Recognized by the
Federal Communications Commission
Anechoic chamber registration no.: 90462 (FCC)
Anechoic chamber registration no.: IC3462C-1 (IC)
TCB ID: DE 0001

Accredited by the
German Accreditation Council
DAR–Registration Number
DAT-P-176/94-D1

Accredited Bluetooth® Test Facility (BQTF)

Test report no.	**:**	**1-0648-01-06/08 B**
Applicant	**:**	**televic nv.**
Type	**:**	**Confidea DU**
Test Standard	**:**	**FCC Part 15.407** **RSS 210 Issue 7**
FCC ID	**:**	**WM7CONFIDEADU**
IC Certification No.	**:**	**7932A-CONFIDEADU**

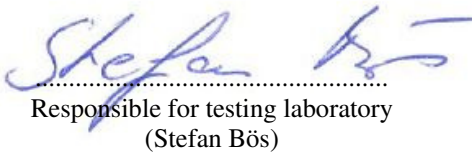
Table of contents

1. Administrative data

1.1. Administrative data of the test facility

1.1.1 Identification of the testing laboratory

Company name:	Cetecom ICT Services GmbH
Address:	Untertürkheimerstr. 6-10 D-66117 Saarbruecken Germany
Laboratory accreditation:	DAR-Registration No. DAT-P-176/94-D1 Bluetooth Qualification Test Facility (BQTF)
Responsible for testing laboratory:	Stefan Bös, Marco Bertolino Phone: +49 681 598 0 Fax: +49 681 598 9075 email: info@ict.cetecom.de



Responsible for testing laboratory
(Stefan Bös)

1.1.2 Organizational items

Reference No.:	1-0648-01-06/08 B
Order No.:	-/-
Responsible for test report and project leader:	Stefan Bös, Marco Bertolino
Receipt of EUT:	2008-08-18
Date(s) of test:	2008-08-18 to 2009-04-16
Date of report:	2009-04-17
Number of report pages:	75
Version of template: 1.6	

Responsible for test report
(Marco Bertolino)

Note:

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

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.

During the test no hardware and software changes are allowed to be performed at the EUT.

1.1.3 Applicant´s details

Name:	televic nv.
Street:	Leo Bekaertlaan 1
Town:	8870 Izegem
Country:	BELGIUM
Telephone:	+32 51 30 30 45
Fax:	+32 51 33 18 86
Contact:	John Gesquiere
E-mail:	j.gesquiere@televic.com
Telephone:	+32 51 30 30 45

1.2 Administrative data of manufacturer / member

Name:	televic nv.
Street:	Leo Bekaertlaan 1
Town:	8870 Izegem
Country:	BELGIUM
Telephone:	+32 51 30 30 45
Fax:	+32 51 33 18 86
Contact:	John Gesquiere
E-mail:	j.gesquiere@televic.com
Telephone:	+32 51 30 30 45

1.3 Description of the Equipment under test (EUT)

1.3.1 EUT: Type, S/N etc.

Product name		Description	S/N serial number	HW hardware status	SW software status
Confidea DU		Wireless Discussion Unit 2.4 / 5 GHz	0x25 * / 0x19	0.01	-/-
Frequency Band [MHz]	Type of Modulation	Number of channels	Antenna	Power Supply	Temperature Range
5150 - 5250	OFDM	4	Integrated PCB antenna	115 V / 15 V AC / DC power supply	-20°C to +55°C

1.3.2 If RF component testing only, description of additional used HW/SW

	Product name	Product ID	Description	S/N serial number	HW hardware status	SW software status
1	--	--	--	--	--	--
2	--	--	--	--	--	--

1.3.3 Additional EUT information For IC Canada (appendix 2)

IC Certification Number:	**7932A-CONFIDEADU**
Model Name:	**Confidea DU**
Manufacturer (complete Address):	**televic nv.** **Leo Bekaertlaan 1** **8870 Izegem** **BELGIUM**
Tested to Radio Standards Specification (RSS) No.:	**RSS-210 Issue 7**
Open Area Test Site Industry Canada Number:	**IC 3463A-1**
Frequency Range (or fixed frequency) [MHz]:	**5150 MHz – 5250 MHz**
RF: Power [W] (max):	**OFDM:** **Rad. EIRP: 59.02 mW** **Conducted: 19.91 mW**
Antenna Type:	**Integrated PCB antenna**
Occupied Bandwidth (99% BW):	**OFDM 6 dB: 16.44 MHz** **OFDM 20 dB: 19.76 MHz**
Type of Modulation:	**OFDM**
Emission Designator (TRC-43):	**16M4G7D 6dB bandwidth** **19M8G7D 20dB bandwidth**
Transmitter Spurious (worst case) [dBµV/m in 3m]:	**-44.83 @ 15.52 GHz PP**
Receiver Spurious (worst case) [dBµV/m in 3m]:	**-47.00 @ 13.89 GHz PP**

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: Marco Bertolino Date: 2009-04-17

1.3.4 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. 3		low temperature, high power source conditions
Op. 4		high temperature, low power source conditions
Op. 5		high temperature, high power source conditions

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

1.3.5 Extreme conditions testing values

Description	**Shortcut**	**Unit**	**Value**
Nominal Temperature	T_{nom}	°C	**20**
Nominal Humidity	H_{nom}	%	**54**
Nominal Power Source	V_{nom}	V	**115 V / 15 V**

Type of power source: **AC / DC power supply**

Deviations from these values are reported in chapter 2

2 Test standard & summary 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	2009-04-17	-/-

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
Range:	5.150 to 5.250 GHz				
None	Antenna Gain	Yes			
§15.407a(3)+(4)	Peak transmit power	Yes			
§15.407	Emission bandwidth (6 dB, 20 dB, 26 dB)	Yes			
§15.407a(5)	Peak power spectral density conducted	Yes			
§ 15.407a (6)	Ratio of peak excursion	Yes			
§ 15.407b (3)	Undesirable emissions conducted	Yes			
§ 15.209	Spurious Emission -radiated (TX)	Yes			
§ 15.209	Spurious Emission -radiated (RX)	Yes			
§ 15.107/207	Conducted Emissions <30 MHz	Yes			

3 RF measurement testing

3.1 Description of test set-up

3.1.1 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.

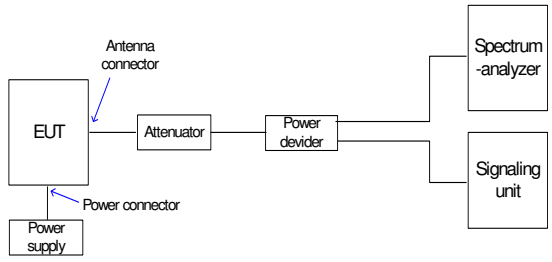
Antennas are confirmed with ANSI C63.2-1996 item 15.

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, bi-conical 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

3.1.2 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.



3.2 Referenced Documents

Confidea: Reference document for the initiation of the EUT's and further important settings.
This document is provided by televic n.v.!

Test report: 1-0648-01-11/08 Base station

3.3 Additional comments

-/-

3.4 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 (36) 5180 MHz	mid channel (44) 5220 MHz	high channel (48) 5240 MHz
Conducted power [dBm] *(measured)*	12.72	12.76	**12.99**
Radiated power [dBm] *(measured)*	17.70	17.57	**17.71**
Gain [dBi] *(calculated)*	**4.98**	4.81	4.72

Note:

The radiated output power is measured with the following settings:

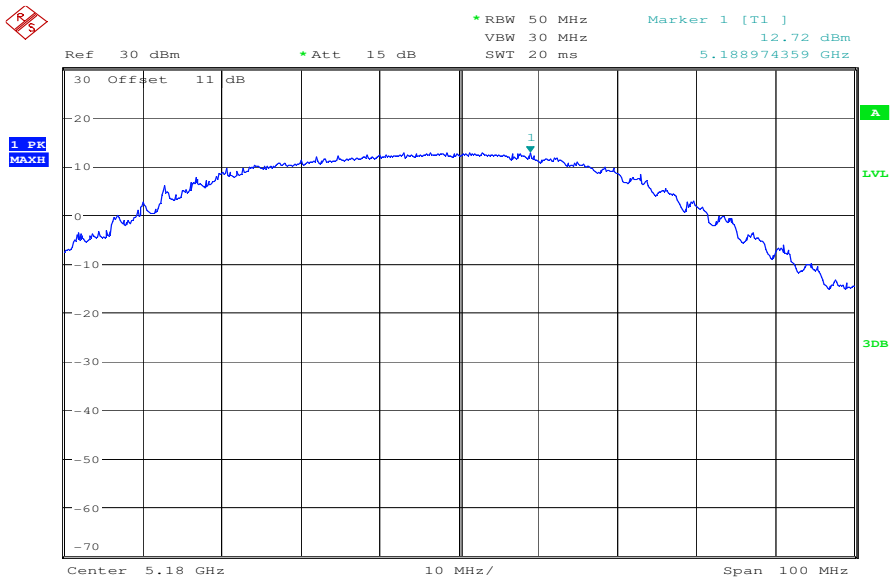
- Peak detector
- 50 MHz RBW / 30 MHz VBW
- Span 50 MHz
- Max. hold mode

The maximum antenna gain is below 6 dBi.

Limits:

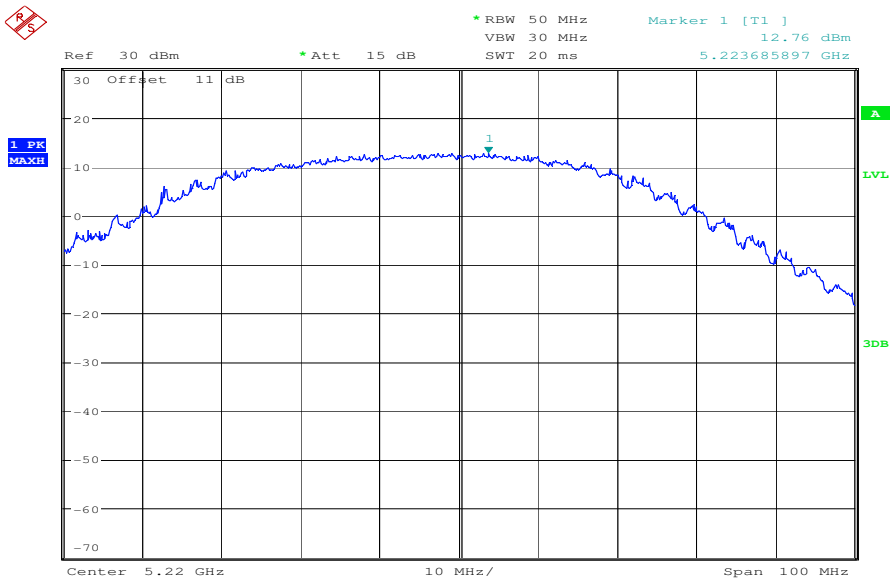
Under normal test conditions only	max. 6 dBi

Plot 1: Conducted output power, channel 36



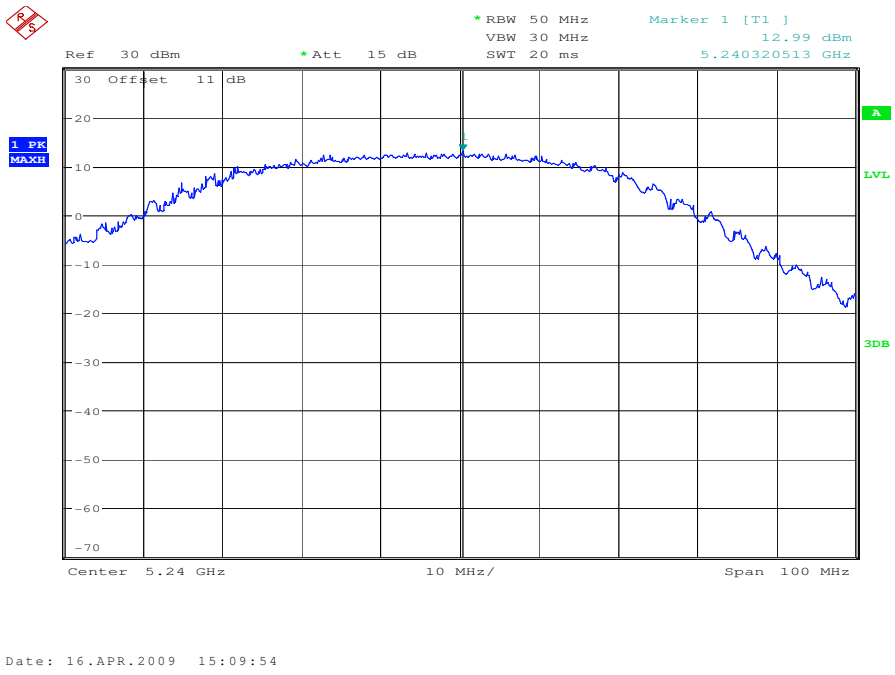
Date: 16.APR.2009 15:07:30

Plot 2: Conducted output power, channel 44



Date: 16.APR.2009 15:08:41

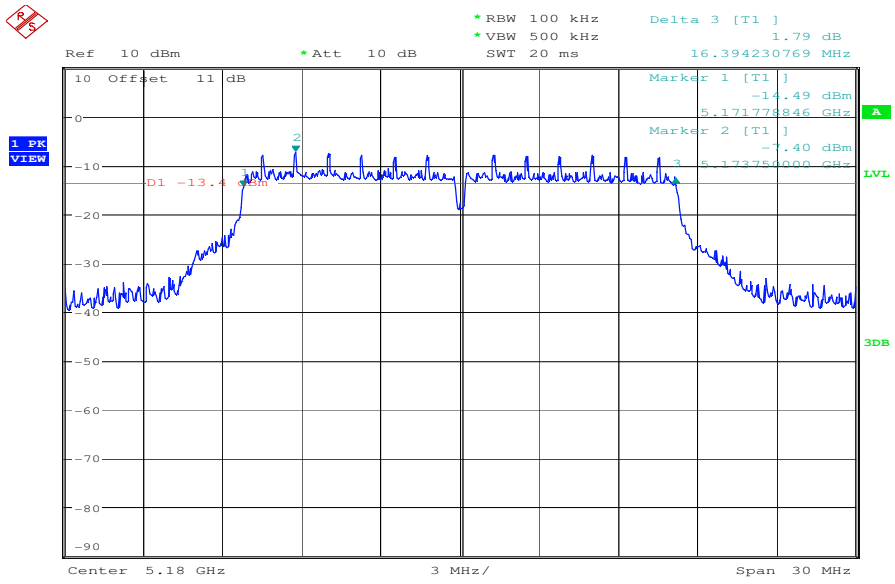
Plot 3: Conducted output power, channel 48



3.5 Transmit Power §15.407a(1)+(4)

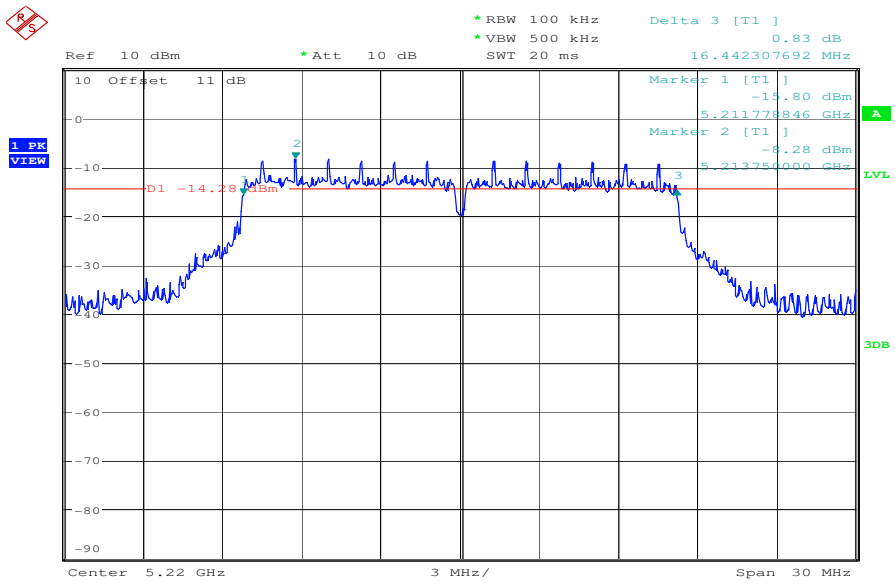
3.5.1 Measurement 1: 6 dB emission bandwidth of the sample

Plot 1: channel 36, 5180 MHz



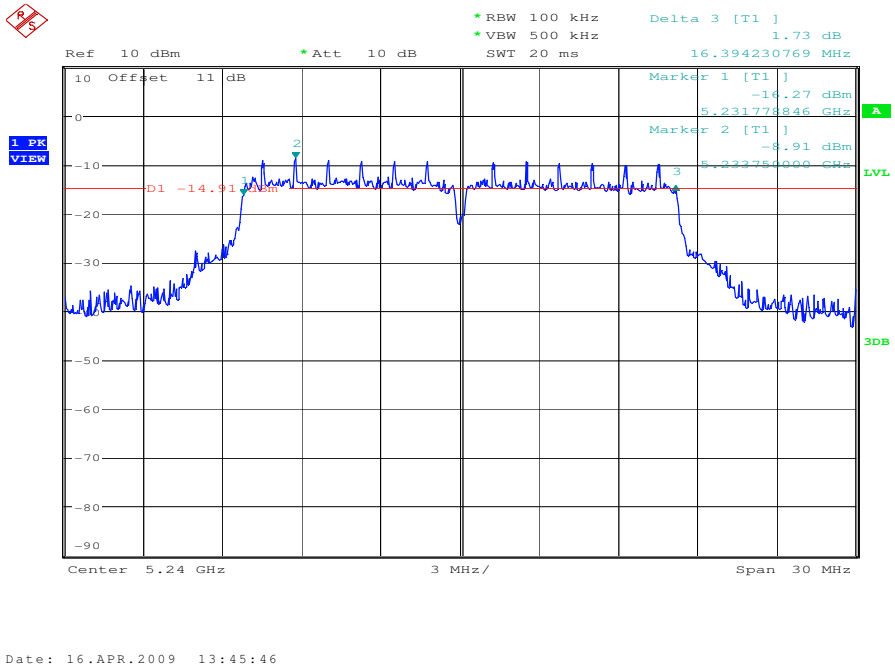
Date: 16.APR.2009 13:36:32

Plot 2: channel 44, 5220 MHz



Date: 16.APR.2009 13:39:33

Plot 3: channel 48, 5240 MHz

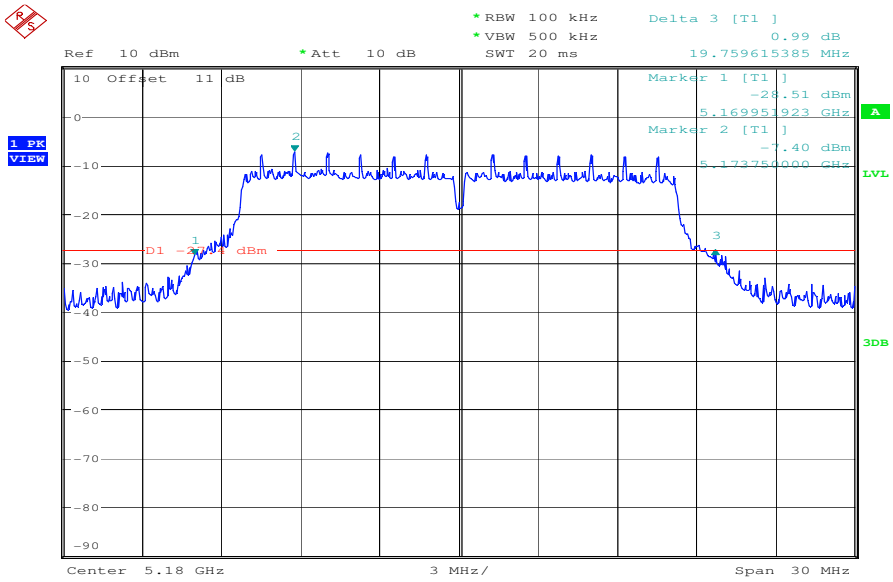


Results:

Frequency (MHz)	6 dB BW (MHz)
5180	16.39
5220	16.44
5240	16.39

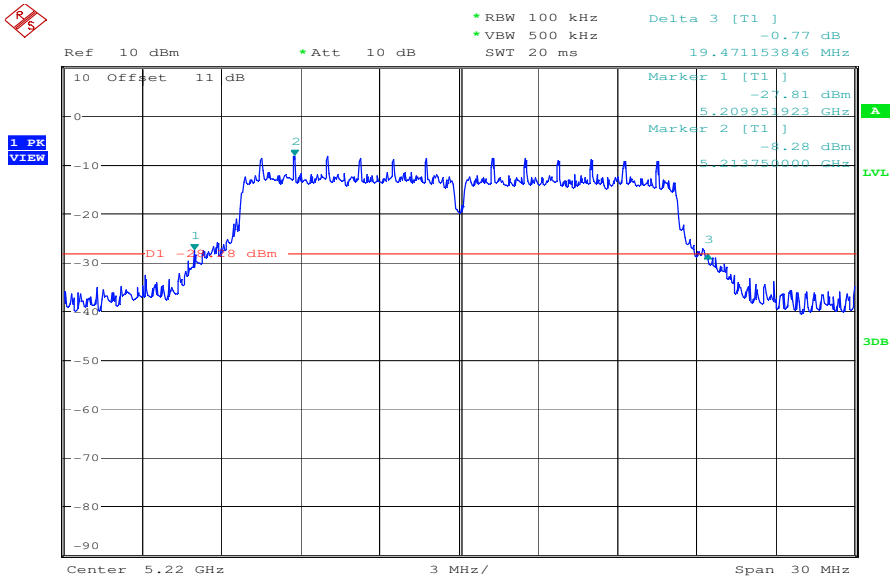
3.5.2 Measurement 1: 20 dB emission bandwidth of the sample

Plot 1: channel 36, 5180 MHz



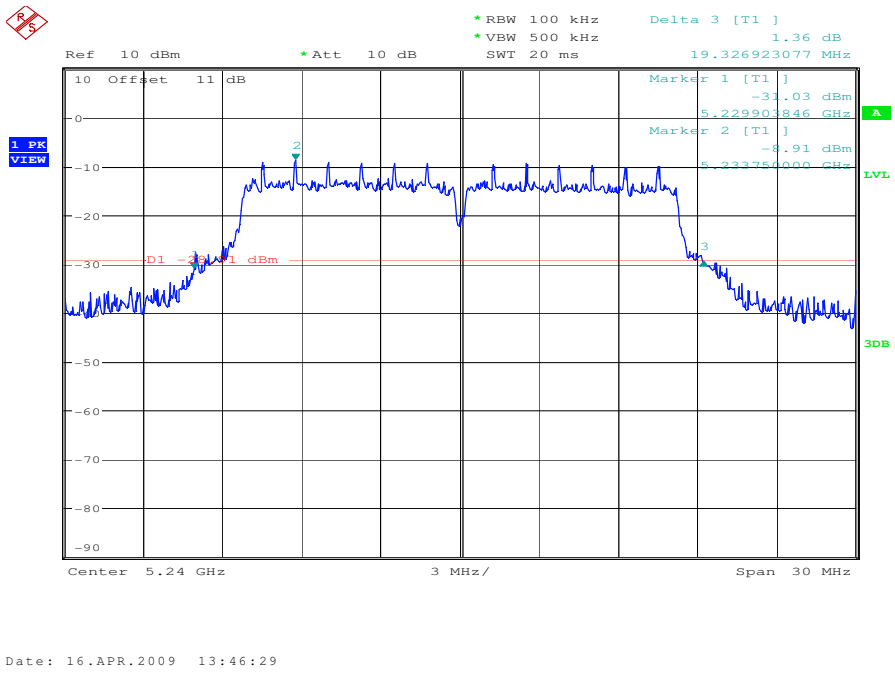
Date: 16.APR.2009 13:37:12

Plot 2: channel 44, 5220 MHz



Date: 16.APR.2009 13:40:10

Plot 3: channel 48, 5240 MHz

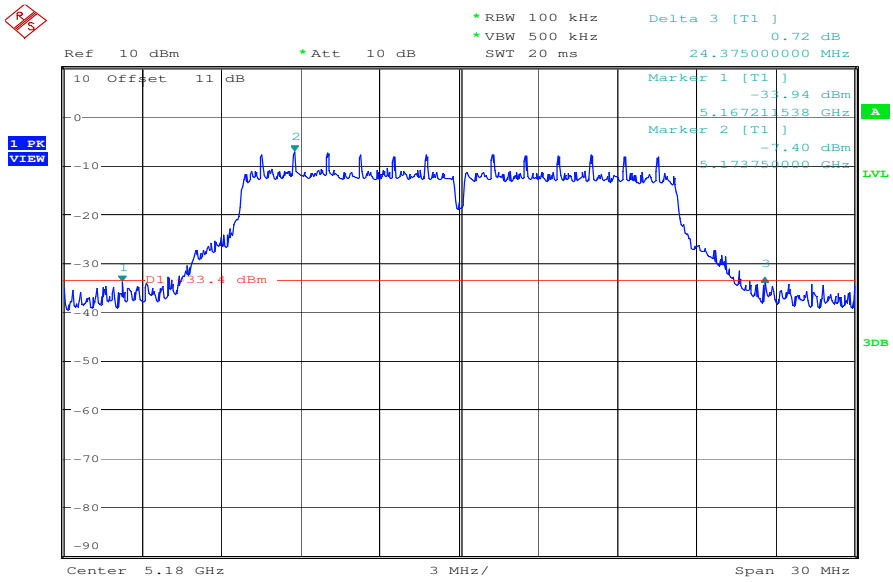


Results:

Frequency (MHz)	20 dB BW (MHz)
5180	19.76
5220	19.47
5240	19.33

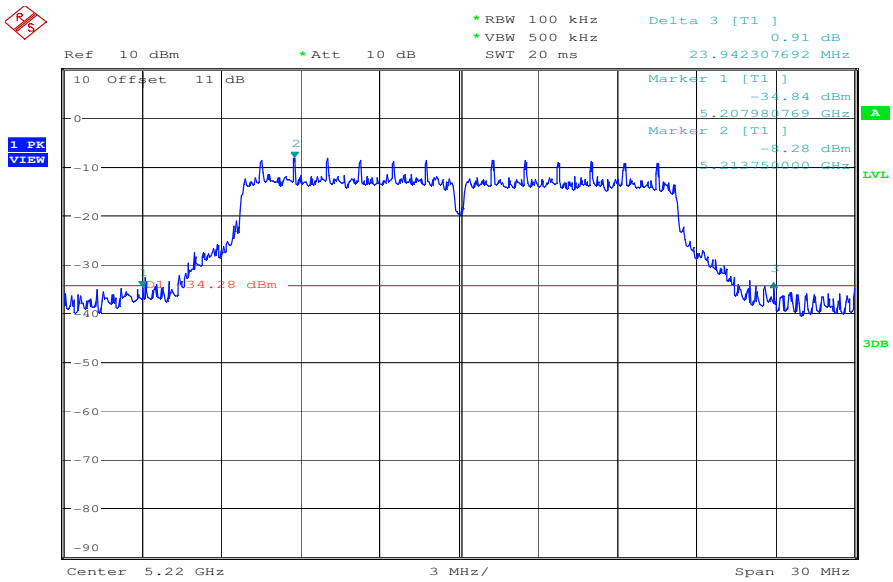
3.5.3 Measurement 1: 26 dB emission bandwidth of the sample

Plot 1: channel 36, 5180 MHz



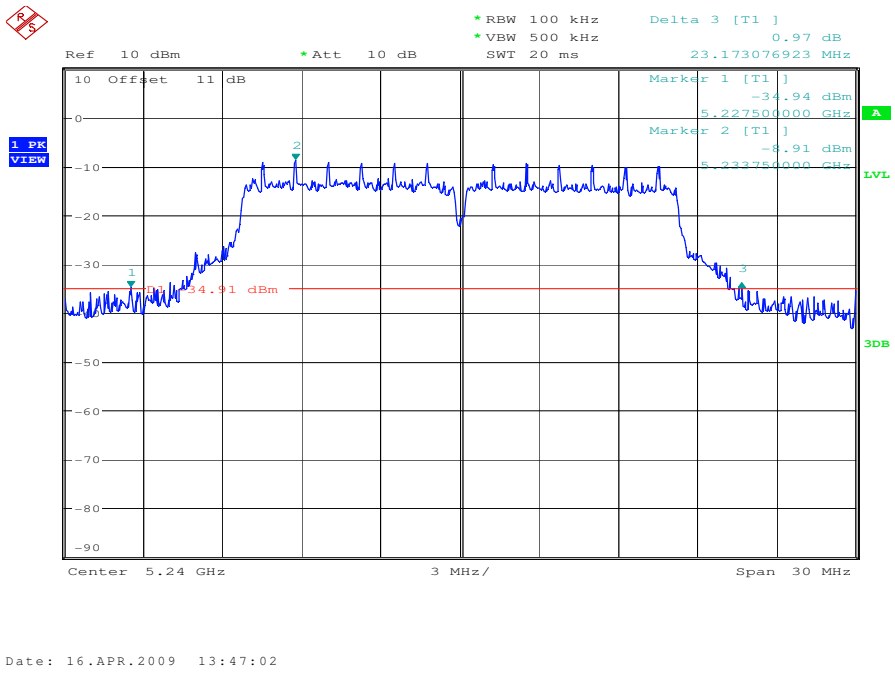
Date: 16.APR.2009 13:37:52

Plot 2: channel 44, 5220 MHz



Date: 16.APR.2009 13:41:01

Plot 3: channel 48, 5240 MHz



Results:

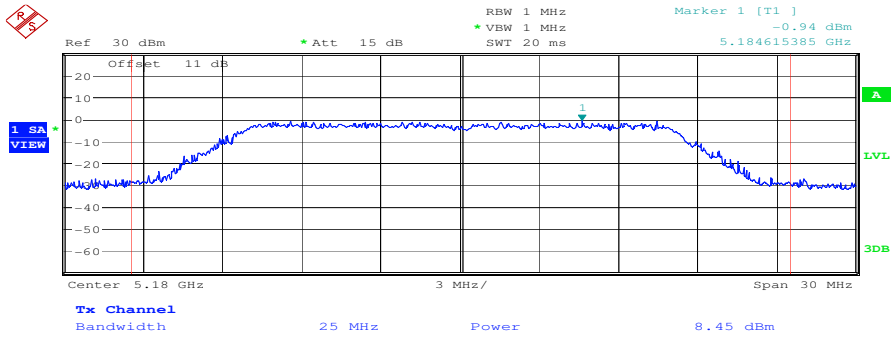
Frequency (MHz)	26 dB BW (MHz)
5180	24.38
5220	23.94
5240	23.17

Measurement 2: Peak conducted transmit output power

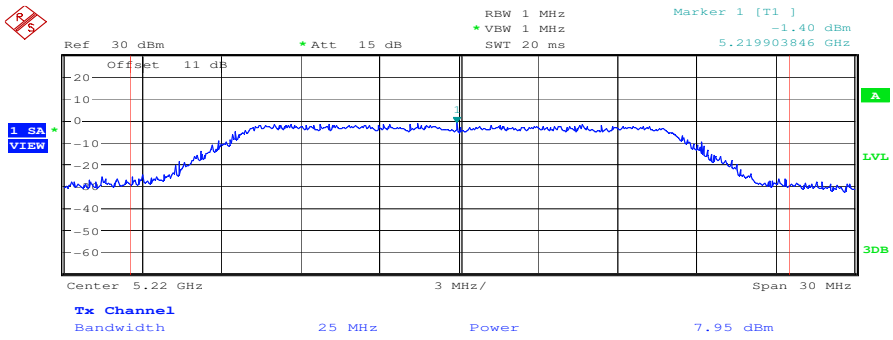
Measured with the spectrum analyzer`s band power measurement according to the guidelines of the FCC public notice DA 02-2138 - method #3:

- Set span to encompass the entire emission bandwidth (EBW) of the signal
- Set sweep trigger to “free run”
- Set RBW = 1 MHz. Set VBW ≥ 1/T
- Use linear display mode
- Use sample detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode
- Set max hold
- Allow max hold to run for 60 seconds
- Compute power by integrating the spectrum across the 26 dB EBW or apply a bandwidth correction factor of 10*log(EBW/1 MHz) to the spectral peak of the emission. The integration can be performed using the spectrum analyzer´s band power measurement function with band limits set to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

Plot 1: channel 36, 5180 MHz

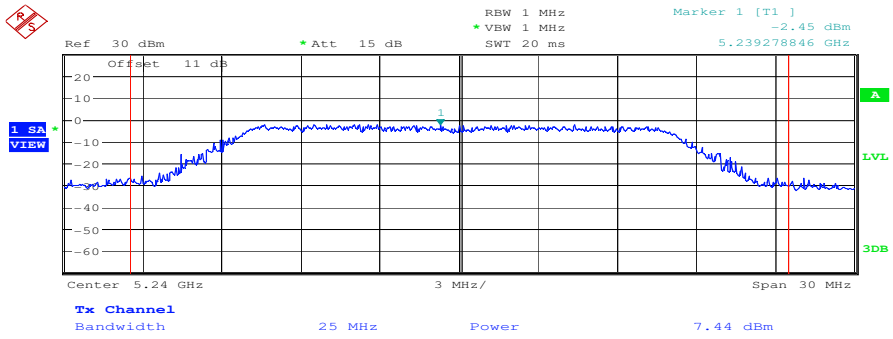


Plot 2: channel 44, 5220 MHz



Date: 16.APR.2009 13:54:01

Plot 3: channel 48, 5240 MHz



Date: 16.APR.2009 13:52:01

Results: Plot 1: Peak transmit power: 7.00 mW / 8.45 dBm
Plot 2: Peak transmit power: 6.24 mW / 7.95 dBm
Plot 3: Peak transmit power: 5.55 mW / 7.44 dBm

Limits:

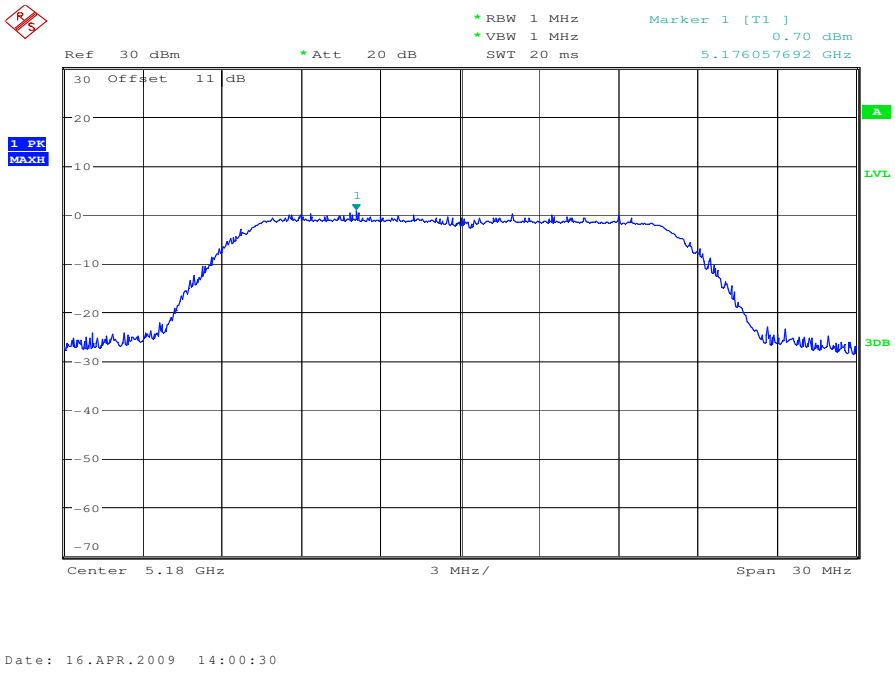
Under normal test conditions only	For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10logB, where B is the 26dB-emission bandwidth in MHz. If transmitting antennas if directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the gain of the antenna exceeds 6 dBi.

3.6 Peak power spectral density §15.407(a5)

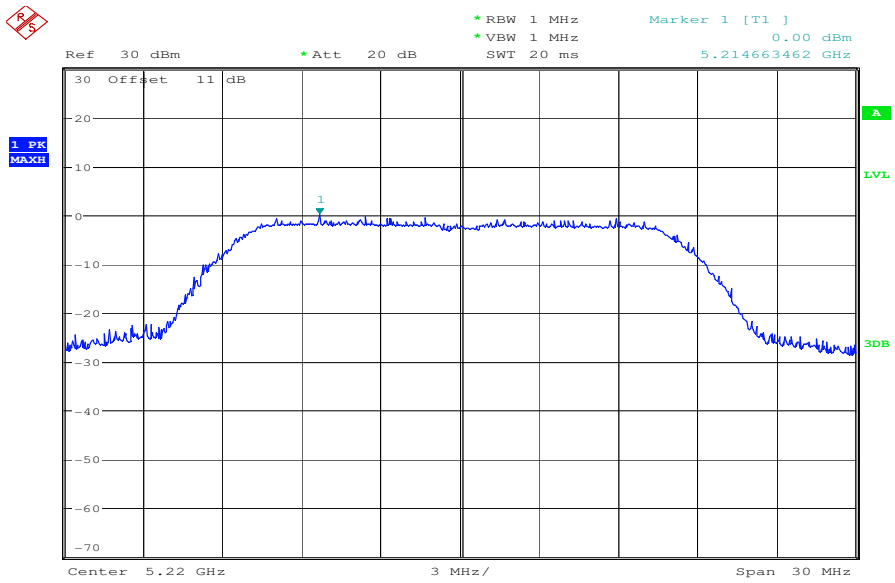
Measured according to the guidelines of the FCC public notice DA 02-2138 - method #1:

- Use peak detector and max hold
- Set RBW = 1 MHz. Set VBW > 1 MHz
- The PPSD is the highest level found across the emission in any 1 MHz band.

Plot 1: channel 36, 5180 MHz

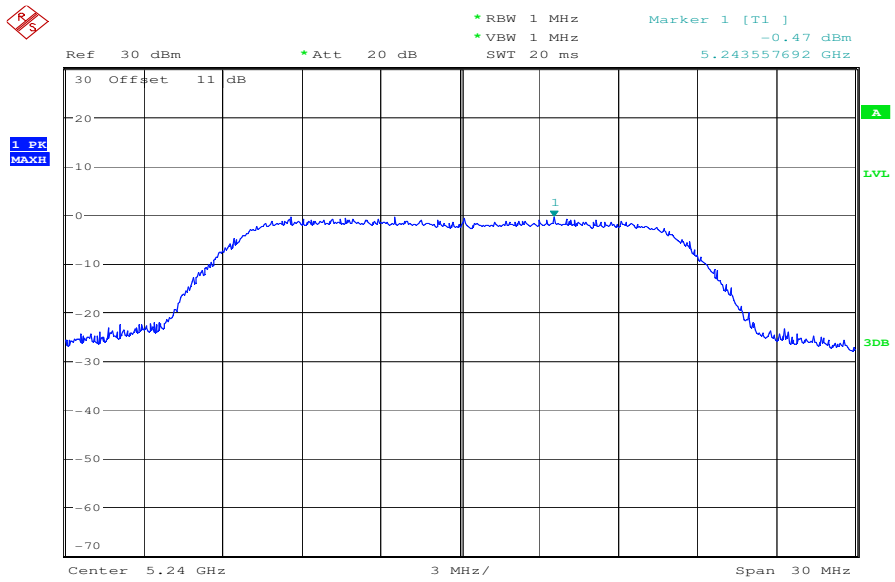


Plot 2: channel 44, 5220 MHz



Date: 16.APR.2009 14:02:05

Plot 3: channel 48, 5240 MHz



Date: 16.APR.2009 14:08:43

Results:

Test conditions Frequency [MHz]	Spectral density 1 MHz BW
5180 MHz	+0.70 dBm
5220 MHz	+0.00 dBm
5240 MHz	-0.47 dBm

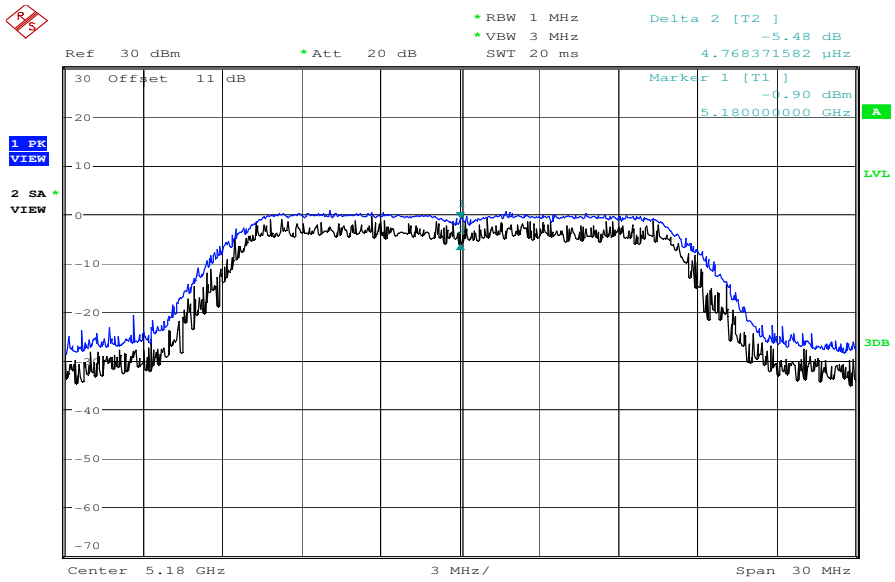
Limits:

Under normal test conditions only	For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1 MHz-band. If transmitting antennas if directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the gain of the antenna exceeds 6 dBi.

3.7 Ratio of Peak Excursion §15.407(a6)

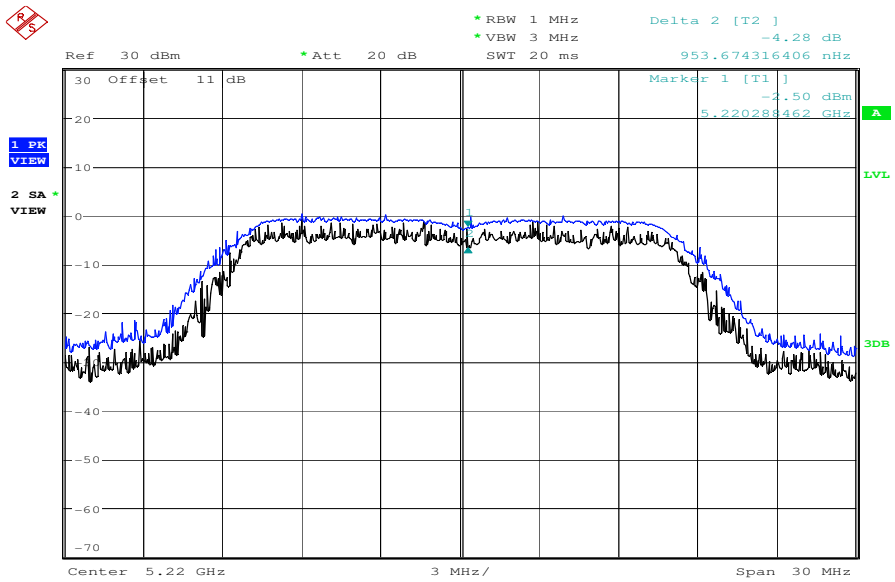
Measured according to the guidelines of the FCC public notice DA 02-2138.

Plot 1: channel 36, 5180 MHz



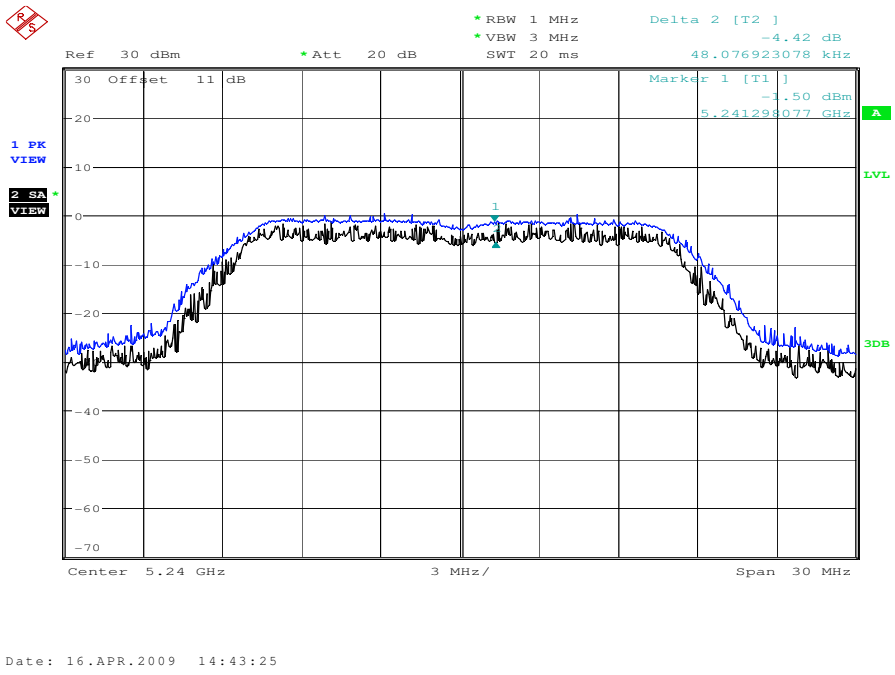
Date: 16.APR.2009 14:47:44

Plot 2: channel 44, 5220 MHz



Date: 16.APR.2009 14:46:18

Plot 3: channel 48, 5240 MHz



Results:

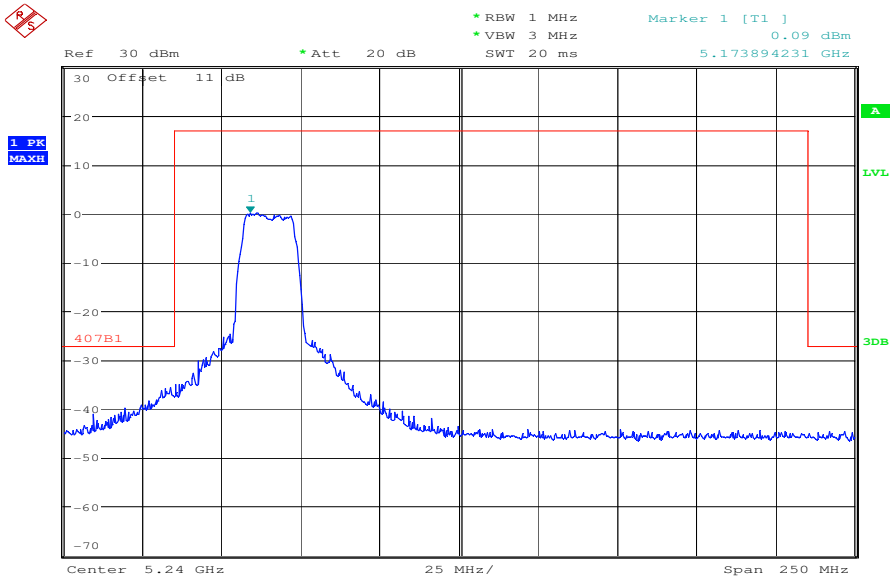
Frequency	Ratio of peak excursion of the modulation envelope		
	Limit	Ratio(dB)	passed/fail
5180 MHz	< 13 dB	5.48	passed
5220 MHz	< 13 dB	4.28	passed
5240 MHz	< 13 dB	4.42	passed
Measurement uncertainty	±1dB		

Limits:

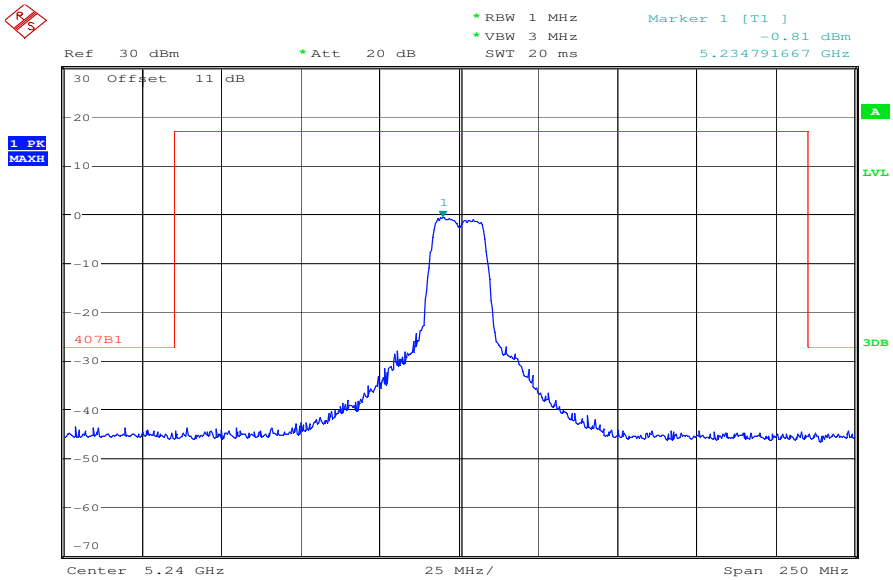
Under normal test conditions only	The ratio of peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

3.8 Undesirable emission limits at band edges 15.407 (b3)

Plot 1: lower band edge



Plot 2: upper band edge

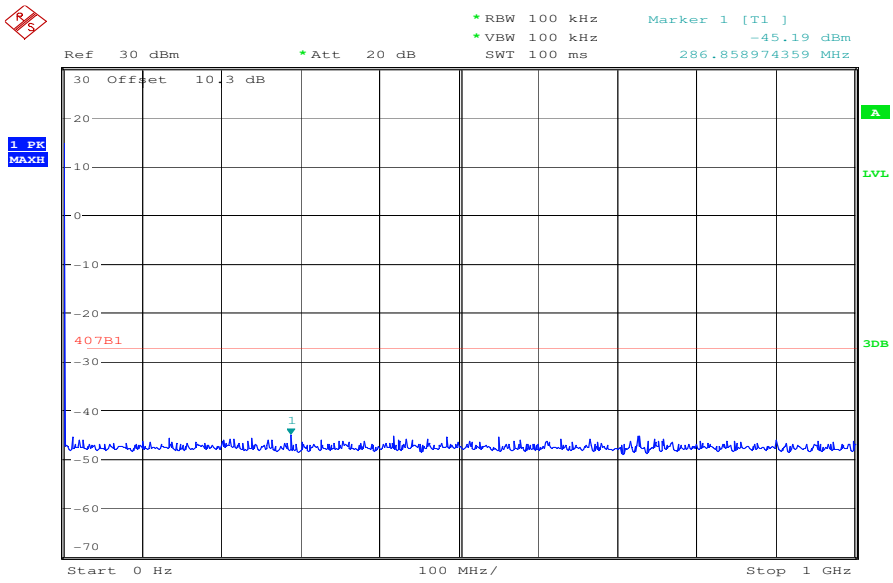


Limits:

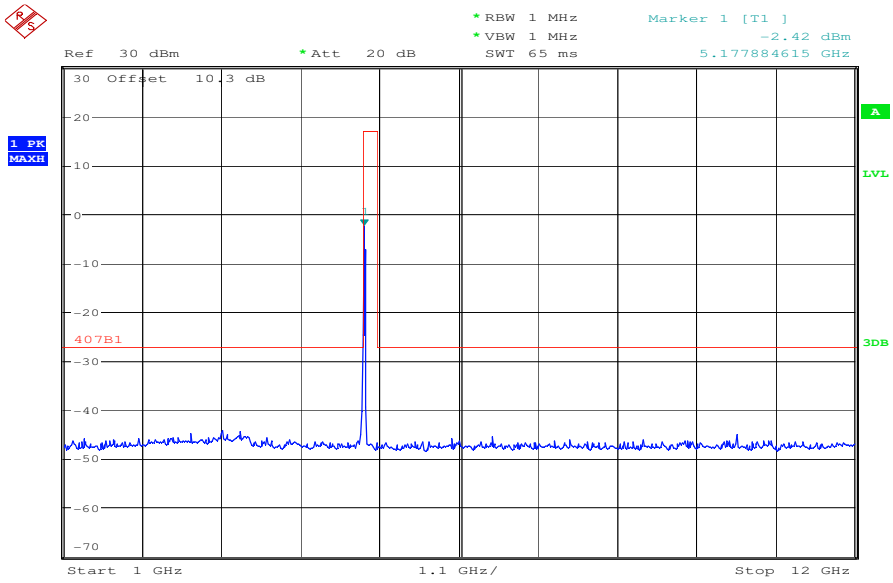
Under normal test conditions only	The ratio of peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

3.9 Spurious emissions (conducted) 15.407 (b3)

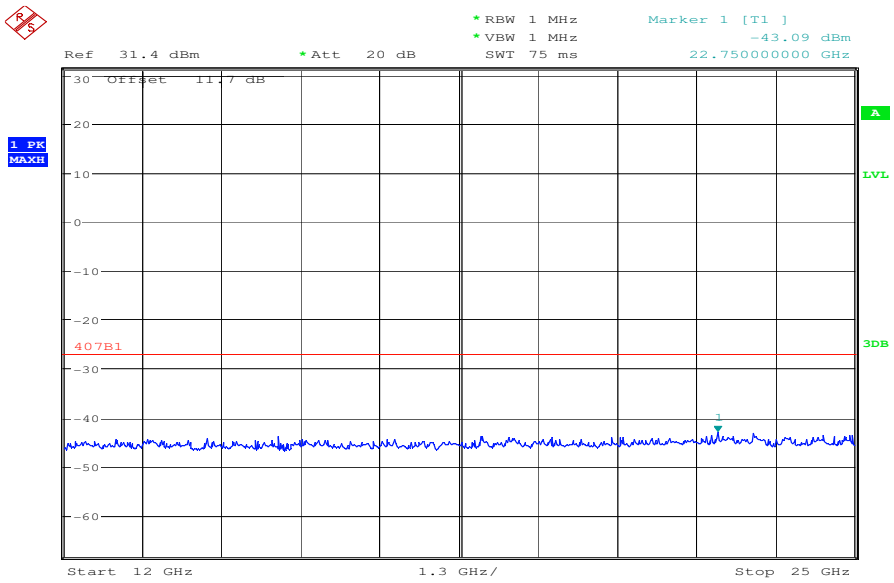
Plot 1: channel 36, 5180 MHz



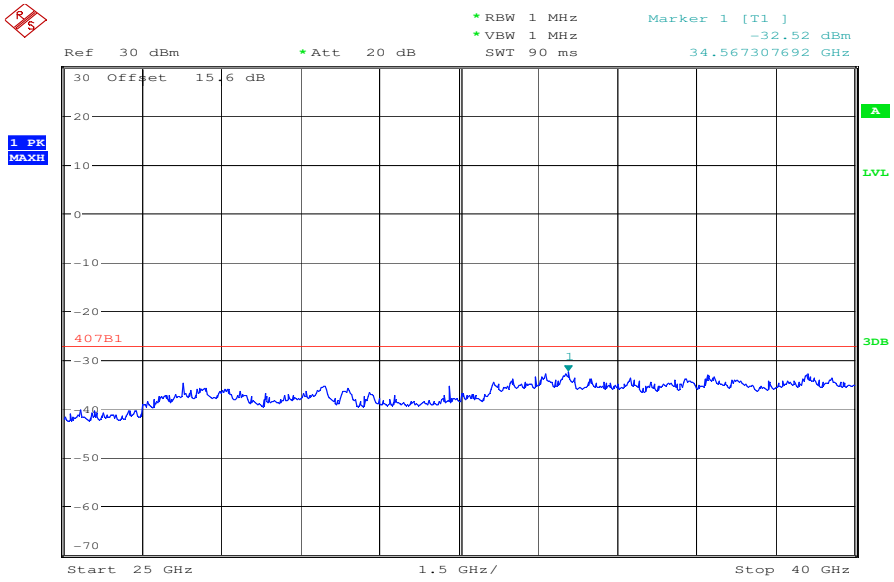
Plot 2: channel 36, 5180 MHz



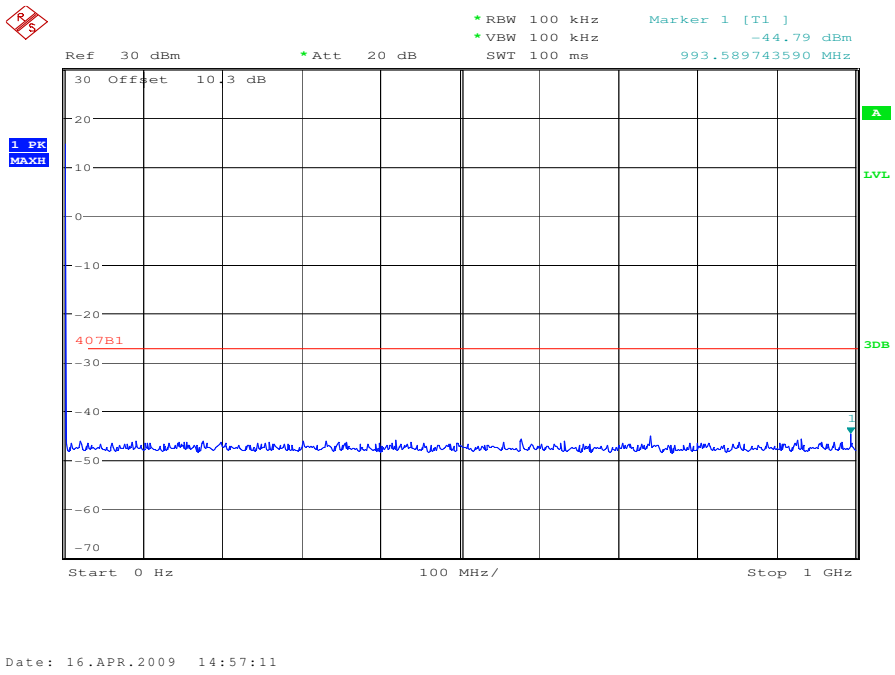
Plot 3: channel 36, 5180 MHz



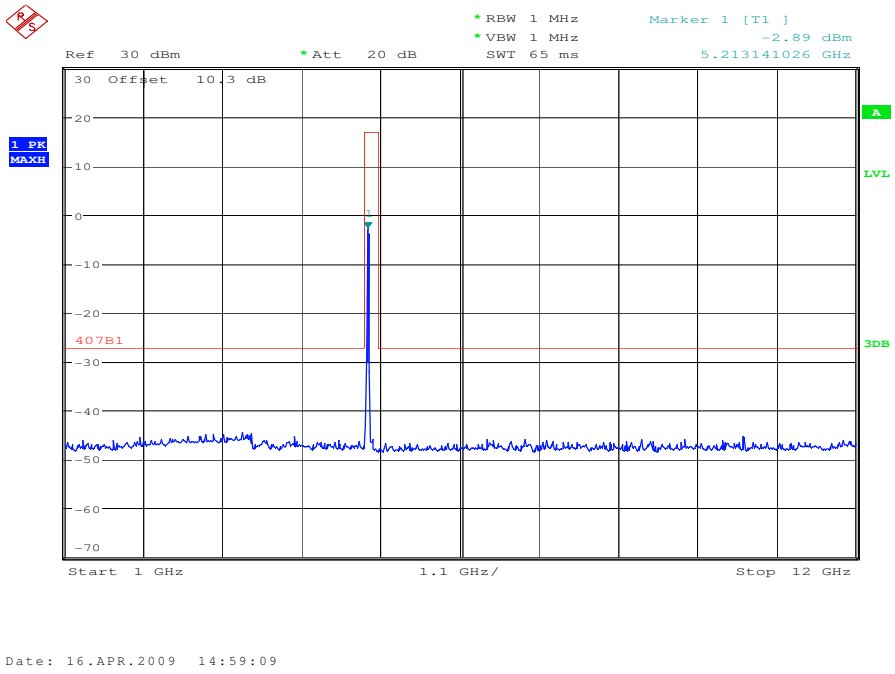
Plot 4: channel 36, 5180 MHz



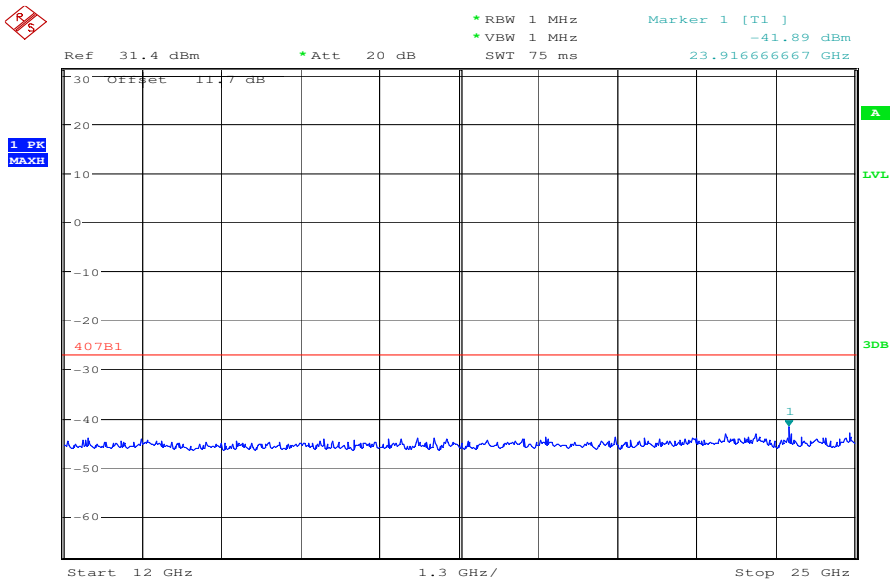
Plot 5: channel 44, 5220 MHz



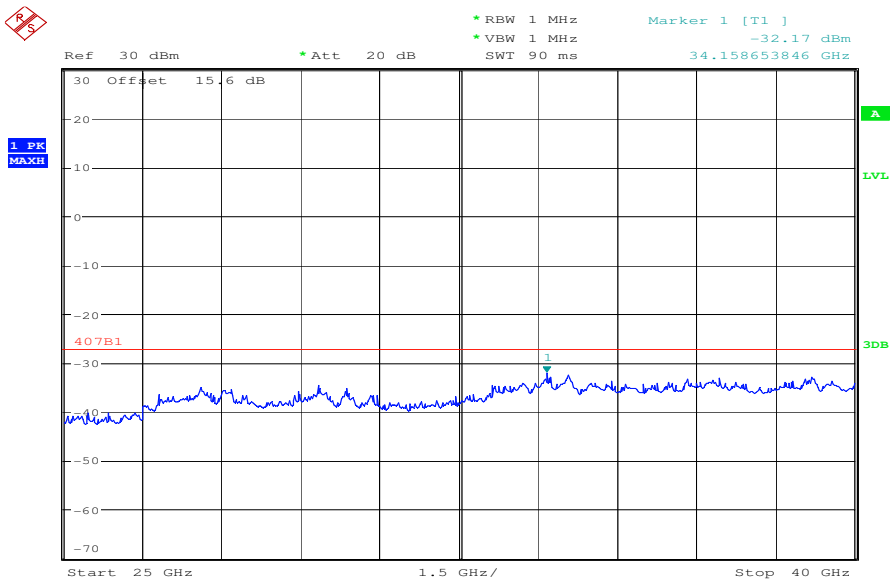
Plot 6: channel 44, 5220 MHz



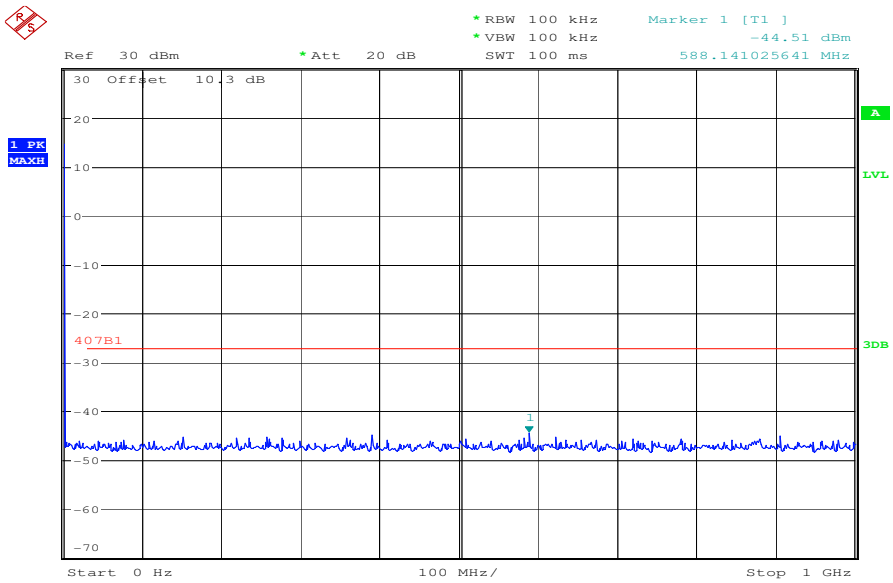
Plot 7: channel 44, 5220 MHz



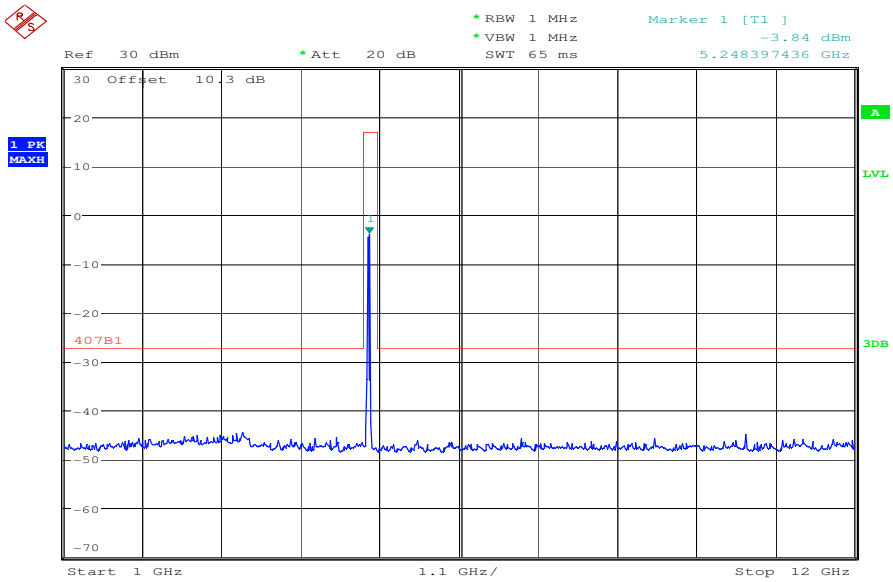
Plot 8: channel 44, 5220 MHz



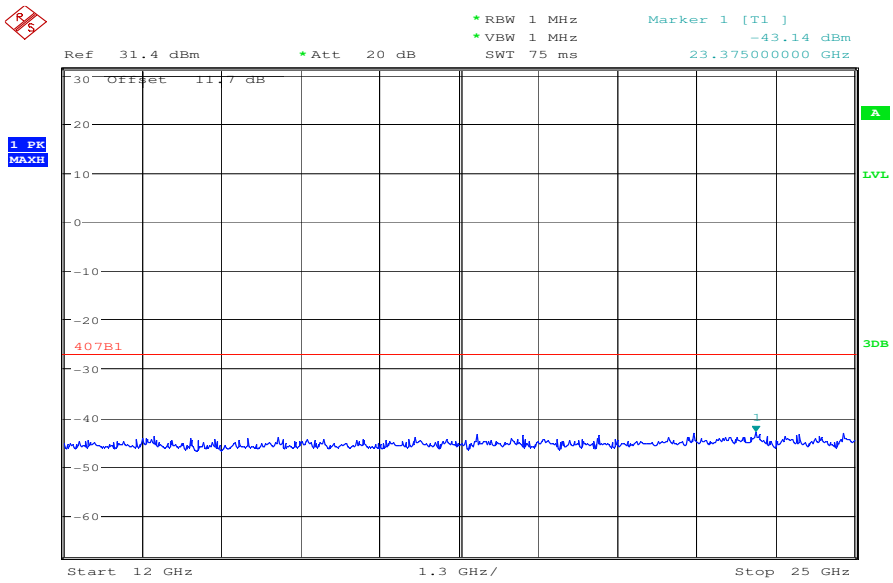
Plot 9: channel 48, 5240 MHz



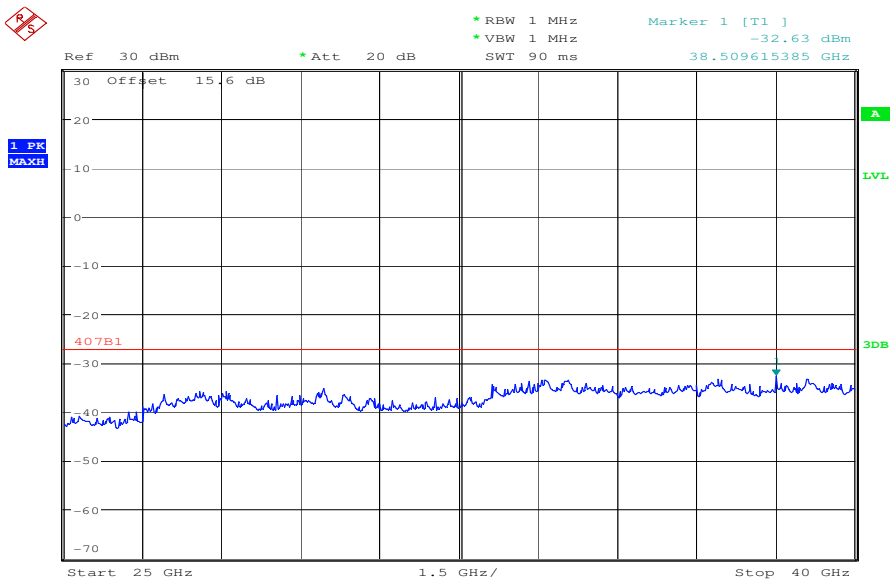
Plot 10: channel 48, 5240 MHz



Plot 11: channel 48, 5240 MHz



Plot 12: channel 48, 5240 MHz



Spurious emissions (conducted)

Result & Limits

Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5180		-2.42	17 dBm		Operating frequency
	No critical peaks detected.				
5220		-2.89	17 dBm		Operating frequency
	No critical peaks detected.				
5240		-3.84	17 dBm		Operating frequency
	No critical peaks detected.				
Measurement uncertainty		± 3dB			

RBW : 100 kHz VBW: 100 kHz ≤ 1 GHz
RBW : 1 MHz VBW: 1 MHz > 1 GHz

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.

3.10 MPE calculation

These equations are generally accurate in the far field of an antenna but will over predict power density in the near field, where they could be used for making a “worst case” prediction.

$$S = PG/4\pi R^2$$

where S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units e.g. mW)
G = power gain of the antenna in the direction of interest relative to the isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units e.g. cm)

Or

$$S = EIRP/4\pi R^2$$

where EIRP = equivalent isotropically radiated power

Calculation:

(Calculated for max. EIRP)

EIRP: 17.71 dBm = 59.02 mW (Peak power)
calculated at distance of 20 cm:

power density = $59.02 / 4\pi 20^2 = 0.0117$ mW/ cm^2

Limit:

1mW/ cm^2 is the reference level for general public exposure according to the OET Bulletin 65, Edition 97-01 Table 1.

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

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		5180 MHz	5220 MHz	5240 MHz
T_{nom}	V_{nom}	17.70	17.57	**17.71**
Measurement uncertainty		±3dB		

Note:

The radiated output power is measured with the following settings:

- Peak detector
- 50 MHz RBW / 30 MHz VBW
- Span 50 MHz
- Max. hold mode

Limits:

for antennas with gain > 6 dBi	reduce the conducted output power by the amount in dB that the directional gain exceeds 6 dBi

3.12 Spurious Emissions - radiated (Transmitter) §15.209

Plot 1: 0.03 - 1 GHz (lowest channel)

Information

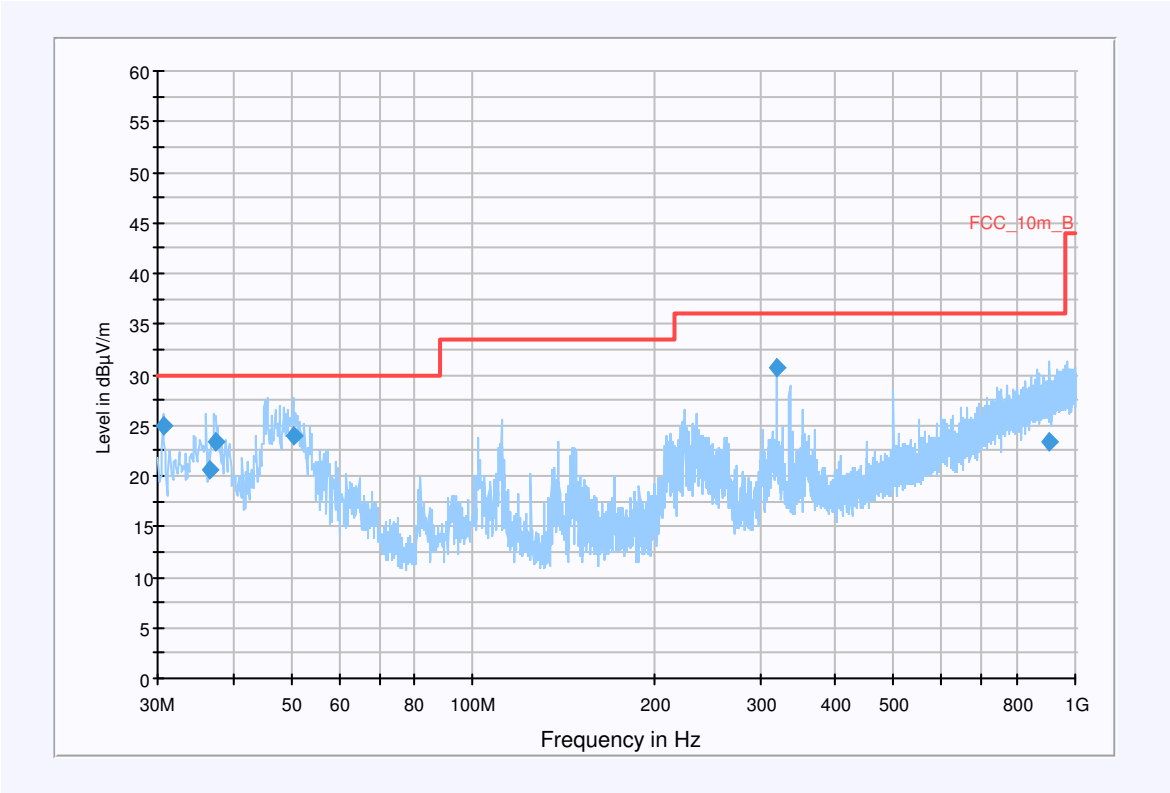
EUT:	SCDw 9000 AP + FRA012-S24-1 + confidea CIV + FRA030E-S15-I
Serial Number:	0x11 + R301212401 + 19 + R33E11501
Test Description:	FCC @ 10 m
Operating Conditions:	Transmit bottom frequency (5180 MHz)
Operator Name:	Folz
Comment:	Powered with AC 115V/ 60 Hz

Scan Setup: FCC_Fin [EMI radiated]

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

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

FCC_10m(B)_4



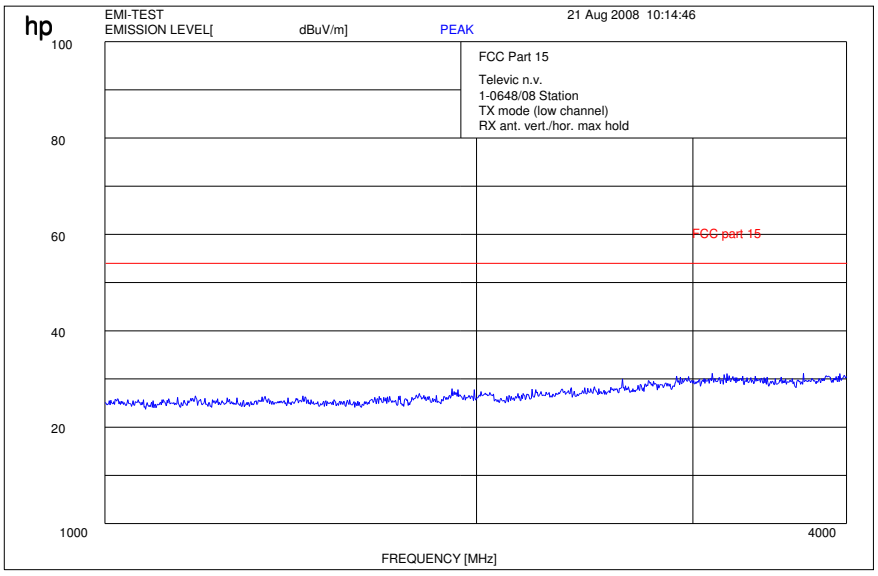
Final Measurement Detector 1

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
30.623200	24.9	15000.000	120.000	100.0	V	233.0	12.7	5.1	30.0	
36.620850	20.7	15000.000	120.000	100.0	V	137.0	13.3	9.3	30.0	
37.533450	23.3	15000.000	120.000	172.0	V	87.0	13.4	6.7	30.0	
50.387550	23.9	15000.000	120.000	100.0	V	35.0	13.6	6.1	30.0	
319.467600	30.6	15000.000	120.000	100.0	V	280.0	15.3	5.4	36.0	
903.757950	23.3	15000.000	120.000	123.0	H	43.0	26.1	12.7	36.0	

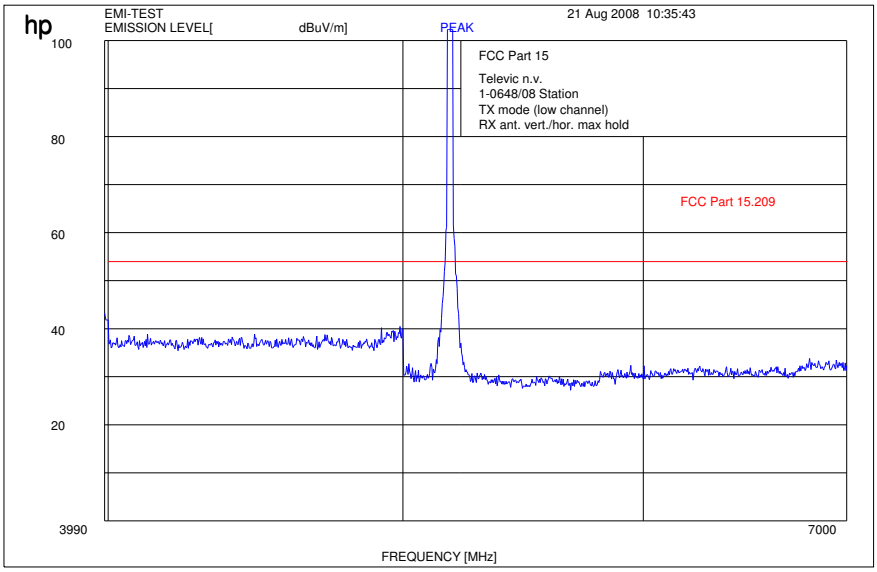
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

	Subrange 1
Frequency Range:	30MHz - 2GHz
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 (0408)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

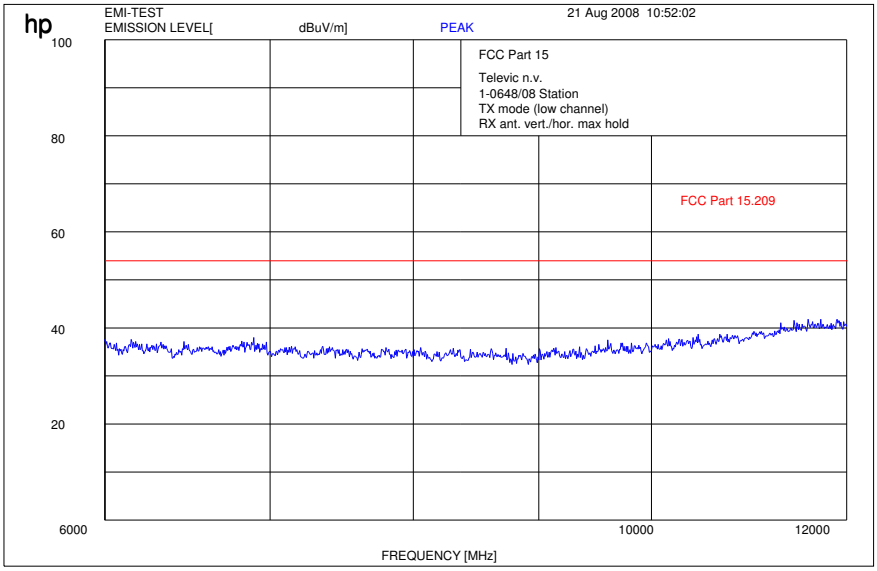
Plot 2: 1 GHz - 4 GHz (lowest channel)



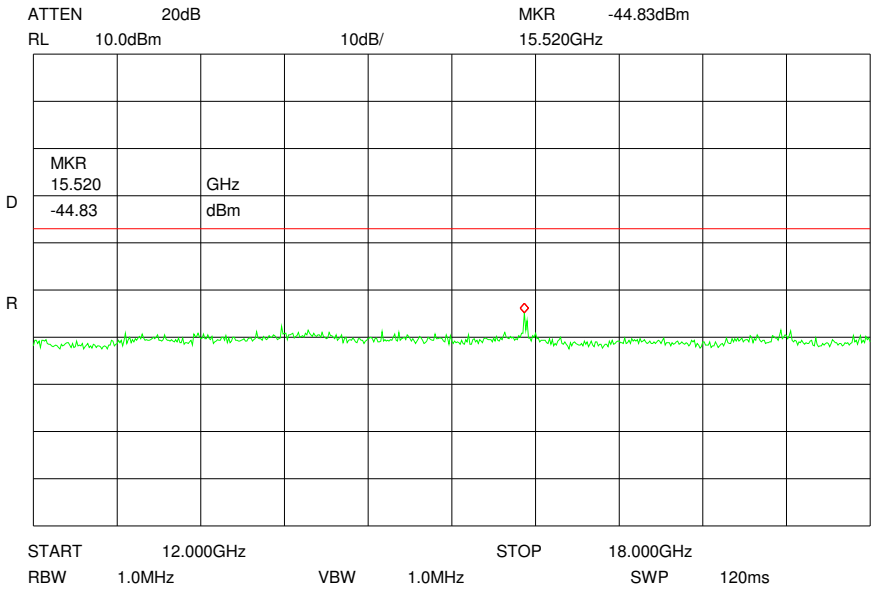
Plot 3: 4 GHz – 7 GHz (lowest channel)



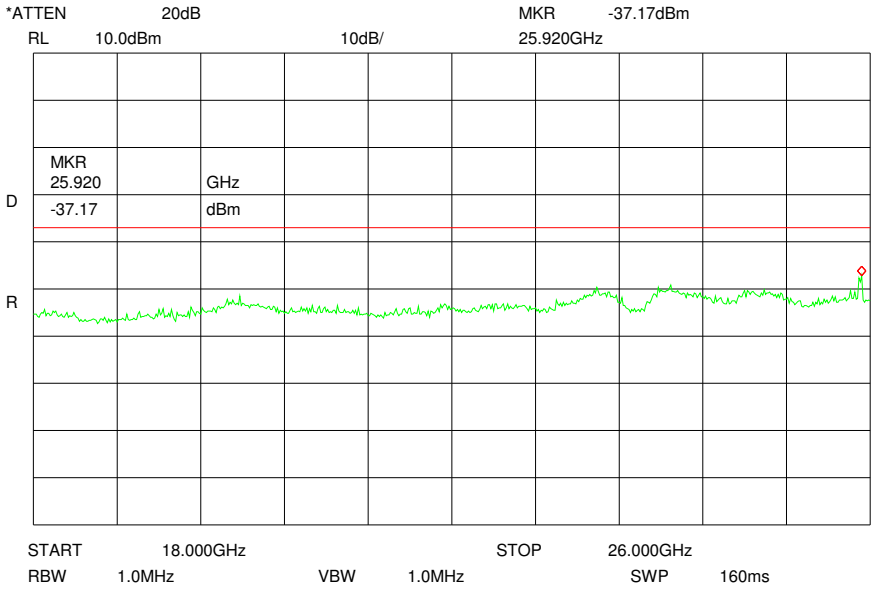
Plot 4: 6 GHz – 12 GHz (lowest channel)



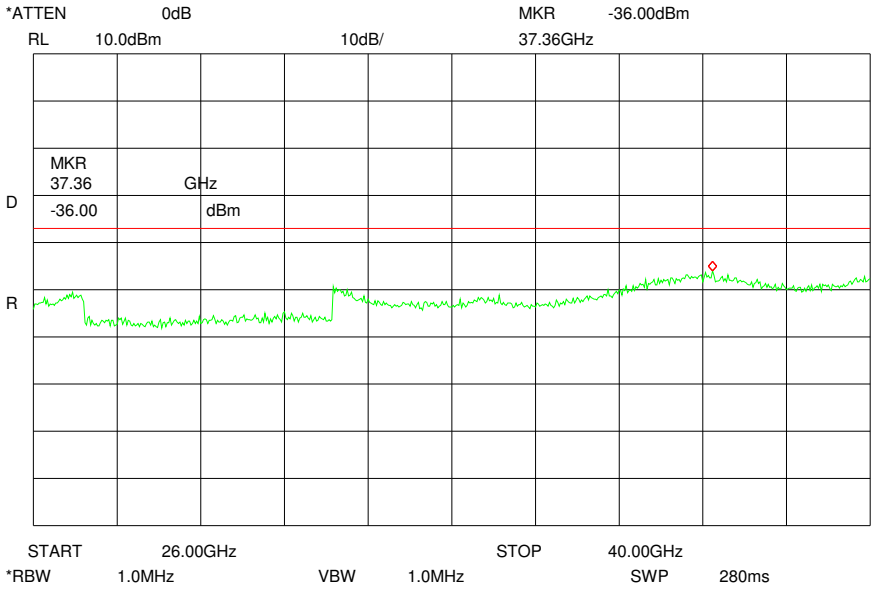
Plot 5: 12 - 18 GHz (valid for all three channels)



Plot 6: 18 - 26 GHz (valid for all three channels)



Plot 7: 26 - 40 GHz (valid for all three channels)



Plot 8: 30 MHz to 1 GHz (middle channel)

Information

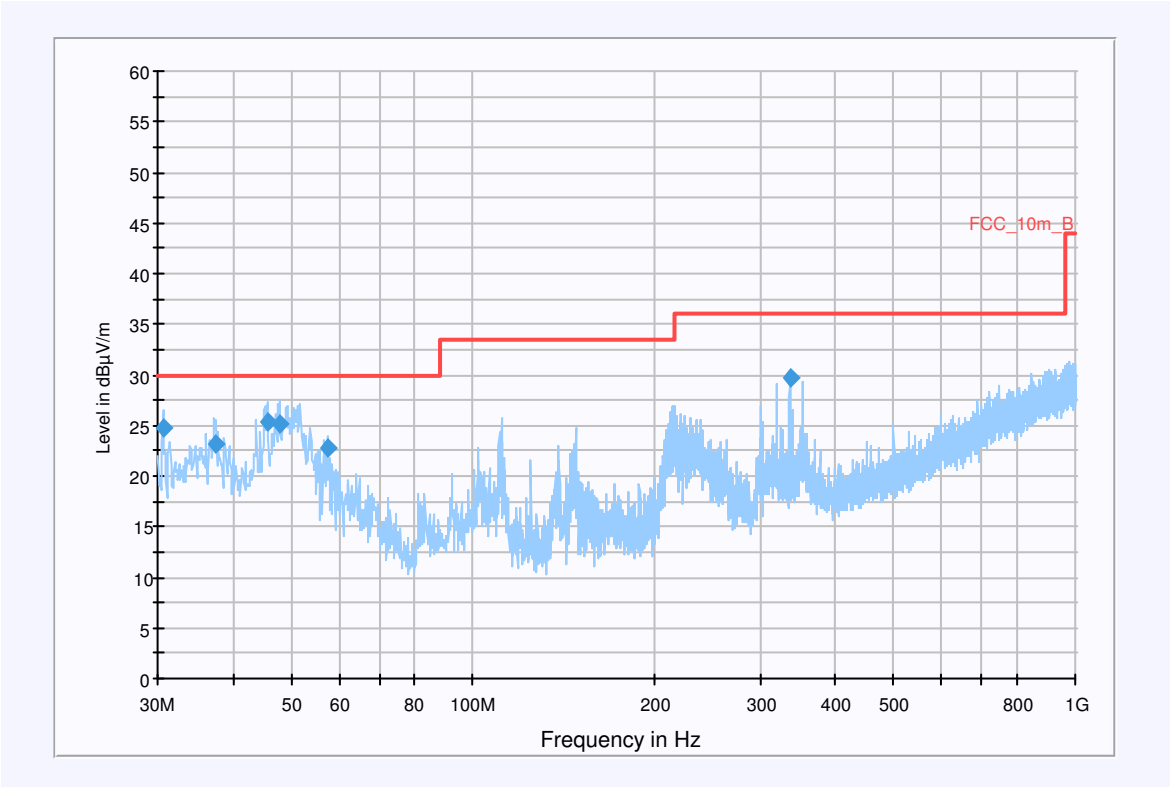
EUT:	SCDw 9000 AP + FRA012-S24-1 + confidea CIV + FRA030E-S15-I
Serial Number:	0x11 + R301212401 + 19 + R33E11501
Test Description:	FCC @ 10 m
Operating Conditions:	Transmit mid frequency (5220 MHz)
Operator Name:	Folz
Comment:	Powered with AC 115V/ 60 Hz

Scan Setup: FCC_Fin [EMI radiated]

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

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

FCC_10m(B)_4



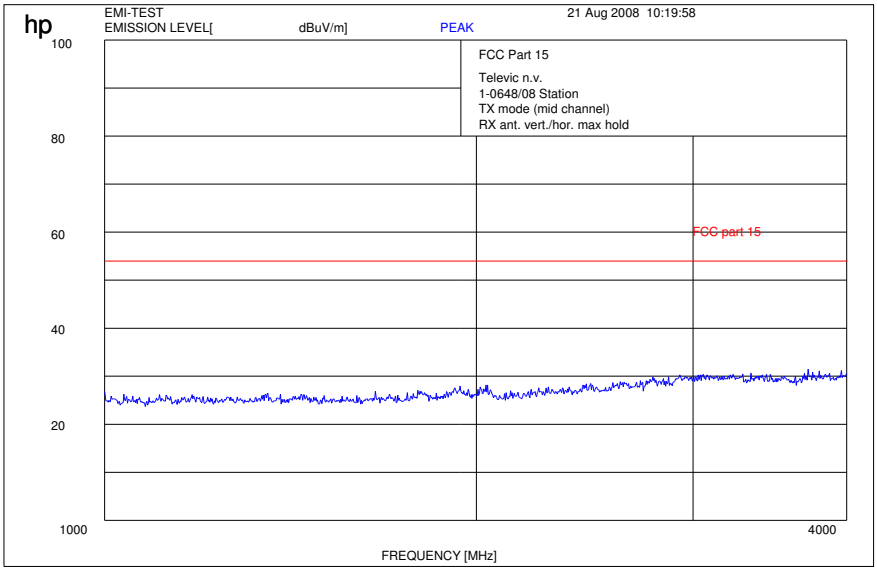
Final Measurement Detector 1

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
30.633550	24.7	15000.000	120.000	100.0	V	14.0	12.7	5.3	30.0	
37.527900	23.2	15000.000	120.000	115.0	V	295.0	13.4	6.8	30.0	
45.726150	25.3	15000.000	120.000	100.0	V	161.0	13.5	4.7	30.0	
47.774700	25.1	15000.000	120.000	100.0	V	225.0	13.6	4.9	30.0	
57.442400	22.8	15000.000	120.000	100.0	V	233.0	12.5	7.2	30.0	
335.878950	29.8	15000.000	120.000	100.0	V	262.0	15.8	6.2	36.0	

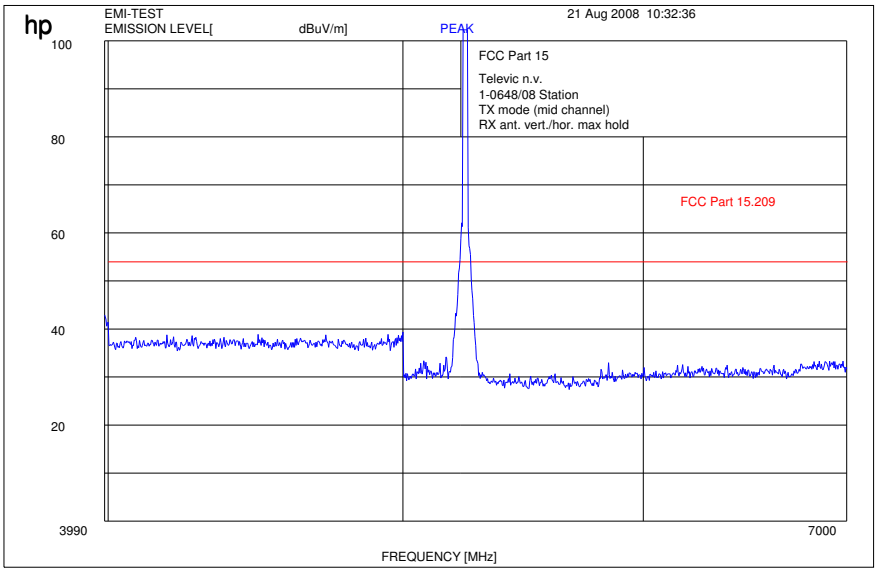
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

	Subrange 1
Frequency Range:	30MHz - 2GHz
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 (0408)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

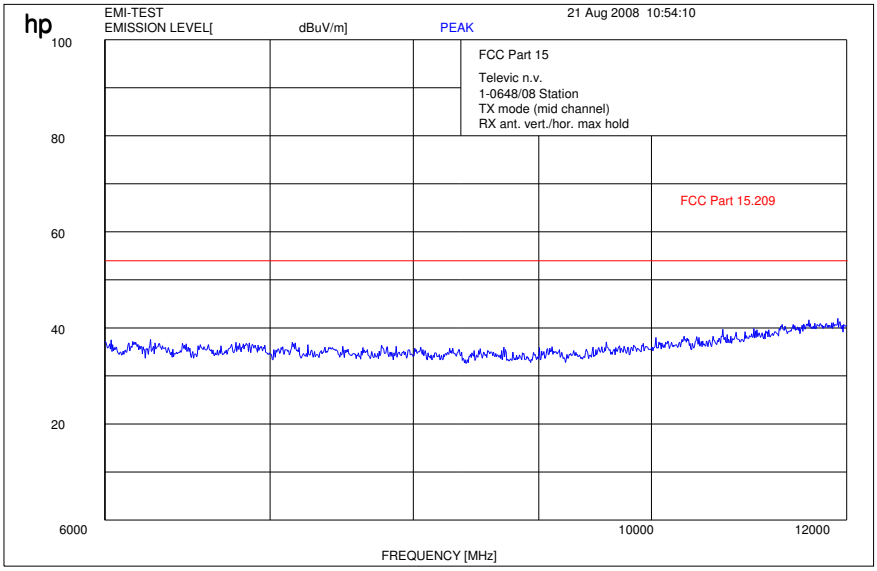
Plot 9: 1 GHz to 4 GHz (middle channel)



Plot 10: 4 GHz to 7 GHz (middle channel)



Plot 11: 6 GHz to 12 GHz (middle channel)



Plot 12: 30 MHz to 1 GHz (highest channel)

Information

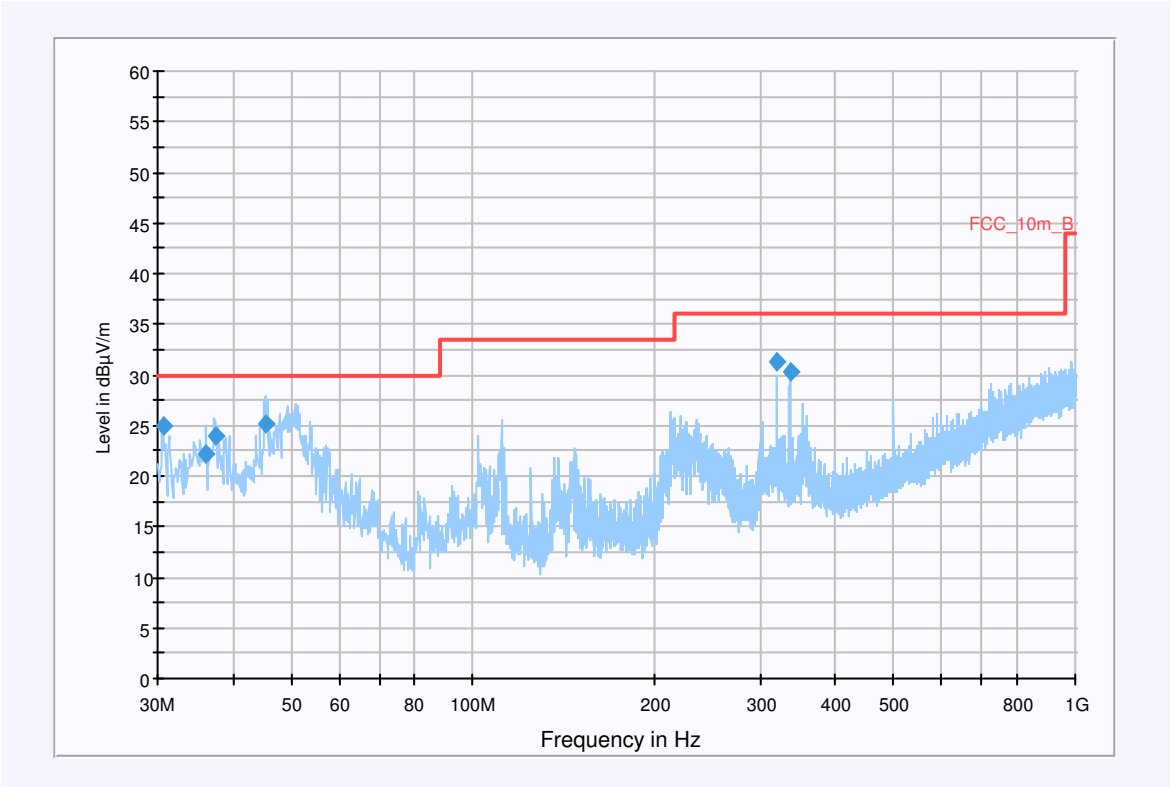
EUT:	SCDw 9000 AP + FRA012-S24-1 + confidea CIV + FRA030E-S15-I
Serial Number:	0x11 + R301212401 + 19 + R33E11501
Test Description:	FCC @ 10 m
Operating Conditions:	Transmit top frequency (5240 MHz)
Operator Name:	Folz
Comment:	Powered with AC 115V/ 60 Hz

Scan Setup: FCC_Fin [EMI radiated]

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

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

FCC_10m(B)_4



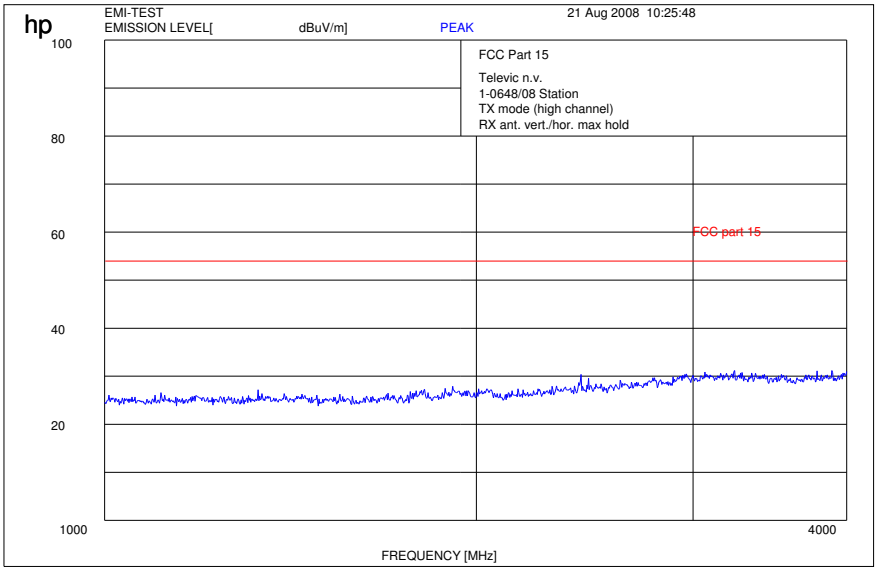
Final Measurement Detector 1

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
30.602200	25.0	15000.000	120.000	100.0	V	189.0	12.7	5.0	30.0	
36.142800	22.1	15000.000	120.000	114.0	V	0.0	13.3	7.9	30.0	
37.550550	24.0	15000.000	120.000	100.0	V	120.0	13.4	6.0	30.0	
45.283200	25.1	15000.000	120.000	115.0	V	50.0	13.5	4.9	30.0	
319.478850	31.4	15000.000	120.000	100.0	V	273.0	15.3	4.6	36.0	
335.879550	30.3	15000.000	120.000	100.0	V	261.0	15.8	5.7	36.0	

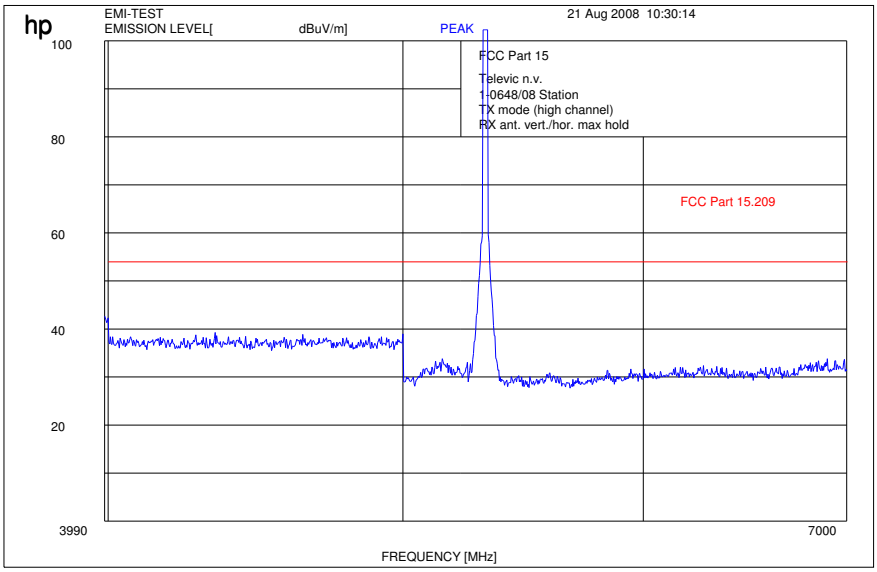
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30MHz - 2GHz
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 (0408)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

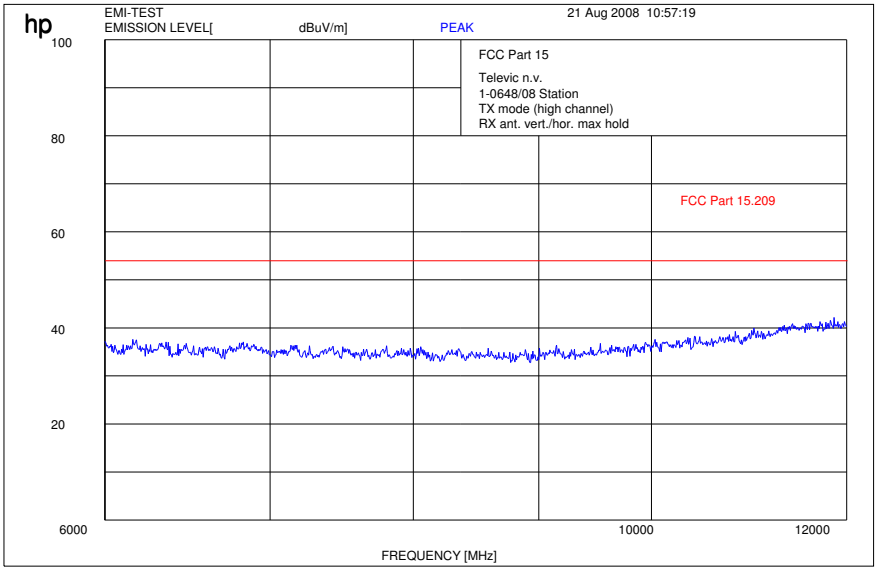
Plot 13: 1 GHz to 4 GHz (highest channel)



Plot 14: 4 GHz to 7 GHz (highest channel)



Plot 15: 6 GHz to 12 GHz (highest channel)



Results:

Spurious Emissisons level [µV/m]								
Channel 36			Channel 44			Channel 48		
f[MHz]	Detector	Level [µV/m]	f[MHz]	Detector	Level [µV/m]	f[MHz]	Detector	Level [µV/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
see above plots

Limits :

Under normal test conditions only	See plots

3.13 Spurious emissions radiated (RX) § 15.209

Plot 1: 30 to 1000 MHz

Information

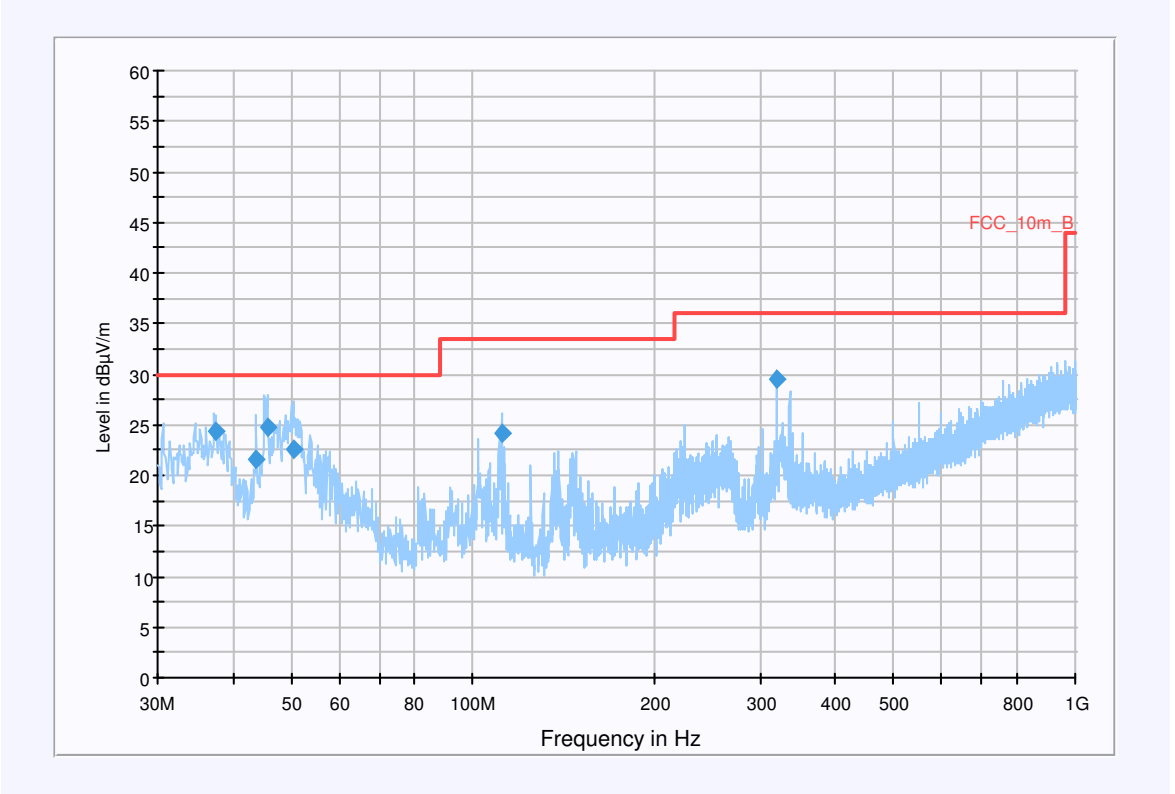
EUT:	SCDw 9000 AP + FRA012-S24-1 + confidea CIV + FRA030E-S15-I
Serial Number:	0x11 + R301212401 + 19 + R33E11501
Test Description:	FCC @ 10 m
Operating Conditions:	Receive (5GHz)
Operator Name:	Folz
Comment:	Powered with AC 115V/ 60 Hz

Scan Setup: FCC_Fin [EMI radiated]

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

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

FCC_10m(B)_4



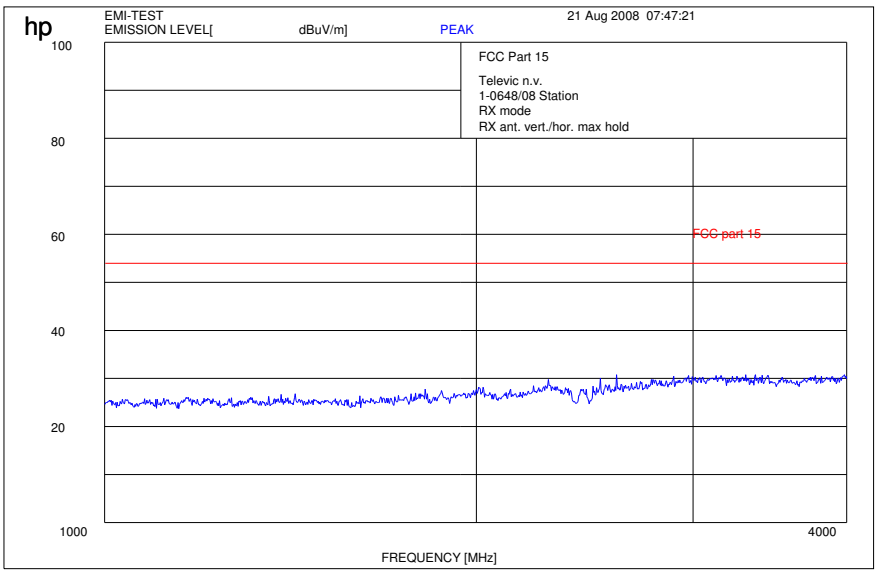
Final Measurement Detector 1

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
37.527150	24.5	15000.000	120.000	100.0	V	88.0	13.4	5.5	30.0	
43.799500	21.6	15000.000	120.000	100.0	V	155.0	13.5	8.4	30.0	
45.740050	24.8	15000.000	120.000	115.0	V	174.0	13.5	5.2	30.0	
50.348700	22.5	15000.000	120.000	100.0	V	131.0	13.6	7.5	30.0	
111.579500	24.2	15000.000	120.000	115.0	V	84.0	11.3	9.3	33.5	
319.481550	29.5	15000.000	120.000	123.0	V	276.0	15.3	6.5	36.0	

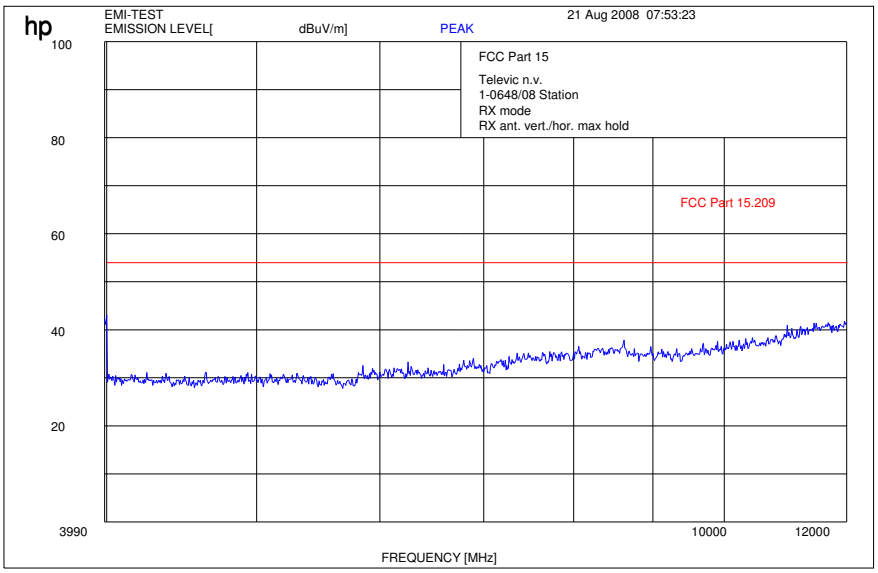
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30MHz - 2GHz
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 (0408)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

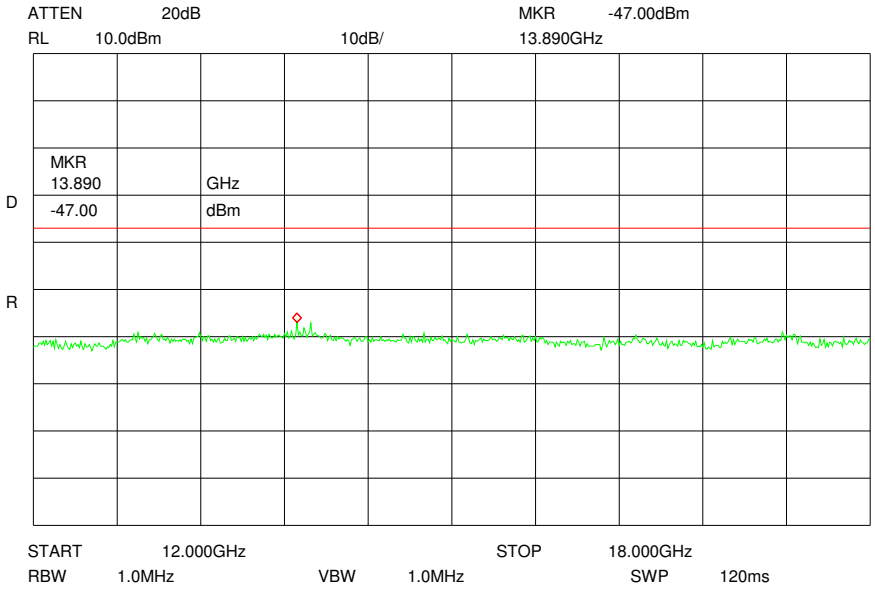
Plot 2: 1 GHz to 4 GHz



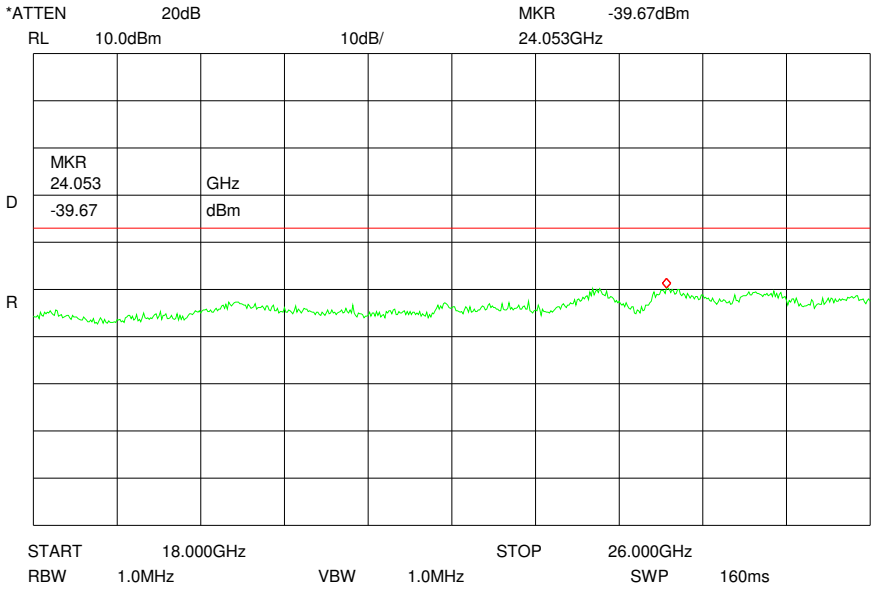
Plot 3: 4 GHz to 12 GHz



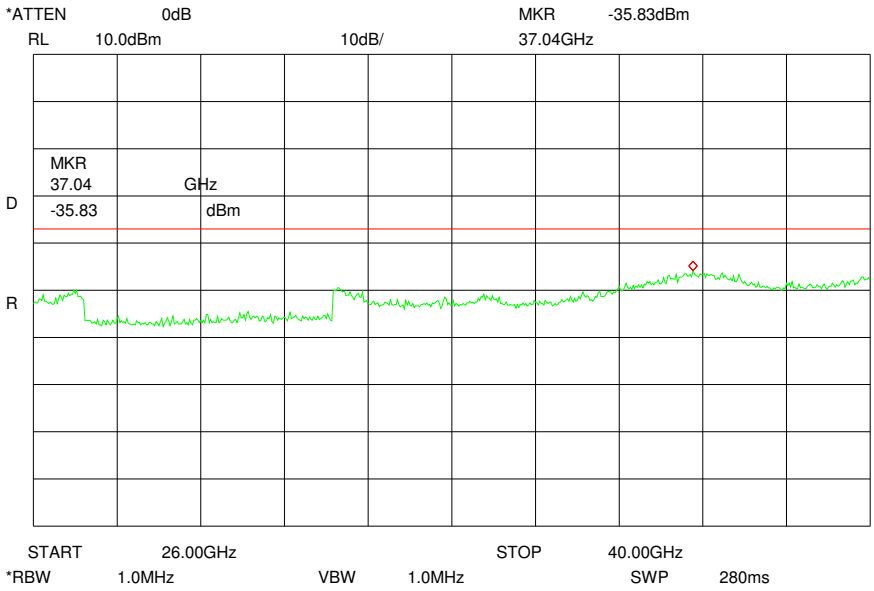
Plot 4: 12 GHz to 18 GHz



Plot 5: 18 GHz to 26 GHz



Plot 6: 26 GHz to 40GHz



Results:

Spurious Emissions level [µV/m]								
RX / Idle mode			--			--		
f[MHz]	Detector	Level [µV/m]	f[MHz]	Detector	Level [µV/m]	f[MHz]	Detector	Level [µV/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

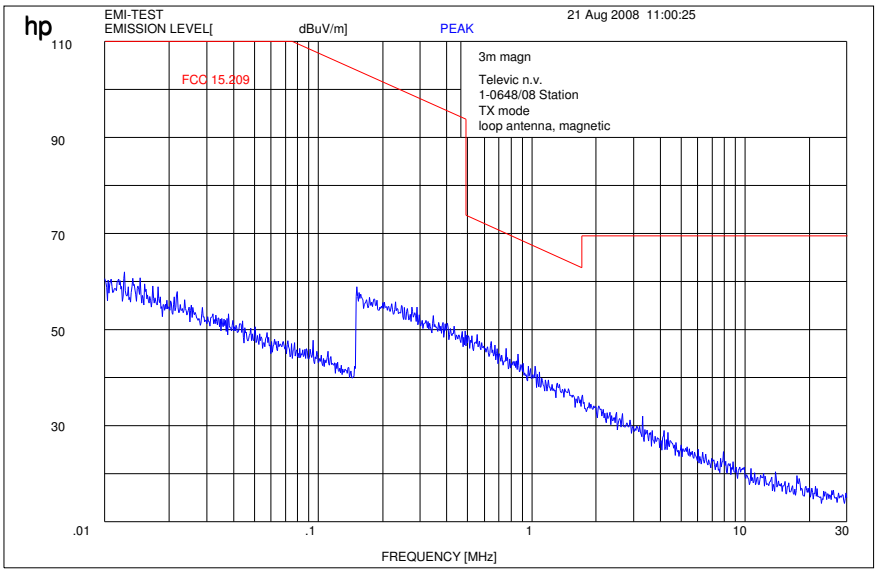
Limits :

Under normal test conditions only	See plots

3.14 Spurious Emissions - radiated <30 MHz (valid for all antenna types) §15.109

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

Plot 1:

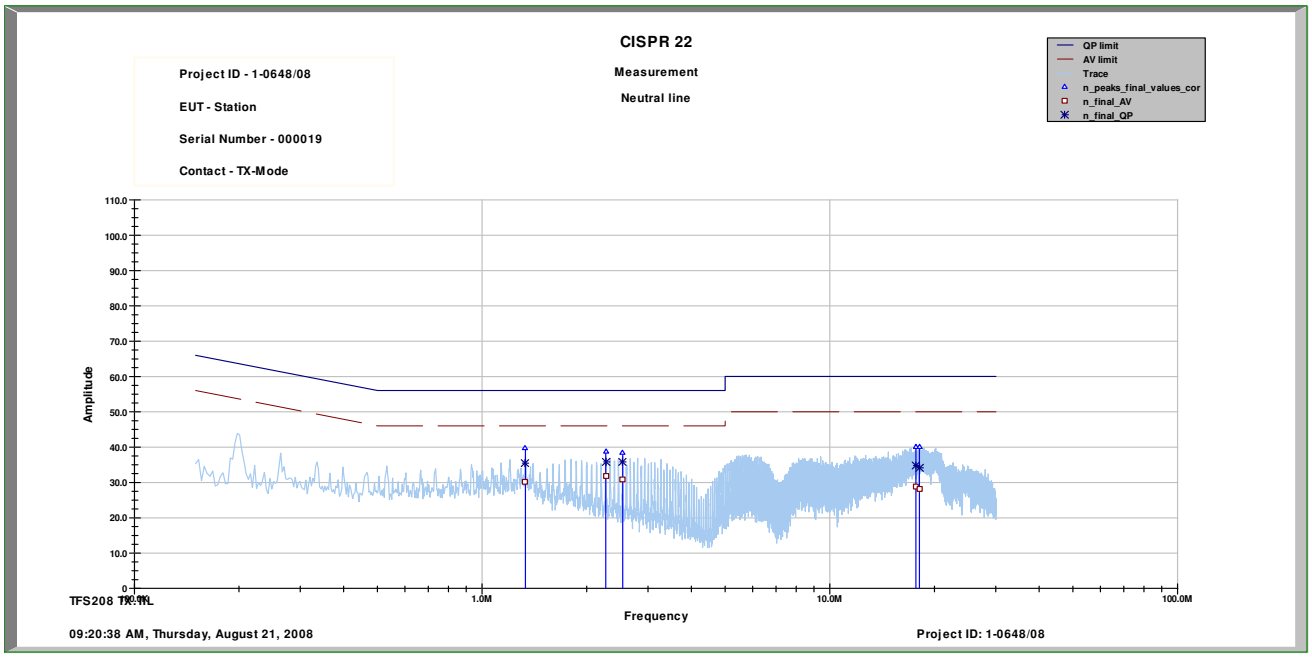


Limits:

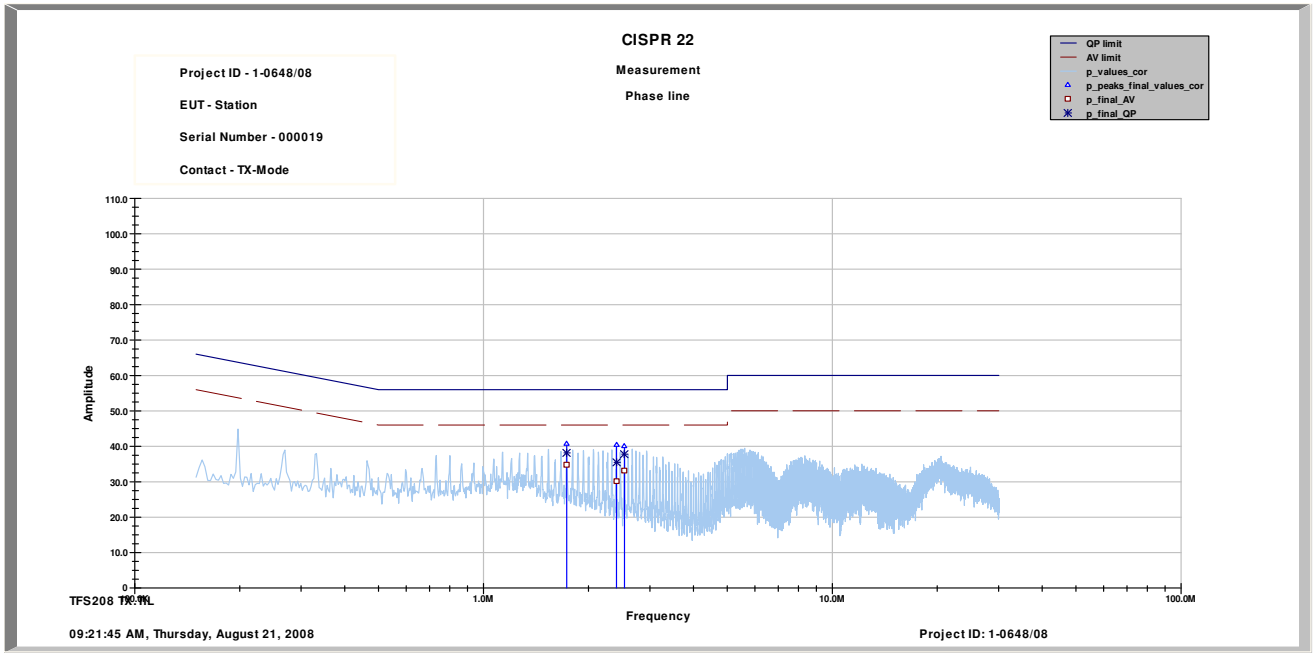
Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dBµV/m	30
30 - 88	100 / 40 dBµV/m	3
88 - 216	150 / 43.5 dBµV/m	3
216 - 960	200 / 46 dBµV/m	3
above 960	54 dBµV/m	3

3.15 Conducted Emissions <30 MHz §15.107/207

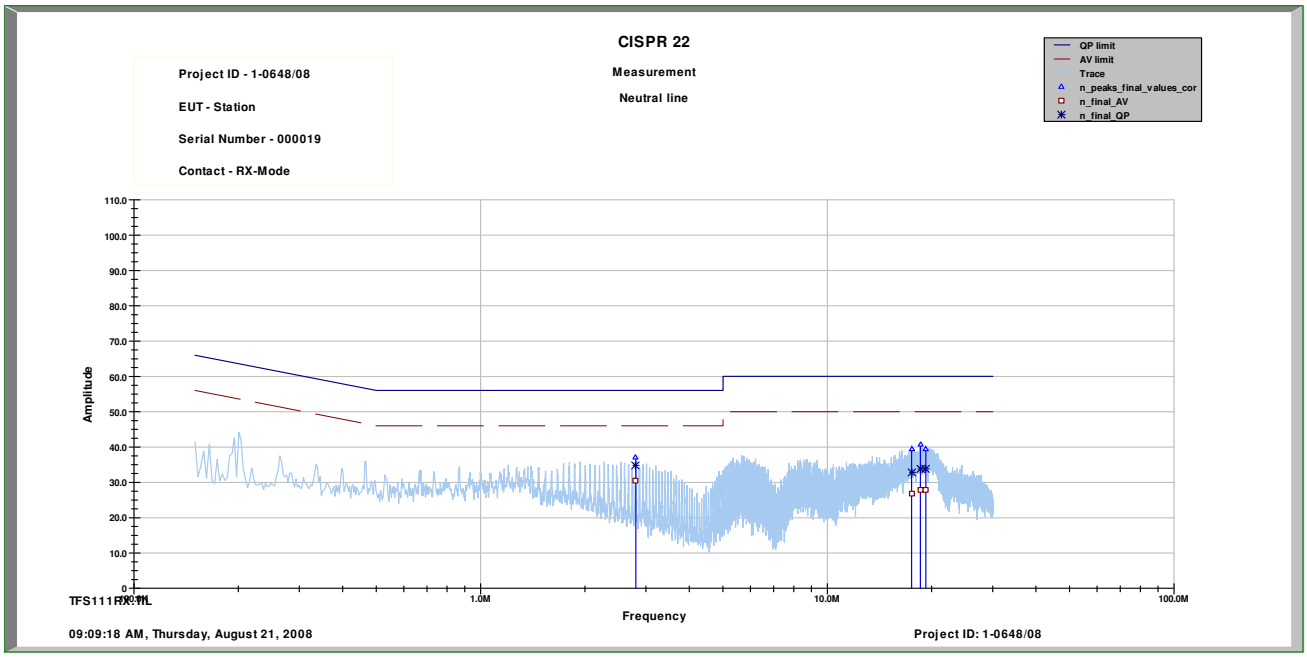
Plot 1: Neutral line TX mode



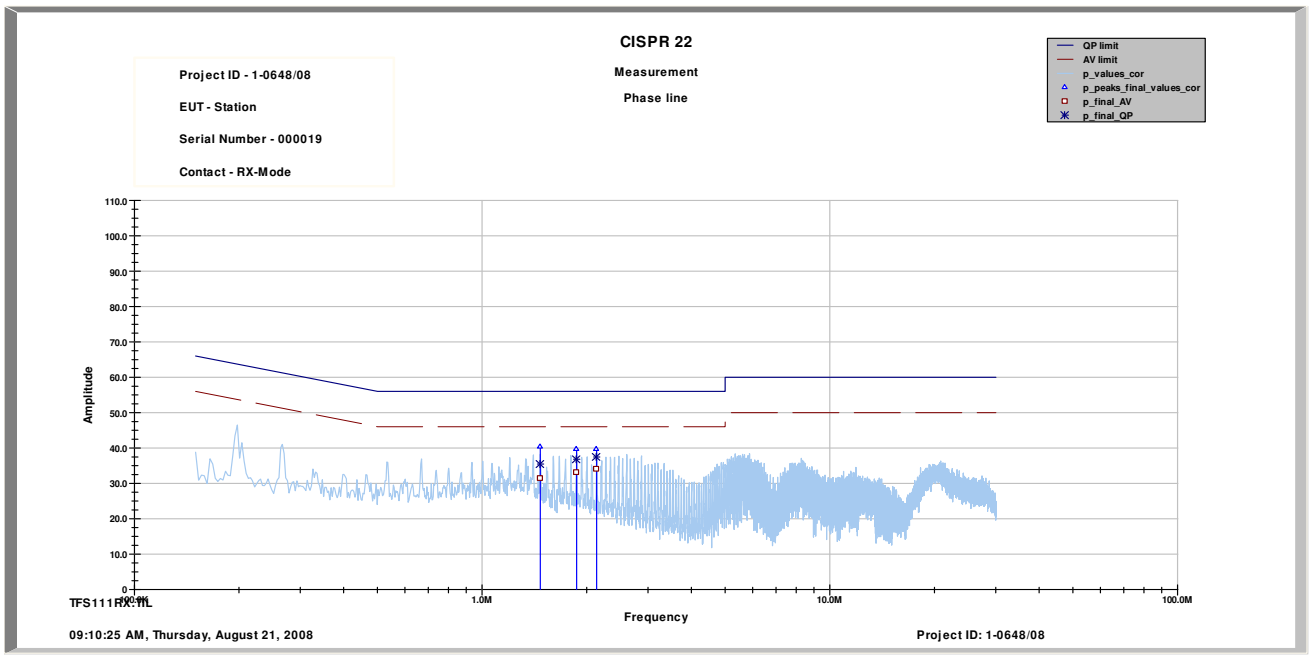
Plot 2: Phase line TX mode



Plot 3: Neutral line RX mode



Plot 4: Phase line RX mode



Limits:

Under normal test conditions only	See plots

3.16 Test equipment

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	2747A05306	300001000	05.10.2006	24	05.10.2008
5	Spektrum Analyzer Display 85662A	HP	2816A16541	300002297	05.10.2006	24	05.10.2008
6	Quasi-Peak-Adapter 85650A	HP	2811A01131	300000999	05.10.2006	24	05.10.2008
7	RF-Preselector 85685A	HP	2837A00779	300000218	08.11.2006	24	08.11.2008
8	PC Vectra VL	HP		300001688	n.a.		
9	Software EMI	HP		300000983	n.a.		
10	Measurement System 2						
11	FSP 30	R&S	100623	ICT 300003464	05.10.2007	24	15.10.2009
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		300003575	02.04.2007	24	02.04.2009
2	CBT	R&S	100313	300003516	24.10.2006	24	24.10.2008
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

Signalling Units:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	CBT	R&S	100313	300003516	24.10.2006	24	24.10.2008
2	CBT	R&S	100185	300003416	21.02.2006	24	21.02.2008
3	CMU-200	R&S	103992	300003231	27.04.2007	12	27.04.2008
4	CMU-200	R&S	106240	300003321	02.05.2006	24	02.05.2008
5	CMU-200	R&S	832221/0055	300002862	20.03.2008	24	20.03.2010

Climatic Box:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Climatic box VT 4002	Heraeus Vötsch	58566046820010	300003019	11.05.2007	24	11.05.2009
2	Climatic box CTS T-40/50	CTS	064023	300003540	03.01.2007	24	03.01.2009

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	3000002681-00xx	n.a.		
2	Memory Extension PSM-K10	R&S	To 1	3000002681	n.a.		
3	Operating Software PSM-B2	R&S	To 1	3000002681	n.a.		
4	19'' Monitor		22759020-ED	3000002681	n.a.		
5	Mouse		LZE 0095/6639	3000002681	n.a.		
6	Keyboard		G00013834L461	3000002681	n.a.		
7	Spectrum Analyser FSIQ 26	R&S	835540/018	3000002681-0005	01.08.2006	24	01.08.2008
8	Tracking Generator FSIQ-B10	R&S	835107/015	3000002681	s.No.7		
10	RF-Generator SMIQ03 (B1 Signal)	R&S	835541/056	3000002681-0002	01.08.2006	36	01.08.2009
11	Modulation Coder SMIQ-B20	R&S	To 10	3000002681	s.No.10		
12	Data Generator SMIQ-B11	R&S	To 10	3000002681	s.No.10		
13	RF Rear Connection SMIQ-B19	R&S	To 10	3000002681	s.No.10		
14	Fast CPU SM-B50	R&S	To 10	3000002681	s.No.10		
15	FM Modulator SM-B5	R&S	835676/033	3000002681	s.No.10		
16	RF-Generator SMIQ03 (B2 Signal)	R&S	835541/055	3000002681-0001	01.08.2006	36	01.08.2009
17	Modulation Coder SMIQ-B20	R&S	To 16	3000002681	s.No.16		
18	Data Generator SMIQ-B11	R&S	To 16	3000002681	s.No.16		
19	RF Rear Connection SMIQ-B19	R&S	To 16	3000002681	s.No.16		
20	Fast CPU SM-B50	R&S	To 16	3000002681	s.No.16		
21	FM Modulator SM-B5	R&S	836061/022	3000002681	s.No.16		
22	RF-Generator SMP03 (B3 Signal)	R&S	835133/011	3000002681-0003	01.08.2006	36	01.08.2009
23	Attenuator SMP-B15	R&S	835136/014	3000002681	S.No.22		
24	RF Rear Connection SMP-B19	R&S	834745/007	3000002681	S.No.22		
25	Power Meter NRVD	R&S	835430/044	3000002681-0004	01.08.2006	24	01.08.2008
26	Power Sensor NRVD-Z1	R&S	833894/012	3000002681-0013	01.08.2006	24	01.08.2008
27	Power Sensor NRVD-Z1	R&S	833894/011	3000002681-0010	01.08.2006	24	01.08.2008
28	Rubidium Standard RUB	R&S		3000002681-0009	01.08.2006	24	01.08.2008

29	Switching and Signal Conditioning Unit SSCU	R&S	338864/003	3000002681-0006	01.08.2006	24	01.08.2008
30	Laser Printer HP Deskjet 2100	HP	N/A	3000002681-0011	n.a.		
31	19'' Rack	R&S	11138363000004	3000002681	n.a.		
32	RF-cable set	R&S	N/A	3000002681	n.a.		
33	IEEE-cables	R&S	N/A	3000002681	n.a.		
34	Sampling System FSIQ-B70	R&S	835355/009	3000002681	s.No.7		
35	RSP programmable attenuator	R&S	834500/010	3000002681-0007	01.08.2006	24	01.08.2008
36	Signalling Unit	R&S	838312/011	3000002681	n.a.		
37	NGPE programmable Power Supply for EUT	R&S	192.033.41	3000002681			
39	Power Splitter 6005-3	Inmet Corp.	none	300002841	23.12.2006	24	23.12.2008
40	SMA Cables SPS-1151-985-SPS	Insulated Wire	different	different	n.a.		
41	CBT32 with EDR Signalling Unit	R&S					
42	Coupling unit	Narda	N/A	--	n.a.		
43	2xSwitch Matrix PSU	R&S	872584/021	300001329	n.a.		
44	RF-cable set	R&S	N/A	different	n.a.		
45	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	08.11.2006	24	08.11.2008
2	Spektrum Analyzer Display 85662A	HP	2816A16497	300001690	08.11.2006	24	08.11.2008
3	Quasi-Peak-Adapter 85650A	HP	2811A01135	300000216	08.11.2006	24	08.11.2008
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

SRD Laboratory Room 011:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	NRP Power Meter	R&S	100212	300003780	27.02.2008	24	27.02.2010

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	9163-295	-/-	-/-	30.04.2008	24	30.04.2010
3	Amplifier - 0518C-138	Veritech Micro-wave Inc.	-/-	-/-	-/-	-/-	-/-
4	Switch - 3488A	HP		300000368	-/-	-/-	-/-
5	EMI Test receiver - ESCI	R&S	100083	300003312	31.01.2009	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	-/-	-/-	-/-	-/-

4 Photographs

Photo documentation:

Photo 1:

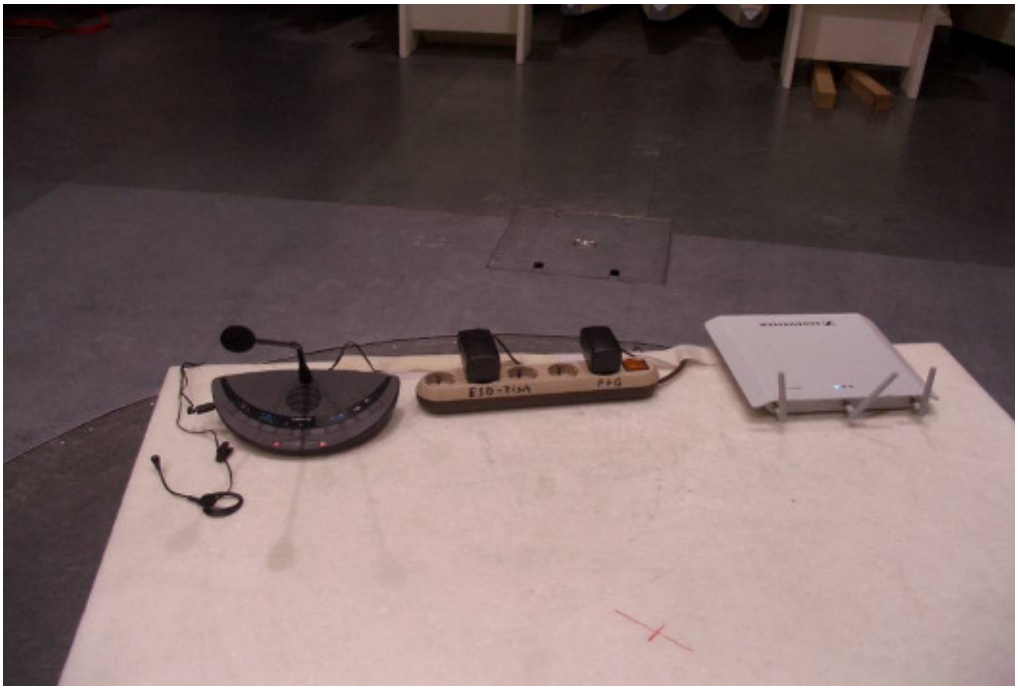


Photo 2:

Photo 3:

Photo 4:

5 Photographs of equipment under test

Photo documentation

Photo 1:

Photo 2:

Photo 3:

Photo 4:

Photo 5:

Photo 6:

Photo 7:

Photo 8:

Photo 9:

Photo 10:

Photo 11:

Photo 12:

Photo 13:

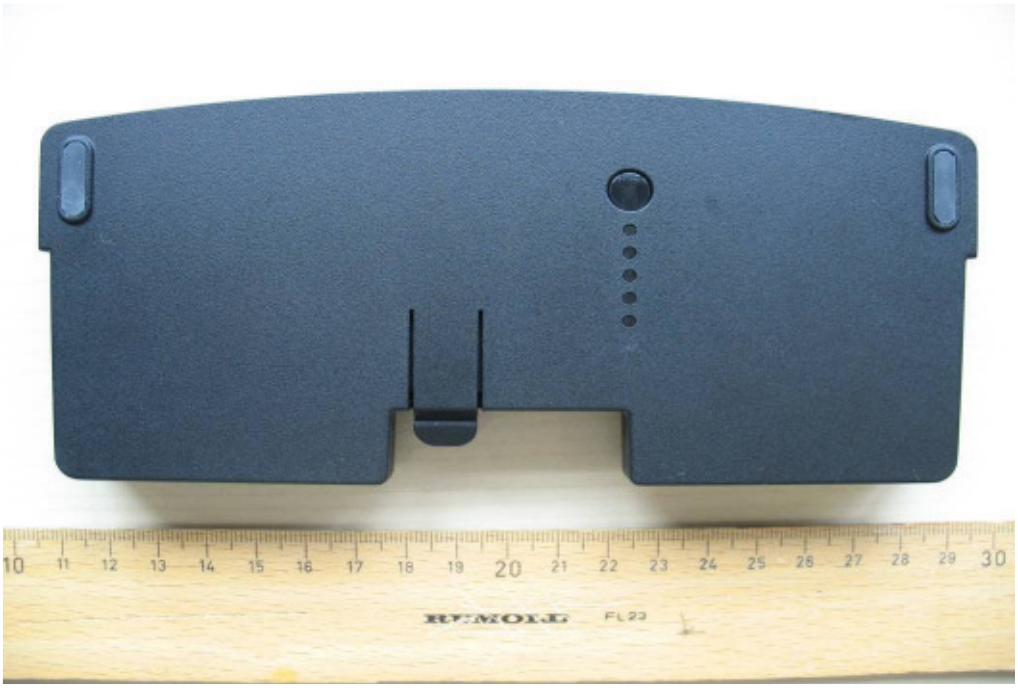


Photo 14

Photo 15:

Photo 16:

Photo 17:

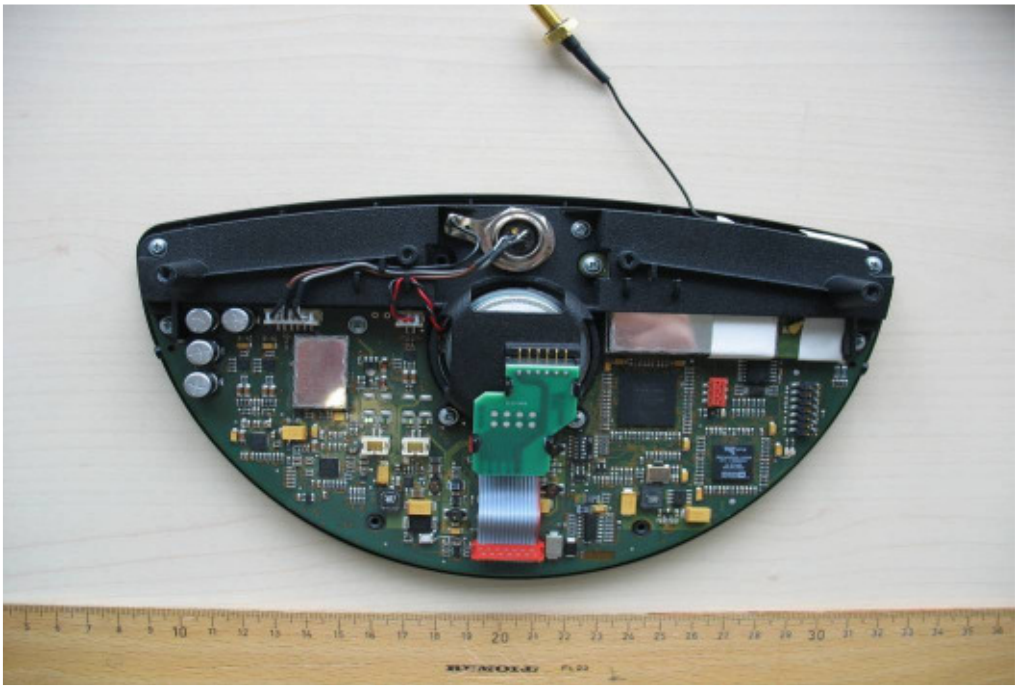


Photo 18:

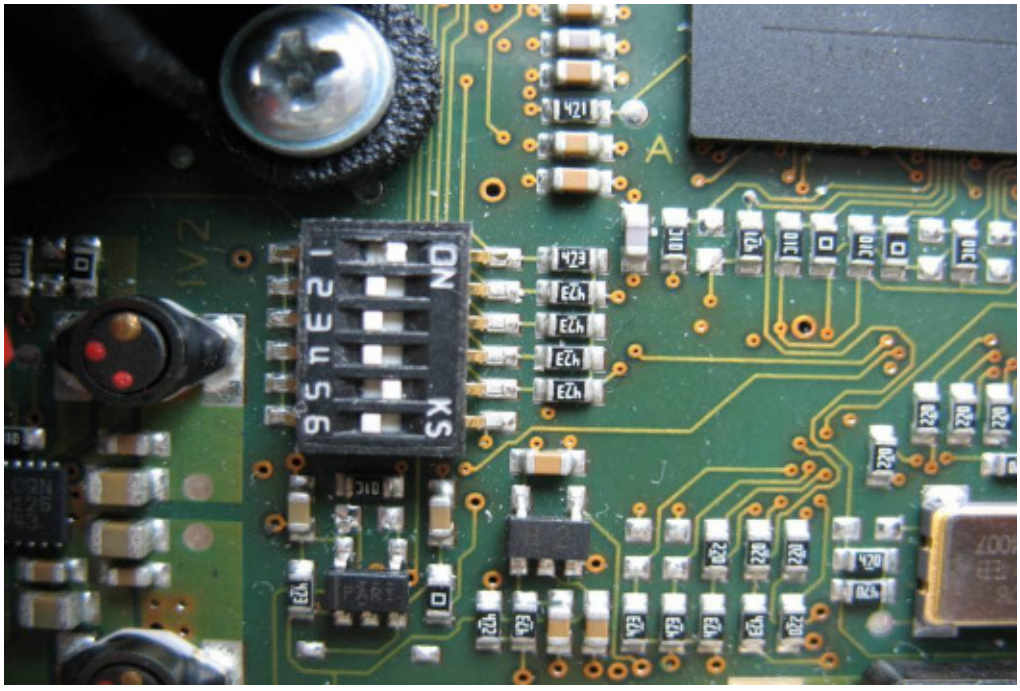


Photo 19:

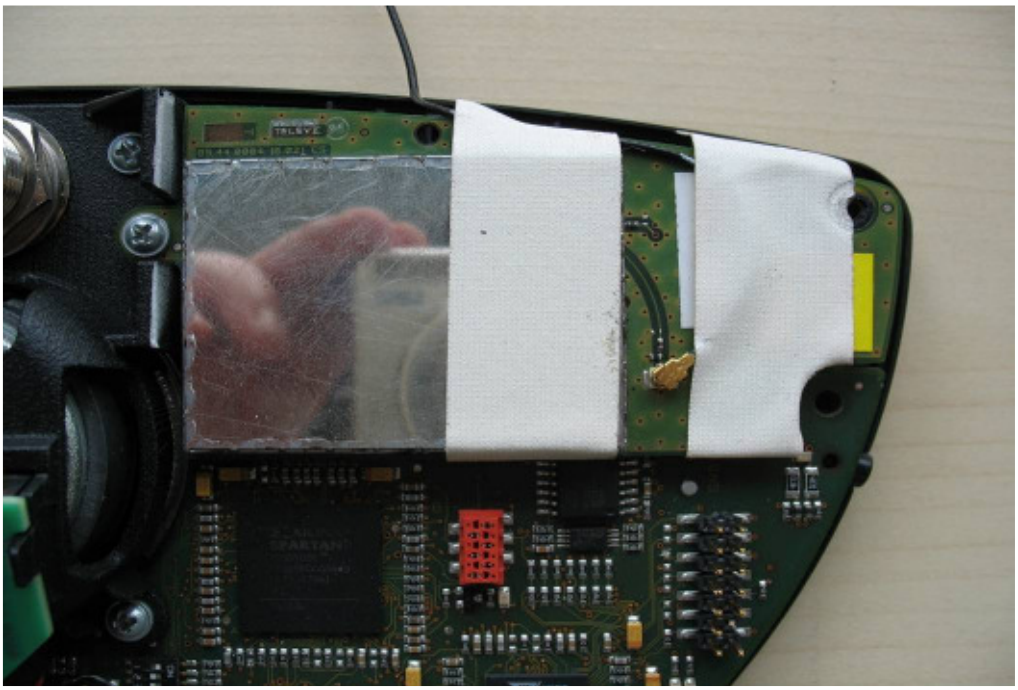


Photo 20:

Photo 21:

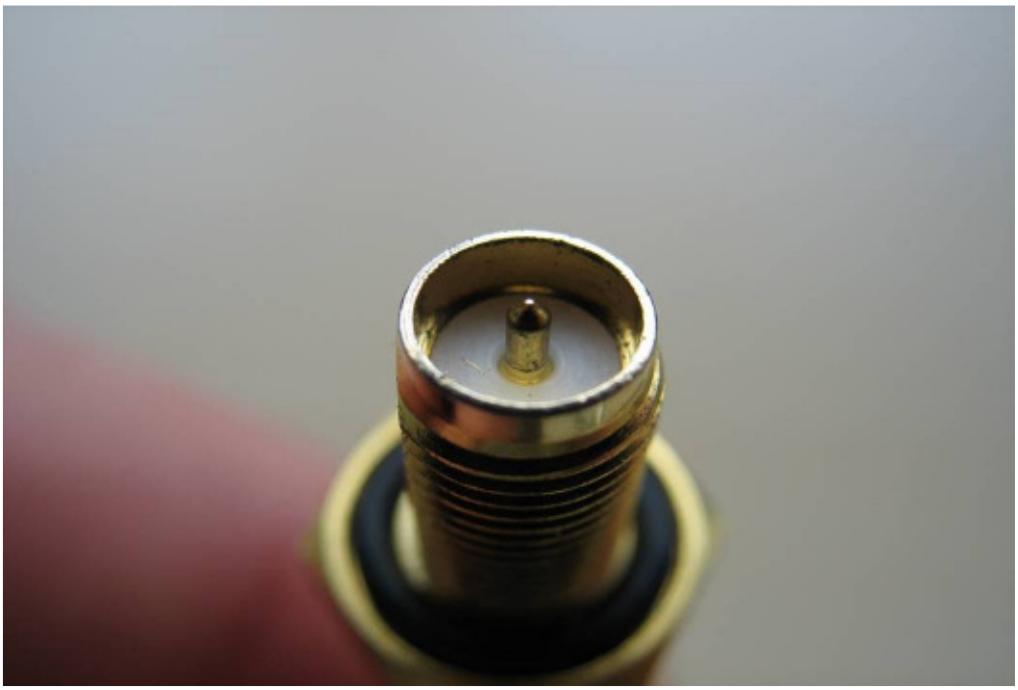


Photo 22:

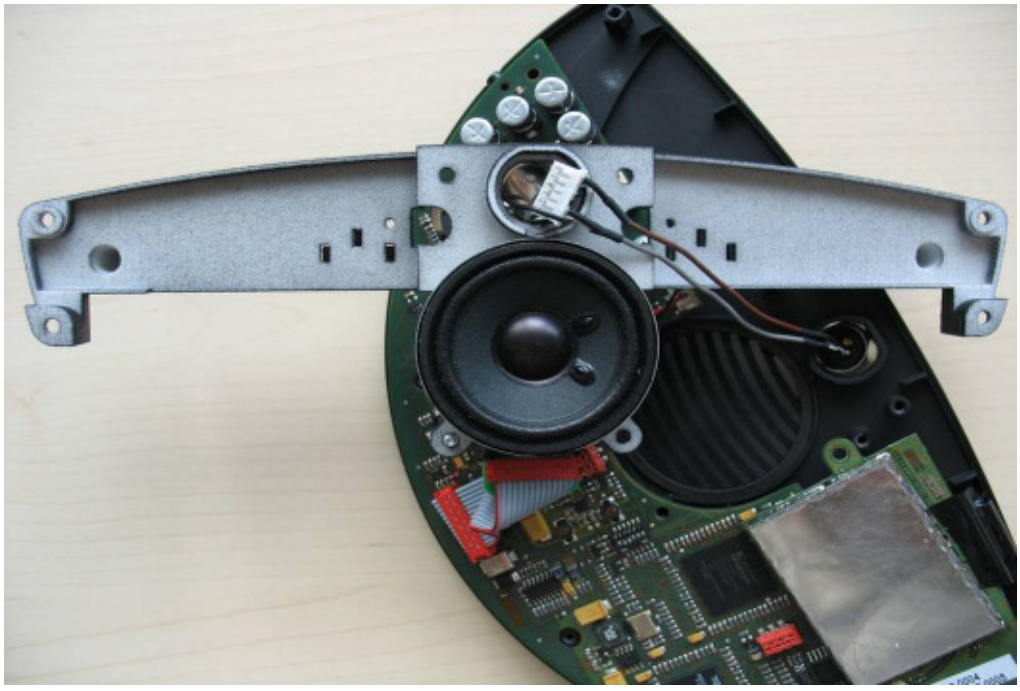


Photo 23:

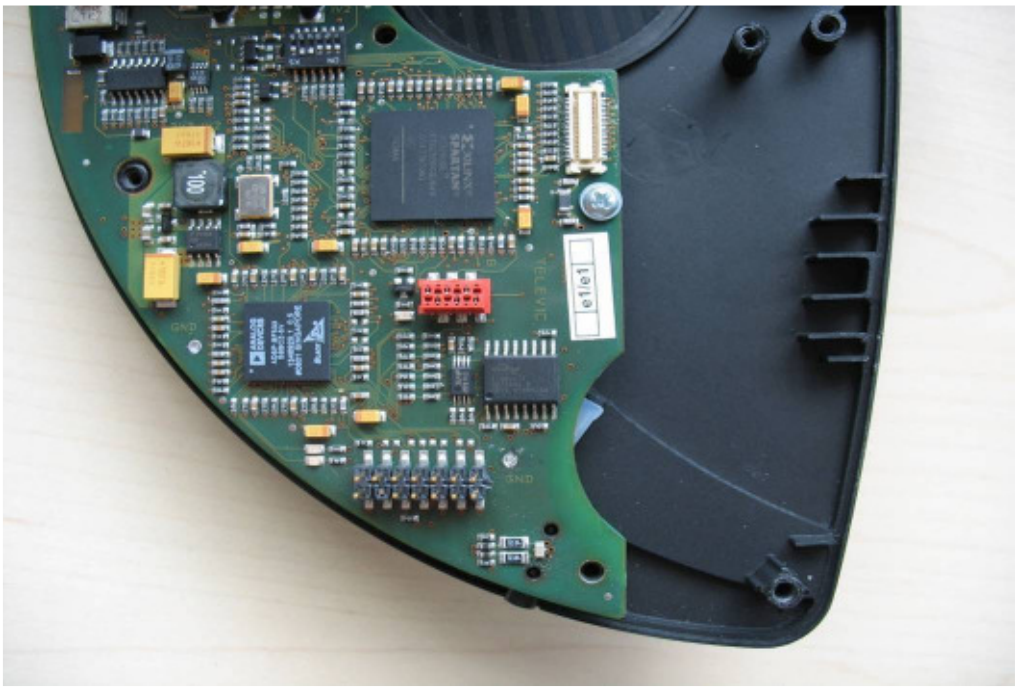


Photo 23: