

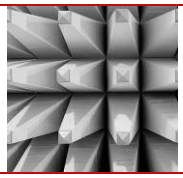

CETECOM™
CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-3661/11-01-02

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

Testing laboratory

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

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

Applicant

Indutech GmbH
Ahornweg 6-8
72226 Simmersfeld / GERMANY
Phone: +49 7484 9297-31
Fax: + 49 7484 9297-33
Contact: Elisabeth Katz
e-mail: elisabeth.katz@indutech.com
Phone: + 49 7484 9297-41

Manufacturer

Indutech GmbH
Ahornweg 6-8
72226 Simmersfeld / GERMANY

Test standard/s

47 CFR Part 15	Title 47 of the Code of Federal Regulations; Chapter I-Federal Communications Commission Subchapter A – General, Part 15-Radio Frequency Devices
RSS – 210 Issue 8	Licence-Exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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

Test item

Kind of test item:	**Precision Microwave Detector**
Model name:	**PMD 2450-3**
FCC ID:	**ZYLPMD2450-3**
IC:	**9883A-PMD2450V3**
Frequency:	**2400 MHz – 2483.5 MHz** **2500 MHz – 2690 MHz** **2900 MHz – 2950 MHz**
Power supply:	**115 V AC**
Temperature range:	**+23 °C** **(Tests performed under normal conditions)**

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorised:

Digital unterschrieben von Karsten Geraldy
DN: cn=Karsten Geraldy, o=Cetecom ICT Services GmbH, ou=GER-101125, email=karsten.geraldy@cetecom.com, c=DE
Datum: 2011.10.13 15:07:45 +02'00'

Karsten Geraldy

Test performed:

Digital unterschrieben von Meheza Walla
DN: cn=Meheza Walla, o=CETECOM ICT Services GmbH, ou=WAL-100930, email=Meheza.Walla@cetecom.com, c=DE
Datum: 2011.10.13 15:11:09 +02'00'

Meheza Walla

1 Table of contents

2 General information

2.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report. 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.
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In no case this test report can be considered as a Letter of Approval.

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

2.2 Application details

Date of receipt of order:	2011-09-01
Date of receipt of test item:	2011-09-01
Start of test:	2011-09-05
End of test:	2011-10-11
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Version	Test standard description
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
RSS - 210 Issue 8	2010-12	Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

4 Test environment

Temperature:	T_{nom}	+23 °C during room temperature tests
Relative humidity:		55 %
Air pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	115 V AC

5 Test item

Kind of test item	:	Precision Microwave Detector
Type identification	:	PMD 2450-3
S/N serial number	:	PMD 2450: 1081-07/2011 Module: SN113012 / SE0100
HW hardware status	:	None
SW software status	:	None
Frequency band [MHz]	:	2400 MHz – 2483.5 MHz 2500 MHz – 2690 MHz 2900 MHz – 2950 MHz
Type of modulation	:	Stepped CW
Number of channels	:	10 (2410 MHz; 2440 MHz; 2480 MHz; 2520 MHz; 2560 MHz; 2600 MHz; 2640 MHz; 2680 MHz; 2905 MHz; 2940 MHz)
Antenna	:	For more information see Annex B “External photographs of the EUT”
Power supply	:	115 V AC
Temperature range	:	+23 °C (Tests performed under normal conditions)

6 Test laboratories sub-contracted

None

7 Summary of measurement results

☒	**No deviations from the technical specifications were ascertained**
☐	There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210, Issue 8	Passed	2011-10-13	-/-

Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Pass	Fail	NA	NP	Results
§ 15.35 (c) / RSS-GEN Issue 2 Section 4.5	Timing of the transmitter (Duty cycle correction factor)	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.223 / RSS-210 Issue 8	Bandwidth of the modulated carrier	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.223 / RSS-210 Issue 8	Fieldstrength of fundamental	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.205	Band edge compliance	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.209 (a) / RSS-210 Issue 8	Fieldstrength of harmonics and spurious	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.109 / RSS-210 Issue 8	Receiver spurious emissions	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.109 / § 15.207	Conducted limits	Nominal	Nominal	☐	☐	☒	☐	-

Note: NA = Not Applicable; NP = Not Performed

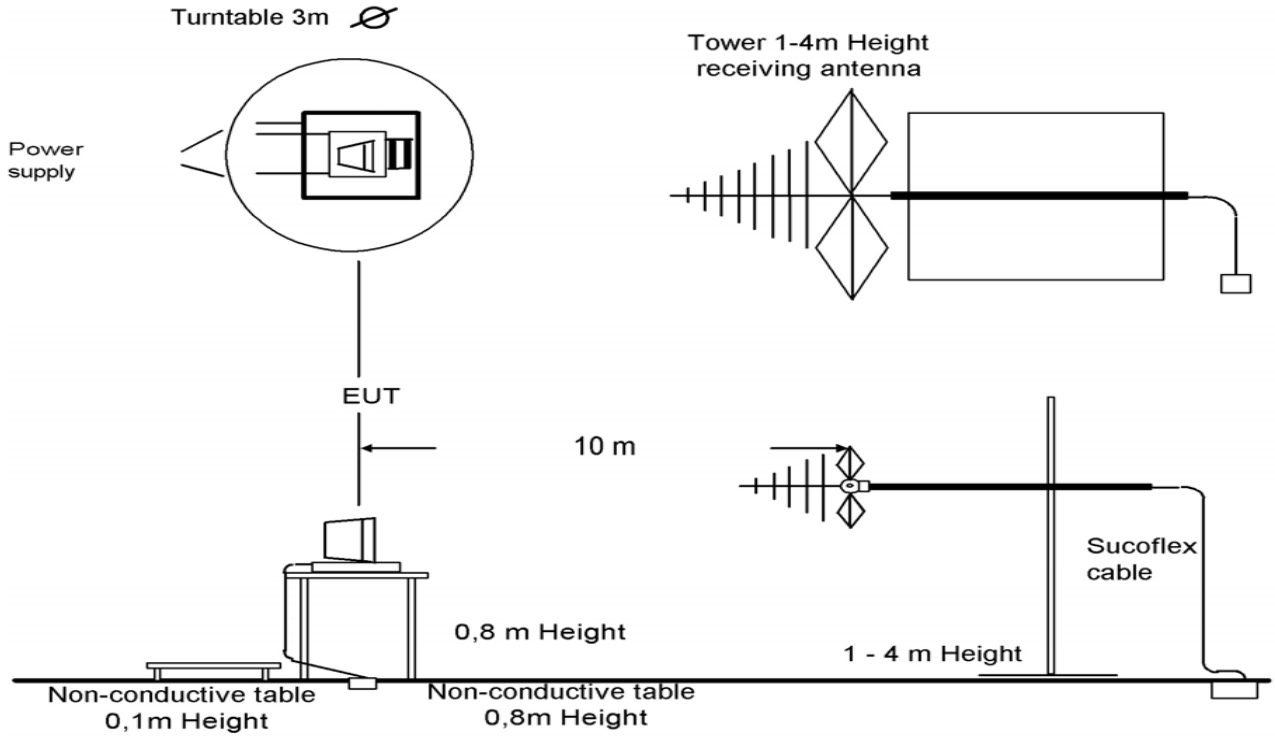
8 RF measurement testing

8.1 Description of test setup

8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 and ANSI C63.4-2009. 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.
Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



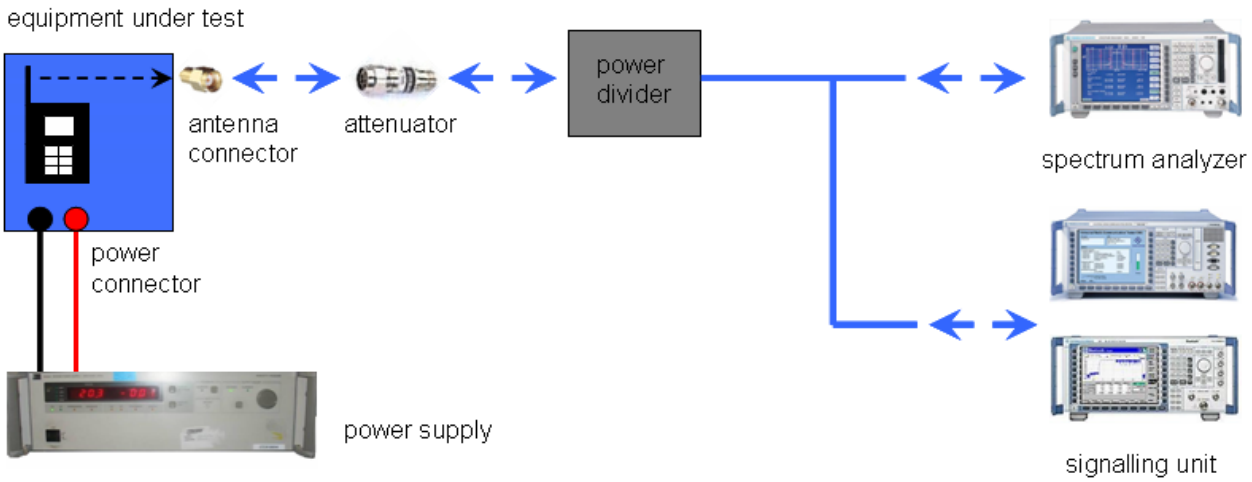
Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

The EUT is powered by an external power supply with nominal voltage. The signalling (if needed) is performed from outside the chamber with a signalling unit by air link using signalling antenna.

8.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, and the spectrum analyzer are impedance matched on 50 Ohm.



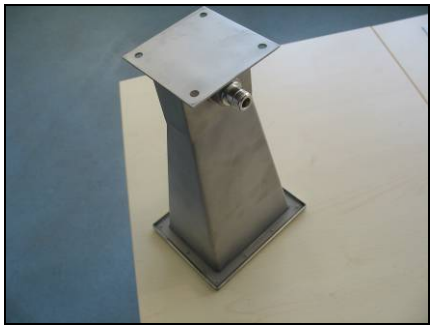
Picture 2: Diagram conducted measurements

8.2 Additional comments

As soon as the Precision Microwave Detector PMD 2450 with integral control and display touch screen is powered up, TX and RX start operating.

The measurements were performed with 3 different antennas.

Antenna 1



Antenna 2

Antenna 3

8.3 RSP100 test report cover sheet / performance test data

Test Report Number	:	1-3661/11-01-02
Equipment Model Number	:	PMD 2450-3
Certification Number	:	9883A-PMD2450V3
Manufacturer (complete Address)	:	Indutech **GmbH** Ahornweg 6-8 72226 Simmersfeld / GERMANY
Tested to radio standards specification no.	:	RSS 210, Issue 8
Open Area Test Site IC No.	:	IC 3462C-1
Frequency Range or fixed frequency	:	2410 MHz; 2440 MHz; 2480 MHz; 2520 MHz; 2560 MHz; 2600 MHz; 2640 MHz; 2680 MHz; 2905 MHz; 2940 MHz.
Field Strength [dBµV/m] (at which distance)	:	49.82 dBµV/m @ 1 m (Antenna 1) 47.14 dBµV/m @ 1 m (Antenna 2) 44.04 dBµV/m @ 1 m (Antenna 3)
Occupied bandwidth (99%-BW) [kHz]	:	144
Type of modulation	:	Stepped CW
Emission Designator (TRC-43)	:	144k0P0N
Antenna Information	:	Rectangular horn antenna – for more information please see Annex C “External photographs of the EUT”
Transmitter Spurious (worst case) [dBµV/m]:		33.5 dBµV/m @ 113.7 MHz
Receiver Spurious (worst case) [dBµV/m]:		33.5 dBµV/m @ 113.7 MHz

ATTESTATION:

DECLARATION OF COMPLIANCE:

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

Laboratory Manager:

2011-10-13	Meheza Walla	M. Walla
Date	Name	Signature

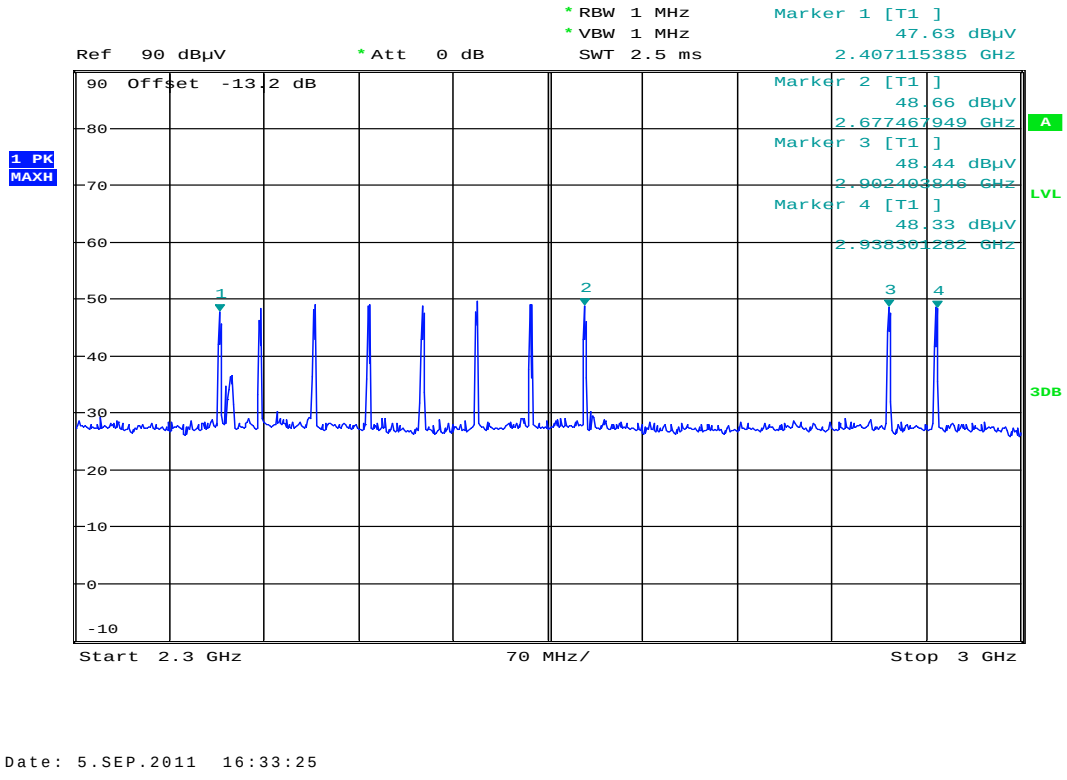
9 Measurement results

9.1 Timing of the transmitter

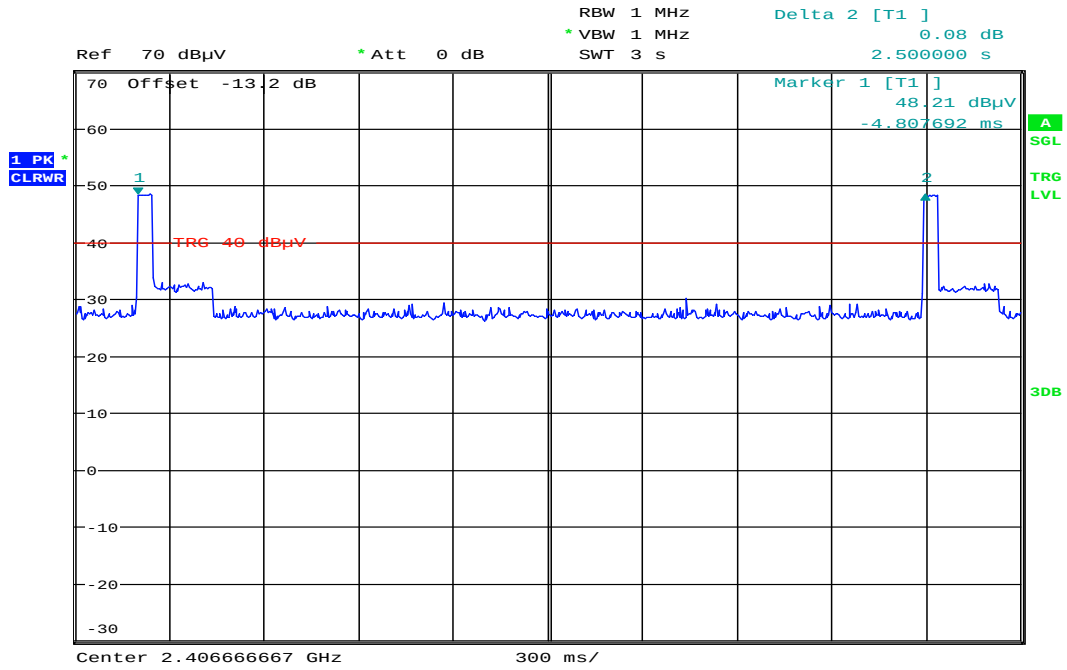
Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	See plot
Resolution bandwidth:	See plot
Video bandwidth:	See plot
Span:	Zero
Trace-Mode:	Single

Plot 1: normal operation



Plot 2:



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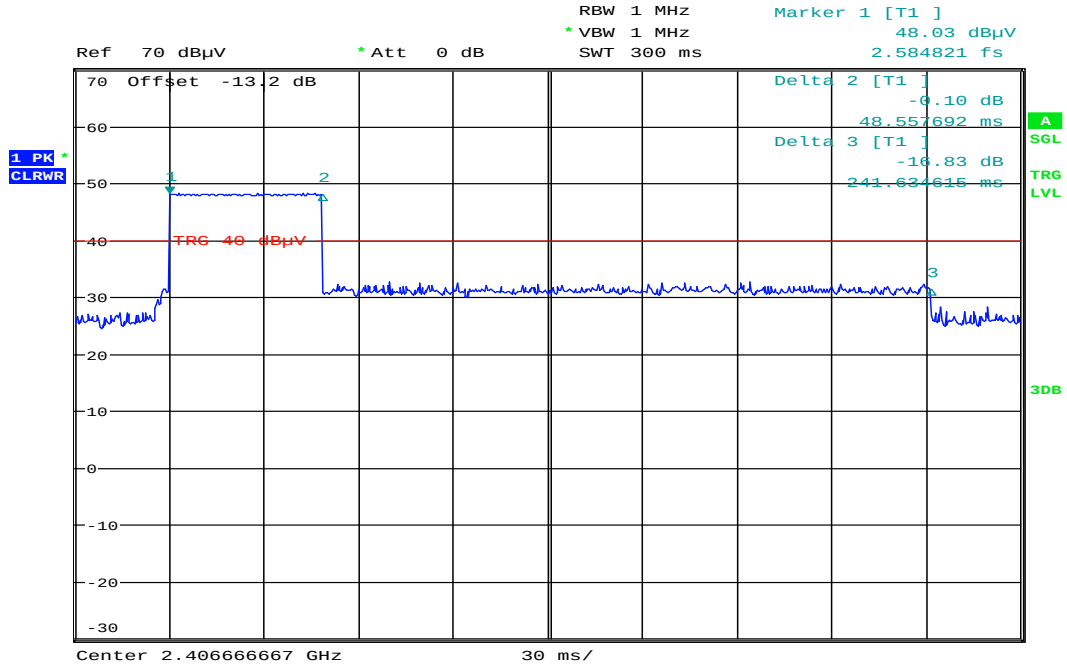
Plot 3:



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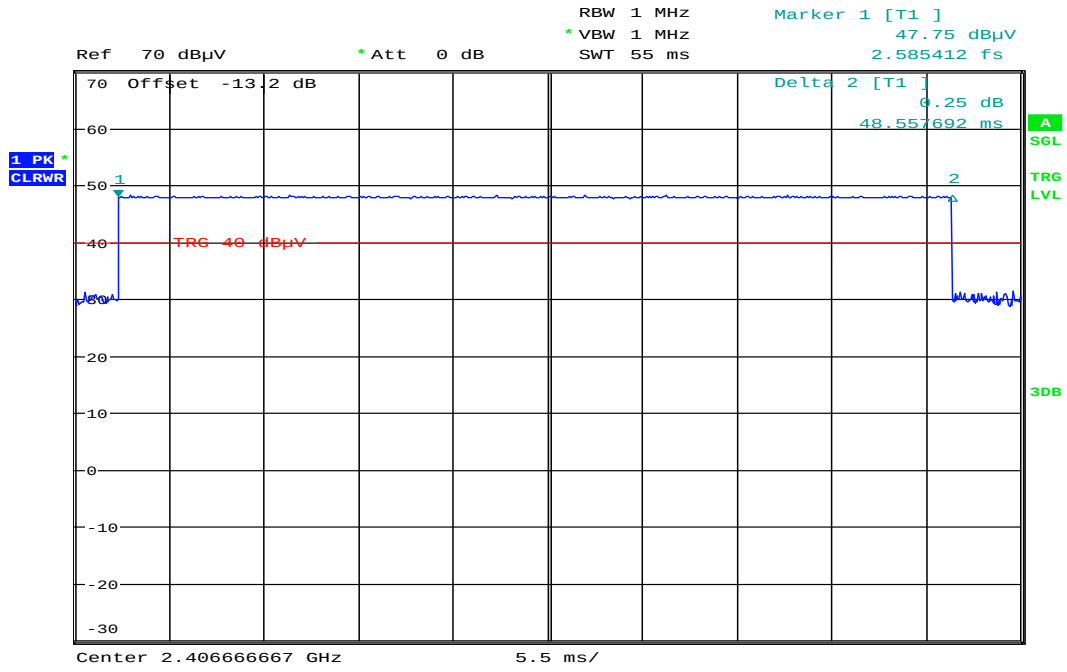
Plot 4:



Limits:

FCC	IC
CFR Part SUBCLAUSE § 15.35 (c)	RSS-GEN Issue 2 Section 4.5
Timing of the transmitter	
(c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.	

Result: **The measurement is passed.**

9.2 Bandwidth of the modulated carrier

Limits:

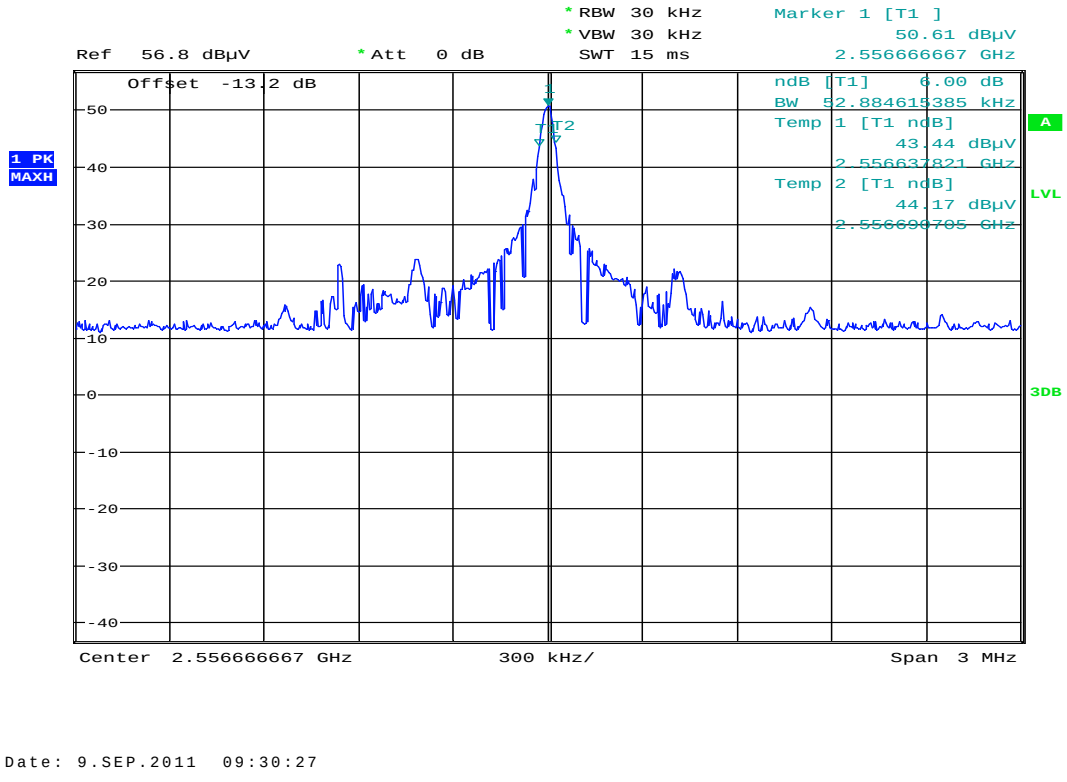
FCC	IC
CFR Part SUBCLAUSE § 15.223	RSS-210 Issue 8
Bandwidth of the modulated carrier	

Measured with the integrated OBW-function of the spectrum analyser Rohde&Schwarz FSU50 (measurement criteria is the integrated power in %)

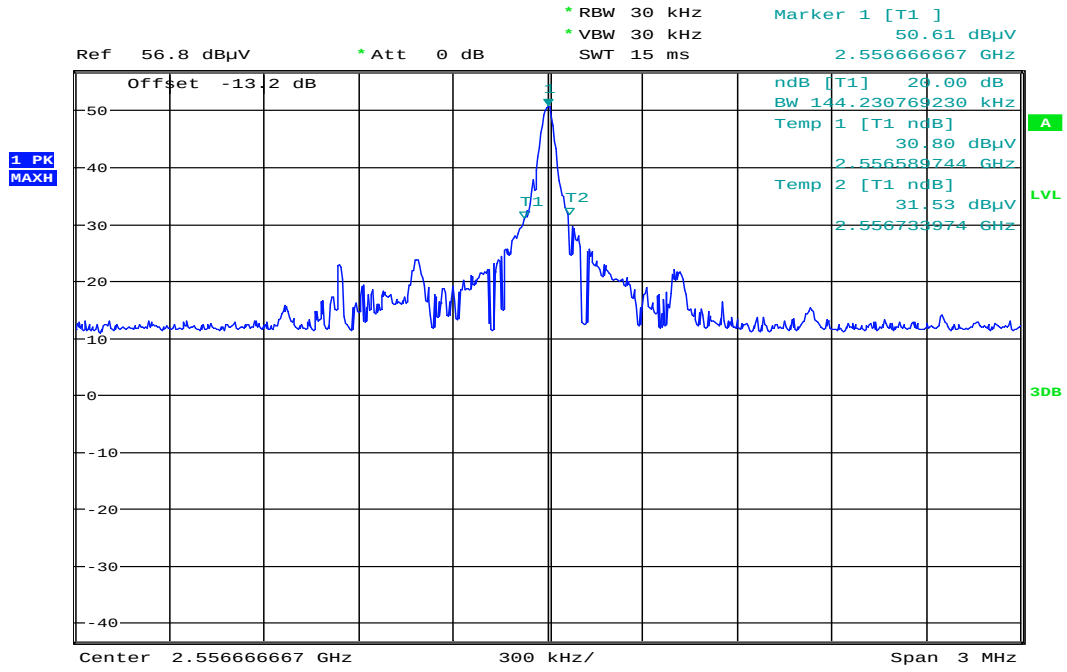
Result:

	Occupied Bandwidth (kHz)
6 dB (75%)	53
20 dB (99%)	144

Plot 5: 6dB (75%) – Bandwidth



Plot 6: 20dB (99%) – Bandwidth



9.3 Field strength of the fundamental

Measurement:

Measurement parameter	
Detector:	Peak
Resolution bandwidth:	1 MHz
Trace-Mode:	Max Hold

Limits:

FCC		IC
CFR Part SUBCLAUSE § 15.209		RSS-210 Issue 8
Fundamental Frequency (MHz)	**Field strength of Fundamental (µV/m)**	**Measurement distance (m)**
Above 960	500 (54 dBµV/m)	3

Result:

- **Antenna 1:**

TEST CONDITIONS (T_{nom} ; V_{nom})	MAXIMUM POWER (dBµV/m)
2410 MHz	49.82
2440 MHz	49.04
2480 MHz	49.68
2520 MHz	48.73
2560 MHz	49.06
2600 MHz	49.57
2640 MHz	49.27
2680 MHz	48.91
2905 MHz	49.13
2940 MHz	49.77
Measurement uncertainty	±3dB

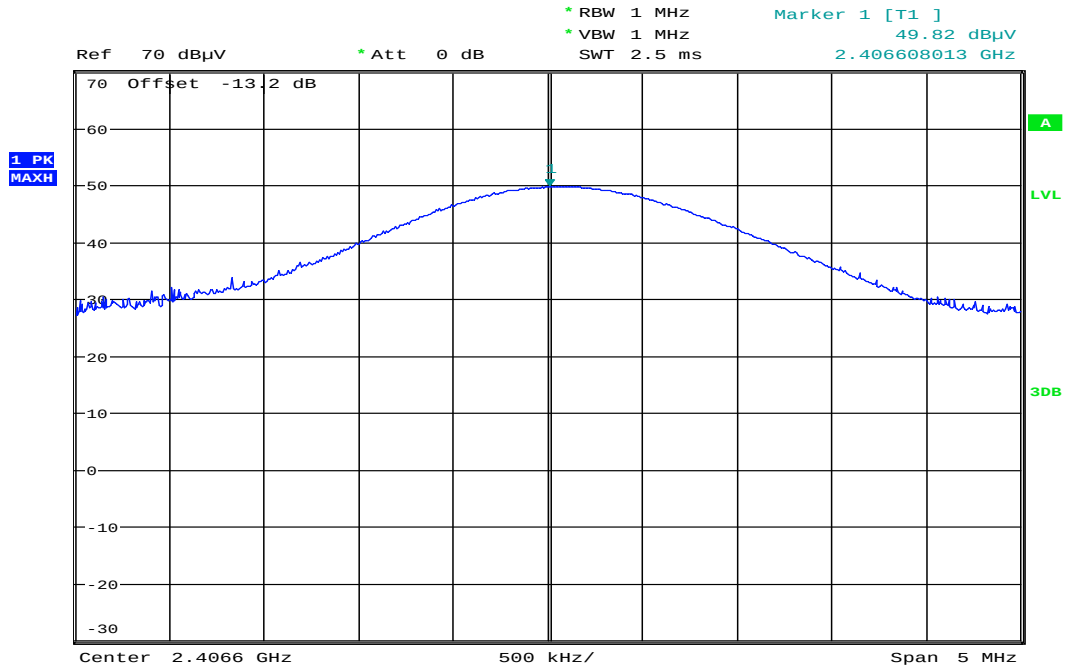
- **Antenna 2:**

TEST CONDITIONS (T_{nom} ; V_{nom})	MAXIMUM POWER (dBµV/m)
2410 MHz	45.87
2440 MHz	46.07
2480 MHz	47.14
2520 MHz	44.29
2560 MHz	43.40
2600 MHz	43.21
2640 MHz	44.89
2680 MHz	44.77
2905 MHz	45.57
2940 MHz	45.15
Measurement uncertainty	±3dB

- **Antenna 3:**

TEST CONDITIONS (T_{nom} ; V_{nom})	MAXIMUM POWER (dBµV/m)
2410 MHz	34.01
2440 MHz	36.31
2480 MHz	32.90
2520 MHz	33.40
2560 MHz	34.31
2600 MHz	36.94
2640 MHz	42.98
2680 MHz	44.04
2905 MHz	39.87
2940 MHz	41.03
Measurement uncertainty	±3dB

Plot 7: 2410 MHz, Antenna 1



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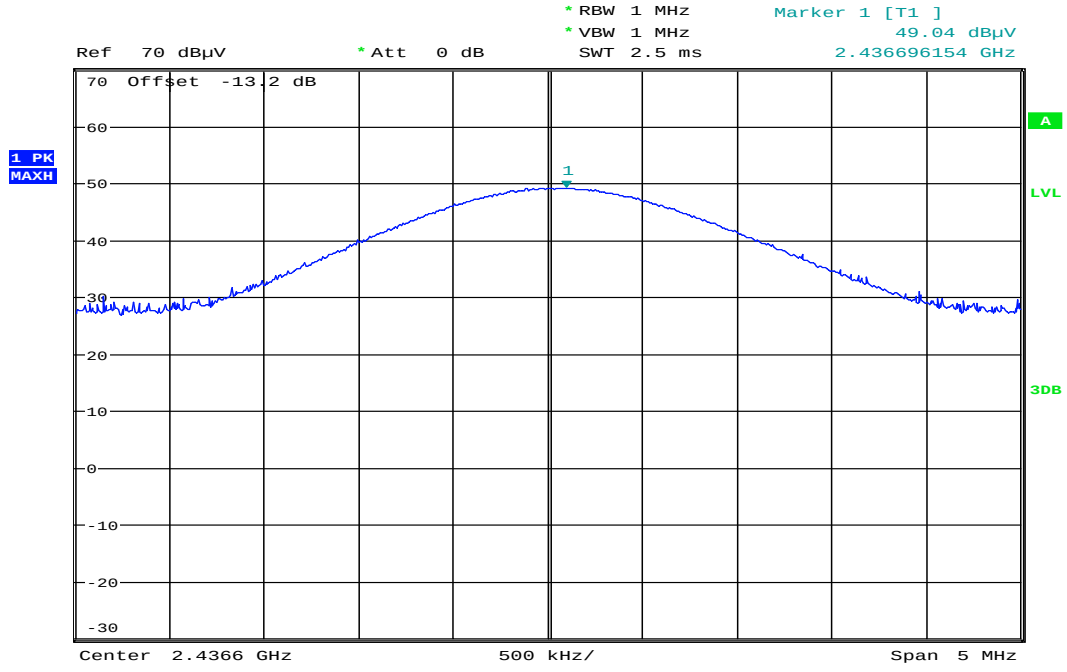
Plot 8: 2440 MHz, Antenna 1



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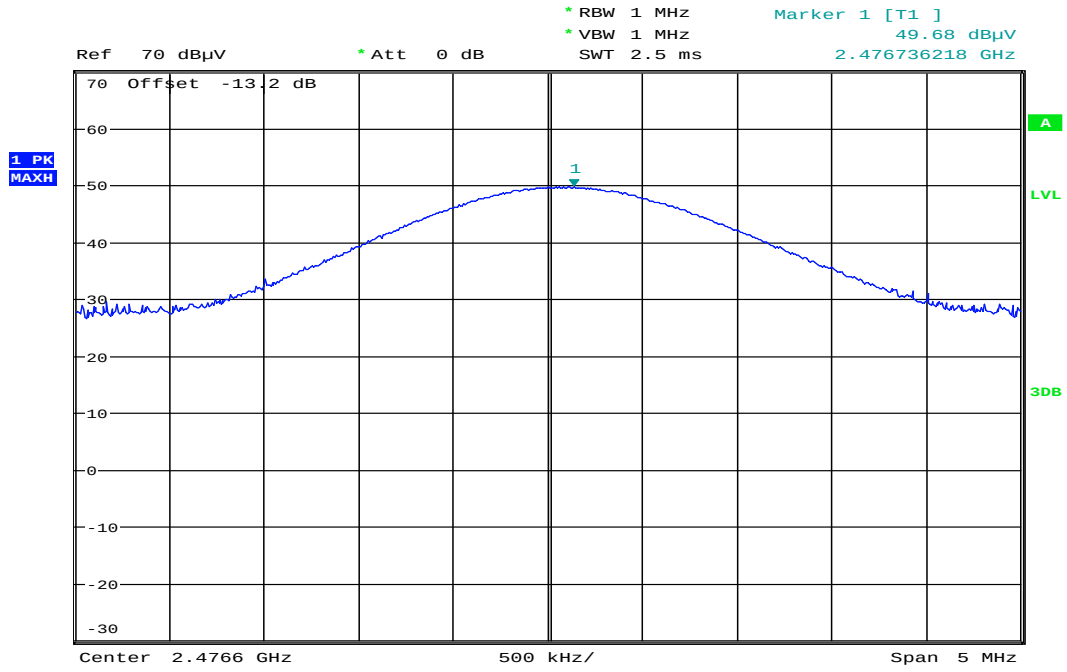
Plot 9: 2480 MHz, Antenna 1



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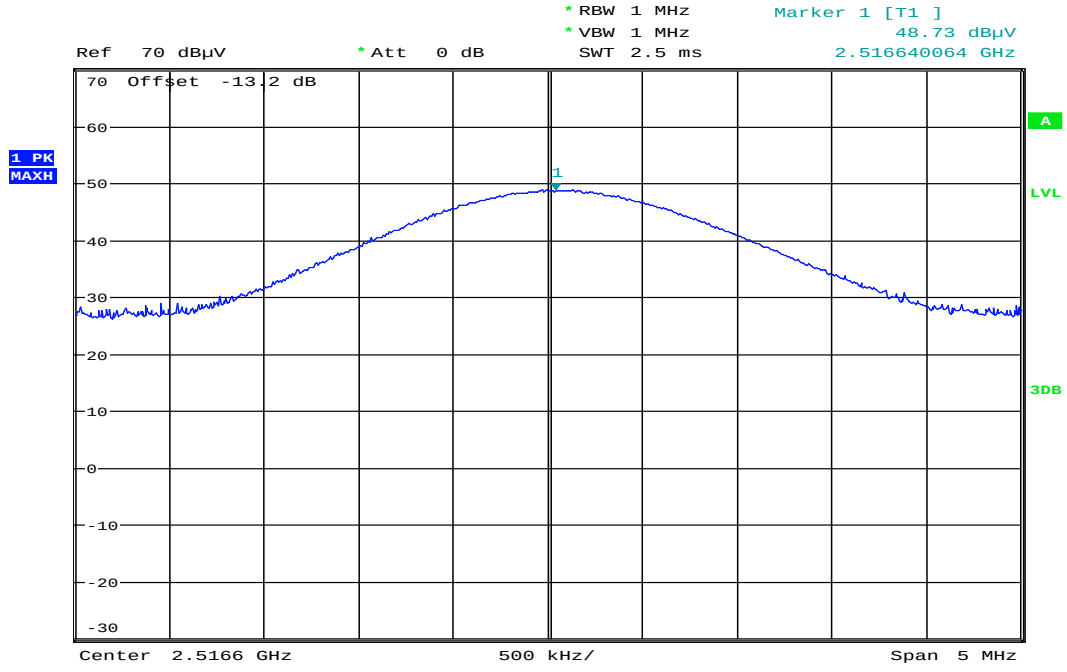
Plot 10: 2520 MHz, Antenna 1



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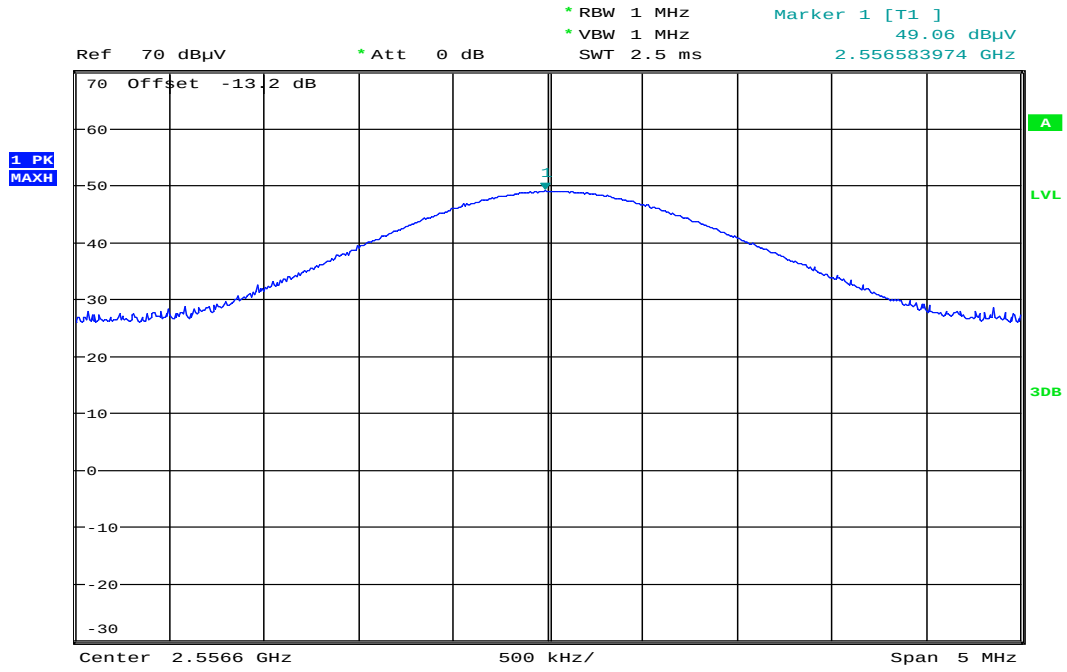
Plot 11: 2560 MHz, Antenna 1



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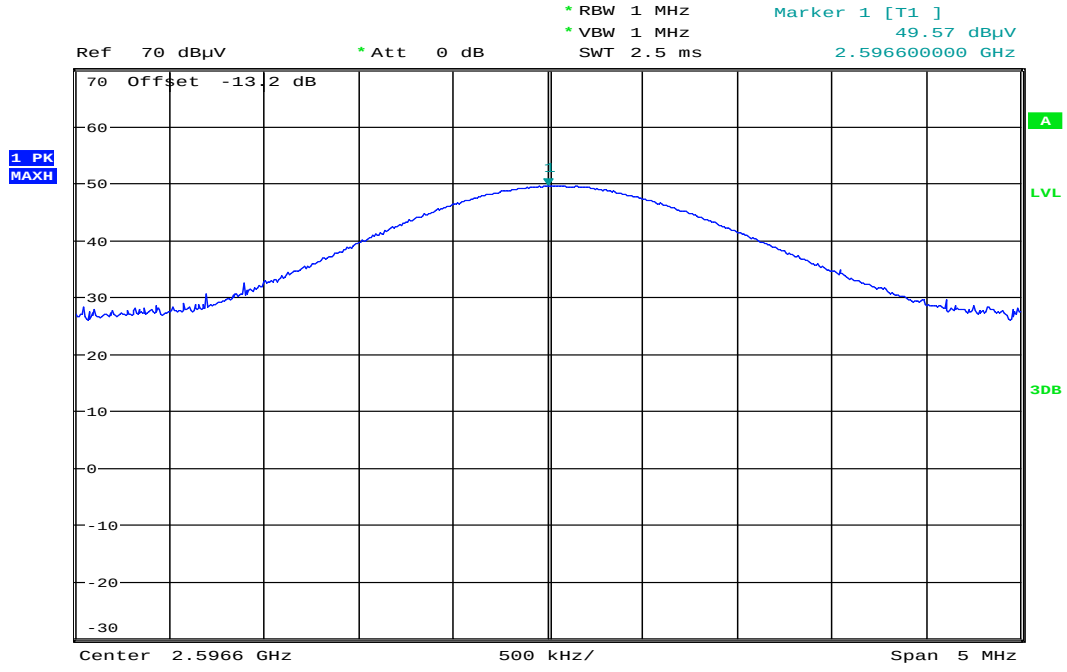
Plot 12: 2600 MHz, Antenna 1



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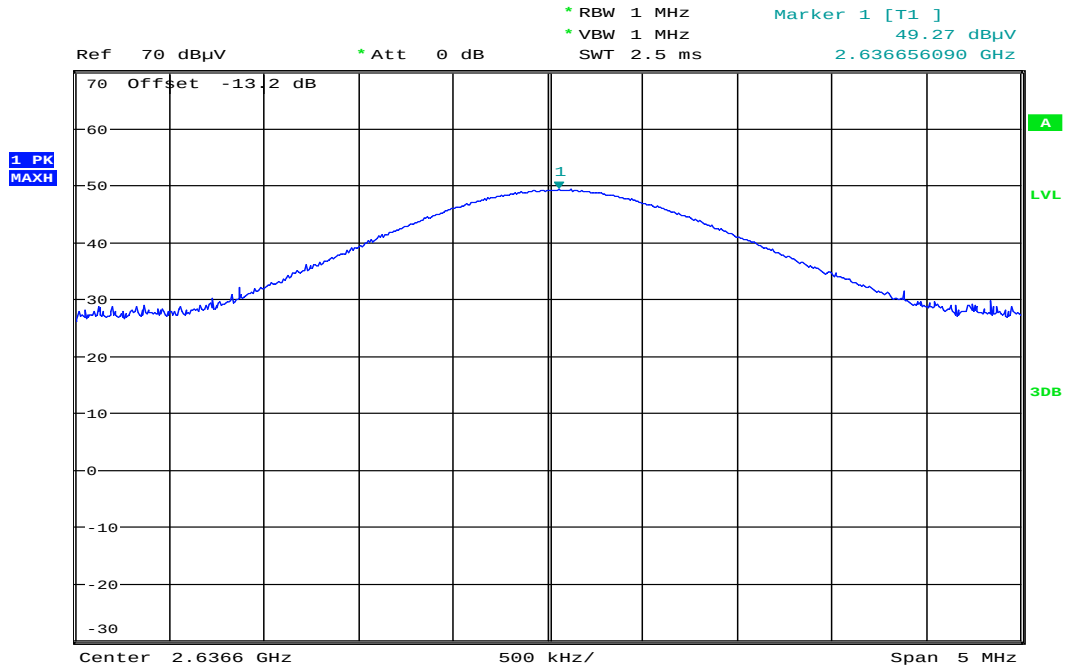
Plot 13: 2640 MHz, Antenna 1



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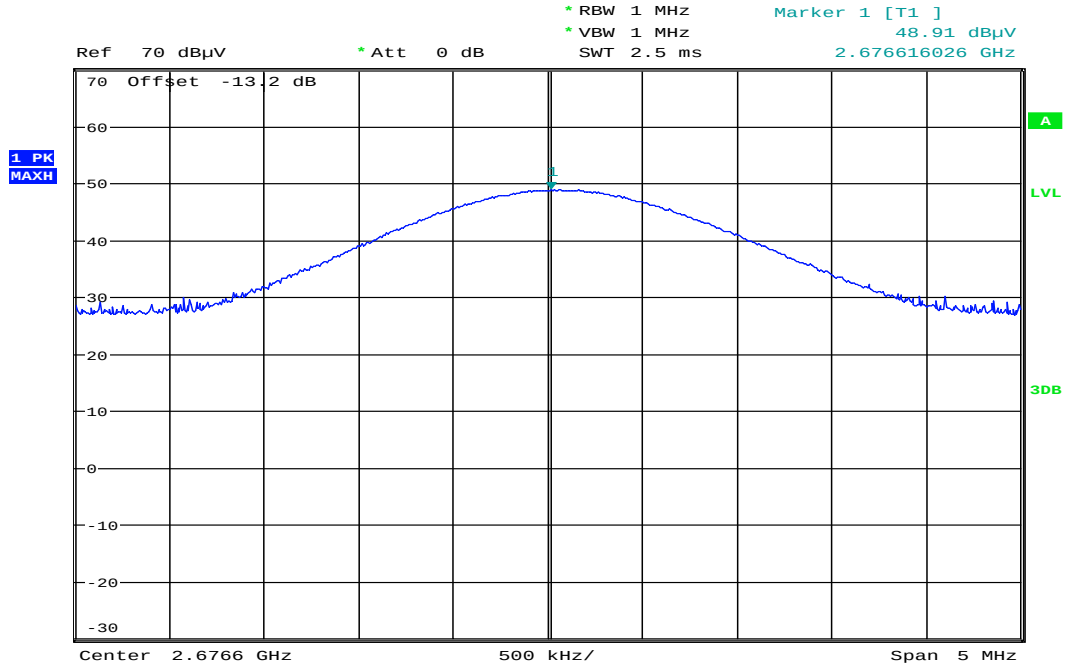
Plot 14: 2680 MHz, Antenna 1



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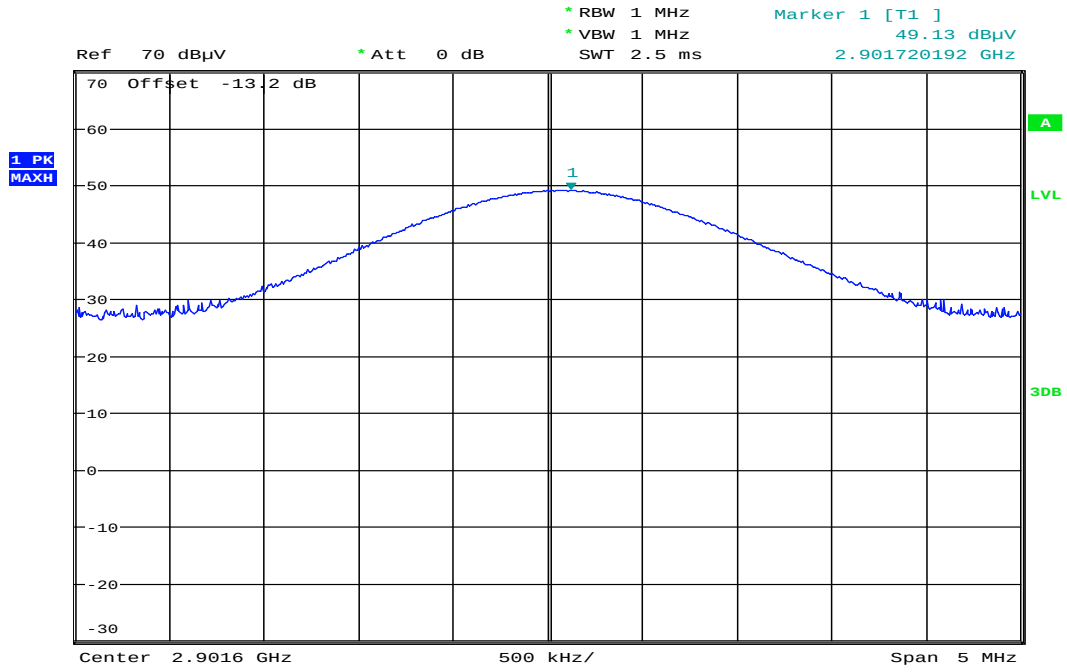
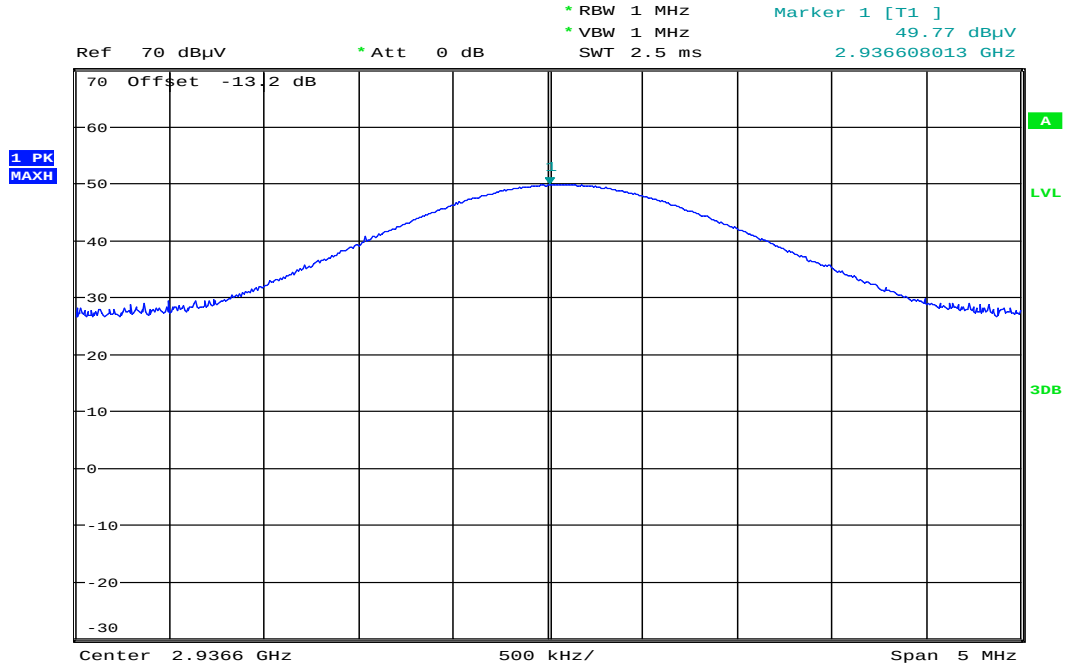
Plot 15: 2905 MHz, Antenna 1



Date: 5.SEP.2011 15:09:41

Plot 16: 2940 MHz, Antenna 1



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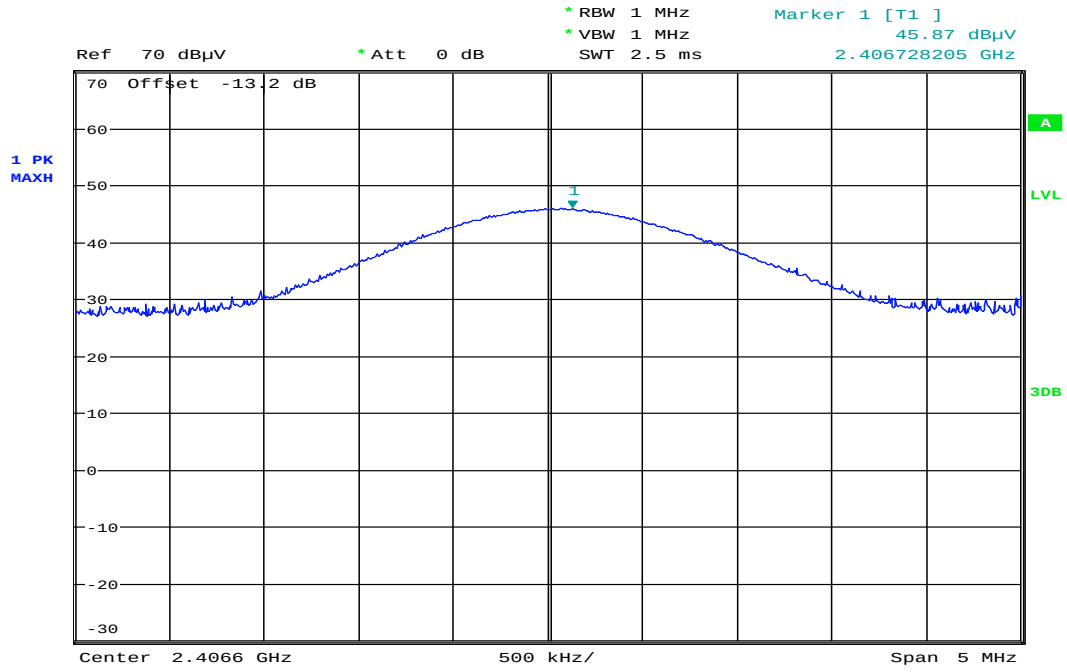
Plot 17: 2410 MHz, Antenna 2



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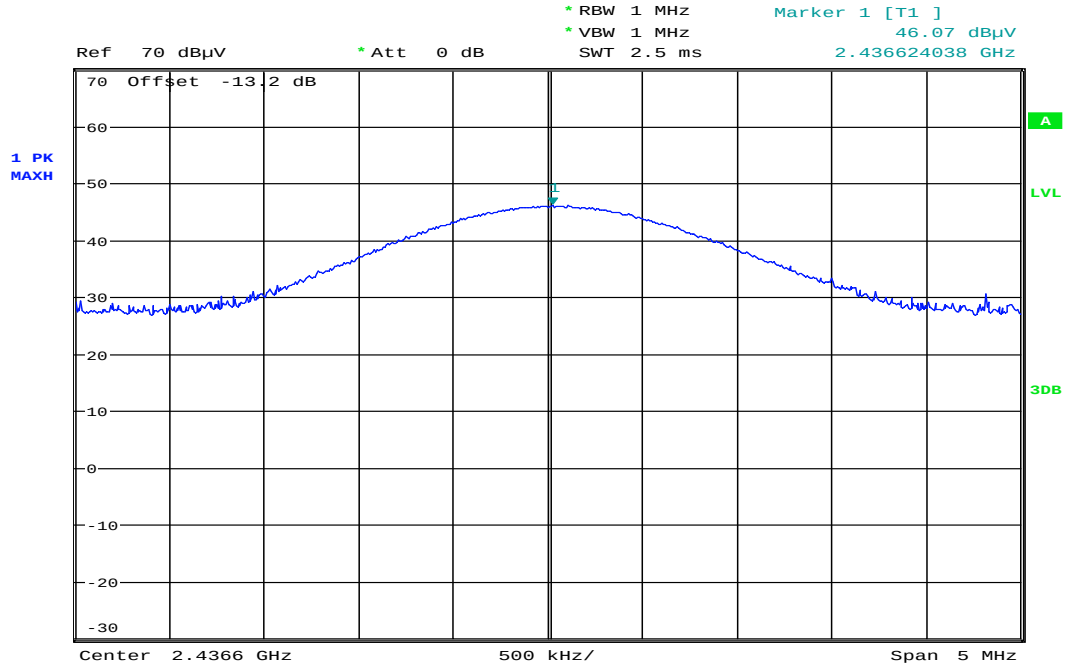
Plot 18: 2440 MHz, Antenna 2



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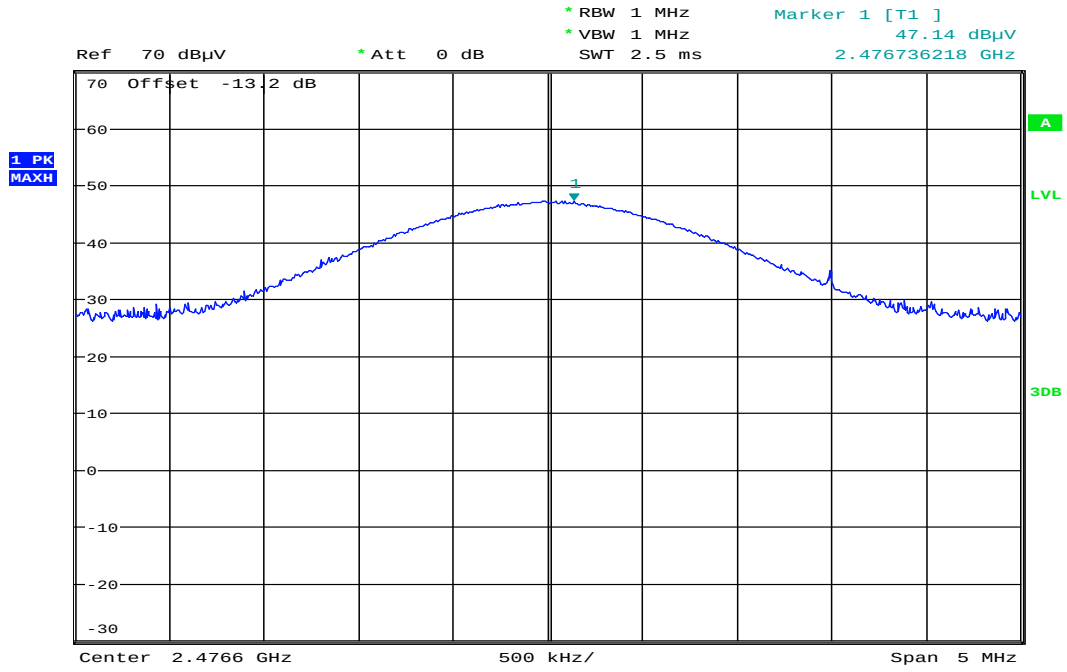
Plot 19: 2480 MHz, Antenna 2



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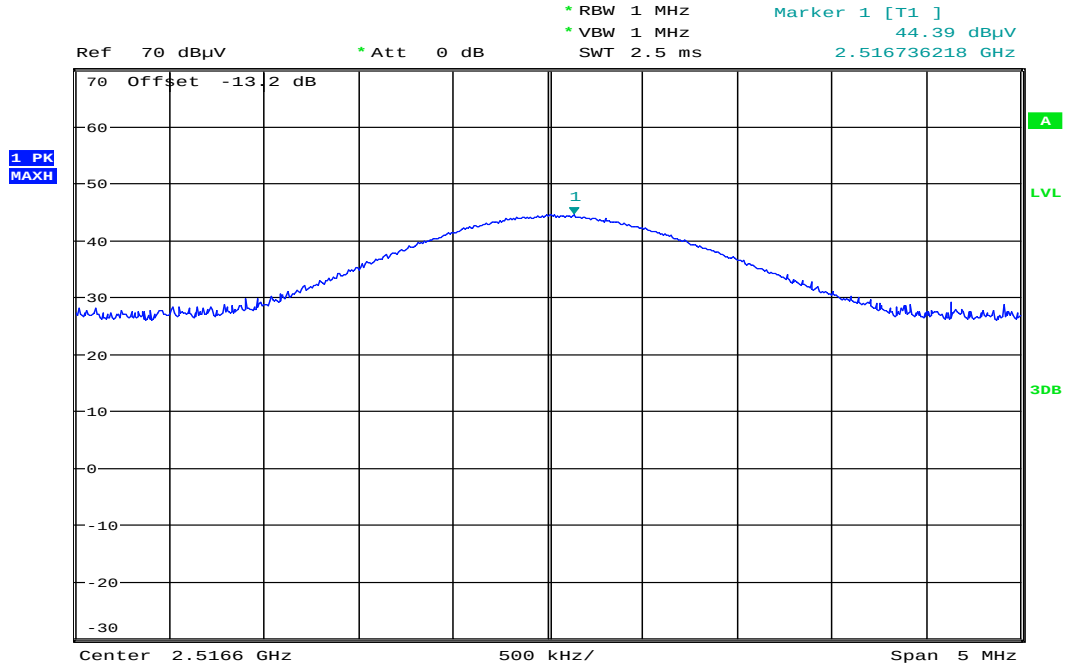
Plot 20: 2520 MHz, Antenna 2



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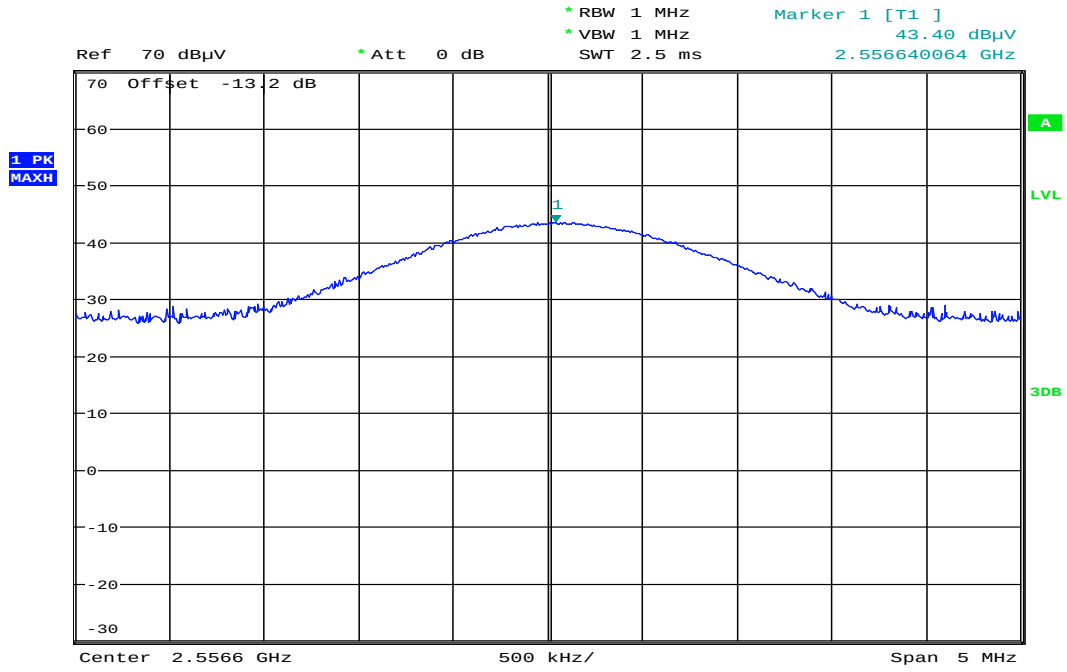
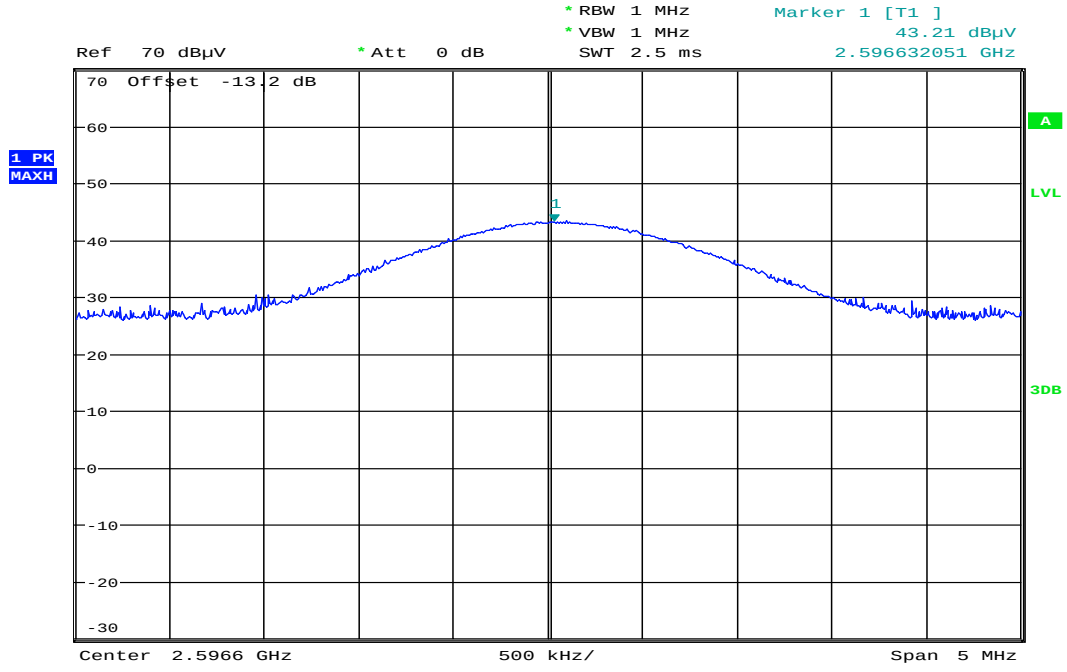
Plot 21: 2560 MHz, Antenna 2



Date: 5.OCT.2011 15:12:24

Plot 22: 2600 MHz, Antenna 2



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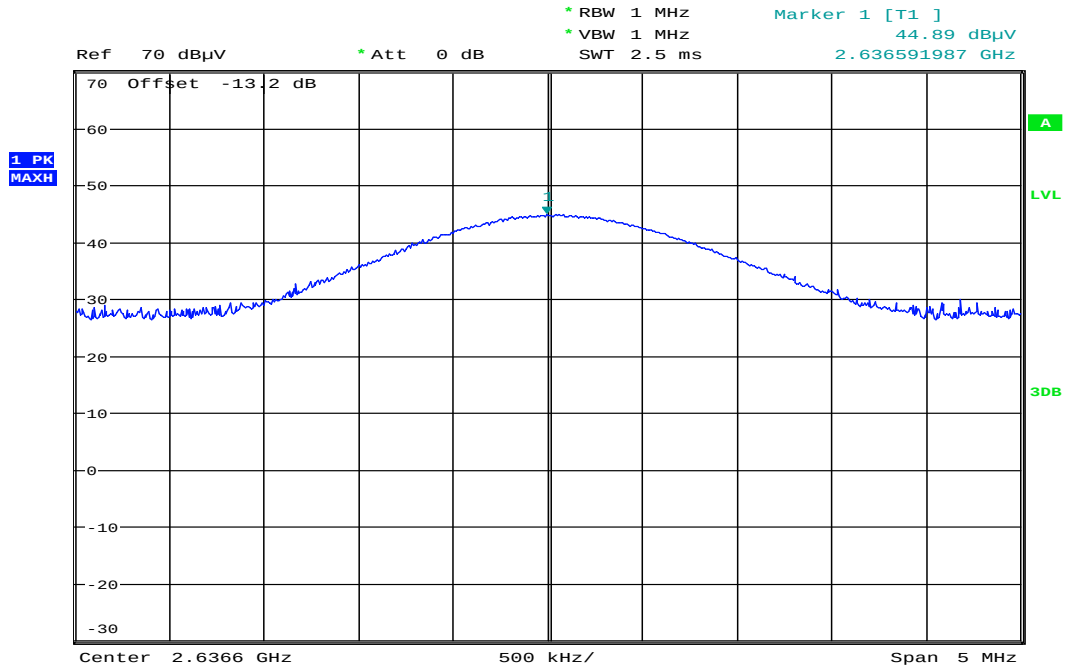
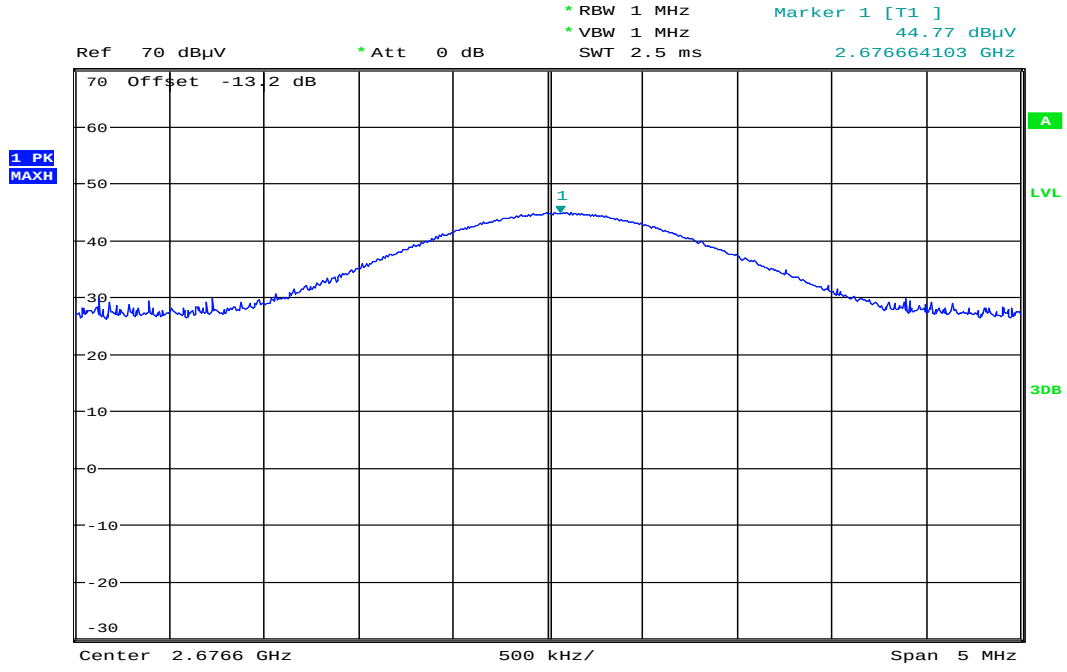
Plot 23: 2640 MHz, Antenna 2



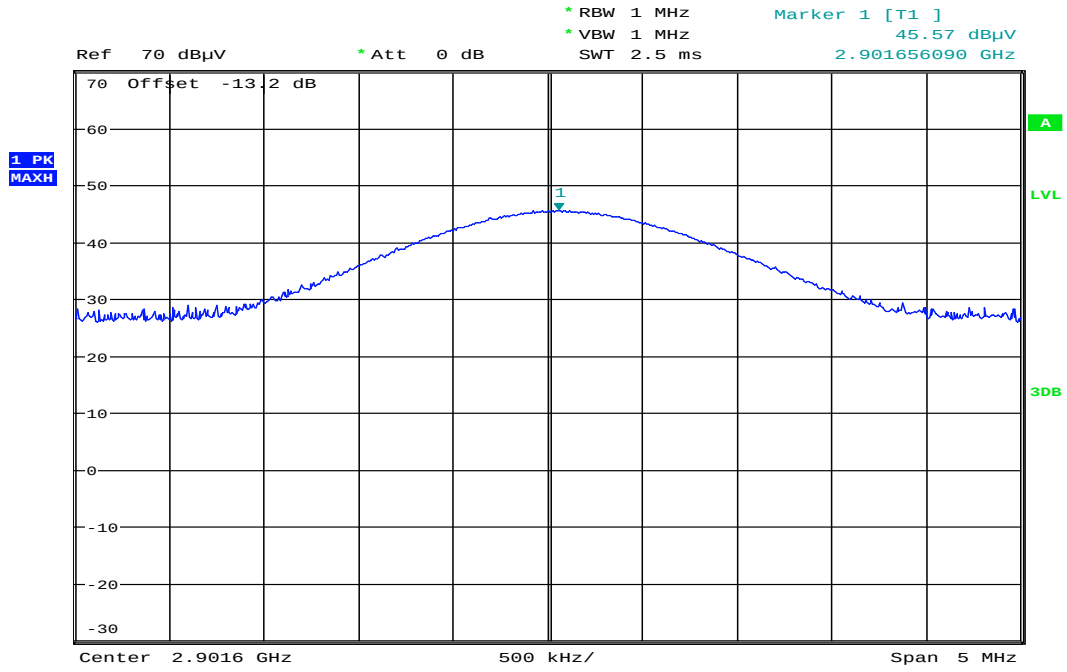
Date: 5.OCT.2011 15:13:47

Plot 24: 2680 MHz, Antenna 2



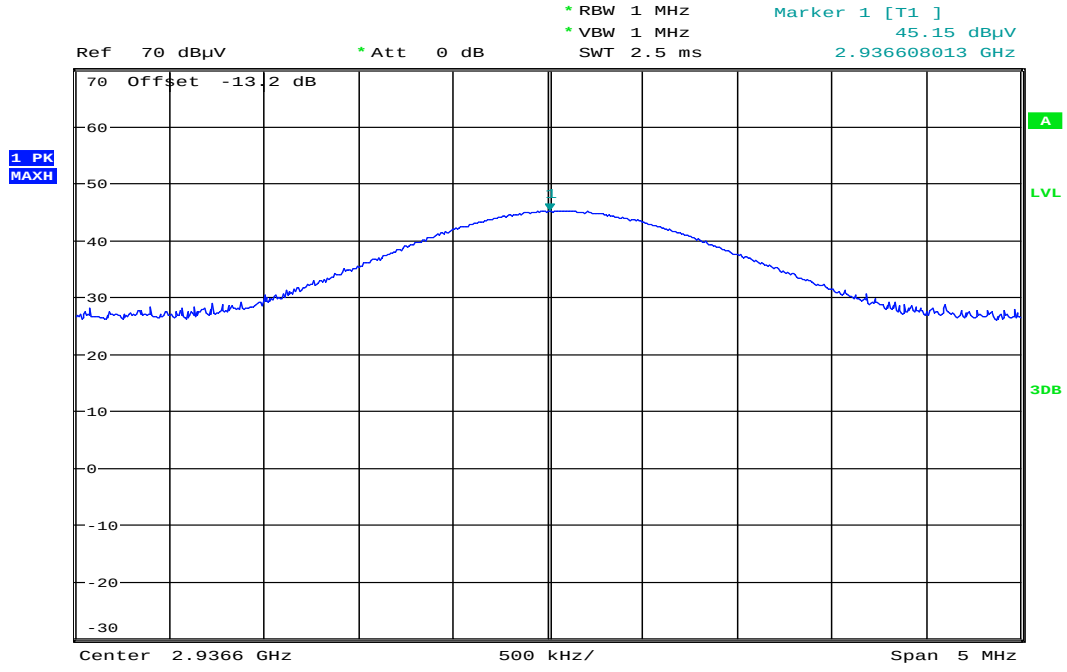
Date: 5.OCT.2011 15:14:30

Plot 25: 2905 MHz, Antenna 2



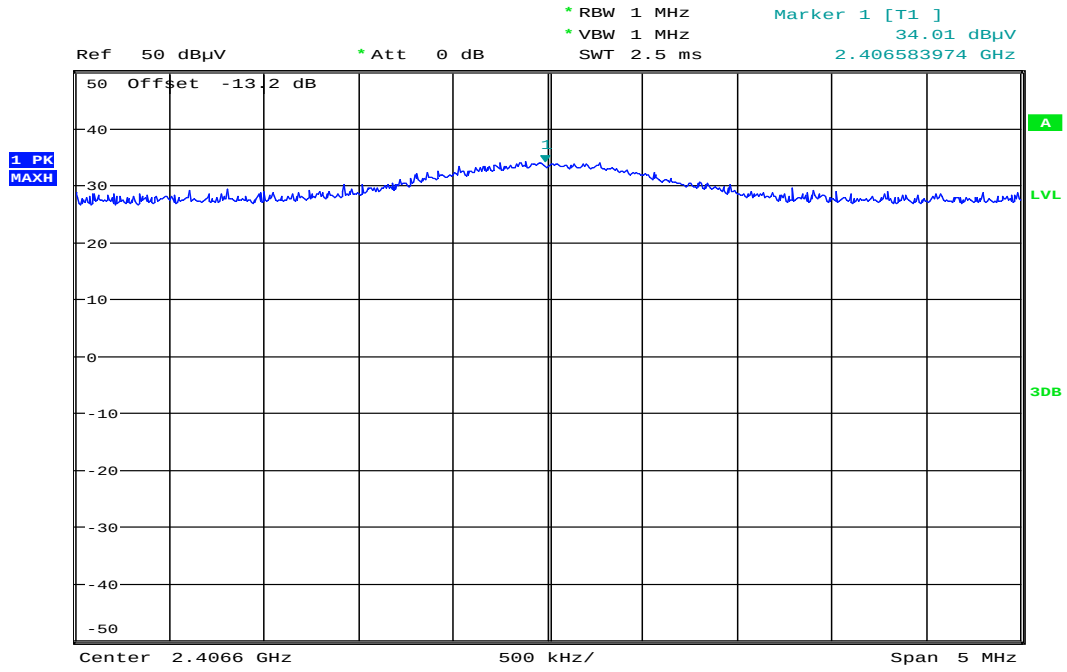
Date: 5.OCT.2011 15:15:29

Plot 26: 2940 MHz, Antenna 2



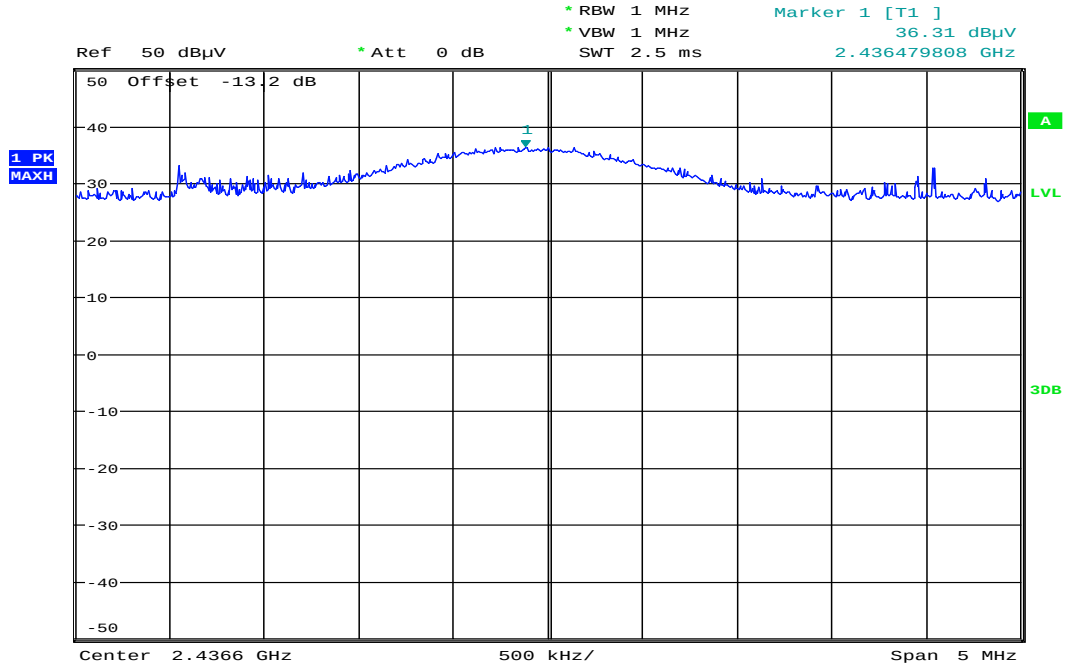
Date: 5.OCT.2011 15:16:14

Plot 27: 2410 MHz, Antenna 3



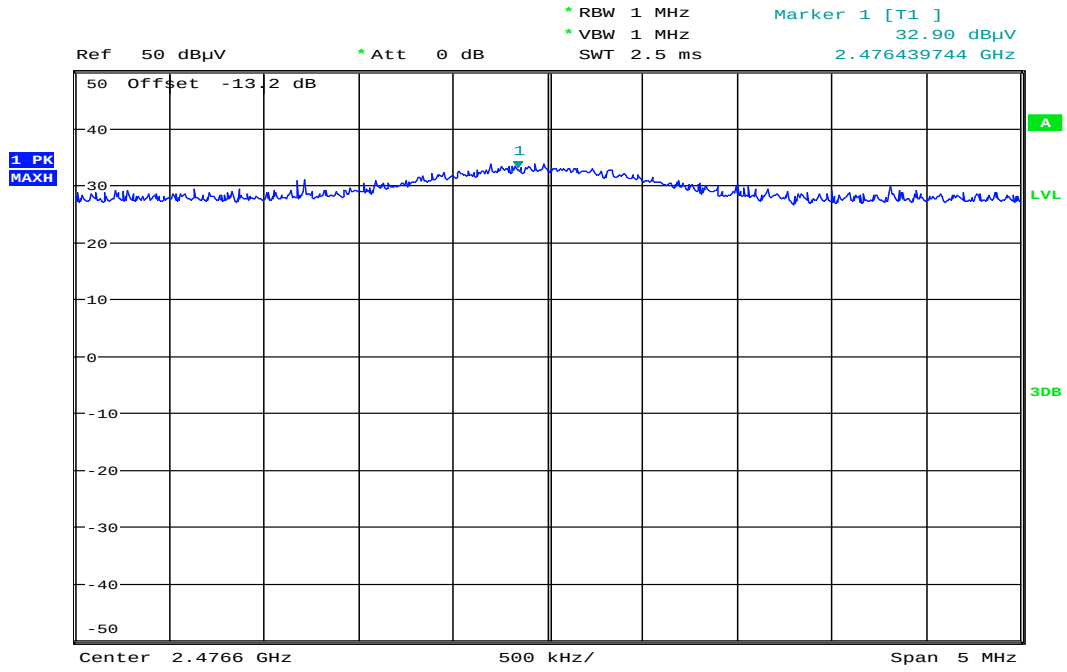
Date: 5.OCT.2011 16:08:38

Plot 28: 2440 MHz, Antenna 3



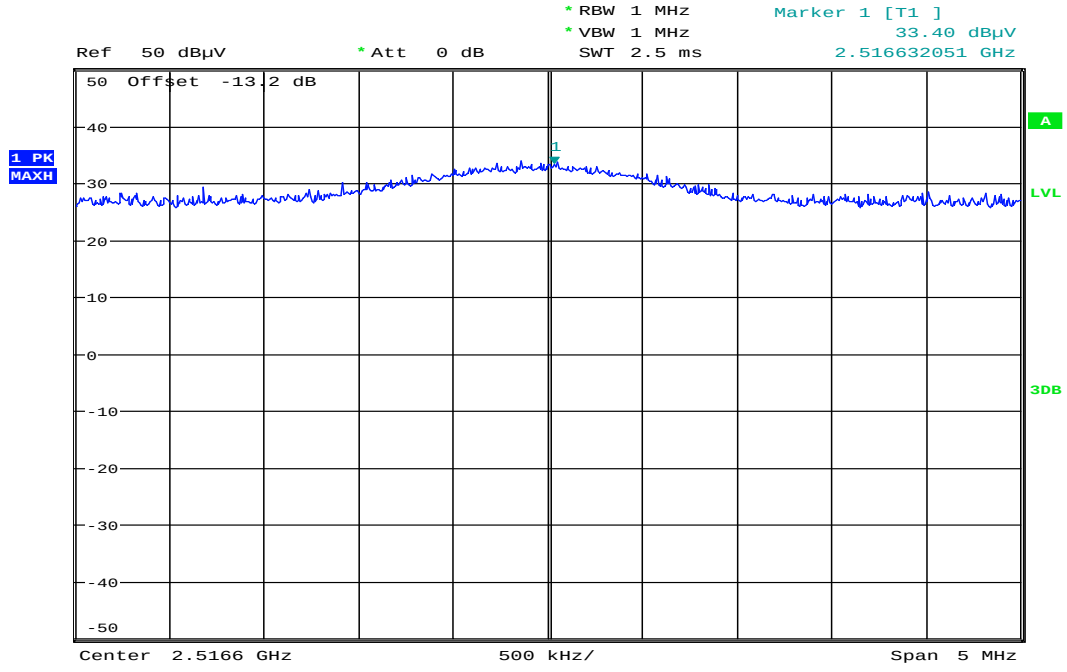
Date: 5.OCT.2011 16:09:46

Plot 29: 2480 MHz, Antenna 3



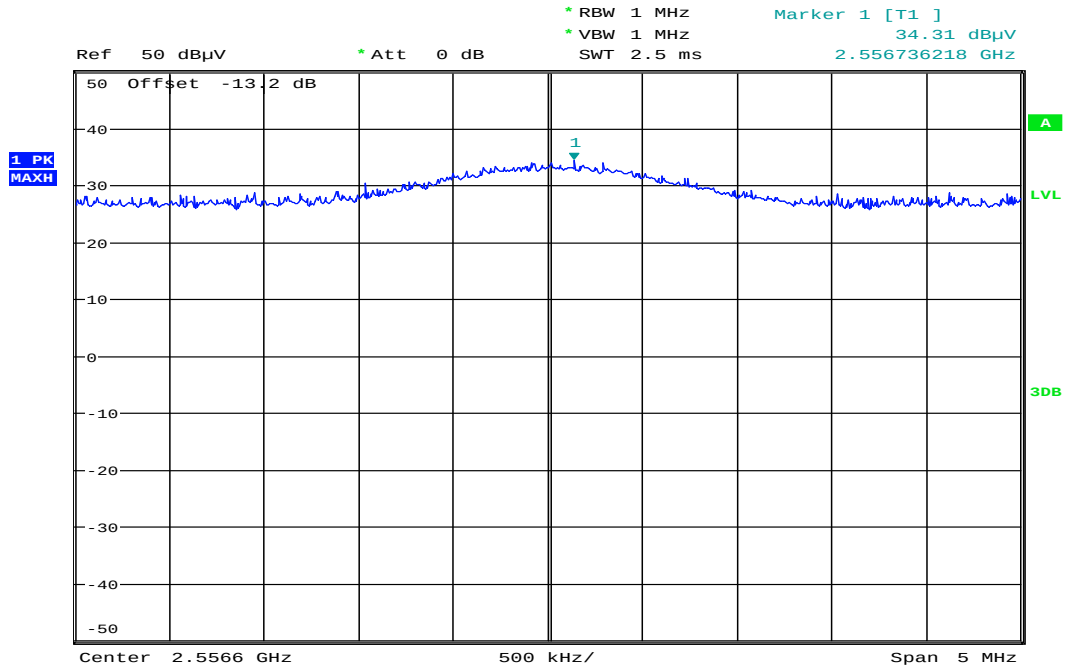
Date: 5.OCT.2011 16:10:37

Plot 30: 2520 MHz, Antenna 3



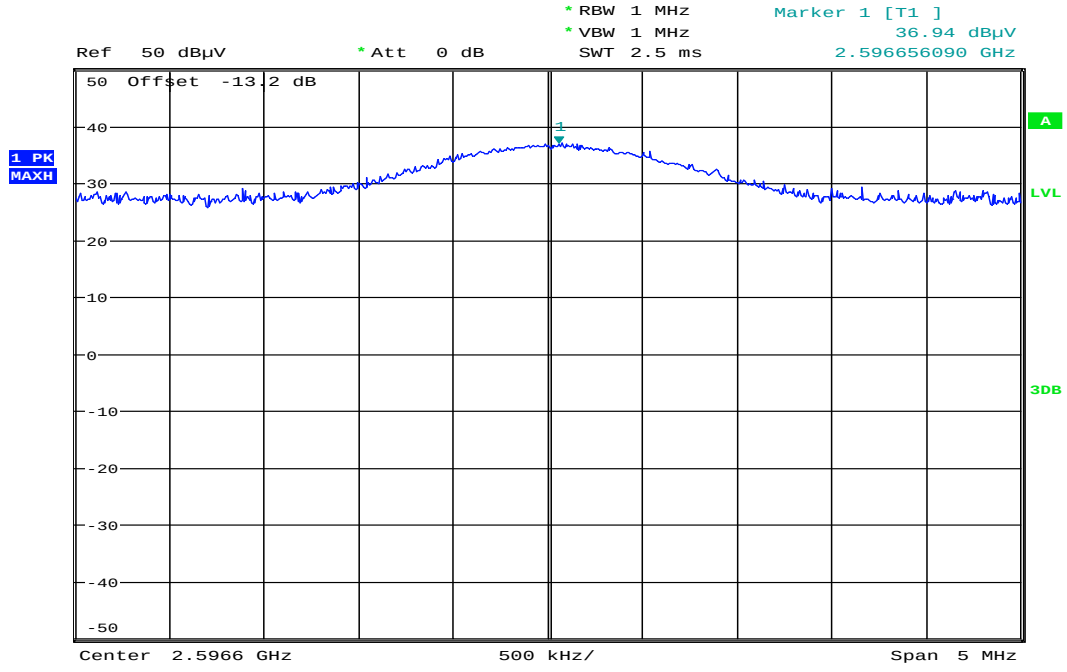
Date: 5.OCT.2011 16:11:19

Plot 31: 2560 MHz, Antenna 3



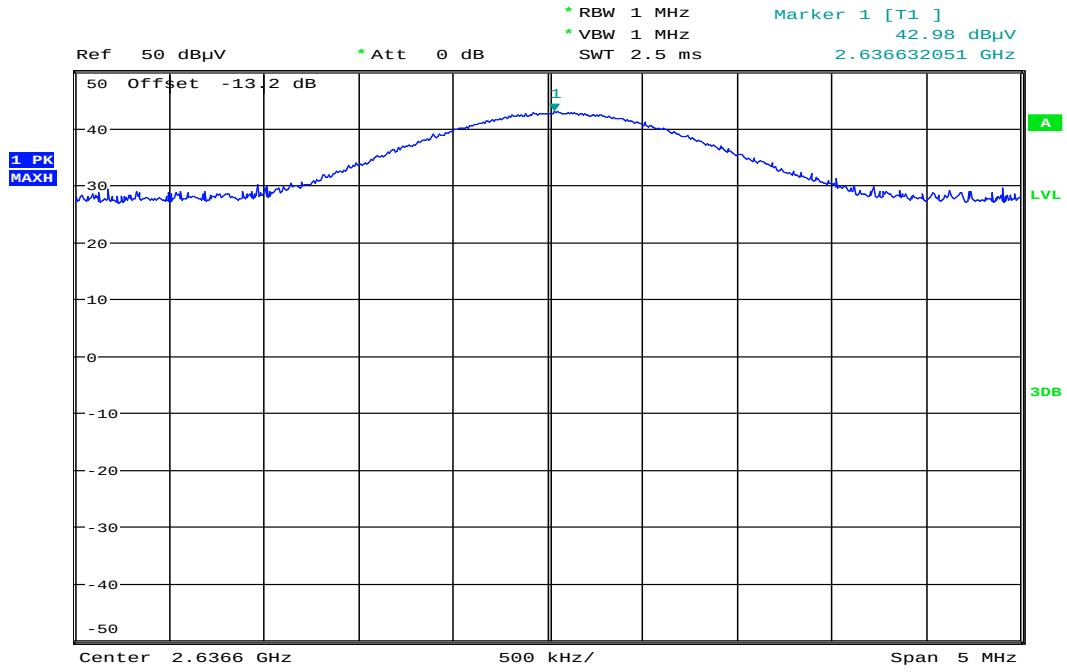
Date: 5.OCT.2011 16:12:17

Plot 32: 2600 MHz, Antenna 3



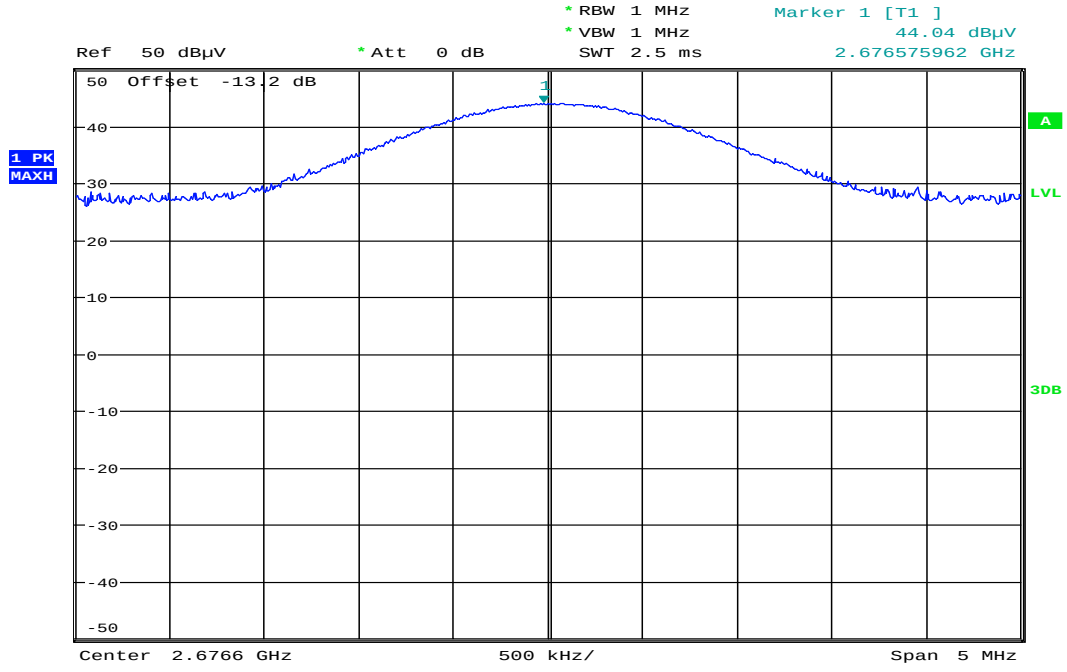
Date: 5.OCT.2011 16:13:01

Plot 33: 2640 MHz, Antenna 3



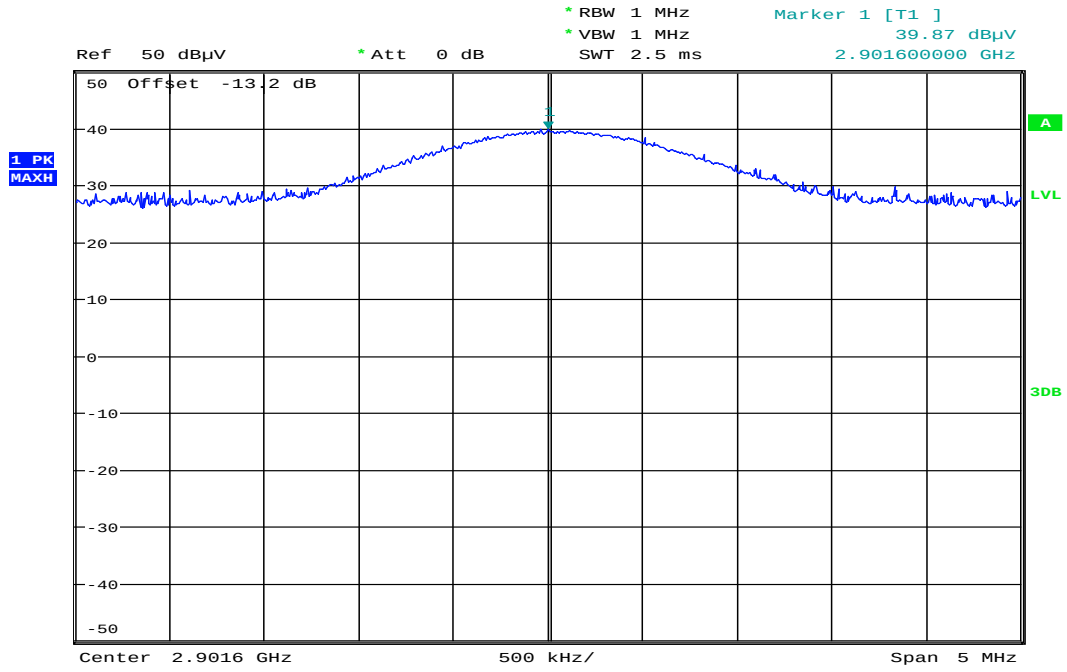
Date: 5.OCT.2011 16:14:28

Plot 34: 2680 MHz, Antenna 3

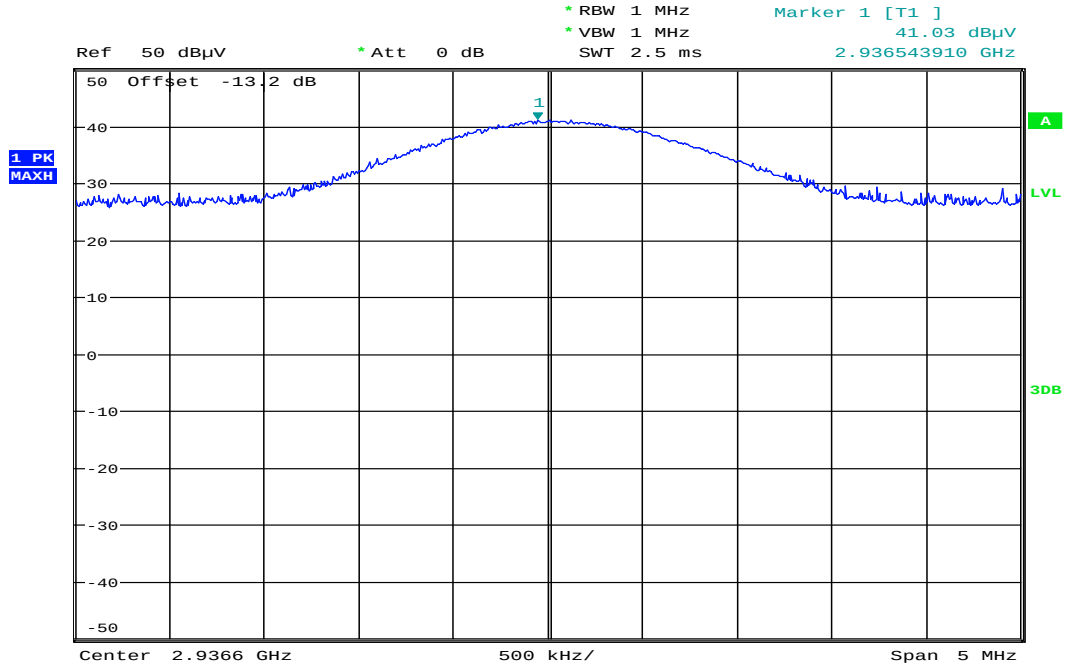


Date: 5.OCT.2011 16:15:16

Plot 35: 2905 MHz, Antenna 3



Plot 36: 2940 MHz, Antenna 3



Result: **The measurement is passed.**

9.4 Band edge compliance

Description:

The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed.

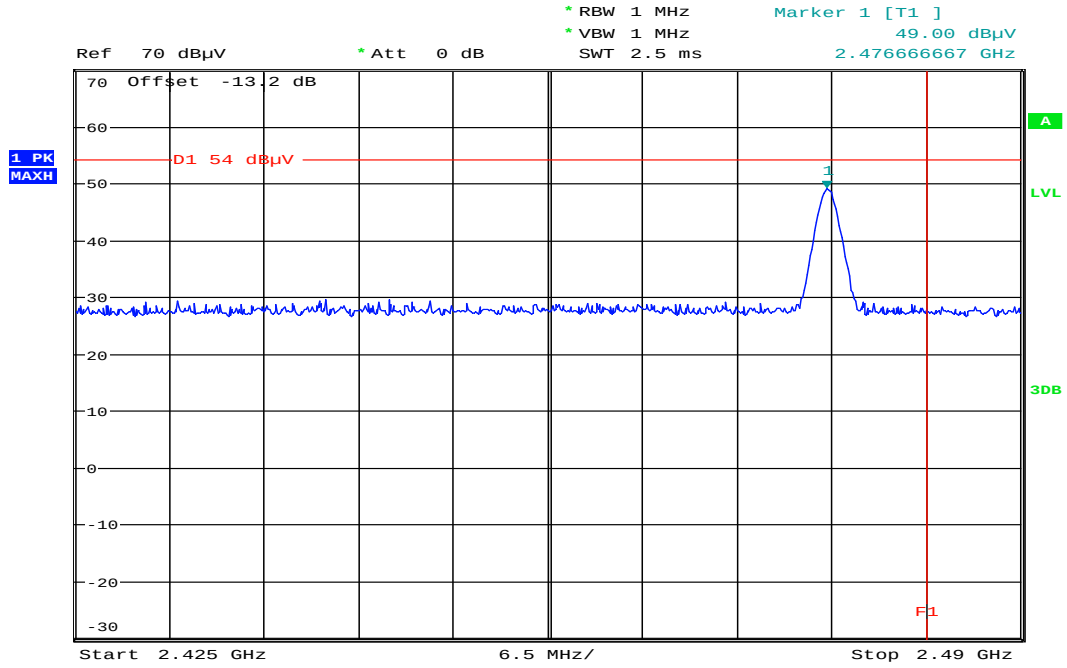
Limits:

FCC	IC
CFR Part 15.205	RSS 210, Issue 8, A 8.5
Band Edge Compliance Radiated	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).	
54 dBµV/m AVG / 74 dBµV/m (Peak)	

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
[1]0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	([2])
13.36–13.41			

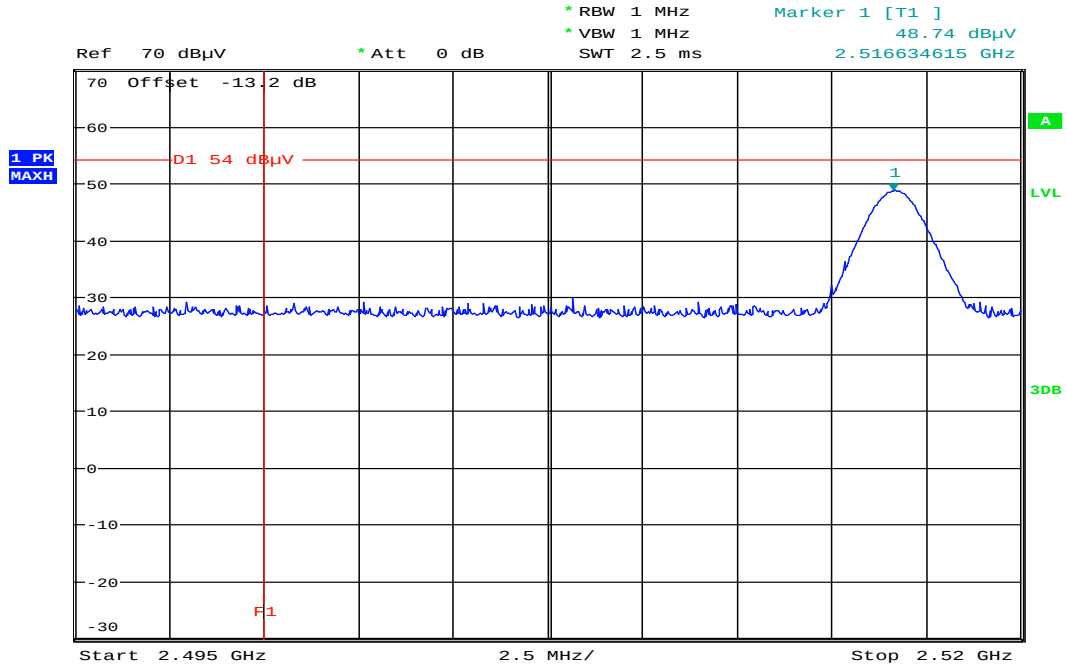
- **Antenna 1:**

Plot 37: Antenna 1, BEC Channel 3, 2480 MHz (Restricted band 2483.5 MHz – 2500 MHz)



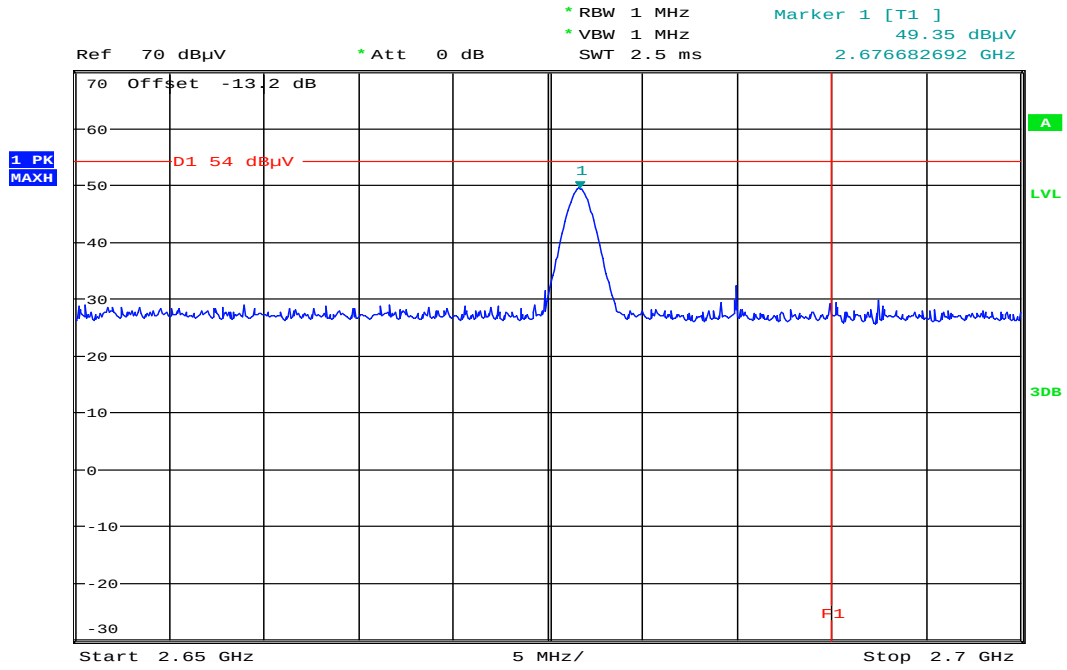
Date: 5.SEP.2011 15:44:12

Plot 38: Antenna 1, BEC Channel 4, 2520 MHz (Restricted band 2483.5 MHz – 2500 MHz)



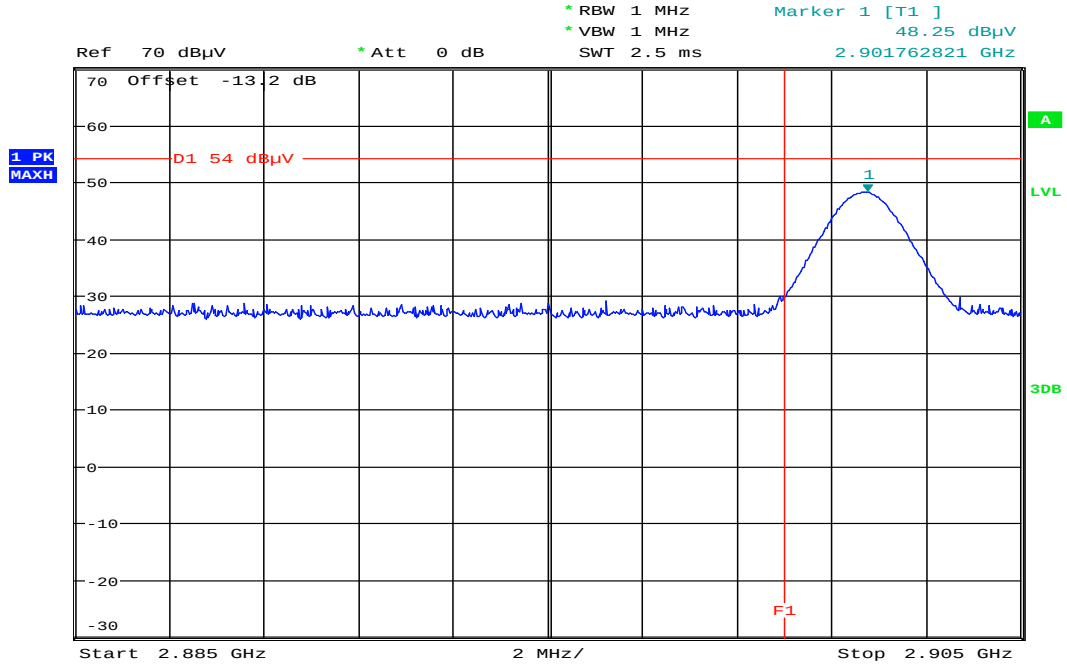
Date: 5.SEP.2011 15:49:36

Plot 39: Antenna 1, BEC Channel 8, 2680 MHz (Restricted band 2690 MHz – 2900 MHz)



Date: 5.SEP.2011 15:54:44

Plot 40: Antenna 1, BEC Channel 9, 2905 MHz (Restricted band 2690 MHz – 2900 MHz)

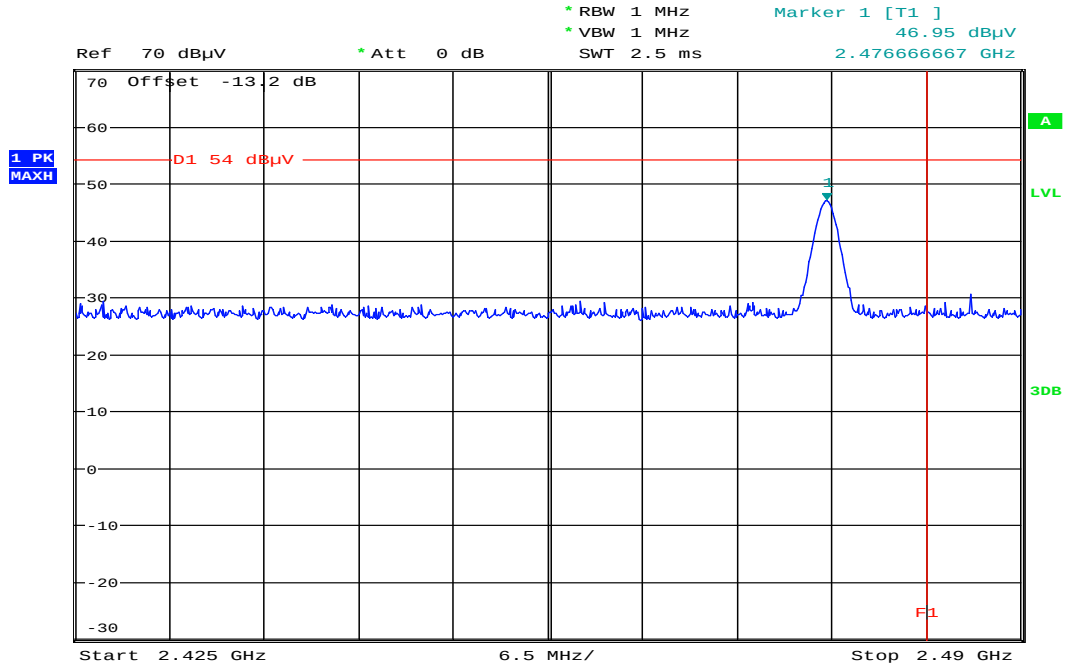


Date: 5.SEP.2011 15:58:45

Result: **The measurement is passed.**

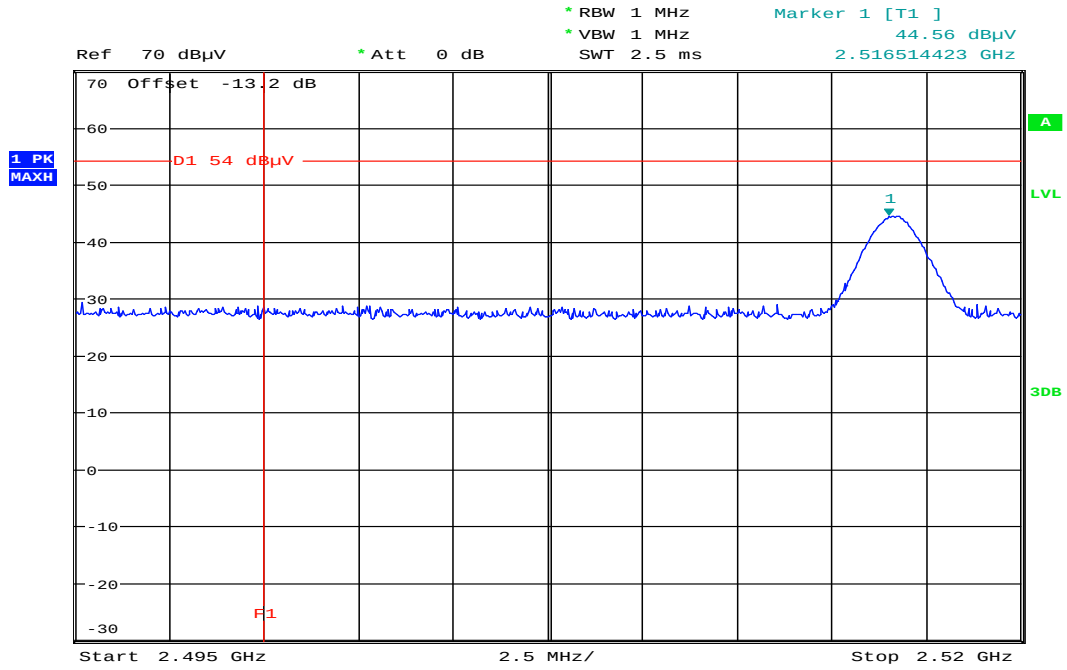
- **Antenna 2:**

Plot 41: Antenna 2, BEC Channel 3, 2480 MHz (Restricted band 2483.5 MHz – 2500 MHz)



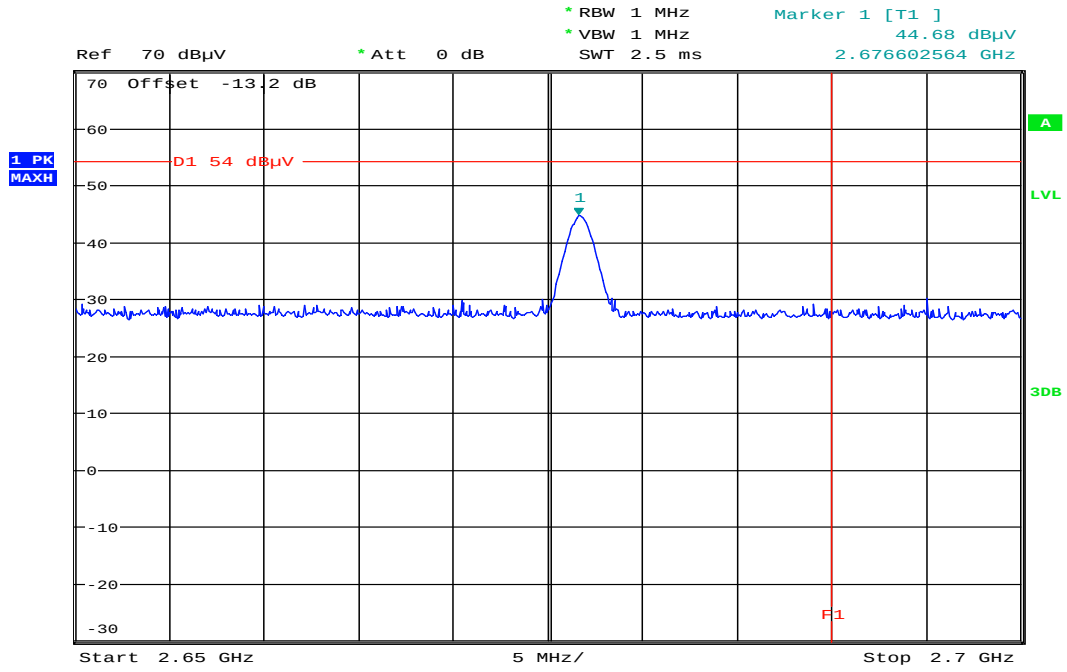
Date: 5.OCT.2011 15:19:54

Plot 42: Antenna 2, BEC Channel 4, 2520 MHz (Restricted band 2483.5 MHz – 2500 MHz)



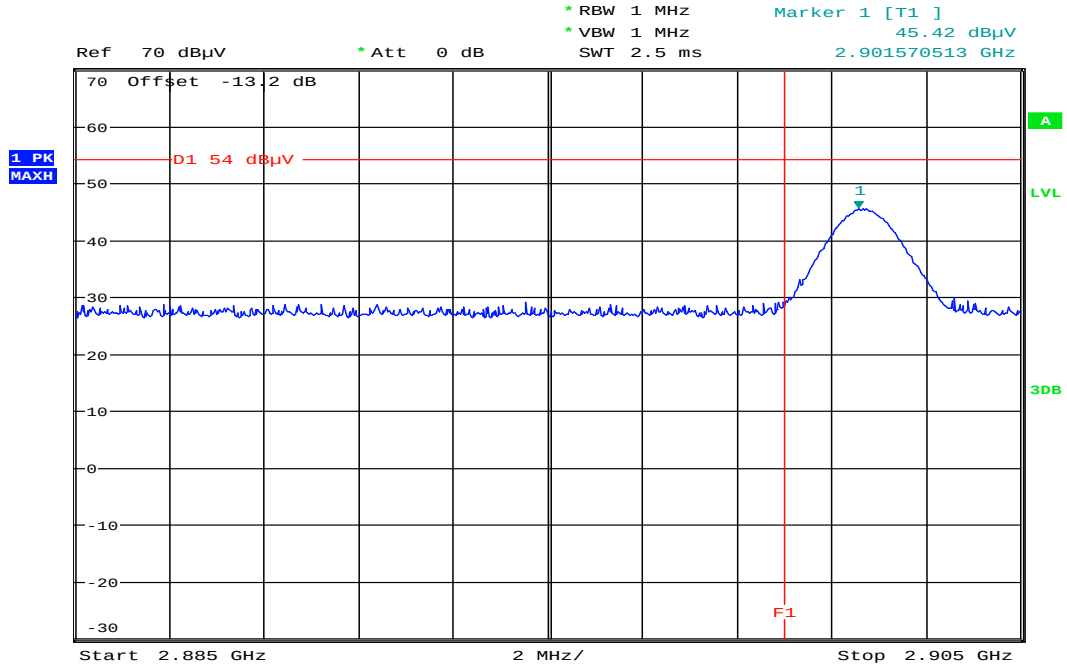
Date: 5.OCT.2011 15:21:07

Plot 43: Antenna 2, BEC Channel 8, 2680 MHz (Restricted band 2690 MHz – 2900 MHz)



Date: 5.OCT.2011 15:22:15

Plot 44: Antenna 2, BEC Channel 9, 2905 MHz (Restricted band 2690 MHz – 2900 MHz)

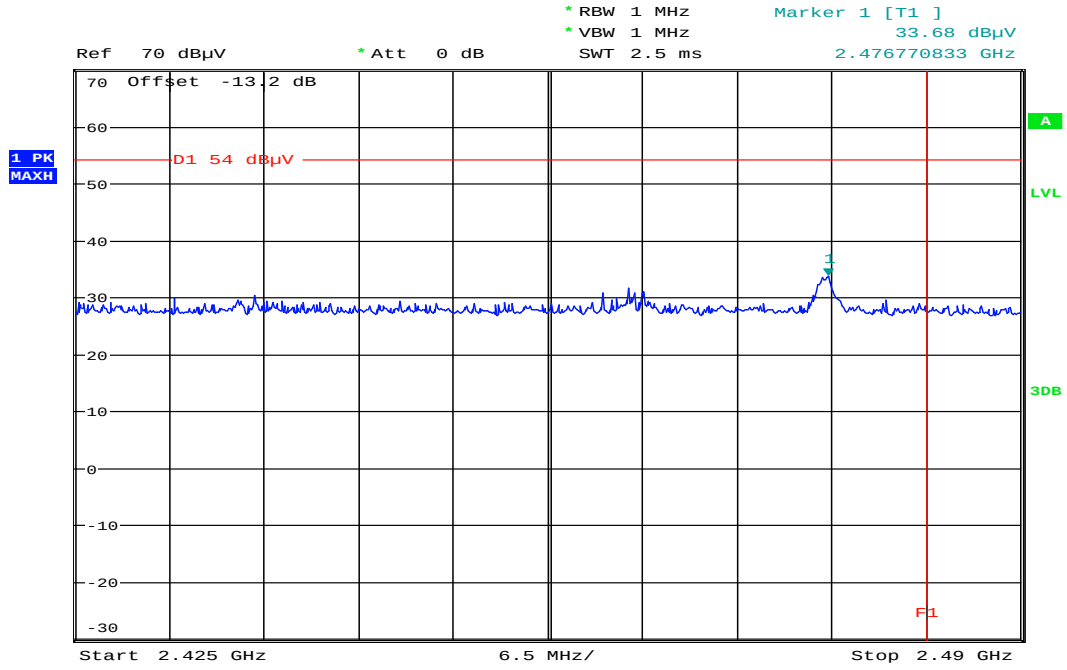


Date: 5.OCT.2011 15:23:35

Result: **The measurement is passed.**

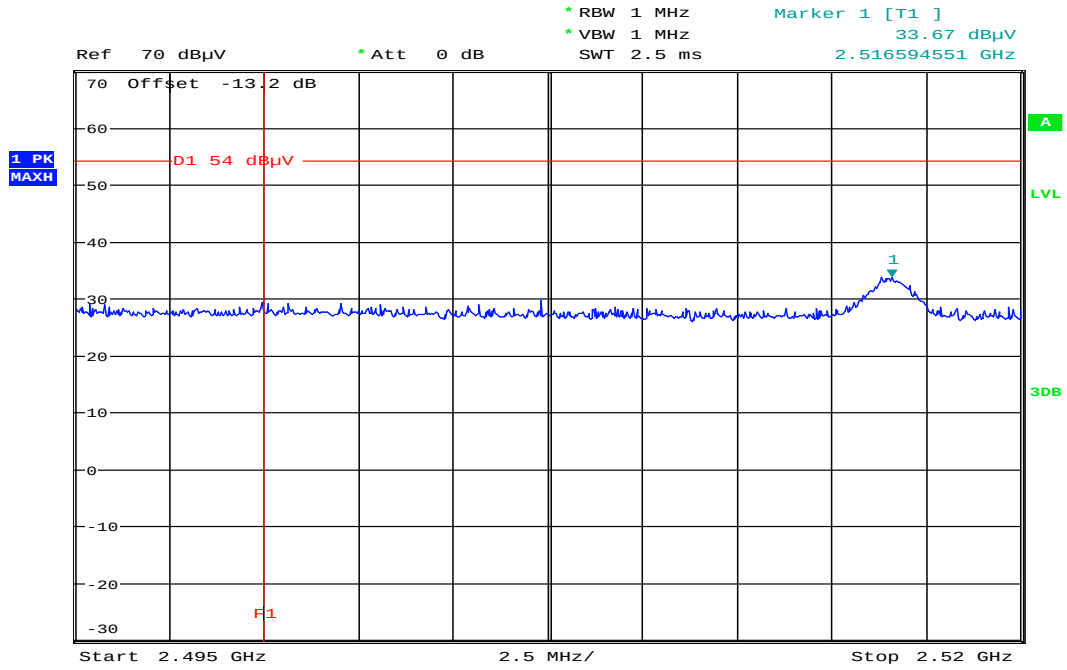
- **Antenna 3:**

Plot 45: Antenna 3, BEC Channel 3, 2480 MHz (Restricted band 2483.5 MHz – 2500 MHz)



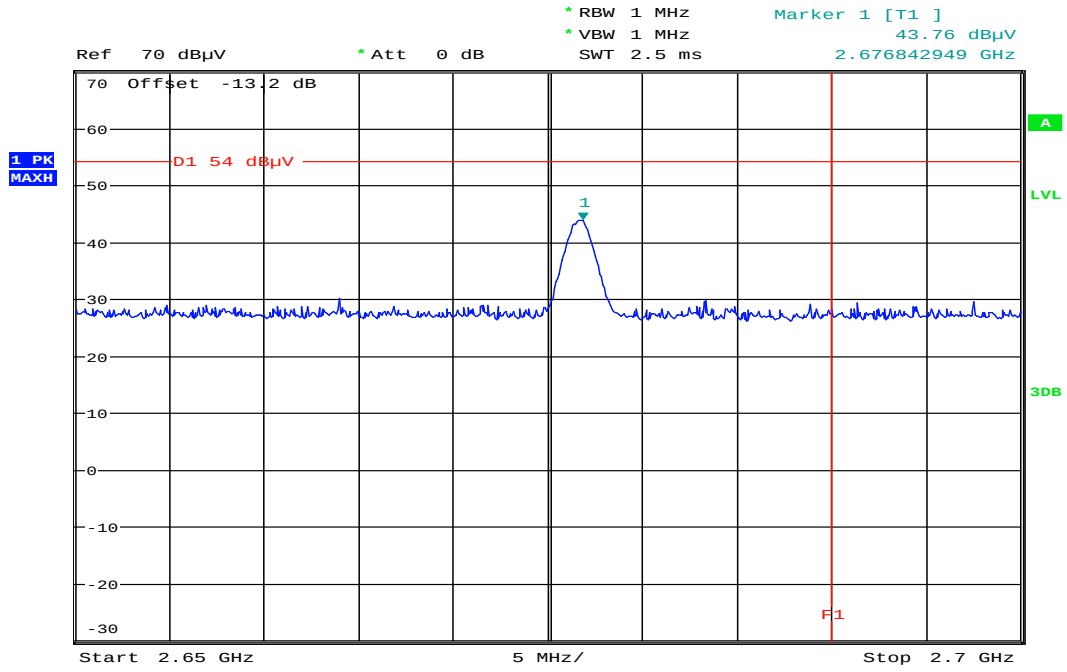
Date: 5.OCT.2011 16:20:01

Plot 46: Antenna 3, BEC Channel 4, 2520 MHz (Restricted band 2483.5 MHz – 2500 MHz)



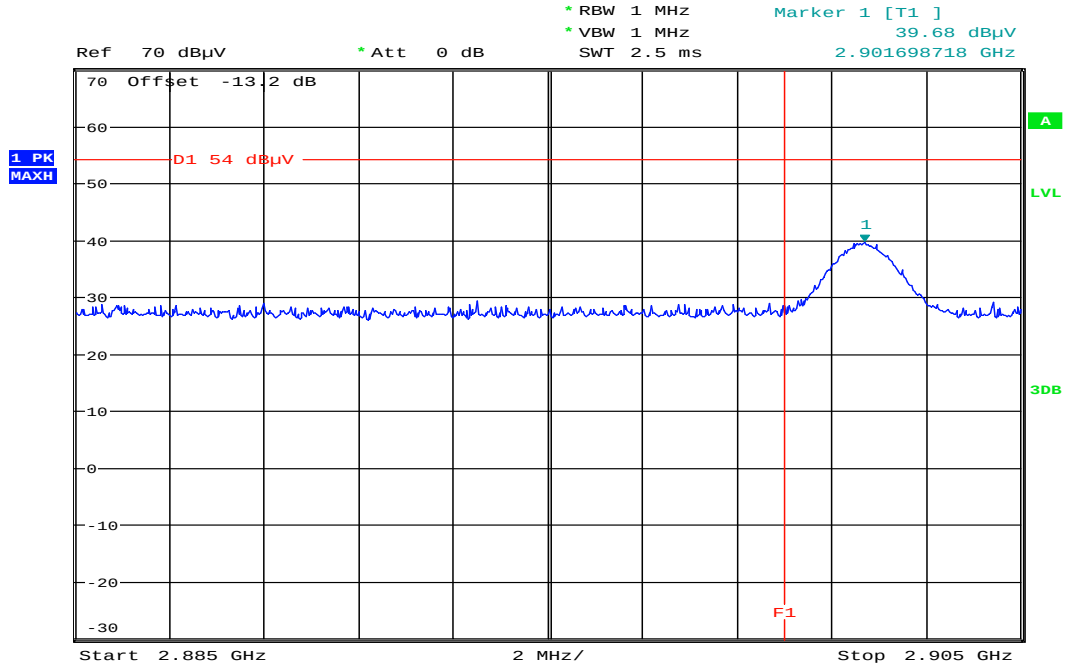
Date: 5.OCT.2011 16:22:29

Plot 47: Antenna 3, BEC Channel 8, 2680 MHz (Restricted band 2690 MHz – 2900 MHz)



Date: 5.OCT.2011 16:23:38

Plot 48: Antenna 3, BEC Channel 9, 2905 MHz (Restricted band 2690 MHz – 2900 MHz)



Date: 5.OCT.2011 16:24:39

Result: **The measurement is passed.**

9.5 Field strength of the harmonics and spurious

Measurement:

Measurement parameter	
Detector:	Average / Quasi Peak
Sweep time:	Auto
Resolution bandwidth:	See table / See plots
Video bandwidth:	See table / See plots
Trace-Mode:	Max Hold

Limits:

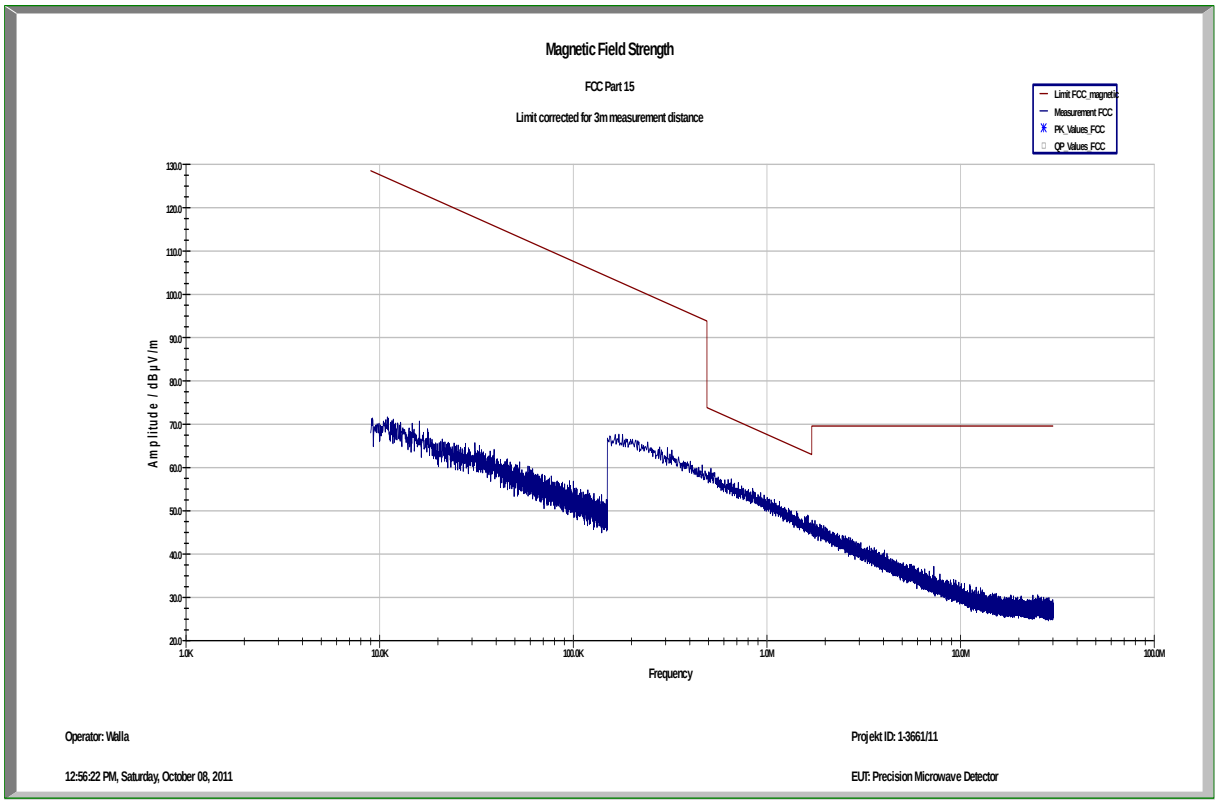
FCC		IC
SUBCLAUSE § 15.209 (a)		RSS-210 Issue 7
Field strength of the harmonics and spurious.		
Frequency (MHz)	**Field strength (µV/m)**	**Measurement distance (m)**
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30 (29.5 dBµV/m)	30
30 – 88	100 (40 dBµv/m)	3
88 – 216	150 (43.5 dBµV/m)	3
216 – 960	200 (46 dBµV/m)	3
Above 960	500 (54 dBµV/m)	3

Result:

EMISSION LIMITATIONS				
Frequency [MHz]	Detector	Limit max. allowed [dBµV/m]	Amplitude of emission [dBµV/m]	Results
See table				

- **Antenna 1:**

Plot 49: 9 kHz – 30 MHz (Valid for all channels)



Channel 1: 2410 MHz, antenna 1

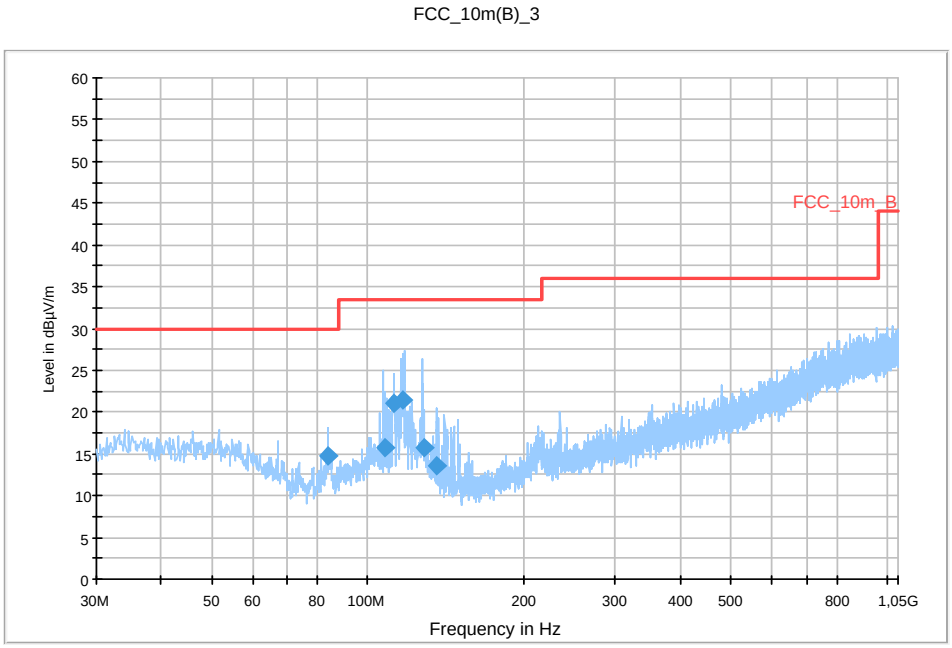
Plot 50: 30 MHz – 1 GHz

EUT:	PMD 2450-3
Serial Number:	1081-07/2011
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	cont. TX 2410 MHz
Operator Name:	Hennemann
Comment:	AC: 115 V

Scan Setup: STAN_Fin [EMI radiated]

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

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



Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
83.934300	14.7	1000.0	120.000	170.0	V	83.0	9.7	15.3	30.0
107.531400	15.7	1000.0	120.000	170.0	V	283.0	11.2	17.8	33.5
112.113000	21.0	1000.0	120.000	98.0	V	77.0	10.9	12.5	33.5
117.071250	21.5	1000.0	120.000	98.0	V	79.0	10.5	12.0	33.5
128.249850	15.8	1000.0	120.000	170.0	V	79.0	9.6	17.7	33.5
135.725550	13.6	1000.0	120.000	112.0	V	79.0	9.0	19.9	33.5

Plot 51: 1 GHz – 12 GHz

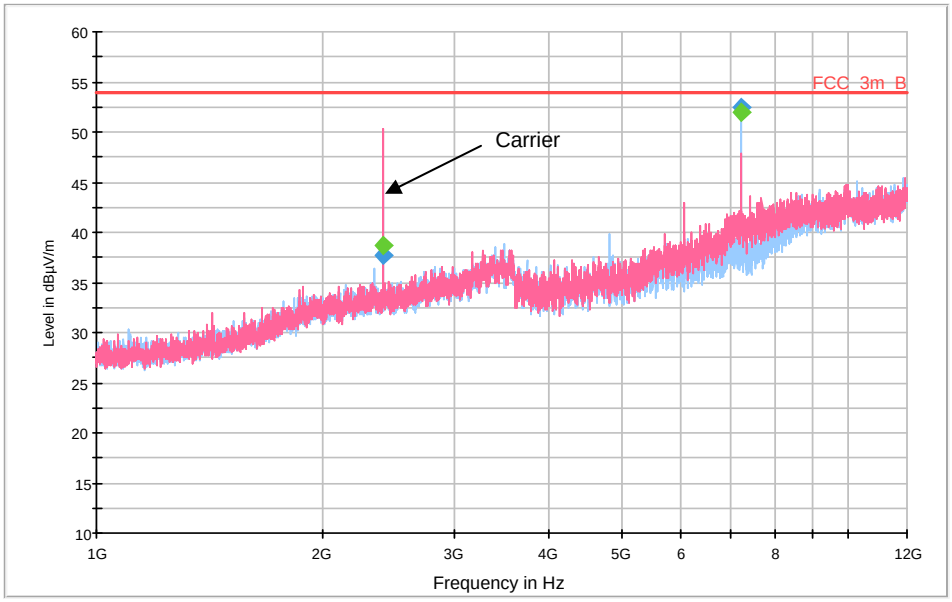
EUT:	PMD 2450-3
Serial Number:	1081-07/2011
Test Description:	FCC part 15 class B @ 3 m
Operating Conditions:	cont. TX 2410 MHz
Operator Name:	Hennemann
Comment:	AC: 115 V

Scan Setup: C_FIN [EMI radiated]

Hardware Setup:	C_MATRIX
Receiver:	[ESU 26]
Level Unit:	dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
1 GHz - 4 GHz	400 kHz	AVG	1 MHz	0,1 s	0 dB
4 GHz - 12 GHz	1 MHz	AVG	1 MHz	0,1 s	0 dB

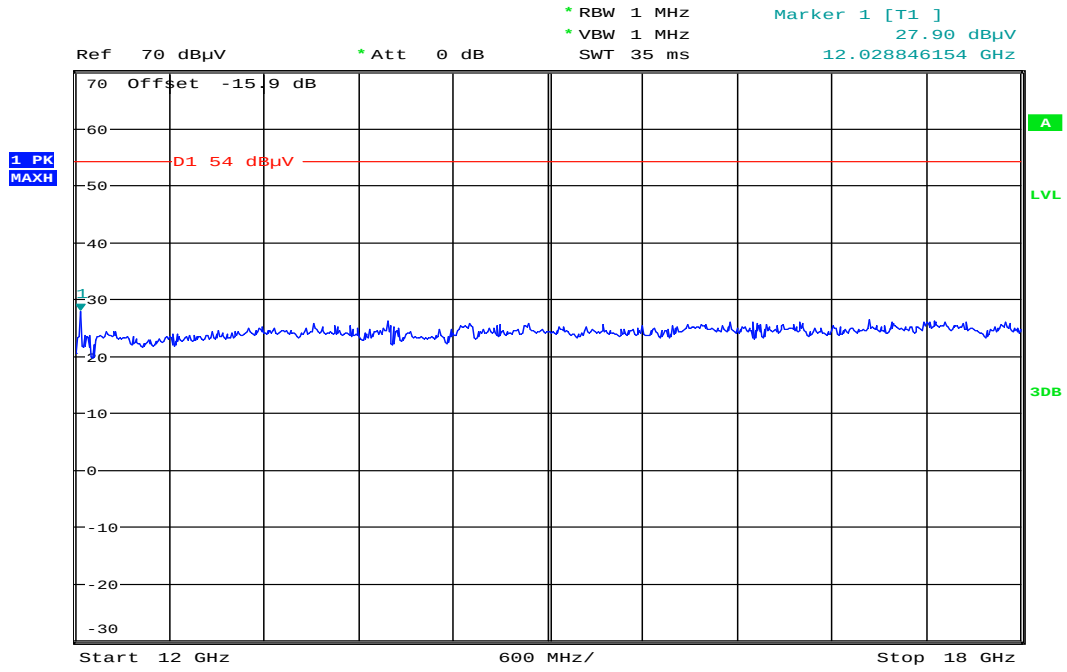
FCC_1_18_B_oH



Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2406.24111	37.8	3000.0	1000.000	100.0	V	0.0	-9.1	16.2	54.0
7218.85721	52.4	3000.0	1000.000	100.0	H	345.0	0.4	1.6	54.0

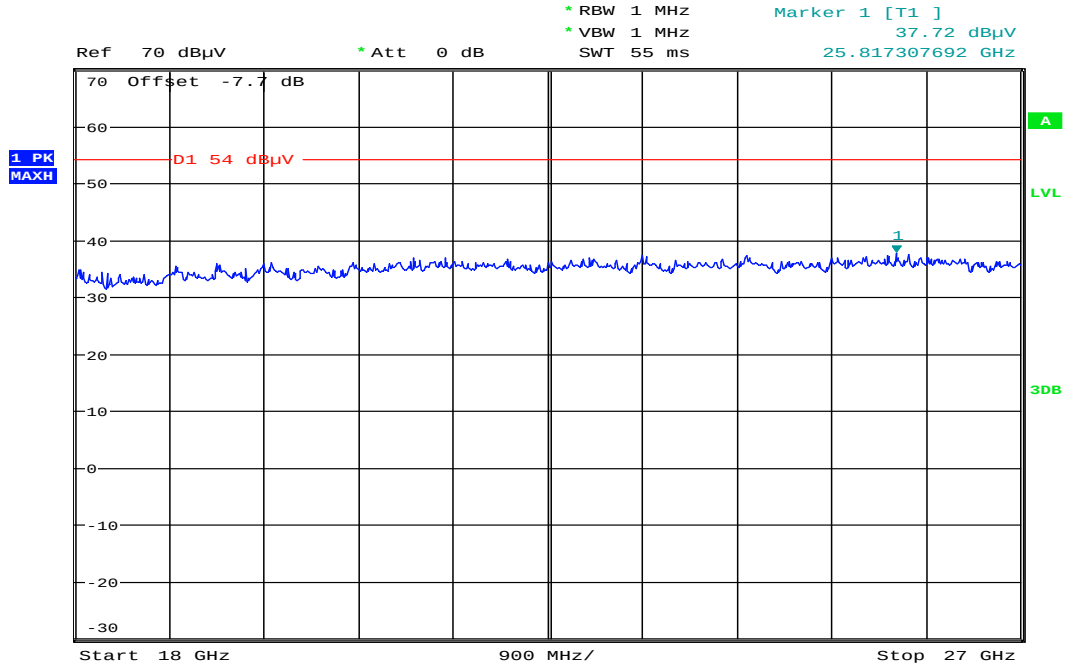
Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)
2406.241110	38.7	100.0	V	13.0	-9.1
7218.857219	52.0	100.0	H	353.0	0.4

Plot 52: 12 GHz – 18 GHz



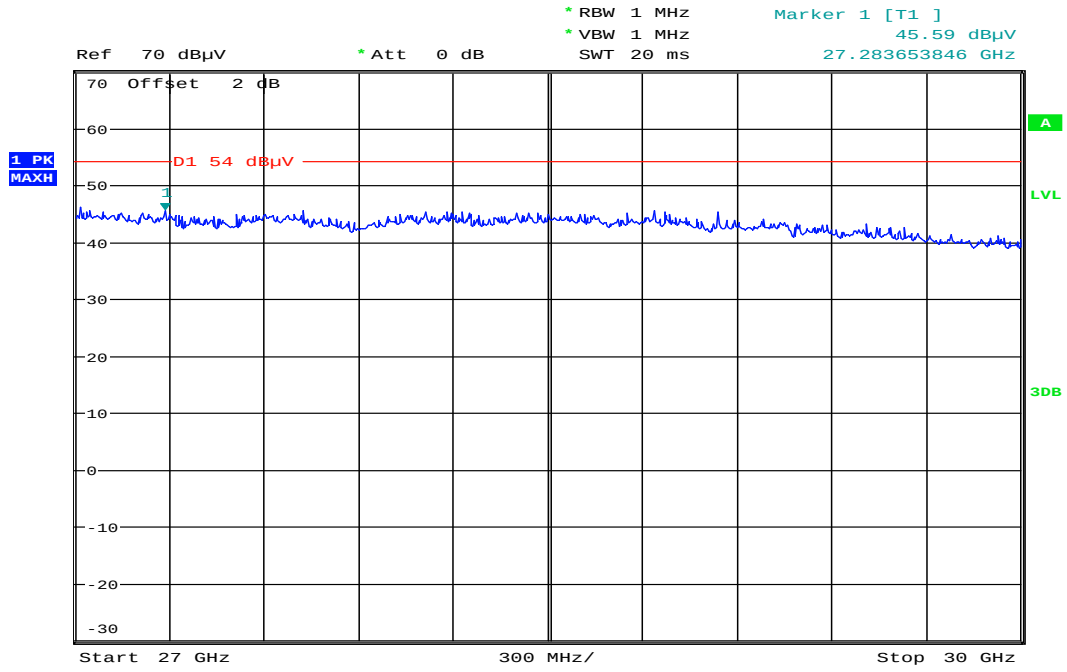
Date: 5.SEP.2011 16:55:11

Plot 53: 18 GHz – 27 GHz



Date: 5.SEP.2011 17:32:30

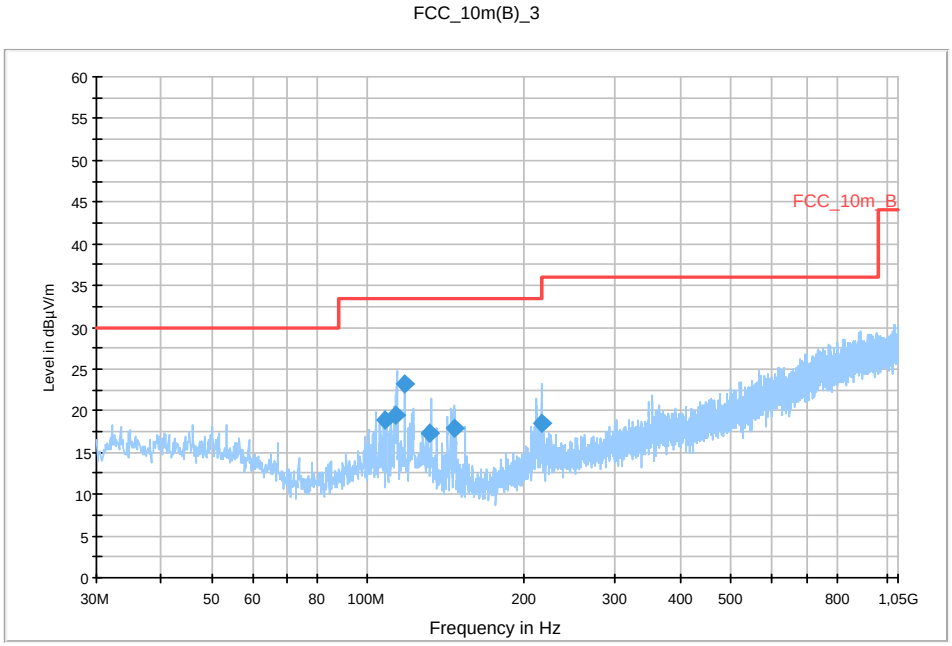
Plot 54: 27 GHz – 30 GHz



Date: 5.SEP.2011 17:47:41

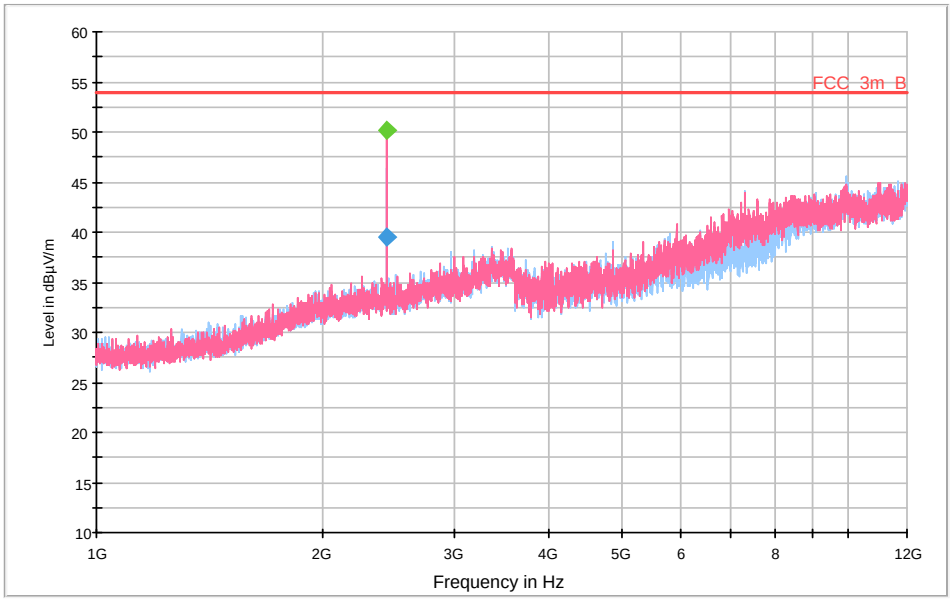
Channel 2: 2440 MHz, antenna 1

Plot 55: 30 MHz – 1 GHz

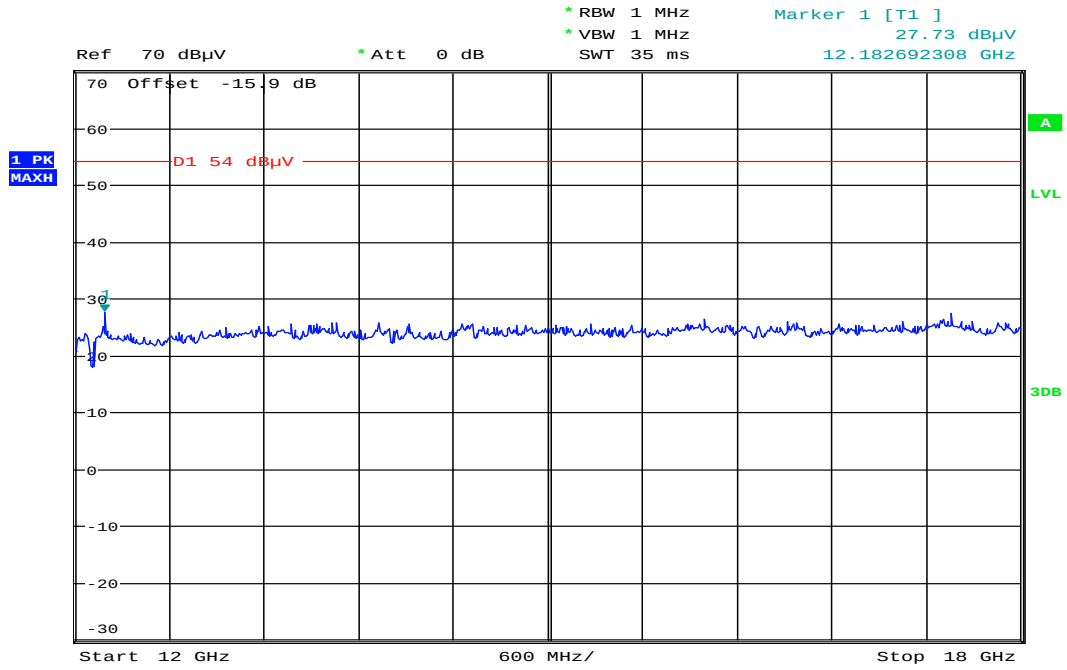


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
107.602050	19.0	1000.0	120.000	170.0	V	181.0	11.2	14.5	33.5
113.096400	19.5	1000.0	120.000	98.0	V	176.0	10.8	14.0	33.5
117.426150	23.2	1000.0	120.000	126.0	V	196.0	10.4	10.3	33.5
131.882400	17.4	1000.0	120.000	170.0	V	-6.0	9.3	16.1	33.5
146.335950	17.9	1000.0	120.000	98.0	V	-2.0	8.8	15.6	33.5
216.232650	18.4	1000.0	120.000	115.0	V	180.0	12.3	17.6	36.0

Plot 56: 1 GHz – 12 GHz

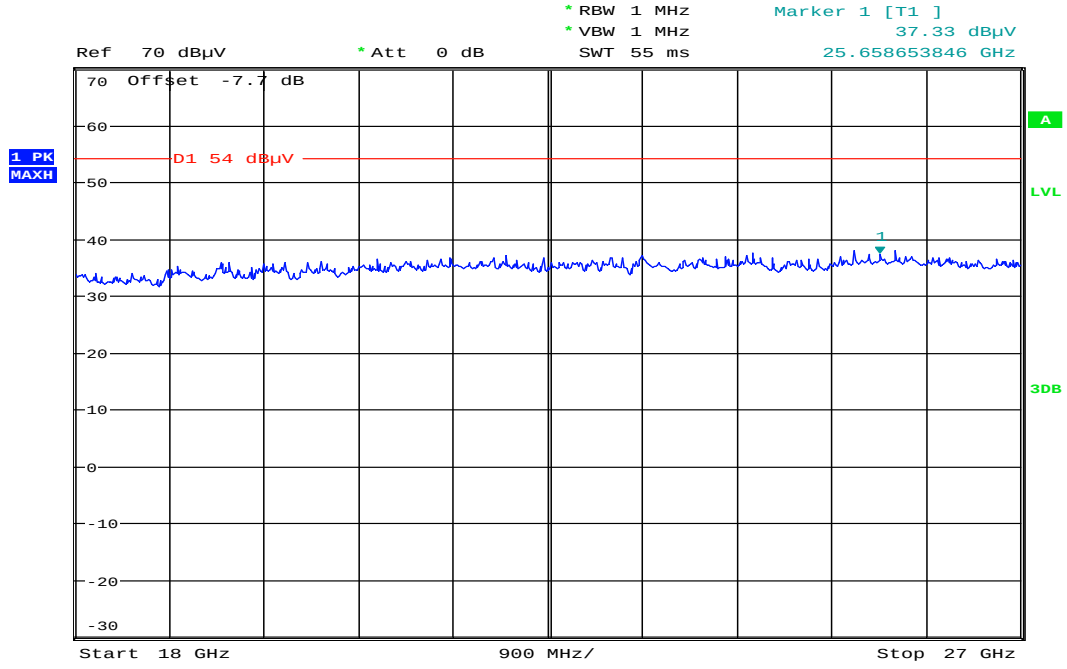


Plot 57: 12 GHz – 18 GHz



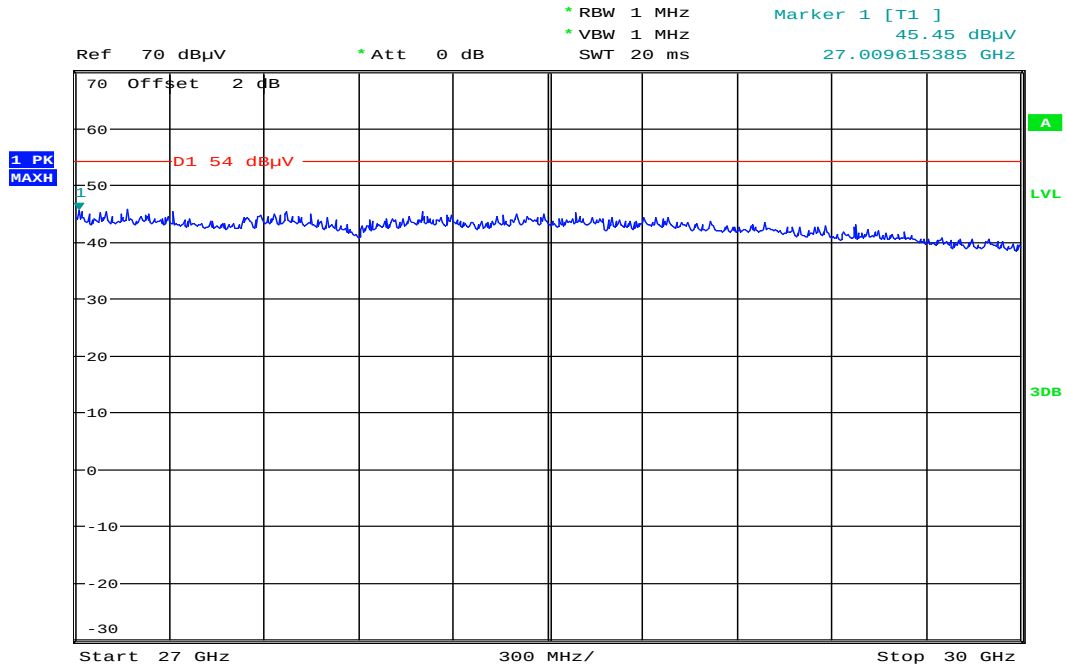
Date: 5.SEP.2011 16:56:29

Plot 58: 18 GHz – 27 GHz



Date: 5.SEP.2011 17:33:19

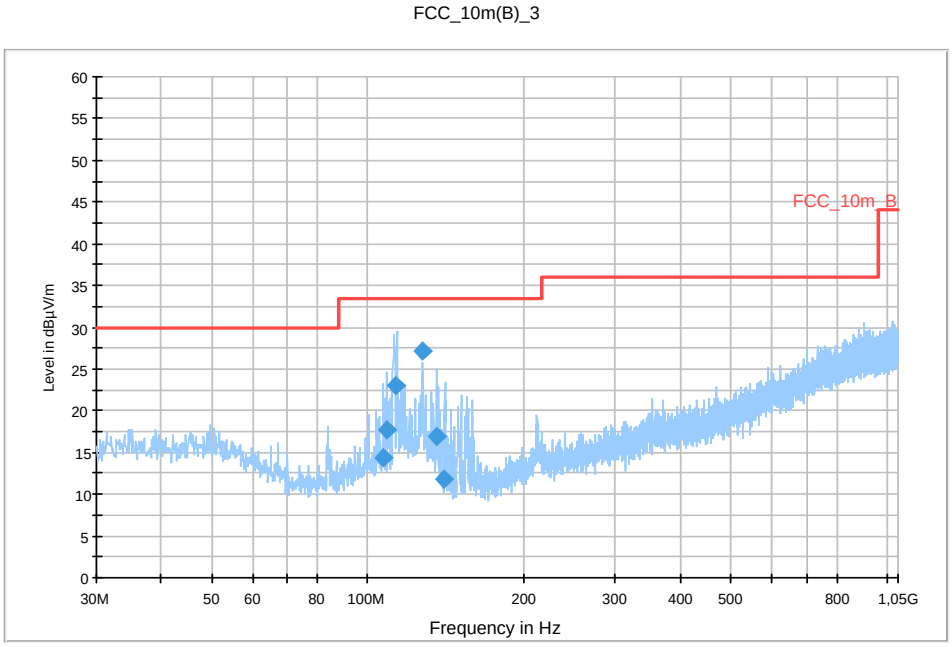
Plot 59: 27 GHz – 30 GHz



Date: 5.SEP.2011 17:49:28

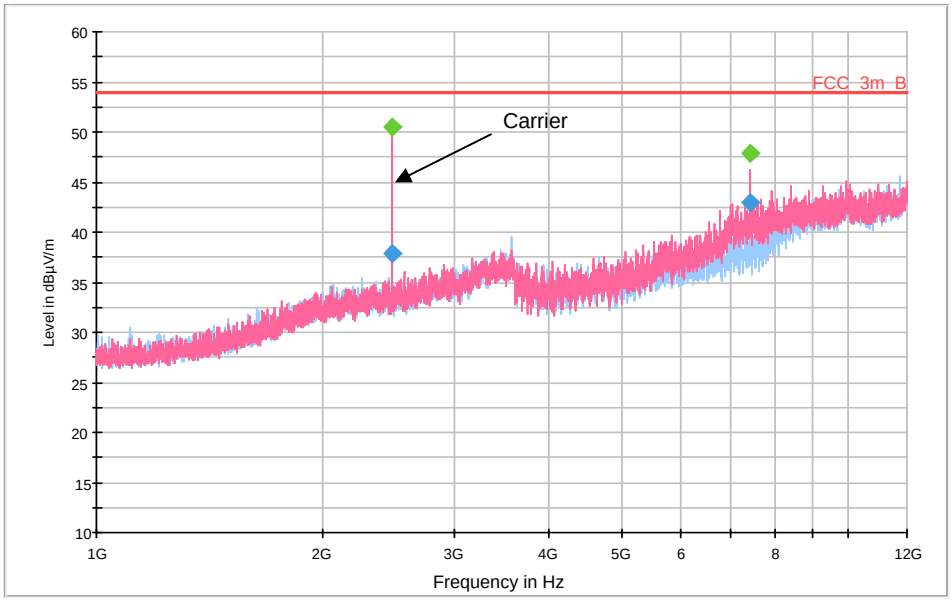
Channel 3: 2480 MHz, antenna 1

Plot 60: 30 MHz – 1 GHz

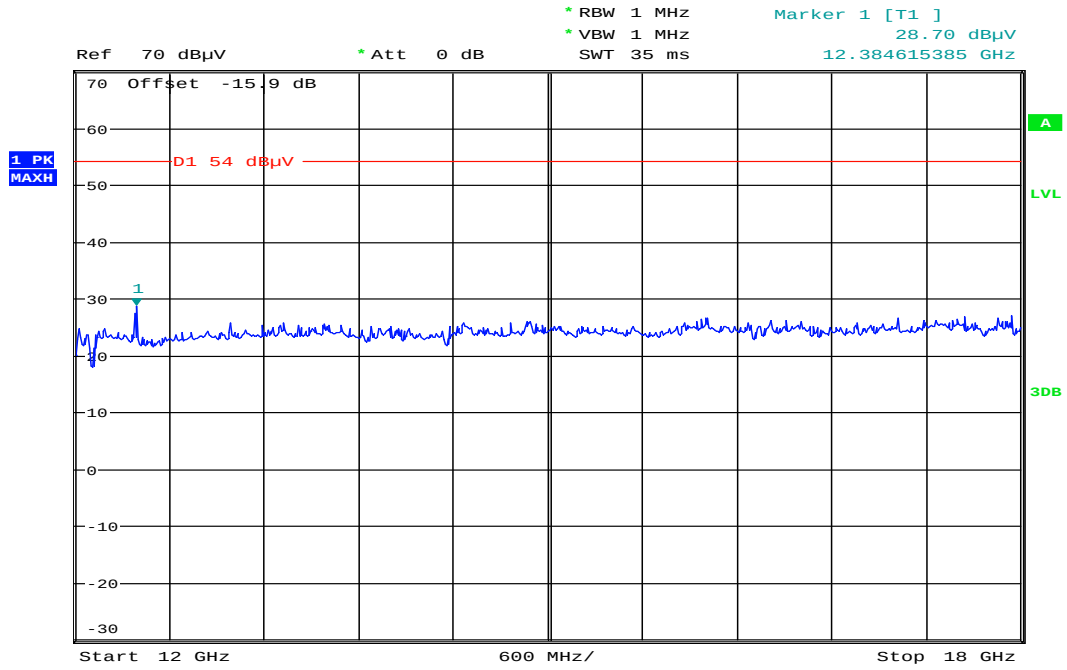


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
106.635150	14.4	1000.0	120.000	154.0	V	82.0	11.3	19.1	33.5
108.412950	17.6	1000.0	120.000	170.0	V	94.0	11.2	15.9	33.5
113.554350	23.1	1000.0	120.000	98.0	V	196.0	10.7	10.4	33.5
127.322400	27.2	1000.0	120.000	170.0	V	8.0	9.6	6.3	33.5
135.872850	16.9	1000.0	120.000	170.0	V	8.0	9.0	16.6	33.5
140.118900	11.8	1000.0	120.000	106.0	V	-6.0	8.7	21.7	33.5

Plot 61: 1 GHz – 12 GHz

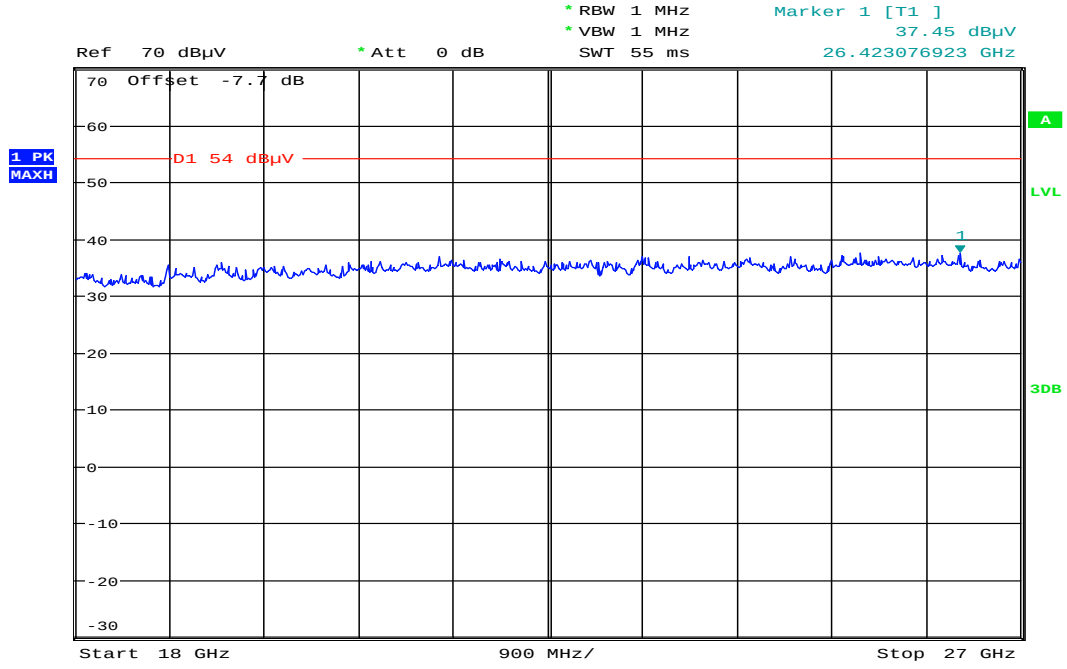


Plot 62: 12 GHz – 18 GHz



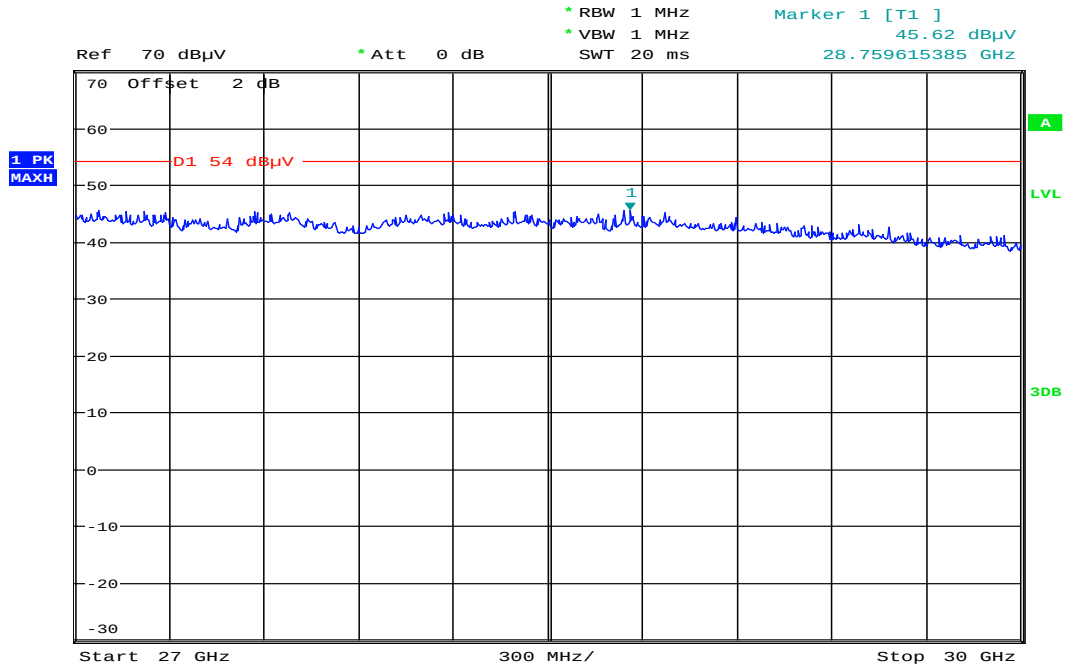
Date: 5.SEP.2011 16:57:43

Plot 63: 18 GHz – 27 GHz



Date: 5.SEP.2011 17:36:19

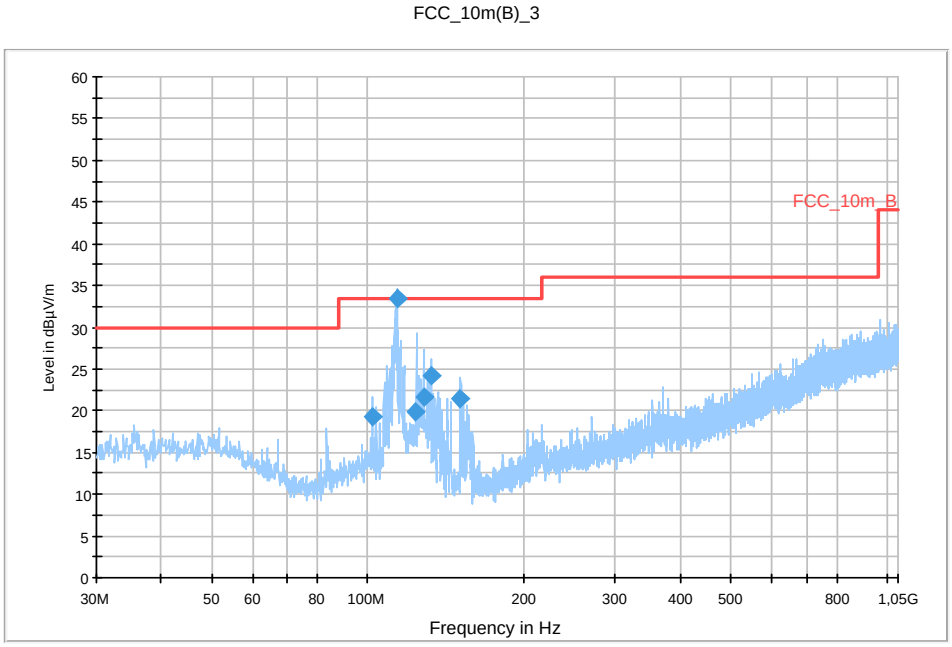
Plot 64: 27 GHz – 30 GHz



Date: 5.SEP.2011 17:50:18

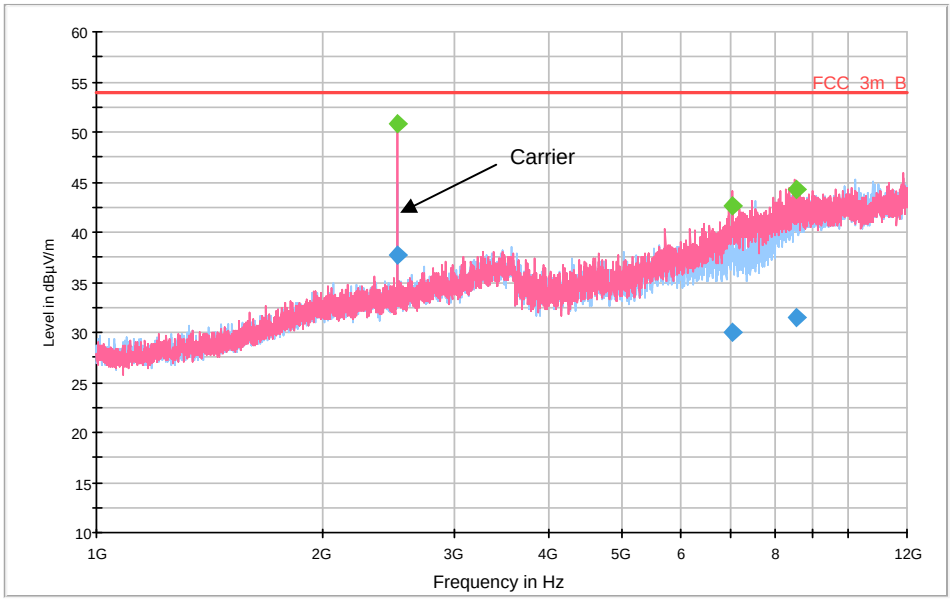
Channel 4: 2520 MHz, antenna 1

Plot 65: 30 MHz – 1 GHz

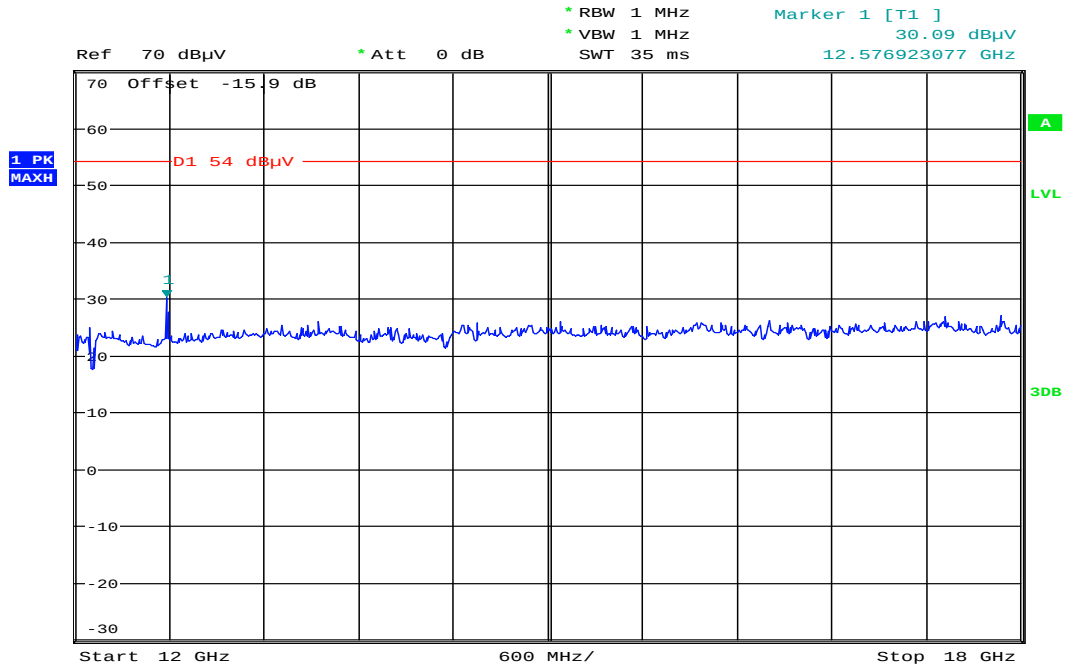


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
102.446400	19.2	1000.0	120.000	98.0	V	82.0	11.7	14.3	33.5
113.700900	33.5	1000.0	120.000	98.0	V	80.0	10.7	0.0	33.5
123.736800	19.9	1000.0	120.000	98.0	V	0.0	9.9	13.6	33.5
128.209200	21.6	1000.0	120.000	170.0	V	-2.0	9.6	11.9	33.5
132.235050	24.2	1000.0	120.000	134.0	V	8.0	9.2	9.3	33.5
150.936000	21.4	1000.0	120.000	98.0	V	-6.0	9.0	12.1	33.5

Plot 66: 1 GHz – 12 GHz

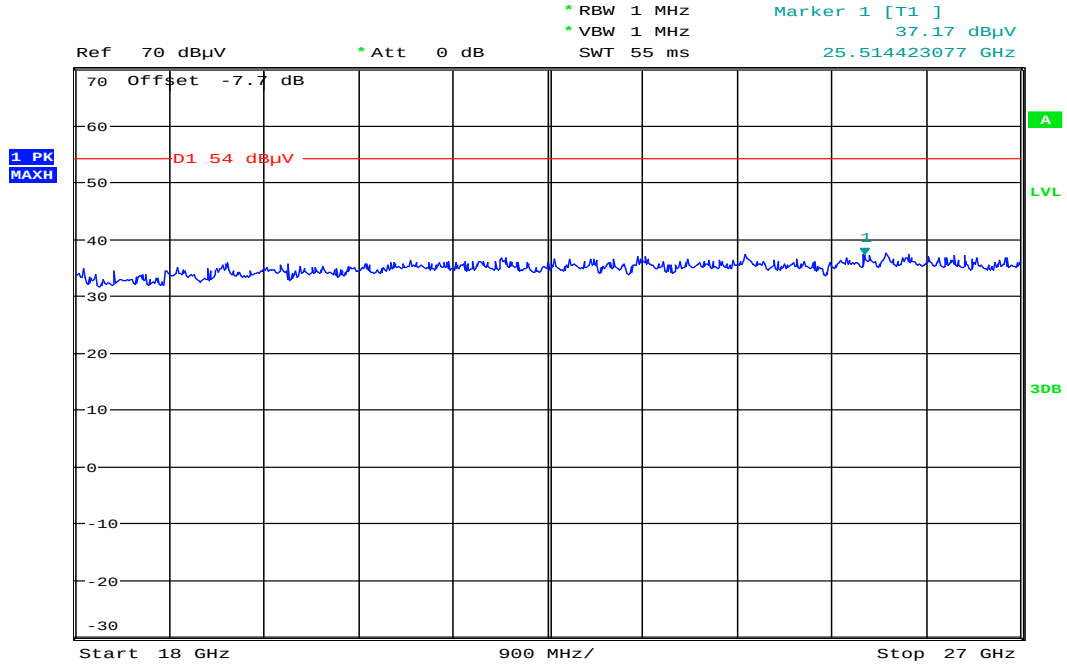


Plot 67: 12 GHz – 18 GHz



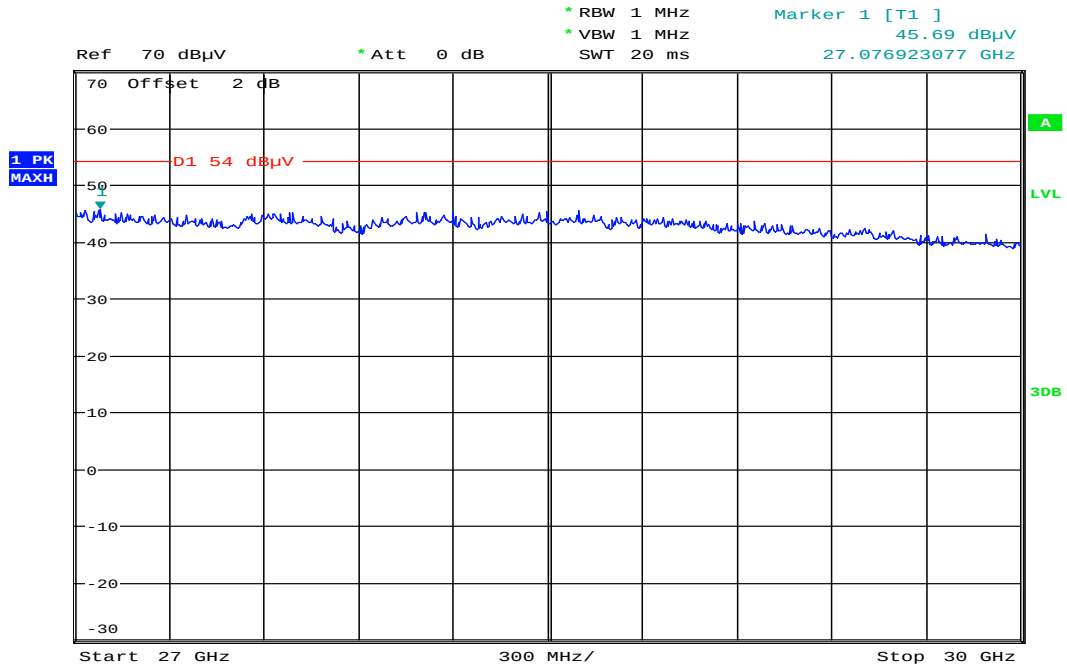
Date: 5.SEP.2011 16:58:35

Plot 68: 18 GHz – 27 GHz



Date: 5.SEP.2011 17:37:08

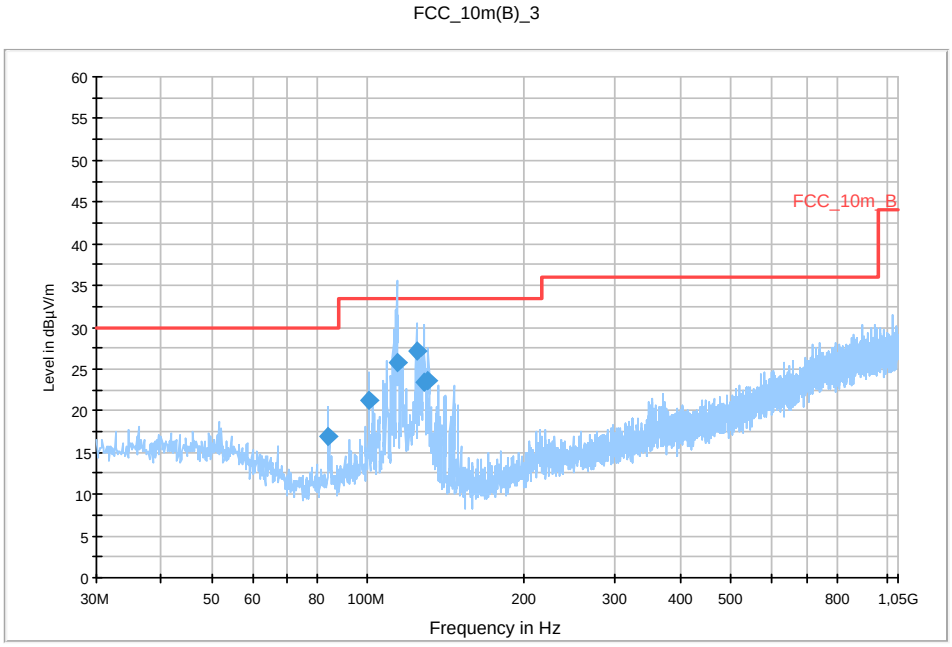
Plot 69: 27 GHz – 30 GHz



Date: 5.SEP.2011 17:51:24

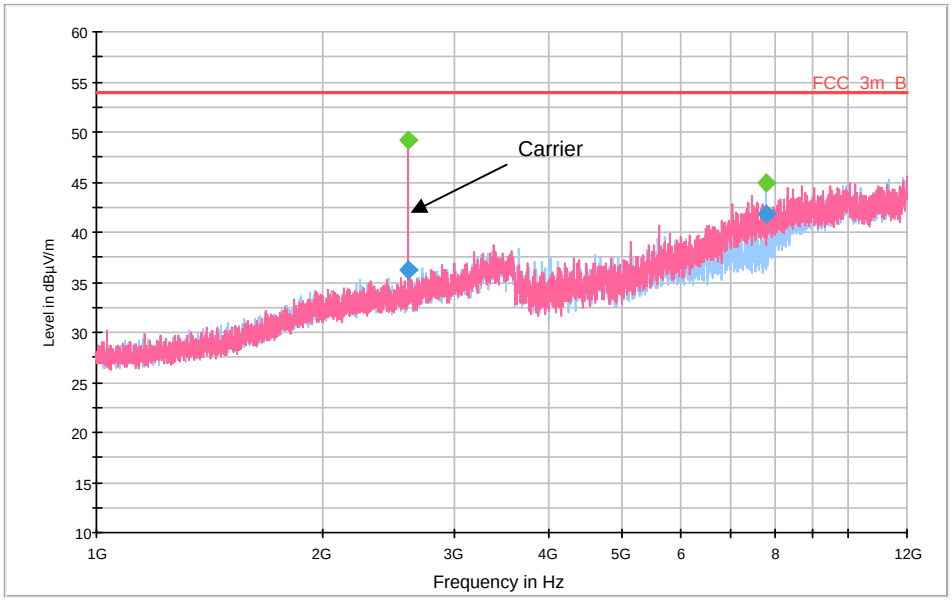
Channel 6: 2600 MHz, antenna 1

Plot 70: 30 MHz – 1 GHz

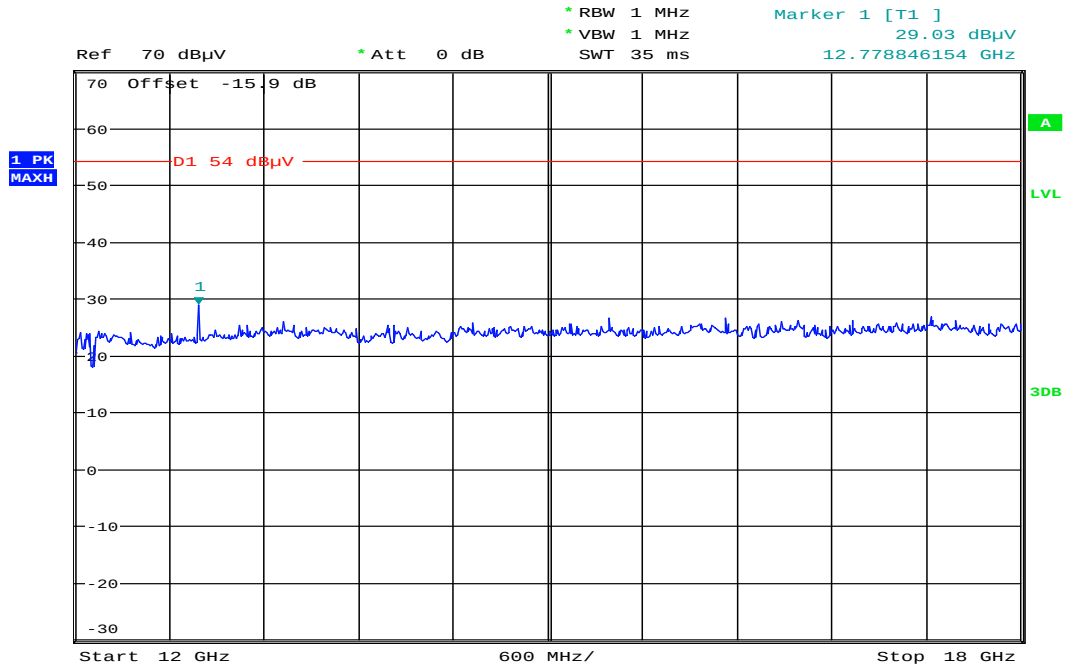


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
83.907300	16.9	1000.0	120.000	170.0	V	106.0	9.7	13.1	30.0
100.648650	21.2	1000.0	120.000	144.0	V	8.0	11.8	12.3	33.5
113.964600	25.8	1000.0	120.000	112.0	V	90.0	10.7	7.7	33.5
123.981600	27.2	1000.0	120.000	170.0	V	-6.0	9.9	6.3	33.5
128.355900	23.3	1000.0	120.000	170.0	V	8.0	9.5	10.2	33.5
130.824000	23.6	1000.0	120.000	170.0	V	8.0	9.3	9.9	33.5

Plot 71: 1 GHz – 12 GHz

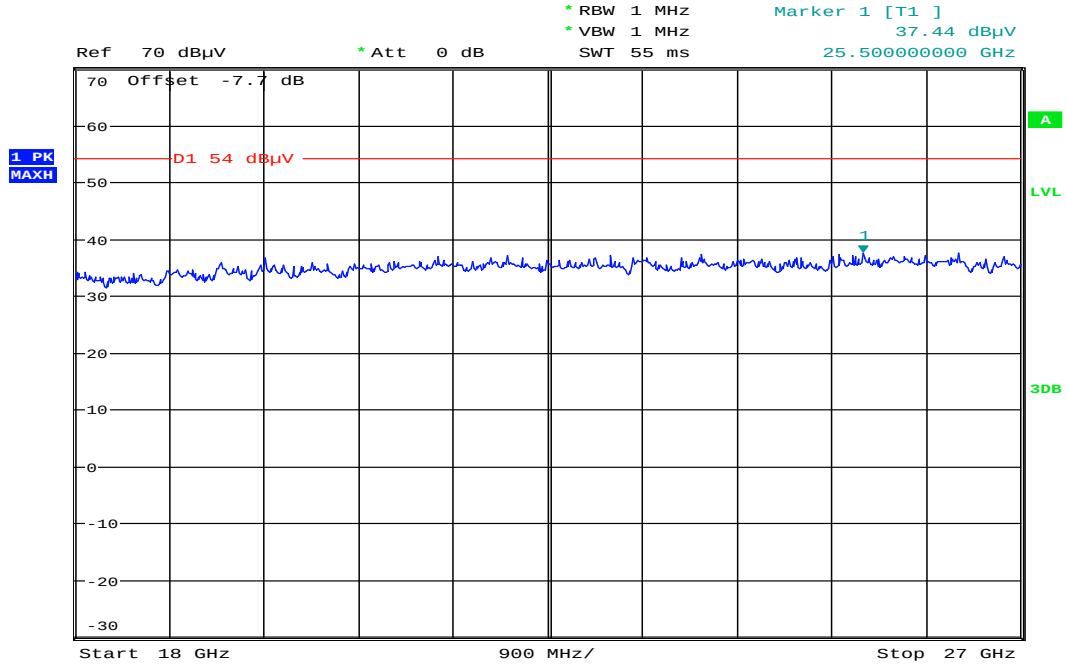


Plot 72: 12 GHz – 18 GHz



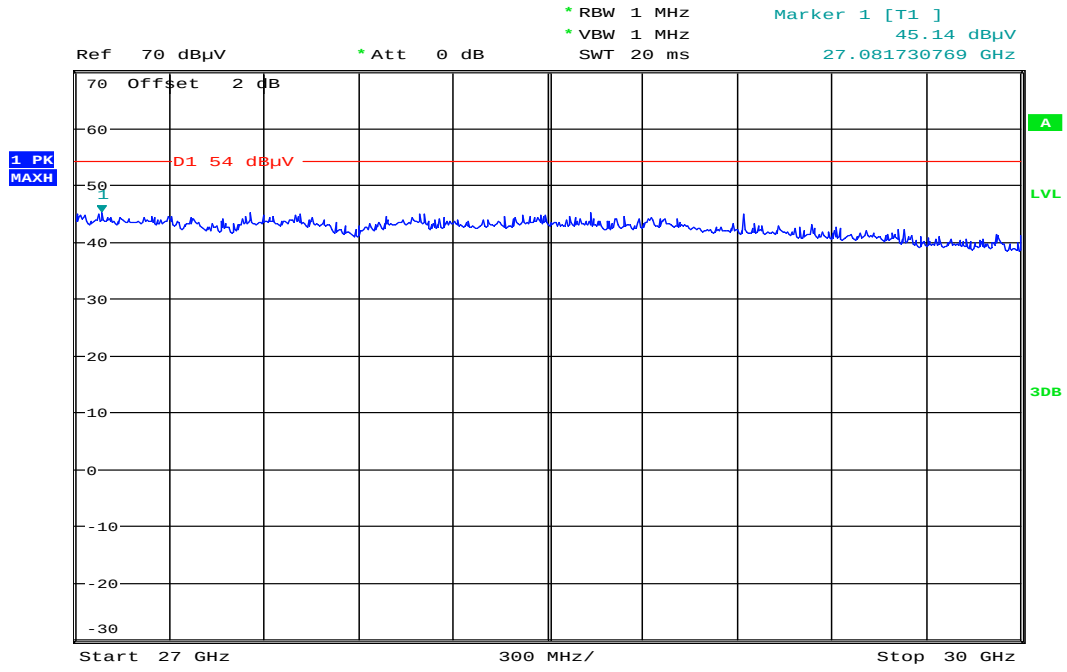
Date: 5.SEP.2011 16:59:32

Plot 73: 18 GHz – 27 GHz



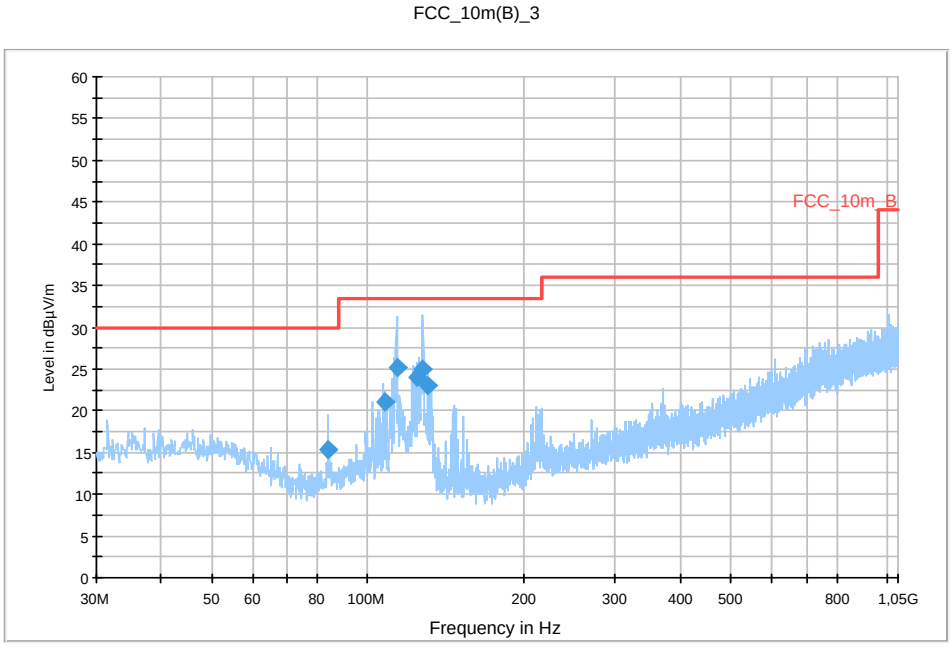
Date: 5.SEP.2011 17:38:13

Plot 74: 27 GHz – 30 GHz



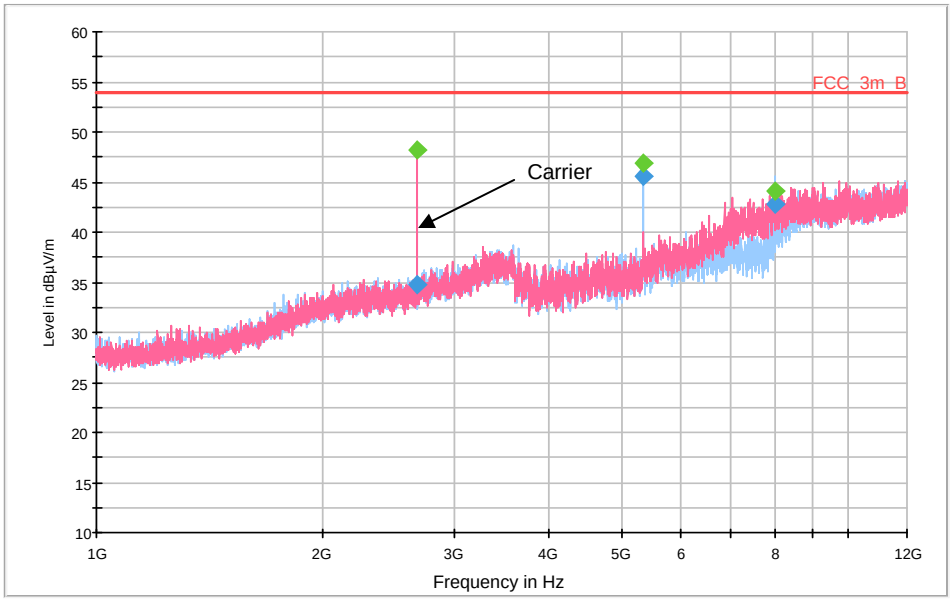
Channel 8: 2680 MHz, antenna 1

Plot 75: 30 MHz – 1 GHz

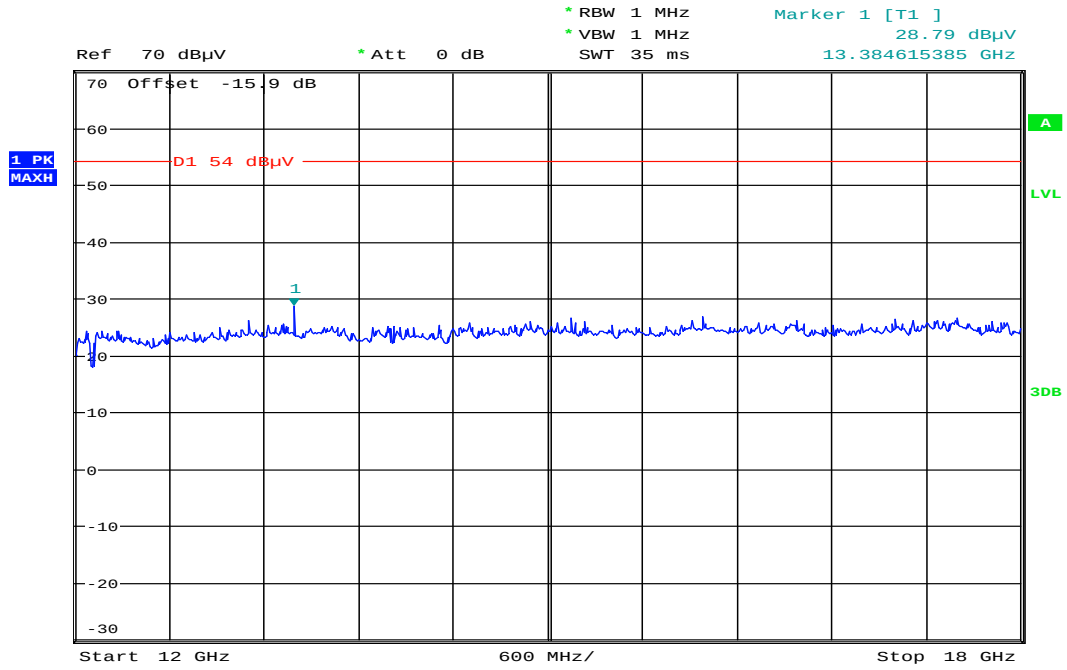


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
83.950950	15.3	1000.0	120.000	126.0	V	106.0	9.7	14.7	30.0
107.626050	21.0	1000.0	120.000	122.0	V	85.0	11.2	12.5	33.5
114.091650	25.2	1000.0	120.000	98.0	V	170.0	10.7	8.3	33.5
124.382250	23.9	1000.0	120.000	170.0	V	-7.0	9.9	9.6	33.5
127.515600	24.9	1000.0	120.000	158.0	V	-7.0	9.6	8.6	33.5
130.920900	22.9	1000.0	120.000	170.0	V	-1.0	9.3	10.6	33.5

Plot 76: 1 GHz – 12 GHz

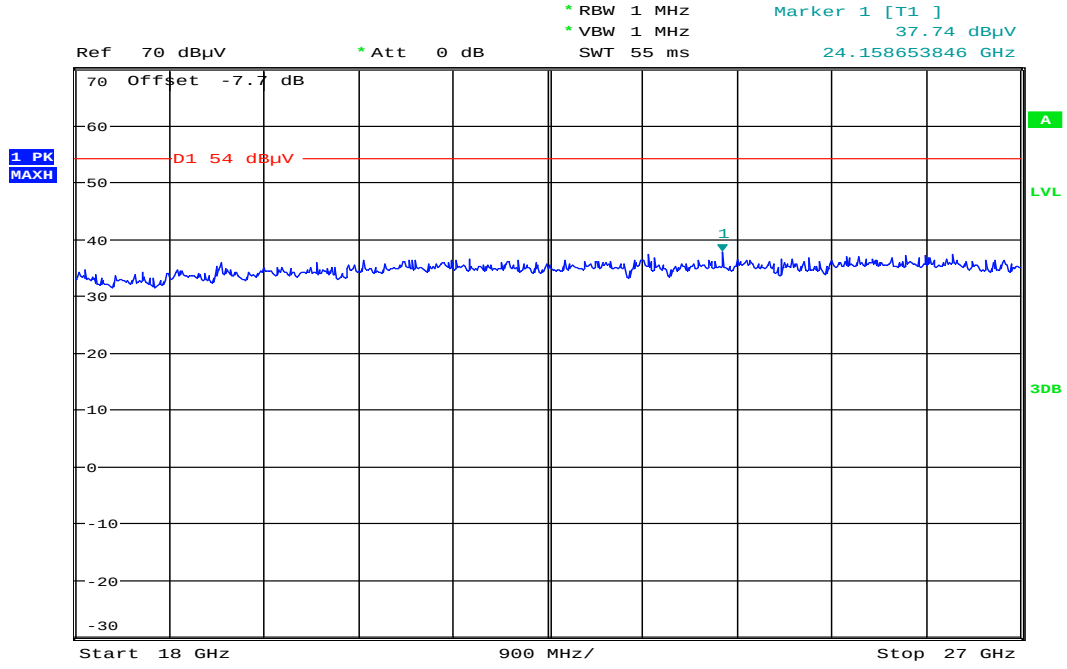


Plot 77: 12 GHz – 18 GHz



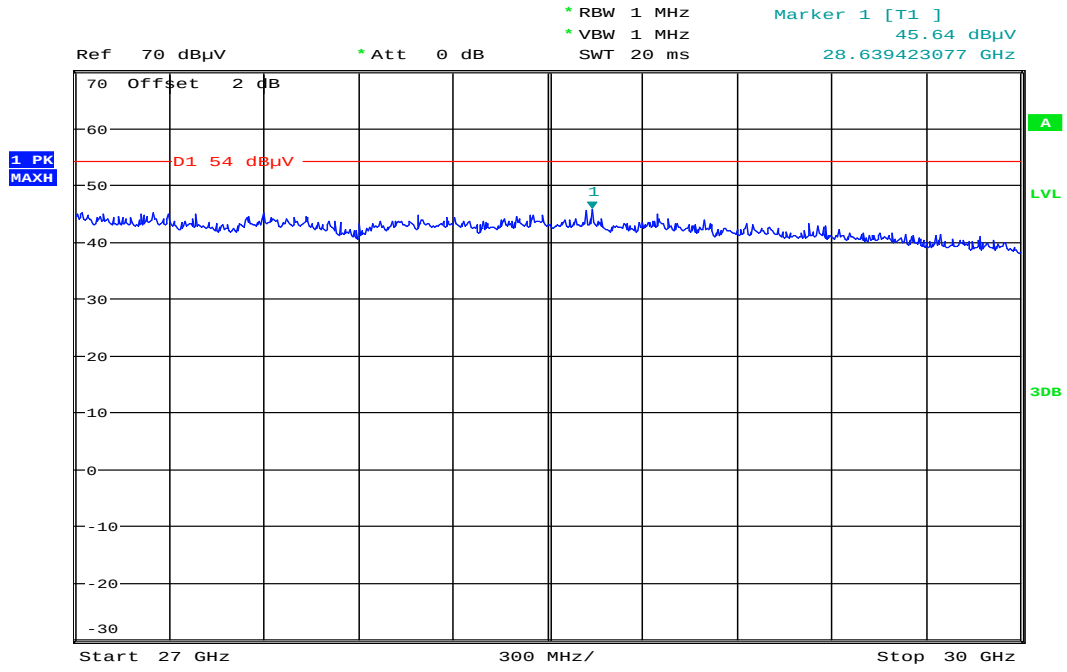
Date: 5.SEP.2011 17:03:00

Plot 78: 18 GHz – 27 GHz



Date: 5.SEP.2011 17:40:17

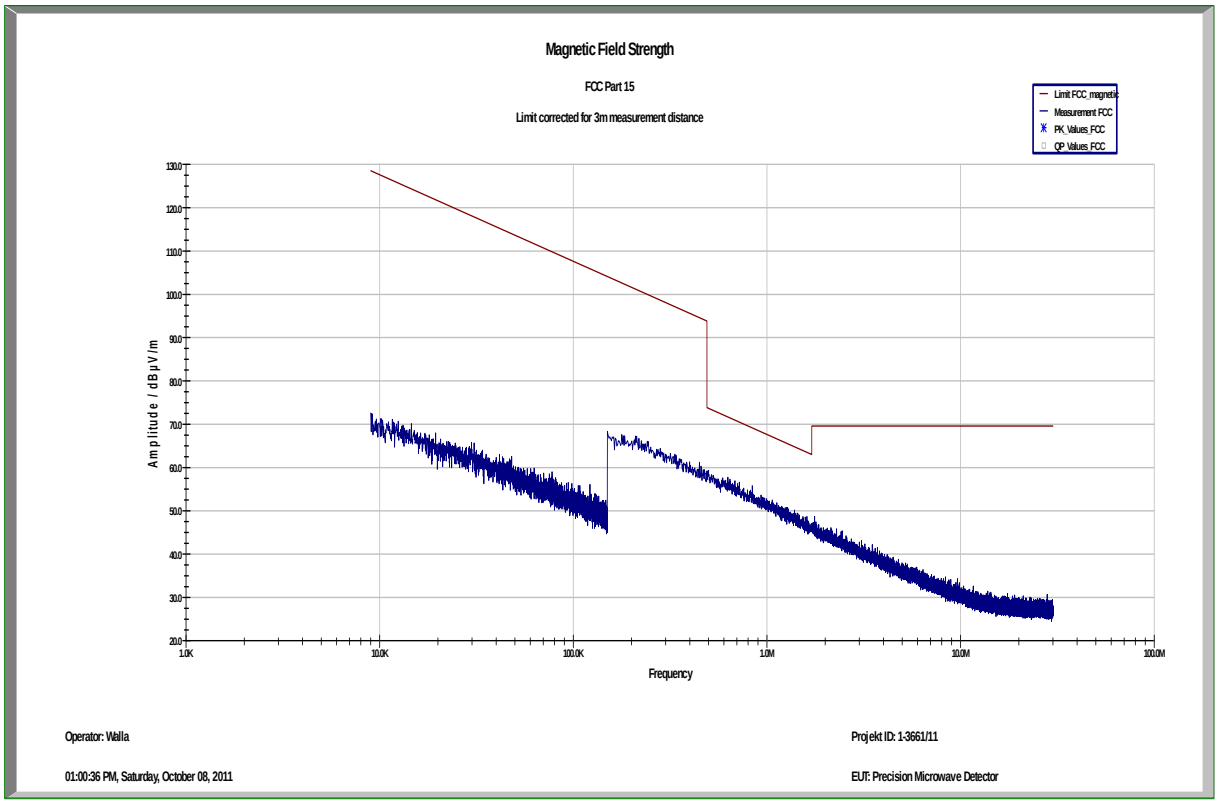
Plot 79: 27 GHz – 30 GHz



Result: **The measurement is passed.**

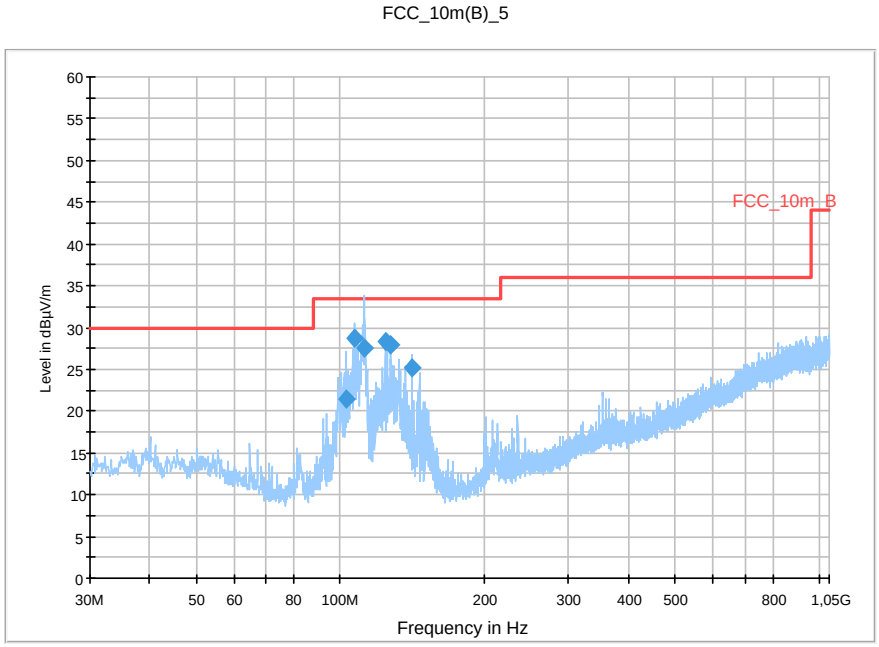
- **Antenna 2:**

Plot 80: 9 kHz – 30 MHz (Valid for all channels)



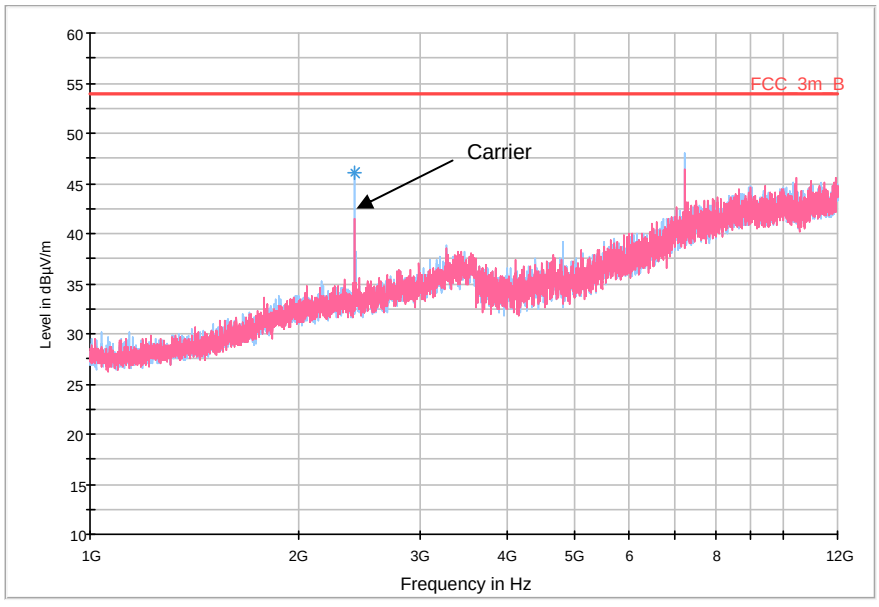
Channel 1: 2410 MHz, antenna 2

Plot 81: 30 MHz – 1 GHz

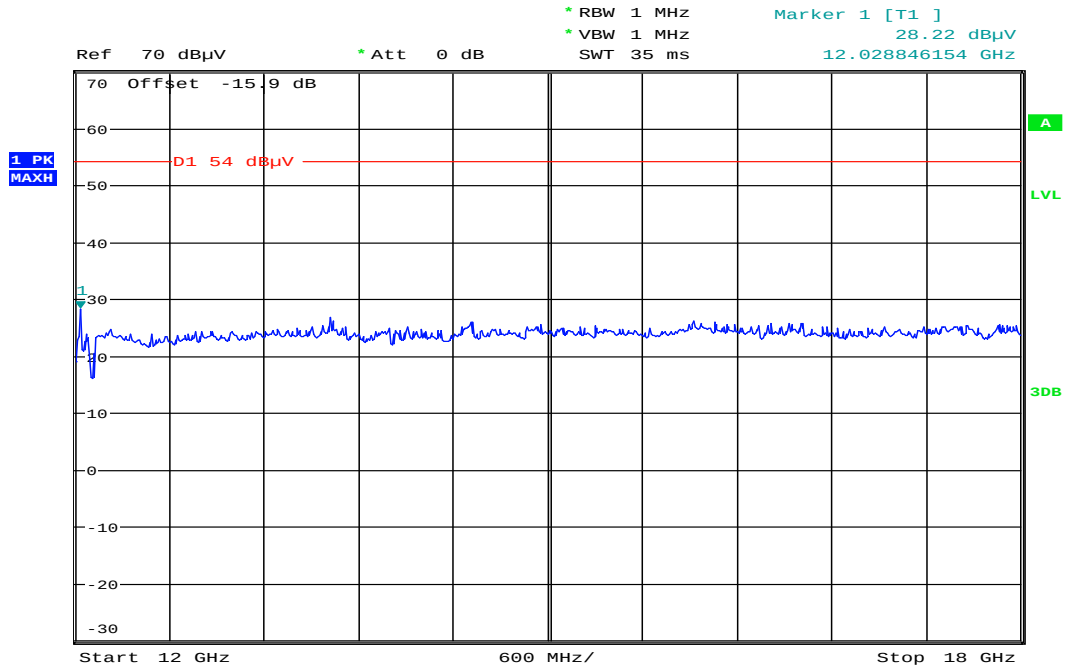


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
102.600000	21.5	1000.0	120.000	112.0	V	69.0	11.7	12.0	33.5
107.160000	28.6	1000.0	120.000	98.0	V	-2.0	11.3	4.9	33.5
112.200000	27.6	1000.0	120.000	105.0	V	29.0	10.8	5.9	33.5
123.960000	28.4	1000.0	120.000	112.0	V	-2.0	9.9	5.1	33.5
127.680000	27.8	1000.0	120.000	149.0	V	19.0	9.6	5.7	33.5
140.760000	25.1	1000.0	120.000	113.0	V	19.0	8.7	8.4	33.5

Plot 82: 1 GHz – 12 GHz

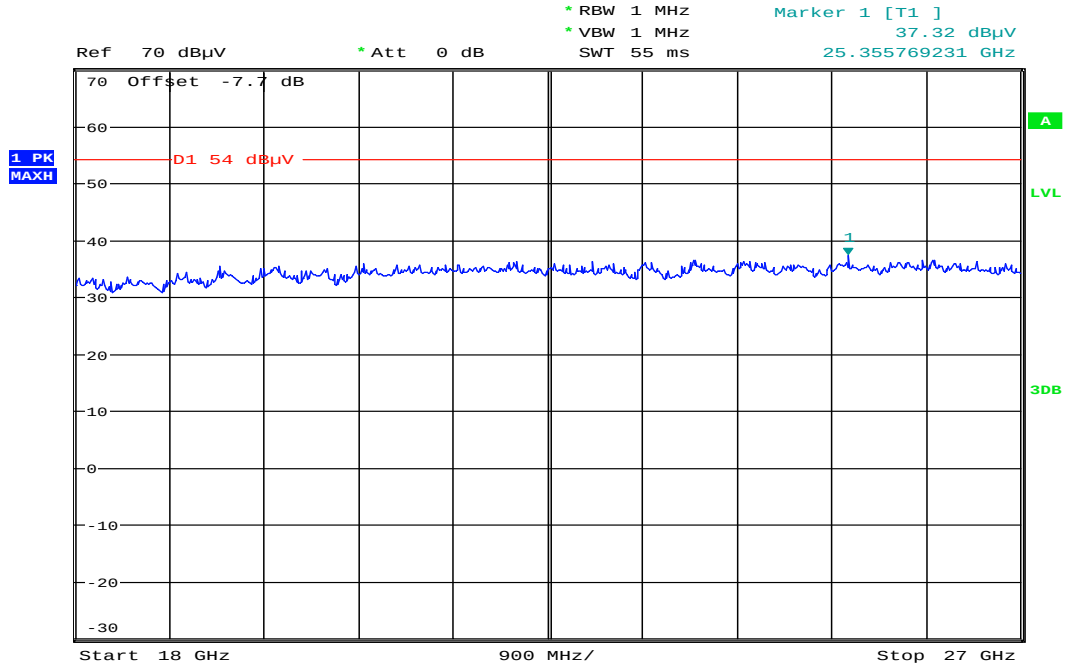


Plot 83: 12 GHz – 18 GHz



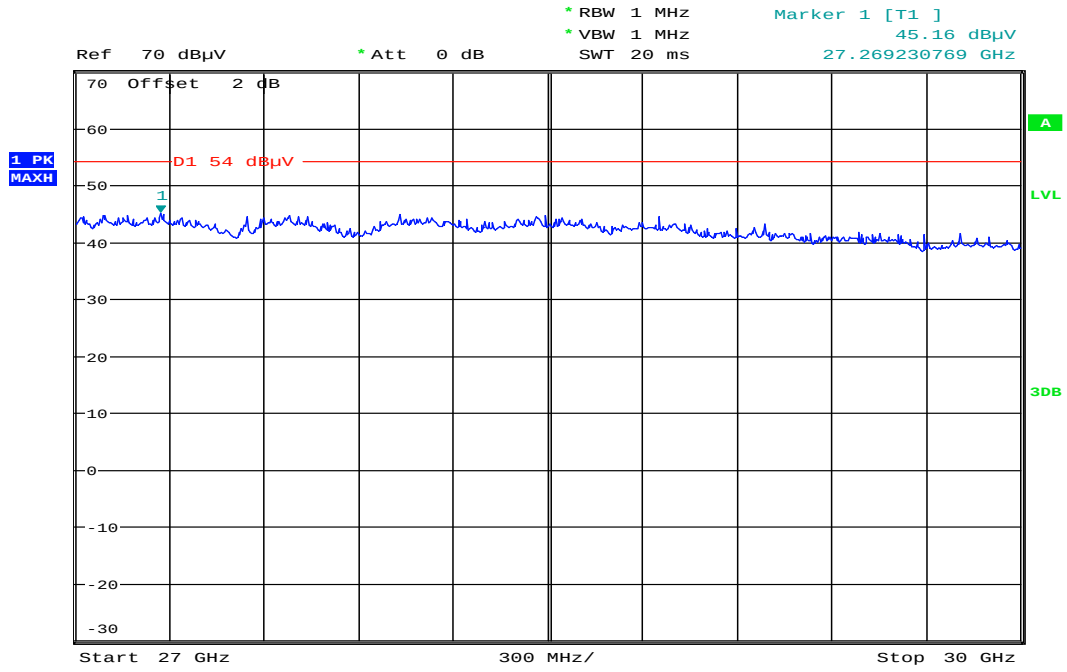
Date: 5.OCT.2011 15:27:34

Plot 84: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:48:24

Plot 85: 27 GHz – 30 GHz

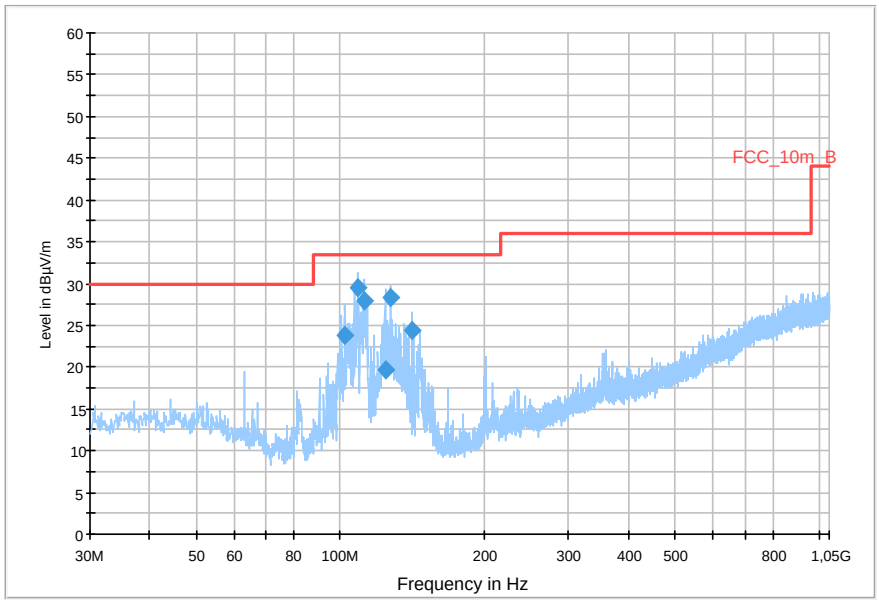


Date: 5.OCT.2011 10:56:10

Channel 2: 2440 MHz, antenna 2

Plot 86: 30 MHz – 1 GHz

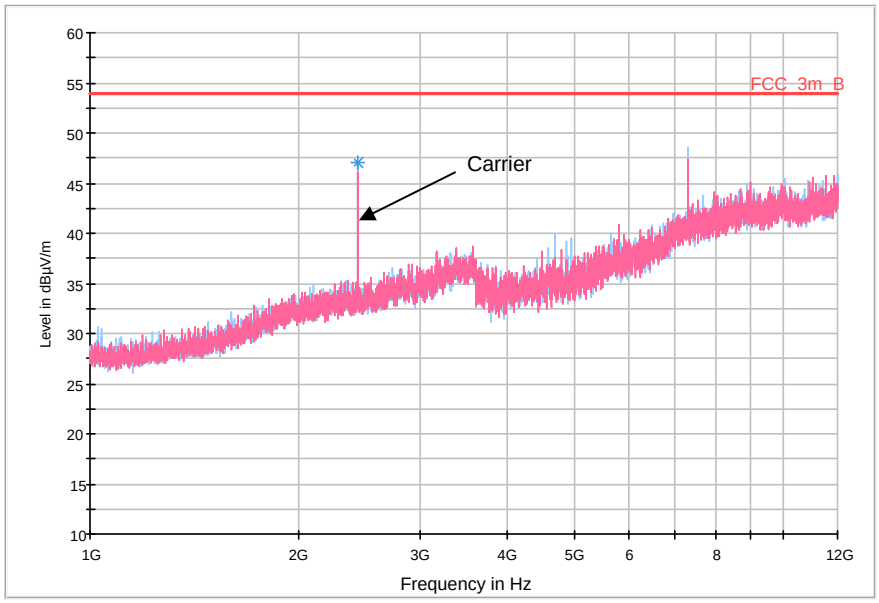
FCC_10m(B)_5



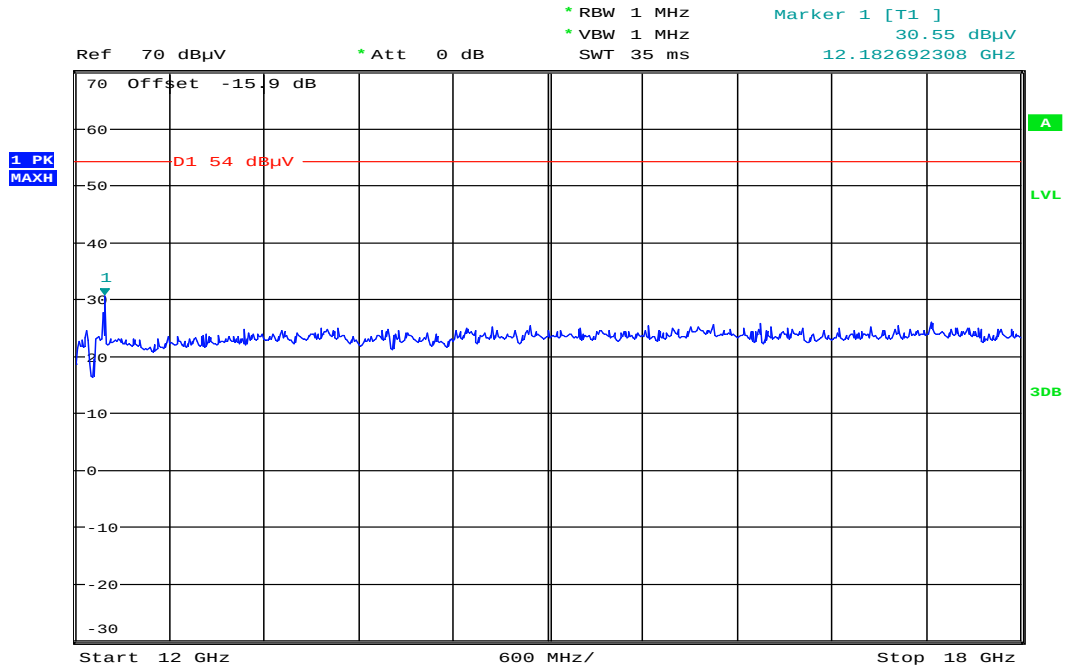
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
102.360000	23.7	1000.0	120.000	98.0	V	35.0	11.7	9.8	33.5
108.960000	29.5	1000.0	120.000	98.0	V	94.0	11.1	4.0	33.5
112.080000	28.0	1000.0	120.000	105.0	V	62.0	10.9	5.5	33.5
124.080000	19.6	1000.0	120.000	98.0	V	52.0	9.9	13.9	33.5
127.680000	28.4	1000.0	120.000	144.0	V	13.0	9.6	5.1	33.5
140.760000	24.4	1000.0	120.000	112.0	V	-2.0	8.7	9.1	33.5

Plot 87: 1 GHz – 12 GHz

FCC_1_18_B_oH

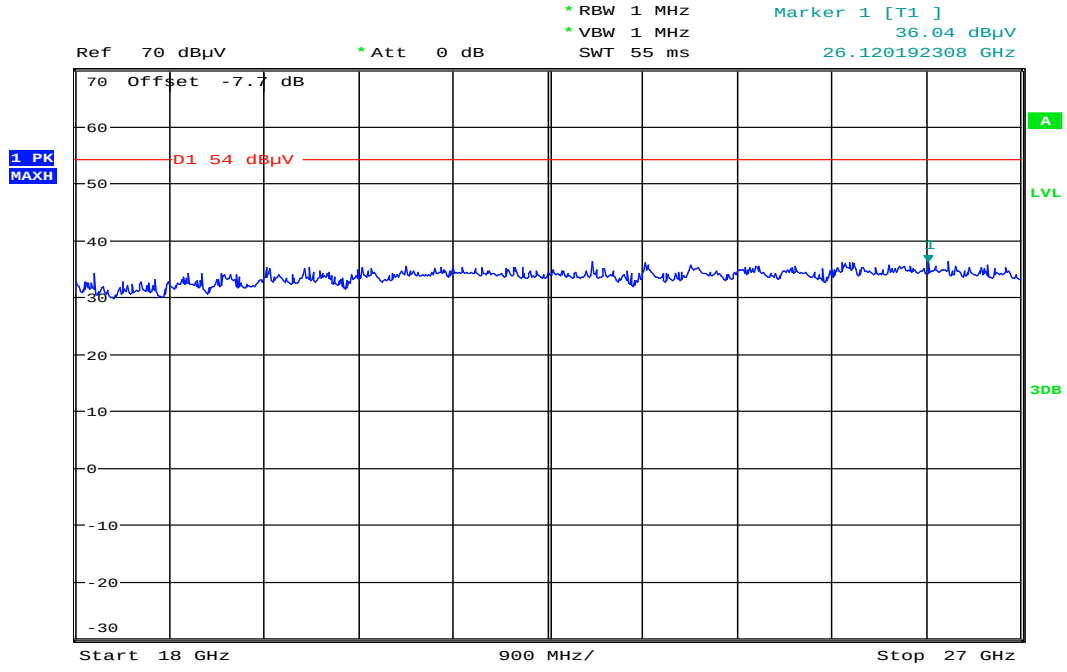


Plot 88: 12 GHz – 18 GHz



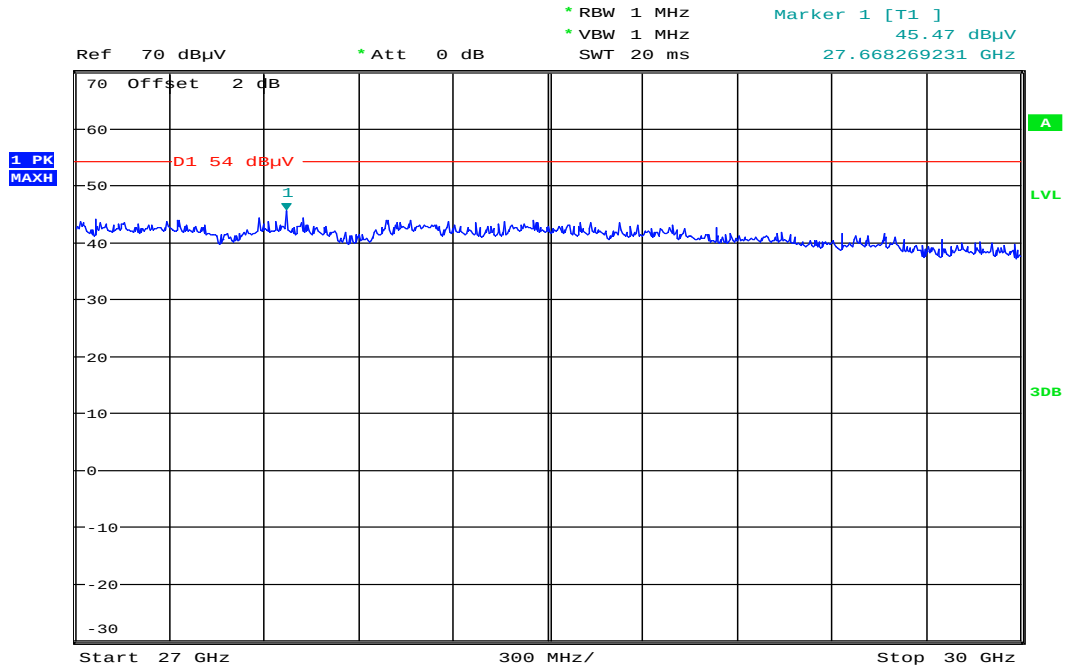
Date: 5.OCT.2011 15:29:58

Plot 89: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:49:02

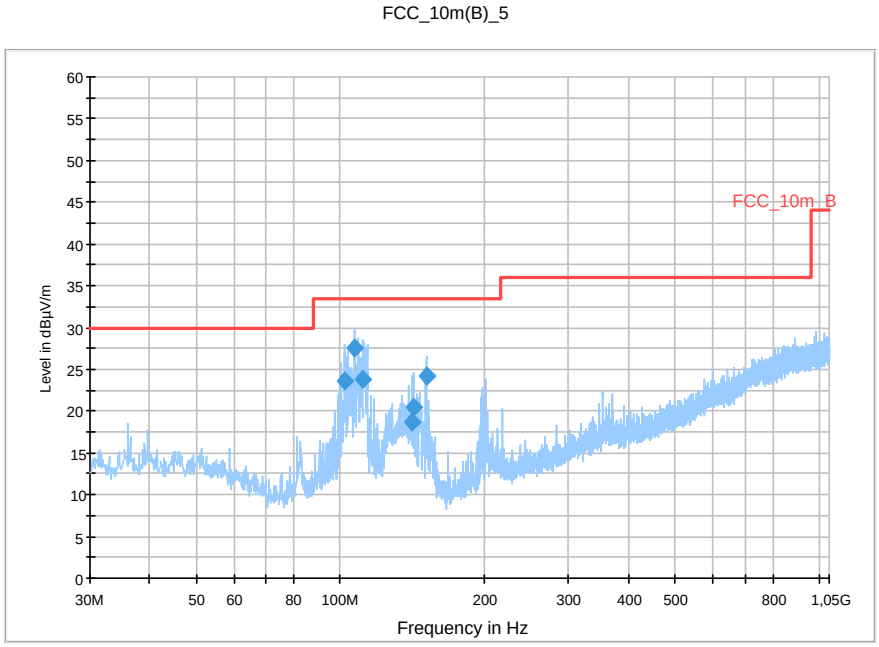
Plot 90: 27 GHz – 30 GHz



Date: 5.OCT.2011 10:56:36

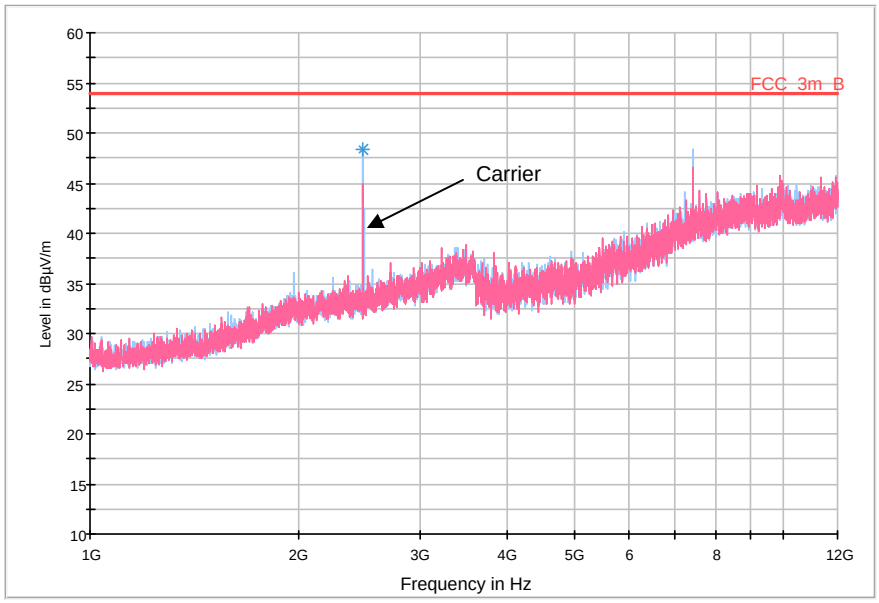
Channel 3: 2480 MHz, antenna 2

Plot 91: 30 MHz – 1 GHz

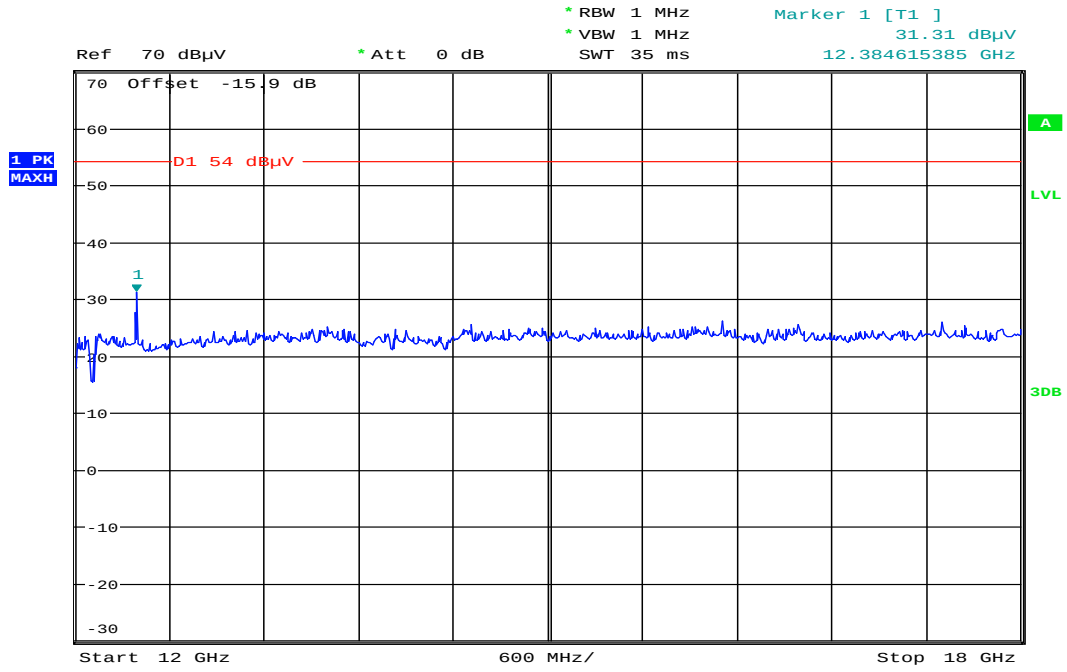


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
102.360000	23.7	1000.0	120.000	98.0	V	-2.0	11.7	9.8	33.5
107.160000	27.5	1000.0	120.000	98.0	V	19.0	11.3	6.0	33.5
111.360000	23.8	1000.0	120.000	114.0	V	90.0	10.9	9.7	33.5
141.240000	18.6	1000.0	120.000	98.0	V	58.0	8.7	14.9	33.5
142.680000	20.4	1000.0	120.000	98.0	V	41.0	8.7	13.1	33.5
150.960000	24.2	1000.0	120.000	98.0	V	41.0	9.0	9.3	33.5

Plot 92: 1 GHz – 12 GHz

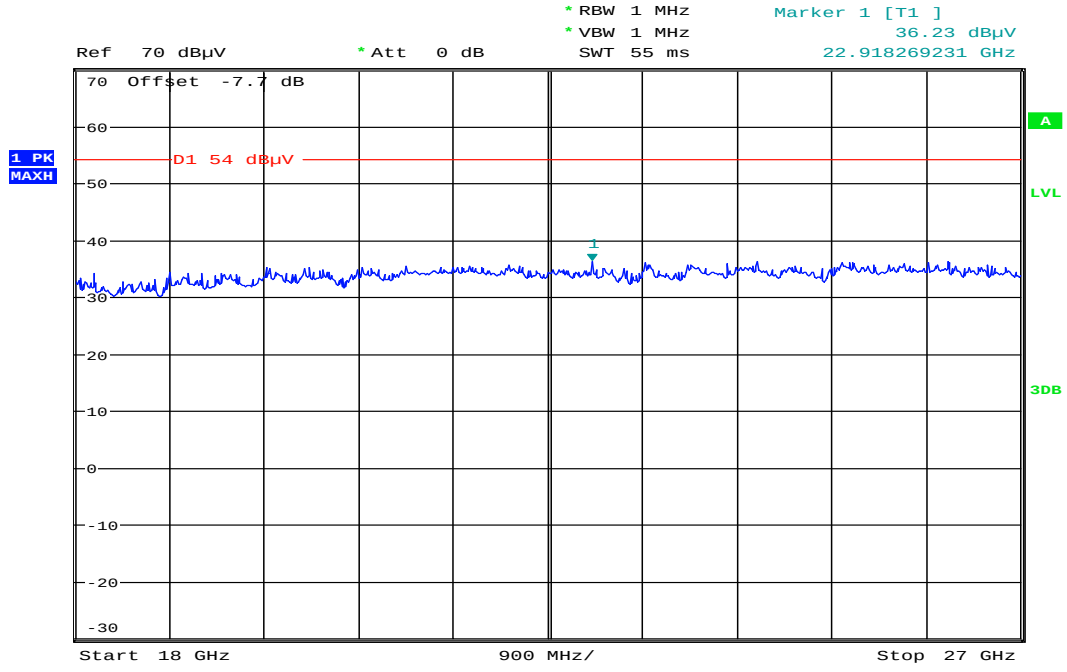


Plot 93: 12 GHz – 18 GHz



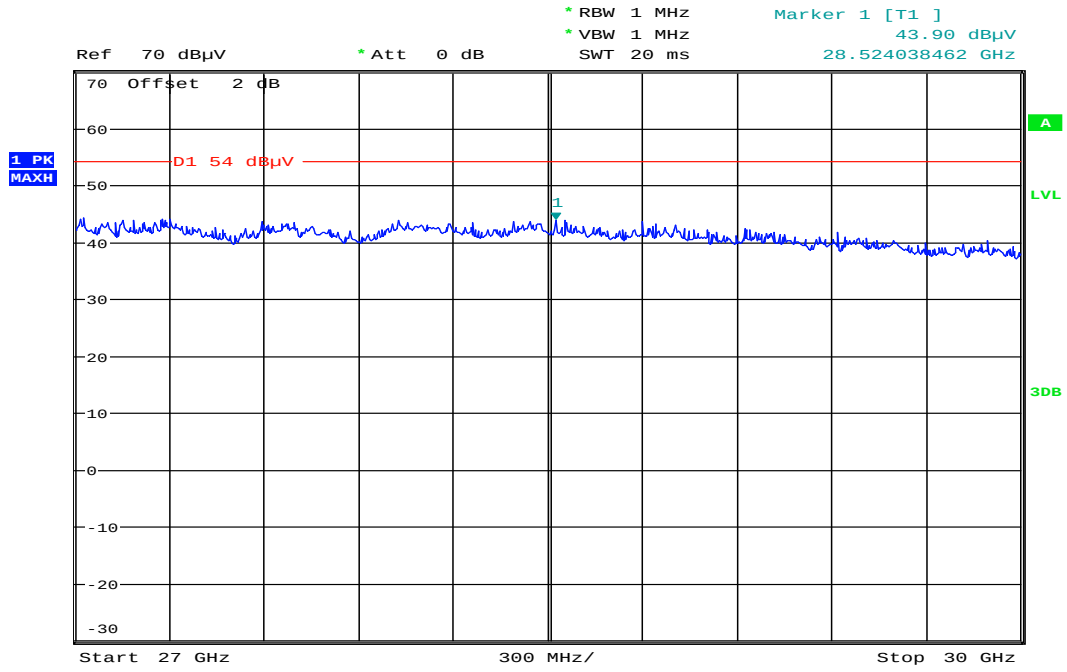
Date: 5.OCT.2011 15:31:02

Plot 94: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:49:24

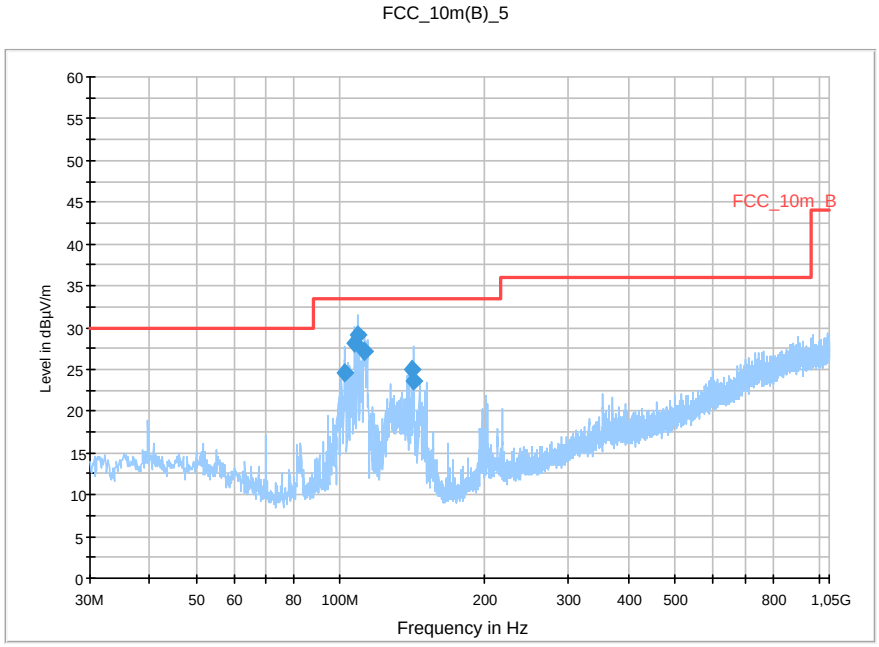
Plot 95: 27 GHz – 30 GHz



Date: 5.OCT.2011 10:57:00

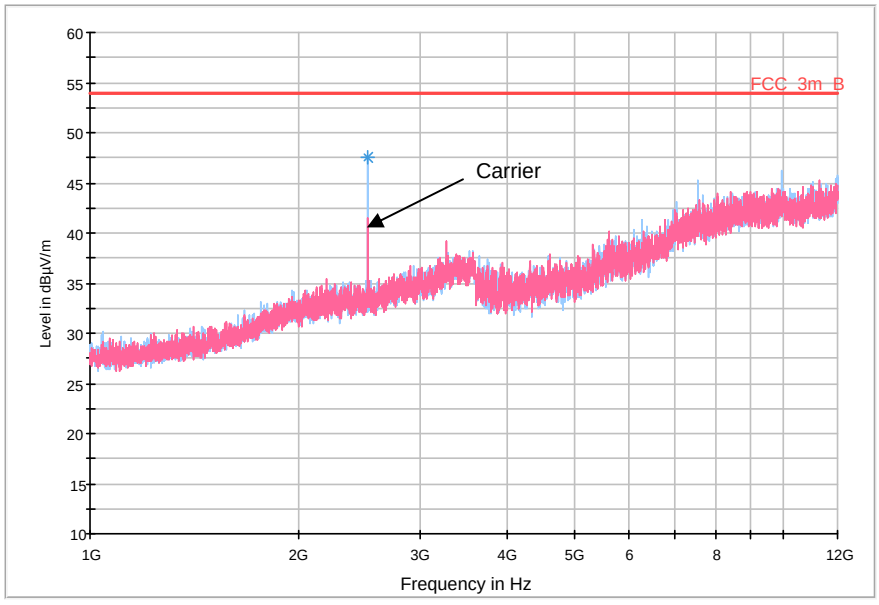
Channel 4: 2520 MHz, antenna 2

Plot 96: 30 MHz – 1 GHz

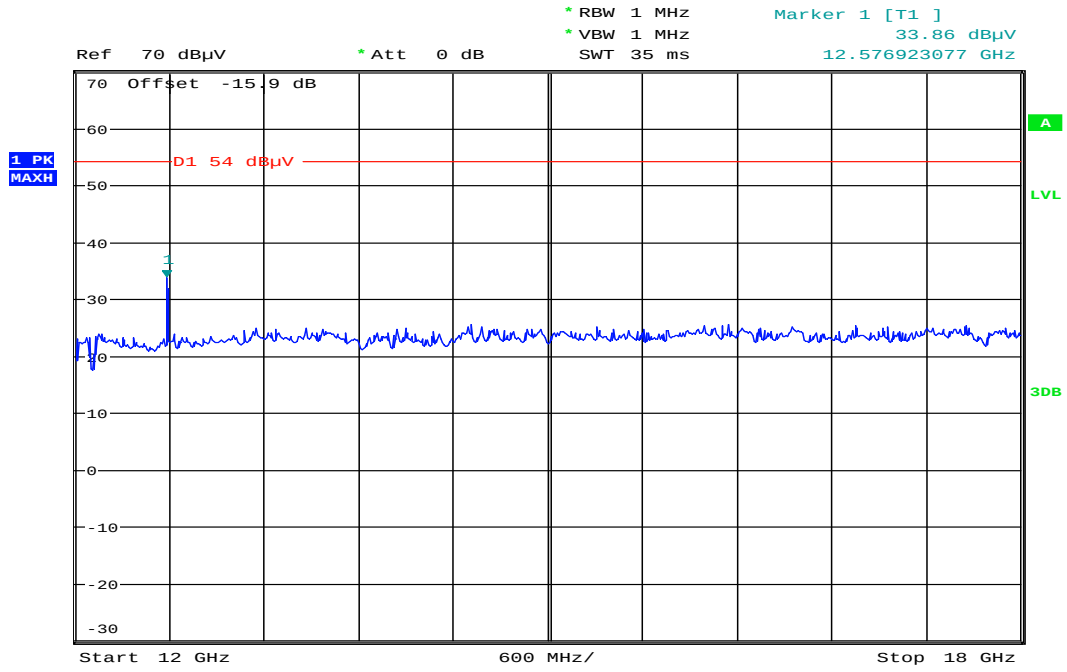


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
102.480000	24.6	1000.0	120.000	98.0	V	81.0	11.7	8.9	33.5
107.160000	28.1	1000.0	120.000	98.0	V	23.0	11.3	5.4	33.5
108.960000	29.0	1000.0	120.000	133.0	V	90.0	11.1	4.5	33.5
112.680000	27.1	1000.0	120.000	98.0	V	108.0	10.8	6.4	33.5
140.760000	25.0	1000.0	120.000	98.0	V	337.0	8.7	8.5	33.5
142.560000	23.7	1000.0	120.000	115.0	V	-2.0	8.7	9.8	33.5

Plot 97: 1 GHz – 12 GHz

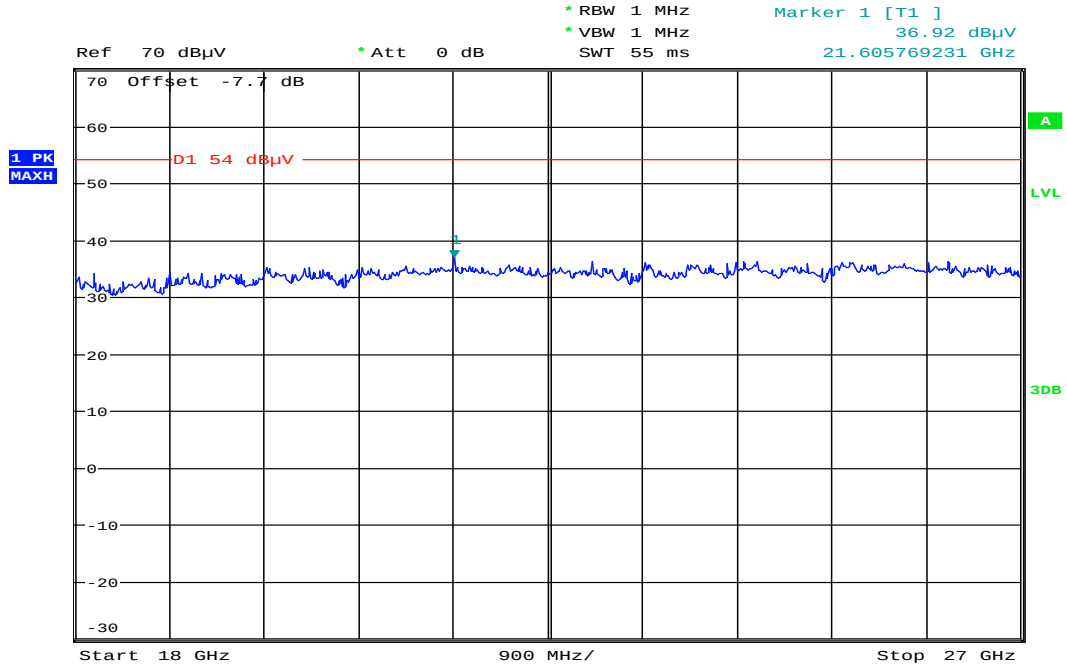


Plot 98: 12 GHz – 18 GHz



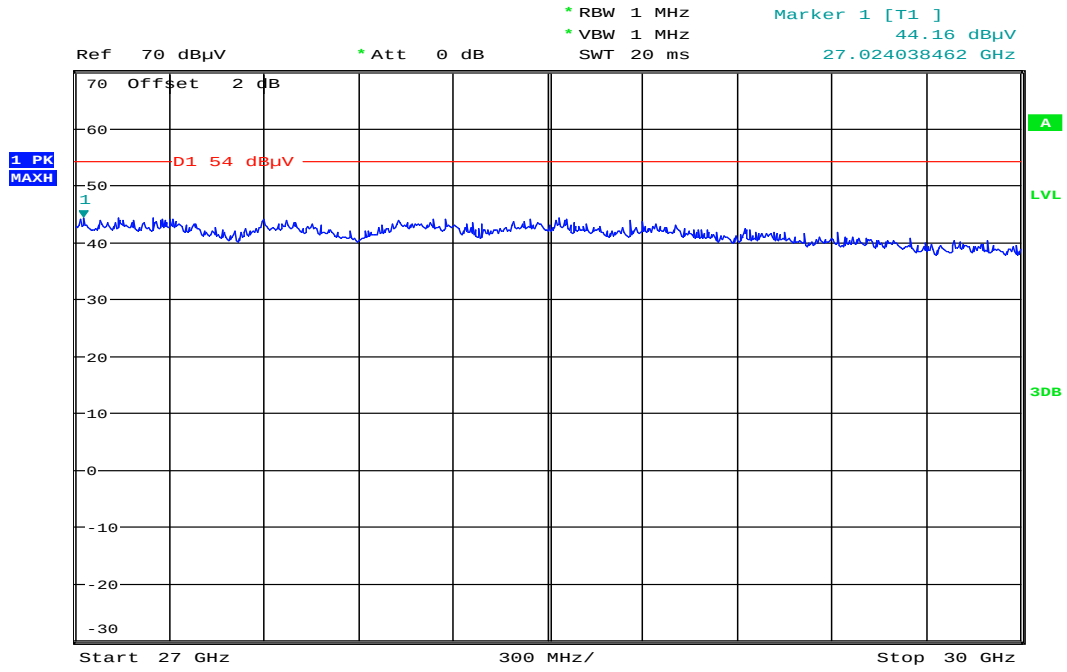
Date: 5.OCT.2011 15:32:06

Plot 99: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:49:47

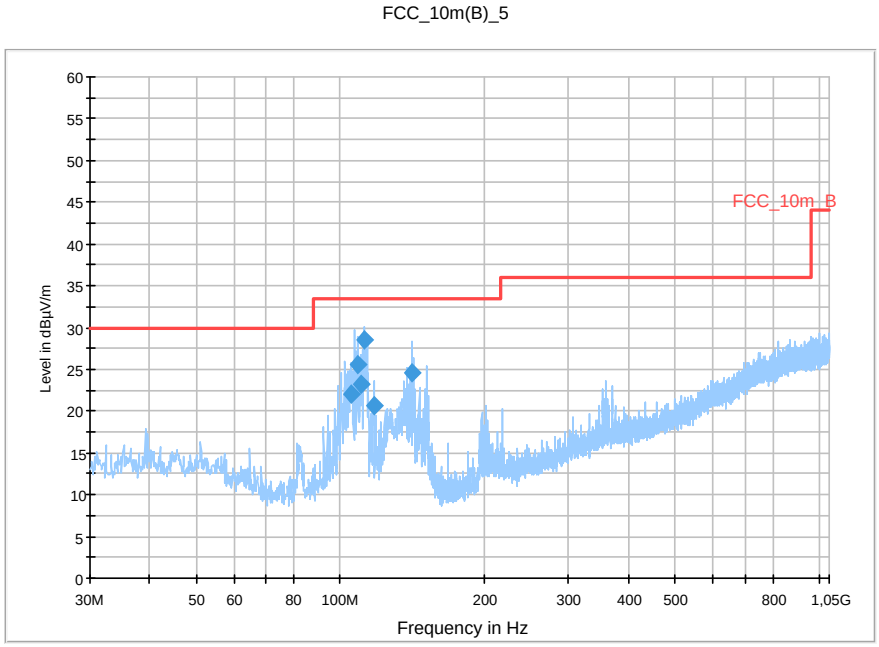
Plot 100: 27 GHz – 30 GHz



Date: 5.OCT.2011 10:57:20

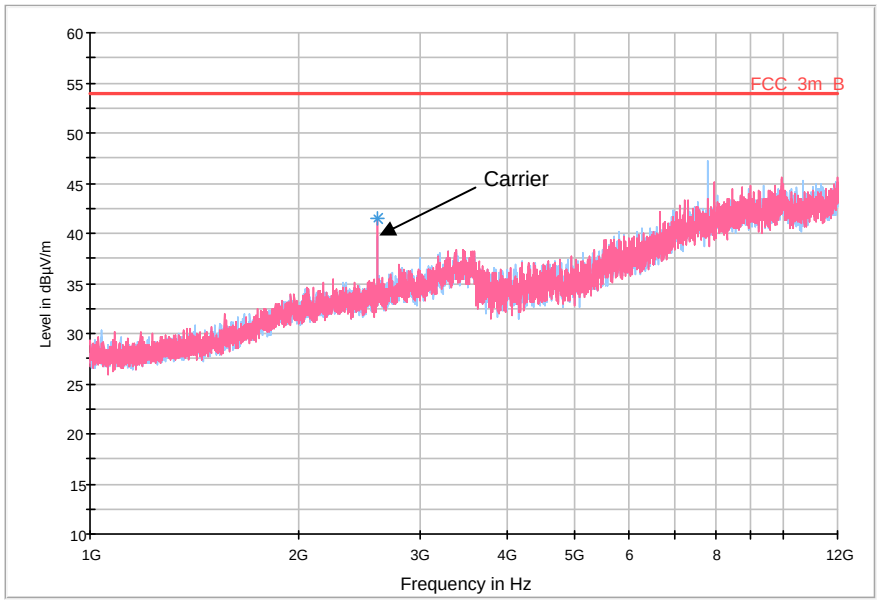
Channel 6: 2600 MHz, antenna 2

Plot 101: 30 MHz – 1 GHz

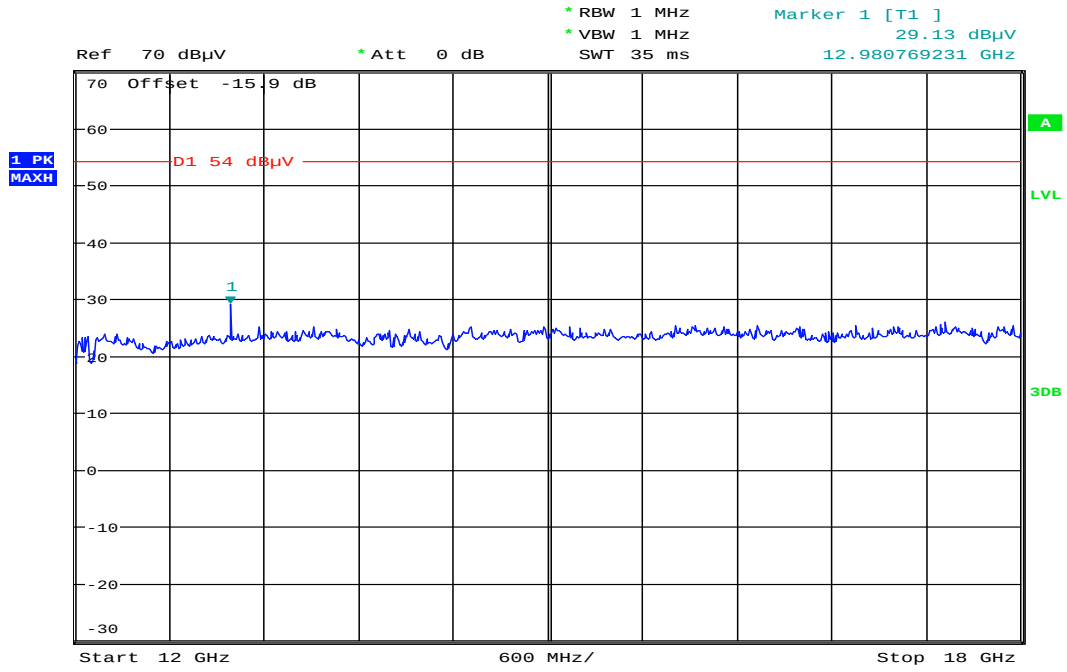


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
105.360000	22.0	1000.0	120.000	179.0	V	20.0	11.4	11.5	33.5
108.720000	25.6	1000.0	120.000	131.0	V	46.0	11.1	7.9	33.5
110.640000	23.3	1000.0	120.000	145.0	V	116.0	11.0	10.2	33.5
112.680000	28.5	1000.0	120.000	98.0	V	46.0	10.8	5.1	33.5
117.480000	20.6	1000.0	120.000	134.0	V	-2.0	10.4	12.9	33.5
140.760000	24.5	1000.0	120.000	114.0	V	348.0	8.7	9.0	33.5

Plot 102: 1 GHz – 12 GHz

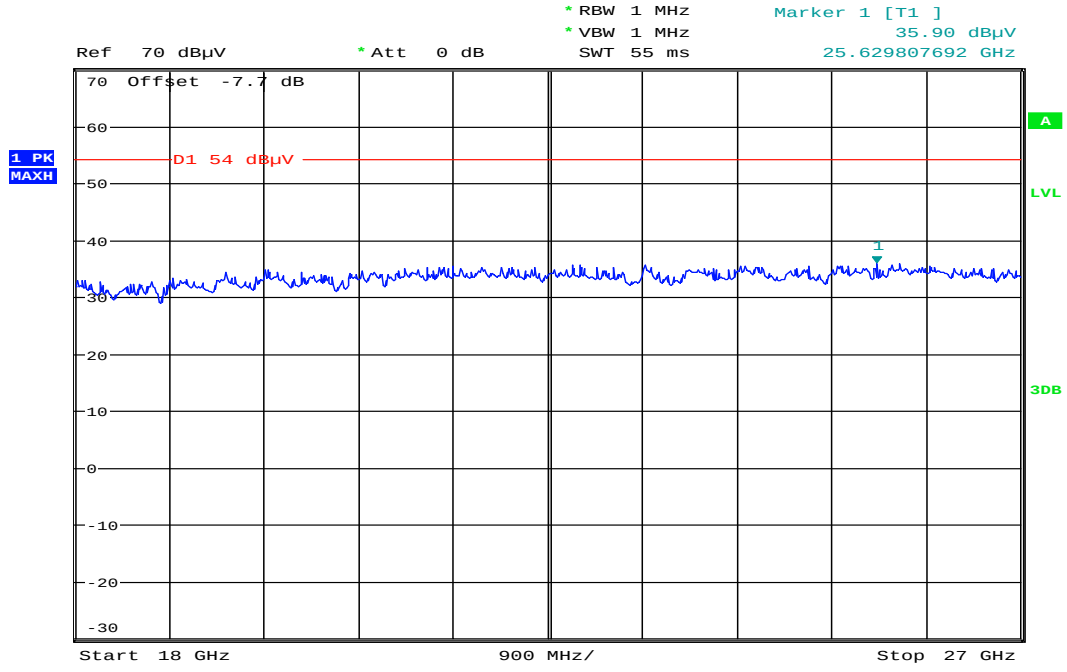


Plot 103: 12 GHz – 18 GHz



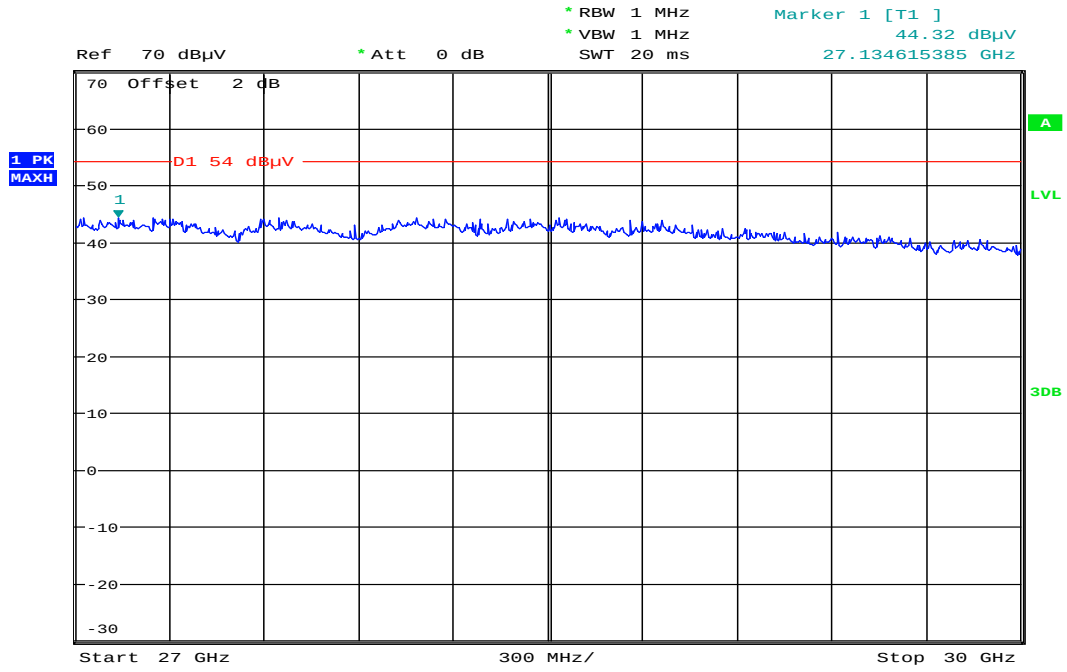
Date: 5.OCT.2011 15:33:26

Plot 104: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:50:16

Plot 105: 27 GHz – 30 GHz

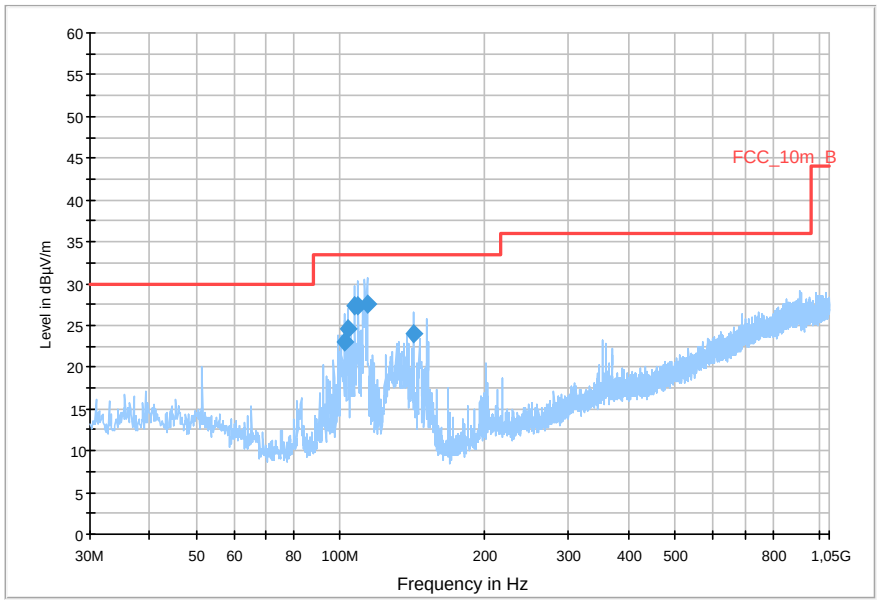


Date: 5.OCT.2011 10:57:38

Channel 8: 2680 MHz, antenna 2

Plot 106: 30 MHz – 1 GHz

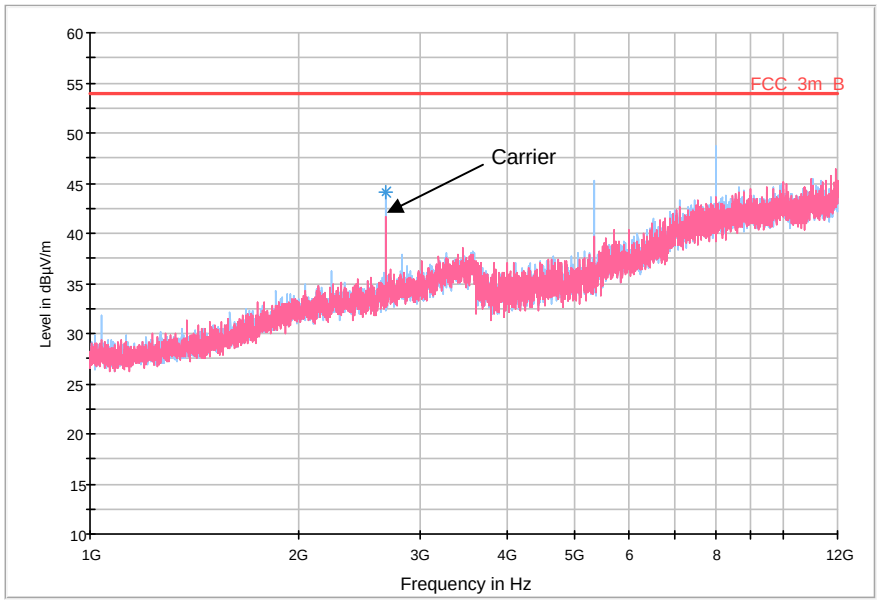
FCC_10m(B)_5



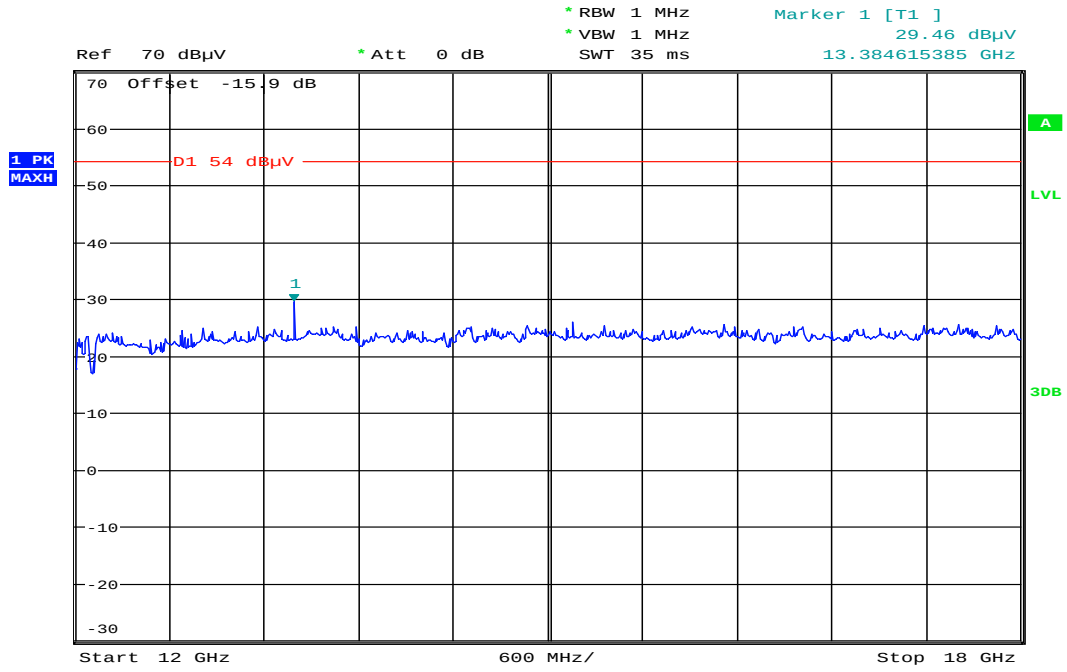
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
102.480000	22.9	1000.0	120.000	98.0	V	148.0	11.7	10.6	33.5
103.800000	24.5	1000.0	120.000	98.0	V	68.0	11.6	9.0	33.5
107.160000	27.4	1000.0	120.000	105.0	V	-2.0	11.3	6.1	33.5
108.960000	27.4	1000.0	120.000	112.0	V	-2.0	11.1	6.1	33.5
113.640000	27.6	1000.0	120.000	105.0	V	29.0	10.7	5.9	33.5
142.560000	24.0	1000.0	120.000	105.0	V	-2.0	8.7	9.5	33.5

Plot 107: 1 GHz – 12 GHz

FCC_1_18_B_oH

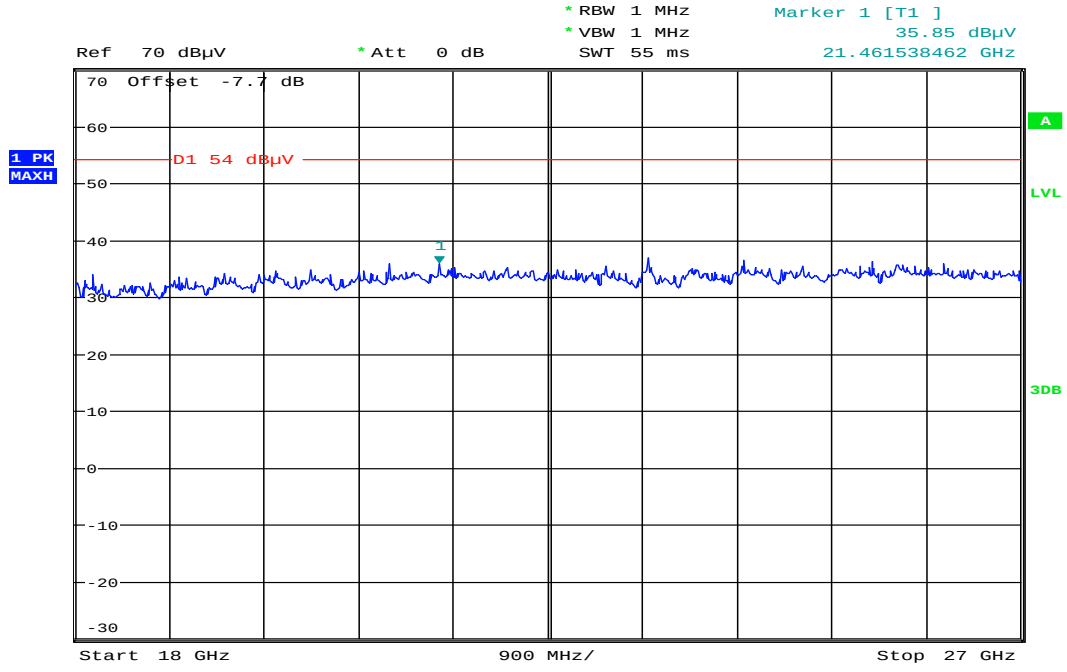


Plot 108: 12 GHz – 18 GHz



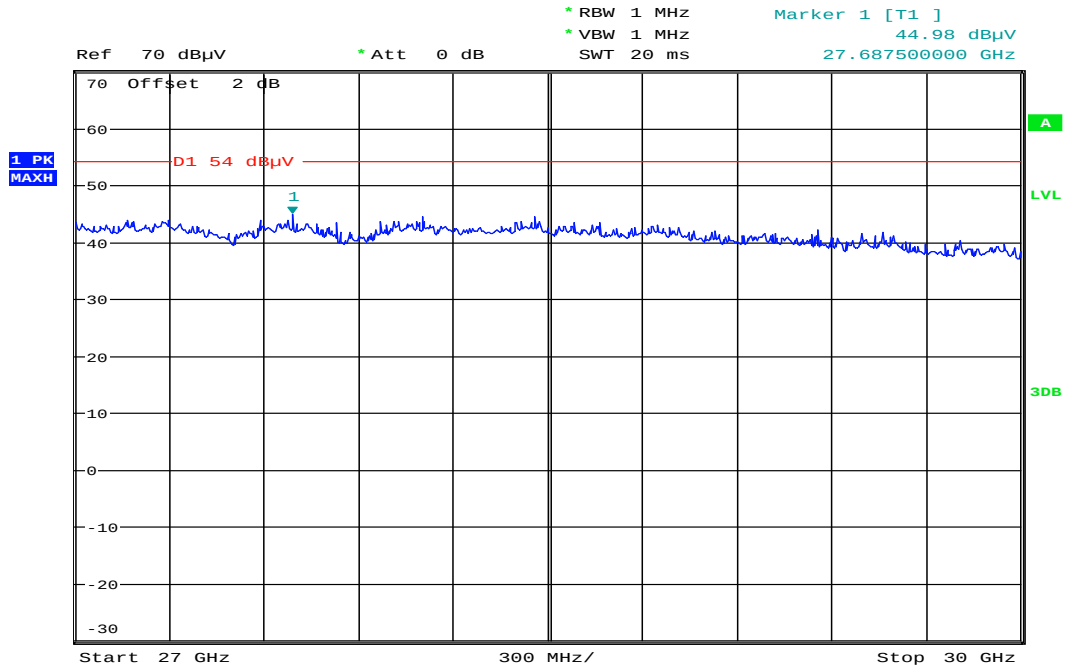
Date: 5.OCT.2011 15:34:36

Plot 109: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:50:38

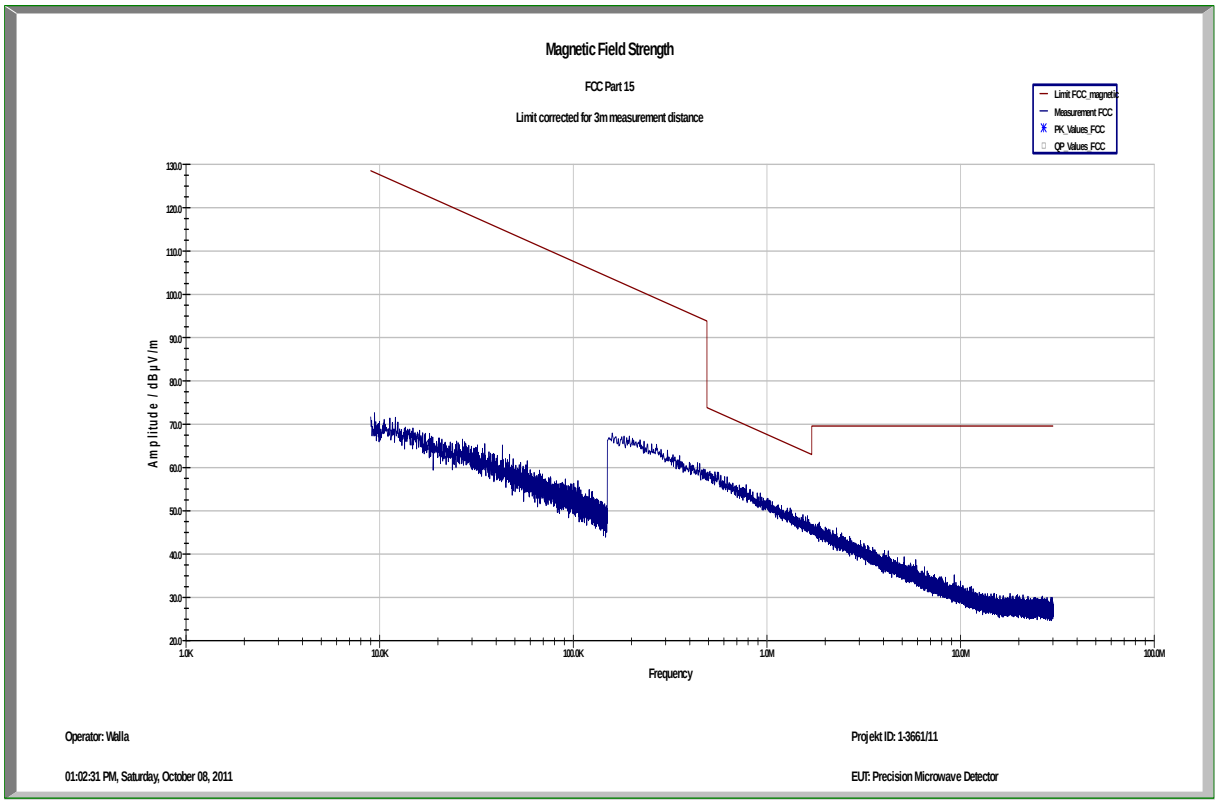
Plot 110: 27 GHz – 30 GHz



Result: **The measurement is passed.**

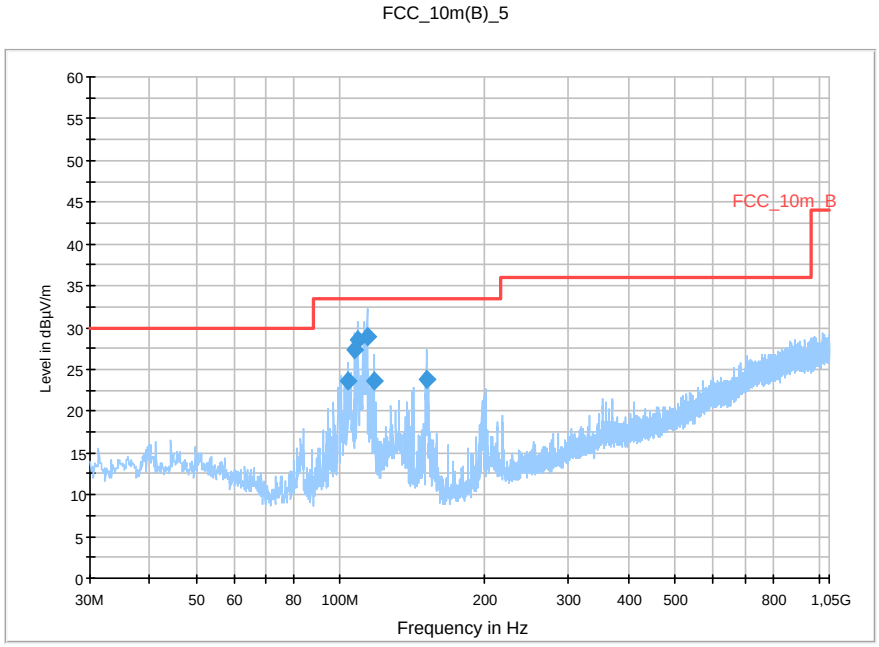
- **Antenna 3:**

Plot 111: 9 kHz – 30 MHz (Valid for all channels)



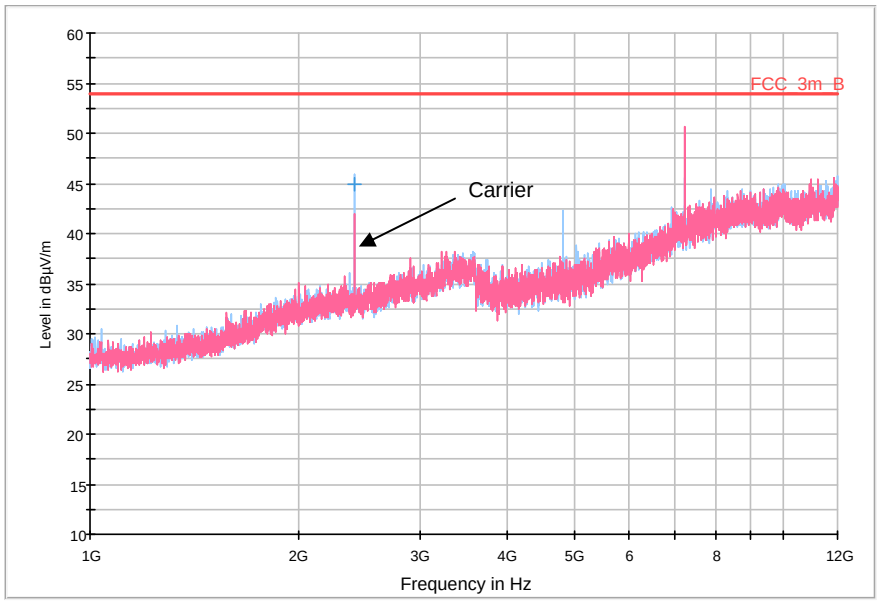
Channel 1: 2410 MHz, antenna 3

Plot 112: 30 MHz – 1 GHz

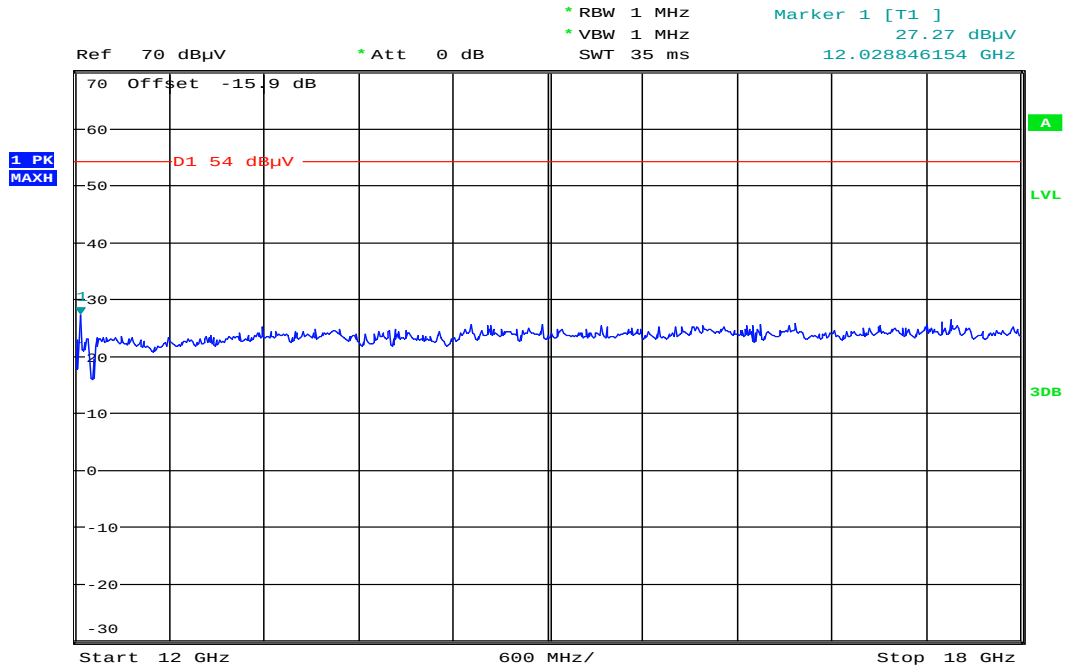


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
103.800000	23.7	1000.0	120.000	98.0	V	23.0	11.6	9.8	33.5
107.160000	27.2	1000.0	120.000	98.0	V	90.0	11.3	6.3	33.5
108.960000	28.6	1000.0	120.000	98.0	V	90.0	11.1	4.9	33.5
113.640000	28.8	1000.0	120.000	124.0	V	108.0	10.7	4.7	33.5
117.480000	23.7	1000.0	120.000	124.0	V	141.0	10.4	9.8	33.5
151.080000	23.9	1000.0	120.000	120.0	V	68.0	9.0	9.6	33.5

Plot 113: 1 GHz – 12 GHz

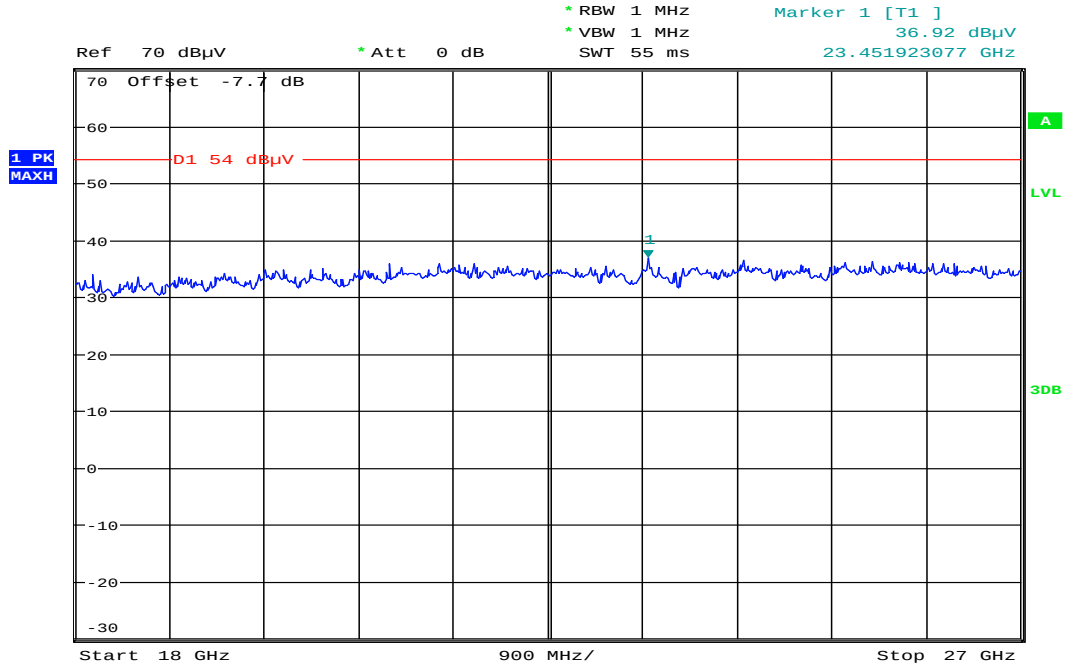


Plot 114: 12 GHz – 18 GHz



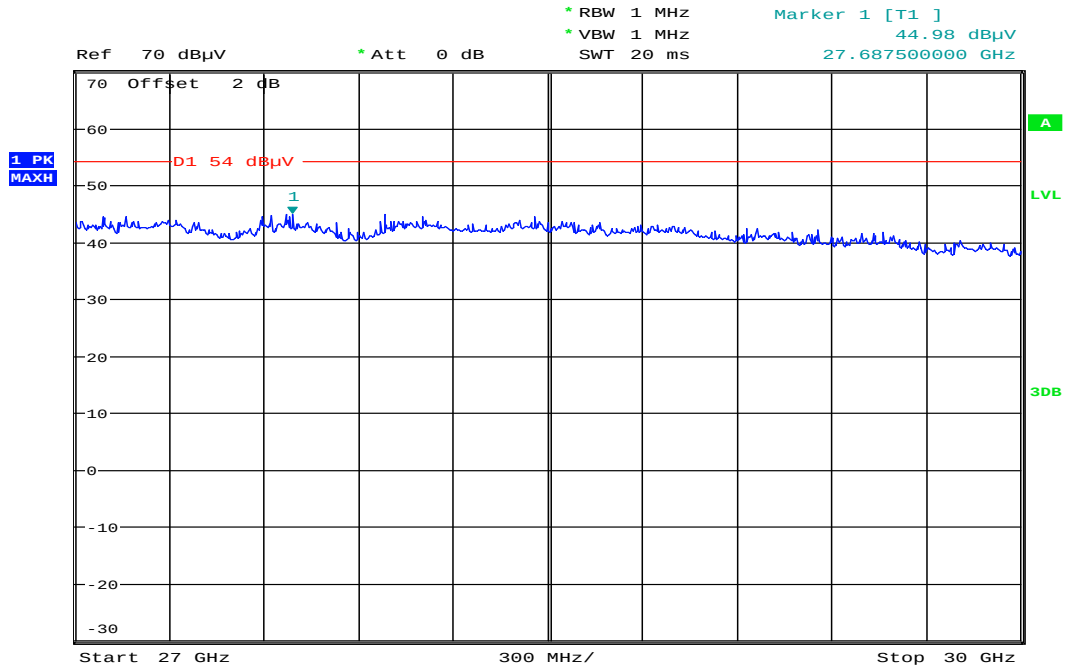
Date: 5.OCT.2011 15:28:48

Plot 115: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:51:02

Plot 116: 27 GHz – 30 GHz

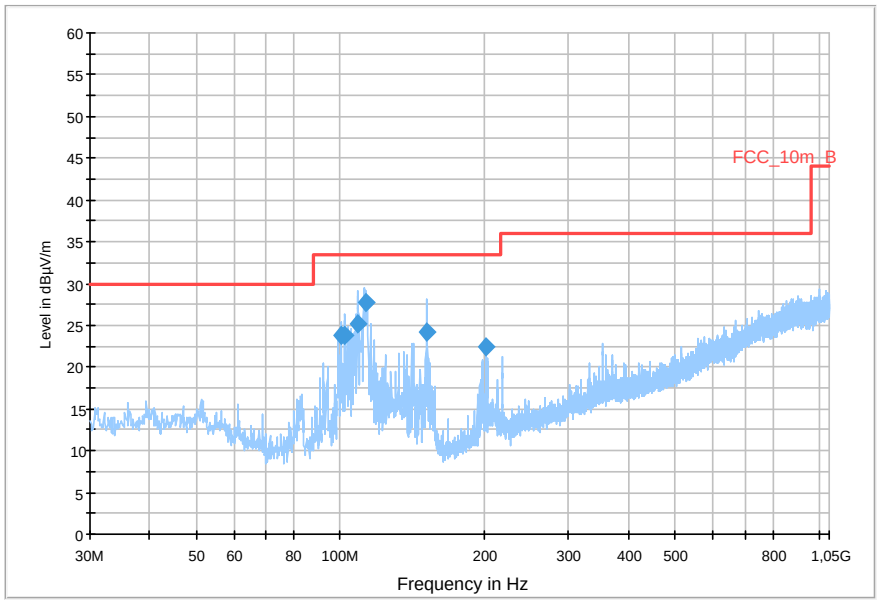


Date: 5.OCT.2011 10:58:27

Channel 2: 2440 MHz, antenna 3

Plot 117: 30 MHz – 1 GHz

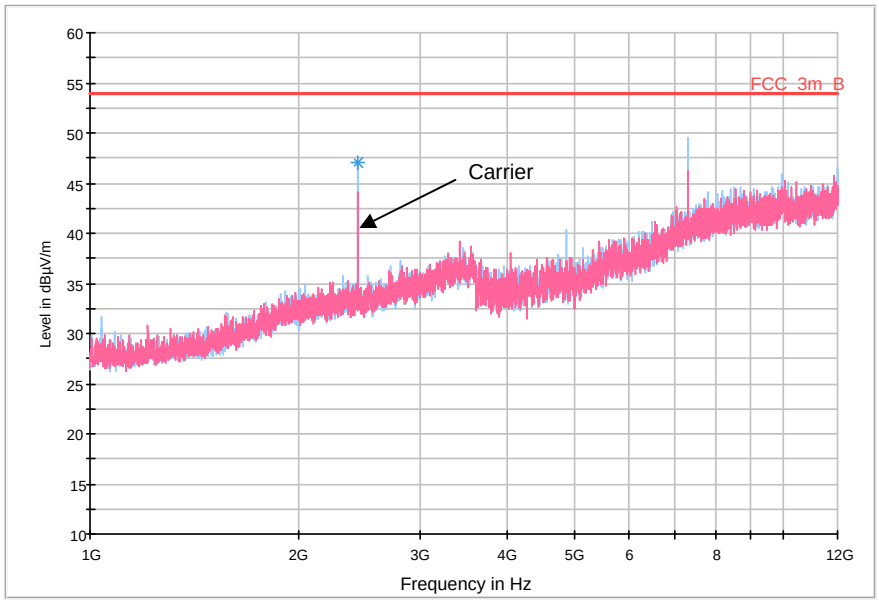
FCC_10m(B)_5



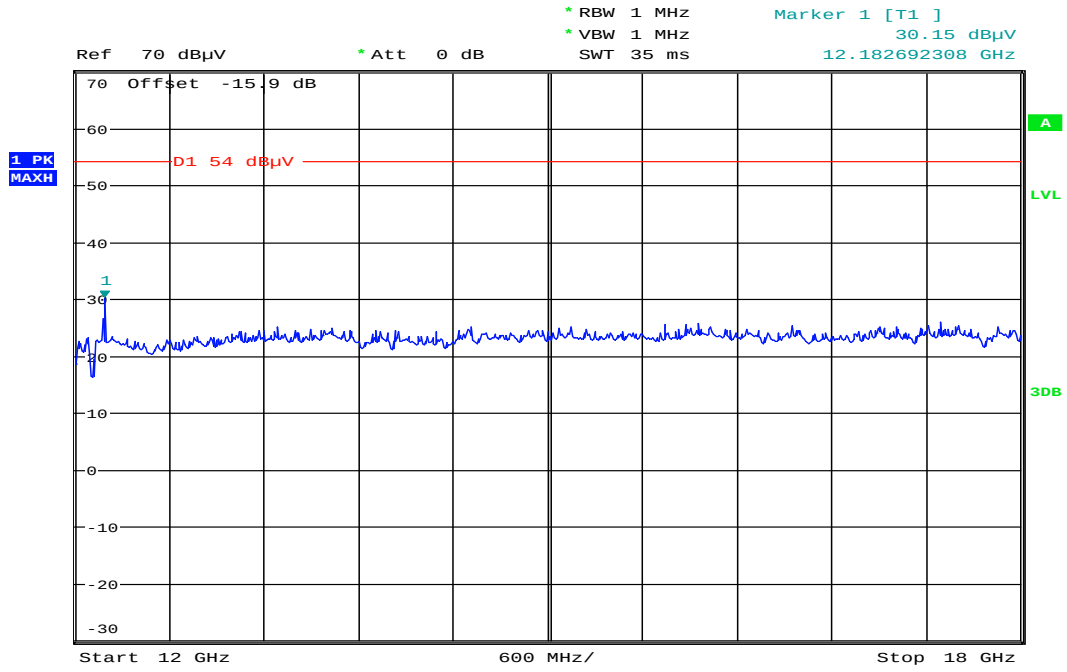
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
100.680000	23.8	1000.0	120.000	98.0	V	8.0	11.8	9.7	33.5
102.480000	23.8	1000.0	120.000	98.0	V	41.0	11.7	9.7	33.5
108.720000	25.3	1000.0	120.000	98.0	V	107.0	11.1	8.2	33.5
113.280000	27.7	1000.0	120.000	120.0	V	146.0	10.8	5.8	33.5
151.080000	24.2	1000.0	120.000	112.0	V	90.0	9.0	9.3	33.5
201.360000	22.5	1000.0	120.000	105.0	V	204.0	11.7	11.0	33.5

Plot 118: 1 GHz – 12 GHz

FCC_1_18_B_oH

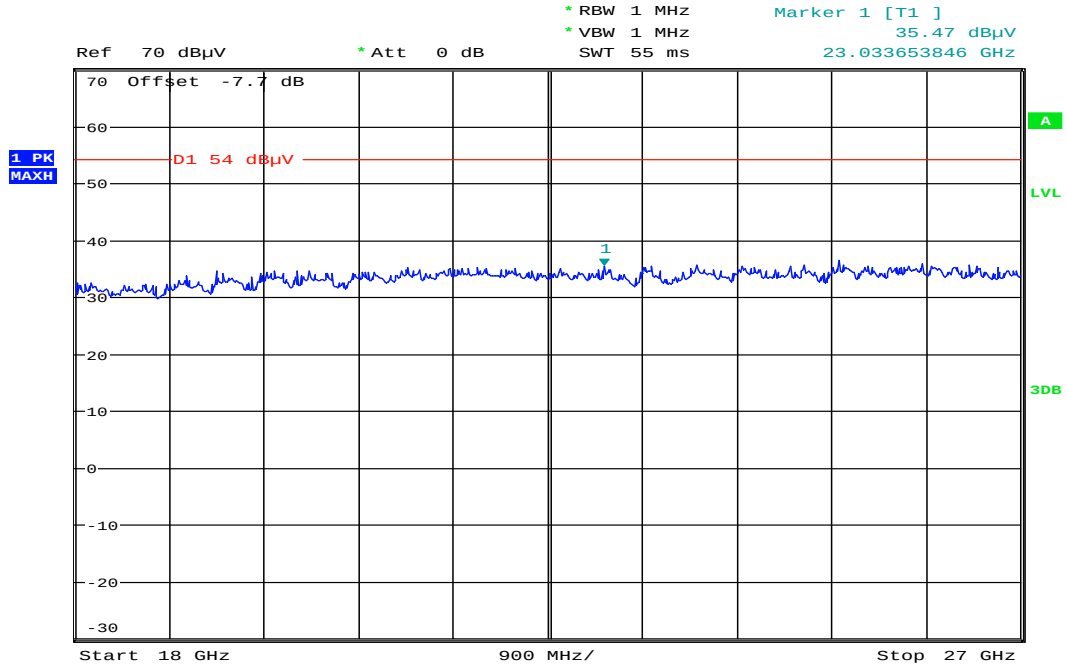


Plot 119: 12 GHz – 18 GHz



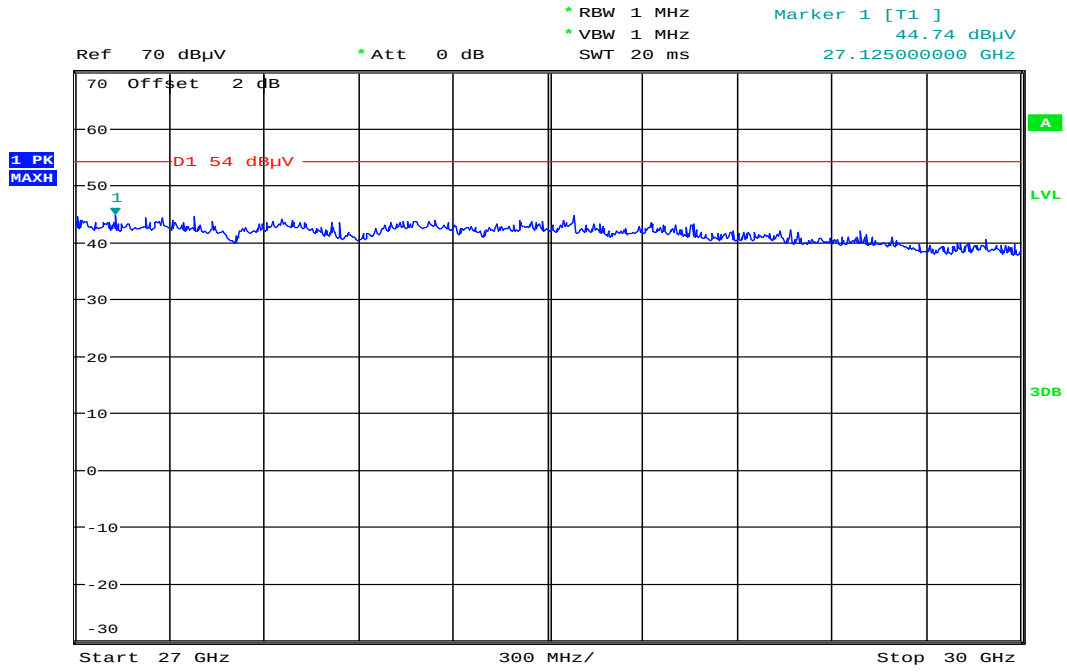
Date: 5.OCT.2011 15:30:24

Plot 120: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:51:30

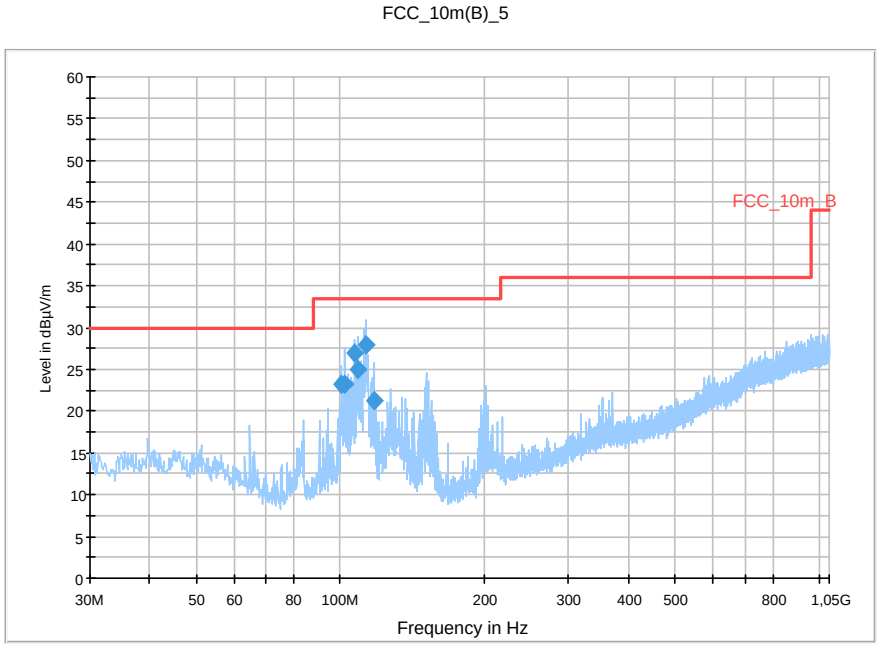
Plot 121: 27 GHz – 30 GHz



Date: 5.OCT.2011 10:59:08

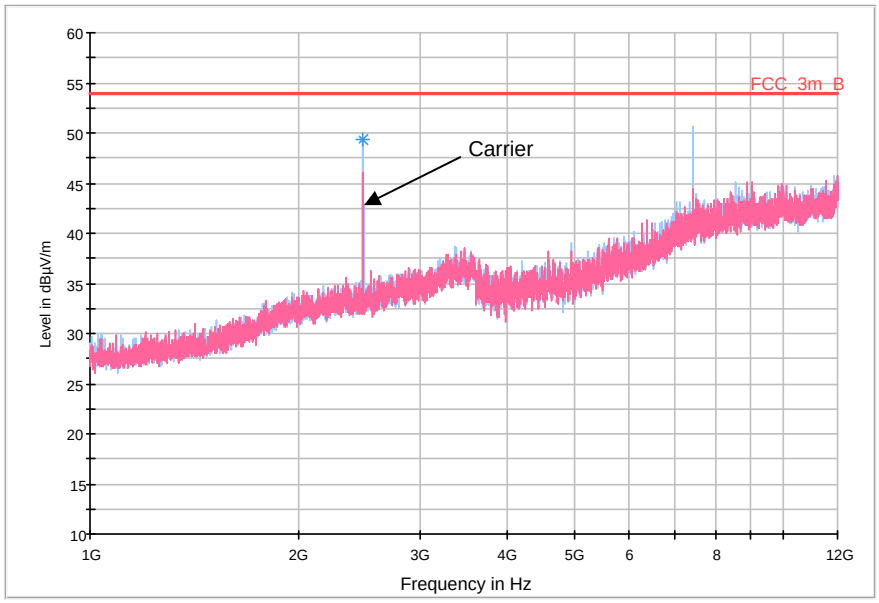
Channel 3: 2480 MHz, antenna 3

Plot 122: 30 MHz – 1 GHz

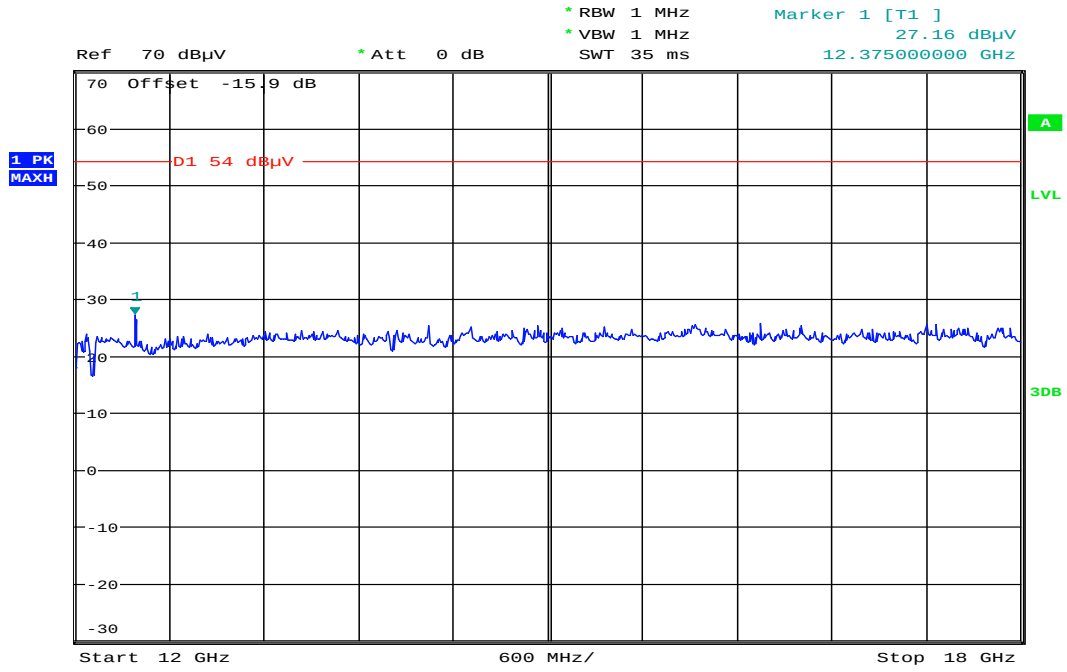


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
100.680000	23.2	1000.0	120.000	105.0	V	11.0	11.8	10.3	33.5
102.000000	23.2	1000.0	120.000	112.0	V	11.0	11.7	10.3	33.5
107.160000	27.0	1000.0	120.000	98.0	V	131.0	11.3	6.5	33.5
108.720000	25.0	1000.0	120.000	156.0	V	98.0	11.1	8.5	33.5
113.280000	28.0	1000.0	120.000	105.0	V	98.0	10.8	5.5	33.5
117.360000	21.2	1000.0	120.000	123.0	V	166.0	10.4	12.3	33.5

Plot 123: 1 GHz – 12 GHz

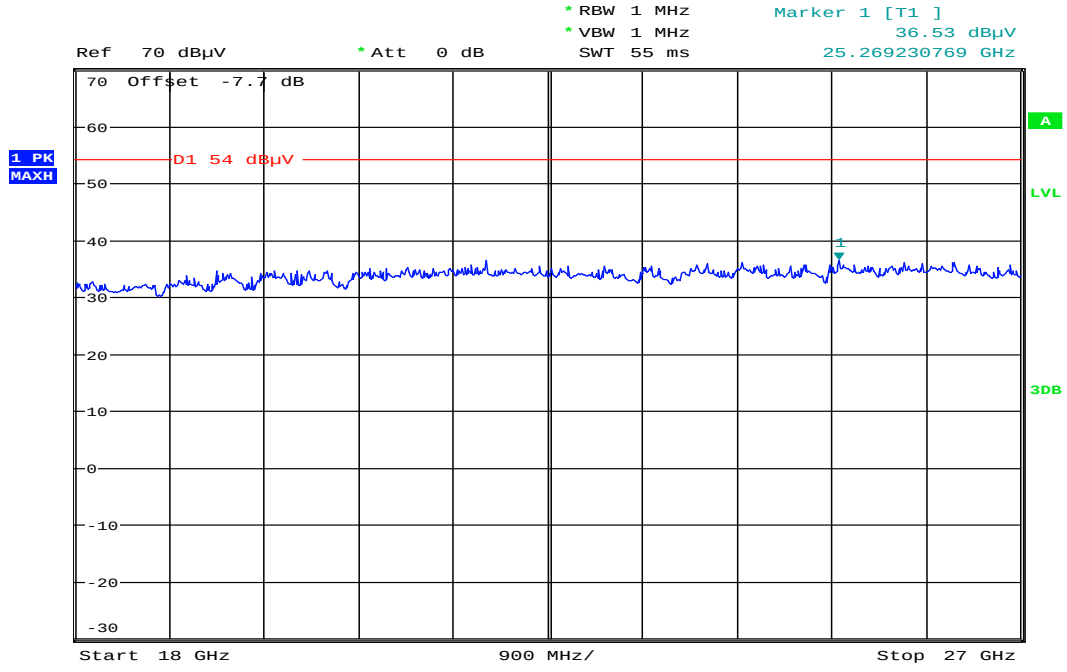


Plot 124: 12 GHz – 18 GHz



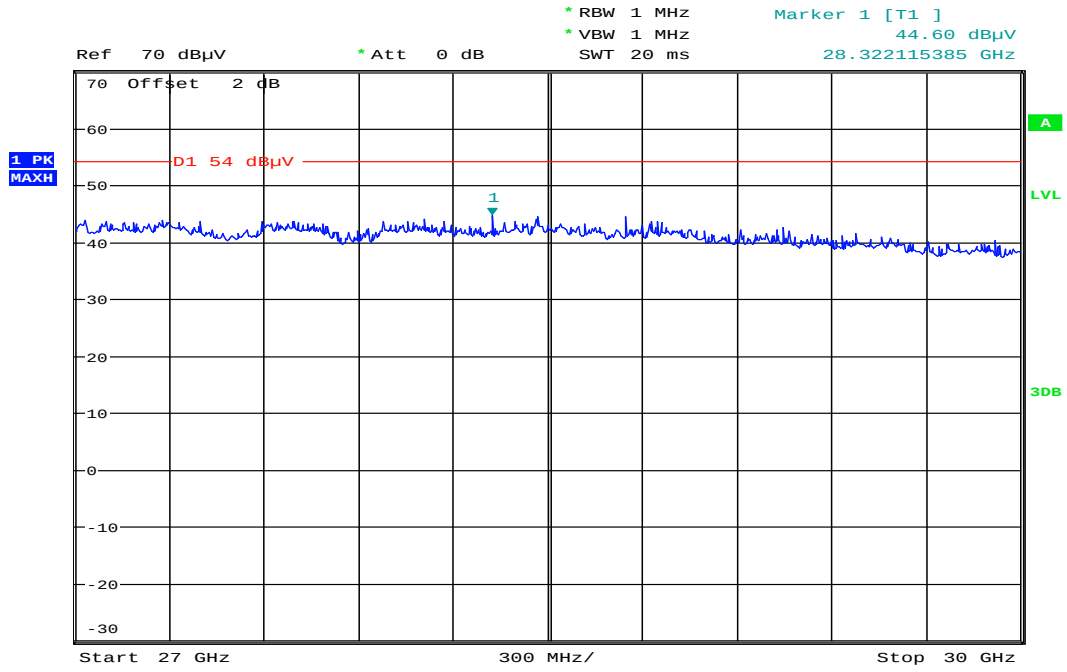
Date: 5.OCT.2011 15:31:28

Plot 125: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:51:48

Plot 126: 27 GHz – 30 GHz

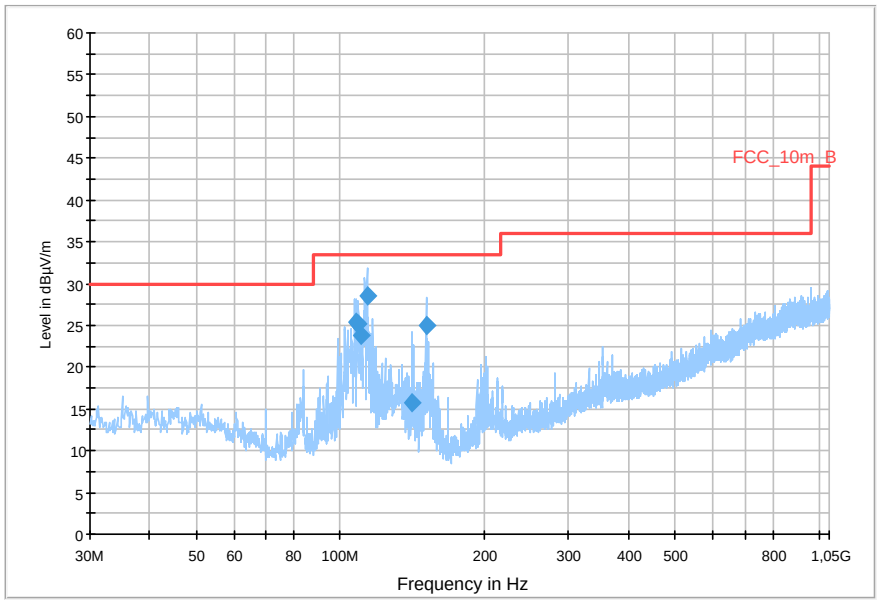


Date: 5.OCT.2011 10:59:34

Channel 4: 2520 MHz, antenna 3

Plot 127: 30 MHz – 1 GHz

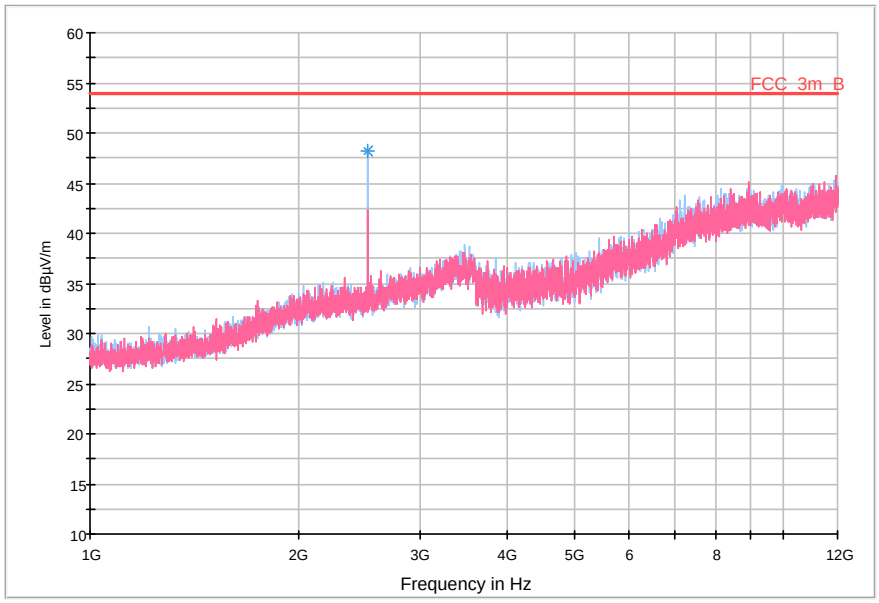
FCC_10m(B)_5



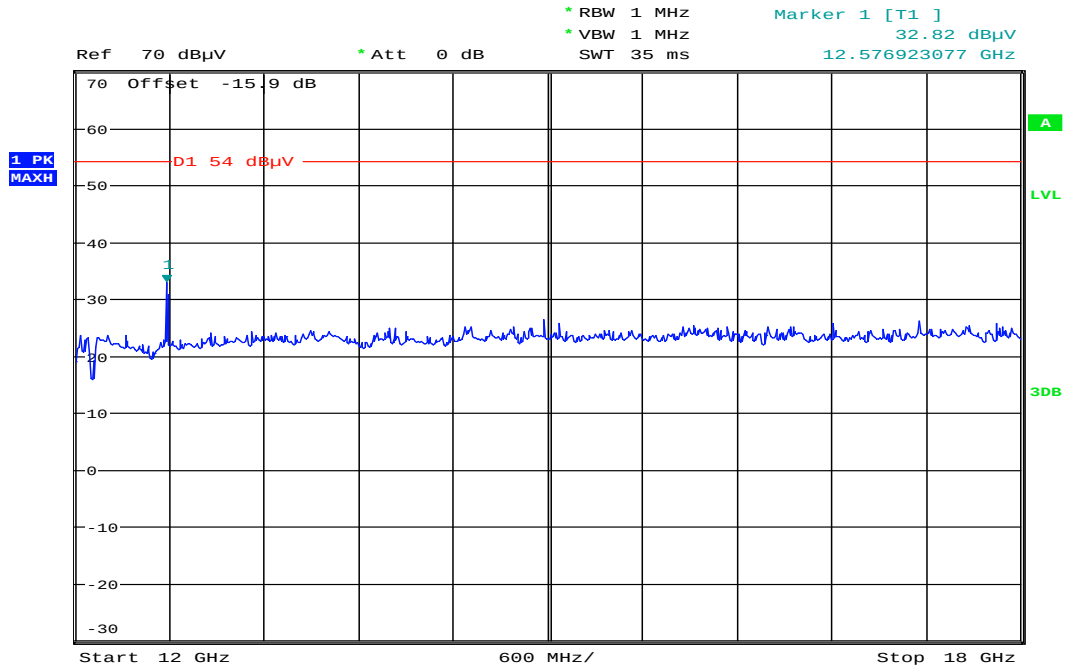
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
107.640000	25.4	1000.0	120.000	98.0	V	135.0	11.2	8.1	33.5
108.960000	25.2	1000.0	120.000	165.0	V	303.0	11.1	8.3	33.5
110.520000	23.8	1000.0	120.000	98.0	V	59.0	11.0	9.7	33.5
113.640000	28.6	1000.0	120.000	142.0	V	135.0	10.7	4.9	33.5
140.880000	15.7	1000.0	120.000	98.0	V	311.0	8.7	17.8	33.5
150.960000	25.0	1000.0	120.000	105.0	V	86.0	9.0	8.5	33.5

Plot 128: 1 GHz – 12 GHz

FCC_1_18_B_oH

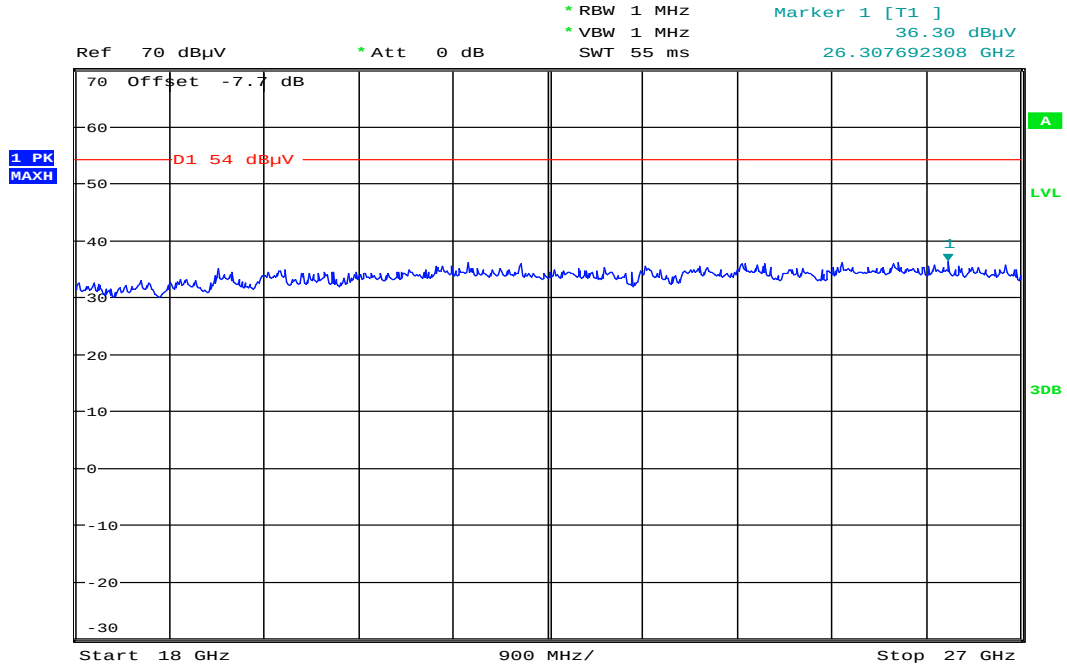


Plot 129: 12 GHz – 18 GHz



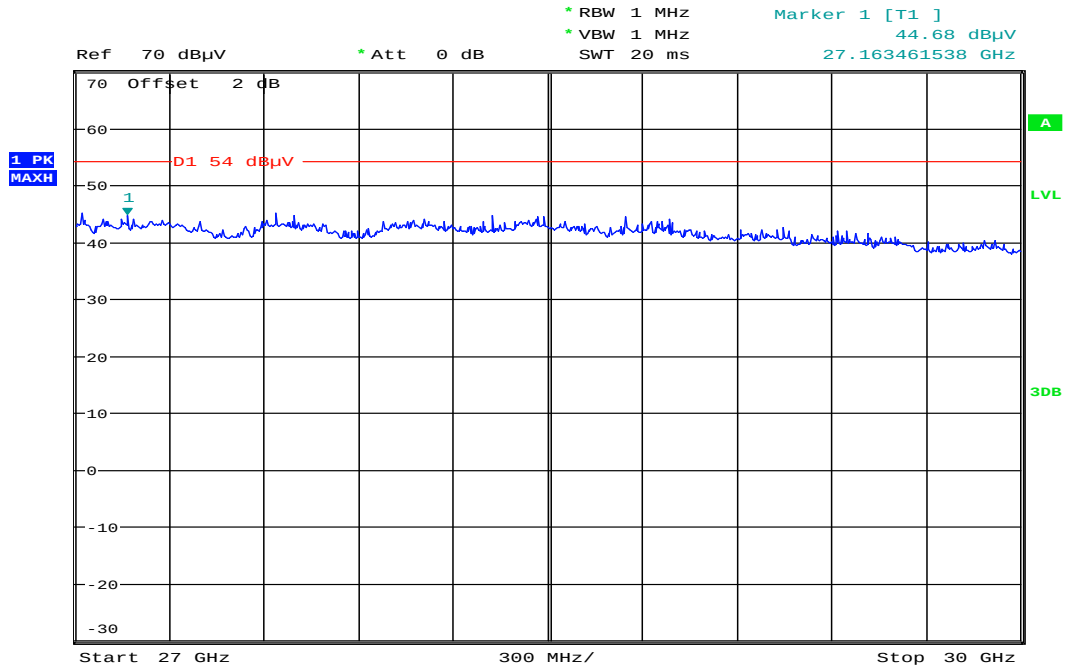
Date: 5.OCT.2011 15:32:35

Plot 130: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:52:27

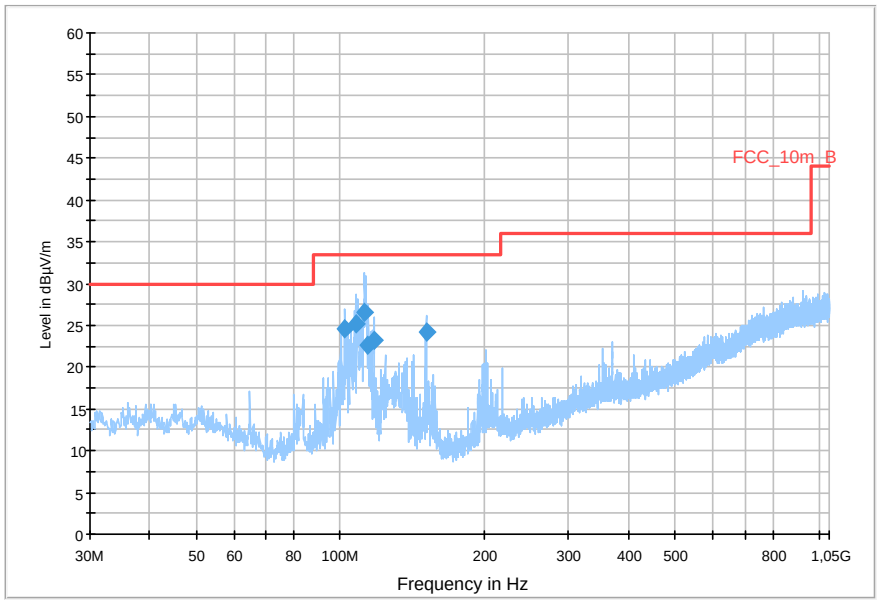
Plot 131: 27 GHz – 30 GHz



Channel 6: 2600 MHz, antenna 3

Plot 132: 30 MHz – 1 GHz

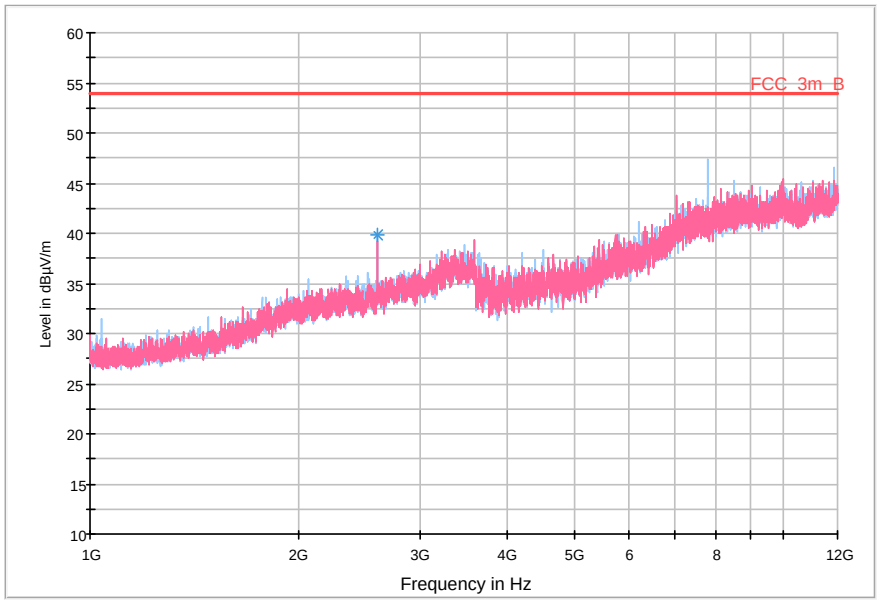
FCC_10m(B)_5



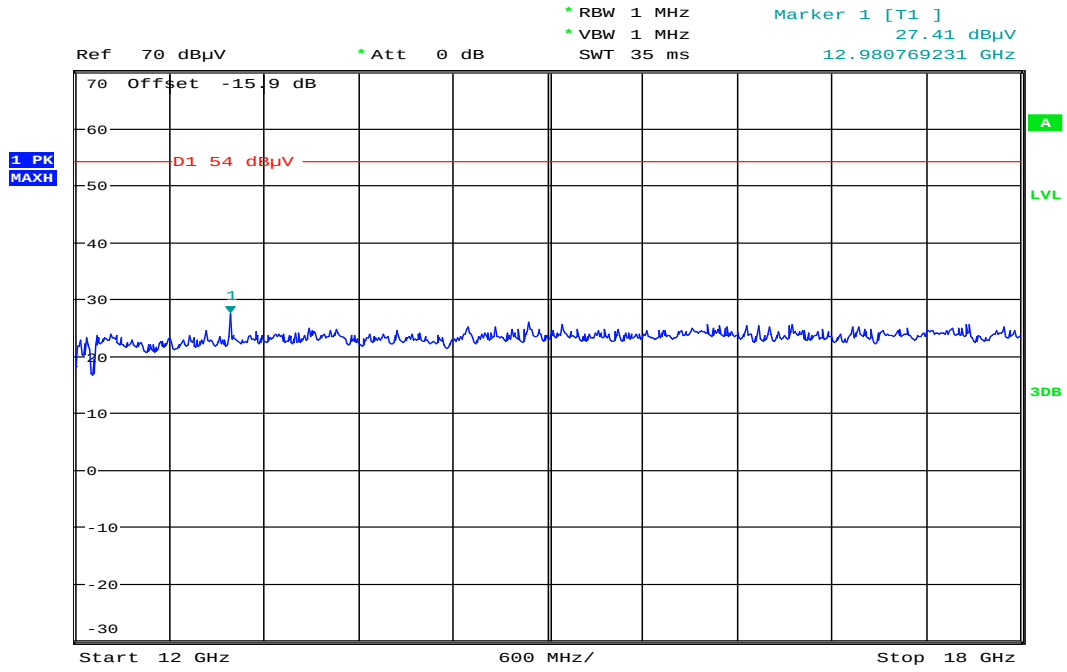
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
102.480000	24.6	1000.0	120.000	98.0	V	334.0	11.7	8.9	33.5
107.520000	25.2	1000.0	120.000	98.0	V	71.0	11.2	8.3	33.5
112.560000	26.5	1000.0	120.000	112.0	V	89.0	10.8	7.0	33.5
114.360000	22.6	1000.0	120.000	112.0	V	89.0	10.7	10.9	33.5
117.480000	23.3	1000.0	120.000	120.0	V	130.0	10.4	10.2	33.5
150.960000	24.2	1000.0	120.000	112.0	V	99.0	9.0	9.3	33.5

Plot 133: 1 GHz – 12 GHz

FCC_1_18_B_oH

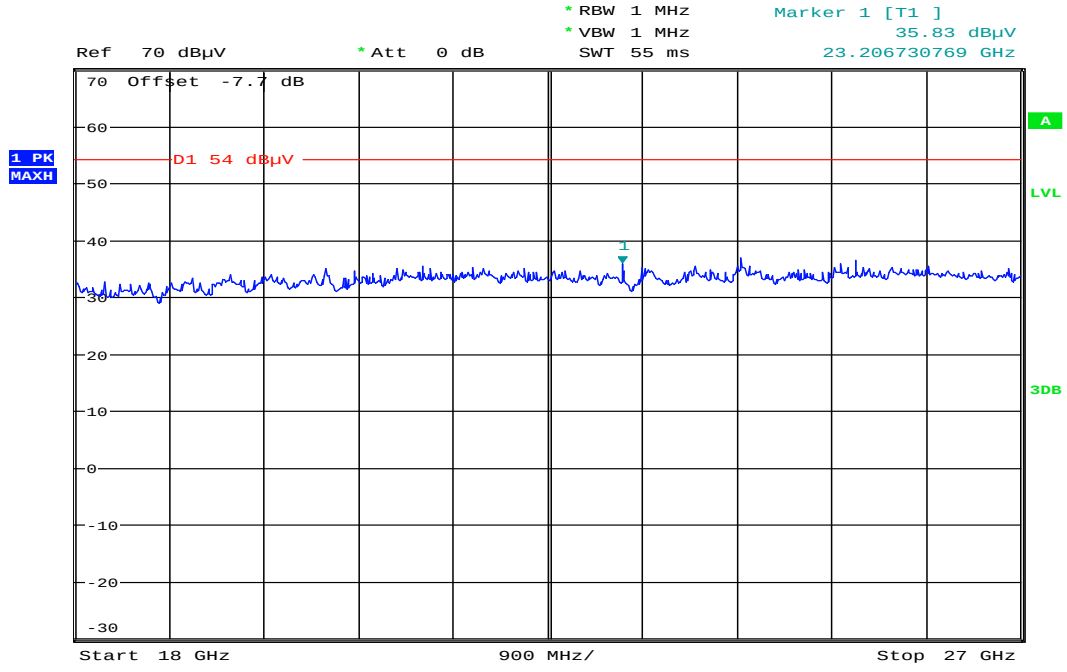


Plot 134: 12 GHz – 18 GHz



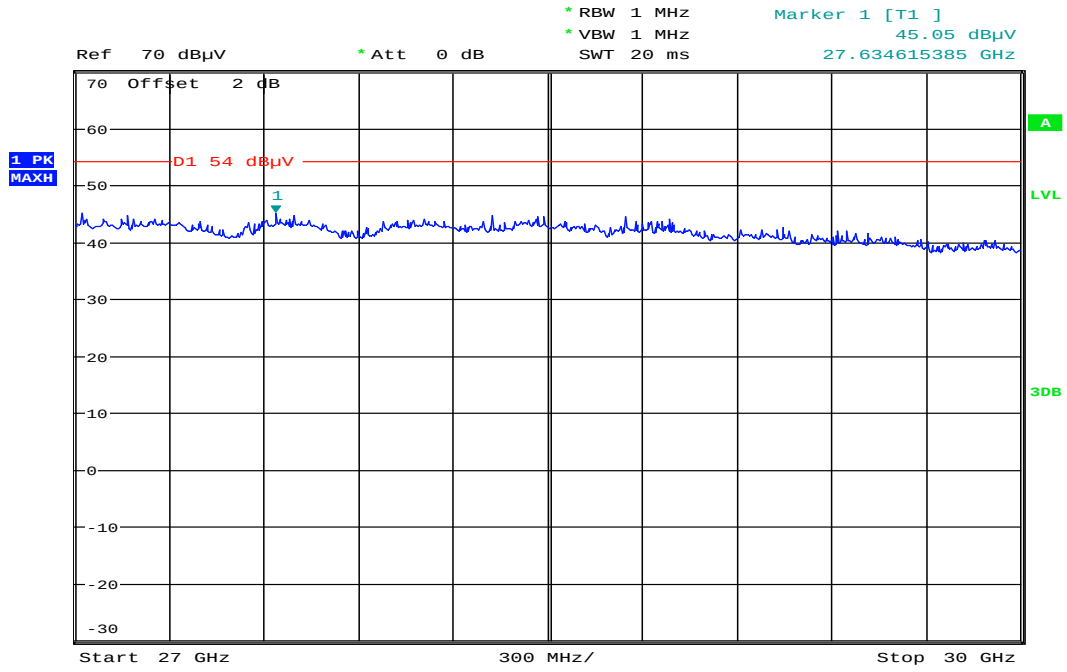
Date: 5.OCT.2011 15:33:52

Plot 135: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:52:43

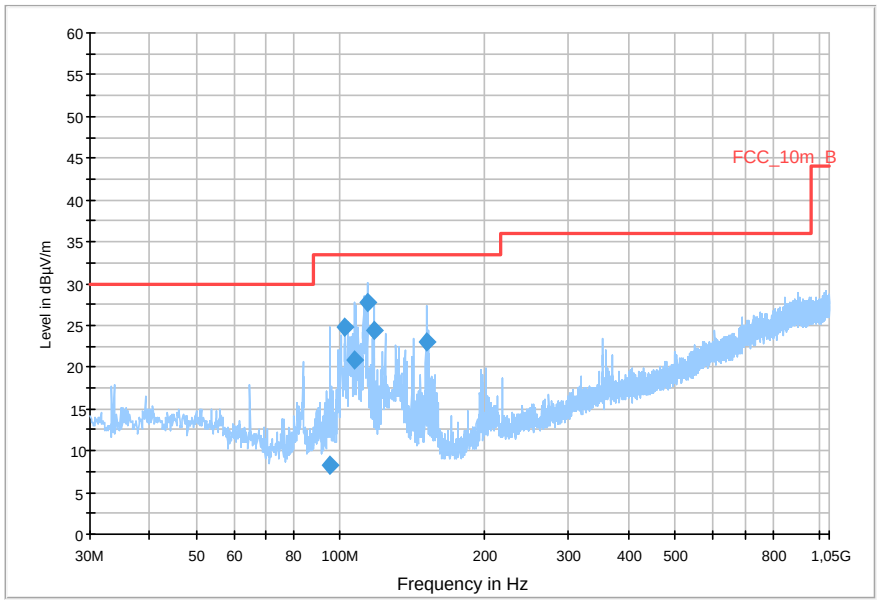
Plot 136: 27 GHz – 30 GHz



Channel 8: 2680 MHz, antenna 3

Plot 137: 30 MHz – 1 GHz

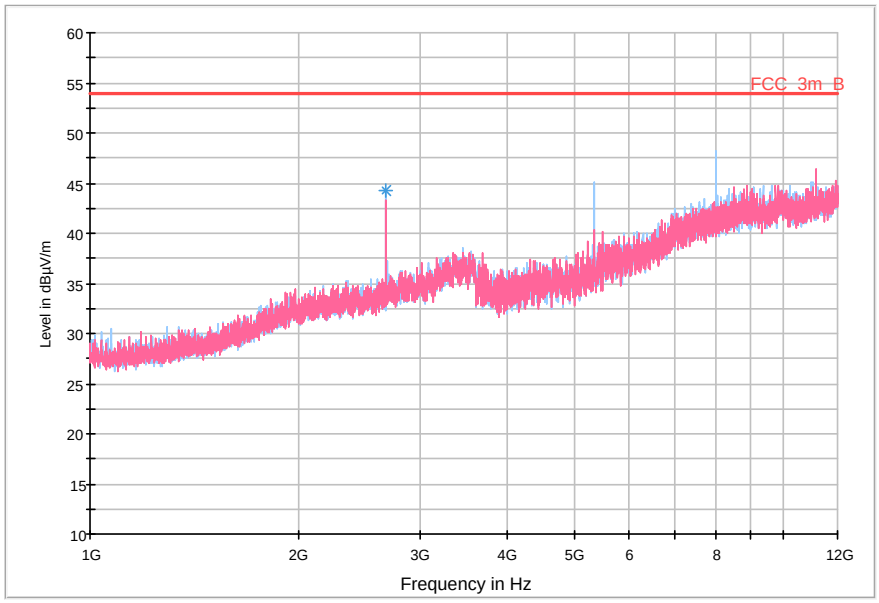
FCC_10m(B)_5



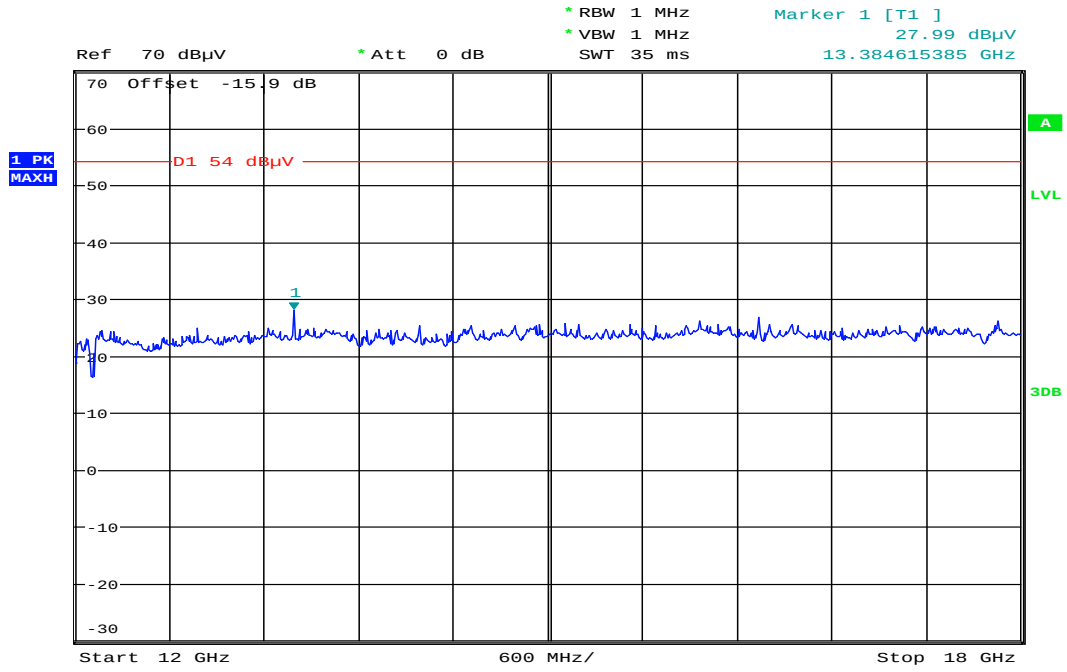
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
95.040000	8.2	1000.0	120.000	270.0	V	230.0	11.2	25.3	33.5
102.480000	24.8	1000.0	120.000	98.0	V	352.0	11.7	8.7	33.5
107.280000	20.9	1000.0	120.000	120.0	V	352.0	11.3	12.6	33.5
113.760000	27.7	1000.0	120.000	146.0	V	164.0	10.7	5.8	33.5
117.480000	24.4	1000.0	120.000	140.0	V	164.0	10.4	9.1	33.5
151.080000	23.0	1000.0	120.000	98.0	V	62.0	9.0	10.5	33.5

Plot 138: 1 GHz – 12 GHz

FCC_1_18_B_oH

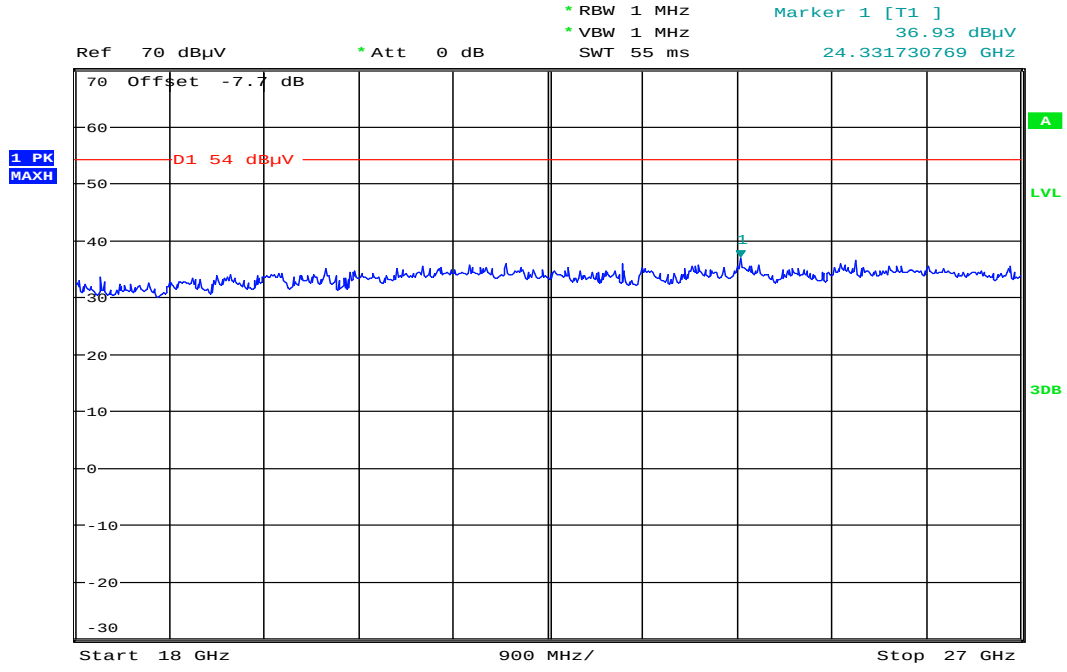


Plot 139: 12 GHz – 18 GHz



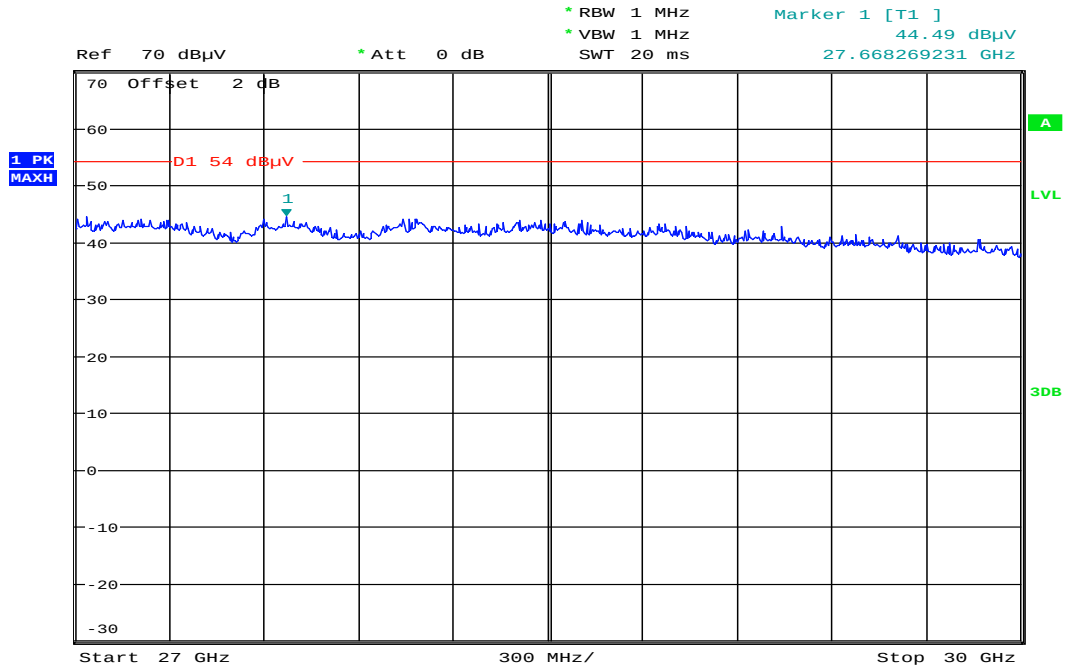
Date: 5.OCT.2011 15:35:22

Plot 140: 18 GHz – 27 GHz



Date: 5.OCT.2011 10:53:00

Plot 141: 27 GHz – 30 GHz



Result: **The measurement is passed.**

9.6 Receiver spurious emissions

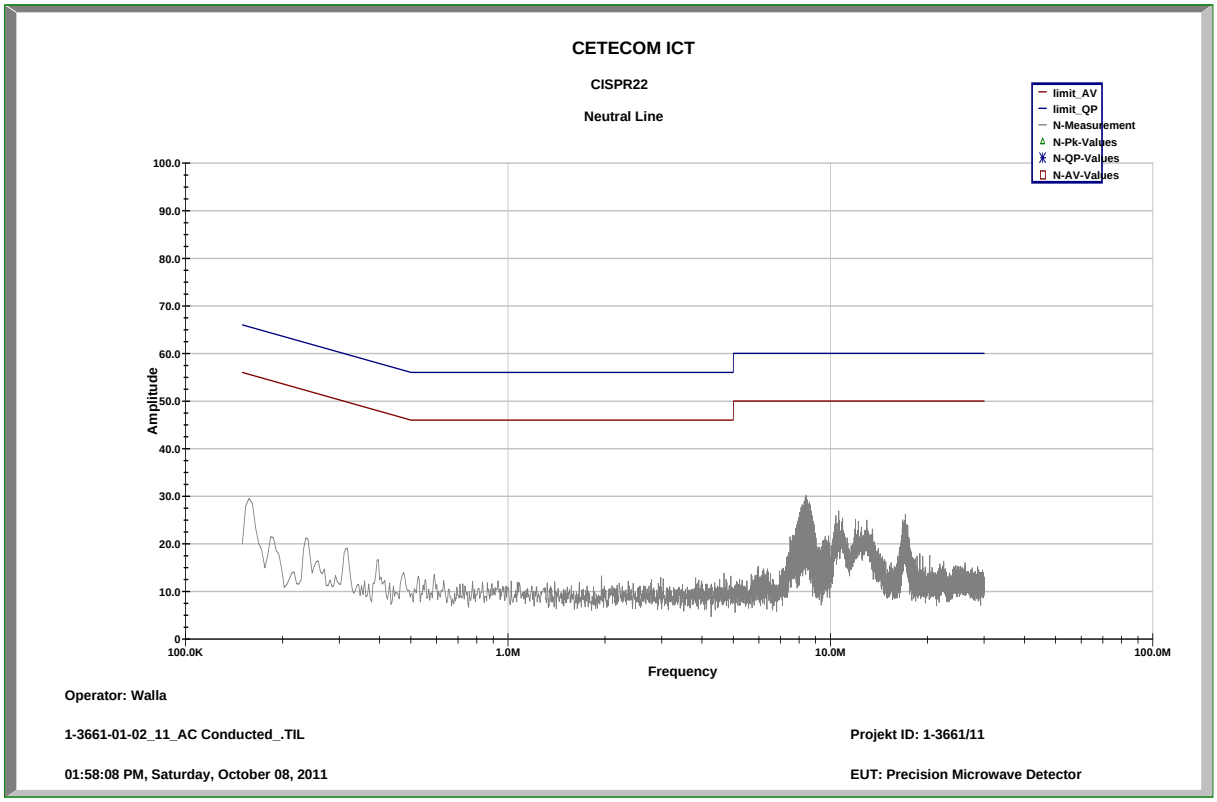
As soon as the Precision Microwave Detector PMD 2450 with integral control and display touch screen is powered up, TX and RX start operating.
No separate Rx mode available!

9.7 Conducted limits

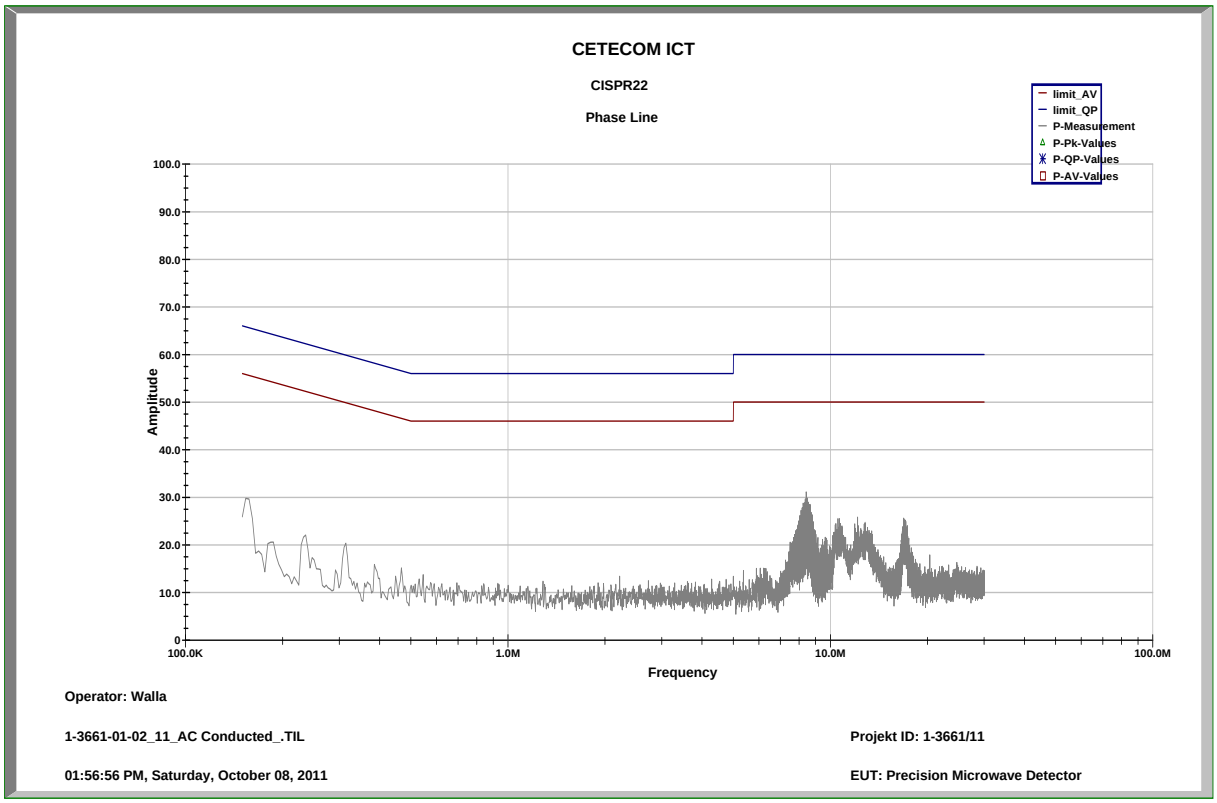
Measurement:

Measurement parameter	
Detector:	Quasi Peak / Average
Sweep time:	Auto
Resolution bandwidth:	10 kHz
Video bandwidth:	10 kHz
Span:	150 kHz – 30 MHz
Trace-Mode:	Max Hold

Plot 142: Neutral line, (Valid for all antennas and all channels)



Plot 143: Phase line, (Valid for all antennas and all channels)



Limits:

FCC	IC	
SUBCLAUSE § 15.107 / 15.207	**-/-**	
Conducted limits		
Frequency of Emission (MHz)	**Conducted Limit (dBµV)**	
	Quasi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 - 30	60	50

*Decreases with the logarithm of the frequency

Result: **The measurement is passed.**

10 Test equipment and ancillaries used for tests

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

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

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Next Calibration
1	Anechoic chamber	MWB	87400/02	300000996	Monthly verification	
2	System-Rack 85900	HP I.V.	*	300000222	n.a.	
3	Measurement System 1					
4	PSA-Spektrumanalysator 3 Hz - 26.5 GHz	Agilent	MY48250080	300003812	08.09.2010	08.09.2012
5	EMI Preselector 9 kHz - 1 GHz (N9039A)	Agilent	MY48260003	300003825	08.09.2010	08.09.2012
6	Microwave Analog Signal Generator (N5183A)	Agilent	MY47420220	300003813	08.09.2010	08.09.2012
7	PC	F+W			n.a.	
8	TILE	TILE			n.a.	
9	TRILOG Super Broadband Antenna (VULB9163)	Schwarzbeck	371	300003854	Monthly verification (System cal.)	
10	Double Ridged Antenna 3115	EMCO	3088	300001032	Monthly verification (System cal.)	
11	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)	
12	Switch / Control Unit 3488A	HP	2719A15013	300001156	n.a.	
13	Power Supply 6032A	HP	2818A03450	300001040	08.01.2009	08.01.2012
14	Busisolator	Kontron		300001056	n.a.	
15	Leitungsteiler 11850C	HP		300000997	Monthly verification (System cal.)	
16	Power attenuator 8325	Byrd	1530	300001595	Monthly verification (System cal.)	
17	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verification (System cal.)	
18	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verification (System cal.)	
19	Hochpassfilter WHK1.1/15G-10SS	Wainwright	3	300003255	Monthly verification (System cal.)	
20	Hochpassfilter WHKX2.9/18G-12SS	Wainwright	1	300003492	Monthly verification (System cal.)	
21	Hochpassfilter WHKX7.0/18G-8SS	Wainwright	18	300003789	Monthly verification (System cal.)	
22	Switch / Control Unit 3488A	HP	2605e08770	300001443	n.a.	
23	Trenntrafo RT5A	Grundig	9242	300001263	n.a.	
24	Relais Matrix PSU	R&S	890167/024	300001168	n.a.	
25	Netznachbildung ESH3-Z5	R&S	828576/020	300001210	n.a.	
26	Control Computer	F+W	FW0502032	300003303	-/-	-/-
27	Trilog Antenna VULB 9163	Schwarzbeck	295	300003787	01.04.2010	01.04.2012
28	Amplifier - 0518C-138	Veritech	-/-	-/-	-/-	-/-
29	Switch - 3488A	HP		300000368	-/-	-/-
30	EMI Test receiver - ESCI	R&S	100083	300003312	05.01.2011	05.01.2013
31	Turntable Controller - 1061 3M	EMCO	1218	300000661	-/-	-/-
32	Tower Controller / 1051 Controller	EMCO	1262	300000625	-/-	-/-
33	Tower - 1051	EMCO	1262	300000625	-/-	-/-
34	Ultra Notch-Filter Rejected band Ch. 62	WRCD	9	-/-	-/-	-/-
35	Spectrum Analyser FSU50	R&S	200012	300003443	01.07.2010	01.07.2012
36	Spectrum Analyser 8565E	HP	3738A00773	300001665	08.01.2010	08.01.2012
37	Amplifier 0.1 to 26.0 GHz 83017A	HP	00419	300002267	10.03.2011	10.03.2012
38	DC Power supply 6038A	HP	2848A07027	300001174	07.01.2009	07.01.2012
39	RF-cable	H & S		-/-	cyclic verification	

Agenda: Kind of Calibration

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

Annex A Photographs of the test setup

Photo 1: EUT and antenna 1

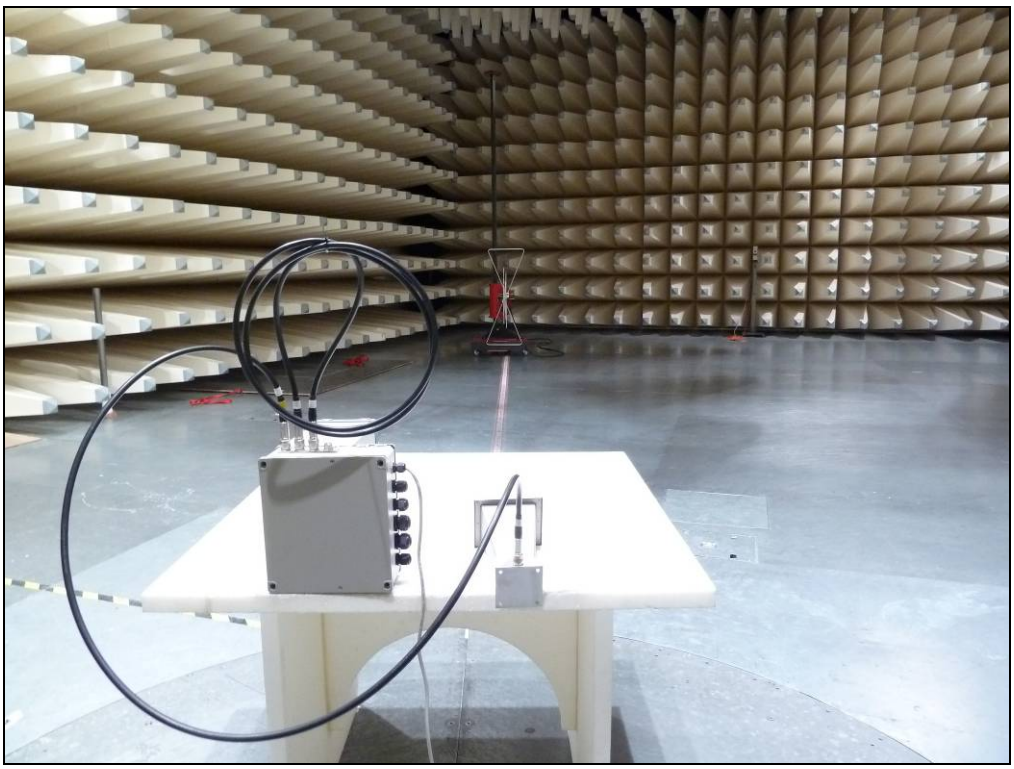


Photo 2: EUT and antenna 1

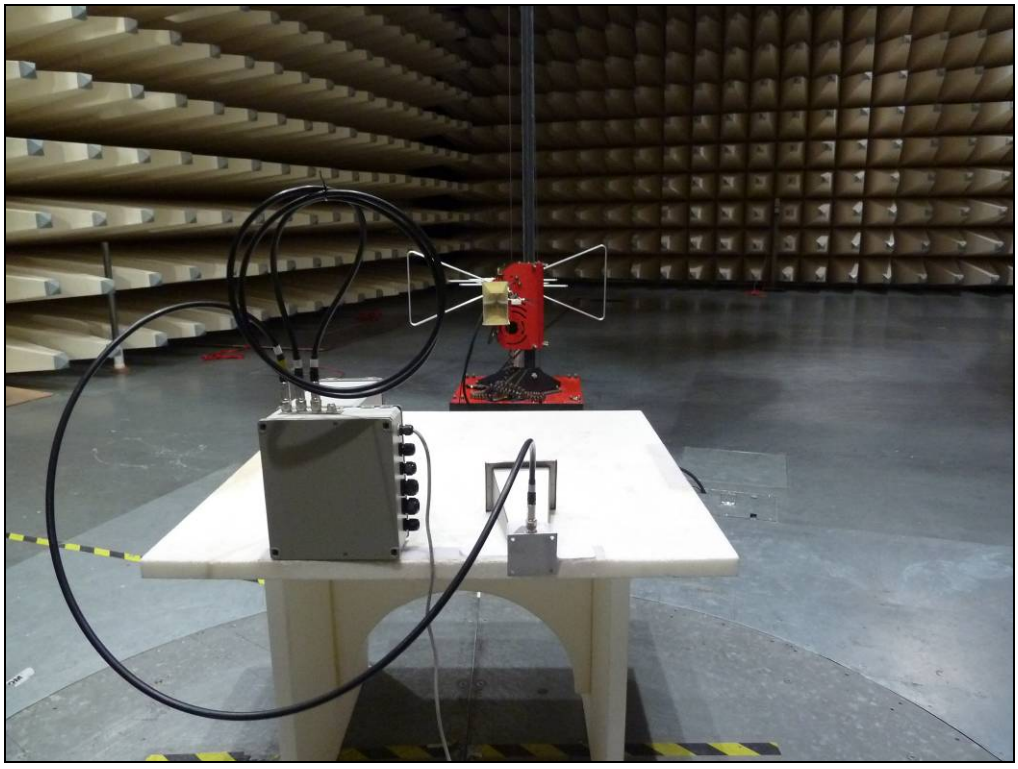


Photo 3: EUT and antenna 2

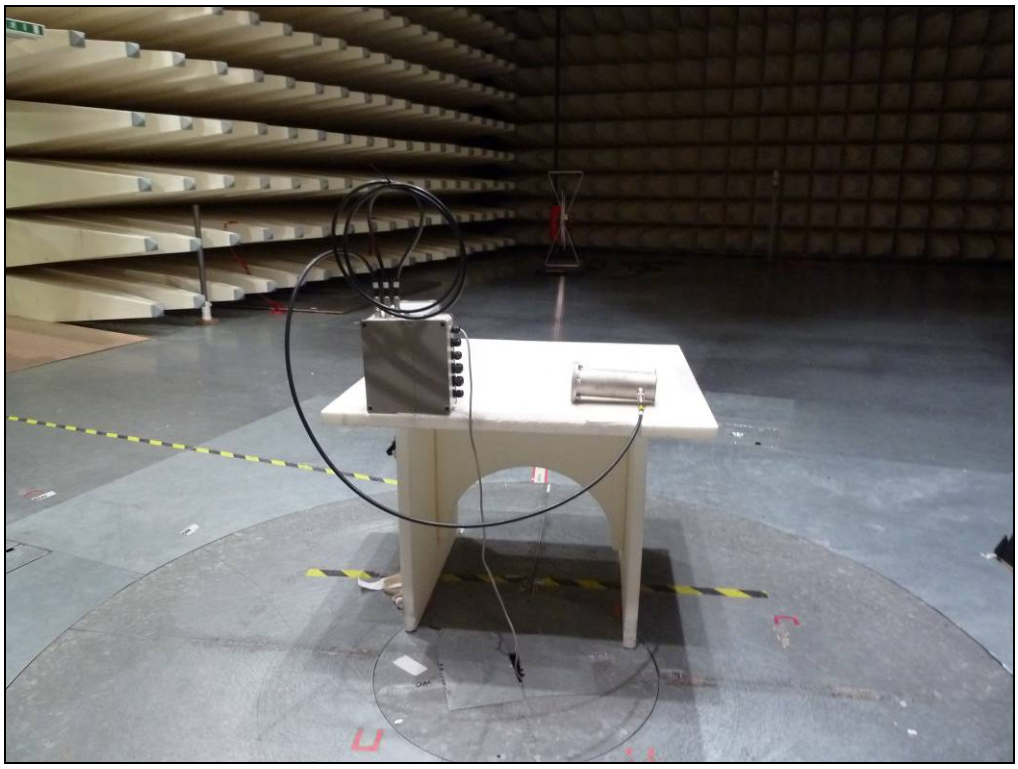


Photo 4: EUT and antenna 2

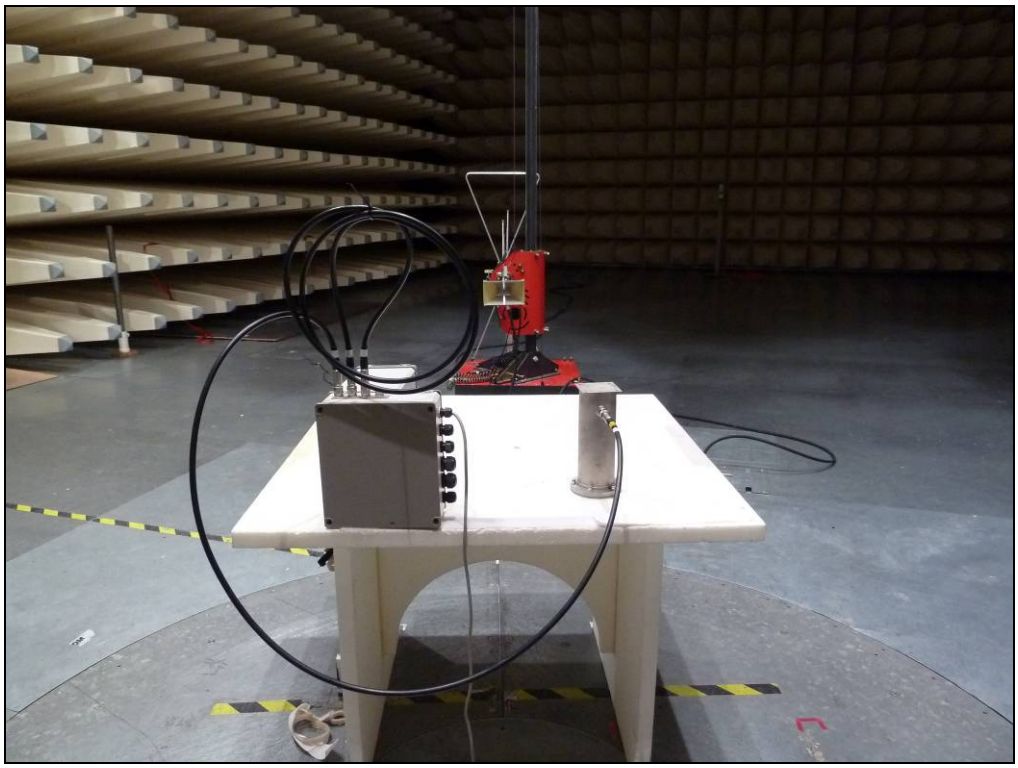


Photo 5: EUT and antenna 3

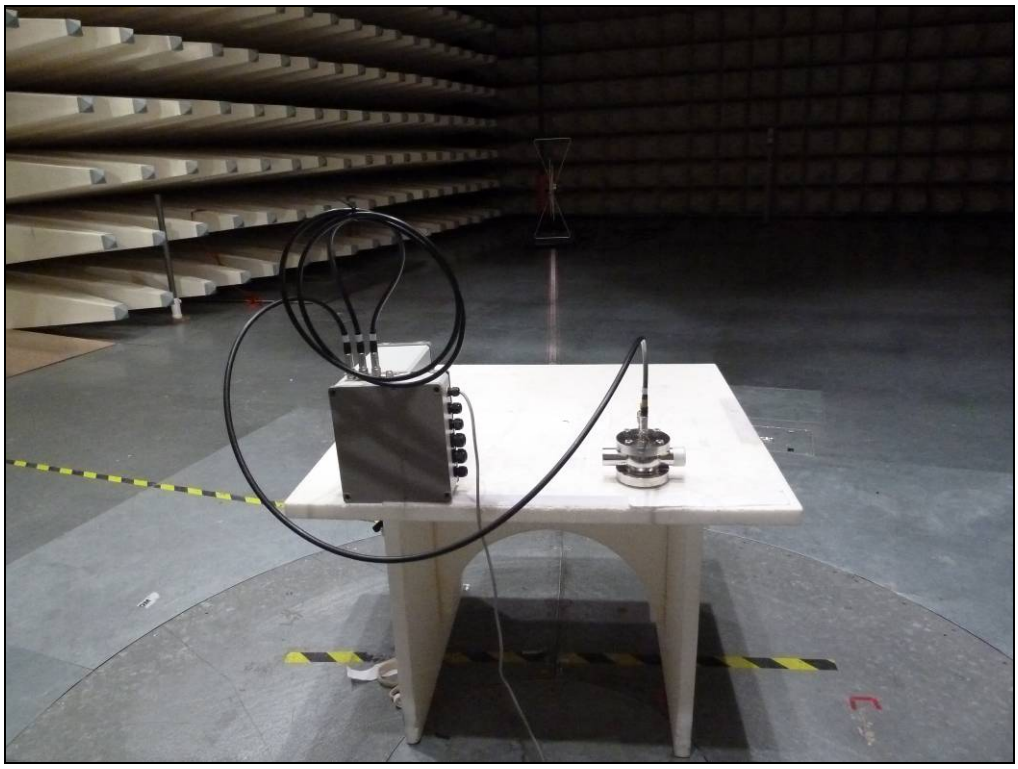
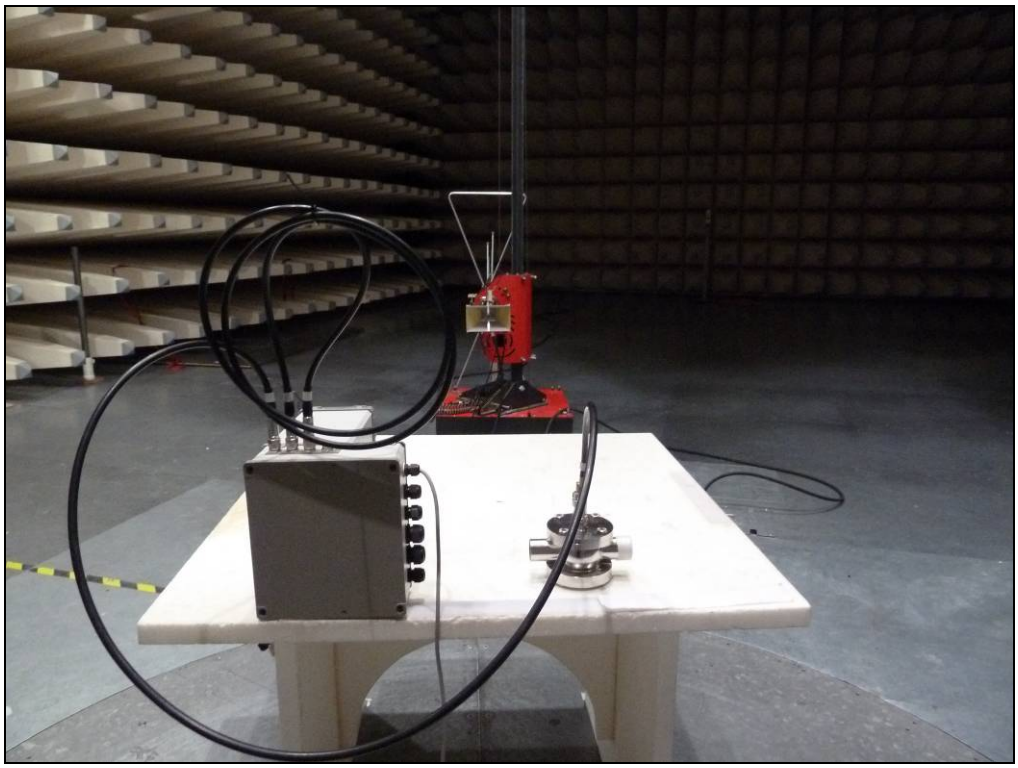


Photo 6: EUT and antenna 3



Annex B External photographs of the EUT

Photo 7:

Photo 8:

Photo 9:

Photo 10:

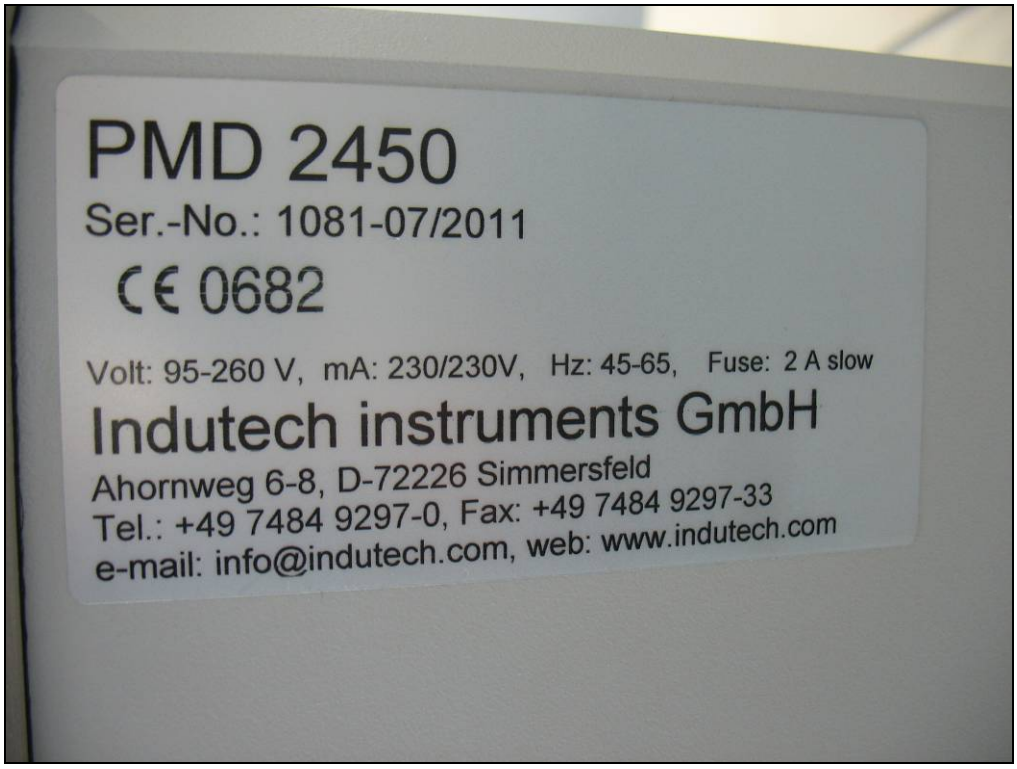


Photo 11: Antenna 1

Photo 12: Antenna 2

Photo 13: Antenna 2

Photo 14: Antenna 3

Annex C Internal photographs of the EUT

Photo 15:

Photo 16:

Photo 17:

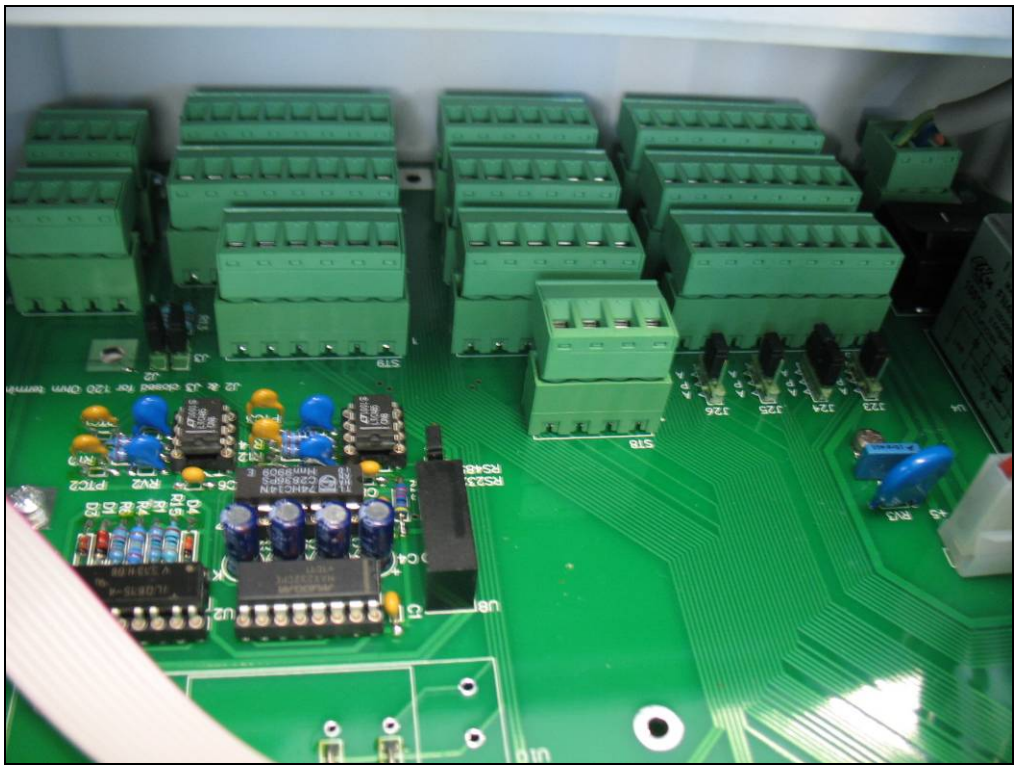


Photo 18:

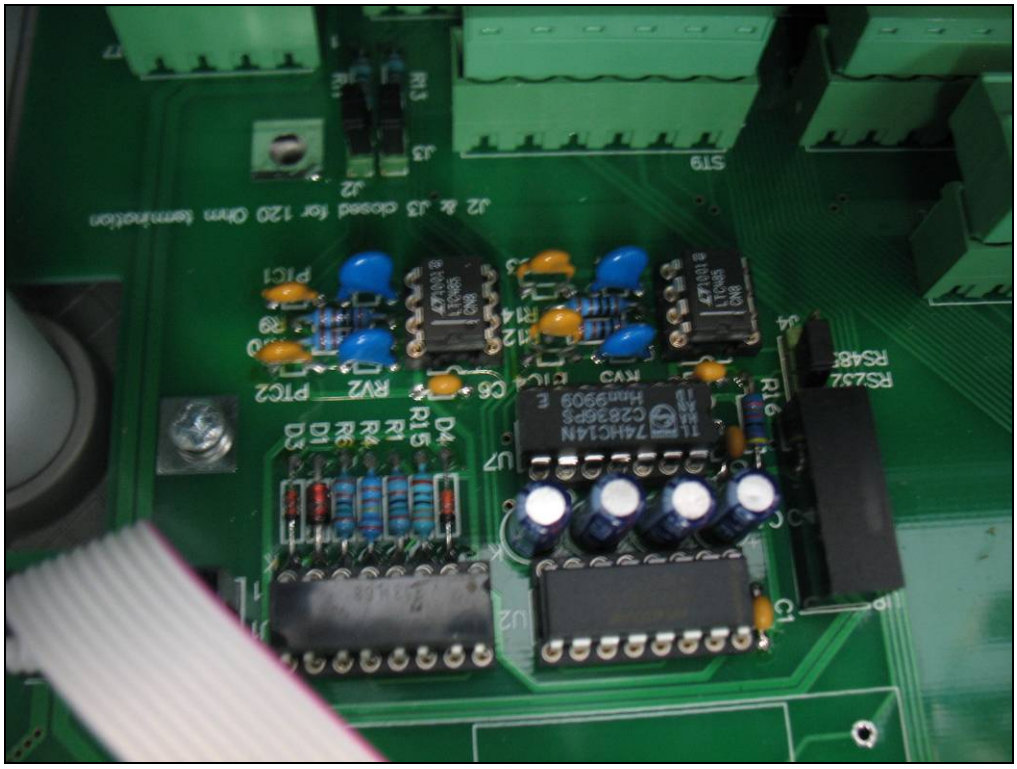


Photo 19:

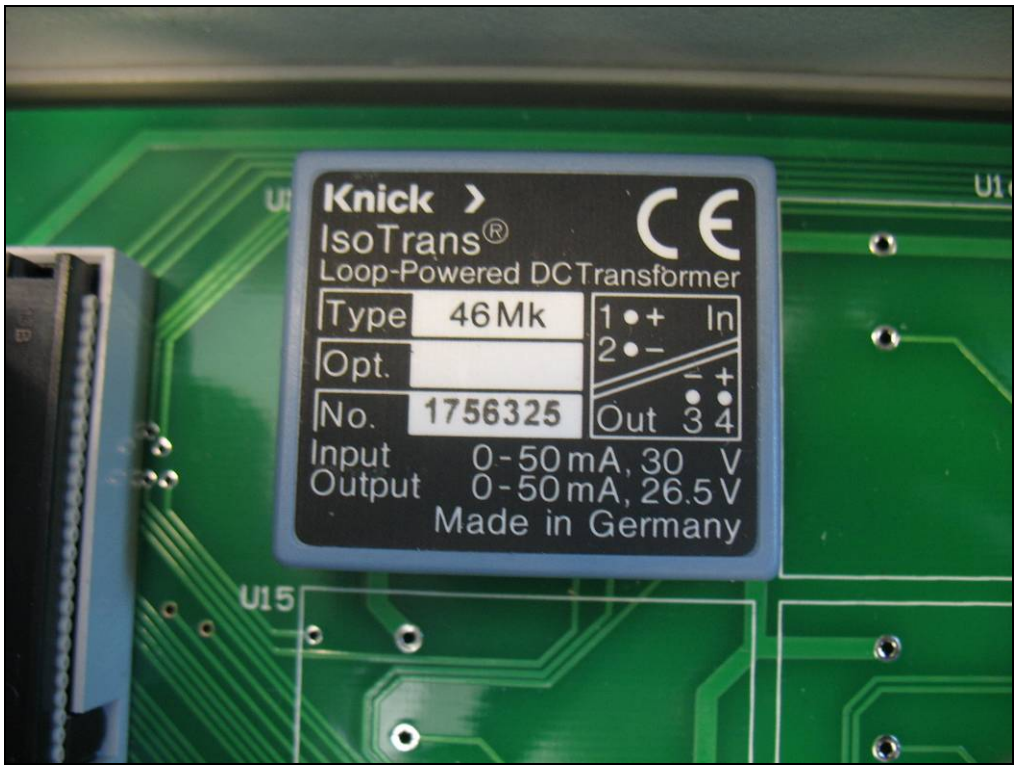


Photo 20:

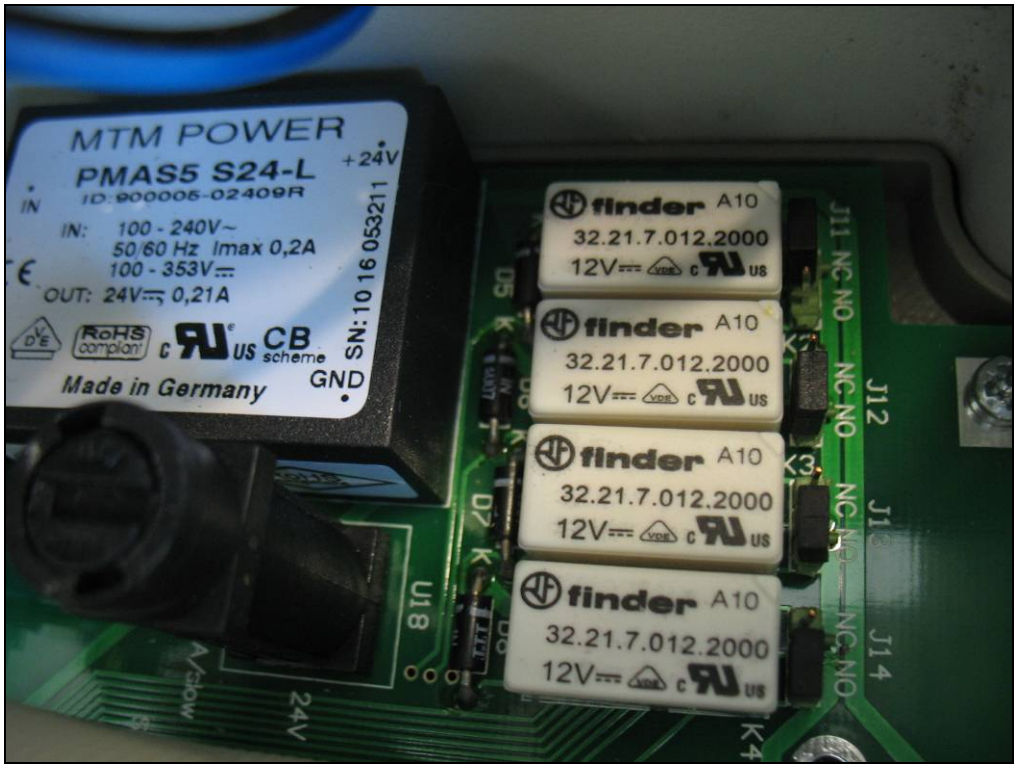


Photo 21:

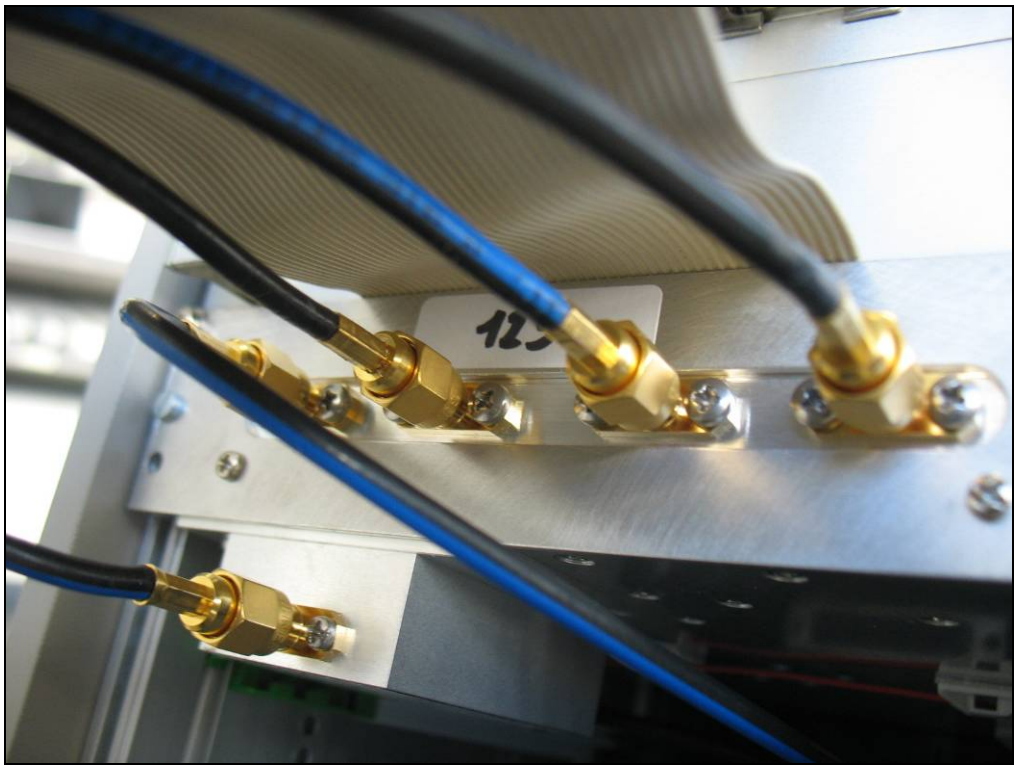


Photo 22:

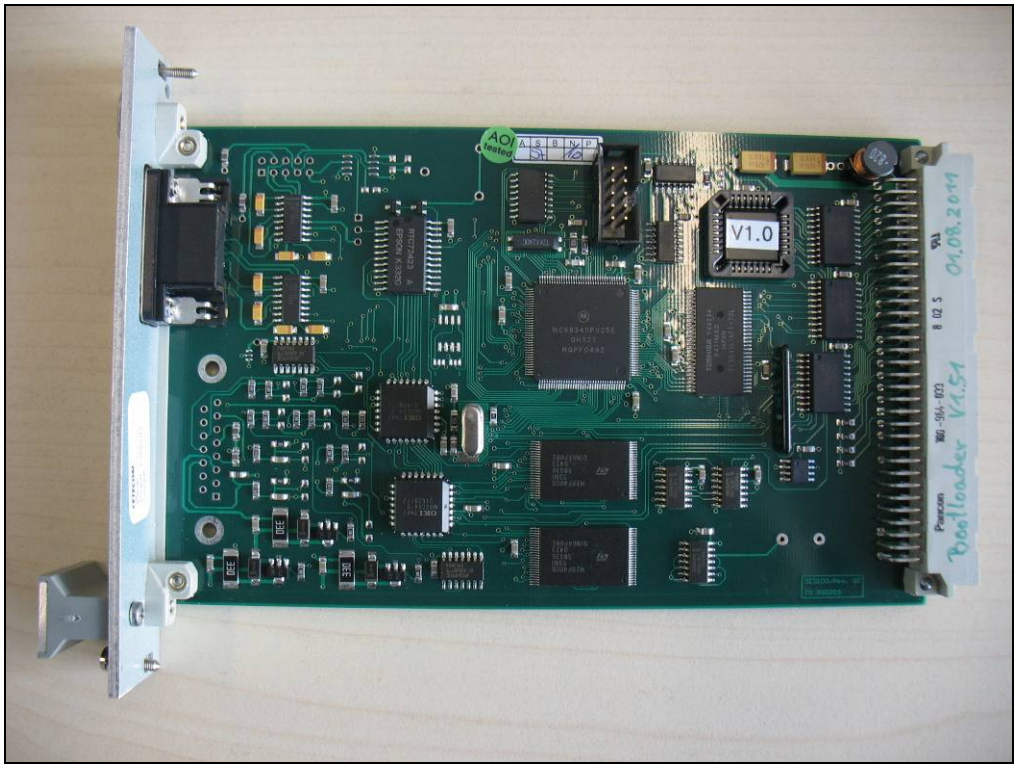
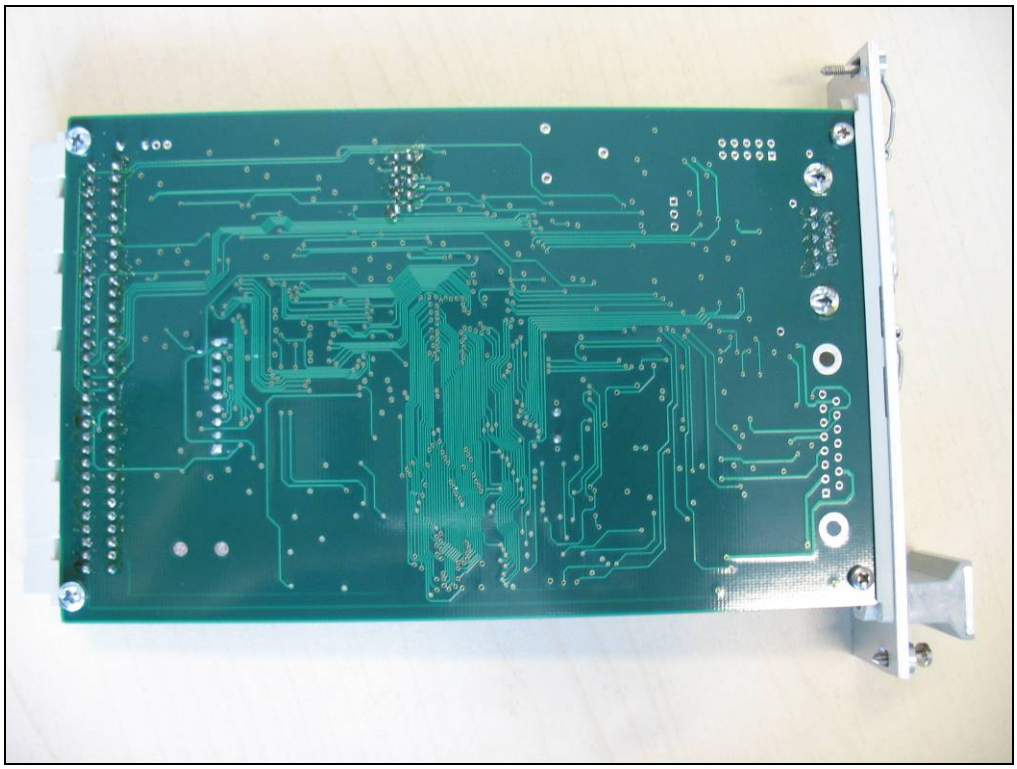


Photo 23:



Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2011-10-13

Annex E Further information

Glossary

AVG - Average
DUT - Device under test
EMC - Electromagnetic Compatibility
EN - European Standard
EUT - Equipment under test
ETSI - European Telecommunications Standard Institute
FCC - Federal Communication Commission
FCC ID - Company Identifier at FCC
HW - Hardware
IC - Industry Canada
Inv. No. - Inventory number
N/A - Not applicable
PP - Positive peak
QP - Quasi peak
S/N - Serial number
SW - Software

Annex F Accreditation Certificate

DAkkS
Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH
German Accreditation Body

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

Accreditation

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

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10
66117 Saarbrücken

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

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

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

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

Frankfurt am Main, 13.04.2011

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

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

See notes overleaf

Front side of the certificate

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Office Braunschweig
Bundesallee 100
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

Back side of the certificate

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

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