

RADIO TEST REPORT

No. 613256R-2**EQUIPMENT UNDER TEST**

Equipment: Surveillance camera
Type / model: 211 W
Manufacturer: Axis Communication AB
Tested by request of: Axis Communication AB

SUMMARY

The equipment complies with the requirements of the following standards:

FCC, Part 15, Subpart B (2005) and Subpart C (2005);

RSS-210, Issue 6 (September 2005); RSS-Gen, Issue 1 (September 2005).

Industry Canada listed test facility No. IC 3481

Date of issue: 2007-03-16

Tested by:



Niklas Boström

Approved by:



Björn Utermöhl

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1 CLIENT INFORMATION

The EUT has been tested by request of

Company: Axis Communication AB
Emdalavägen 14
223 69 Lund
SWEDEN
Name of contact: Jon Hansson

2 EQUIPMENT UNDER TEST (EUT)

2.1 Identification of the EUT according to the manufacturer/client declaration

Equipment:	Surveillance camera
Type / Model:	211W
Brand name:	--
Serial number:	We used two units during the tests, one unmarked, the other with serial 00408C18318A
Manufacturer:	Axis Communication AB
Rating/Supplying voltage:	120 VAC, 60 Hz
Rating RF output power:	19 dBm
Antenna gain:	6,0 dBi
External antenna connector:	Reversed SMA
Operating temperature range:	0 to +55 °C
Frequency range:	2400 - 2483,5 MHz
Number of channels:	11
Modulation characteristics:	CSK (5.5 and 11 Mbps) and OFDM (6, 9, 12, 18, 24, 36, 48 and 54Mbps)
	The radio-module in the product also supports BPSK (1Mbps) and QPSK (2Mbps) but these will not be used because the data rates are too slow to send the video-stream.
Stand by mode supported:	Yes
Low channel = 1	2412 MHz
Mid channel = 6	2437 MHz
High channel = 11	2462 MHz
Duty cycle	9% at 54 Mbps 45% at 11 Mbps



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2.2 Additional information about the EUT

The EUT is normally equipped with an antenna with 1,5 dBi antenna gain. The EUT can also be equipped with an outdoor antenna with an antenna gain of 6,0 dBi.



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3 TEST SPECIFICATIONS

3.1 Standards

FCC 47 CFR part 15 (2005) Subpart B – Unintentional radiators
FCC 47 CFR part 15 (2005) Subpart C – Intentional Radiators; §15.247 Operation within the bands 902-928 MHz, 2400 – 2483.5 MHz and 5725 – 5850 MHz.

Measurements methods according to ANSI C63.4-2003 and DTS test procedure (KDB Publication No. 558074)

RSS-210, Issue 6 (September 2005): Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment.

RSS-Gen, Issue 1 (September 2005): General Requirements and Information for the Certification of Radiocommunication Equipment.

3.2 Additions, deviations and exclusions from standards

The radio-module in the product supports BPSK (1Mbps), QPSK (2Mbps), CSK (5.5 and 11Mbps) and OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps). Not all of these has been tested in this report. To determine which modulation type and data rate that is the worst case the peak output power was measured for all modulation types and data rates. This showed that different data rates for a specific modulation type don't change the peak output power but there were differences between the modulation types. So the product has been tested using the highest data rate for the modulation types that could produce the data rates that are necessary for the video-stream (CSK and OFDM).

No other additions, deviations or exclusions have been made from standards.

3.3 Test set-up

Measurement set-up radiated spurious emissions test is described in corresponding section. During other tests the EUT was connected to the spectrum analyser by cable.

3.4 Operating environment

If not additionally specified, the tests were performed under the following environmental conditions:

Air temperature: 20-25 °C
Relative humidity: 15-30 %



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4 TEST SUMMARY

The results in this report apply only to the sample tested.

FCC reference	Test	Result	Note
15.247(b)	Peak output power	Pass	
15.247(a)	6 dB Bandwidth	Pass	
15.247(a)	Carrier frequency separation	NA	
15.247(a)	Number of hopping frequencies (channels)	NA	
15.247(a)	Time of occupancy (dwell time)	NA	
15.215	Band edge compliance	Pass	
15.247(e)	Power spectral density	Pass	
15.205 15.209 15.247(d) 15.109	Out of band spurious emissions, radiated	Pass	Class B
15.209 15.247(d)	Out of band spurious emissions, conducted	Pass	
15.107 15.207	Conducted emission at AC port	Pass	Class B

NT = Not Tested

NA = Not Applicable



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5 PEAK OUTPUT POWER

5.1 Test equipment

Equipment	Manufacturer	Type	SEMKO No.
Power meter:	Rohde & Schwarz	NRVD	12455
Peak power sensor:	Rohde & Schwarz	NRV-Z31	7411
Attenuator:	Aeroflex / Weinschel	46-10-34	9443

5.2 Test protocol

Date of test: 2007-03-07

CSK modulation, 11 Mbps data rate

Test conditions	Peak Output Power [dBm]			Limit
	2412 MHz	2437 MHz	2462 MHz	[dBm]
V _{nom} 120 VAC	15,4	15,1	15,0	30
V _{max} , 115%, 138 VAC	14,9	15,1	14,6	
V _{min} , 85%, 102 VAC	14,0	15,1	14,4	

OFDM modulation, 54 Mbps data rate

Test conditions	Peak Output Power [dBm]			Limit
	2412 MHz	2437 MHz	2462 MHz	[dBm]
V _{nom} 120 VAC	16,1	16,3	16,2	30
V _{max} , 115%, 138 VAC	16,1	16,2	16,1	
V _{min} , 85%, 102 VAC	16,0	16,3	16,0	

Measurement results are corrected for attenuation in the set-up configuration.

Fulfil requirements: YES



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6 6 DB BANDWIDTH

6.1 Test protocol

Date of test: 2007-03-09

Spectrum analyser settings:

Span: 40 MHz
RBW: 100 kHz
VBW: 300 kHz
Sweep time: Auto
Detector: Peak
Trace: Max Hold

CSK modulation, 11 Mbps data rate

Channel	6 dB Bandwidth	Limit value
(MHz)	(MHz)	(MHz)
2412	11,0	> 0,5
2437	10,5	
2462	10,3	

OFDM modulation, 54 Mbps data rate

Channel	6 dB Bandwidth	Limit value
(MHz)	(MHz)	(MHz)
2412	16,7	> 0,5
2437	16,7	
2462	16,7	

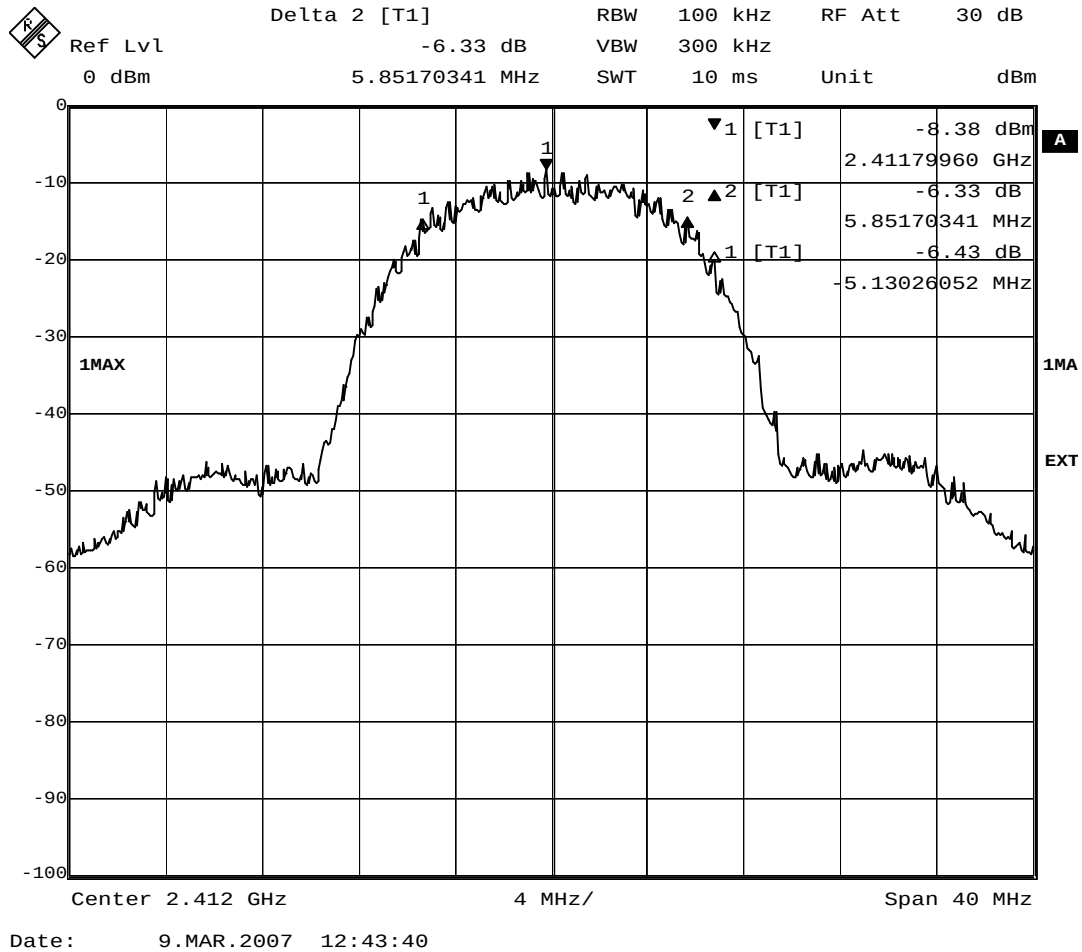
Fulfil requirements: YES



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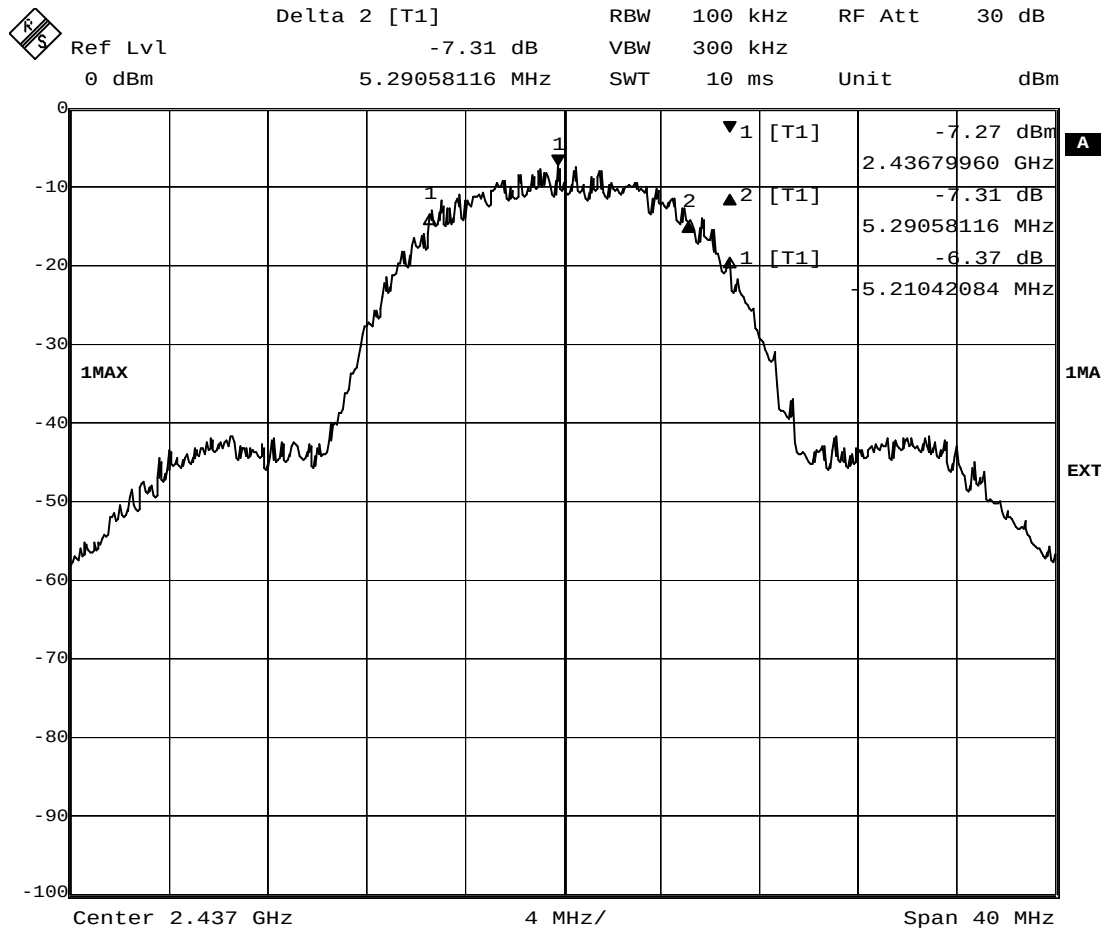
Channel 1, 6 dB bandwidth, CSK, 11 Mbps data rate



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Channel 6, 6 dB bandwidth, CSK, 11 Mbps data rate



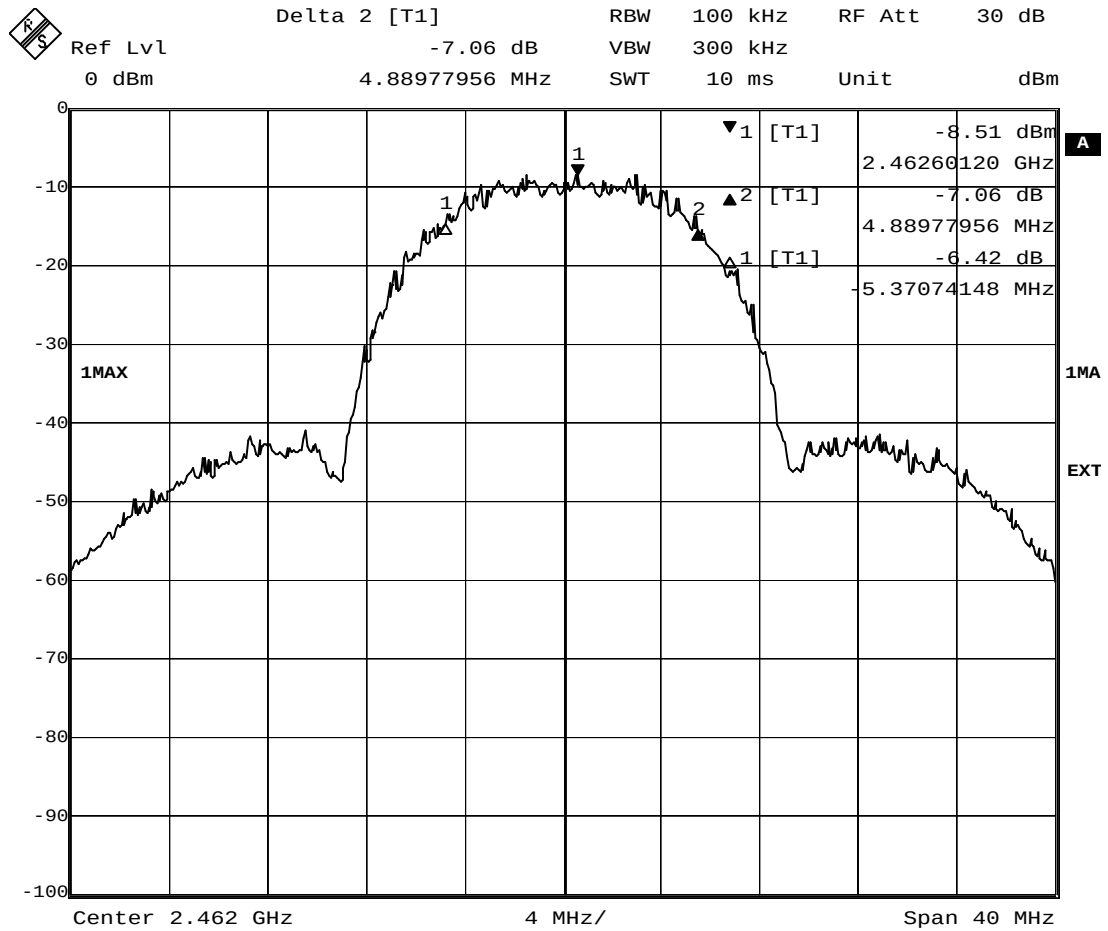
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Channel 11, 6 dB bandwidth, CSK, 11 Mbps data rate



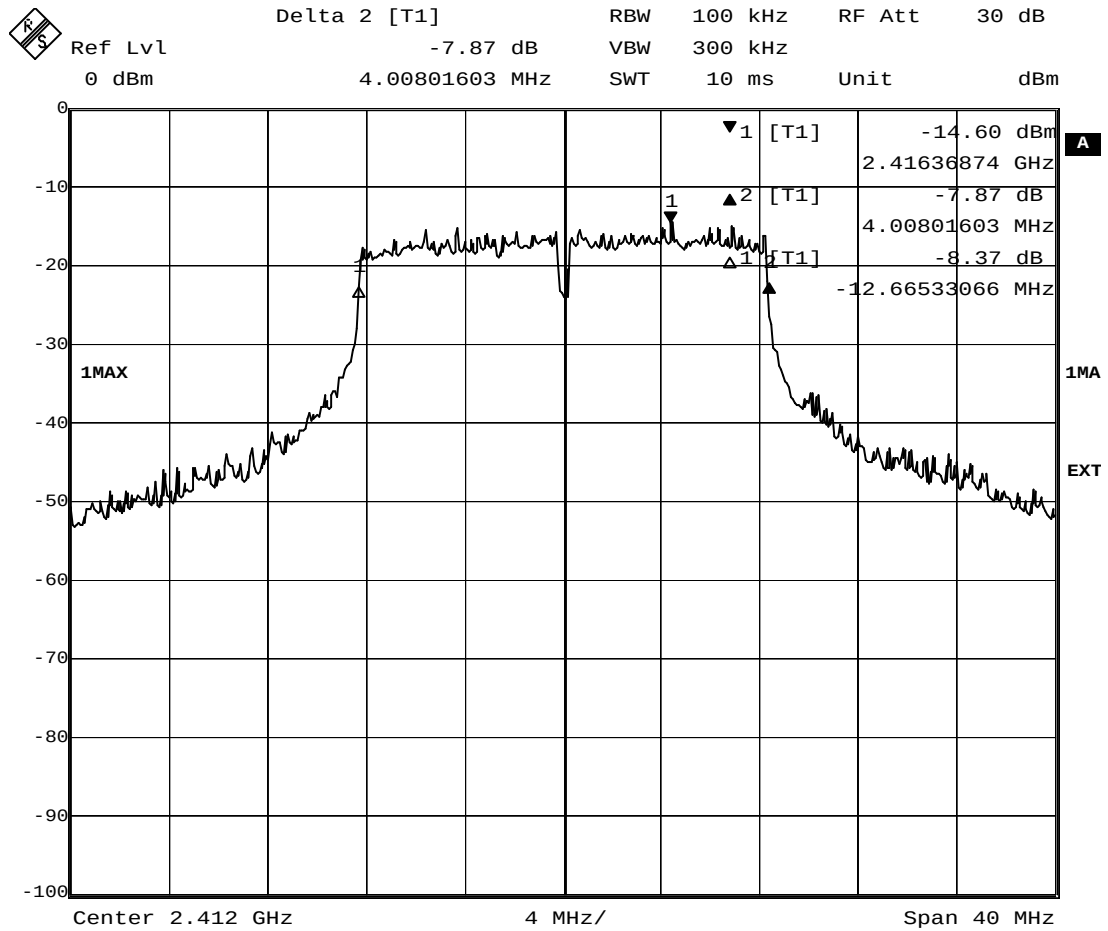
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Channel 1, 6 dB bandwidth, ODM, 54 Mbps data rate



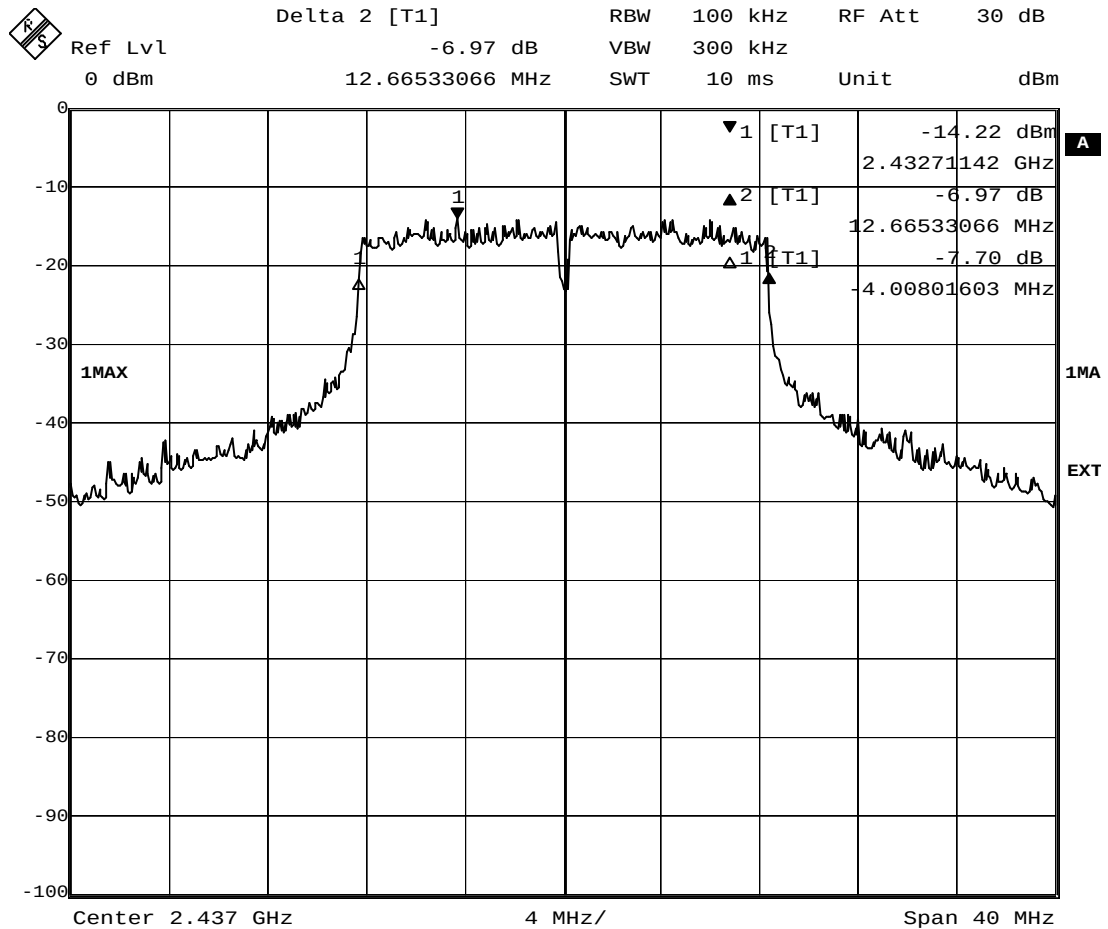
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Channel 6, 6 dB bandwidth, OFDM, 54 Mbps data rate



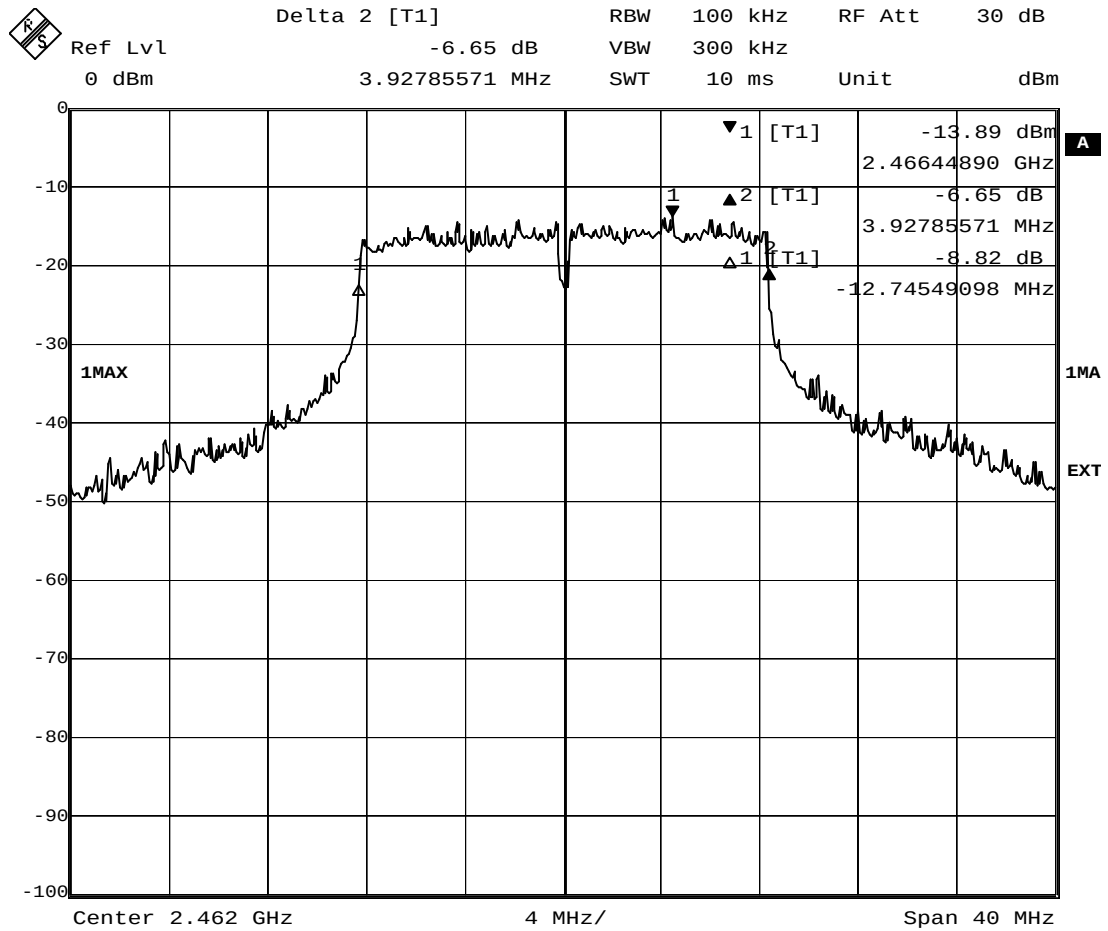
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Channel 11, 6 dB bandwidth, OFDM, 54 Mbps data rate



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7 BAND EDGE COMPLIANCE, CONDUCTED

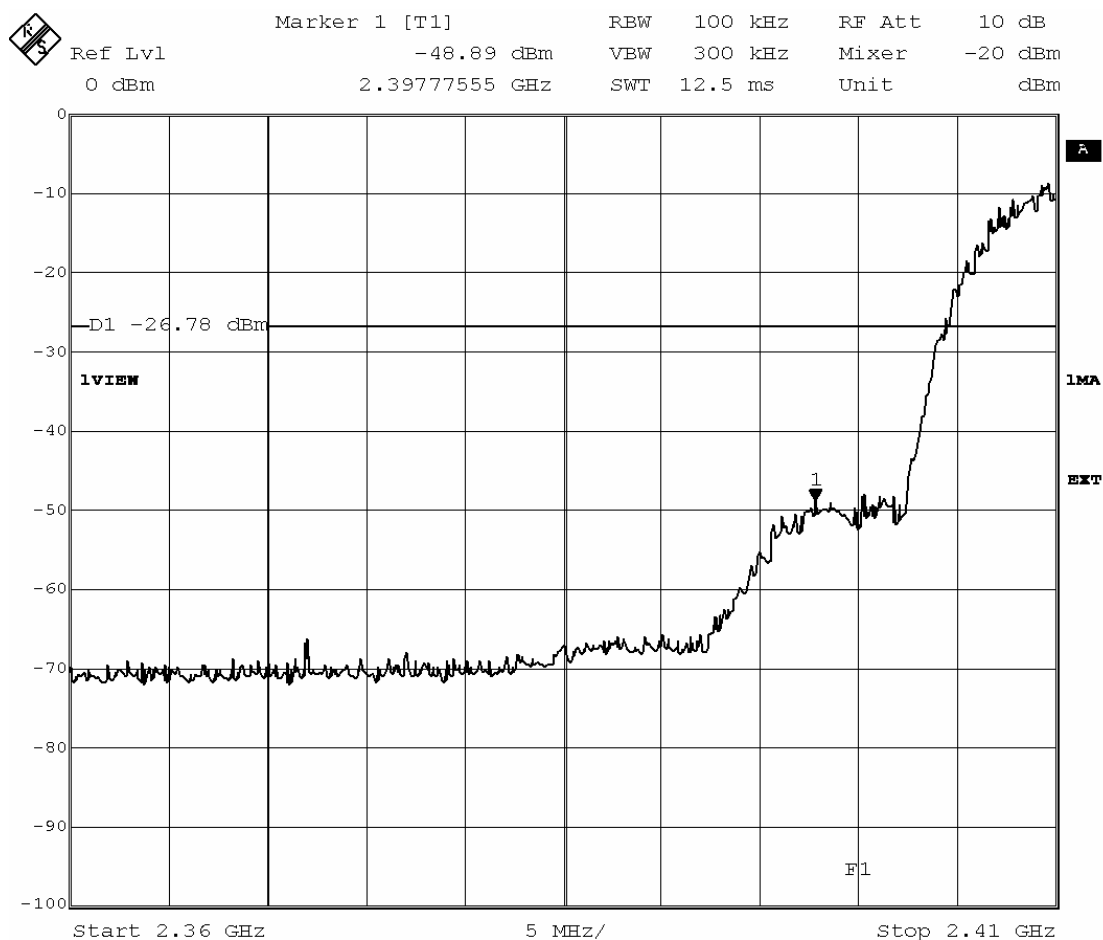
7.1 Test protocol

Date of test: 2006-11-15

Fulfil requirements: YES

Band edge compliance at low channel

Channel 1, Band edge compliance, CSK, 11 Mbps data rate



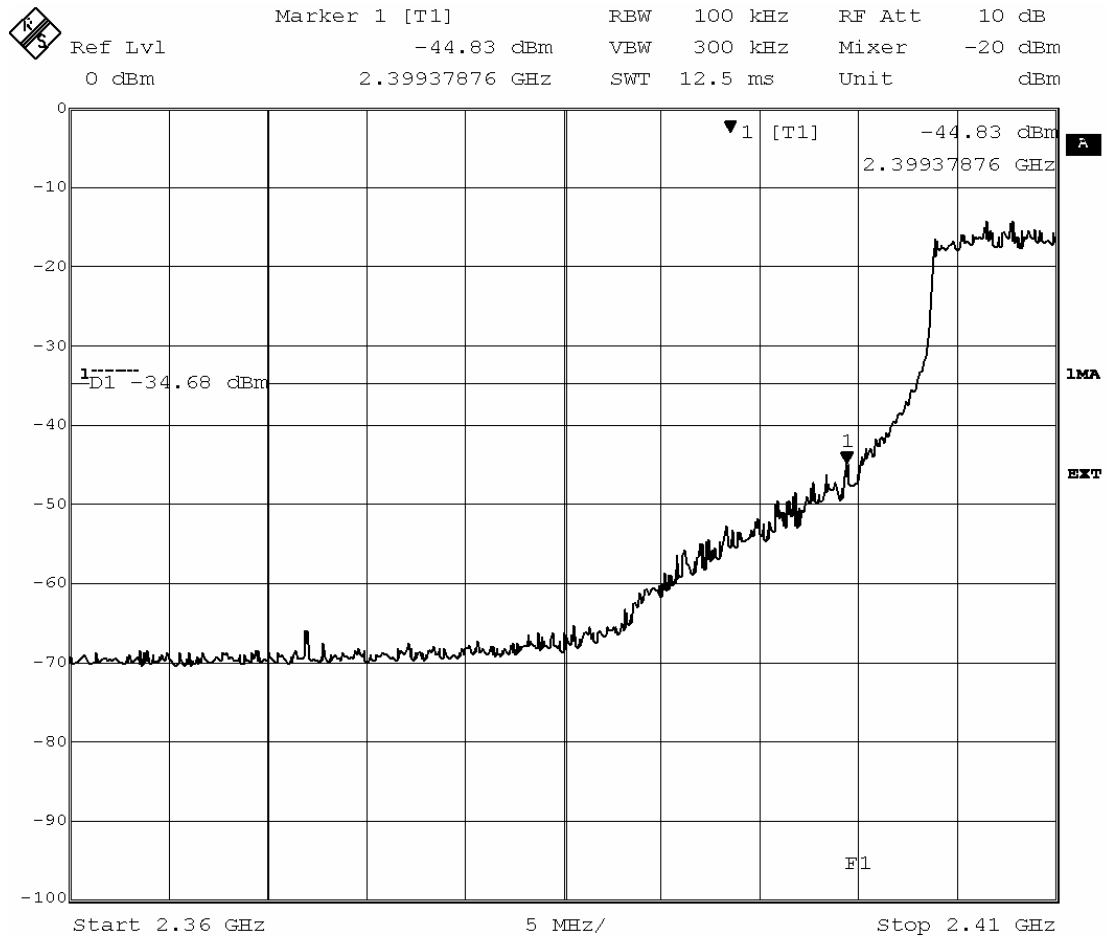
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Channel 1, Band edge compliance, OFDM, 54 Mbps data rate



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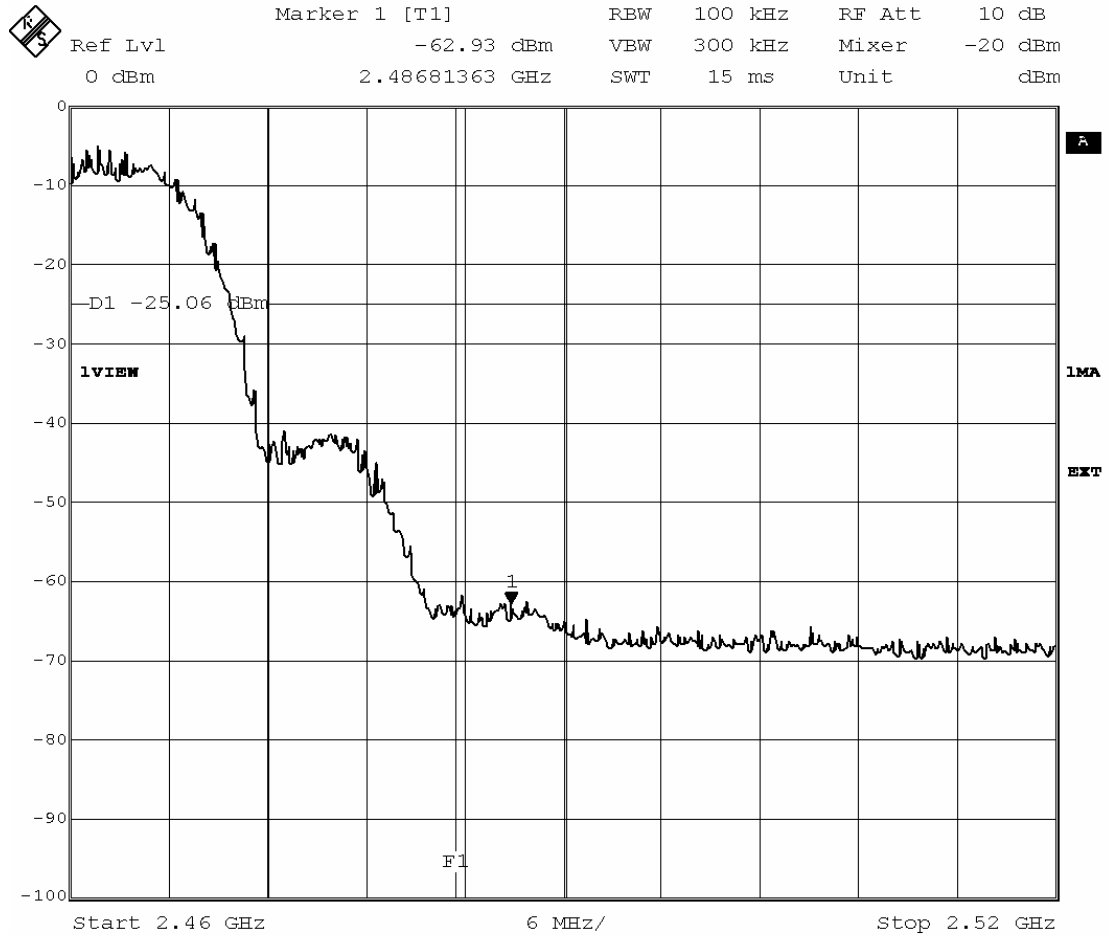


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Band edge compliance at high channel

Channel 11, Band edge compliance, QPSK, 11 Mbps data rate



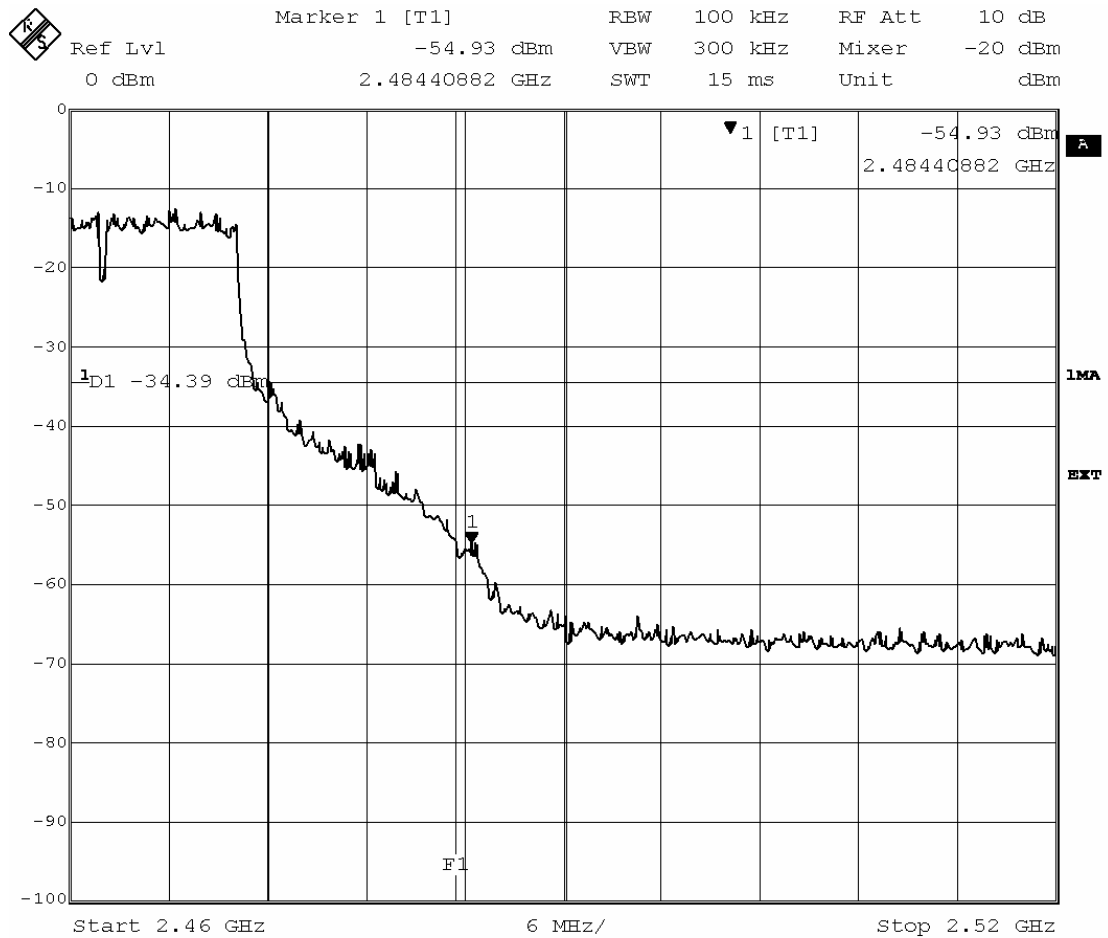
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Channel 11, Band edge compliance, OFDM, 54 Mbps data rate



Date: 15.NOV.2006 13:31:44



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8 POWER SPECTRAL DENSITY

8.1 Test protocol

Date of test: 2007-03-09

Spectrum analyzer settings:

Span: 1,5 MHz

RBW: 3 kHz

VBW: 10 kHz

Sweep time: 500 s

Detector: Peak

CSK modulation, 11 Mbps data rate

Channel	Peak Power Spectral Density	Limit value
(MHz)	(dBm)	(dBm)
2412	-12,5	< 8
2437	-11,7	
2462	-13,15	

OFDM modulation, 54 Mbps data rate

Channel	Peak Power Spectral Density	Limit value
(MHz)	(dBm)	(dBm)
2412	-19,1	< 8
2437	-18,6	
2462	-18,7	

Measurement results are corrected for attenuation in the set-up configuration.

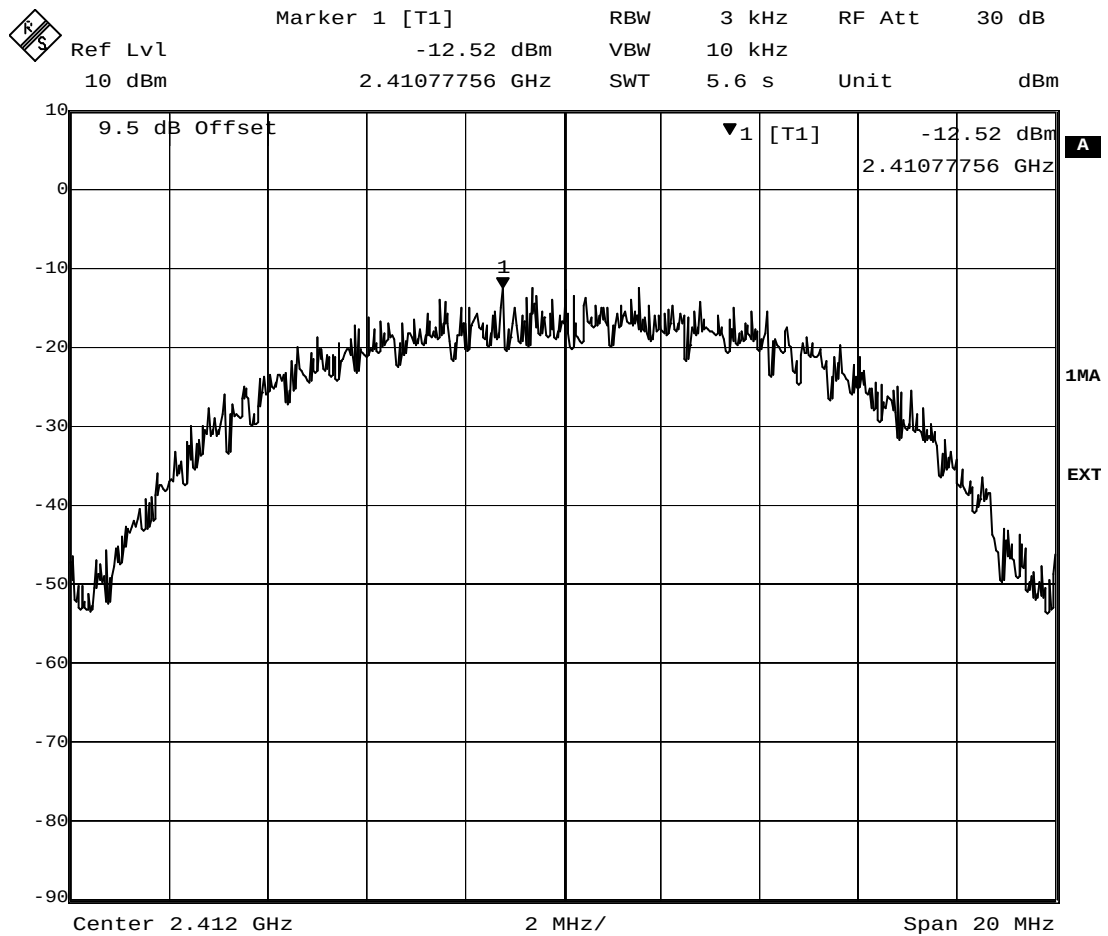
Fulfil requirements: YES



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Channel 1, search for emission peaks, CSK, 11 Mbps data rate



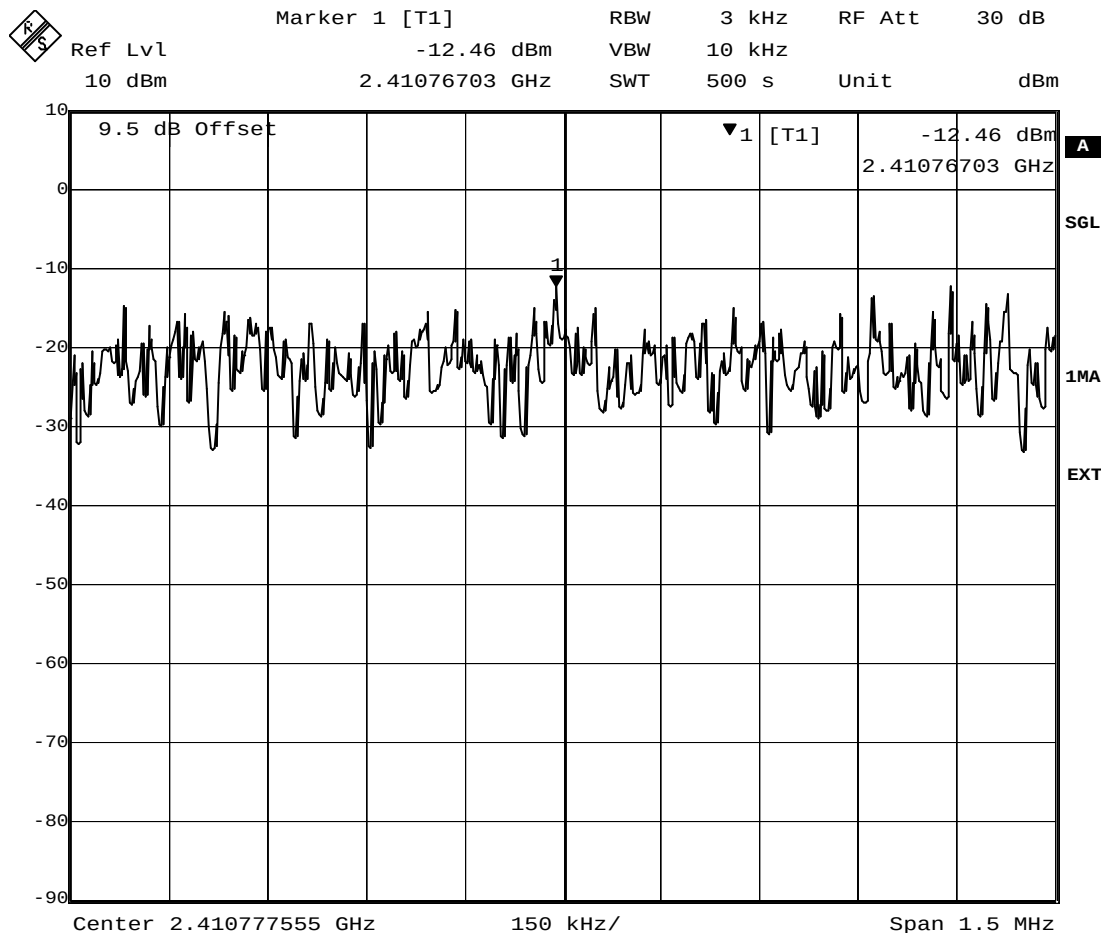
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Channel 1, peak power spectral density, CSK, 11 Mbps data rate



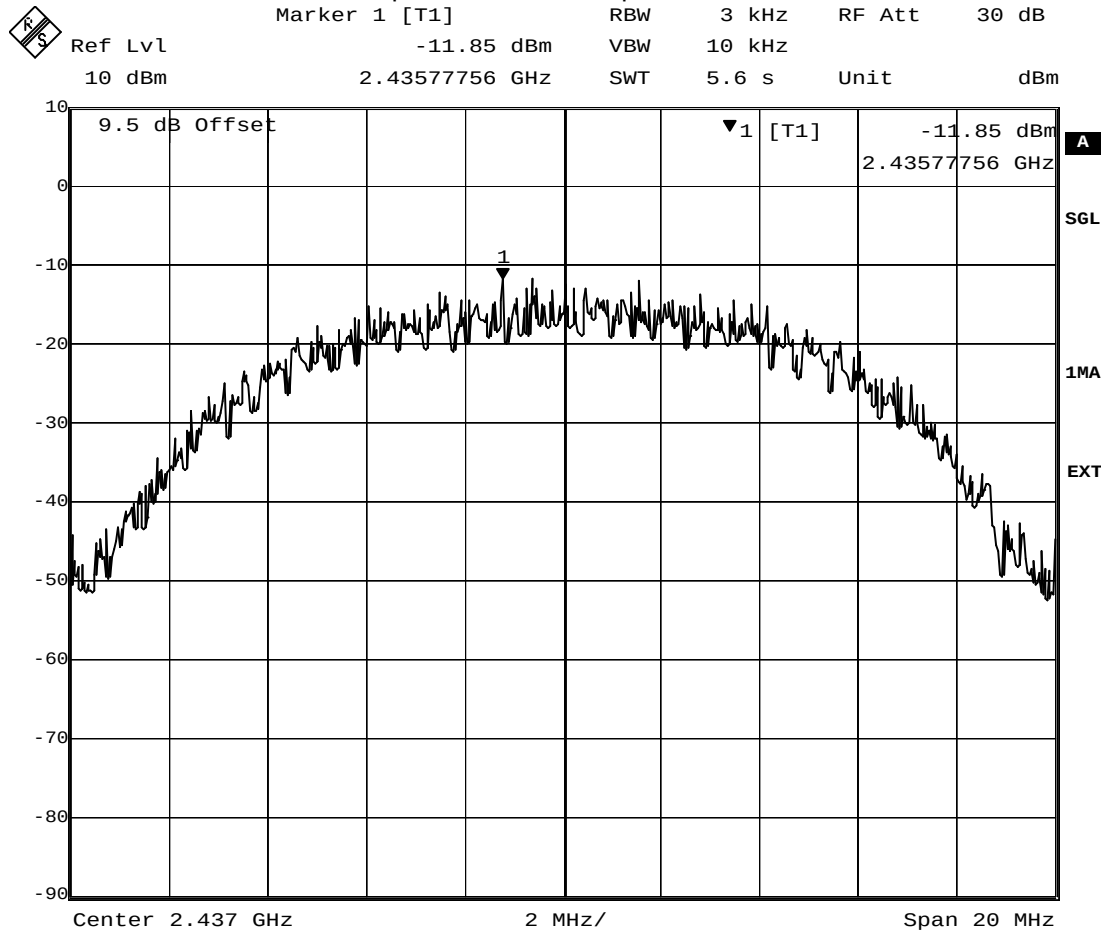
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Channel 6, search for emission peaks, CSK, 11 Mbps data rate



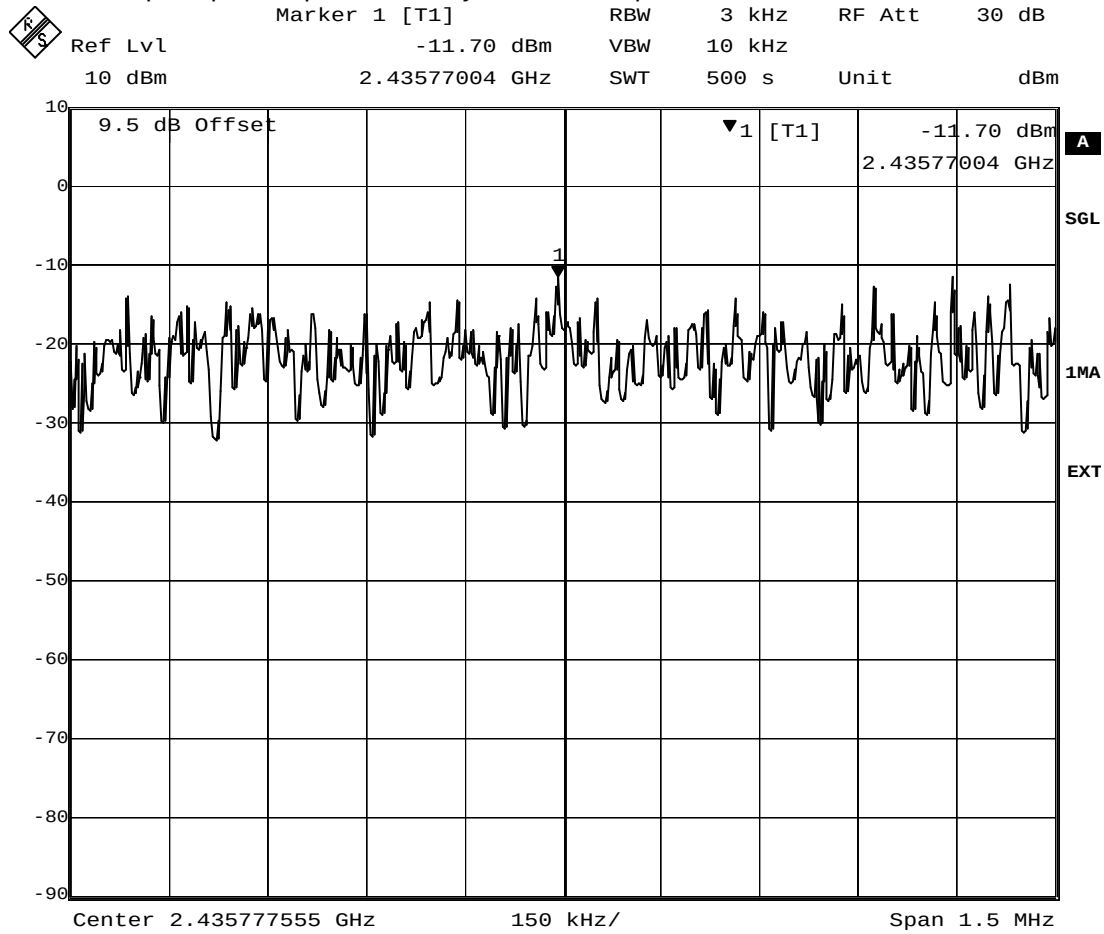
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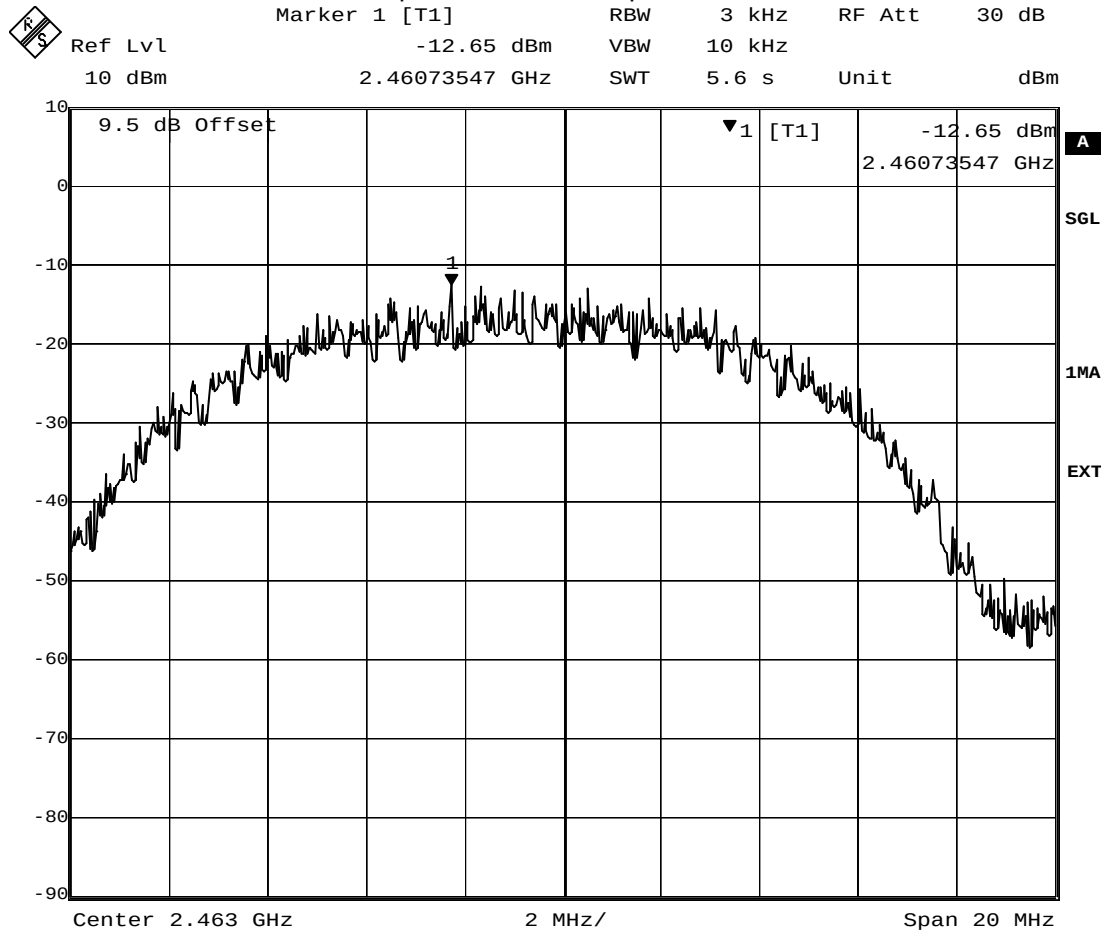
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Channel 11, search for emission peaks, CSK, 11 Mbps data rate"



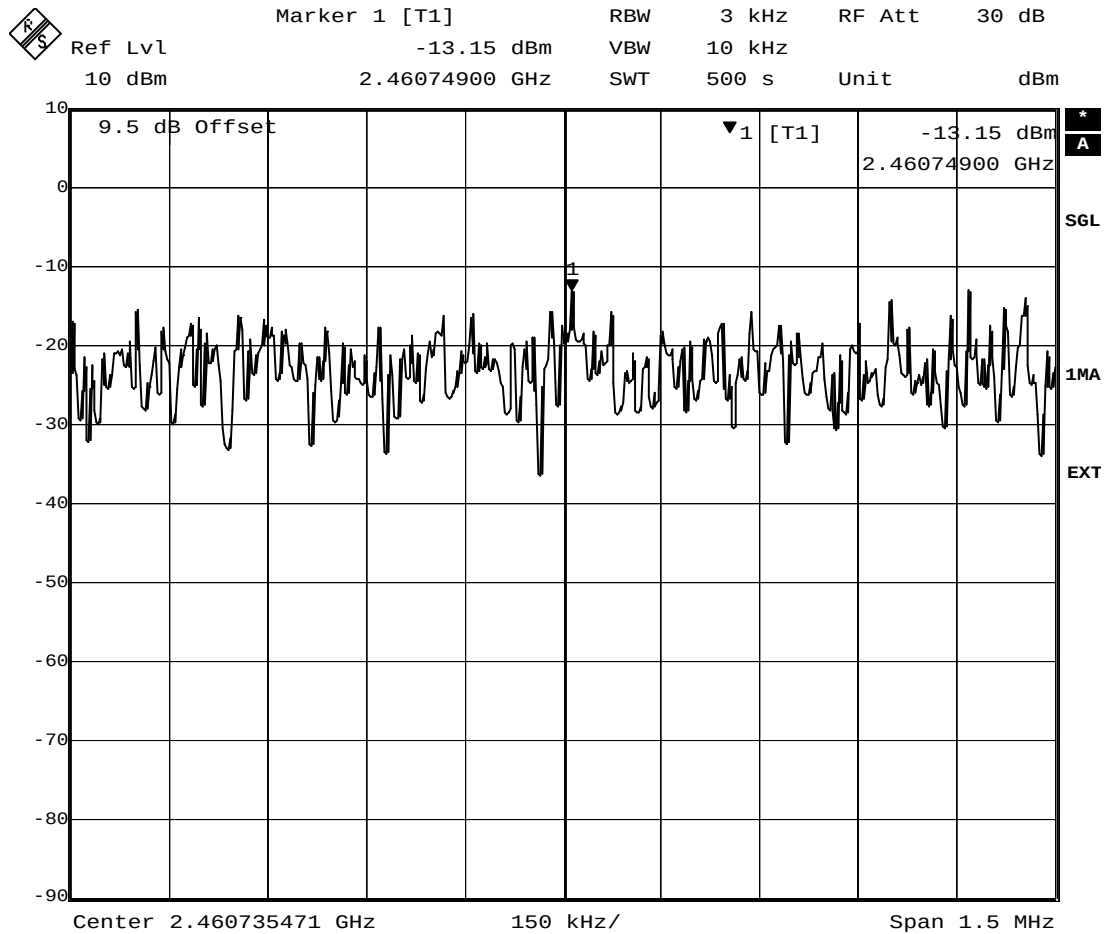
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Channel 11, peak power spectral density, CSK, 11 Mbps data rate



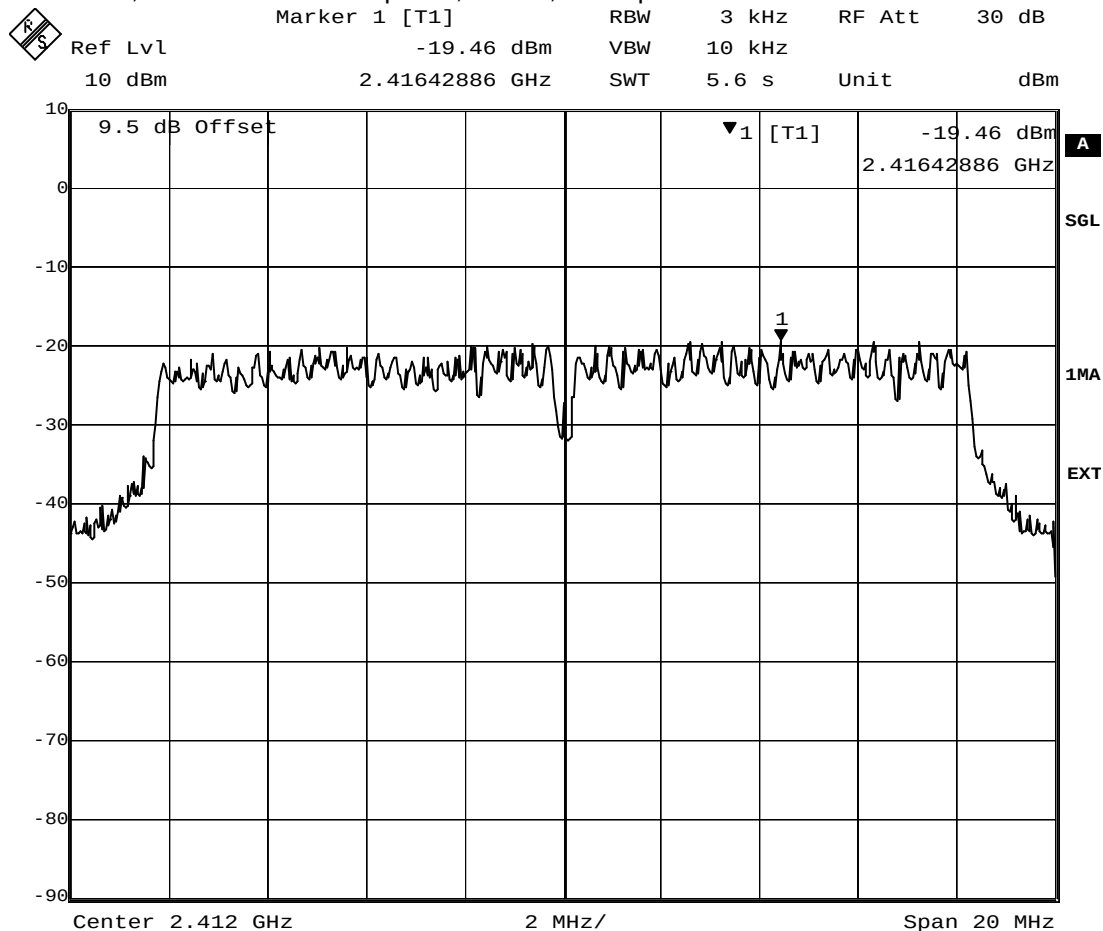
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Channel 1, search for emission peaks, OFDM, 11 Mbps data rate



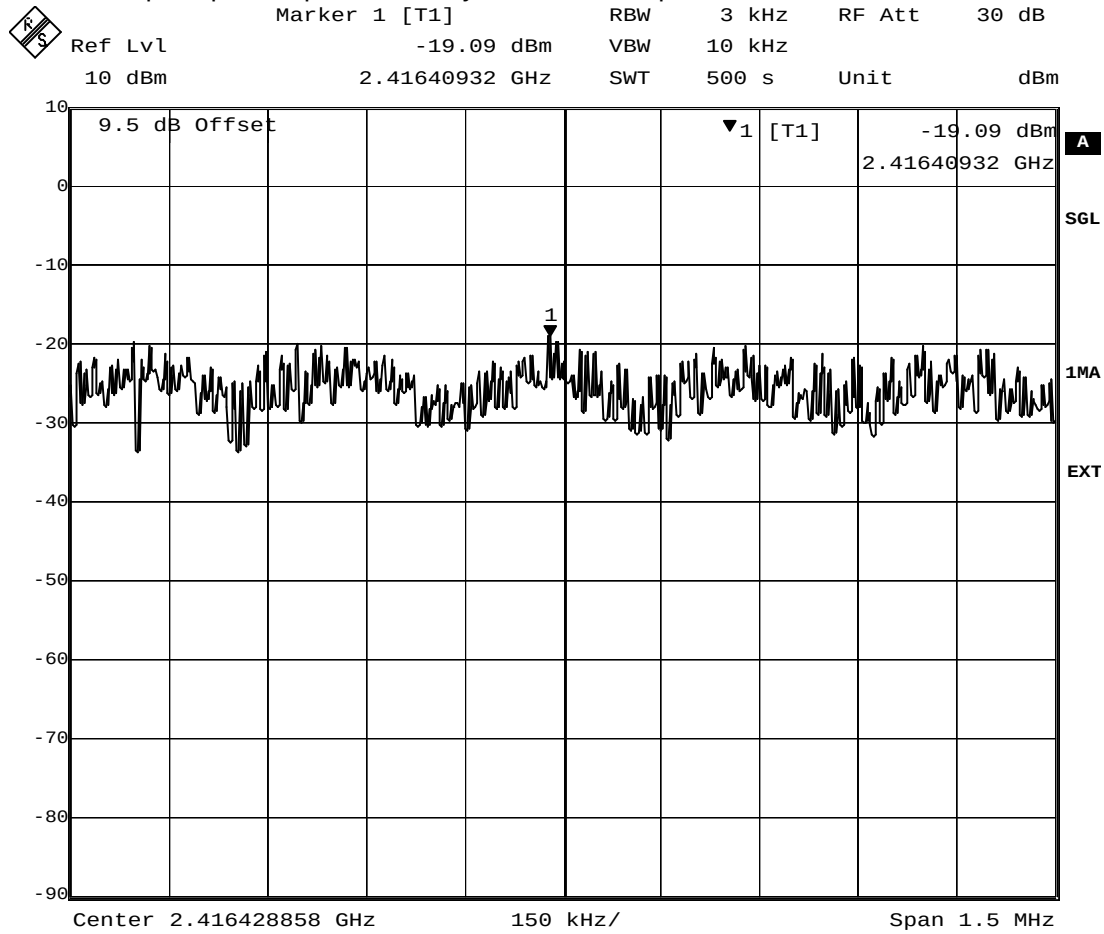
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Channel 1, peak power spectral density, OFDM, 54 Mbps data rate



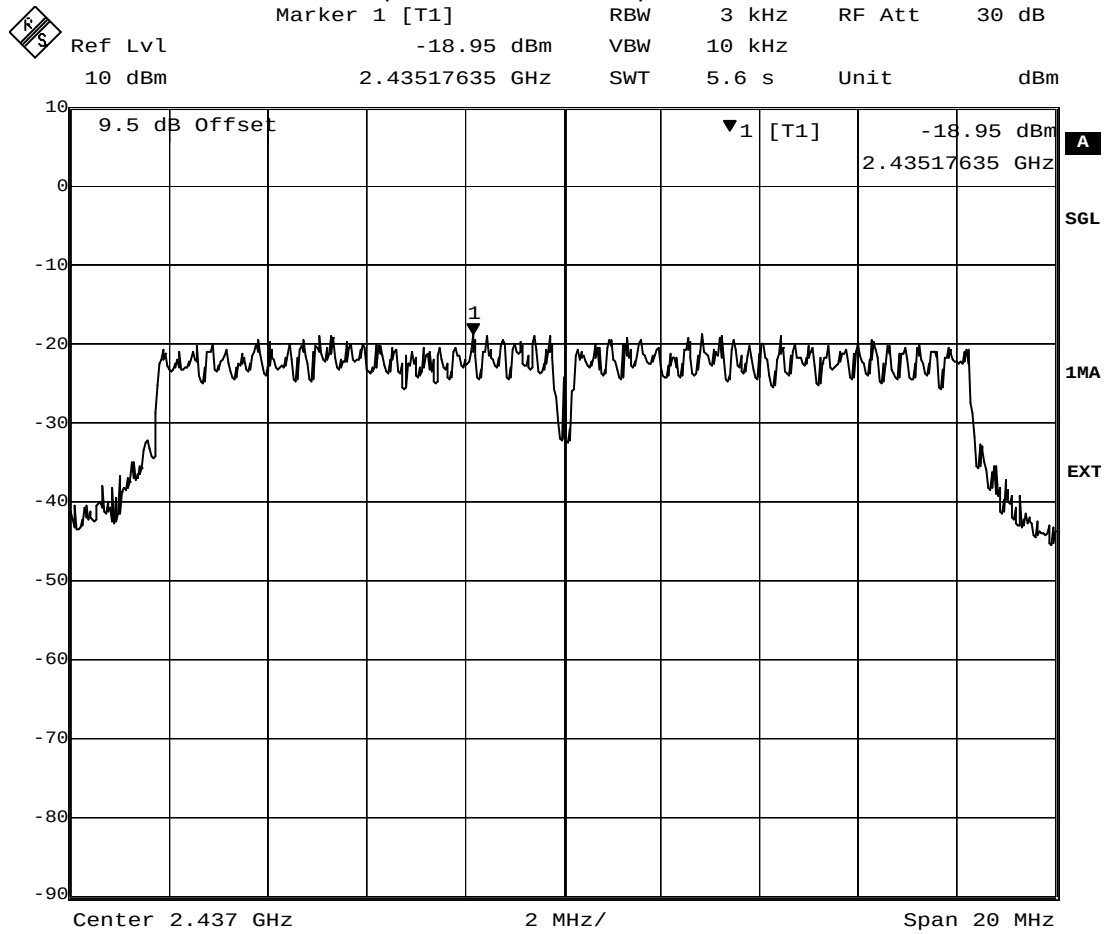
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Channel 6, search for emission peaks, OFDM, 11 Mbps data rate



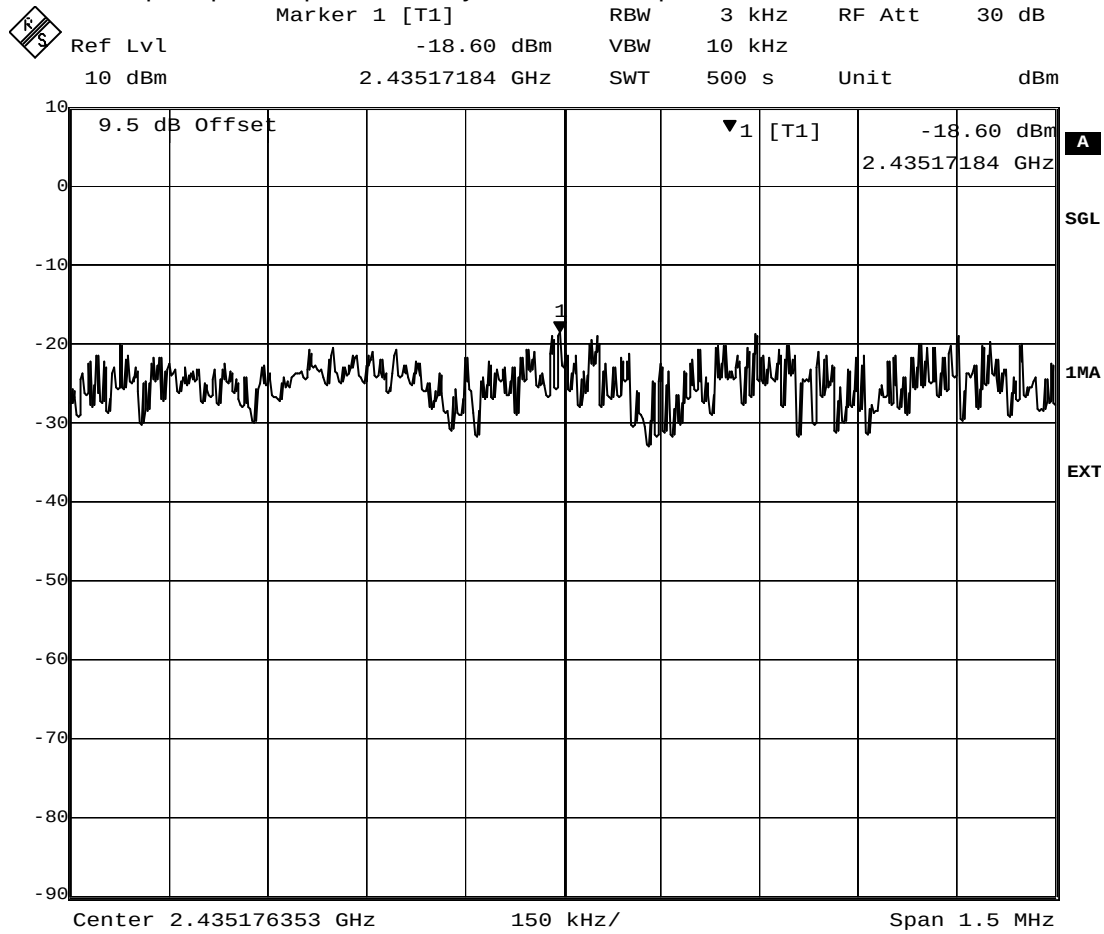
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Channel 6, peak power spectral density, OFDM, 54 Mbps data rate



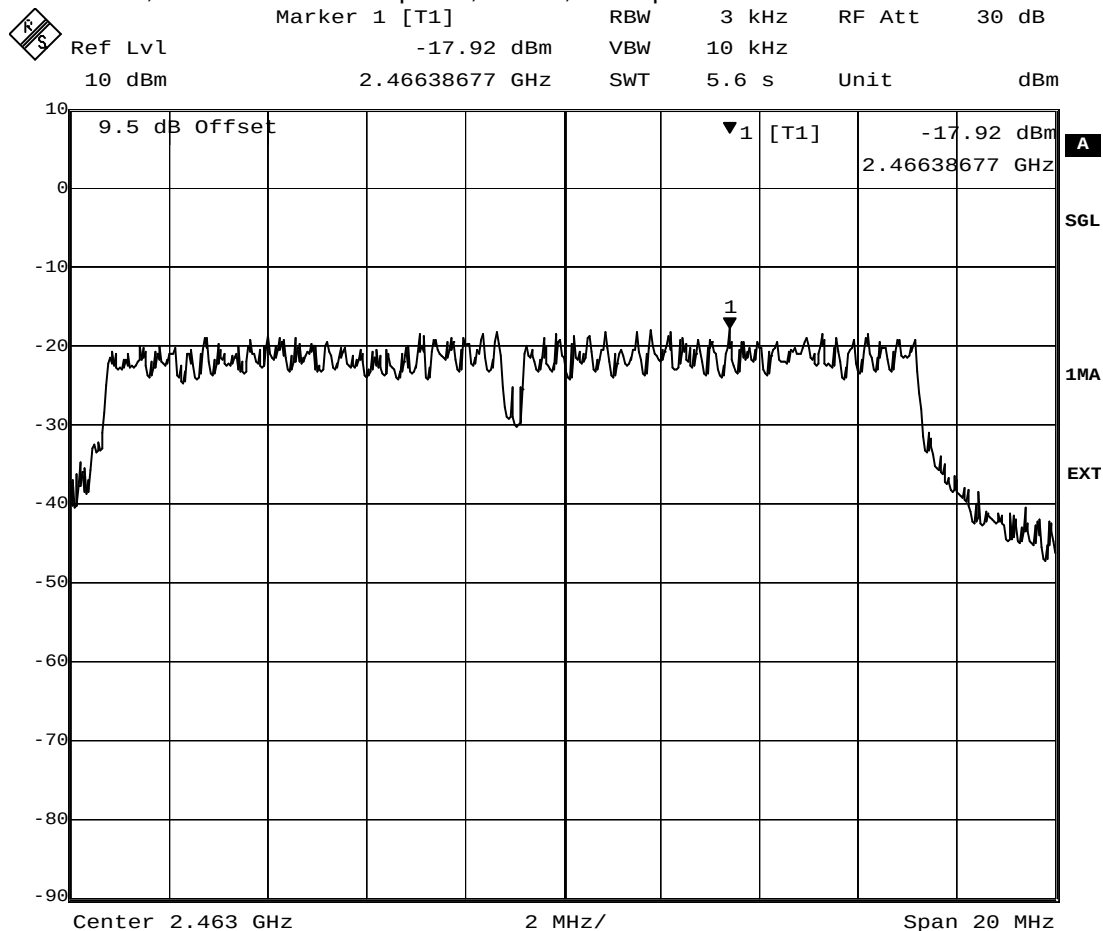
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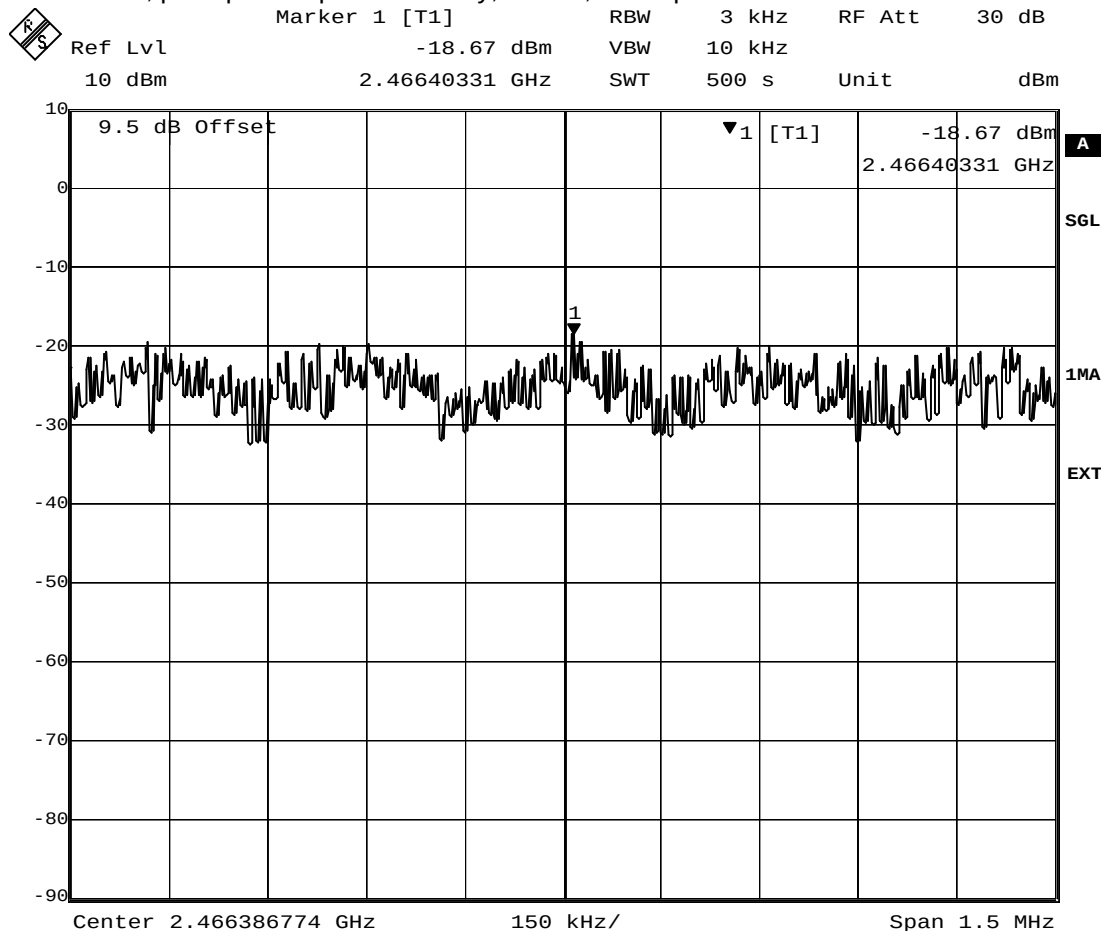
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Channel 11, peak power spectral density, OFDM, 54 Mbps data rate



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9 RADIATED SPURIOUS EMISSIONS

9.1 Measurement uncertainty

Radiated disturbance electric field intensity, 30 – 1000 MHz: $\pm 4,6$ dB

Radiated disturbance electric field intensity, 1000 – 25000 MHz: $\pm 6,0$ dB

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT.

Measurement uncertainty is calculated in accordance with EA-4/02-1997.

The measurement uncertainty is given with a confidence of 95%.

9.2 Test equipment

Equipment	Manufacturer	Type	SEMKO No.
<i>Test site: Semi-anechoic shielded chamber, 5,9 x 8,9 x 6,0 m (W x L x H)</i>			30900
Software:	Rohde & Schwarz	EMC 32	
Measurement receiver:	Rohde & Schwarz	ESCI	12798
Antenna, bilog:	Rohde & Schwarz	HL562	30711
<i>Test site: Radio anechoic shielded chamber, 3,7 x 7,0 x 2,4 m (W x L x H)</i>			12285
Software:	Rohde & Schwarz	ES-K1, V1.70	
Signal analyser:	Rohde & Schwarz	FSIQ 40	12793
Preamplifier:	MITEQ	AFS6/AFS44	12335
Antennas:			
Double Ridge Guide Horn:	EMCO	3115	4936
Horn antenna:	EMCO	3160-08	30099
Horn antenna:	EMCO	3160-09	30101
High pass filter	K & L	4410-X4500/18000-0	5133
Attenuator	Hewlett-Packard	8491A	7637



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9.3 Measurement set-up

Test site: Semi-anechoic shielded chamber (30 – 1000 MHz)

The radiated disturbance electric field intensity was measured in a semi-anechoic chamber at a distance of 3 m and the EUT was placed on a non-metallic table, 0,8 m above the reference ground plane. The specified test mode was enabled. Test set-up photos are given below.

An overview sweep with peak detection of the electric field intensity was performed with the measurement receiver in max-hold and with the antenna placed 1,5 m, 2,5 m and 3,5 m above the floor. The polarisation was horizontal and vertical. The measurements were repeated with the EUT rotated in 90-degree steps.

At the frequencies where high disturbance levels were found a search for max disturbance level was performed. With the EUT and antenna in the worst-case configuration new measurements with quasi-peak detector were carried out.

The EUT was supplied with 120 VAC, 60 Hz during the test.

Test set-up photos:



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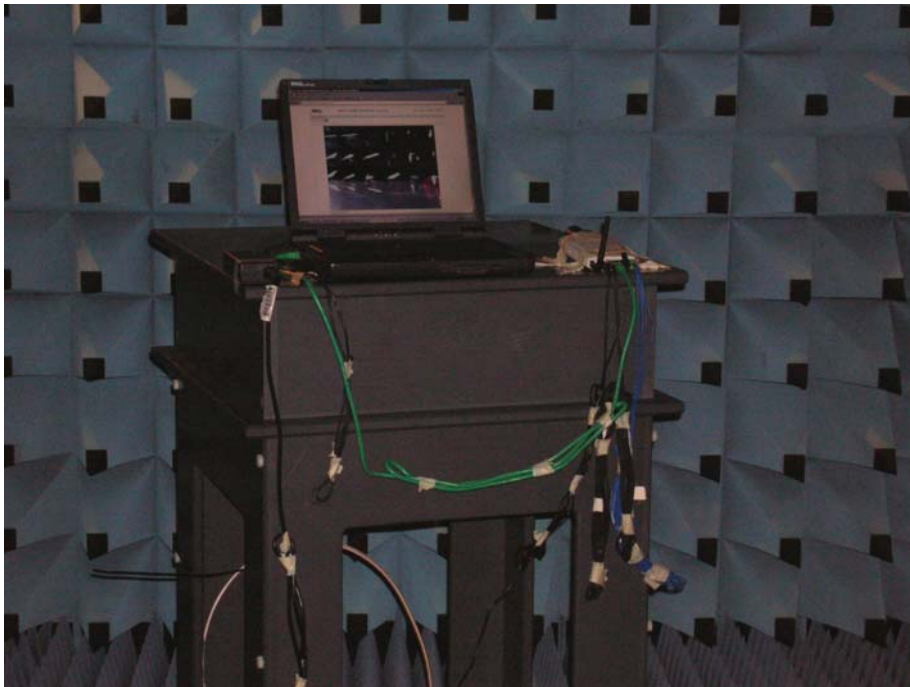
Test site: Bluetooth anechoic shielded chamber (1 – 26 GHz)

In the Bluetooth anechoic chamber the EUT was placed on a non-metallic table, 1,4 m above the floor. The radiated disturbance electric field intensity was measured at a distance of 3 m. The specified test mode was enabled.

An overview sweep with peak detection of the electric field intensity was performed with the spectrum analyser in max-hold and with the antenna height adjusted at the level of the EUT center (placed 1,4 m above the floor). The polarisation was horizontal and vertical. The measurements were repeated with the EUT rotated in 90-degree steps.

At the frequencies where high disturbance levels were found a search for max disturbance level was performed. With the EUT and antenna in the worst-case configuration new measurements with peak and average detectors were carried out.

The EUT was supplied by 120 VAC, 60 Hz during the test.



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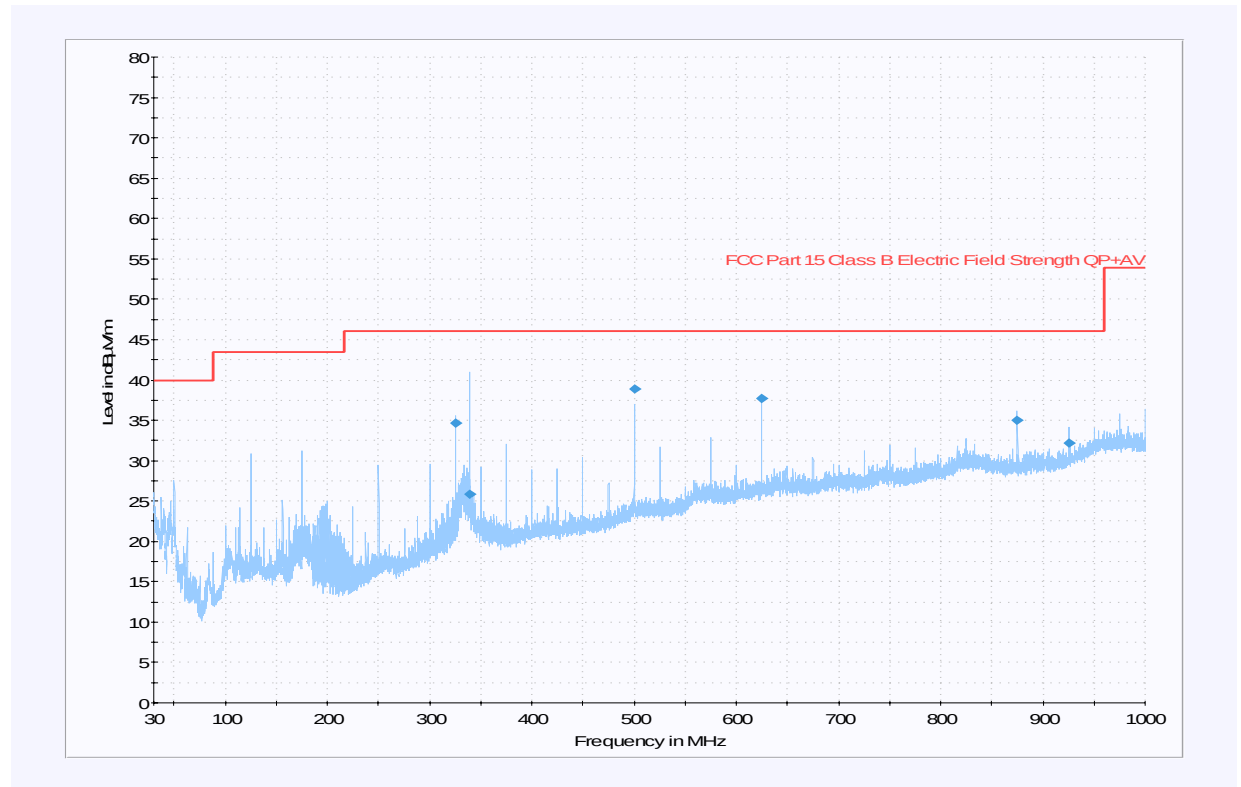
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9.4 Test protocol

Semi-anechoic shielded chamber

Date of test: 2006-10-20

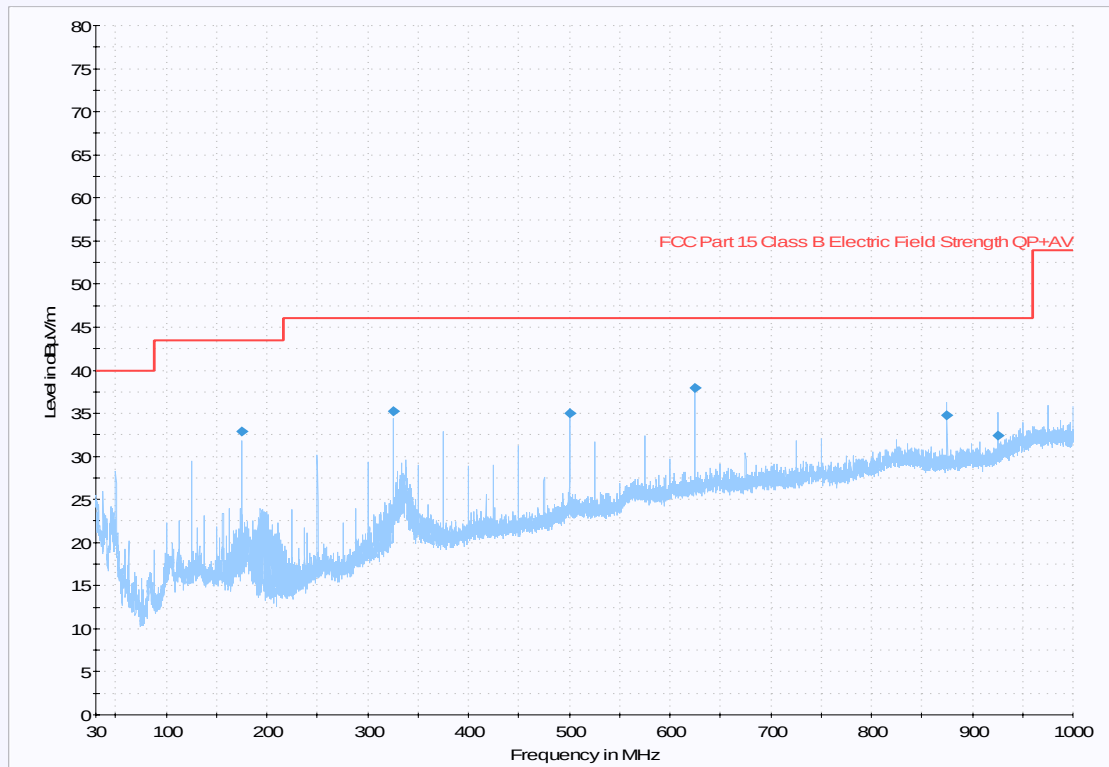
30 – 1000 MHz, max peak at a distance of 3 m on the lowest TX channel, CSK, 11 Mbps



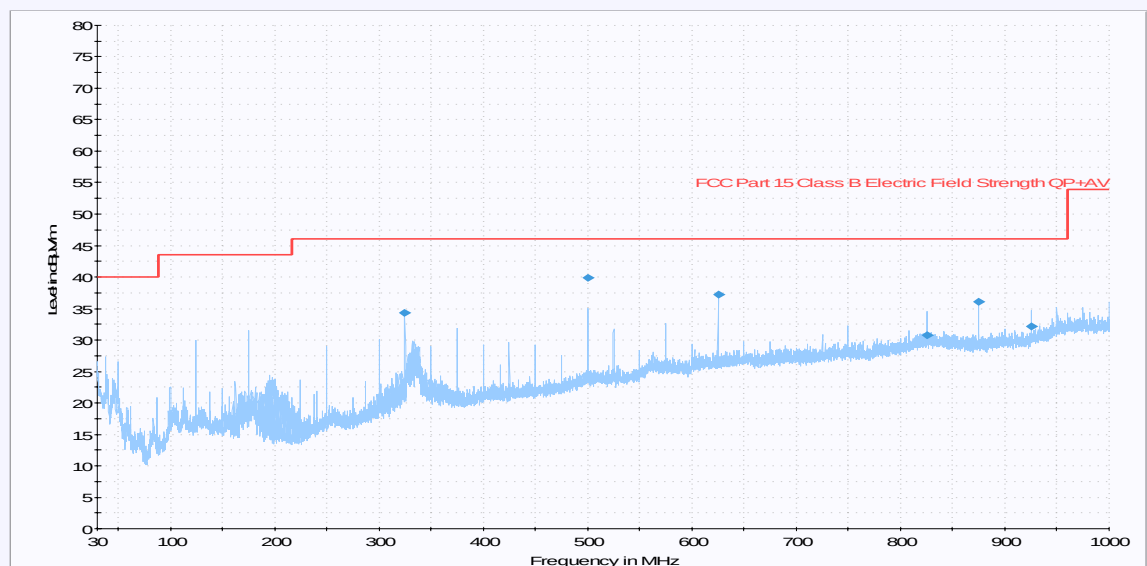
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30 – 1000 MHz, max peak at a distance of 3 m on the middle TX channel, CSK, 11 Mbps



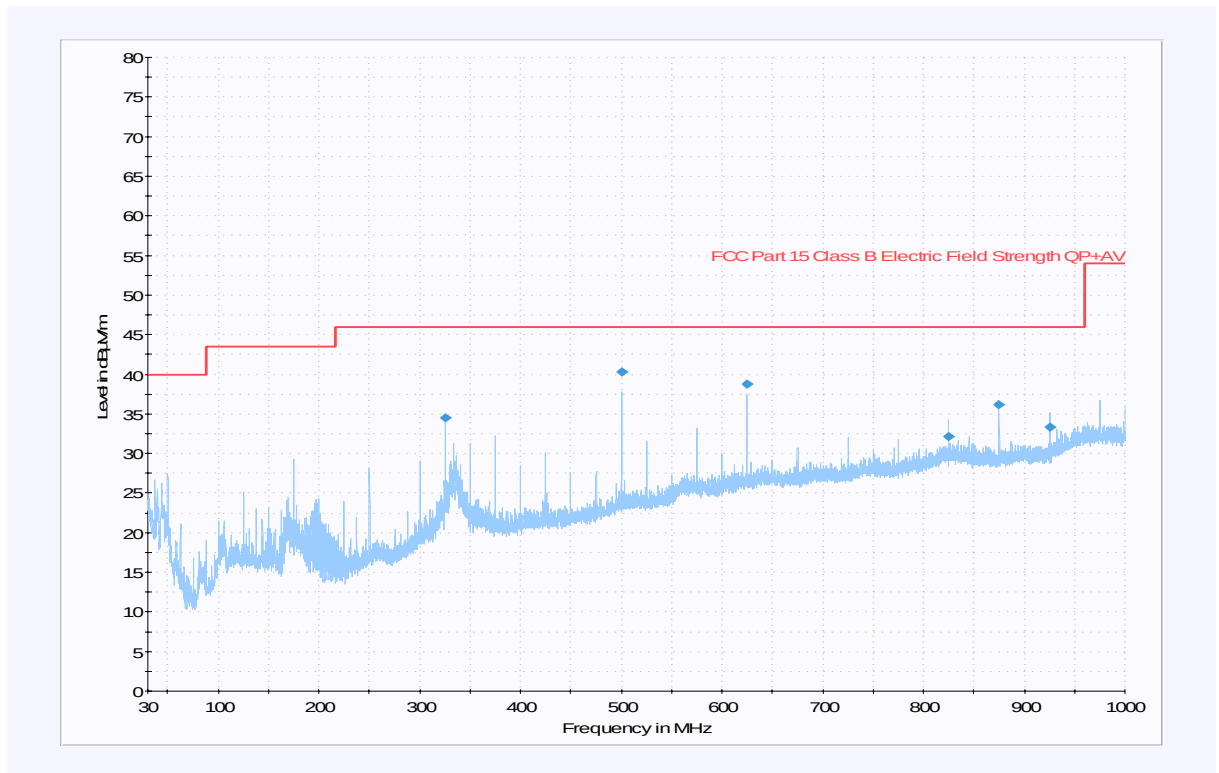
30 – 1000 MHz, max peak at a distance of 3 m on the highest TX channel, CSK, 11 Mbps



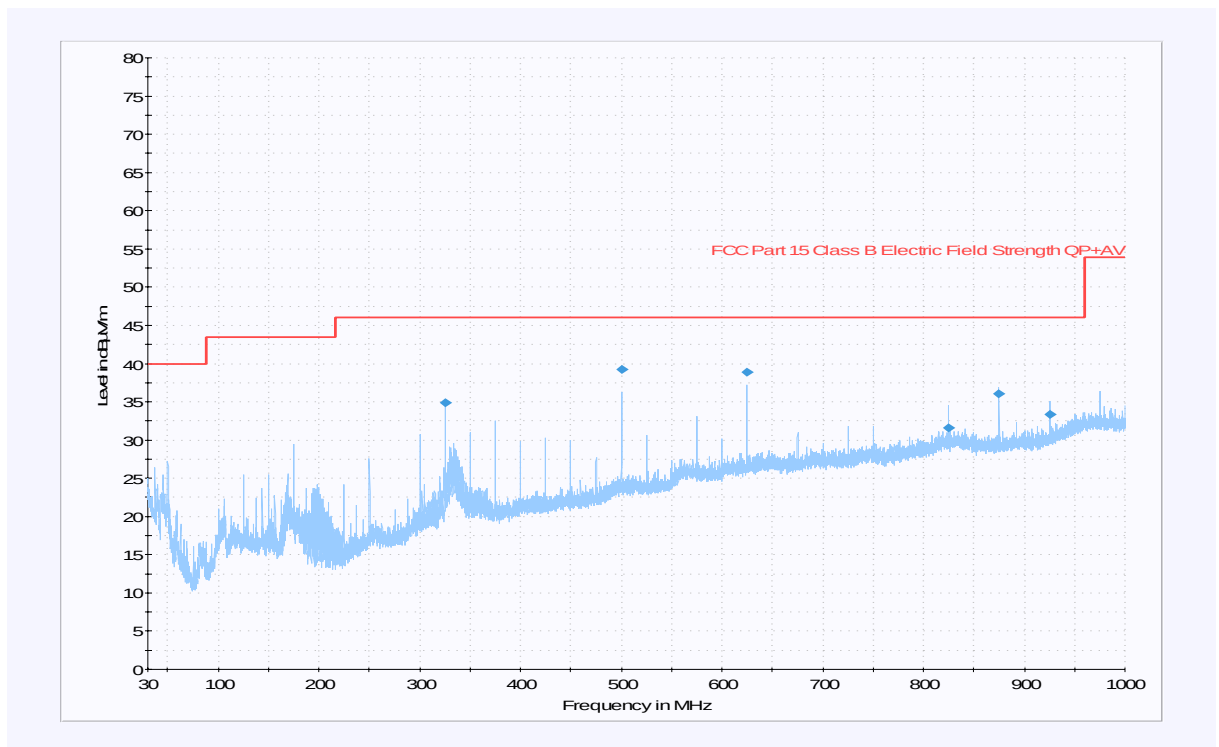
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30 – 1000 MHz, max peak at a distance of 3 m on the lowest TX channel, OFDM, 54 Mbps



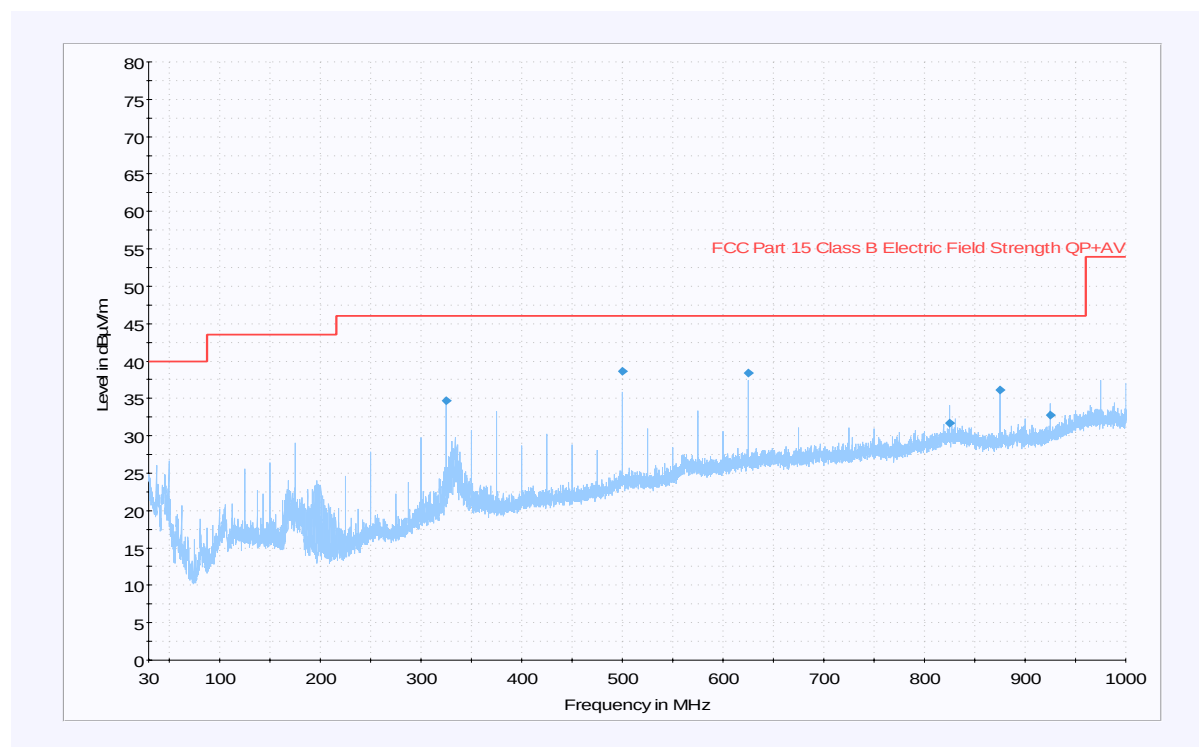
30 – 1000 MHz, max peak at a distance of 3 m on the middle TX channel, OFDM, 54 Mbps



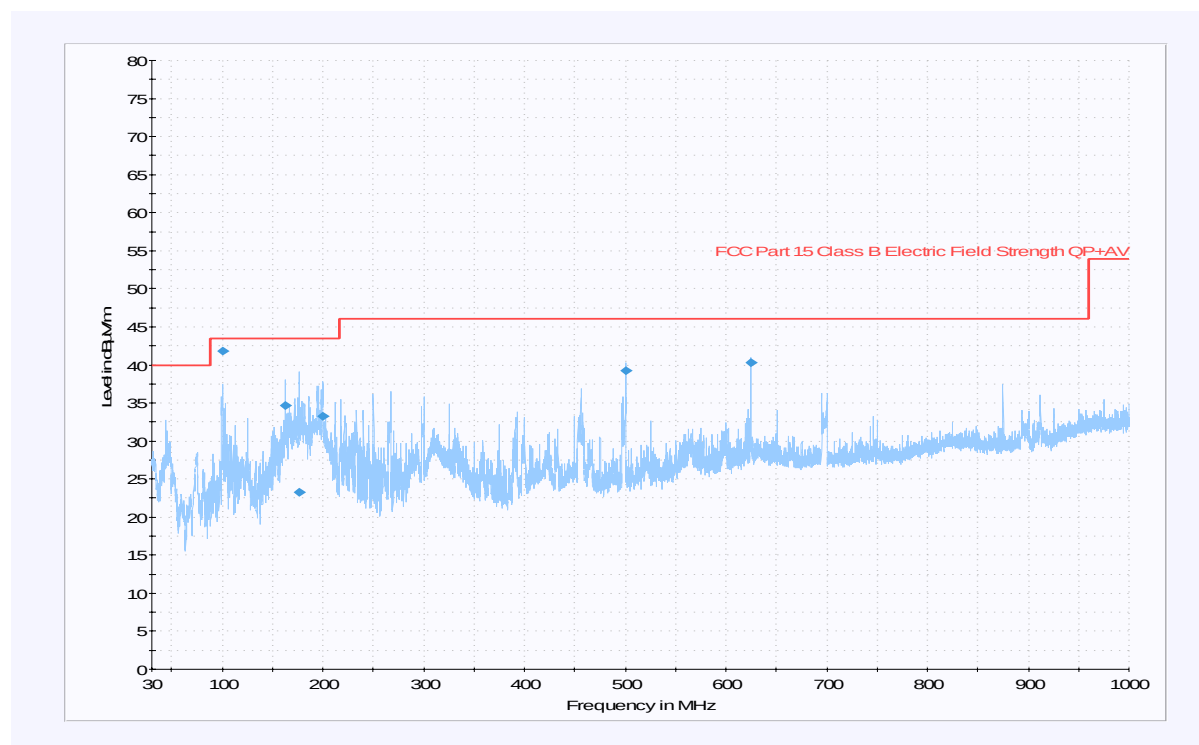
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30 – 1000 MHz, max peak at a distance of 3 m on the highest TX channel, OFDM, 54 Mbps



30 – 1000 MHz, max peak at a distance of 3 m in standby/Rx mode



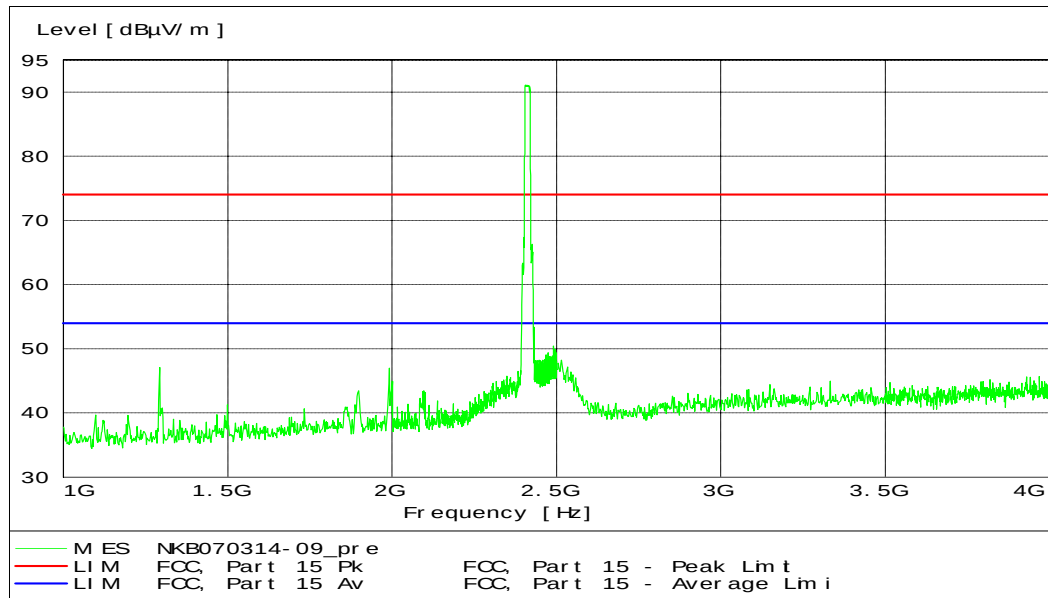
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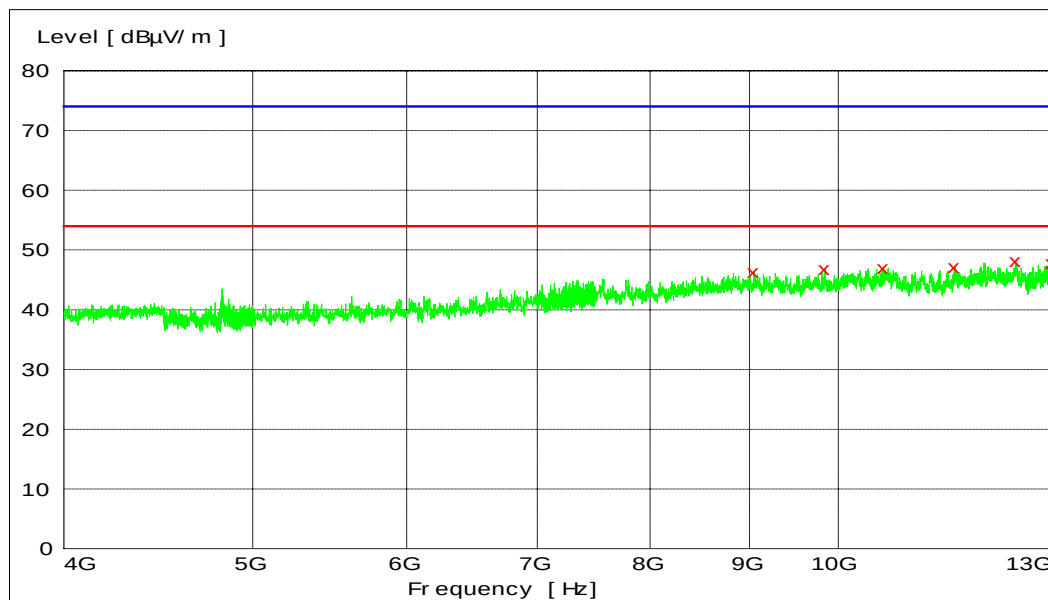
Radio anechoic shielded chamber

Date of test: 2006-10-24 and 2007-03-13

1000 – 4000 MHz, max peak at a distance of 3 m on the lowest TX channel, CSK, 11 Mbps
A 6dB attenuator (HP 8491A) was used between the antenna and the preamplifier.



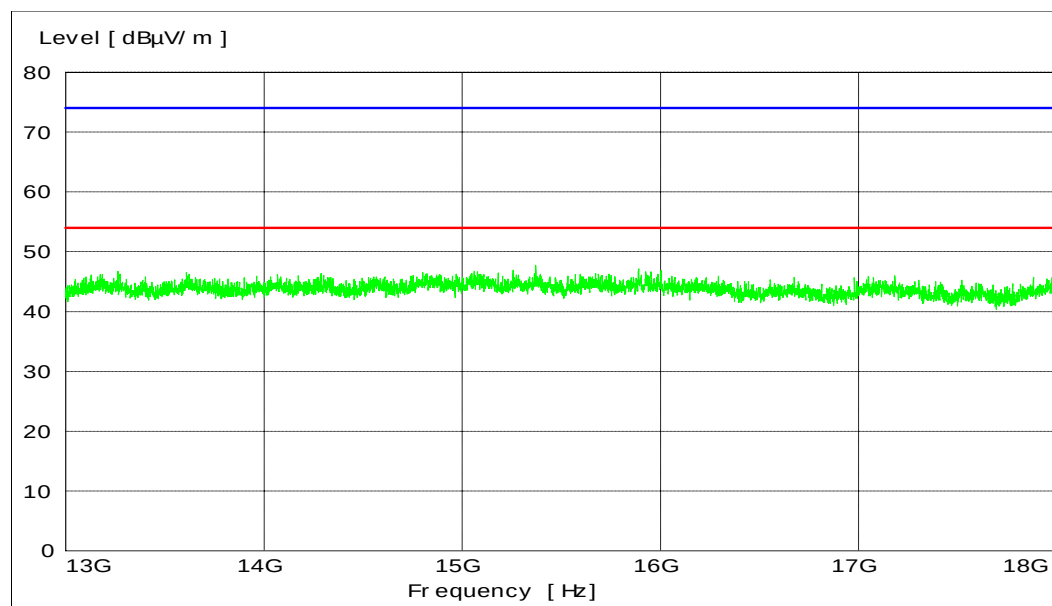
4000 – 13000 MHz, max peak at a distance of 3 m on the lowest TX channel, CSK, 11 Mbps
Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0



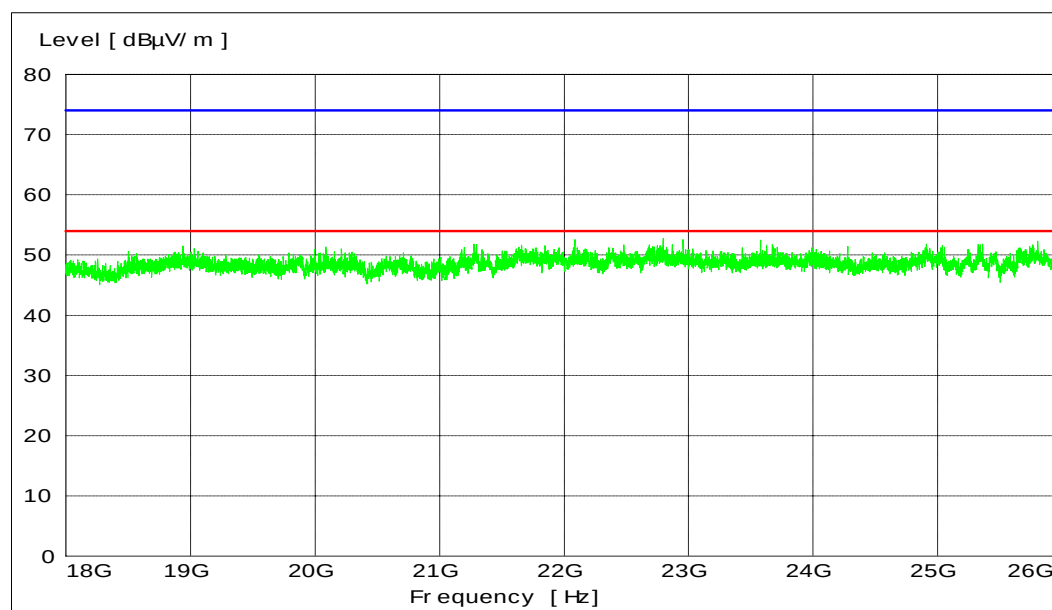
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13 – 18 GHz, max peak at a distance of 3 m on the lowest TX channel, CSK, 11 Mbps



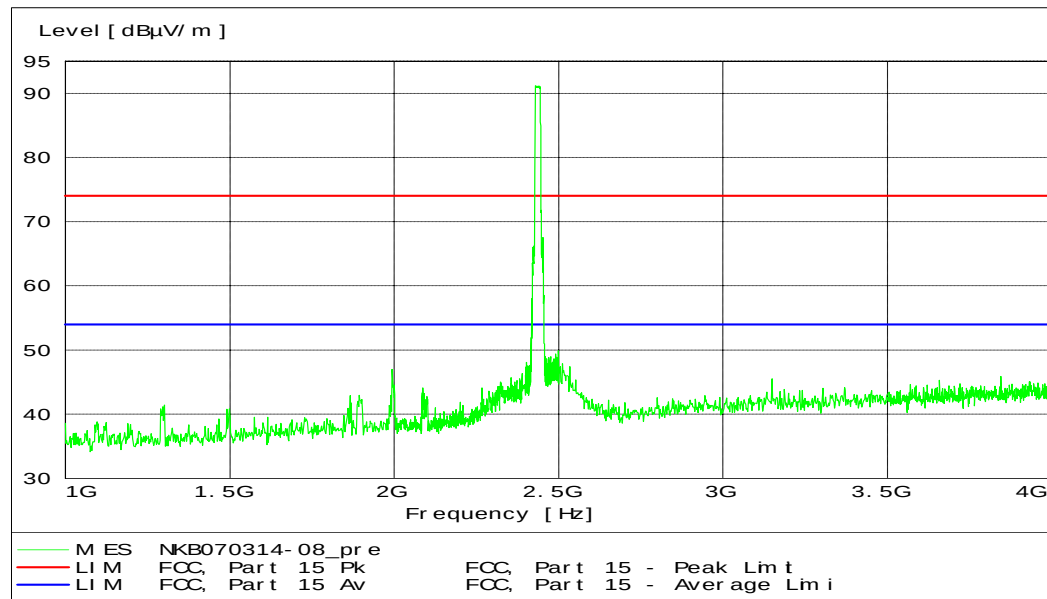
18 – 26 GHz, max peak at a distance of 3 m on the lowest TX channel, CSK, 11 Mbps



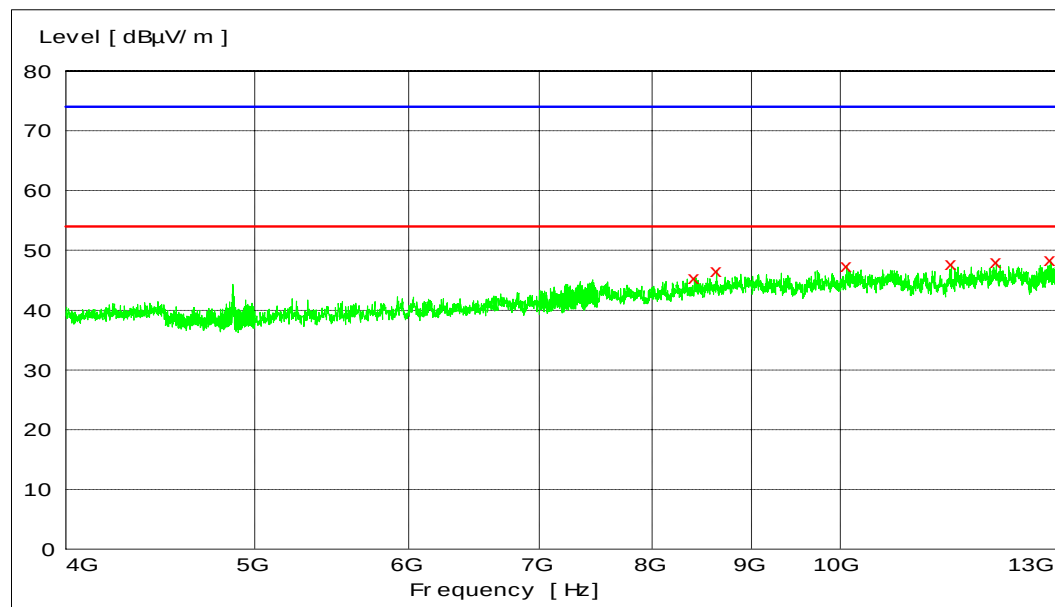
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1000 – 4000 MHz, max peak at a distance of 3 m on the middle TX channel, CSK, 11 Mbps
A 6dB attenuator (HP 8491A) was used between the antenna and the preamplifier.



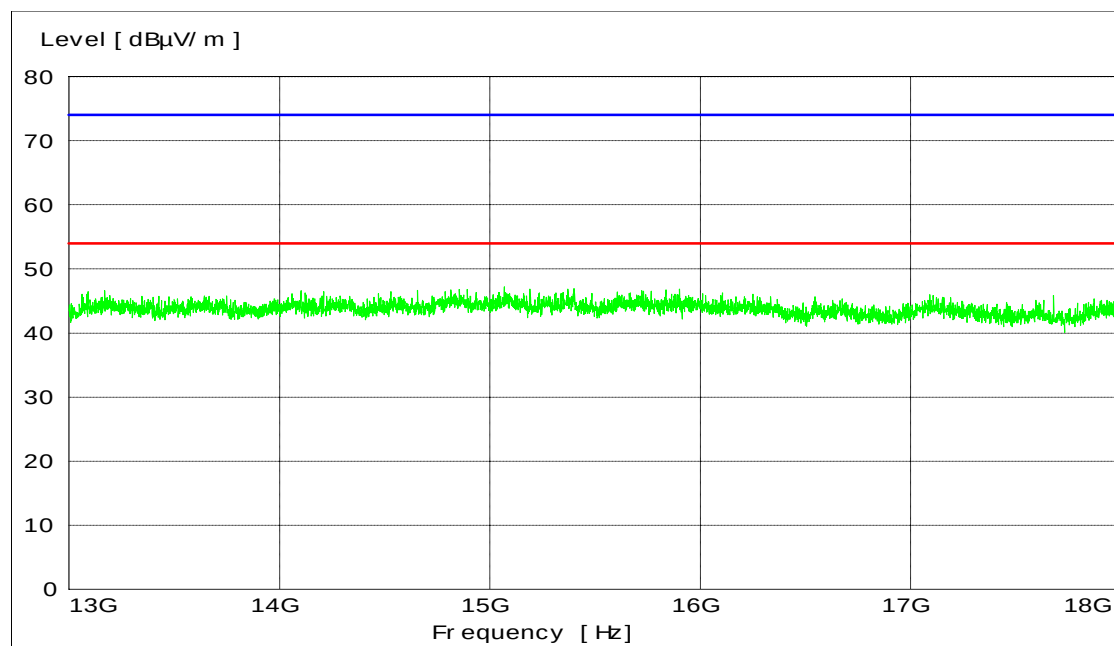
4000 – 13000 MHz, max peak at a distance of 3 m on the middle TX channel, CSK, 11 Mbps
Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0



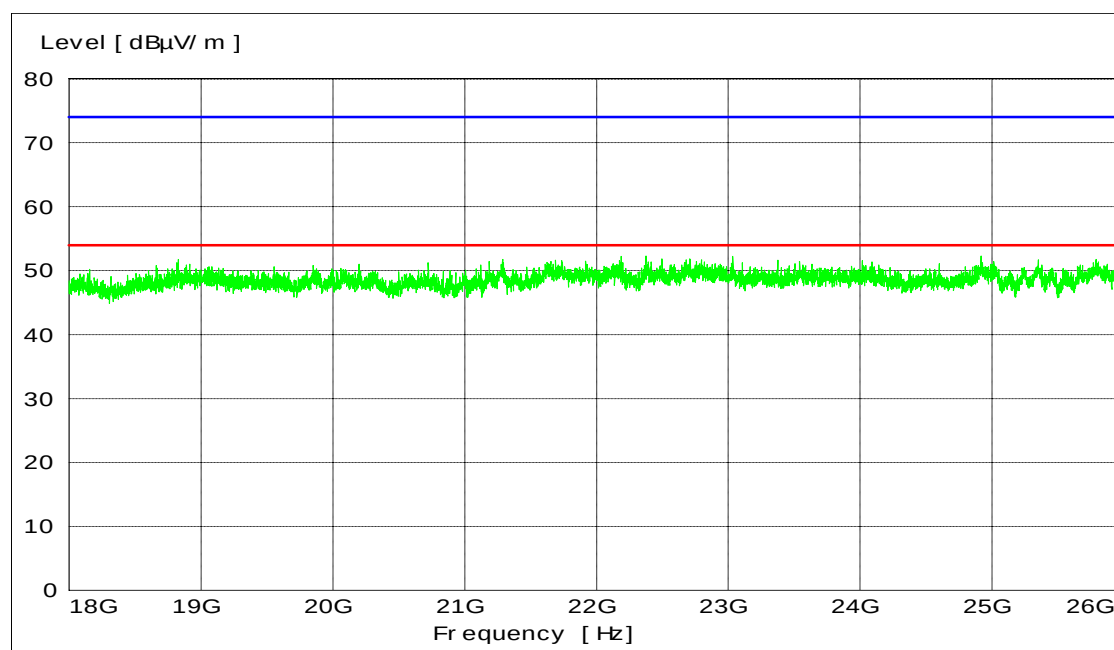
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13 – 18 GHz, max peak at a distance of 3 m on the middle TX channel, CSK, 11 Mbps



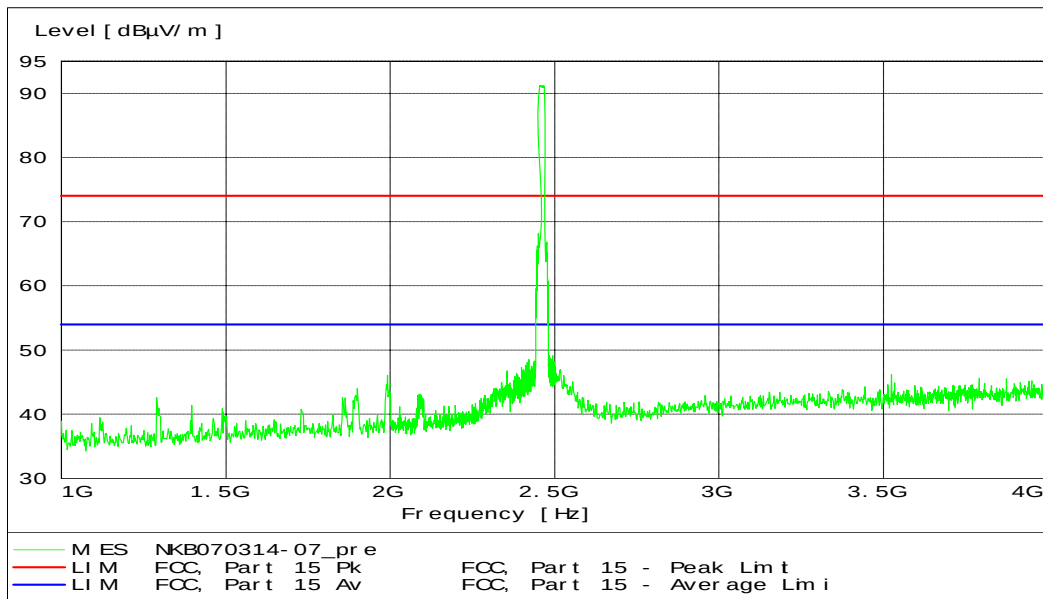
18 – 26 GHz, max peak at a distance of 3 m on the middle TX channel, CSK, 11 Mbps



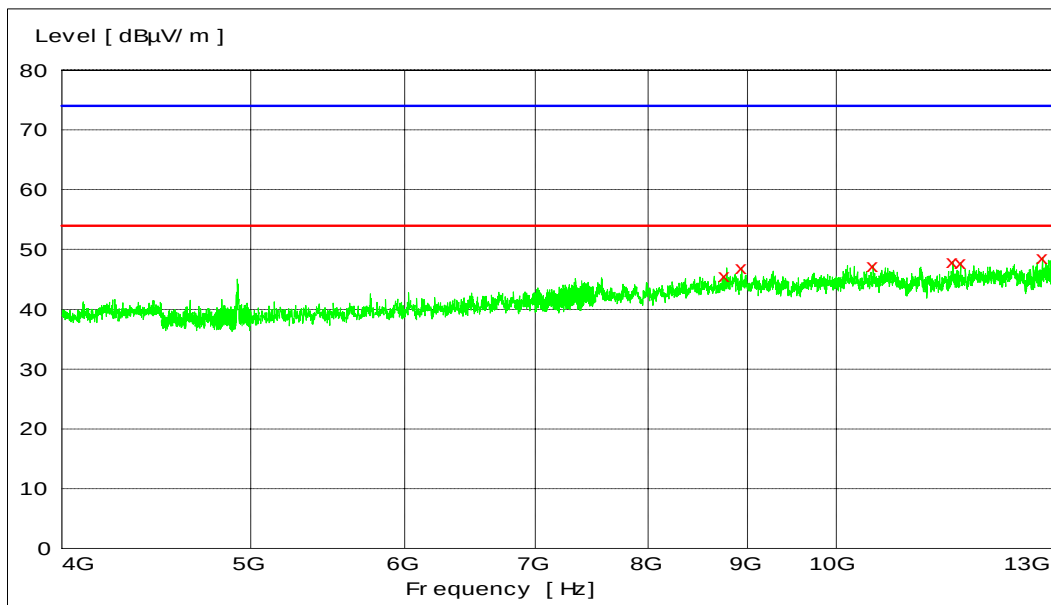
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1000 – 4000 MHz, max peak at a distance of 3 m on the highest TX channel, CSK, 11 Mbps
A 6dB attenuator (HP 8491A) was used between the antenna and the preamplifier.



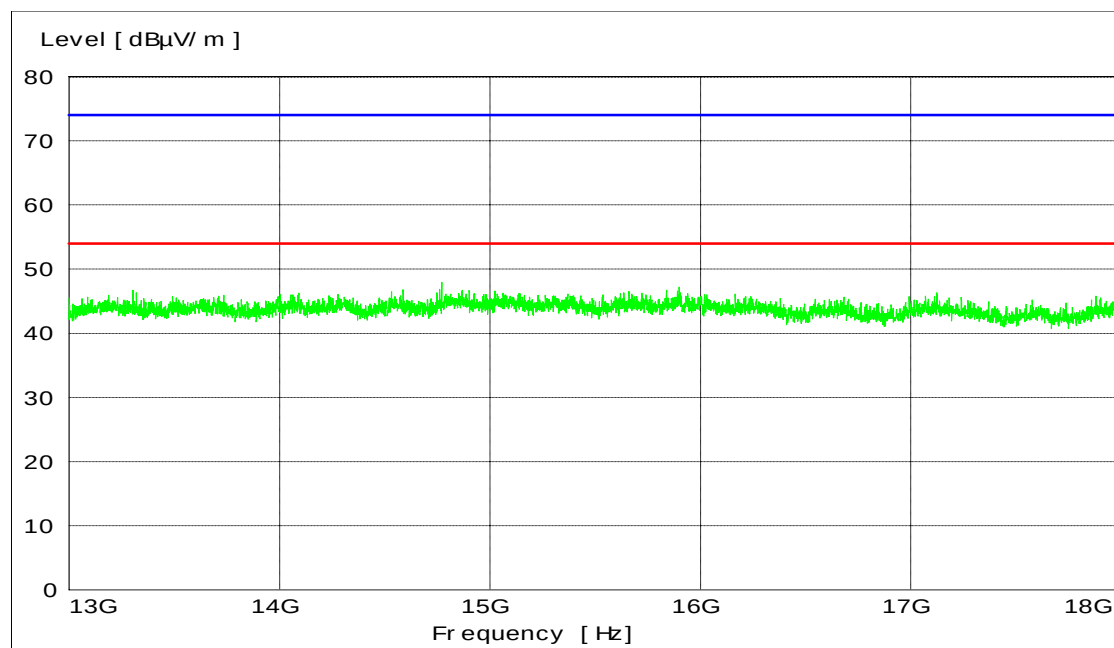
4000 – 13000 MHz, max peak at a distance of 3 m on the highest TX channel, CSK, 11 Mbps
Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0



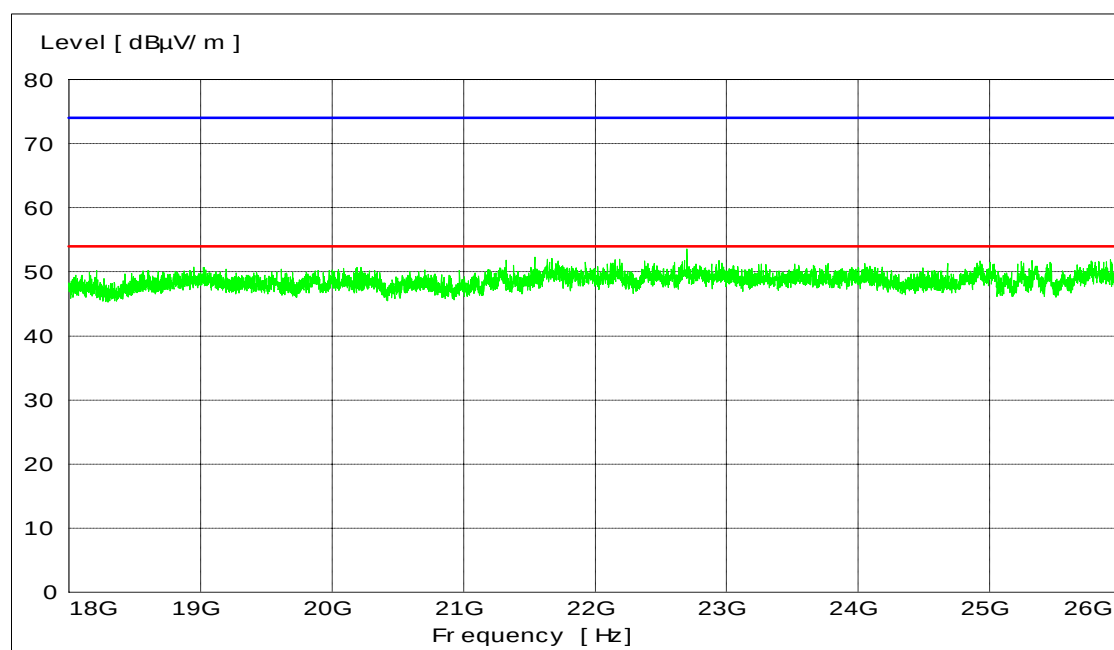
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13 – 18 GHz, max peak at a distance of 3 m on the highest TX channel, CSK, 11 Mbps



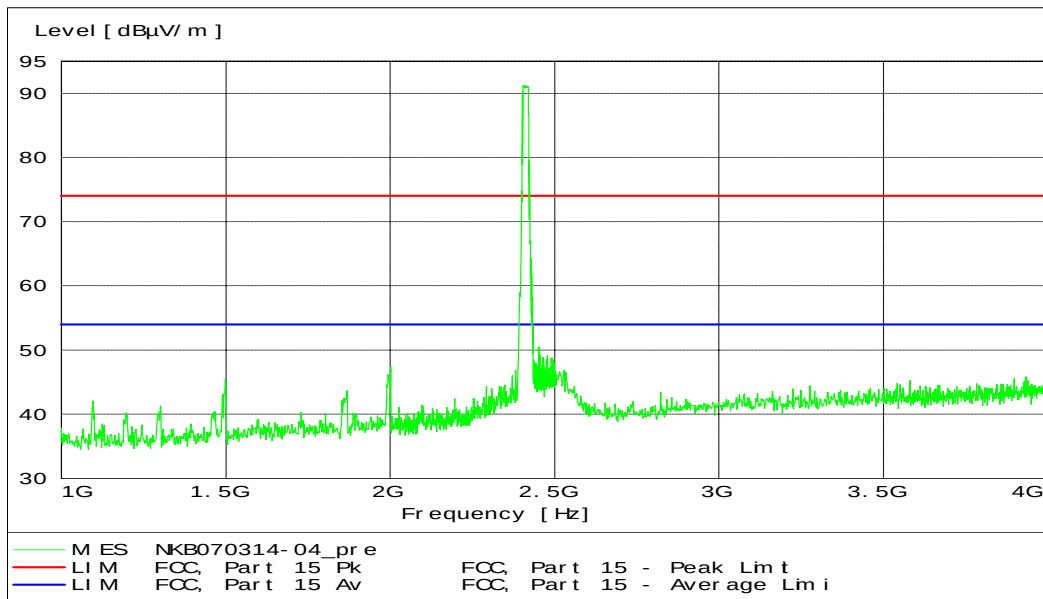
18 – 26 GHz, max peak at a distance of 3 m on the highest TX channel, CSK, 11 Mbps



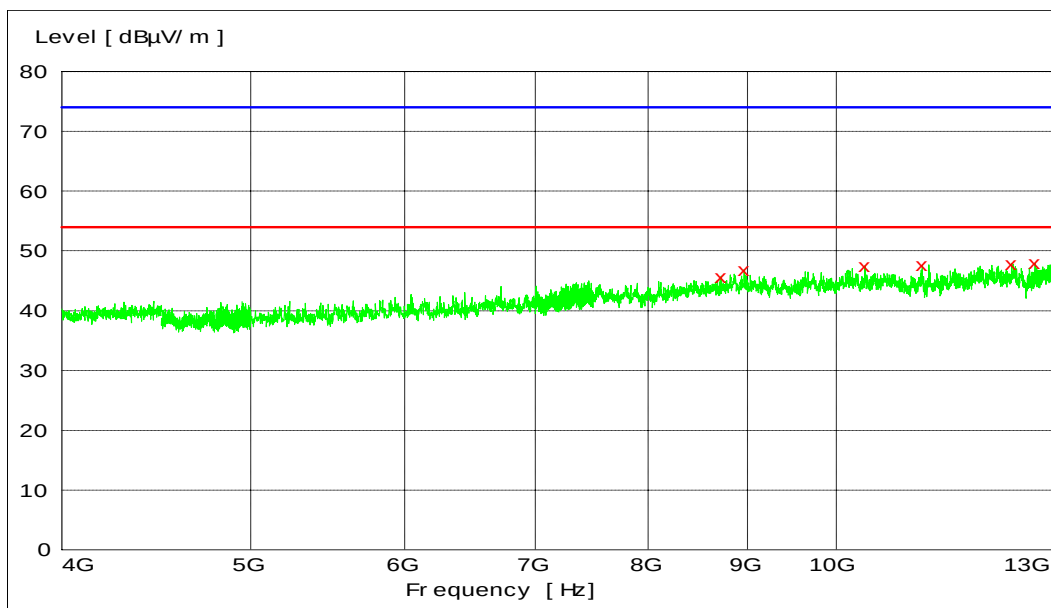
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1000 – 4000 MHz, max peak at a distance of 3 m on the lowest TX channel, OFDM, 54 Mbps
A 6dB attenuator (HP 8491A) was used between the antenna and the preamplifier.



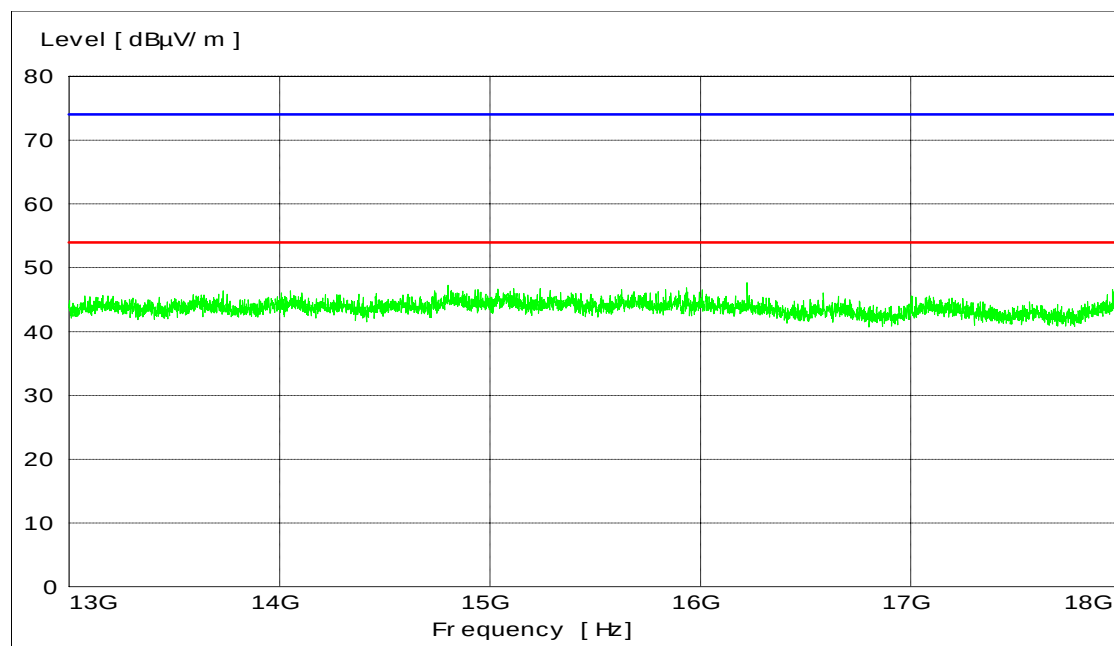
4000 – 13000 MHz, max peak at a distance of 3 m on the lowest TX channel, OFDM, 54 Mbps
Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0



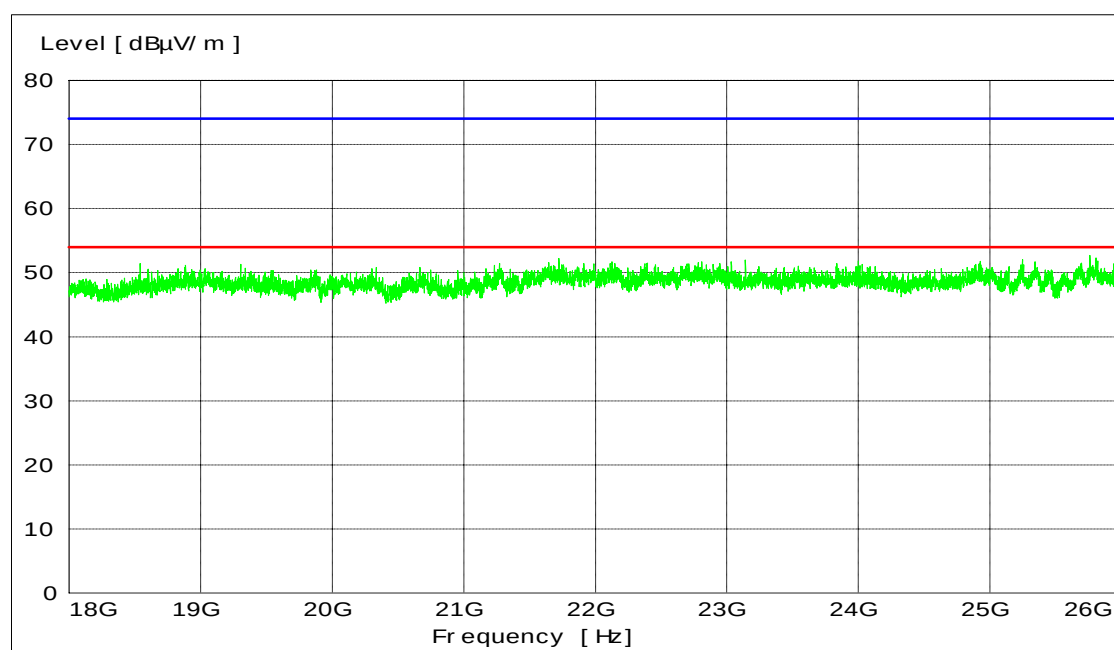
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13 – 18 GHz, max peak at a distance of 3 m on the lowest TX channel, OFDM, 54 Mbps



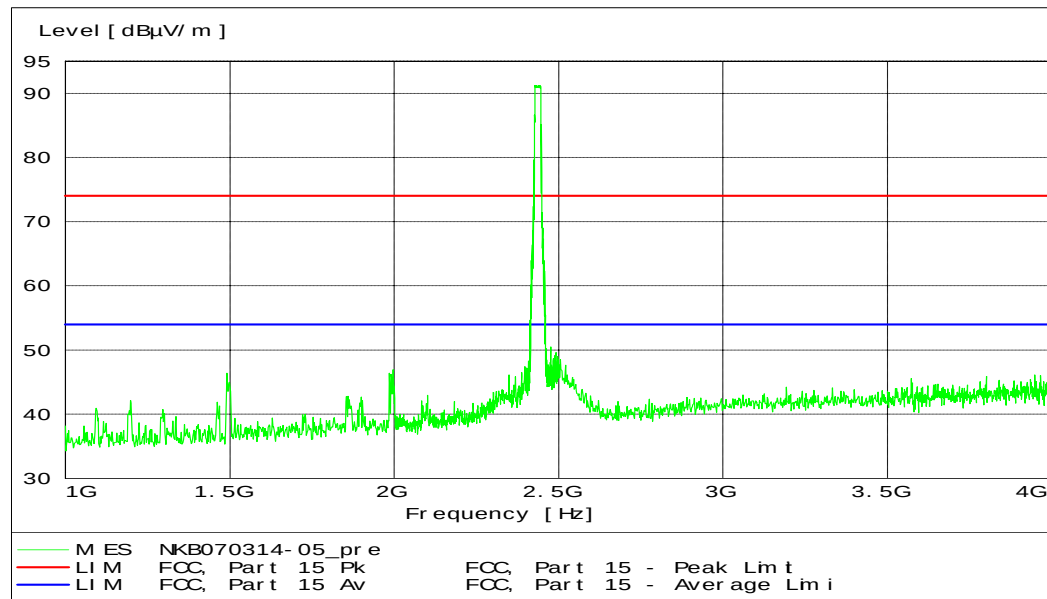
18 – 26 GHz, max peak at a distance of 3 m on the lowest TX channel, OFDM, 54 Mbps



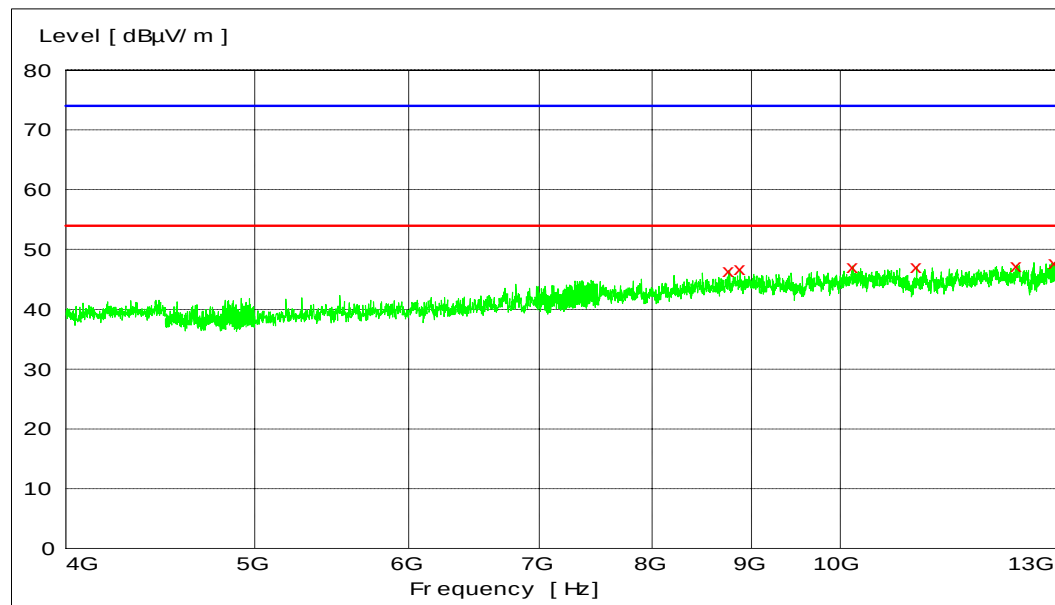
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1000 – 4000 MHz, max peak at a distance of 3 m on the middle TX channel, OFDM, 54 Mbps
A 6dB attenuator (HP 8491A) was used between the antenna and the preamplifier.



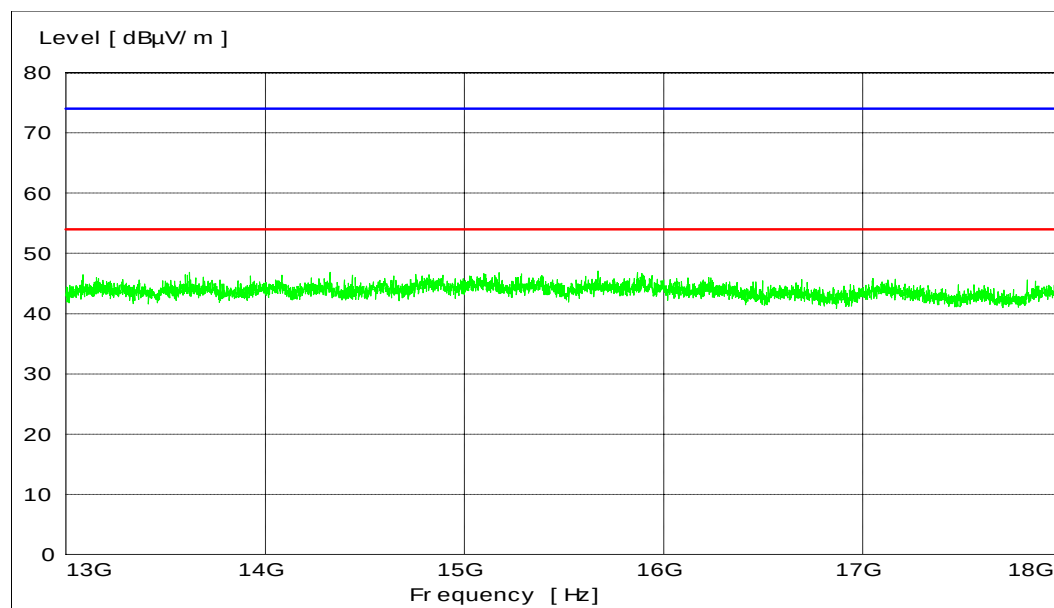
4000 – 13000 MHz, max peak at a distance of 3 m on the middle TX channel, OFDM, 54 Mbps
Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0



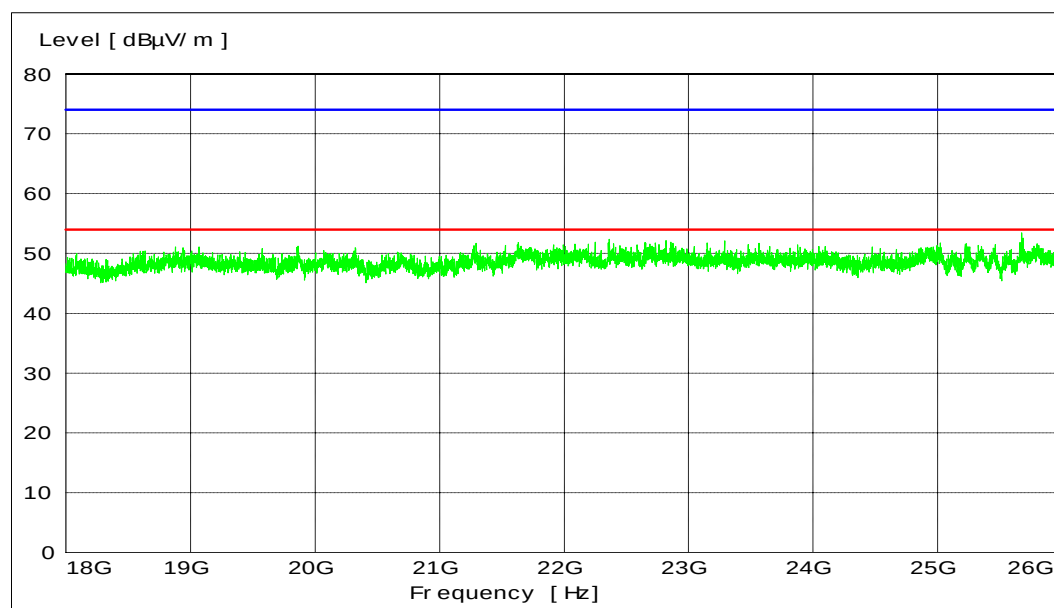
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13 – 18 GHz, max peak at a distance of 3 m on the middle TX channel, OFDM, 54 Mbps



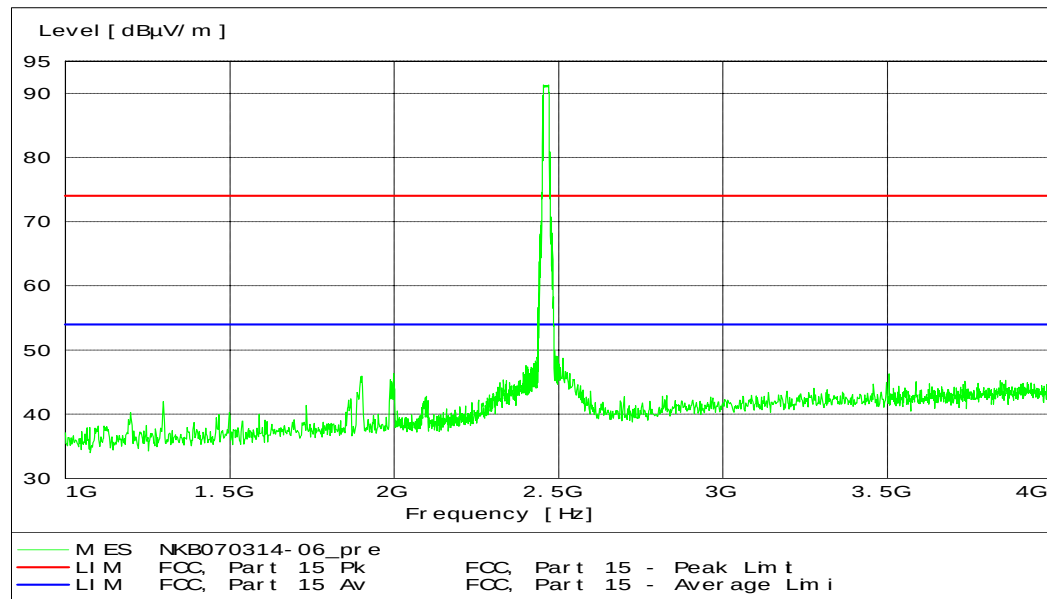
18 – 26 GHz, max peak at a distance of 3 m on the middle TX channel, OFDM, 54 Mbps



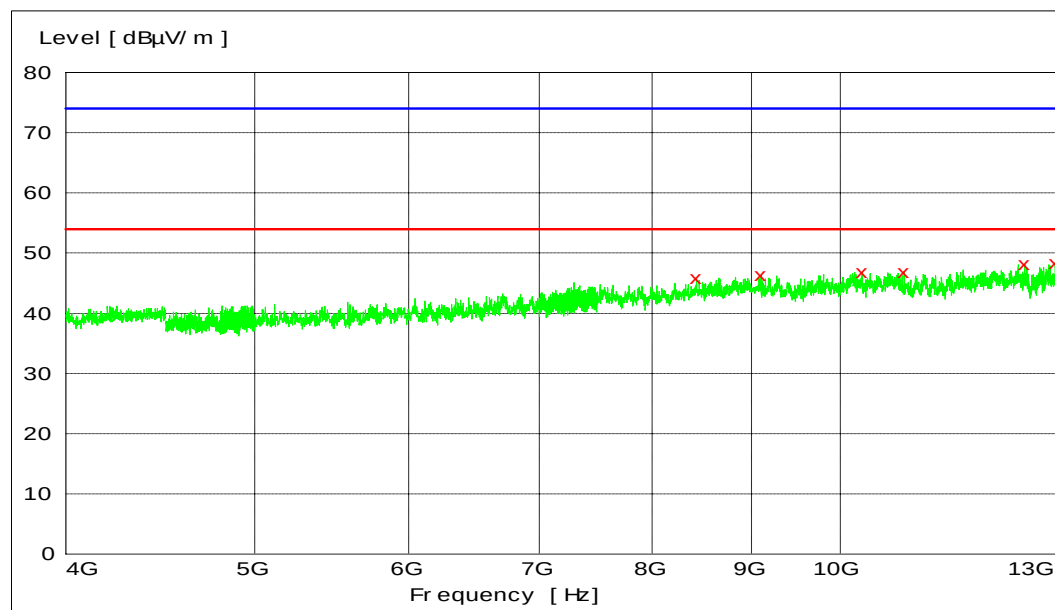
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1000 – 4000 MHz, max peak at a distance of 3 m on the highest TX channel, OFDM, 54 Mbps
A 6dB attenuator (HP 8491A) was used between the antenna and the preamplifier.



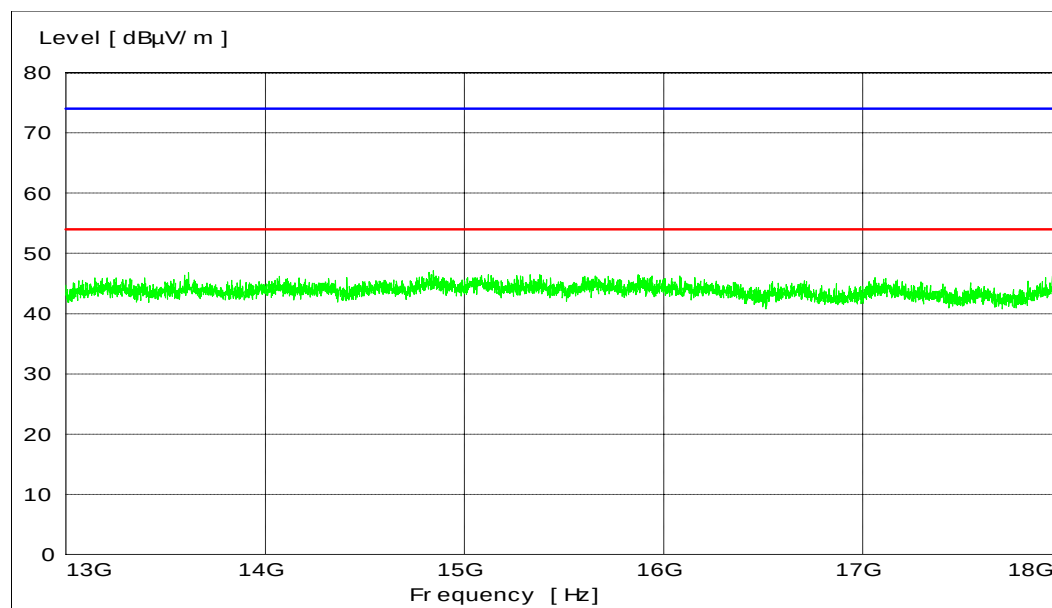
4000 – 13000 MHz, max peak at a distance of 3 m on the highest TX channel, OFDM, 54 Mbps
Emissions below 4000 MHz are attenuated by high-pass filter K&L 4410-X4500/18000-0



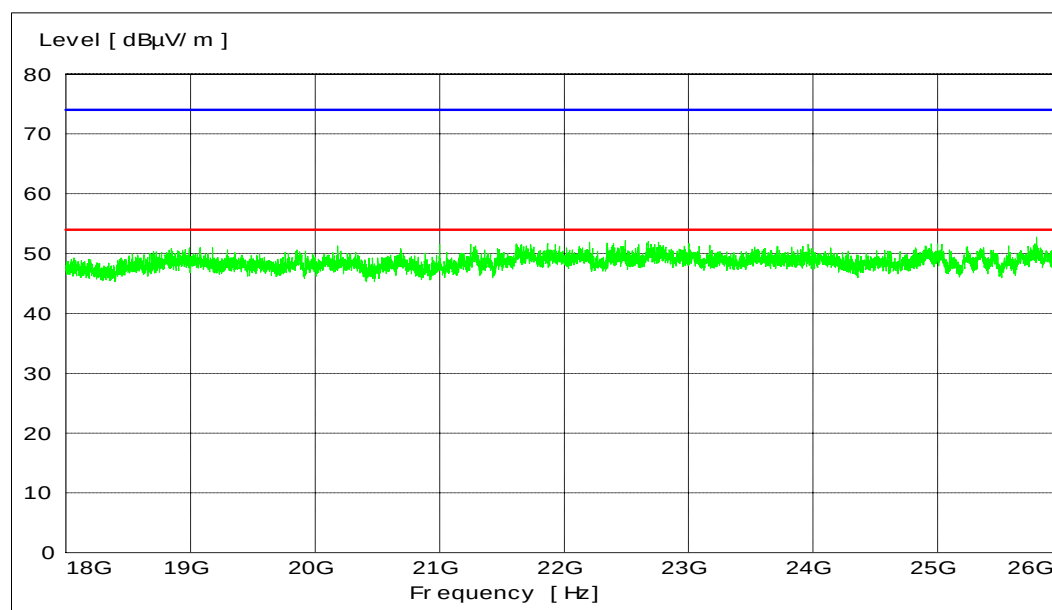
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13 – 18 GHz, max peak at a distance of 3 m on the highest TX channel, OFDM, 54 Mbps



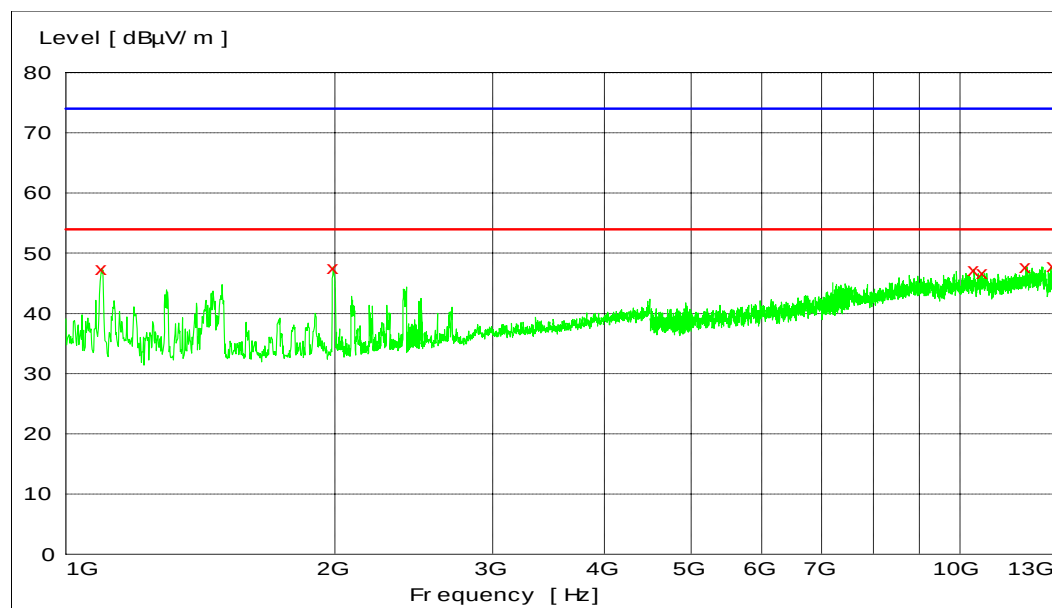
18 – 26 GHz, max peak at a distance of 3 m on the highest TX channel, OFDM, 54 Mbps



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1000 – 13000 MHz, max peak at a distance of 3 m in the standby mode



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Data summary

Low channel, 1, CSK, 11 Mbps data rate

Detector Type	Frequency MHz	Measured level dBuV/m	Limit dBuV/m	Bandwidth kHz	Note
QP	325,0	34,5	46	120	
QP	500,0	40,3	46	120	
QP	625,0	38,7	46	120	
QP	825,0	32,2	46	120	
QP	875,0	36,2	46	120	
QP	925,0	33,3	46	120	
Pk	1300,6	45,7	74	1000	
Avg	1300,6	27,6	54	1000	
Pk	2384,0	50,6	74	1000	
Avg	2384,0	36,0	54	1000	
Pk	2491,0	52,0	74	1000	
Avg	2491,0	38,3	54	1000	
Pk	2495,3	52,5	74	1000	
Avg	2495,3	38,3	54	1000	
Pk	15370,7	52,0	74 (54)	1000	

Middle channel, 6, CSK, 11 Mbps data rate

Detector Type	Frequency MHz	Measured level dBuV/m	Limit dBuV/m	Bandwidth kHz	Note
QP	175,0	32,9	46	120	
QP	325,0	35,2	46	120	
QP	500,0	35,0	46	120	
QP	625,0	37,9	46	120	
QP	875,0	34,8	46	120	
QP	625,0	32,4	46	120	
Pk	1300,6	47,8	74	1000	
Avg	1300,6	27,2	54	1000	
Pk	2267,0	44,8	74 (54)	1000	
Pk	2389,6	50,1	74	1000	
Avg	2389,6	35,7	54	1000	
Pk	2498,5	52,6	74	1000	
Avg	2498,5	38,0	54	1000	
Pk	4876,8	49,9	74 (54)	1000	



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High channel, 11, CSK, 11 Mbps data rate

Detector Type	Frequency MHz	Measured level dBuV/m	Limit dBuV/m	Bandwidth kHz	Note
QP	325,0	34,3	46	120	
QP	500,0	39,9	46	120	
QP	625,0	37,2	46	120	
QP	825,0	30,7	46	120	
QP	875,0	36,1	46	120	
QP	925,0	32,1	46	120	
Pk	1396,8	46,5	74	1000	
Avg	1396,8	25,9	54	1000	
Pk	2355,1	48,9	74	1000	
Avg	2355,1	34,8	54	1000	
Pk	2494,8	53,4	74	1000	
Avg	2494,8	38,9	54	1000	
Pk	4924,2	52,5	74 (54)	1000	

Low channel, 1, OFDM, 54 Mbps data rate

Detector Type	Frequency MHz	Measured level dBuV/m	Limit dBuV/m	Bandwidth kHz	Note
QP	325,0	34,6	46	120	
QP	339,6	25,8	46	120	
QP	500,0	38,9	46	120	
QP	625,0	37,7	46	120	
QP	875,0	35,0	46	120	
QP	925,0	32,1	46	120	
Pk	1499,0	45,6	74	1000	
Avg	1499,0	27,8	54	1000	
Pk	2390,0	68,4	74	1000	
Avg	2390,0	47,0	54	1000	
Pk	2485,0	54,7	74	1000	
Avg	2485,0	39,5	54	1000	
Pk	2500,0	53,9	74	1000	
Avg	2500,0	39,8	54	1000	
Pk	16220,5	50,7	74 (54)	1000	



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Middle channel, 6, OFDM, 54 Mbps data rate

Detector Type	Frequency MHz	Measured level dBuV/m	Limit dBuV/m	Bandwidth kHz	Note
QP	325,0	34,9	46	120	
QP	500,0	36,0	46	120	
QP	625,0	38,9	46	120	
QP	825,0	31,6	46	120	
QP	875,0	36,1	46	120	
QP	925,0	33,4	46	120	
Pk	1491,0	47,3	74	1000	
Avg	1491,0	27,6	54	1000	
Pk	2492,5	53,9	74	1000	
Avg	2492,5	39,5	54	1000	

High channel, 11, OFDM, 54 Mbps data rate

Detector Type	Frequency MHz	Measured level dBuV/m	Limit dBuV/m	Bandwidth kHz	Note
QP	325,0	34,7	46	120	
QP	500,0	38,6	46	120	
QP	625,0	38,4	46	120	
QP	825,0	31,7	46	120	
QP	875,0	36,1	46	120	
QP	925,0	32,7	46	120	
Pk	2331,0	49,4	74	1000	
Avg	2331,0	35,5	54	1000	
Pk	2383,0	50,8	74	1000	
Avg	2383,0	36,2	54	1000	
Pk	2483,5	63,3	74	1000	
Avg	2483,5	50,5	54	1000	



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Standby/Rx

Detector Type	Frequency MHz	Measured level dBuV/m	Limit dBuV/m	Bandwidth kHz	Note
QP	100,0	41,9	46	120	
QP	162,5	34,6	46	120	
QP	177,0	23,2	46	120	
QP	200,0	33,3	46	120	
QP	500,0	39,3	46	120	
QP	625,0	40,3	46	120	
Pk	1096,2	47,6	74 (54)	1000	
Pk	1990,0	48,3	74 (54)	1000	

Example calculation:

Measured level [dB μ V/m] = Analyser reading [dB μ V] + cable loss [dB] – preamplifier gain [dB] + antenna factor [1/m]



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10 CONDUCTED SPURIOUS EMISSIONS AT ANTENNA PORT

10.1 Measurement uncertainty

Measurement uncertainty for conducted disturbances at the antenna port: $\pm 3,6$ dB

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT. Measurement uncertainty is calculated in accordance with EA-4/02-1997. The uncertainty is given with a level of confidence of approximately 95% ($k=2$).

10.2 Test protocol

Date of test: 2006-11-15

Limit: In any 100 kHz bandwidth outside the operating frequency band (2400 – 2483,5 MHz), 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.

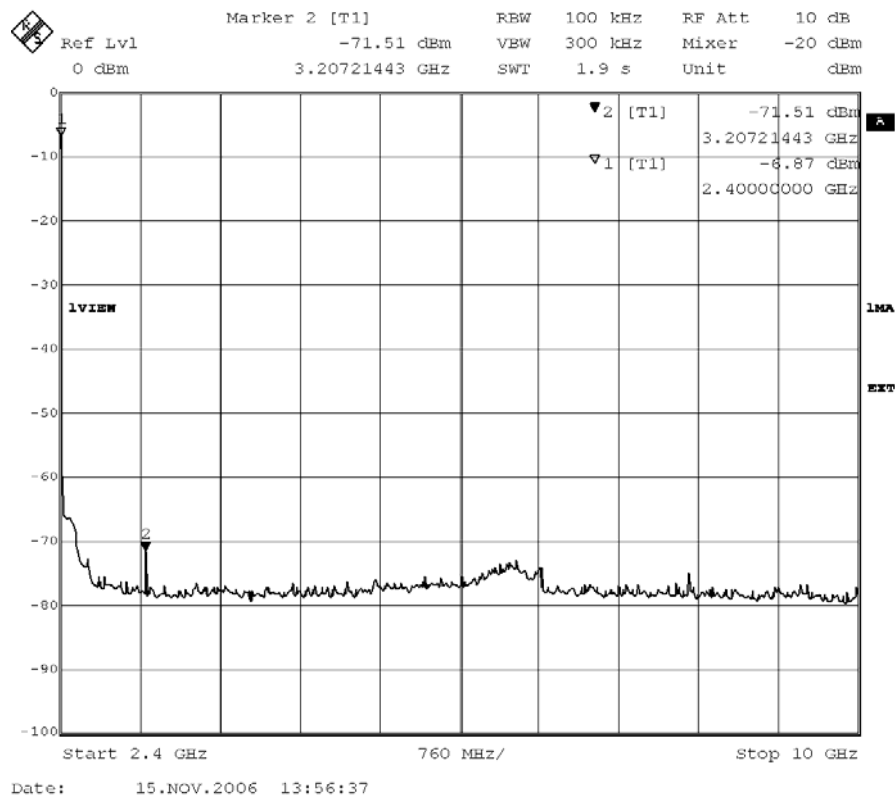
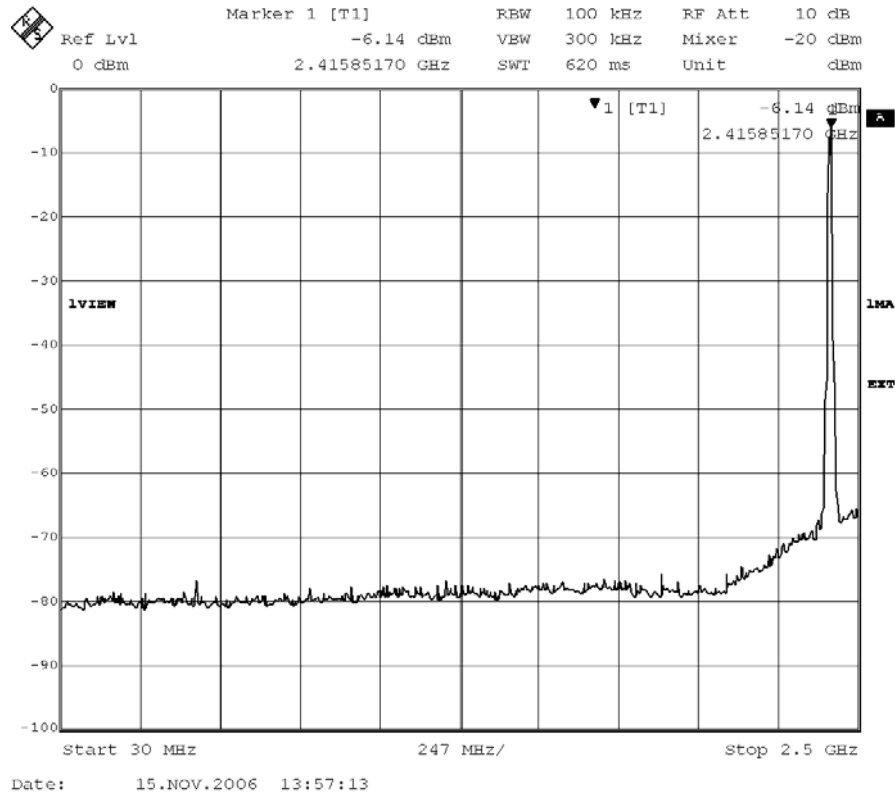
Measurement results are corrected for attenuation in the set-up configuration.



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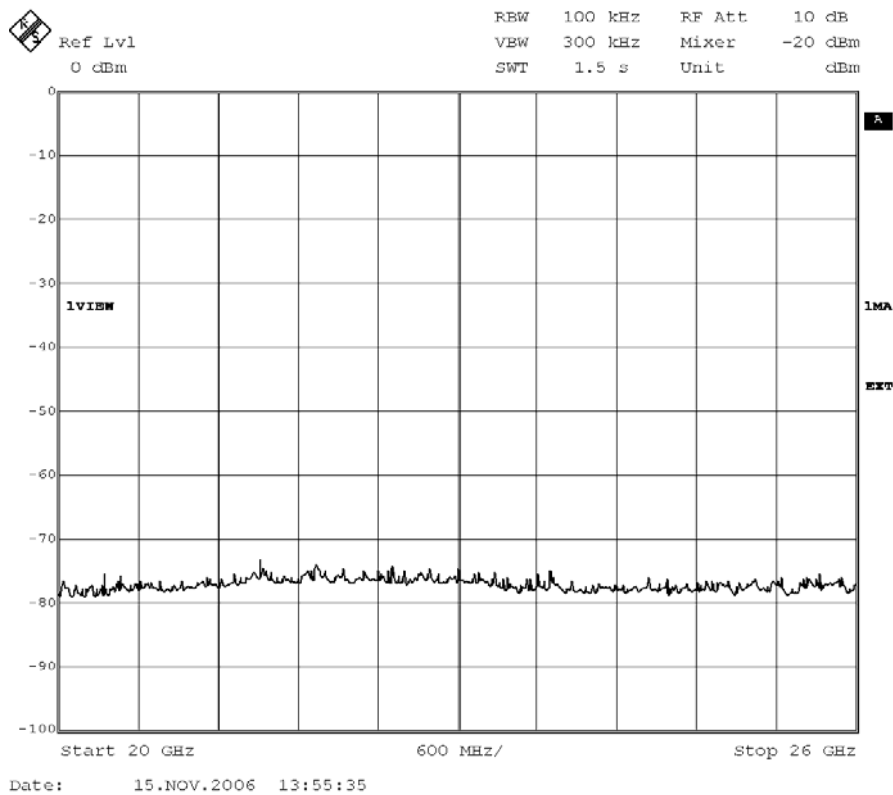
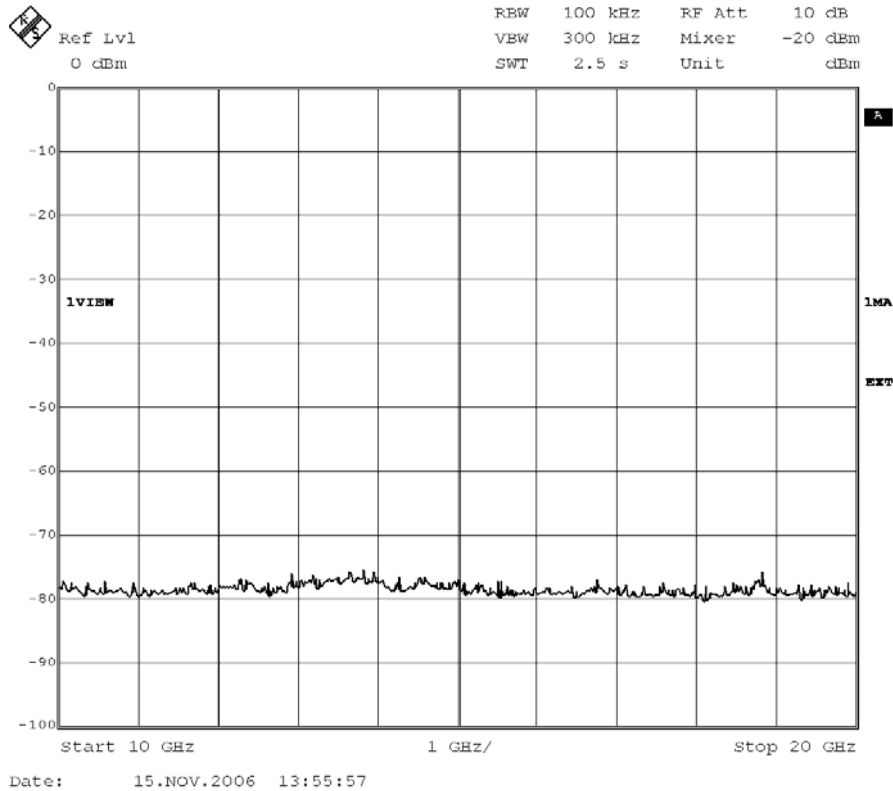
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Lowest channel, 1, CSK, 11 Mbps data rate



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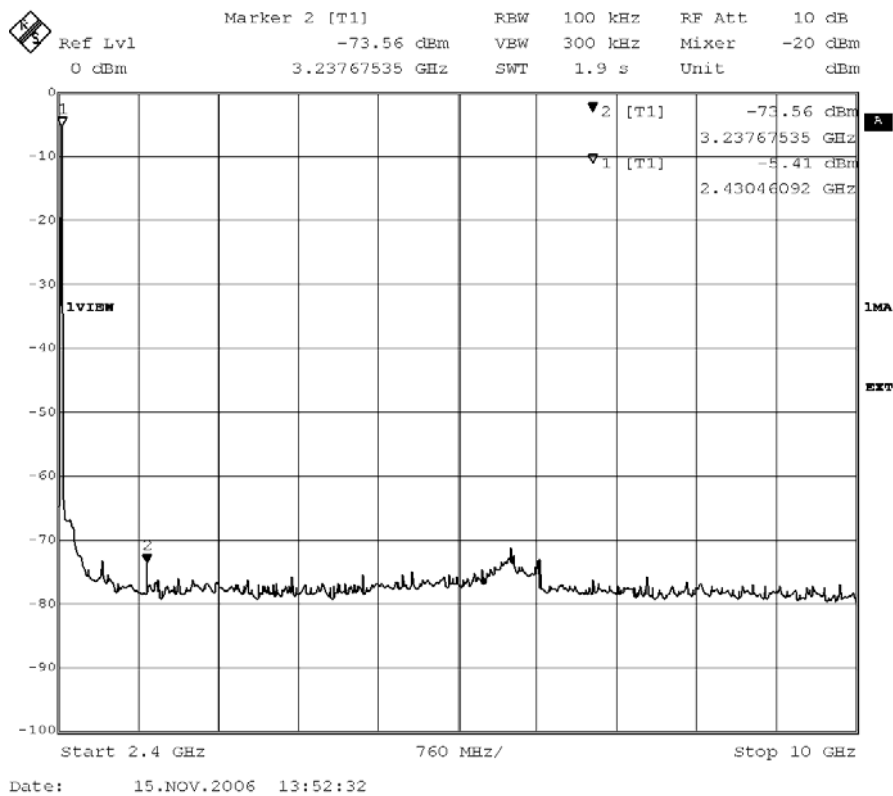
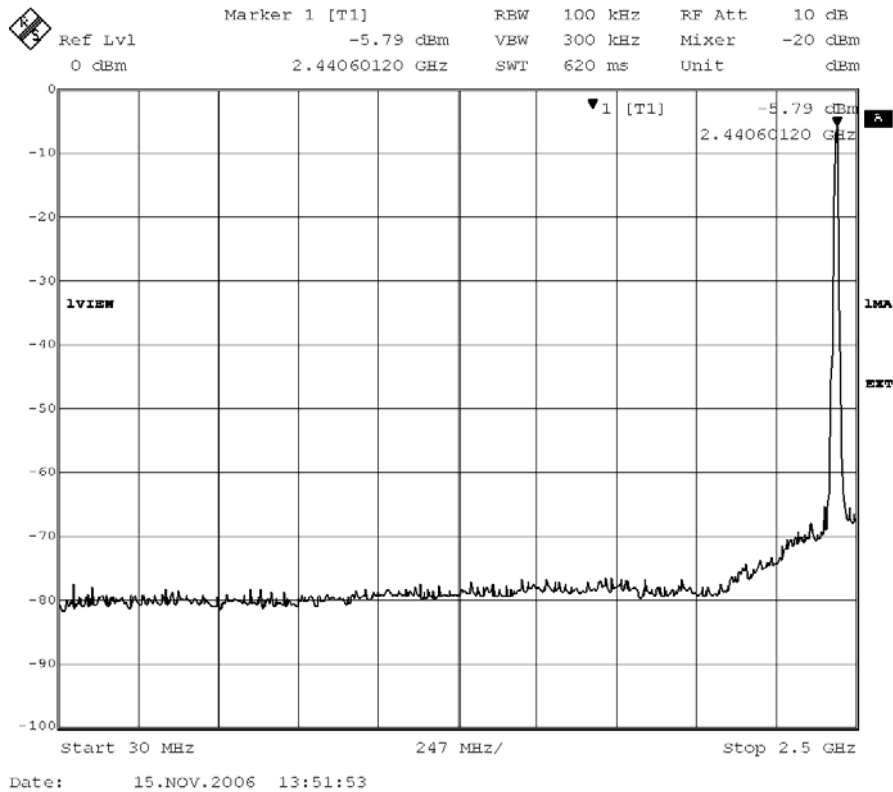
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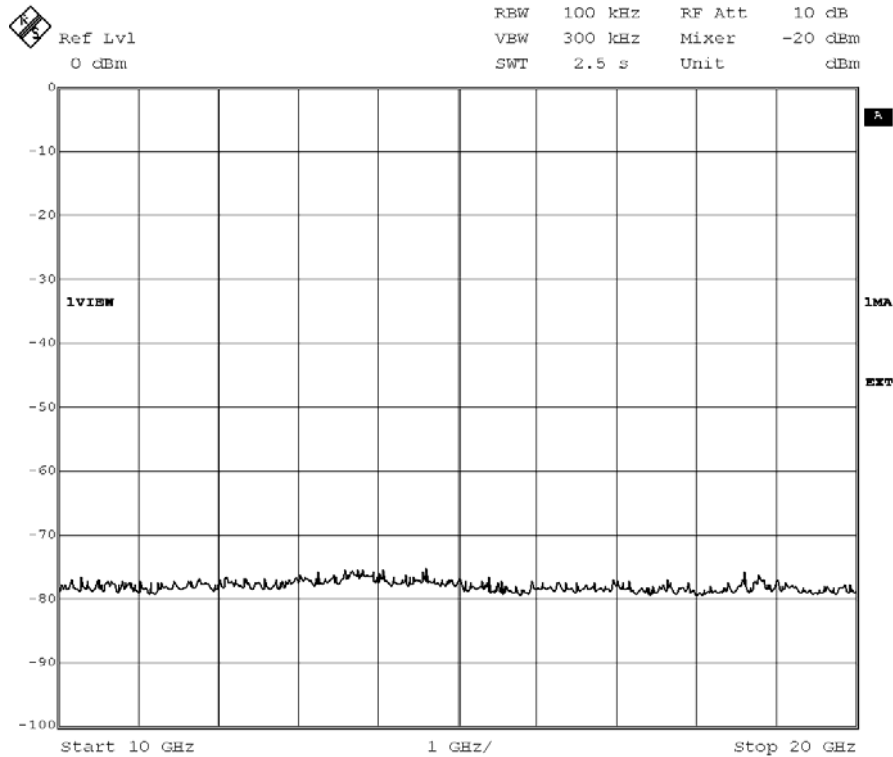
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Mid channel, 6, CSK, 11 Mbps data rate

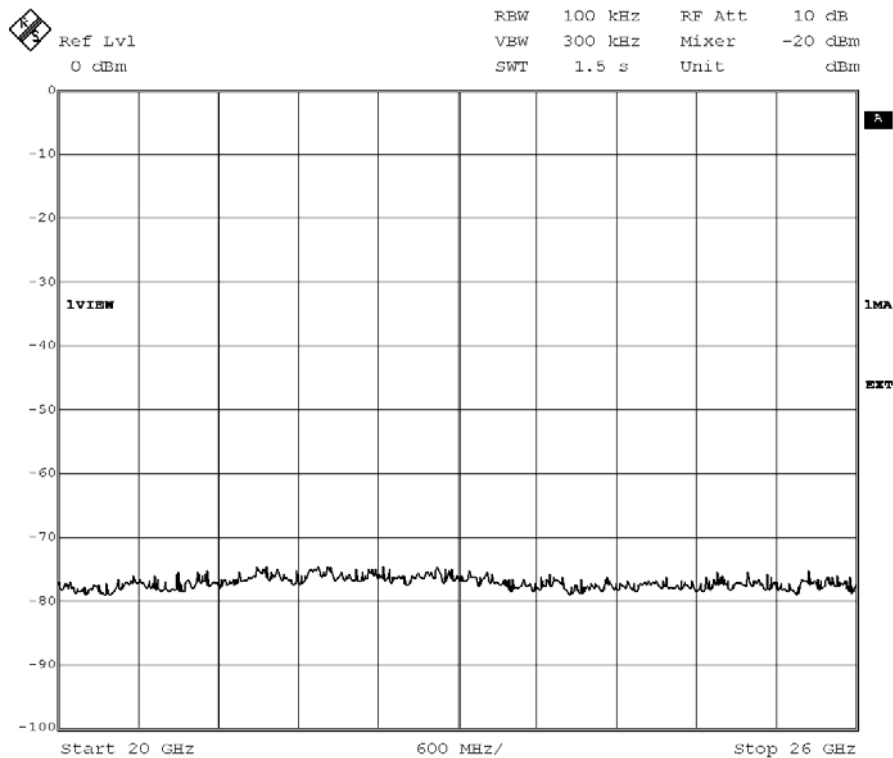


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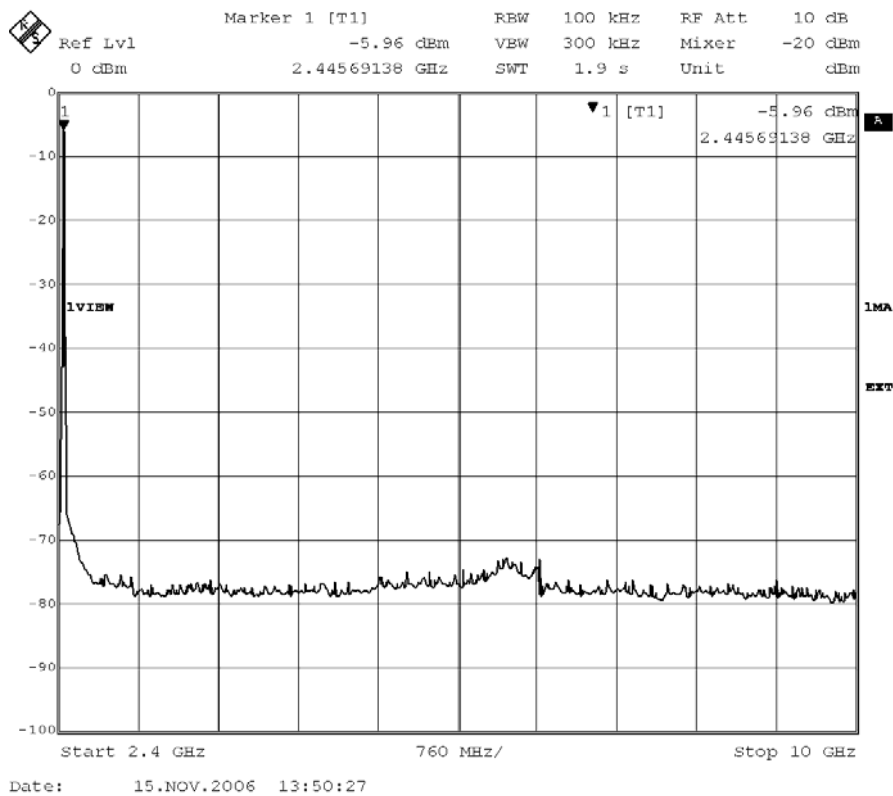
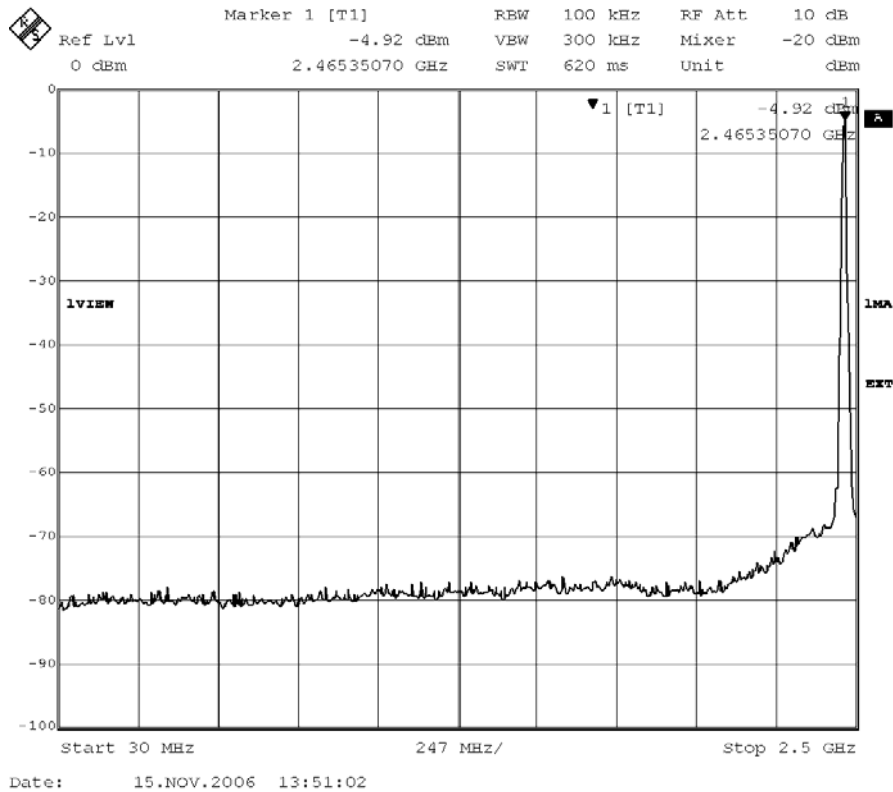
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Intertek Semko AB

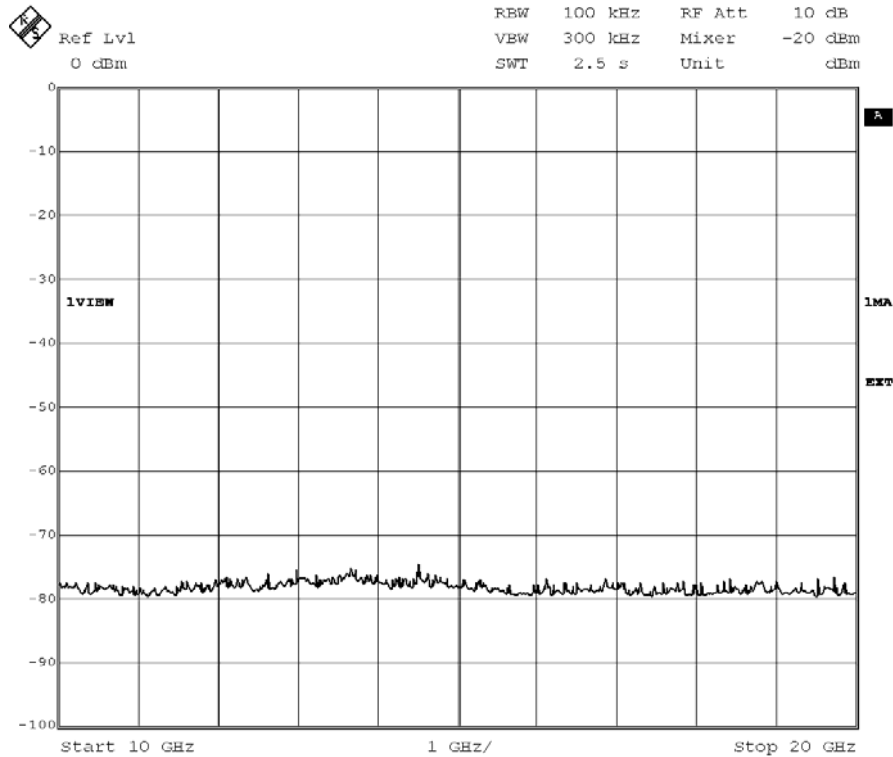
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Highest channel, 11, CSK, 11 Mbps data rate

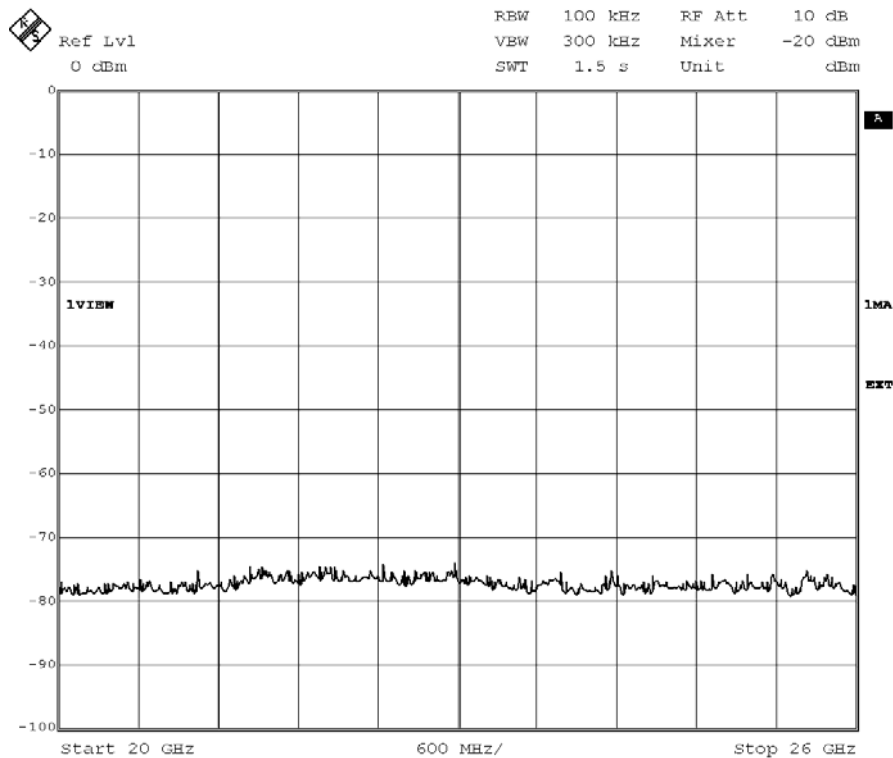


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Date: 15.NOV.2006 13:49:42



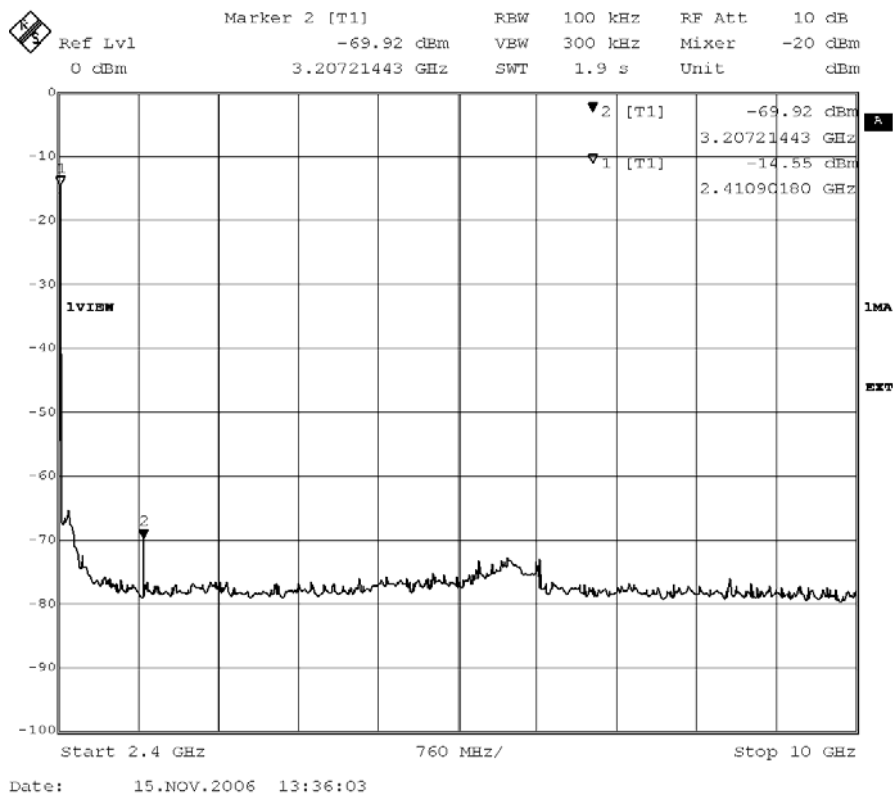
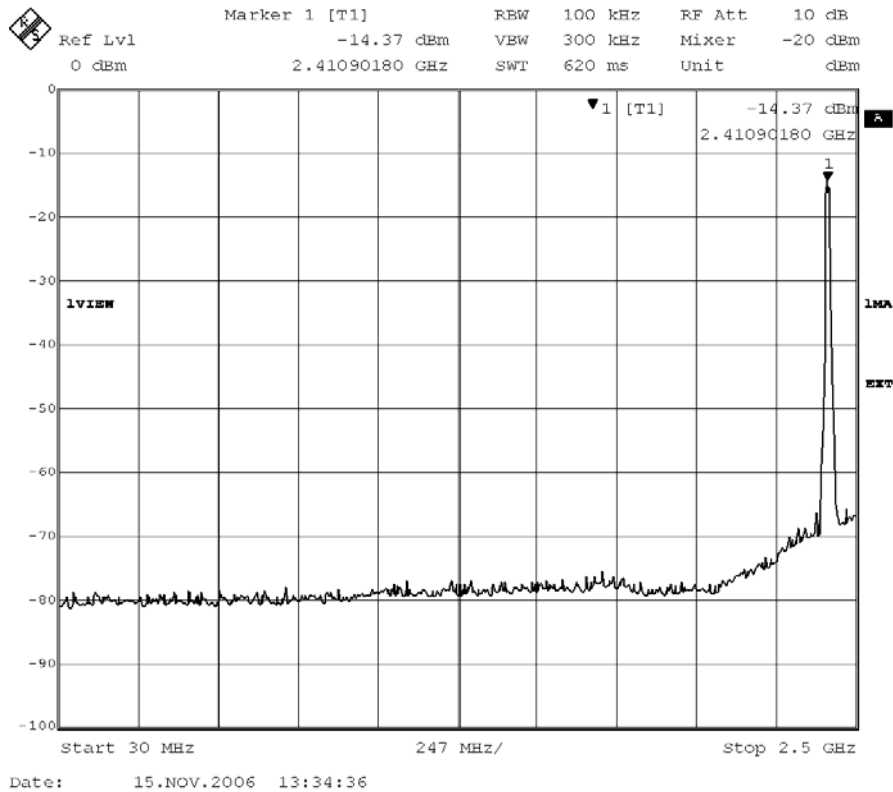
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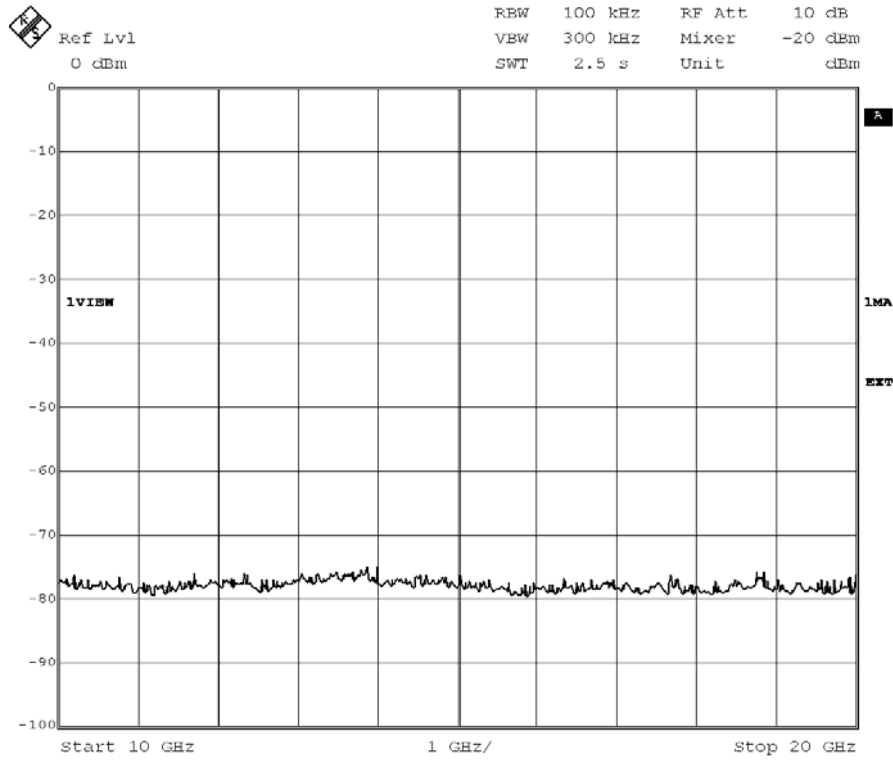
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Lowest channel, 1, OFDM, 54 Mbps data rate

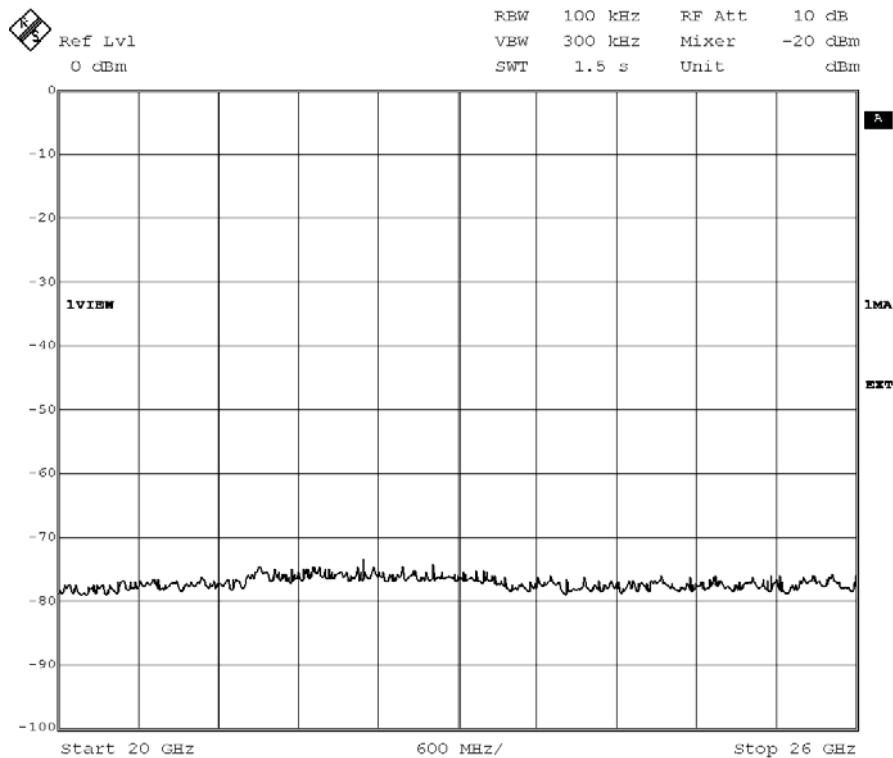


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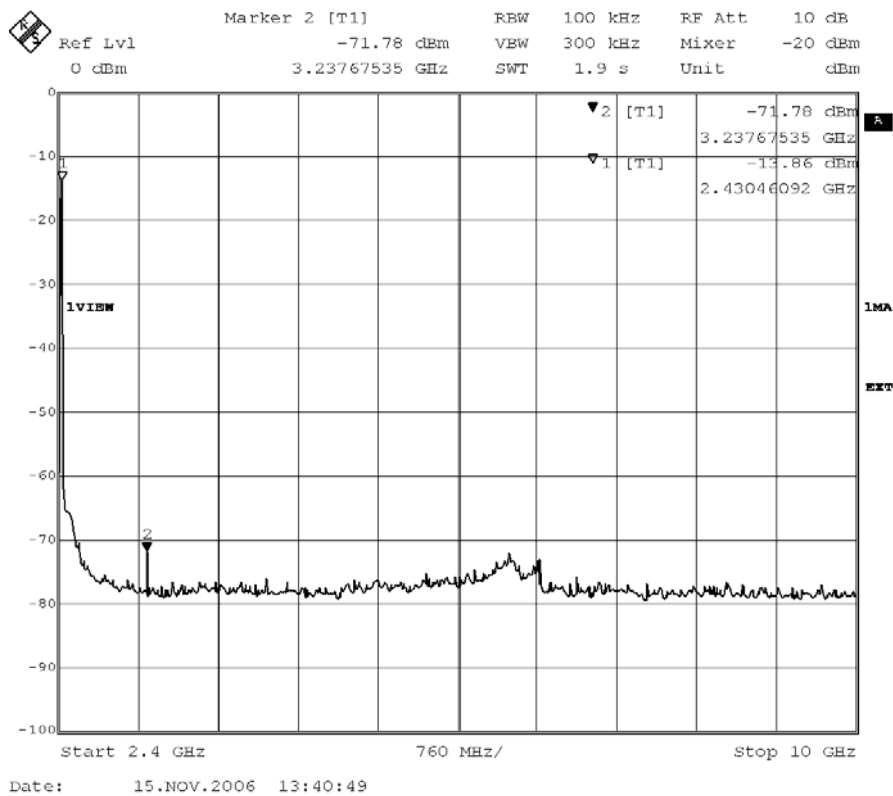
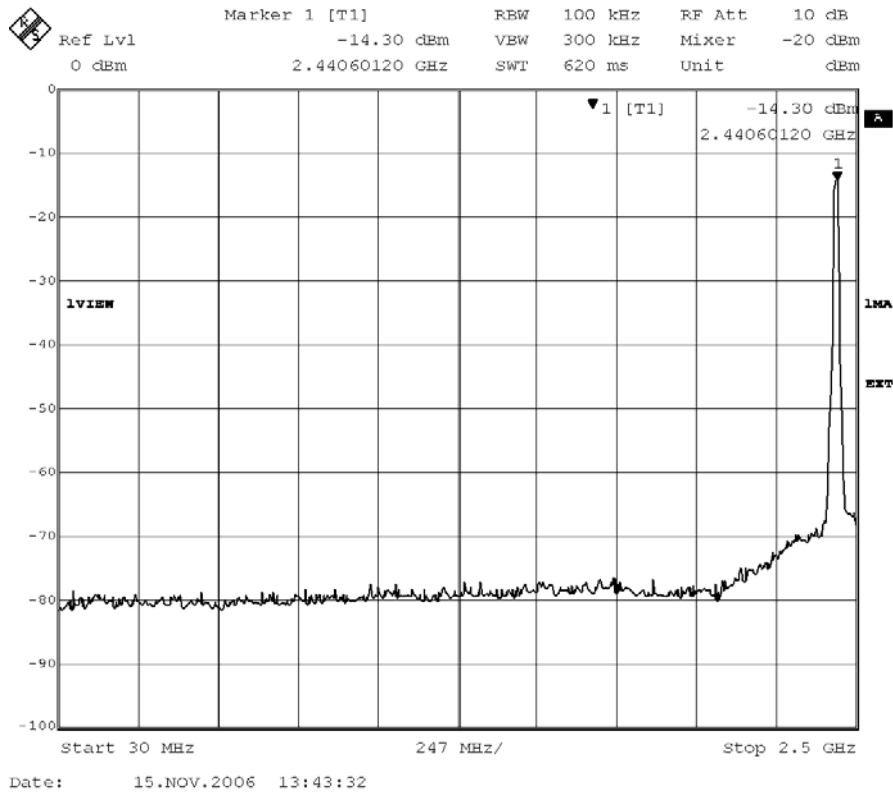
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Intertek Semko AB

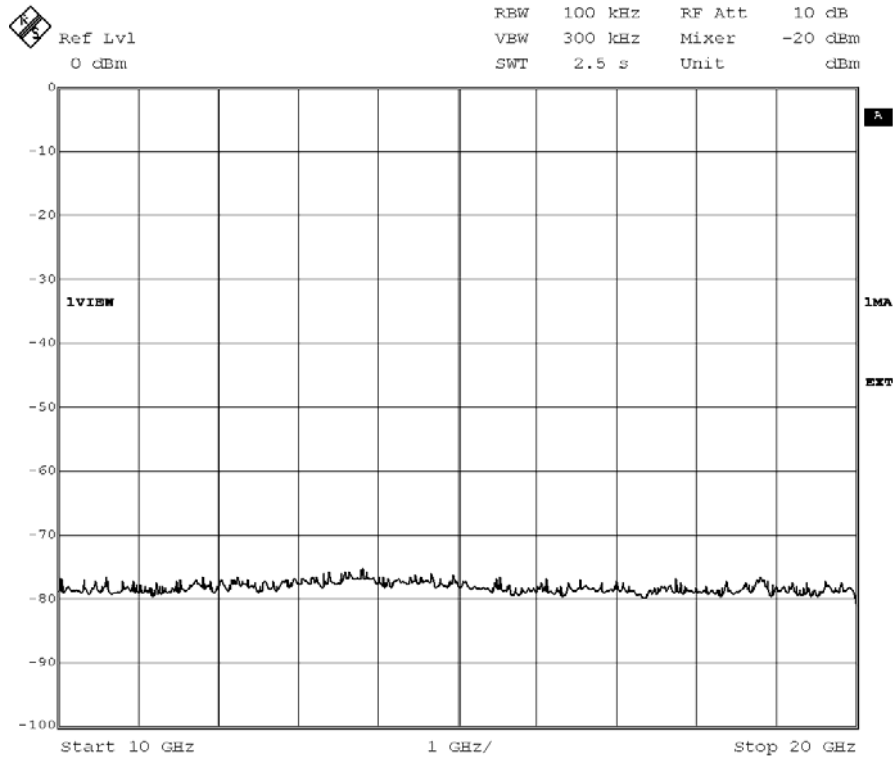
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Mid channel, 6, OFDM, 54 Mbps data rate

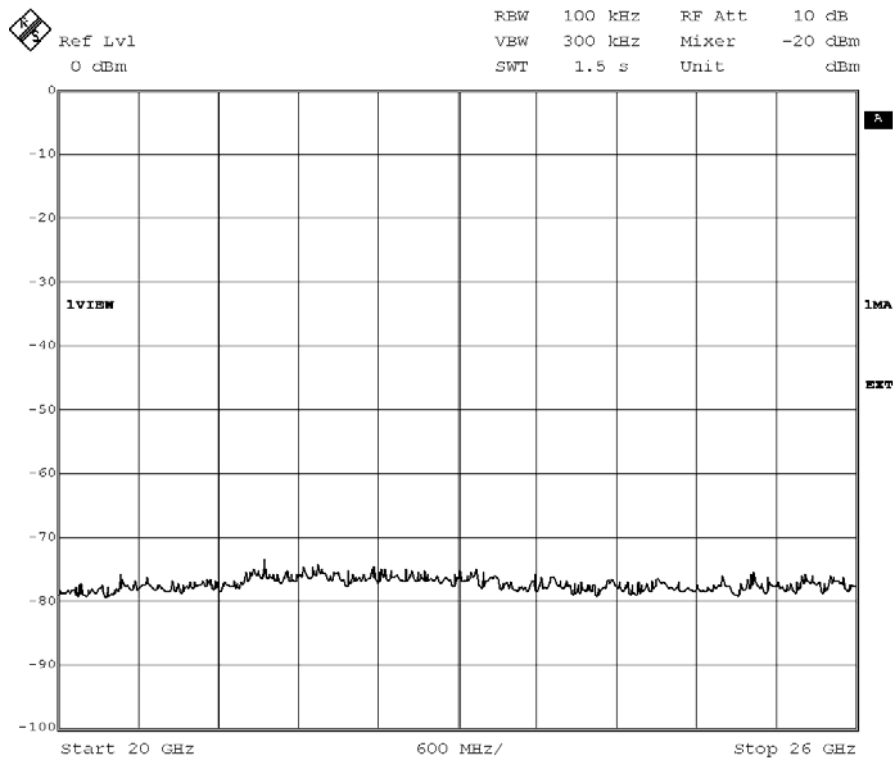


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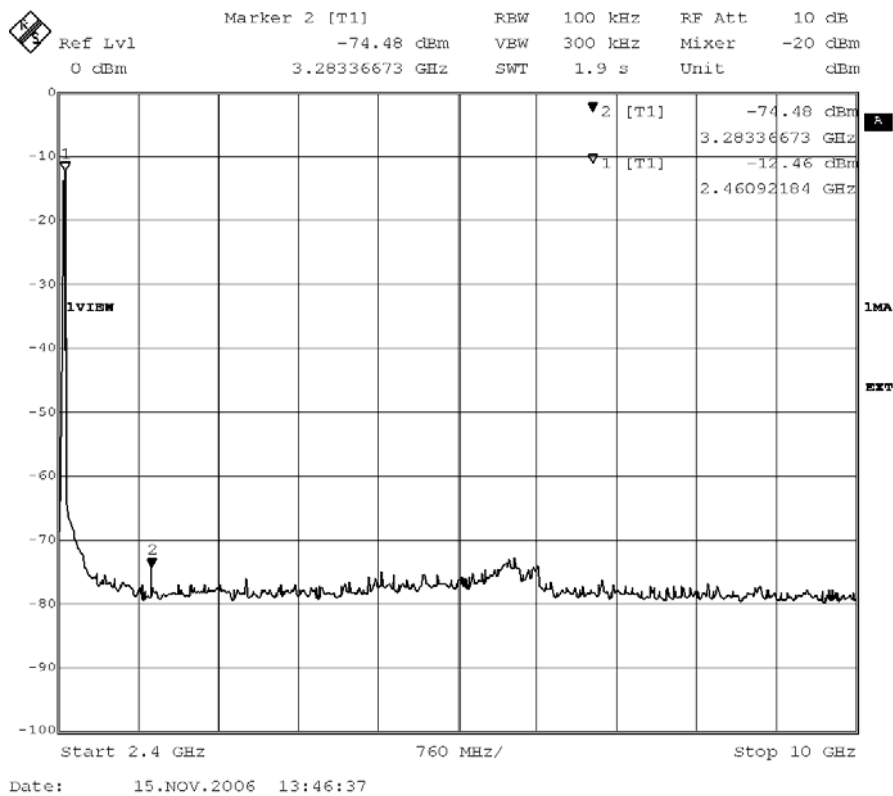
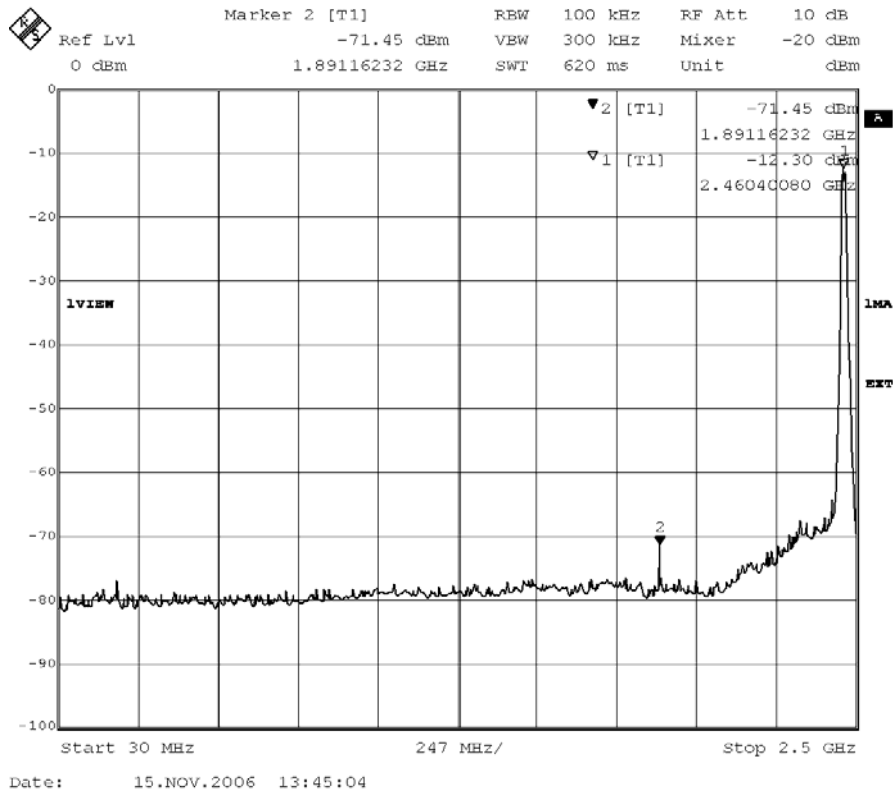
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Intertek Semko AB

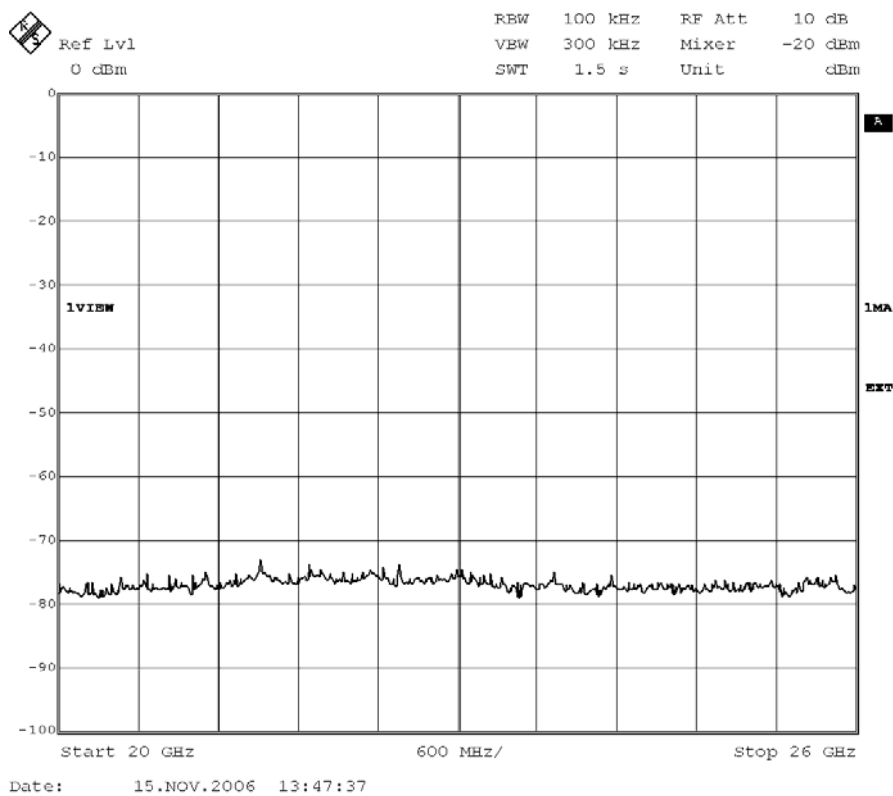
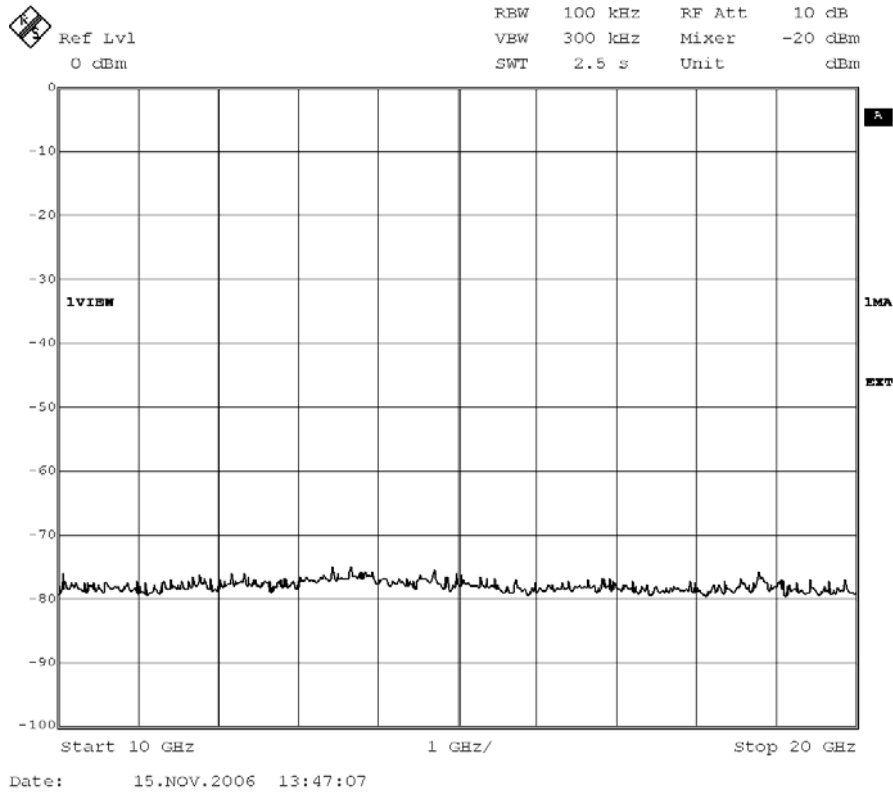
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Highest channel, 11, OFDM, 54 Mbps data rate



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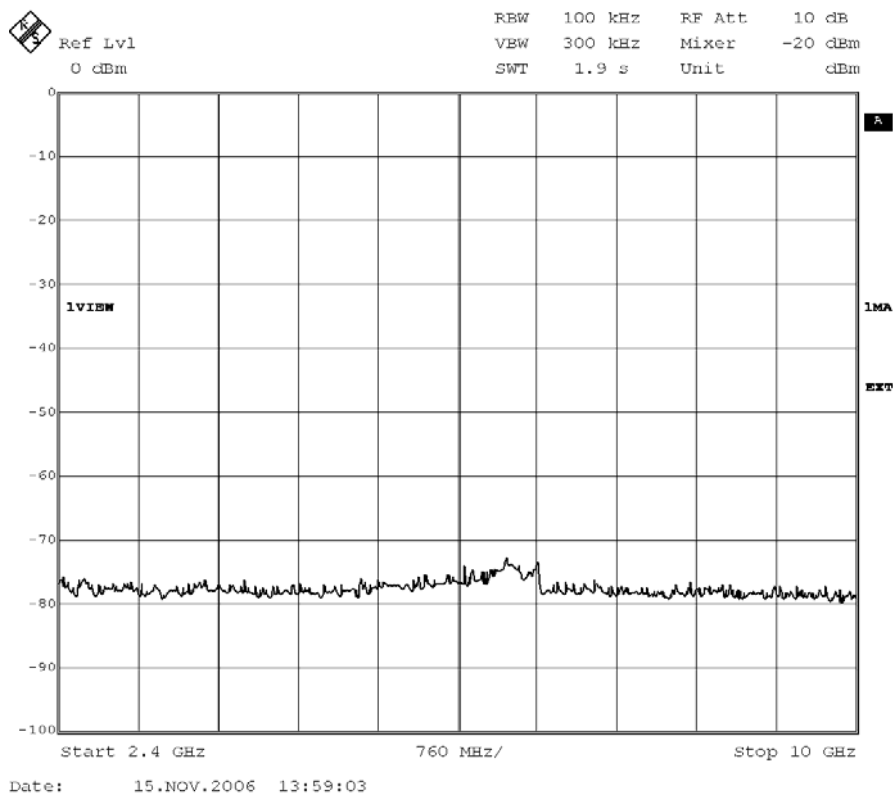
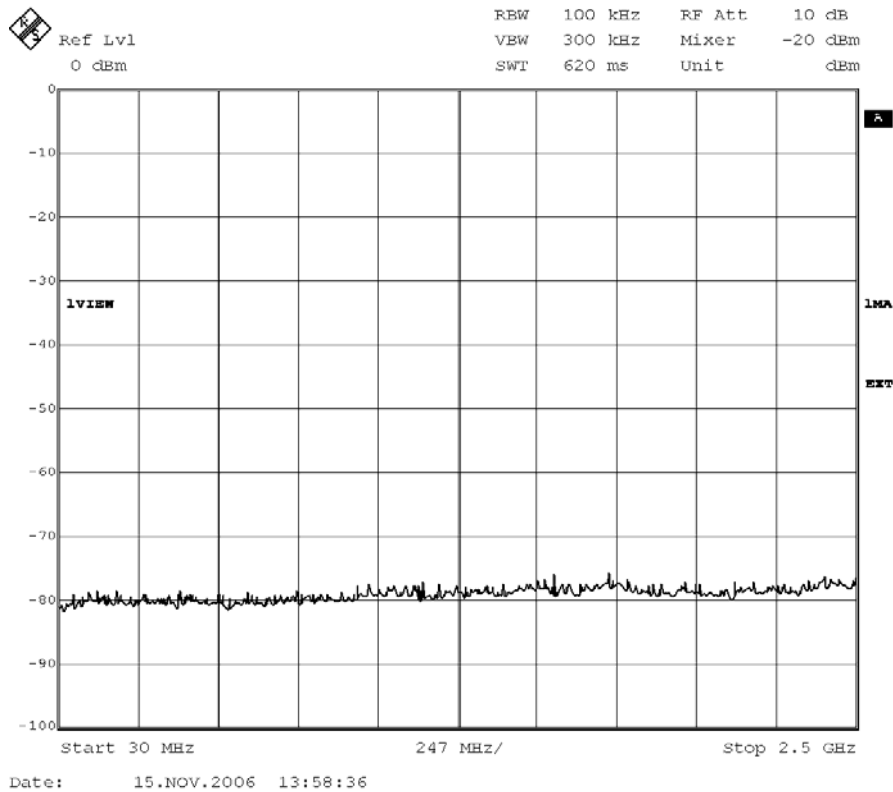
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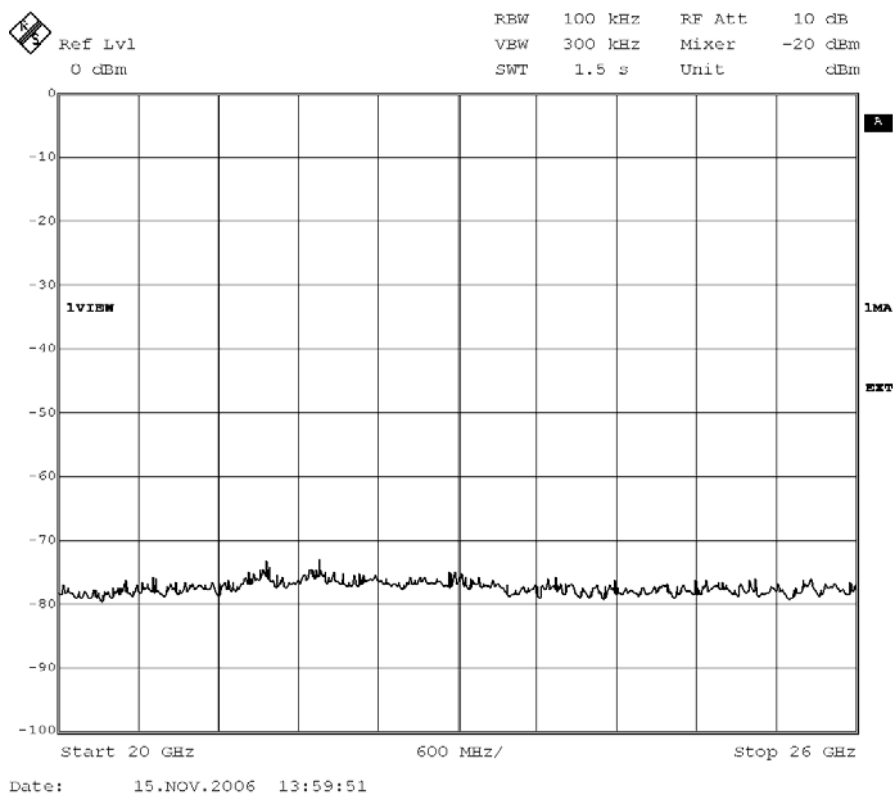
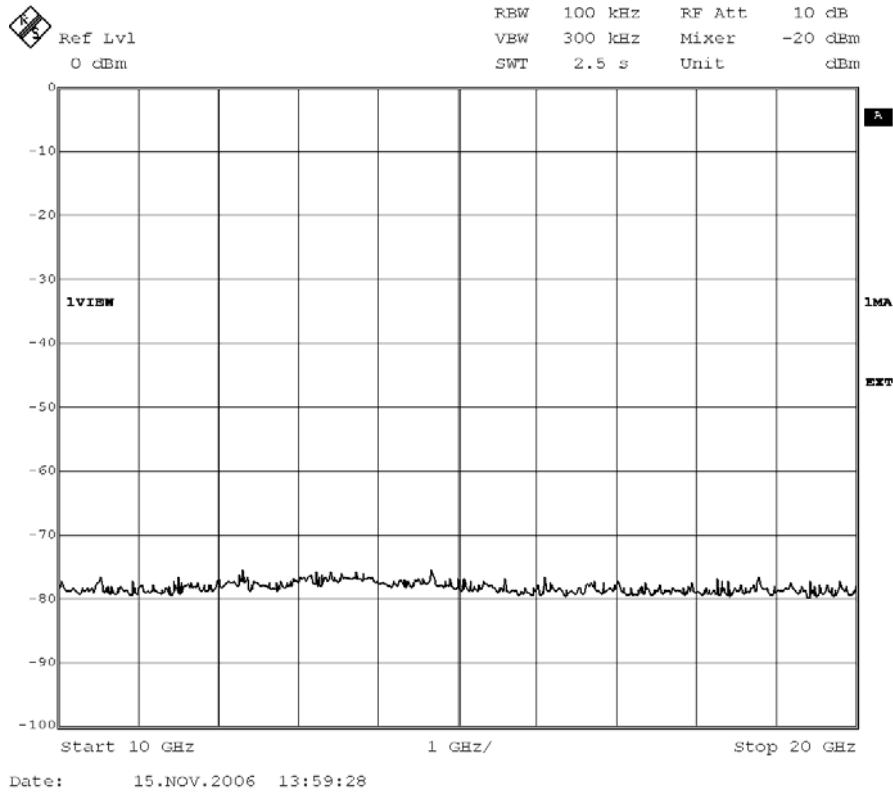
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Standby/Rx



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11 CONDUCTED DISTURBANCE VOLTAGE IN THE FREQUENCY RANGE 0,15 - 30 MHZ

11.1 Measurement uncertainty

Conducted disturbance voltage, quasi-peak detection: $\pm 2,0$ dB

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT.

Measurement uncertainty is calculated in accordance with EA-4/02-1997.
The measurement uncertainty is given with a confidence of 95%.

11.2 Test equipment

Test site:	FCC		
Equipment	Manufacturer	Type	SEMKO No.
Software:	Rohde & Schwarz	ES-K1 V1.60	
Measurement receiver:	Rohde & Schwarz	ESHS 30	4946
Artificial mains network:	Rohde & Schwarz	ESH3-Z5	2727

11.3 Measurement set-up

The mains terminal disturbance voltage was measured with the EUT located 0,8 m above the ground plane and 0,4 m from the vertical ground plane. The EUT was connected to an artificial mains network (AMN). The AMN was placed on the ground plane. Amplitude measurements were performed with a quasi-peak detector. The EUT was supplied by 120 VAC (60 Hz) during the standby test.

Test set-up photo:



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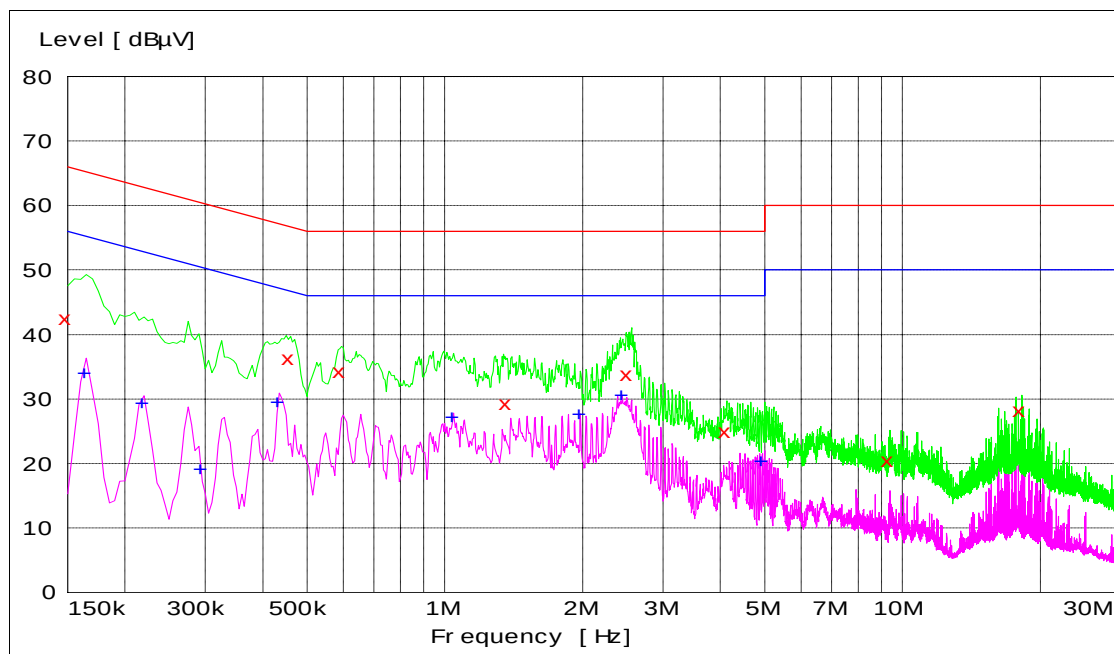
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11.4 Test protocol

Date of test: 2006-10-27

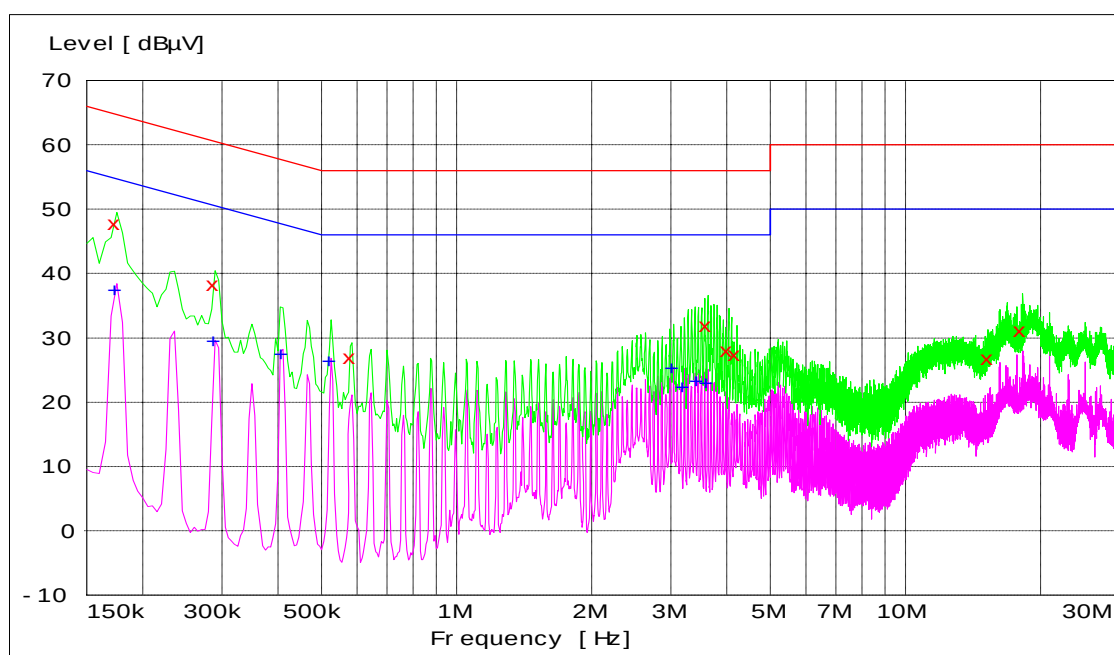
AC port, EUT

Overview sweeps performed with peak and average detectors



AC port, PC

Overview sweeps performed with peak and average detectors



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AC port, EUT

Frequency /MHz	Quasi-Peak	
	Disturbance Level /dB(μV)	Permitted limit /dB(μV)
0,150	42,5	66
0,460	36,4	57
0,595	34,3	56
1,375	29,4	56
2,530	33,8	56
9,390	20,6	60
18,245	28,2	60

AC port, EUT

Frequency /MHz	Average	
	Disturbance Level /dB(μV)	Permitted limit /dB(μV)
0,165	34,0	55
0,220	29,3	53
0,295	19,1	50
0,435	29,5	47
1,050	27,2	46
1,985	27,7	46
2,455	30,6	46
4,965	20,4	46

AC port, PC

Frequency /MHz	Quasi-Peak	
	Disturbance Level /dB(μV)	Permitted limit /dB(μV)
0,175	47,9	65
0,290	38,4	61
0,585	27,1	56
3,635	32,0	56
4,040	28,0	56
4,215	27,4	56
15,405	26,8	60
18,240	31,2	60



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AC port, PC

Frequency /MHz	Average	
	Disturbance Level /dB(μV)	Permitted limit /dB(μV)
0,175	37,5	55
0,290	29,5	51
0,410	27,5	48
0,525	26,4	46
3,045	25,3	46
3,220	22,3	46
3,455	23,3	46
3,630	22,9	46



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APPENDIX I – PHOTOS OF THE EUT



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