

TEST REPORT

Test report no.: 1-5753/12-01-14-A



Deutsche
 Akkreditierungsstelle
 D-PL-12076-01-00

Testing laboratory

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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-12076-01-00
 Area of Testing:
 Radio Communications & EMC (RCE)

Applicant

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 30900 Wedemark / GERMANY
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 Phone: +49 5130 600-2621

Manufacturer

Sennheiser electronic GmbH & Co. KG
 Am Labor 1
 30900 Wedemark / GERMANY

Test standard/s

47 CFR Part 15 Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
 RSS - 210 Issue 8 Spectrum Management and Telecommunications Radio Standards Specification - 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: Wireless Microphone Stationary Device
Model name: EM D1
FCC ID: DMOEM2G4WE
IC: 2099A-EM2G4WE
Frequency: DTS band 2400 MHz to 2483.5 MHz
Technology tested: Modulated carrier
Antenna: External rod. antennas
Power supply: 12.0 V DC by external AC/DC adapter
Temperature range: -10°C to +55°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:

Stefan Bös
 Radio Communications & EMC

Test performed:

Andreas Luckenbill
 Radio Communications & EMC

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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 replaces the test report with the number 1-5753/12-01-14 and dated 2014-07-10

2.2 Application details

Date of receipt of order:	2013-01-14
Date of receipt of test item:	2014-06-23
Start of test:	2014-06-23
End of test:	2014-12-12
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	-/-	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 8	01.12.2010	Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

3.1 Measurement guidance

DTS : KDB 558074	2014-06	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
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4 Test environment

Temperature:	T_{nom}	+22 °C during room temperature tests
	T_{max}	+55 °C during high temperature tests
	T_{min}	-10 °C during low temperature tests
Relative humidity content:		56 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	12.0 V DC by external AC/DC adapter
	V_{max}	14.5 V
	V_{min}	8.1 V

5 Test item

Kind of test item	:	Wireless Microphone Stationary Device
Type identification	:	EM D1
S/N serial number	:	Radiated unit: 1234100411 Conducted unit: 1234100409, 1454101539
HW hardware status	:	551079-9
SW software status	:	0.4.7
Frequency band [MHz]	:	DTS band 2400 MHz to 2483.5 MHz (lowest channel 2403 MHz, highest channel 2481 MHz)
Type of radio transmission	:	DTS
Use of frequency spectrum	:	
Type of modulation	:	GFSK
Number of channels	:	40
Antenna	:	External rod. antennas
Power supply	:	12.0 V DC by external AC/DC adapter
Temperature range	:	-10°C to +55°C

5.1 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:

- 1-5753/12-01-01_AnnexA
- 1-5753/12-01-01_AnnexB
- 1-5753/12-01-01_AnnexD

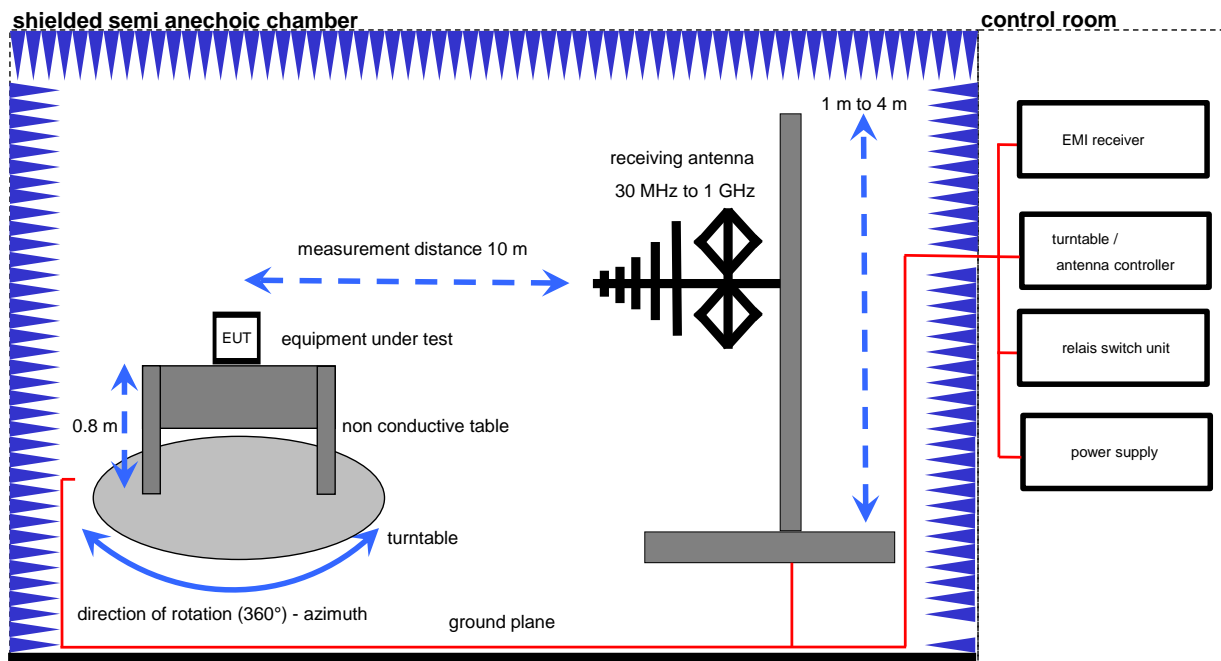
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements chamber F

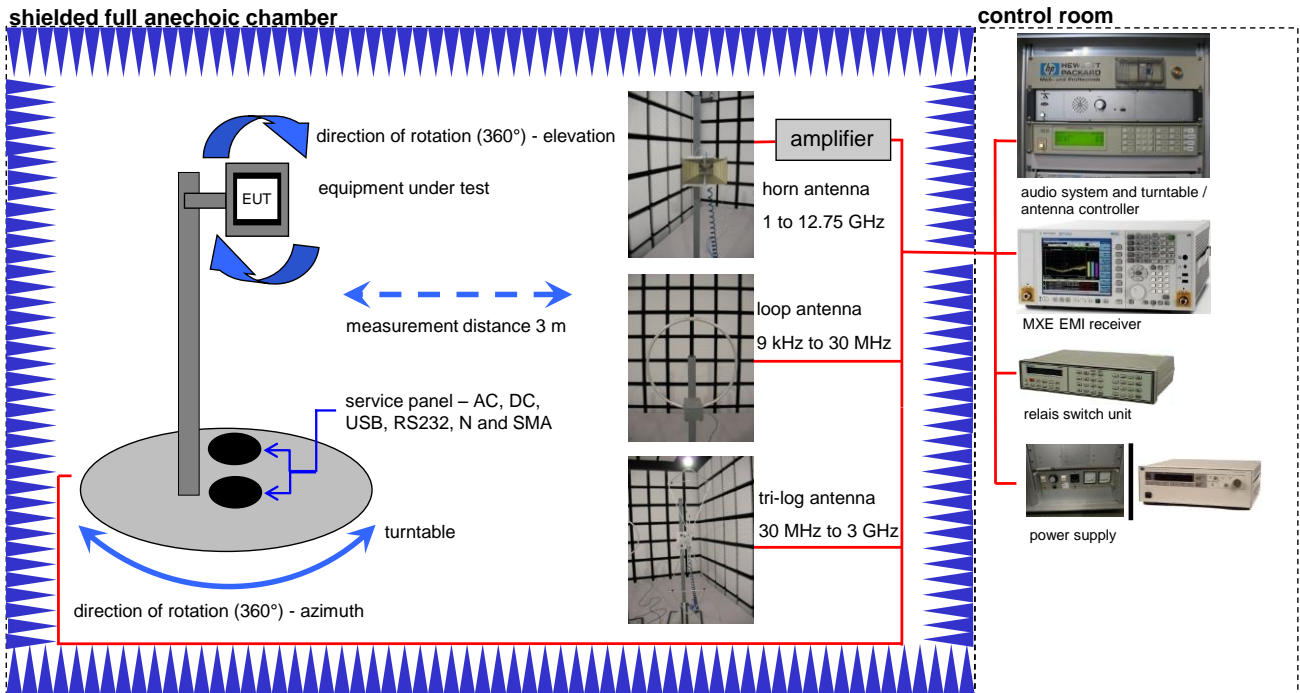
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas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



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Software	EMC32 V. 9.12.05	R&S	-/-	-/-
Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368
DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580
EMI Test Receiver	ESCI 3	R&S	100083	300003312
Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379
Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745
Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746
Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787

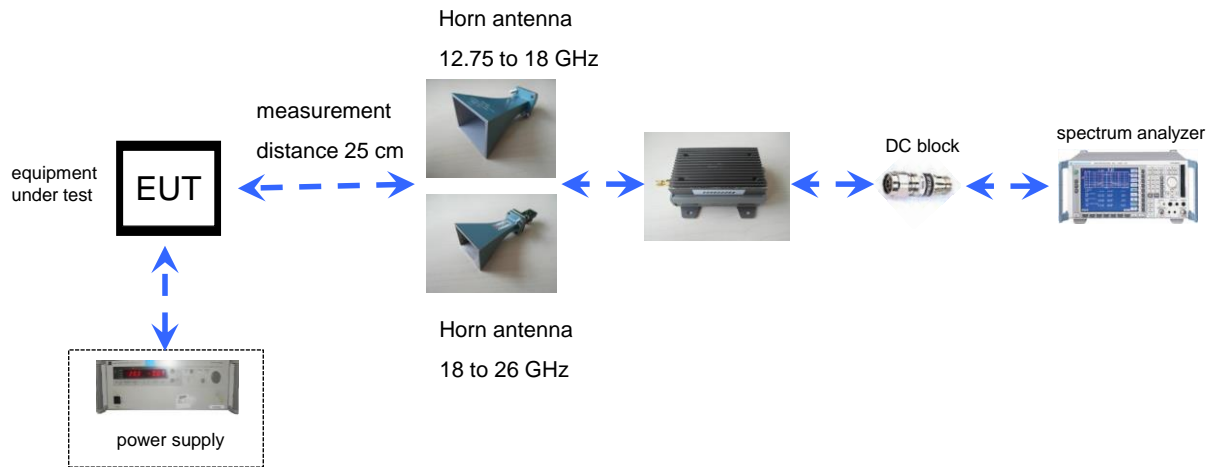
7.2 Radiated measurements chamber C



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854
Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351
Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789
Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032
Active Loop Antenna	6502	EMCO	8905-2342	300000256
Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erfi	91350	300001155
Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997
Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143

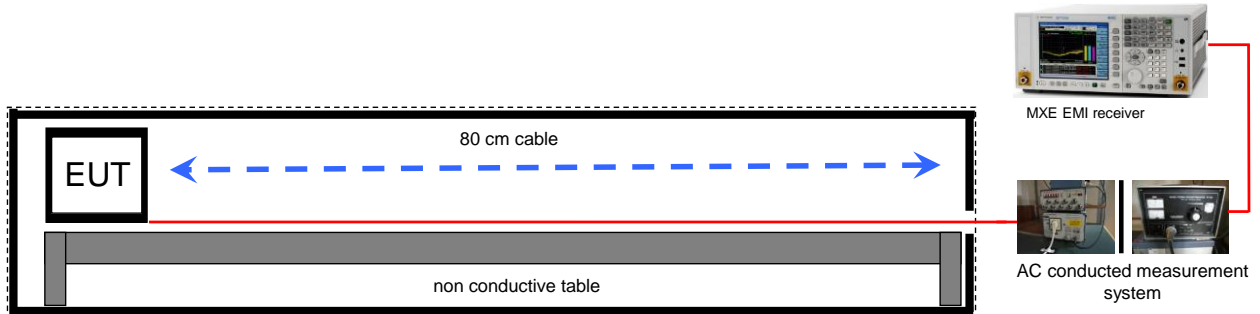
7.3 Radiated measurements 12.75 GHz to 26 GHz



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787
Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442
Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268
Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517

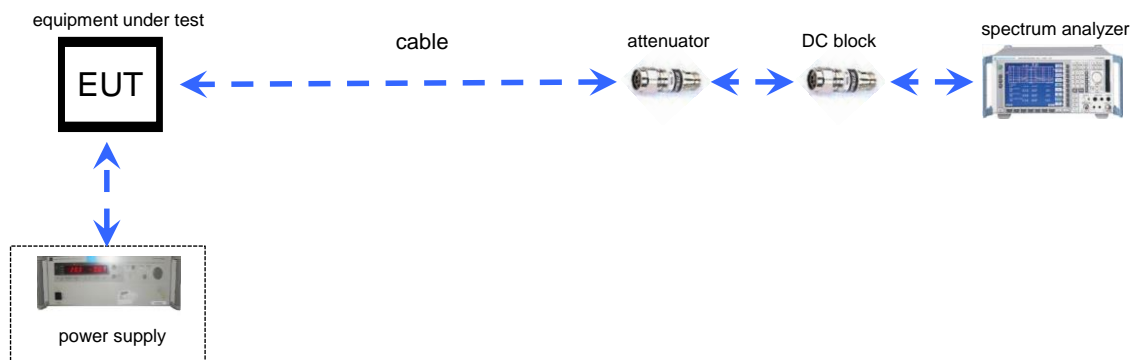
7.4 AC conducted



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erfi	91350	300001155
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001168
Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210

7.5 Conducted measurements



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517

8 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	2015-01-23	-/-

Test specification clause	Test case	Guideline	Temperature conditions	Power source voltages	Mode	Pass	Fail	NA	NP	Remark
§15.247(b)(4) RSS 210 / A8.4(2)	Antenna gain	-/-	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.247(e) RSS 210 / A8.2(b)	Power spectral density	KDB 558074 DTS clause: 10.6	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.247(a)(2) RSS 210 / A8.2(a)	Spectrum bandwidth – 6 dB bandwidth	KDB 558074 DTS clause: 8.2	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
RSS Gen clause 4.6.1	Occupied bandwidth	-/-	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.247(b)(3) RSS-210 / A8.4(4)	Maximum output power	KDB 558074 DTS clause: 9.2.2.5	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.247(d) RSS-210 / A8.5	Spurious emissions near the band edges	KDB 558074 DTS clause: 11.1 (b)	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.205 RSS-210 / A8.5	Band edge compliance radiated	KDB 558074 DTS clause: 13.2	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.247(d) RSS-210 / A8.5	TX spurious emissions conducted	KDB 558074 DTS clause: 11.1 (b)	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.247(d) RSS-210 / A8.5	TX spurious emissions radiated	-/-	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.109 RSS-Gen	RX spurious emissions radiated	-/-	Nominal	Nominal	RX mode	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	-/-	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.107(a) §15.207	Conducted emissions < 30 MHz	-/-	Nominal	Nominal	GFSK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies

Note: NA = Not Applicable; NP = Not Performed

9 Additional comments

Reference documents: None

Special test descriptions: Both ports show the same behaviour.

Configuration descriptions: None

Test mode:

- No test mode available.
Iperf was used to ping another device with the largest support packet size
- Special software is used.
EUT is transmitting data on defined channels.

10 Measurement results

10.1 Antenna gain

Measurement:

The antenna gain is measured in a special anechoic chamber. The result represents the maximum gain.

Limits:

FCC	IC
Antenna Gain	
6 dBi	

Results: ANT 1 & Ant 2 are the same external rod antennas

T _{nom}	V _{nom}	Lowest channel 2403 MHz	Middle channel 2443 MHz	Highest channel 2481 MHz
Gain [dBi]		1.70	1.57	1.64
Measurement uncertainty			± 3 dB	

Verdict: Passed

10.2 Maximum output power

Description:

Measurement of the maximum conducted average output power.

Measurement:

Measurement parameter	
According to DTS clause: 9.2.2.5	
Detector:	Peak
Sweep time:	930 ms
Resolution bandwidth:	30 kHz
Video bandwidth:	100 kHz
Span:	2.75 MHz
Integration bandwidth:	99% power - bandwidth (OBW)
Trace-Mode:	Single Sweep
Measurement function:	Channel power over OBW

Limits:

FCC	IC
Maximum Output Power	
Conducted: 1.0 W – Antenna Gain max. 6 dBi	

Results:

GFSK / ANT 1 & ANT 2 Frequency	Maximum conducted average output power [dBm]		
	Lowest channel 2403 MHz	Middle channel 2443 MHz	Highest channel 2481 MHz
AVG output power conducted	12.5	12.6	13.0
Measurement uncertainty	± 1.5 dB (cond.)		

Verdict: **Passed**

10.3 Power spectral density

Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated at the lowest, middle and highest channel.

Measurement:

Measurement parameter	
According to DTS clause: 10.6	
Detector:	RMS
Sweep time:	15.2
Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Span:	3 MHz

Limits:

FCC	IC
Power Spectral Density	
8 dBm (conducted)	

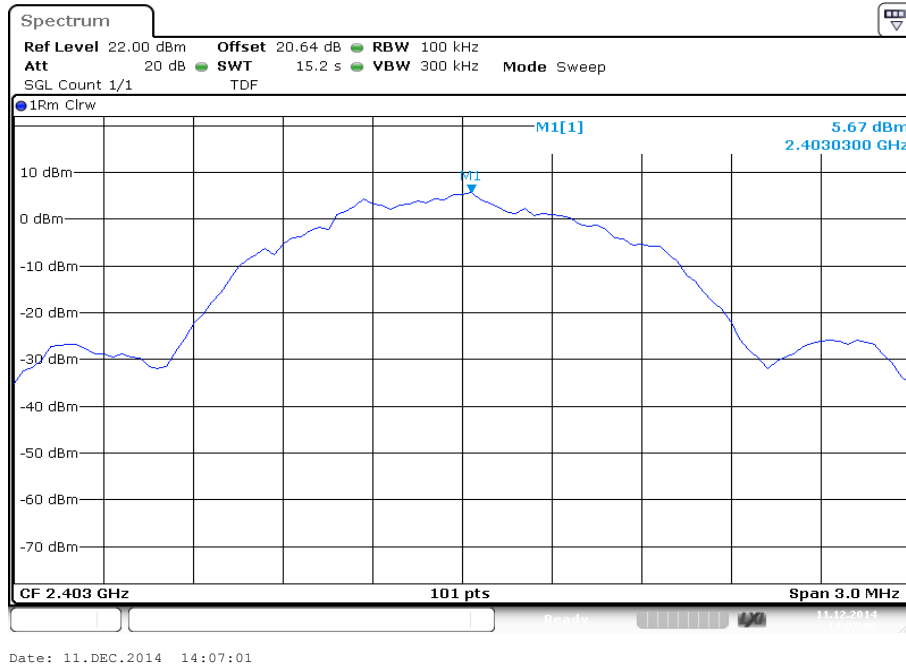
Results:

Modulation	Power Spectral density [dBm]		
	Lowest channel 2403 MHz	Middle channel 2443 MHz	Highest channel 2481 MHz
Frequency			
GFSK / ANT 1 & ANT 2	5.67	6.18	6.48
Measurement uncertainty	± 1.5 dB (cond.)		

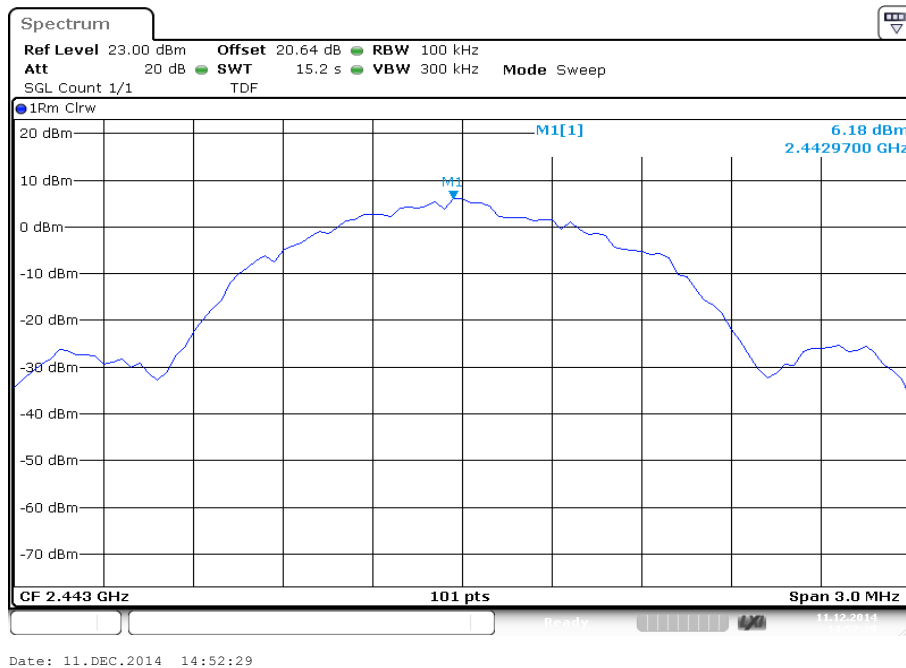
Verdict: **Passed**

Plots: ANT 1 and ANT 2

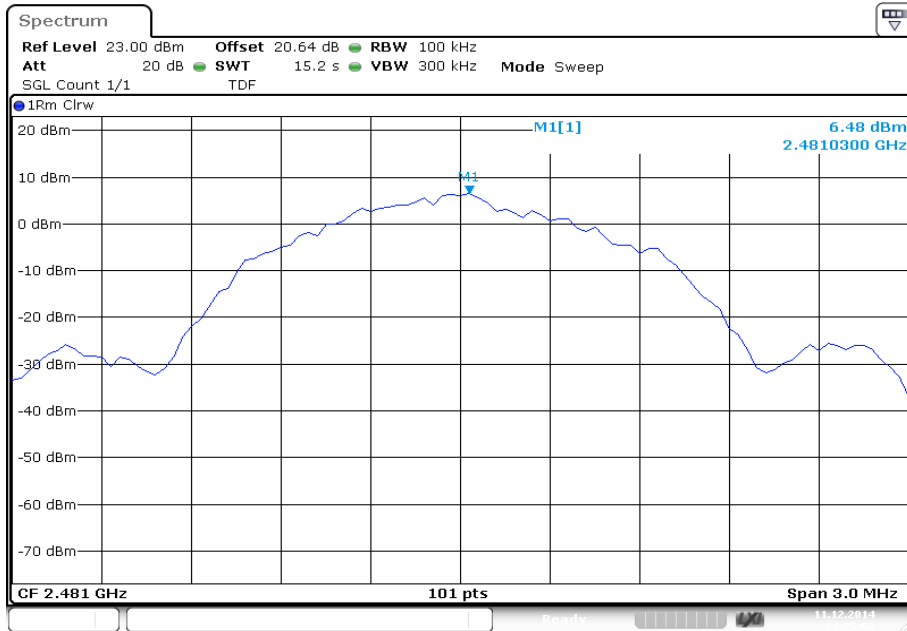
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel



Plot 3: TX mode, highest channel



10.4 Spectrum bandwidth – 6 dB

Description:

Measurement of the 6 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter	
According to DTS clause: 8.2	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Span:	3 MHz
Measurement procedure:	Using marker function 6 dB down.
Trace-Mode:	Max hold (allow trace to stabilize)

Limits:

FCC	IC
Spectrum Bandwidth – 6 dB	
Systems using digital modulation techniques may operate in the 2400–2483.5 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.	

Results:

Frequency	6 dB bandwidth [kHz]		
	Lowest channel 2403 MHz	Middle channel 2443 MHz	Highest channel 2481 MHz
GFSK / ANT 1 & ANT 2	837	817	805
Measurement uncertainty	± RBW		

Verdict: Passed

10.5 Occupied bandwidth – 99% emission bandwidth

Description:

Measurement of the 99% bandwidth of the modulated signal acc. RSS-GEN or ANSI C63.10.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	30 kHz
Video bandwidth:	100 kHz
Span:	3 MHz
Measurement procedure:	Measurement of the 99% bandwidth using the integration function of the analyzer
Trace-Mode:	Max hold (allow trace to stabilize)

Usage:

-/-	IC
Occupied Bandwidth – 99% emission bandwidth	
OBW is necessary for Emission Designator	

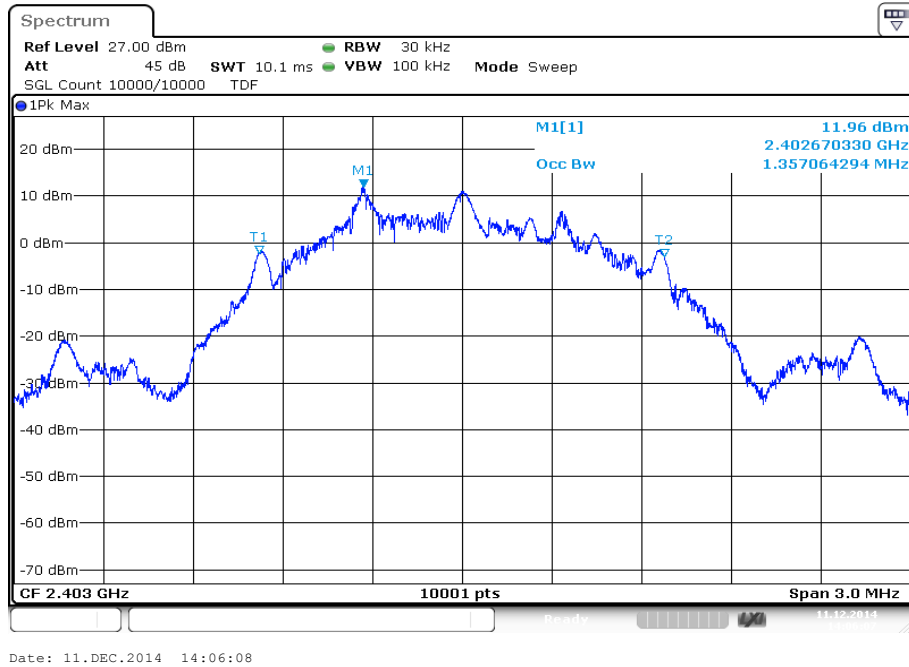
Results:

Modulation Frequency	99 % bandwidth [kHz]		
	Lowest channel 2403 MHz	Middle channel 2443 MHz	Highest channel 2481 MHz
GFSK / ANT 1 & ANT 2	1357	1367	1360
Measurement uncertainty	± RBW		

Verdict: Passed

Plots: ANT 1

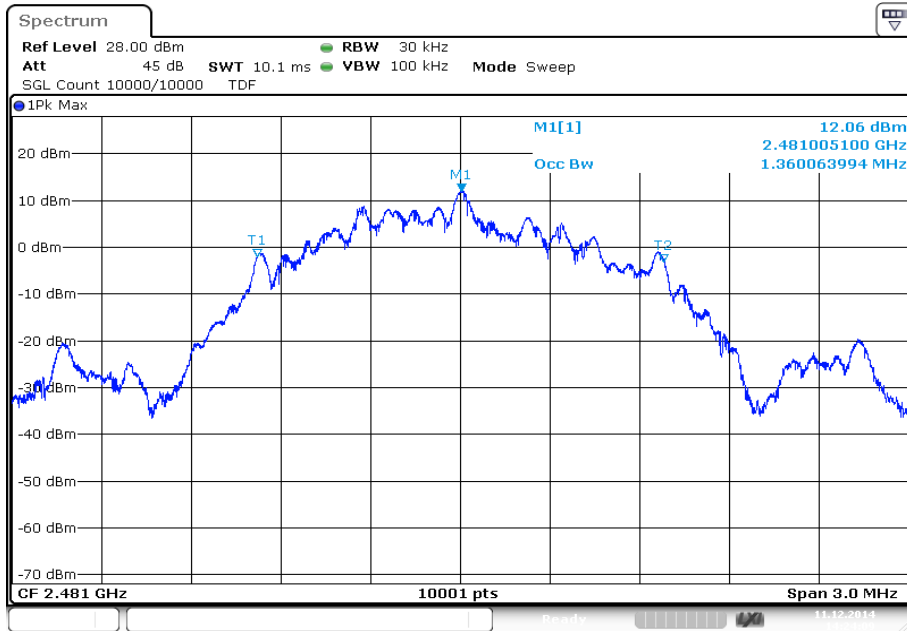
Plot 1: TX mode, lowest channel



Plot 2: TX mode, middle channel



Plot 3: TX mode, highest channel



Date: 11.DEC.2014 14:24:10

10.6 Spurious emissions near the band edges

Description:

EUT is measured at the lower and upper band edge of the frequency band.

Measurement:

Measurement parameter	
According to DTS clause: 11.1 (b)	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	500 kHz
Span:	2380 MHz – 2500 MHz
Trace-Mode:	Max hold

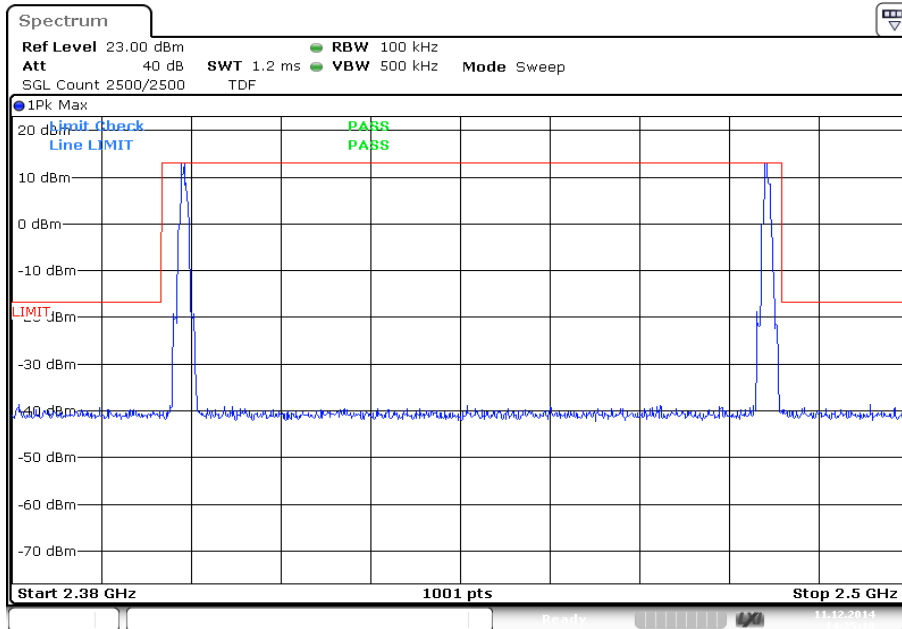
Limits:

FCC	IC
Band Edge Compliance Conducted	
<p>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.</p>	

Verdict: Passed

Plots: ANT 1 & ANT 2

Plot 1: Lowest + highest channel



Date: 11.DEC.2014 14:25:19

10.7 Band edge compliance radiated

Description:

Measurement of the radiated band edge compliance. 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.

Measurement:

Measurement parameter	
According to DTS clause: 13.2	
Detector:	Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	5 MHz
Trace-Mode:	Max Hold

Limits:

FCC	IC
Band Edge Compliance Radiated	
<p>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)).</p>	
74 dB μ V/m Peak 54 dB μ V/m AVG	

Results:

Scenario	Band Edge Compliance Radiated [dB]	
	GFSK / ANT 1	GFSK / ANT 2
Modulation		
Lower Band Edge	> 20 dB (Peak) > 20 dB (AVG)	71.00 (Peak) * > 10 dB (AVG)
Upper Band Edge	> 20 dB (Peak) > 20 dB (AVG)	71.29 (Peak) * > 10 dB (AVG)
Measurement uncertainty	± 3 dB	

* Remeasured with Marker Delta method

Verdict: Passed

10.8 TX spurious emissions conducted

Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at the lowest, middle and highest channel.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	500 kHz
Span:	9 kHz to 25 GHz
Trace-Mode:	Max Hold

Limits:

FCC	IC
TX Spurious Emissions Conducted	
<p>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 30 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</p>	

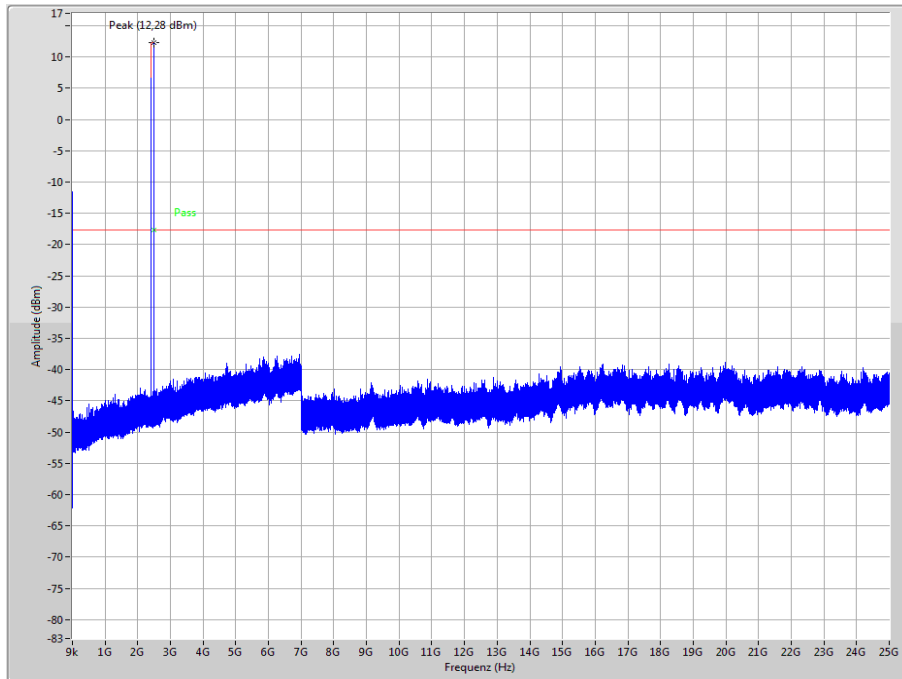
Results: ANT 1 & ANT 2

TX Spurious Emissions Conducted					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
Low channel		12.3	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -30 dBc criteria.			-30 dBc (average)		complies
Mid channel		9.4	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -30 dBc criteria.			-30 dBc (average)		complies
High channel		13.1	30 dBm		Operating frequency
No peaks detected. All detected emissions are below the -30 dBc criteria.			-30 dBc (average)		complies
Measurement uncertainty		± 3 dB			

Verdict: Passed

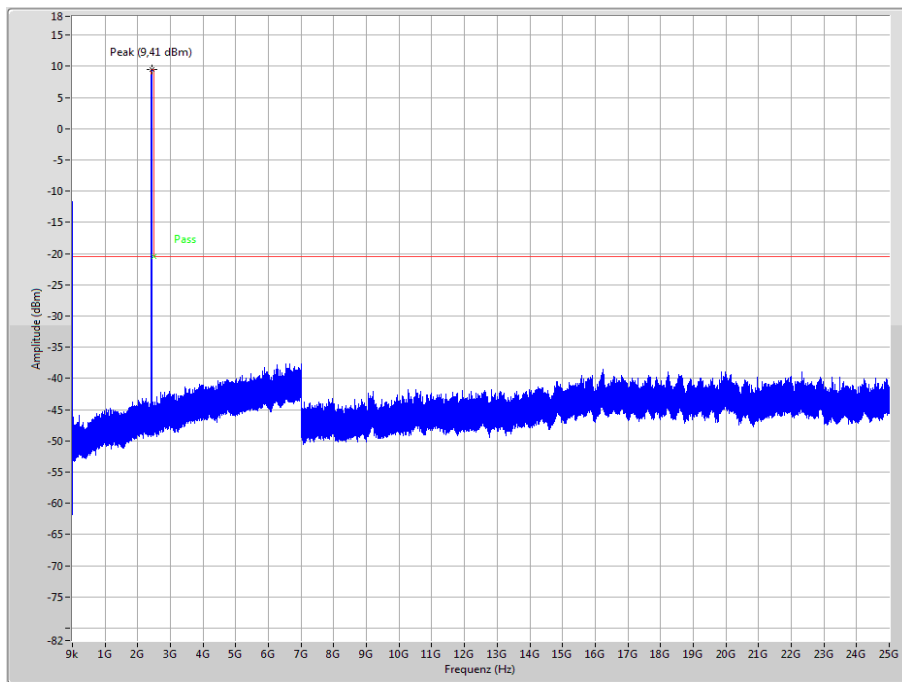
Plots: ANT 1 & ANT 2

Plot 1: TX mode, lowest channel, up to 25 GHz



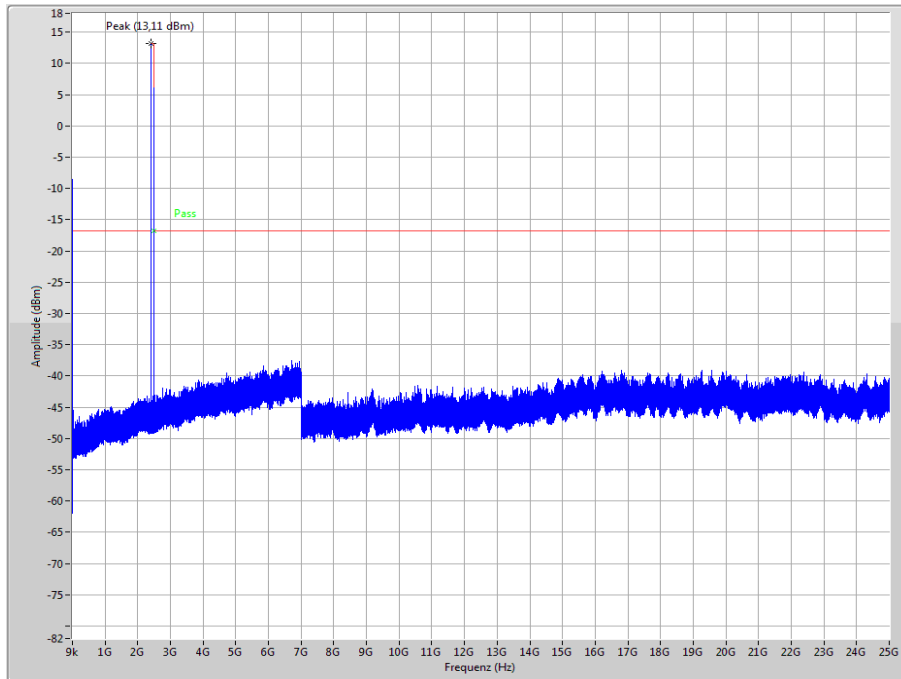
The peak at the beginning of the plot is the LO from the SA.

Plot 2: TX mode, middle channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

Plot 3: TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

10.9 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	3 x RBW
Span:	30 MHz to 26 GHz
Trace-Mode:	Max Hold

The modulation with the highest output power was used to perform the transmitter spurious emissions. If spurious were detected a re-measurement was performed on the detected frequency with each modulation.

Limits:

FCC	IC	
TX Spurious Emissions Radiated		
<p>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 30 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 §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).</p>		
Frequency (MHz)	Field Strength (dB μ V/m)	Measurement distance
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
Above 960	54.0	3

Results: ANT 1

TX Spurious Emissions Radiated [dBµV/m]								
GFSK / ANT 1								
Lowest channel 2403 MHz			Middle channel 2443 MHz			Highest channel 2481 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
1 st harmonic	Peak	60.08	1 st harmonic	Peak	64.25	1 st harmonic	Peak	63.89
	RMS	36.77		RMS	41.42		RMS	39.60
2 nd harmonic	Peak	65.45	2 nd harmonic	Peak	69.99	2 nd harmonic	Peak	65.14
	RMS	42.37		RMS	46.59		RMS	42.90
3 rd harmonic	Peak	62.68	3 rd harmonic	Peak	67.30	3 rd harmonic	Peak	67.19
	RMS	39.71		RMS	43.64		RMS	44.80
4 th harmonic	Peak	48.67	4 th harmonic	Peak	57.83	4 th harmonic	Peak	44.00
	RMS	-/-		RMS	34.78		RMS	-/-
5 th harmonic	Peak	55.98	5 th harmonic	Peak	54.40	5 th harmonic	Peak	61.36
	RMS	32.96		RMS	31.67		RMS	38.25
6 th harmonic	Peak	57.20	6 th harmonic	Peak	61.97	6 th harmonic	Peak	65.47
	RMS	34.11		RMS	38.87		RMS	42.75
7 th harmonic	Peak	56.14	7 th harmonic	Peak	61.07	7 th harmonic	Peak	64.03
	RMS	33.27		RMS	38.31		RMS	41.02
8 th harmonic	Peak	56.68	8 th harmonic	Peak	58.19	8 th harmonic	Peak	57.68
	RMS	33.70		RMS	35.07		RMS	34.72
Measurement uncertainty			± 3 dB					

Verdict: Passed

Results: ANT 2

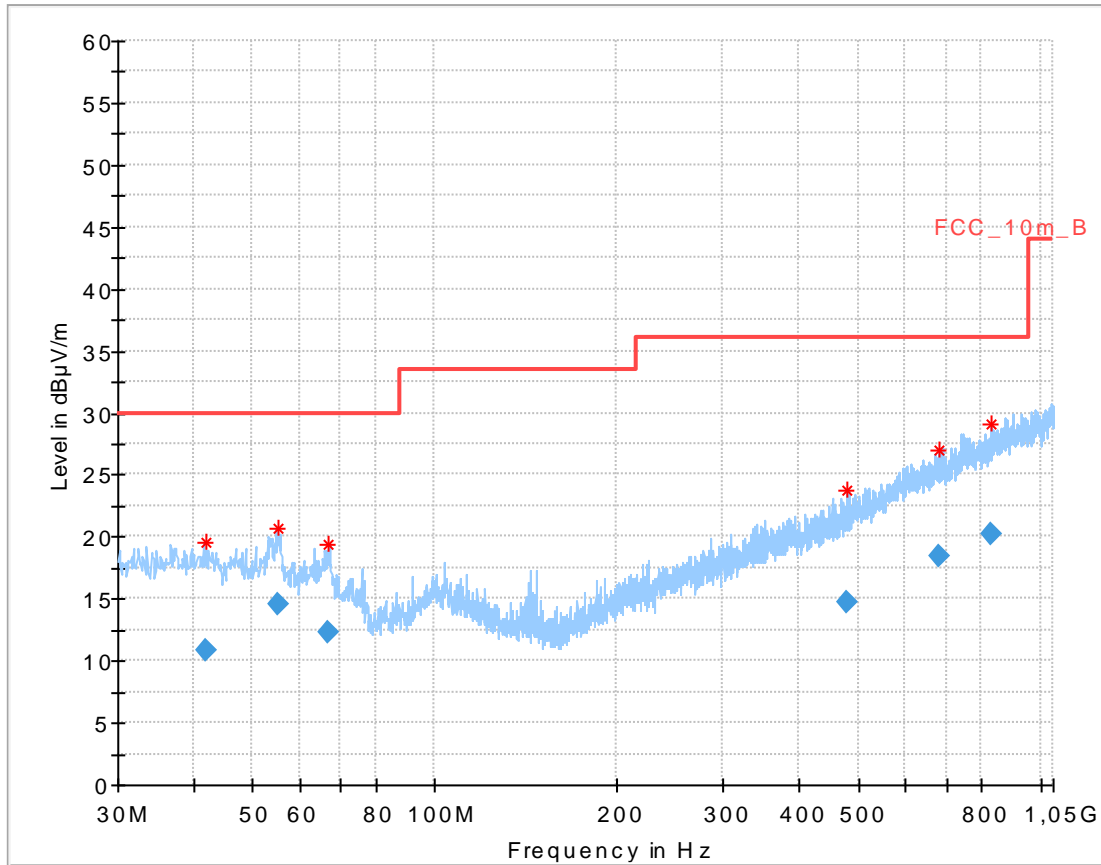
TX Spurious Emissions Radiated [dBµV/m]								
GFSK / ANT 2								
Lowest channel 2403 MHz			Middle channel 2443 MHz			Highest channel 2481 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
1 st harmonic	Peak	56.32	1 st harmonic	Peak	66.18	1 st harmonic	Peak	-/-
	RMS	33.24		RMS	43.12		RMS	-/-
2 nd harmonic	Peak	60.28	2 nd harmonic	Peak	69.71	2 nd harmonic	Peak	64.30
	RMS	37.18		RMS	46.48		RMS	41.50
3 rd harmonic	Peak	66.39	3 rd harmonic	Peak	67.57	3 rd harmonic	Peak	-/-
	RMS	43.19		RMS	44.50		RMS	-/-
4 th harmonic	Peak	51.09	4 th harmonic	Peak	52.00	4 th harmonic	Peak	51.69
	RMS	-/-		RMS	-/-		RMS	-/-
5 th harmonic	Peak	56.73	5 th harmonic	Peak	57.33	5 th harmonic	Peak	54.01
	RMS	33.88		RMS	34.19		RMS	30.81
6 th harmonic	Peak	63.84	6 th harmonic	Peak	61.45	6 th harmonic	Peak	66.38
	RMS	40.95		RMS	38.35		RMS	43.51
7 th harmonic	Peak	61.44	7 th harmonic	Peak	63.67	7 th harmonic	Peak	60.07
	RMS	38.38		RMS	40.52		RMS	37.31
8 th harmonic	Peak	53.63	8 th harmonic	Peak	55.20	8 th harmonic	Peak	56.10
	RMS	-/-		RMS	31.93		RMS	33.13
Measurement uncertainty			± 3 dB					

Verdict: Passed

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

Plots: ANT 1

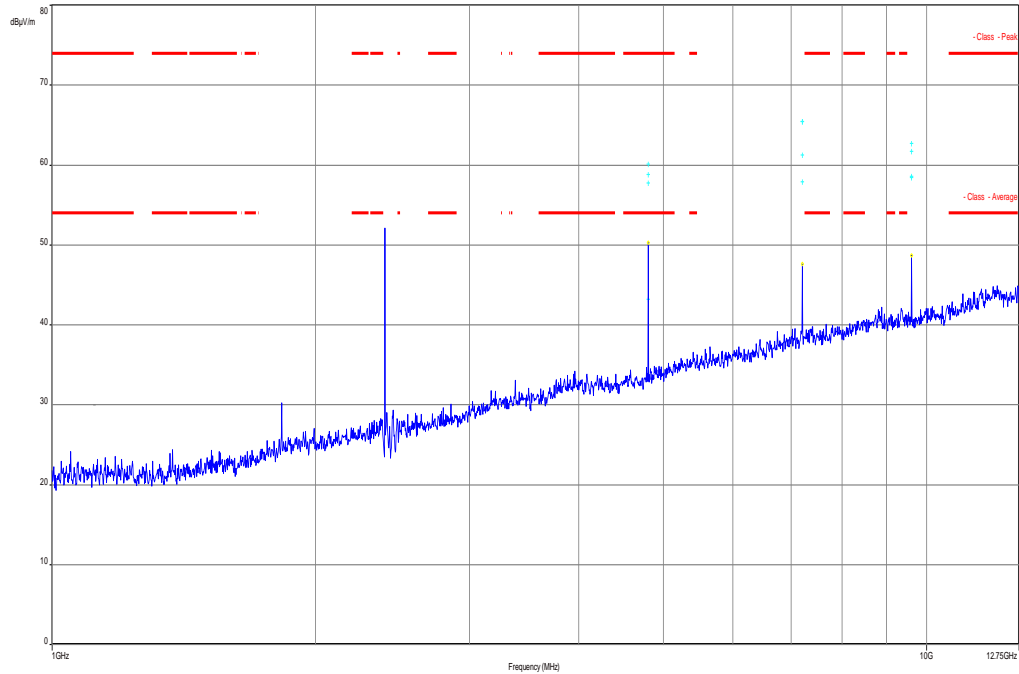
Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization



Final_Result:

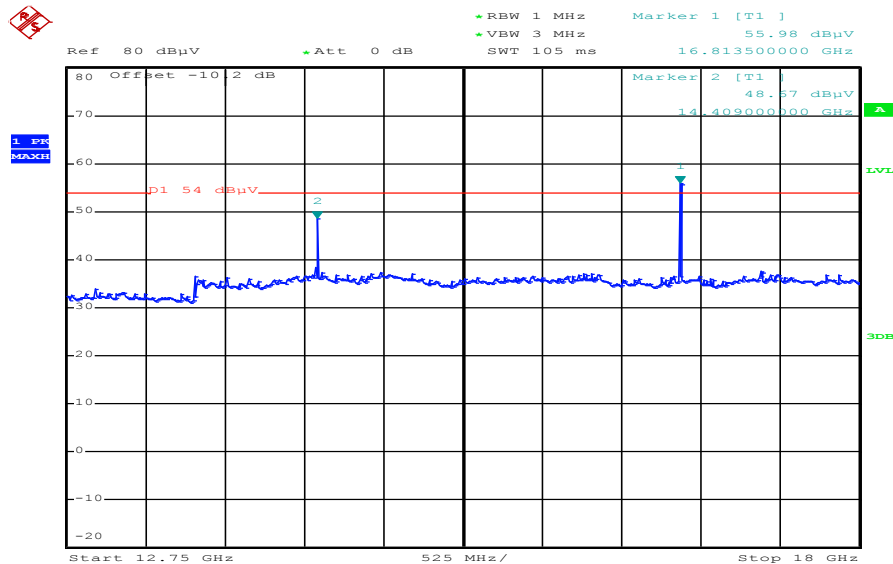
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
41.784000	10.91	30.00	19.09	1000.0	120.000	315.0	H	-1	14.0
55.130850	14.55	30.00	15.45	1000.0	120.000	312.0	V	8	12.8
66.831300	12.37	30.00	17.63	1000.0	120.000	396.0	V	132	10.1
479.140500	14.67	36.00	21.33	1000.0	120.000	258.0	H	140	18.3
680.020350	18.48	36.00	17.52	1000.0	120.000	200.0	H	255	21.4
830.052450	20.21	36.00	15.79	1000.0	120.000	343.0	H	97	23.2

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



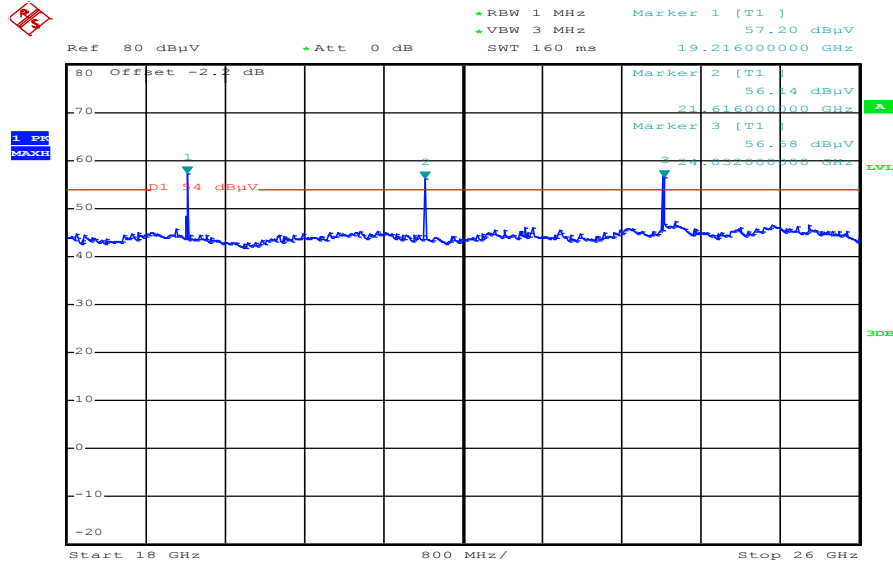
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



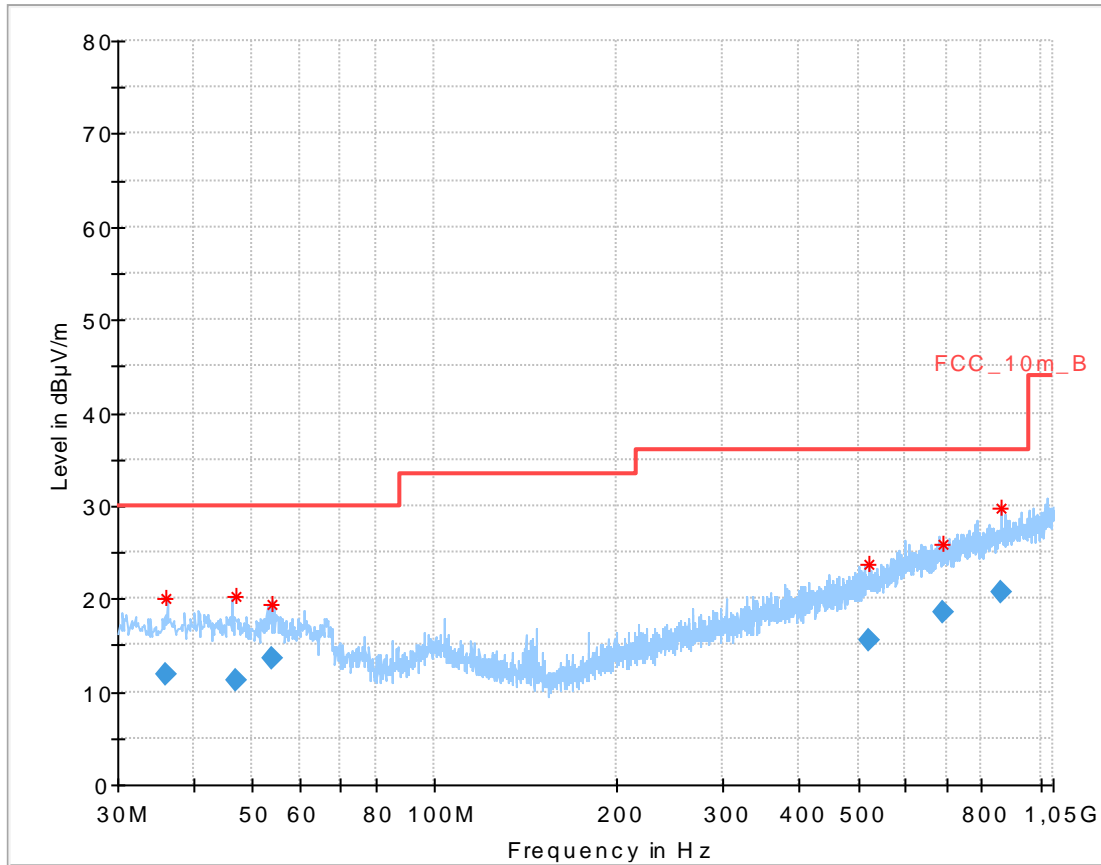
Date: 24.JUN.2014 11:58:25

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 24.JUN.2014 12:17:58

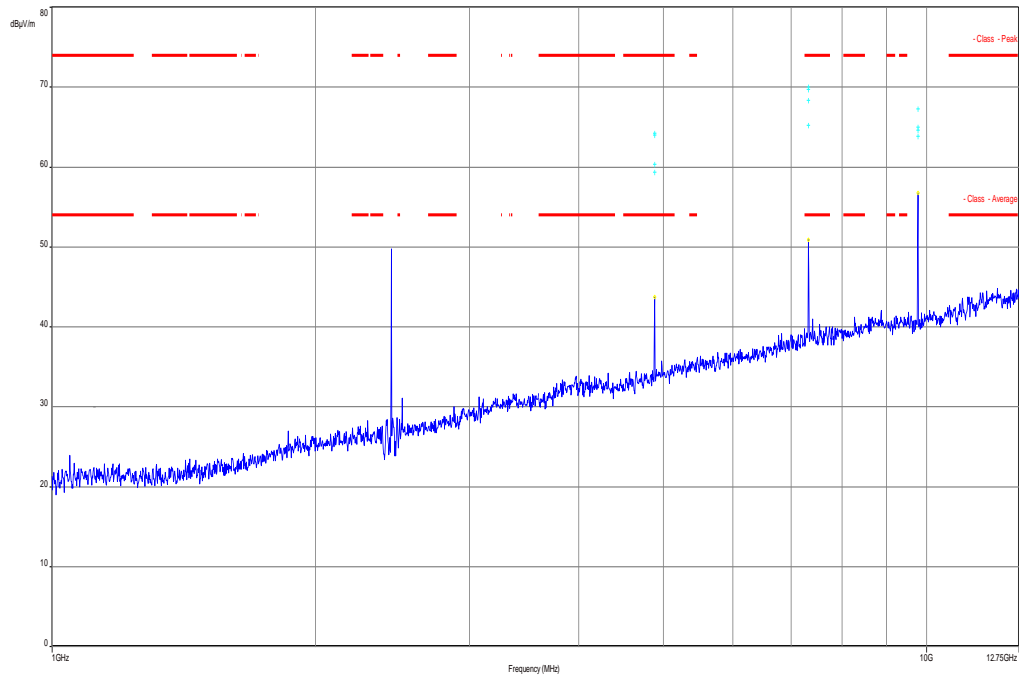
Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization



Final_Result:

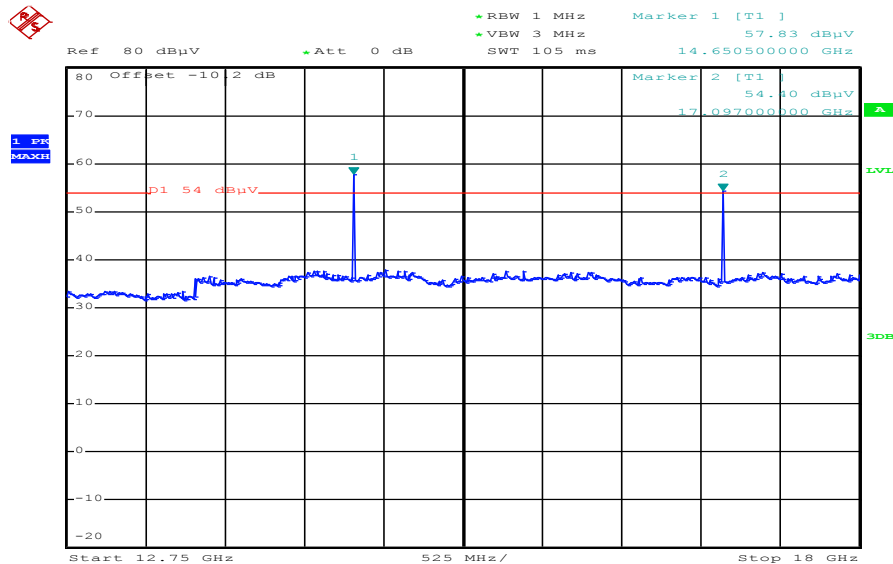
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
36.022050	11.79	30.00	18.21	1000.0	120.000	170.0	V	25	13.8
46.901850	11.14	30.00	18.86	1000.0	120.000	170.0	V	102	13.8
53.766300	13.59	30.00	16.41	1000.0	120.000	98.0	V	205	13.0
521.608800	15.58	36.00	20.42	1000.0	120.000	170.0	H	65	19.0
693.244800	18.49	36.00	17.51	1000.0	120.000	170.0	H	93	21.5
862.603050	20.74	36.00	15.26	1000.0	120.000	170.0	H	103	23.6

Plot 6: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



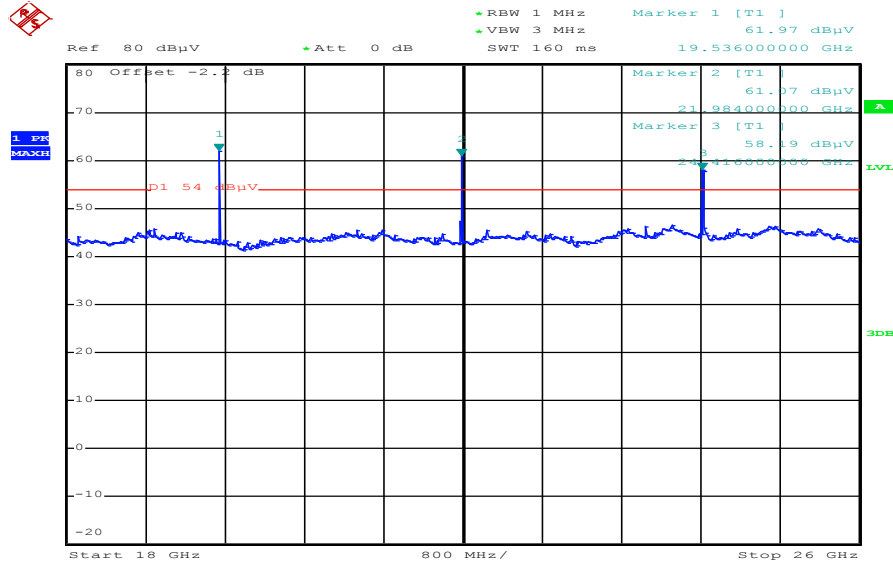
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



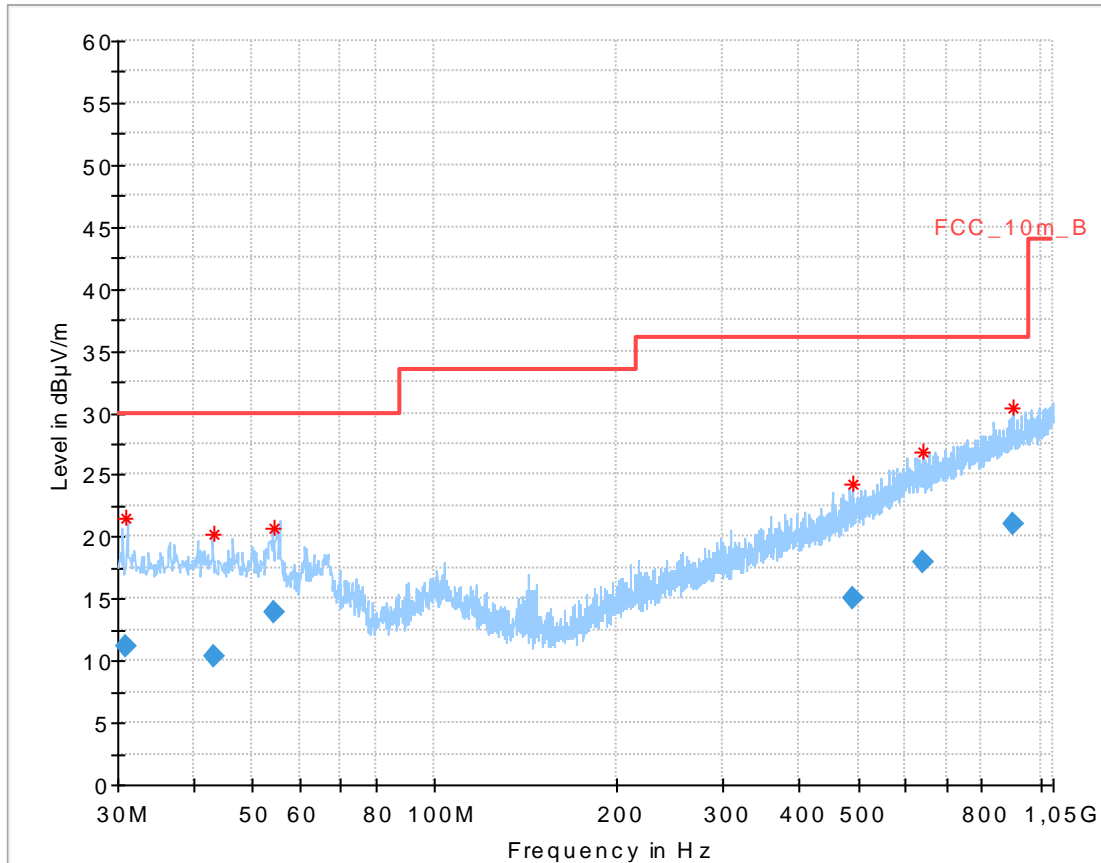
Date: 24.JUN.2014 12:00:13

Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 24.JUN.2014 12:28:49

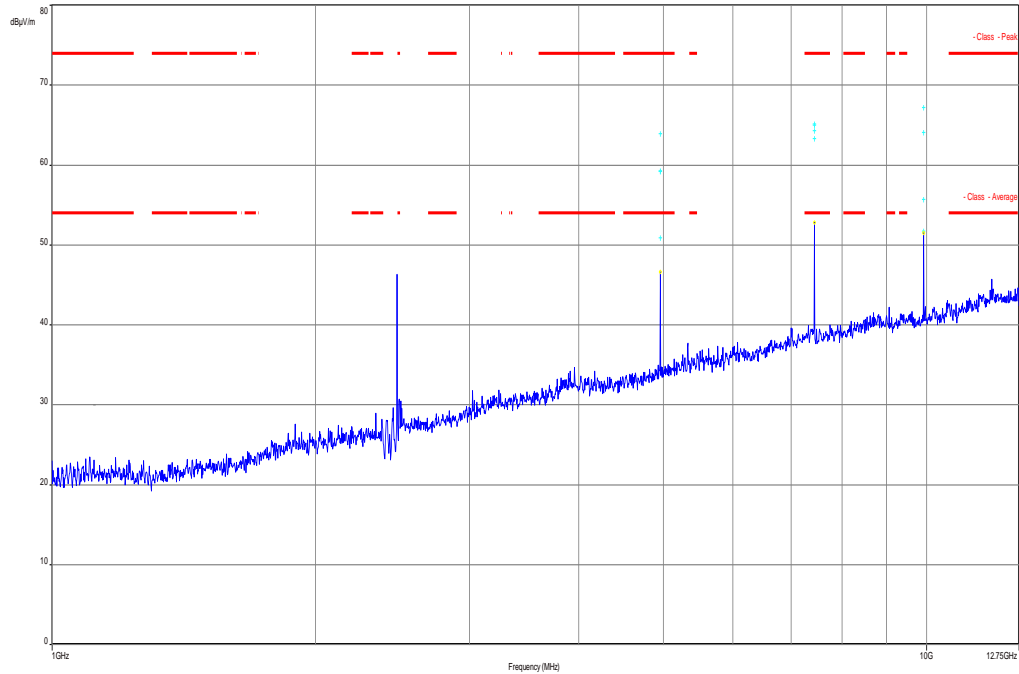
Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization



Final_Result:

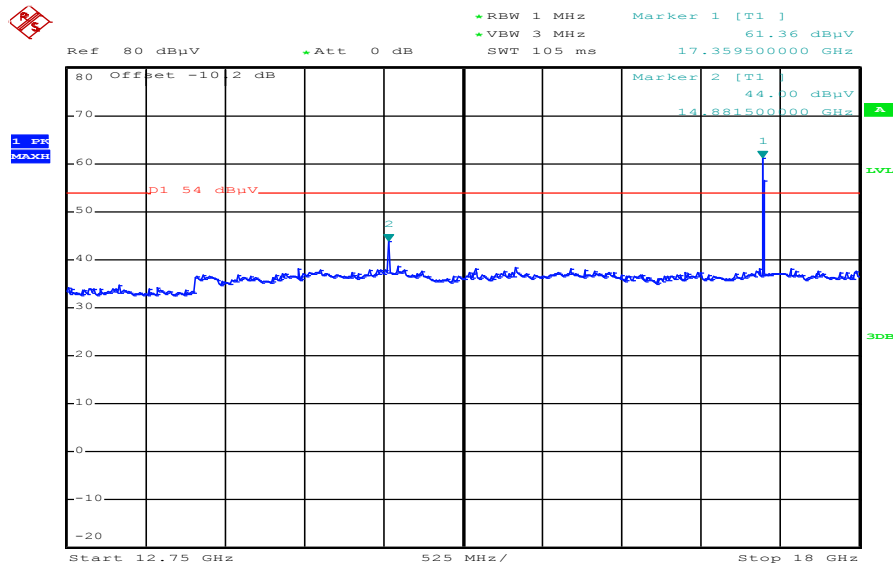
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.013100	11.20	30.00	18.80	1000.0	120.000	200.0	V	84	13.4
43.207050	10.38	30.00	19.62	1000.0	120.000	255.0	V	48	13.9
54.340950	13.85	30.00	16.15	1000.0	120.000	373.0	V	300	12.9
488.947050	14.96	36.00	21.04	1000.0	120.000	200.0	H	68	18.5
640.456950	18.02	36.00	17.98	1000.0	120.000	200.0	H	315	21.0
905.015850	21.07	36.00	14.93	1000.0	120.000	400.0	H	270	24.1

Plot 10: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



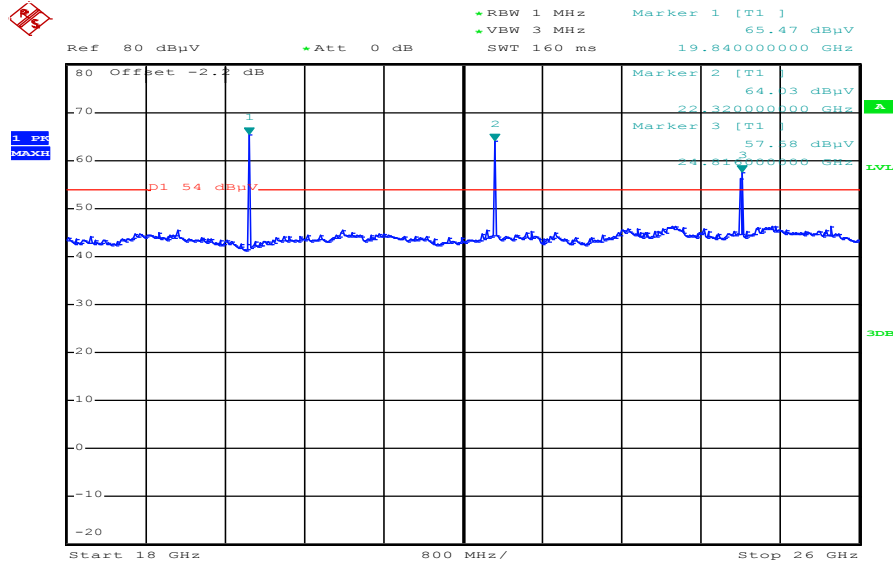
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 24.JUN.2014 11:50:19

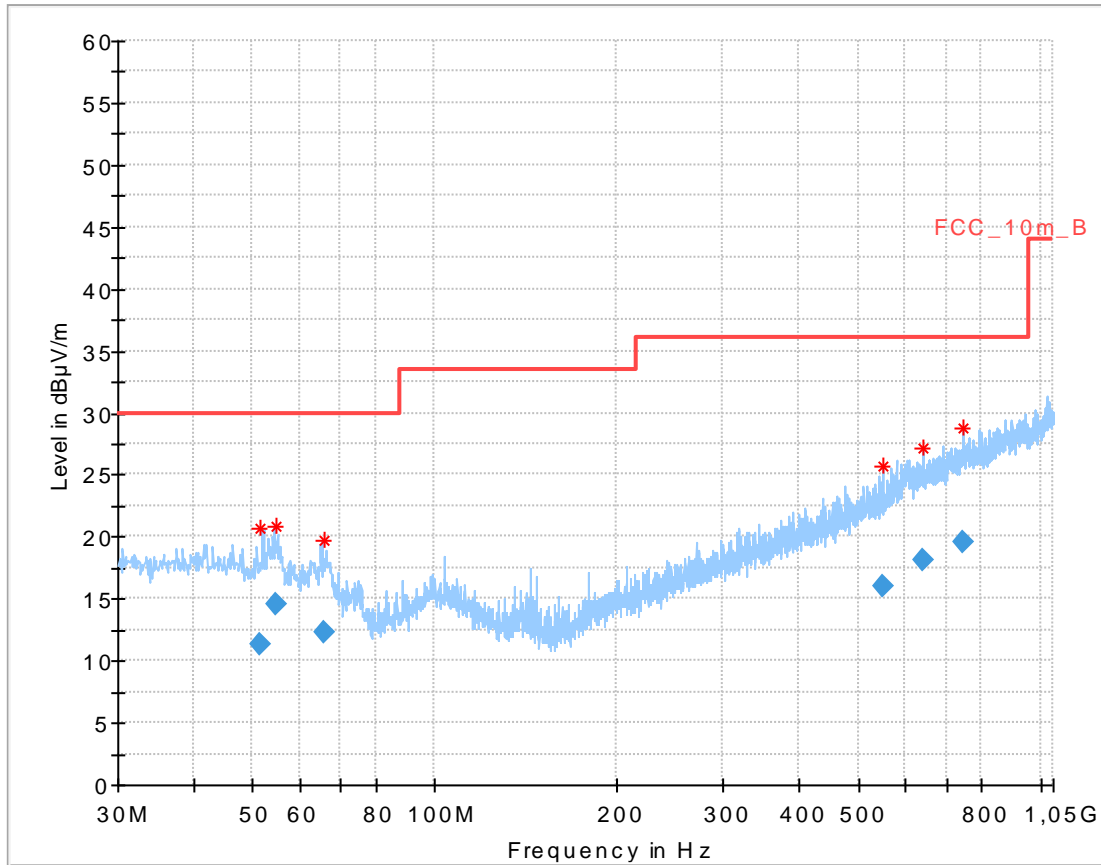
Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 24.JUN.2014 12:26:59

Plots: ANT 2

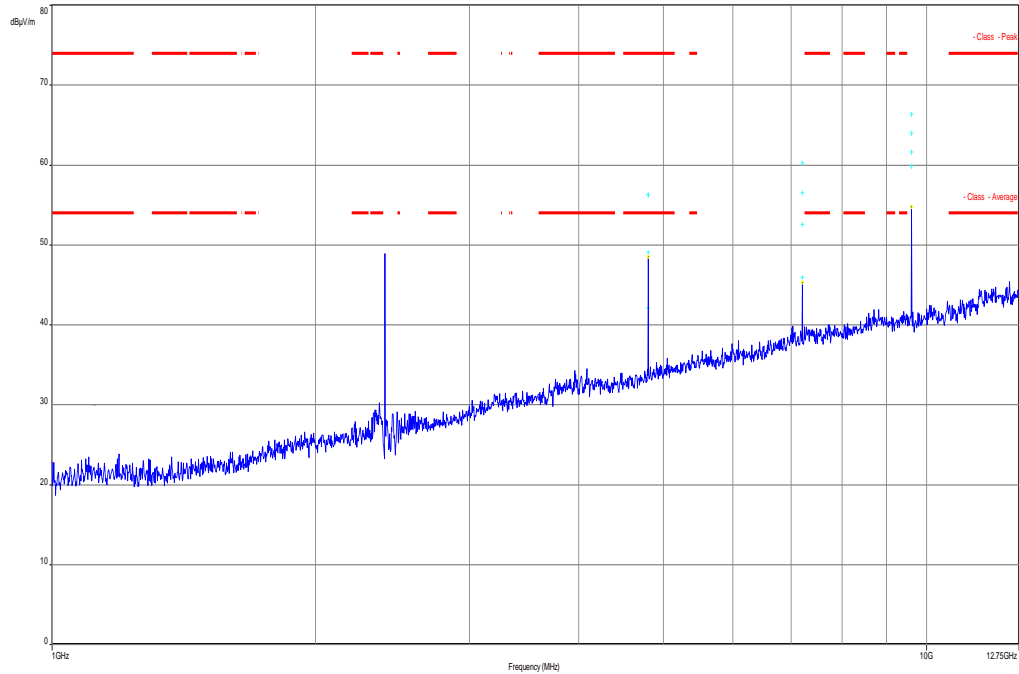
Plot 1: Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization



Final_Result:

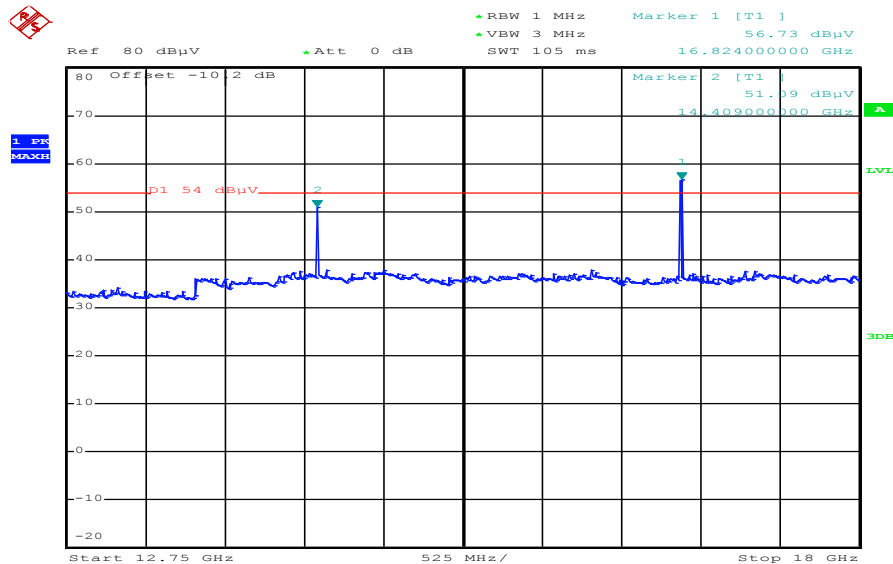
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
51.495000	11.34	30.00	18.66	1000.0	120.000	100.0	V	0	13.4
54.850050	14.62	30.00	15.38	1000.0	120.000	343.0	V	-50	12.9
65.864250	12.30	30.00	17.70	1000.0	120.000	400.0	V	50	10.3
548.615100	16.07	36.00	19.93	1000.0	120.000	200.0	V	311	19.3
641.468700	18.06	36.00	17.94	1000.0	120.000	200.0	H	191	21.0
745.684650	19.58	36.00	16.42	1000.0	120.000	400.0	V	280	22.6

Plot 2: Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



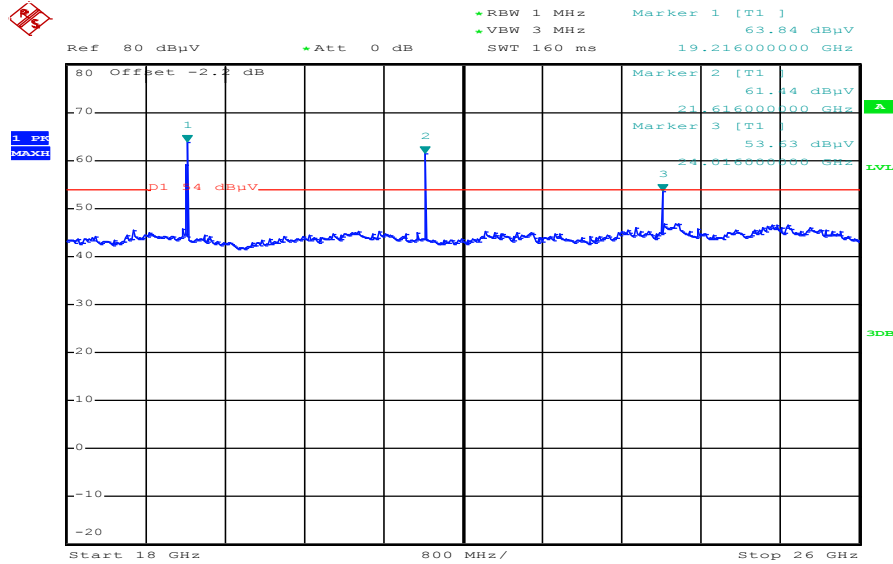
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



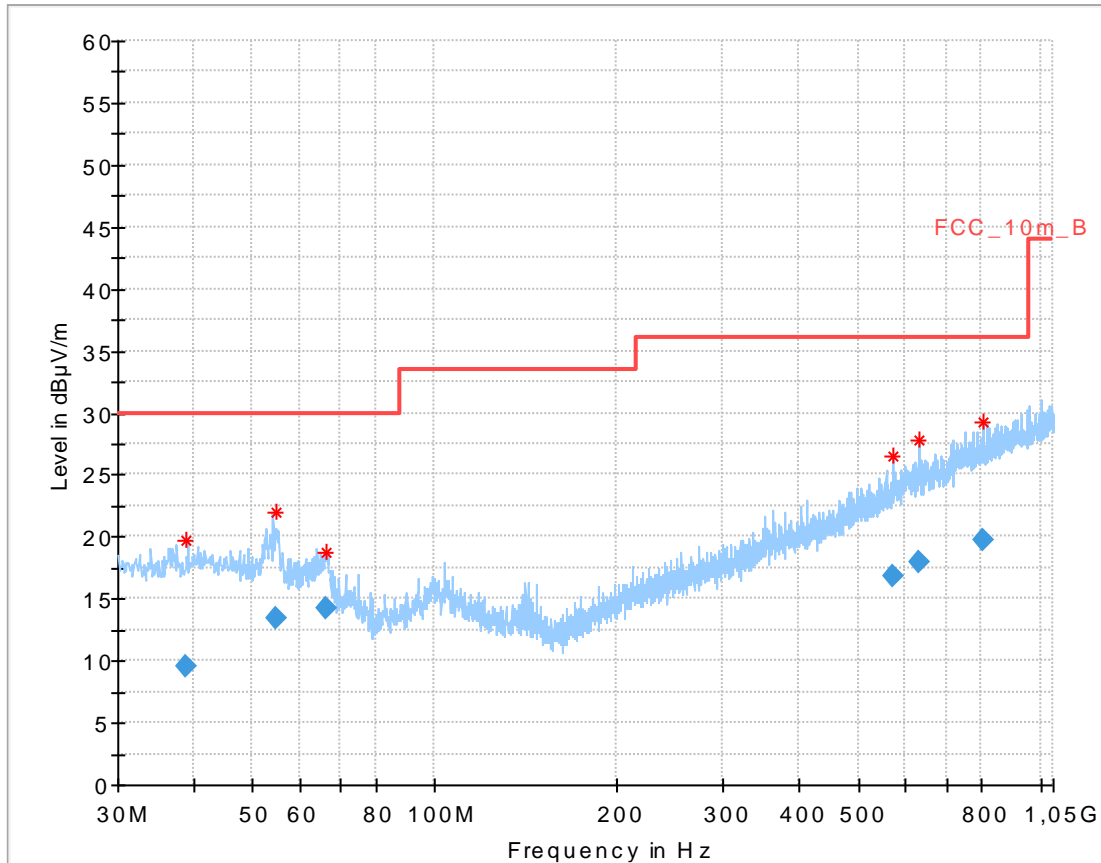
Date: 24.JUN.2014 11:57:29

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 24.JUN.2014 12:19:54

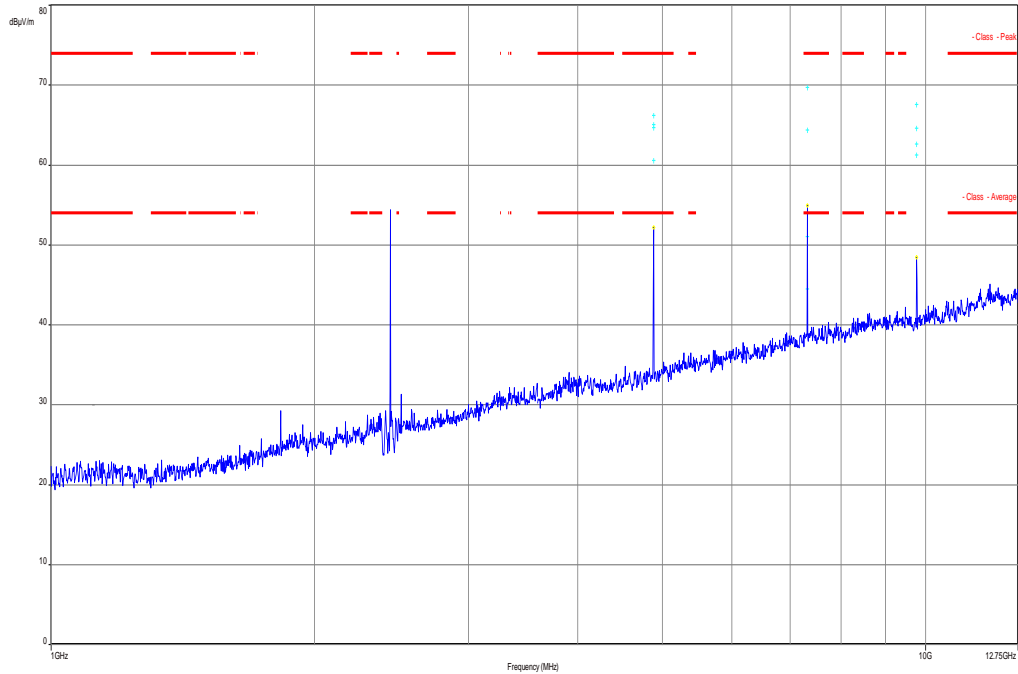
Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization



Final_Result:

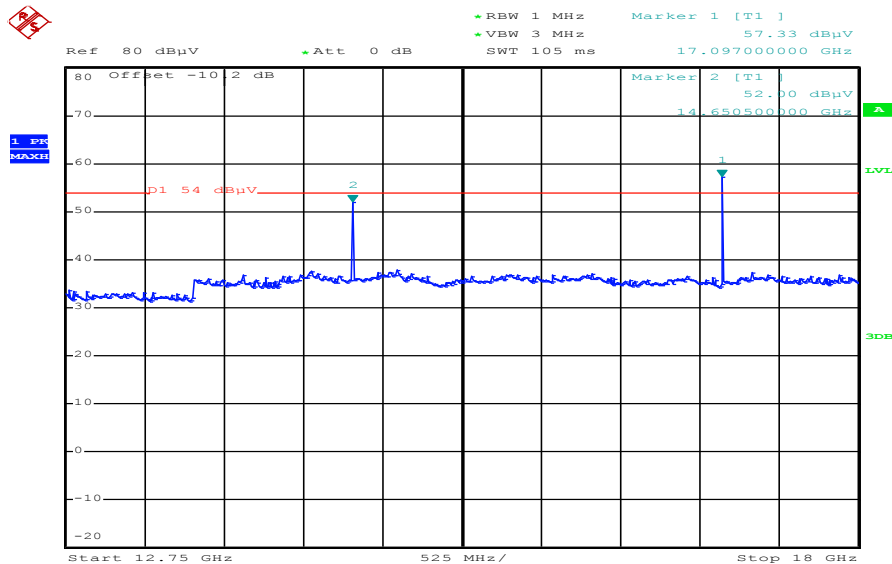
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
38.761950	9.60	30.00	20.40	1000.0	120.000	140.0	H	210	14.0
54.605850	13.37	30.00	16.63	1000.0	120.000	400.0	V	200	12.9
66.145350	14.20	30.00	15.80	1000.0	120.000	300.0	V	128	10.2
571.540500	16.89	36.00	19.11	1000.0	120.000	200.0	V	166	19.9
631.189050	17.97	36.00	18.03	1000.0	120.000	200.0	V	239	21.0
802.026000	19.67	36.00	16.33	1000.0	120.000	359.0	H	267	22.8

Plot 6: Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



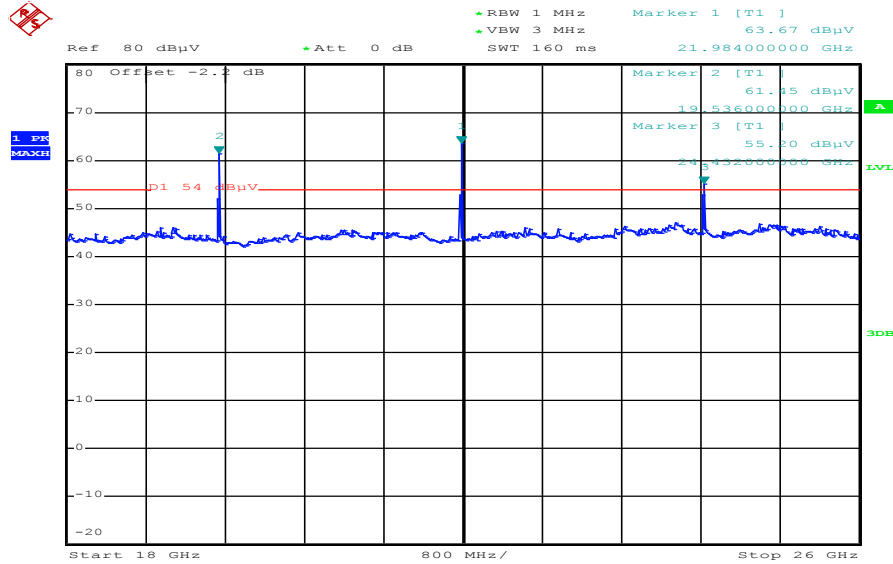
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



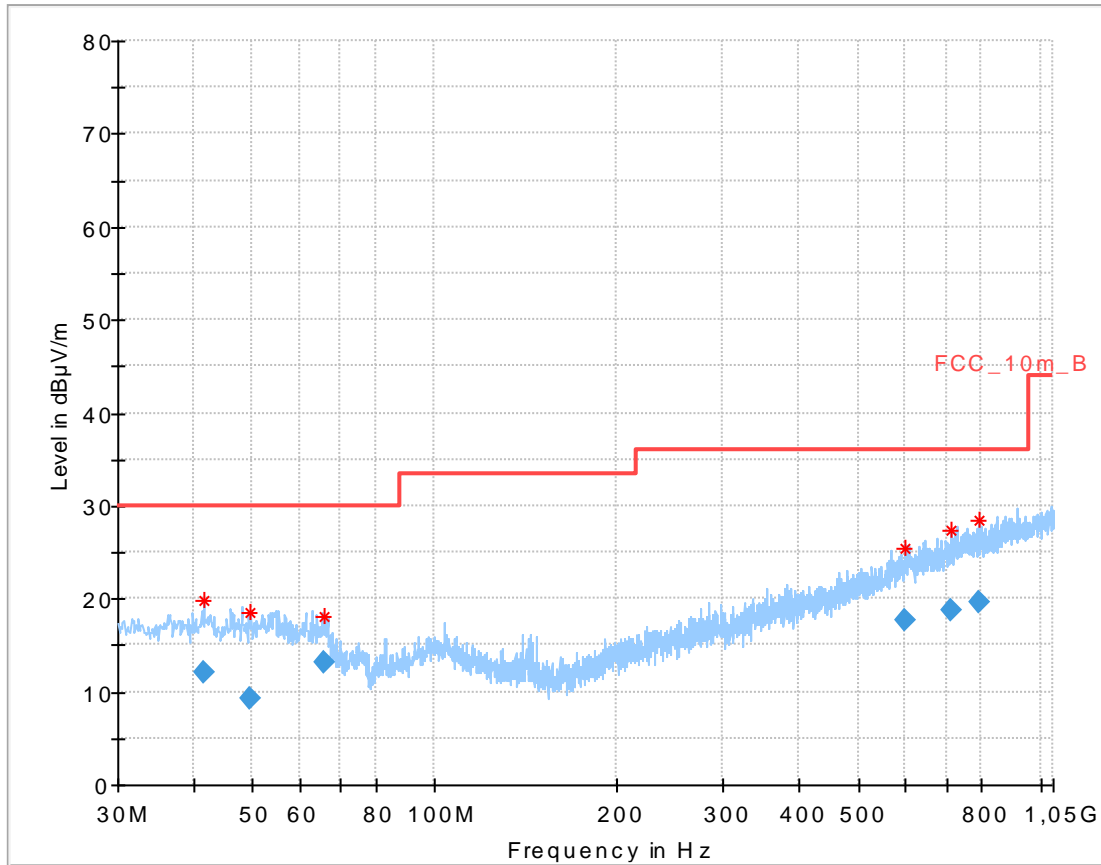
Date: 24.JUN.2014 12:04:10

Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 24.JUN.2014 12:15:29

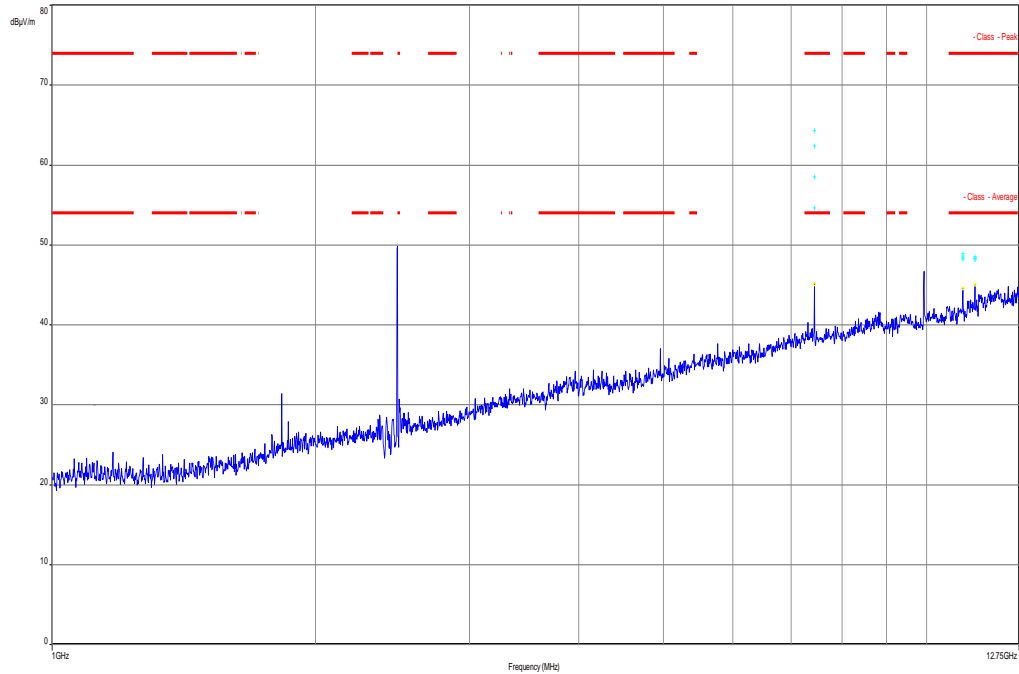
Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization



Final_Result:

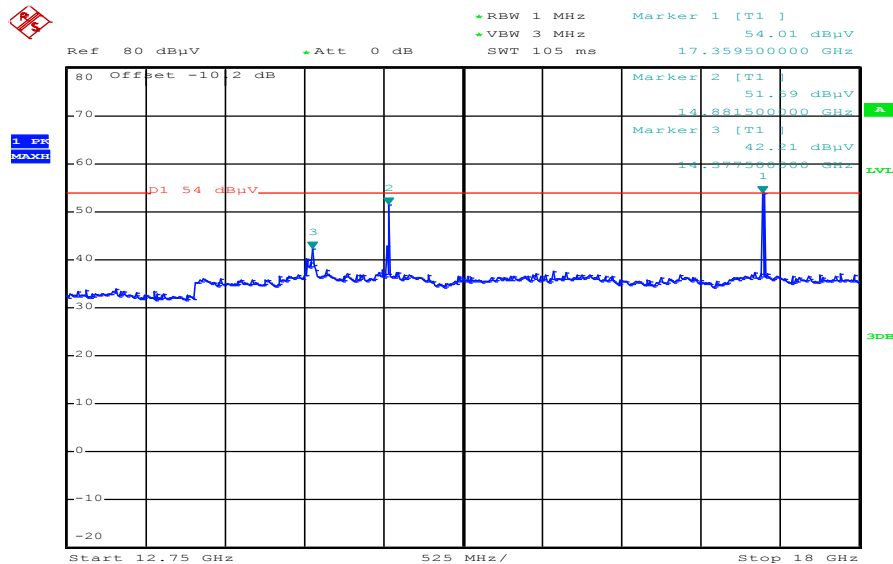
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
41.585400	12.02	30.00	17.98	1000.0	120.000	98.0	V	178	14.0
49.557150	9.25	30.00	20.75	1000.0	120.000	170.0	H	16	13.7
65.637450	13.25	30.00	16.75	1000.0	120.000	170.0	V	115	10.3
599.027250	17.70	36.00	18.30	1000.0	120.000	140.0	V	269	20.7
711.365850	18.86	36.00	17.14	1000.0	120.000	170.0	V	197	21.8
794.337150	19.58	36.00	16.42	1000.0	120.000	156.0	V	65	22.7

Plot 10: Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



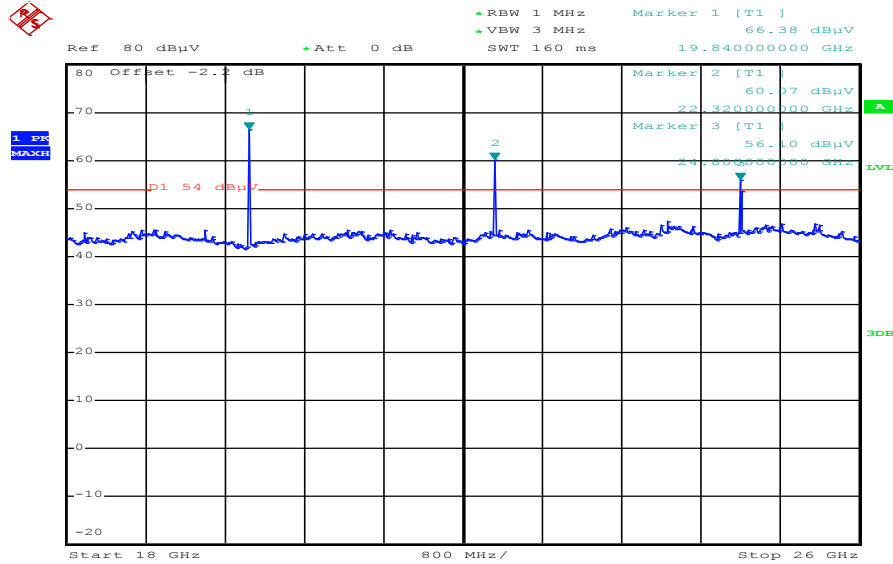
The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 11: Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 24.JUN.2014 12:02:48

Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 24.JUN.2014 12:22:15

10.10 RX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in idle/receive mode. The results are valid for both modes.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	3 x RBW
Span:	30 MHz to 26 GHz
Trace-Mode:	Max Hold

Limits:

FCC	IC	
RX Spurious Emissions Radiated		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Results:

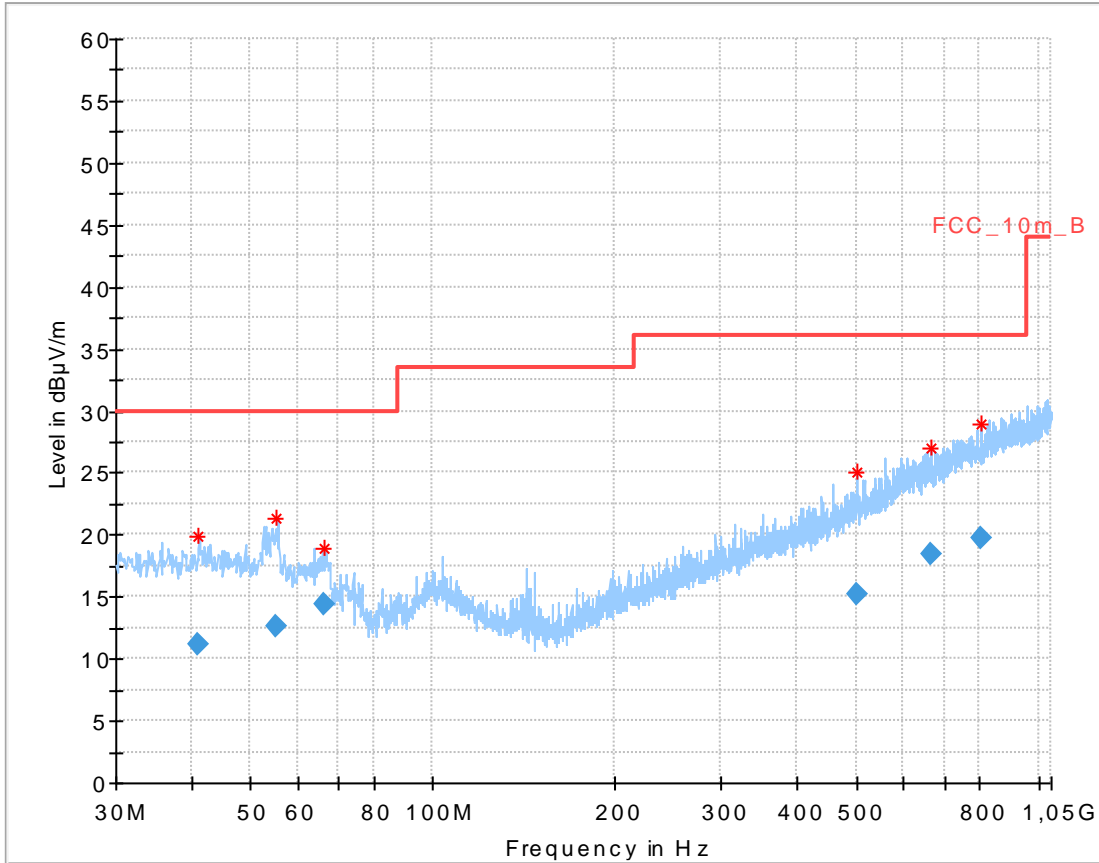
RX Spurious Emissions Radiated [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
All detected peak emissions above 1 GHz are below the average limit.		
Measurement uncertainty	± 3 dB	

Verdict: Passed

Note: The limit was recalculated with 20 dB / decade (Part 15.31) for all radiated spurious emissions 30 MHz to 1 GHz from 3 meter limit to a 10 meter distance. (40dB/decade for emissions < 30MHz)

Plots: RX / Idle – mode

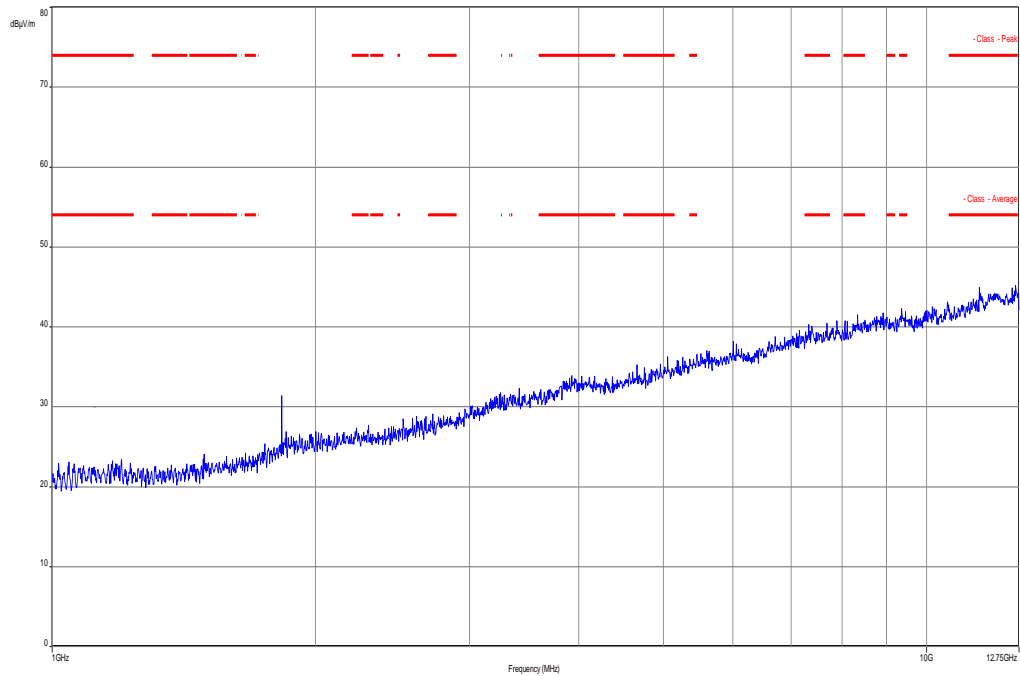
Plot 1: 30 MHz to 1 GHz, vertical & horizontal polarization



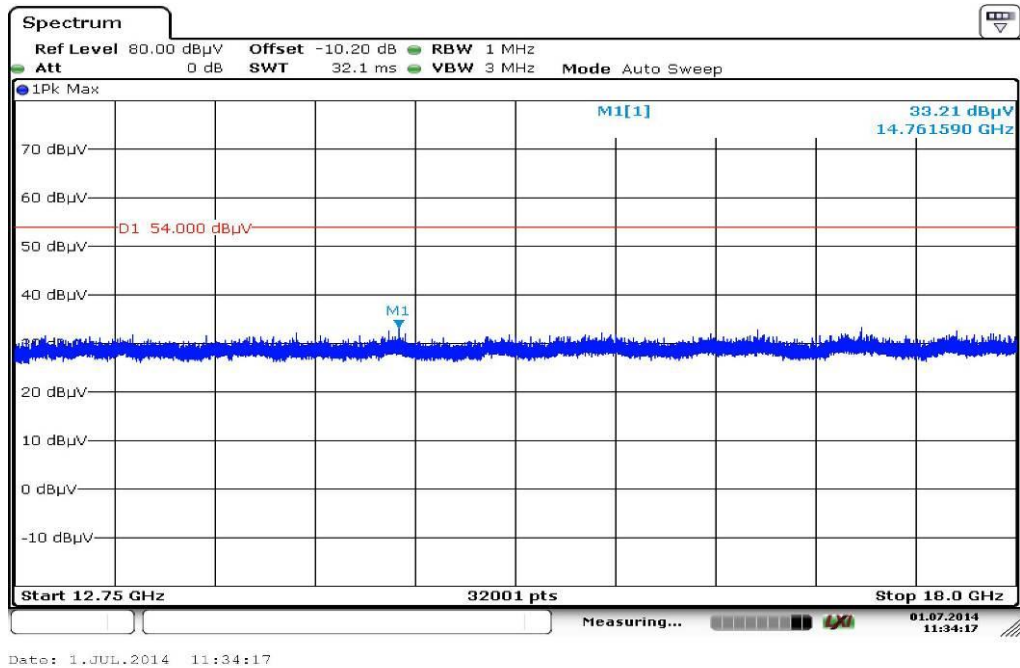
Final_Result:

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
40.885200	11.22	30.00	18.78	1000.0	120.000	160.0	V	140	14.0
55.096050	12.62	30.00	17.38	1000.0	120.000	396.0	V	94	12.8
66.223500	14.47	30.00	15.53	1000.0	120.000	300.0	V	39	10.2
500.986950	15.21	36.00	20.79	1000.0	120.000	400.0	V	290	18.7
663.537750	18.39	36.00	17.61	1000.0	120.000	154.0	H	8	21.2
805.002900	19.66	36.00	16.34	1000.0	120.000	170.0	V	312	22.8

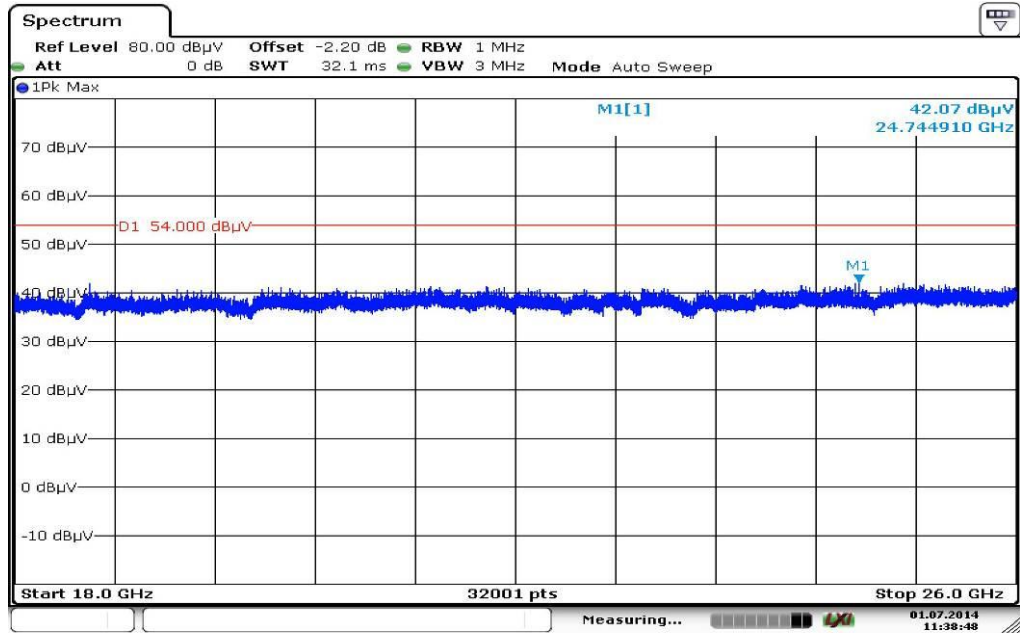
Plot 2: 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization



Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 1.JUL.2014 11:38:48

10.11 Spurious emissions radiated < 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to the middle channel. This measurement is representative for all channels and modes. If peaks are found the lowest and highest channel will be measured too. The measurement is performed with the data rate producing the highest output power. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

Measurement:

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

Limits:

FCC		IC
TX Spurious Emissions Radiated < 30 MHz		
Frequency (MHz)	Field Strength (dB μ V/m)	Measurement distance
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

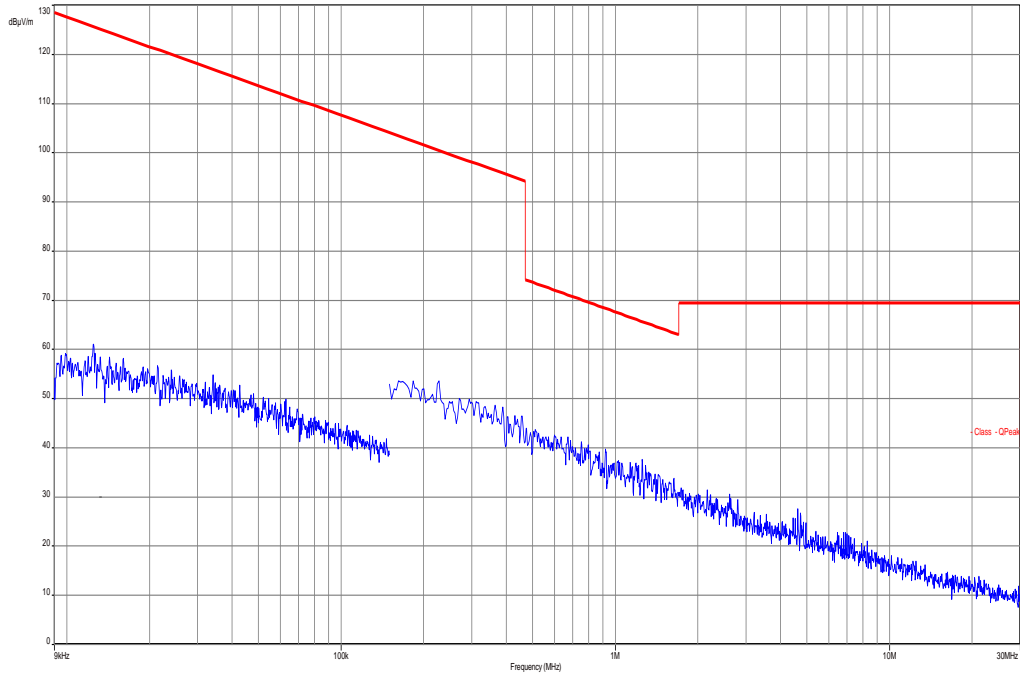
Results:

TX Spurious Emissions Radiated < 30 MHz [dB μ V/m]		
F [MHz]	Detector	Level [dB μ V/m]
No peaks detected.		
Measurement uncertainty	± 3 dB	

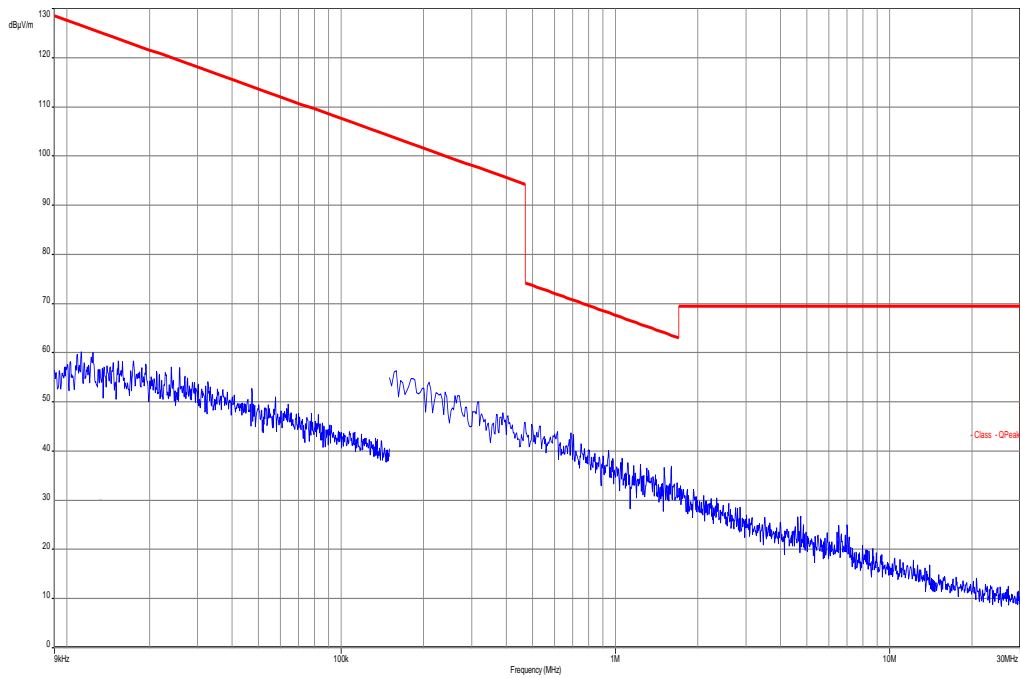
Verdict: Passed

Plots: TX mode

Plot 1: 9 kHz to 30 MHz, ANT 1

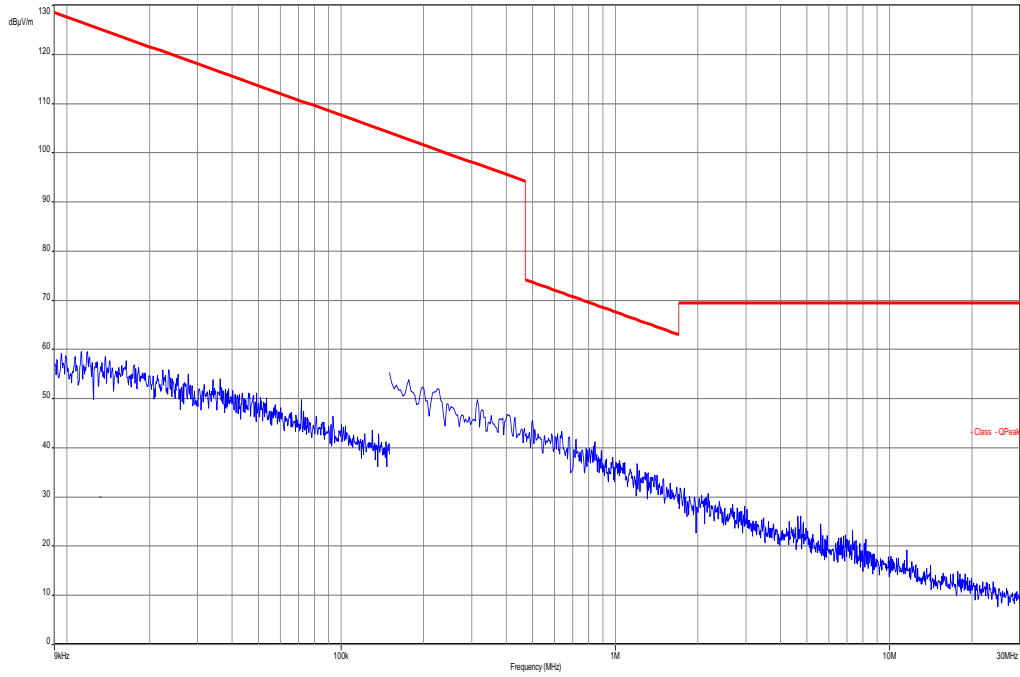


Plot 2: 9 kHz to 30 MHz, ANT 2



Plots: RX / Idle – mode

Plot 1: 9 kHz to 30 MHz



10.12 Spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz.

Measurement:

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

Limits:

FCC		IC	
TX Spurious Emissions Conducted < 30 MHz			
Frequency (MHz)	Quasi-Peak (dBµV/m)	Average (dBµV/m)	
0.15 – 0.5	66 to 56*	56 to 46*	
0.5 – 5	56	46	
5 – 30.0	60	50	

*Decreases with the logarithm of the frequency

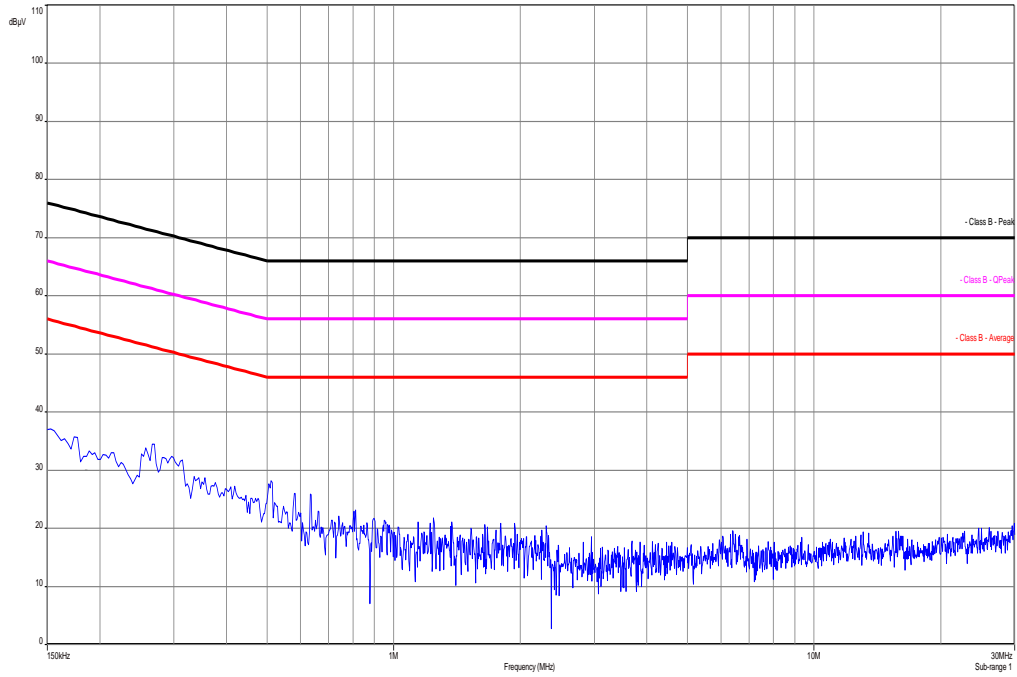
Results:

TX Spurious Emissions Conducted < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No peaks detected.		
Measurement uncertainty	± 3 dB	

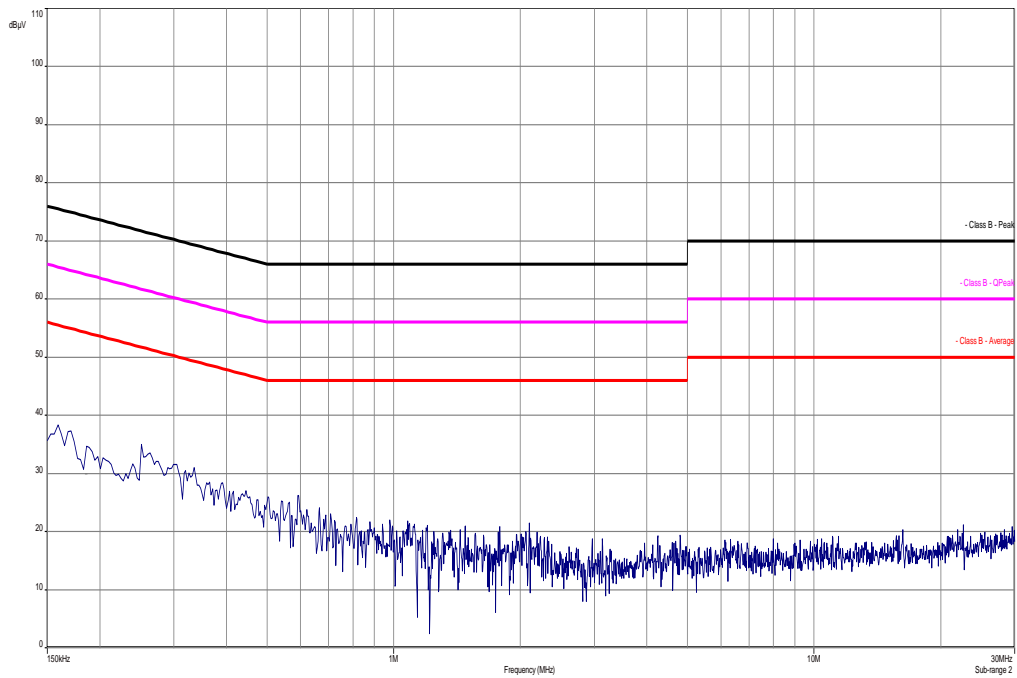
Verdict: Passed

Plots:

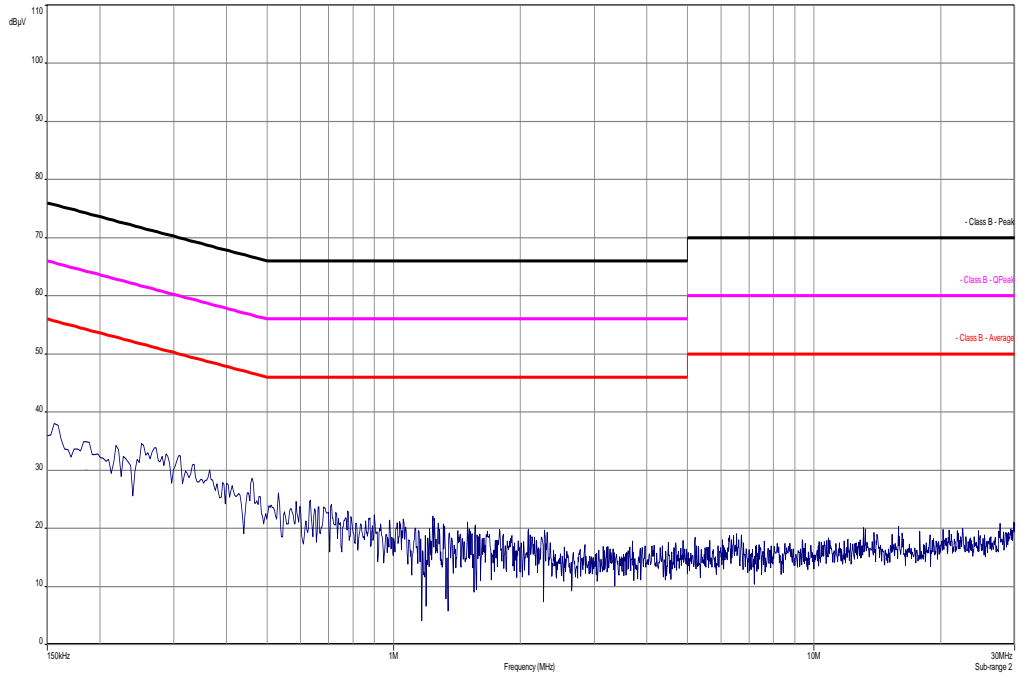
Plot 1: TX mode, 150 kHz to 30 MHz, phase line



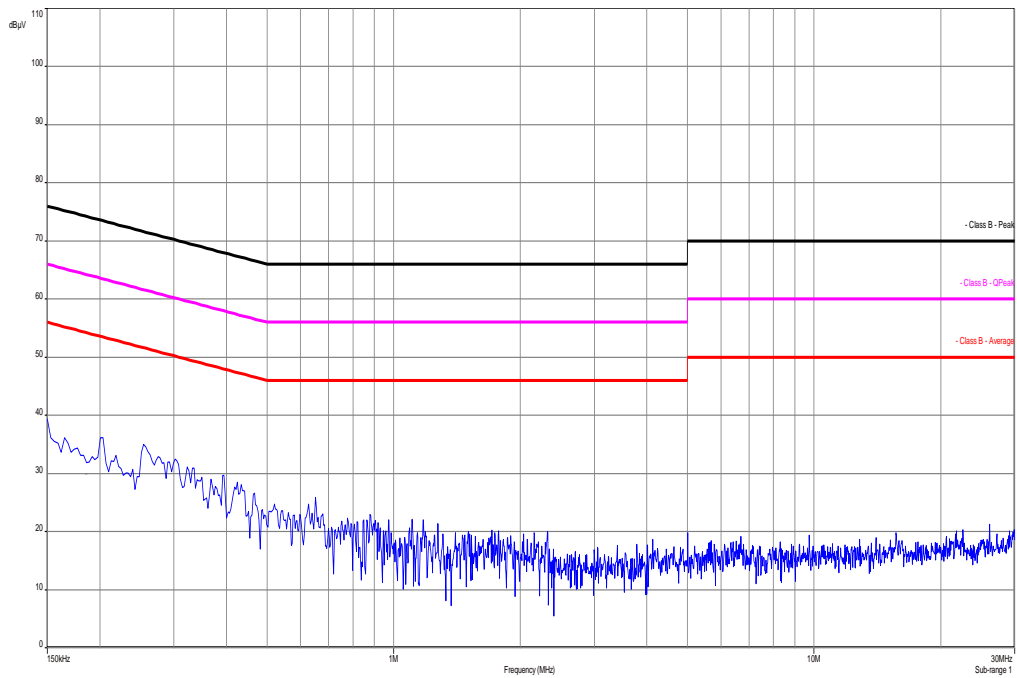
Plot 2: TX mode, 150 kHz to 30 MHz, neutral line



Plot 3: RX / Idle – mode, 150 kHz to 30 MHz, phase line



Plot 4: RX / Idle – mode, 150 kHz to 30 MHz, neutral line



11 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		
3	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	27.01.2014	27.01.2015
4	n. a.	Funkstörmesse mpfänger 20Hz-26,5GHz	ESU26	R&S	100037	300003555	k	28.02.2014	28.02.2015
5	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
6	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
7	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
8	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	22.04.2014	22.04.2016
9	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vKI!	08.05.2013	08.05.2015
10	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
11	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
12	9	Isolating Transformer	MPL IEC625 Bus Regeltrennravo	Erfi	91350	300001155	ne		
13	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
14	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
15	n. a.	Band Reject filter	WRCG240/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
16	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vKI!	14.10.2011	14.10.2014
17	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	13.03.2014	13.03.2015
18	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
19	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787	k	22.07.2013	22.07.2015
20	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442	k	19.07.2013	19.07.2015
21	n. a.	Spectrum Analyzer 9kHz	FSP30	R&S	100886	300003575	k	22.08.2012	22.08.2014

		to 30GHz - 140..+30dBm							
22	n. a.	Switch / Control Unit	3488A	HP Meßtechnik		300001691	ne		
23	n. a.	Switch / Control Unit	SSCU	R&S	338864/003	300002681-0006	ne		
24	n. a.	Frequency Standard (Rubidium Frequency Standard)	MFS (Rubidium)	R&S (Datum)	002	300002681-0009	Ve	21.08.2012	21.08.2014
25	n. a.	Directional Coupler	101020010	Krytar	70215	300002840	ev		
26	n. a.	DC-Blocker	8143	Inmet Corp.	none	300002842	ne		
27	n. a.	Powersplitter	6005-3	Inmet Corp.		300002841	ev		

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

12 Observations

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

Annex A Document history

Version	Applied changes	Date of release
	Initial release	2014-07-11
-A	Updated of the conducted measurements	2015-01-23

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

Back side of certificate



Deutsche Akkreditierungsstelle GmbH

Befehle 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 / GPRS, Over the Air (OTA) Performance)
Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
Produktsicherheit
SAR and 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

Im Auftrag D-PL-12076-01/14/001
 Akkreditierungsstellenleiter

Deutsche Akkreditierungsstelle GmbH

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 Spittelmarkt 10
 10117 Berlin

Standort Frankfurt am Main
 Gartenstraße 6
 60504 Frankfurt am Main

Standort Braunschweig
 Bundesallee 100
 38116 Braunschweig

Die auszugsweise Veröffentlichung der Akkreditierungsurkunde bedarf der vorherigen schriftlichen
 Zustimmung der Deutsche Akkreditierungsstelle GmbH (DAkkS). Ausgenommen davon ist die separate
 Weiterverarbeitung des Deckblattes durch die umseitig genannte Konformitätsbewertungsstelle in
 unveränderter Form.

Es darf nicht der Anschein erweckt werden, dass sich die Akkreditierung auch auf Bereiche erstreckt,
 die über den durch die DAkkS bestätigten Akkreditierungsbereich hinausgehen.

Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom
 31. Juli 2009 (BGBl. I S. 2675) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments
 und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung
 im Zusammenhang mit der Vermarktung von Produkten (Abt. L 228 vom 9. Juli 2008, S. 30).
 Die DAkkS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der
 European Cooperation for Accreditation (EA), des International Accreditation Forum (IAF) und
 der International Laboratory Accreditation Cooperation (ILAC). Die Unterzeichner dieser Abkommen
 erkennen ihre Akkreditierungen gegenseitig an.

Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:
 EA: www.european-accreditation.org
 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.

<http://www.cetecom.com/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html>