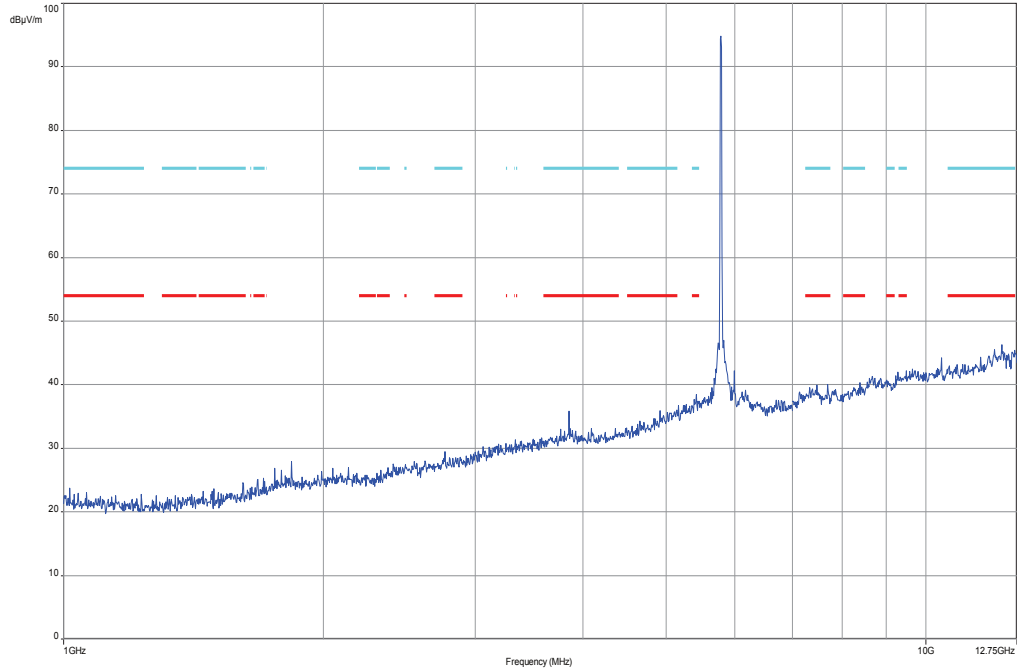
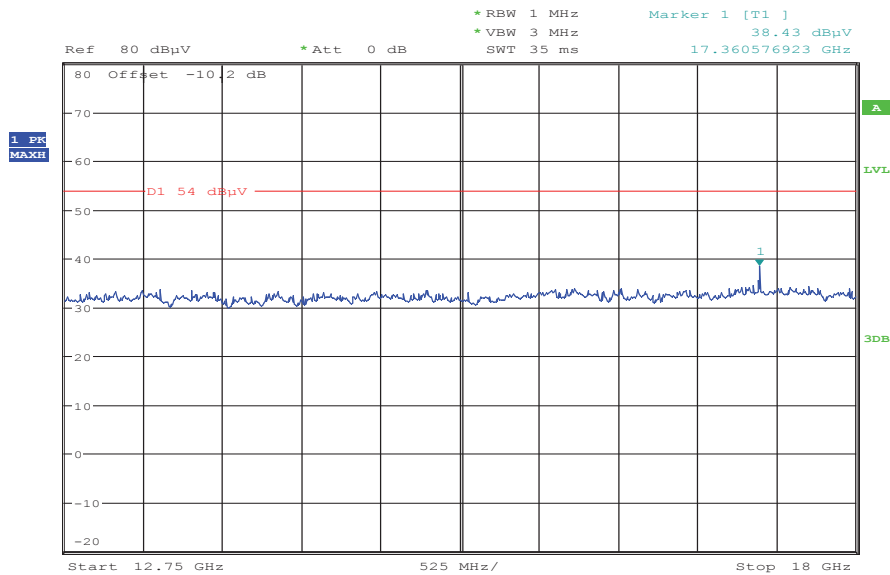


Plot 7: Channel 157, 1 GHz to 12.75 GHz, vertical & horizontal polarization

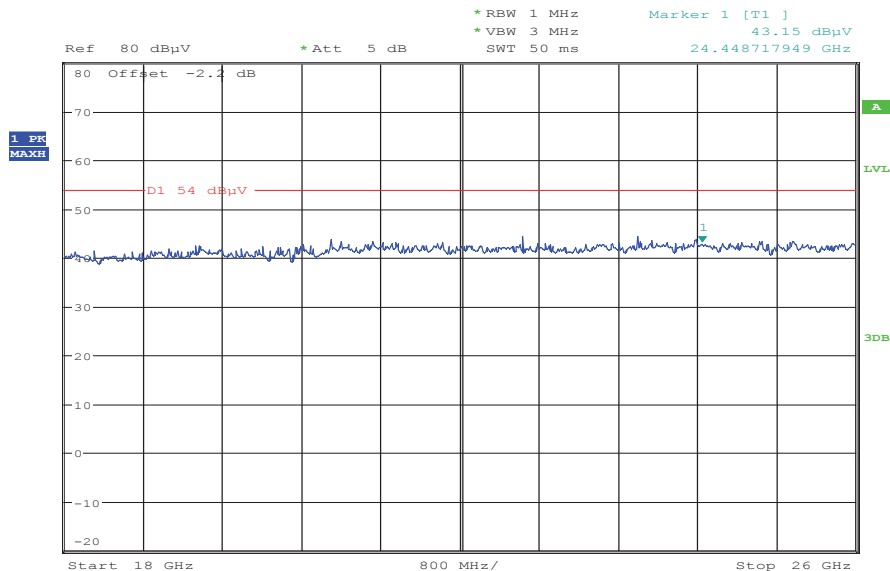


Plot 8: Channel 157, 12.75 GHz to 18 GHz, vertical & horizontal polarization



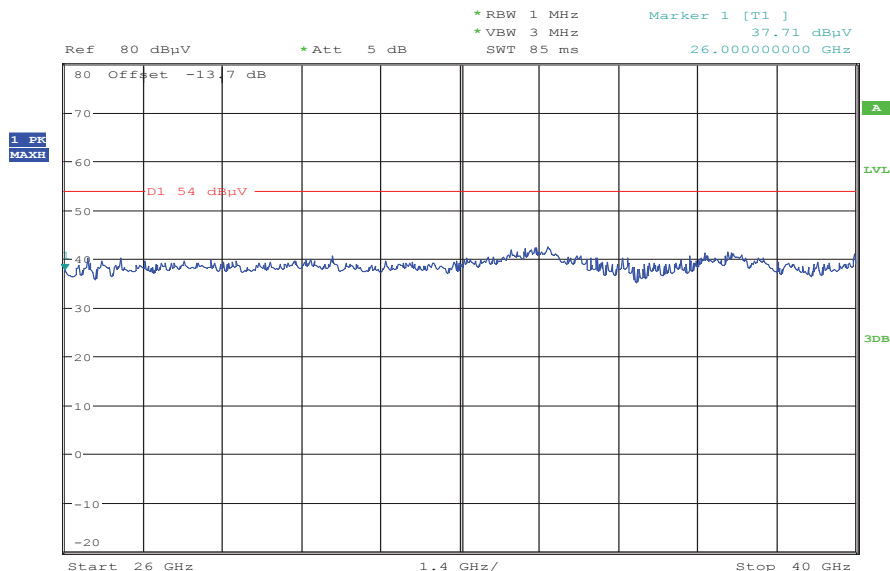
Date: 25.MAR.2013 14:20:00

Plot 9: Channel 157, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:53:48

Plot 10: Channel 157, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:01:23

Plot 11: Channel 165, 30 MHz to 1 GHz, vertical & horizontal polarization

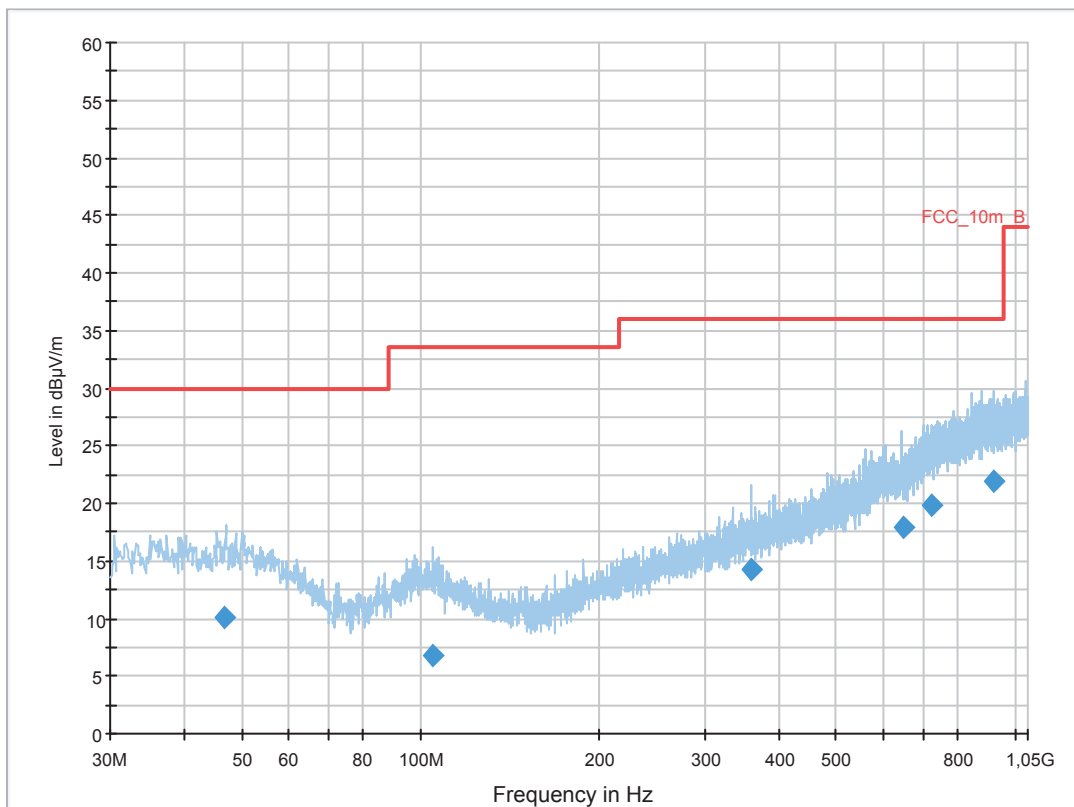
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan a mode CH165 6Mbps  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

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

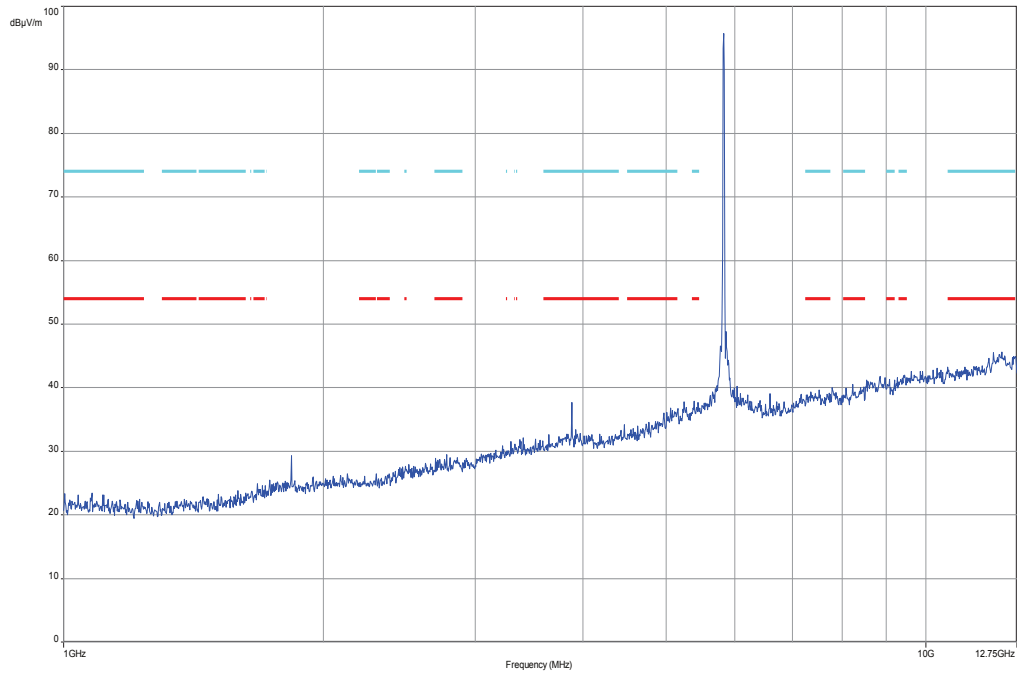
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



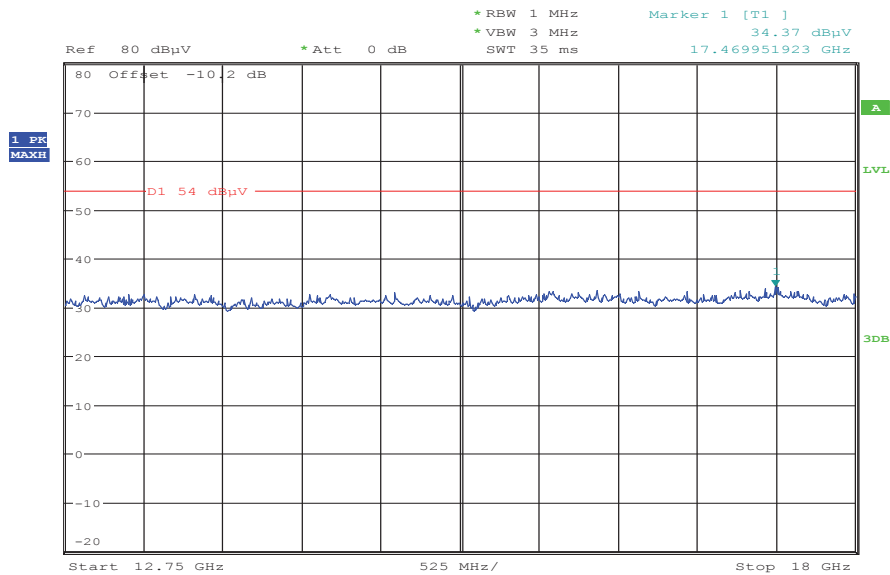
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
46.846800	10.1	1000.0	120.000	98.0	V	175.0	13.3	19.9	30.0	
104.746650	6.7	1000.0	120.000	170.0	H	261.0	11.5	26.8	33.5	
360.006750	14.3	1000.0	120.000	170.0	V	-2.0	16.2	21.7	36.0	
646.434000	17.8	1000.0	120.000	170.0	V	-10.0	21.1	18.2	36.0	
725.281650	19.8	1000.0	120.000	170.0	H	100.0	23.1	16.2	36.0	
921.847350	21.8	1000.0	120.000	170.0	H	88.0	25.3	14.2	36.0	

**Plot 12:** Channel 165, 1 GHz to 12.75 GHz, vertical & horizontal polarization

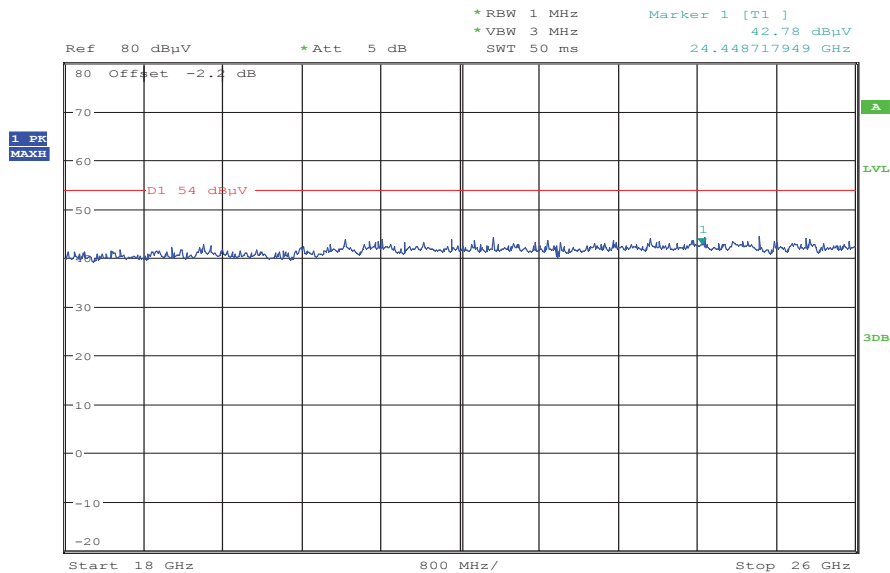


**Plot 13:** Channel 165, 12.75 GHz to 18 GHz, vertical & horizontal polarization



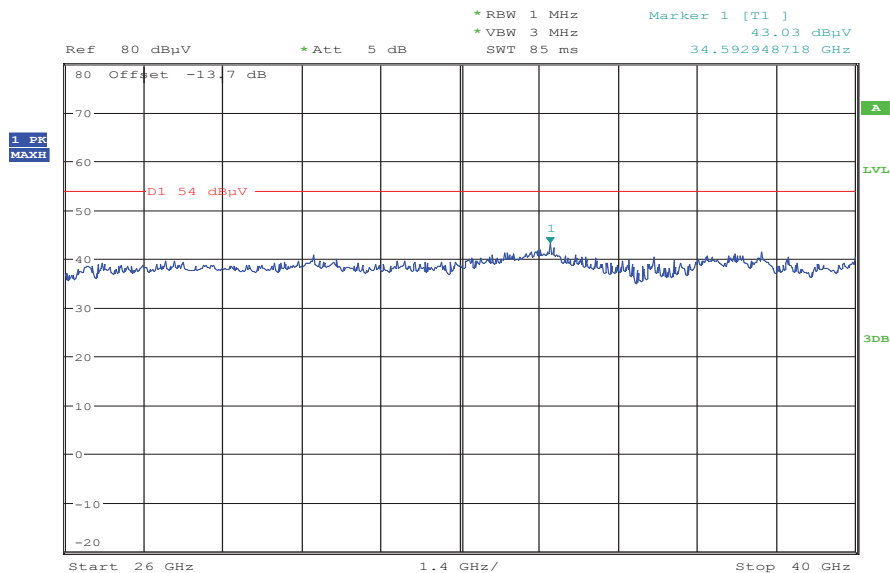
Date: 25.MAR.2013 13:37:26

Plot 14: Channel 165, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:54:38

Plot 15: Channel 165, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:02:16

**Plots: OFDM / n – mode HT20**

**Plot 1:** Channel 149, 30 MHz to 1 GHz, vertical & horizontal polarization

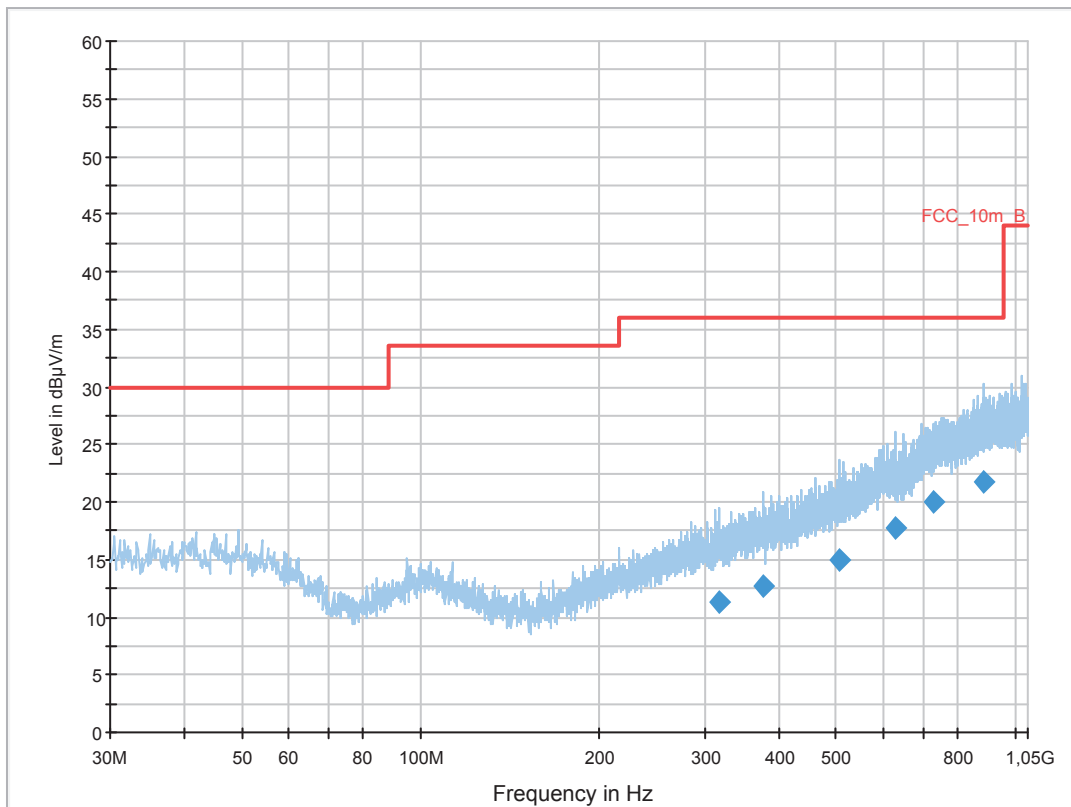
**Common Information**

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan n mode CH149 mcs0  
 Operator Name: Wolsdorfer  
 Comment: battery powered

**Scan Setup: STAN\_Fin [EMI radiated]**

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

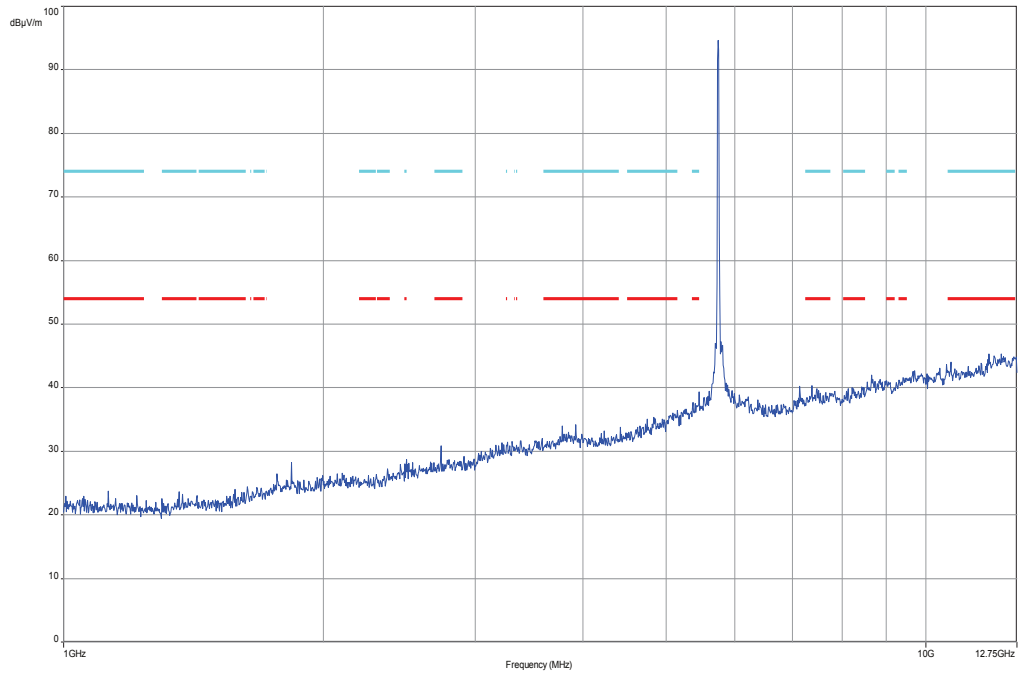
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



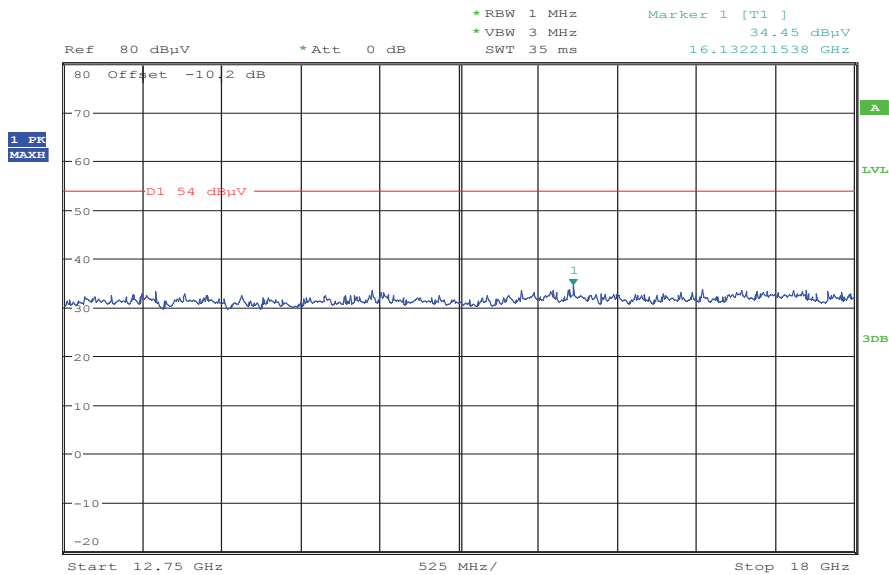
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
318.366900	11.3	1000.0	120.000	170.0	H	0.0	15.1	24.7	36.0	
378.229050	12.6	1000.0	120.000	170.0	H	260.0	16.5	23.4	36.0	
506.622750	14.9	1000.0	120.000	153.0	V	0.0	18.8	21.1	36.0	
627.068250	17.7	1000.0	120.000	170.0	V	177.0	21.0	18.3	36.0	
728.218800	20.0	1000.0	120.000	170.0	V	190.0	23.2	16.0	36.0	
886.753350	21.8	1000.0	120.000	170.0	V	100.0	25.0	14.2	36.0	

**Plot 2:** Channel 149, 1 GHz to 12.75 GHz, vertical & horizontal polarization

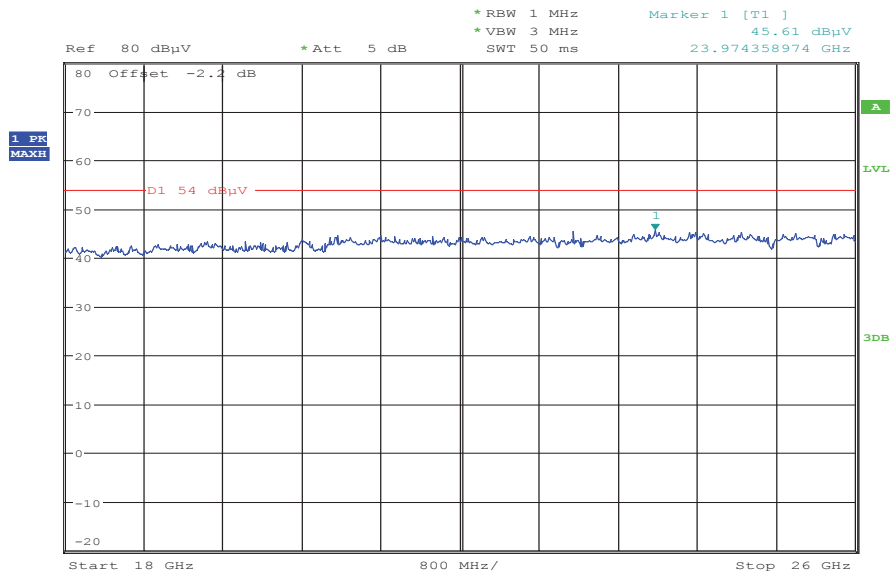


**Plot 3:** Channel 149, 12.75 GHz to 18 GHz, vertical & horizontal polarization



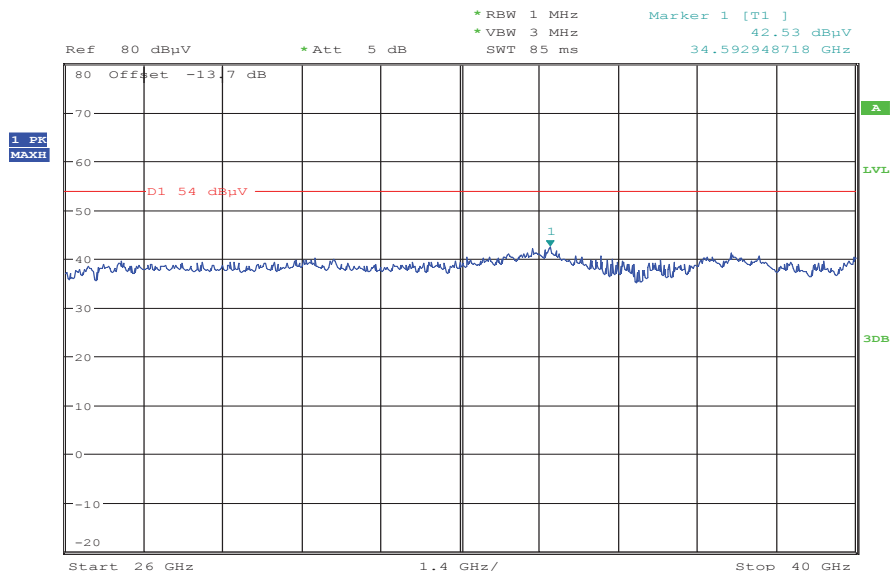
Date: 25.MAR.2013 13:39:32

Plot 4: Channel 149, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:17:35

Plot 5: Channel 149, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:03:29



**Plot 6:** Channel 157, 30 MHz to 1 GHz, vertical & horizontal polarization

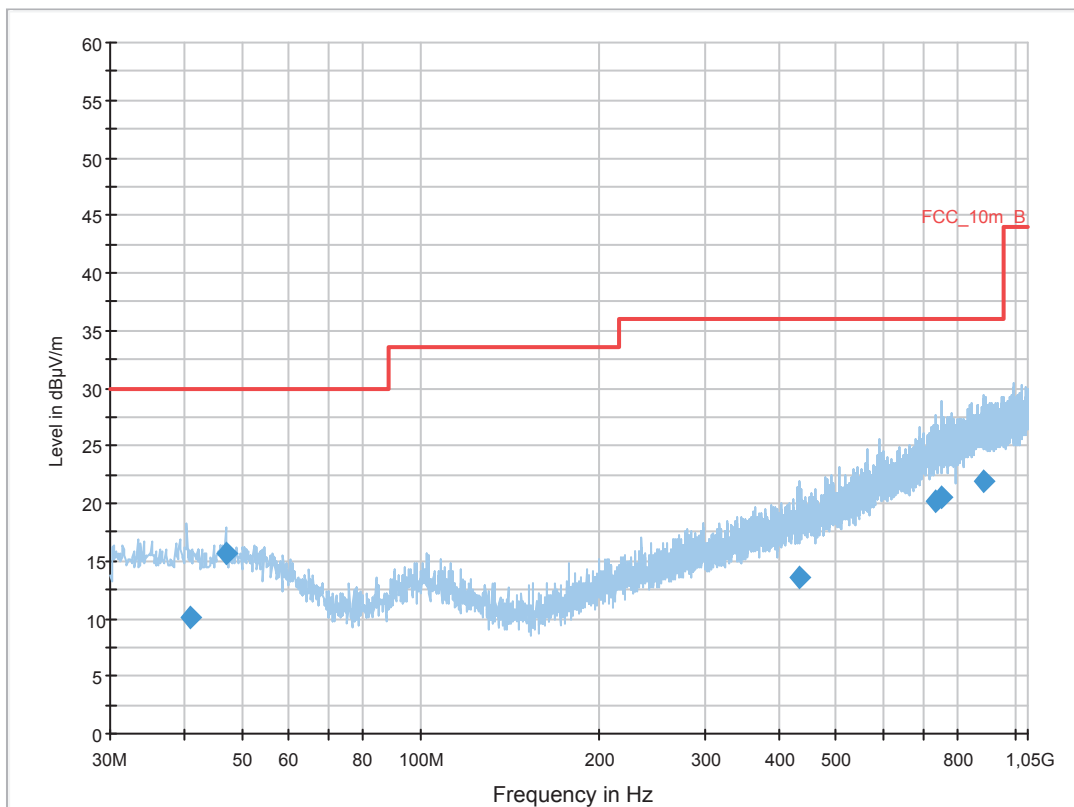
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan n mode CH157 mcs0  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

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

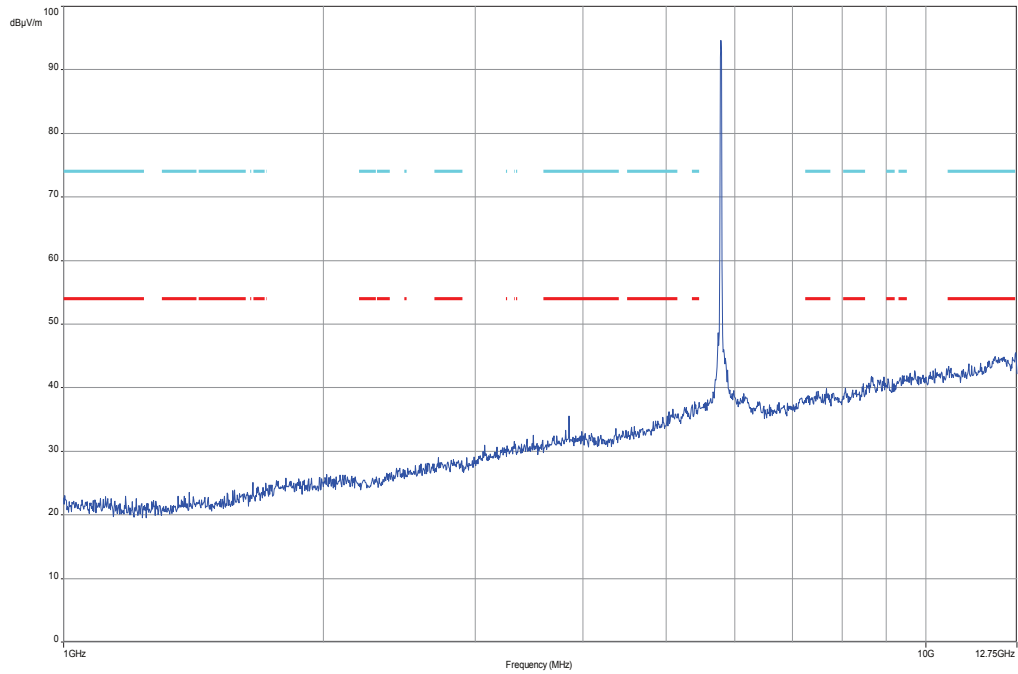
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



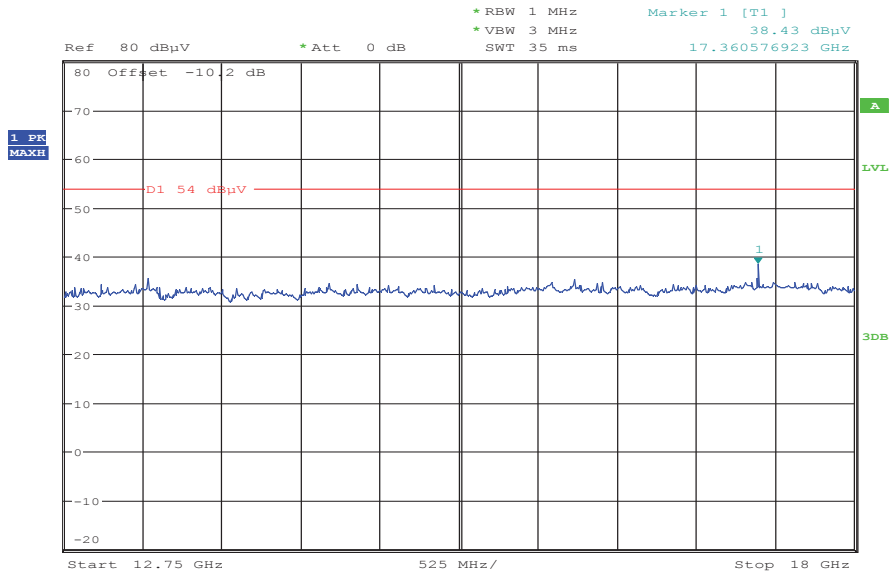
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
40.836000	10.1	1000.0	120.000	143.0	H	90.0	13.4	19.9	30.0	
47.005650	15.7	1000.0	120.000	104.0	V	270.0	13.3	14.3	30.0	
432.601500	13.6	1000.0	120.000	170.0	V	100.0	17.4	22.4	36.0	
734.373600	20.2	1000.0	120.000	170.0	V	85.0	23.3	15.8	36.0	
750.992100	20.5	1000.0	120.000	170.0	H	265.0	23.7	15.5	36.0	
886.612200	21.9	1000.0	120.000	170.0	V	280.0	25.0	14.1	36.0	

Plot 7: Channel 157, 1 GHz to 12.75 GHz, vertical & horizontal polarization

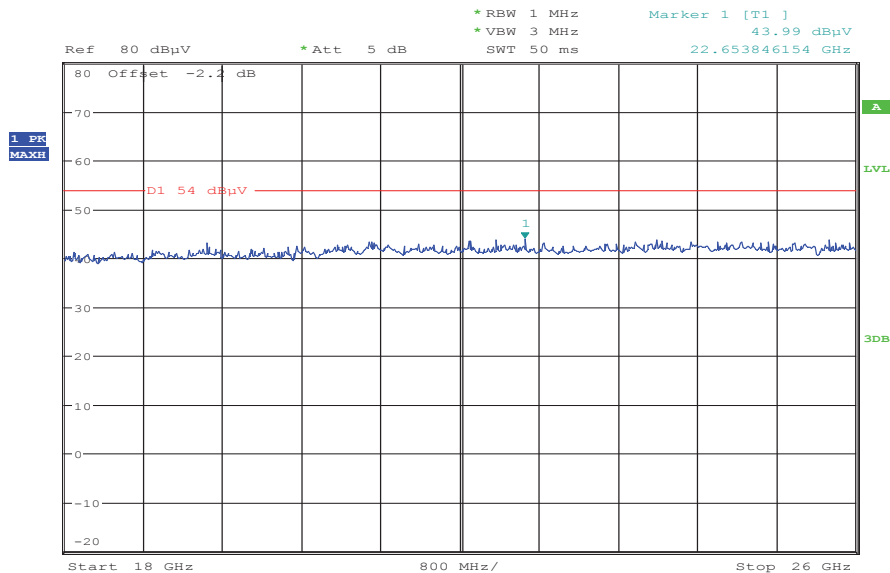


Plot 8: Channel 157, 12.75 GHz to 18 GHz, vertical & horizontal polarization



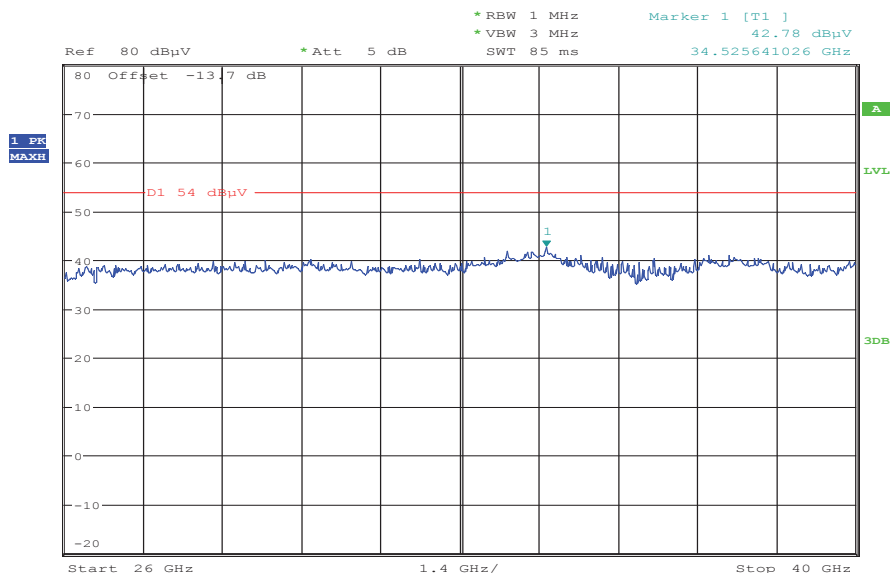
Date: 25.MAR.2013 14:42:17

Plot 9: Channel 157, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:57:01

Plot 10: Channel 157, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:04:34

Plot 11: Channel 165, 30 MHz to 1 GHz, vertical & horizontal polarization

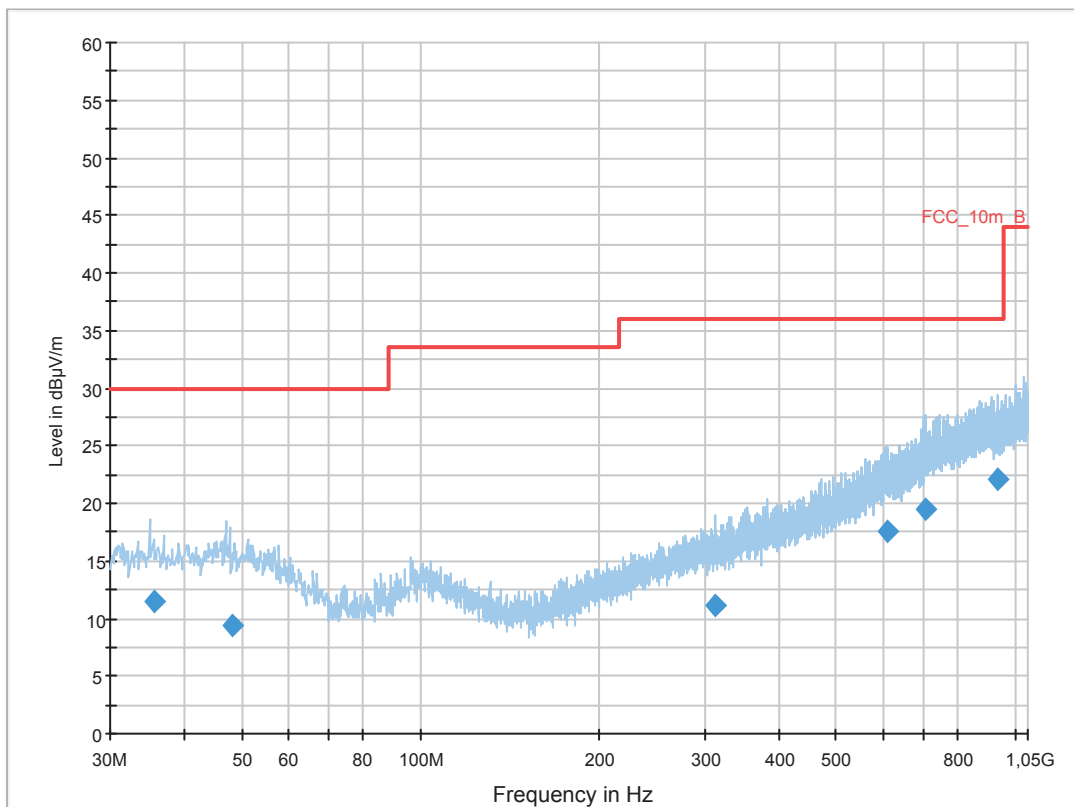
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan n mode CH165 mcs0  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

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

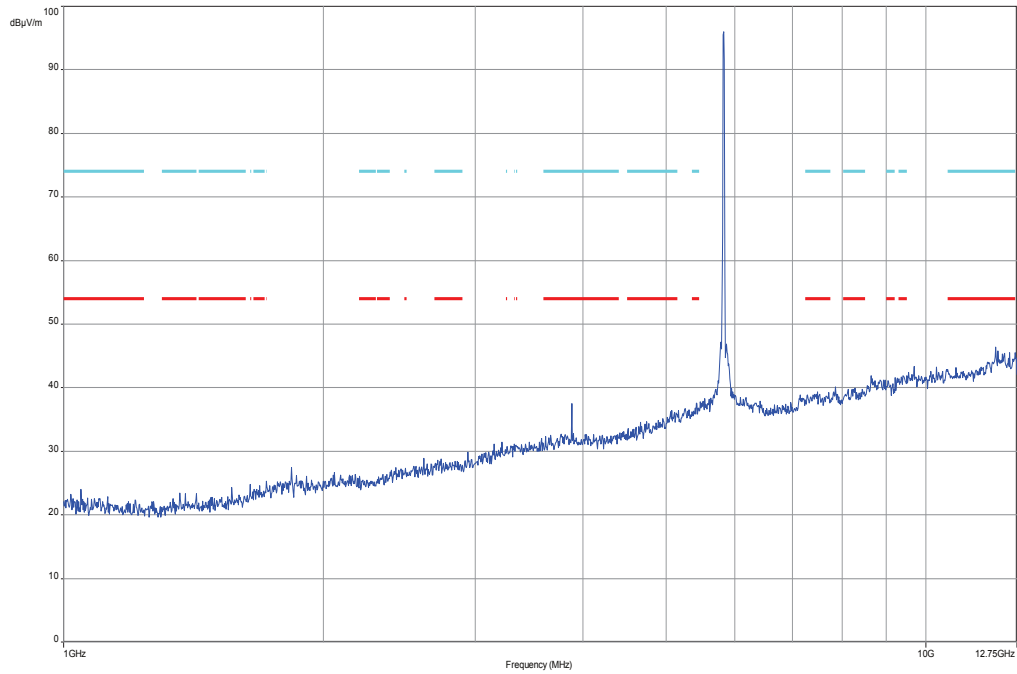
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



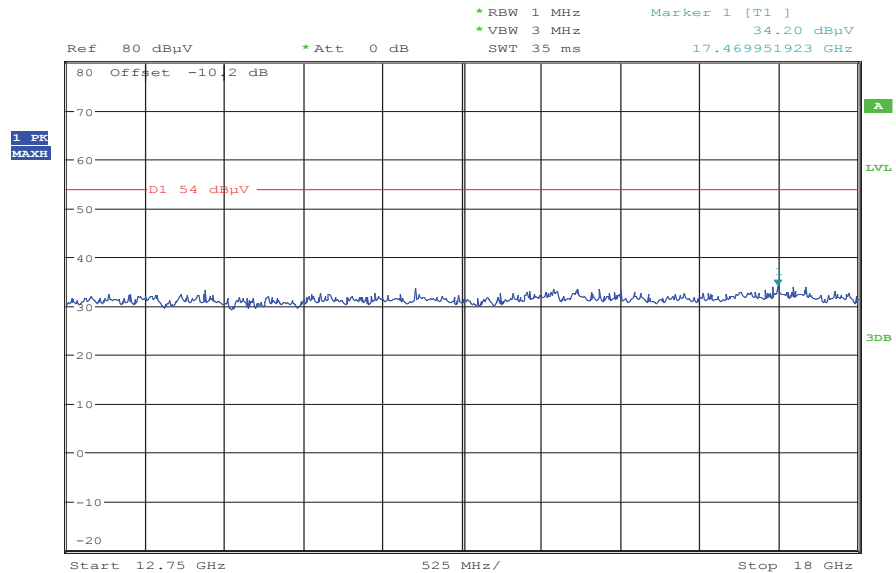
### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.507850	11.4	1000.0	120.000	170.0	V	100.0	13.1	18.6	30.0	
47.987550	9.4	1000.0	120.000	120.0	V	100.0	13.3	20.6	30.0	
311.710050	11.0	1000.0	120.000	121.0	V	270.0	14.9	25.0	36.0	
608.257350	17.6	1000.0	120.000	170.0	H	182.0	20.9	18.4	36.0	
705.124350	19.5	1000.0	120.000	170.0	V	274.0	22.6	16.5	36.0	
931.684800	22.0	1000.0	120.000	170.0	H	-2.0	25.3	14.0	36.0	

**Plot 12:** Channel 165, 1 GHz to 12.75 GHz, vertical & horizontal polarization

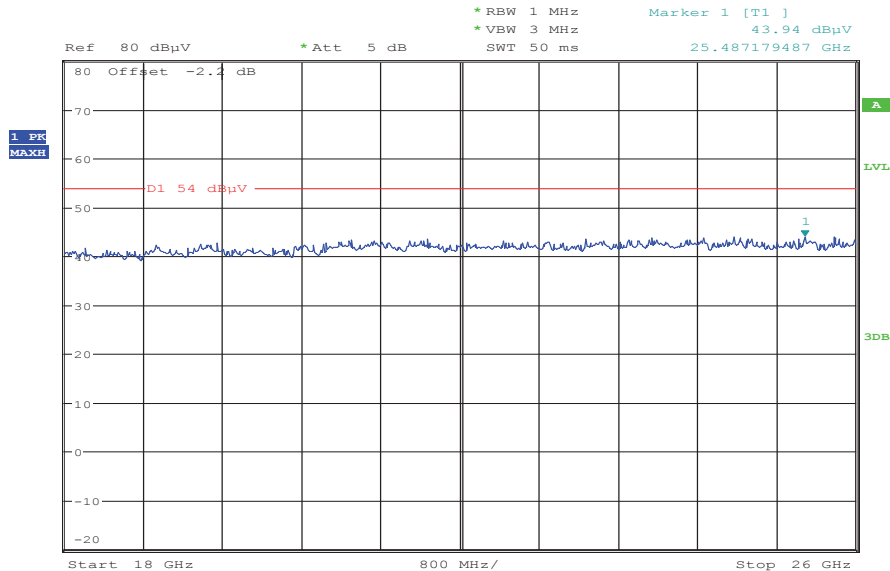


**Plot 13:** Channel 165, 12.75 GHz to 18 GHz, vertical & horizontal polarization



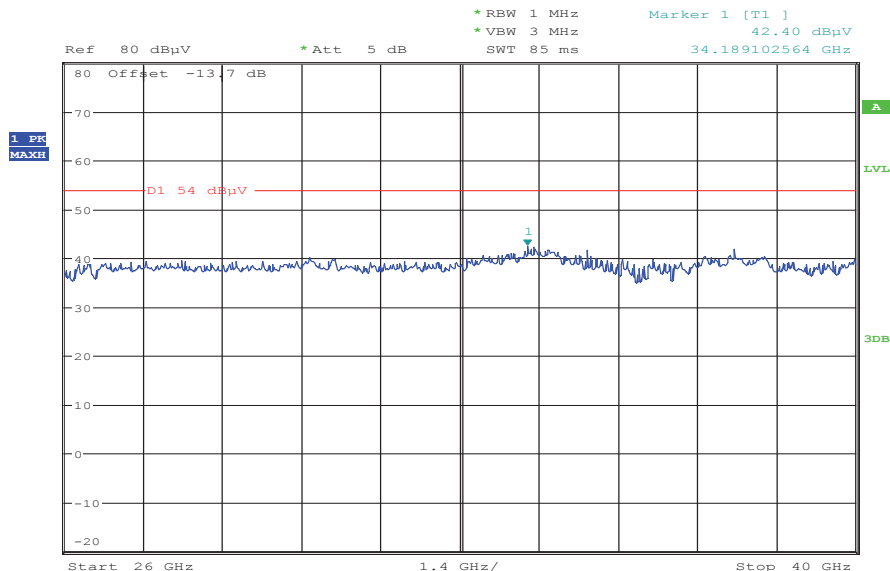
Date: 25.MAR.2013 13:41:57

Plot 14: Channel 165, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:58:03

Plot 15: Channel 165, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:05:25

## 9.12 RX spurious emissions radiated

Not performed! Tests according to manufacturer test plan!

## 9.13 Spurious emissions radiated < 30 MHz

Not performed! Tests according to manufacturer test plan!

### 9.14 Spurious emissions conducted < 30 MHz

**Description:**

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

**Measurement:**

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
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

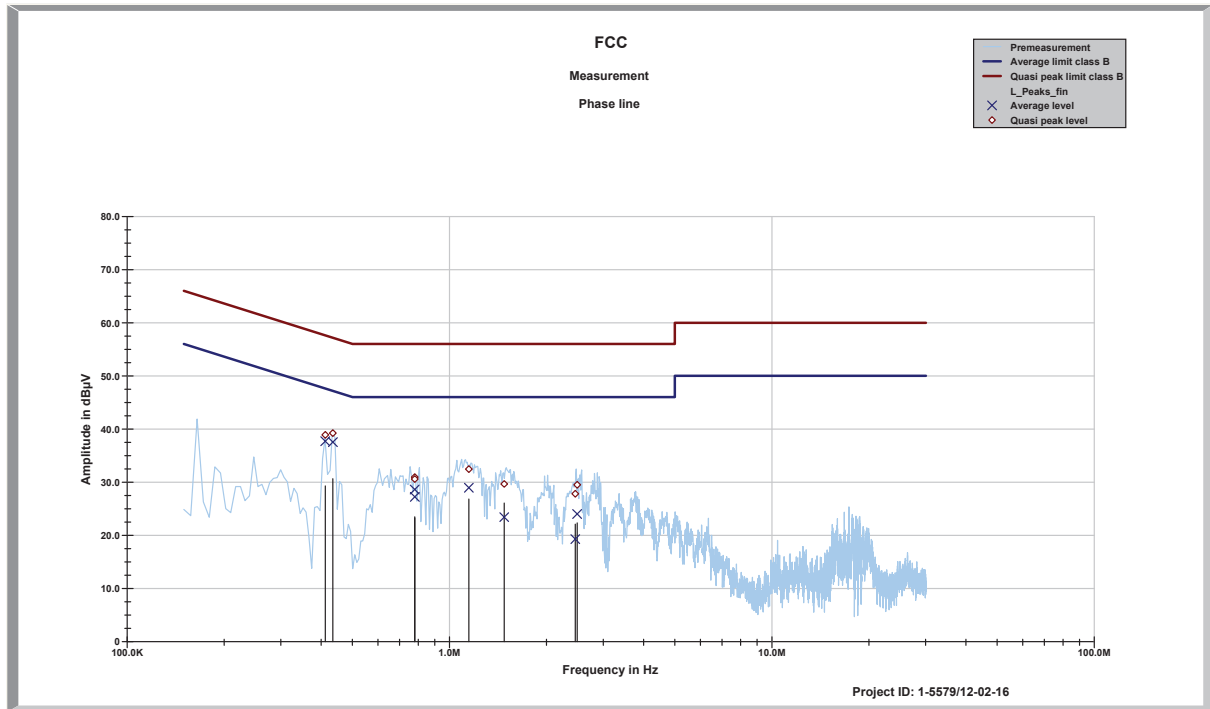
**Results:**

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

**Result: Passed**



**Plots:**



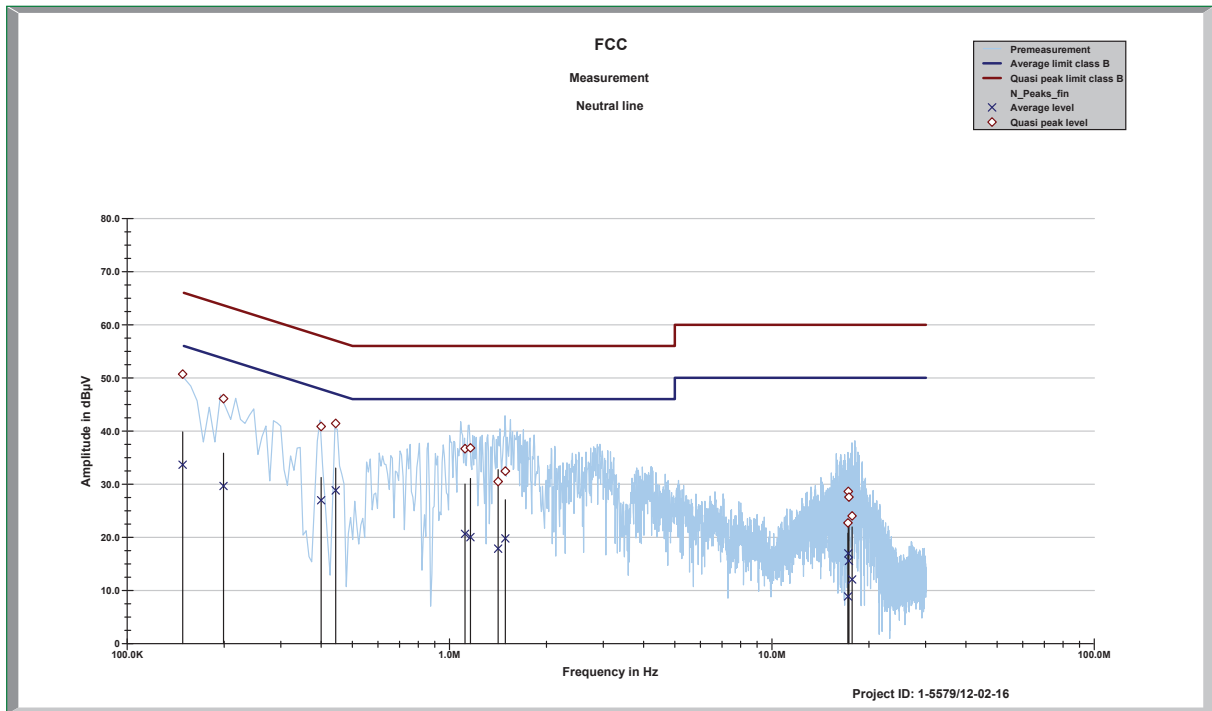
FCC  
Phase line tbl

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;B597 9	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	Schwarzbe ck	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.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	371	300003854	vIKI!	14.10.2011	14.10.2014
22	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologi es	MY51210197	300004405	k	21.02.2013	21.02.2014

23	CR 79	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751	ne		
24	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
25	A025	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000786	ne		
26	A027	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300000486	ne		
27	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	09.10.2012	09.10.2014
28	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL18503 070-XX	CERNEX	19338	300004273	ne		
29	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	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlk!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

## 11 Observations

No observations 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	2013-03-28
-A	Addition of PIN	2013-04-03
-A	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



Deutsche Akkreditierungsstelle GmbH

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

**Akkreditierung**



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

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

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

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

Die Akkreditierungskunde gilt nur in Verbindung mit dem Bescheid vom 18.01.2013 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 80 Seiten.

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

Frankfurt am Main, 18.01.2013  
 Leiter Prüfungsausschuss

Im Auftrag  
 Dr. Ingrid Pfeiffer  
 Abteilungsleiter

Back side of certificate

Deutsche Akkreditierungsstelle GmbH

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Die aussagefreie Veröffentlichung der Akkreditierungskunde bedarf der vorherigen schriftlichen Zustimmung der Deutschen Akkreditierungsstelle GmbH (DAkkS). Ausgenommen davon ist die separate Weiterverbreitung 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. 2525) 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 (Abl. L 218 vom 9. Juli 2008, S. 30). Die DAkkS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der European co-operation 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](http://www.european-accreditation.org)  
 ILAC: [www.ilac.org](http://www.ilac.org)  
 IAF: [www.iaf.ru](http://www.iaf.ru)

**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>