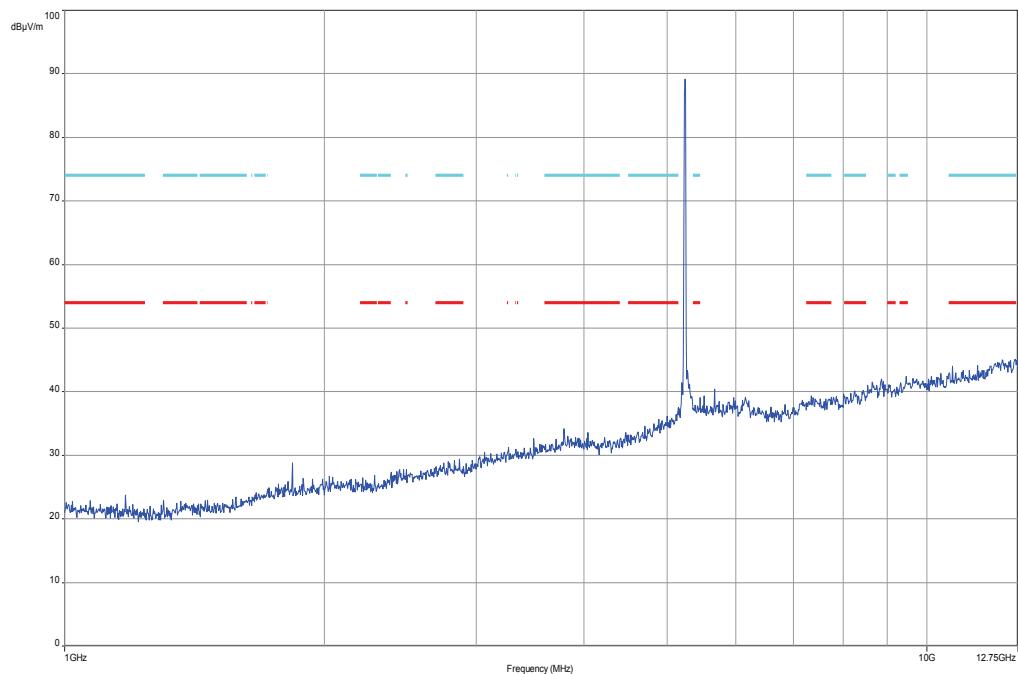
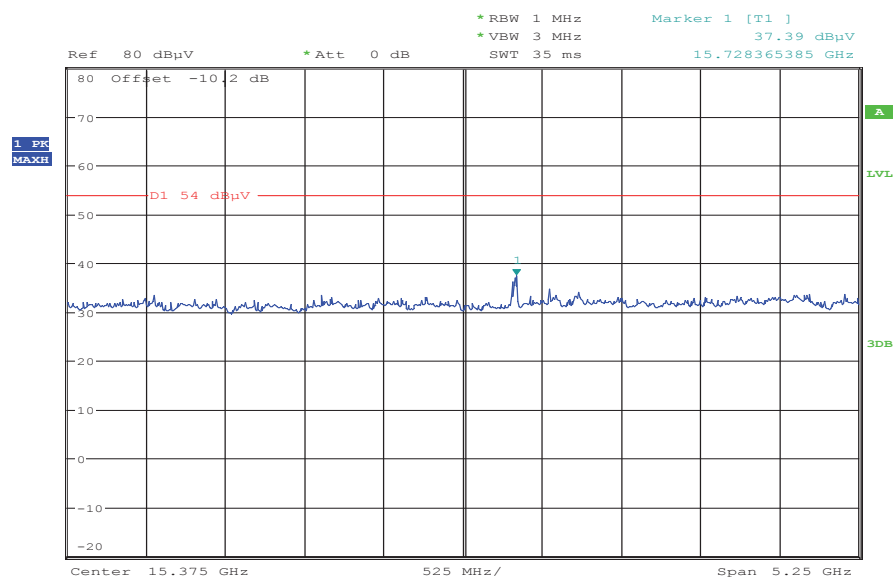


Plot 7: 1 GHz to 12.75 GHz, 5240 MHz, vertical & horizontal polarization

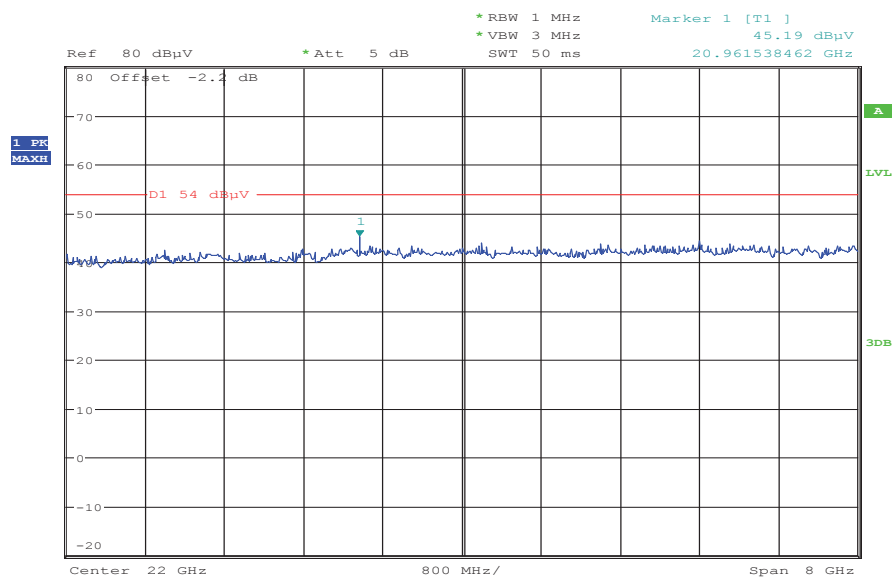


Plot 8: 12 GHz to 18 GHz, 5240 MHz, vertical & horizontal polarization



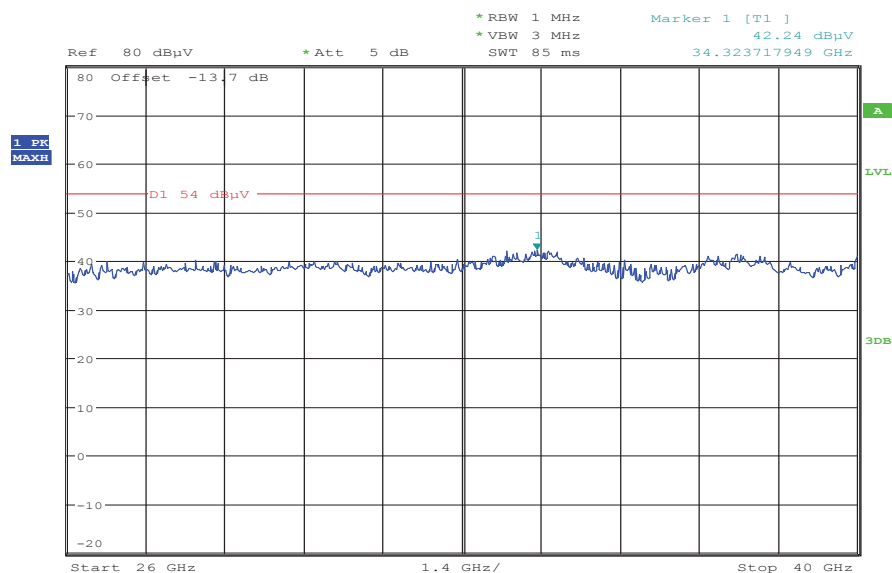
Date: 25.MAR.2013 10:06:34

Plot 9: 18 GHz to 26 GHz, 5240 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:27:54

Plot 10: 26 GHz to 40 GHz, 5240 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:38:51

Plot 11: 30 MHz to 1 GHz, 5320 MHz, vertical & horizontal polarization

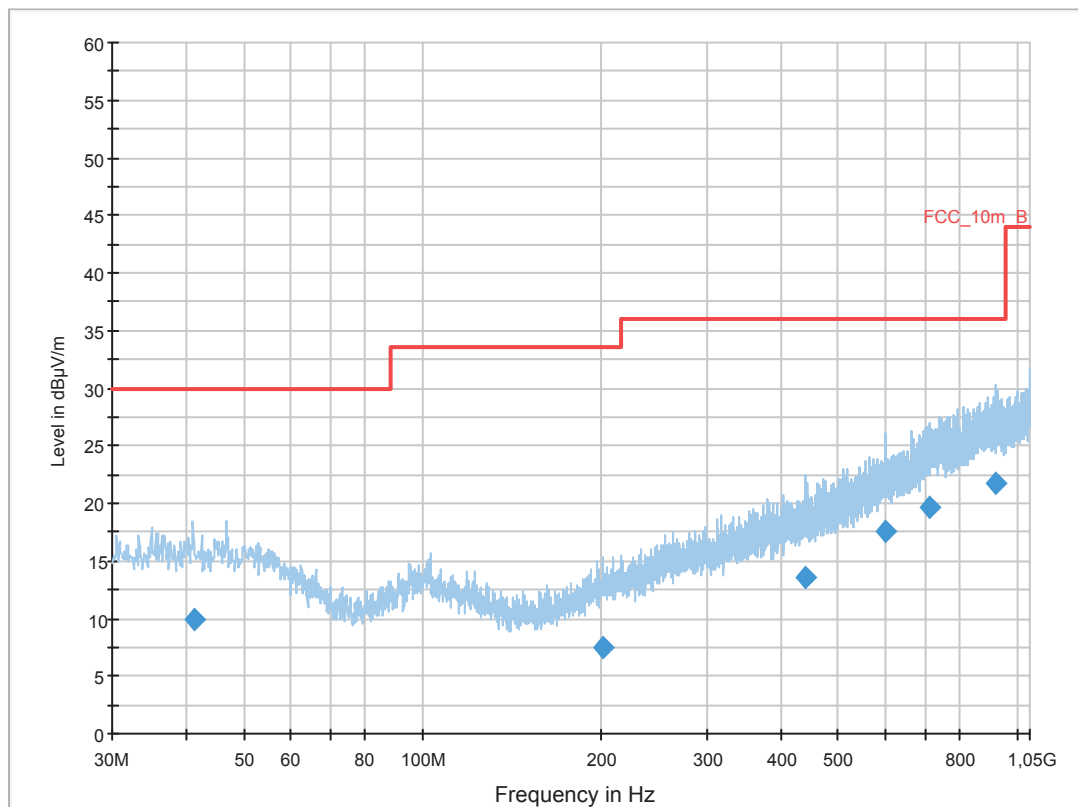
Common Information

EUT: RFM121LW
 Serial Number: lmei:990002430036317
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: w-lan n mode CH64 mcs0
 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

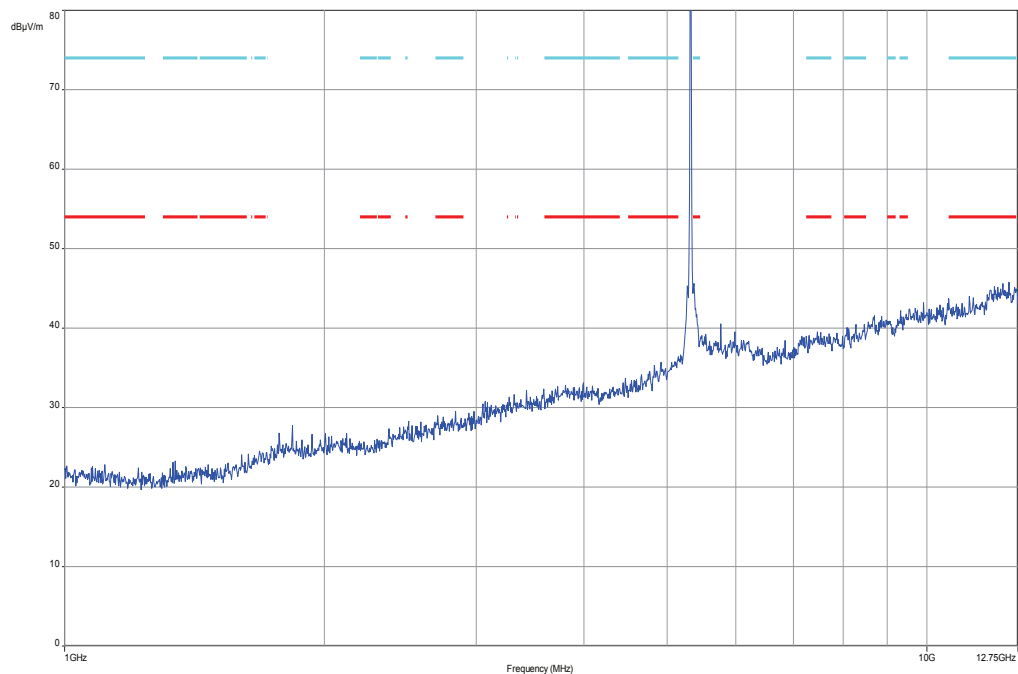
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



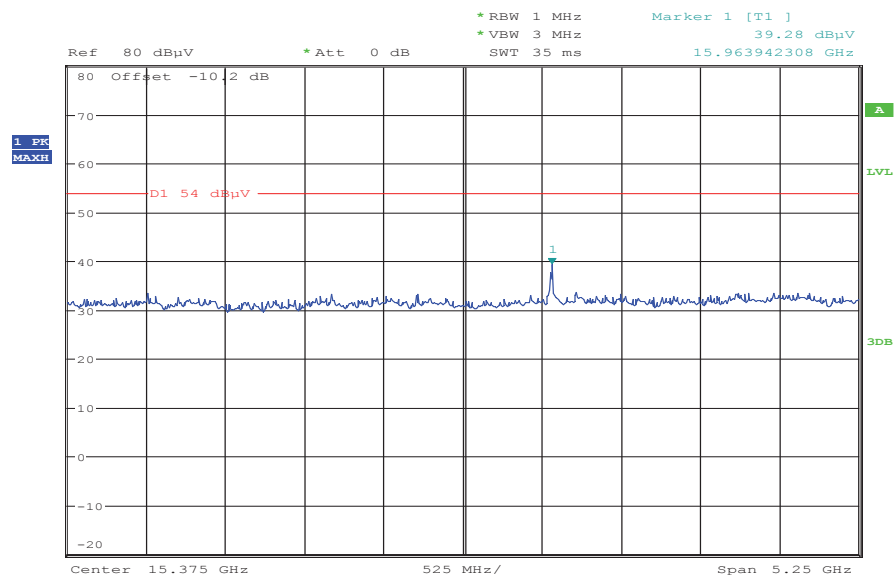
Final Result 1

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
41.165250	10.0	1000.0	120.000	104.0	V	261.0	13.4	20.0	30.0	
201.073800	7.4	1000.0	120.000	130.0	V	10.0	11.7	26.1	33.5	
441.101250	13.6	1000.0	120.000	170.0	V	280.0	17.5	22.4	36.0	
601.729800	17.6	1000.0	120.000	170.0	H	280.0	20.8	18.4	36.0	
713.505150	19.7	1000.0	120.000	170.0	H	90.0	22.8	16.3	36.0	
916.800900	21.8	1000.0	120.000	104.0	H	85.0	25.3	14.2	36.0	

Plot 12: 1 GHz to 12.75 GHz, 5320 MHz, vertical & horizontal polarization

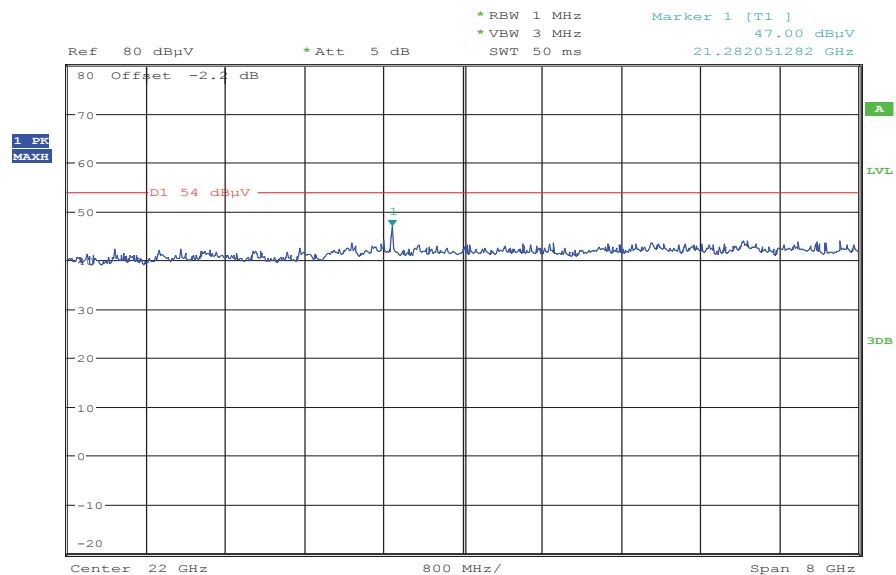


Plot 13: 12 GHz to 18 GHz, 5320 MHz, vertical & horizontal polarization



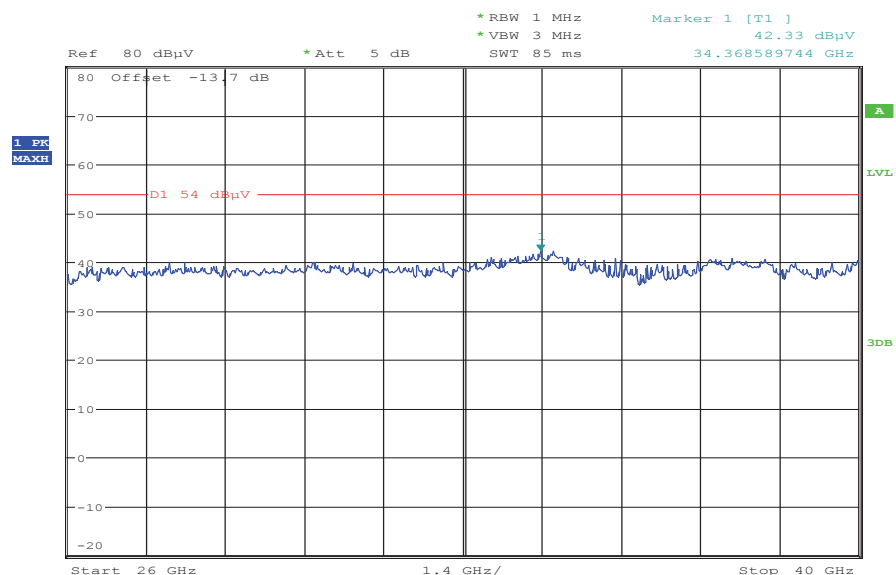
Date: 25.MAR.2013 10:07:45

Plot 14: 18 GHz to 26 GHz, 5320 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:28:37

Plot 15: 26 GHz to 40 GHz, 5320 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:55:13

Plot 16: 30 MHz to 1 GHz, 5500 MHz, vertical & horizontal polarization

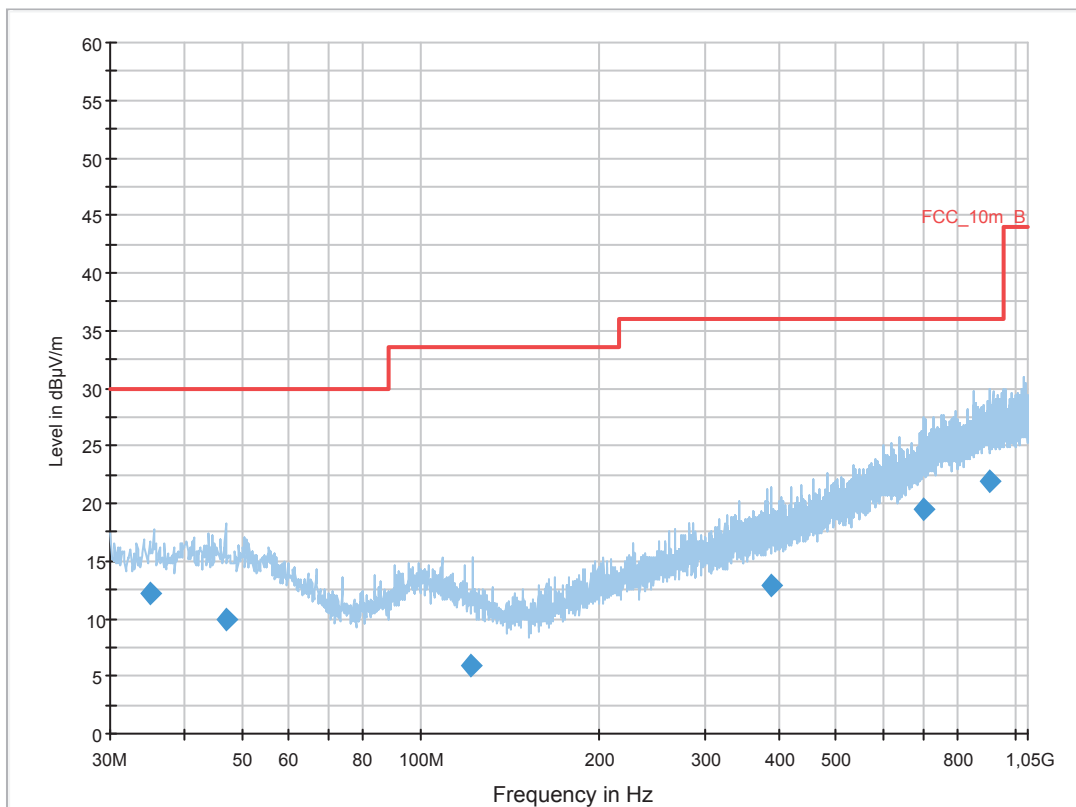
Common Information

EUT: RFM121LW
 Serial Number: lmei:990002430036317
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: w-lan n mode CH100 mcs0
 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

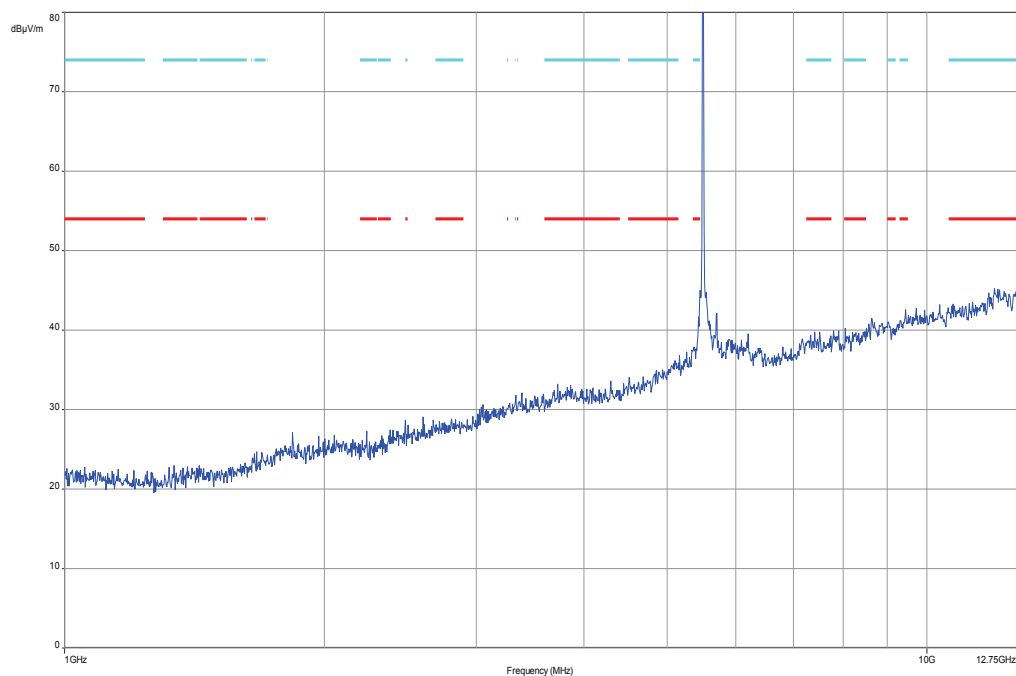
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



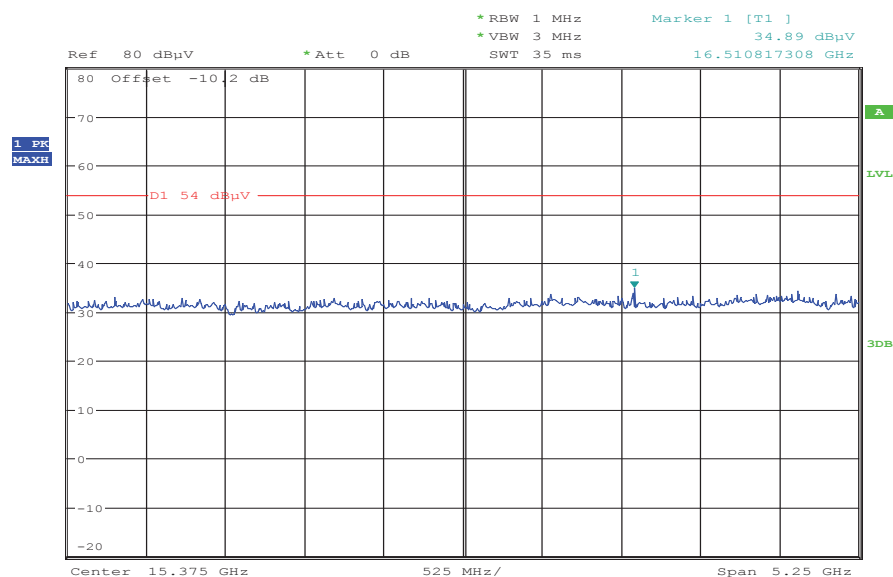
Final Result 1

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
35.042700	12.2	1000.0	120.000	143.0	V	-5.0	13.0	17.8	30.0	
47.232150	9.8	1000.0	120.000	98.0	V	81.0	13.3	20.2	30.0	
121.732950	6.0	1000.0	120.000	143.0	H	100.0	10.1	27.5	33.5	
389.032950	12.8	1000.0	120.000	120.0	H	261.0	16.7	23.2	36.0	
701.330100	19.4	1000.0	120.000	170.0	V	85.0	22.5	16.6	36.0	
907.711950	21.9	1000.0	120.000	120.0	V	10.0	25.2	14.1	36.0	

Plot 17: 1 GHz to 12.75 GHz, 5500 MHz, vertical & horizontal polarization

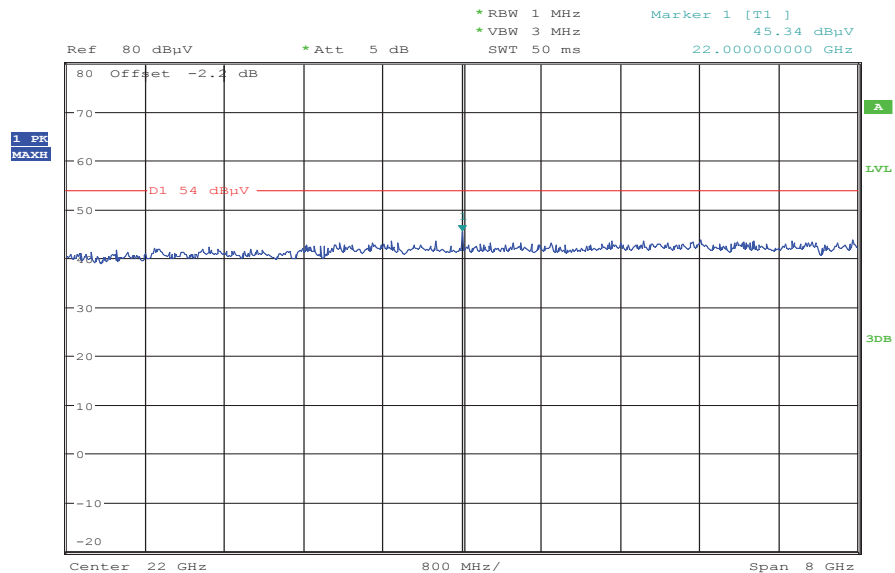


Plot 18: 12 GHz to 18 GHz, 5500 MHz, vertical & horizontal polarization



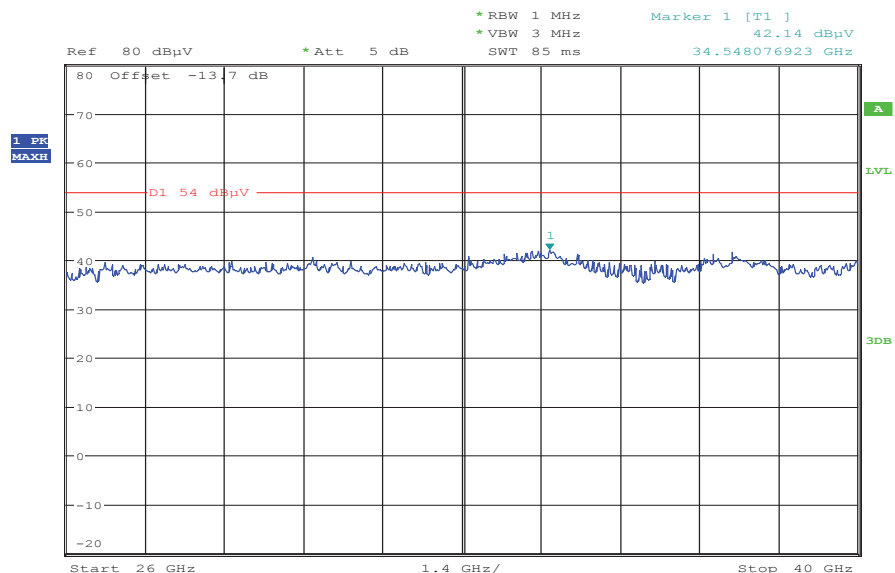
Date: 25.MAR.2013 10:08:53

Plot 19: 18 GHz to 26 GHz, 5500 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:29:32

Plot 20: 26 GHz to 40 GHz, 5500 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:56:53

Plot 21: 30 MHz to 1 GHz, 5600 MHz, vertical & horizontal polarization

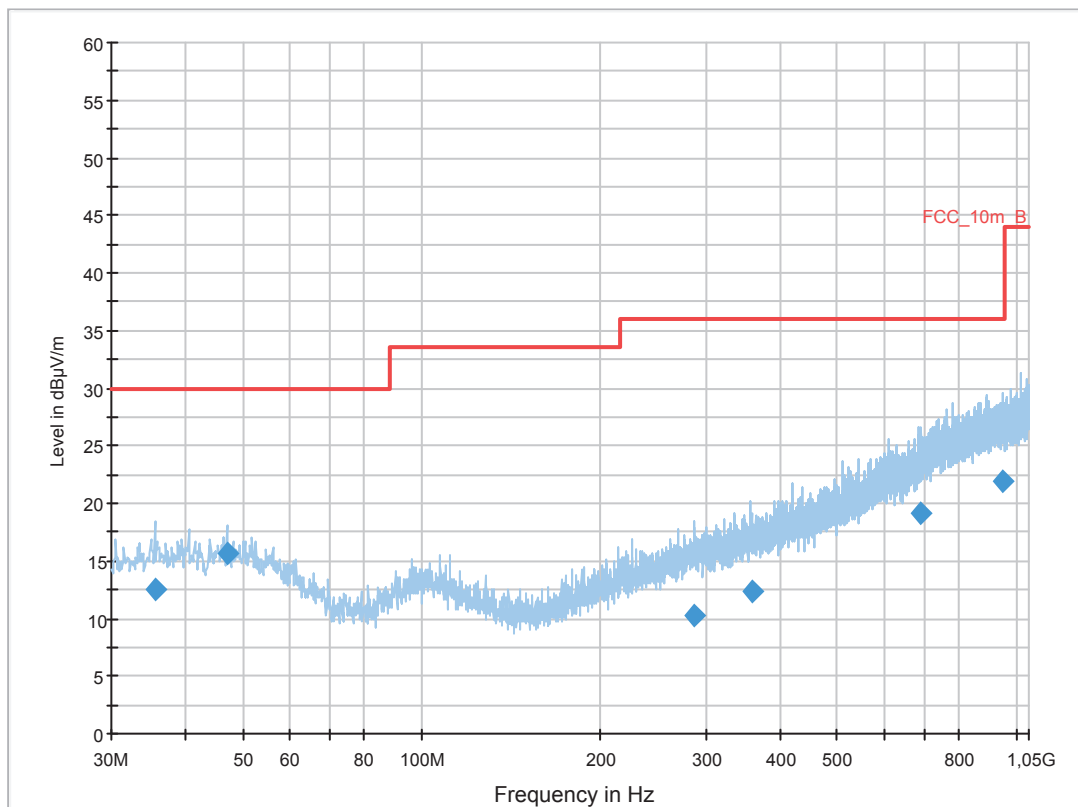
Common Information

EUT: RFM121LW
 Serial Number: lmei:990002430036317
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: w-lan n mode CH120 mcs0
 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

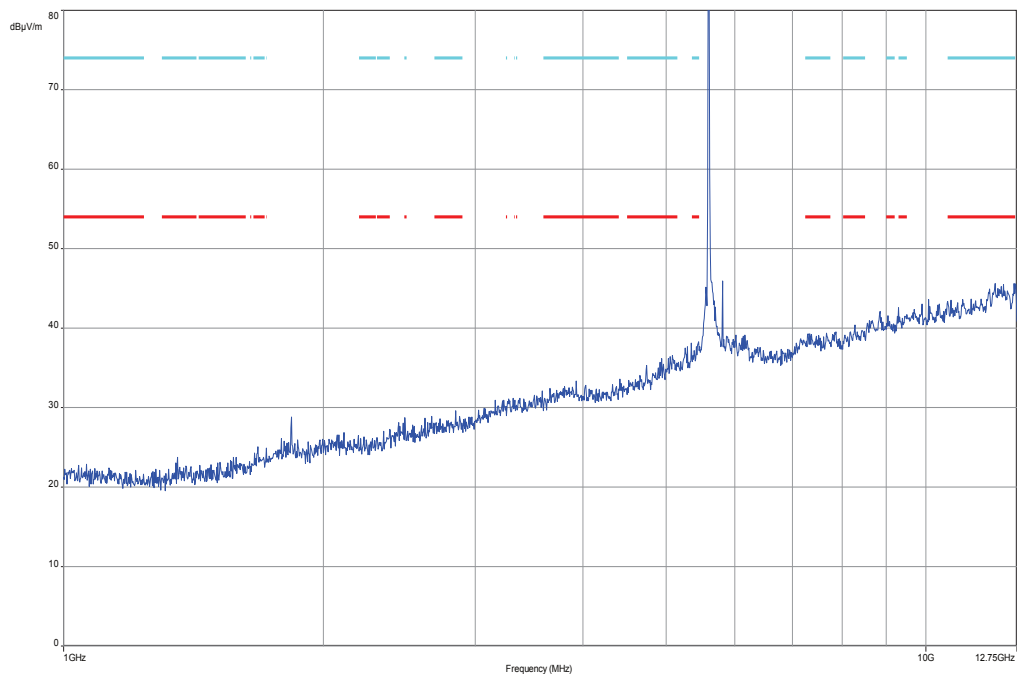
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



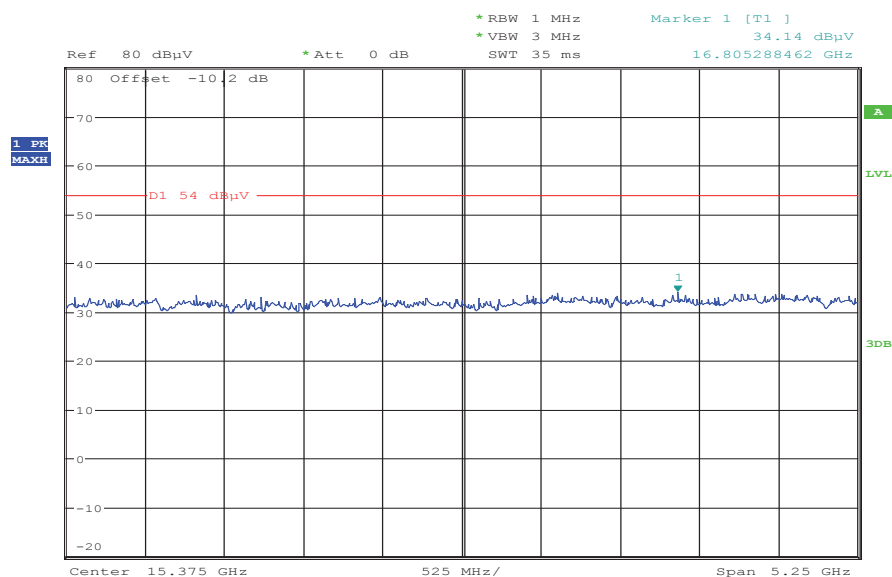
Final Result 1

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
35.482200	12.5	1000.0	120.000	135.0	V	10.0	13.1	17.5	30.0	
46.978800	15.6	1000.0	120.000	98.0	V	261.0	13.3	14.4	30.0	
286.291950	10.3	1000.0	120.000	170.0	V	100.0	14.2	25.7	36.0	
358.479750	12.3	1000.0	120.000	170.0	V	280.0	16.2	23.7	36.0	
692.815500	19.1	1000.0	120.000	170.0	V	270.0	22.3	16.9	36.0	
947.095650	21.9	1000.0	120.000	132.0	V	261.0	25.3	14.1	36.0	

Plot 22: 1 GHz to 12.75 GHz, 5600 MHz, vertical & horizontal polarization

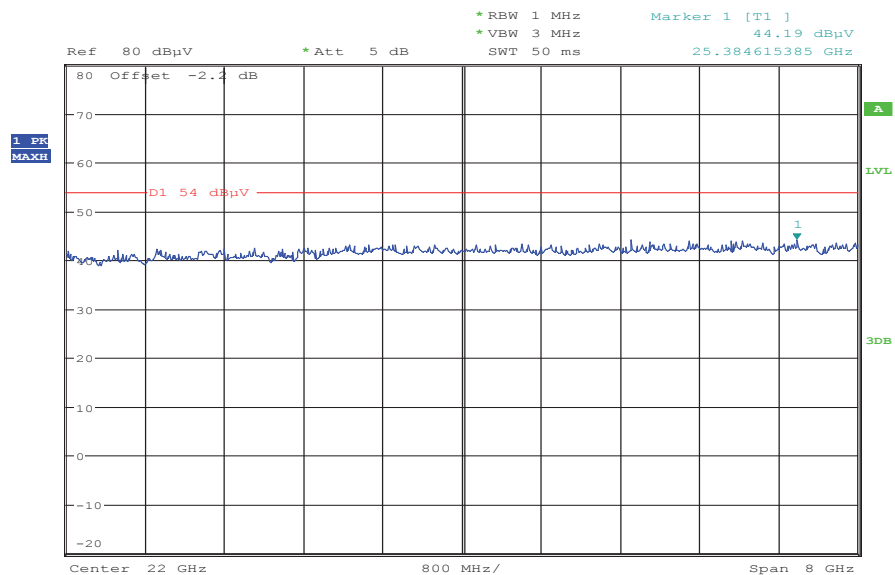


Plot 23: 12 GHz to 18 GHz, 5600 MHz, vertical & horizontal polarization



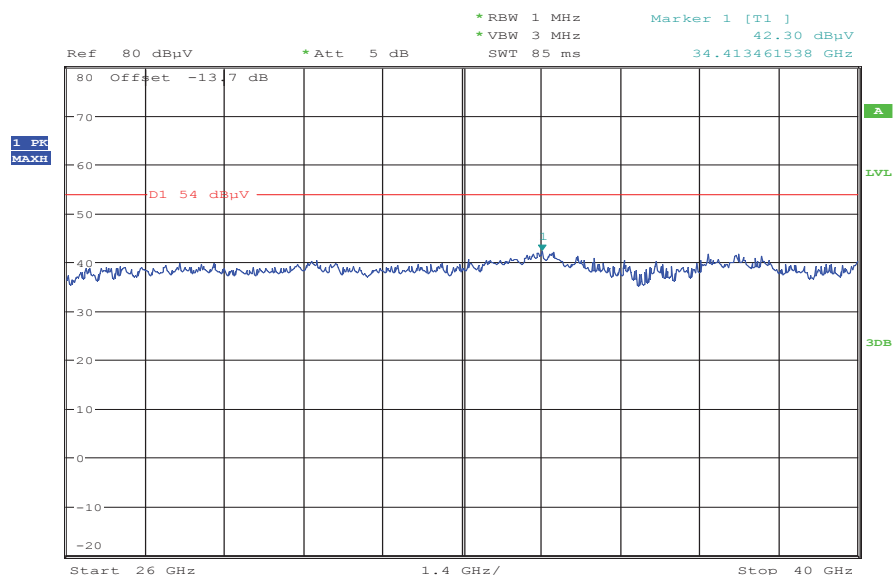
Date: 25.MAR.2013 10:11:14

Plot 24: 18 GHz to 26 GHz, 5600 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:30:28

Plot 25: 26 GHz to 40 GHz, 5600 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:58:32

Plot 26: 30 MHz to 1 GHz, 5700 MHz, vertical & horizontal polarization

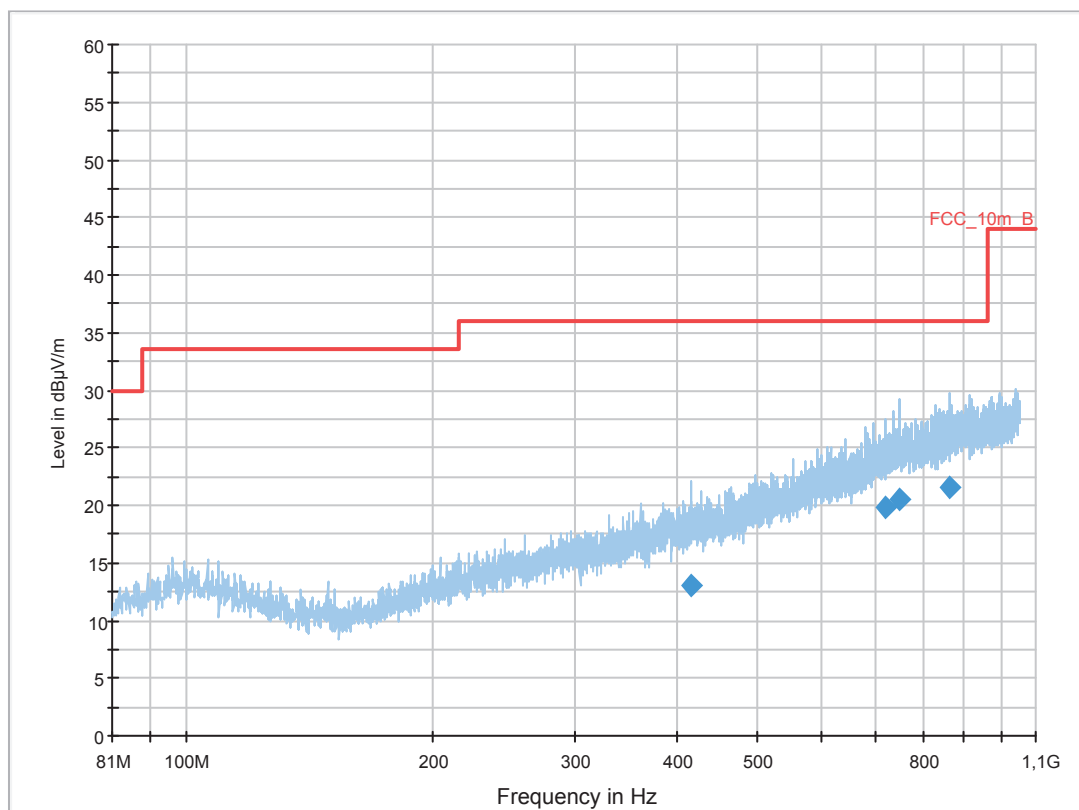
Common Information

EUT: RFM121LW
 Serial Number: lmei:990002430036317
 Test Description: FCC part 15 C class B @ 10 m
 Operating Conditions: w-lan n mode CH140 mcs0
 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

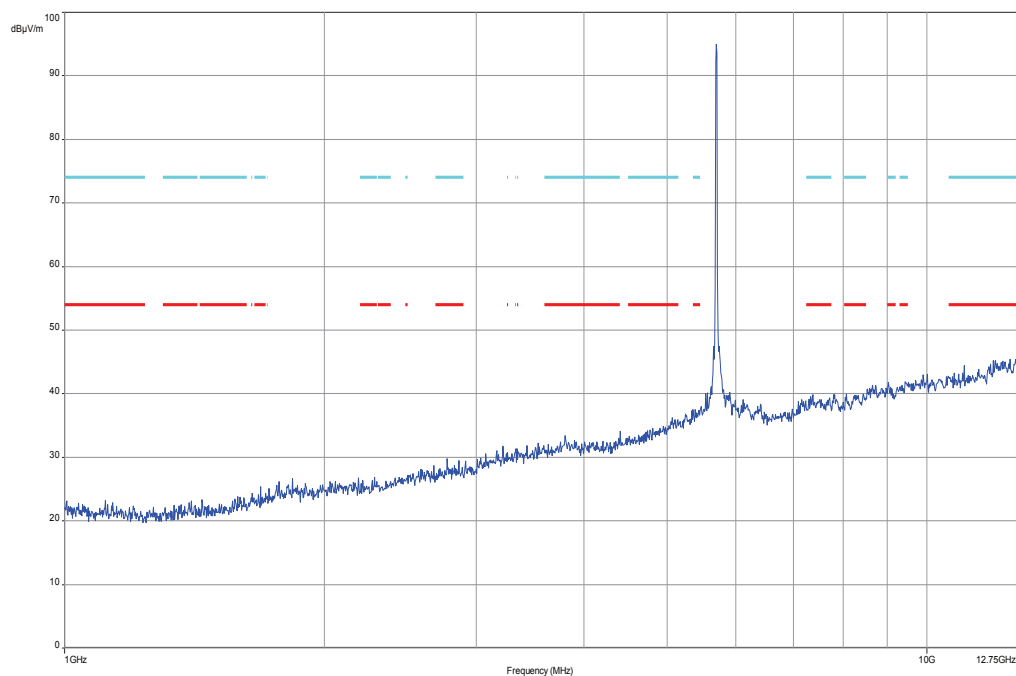
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



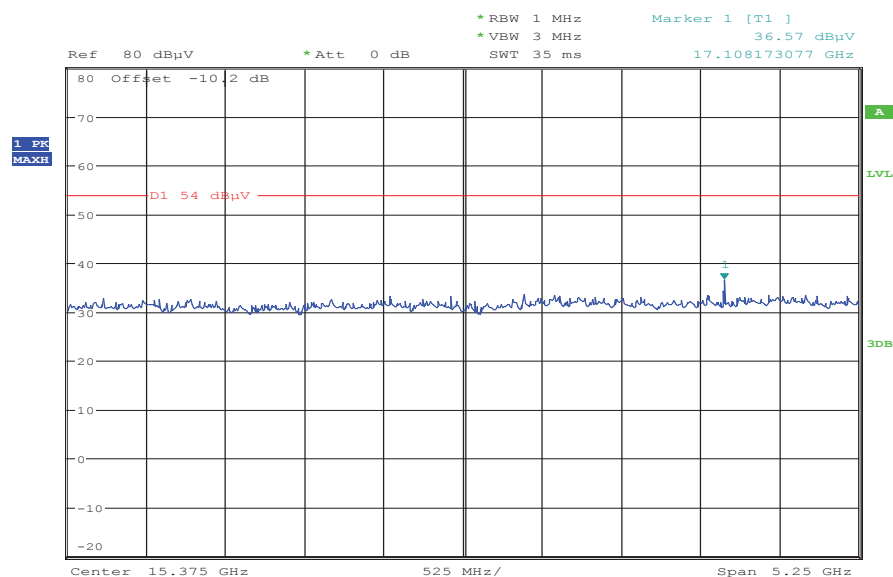
Final Result 1

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
35.494350	12.1	1000.0	120.000	143.0	V	260.0	13.1	17.9	30.0	
46.042200	11.7	1000.0	120.000	98.0	V	80.0	13.3	18.3	30.0	
414.690000	13.1	1000.0	120.000	170.0	V	175.0	17.1	22.9	36.0	
721.842300	19.8	1000.0	120.000	170.0	H	270.0	23.0	16.2	36.0	
749.217600	20.4	1000.0	120.000	170.0	V	183.0	23.6	15.6	36.0	
862.322100	21.6	1000.0	120.000	170.0	H	2.0	24.7	14.4	36.0	

Plot 27: 1 GHz to 12.75 GHz, 5700 MHz, vertical & horizontal polarization

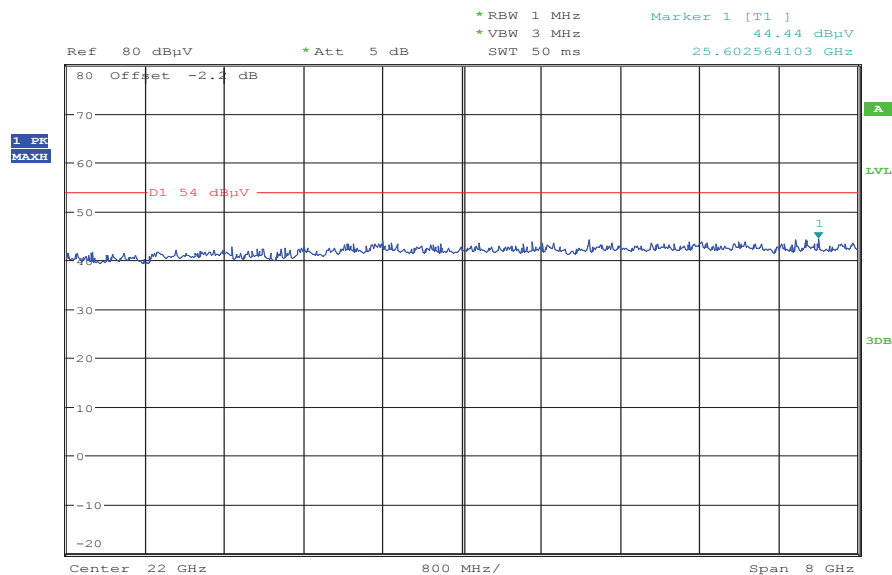


Plot 28: 12 GHz to 18 GHz, 5700 MHz, vertical & horizontal polarization



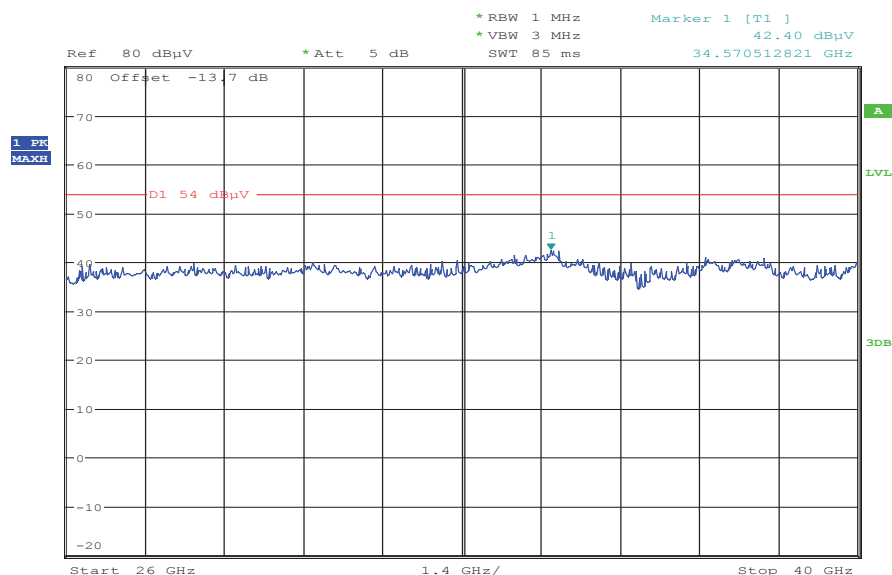
Date: 25.MAR.2013 10:12:23

Plot 29: 18 GHz to 26 GHz, 5700 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:31:37

Plot 30: 26 GHz to 40 GHz, 5700 MHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:59:32

9.11 RX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in idle/receive mode.

Measurement:

Measurement parameter	
Detector:	Quasi Peak below 1 GHz (alternative Peak) Peak above 1 GHz / RMS
Sweep time:	Auto
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Video bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: ≥ 3 MHz / 10 Hz
Span:	30 MHz to 40 GHz
Trace-Mode:	Max Hold / Average with 100 counts + 20 log (1 / X) for duty cycle lower than 100 %

Limits:

RX Spurious Emissions Radiated		
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:

RX Spurious Emissions Radiated [dB μ V/m]		
F [MHz]	Detector	Level [dB μ V/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	

Result: Passed

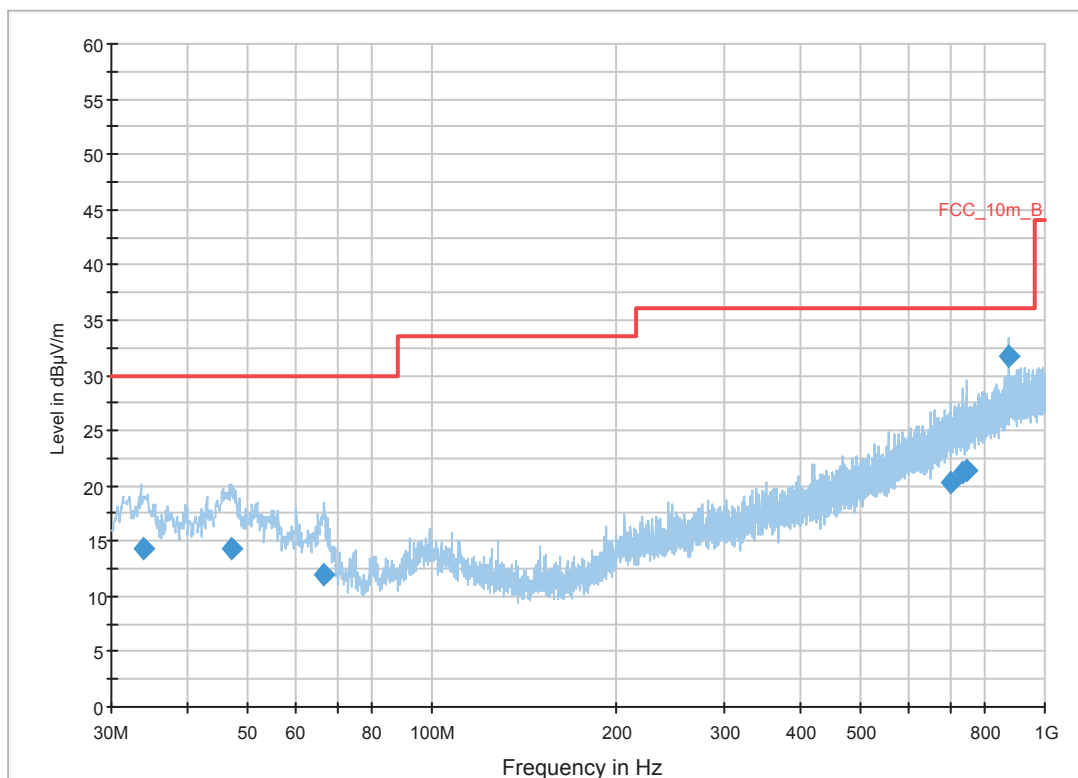
Plots: RX / Idle – mode**Plot 1:** 30 MHz to 1 GHz, vertical & horizontal polarization**Common Information**

EUT: RFM121LW
 Serial Number: lmei:990002430036317
 Test Description: FCC part 15 B class B @ 10 m
 Operating Conditions: Idle + charging
 Operator Name: Wolsdorfer
 Comment: AC: 115 V / 60 Hz

Scan Setup: GSM_N85_Fin [EMI radiated]

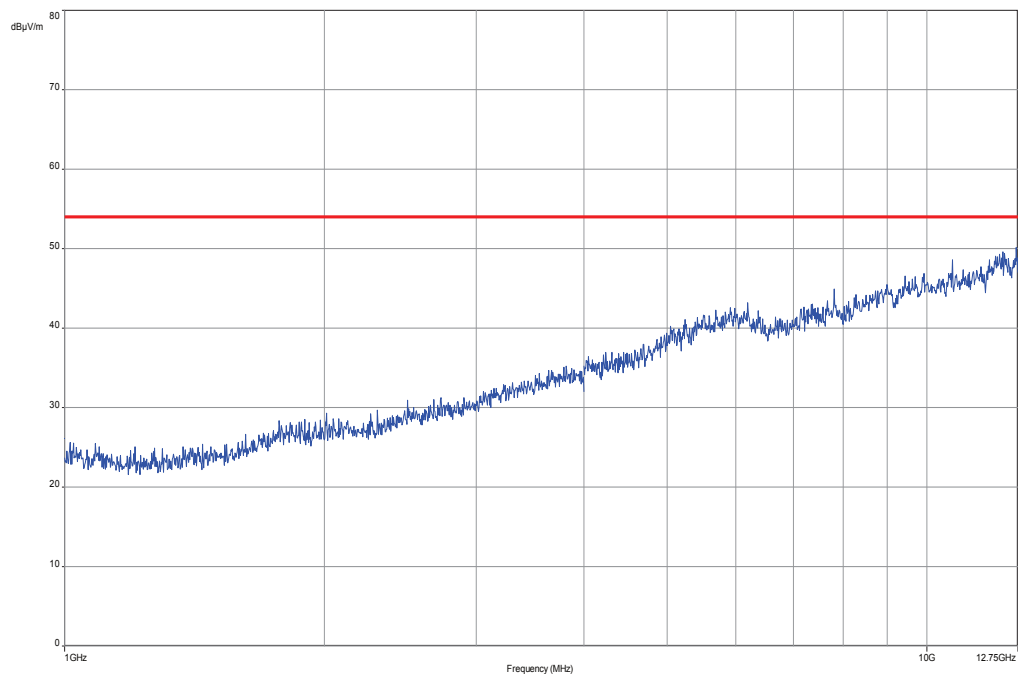
Hardware Setup: Electric Field (N850)
 Receiver: [ESCI 3]
 Level Unit: dB μ V/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 1 GHz	60 kHz	QPK GSM_850TCH	120 kHz	5 s	20 dB

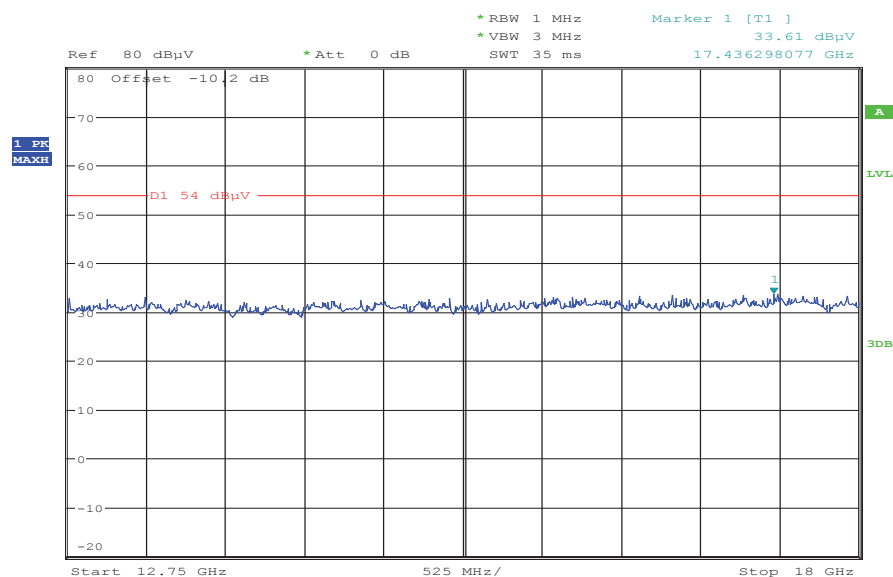
**Final Result 1**

Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth h (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
33.720550	14.3	5000.0	120.000	185.0	V	253.0	13.0	15.7	30.0	
47.292000	14.3	5000.0	120.000	145.0	V	127.0	13.4	15.7	30.0	
66.778650	12.0	5000.0	120.000	400.0	V	214.0	10.1	18.0	30.0	
701.084300	20.4	5000.0	120.000	239.0	H	232.0	23.1	15.6	36.0	
736.429550	21.2	5000.0	120.000	200.0	H	117.0	24.0	14.8	36.0	
744.357000	21.3	5000.0	120.000	200.0	H	185.0	24.1	14.7	36.0	
876.072550	31.8	5000.0	120.000	100.0	H	228.0	25.8	4.2	36.0	

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

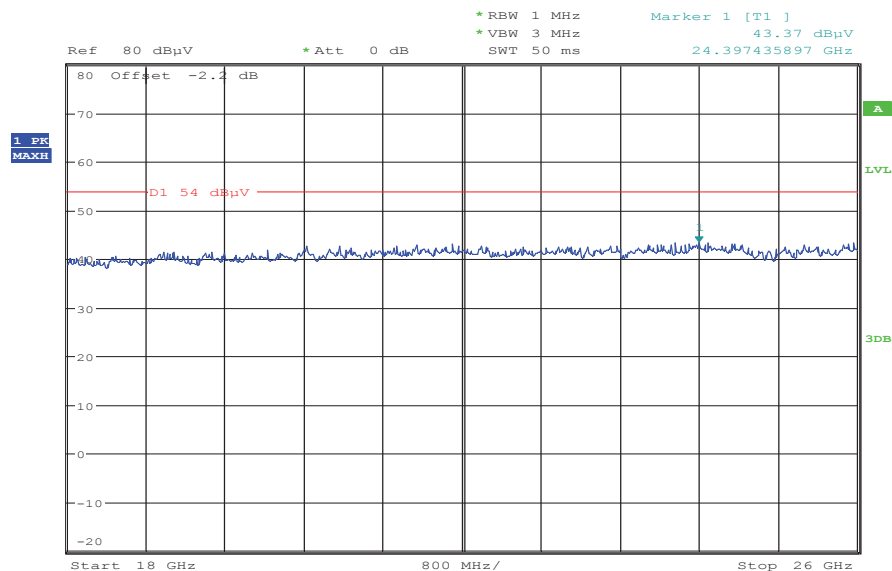


Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization



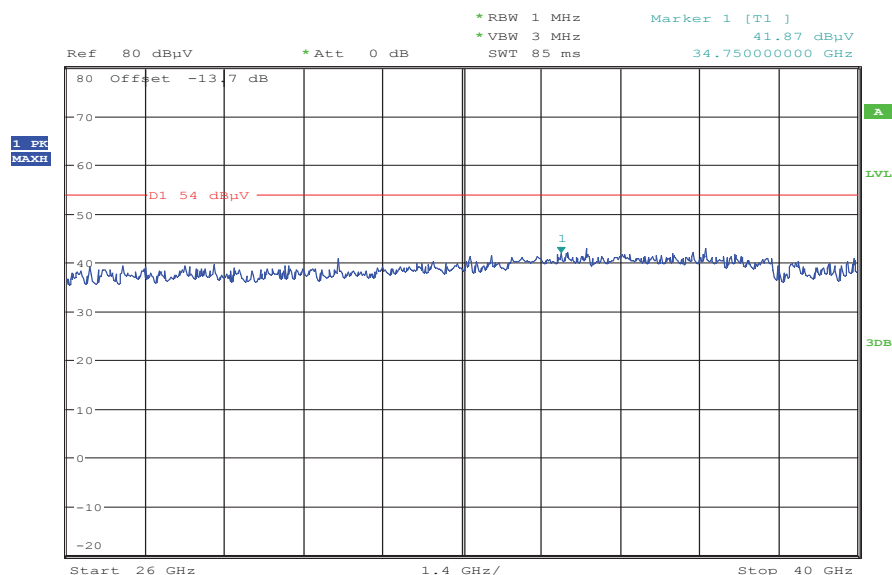
Date: 25.MAR.2013 16:25:55

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



Date: 25.MAR.2013 16:26:54

Plot 5: 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 16:51:15

9.12 Spurious emissions radiated < 30 MHz

Not performed! Tests according to manufacturer test plan!

9.13 Spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to middle channel. If critical peaks are found the lowest channel and the highest channel will be measured too. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

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

Limits:

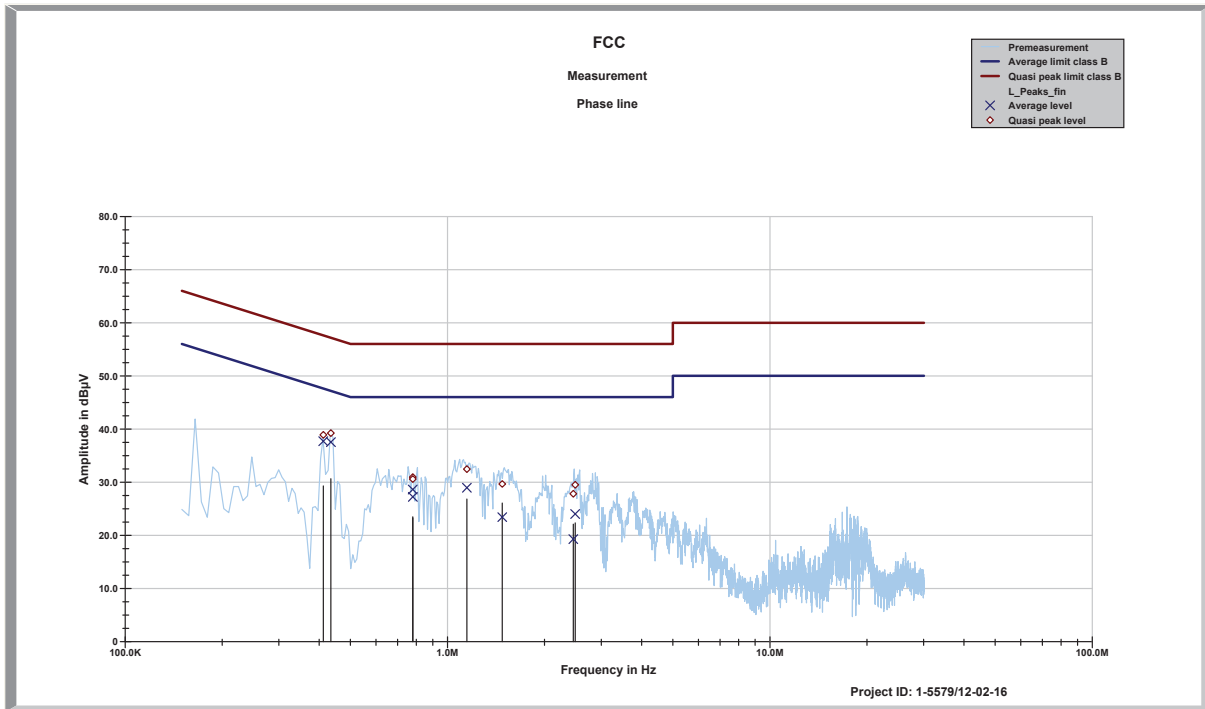
Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dB μ V/m)	Average (dB μ V/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

*Decreases with the logarithm of the frequency

Results:

Spurious Emissions Conducted < 30 MHz [dB μ V/m]		
F [MHz]	Detector	Level [dB μ V/m]
No critical peaks detected. All detected peak values are below the average limits.		
Measurement uncertainty	± 3 dB	

Result: Passed

Plots:

FCC

Phase line tbl

Project ID: 1-5579/12-02-33

01:58:36 PM, Thursday, February 28, 2013

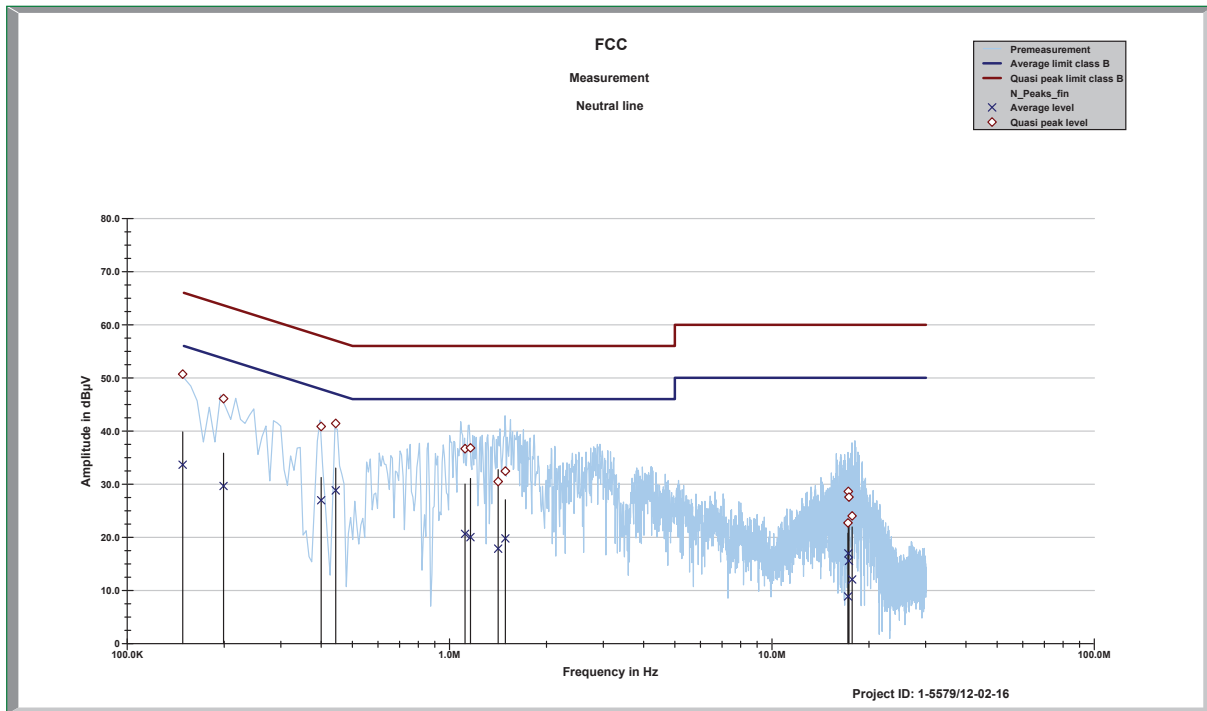
Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.41168	38.89	18.72	37.71	10.82
0.43466	39.23	17.94	37.54	10.33
0.77974	30.94	25.06	28.63	17.37
0.7807	30.59	25.41	27.23	18.77
1.14802	32.45	23.55	28.94	17.06
1.4781	29.66	26.34	23.42	22.58
2.4551	27.82	28.18	19.29	26.71
2.4866	29.49	26.51	24.01	21.99

Project ID - 1-5579/12-02-33

EUT - RFM121LW

Serial Number - 990002430024636

Operating mode - W-LAN a-mode + 2x charging; 115V AC/60Hz



FCC
Neutral line tbl

Project ID: 1-5579/12-02-33

01:58:36 PM, Thursday, February 28, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.14874	50.70	NAN	33.66	NAN
0.19902	46.09	17.56	29.65	24.95
0.39975	40.86	16.99	26.97	21.89
0.4435	41.43	15.56	28.84	18.78
1.11728	36.67	19.33	20.65	25.35
1.161	36.83	19.17	20.04	25.96
1.4156	30.48	25.52	17.87	28.13
1.4896	32.45	23.55	19.79	26.21
17.204	22.72	37.28	8.86	41.14
17.237	28.63	31.37	16.97	33.03
17.317	27.57	32.43	15.58	34.42
17.716	24.04	35.96	12.07	37.93

Project ID - 1-5579/12-02-33
 EUT - RFM121LW
 Serial Number - 990002430024636
 Operating mode - W-LAN a-mode + 2x charging; 115V AC/60Hz

10 Test equipment and ancillaries used for tests

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

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

No.	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	k	14.07.2011	14.07.2013
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!	11.05.2011	11.05.2013
14	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
15	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
16	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
17	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
18	9	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
19	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
20	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
21	n. a.	Highpass Filter	WHKX7.0/1 8G-8SS	Wainwright	18	300003789	ne		
22	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	viKI!	14.10.2011	14.10.2014
23	n. a.	MXE EMI	N9038A	Agilent	MY51210197	300004405	k	21.02.2013	21.02.2014

		Receiver 20 Hz bis 26,5 GHz		Technologi es					
24	CR 79	Std. Gain Horn Antenna 26.5- 40.0 GHz	V637	Narda	7911	300001751	ne		
25	11b	Microwave System Amplifier, 0.5- 26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
26	A025	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000786	ne		
27	A027	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300000486	ne		
28	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	09.10.2012	09.10.2014
29	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL18503 070-XX	CERNEX	19338	300004273	ne		
30	n. a.	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	22.10.2012	22.10.2013

Agenda: Kind of Calibration

k calibration / calibrated
 ne not required (k, ev, izw, zw not required)
 ev periodic self verification
 Ve long-term stability recognized
 vlk! Attention: extended calibration interval
 NK! Attention: not calibrated

EK limited calibration
 zw cyclical maintenance (external cyclical maintenance)
 izw internal cyclical maintenance
 g blocked for accredited testing
 *) next calibration ordered / currently in progress

11 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	2013-03-27
-A	Addition of PIN	2013-04-02
-B	Changed standard version	2013-04-04

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

Standort Berlin
Spittelmarkt 10
10117 BerlinStandort Frankfurt am Main
Gartenstraße 5
60594 Frankfurt am MainStandort Braunschweig
Rundersloh 100
38116 Braunschweig

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