CETECOM™
CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-4254/12-24-08-B

DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

Testing laboratory

CETECOM ICT Services GmbH
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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/Satellite Communications

Applicant

Sony Mobile Communications AB
Nya Vattentornet
22188 Lund / SWEDEN
Phone: +46 46 19 30 00
Fax: +46 46 19 32 95
Contact: Håkan Sjöberg
e-mail: hakan.sjoberg@sonymobile.com
Phone: +46 46 19 35 59

Manufacturer

Sony Mobile Communications AB
Nya Vattentornet
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
RSS - 210 Issue 8	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

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

Test Item

Kind of test item:	**GSM Mobile Phone GPRS/EGPRS 850/900/1800/1900; UMTS FDDI/FDDV/FDDVI/FDDXIX; HSPA; LTE Band 1; BT3.1; WLAN a/b/g/n; AGPS; RFID, FM Rx**
Model name:	**PM-0020-BV**
FCC ID:	**PY7PM-0020**
IC:	
Frequency:	ISM band 5150 MHz to 5250 MHz; 5250 MHz to 5350 MHz and 5470 MHz to 5725 MHz
Technology tested:	WLAN (OFDM → a – mode / n – mode HT20 & n – mode HT40)
Antenna:	Integrated antenna
Power Supply:	3.7 V DC by Li - ion battery
Temperature Range:	-20°C to +55 °C

Test report authorised:

2012-06-26 Andreas Luckenbill

Test performed:

2012-06-26 Marco Bertolino
Testing Manager

1 Table of contents

2 General information

2.1 Notes and disclaimer

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2.2 Application details

Date of receipt of order:	2012-04-26
Date of receipt of test item:	2012-05-23
Start of test:	2012-05-31
End of test:	2012-06-05
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	2010-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	2010-12	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

4 Test environment

Temperature:	T_{nom}	+22	℃ during room temperature tests
	T_{max}	+55	℃ during high temperature tests
	T_{min}	-20	℃ during low temperature tests
Relative humidity content:		45 %	
Barometric pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	3.7 V	DC by Li - ion battery
	V_{max}	4.1 V	
	V_{min}	3.3 V	

5 Test item

Kind of test item	**:**	**GSM Mobile Phone GPRS/EGPRS 850/900/1800/1900; UMTS FDDI/FDDV/FDDVI/FDDXIX; HSPA; LTE Band 1; BT3.1; WLAN a/b/g/n; AGPS; RFID, FM Rx**
Type identification	**:**	**PM-0020-BV**
S/N serial number	**:**	**Radiated units: CB5A1K3QFR** **Conducted units: CB5A1K3QF1, CB5A1K3QG0**
HW hardware status	**:**	**AP1**
SW software status	**:**	**7.0.A.0.649**
Frequency band [MHz]	**:**	**ISM bands:** - **5150 MHz to 5250 MHz** - **5250 MHz to 5350 MHz** - **5470 MHz to 5725 MHz**
Type of radio transmission **Use of frequency spectrum**	**:** **:**	**OFDM**
Channel access method	**:**	**FDMA**
Type of modulation	**:**	**QPSK, 16 – QAM, 64 – QAM**
Number of channels	**:**	**19**
Antenna	**:**	**OFDM**
Power supply	**:**	**3.7 V DC by Li - ion battery**
Temperature range	**:**	**-20℃ to +55 ℃**

6 Test laboratories sub-contracted

None

7 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 RSS 210, Issue 8, Annex 8	Passed	2012-06-26	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	Pass	Fail	NA	NP	Results (max.)
-/-	Output power verification (conducted)	Nominal	Nominal	☐	☐	☐	☐	No passed / fail criteria!
-/-	Gain	Nominal	Nominal	☐	☐	☐	☐	No passed / fail criteria!
U-NII Part 15	Duty cycle	Nominal	Nominal	☐	☐	☐	☐	No passed / fail criteria!
§15.407(a) RSS-210	Maximum output power (conducted & radiated)	Nominal	Nominal	☒	☐	☐	☐	complies
§15.407(a) RSS-210	Power spectral density	Nominal	Nominal	☒	☐	☐	☐	complies
§15.407(a) RSS-210	Spectrum bandwidth 26dB bandwidth	Nominal	Nominal	☒	☐	☐	☐	complies
§15.407(a) RSS-210	Peak excursion measurements	Nominal	Nominal	☒	☐	☐	☐	complies
§15.205 RSS-210	Band edge compliance radiated	Nominal	Nominal	☒	☐	☐	☐	complies
§15.407(b) RSS-210	TX spurious emissions radiated	Nominal	Nominal	☒	☐	☐	☐	complies
§15.109 RSS-Gen.	RX spurious emissions radiated	Nominal	Nominal	☒	☐	☐	☐	complies
§15.209(a) RSS-Gen	Spurious emissions radiated < 30 MHz	Nominal	Nominal	☒	☐	☐	☐	complies
§15.107(a)	Spurious emissions conducted emissions < 30 MHz	Nominal	Nominal	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

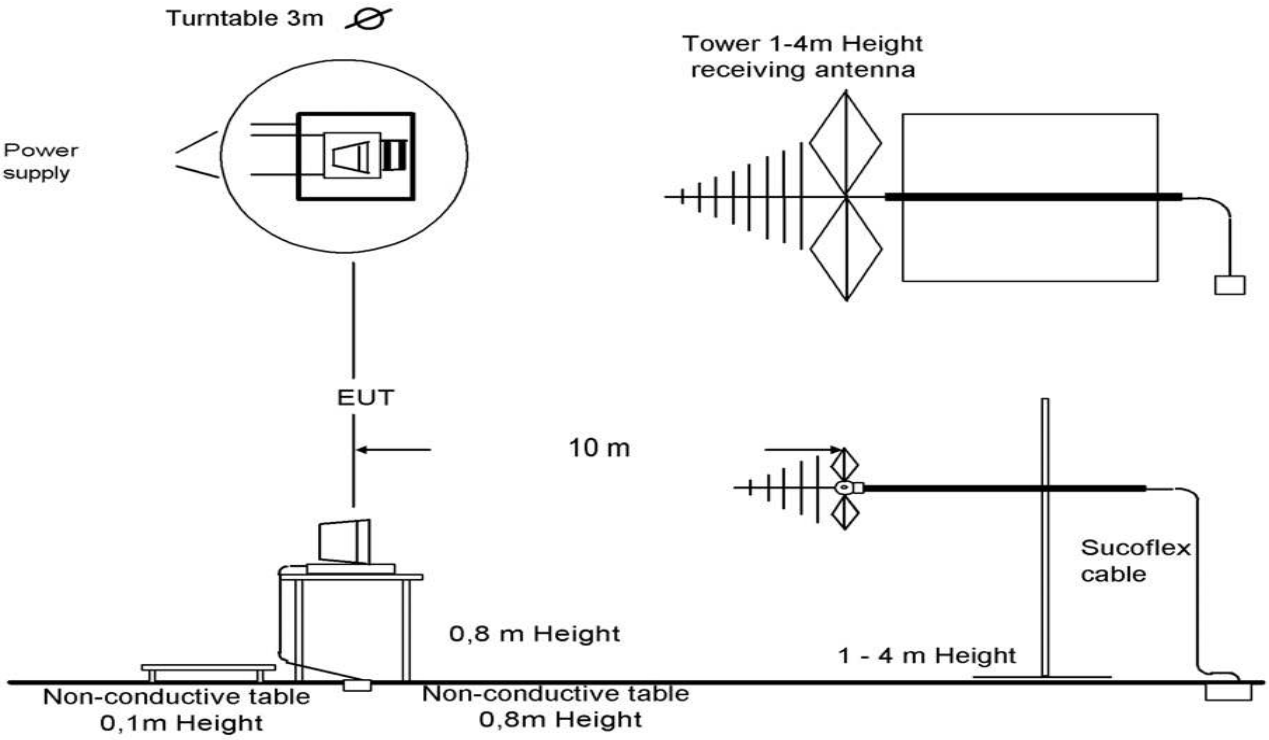
8 RF measurements

8.1 Description of test setup

8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 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 C63.2-1996 clause 15 and ANSI C63.4-2009 clause 4.1.5. 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 C63-4-2009 clause 4.2.
Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



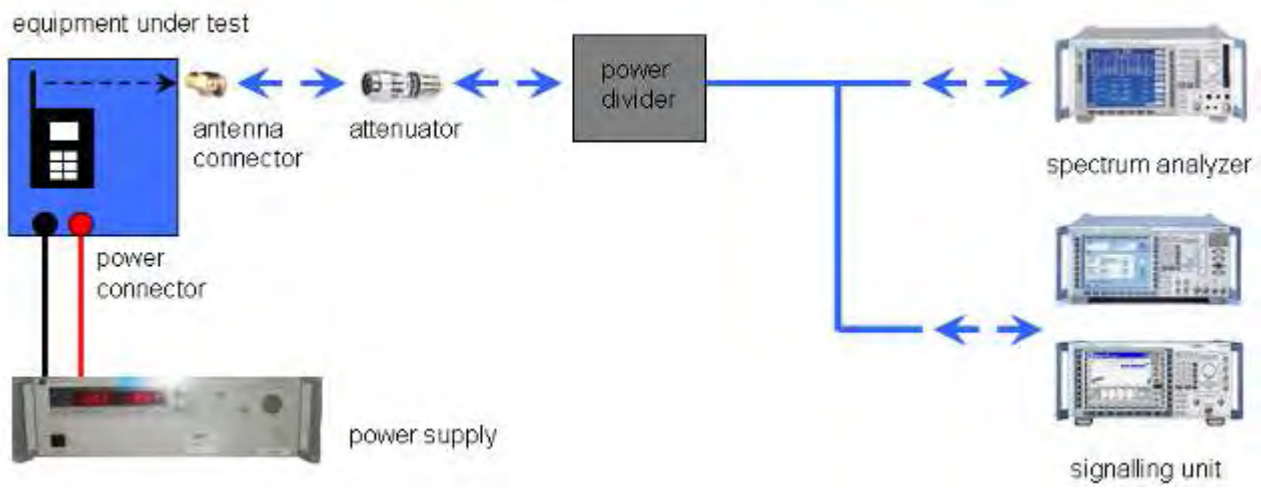
Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

The EUT is powered by an external power supply with nominal voltage

8.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal paths is connected to the communication base Station (CMU200 or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signalling unit and the spectrum analyzer are impedance matched on 50 Ohm.



Picture 2: Diagram conducted measurements

8.2 Additional comments

Reference documents:	Komachi_FCC_WLAN_command_20120511
Special test descriptions:	OFDM / a – mode setting → channel, data rate, 1,1000,10,0,13 OFDM / n – mode HT20 setting → channel, data rate, 1,1000,10,0,12 OFDM / n – mode HT40 setting → channel, data rate, 1,1000,10,0,12,1
Configuration descriptions:	None
Test mode:	☐ No test mode available. ☒ Special software is used. EUT is transmitting pseudo random data by itself

8.3 RSP100 test report cover sheet / performance test data

Test report number	:	1-4254/12-24-08-B
Equipment model number	:	PM-0020-BV
Certification number	:	
Manufacturer (complete address)	:	Sony Mobile Communications AB Nya Vattentornet 22188 Lund / SWEDEN
Tested to radio standards specification no.	:	RSS 210, Issue 8
Open area test site IC No.	:	IC 3462C-1
Frequency range	:	ISM bands: 5150 MHz to 5250 MHz, 5250 MHz to 5350 MHz and 5470 MHz to 5725 MHz
RF-power [mW] (max.)	:	Conducted: OFDM / a – mode: 11.30 OFDM / n – mode HT20: 8.97 OFDM / n – mode HT40: 10.59 Radiated: OFDM / a – mode: 24.72 OFDM / n – mode HT20: 19.63 OFDM / n – mode HT40: 20.51
Occupied bandwidth (99%-BW) [MHz]	:	OFDM / a – mode: 17.79 OFDM / n – mode HT20: 18.27 OFDM / n – mode HT40: 36.38
Type of modulation	:	OFDM with QPSK, 16 – QAM, 64 – QAM
Emission designator (TRC-43)	:	OFDM / a – mode: 17M8G7D OFDM / n – mode HT20: 18M3G7D OFDM / n – mode HT40: 36M4G7D
Antenna information	:	Integrated antenna
Transmitter spurious (worst case) [dBµV/m @ 3m]	:	48 @ 12.5 GHz (noise floor)
Receiver spurious (worst case) [dBµV/m @ 3m]	:	48 @ 12.5 GHz (noise floor)

ATTESTATION:
DECLARATION OF COMPLIANCE:

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Laboratory manager:

2012-06-26	Marco Bertolino	
Date	Name	Signature

9 Measurement results

9.1 Output power verification (conducted)

Description:

Measurement of the maximum output power conducted. This measurement is performed only at the middle channel in both modes and all data rates to determine the data rate per mode which results in the highest output power. This mode will be selected for all further measurements.

Used measurement option: 5.2.1.1 PK1

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	5s
Resolution bandwidth:	> EBW
Video bandwidth:	≥ 3 x RBW (or the maximum of the analyzer)
Span:	Zero span
Trace-Mode:	Max hold (allow trace to fully stabilize)

Results:

OFDM / a – mode	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	6	9	12	18	24	36	48	54
Ch 48 - 5240 MHz	18.91	18.15	18.10	18.59	18.45	18.55	18.68	18.47
Measurement uncertainty	± 0.5 dB							

OFDM / n – mode HT 20	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch 48 - 5240 MHz	17.94	17.89	18.84	18.35	18.39	18.46	18.20	17.59
Measurement uncertainty	± 0.5 dB							

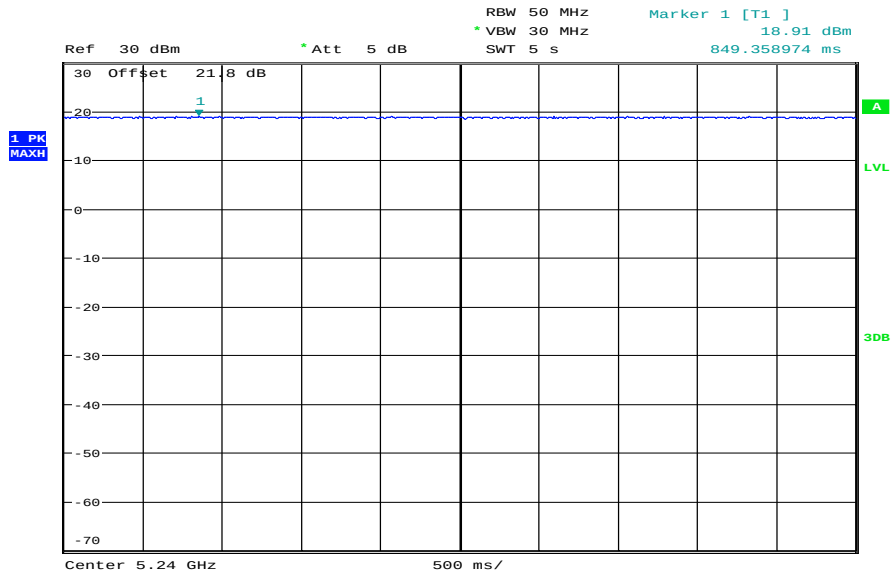
OFDM / n – mode HT40	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch 44 - 5230 MHz	17.72	17.97	17.75	17.47	17.60	17.20	18.26	17.54
Measurement uncertainty	± 0.5 dB							

Result: **Selected data rate for all measurements:**

OFDM / a – mode: **6 MBit/s**
OFDM / n – mode HT20: **MCS2**
OFDM / n – mode HT40: **MCS6**

Plots: OFDM / a – mode

Plot 1: 6 Mbit/s



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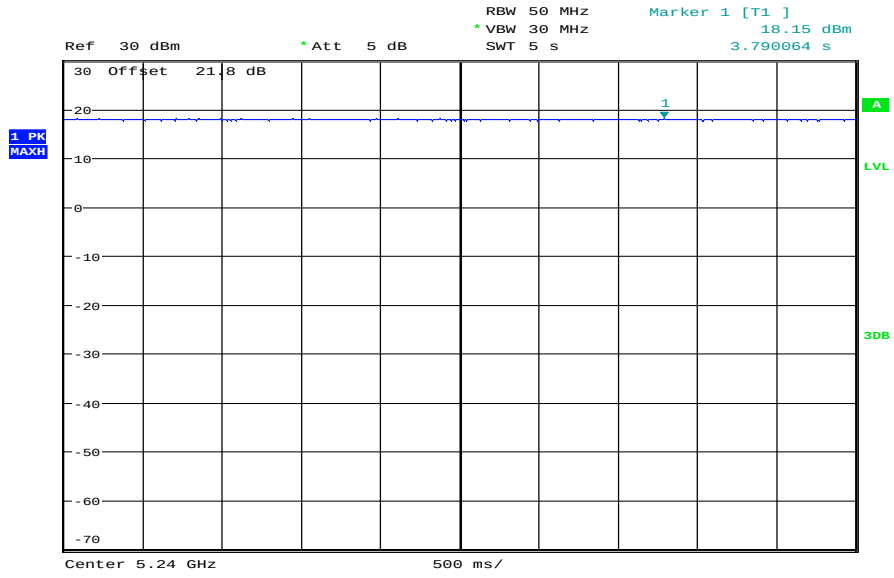
Plot 2: 9 Mbit/s



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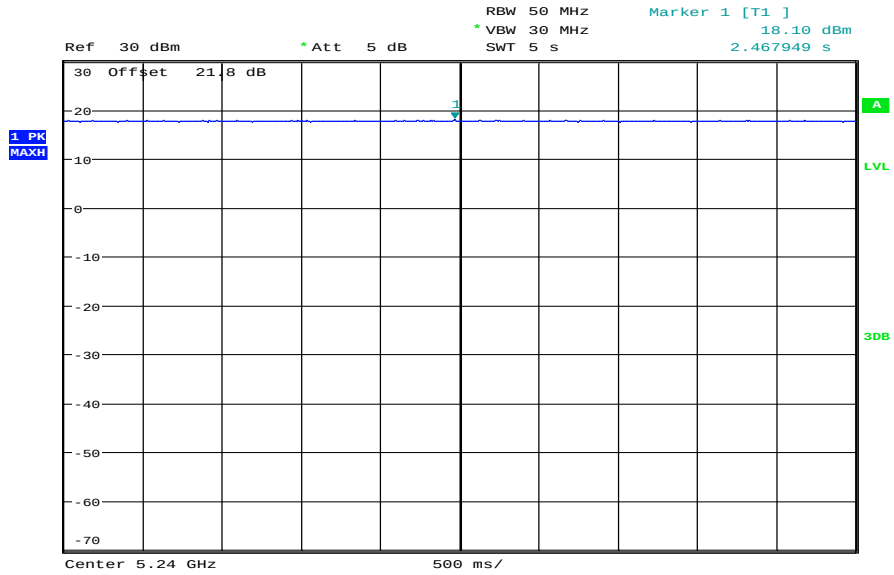
Plot 3: 12 Mbit/s



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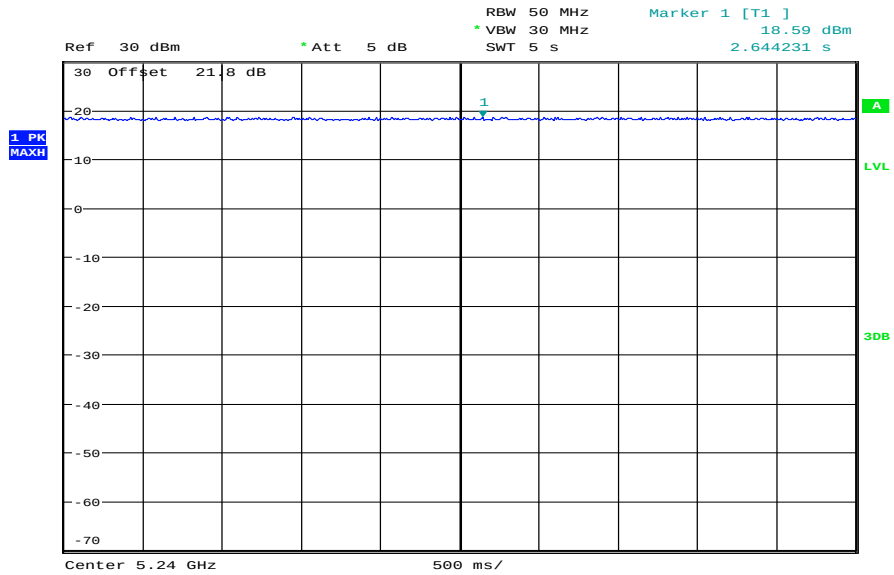
Plot 4: 18 Mbit/s



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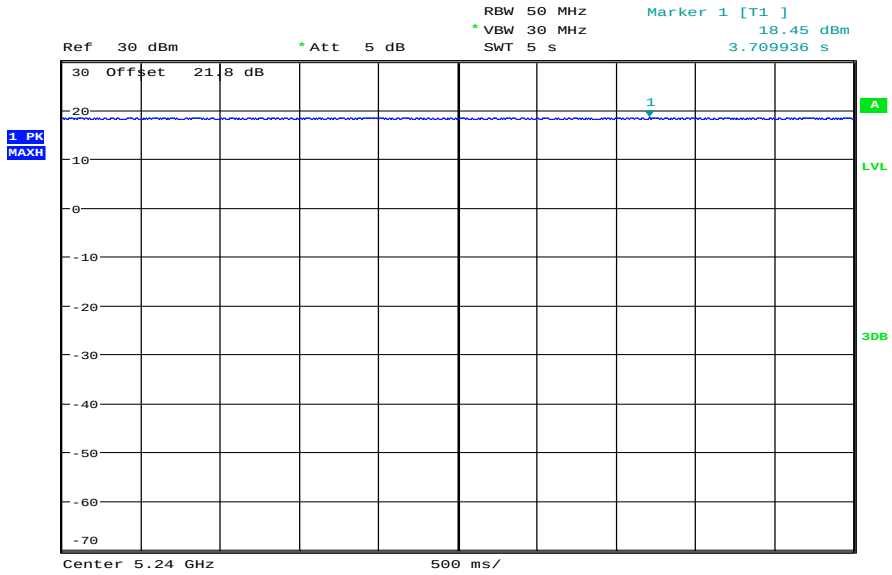
Plot 5: 24 Mbit/s



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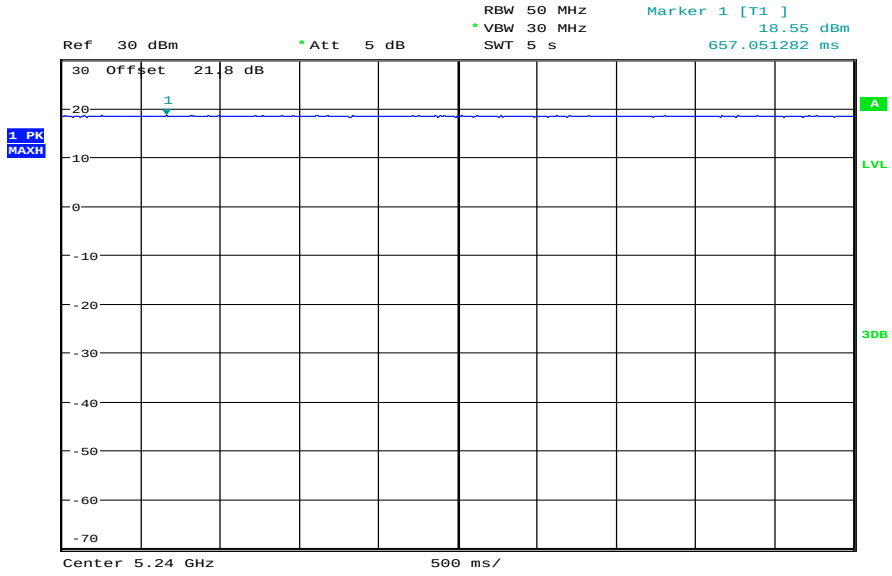
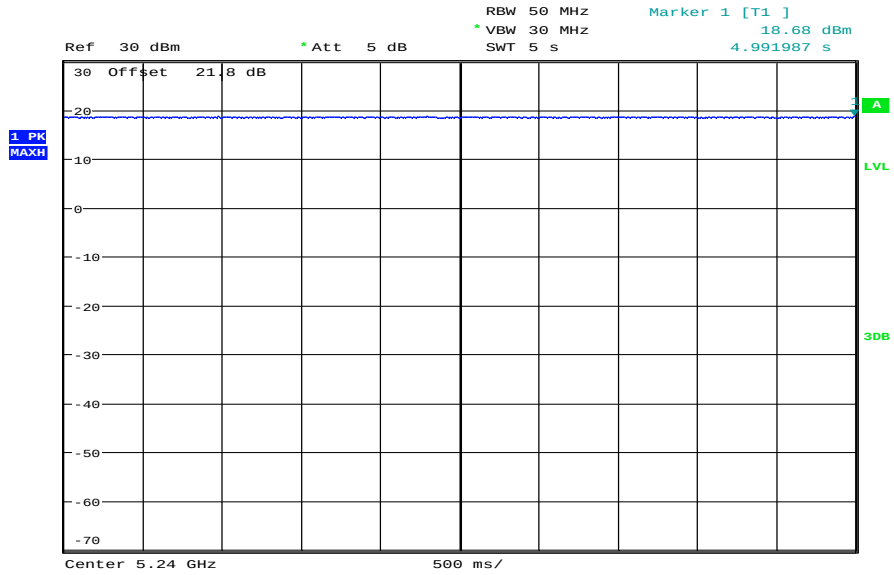
Plot 6: 36 Mbit/s



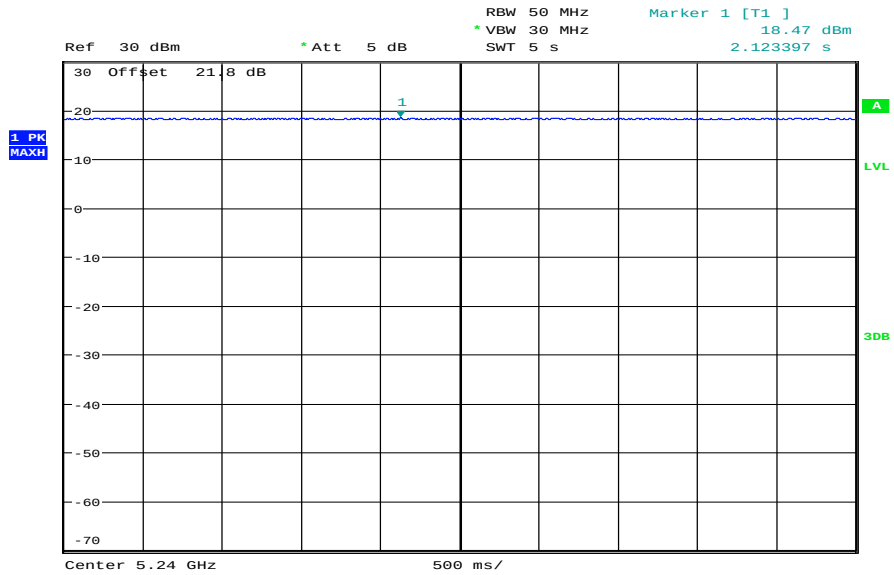
Date: 31.MAY.2012 07:44:14

Plot 7: 48 Mbit/s



Date: 31.MAY.2012 07:45:14

Plot 8: 54 Mbit/s



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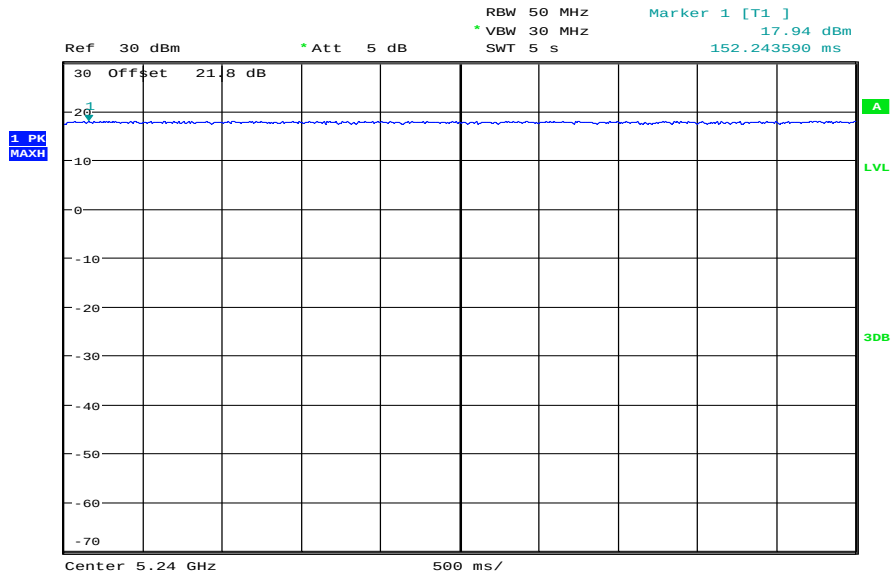
Plots: OFDM / n – mode HT20

Plot 1: MCS0



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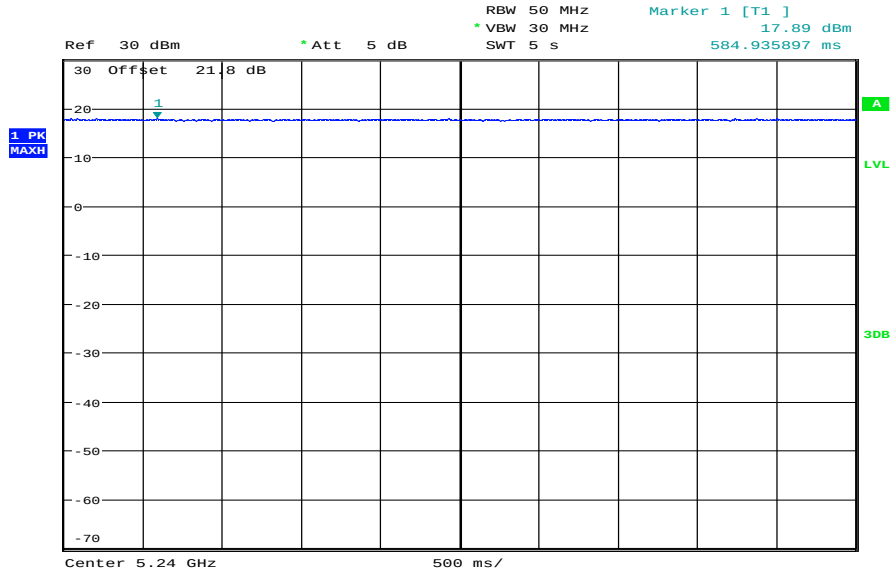
Plot 2: MCS1



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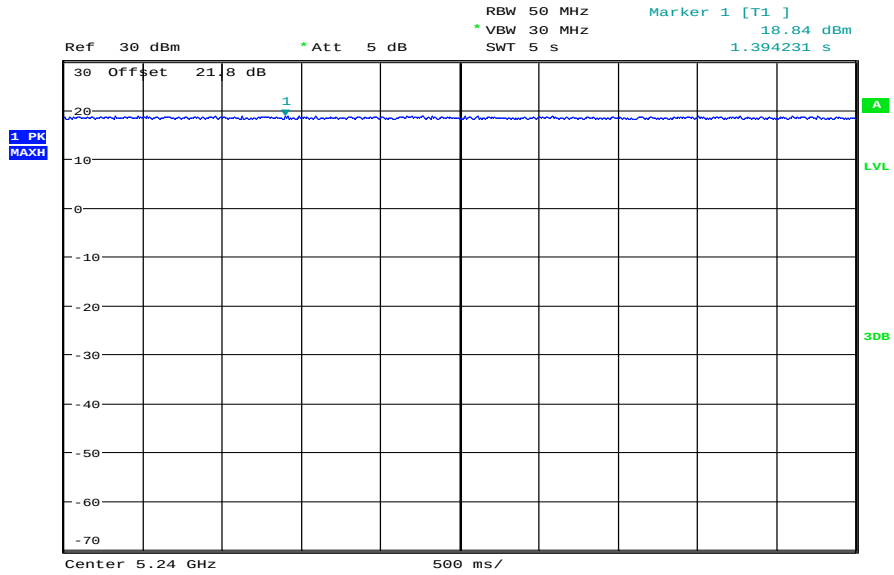
Plot 3: MCS2



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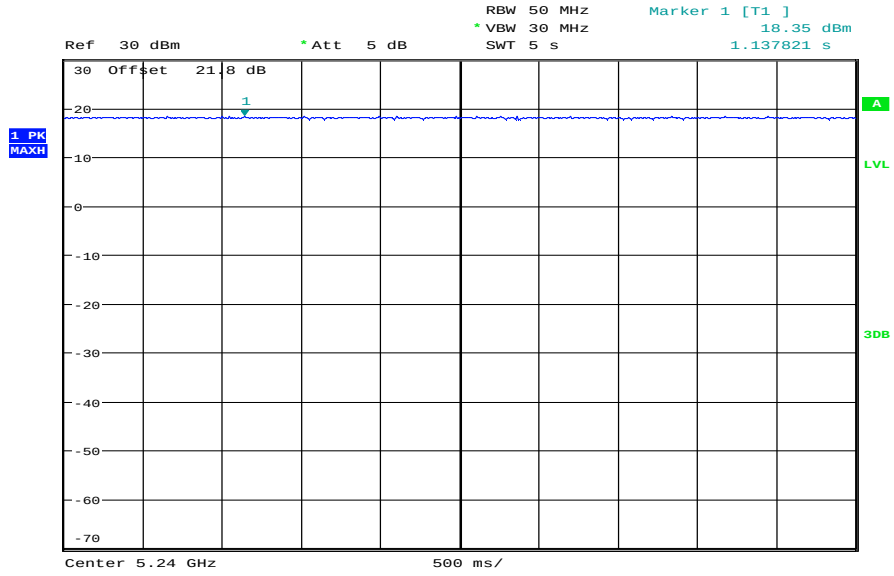
Plot 4: MCS3



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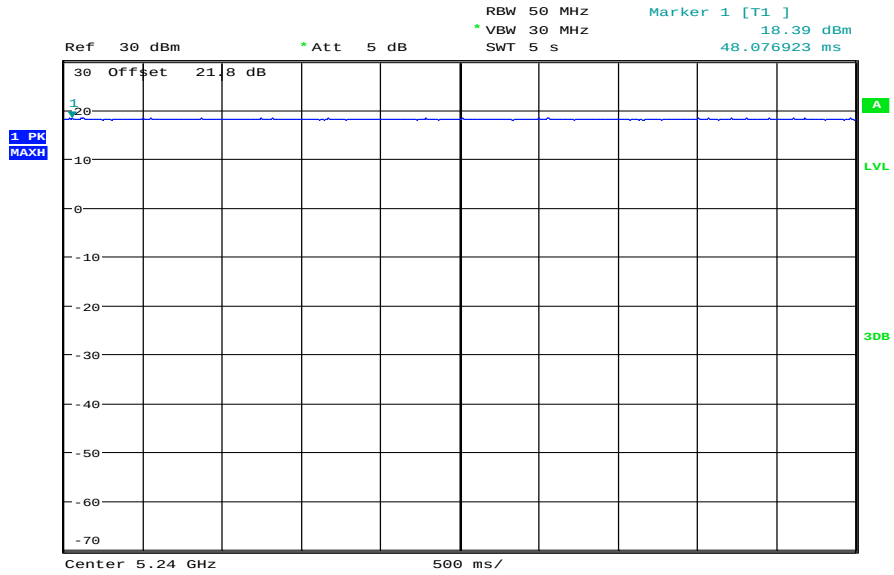
Plot 5: MCS4



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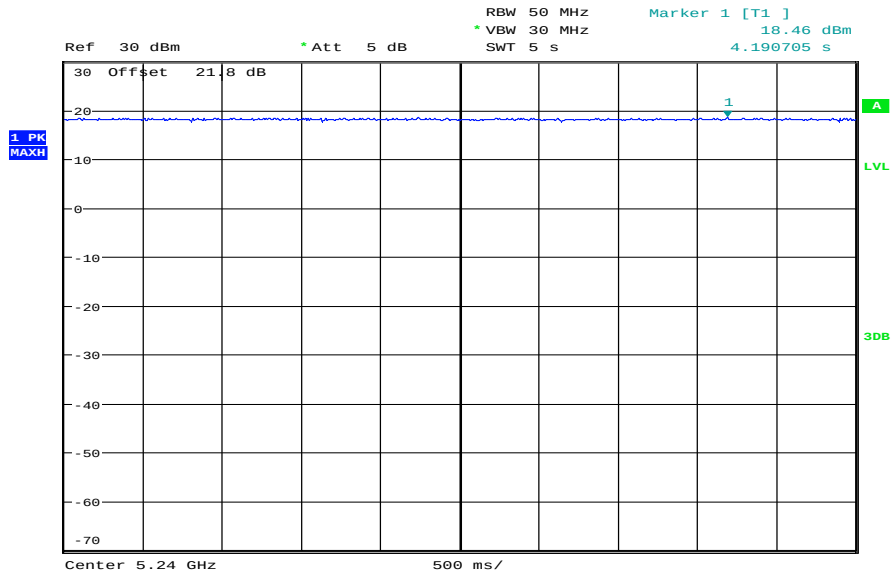
Plot 6: MCS5



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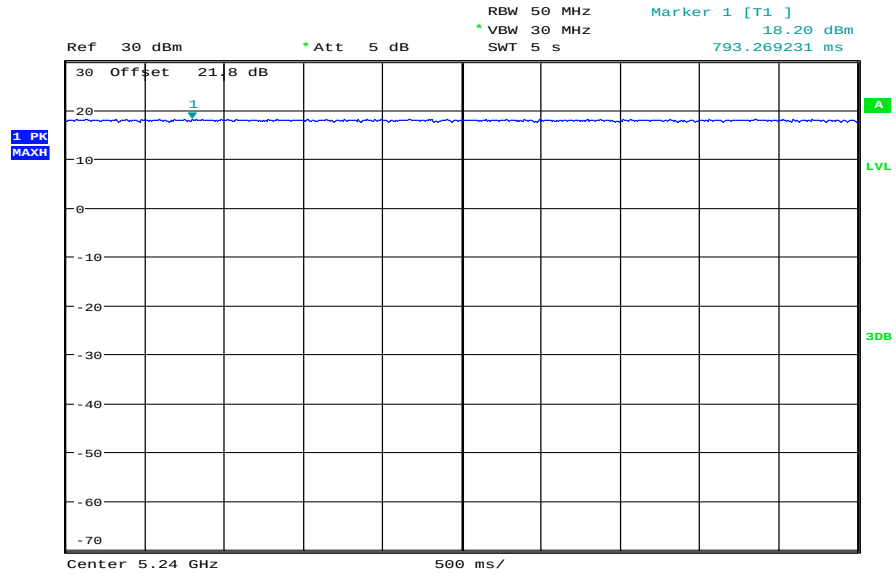
Plot 7: MCS6



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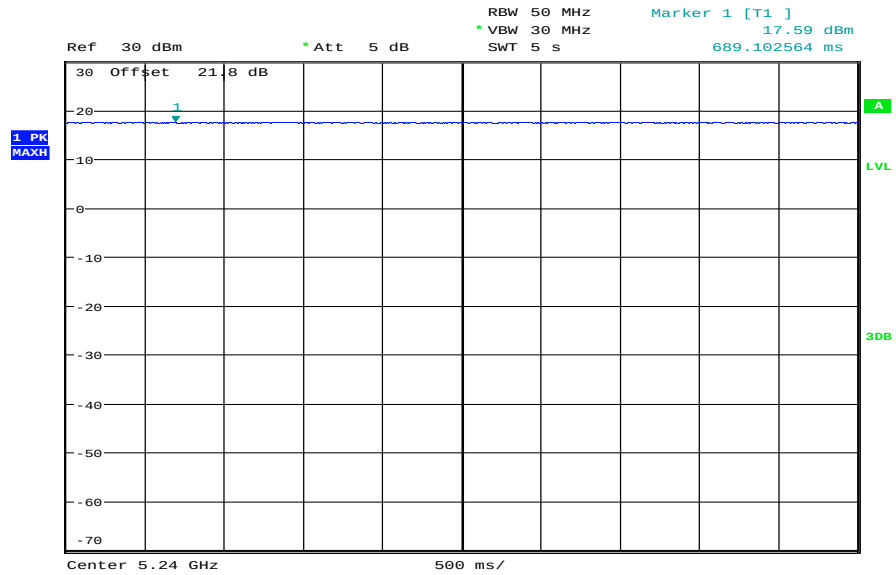
Plot 8: MCS7



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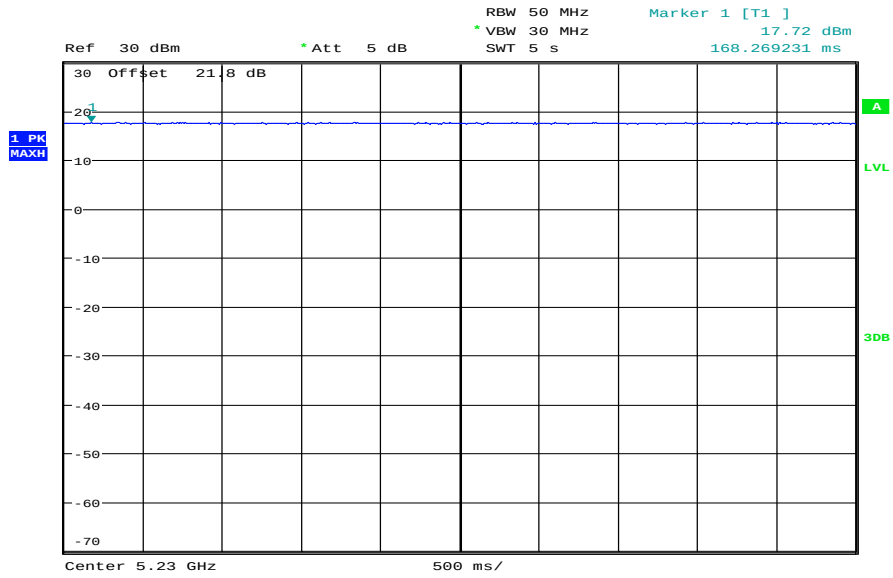
Plots: OFDM / n – mode HT40

Plot 1: MCS0



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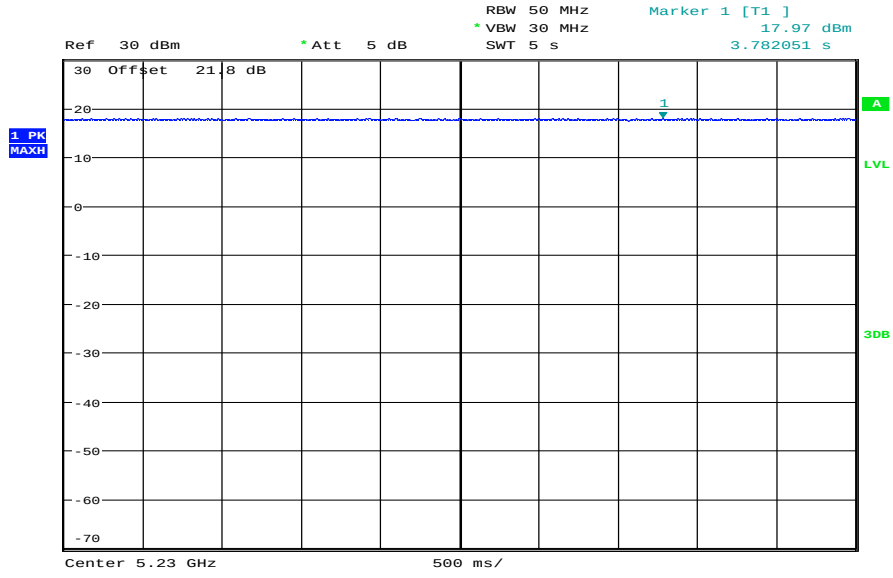
Plot 2: MCS1



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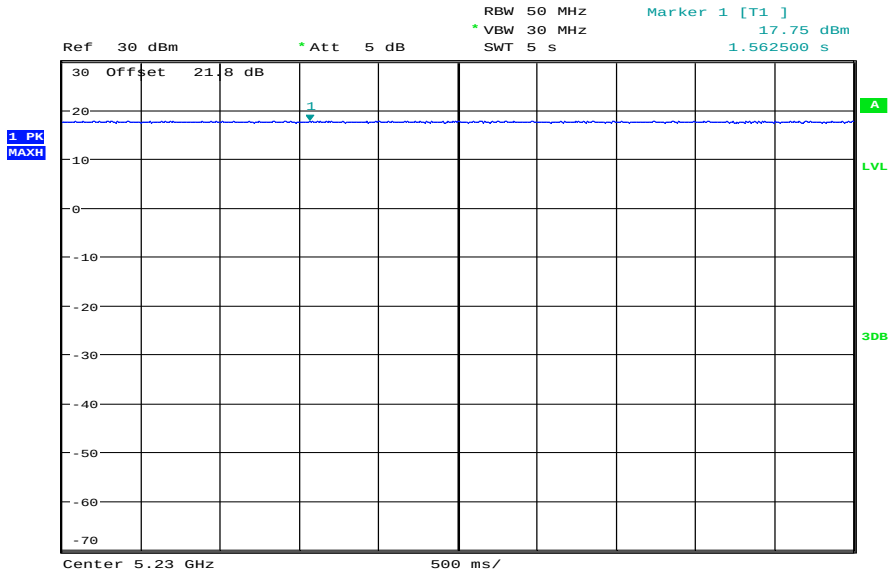
Plot 3: MCS2



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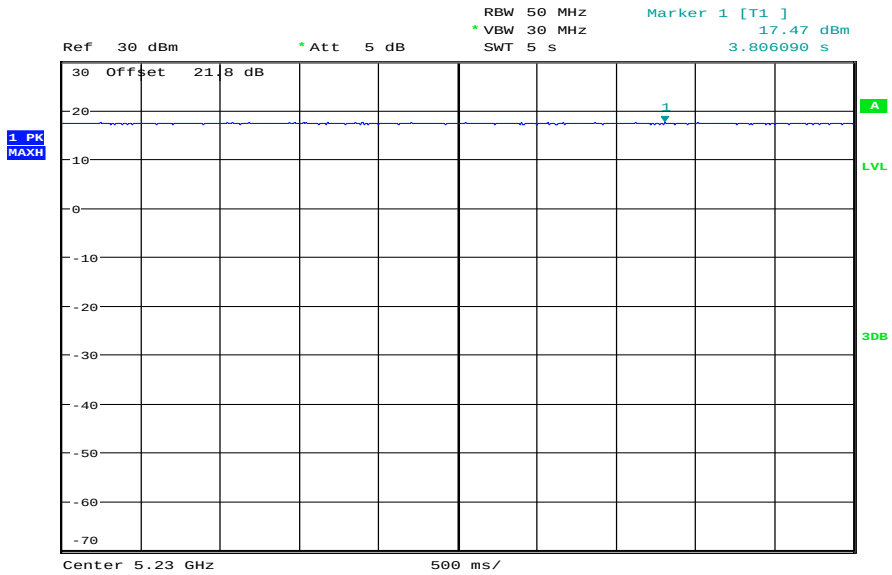
Plot 4: MCS3



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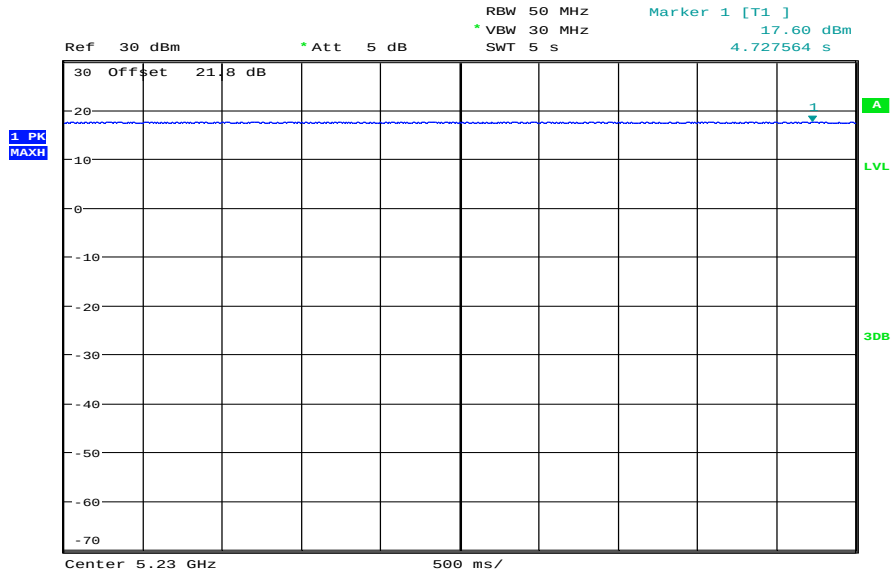
Plot 5: MCS4



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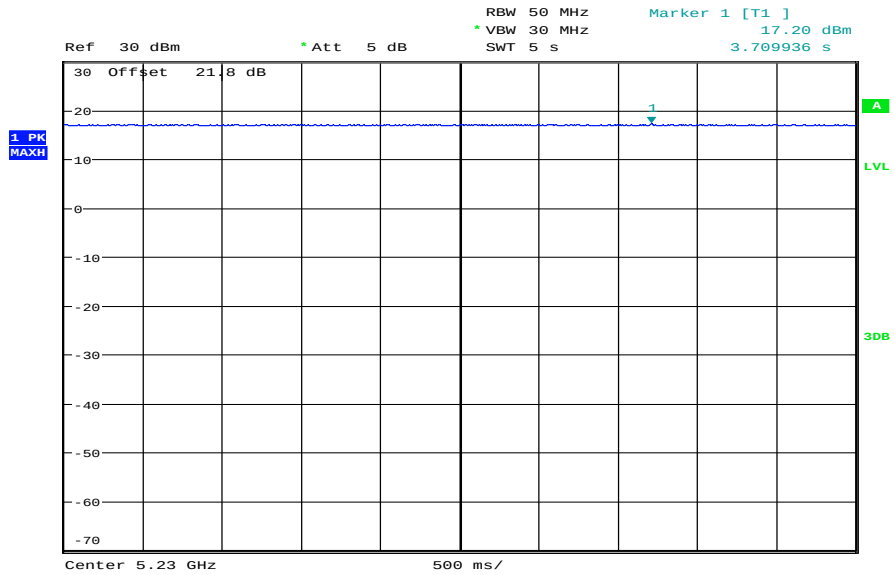
Plot 6: MCS5



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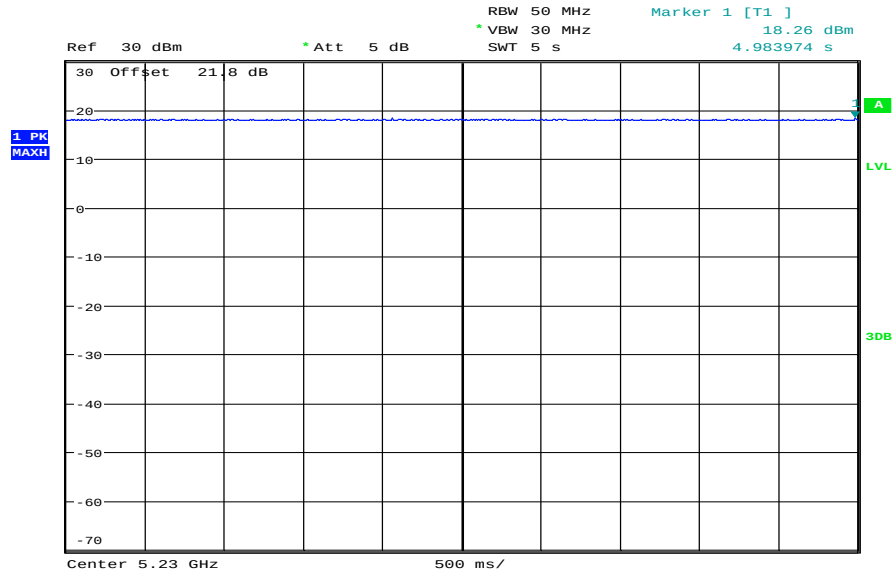
Plot 7: MCS6



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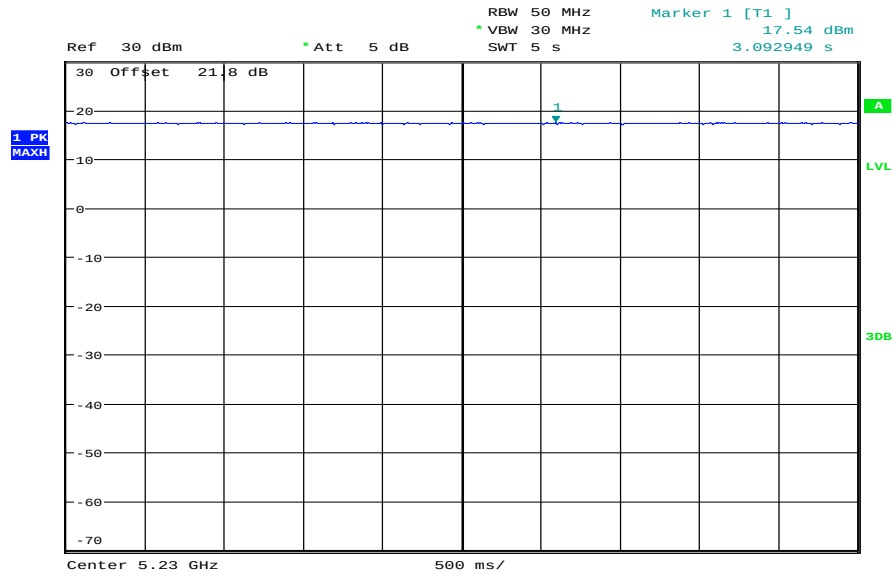
Plot 8: MCS7



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9.2 Gain

Description:

Measurement of the maximum output power conduced and radiated

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	5s
Resolution bandwidth:	3 MHz
Video bandwidth:	10 MHz / 8 MHz
Span:	40 MHz
Trace-Mode:	Max Hold

Limits:

Antenna Gain
Maximum 6 dBi

Result:

OFDM	Gain		
Channel	Lowest 5180 MHz	-/-	Highest 5240 MHz
Band 5150 MHz to 5250 MHz	3.40	-/-	3.10
Conducted power for gain calculation	15.14	-/-	14.08
Radiated power for gain calculation	18.54	-/-	17.18
Measurement uncertainty	± 3 dB		

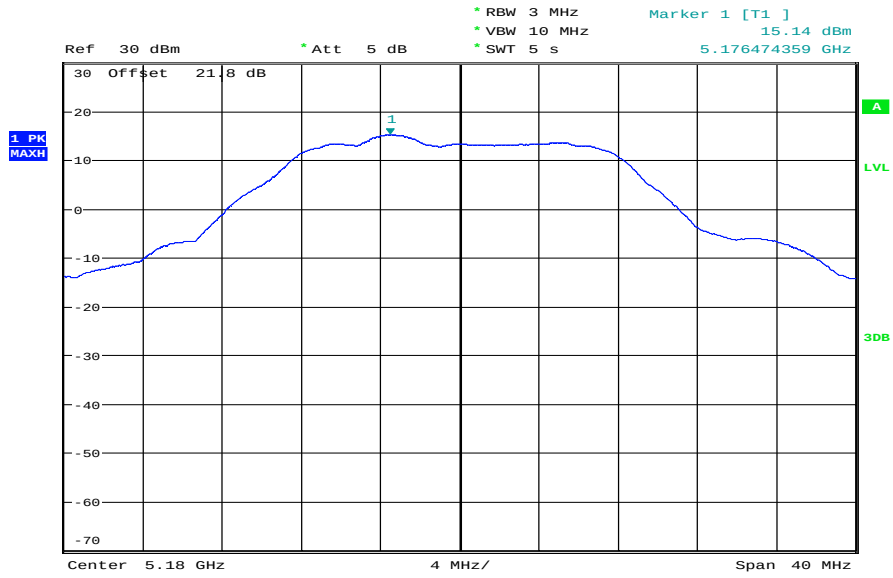
OFDM	Gain		
Channel	Lowest 5260 MHz	-/-	Highest 5320 MHz
Band 5250 MHz to 5350 MHz	2.93	-/-	2.78
Conducted power for gain calculation	14.60	-/-	14.64
Radiated power for gain calculation	17.53	-/-	17.42
Measurement uncertainty	± 3 dB		

OFDM	Gain		
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz
Band 5470 MHz to 5725 MHz	-0.81	-1.15	-1.44
Conducted power for gain calculation	14.14	13.85	13.53
Radiated power for gain calculation	13.33	12.70	12.09
Measurement uncertainty	± 3 dB		

Result: **Passed**

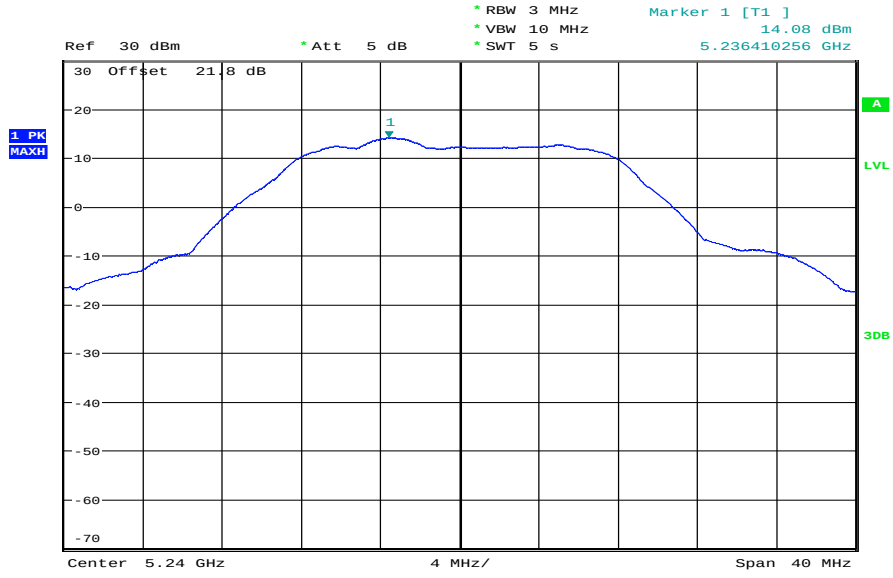
Plots: conducted power for gain calculation

Plot 1: OFDM / a – mode, 5180 MHz



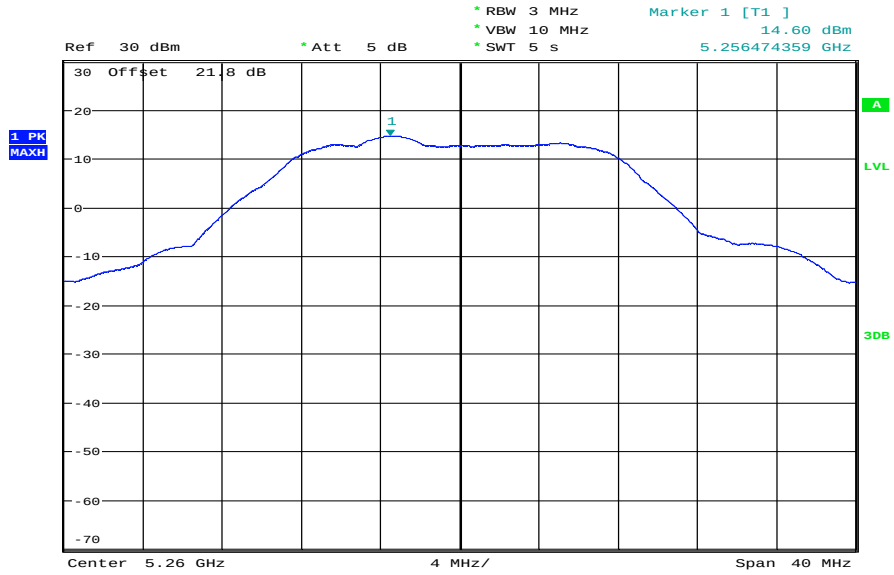
Date: 31.MAY.2012 10:02:04

Plot 2: OFDM / a – mode, 5240 MHz



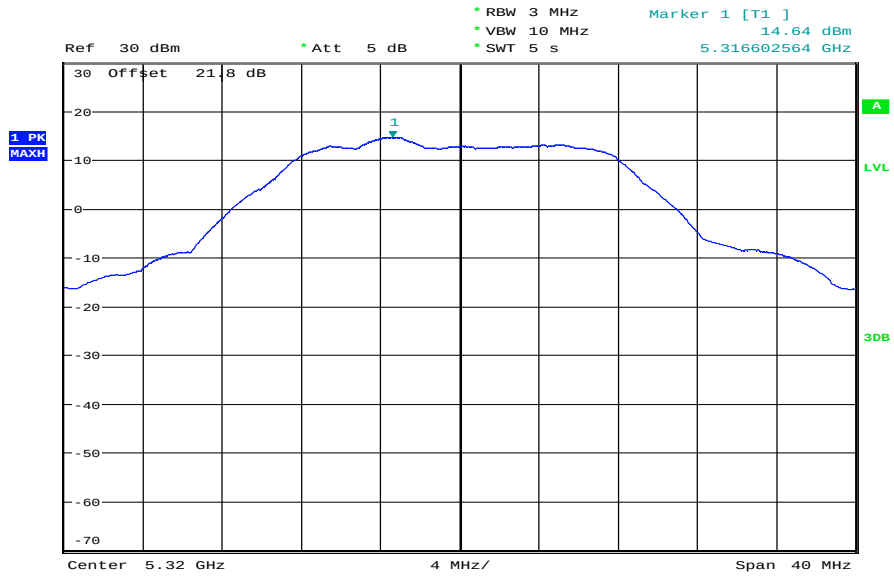
Date: 31.MAY.2012 10:03:28

Plot 3: OFDM / a – mode, 5260 MHz



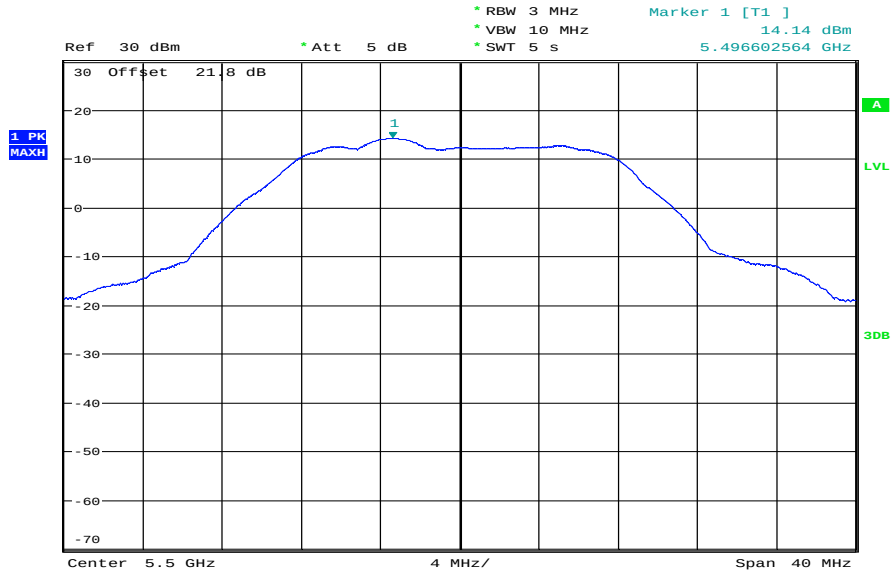
Date: 31.MAY.2012 10:04:57

Plot 4: OFDM / a – mode, 5320 MHz



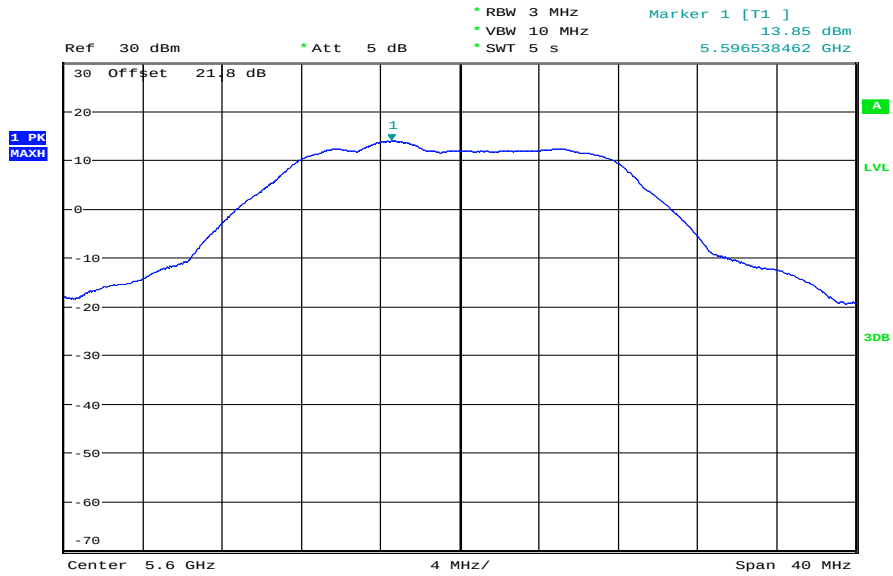
Date: 31.MAY.2012 10:06:24

Plot 5: OFDM / a – mode, 5500 MHz



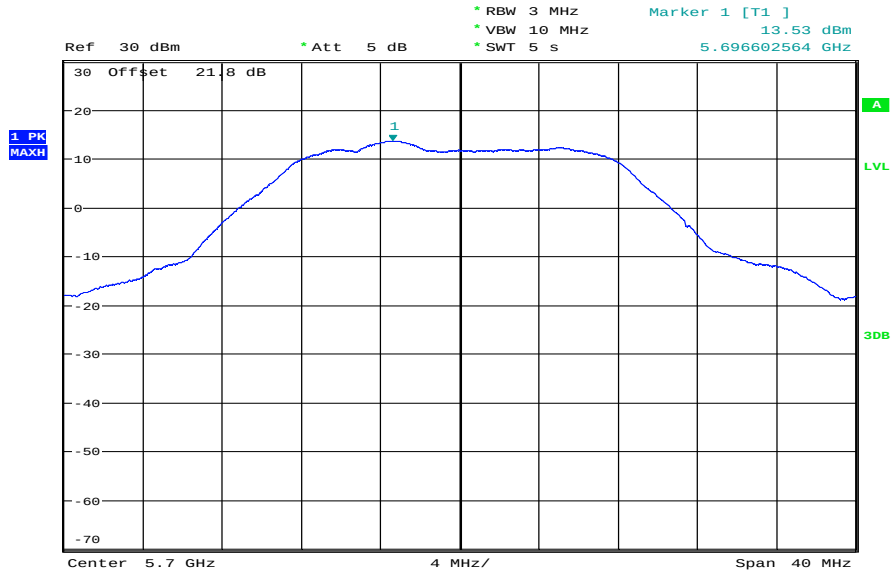
Date: 31.MAY.2012 10:20:40

Plot 6: OFDM / a – mode, 5600 MHz



Date: 31.MAY.2012 10:22:01

Plot 7: OFDM / a – mode, 5700 MHz



9.3 Duty cycle

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	50 MHz
Video bandwidth:	30 MHz
Span:	Zero
Trace-Mode:	Single sweep / Clear Write

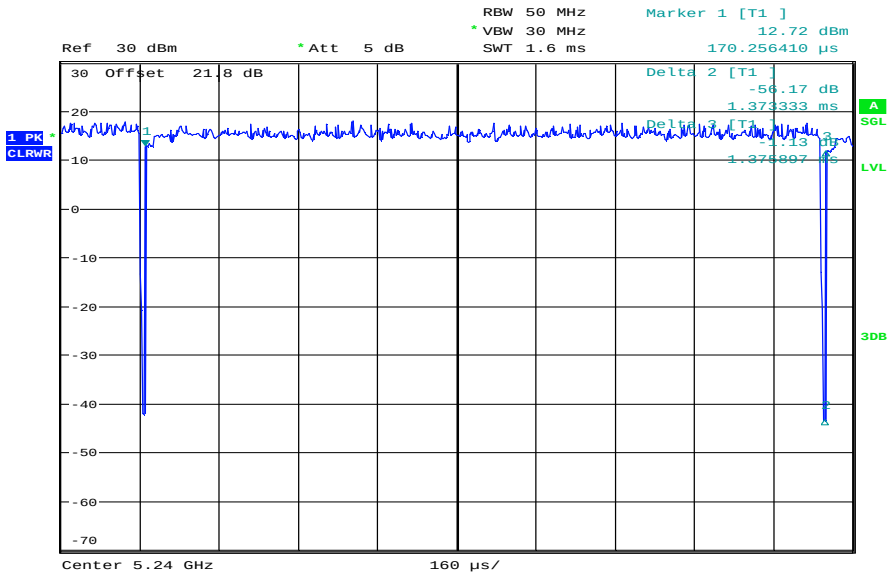
Results:

Duty cycle and correction factor:

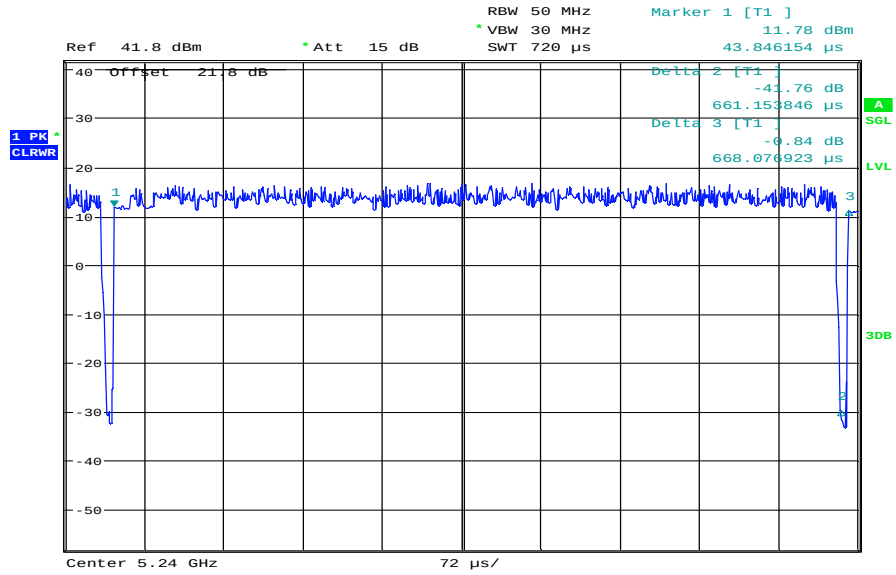
OFDM / a – mode:	99.82 % duty cycle	=>	0.0 dB
OFDM / n – mode HT20:	98.96 % duty cycle	=>	0.05 dB
OFDM / n – mode HT40:	98.25 % duty cycle	=>	0.08 dB

Plots:

Plot 1: duty cycle of the transmitter / OFDM a – mode

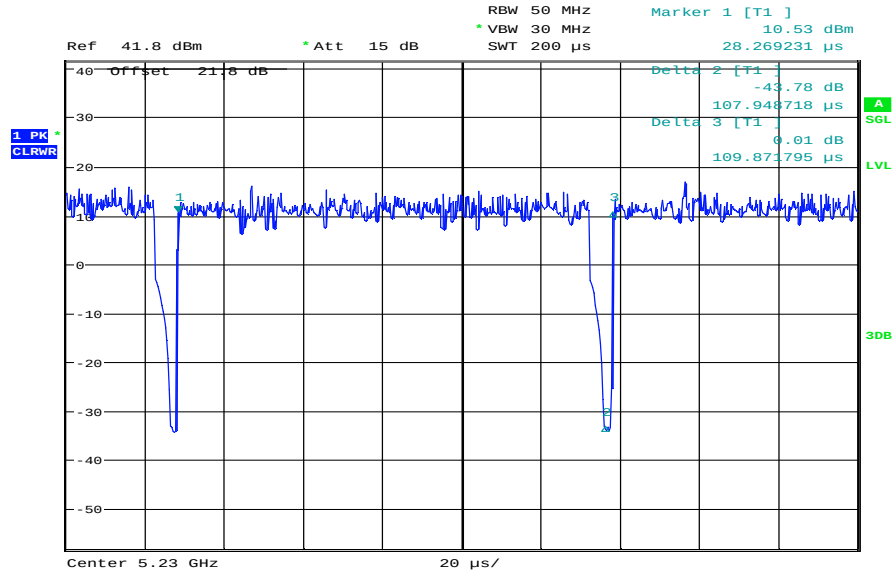


Plot 2: duty cycle of the transmitter / OFDM n – mode HT 20



Date: 31.MAY.2012 10:35:53

Plot 3: duty cycle of the transmitter / OFDM n – mode HT 40



Date: 5.JUN.2012 10:30:18

9.4 Maximum output power conducted and radiated

Description:

Measurement of the maximum output power conduced and radiated

Measurement: Method SA-1 alternative (for devices with 100 % duty cycle only)

Measurement parameter	
Detector:	RMS
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	≥ 3 MHz
Span:	> EBW
Trace-Mode:	Max hold
Analyzer function	Band power / channel power Interval > 26 dB EBW

Limits:

Radiated output power	Conducted output power
23 dBm (calculated with 50mW and 6dBi antenna gain)	The lesser one of 50mW or 4 dBm + 10 log Bandwidth 5.15-5.25 GHz 250mW or 11 dBm + 10 log Bandwidth 5.25-5.725 GHz (where Bandwidth is the 26dB Bandwidth)

Result: OFDM / a – mode

OFDM / a – mode	Maximum output power conducted [dBm]			
Channel	Lowest 5180 MHz	Middle 5240 MHz	Middle 5260 MHz	Highest 5320 MHz
+0.0 duty cycle correction	10.53	10.20	10.22	10.00
Measurement uncertainty	± 1 dB			
OFDM / a – mode	**Maximum output power radiated - EIRP [dBm]**			
Channel	Lowest 5180 MHz	Middle 5240 MHz	Middle 5260 MHz	Highest 5320 MHz
	13.93	13.30	13.15	12.78
Measurement uncertainty	± 3 dB			

OFDM / a – mode	Maximum output power conducted [dBm]			
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
+0.0 duty cycle correction	10.51	10.00	9.53	-/-
Measurement uncertainty	± 1 dB			
OFDM / a – mode	**Maximum output power radiated - EIRP [dBm]**			
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
	9.70	8.85	8.09	-/-
Measurement uncertainty	± 3 dB			

Result: **Passed**

Result: OFDM / n – mode HT20

OFDM / n – mode HT20	Maximum output power conducted [dBm]			
Channel	Lowest 5180 MHz	Middle 5240 MHz	Middle 5260 MHz	Highest 5320 MHz
+0.05 duty cycle correction	9.53	8.48	9.30	8.86
Measurement uncertainty	± 1 dB			
OFDM / n – mode HT20	**Maximum output power radiated - EIRP [dBm]**			
Channel	Lowest 5180 MHz	Middle 5240 MHz	Middle 5260 MHz	Highest 5320 MHz
	12.93	11.58	12.23	11.64
Measurement uncertainty	± 3 dB			

OFDM / n – mode HT20	Maximum output power conducted [dBm]			
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
+0.05 duty cycle correction	9.49	9.22	8.53	-/-
Measurement uncertainty	± 1 dB			
OFDM / n – mode HT20	**Maximum output power radiated - EIRP [dBm]**			
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
	8.68	8.07	7.09	-/-
Measurement uncertainty	± 3 dB			

Result: **Passed**

Result: OFDM / n – mode HT40

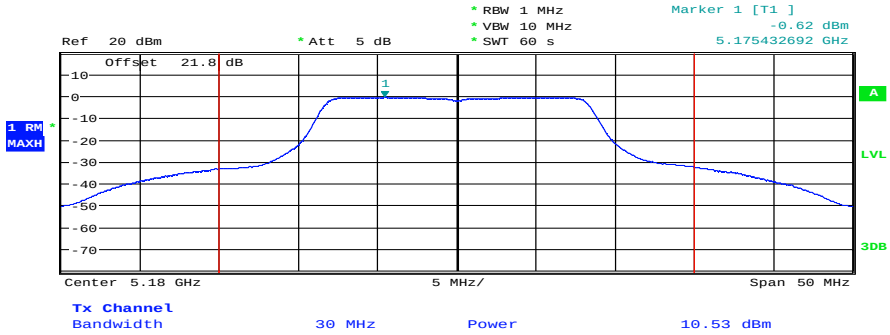
OFDM / n – mode HT40	Maximum output power conducted [dBm]			
Channel	Lowest 5190 MHz	Middle 5230 MHz	Middle 5270 MHz	Highest 5310 MHz
+0.08 duty cycle correction	9.64	9.57	10.25	9.55
Measurement uncertainty	± 1 dB			
OFDM / n – mode HT40	**Maximum output power radiated - EIRP [dBm]**			
Channel	Lowest 5190 MHz	Middle 5230 MHz	Middle 5270 MHz	Highest 5310 MHz
	12.98	12.61	13.12	12.27
Measurement uncertainty	± 3 dB			

OFDM / n – mode HT40	Maximum output power conducted [dBm]			
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
+0.08 duty cycle correction	9.89	9.44	9.38	-/-
Measurement uncertainty	± 1 dB			
OFDM / n – mode HT40	**Maximum output power radiated - EIRP [dBm]**			
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
	9.02	8.23	7.88	-/-
Measurement uncertainty	± 3 dB			

Result: **Passed**

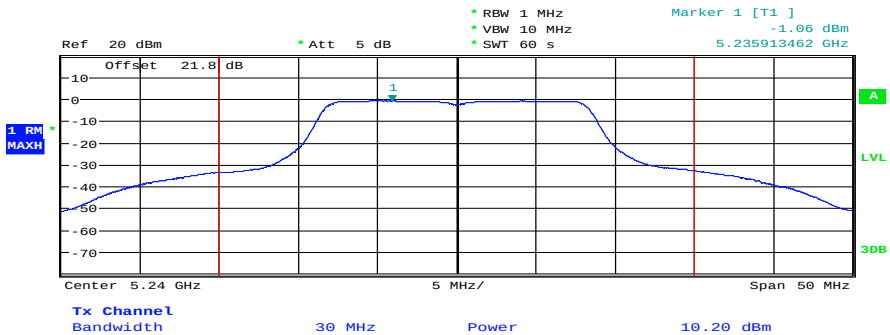
Plots: OFDM / a – mode

Plot 1: 5180 MHz



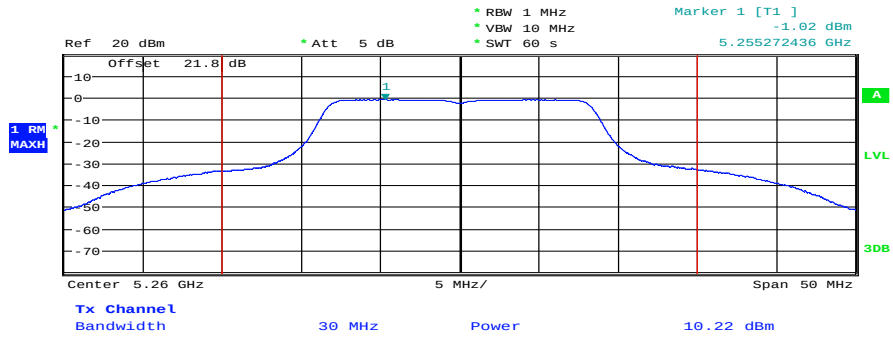
Date: 1.JUN.2012 07:53:31

Plot 2: 5240 MHz



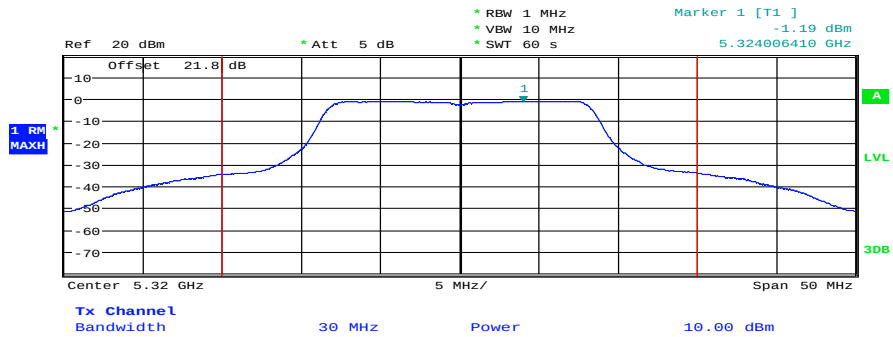
Date: 1.JUN.2012 07:55:04

Plot 3: 5260 MHz



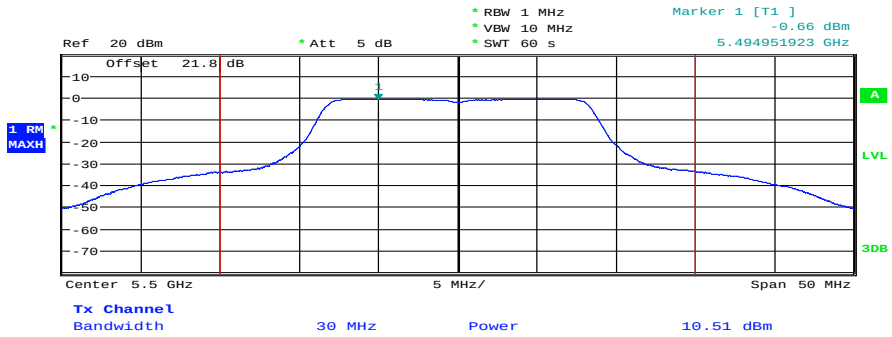
Date: 1.JUN.2012 07:56:38

Plot 4: 5320 MHz



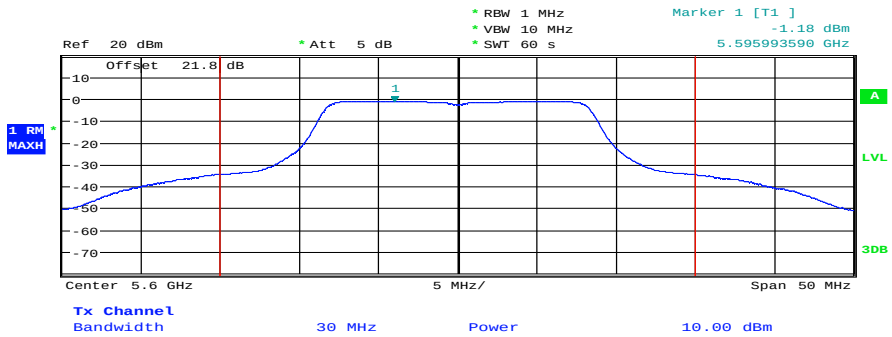
Date: 1.JUN.2012 07:58:04

Plot 5: 5500 MHz



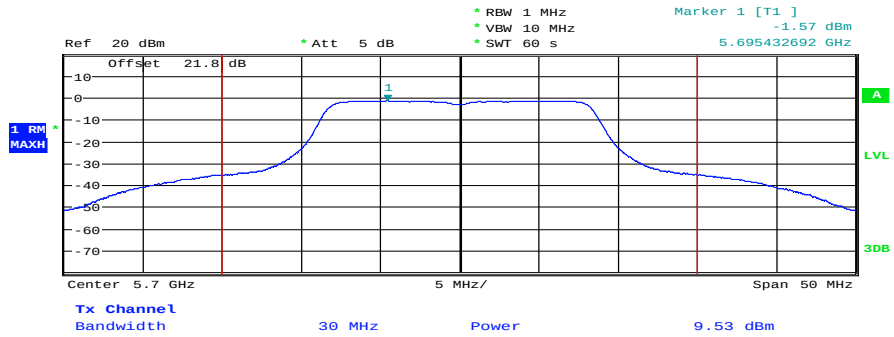
Date: 1.JUN.2012 07:59:35

Plot 6: 5600 MHz



Date: 1.JUN.2012 08:01:03

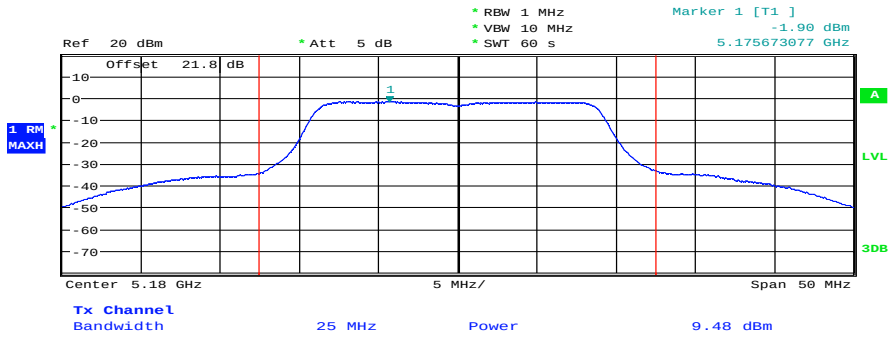
Plot 7: 5700 MHz



Date: 1.JUN.2012 08:02:29

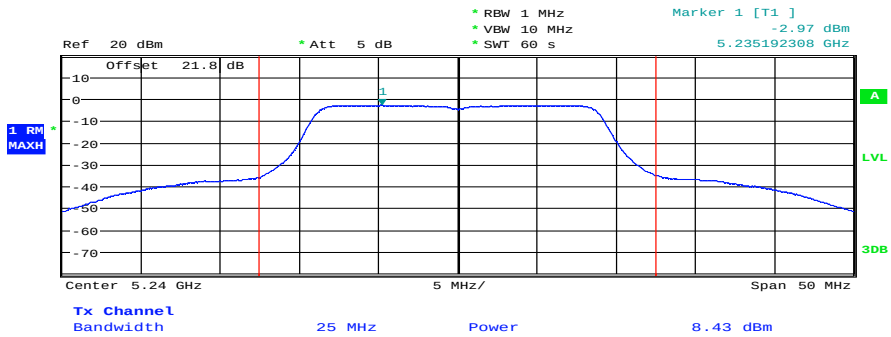
Plots: OFDM / n – mode HT20

Plot 1: 5180 MHz



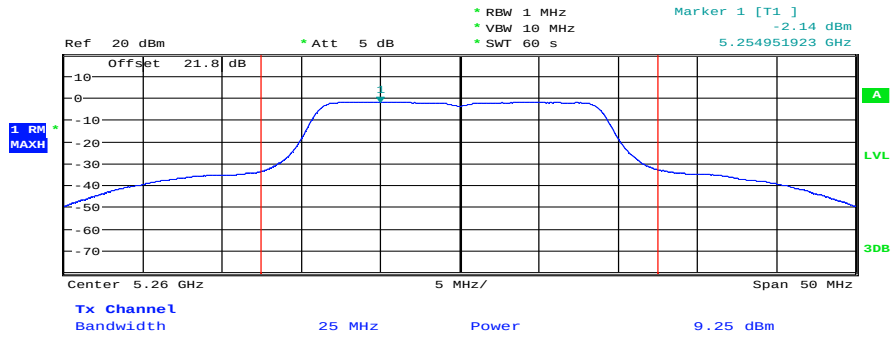
Date: 1.JUN.2012 08:16:41

Plot 2: 5240 MHz



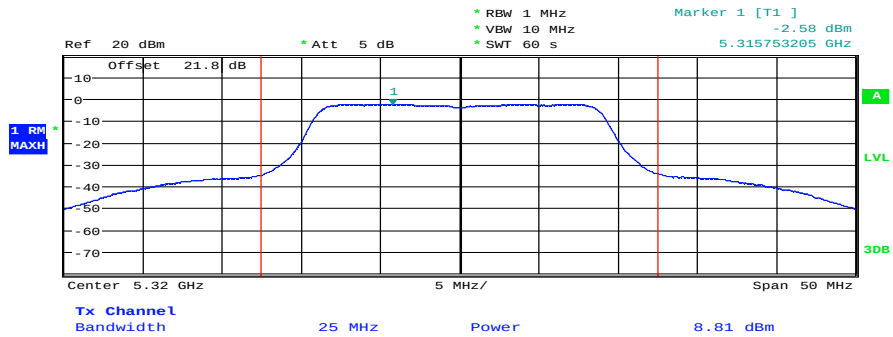
Date: 1.JUN.2012 08:15:09

Plot 3: 5260 MHz



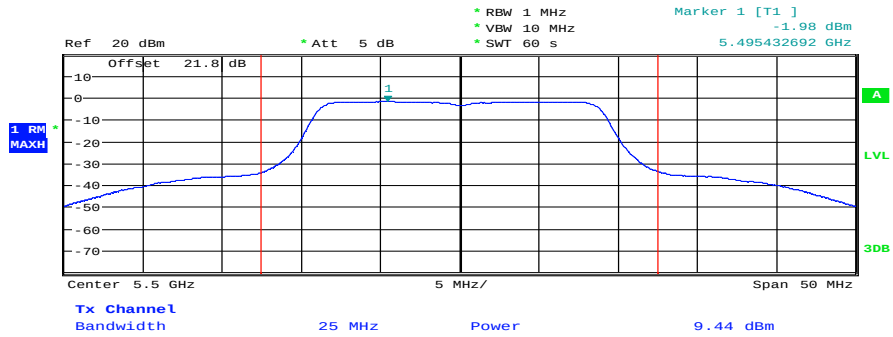
Date: 1.JUN.2012 08:10:44

Plot 4: 5320 MHz



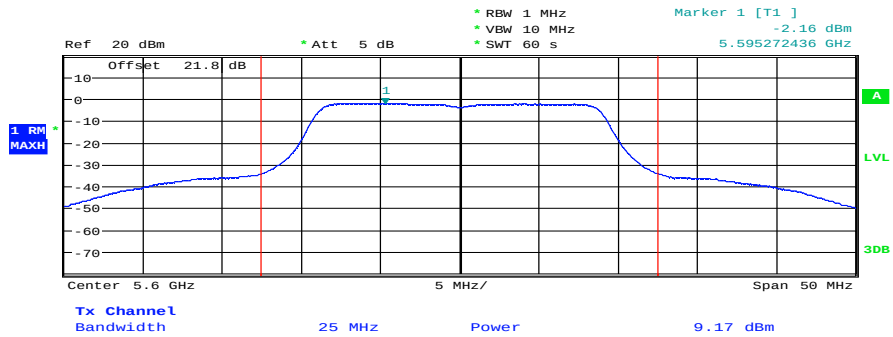
Date: 1.JUN.2012 08:09:04

Plot 5: 5500 MHz



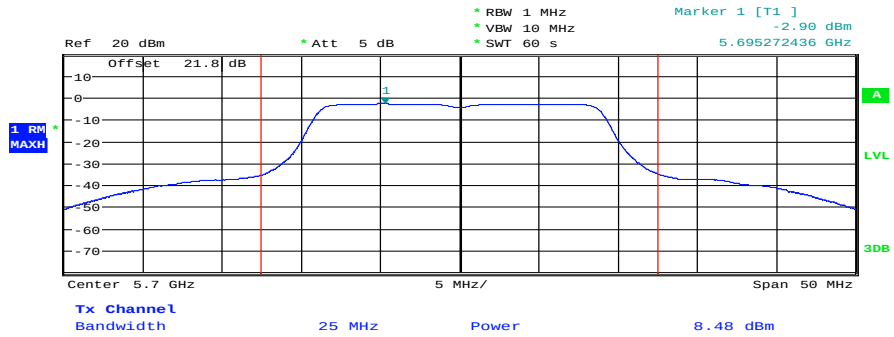
Date: 1.JUN.2012 08:07:38

Plot 6: 5600 MHz



Date: 1.JUN.2012 08:06:04

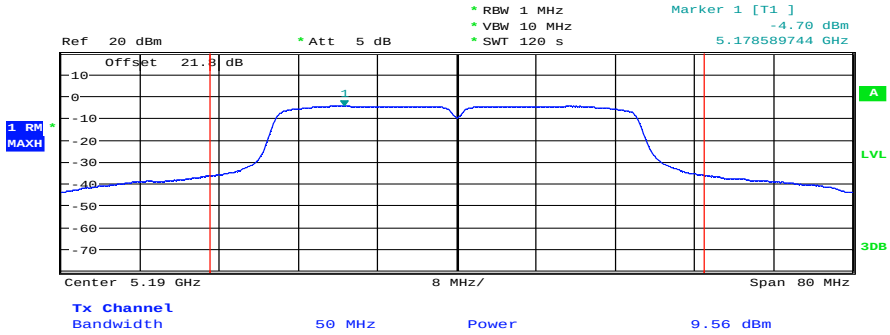
Plot 7: 5700 MHz



Date: 1.JUN.2012 08:04:36

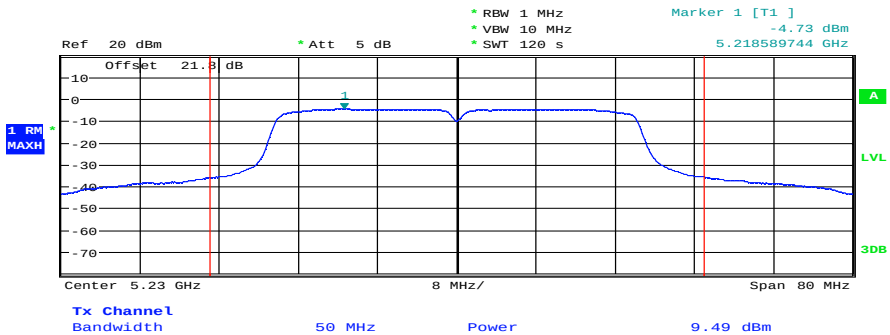
Plots: OFDM / n – mode HT40

Plot 1: 5190 MHz



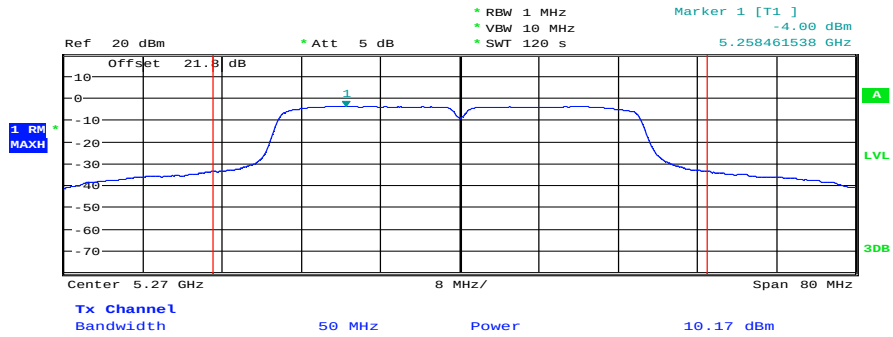
Date: 1.JUN.2012 08:20:03

Plot 2: 5230 MHz



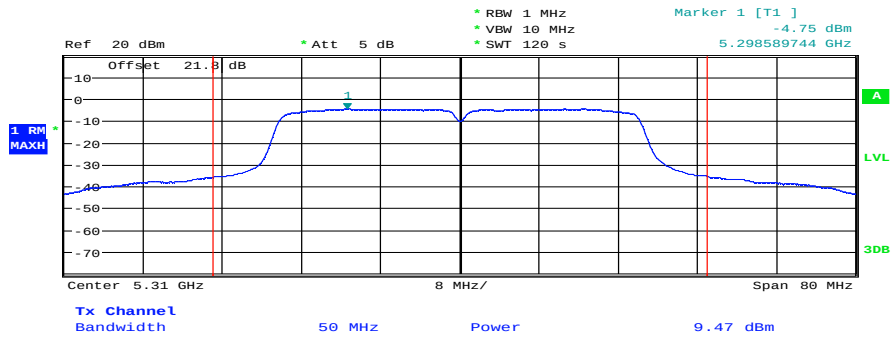
Date: 1.JUN.2012 08:41:46

Plot 3: 5270 MHz



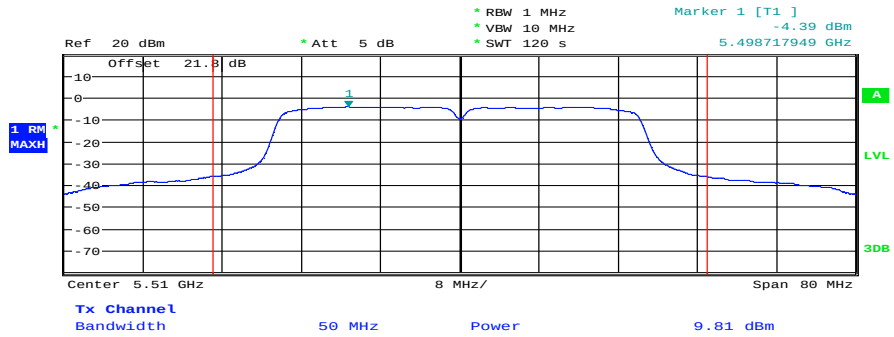
Date: 1.JUN.2012 08:44:18

Plot 4: 5310 MHz



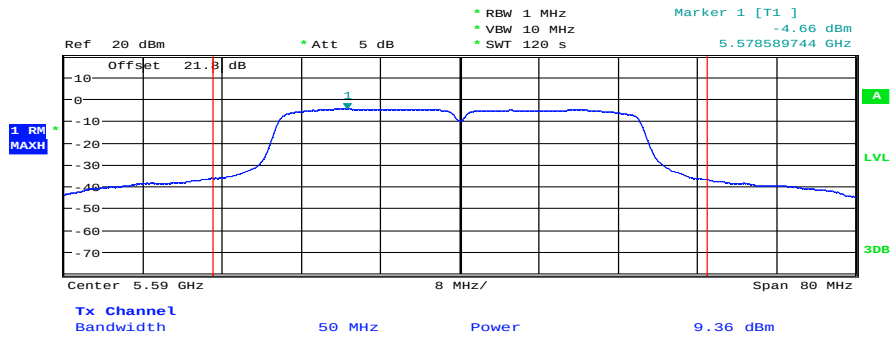
Date: 1.JUN.2012 08:46:55

Plot 5: 5510 MHz



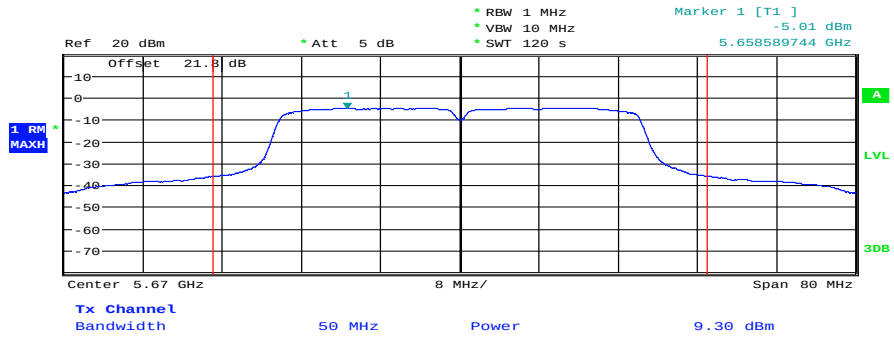
Date: 1.JUN.2012 08:49:44

Plot 6: 5590 MHz



Date: 1.JUN.2012 08:52:16

Plot 7: 5670 MHz



Date: 1.JUN.2012 08:58:34

9.5 Power spectral density

Description:

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

Measurement:

Measurement parameter	
Detector:	RMS
Sweep time:	60 s / 120 s
Resolution bandwidth:	1 MHz
Video bandwidth:	≥ 3 MHz
Span:	> EBW
Trace-Mode:	Max hold

Limits:

Power Spectral Density
The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 4 dBm in any 1 MHz band

Results:

Modulation OFDM / a – mode	Power Spectral density [dBm/MHz]		
Channel	5180 MHz	5240 MHz	5260 MHz
+0.0 duty cycle correction	-0.94	-1.81	-1.13
Channel	5320 MHz	5500 MHz	5600 MHz
+0.0 duty cycle correction	-1.19	-1.41	-1.66
Channel	5700 MHz	-/-	-/-
+0.0 duty cycle correction	-2.07	-/-	-/-
Measurement uncertainty	± 0.5 dB		

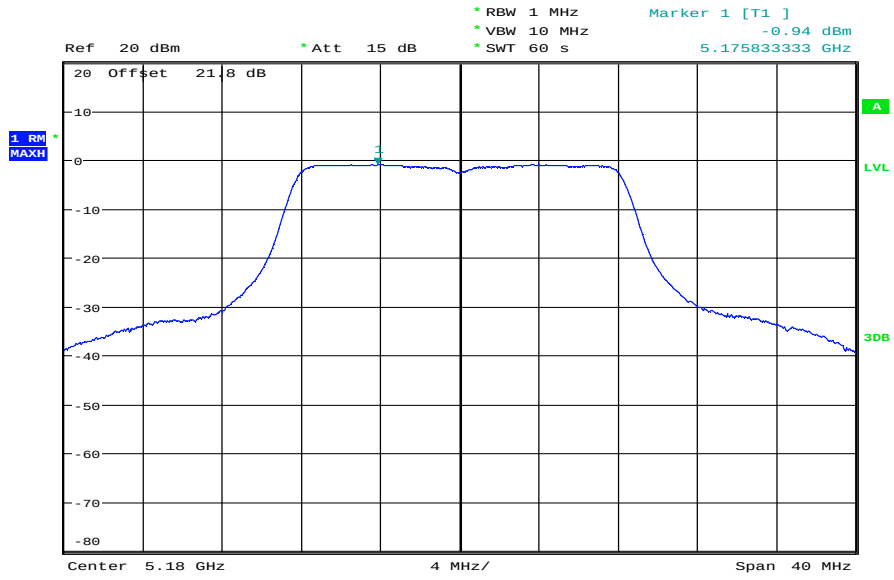
Modulation OFDM / n – mode HT20	Power Spectral density [dBm/MHz]		
Channel	5180 MHz	5240 MHz	5260 MHz
+0.05 duty cycle correction	-1.74	-2.97	-1.90
Channel	5320 MHz	5500 MHz	5600 MHz
+0.05 duty cycle correction	-2.35	-2.08	-2.52
Channel	5700 MHz	-/-	-/-
+0.05 duty cycle correction	-3.47	-/-	-/-
Measurement uncertainty	± 0.5 dB		

Modulation OFDM / n – mode HT40	Power Spectral density [dBm/MHz]		
Channel	5190 MHz	5230 MHz	5270 MHz
+0.08 duty cycle correction	-4.45	-4.97	-5.12
Channel	5310 MHz	5510 MHz	5590 MHz
+0.08 duty cycle correction	-4.58	-4.89	-4.93
Channel	5670 MHz	-/-	-/-
+0.08 duty cycle correction	-5.32	-/-	-/-
Measurement uncertainty	± 0.5 dB		

Result: **Passed**

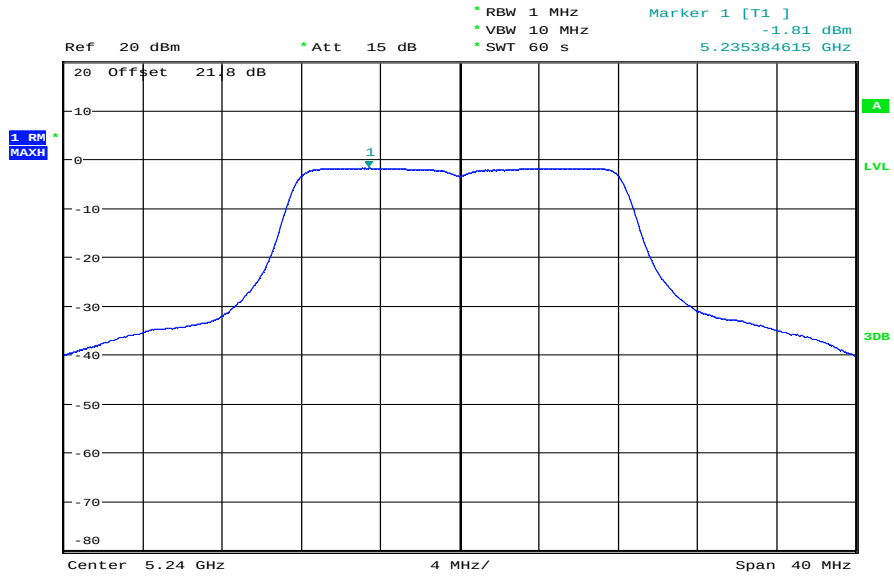
Plots: OFDM / a – mode

Plot 1: 5180 MHz



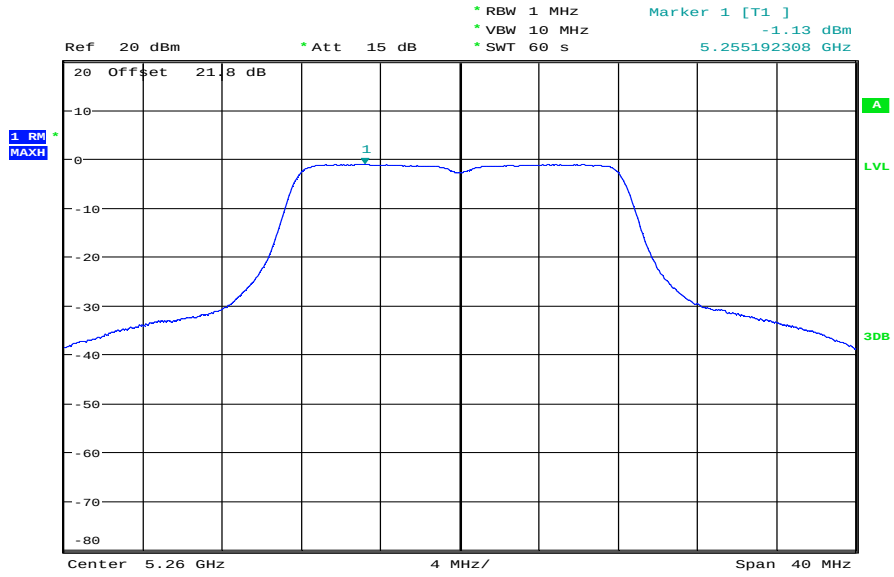
Date: 31.MAY.2012 13:25:01

Plot 2: 5240 MHz



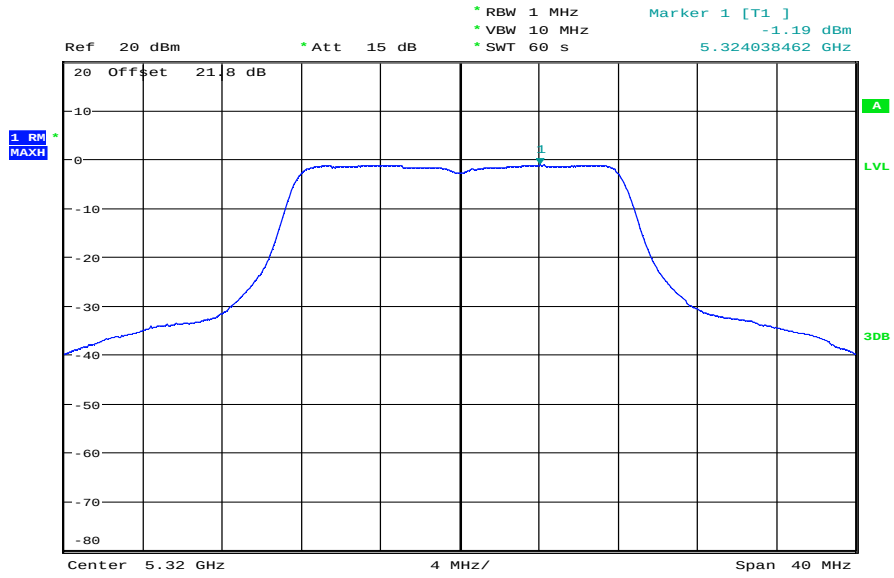
Date: 31.MAY.2012 13:26:35

Plot 3: 5260 MHz



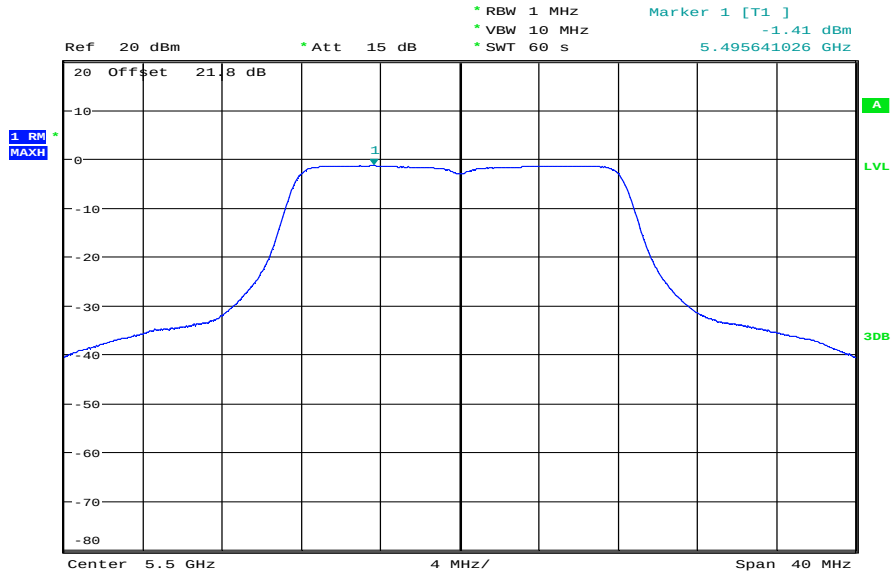
Date: 31.MAY.2012 13:28:22

Plot 4: 5320 MHz



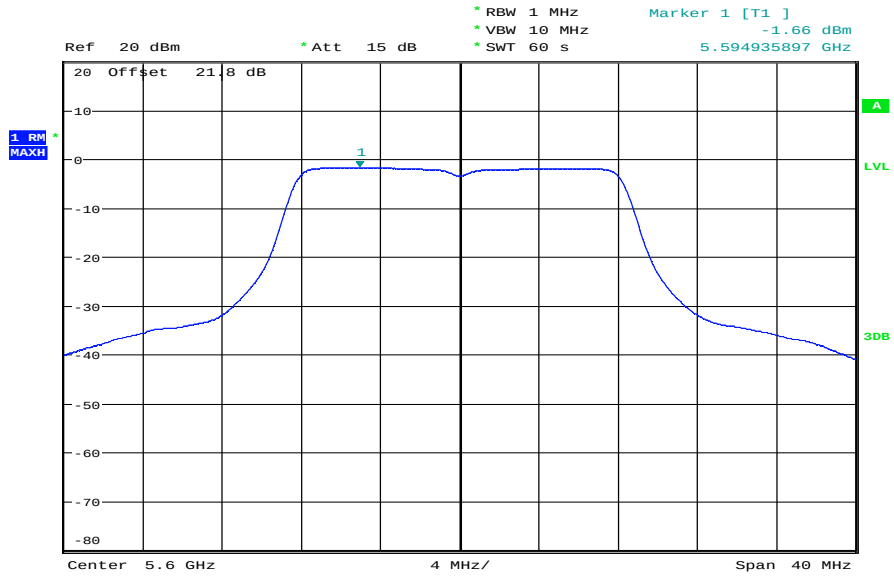
Date: 31.MAY.2012 13:31:54

Plot 5: 5500 MHz



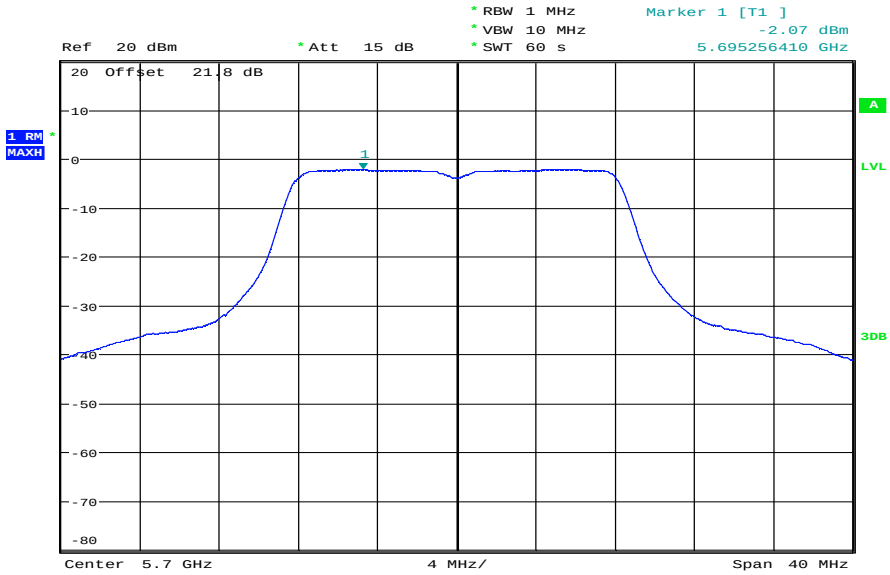
Date: 31.MAY.2012 13:33:20

Plot 6: 5600 MHz



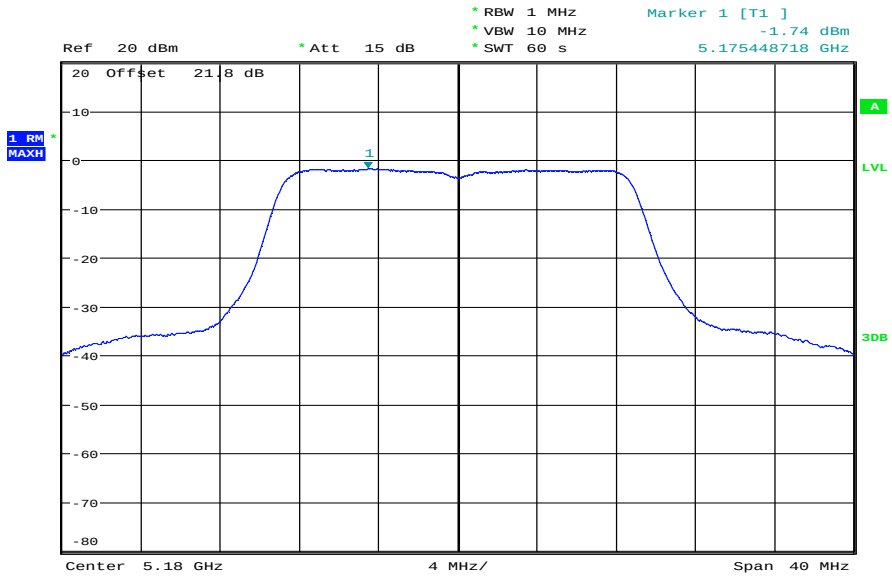
Date: 31.MAY.2012 13:34:49

Plot 7: 5700 MHz



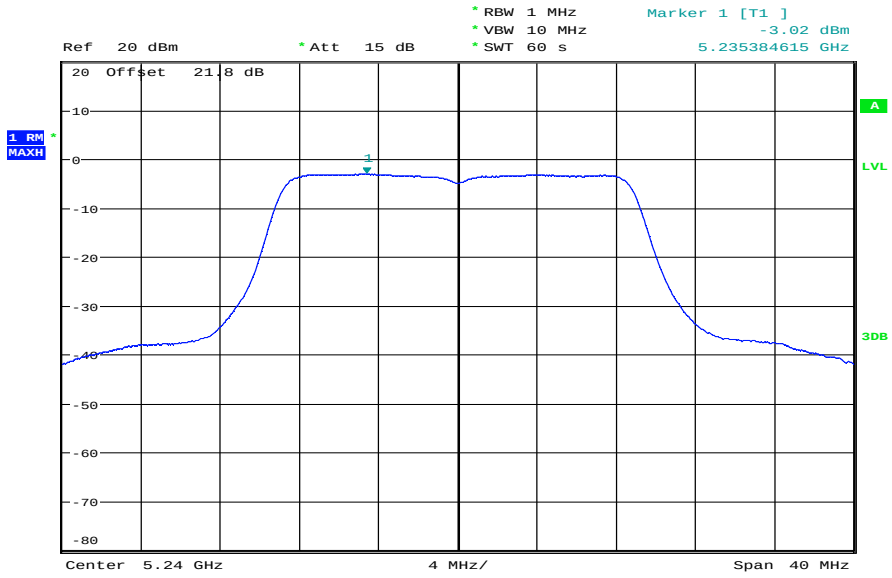
Plots: OFDM / n – mode HT20

Plot 1: 5180 MHz



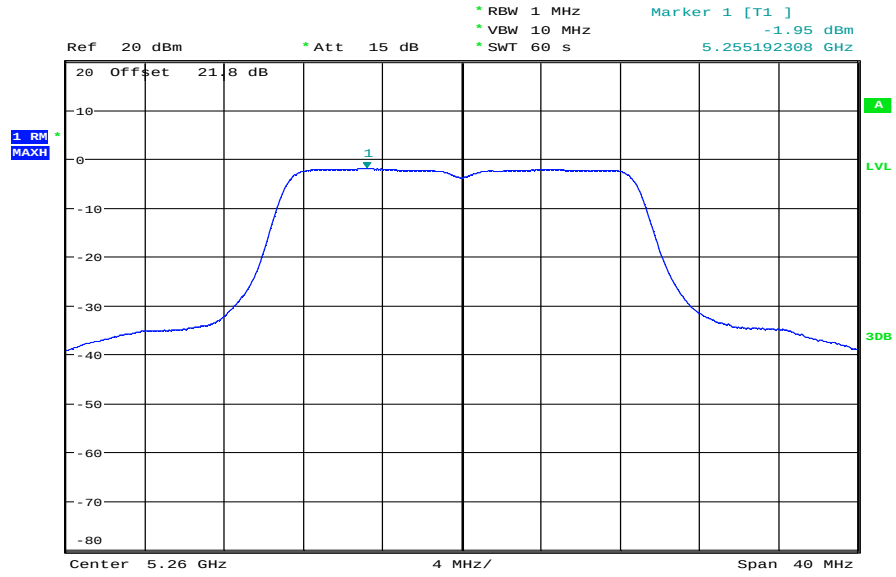
Date: 31.MAY.2012 13:48:01

Plot 2: 5240 MHz



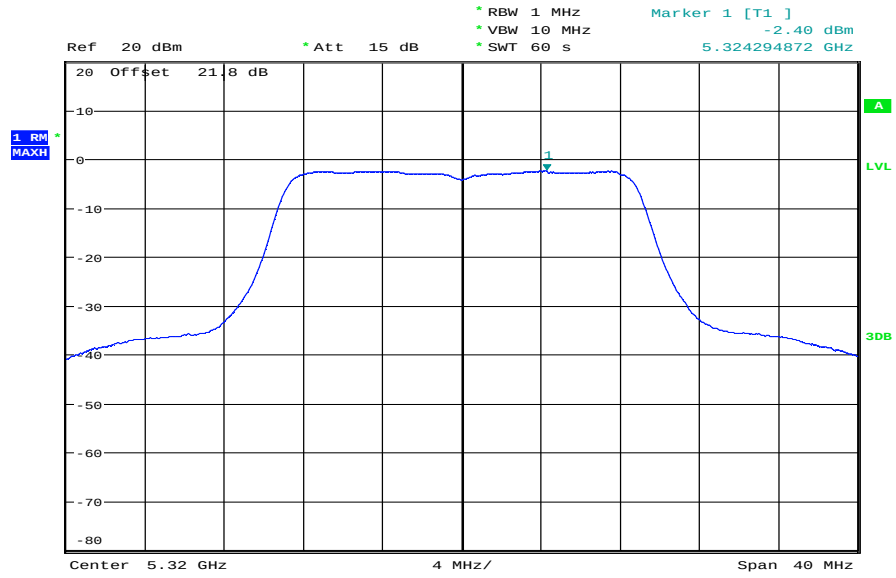
Date: 31.MAY.2012 13:46:36

Plot 3: 5260 MHz



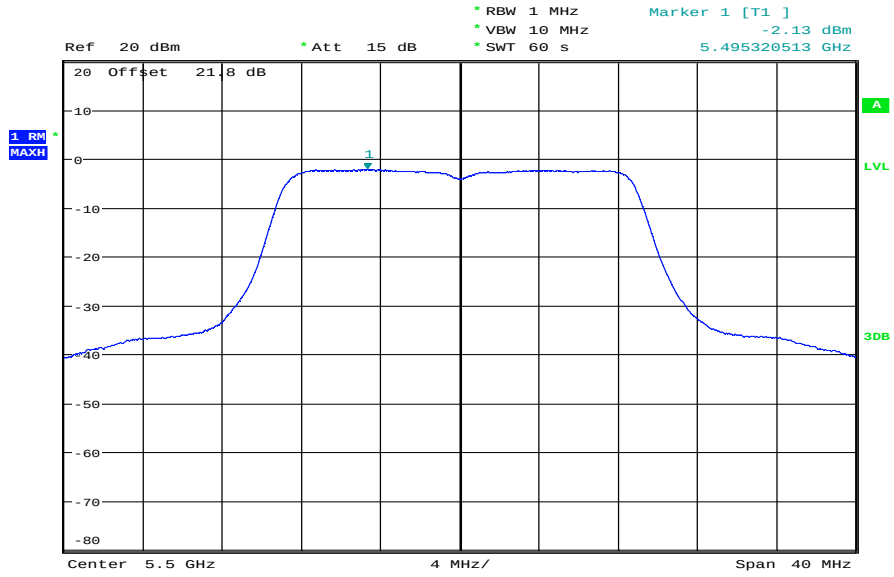
Date: 31.MAY.2012 13:44:50

Plot 4: 5320 MHz



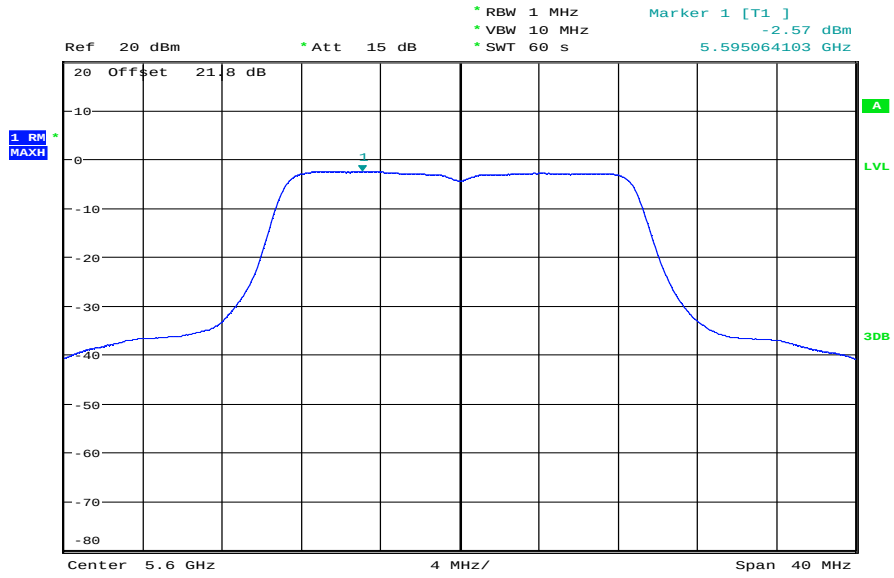
Date: 31.MAY.2012 13:43:18

Plot 5: 5500 MHz



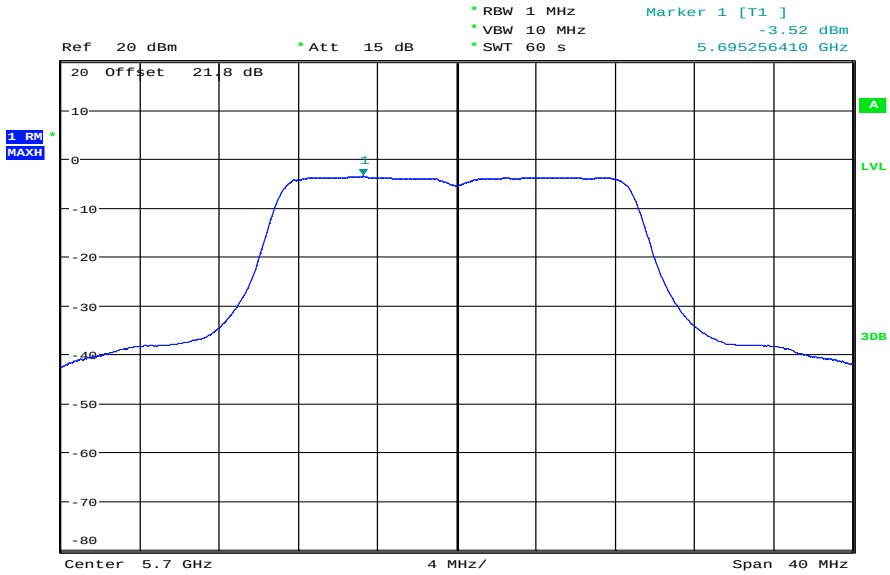
Date: 31.MAY.2012 13:41:48

Plot 6: 5600 MHz



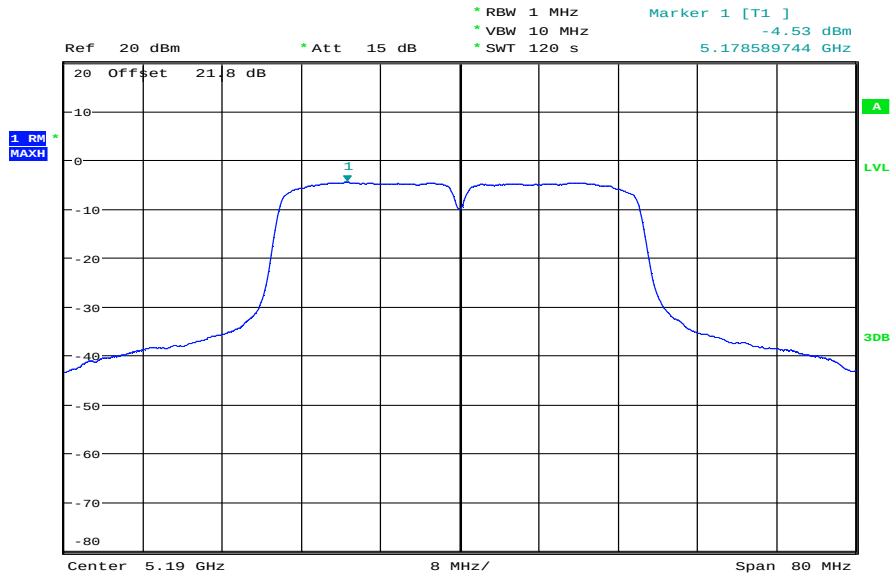
Date: 31.MAY.2012 13:40:09

Plot 7: 5700 MHz



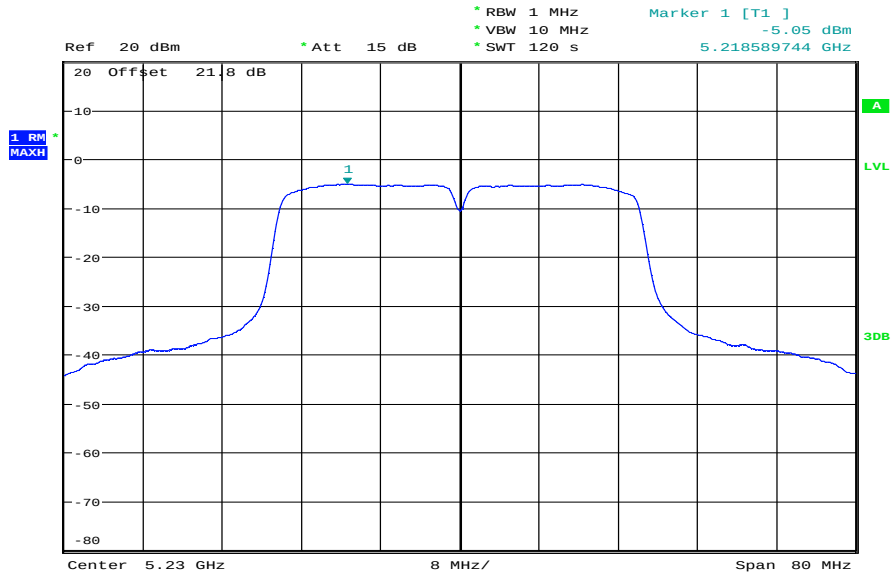
Plots: OFDM / a – mode HT40

Plot 1: 5190 MHz



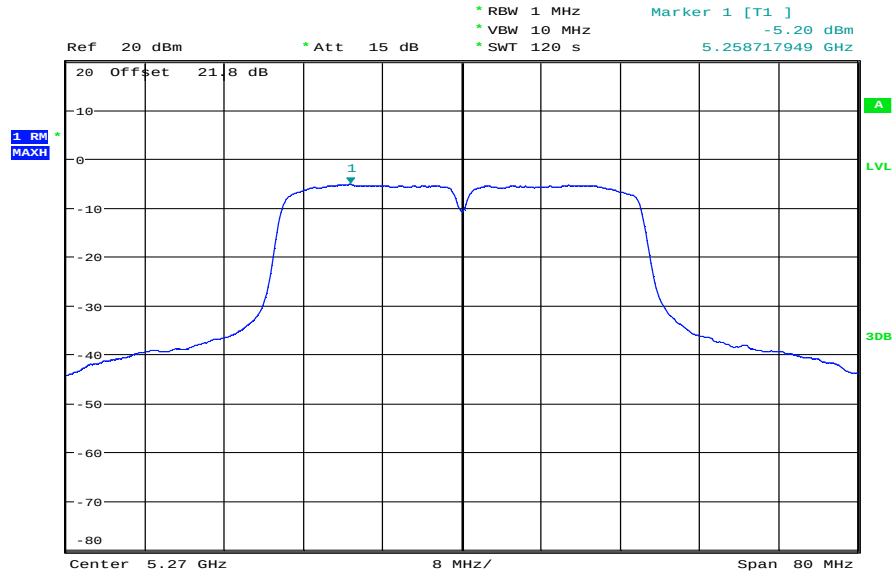
Date: 31.MAY.2012 13:58:54

Plot 2: 5230 MHz



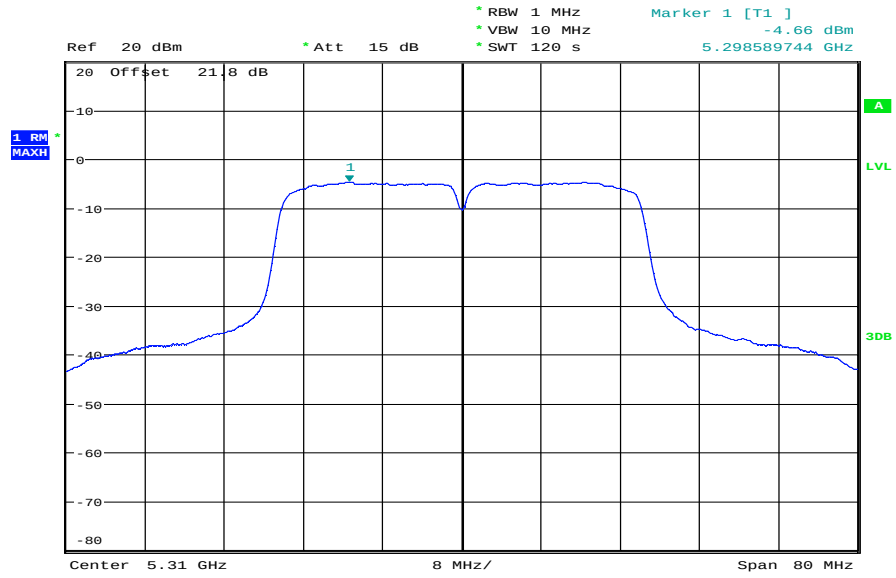
Date: 31.MAY.2012 14:27:25

Plot 3: 5270 MHz



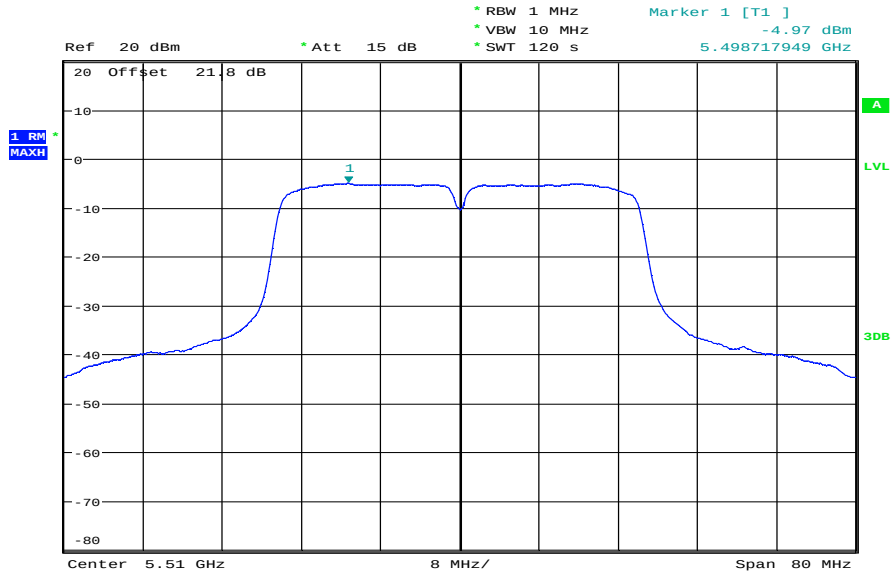
Date: 31.MAY.2012 14:29:56

Plot 4: 5310 MHz



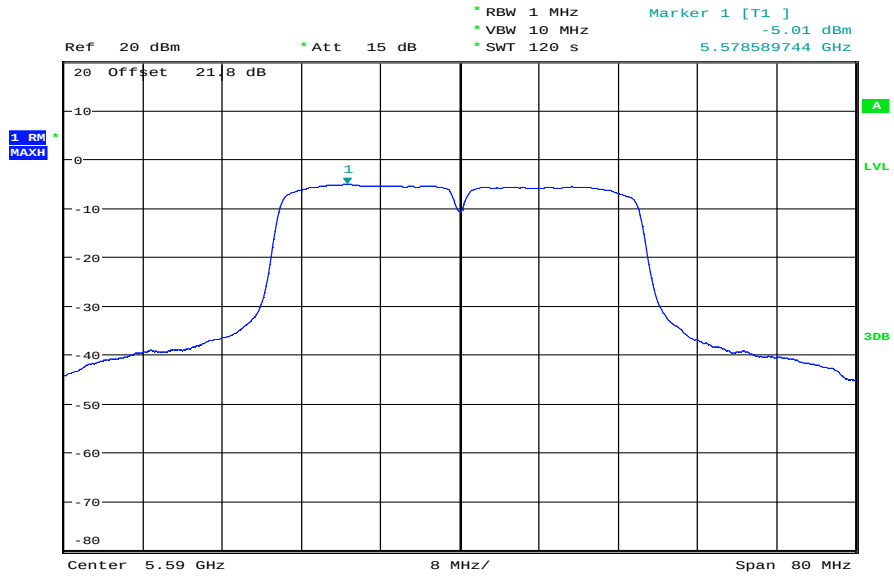
Date: 31.MAY.2012 14:32:22

Plot 5: 5510 MHz



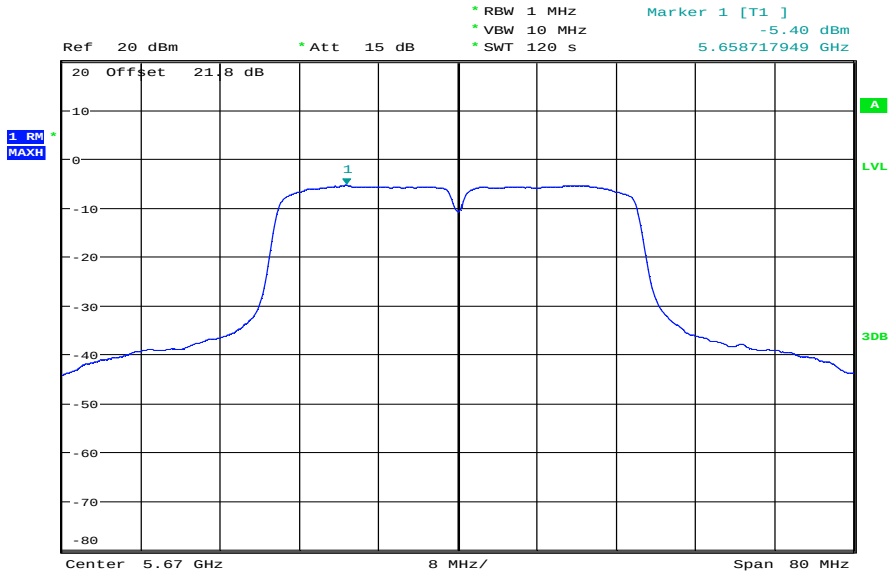
Date: 31.MAY.2012 14:35:01

Plot 6: 5590 MHz



Date: 31.MAY.2012 14:37:42

Plot 7: 5670 MHz



9.6 Spectrum bandwidth – 26 dB bandwidth

Description:

Measurement of the 26 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1% EBW
Video bandwidth:	≥ EBW
Span:	>Full signal
Trace-Mode:	Max hold

Limits:

Spectrum Bandwidth – 26 dB Bandwidth
-/-

Results: OFDM / a – mode

Modulation OFDM / a – mode	26 dB BANDWIDTH [MHz]		
Channel	5180 MHz	5240 MHz	5260 MHz
	28.9	24.9	28.5
Channel	5320 MHz	5500 MHz	5600 MHz
	24.9	24.7	23.1
Channel	5700 MHz	-/-	-/-
	23.1	-/-	-/-
Measurement uncertainty	See RBW!		

Result: **Passed**

Results: OFDM / n – mode HT20

Modulation OFDM / n – mode HT20	26 dB BANDWIDTH [MHz]		
Channel	5180 MHz	5240 MHz	5260 MHz
	23.3	23.0	23.2
Channel	5320 MHz	5500 MHz	5600 MHz
	23.0	23.0	23.0
Channel	5700 MHz	-/-	-/-
	22.9	-/-	-/-
Measurement uncertainty	See RBW!		

Result: **Passed**

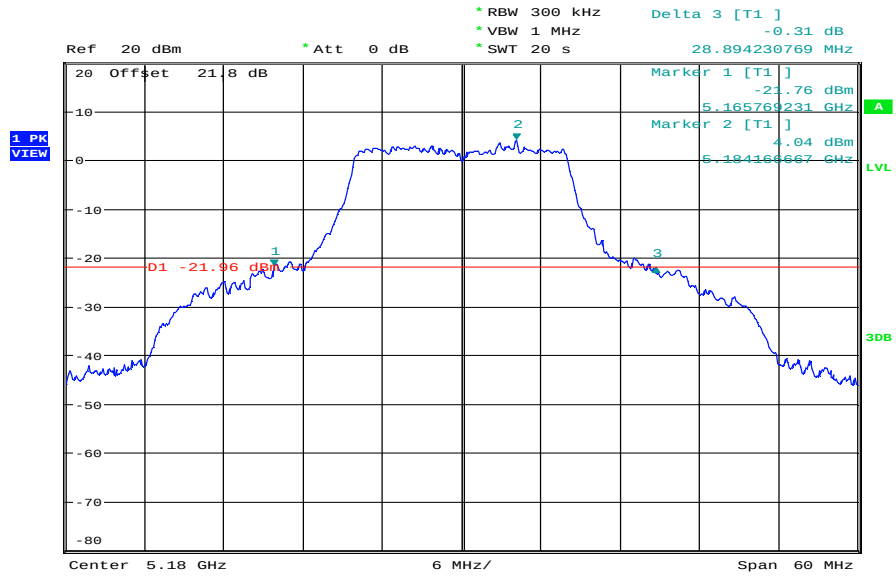
Results: OFDM / n – mode HT40

Modulation OFDM / n – mode HT40	26 dB BANDWIDTH [MHz]		
Channel	5190 MHz	5230 MHz	5270 MHz
	44.3	44.4	48.9
Channel	5310 MHz	5510 MHz	5590 MHz
	44.2	44.1	44.1
Channel	5670 MHz	-/-	-/-
	44.2	-/-	-/-
Measurement uncertainty	See RBW!		

Result: **Passed**

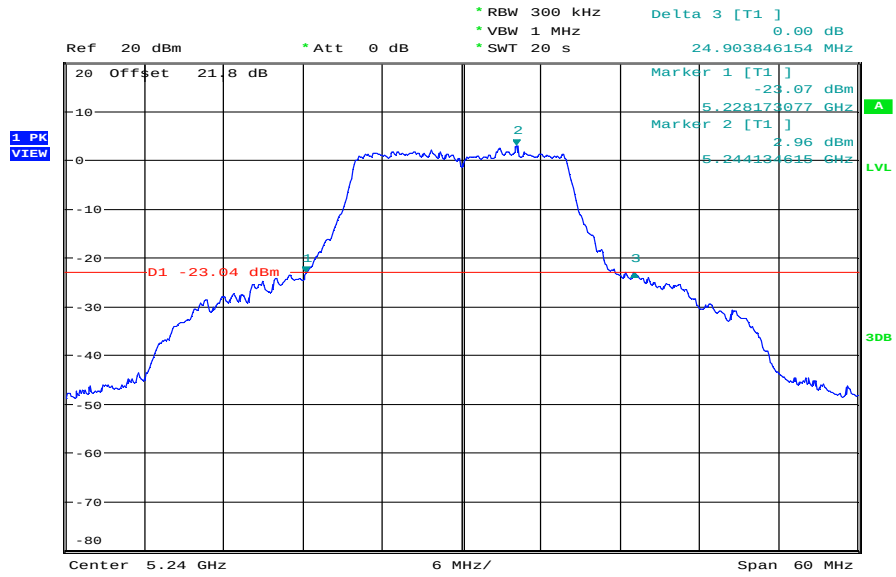
Plots: OFDM / a – mode

Plot 1: 5180 MHz



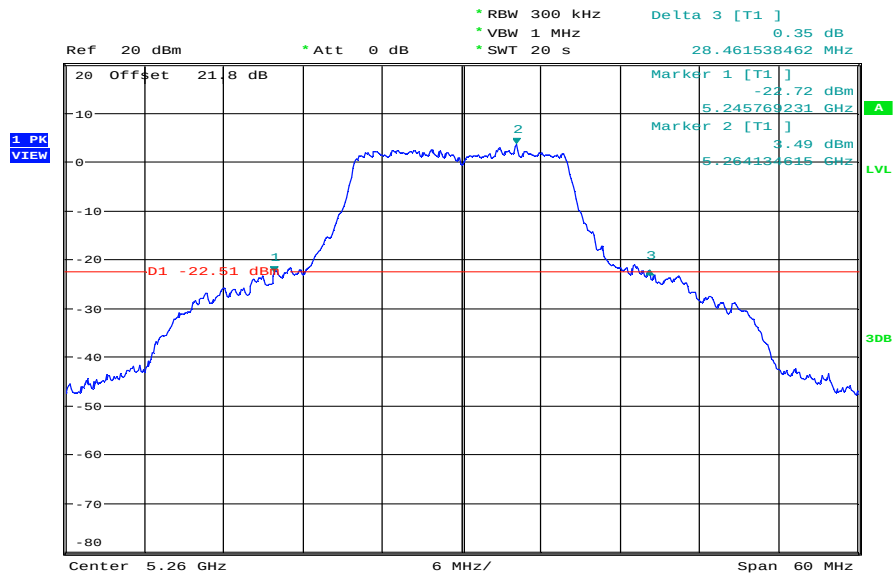
Date: 31.MAY.2012 14:50:30

Plot 2: 5240 MHz



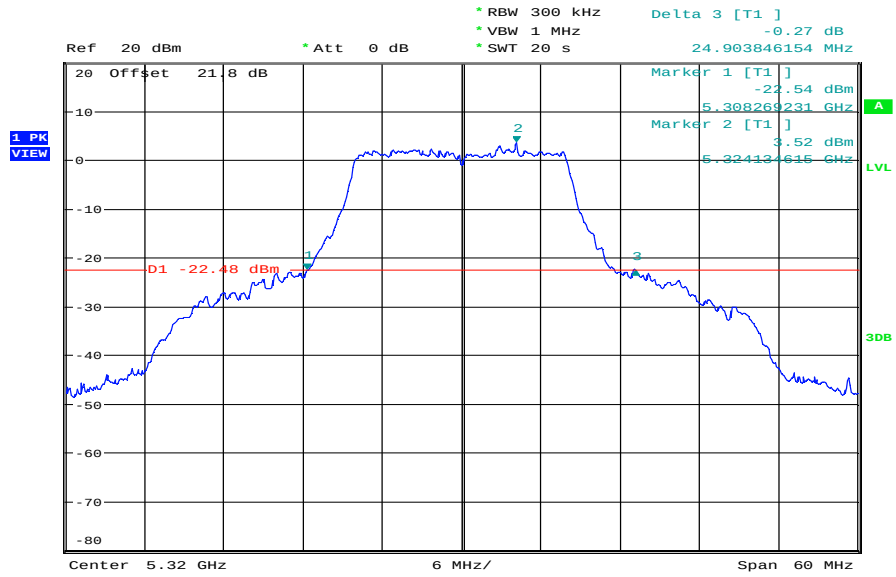
Date: 31.MAY.2012 14:52:41

Plot 3: 5260 MHz



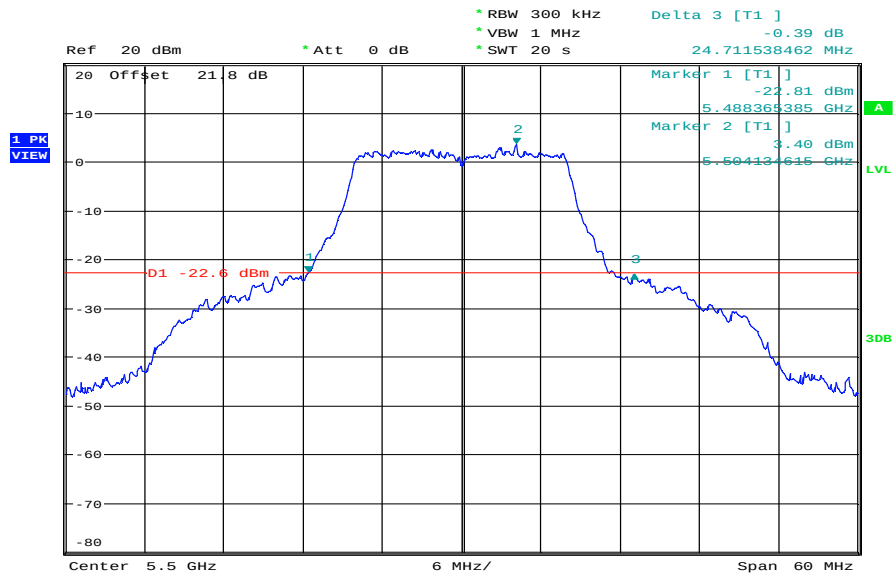
Date: 31.MAY.2012 14:54:20

Plot 4: 5320 MHz



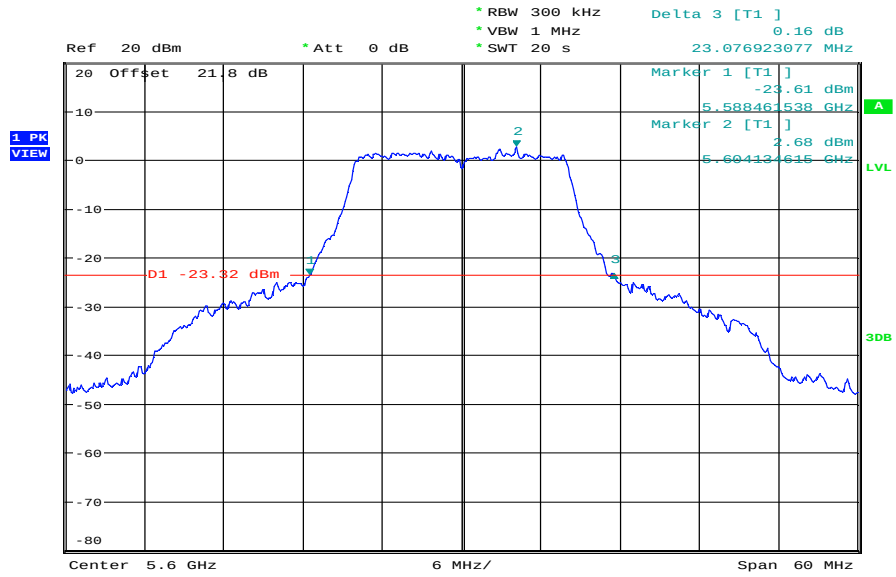
Date: 31.MAY.2012 14:56:27

Plot 5: 5500 MHz



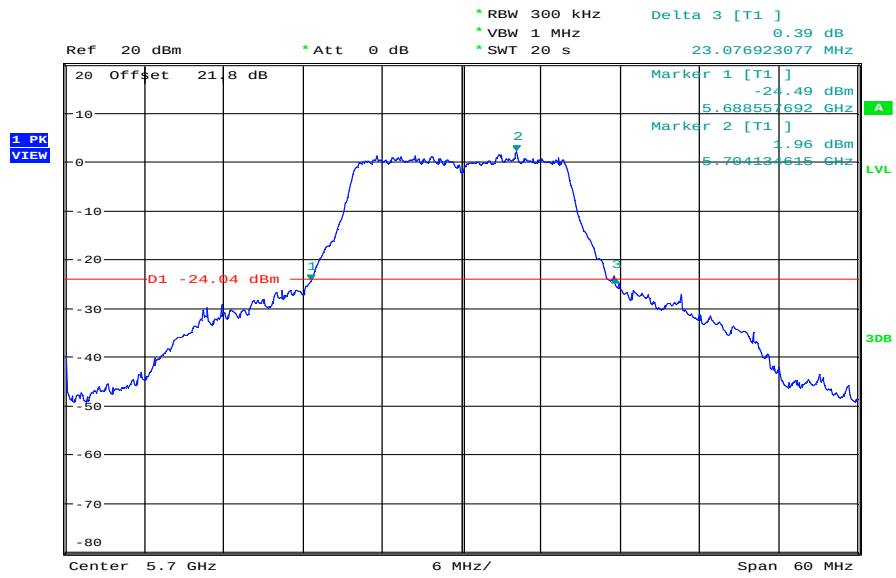
Date: 31.MAY.2012 14:59:45

Plot 6: 5600 MHz



Date: 31.MAY.2012 15:01:25

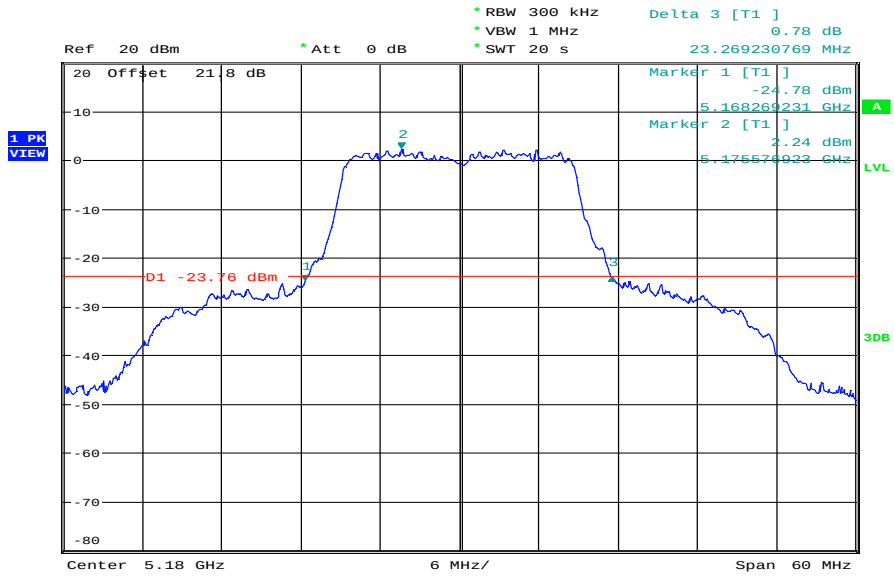
Plot 7: 5700 MHz



Date: 31.MAY.2012 15:03:07

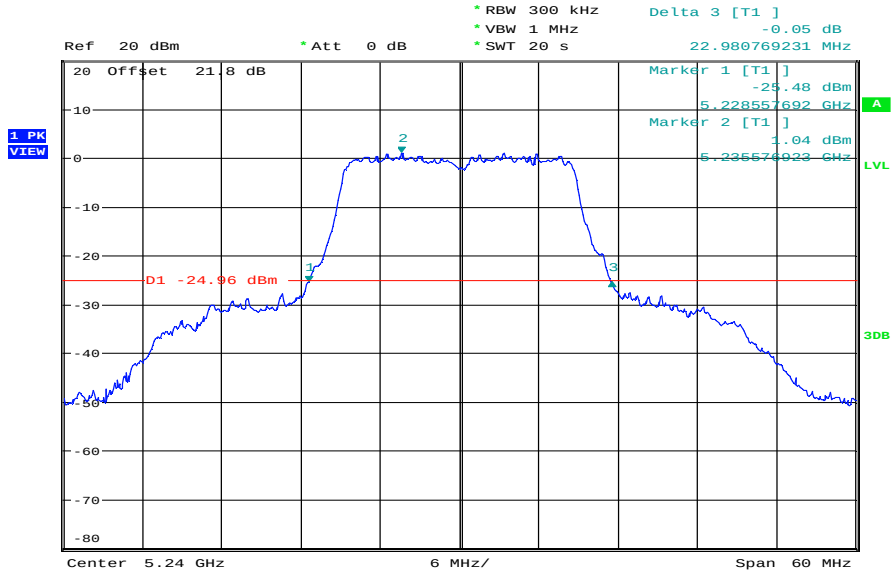
Plots: OFDM / n – mode HT20

Plot 1: 5180 MHz



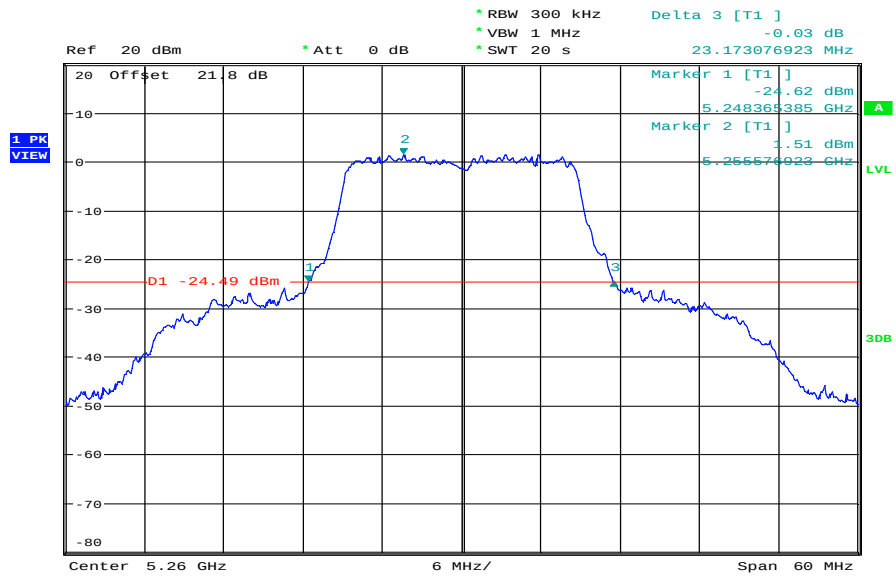
Date: 31.MAY.2012 15:15:57

Plot 2: 5240 MHz



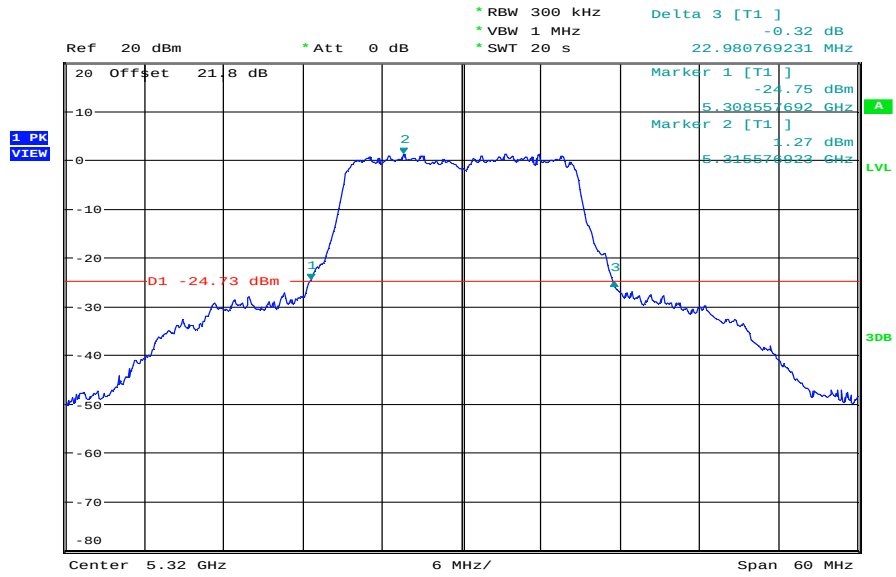
Date: 31.MAY.2012 15:14:14

Plot 3: 5260 MHz



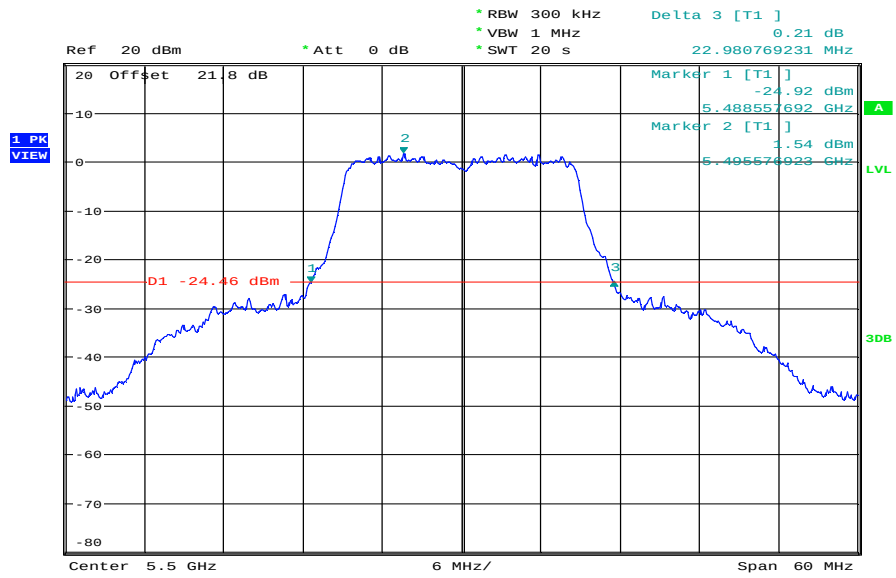
Date: 31.MAY.2012 15:12:33

Plot 4: 5320 MHz



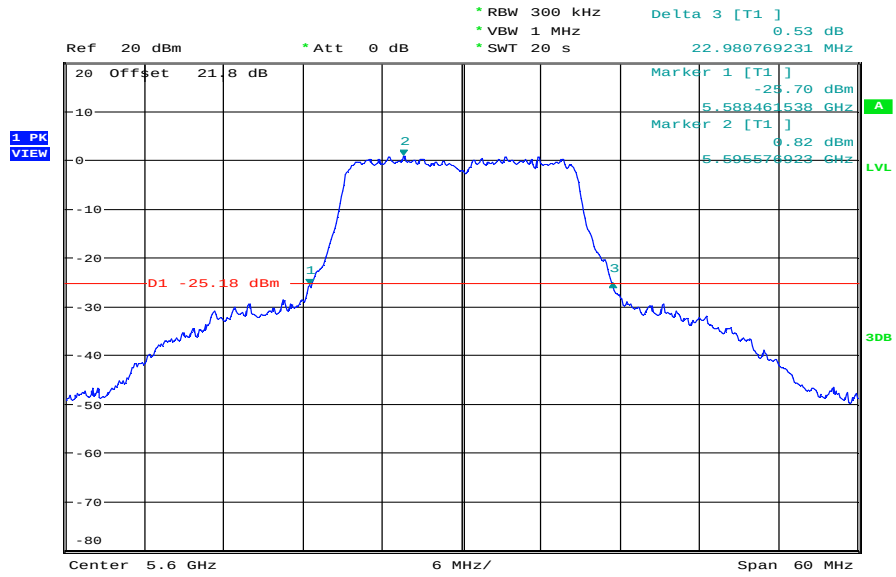
Date: 31.MAY.2012 15:10:37

Plot 5: 5500 MHz



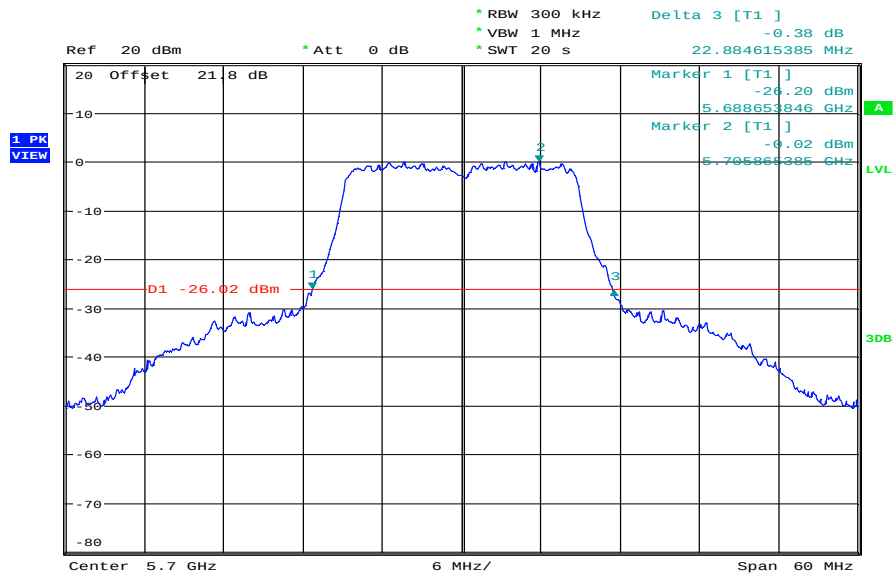
Date: 31.MAY.2012 15:08:27

Plot 6: 5600 MHz



Date: 31.MAY.2012 15:06:52

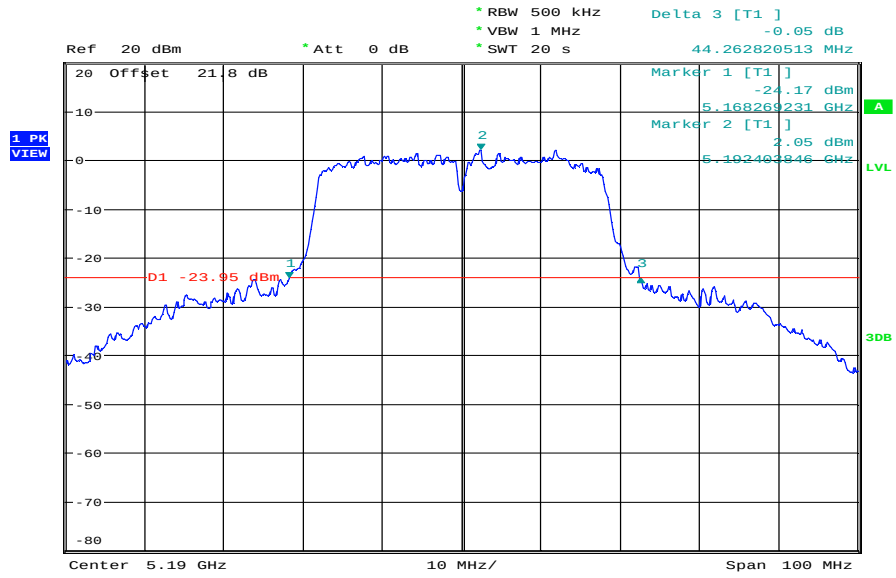
Plot 7: 5700 MHz



Date: 31.MAY.2012 15:04:48

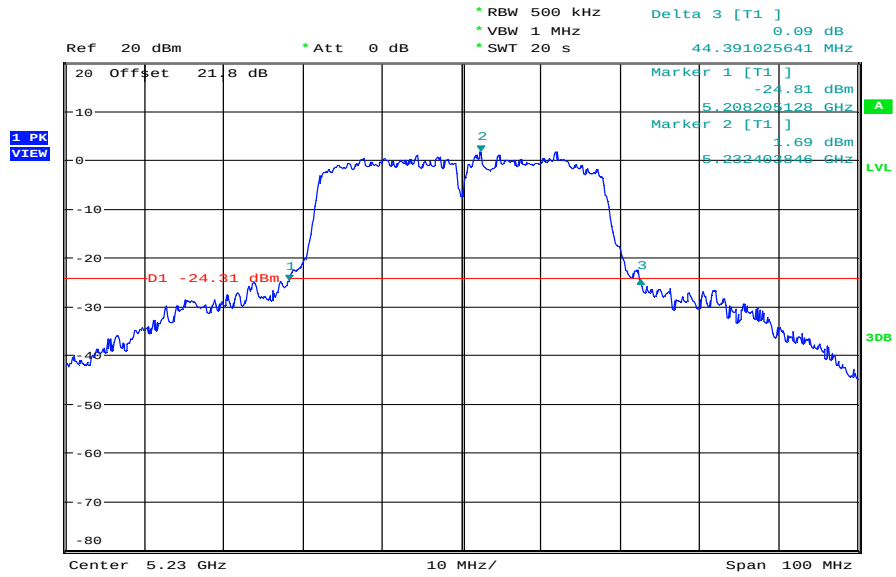
Plots: OFDM / a – mode HT40

Plot 1: 5190 MHz



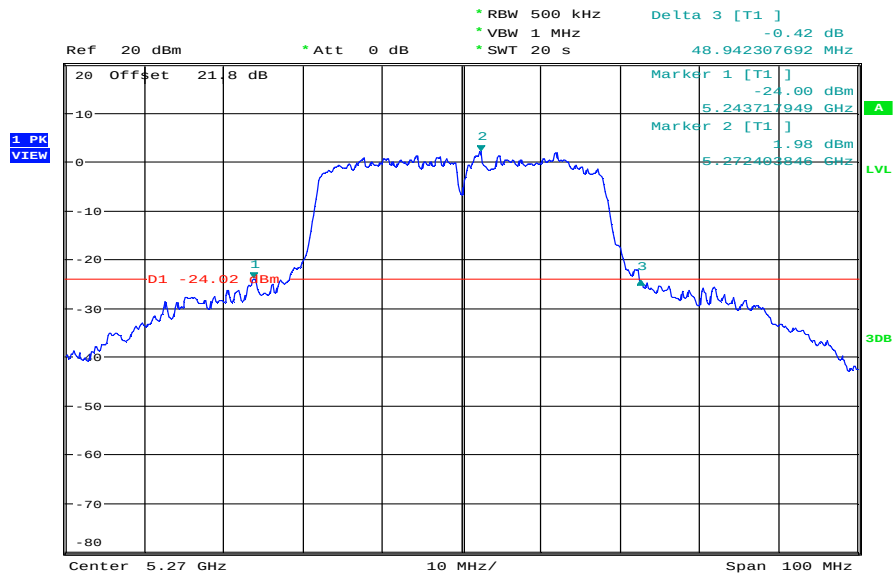
Date: 31.MAY.2012 15:20:17

Plot 2: 5230 MHz



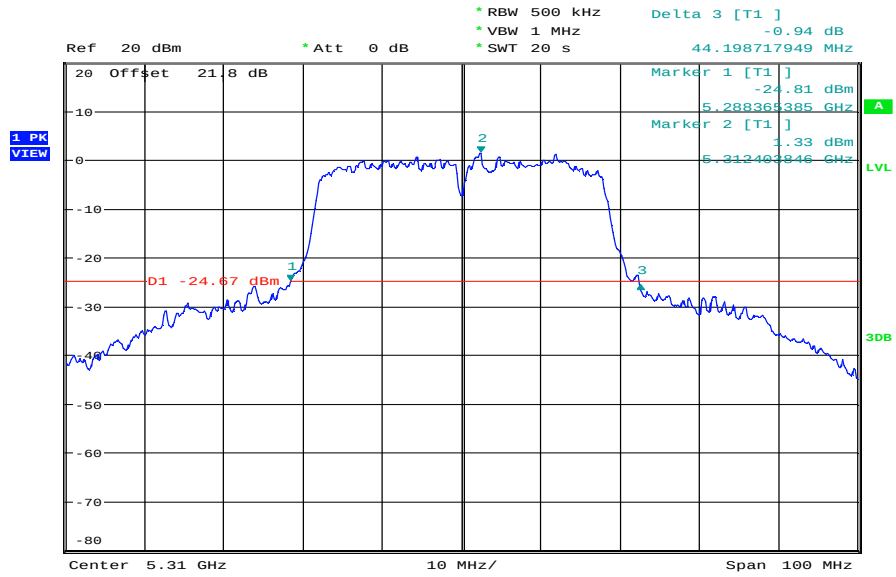
Date: 31.MAY.2012 15:22:03

Plot 3: 5270 MHz



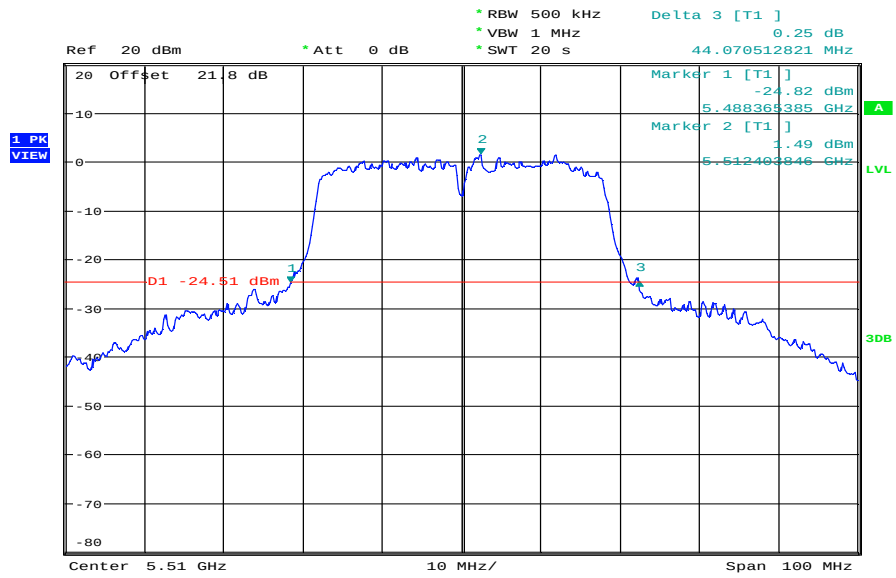
Date: 31.MAY.2012 15:23:42

Plot 4: 5310 MHz



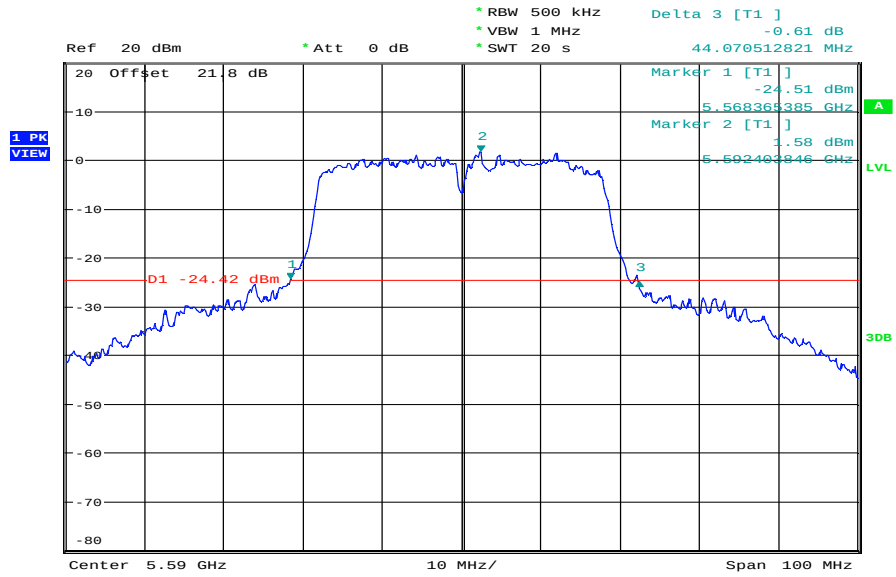
Date: 31.MAY.2012 15:27:32

Plot 5: 5510 MHz



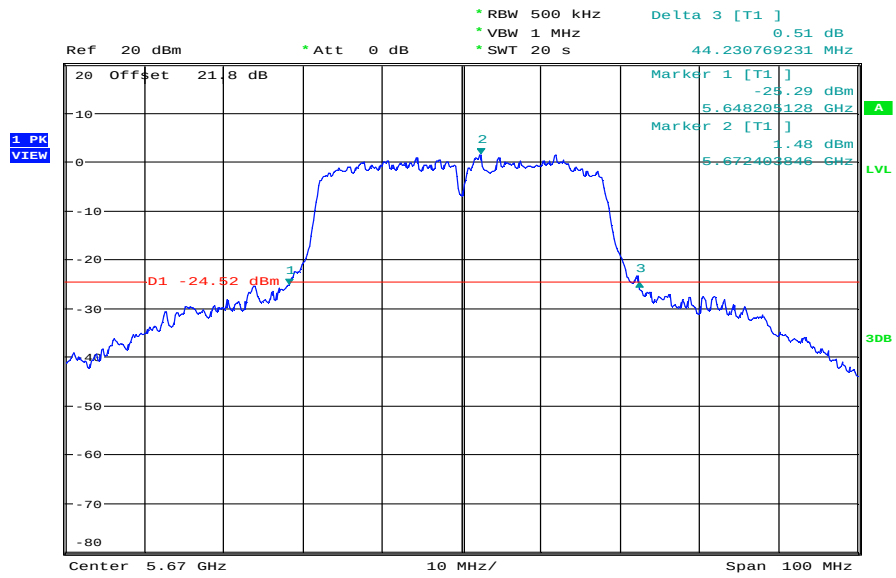
Date: 31.MAY.2012 15:29:09

Plot 6: 5590 MHz



Date: 31.MAY.2012 15:31:26

Plot 7: 5670 MHz



Date: 31.MAY.2012 15:33:23

9.7 Peak excursion measurements

Description:

Peak to average value.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	60 s / 120 s
Resolution bandwidth:	1 MHz
Video bandwidth:	≥ 3 MHz
Span:	> Complete signal
Trace-Mode:	Max hold

Limits:

Peak excursion value
Does not exceed 13 dB.

Results:

Modulation OFDM / a – mode	Peak excursion value		
Channel	5180 MHz	5240 MHz	5260 MHz
RMS	-0.94	-1.81	-1.13
Peak	8.95	8.53	8.45
Peak excursion value	9.89	10.34	9.58
Channel	5320 MHz	5500 MHz	5600 MHz
RMS	-1.19	-1.41	-1.66
Peak	8.32	9.64	8.68
Peak excursion value	9.51	11.05	10.34
Channel	5700 MHz	-/-	-/-
RMS	-2.07	-/-	-/-
Peak	7.82		
Peak excursion value	9.89		
Measurement uncertainty	± 0.5 dB		

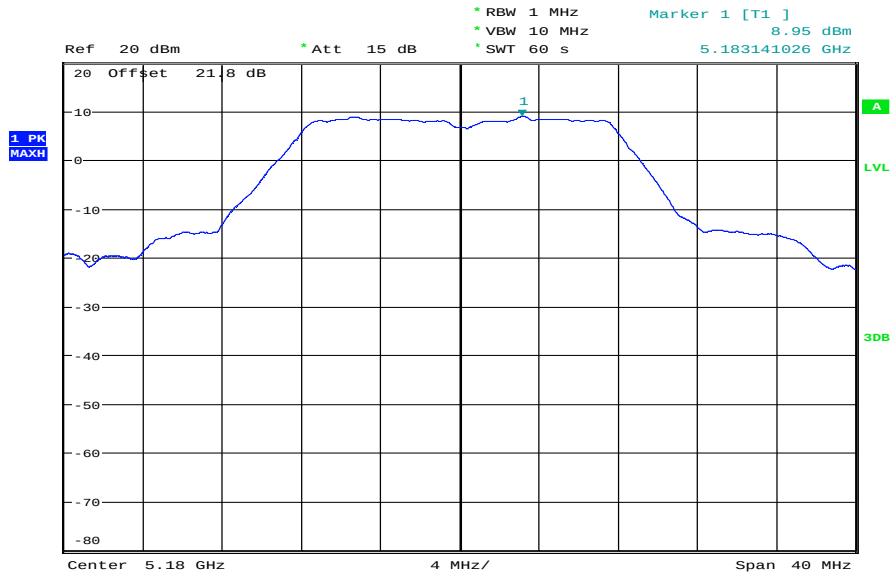
Modulation OFDM / n – mode HT20	Peak excursion value		
Channel	5180 MHz	5240 MHz	5260 MHz
RMS	-1.74	-2.97	-1.90
Peak	8.03	6.75	7.47
Peak excursion value	9.77	9.72	9.37
Channel	5320 MHz	5500 MHz	5600 MHz
RMS	-2.35	-2.08	-2.52
Peak	7.98	8.61	7.54
Peak excursion value	10.33	10.69	10.06
Channel	5700 MHz	-/-	-/-
RMS	-3.47	-/-	-/-
Peak	6.83		
Peak excursion value	10.30		
Measurement uncertainty	± 0.5 dB		

Modulation OFDM / n – mode HT40	Peak excursion value		
Channel	5190 MHz	5230 MHz	5270 MHz
RMS	-4.45	-4.97	-5.12
Peak	5.46	5.12	5.33
Peak excursion value	9.91	10.09	10.45
Channel	5310 MHz	5510 MHz	5590 MHz
RMS	-4.58	-4.89	-4.93
Peak	4.81	5.44	5.28
Peak excursion value	9.39	10.33	10.21
Channel	5670 MHz	-/-	-/-
RMS	-5.32	-/-	-/-
Peak	5.00		
Peak excursion value	10.32		
Measurement uncertainty	± 0.5 dB		

Result: **Passed**

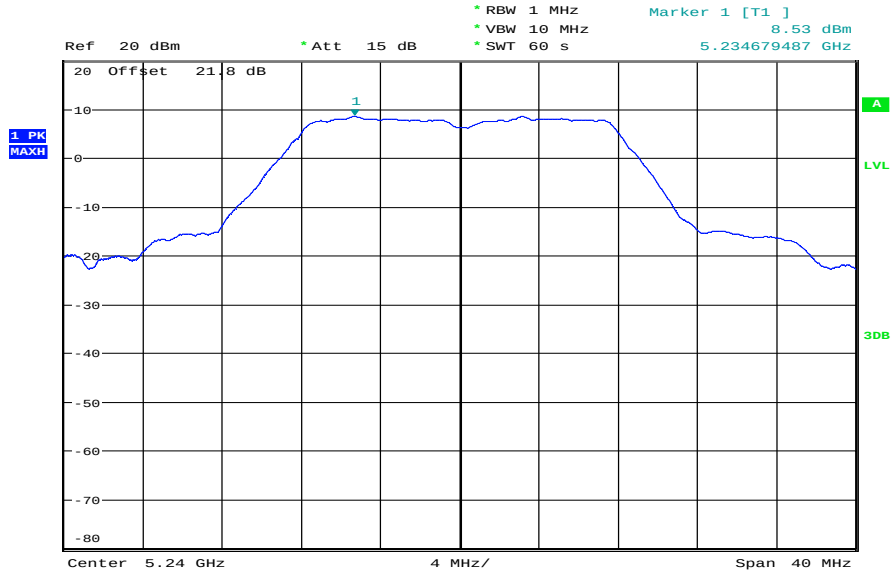
Plots: OFDM / a – mode

Plot 1: 5180 MHz



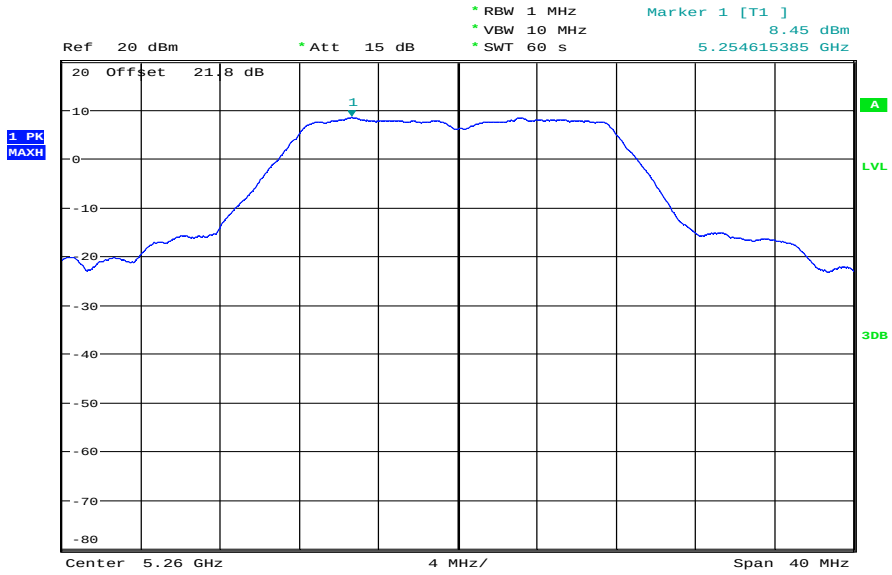
Date: 1.JUN.2012 11:27:14

Plot 2: 5240 MHz



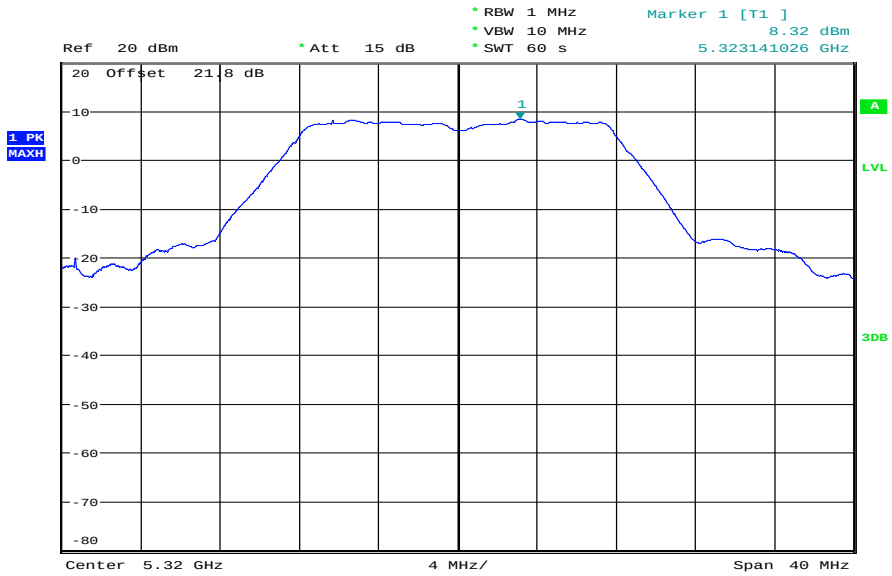
Date: 1.JUN.2012 11:51:33

Plot 3: 5260 MHz



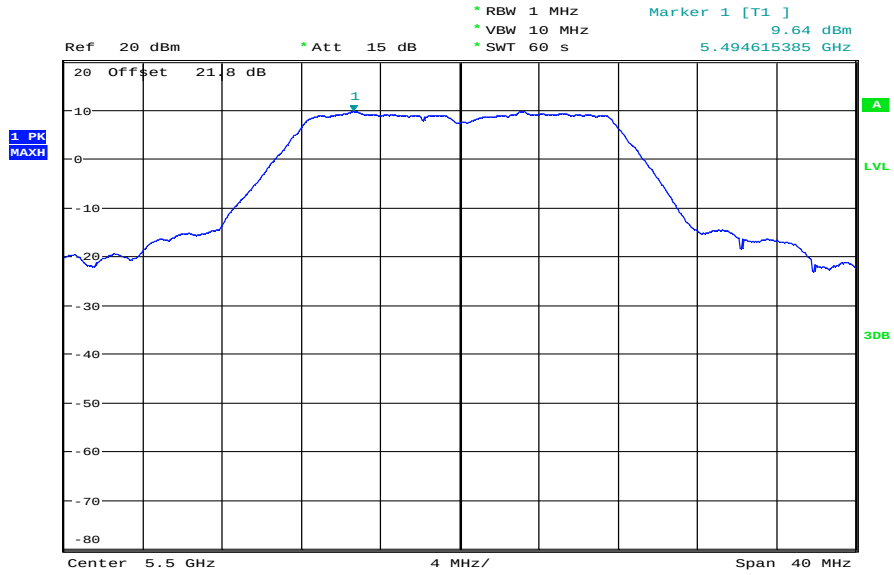
Date: 1.JUN.2012 11:53:20

Plot 4: 5320 MHz



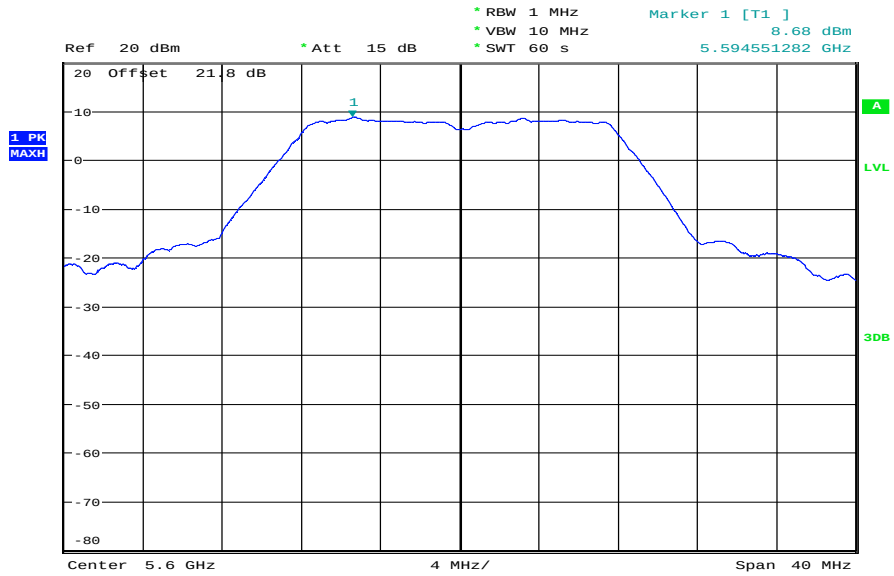
Date: 1.JUN.2012 11:55:12

Plot 5: 5500 MHz



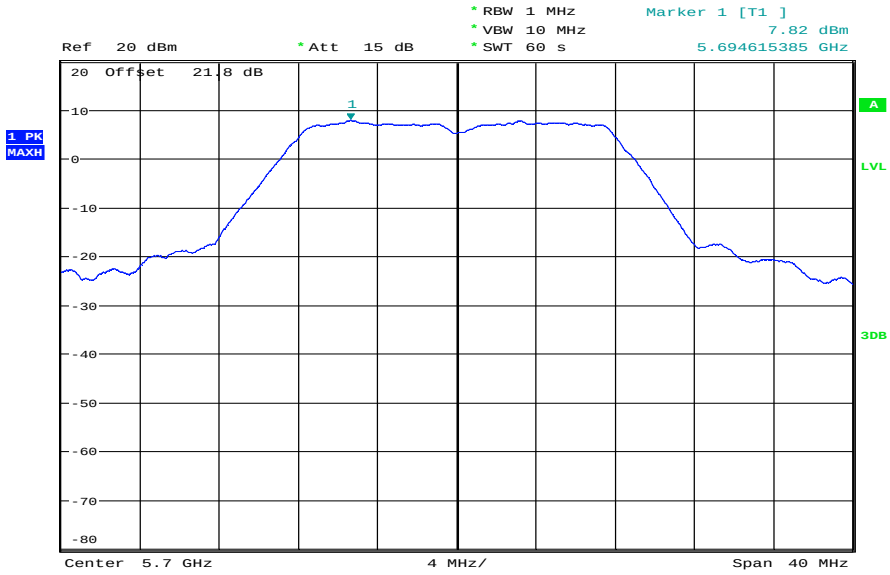
Date: 1.JUN.2012 11:59:49

Plot 6: 5600 MHz



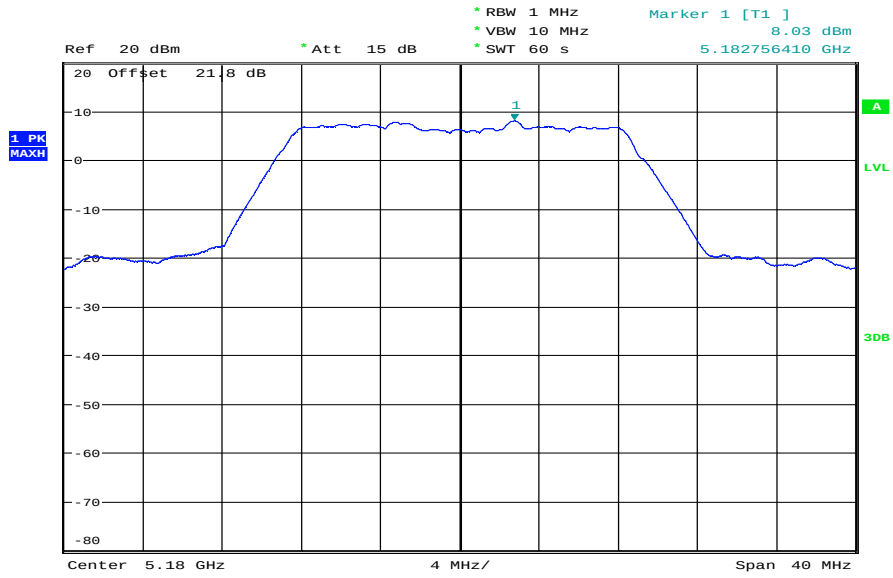
Date: 1.JUN.2012 12:01:18

Plot 7: 5700 MHz



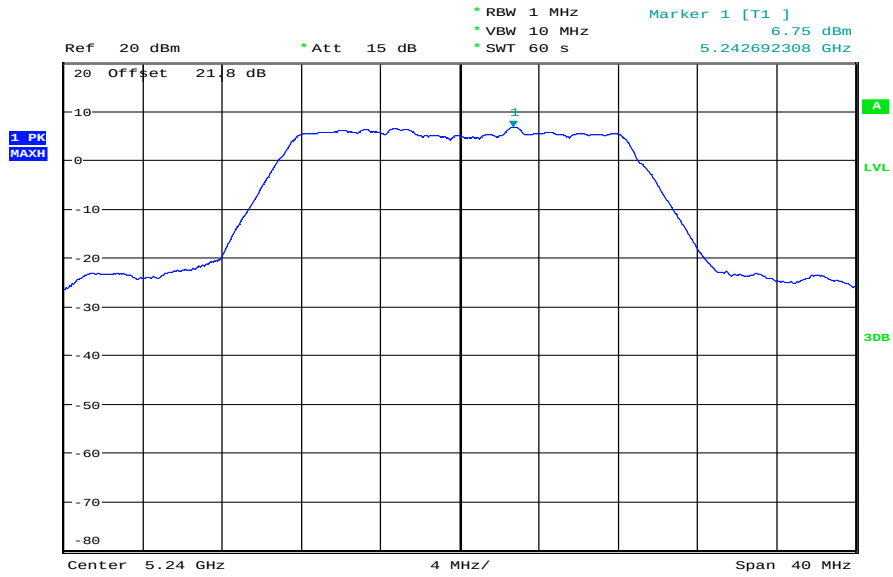
Plots: OFDM / n – mode HT20

Plot 1: 5180 MHz



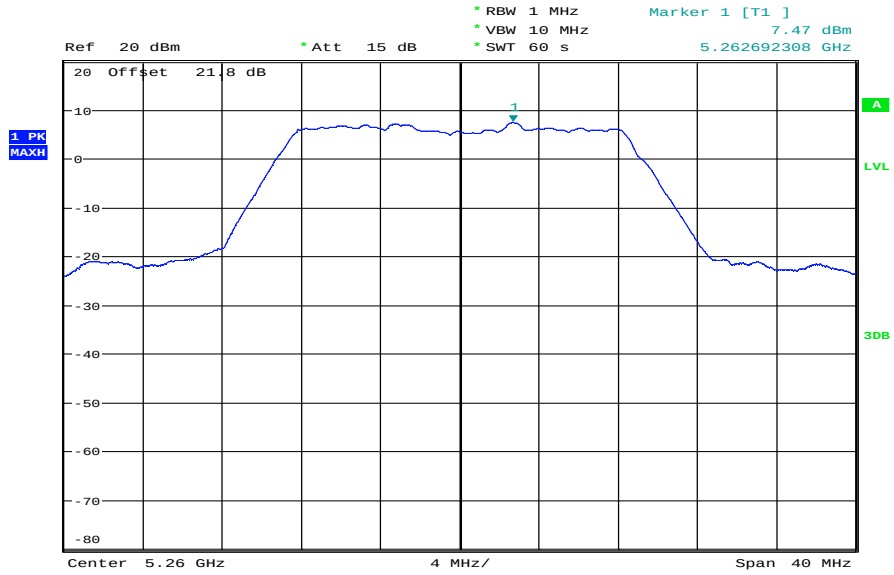
Date: 1.JUN.2012 12:14:25

Plot 2: 5240 MHz



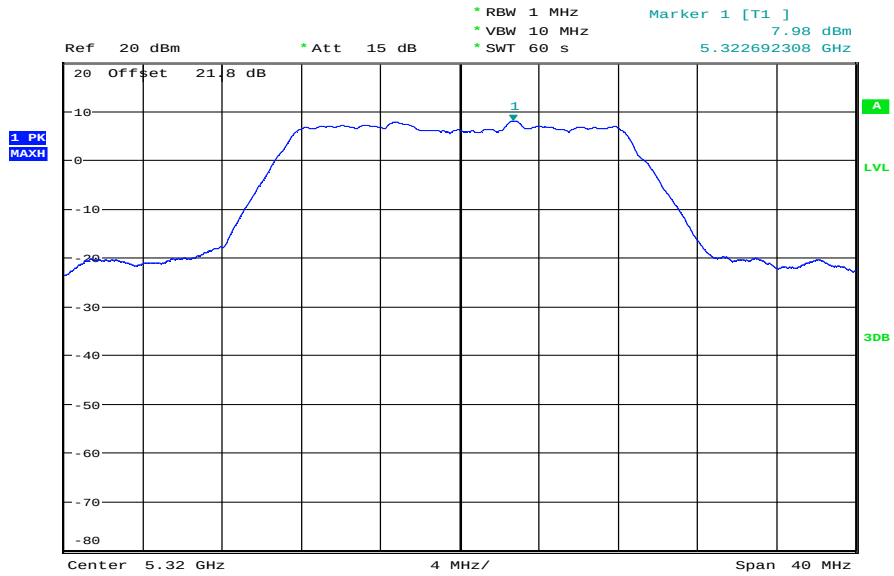
Date: 1.JUN.2012 12:13:01

Plot 3: 5260 MHz



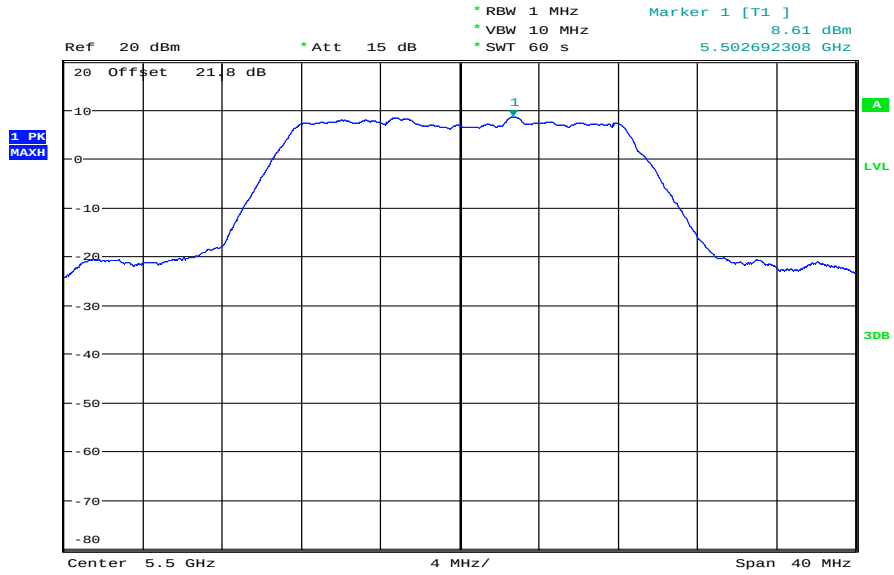
Date: 1.JUN.2012 12:11:34

Plot 4: 5320 MHz



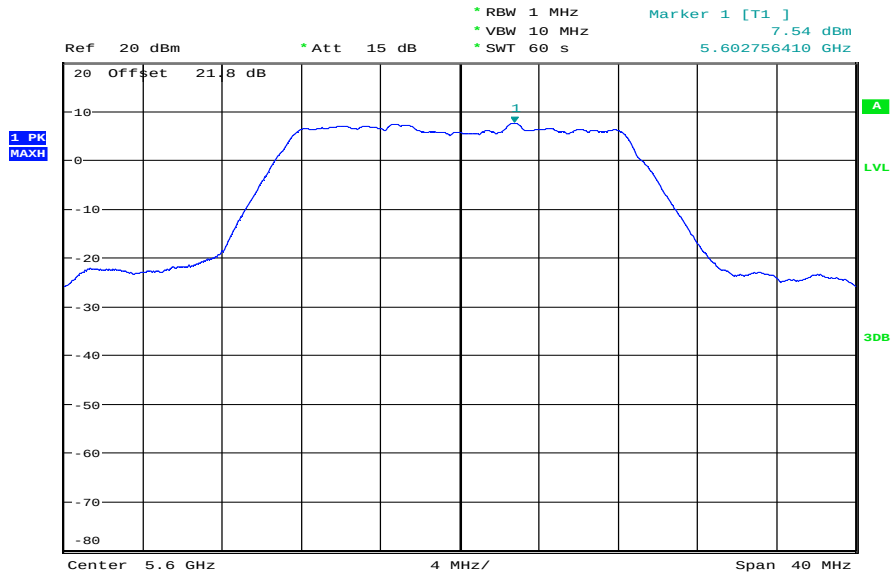
Date: 1.JUN.2012 12:09:18

Plot 5: 5500 MHz



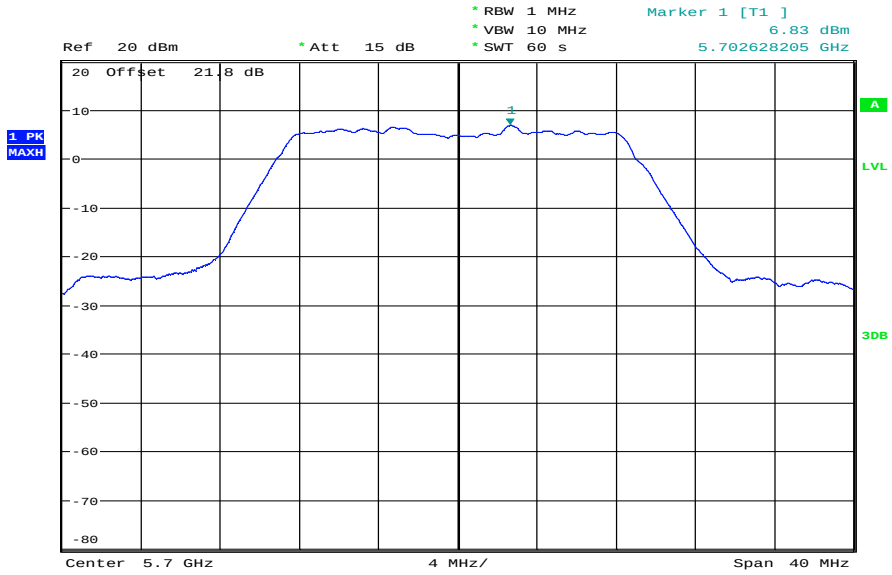
Date: 1.JUN.2012 12:07:46

Plot 6: 5600 MHz



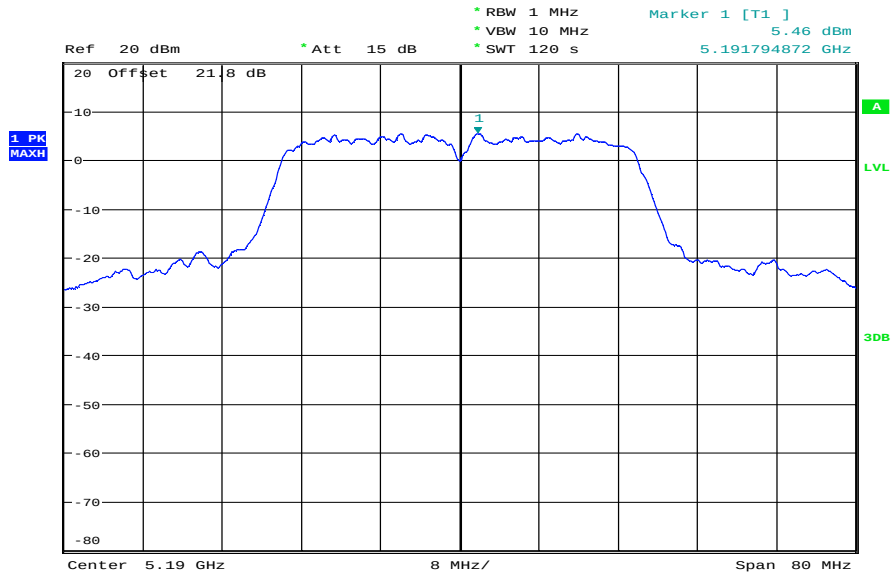
Date: 1.JUN.2012 12:05:57

Plot 7: 5700 MHz



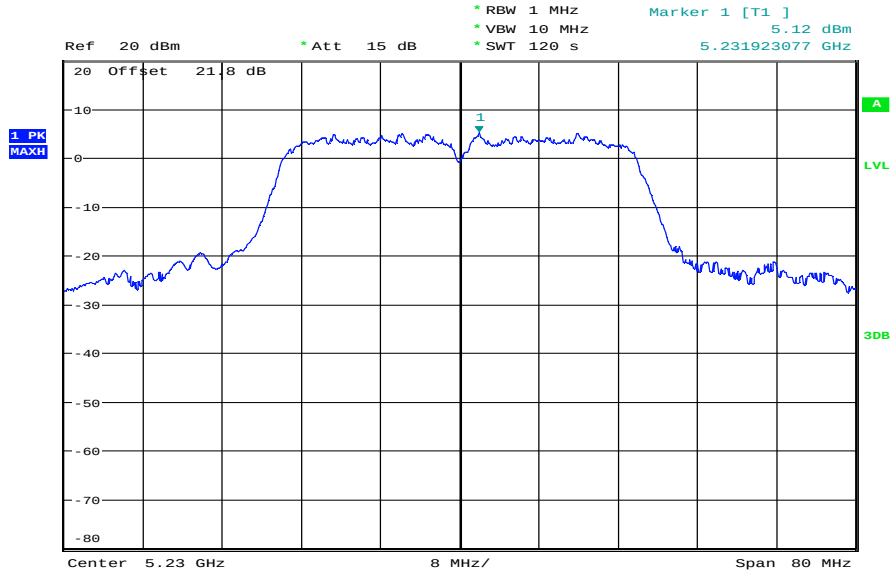
Plots: OFDM / a – mode HT40

Plot 1: 5190 MHz



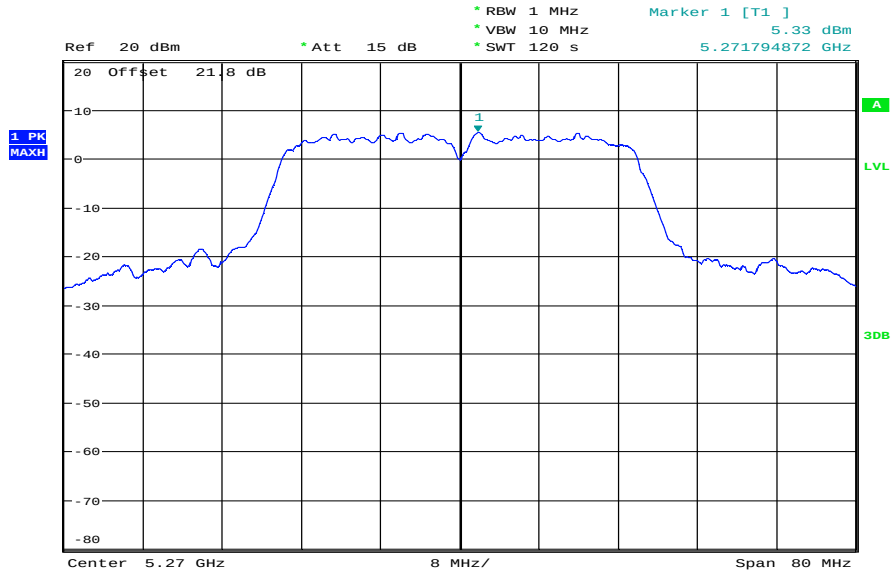
Date: 1.JUN.2012 12:55:10

Plot 2: 5230 MHz



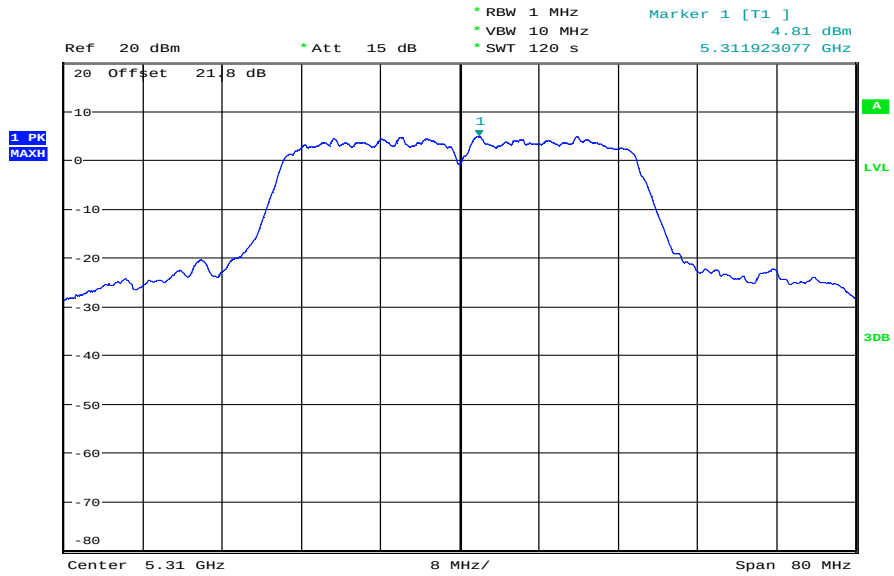
Date: 1.JUN.2012 12:57:48

Plot 3: 5270 MHz



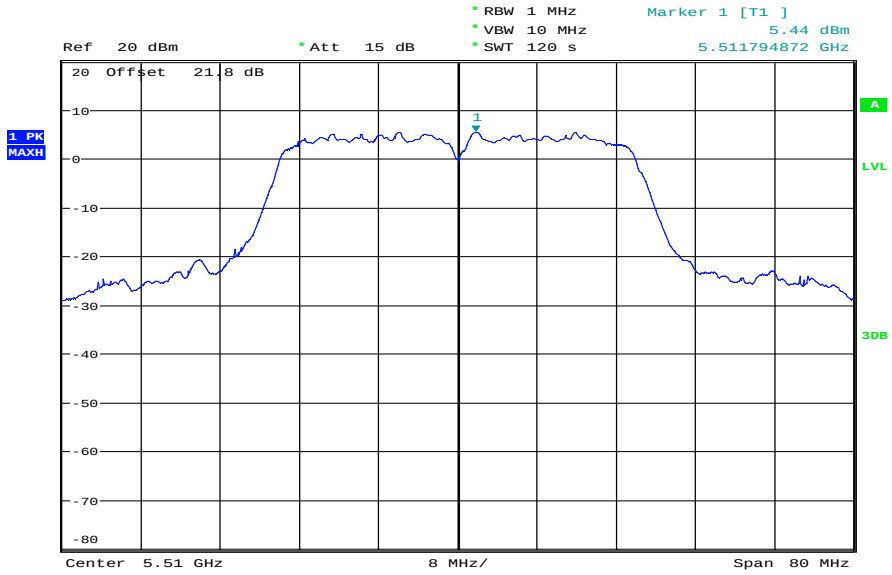
Date: 1.JUN.2012 13:00:19

Plot 4: 5310 MHz

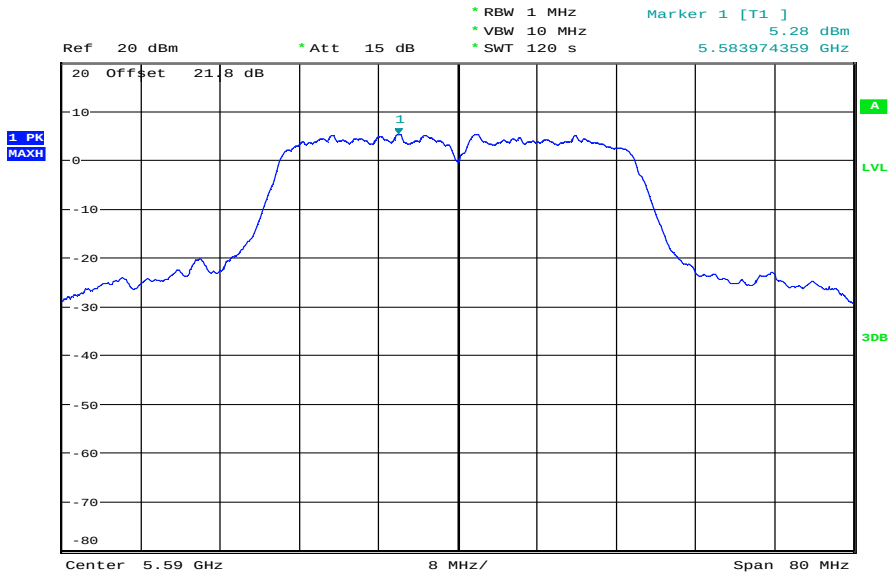


Date: 1.JUN.2012 13:03:25

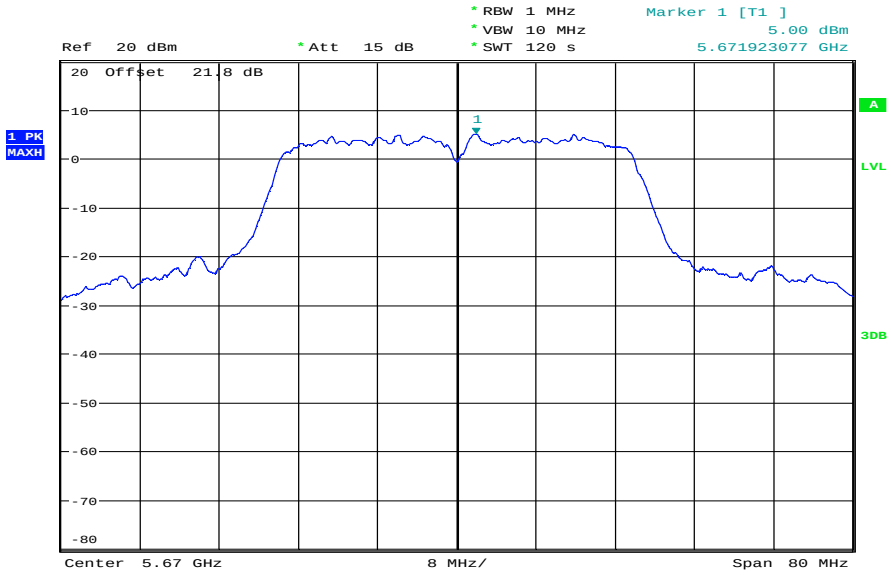
Plot 5: 5510 MHz



Plot 6: 5590 MHz



Plot 7: 5670 MHz



9.8 Band edge compliance radiated

Description:

Measurement of the radiated band edge compliance. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed. The EUT is set to the lowest channel for the lower restricted band and to the highest channel for the upper restricted band. Measurement distance is 3m.

Measurement:

Measurement parameter	
Detector:	Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	10 Hz / 3 MHz
Span:	5150 MHz ± 100 MHz
Trace-Mode:	Max Hold

Limits:

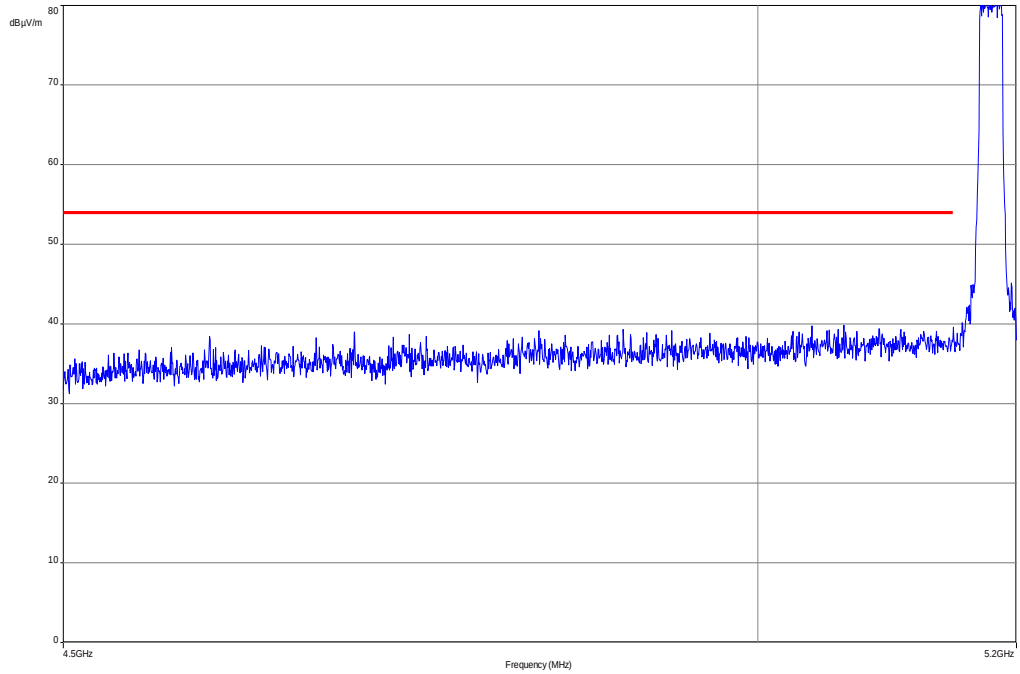
Band Edge Compliance Radiated
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within 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 Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).
54 dBµV/m AVG

Result:

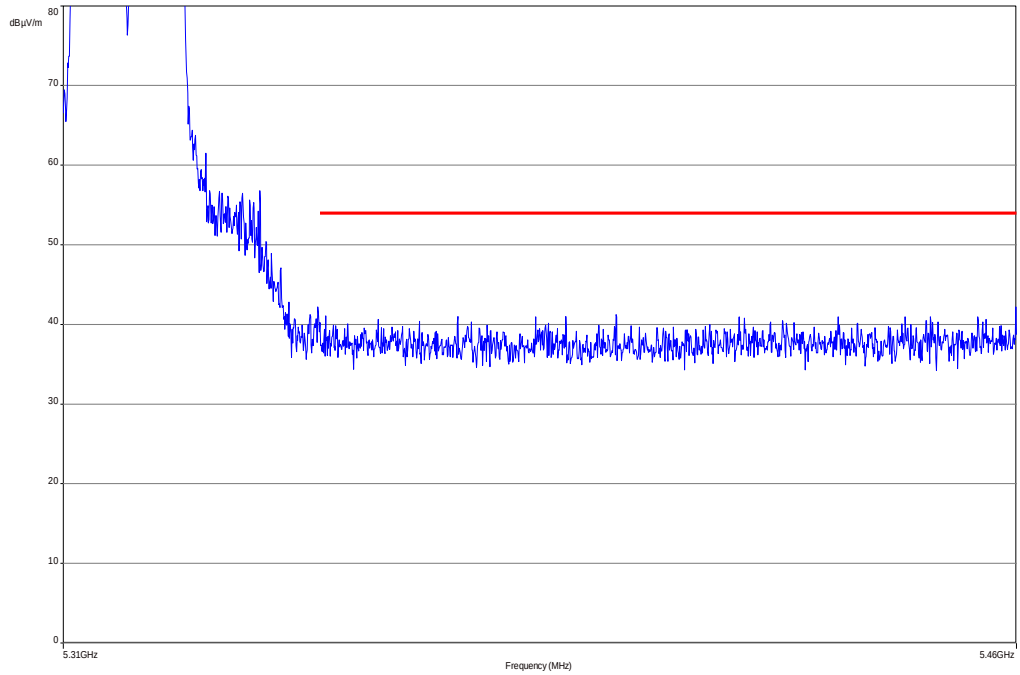
Scenario	Band Edge Compliance Radiated [dBµV/m]
Lower Band Edge	< 54 dBµV/m (see plots 1/3)
Measurement uncertainty	± 3 dB

Plots:

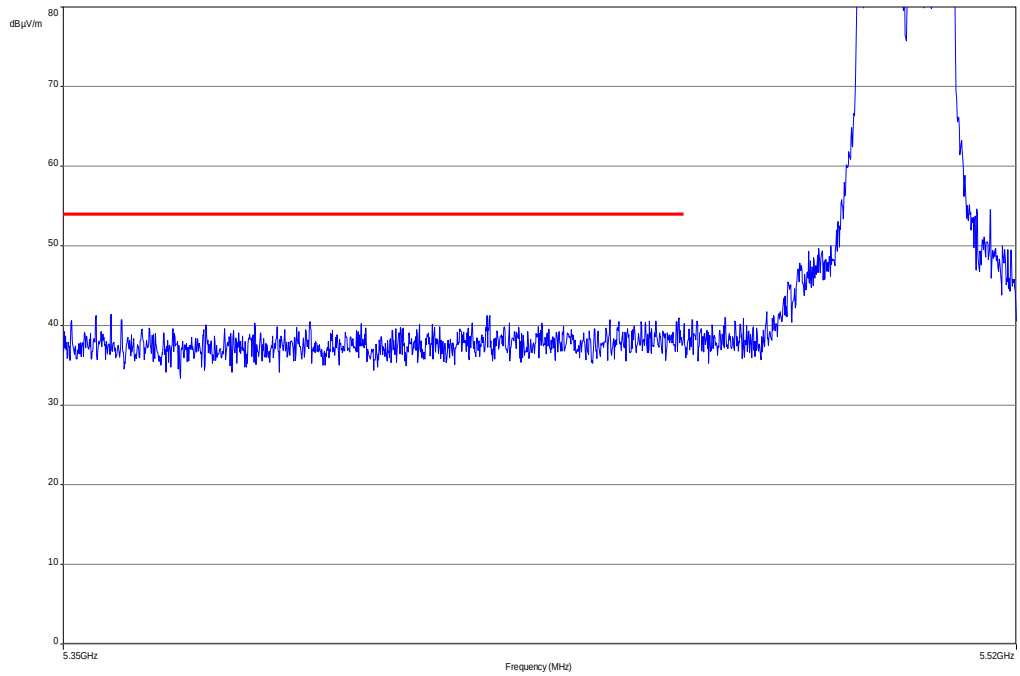
Plot 1: lower band edge, vertical & horizontal polarization (n HT 20 mode / a mode), channel 36



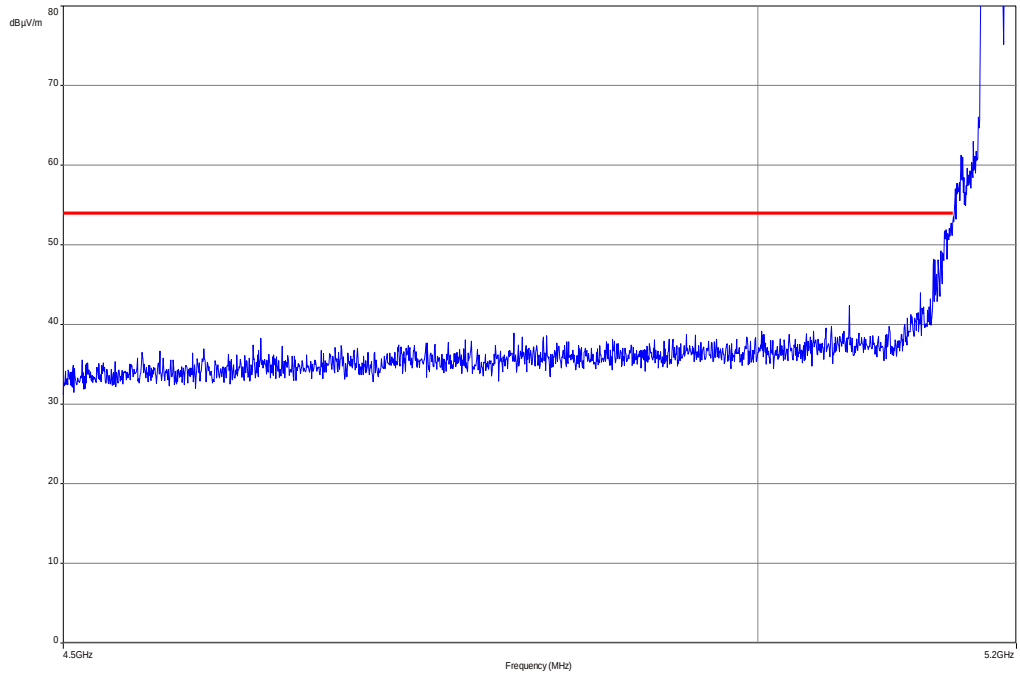
Plot 2: upper band edge, vertical & horizontal polarization (n HT 20 mode / a mode), channel 64



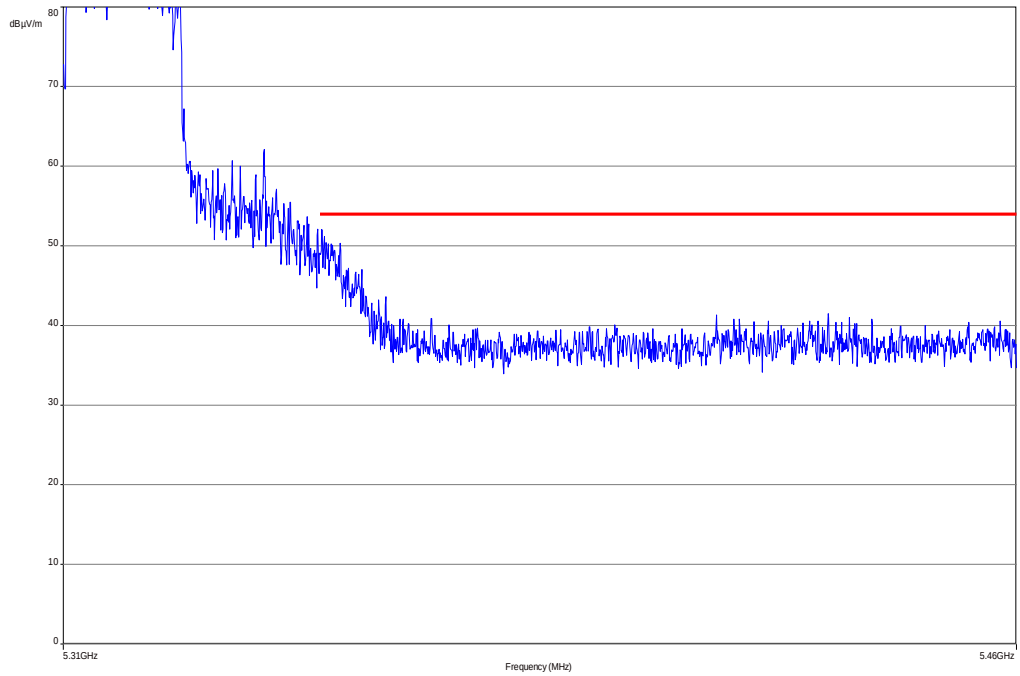
Plot 3: lower band edge, vertical & horizontal polarization (n HT 20 mode / a mode), channel 100



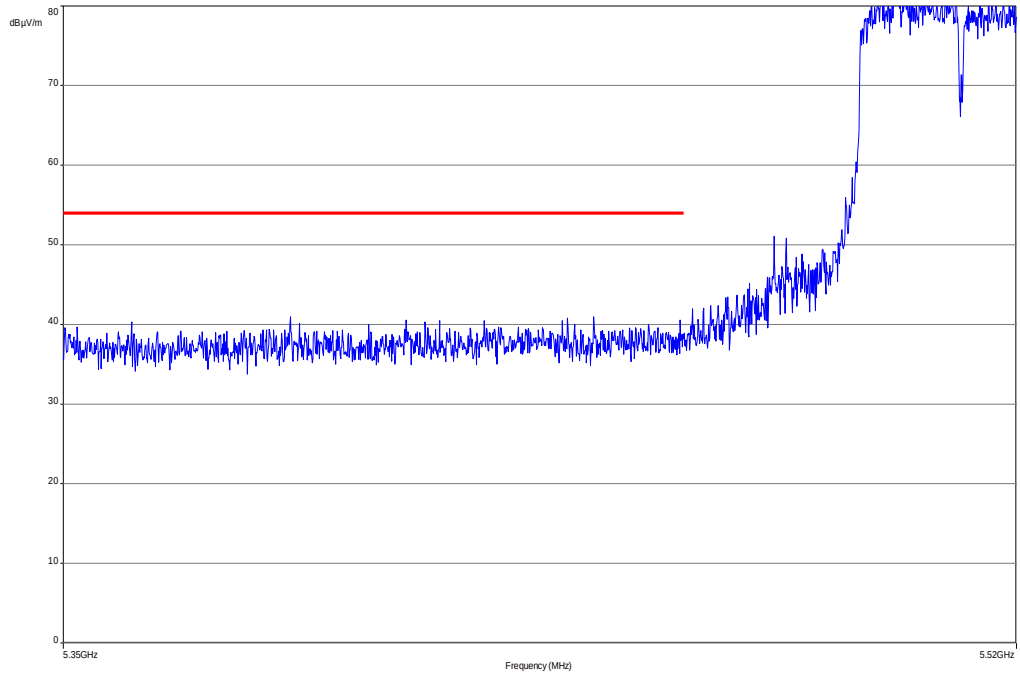
Plot 4: lower band edge, vertical & horizontal polarization (n HT 40 mode), channel 36



Plot 5: upper band edge, vertical & horizontal polarization (n HT 40 mode), channel 60



Plot 6: lower band edge, vertical & horizontal polarization (n HT 40 mode), channel 100



Result: **Passed**

9.9 TX spurious emissions radiated

Description:

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

Measurement:

Measurement parameter	
Detector:	Quasi Peak below 1 GHz (alternative Peak) Peak above 1 GHz / RMS
Sweep time:	Auto
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Video bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: ≥ 3 MHz /10 Hz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold / Average with 100 counts + 20 log (1 / X) for duty cycle lower than 100 %

Limits:

TX Spurious Emissions Radiated		
§15.209		
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
§15.407		
Outside the restricted bands!	-27 dBm / MHz	

Results: OFDM / a – mode

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM a – mode								
Lowest 5180 MHz			-/-			Highest 5240 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM a – mode								
Lowest 5260 MHz			-/-			Highest 5320 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM a – mode								
Lowest 5500 MHz			Middle 5600 MHz			Highest 5700 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Results: OFDM / n – mode HT20

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM n – mode HT20								
Lowest 5180 MHz			-/-			Highest 5240 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM n – mode HT20								
Lowest 5260 MHz			-/-			Highest 5320 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM n – mode HT20								
Lowest 5500 MHz			Middle 5600 MHz			Highest 5700 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Results: OFDM / n – mode HT40

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM n – mode HT20								
Lowest 5190 MHz			-/-			Highest 5230 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM n – mode HT20								
Lowest 5270 MHz			-/-			Highest 5310 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dBµV/m] / dBm								
OFDM n – mode HT20								
Lowest 5510 MHz			Middle 5590 MHz			Highest 5670 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Note:

Results of the OFDM / n – mode HT20 and HT40 are added to show the behaviour of the EUT.

Plots: OFDM / n – mode HT20

Plot 1: 30 MHz to 1 GHz, channel 36, vertical & horizontal polarization

Common Information

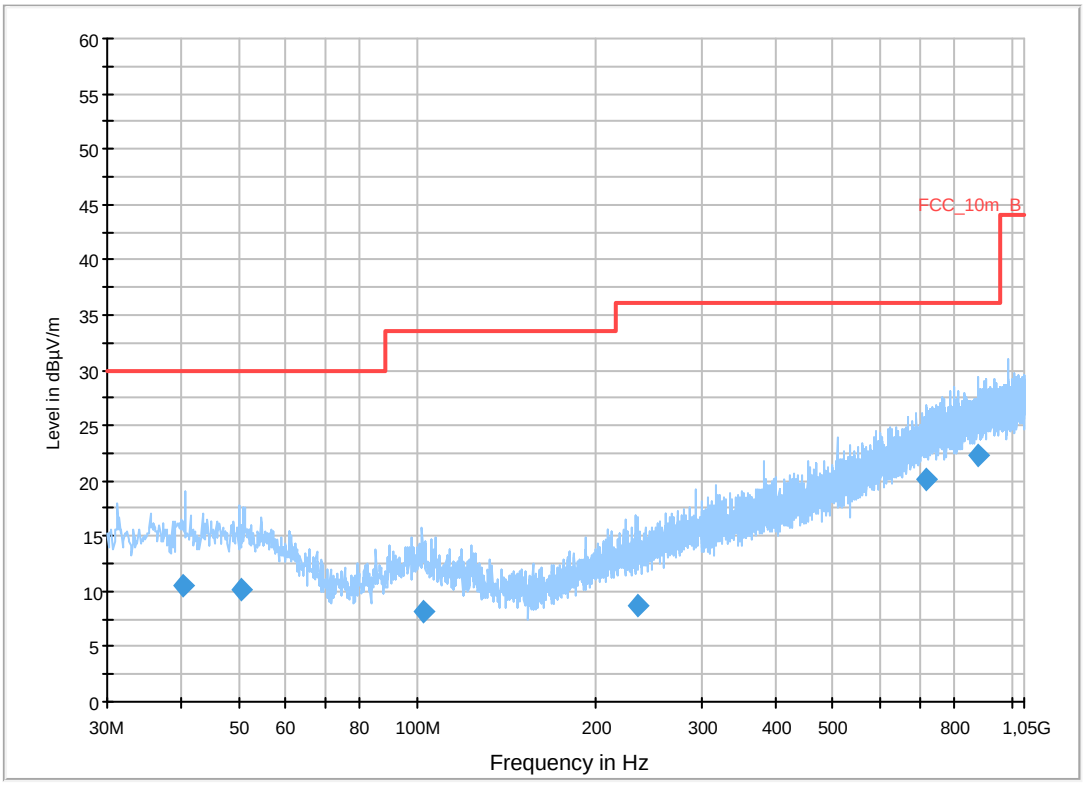
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT20 ch 36 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

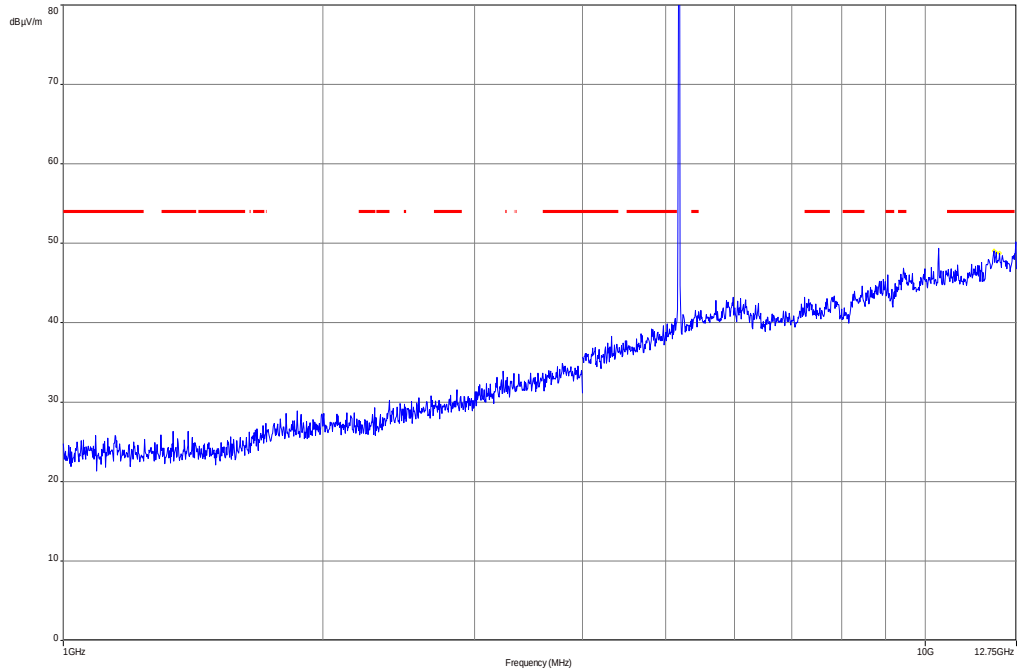
FCC_10m(B)_3



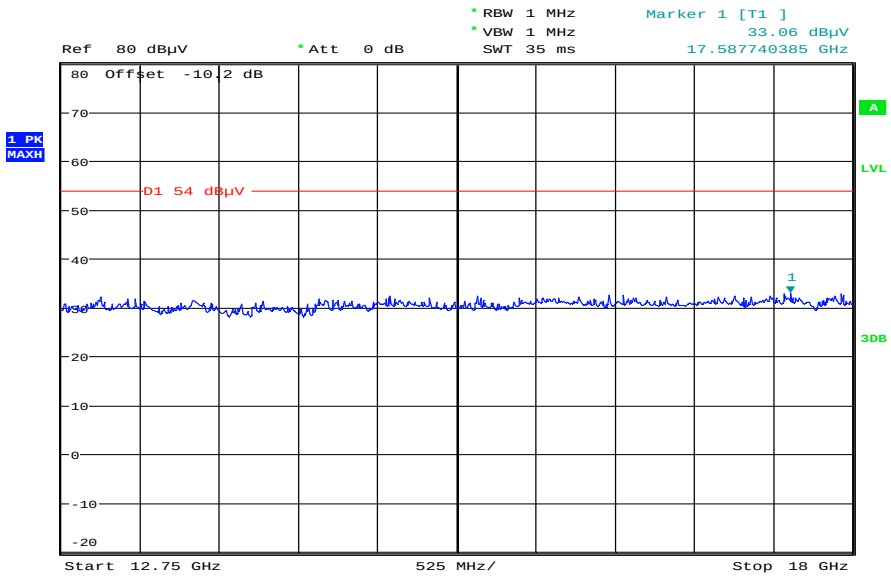
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
40.259550	10.6	1000.0	120.000	121.0	V	171.0	13.4	19.4	30.0	
50.541900	10.2	1000.0	120.000	170.0	H	100.0	13.3	19.8	30.0	
102.296700	8.2	1000.0	120.000	170.0	H	261.0	11.7	25.3	33.5	
233.808450	8.7	1000.0	120.000	170.0	V	10.0	12.8	27.3	36.0	
720.407700	20.2	1000.0	120.000	105.0	H	10.0	23.0	15.8	36.0	
875.795550	22.2	1000.0	120.000	170.0	H	280.0	24.9	13.8	36.0	

Plot 2: 1 GHz to 12.75 GHz, channel 36, vertical & horizontal polarization

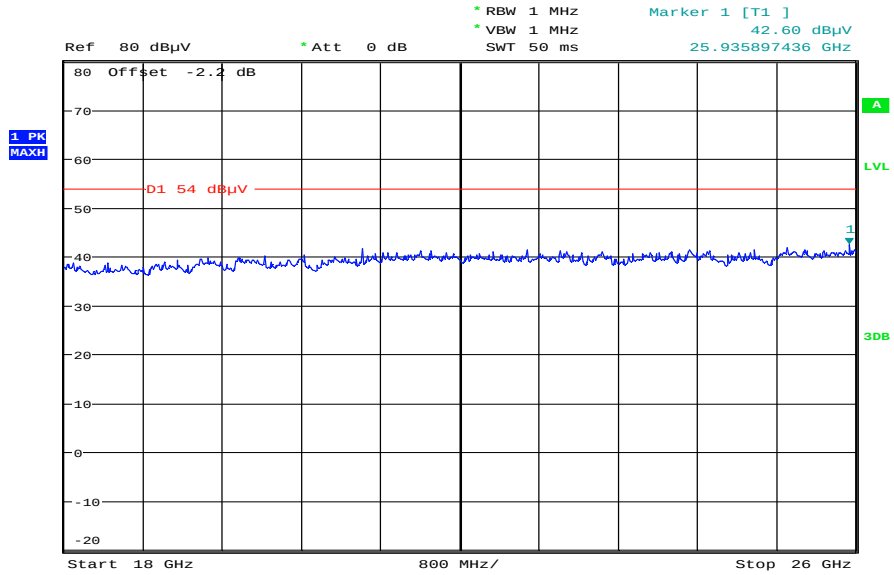


Plot 3: 12 GHz to 18 GHz, channel 36, vertical & horizontal polarization



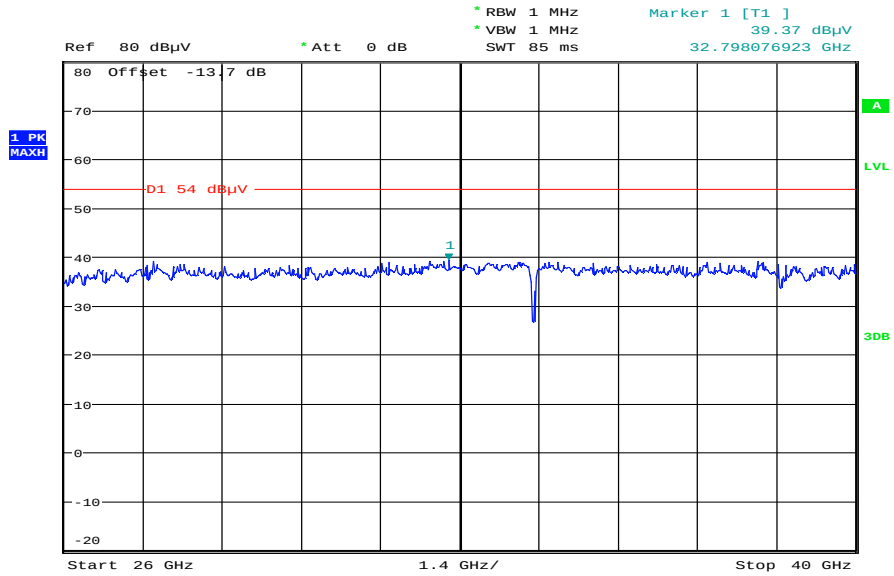
Date: 4.JUN.2012 08:17:04

Plot 4: 18 GHz to 26 GHz, channel 36, vertical & horizontal polarization



Date: 4.JUN.2012 08:45:20

Plot 5: 26 GHz to 40 GHz, channel 36, vertical & horizontal polarization



Date: 4.JUN.2012 08:50:36

Plot 6: 30 MHz to 1 GHz, channel 48, vertical & horizontal polarization

Common Information

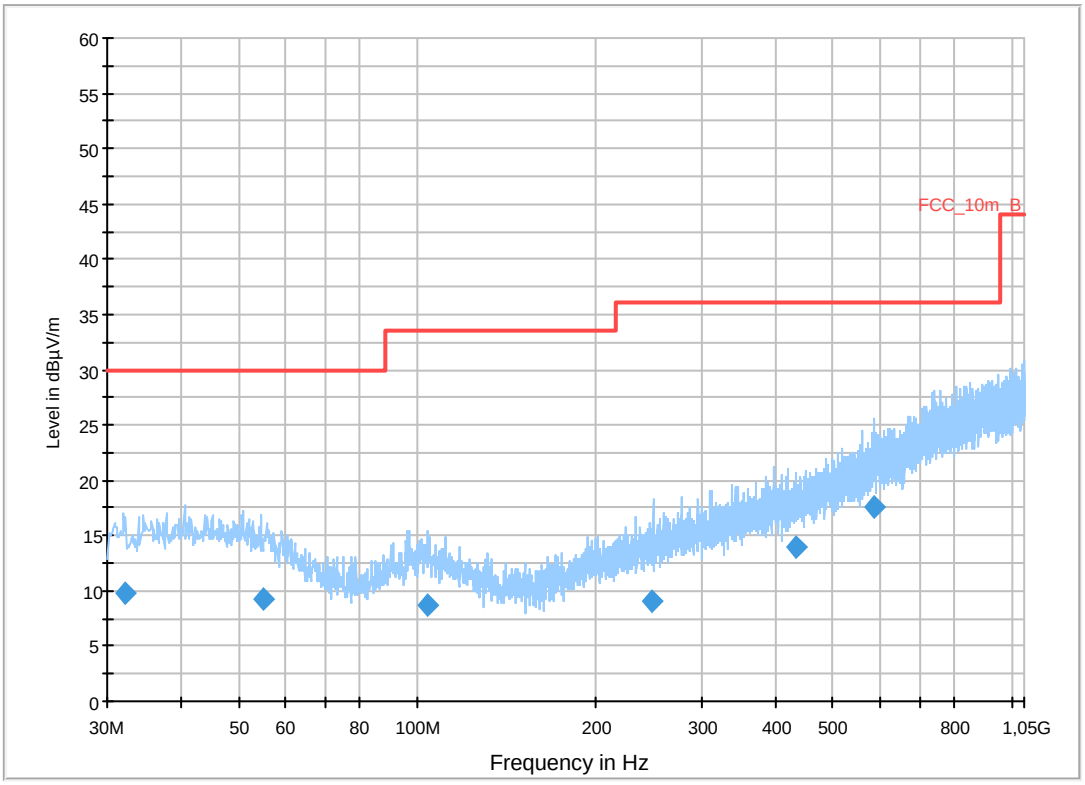
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT20 ch 48 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

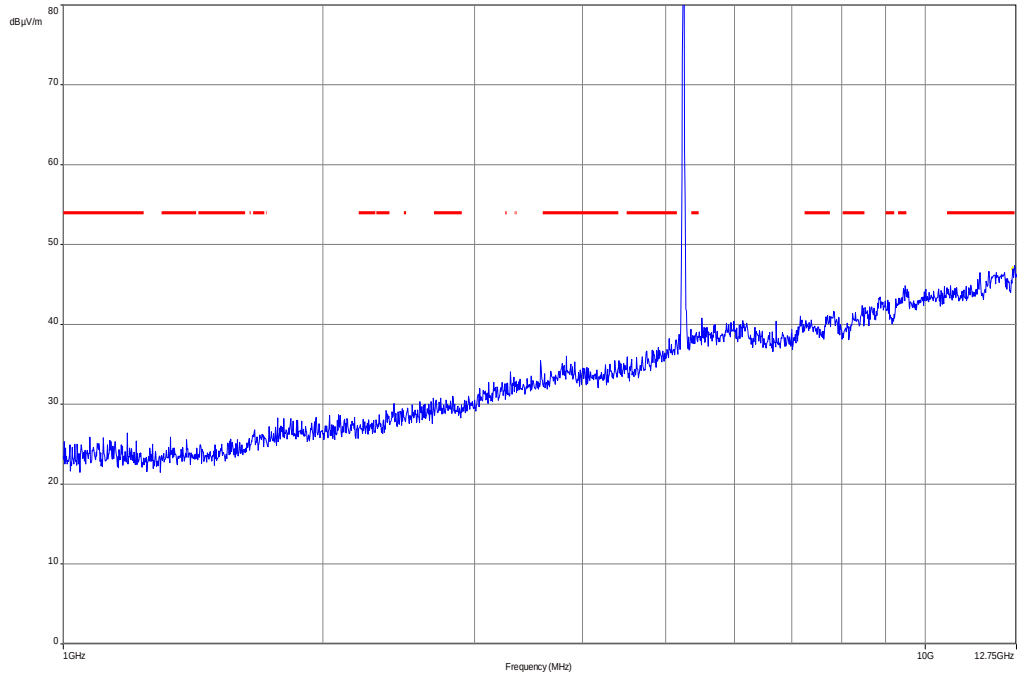
FCC_10m(B)_3



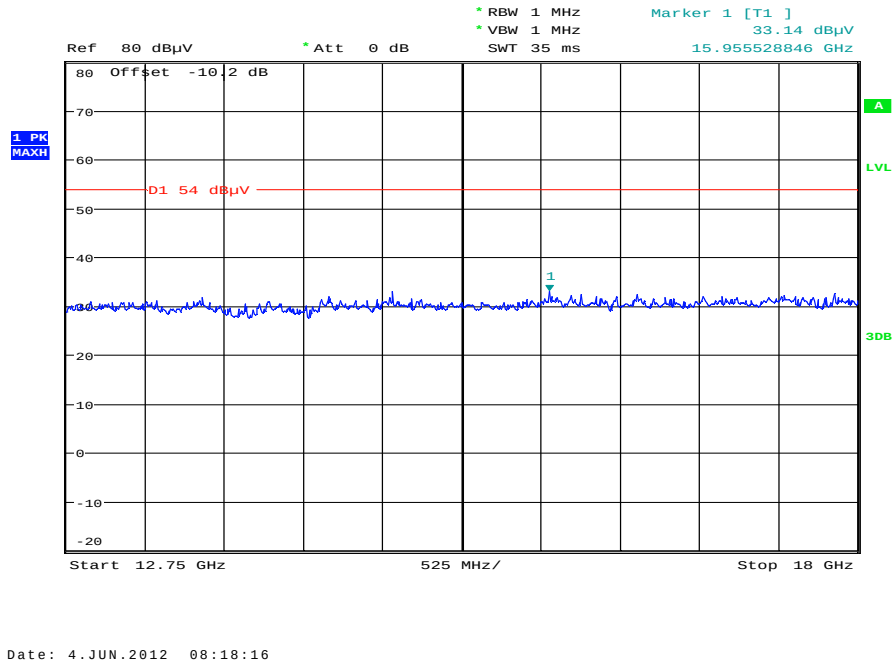
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
32.154600	9.8	1000.0	120.000	112.0	V	178.0	12.7	20.2	30.0	
54.779250	9.2	1000.0	120.000	170.0	H	261.0	12.9	20.8	30.0	
103.719000	8.7	1000.0	120.000	170.0	V	272.0	11.6	24.8	33.5	
248.549550	9.1	1000.0	120.000	98.0	H	-3.0	13.3	26.9	36.0	
434.126700	13.9	1000.0	120.000	170.0	V	-10.0	17.4	22.1	36.0	
585.368850	17.6	1000.0	120.000	170.0	H	268.0	20.4	18.4	36.0	

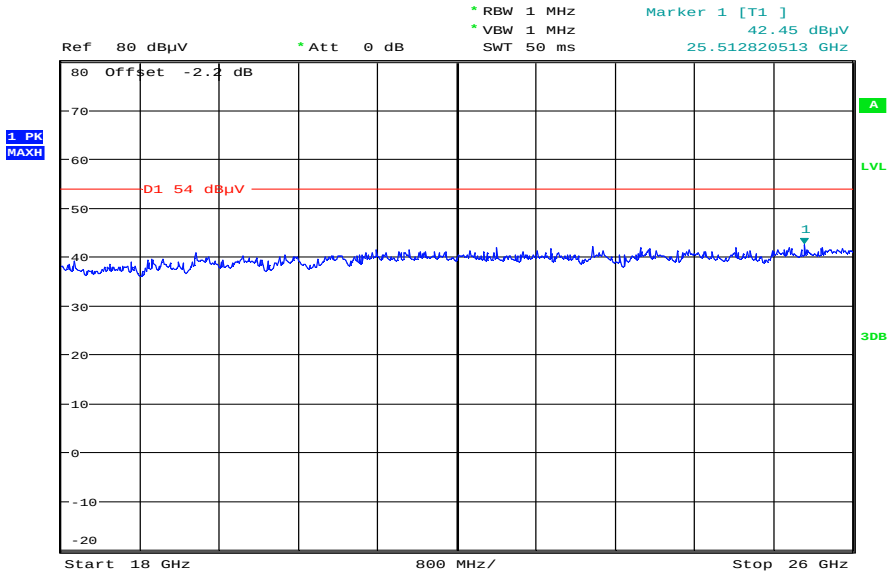
Plot 7: 1 GHz to 12.75 GHz, channel 48, vertical & horizontal polarization



Plot 8: 12 GHz to 18 GHz, channel 48, vertical & horizontal polarization

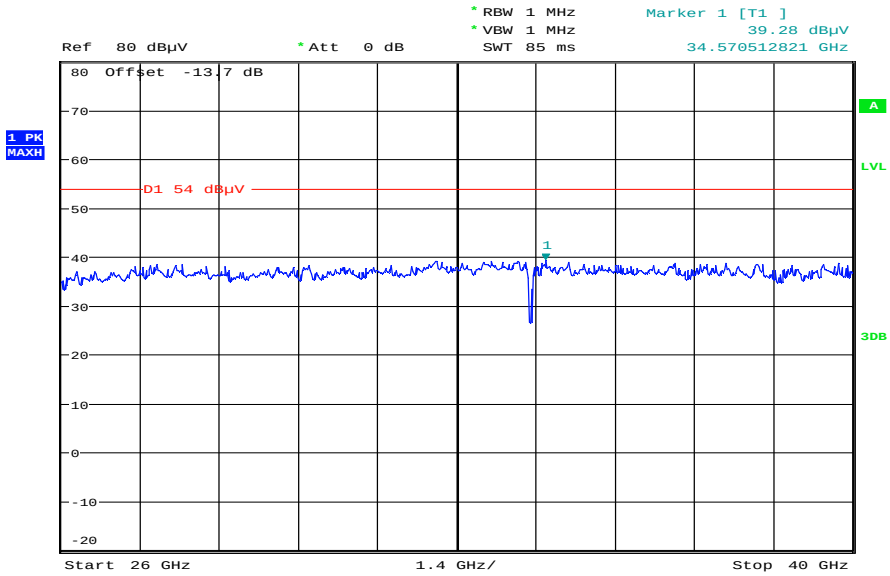


Plot 9: 18 GHz to 26 GHz, channel 48, vertical & horizontal polarization



Date: 4.JUN.2012 08:44:44

Plot 10: 26 GHz to 40 GHz, channel 4484, vertical & horizontal polarization



Date: 4.JUN.2012 08:51:23

Plot 11: 30 MHz to 1 GHz, channel 52, vertical & horizontal polarization

Common Information

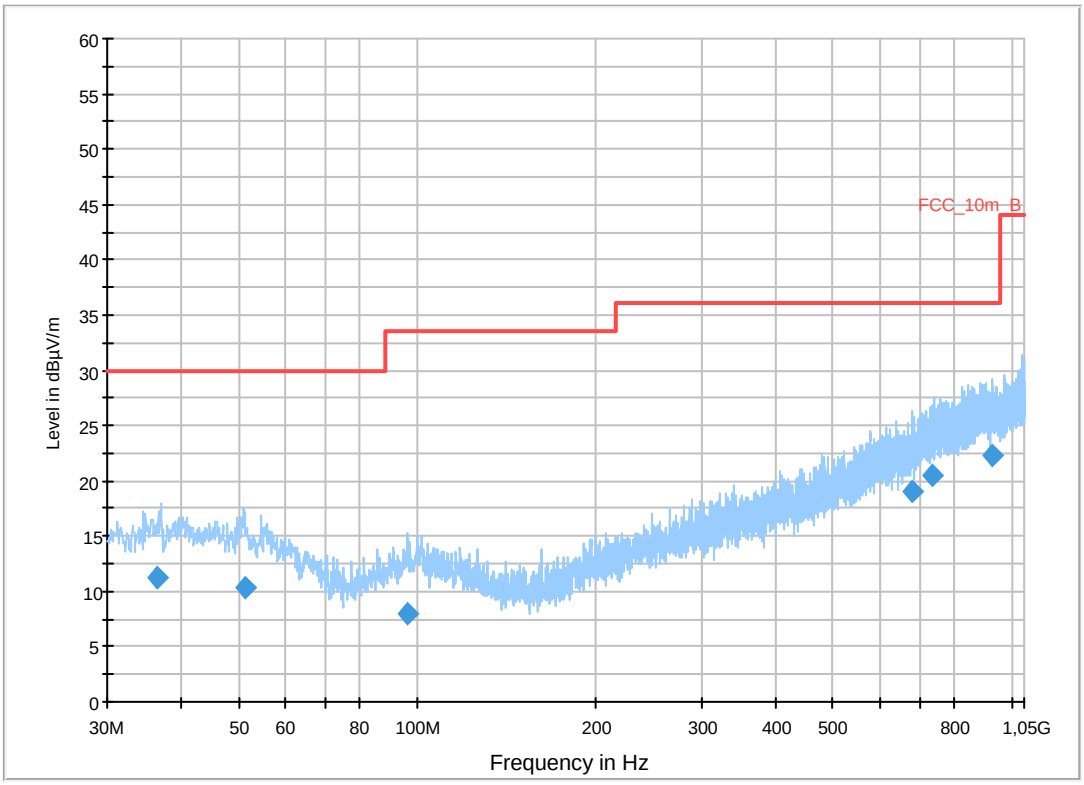
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT20 ch 52 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

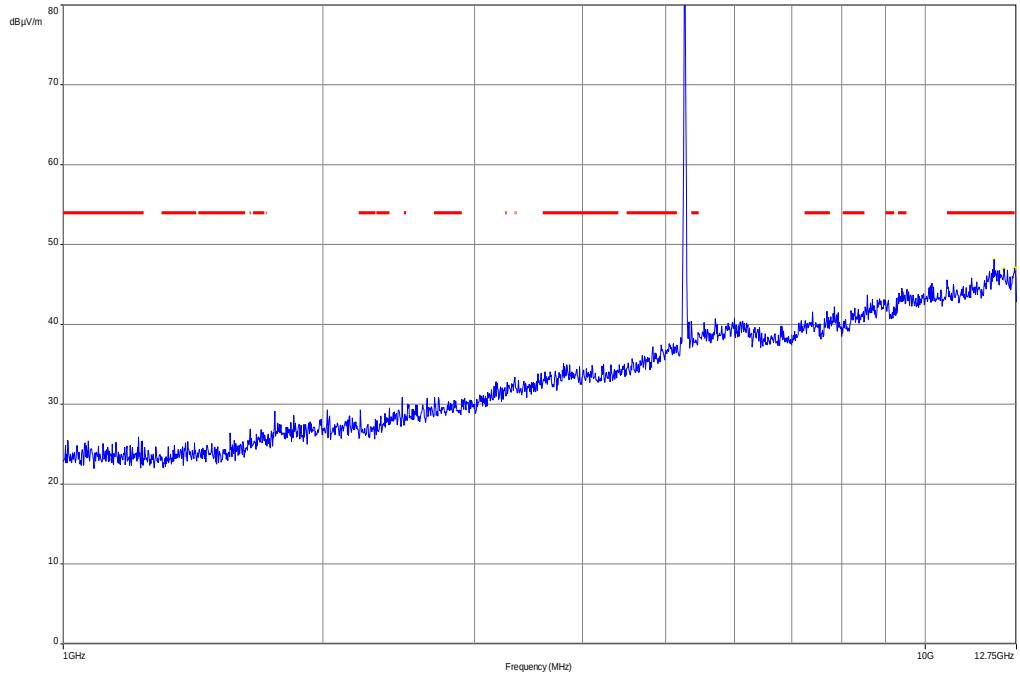
FCC_10m(B)_3



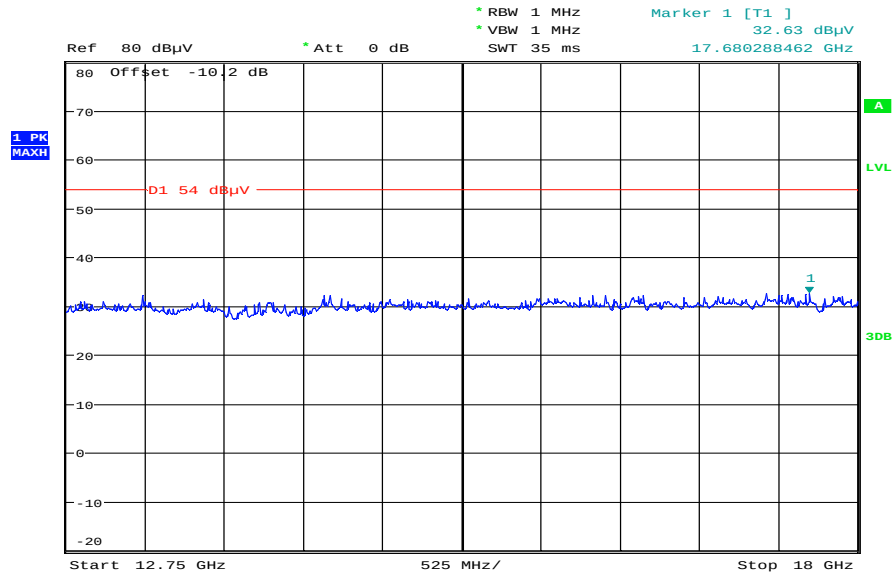
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
36.328200	11.2	1000.0	120.000	169.0	V	190.0	13.1	18.8	30.0	
51.120750	10.3	1000.0	120.000	169.0	V	-10.0	13.3	19.7	30.0	
96.396600	7.9	1000.0	120.000	169.0	H	-2.0	11.4	25.6	33.5	
682.076700	19.1	1000.0	120.000	105.0	V	81.0	22.0	16.9	36.0	
733.125300	20.5	1000.0	120.000	169.0	V	100.0	23.3	15.5	36.0	
923.811300	22.3	1000.0	120.000	111.0	V	80.0	25.3	13.7	36.0	

Plot 12: 1 GHz to 12.75 GHz, channel 52, vertical & horizontal polarization

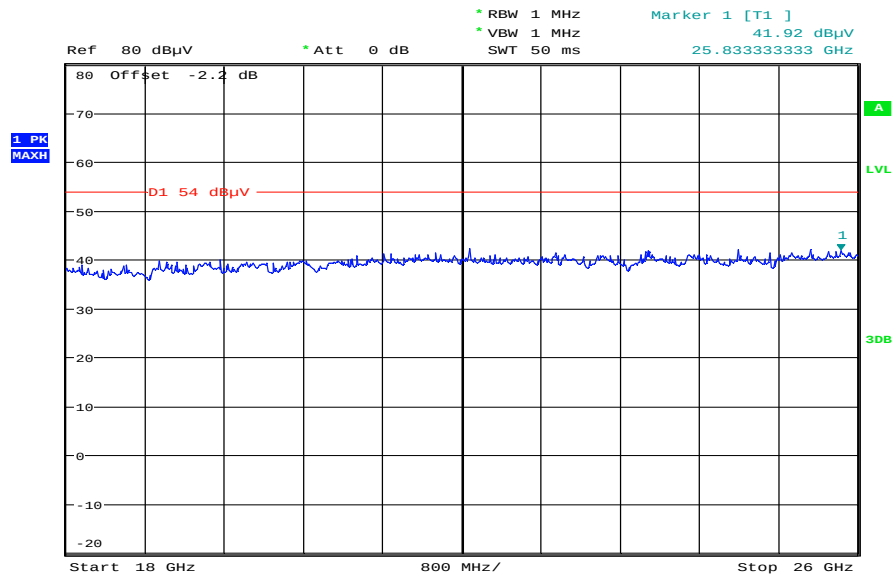


Plot 13: 12 GHz to 18 GHz, channel 52, vertical & horizontal polarization

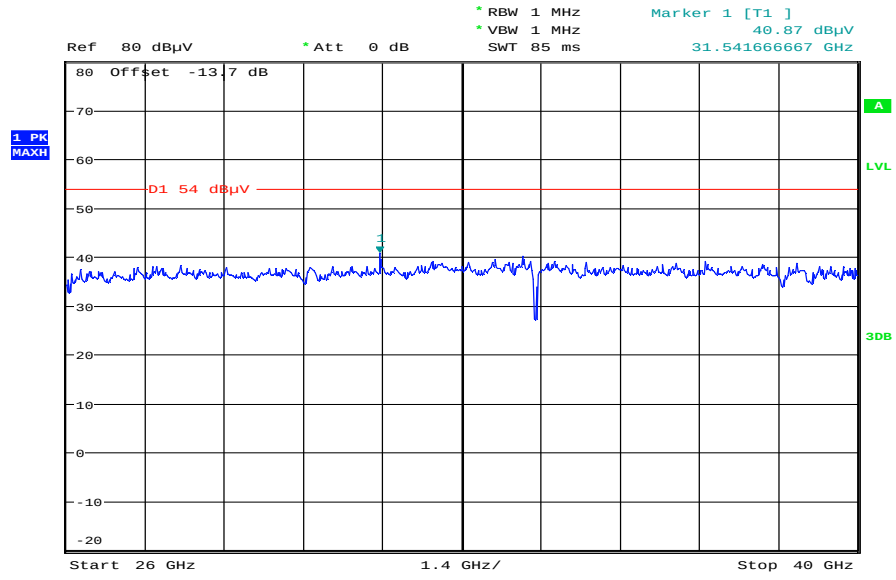


Date: 4.JUN.2012 08:19:02

Plot 14: 18 GHz to 26 GHz, channel 52, vertical & horizontal polarization



Plot 15: 26 GHz to 40 GHz, channel 52, vertical & horizontal polarization



Plot 16: 30 MHz to 1 GHz, channel 64, vertical & horizontal polarization

Common Information

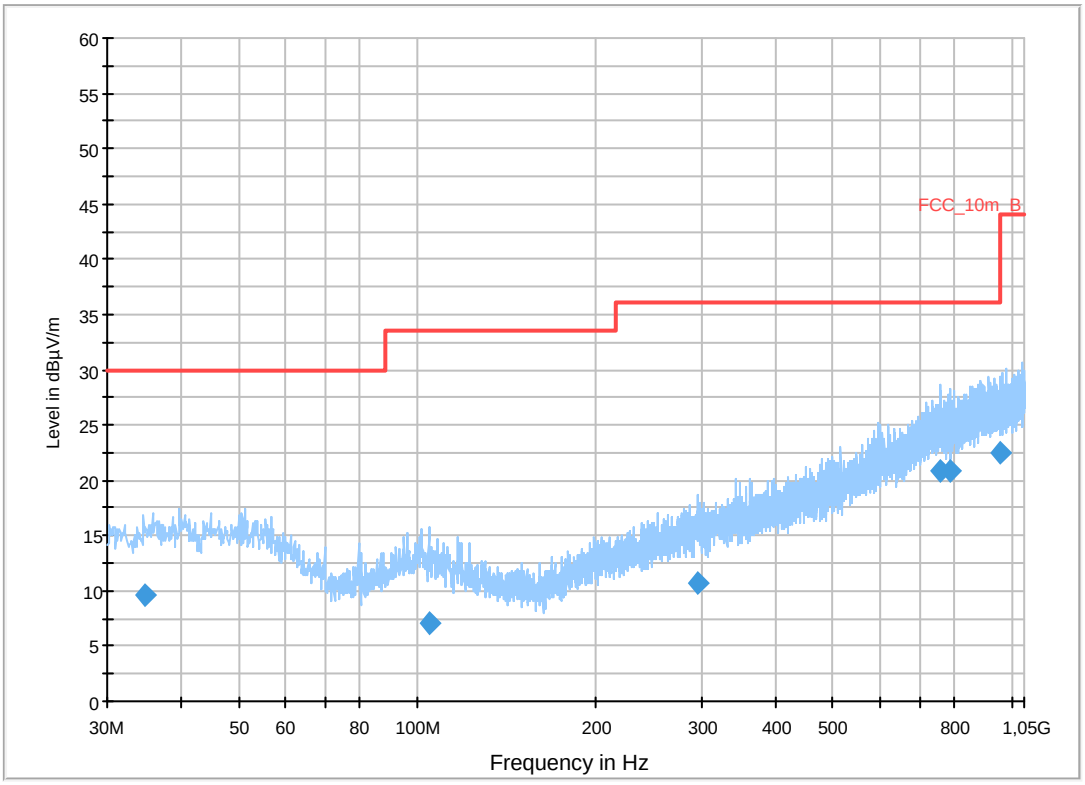
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT20 ch 64 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

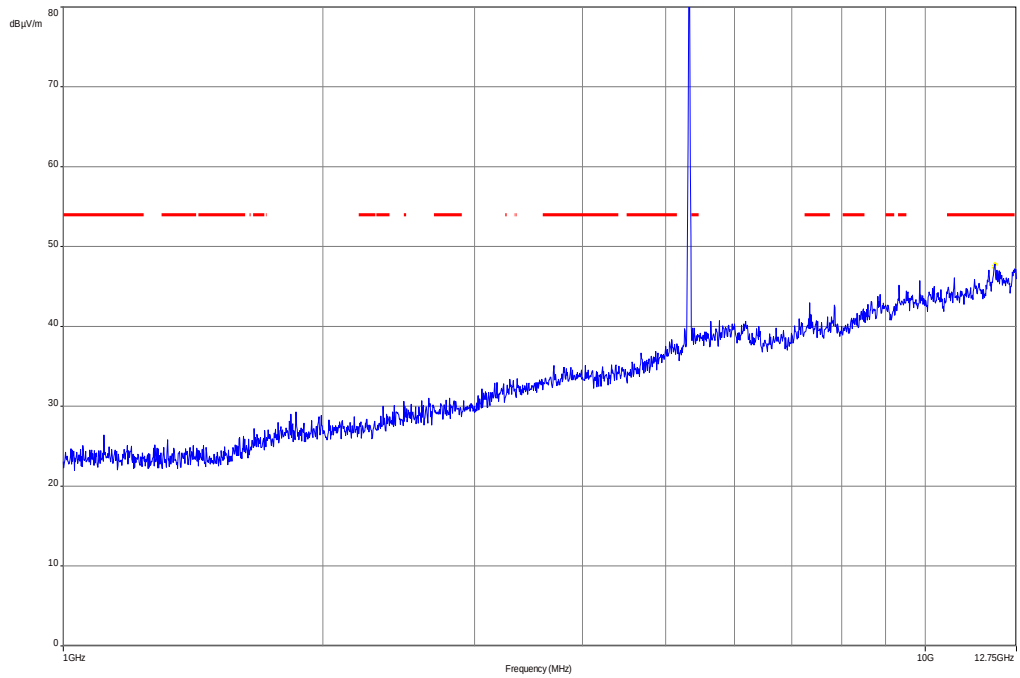
FCC_10m(B)_3



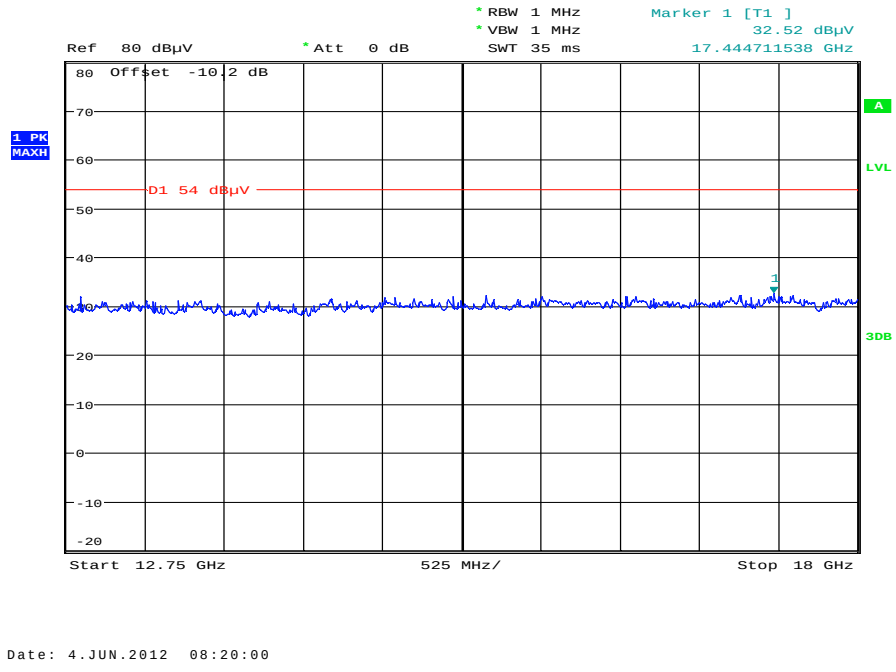
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
34.671600	9.5	1000.0	120.000	112.0	H	10.0	13.0	20.5	30.0	
104.447400	7.0	1000.0	120.000	170.0	H	190.0	11.5	26.5	33.5	
296.517450	10.8	1000.0	120.000	170.0	V	170.0	14.4	25.2	36.0	
756.389250	20.8	1000.0	120.000	122.0	V	0.0	23.7	15.2	36.0	
788.249700	20.8	1000.0	120.000	170.0	H	91.0	23.8	15.2	36.0	
954.486600	22.4	1000.0	120.000	170.0	V	-9.0	25.4	13.6	36.0	

Plot 17: 1 GHz to 12.75 GHz, channel 64, vertical & horizontal polarization

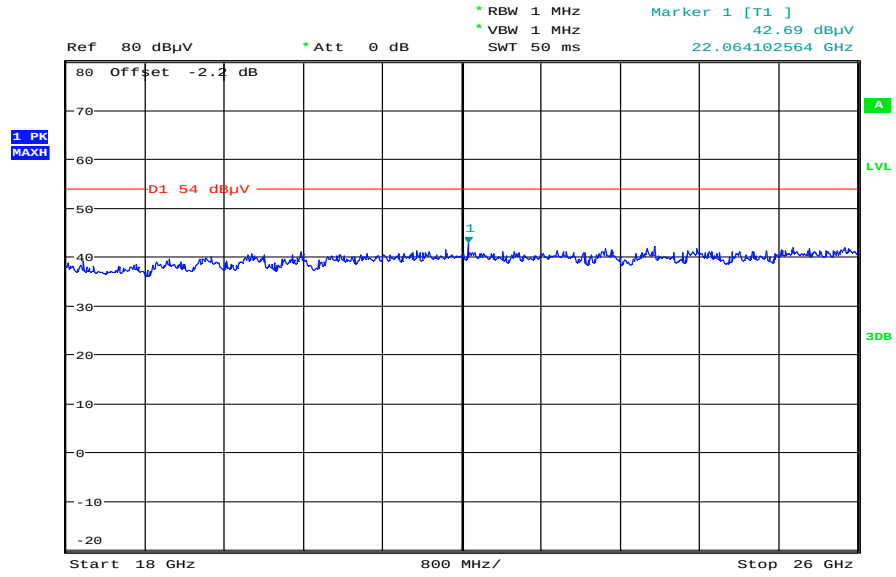


Plot 18: 12 GHz to 18 GHz, channel 64, vertical & horizontal polarization



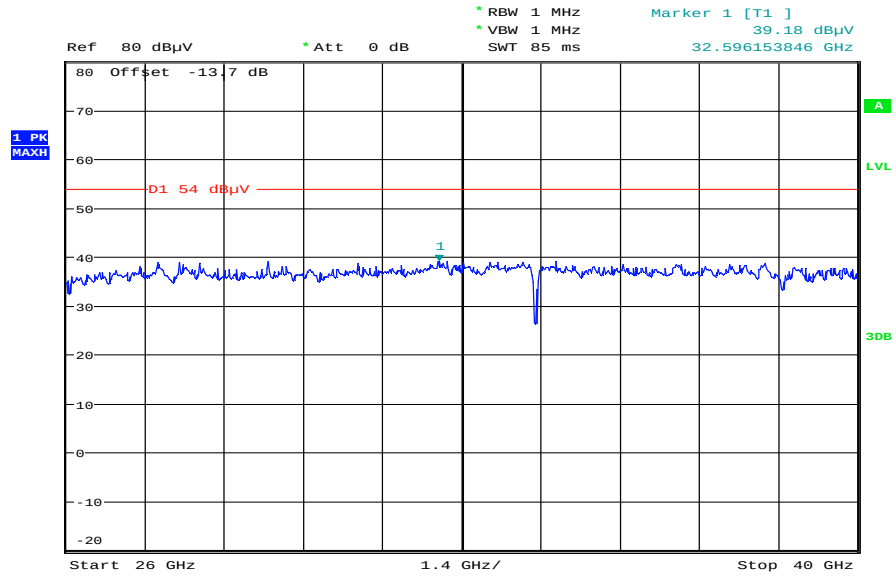
Date: 4.JUN.2012 08:20:00

Plot 19: 18 GHz to 26 GHz, channel 64, vertical & horizontal polarization



Date: 4.JUN.2012 08:43:10

Plot 20: 26 GHz to 40 GHz, channel 64, vertical & horizontal polarization



Date: 4.JUN.2012 08:52:53

Plot 21: 30 MHz to 1 GHz, channel 100, vertical & horizontal polarization

Common Information

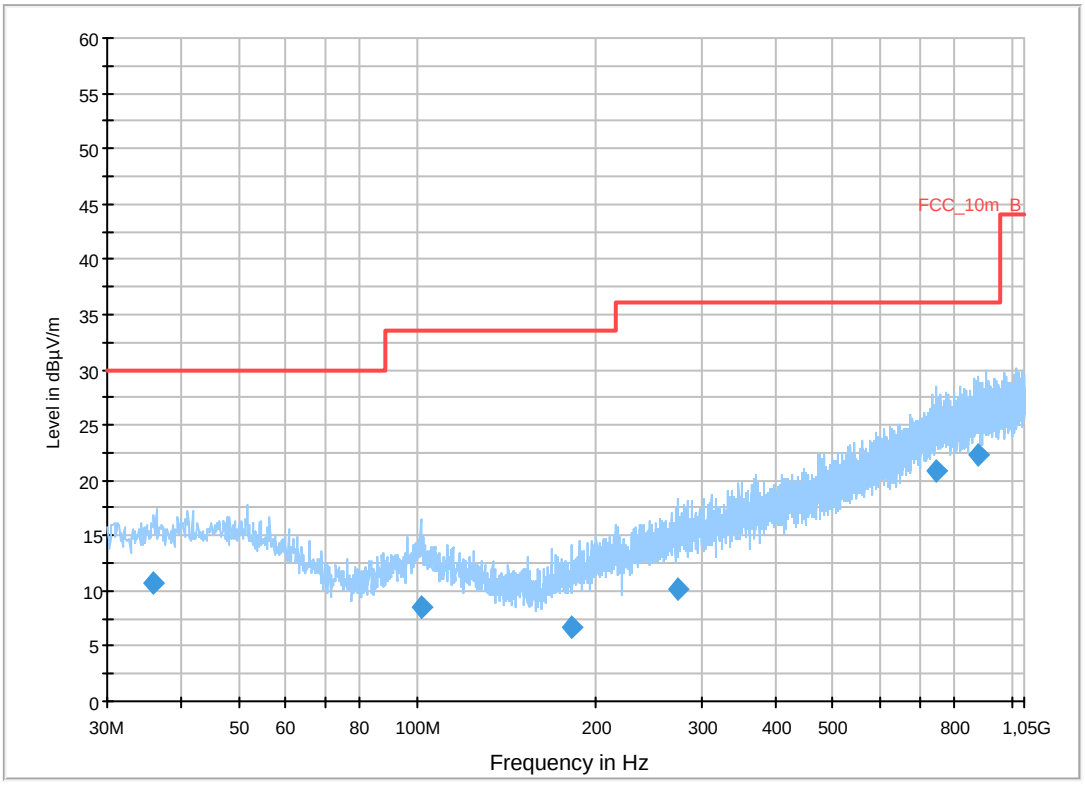
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT20 ch 100 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

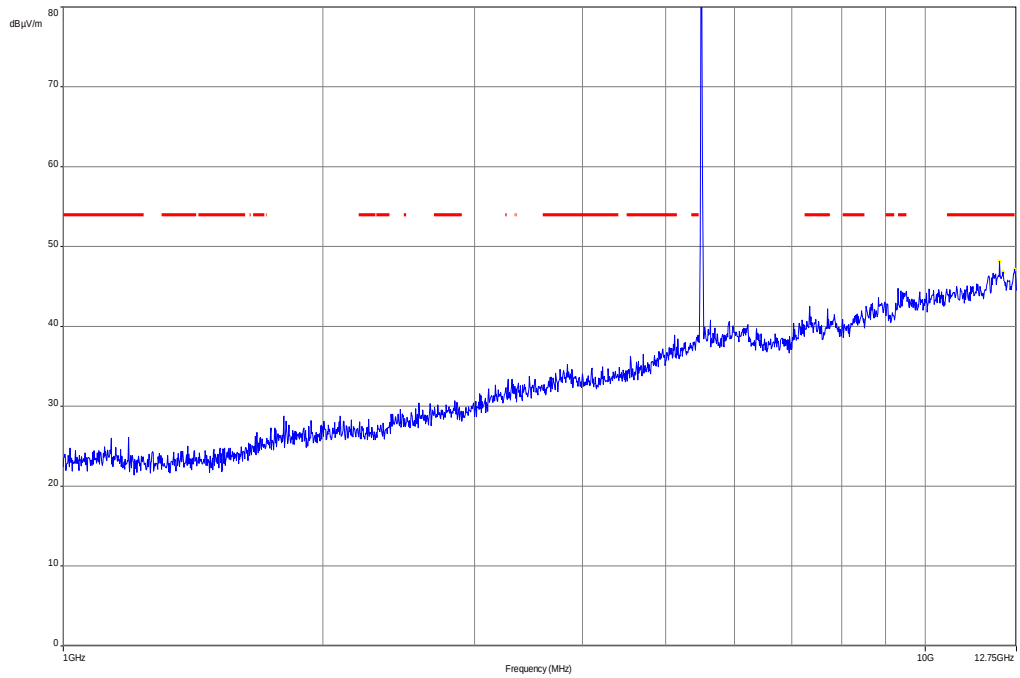
FCC_10m(B)_3



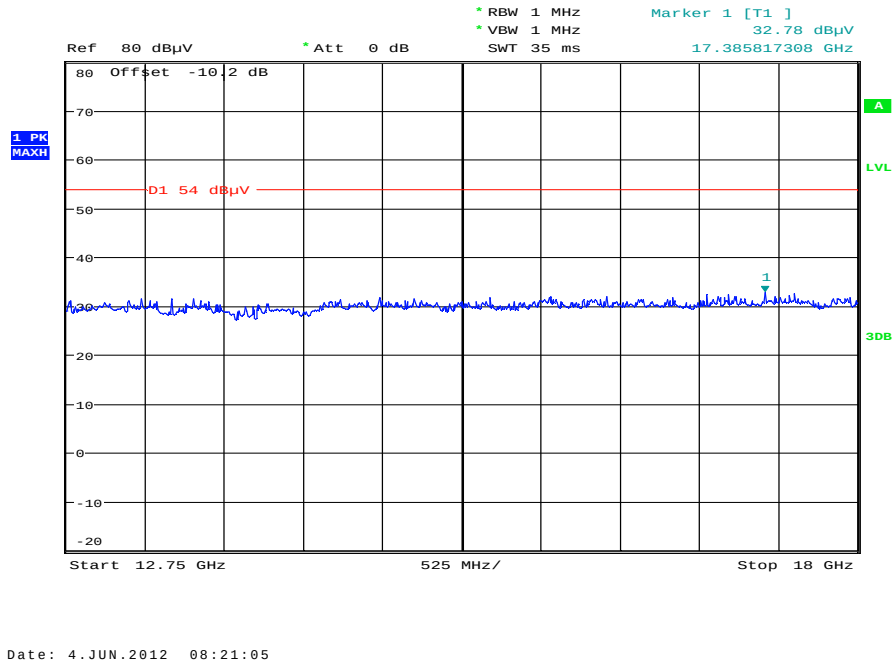
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.805600	10.7	1000.0	120.000	120.0	V	88.0	13.1	19.3	30.0	
101.590200	8.5	1000.0	120.000	170.0	V	14.0	11.8	25.0	33.5	
181.024350	6.6	1000.0	120.000	170.0	H	190.0	10.5	26.9	33.5	
274.431450	10.2	1000.0	120.000	170.0	V	180.0	13.9	25.8	36.0	
746.767200	20.8	1000.0	120.000	145.0	H	14.0	23.6	15.2	36.0	
875.909250	22.4	1000.0	120.000	170.0	H	14.0	24.9	13.6	36.0	

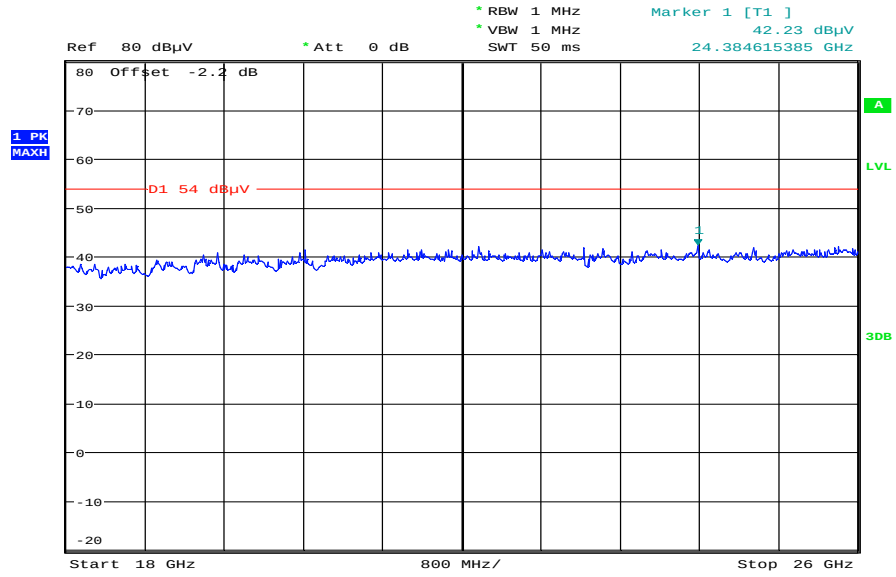
Plot 22: 1 GHz to 12.75 GHz, channel 100, vertical & horizontal polarization



Plot 23: 12 GHz to 18 GHz, channel 100, vertical & horizontal polarization

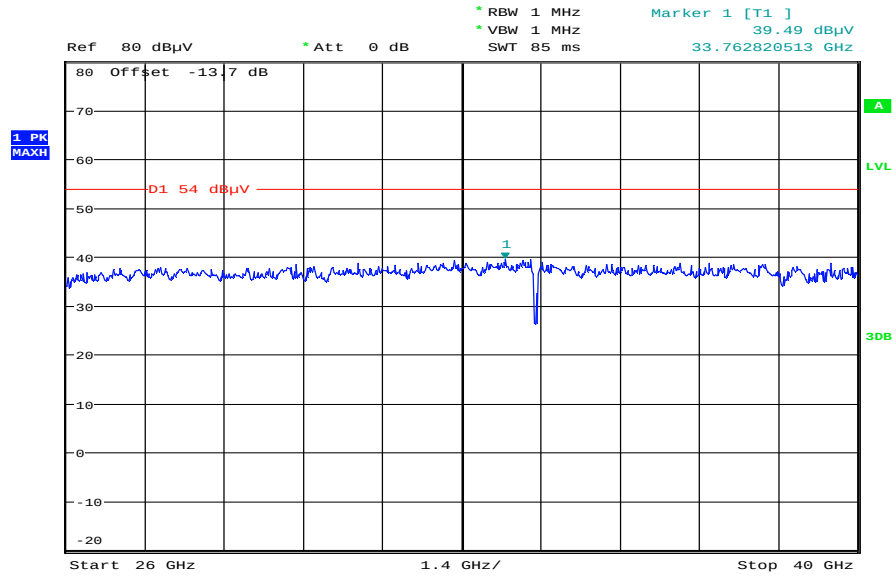


Plot 24: 18 GHz to 26 GHz, channel 100, vertical & horizontal polarization



Date: 4.JUN.2012 08:42:19

Plot 25: 26 GHz to 40 GHz, channel 100, vertical & horizontal polarization



Date: 4.JUN.2012 08:53:51

Plot 26: 30 MHz to 1 GHz, channel 120, vertical & horizontal polarization

Common Information

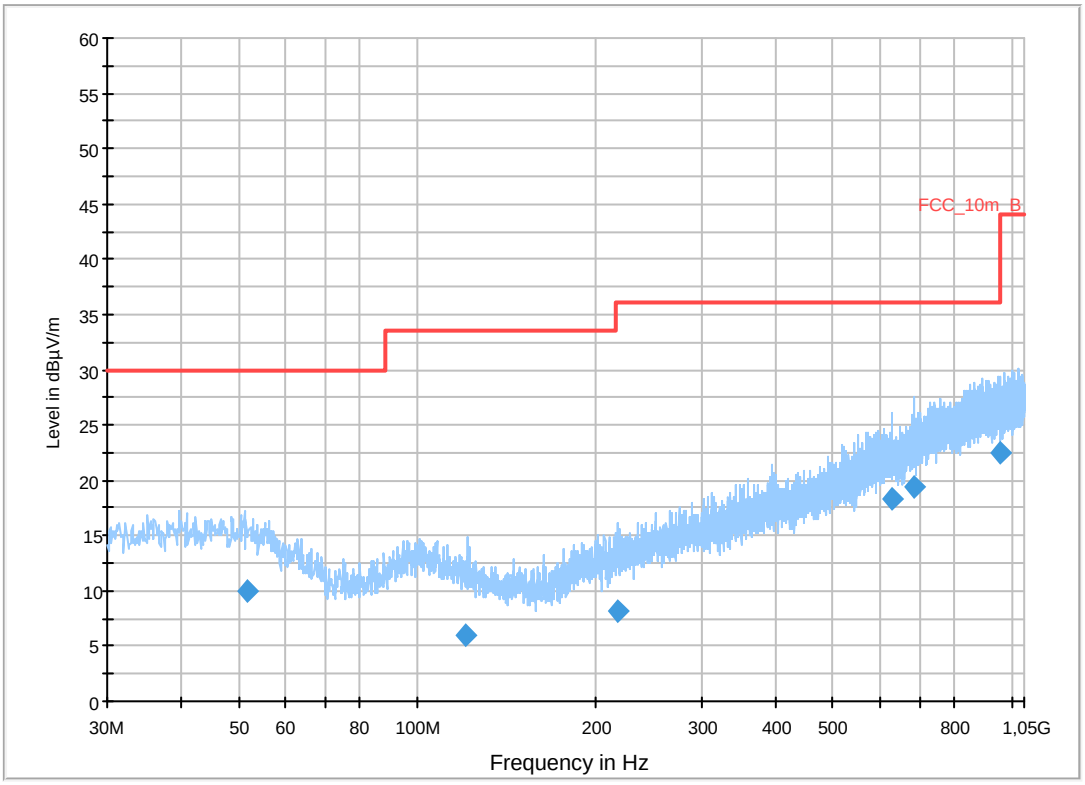
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT20 ch 120 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

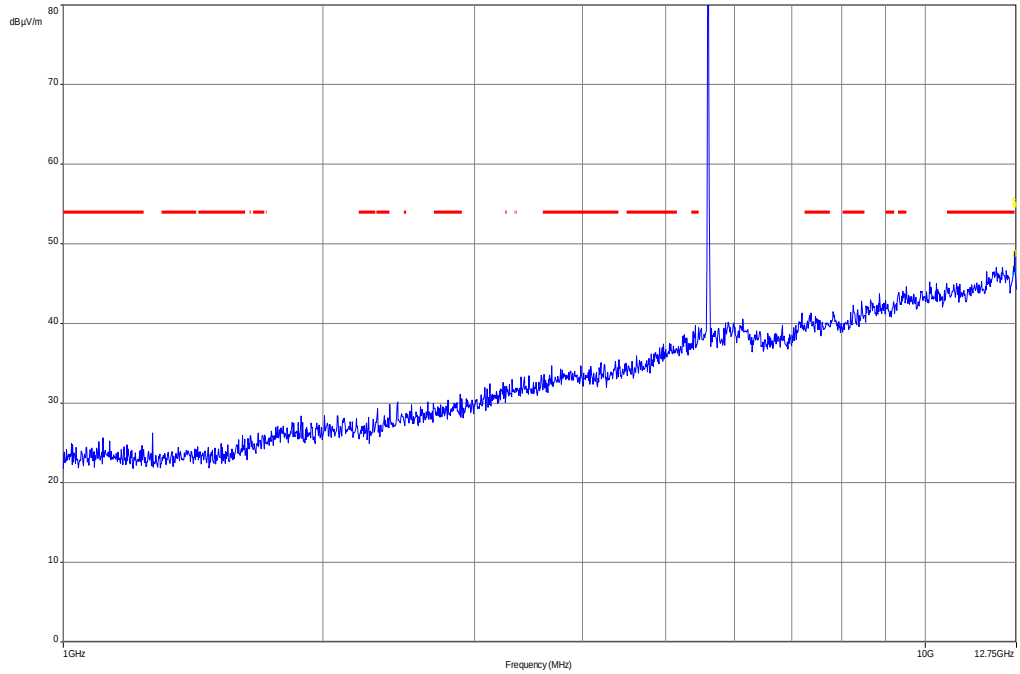
FCC_10m(B)_3



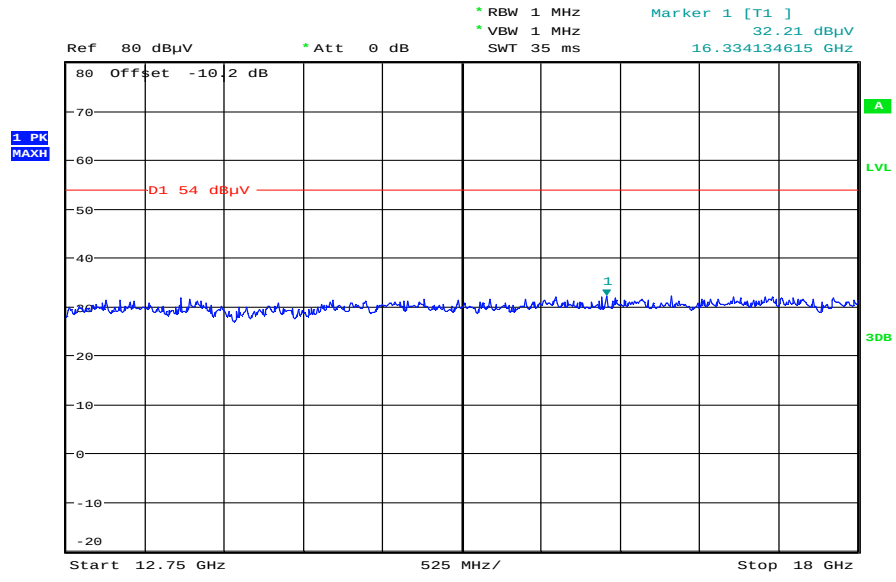
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
51.671700	10.0	1000.0	120.000	112.0	H	90.0	13.2	20.0	30.0	
120.713850	6.0	1000.0	120.000	170.0	H	170.0	10.2	27.5	33.5	
216.625800	8.1	1000.0	120.000	170.0	V	280.0	12.3	27.9	36.0	
629.605500	18.2	1000.0	120.000	170.0	H	178.0	21.0	17.8	36.0	
687.491850	19.4	1000.0	120.000	98.0	V	178.0	22.2	16.6	36.0	
953.520750	22.5	1000.0	120.000	161.0	H	261.0	25.4	13.5	36.0	

Plot 27: 1 GHz to 12.75 GHz, channel 120, vertical & horizontal polarization

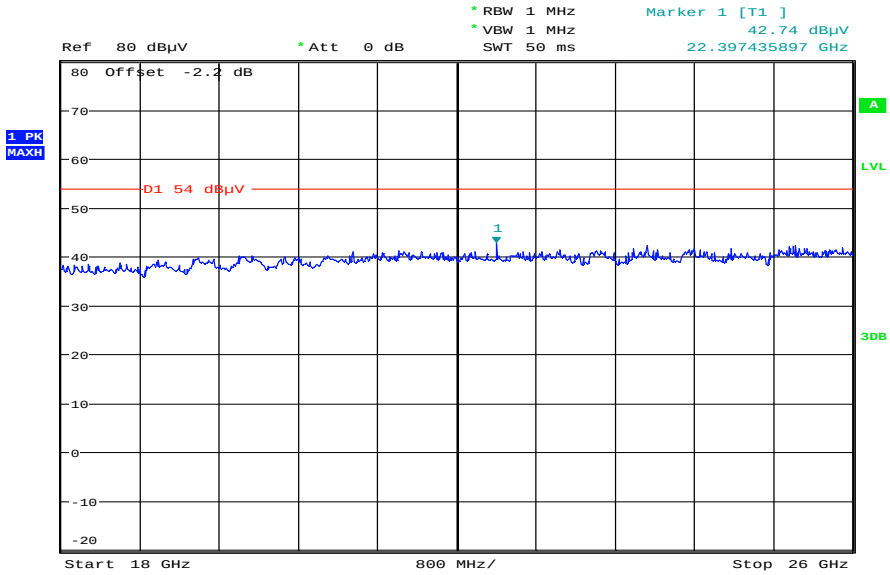


Plot 28: 12 GHz to 18 GHz, channel 120, vertical & horizontal polarization



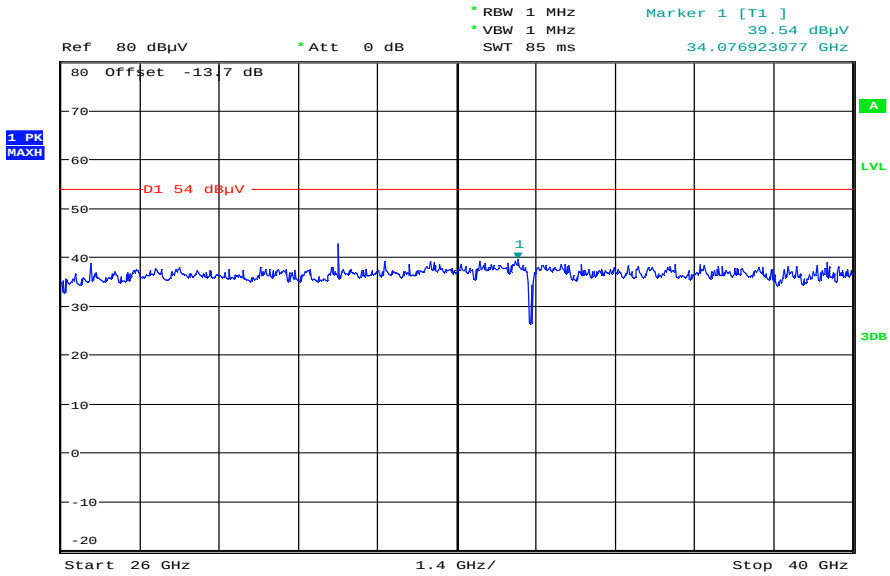
Date: 4.JUN.2012 08:21:51

Plot 29: 18 GHz to 26 GHz, channel 120, vertical & horizontal polarization



Date: 4.JUN.2012 08:41:36

Plot 30: 26 GHz to 40 GHz, channel 120, vertical & horizontal polarization



Date: 4.JUN.2012 08:54:24

Plot 31: 30 MHz to 1 GHz, channel 140, vertical & horizontal polarization

Common Information

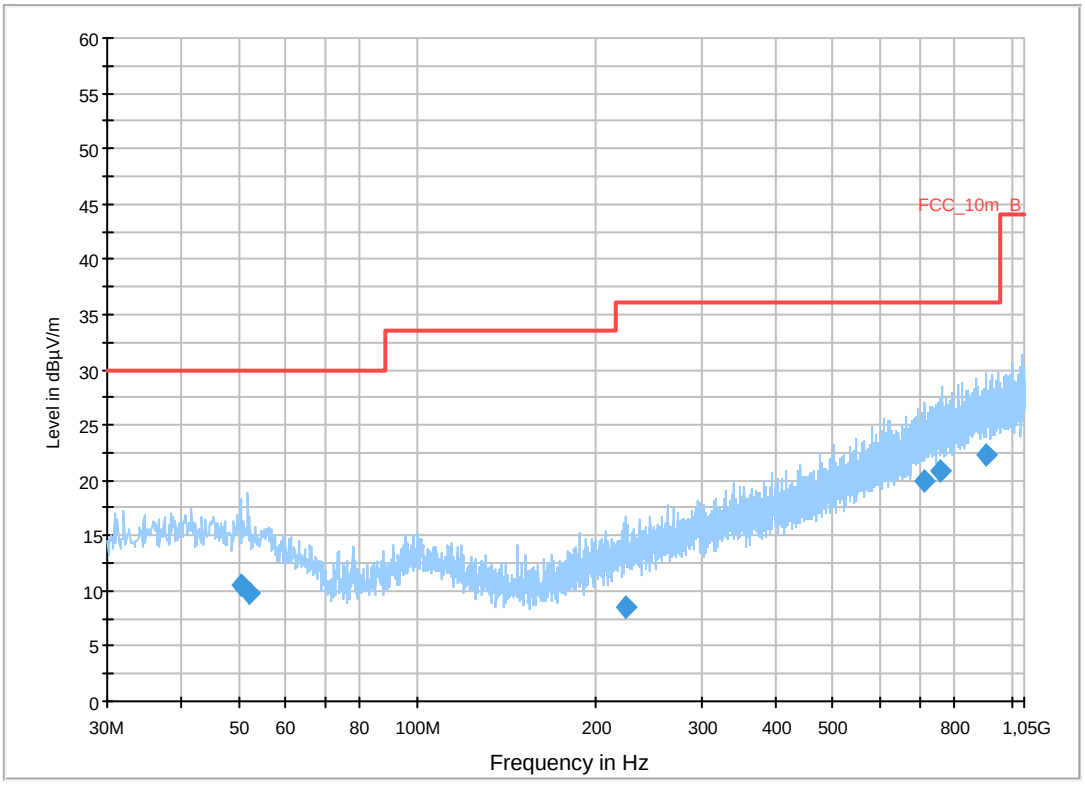
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT20 ch 140 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

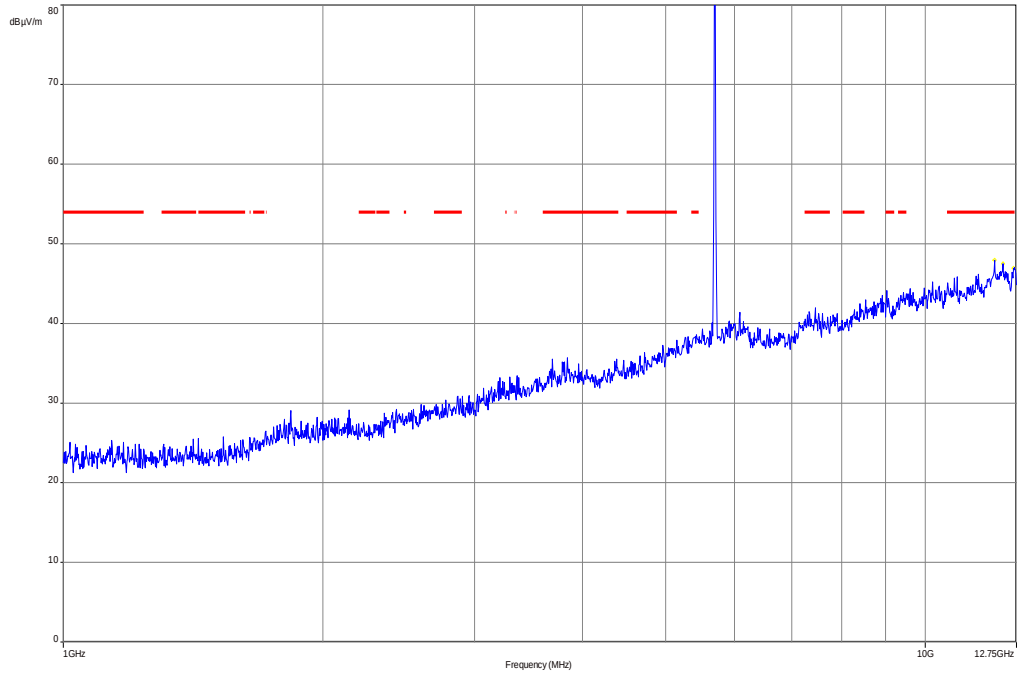
FCC_10m(B)_3



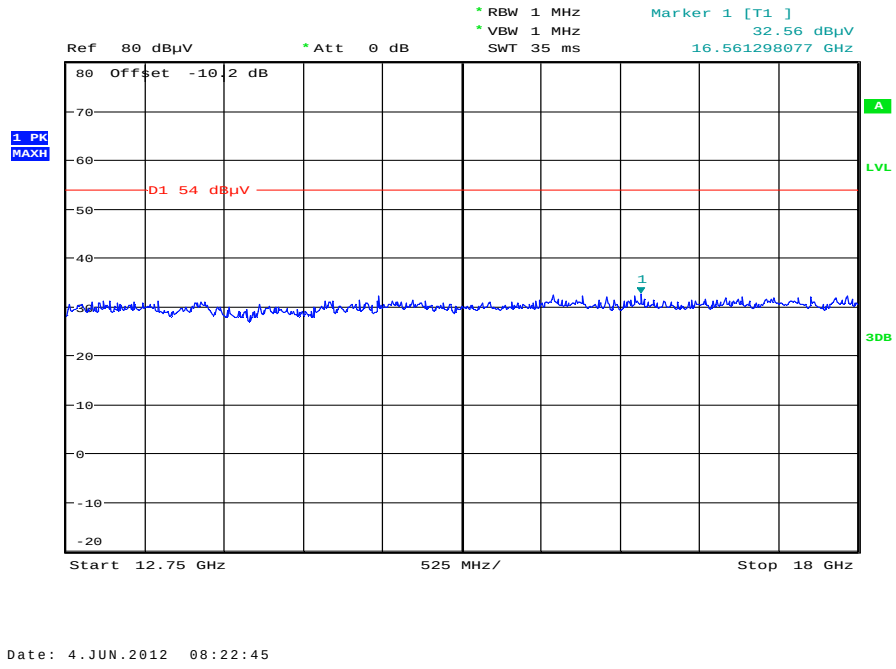
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
50.577450	10.6	1000.0	120.000	170.0	V	10.0	13.3	19.4	30.0	
52.199850	9.8	1000.0	120.000	170.0	V	190.0	13.2	20.2	30.0	
223.945200	8.6	1000.0	120.000	111.0	V	183.0	12.5	27.4	36.0	
713.829600	20.0	1000.0	120.000	170.0	H	-5.0	22.8	16.0	36.0	
760.721550	20.8	1000.0	120.000	170.0	V	89.0	23.7	15.2	36.0	
905.730300	22.3	1000.0	120.000	170.0	V	280.0	25.2	13.7	36.0	

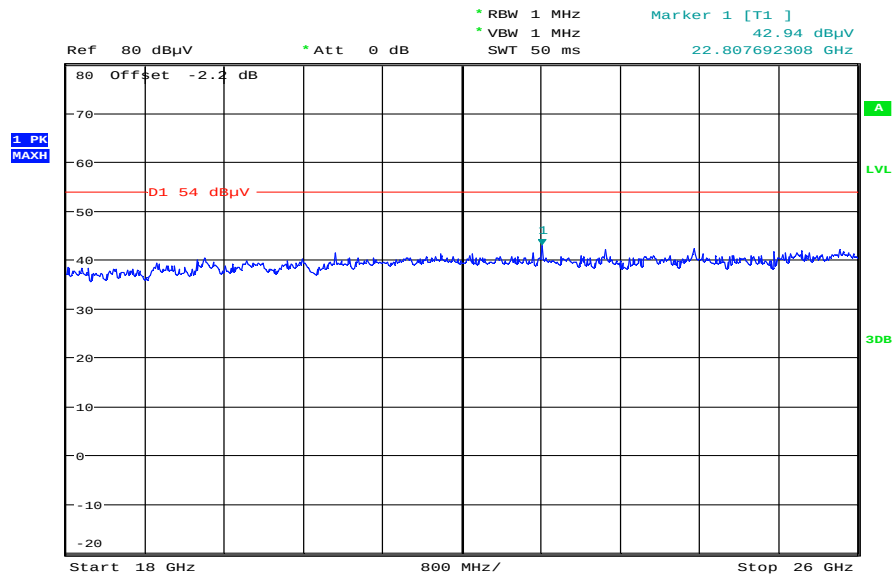
Plot 32: 1 GHz to 12.75 GHz, channel 140, vertical & horizontal polarization



Plot 33: 12 GHz to 18 GHz, channel 140, vertical & horizontal polarization

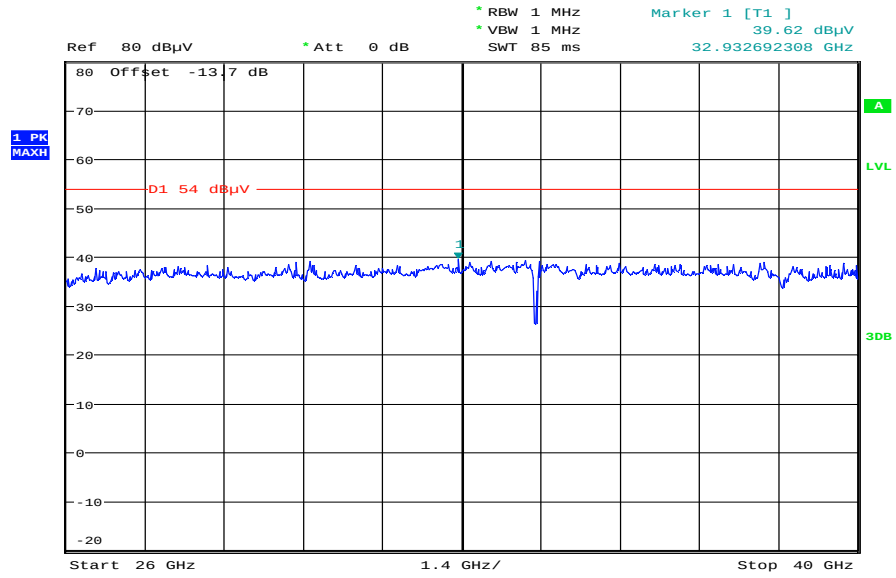


Plot 34: 18 GHz to 26 GHz, channel 140, vertical & horizontal polarization



Date: 4.JUN.2012 08:40:42

Plot 35: 26 GHz to 40 GHz, channel 140, vertical & horizontal polarization



Date: 4.JUN.2012 08:55:15

Plots: OFDM / n – mode HT40

Plot 1: 30 MHz to 1 GHz, channel 36, vertical & horizontal polarization

Common Information

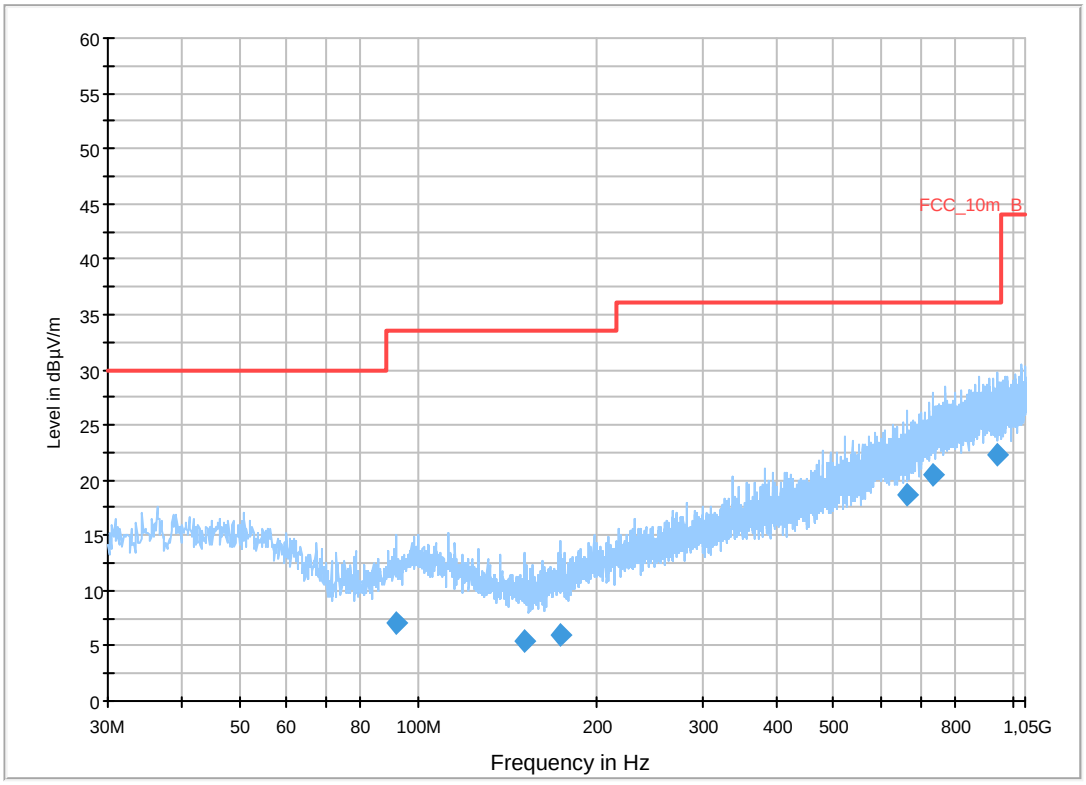
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT40 ch 36 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
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

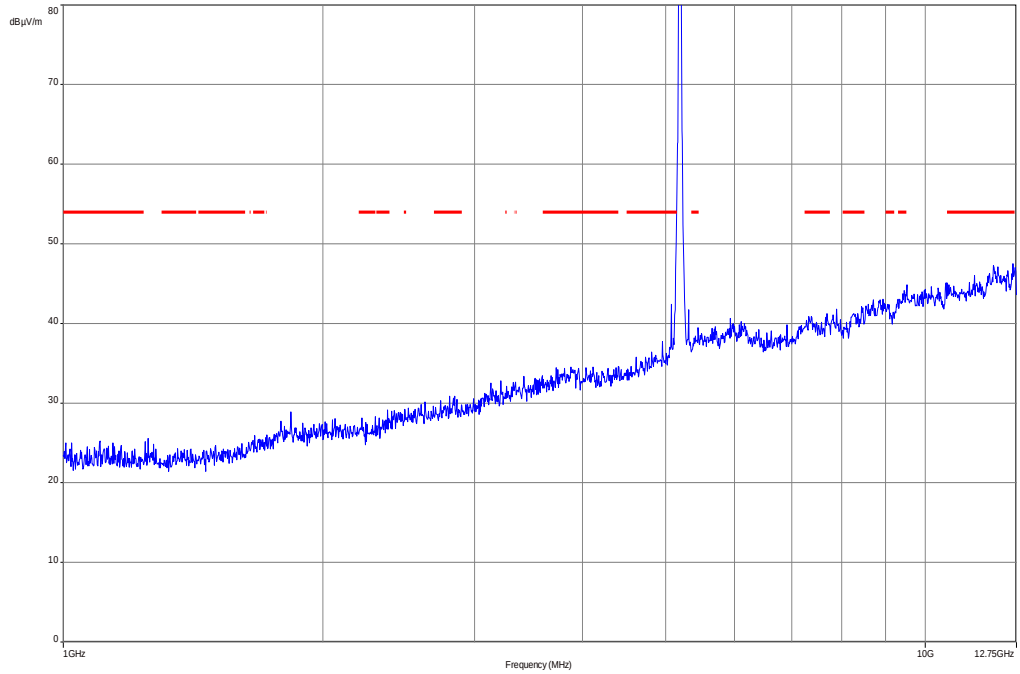
FCC_10m(B)_3



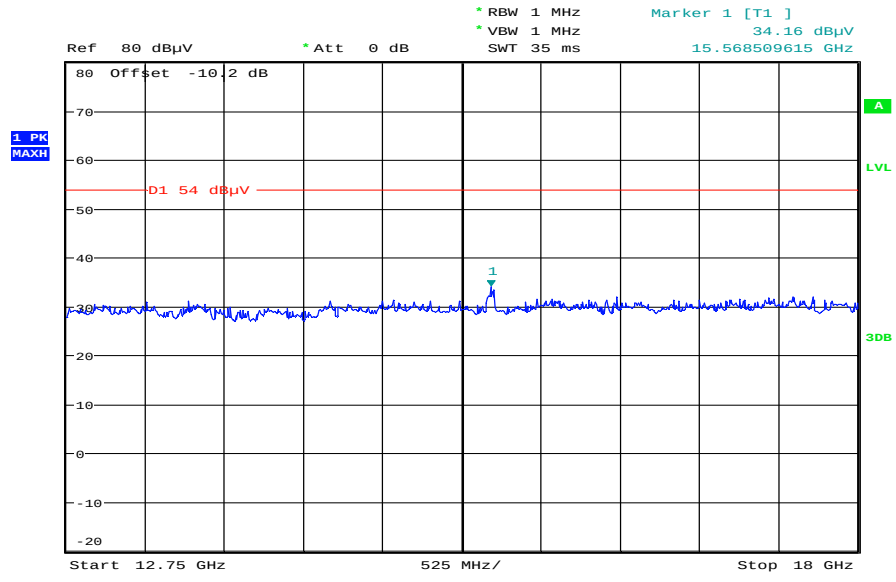
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
91.598250	7.1	1000.0	120.000	170.0	H	100.0	10.8	26.4	33.5	
151.330350	5.5	1000.0	120.000	170.0	H	180.0	9.0	28.0	33.5	
173.786400	6.0	1000.0	120.000	170.0	V	265.0	10.1	27.5	33.5	
664.889700	18.7	1000.0	120.000	170.0	V	280.0	21.5	17.3	36.0	
733.838400	20.5	1000.0	120.000	98.0	V	190.0	23.3	15.5	36.0	
939.988350	22.3	1000.0	120.000	170.0	H	260.0	25.3	13.7	36.0	

Plot 2: 1 GHz to 12.75 GHz, channel 36, vertical & horizontal polarization

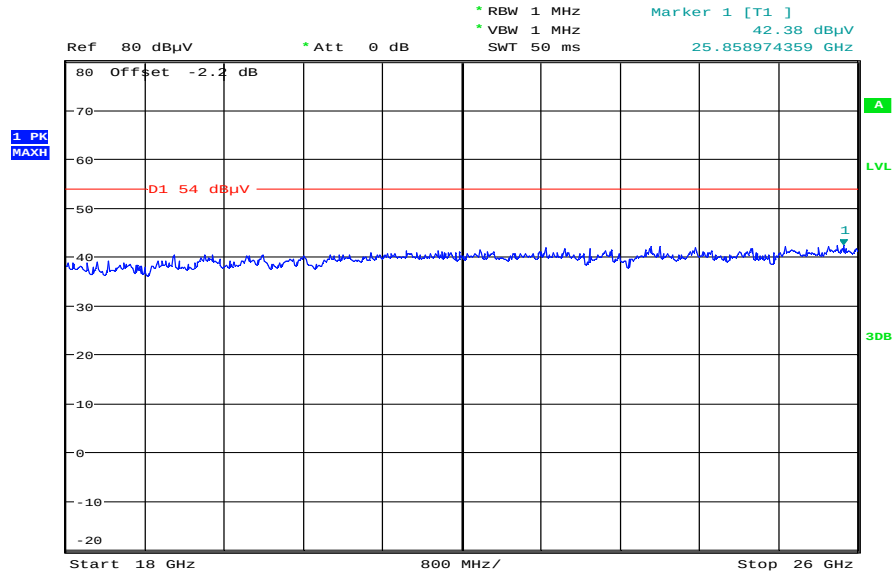


Plot 3: 12 GHz to 18 GHz, channel 36, vertical & horizontal polarization



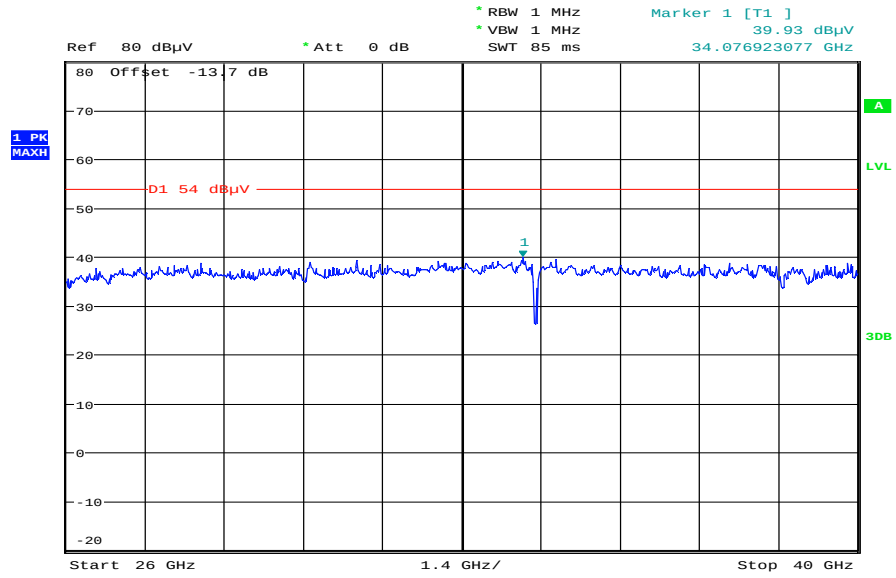
Date: 4.JUN.2012 08:31:23

Plot 4: 18 GHz to 26 GHz, channel 36, vertical & horizontal polarization



Date: 4.JUN.2012 08:34:00

Plot 5: 26 GHz to 40 GHz, channel 36, vertical & horizontal polarization



Date: 4.JUN.2012 09:28:09

Plot 6: 30 MHz to 1 GHz, channel 44, vertical & horizontal polarization

Common Information

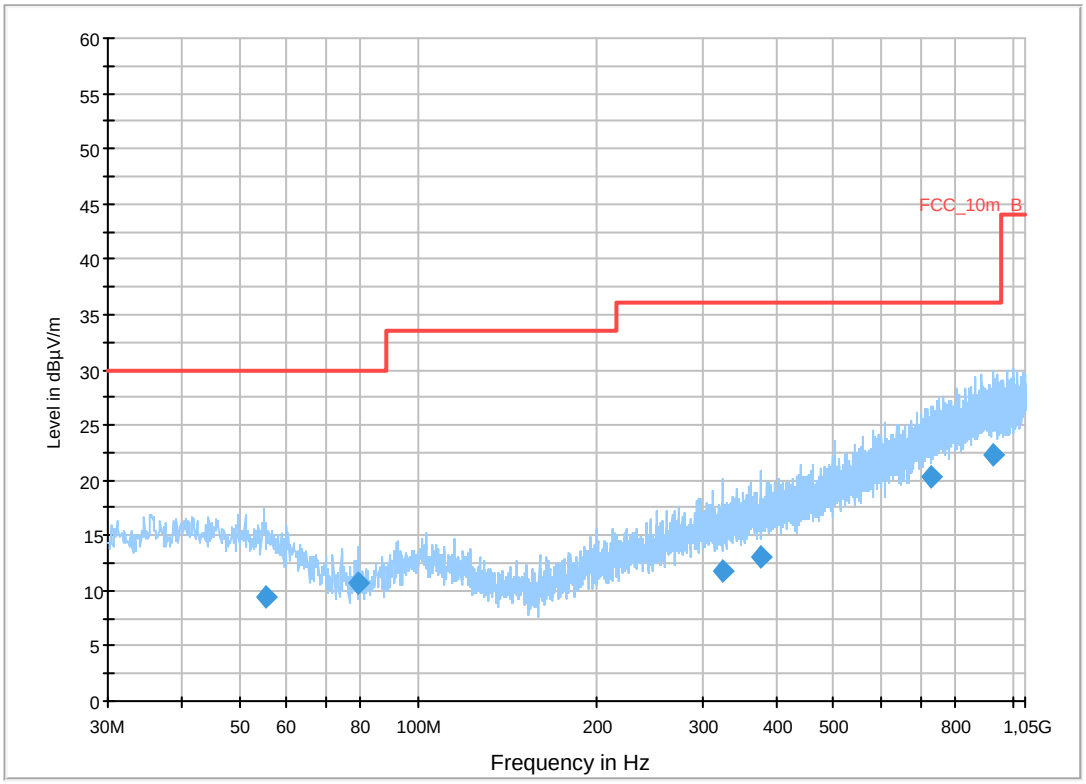
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT40 ch 44 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
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

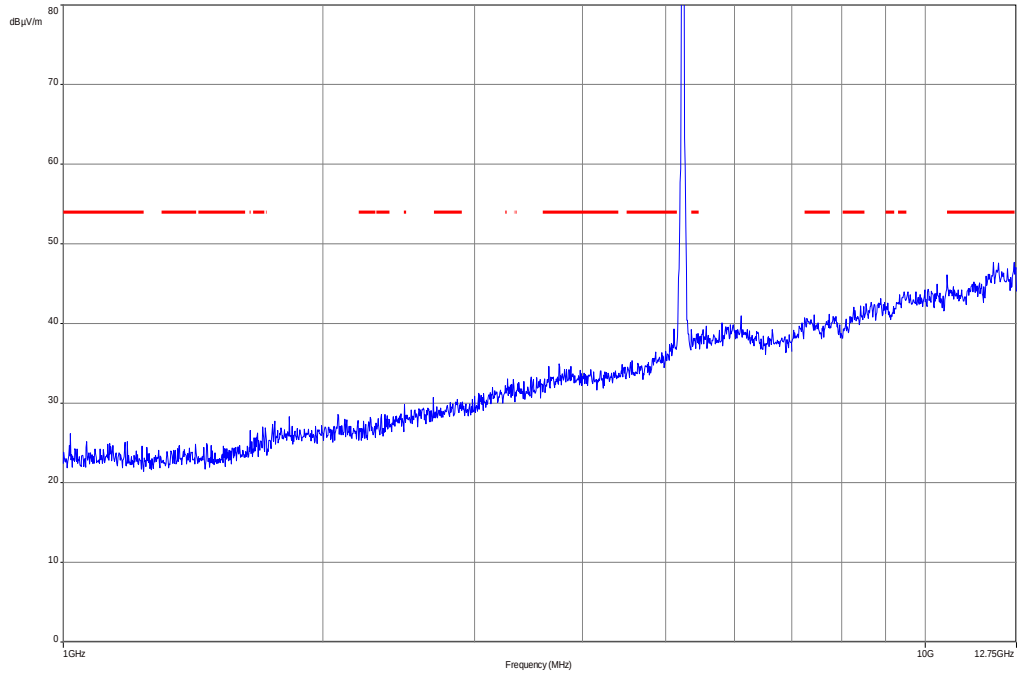
FCC_10m(B)_3



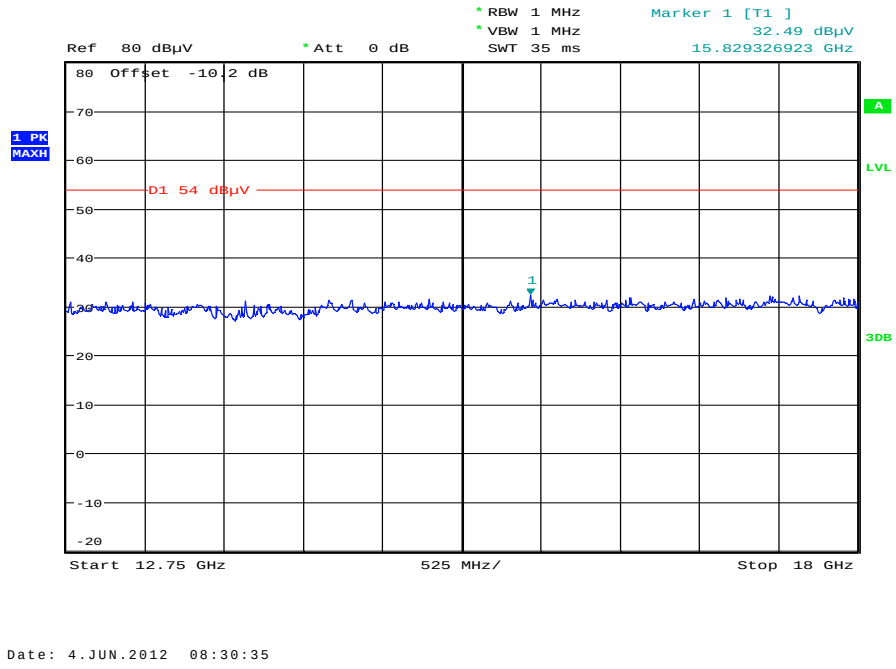
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
55.350750	9.4	1000.0	120.000	170.0	H	100.0	12.8	20.6	30.0	
79.347450	10.7	1000.0	120.000	170.0	V	171.0	9.1	19.3	30.0	
326.017050	11.8	1000.0	120.000	170.0	H	-3.0	15.3	24.2	36.0	
377.031600	13.0	1000.0	120.000	170.0	H	10.0	16.5	23.0	36.0	
730.151700	20.3	1000.0	120.000	160.0	V	-5.0	23.2	15.7	36.0	
928.431000	22.2	1000.0	120.000	170.0	V	266.0	25.3	13.8	36.0	

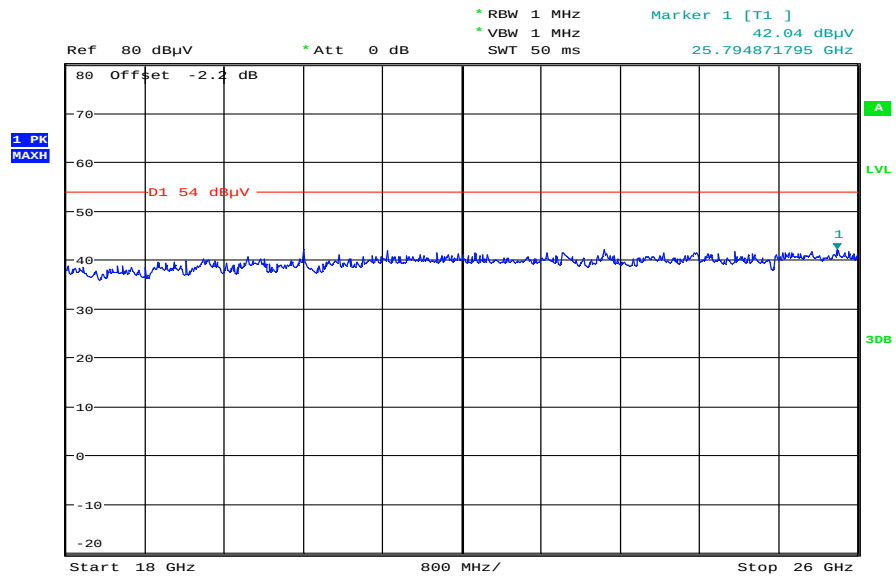
Plot 7: 1 GHz to 12.75 GHz, channel 44, vertical & horizontal polarization



Plot 8: 12 GHz to 18 GHz, channel 44, vertical & horizontal polarization

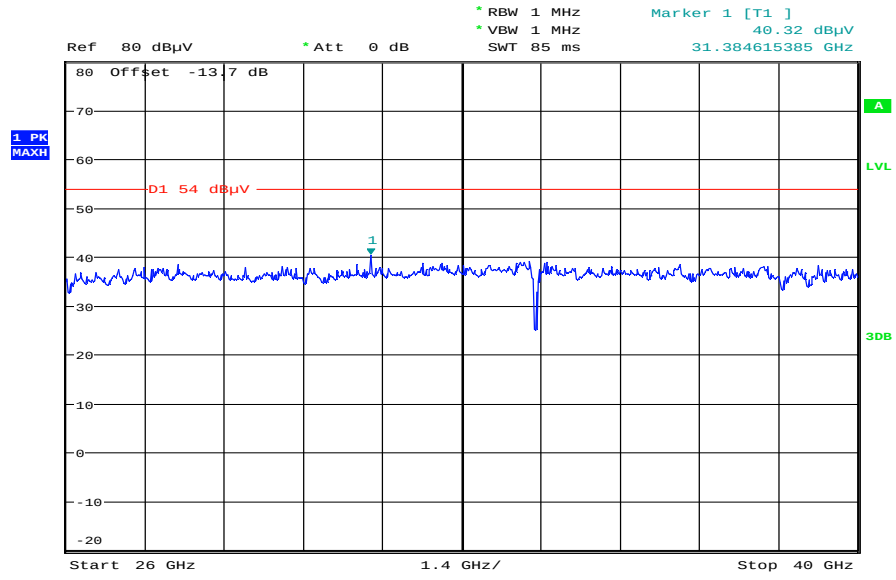


Plot 9: 18 GHz to 26 GHz, channel 44, vertical & horizontal polarization



Date: 4.JUN.2012 08:34:40

Plot 10: 26 GHz to 40 GHz, channel 44, vertical & horizontal polarization



Date: 4.JUN.2012 09:26:47

Plot 11: 30 MHz to 1 GHz, channel 52, vertical & horizontal polarization

Common Information

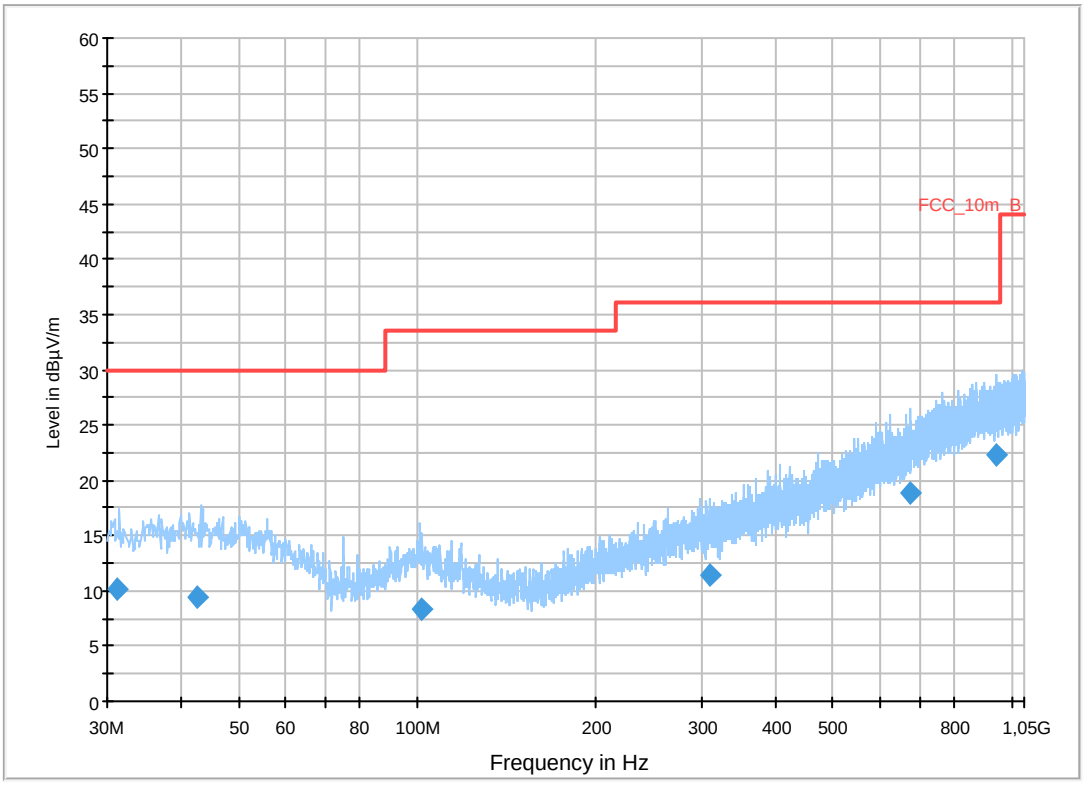
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT40 ch 52 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

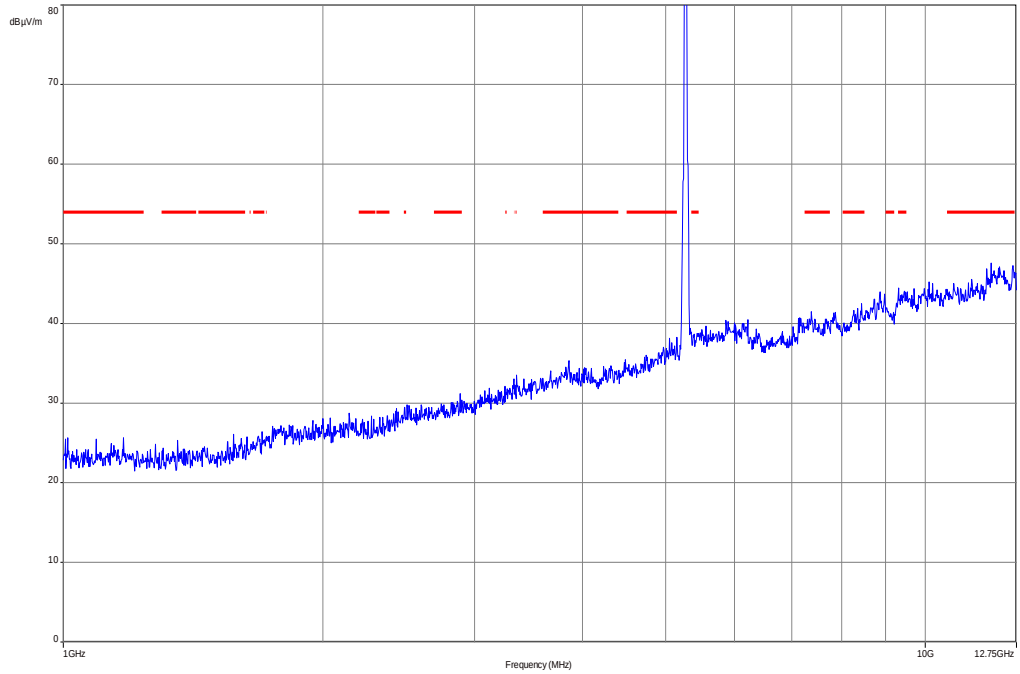
FCC_10m(B)_3



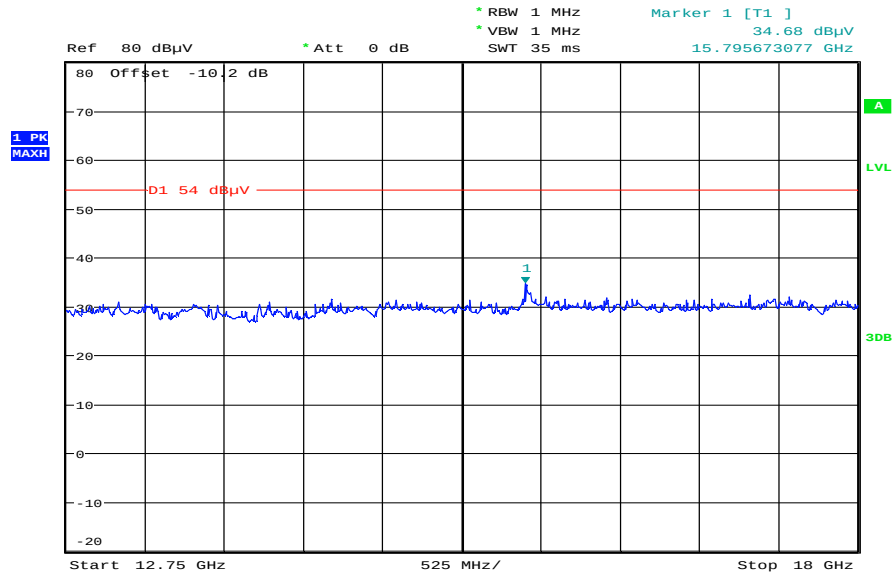
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
31.209150	10.1	1000.0	120.000	133.0	V	170.0	12.6	19.9	30.0	
42.538200	9.4	1000.0	120.000	170.0	V	100.0	13.3	20.6	30.0	
101.481150	8.3	1000.0	120.000	170.0	H	10.0	11.8	25.2	33.5	
309.951600	11.4	1000.0	120.000	170.0	V	2.0	14.8	24.6	36.0	
676.752750	18.9	1000.0	120.000	153.0	V	270.0	21.9	17.1	36.0	
942.406950	22.3	1000.0	120.000	122.0	H	10.0	25.3	13.7	36.0	

Plot 12: 1 GHz to 12.75 GHz, channel 52, vertical & horizontal polarization

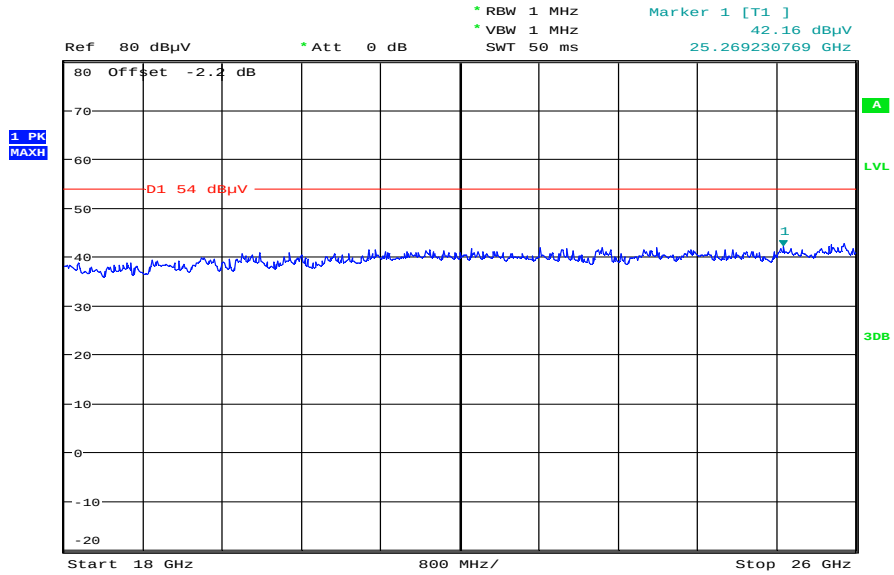


Plot 13: 12 GHz to 18 GHz, channel 52, vertical & horizontal polarization



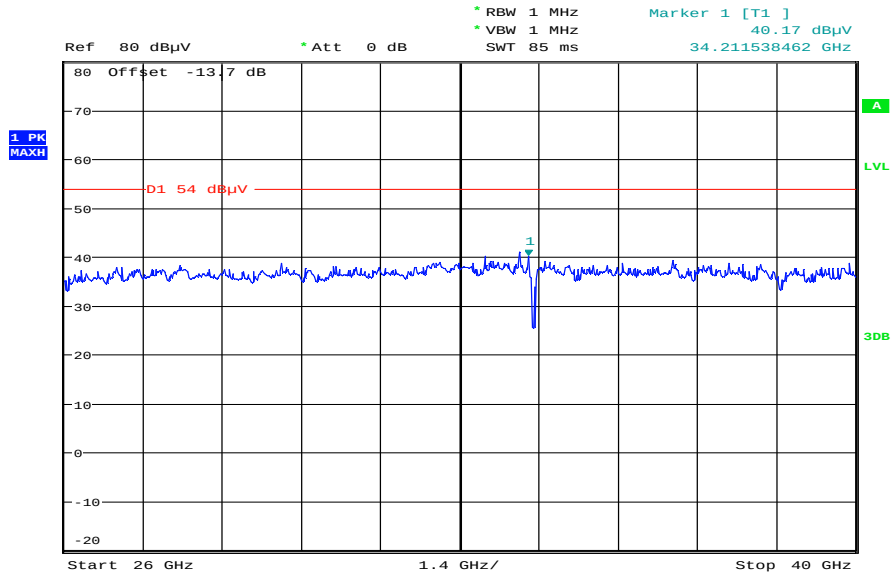
Date: 4.JUN.2012 08:29:04

Plot 14: 18 GHz to 26 GHz, channel 52, vertical & horizontal polarization



Date: 4.JUN.2012 08:35:30

Plot 15: 26 GHz to 40 GHz, channel 52, vertical & horizontal polarization



Date: 4.JUN.2012 09:26:18

Plot 16: 30 MHz to 1 GHz, channel 60, vertical & horizontal polarization

Common Information

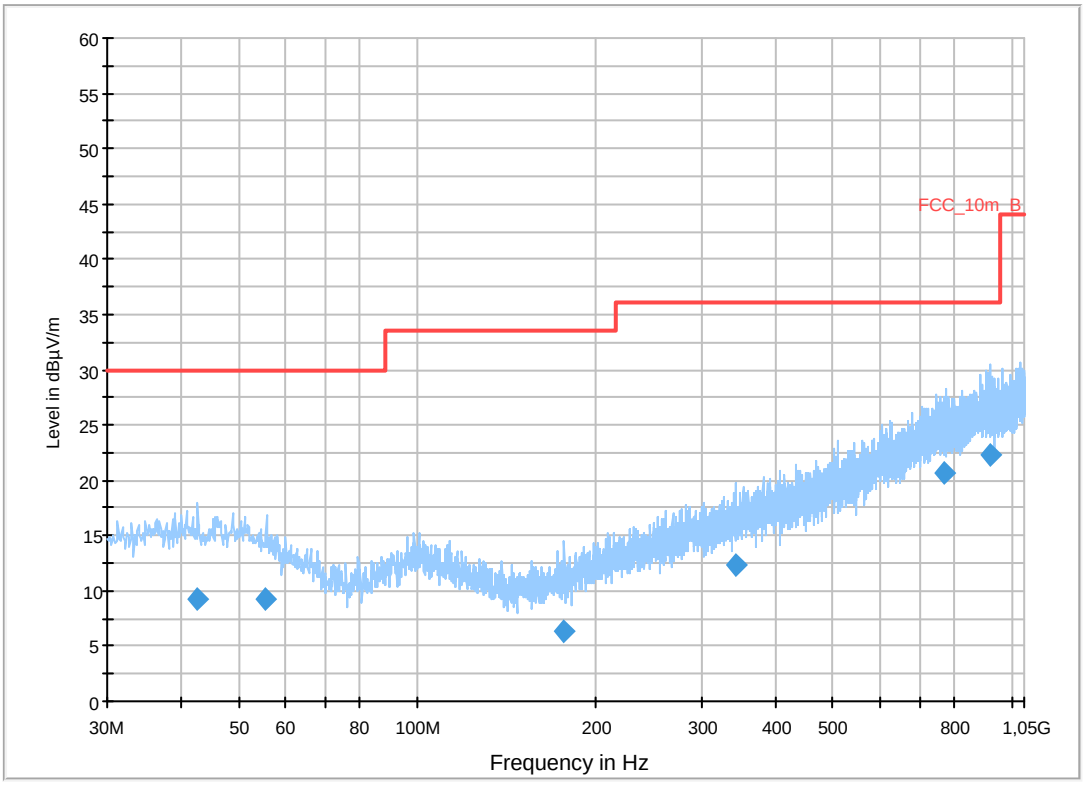
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT40 ch 60 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

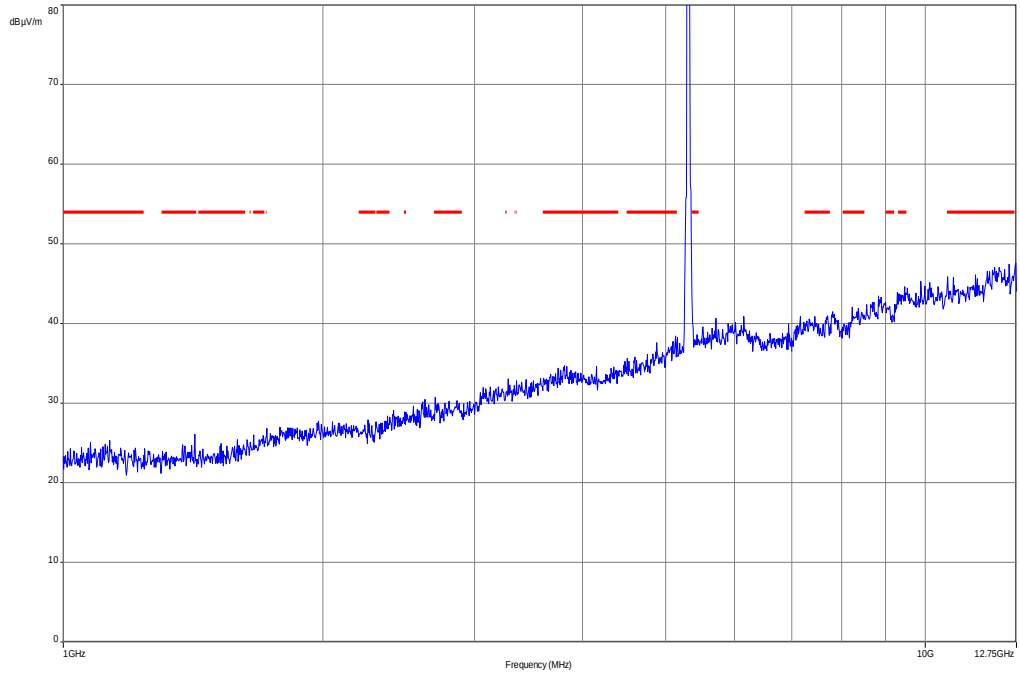
FCC_10m(B)_3



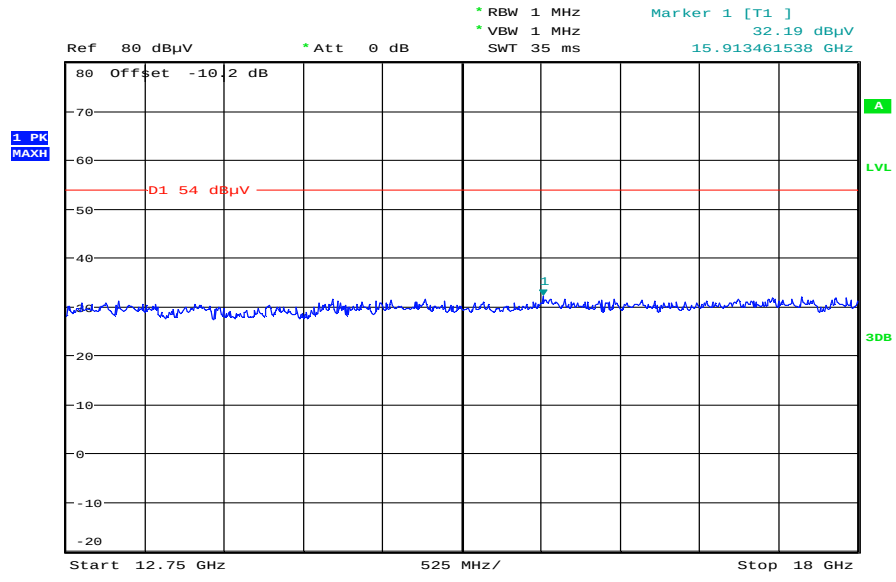
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
42.420300	9.2	1000.0	120.000	170.0	H	280.0	13.4	20.8	30.0	
55.205550	9.3	1000.0	120.000	170.0	V	261.0	12.8	20.7	30.0	
176.315250	6.3	1000.0	120.000	170.0	V	100.0	10.2	27.2	33.5	
344.129550	12.3	1000.0	120.000	153.0	V	180.0	15.9	23.7	36.0	
772.367550	20.7	1000.0	120.000	170.0	H	280.0	23.7	15.3	36.0	
920.097150	22.3	1000.0	120.000	170.0	H	272.0	25.3	13.7	36.0	

Plot 17: 1 GHz to 12.75 GHz, channel 60, vertical & horizontal polarization

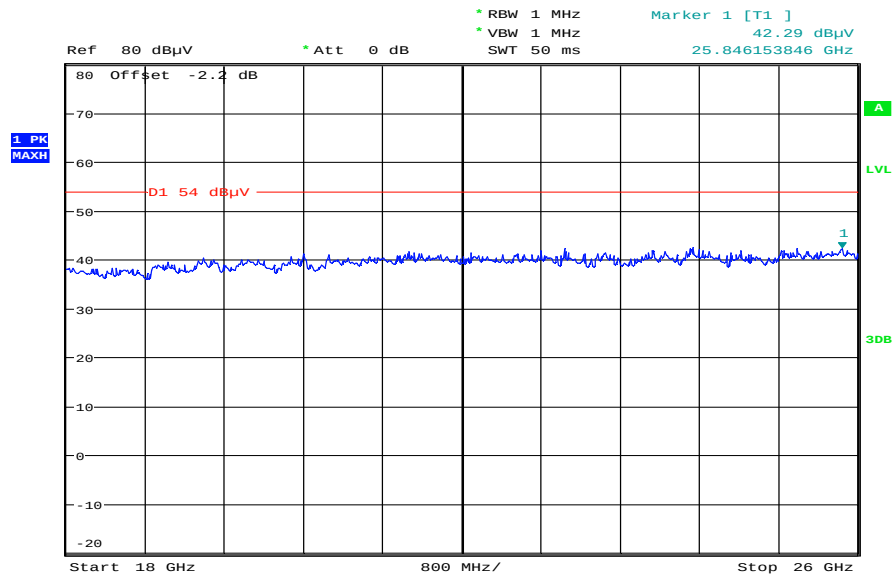


Plot 18: 12 GHz to 18 GHz, channel 60, vertical & horizontal polarization



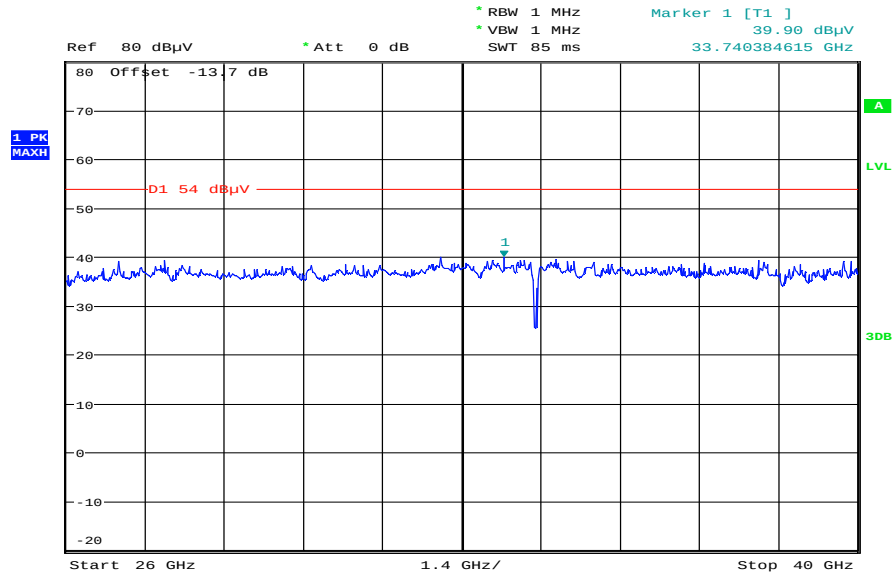
Date: 4.JUN.2012 08:27:31

Plot 19: 18 GHz to 26 GHz, channel 60, vertical & horizontal polarization



Date: 4.JUN.2012 08:36:28

Plot 20: 26 GHz to 40 GHz, channel 60, vertical & horizontal polarization



Date: 4.JUN.2012 09:25:32

Plot 21: 30 MHz to 1 GHz, channel 100, vertical & horizontal polarization

Common Information

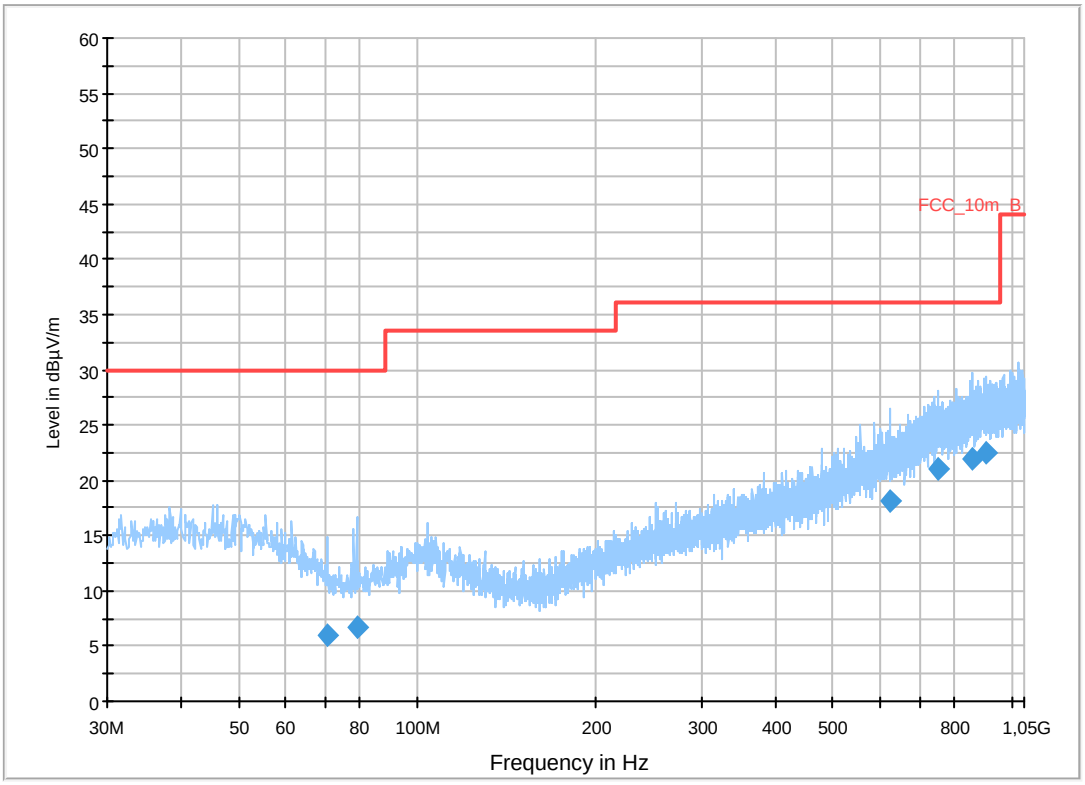
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT40 ch 100 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

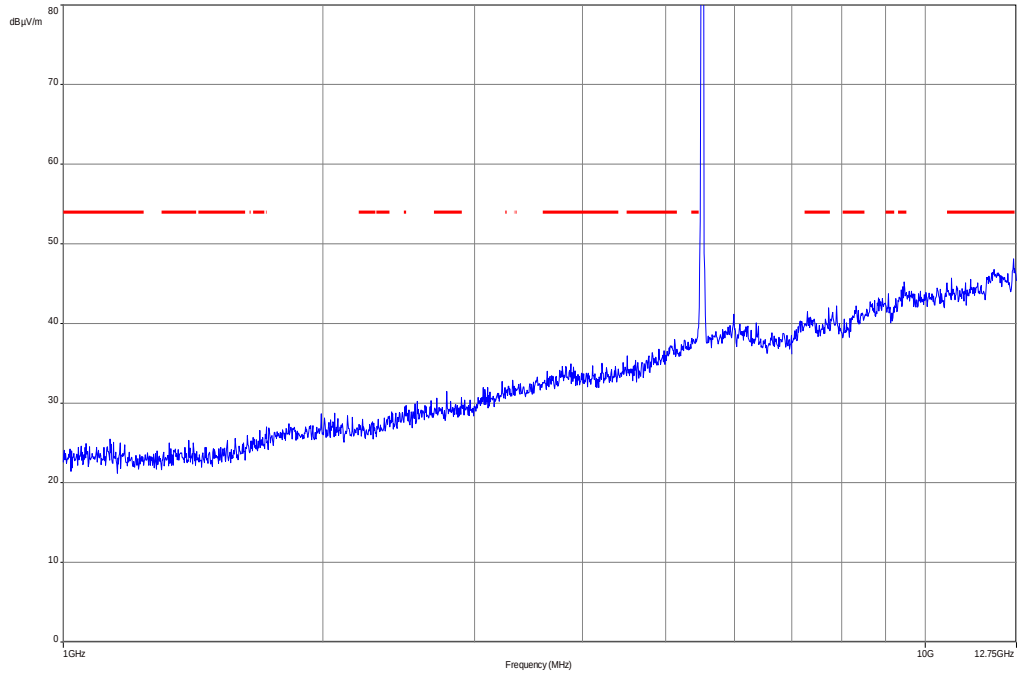
FCC_10m(B)_3



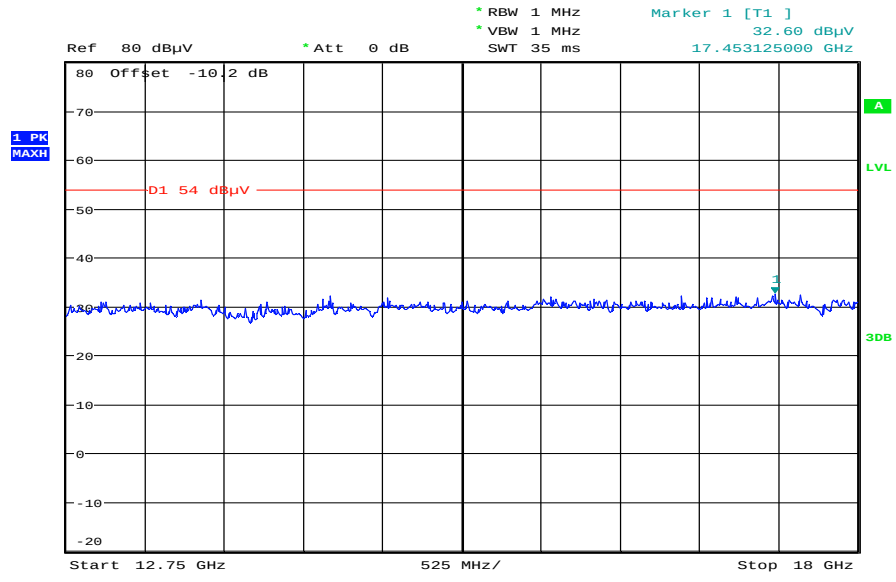
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
70.464300	6.0	1000.0	120.000	170.0	V	100.0	9.3	24.0	30.0	
79.207650	6.8	1000.0	120.000	170.0	V	-2.0	9.1	23.2	30.0	
625.723200	18.2	1000.0	120.000	170.0	H	270.0	21.0	17.8	36.0	
751.269000	21.0	1000.0	120.000	170.0	V	190.0	23.7	15.0	36.0	
857.692650	22.0	1000.0	120.000	144.0	H	265.0	24.7	14.0	36.0	
906.513900	22.4	1000.0	120.000	170.0	V	280.0	25.2	13.6	36.0	

Plot 22: 1 GHz to 12.75 GHz, channel 100, vertical & horizontal polarization

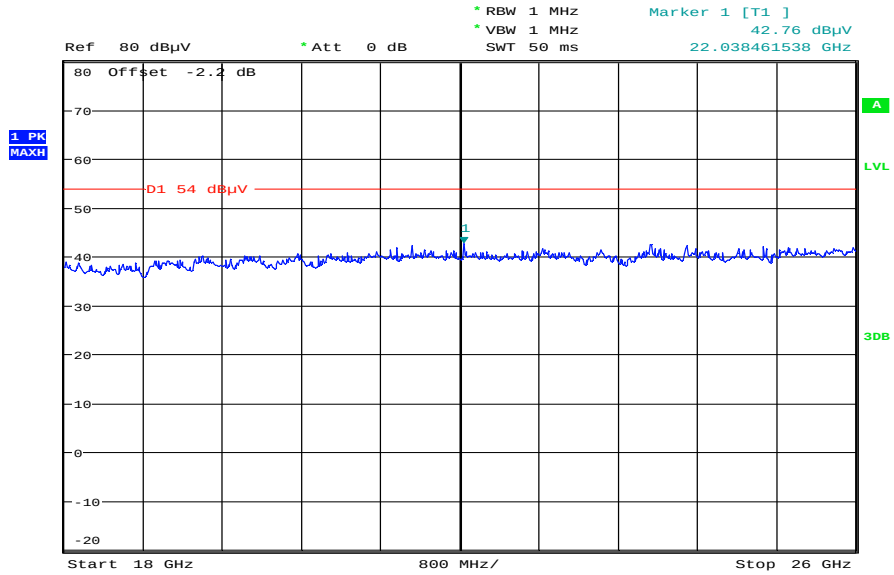


Plot 23: 12 GHz to 18 GHz, channel 100, vertical & horizontal polarization



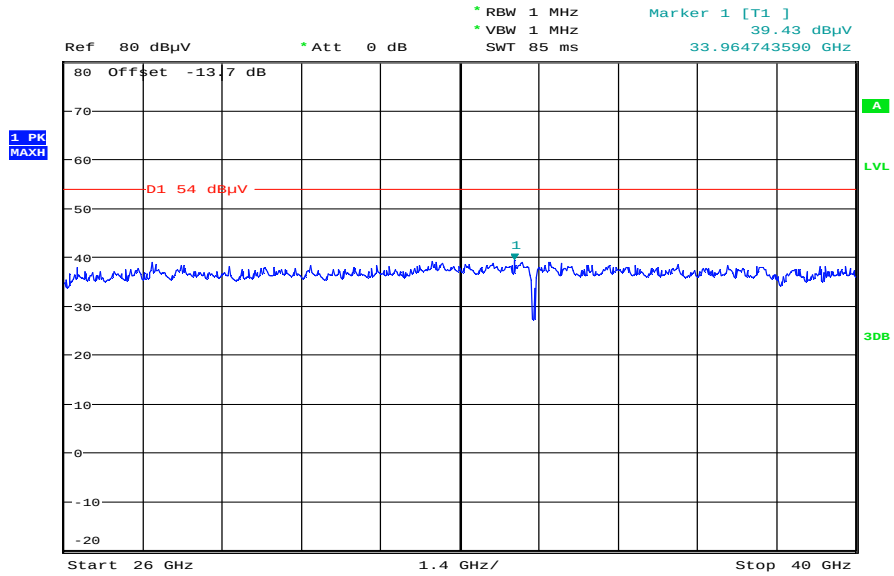
Date: 4.JUN.2012 08:26:04

Plot 24: 18 GHz to 26 GHz, channel 100, vertical & horizontal polarization



Date: 4.JUN.2012 08:37:25

Plot 25: 26 GHz to 40 GHz, channel 100, vertical & horizontal polarization



Date: 4.JUN.2012 09:24:29

Plot 26: 30 MHz to 1 GHz, channel 116, vertical & horizontal polarization

Common Information

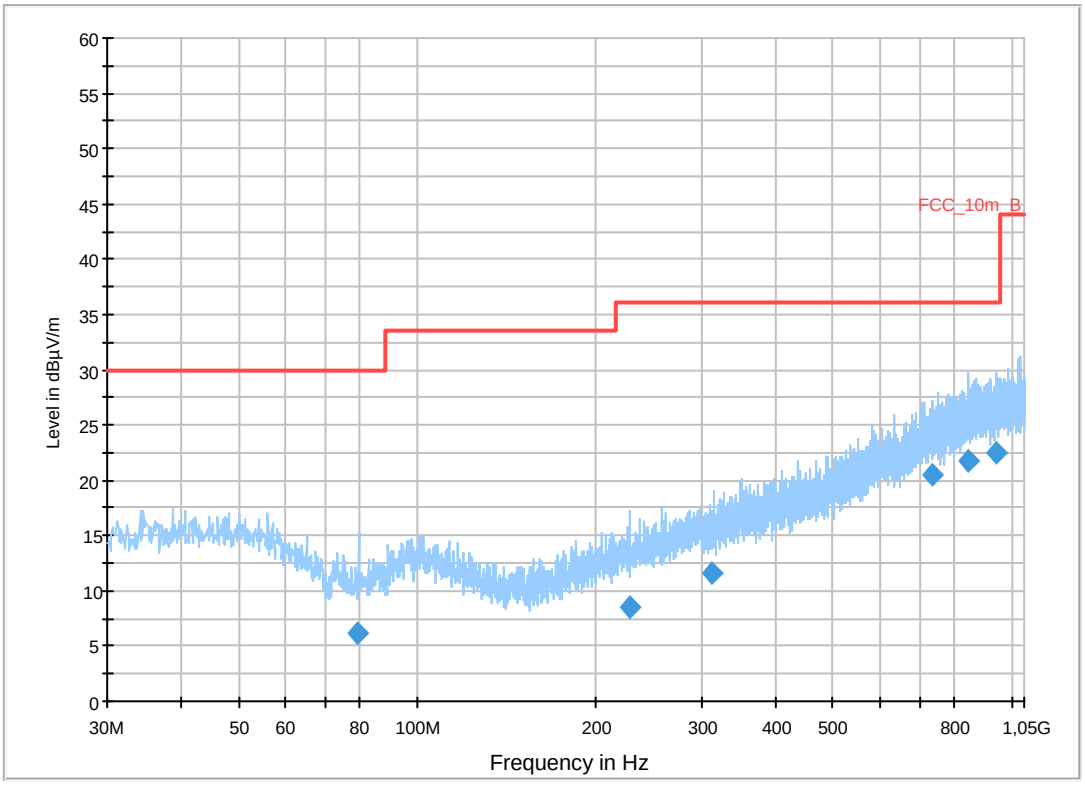
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT40 ch 116 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

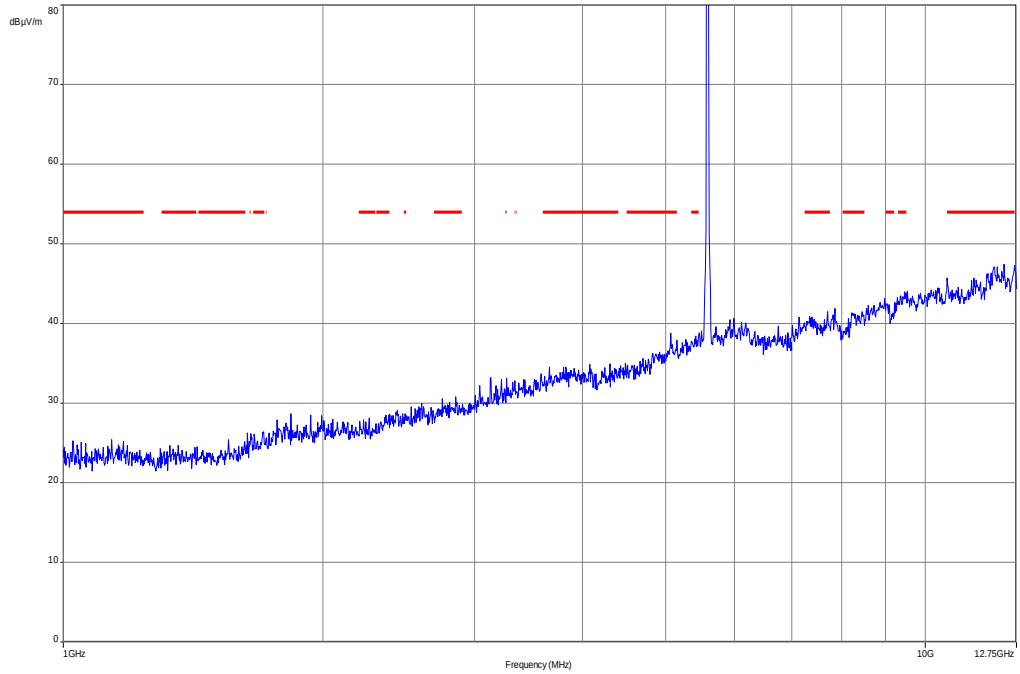
FCC_10m(B)_3



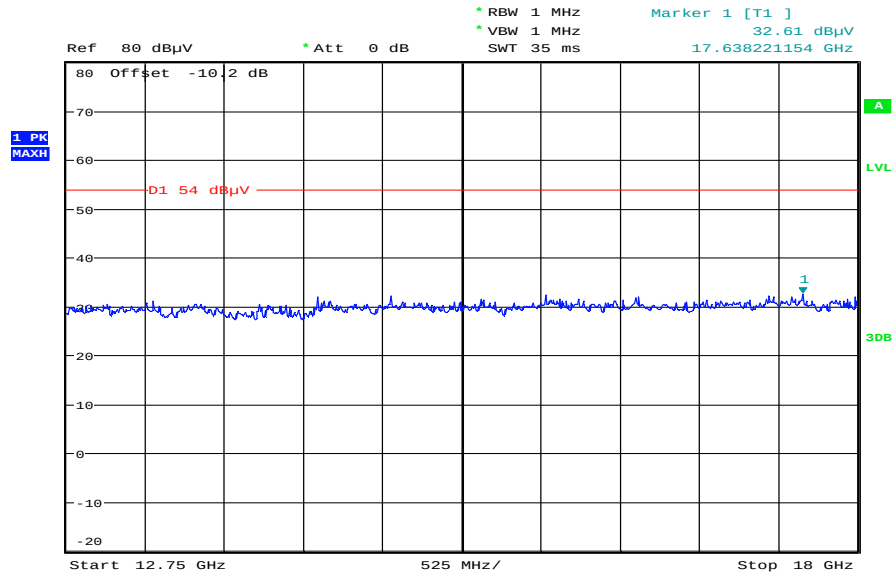
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
79.059450	6.2	1000.0	120.000	170.0	V	88.0	9.1	23.8	30.0	
227.723550	8.5	1000.0	120.000	111.0	V	180.0	12.6	27.5	36.0	
313.867050	11.5	1000.0	120.000	161.0	V	2.0	15.0	24.5	36.0	
734.881650	20.6	1000.0	120.000	170.0	V	80.0	23.3	15.4	36.0	
845.207550	21.7	1000.0	120.000	170.0	V	190.0	24.5	14.3	36.0	
942.849900	22.4	1000.0	120.000	163.0	H	190.0	25.3	13.6	36.0	

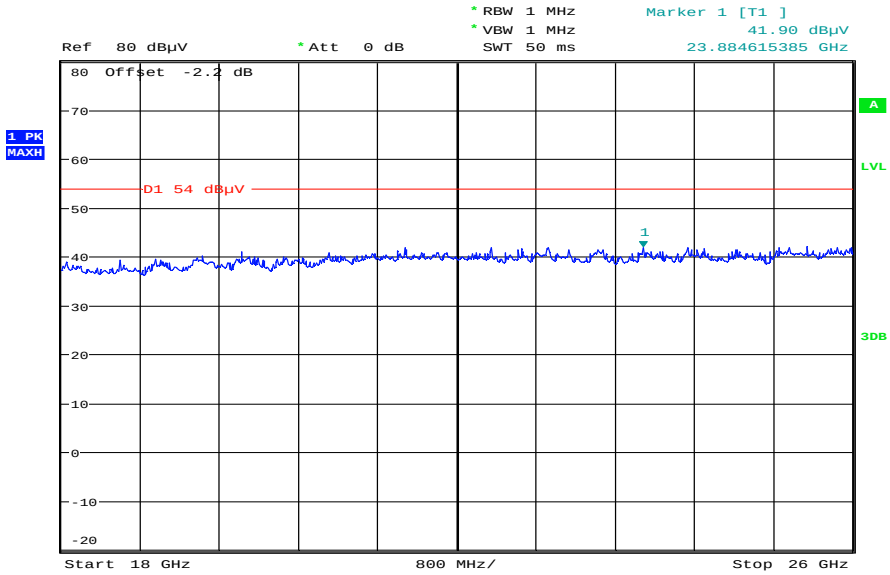
Plot 27: 1 GHz to 12.75 GHz, channel 116, vertical & horizontal polarization



Plot 28: 12 GHz to 18 GHz, channel 116, vertical & horizontal polarization

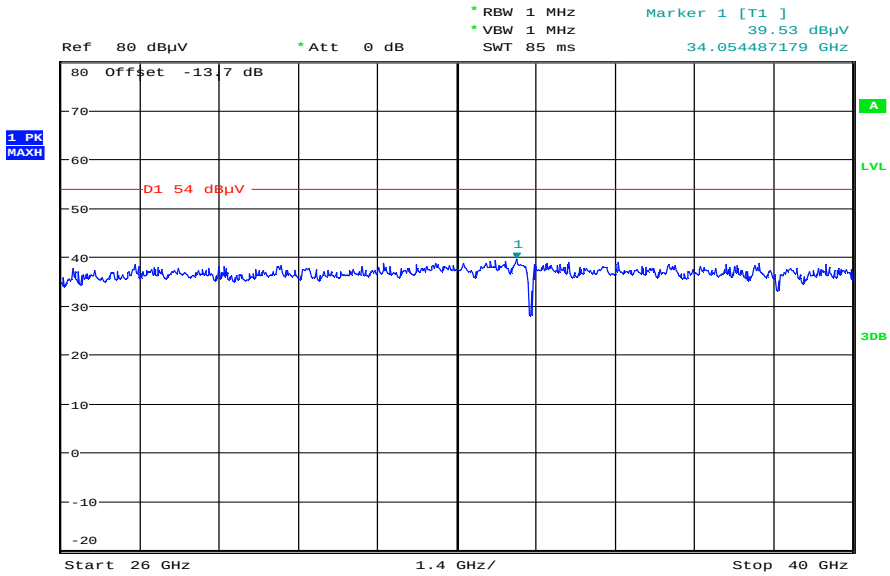


Plot 29: 18 GHz to 26 GHz, channel 116, vertical & horizontal polarization



Date: 4.JUN.2012 08:38:11

Plot 30: 26 GHz to 40 GHz, channel 116, vertical & horizontal polarization



Date: 4.JUN.2012 09:23:39

Plot 31: 30 MHz to 1 GHz, channel 132, vertical & horizontal polarization

Common Information

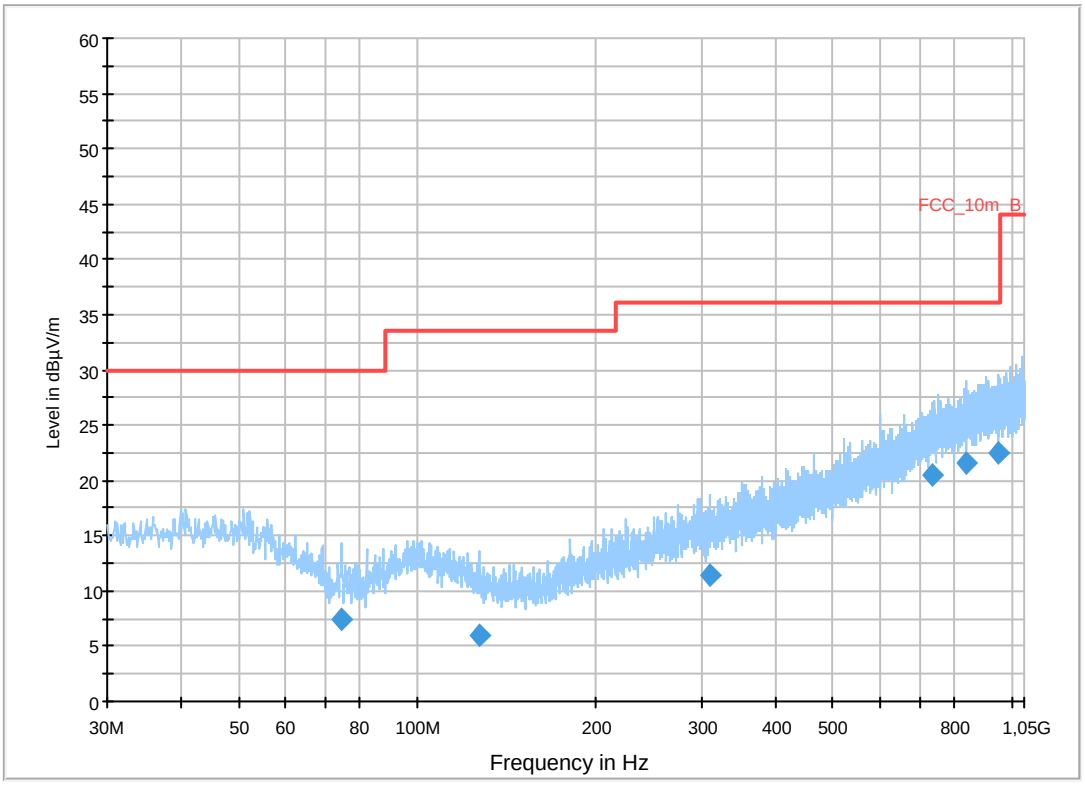
EUT:	PM-0020-BV
Serial Number:	CB5A1K3QFD
Test Description:	FCC part 15 C class B @ 10m
Operating Conditions:	w-lan OFDM / n-mode HT40 ch 136 + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

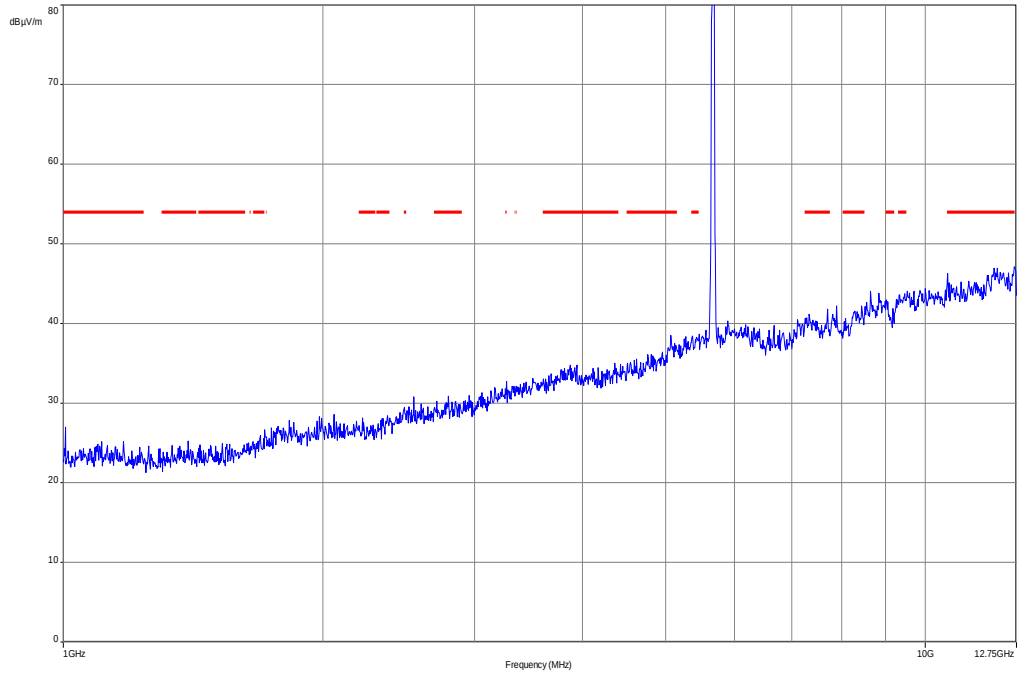
FCC_10m(B)_3



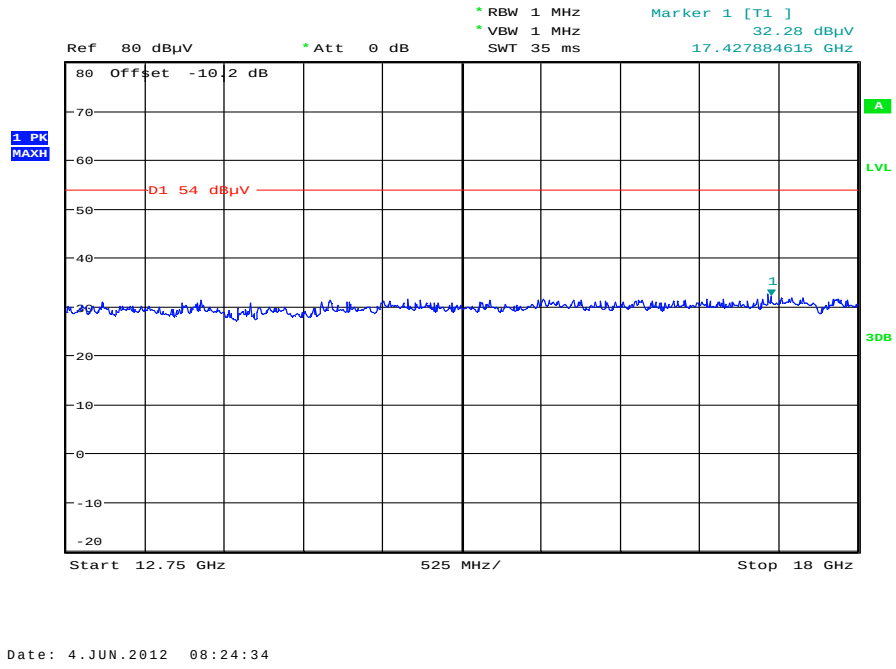
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
74.512500	7.4	1000.0	120.000	170.0	V	80.0	9.2	22.6	30.0	
127.380000	6.0	1000.0	120.000	170.0	V	10.0	9.6	27.5	33.5	
310.331400	11.4	1000.0	120.000	170.0	V	190.0	14.8	24.6	36.0	
735.199500	20.5	1000.0	120.000	111.0	H	90.0	23.3	15.5	36.0	
837.567450	21.6	1000.0	120.000	104.0	V	100.0	24.4	14.4	36.0	
949.495200	22.4	1000.0	120.000	170.0	H	280.0	25.3	13.6	36.0	

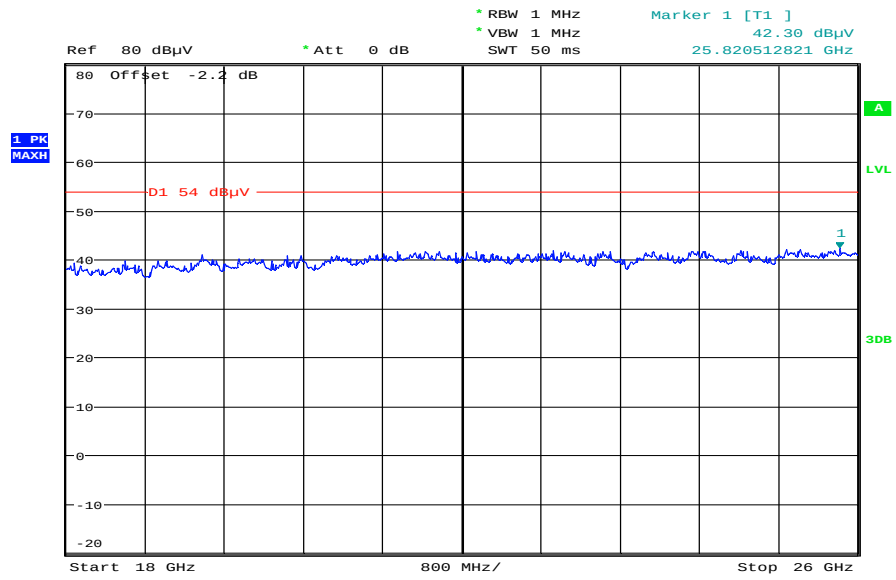
Plot 32: 1 GHz to 12.75 GHz, channel 132, vertical & horizontal polarization



Plot 33: 12 GHz to 18 GHz, channel 132, vertical & horizontal polarization

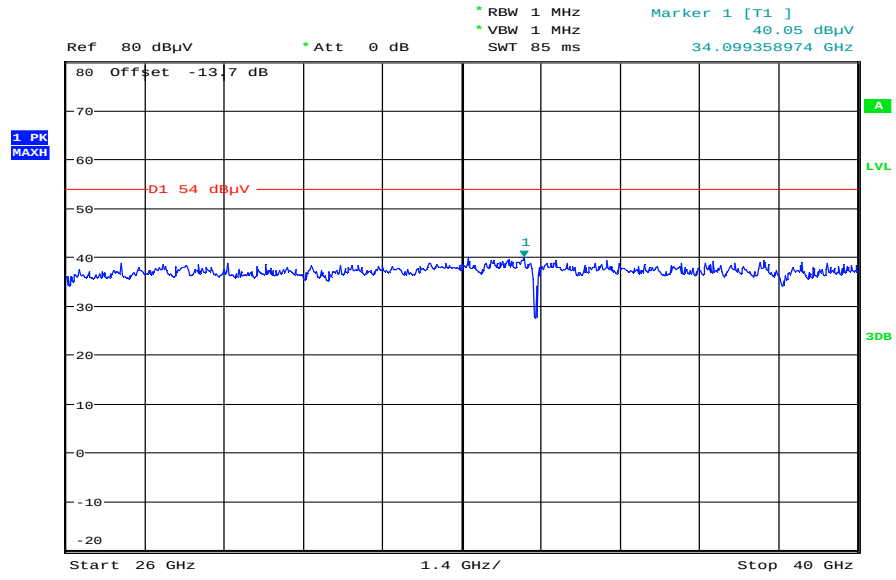


Plot 34: 18 GHz to 26 GHz, channel 132, vertical & horizontal polarization



Date: 4.JUN.2012 08:39:46

Plot 35: 26 GHz to 40 GHz, channel 132, vertical & horizontal polarization



Date: 4.JUN.2012 09:22:48

9.10 RX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in idle/receive mode.

Measurement:

Measurement parameter	
Detector:	Quasi Peak below 1 GHz (alternative Peak) Peak above 1 GHz / RMS
Sweep time:	Auto
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Video bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: ≥ 3 MHz /10 Hz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold

Limits:

RX Spurious Emissions Radiated		
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:

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

Result: Passed

Plots: RX / Idle – mode

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

Common Information

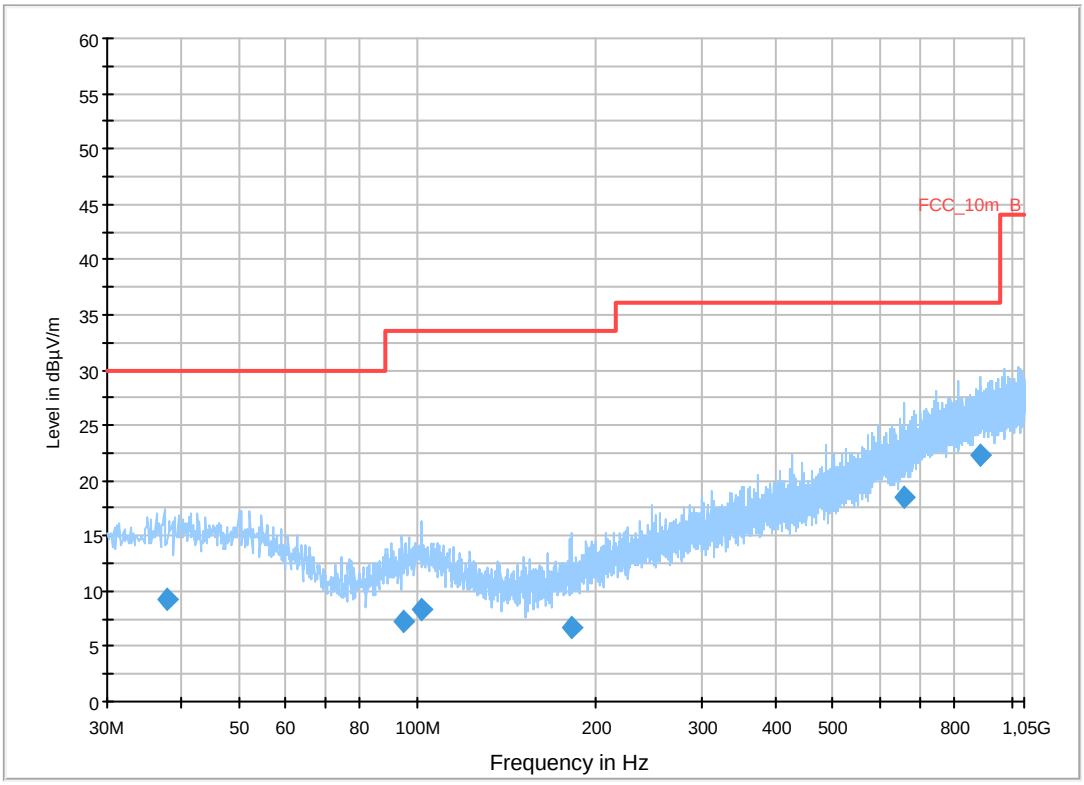
EUT:	PM-0020-BV
Serial Number:	CB5A1K2ZH5
Test Description:	FCC part 15 B class B@10m
Operating Conditions:	w-lan rx mode + charging
Operator Name:	Wolsdorfer
Comment:	AC 115 V / 60 Hz

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

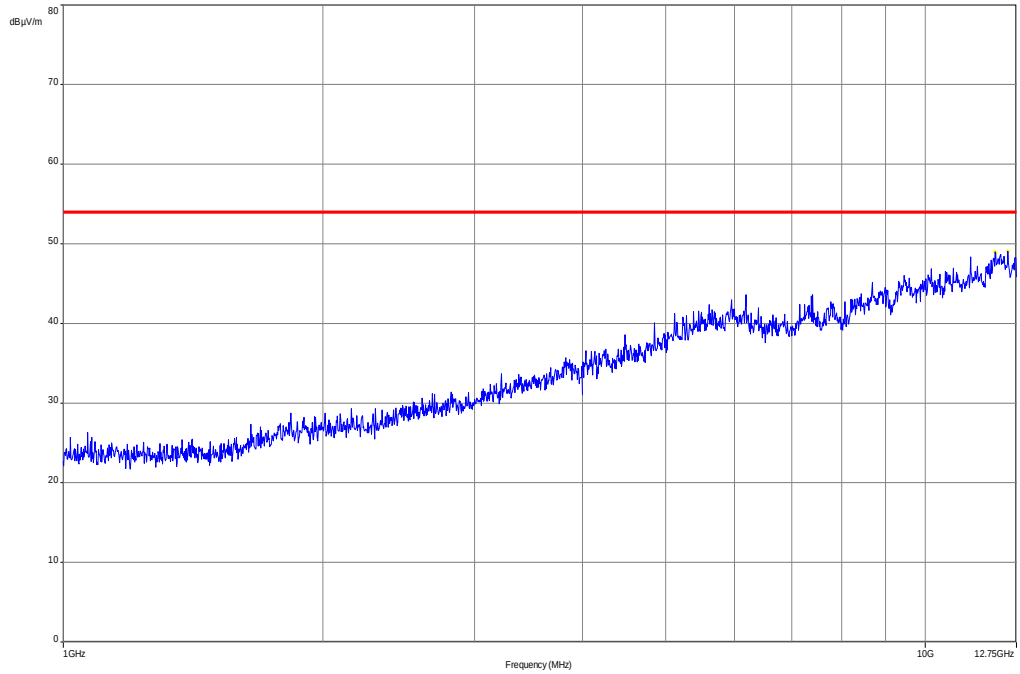
FCC_10m(B)_3



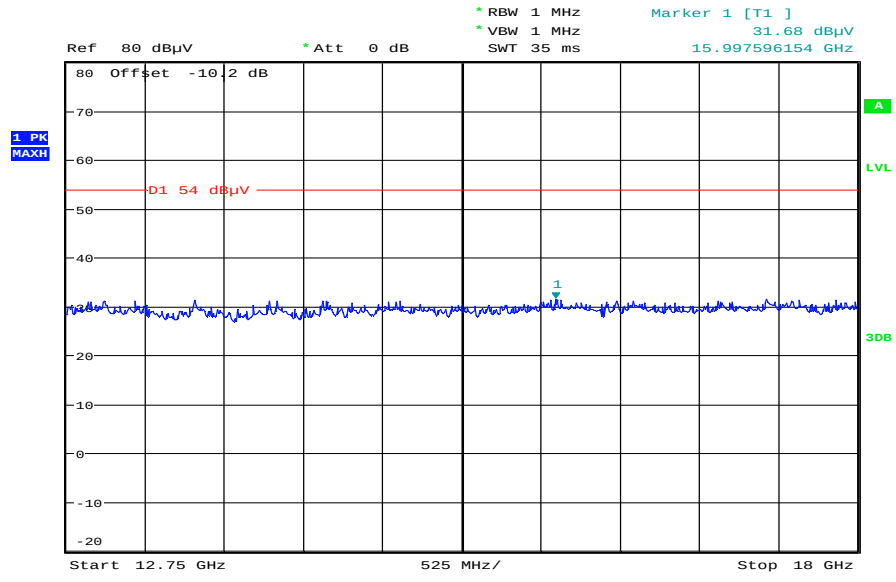
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
37.964100	9.3	1000.0	120.000	170.0	V	93.0	13.3	20.7	30.0	
94.515150	7.2	1000.0	120.000	170.0	V	100.0	11.2	26.3	33.5	
101.465550	8.3	1000.0	120.000	122.0	H	260.0	11.8	25.2	33.5	
182.188500	6.6	1000.0	120.000	98.0	V	261.0	10.6	26.9	33.5	
661.052700	18.5	1000.0	120.000	170.0	V	-2.0	21.4	17.5	36.0	
884.804550	22.2	1000.0	120.000	98.0	H	0.0	25.0	13.8	36.0	

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

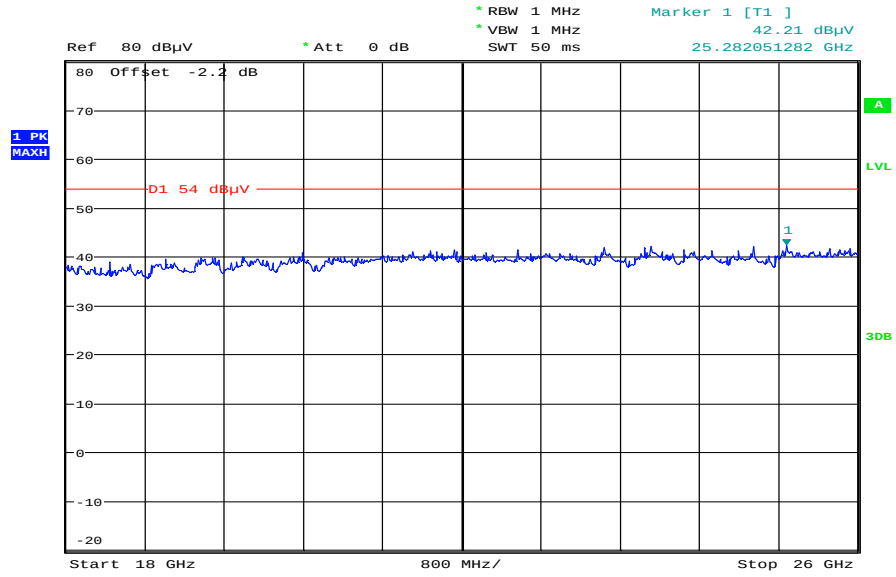


Plot 3: 12 GHz to 18 GHz, vertical & horizontal polarization



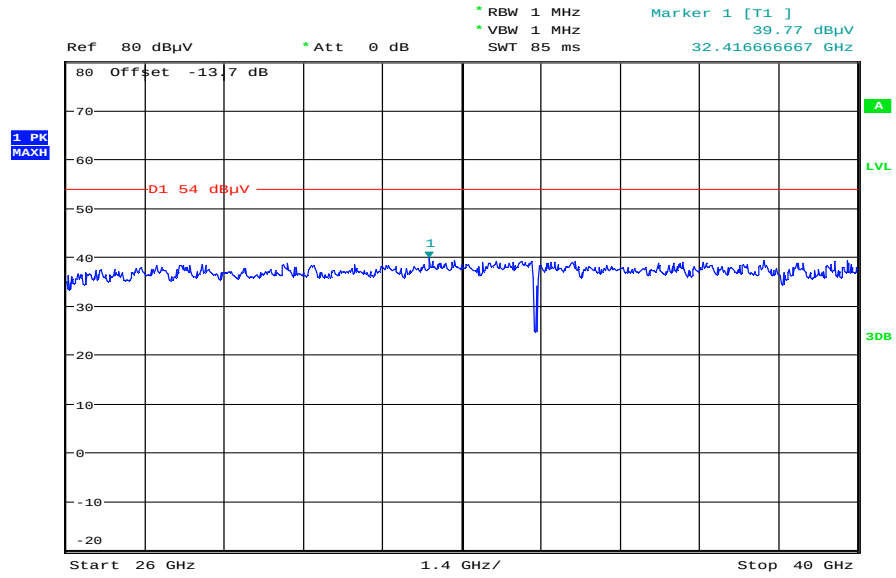
Date: 4.JUN.2012 08:46:34

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



Date: 4.JUN.2012 08:45:53

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



Date: 4.JUN.2012 08:49:44

9.11 Spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode and receive mode below 30 MHz. The EUT is set first to channel 39. This measurement is representative for all channels and modes. If critical peaks are found channel 00 and channel 78 will be measured too. Then the EUT is set to receive or idle mode. 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:

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

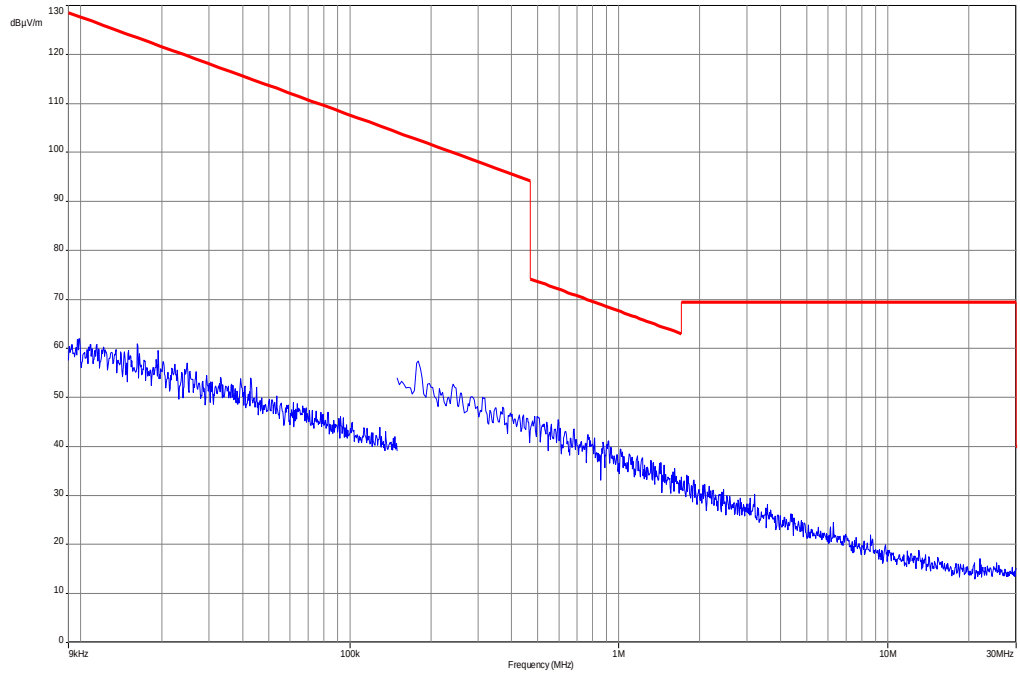
Results:

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

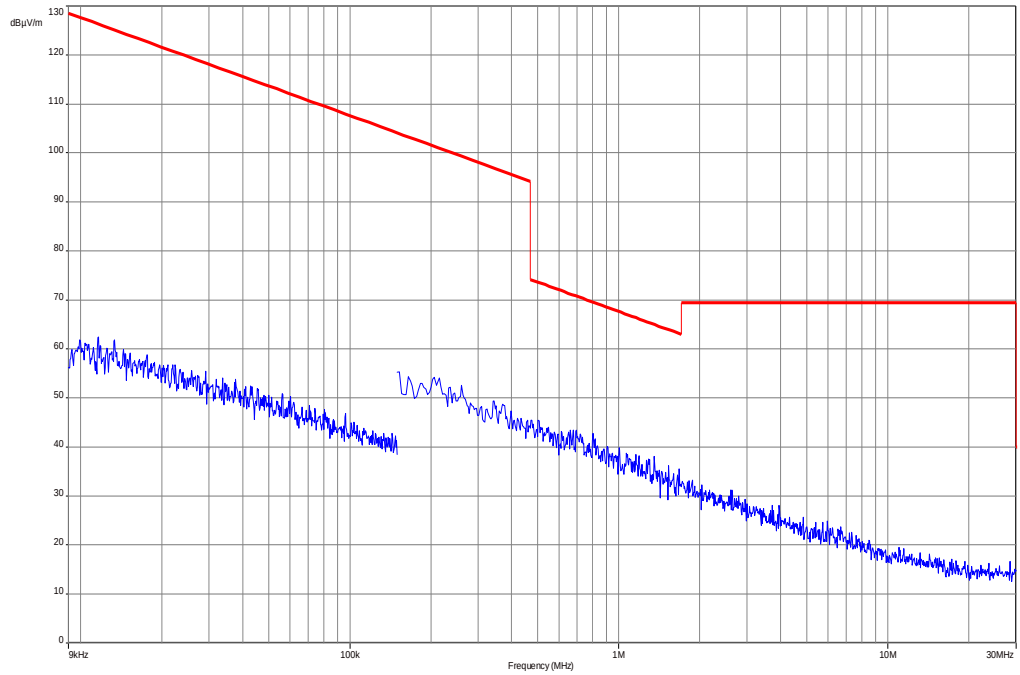
Result: Passed

Plots:

Plot 1: 9 kHz to 30 MHz, TX mode



Plot 2: 9 kHz to 30 MHz, RX mode



9.12 Spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 39. If critical peaks are found channel 00 and channel 78 will be measured too. Both power lines, phase and neutral line, are measured. Found peaks are remeasured 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:

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

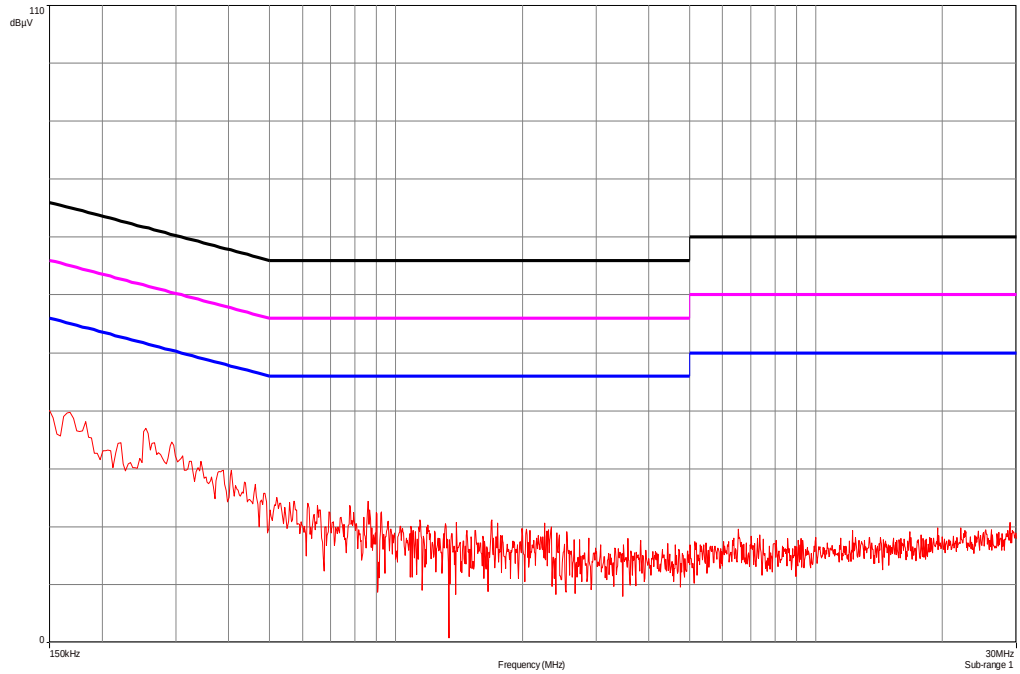
Results:

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

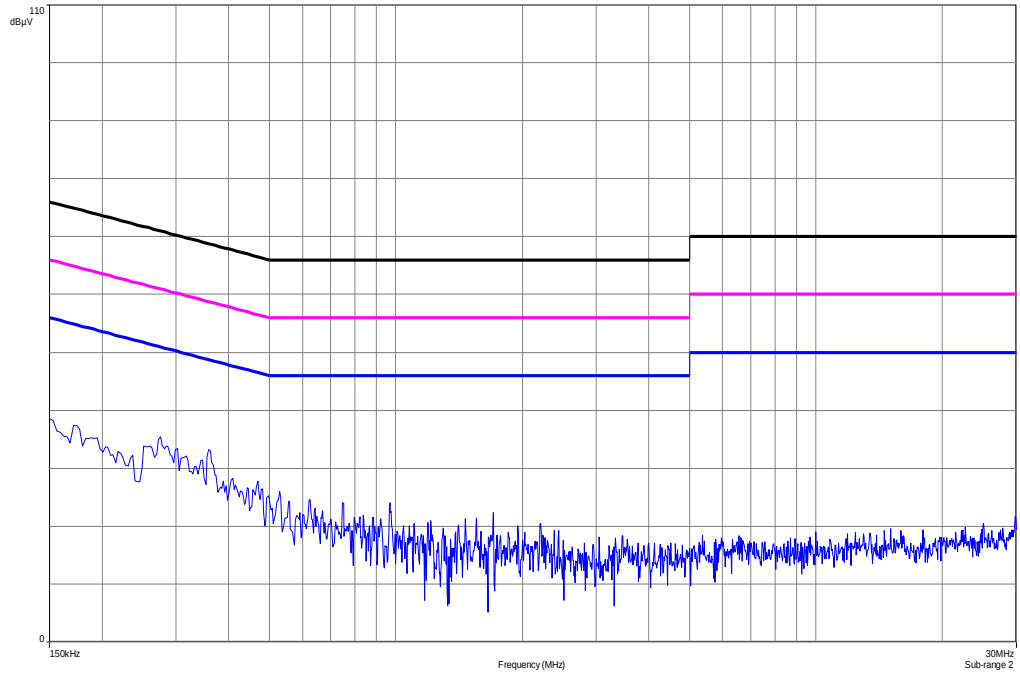
Result: Passed

Plots:

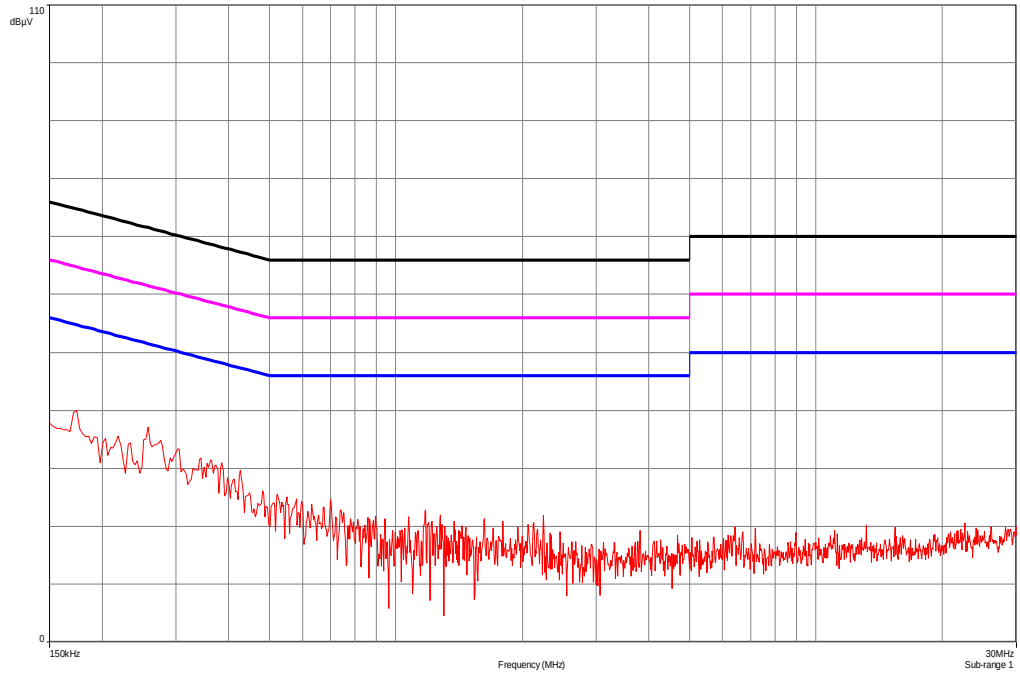
Plot 1: 9 kHz to 30 MHz / phase Line, TX mode



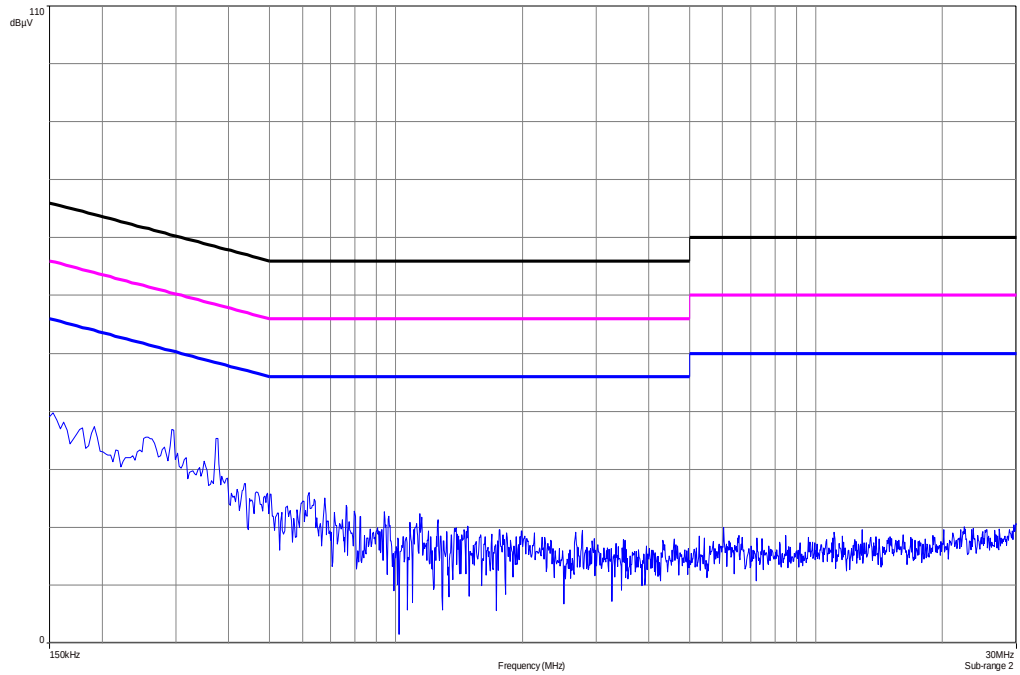
Plot 2: 9 kHz to 30 MHz / neutral Line, TX mode



Plot 3: 9 kHz to 30 MHz / phase Line, RX mode



Plot 4: 9 kHz to 30 MHz / neutral Line, RX mode



10 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 1166.5950.03	R&S	100083	300003312	k	04.01.2012	04.01.2013
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/00205	300003314	k	14.07.2011	14.07.2013
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		
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	06.01.2012	06.01.2014
12	n. a.	Isolating Transformer	RT5A	Grundig	8041	300001626	g		
13	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
14	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vlKl!	11.05.2011	11.05.2013
15	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
16	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
17	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
18	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
19	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
20	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
21	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
22	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
23	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vlKl!	14.10.2011	14.10.2014

24	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	19.12.2011	19.12.2012
25	CR 79	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751	ne		
26	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
27	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000787	ne		
28	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300002442	ne		
29	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL19503 070-XX	CERNEX	19338	300004273	ne		
30	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	ve	01.07.2010	01.07.2012

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
vlkl!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

11 Observations

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

Annex F Accreditation Certificate

Deutsche Akkreditierungsstelle GmbH
German Accreditation Body

Entrusted according to Section 8 subsection1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH (German Accreditation Body) attests that the testing laboratory

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10
66117 Saarbrücken

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

Wired communications and DECT
Acoustic
Radio
Short Range Devices (SRD)
RFID
WiMax and Richtfunk
Mobile radio (GSM / DCS), Over the Air (OTA) Performance
Electromagnetic Compatibility (EMC) incl. Automotive
Product safety
SAR and Hearing Aid Compatibility (HAC)
Environmental simulation
Smart Card Terminals
Bluetooth
Wi-Fi-Services

The accreditation certificate shall only apply in connection with the notice of accreditation of 13.04.2011 with the accreditation number D-PL-12076-01 and is valid until 03.09.2014. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 82 pages.

Registration number of the certificate: **D-PL-12076-01-01**

Deutsche Akkreditierungsstelle GmbH

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/fileadmin/de/CETECOM_D_Saarbruecken/accreditations_Jan_2010/DAKKS_Akkredi_Urk_EN17025-En_incl_Annex.pdf