**CETECOM™****CETECOM ICT Services**
consulting - testing - certification >>>

TEST REPORT

Test report no.: 1-7882/14-01-03

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

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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 Communications & EMC (RCE)

Applicant

KROHNE Messtechnik GmbH

Ludwig-Krohne-Str. 5

47058 Duisburg / GERMANY

Phone: +49 234 588 80-155

Fax: +49 234 588 80-101

Contact: Thomas Convent

e-mail: t.convent@krohne.com

Phone: +49 234 588 80-155

Manufacturer

KROHNE SAS

2 allée des Ors – BP98

26103 Romans / FRANCE

Test standard/s

47 CFR Part 15

Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

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

Test Item

Kind of test item: Tank level probing radar**Model name:** OPTIWAVE 1010**FCC ID:** Q6BFMCW06G10

Frequency: 5.7 GHz – 6.7 GHz

Antenna: no antenna

Power supply: 14.5 – 30V DC

Temperature range: -40°C to +80°C

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:

Meheza Walla
Specialist

Test performed:

Karsten Gerald
Professional

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2 General information

2.1 Notes and disclaimer

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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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:	2014-04-14
Date of receipt of test item:	2014-05-05
Start of test:	2014-05-05
End of test:	2014-05-07
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	01.10.2013	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

4 Test laboratories sub-contracted

None

5 Test environment

Temperature:	T _{nom}	+22 °C during room temperature tests
	T _{max}	-/-
	T _{min}	-/-
Relative humidity content:		45 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V _{nom}	24.0 V DC
	V _{max}	-/-
	V _{min}	-/-

6 Test item

Kind of test item	Tank level probing radar
Type identification	OPTIWAVE 1010
S/N serial number	011128134 (FMCW/sweep mode) 011128136 (low/mid/high stopped mode)
HW hardware status	4000702401 E-mod
SW software status	OPTIWAVE1010_Sensor_MSP430_V8.00PRE03 V8.00PRE02_CW5,7.txt V8.00PRE02_CW6,2.txt V8.00PRE02_CW6,7.txt
Frequency band	5.7 GHz – 6.7 GHz
Type of modulation	FMCW
Number of channels	1
Antenna	no antenna, installation on waveguide / bypass tube
Power supply	14.5 - 30 V DC, < 22 mA
Temperature range	-40°C to +80°C

6.1 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup- and EUT-photos are included in test report:

- 1-7882/14-01-03_AnnexA
- 1-7882/14-01-03_AnnexB
- 1-7882/14-01-03_AnnexC

EUT-description:

Based on the original SW version *OPTIWAVE1010_Sensor_MSP430_V8.00PRE03* a special software version (*OPTIWAVE1010_Sensor_MSP430_V8.00PRE01_R&TTE_ramping_120ms*) was prepared with faster repetition time (120ms instead of 500 ms) for testing purpose only.

Furthermore another test sample with special test software was used for transmitting in CW-stopped mode at low/mid/high frequency: V8.00PRE02_CW5,7.txt; V8.00PRE02_CW6,2.txt and V8.00PRE02_CW6,7.txt.

Application:

The Tank Level Probing Radar OPTIWAVE 1010 is intended to measure the level of liquids contained in the bypass.

The OPTIWAVE 1010 is always installed at the top of a bypass. The bypass connected to the tank is a completely shielded system for RF so that spurious radiation is minimized.

The device is able to work with different diameters of the bypass in the range of 40 to 80 mm.

The device is always mounted on a shielded flange which adapt to the bypass.

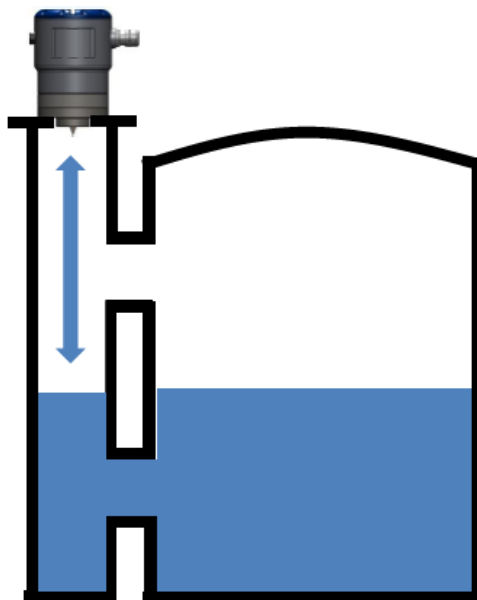
The device is pointing in a downward direction transmitting the microwave energy down to the surface of the product where it is reflected back to the device in order to calculate the distance between top of the bypass and the product surface.

Antenna construction:

The OPTIWAVE 1010 uses an integral antenna which makes the adaptation from PCB to the bypass tube. The bypass tube behaves as a wave guide. As the antenna is not intended to radiate into free space, there is no antenna radiation pattern available.

In fact the antenna is just a matching element between PCB and the bypass as wave guide. The device will not work without the bypass tube. "Antenna gain" is therefore set to 0 dBi.

In order to react on different application scenarios in chemical industries the flange part (outer geometry) can be exchanged and adapted to special purposes.

Exemplary installation:

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	47 CFR Part 15	Passed	2014-09-30	-/-

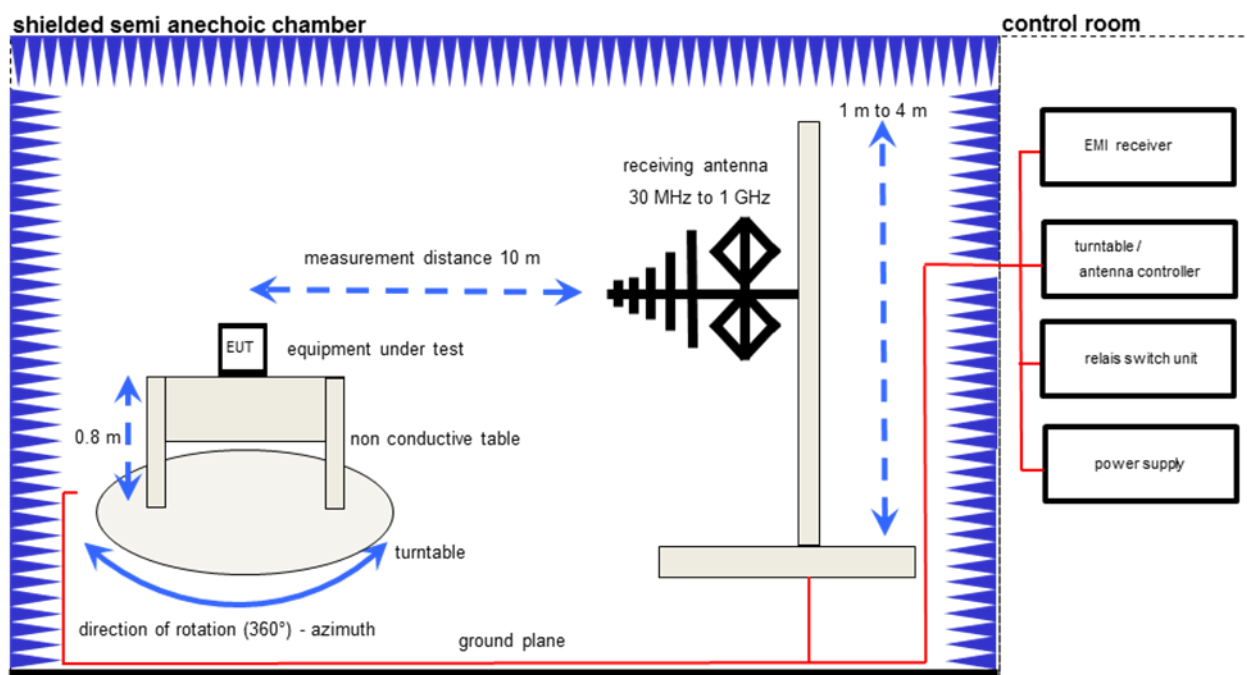
Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Pass	Fail	NA	NP	Results
§ 15.35 (c)	Timing of the transmitter	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.209	Bandwidth of the carrier	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.209	Fieldstrength of fundamental	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.209	Fieldstrength of spurious emissions	Nominal	Nominal	☒	☐	☐	☐	complies
§ 15.109	Receiver spurious emissions	Nominal	Nominal	☐	☐	☒	☐	-NA-
§ 15.107 § 15.207	Conducted limits	Nominal	Nominal	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

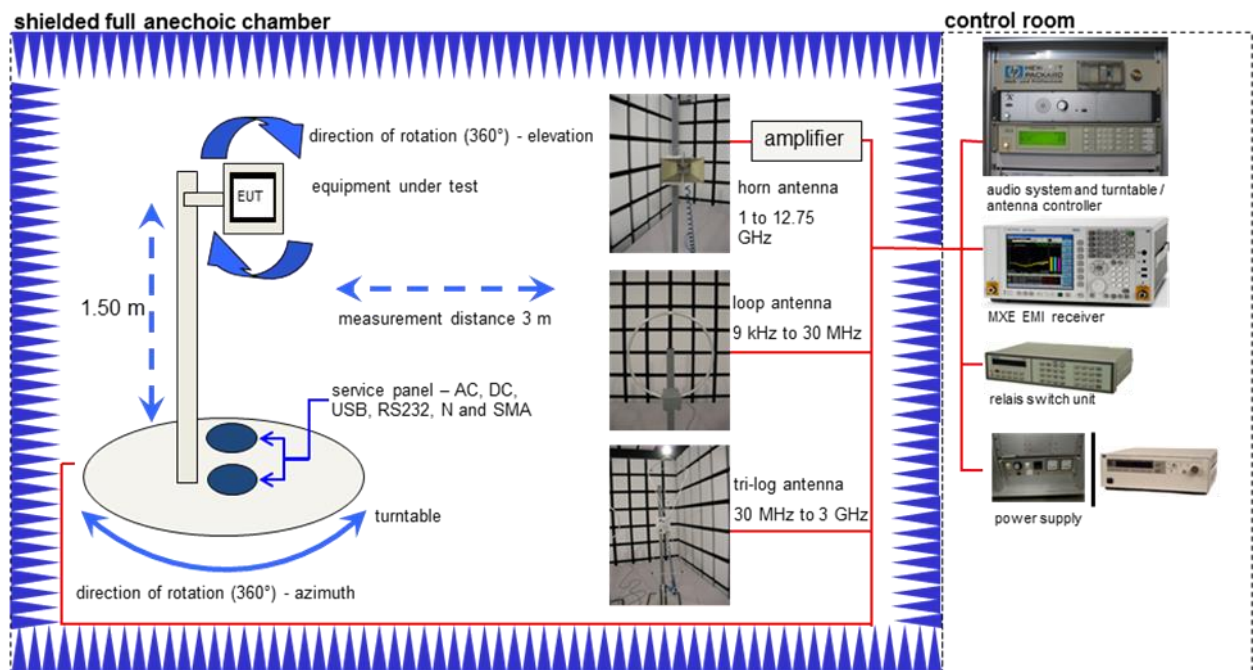
8 Description of the test setup

8.1 Radiated measurements chamber F

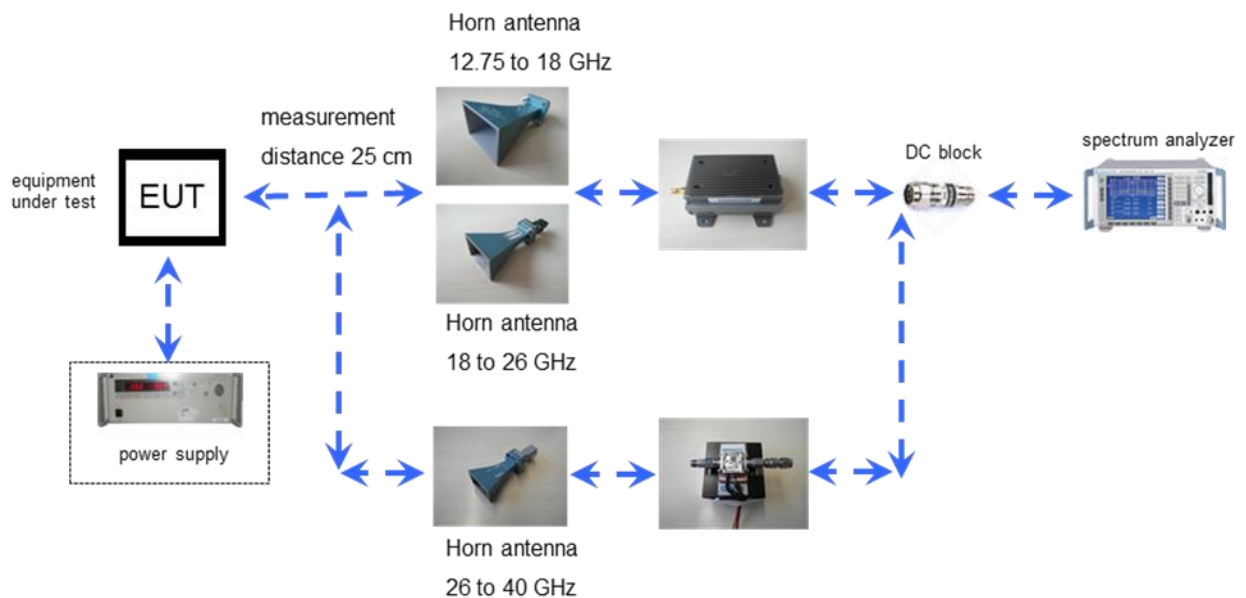
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63. 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.



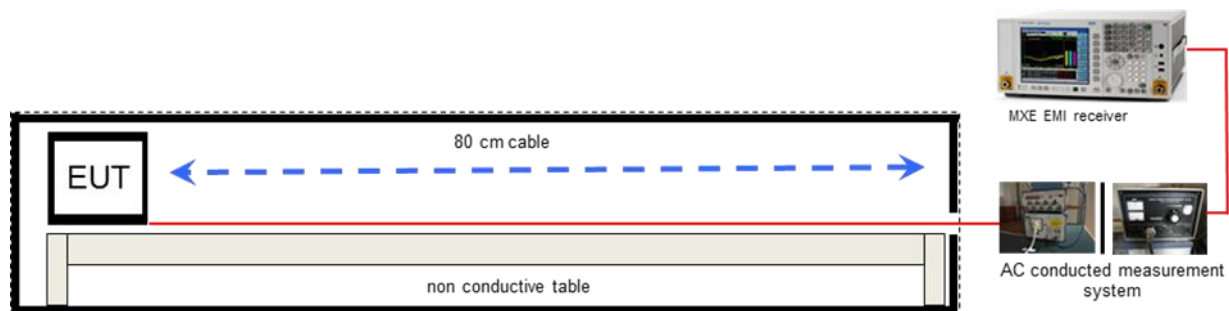
8.2 Radiated measurements chamber C



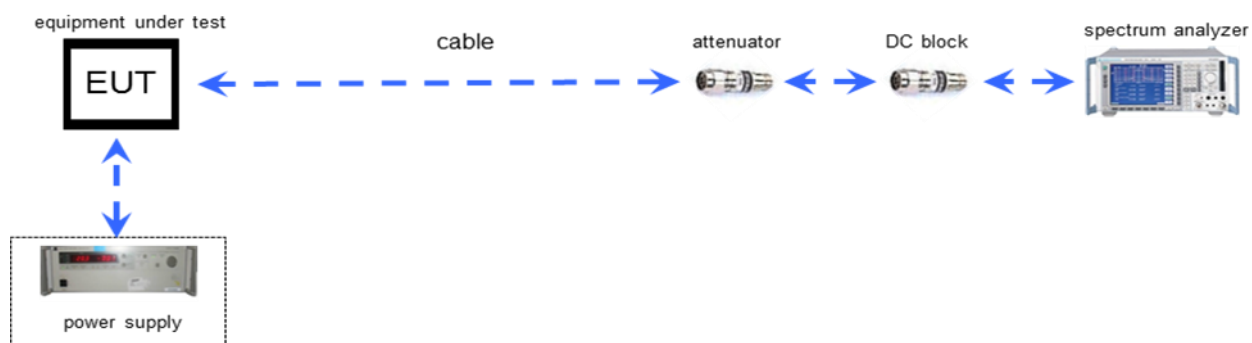
8.3 Radiated measurements 12.75 GHz to 40 GHz



8.4 AC conducted



8.5 Conducted measurements



9 Measurement results

9.1 Timing of the transmitter

Measurement:

Measurement parameter	
Detector:	Pos-Peak / RMS
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max Hold

Limits:

FCC
Timing of the transmitter
(c) Unless otherwise specified, e.g., §§15.255(b), and 15.256(l)(5), 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.

Note:

There are two different aspects which will affect the peak-to-average ratio or RMS measurement level at all:

- Duty cycle of the device
- Frequency domain mitigation due to FMCW-modulation

In normal use the EUT uses FMCW with a positive ramp over approx. 1 GHz within approx. 20 ms.

The total DUT cycle is 500 ms. Therefore the blanking period between the emissions is approx. 480 ms.

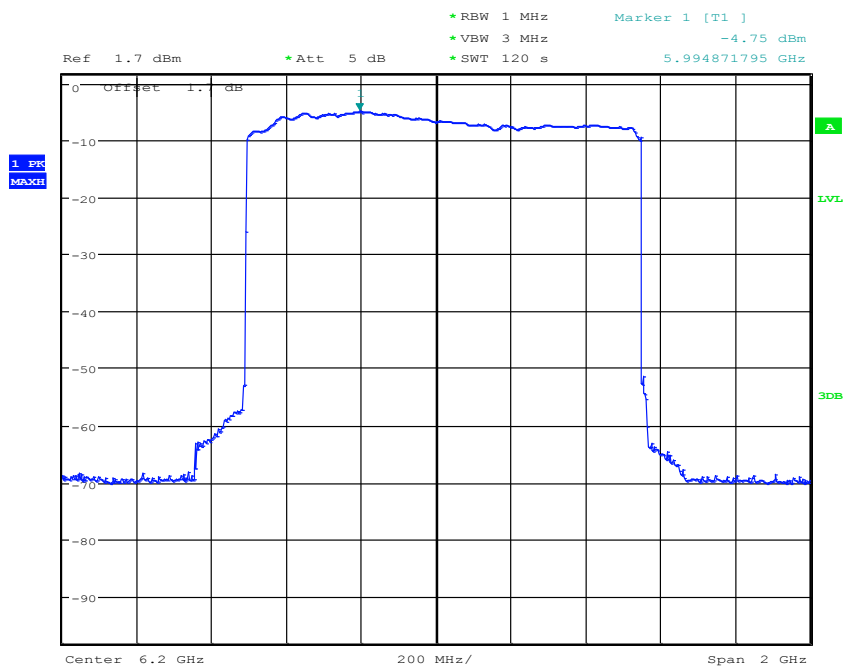
In theory, this will lead to:

- Duty cycle of 4% (± 14 dB)
- Frequency domain mitigation of 1 GHz / 1 MHz resolution bandwidth (± 30 dB)

The special test devices was prepared as described under 6.1 Additional information which will lead to a duty cycle of 16.7% and to a total peak-to-average ratio of approx. 37 dB.

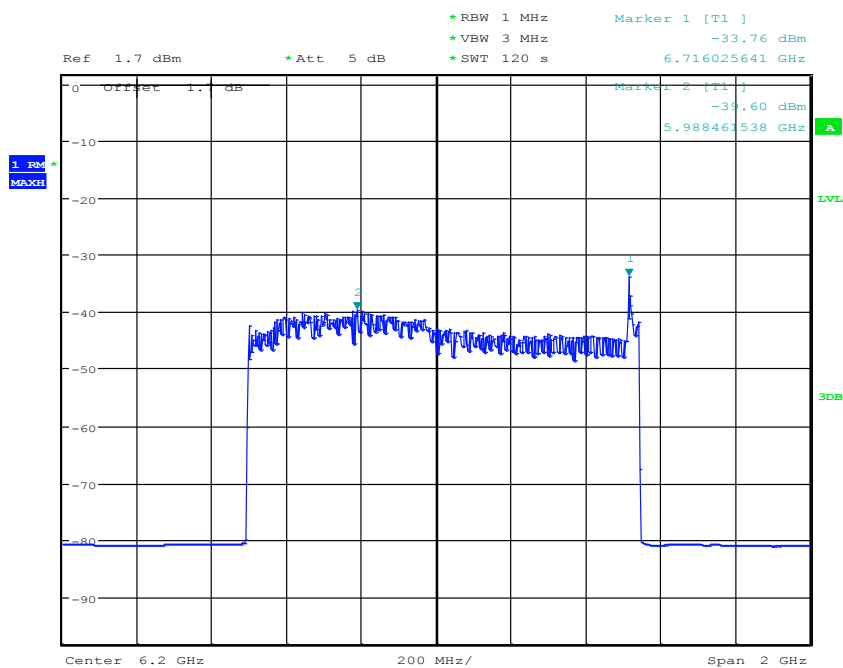
Result: The measurement is passed.

Plot 1: Pos-Peak measurement



Date: 5.MAY.2014 10:32:32

Plot 2: RMS-measurement (test mode)



Date: 5.MAY.2014 11:21:21

9.2 Bandwidth of the carrier

Measurement:

Measurement parameter	
Detector:	Pos-Peak
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max Hold

Limits:

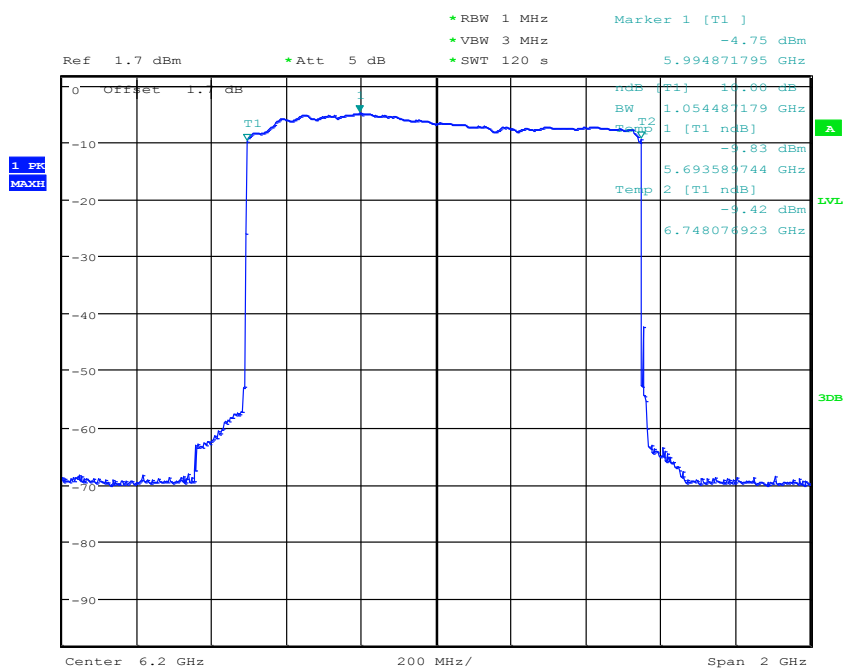
FCC
Bandwidth of the carrier

Result:

	Bandwidth of the carrier (MHz)			
	normal mode	f_{low}	f_{mid}	f_{high}
10 dB bw	1054	10.18	8.33	2.96

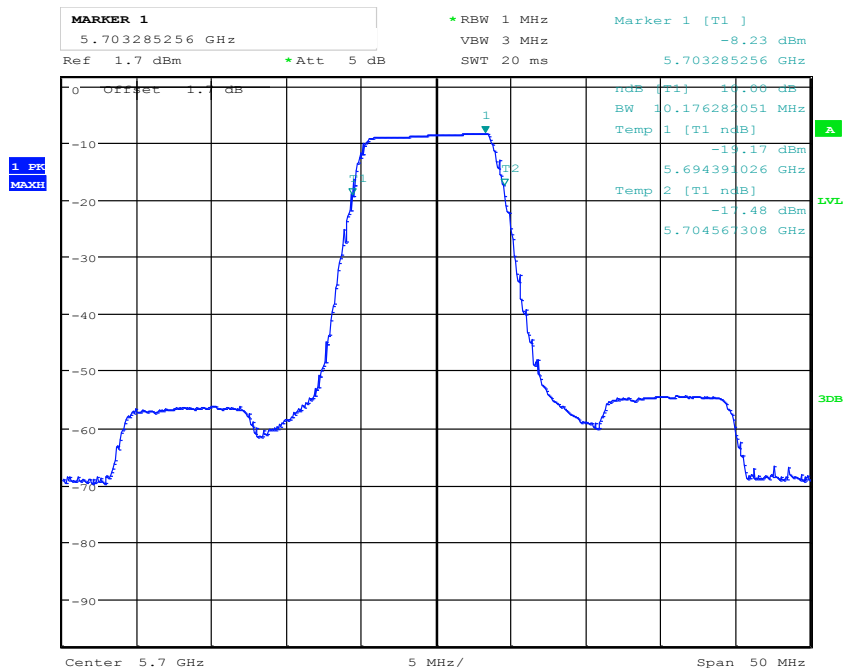
Result: The measurement is passed.

Plot 3: normal mode



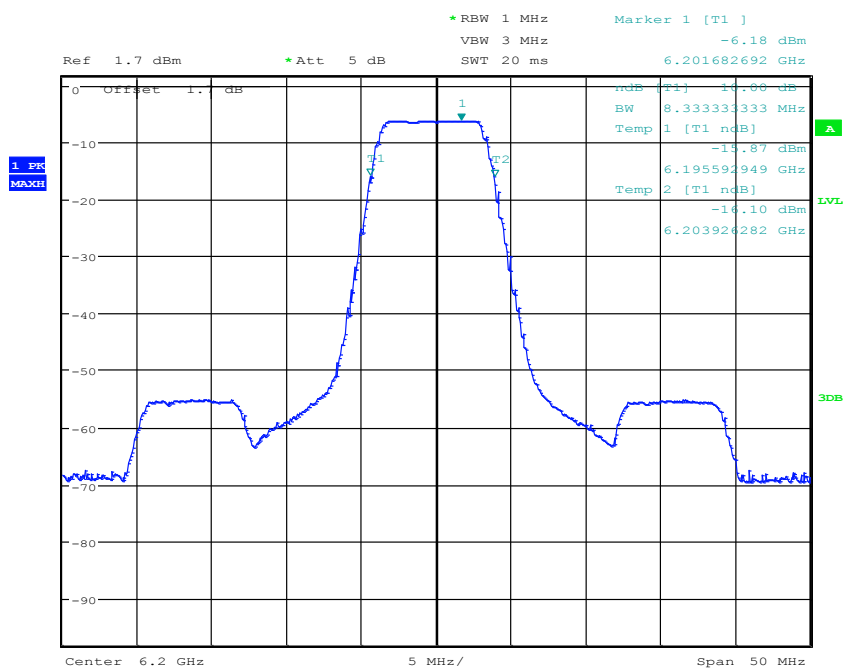
Date: 5.MAY.2014 10:33:52

Plot 4: f_{low}



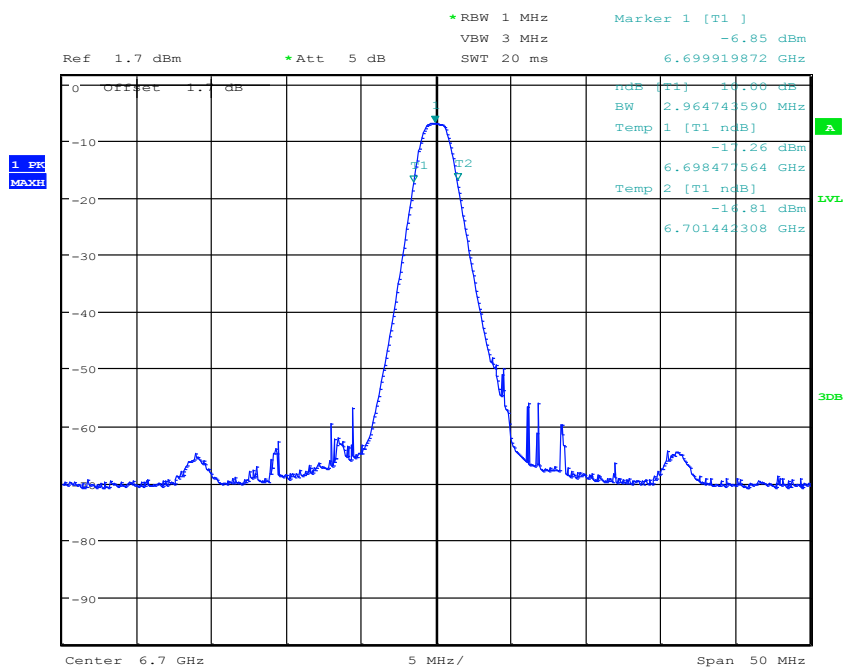
Date: 5.MAY.2014 11:49:34

Plot 5: f_{mid}



Date: 5.MAY.2014 11:43:32

Plot 6: f_{high}



Date: 5.MAY.2014 11:53:54

9.3 Field strength of the fundamental

Measurement:

Measurement parameter	
Detector:	Average (RMS)
Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max Hold

Limits:

FCC		
Fundamental Frequency (GHz)	Field strength of Fundamental	Measurement distance (m)
5.6 – 6.8	500µV/m // 54 dBµV/m	3

Result:

TEST CONDITIONS		MAXIMUM FIELD STRENGTH (dBµV/m)			
Mode		normal mode	f _{low}	f _{mid}	f _{high}
T _{nom}	V _{nom}	28.8	56.4	60.1	58.1
Measurement uncertainty		±3dB			

Note:

Peak-to-average ration as show on page 10 needs to be considered on f_{low}, f_{mid} and f_{high} values!

Result: The measurement is passed.

9.4 Field strength of spurious emissions

Measurement:

Measurement parameter	
Detector:	Quasi Peak / Average (RMS)
Sweep time:	Auto
Resolution bandwidth:	100 kHz / 1 MHz
Video bandwidth:	> resbw
Trace-Mode:	Max-Hold

Limits:

FCC		
Field strength of the harmonics and spurious.		
Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Measurement distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30 (29.5 dB $\mu\text{V/m}$)	30
30 – 88	100 (40 dB $\mu\text{V/m}$)	3
88 – 216	150 (43.5 dB $\mu\text{V/m}$)	3
216 – 960	200 (46 dB $\mu\text{V/m}$)	3
>960	500 (54 dB $\mu\text{V/m}$)	3

Result:

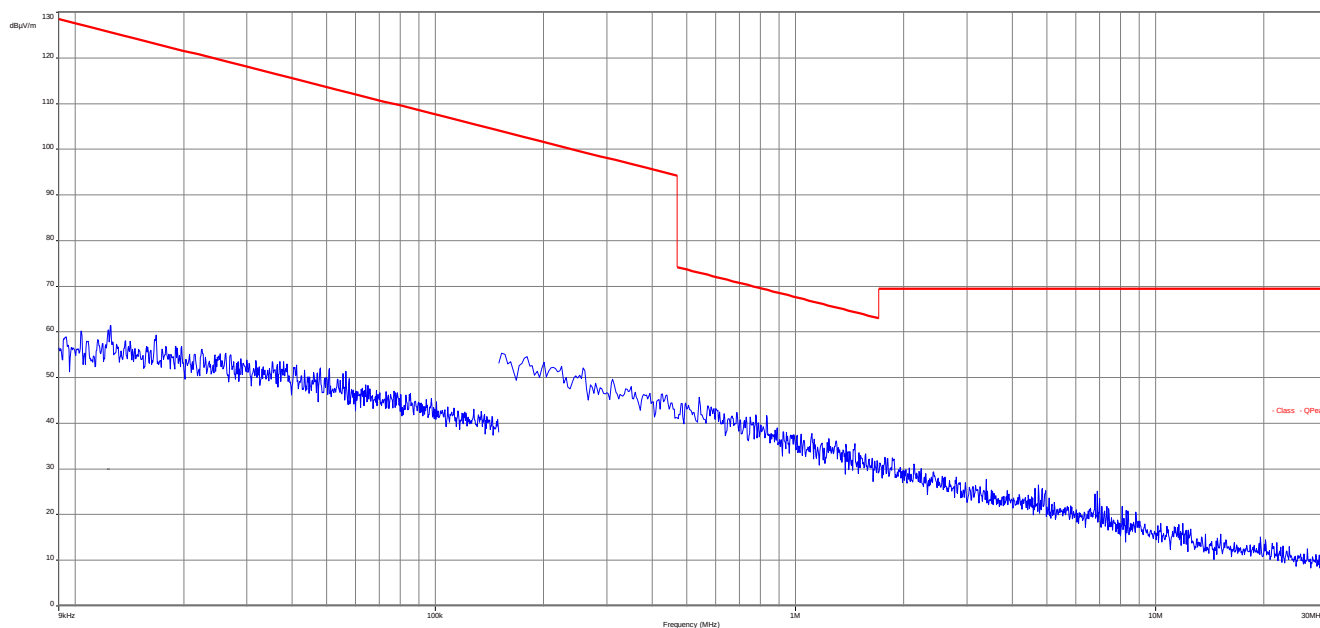
EMISSION LIMITATIONS				
f [GHz]	Detector used	Limit max. allowed [dB $\mu\text{V/m}$]	Amplitude of emission [dB $\mu\text{V/m}$]	Results
2 nd harm.	Peak	54.0	56.8	pass
3 rd harm.	Peak	54.0	51.0	pass
4 th harm.	Peak	54.0	44.6	pass
5 th harm.	Peak	54.0	44.9	pass

Note:

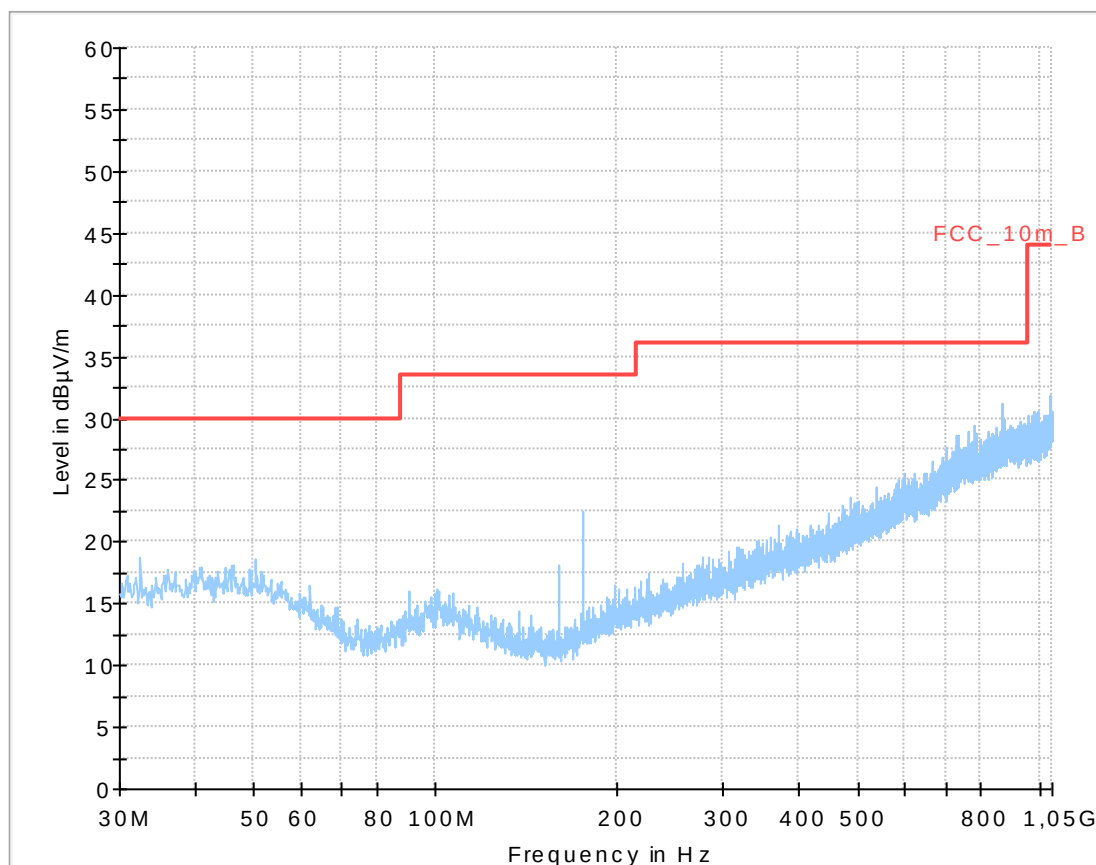
Peak-to-average ration as show on page 10 needs to be considered on measurement values!

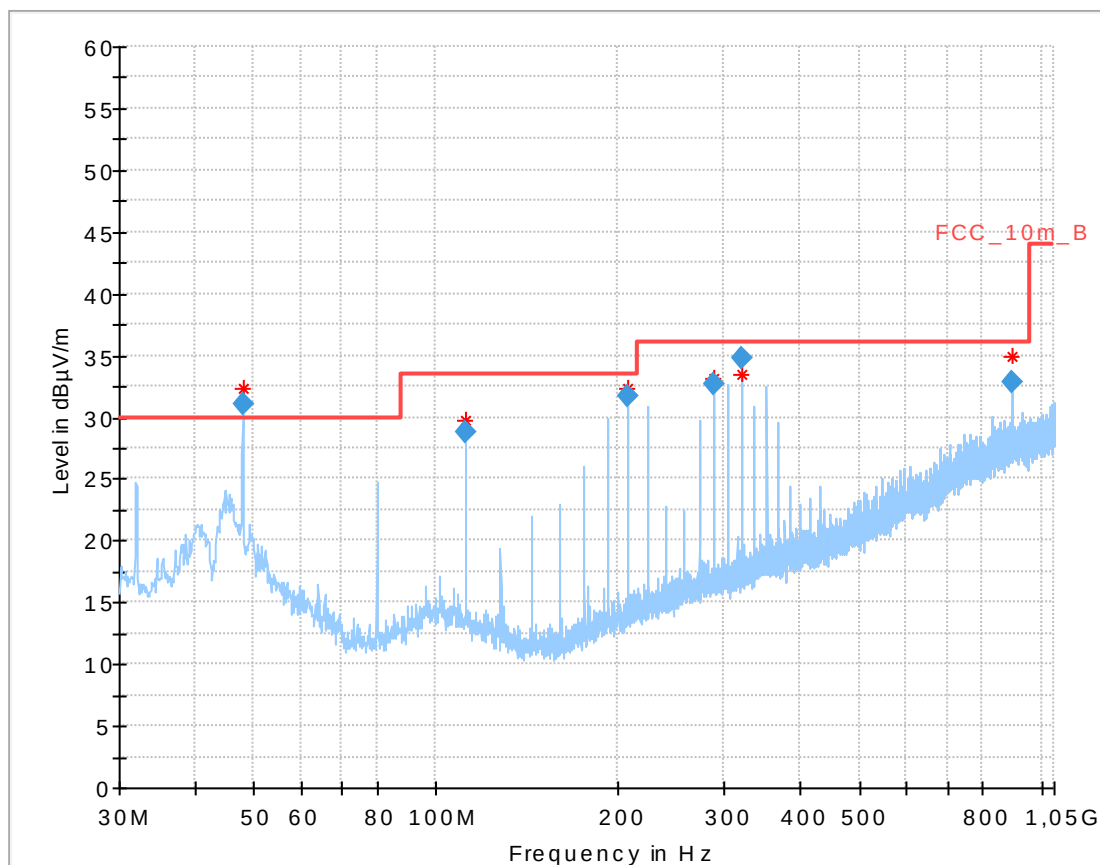
Result: The measurement is passed.

Plot 7: 9 kHz – 30 MHz, f_{mid}



Plot 8: 30 MHz – 1000 MHz, normal mode



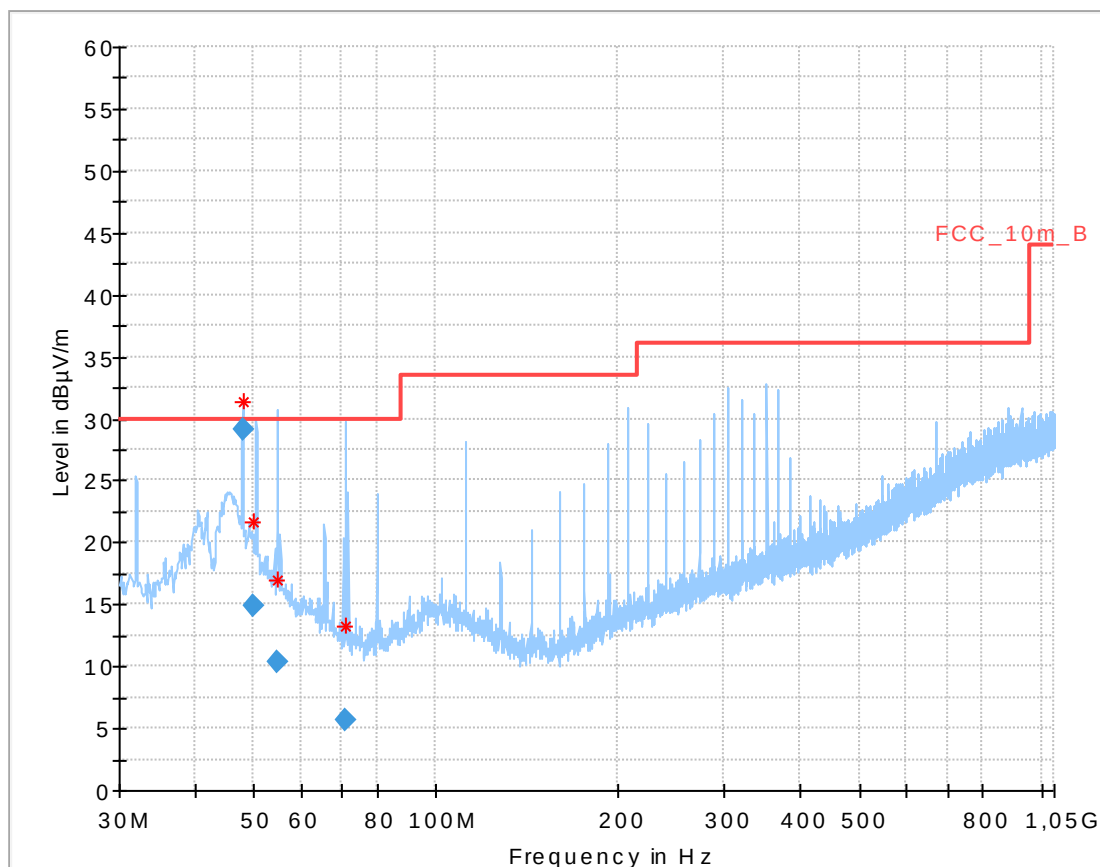
Plot 9: 30 MHz – 1000 MHz, f_{low} 

Final Result:

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
47.999850	31.07	30.00	-1.07	1000.0	120.000	100.0	V	105.0	13.3
111.992250	28.86	33.50	4.64	1000.0	120.000	121.0	V	239.0	10.9
208.002600	31.77	33.50	1.73	1000.0	120.000	100.0	V	200.0	12.0
288.009300	32.64	36.00	3.36	1000.0	120.000	108.0	V	175.0	14.2
320.002200	34.70	36.00	1.30	1000.0	120.000	237.0	H	-16.0	15.2
897.357150	32.79	36.00	3.21	1000.0	120.000	200.0	V	272.0	25.2

Note:

Peak-to-average ratio as show on page 10 needs to be considered on measurement values!

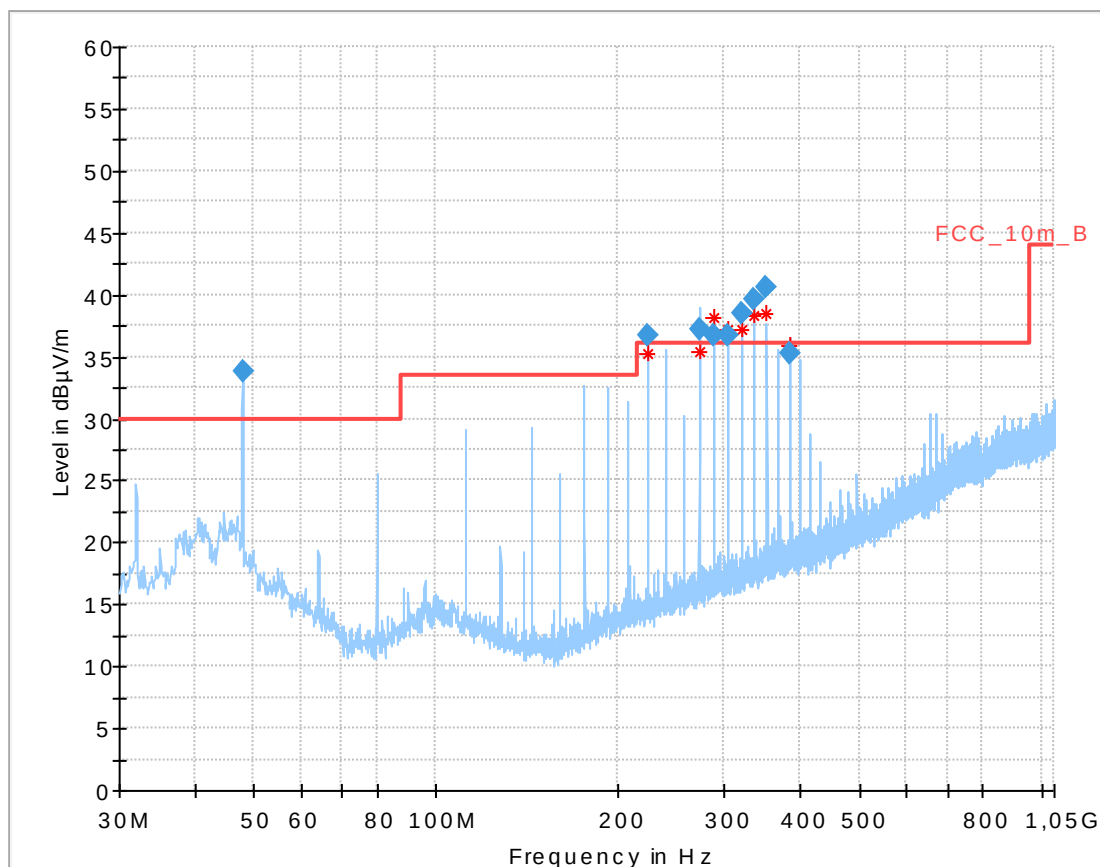
Plot 10: 30 MHz – 1000 MHz, f_{mid} 

Final Result:

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
48.003150	29.16	30.00	0.84	1000.0	120.000	163.0	V	114.0	13.3
50.082750	14.95	30.00	15.05	1000.0	120.000	107.0	V	56.0	13.4
54.541500	10.30	30.00	19.70	1000.0	120.000	125.0	V	104.0	12.9
70.929900	5.69	30.00	24.31	1000.0	120.000	140.0	V	265.0	9.3

Note:

Peak-to-average ration as show on page 10 needs to be considered on measurement values!

Plot 11: 30 MHz – 1000 MHz, f_{high} 

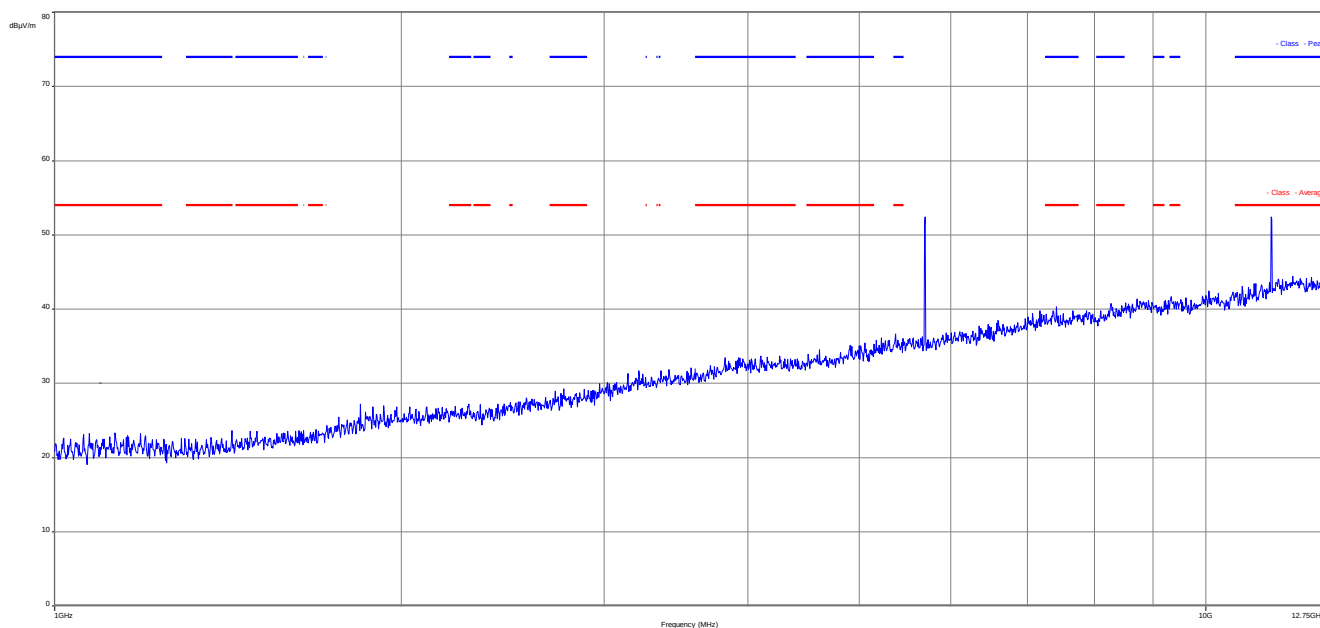
Final Result:

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
47.996700	33.79	30.00	-3.79	1000.0	120.000	100.0	V	-13.0	13.3
224.006550	36.79	36.00	-0.79	1000.0	120.000	200.0	V	59.0	12.5
271.995000	37.22	36.00	-1.22	1000.0	120.000	300.0	H	305.0	13.9
288.002850	36.64	36.00	-0.64	1000.0	120.000	271.0	H	308.0	14.2
303.997050	36.74	36.00	-0.74	1000.0	120.000	284.0	H	302.0	14.6
320.011350	38.42	36.00	-2.42	1000.0	120.000	296.0	H	302.0	15.2
336.004200	39.58	36.00	-3.58	1000.0	120.000	274.0	H	295.0	15.6
351.998100	40.58	36.00	-4.58	1000.0	120.000	207.0	H	331.0	16.1
383.998500	35.31	36.00	0.69	1000.0	120.000	236.0	H	271.0	16.6

Note:

Peak-to-average ration as show on page 10 needs to be considered on measurement values!

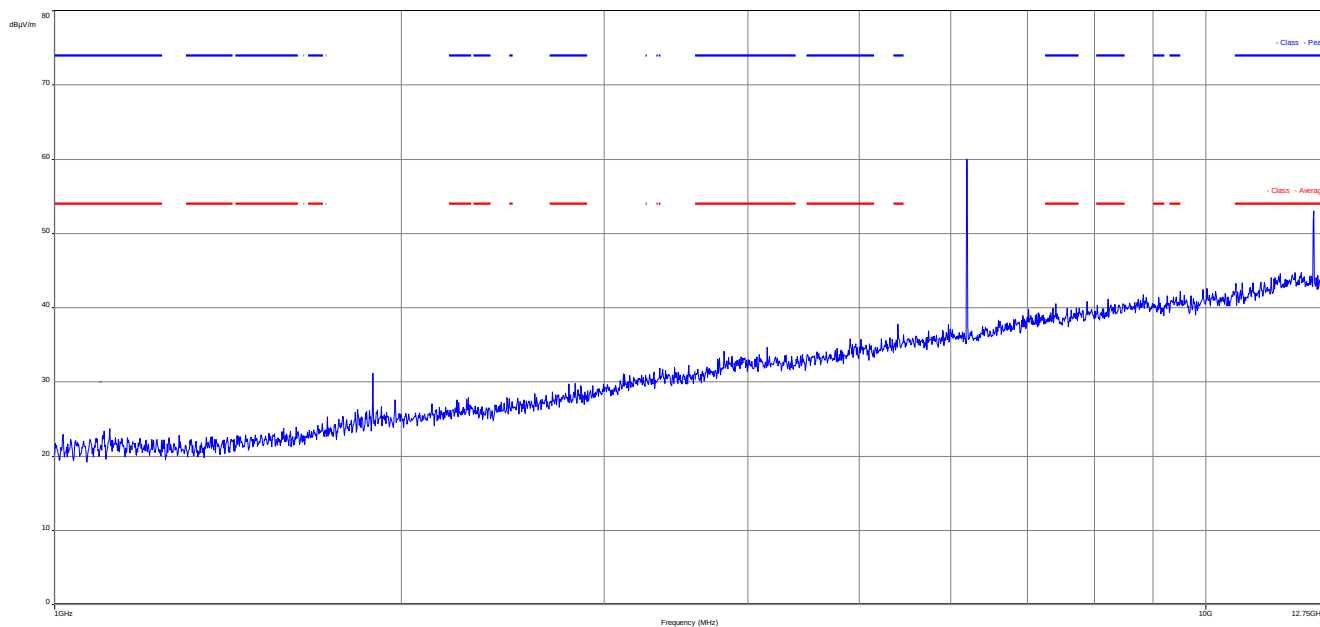
Plot 12: 1 GHz – 12.75 GHz, f_{low}



Note:

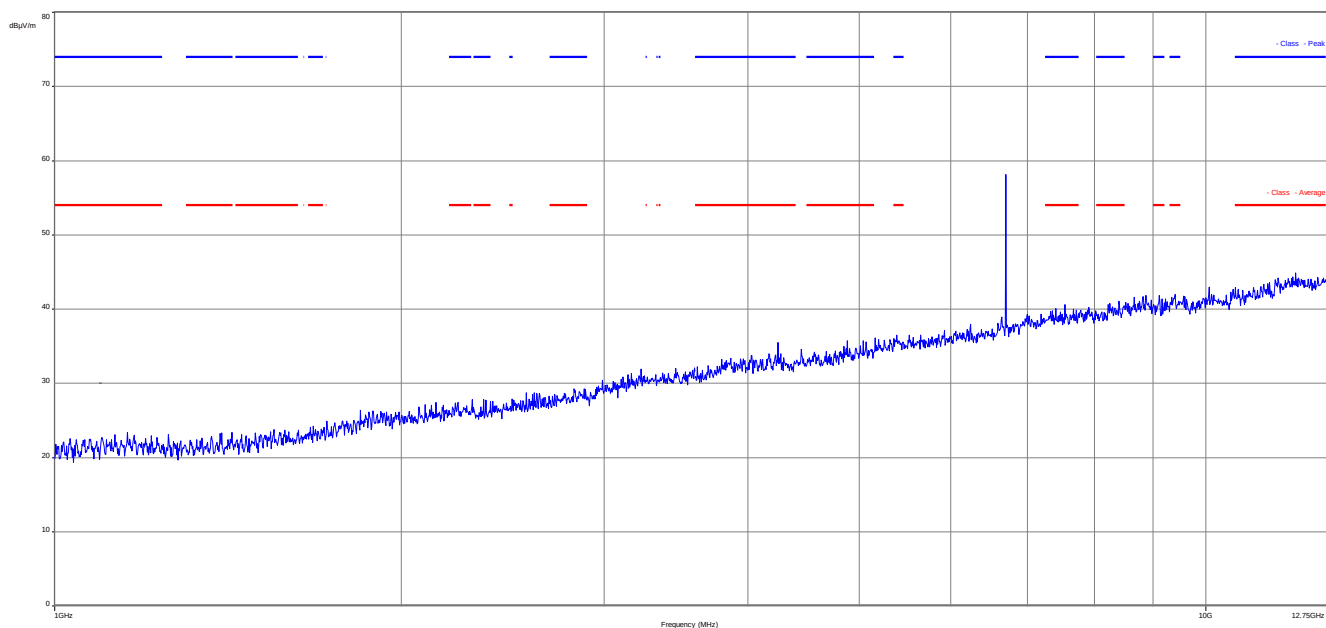
Peak-to-average ratio as show on page 10 needs to be considered on measurement values!

Plot 13: 1 GHz – 12.75 GHz, f_{mid}

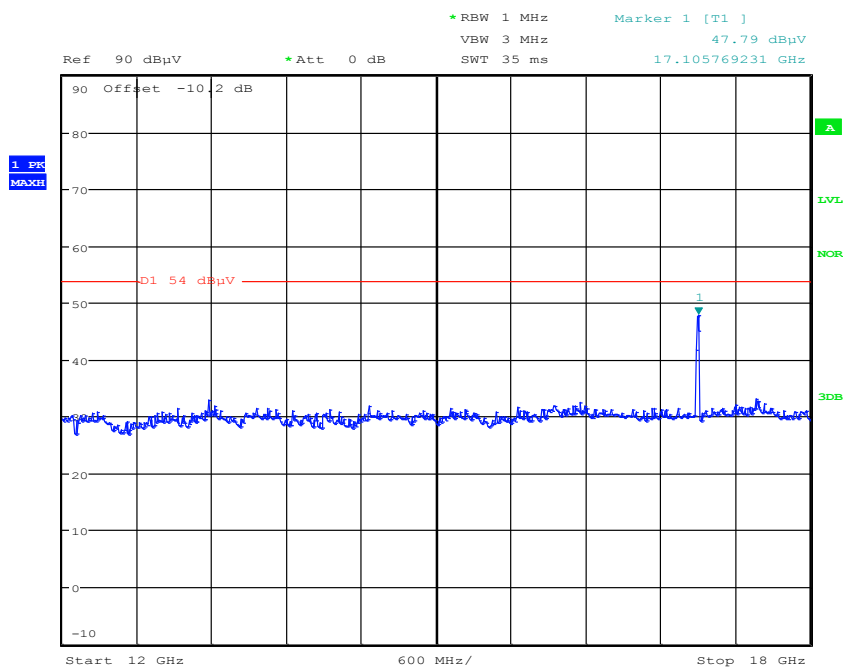


Note:

Peak-to-average ratio as show on page 10 needs to be considered on measurement values!

Plot 14: 1 GHz – 12.75 GHz, Pos-Peak measurement, f_{high} **Note:**

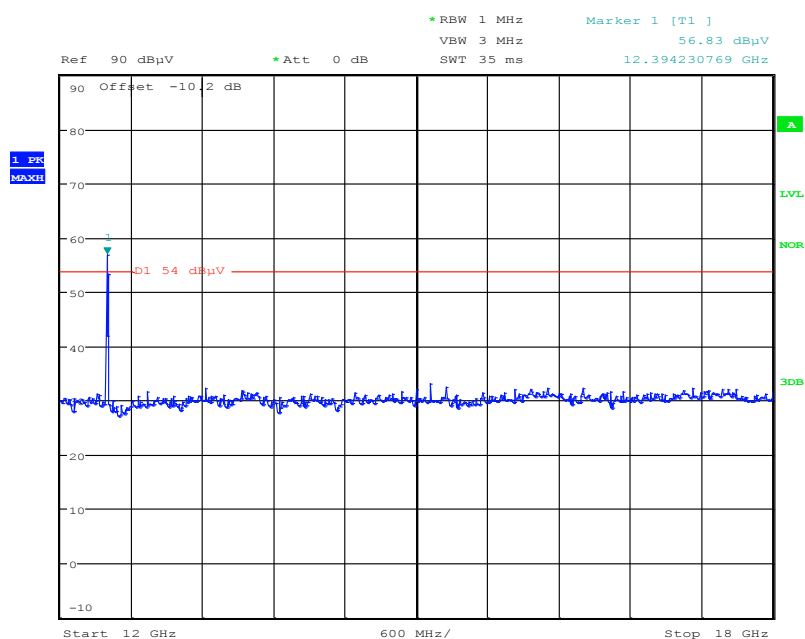
Peak-to-average ratio as show on page 10 needs to be considered on measurement values!

Plot 15: 12 GHz – 18 GHz, f_{low} 

Date: 5.MAY.2014 14:01:35

Note: Peak-to-average ratio as show on page 10 needs to be considered on measurement values!

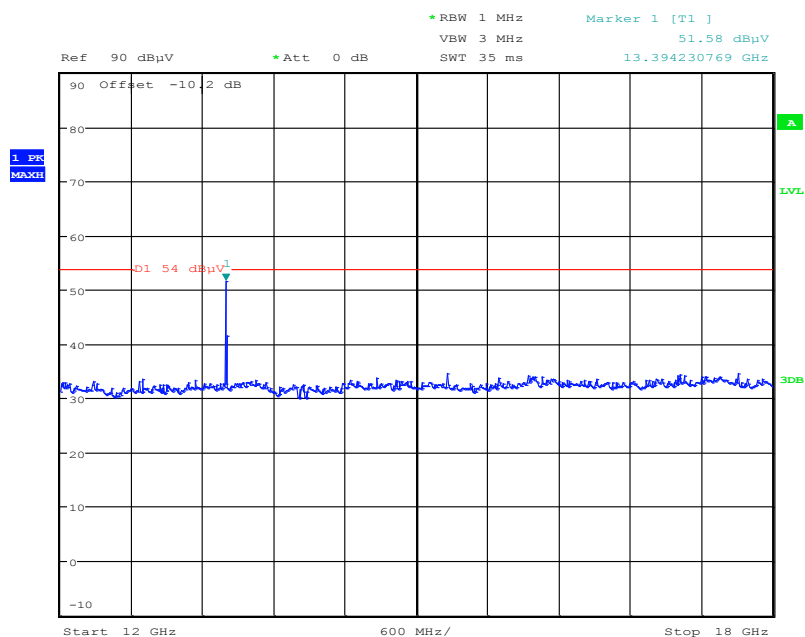
Plot 16: 12 GHz – 18 GHz, f_{mid}



Date: 5.MAY.2014 13:49:26

Note: Peak-to-average ration as show on page 10 needs to be considered on measurement values!

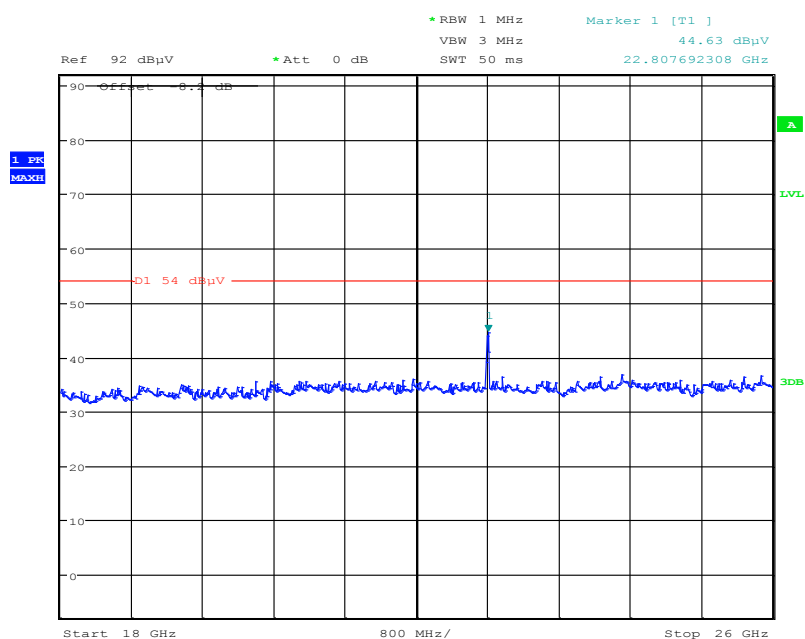
Plot 17: 12 GHz – 18 GHz, f_{high}



Date: 5.MAY.2014 13:22:45

Note: Peak-to-average ration as show on page 10 needs to be considered on measurement values!

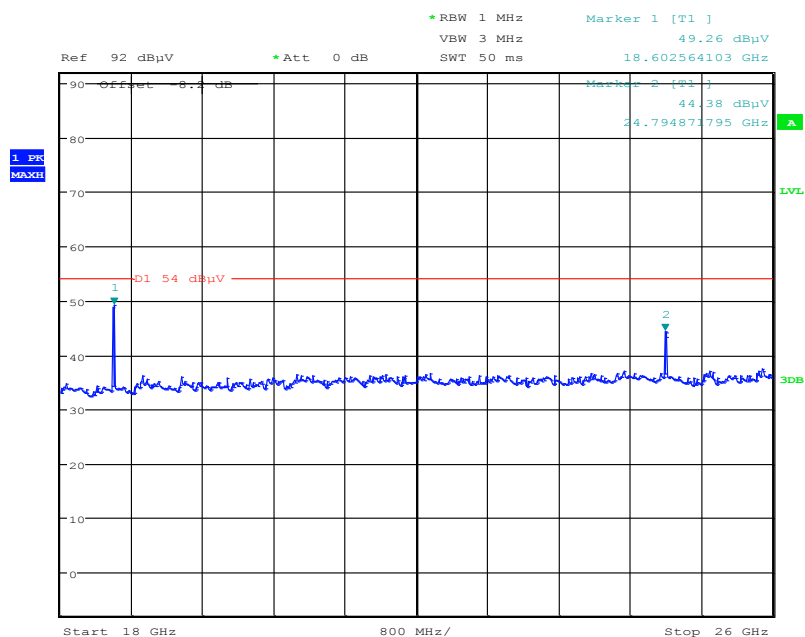
Plot 18: 18 GHz – 26 GHz, f_{low}



Date: 5.MAY.2014 14:20:22

Note: Peak-to-average ration as show on page 10 needs to be considered on measurement values!

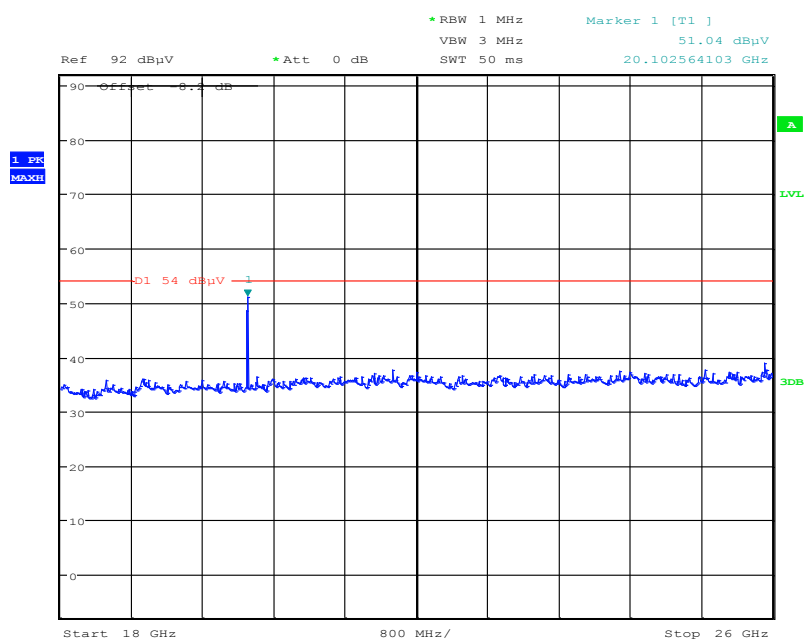
Plot 19: 18 GHz – 26 GHz, f_{mid}



Date: 5.MAY.2014 13:47:27

Note: Peak-to-average ration as show on page 10 needs to be considered on measurement values!

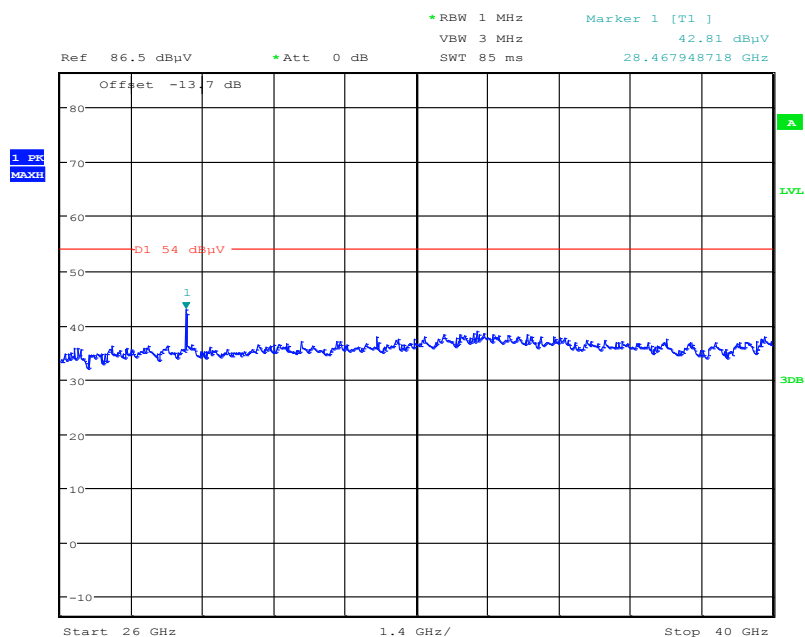
Plot 20: 18 GHz – 26 GHz, f_{high}



Date: 5.MAY.2014 13:28:43

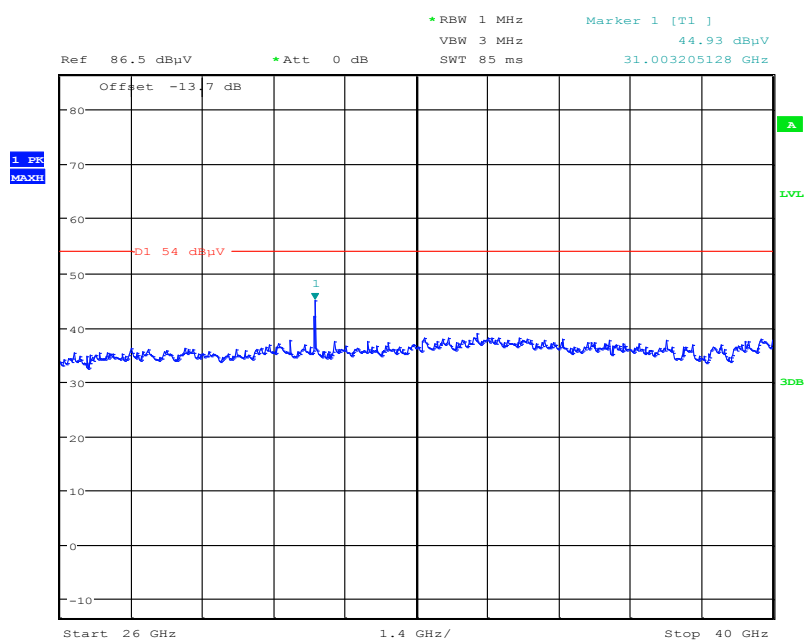
Note: Peak-to-average ration as show on page 10 needs to be considered on measurement values!

Plot 21: 26 GHz – 40 GHz, f_{low}



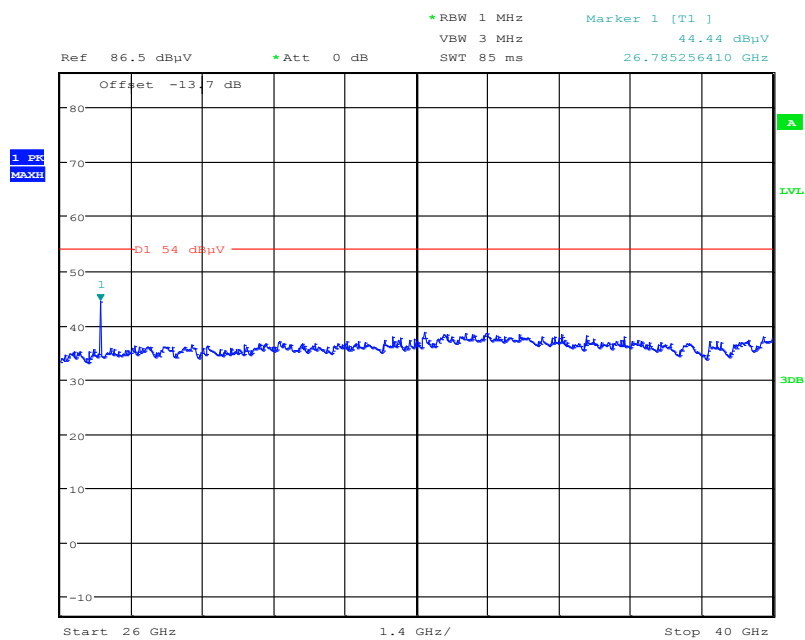
Date: 5.MAY.2014 14:23:48

Note: Peak-to-average ration as show on page 10 needs to be considered on measurement values!

Plot 22: 26 GHz – 40 GHz, f_{mid} 

Date: 5.MAY.2014 13:42:31

Note: Peak-to-average ration as show on page 10 needs to be considered on measurement values!

Plot 23: 26 GHz – 40 GHz, f_{high} 

Date: 5.MAY.2014 13:37:15

Note: Peak-to-average ration as show on page 10 needs to be considered on measurement values!

9.5 Conducted limits

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. Both power lines, phase and neutral line, are measured. Found peaks are re-measured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Resolution bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Video bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

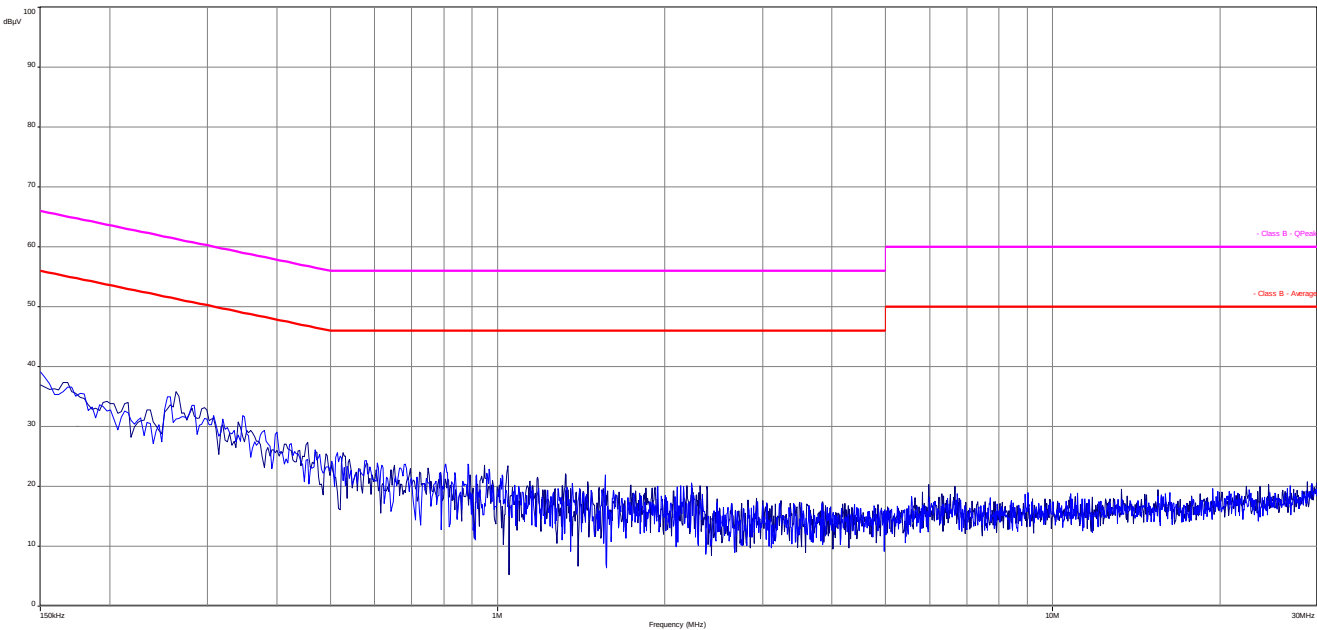
Limits:

FCC		
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

Plot 24:



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 (Lab/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
4	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	27.01.2014	27.01.2015
6	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	22.04.2014	22.04.2016
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	22.01.2014	22.01.2015
12	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
13	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vKII	08.05.2013	08.05.2015
14	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
15	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
16	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	30.01.2014	30.01.2016
17	9	Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erft	91350	300001155	ne		
18	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
19	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
20	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
21	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
22	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
23	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vKII	14.10.2011	14.10.2014
24	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	13.03.2014	13.03.2015
25	n. a.	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000037	300004509	ne		
26	CR 79	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751	ne		
27	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
28	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787	k	22.07.2013	22.07.2015
29	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442	k	19.07.2013	19.07.2015
30	5	DC Power Supply, 60V, 10A	6038A	HP Meßtechnik	2848A07027	300001174	Ve	05.01.2012	05.01.2015
31	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	02.07.2014	02.07.2016
32	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL18503070-XX	CERNEX	19338	300004273	ne		

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
vlk!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

11 Observations

No observations except those reported with the single test cases have been made.

Annex A Document history

Version	Applied changes	Date of release
	Initial release - DRAFT	2014-07-23
	minor changes based on manufacturer's comments	2014-09-30

Annex B 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 C Accreditation Certificate

Front side of certificate



Deutsche Akkreditierungsstelle GmbH

Befähigung gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

Drahtgebundene Kommunikation einschließlich xDSL
VoIP und DECT
Akustik
Funk einschließlich WLAN
Short Range Devices (SRD)
RFID
WiMax und Richtfunk
Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)
Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
Produktsicherheit
SAR und Hearing Aid Compatibility (HAC)
Umweltsimulation
Smart Card, Terminals
Bluetooth
Wi-Fi-Services

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 07.03.2014 mit der Akkreditierungsnummer D-PL-12076-01 und ist gültig 17.01.2018. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 77 Seiten.

Registrierungsnummer der Urkunde: D-PL-12076-01-00

Frankfurt am Main, 07.03.2014

Deutsche Akkreditierungsstelle

Im Auftrag (D-PL-12076-01) vollziehend
Akreditierungsstelle

Back side of certificate

Deutsche Akkreditierungsstelle GmbH

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IAF: www.iaf.org
ILAC: www.ilac.org

Note:

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

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