**CETECOM™****CETECOM ICT Services**
consulting - testing - certification >>>**TEST REPORT**

Test report no.: 1-6965/13-04-18-A

Deutsche
Akkreditierungsstelle
D-PL-12076-01-01**Testing laboratory****CETECOM ICT Services GmbH**

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Internet: <http://www.cetecom.com>e-mail: ict@cetecom.com**Accredited Testing Laboratory:**

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

Area of Testing:

Radio Communications & Compatibility Testing (RCT)

Applicant**Sony Mobile Communications AB**

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Manufacturer**Sony Mobile Communications AB**

Nya Vattentorget

22188 Lund / SWEDEN

Test standard/s

47 CFR Part 15

Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

For further applied test standards please refer to section 3 of this test report.

Test Item**Kind of test item:****Smart Phone GPRS/EGPRS 850/900/1800/1900; UMTS HSPA FDDI/III/IV/V/VIII; LTE FDD1/2/3/4/5/7/8/13/17/20; WLAN b/g/n/a/ac; BT 4.0; RFID; A-GPS****Type name:****PM-0740-BV****FCC ID:****PY7PM-0740****Frequency:**

DTS band 5725 MHz to 5850 MHz

(lowest channel 149 – 5745 MHz; highest channel 165 – 5825 MHz)

Technology tested:

WLAN (OFDM/a – mode; n/ac HT20 / HT40 – mode and ac HT80 – mode)

Antenna:

Integrated antenna

Power supply:

3.7 V DC by Li - polymer battery

Temperature range:

-20°C to +55°C

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

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1 Table of contents

1	Table of contents	2
2	General information	3
2.1	Notes and disclaimer	3
2.2	Application details	3
3	Test standard/s	3
3.1	Measurement guidance	3
4	Test environment	4
5	Test item	4
5.1	Additional information	4
6	Test laboratories sub-contracted	4
7	Description of the test setup	5
7.1	Radiated measurements chamber F	5
7.2	Radiated measurements chamber C	6
7.3	Radiated measurements 12.75 GHz to 40 GHz	7
7.4	AC conducted	8
7.5	Conducted measurements	9
8	Summary of measurement results	10
9	Additional comments	11
10	Measurement results	12
10.1	Antenna gain	12
10.2	Maximum conducted output power	13
10.3	Power spectral density	18
10.4	Spectrum bandwidth – 6 dB	26
10.5	Spectrum bandwidth – 20 dB	31
10.6	TX spurious emissions conducted	39
10.7	TX spurious emissions radiated	48
10.8	RX spurious emissions radiated	78
10.9	Spurious emissions radiated < 30 MHz	82
10.10	Spurious emissions conducted < 30 MHz	84
11	Test equipment and ancillaries used for tests	87
12	Observations	88
Annex A	Document history	89
Annex B	Further information	89
Annex C	Accreditation Certificate	90

2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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2.2 Application details

Date of receipt of order:	2013-11-29
Date of receipt of test item:	2013-12-02
Start of test:	2013-12-11
End of test:	2013-12-21
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15		Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

3.1 Measurement guidance

DTS : KDB 558074	2013-04	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
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4 Test environment

Temperature:	T_{nom}	+22 °C during room temperature tests
	T_{max}	+55 °C during high temperature tests
	T_{min}	-20 °C during low temperature tests
Relative humidity content:		41 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	3.7 V DC by Li - polymer battery
	V_{max}	4.2 V
	V_{min}	3.3 V

5 Test item

Kind of test item	:	Smart Phone GPRS/EGPRS 850/900/1800/1900; UMTS HSPA FDDI/III/IV/V/VIII; LTE FDD1/2/3/4/5/7/8/13/17/20; WLAN b/g/n/a/ac; BT 4.0; RFID; A-GPS
Type name	:	PM-0740-BV
S/N serial number	:	Radiated unit: CB5A1W1HPG
HW hardware status	:	AP1.1
SW software status	:	RF test software
Frequency band [MHz]	:	DTS band 5725 MHz to 5850MHz (lowest channel 149 – 5745 MHz; highest channel 165 – 5825 MHz)
Type of radio transmission	:	OFDM
Use of frequency spectrum	:	
Type of modulation	:	BPSK, QPSK, 16 – QAM, 64 – QAM and 256 – QAM
Number of channels	:	5
Antenna	:	Integrated antenna
Power supply	:	3.7 V DC by Li - polymer battery
Temperature range	:	-20°C to +55 °C

5.1 Additional information

Test setup- and EUT-photos are included in test report: 1-6965/13-04-01_AnnexA
 1-6965/13-04-01_AnnexB
 1-6965/13-04-01_AnnexD

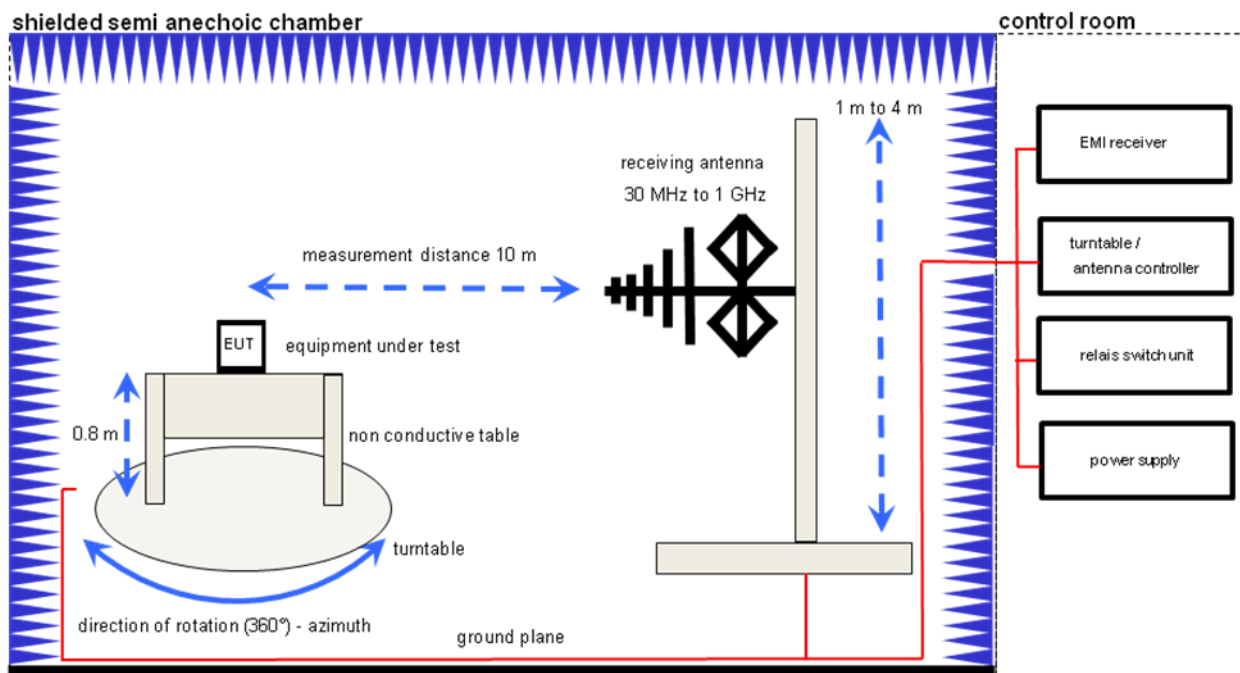
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements chamber F

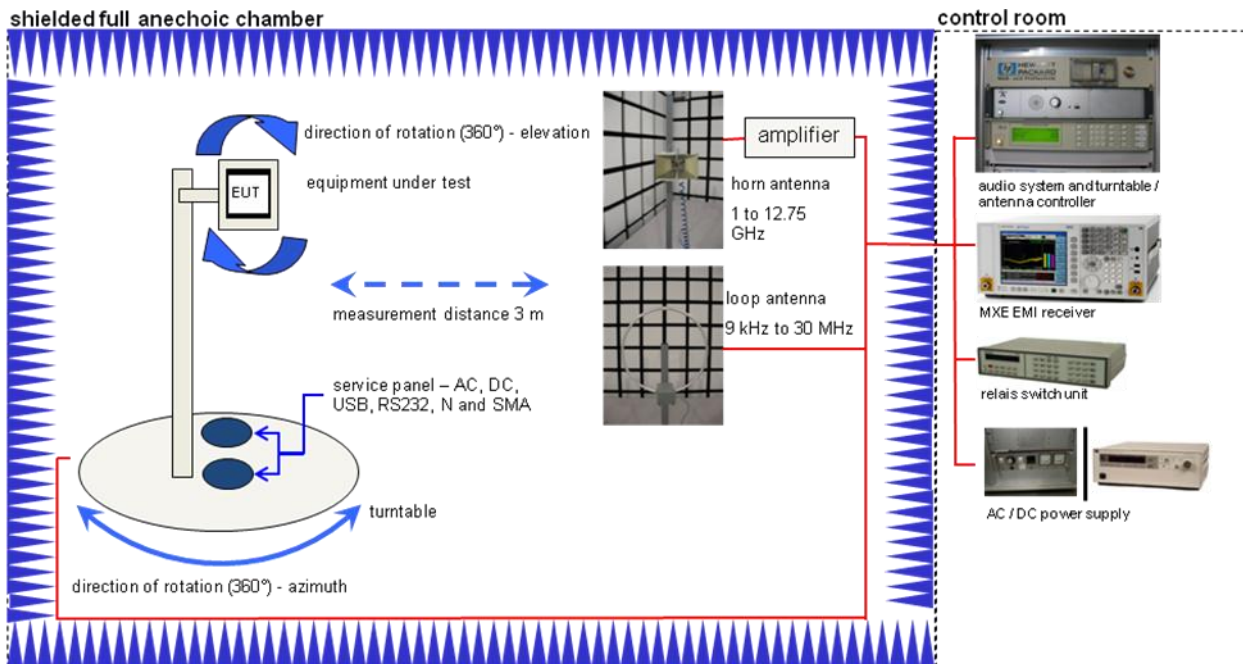
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368
DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580
EMI Test Receiver	ESCI 3	R&S	100083	300003312
Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379
Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745
Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746
Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787

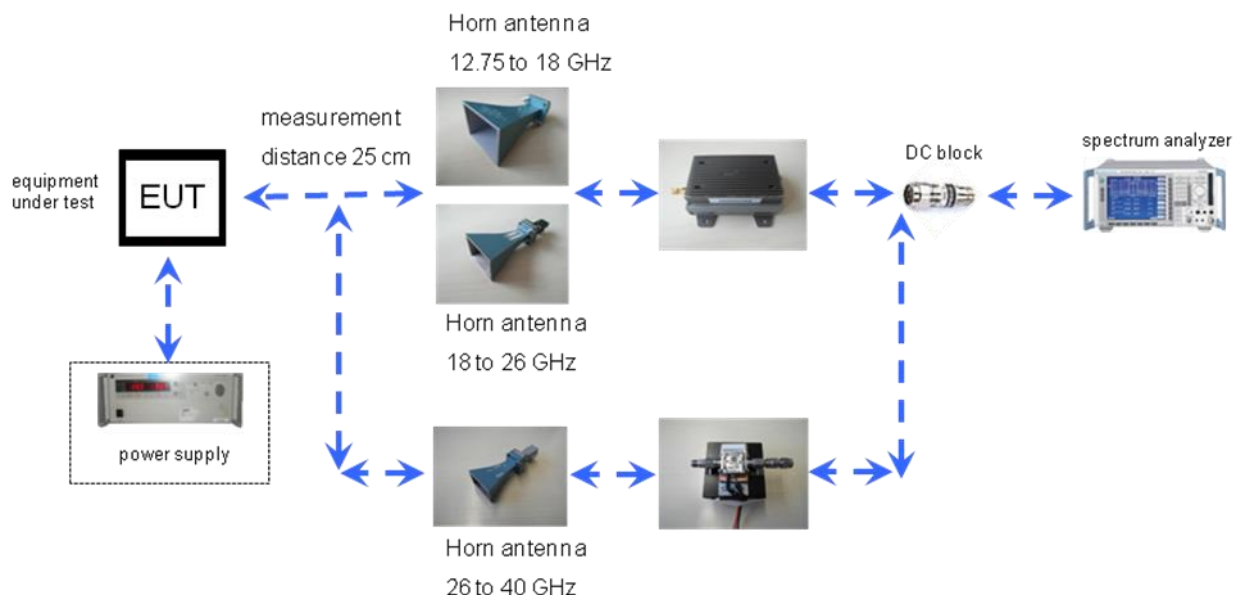
7.2 Radiated measurements chamber C



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789
Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032
Active Loop Antenna	6502	EMCO	8905-2342	300000256
Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erft	91350	300001155
Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997
Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143

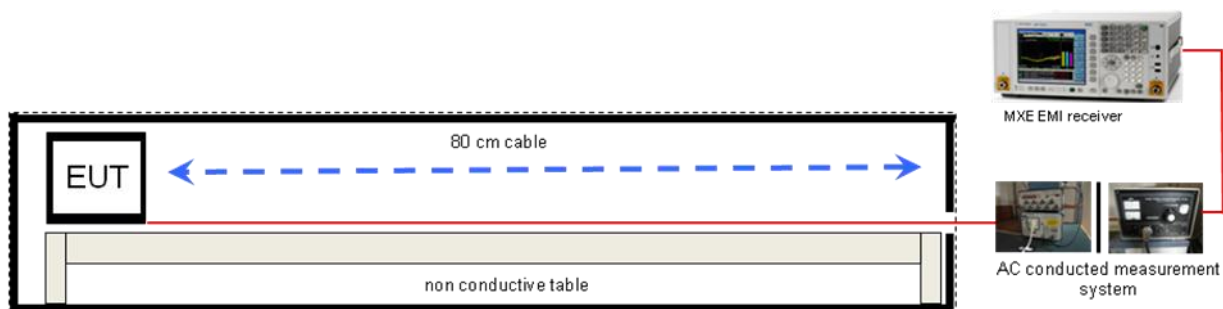
7.3 Radiated measurements 12.75 GHz to 40 GHz



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787
Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442
Std. Gain Horn Antenna 26.5 to 40.0 GHz	637	Narda	GB42110541	300000510
Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268
Broadband Low Noise Amplifier 18-50 GHz	CBL18503070-XX	CERNEX	19338	300004273
Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443
Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517

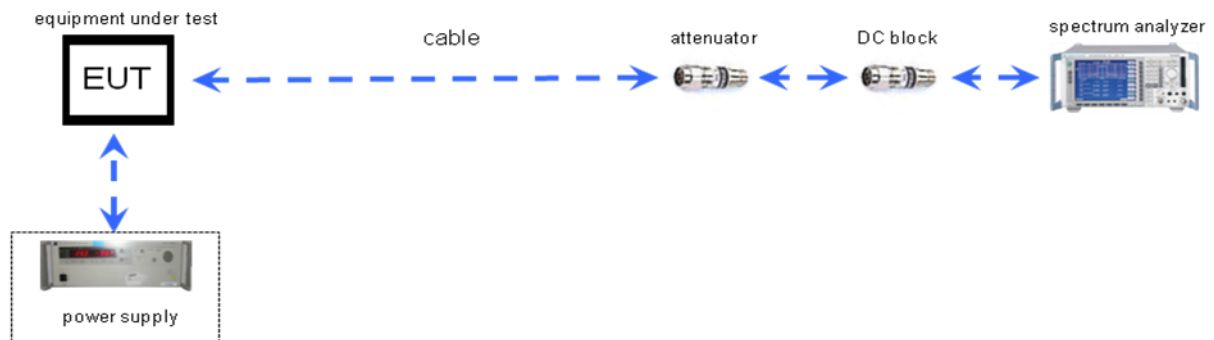
7.4 AC conducted



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erft	91350	300001155
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001168
Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210

7.5 Conducted measurements



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517

8 Summary of measurement results



No deviations from the technical specifications were ascertained



There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15	Passed	2014-01-22	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	Mode	Pass	Fail	NA	NP	Remark
§15.247(b)(4)	Antenna gain	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(e)	Power spectral density DTS clause 10.2	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(a)(2)	Spectrum bandwidth - 6dB bandwidth DTS clause 8.2	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(a)(2)	Spectrum bandwidth - 20dB bandwidth	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(b)(3)	Maximum output power DTS clause 9.1.2	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(d)	TX spurious emissions conducted DTS clause 11.1 & 2	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(d)	TX spurious emissions radiated	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.109	RX spurious emissions radiated	Nominal	Nominal	-/-	☒	☐	☐	☐	complies
§15.209(a)	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.107(a) §15.207	Conducted emissions < 30 MHz	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

9 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

Test mode:

☐ No test mode available.
Iperf was used to ping another device with the largest support packet size

☒ Special software is used.
EUT is transmitting pseudo random data by itself

10 Measurement results**10.1 Antenna gain****Limits:**

FCC	-/-
Antenna Gain	
6 dBi	

Results:

T _{nom}	V _{nom}	lowest channel 5745 MHz	middle channel 5785 MHz	highest channel 5825 MHz
Gain [dBi] Declared by the manufacturer		1.7	2.3	2.0

Result: **Passed**

10.2 Maximum conducted output power

Description:

Measurement of the maximum output power conducted.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Span:	40 MHz / 80 MHz
Measurement type:	Channel power
Integration bandwidth:	75 % power - bandwidth (DTS BW)
Trace-Mode:	Max hold (allow trace to fully stabilize)

Limits:

FCC	-/-
Maximum Output Power	
Conducted: 1.0 W – Antenna Gain max. 6 dBi	

Results: OFDM / a – mode

OFDM / a – mode Frequency	Maximum Output Power [dBm]		
	5745 MHz	5785 MHz	5825 MHz
Peak output power conducted 6 MBit/s	20.8	20.6	20.9
Peak output power conducted 9 MBit/s	20.8	20.4	20.8
Peak output power conducted 12 MBit/s	19.9	20.1	20.4
Peak output power conducted 18 MBit/s	19.8	20.1	20.4
Peak output power conducted 24 MBit/s	20.4	20.4	20.4
Peak output power conducted 36 MBit/s	20.4	20.5	20.9
Peak output power conducted 48 MBit/s	20.4	20.3	20.6
Peak output power conducted 54 MBit/s	20.4	20.4	20.1
Measurement uncertainty	± 1.5 dB (cond.)		

Result: Passed

Results: OFDM / ac – mode HT20

OFDM / ac – mode Frequency	Maximum Output Power [dBm]		
	5745 MHz	5785 MHz	5825 MHz
Peak output power conducted MCS0	20.6	21.1	20.8
Peak output power conducted MCS1	20.9	20.9	20.8
Peak output power conducted MCS2	20.8	20.9	21.1
Peak output power conducted MCS3	21.2	21.4	21.5
Peak output power conducted MCS4	21.1	21.3	21.3
Peak output power conducted MCS5	21.2	21.3	21.2
Peak output power conducted MCS6	21.5	21.4	21.4
Peak output power conducted MCS7	21.3	21.1	21.3
Peak output power conducted MCS8	21.2	21.2	21.0
Measurement uncertainty	± 1.5 dB (cond.)		

Result: Passed

Results: OFDM / ac – mode HT40

OFDM / ac – mode HT40 Frequency	Maximum Output Power [dBm]		
	5755 MHz	5795 MHz	-/-
Peak output power conducted MCS0	20.6	20.5	-/-
Peak output power conducted MCS1	20.7	20.6	-/-
Peak output power conducted MCS2	20.4	20.5	-/-
Peak output power conducted MCS3	21.2	21.0	-/-
Peak output power conducted MCS4	21.2	20.9	-/-
Peak output power conducted MCS5	21.1	21.2	-/-
Peak output power conducted MCS6	21.1	21.1	-/-
Peak output power conducted MCS7	20.9	21.0	-/-
Peak output power conducted MCS8	20.8	20.7	-/-
Measurement uncertainty	± 1.5 dB (cond.)		

Result: Passed

Results: OFDM / ac – mode HT80

OFDM / ac – mode HT80 Frequency	Maximum Output Power [dBm]		
	5775 MHz	-/-	-/-
Peak output power conducted MCS0	18.4	-/-	-/-
Peak output power conducted MCS1	18.5	-/-	-/-
Peak output power conducted MCS2	16.9	-/-	-/-
Peak output power conducted MCS3	18.6	-/-	-/-
Peak output power conducted MCS4	18.3	-/-	-/-
Peak output power conducted MCS5	18.6	-/-	-/-
Peak output power conducted MCS6	18.8	-/-	-/-
Peak output power conducted MCS7	17.0	-/-	-/-
Peak output power conducted MCS8	18.8	-/-	-/-
Peak output power conducted MCS9	19.1	-/-	-/-
Measurement uncertainty	± 1.5 dB (cond.)		

Result: Passed

10.3 Power spectral density

Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated for both modulations at the lowest, middle and highest channel.

Measurement:

Measurement parameter	
According to:	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	3 kHz
Video bandwidth:	10 kHz
Span:	40 MHz / 80 MHz
Trace-Mode:	Max hold (allow trace to fully stabilize)

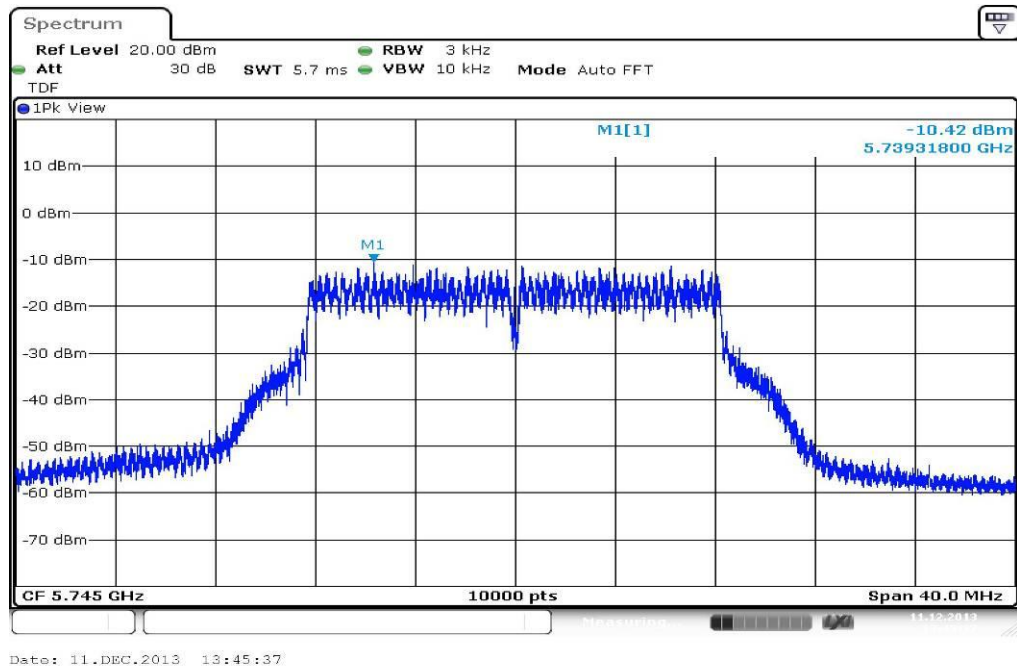
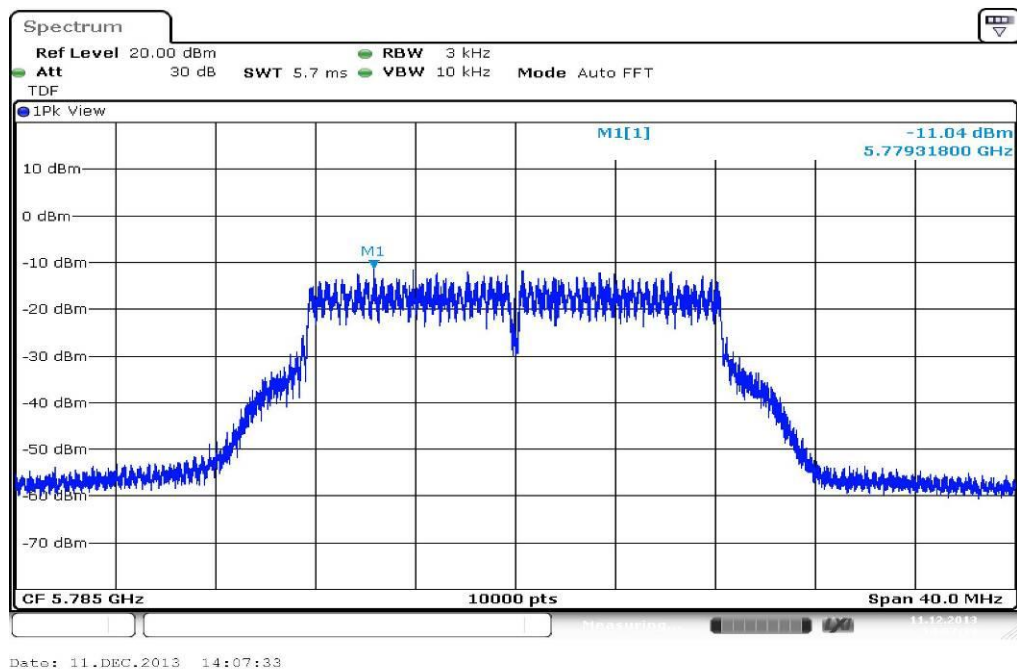
Limits:

FCC	-/-
Power Spectral Density	
8 dBm (conducted)	

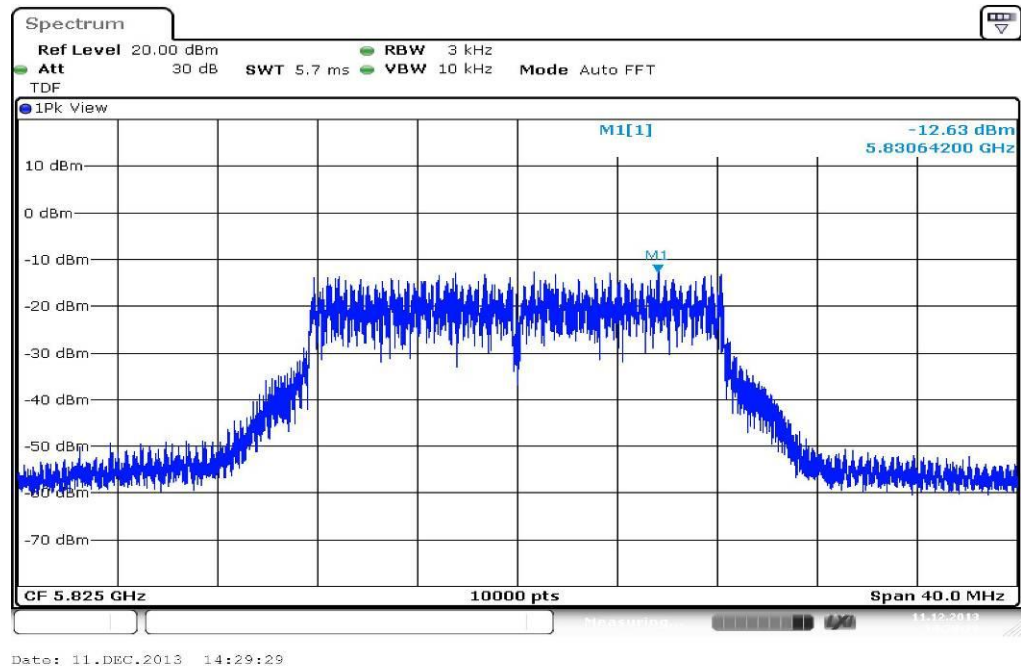
Results:

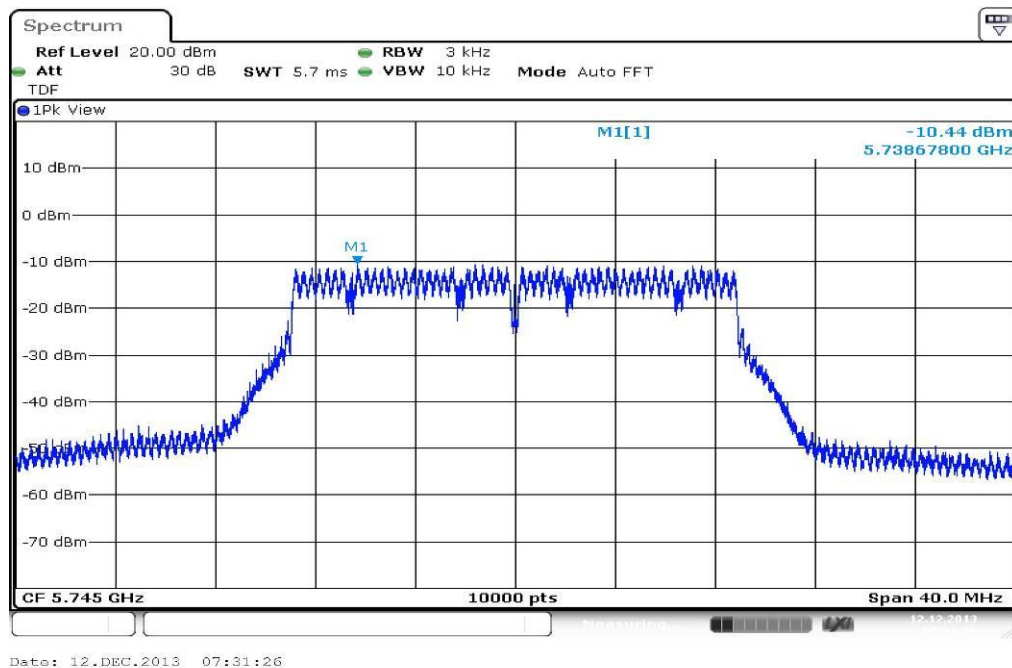
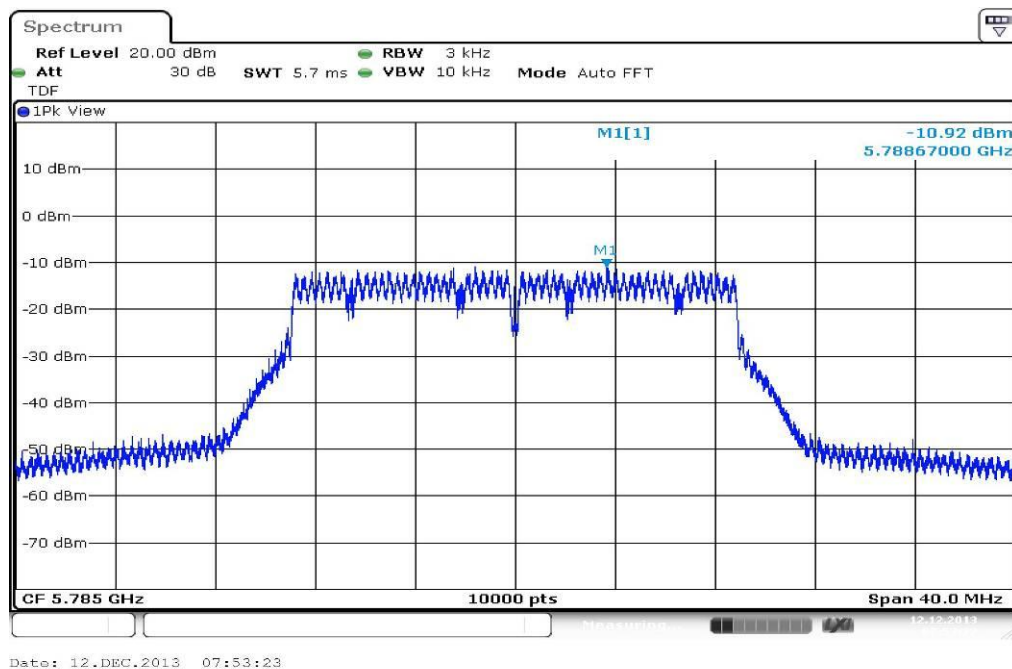
Modulation Frequency	Power Spectral density [dBm]		
	5745 MHz	5785 MHz	5825 MHz
OFDM / a – mode	-10.42	-11.04	-12.63
OFDM / ac – mode HT20	-10.44	-10.92	-10.53
Frequency	5755 MHz	5795 MHz	-/-
OFDM / ac – mode HT40	-13.98	-13.65	-/-
Frequency	5775 MHz	-/-	-/-
OFDM / ac – mode HT80	-19.16	-/-	-/-
Measurement uncertainty	± 1.5 dB		

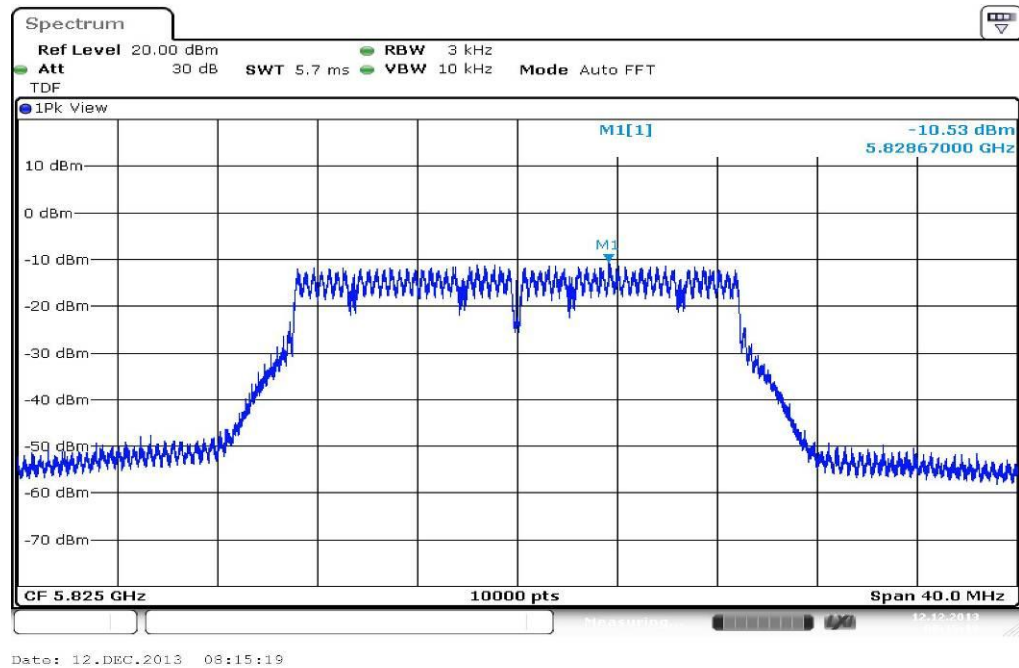
Result: Passed

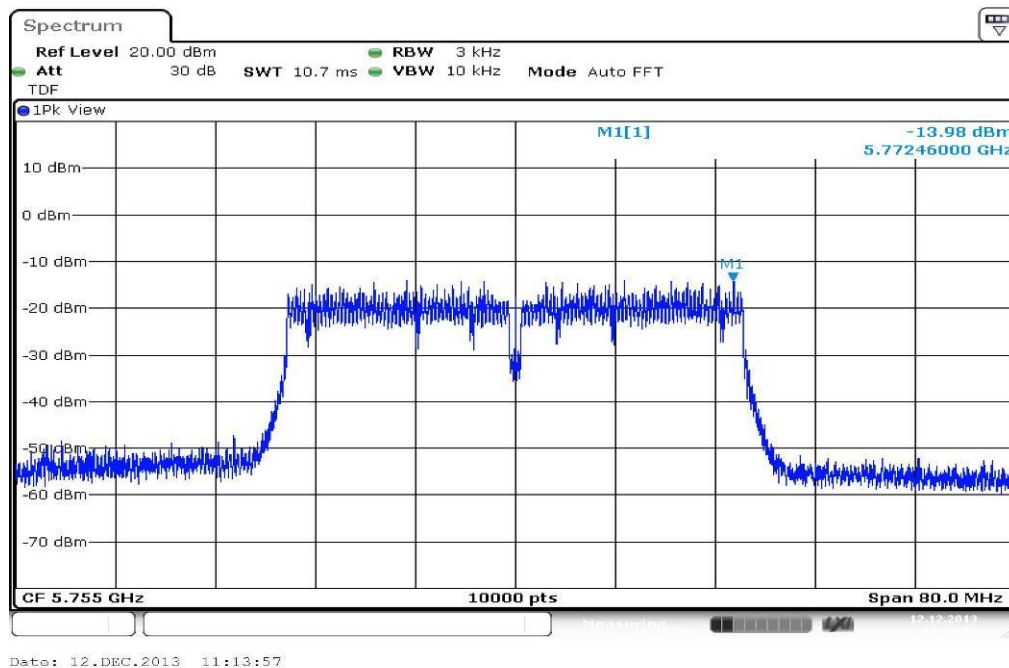
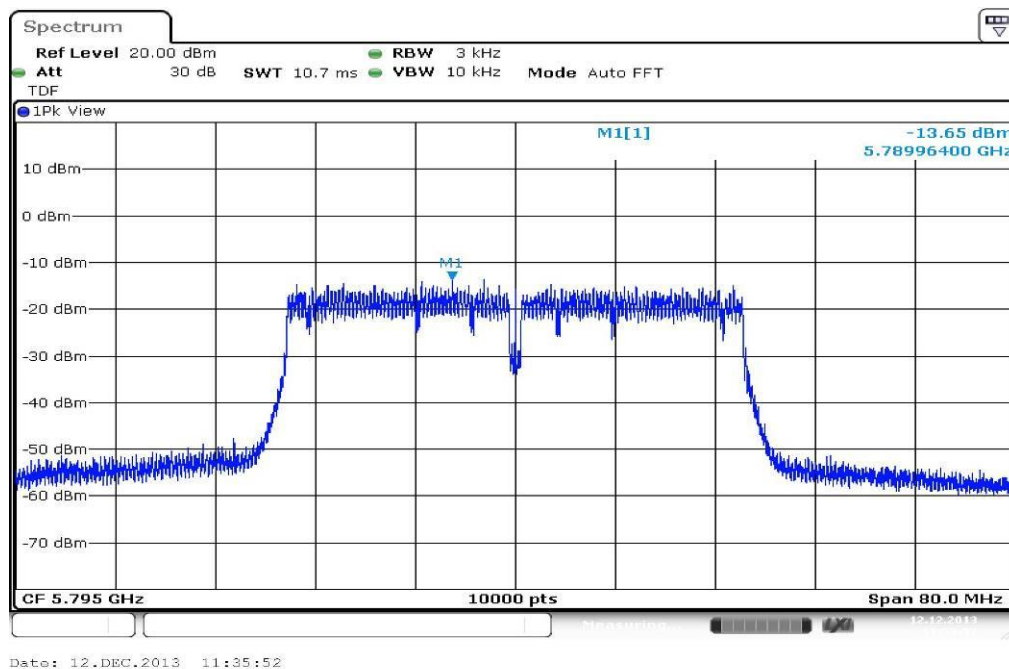
Plots: OFDM / a – mode**Plot 1: TX mode, lowest channel****Plot 2: TX mode, middle channel**

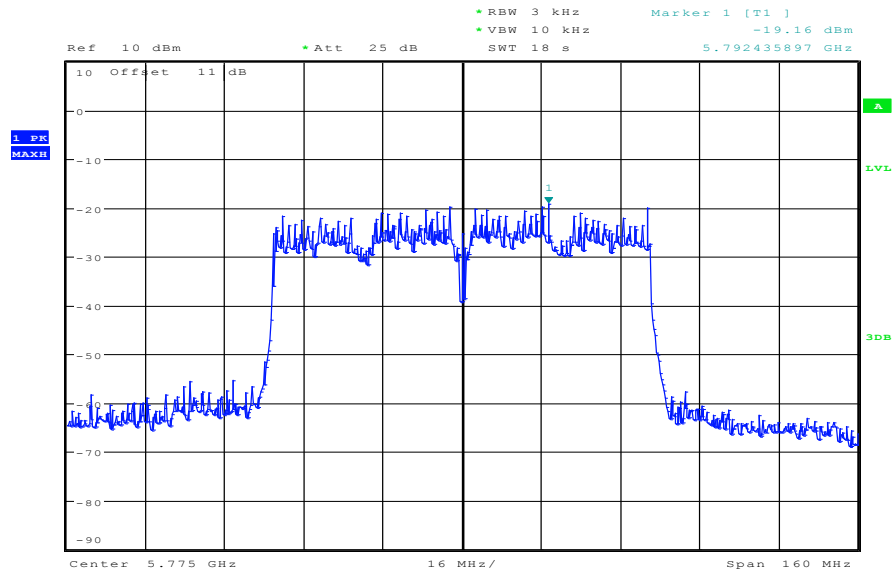
Plot 3: TX mode, highest channel



Plots: OFDM / ac – mode HT20**Plot 1: TX mode, lowest channel****Plot 2: TX mode, middle channel**

Plot 3: TX mode, highest channel

Plots: OFDM / ac – mode HT40**Plot 1: TX mode, lowest channel****Plot 2: TX mode, highest channel**

Plots: OFDM / ac – mode HT80**Plot 1: TX mode**

Date: 19.DEC.2013 12:37:55

10.4 Spectrum bandwidth – 6 dB

Description:

Measurement of the 6 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter	
According to:	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Span:	40 MHz
Measurement procedure:	Measurement of the 75% bandwidth using the integration function of the analyzer
Trace-Mode:	Max hold (allow trace to stabilize)

Limits:

FCC	-/-
Spectrum Bandwidth – 6 dB	
Systems using digital modulation techniques may operate in the 2400–2483.5 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.	

Results: OFDM / a – mode

Modulation Frequency	6 dB bandwidth [MHz]		
	5745 MHz	5785 MHz	5825 MHz
OFDM / a – mode 6 Mbit/s	12.4	12.4	12.4
OFDM / a – mode 9 Mbit/s	12.4	12.4	12.4
OFDM / a – mode 12 Mbit/s	12.4	12.4	12.4
OFDM / a – mode 18 Mbit/s	12.4	12.4	12.4
OFDM / a – mode 24 Mbit/s	12.4	12.4	12.4
OFDM / a – mode 36 Mbit/s	12.5	12.5	12.5
OFDM / a – mode 48 Mbit/s	12.4	12.4	12.4
OFDM / a – mode 54 Mbit/s	12.4	12.4	12.4
Measurement uncertainty	± RBW		

Result: **Passed**

Results: OFDM / ac – mode HT20

Modulation Frequency	6 dB bandwidth [MHz]		
	5745 MHz	5785 MHz	5825 MHz
OFDM / ac – mode HT20 MCS0	13.1	12.9	13.0
OFDM / ac – mode HT20 MCS1	13.1	13.1	13.0
OFDM / ac – mode HT20 MCS2	13.1	13.0	13.1
OFDM / ac – mode HT20 MCS3	13.2	13.2	13.3
OFDM / ac – mode HT20 MCS4	13.2	13.1	13.2
OFDM / ac – mode HT20 MCS5	13.2	13.1	13.2
OFDM / ac – mode HT20 MCS6	13.3	13.2	13.2
OFDM / ac – mode HT20 MCS7	13.2	13.3	13.2
OFDM / ac – mode HT20 MCS8	13.2	13.1	13.2
Measurement uncertainty	± RBW		

Result: Passed

Results: OFDM / ac – mode HT40

Modulation Frequency	6 dB bandwidth [MHz]		
	5755 MHz	5795 MHz	-/-
OFDM / ac – mode HT40 MCS0	27.2	27.3	-/-
OFDM / ac – mode HT40 MCS1	27.2	27.3	-/-
OFDM / ac – mode HT40 MCS2	27.3	27.2	-/-
OFDM / ac – mode HT40 MCS3	27.3	27.2	-/-
OFDM / ac – mode HT40 MCS4	27.1	27.2	-/-
OFDM / ac – mode HT40 MCS5	27.1	27.2	-/-
OFDM / ac – mode HT40 MCS6	27.3	27.3	-/-
OFDM / ac – mode HT40 MCS7	27.2	27.2	-/-
OFDM / ac – mode HT40 MCS8	27.3	27.2	-/-
Measurement uncertainty	± RBW		

Result: Passed

Results: OFDM / ac – mode HT80

Modulation Frequency	6 dB bandwidth [MHz]		
	5775 MHz	-/-	-/-
OFDM / ac – mode HT80 MCS0	55.63	-/-	-/-
OFDM / ac – mode HT80 MCS1	55.88	-/-	-/-
OFDM / ac – mode HT80 MCS2	55.83	-/-	-/-
OFDM / ac – mode HT80 MCS3	55.63	-/-	-/-
OFDM / ac – mode HT80 MCS4	55.42	-/-	-/-
OFDM / ac – mode HT80 MCS5	55.63	-/-	-/-
OFDM / ac – mode HT80 MCS6	55.63	-/-	-/-
OFDM / ac – mode HT80 MCS7	56.04	-/-	-/-
OFDM / ac – mode HT80 MCS8	55.41	-/-	-/-
OFDM / ac – mode HT80 MCS9	55.41	-/-	-/-
Measurement uncertainty	± RBW		

Result: Passed

10.5 Spectrum bandwidth – 20 dB

Description:

Measurement of the 20 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 - 5% of the DTS BW
Video bandwidth:	$\geq 3 \times \text{RBW}$
Span:	Complete signal
Measurement procedure:	Measurement of the 99% bandwidth using the integration function of the analyzer
Trace-Mode:	Max hold (allow trace to stabilize)

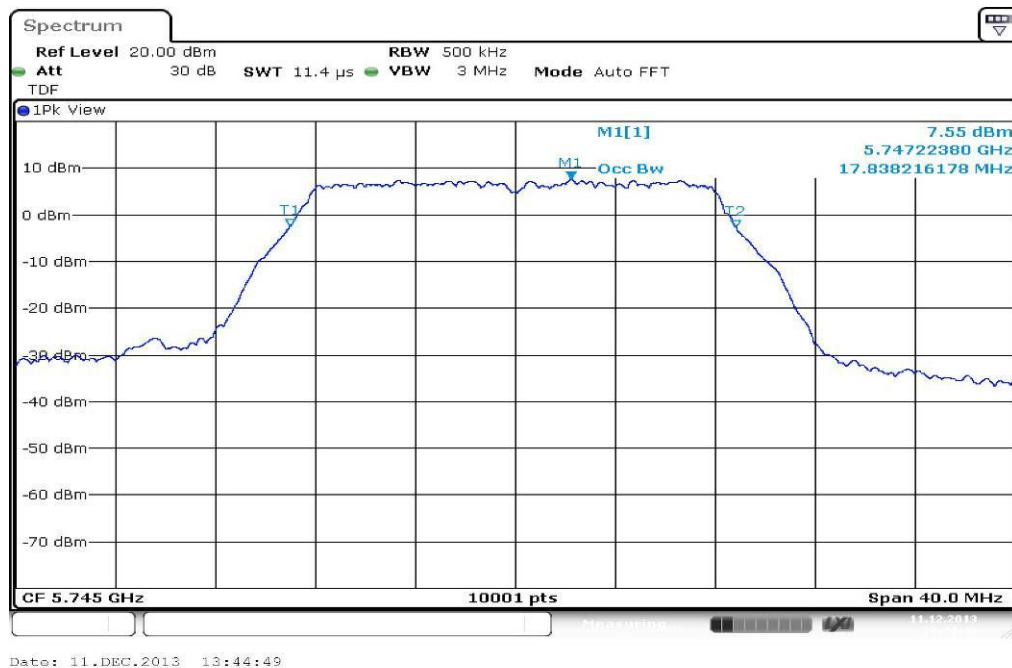
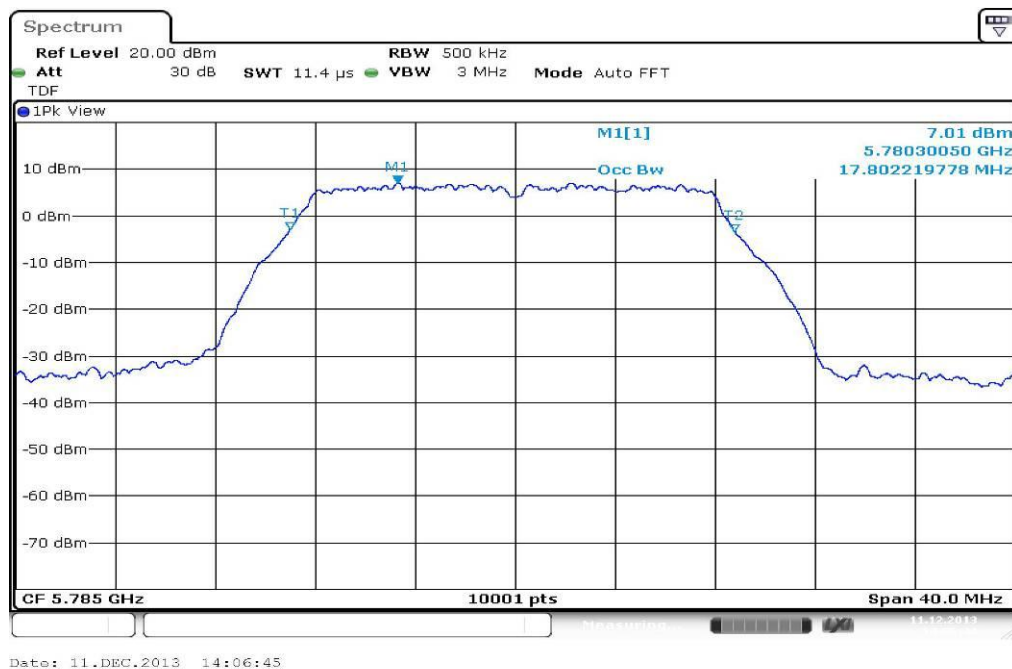
Limits:

-/-	-/-
Spectrum Bandwidth – 20 dB	
Systems using digital modulation techniques may operate in the 2400–2483.5 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.	

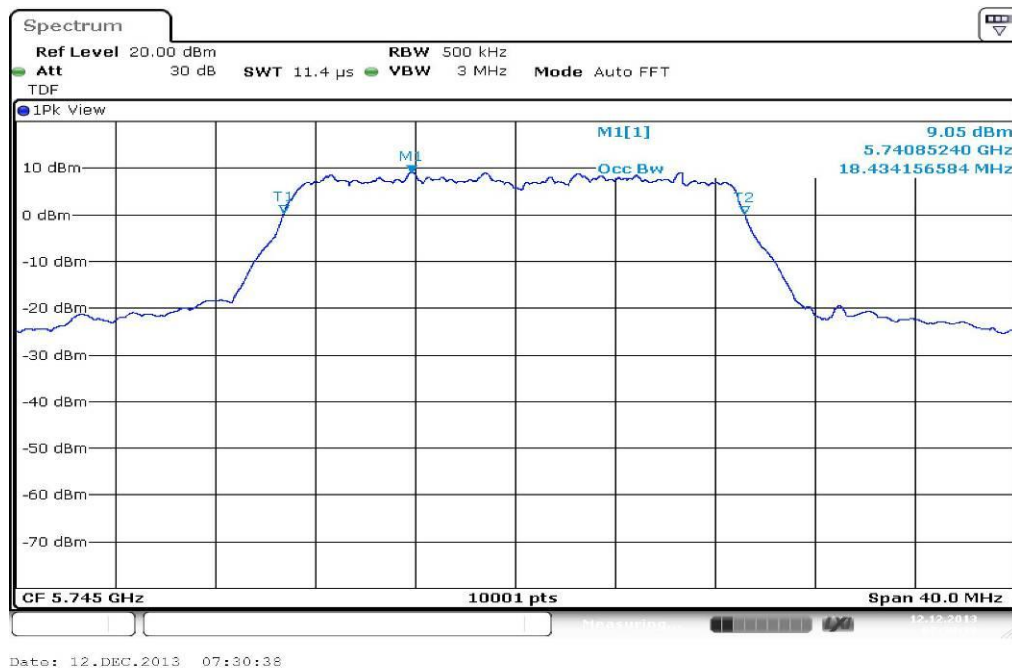
Results:

Modulation Frequency	20 dB bandwidth [MHz]		
	Lowest channel	Middle channel	Highest channel
OFDM / a – mode	17.84	17.80	17.40
OFDM / ac – mode HT20	18.43	18.40	18.46
OFDM / ac – mode HT40	36.78	-/-	36.77
OFDM / ac – mode HT80	-/-	75.90	-/-
Measurement uncertainty	± RBW		

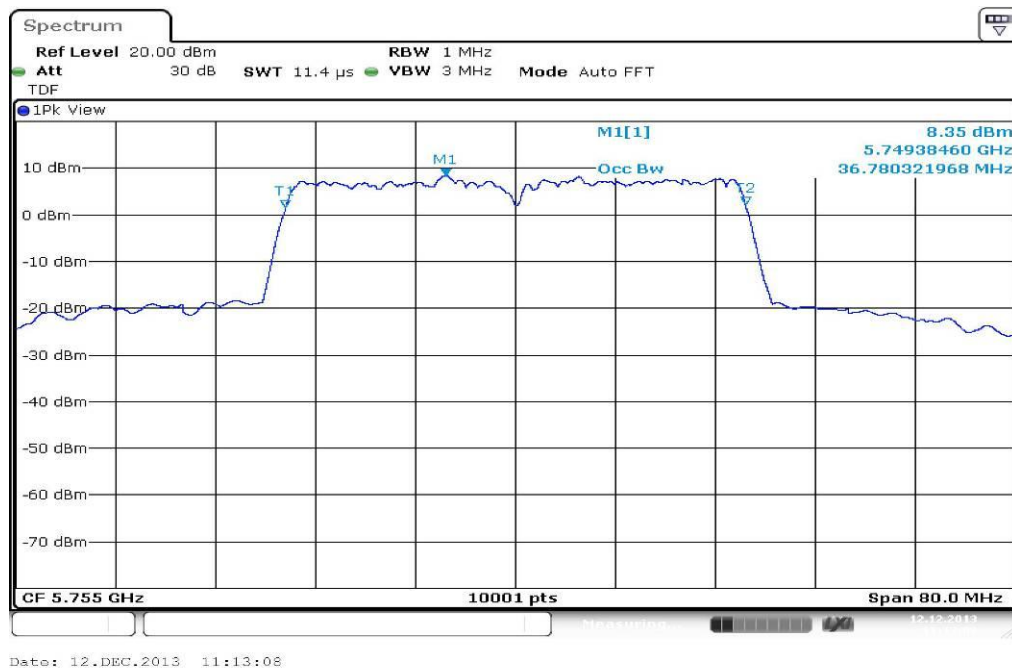
Result: Passed

Plots: OFDM / a – mode**Plot 1: TX mode, lowest channel****Plot 2: TX mode, middle channel**

Plot 3: TX mode, highest channel

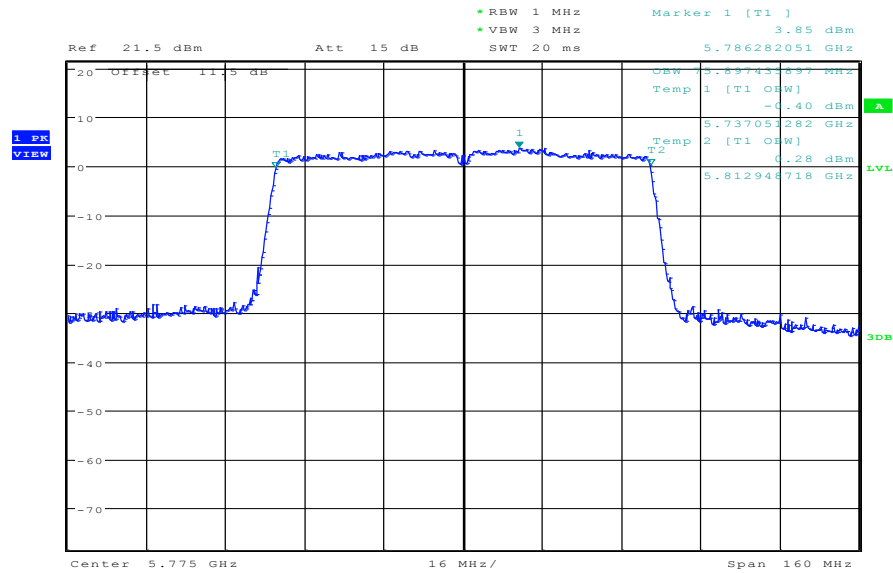
Plots: OFDM / ac – mode HT20**Plot 1: TX mode, lowest channel****Plot 2: TX mode, middle channel**

Plot 3: TX mode, highest channel

Plots: OFDM / ac – mode HT40**Plot 1: TX mode, lowest channel****Plot 2: TX mode, highest channel**

Plots: OFDM / ac – mode HT80

Plot 1: TX mode



Date: 21.DEC.2013 14:07:46

10.6 TX spurious emissions conducted

Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at the lowest, middle and highest channel. The measurement is repeated for all modulations.

Measurement:

Measurement parameter	
According to:	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	500 kHz
Span:	9 kHz to 25 GHz
Trace-Mode:	Max Hold

Limits:

FCC	-/-
TX Spurious Emissions Conducted	
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. Attenuation below the general limits specified in Section 15.209(a) is not required	

Results: OFDM / a – mode

TX Spurious Emissions Conducted					
OFDM / a – mode					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5745		3.21	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5785		2.62	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5825		2.73	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
Measurement uncertainty		± 3 dB			

Result: Passed**Results: OFDM / ac – mode HT20**

TX Spurious Emissions Conducted					
OFDM / ac – mode HT20					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5745		3.12	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5785		2.44	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5825		2.66	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
Measurement uncertainty		± 3 dB			

Result: Passed

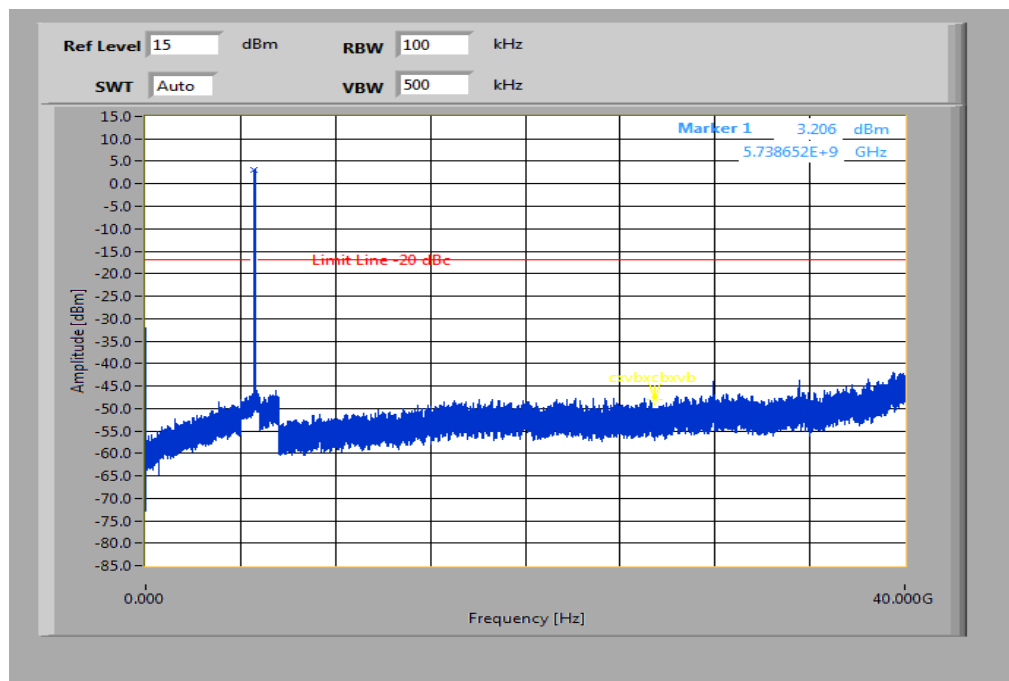
Results: OFDM / ac – mode HT40

TX Spurious Emissions Conducted					
OFDM / ac – mode HT40					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5755		-0.39	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak)		complies
			-30 dBc (average)		
5785		-0.32	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak)		complies
			-30 dBc (average)		
			30 dBm		Operating frequency
-/-			-20 dBc (peak)		-/-
			-30 dBc (average)		
Measurement uncertainty		± 3 dB			

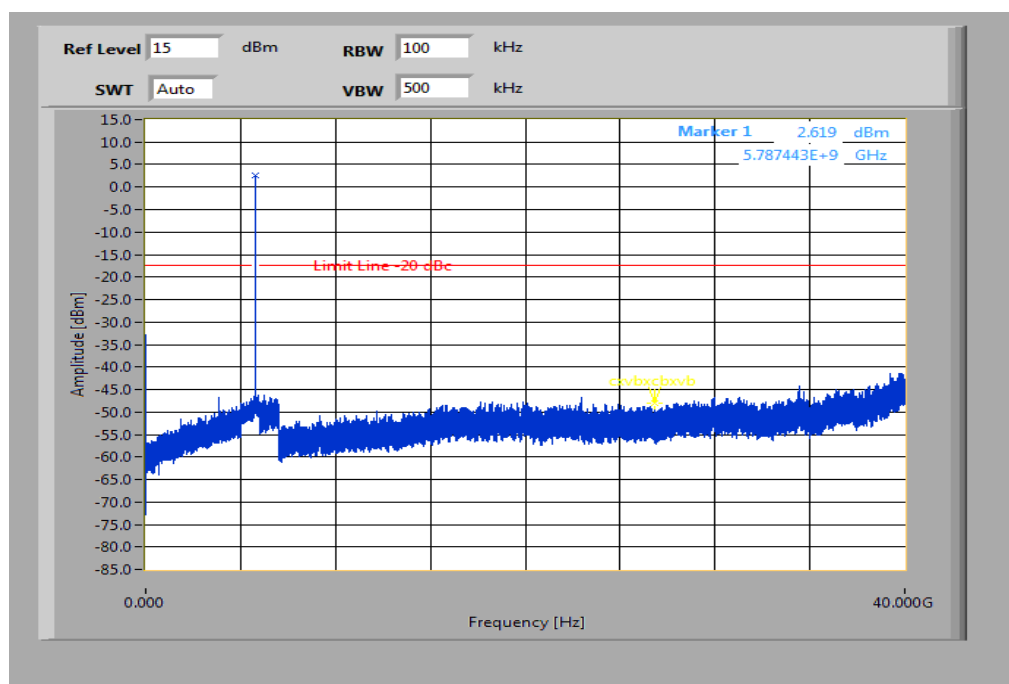
Result: Passed**Results: OFDM / ac – mode HT80**

TX Spurious Emissions Conducted					
OFDM / ac – mode HT80					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5775		-6.01	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak)		complies
			-30 dBc (average)		
			30 dBm		Operating frequency
-/-			-20 dBc (peak)		complies
			-30 dBc (average)		
			30 dBm		Operating frequency
-/-			-20 dBc (peak)		-/-
			-30 dBc (average)		
Measurement uncertainty		± 3 dB			

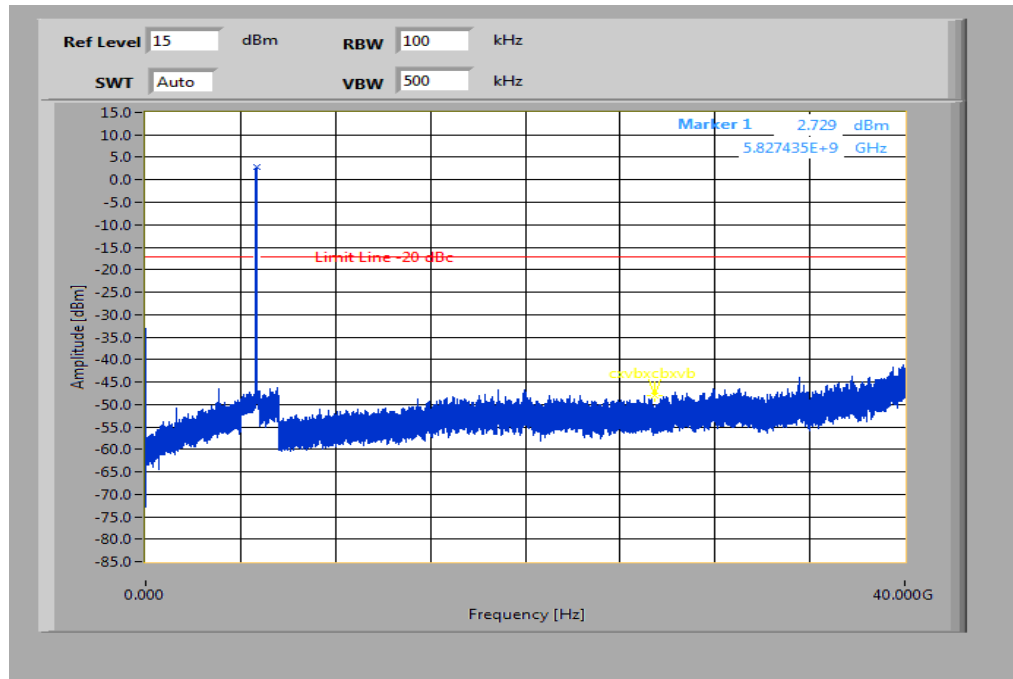
Result: Passed

Plots: OFDM / a – mode**Plot 1: TX mode, lowest channel, up to 40 GHz**

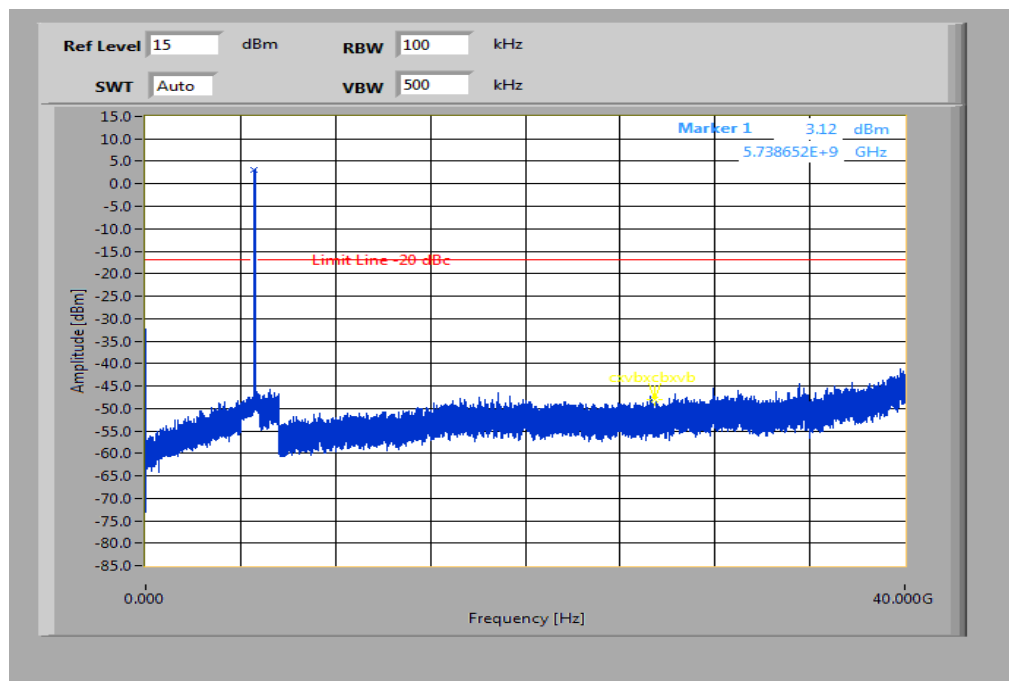
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 40 GHz

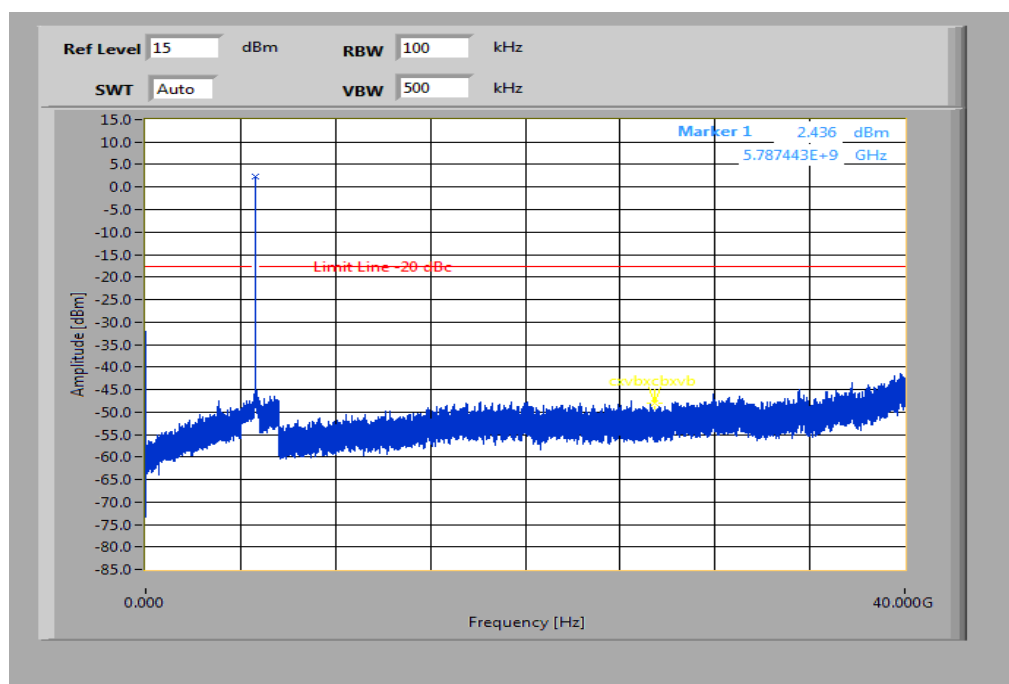
The peak at the beginning of the plot is the LO from the SA.

Plot 3: TX mode, highest channel, up to 40 GHz

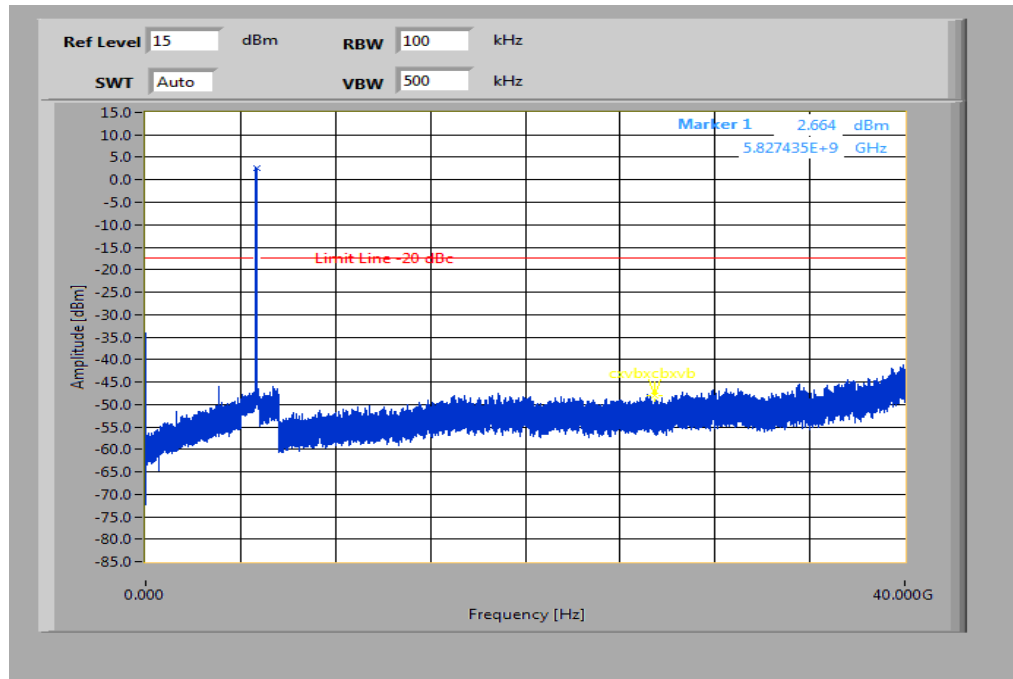
The peak at the beginning of the plot is the LO from the SA.

Plots: OFDM / ac – mode HT20**Plot 1: TX mode, lowest channel, up to 40 GHz**

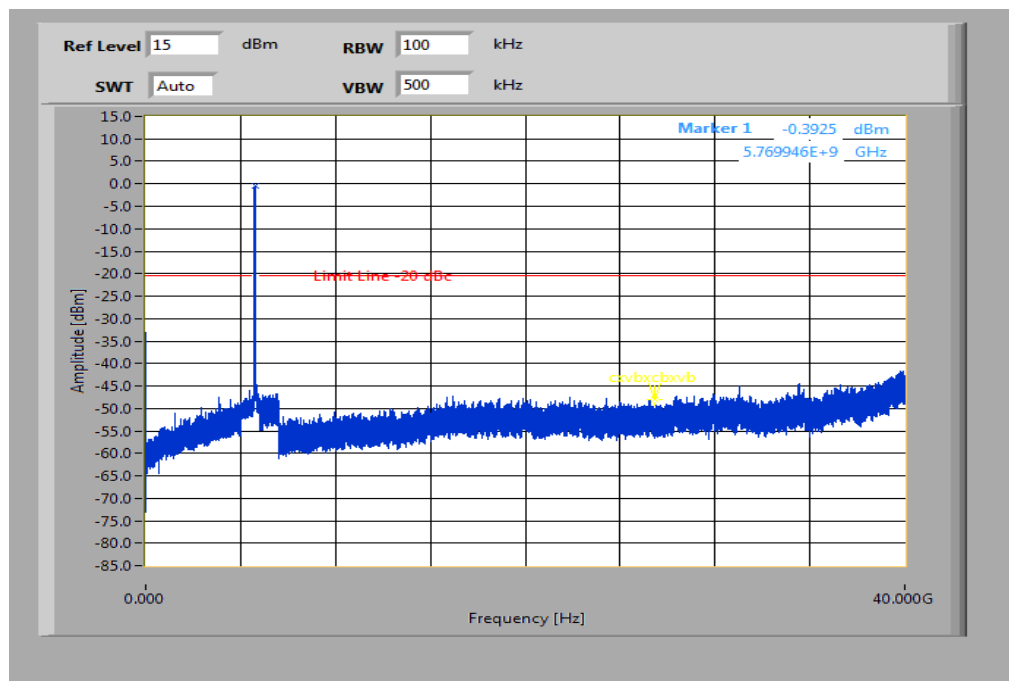
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 40 GHz

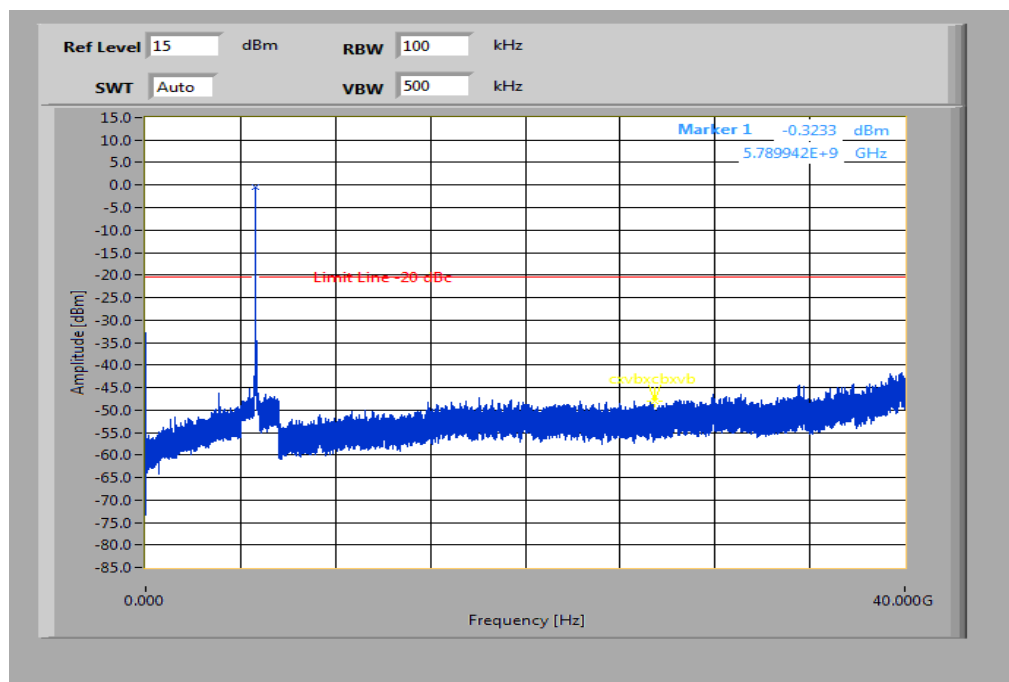
The peak at the beginning of the plot is the LO from the SA.

Plot 3: TX mode, highest channel, up to 40 GHz

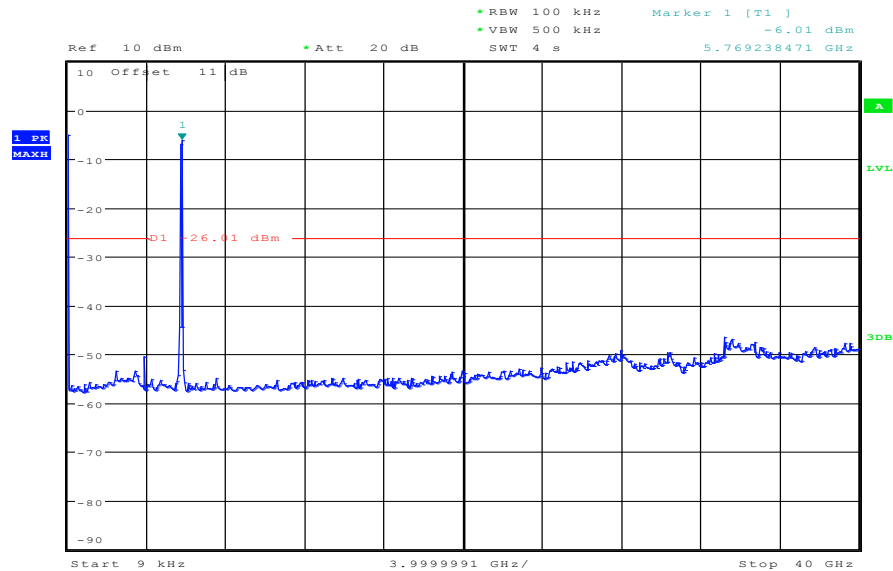
The peak at the beginning of the plot is the LO from the SA.

Plots: OFDM / ac – mode HT40**Plot 1: TX mode, lowest channel, up to 40 GHz**

The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, highest channel, up to 40 GHz

The peak at the beginning of the plot is the LO from the SA.

Plots: OFDM / ac – mode HT80**Plot 1: TX mode, up to 40 GHz**

Date: 19.DEC.2013 12:40:47

The peak at the beginning of the plot is the LO from the SA.

10.7 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at the lowest, middle and highest channel. The measurement is repeated for all modulations.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	3 x RBW Remeasurement: 10 Hz / 3 MHz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold
Measured Modulation	☒ OFDM a – mode ☒ OFDM ac – mode HT20 ☒ OFDM ac – mode HT40 ☒ OFDM ac – mode HT80

The modulation with the highest output power was used to perform the transmitter spurious emissions. If spurious were detected a re-measurement was performed on the detected frequency with each modulation.

Limits:

FCC		-/-
TX Spurious Emissions Radiated		
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. Attenuation below the general limits specified in Section 15.209(a) is not required. 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)).		
Frequency (MHz)	Field Strength (dBμV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results: OFDM / a – mode

TX Spurious Emissions Radiated [dBμV/m]								
OFDM / a – mode								
5745 MHz			5785 MHz			5825 MHz		
F [MHz]	Detector	Level [dBμV/m]	F [MHz]	Detector	Level [dBμV/m]	F [MHz]	Detector	Level [dBμV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
All detected peaks are below the average limit!			All detected peaks are below the average limit!			All detected peaks are below the average limit!		
Measurement uncertainty			± 3 dB					

Result: Passed**Results: OFDM / ac – mode HT20**

TX Spurious Emissions Radiated [dBμV/m]								
OFDM / ac – mode HT20								
5745 MHz			5785 MHz			5825 MHz		
F [MHz]	Detector	Level [dBμV/m]	F [MHz]	Detector	Level [dBμV/m]	F [MHz]	Detector	Level [dBμV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
All detected peaks are below the average limit!			All detected peaks are below the average limit!			All detected peaks are below the average limit!		
Measurement uncertainty			± 3 dB					

Result: Passed**Results: OFDM / ac – mode HT40**

TX Spurious Emissions Radiated [dBμV/m]								
OFDM / ac – mode HT40								
5755 MHz			5795 MHz			-/-		
F [MHz]	Detector	Level [dBμV/m]	F [MHz]	Detector	Level [dBμV/m]	F [MHz]	Detector	Level [dBμV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			-/-		
All detected peaks are below the average limit!			All detected peaks are below the average limit!			-/-		
Measurement uncertainty			± 3 dB					

Result: Passed

Results: OFDM / ac – mode HT80

TX Spurious Emissions Radiated [dBμV/m]								
OFDM / ac – mode HT80								
5775 MHz			-/-			-/-		
F [MHz]	Detector	Level [dBμV/m]	F [MHz]	Detector	Level [dBμV/m]	F [MHz]	Detector	Level [dBμV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			-/-			-/-		
All detected peaks are below the average limit!			-/-			-/-		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

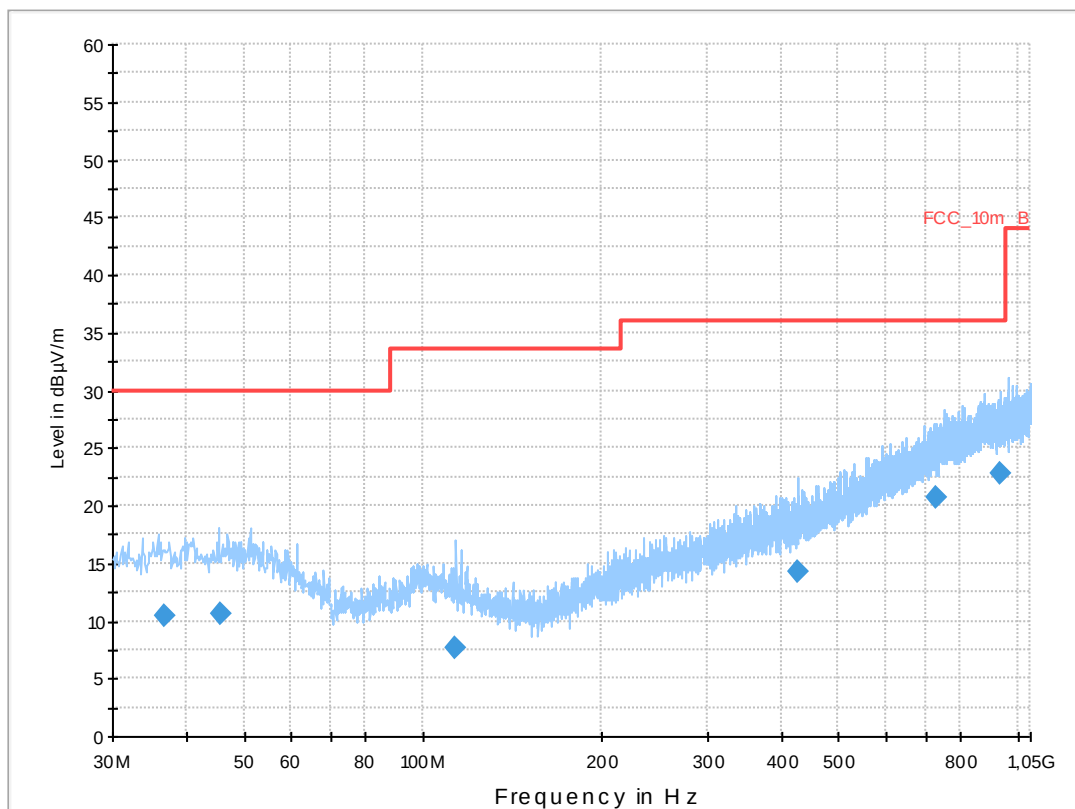
Plots: OFDM / a**Plot 1:** Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization**Common Information**

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan a-mode tx ch 149
 Operator Name: Hennemann
 Comment: battery powered

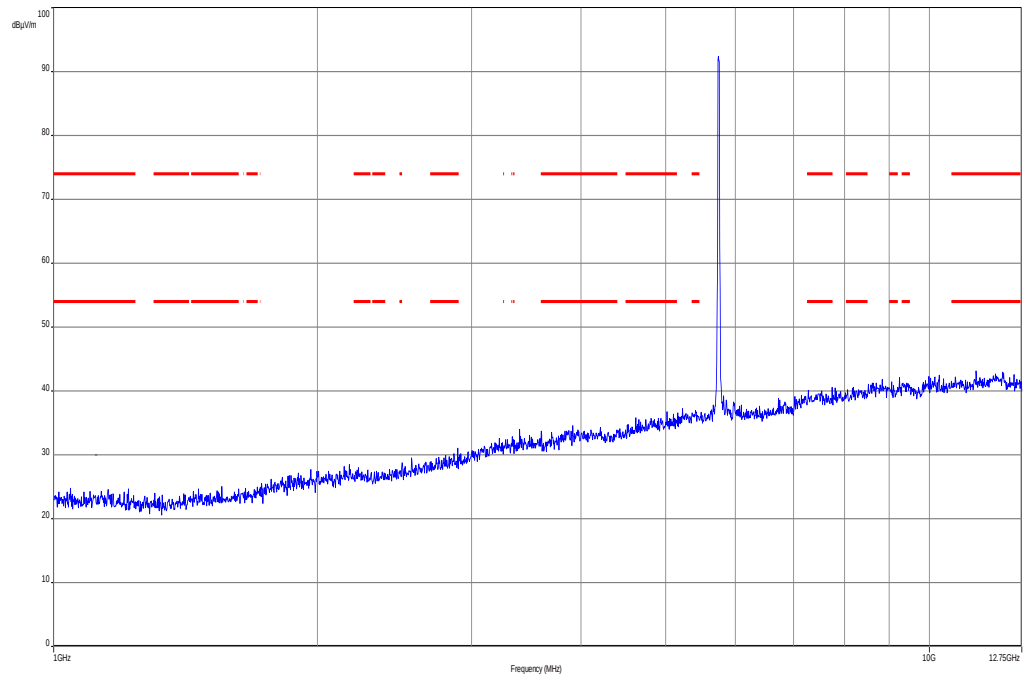
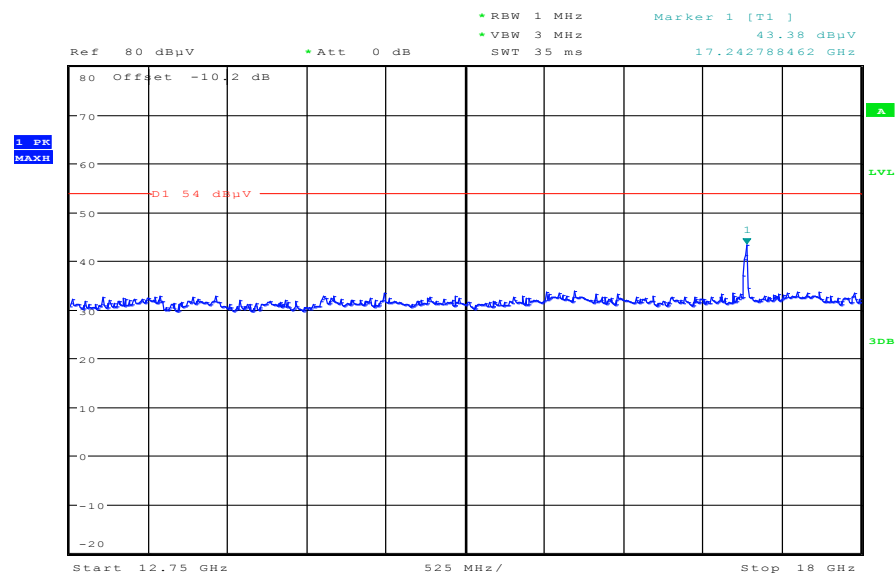
Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

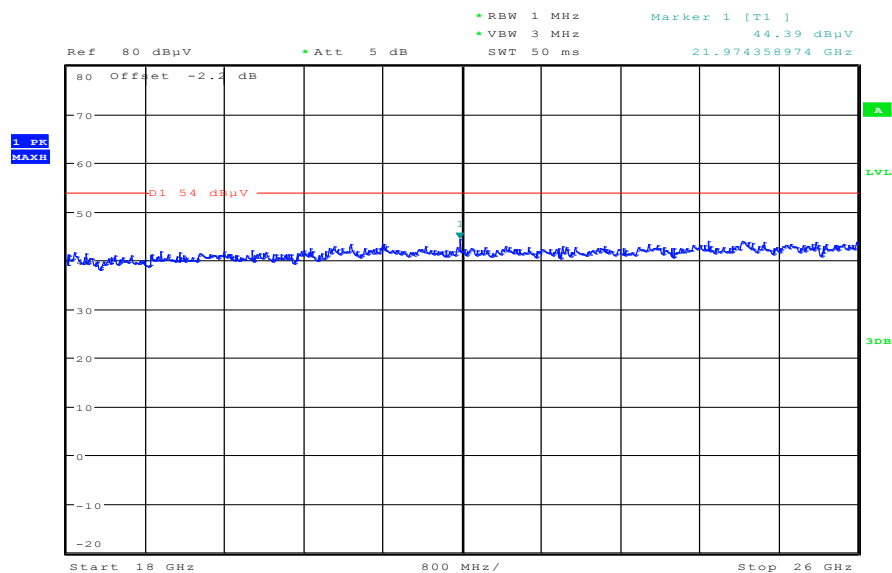
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

**Final Result 1**

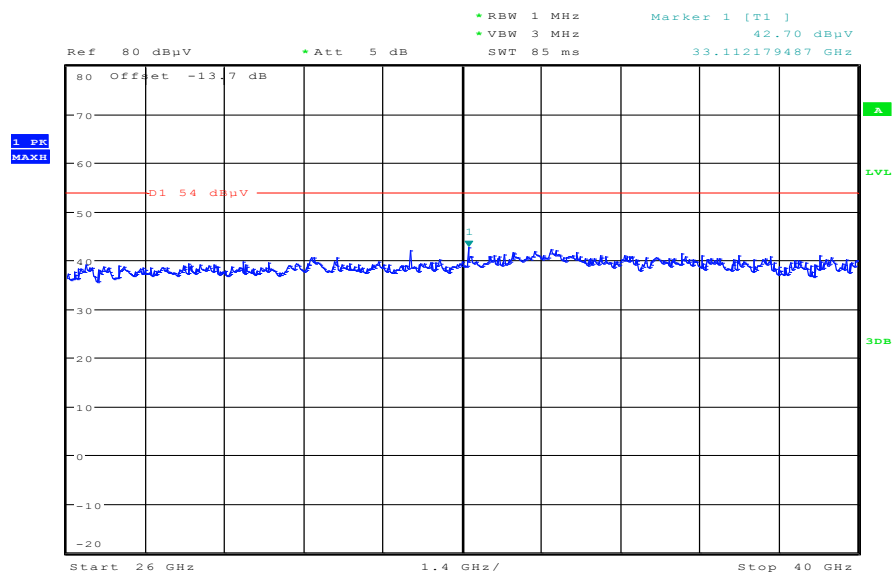
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
36.578250	10.5	1000.0	120.000	170.0	H	171.0	13.2	19.5	30.0	
45.551250	10.6	1000.0	120.000	170.0	H	100.0	13.3	19.4	30.0	
112.985100	7.6	1000.0	120.000	152.0	V	190.0	10.8	25.9	33.5	
428.271300	14.2	1000.0	120.000	160.0	V	92.0	17.3	21.8	36.0	
726.749400	20.6	1000.0	120.000	170.0	H	100.0	23.1	15.4	36.0	
937.555500	22.8	1000.0	120.000	153.0	V	270.0	25.3	13.2	36.0	

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 3:** Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:28:14

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:49:04

Plot 5: Lowest channel, 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:55:39

Plot 6: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

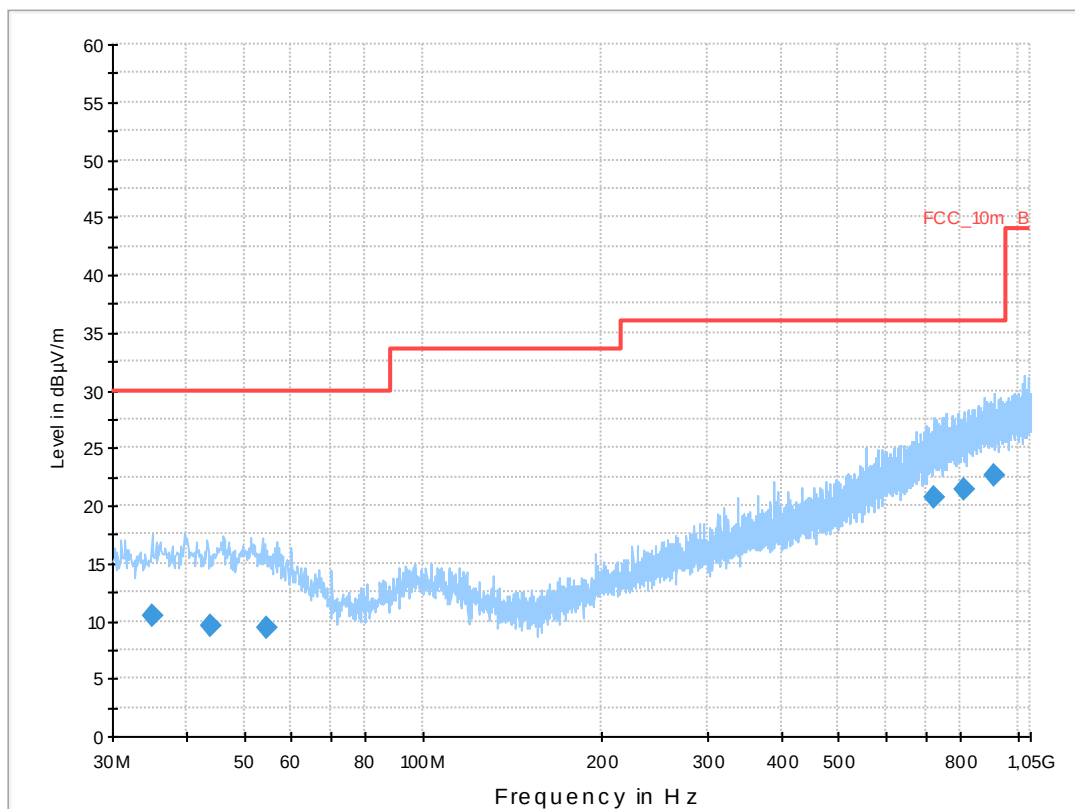
Common Information

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan a-mode tx ch 157
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

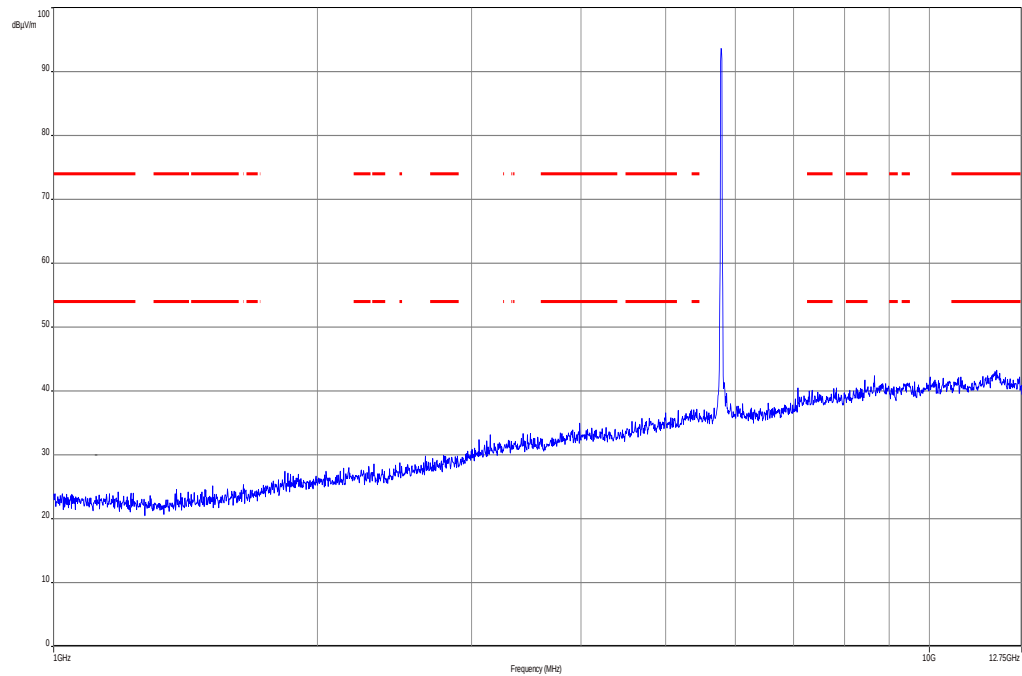
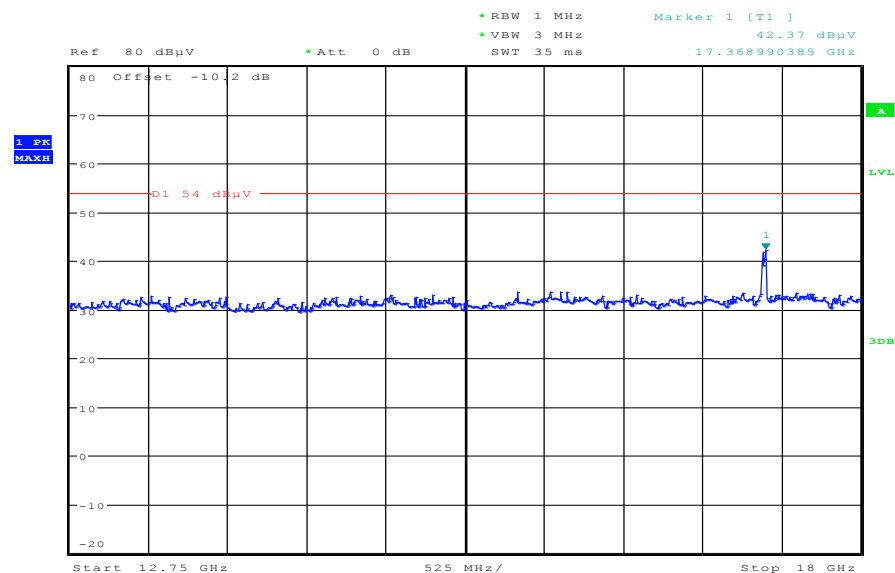
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

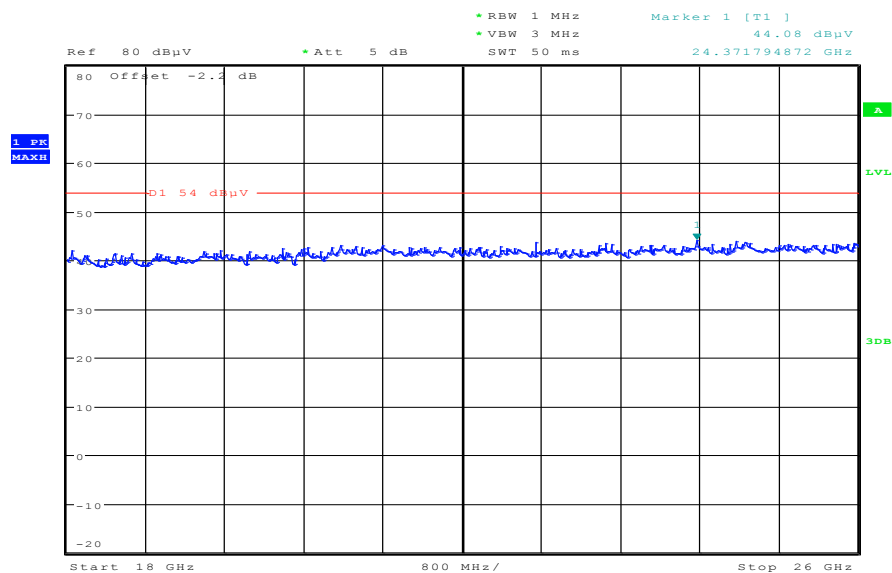


Final Result 1

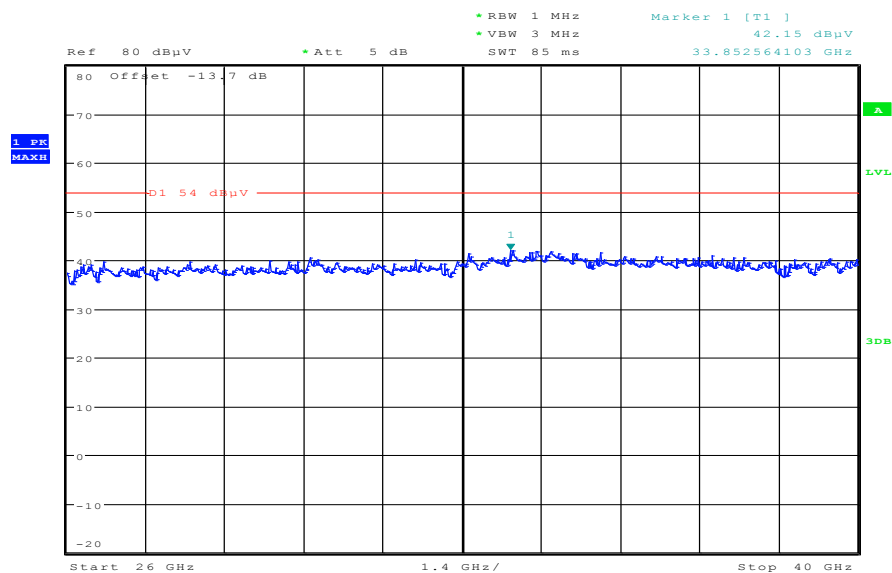
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.117550	10.4	1000.0	120.000	170.0	V	267.0	13.0	19.6	30.0	
43.823100	9.5	1000.0	120.000	170.0	V	92.0	13.3	20.5	30.0	
54.330450	9.3	1000.0	120.000	170.0	H	2.0	12.9	20.7	30.0	
725.596950	20.6	1000.0	120.000	111.0	H	180.0	23.1	15.4	36.0	
809.793450	21.4	1000.0	120.000	170.0	V	180.0	24.0	14.6	36.0	
911.881950	22.6	1000.0	120.000	98.0	V	87.0	25.2	13.4	36.0	

Plot 7: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 8:** Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:28:58

Plot 9: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:49:42

Plot 10: Middle channel, 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:56:29

Plot 11: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

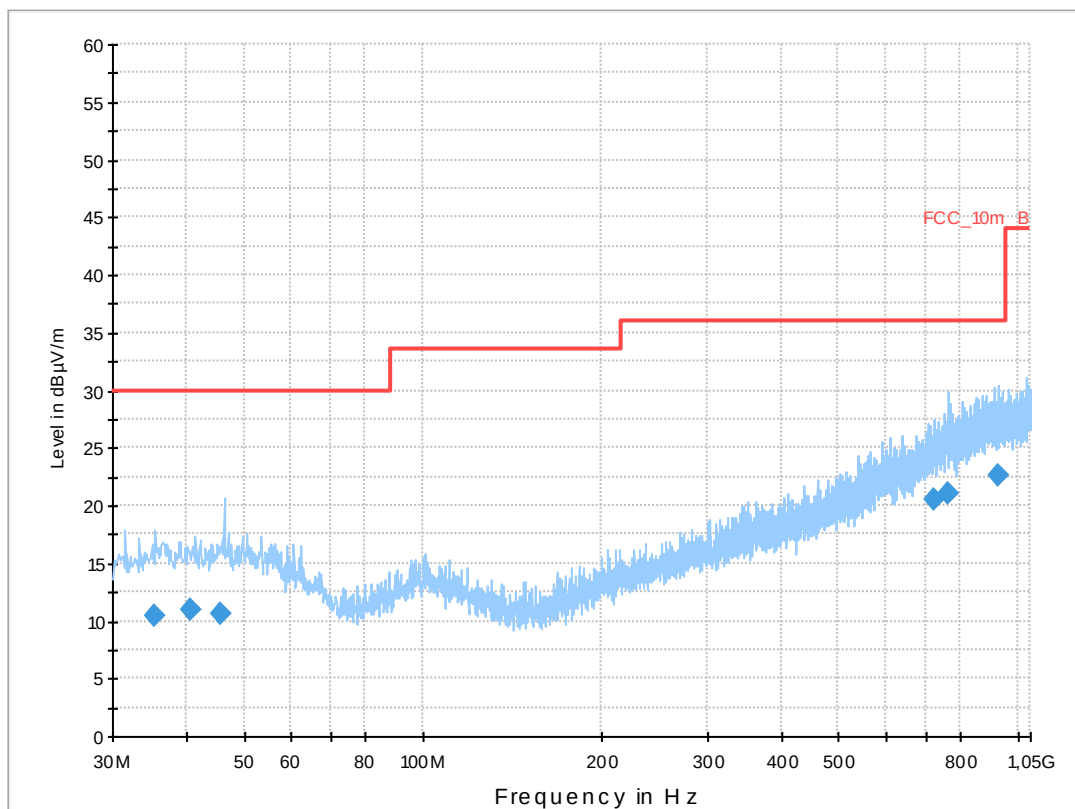
Common Information

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan a-mode tx ch 165
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

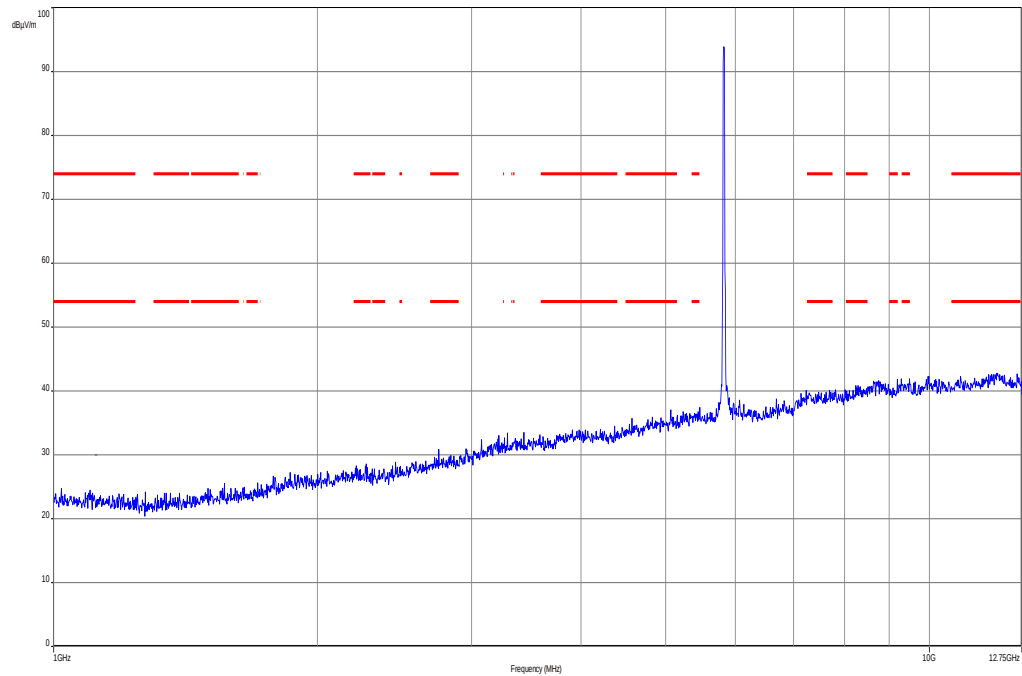
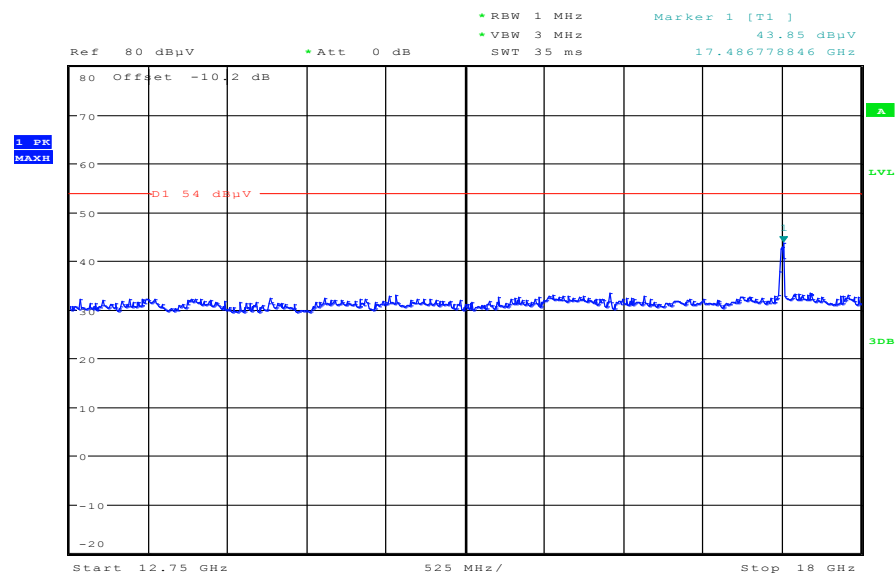
Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dB μ V/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

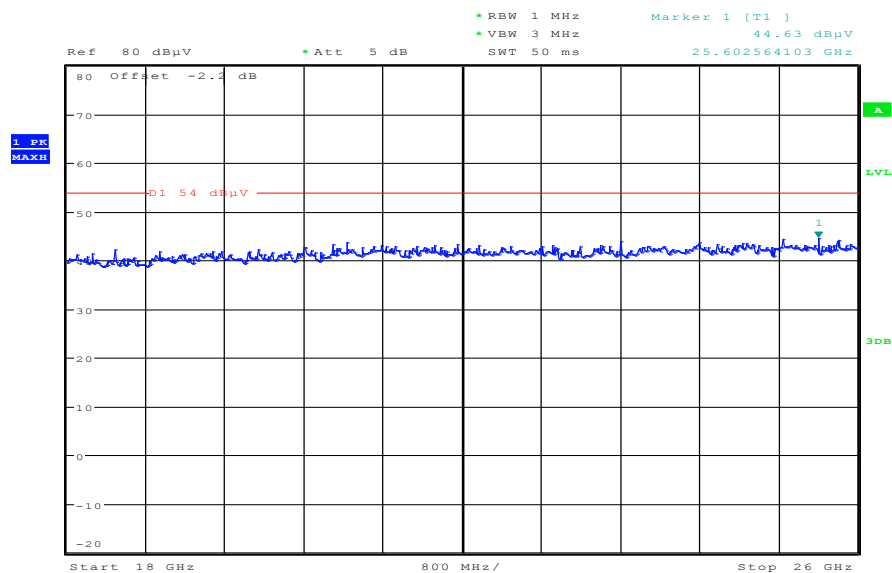


Final Result 1

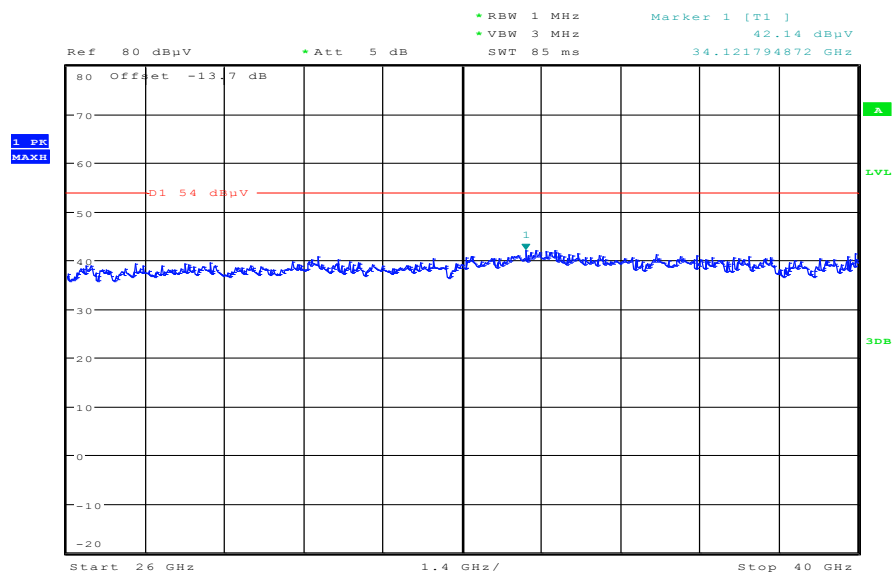
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.266500	10.5	1000.0	120.000	170.0	V	190.0	13.0	19.5	30.0	
40.753800	10.9	1000.0	120.000	170.0	H	190.0	13.4	19.1	30.0	
45.609750	10.7	1000.0	120.000	143.0	V	-5.0	13.3	19.3	30.0	
721.327050	20.6	1000.0	120.000	170.0	H	261.0	23.0	15.4	36.0	
763.900050	21.1	1000.0	120.000	170.0	H	182.0	23.7	14.9	36.0	
929.345250	22.6	1000.0	120.000	170.0	H	100.0	25.3	13.4	36.0	

Plot 12: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 13:** Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:29:33

Plot 14: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:50:18

Plot 15: Highest channel, 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:57:01

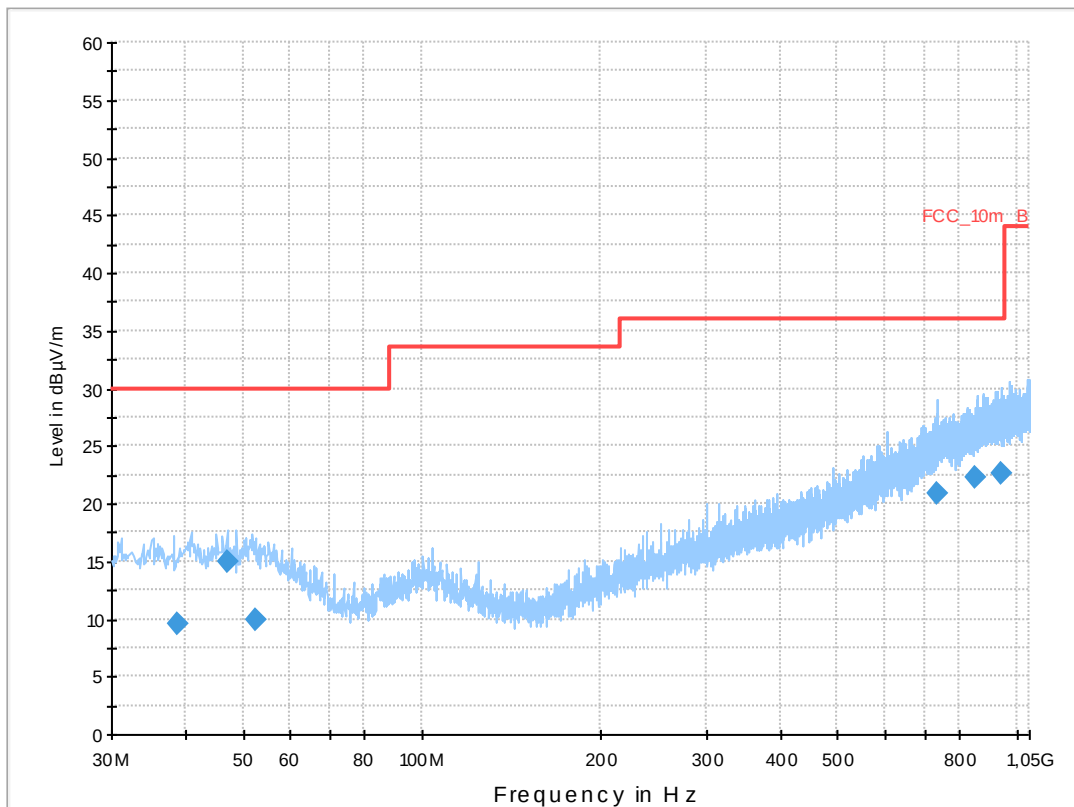
Plots: OFDM / ac HT20**Plot 1:** Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization**Common Information**

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan ac-mode (HT20) tx ch 149
 Operator Name: Hennemann
 Comment: battery powered

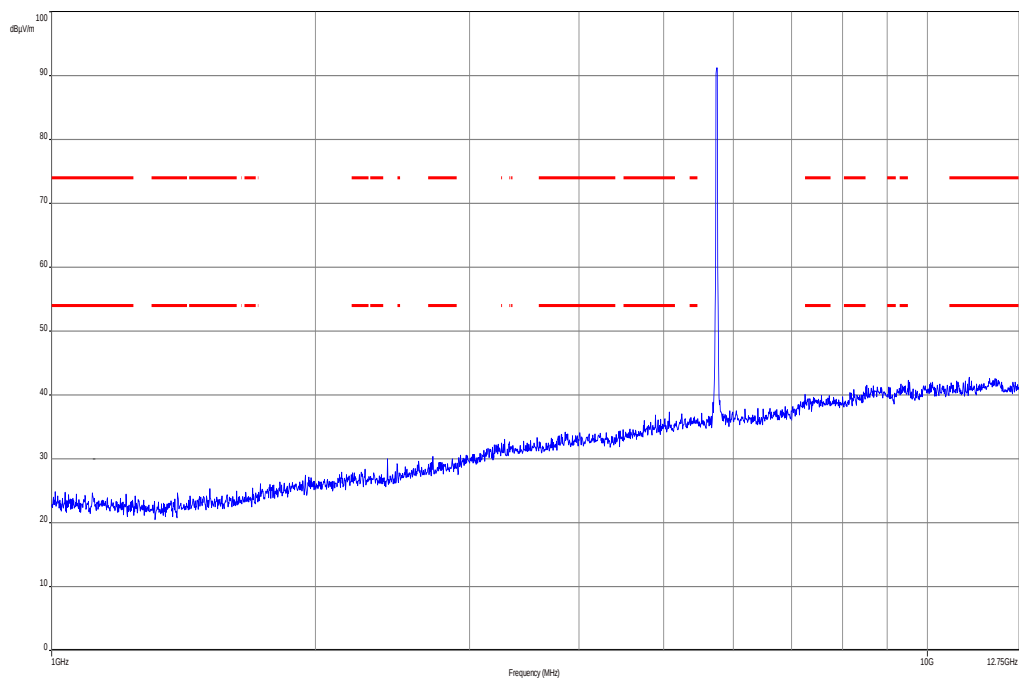
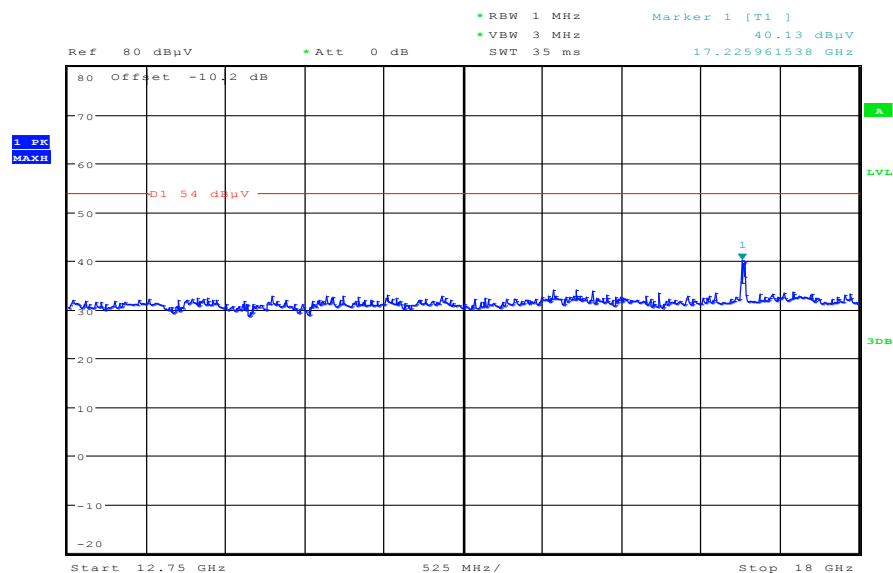
Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dB μ V/m

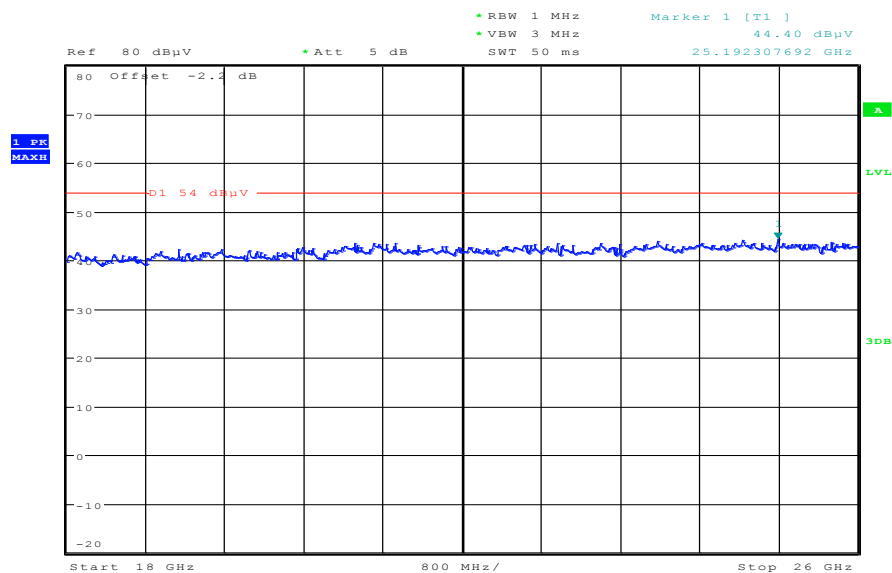
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

**Final Result 1**

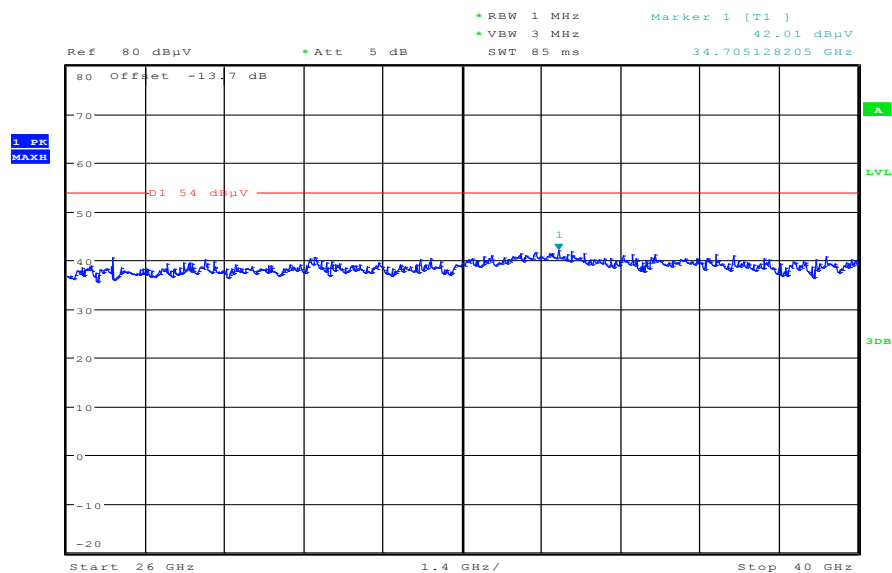
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
38.688900	9.5	1000.0	120.000	98.0	H	171.0	13.3	20.5	30.0	
47.000400	14.9	1000.0	120.000	98.0	V	280.0	13.3	15.1	30.0	
52.266450	10.0	1000.0	120.000	105.0	V	171.0	13.1	20.0	30.0	
737.075850	20.9	1000.0	120.000	135.0	H	100.0	23.4	15.1	36.0	
850.335450	22.2	1000.0	120.000	170.0	V	261.0	24.6	13.8	36.0	
940.478250	22.7	1000.0	120.000	98.0	H	280.0	25.3	13.3	36.0	

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 3:** Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:30:46

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:02:04

Plot 5: Lowest channel, 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:44:11

Plot 6: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

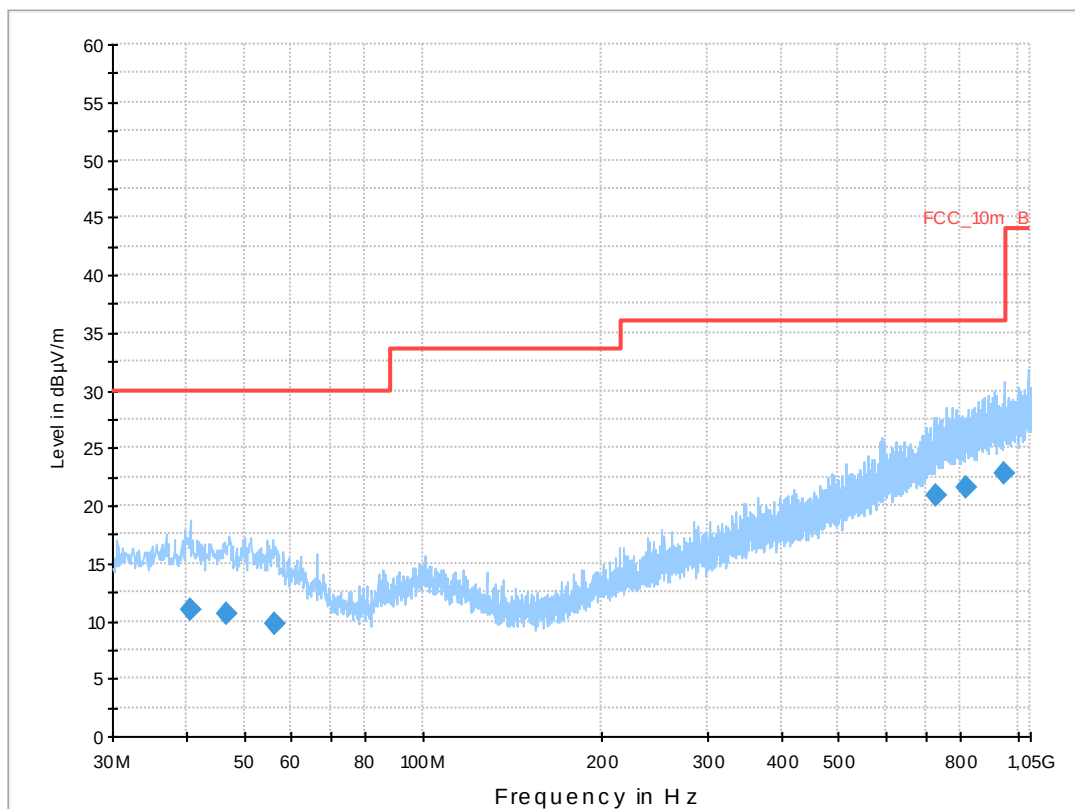
Common Information

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan ac-mode (HT20) tx ch 157
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

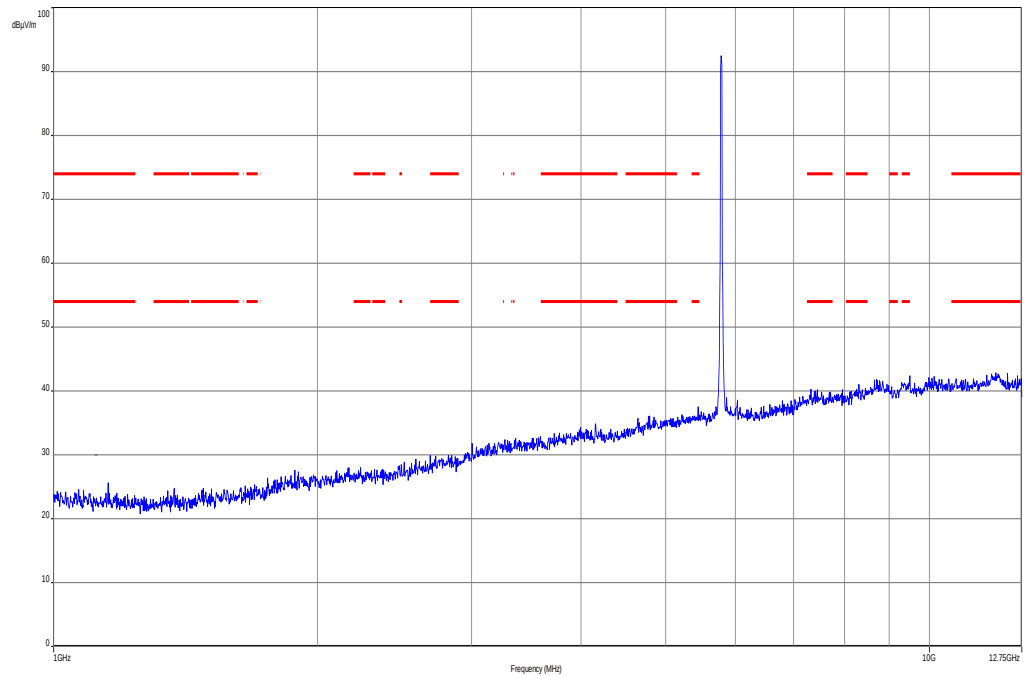
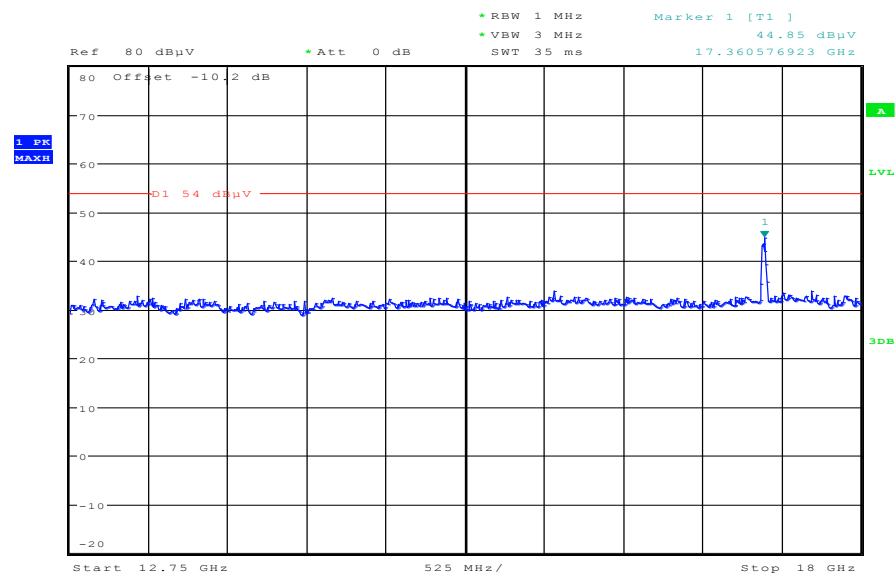
Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dB μ V/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

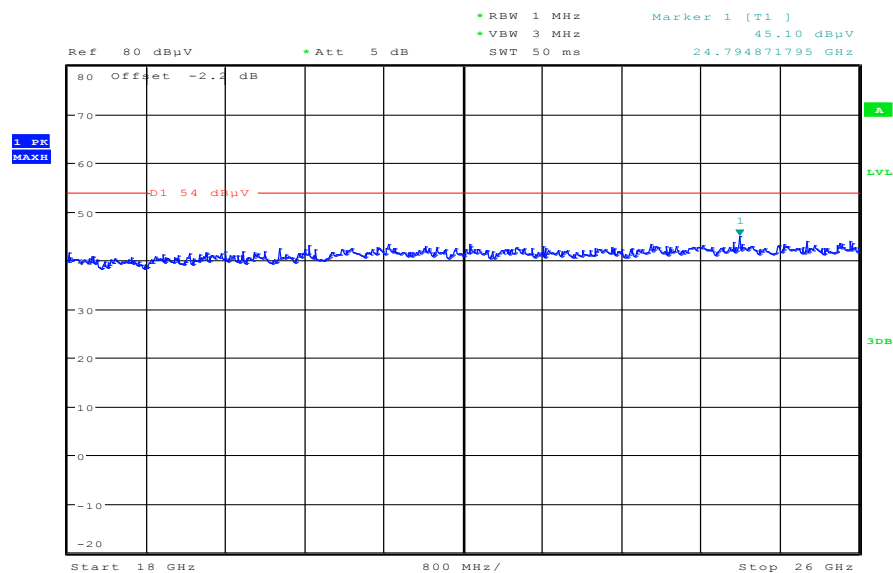


Final Result 1

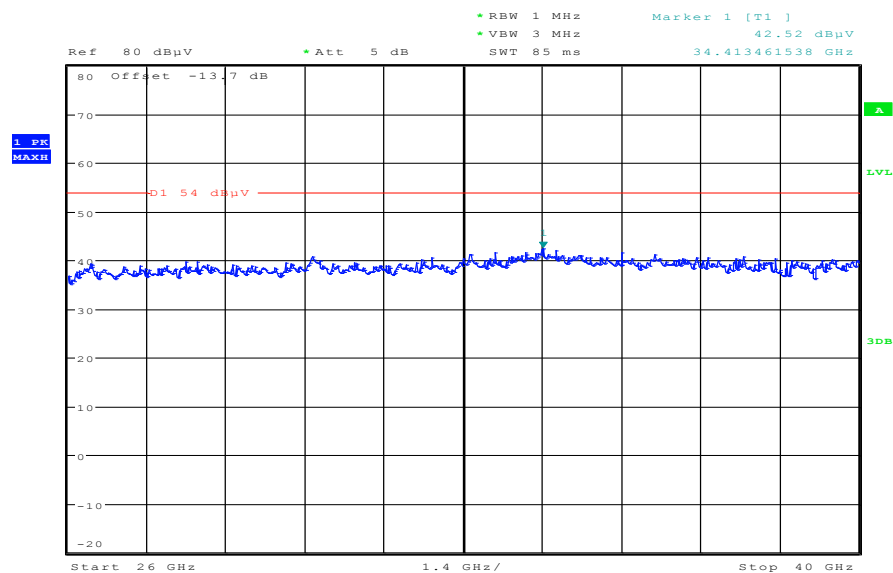
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
40.559100	10.9	1000.0	120.000	98.0	H	92.0	13.4	19.1	30.0	
46.826700	10.5	1000.0	120.000	107.0	V	260.0	13.3	19.5	30.0	
56.419350	9.8	1000.0	120.000	170.0	V	10.0	12.5	20.2	30.0	
731.806350	20.8	1000.0	120.000	170.0	V	85.0	23.2	15.2	36.0	
820.843050	21.6	1000.0	120.000	98.0	V	0.0	24.1	14.4	36.0	
948.999900	22.7	1000.0	120.000	170.0	V	-5.0	25.3	13.3	36.0	

Plot 7: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 8:** Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:31:16

Plot 9: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:02:40

Plot 10: Middle channel, 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:44:49

Plot 11: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

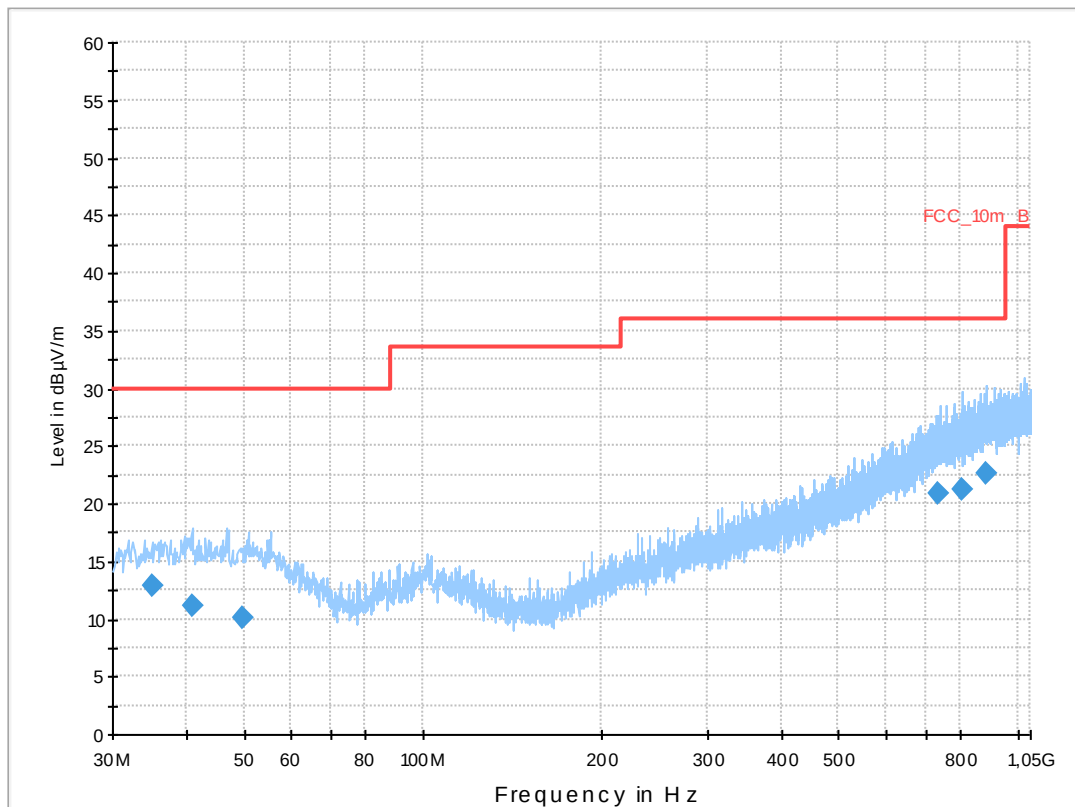
Common Information

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan ac-mode (HT20) tx ch 165
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

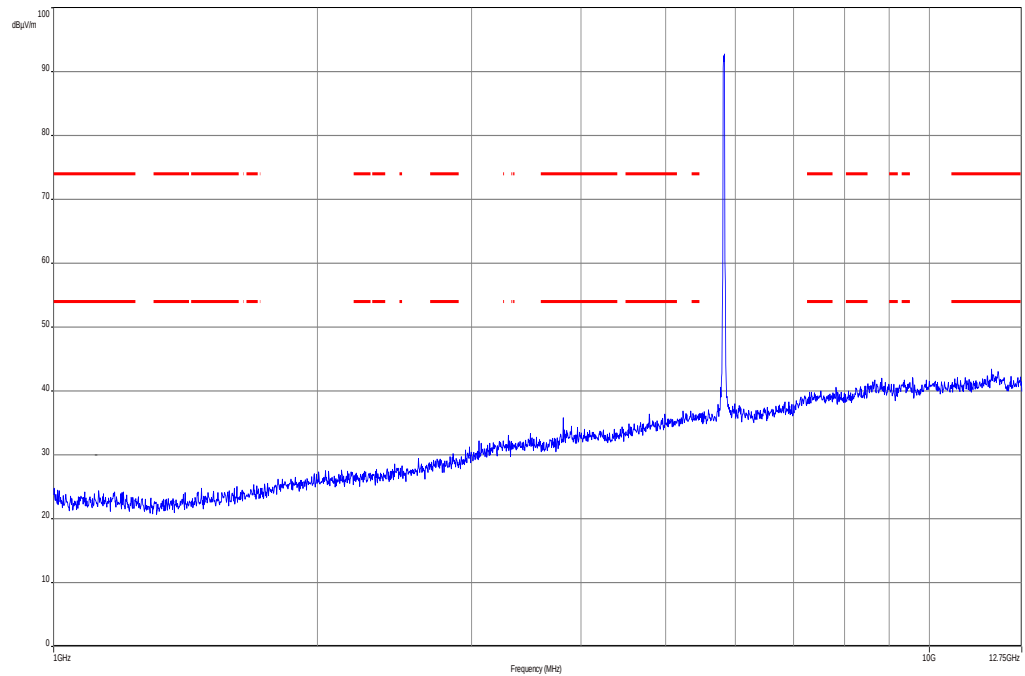
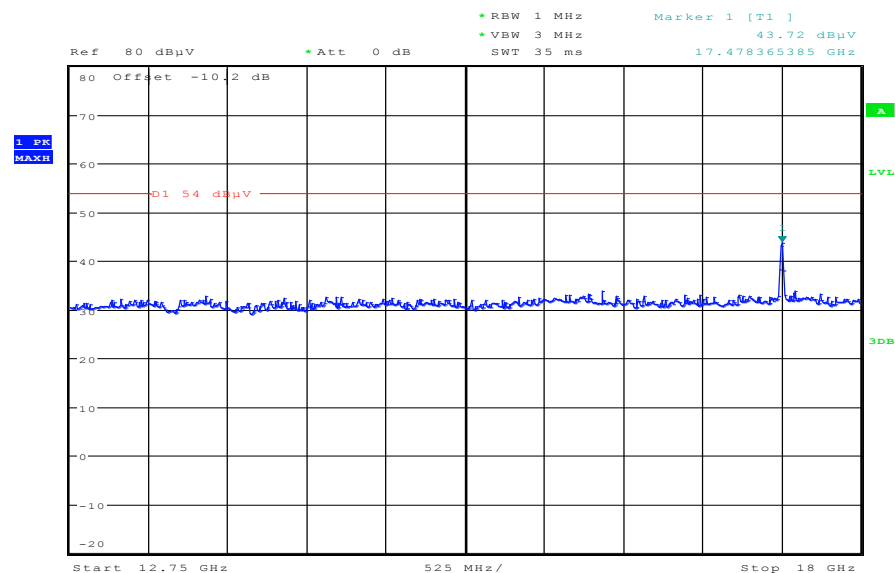
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

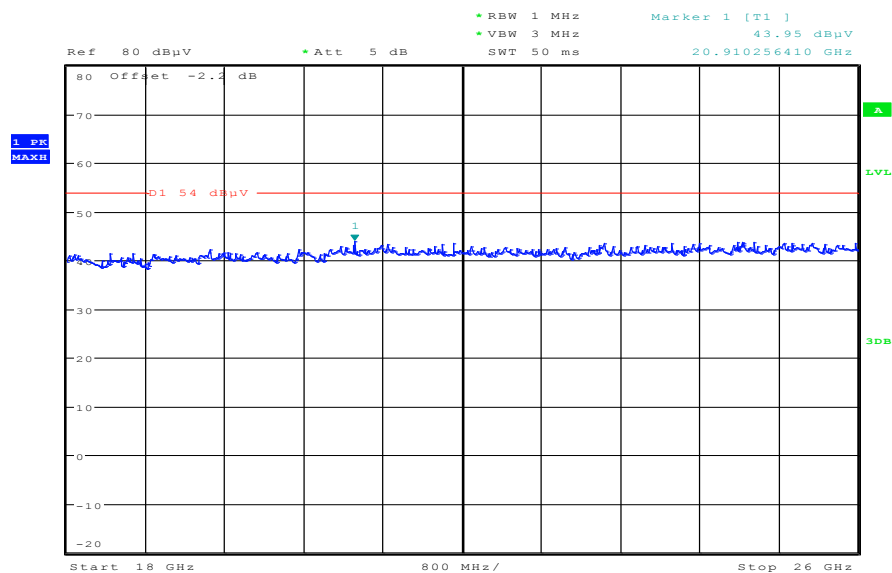


Final Result 1

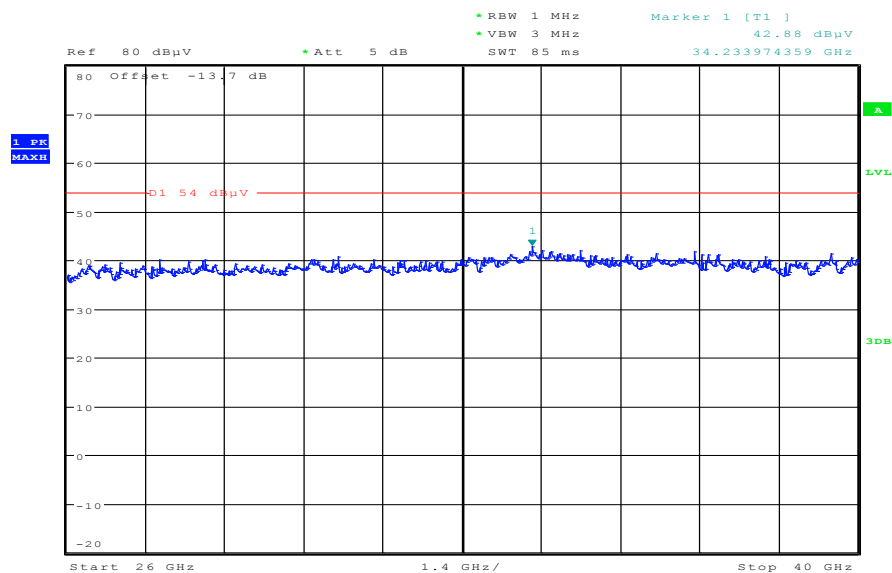
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.017050	12.9	1000.0	120.000	133.0	V	177.0	13.0	17.1	30.0	
40.788000	11.1	1000.0	120.000	154.0	V	88.0	13.4	18.9	30.0	
49.839450	10.2	1000.0	120.000	105.0	H	190.0	13.4	19.8	30.0	
735.691650	20.9	1000.0	120.000	98.0	H	171.0	23.3	15.1	36.0	
803.611950	21.3	1000.0	120.000	170.0	H	178.0	23.9	14.7	36.0	
882.389250	22.6	1000.0	120.000	170.0	H	280.0	25.0	13.4	36.0	

Plot 12: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 13:** Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:31:59

Plot 14: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:03:18

Plot 15: Highest channel, 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:45:35

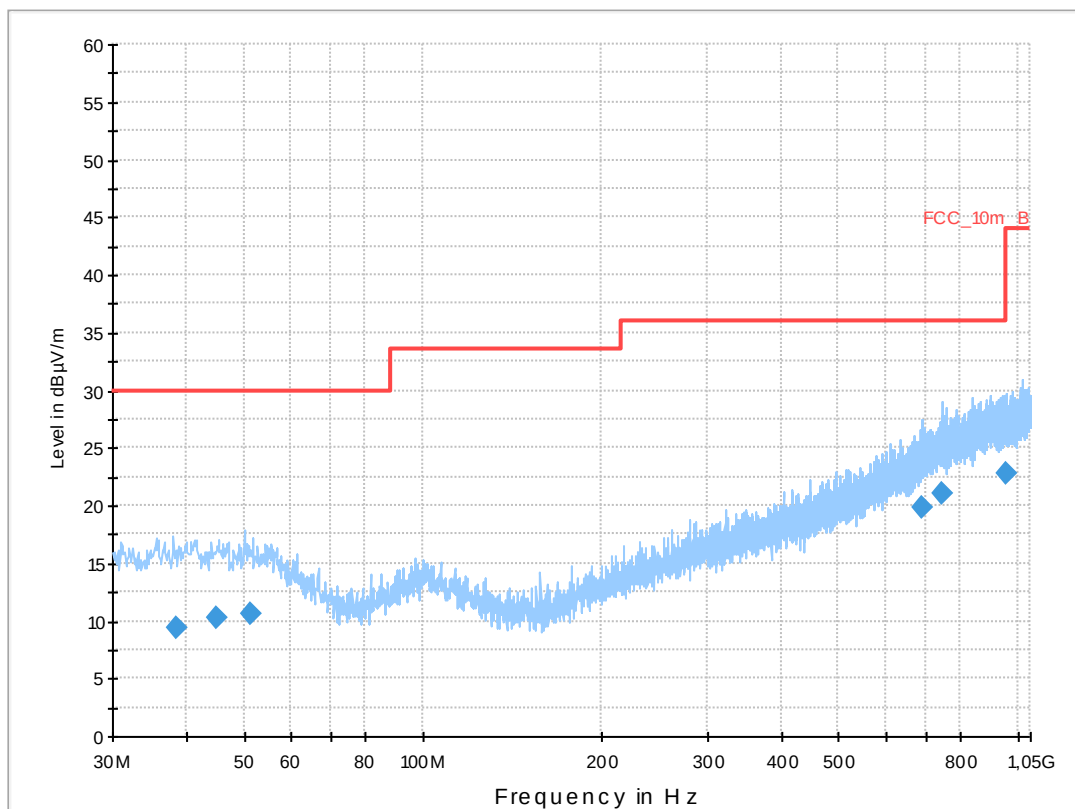
Plots: OFDM / ac – mode HT40**Plot 1:** Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization**Common Information**

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan n-mode (HT40) tx ch 151
 Operator Name: Hennemann
 Comment: battery powered

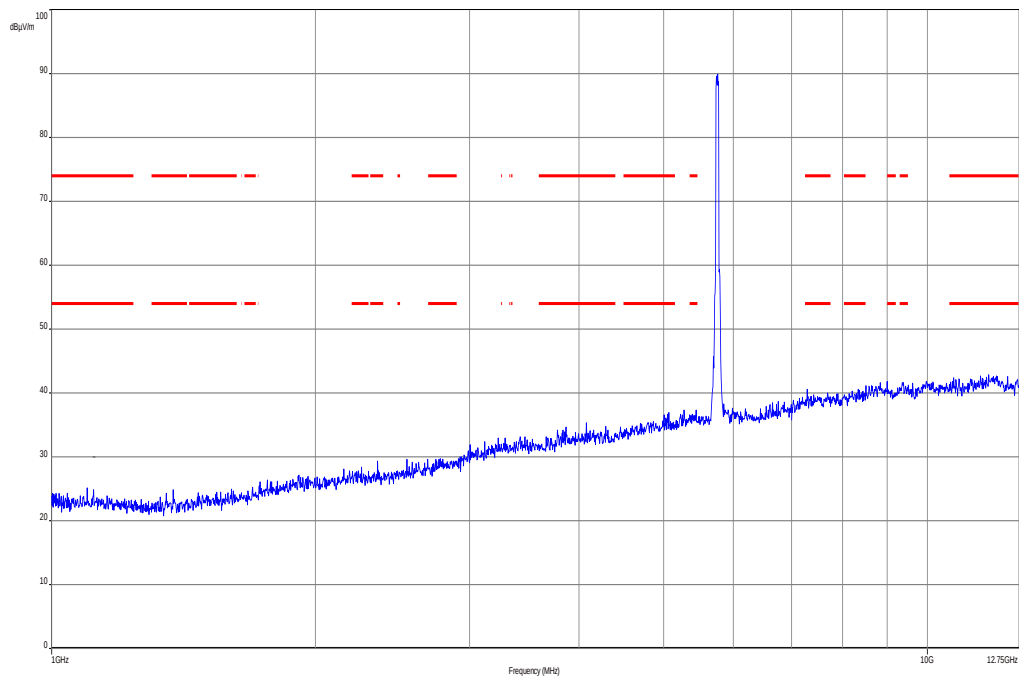
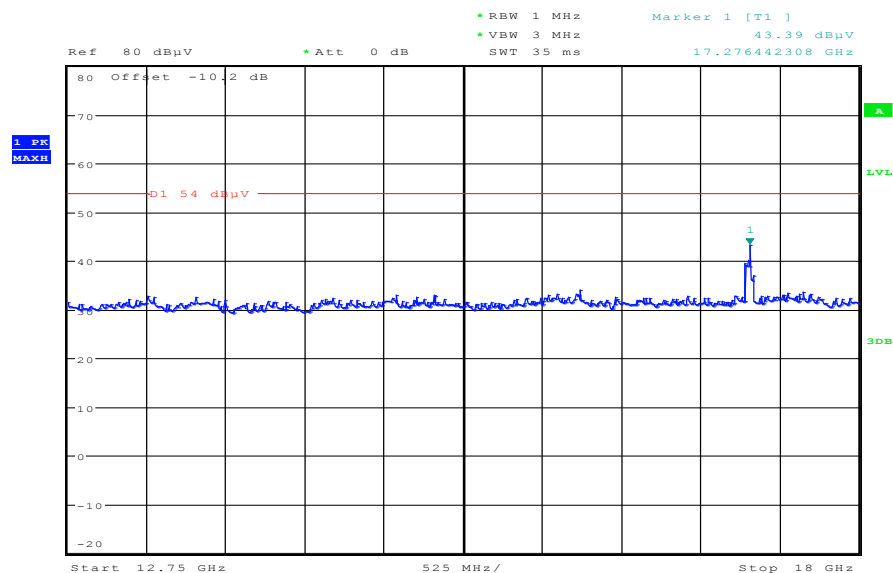
Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dBμV/m

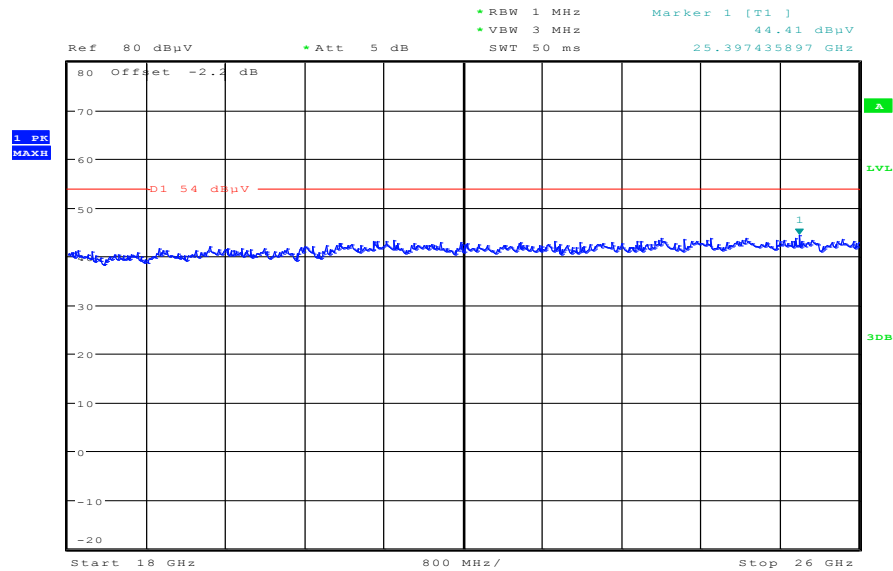
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

**Final Result 1**

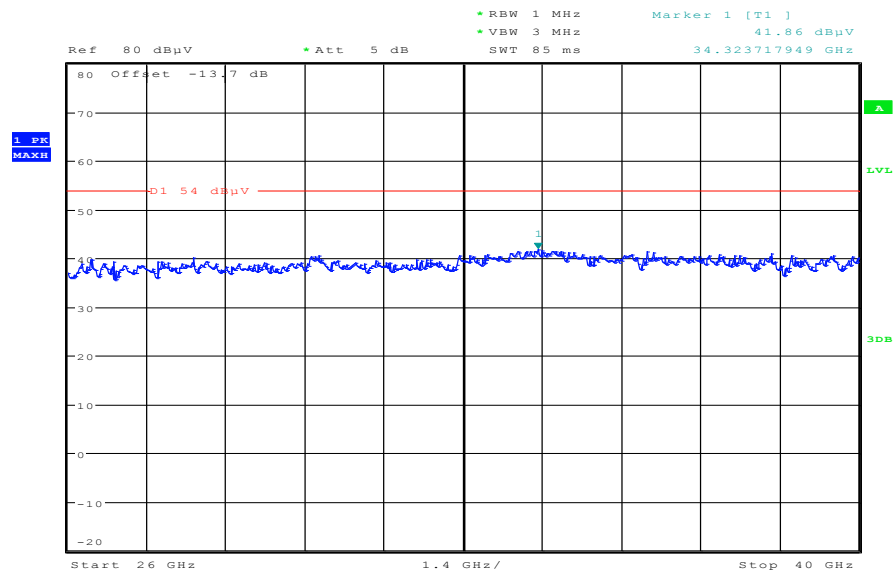
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
38.445300	9.5	1000.0	120.000	170.0	V	-9.0	13.3	20.5	30.0	
44.827050	10.2	1000.0	120.000	170.0	H	81.0	13.3	19.8	30.0	
51.153900	10.5	1000.0	120.000	111.0	H	80.0	13.3	19.5	30.0	
689.797650	19.8	1000.0	120.000	160.0	V	182.0	22.2	16.2	36.0	
747.494700	21.1	1000.0	120.000	170.0	V	280.0	23.6	14.9	36.0	
954.013500	22.8	1000.0	120.000	112.0	V	267.0	25.4	13.2	36.0	

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 3:** Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:24:35

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:12:58

Plot 5: Lowest channel, 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:28:04

Plot 6: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

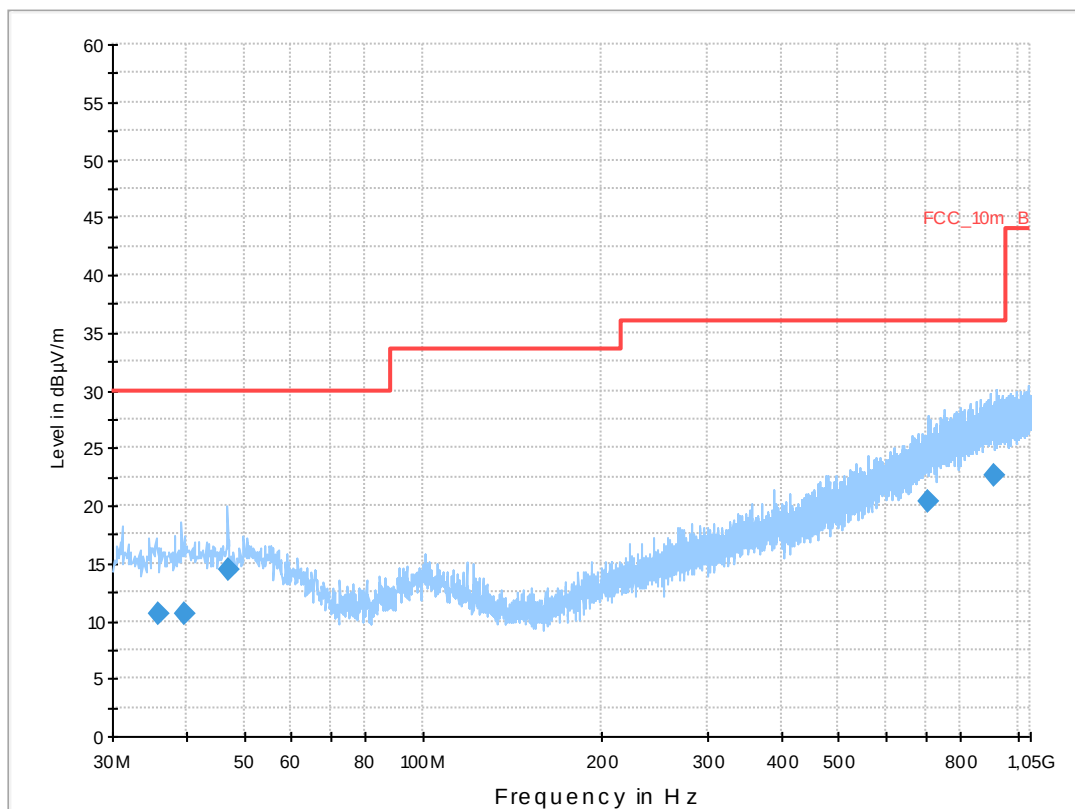
Common Information

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan ac-mode (HT40) tx ch 159
 Operator Name: Hennemann
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

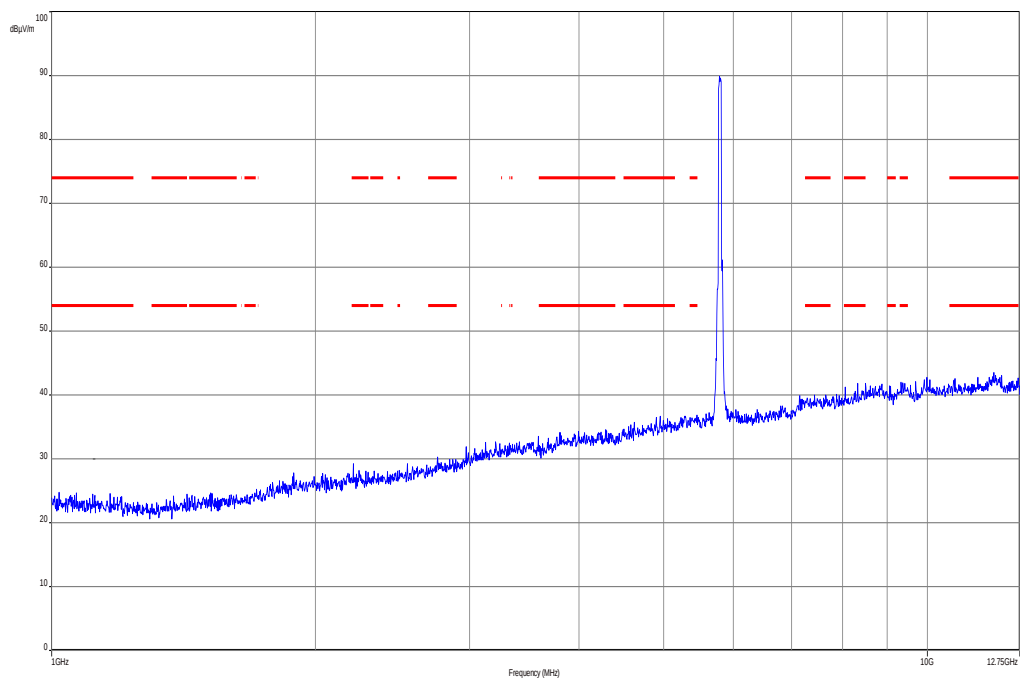
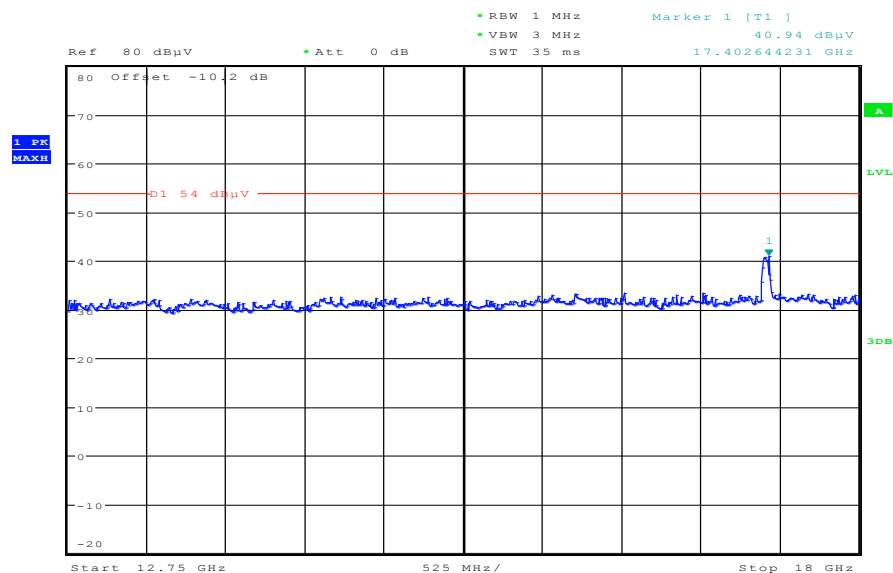
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

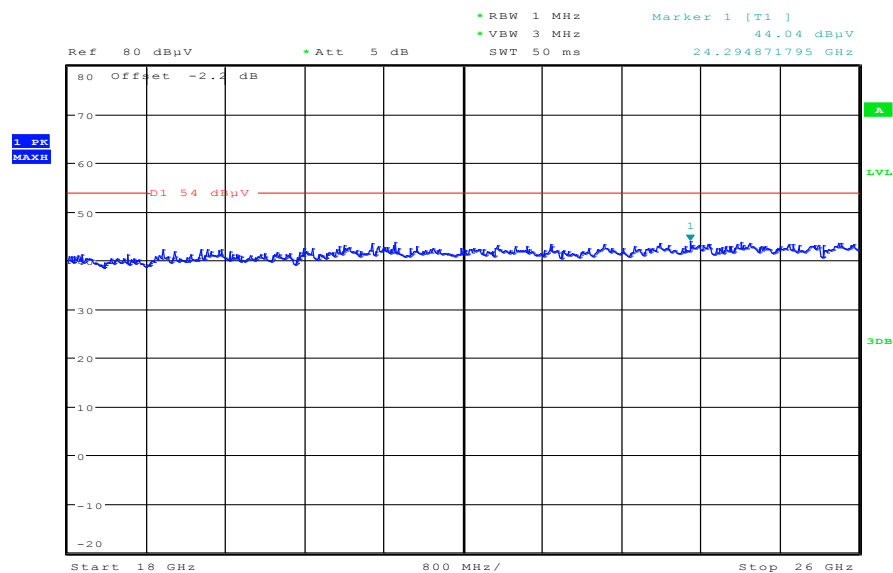


Final Result 1

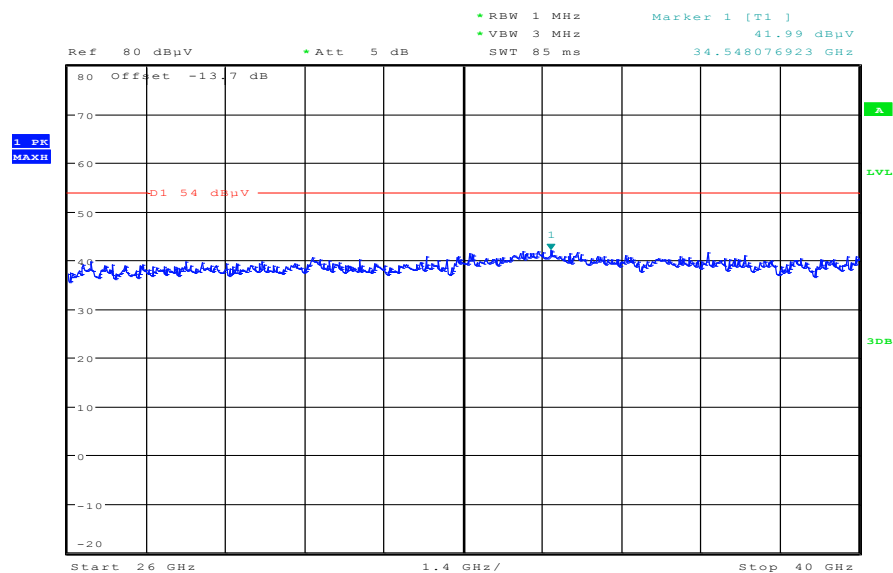
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.733000	10.7	1000.0	120.000	170.0	H	280.0	13.1	19.3	30.0	
39.669450	10.6	1000.0	120.000	98.0	V	265.0	13.4	19.4	30.0	
46.980750	14.5	1000.0	120.000	98.0	V	10.0	13.3	15.5	30.0	
707.749500	20.3	1000.0	120.000	170.0	H	171.0	22.7	15.7	36.0	
916.358850	22.6	1000.0	120.000	170.0	V	92.0	25.3	13.4	36.0	

Plot 7: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 8:** Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 15:25:22

Plot 9: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:13:43

Plot 10: Highest channel, 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 16.DEC.2013 16:28:43

Plots: OFDM / ac – mode HT80

Plot 1:, 30 MHz to 1 GHz, vertical & horizontal polarization

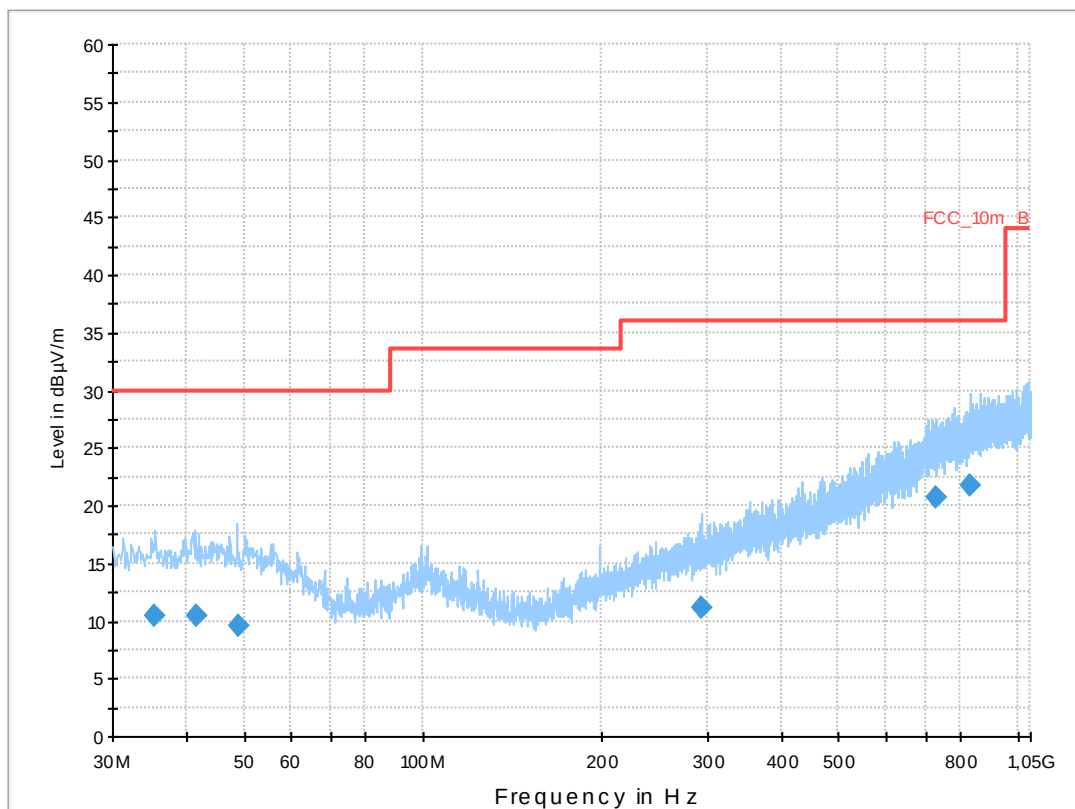
Common Information

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPG
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan ac-mode (HT80) tx ch 155
 Operator Name: Wolsdorfer
 Comment: battery powered

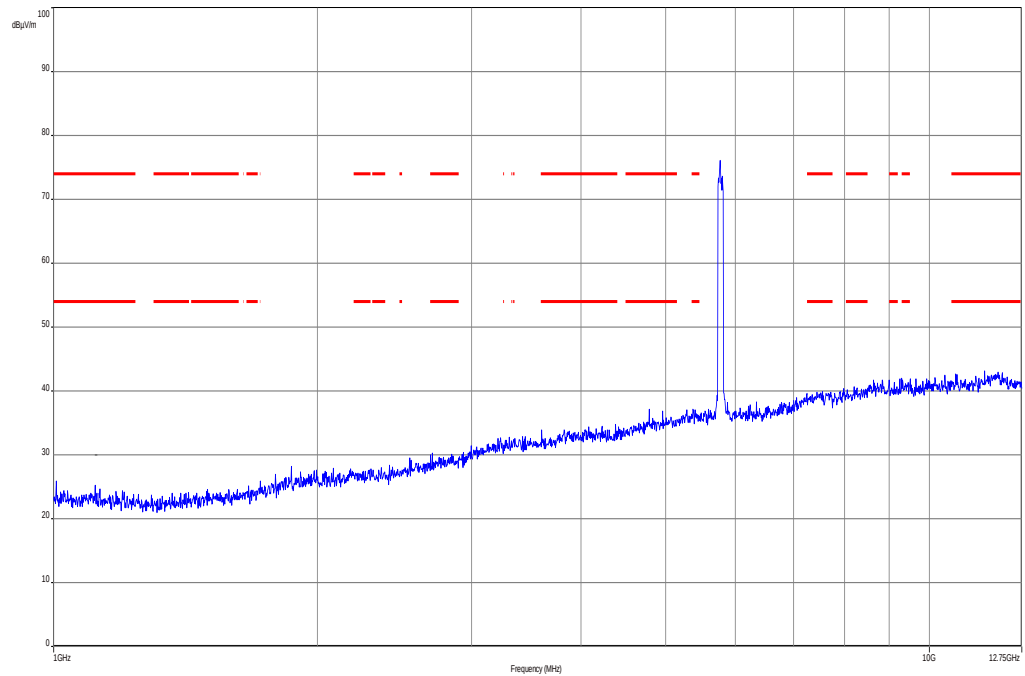
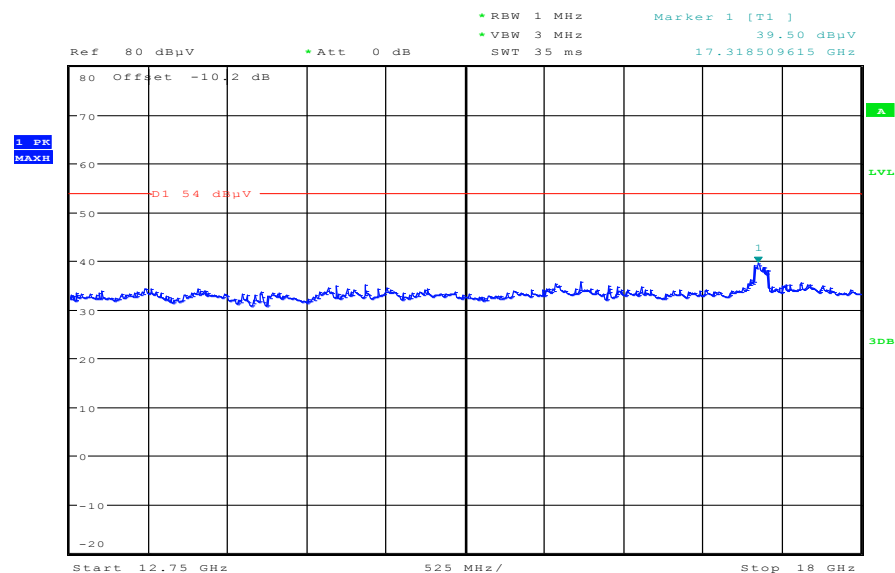
Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dB μ V/m

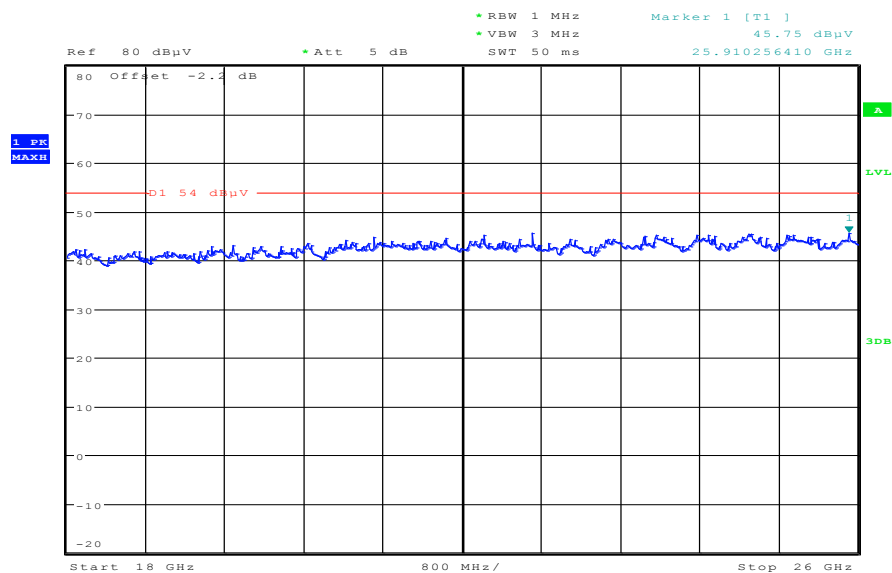
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

**Final Result 1**

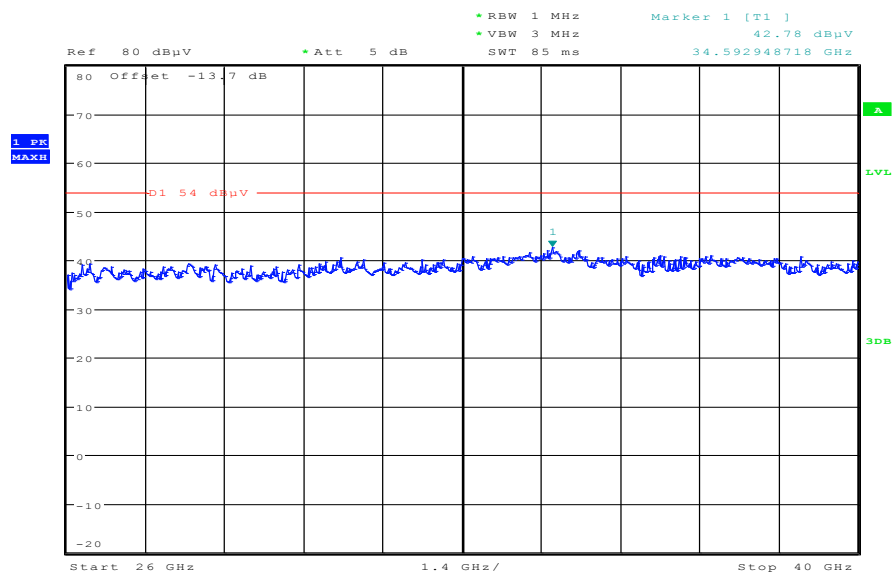
Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.202900	10.4	1000.0	120.000	170.0	V	260.0	13.0	19.6	30.0	
41.533350	10.4	1000.0	120.000	170.0	H	190.0	13.4	19.6	30.0	
48.833550	9.6	1000.0	120.000	142.0	V	280.0	13.3	20.4	30.0	
293.284500	11.1	1000.0	120.000	141.0	V	100.0	14.4	24.9	36.0	
729.205050	20.7	1000.0	120.000	170.0	V	10.0	23.2	15.3	36.0	
829.315050	21.8	1000.0	120.000	111.0	H	85.0	24.2	14.2	36.0	

Plot 2: 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization**

Date: 21.DEC.2013 08:15:22

Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization

Date: 21.DEC.2013 08:16:32

Plot 5: 26 GHz to 40 GHz, vertical & horizontal polarization

Date: 21.DEC.2013 08:30:41

10.8 RX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in idle/receive mode. The results are valid for both modes.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	3 x RBW Remeasurement: 10 Hz / 3 MHz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold

Limits:

FCC		-/-
RX Spurious Emissions Radiated		
Frequency (MHz)	Field Strength (dB μ V/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results:

RX Spurious Emissions Radiated [dB μ V/m]		
F [MHz]	Detector	Level [dB μ V/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
All detected peaks are below the average limit!		
Measurement uncertainty	± 3 dB	

Result: **Passed.**

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

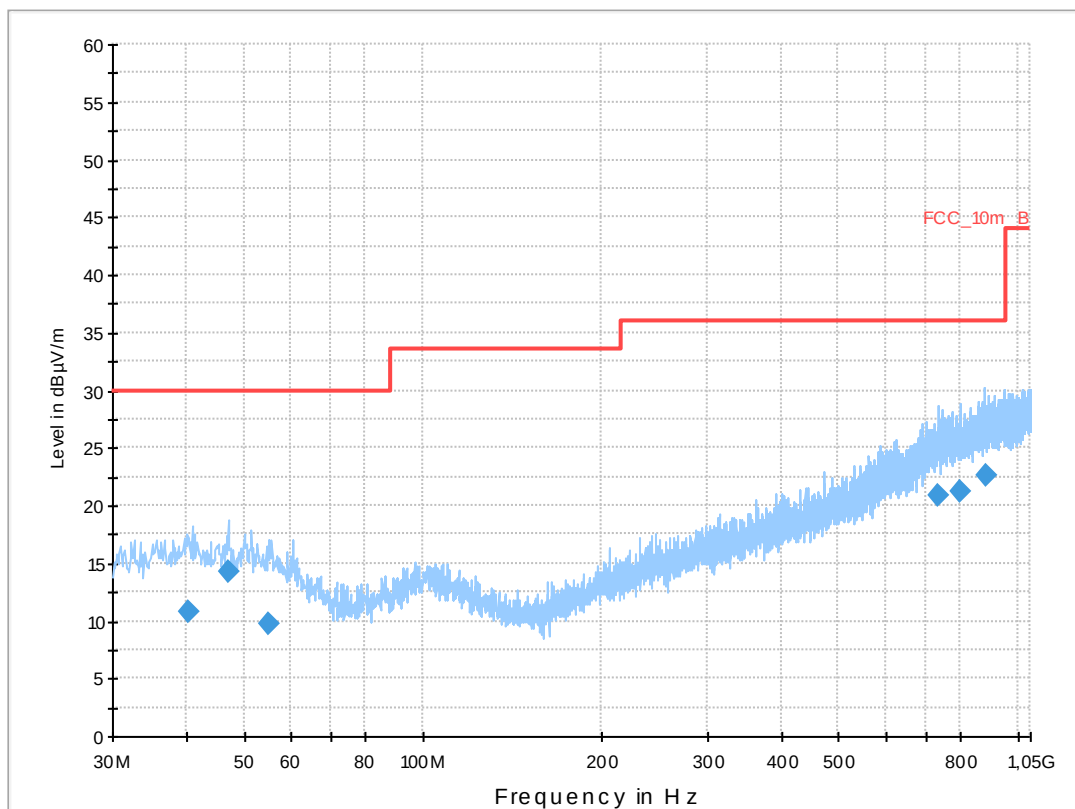
Plots: RX / Idle – mode**Plot 1:** 30 MHz to 1 GHz, vertical & horizontal polarization**Common Information**

EUT: PM-0740-BV
 Serial Number: CB5A1W1HPS
 Test Description: FCC part 15 class B @ 10 m
 Operating Conditions: w-lan idle
 Operator Name: Hennemann
 Comment: battery powered

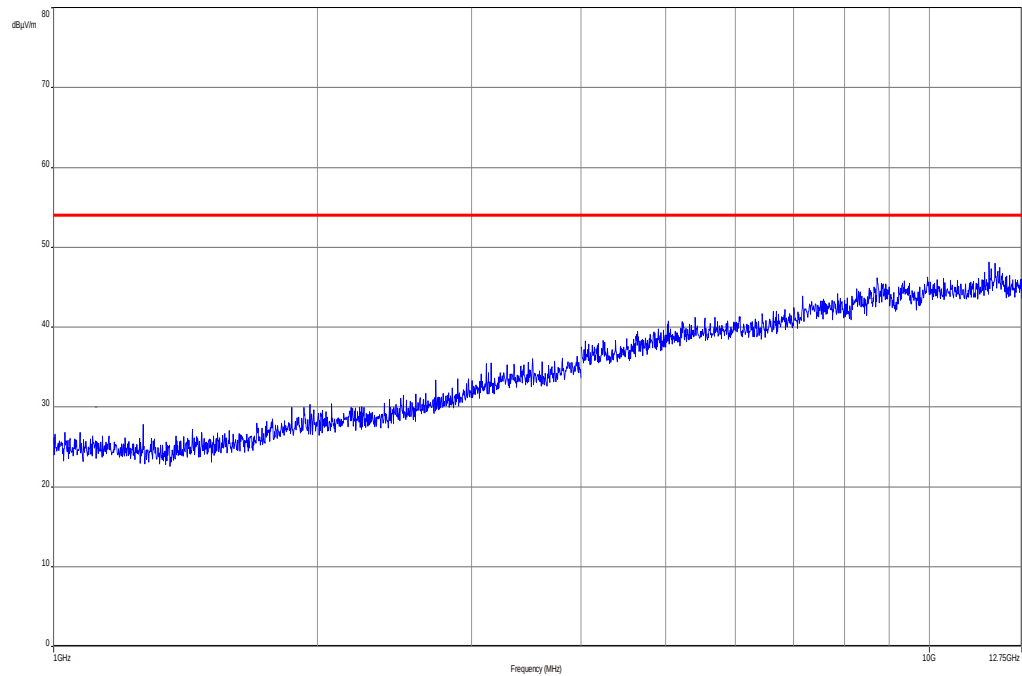
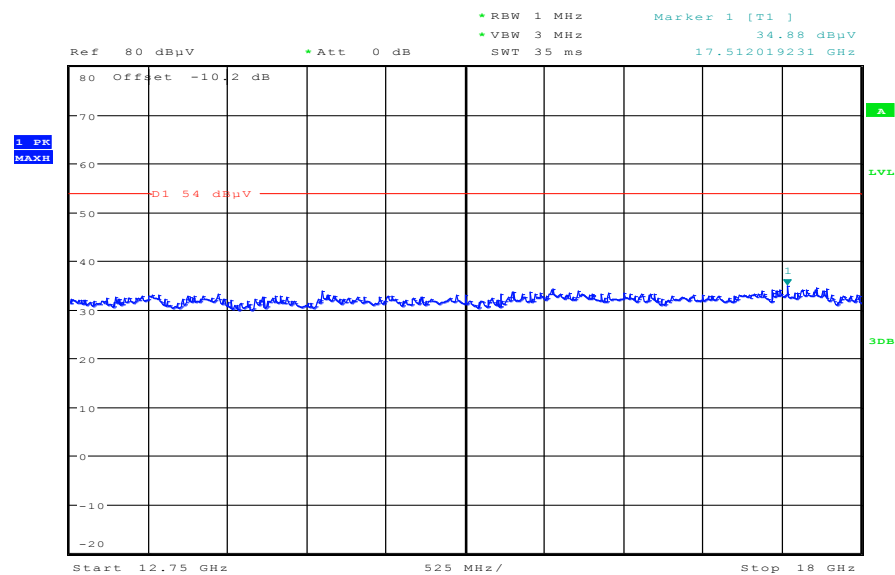
Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Receiver: [ESC1 3]
 Level Unit: dB μ V/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

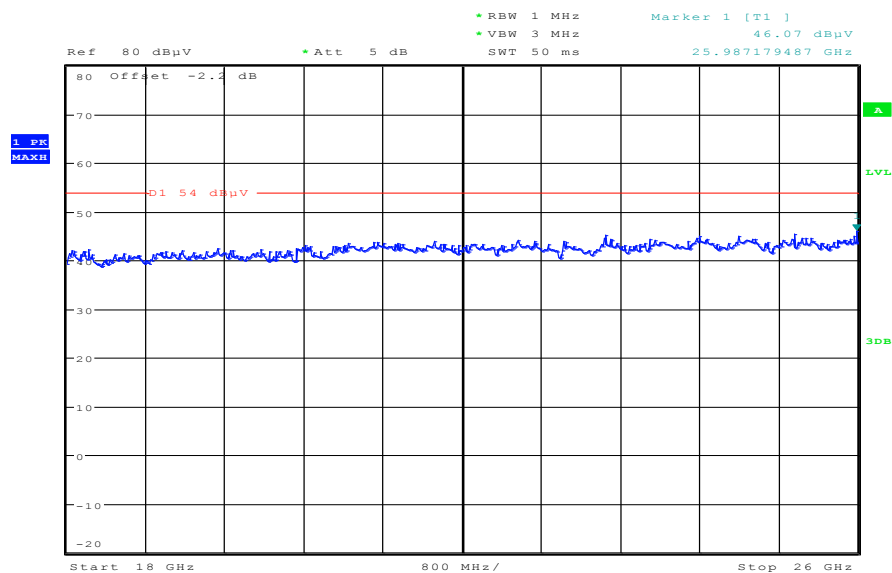
**Final Result 1**

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
40.324200	10.8	1000.0	120.000	170.0	H	10.0	13.4	19.2	30.0	
46.969500	14.2	1000.0	120.000	98.0	V	190.0	13.3	15.8	30.0	
55.074450	9.8	1000.0	120.000	170.0	V	-9.0	12.9	20.2	30.0	
734.392950	20.9	1000.0	120.000	111.0	V	280.0	23.3	15.1	36.0	
797.965200	21.2	1000.0	120.000	170.0	H	-10.0	23.8	14.8	36.0	
881.866650	22.6	1000.0	120.000	104.0	H	10.0	25.0	13.4	36.0	

Plot 2: 1 GHz to 12.75 GHz, vertical & horizontal polarization**Plot 3:** 12.75 GHz to 18 GHz, vertical & horizontal polarization

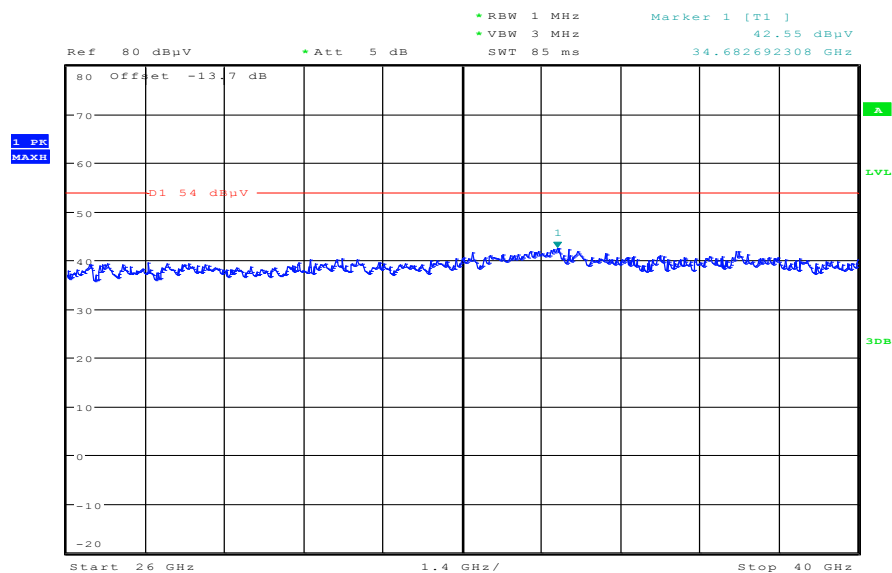
Date: 21.DEC.2013 08:38:05

Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 21.DEC.2013 08:37:11

Plot 5: 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 21.DEC.2013 08:35:54

10.9 Spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to mid channel. This measurement is representative for all channels and modes. If peaks are found the lowest channel and the highest channel will be measured too. The measurement is performed with the data rate producing the highest output power. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

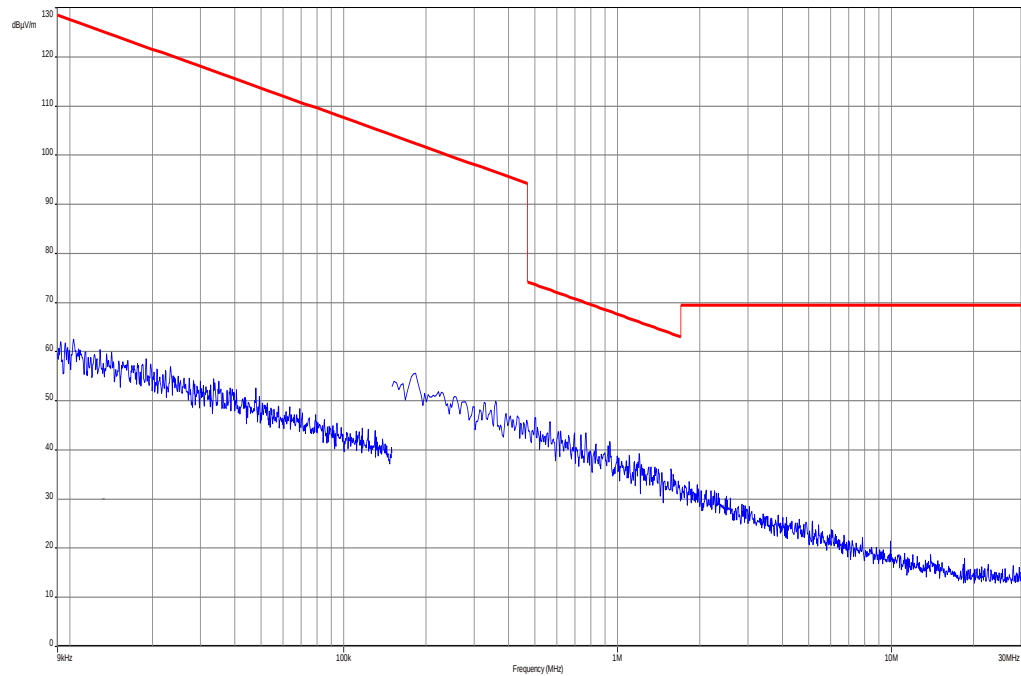
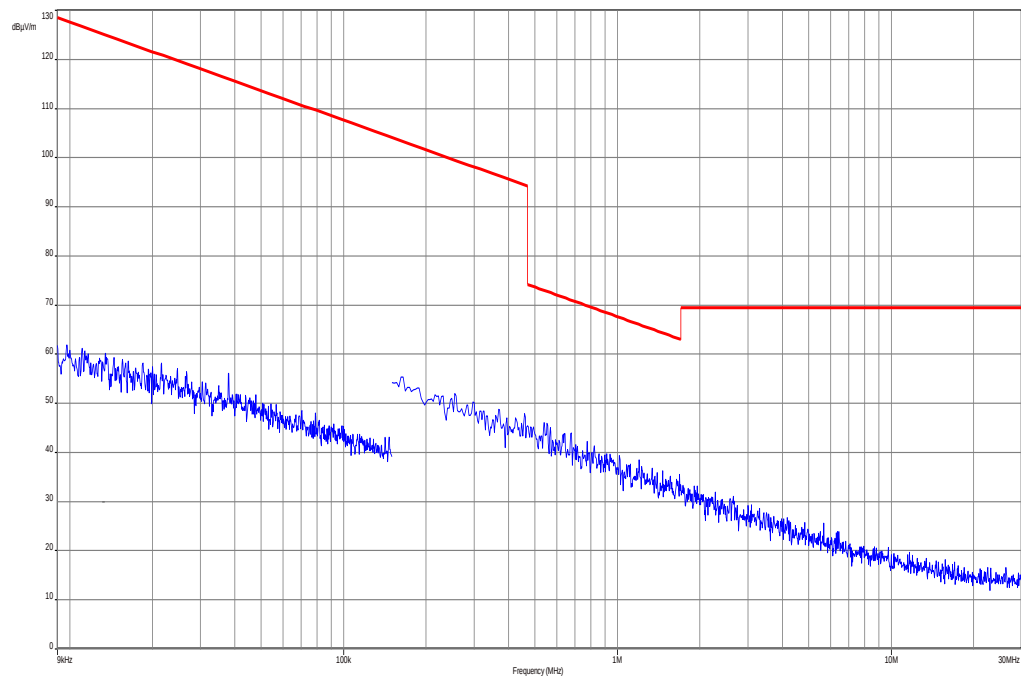
Limits:

FCC		-/-
TX Spurious Emissions Radiated < 30 MHz		
Frequency (MHz)	Field Strength (dBμV/m)	Measurement distance
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

Results:

TX Spurious Emissions Radiated < 30 MHz [dBμV/m]		
F [MHz]	Detector	Level [dBμV/m]
No peaks found.		
Measurement uncertainty	± 3 dB	

Result: Passed

Plots: TX mode**Plot 1: 9 kHz to 30 MHz****Plots: RX / Idle – mode****Plot 1: 9 kHz to 30 MHz**

10.10 Spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to mid channel. If peaks are found the lowest channel and the highest channel will be measured too. The measurement is performed with the data rate producing the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are re-measured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

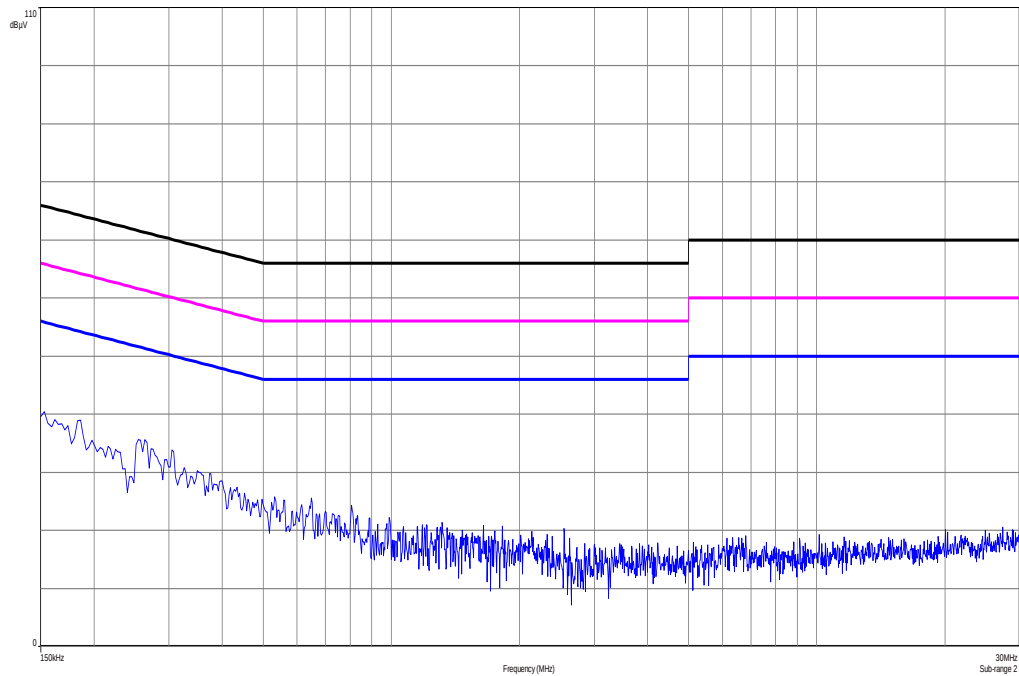
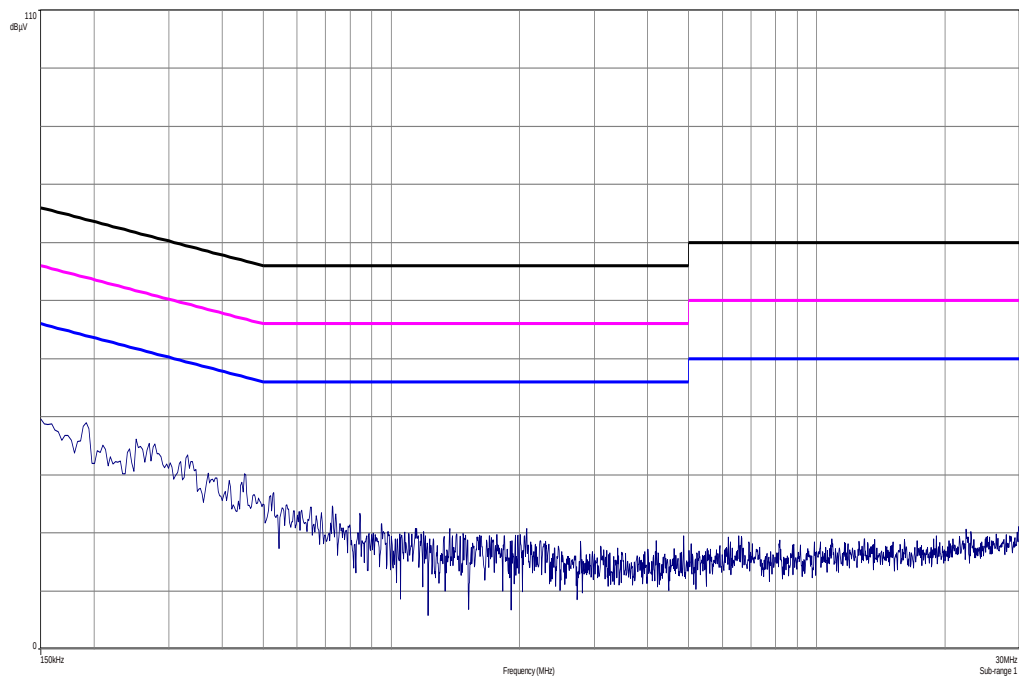
FCC		-/-
TX Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dBμV/m)	Average (dBμV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

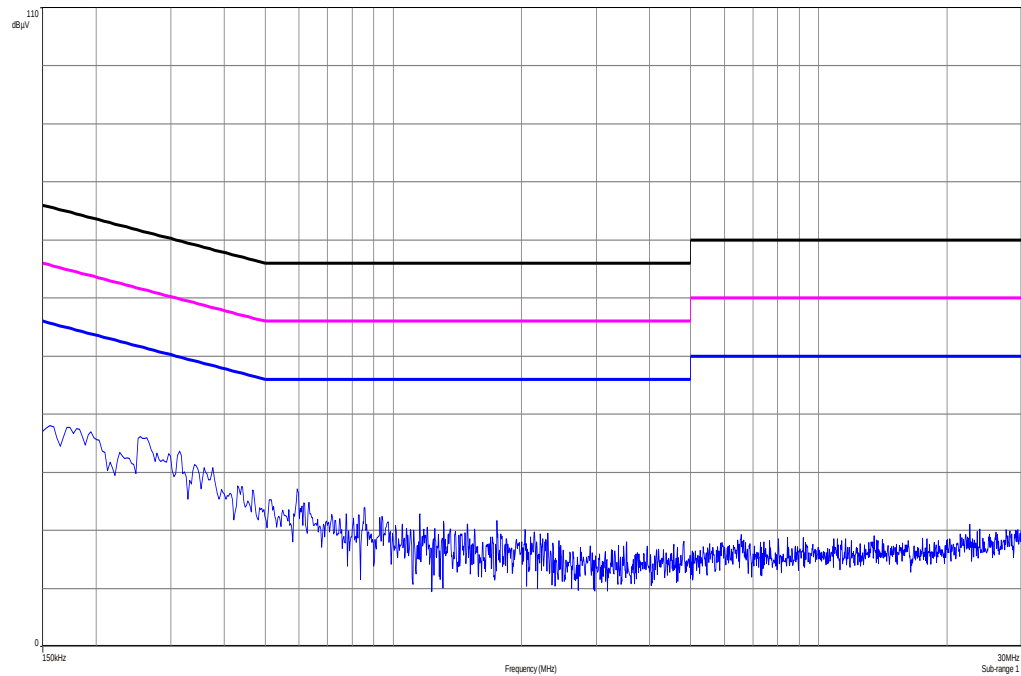
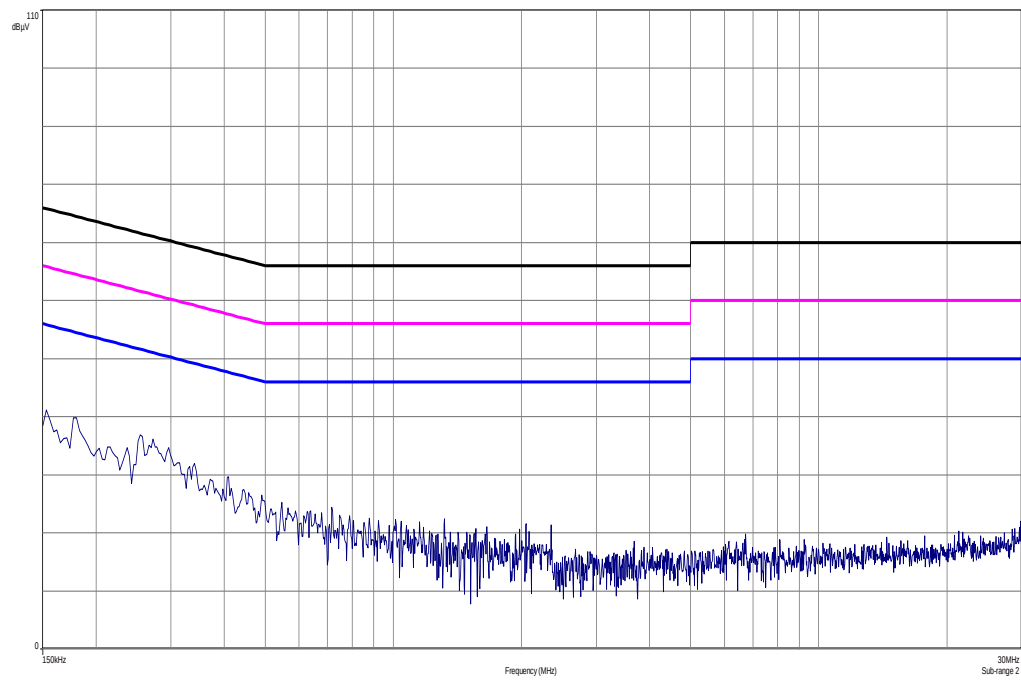
*Decreases with the logarithm of the frequency

Results:

TX Spurious Emissions Conducted < 30 MHz [dBμV/m]		
F [MHz]	Detector	Level [dBμV/m]
No peaks detected. All detected peak values are below the average limits.		
Measurement uncertainty	± 3 dB	

Result: Passed

Plots:**Plot 1: TX mode, 150 kHz to 30 MHz, phase line****Plot 2: TX mode, 150 kHz to 30 MHz, neutral line**

Plot 3: RX / Idle – mode, 150 kHz to 30 MHz, phase line**Plot 4: RX / Idle – mode, 150 kHz to 30 MHz, neutral line**

11 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081; B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	09.01.2013	09.01.2014
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	Ve	14.07.2011	14.01.2014
6	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	12.04.2012	12.04.2014
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	16.01.2013	16.01.2014
12	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
13	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKII	08.05.2013	08.05.2015
14	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
15	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
16	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
17	9	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
18	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
19	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
20	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
21	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vIKII	14.10.2011	14.10.2014
22	n. a.	MXE EMI Receiver 20 Hz	N9038A	Agilent Technologi	MY51210197	300004405	k	21.02.2013	21.02.2014

		bis 26.5 GHz		es					
23	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
24	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787	k	22.07.2013	22.07.2015
25	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442	k	19.07.2013	19.07.2015
26	A031	Std. Gain Horn Antenna 26.5 to 40.0 GHz	637	Narda	GB42110541	300000510	k	19.07.2013	19.07.2015
27	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	09.10.2012	09.10.2014
28	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL18503 070-XX	CERNEX	19338	300004273	ne		
29	n. a.	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	22.10.2012	22.01.2014
30	n. a.	Power Supply 0-20V, 0-5A	6632B	Agilent Technologies	GB42110541	400000562	vlKI!	10.01.2013	10.01.2016

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlKI!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

12 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A Document history

Version	Applied changes	Date of release
	Initial release	2014-01-18
A	Canada removed	2014-01-22

Annex B Further information**Glossary**

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software

Annex C Accreditation Certificate

Front side of certificate



Back side of certificate



Note:

The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

<http://www.cetecom.com/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html>