TECHNICAL REPORT

卓時檢測 TIMEWAY TESTING LABORATORY

TESTING CNAS L2292

ISO/IEC17025Accredited Lab.

Report No:	FCC 1003074-01
File reference No:	2010-07-30
Applicant:	Shenzhen Sungworld Electronics Co., Ltd
Product:	EPC
Model No:	E700 Series
Trademark:	N/A
Test Standards:	FCC Part 15 Subpart C, Paragraph 15.247
Test result:	It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4FCC Part 15 Subpart C, Paragraph 15.247 regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung
Manager

Dated: July 30, 2010

Results appearing herein relate only to the sample tested
The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Tel (755) 83448688 Fax (755) 83442996

Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAL-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-01

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-01.

TEST REPORT

Test Report Conclusion

Content

TEST REPORT

1.0 General Details

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

Telephone: (755) 83448688

Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-01

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: Shenzhen Sinchun Electronic Co., Ltd

Address: Shenzhen Sinchun Electronic Co., Ltd/3/F,Unit5,Cuihai Industrial Zone,Fengtang Road,Fuyong Town,Baoan District,Shenzhen, China

Telephone: 755 83957777

Fax: 755 83956777

1.3 Description of EUT

Product:	EPC
Manufacturer:	Shenzhen Sungworld Electronics Co., Ltd
Brand Name:	N/A
Model Number:	E700 Series
Power Source Adapter	Model: APS-A01809020-G Input: 100-240V~0.55A 60/50Hz ,Output: 9V, 2A
Type of Modulation	IEEE 802.11b : DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g : OFDM(64QAM, 16AQM, QPSK, BPSK)
Frequency range	IEEE 802.11b/g: 2412-2462MHz
Channel Spacing	IEEE 802.11b/g: 5MHz
Air Data Rate	IEEE 802.11b : 11 long, 11 short, 5.5 long, 5.5 short, 2 long, 2 short, 1 long Mbps IEEE 802.11g : 54, 48, 36, 24, 18, 12, 9, 6 Mbps
Frequency Selection	By software
Channel Number	IEEE 802.11b/g : 11 Channels

1.4 Submitted Sample: 1 Sample

1.5 Test Duration

2010-03-10 to 2010-07-26

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1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

The sample tested by Terry Tang

Print Name: Terry Tang

TEST REPORT

6.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2009-12-05	2010-12-04
Absorbing Clamp	ROHDE&SCHWARZ	MDS-21	100126	2009-12-05	2010-12-04
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2009-12-05	2010-12-04
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2009-12-05	2010-12-04
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2009-12-05	2010-12-04
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2010-03-29	2011-03-28
4-WIRE ISN	ROHDE&SCHWARZ	ENY 41	830663/044	2010-02-17	2011-02-16
GG ENY22 Double 2-Wire ISN	ROHDE&SCHWARZ	ENY22	83066/016	2010-02-17	2011-02-16
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2010-02-17	2011-02-16
System Controller	CT	SC100	-	2010-02-17	2011-02-16
Printer	EPSON	PHOTO EX3	CFNH234850	2010-02-17	2011-02-16
FM-AM Signal Generator	JUNG.JIN	SG-150M	389911177	2010-02-17	2011-02-16
Color TV Pattern Generator	PHILIPS	PM5418	LO621747	2010-02-17	2011-02-16
Computer	IBM	8434	1S8434KCE99 BLXLO*	-	-
Oscillator	KENWOOD	AG-203D	3070002	2010-02-17	2011-02-16
Spectrum Analyzer	HAMEG	HM5012	-	-	-
Power Supply	LW	APS1502	-	-	-
5K VA AC Power Source	California Instruments	5001iX	56060	2010-02-17	2011-02-16
CDN	EM TEST	CDN M2/M3	-	2010-02-17	2011-02-16
Attenuation	EM TEST	ATT6/75	-	2010-02-17	2011-02-16
Resistance	EM TEST	R100	-	2010-02-17	2011-02-16
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2010-02-17	2011-02-16
Inductive Components	EM TEST	MC2630	-	2010-02-17	2011-02-16
Antenna	EM TEST	MS100	-	2010-02-17	2011-02-16

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Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2010-02-17	2011-02-16
Power Amplifier	AR	150W1000	300999	2010-02-17	2011-02-16
Field probe	Holaday	HI-6005	105152	2010-02-17	2011-02-16
Bilog Antenna	Chase	CBL6111C	2576	2010-02-17	2011-02-16
Loop Antenna	EMCO	6502	00042960	2010-02-17	2011-02-16
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2010-02-17	2011-02-16
3m OATS	--	--	N/A	2010-02-17	2011-02-16
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2009-08-15	2010-08-14
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2010-07-03	2011-07-02
Power meter	Anritsu	ML2487A	6K00003613	2010-02-17	2011-02-16
Power sensor	Anritsu	MA2491A	32263	2010-02-17	2011-02-16
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2010-05-14	2011-05-13
LISN	AFJ	LS16C	10010947251	2010-5-14	2011-05-13
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2010-5-14	2011-05-13
9*6*6 Anechoic	--	--	N/A	2010-5-14	2011-05-13

3. DESCRIPTION OF TEST MODES

IEEE 802.11b, 802.11g mode

The EUT had been tested under operating condition. There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode : 1Mbps data rate (worst case) were chosen for full testing. IEEE 802.11g mode : 6Mbps data rate (worst case) were chosen for full testing.

The worst-case data rates are determined according to the description above, based on the investigations by measuring the PSD and average power across all the data rates, bandwidths, modulations and spatial stream modes.

3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107 & 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.247(a)(2) Limit	Spectrum bandwidth of a Orthogonal Frequency Division Multiplex System Limit: 6dB bandwidth>500kHz	PASS	Complies
FCC Part 15, Paragraph 15.247(b)	Maximum peak output power Limit: max. 30dBm	PASS	Complies
FCC Part 15, Paragraph 15.109,15.205 & 15.209	Transmitter Radiated Emission Limit: Table 15.209	PASS	Complies
FCC Part 15, Paragraph 15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Complies
FCC Part 15, Paragraph 15.247(d)	Out of Band Emission and Restricted Band Radiation Limit: 20dB less than peak value of fundamental frequency Restricted band limit: Table 15.209	PASS	Complies

3.2 Test Standards

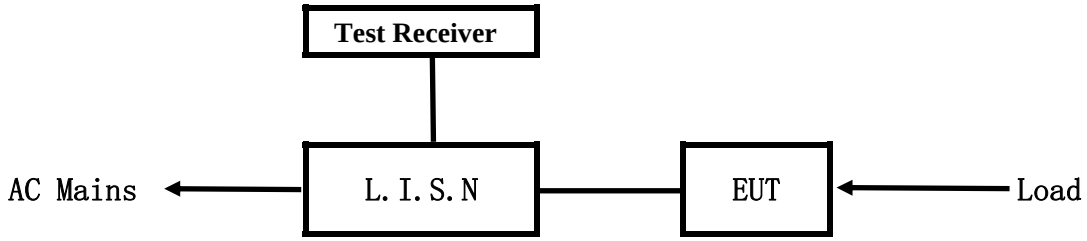
FCC Part 15 Subpart & Subpart C, Paragraph 15.247

4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co.,Ltd

5. Power Line Conducted Emission Test

5.1 Schematics of the test



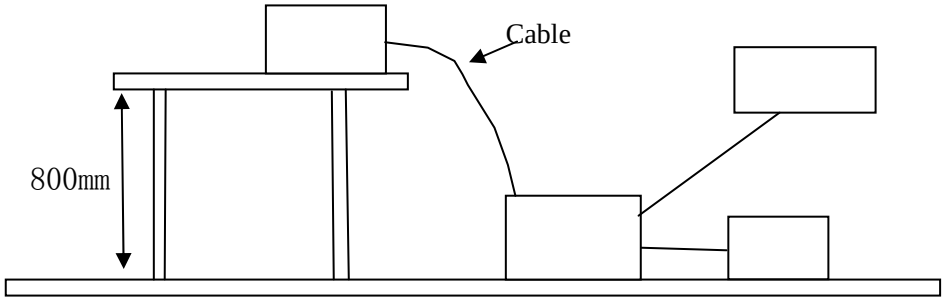
EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003.The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Actual Working Voltage and Frequency: 120V~, 60Hz

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Manufacturer	Model	FCC ID
EPC	Shenzhen Sungworld Electronics Co., Ltd	E700 Series	WI3SW-E700X

B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207 and 15.107

Frequency (MHz)	Class A Limits (dB μ V)		Class B Limits (dB μ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ～ 0.50	79.0	66.0	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	73.0	60.0	56.0	46.0
5.00 ～ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

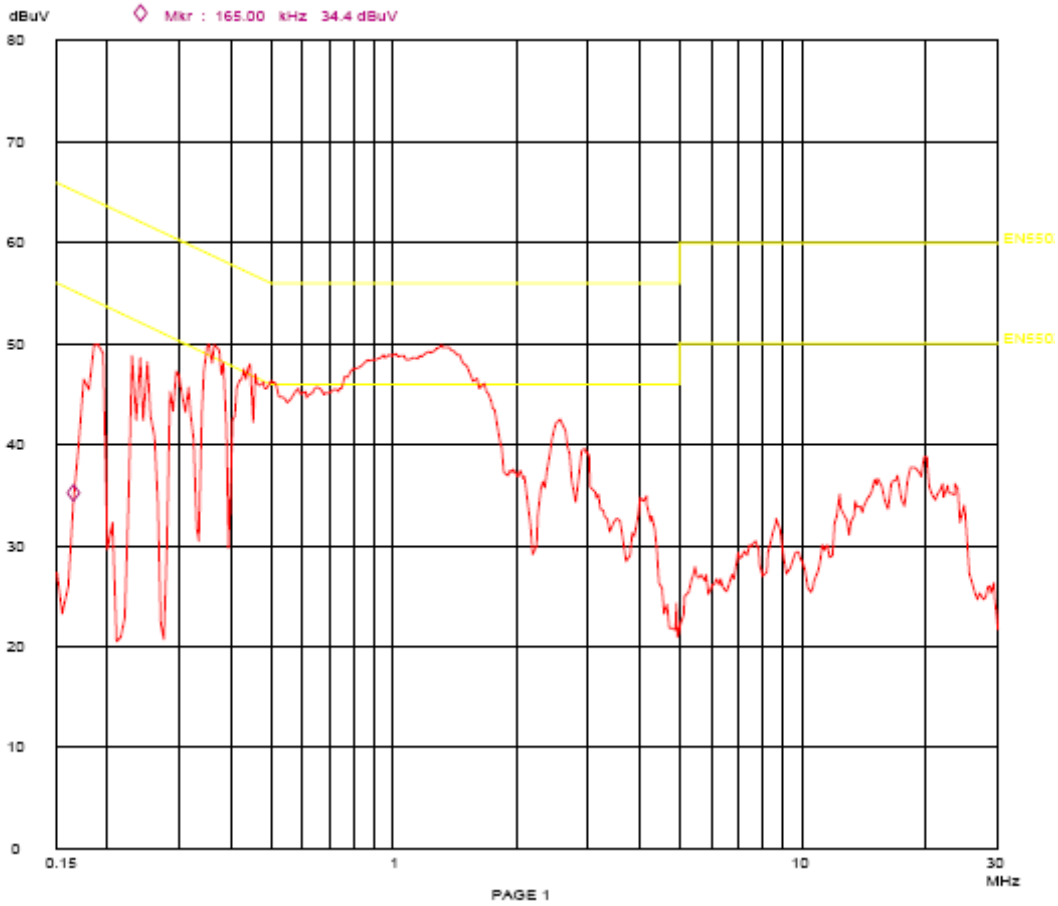
Note: the worse cases was selected to conducted the test

A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Read USB,SD card and Running EMC test software and Ping wireless network

Results: **Pass**

Please refer to following diagram for individual



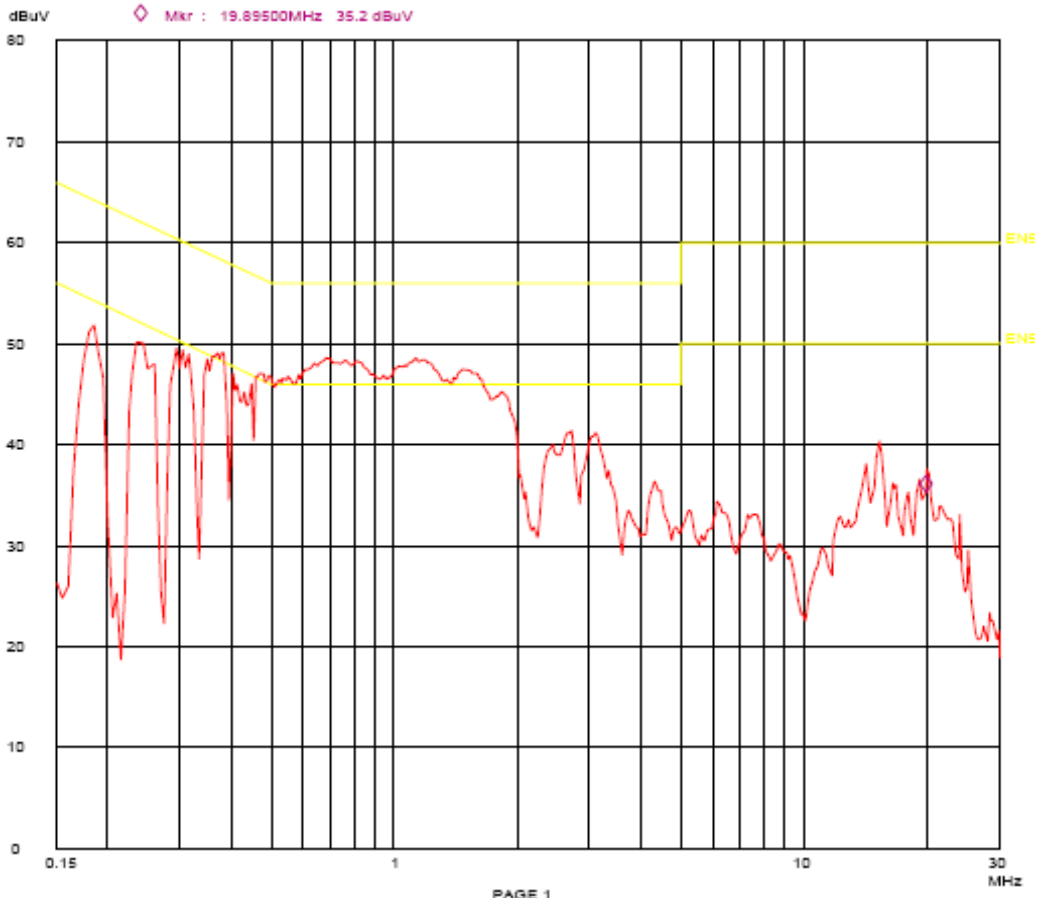
Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Line		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.175	46.80	34.60	--	--	64.70	54.70
0.375	46.70	35.90	--	--	58.40	48.40
3.910	28.70	24.20	--	--	56.00	46.00
16.060	31.50	22.50	--	--	60.00	50.00

B **Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)**

EUT set Condition: Read USB,SD card and Running EMC test software and Ping wireless network

Results: **Pass**

Please refer to following diagram for individual



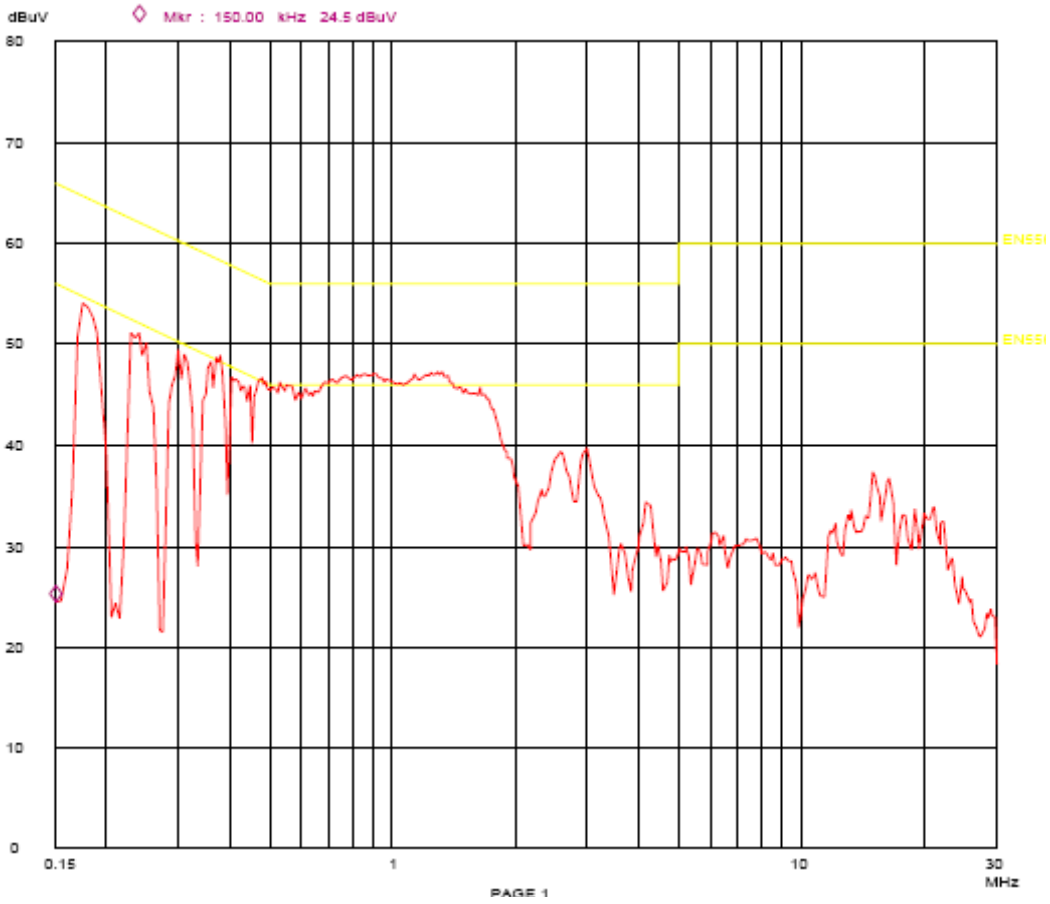
Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.175	--	--	48.60	36.50	64.70	54.70
0.380	--	--	45.70	33.10	58.30	48.30
4.165	--	--	31.10	26.50	56.00	46.00
14.980	--	--	32.80	24.50	60.00	50.00

C Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT set Condition: Running notebook test program and Ping network

Results: **Pass**

Please refer to following diagram for individual



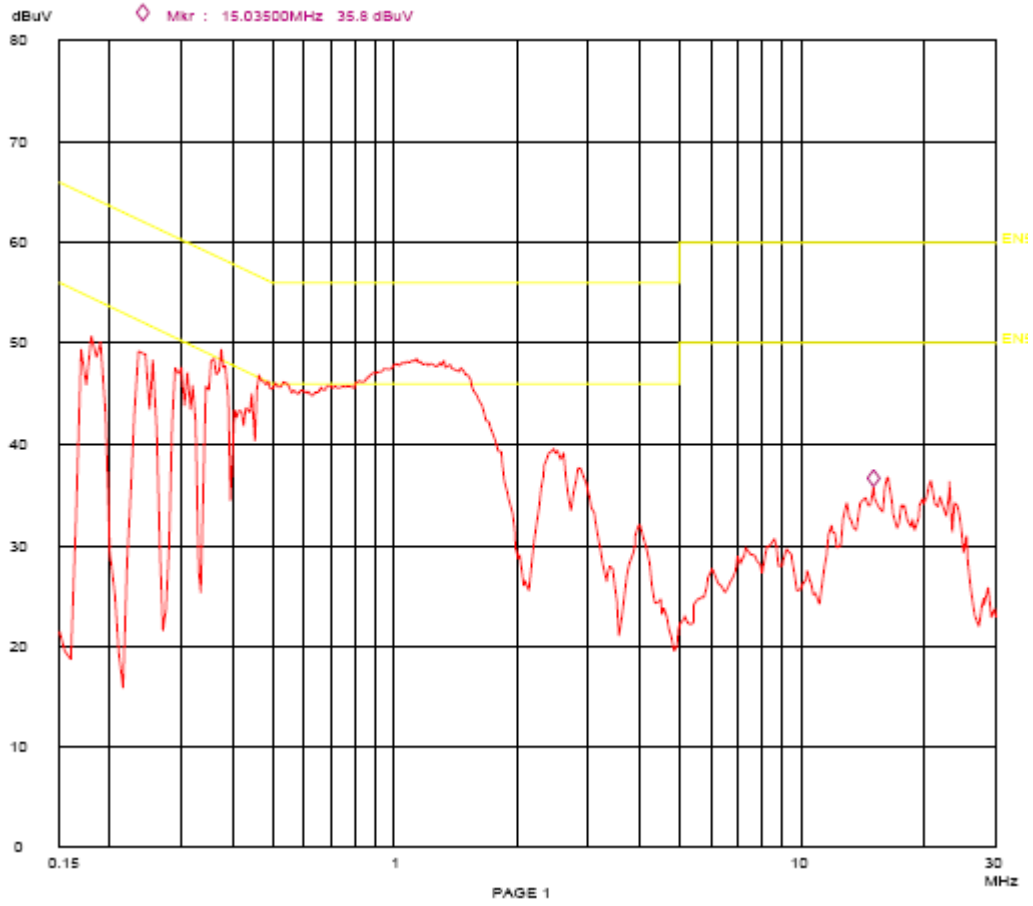
Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Line		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.190	45.00	32.9	--	--	64.00	54.00
0.240	43.4	34.6	--	--	62.10	52.10
0.365	47.4	37.2	--	--	58.60	48.60
1.325	48.5	39.0	--	--	56.00	46.00
19.805	31.1	25.7	--	--	60.00	50.00

D **Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)**

EUT set Condition: Running notebook test program and Ping network

Results: **Pass**

Please refer to following diagram for individual



Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.180	--	--	47.60	40.30	64.50	54.50
0.245	--	--	47.00	39.40	61.90	51.90
0.380	--	--	47.90	35.10	58.30	48.30
1.160	--	--	46.60	36.70	56.00	46.00
19.950	--	--	31.10	23.50	60.00	50.00

6 Radiated Emission Test

6.1 Test Method and test Procedure:

(1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988

(2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.

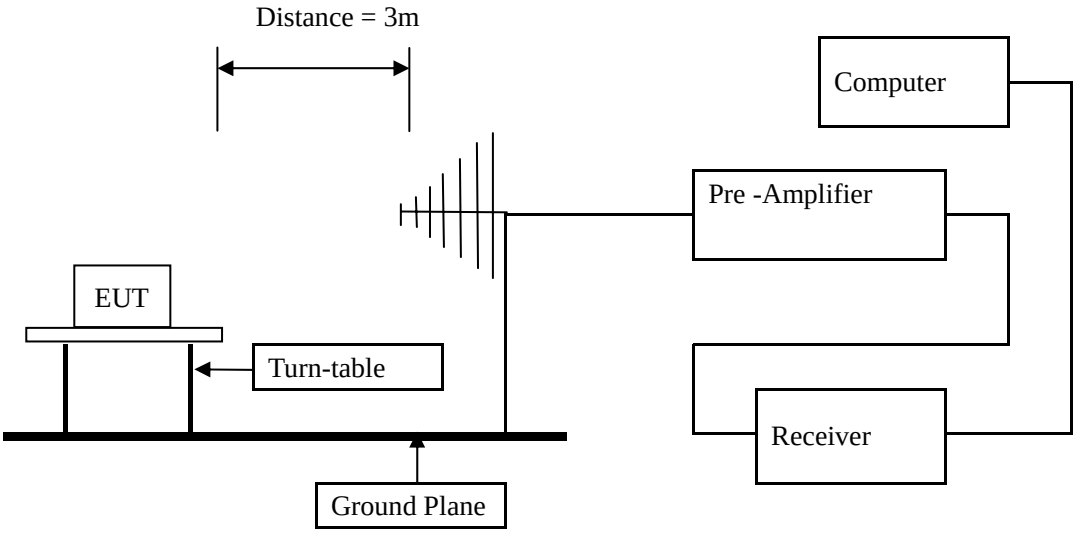
(3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.

(4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.

(5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.

(6) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup



6.2 Configuration of The EUT

Same as section 5.3 of this report

6.3 EUT Operating Condition

Same as section 5.4 of this report.

6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209 and 15.109

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)

2. In the Above Table, the higher limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal (30MHz----8000MHz)

EUT set Condition: Read USB,SD card and Running EMC test software and Ping wireless network

Results: **Pass**

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
135.149	36.98	H	43.50
184.314	36.02	H	43.50
211.900	36.43	H	43.50
284.625	42.83	H	46.00
335.550	42.41	H	46.00
408.300	42.98	H	46.00
135.144	36.31	V	43.50
192.475	36.09	V	43.50
456.800	42.15	V	46.00
517.425	41.50	V	46.00
578.050	40.84	V	46.00
641.100	40.35	V	46.00

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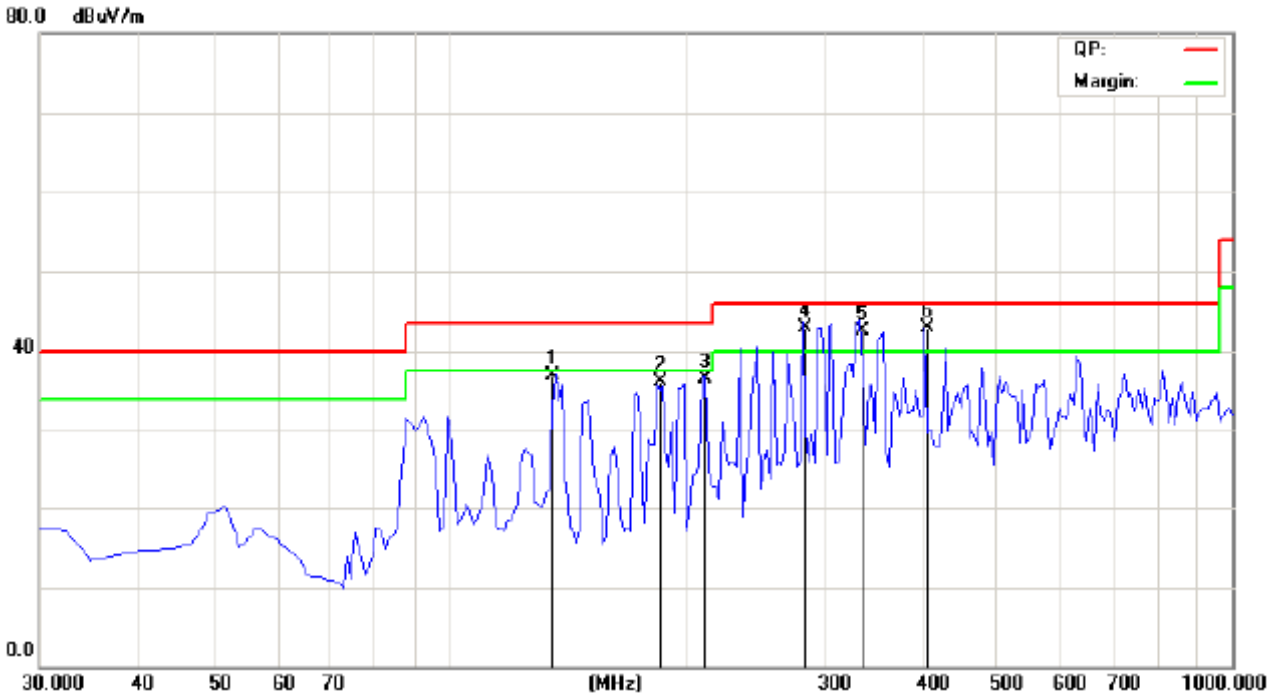
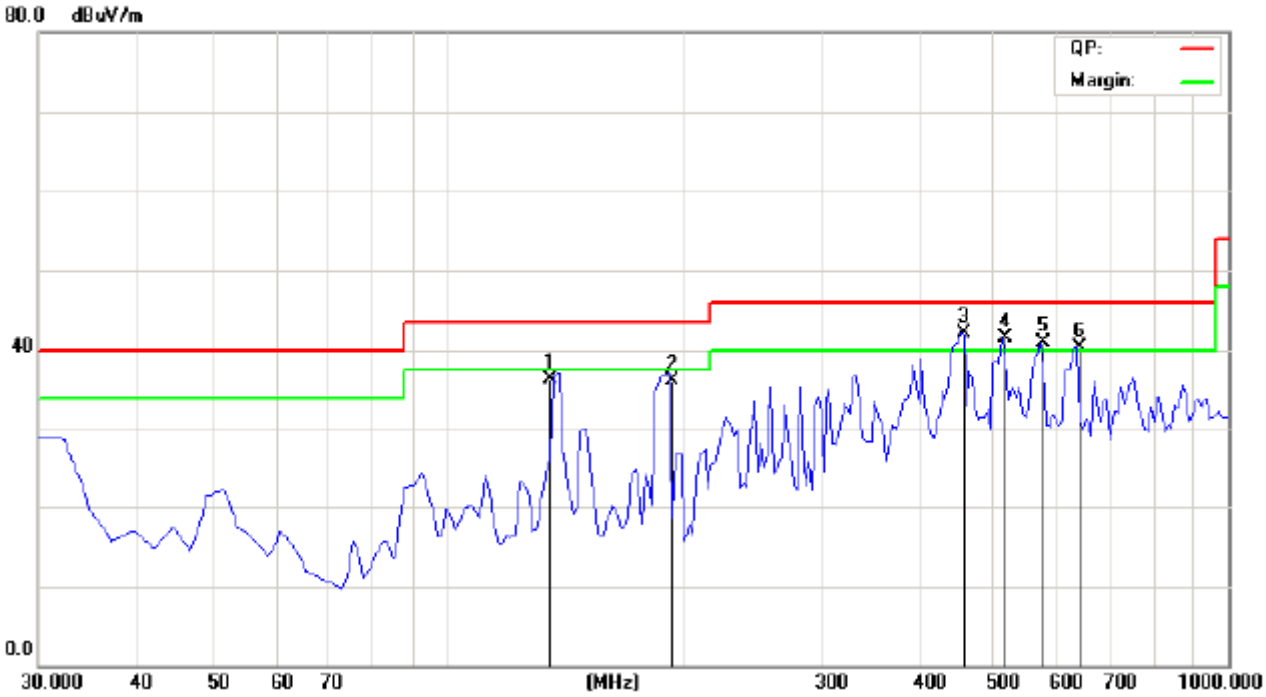
Test Figure:

H



V



Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal (30MHz----8000MHz)

EUT set Condition: Running notebook test program and Ping network

Results: **Pass**

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
136.700	35.42	H	43.50
337.975	41.22	H	46.00
245.825	36.80	H	46.00
638.675	41.05	H	46.00
192.475	32.01	H	43.50
226.425	34.80	H	46.00
192.475	36.79	V	43.50
226.425	35.67	V	46.00
456.800	43.00	V	46.00
578.050	43.66	V	46.00
139.125	34.41	V	43.50
641.100	42.08	V	46.00

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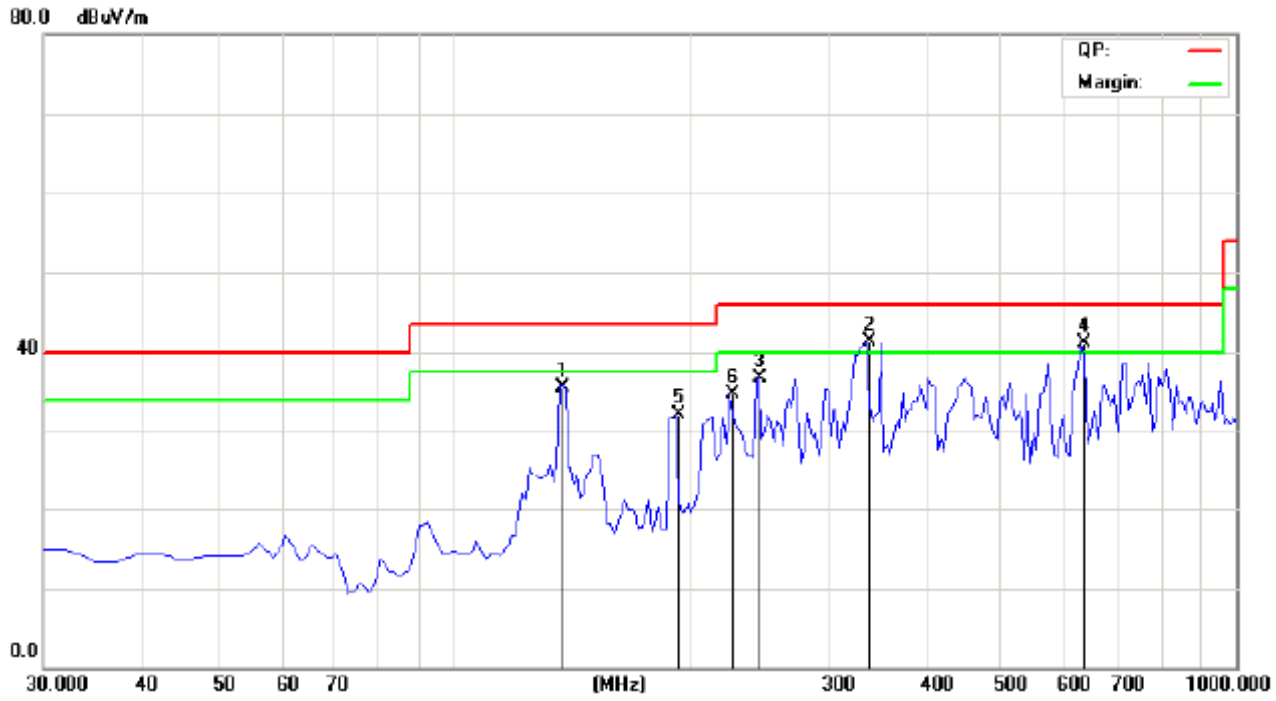
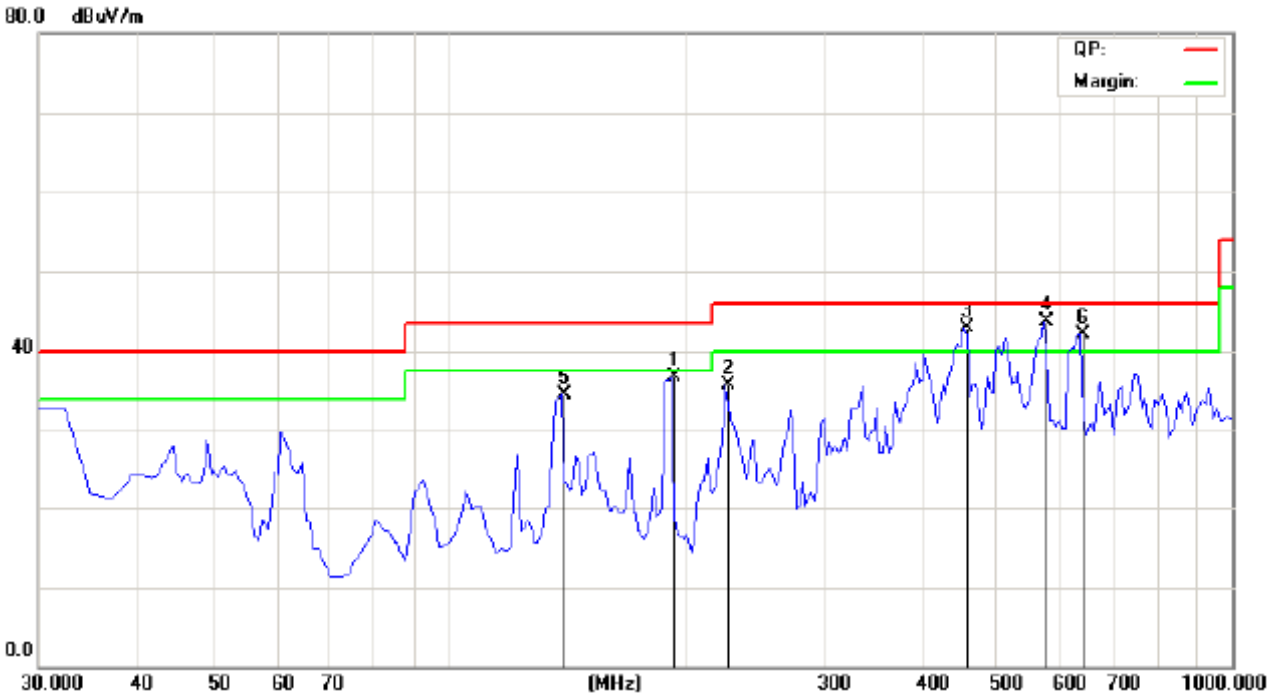
Test Figure:

H



V



Operation Mode: Transmitting & Receiving under CH01 at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2412.00	94.8(PK）/78.5（AV）	H	Fundamental Frequency
2412.00	98.7(PK）/79.8（AV）	V	
4824.00	--	H/V	74(Peak)/ 54(AV)
7236.00	--	H/V	74(Peak)/ 54(AV)
9648.00	--	H/V	74(Peak)/ 54(AV)
12060	--	H/V	74(Peak)/ 54(AV)
14472	--	H/V	74(Peak)/ 54(AV)
16684	--	H/V	74(Peak)/ 54(AV)
19296	--	H/V	74(Peak)/ 54(AV)
21708	--	H/V	74(Peak)/ 54(AV)
24120	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark “---” means that the emissions level is too low to be measured

3. For 802.11g mode 6Mbps

4. Test results are for the worst case condition

Operation Mode: Transmitting & Receiving under CH06 at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2437.00	99.7（PK）/81.8（AV）	V	Fundamental Frequency
2437.00	95.7（PK）/80.1（AV）	H	
4874.00	--	H/V	74(Peak)/ 54(AV)
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark “---” means that the emissions level is too low to be measured

3. For 802.11g mode 6Mbps

4. Test results are for the worst case condition

Operation Mode: Transmitting & Receiving under CH11 at 6Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2462.00	93.4（PK）/75.7（AV）	H	Fundamental Frequency
2462.00	95.8（PK）/81.1（AV）	V	
4824	46.7（PK）/38.2（AV）	V	74(Peak)/ 54(AV)
4824	--	H	74(Peak)/ 54(AV)
7368	--	H/V	74(Peak)/ 54(AV)
9848	--	H/V	74(Peak)/ 54(AV)
12310	--	H/V	74(Peak)/ 54(AV)
14772	--	H/V	74(Peak)/ 54(AV)
17234	--	H/V	74(Peak)/ 54(AV)
19696	--	H/V	74(Peak)/ 54(AV)
22158	--	H/V	74(Peak)/ 54(AV)
24650	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

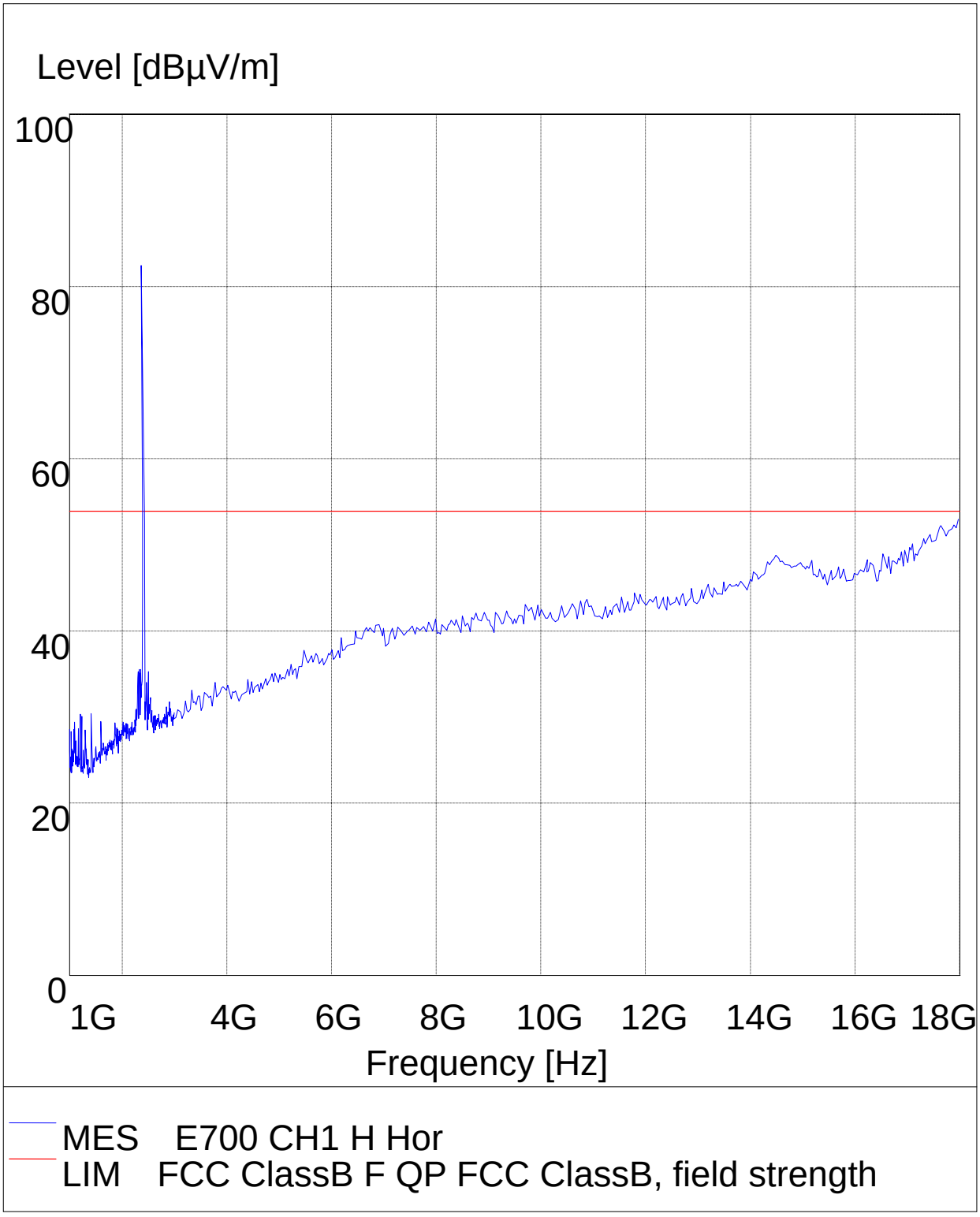
2. Remark “---” means that the emissions level is too low to be measured

3. For 802.11g mode at 6Mbps

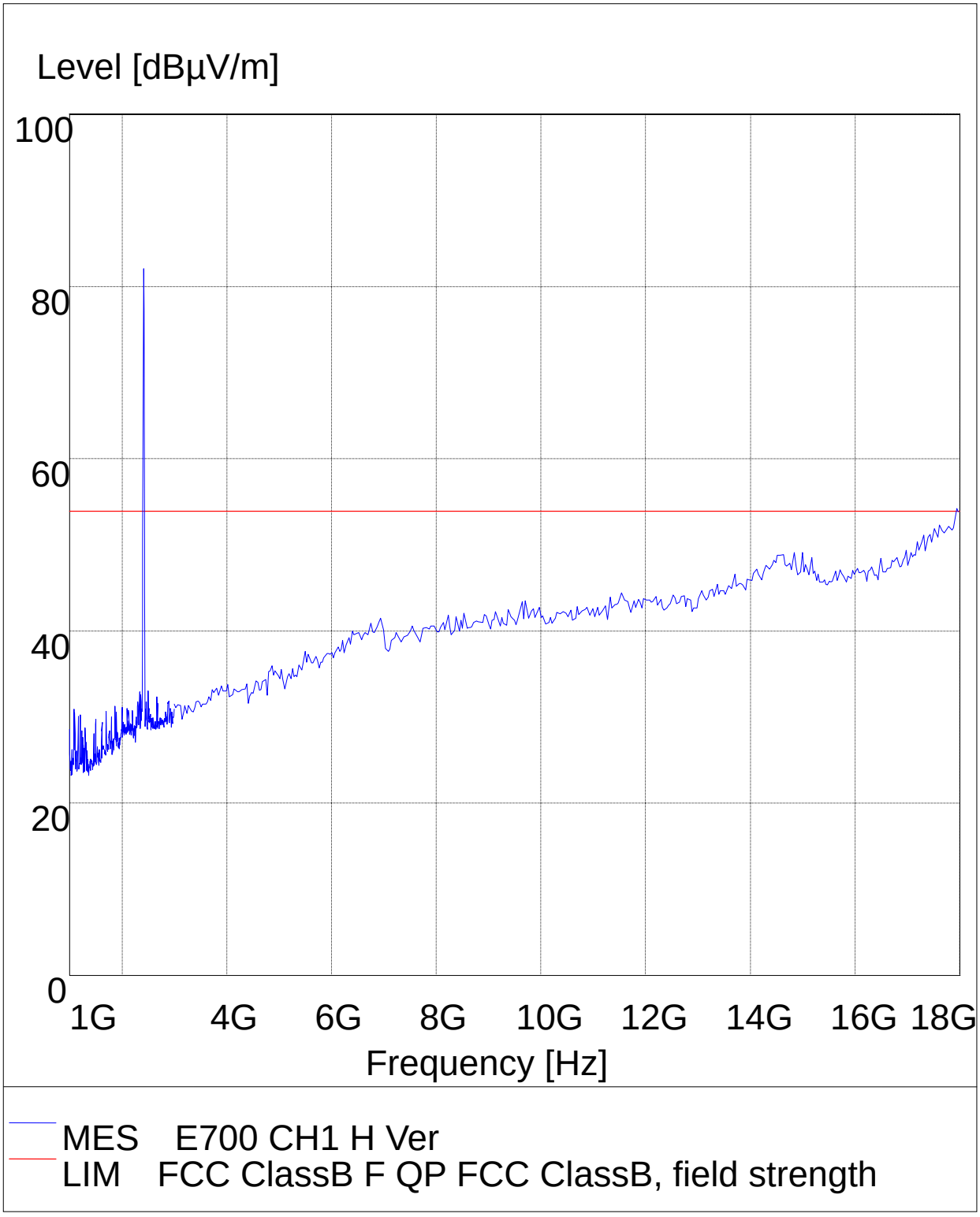
4. Test results are for the worst case condition

Please refer to the following test plots for details:

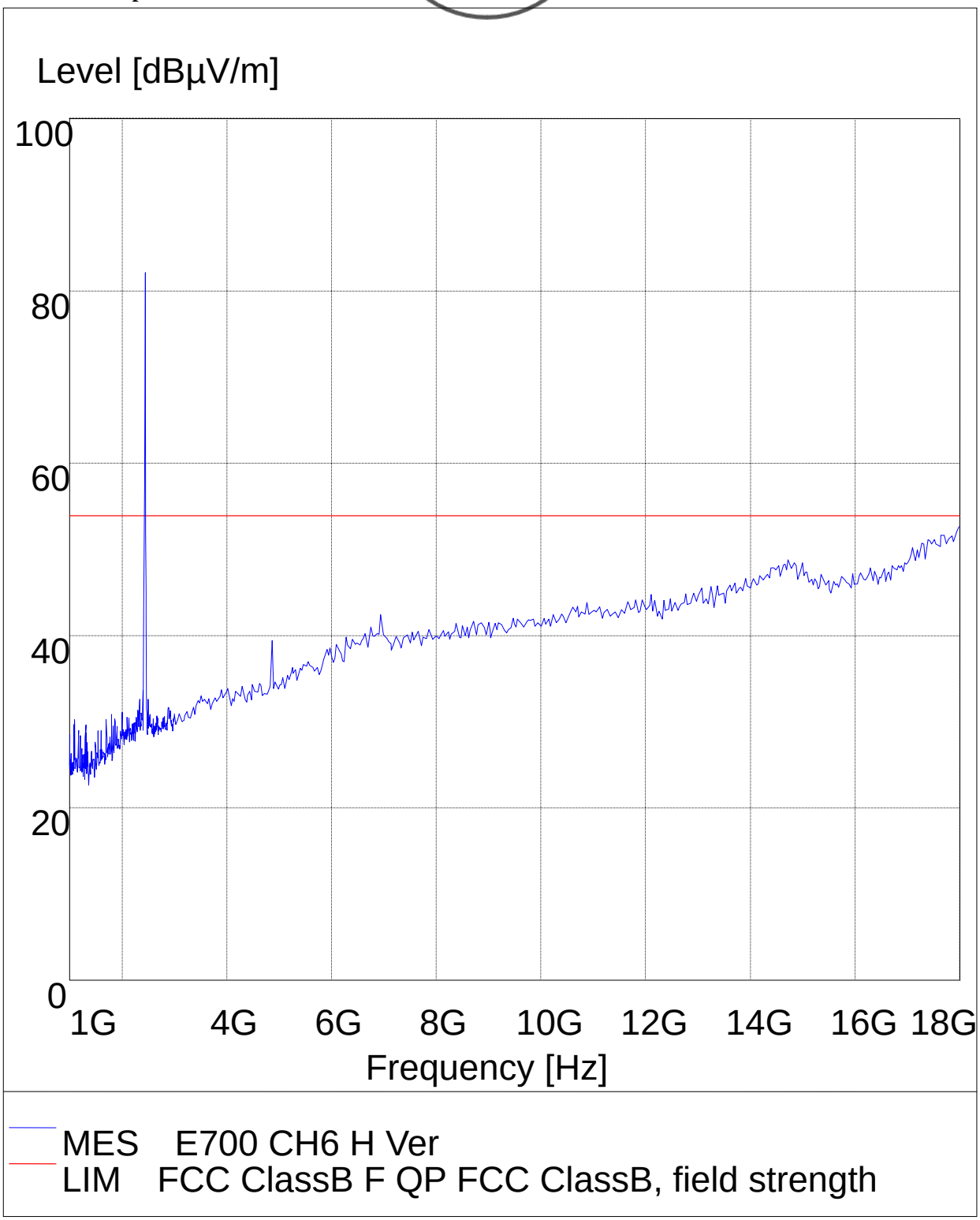
CH01 at 6Mbps: Horizontal



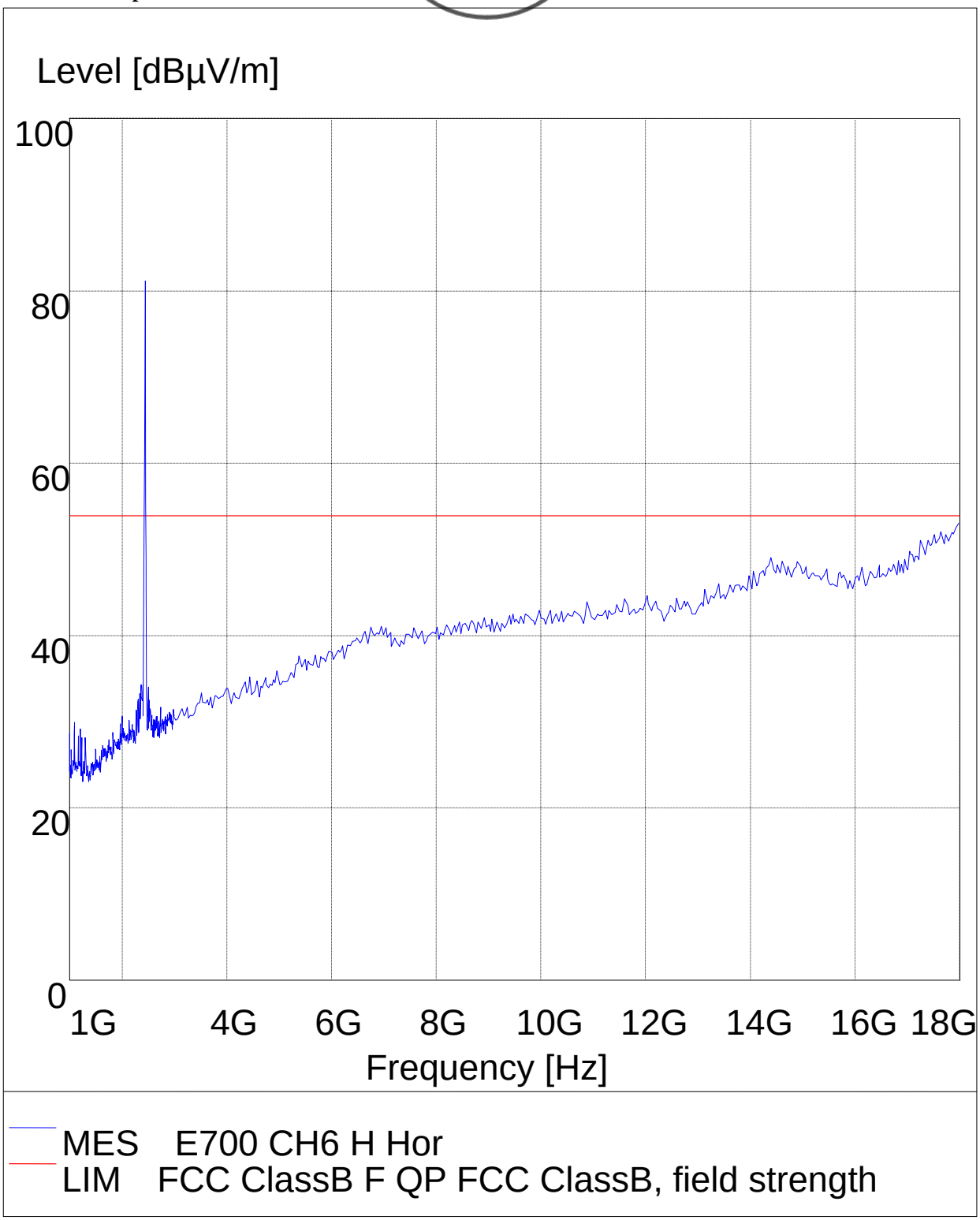
CH01 at 6Mbps: Vertical



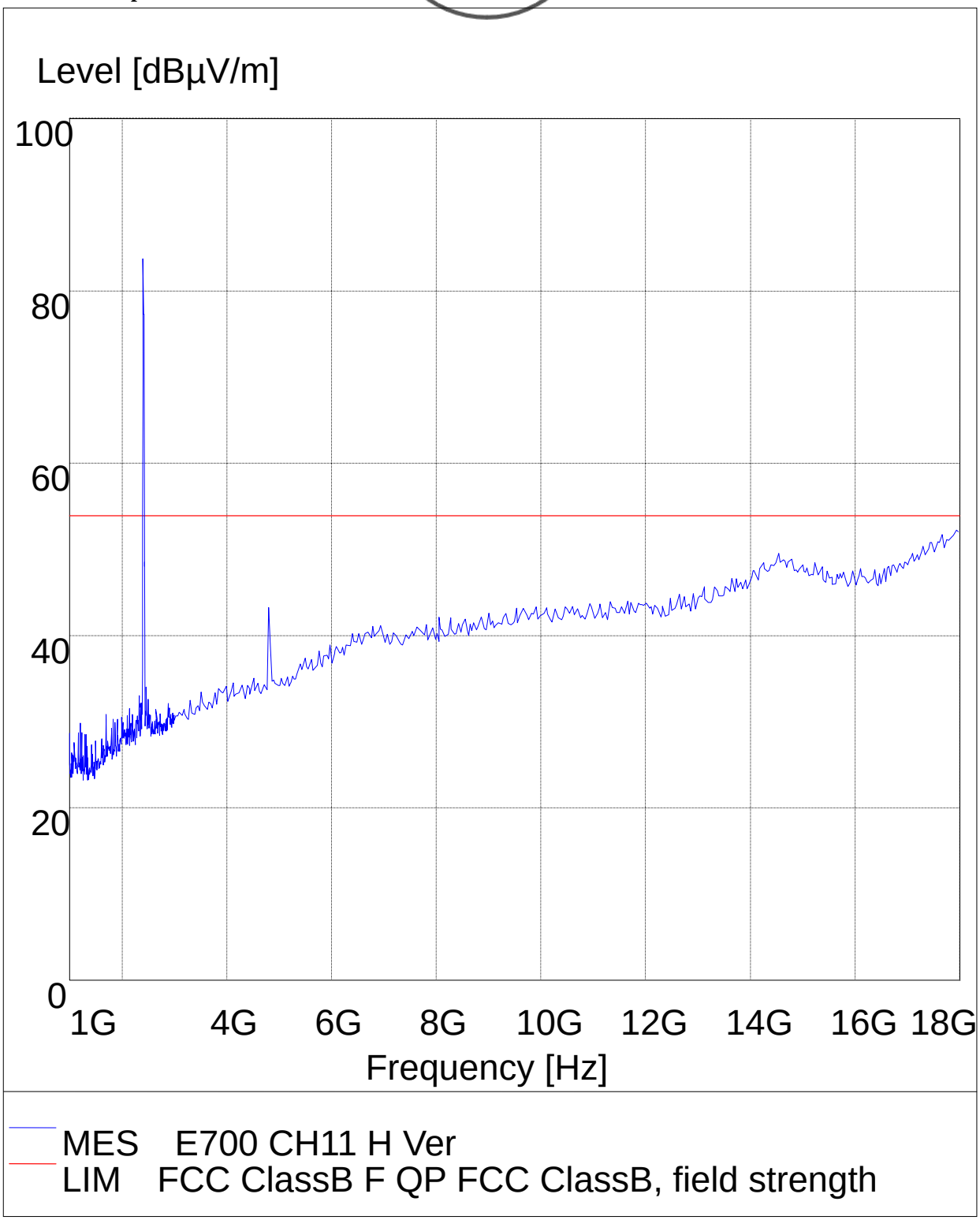
CH06 at 6Mbps: Vertical



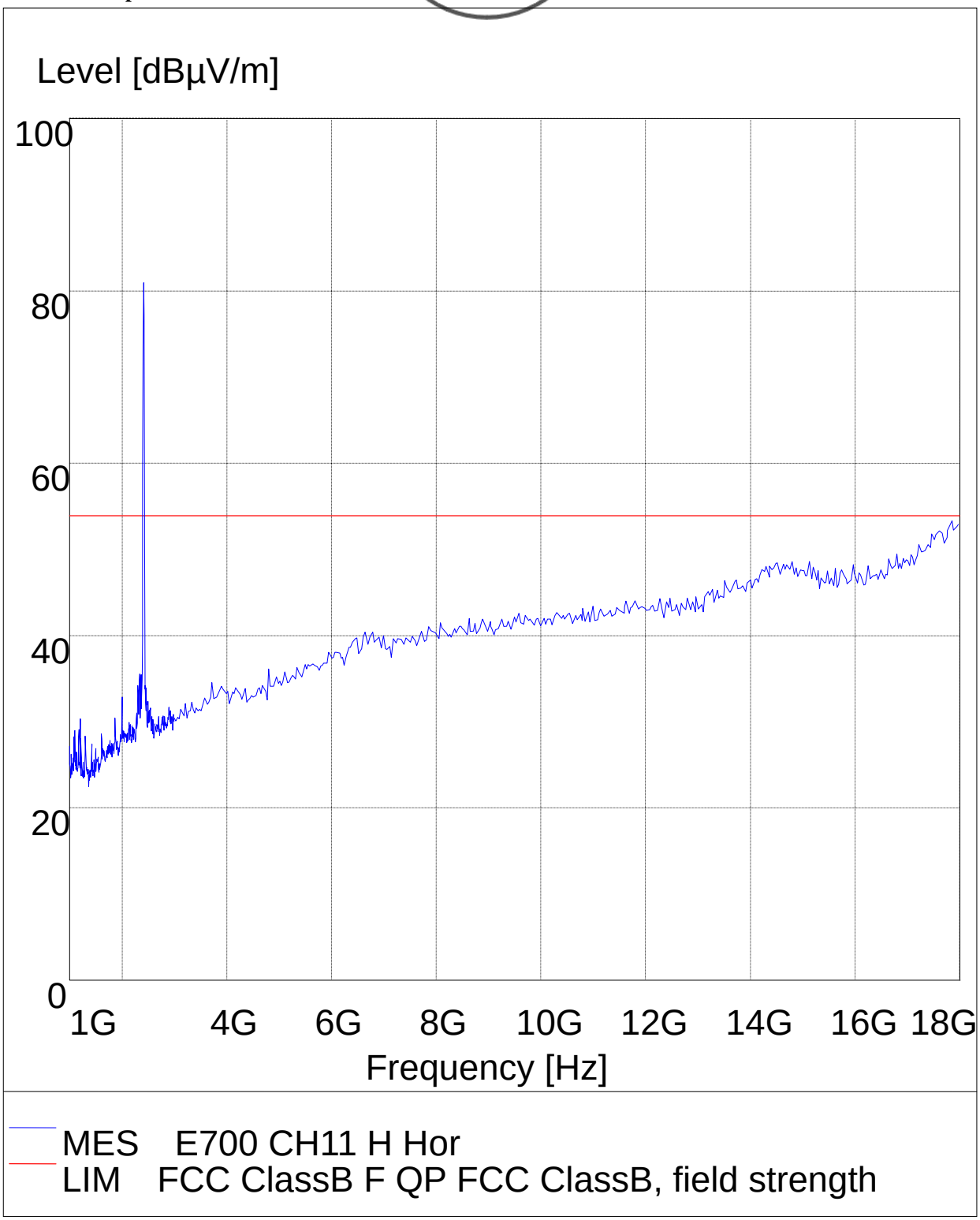
CH06 at 6Mbps: Horizontal



CH11 at 6Mbps: Vertical

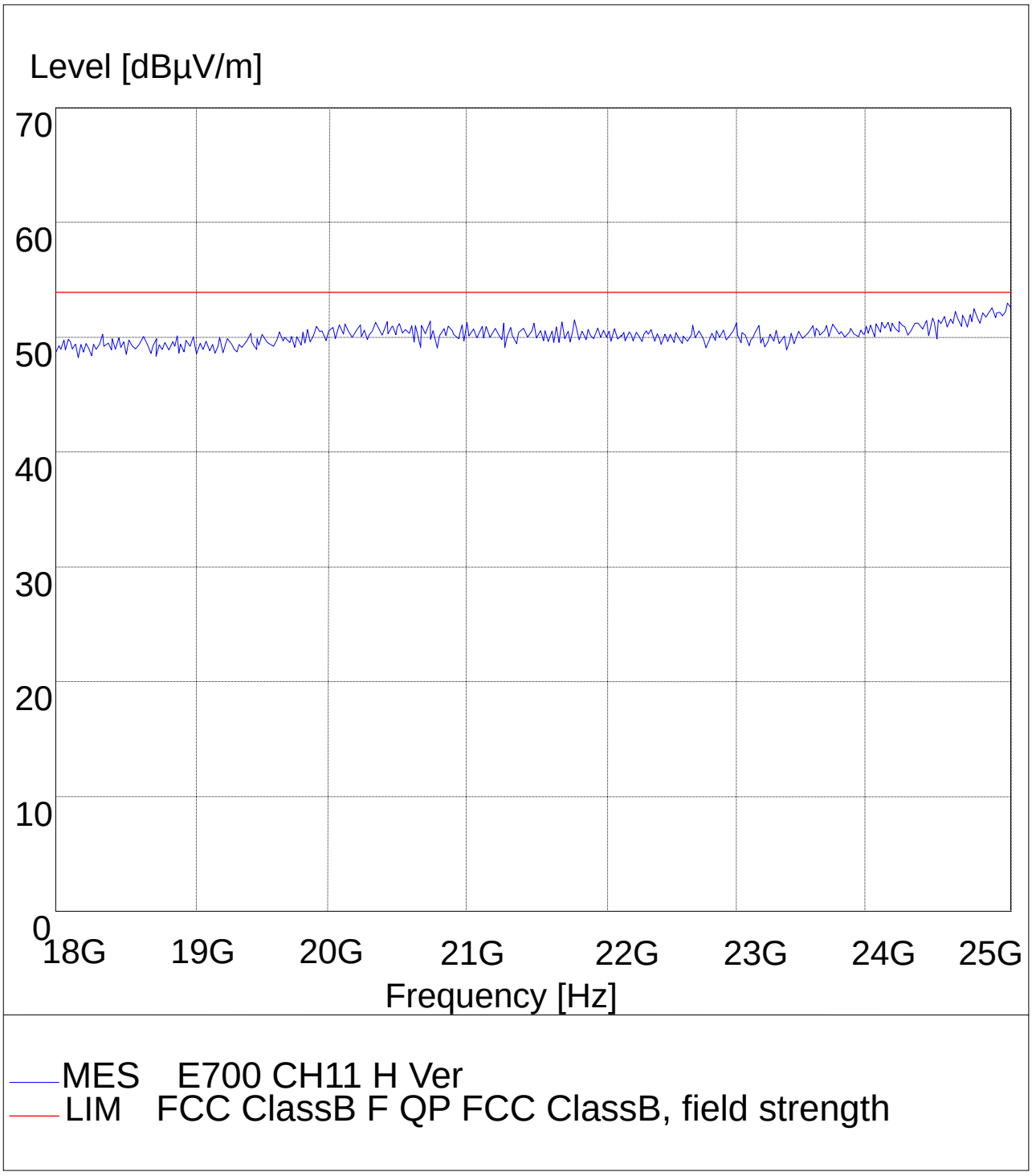


CH11at 6Mbps: Horizontal



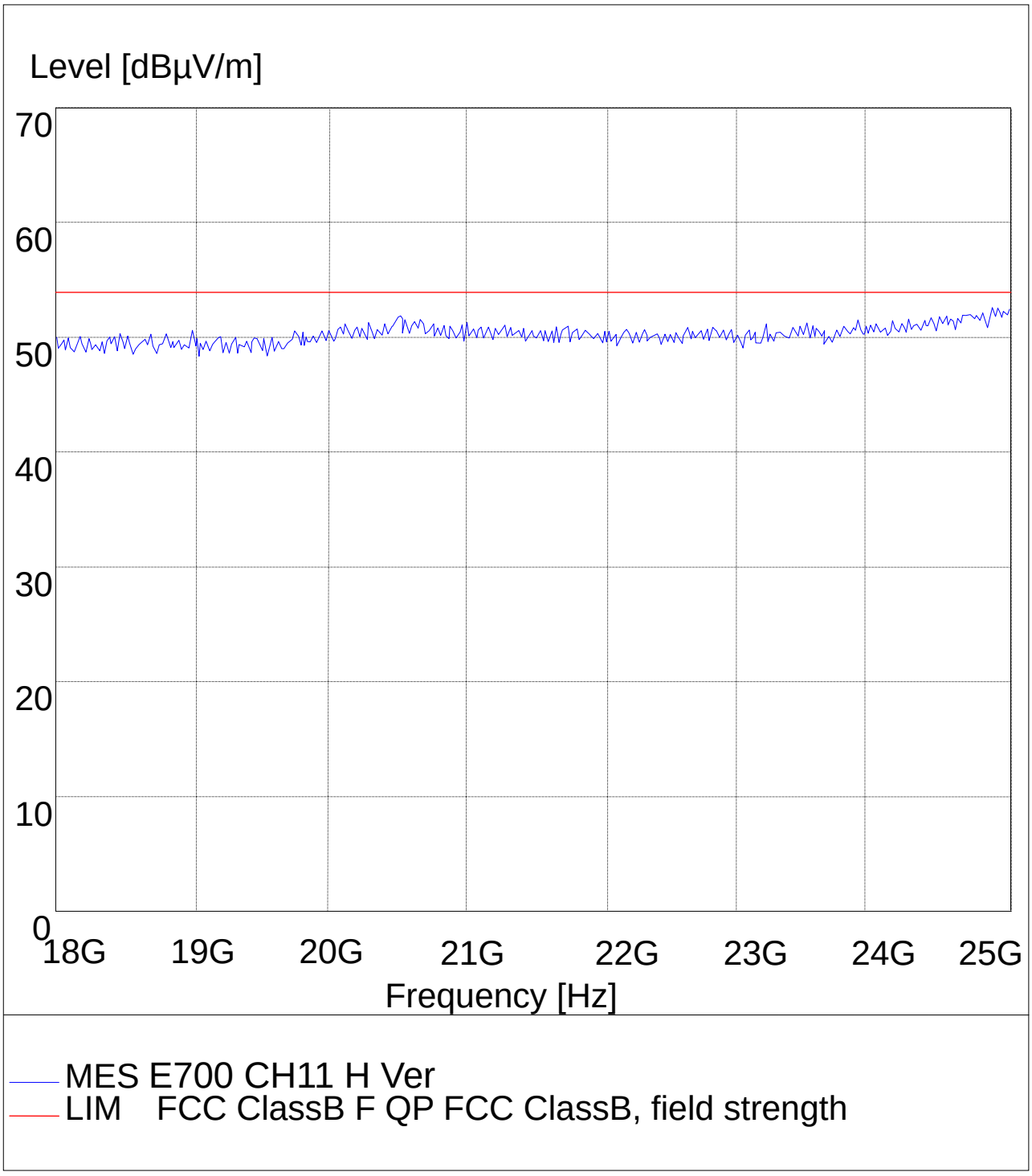
18-25G

CH11 6M Horizontal



18-25G

CH11 6M Vertical



Operation Mode: Transmitting & Receiving under CH01 at 1Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2412.00	95.3 (PK)/ 79.8(AV)	H	Fundamental Frequency
2412.00	98.7 (PK)/81.3 (AV)	V	
4824.00	54.8 (PK)/ 41.7(AV)	H	74(Peak)/ 54(AV)
4824.00	57.2 (PK)/ 44.1(AV)	V	74(Peak)/ 54(AV)
7236.00	--	H/V	74(Peak)/ 54(AV)
9648.00	--	H/V	74(Peak)/ 54(AV)
12060	--	H/V	74(Peak)/ 54(AV)
14472	--	H/V	74(Peak)/ 54(AV)
16684	--	H/V	74(Peak)/ 54(AV)
19296	--	H/V	74(Peak)/ 54(AV)
21708	--	H/V	74(Peak)/ 54(AV)
24120	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11b mode 1Mbps

4. Test results are for the worst case condition

Operation Mode: Transmitting & Receiving under CH06 at 1Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2437.00	97.8(PK)/ 81.2AV）	H	Fundamental Frequency
2437.00	100.3(PK)/83.6 (AV)	V	
4874.00	57.9(PK)/45.9 (AV)	V	74(Peak)/ 54(AV)
4874.00	55.7(PK)/42.6 (AV)	H	74(Peak)/ 54(AV)
7311.00	--	H/V	74(Peak)/ 54(AV)
9748.00	--	H/V	74(Peak)/ 54(AV)
12185	--	H/V	74(Peak)/ 54(AV)
14622	--	H/V	74(Peak)/ 54(AV)
17059	--	H/V	74(Peak)/ 54(AV)
19496	--	H/V	74(Peak)/ 54(AV)
21933	--	H/V	74(Peak)/ 54(AV)
24370	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

3. For 802.11b mode 1Mbps

4. test results are for the worst case condition

Operation Mode: Transmitting & Receiving under CH11 at 1Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
2462.00	99.1(PK)/82.3(AV）	H	Fundamental Frequency
2462.00	101.7(PK)/84.1(AV）	V	
4924	--	H/V	74(Peak)/ 54(AV)
7368	--	H/V	74(Peak)/ 54(AV)
9848	--	H/V	74(Peak)/ 54(AV)
12310	--	H/V	74(Peak)/ 54(AV)
14772	--	H/V	74(Peak)/ 54(AV)
17234	--	H/V	74(Peak)/ 54(AV)
19696	--	H/V	74(Peak)/ 54(AV)
22158	--	H/V	74(Peak)/ 54(AV)
24620	--	H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

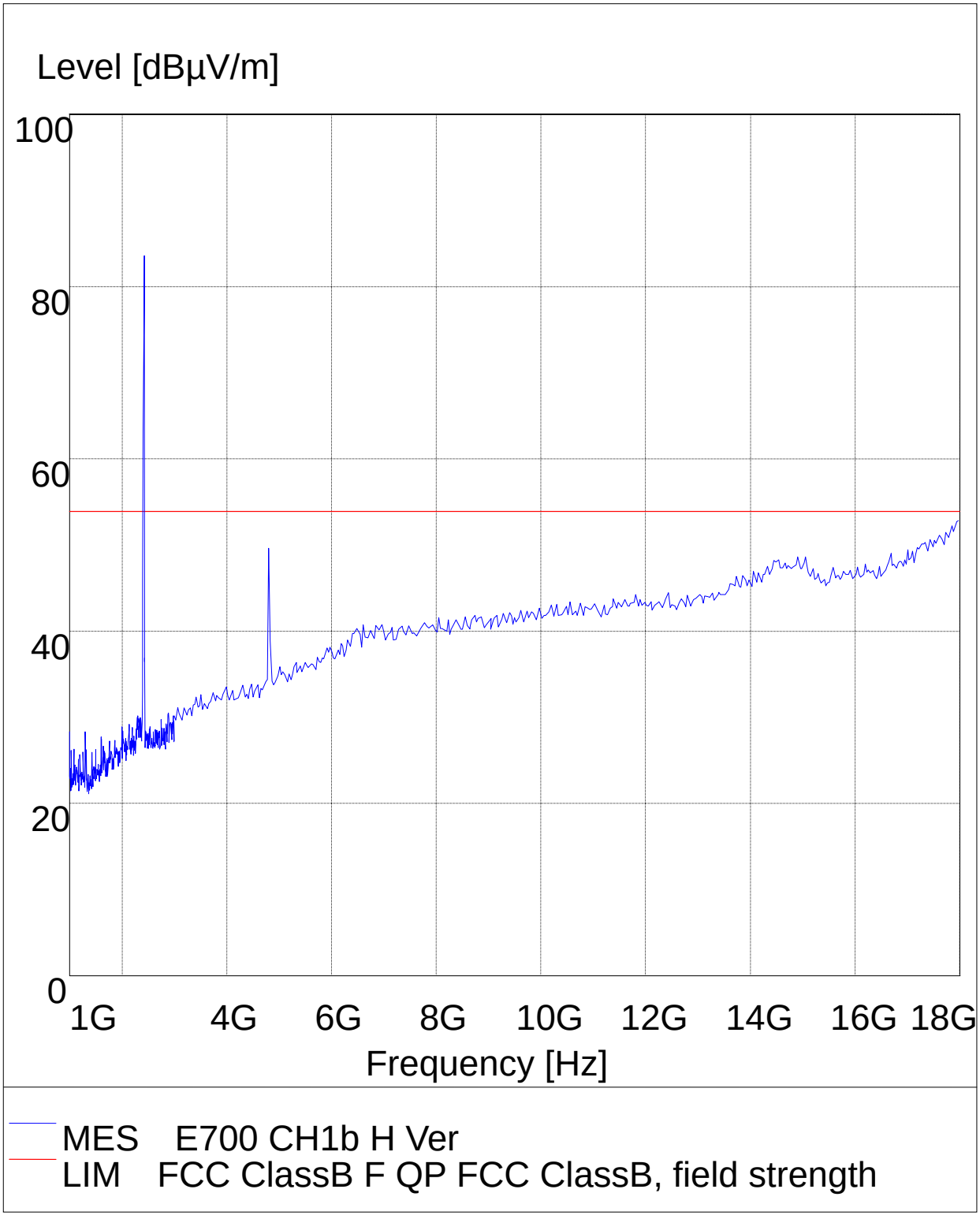
2. Remark “---” means that the emissions level is too low to be measured

3. For 802.11b mode at 1Mbps

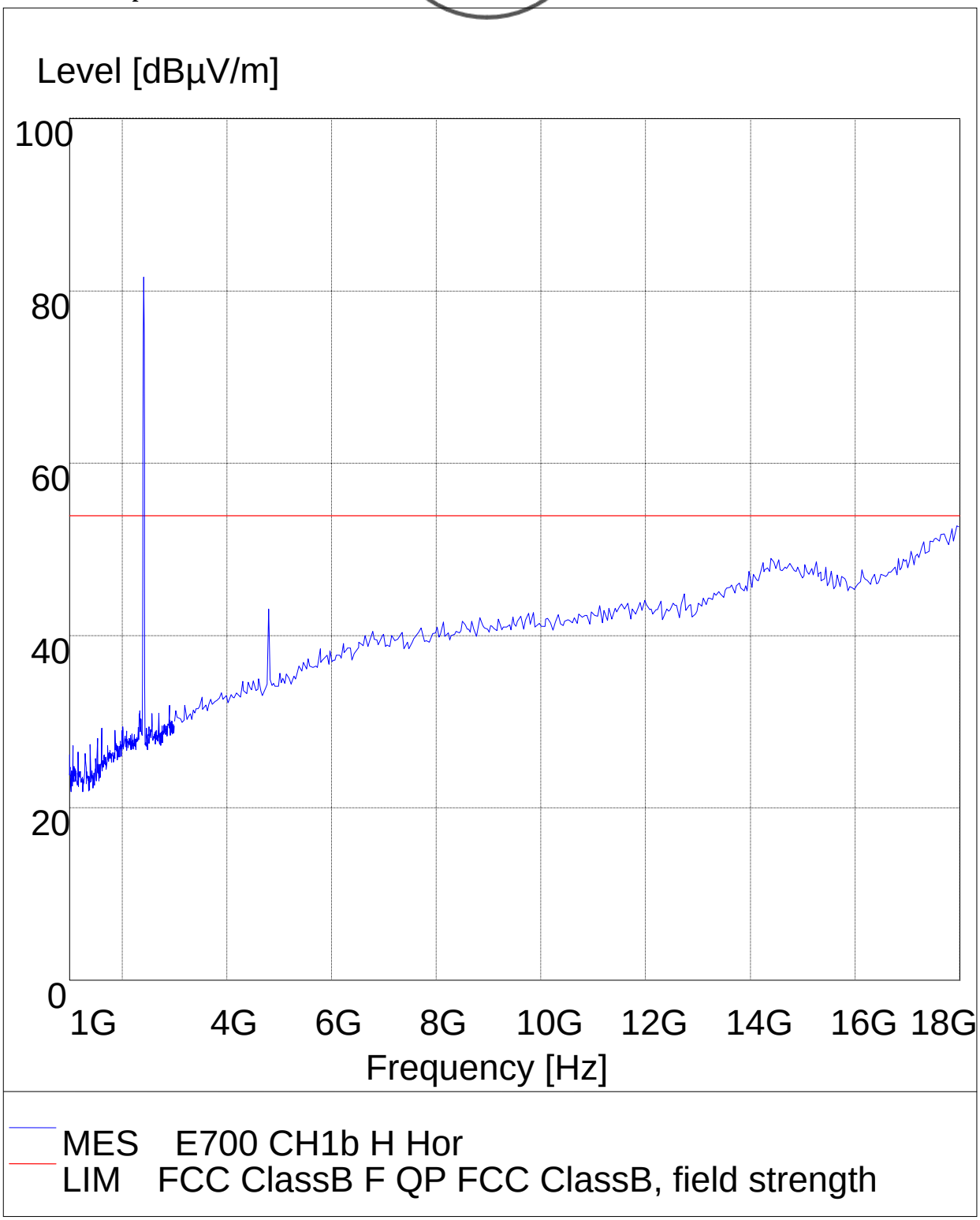
4. Test results are for the worst case condition

Please refer to the following test plots for details:

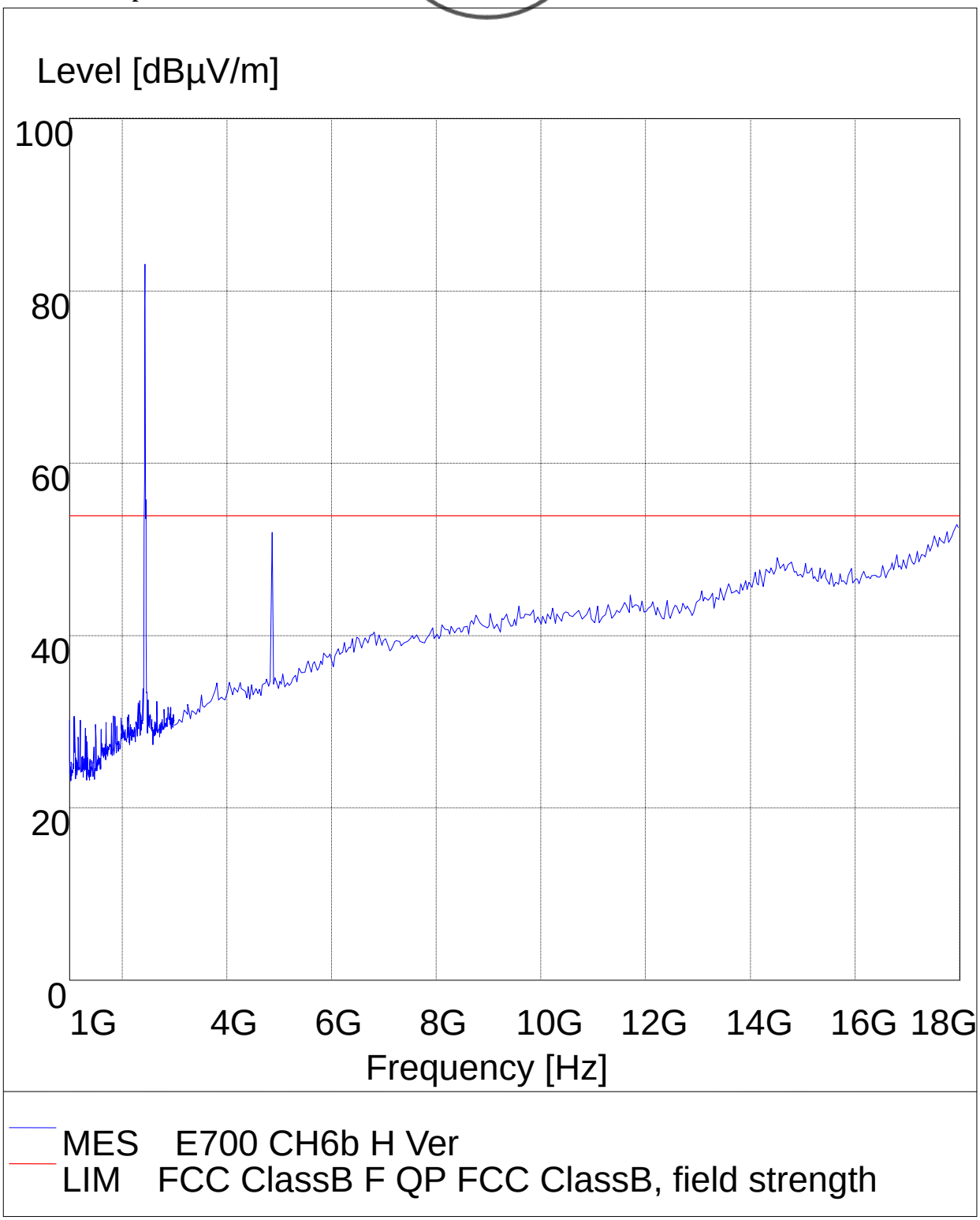
CH01 at 1Mbps: Vertical



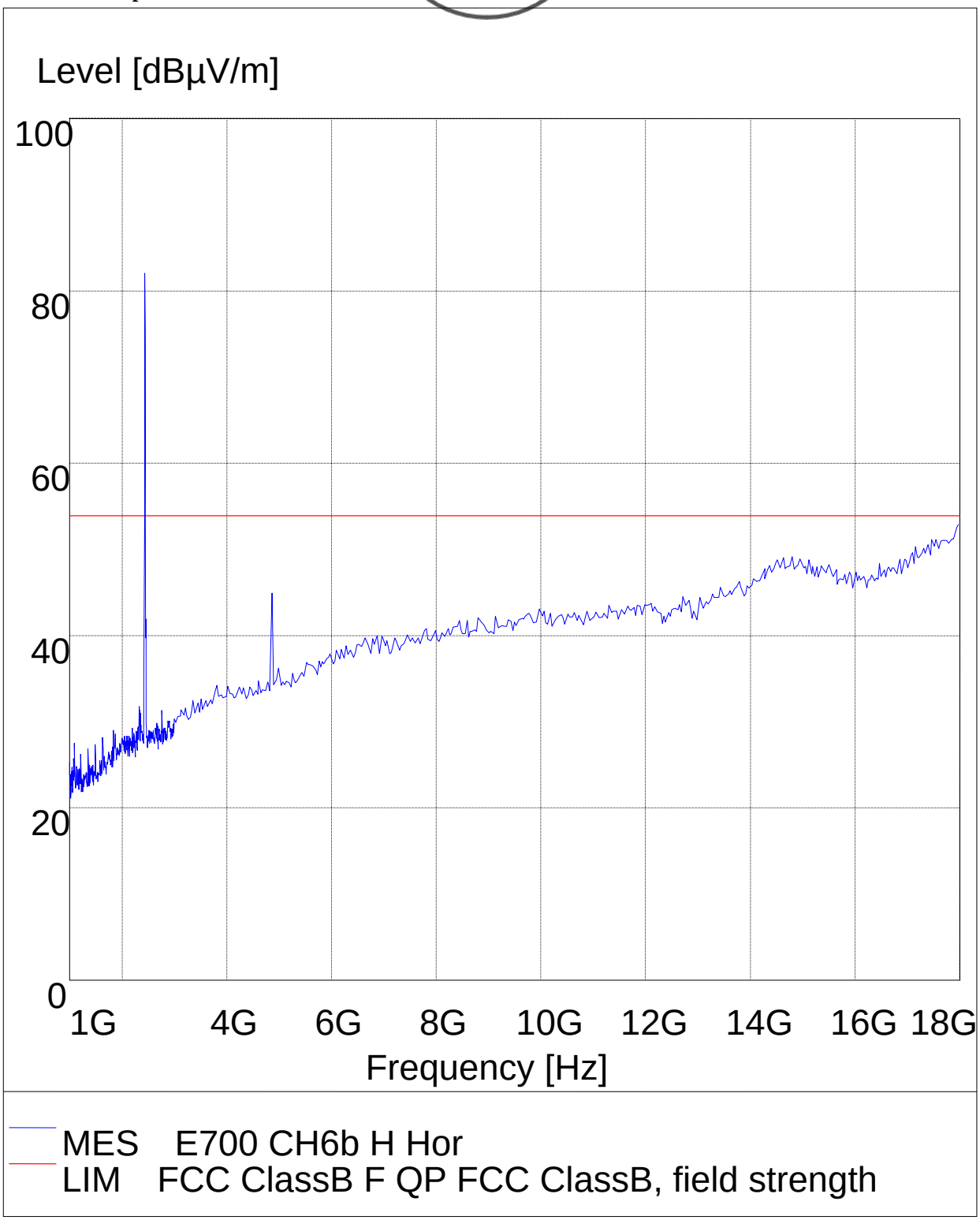
CH01 at 1Mbps: Horizontal



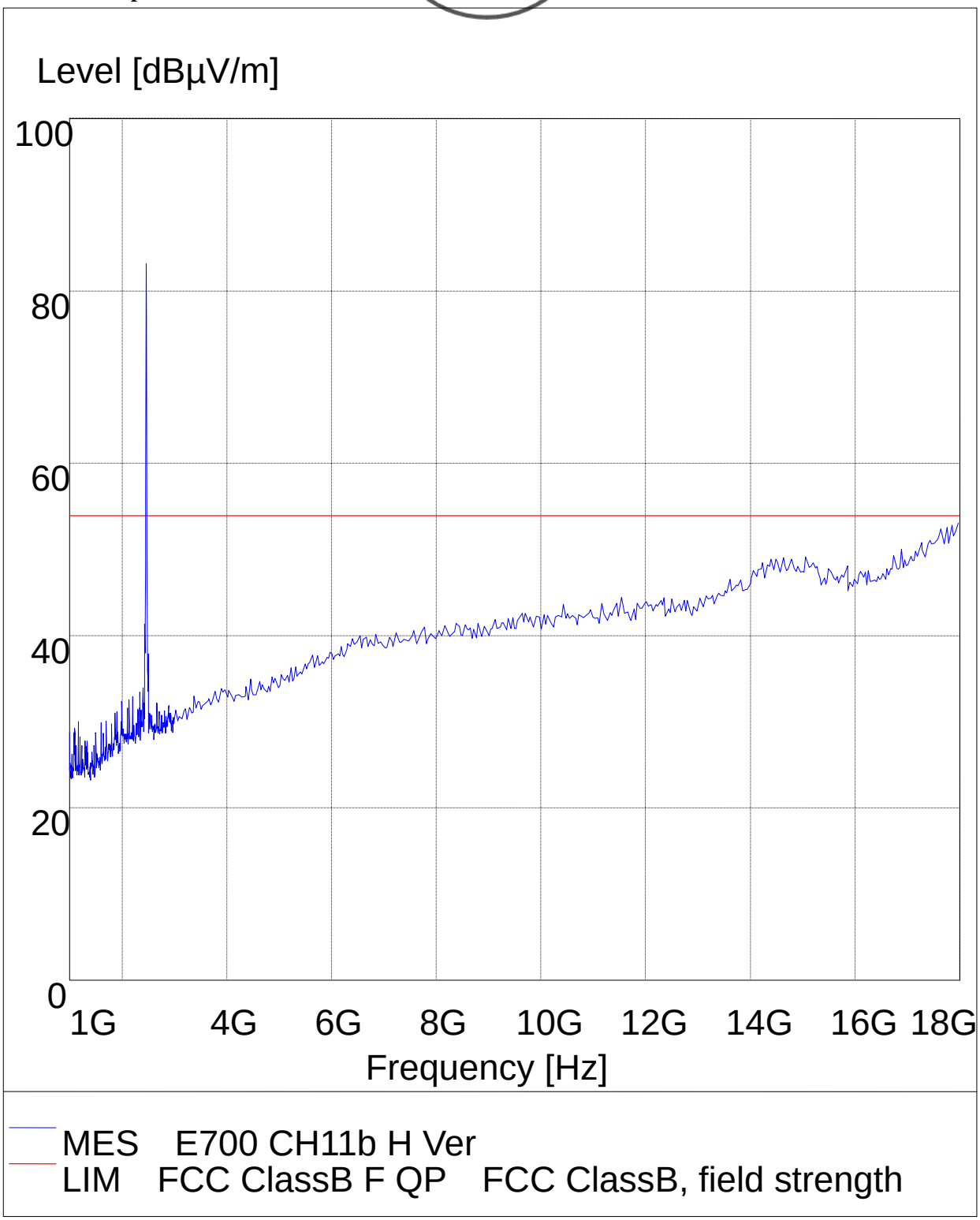
CH06 at 1Mbps: Vertical



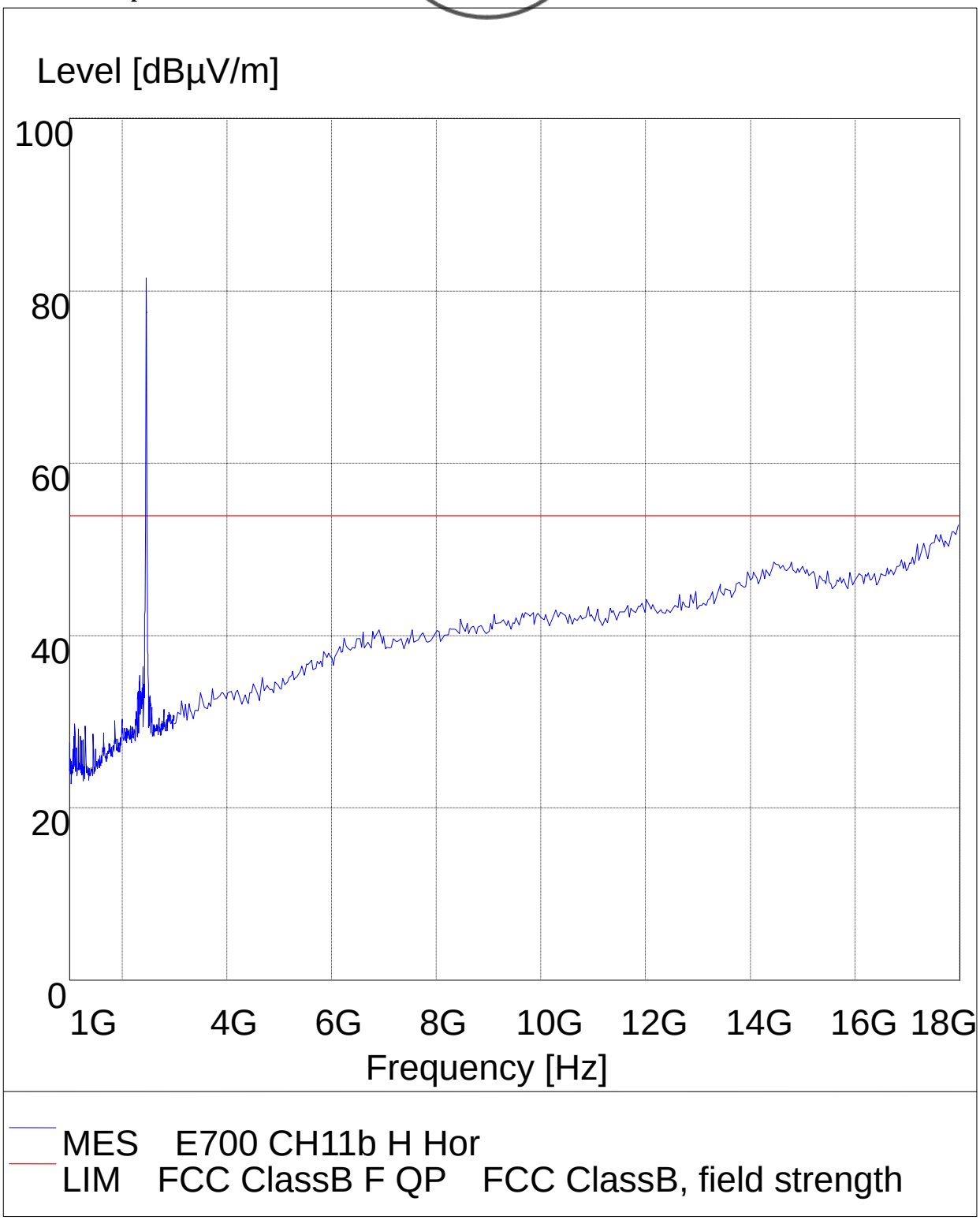
CH06 at 1Mbps: Horizontal



CH11 at 1Mbps: Vertical

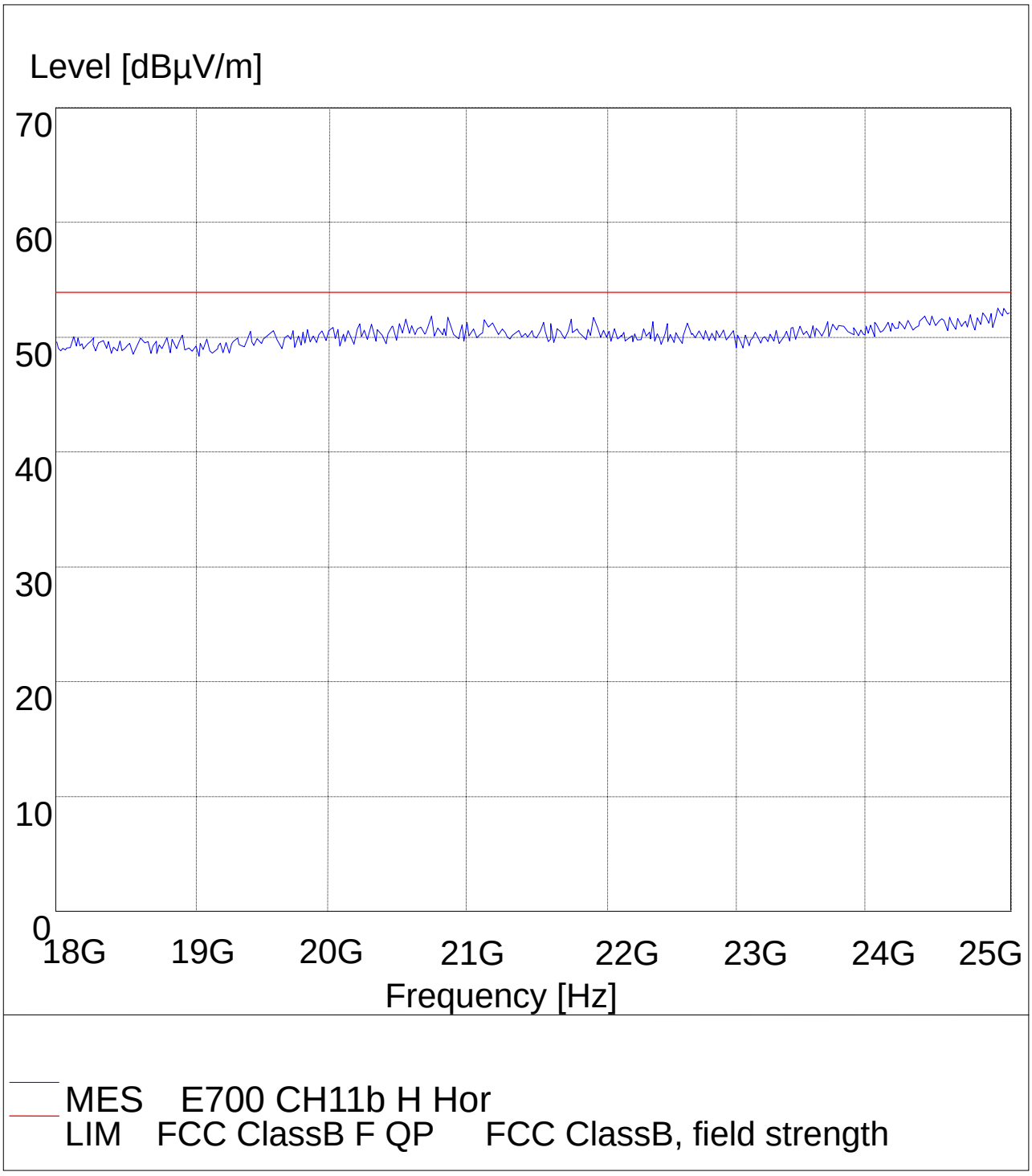


CH11 at 1Mbps: Horizontal



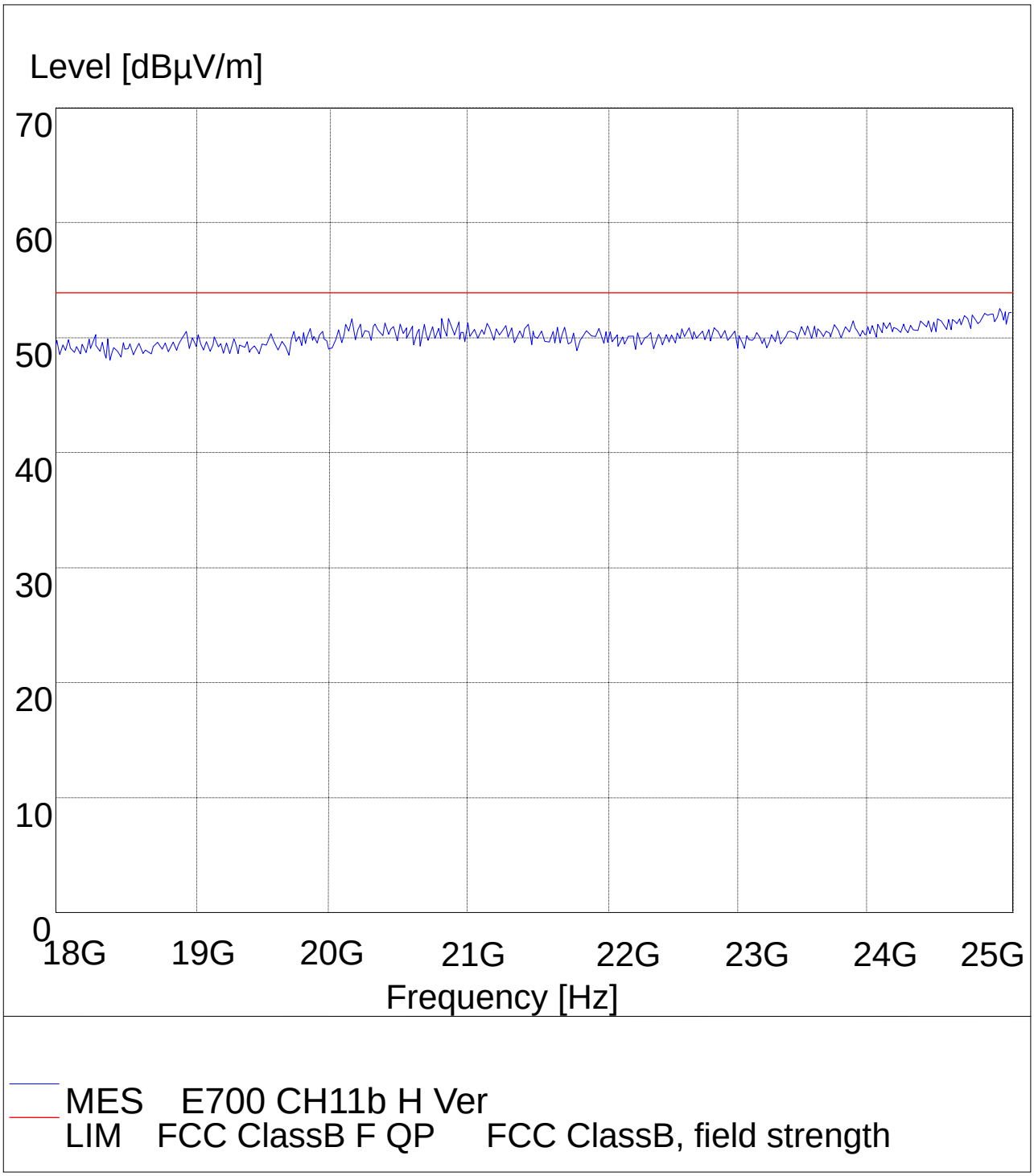
18-25G

CH11 1M Horizontal



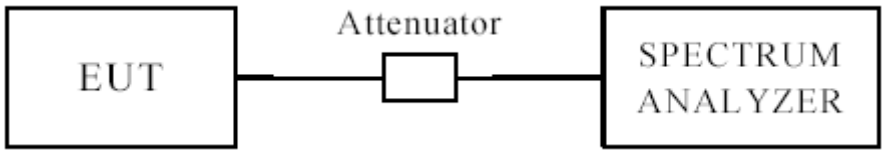
18-25G

CH11 1M Vertical



7.0 6dB Bandwidth Measurement

7.1 Test Setup



7.2 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is >500kHz

7.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator.

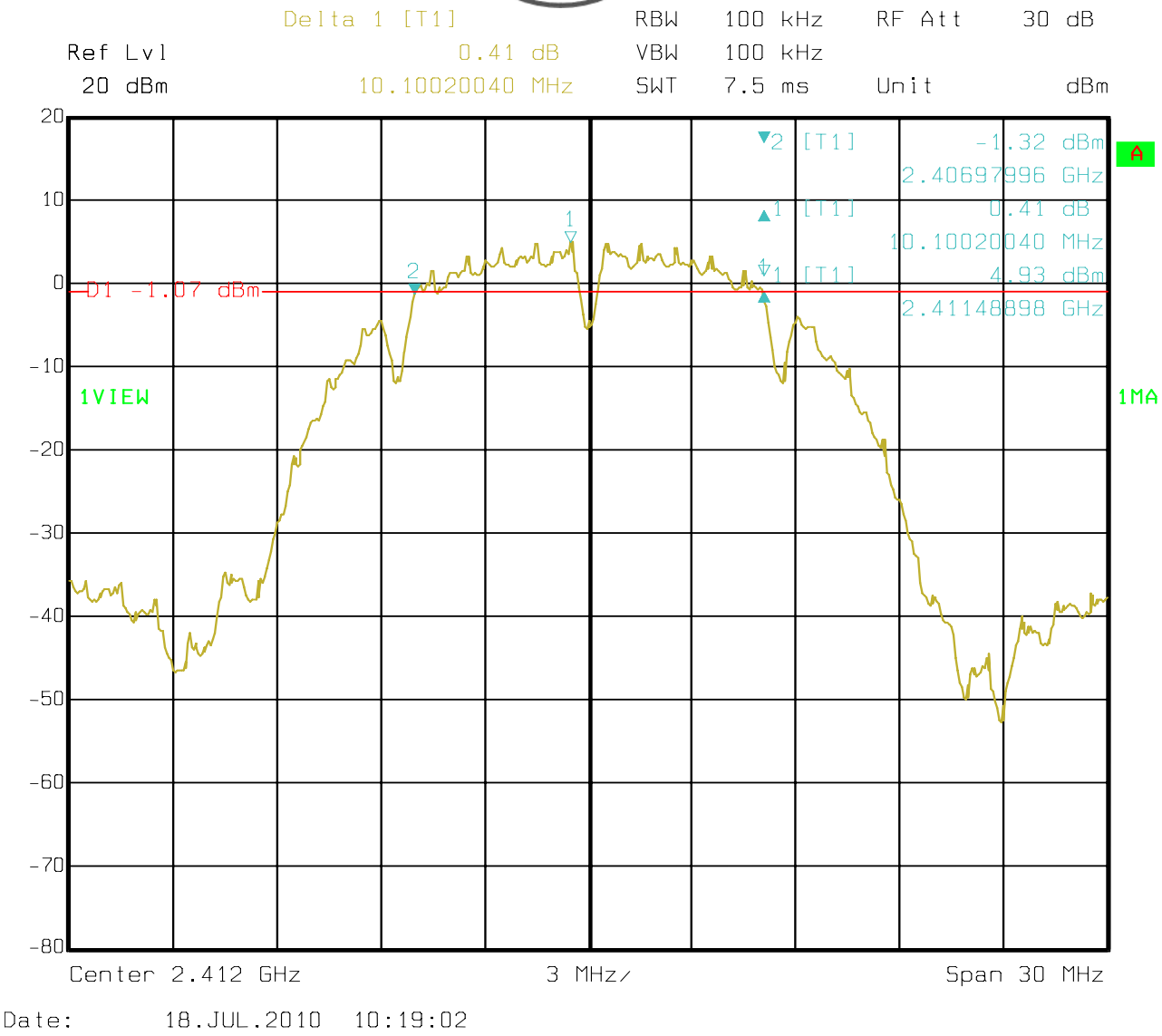
The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100 kHz VBW for 802.11b/g mode; The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

7.4 Test Result

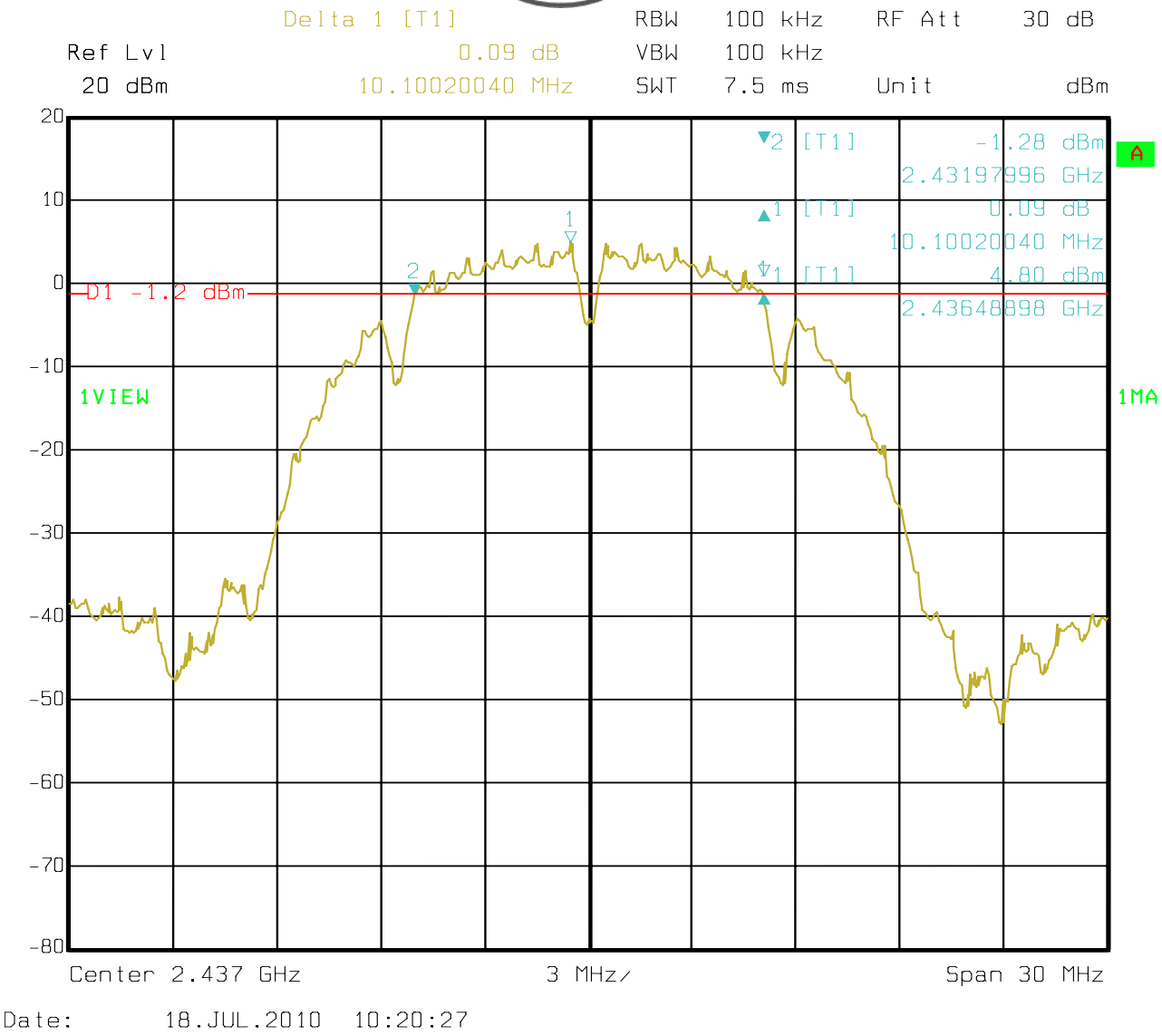
EUT	EPC	Model	E700
Mode	802.11b	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	1	10.1	0.5	Pass
6	2437	1	10.1	0.5	Pass
11	2462	1	10.1	0.5	Pass

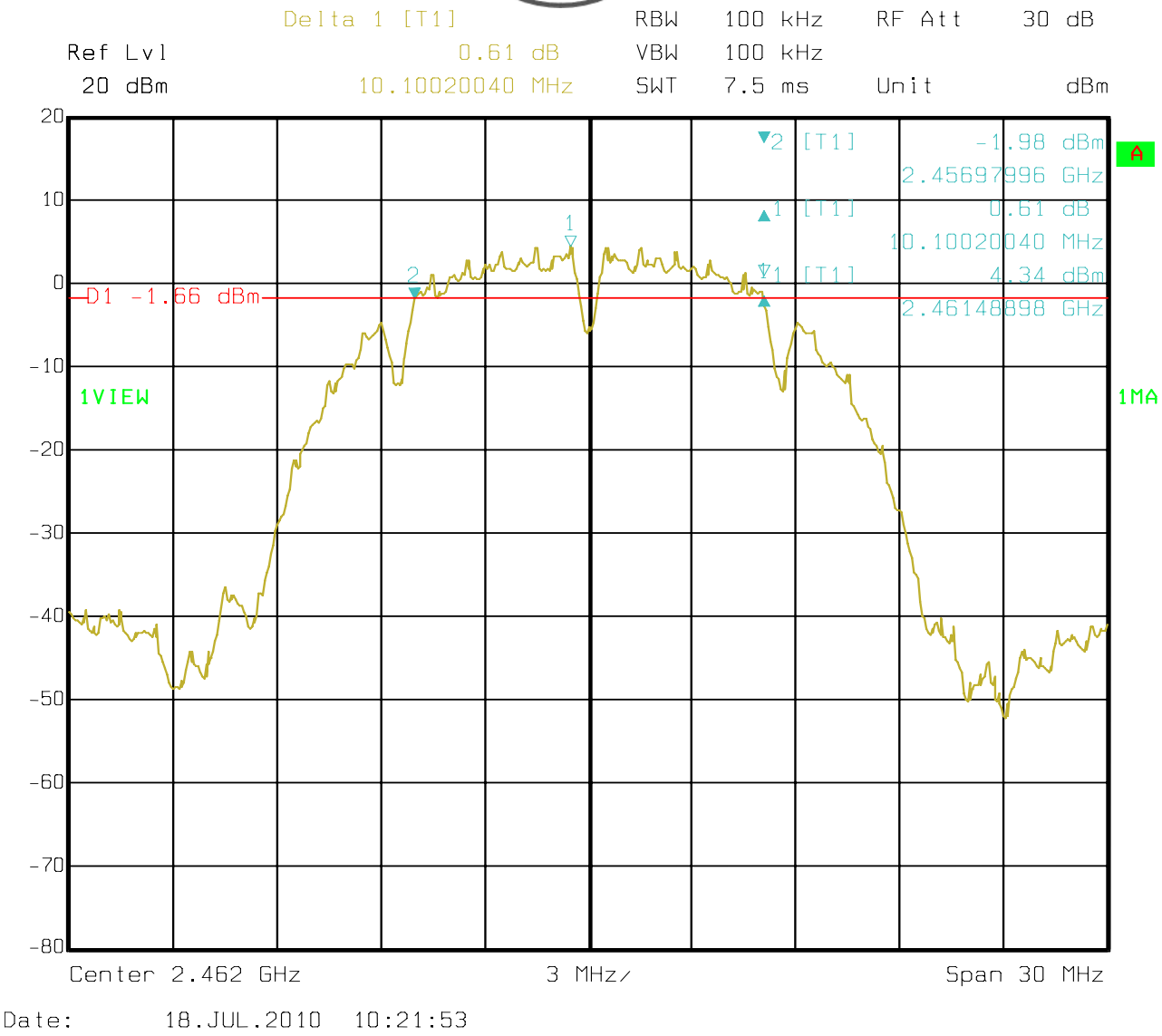
1. 802.11b at 1Mbps of CH01



2. 802.11b at 1Mbps of CH06



3. 802.11b at 1Mbps of CH11



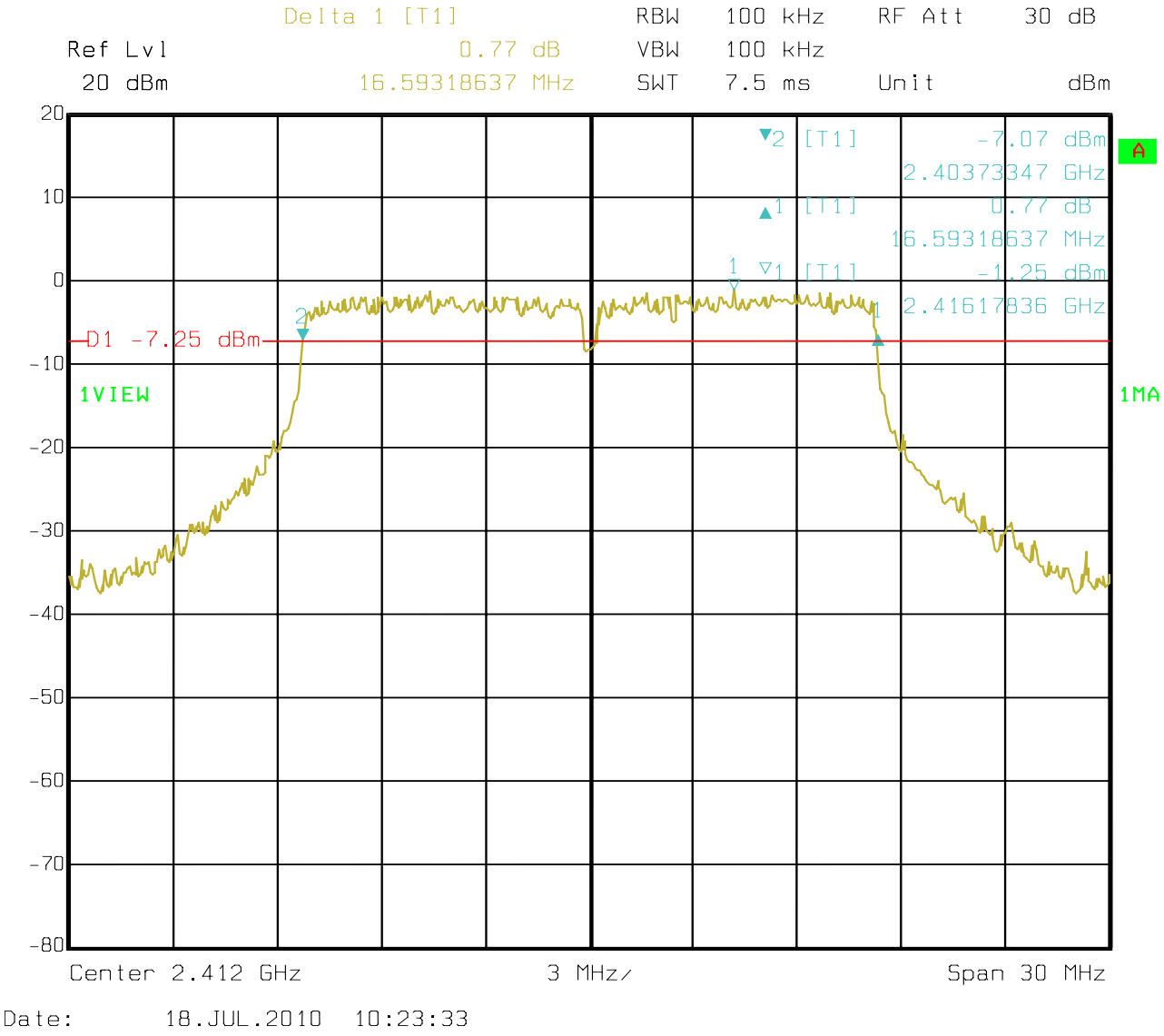
TEST REPORT

EUT	EPC	Model	E700
Mode	802.11g	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

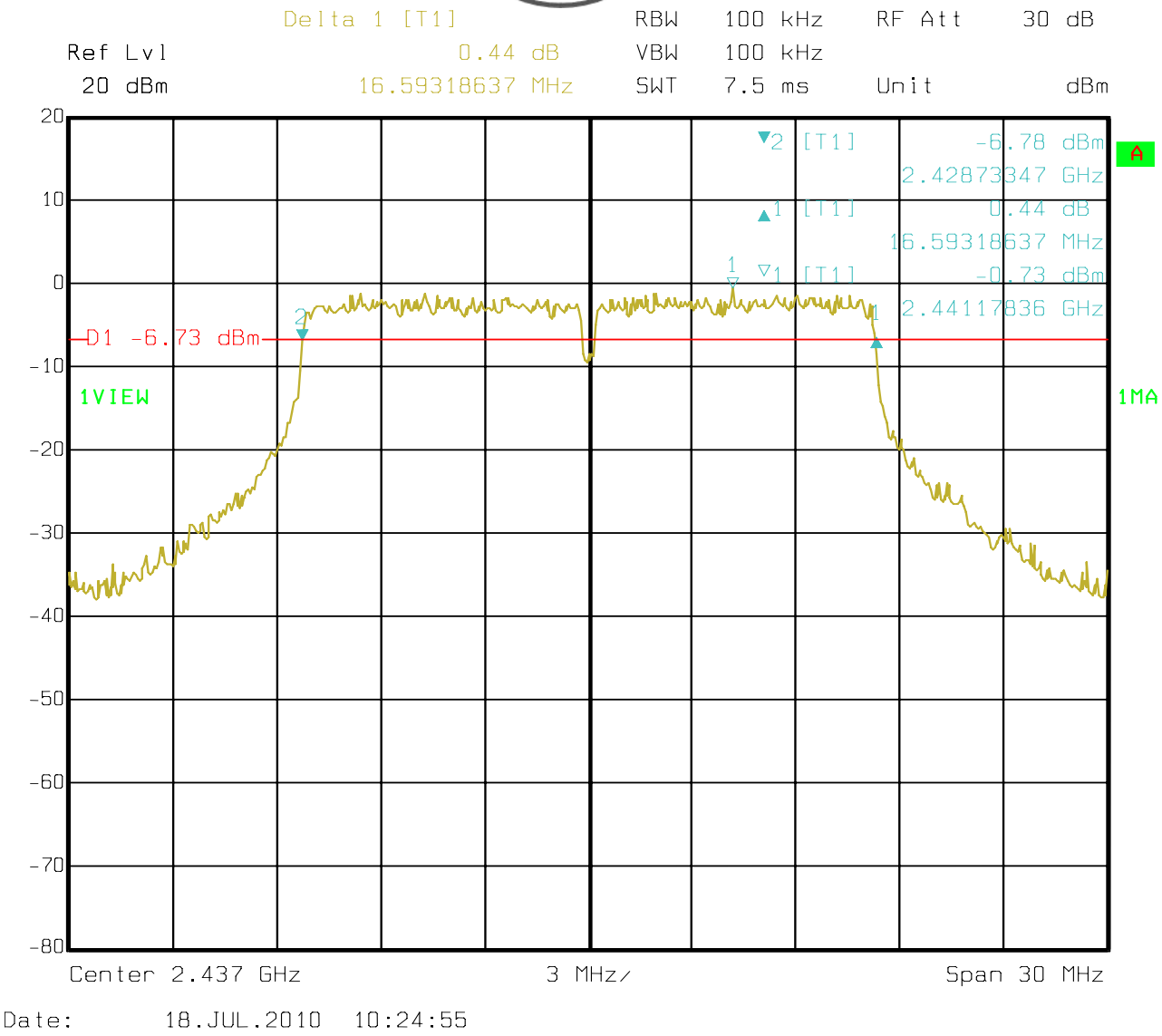
Channel	Channel Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/ Fail
1	2412	6	16.59	0.5	Pass
6	2437	6	16.59	0.5	Pass
11	2462	6	16.53	0.5	Pass

Test Plots:

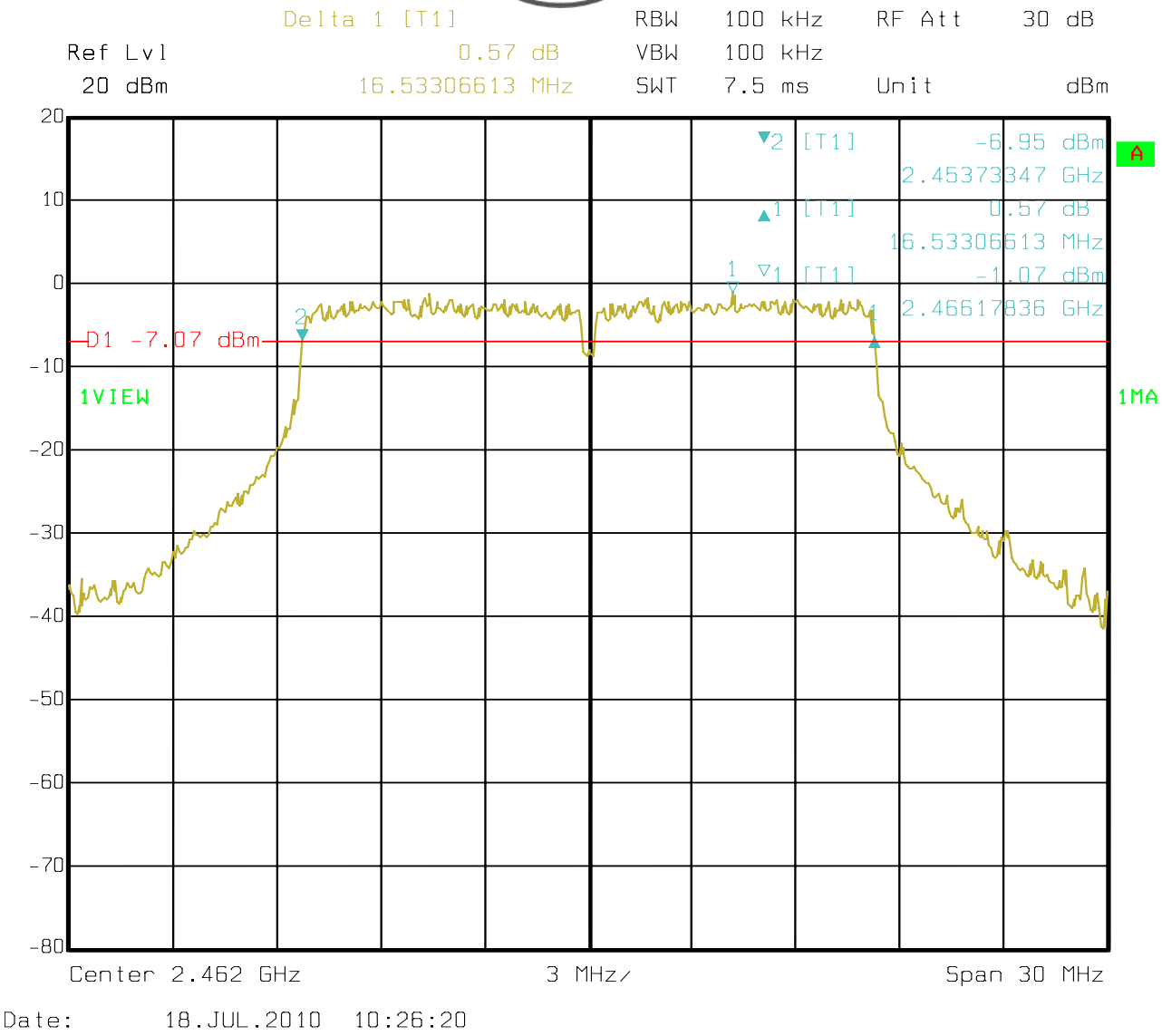
1. 802.11g at 6Mbps of CH01



2. 802.11g at 6Mbps of CH06

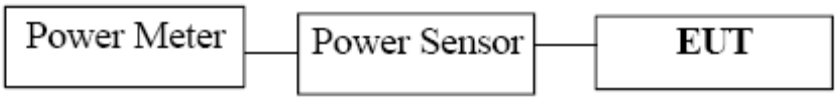


3. 802.11g at 6Mbps of CH11



8. Maximum Peak Output Power

8.1 Test Setup



8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

8.3 Test Procedure

The RF power output was measured with a Power meter connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate centre frequency.

Note: the peak power was measured

8.4Test Results

EUT	EPC	Model	E700
Mode	802.11b	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
1	2412	10.50	30	Pass
6	2437	11.21	30	Pass
11	2462	12.36	30	Pass

Note: 1. At finial test to get the worst-case emission at 1Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

TEST REPORT

EUT	EPC	Model	E700
Mode	802.11g	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail
1	2412	10.61	30	Pass
6	2437	11.56	30	Pass
11	2462	9.78	30	Pass

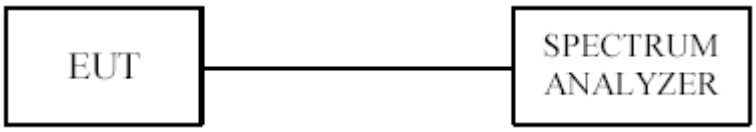
Note: 1. At finial test to get the worst-case emission at 6Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

9. Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density Measurement is 8dBm.

9.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3KHz RBW and 10kHz VBW, set sweep time=100s, **PK detector.**

The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span / 3KHz for a full response of the mixer in the spectrum analyzer.

9.4Test Result

EUT	EPC	Model	E700
Mode	802.11b	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Final RF Power Level in 3kHz BW (dBm)	Maximum Limit (dBm)	Pass/ Fail
1	2412	-19.00	8	Pass
6	2437	-17.16	8	Pass
11	2462	-16.14	8	Pass

Note: For 802.11b mode at finial test to get the worst-case emission at 1Mbps for CH11，CH06 and CH01

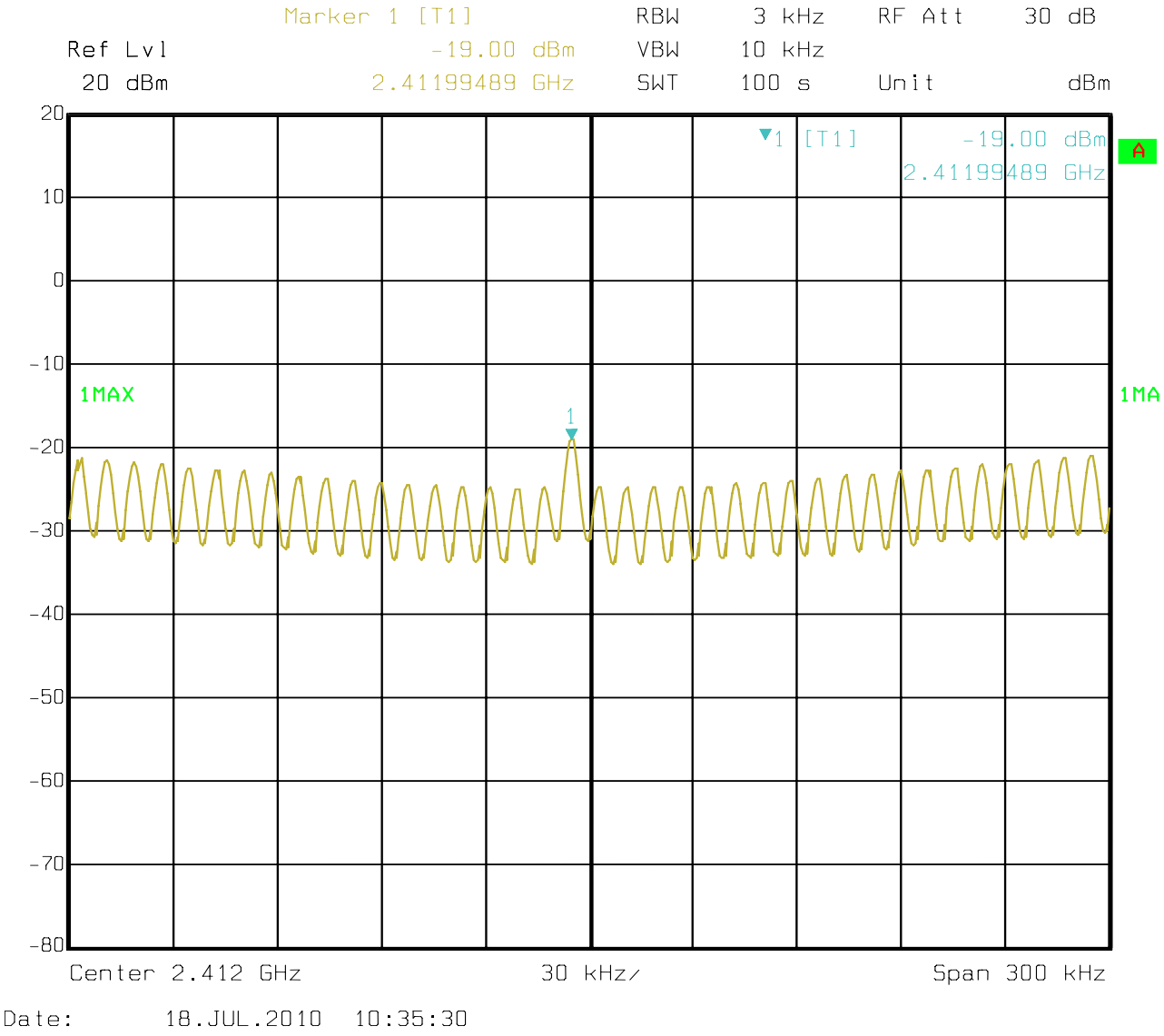
EUT	EPC	Model	E700
Mode	802.11g	Input Voltage	120V~
Temperature	24 deg. C,	Humidity	56% RH

Channel	Channel Frequency (MHz)	Final RF Power Level in 3kHz BW (dBm)	Maximum Limit (dBm)	Pass/ Fail
1	2412	-15.16	8	Pass
6	2437	-13.72	8	Pass
11	2462	-15.35	8	Pass

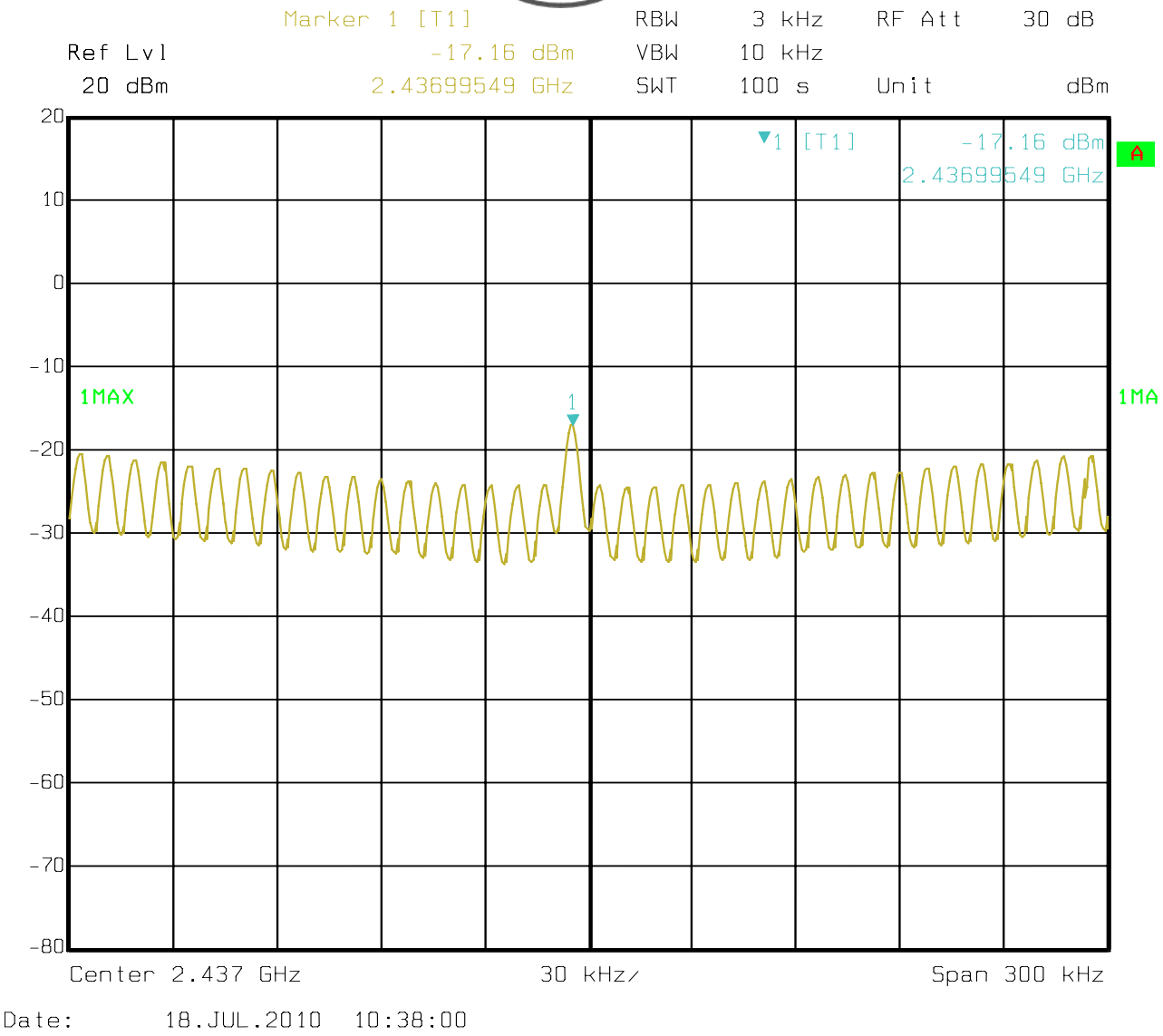
Note: For 802.11g mode at finial test to get the worst-case emission at 6Mbps for CH11，CH06 and CH01

9.5 Photo of Power Spectral Density Measurement

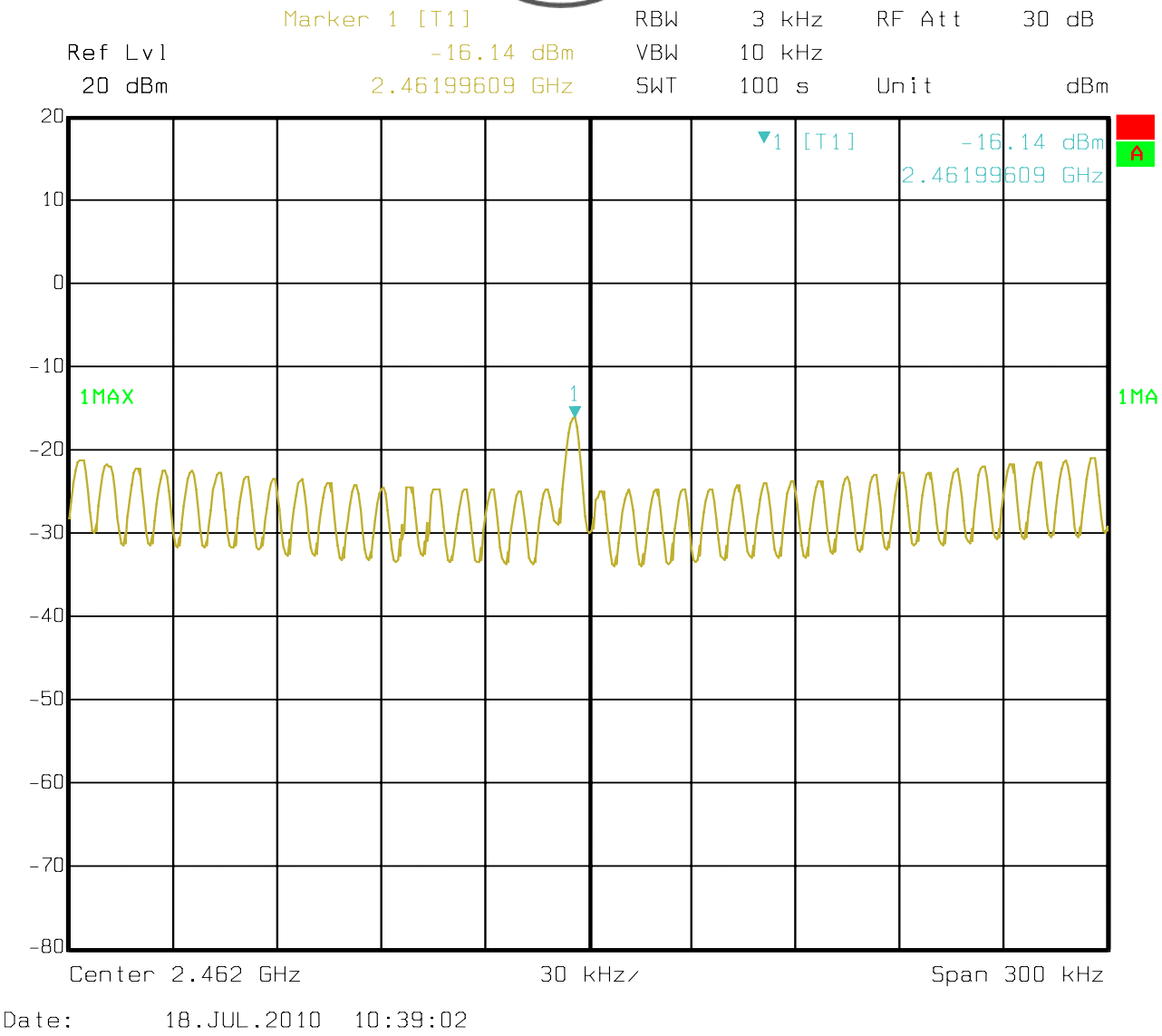
1.802.11b at 1Mbps of CH01



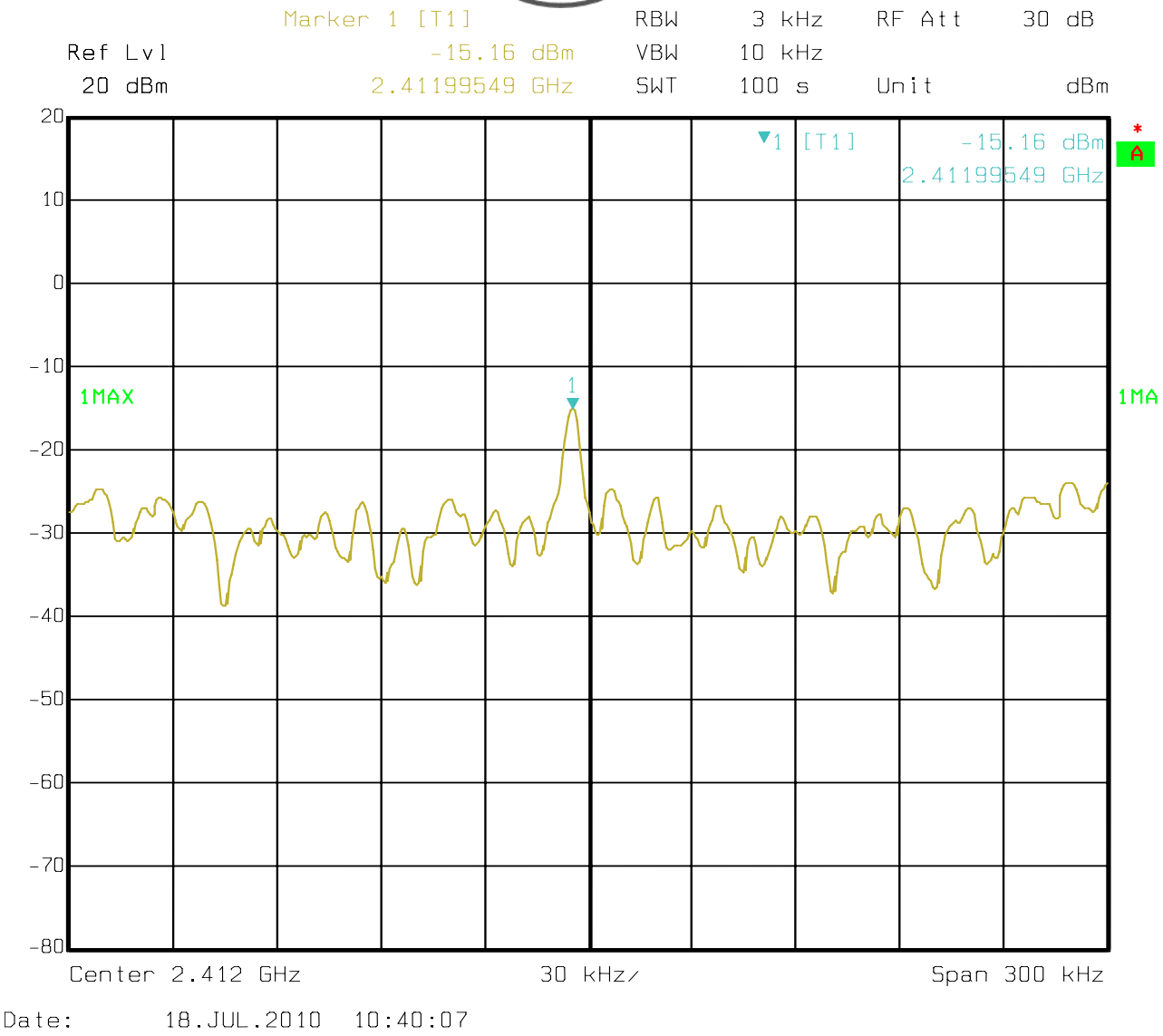
2. 802.11b at 1Mbps at CH06



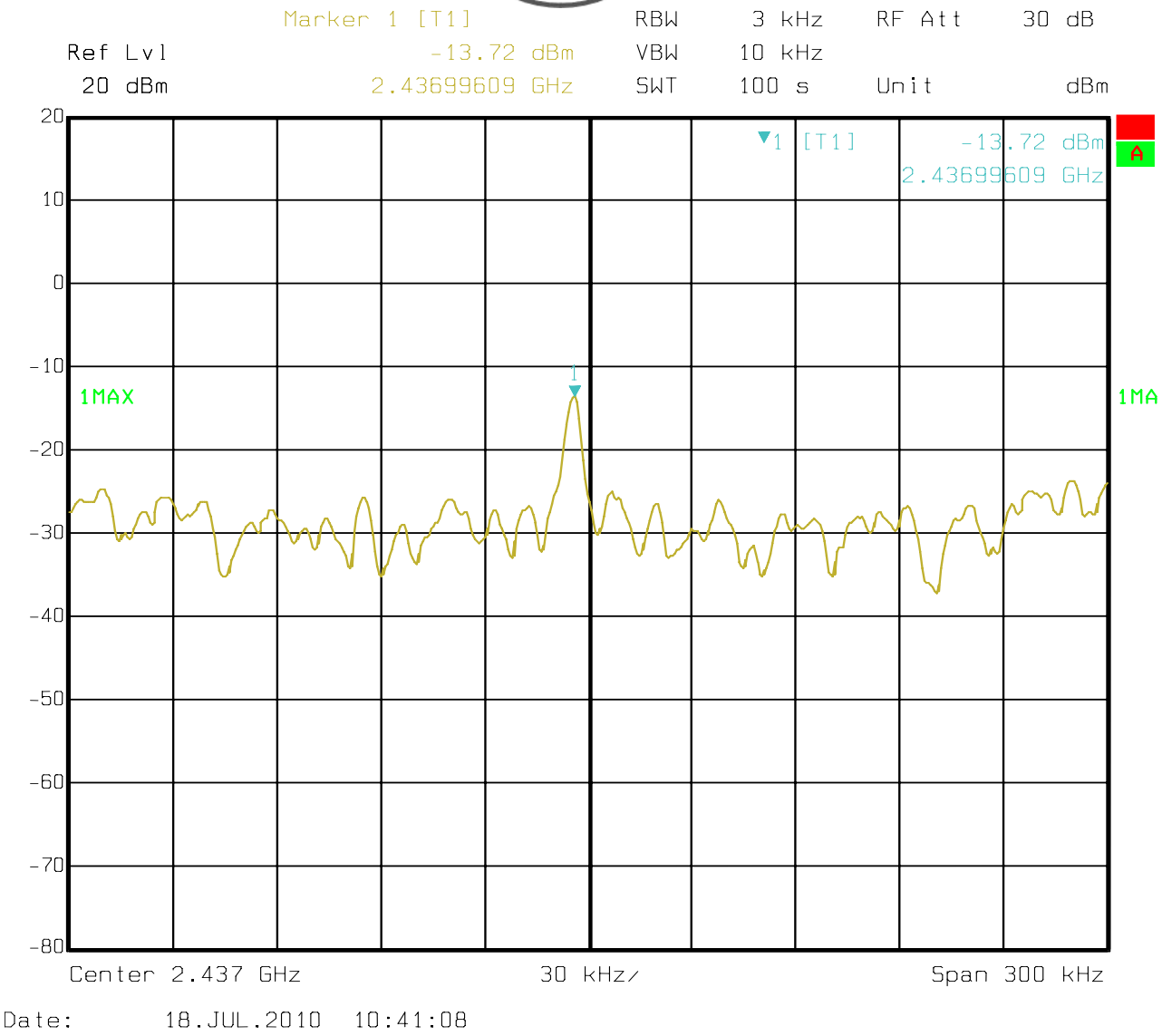
3. 802.11b at 1Mbps of CH11



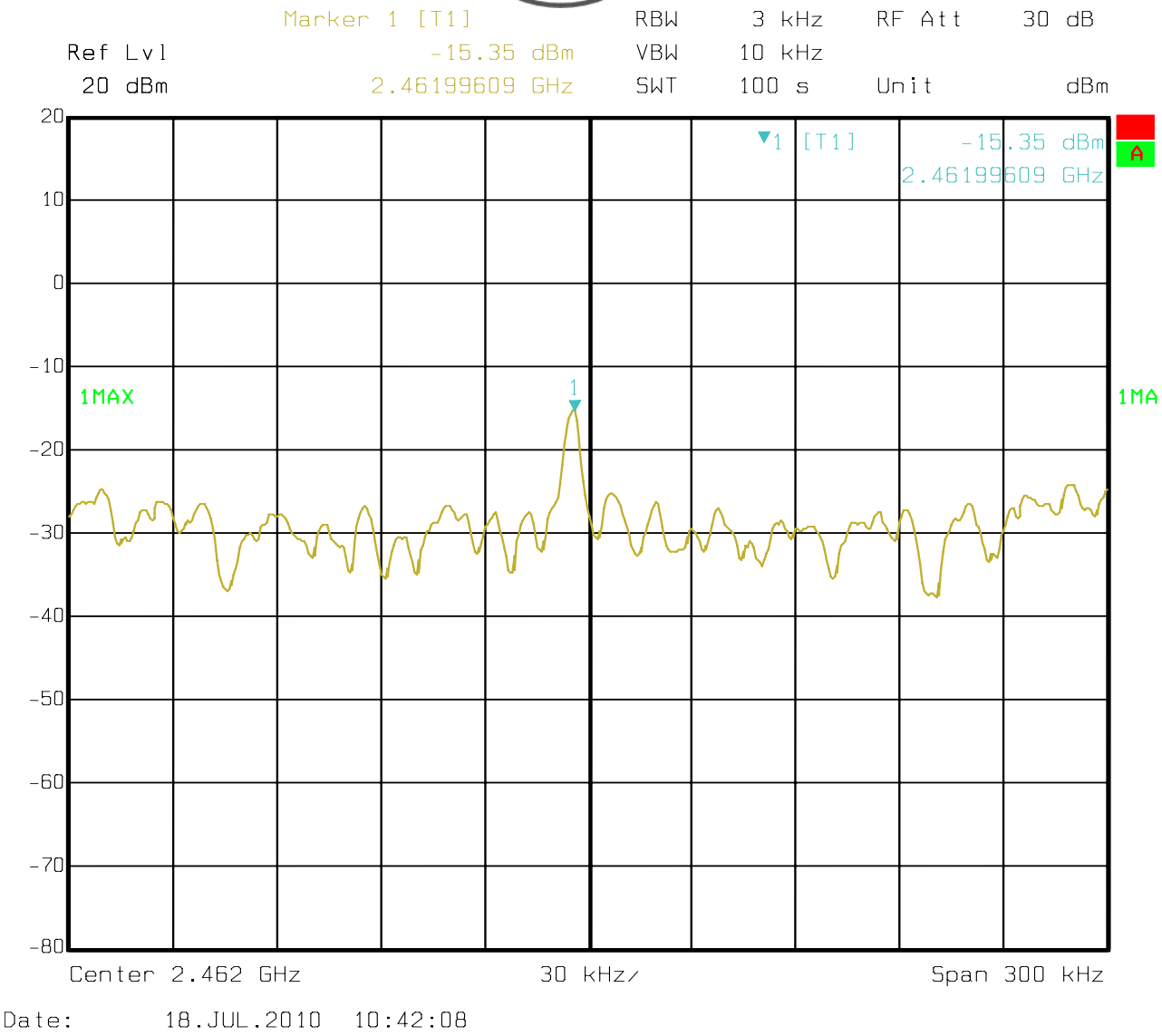
4. 802.11g at 6Mbps of CH01



5. 802.11g at 6Mbps of CH06

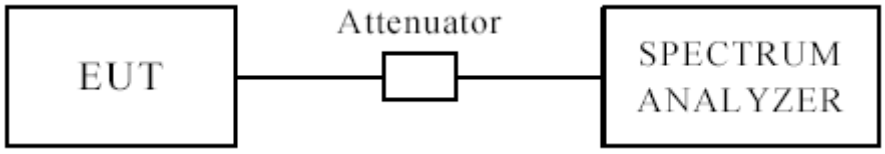


6. 802.11g at 6Mbps of CH11



10 Out of Band Measurement

10.1 Test Setup for band edge



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

10.2 Limits of Out of Band Emissions Measurement

1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

10.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test.(Peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector)

For bandage test, the spectrum set as follows: RBW=VBW=100 kHz. A conducted measurement used

10.4Test Result

Please see next pages

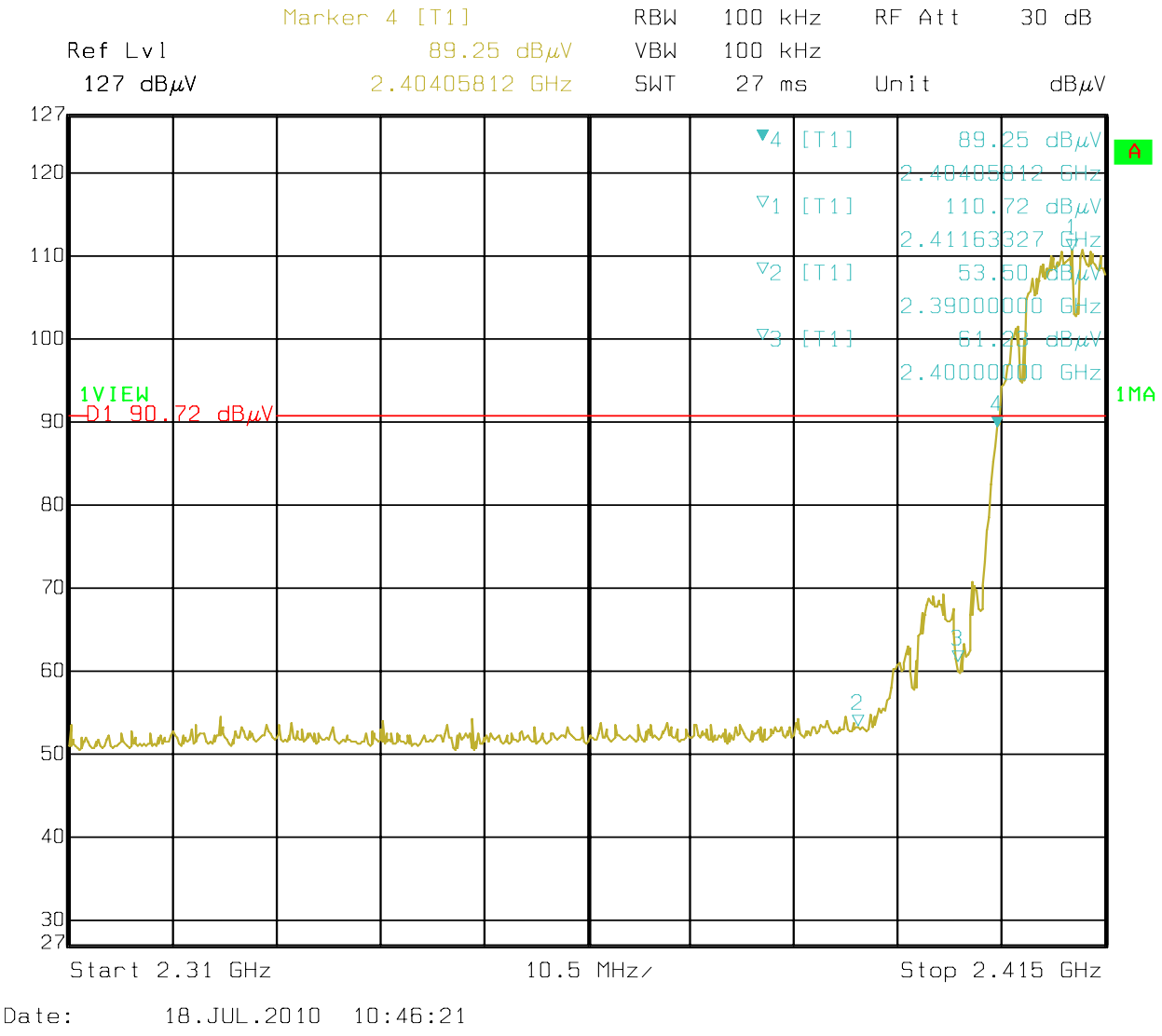
For 802.11b mode

CH01 at 1Mbps

10.4 Restricted band and bandedge Measurement

Product:	EPC		Test Mode:	CH1
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dBμV/m)	47.18(V)/45.81(H)	Limit	74(dBμV/m)
	AV (dBμV/m)	34.78(V)/33.95(H)		54(dBμV/m)

Test Figure:



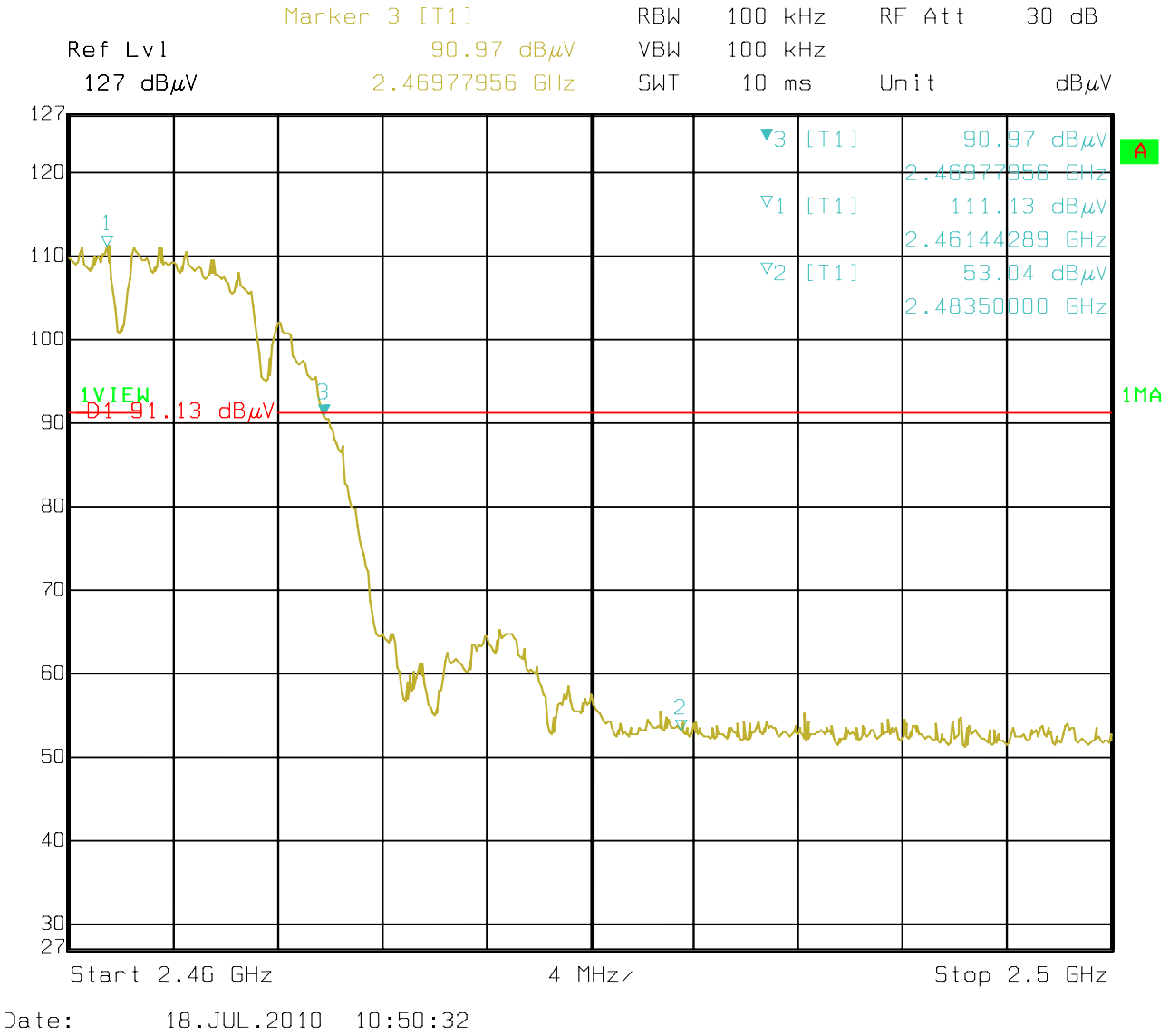
Note: The Max. FS in Restrict Band are measured in conventional method.

CH11 at 1Mbps

10.4 Restricted band and bandedge Measurement

Product:	EPC		Test Mode:	CH11
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2483.5MHz	PK (dBμV/m)	49.18(V)/46.26(H)	Limit	74(dBμV/m)
	AV (dBμV/m)	35.10(V)/34.62(H)		54(dBμV/m)

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

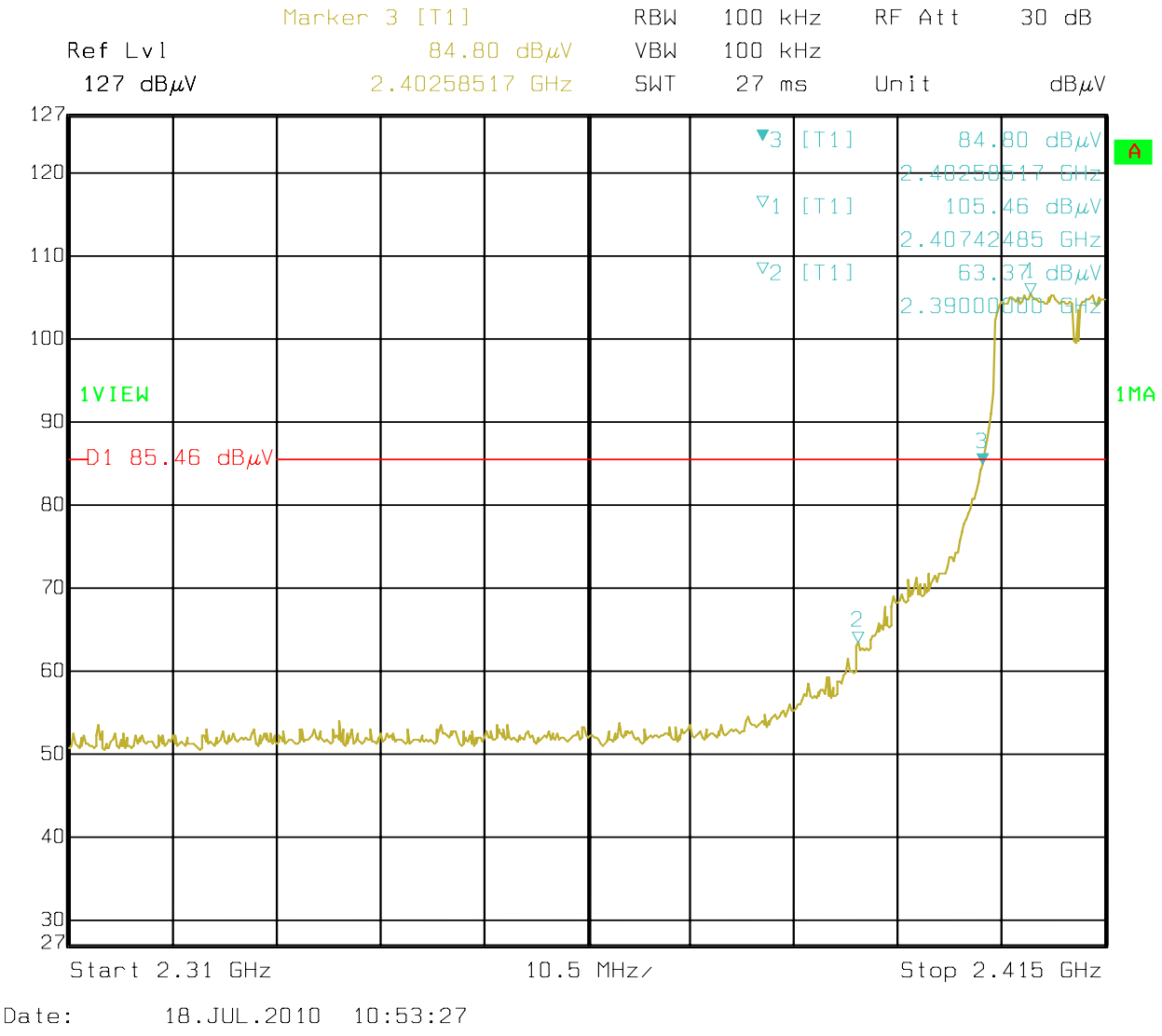
For 802.11g mode

CH01 at 6Mbps

10.4 Restricted band and bandedge Measurement

Product:	EPC		Test Mode:	CH1
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
The Max. FS in Restrict Band 2390MHz	PK (dBμV/m)	57.38(V)/54.29(H)	Limit	74(dBμV/m)
	AV (dBμV/m)	44.78(V)/40.81(H)		54(dBμV/m)

Test Figure:



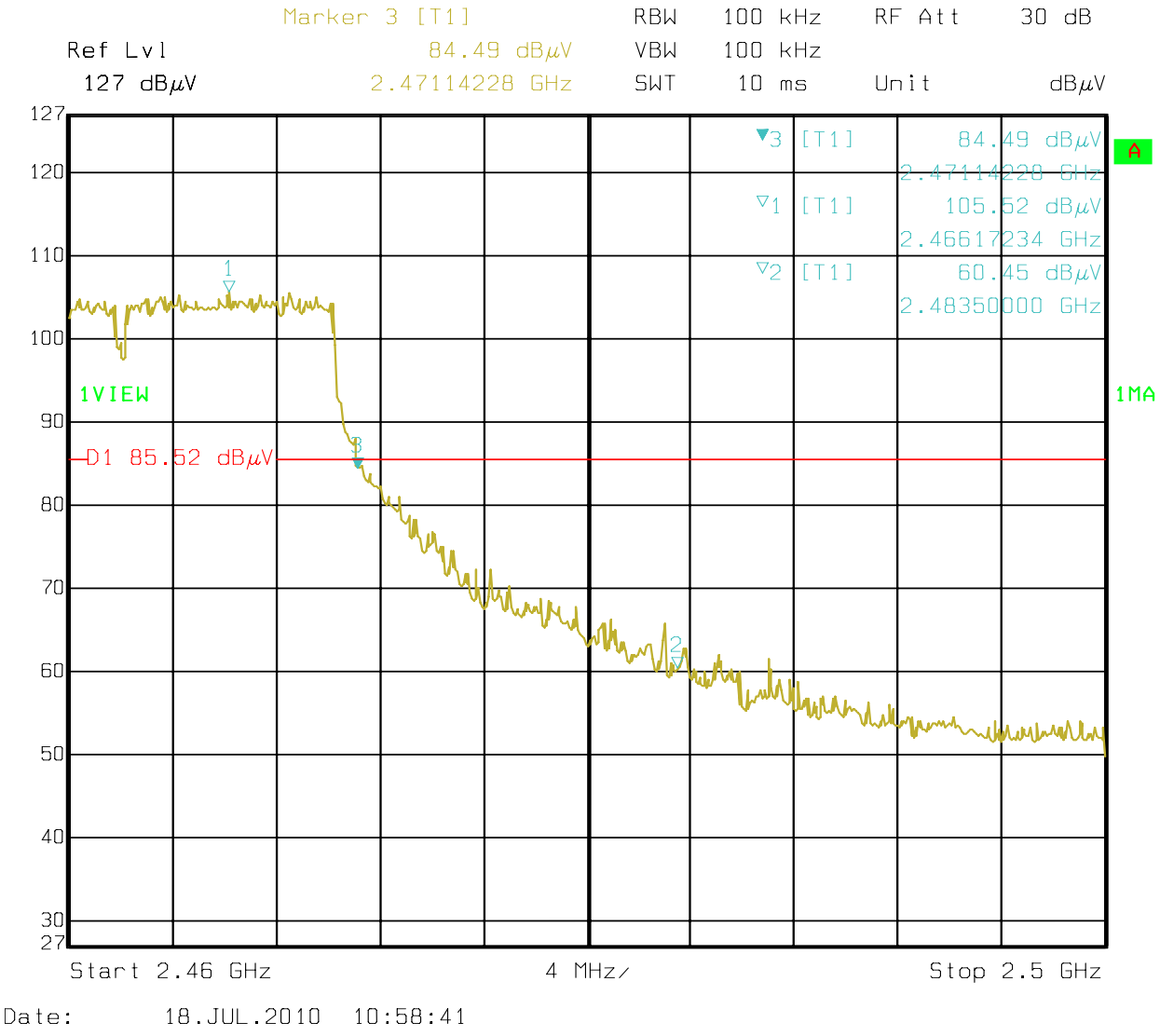
Note: The Max. FS in Restrict Band are measured in conventional method.

CH11 at 6Mbps

10.4 Restricted band and bandedge Measurement

Product:	EPC		Test Mode:	CH11
Mode	Keeping Transmitting		Input Voltage	120V~
Temperature	24 deg. C,		Humidity	56% RH
Test Result:		Pass	Detector	PK
The Max. FS in Restrict Band 2485.6MHz	PK (dBμV/m)	56.73(V)/52.20(H)	Limit	74(dBμV/m)
	AV (dBμV/m)	43.08(V)/40.55(H)		54(dBμV/m)

Test Figure:



Note: The Max. FS in Restrict Band are measured in conventional method.

11.0 Antenna Requirement

11.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

PCB printed Antenna. The Maximum antenna gain antenna is 1.0dBi.

12.0 Maximum Permissible Exposure

Applicable Standard

According to §1.1307(b)(5), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline. This is a Portable device. **KDB616217 was used as the guidance.**
According to §1.1310 and §2.1093 RF exposure is calculated.

Measurement Result

This is a laptop and the conducted output power is 12.36dBm (17.219mW)，which is lower than low threshold 60/fGHz mW (60/2.462GHz= 24.37 mW), and the antenna is 1.0dBi which is less than 6dBi.

The SAR measurement is not necessary.

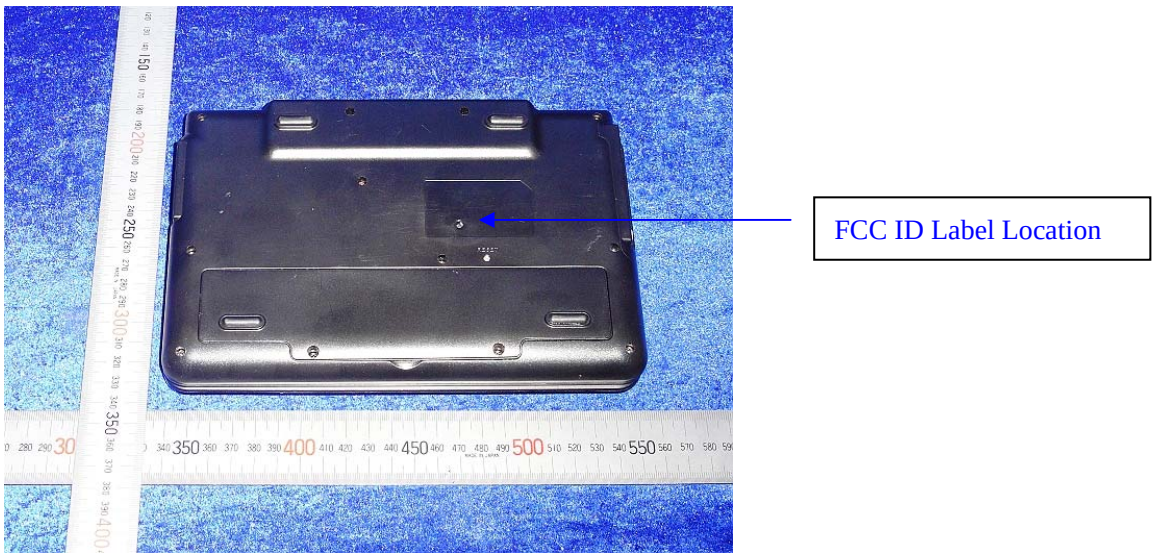
13.0 FCC ID Label

FCC ID: WI3SW-E700X

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



14.0 Photo of testing

Conducted Emissions

Radiated Emissions

14.3 Photo for the EUT

Photo for the EUT

Photo for the EUT

Photo for the EUT

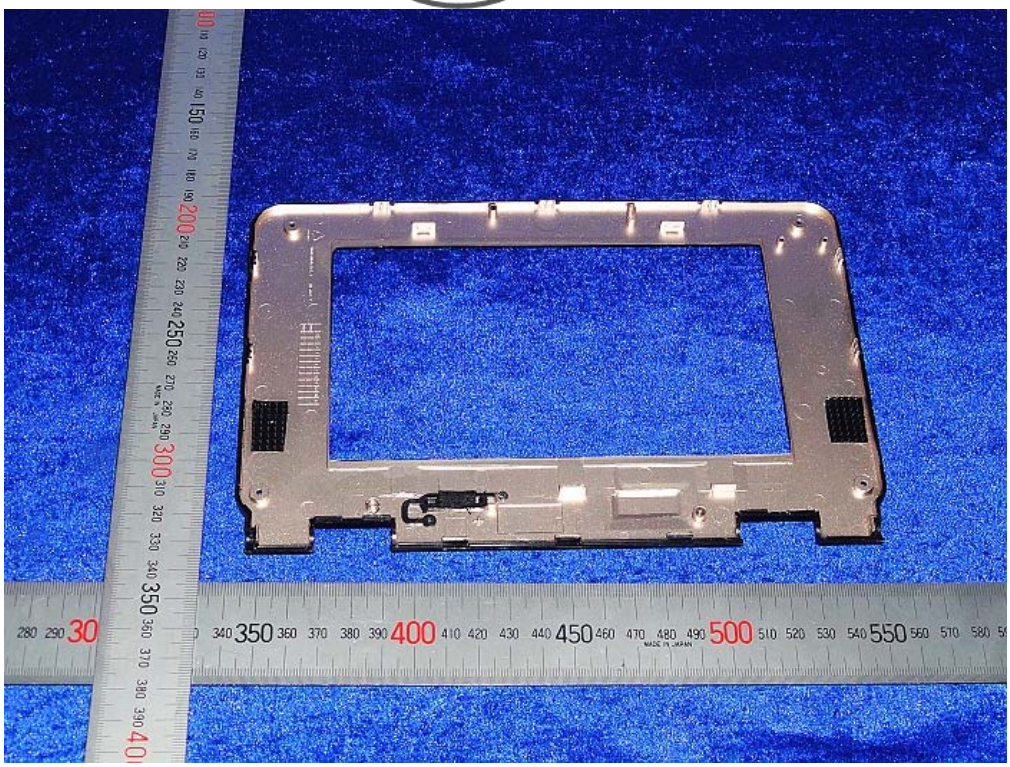
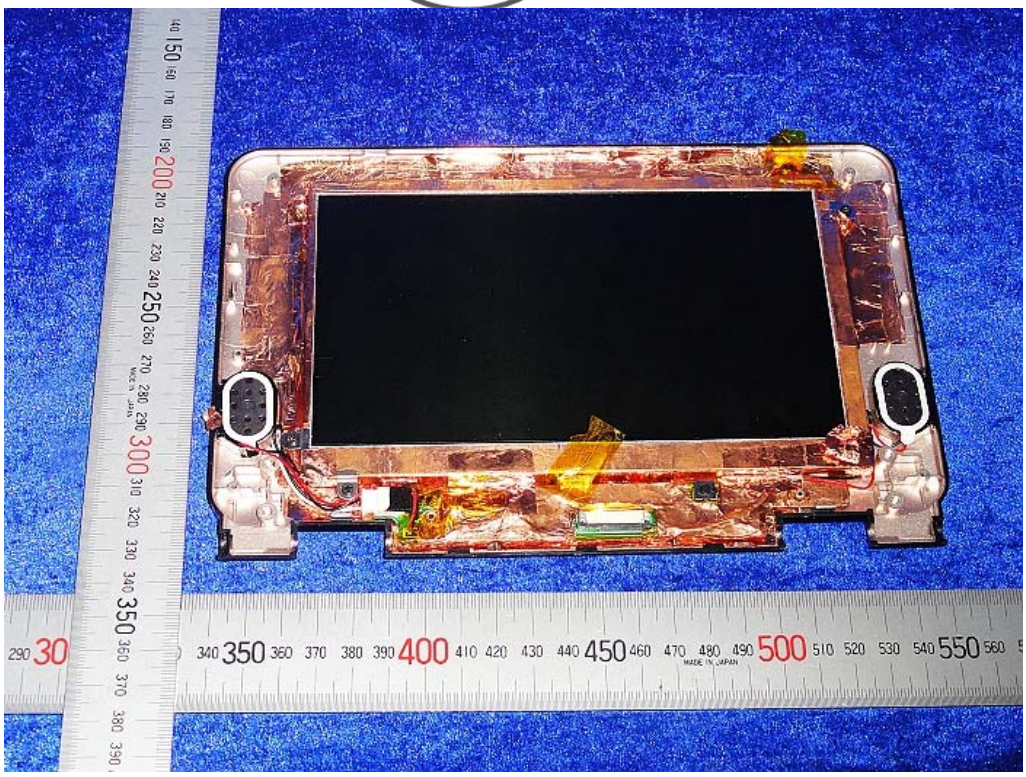


Photo for the EUT



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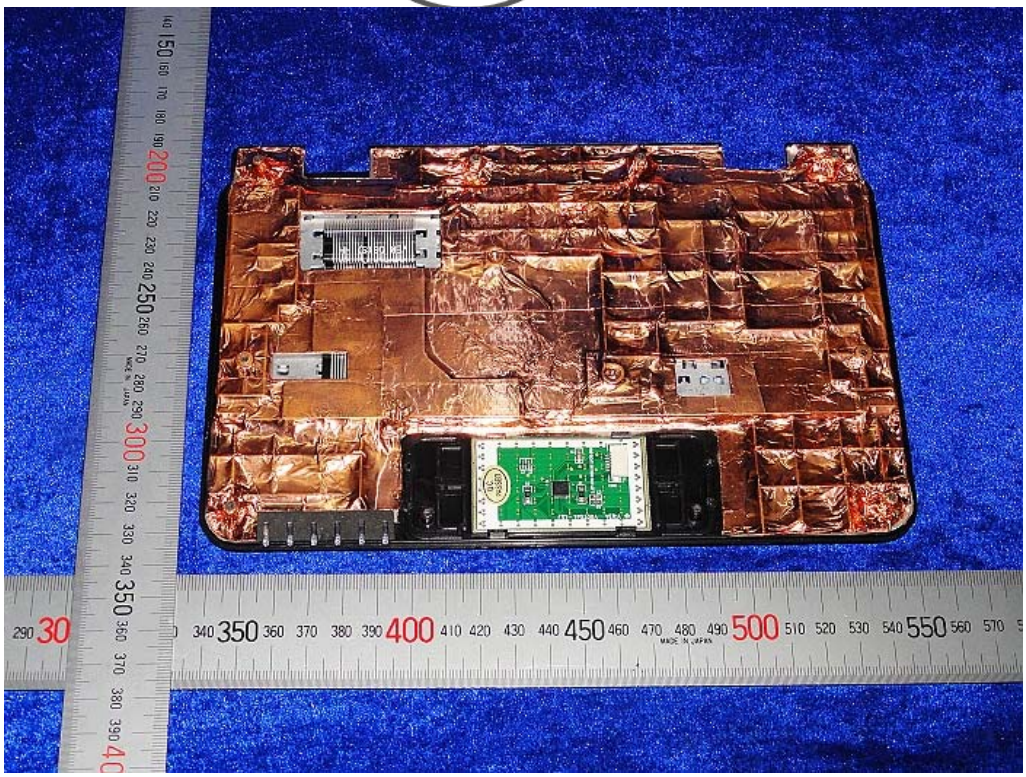

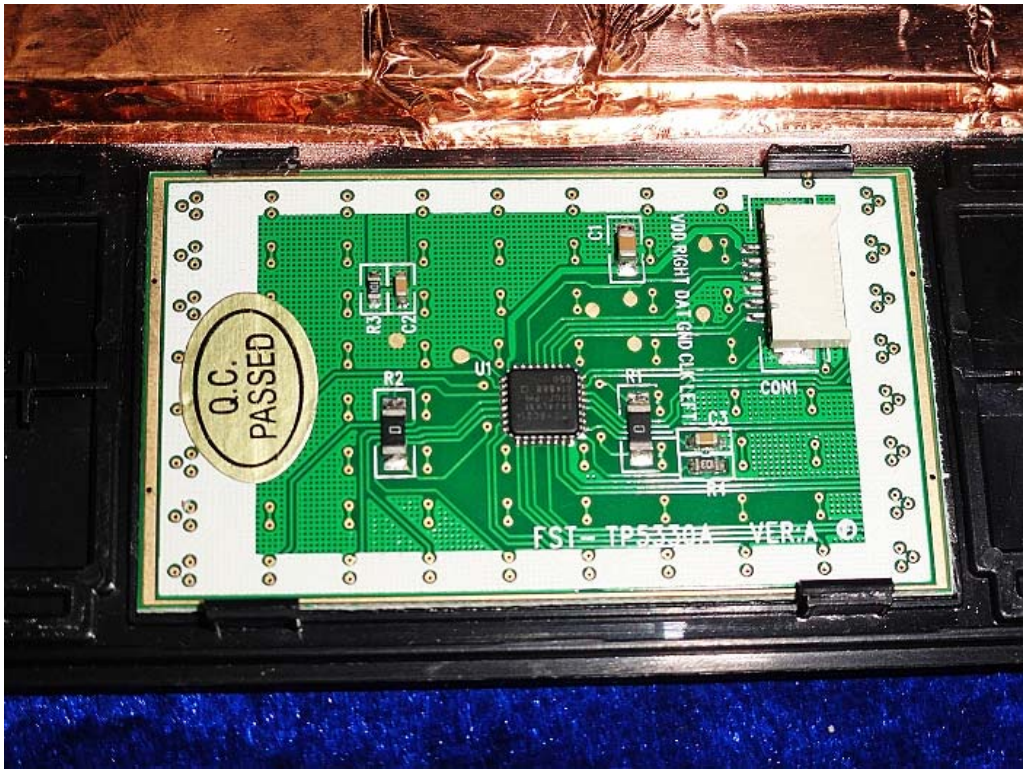

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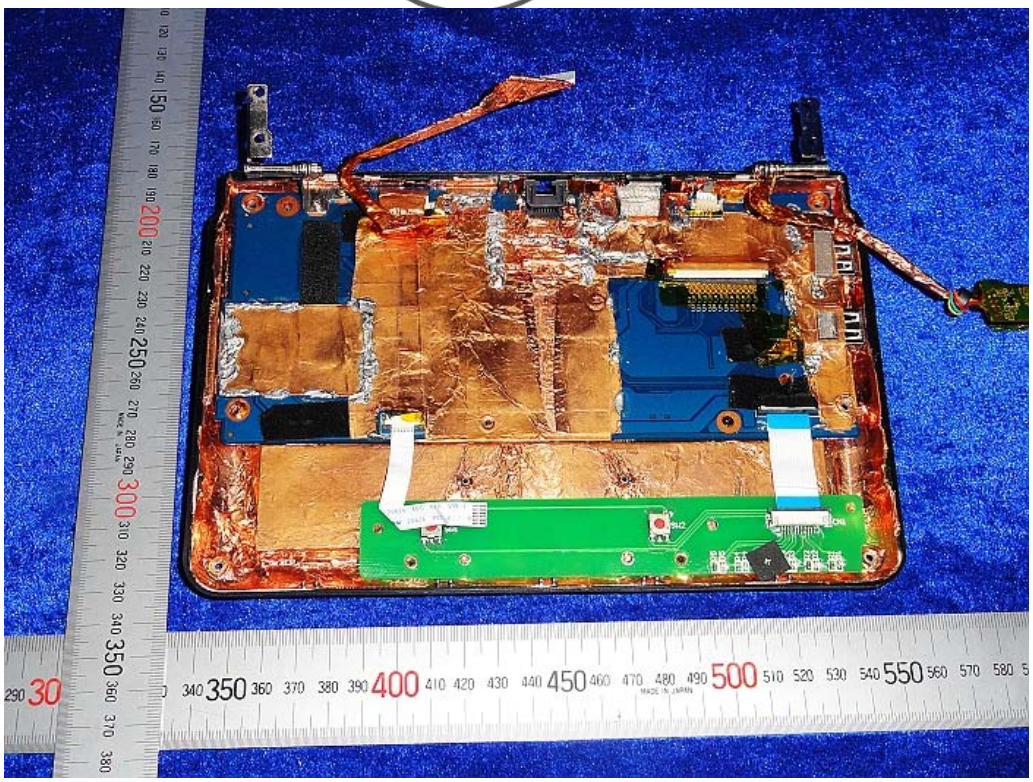

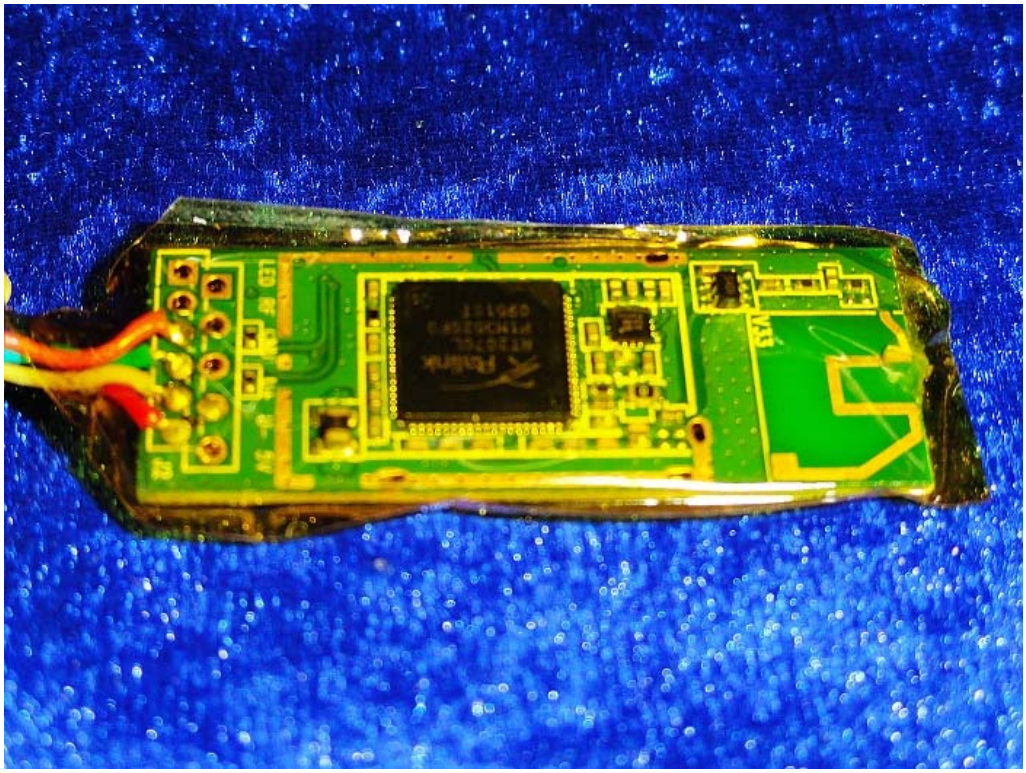

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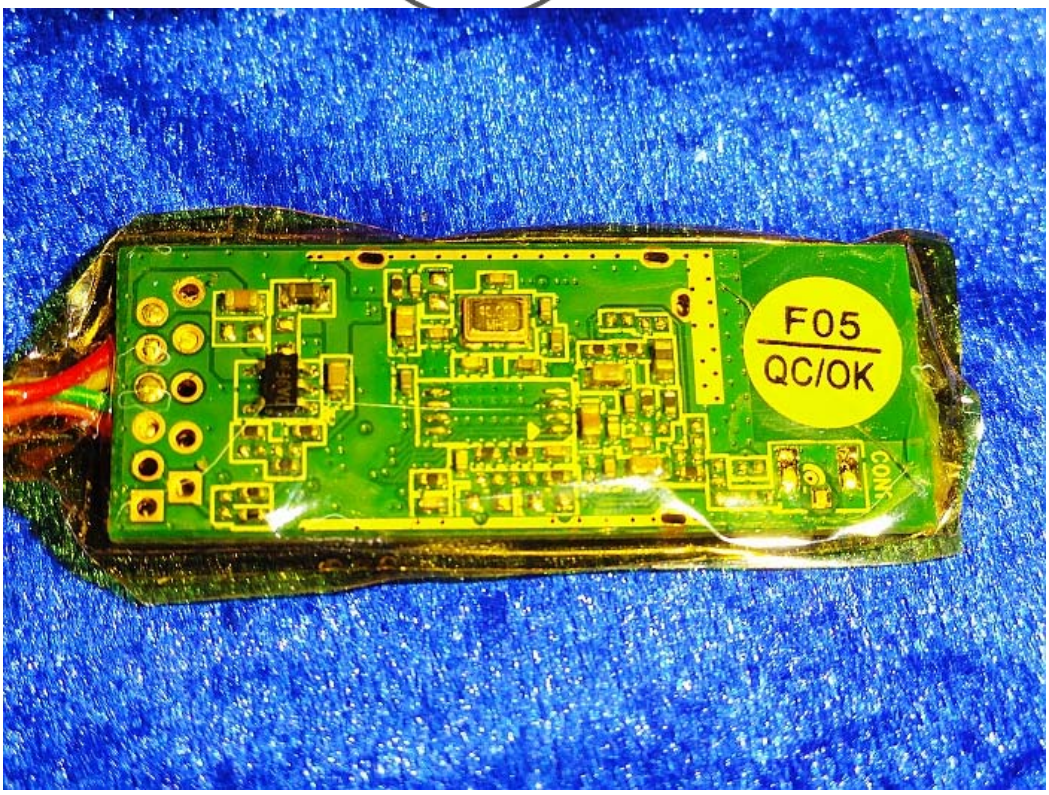

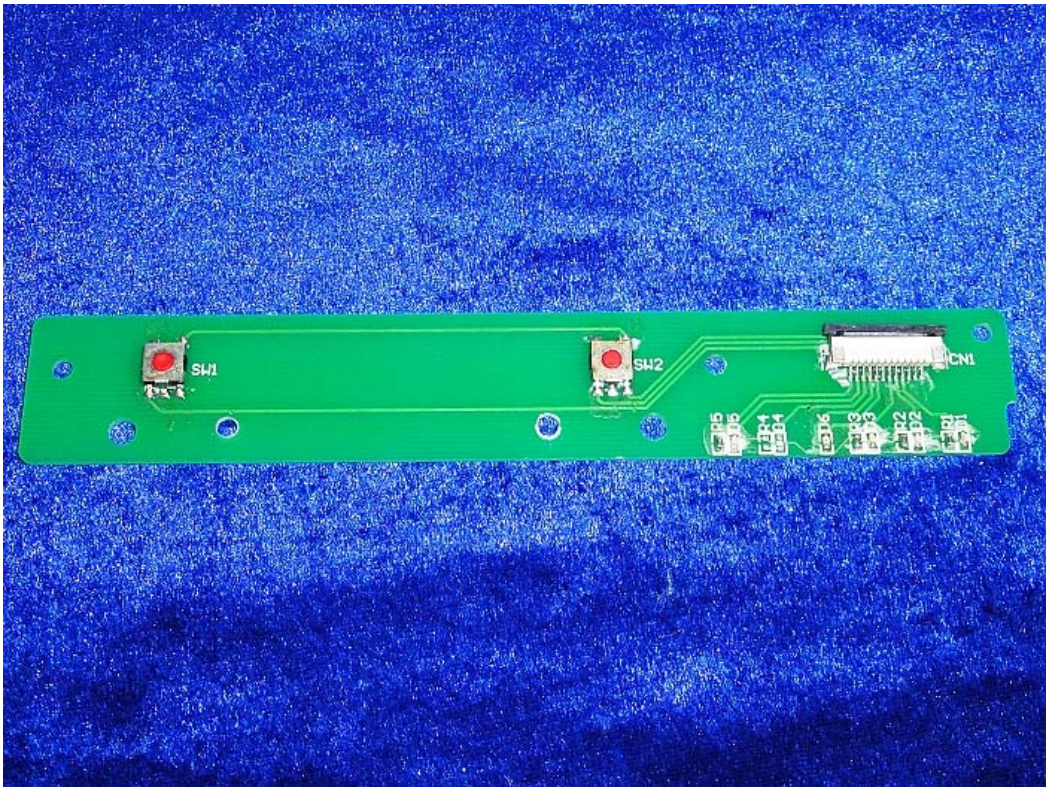

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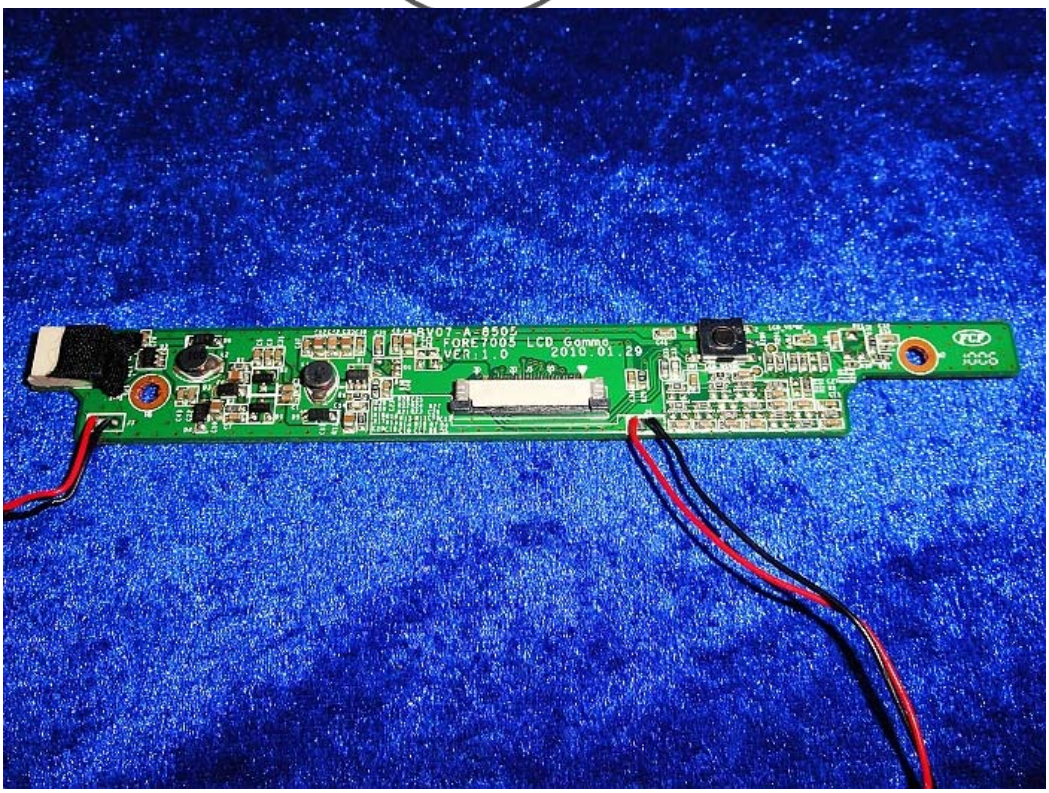

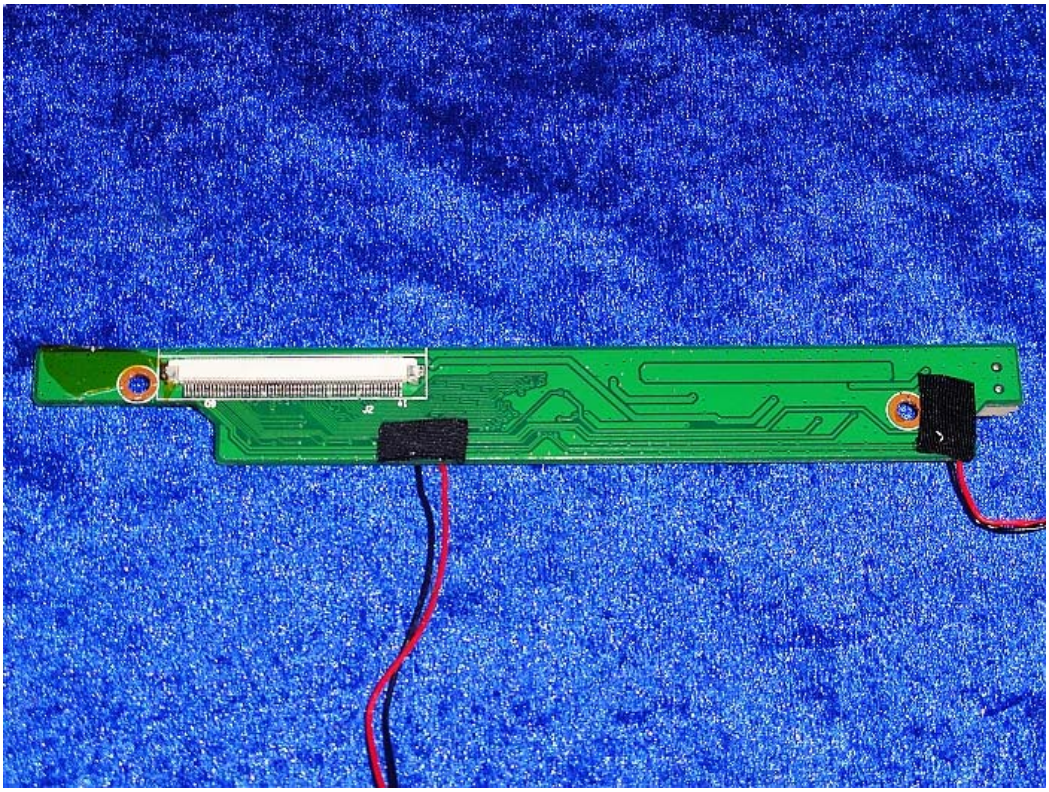

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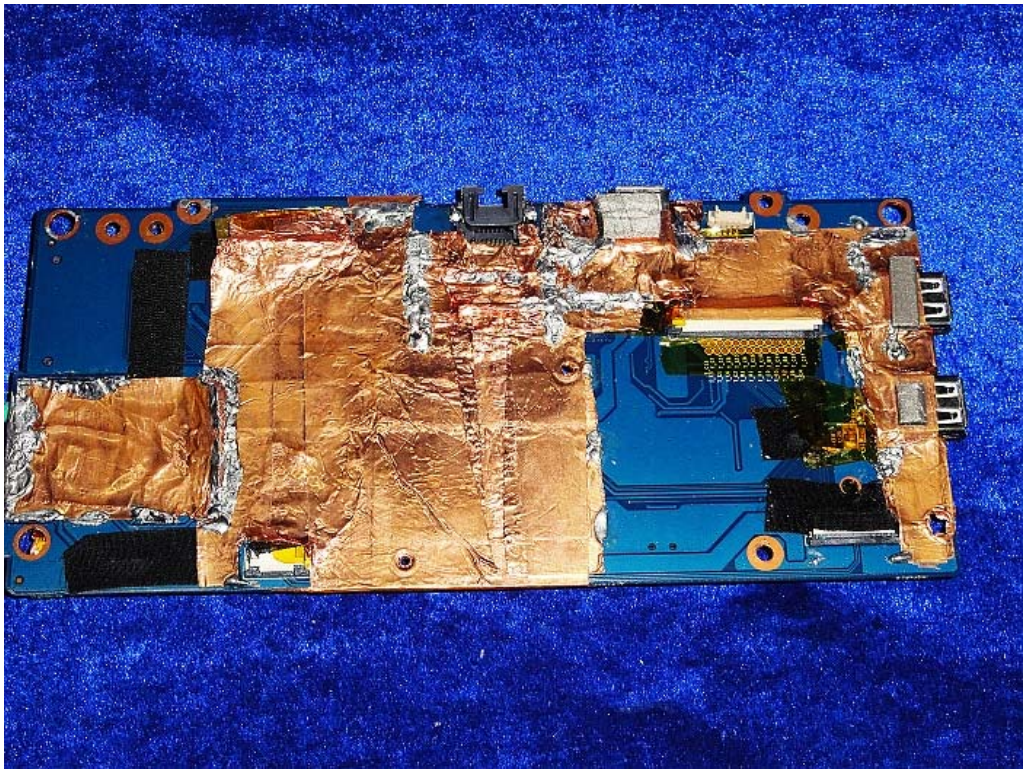

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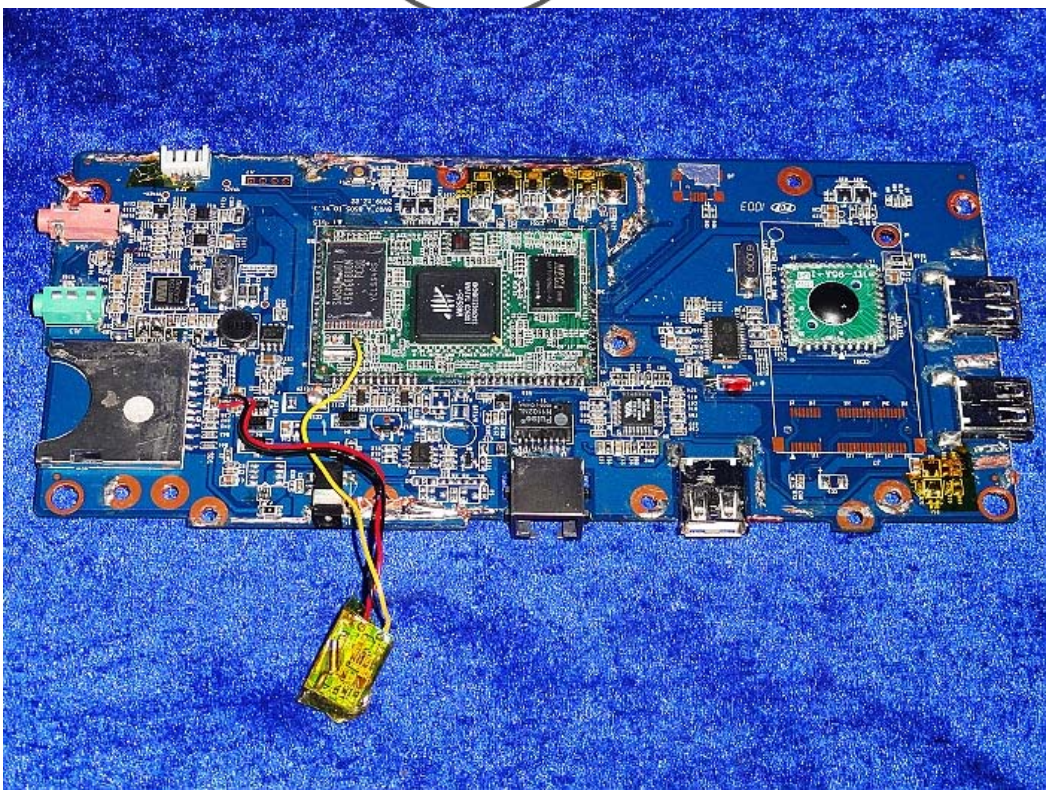

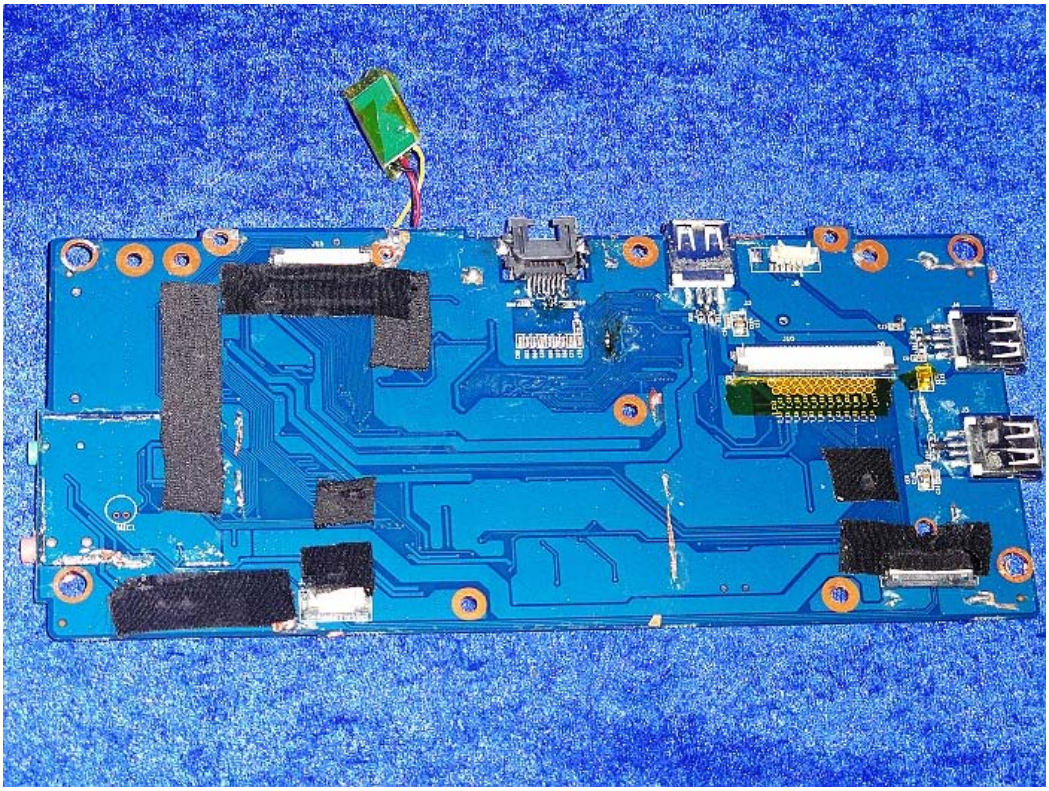

Photo for the EUT

End of the report