	3000002681
35	RSP programmable attenuator	R&S	834500/010	3000002681
36	Signalling Unit	R&S	838312/011	3000002681
37	NGPE programmable Power Supply for EUT	R&S	192.033.41	3000002681

**SRD Laboratory (Bluetooth Testsystem Extended)**

No	Equipment/Type	Manufact.	Serial Nr.	Inv. No. Cetecom
1	Climatic box	Voetsch	58566046820010	300003019
2	CBT32 with EDR Signaling Unit	R&S		
3	Coupling unit	Narda	N/A	--
4	2xSwitch Matrix PSU	R&S	872584/021	--
5	RF-cable set	R&S	N/A	different
6	IEEE-cables	R&S	N/A	--
7	System Controller with NI IEEE card	other	N/A	--
8	CMU 200	R&S	832221/0055	300002862

## 4 Photographs of Test Set-up

Photo 1: Radiated Emissions

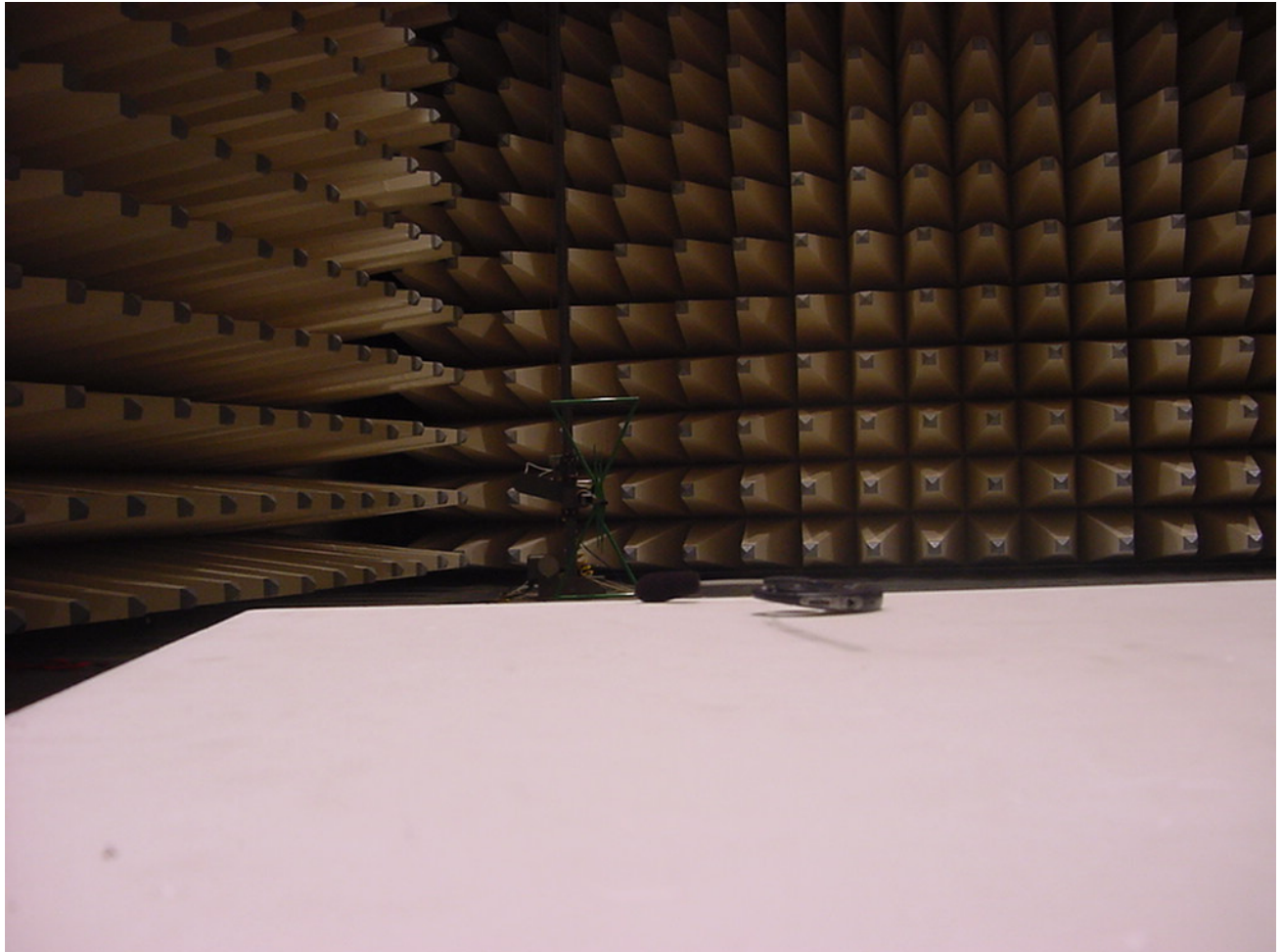




Photo 2: Radiated Emissions





## 5 Photographs of EUT













