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)

Test report no.	**:**	**1-1288-1-4/09-A**
Type identification	**:**	**CP810 Sound Processor**
Applicant	**:**	**Cochlear Limited**
FCC ID	**:**	**WTOCP81000**
IC Certification No	**:**	**8039A-CP81000**
Test standards	**:**	**47 CFR Part 15**
		RSS - 210 Issue 7

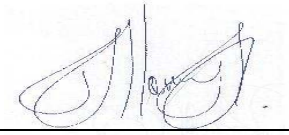
Table of contents

1 General information

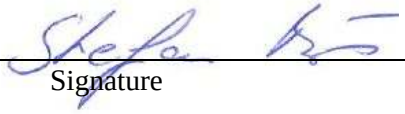
1.1 Notes

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:

2009-06-25	**Daniel Muyunga**	
Date	Name	Signature

Technical responsibility for area of testing:

2009-06-25	**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:	**Cochlear Limited**
Street:	**14 Mars Road**
Town:	**Lane Cove NSW 2066**
Country:	**Australia**
Telephone:	**+61-29428-6560**
Fax:	**+61-29428-5349**
Contact:	**Mr Johan Brinch**
E-mail:	**jbrinch@cochlear.com**
Telephone:	**+61-29428-6560**

1.4 Application details

Date of receipt of order:	**2009-04-30**
Date of receipt of test item:	**2009-05-04**
Date of start test:	**2009-05-04**
Date of end test	**2009-06-25**
Persons(s) who have been present during the test:	**Werner Weskens** **MEE, Wireless Research & Development Engineer**

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:	**Cochlear Limited**
Street:	**14 Mars Road**
Town:	**Lane Cove NSW 2066**
Country:	**Australia**

3.1.1 Test item

Kind of test item	:	**Wireless Hearing Aid**
Type identification	:	**CP810 Sound Processor**
S/N serial number	:	**0008167S** **0004220S**
HW hardware status	:	**-/-**
SW software status	:	**-/-**
Frequency Band [MHz]	:	**ISM 2.400 - 2.483,5**
Type of Modulation	:	**GFSK**
Number of channels	:	**10**
Antenna	:	**Internal antenna**
Power Supply	:	**2.9 V DC by two 1.45 V PR44 Batteries**
Temperature Range	:	**-20 °C to +55 °C**

Max. power radiated: -0.94 dBm
Max. power conducted: 0.34 dBm

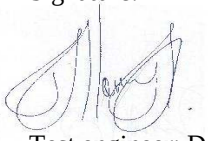
FCC ID: WTOCP81000
IC: 8039A-CP81000

3.1.2 Additional EUT information For IC Canada (appendix 2)

IC Registration Number:	**8039A-CP81000**
Model Name:	**CP810 Sound Processor**
Manufacturer (complete Adress):	**Cochlear Limited** **4 Mars Road Lane Cove NSW 2066** **Australia**
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]:	**2400 – 2483.5 MHz**
RF: Power [W] (max):	**Rad. EIRP: 0.8 mW** **Conducted : 1.08 mW**
Antenna Type:	**Internal antenna**
Field Strength [dBµV/m in 3m]:	**87.4**
Occupied Bandwidth (99% BW) [kHz]:	**1643**
Type of Modulation:	**GFSK**
Emission Designator (TRC-43):	**1M64FXD**
Transmitter Spurious (worst case) [dBµV/m in 10m]:	**29.45**
Receiver Spurious (worst case) [dBµV/m in 10m]:	**38.68**

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, Dipl.-Ing. (FH)
Date: 2009-06-25

3.1.3 RF Technical Brief Cover Sheet acc. To RSS-102

All Fields must be completed with the requested information or the following codes: N/A for Not Applicable, N/P for Not Performed or N/V for Not Available. Where applicable, check appropriate box.

1. COMPANY NUMBER: **8039A**

2. MODEL NUMBER: **CP810 Sound Processor**

3. MANUFACTURER: **Cochlear**

4. TYPE OF EVALUATION: **N/A**

(c) RF Evaluation
- Evaluated against exposure limits: General Public Use ☐ Controlled Use ☐
- Duty cycle used in evaluation: _____%
- Standard used for evaluation: RSS-102 Issue 2 (2005-11)
- Measurement distance: 0.20 m
- RF value: _____ V/m ☐ A/m ☐ W/m^2 ☐

Measured ☐ Computed ☐ Calculated ☐

Declaration of RF Exposure Compliance

ATTESTATION: I attest that the information provided in this testreport is correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meets the SAR and/or RF exposure limits of RSS-102.

Name: Daniel K. Muyunga
Title: Dipl.-Ing. (FH)
Company: Cetecom ICT Services GmbH

3.1.4 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

3.1.5 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T_{nom}	°C	**23**
Nominal Humidity	H_{nom}	%	**46**
Nominal Power Source	V_{nom}	V	**2.9**

Type of power source: **DC by two 1.45 V PR44 Batteries**

Deviations from these values are reported in chapter 2

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	PASS	2009-06-25	-/-

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.

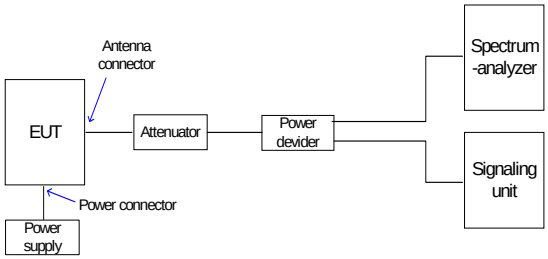
The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.4-2003 clause 4.2.
Antennas are confirmed with ANSI C63.2-1996 item 15.

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

None

5.3 Additional comments

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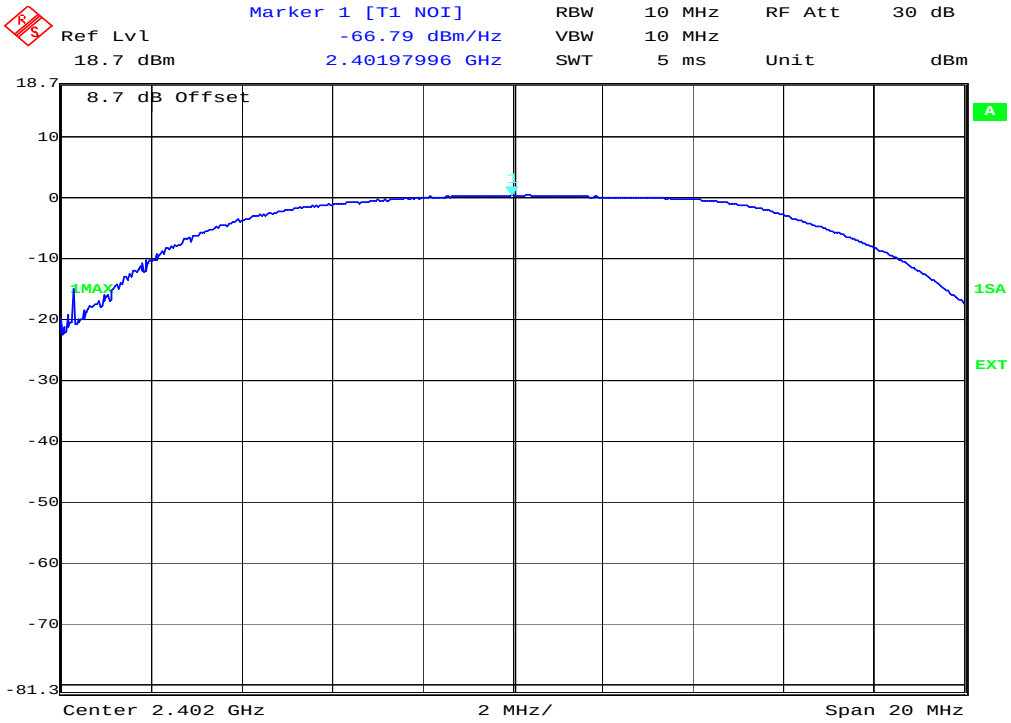
5.4 Antenna gain

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

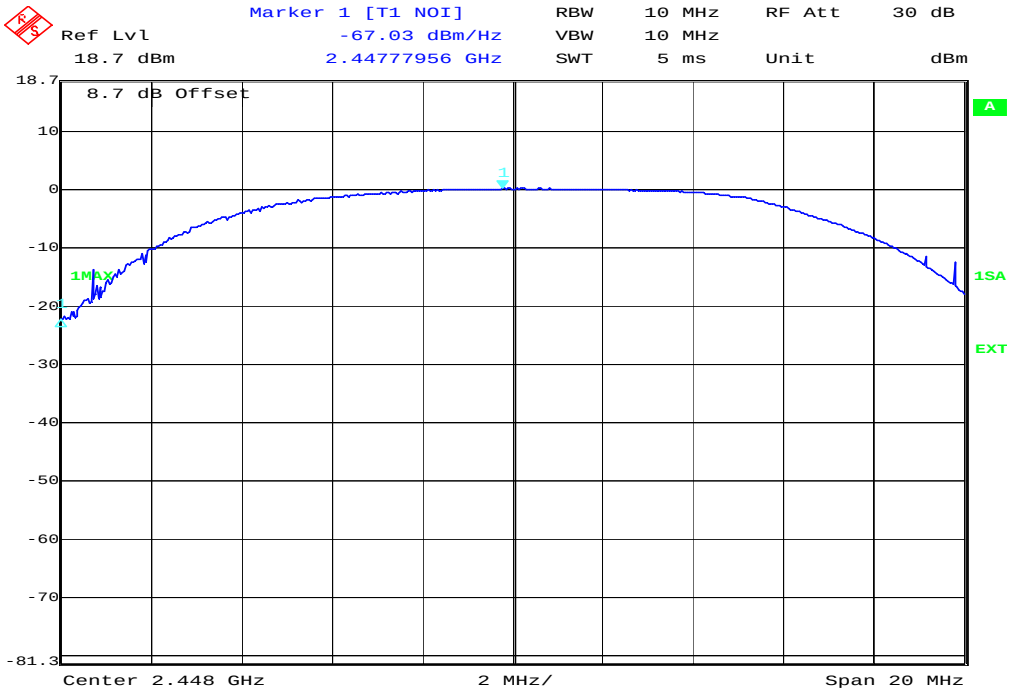
	low channel 2402 MHz	mid channel 2448 MHz	high channel 2482 MHz
Conducted power [dBm] *(measured)*	**0.34**	0.12	-0.40
Radiated power [dBm] *(measured)*	-3.02	**-1.53**	-0.94
Gain [dBi] *(calculated)*	-3.36	**-1.65**	-0.54

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

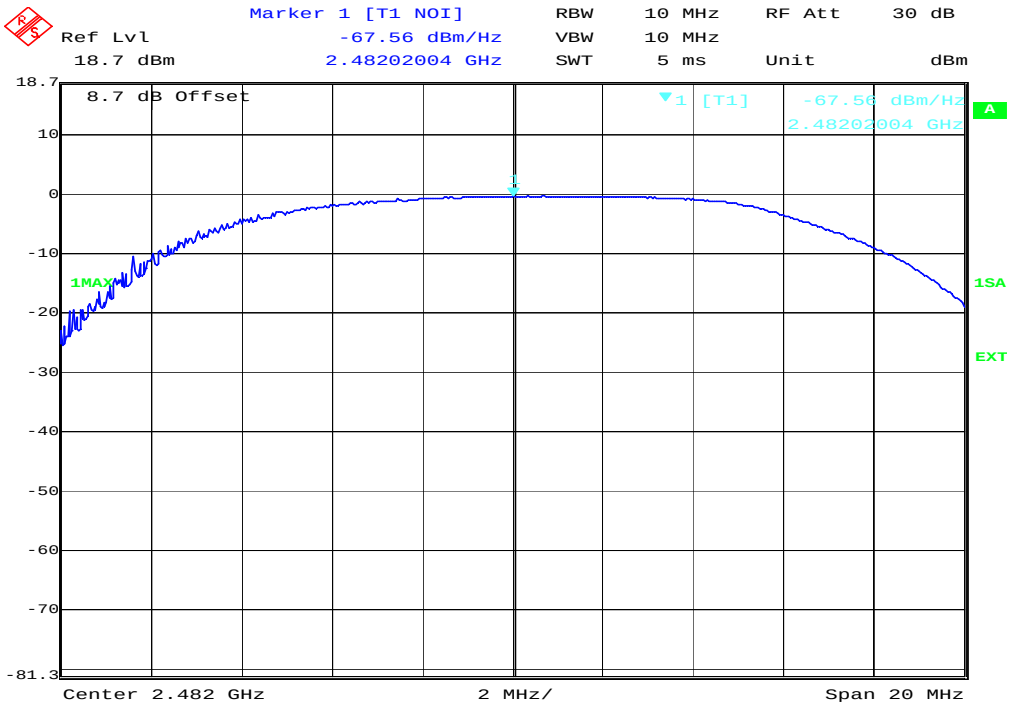
Plot 1: (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Plot 2: (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Plot 3: (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Results: Plot 1: Power density: -66.79 dBm/Hz = -31.99 dBm / 3 kHz
Plot 2: Power density: -67.03 dBm/Hz = -32.23 dBm / 3 kHz
Plot 3: Power density: -67.56 dBm/Hz = -32.76 dBm / 3 kHz

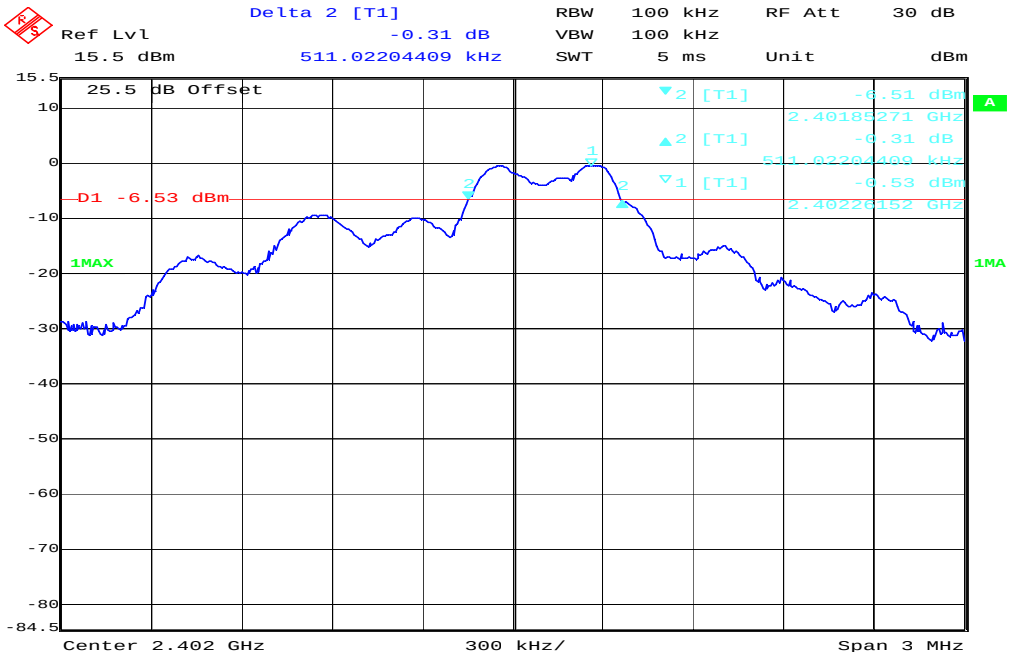
The signal analyzer FSIQ 26 from Rohde & Schwarz calculates directly the noise power density normalized to a 1 Hz noise power bandwidth (dBm/Hz), this value is then corrected for 3 KHz bandwidth (dBm/3KHz). The correction factor from dBm/Hz to dBm/3 kHz is +34.8 dB.

Limits :

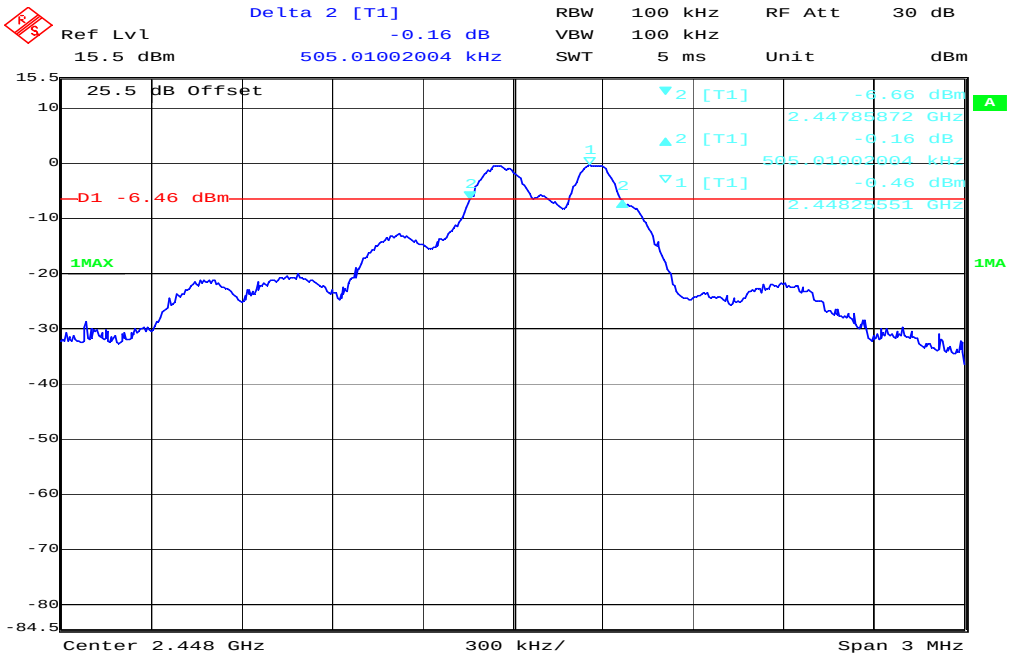
Under normal test conditions only	For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

5.6 Spectrum Bandwidth of a DSSS System / 6 dB Bandwidth

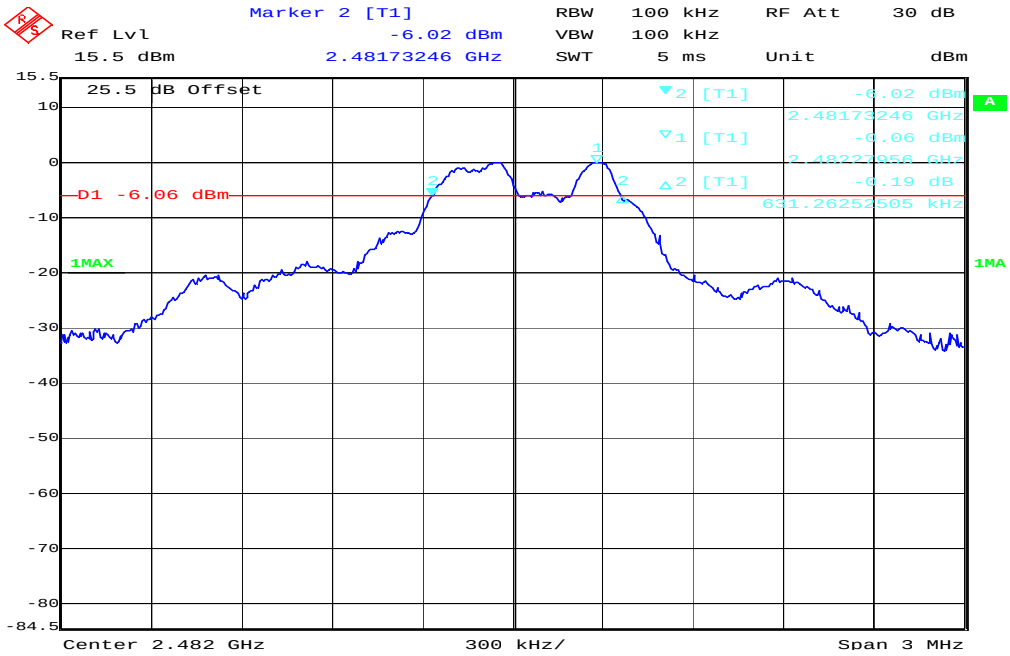
Plot 1:



Plot 2:



Plot 3:



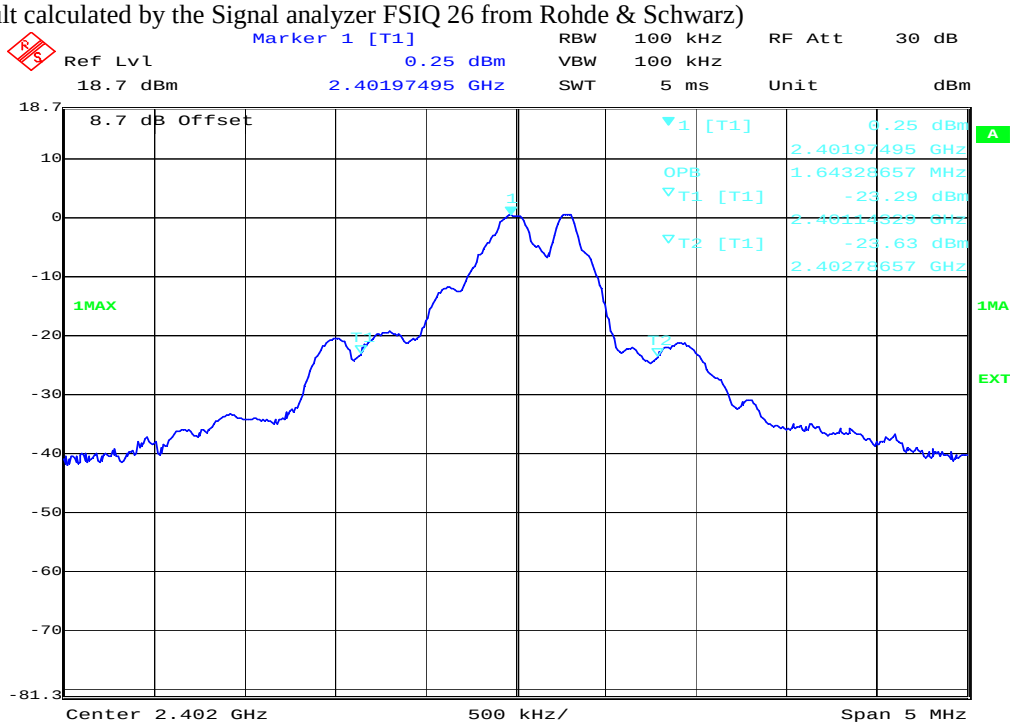
Results:

Test conditions		6 dB BANDWIDTH [MHz]		
Frequency [MHz]		2402	2448	2482
T_{nom}	V_{nom}	511	505	631
Measurement uncertainty		±1kHz		

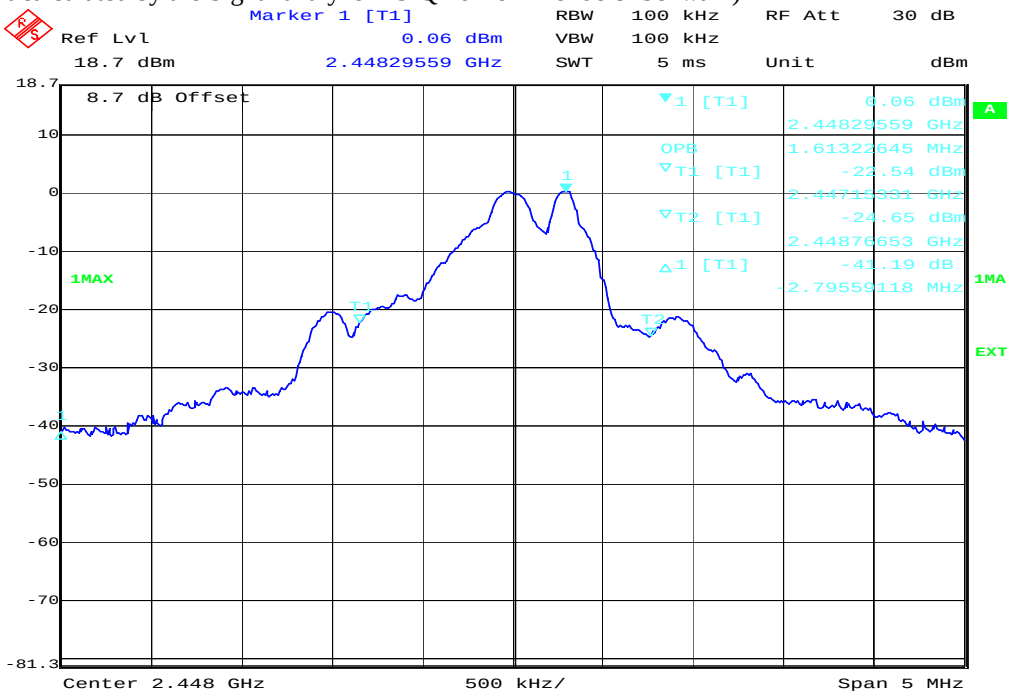
RBW: 100 kHz / VBW 100 kHz

5.7 Spectrum Bandwidth of a DSSS System / 20 dB Bandwidth

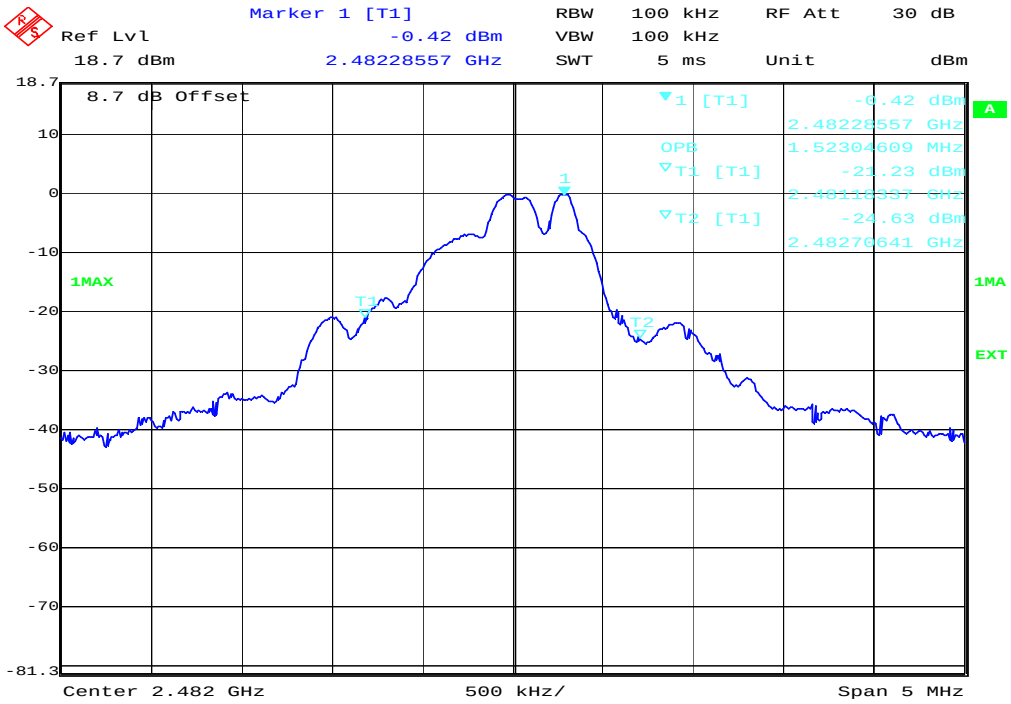
Plot 1: (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Plot 2: (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Plot 3: (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



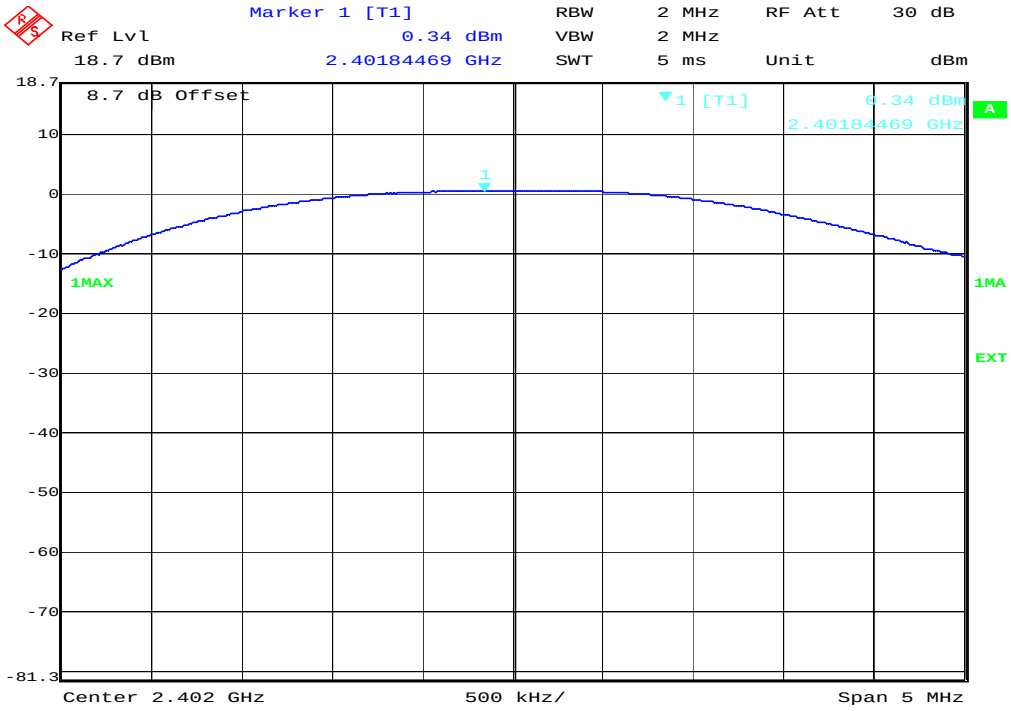
Results:

Test conditions		**20 dB BANDWIDTH [MHz]**		
Frequency [MHz]		2402	2448	2482
T_{nom}	V_{nom}	**1.643**	1.613	1.523
Measurement uncertainty		±1kHz		

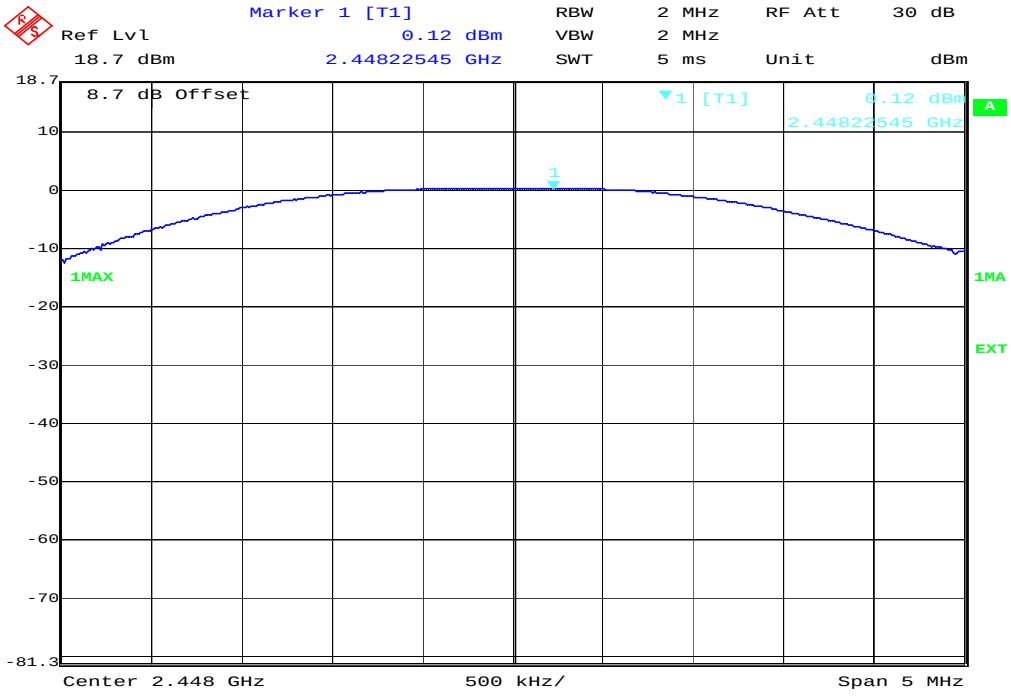
RBW: 100 kHz / VBW 100 kHz

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

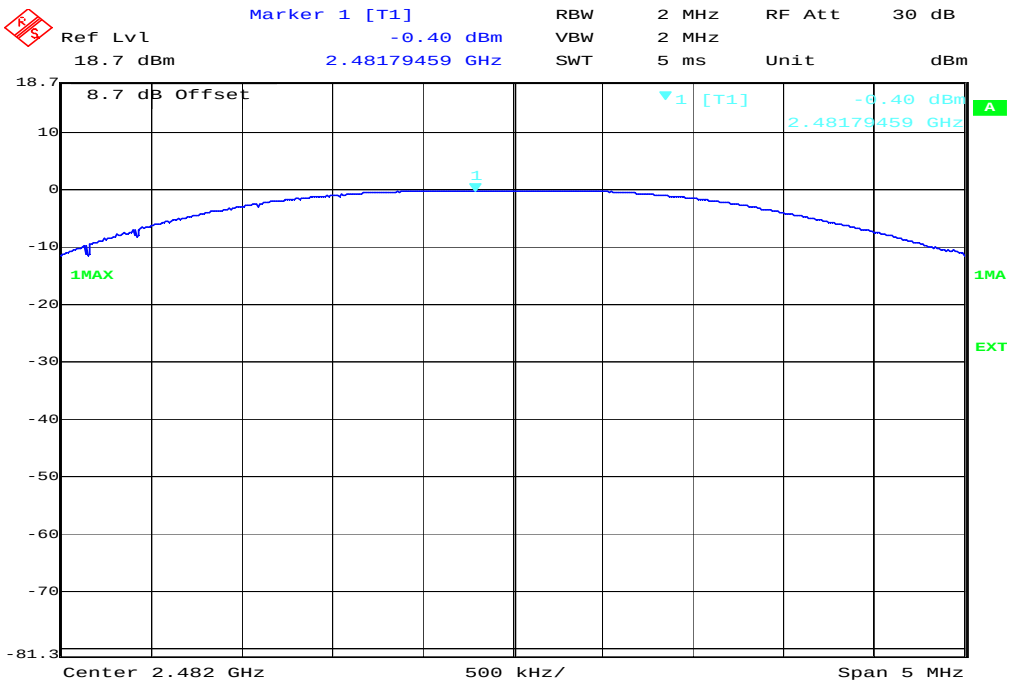
Plot 1:



Plot 2:



Plot 3:



Results:

Test conditions		Max. peak output power [dBm]			
Frequency [MHz]		2402 MHz		2448 MHz	2482 MHz
T_{nom}	V_{nom}	PK	**0.34**	0.12	-0.40
Measurement uncertainty		±3dB			

RBW / VBW: 2 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)

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2402 MHz	2448 MHz	2482 MHz
T_{nom}	V_{nom}	-3.02	-1.53	**-0.94**
Measurement uncertainty		±3dB		

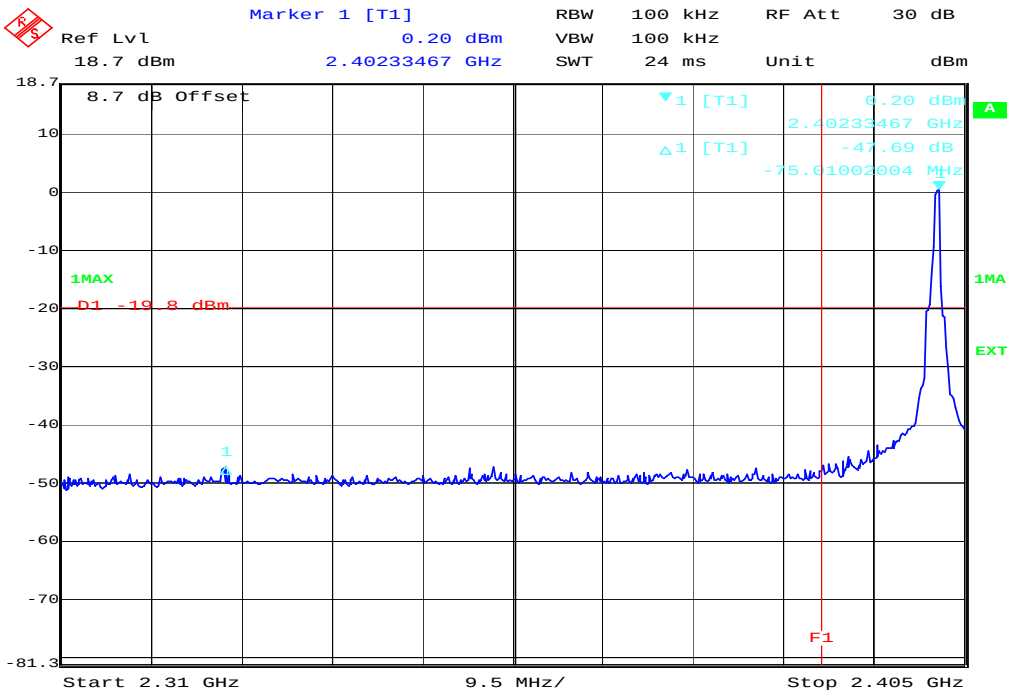
RBW / VBW: 2 MHz

Limits:

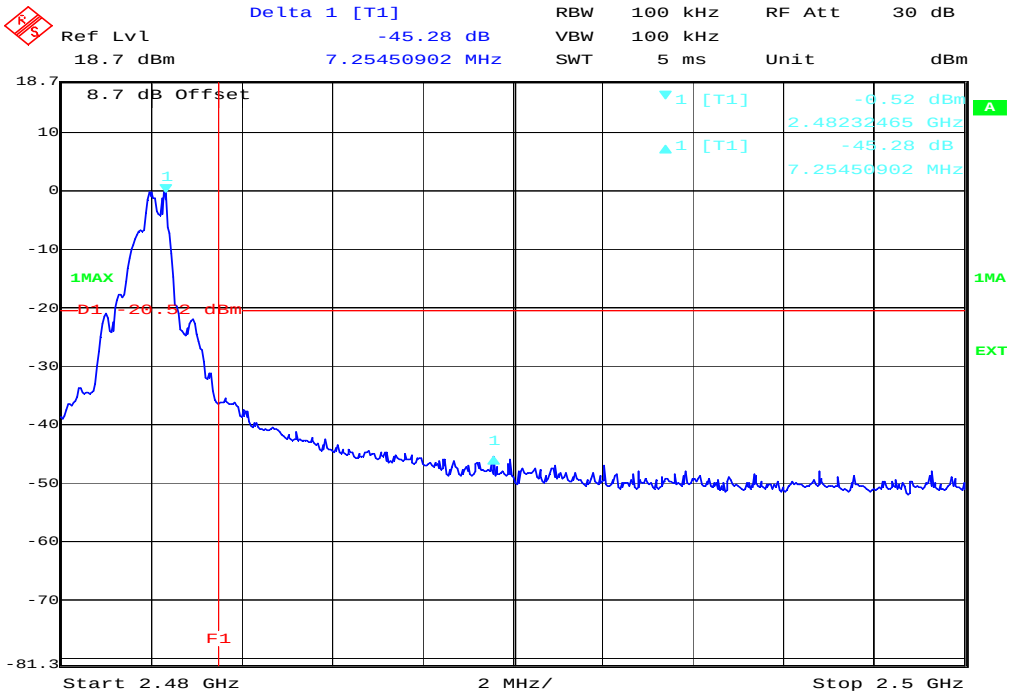
Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt

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

Plot 1: lowest channel (2402 MHz)



Plot 2: highest channel (2482 MHz)

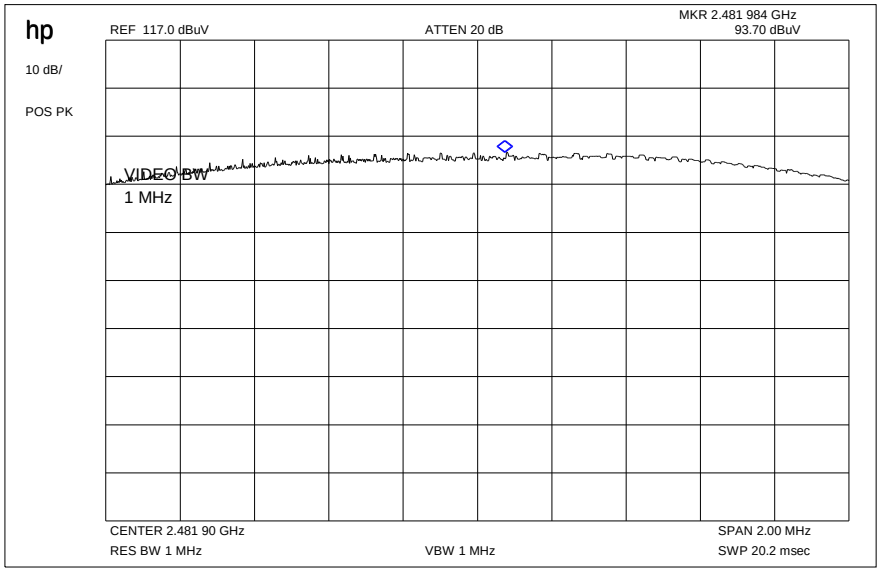


Limits:

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)).

5.11 Band-edge compliance of radiated emissions §15.205

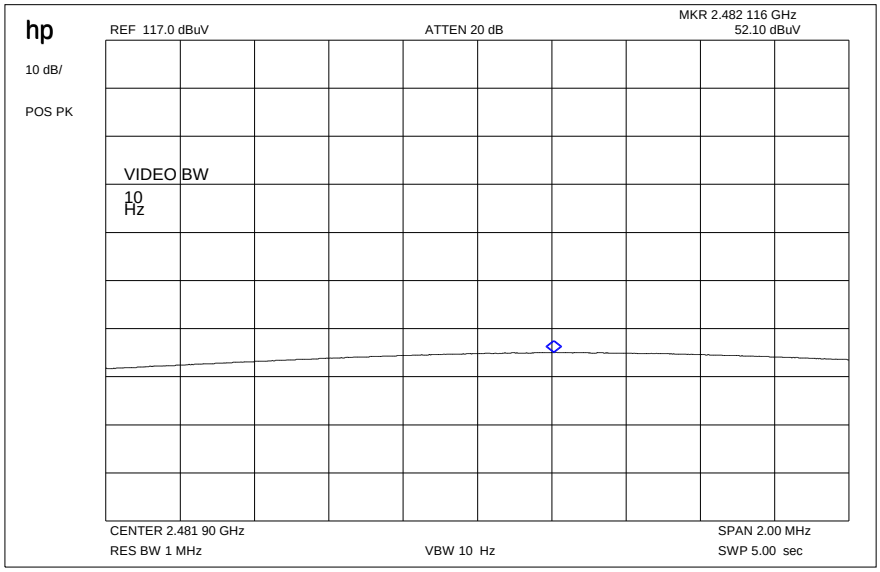
Plot 1: Max field strength in 3m distance (single frequency) peak



Result:

Frequency	Meter reading	Correction factor	Results
2462 MHz	93.70	-6.3 dB	87.40 dBµV/m at 3m

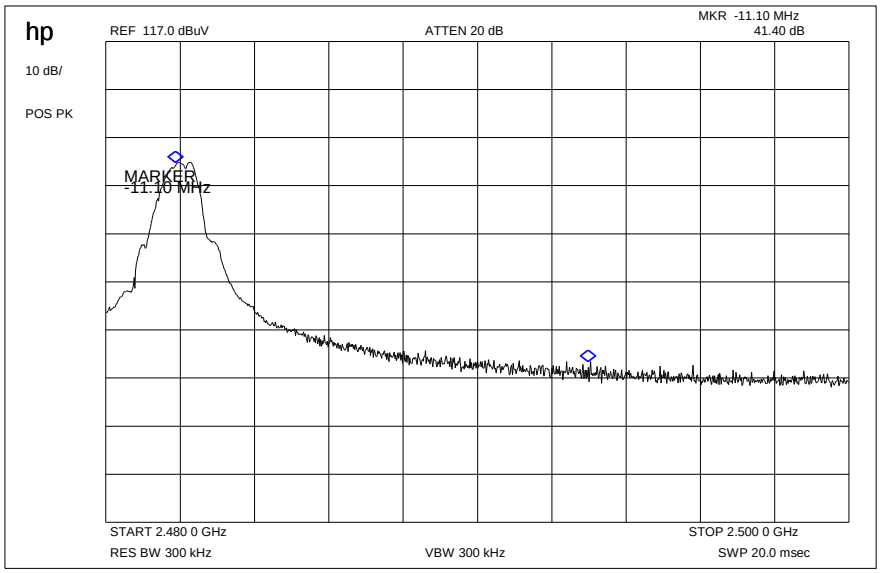
Plot 2 : Max field strength in 3m distance (single frequency) average



Result:

Frequency	Meter reading	Correction factor	Results
2462 MHz	52.10	-6.3 dB	45.80 dBµV/m at 3 m

Plot 3: Marker-Delta Method RBW/VBW = 1% of span

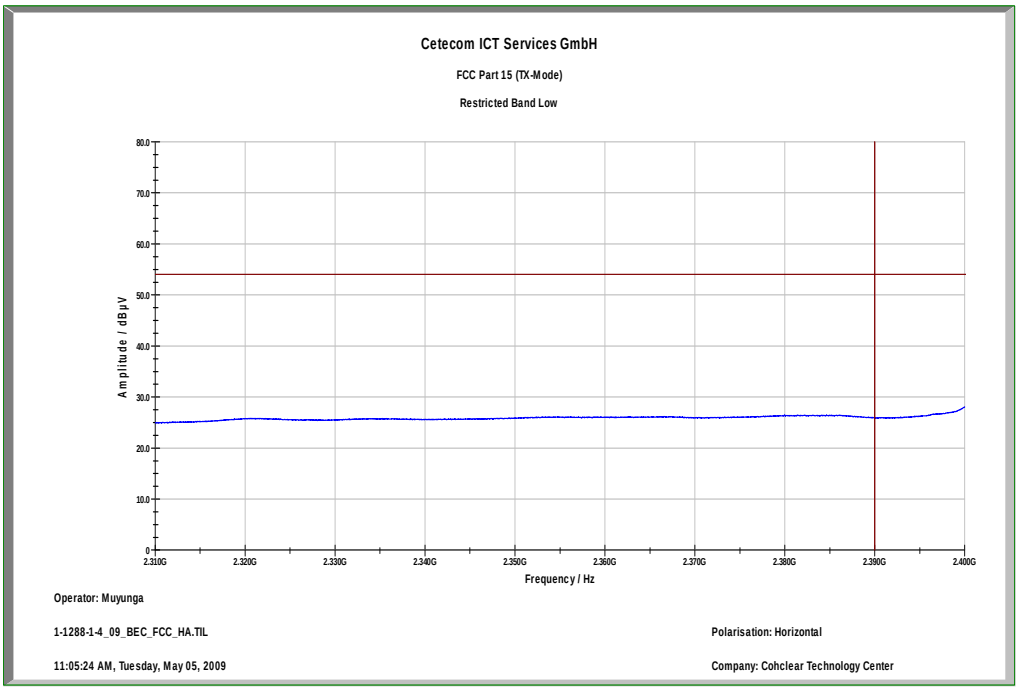


Result:

Marker-Delta-Value: 41.40 dB

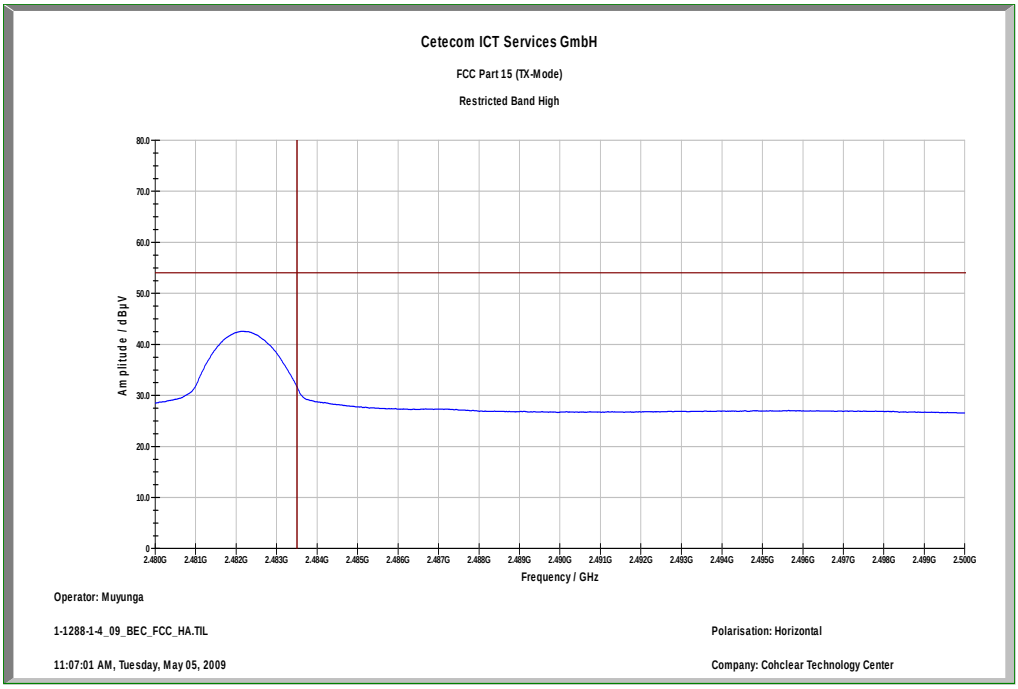
This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

Plot 4 Restricted band low



1MHz RBW / 10Hz VBW

Plot 5 Restricted band high



1MHz RBW / 10Hz VBW

Results & Limits:

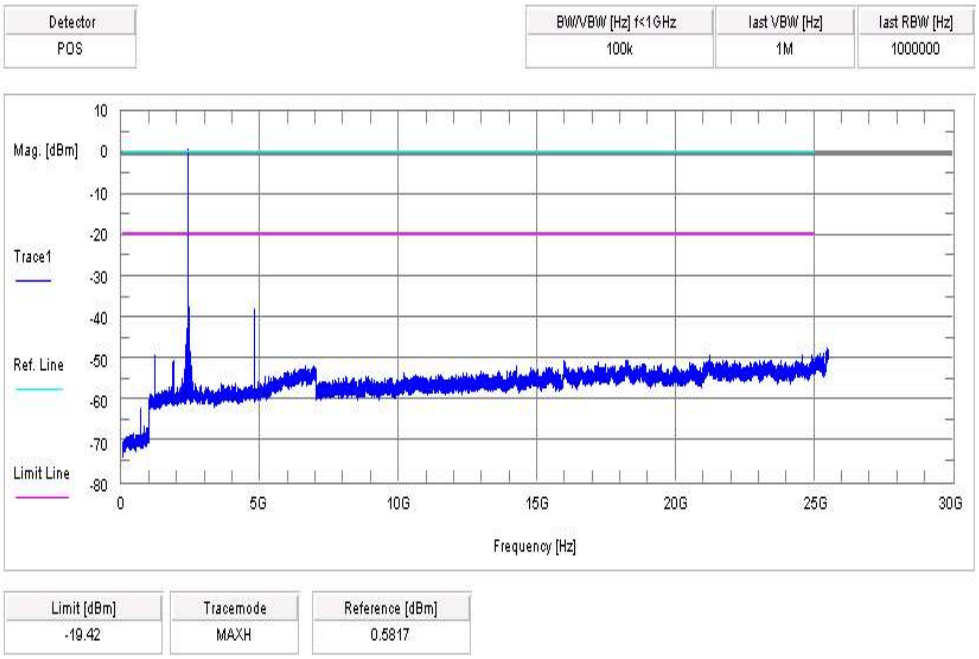
Radiated field strength

The field strength was measured with a PSA spectrum analyzer (E4440A) and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

high channel	setup	measured value (3m)	correction factor (3m)	calculated value (3m)
Max. peak value	1 MHz RBW 1 MHz VBW	93.70 dBµV/m	-6.3 dB	87.40 dBµV/m
Max. average value	1 MHz RBW 10 Hz VBW	52.10 dBµV/m	-6.3 dB	45.80 dBµV/m
Delta value	Peak 300 kHz RBW/VBW	41.40 dB		
Value at band edge	limit 54 dBµV/m			4.40 dBµV/m
Statement:				**Complies**

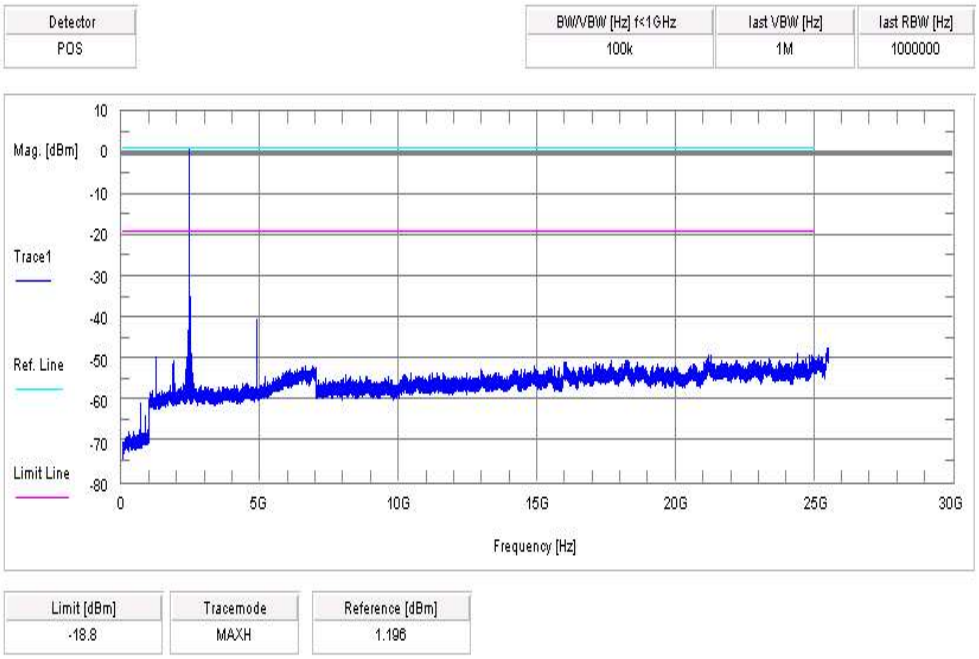
5.12 Spurious Emissions - conducted (Transmitter) §15.247 (c)

Plot 1: Lowest Channel



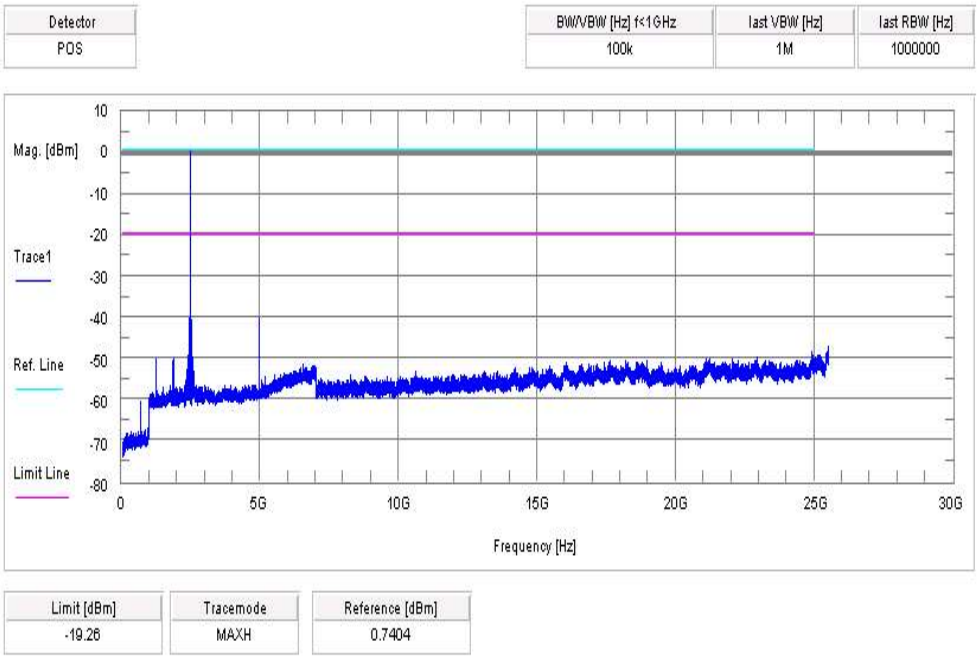
f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Plot 2: Middle Channel



f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Plot 3: Highest Channel



f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Result & Limits:

Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emmision power	actual attenuation below frequency of operation [dB]	results
2402		0.581	30 dBm	-	Operating frequency
No critical peaks detected Also, see plots			-20 dBc		Complies
2448		1.196	30 dBm		Operating frequency
No critical peaks detected Also, see plots			-20 dBc		Complies
2482		0.740	30 dBm		Operating frequency
No critical peaks detected Also, see plots			-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)).

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

Plot 1: 0.03 - 1 GHz (lowest channel)

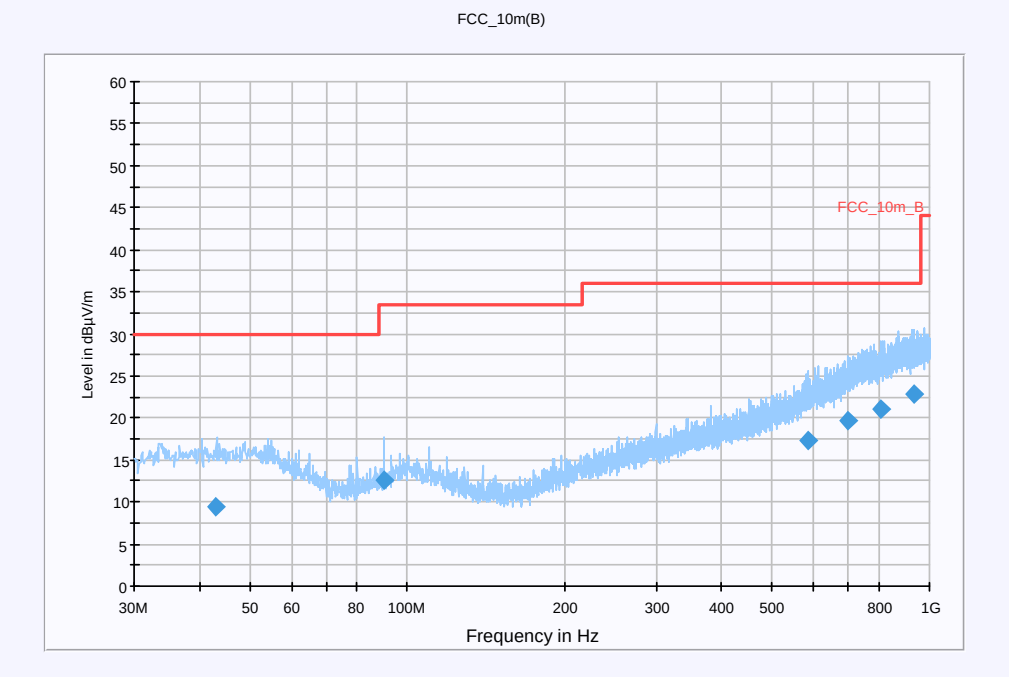
Information

EUT:	Sound Processor - CP 810 (Build P5)
Serial Number:	0004220S (white colored)
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	TX low channel
Operator Name:	Hennemann
Comment:	battery powered

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)
42.909050	9.4	15000.000	120.000	198.0	V	146.0	13.5	20.6	30.0
90.200000	12.7	15000.000	120.000	116.0	V	238.0	10.9	20.8	33.5
584.943600	17.4	15000.000	120.000	119.0	H	231.0	20.9	18.6	36.0
698.054450	19.8	15000.000	120.000	198.0	H	276.0	22.9	16.2	36.0
804.747100	21.1	15000.000	120.000	400.0	V	235.0	24.4	14.9	36.0
931.122150	22.7	15000.000	120.000	109.0	V	100.0	25.8	13.3	36.0

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

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3]
	@ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch
	FW 1.0
Antenna:	VULB 9163
	SN 9163-295, FW ---, CAL 08.04.2010
	Correction Table (vertical): VULP6113
	Correction Table (horizontal): VULP6113
	Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower]
	@ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable]
	@ GPIB0 (ADR 9), FW REV 3.12

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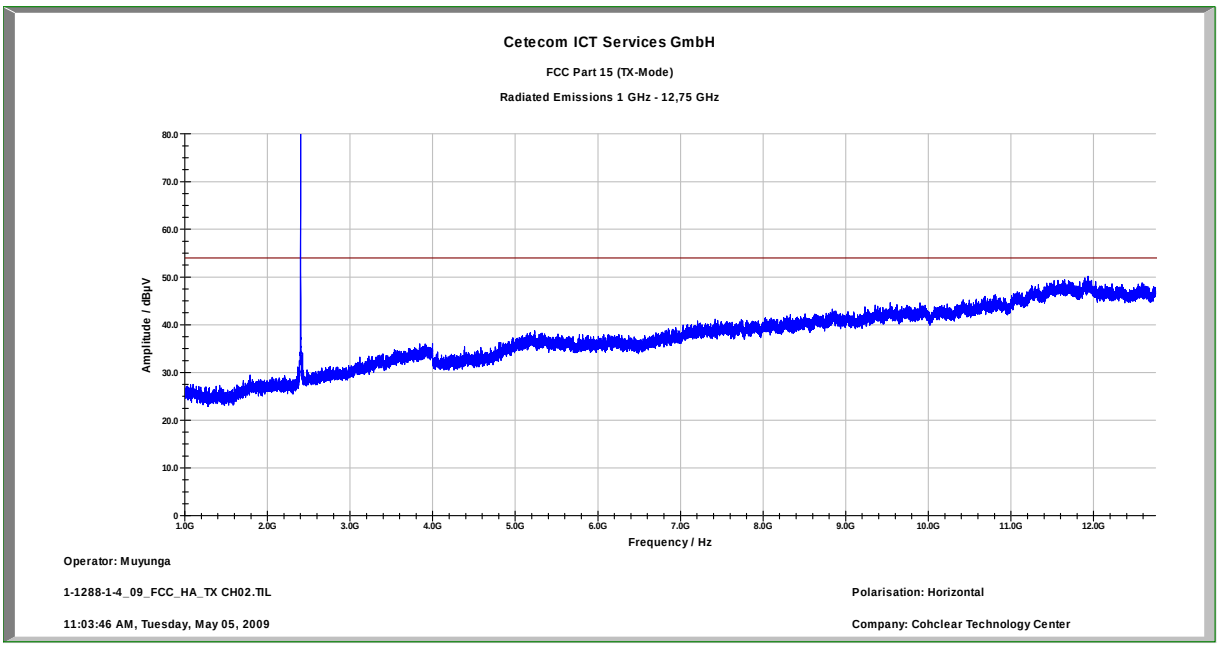
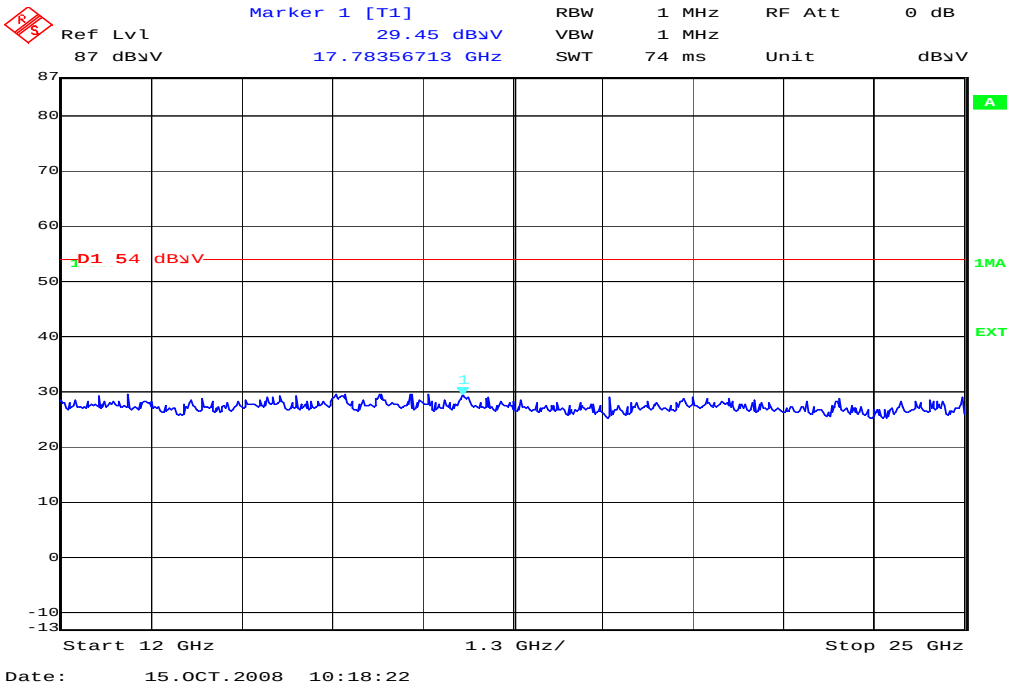
Plot 2: 1 - 12 GHz (lowest channel)



f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

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



f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Plot 4: 0.03 - 1 GHz (middle channel)

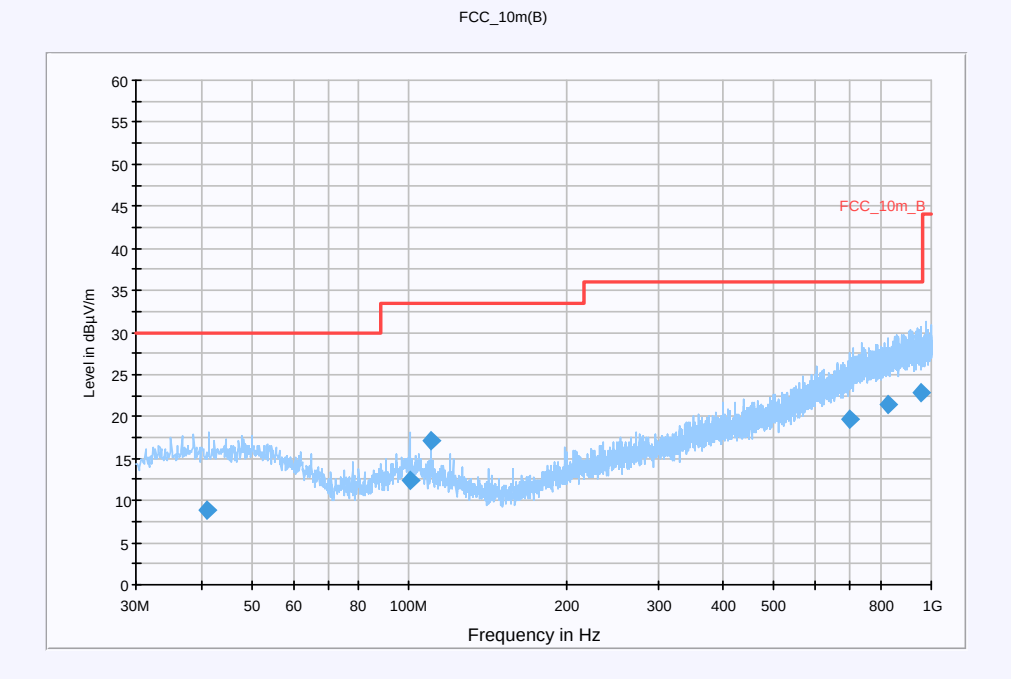
Information

EUT:	Sound Processor - CP 810 (Build P5)
Serial Number:	0004220S (white colored)
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	TX middle channel
Operator Name:	Hennemann
Comment:	battery powered

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)
41.122700	8.9	15000.000	120.000	400.0	H	331.0	13.5	21.1	30.0
100.258350	12.4	15000.000	120.000	118.0	V	60.0	12.3	21.1	33.5
110.248550	17.0	15000.000	120.000	200.0	V	82.0	11.4	16.5	33.5
696.335750	19.8	15000.000	120.000	400.0	V	234.0	22.9	16.2	36.0
828.002600	21.4	15000.000	120.000	174.0	H	272.0	24.7	14.6	36.0
957.995550	22.8	15000.000	120.000	141.0	V	175.0	25.9	13.2	36.0

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

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3]
	@ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch
	FW 1.0
Antenna:	VULB 9163
	SN 9163-295, FW ---, CAL 08.04.2010
	Correction Table (vertical): VULP6113
	Correction Table (horizontal): VULP6113
	Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower]
	@ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable]
	@ GPIB0 (ADR 9), FW REV 3.12

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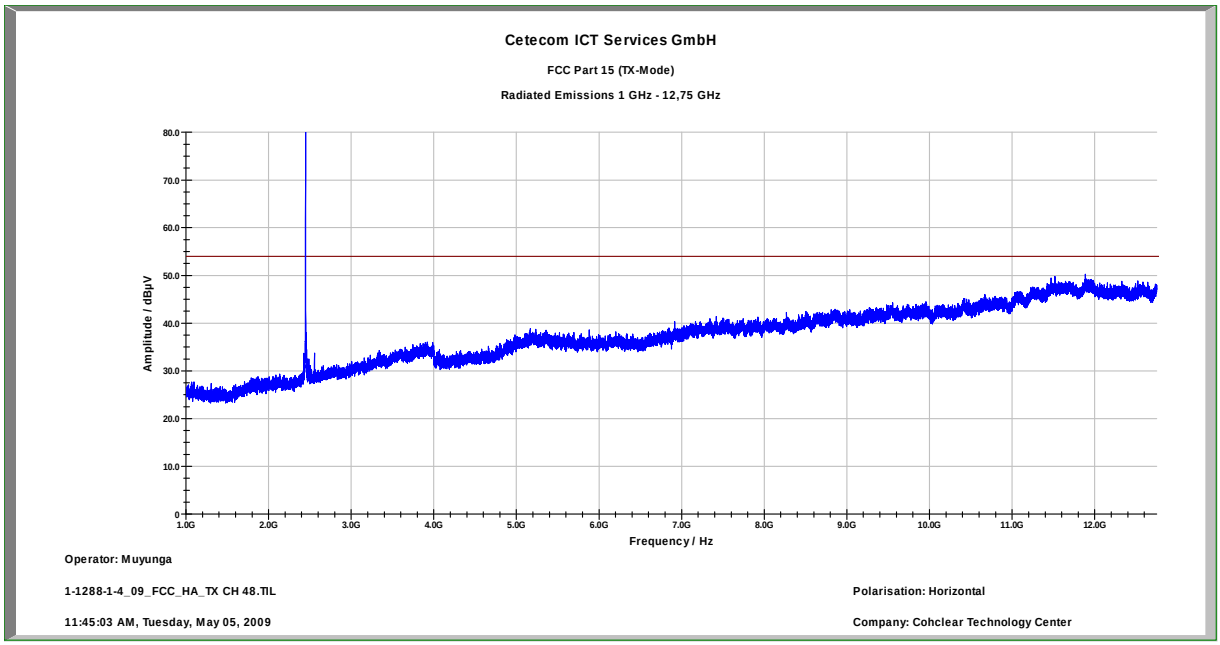
Plot 5: 1 - 12 GHz (middle channel)



f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Plot 6: 0.03 - 1 GHz (highest channel)

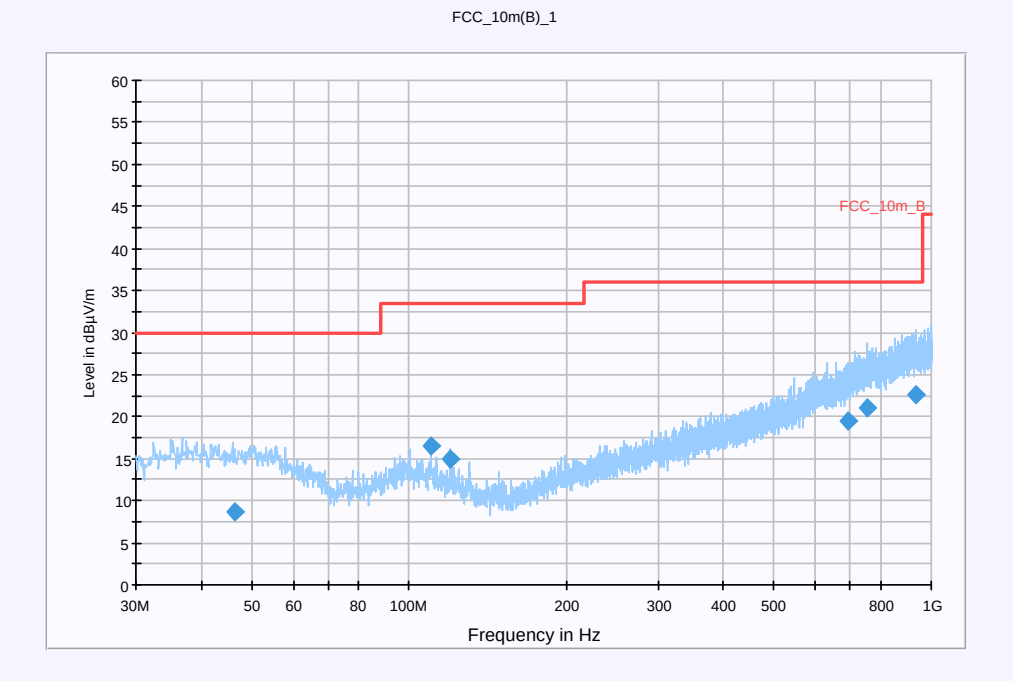
Information

EUT:	Sound Processor - CP 810 (Build P5)
Serial Number:	0004220S (white colored)
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	TX high channel
Operator Name:	Hennemann
Comment:	battery powered

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)
46.374900	8.6	15000.000	120.000	200.0	V	233.0	13.5	21.4	30.0
110.253850	16.5	15000.000	120.000	254.0	V	98.0	11.4	17.0	33.5
120.256650	15.0	15000.000	120.000	100.0	V	280.0	10.5	18.5	33.5
690.634150	19.6	15000.000	120.000	200.0	H	262.0	22.8	16.4	36.0
753.849950	21.0	15000.000	120.000	302.0	V	263.0	24.2	15.0	36.0
936.411950	22.6	15000.000	120.000	400.0	V	170.0	25.8	13.4	36.0

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

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3]
	@ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch
	FW 1.0
Antenna:	VULB 9163
	SN 9163-295, FW ---, CAL 08.04.2010
	Correction Table (vertical): VULP6113
	Correction Table (horizontal): VULP6113
	Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower]
	@ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable]
	@ GPIB0 (ADR 9), FW REV 3.12

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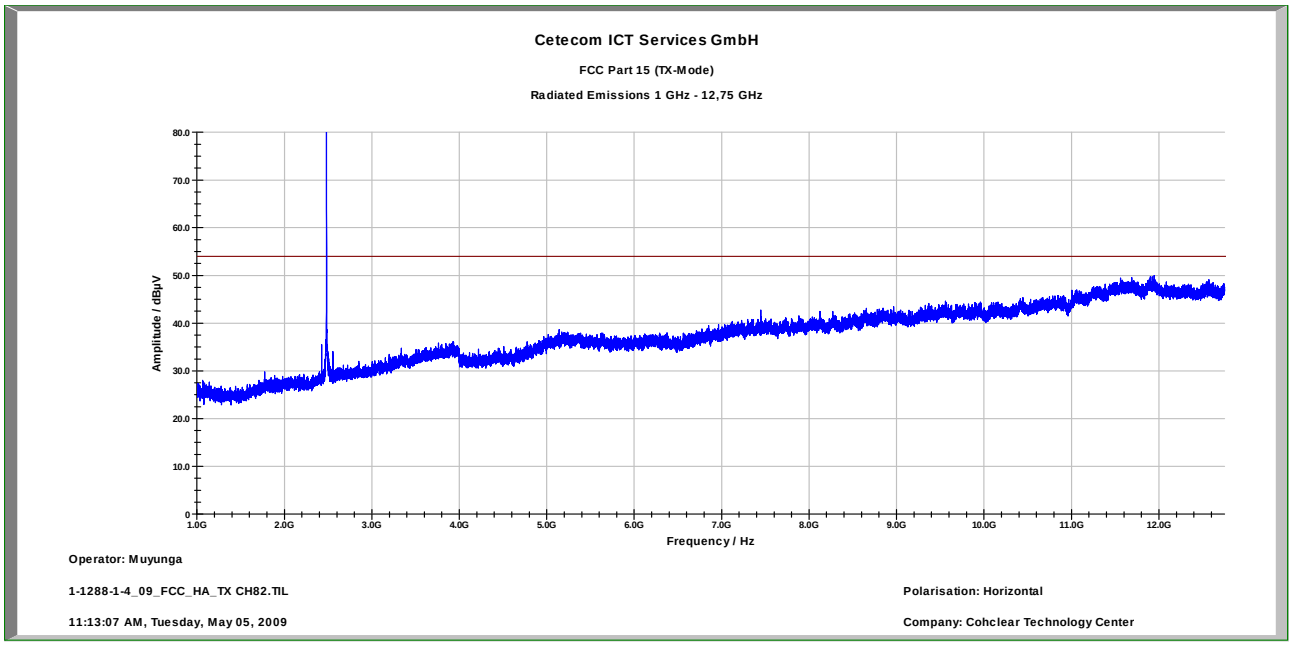
Plot 7: 1 - 12 GHz (highest channel)



f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Results:

SPURIOUS EMISSIONS LEVEL §15.209								
2402 MHz			2448 MHz			2482 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No critical Peaks detected And see tables below plots			No critical Peaks detected And see tables below plots			No critical Peaks detected And see tables below plots		
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)

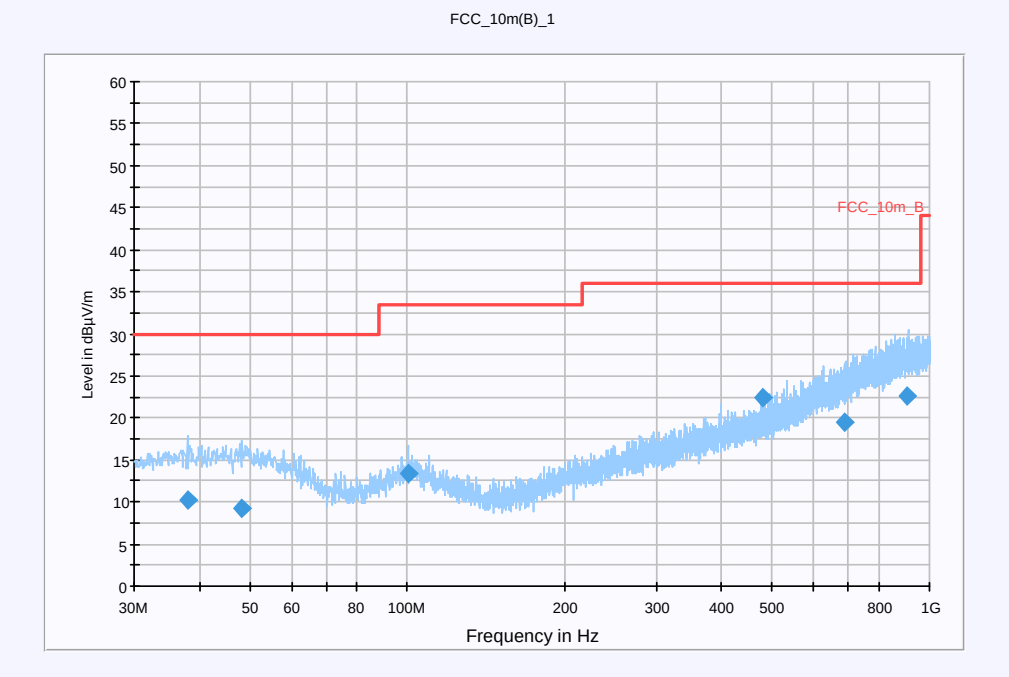
Information

EUT:	Sound Processor - CP 810 (Build P5)
Serial Number:	0004220S (white colored)
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	RX
Operator Name:	Hennemann
Comment:	battery powered

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)
38.002650	10.2	15000.000	120.000	200.0	V	209.0	13.4	19.8	30.0
48.260150	9.3	15000.000	120.000	276.0	V	235.0	13.5	20.7	30.0
100.234800	13.4	15000.000	120.000	138.0	V	263.0	12.3	20.1	33.5
481.034250	22.4	15000.000	120.000	327.0	V	207.0	18.7	13.6	36.0
689.251950	19.5	15000.000	120.000	144.0	H	40.0	22.7	16.5	36.0
908.635500	22.7	15000.000	120.000	155.0	H	100.0	25.7	13.3	36.0

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

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3]
	@ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch
	FW 1.0
Antenna:	VULB 9163
	SN 9163-295, FW ---, CAL 08.04.2010
	Correction Table (vertical): VULP6113
	Correction Table (horizontal): VULP6113
	Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower]
	@ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable]
	@ GPIB0 (ADR 9), FW REV 3.12

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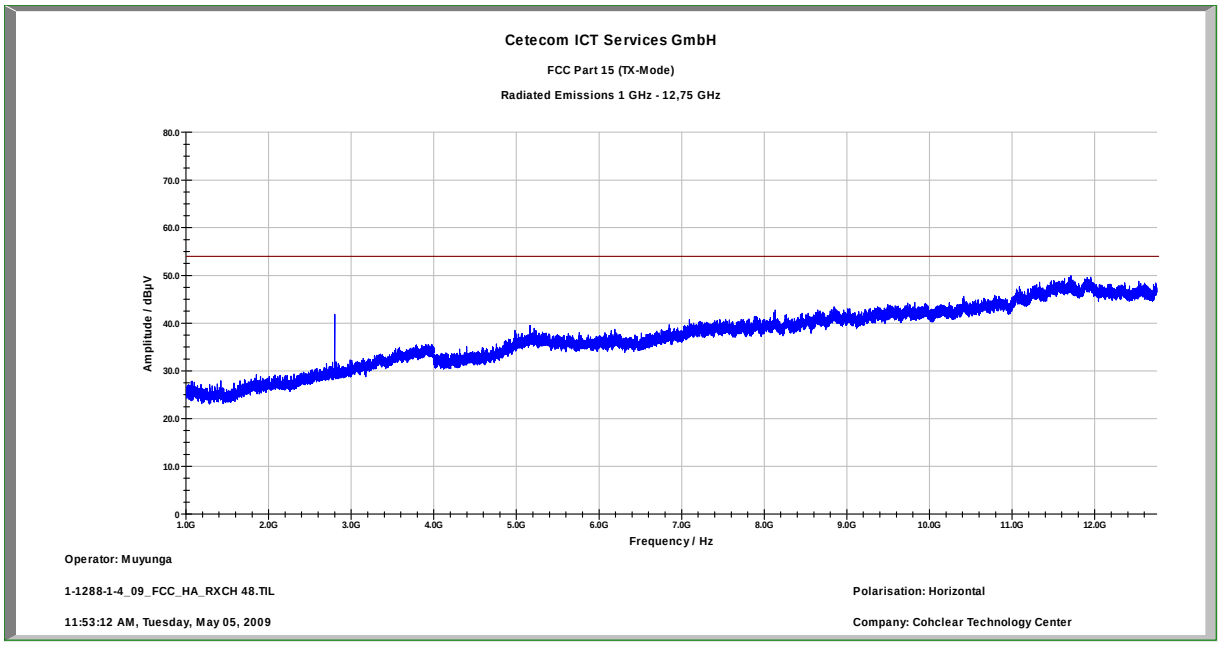
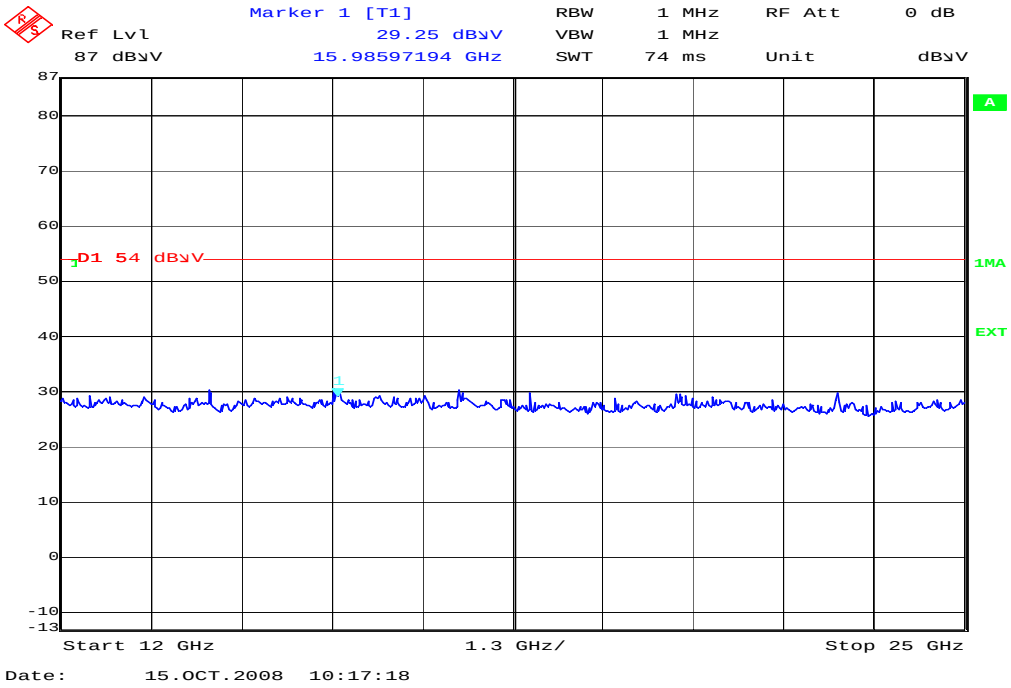
Plot 2: 1 - 12 GHz vertical / horizontal (receiver)



f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Plot 3: 12- 25 GHz (receiver)



f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz

Results:

Spurious Emissisons level [dBµV/m]		
f[MHz]	Detector	Level [dBµV/m]
2800	Peak	49.14
Also see tables below plots		
Measurement uncertainty	±3 dB	

f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz
See above plots

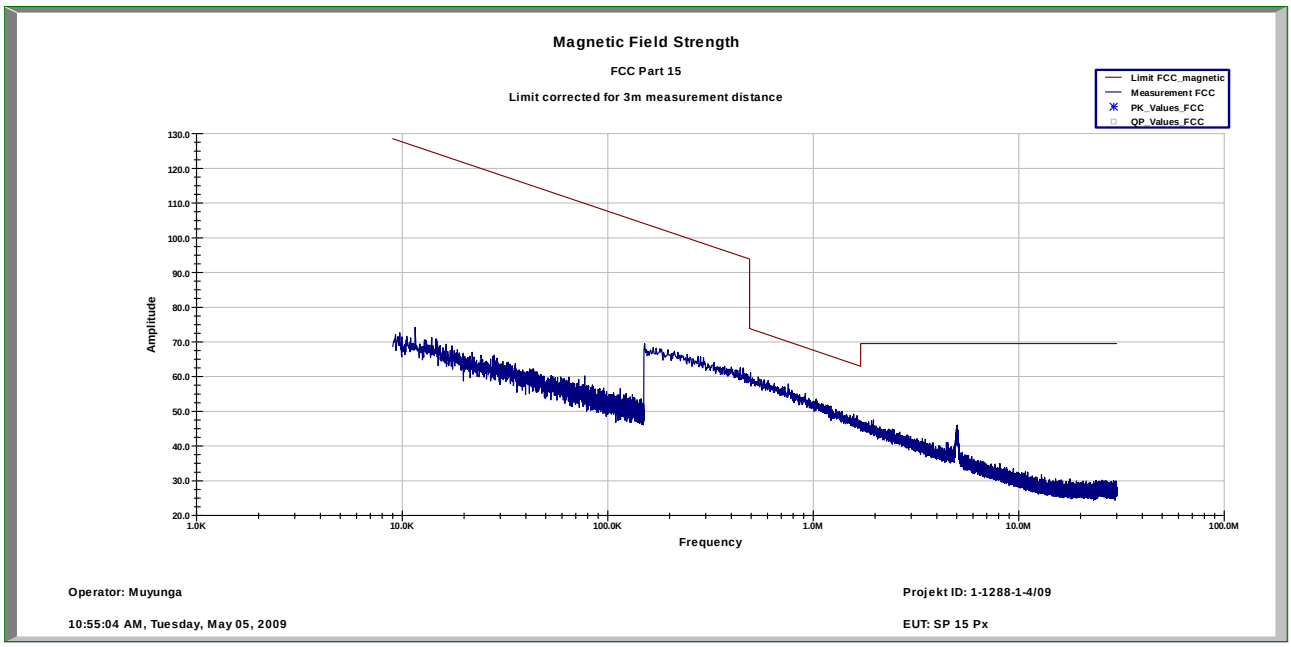
Measurement distance see table
Limits: § 15.109

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

5.15 Spurious Emissions - radiated <30 MHz §15.209

Measured at 3 m distance.
Values recalculated with 40 dB/decade according to FCC rules.

Plot 1:



Limits:

Frequency (MHz)	Field strength (µV/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 dBµV/m	30
30 - 88	100 / 40 dBµV/m	3
88 - 216	150 / 43.5 dBµV/m	3
216 - 960	200 / 46 dBµV/m	3
above 960	54 dBµV/m	3

5.16 Conducted Emissions <30 MHz §15.107/207

Not applicable

EUT only battery powered.

Limits:

Under normal test conditions only	See plots

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	Spektrum Analyzer 8566B	HP	3138A07614	300001207	13.12.2007	24	13.12.2009
5	Spektrum Analyzer Display 85662A	HP	3144A28627	300001208	13.12.2007	24	13.12.2009
6	Quasi-Peak-Adapter 85650A	HP	2811A01204	300002308	13.12.2007	24	13.12.2009
7	RF-Preselector 85685A	HP	2837A00778	300002448	13.12.2007	24	13.12.2009
8	PC Vectra VL	HP		300001688	n.a.		
9	Software EMI	HP		300000983	n.a.		
10	Measurement System 2						
11	FSP 30	R&S	100886	300003575	25.08.2008	24	25.08.2010
12	PC	F+W			n.a.		
13	TILE	TILE			n.a.		
14	Biconical antenna	EMCO	S/N: 860 942/003		Monthly verification (System cal.)		
15	Log. Period. Antenna 3146	EMCO	2130	300001603	Monthly verification (System cal.)		
16	Double Ridged Antenna HP 3115P	EMCO	3088	300001032	Monthly verification (System cal.)		
17	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)		
18	Power Supply 6032A	HP	2818A03450	300001040	12.05.2007	36	12.05.2010
19	Busisolator	Kontron		300001056	n.a.		
20	Leitungsteiler 11850C	HP		300000997	Monthly verification (System cal.)		
21	Power attenuator 8325	Byrd	1530	300001595	Monthly verification (System cal.)		
22	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verification (System cal.)		
23	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verification (System cal.)		

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	HP	3041A00544	300002270	13.05.2007	36	13.05.2010
5	Signal Generator	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

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	31.01.2007	24	31.01.2009
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	-/-	-/-	-/-	-/-