Accredited testing-laboratory

DAR registration number: DGA-PL-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.	**:**	**1-1775-01-08B/09**
Type identification	**:**	**Single Short Range Radio Module**
		intended for
		IntelliVue CL SpO2 Pod
		IntelliVue CL NBP Pod
		IntelliVue CL Charging Station
		865244 Remote Control
Applicant	**:**	**Philips Medizin Systeme Böblingen GmbH**
FCC ID	**:**	**PQC-SRRBV2 (Module)**
IC Certification No	**:**	**3549C- SRRBV2 (Module)**
FCC ID	**:**	**PQC-CLNBPBV1 (IntelliVue CL NBP Pod)**
IC Certification No	**:**	**3549C-CLNBPBV1 (IntelliVue CL NBP Pod)**
Test standards	**:**	**47 CFR Part 2**
		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:

2010-08-16	**Andreas Keller**	
Date	Name	Signature

Technical responsibility for area of testing:

2010-08-16	**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: DGA-PL-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:	**Philips Medizin Systeme Böblingen GmbH**
Street:	**Hewlett-Packard-Strasse 2**
Town:	**71034 Böblingen**
Country:	**GERMANY**
Telephone:	**+49 (0) 7031 463-2840**
Fax:	**+49 (0) 7031 463-2442**
Contact:	**Mr. Markus Stacha**
E-mail:	**markus.stacha@philips.com**
Telephone:	**+49 (0) 7031 463-2840**

1.4 Application details

Date of receipt of order:	**2009-11-18**
Date of receipt of test item:	**2009-11-17**
Date of start test:	**2009-11-23**
Date of end test	**2010-08-16**
Persons(s) who have been present during the test:	**-/-**

2 Test standard/s

47 CFR Part 2	**2006-10**	**Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission Frequency allocations and radio treaty matters; general rules and regulations**
47 CFR Part 15	**2009-10**	**Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission Subchapter A - general, Part 15-Radio frequency devices Subchapter B—Unintentional Radiators Subchapter C—Intentional Radiators**
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:	**Philips Medizin Systeme Böblingen GmbH**
Street:	**Hewlett-Packard-Strasse 2**
Town:	**71034 Böblingen**
Country:	**GERMANY**

3.1.1 Test item

Kind of test item	:	**Short Range Radio Module**
Type identification	:	**Short Range Radio Module** **intended for** **IntelliVue CL SpO2 Pod** **IntelliVue CL NBP Pod** **IntelliVue CL Charging Station** **865244 Remote Control**
S/N serial number	:	**Radiated Sample** **Part Number 453564118341** **Serial Number SC 926 000115** **Conducted Sample** **Part Number 453564118341** **Serial Number SC 926 000441**
HW hardware status	:	**0919**
SW software status	:	**n/a**
Frequency Band [MHz]	:	**ISM 2.400 - 2.483.5**
Type of Modulation	:	**OQPSK**
Number of channels	:	**16**
Antenna	:	**Printed PCB antenna**
Power Supply	:	**Radio module 1.8 V by internal voltage regulator,** **Test board powered by external 4.5V DC**
Operating Temperature Range:		**0 °C to 40 °C**

Single Short Range Radio Module: Max. power radiated (EIRP): -5.8dBm (0.26 mW)
Max. power conducted: -2.8dBm (0.52 mW)

FCC ID: PQC-SRRBV2
IC: 3549C- SRRBV2

These IDs do not apply to IntelliVue CL NBP Pod

SAR/RF Exposure Statement:
According to the FCC and IC regulations SAR/RF exposure tests are not required because the maximum output power of the Short Range Radio module is 0.52 mW. This value is far below the SAR/RF exposure limit of 25 mW (60/F[GHz]).

3.1.2 Additional EUT information For IC Canada (appendix 2)

IC Registration Number:	**3549C-SRRBV2**
Model Name:	**Single Short Range Radio Module**
Manufacturer (complete Address):	**Philips Medizin Systeme Böblingen GmbH Hewlett-Packard-Strasse 2 71034 Böblingen GERMANY**
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: 0.26 mW Conducted : 0.52 mW**
Antenna Type:	**Printed PCB antenna**
Occupied Bandwidth (99% BW) [kHz]:	**2565**
Type of Modulation:	**OQPSK**
Emission Designator (TRC-43):	**2M57G1D**
Transmitter Spurious (worst case) [dBµV/m in 3m]:	**50 (noise floor)**
Receiver Spurious (worst case) [dBµV/m in 3m]:	**50 (noise floor)**

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:

Name: Andreas Keller
Company title: Testing manager
Date: 2010-08-16

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_{nom}	°C	**22**
Nominal Humidity	H_{nom}	%	**49**
Nominal Power Source	V_{nom}	V	**4.5**

Type of power source: DC

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 FCC Part 15 - Radio frequency devices Subchapter B - Unintentional Radiators Subchapter C - Intentional Radiators	PASSED	2010-08-16	-/-

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
None	Antenna Gain	Yes			
§15.247(a1)	Carrier frequency separation			Yes	
§15.247(a1)	Number of hopping channels			Yes	
§15.247(a)(1)(iii)	Time of occupancy (dwell time)			Yes	
§15.247(e)	Power Spectral density (Hybrid system in Inquiry mode/Page scan)			Yes	
§15.247(a)(1)	Spectrum Bandwidth of a FHSS System / 20dB Bandwith	Yes			
§ 15.247 (b)(1)	Maximum output power (conducted)	Yes			
§ 15.247 (b)(1)	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			
§ 15.247 (d)	Spurious Emission - radiated (Transmitter) >30 MHz	Yes			
§ 15.109	Spurious Emissions - radiated (Receiver)	Yes			
§ 15.209	Spurious Emissions - radiated (Transmitter) <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

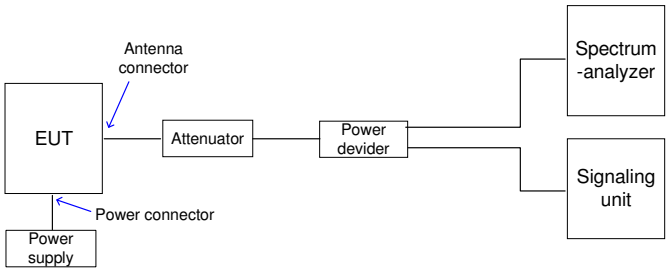
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2003 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 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 C63-4-2003 clause 4.2.
Antennas are confirmed with ANSI C63.2-1996 item 15.

9 kHz - 150 kHz: Quasi Peak measurement, 200 Hz Bandwidth, active loop antenna.
150 kHz - 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, active loop antenna.
30 MHz - 1GHz: Quasi Peak measurement, 120 kHz Bandwidth, trilog antenna
>1GHz: Average, RBW 1MHz, VBW 10 Hz, waveguide horn

All measurements are done in accordance with the Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems DA 00-705 and Appendix A “BLUETOOTH APPROVALS”
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.

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 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.



5.2 Referenced documents

-/-

5.3 Additional comments

Valid for all samples:

Test sample with 100% duty cycle.

Normal use duty cycle 17.024% declared by the manufacturer.

The output power setting of 0dB, as stated for all transmission measurements, was adjusted with aid of control software, named RISP Test Tool, provided and described in a short manual by the customer.

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.

Transmitter modulated, 0dBm, RBW=VBW=3MHz

	low channel 2405 MHz	mid channel 2445 MHz	high channel 2480 MHz
Conducted power [dBm]	-3.6	-2.9	-2.8
Radiated power [dBm]	-7.8	-6.3	-5.8
Gain [dBi] Calculated	-4.2	-3.4	-3.0

5.5 Carrier frequency separation §15.247(a)(1)

Not applicable

5.6 Number of hopping channels §15.247(a)(1)

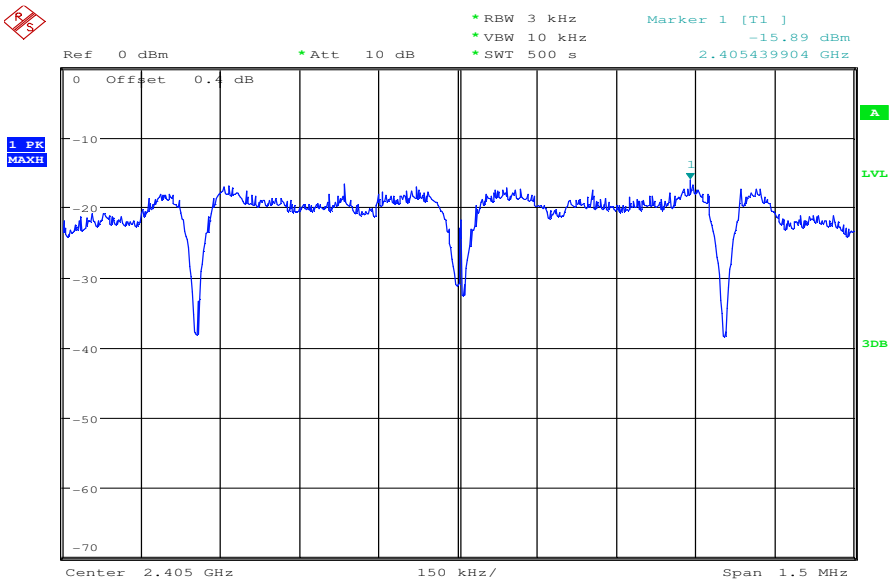
Not applicable

5.7 Time of occupancy (dwell time) §15.247(a)(1)(iii)

Not applicable

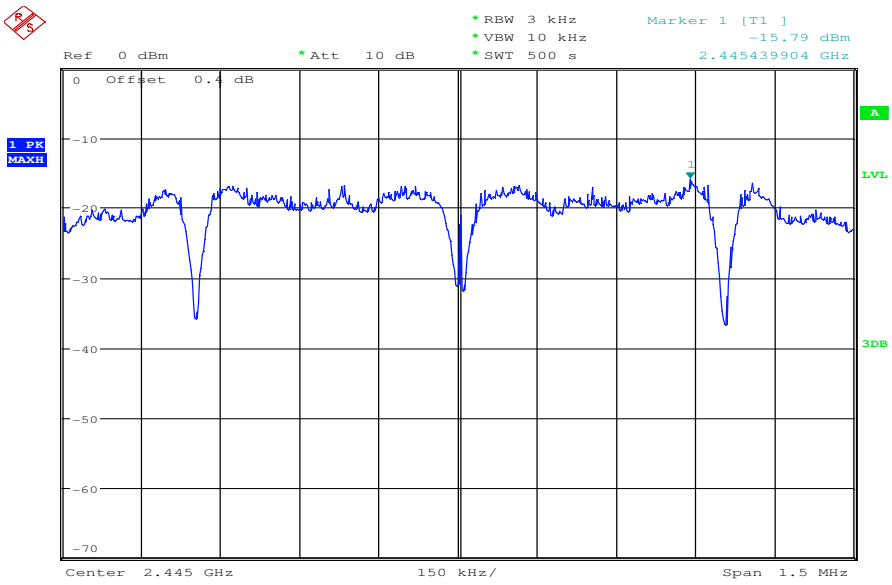
5.8 Power Spectral density (Hybrid system in Inquiry mode/Page scan) §15.247(e)

Plot 1 of 3: Low channel



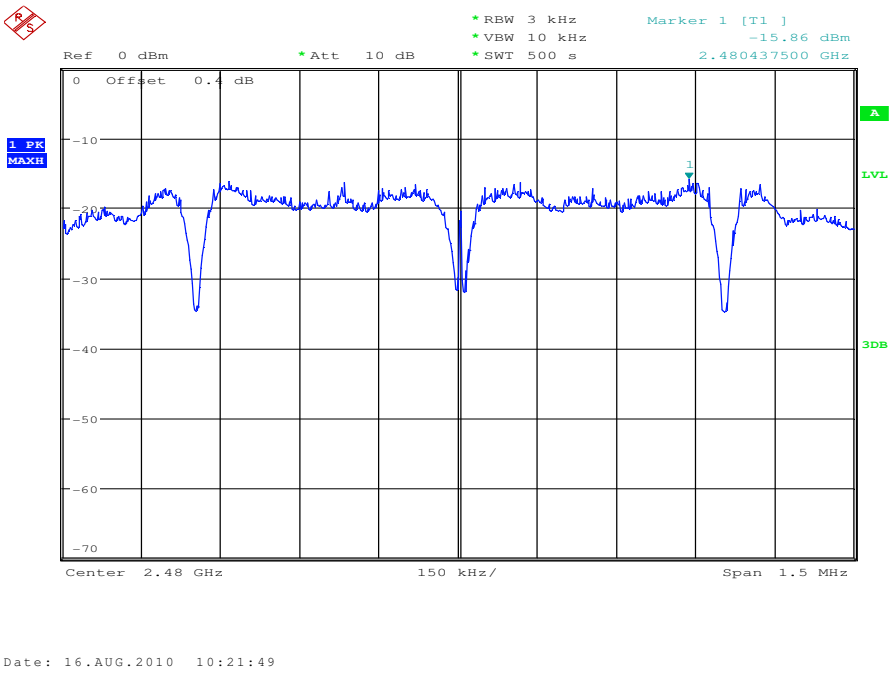
Date: 16.AUG.2010 10:02:17

Plot 2 of 3: Middle channel



Date: 16.AUG.2010 10:11:36

Plot 3 of 3: High channel

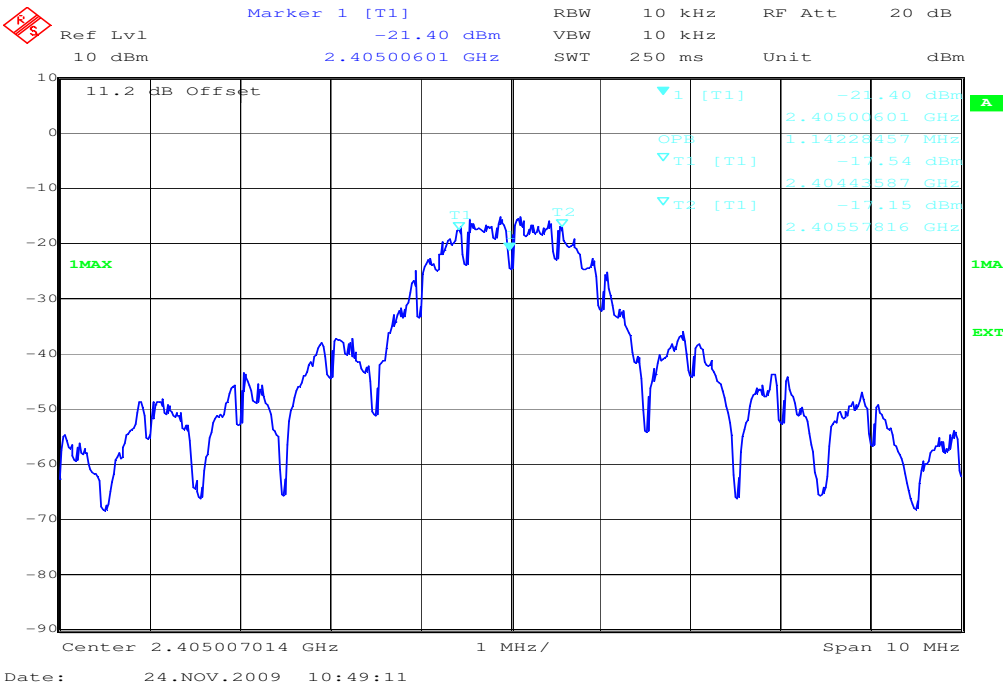


Limits:

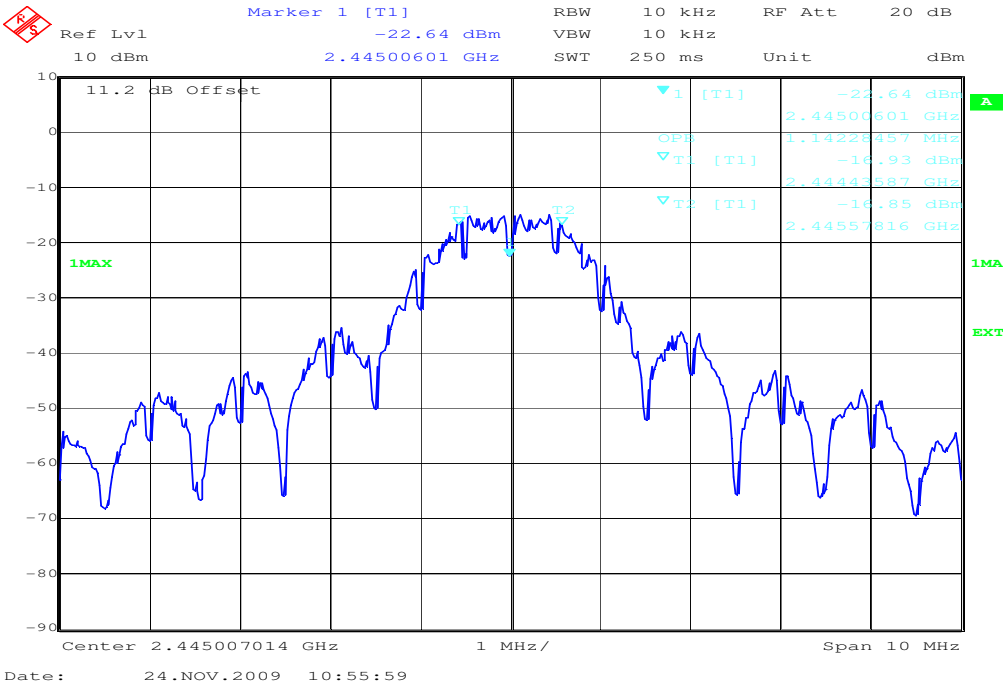
Under normal test conditions only	For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

5.9 Spectrum Bandwidth of a FHSS System 6/20dB Bandwidth §15.247(a)(1)

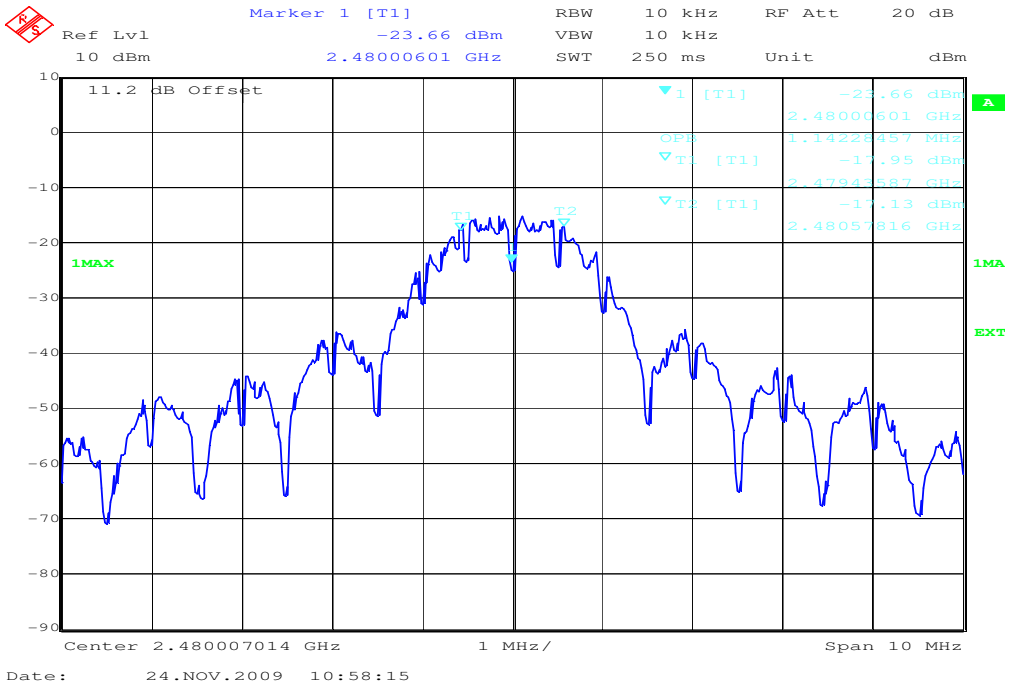
Plot 1 of 3



Plot 2 of 3



Plot 3 of 3



Result:

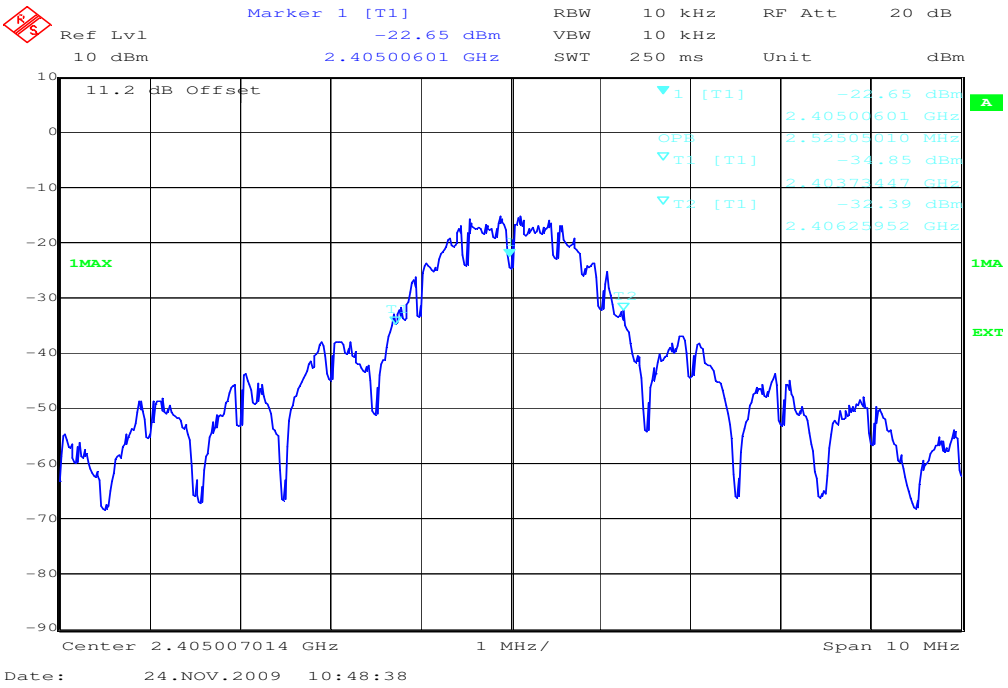
Test conditions		6 dB BANDWIDTH [kHz]		
Frequency [MHz]		2405	2445	2480
T_{nom}	V_{nom}	1142	1142	1142
Measurement uncertainty		±10 kHz		

RBW / VBW as provided in the „Measurement Guidelines“ (DA 00-705, March 30, 2000)
RBW: 10 kHz / VBW 10 kHz

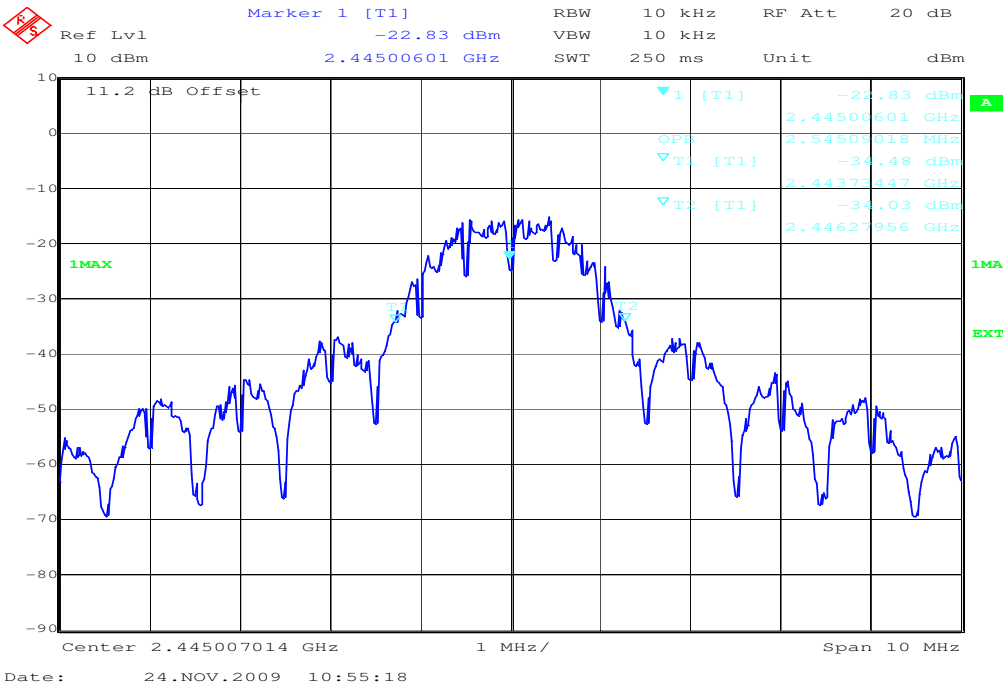
Limits:

Under normal test conditions only	>500 kHz

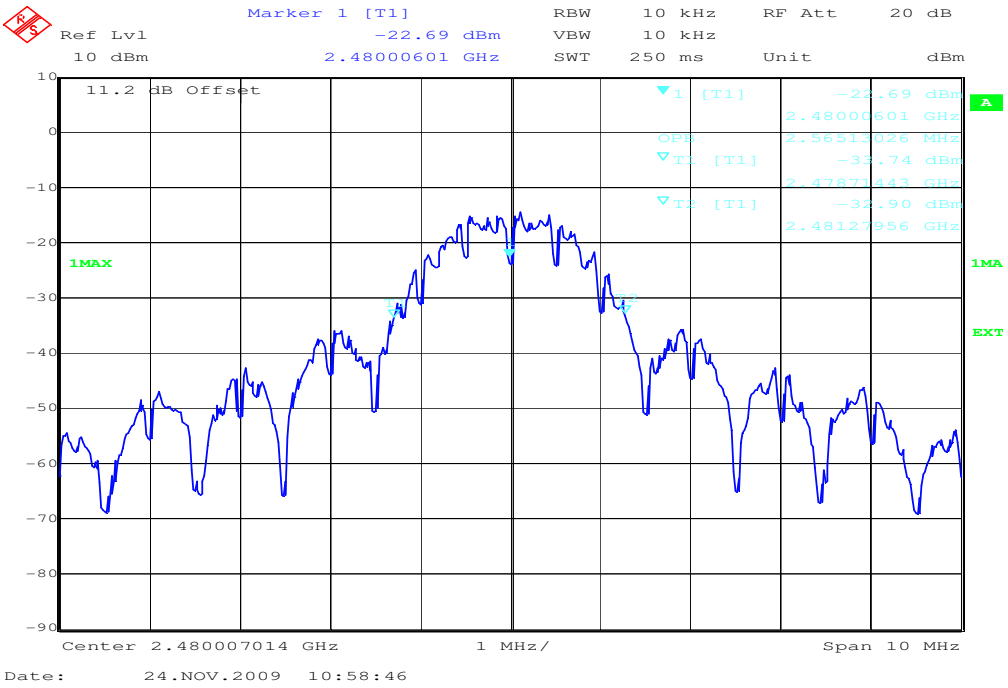
Plot 4 of 6



Plot 5 of 6



Plot 6 of 6



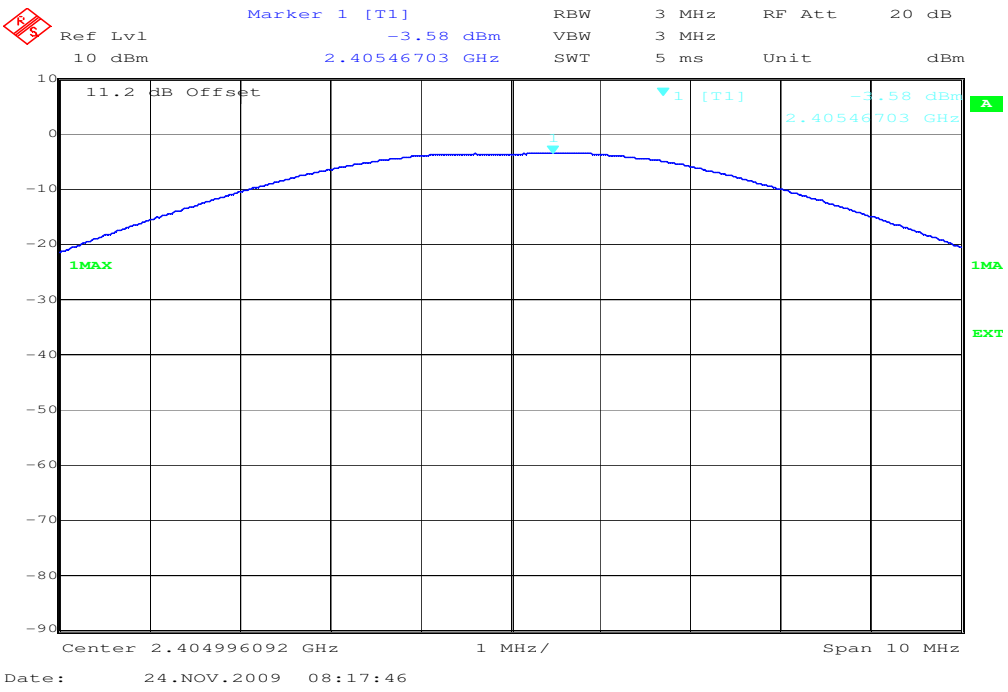
Result:

Test conditions		20 dB BANDWIDTH [kHz]		
Frequency [MHz]		2405	2445	2480
T_{nom}	V_{nom}	2525	2545	2565
Measurement uncertainty		±10kHz		

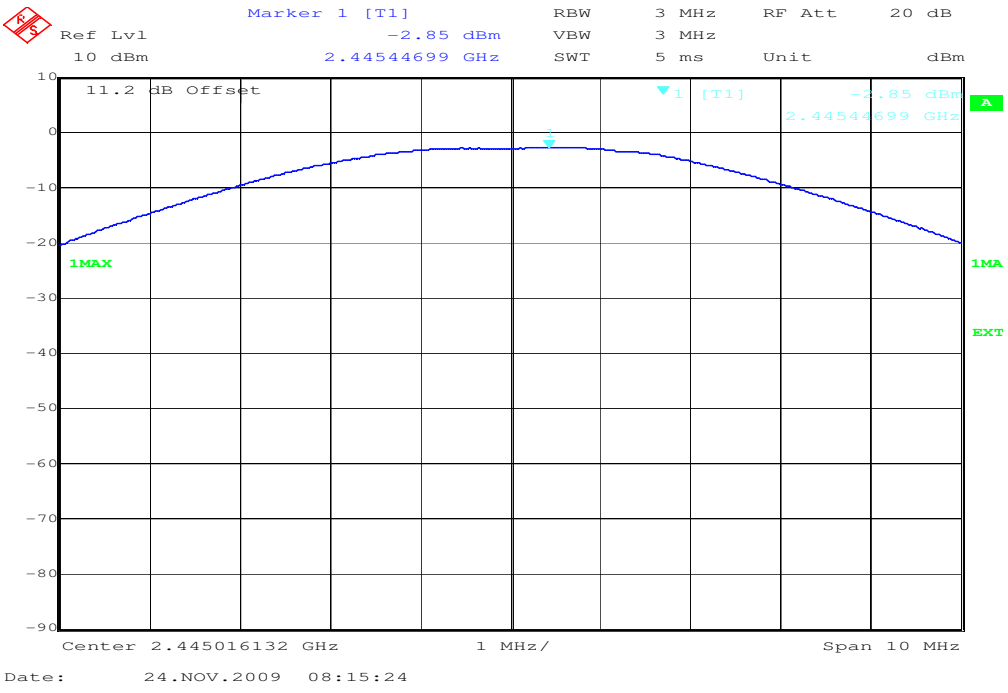
RBW / VBW as provided in the „Measurement Guidelines“ (DA 00-705, March 30, 2000)
RBW: 10 kHz / VBW 10 kHz

5.10 Maximum output power (conducted) § 15.247 (b)(1)

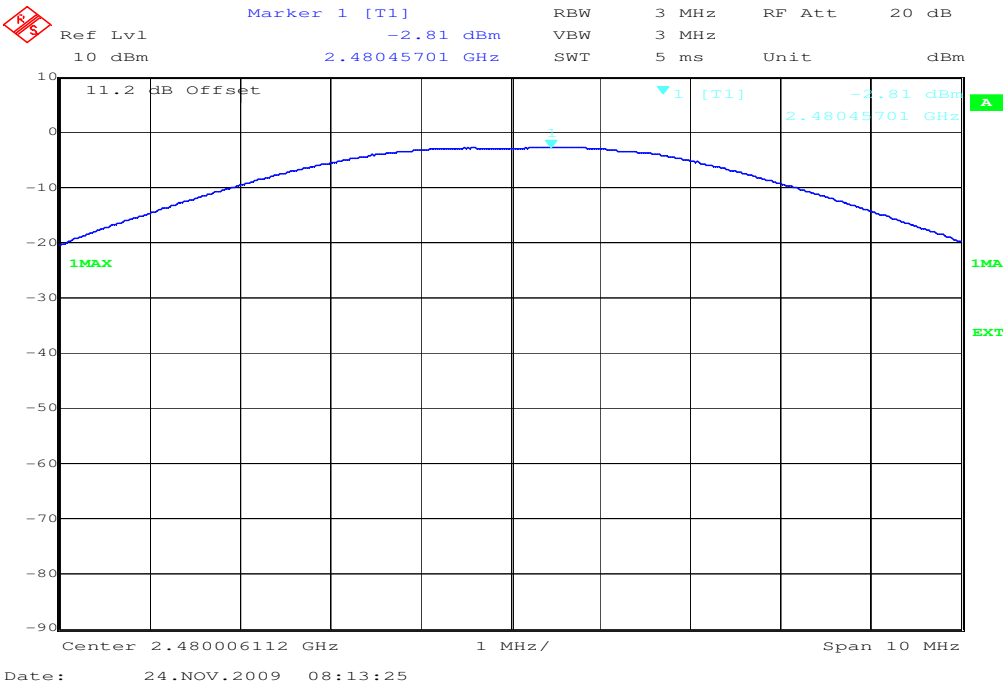
Plot 1 of 3



Plot 2 of 3



Plot 3 of 3



Results:

Test conditions		Max. peak output power [dBm]					
Frequency [MHz]		2405		2445		2480	
T_{nom}	V_{nom}	PK	-3.6	PK	-2.9	PK	-2.8
Measurement uncertainty		±3dB					

RBW / VBW: 3 MHz

Limits:

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

5.11 Max. peak output power (radiated) § 15.247 (b)(1)

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2405	2445	2480
T_{nom}	V_{nom}	-7.8	-6.3	-5.8
Measurement uncertainty		±3dB		

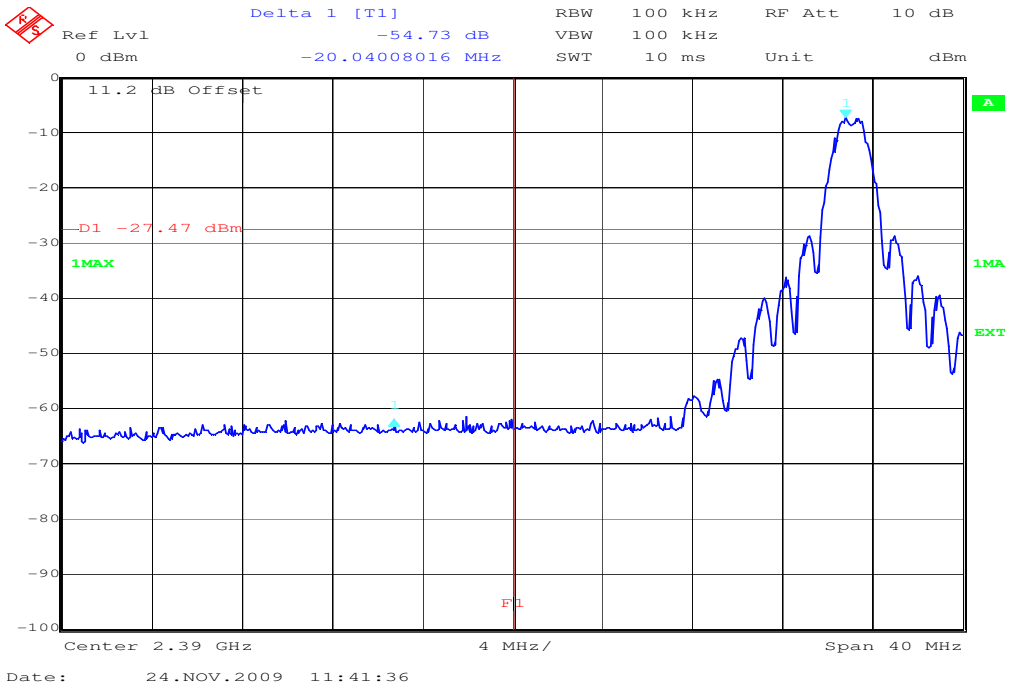
RBW / VBW: 3 MHz
Measured at a distance of 3m

Limits:

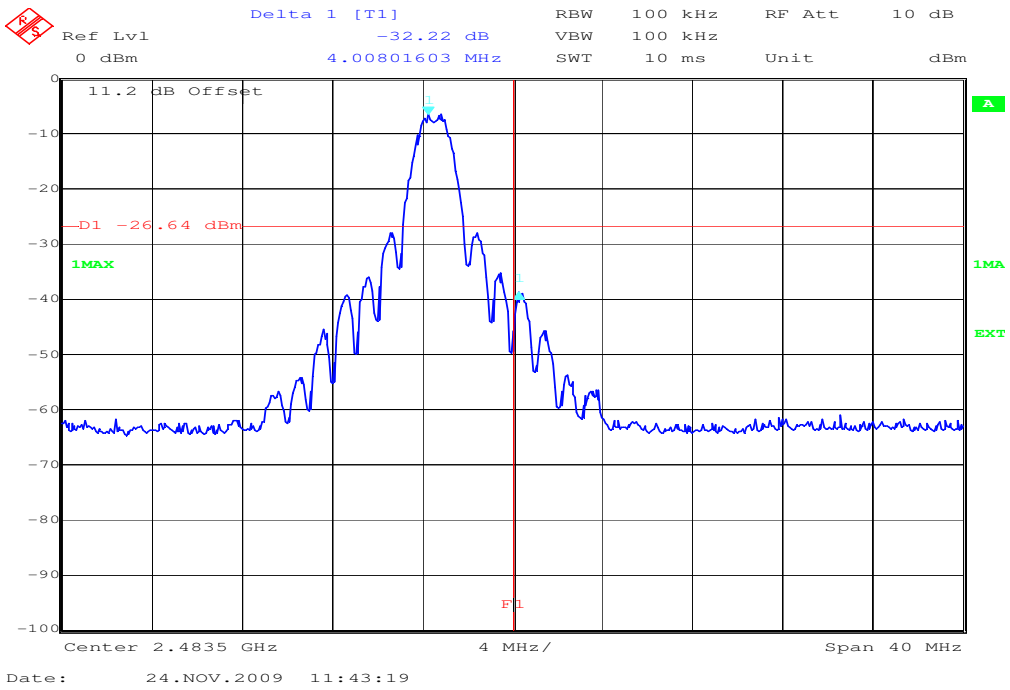
Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt

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

Plot 1 of 2 (lowest frequency):



Plot 2 of 2 (highest frequency):



Results:

SZENARIO	DELTA VALUE [DB]
hopping off, lowest frequency	> 20 dB
hopping on, lowest frequency	> 20 dB
hopping off, highest frequency	> 20 dB
hopping on, highest frequency	> 20 dB
Measurement uncertainty	±1.5dB

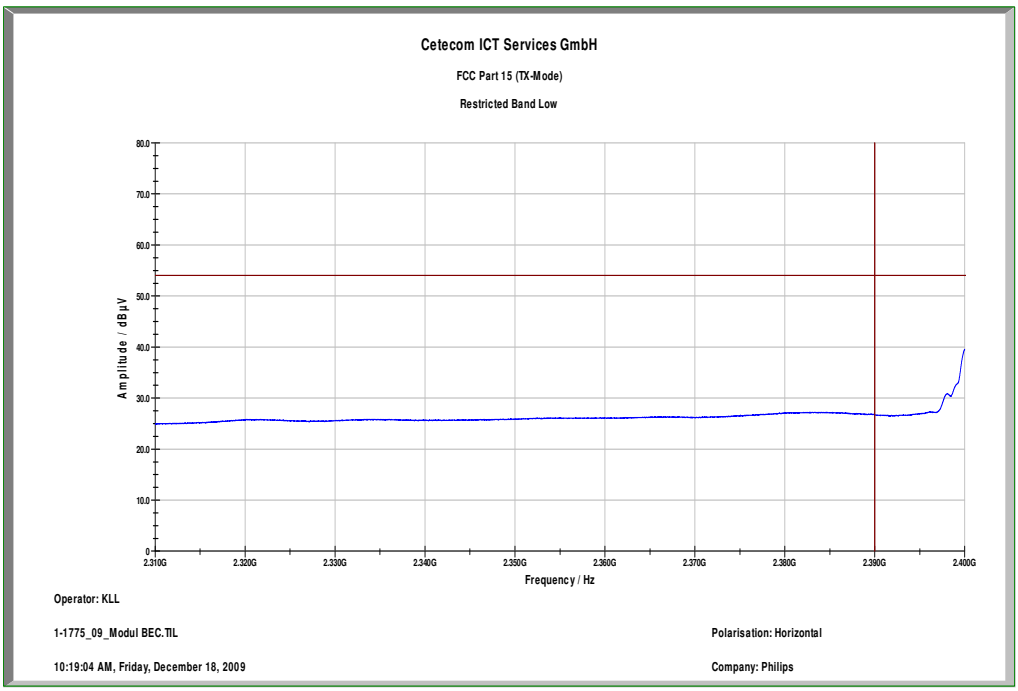
Limits:

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)).

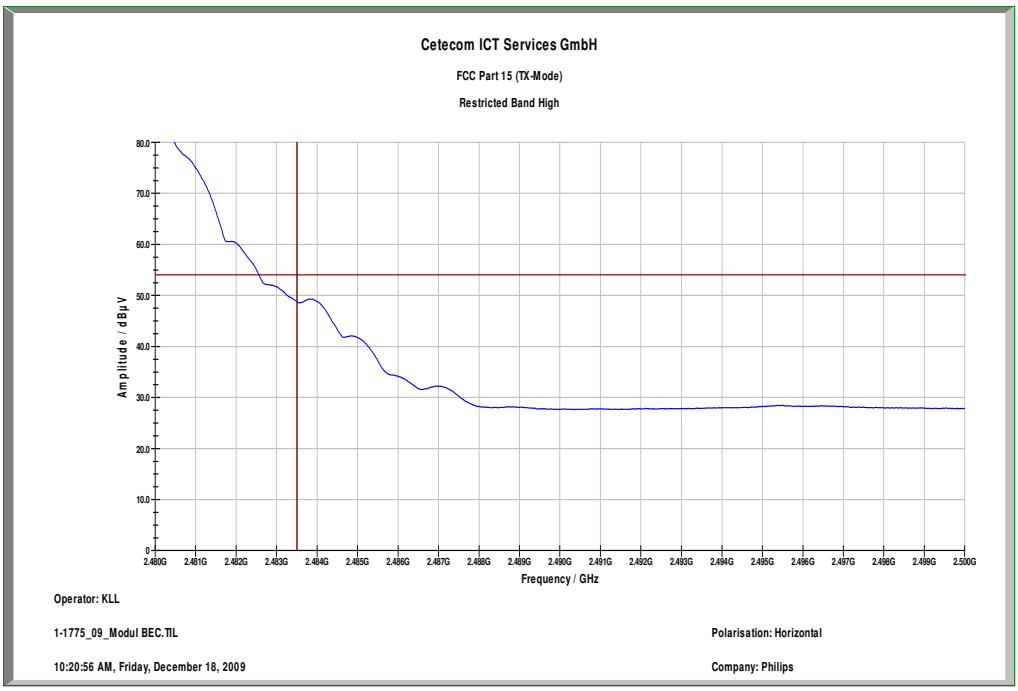
5.13 Band-edge compliance of radiated emissions §15.205

Measured with with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

Plot 1: Restricted band low



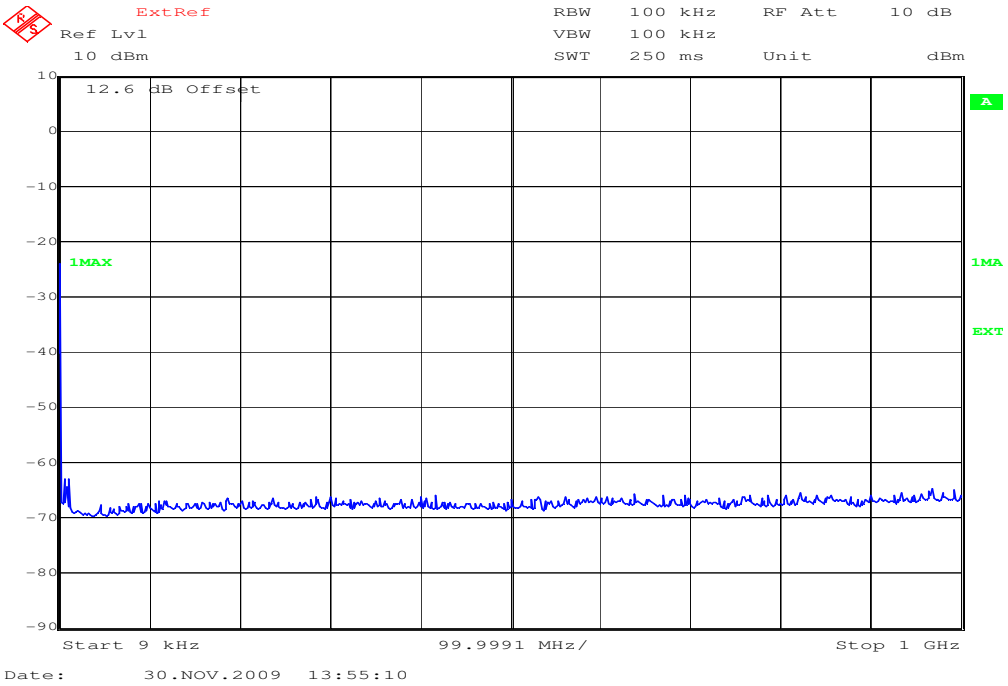
Plot 2: Restricted band high



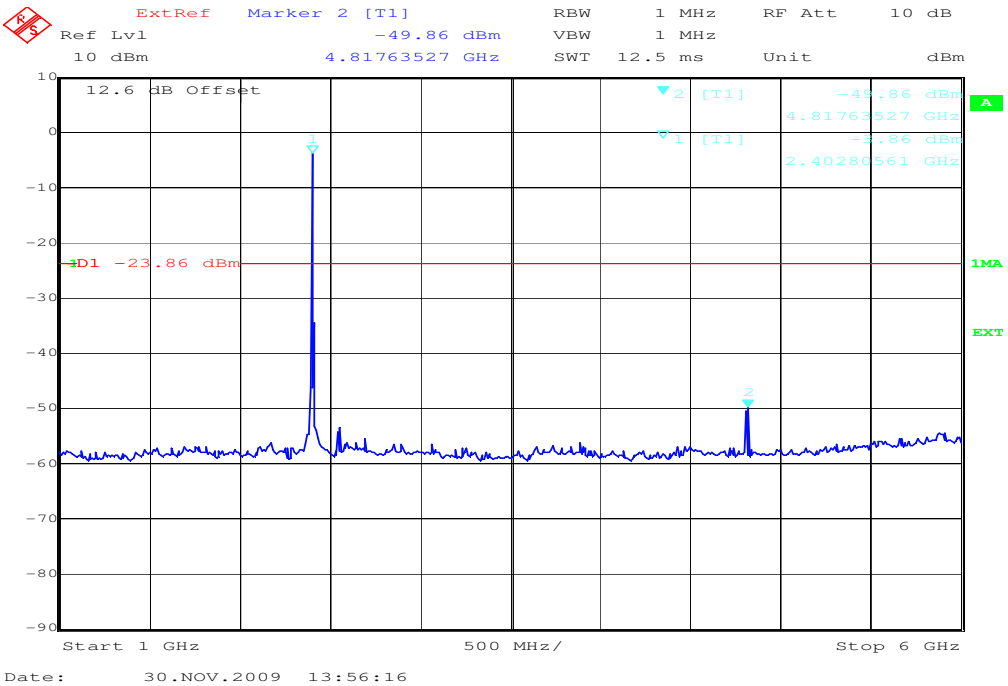
Result: **Complies**

5.14 Spurious Emissions - conducted (Transmitter) § 15.247 (c)(1)

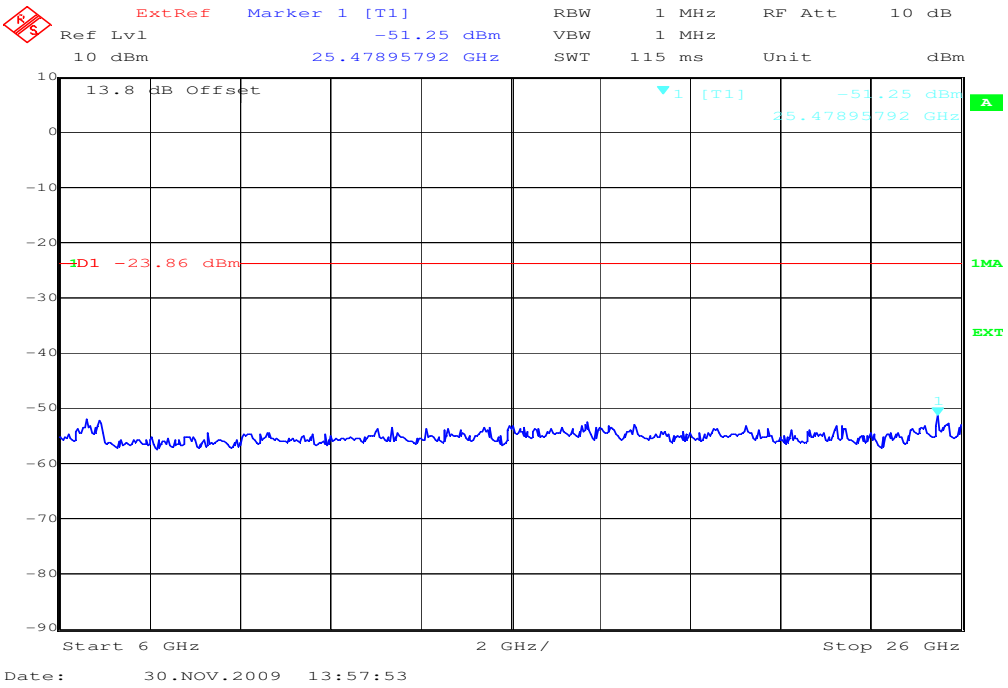
Plot 1 of 9: lowest channel, 9kHz – 1GHz



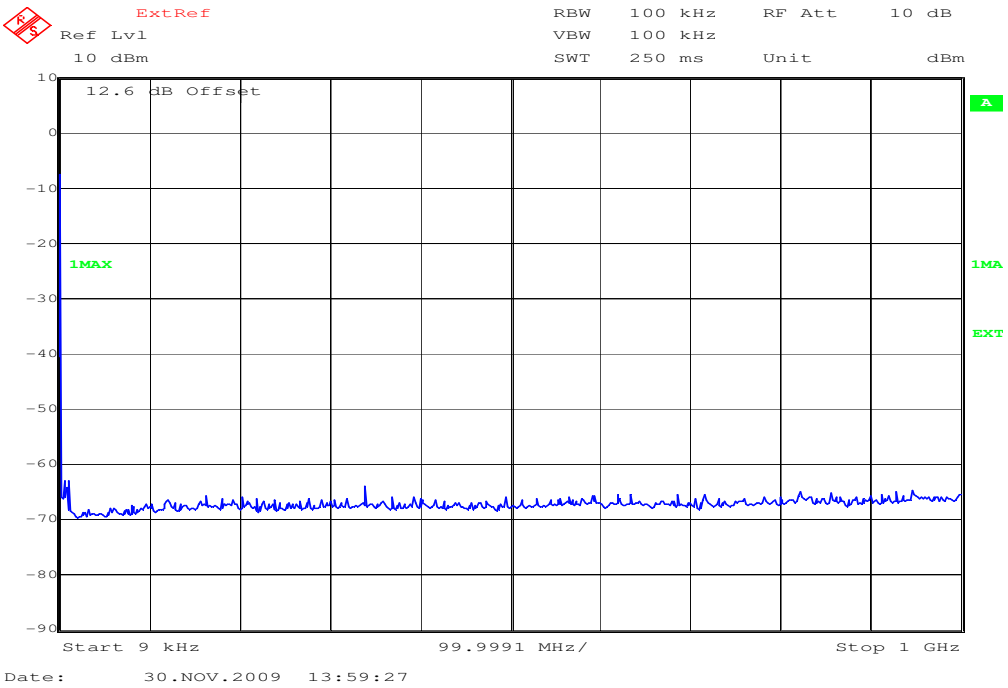
Plot 2 of 9: lowest channel, 1GHz – 6GHz



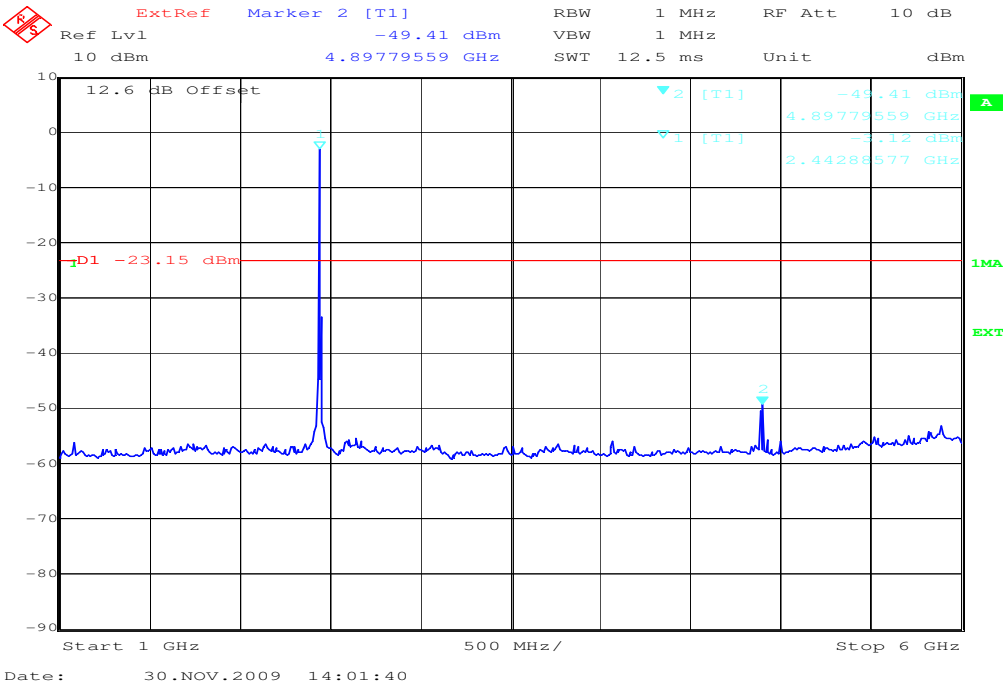
Plot 3 of 9: lowest channel, 6GHz – 26GHz



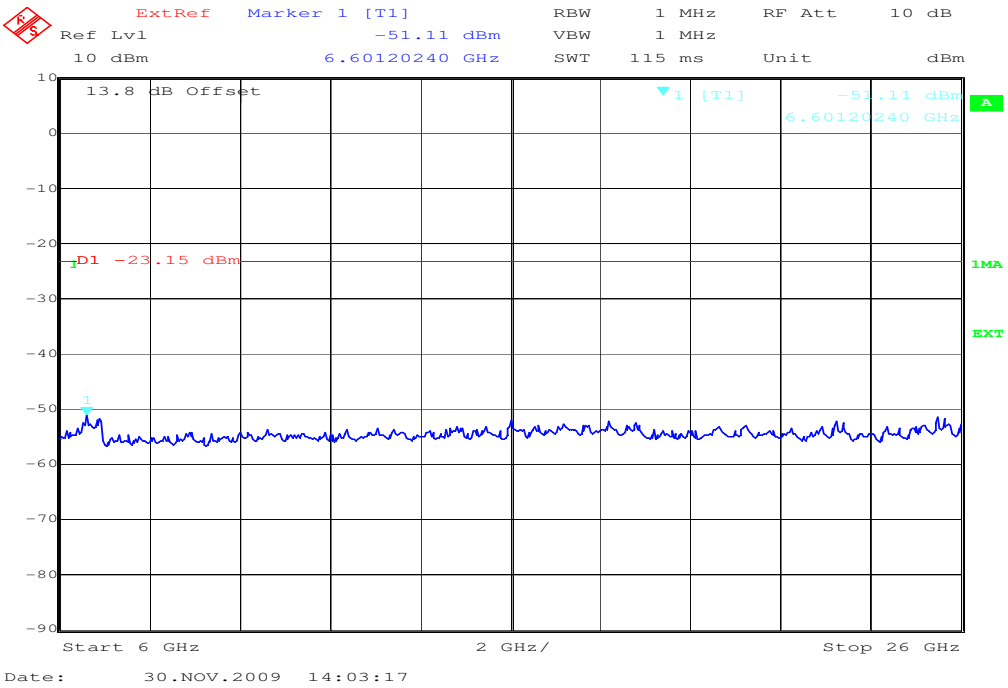
Plot 4 of 9: middle channel, 9kHz – 1GHz



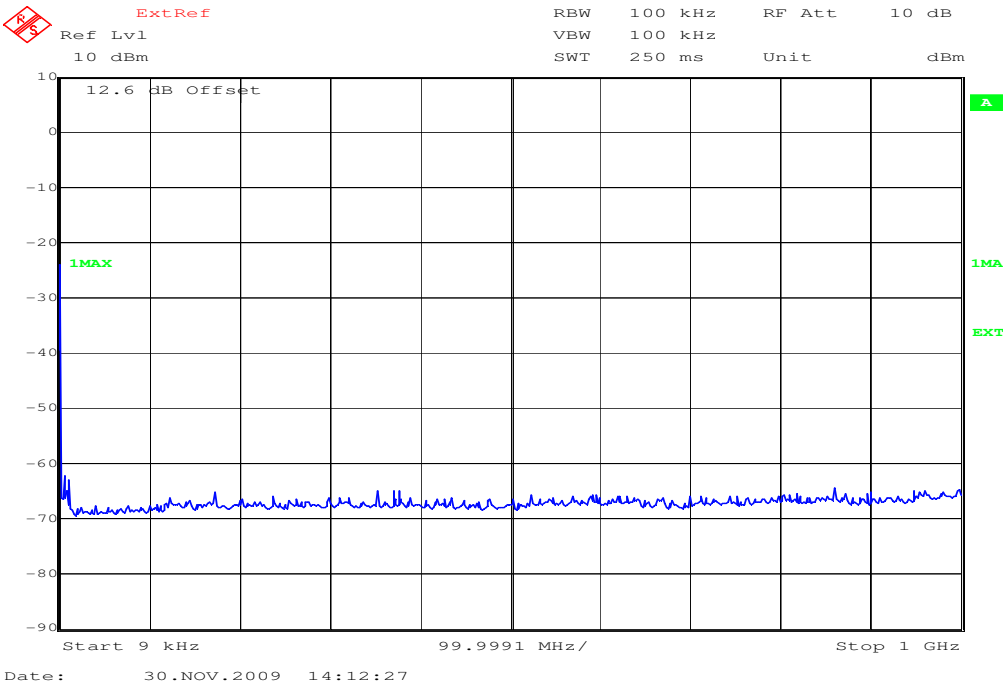
Plot 5 of 9: middle channel, 1GHz – 6GHz



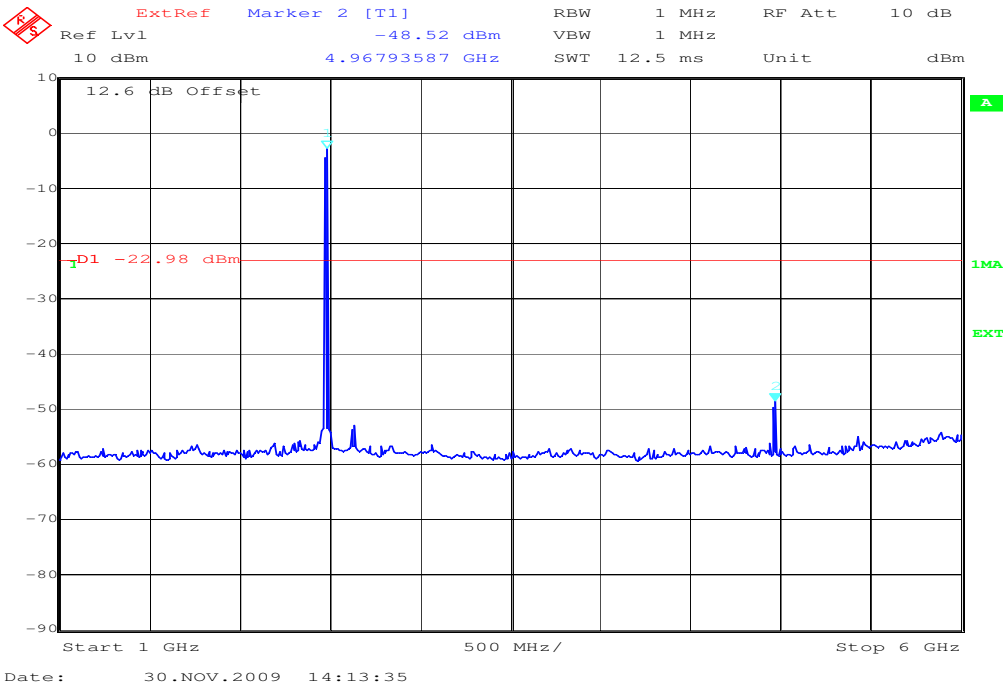
Plot 6 of 9: middle channel, 6GHz – 26GHz



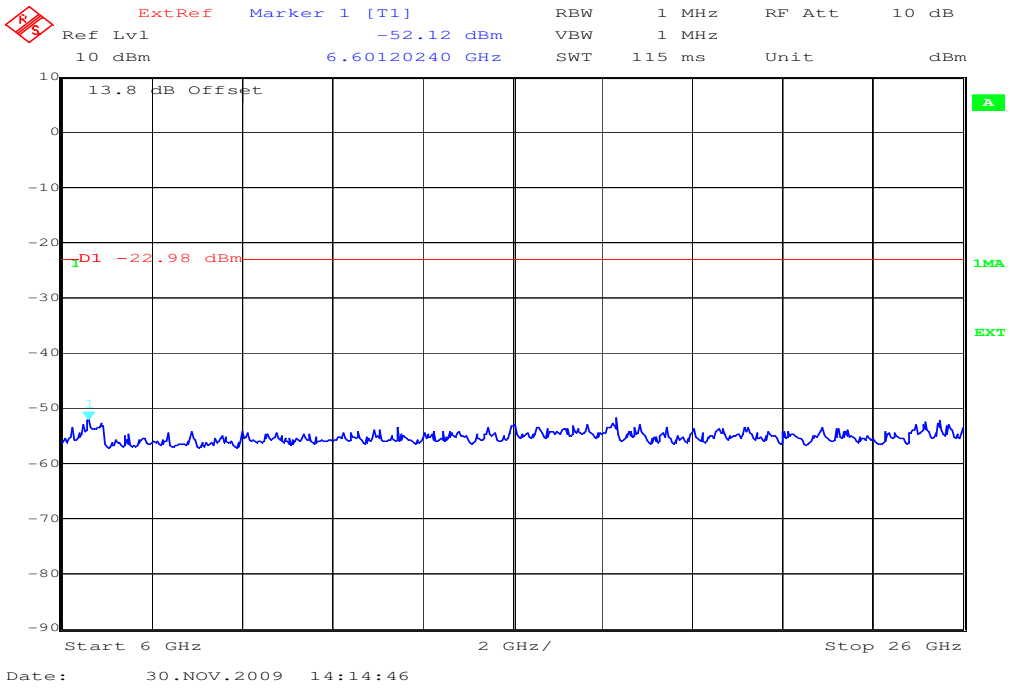
Plot 7 of 9: highest channel, 9kHz – 1GHz



Plot 8 of 9: highest channel, 1GHz – 6GHz



Plot 9 of 9: highest channel, 6GHz – 26GHz



Result & Limits:

Emission Limitation					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2405		-3.9	30 dBm		Operating frequency
4818		-49.9	-20 dBc	-46.0	
2445		-3.1	30 dBm		Operating frequency
4898		-49.4	-20 dBc	-46.3	
2480		-3.0	30 dBm		Operating frequency
4968		-48.5	-20 dBc	-45.5	
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.

5.15 Spurious Emissions > 30 MHz- radiated (Transmitter) § 15.247 (c)(1)

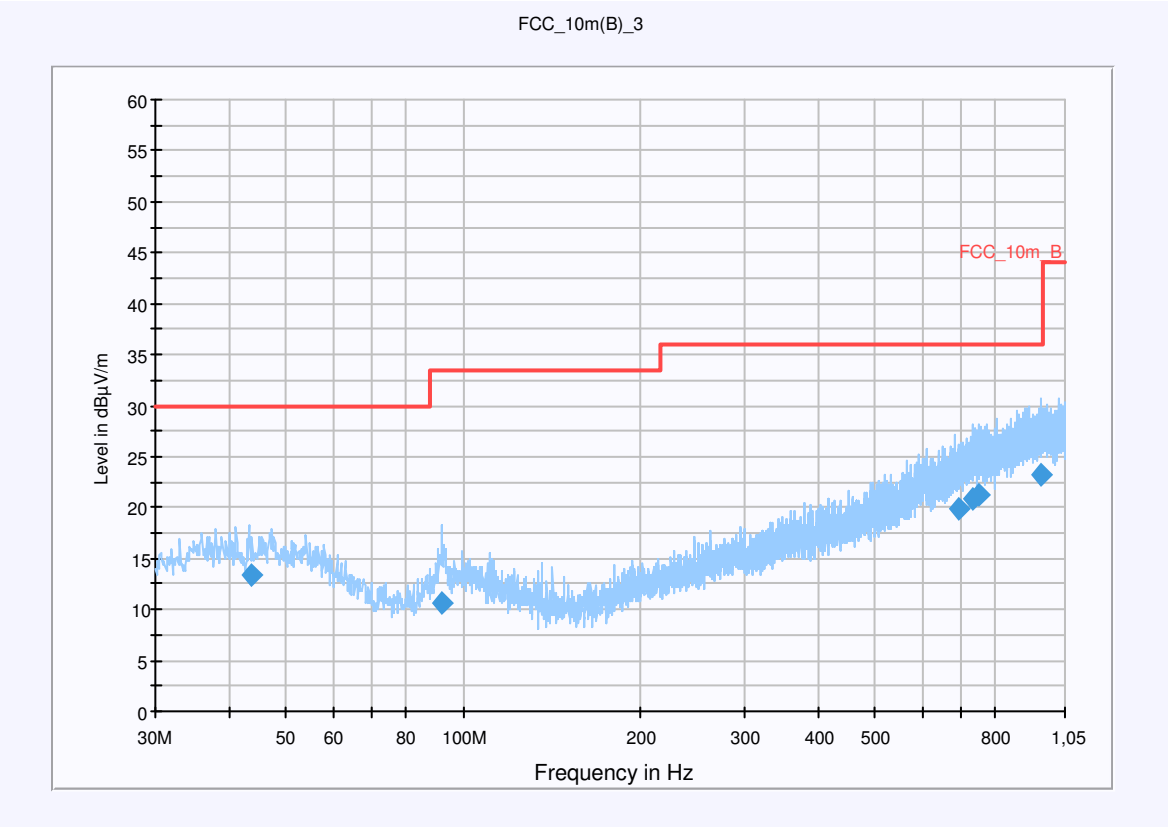
Plot 1: 0.03 - 1 GHz (lowest channel) Halle F

EUT:	Single SRR Module (Stand-alone)
Serial Number:	SC 926 000115
Test Description:	FCC part 15 C @ 10 m
Operating Conditions:	Tx unmodulated carrier; CH:11 (2.40 GHz)
Operator Name:	Lang
Comment:	Power: 4.5 VDC

Scan Setup: STAN_Fin [EMI radiated]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1.05 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)	Comment
43.765800	13.5	15000.000	120.000	189.0	V	198.0	13.5	16.5	30.0	
91.667850	10.6	15000.000	120.000	220.0	V	199.0	11.1	22.9	33.5	
694.089750	19.9	15000.000	120.000	182.0	V	-1.0	22.8	16.1	36.0	
730.451400	20.9	15000.000	120.000	110.0	H	313.0	23.7	15.1	36.0	
748.032900	21.2	15000.000	120.000	220.0	V	172.0	24.1	14.8	36.0	
958.183200	23.2	15000.000	120.000	220.0	V	39.0	25.9	12.8	36.0	

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

Subrange 1

Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
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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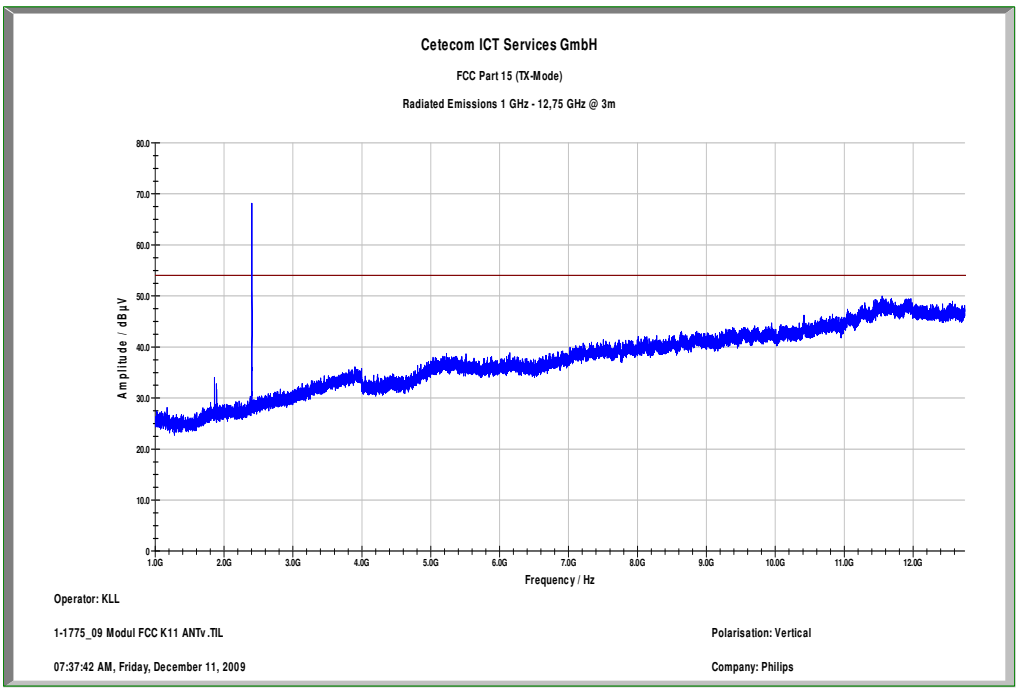
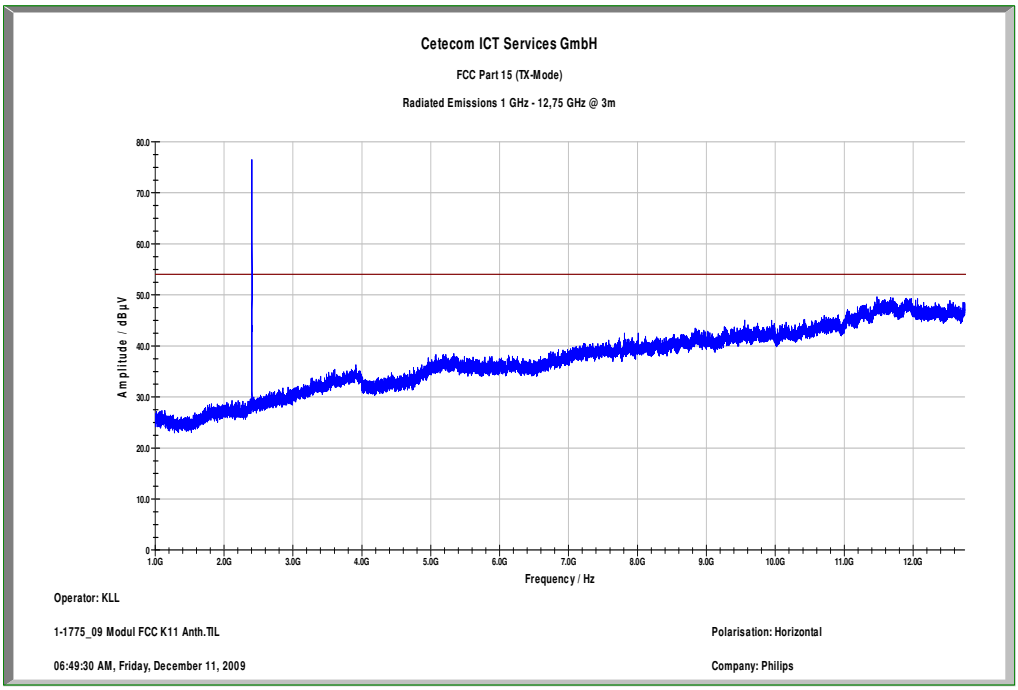
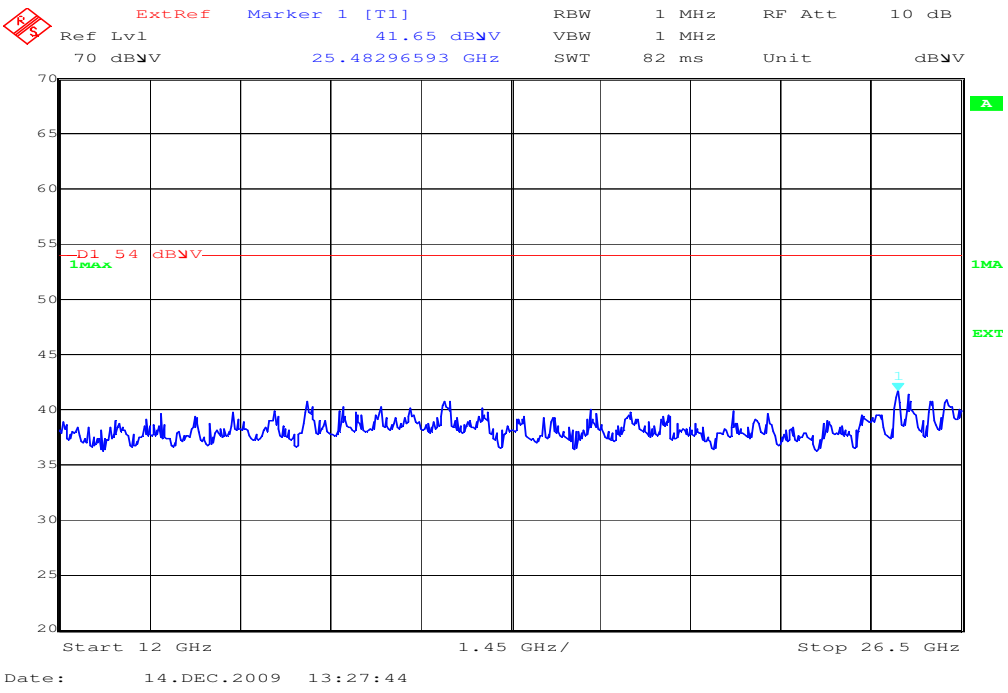
Plot 2: 1 -13 GHz vertical (lowest channel)



Plot 3: 1 -13 GHz horizontal (lowest channel)



Plot 4: 12 - 25 GHz vertical/horizontal (valid for all channels)



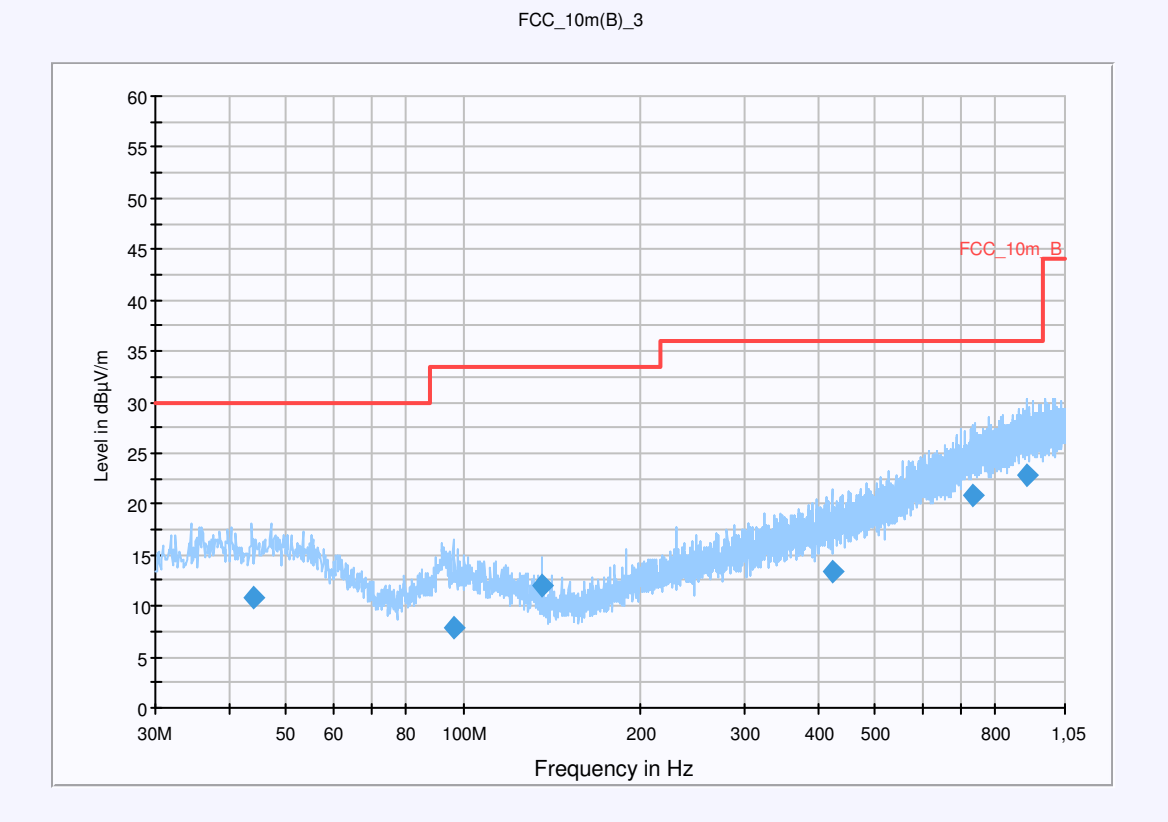
Plot 5: 0.03 - 1 GHz (middle channel) Halle F

EUT:	Single SRR Module (Stand-alone)
Serial Number:	SC 926 000115
Test Description:	FCC part 15 C @ 10 m
Operating Conditions:	Tx modulated spectrum; CH:18 (2.44 GHz)
Operator Name:	Lang
Comment:	Power: 4.5 VDC

Scan Setup: STAN_Fin [EMI radiated]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 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)	Comment
44.029500	10.8	15000.000	120.000	147.0	V	38.0	13.4	19.2	30.0	
96.169500	8.0	15000.000	120.000	220.0	V	253.0	11.8	25.5	33.5	
135.998100	11.9	15000.000	120.000	134.0	V	200.0	9.2	21.6	33.5	
422.244750	13.4	15000.000	120.000	167.0	V	22.0	17.6	22.6	36.0	
733.698900	20.9	15000.000	120.000	194.0	V	52.0	23.8	15.1	36.0	
906.428100	22.9	15000.000	120.000	220.0	V	324.0	25.7	13.1	36.0	

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

Subrange 1

Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
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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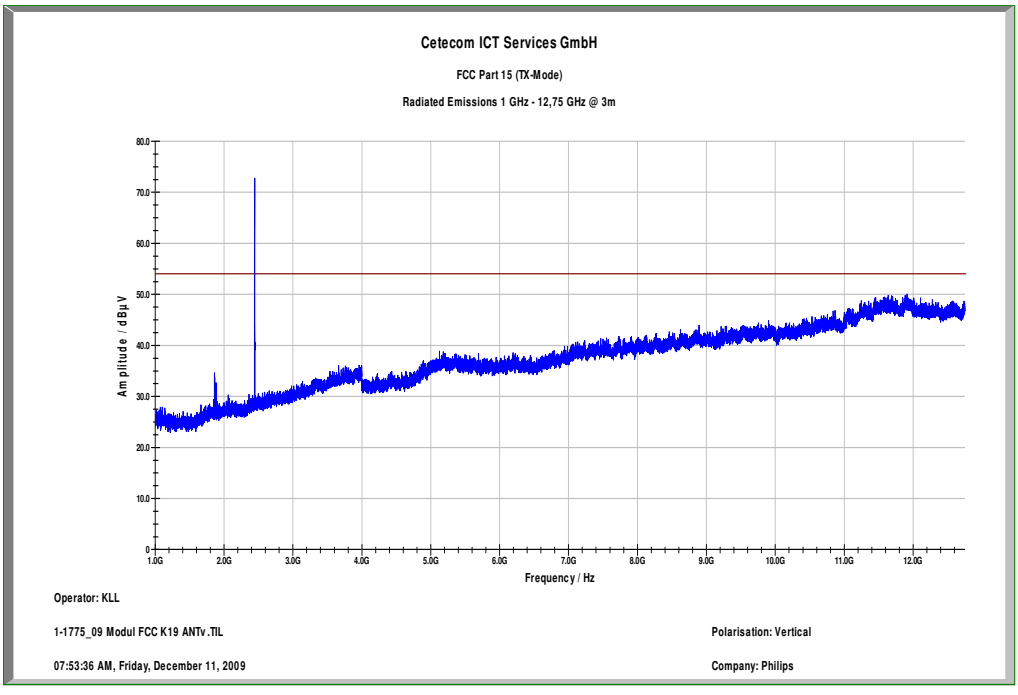
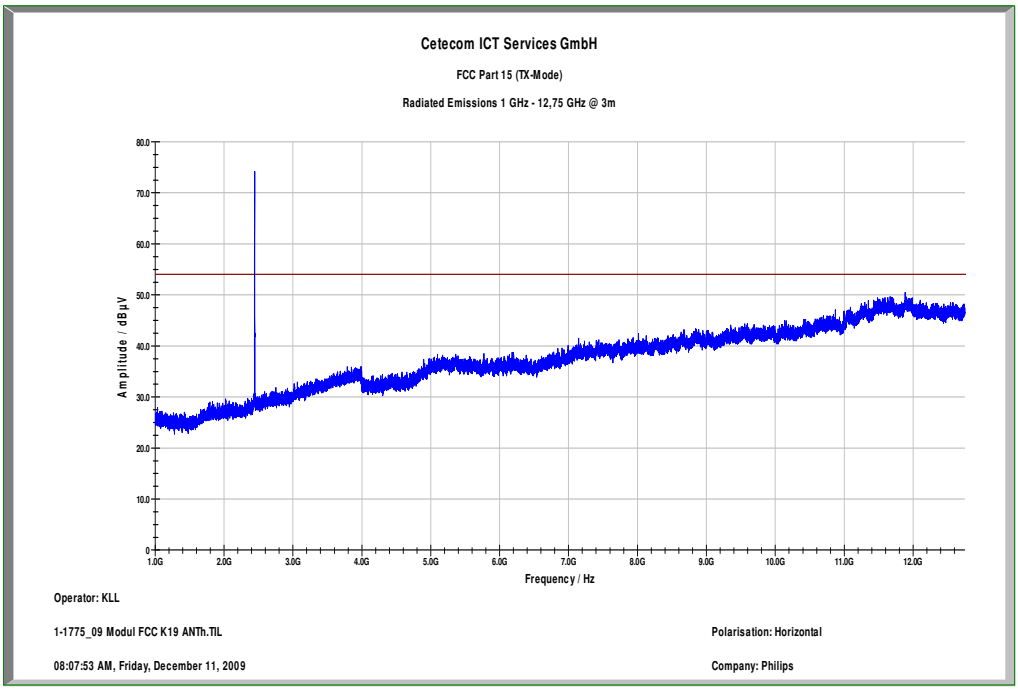
Plot 6: 1 -13 GHz vertical (middle channel)



Plot 7: 1 -13 GHz horizontal (middle channel)



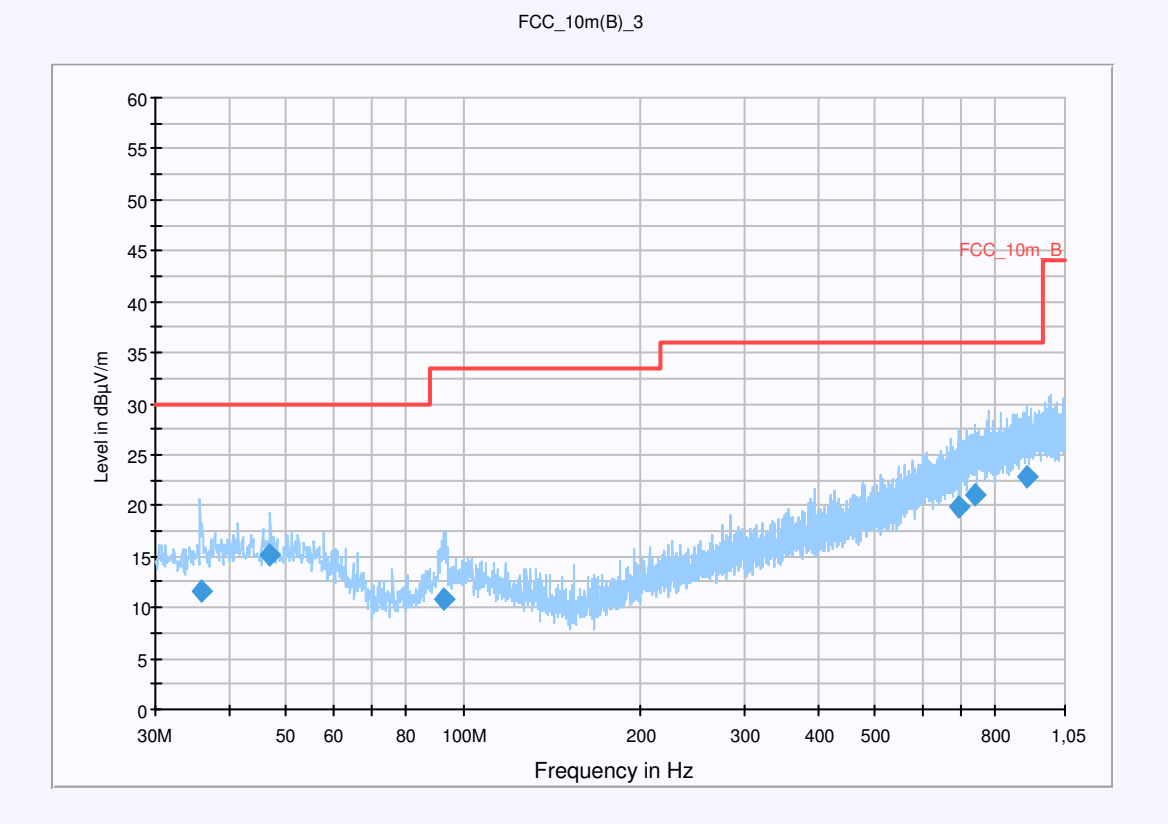
Plot 8: 0.03 - 1 GHz (highest channel) Halle F

EUT:	Single SRR Module (Stand-alone)
Serial Number:	SC 926 000115
Test Description:	FCC part 15 C @ 10 m
Operating Conditions:	Tx modulated spectrum; CH:26 (2.48 GHz)
Operator Name:	Lang
Comment:	Power: 4.5 VDC

Scan Setup: STAN_Fin [EMI radiated]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1.05 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)	Comment
35.932650	11.6	15000.000	120.000	116.0	V	26.0	13.2	18.4	30.0	
46.985400	15.1	15000.000	120.000	220.0	V	167.0	13.5	14.9	30.0	
92.832300	10.8	15000.000	120.000	136.0	V	56.0	11.3	22.7	33.5	
692.963400	19.9	15000.000	120.000	98.0	V	171.0	22.8	16.1	36.0	
737.188800	21.0	15000.000	120.000	220.0	H	150.0	23.9	15.0	36.0	
906.182250	22.9	15000.000	120.000	168.0	V	43.0	25.7	13.1	36.0	

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

Subrange 1

Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
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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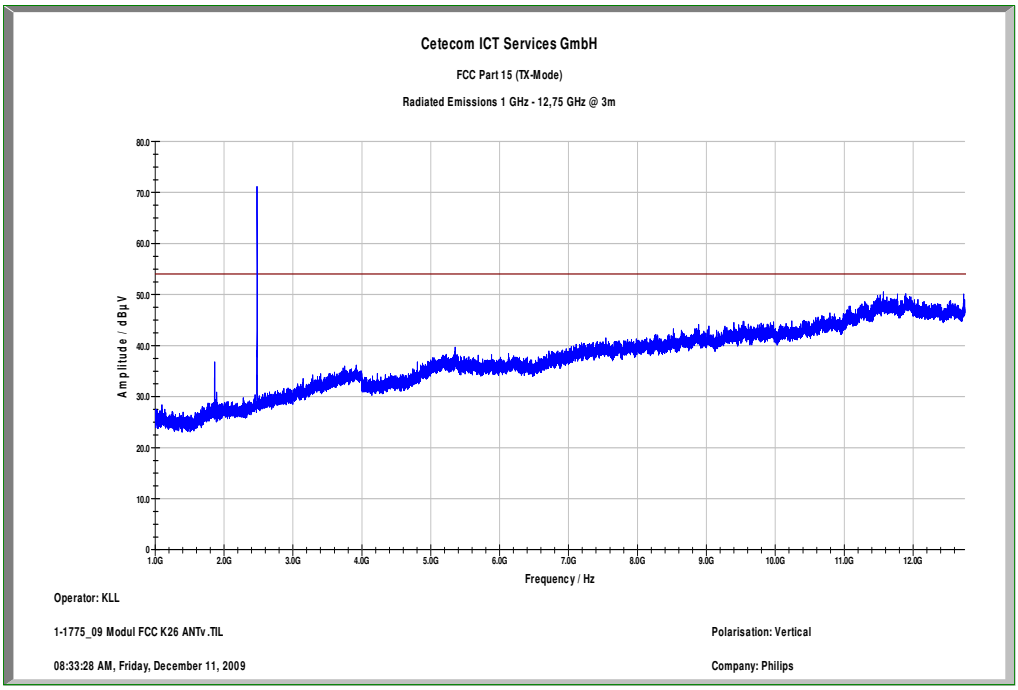
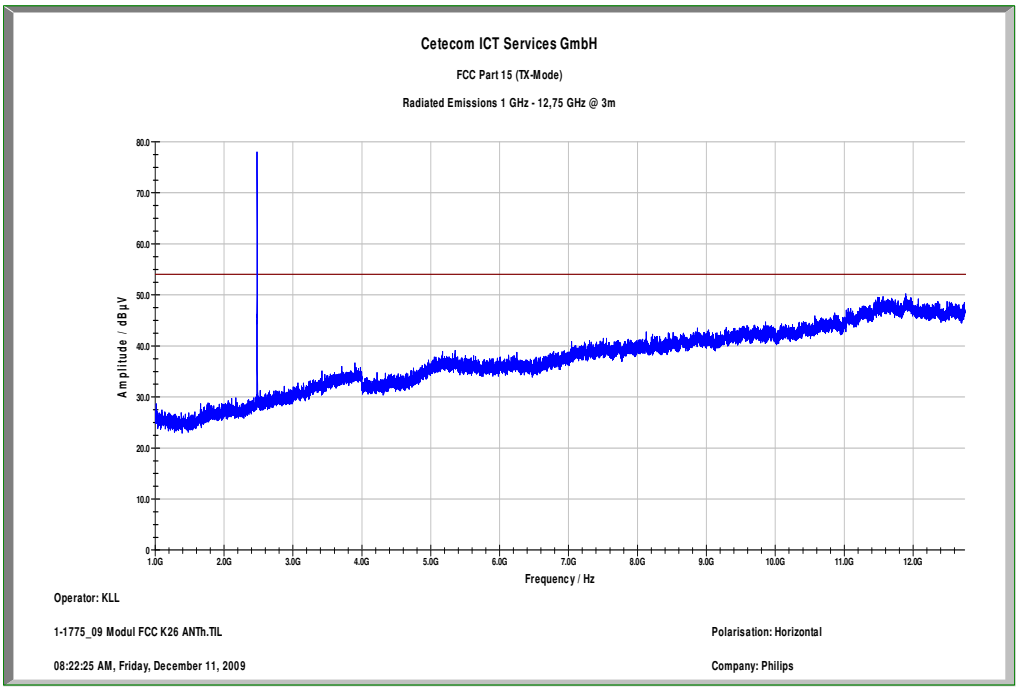
Plot 9: 1 -13 GHz vertical (highest channel)



Plot 10: 1 -13 GHz horizontal (highest channel)



Results:

SPURIOUS EMISSIONS LEVEL (dBµV/m)								
2405 MHz			2445 MHz			2480 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
4810	PK	45.5 (h)	4890	PK	45.7 (h)	4960	PK	46.2 (h)
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW: 1 MHz, VBW: 10Hz

(v) = measurement antenna vertical
(h) = measurement antenna horizontal

Azimuth scan DUT position 0° and 90°

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: § 15.209

Frequency [MHz]	Field strength [µV/m]	Measurement distance (m)
30 - 88	100 (40 dBµV/m)	3
88 - 216	150 (43.5 dBµV/m)	3
216 - 960	200 (46 dBµV/m)	3
above 960	500 (54 dBµV/m)	3

5.16 Spurious Emissions - radiated (Receiver) § 15.109

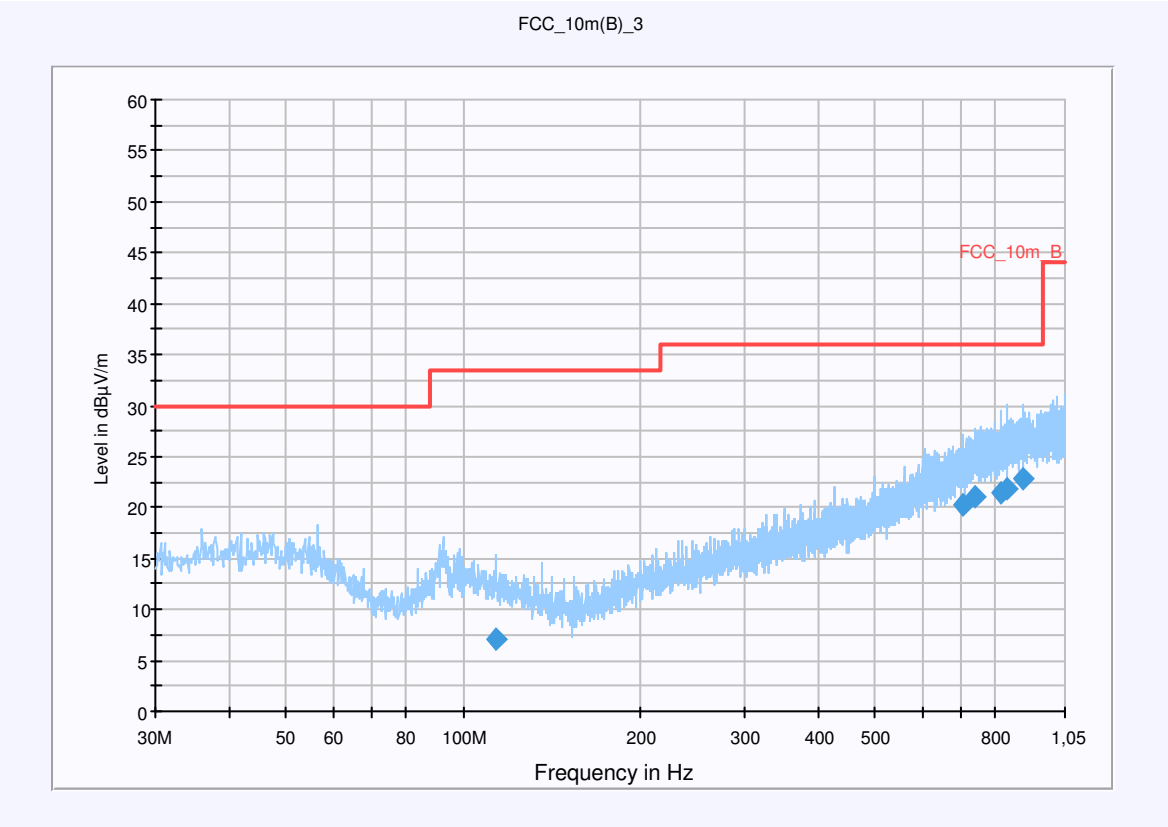
Plot 1: 0.03 - 1 GHz (idle) Halle F

EUT:	Single SRR Module (Stand-alone)
Serial Number:	SC 926 000115
Test Description:	FCC part 15 Class B @ 10 m
Operating Conditions:	Rx-Testmode
Operator Name:	Lang
Comment:	Power: 4.5 VDC

Scan Setup: STAN_Fin [EMI radiated]

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

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1.05 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)	Comment
113.257200	7.1	15000.000	120.000	220.0	H	114.0	11.1	26.4	33.5	
702.669900	20.2	15000.000	120.000	220.0	V	82.0	23.1	15.8	36.0	
735.469950	21.0	15000.000	120.000	220.0	H	94.0	23.8	15.0	36.0	
816.712200	21.5	15000.000	120.000	220.0	V	-3.0	24.6	14.5	36.0	
834.889050	21.8	15000.000	120.000	123.0	H	246.0	24.8	14.2	36.0	
888.561450	22.7	15000.000	120.000	108.0	H	52.0	25.6	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 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
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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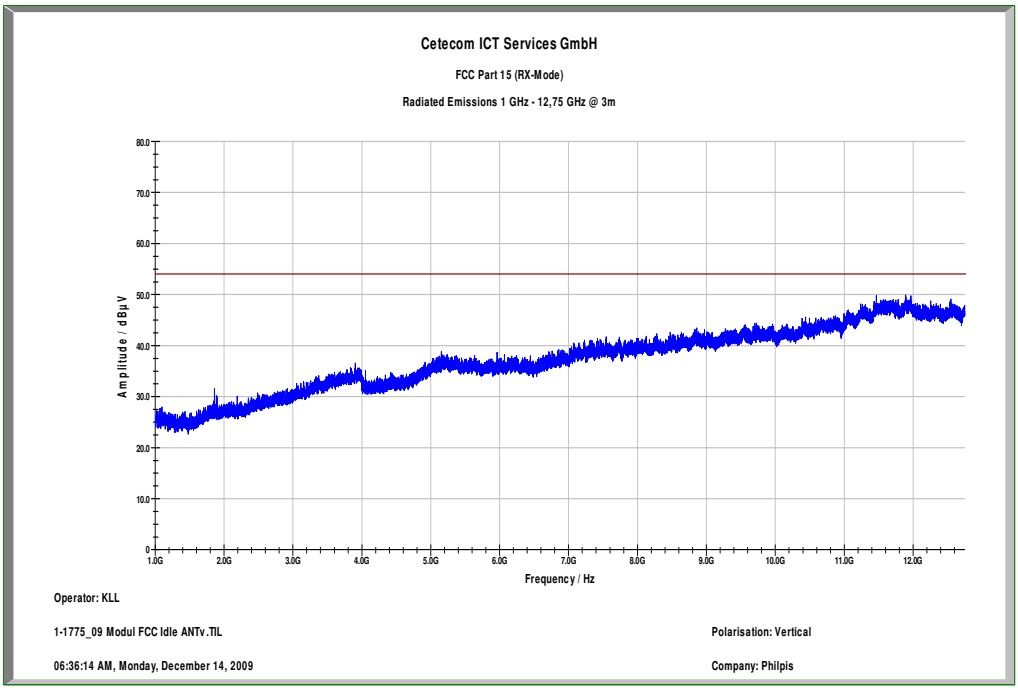
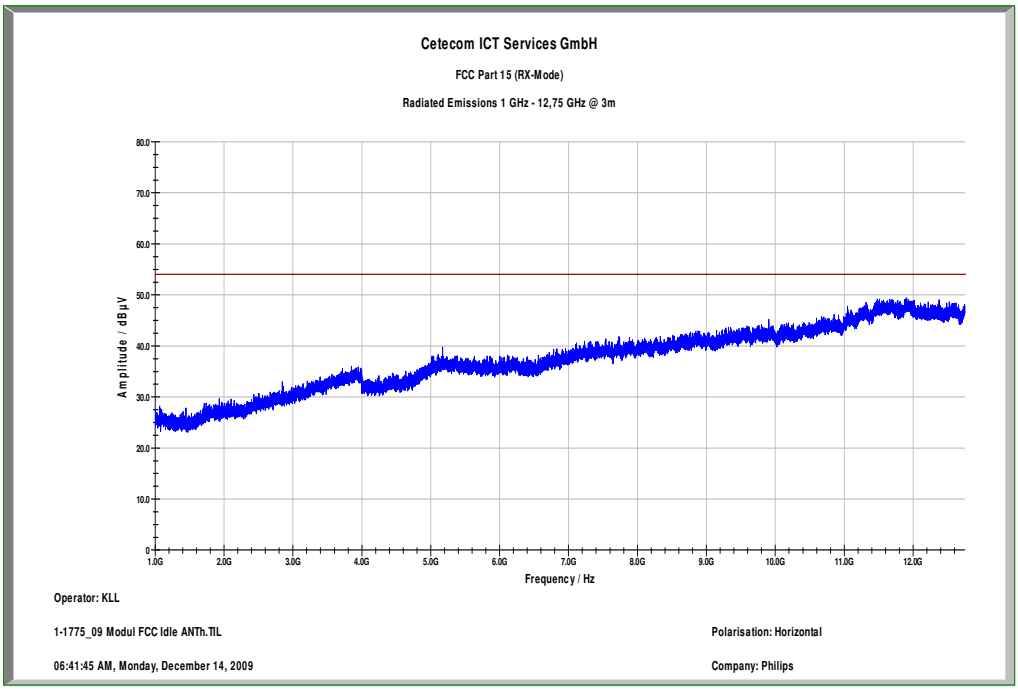
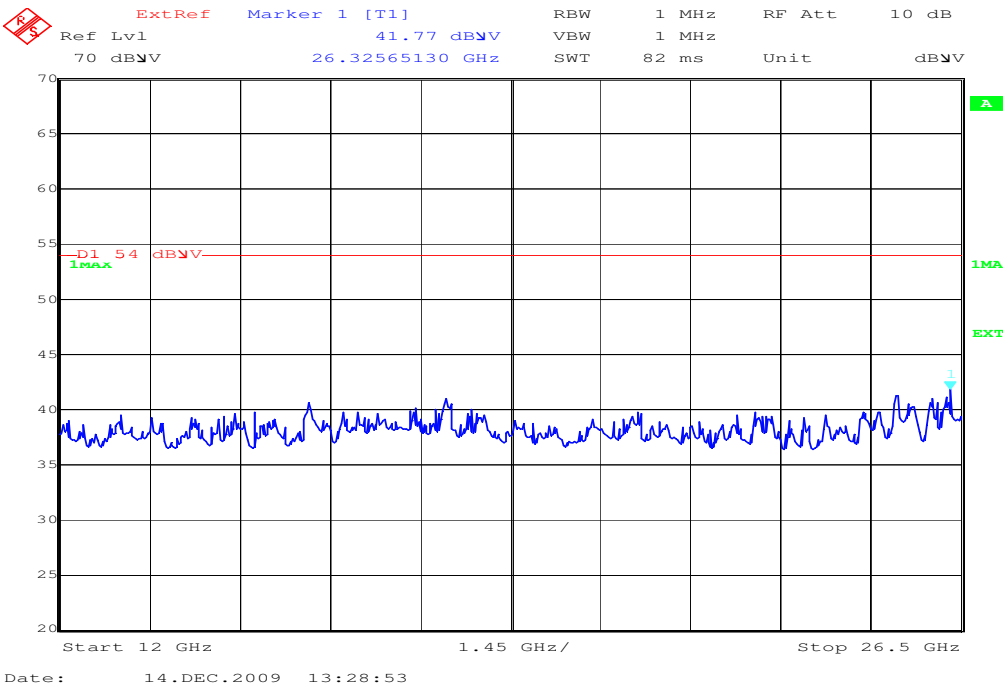
Plot 2: 1 -13 GHz vertical (idle)



Plot 3: 1 -13 GHz horizontal (idle)



Plot: 12 - 25 GHz vertical/horizontal (max hold)



Results:

Spurious Emissisons level [dBµV/m]		
f[MHz]	Detector	Level [dBµV/m]
No critical peaks detected		
Measurement uncertainty	±3 dB	

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

Measurement distance see table

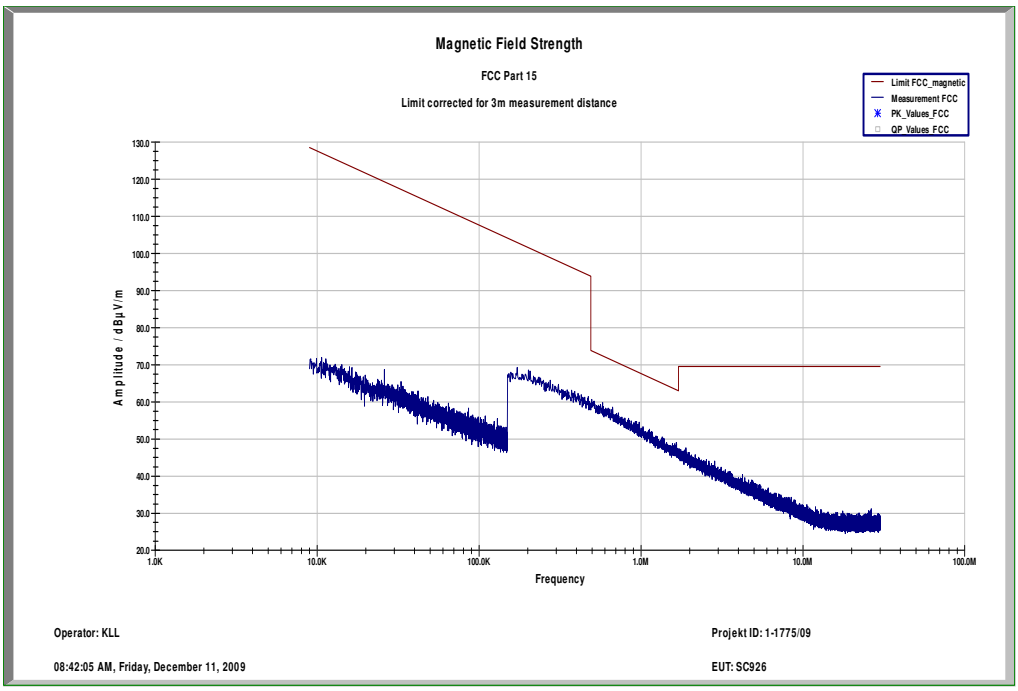
Limits: § 15.109

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
30 - 88	100 (40 dBµV/m)	3
88 - 216	150 (43.5 dBµV/m)	3
216 - 960	200 (46 dBµV/m)	3
above 960	500 (54 dBµV/m)	3

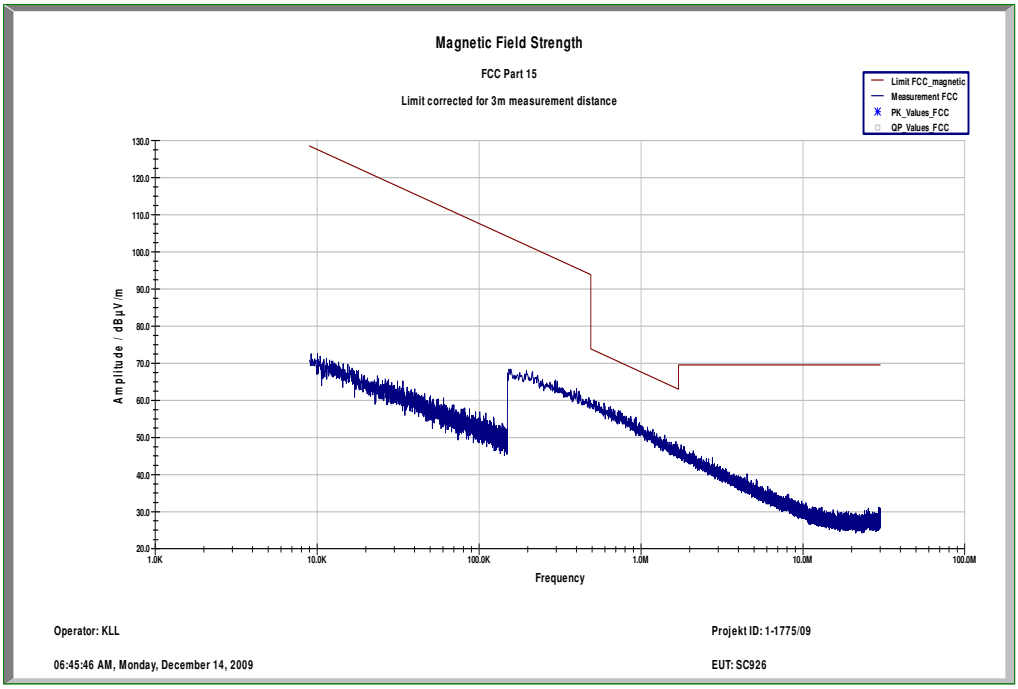
5.17 Spurious Emissions < 30 MHz - Transmitter radiated § 15.209

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

Plot 1: Transmitter operation (middle channel)



Plot 2: Idle mode



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

6 Test equipment and ancillaries used for tests

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	**-/-**	**-/-**	**-/-**	**-/-**

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