

TEST REPORT

Test report no.: 1-6234/13-08-09



Deutsche
Akkreditierungsstelle
D-PL-12076-01-01

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-12076-01-01

Area of Testing: Radio/Satellite Communications

Applicant

Research In Motion Limited

305 Phillip Street

Waterloo, ON N2L 3W8 / CANADA

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Contact: Masud Attayi

e-mail: mattayi@rim.com

Manufacturer

Research In Motion Limited

305 Phillip Street

Waterloo, ON N2L 3W8 / CANADA

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
Low-power Licence-exempt Radiocommunication Devices (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: Blackberry GSM Phones

Model name: RGF111LW

FCC ID: L6ARGF110LW

IC: 2503A-RGF110LW

Frequency: DTS band 2400 MHz to 2483.5 MHz
(lowest channel 00 - 2402 MHz; highest channel 78 - 2480 MHz)

Technology tested: Bluetooth® + EDR

Antenna: Integrated antenna

Power supply: 3.80 V DC by Li - polymer battery

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:

Andreas Luckenbill
Expert

Test performed:

Marco Bertolino
Testing Manager

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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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2.2 Application details

Date of receipt of order:	2013-08-19
Date of receipt of test item:	2013-08-23
Start of test:	2013-08-23
End of test:	2013-08-27
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	01.10.2012	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 Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

4 Test environment

Temperature:	T_{nom}	+22 °C during room temperature tests
	T_{max}	No tests under extreme conditions!
	T_{min}	No tests under extreme conditions!
Relative humidity content:		46 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	3.80 V DC by Li - polymer battery
	V_{max}	No tests under extreme conditions!
	V_{min}	No tests under extreme conditions!

5 Test item

Kind of test item	:	Blackberry GSM Phones
Type identification	:	RGF111LW
S/N serial number	:	Radiated units: IMEI EUT 1: 004402242479081 IMEI EUT 2: 004402242479065
HW hardware status	:	CER-57711-001 Rev. 2
SW software status	:	10.2.0.1155
Frequency band [MHz]	:	DTS band 2400 MHz to 2483.5 MHz (lowest channel 00 - 2402 MHz; highest channel 78 - 2480 MHz)
Type of radio transmission	:	FHSS
Use of frequency spectrum	:	
Type of modulation	:	GFSK, Pi/4 DQPSK and 8 DPSK
Number of channels	:	79
Antenna	:	Integrated antenna
Power supply	:	3.80 V DC by Li - polymer battery

5.1 Additional information

Test setup- and EUT-photos are included in test reports: 1-6234/13-08-01_AnnexA
1-6234/13-08-01_AnnexD

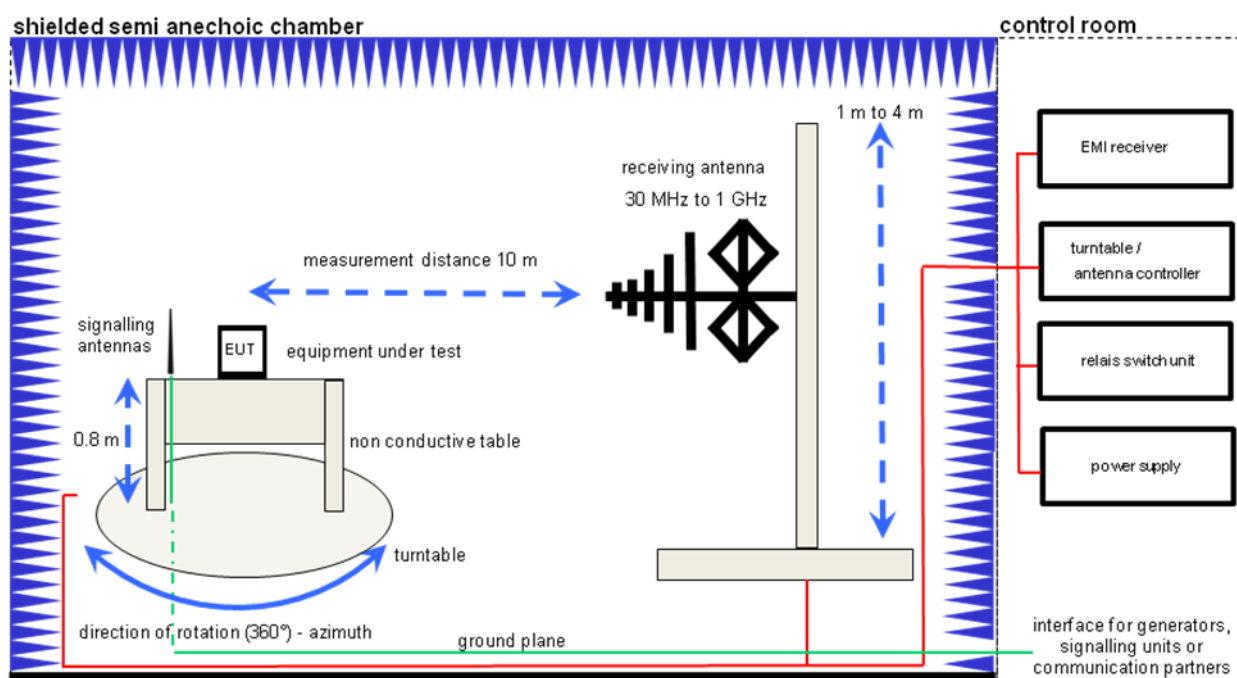
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements chamber F

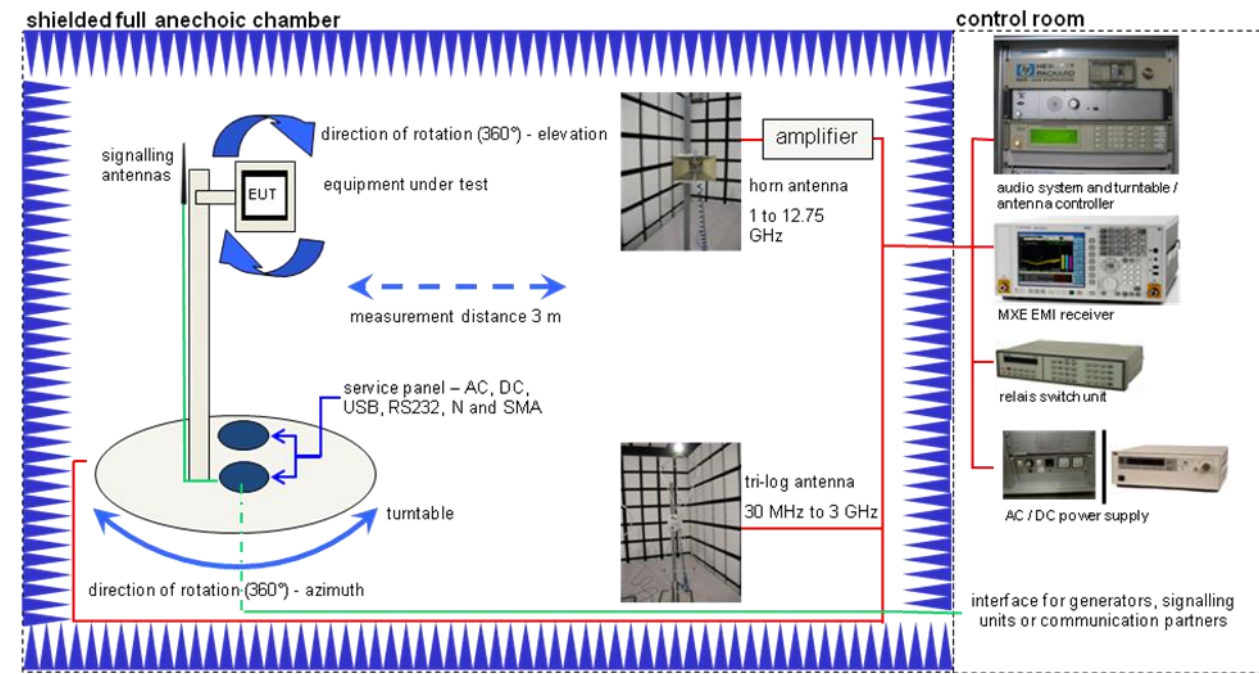
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas 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
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
CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516

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
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
CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516

7.3 Radiated measurements 12.75 GHz to 25 GHz



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268
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		300002440
Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517
CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516

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, Annex 8	Passed	2013-08-30	Tests according to manufacturer test plan.

Test specification clause	Test case	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	☐	☐	☐	☒	-/-
§15.247(e) RSS 210 / A8.2(b)	Power spectral density	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐	☐	☒	☐	Not applicable for FHSS!
§15.247(a)(1) RSS 210 / A8.1(b)	Carrier frequency separation	Nominal	Nominal	GFSK	☐	☐	☐	☒	-/-
§15.247(a)(1) RSS 210 / A8.1(d)	Number of hopping channels	Nominal	Nominal	GFSK	☐	☐	☐	☒	-/-
§15.247(a)(1) (iii) RSS 210 / A8.3(1)	Time of occupancy (dwell time)	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐	☐	☐	☒	-/-
§15.247(a)(1) RSS 210 / A8.2(a)	Spectrum bandwidth of a FHSS system 20dB bandwidth	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☒ ☒ ☒	-/-
§15.247(b)(1) RSS-210 / A8.4(2)	Maximum output power	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☒ ☒ ☒	-/-
§15.247(d) RSS-210 / A8.5	Band edge compliance conducted	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☒ ☒ ☒	-/-
§15.205 RSS-210 / A8.5	Band edge compliance radiated	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☒ ☒ ☒	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	complies
§15.247(d) RSS-210 / A8.5	TX spurious emissions conducted	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	☒ ☒ ☒	-/-
§15.247(d) RSS-210 / A8.5	TX spurious emissions radiated	Nominal	Nominal	GFSK Pi/4 DQPSK 8 DPSK	☒ ☒ ☒	☐ ☐ ☐	☐ ☐ ☐	☐ ☐ ☐	complies
§15.109 RSS-Gen	RX spurious emissions radiated	Nominal	Nominal	-/-	☐	☐	☐	☒	-/-
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	GFSK	☐	☐	☐	☒	-/-
§15.107(a)	Conducted emissions < 30 MHz	Nominal	Nominal	GFSK	☐	☐	☐	☒	-/-

Note: NA = Not Applicable; NP = Not Performed

9 Additional comments

The Bluetooth[®] word mark and logos are owned by the Bluetooth SIG Inc. and any use of such marks by Cetecom ICT Services GmbH is under license.

Reference documents: RIM_EMI_Matrix for Cetecom_King_RGF111LW (Aug-12-2013)

Special test descriptions: Tests according to manufacturer test plan.

Configuration descriptions: TX tests: were performed with x-DH5 packets and static PRBS pattern payload.
RX/Standby tests: BT test mode enabled, scan enabled, TX Idle

Test mode:

- ☒ Bluetooth Test mode loop back enabled
(EUT is controlled over CBT/CMU)
- ☐ Special software is used.
EUT is transmitting pseudo random data by itself

10 Measurement results

10.1 Antenna gain

Not performed – tests according to manufacturer test plan.

10.2 Power spectral density

Not performed – tests according to manufacturer test plan.

10.3 Carrier frequency separation

Not performed – tests according to manufacturer test plan.

10.4 Number of hopping channels

Not performed – tests according to manufacturer test plan.

10.5 Time of occupancy (dwell time)

Not performed – tests according to manufacturer test plan.

10.6 Spectrum bandwidth of a FHSS system – 20 dB bandwidth

Not performed – tests according to manufacturer test plan.

10.7 Maximum output power

Not performed – tests according to manufacturer test plan.

10.8 Band edge compliance conducted

Not performed – tests according to manufacturer test plan.

10.9 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. The EUT is set to single channel mode and the transmit channel is channel 00 for the lower restricted band and channel 78 for the upper restricted band. The measurement is repeated for all modulations. Measurement distance is 3m.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	1 MHz Peak / 10 Hz AVG
Resolution bandwidth:	1 MHz
Span:	Lower Band: 2370 – 2400 MHz higher Band: 2480 – 2500 MHz
Trace-Mode:	Max Hold

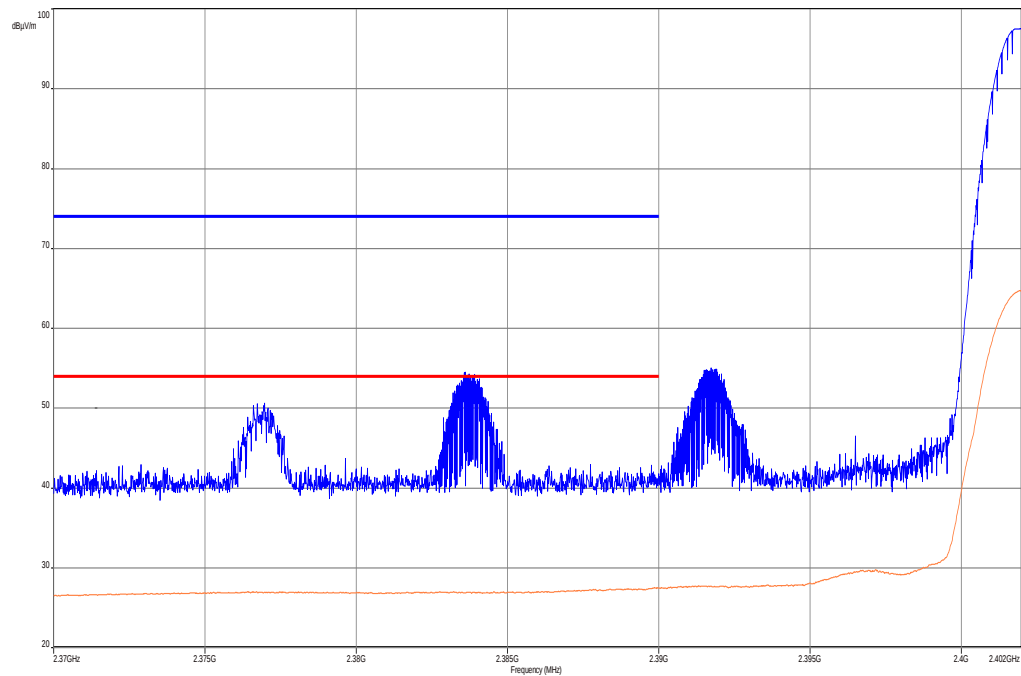
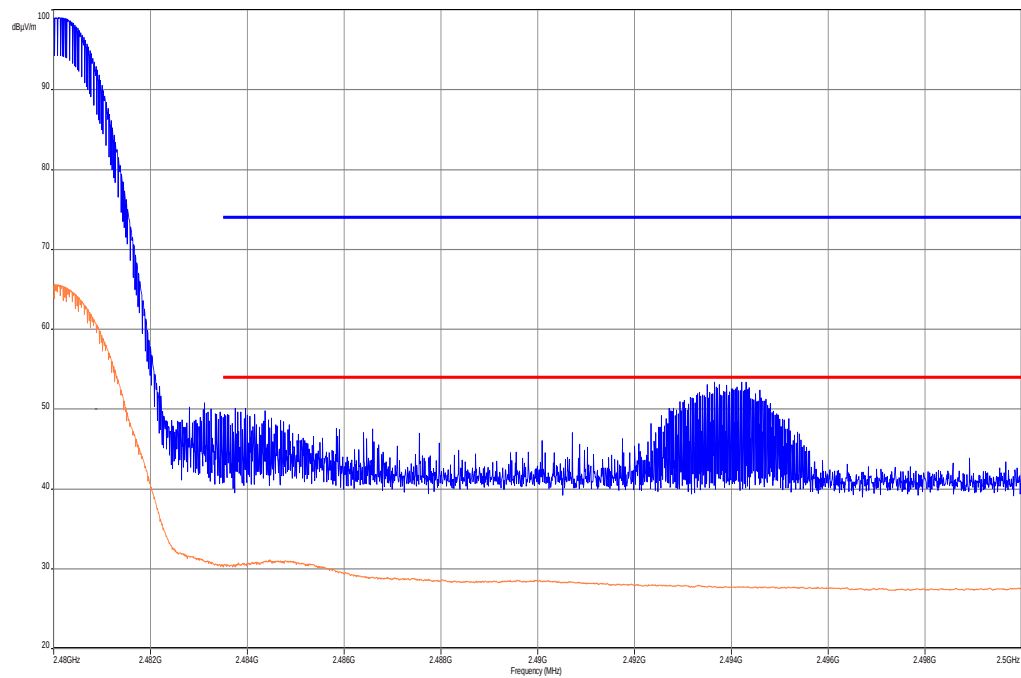
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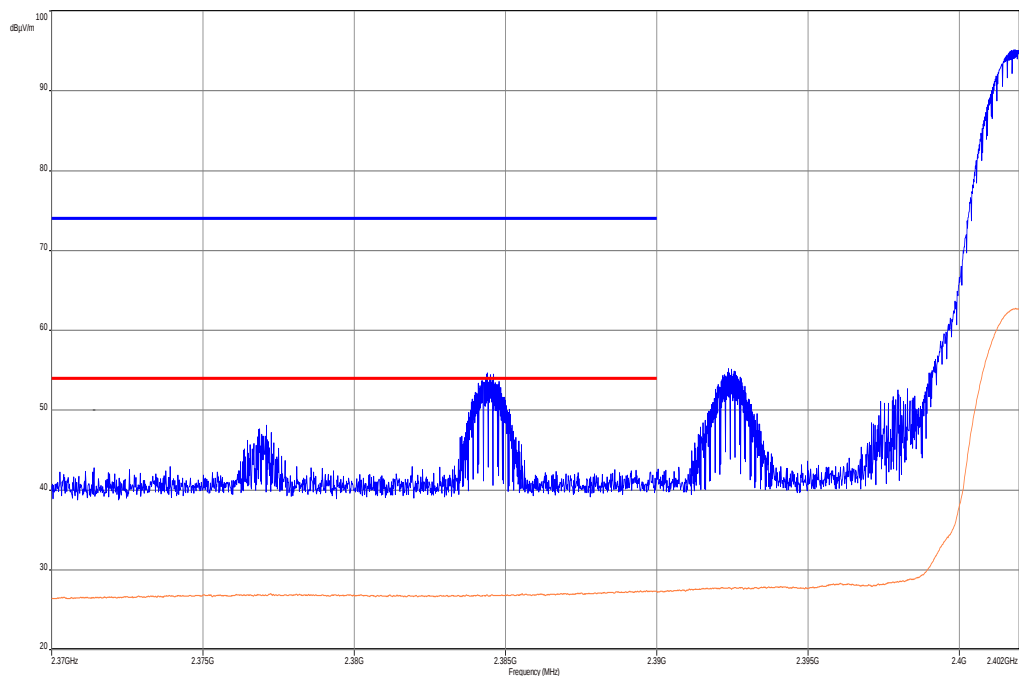
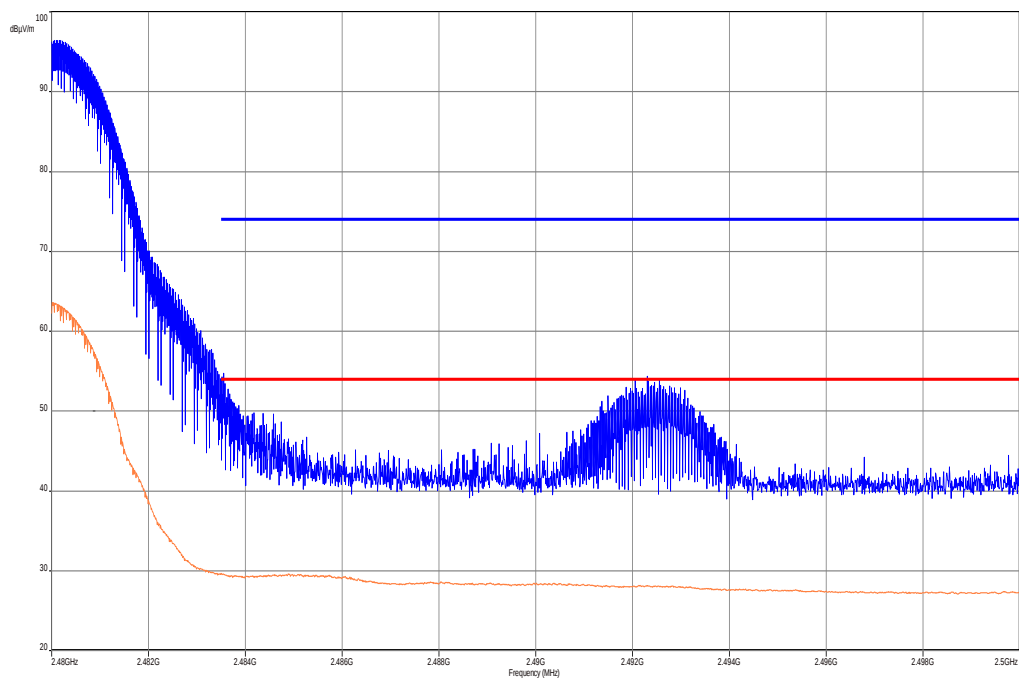
FCC	IC
Band edge compliance radiated	
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth 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)).	
74 dBµV/m Peak 54 dBµV/m AVG	

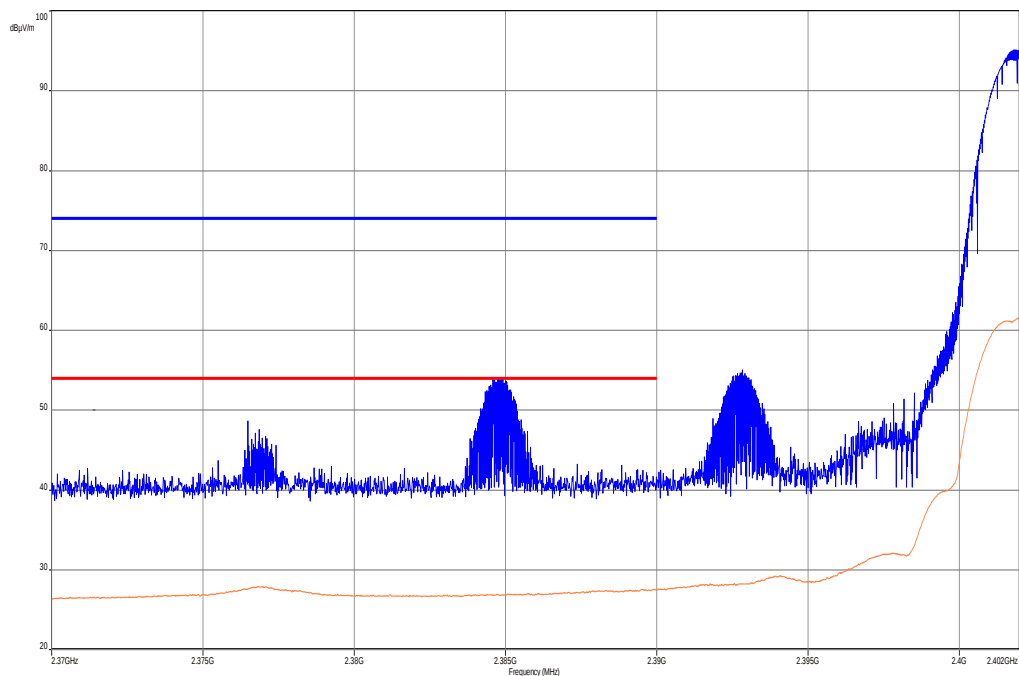
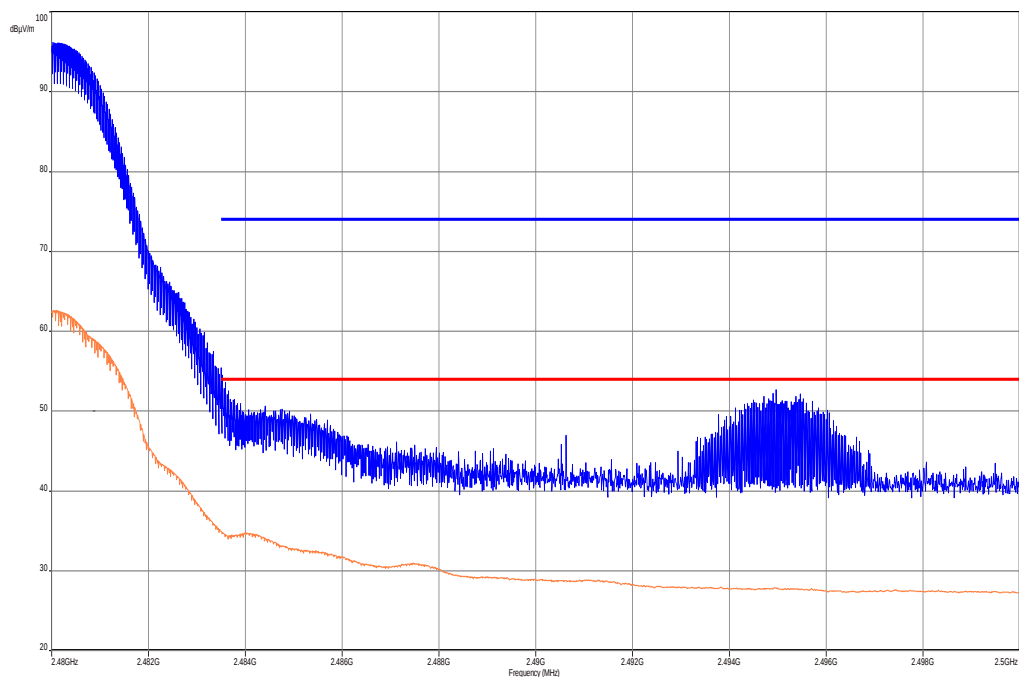
Results:

Scenario Modulation	Band edge compliance radiated [dBµV/m]		
	GFSK	PI/4 DQPSK	8DPSK
Lower restricted band	54.5 dBµV/m Peak 27.5 dBµV/m AVG	54.7 dBµV/m Peak 27.4 dBµV/m AVG	54.1 dBµV/m Peak 27.9 dBµV/m AVG
Upper restricted band	53.4 dBµV/m Peak 31.1 dBµV/m AVG	54.3 dBµV/m Peak 29.6 dBµV/m AVG	54.5 dBµV/m Peak 34.8 dBµV/m AVG
Measurement uncertainty	± 3 dB		

Result: Passed

Plots:**Plot 1:** Lower band edge, GFSK modulation, vertical & horizontal polarization**Plot 2:** Upper band edge, GFSK modulation, vertical & horizontal polarization

Plot 3: Lower band edge, Pi/4 DQPSK modulation, vertical & horizontal polarization**Plot 4:** Upper band edge, Pi/4 DQPSK modulation, vertical & horizontal polarization

Plot 5: Lower band edge, 8 DPSK modulation, vertical & horizontal polarization**Plot 6:** Upper band edge, 8 DPSK modulation, vertical & horizontal polarization

10.10 TX spurious emissions conducted

Not performed – tests according to manufacturer test plan.

10.11 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode. The EUT is set to single channel mode and the transmit channel is channel 00, channel 39 and channel 78. The measurement is performed in the mode with the highest output power.

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold
Measured Modulation:	☒ GFSK ☒ Pi/4 DQPSK ☒ 8DPSK

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		
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 §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
§15.209		
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: GFSK

TX spurious emissions radiated [dBμV/m]								
2402 MHz			2441 MHz			2480 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.		
All detected emissions above 1 GHz are more than 20 dB below the limit.			All detected emissions above 1 GHz are more than 20 dB below the limit.			All detected emissions above 1 GHz are more than 20 dB below the limit.		
Measurement uncertainty			± 3 dB					

Result: Passed**Results: Pi/4 DQPSK**

TX spurious emissions radiated [dBμV/m]								
2402 MHz			2441 MHz			2480 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.		
All detected emissions above 1 GHz are more than 20 dB below the limit.			All detected emissions above 1 GHz are more than 20 dB below the limit.			All detected emissions above 1 GHz are more than 20 dB below the limit.		
Measurement uncertainty			± 3 dB					

Result: Passed**Results: 8 DPSK**

TX spurious emissions radiated [dBμV/m]								
2402 MHz			2441 MHz			2480 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.		
All detected emissions above 1 GHz are more than 20 dB below the limit.			All detected emissions above 1 GHz are more than 20 dB below the limit.			All detected emissions above 1 GHz are more than 20 dB below the limit.		
Measurement uncertainty			± 3 dB					

Result: Passed

Plots: GFSK (DH5) modulation

Plot 1: 30 MHz to 1 GHz, TX mode, channel 00, vertical & horizontal polarization

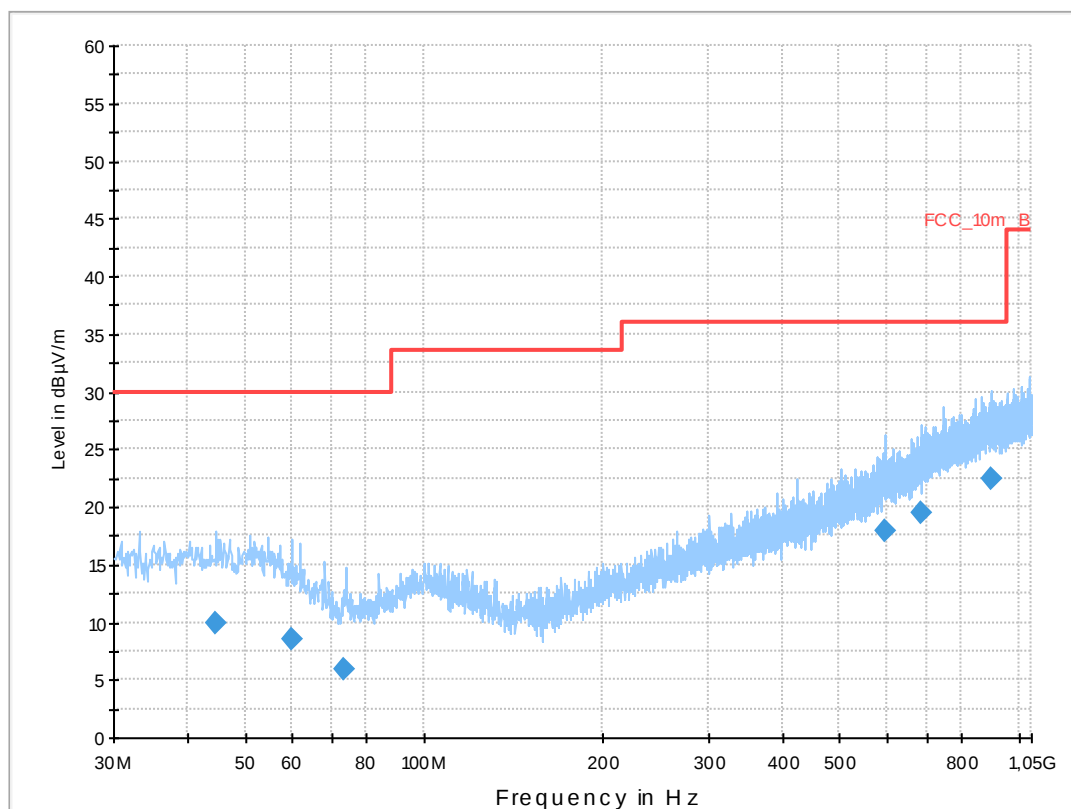
Common Information

EUT: RGF111LW + HS1 + CH1 + USB1
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT DH5 testmode CH0
 Operator Name: Wolsdorfer
 Comment: AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

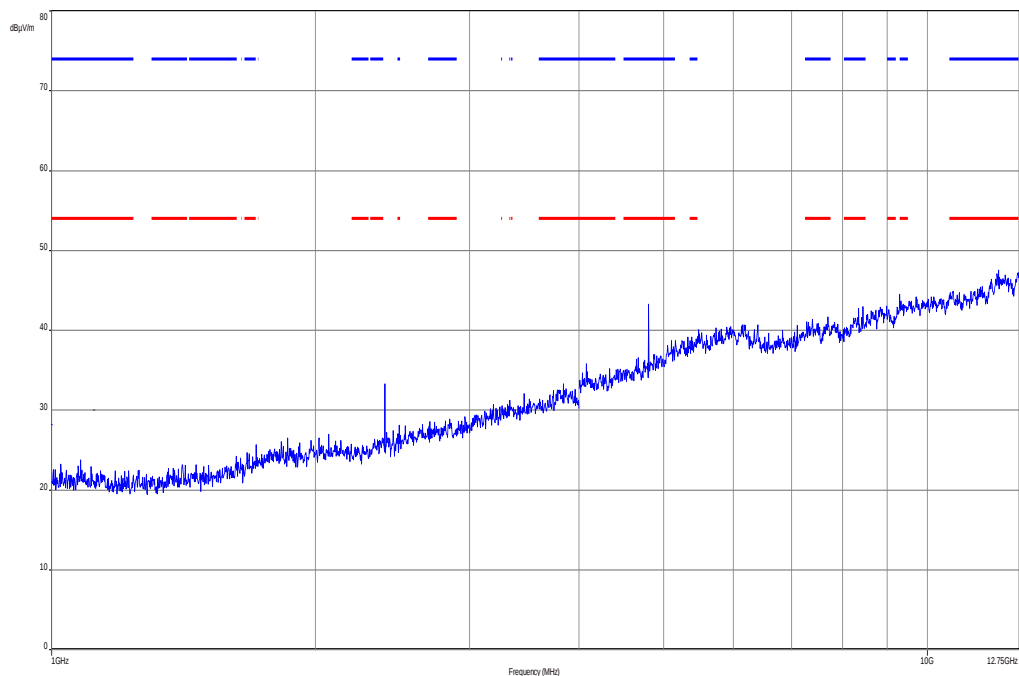
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

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

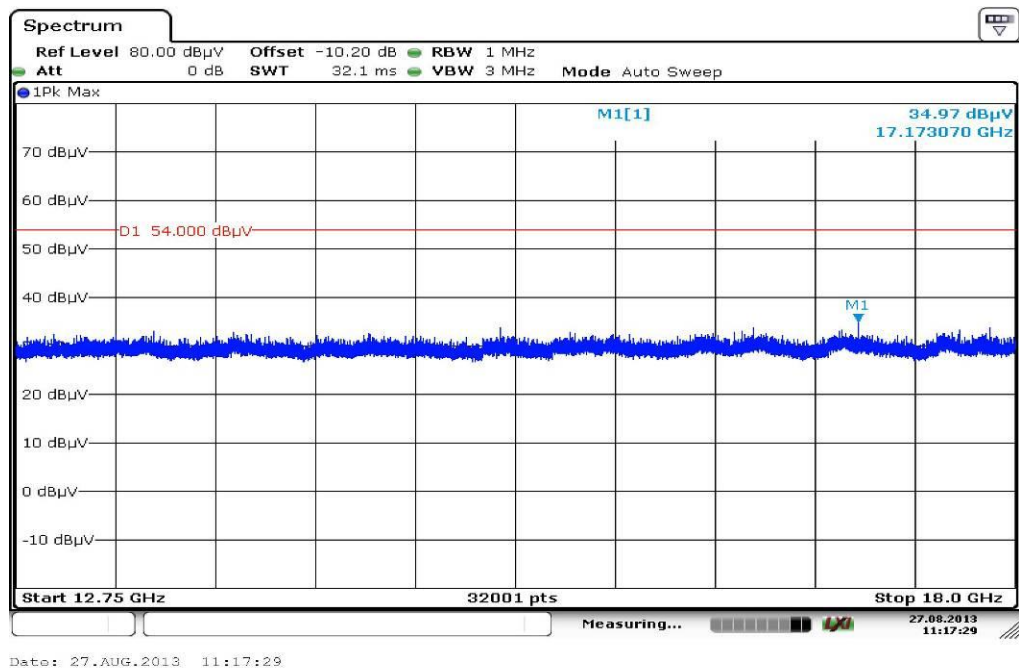


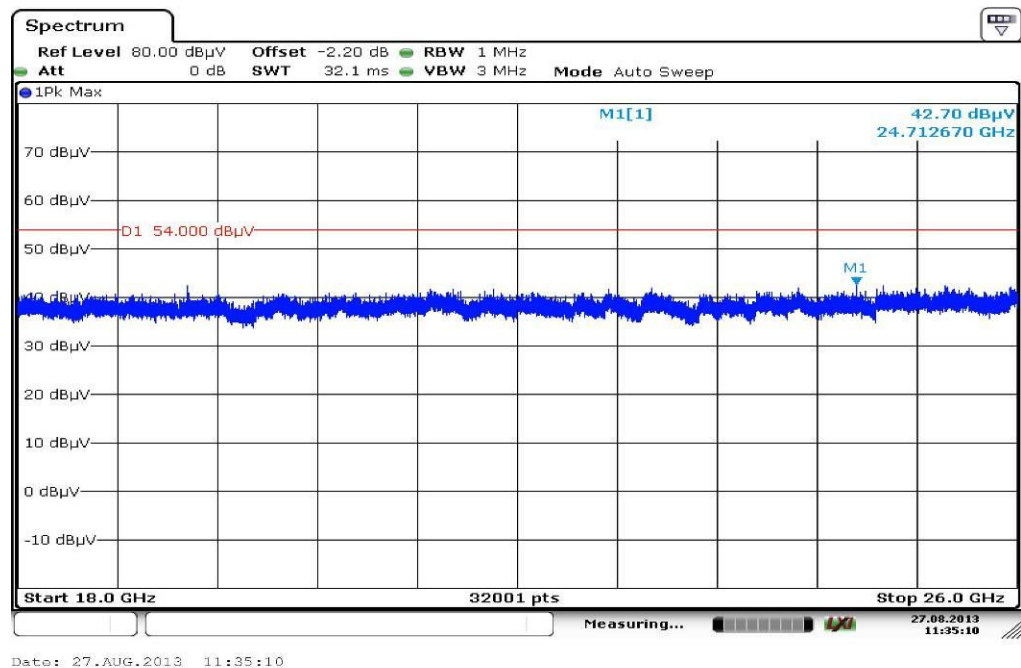
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
44.676300	9.9	1000.0	120.000	98.0	H	-3.0	13.3	20.1	30.0	
59.934150	8.5	1000.0	120.000	151.0	V	280.0	11.6	21.5	30.0	
73.468800	6.0	1000.0	120.000	153.0	H	-9.0	9.2	24.0	30.0	
594.383850	17.9	1000.0	120.000	170.0	V	100.0	20.6	18.1	36.0	
686.717550	19.5	1000.0	120.000	170.0	H	265.0	22.1	16.5	36.0	
897.195150	22.5	1000.0	120.000	132.0	H	170.0	25.2	13.5	36.0	

Plot 2: 1 GHz to 12.75 GHz, TX mode, channel 00, vertical & horizontal polarization

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

Plot 3: 12.75 GHz to 18 GHz, TX mode, channel 00, vertical & horizontal polarization

Plot 4: 18 GHz to 26 GHz, TX mode, channel 00, vertical & horizontal polarization

Plot 5: 30 MHz to 1 GHz, TX mode, channel 39, vertical & horizontal polarization

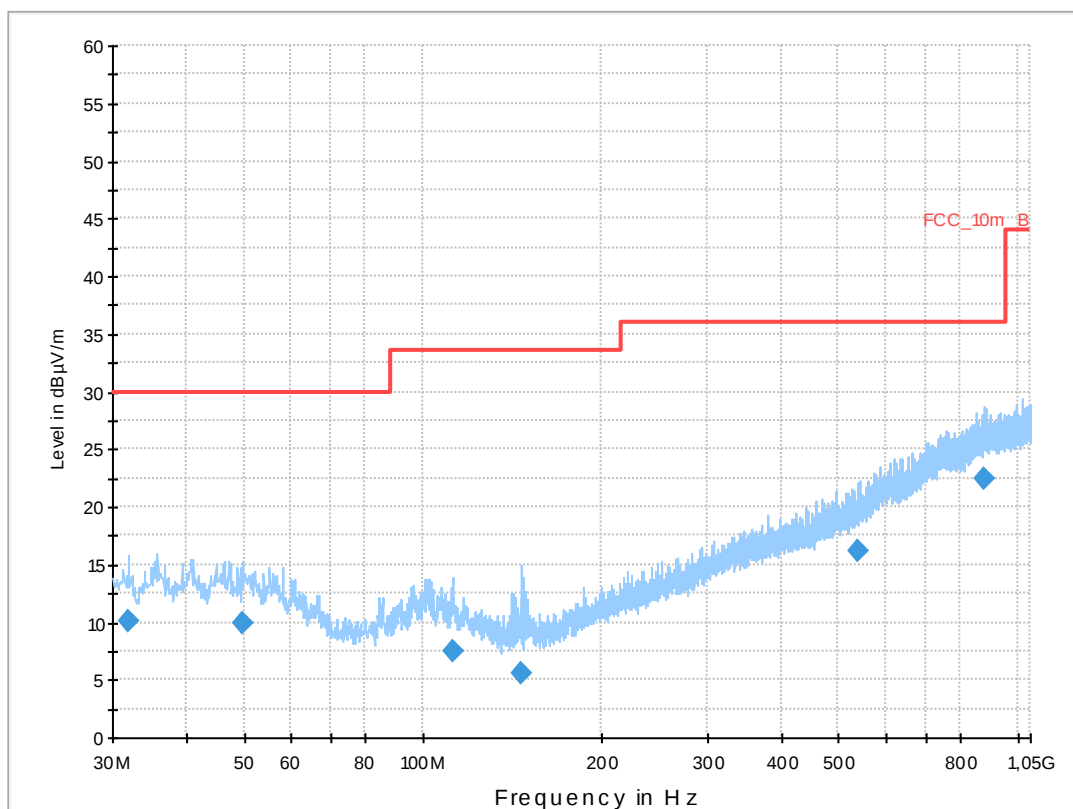
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT DH5 testmode CH39
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

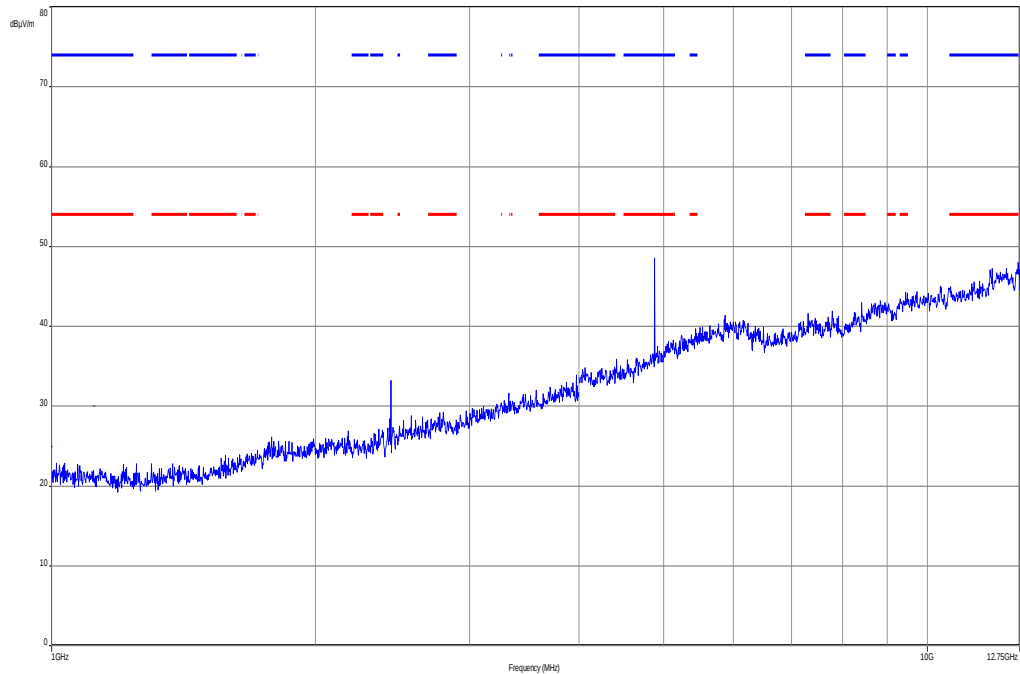
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

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

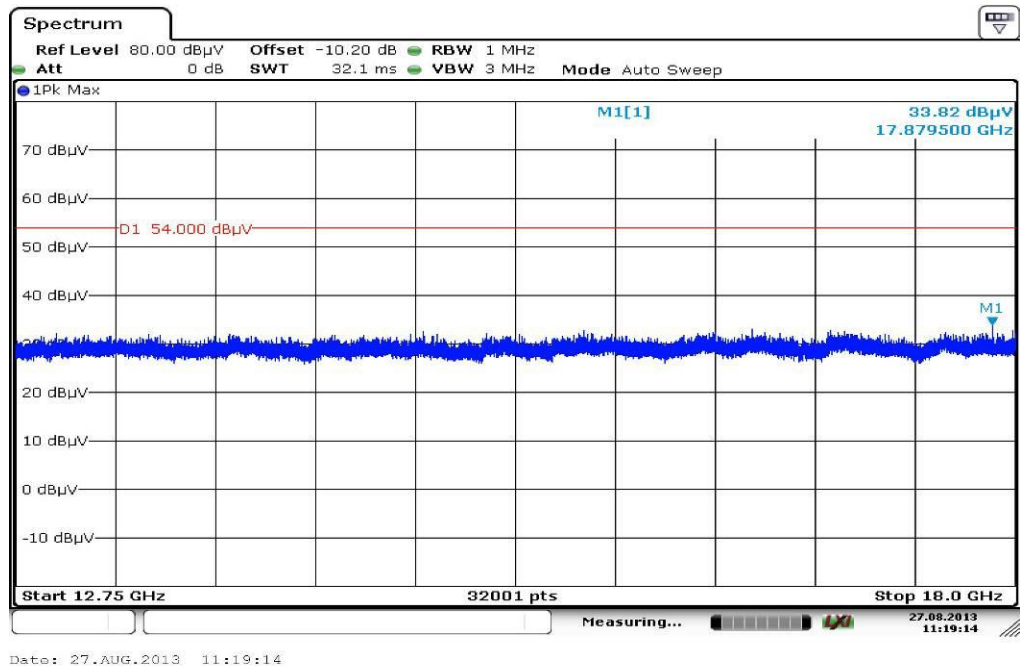


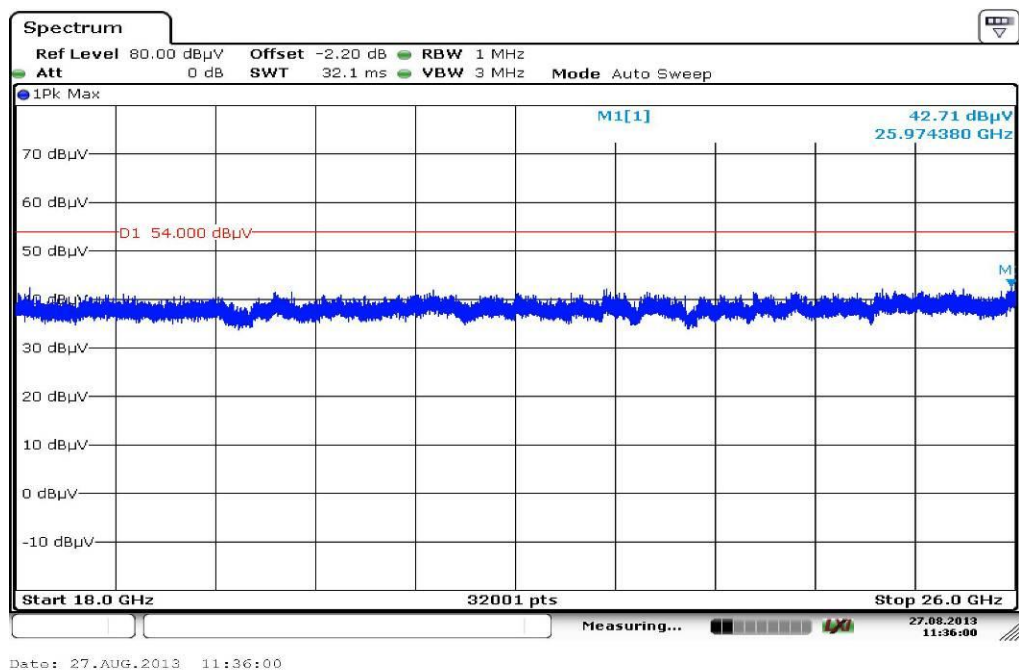
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
31.920000	10.0	1000.0	120.000	185.0	V	277.0	12.7	20.0	30.0	
49.680000	9.8	1000.0	120.000	185.0	V	240.0	13.4	20.2	30.0	
111.840000	7.5	1000.0	120.000	183.0	V	291.0	10.9	26.0	33.5	
146.160000	5.5	1000.0	120.000	270.0	V	214.0	8.8	28.0	33.5	
538.560000	16.2	1000.0	120.000	270.0	H	109.0	19.2	19.8	36.0	
879.840000	22.4	1000.0	120.000	270.0	V	225.0	24.9	13.6	36.0	

Plot 6: 1 GHz to 12.75 GHz, TX mode, channel 39, vertical & horizontal polarization

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

Plot 7: 12.75 GHz to 18 GHz, TX mode, channel 39, vertical & horizontal polarization

Plot 8: 18 GHz to 26 GHz, TX mode, channel 39, vertical & horizontal polarization

Plot 9: 30 MHz to 1 GHz, TX mode, channel 78, vertical & horizontal polarization

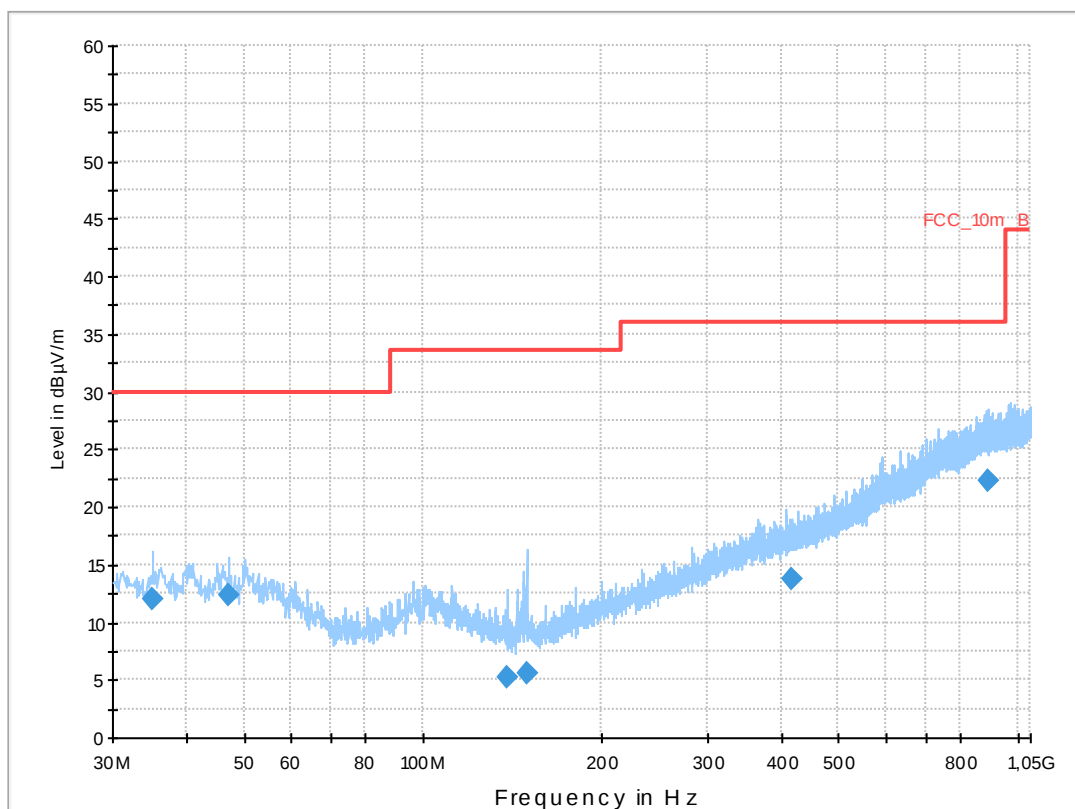
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT DH5 testmode CH78
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

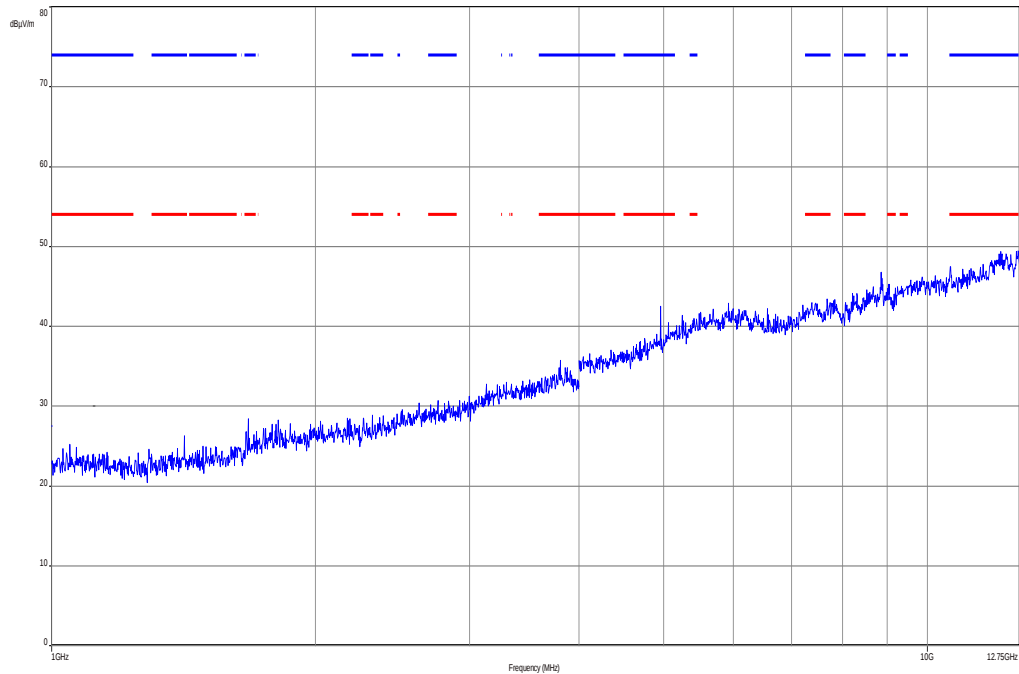
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

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

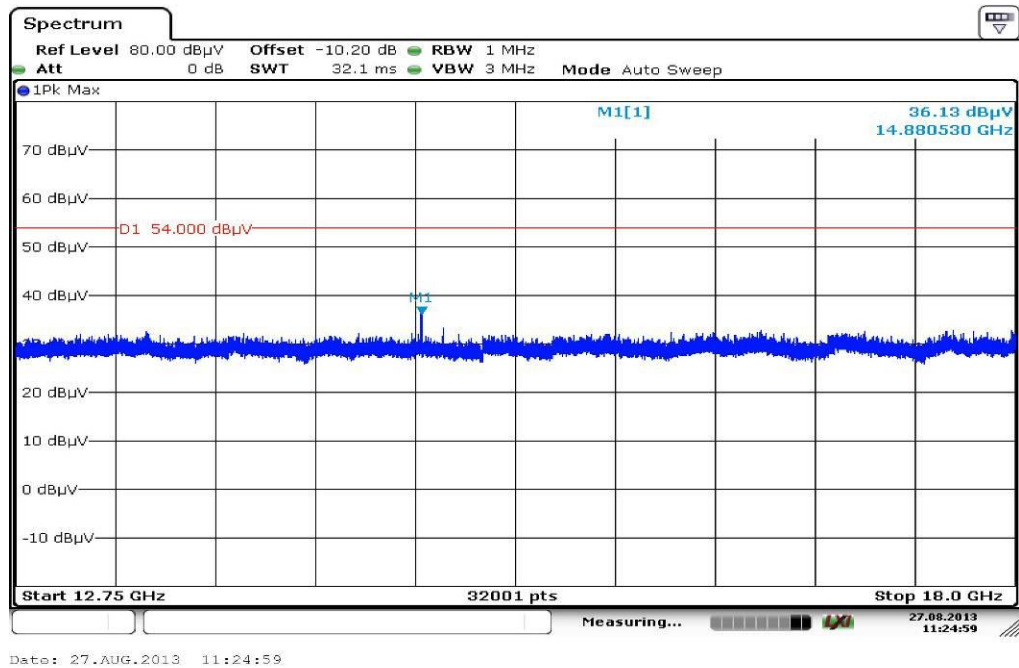


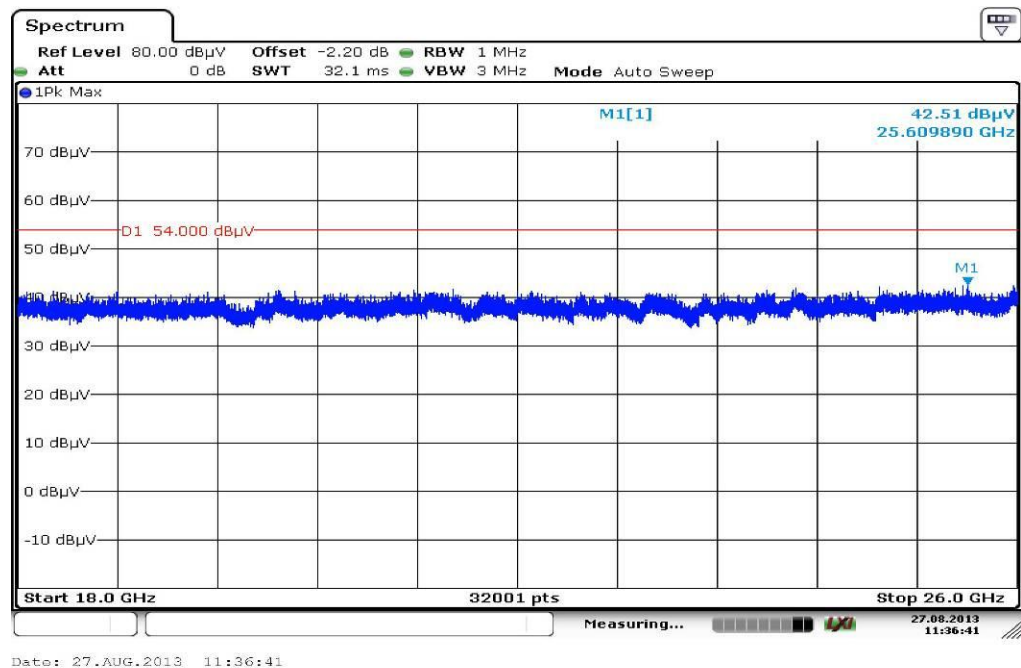
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.040000	12.0	1000.0	120.000	185.0	V	237.0	13.0	18.0	30.0	
47.040000	12.4	1000.0	120.000	98.0	V	145.0	13.3	17.6	30.0	
138.120000	5.3	1000.0	120.000	194.0	V	291.0	8.8	28.2	33.5	
149.040000	5.6	1000.0	120.000	270.0	V	222.0	8.9	27.9	33.5	
418.200000	13.8	1000.0	120.000	181.0	H	350.0	17.2	22.2	36.0	
888.600000	22.3	1000.0	120.000	263.0	H	0.0	25.1	13.7	36.0	

Plot 10: 1 GHz to 12.75 GHz, TX mode, channel 78, vertical & horizontal polarization

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

Plot 11: 12.75 GHz to 18 GHz, TX mode, channel 78, vertical & horizontal polarization

Plot 12: 18 GHz to 26 GHz, TX mode, channel 78, vertical & horizontal polarization

Plots: Pi/4 DQPSK (2-DH5) modulation

Plot 1: 30 MHz to 1 GHz, TX mode, channel 00, vertical & horizontal polarization

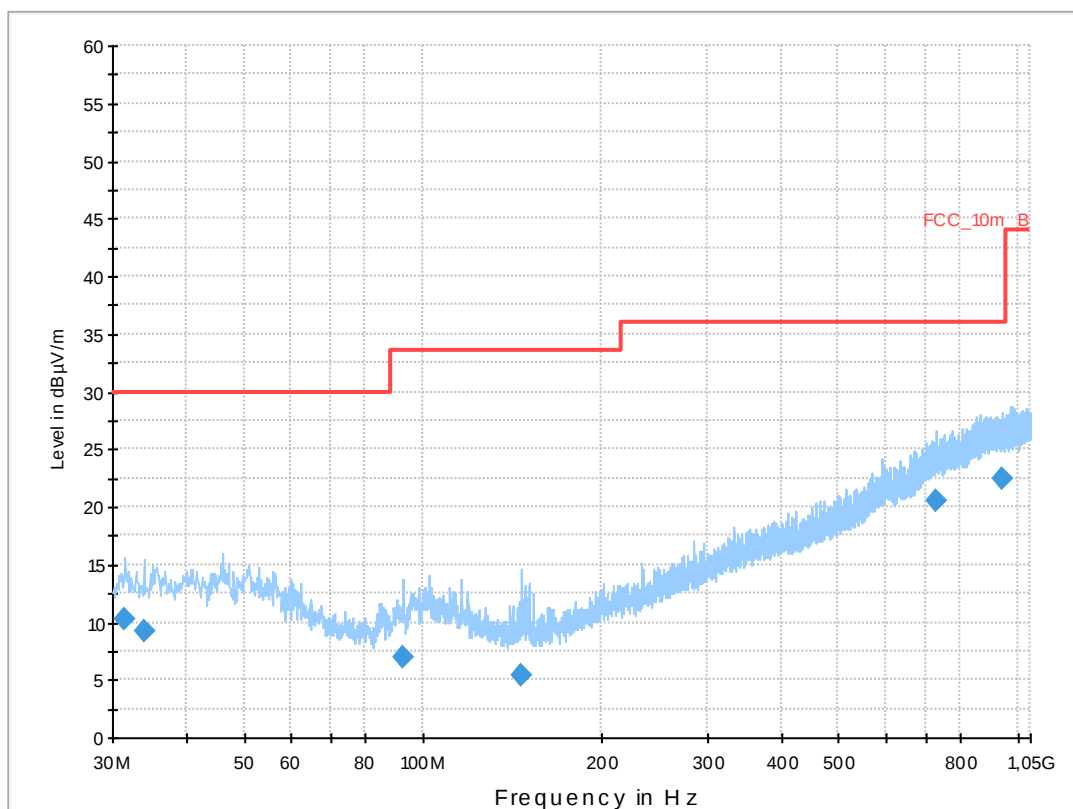
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT 2DH5 testmode CH0
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

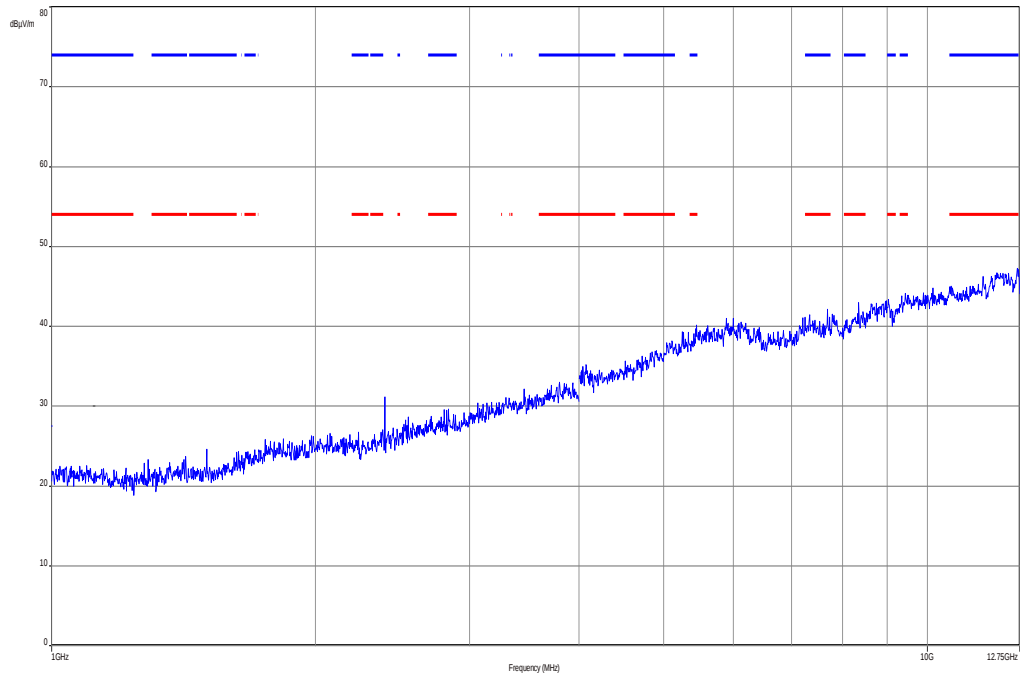
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dBμV/m

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

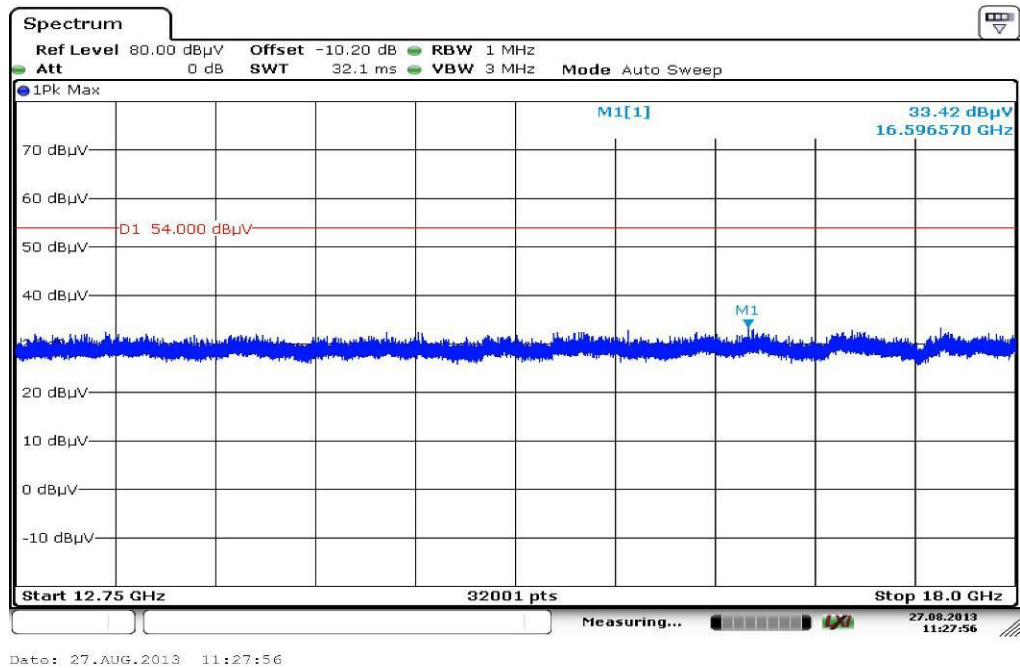


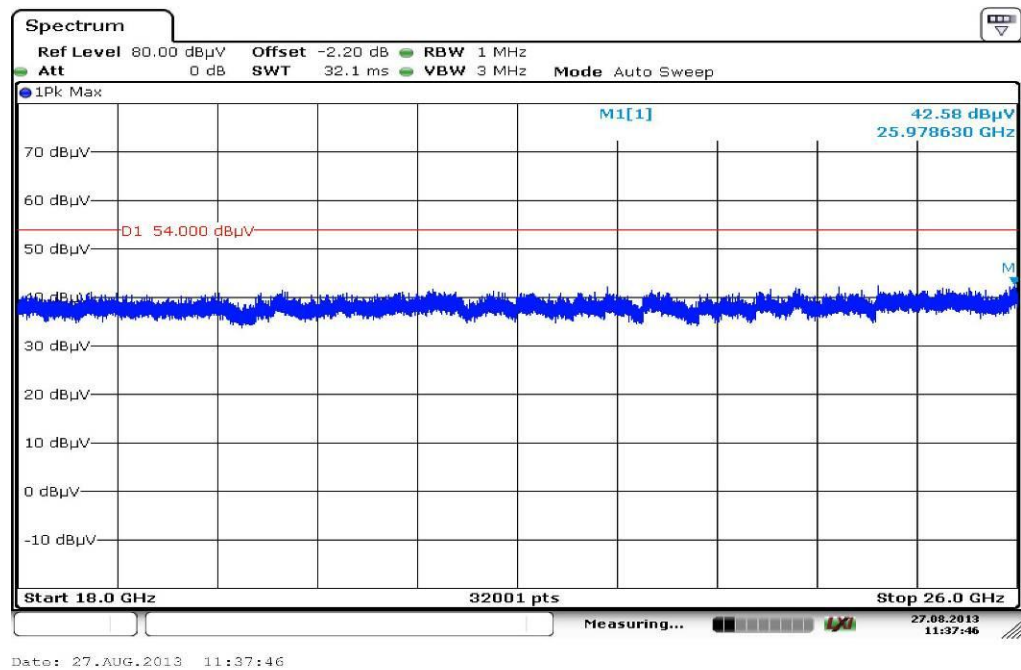
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
31.440000	10.2	1000.0	120.000	182.0	V	268.0	12.7	19.8	30.0	
33.840000	9.1	1000.0	120.000	196.0	V	129.0	12.9	20.9	30.0	
92.640000	6.9	1000.0	120.000	104.0	V	52.0	10.9	26.6	33.5	
146.280000	5.4	1000.0	120.000	168.0	V	228.0	8.8	28.1	33.5	
730.320000	20.5	1000.0	120.000	270.0	V	100.0	23.2	15.5	36.0	
938.520000	22.5	1000.0	120.000	270.0	V	191.0	25.3	13.5	36.0	

Plot 2: 1 GHz to 12.75 GHz, TX mode, channel 00, vertical & horizontal polarization

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

Plot 3: 12.75 GHz to 18 GHz, TX mode, channel 00, vertical & horizontal polarization

Plot 4: 18 GHz to 26 GHz, TX mode, channel 00, vertical & horizontal polarization

Plot 5: 30 MHz to 1 GHz, TX mode, channel 39, vertical & horizontal polarization

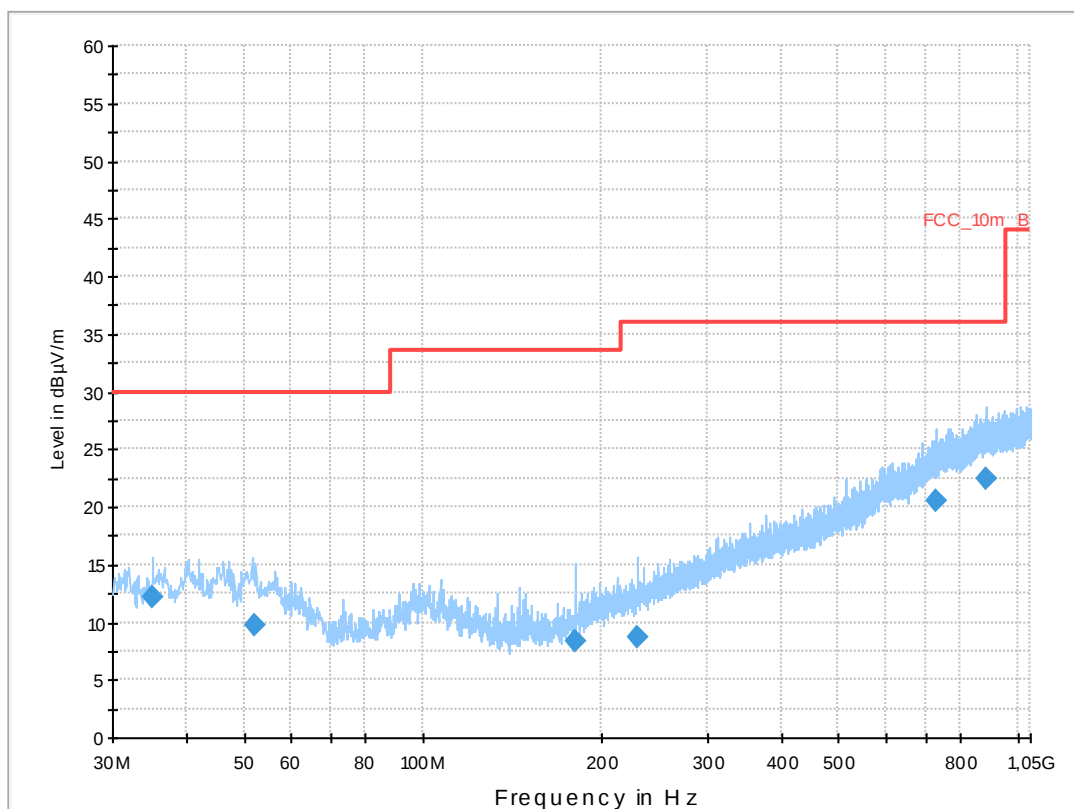
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT 2DH5 testmode CH39
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

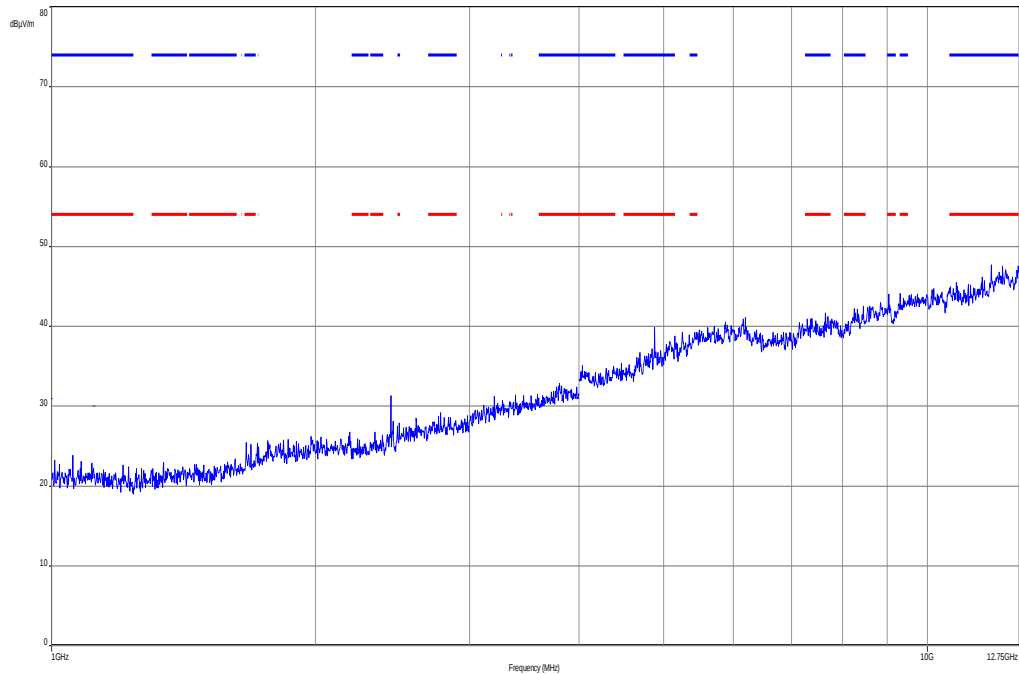
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

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

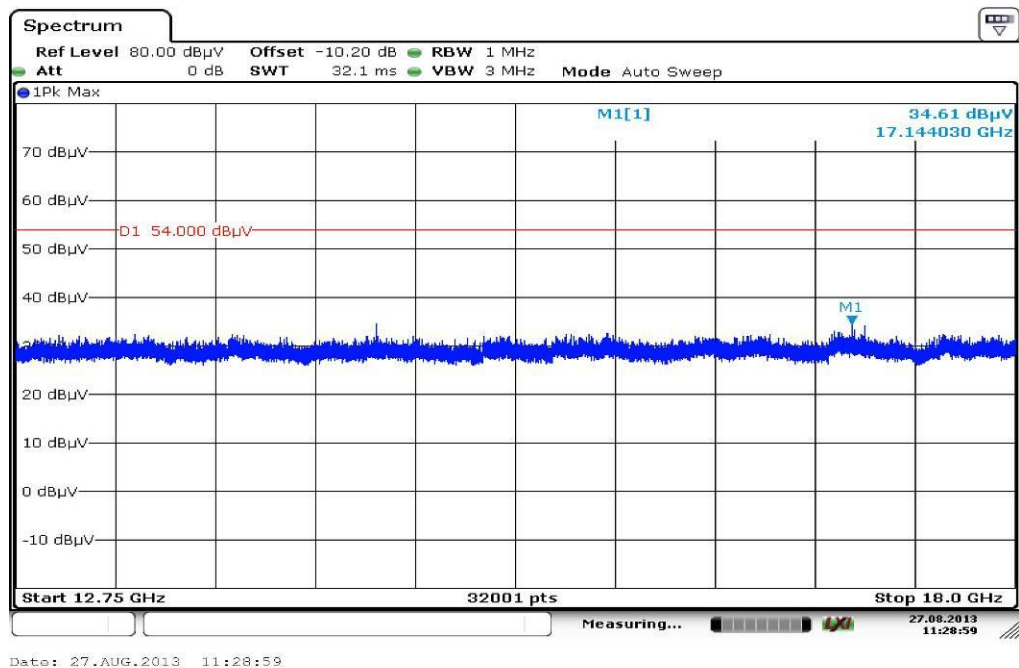


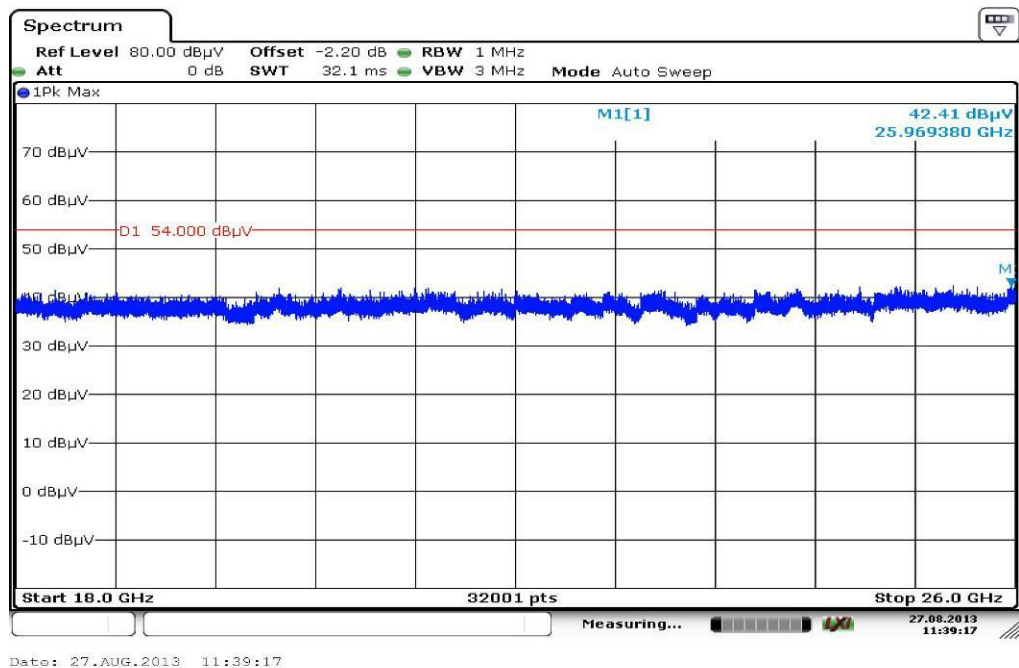
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.040000	12.1	1000.0	120.000	183.0	V	123.0	13.0	17.9	30.0	
52.200000	9.8	1000.0	120.000	234.0	V	131.0	13.2	20.2	30.0	
180.000000	8.3	1000.0	120.000	98.0	V	131.0	10.4	25.2	33.5	
229.080000	8.8	1000.0	120.000	270.0	V	182.0	12.7	27.2	36.0	
728.520000	20.5	1000.0	120.000	270.0	V	182.0	23.2	15.5	36.0	
882.600000	22.4	1000.0	120.000	225.0	H	229.0	25.0	13.6	36.0	

Plot 6: 1 GHz to 12.75 GHz, TX mode, channel 39, vertical & horizontal polarization

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

Plot 7: 12.75 GHz to 18 GHz, TX mode, channel 39, vertical & horizontal polarization

Plot 8: 18 GHz to 26 GHz, TX mode, channel 39, vertical & horizontal polarization

Plot 9: 30 MHz to 1 GHz, TX mode, channel 78, vertical & horizontal polarization

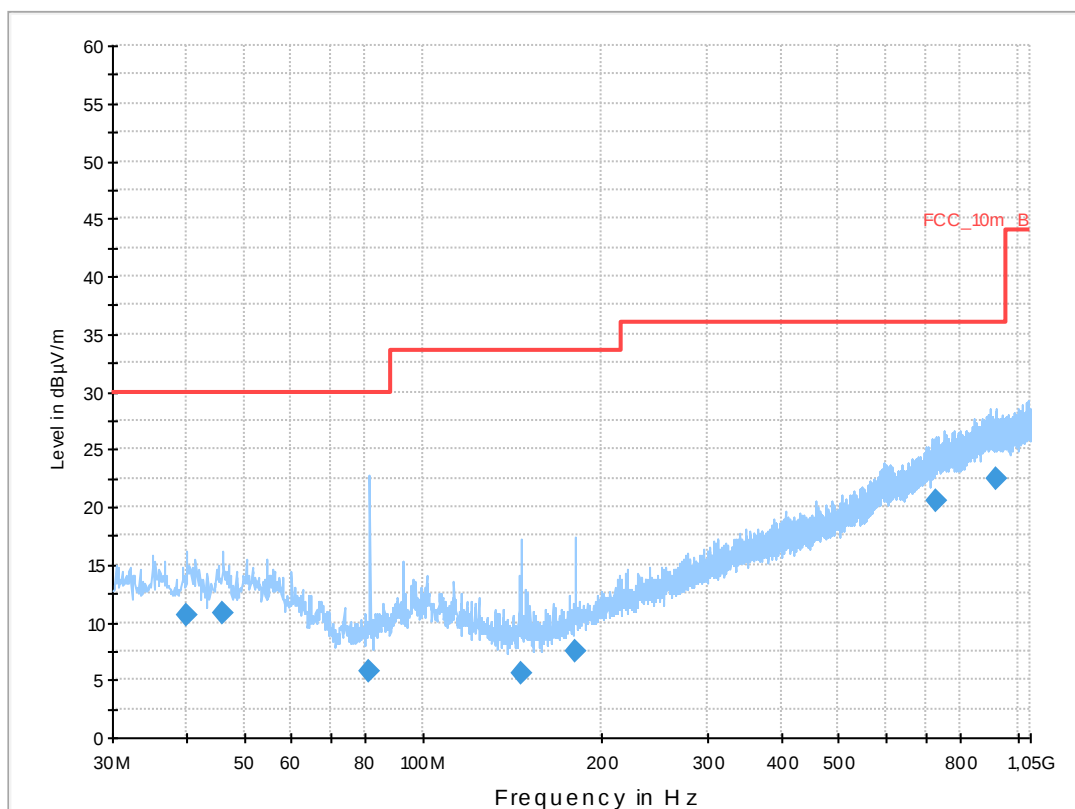
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT 2DH5 testmode CH78
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

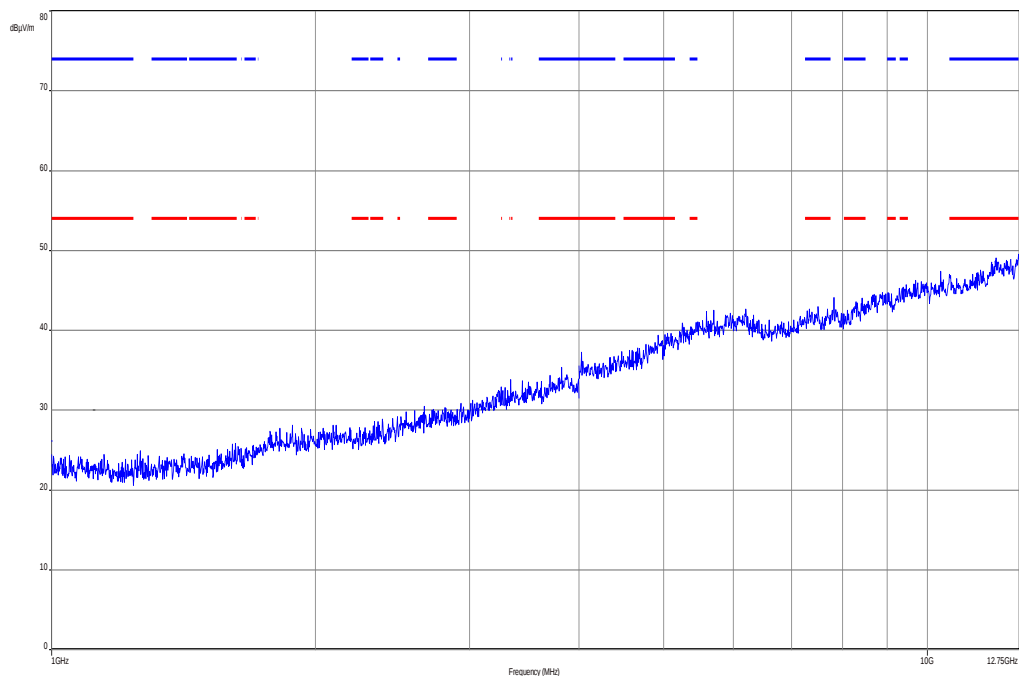
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

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

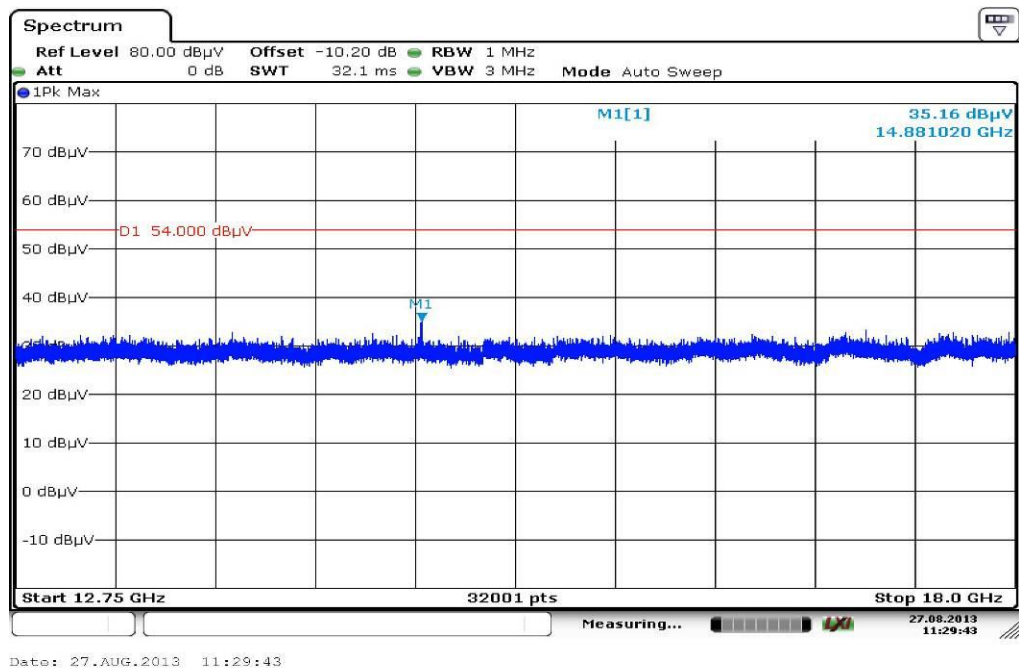


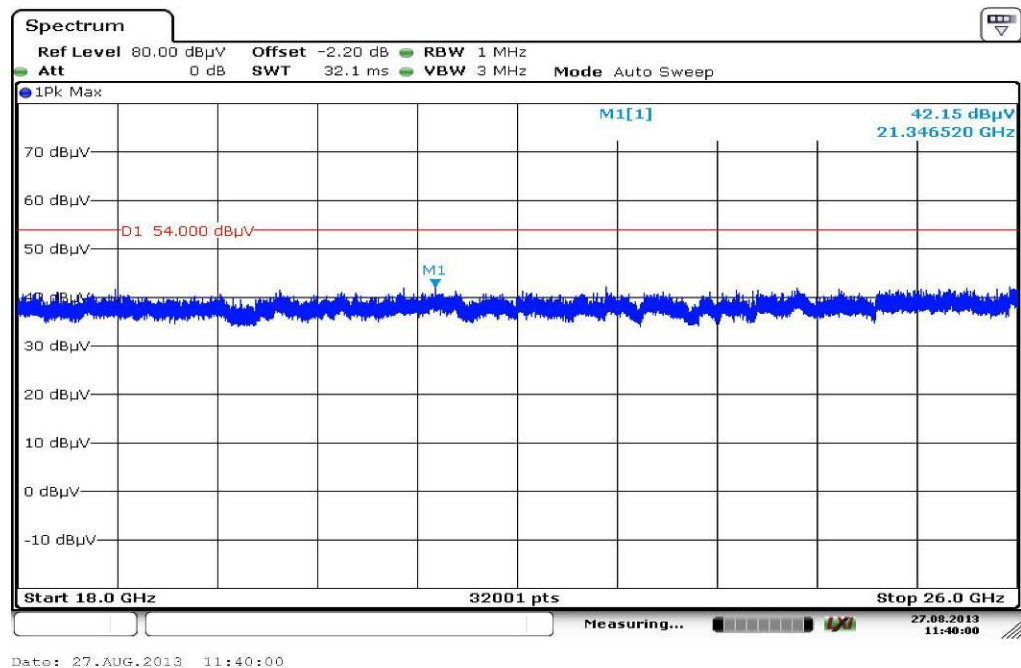
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
39.960000	10.6	1000.0	120.000	183.0	V	283.0	13.4	19.4	30.0	
45.960000	10.7	1000.0	120.000	270.0	V	138.0	13.3	19.3	30.0	
81.240000	5.7	1000.0	120.000	270.0	H	223.0	9.3	24.3	30.0	
146.280000	5.5	1000.0	120.000	270.0	V	0.0	8.8	28.0	33.5	
180.000000	7.5	1000.0	120.000	270.0	V	112.0	10.4	26.0	33.5	
731.160000	20.5	1000.0	120.000	270.0	H	41.0	23.2	15.5	36.0	
...	...	...	...	...	...	...	...	...	...	...

Plot 10: 1 GHz to 12.75 GHz, TX mode, channel 78, vertical & horizontal polarization

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

Plot 11: 12.75 GHz to 18 GHz, TX mode, channel 78, vertical & horizontal polarization

Plot 12: 18 GHz to 26 GHz, TX mode, channel 78, vertical & horizontal polarization

Plots: 8 DPSK (3-DH5) modulation

Plot 1: 30 MHz to 1 GHz, TX mode, channel 00, vertical & horizontal polarization

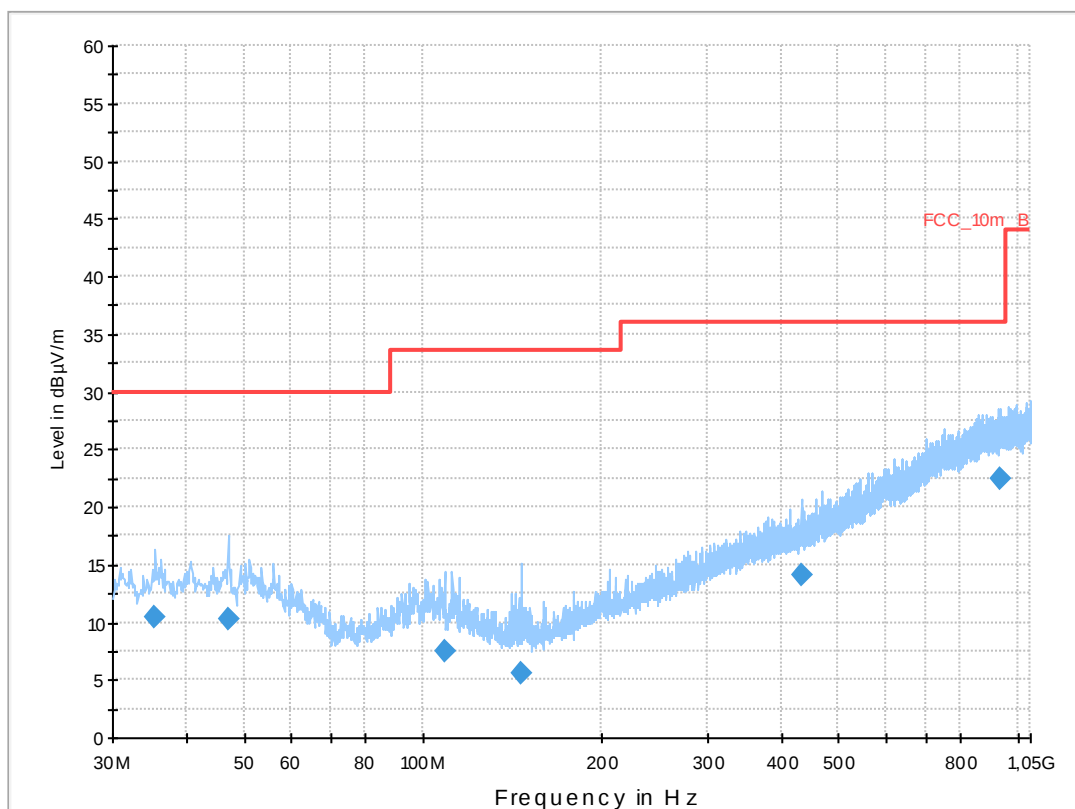
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT 3DH5 testmode CH0
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

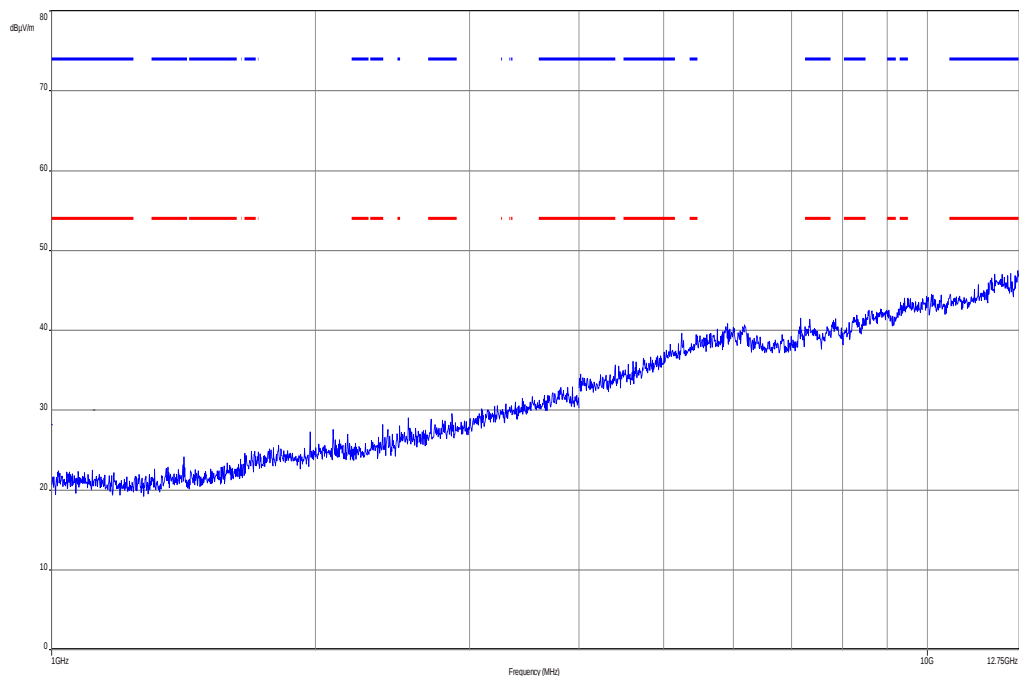
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

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

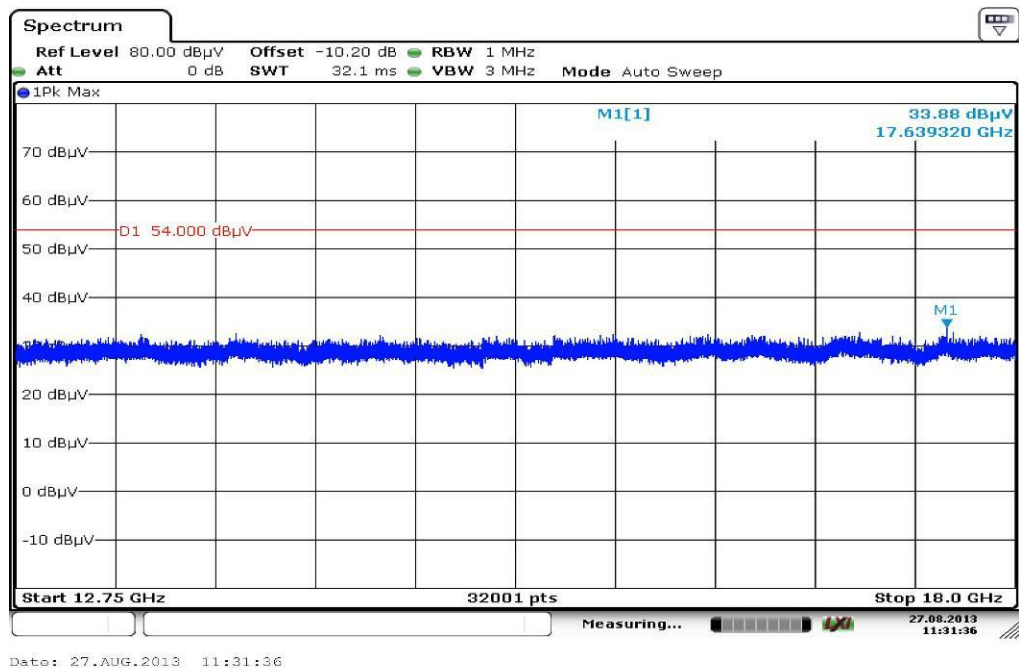


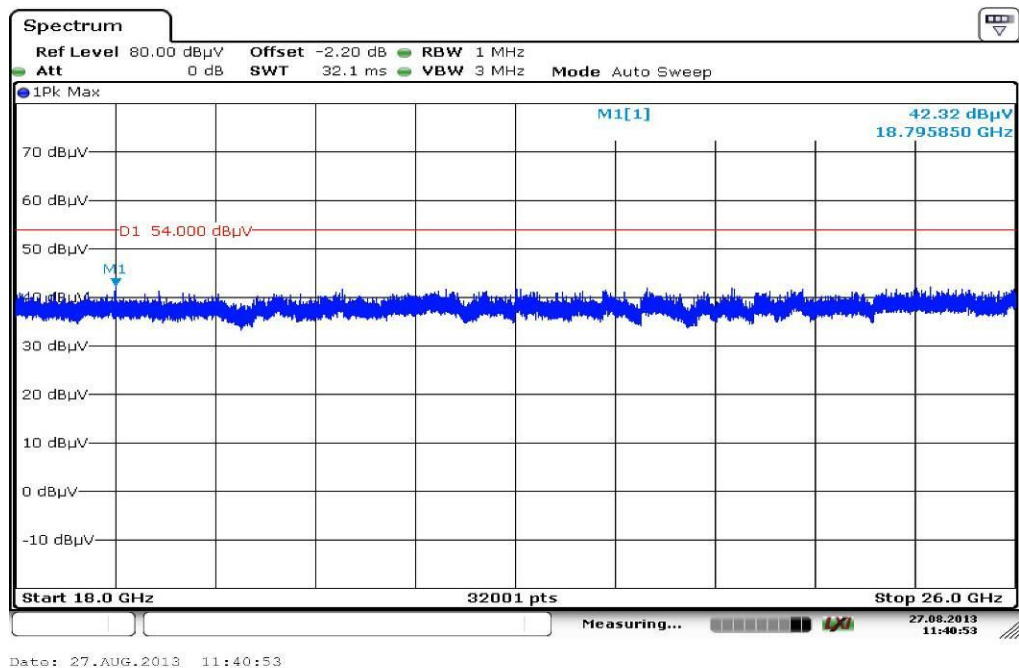
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
35.400000	10.4	1000.0	120.000	210.0	V	283.0	13.1	19.6	30.0	
46.920000	10.3	1000.0	120.000	103.0	V	152.0	13.3	19.7	30.0	
108.480000	7.4	1000.0	120.000	129.0	V	105.0	11.2	26.1	33.5	
146.520000	5.5	1000.0	120.000	120.0	V	0.0	8.8	28.0	33.5	
431.760000	14.0	1000.0	120.000	208.0	V	32.0	17.4	22.0	36.0	
933.600000	22.5	1000.0	120.000	98.0	H	197.0	25.3	13.5	36.0	

Plot 2: 1 GHz to 12.75 GHz, TX mode, channel 00, vertical & horizontal polarization

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

Plot 3: 12.75 GHz to 18 GHz, TX mode, channel 00, vertical & horizontal polarization

Plot 4: 18 GHz to 26 GHz, TX mode, channel 00, vertical & horizontal polarization

Plot 5: 30 MHz to 1 GHz, TX mode, channel 39, vertical & horizontal polarization

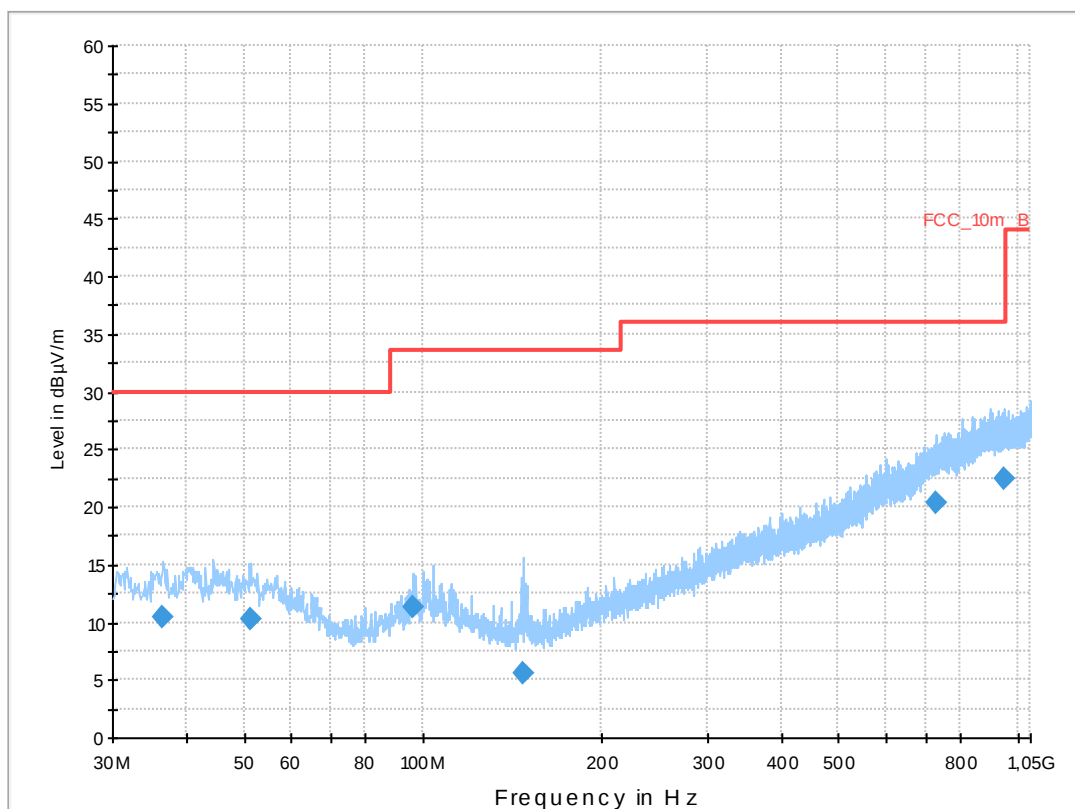
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT 3DH5 testmode CH39
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

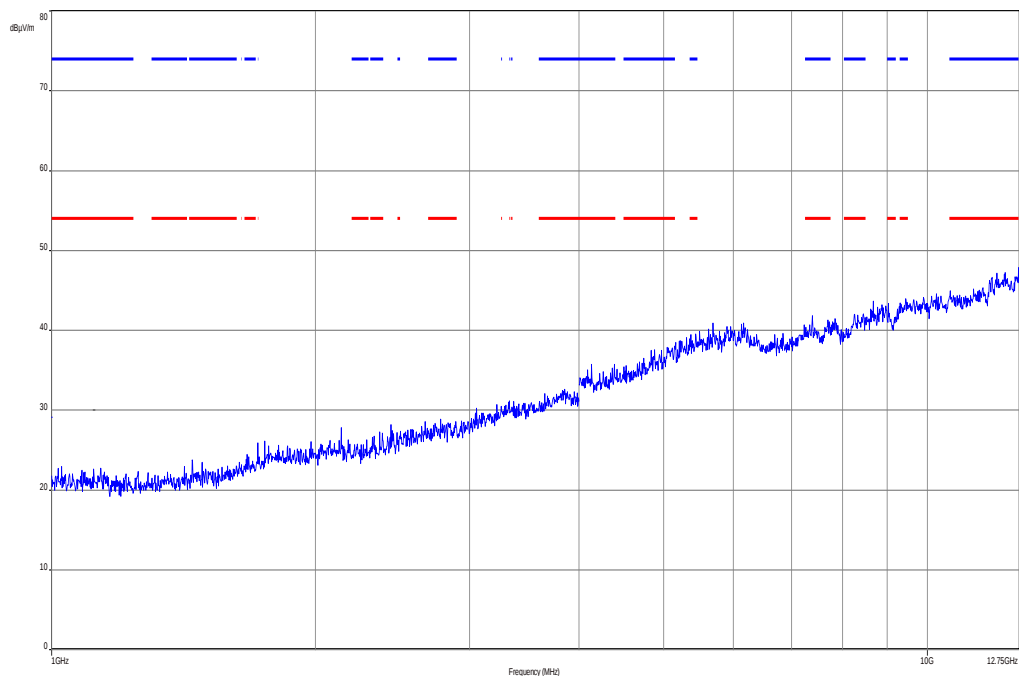
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



Final Result 1

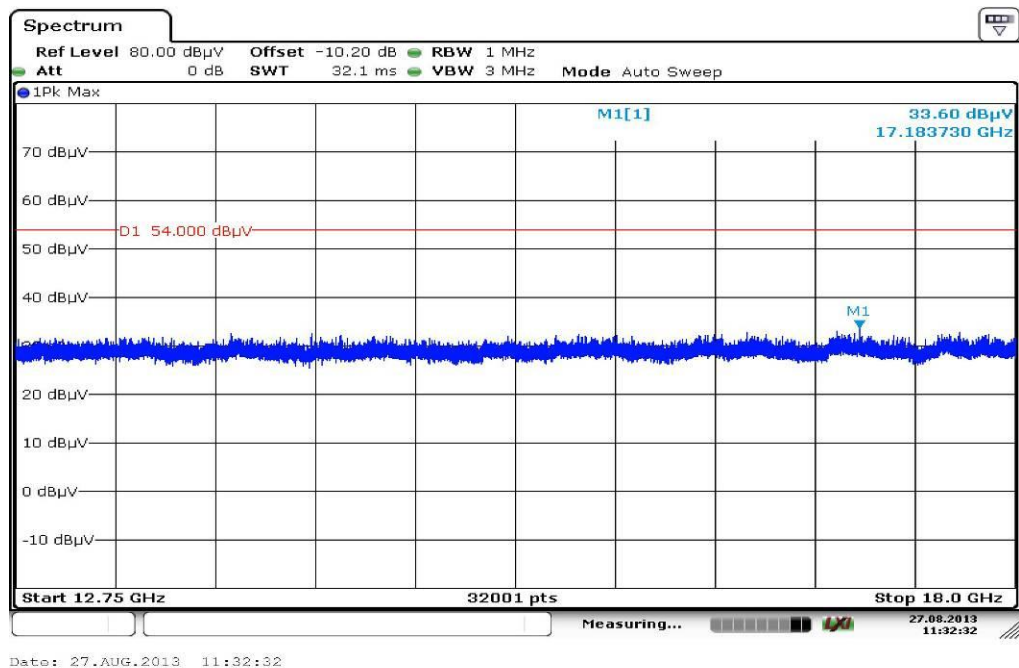
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
36.480000	10.4	1000.0	120.000	121.0	V	58.0	13.2	19.6	30.0	
51.240000	10.3	1000.0	120.000	104.0	V	167.0	13.2	19.7	30.0	
96.000000	11.2	1000.0	120.000	120.0	V	44.0	11.4	22.3	33.5	
147.720000	5.5	1000.0	120.000	270.0	V	222.0	8.9	28.0	33.5	
726.840000	20.4	1000.0	120.000	270.0	V	240.0	23.1	15.6	36.0	
945.840000	22.5	1000.0	120.000	270.0	V	14.0	25.3	13.5	36.0	

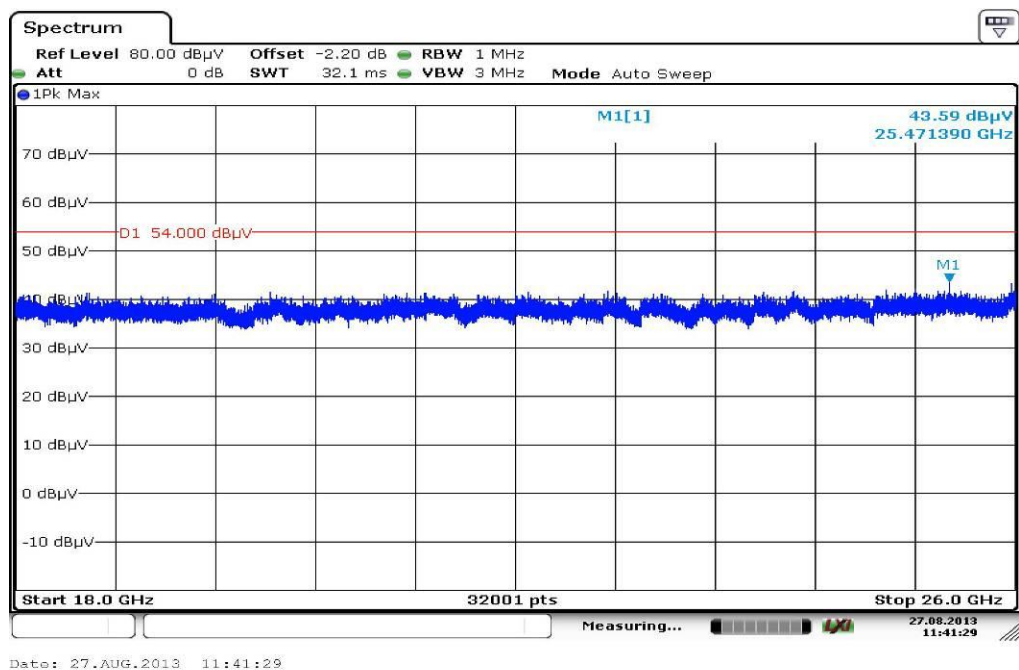
Plot 6: 1 GHz to 12.75 GHz, TX mode, channel 39, vertical & horizontal polarization



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

Plot 7: 12.75 GHz to 18 GHz, TX mode, channel 39, vertical & horizontal polarization



Plot 8: 18 GHz to 26 GHz, TX mode, channel 39, vertical & horizontal polarization

Plot 9: 30 MHz to 1 GHz, TX mode, channel 78, vertical & horizontal polarization

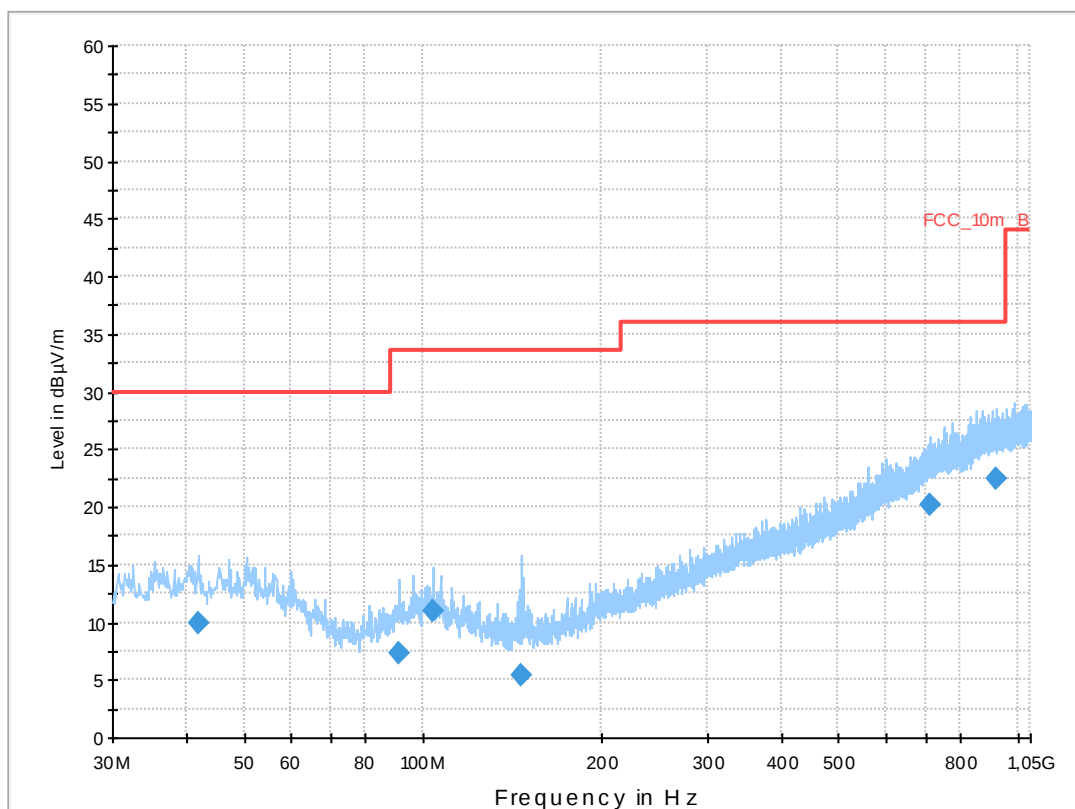
Common Information

EUT: RGF111LW
 Serial Number: imei: 004402242479065
 Test Description: FCC part 15 class B
 Operating Conditions: BT 3DH5 testmode CH78
 Operator Name: Wolsdorfer
 Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

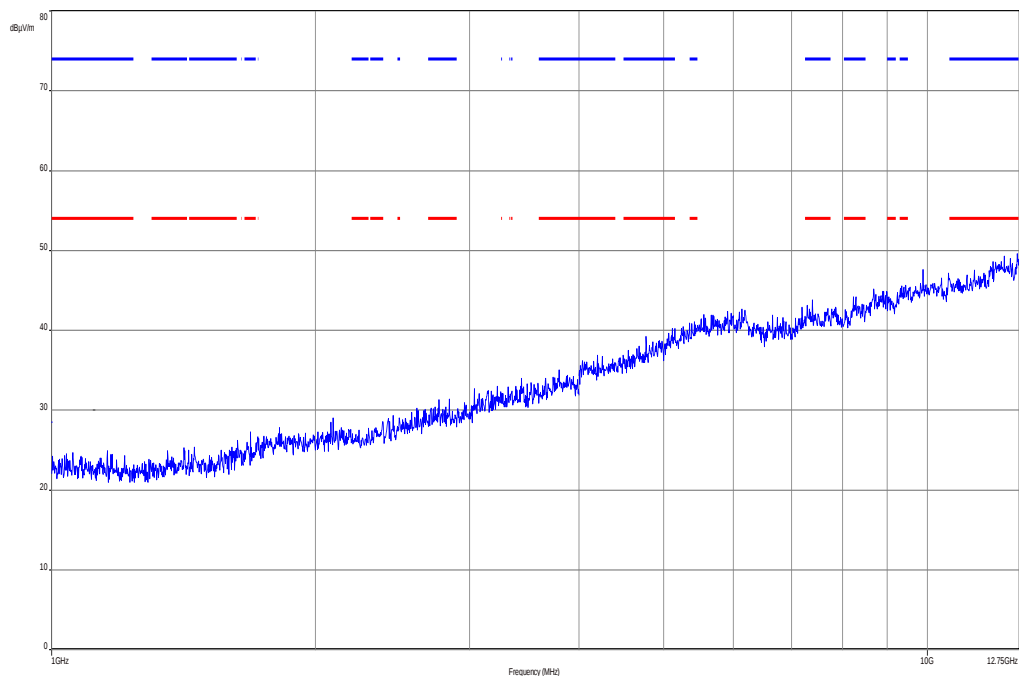
Hardware Setup: Electric Field (NOS)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

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

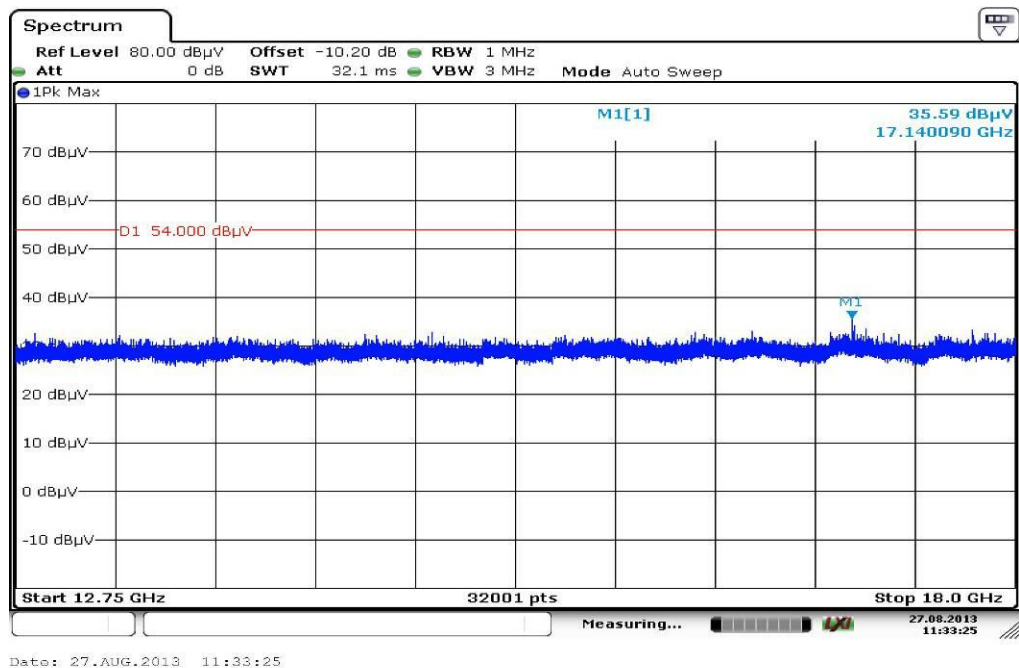


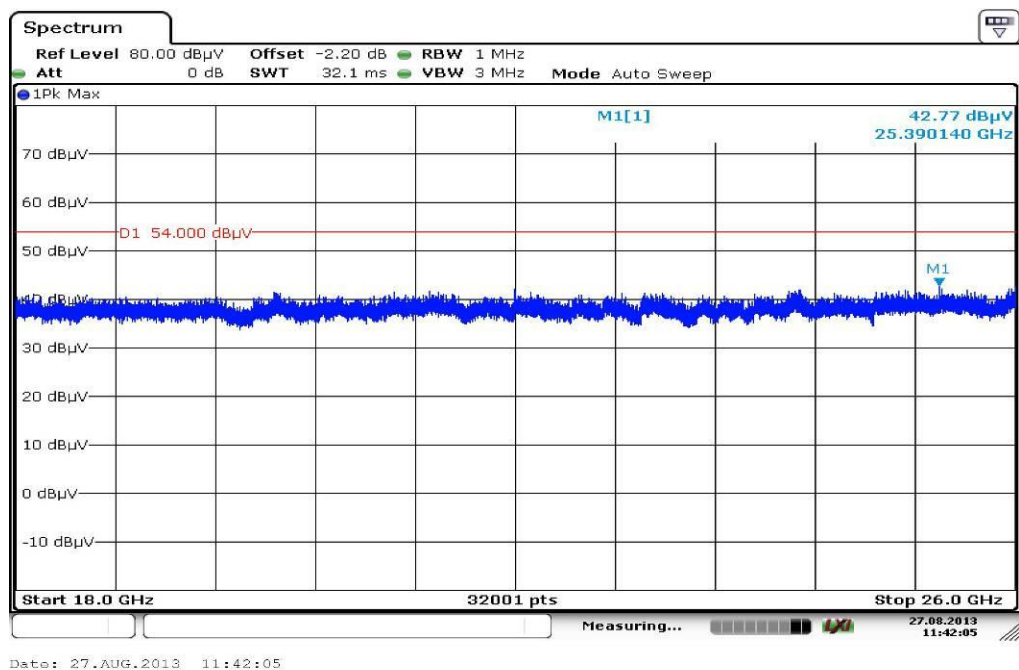
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
41.760000	10.0	1000.0	120.000	270.0	H	99.0	13.4	20.0	30.0	
91.080000	7.4	1000.0	120.000	173.0	V	159.0	10.7	26.1	33.5	
103.680000	11.0	1000.0	120.000	270.0	V	36.0	11.6	22.5	33.5	
145.920000	5.5	1000.0	120.000	134.0	V	313.0	8.8	28.0	33.5	
711.360000	20.2	1000.0	120.000	98.0	H	307.0	22.8	15.8	36.0	
922.200000	22.4	1000.0	120.000	104.0	V	0.0	25.3	13.6	36.0	

Plot 10: 1 GHz to 12.75 GHz, TX mode, channel 78, vertical & horizontal polarization

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

Plot 11: 12.75 GHz to 18 GHz, TX mode, channel 78, vertical & horizontal polarization

Plot 12: 18 GHz to 26 GHz, TX mode, channel 78, vertical & horizontal polarization

10.12 RX spurious emissions radiated

Not performed – tests according to manufacturer test plan.

10.13 Spurious emissions radiated < 30 MHz

Not performed – tests according to manufacturer test plan.

10.14 Spurious emissions conducted < 30 MHz

Not performed – tests according to manufacturer test plan.

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 (Labor/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.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081; B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	09.01.2013	09.01.2014
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	Ve	14.07.2011	14.01.2014
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	12.04.2012	12.04.2014
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	16.01.2013	16.01.2014
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	vIKI!	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	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
17	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	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	WRCG240 0/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
21	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	21.02.2013	21.02.2014
22	n. a.	CBT (Bluetooth)	CBT	R&S	100313	300003516	vIKI!	21.08.2012	21.08.2014

		Tester + EDR Signalling)	1153.9000 K35, CBT- B55, CBT- K55						
23	11b	Microwave System Amplifier, 0.5- 26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
24	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787	k	22.07.2013	22.07.2015
25	A028	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300002440	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
vkI!	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
1.0	Initial release	2013-08-30

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

Front side of certificate



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

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

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

Frankfurt am Main, 18.01.2013

Im Auftrag
Dir.-Ing. (FH) Ralf Egner
Abteilungsleiter

Back side of certificate

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