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consulting - testing - certification >>>

TEST REPORT

Test report no.: 1-4254/12-47-10-A

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

Testing laboratory

CETECOM ICT Services GmbH
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.cetecom.com
e-mail: ict@cetecom.com

Accredited Testing Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01
Area of Testing: Radio/Satellite Communications

Applicant

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

Manufacturer

Sony Mobile Communications AB
Nya Vattentornet
22188 Lund / SWEDEN

Test standard/s

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

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

Test Item

Kind of test item:	**GSM Mobile Phone GPRS/EGPRS 850/900/1800/1900; UMTS HSPA FDDI/V/VI/XIX; LTE FDD 1/19/21; WLAN a/b/g/n; BT 3.1; RFID; FM Rx; A-GPS**
Model name:	**PM-0070-BV**
FCC ID:	**PY7PM-0070**
IC:	**-/-**
Frequency:	ISM band 5725 MHz to 5850 MHz (lowest channel 149 – 5745 MHz, highest channel 165 – 5825 MHz
Technology tested:	WLAN (OFDM a, n HT20 & n HT40)
Antenna:	Integrated antenna
Power Supply:	3.7 V DC by Li - polymer battery
Temperature Range:	-20°C to +55 °C

Test report authorised:

2012-09-12 Stefan Bös
Senior Testing Manager

Test performed:

2012-09-12 Marco Bertolino
Testing Manager

1 Table of contents

2 General information

2.1 Notes and disclaimer

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2.2 Application details

Date of receipt of order:	2012-08-02
Date of receipt of test item:	2012-08-08
Start of test:	2012-08-27
End of test:	2012-08-31
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

3.1 Measurement guidance

DTS : KDB 558074	2012-01	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

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:		58 %	
Barometric pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	3.7 V	DC by Li - polymer battery
	V_{max}	4.2 V	
	V_{min}	3.3 V	

5 Test item

Kind of test item	**:**	**GSM Mobile Phone GPRS/EGPRS 850/900/1800/1900; UMTS HSPA FDDI/V/VI/XIX; LTE FDD 1/19/21; WLAN a/b/g/n; BT 3.1; RFID; FM Rx; A-GPS**
Type identification	**:**	**PM-0070-BV**
S/N serial number	**:**	**Radiated units: CB5A1K8J9R, CB5A1K8J5S** **Conducted units: CB5A1K8JGV, CB5A1K8LPZ**
HW hardware status	**:**	**AP1**
SW software status	**:**	**9.0.A.0.120, s_atp_tsubasa_1_0_8_0_e, 9.0.A.172A**
Frequency band [MHz]	**:**	**ISM band 5725 MHz to 5850 MHz** **(lowest channel 149 – 5745 MHz, highest channel 165 – 5825 MHz**
Type of radio transmission **Use of frequency spectrum**	**:** **:**	**OFDM**
Channel access method	**:**	**FDMA**
Type of modulation	**:**	**QPSK, 16-QAM, 64-QAM**
Number of channels	**:**	**a & n HT20 – mode: 5** **n HT40 – mode: 2**
Antenna	**:**	**Integrated antenna**
Power supply	**:**	**3.7 V DC by Li - polymer battery**
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	Passed	2012-09-12	-/-

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

Note: NA = Not Applicable; NP = Not Performed

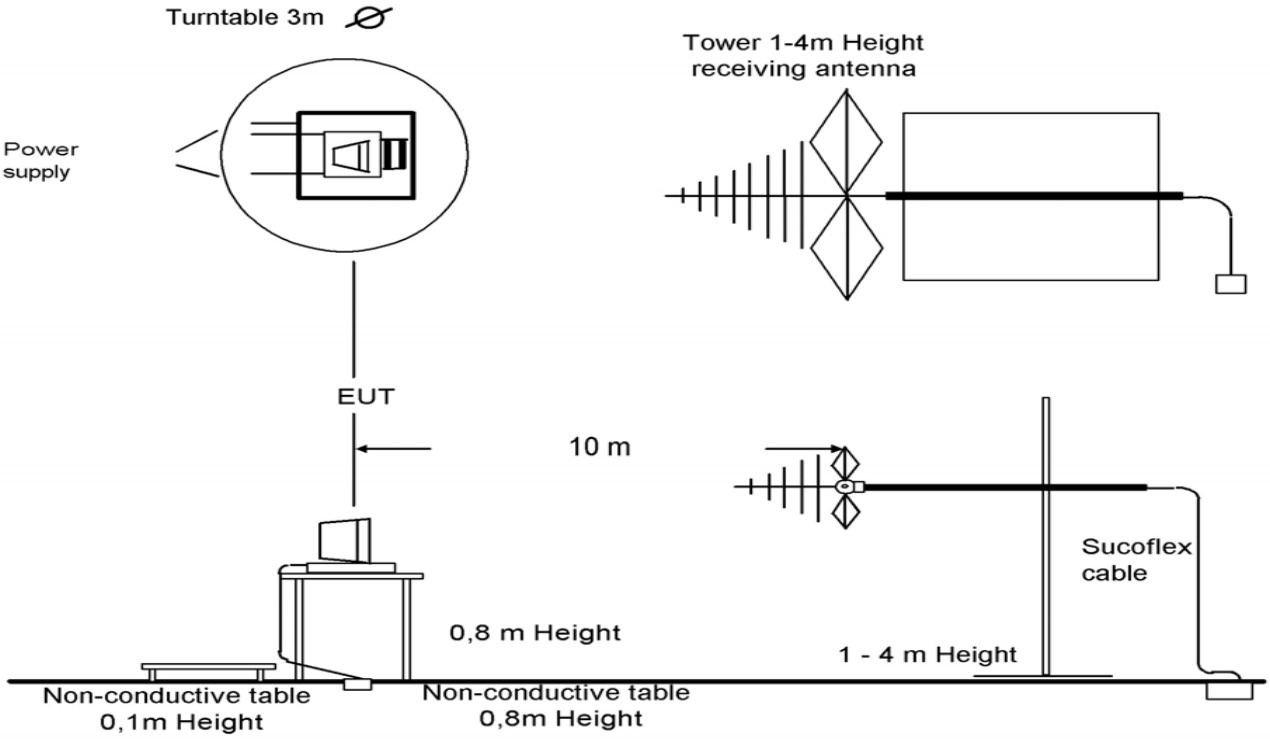
8 RF measurements

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



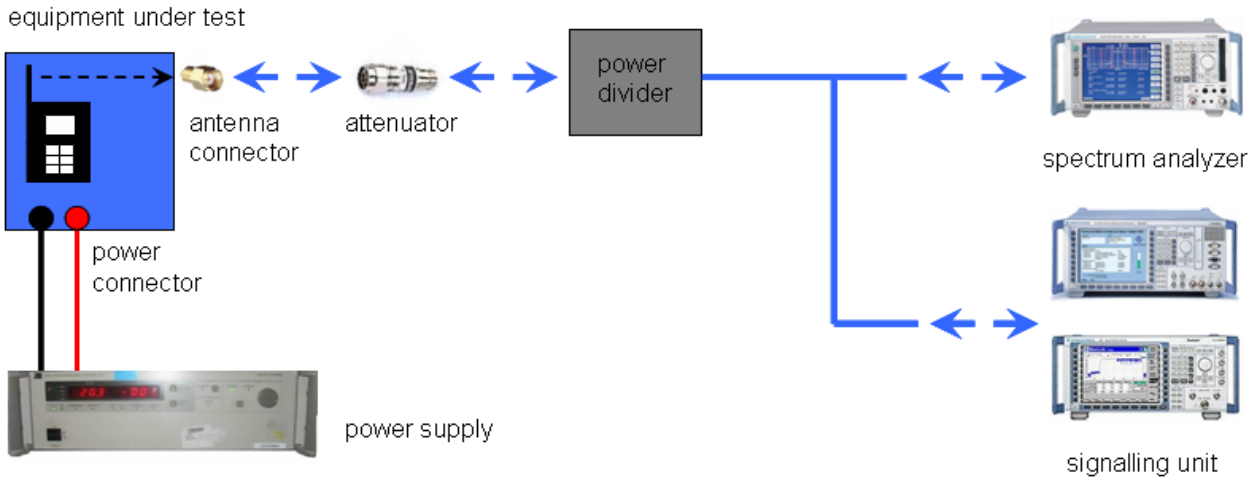
Picture 1: Diagram radiated measurements

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. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

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.
Iperf was used to ping another device with the largest support packet size

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

9 Measurement results

9.1 Output power verification (conducted)

Description:

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

Used measurement option: 5.2.1.1 PK1

Measurement:

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

Results:

OFDM / a – mode	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	6	9	12	18	24	36	48	54
Ch 157 - 5785 MHz	15.34	15.37	14.55	15.14	14.98	14.43	14.50	14.81
Measurement uncertainty	± 0.5 dB							

OFDM / n – mode HT20	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch 157 - 5785 MHz	14.76	14.89	15.73	15.11	15.09	15.93	15.34	14.74
Measurement uncertainty	± 0.5 dB							

OFDM / n – mode HT40	Maximum Output Power Conducted [dBm]							
Data Rate [MBit/s]	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Ch 151 - 5755 MHz	15.83	14.61	13.15	14.44	12.48	13.40	15.66	14.64
Measurement uncertainty	± 0.5 dB							

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

OFDM / a – mode: **9 MBit/s**
OFDM / n – mode HT20: **MCS5**
OFDM / n – mode HT40: **MCS0**

9.2 Antenna gain

Measurement:

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

Measurement parameters:

Measurement parameter	
Detector:	Peak
Sweep time:	5 s
Resolution bandwidth:	3 MHz
Video bandwidth:	10 MHz
Trace-Mode:	Max hold

Limits:

FCC	IC
Antenna Gain	
6 dBi	

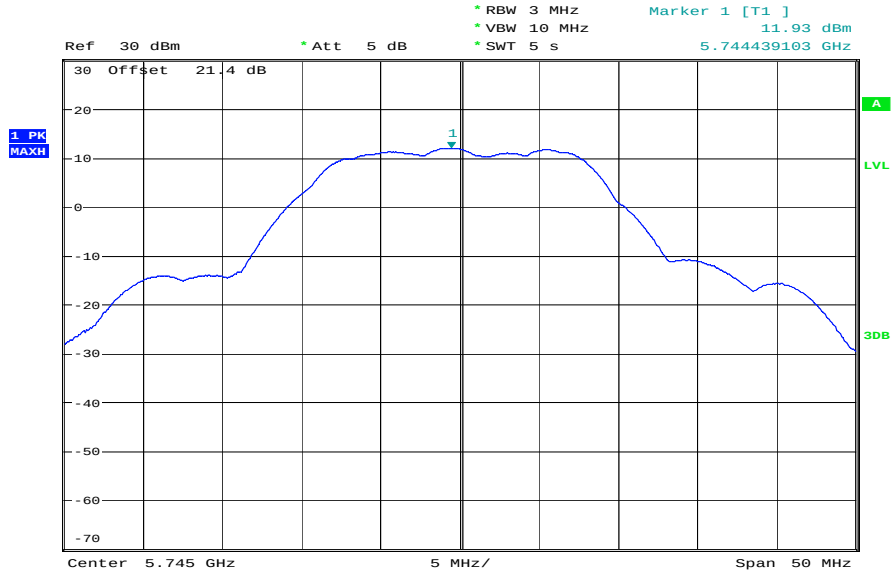
Results:

T_{nom}	V_{nom}	lowest channel 5745 MHz	middle channel 5785 MHz	highest channel 5825 MHz
Conducted power [dBm]		11.93	11.99	12.63
Radiated power [dBm]		9.03	8.89	9.33
Gain [dBi] Calculated		-2.90	-3.10	-3.30
Measurement uncertainty		± 1.5 dB (cond.) / ± 3 dB (rad.)		

Result: Passed

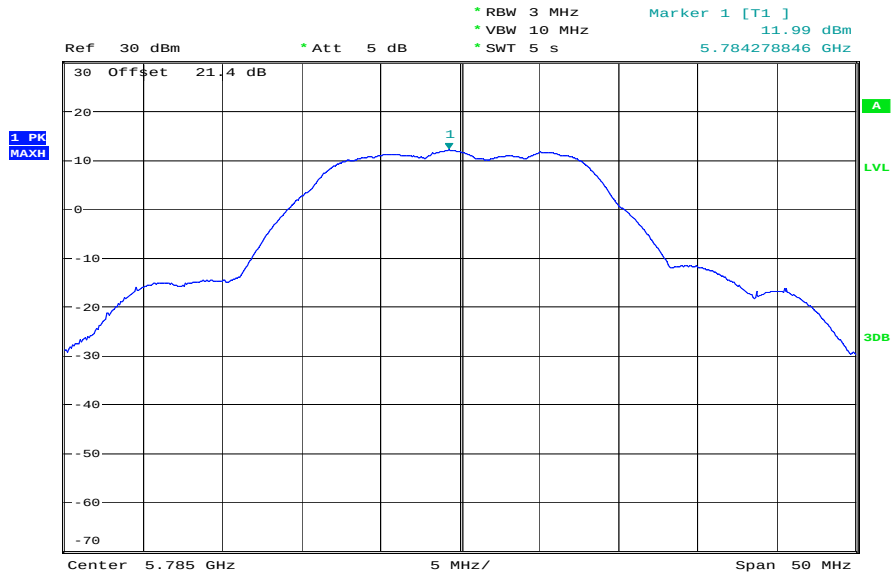
Plots: conducted power for gain calculation

Plot 1: low channel



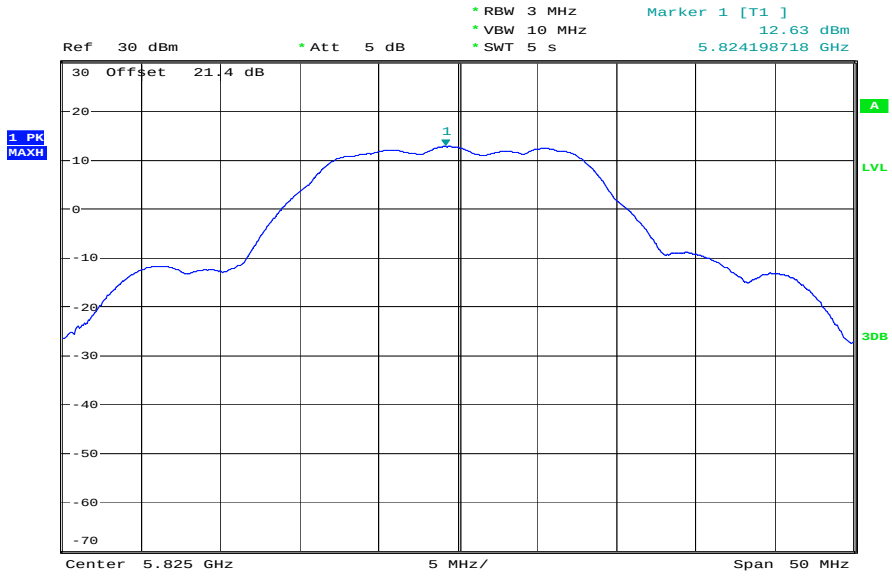
Date: 23.AUG.2012 09:55:50

Plot 2: middle channel



Date: 23.AUG.2012 09:57:04

Plot 3: high channel



9.3 Maximum output power

Description:

Measurement of the maximum output power conducted and radiated. The measurements are performed using the data rate producing the highest conducted output power. The determination of these data rates was performed at the beginning of the tests.

Used measurement option: 5.2.1.1 PK1

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	5 s
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)

Limits:

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

Results: OFDM / a – mode

OFDM / a – mode	Maximum Output Power [dBm]		
Frequency	5745 MHz	5785 MHz	5825 MHz
Peak Output Power Conducted	15.29	15.37	15.73
Output Power Radiated – EIRP*)	12.39	12.27	12.43
Measurement uncertainty	± 1.5 dB (cond.) / ± 3 dB (rad.)		

*) calculated with Antenna gain

Result: **Passed**

Results: OFDM / n – mode HT20

OFDM / n – mode Ht20	Maximum Output Power [dBm]		
Frequency	5745 MHz	5785 MHz	5825 MHz
Peak Output Power Conducted	15.62	15.93	15.87
Output Power Radiated – EIRP*)	12.72	12.83	12.57
Measurement uncertainty	± 1.5 dB (cond.) / ± 3 dB (rad.)		

*) calculated with Antenna gain

Result: **Passed**

Results: OFDM / n – mode

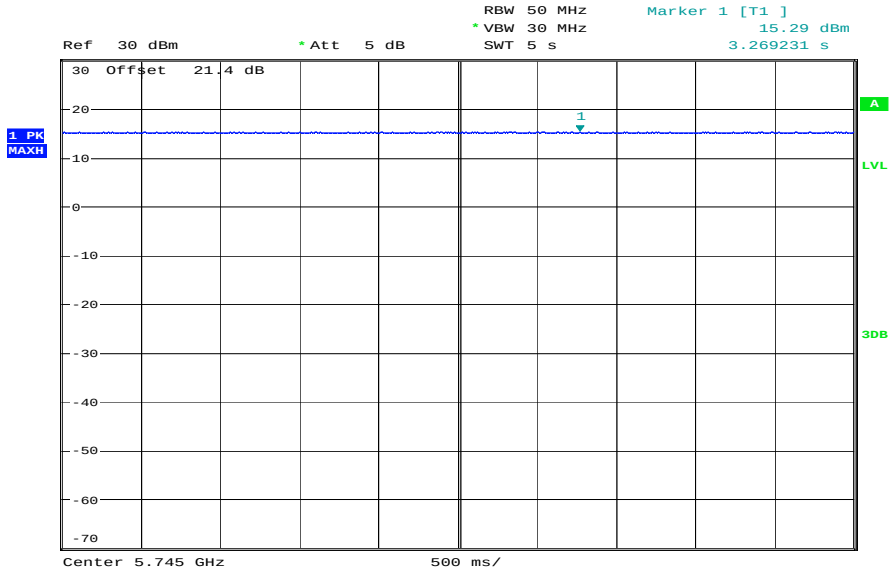
OFDM / n – mode Ht40	Maximum Output Power [dBm]		
Frequency	5755 MHz	5795 MHz	-/-
Peak Output Power Conducted	15.83	15.99	-/-
Output Power Radiated – EIRP*)	12.93	12.89	-/-
Measurement uncertainty	± 1.5 dB (cond.) / ± 3 dB (rad.)		

*) calculated with Antenna gain

Result: **Passed**

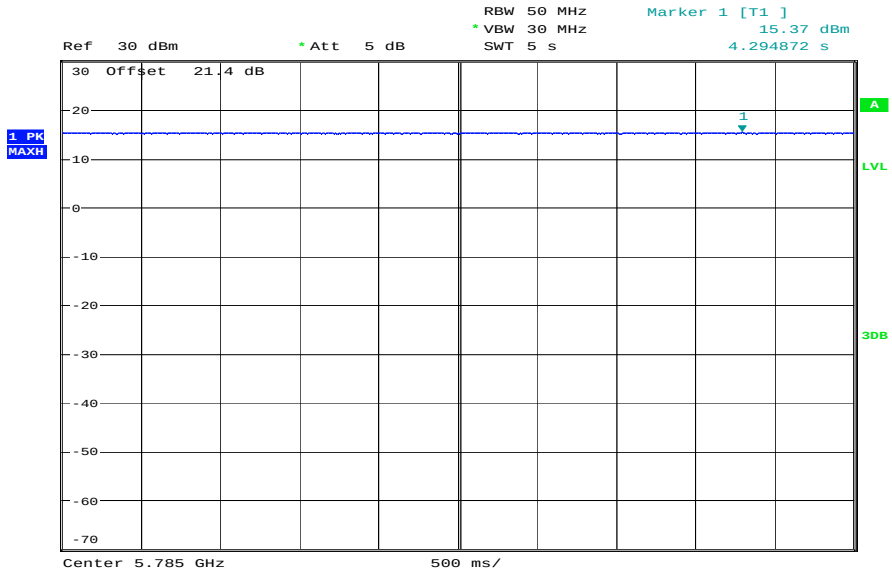
Plots: OFDM / a – mode

Plot 1: TX mode, lowest channel



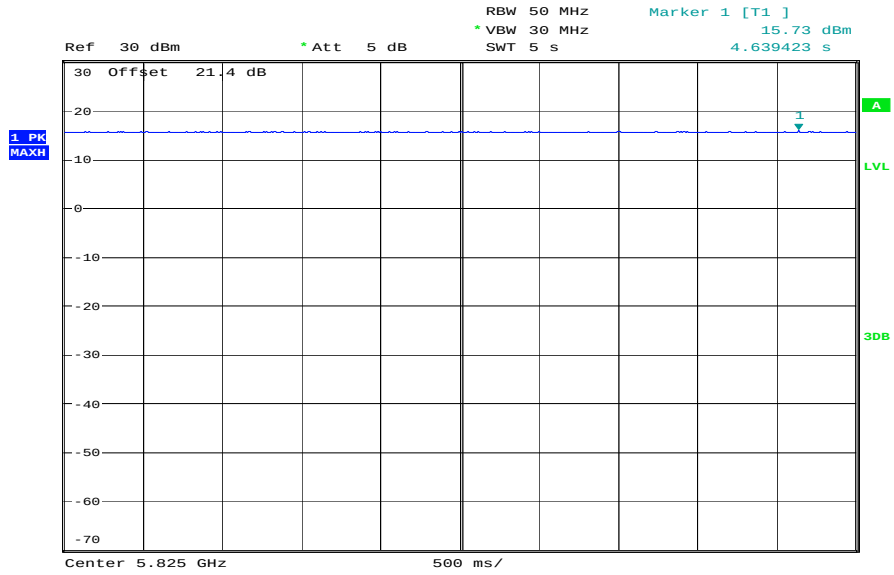
Date: 23.AUG.2012 09:01:15

Plot 2: TX mode, middle channel



Date: 23.AUG.2012 08:51:59

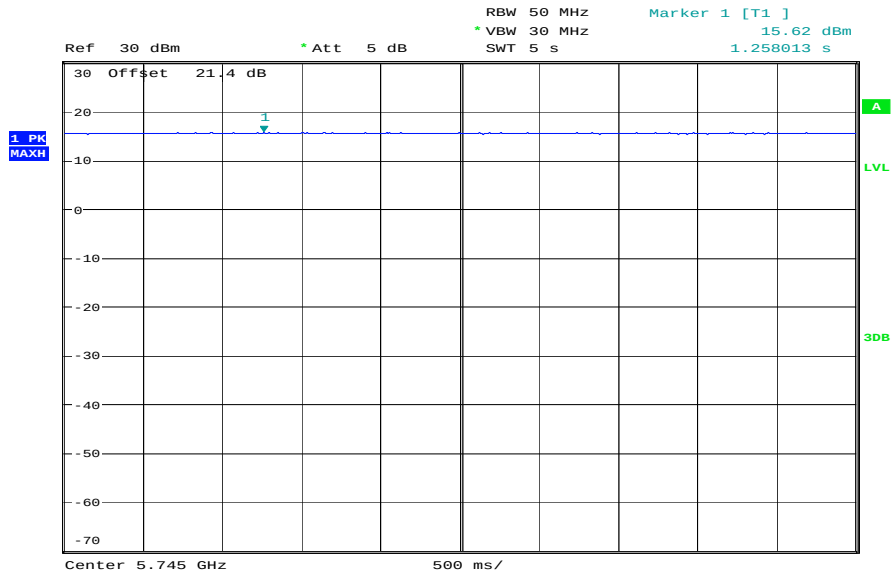
Plot 3: TX mode, highest channel



Date: 23.AUG.2012 09:03:20

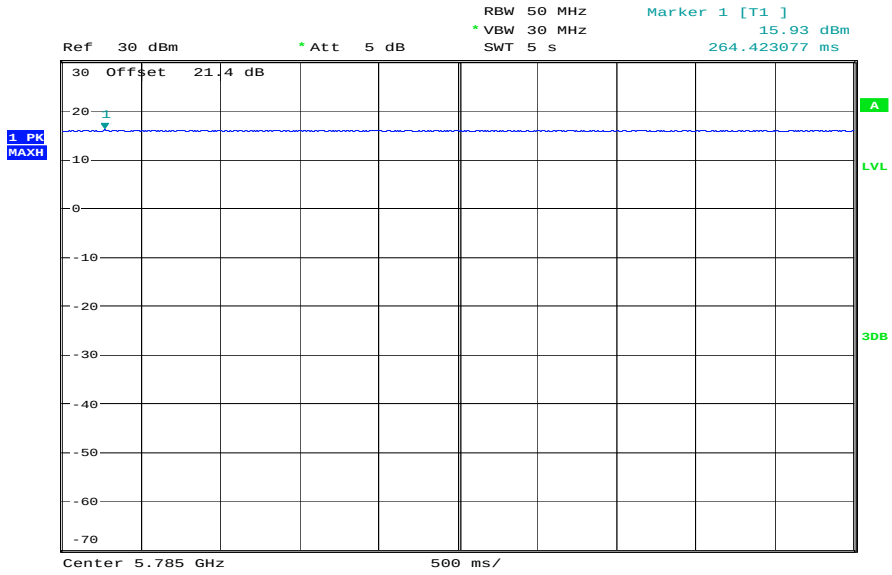
Plots: OFDM / n – mode HT20

Plot 1: TX mode, lowest channel



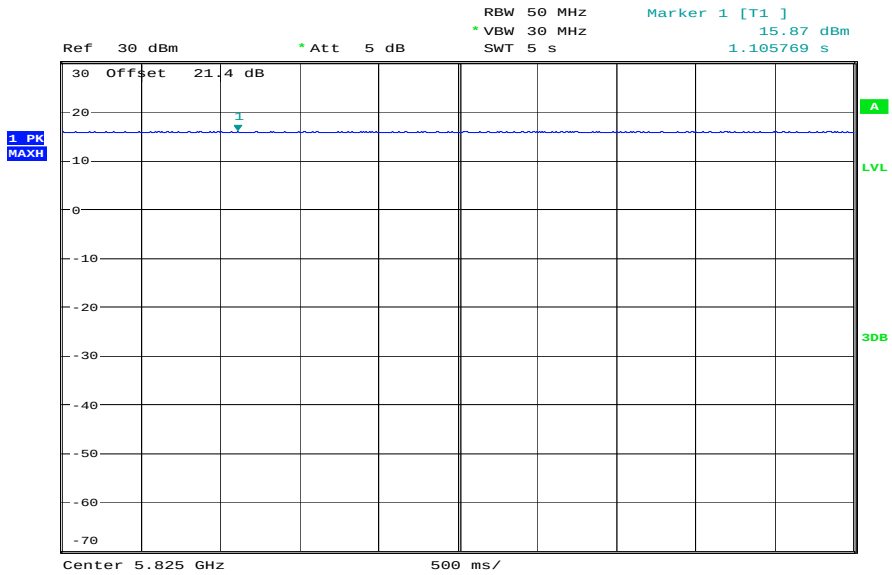
Date: 23.AUG.2012 09:17:20

Plot 2: TX mode, middle channel



Date: 23.AUG.2012 09:12:51

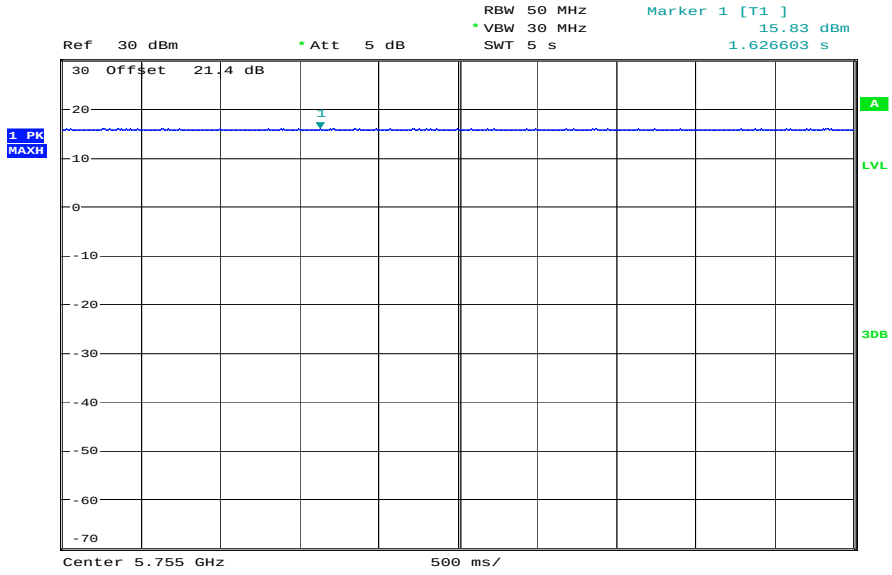
Plot 3: TX mode, highest channel



Date: 23.AUG.2012 09:18:52

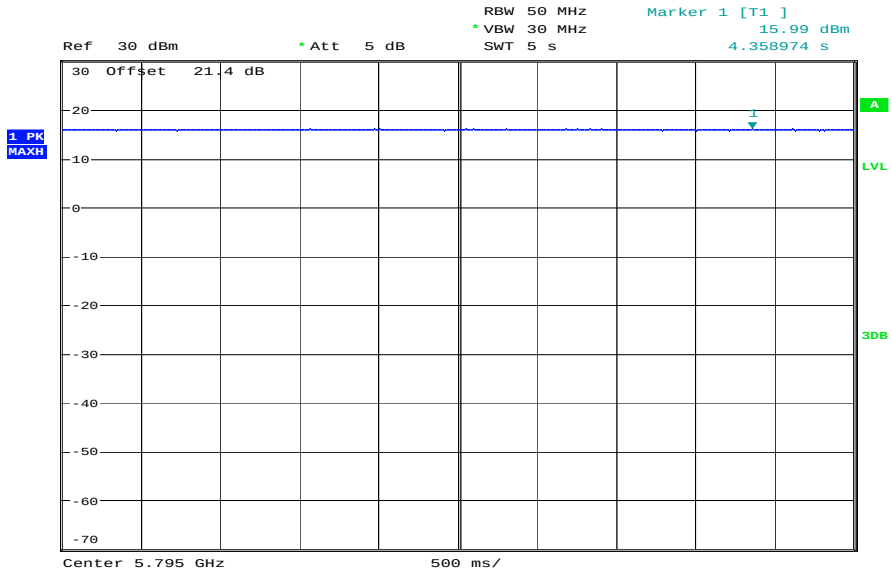
Plots: OFDM / n – mode HT40

Plot 1: TX mode, lowest channel



Date: 23.AUG.2012 09:40:00

Plot 2: TX mode, highest channel



Date: 23.AUG.2012 09:52:51

9.4 Power spectral density

Description:

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

Used measurement option: 5.3.1 PKPSD

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	≥ 300 kHz
Span:	5 - 30 % greater than the EBW
Trace-Mode:	Max hold (allow trace to fully stabilize)
Bandwidth correction:	10 log (3kHz / 100kHz) = -15.2 dB

Limits:

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

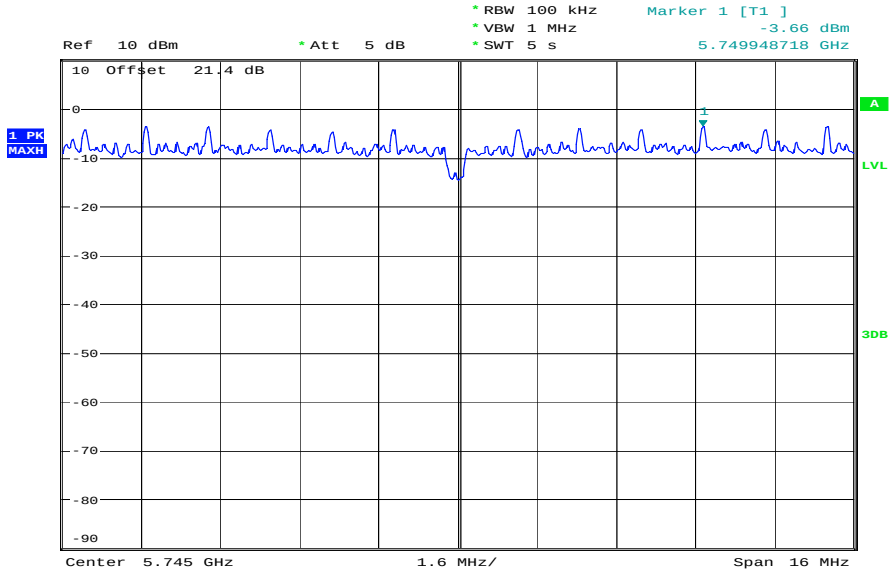
Results:

Modulation / Frequency	Power Spectral density [dBm]		
	5725 MHz	5785 MHz	5825 MHz
OFDM / a – mode measured value (100 kHz)	-3.66	-4.04	-3.19
OFDM / a – mode re-calculated value (to 3 kHz)	-18.86	-19.24	-18.39
OFDM / n – mode HT20 measured value (100 kHz)	-3.62	-4.05	-3.16
OFDM / n – mode HT20 re-calculated value (to 3 kHz)	-18.82	-19.25	-18.36
Frequency	5755 MHz	5795 MHz	-/-
OFDM / n – mode HT40 measured value (100 kHz)	-7.31	-5.90	-/-
OFDM / n – mode HT40 re-calculated value (to 3 kHz)	-22.51	-21.1	-/-
Measurement uncertainty	± 1.5 dB		

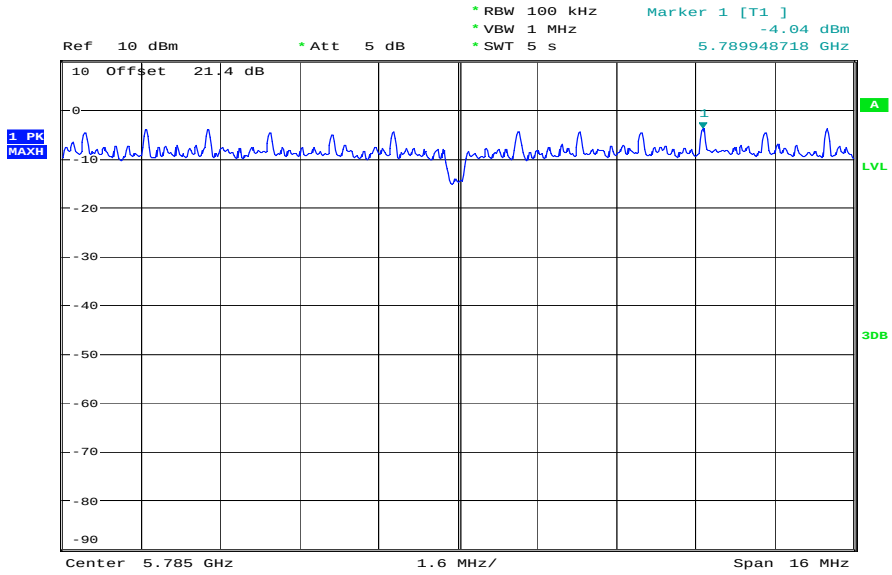
Result: **Passed**

Plots: OFDM / a – mode

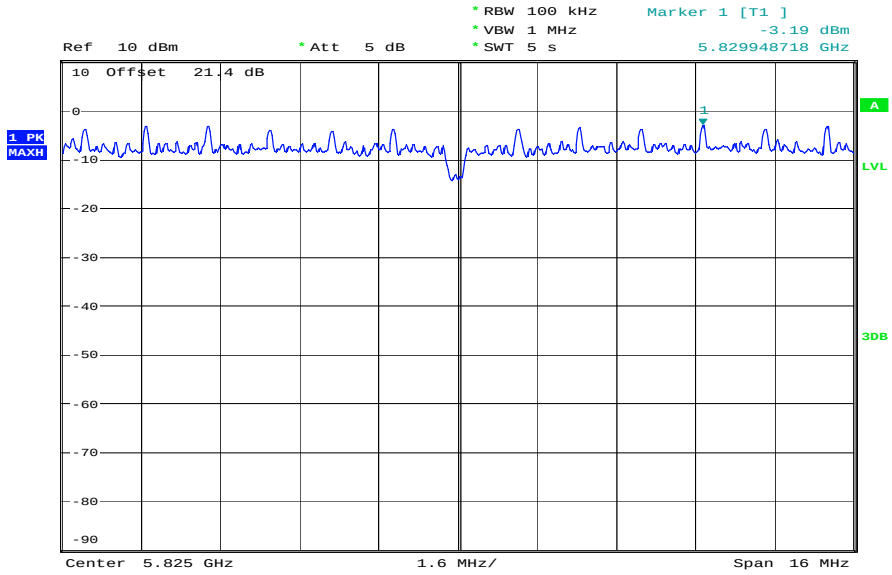
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel



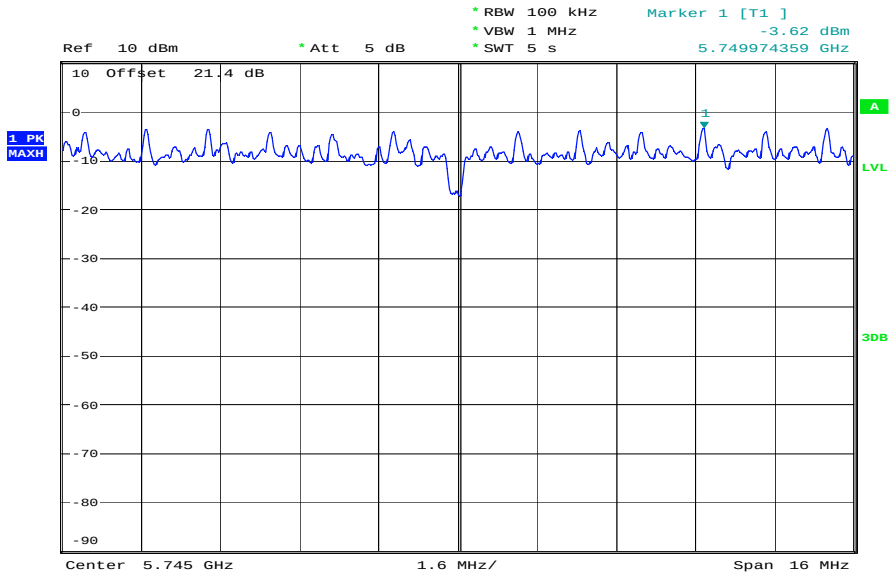
Plot 3: TX mode, highest channel



Date: 23.AUG.2012 10:34:48

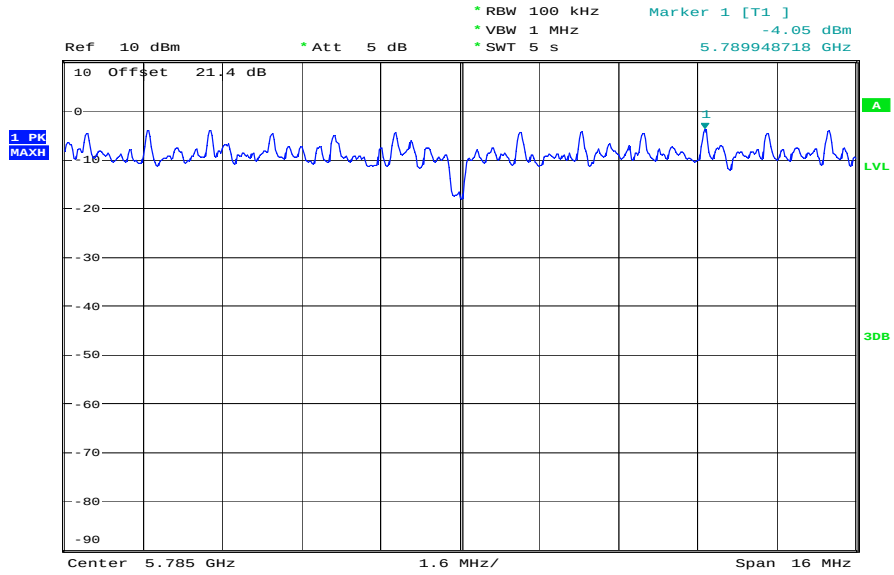
Plots: OFDM / n – mode HT20

Plot 1: TX mode, lowest channel



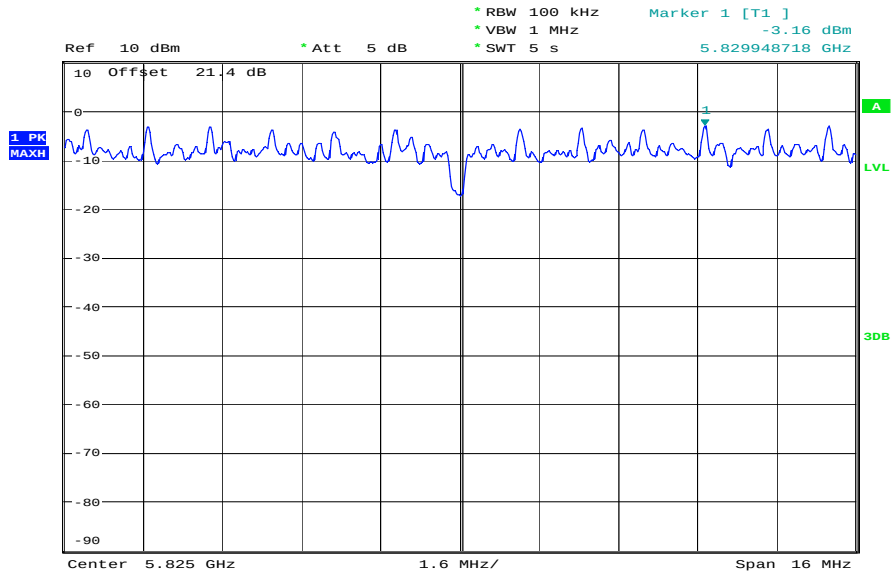
Date: 23.AUG.2012 10:37:05

Plot 2: TX mode, middle channel



Date: 23.AUG.2012 10:39:43

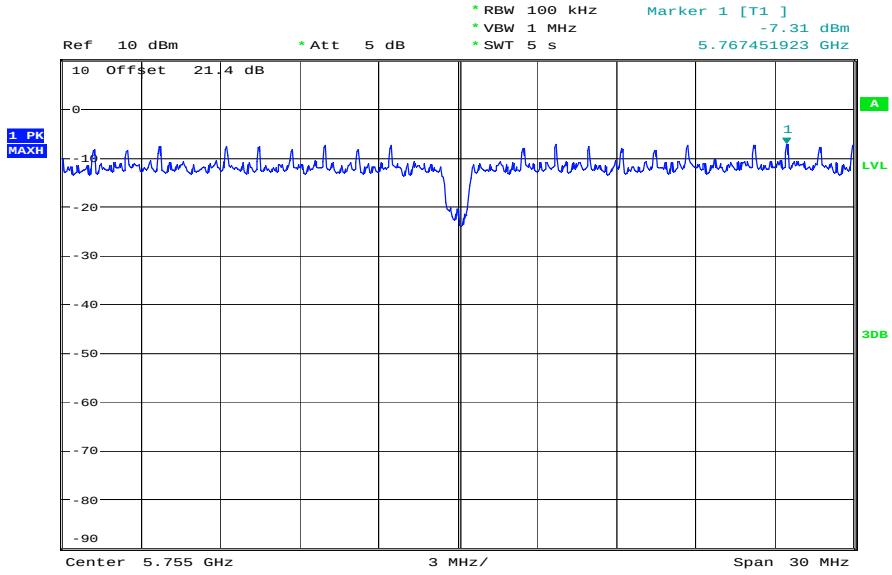
Plot 3: TX mode, highest channel



Date: 23.AUG.2012 10:40:53

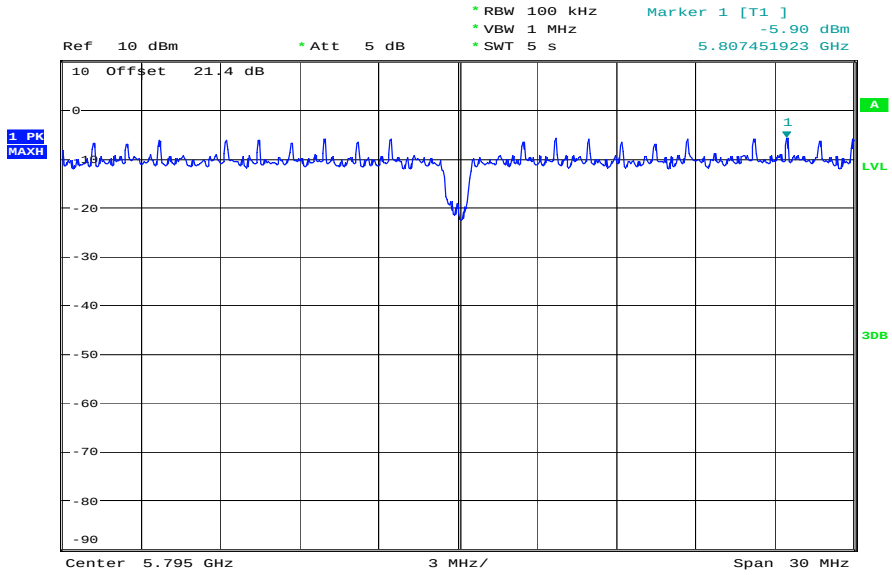
Plots: OFDM / n – mode HT40

Plot 1: TX mode, lowest channel



Date: 23.AUG.2012 10:47:44

Plot 2: TX mode, highest channel



Date: 23.AUG.2012 10:49:00

9.5 Spectrum bandwidth – 6 dB / 75 % power bandwidth (EBW)

Description:

Measurement of the 6 dB / 75 % power bandwidth of the modulated signal.

Used measurement option: 5.1.2.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 - 5% of emission bandwidth
Video bandwidth:	≥ 3 x RBW
Span:	> complete emission
Trace-Mode:	Max hold (allow trace to stabilize)
Measurement option:	Automatic bandwidth measurement (75% power)

Limits:

FCC	-/-
Spectrum Bandwidth – 6 dB / 75 % power bandwidth (EBW)	
Systems using digital modulation techniques may operate in the 2400–2483.5 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.	

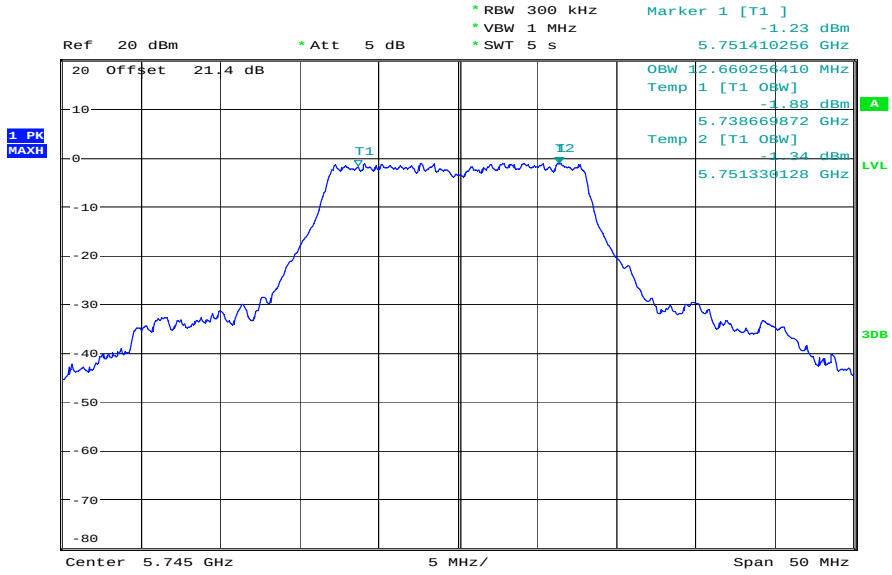
Results:

Modulation	6 dB / 75 % power bandwidth [MHz] (EBW)		
Frequency	Lowest channel	Middle channel	Highest channel
OFDM / a – mode	12.66	12.66	12.66
OFDM / n – mode HT20	13.70	13.70	13.78
OFDM / n – mode HT40	26.28	-/-	26.41
Measurement uncertainty	± RBW		

Result: Passed

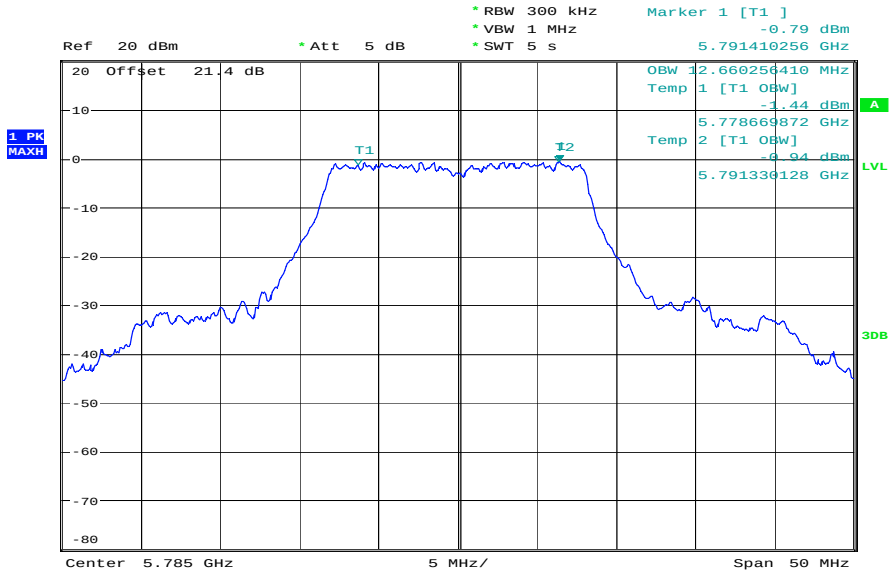
Plots: OFDM / a – mode

Plot 1: TX mode, lowest channel



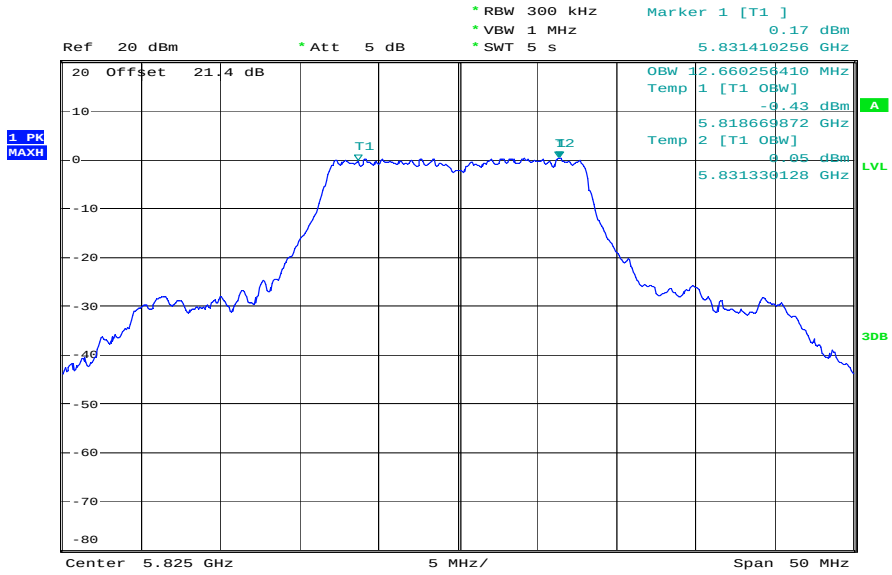
Date: 23.AUG.2012 10:08:44

Plot 2: TX mode, middle channel



Date: 23.AUG.2012 10:03:59

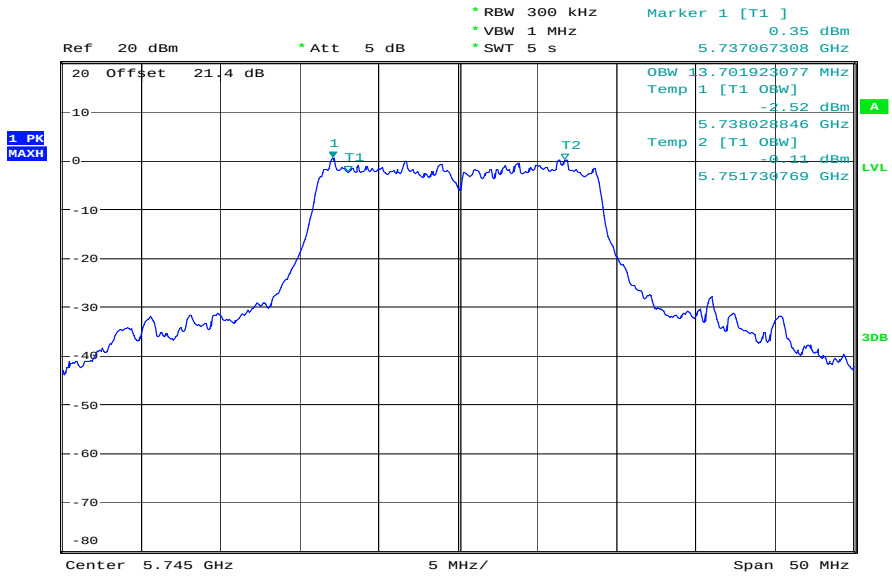
Plot 3: TX mode, highest channel



Date: 23.AUG.2012 10:02:41

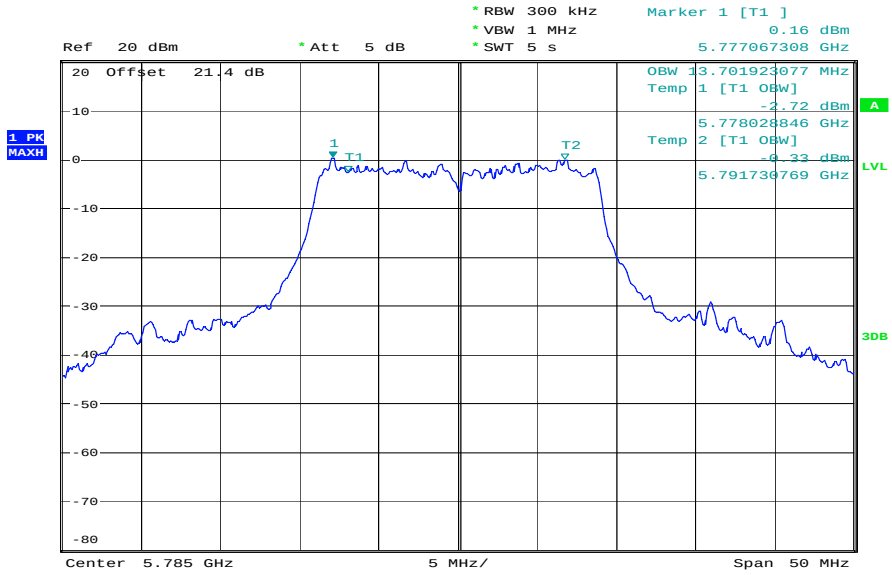
Plots: OFDM / n – mode HT20

Plot 1: TX mode, lowest channel



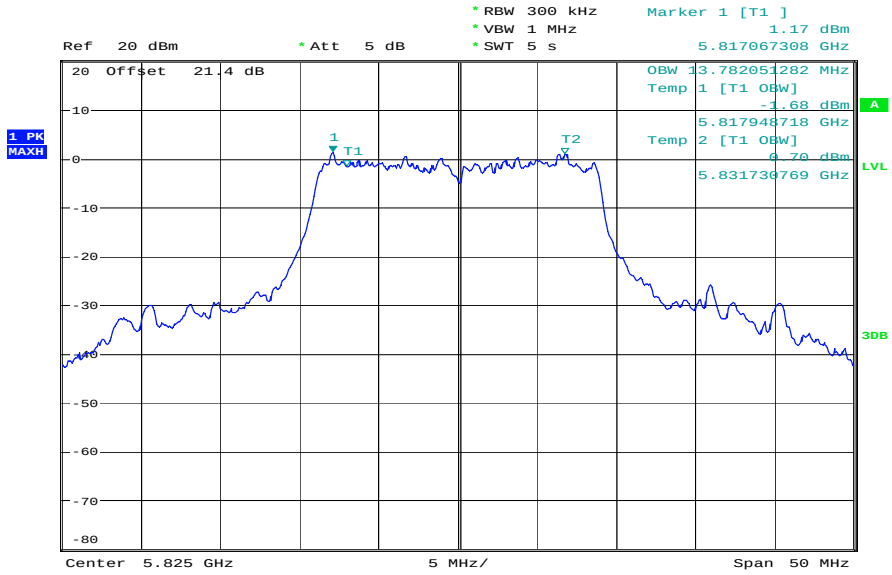
Date: 23.AUG.2012 10:11:12

Plot 2: TX mode, middle channel



Date: 23.AUG.2012 10:16:11

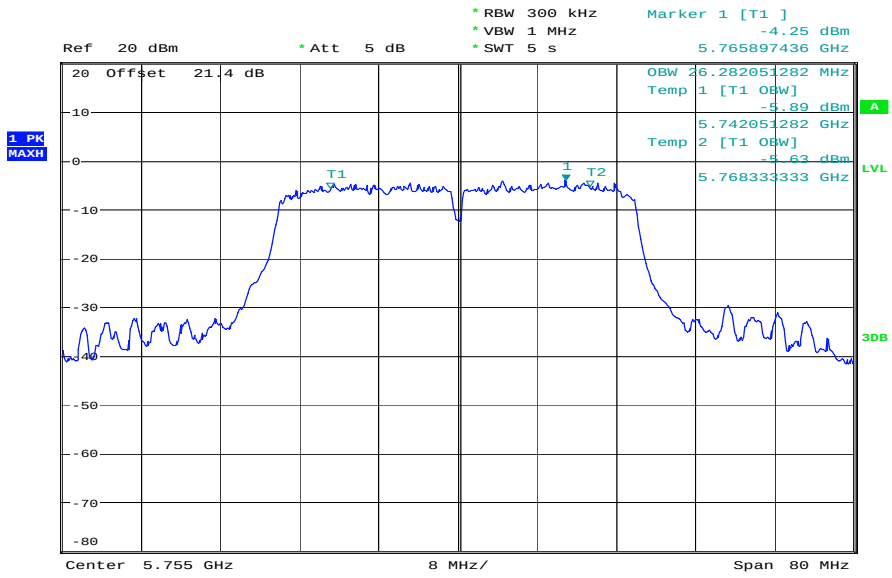
Plot 3: TX mode, highest channel



Date: 23.AUG.2012 10:18:01

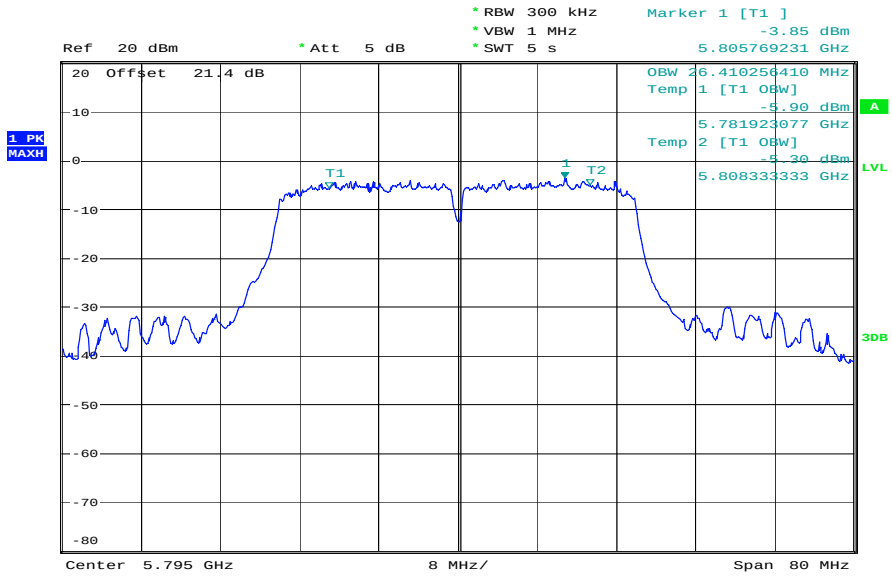
Plots: OFDM / n – mode HT40

Plot 1: TX mode, lowest channel



Date: 23.AUG.2012 10:24:24

Plot 2: TX mode, highest channel



Date: 23.AUG.2012 10:28:03

9.6 Spectrum bandwidth – 20 dB / 99 % power bandwidth

Description:

Measurement of the 20 dB / 99% power bandwidth of the modulated signal.

Used measurement option: 5.1.2.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 - 5% of emission bandwidth
Video bandwidth:	≥ 3 x RBW
Span:	> complete emission
Trace-Mode:	Max hold (allow trace to stabilize)
Measurement option:	Automatic bandwidth measurement (99% power)

Limits:

FCC	-/-
Spectrum Bandwidth – 20 dB / 99 % power bandwidth	
Systems using digital modulation techniques may operate in the 2400–2483.5 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.	

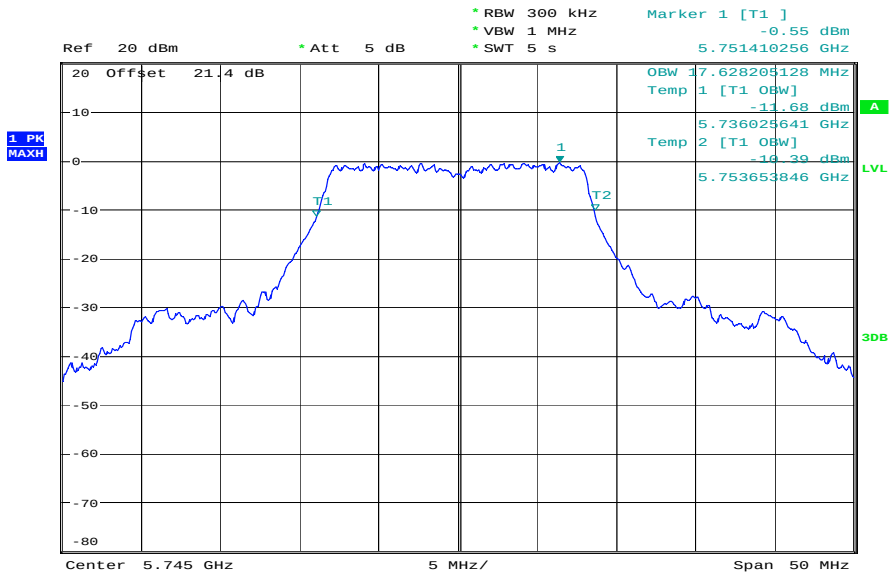
Results:

Modulation Frequency	20 dB / 99 % power bandwidth [MHz]		
	Lowest channel	Middle channel	Highest channel
OFDM / a – mode	17.63	17.63	17.63
OFDM / n – mode HT20	18.27	18.19	18.27
OFDM / n – mode HT40	36.28	-/-	36.28
Measurement uncertainty	± RBW		

Result: Passed

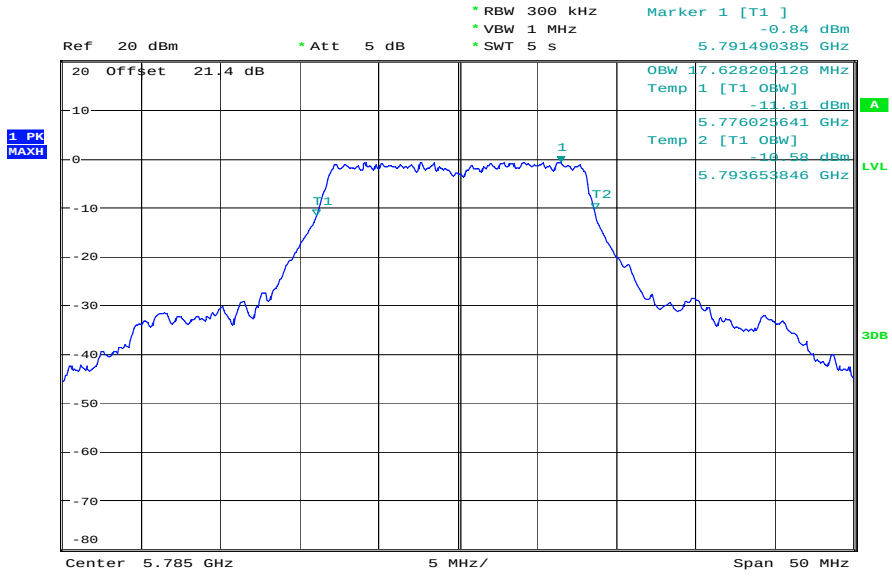
Plots: OFDM / a – mode

Plot 1: TX mode, lowest channel



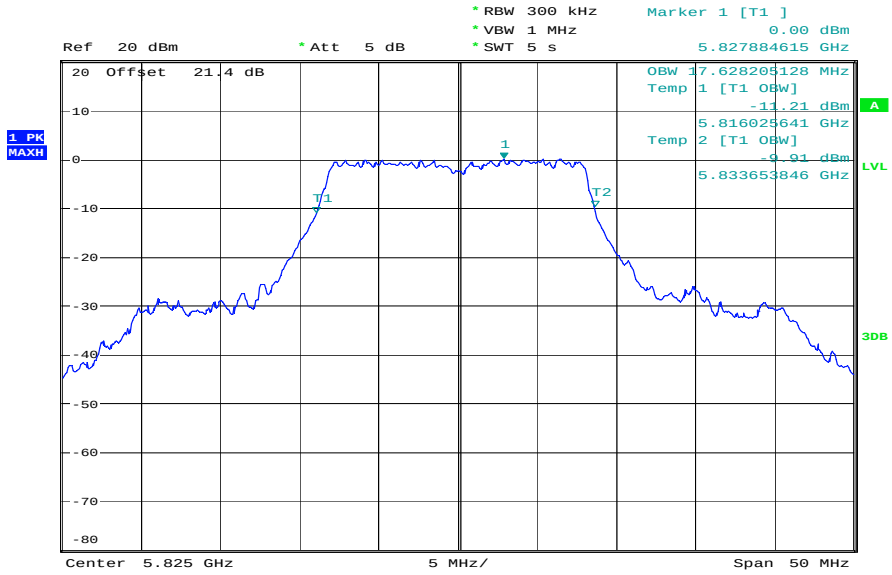
Date: 23.AUG.2012 10:07:16

Plot 2: TX mode, middle channel



Date: 23.AUG.2012 10:04:39

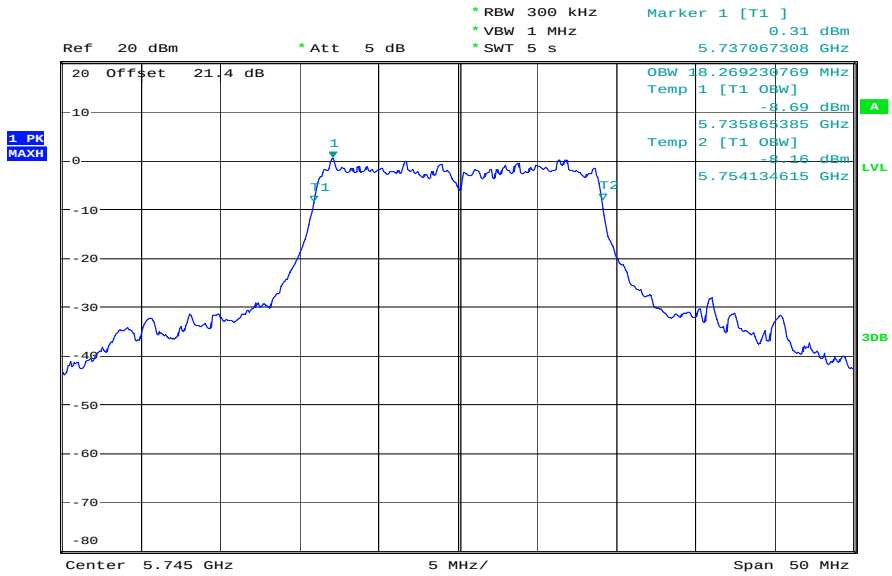
Plot 3: TX mode, highest channel



Date: 23.AUG.2012 10:05:58

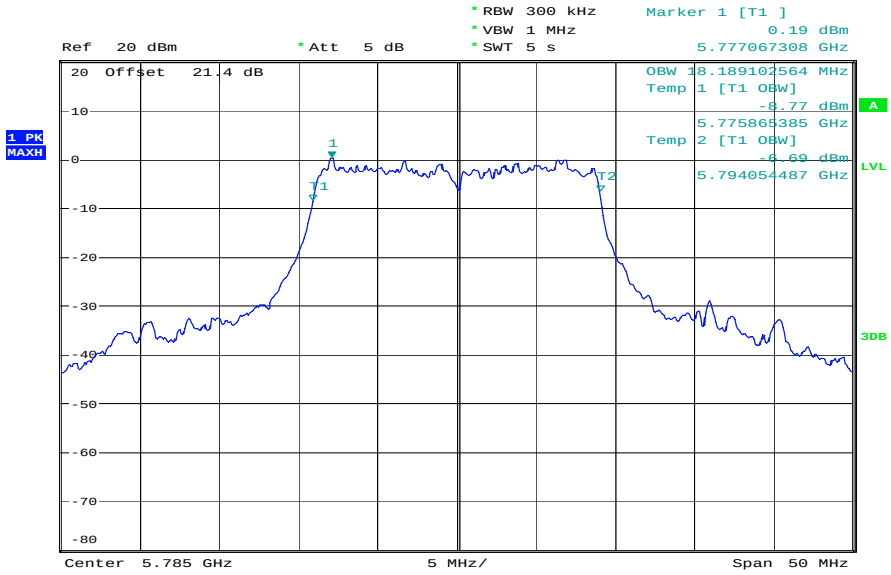
Plots: OFDM / n – mode HT20

Plot 1: TX mode, lowest channel



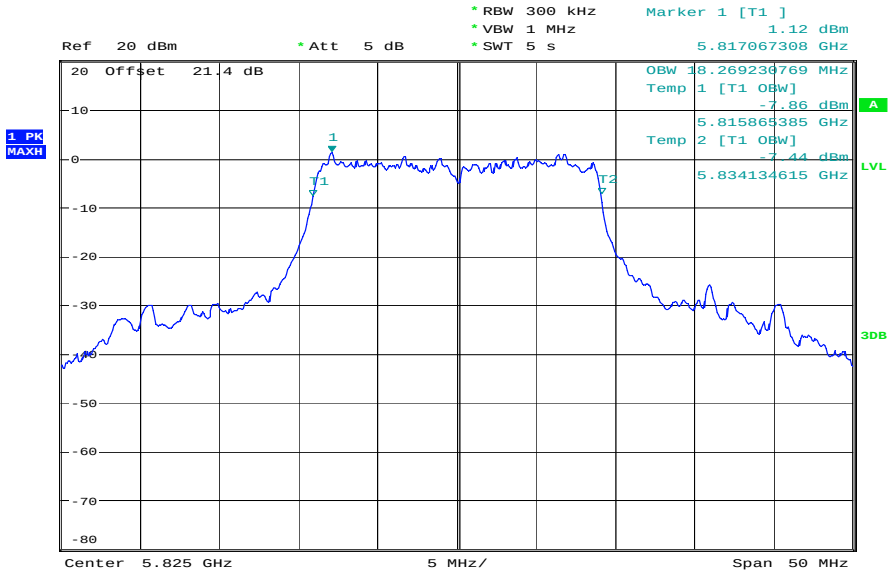
Date: 23.AUG.2012 10:12:03

Plot 2: TX mode, middle channel



Date: 23.AUG.2012 10:15:34

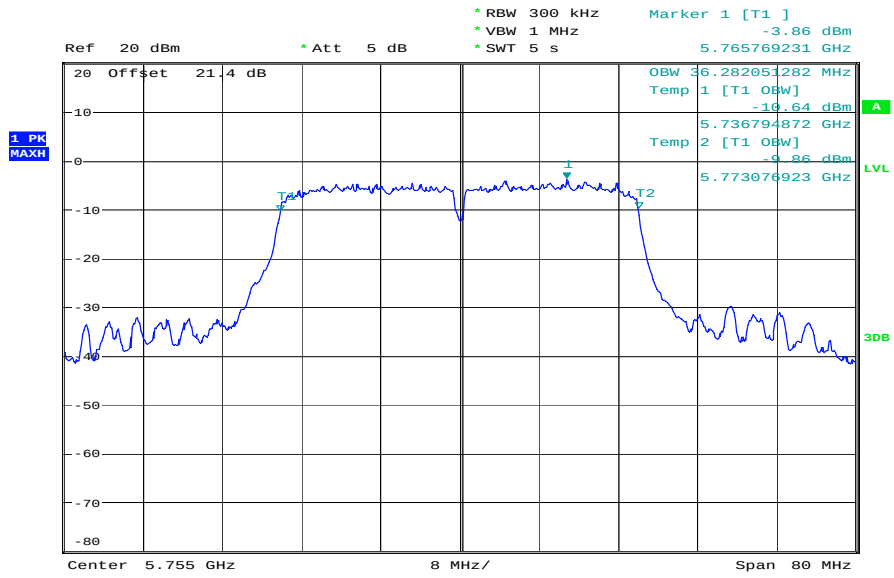
Plot 3: TX mode, highest channel



Date: 23.AUG.2012 10:18:43

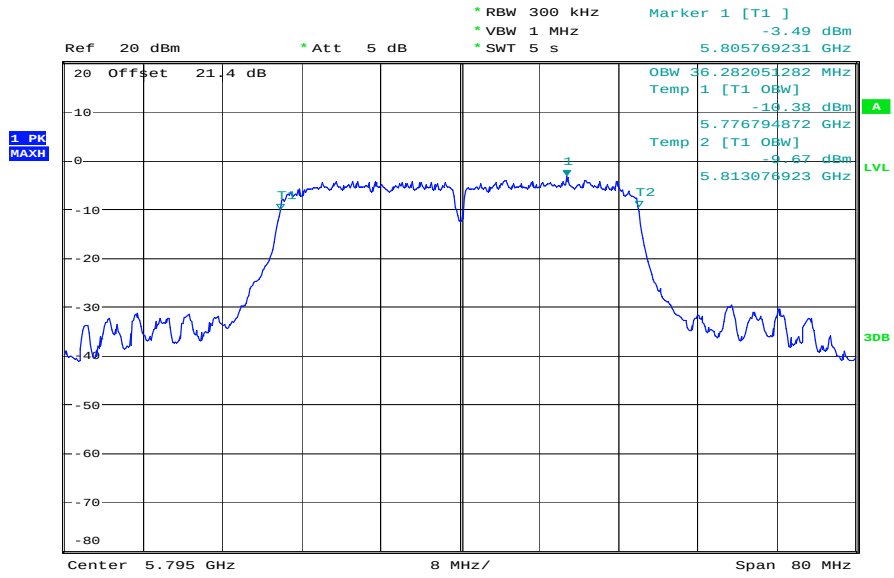
Plots: OFDM / n – mode HT40

Plot 1: TX mode, lowest channel



Date: 23.AUG.2012 10:25:21

Plot 2: TX mode, highest channel



Date: 23.AUG.2012 10:27:20

9.7 Band edge compliance conducted

Not applicable! No restricted band close to used band!

9.8 Band edge compliance radiated

Not applicable! No restricted band close to used band!

9.9 TX spurious emissions conducted

Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at channel 1, 6 and 11. The measurement is repeated for all modulations.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	1s / 100 MHz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 100 kHz
Video bandwidth:	F < 1 GHz: 500 kHz F > 1 GHz: 500 kHz
Span:	9 kHz to 25 GHz
Trace-Mode:	Max Hold

Limits:

FCC	-/-
TX Spurious Emissions Conducted	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required	

Results: OFDM / a – mode

TX Spurious Emissions Conducted					
OFDM / a – mode					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5745		-1.57	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5785		-1.18	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5825		-1.03	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
Measurement uncertainty		± 3 dB			

Result: **Passed**

Results: OFDM / n – mode HT20

TX Spurious Emissions Conducted					
OFDM / n – mode HT20					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5745		-1.22	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5785		-1.93	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5825		-0.80	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
Measurement uncertainty		± 3 dB			

Result: **Passed**

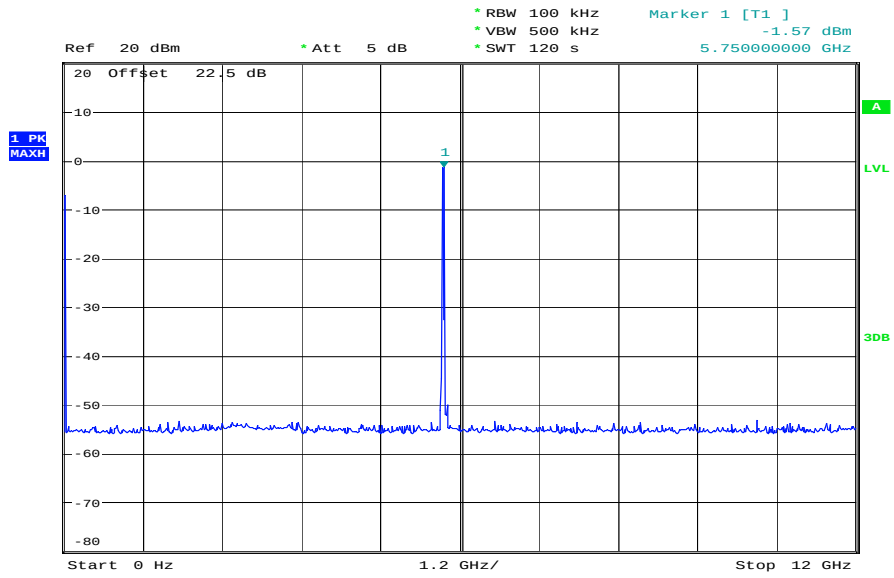
Results: OFDM / n – mode HT40

TX Spurious Emissions Conducted OFDM / n – mode HT40					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5755		-6.43	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5785		-6.77	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
			30 dBm		Operating frequency
-/-			-20 dBc (peak) -30 dBc (average)		-/-
Measurement uncertainty			± 3 dB		

Result: **Passed**

Plots: OFDM / a – mode

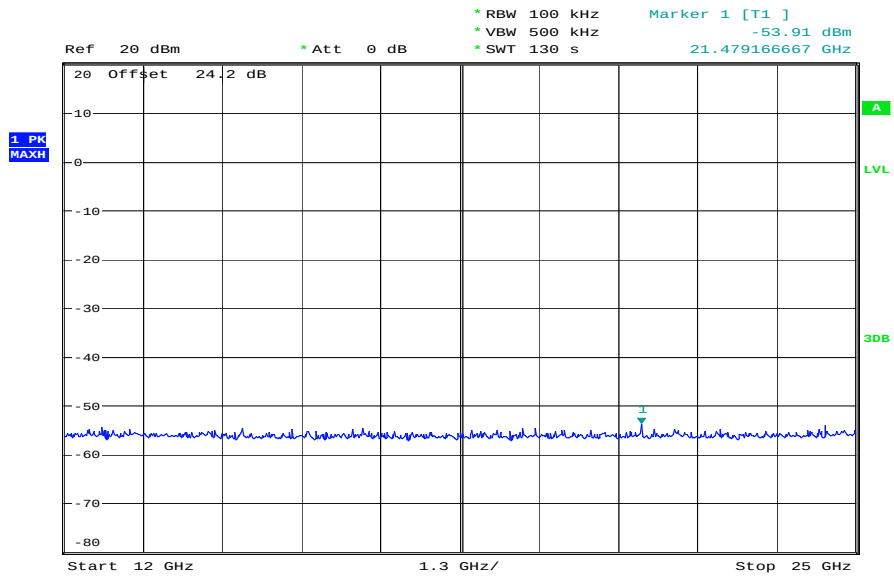
Plot 1: TX mode, lowest channel, up to 12 GHz



Date: 23.AUG.2012 10:56:30

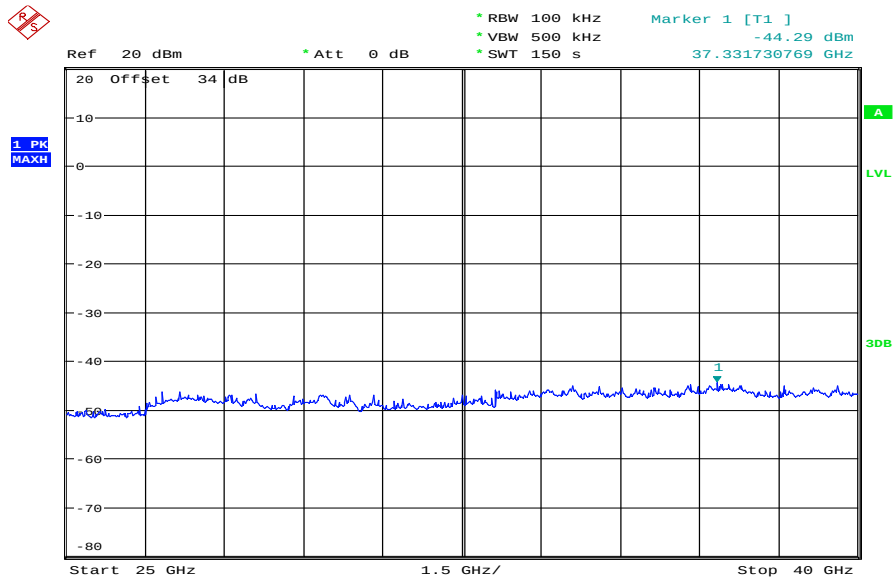
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, lowest channel, up to 25 GHz

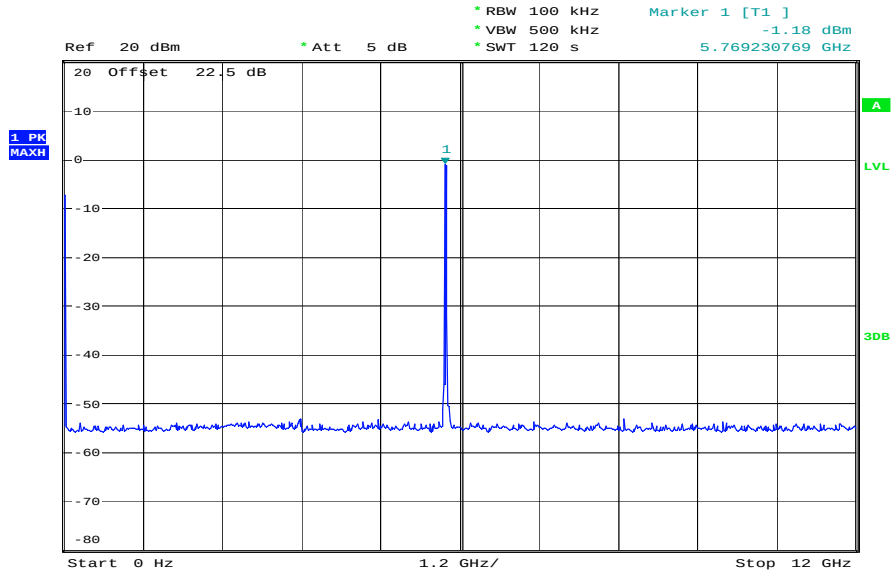


Date: 23.AUG.2012 11:31:05

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



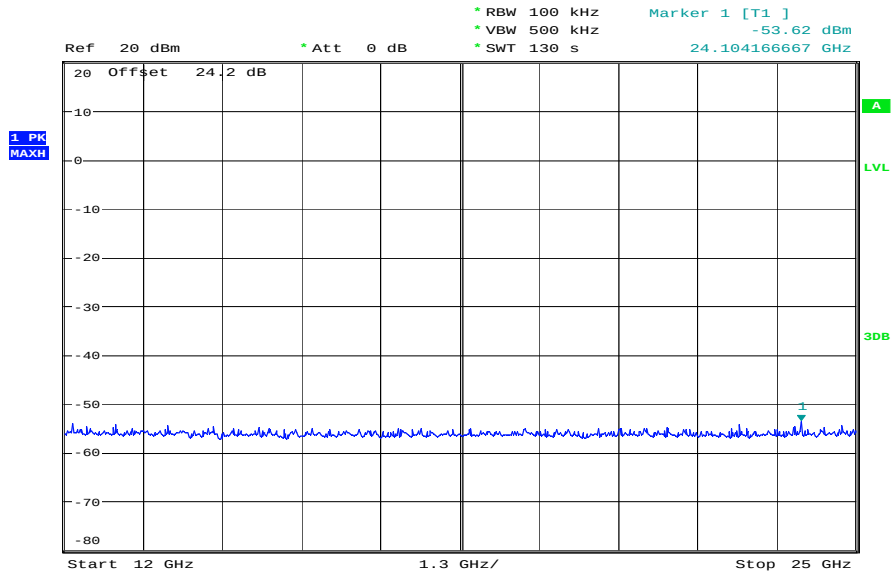
Plot 4: TX mode, middle channel, up to 12 GHz



Date: 23.AUG.2012 11:02:33

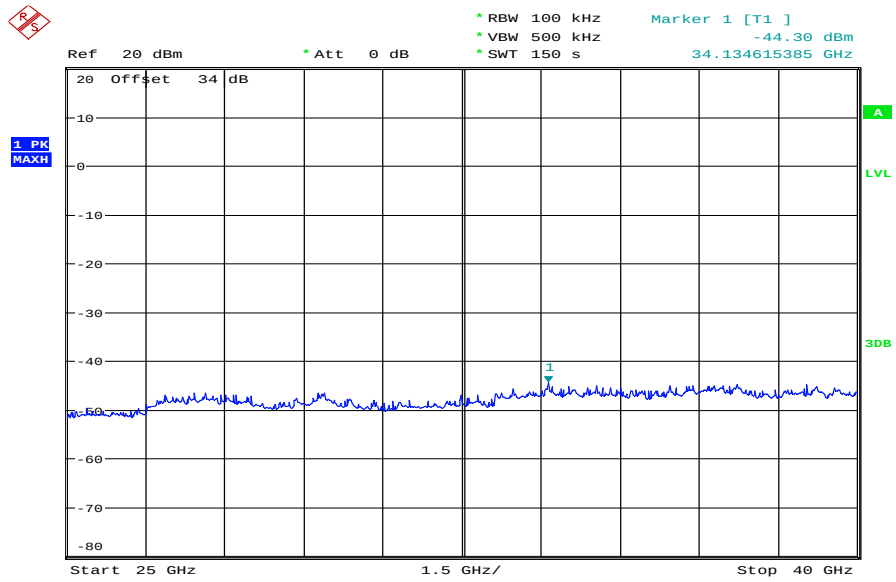
The peak at the beginning of the plot is the LO from the SA.

Plot 5: TX mode, middle channel, up to 25 GHz

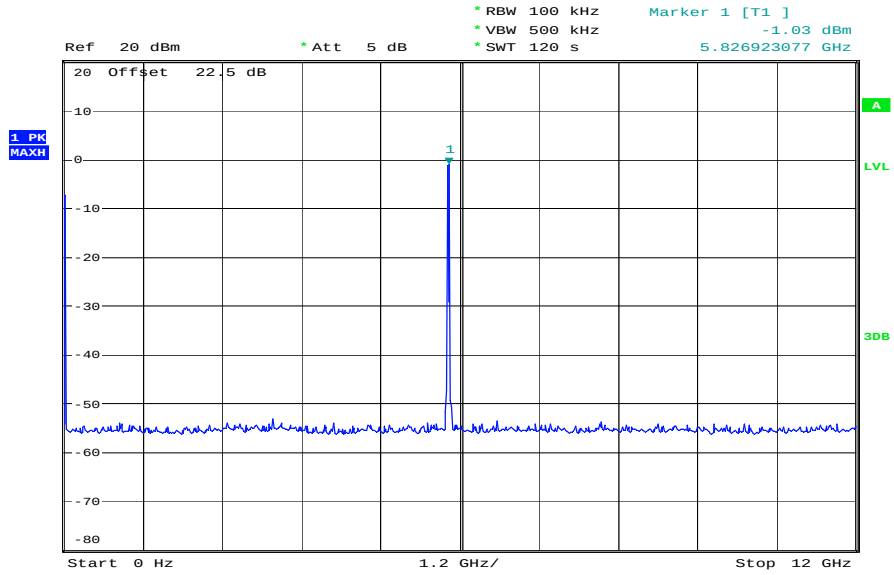


Date: 23.AUG.2012 11:33:57

Plot 6: TX mode, middle channel, up to 40 GHz



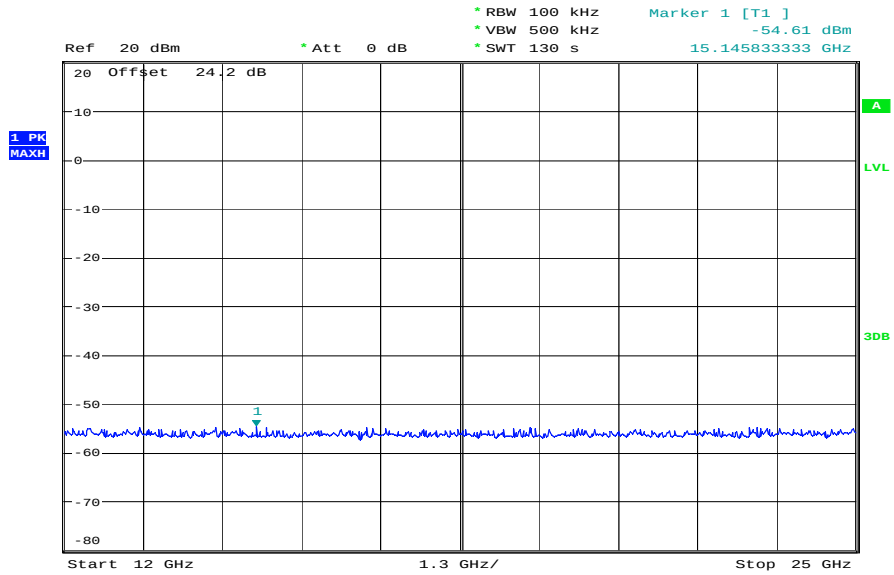
Plot 7: TX mode, highest channel, up to 12 GHz



Date: 23.AUG.2012 11:05:12

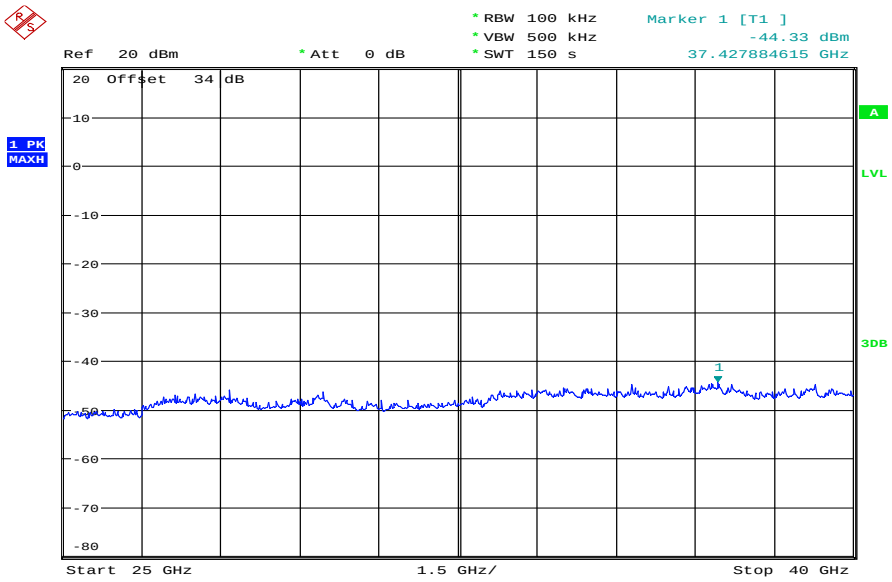
The peak at the beginning of the plot is the LO from the SA.

Plot 8: TX mode, highest channel, up to 25 GHz



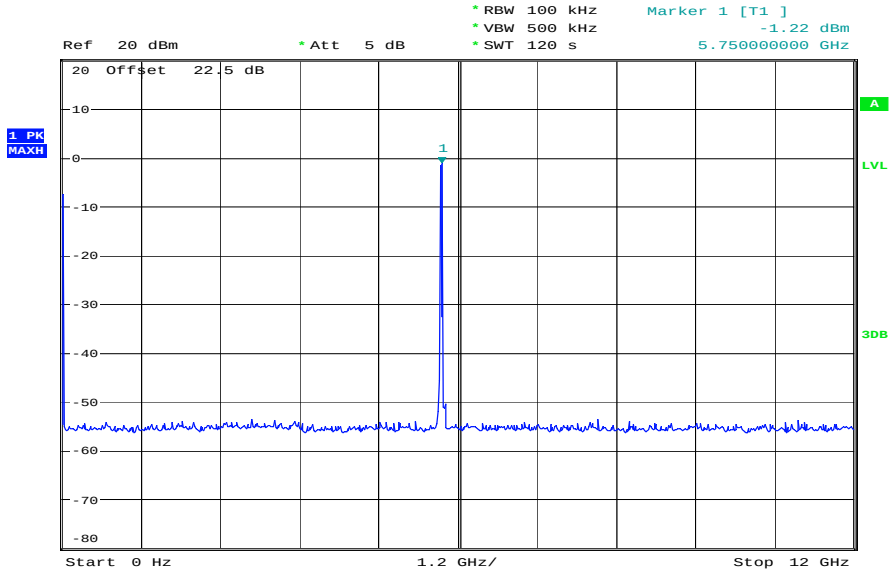
Date: 23.AUG.2012 11:36:45

Plot 9: TX mode, highest channel, up to 40 GHz



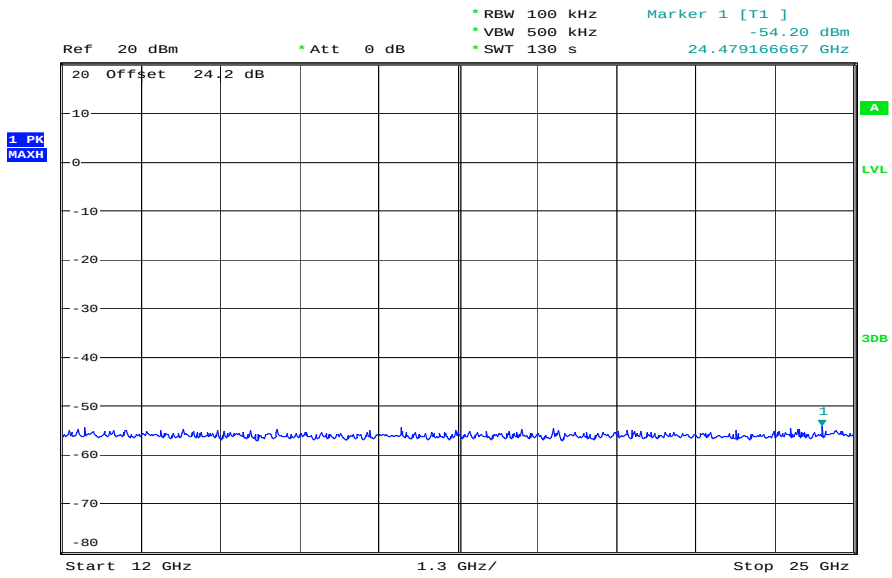
Plots: OFDM / n – mode HT20

Plot 1: TX mode, lowest channel, up to 12 GHz

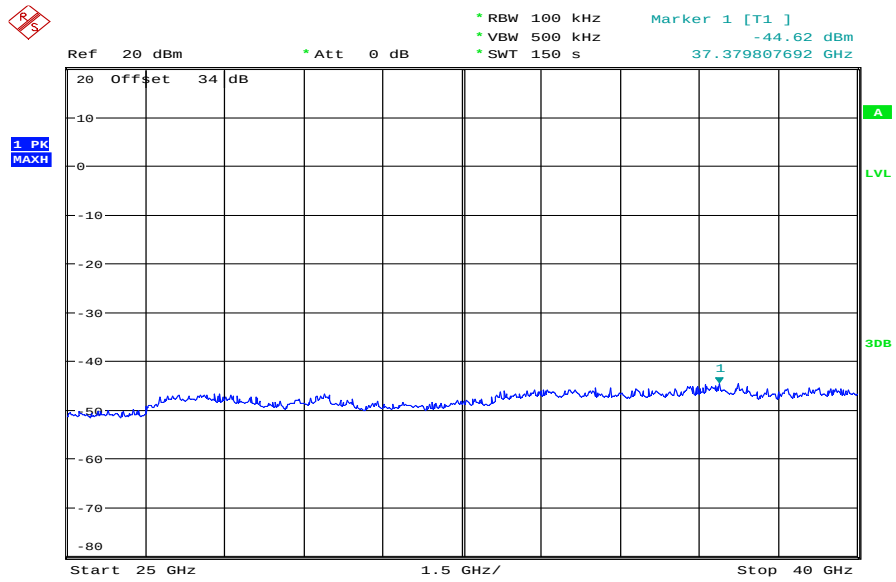


The peak at the beginning of the plot is the LO from the SA.

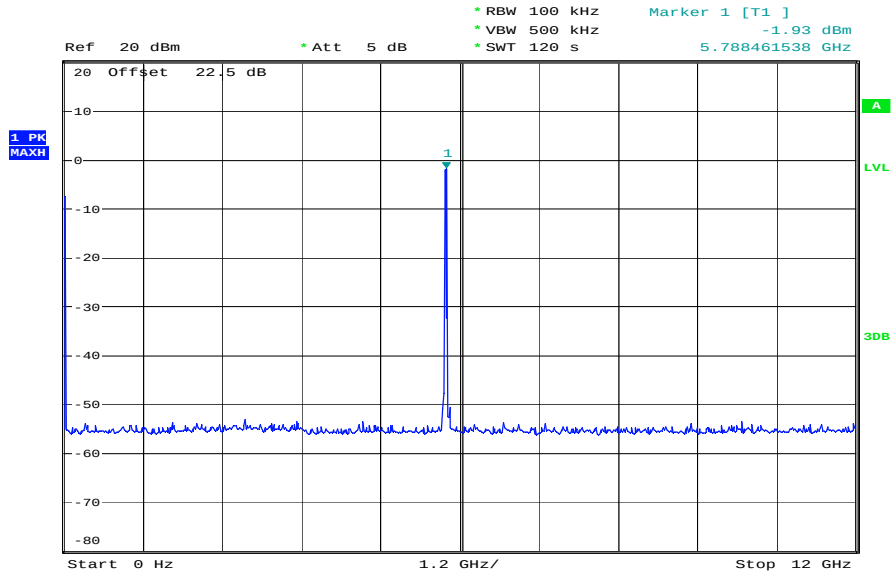
Plot 2: TX mode, lowest channel, up to 25 GHz



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

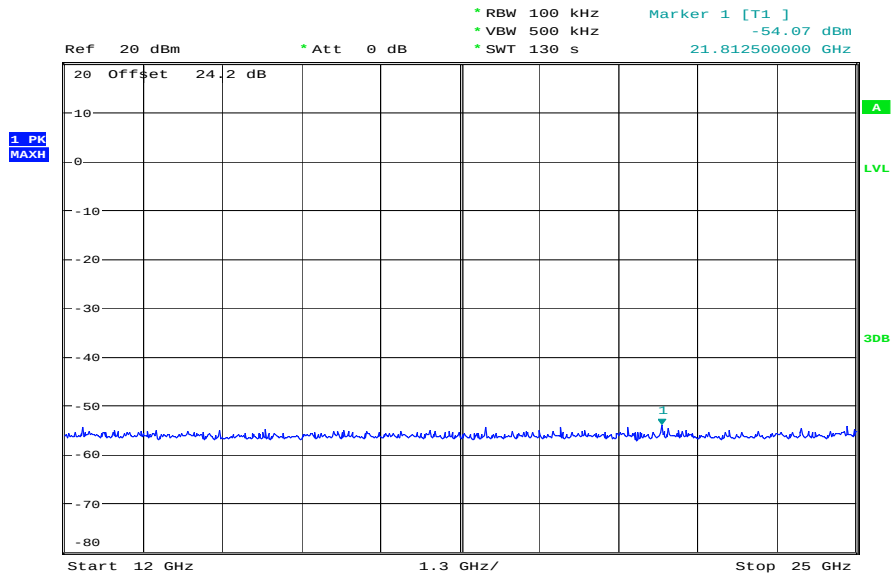


Plot 4: TX mode, middle channel, up to 12 GHz

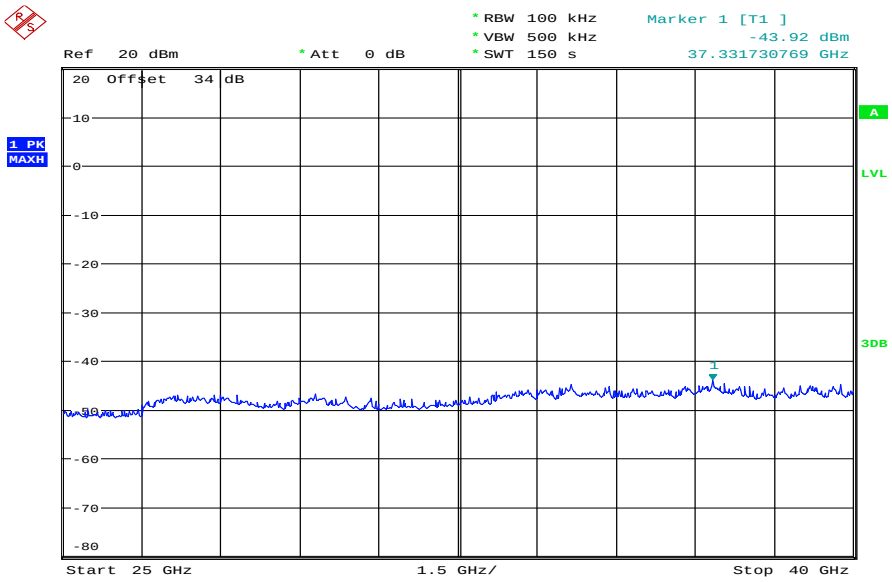


The peak at the beginning of the plot is the LO from the SA.

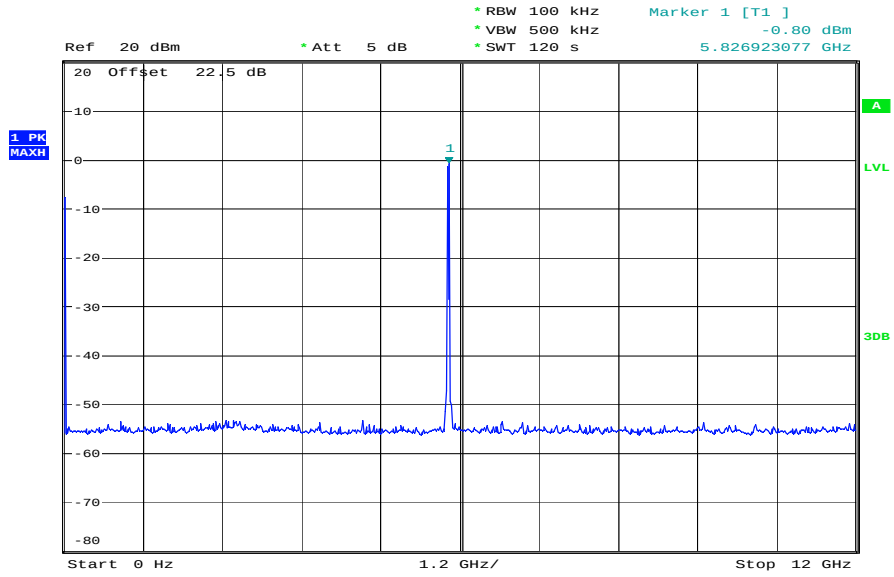
Plot 5: TX mode, middle channel, up to 25 GHz



Plot 6: TX mode, middle channel, up to 40 GHz

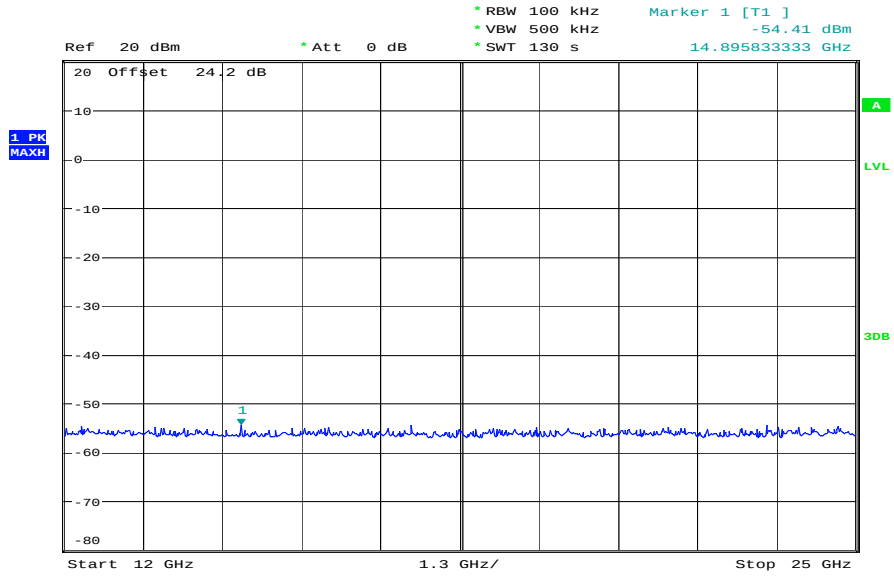


Plot 7: TX mode, highest channel, up to 12 GHz

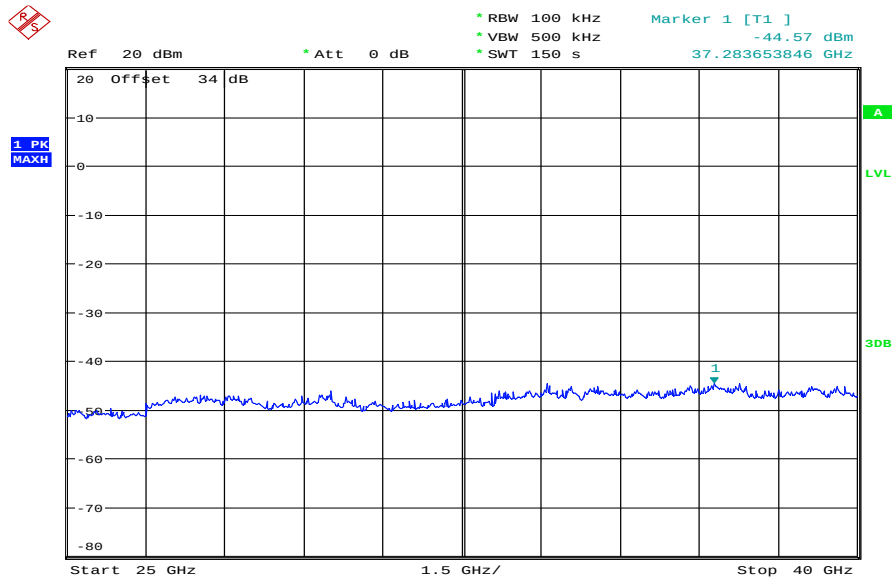


The peak at the beginning of the plot is the LO from the SA.

Plot 8: TX mode, highest channel, up to 25 GHz

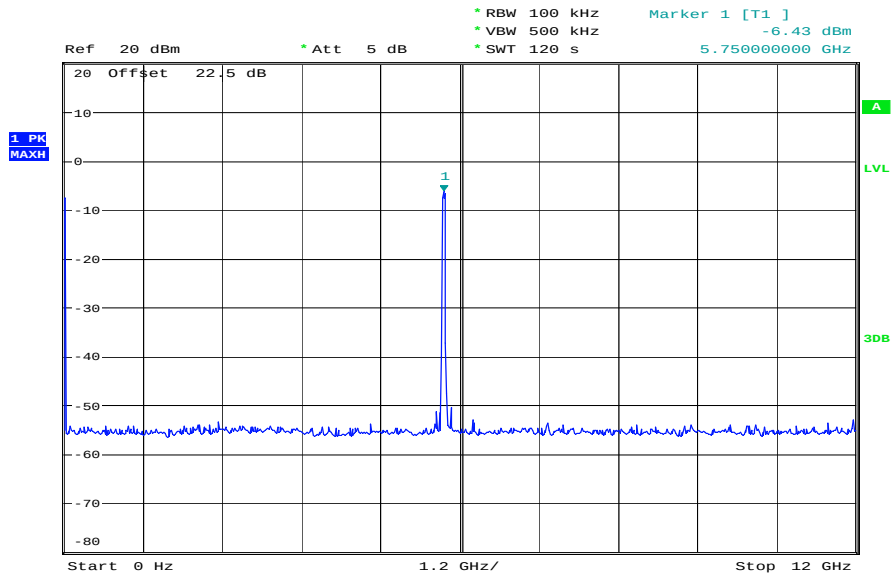


Plot 9: TX mode, highest channel, up to 40 GHz



Plots: OFDM / n – mode HT40

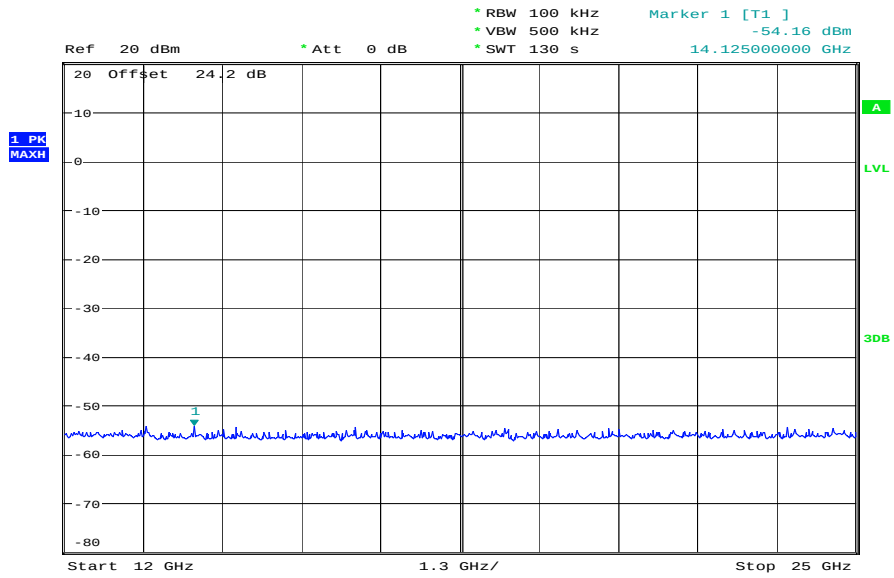
Plot 1: TX mode, lowest channel, up to 12 GHz



Date: 23.AUG.2012 11:16:56

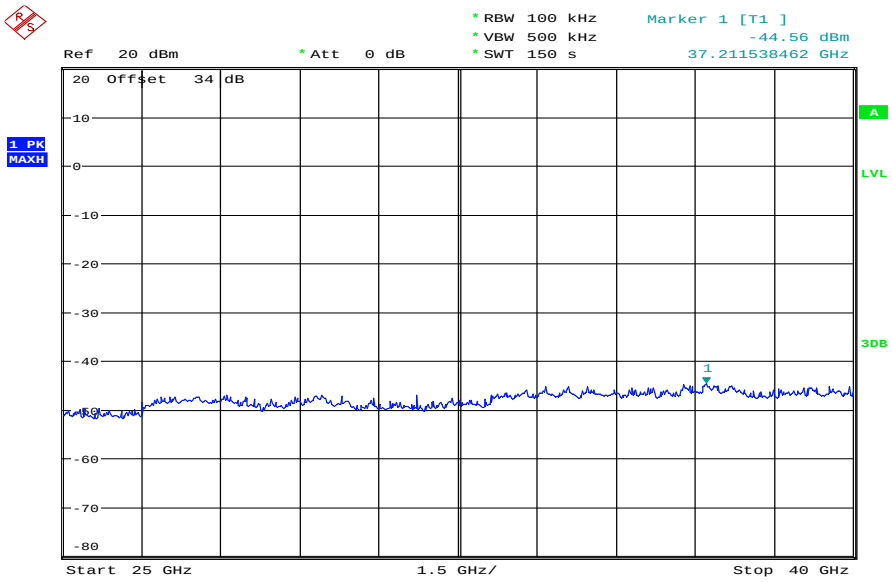
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, lowest channel, up to 25 GHz

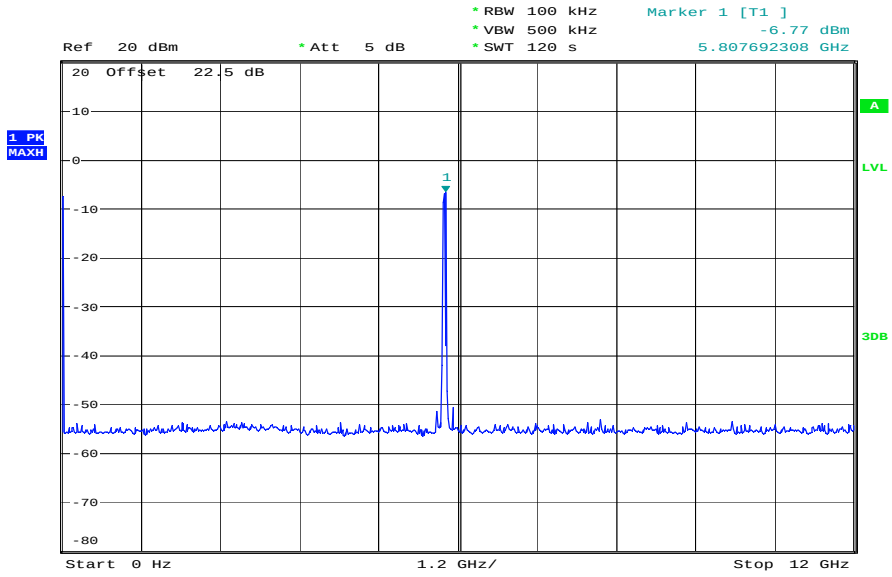


Date: 23.AUG.2012 11:27:45

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

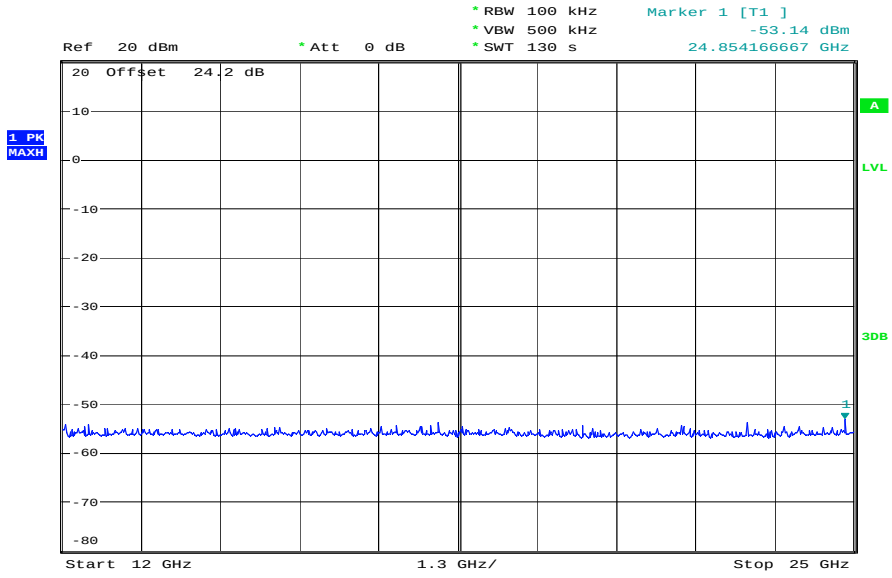


Plot 4: TX mode, highest channel, up to 12 GHz

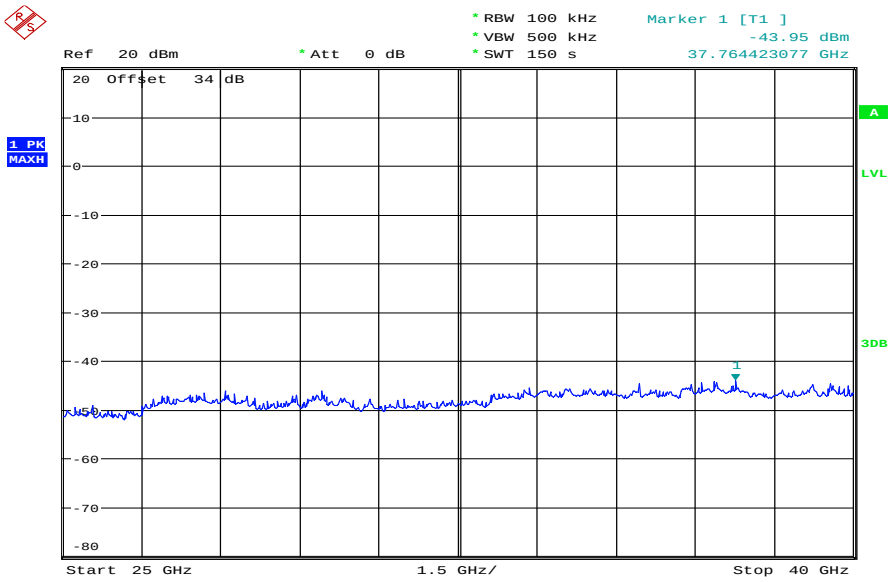


The peak at the beginning of the plot is the LO from the SA.

Plot 5: TX mode, highest channel, up to 25 GHz



Plot 6: TX mode, highest channel, up to 40 GHz



9.10 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at channel 1, 6 and 11. The measurement is repeated for all modulations.

Measurement:

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

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

Limits:

FCC	-/-	
TX Spurious Emissions Radiated		
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results: OFDM / a – mode

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / a – mode								
5745 MHz			5785 MHz			5825 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
No peaks detected above 1 GHz.			No peaks detected above 1 GHz.			No peaks detected above 1 GHz.		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Results: OFDM / n – mode HT20

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / n – mode HT20								
5745 MHz			5785 MHz			5825 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
No peaks detected above 1 GHz.			No peaks detected above 1 GHz.			No peaks detected above 1 GHz.		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Results: OFDM / n – mode HT40

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / n – mode HT40								
5755 MHz			5795 MHz			-/-		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			-/-		
No peaks detected above 1 GHz.			No peaks detected above 1 GHz.			No peaks detected above 1 GHz.		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Note: Results of OFDM a – mode are added to show the compliance with the standard.

Plots: OFDM / a – mode

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

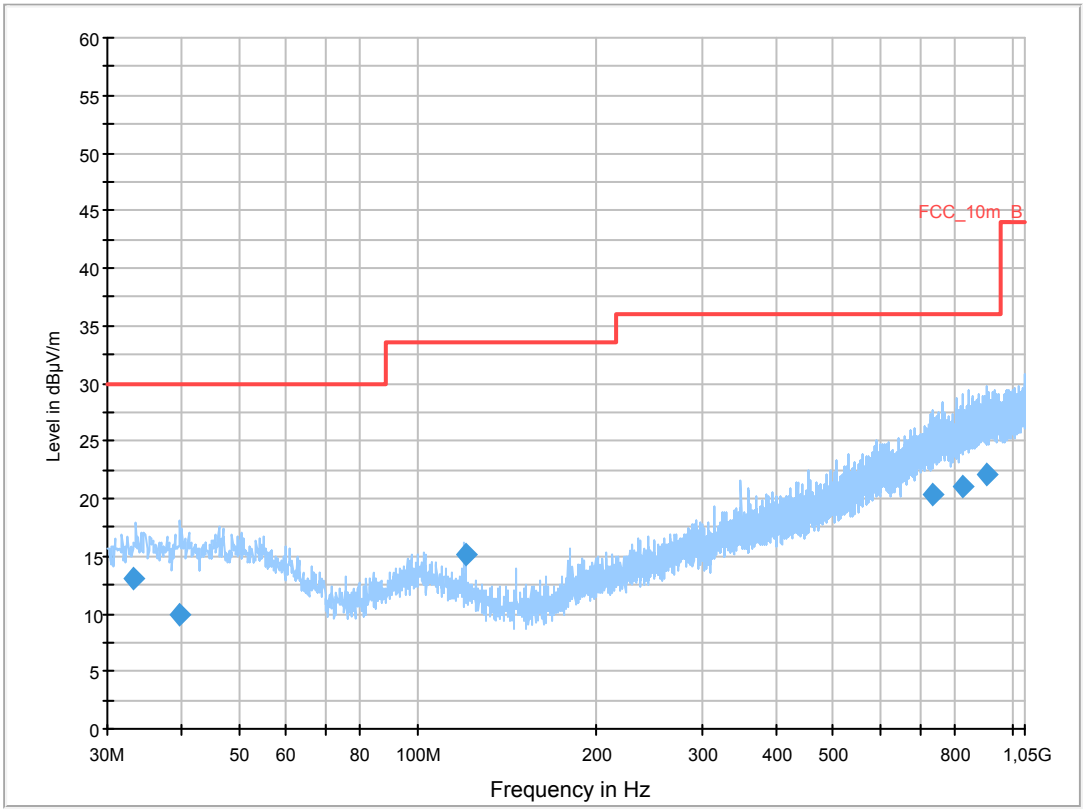
Common Information

EUT:	PM-0070-BV
Serial Number:	CB5A1K8J9R
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	TX WLAN a-mode TX ch 149 + 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

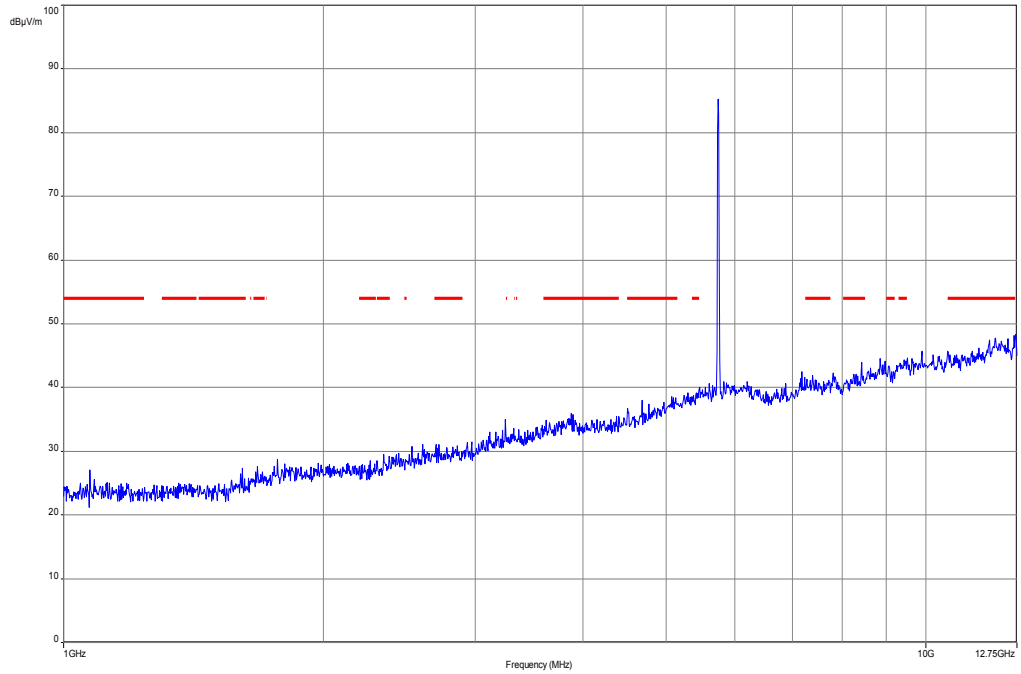
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



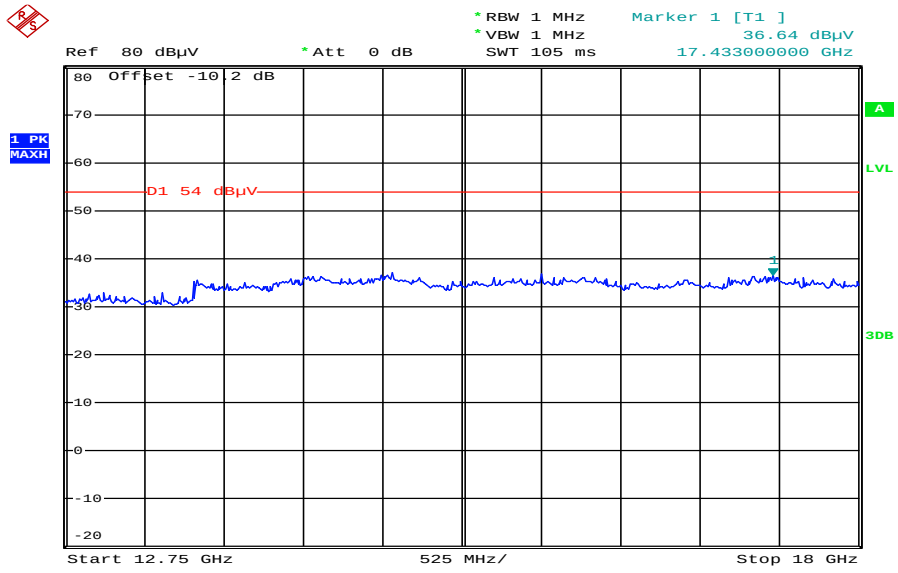
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.212700	13.1	1000.0	120.000	122.0	V	260.0	12.8	16.9	30.0	
39.577950	10.0	1000.0	120.000	143.0	V	180.0	13.4	20.0	30.0	
120.010650	15.1	1000.0	120.000	123.0	V	100.0	10.2	18.4	33.5	
735.475950	20.3	1000.0	120.000	145.0	H	-2.0	23.3	15.7	36.0	
824.696550	21.1	1000.0	120.000	133.0	H	270.0	24.2	14.9	36.0	
903.475950	22.1	1000.0	120.000	170.0	H	261.0	25.2	13.9	36.0	

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

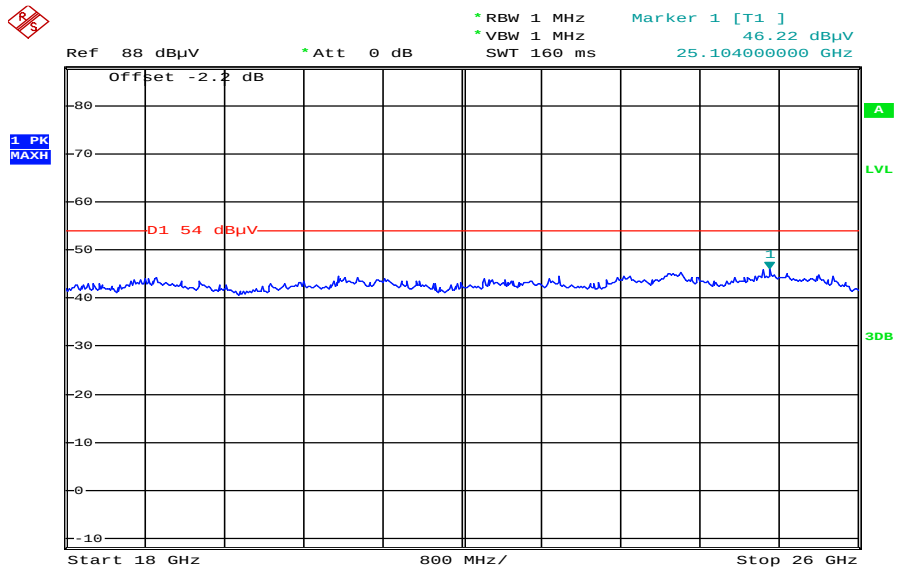


Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



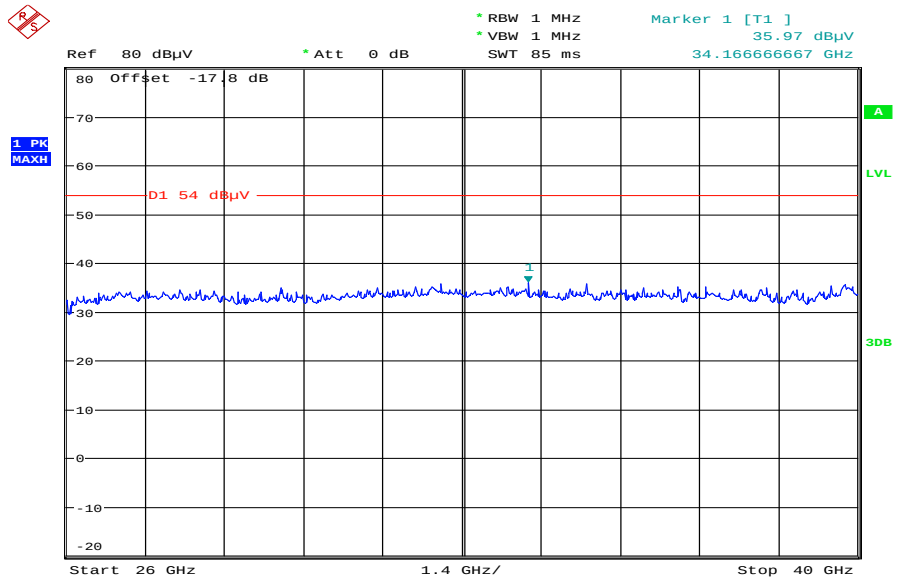
Date: 30.AUG.2012 13:24:12

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



Date: 30.AUG.2012 14:13:44

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



Date: 3.SEP.2012 08:12:44

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

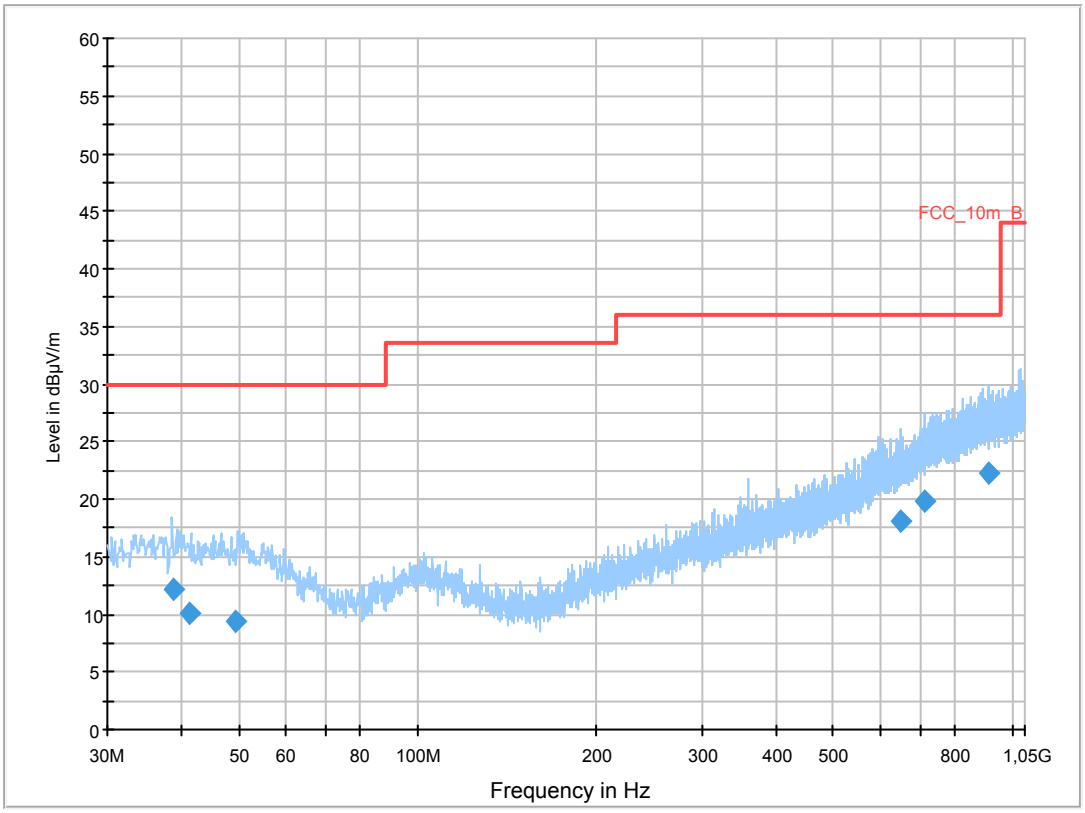
Common Information

EUT:	PM-0070-BV
Serial Number:	CB5A1K8J9R
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	TX WLAN a-mode TX ch 157 + 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

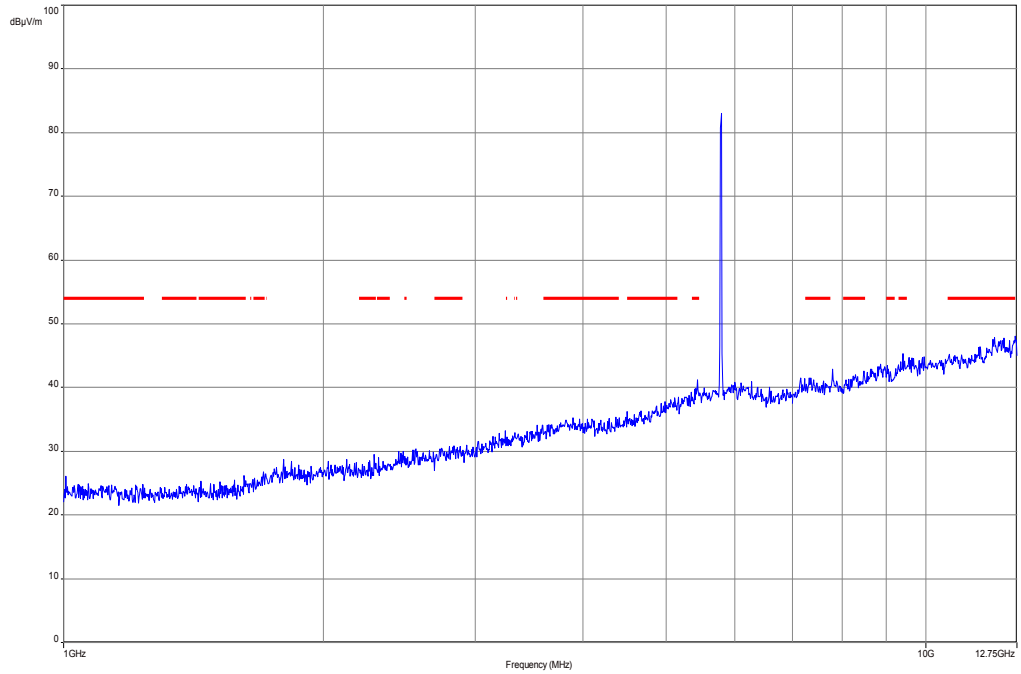
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



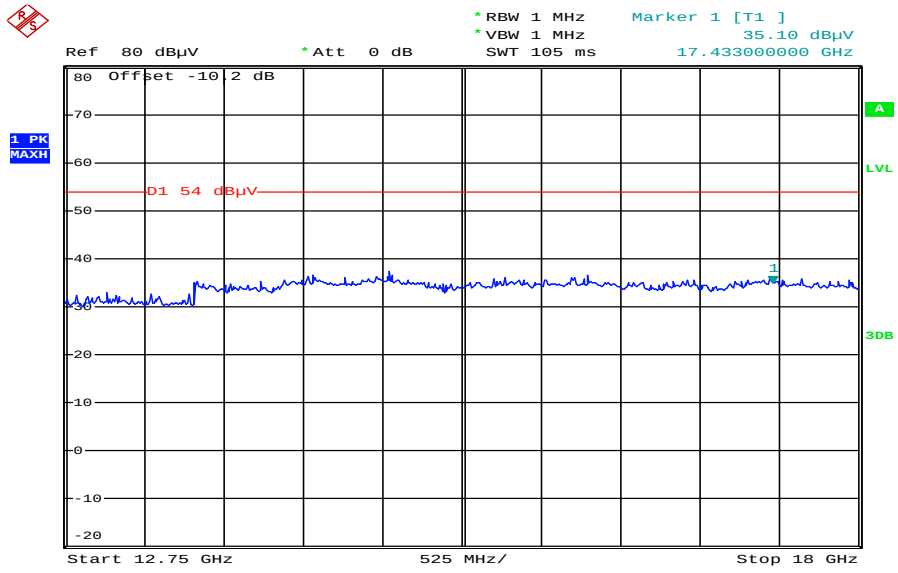
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
38.719500	12.1	1000.0	120.000	98.0	V	10.0	13.3	17.9	30.0	
41.285550	10.0	1000.0	120.000	170.0	V	81.0	13.4	20.0	30.0	
49.293900	9.4	1000.0	120.000	143.0	H	265.0	13.4	20.6	30.0	
650.345250	18.1	1000.0	120.000	156.0	H	280.0	21.1	17.9	36.0	
713.050650	19.8	1000.0	120.000	154.0	H	272.0	22.8	16.2	36.0	
912.210900	22.2	1000.0	120.000	155.0	V	178.0	25.2	13.8	36.0	

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

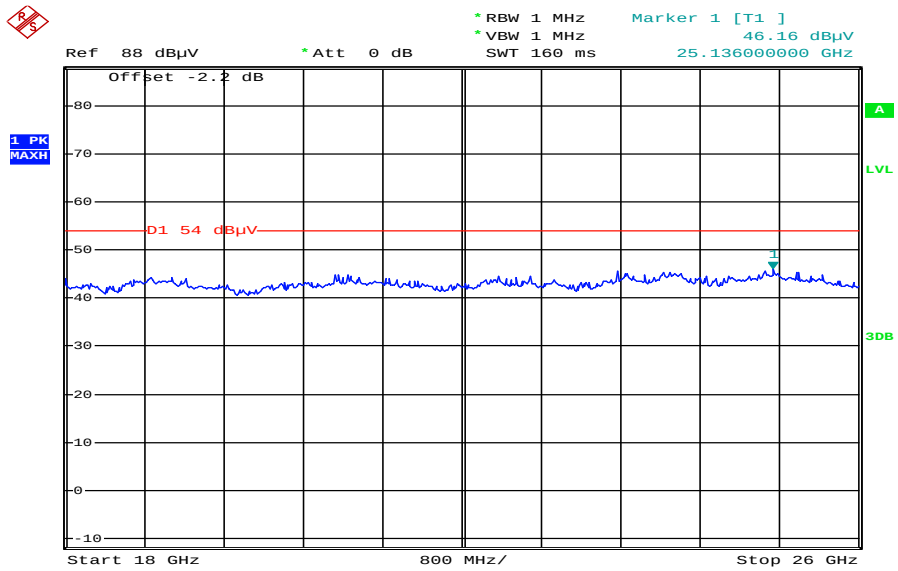


Plot 8: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



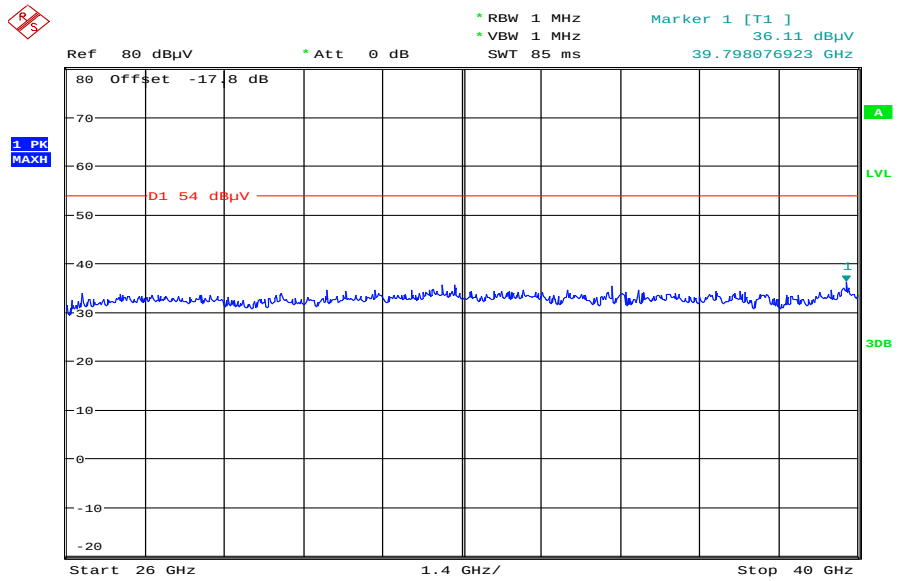
Date: 30.AUG.2012 13:25:38

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



Date: 30.AUG.2012 14:14:57

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



Date: 3.SEP.2012 08:13:04

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

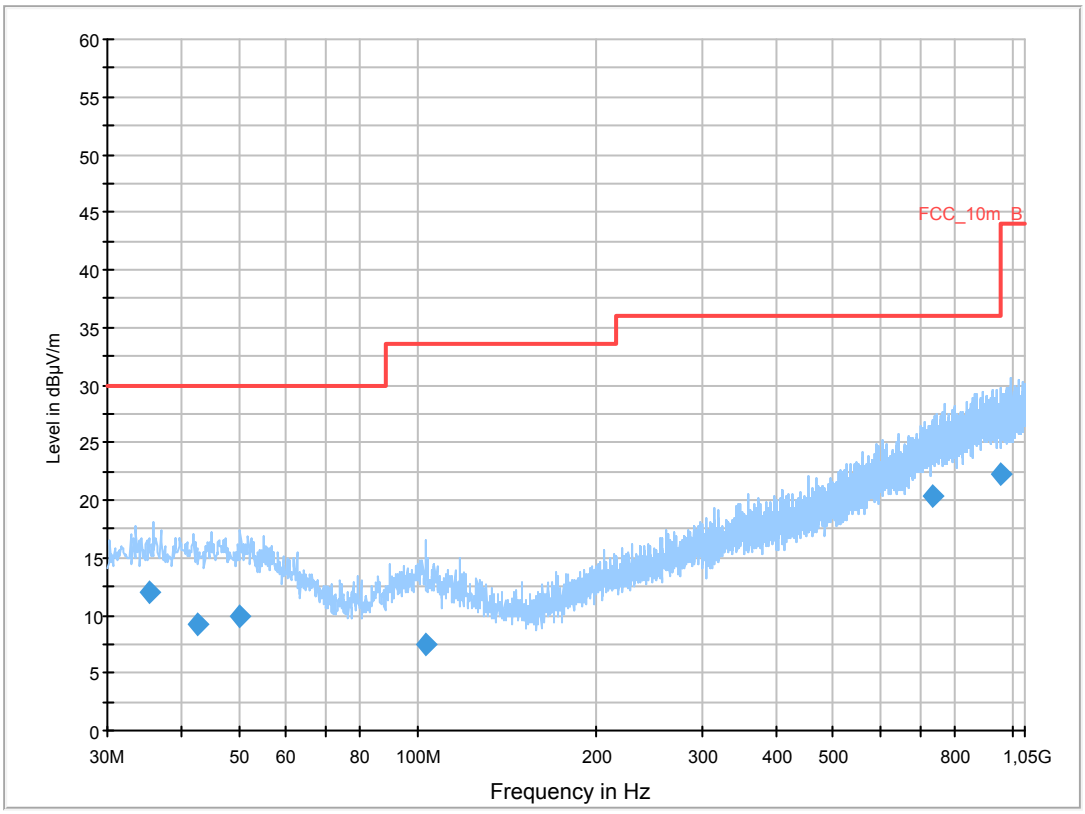
Common Information

EUT:	PM-0070-BV
Serial Number:	CB5A1K8J9R
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	TX WLAN a-mode TX ch 165 + 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

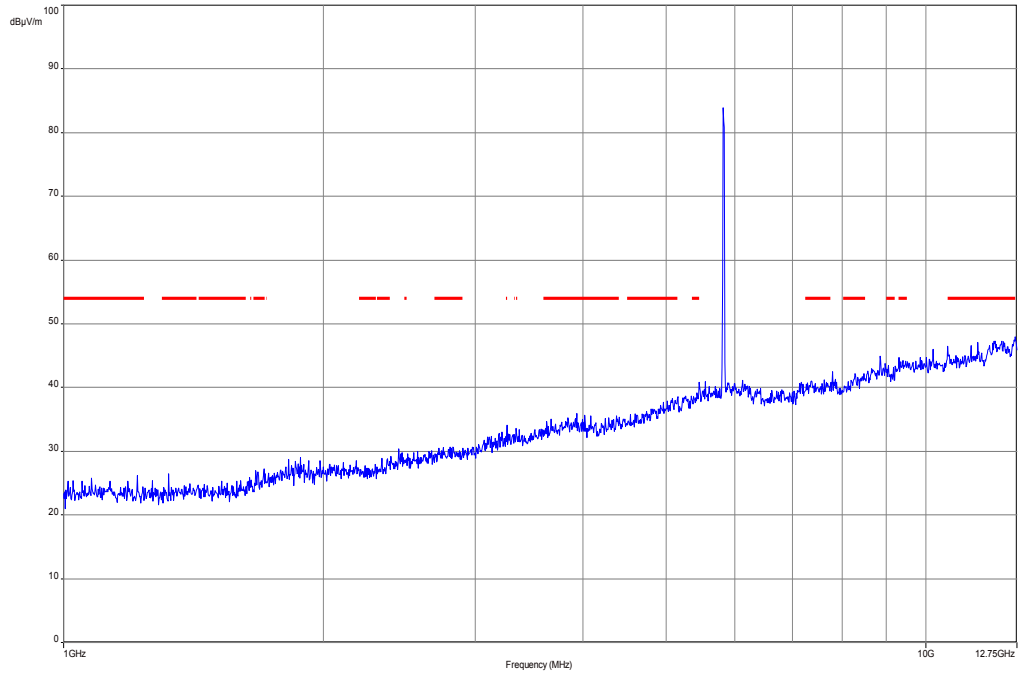
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



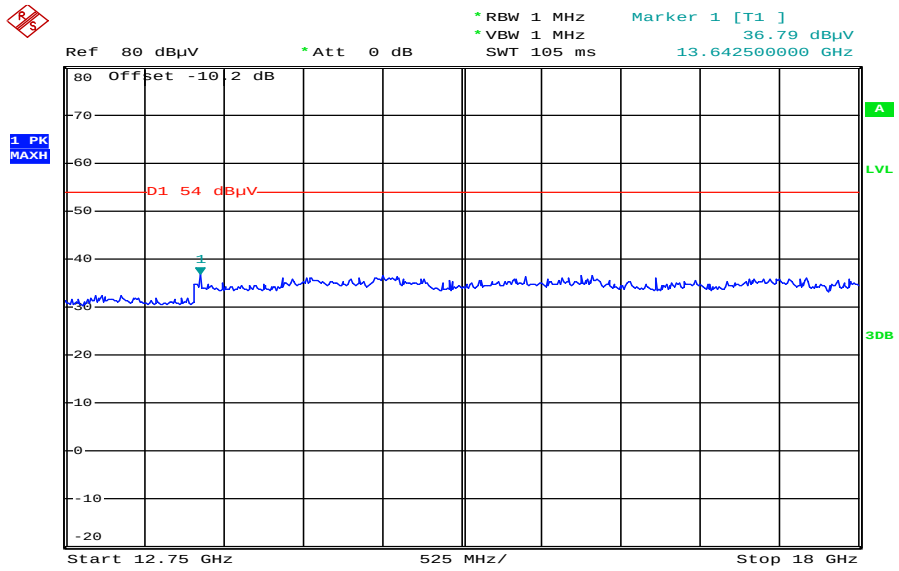
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.283450	12.0	1000.0	120.000	170.0	V	10.0	13.0	18.0	30.0	
42.402600	9.1	1000.0	120.000	170.0	H	280.0	13.4	20.9	30.0	
50.002950	9.9	1000.0	120.000	143.0	H	92.0	13.4	20.1	30.0	
103.295250	7.4	1000.0	120.000	105.0	V	190.0	11.6	26.1	33.5	
734.411250	20.3	1000.0	120.000	105.0	V	280.0	23.3	15.7	36.0	
953.822700	22.3	1000.0	120.000	98.0	V	260.0	25.4	13.7	36.0	

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

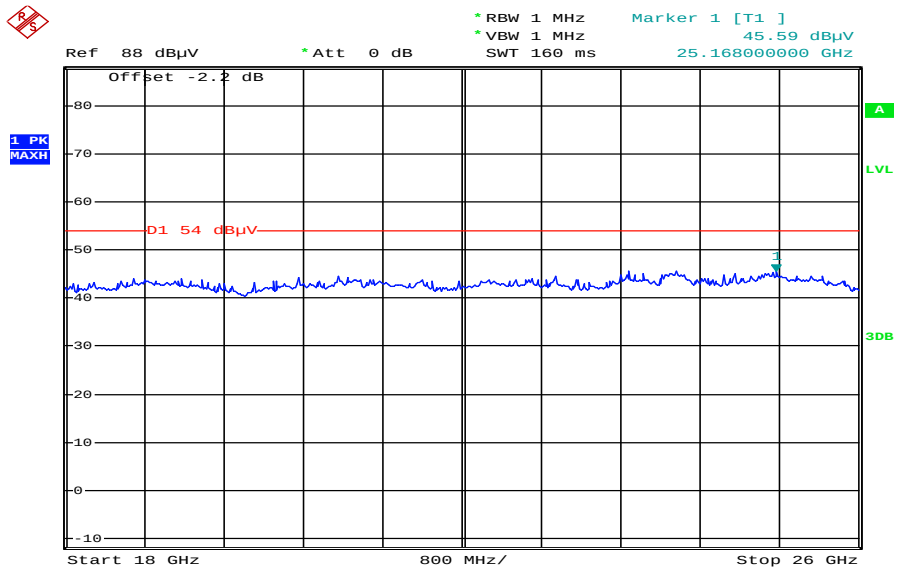


Plot 13: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



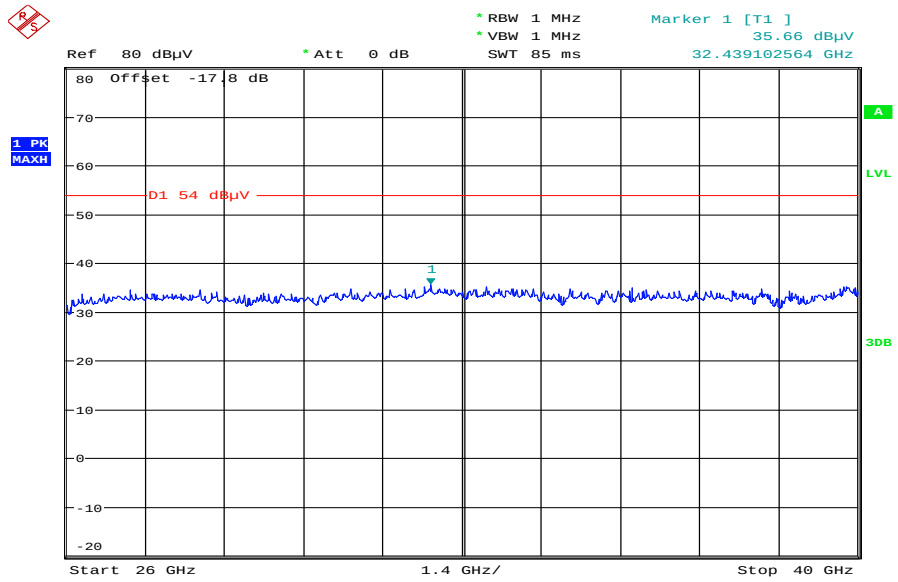
Date: 30.AUG.2012 13:27:13

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



Date: 30.AUG.2012 14:16:16

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



Date: 3.SEP.2012 08:14:10

Plots: OFDM / n – mode HT40

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

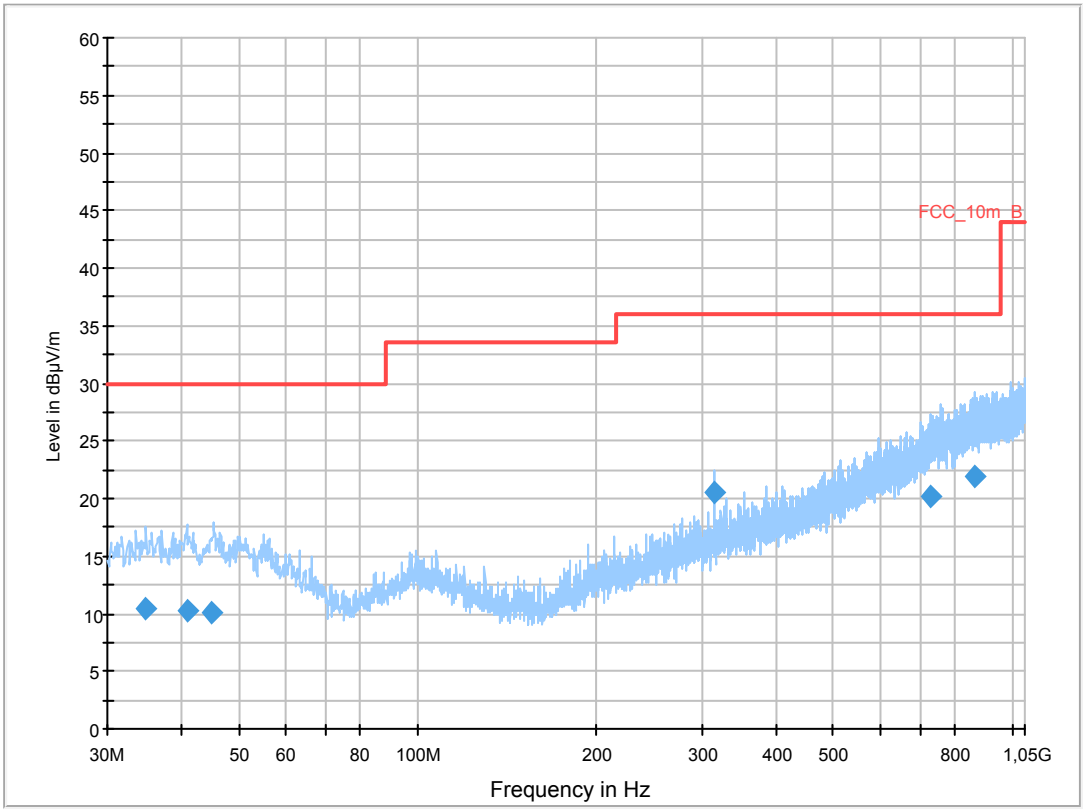
Common Information

EUT:	PM-0070-BV
Serial Number:	CB5A1K8J9R
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	TX WLAN n-mode HT40 TX ch 151 + 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

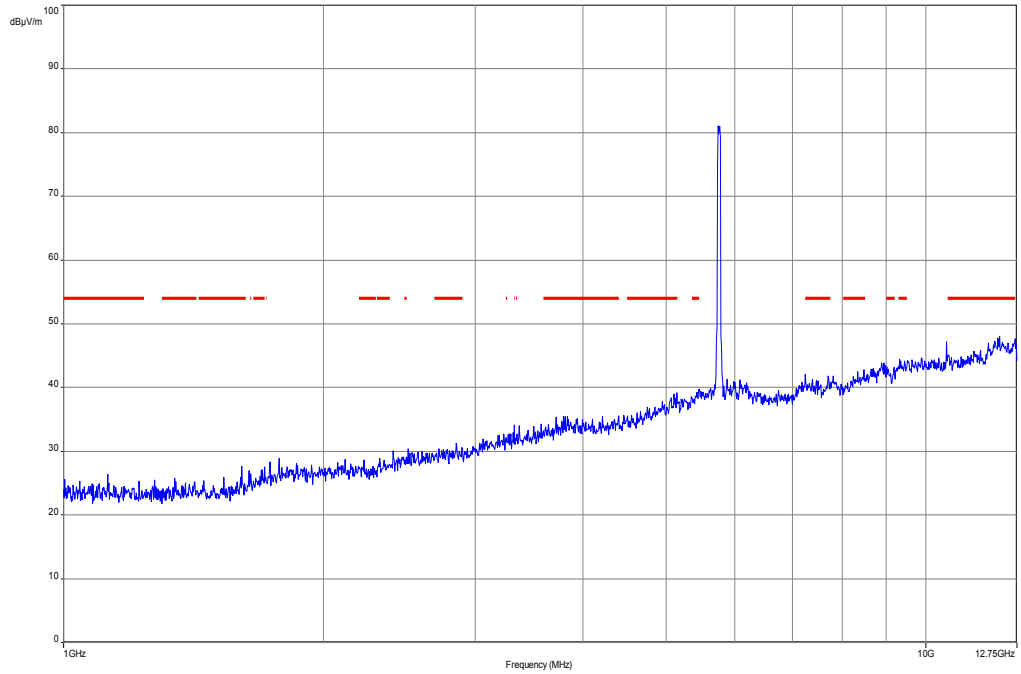
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



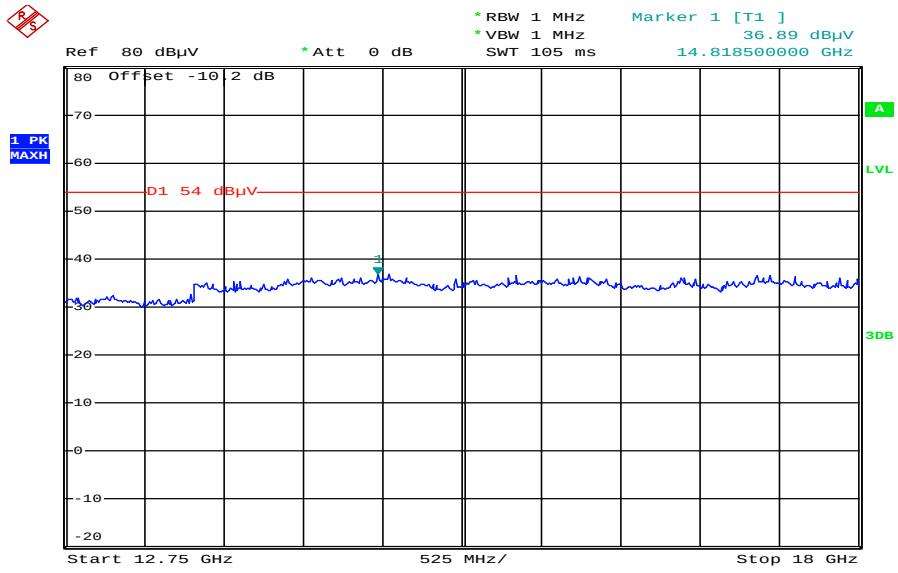
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
34.678800	10.5	1000.0	120.000	120.0	V	270.0	13.0	19.5	30.0	
40.835700	10.2	1000.0	120.000	170.0	V	92.0	13.4	19.8	30.0	
44.770500	10.0	1000.0	120.000	170.0	V	100.0	13.3	20.0	30.0	
314.992800	20.4	1000.0	120.000	98.0	V	10.0	15.0	15.6	36.0	
726.396750	20.2	1000.0	120.000	170.0	H	171.0	23.1	15.8	36.0	
861.859650	21.8	1000.0	120.000	170.0	H	-10.0	24.7	14.2	36.0	

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

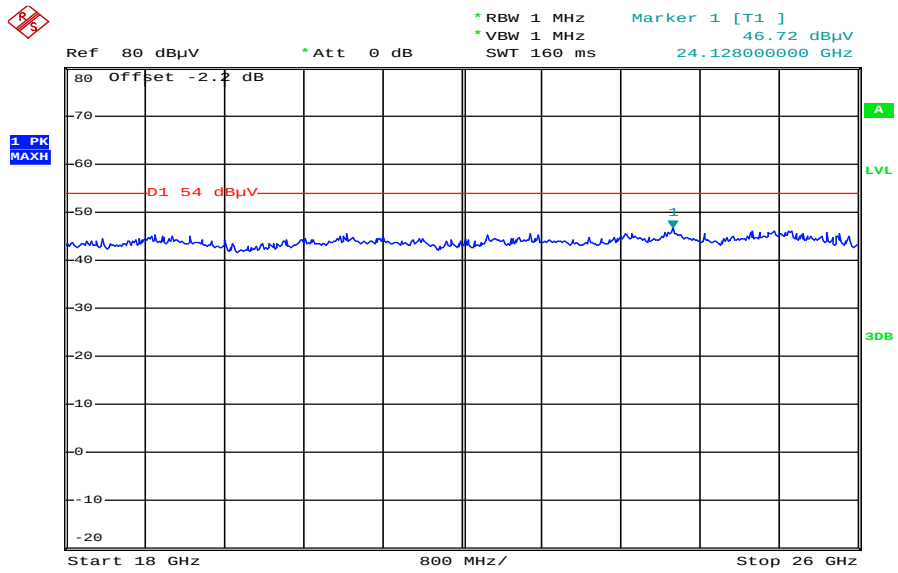


Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



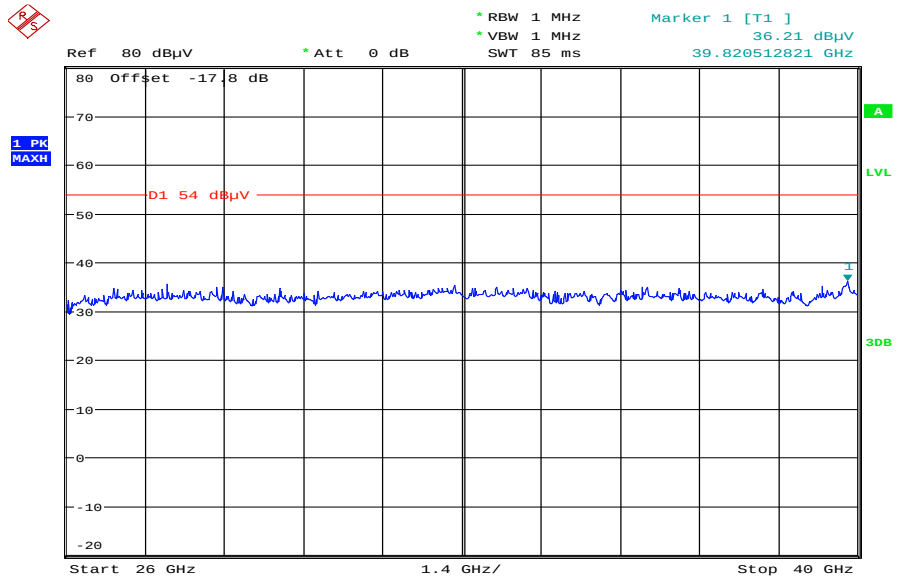
Date: 30.AUG.2012 13:53:29

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



Date: 31.AUG.2012 10:01:05

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



Date: 3.SEP.2012 08:15:50

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

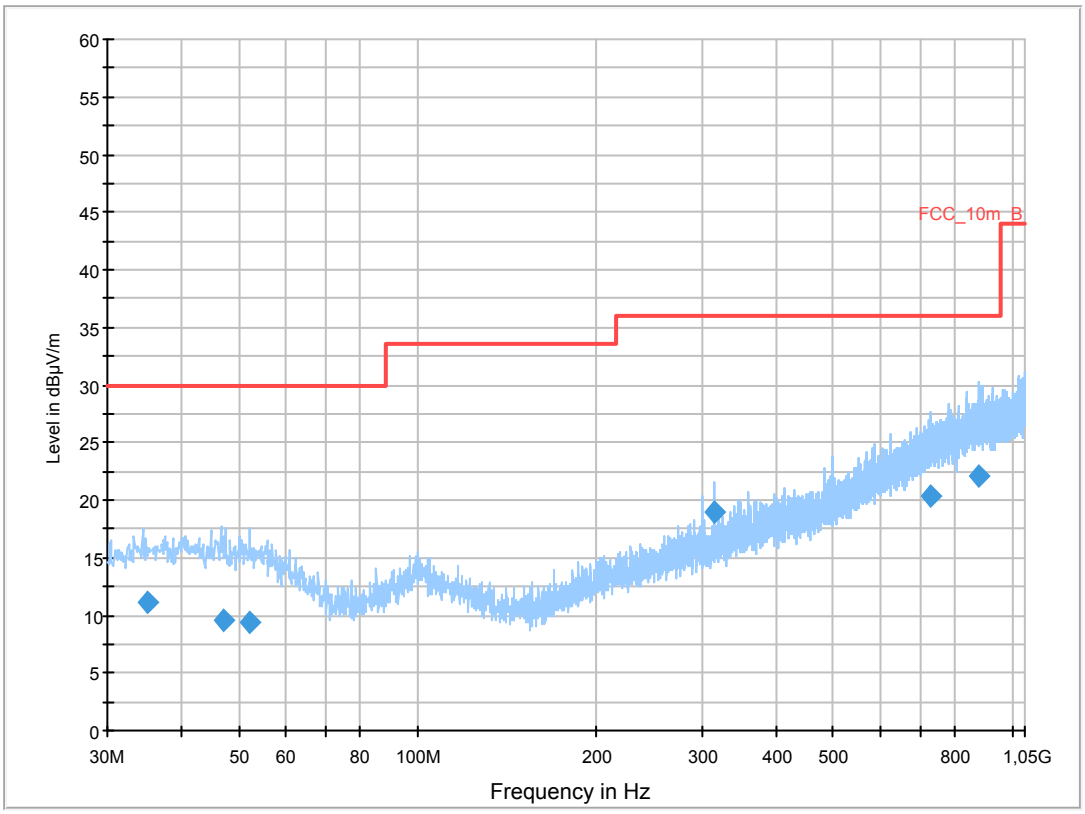
Common Information

EUT:	PM-0070-BV
Serial Number:	CB5A1K8J9R
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	TX WLAN n-mode HT40 TX ch 159 + 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

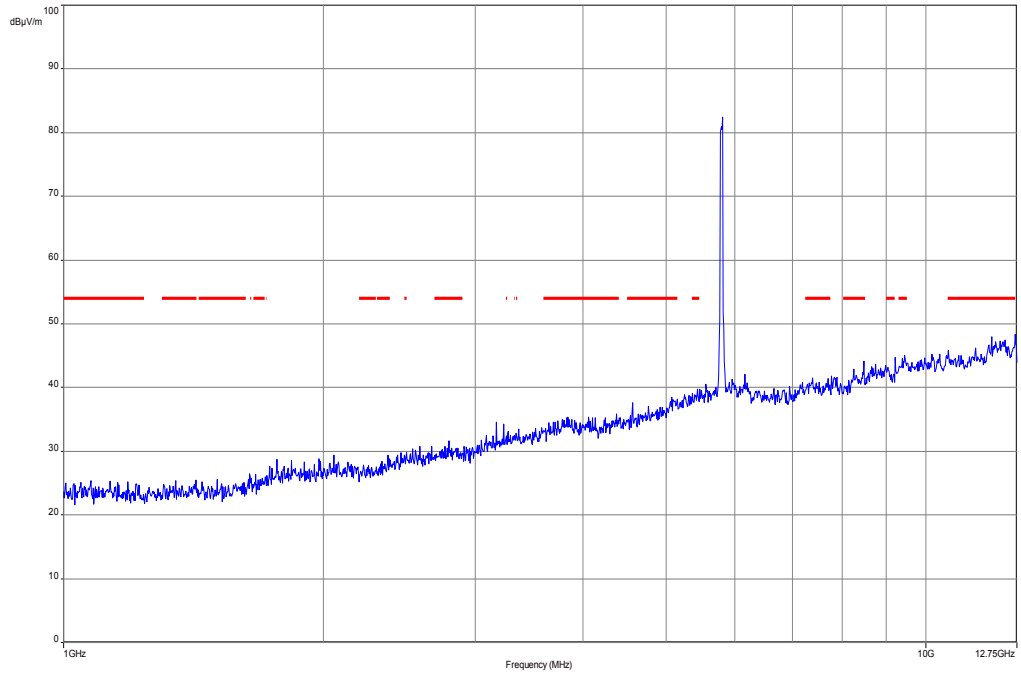
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



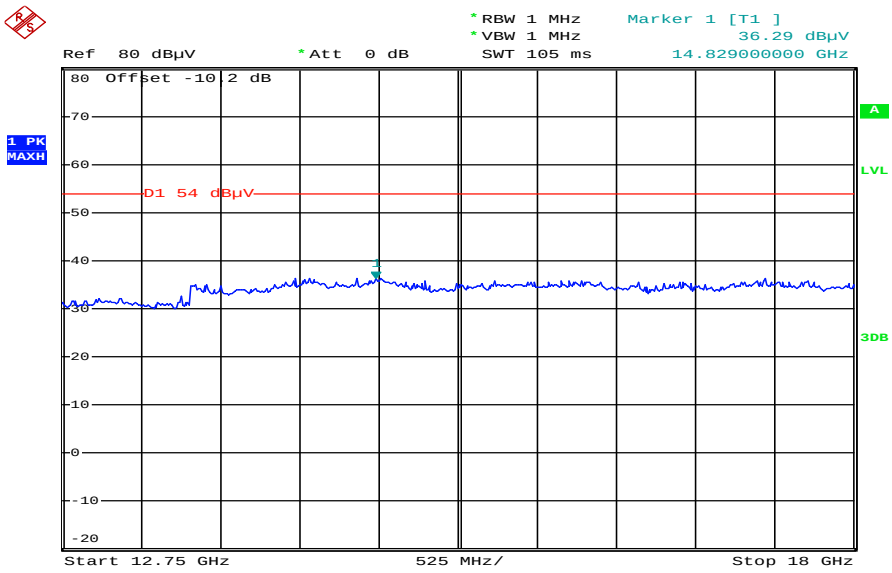
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
34.956600	11.2	1000.0	120.000	113.0	V	260.0	13.0	18.8	30.0	
47.084250	9.5	1000.0	120.000	155.0	H	10.0	13.3	20.5	30.0	
52.180950	9.4	1000.0	120.000	98.0	H	268.0	13.2	20.6	30.0	
315.021300	18.9	1000.0	120.000	170.0	V	-4.0	15.0	17.1	36.0	
731.175900	20.3	1000.0	120.000	170.0	H	80.0	23.2	15.7	36.0	
880.290300	22.1	1000.0	120.000	170.0	V	268.0	24.9	13.9	36.0	

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

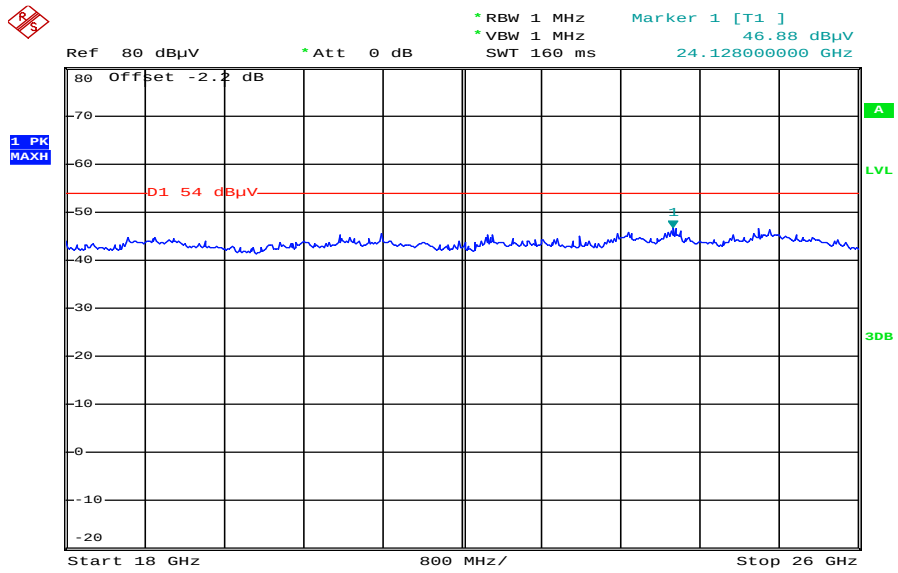


Plot 8: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



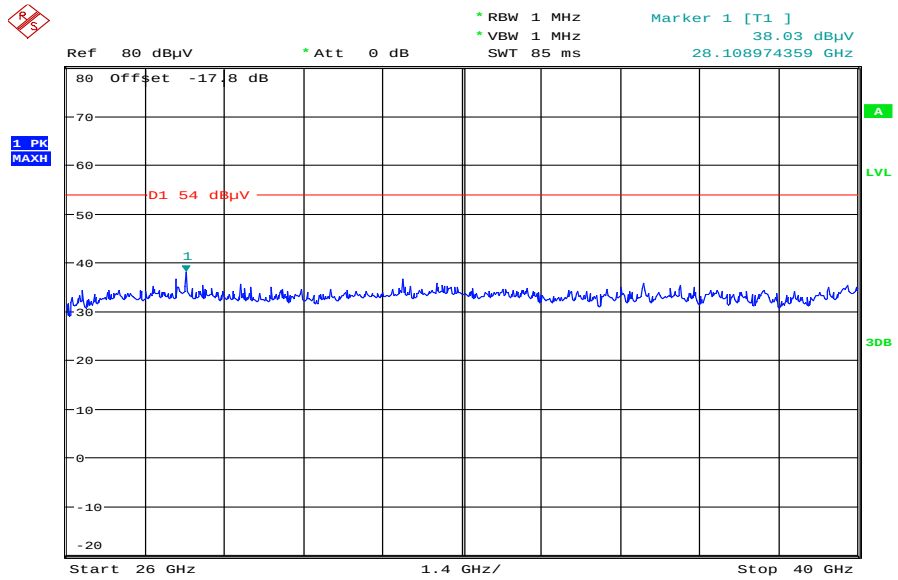
Date: 30.AUG.2012 13:54:57

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



Date: 31.AUG.2012 10:04:43

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



Date: 3.SEP.2012 08:16:47

9.11 RX spurious emissions radiated

Description:

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

Measurement:

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

Limits:

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

Results:

RX Spurious Emissions Radiated [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
No peaks detected above 1 GHz.		
Measurement uncertainty	± 3 dB	

Result: Passed

Plots: RX / Idle – mode

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

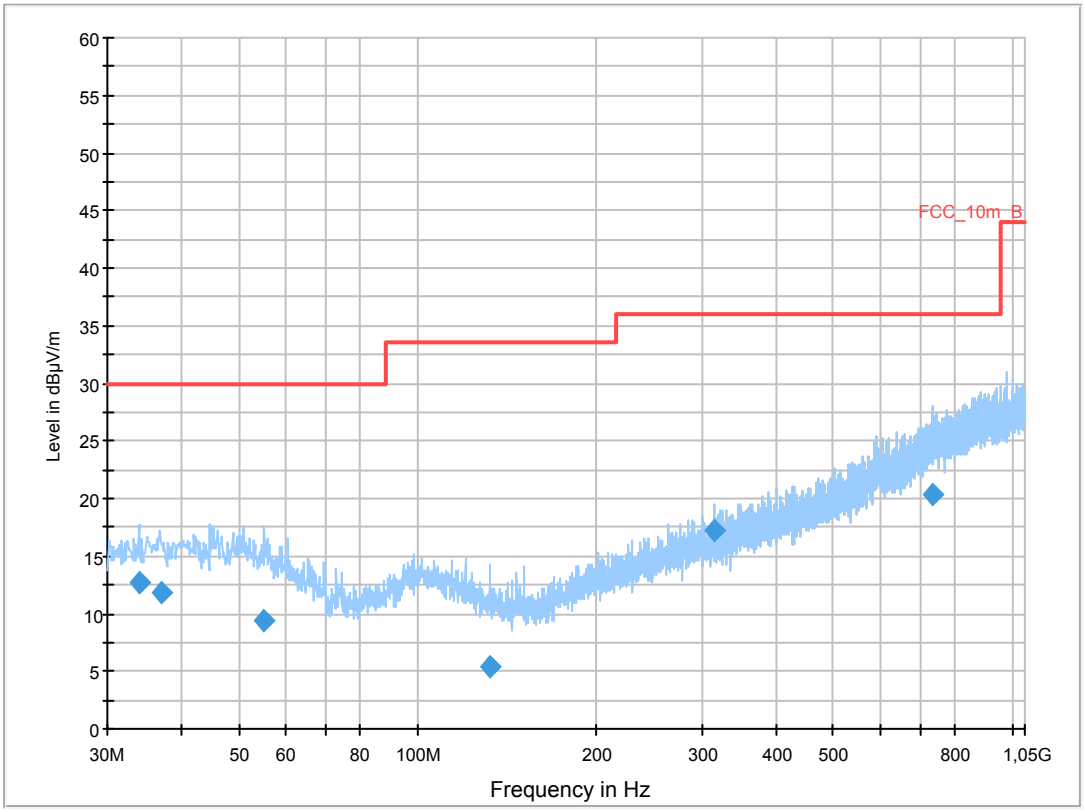
Common Information

EUT:	PM-0070-BV
Serial Number:	CB5A1K8J5S
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	TX WLAN RX + charging
Operator Name:	Wolsdorfer
Comment:	AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

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

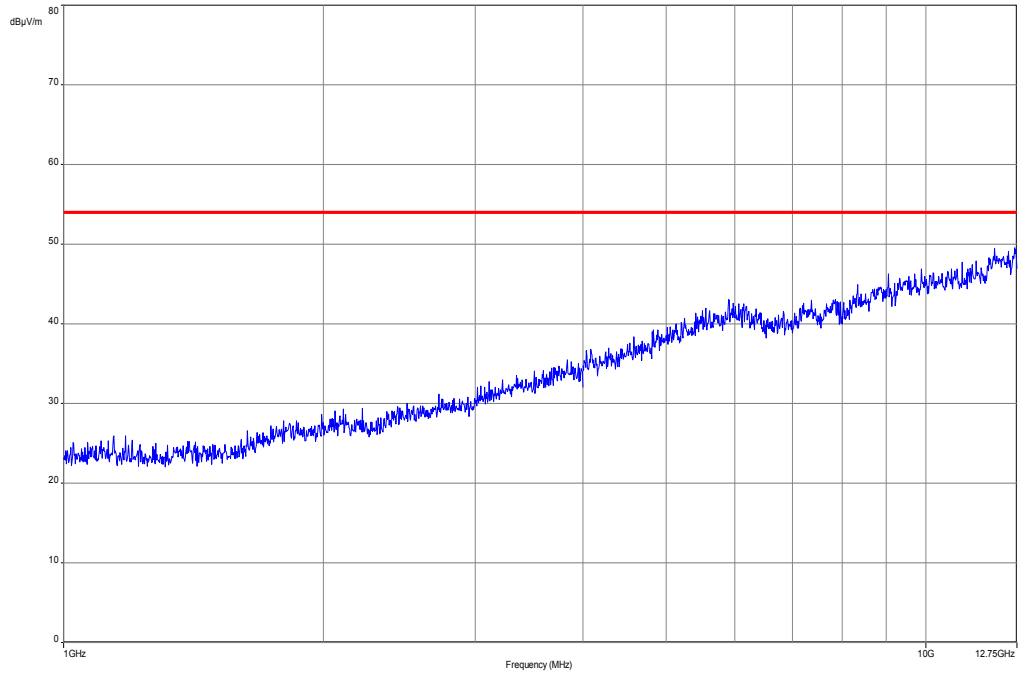
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



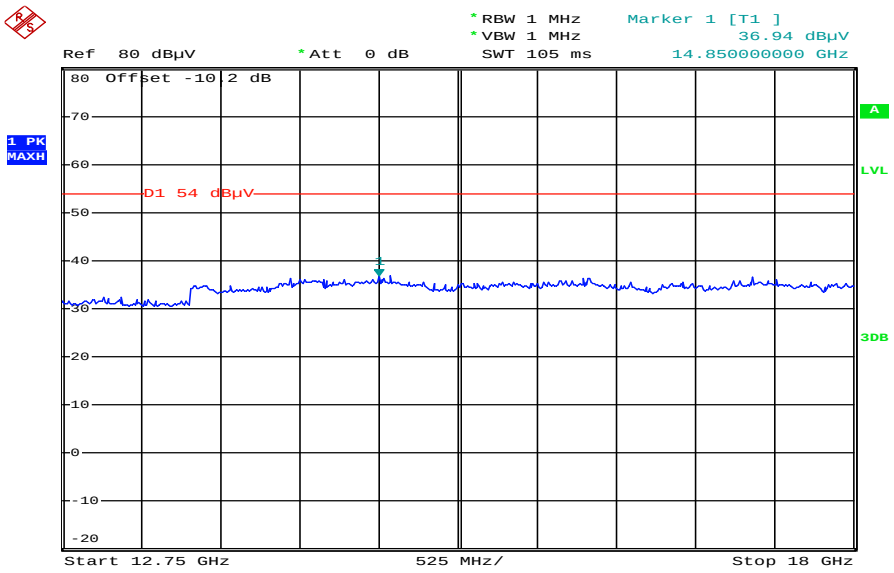
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
34.005900	12.8	1000.0	120.000	98.0	V	92.0	12.9	17.2	30.0	
37.012500	11.9	1000.0	120.000	133.0	V	87.0	13.2	18.1	30.0	
55.154100	9.3	1000.0	120.000	170.0	V	10.0	12.8	20.7	30.0	
132.244950	5.4	1000.0	120.000	163.0	H	280.0	9.2	28.1	33.5	
314.998500	17.3	1000.0	120.000	105.0	V	81.0	15.0	18.7	36.0	
732.189600	20.4	1000.0	120.000	170.0	H	90.0	23.3	15.6	36.0	

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

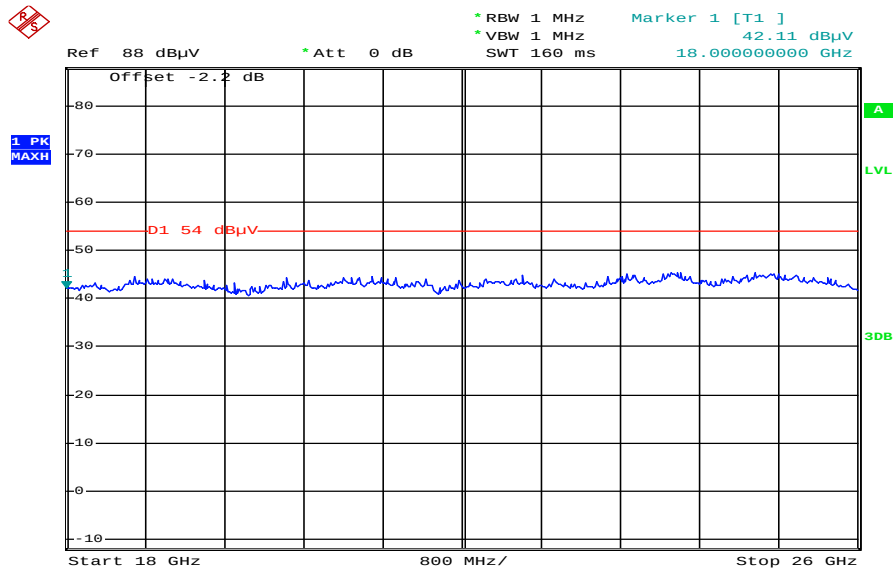


Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization



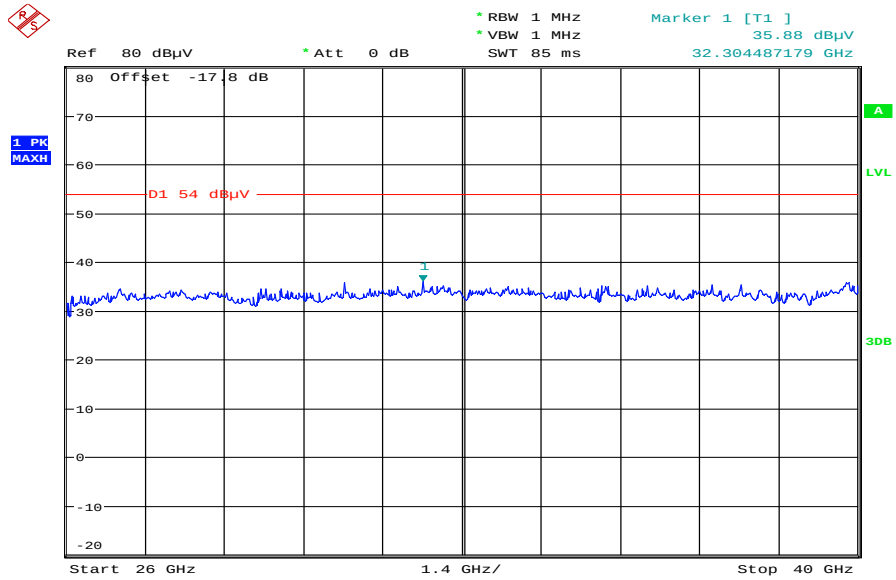
Date: 30.AUG.2012 13:56:28

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



Date: 30.AUG.2012 14:11:56

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



Date: 3.SEP.2012 08:25:06

9.12 TX spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is representative for all channels and modes. If critical peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

Measurement:

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

Limits:

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

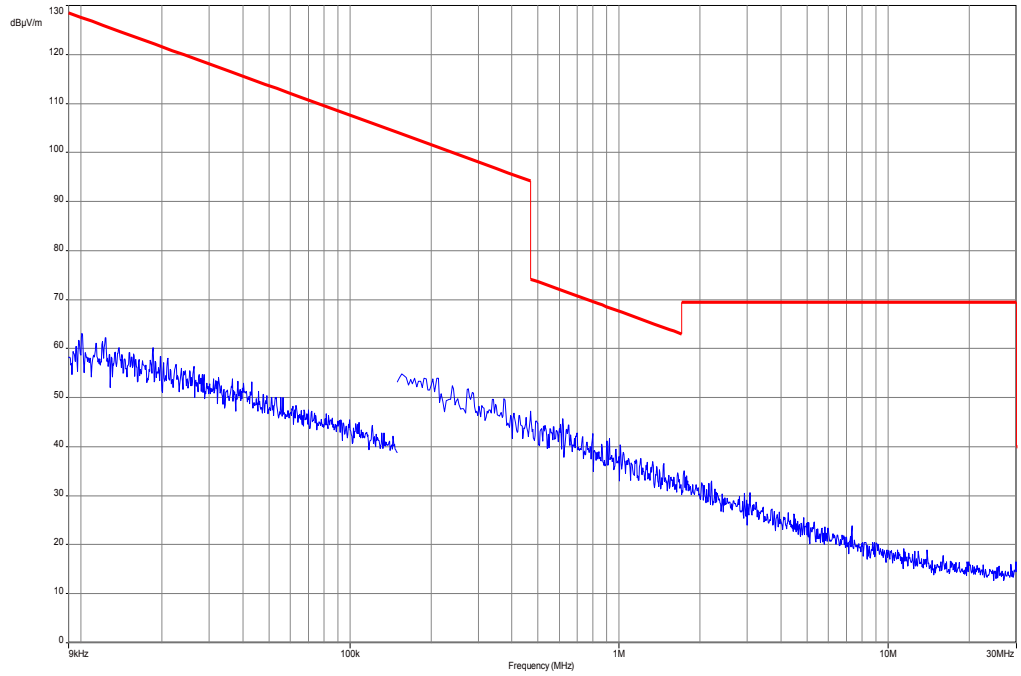
Results:

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

Result: Passed

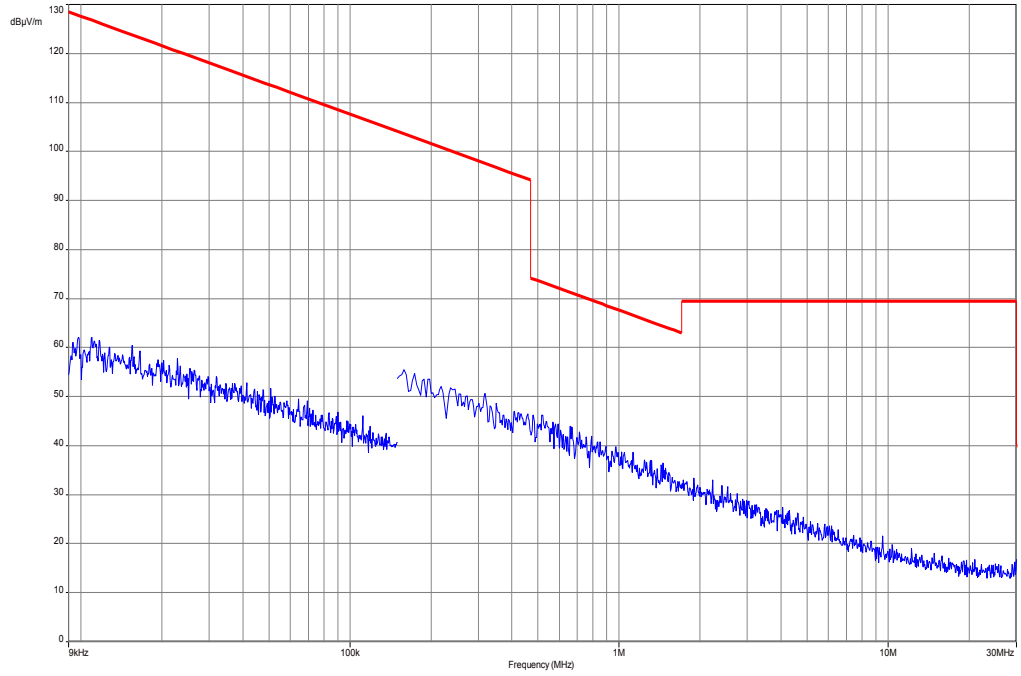
Plots: TX mode

Plot 1: 9 kHz to 30 MHz



Plots: RX / Idle – mode

Plot 1: 9 kHz to 30 MHz



9.13 TX spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is repeated for DSSS and OFDM modulation. If critical peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

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

Limits:

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

*Decreases with the logarithm of the frequency

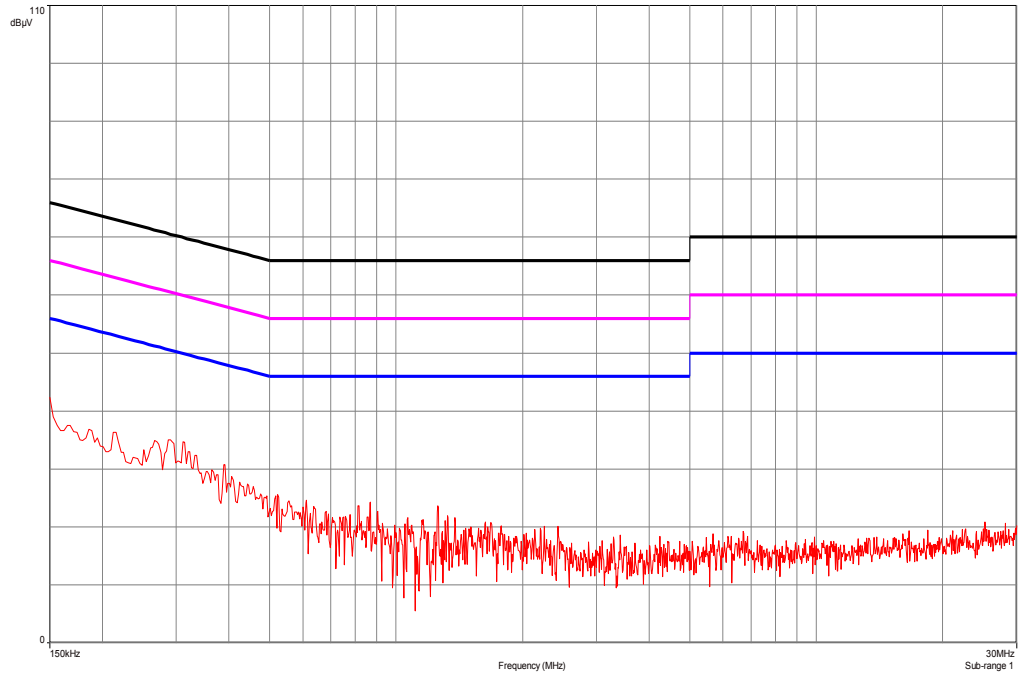
Results:

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

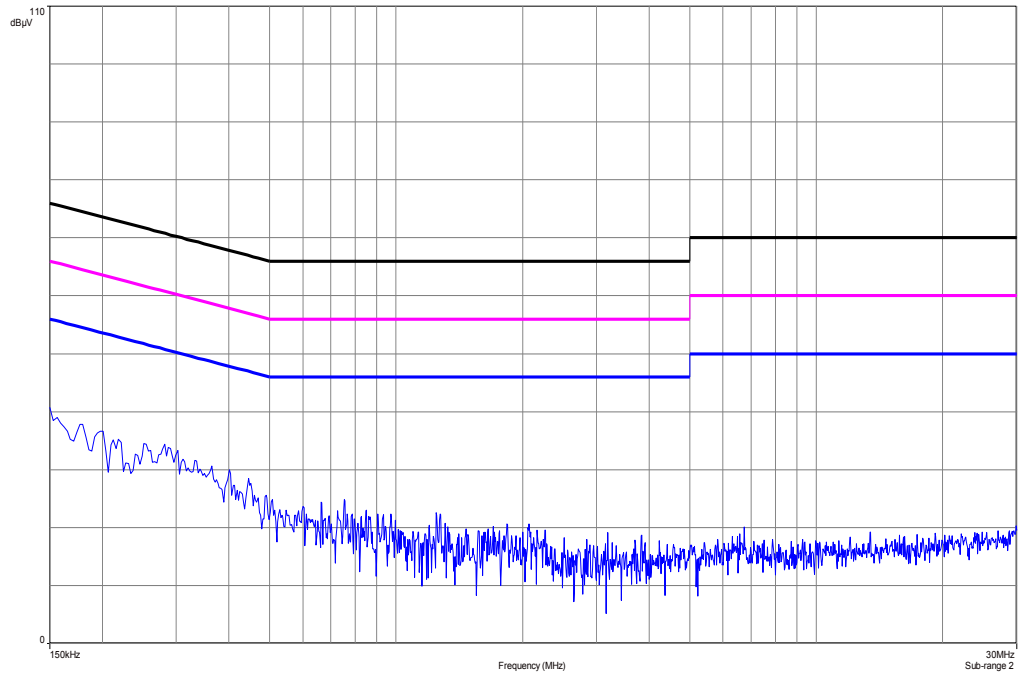
Result: Passed

Plots:

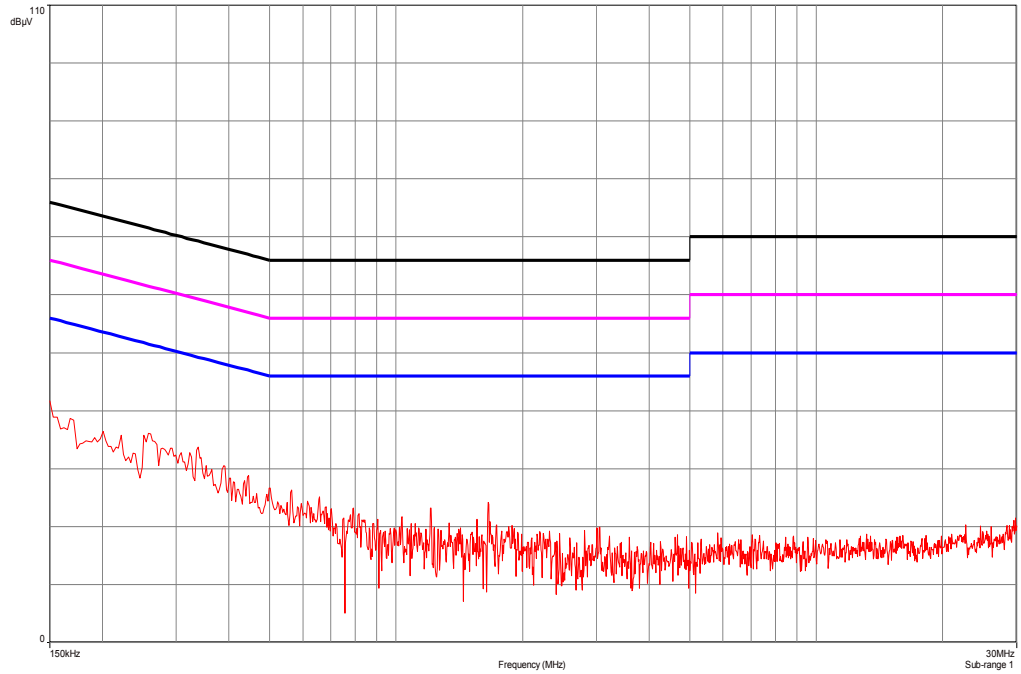
Plot 1: TX mode, 9 kHz to 30 MHz, phase line



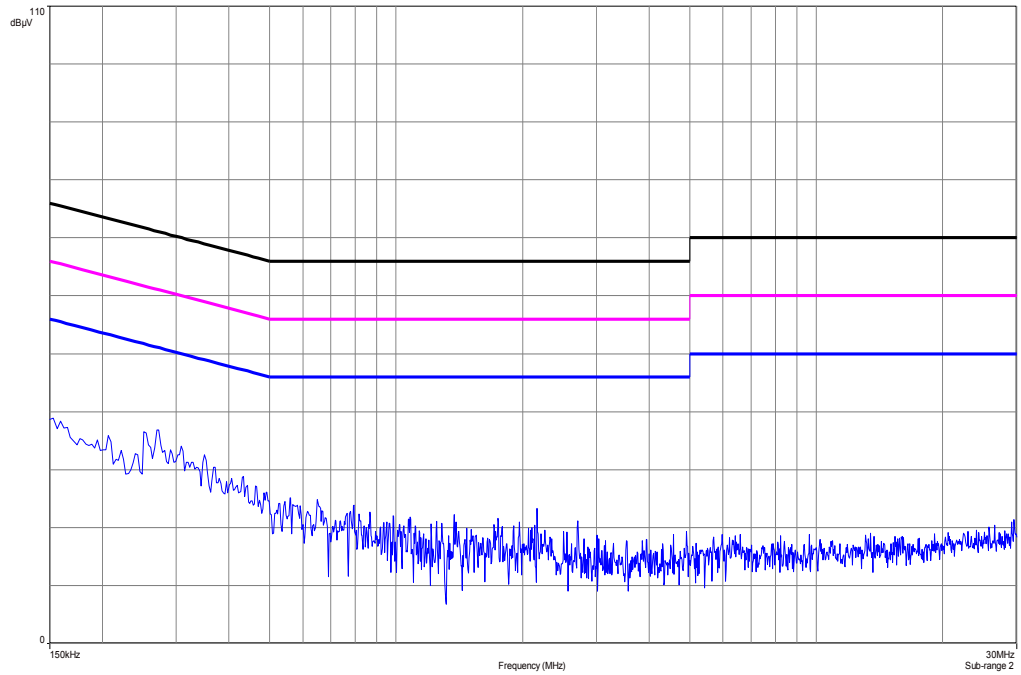
Plot 2: TX mode, 9 kHz to 30 MHz, neutral line



Plot 3: RX / Idle – mode, 9 kHz to 30 MHz, phase line



Plot 4: RX / Idle – mode, 9 kHz to 30 MHz, neutral line



10 Test equipment and ancillaries used for tests

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

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

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 1166.5950.03	R&S	100083	300003312	k	04.01.2012	04.01.2013
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/00205	300003314	k	14.07.2011	14.07.2013
6	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k		
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	06.01.2012	06.01.2014
12	n. a.	Isolating Transformer	RT5A	Grundig	8041	300001626	g		
13	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	11.05.2011	11.05.2013
14	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
15	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
16	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
17	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
18	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
19	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
20	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
21	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
22	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
23	n. a.	TRILOG Broadband Test-Antenna	VULB9163	Schwarzbeck	371	300003854	vIKI!	14.10.2011	14.10.2014

		30 MHz - 3 GHz							
24	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	19.12.2011	19.12.2012
25	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
26	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000787	ne		
27	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300002442	ne		
28	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	ve		

Agenda: Kind of Calibration

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

11 Observations

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

Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2012-09-04
-A	Editorial changes	2012-09-12

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

DAkkS Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH
German Accreditation Body

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

Accreditation

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

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10
66117 Saarbrücken

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

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

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

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

Frankfurt am Main, 13.04.2011

Dipl.-Ing. (FH) Rolf Egner
Head of Division 2

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

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Office Braunschweig
Bundesallee 100
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 overleaf.

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 (AkkStelleG) 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. 30). 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.iaf.nu

Front side of certificate

Back side of certificate

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

http://www.cetecom.com/fileadmin/de/CETECOM_D_Saarbruecken/accreditations_Jan_2010/DAKKS_Akkredi_Urk_EN17025-En_incl_Annex.pdf