

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

Test report no.: 1-4254/12-76-12

Deutsche
Akkreditierungsstelle
D-PL-12076-01-01**Testing laboratory****CETECOM ICT Services GmbH**
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Area of Testing: Radio/Satellite Communications**Applicant****Sony Mobile Communications AB**
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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:** Tablet PC GPRS/EGPRS 850/900/1800/1900; UMTS HSPA FDDI/VVI/XIX; LTE FDD1/19/21; WLAN a/b/g/n; BT 3.1; BT LE; RFID; FM Rx; A-GPS
Model name: TM-0000-BV
FCC ID: PY7TM-0000
IC: 4170B-TM0000
UNII-bands
Frequency: lowest channel: 36 – 5180 MHz; highest channel: 48 – 5240 MHz
lowest channel: 52 – 5260 MHz; highest channel: 64 – 5320 MHz
lowest channel: 100 – 5500 MHz; highest channel: 140 – 5700 MHz
Technology tested: WLAN
Antenna: Integrated antenna
Power Supply: 3.7V DC by LI-ION
Temperature Range: -20°C to +55°C**Test report authorised:**

2013-01-21

p.o. 
Stefan Börs
Senior Testing Manager**Test performed:**

2013-01-21


Andreas Luckenbill
Expert

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2 General information

2.1 Notes and disclaimer

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

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In no case this test report can be considered as a Letter of Approval.

2.2 Application details

Date of receipt of order:	2012-12-14
Date of receipt of test item:	2012-12-14
Start of test:	2013-01-01
End of test:	2013-01-18
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

3.1 Measurement guidance

UNII: KDB 789033	2011-10	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E
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4 Test environment

Temperature:	T_{nom}	+22 °C during room temperature tests
	T_{max}	+55 °C during high temperature tests
	T_{min}	-20 °C during low temperature tests
Relative humidity content:		42 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	3.7 V DC by Li-ION
	V_{max}	4.1 V
	V_{min}	3.3 V

5 Test item

Kind of test item	:	Tablet PC GPRS/EGPRS 850/900/1800/1900; UMTS HSPA FDDI/V/VI/XIX; LTE FDD1/19/21; WLAN a/b/g/n; BT 3.1; BT LE; RFID; FM Rx; A-GPS
Type identification	:	TM-0000-BV
S/N serial number	:	Rad. CB5A1MD99N, CB5A1MD99Z Cond. CB5A1MD98S, CB5A1MD994
HW hardware status	:	AP
SW software status	:	10.1.E.0.61
Frequency band [MHz]	:	UNII-bands lowest channel: 36 – 5180 MHz; highest channel: 48 – 5240 MHz lowest channel: 52 – 5260 MHz; highest channel: 64 – 5320 MHz lowest channel: 100 – 5500 MHz; highest channel: 140 – 5700 MHz
Type of radio transmission	:	OFDM
Use of frequency spectrum	:	
Type of modulation	:	QPSK, 16-QAM, 64-QAM
Number of channels	:	19
Antenna	:	Integrated antenna
Power supply	:	3.7 V DC by Li-ION
Temperature range	:	-20 °C to +55 °C

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 9	Passed	2013-02-15	-/-

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

Note: NA = Not Applicable; NP = Not Performed

8 RF measurements

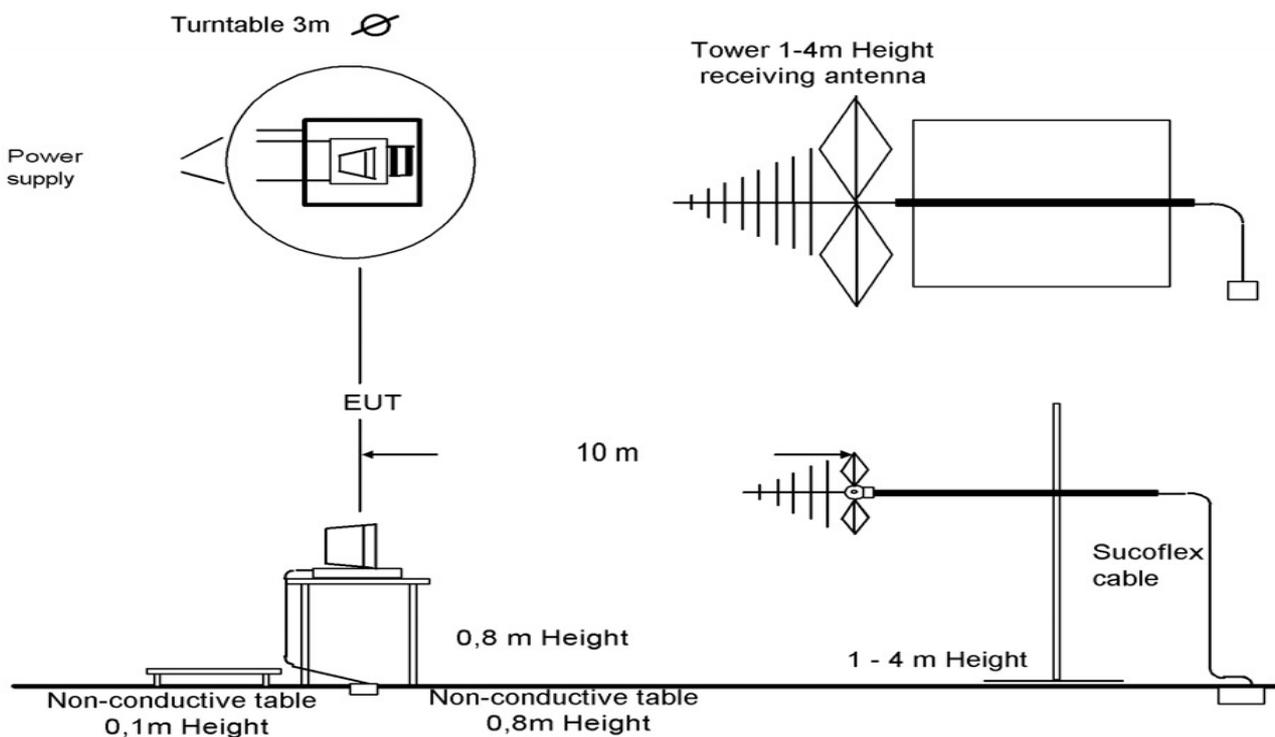
8.1 Description of test setup

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



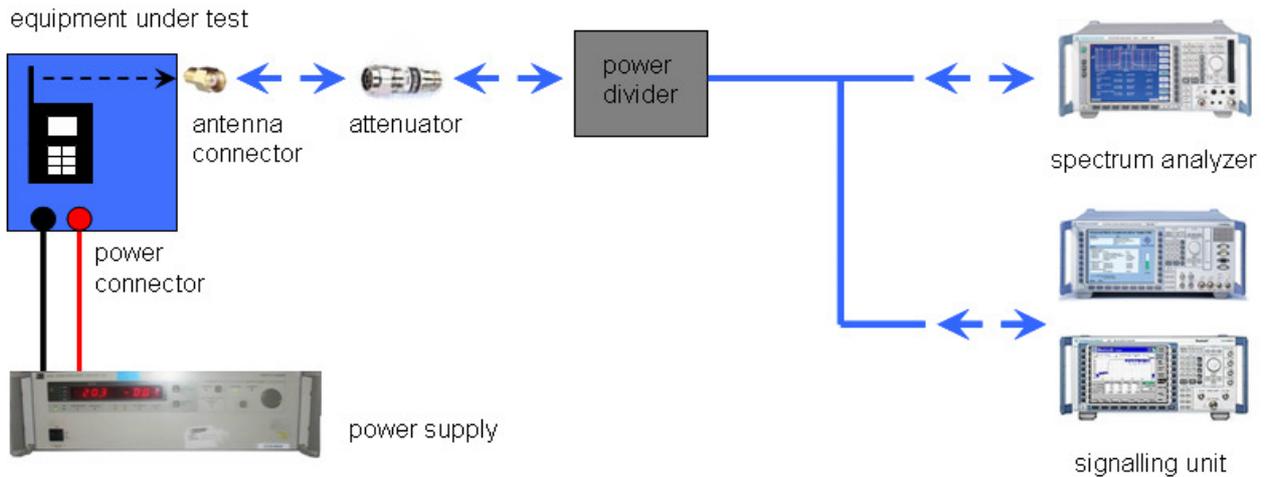
Picture 1: Diagram radiated measurements

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: None

Special test descriptions: None

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	:	1-4254/12-76-12			
Equipment model number	:	TM-0000-BV			
Certification number	:	4170B-TM0000			
Manufacturer (complete address)	:	Sony Mobile Communications AB Nya Vattentornet 22188 Lund / SWEDEN			
Tested to radio standards specification no.	:	RSS 210, Issue 8, Annex 9			
Open area test site IC No.	:	IC 3462C-1			
Frequency range	:	UNII bands: 5150 MHz to 5250 MHz; 5250 MHz to 5350 MHz 5470 MHz to 5600 MHz; 5650 MHz to 5725 MHz			
RF-power [mW] (max.)	:	Conducted values:			
		Band	a	n HT20	n HT40
		5180 – 5240 MHz	5.9 mW	6.8 mW	
		5190 – 5230 MHz			4.8 mW
		5260 – 5320 MHz	6.0 mW	12.0 mW	
		5270 – 5310 MHz			4.6 mW
		5500 – 5700 MHz	6.9 mW	7.4 mW	
		5510 – 5670 MHz			15.1 mW
		Radiated values:			
		Band	a	n HT20	n HT40
		5180 – 5240 MHz	1.8 mW	2.0 mW	
		5190 – 5230 MHz			1.5 mW
		5260 – 5320 MHz	3.7 mW	7.4 mW	
		5270 – 5310 MHz			2.6 mW
5500 – 5700 MHz	14.6 mW	15.9 mW			
5510 – 5670 MHz			32.4 mW		
Occupied bandwidth (99%-BW) [MHz] / Emission designator (TRC-43)	:	Band	a	n HT20	n HT40
		5180 – 5240 MHz	22.4 MHz 22M4G7D	22.7 MHz 22M7G7D	
		5190 – 5230 MHz			46.3 MHz 46M3G7D
		5260 – 5320 MHz	22.1 MHz 22M1G7D	23.1 MHz 23M1G7D	
		5270 – 5310 MHz			43.4 MHz 43M4G7D
		5500 – 5700 MHz	22.1 MHz 22M1G7D	22.7 MHz 22M7G7D	
5510 – 5670 MHz			43.1 MHz 43M1G7D		
Type of modulation	:	QPSK, 16 – QAM, 64 – QAM			
Antenna information	:	Integrated PCB antenna			
Transmitter spurious (worst case)[dBµV/m @ 3m]:	:	48 dBµV/m @ 12.75 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:

2013-01-21
Date

Andreas Luckenbill
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 all 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.

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 Data Rate [MBit/s]	Maximum Output Power Conducted [dBm]							
	6	9	12	18	24	36	48	54
Ch 48 - 5240 MHz	20.3	18.4	18.8	19.3	20.0	19.6	19.4	20.4
Measurement uncertainty	± 0.5 dB							

OFDM / n – mode HT 20 Data Rate [MBit/s]	Maximum Output Power Conducted [dBm]							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch 48 - 5240 MHz	19.2	19.4	19.5	20.1	19.4	18.6	19.6	20.5
Measurement uncertainty	± 0.5 dB							

OFDM / n – mode HT40 Data Rate [MBit/s]	Maximum Output Power Conducted [dBm]							
	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch 44 - 5230 MHz	21.3	19.4	19.5	20.2	18.4	19.3	18.5	20.7
Measurement uncertainty	± 0.5 dB							

Result: Selected data rate for all measurements:

OFDM / a – mode: 6 MBit/s
 OFDM / n – mode HT20: MCS7
 OFDM / n – mode HT40: MCS0

9.2 Gain

Description:

Measurement of the maximum output power conducted and radiated

Measurement:

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

Limits:

Antenna Gain
Maximum 6 dBi

Result:

OFDM Band 5150 MHz to 5250 MHz Channel	Gain		
	Lowest 5180 MHz		Highest 5240 MHz
Radiated power for gain calculation	7.7		10.2
Conducted power for gain calculation	13.3		15.4
Gain	-5.6		-5.2
Measurement uncertainty	± 3 dB		

OFDM Band 5250 MHz to 5350 MHz Channel	Gain		
	Lowest 5260 MHz		Highest 5320 MHz
Radiated power for gain calculation	11.3		12.9
Conducted power for gain calculation	15.0		15.0
Gain	-3.7		-2.1
Measurement uncertainty	± 3 dB		

OFDM Band 5470 MHz to 5725 MHz Channel	Gain		
	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz
Radiated power for gain calculation	14.8	15.9	17.2
Conducted power for gain calculation	14.7	14.2	13.9
Gain	0.1	1.7	3.3
Measurement uncertainty	± 3 dB		

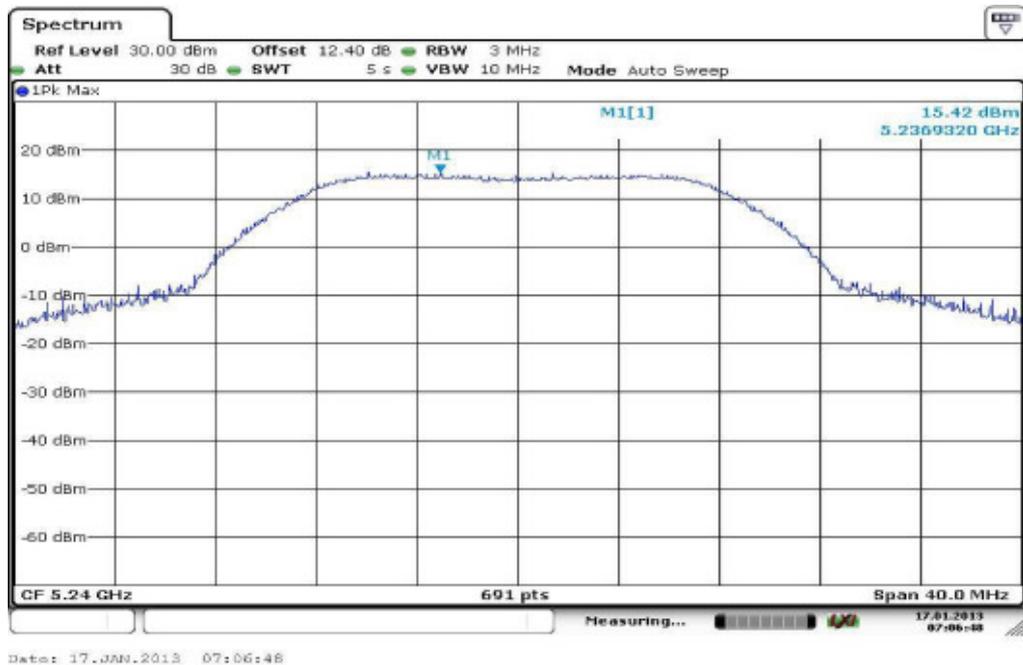
Result: Passed

Plots: conducted power for gain calculation

Plot 1: OFDM / a – mode, 5180 MHz



Plot 2: OFDM / a – mode, 5240 MHz



Plot 3: OFDM / a – mode, 5260 MHz



Plot 4: OFDM / a – mode, 5320 MHz



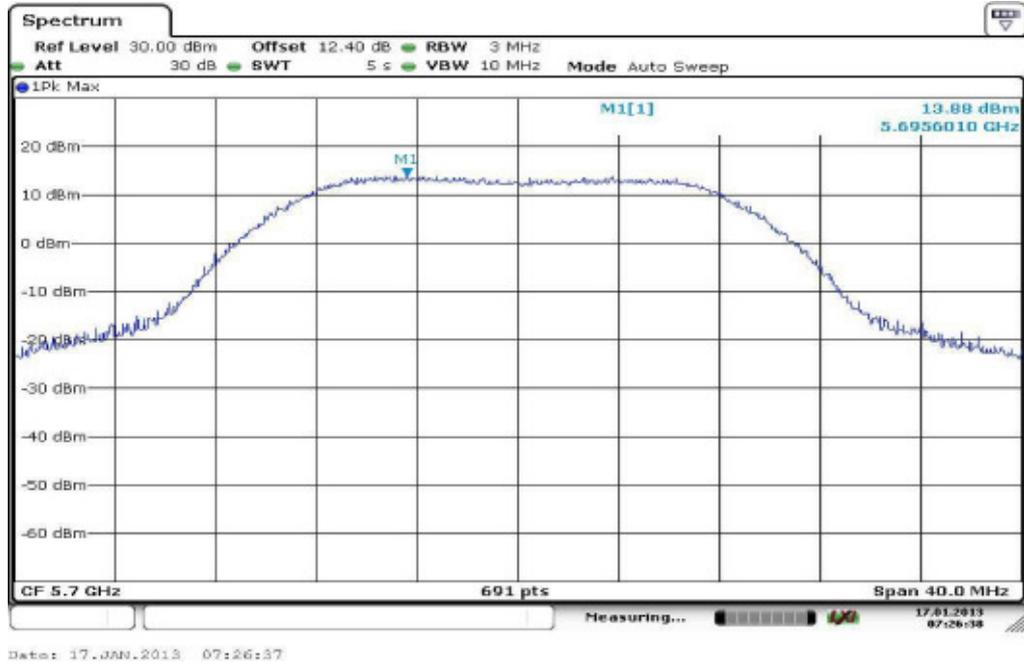
Plot 5: OFDM / a – mode, 5500 MHz



Plot 6: OFDM / a – mode, 5600 MHz



Plot 7: OFDM / a – mode, 5700 MHz



9.3 Duty cycle

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	10 MHz
Video bandwidth:	10 MHz
Span:	Zero
Trace-Mode:	Video trigger / view / single sweep

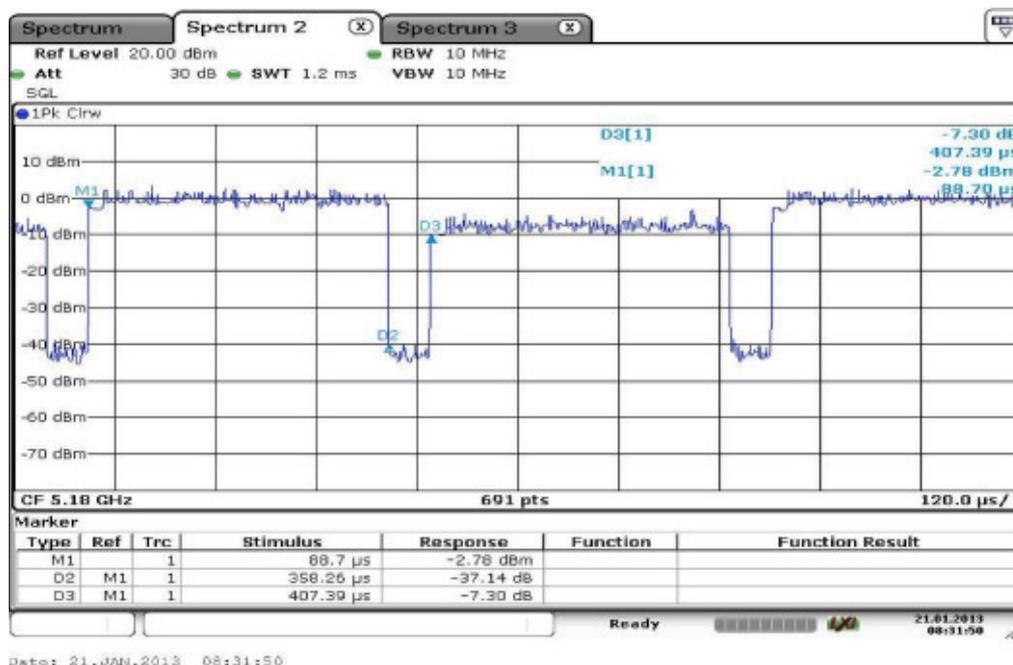
Results:

Duty cycle and correction factor:

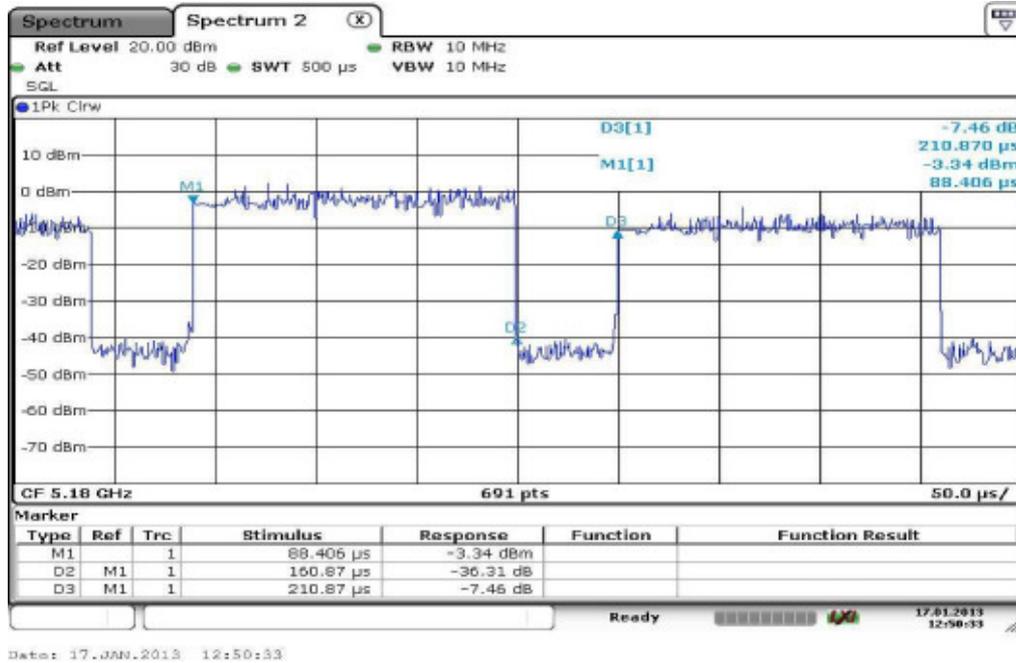
OFDM / a – mode: 87.94 % duty cycle => 0.56 dB
 OFDM / n – mode HT20: 76.29 % duty cycle => 1.18 dB
 OFDM / n – mode HT40: 96.34 % duty cycle => 0.16 dB

Plots:

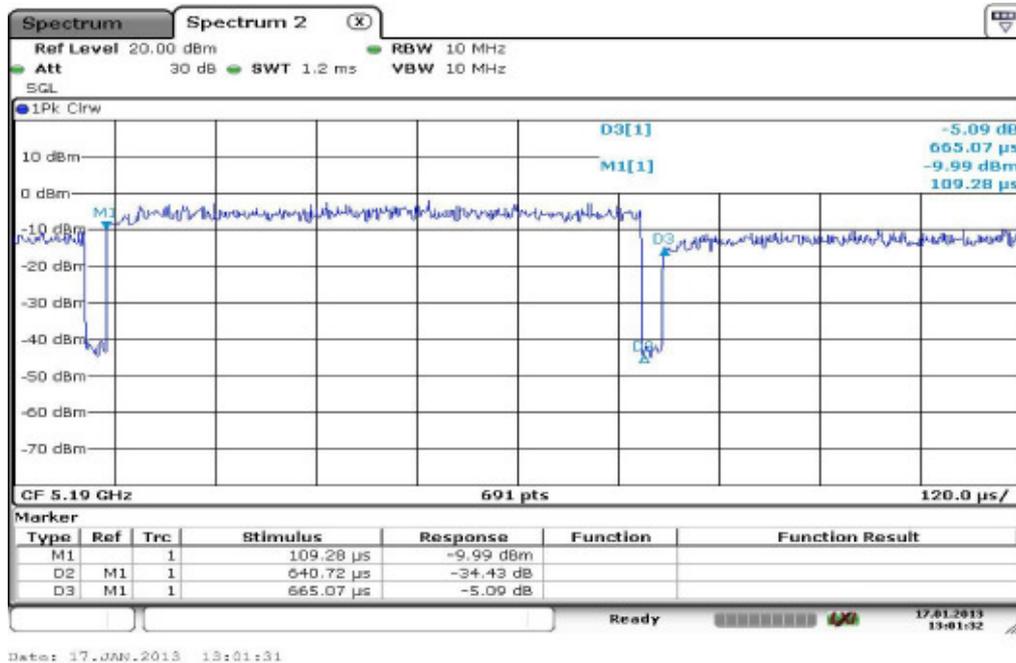
Plot 1: duty cycle of the transmitter – OFDM / a – mode



Plot 2: duty cycle of the transmitter – OFDM / n – mode HT20



Plot 3: duty cycle of the transmitter – OFDM / n – mode HT40



9.4 Maximum output power conducted and radiated

Description:

Measurement of the maximum output power conducted and radiated

Measurement:

Measurement parameter	
Detector:	RMS
Sweep time:	60s
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
Conducted power + 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 5.25-5.35 GHz 250mW or 11 dBm + 10 log Bandwidth 5.47-5.725 GHz 1W or 17 dBm + 10 log Bandwidth 5.47-5.725 GHz (where Bandwidth is the 26dB Bandwidth)

Result: OFDM / a – mode

OFDM / a – mode Channel	Maximum output power conducted [dBm]			
	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
+0.56 dB duty cycle correction	5.3	7.7	7.7	7.8
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
+0.56 dB duty cycle correction	6.1	6.7	8.4	-/-
Measurement uncertainty	± 1 dB			

Result: Passed

OFDM / a – mode Channel	Maximum output power radiated - EIRP [dBm]			
	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
+0.56 dB duty cycle correction	-0.3	2.5	4.0	5.7
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
+0.56 dB duty cycle correction	6.2	8.4	11.7	-/-
Measurement uncertainty	± 3 dB			

Result: Passed

Result: OFDM / n – mode HT20

OFDM / n – mode HT20 Channel	Maximum output power conducted [dBm]			
	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
+1.18 dB duty cycle correction	6.1	8.3	6.2	10.8
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
+1.18 dB duty cycle correction	8.5	7.2	8.7	-/-
Measurement uncertainty	± 1 dB			

Result: Passed

OFDM / n – mode HT20 Channel	Maximum output power radiated - EIRP [dBm]			
	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
+1.18 dB duty cycle correction	0.5	3.1	2.5	8.7
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
+1.18 dB duty cycle correction	8.6	8.9	12.0	-/-
Measurement uncertainty	± 3 dB			

Result: Passed

Result: OFDM / n – mode HT40

OFDM / n – mode HT40 Channel	Maximum output power conducted [dBm]			
	Lowest 5190 MHz	Highest 5230 MHz	Lowest 5270 MHz	Highest 5310 MHz
+0.16 dB duty cycle correction	5.6	6.8	6.6	6.2
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
+0.16 dB duty cycle correction	7.6	9.4	11.8	-/-
Measurement uncertainty	± 1 dB			

Result: Passed

OFDM / n – mode HT40 Channel	Maximum output power radiated - EIRP [dBm]			
	Lowest 5190 MHz	Highest 5230 MHz	Lowest 5270 MHz	Highest 5310 MHz
+0.16 dB duty cycle correction	0.0	1.6	2.9	4.1
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
+0.16 dB duty cycle correction	7.7	11.1	15.1	-/-
Measurement uncertainty	± 3 dB			

Result: Passed

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
power spectral density conducted ≤ 4 dBm in any 1 MHz band (band 5150 – 5250 MHz)
power spectral density conducted ≤ 11 dBm in any 1 MHz band (band 5250 – 5350 MHz)
power spectral density conducted ≤ 11 dBm in any 1 MHz band (band 5470 – 5725 MHz)
power spectral density conducted ≤ 17 dBm in any 1 MHz band (band 5725 – 5850 MHz)

Result: OFDM / a – mode

OFDM / a – mode Channel	Power Spectral density [dBm/MHz]			
	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
+0.56 dB duty cycle correction	-5.64	-3.92	-2.80	-4.03
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
+0.56 dB duty cycle correction	-4.82	-3.22	-2.62	-/-
Measurement uncertainty	± 1 dB			

Result: Passed

Result: OFDM / n – mode HT20

OFDM / n – mode HT20 Channel	Power Spectral density [dBm/MHz]			
	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
+1.18 dB duty cycle correction	-5.66	-3.33	-5.35	-0.84
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
+1.18 dB duty cycle correction	-2.81	-3.87	-2.10	-/-
Measurement uncertainty	± 1 dB			

Result: Passed**Result: OFDM / n – mode HT40**

OFDM / n – mode HT40 Channel	Power Spectral density [dBm/MHz]			
	Lowest 5190 MHz	Highest 5230 MHz	Lowest 5270 MHz	Highest 5310 MHz
+0.16 dB duty cycle correction	-10.05	-5.18	-7.00	-8.67
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
+0.16 dB duty cycle correction	-6.71	-4.38	-4.17	-/-
Measurement uncertainty	± 1 dB			

Result: Passed

Plots: OFDM / a – mode

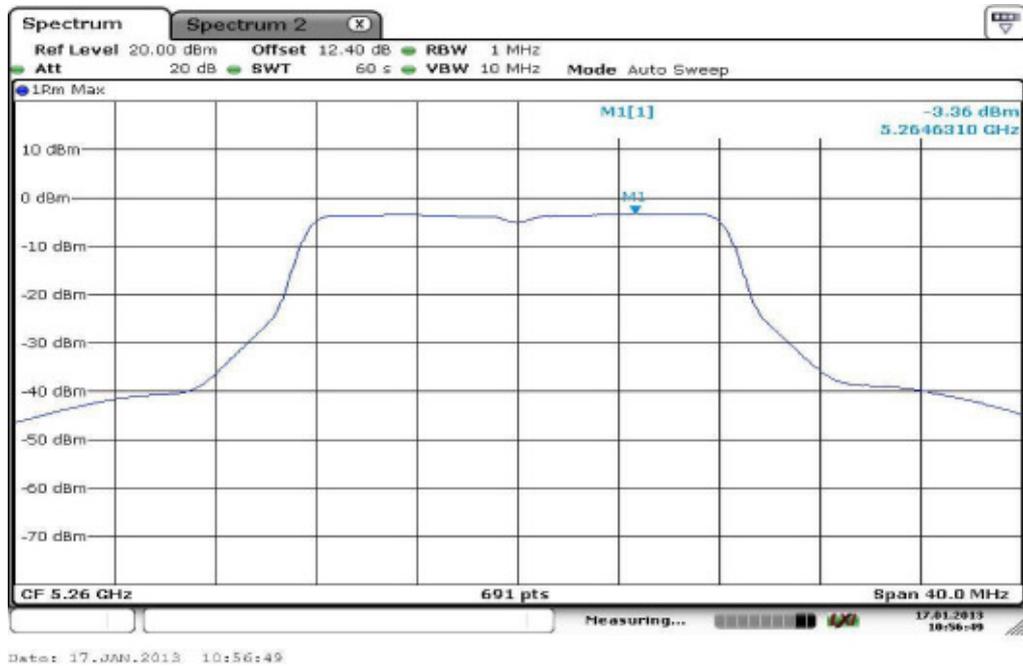
Plot 1: 5180 MHz



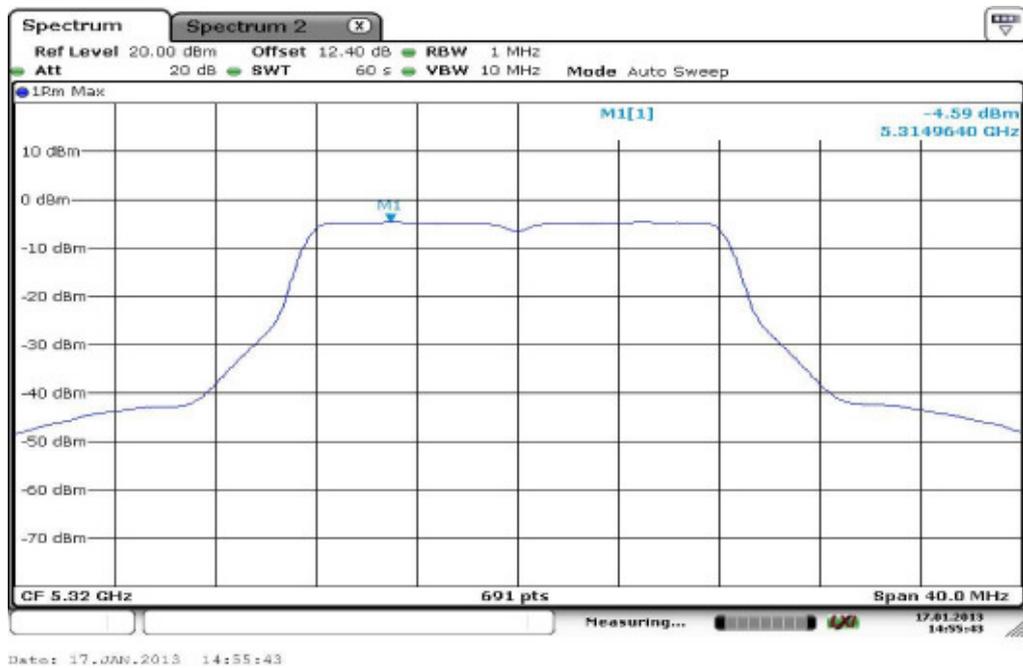
Plot 2: 5240 MHz



Plot 3: 5260 MHz



Plot 4: 5320 MHz



Plot 5: 5500 MHz



Plot 6: 5600 MHz

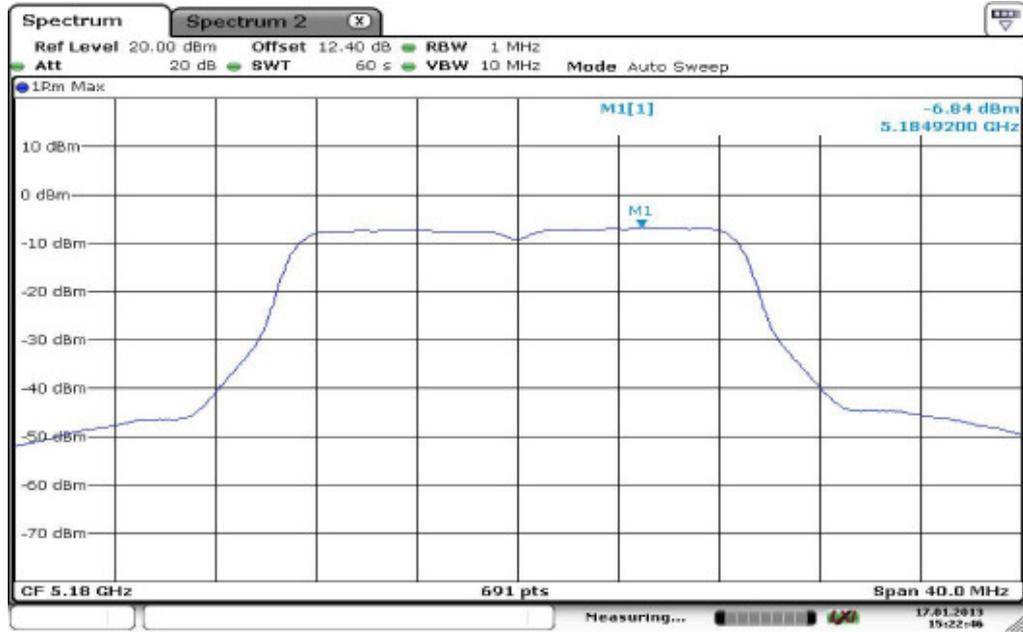


Plot 7: 5700 MHz



Plots: OFDM / n – mode HT20

Plot 1: 5180 MHz



Plot 2: 5240 MHz



Plot 3: 5260 MHz



Plot 4: 5320 MHz



Plot 5: 5500 MHz



Plot 6: 5600 MHz



Plot 7: 5700 MHz



Plots: OFDM / n – mode HT40

Plot 1: 5190 MHz



Plot 2: 5230 MHz



Plot 3: 5270 MHz



Plot 4: 5310 MHz



Plot 5: 5510 MHz



Plot 6: 5590 MHz



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:	≥ RBW
Span:	> complete signal!
Trace-Mode:	Max hold

Limits:

Spectrum Bandwidth – 26 dB Bandwidth
-/-

Result: OFDM / a – mode

OFDM / a – mode Channel	26 dB BANDWIDTH [MHz]			
	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
	22.4	21.7	21.8	22.1
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
	22.1	21.7	22.0	-/-
Measurement uncertainty	± 1 dB			

Result: Passed

Result: OFDM / n – mode HT20

OFDM / n – mode HT20 Channel	26 dB BANDWIDTH [MHz]			
	Lowest 5180 MHz	Highest 5240 MHz	Lowest 5260 MHz	Highest 5320 MHz
	22.7	22.6	22.2	23.1
Channel	Lowest 5500 MHz	Middle 5600 MHz	Highest 5700 MHz	-/-
	22.7	22.4	22.3	-/-
Measurement uncertainty	± 1 dB			

Result: Passed

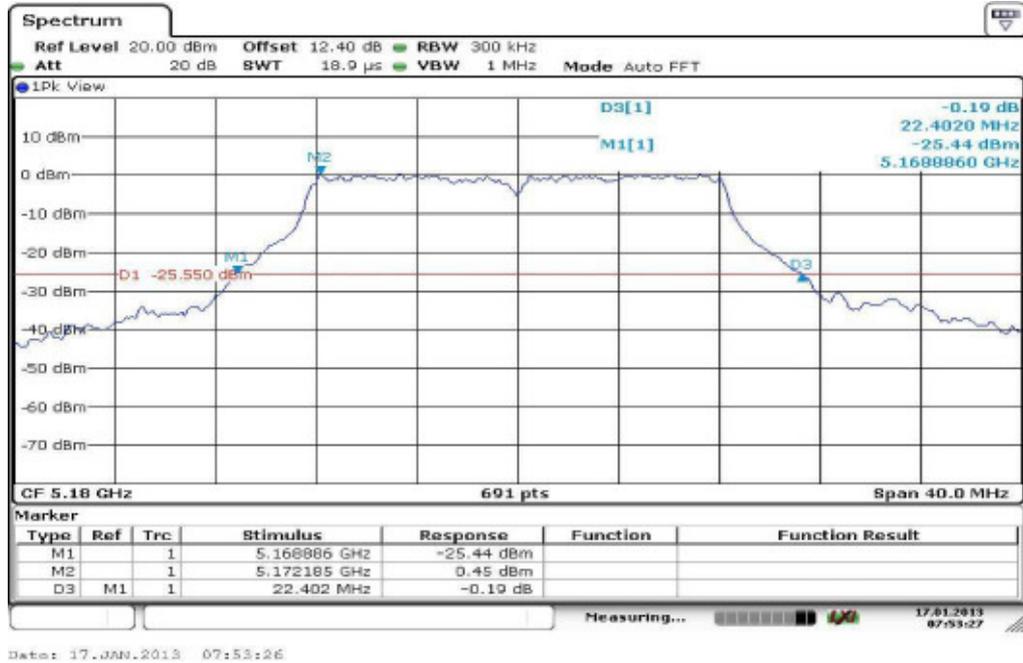
Result: OFDM / n – mode HT40

OFDM / n – mode HT40 Channel	26 dB BANDWIDTH [MHz]			
	Lowest 5190 MHz	Highest 5230 MHz	Lowest 5270 MHz	Highest 5310 MHz
	42.5	46.3	42.2	43.4
Channel	Lowest 5510 MHz	Middle 5590 MHz	Highest 5670 MHz	-/-
	43.1	42.5	42.1	-/-
Measurement uncertainty	± 1 dB			

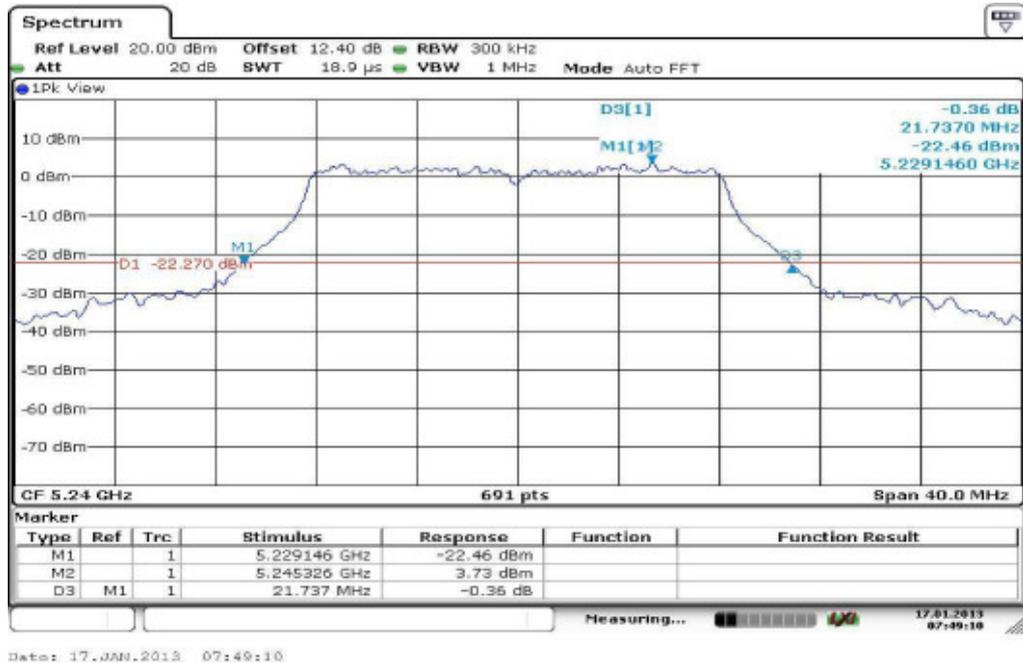
Result: Passed

Plots: OFDM / a – mode

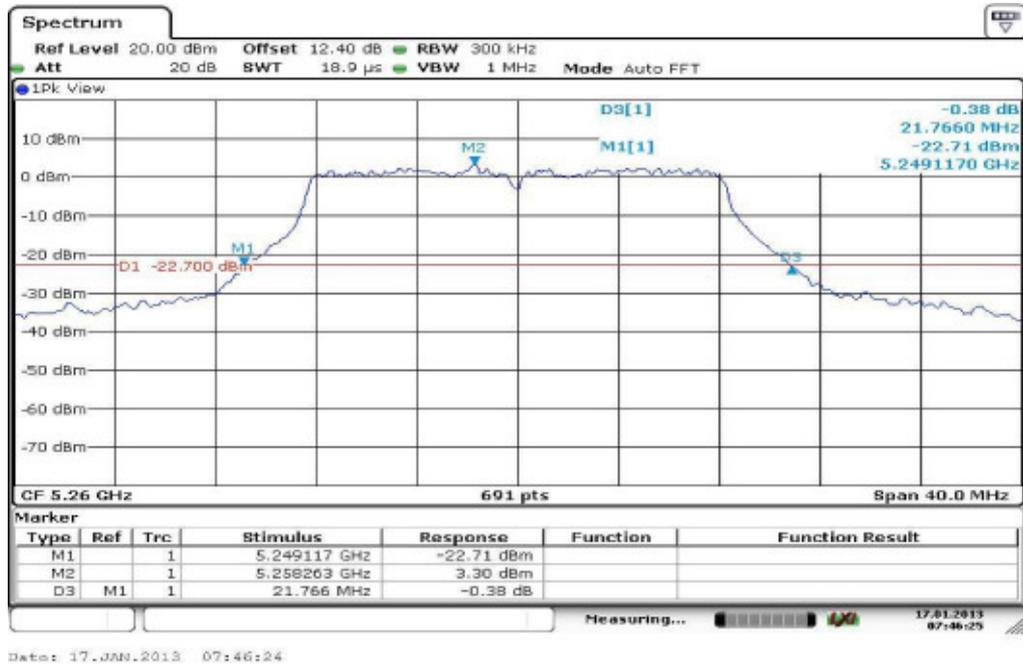
Plot 1: 5180 MHz



Plot 2: 5240 MHz



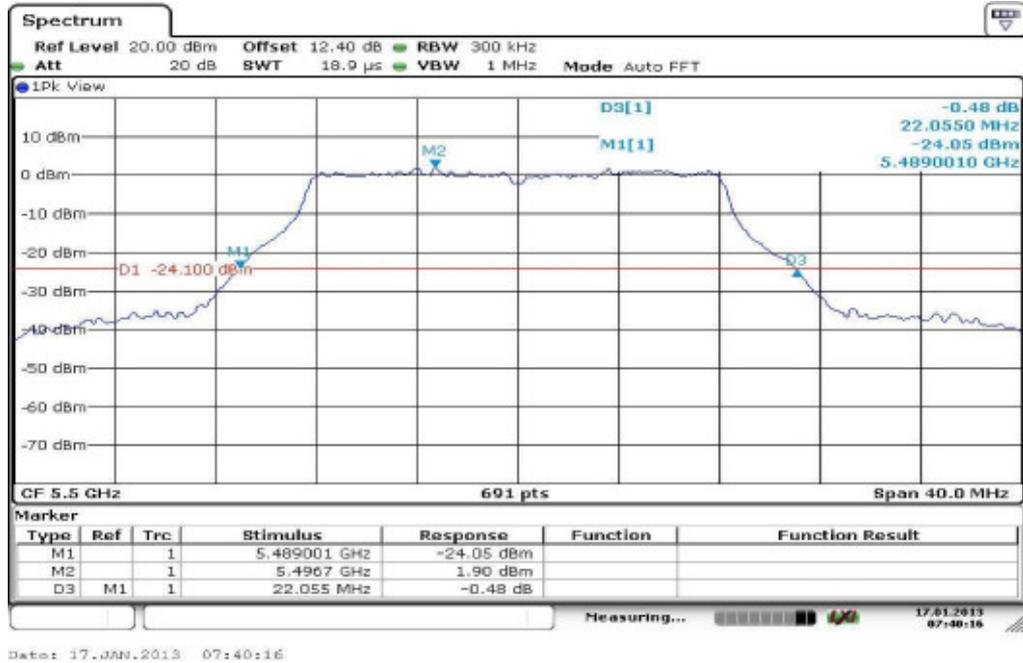
Plot 3: 5260 MHz



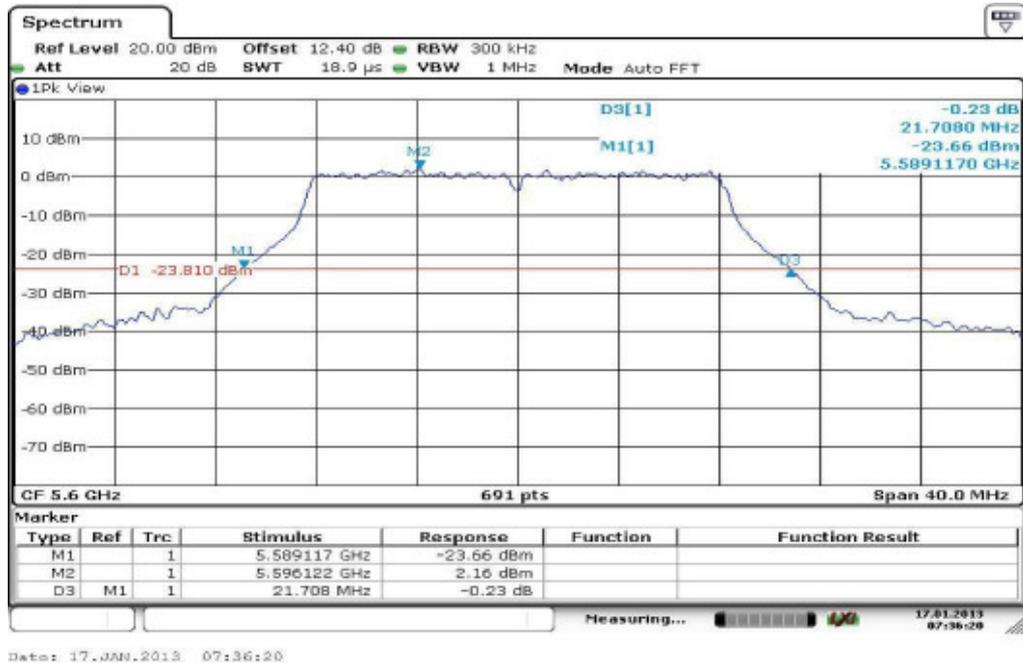
Plot 4: 5320 MHz



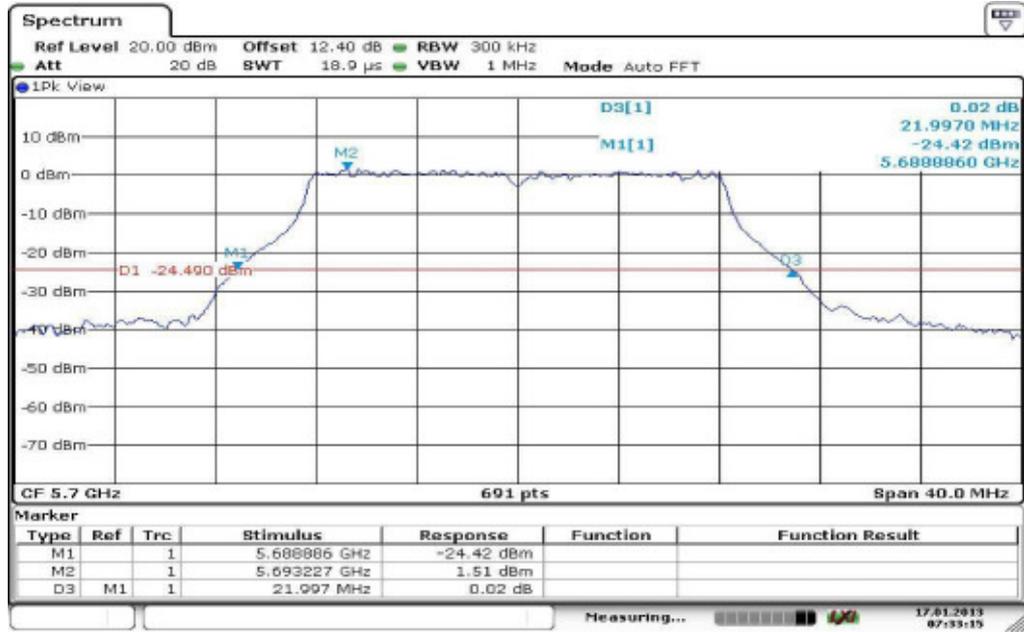
Plot 5: 5500 MHz



Plot 6: 5600 MHz



Plot 7: 5700 MHz



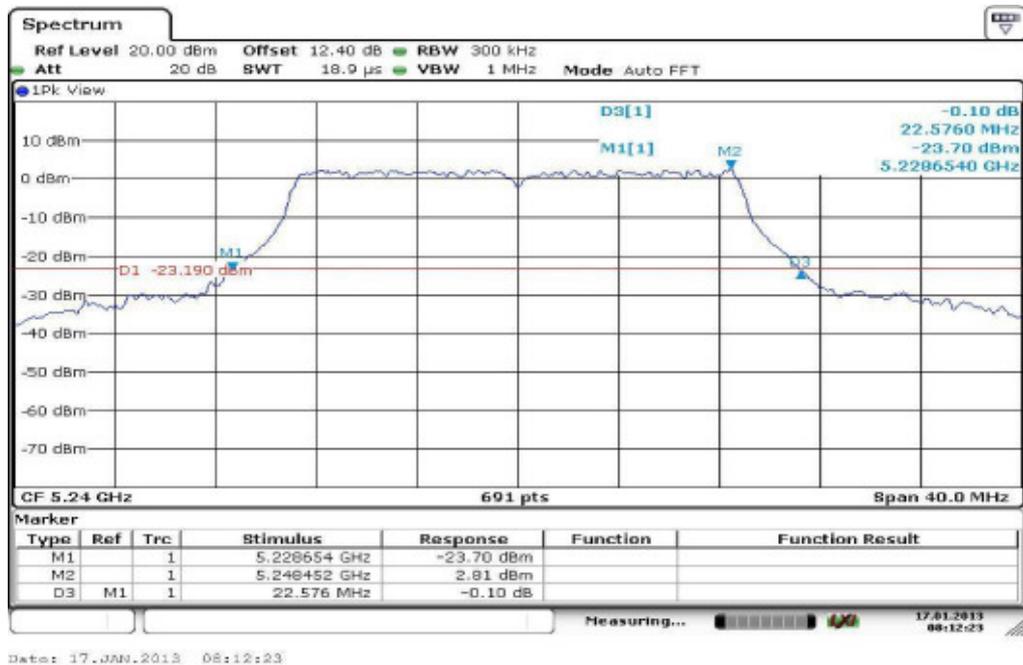
Date: 17.JAN.2013 07:33:14

Plots: OFDM / n – mode HT20

Plot 1: 5180 MHz



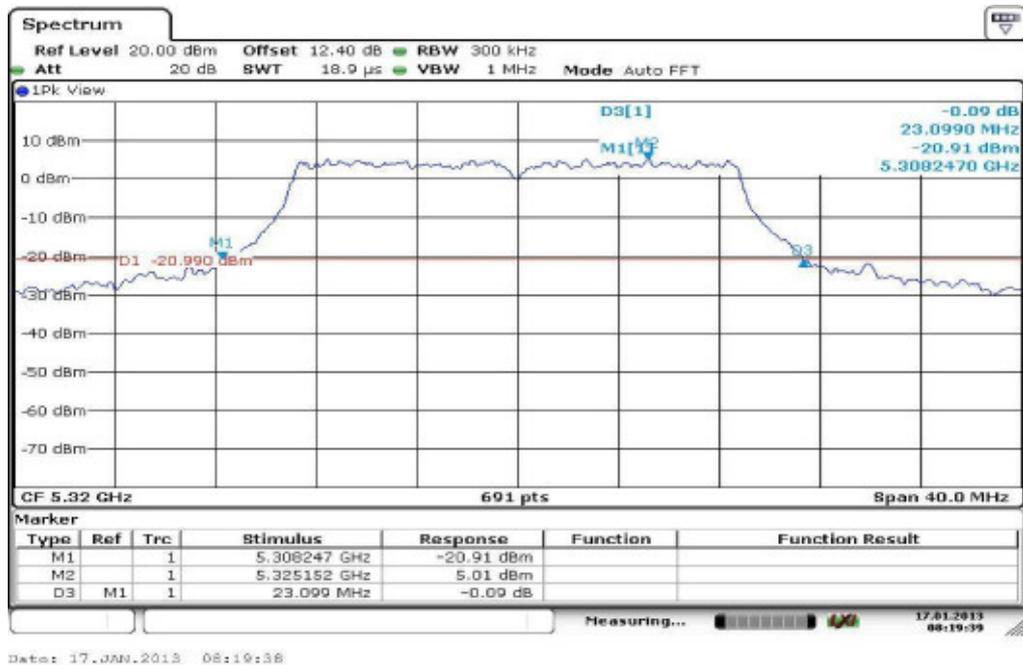
Plot 2: 5240 MHz



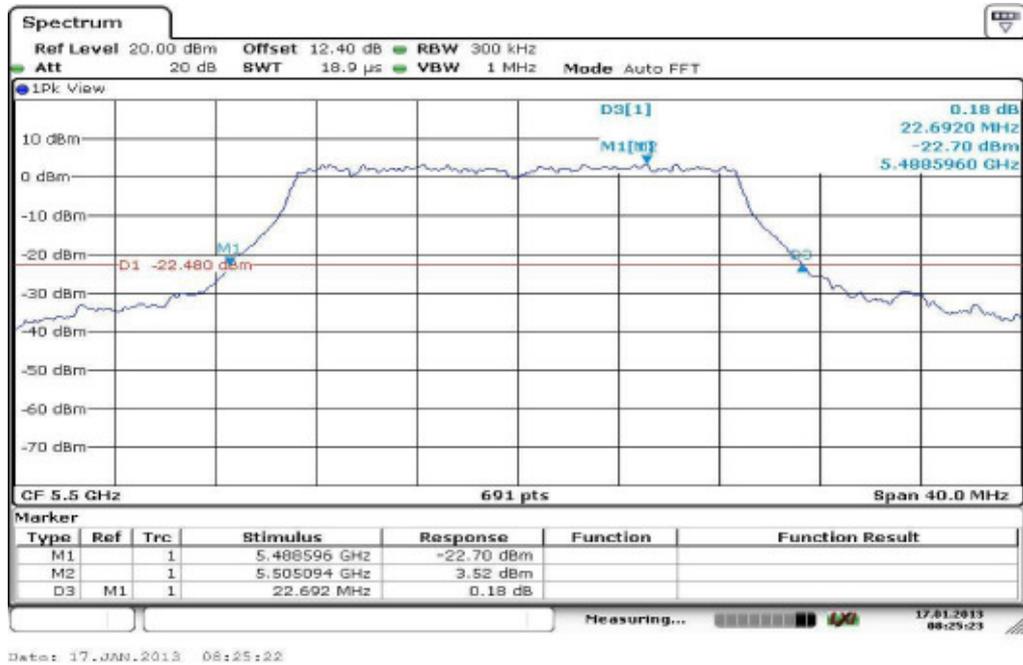
Plot 3: 5260 MHz



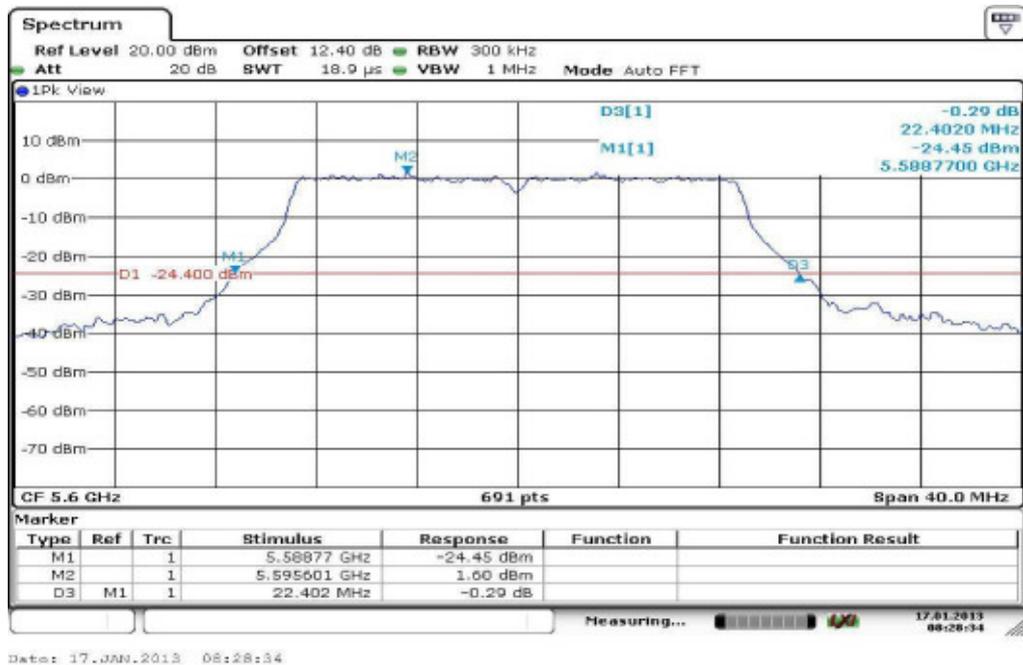
Plot 4: 5320 MHz



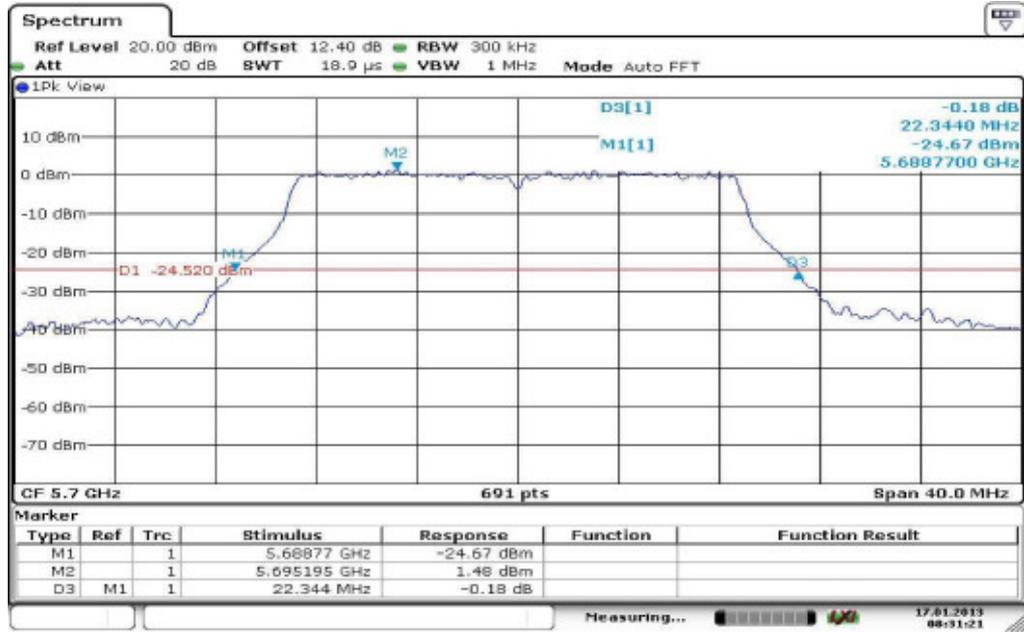
Plot 5: 5500 MHz



Plot 6: 5600 MHz



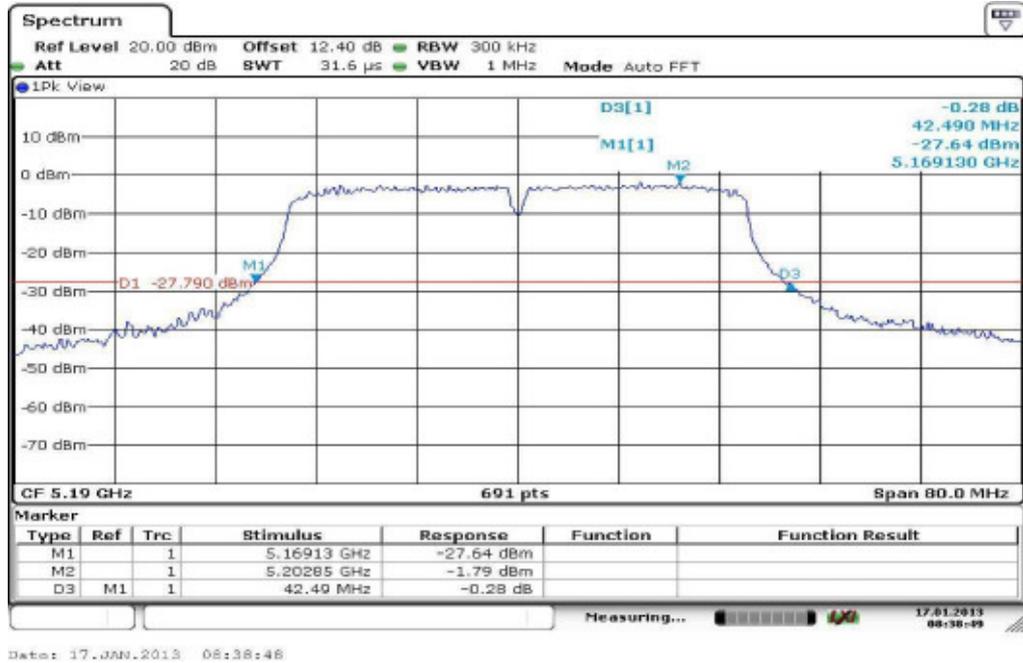
Plot 7: 5700 MHz



Date: 17.JAN.2013 08:31:21

Plots: OFDM / n – mode HT40

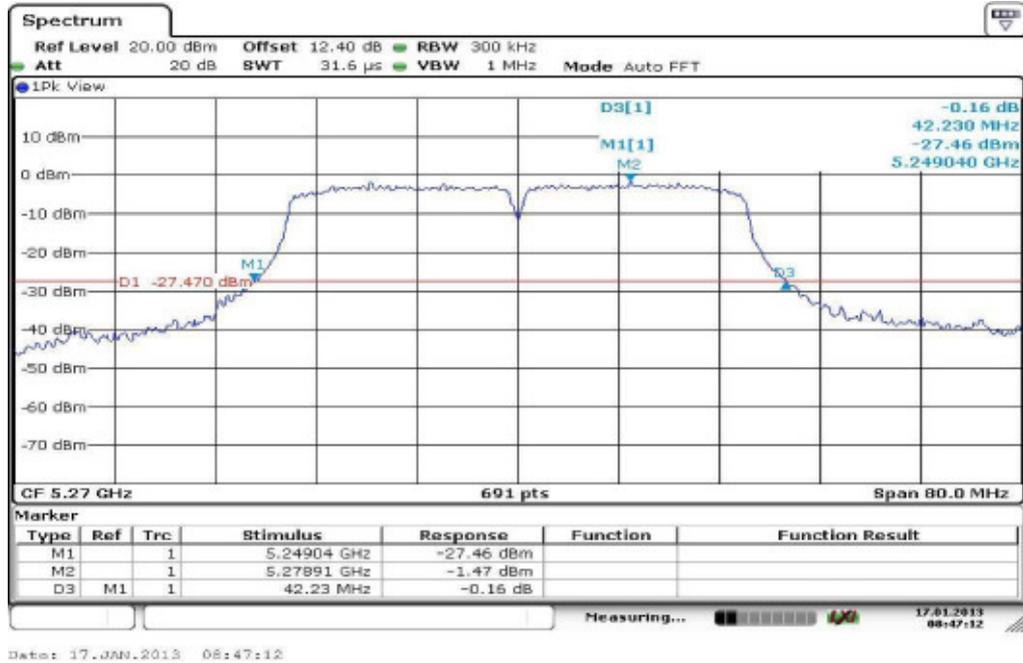
Plot 1: 5190 MHz



Plot 2: 5230 MHz



Plot 3: 5270 MHz



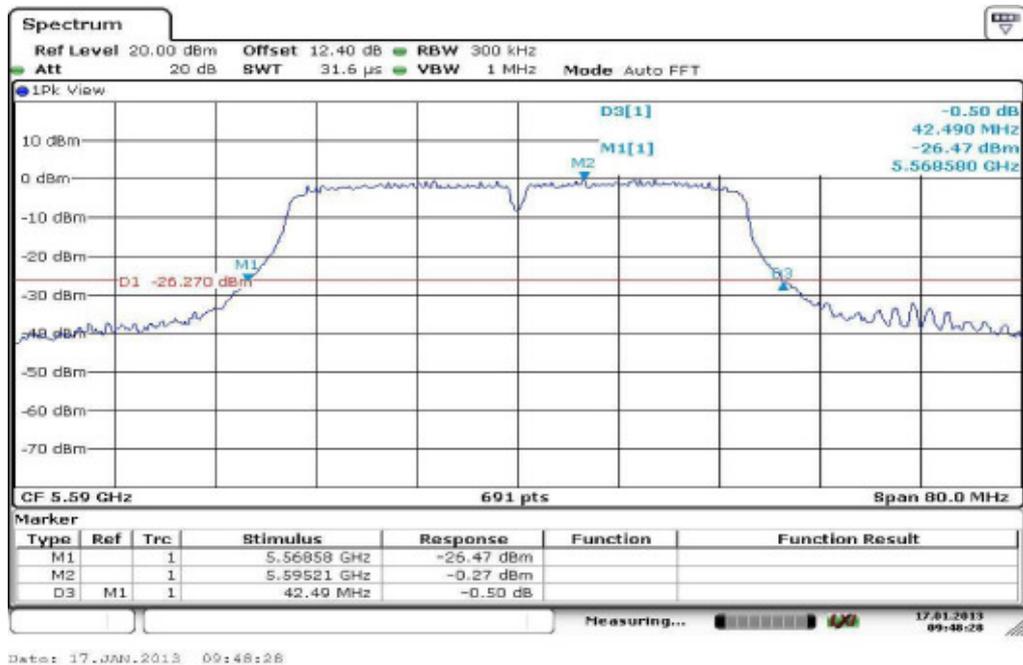
Plot 4: 5310 MHz



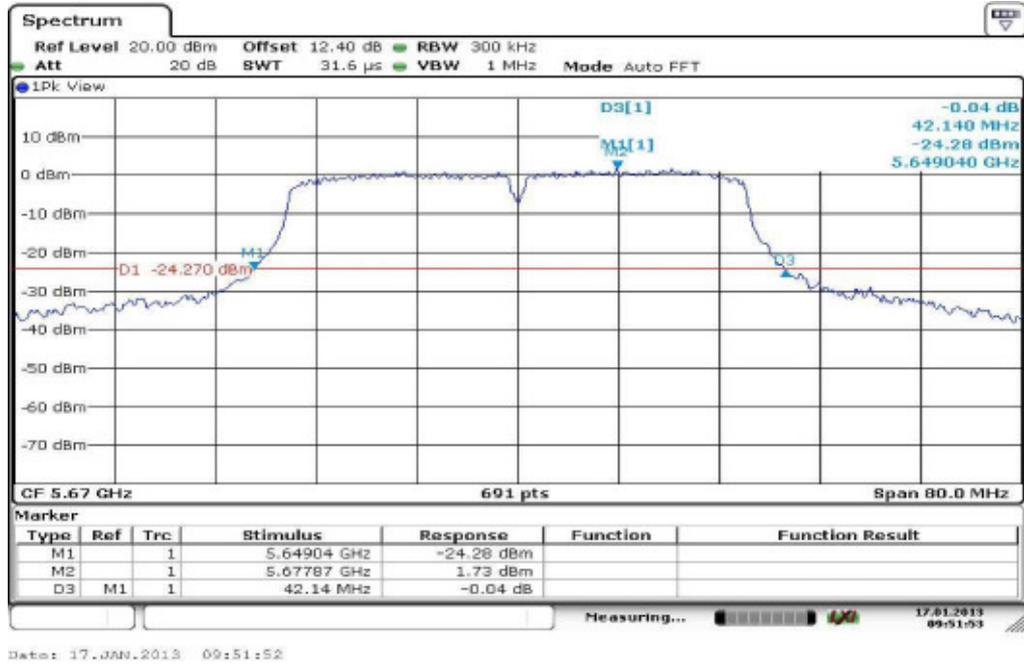
Plot 5: 5510 MHz



Plot 6: 5590 MHz



Plot 7: 5670 MHz



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 Channel	Peak excursion value		
	5180 MHz	5240 MHz	-/-
RMS	-5.64	-3.92	-/-
Peak	6.60	8.70	-/-
Peak excursion value	12.24	12.62	-/-
Channel	5280 MHz	5320 MHz	-/-
RMS	-2.80	-4.03	-/-
Peak	9.14	7.76	-/-
Peak excursion value	11.94	11.79	-/-
Channel	5500 MHz	5600 MHz	5700 MHz
RMS	-4.82	-3.22	-2.62
Peak	7.57	8.53	7.81
Peak excursion value	12.39	11.75	10.43
Measurement uncertainty	± 1 dB		

Result: Passed

Results:

Modulation OFDM / n – mode HT20	Peak excursion value		
	Channel	5180 MHz	5240 MHz
RMS	-5.66	-3.33	-/-
Peak	7.28	7.39	-/-
Peak excursion value	12.94	10.72	-/-
Channel	5260 MHz	5320 MHz	-/-
RMS	-5.35	-0.84	-/-
Peak	7.52	7.39	-/-
Peak excursion value	12.87	8.23	-/-
Channel	5500 MHz	5600 MHz	5700 MHz
RMS	-2.81	-3.87	-2.10
Peak	8.86	8.47	8.81
Peak excursion value	11.67	12.34	10.91
Measurement uncertainty	± 1 dB		

Result: Passed**Results:**

Modulation OFDM / n – mode HT40	Peak excursion value		
	Channel	5190 MHz	5230 MHz
RMS	-10.05	-5.18	-7.00
Peak	2.51	7.27	5.57
Peak excursion value	12.56	12.45	12.57
Channel	5310 MHz	5510 MHz	5590 MHz
RMS	-8.67	-6.71	-4.38
Peak	4.09	4.96	6.20
Peak excursion value	12.76	11.67	10.58
Channel	5670 MHz	-/-	-/-
RMS	-4.17	-/-	-/-
Peak	6.42	-/-	-/-
Peak excursion value	10.59	-/-	-/-
Measurement uncertainty	± 1 dB		

Result: Passed

Plots: OFDM / a – mode

Plot 1: 5180 MHz



Plot 3: 5240 MHz



Plot 4: 5260 MHz



Plot 5: 5320 MHz



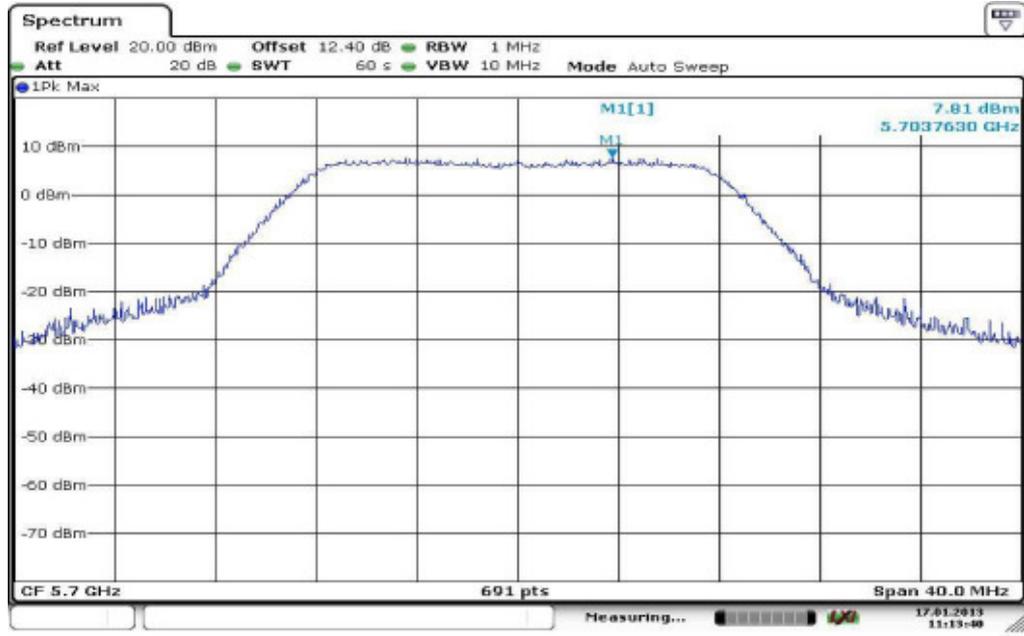
Plot 7: 5500 MHz



Plot 8: 5600 MHz



Plot 9: 5700 MHz

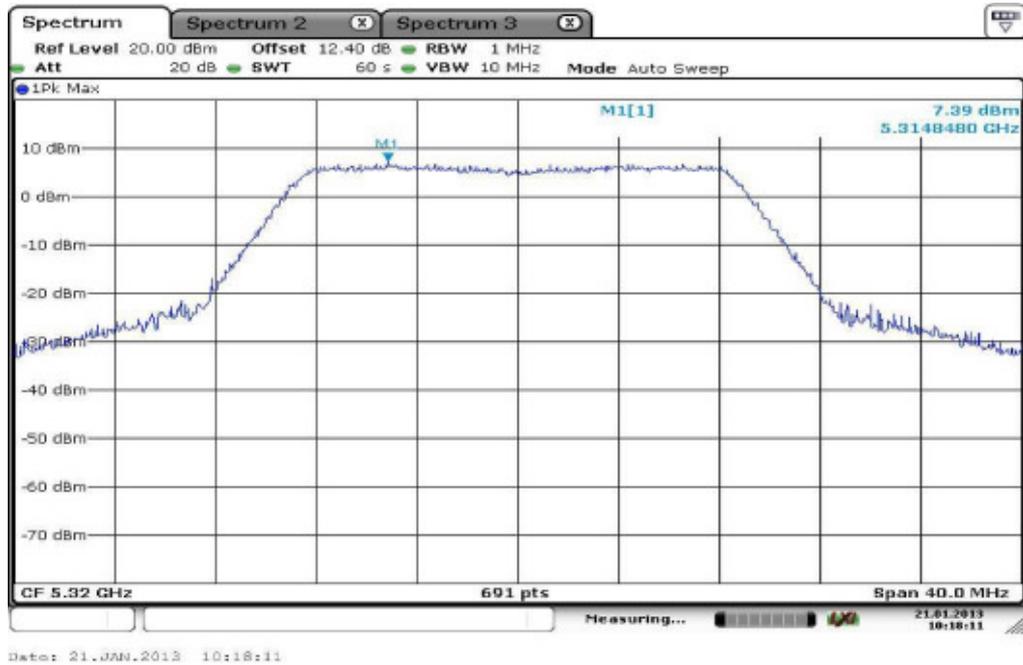


Plots: OFDM / n – mode HT20

Plot 1: 5180 MHz



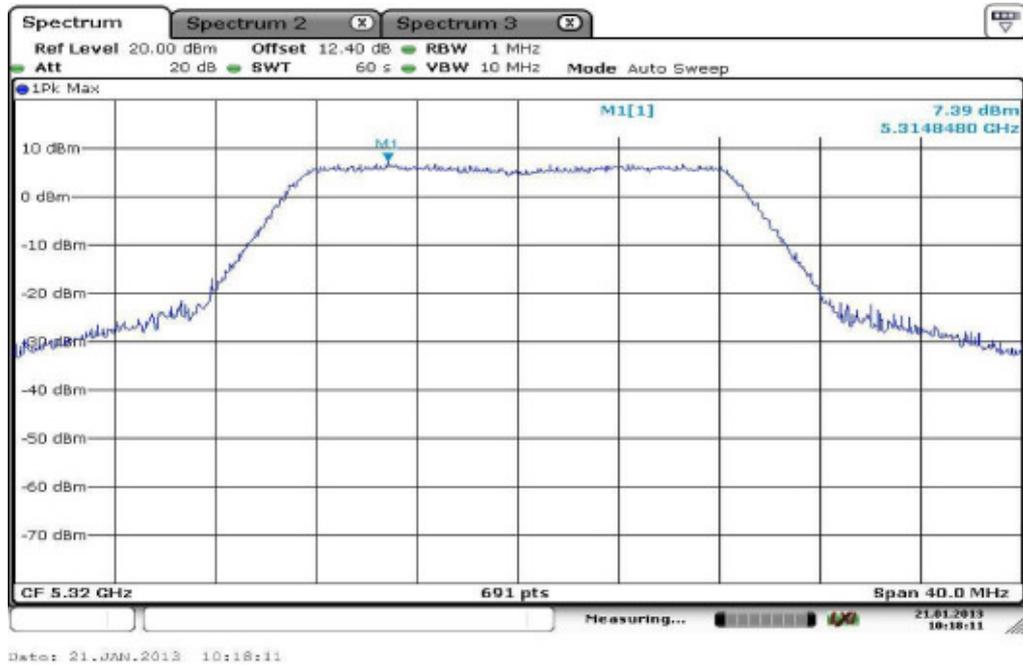
Plot 2: 5240 MHz



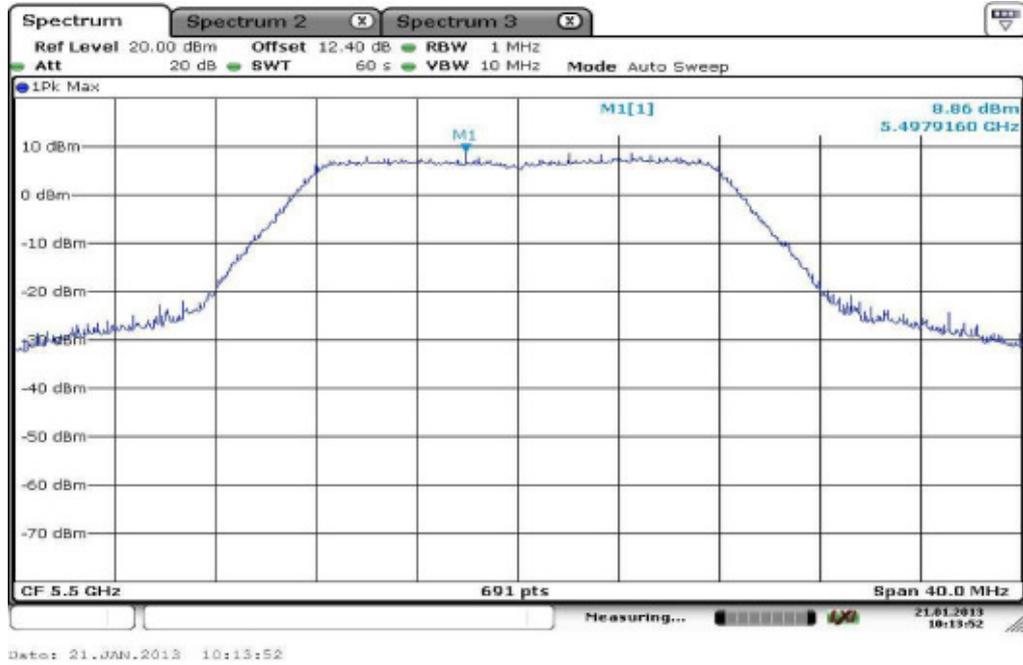
Plot 3: 5260 MHz



Plot 4: 5320 MHz



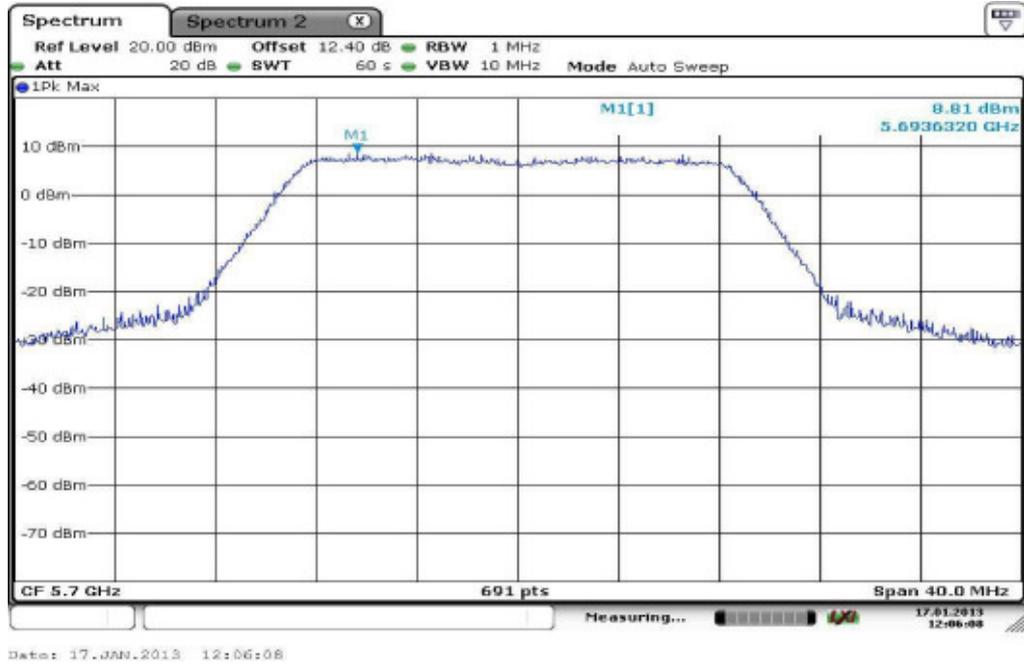
Plot 5: 5500 MHz



Plot 8: 5600 MHz

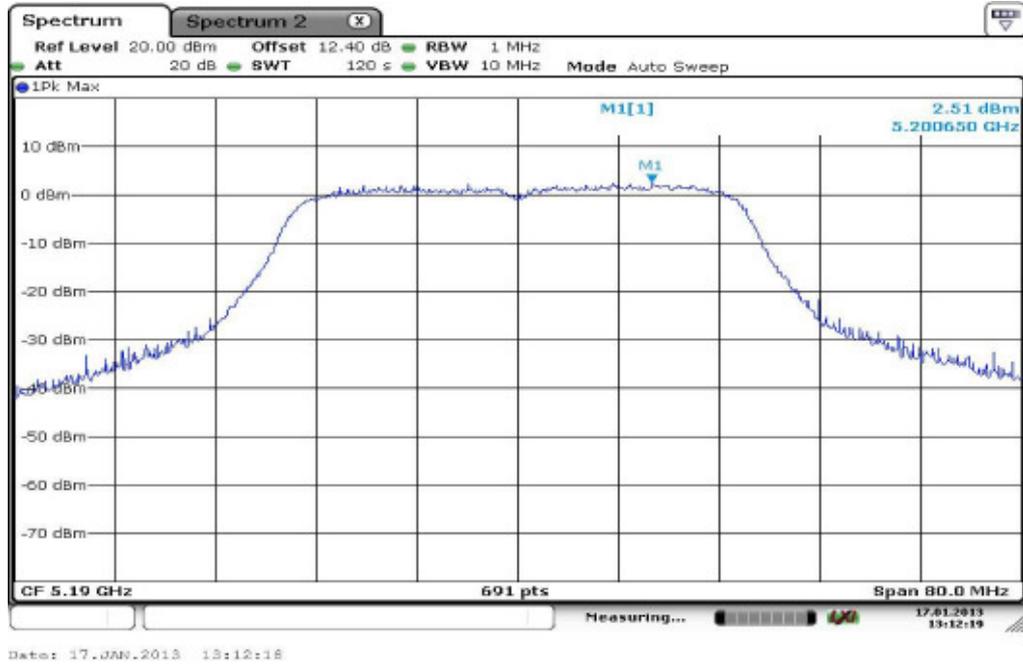


Plot 9: 5700 MHz

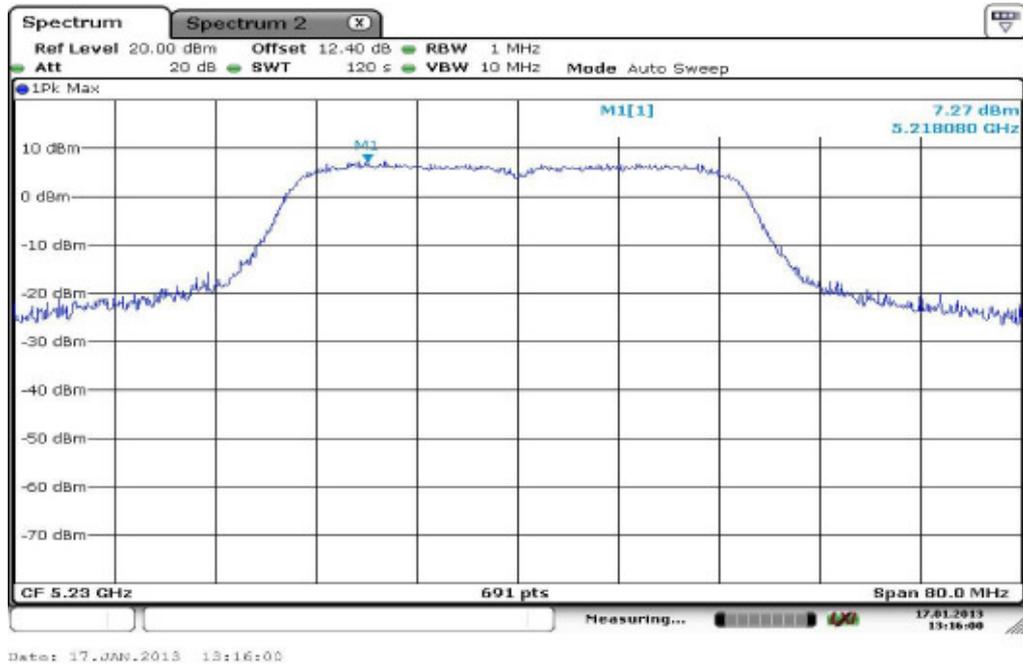


Plots: OFDM / n – mode HT40

Plot 1: 5190 MHz



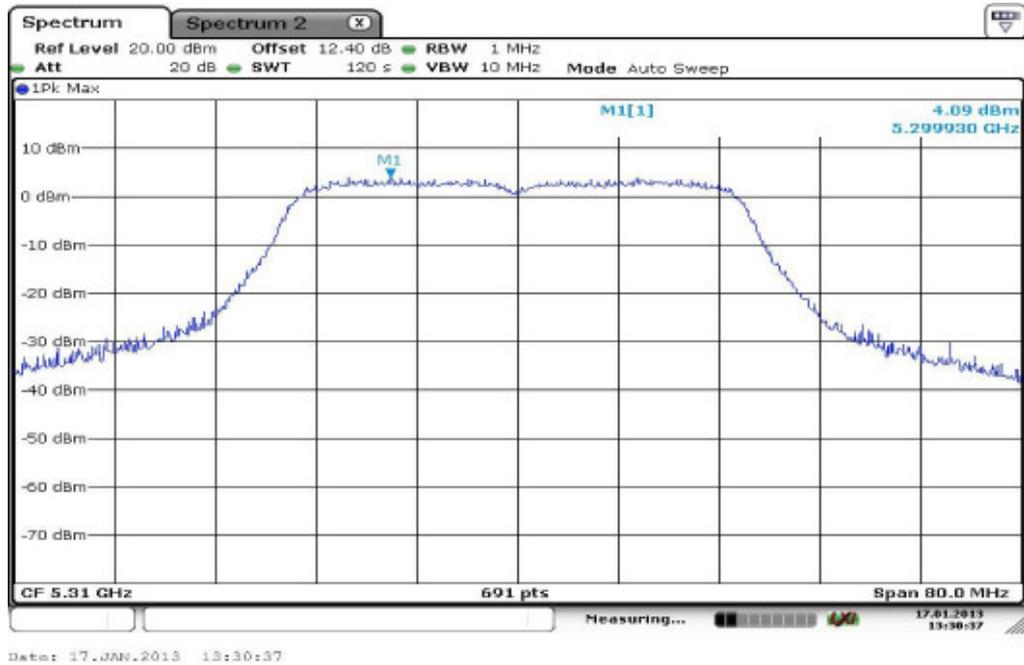
Plot 2: 5230 MHz



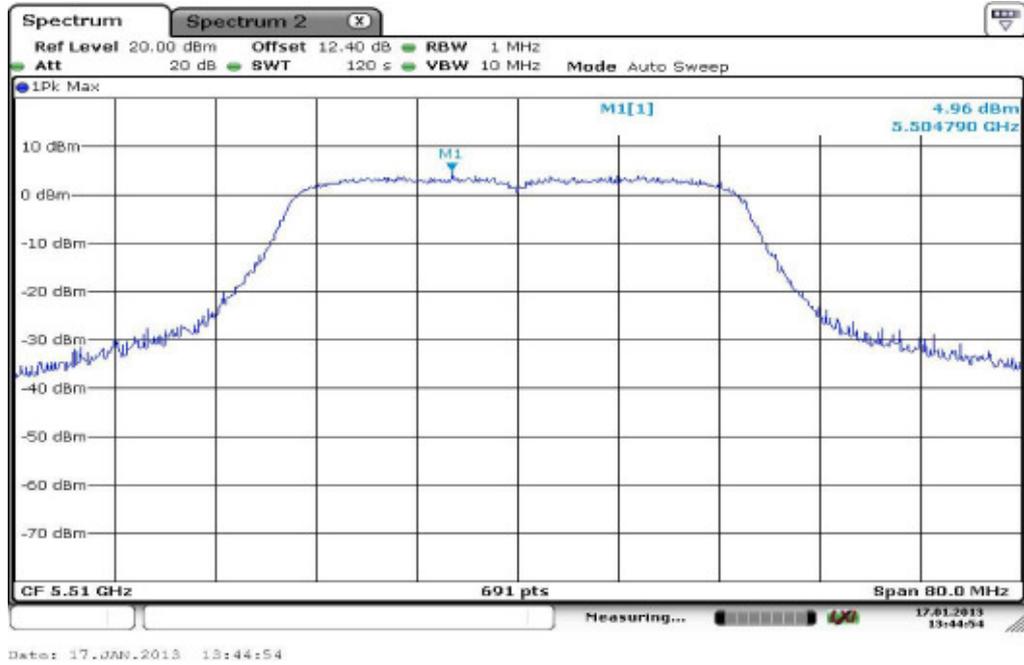
Plot 3: 5270 MHz



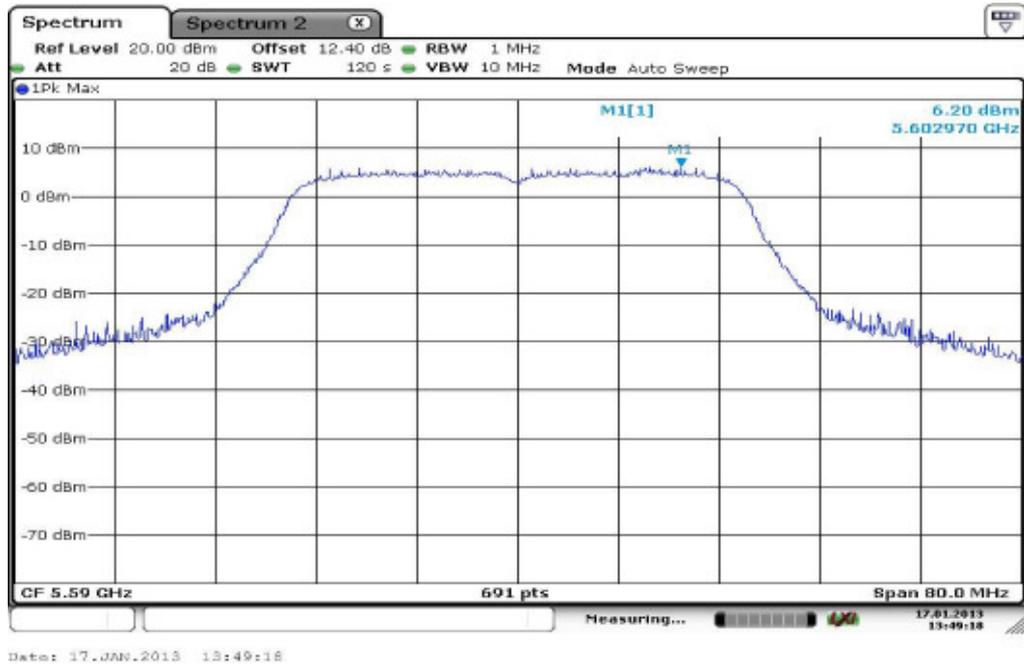
Plot 4: 5310 MHz



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 / 1 MHz
Span:	See plots!
Trace-Mode:	Max Hold

Limits:

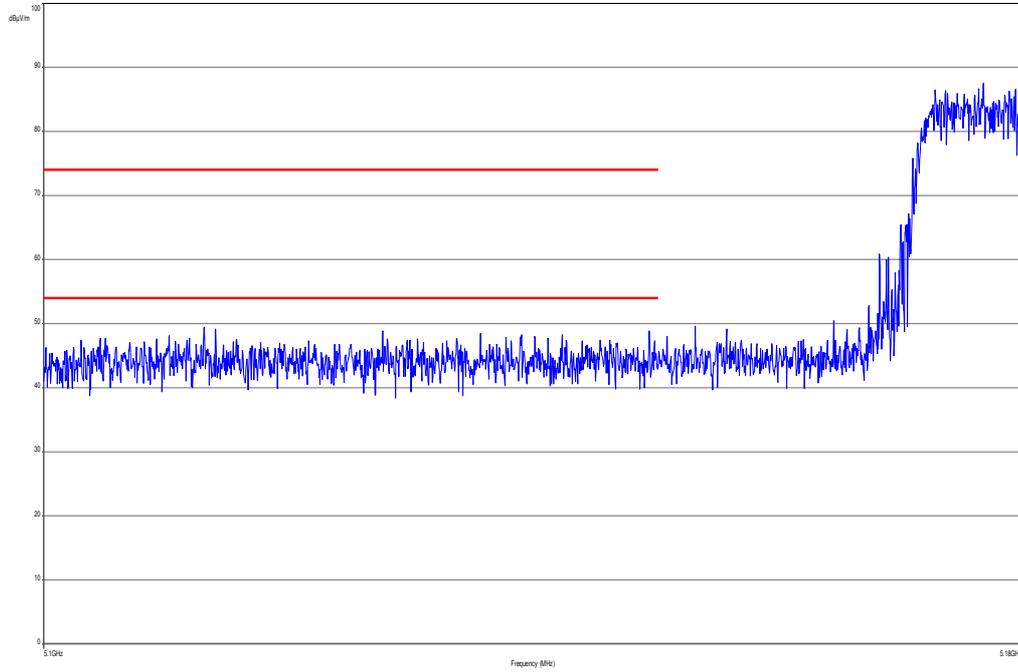
Band Edge Compliance Radiated
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within 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)).
74 dB μ V/m PEAK 54 dB μ V/m AVG

Result:

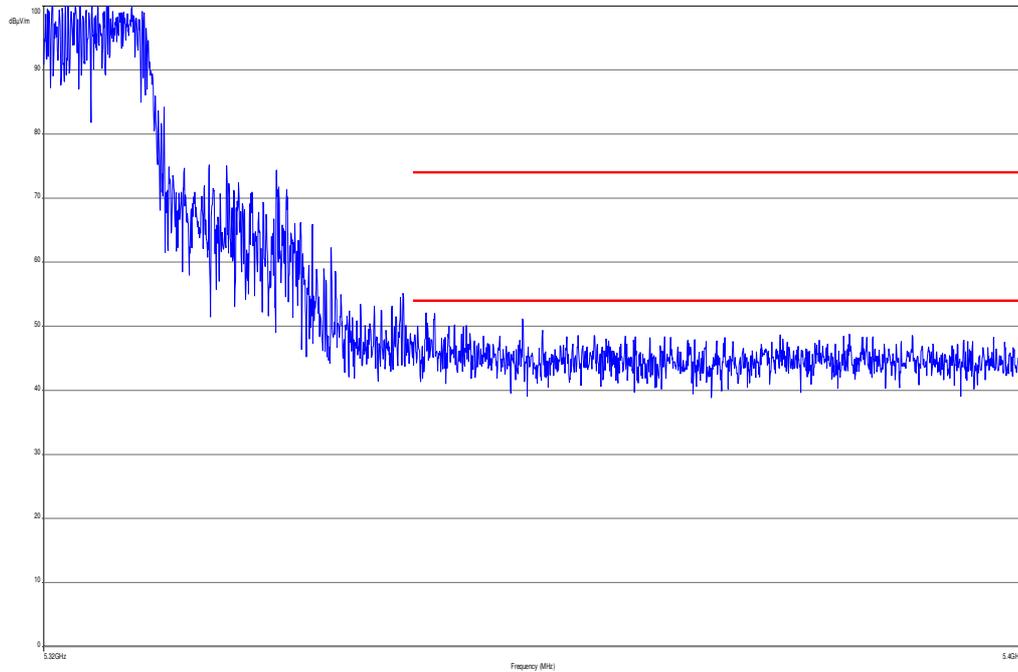
Scenario	Band Edge Compliance Radiated [dB μ V/m]
band edge	< 74 dB μ V/m (AVG) < 54 dB μ V/m (PEAK)
Measurement uncertainty	\pm 3 dB

Plots:

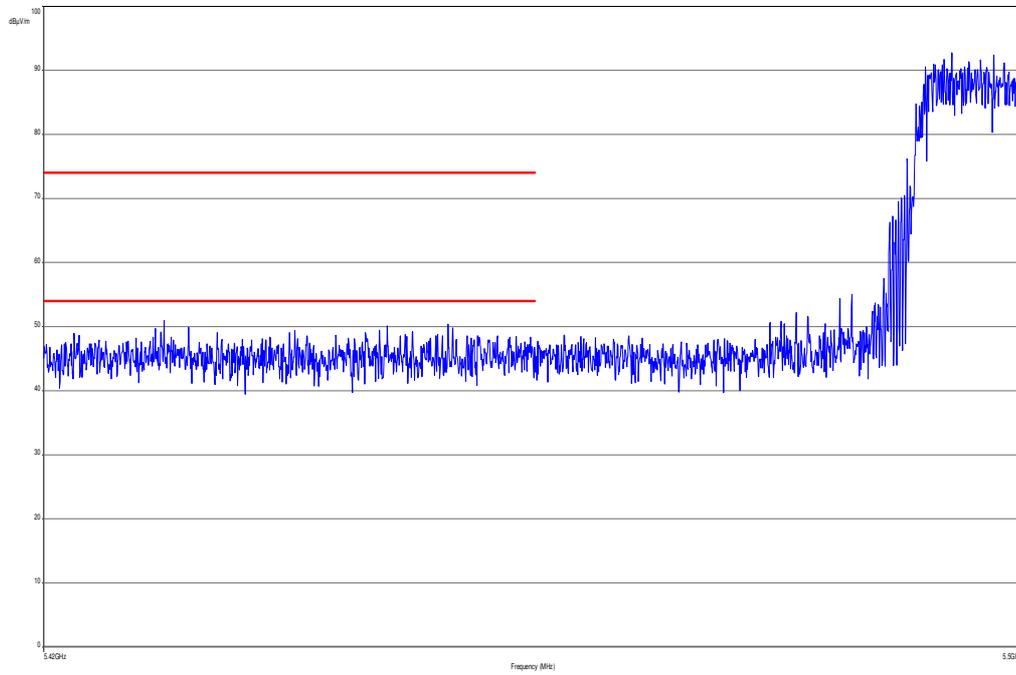
Plot 1: lower band edge, vertical & horizontal polarization (a mode / n HT 20 mode), channel 36



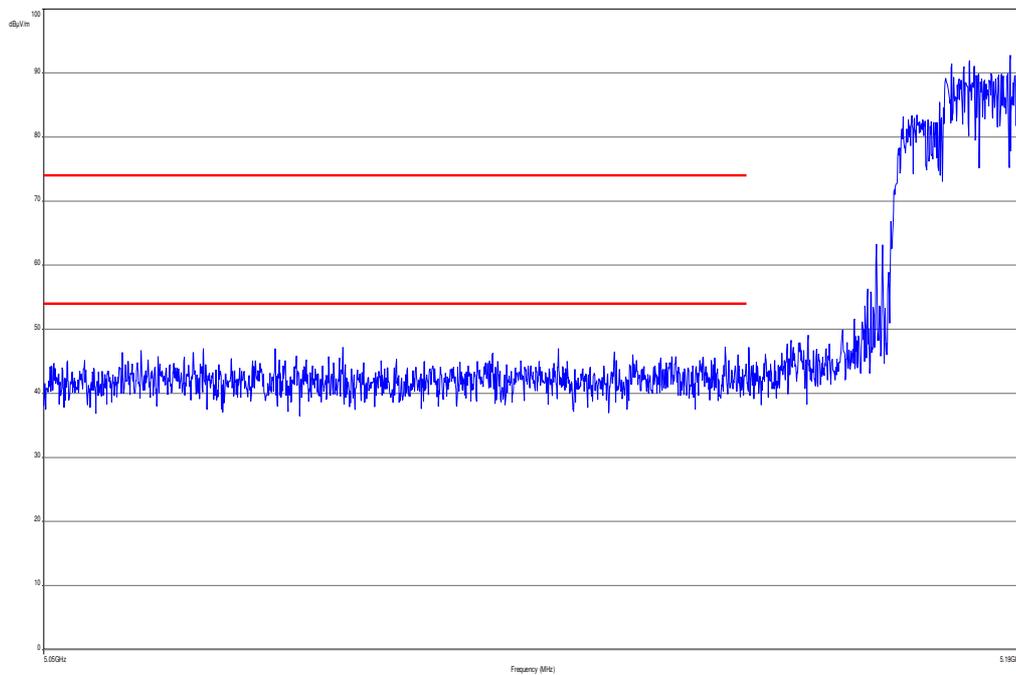
Plot 2: upper band edge, vertical & horizontal polarization (a mode / n HT 20 mode), channel 64



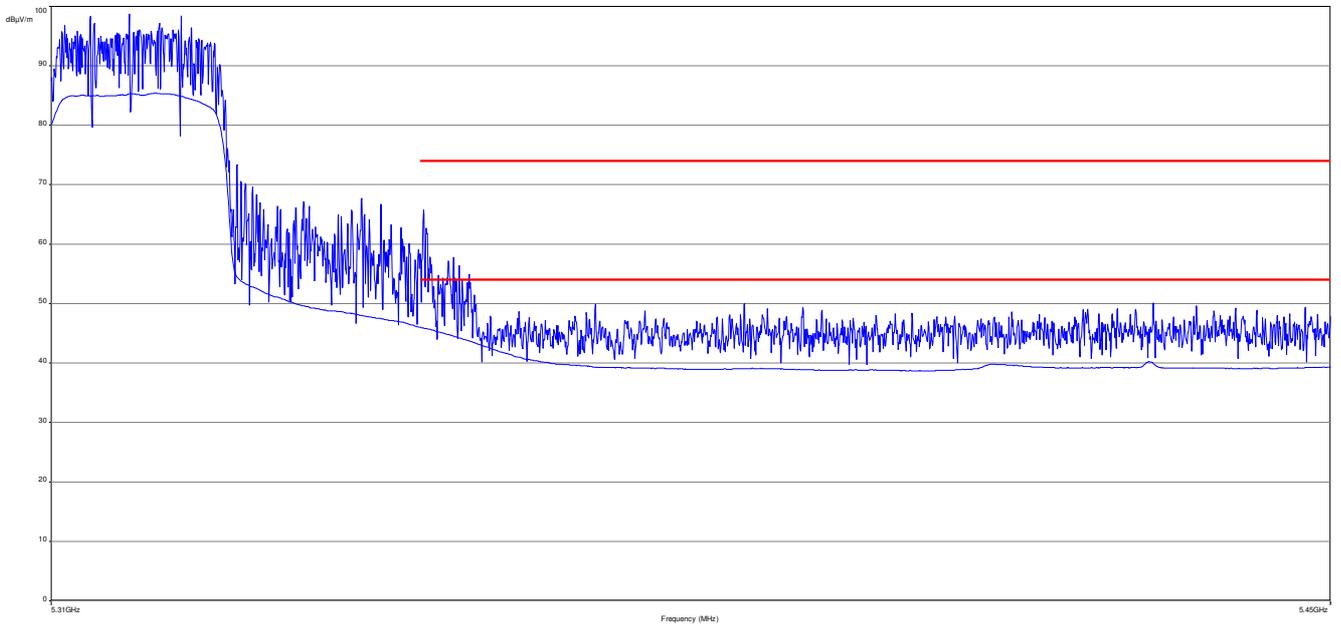
Plot 3: lower band edge, vertical & horizontal polarization (a mode / n HT 20 mode), channel 100



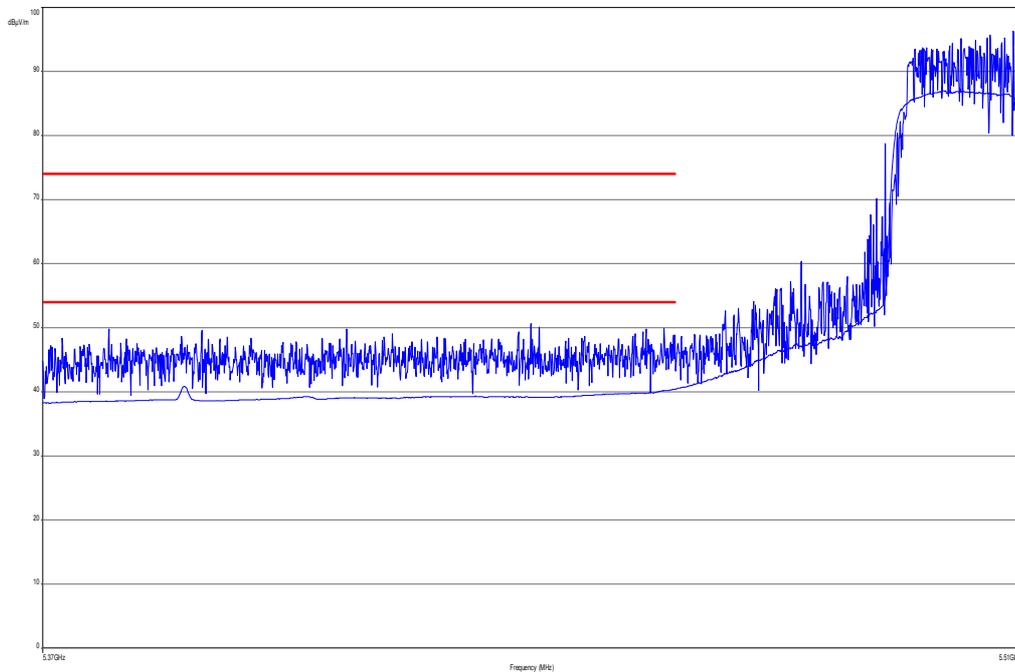
Plot 4: lower band edge, vertical & horizontal polarization (n HT 40 mode), channel 38



Plot 5: upper band edge, vertical & horizontal polarization (n HT 40 mode), channel 62



Plot 6: lower band edge, vertical & horizontal polarization (n HT 40 mode), channel 102



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 40 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 / n- mode

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
OFDM a – mode								
Lowest 5180 MHz			Middle 5200 MHz			Highest 5240 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
OFDM a – mode								
Lowest 5260 MHz			Middle 5280 MHz			Highest 5320 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

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

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
OFDM a – mode								
Lowest 5745 MHz			Middle 5765 MHz			Highest 5805 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/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 [dB μ V/m] / dBm								
OFDM n – mode HT40								
Lowest 5190 MHz			Middle 5230 MHz			Highest 5270 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
OFDM n – mode HT40								
Lowest 5310 MHz			Middle 5510 MHz			Highest 5590 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]
No peaks found.			No peaks found.			No peaks found.		
Measurement uncertainty			± 3 dB					

TX Spurious Emissions Radiated [dB μ V/m] / dBm								
OFDM n – mode HT40								
Lowest 5670 MHz			Middle 5765 MHz			Highest 5795 MHz		
F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/m]	F [MHz]	Detector	Level [dB μ V/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 / a – mode

Plot 1: 30 MHz to 1 GHz, 5180 MHz, vertical & horizontal polarization

Common Information

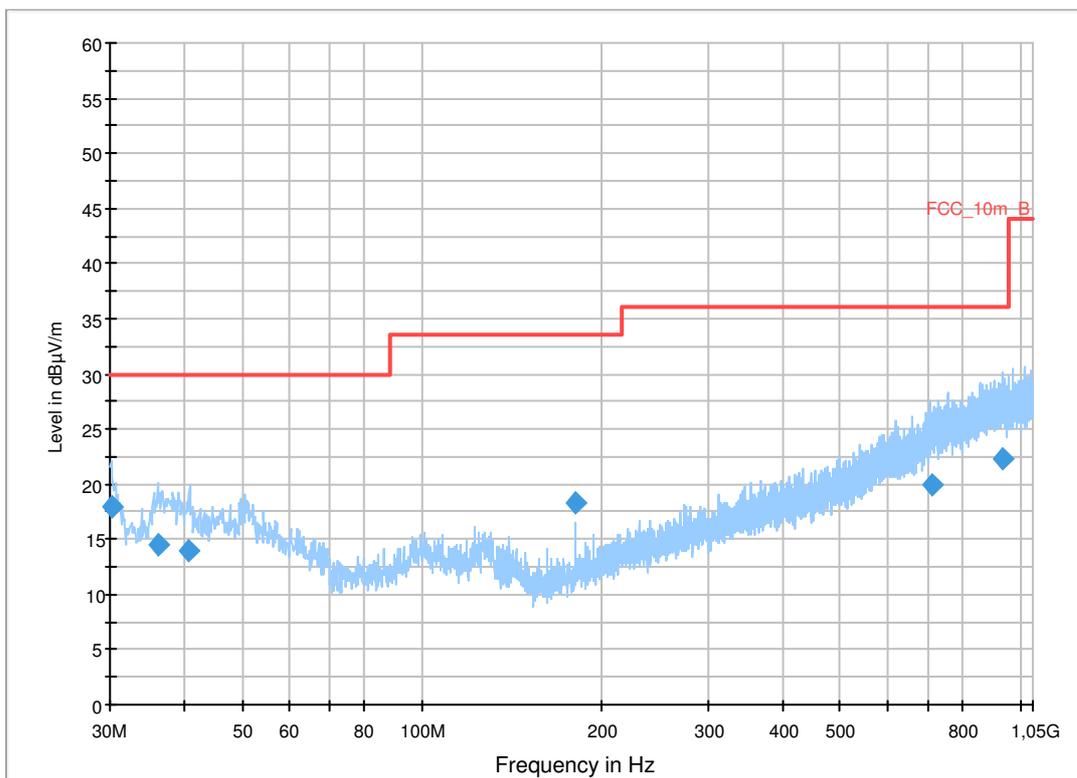
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN a/n-mode HT20 Ch. 36 + charging
 Operator Name: Hennemann
 Comment: AC: 115 V / 60 Hz

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
30.153139	18.0	1000.0	120.000	98.0	V	190.0	12.5	12.0	30.0	
36.101700	14.6	1000.0	120.000	170.0	V	92.0	13.1	15.4	30.0	
40.715700	14.0	1000.0	120.000	105.0	V	190.0	13.4	16.0	30.0	
180.028800	18.4	1000.0	120.000	98.0	V	92.0	10.4	15.1	33.5	
709.592850	19.9	1000.0	120.000	170.0	H	190.0	22.7	16.1	36.0	
934.398150	22.3	1000.0	120.000	170.0	H	81.0	25.3	13.7	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

Signal Path: without Notch
FW 1.0

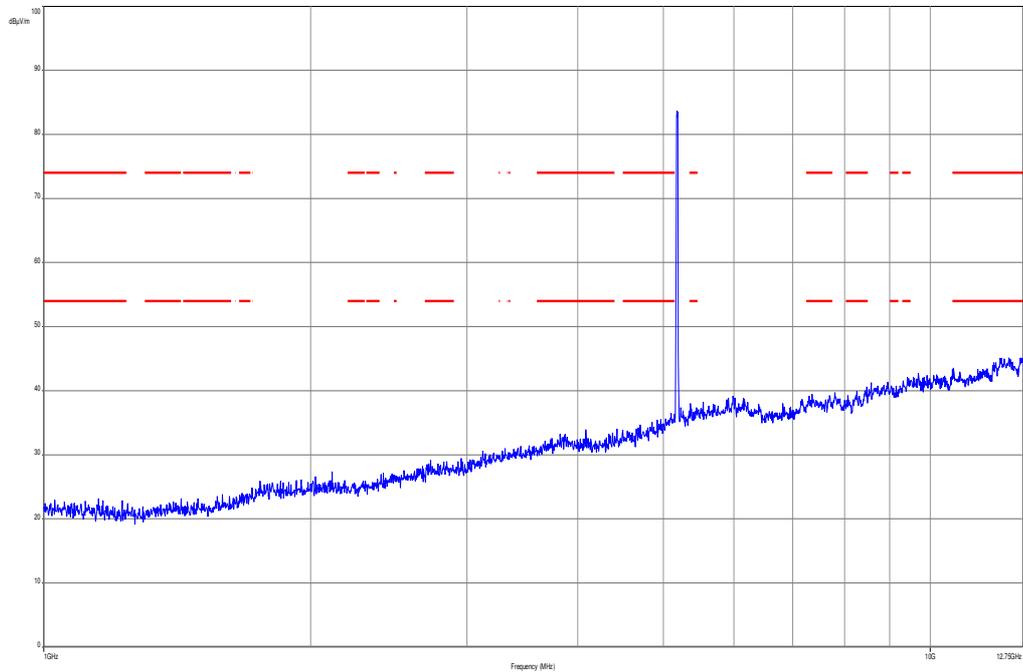
Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

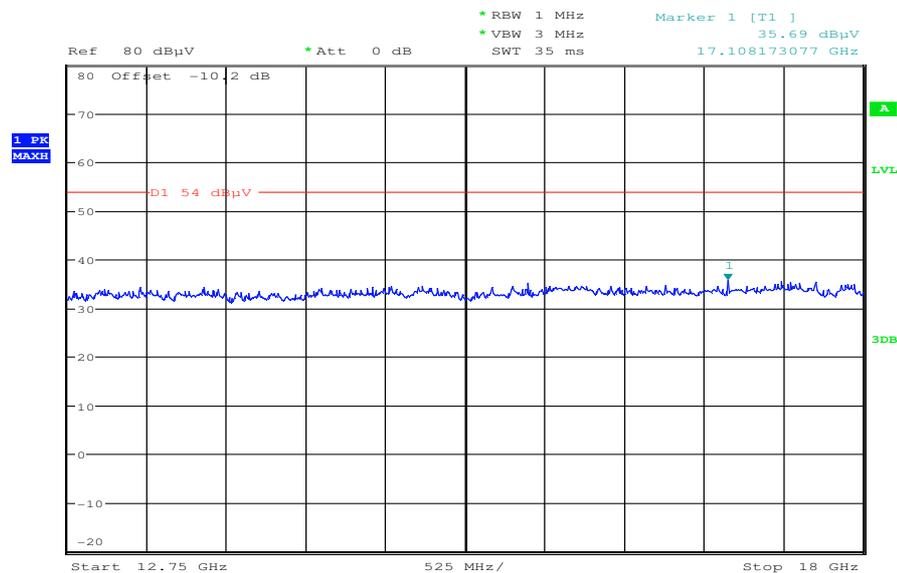
Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.52

Plot 2: 1 GHz to 12.75 GHz, 5180 MHz, vertical & horizontal polarization

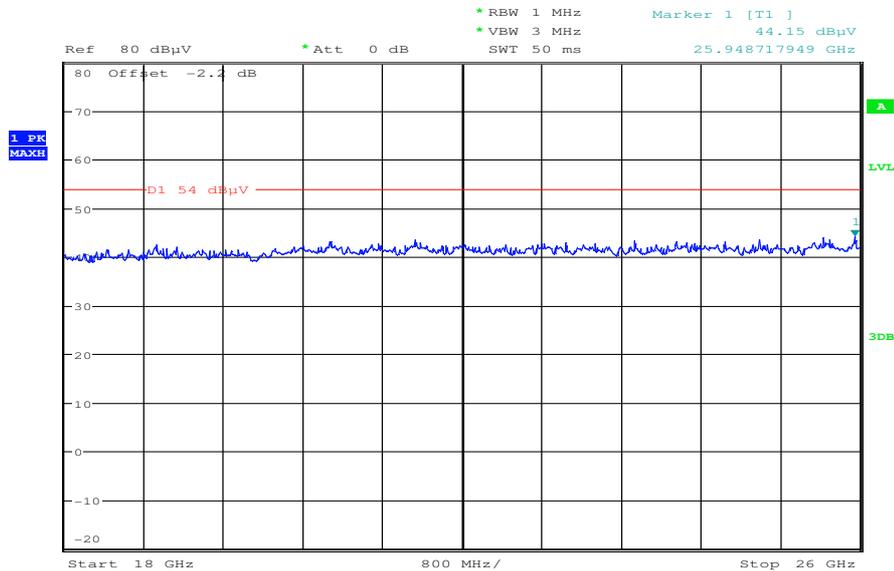


Plot 3: 12 GHz to 18 GHz, 5180 MHz, vertical & horizontal polarization



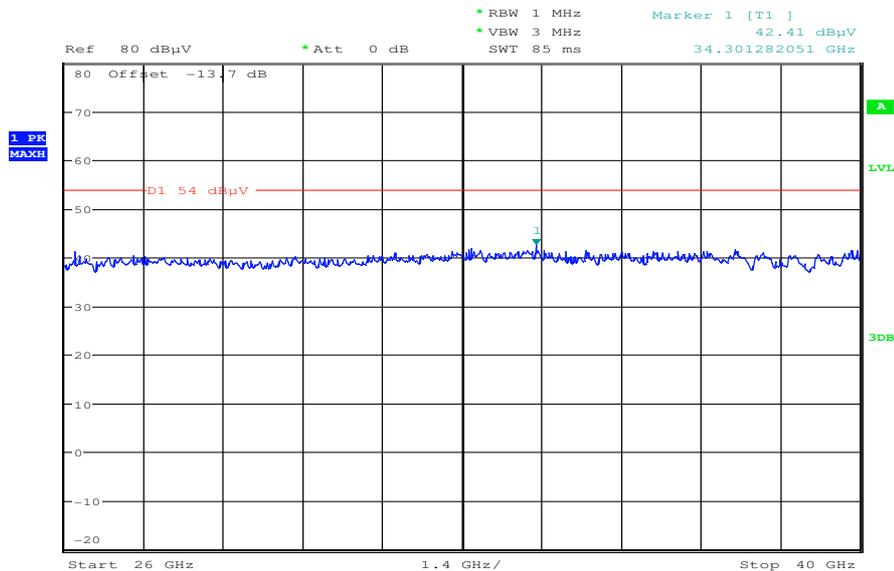
Date: 21.JAN.2013 15:30:20

Plot 4: 18 GHz to 26 GHz, 5180 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:31:55

Plot 5: 26 GHz to 40 GHz, 5180 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:44:00

Plot 6: 30 MHz to 1 GHz, 5240 MHz, vertical & horizontal polarization

Common Information

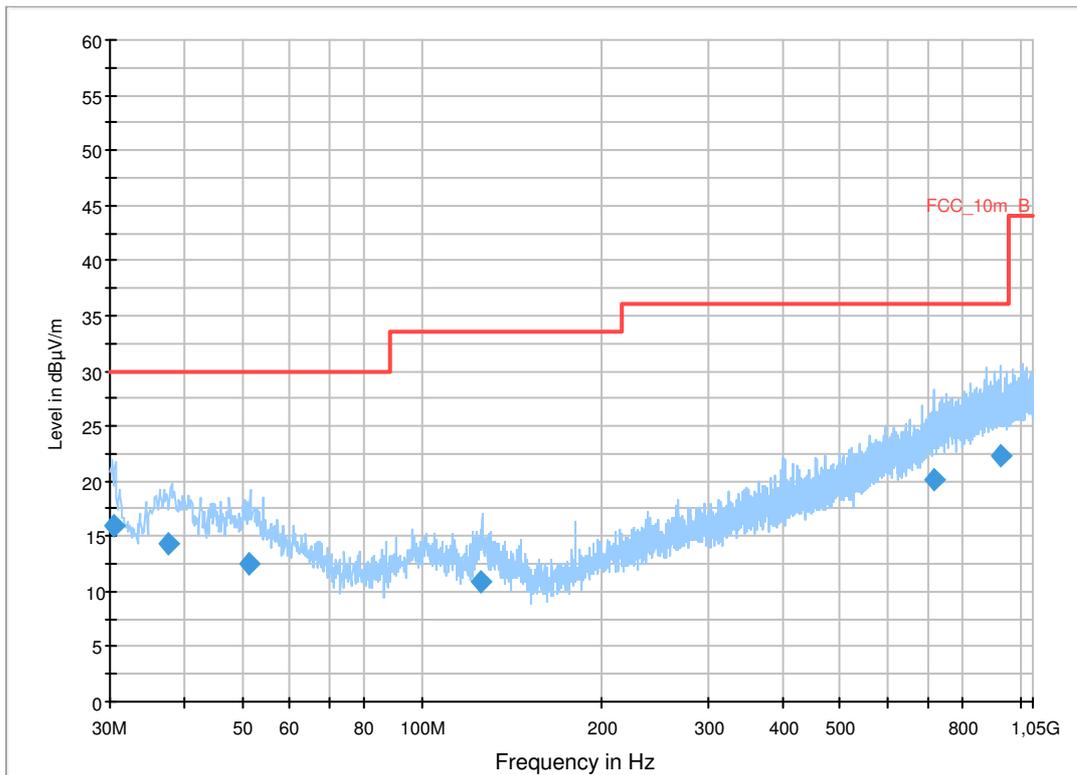
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN a/n-mode HT20 Ch. 48 + charging
 Operator Name: Hennemann
 Comment: AC: 115 V / 60 Hz

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
30.434126	16.0	1000.0	120.000	170.0	V	182.0	12.5	14.0	30.0	
37.679550	14.4	1000.0	120.000	98.0	V	182.0	13.3	15.6	30.0	
51.261600	12.6	1000.0	120.000	170.0	V	280.0	13.2	17.4	30.0	
125.512800	10.8	1000.0	120.000	159.0	V	81.0	9.8	22.7	33.5	
718.110600	20.1	1000.0	120.000	120.0	V	175.0	22.9	15.9	36.0	
930.194850	22.4	1000.0	120.000	170.0	V	100.0	25.3	13.6	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

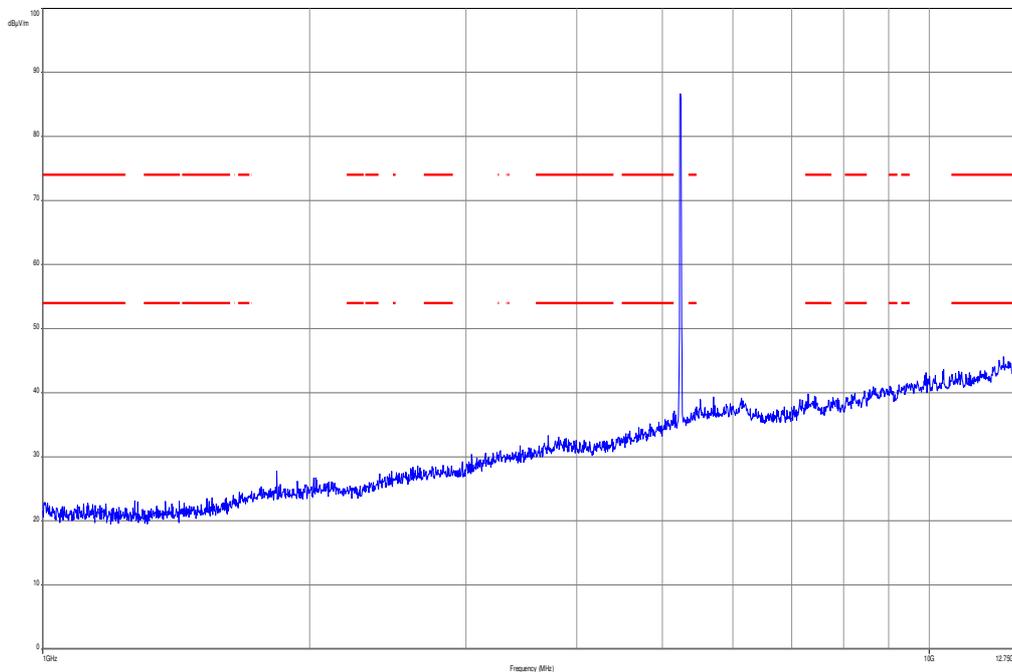
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

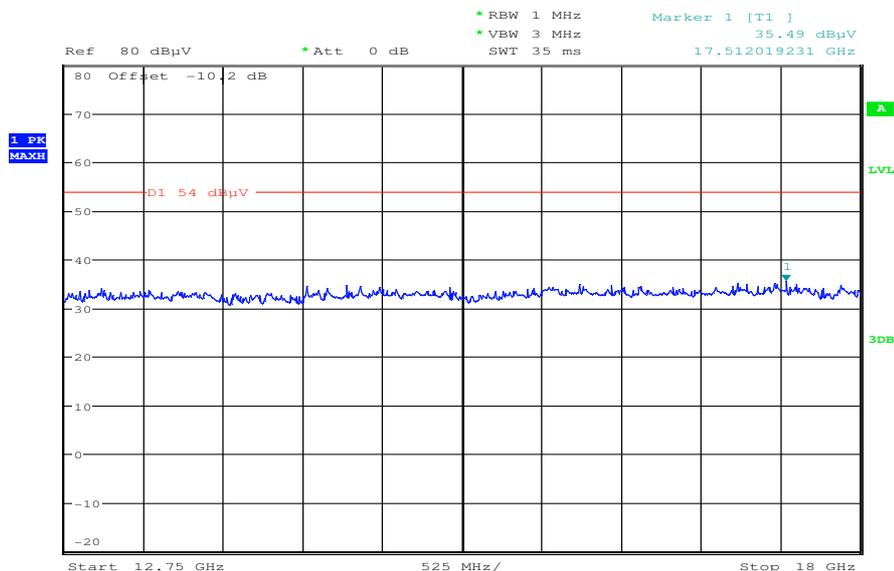
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 7: 1 GHz to 12.75 GHz, 5240 MHz, vertical & horizontal polarization

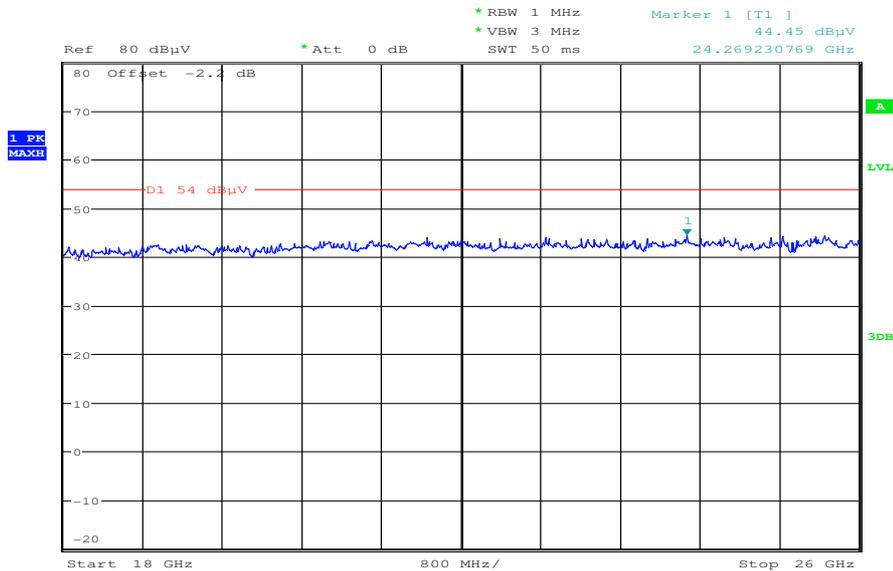


Plot 8: 12 GHz to 18 GHz, 5240 MHz, vertical & horizontal polarization



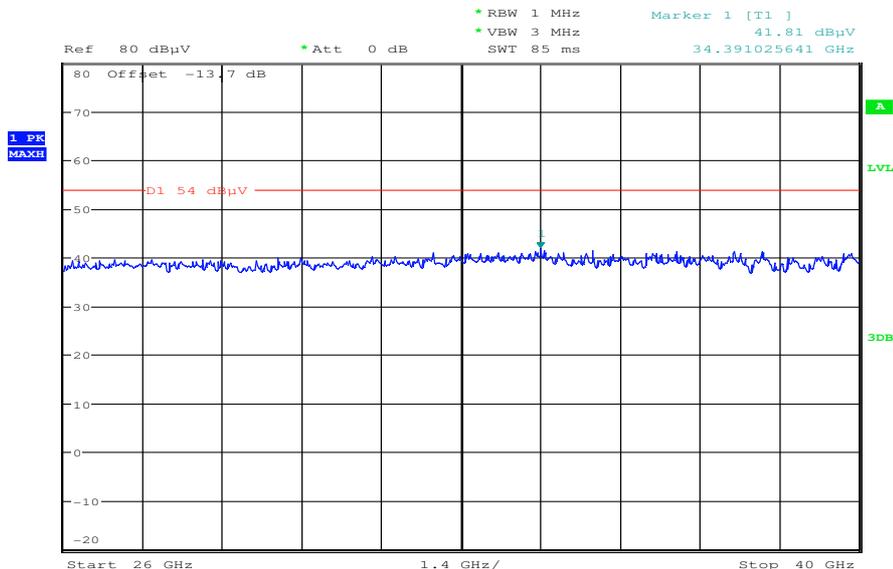
Date: 21.JAN.2013 15:32:00

Plot 9: 18 GHz to 26 GHz, 5240 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:31:31

Plot 10: 26 GHz to 40 GHz, 5240 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:44:35

Plot 11: 30 MHz to 1 GHz, 5260 MHz, vertical & horizontal polarization

Common Information

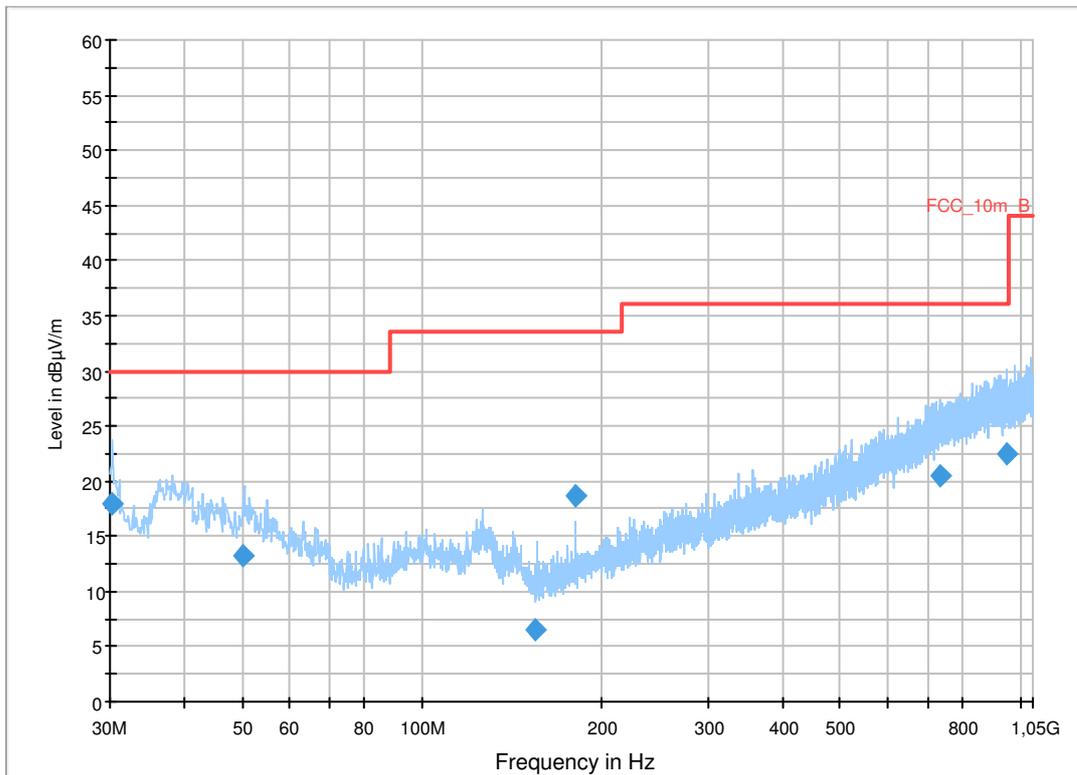
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN a/n-mode HT20 Ch. 52 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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
30.212147	18.0	1000.0	120.000	98.0	V	190.0	12.5	12.0	30.0	
50.004300	13.2	1000.0	120.000	98.0	V	280.0	13.4	16.8	30.0	
154.679100	6.6	1000.0	120.000	170.0	V	280.0	9.0	26.9	33.5	
179.989050	18.7	1000.0	120.000	98.0	V	10.0	10.4	14.8	33.5	
735.119100	20.5	1000.0	120.000	112.0	V	280.0	23.3	15.5	36.0	
950.697750	22.5	1000.0	120.000	122.0	H	2.0	25.4	13.5	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

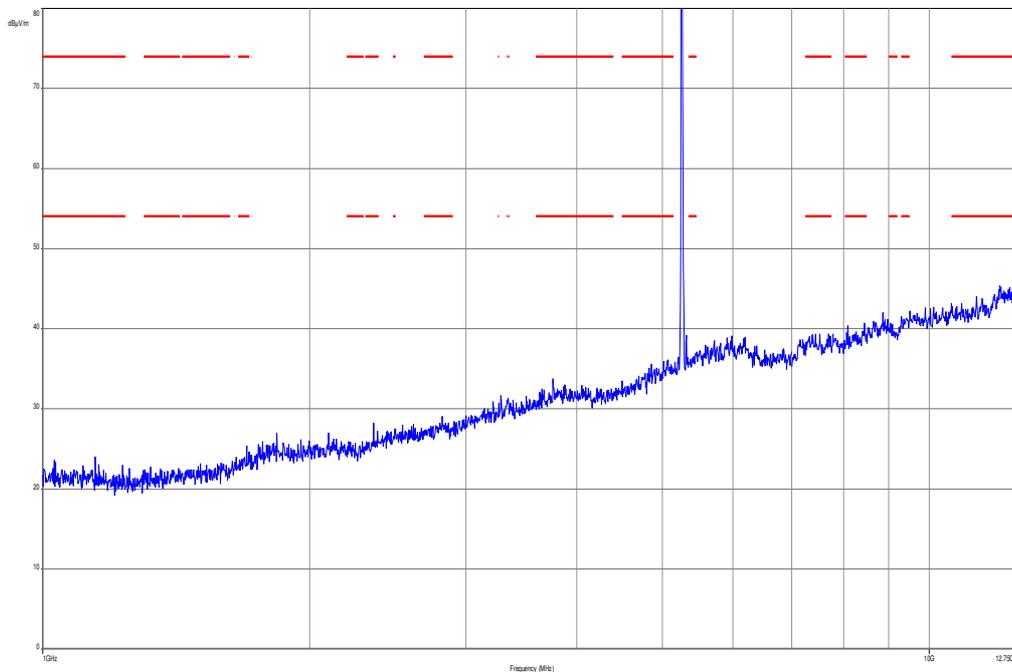
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

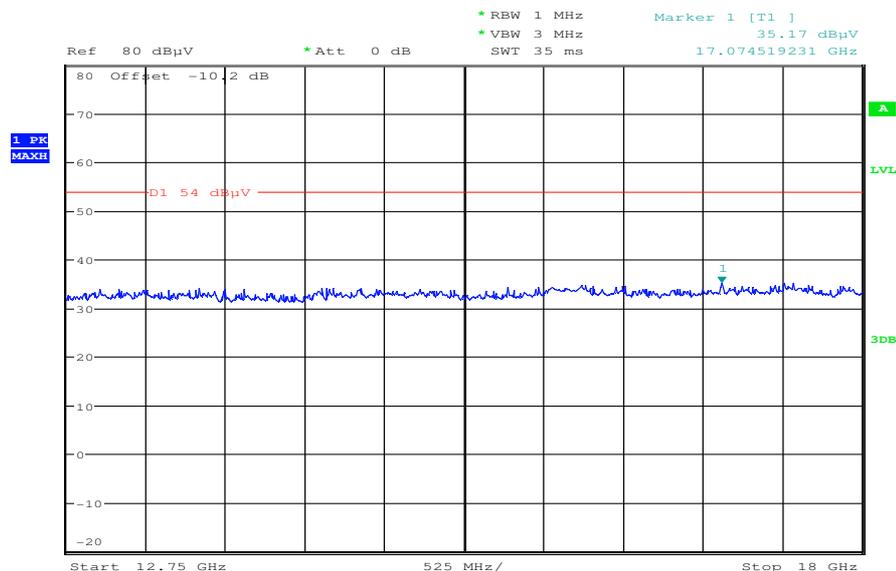
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 12: 1 GHz to 12.75 GHz, 5260 MHz, vertical & horizontal polarization

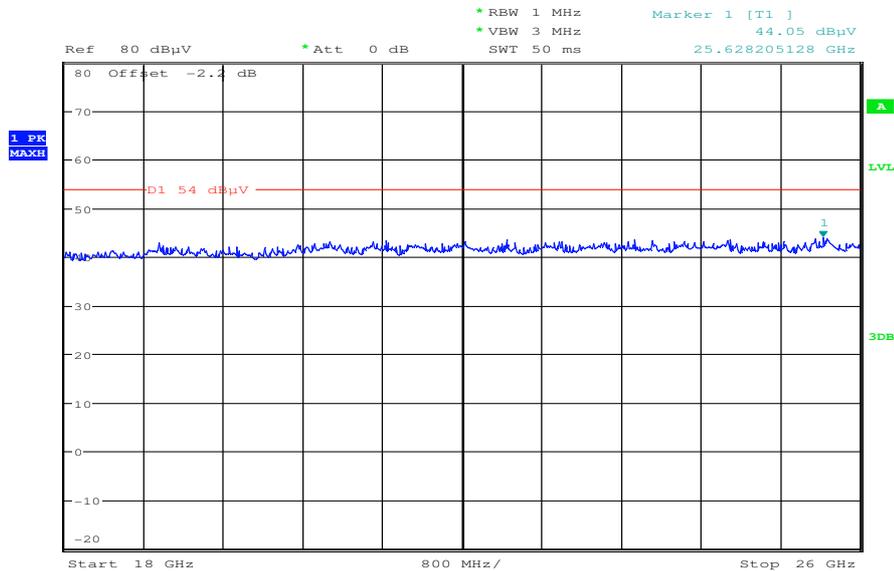


Plot 13: 12 GHz to 18 GHz, 5260 MHz, vertical & horizontal polarization



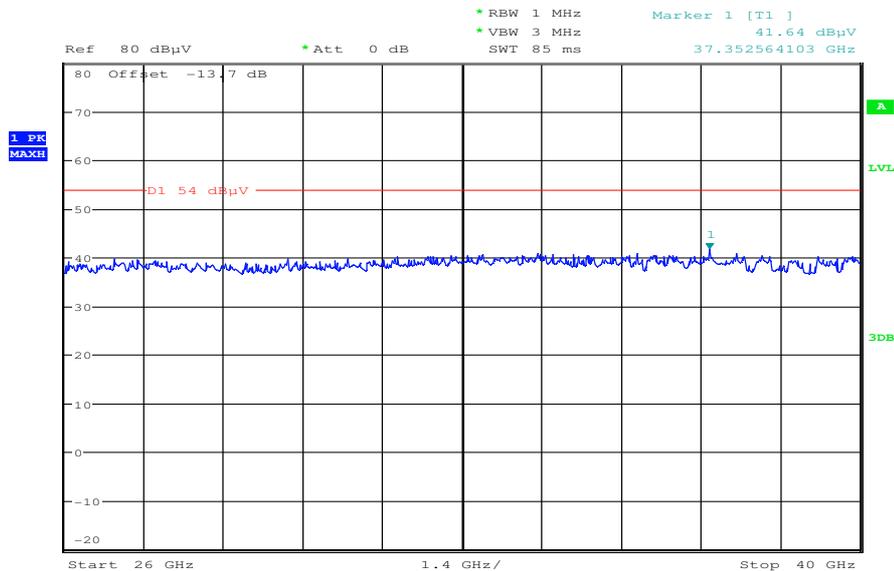
Date: 21.JAN.2013 15:33:35

Plot 14: 18 GHz to 26 GHz, 5260 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:28:09

Plot 15: 26 GHz to 40 GHz, 5260 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:45:13

Plot 16: 30 MHz to 1 GHz, 5320 MHz, vertical & horizontal polarization

Common Information

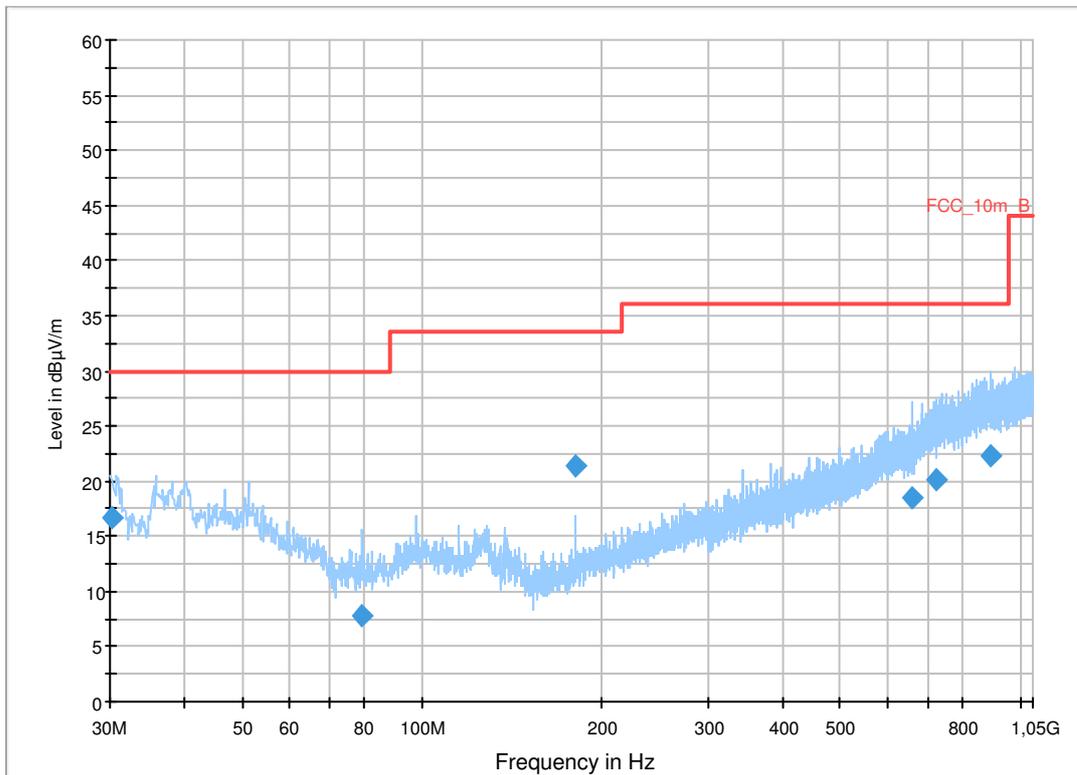
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN a/n-mode HT20 Ch. 64 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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 (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.340500	16.7	1000.0	120.000	120.0	V	10.0	12.5	13.3	30.0	
79.187550	7.8	1000.0	120.000	170.0	V	178.0	9.1	22.2	30.0	
180.015150	21.4	1000.0	120.000	98.0	V	80.0	10.4	12.1	33.5	
656.871450	18.4	1000.0	120.000	144.0	V	272.0	21.3	17.6	36.0	
723.425700	20.2	1000.0	120.000	170.0	H	176.0	23.0	15.8	36.0	
894.475350	22.3	1000.0	120.000	170.0	V	178.0	25.1	13.7	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

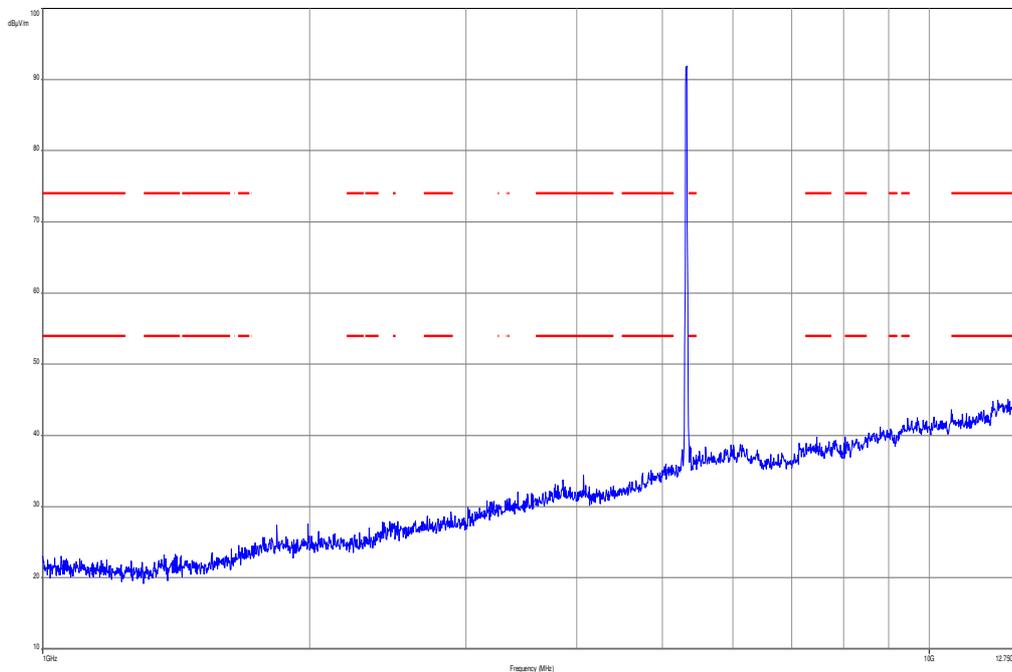
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

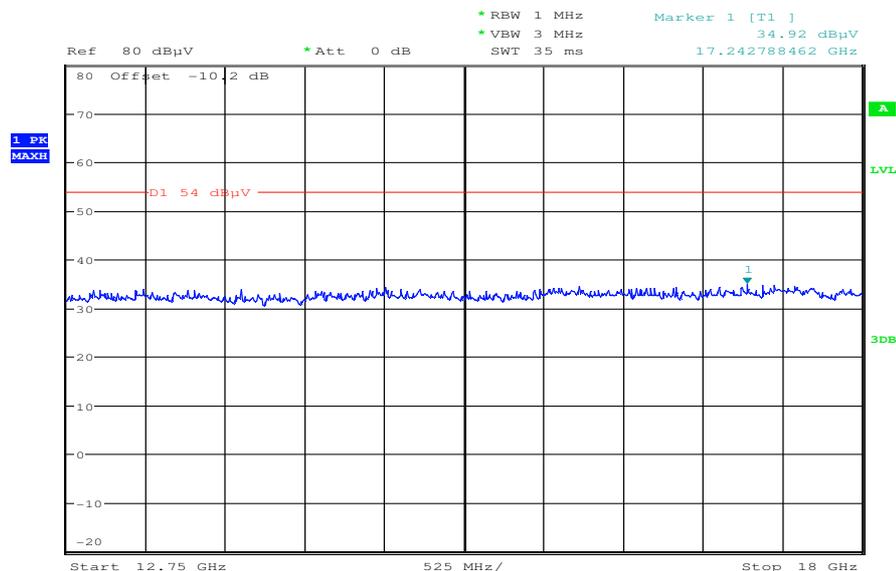
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 17: 1 GHz to 12.75 GHz, 5320 MHz, vertical & horizontal polarization

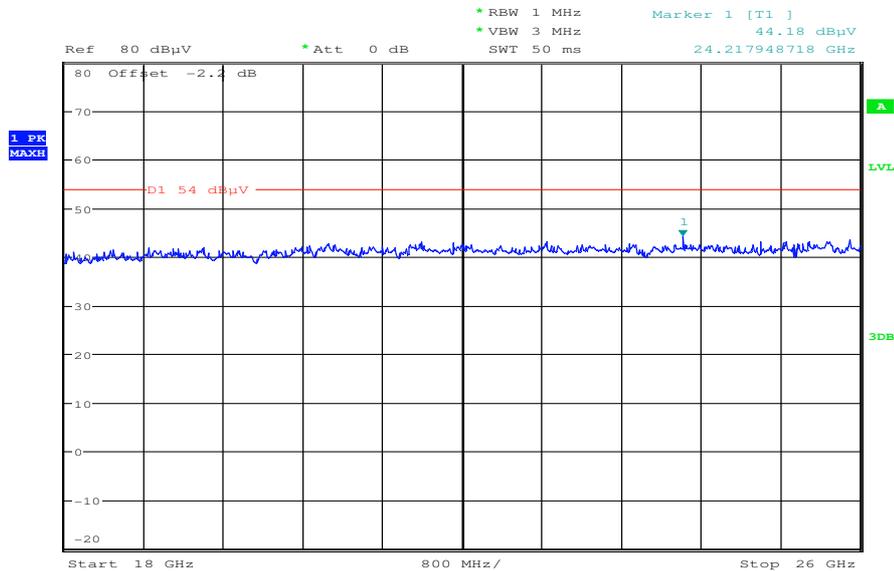


Plot 18: 12 GHz to 18 GHz, 5320 MHz, vertical & horizontal polarization



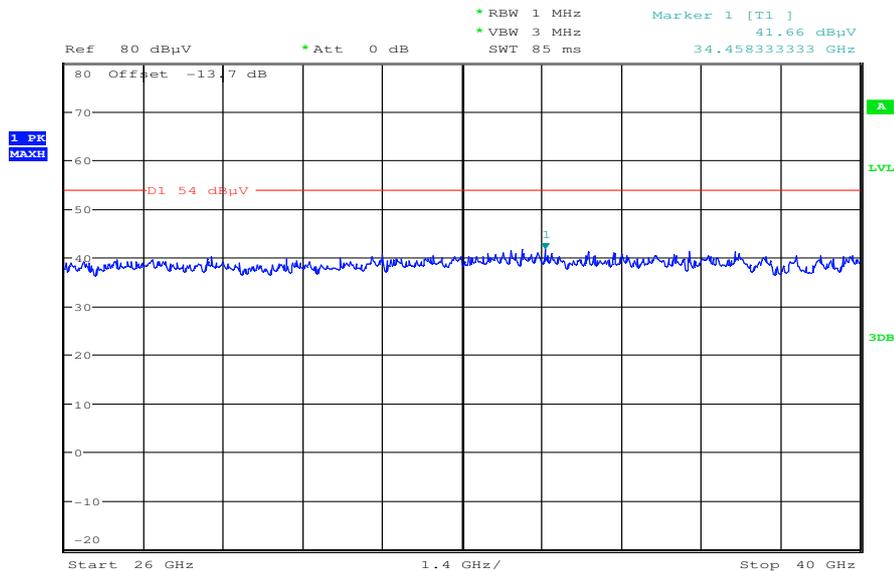
Date: 21.JAN.2013 15:34:54

Plot 19: 18 GHz to 26 GHz, 5320 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:27:27

Plot 20: 26 GHz to 40 GHz, 5320 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:45:34

Plot 21: 30 MHz to 1 GHz, 5500 MHz, vertical & horizontal polarization

Common Information

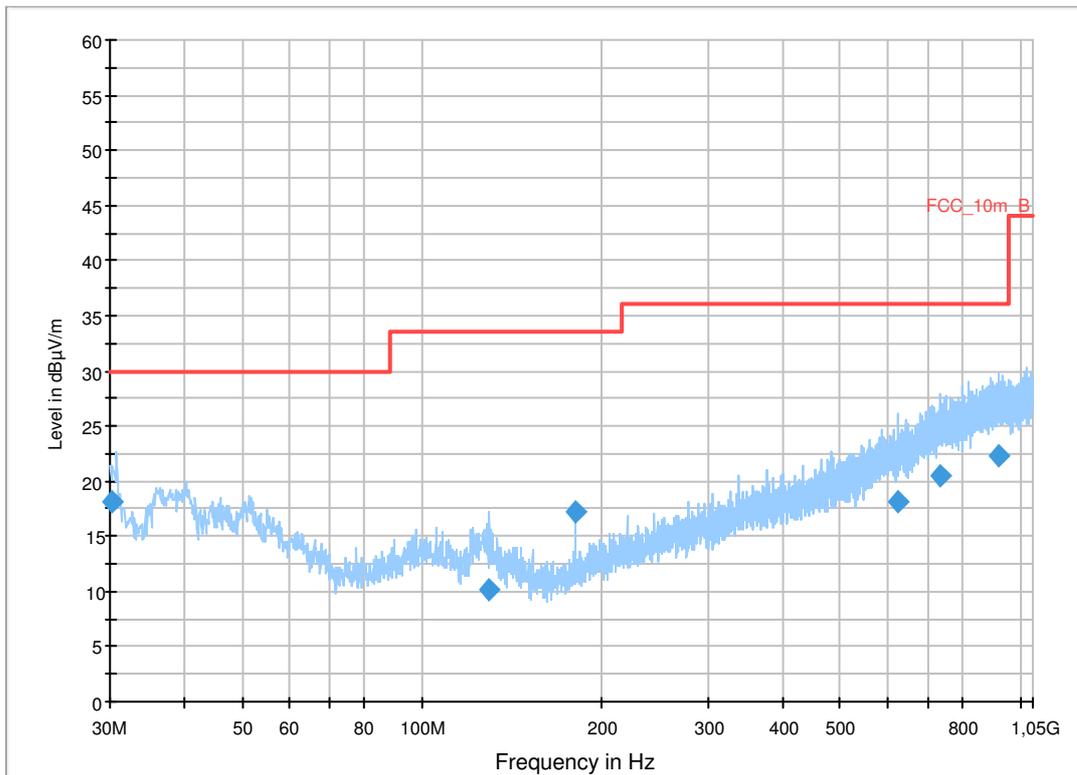
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN a/n-mode HT20 Ch. 100 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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
30.183600	18.2	1000.0	120.000	98.0	V	270.0	12.5	11.8	30.0	
129.271050	10.1	1000.0	120.000	170.0	V	92.0	9.5	23.4	33.5	
180.016950	17.2	1000.0	120.000	121.0	V	265.0	10.4	16.3	33.5	
622.584750	18.1	1000.0	120.000	170.0	V	280.0	20.9	17.9	36.0	
733.945500	20.4	1000.0	120.000	143.0	V	3.0	23.3	15.6	36.0	
917.164800	22.3	1000.0	120.000	170.0	V	171.0	25.3	13.7	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

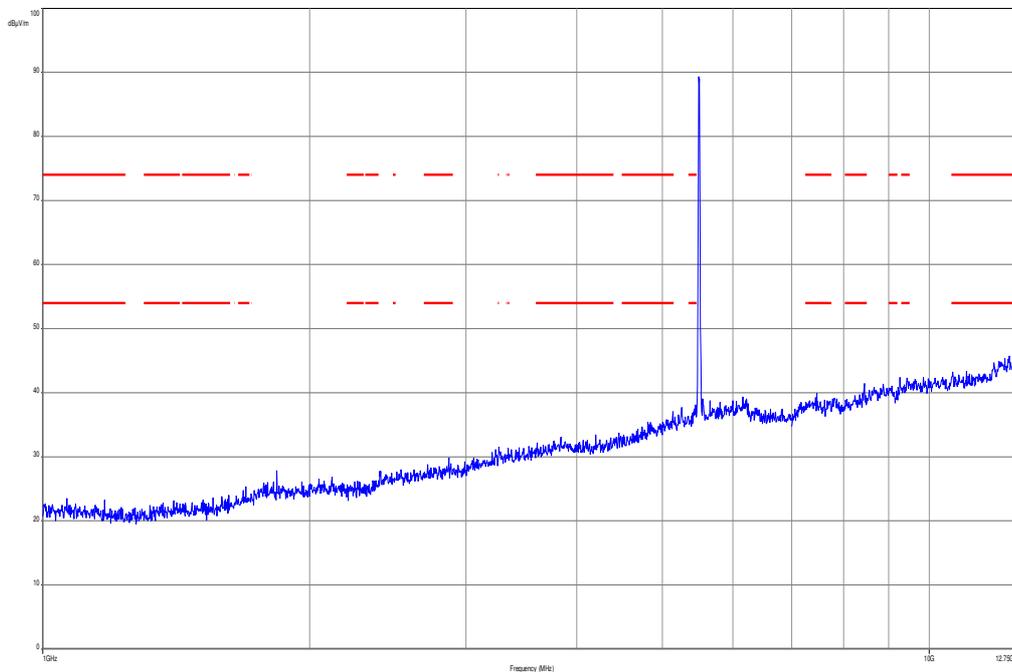
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

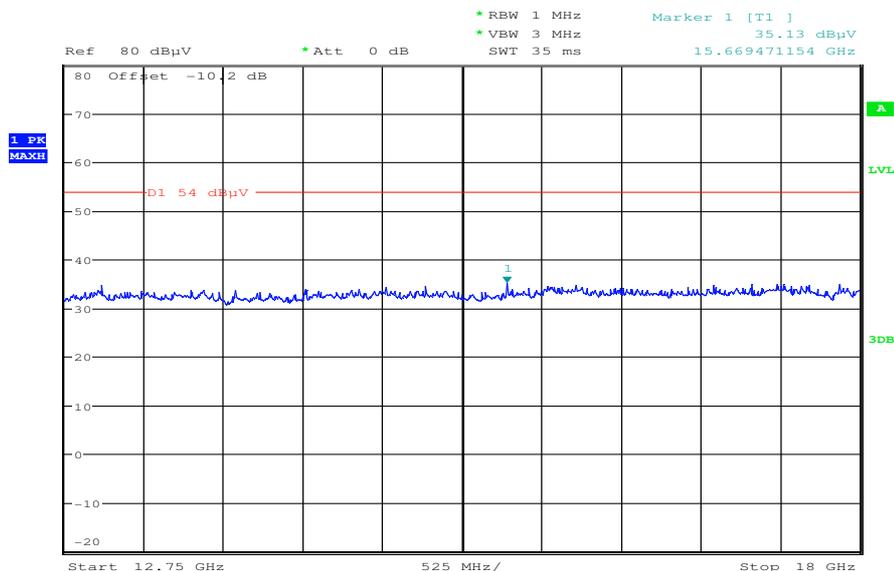
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 22: 1 GHz to 12.75 GHz, 5500 MHz, vertical & horizontal polarization

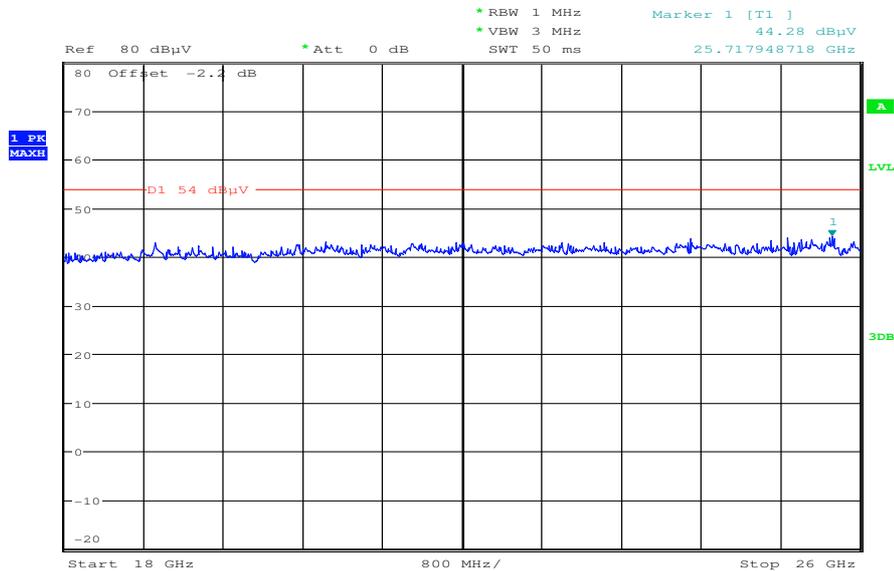


Plot 23: 12 GHz to 18 GHz, 5500 MHz, vertical & horizontal polarization



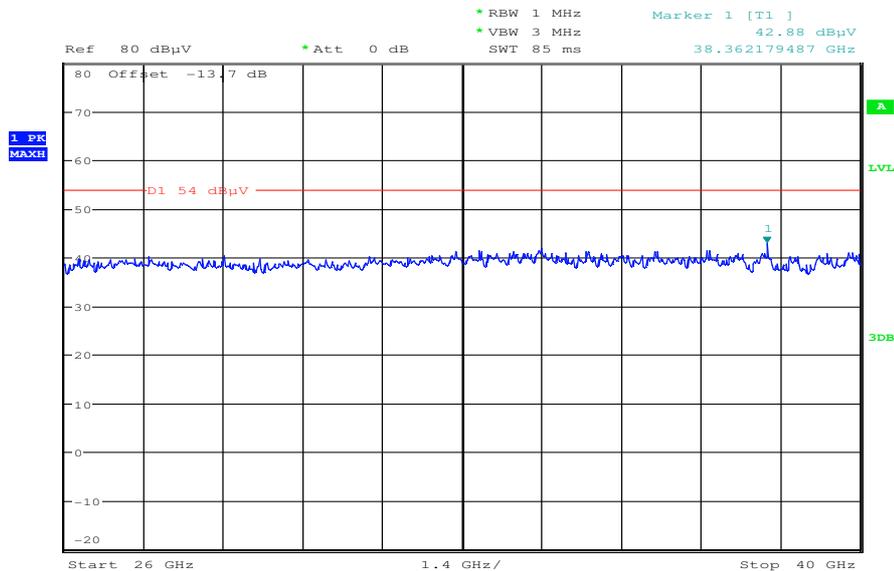
Date: 21.JAN.2013 15:36:34

Plot 24: 18 GHz to 26 GHz, 5500 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:27:09

Plot 25: 26 GHz to 40 GHz, 5500 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:46:17

Plot 26: 30 MHz to 1 GHz, 5600 MHz, vertical & horizontal polarization

Common Information

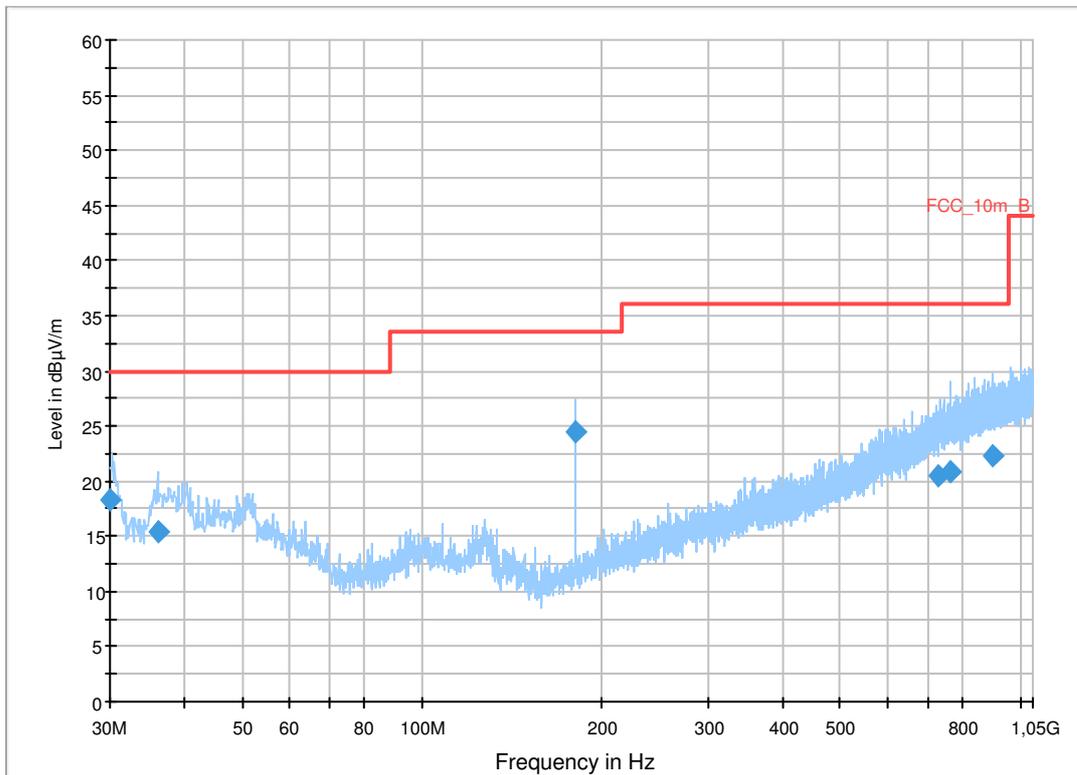
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN a/n-mode HT20 Ch. 120 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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 (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.090202	18.4	1000.0	120.000	104.0	V	261.0	12.5	11.6	30.0	
36.019950	15.4	1000.0	120.000	170.0	V	10.0	13.1	14.6	30.0	
180.000750	24.5	1000.0	120.000	98.0	V	10.0	10.4	9.0	33.5	
731.793150	20.4	1000.0	120.000	143.0	V	-10.0	23.2	15.6	36.0	
765.372150	20.8	1000.0	120.000	170.0	V	85.0	23.7	15.2	36.0	
901.229550	22.3	1000.0	120.000	111.0	V	10.0	25.2	13.7	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

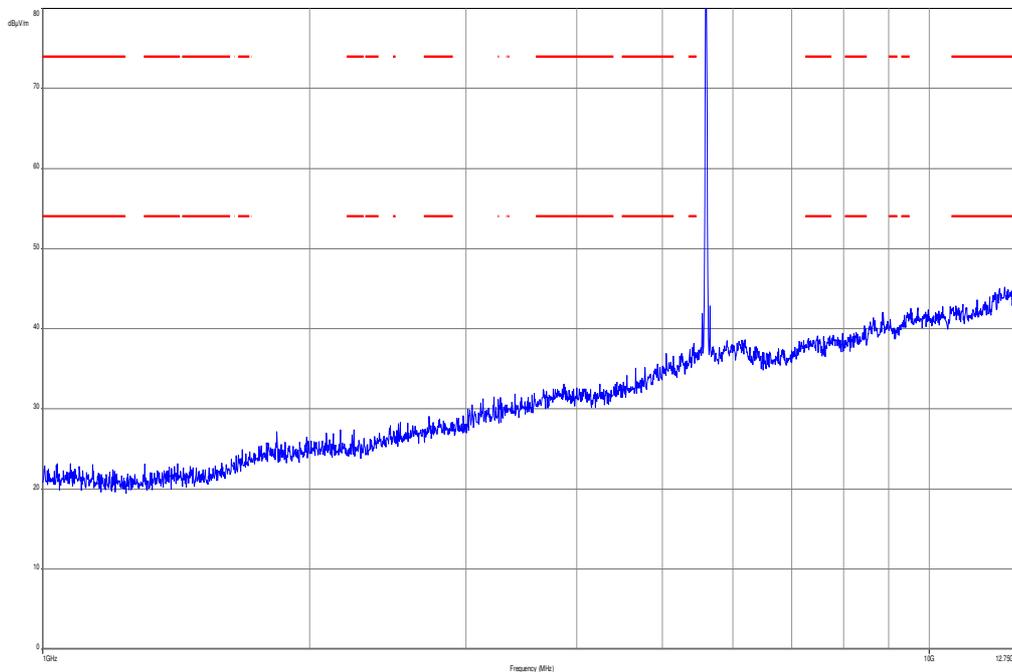
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

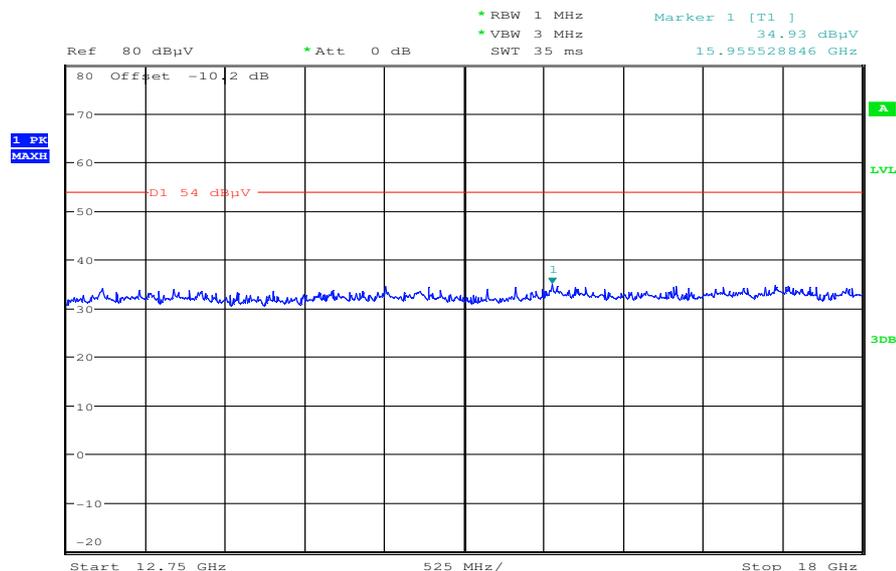
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 27: 1 GHz to 12.75 GHz, 5600 MHz, vertical & horizontal polarization

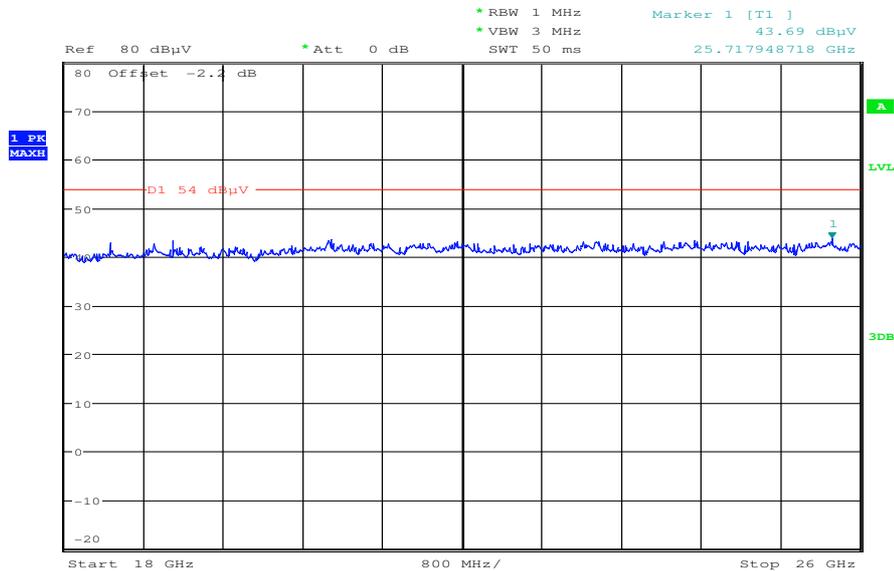


Plot 28: 12 GHz to 18 GHz, 5600 MHz, vertical & horizontal polarization



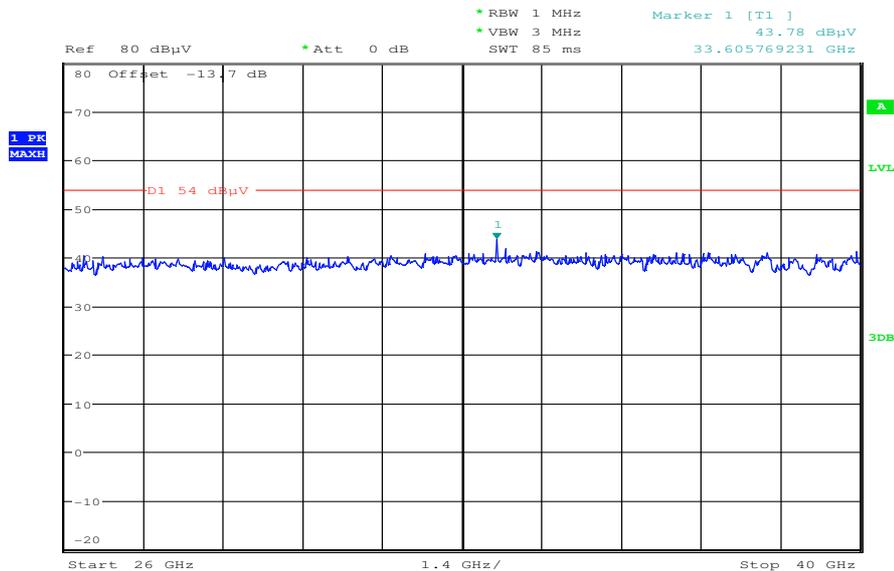
Date: 21.JAN.2013 15:37:34

Plot 29: 18 GHz to 26 GHz, 5600 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:26:47

Plot 30: 26 GHz to 40 GHz, 5600 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:46:49

Plot 31: 30 MHz to 1 GHz, 5700 MHz, vertical & horizontal polarization

Common Information

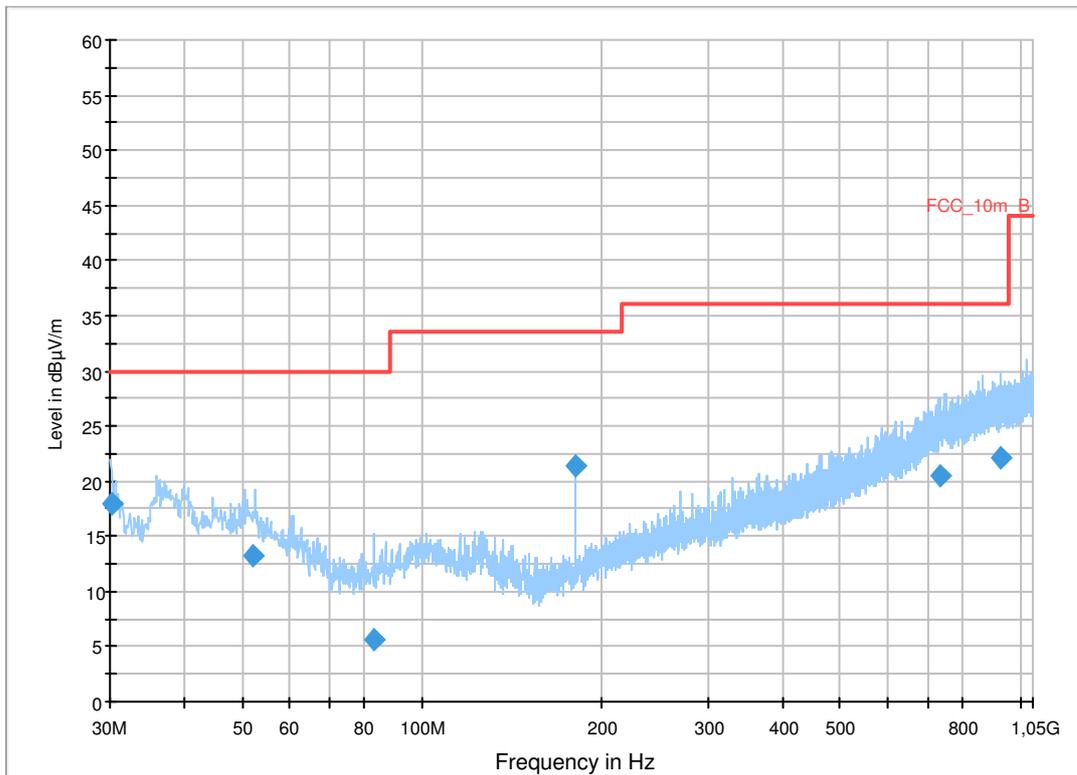
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN a/n-mode HT20 Ch. 140 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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
30.164100	18.0	1000.0	120.000	143.0	V	183.0	12.5	12.0	30.0	
51.901500	13.3	1000.0	120.000	98.0	V	280.0	13.2	16.7	30.0	
83.090100	5.6	1000.0	120.000	120.0	H	270.0	9.5	24.4	30.0	
180.010050	21.4	1000.0	120.000	104.0	V	175.0	10.4	12.1	33.5	
732.048600	20.4	1000.0	120.000	170.0	H	170.0	23.2	15.6	36.0	
925.807350	22.2	1000.0	120.000	104.0	V	190.0	25.3	13.8	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

Signal Path: without Notch
FW 1.0

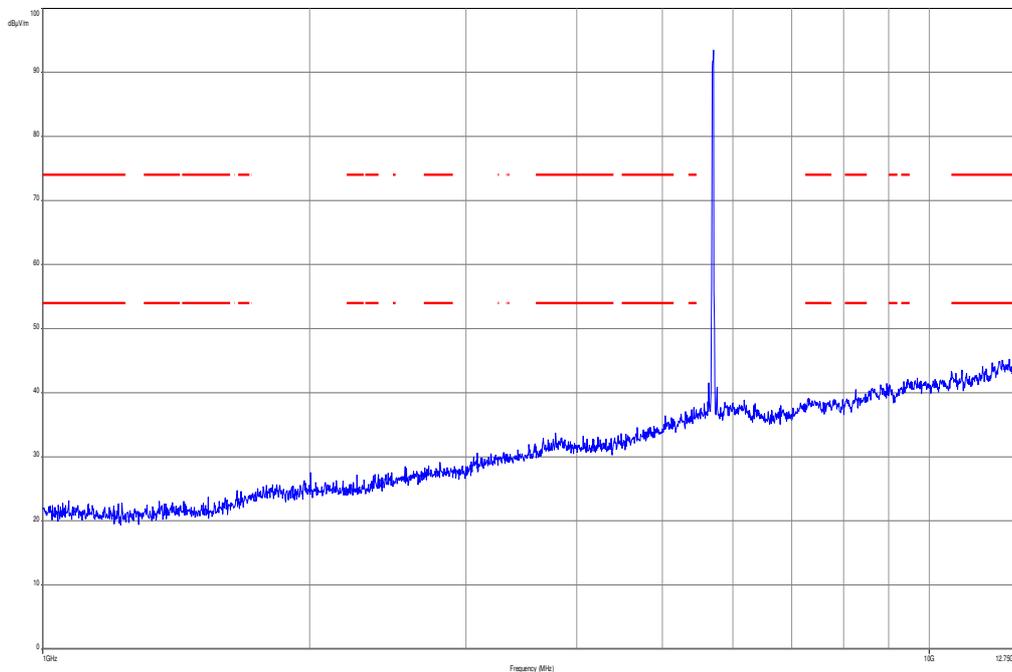
Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

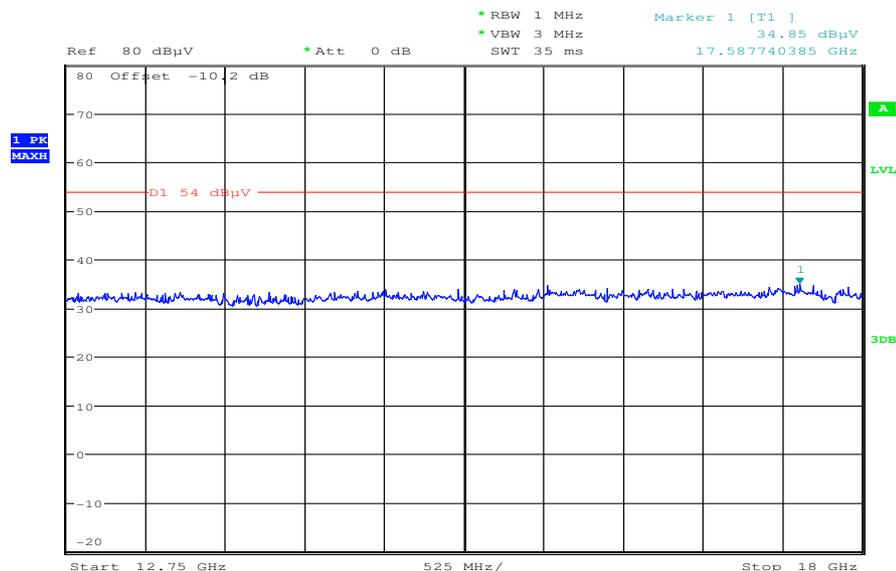
Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.52

Plot 32: 1 GHz to 12.75 GHz, 5700 MHz, vertical & horizontal polarization

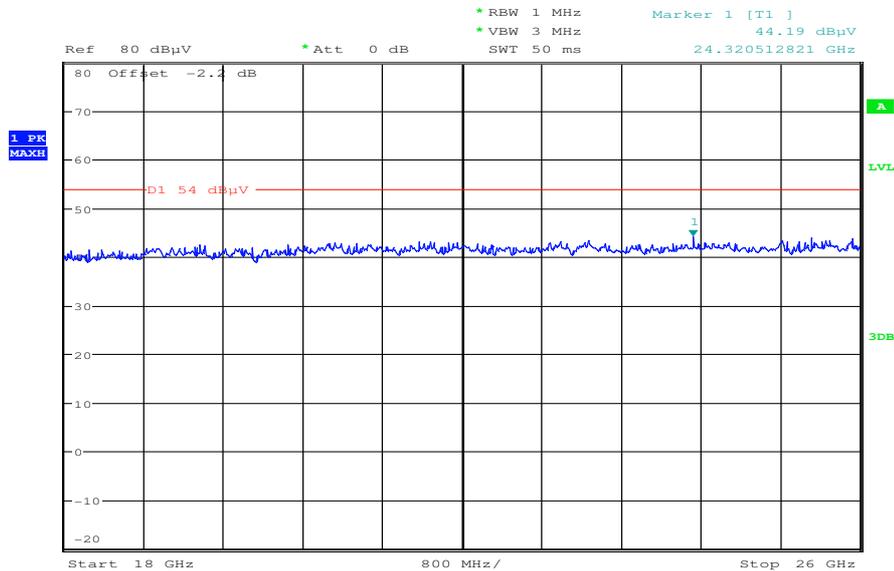


Plot 33: 12 GHz to 18 GHz, 5700 MHz, vertical & horizontal polarization



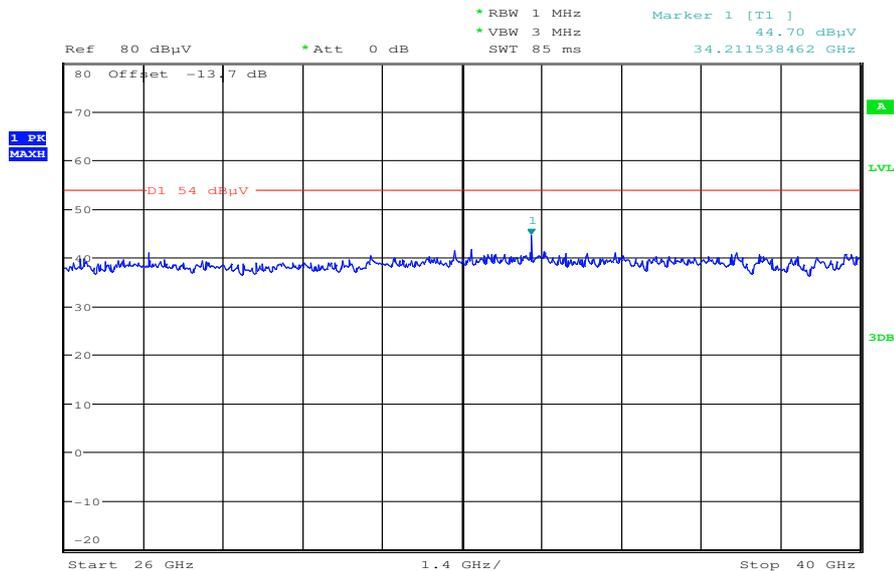
Date: 21.JAN.2013 15:38:15

Plot 34: 18 GHz to 26 GHz, 5700 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:25:33

Plot 35: 26 GHz to 40 GHz, 5700 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:47:26

Plots: OFDM / n – mode HT40

Plot 1: 30 MHz to 1 GHz, 5190 MHz, vertical & horizontal polarization

Common Information

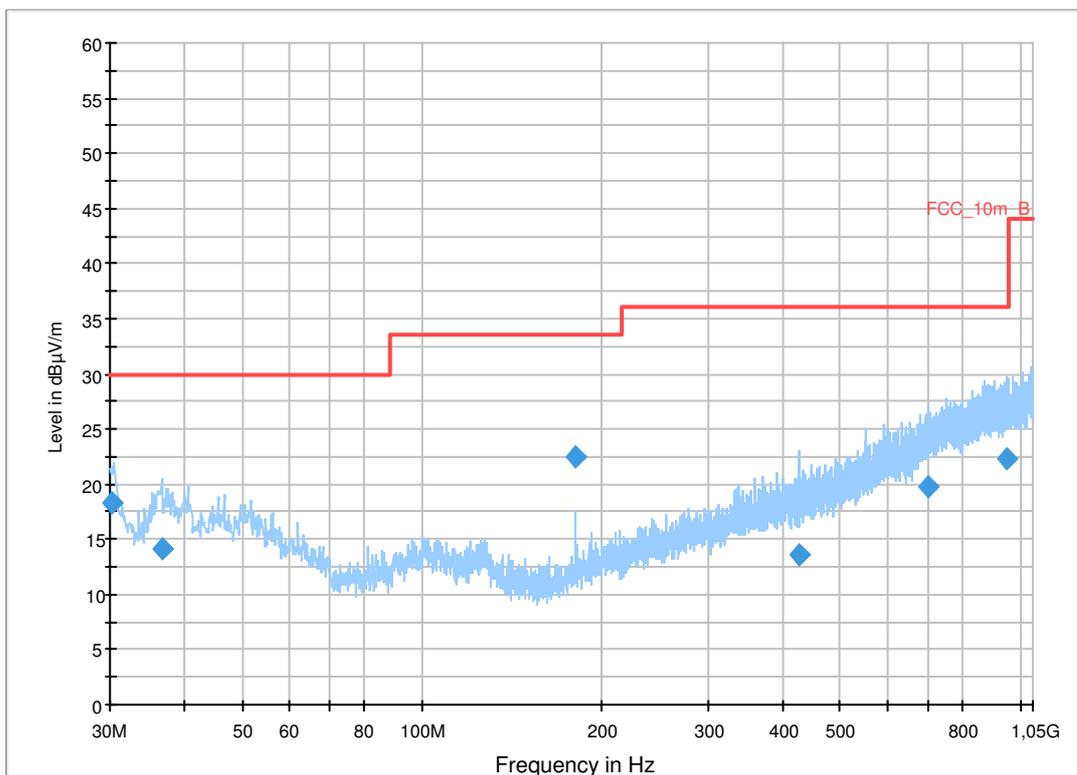
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN n-mode HT40 Ch. 38 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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 (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.339244	18.3	1000.0	120.000	107.0	V	265.0	12.5	11.7	30.0	
36.607950	14.2	1000.0	120.000	120.0	V	270.0	13.2	15.8	30.0	
179.989800	22.5	1000.0	120.000	98.0	V	-2.0	10.4	11.0	33.5	
425.845050	13.7	1000.0	120.000	170.0	V	85.0	17.3	22.3	36.0	
700.607250	19.7	1000.0	120.000	170.0	V	10.0	22.5	16.3	36.0	
945.592950	22.4	1000.0	120.000	170.0	H	182.0	25.3	13.6	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

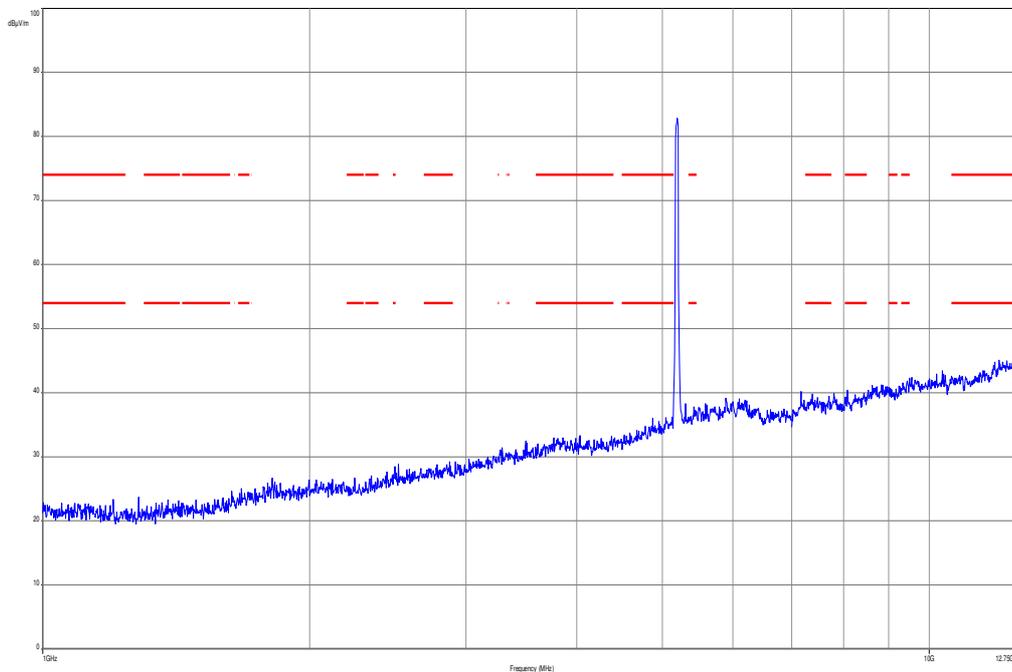
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

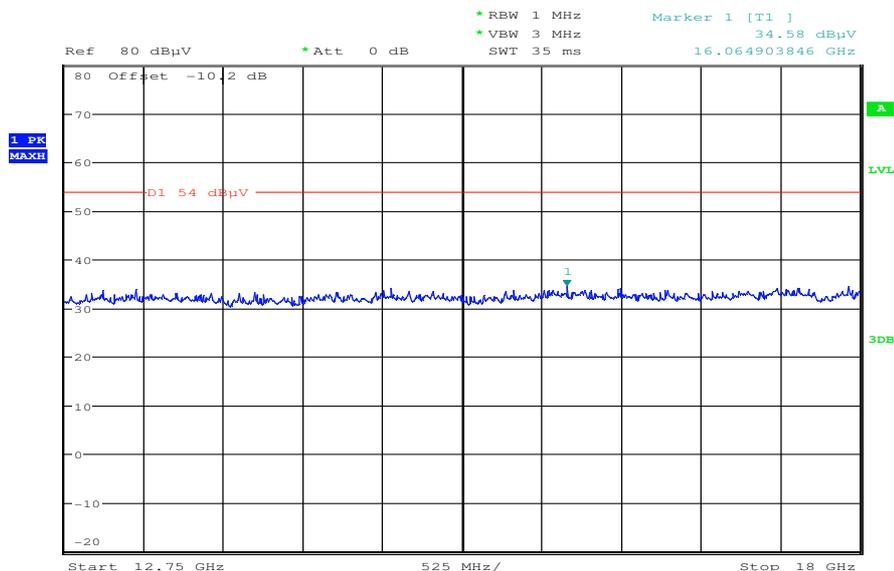
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 2: 1 GHz to 12.75 GHz, 5190 MHz, vertical & horizontal polarization

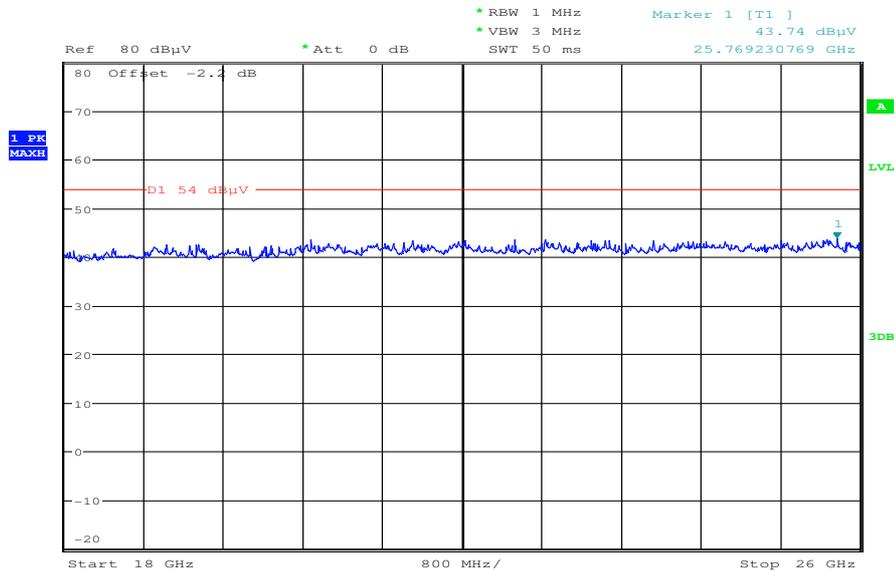


Plot 3: 12 GHz to 18 GHz, 5190 MHz, vertical & horizontal polarization



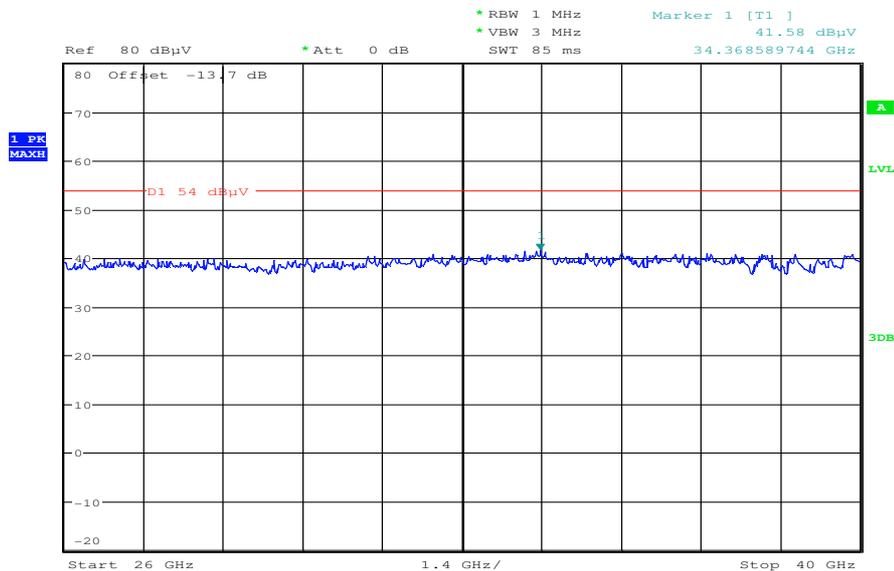
Date: 21.JAN.2013 15:47:49

Plot 4: 18 GHz to 26 GHz, 5190 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:11:54

Plot 5: 26 GHz to 40 GHz, 5190 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:48:57

Plot 6: 30 MHz to 1 GHz, 5230 MHz, vertical & horizontal polarization

Common Information

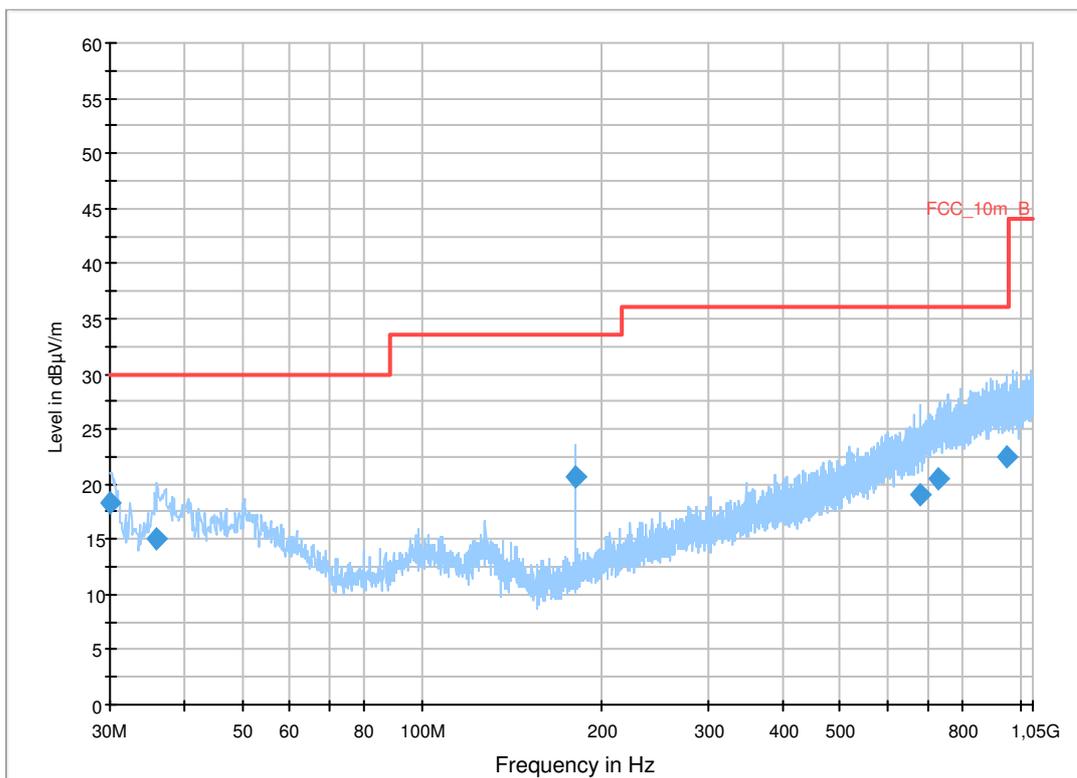
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN n-mode HT40 Ch. 46 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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
30.090523	18.3	1000.0	120.000	98.0	V	100.0	12.5	11.7	30.0	
36.000750	15.0	1000.0	120.000	98.0	V	190.0	13.1	15.0	30.0	
179.985450	20.7	1000.0	120.000	98.0	V	265.0	10.4	12.8	33.5	
678.177900	19.0	1000.0	120.000	170.0	H	10.0	21.9	17.0	36.0	
731.820600	20.4	1000.0	120.000	170.0	V	280.0	23.2	15.6	36.0	
951.219000	22.4	1000.0	120.000	98.0	H	81.0	25.4	13.6	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

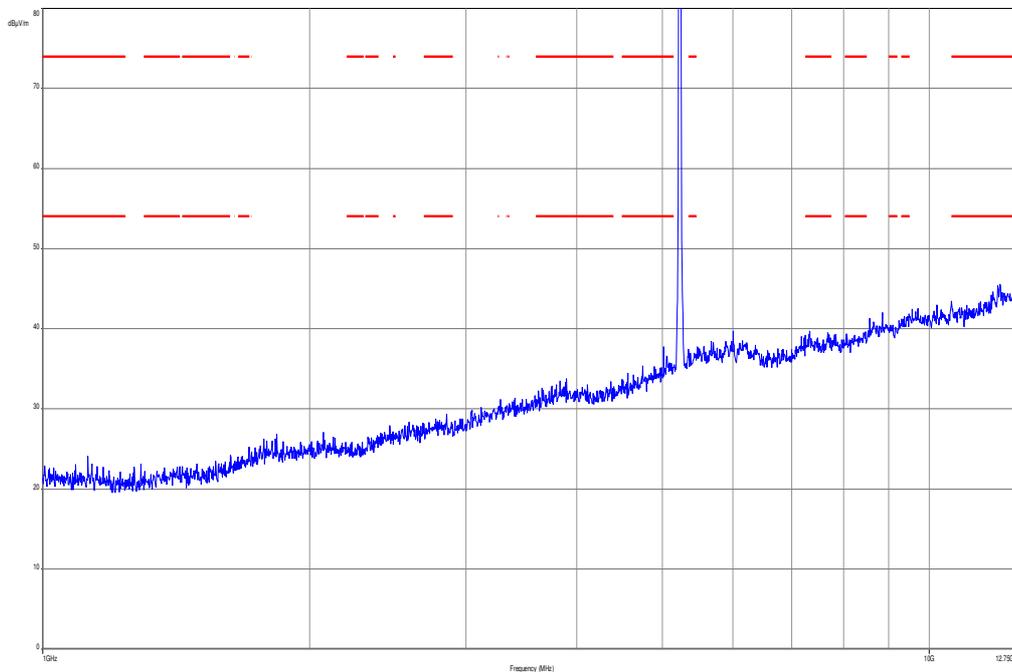
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

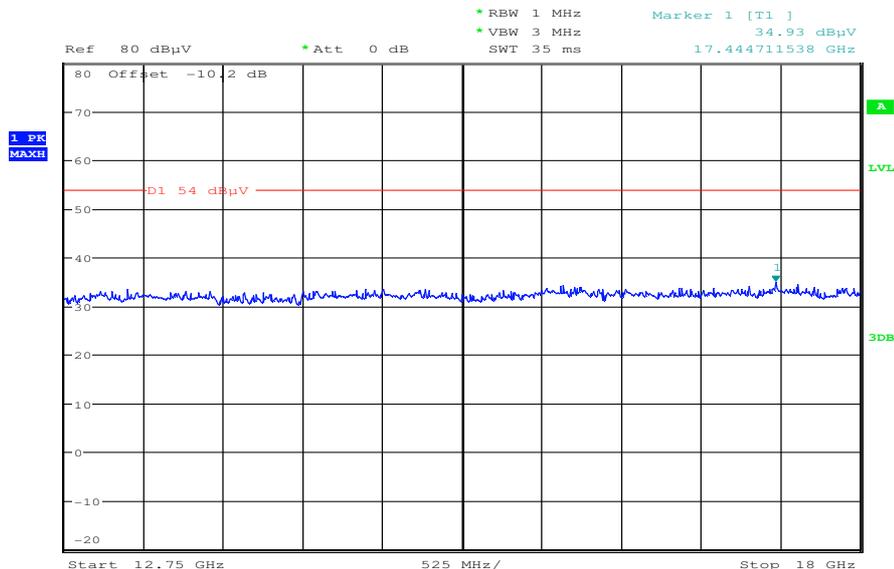
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 7: 1 GHz to 12.75 GHz, 5230 MHz, vertical & horizontal polarization

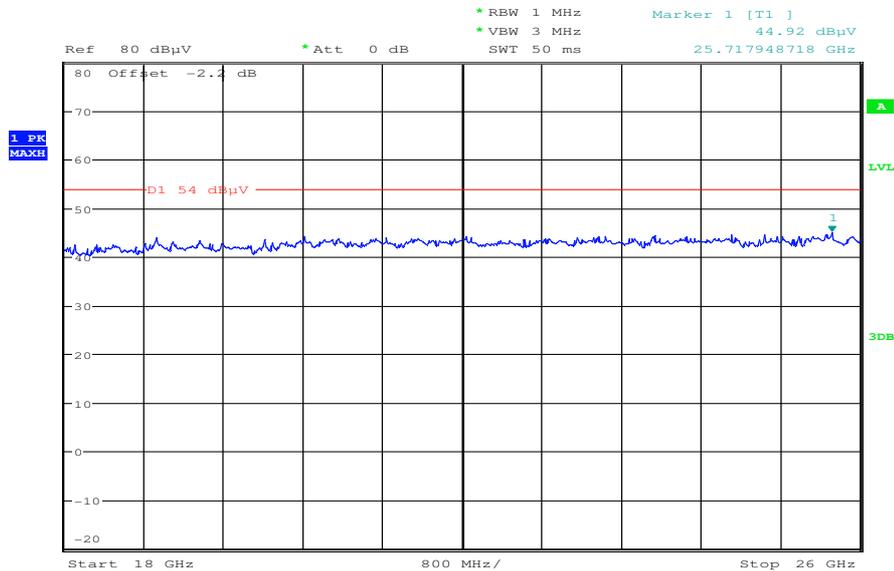


Plot 8: 12 GHz to 18 GHz, 5230 MHz, vertical & horizontal polarization



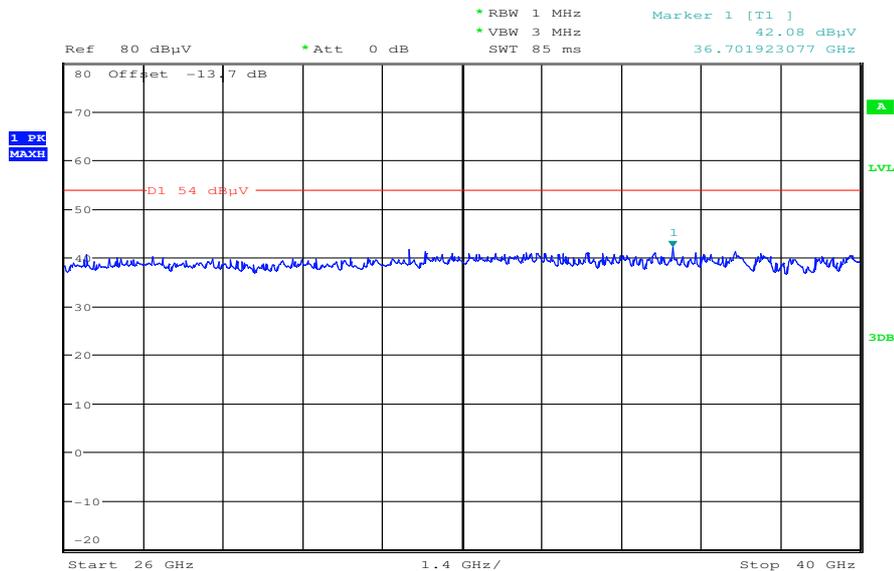
Date: 21.JAN.2013 15:48:41

Plot 9: 18 GHz to 26 GHz, 5230 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:11:13

Plot 10: 26 GHz to 40 GHz, 5230 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:49:47

Plot 11: 30 MHz to 1 GHz, 5270 MHz, vertical & horizontal polarization

Common Information

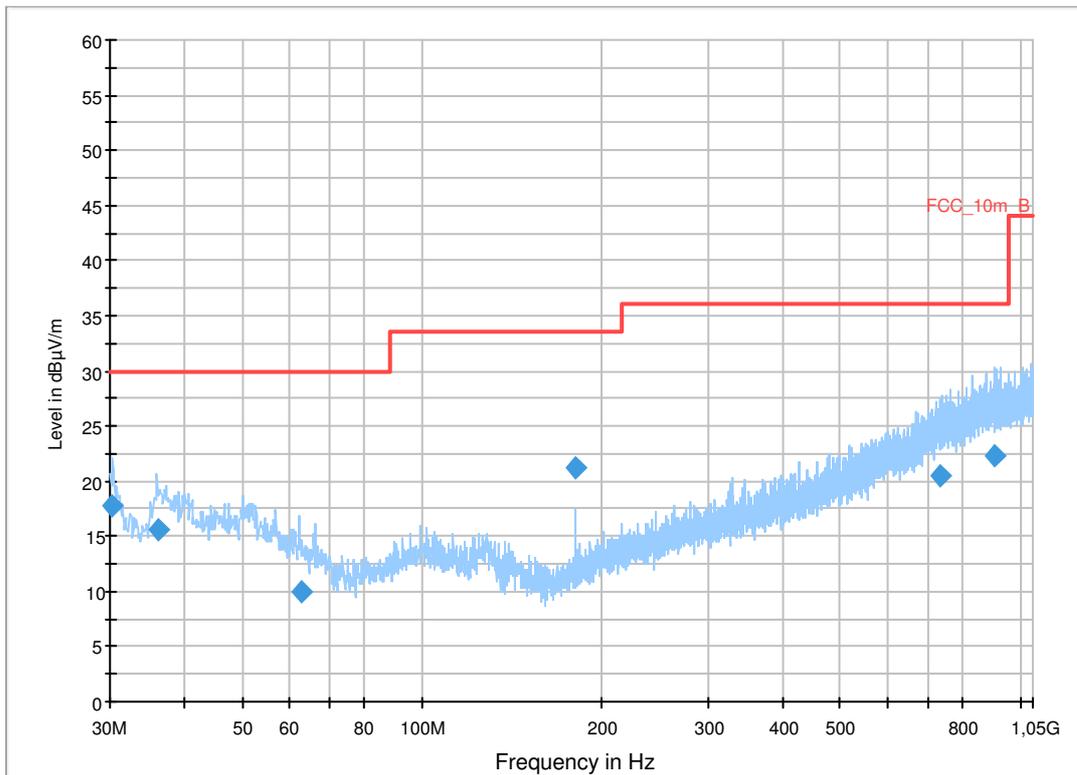
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN n-mode HT40 Ch. 54 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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 (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.222941	17.8	1000.0	120.000	111.0	V	100.0	12.5	12.2	30.0	
36.044700	15.6	1000.0	120.000	120.0	V	88.0	13.1	14.4	30.0	
62.758500	9.9	1000.0	120.000	170.0	V	270.0	10.9	20.1	30.0	
179.962800	21.3	1000.0	120.000	143.0	V	10.0	10.4	12.2	33.5	
732.141750	20.4	1000.0	120.000	170.0	H	90.0	23.2	15.6	36.0	
904.591950	22.2	1000.0	120.000	170.0	V	267.0	25.2	13.8	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

Signal Path: without Notch
FW 1.0

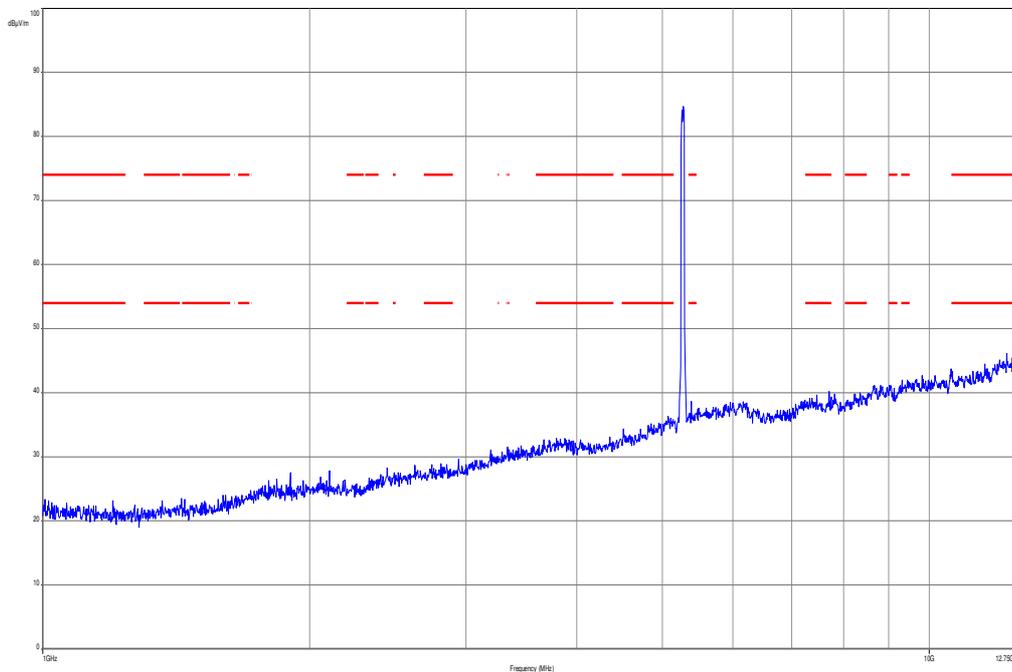
Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

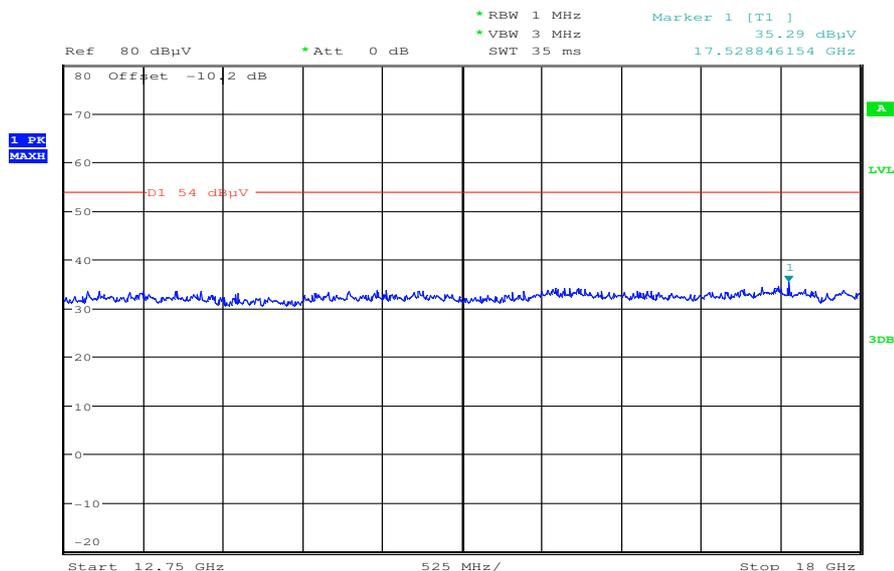
Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.52

Plot 12: 1 GHz to 12.75 GHz, 5270 MHz, vertical & horizontal polarization

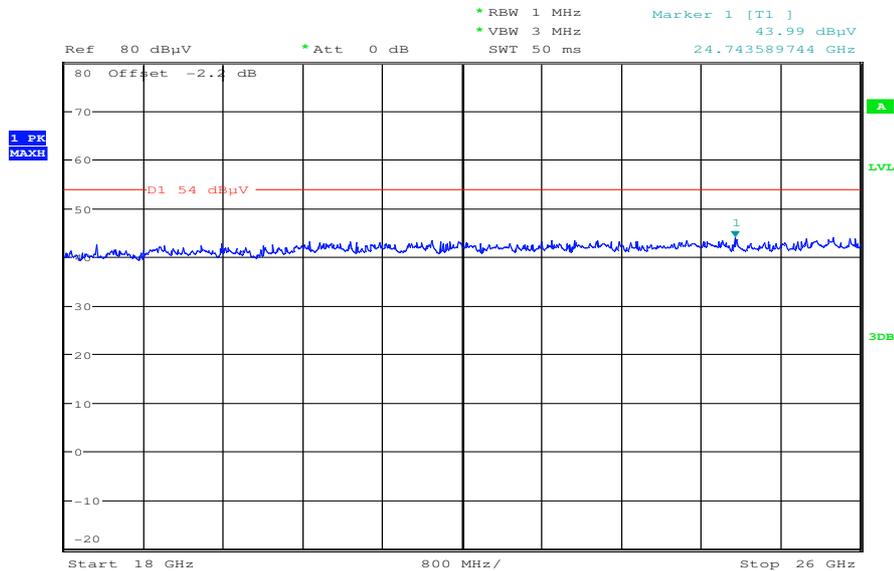


Plot 13: 12 GHz to 18 GHz, 5270 MHz, vertical & horizontal polarization



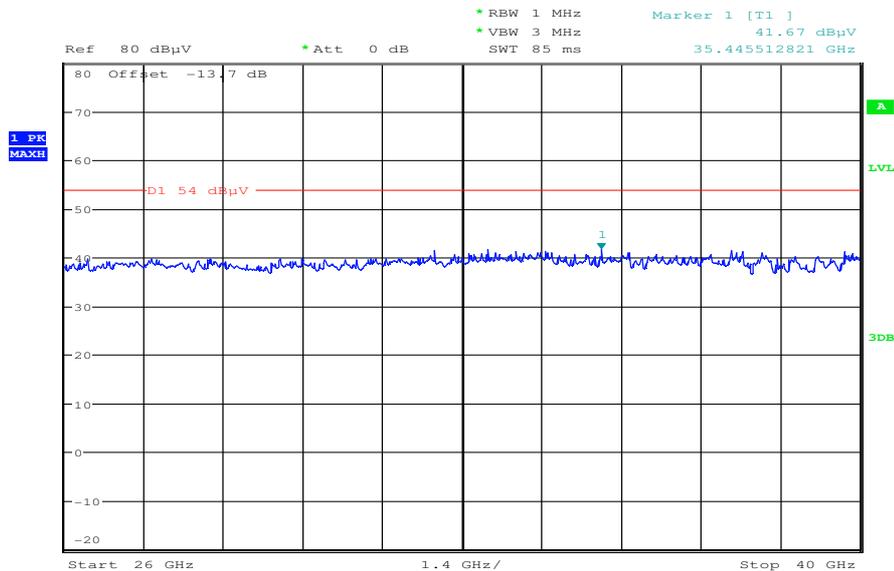
Date: 21.JAN.2013 15:49:51

Plot 14: 18 GHz to 26 GHz, 5270 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:00:43

Plot 15: 26 GHz to 40 GHz, 5270 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:50:38

Plot 16: 30 MHz to 1 GHz, 5310 MHz, vertical & horizontal polarization

Common Information

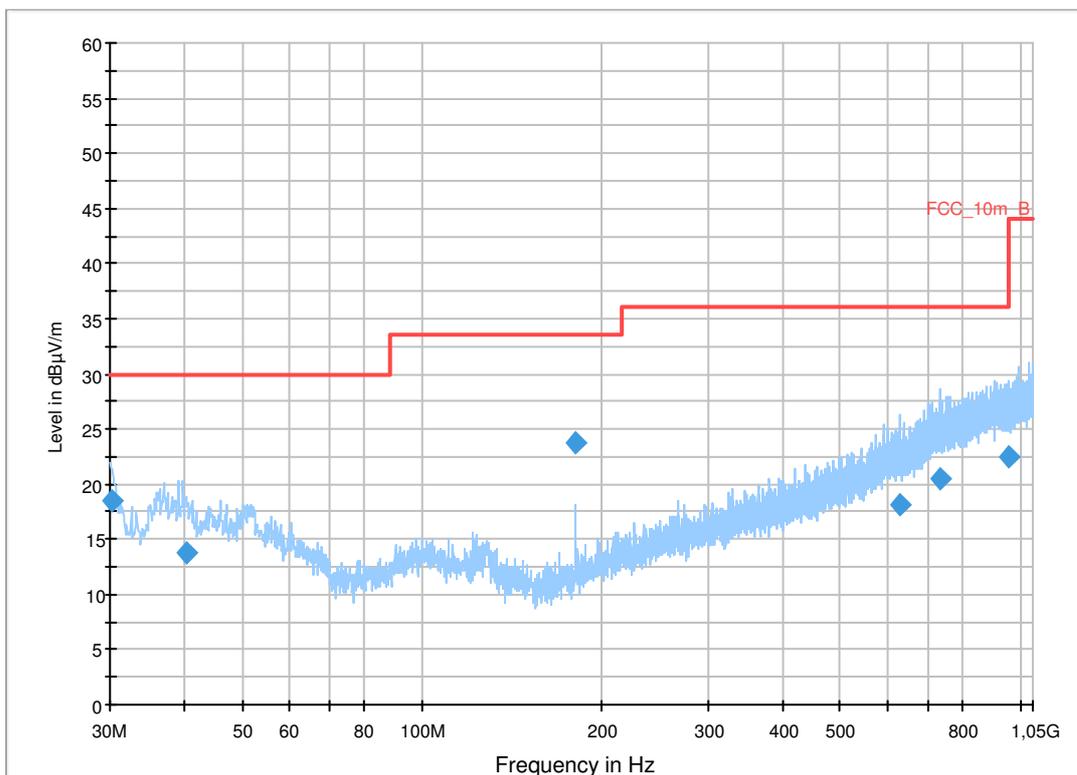
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN n-mode HT40 Ch. 62 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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 (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.119325	18.4	1000.0	120.000	121.0	V	190.0	12.5	11.6	30.0	
40.409850	13.7	1000.0	120.000	133.0	V	10.0	13.4	16.3	30.0	
179.993400	23.7	1000.0	120.000	170.0	V	81.0	10.4	9.8	33.5	
628.636650	18.1	1000.0	120.000	170.0	V	170.0	21.0	17.9	36.0	
733.186350	20.4	1000.0	120.000	170.0	H	100.0	23.3	15.6	36.0	
957.870300	22.4	1000.0	120.000	98.0	V	-10.0	25.4	13.6	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

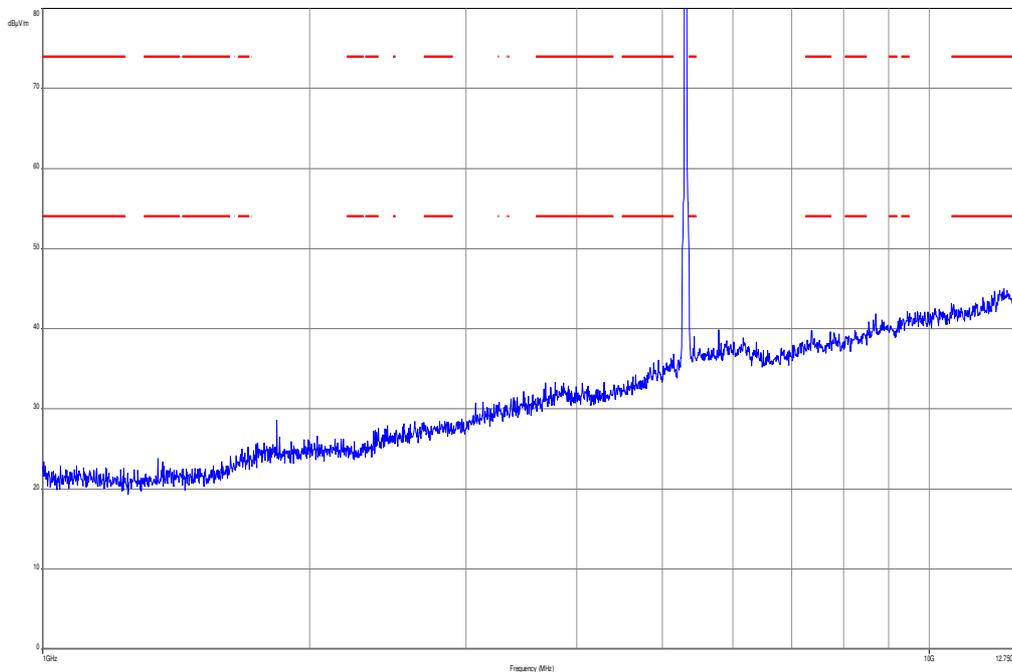
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

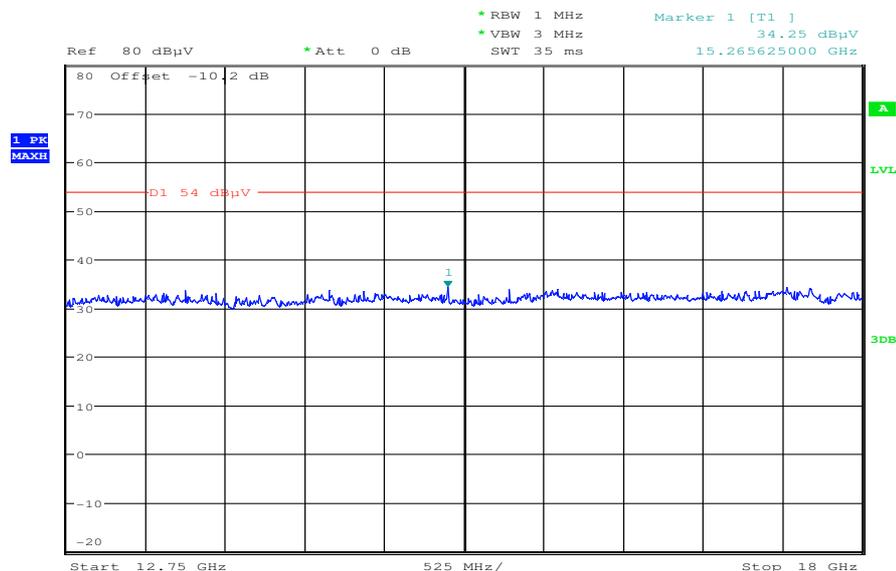
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 17: 1 GHz to 12.75 GHz, 5310 MHz, vertical & horizontal polarization

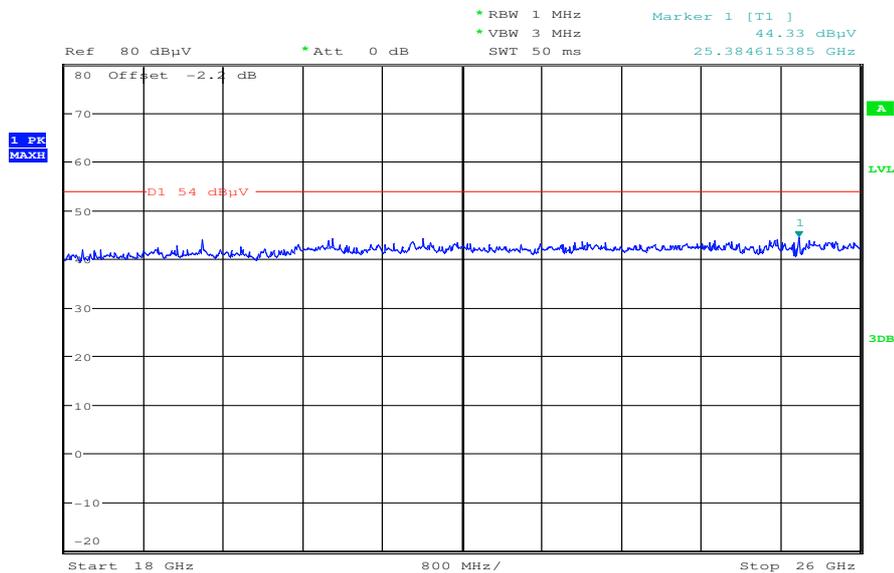


Plot 18: 12 GHz to 18 GHz, 5310 MHz, vertical & horizontal polarization



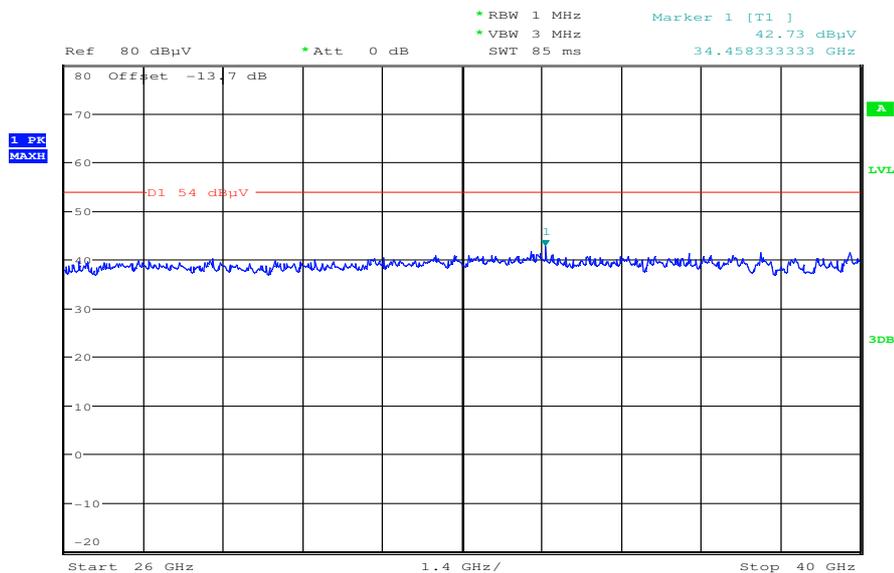
Date: 21.JAN.2013 15:50:16

Plot 19: 18 GHz to 26 GHz, 5310 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 15:59:46

Plot 20: 26 GHz to 40 GHz, 5310 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:51:20

Plot 21: 30 MHz to 1 GHz, 5510 MHz, vertical & horizontal polarization

Common Information

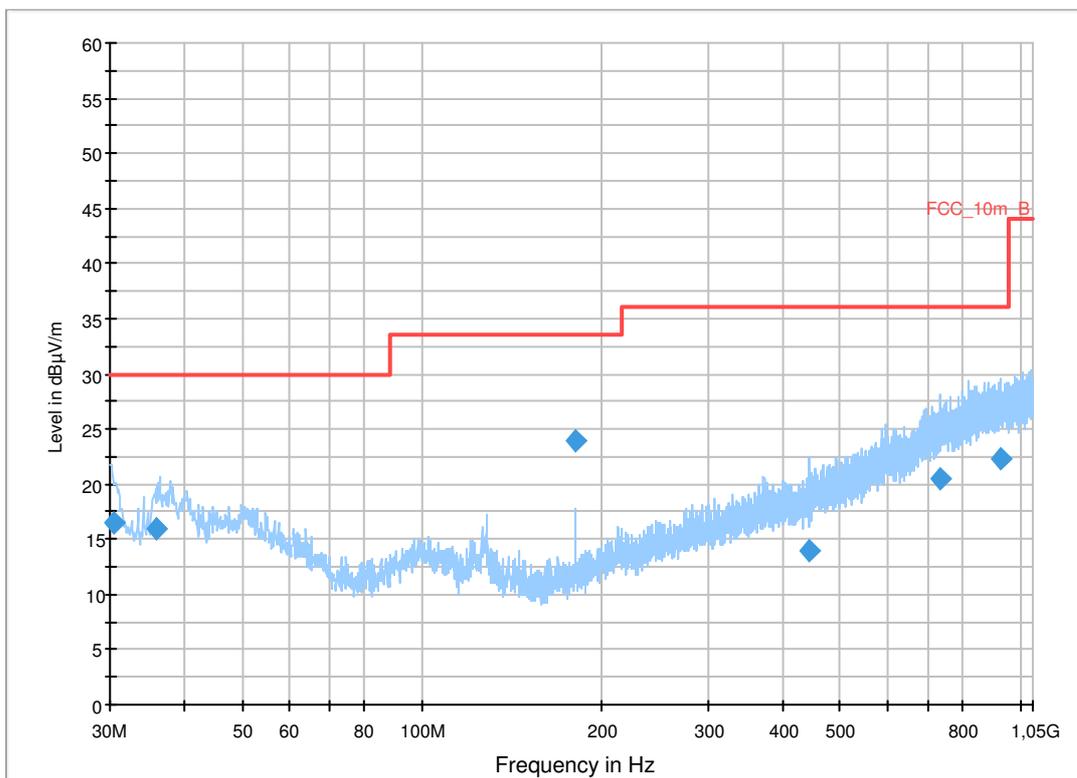
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN n-mode HT40 Ch. 102 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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
30.553628	16.6	1000.0	120.000	98.0	V	100.0	12.6	13.4	30.0	
35.863650	15.9	1000.0	120.000	98.0	V	-10.0	13.1	14.1	30.0	
179.972100	24.0	1000.0	120.000	98.0	V	10.0	10.4	9.5	33.5	
442.266450	13.9	1000.0	120.000	170.0	H	90.0	17.5	22.1	36.0	
733.298250	20.4	1000.0	120.000	170.0	V	183.0	23.3	15.6	36.0	
928.304850	22.3	1000.0	120.000	161.0	H	261.0	25.3	13.7	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

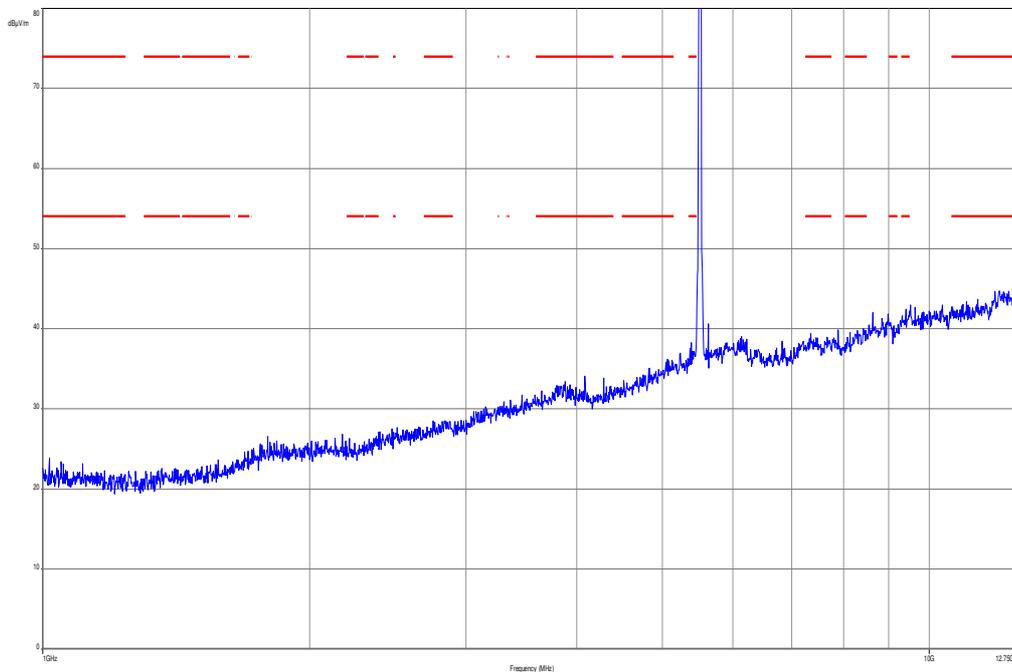
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

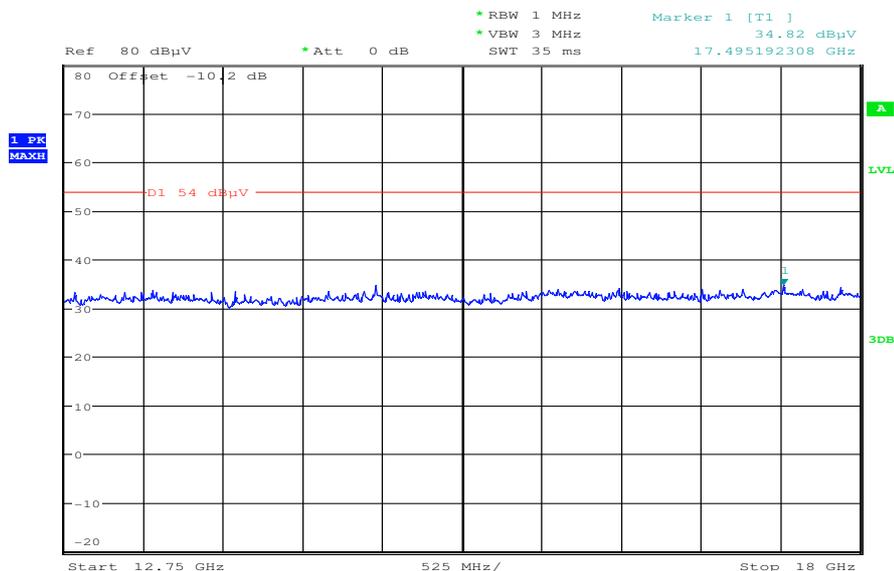
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 22: 1 GHz to 12.75 GHz, 5510 MHz, vertical & horizontal polarization

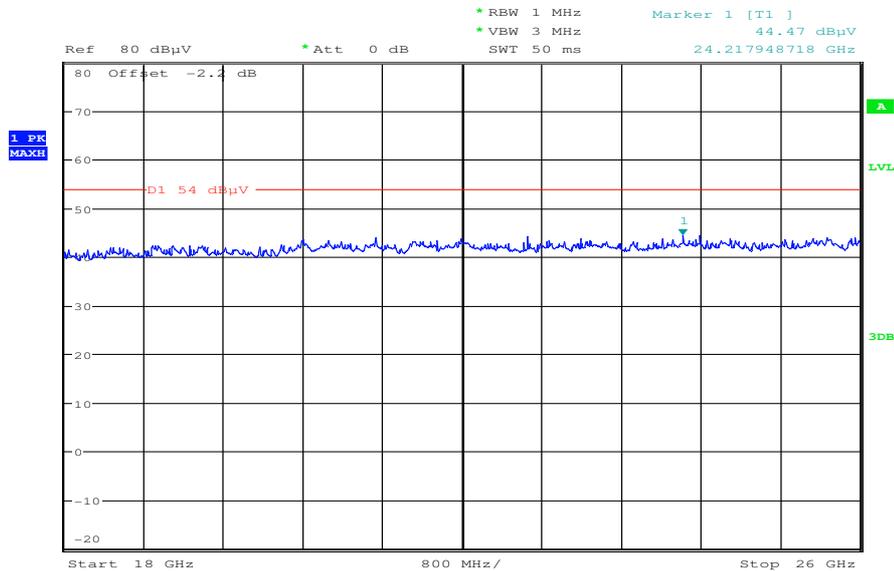


Plot 23: 12 GHz to 18 GHz, 5510 MHz, vertical & horizontal polarization



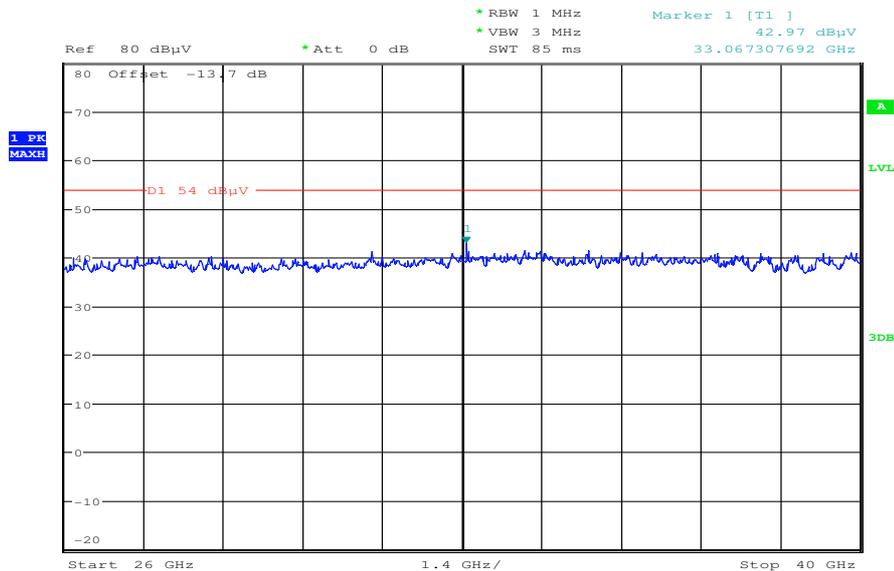
Date: 21.JAN.2013 15:51:17

Plot 24: 18 GHz to 26 GHz, 5510 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 15:58:19

Plot 25: 26 GHz to 40 GHz, 5510 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:52:09

Plot 26: 30 MHz to 1 GHz, 5590 MHz, vertical & horizontal polarization

Common Information

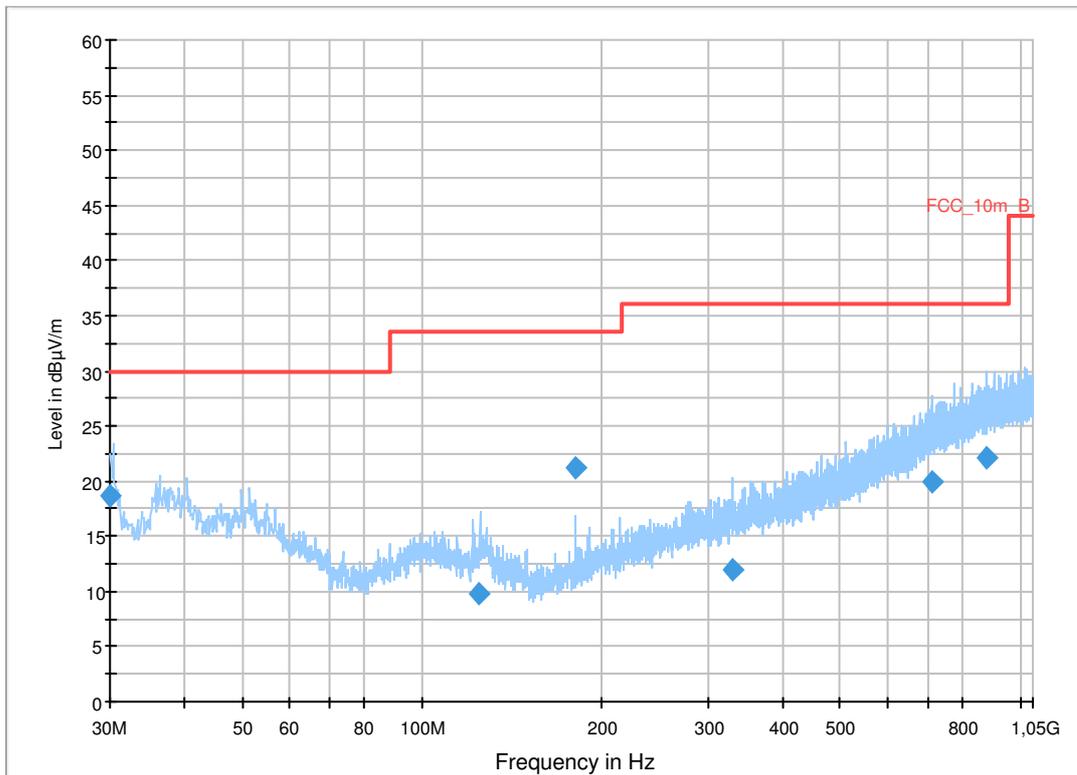
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN n-mode HT40 Ch. 118 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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
30.105742	18.7	1000.0	120.000	111.0	V	182.0	12.5	11.3	30.0	
124.499850	9.7	1000.0	120.000	170.0	V	100.0	9.9	23.8	33.5	
179.991000	21.2	1000.0	120.000	98.0	V	280.0	10.4	12.3	33.5	
330.999450	11.9	1000.0	120.000	170.0	V	85.0	15.5	24.1	36.0	
713.590350	19.9	1000.0	120.000	170.0	H	170.0	22.8	16.1	36.0	
881.247000	22.1	1000.0	120.000	170.0	V	100.0	25.0	13.9	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

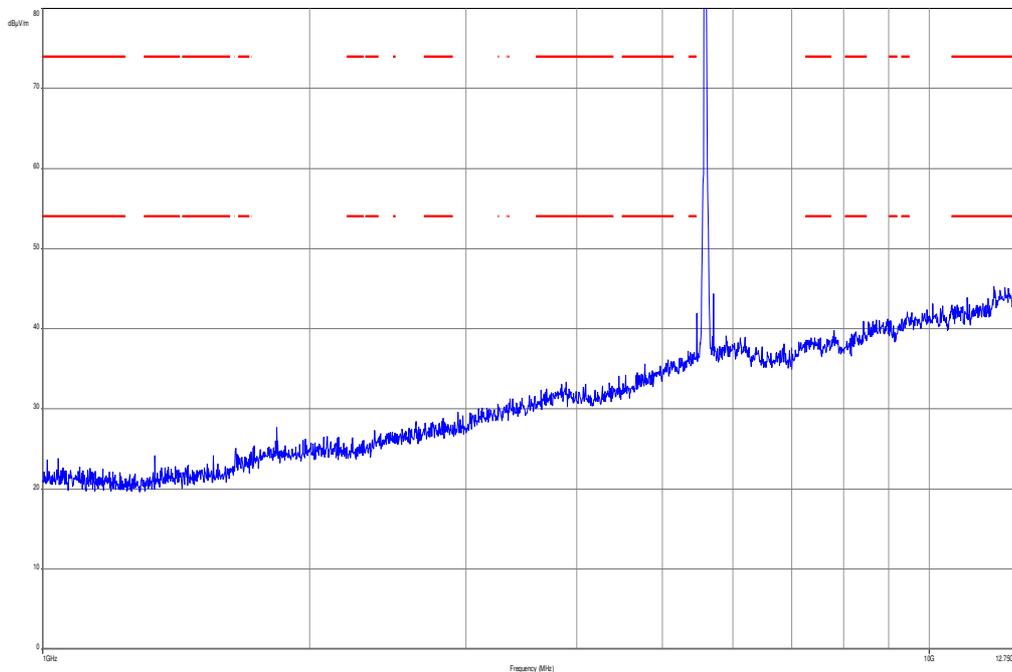
Signal Path: without Notch
FW 1.0

Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

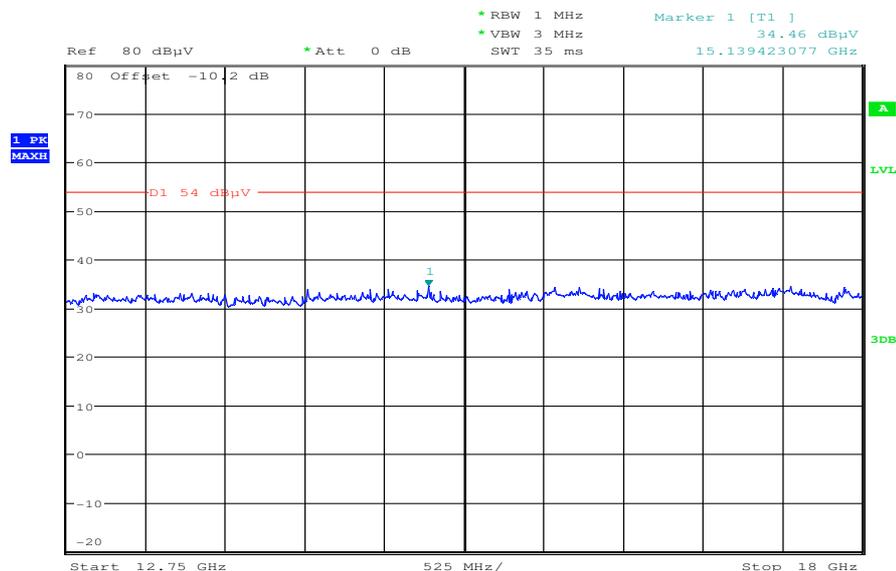
Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 27: 1 GHz to 12.75 GHz, 5590 MHz, vertical & horizontal polarization

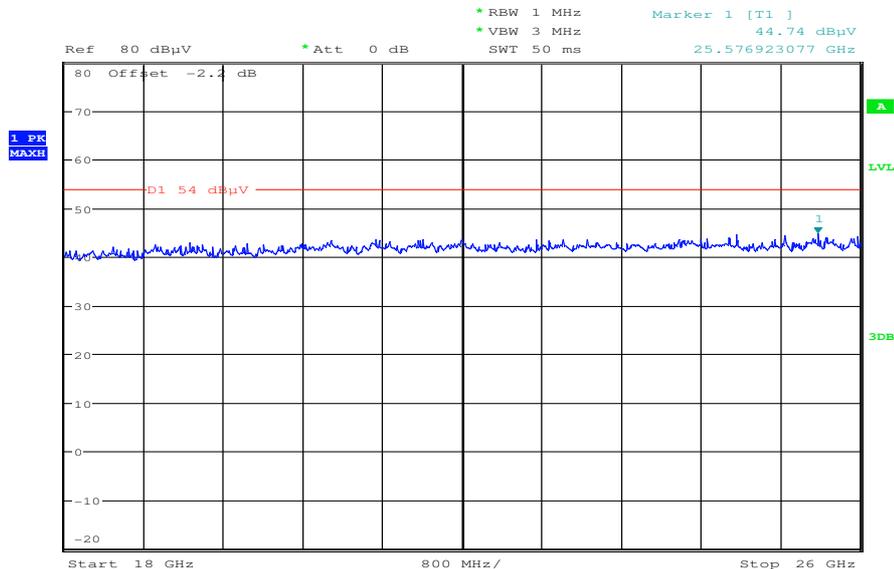


Plot 28: 12 GHz to 18 GHz, 5590 MHz, vertical & horizontal polarization



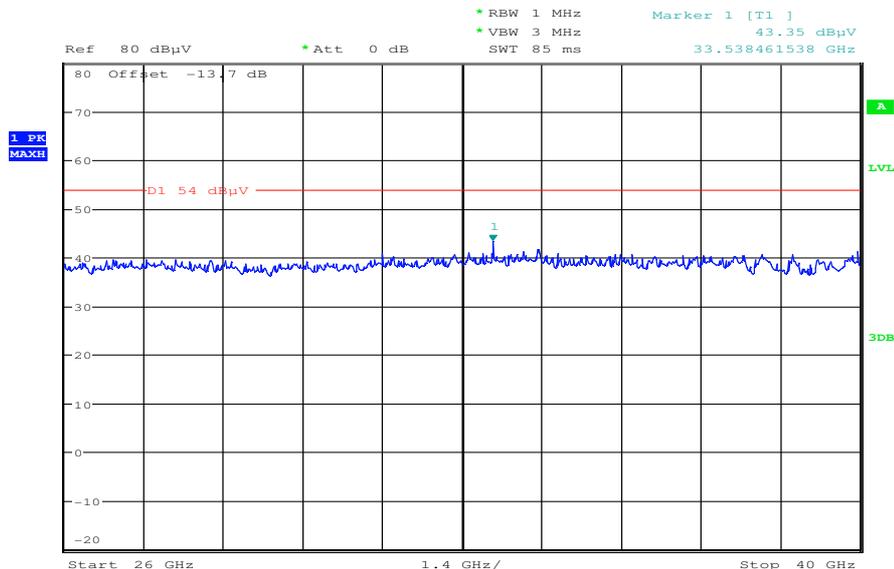
Date: 21.JAN.2013 15:52:34

Plot 29: 18 GHz to 26 GHz, 5590 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 15:57:24

Plot 30: 26 GHz to 40 GHz, 5590 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:53:02

Plot 31: 30 MHz to 1 GHz, 5670 MHz, vertical & horizontal polarization

Common Information

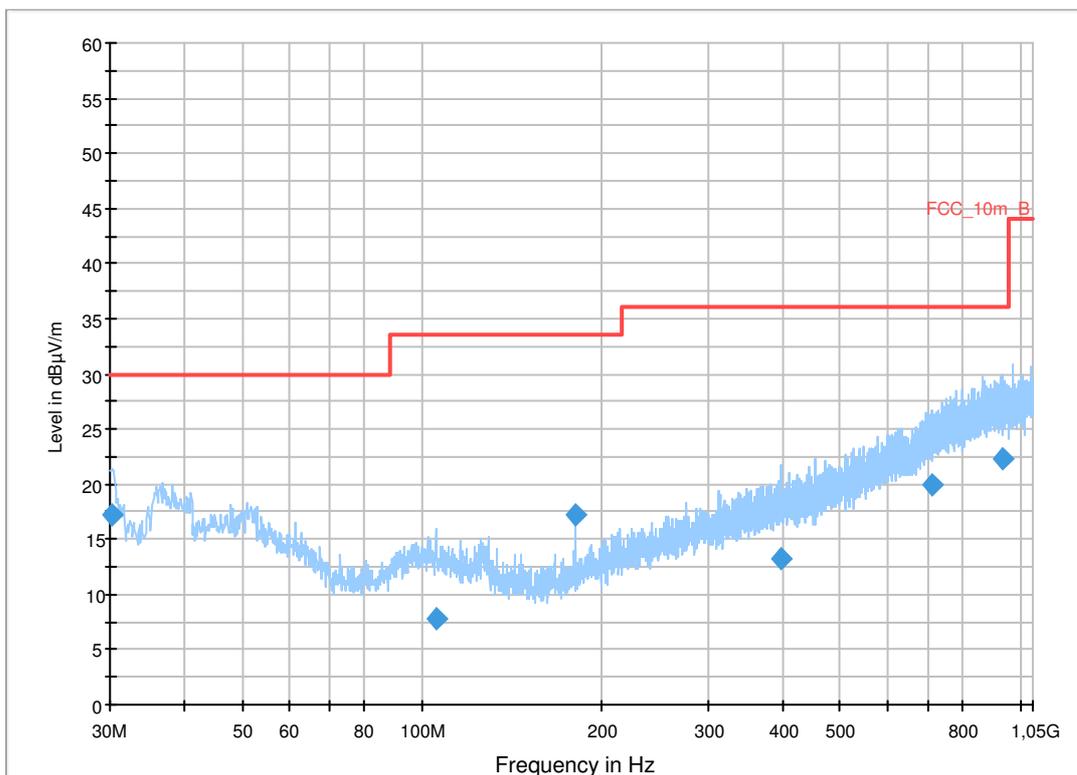
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: TX WLAN n-mode HT40 Ch. 134 + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

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

FCC_10m(B)_3



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
30.249126	17.3	1000.0	120.000	112.0	V	280.0	12.5	12.7	30.0	
105.658350	7.8	1000.0	120.000	111.0	V	100.0	11.4	25.7	33.5	
180.004050	17.2	1000.0	120.000	121.0	V	170.0	10.4	16.3	33.5	
398.416350	13.3	1000.0	120.000	170.0	V	80.0	16.9	22.8	36.0	
710.688900	19.9	1000.0	120.000	170.0	H	180.0	22.8	16.1	36.0	
934.823250	22.3	1000.0	120.000	151.0	V	92.0	25.3	13.7	36.0	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

Frequency Range: 30 MHz - 2 GHz

Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42

Signal Path: without Notch
FW 1.0

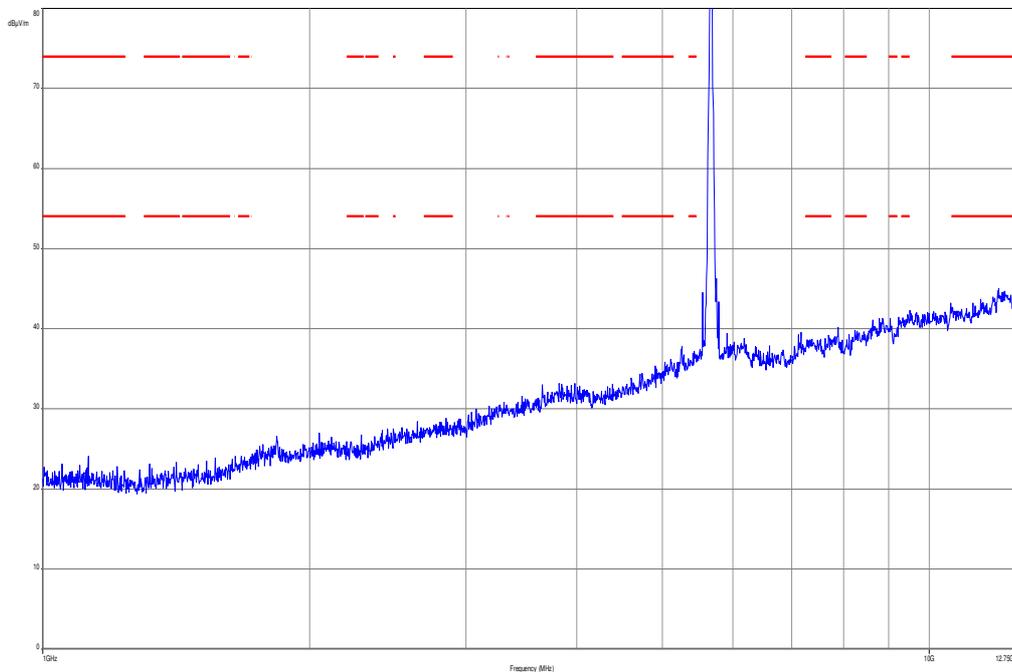
Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)

Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12

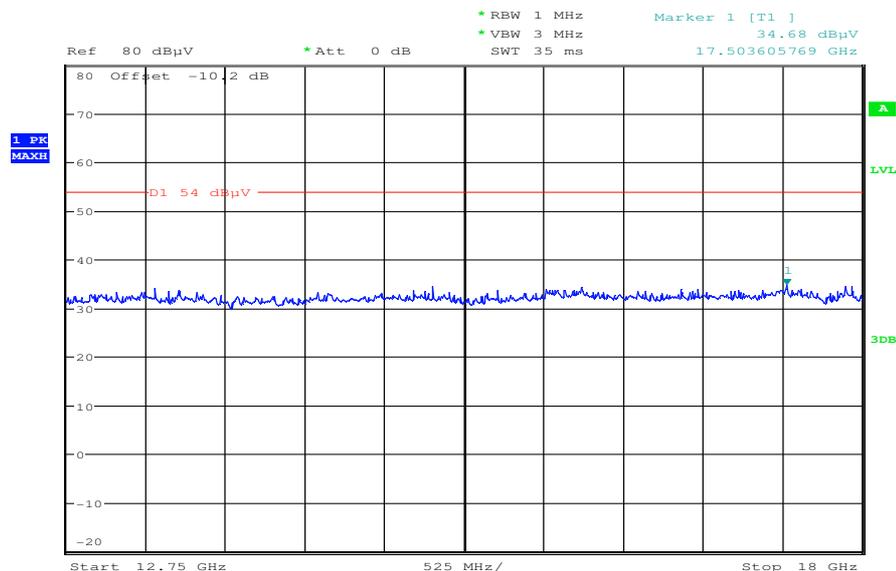
Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.52

Plot 32: 1 GHz to 12.75 GHz, 5670 MHz, vertical & horizontal polarization

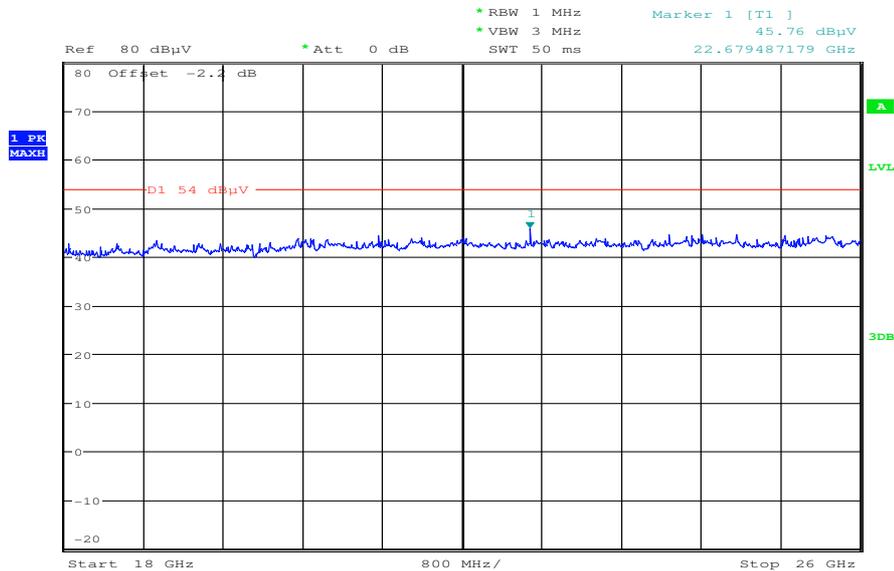


Plot 33: 12 GHz to 18 GHz, 5670 MHz, vertical & horizontal polarization



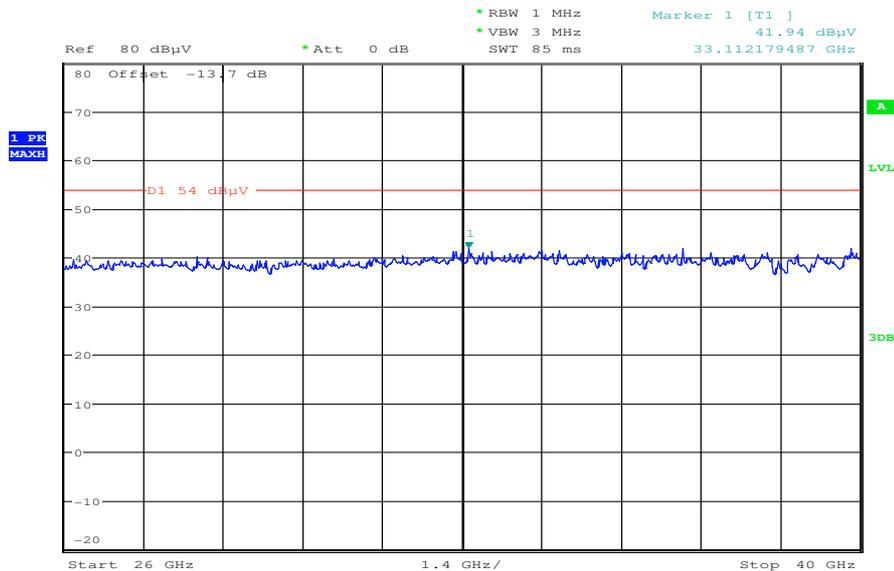
Date: 21.JAN.2013 15:53:42

Plot 34: 18 GHz to 26 GHz, 5670 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 15:56:14

Plot 35: 26 GHz to 40 GHz, 5670 MHz, vertical & horizontal polarization



Date: 21.JAN.2013 16:54:05

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 40 GHz
Trace-Mode:	Max Hold / Average with 100 counts + 20 log (1 / X) for duty cycle lower than 100 %

Limits:

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

Results:

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

Result: Passed

Plots: RX / Idle – mode

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

Common Information

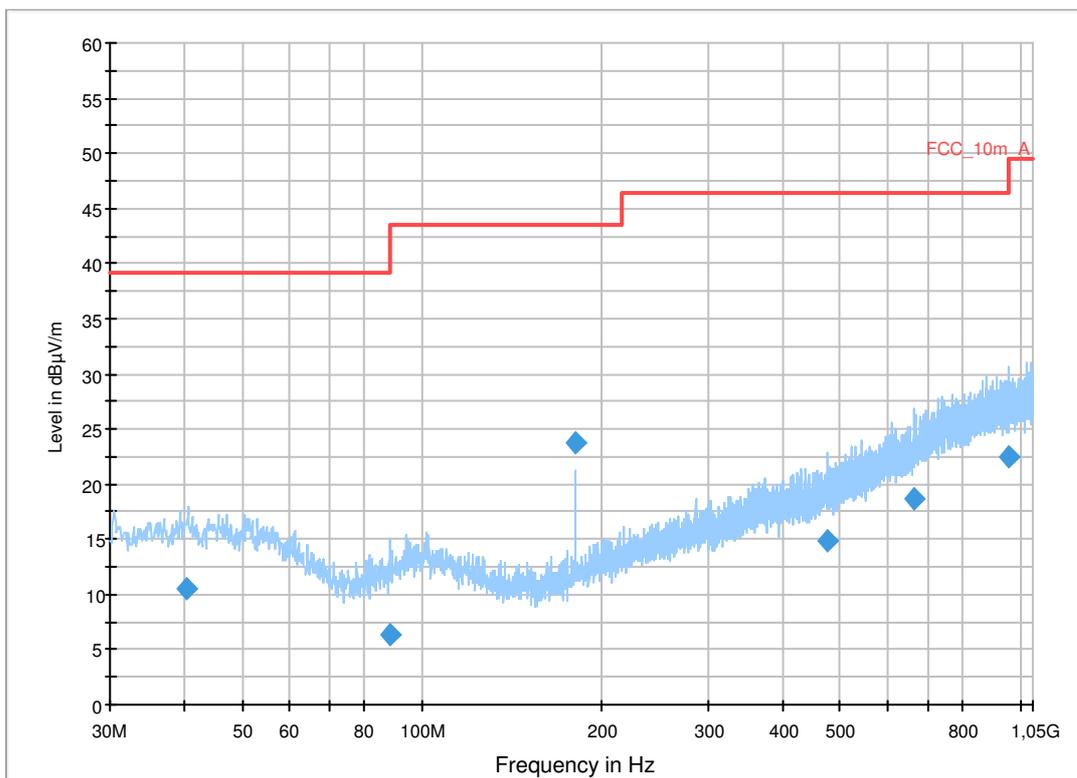
EUT: TM-0000-BV
 Serial Number: CB5A1MD99N
 Test Description: FCC part 15 class B @ 10m
 Operating Conditions: WLAN RX + charging
 Operator Name: Medrow
 Comment: AC: 115 V / 60 Hz

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(A)_3



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
40.249350	10.5	1000.0	120.000	220.0	V	-39.0	13.4	28.6	39.1	
88.567350	6.3	1000.0	120.000	220.0	H	67.0	10.3	37.2	43.5	
179.984400	23.8	1000.0	120.000	132.0	V	230.0	10.4	19.7	43.5	
475.435950	14.8	1000.0	120.000	220.0	V	175.0	18.2	31.6	46.4	
664.126950	18.7	1000.0	120.000	220.0	V	9.0	21.5	27.7	46.4	
953.589450	22.6	1000.0	120.000	122.0	V	34.0	25.4	23.8	46.4	

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

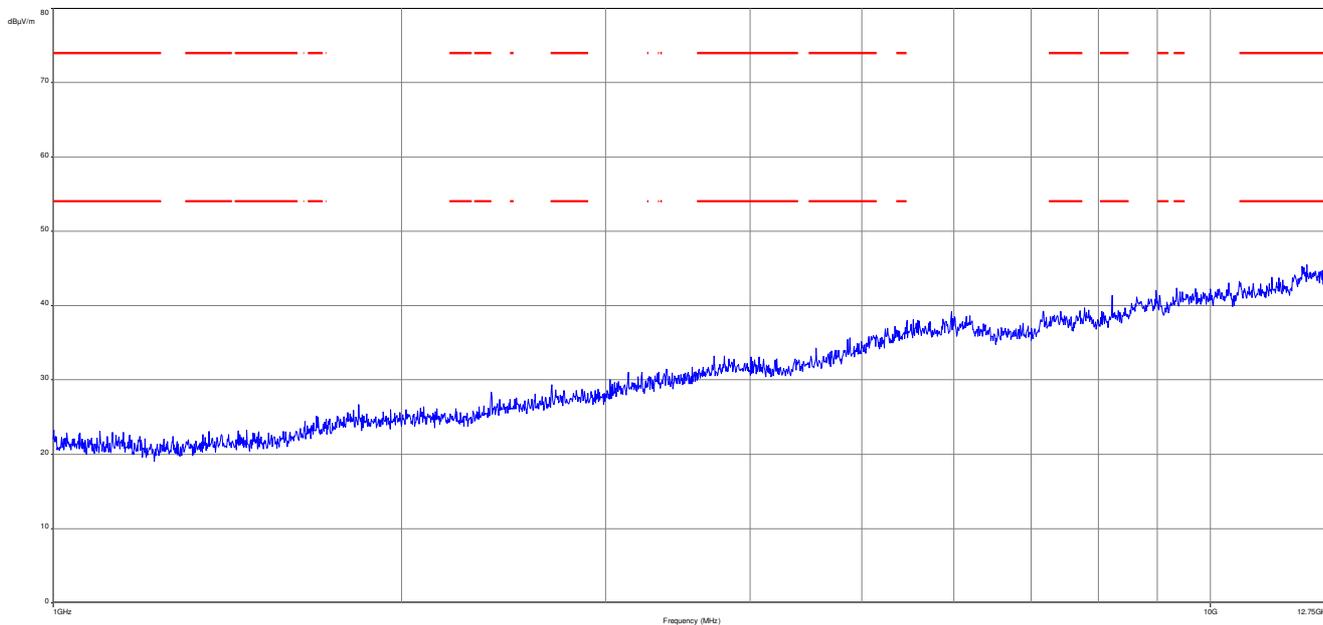
Subrange 1

Frequency Range: 30 MHz - 2 GHz

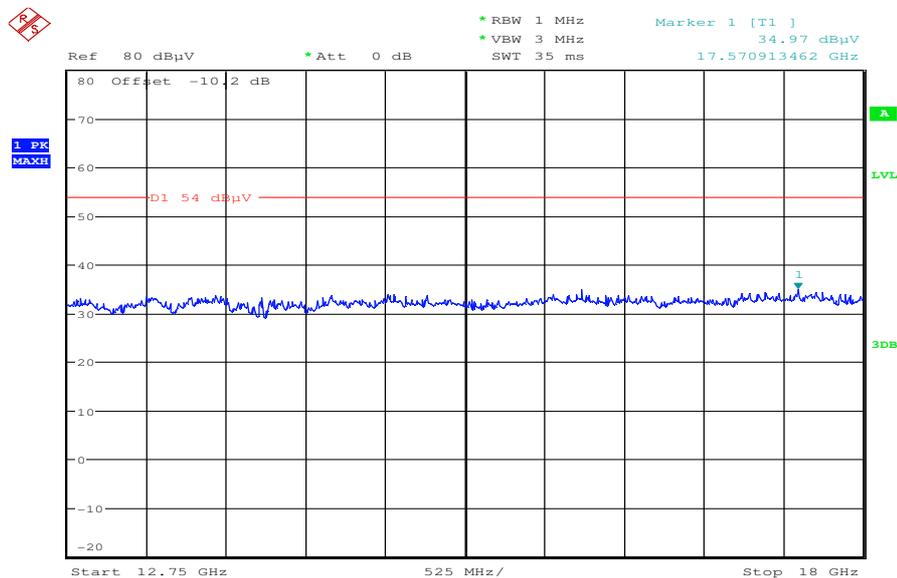
Receiver: Receiver [ESCI 3]
@ GPIB0 (ADR 20), SN 100083/003, FW 4.42Signal Path: without Notch
FW 1.0Antenna: VULB 9163
SN 9163-295, FW ---
Correction Table (vertical): VULP6113
Correction Table (horizontal): VULP6113
Correction Table (vertical): Cable_EN_1GHz (1005)
Correction Table (horizontal): Cable_EN_1GHz (1005)Antenna Tower: Tower [EMCO 2090 Antenna Tower]
@ GPIB0 (ADR 8), FW REV 3.12Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.52

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

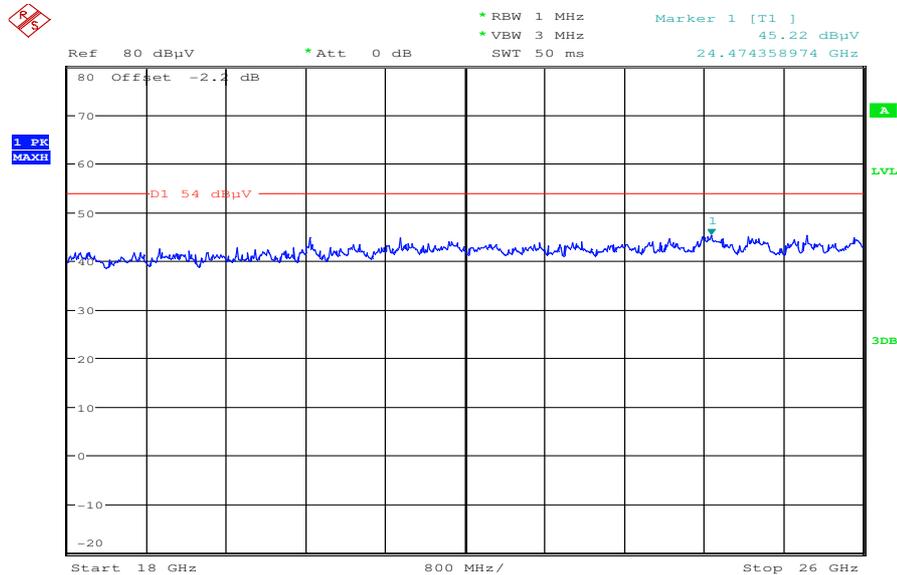


Plot 3: 12 GHz to 18 GHz, vertical & horizontal polarization



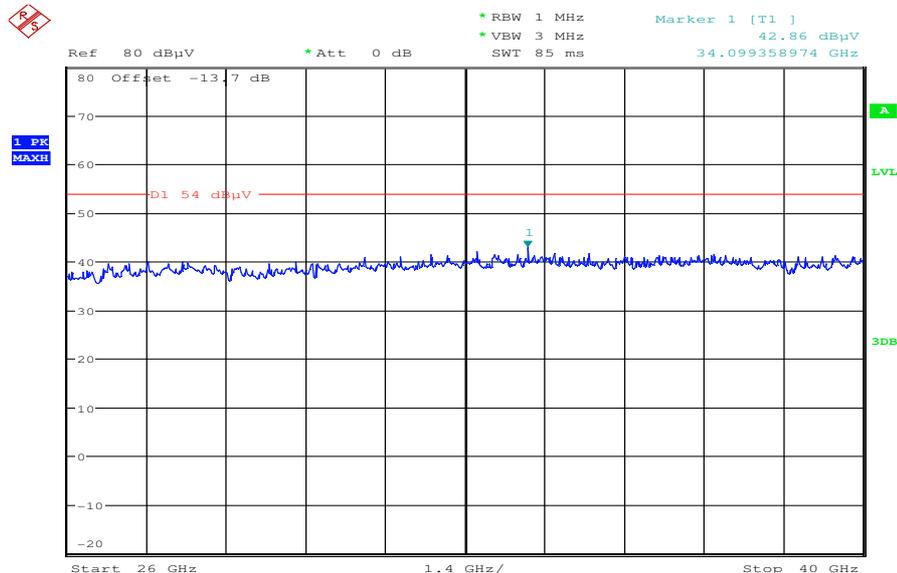
Date: 16.JAN.2013 08:06:31

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



Date: 16.JAN.2013 08:08:50

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



Date: 16.JAN.2013 08:50:23

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 middle channel. This measurement is representative for all channels and modes. If critical peaks are found the lowest channel and the highest channel 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

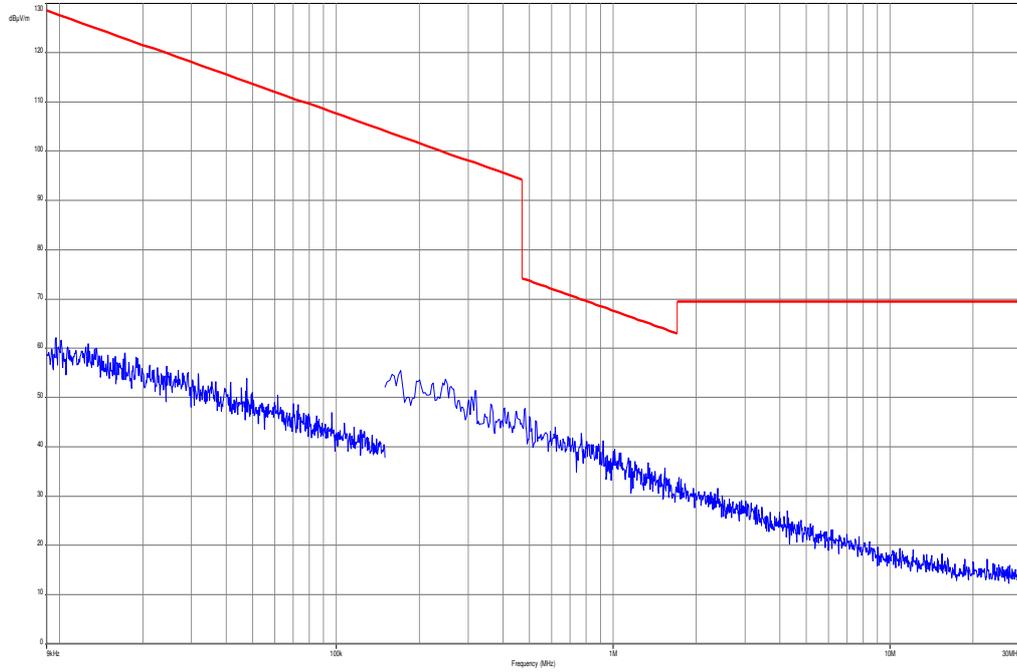
Results:

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

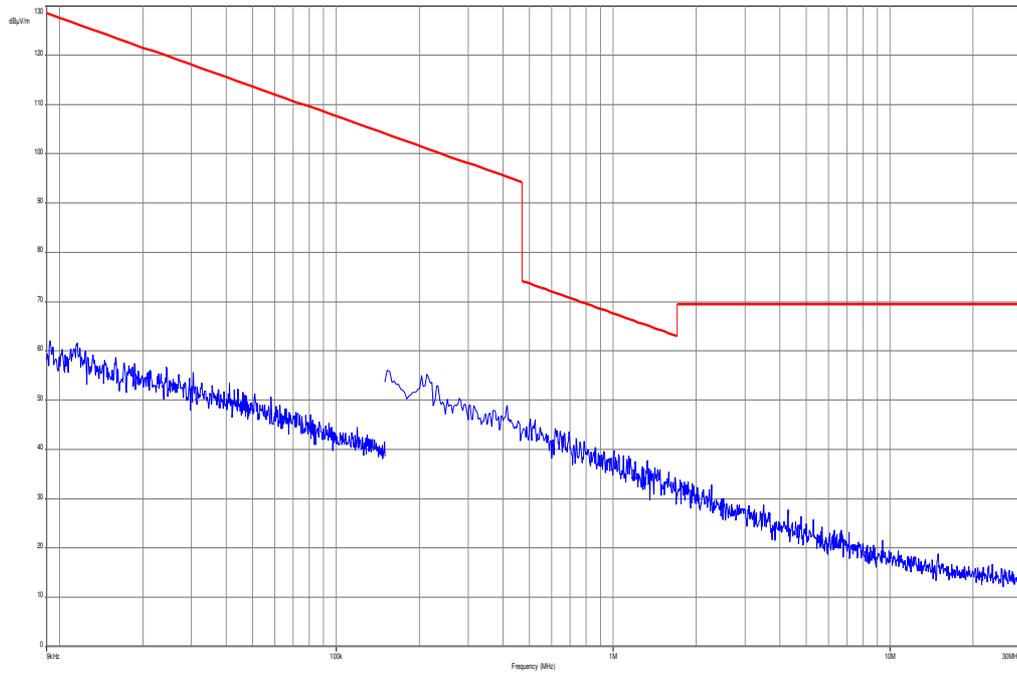
Result: Passed

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 middle channel. If critical peaks are found the lowest channel and the highest channel 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: 9 kHz
Resolution bandwidth:	F > 150 kHz: 100 kHz
Span:	150 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dB μ V/m)	Average (dB μ V/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

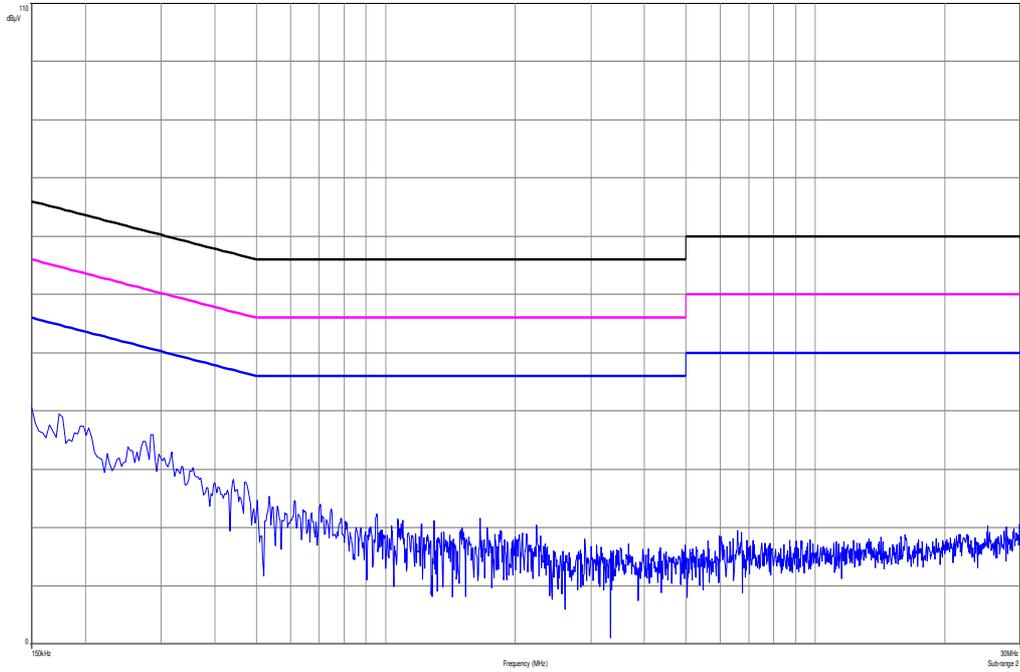
Results:

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

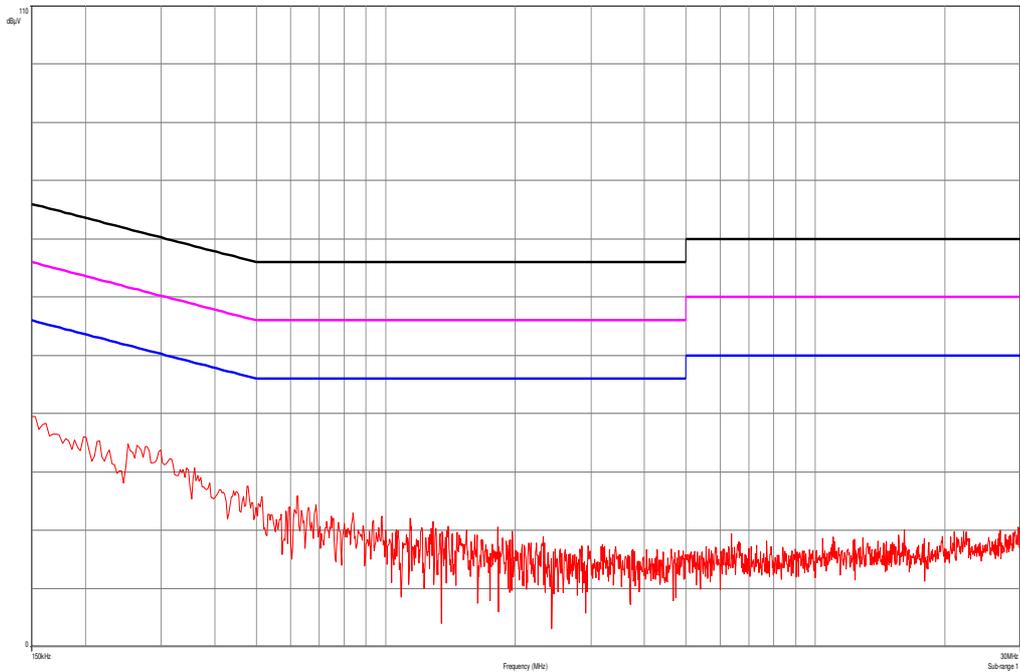
Result: Passed

Plots:

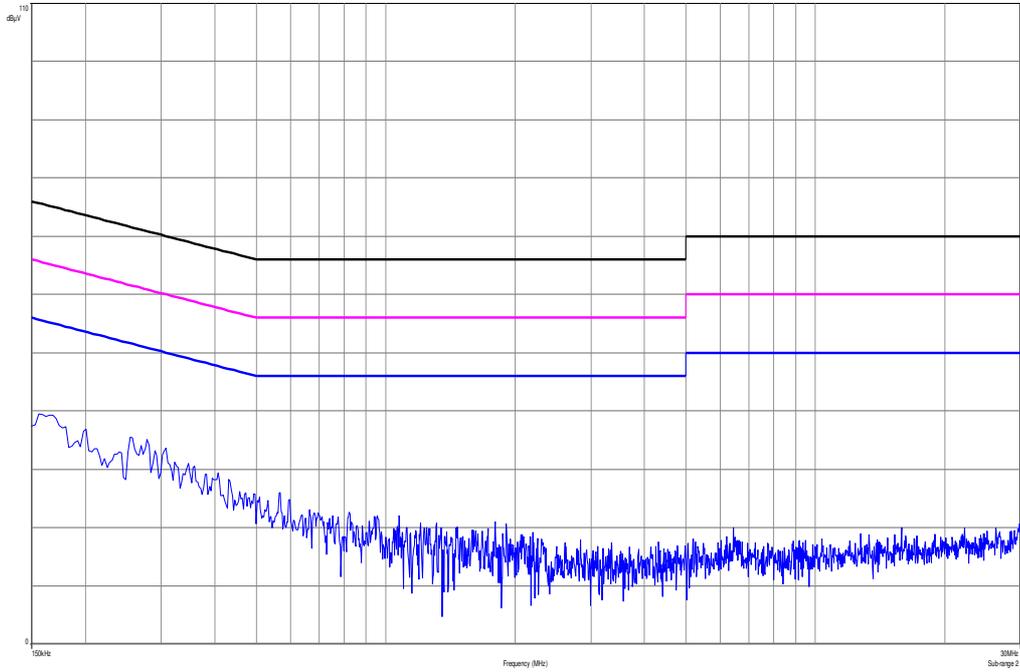
Plot 1: 150 kHz to 30 MHz / phase Line, TX mode



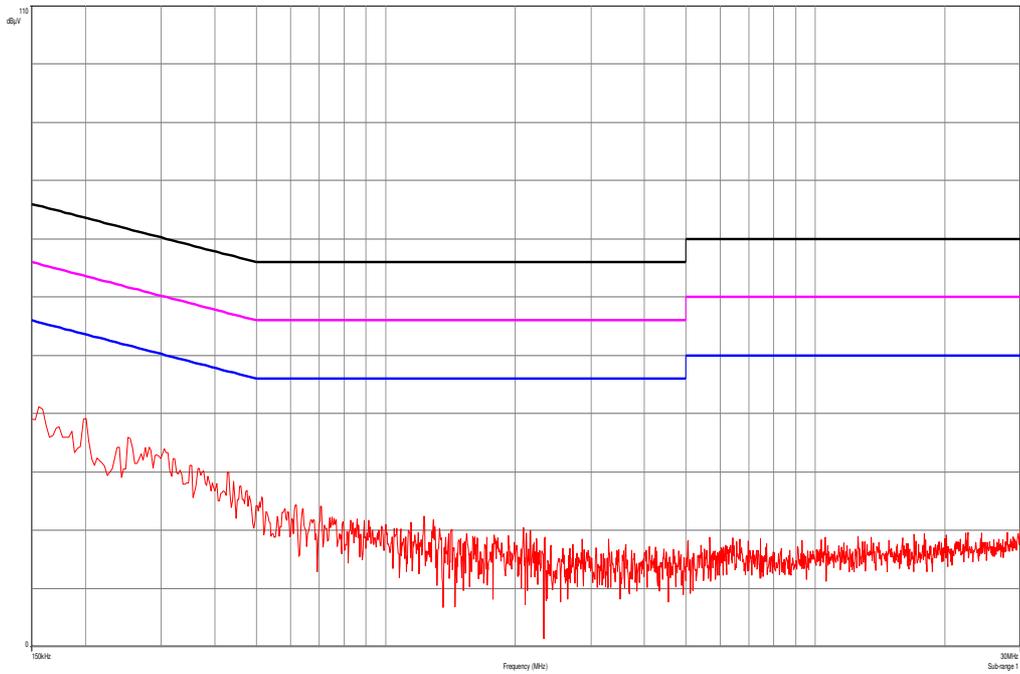
Plot 2: 150 kHz to 30 MHz / neutral Line, TX mode



Plot 3: 150 kHz to 30 MHz / phase Line, RX mode



Plot 4: 150 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	
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	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	12.04.2012	12.04.2014
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	06.01.2012	06.01.2014
12	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIK!!	11.05.2011	11.05.2013
13	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
14	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
15	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
16	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
17	9	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
18	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
19	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
20	n. a.	Highpass Filter	WHKX7.0/1 8G-8SS	Wainwright	18	300003789	ne		
21	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vIK!!	14.10.2011	14.10.2014
22	n. a.	MXE EMI	N9038A	Agilent	MY51210197	300004405	k	19.12.2011	

		Receiver 20 Hz bis 26,5 GHz		Technologies					
23	CR 79	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751	ne		
24	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
25	A025	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000786	ne		
26	A027	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300000486	ne		
27	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL18503 070-XX	CERNEX	19338	300004273	ne		
28	n. a.	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004xxx	k	22.10.2012	22.10.2013

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

11 Observations

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

Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2013-02-15

Annex E Further information

Glossary

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

Annex F Accreditation Certificate



Deutsche Akkreditierungsstelle GmbH
German Accreditation Body

Entrusted according to Section 8 subsection 1, AkkStellG in connection with Section 1 subsection 3, AKKStellG DV
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)
- RFD
- WiMax and Richtfunk
- Mobile radio (GSM / GPRS), Over the Air (OTA) Performance
- Electromagnetic Compatibility (EMC) incl. Automotive
- Product safety
- Safety 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 its 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**

Frankfurt am Main, 13.04.2011

[Signature]
Dr. Ina. H. K. B. B. B. B.
Head of Office 2

This document is a translation. The definitive version is the original German accreditation certificate.
Annex 1

Front side of certificate

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 39
10117 Berlin

Office Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Office Braunschweig
Bundesallee 500
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAKKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned above.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAKKS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStellG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No. 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 16). DAKKS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iafno.com

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