



## Accredited testing-laboratory

**DAR registration number: DAT-P-176/94-D1**

**Federal Motor Transport Authority (KBA)  
DAR registration number: KBA-P 00070-97**

**Recognized by the Federal Communications Commission**

**Anechoic chamber registration no.: 90462 (FCC)**

**Anechoic chamber registration no.: 3462C-1 (IC)**

**Certification ID: DE 0001**

**Accreditation ID: DE 0002**

**Accredited Bluetooth® Test Facility (BQTF)**

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**Test report no. : 1-1065-60-06/09-A**  
**Type identification : AAD-3880056-BV**  
**Applicant : Sony Ericsson Mobile Communications AB**  
**FCC ID : PY7A3880056**  
**IC Certification No : 4170B-A3880056**  
**Test standards : 47 CFR Part 15**  
**RSS - 210 Issue 7**

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## 1 General information

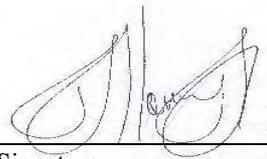
### 1.1 Notes

The test results of this test report relate exclusively to the test item specified in 3.1.1. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

#### Test laboratory manager:

2009-12-16

Daniel Muyunga



Date

Name

Signature

#### Technical responsibility for area of testing:

2009-12-16

Stefan Bös



Date

Name

Signature

## 1.2 Testing laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10  
 66117 Saarbrücken  
 Germany  
 Phone: + 49 681 5 98 - 0  
 Fax: + 49 681 5 98 - 9075  
 e-mail: info@ICT.cetecom.de  
 Internet: http://www.cetecom-ict.de

**State of accreditation:** The test laboratory (area of testing) is accredited according to  
 DIN EN ISO/IEC 17025  
 DAR registration number: DAT-P-176/94-D1

**Accredited by:** Federal Motor Transport Authority (KBA)  
 DAR registration number: KBA-P 00070-97

**Testing location, if different from CETECOM ICT Services GmbH:**

**Name :**  
**Street :**  
**Town :**  
**Country :**  
**Phone :**  
**Fax :**

## 1.3 Details of applicant

Name:	Sony Ericsson Mobile Communications AB
Street:	Mobilvägen 10
Town:	22188 Lund
Country:	Sweden
Telephone:	+46-46-19-3000
Fax:	+46-10-800-2441
Contact:	Peter Lindeborg
E-mail:	peter.lindeborg@sonyericsson.com
Telephone:	+46-10-802-43 68

## 1.4 Application details

Date of receipt of order:	2009-10-15
Date of receipt of test item:	2009-10-16
Date of start test:	2009-10-16
Date of end test:	2009-10-23
Persons(s) who have been present during the test:	-/-

## 2 Test standard/s

47 CFR Part 15	2008-07	Title 47 of the Code of Federal Regulations; Chapter I- Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
RSS - 210 Issue 7	2007-06	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

### 3 Technical tests

#### 3.1 Details of manufacturer

Name:	Sony Ericsson Mobile Communications AB
Street:	Mobilvägen 10
Town:	22188 Lund
Country:	Sweden

##### 3.1.1 Test Item

Kind of test item	:	Mobile Phone 850/900/1800/1900/UMTS FDD1/FDD4/FDD8 /HSDPA/HSUPA/ BT2.0+EDR, A-GPS, WLAN
Type identification	:	AAD-3880056-BV
S/N serial number	:	Radiated samples: CB511ECKK1, CB511ECHMG Conducted samples: CB511ECKD0, CB511ECKEW
HW hardware status	:	AP2
SW software status	:	R1AA023
Frequency Band	:	ISM 2.400 MHz- 2.483,5 MHz Lowest channel: 2412 MHz Highest channel: 2462 MHz
Type of Modulation	:	BPSK & QPSK (DSSS) QPSK & 64-QAM (OFDM)
Number of channels	:	11
Antenna	:	Internal PCB antenna Please also see EUT pictures
Power Supply	:	4.0 V by power supply / BST-41 Li-Polymer battery
Temperature Range	:	-20 °C to +55 °C

**DSSS:**

Max. power radiated: 11.59 dBm

Max. power conducted: 13.76 dBm

**OFDM:**

Max. power radiated: 13.51 dBm

Max. power conducted: 15.63 dBm

FCC ID: PY7A3880056

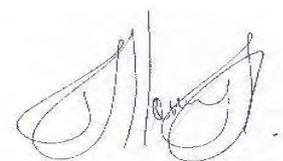
IC: 4170B-A3880056

**3.1.2 Additional EUT information For IC Canada (appendix 2)**

IC Registration Number:	4170B-A3880056
Model Name:	AAD-3880056-BV
Manufacturer (complete Address):	Sony Ericsson Mobile Communications AB Mobilvägen 10 22188 Lund Sweden
Tested to Radio Standards Specification (RSS) No.:	RSS-210 Issue 7
Open Area Test Site Industry Canada Number:	IC 3462C-1
Frequency Range (or fixed frequency) [MHz]:	ISM 2.400 - 2.483,5  Lowest channel: 2412 Highest channel: 2462
RF: Power [W] (max):	<u>DSSS:</u> Rad. EIRP: 14.42 mW Conducted : 23.76 mW  <u>OFDM:</u> Rad. EIRP: 22.44 mW Conducted : 35.56 mW
Antenna Type:	Internal PCB antenna Please also see EUT pictures
Occupied Bandwidth (99% BW) [MHz]:	DSSS: 1792 OFDM: 1841
Type of Modulation:	BPSK & QPSK (DSSS) QPSK & 64-QAM (OFDM)
Emission Designator (TRC-43):	17M9G1D (DSSS) 18M4G7D (OFDM)
Transmitter Spurious (worst case) [ $\mu$ V/m in 3m]:	354.81
Receiver Spurious (worst case) [ $\mu$ V/m in 3m]:	281.83

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

Signature:



Test engineer: Daniel K. Muyunga

Date: 2009-12-16

### 3.1.3 EUT operating modes

EUT operating mode no. *)	Description of operating modes	Additional information
Op. 0	normal mode	normal temperature and power source conditions
Op. 1		low temperature, low power source conditions
Op. 2		low temperature, high power source conditions
Op. 3		high temperature, low power source conditions
Op. 4		high temperature, high power source conditions

\*) EUT operating mode no. is used to simplify the test plan

### 3.1.4 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T <sub>nom</sub>	°C	<b>+23</b>
Nominal Humidity	H <sub>nom</sub>	%	<b>38</b>
Nominal Power Source	V <sub>nom</sub>	V	<b>4.0</b>

Type of power source: DC by power supply / BST-41 Li-Polymer battery type CBA-0002012

#### 4 Summary of Measurement Results and list of all performed test cases

- No deviations from the technical specifications were ascertained
- There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC Part 15 §15.247 - CANADA RSS-210	PASSED	2009-10-23	-/-

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
None	Antenna Gain	Yes			
§15.247 (e)	Peak power spectral density	Yes			
§15.247(a)(2)	Spectrum Bandwidth of a DSSS System / 6dB BW	Yes			
§15.247(a)(2)	Spectrum Bandwidth of a DSSS System / 20dB BW	Yes			
§ 15.247 (b)(3)	Maximum output power (conducted)	Yes			
§ 15.247 (b)(3)	Max. peak output power (radiated)	Yes			
§15.247 (d)	Band-edge compliance of conducted emissions	Yes			
§15.205	Band-edge compliance of radiated emissions	Yes			
§15.247 (d)	Spurious Emission - conducted (Transmitter)	Yes			
§ 15.209	Spurious Emission -radiated (Transmitter)	Yes			
§ 15.109	Spurious Emissions-radiated (Receiver)	Yes			
§ 15.209	Spurious Emissions-radiated <30 MHz	Yes			
§ 15.107/207	Conducted Emissions <30 MHz	Yes			

## 5 RF measurement testing

### 5.1 Description of test set-up

#### 5.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 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 C63.4-2003 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 set-ups 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 C63.4-2003 clause 4.2.

Antennas are confirmed with ANSI C63.2-1996 item 15.

9 kHz - 150 MHz: Quasi Peak measurement, 200 Hz Bandwidth, passive loop antenna.

150 kHz - 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, passive loop antenna.

30 MHz - 200 MHz: Quasi Peak measurement, 120 kHz Bandwidth, biconical antenna

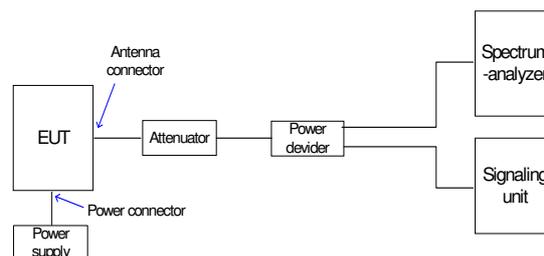
200MHz - 1GHz: Quasi Peak measurement, 120 kHz Bandwidth, log periodic antenna

>1GHz: Average, RBW 1MHz, VBW 10 Hz, wave guide horn

All measurement settings are according to FCC 15.209 and 15.207

#### 5.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is connected to the spectrum analyzer. The specific losses for signal path are first checked within a calibration. The measurement readings on the 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.



## 5.2 Referenced Documents

How to enter WLAN RF test mode ( v.1.0 ) Rev PA1 01/06/2007

## 5.3 Additional comments

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## 5.4 Antenna gain

The antenna gain of the complete system was calculated by the difference of the EIRP and the conducted power of the EUT. The following measurement settings were used

EUT Signal:	DSSS	
Spectrum analyser:	RBW/VBW	50/30 MHz
	Detector	Positive peak (PK+)
	Span	100 MHz
	Sweep Time	Auto
	Trace Mode	Max hold

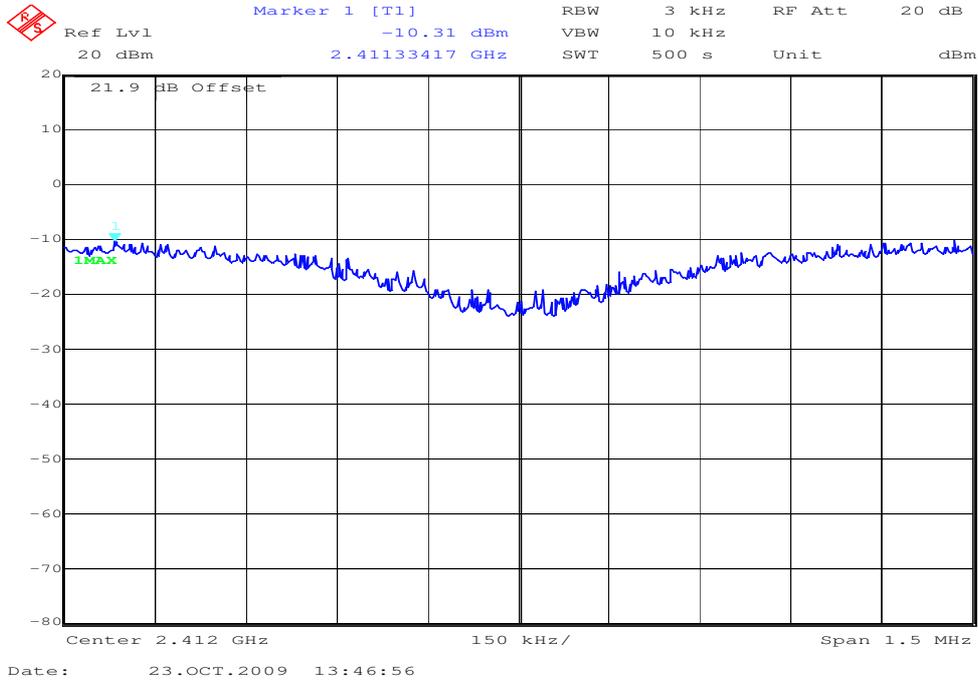
This measurement is conform to the FCC procedure for output power measurement option 1.

	low channel	mid channel	high channel
Conducted power [dBm] <i>(measured)</i>	<b>13.76</b>	13.37	13.56
Radiated power [dBm] <i>(measured)</i>	<b>11.59</b>	11.34	11.10
Gain [dBi] <i>(calculated)</i>	-2.17	<b>-2.03</b>	-2.46

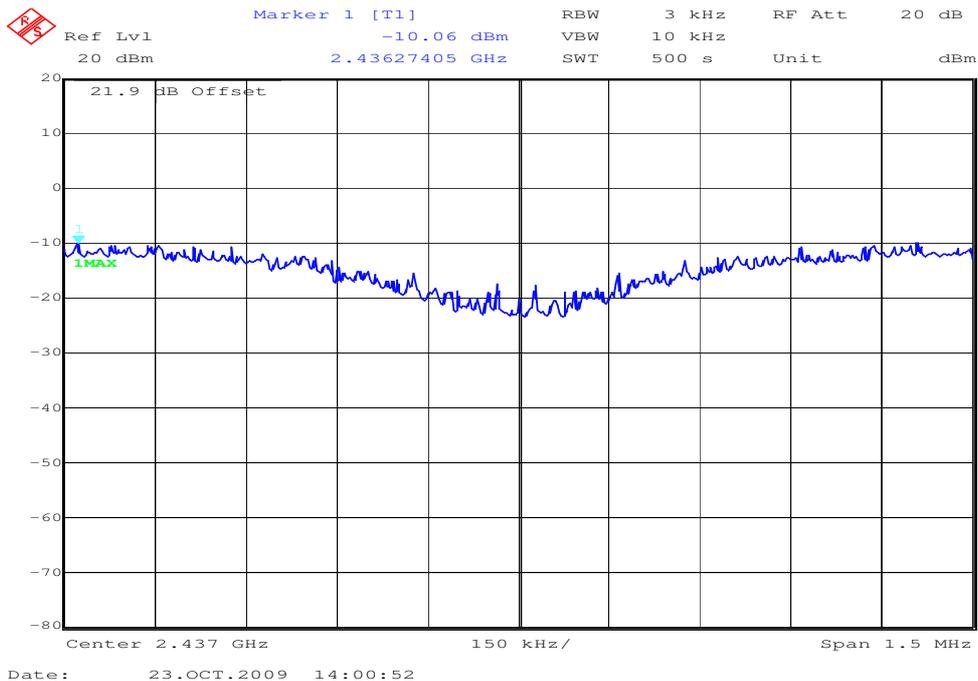
5.5 Peak Power Spectral density (digitally modulated systems) §15.247(e)

DSSS

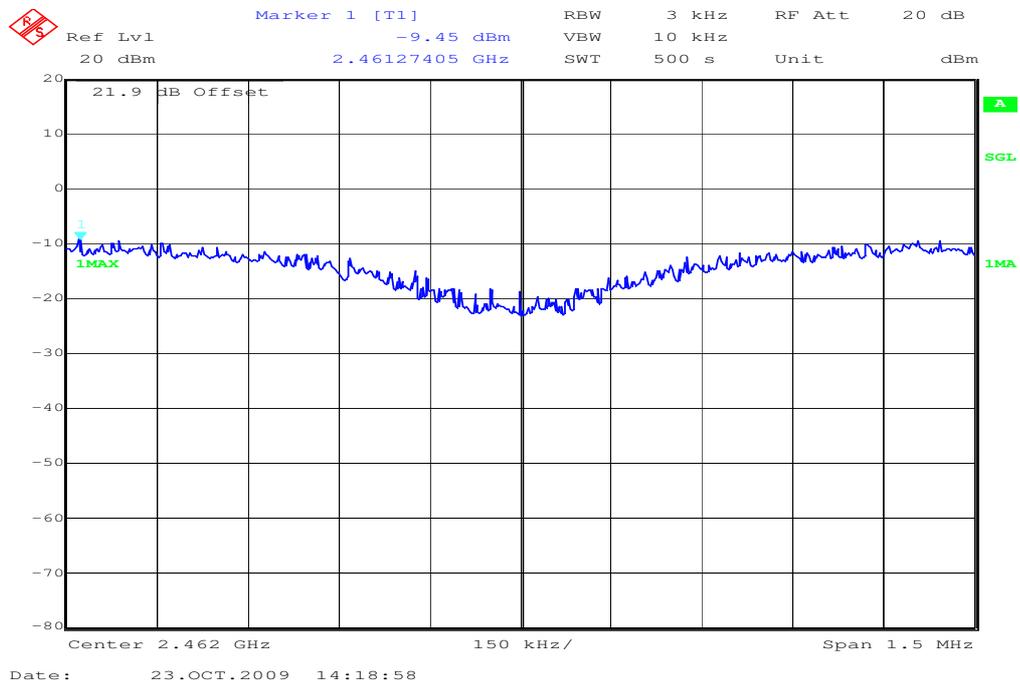
Plot 1: Lowest channel – 2412 MHz, 1 Mbits/s,



Plot 2: Middle channel – 2437 MHz, 1 Mbits/s,



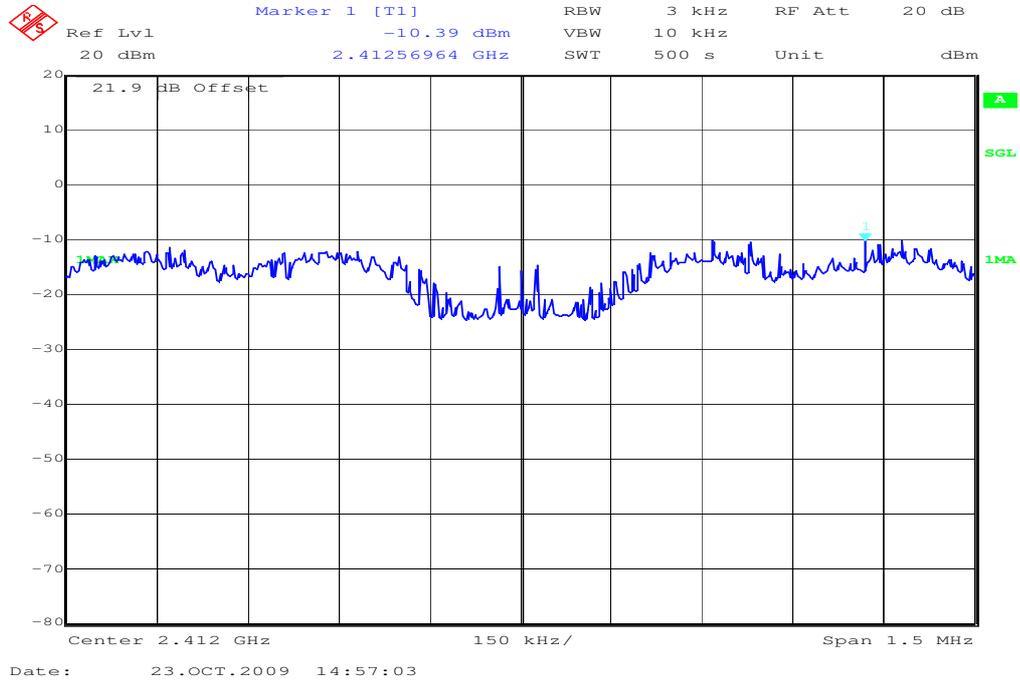
Plot 3: Highest channel – 2462 MHz, 1 MBits/s,



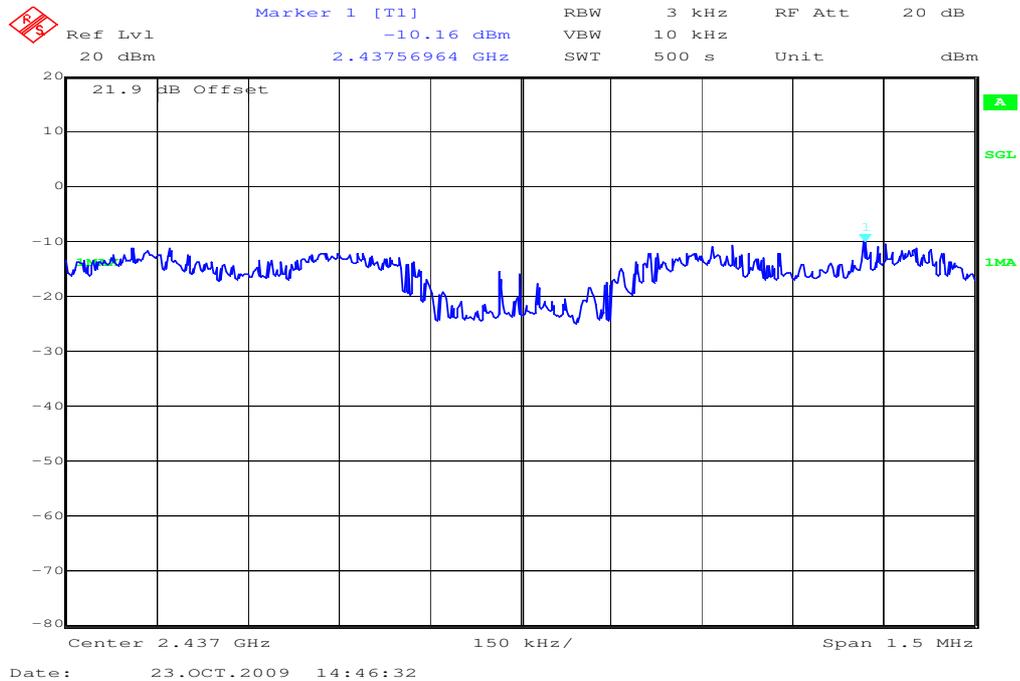
Results: Plot 1: Power density: -10.31 dBm / 3 kHz  
 Plot 2: Power density: -10.06 dBm / 3 kHz  
 Plot 3: Power density: - 9.45 dBm / 3 kHz

**OFDM**

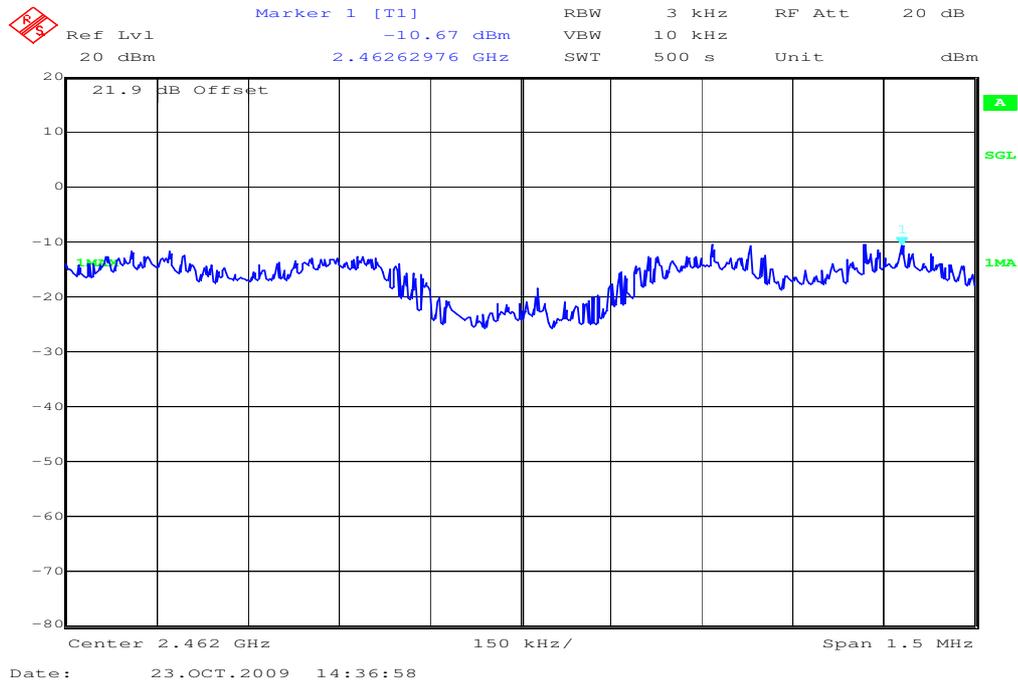
Plot 1: Lowest channel – 2412 MHz, 6 MBits/s,



Plot 2: Middle channel – 2437 MHz, 6 MBits/s,



Plot 3: Highest channel – 2462 MHz, 6 Mbits/s,



Results:  
 Plot 1: Power density: -10.39 dBm / 3 kHz  
 Plot 2: Power density: -10.16 dBm / 3 kHz  
 Plot 3: Power density: -10.67 dBm / 3 kHz

Limits:

Under normal test conditions only	For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission
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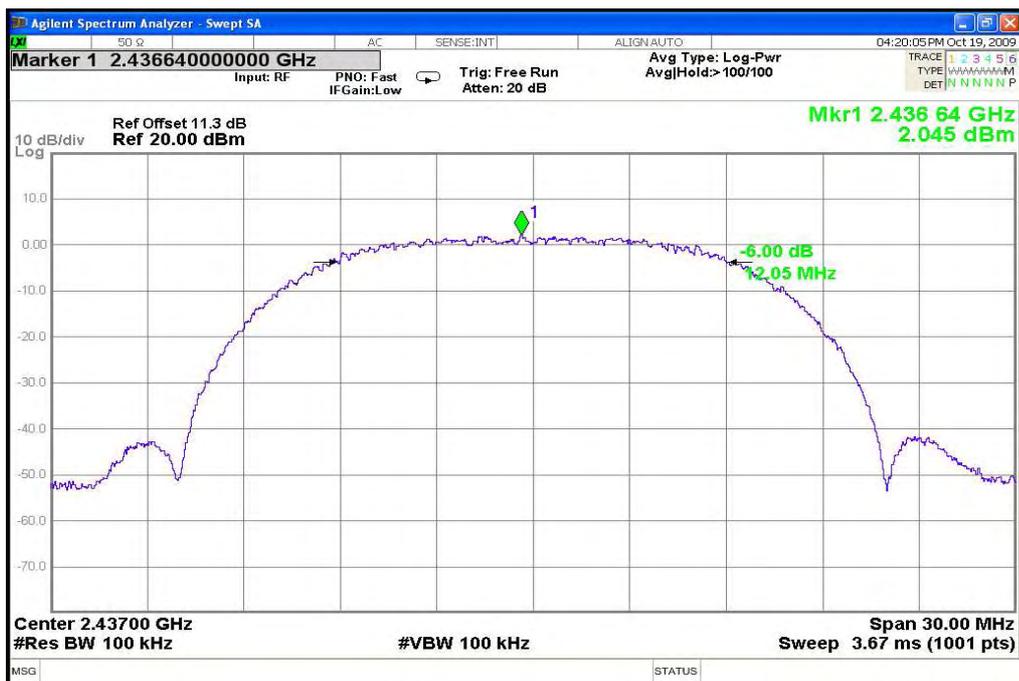
5.6 Spectrum Bandwidth of a DSSS System / 6 dB Bandwidth §15.247(a)(2)

DSSS

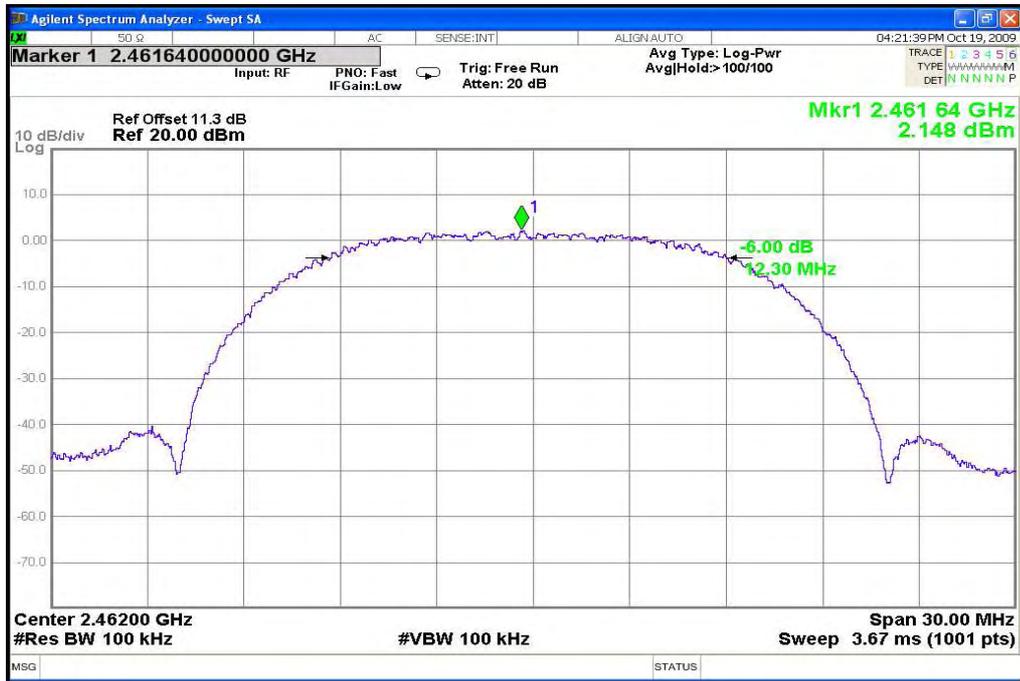
Plot 1: Lowest channel – 2412 MHz, 11 MBits/s,



Plot 2: Middle channel – 2437 MHz, 11 MBits/s,



Plot 3: Highest channel – 2462 MHz, 11 Mbits/s,



Results:

Test conditions		6 dB BANDWIDTH [MHz]		
		2412	2437	2462
Frequency [MHz]				
$T_{nom}$	$V_{nom}$	12.13	12.05	12.30
Measurement uncertainty		±100 kHz		

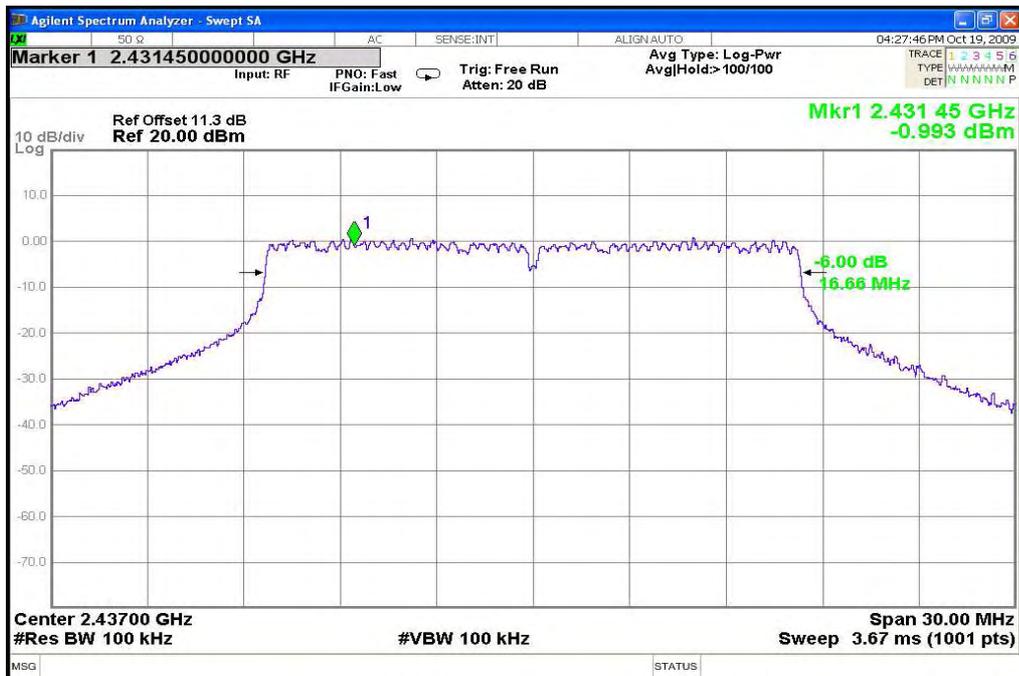
RBW: 100 kHz / VBW 100 kHz

**OFDM**

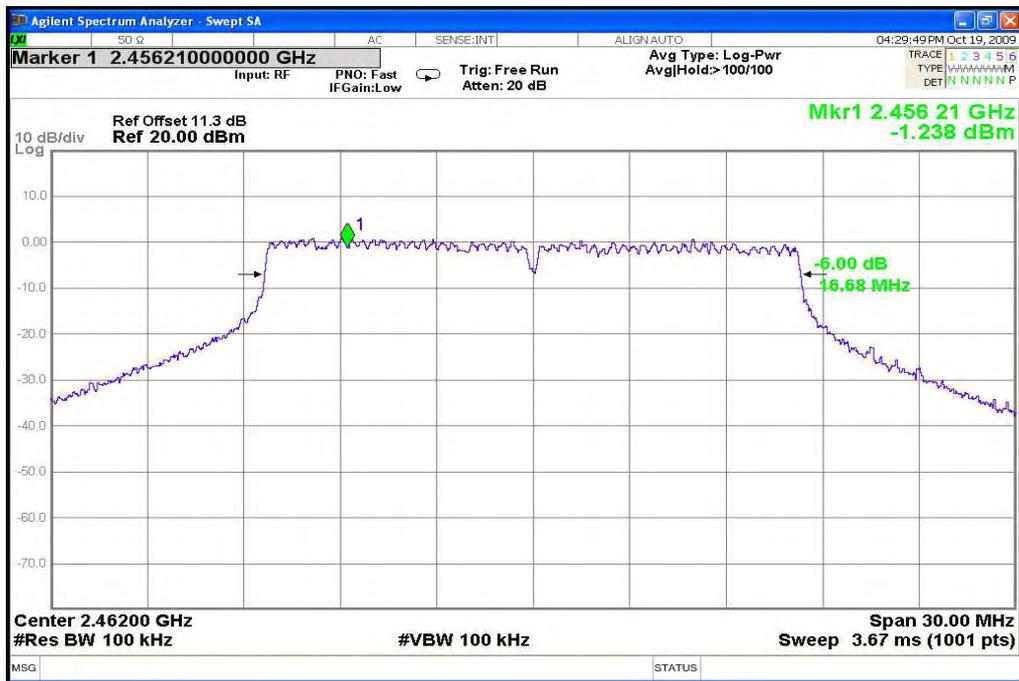
Plot 1: Lowest channel – 2412 MHz 54 Mbits/s,



Plot 2: Middle channel – 2437 MHz, 54 Mbits/s,



Plot 3: Highest channel – 2462 MHz, 54 Mbits/s,



Results:

Test conditions		6 dB BANDWIDTH [MHz]		
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	16.66	16.66	16.68
Measurement uncertainty		±100 kHz		

RBW: 100 kHz / VBW 100 kHz

Limits:

Under normal test conditions only	> 500 kHz
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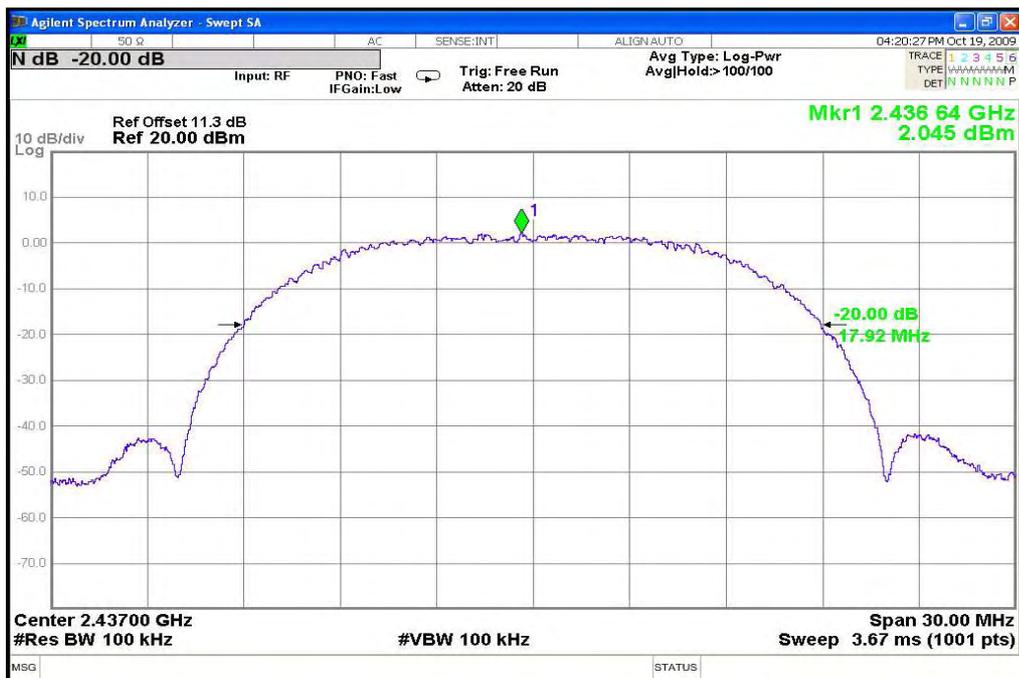
### 5.7 Spectrum Bandwidth of a DSSS System / 20 dB Bandwidth

#### DSSS

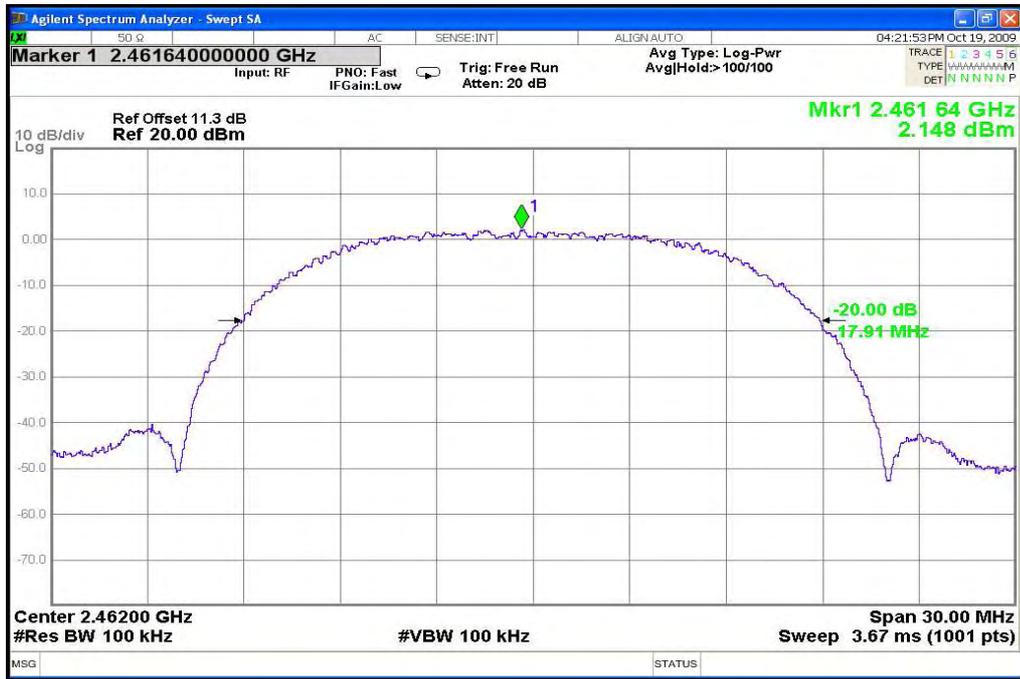
Plot 1: Lowest channel – 2412 MHz, 11 MBits/s,



Plot 2: Middle channel – 2437 MHz, 11 MBits/s,



Plot 3: Highest channel – 2462 MHz, 11 Mbits/s,



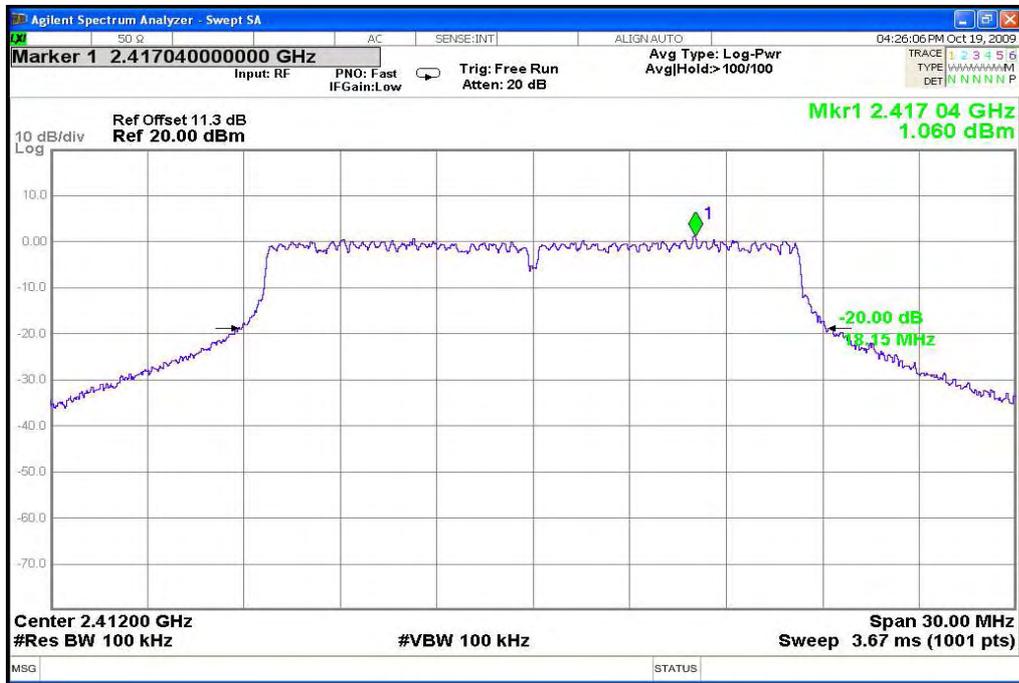
Results:

Test conditions		20 dB BANDWIDTH [MHz]		
		2412	2437	2462
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	17.92	17.92	17.91
Measurement uncertainty		±100 kHz		

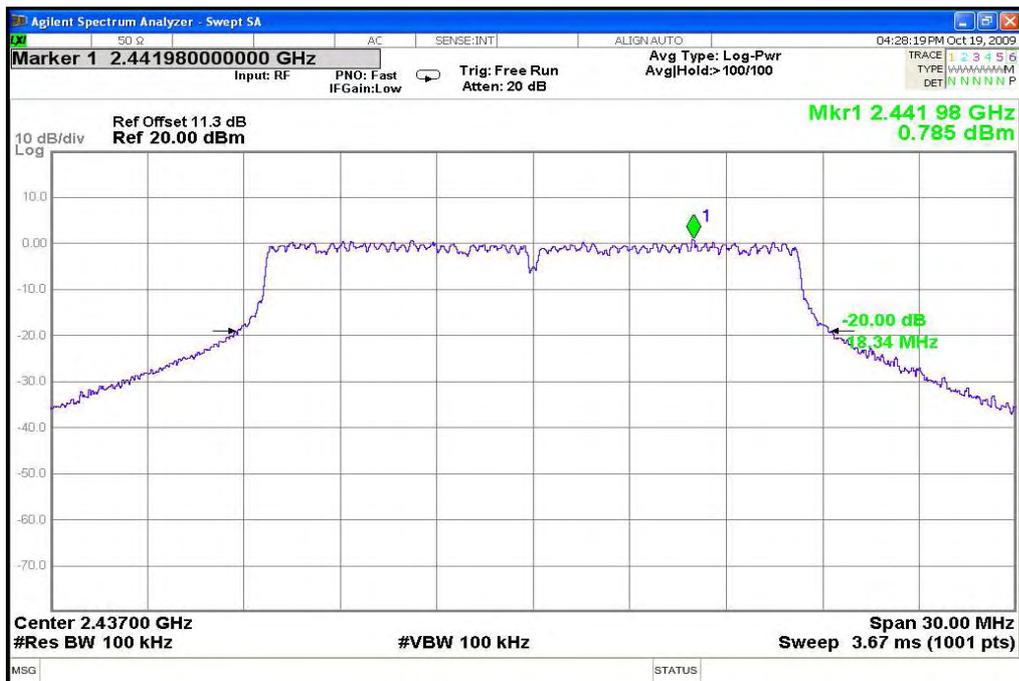
RBW: 100 kHz / VBW 100 kHz

**OFDM**

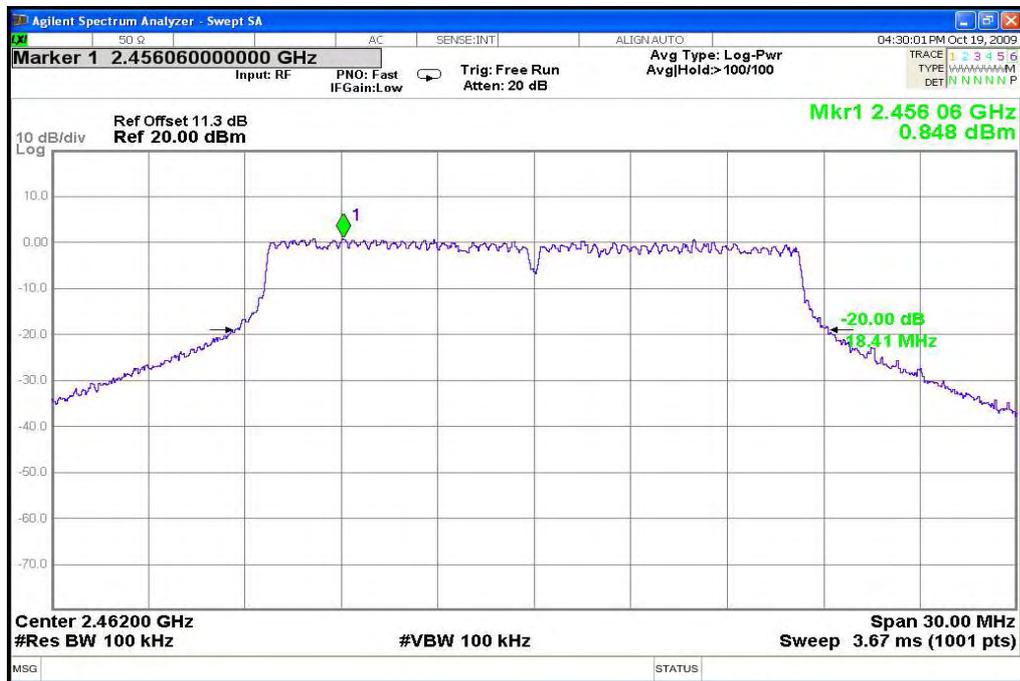
Plot 1: Lowest channel – 2412 MHz 54 Mbits/s,



Plot 2: Middle channel – 2437 MHz, 54 Mbits/s,



Plot 3: Highest channel – 2462 MHz, 54 Mbits/s,



Results:

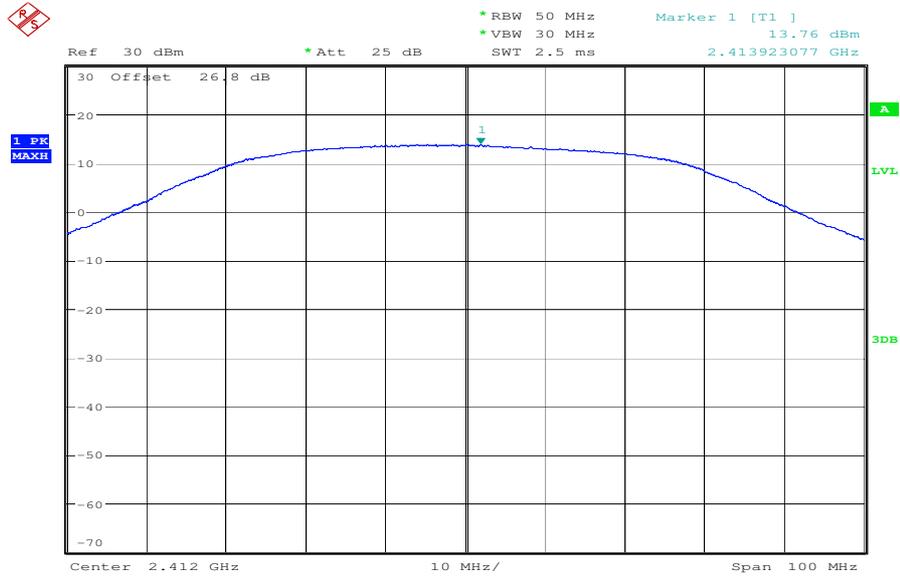
Test conditions		20 dB BANDWIDTH [MHz]		
		2412	2437	2462
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	18.15	18.34	18.41
Measurement uncertainty		±100 kHz		

RBW: 100 kHz / VBW 100 kHz

### 5.8 Maximum output power (conducted) §15.247 (b)(3)

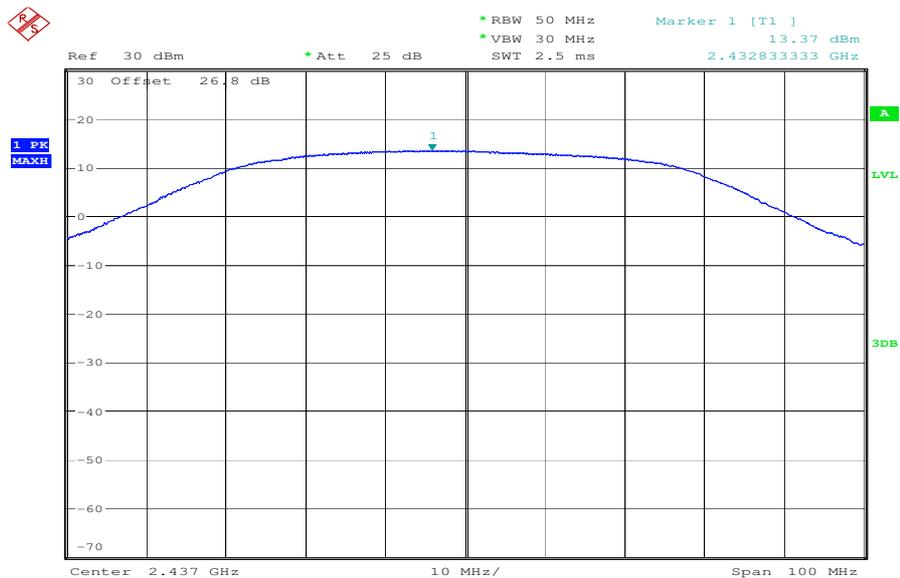
#### DSSS

Plot 1: Lowest channel – 2412 MHz, 11 Mbits/s



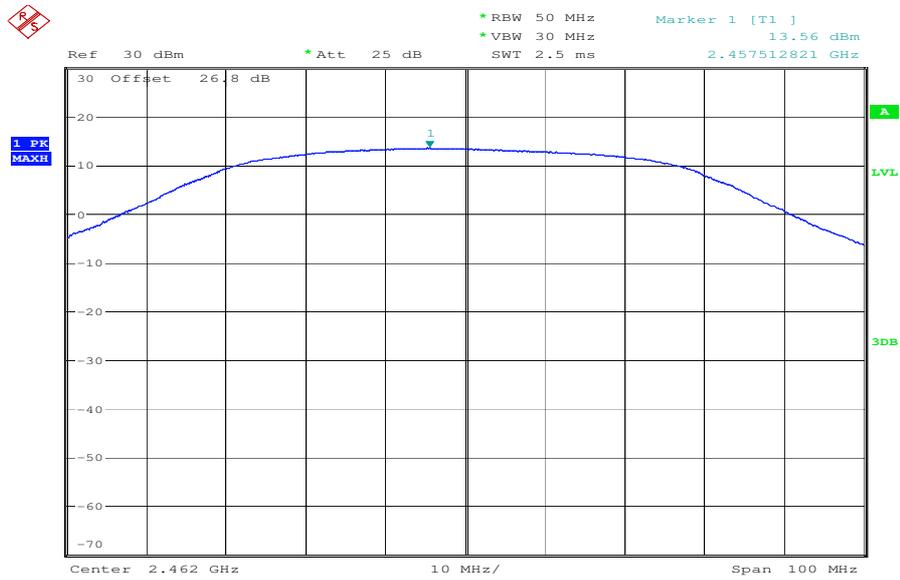
Date: 21.OCT.2009 09:51:52

Plot 2: Middle channel – 2437 MHz, 11 Mbits/s



Date: 21.OCT.2009 09:53:33

Plot 3: Highest channel – 2462 MHz, 11 Mbits/s



Date: 21.OCT.2009 09:54:56

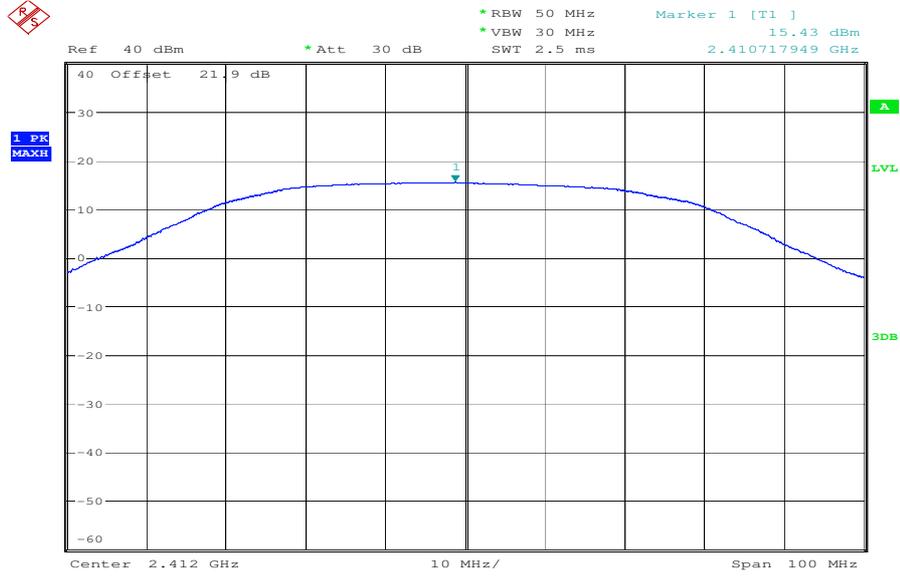
Results:

Test conditions		Max. peak output power [dBm]		
		2412	2437	2462
Frequency [MHz]				
T <sub>nom</sub>	V <sub>nom</sub>	<b>13.76</b>	13.37	13.56
Measurement uncertainty		±3dB		

RBW / VBW: 50/30 MHz

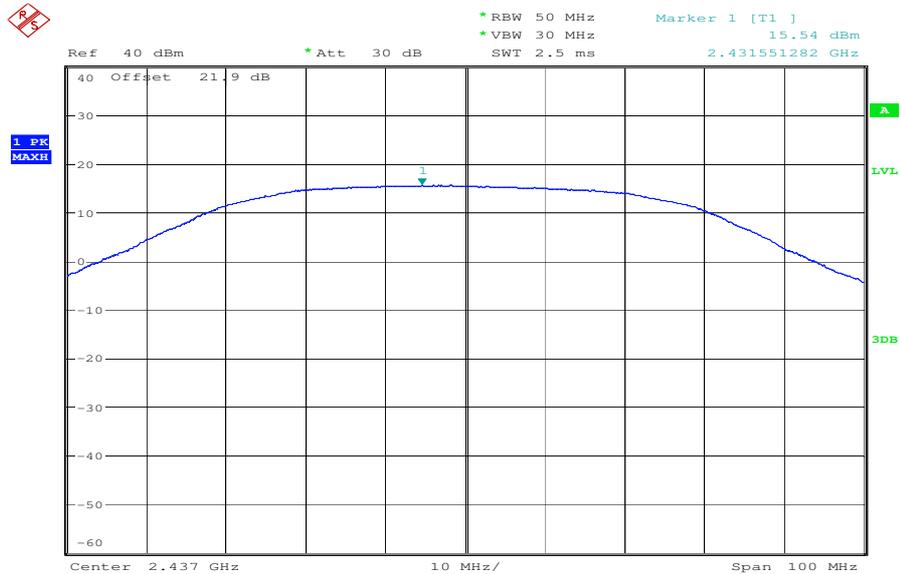
**OFDM**

Plot 1: Lowest channel – 2412 MHz, 54 Mbits/s



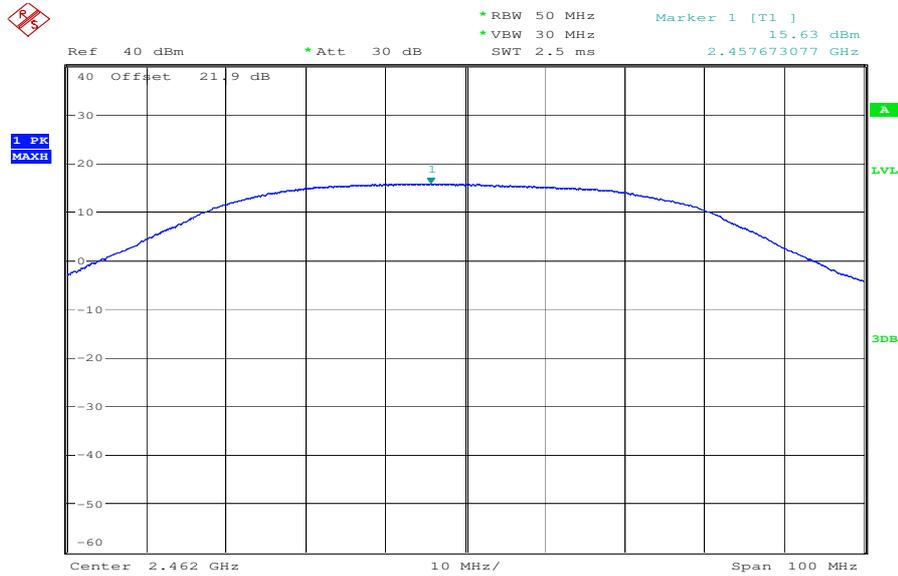
Date: 23.OCT.2009 11:27:44

Plot 2: Middle channel – 2437 MHz, 54 Mbits/s



Date: 23.OCT.2009 11:28:28

Plot 3: Highest channel – 2462 MHz, 54 Mbits/s



Date: 23.OCT.2009 11:29:09

Results:

Test conditions		Max. peak output power [dBm]		
		2412	2437	2462
Frequency [MHz]				
T <sub>nom</sub>	V <sub>nom</sub>	15.43	15.54	<b>15.63</b>
Measurement uncertainty		±3dB		

RBW / VBW: 50/30 MHz

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt / 30 dBm
--	------------------------

**5.9 Max. peak output power (radiated) §15.247 (b)(3)**

**DSSS**

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	<b>11.59</b>	11.34	11.10
Measurement uncertainty		±3dB		

RBW / VBW: 50/30 MHz

Measured at a distance of 3m

**OFDM**

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	13.26	<b>13.51</b>	13.17
Measurement uncertainty		±3dB		

Values calculated from the conducted output power and the antenna gain.

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt
--	---------------

5.10 Band-edge compliance of conducted emissions §15.247 (d)

DSSS

Plot 1: Lowest channel – 2412 MHz, 11 MBits/s



Plot 2: Highest channel – 2462 MHz, 11 MBits/s

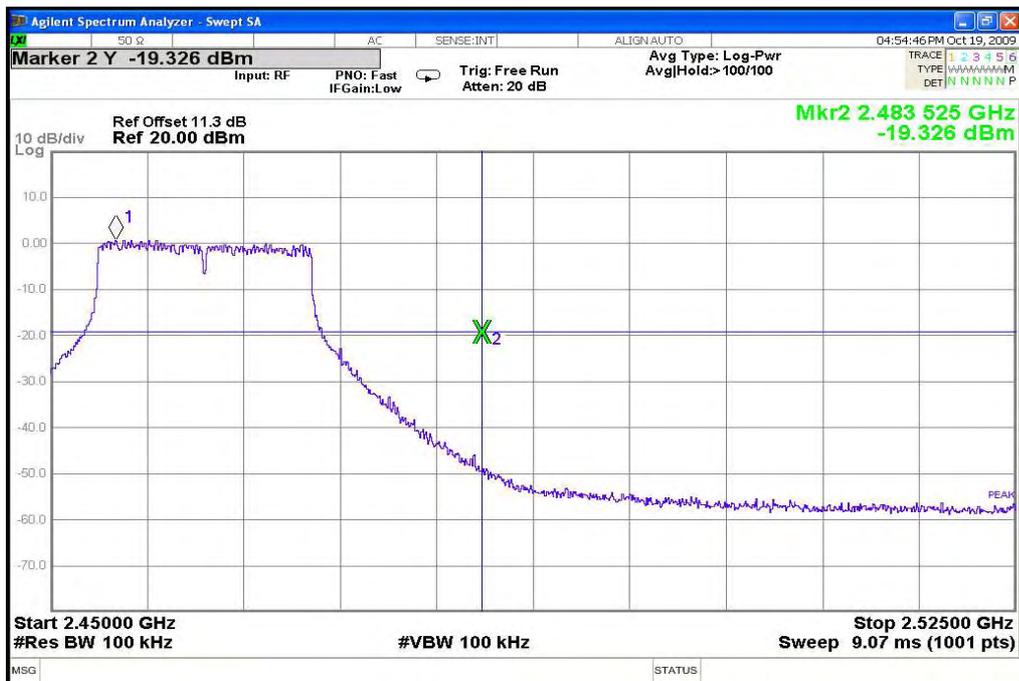


**OFDM**

Plot 1: Lowest channel – 2412 MHz, 54 Mbits/s



Plot 2: Highest channel – 2462 MHz, 54 Mbits/s





Limits:

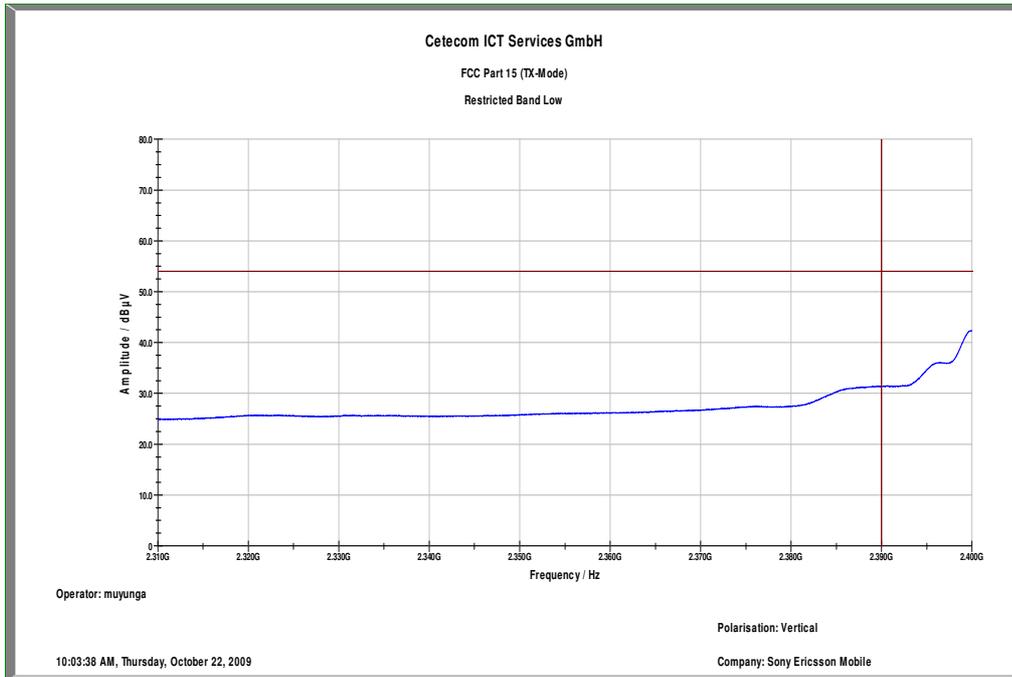
Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth 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)).
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### 5.11 Band-edge compliance of radiated emissions §15.205

#### DSSS

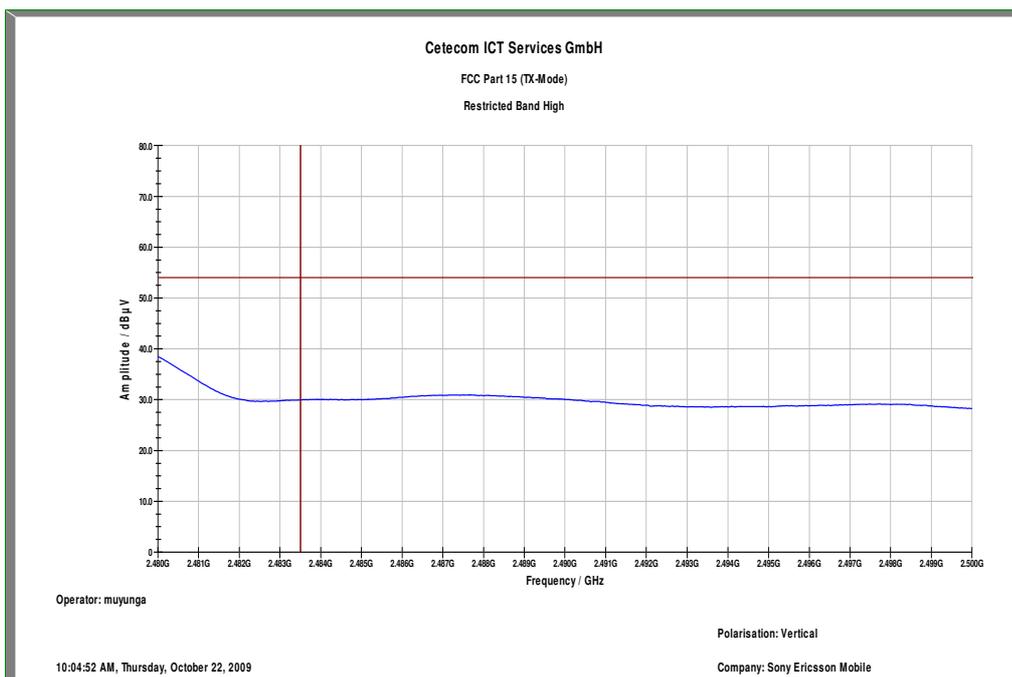
Plot 1: Lowest channel – 2412 MHz, 11 Mbits/s

Worst case polarisation: Vertical



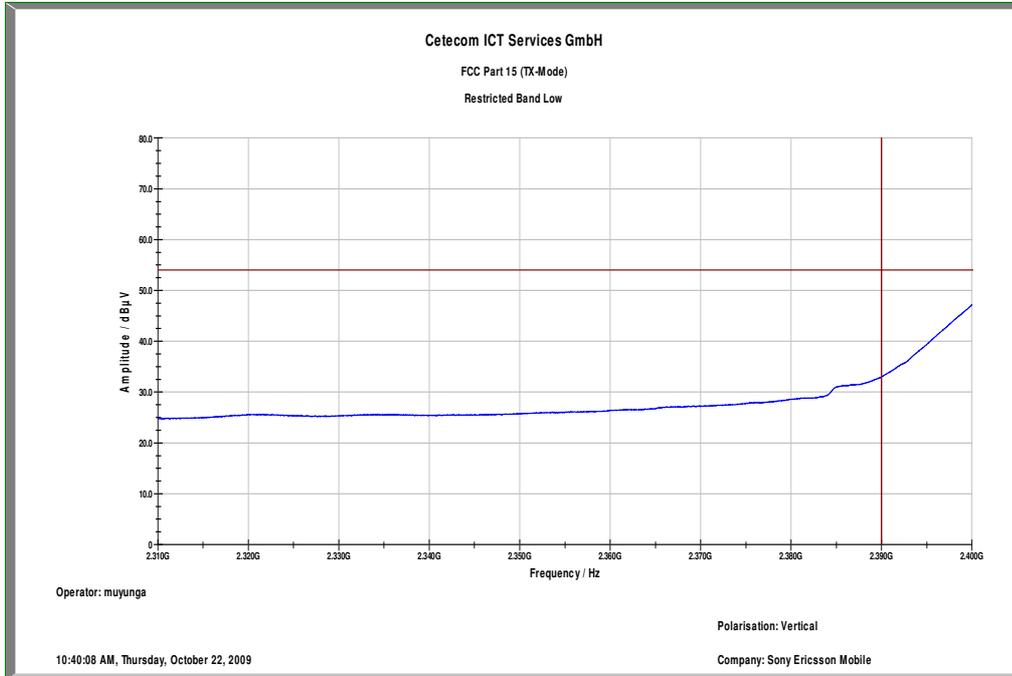
Plot 2: Highest channel – 2462 MHz, 11 Mbits/s

Worst case polarisation: Vertical

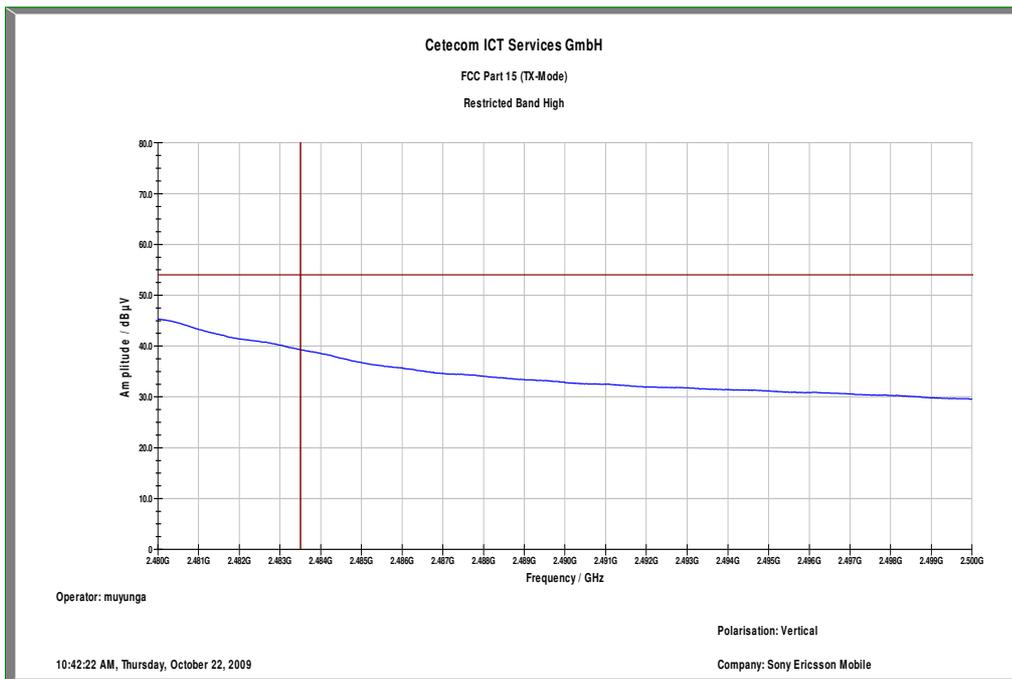


**OFDM**

Plot 1: Lowest channel – 2412 MHz, 54 MBits/s  
Worst case polarisation: Vertical



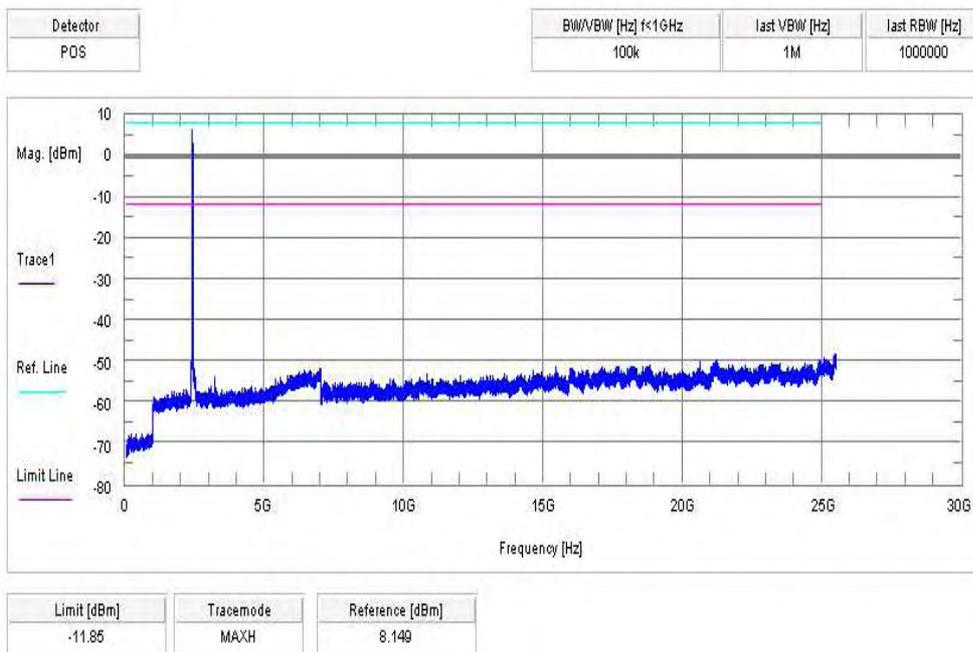
Plot 2: Highest channel – 2462 MHz, 54 MBits/s  
Worst case polarisation: Vertical



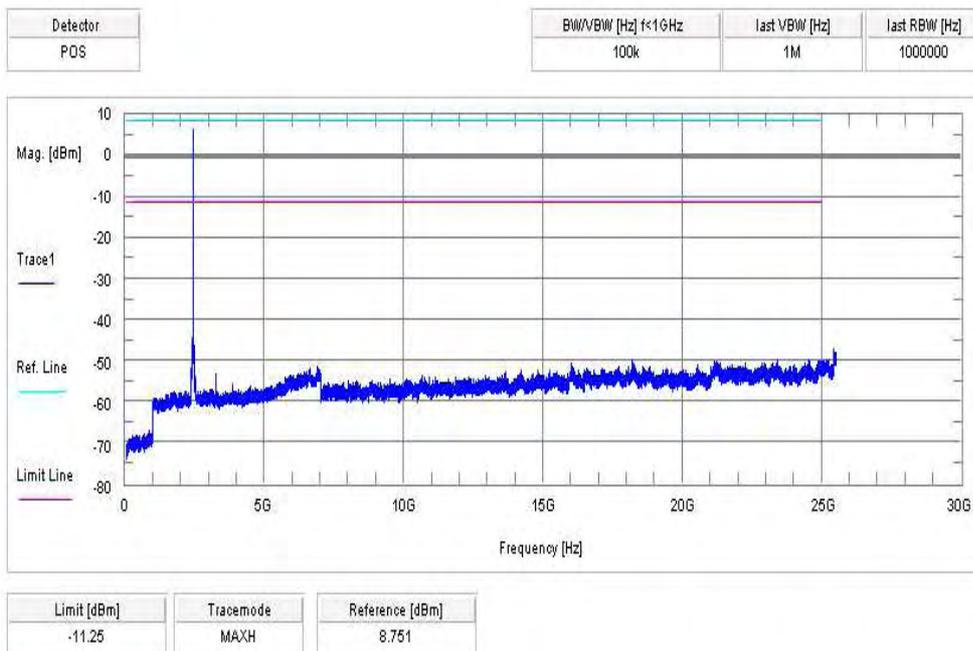
5.12 Spurious Emissions - conducted (Transmitter) §15.247 (c)

DSSS

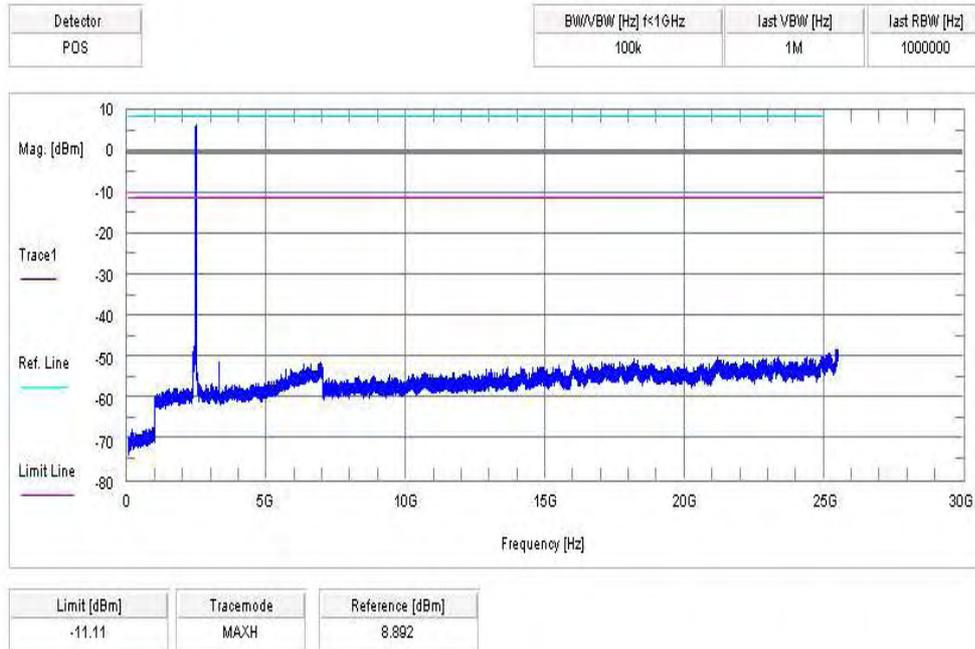
Plot 1: Lowest channel – 2412 MHz, 11 Mbits/s



Plot 2: Middle channel – 2437 MHz, 11 Mbits/s



Plot 3: Highest channel – 2462 MHz, 11 Mbits/s



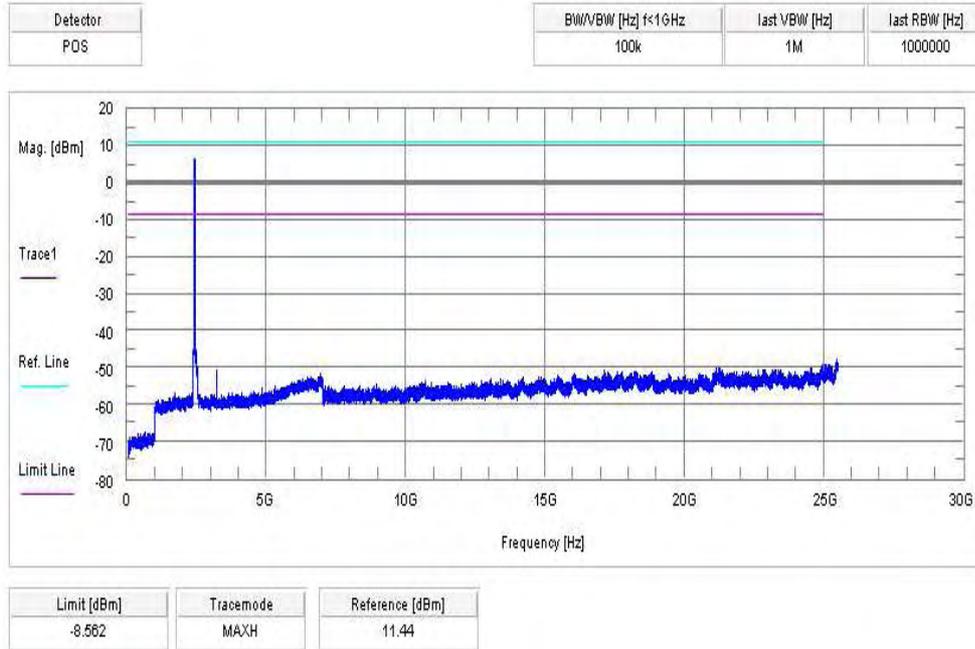
Result & Limits:

Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2412		8.149	30 dBm		Operating frequency
	No peaks detected		-20 dBc		complies
2437		8.751	30 dBm		Operating frequency
	No peaks detected		-20 dBc		complies
2462		8.892	30 dBm		Operating frequency
	No peaks detected		-20 dBc		complies
Measurement uncertainty		± 3dB			

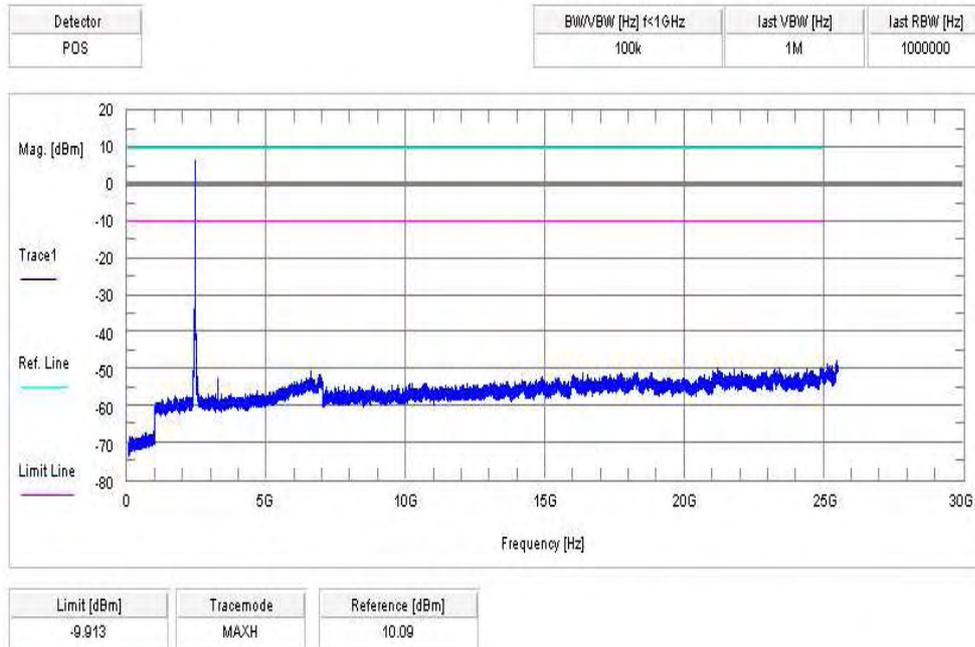
F < 1 GHz: RBW: 100 kHz VBW: 100 kHz  
 F > 1 GHz: RBW: 1 MHz VBW: 1 MHz

**OFDM**

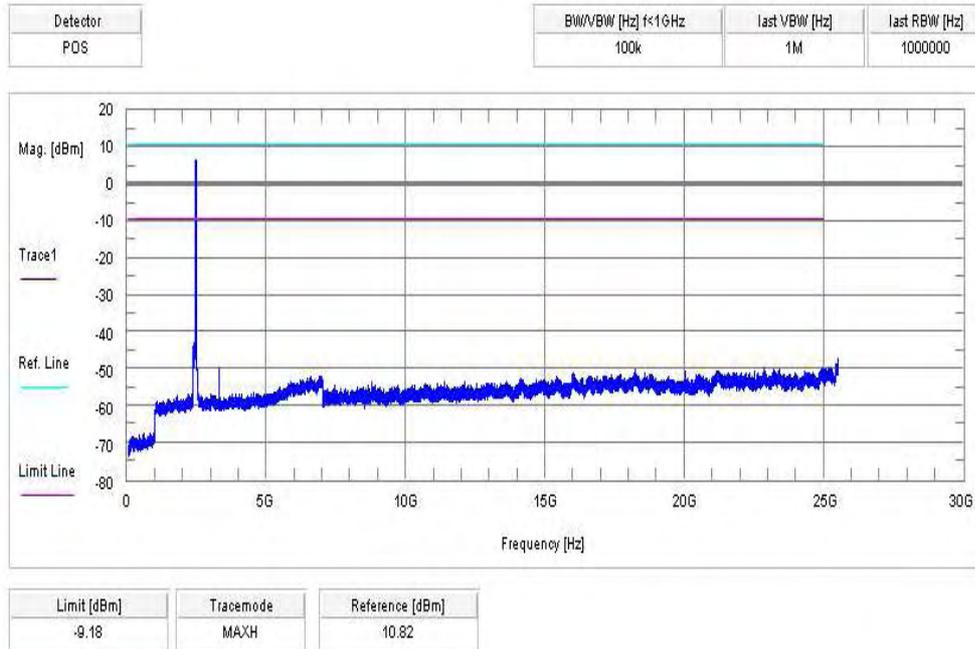
Plot 1: Lowest channel – 2412 MHz, 54 MBits/s



Plot 2: Middle channel – 2437 MHz, 54 MBits/s



Plot 3: Highest channel – 2462 MHz, 54 Mbits/s



Result & Limits:

Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2412		11.44	30 dBm		Operating frequency
	No peaks critical detected		-20 dBc		complies
2437		10.09	30 dBm		Operating frequency
	No peaks critical detected		-20 dBc		complies
2462		10.82	30 dBm		Operating frequency
	No peaks critical detected		-20 dBc		complies
Measurement uncertainty		± 3dB			

F < 1 GHz: RBW: 100 kHz VBW: 100 kHz  
 F > 1 GHz: RBW: 1 MHz VBW: 1 MHz

Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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)).
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Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

### 5.13 Spurious Emissions - radiated (Transmitter) §15.209

The transmitter radiated spurious evaluations were carried out for both DSSS and OFDM modulations. Only data plots for OFDM radiated spurious evaluations are documented in this sub-clause, as OFDM represents the worst-case scenario in terms of emission bandwidth, output power and conducted spurious emissions.

**OFDM:**

Plot 1: 0.03 - 1 GHz (lowest channel)

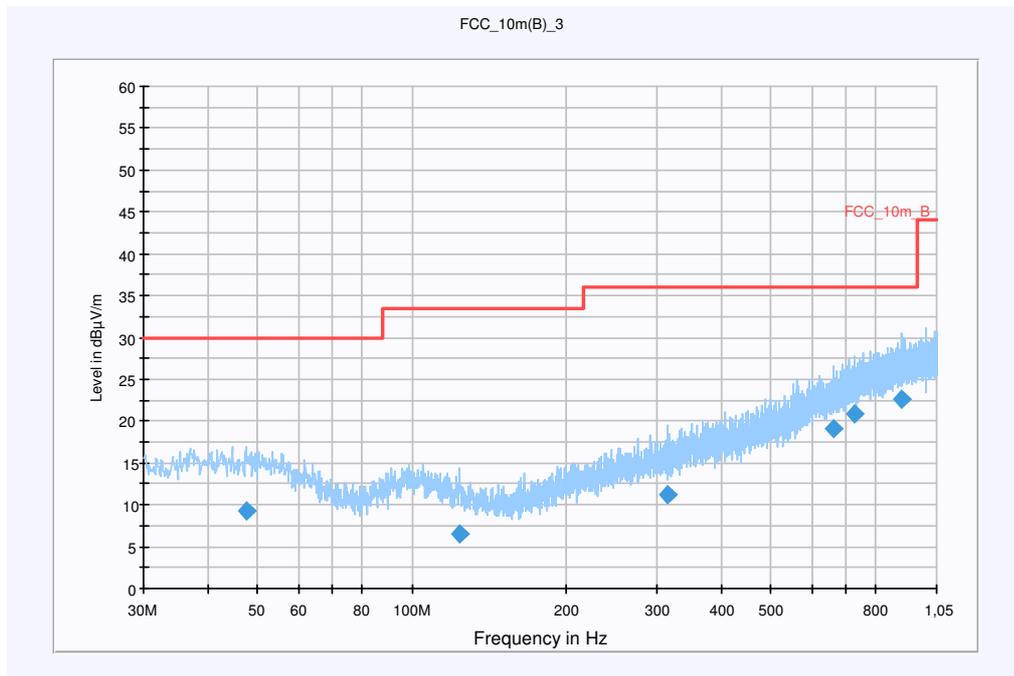
**Information**

EUT:	AAD-3880056-BV + CAA-0003005-BV
Serial Number:	CB511ECHMG + 9308W27102701
Test Description:	FCC part 15 C class B
Operating Conditions:	W-LAN Testmode; Tx: Ch 1
Operator Name:	Lang
Comment:	Power: 115 V/ 60 Hz

**Scan Setup: STAN\_Fin [EMI radiated]**

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

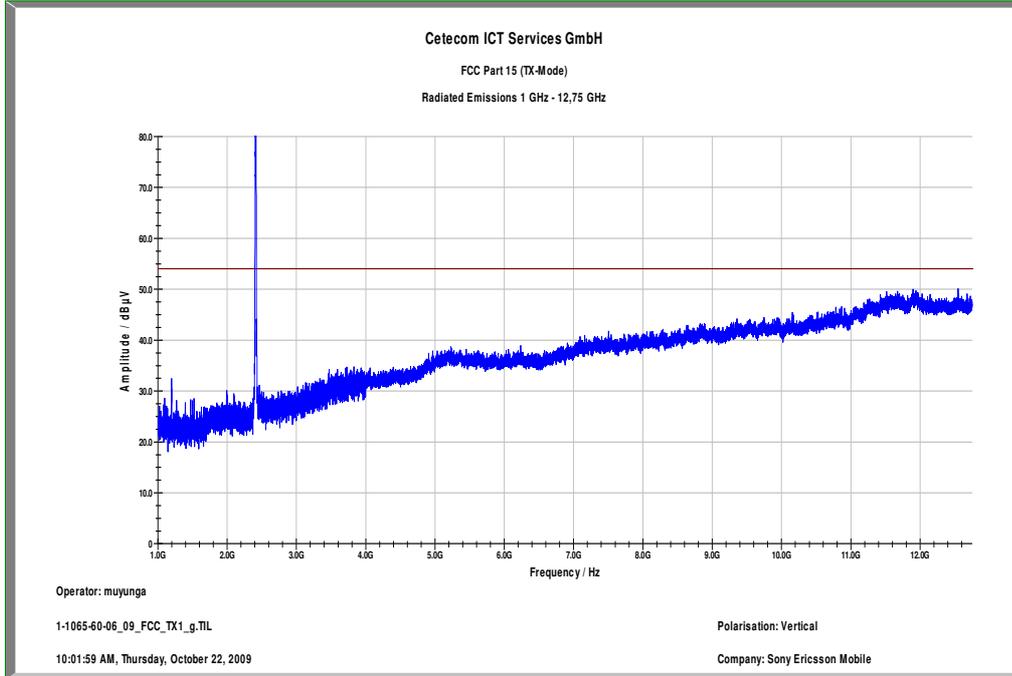
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak	120 kHz	15 s	Receiver



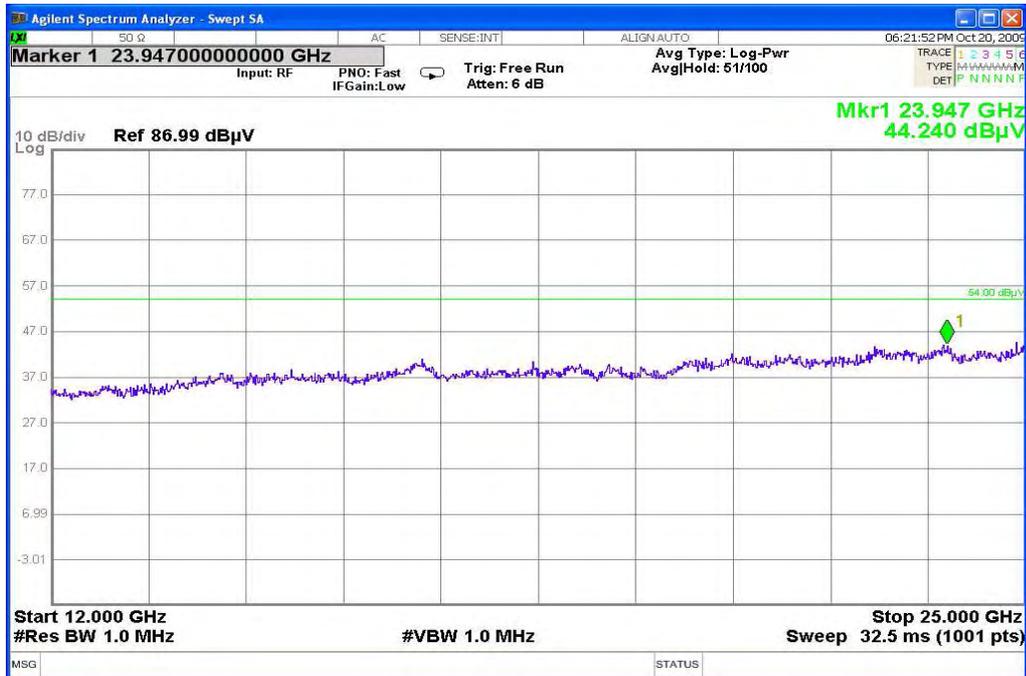
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
47.533500	9.2	15000.000	120.000	110.0	V	288.0	13.5	20.8	30.0
123.909750	6.6	15000.000	120.000	98.0	H	9.0	10.2	26.9	33.5
313.216200	11.2	15000.000	120.000	111.0	H	276.0	15.3	24.8	36.0
662.947500	19.0	15000.000	120.000	220.0	V	23.0	22.0	17.0	36.0
725.776950	20.9	15000.000	120.000	220.0	V	316.0	23.6	15.1	36.0
898.819800	22.6	15000.000	120.000	220.0	V	236.0	25.7	13.4	36.0

Plot 2: 1 - 12 GHz vertical / horizontal (lowest channel)  
Worst case polarisation: Vertical



Plot 3: 12- 25 GHz (valid for all channels)



Plot 4: 0.03 - 1 GHz (middle channel)

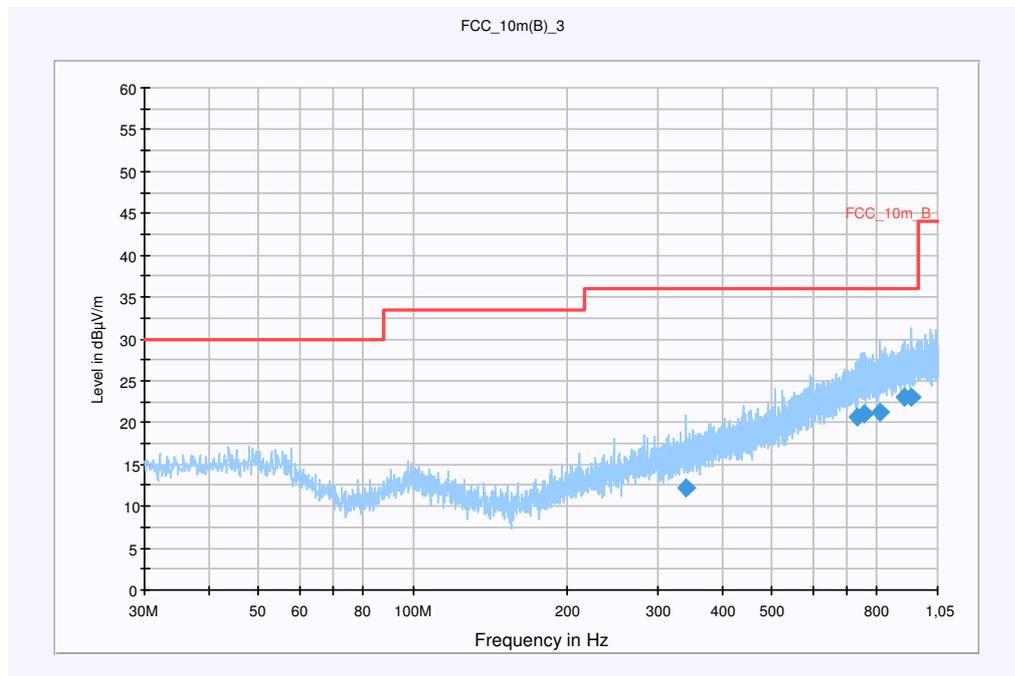
### Information

EUT:	AAD-3880056-BV + CAA-0003005-BV
Serial Number:	CB511ECHMG + 9308W27102701
Test Description:	FCC part 15 C class B
Operating Conditions:	W-LAN Testmode; Tx: Ch 6
Operator Name:	Lang
Comment:	Power: 115 V/ 60 Hz

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dB $\mu$ V/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak	120 kHz	15 s	Receiver

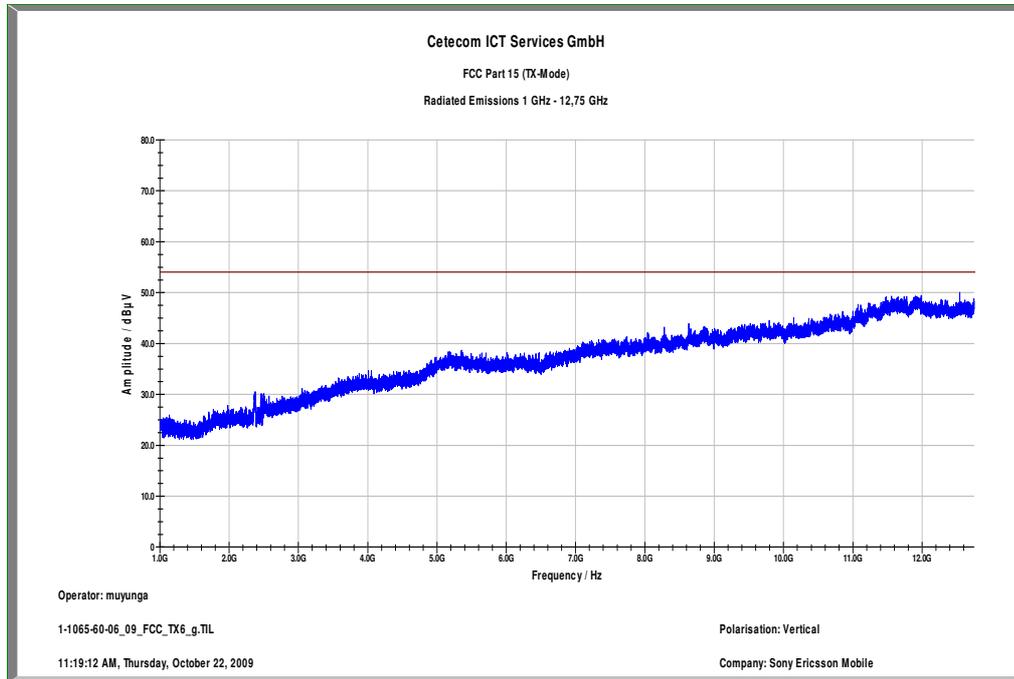


### Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
339.688500	12.1	15000.000	120.000	220.0	H	51.0	16.1	23.9	36.0
730.422900	20.7	15000.000	120.000	220.0	V	208.0	23.7	15.3	36.0
756.550950	21.1	15000.000	120.000	220.0	V	311.0	24.2	14.9	36.0
811.510200	21.3	15000.000	120.000	220.0	H	248.0	24.5	14.7	36.0
903.330300	23.0	15000.000	120.000	220.0	H	51.0	25.7	13.0	36.0
934.978500	23.0	15000.000	120.000	220.0	H	324.0	25.8	13.0	36.0

Plot 5: 1 - 12 GHz vertical / horizontal (middle channel)

Worst case polarisation: Vertical



Signal suppressed with a 2.4 GHz Band-reject Filter

Plot 6: 0.03 - 1 GHz (highest channel)

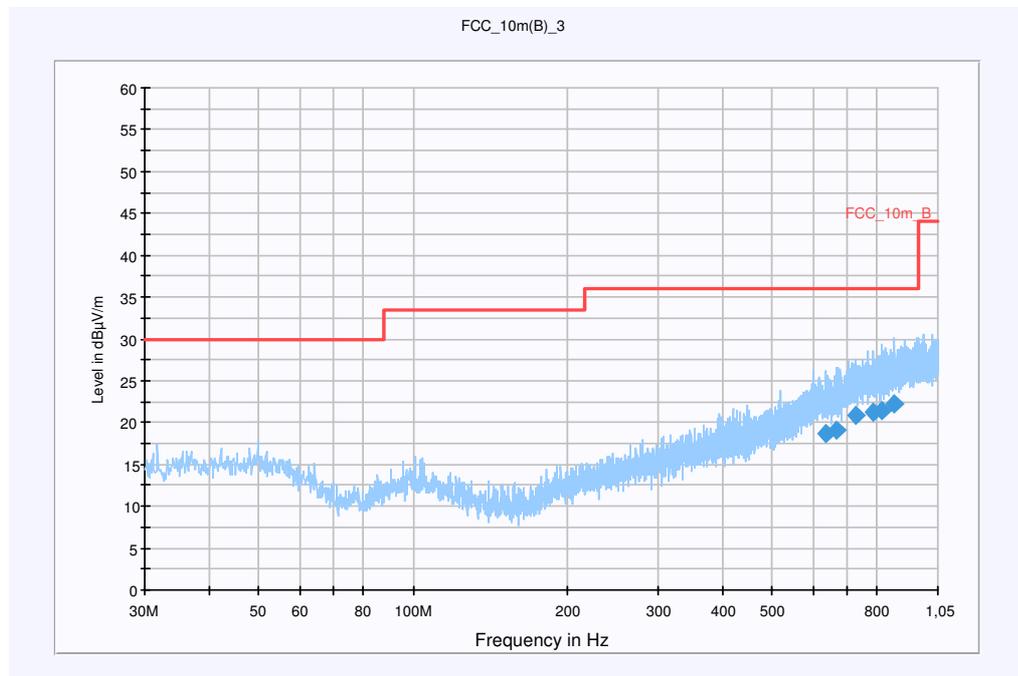
### Information

EUT:	AAD-3880056-BV + CAA-0003005-BV
Serial Number:	CB511ECHMG + 9308W27102701
Test Description:	FCC part 15 C class B
Operating Conditions:	W-LAN Testmode; Tx: Ch 11
Operator Name:	Lang
Comment:	Power: 115 V/ 60 Hz

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dB $\mu$ V/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak	120 kHz	15 s	Receiver

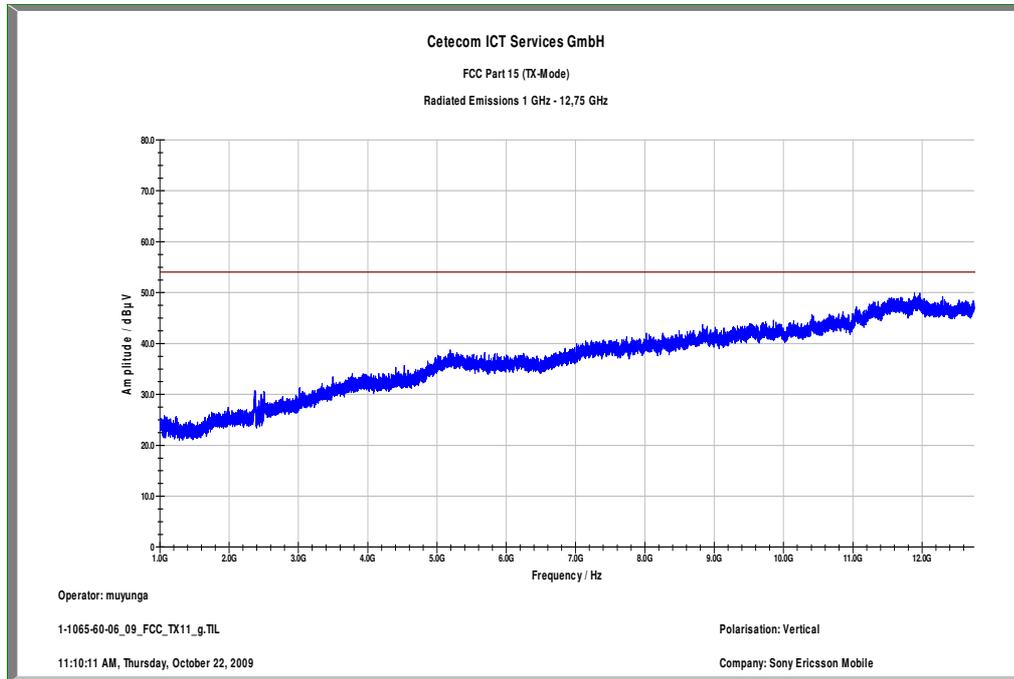


### Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
637.634700	18.8	15000.000	120.000	118.0	H	272.0	21.6	17.2	36.0
668.603250	19.0	15000.000	120.000	120.0	V	27.0	22.2	17.0	36.0
724.950900	20.9	15000.000	120.000	220.0	V	51.0	23.6	15.1	36.0
785.907300	21.3	15000.000	120.000	189.0	V	236.0	24.3	14.7	36.0
817.783650	21.5	15000.000	120.000	220.0	H	299.0	24.6	14.5	36.0
865.050450	22.2	15000.000	120.000	220.0	H	218.0	25.3	13.8	36.0

Plot 7: 1 - 12 GHz (highest channel)

Worst case polarisation: Vertical



Signal suppressed with a 2.4 GHz Band-reject Filter

Results:

SPURIOUS EMISSIONS LEVEL §15.209								
2412 MHz			2437 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No critical peaks detected.			No critical peaks detected.			No critical peaks detected.		
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

Limits: § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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)).

Limits: § 15.109

Frequency (MHz)	Field strength (dBµV/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

**5.14 Spurious Emissions - radiated (Receiver) §15.109 / 209**

Plot 1: 0.03 - 1 GHz vertical / horizontal (receiver)

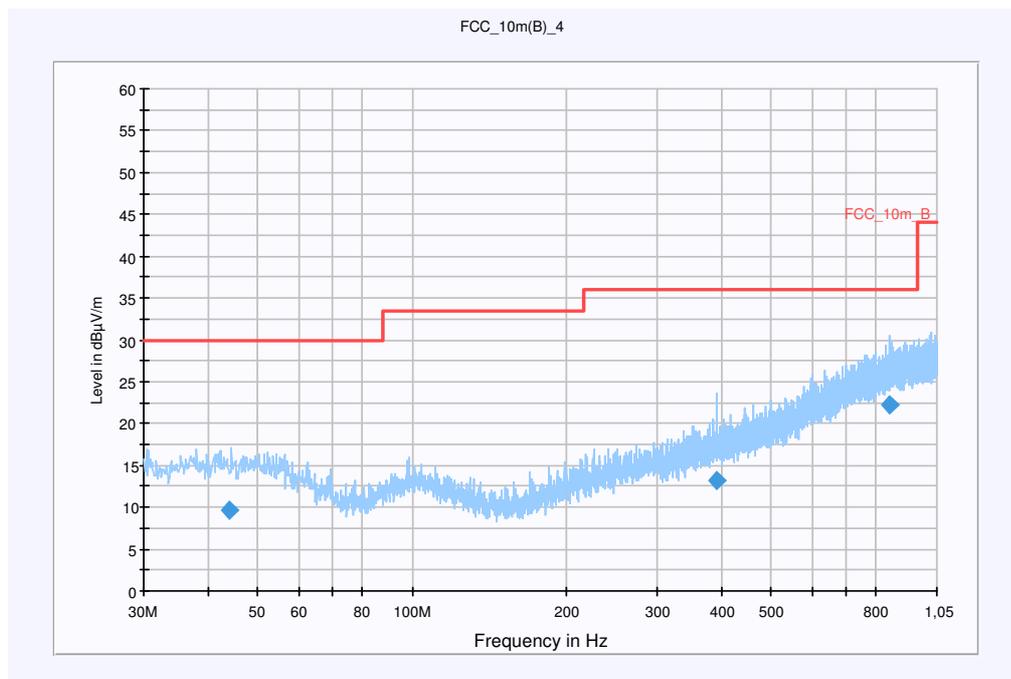
**Information**

EUT:	AAD-3880056-BV + CAA-0003005-BV
Serial Number:	CB511ECHMG + 9308W27102701
Test Description:	FCC part 15 C class B
Operating Conditions:	W-LAN Testmode; Rx
Operator Name:	Lang
Comment:	Power 115 V/ 60 Hz

**Scan Setup: STAN\_Fin [EMI radiated]**

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

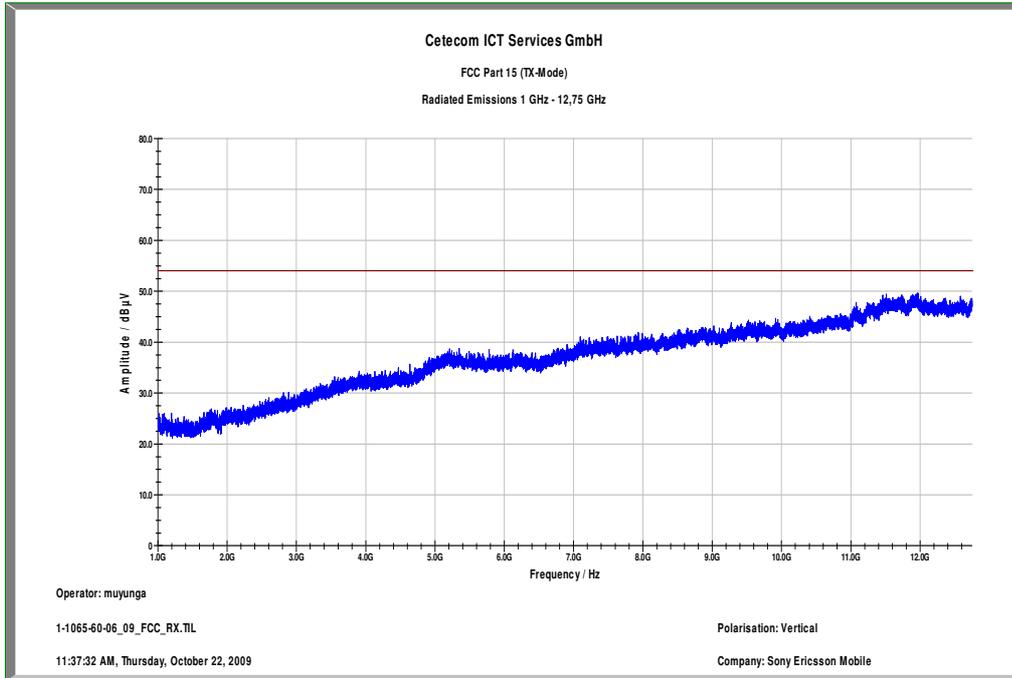
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1 GHz	QuasiPeak	120 kHz	15 s	Receiver



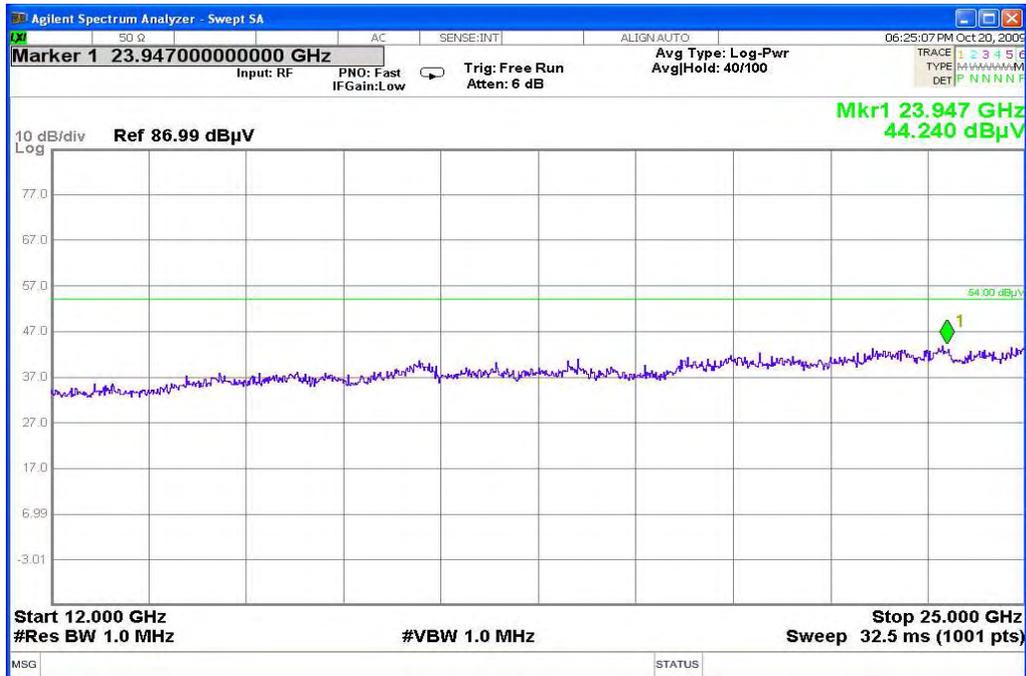
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
43.955850	9.6	15000.000	120.000	137.0	H	44.0	13.5	20.4	30.0
392.785050	13.3	15000.000	120.000	111.0	H	152.0	17.2	22.7	36.0
847.642050	22.2	15000.000	120.000	220.0	H	122.0	25.0	13.8	36.0

Plot 2: 1 - 12 GHz vertical / horizontal (receiver)  
Worst case polarisation: Vertical



Plot 3: 12- 25 GHz (receiver)



Results:

Spurious Emissions level [dB $\mu$ V/m]		
f[MHz]	Detector	Level [dB $\mu$ V/m]
No critical peaks detected		
Measurement uncertainty		$\pm 3$ dB

f < 1 GHz : RBW/VBW: 100 kHz

f  $\geq$  1GHz : RBW/VBW: 1 MHz

See above plots

Measurement distance see table

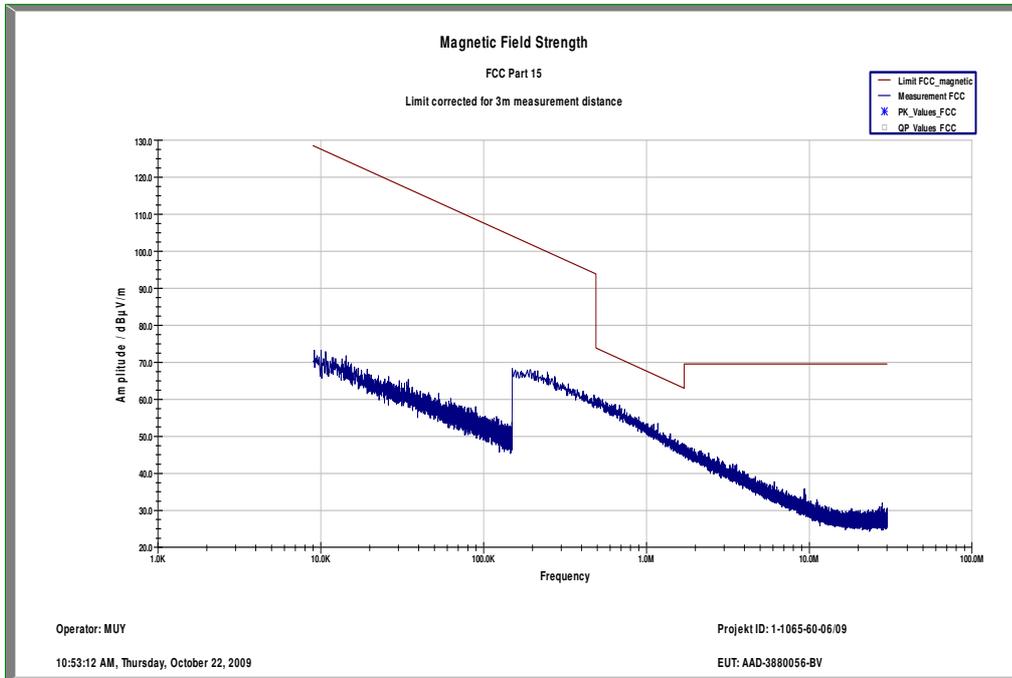
**Limits:** § 15.109

Frequency (MHz)	Field strength (dB $\mu$ V/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

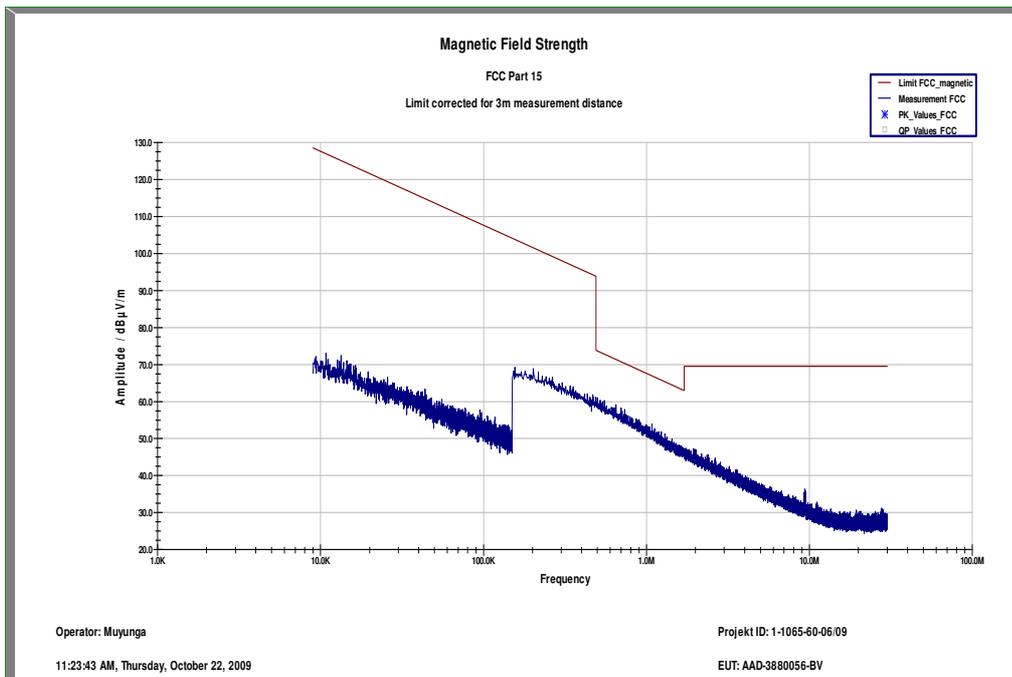
### 5.15 Spurious Emissions - radiated <30 MHz §15.209

Measured at 3 m distance.

Plot 1: Transmit mode, OFDM



Plot 2: Receiver mode



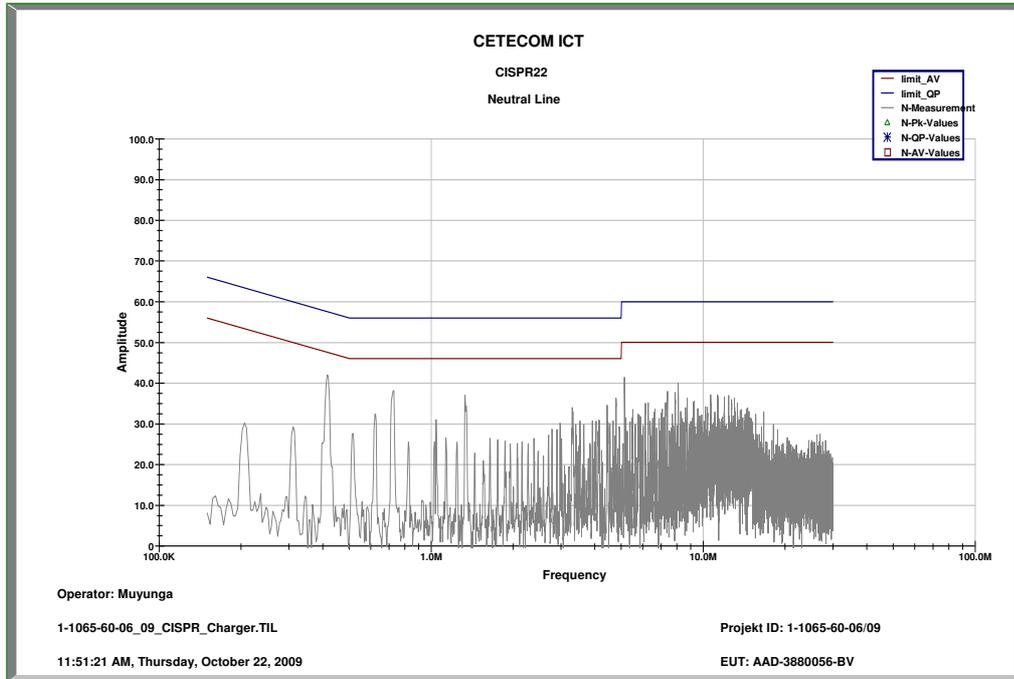
Limits:

Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dB $\mu\text{V/m}$	30
30 - 88	100 / 40 dB $\mu\text{V/m}$	3
88 - 216	150 / 43.5 dB $\mu\text{V/m}$	3
216 - 960	200 / 46 dB $\mu\text{V/m}$	3
above 960	54 dB $\mu\text{V/m}$	3

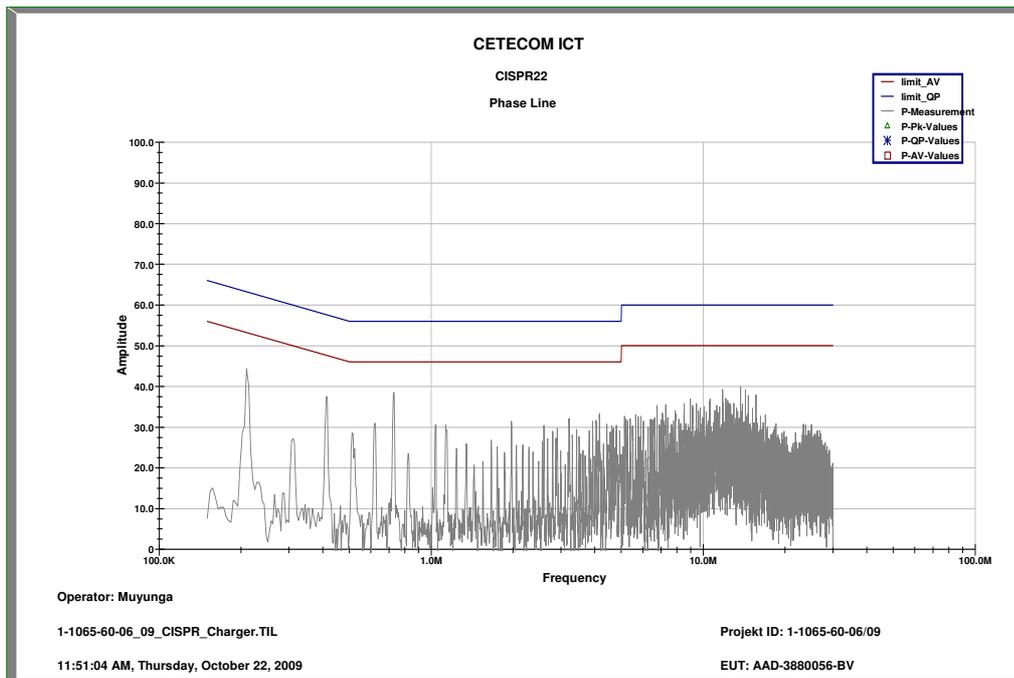
**5.16 Conducted Emissions <30 MHz §15.107/207**

We measured in TX and RX mode, L1 and N floating and grounded, max value was hold.

Plot 1: CISPR 22, Transmit mode  
CST-80 Charger, Neutral Line



Plot 2: CISPR 22, Transmit mode  
CST-80 Charger, Phase Line



Limits:

Under normal test conditions only	See plots
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## 6 Test equipment and ancillaries used for tests

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

All reported calibration intervals are calibrations according to the EN/ISO/IEC 17025 standard. These calibrations were performed from an accredited external calibration laboratory.

Additional to these calibrations the laboratory performed comparison measurements with other calibrated systems and performed a weekly chamber inspection.

All used devices are connected with a 10 MHz external reference.

According to the manufacturers' instruction is it possible to establish a calibration interval for the FSP unit of 24 month, if the device has an external 10 MHz reference.

### *Anechoic chamber C:*

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Anechoic chamber	MWB	87400/02	300000996	Monthly verification		
2	System-Rack 85900	HP I.V.	*	300000222	n.a.		
3	Measurement System 1						
4	PSA-Spektrumanalysator 3 Hz - 26.5 GHz (E4440A)	Agilent	MY48250080	300003812	05.08.2008	24	05.08.2010
5	EMI Preselector 9 kHz - 1 GHz (N9039A)	Agilent	MY48260003	300003825	19.08.2008	24	19.08.2010
6	Microwave Analog Signal Generator (N5183A)	Agilent	MY47420220	300003813	06.08.2008	24	06.08.2010
7	PC	F+W			n.a.		
8	TILE	TILE			n.a.		
9	TRILOG Super Broadband Antenna (VULB9163)	Schwarzbeck	371	300003854	Monthly verification (System cal.)		
10	Double Ridged Antenna 3115	EMCO	3088	300001032	Monthly verification (System cal.)		
11	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)		
12	Switch / Control Unit 3488A	HP	2719A15013	300001156	n.a.		
13	Power Supply 6032A	HP	2818A03450	300001040	08.01.2009	36	08.01.2012
14	Busisolator	Kontron		300001056	n.a.		
15	Leitungsteiler 11850C	HP		300000997	Monthly verification (System cal.)		
16	Power attenuator 8325	Byrd	1530	300001595	Monthly verification (System cal.)		
17	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verification (System cal.)		
18	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verification (System cal.)		
19	Hochpassfilter WHK1.1/15G-10SS	Wainwright	3	300003255	Monthly verification (System cal.)		
20	Hochpassfilter WHKX2.9/18G-12SS	Wainwright	1	300003492	Monthly verification (System cal.)		
21	Hochpassfilter WHKX7.0/18G-8SS	Wainwright	18	300003789	Monthly verification (System cal.)		
22	Switch / Control Unit 3488A	HP	2605e08770	300001443	n.a.		
23	Trenntrafo RT5A	Grundig	9242	300001263	n.a.		
24	Relais Matrix PSU	R&S	890167/024	300001168	n.a.		
25	Netznachbildung ESH3-Z5	R&S	828576/020	300001210	n.a.		

**System Rack Room 005:**

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	FSP 30	R&S	100886	300003575	25.08.2008	24	25.08.2010
2	CBT	R&S	100313	300003516	03.09.2008	24	03.09.2010
3	Switch Matrix	HP		300000929	n.a.		
4	Power Supply 6625A	HP	3041A00544	300002270	13.05.2007	36	13.05.2010
5	Signal Generator SMIQ03B	R&S	836206/0092	300002680	30.05.2007	36	30.05.2010

**SRD Laboratory Room 002:**

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	System Controller PSM 12	R&S	835259/007	300002681-00xx	n.a.		
2	Memory Extension PSM-K10	R&S	To 1	300002681	n.a.		
3	Operating Software PSM-B2	R&S	To 1	300002681	n.a.		
4	19'' Monitor		22759020-ED	300002681	n.a.		
5	Mouse		LZE 0095/6639	300002681	n.a.		
6	Keyboard		G00013834L461	300002681	n.a.		
7	Spectrum Analyser FSIQ 26	R&S	835540/018	300002681-0005	10.01.2008	24	10.01.2010
8	Tracking Generator FSIQ-B10	R&S	835107/015	300002681	s.No.7		
10	RF-Generator SMIQ03 (B1 Signal)	R&S	835541/056	300002681-0002	26.08.2008	36	26.08.2011
11	Modulation Coder SMIQ-B20	R&S	To 10	300002681	s.No.10		
12	Data Generator SMIQ-B11	R&S	To 10	300002681	s.No.10		
13	RF Rear Connection SMIQ-B19	R&S	To 10	300002681	s.No.10		
14	Broadband horn antenna (1-18 GHz)	EMCO	9107-3696	300001604	16.04.2008	24	16.04.2010
15	Broadband horn antenna (1-18 GHz)	EMCO	9107-3697	300001605	21.08.2008	24	21.08.2010
16	Std gain horn antenna (18- 26.5 GHz)	Narda	Model no. 638	300000486	n.a.		
17	Std gain horn antenna (18- 26.5 GHz)	Narda	Model no. 638	300000487	n.a.		
18	Sleeve dipole antenna Model 3126-880	ETS-Lindgren	00040887	3000000	n.a.		
19	Fast CPU SM-B50	R&S	To 10	300002681	s.No.10		
20	FM Modulator SM-B5	R&S	835676/033	300002681	s.No.10		
21	RF-Generator SMIQ03 (B2 Signal)	R&S	835541/055	300002681-0001	25.08.2008	36	25.08.2011
22	Modulation Coder SMIQ-B20	R&S	To 21	300002681	s.No.21		
23	Data Generator SMIQ-B11	R&S	To 21	300002681	s.No.21		
24	RF Rear Connection SMIQ-B19	R&S	To 21	300002681	s.No.21		
25	Fast CPU SM-B50	R&S	To 21	300002681	s.No.21		
26	FM Modulator SM-B5	R&S	836061/022	300002681	s.No.21		
27	RF-Generator SMP03 (B3 Signal)	R&S	835133/011	300002681-0003	26.08.2008	36	26.08.2011
28	Attenuator SMP-B15	R&S	835136/014	300002681	S.No.27		
29	RF Rear Connection SMP-B19	R&S	834745/007	300002681	S.No.27		
30	Power Meter NRVD	R&S	835430/044	300002681-0004	26.08.2008	24	26.08.2010
31	Power Sensor NRVD-Z1	R&S	833894/012	300002681-0013	26.08.2008	24	26.08.2010
32	Power Sensor NRVD-Z1	R&S	833894/011	300002681-0010	26.08.2008	24	26.08.2010
33	Rubidium Standard RUB	R&S		300002681-0009	27.08.2008	24	27.08.2010
34	Switching and Signal Conditioning Unit SSCU	R&S	338864/003	300002681-0006	Verified with path compensation		
35	Laser Printer HP Deskjet 2100	HP	N/A	300002681-0011	n.a.		
36	19'' Rack	R&S	11138363000004	300002681	n.a.		
37	RF-cable set	R&S	N/A	300002681	n.a.		
39	IEEE-cables	R&S	N/A	300002681	n.a.		
40	Sampling System FSIQ-B70	R&S	835355/009	300002681	s.No.7		
41	RSP programmable attenuator	R&S	834500/010	300002681-0007	26.08.2008	24	26.08.2010

42	Signalling Unit	R&S	838312/011	300002681	n.a.		
43	NGPE programmable Power Supply for EUT	R&S	192.033.41	300002681			
44	Power Splitter 6005-3	Inmet Corp.	none	300002841	n.a.		
45	SMA Cables SPS-1151-985-SPS	Insulated Wire	different	different	n.a.		
46	CBT32 with EDR Signaling Unit	R&S					
47	Coupling unit	Narda	N/A	--	n.a.		
48	2xSwitch Matrix PSU	R&S	872584/021	300001329	n.a.		
49	RF-cable set	R&S	N/A	different	n.a.		
50	IEEE-cables	R&S	N/A	--	n.a.		

Note: 3000002681-00xx inventoried as a system

**SRD Laboratory Room 005:**

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Spektrum Analyzer 8566B	HP	2747A05275	300000219	18.01.2008	24	18.01.2010
2	Spektrum Analyzer Display 85662A	HP	2816A16497	300001690	23.01.2008	24	23.01.2010
3	Quasi-Peak-Adapter 85650A	HP	2811A01135	300000216	23.01.2008	24	23.01.2010
4	Power Supply	Heiden	003202	300001187	12.05.2007	36	12.05.2010
5	Power Supply	Heiden	1701	300001392	12.05.2007	36	12.05.2010

**Anechoic chamber F:**

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Control Computer	F+W	FW0502032	300003303	-/-	-/-	-/-
2	Trilog Antenna VULB 9163	Schwarzbeck	295	300003787	01.04.2008	24	01.04.2010
3	Amplifier - 0518C-138	Veritech Micro-wave Inc.	-/-	-/-	-/-	-/-	-/-
4	Switch - 3488A	HP		300000368	-/-	-/-	-/-
5	EMI Test receiver - ESCI	R&S	100083	300003312	01.06.2009	24	01.06.2011
6	Turntable Controller - 1061 3M	EMCO	1218	300000661	-/-	-/-	-/-
7	Tower Controller 1051 Controller	EMCO	1262	300000625	-/-	-/-	-/-
8	Tower - 1051	EMCO	1262	300000625	-/-	-/-	-/-
10	Ultra Notch-Filter Rejected band Ch. 62	WRCD	9	-/-	-/-	-/-	-/-