FCC COMPLIANCE TEST REPORT

Technical Statement of Conformity

in accordance with 47 CFR Part 15 Subpart C

The product

Equipment Under Test	: *Bluetooth Serial Dongle*
Model Number	: *BTS-100*
Product Series	: *USBB-BLUE232、CM-BT232*
Report Number	: *HA150021-RA*
Issue Date	: *14-January-2015*
Test Result	: *Compliance*

is produced by

Chipset Communication Co., LTD.

5F-3, NO.130, Jian Kang Road, Chung Ho Area, New Taipei City, Taiwan, R.O.C.

HongAn TECHNOLOGY CO., LTD.

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BSMI Registration No.: *SL2-IN-E-0023, SL2-A1-E-0023, SL2-IS-E-0023, SL2-R1-E-0023, SL2-R2-E-0023, SL2-L1-E-0023*

FCC Designation No.: *TW1071*
TAF Accreditation No.: *1163*
VCCI Registration No.: *R-2156, C-2329, T-219*

Contents

Test Result Certification

Applicant	:	*Chipset Communication Co., LTD.*
Address of Applicant	:	*5F-3, NO.130, Jian Kang Road, Chung Ho Area, New Taipei City, Taiwan, R.O.C.*
Manufacturer	:	*Chipset Communication Co., LTD.*
Address of Manufacturer	:	*5F-3, NO.130, Jian Kang Road, Chung Ho Area, New Taipei City, Taiwan, R.O.C.*
Trade Name	:	*N/A*
Equipment Under Test	:	*Bluetooth Serial Dongle*
Model Number	:	*BTS-100*
Product Series	:	*USBB-BLUE232, CM-BT232*
FCC ID	:	*2AD2A-BTS-100*
Filing Type	:	*Certification*
Sample Received Date	:	*15-Dec-2014*
Test Standard	:	

☒ *FCC Part 15 Subpart C §15.247*

Deviations from standard test methods & any other specifications : NONE

Remark:

1. *This report details the results of the test carried out on one sample.*
2. *The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in both ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.203, 15.207, 15.209, 15.247.*
3. *This report applies to the above sample only and shall not be reproduced in part without written approval of HongAn Technology Co., Ltd.*

Documented by: *2015-01-10*

Kay Wang/ ADM. Dept Staff

Tested by: *2015-01-05*

Eason Hsieh / ENG. Dept. Staff

Approved by: **Date:** *2015-01-10*

Peter Chin / Section Manager

Summary of Test Result

	Test Item	Applicable Standard	Test Result
1	Antenna Requirement	FCC part 15 subpart C §203	Compliance
2	Conducted limits	FCC part 15 subpart C §207	Compliance
3	Radiated emission limits	FCC part 15 subpart C §209	Compliance
4	20 dB Bandwidth	FCC part 15 subpart C §247(a)(1)	Compliance
5	Hopping Frequency Separation	FCC part 15 subpart C §247(a)(1)	Compliance
6	Number of Hopping Channels	FCC part 15 subpart C §247(a)(1)	Compliance
7	Average Time of Occupancy	FCC part 15 subpart C §247(a)(1)(iii)	Compliance
8	Peak Output Power	FCC part 15 subpart C §247(b)	Compliance
9	100kHz Bandwidth of Band Edges	FCC part 15 subpart C §247(d)	Compliance
10	Spurious RF Conducted Emissions	FCC part 15 subpart C §247(d)	Compliance

1 General Description

1.1 Description of EUT

Equipment Under Test	:	*Bluetooth Serial Dongle*
Model Number of EUT	:	*BTS-100*
Product Series	:	*USBB-BLUE232、CM-BT232*
Power Supply	:	*Switching Adapter* *Manufacturer: Sunny Model No.: SYS1460-0505* *EMC Approval: FCC* *Input: 120 Vac, 1A, 60Hz* *Output: 5 Vdc, 1A* *Power Cord: 2 Pin* ☐*Shielded* ☒ *Non-Shielded* ☐*Detachable* ☒ *Un-Detachable, 1.39 m* ☐*w Ferrite Core* ☒*w/o Ferrite Core*
Frequency Range	:	*2402~2480 MHz*
Transmit Power	:	*-2.39 dBm*
Number of Channels	:	*79 Channels*

Carrier Frequency of Each Channel :

00	*2402*	*20*	*2422*	*40*	*2442*	*60*	*2462*
01	*2403*	*21*	*2423*	*41*	*2443*	*61*	*2463*
02	*2404*	*22*	*2424*	*42*	*2444*	*62*	*2464*
03	*2405*	*23*	*2425*	*43*	*2445*	*63*	*2465*
04	*2406*	*24*	*2426*	*44*	*2446*	*64*	*2466*
05	*2407*	*25*	*2427*	*45*	*2447*	*65*	*2467*
06	*2408*	*26*	*2428*	*46*	*2448*	*66*	*2468*
07	*2409*	*27*	*2429*	*47*	*2449*	*67*	*2469*
08	*2410*	*28*	*2430*	*48*	*2450*	*68*	*2470*
09	*2411*	*29*	*2431*	*49*	*2451*	*69*	*2471*
10	*2412*	*30*	*2432*	*50*	*2452*	*70*	*2472*
11	*2413*	*31*	*2433*	*51*	*2453*	*71*	*2473*
12	*2414*	*32*	*2434*	*52*	*2454*	*72*	*2474*
13	*2415*	*33*	*2435*	*53*	*2455*	*73*	*2475*
14	*2416*	*34*	*2436*	*54*	*2456*	*74*	*2476*
15	*2417*	*35*	*2437*	*55*	*2457*	*75*	*2477*
16	*2418*	*36*	*2438*	*56*	*2458*	*76*	*2478*
17	*2419*	*37*	*2439*	*57*	*2459*	*77*	*2479*
18	*2420*	*38*	*2440*	*58*	*2460*	*78*	*2480*

		19	2421	39	2441	59	2461	-	-
Antenna Specification	**:**	*PCB Antenna/ Gain: 2 dBi*							
Modulation Technique	**:**	*Bluetooth 2.1 (non EDR)* *FHSS* *Bluetooth : GFSK*							
Transmit Data Rate	**:**	*Bluetooth : 1Mbps*							
Specification	**:**	**Dimensions**：*155 mm (L) X 38 mm (W) X 16 mm (H)* **Weight**：*50g* **Function**：*The EUT is a Bluetooth Serial Dongle.* **※For more detail specification, please refer to the User Manual.**							

1.2 Test Instruments

HA1

Instrument Name	Manufacture Mode	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
RF Amplifier	*AR*	*15S1G3*	*306578*	*11-AUG-2014*	*11-AUG-2015*
EMI Receiver	*R&S*	*ESCI*	*100615*	*03-MAR-2014*	*03-MAR-2015*
Spectrum Analyzer	*R&S*	*FSL6*	*100323*	*11-JUN-2014*	*11-JUN-2015*
Spectrum Analyzer	*Advantest*	*R3172*	*101202158*	*24-JUN-2014*	*24-JUN-2015*
Preamplifier	*WIRELESS*	*FPA-6592G*	*060009*	*09-JUL-2014*	*09-JUL-2015*
Preamplifier	*HD*	*HD17187*	*004*	*04-AUG-2014*	*04-AUG-2015*
Bilog Antenna	*TESEQ*	*CBL6111D*	*25769*	*03-MAR-2014*	*03-MAR-2015*
Bilog Antenna	*Schaffner*	*CBL6112B*	*2860*	*12-AUG-2014*	*12-AUG-2015*
Double-Ridged Waveguide Horn	*EMCO*	*3115*	*9912-5992*	*04-MAY-2014*	*04-MAY-2015*
Temp. & Humidity Chamber	*Giant Force*	*GTH-150-20-SP-AR*	*MMA0907-012*	*22-JUL-2014*	*22-JUL-2015*
Horn Antenna (18-40GHz)	*Com-Power*	*AH-840*	*101042*	*03-Jul-2014*	*03-Jul-2015*
Microwave Preamplifier	*Com-Power*	*PAM-840*	*461269*	*02-Jul-2014*	*02-Jul-2015*
L.I.S.N.	*Mess Tec*	*NNB-2/16Z*	*03/1006*	*24-Jan-2014*	*24-Jan-2015*
L.I.S.N.	*EMCIS*	*LN2-16*	*LN04023*	*01-Aug-2014*	*01-Aug-2015*

※ *The test equipments used are calibrated and can be traced to National ITRI and International Standards.*

1.3 Auxiliary Equipments

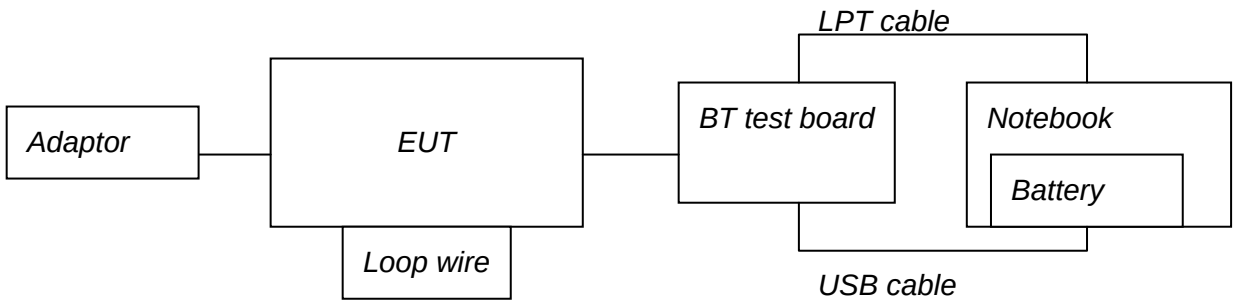
1.3.1. Provided by HongAn Technology Co., Ltd. for Emission Test.

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Description	
						Data Cable	Power Cable
1	Notebook	N61J	N61JV-021A520M	CE,FCC, C-TICK N13219, BSMI R31018	ASUS	Adapter to Notebook Unshielded*1.8 m	AC to Adapter Unshielded*1.8 m
2	Bluetooth Test Board	N/A	N/A	N/A	N/A	N/A	N/A

1.3.2. Provided by the Manufacturer

N/A

1.4 EUT SETUP



Note: Main Test Sample: BTS-100

1.5 Identifying the Final Test Mode

1. Mode 1: TX BT mode (1Mbps) CH 00.
2. Mode 2: TX BT mode (1Mbps) CH 39.
3. Mode 3: TX BT mode (1Mbps) CH 78.

Note:

1. After pre-test, we identified that the TX (Packet type DH5 and X axis) was most likely to cause maximum disturbance and most likely to be susceptible to disturbance. Therefore, the Final Assessment was performed for the worst case.
2. The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.
3. Channel Low (2402 MHz), Mid (2441 MHz) and High (2480 MHz) were chosen for full testing.
4. According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

1.6 Final Test Mode

Conducted Emission: Mode 3
Field Strength: All Mode.
Radiated Emission (30~1000 MHz): Mode 3.
Radiated Emission (1~26.5GHz): All Mode.

1.7 Condition of Power Supply

DC 5 V, through Adaptor.

1.8 EUT Configuration

1. *Setup the EUT as shown in Sec.1.4 Block Diagram.*
2. *Turn on the power of all equipments.*
3. *Activate the selected Final Test Mode.*

1.9 Test Methodology

The tests documented in this report were performed in accordance with ANSI C63.4 (2003) and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.203, 15.207, 15.209 and 15.247.

1.10 General Test Procedures

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.3 of ANSI C63.4 (2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. The EUT was designed to be mounted on back of front seat, according to the requirements in Section 13.4.1 of ANSI C 63.4 (2003), only one axe of the EUT has to be measured.

1.11 Modification

N/A

1.12 FCC Part 15.205 restricted bands of operations

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37635-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

1.13 Qualification of Test Facility

BSMI Certificate No.	:	*SL2-IS-E-0023, SL2-IN-E-0023, SL2-R1-E-0023, SL2-R2-E-0023, SL2-A1-E-0023, SL2-L1-E-0023.*
FCC Designation No.	:	*TW1071*
TAF Accreditation No.	:	*1163*
VCCI Certificate No.	:	*R-2156, C-2329, T-219*

2 Power line Conducted Emission Measurement

2.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

2.2 Test Arrangement and Procedure

1. *The EUT was placed on a table, which is 0.8m above ground plane.*
2. *Maximum procedure was performed on the six highest emissions to ensure EUT compliance.*
3. *Repeat above procedures until all frequency measured were complete.*

2.3 Limit (§ 15.207)

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency (MHz)	*Limits (dBuV)*	
	Q.P. (Quasi-Peak)	*A.V. (Average)*
0.15 to 0.50	*66 to 56*	*56 to 46*
0.50 to 5.0	*56*	*46*
5.0 to 30	*60*	*50*

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

2.4 Test Result

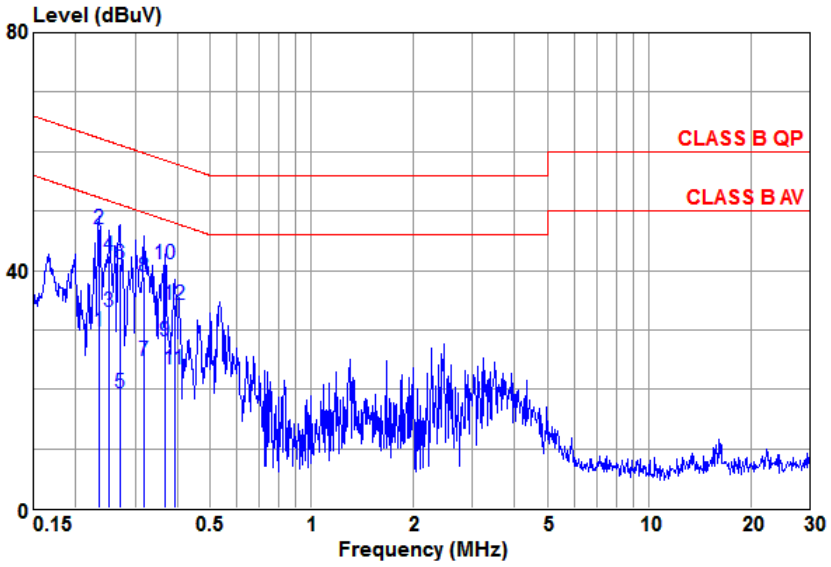
PASS

Compliance

The final test data are shown on the following page(s).

Conducted Emission Test Data

Test Date	:	*2015-01-05*	*Power Line*	:	*Line*
Temperature	:	*24.9℃*	*Humidity*	:	*51%*



		Freq	Reading	C.F	Result	Limit	Margin	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	
1		0.235	29.16	0.57	29.73	52.26	-22.53	Average
2	@	0.235	46.51	0.57	47.08	62.26	-15.18	QP
3	*	0.252	32.65	0.50	33.15	51.69	-18.54	Average
4		0.252	42.06	0.50	42.56	61.69	-19.13	QP
5		0.272	19.03	0.44	19.47	51.07	-31.60	Average
6		0.272	40.53	0.44	40.97	61.07	-20.10	QP
7		0.318	24.39	0.30	24.69	49.75	-25.06	Average
8		0.318	38.77	0.30	39.07	59.75	-20.68	QP
9		0.369	27.81	0.17	27.98	48.52	-20.54	Average
10		0.369	40.80	0.17	40.97	58.52	-17.55	QP
11		0.393	23.16	0.11	23.27	47.99	-24.72	Average
12		0.393	34.17	0.11	34.28	57.99	-23.71	QP

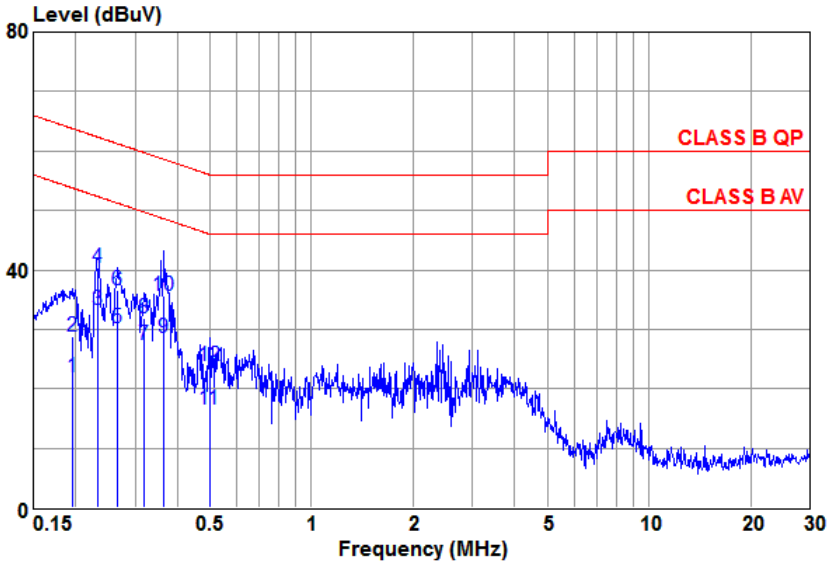
Result = Reading + C.F ; C.F = LISN Factor + Cable Loss

@ :Maximum QP * :Maximum AVG x :Over Limit

Remark：*All readings are Quasi-Peak and Average values.*

Conducted Emission Test Data

Test Date	:	*2015-01-05*	*Power Line*	:	*Neutral*
Temperature	:	*24.9℃*	*Humidity*	:	*51%*



		Freq	Reading	C.F	Result	Limit	Margin	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	
1		0.195	21.96	0.10	22.06	53.80	-31.74	Average
2		0.195	28.61	0.10	28.71	63.80	-35.09	QP
3	*	0.233	33.22	0.10	33.32	52.35	-19.03	Average
4	@	0.233	40.19	0.10	40.29	62.35	-22.06	QP
5		0.267	30.17	0.09	30.26	51.20	-20.94	Average
6		0.267	36.45	0.09	36.54	61.20	-24.66	QP
7		0.318	27.38	0.10	27.48	49.75	-22.27	Average
8		0.318	31.88	0.10	31.98	59.75	-27.77	QP
9		0.365	28.36	0.09	28.45	48.61	-20.16	Average
10		0.365	35.64	0.09	35.73	58.61	-22.88	QP
11		0.499	16.37	0.09	16.46	46.01	-29.55	Average
12		0.499	23.64	0.09	23.73	56.01	-32.28	QP

Result = Reading + C.F ; C.F = LISN Factor + Cable Loss

@ :Maximum QP * :Maximum AVG x :Over Limit

Remark：*All readings are Quasi-Peak and Average values.*

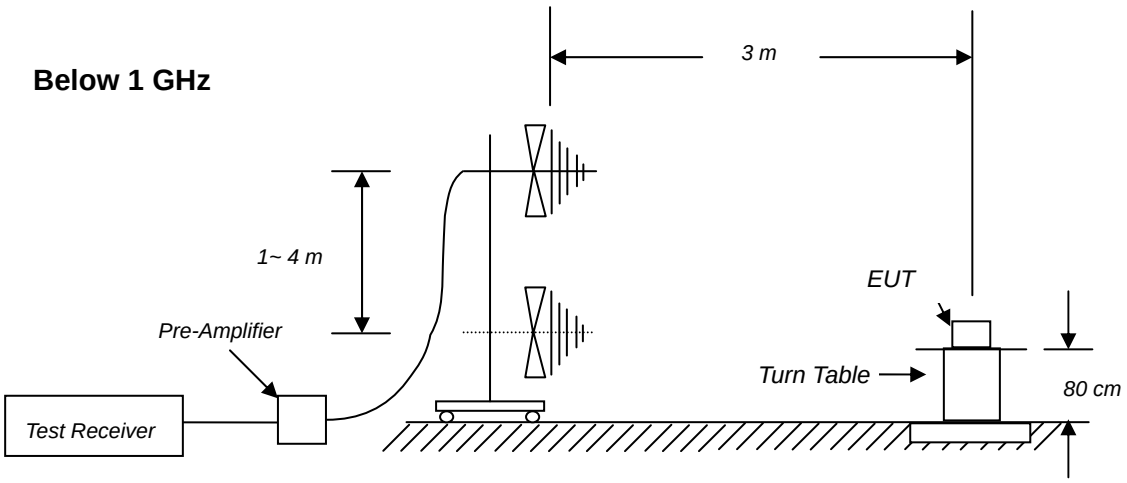
3 Radiated Emission Test

3.1 Test Instruments

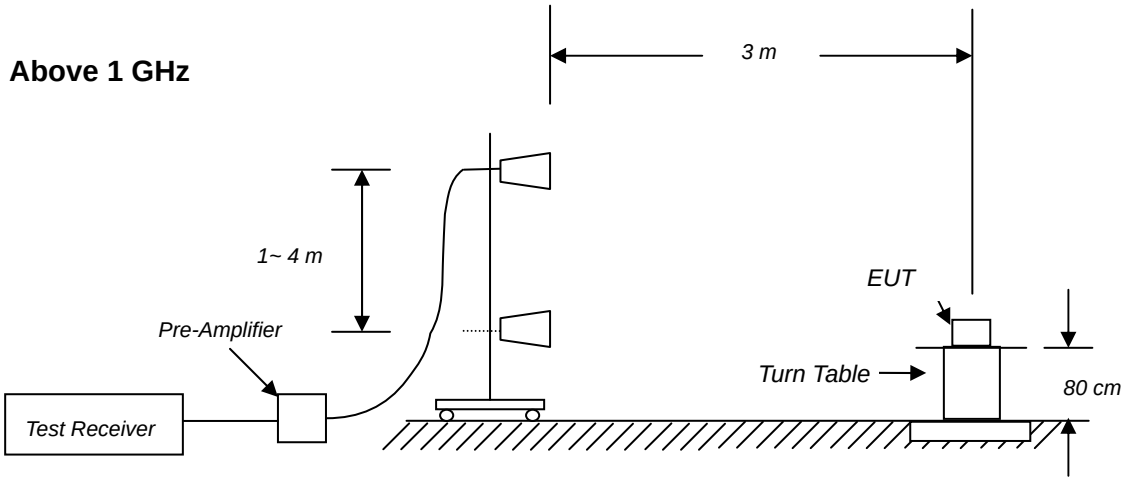
Refer to Sec. 1.2 Test Instruments.

3.2 Test Arrangement and Procedure

Below 1 GHz



Above 1 GHz



1. *The EUT is placed on a turntable, which is 0.8 m above ground plane.*
2. *The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.*
3. *EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.*
4. *Maxium procedure was performed on the six highest emissions to ensure EUT compliance.*
5. *And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.*
6. *Set the spectrum analyzer in the following setting as:*
   (a) *Below 1 GHz: RBW =100 kHz/ VBW = 1 MHz/ Sweep = AUTO.*
   (b) *Above 1 GHz: Peak: RBW = VBW = 1MHz/ Sweep = AUTO; Average: RBW = 1MHz/ VBW =*

10Hz/ Sweep = AUTO.

7. *Repeat above procedures until the meausreemnts for all frequencies are complete.*

3.3 Limit (§ 15.205 & § 15.209)

1.2.1. Limit of Restricted Band of Operation (§ 15.205)

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

Frequency Band			
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1] 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	
13.36-13.41			

1.2.2. Limit of Spurious Emission (§ 15.209)

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is lesser attenuation.

Frequency (MHz)	*Field strength (microvolts/ meter)*	*Measurement distance (meters)*
0.009-0.490	*2400/F(kHz)*	*300*
0.490-1.705	*24000/F(kHz)*	*30*
1.705-30.0	*30*	*30*
30-88	*100***	*3*
88-216	*150***	*3*
216-960	*200***	*3*
Above 960	*500*	*3*

*** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g.§§ 15.231 and 15.241.*

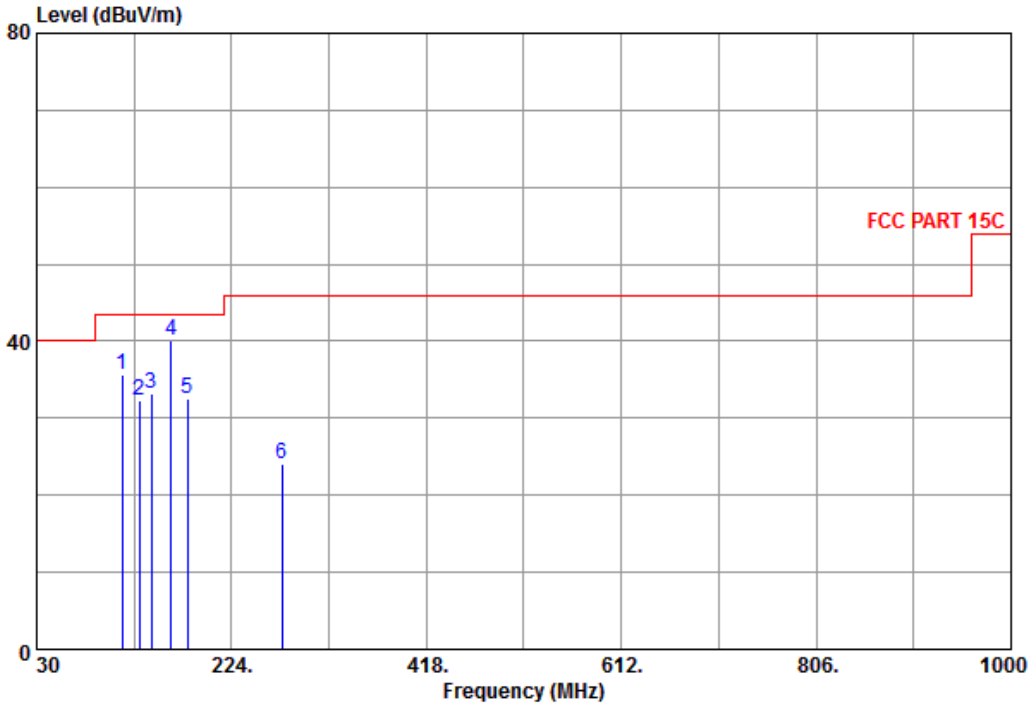
3.4 Test Result

Compliance

The final test data are shown on the following page(s).

Radiated Emission Test Data (Below 1 GHz)

Temperature	:	24.9℃	Humidity	:	51%
Test Date	:	05-Jan-2015	Tested by	:	Eason Hsieh
Polarization	:	Vertical	Channel	:	CH78 (2480MHz)
EUT Position	:	Vertical			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	115.360	58.97	-23.24	35.73	43.50	-7.77	---	---	
2	131.850	54.37	-22.04	32.33	43.50	-11.17	---	---	
3	144.460	55.04	-21.76	33.28	43.50	-10.22	---	---	
4 @	163.860	62.64	-22.44	40.20	43.50	-3.30	---	---	
5	180.350	49.91	-17.39	32.52	43.50	-10.98	---	---	
6	274.440	42.64	-18.60	24.04	46.00	-21.96	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

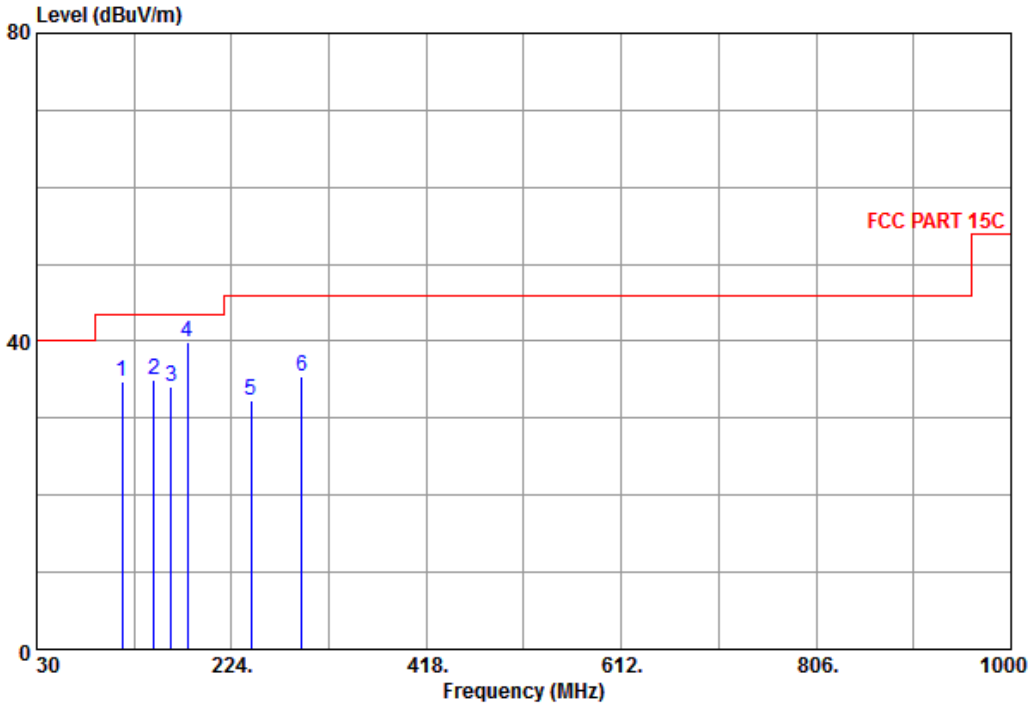
@ :Maximum Data x :Over Limit

Remark：

1. *Measuring frequencies from 30 MHz to 1 GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.*
4. *All readings are Peak values. None of the peak value reading exceeds the Q.P. limit. Hence, Q.P. reading was not measured.*
5. *The IF bandwidth of SPA between 30 MHz to 1 GHz was 100 kHz.*

Radiated Emission Test Data (Below 1 GHz)

Temperature	:	24.9℃	Humidity	:	51%
Test Date	:	05-Jan-2015	Tested by	:	Eason Hsieh
Polarization	:	Horizontal	Channel	:	CH78 (2480MHz)
EUT Position	:	Vertical			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	115.360	58.10	-23.24	34.86	43.50	-8.64	---	---	
2	146.400	56.84	-21.78	35.06	43.50	-8.44	---	---	
3	163.860	56.52	-22.44	34.08	43.50	-9.42	---	---	
4 @	180.350	57.37	-17.39	39.98	43.50	-3.52	---	---	
5	243.400	51.31	-19.02	32.29	46.00	-13.71	---	---	
6	293.840	53.03	-17.64	35.39	46.00	-10.61	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

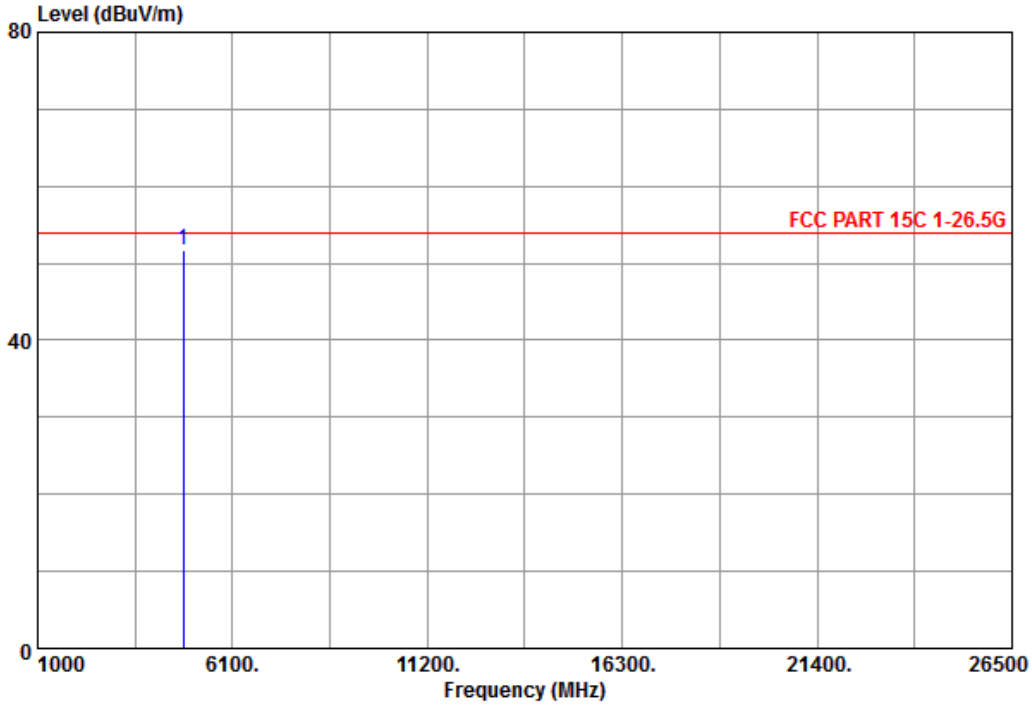
@ :Maximum Data x :Over Limit

Remark：

1. *Measuring frequencies from 30 MHz to 1 GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.*
4. *All readings are Peak values. None of the peak value reading exceeds the Q.P. limit. Hence, Q.P. reading was not measured.*
5. *The IF bandwidth of SPA between 30 MHz to 1 GHz was 100 kHz.*

Radiated Emission Test Data (Above 1G and Field Strength to 10th Harmonic)

Temperature	:	*24.9℃*	*Humidity*	:	*51%*
Test Date	:	*05-Jan-2015*	*Tested by*	:	*Eason Hsieh*
Polarization	:	*Vertical*	*Channel*	:	*CH00 (2402MHz)*
EUT Position	:	*Vertical*			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4804.000	51.12	0.49	51.61	54.00	-2.39	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

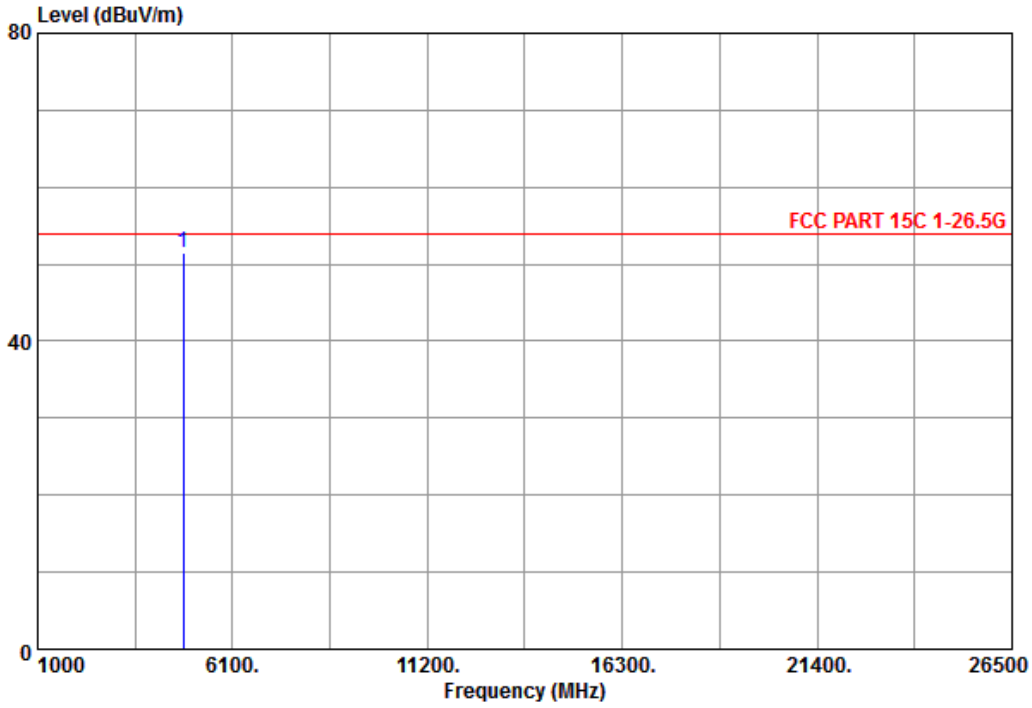
Remark：

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode.*
4. *All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.*
5. *Spectrum setting:*

   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above 1G and Field Strength to 10th Harmonic)

Temperature	:	*24.9℃*	*Humidity*	:	*51%*
Test Date	:	*05-Jan-2015*	*Tested by*	:	*Eason Hsieh*
Polarization	:	*Horizontal*	*Channel*	:	*CH00 (2402MHz)*
EUT Position	:	*Vertical*			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4804.000	50.96	0.49	51.45	54.00	-2.55	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

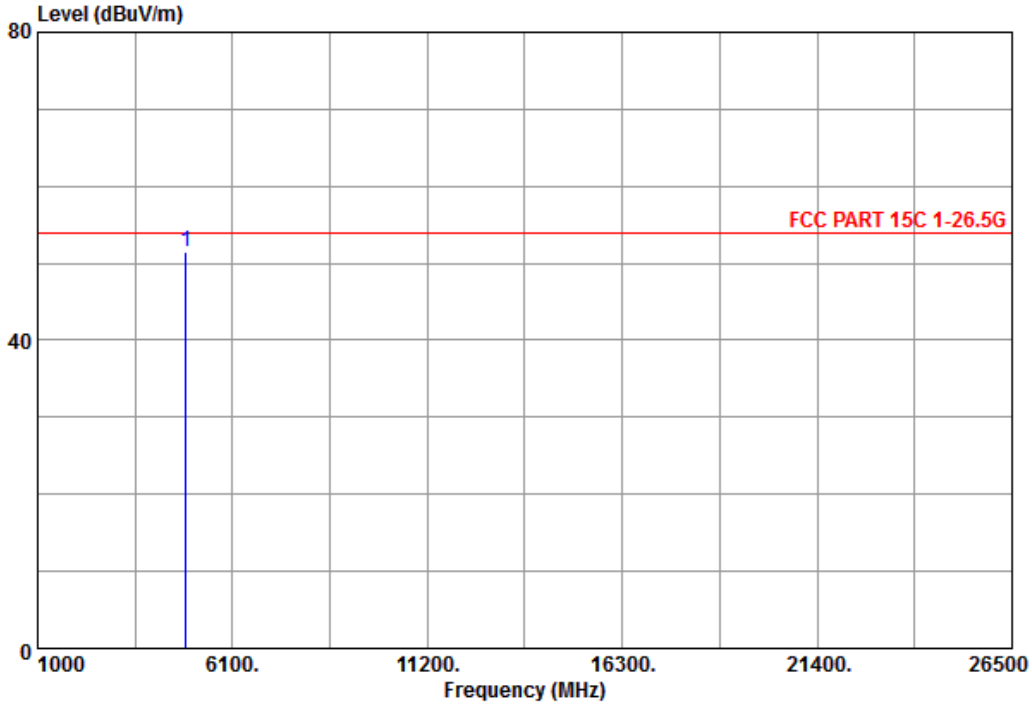
Remark：

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode.*
4. *All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.*
5. *Spectrum setting:*

   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above 1G and Field Strength to 10th Harmonic)

Temperature	:	*24.9℃*	*Humidity*	:	*51%*
Test Date	:	*05-Jan-2015*	*Tested by*	:	*Eason Hsieh*
Polarization	:	*Vertical*	*Channel*	:	*CH39 (2441MHz)*
EUT Position	:	*Vertical*			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4882.000	50.59	0.80	51.39	54.00	-2.61	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

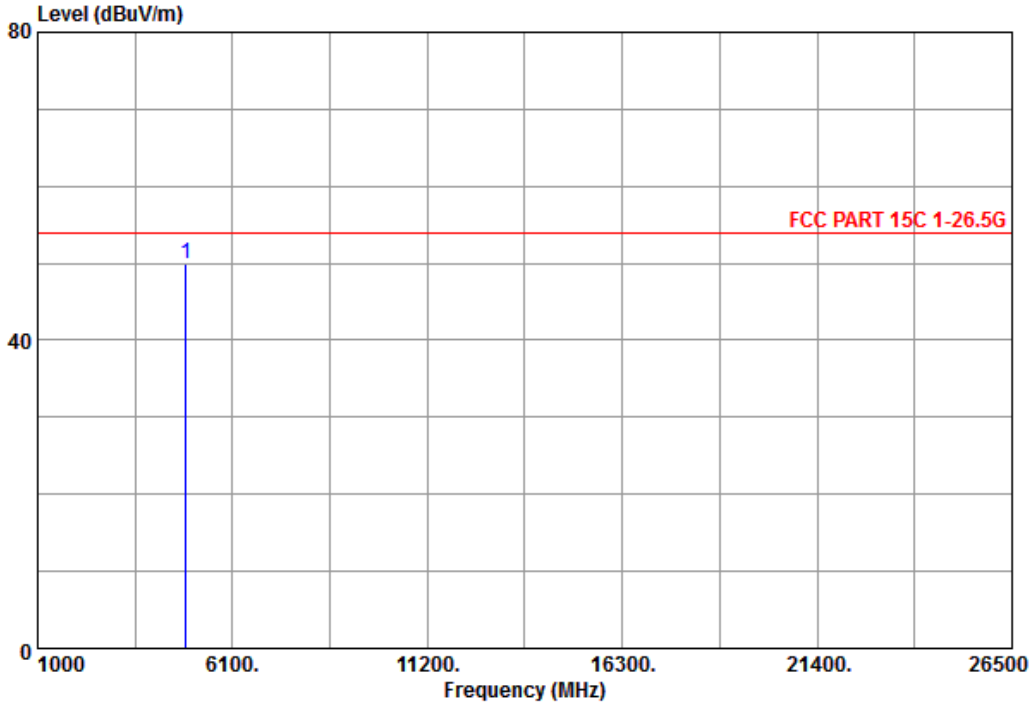
Remark：

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode.*
4. *All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.*
5. *Spectrum setting:*

   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above 1G and Field Strength to 10th Harmonic)

Temperature	:	*24.9℃*	*Humidity*	:	*51%*
Test Date	:	*05-Jan-2015*	*Tested by*	:	*Eason Hsieh*
Polarization	:	*Horizontal*	*Channel*	:	*CH39 (2441MHz)*
EUT Position	:	*Vertical*			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4882.000	49.09	0.80	49.89	54.00	-4.11	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

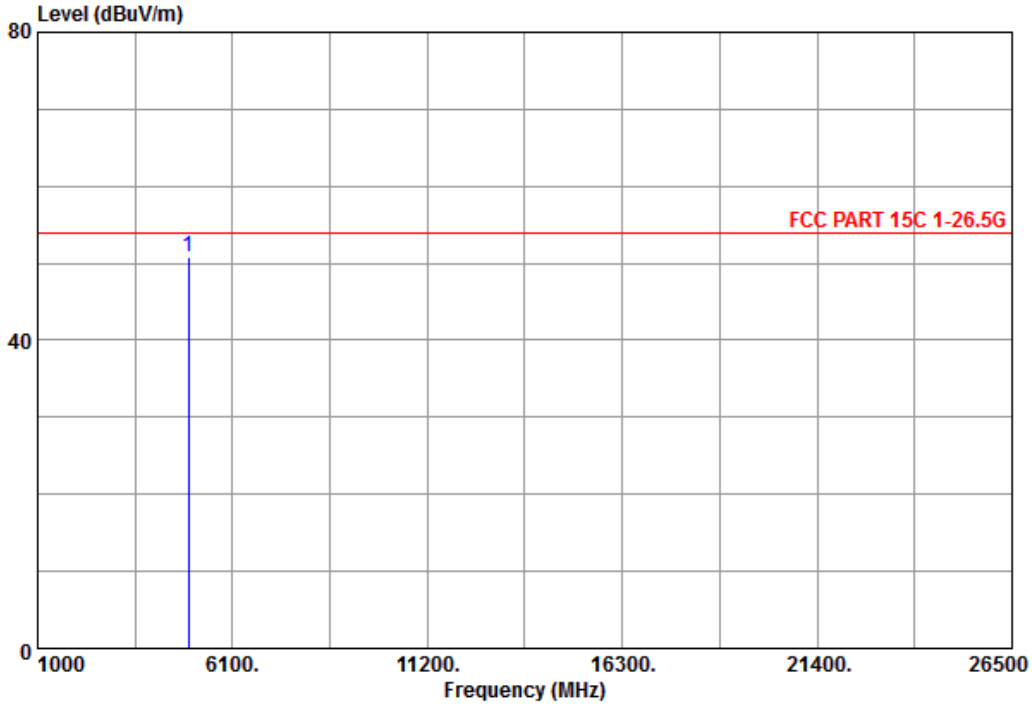
Remark：

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode.*
4. *All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.*
5. *Spectrum setting:*

   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above 1G and Field Strength to 10th Harmonic)

Temperature	:	*24.9℃*	*Humidity*	:	*51%*
Test Date	:	*05-Jan-2015*	*Tested by*	:	*Eason Hsieh*
Polarization	:	*Vertical*	*Channel*	:	*CH78 (2480MHz)*
EUT Position	:	*Vertical*			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4952.500	49.70	1.08	50.78	54.00	-3.22	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

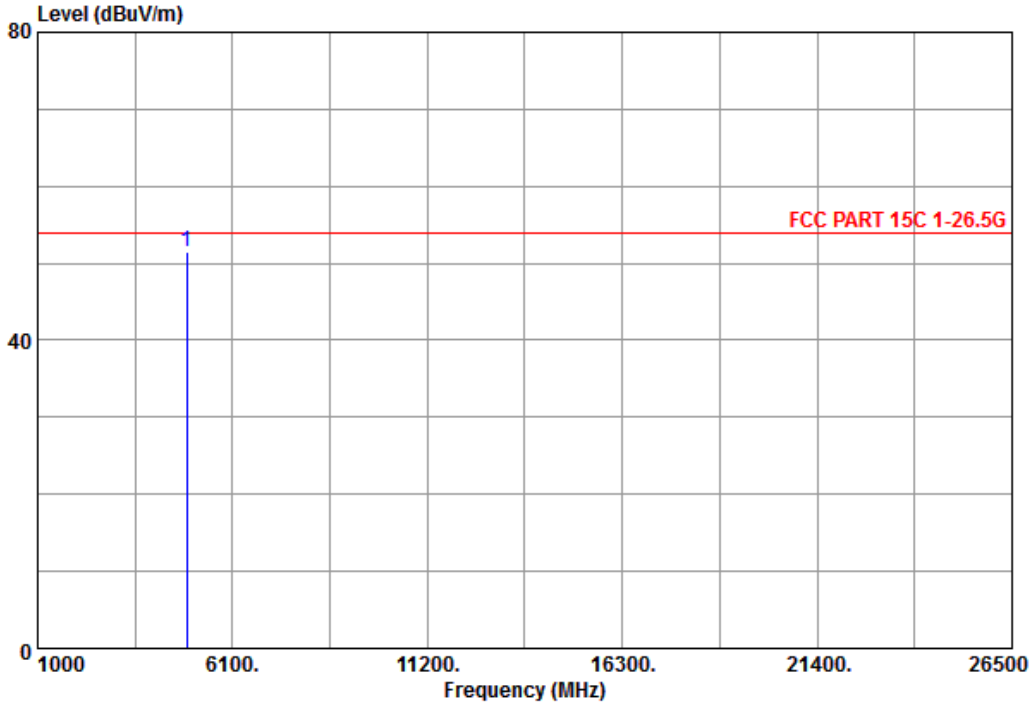
Remark：

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode.*
4. *All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.*
5. *Spectrum setting:*

   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above 1G and Field Strength to 10th Harmonic)

Temperature	:	*24.9℃*	*Humidity*	:	*51%*
Test Date	:	*05-Jan-2015*	*Tested by*	:	*Eason Hsieh*
Polarization	:	*Horizontal*	*Channel*	:	*CH78 (2480MHz)*
EUT Position	:	*Vertical*			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4901.500	50.62	0.94	51.56	54.00	-2.44	---	---	

C.F = Antenna Factor + Cable Loss - Preamp gain
Result = Reading + C.F ; Margin = Result - Limit

@ :Maximum Data x :Over Limit

Remark：

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.*
3. *Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode.*
4. *All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.*
5. *Spectrum setting:*

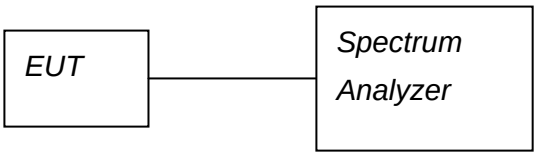
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

4 20 dB Bandwidth

4.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

4.2 Test Arrangement and Procedure



1. *The transmitter output was connected to a spectrum analyzer (through an attenuator, if it's necessary).*
2. *The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 300kHz VBW. Measured the -20 dB bandwidth and plotted the graph.*

4.3 Limit

None; For report purpose only.

4.4 Test Result

No non-compliance noted.

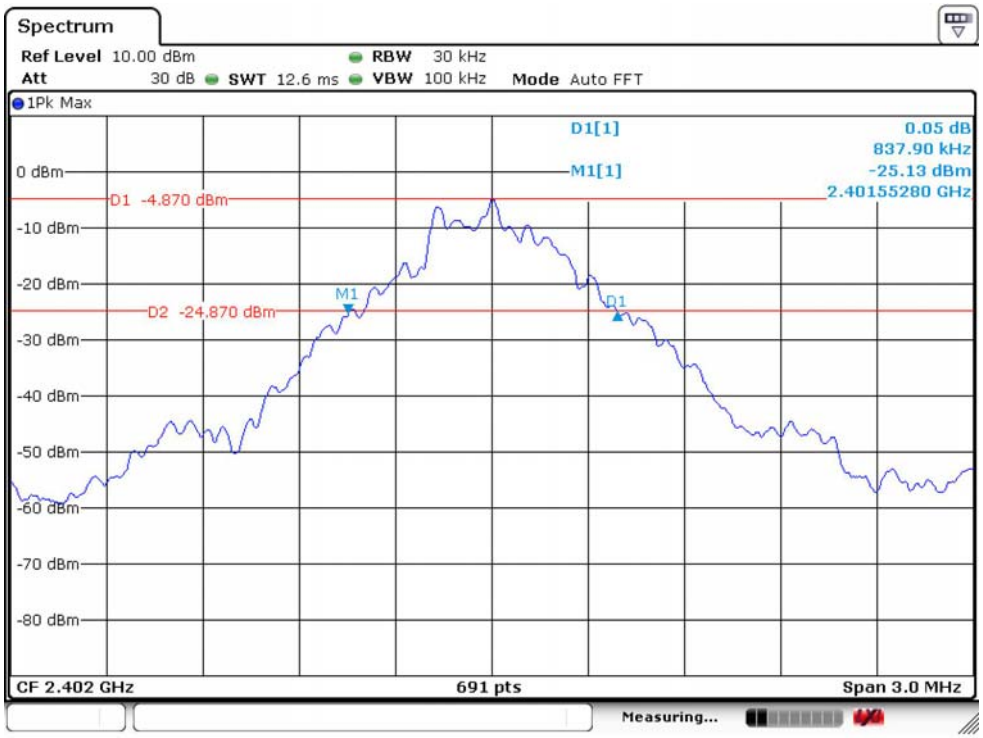
The final test data are shown on the following page(s).

Bluetooth 1 Mbps (DH1)		
Channel	**Frequency (MHz)**	**20dB Bandwidth (MHz)**
Low	*2402*	*0.8379*
Middle	*2441*	*0.8379*
High	*2480*	*0.8423*

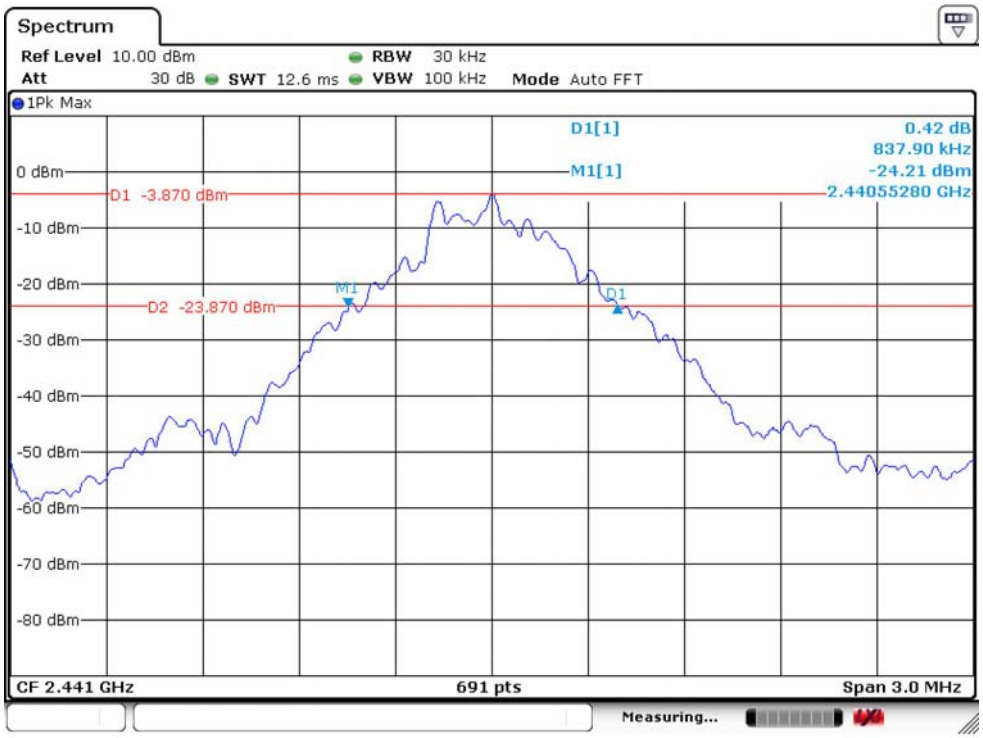
Bluetooth 1 Mbps (DH3)		
Channel	**Frequency (MHz)**	**20dB Bandwidth (MHz)**
Low	*2402*	*0.8379*
Middle	*2441*	*0.8434*
High	*2480*	*0.8478*

Bluetooth 1 Mbps (DH5)		
Channel	**Frequency (MHz)**	**20dB Bandwidth (MHz)**
Low	*2402*	*0.9436*
Middle	*2441*	*0.9421*
High	*2480*	*0.9421*

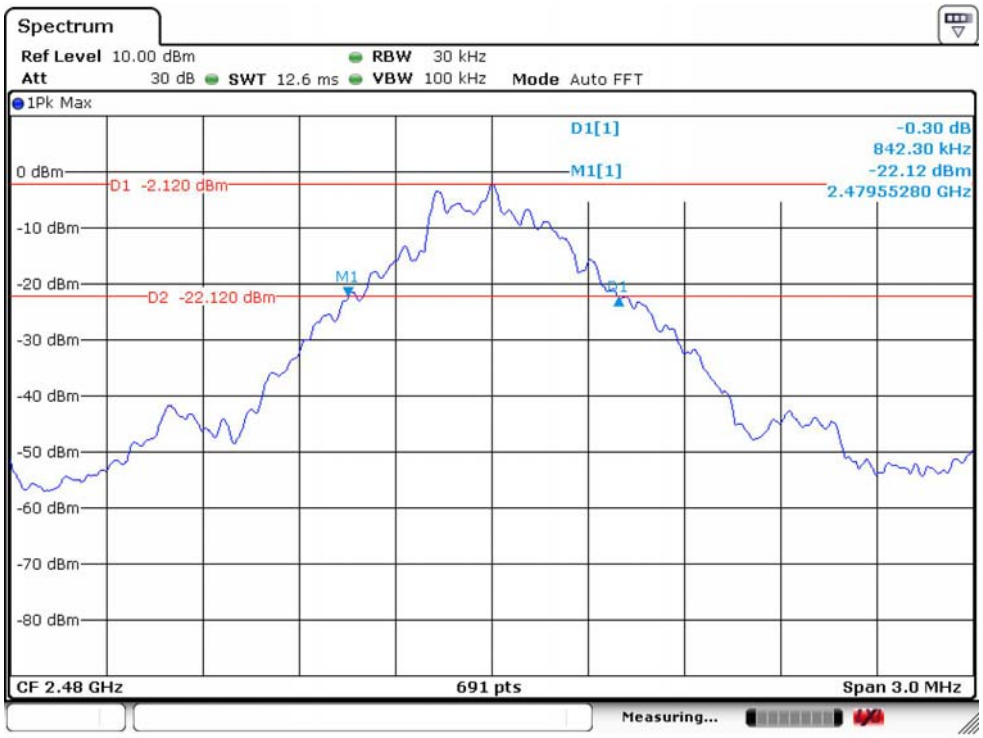
Temperature	:	24.9℃	Humidity	:	51%
Test Date	:	05-Jan-2015	Tested by	:	Eason Hsieh
Test Mode	:	BT (1 Mbps) DH1	Channel	:	00



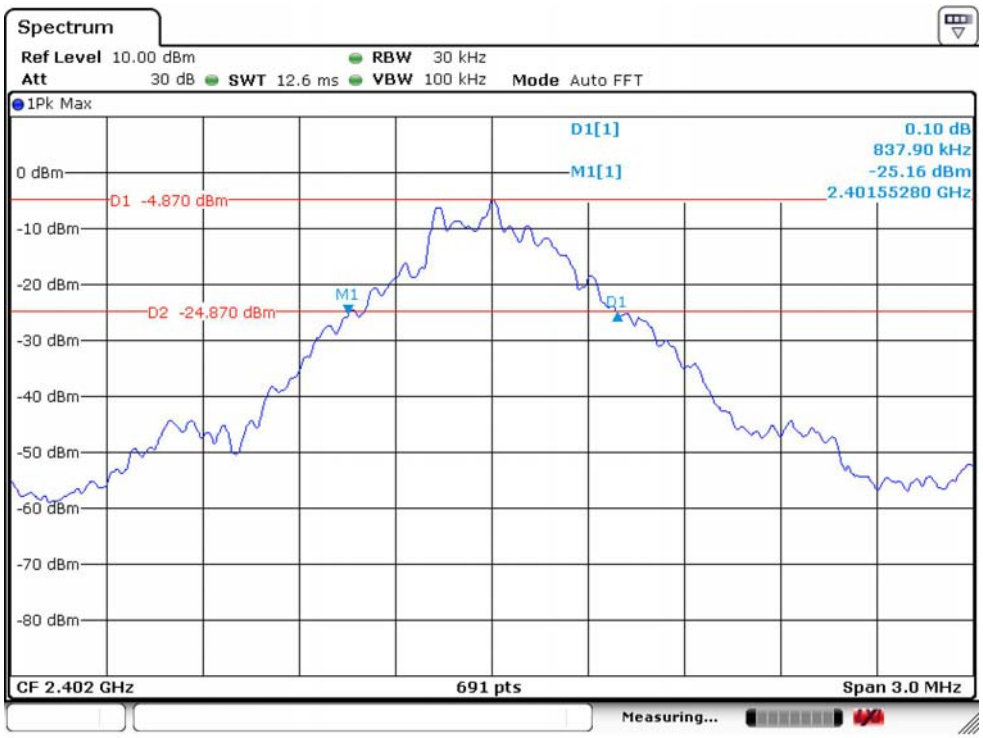
Test Mode	:	BT (1 Mbps) DH1	Channel	:	39



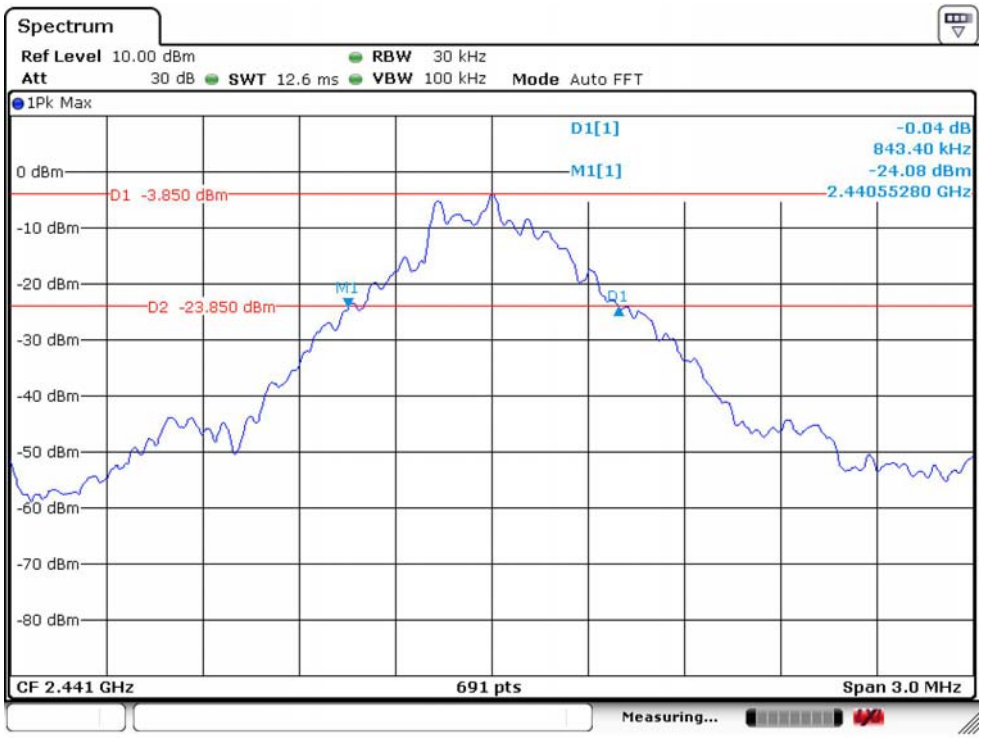
Test Mode : BT (1 Mbps) DH1 Channel : 78



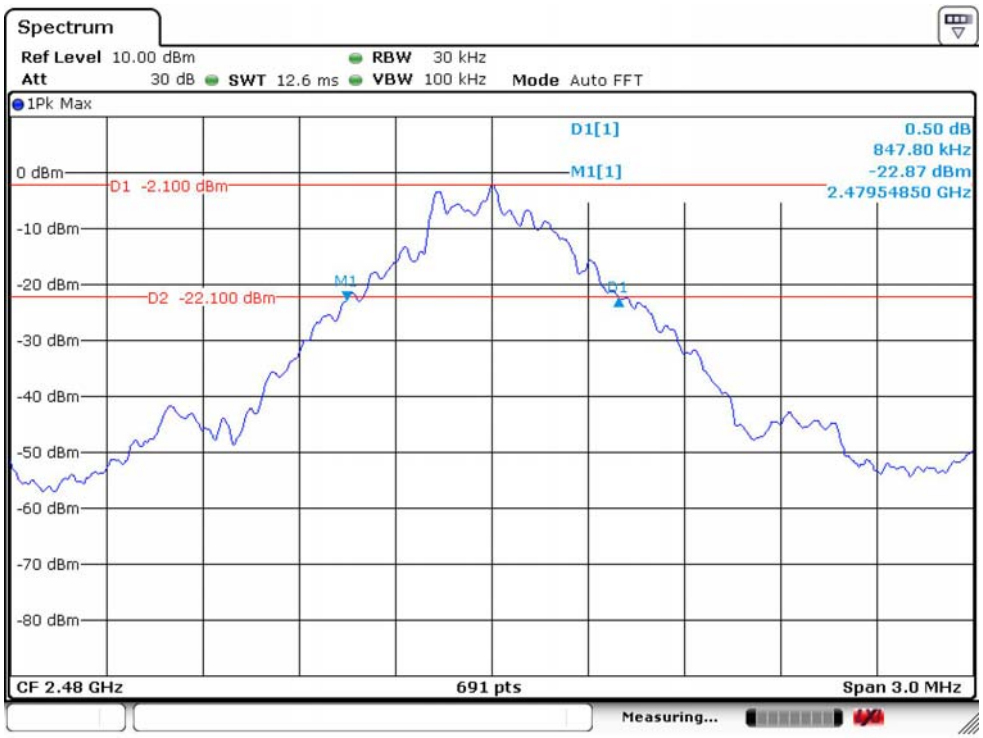
Test Mode : BT (1 Mbps) DH3 Channel : 00



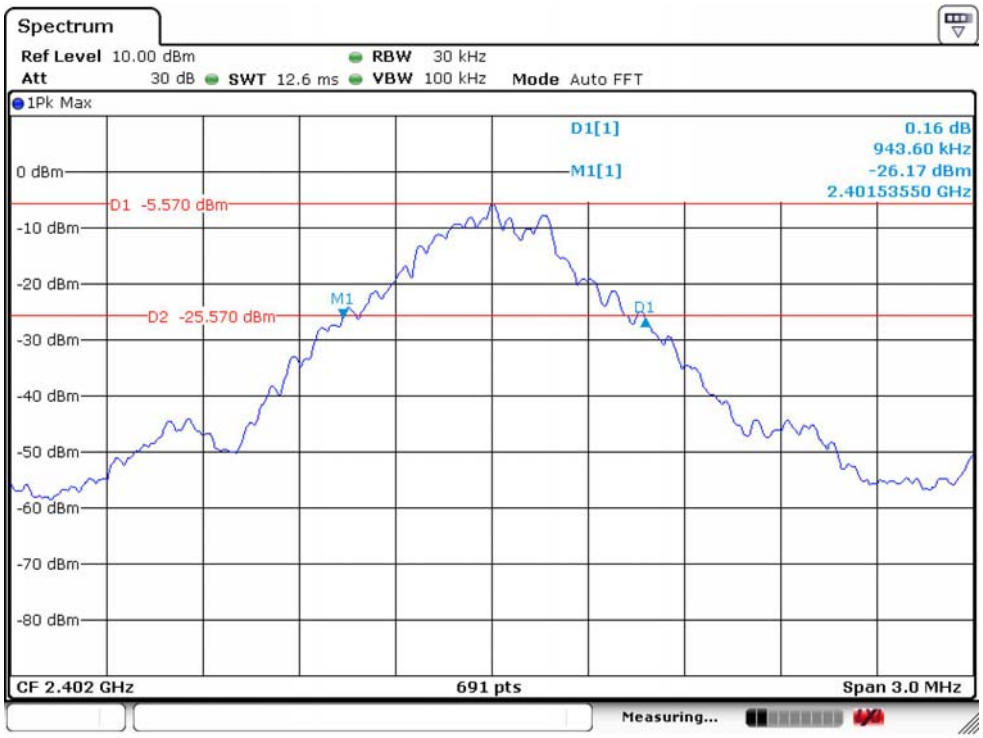
Test Mode : BT (1 Mbps) DH3 Channel : 39



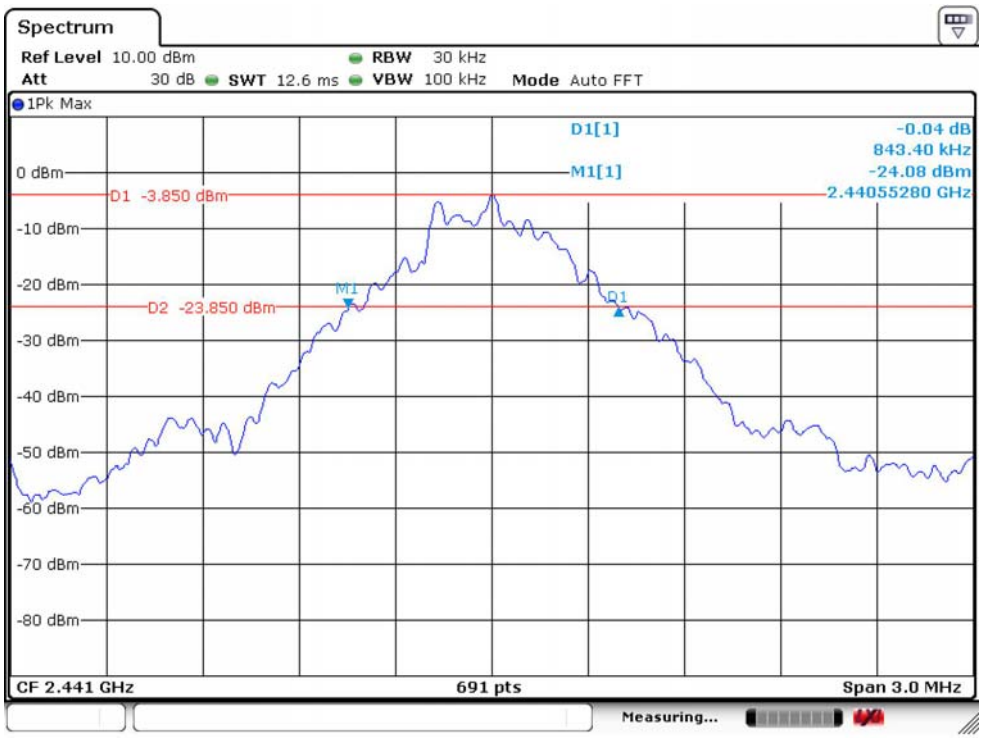
Test Mode : BT (1 Mbps) DH3 Channel : 78



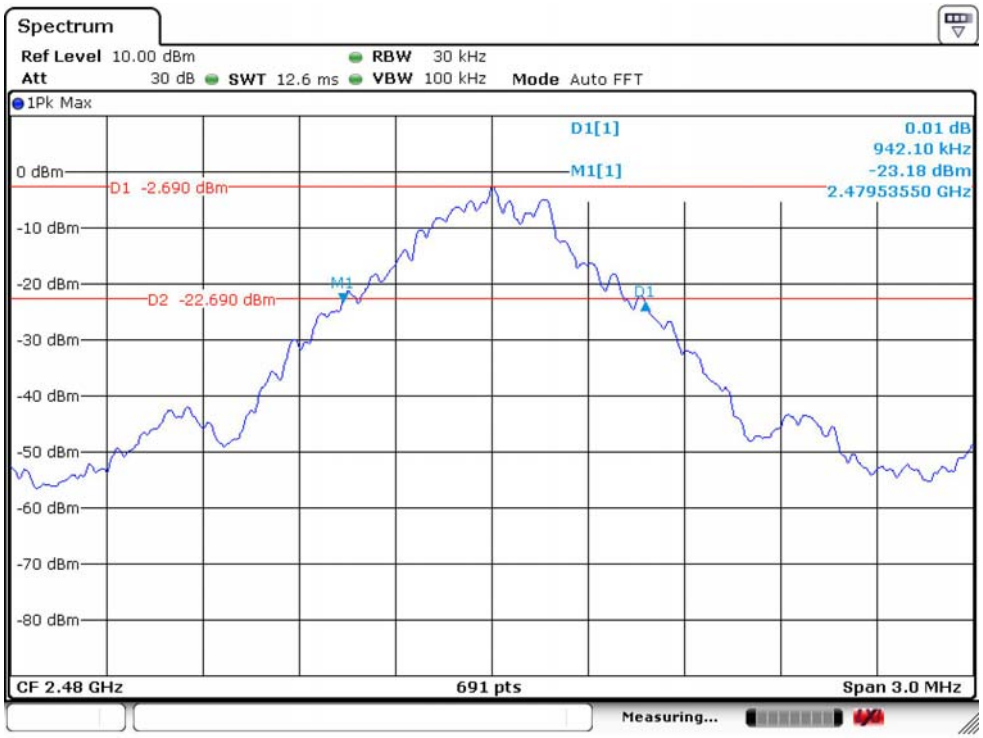
Test Mode : BT (1 Mbps) DH5 Channel : 00



Test Mode : BT (1 Mbps) DH5 Channel : 39



Test Mode : BT (1 Mbps) DH5 Channel : 78

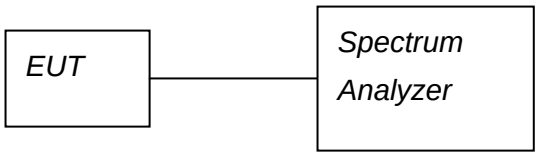


5 Hopping Frequency Separation

5.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

5.2 Test Arrangement and Procedure



1. *The transmitter output was connected to a spectrum analyzer (through an attenuator, if it's necessary).*
2. *The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 300kHz VBW.*
3. *Mark the peak outputs of two adjacent channels. And, measured the separation between the marked peak outputs of two adjacent channels.*

5.3 Limit (§ 15.247(a)(1))

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

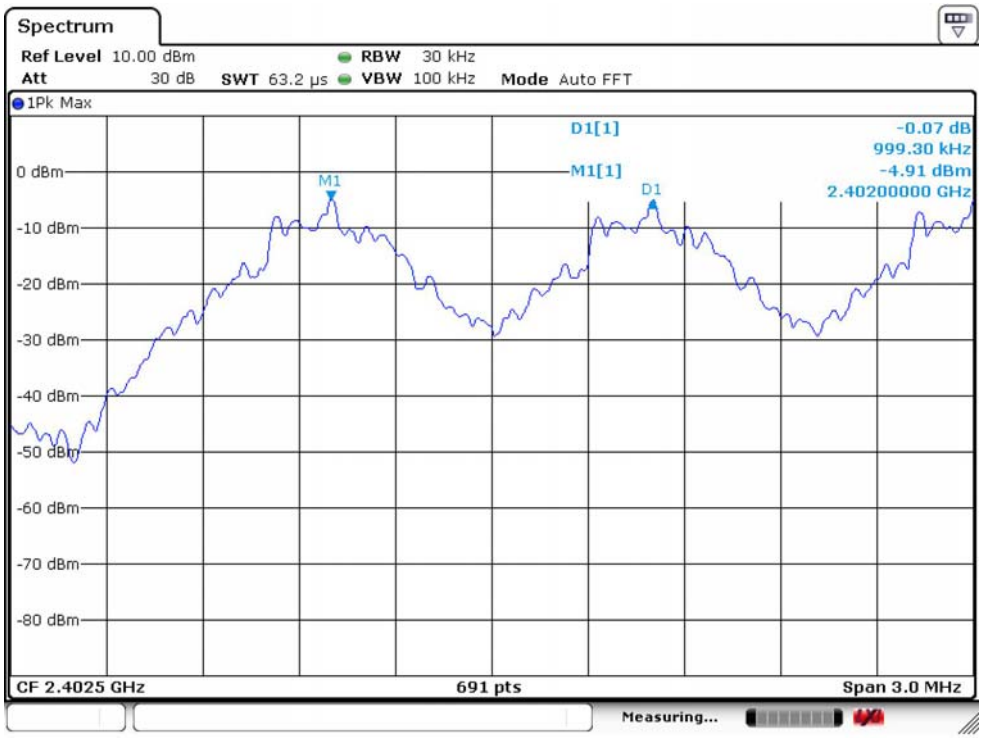
5.4 Test Result

Compliance.

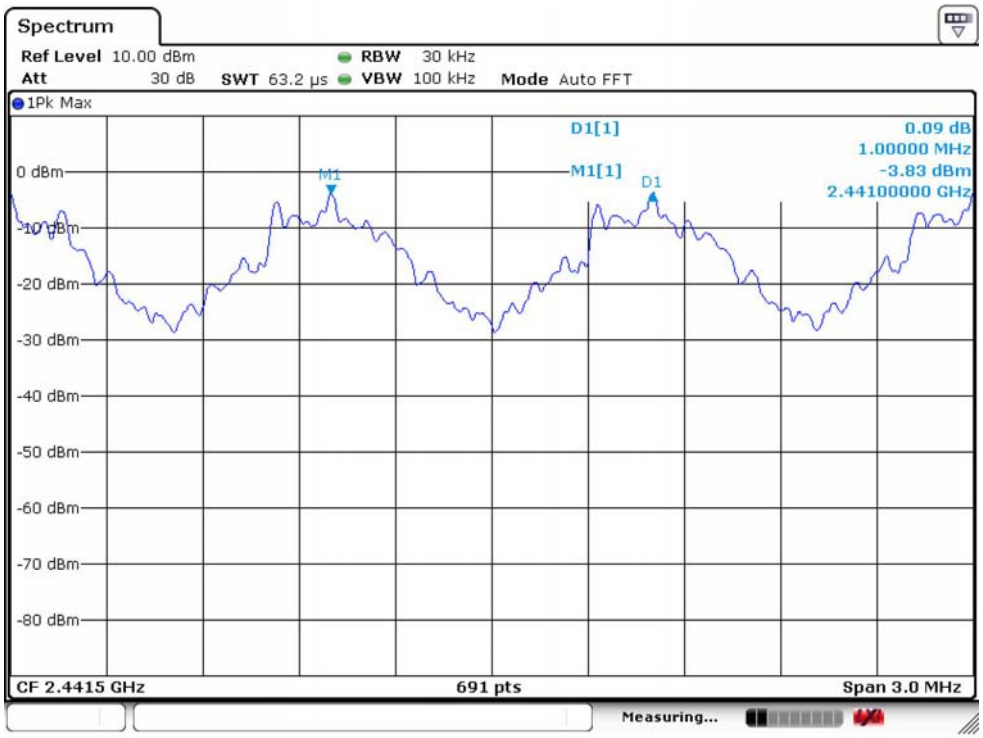
The final test data are shown on the following page(s).

Bluetooth 1 Mbps DH5					
Channel	**Frequency (MHz)**	**20 dB bandwidth (MHz)**	**Limit (2/3 of 20dB bandwidth) (MHz)**	**Result**	**Verdict**
Low	*2402*	*0.9436*	*0.6291*	*0.9993*	*Pass*
Middle	*2441*	*0.9421*	*0.6281*	*1.0000*	*Pass*
High	*2480*	*0.9421*	*0.6281*	*1.0000*	*Pass*

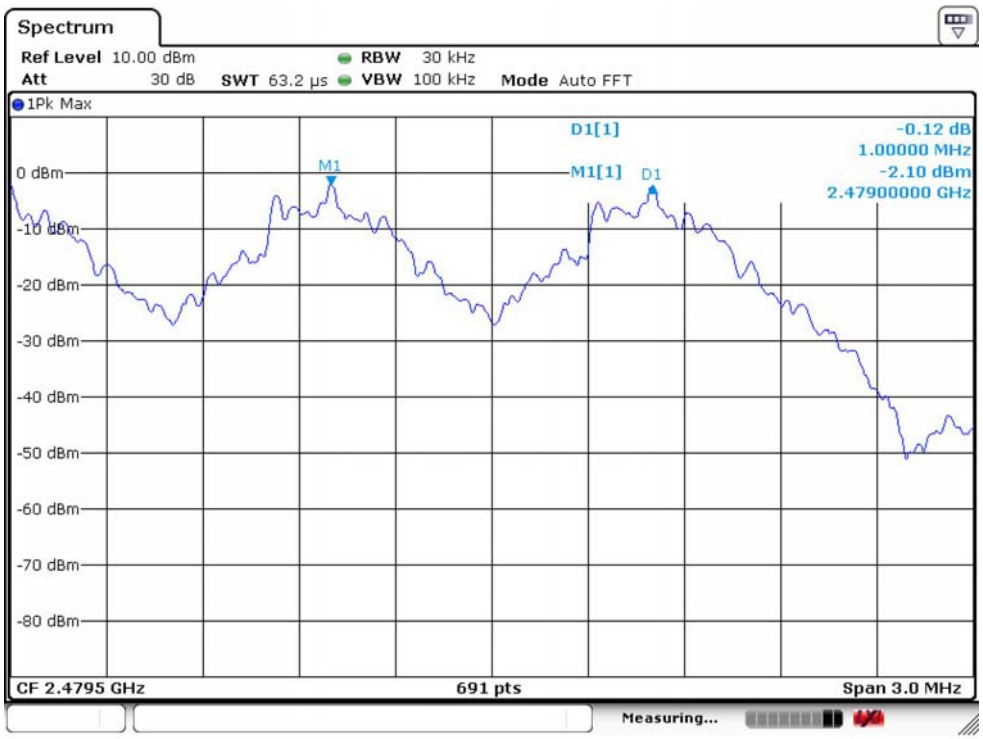
Temperature	:	24.9℃	Humidity	:	51%
Test Date	:	05-Jan-2015	Tested by	:	Eason Hsieh
Test Mode	:	BT (1 Mbps) DH5	Channel	:	Low



Test Mode	:	BT (1 Mbps) DH5	Channel	:	Middle



Test Mode : BT (1 Mbps) DH5 Channel : High

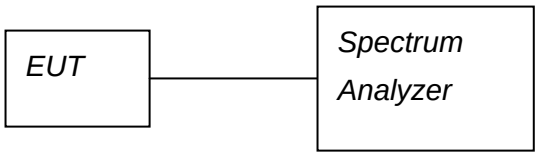


6 Number of Hopping Channels

6.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

6.2 Test Arrangement and Procedure



1. *The transmitter output was connected to a spectrum analyzer (through an attenuator, if it's necessary).*
2. *The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps.*
3. *The RBW is set to 100 kHz and VBW is set to 100 kHz .*
4. *Max Hold.*

6.3 Limit (§ 15.247(a)(1)(iii))

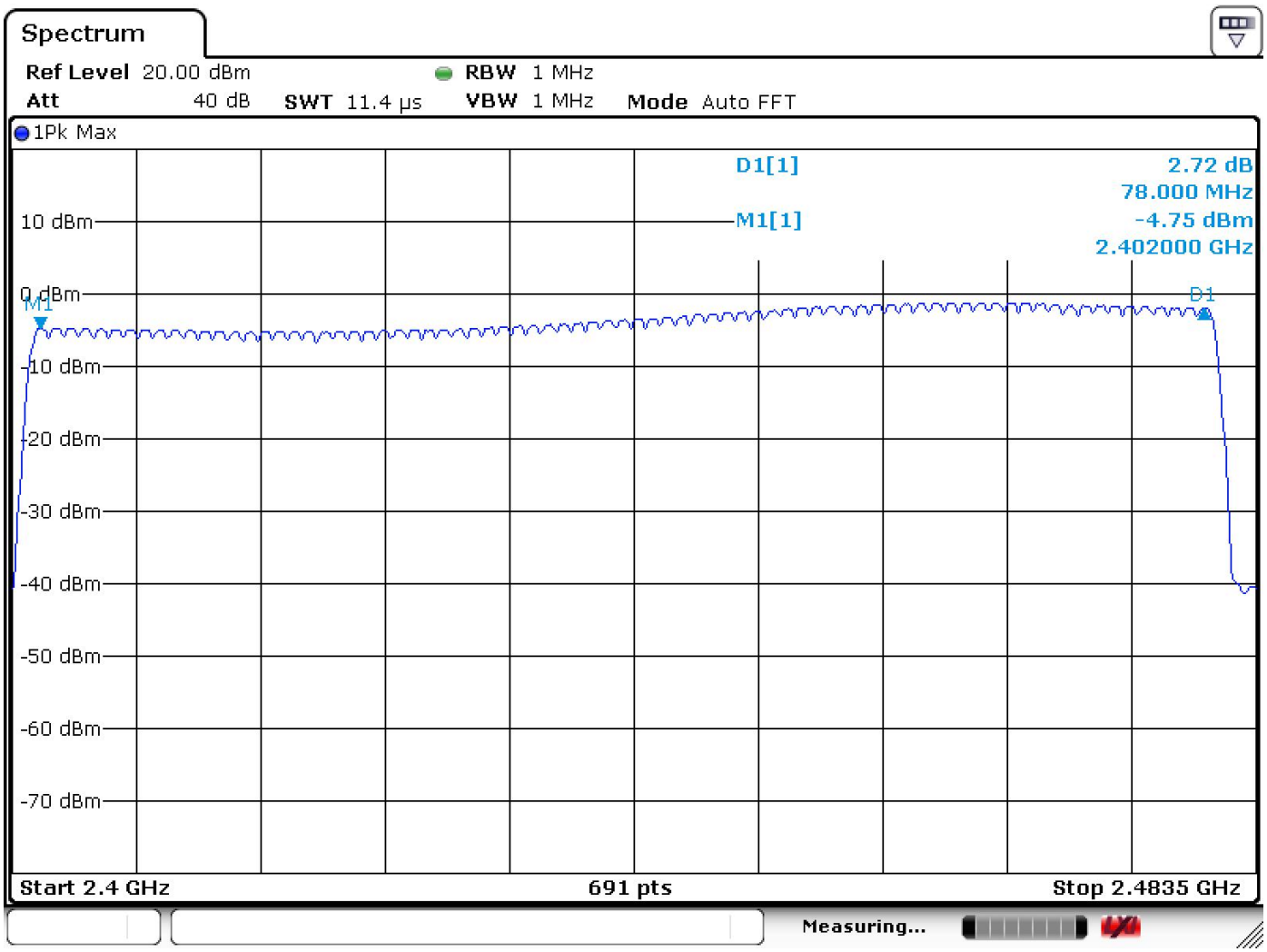
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

6.4 Test Result

79 Channels have been used.

Compliance.

The final test data are shown on the following page(s).

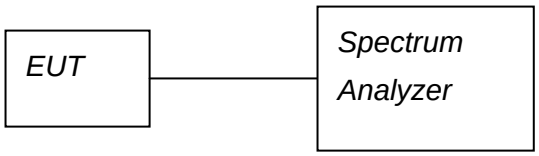

Spectrum
Ref Level 20.00 dBm
RBW 1 MHz
Att 40 dB
SWT 11.4 µs
VBW 1 MHz
Mode Auto FFT
1Pk Max
D1[1]
2.72 dB
78.000 MHz
M1[1]
-4.75 dBm
2.402000 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
Start 2.4 GHz
691 pts
Stop 2.4835 GHz
Measuring...

7 Average Time of Occupancy

7.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

7.2 Test Arrangement and Procedure



1. *The transmitter output was connected to a spectrum analyzer (through an attenuator, if it's necessary).*
2. *First, measure the number of pulses per 5 second, the RBW is set to 100 kHz and VBW is set to 100 kHz. Sweep is set to 5 sec. Span 0 Hz.*
3. *Second, measure the Pulse width, the RBW is set to 1MHz and VBW is set to 1MHz. Sweep is adjusted to appropriate time to show a complete pulse. Span 0 Hz.*

7.3 Limit (§ 15.247(a)(1)(iii))

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

7.4 Test Result

Compliance.

The final test data are shown on the following page(s).

Bluetooth (1 Mbps) Channel 00				
DH Packet	**Number of Pulses per 5 sec**	**Pulse Width (sec)**	**AV time of Occupancy (sec)**	**Limit (sec)**
DH1	*50*	*0.00043188*	*0.128286*	*0.4*
DH3	*26*	*0.00170000*	*0.225624*	*0.4*
DH5	*17*	*0.00294638*	*0.335180*	*0.4*

Bluetooth (1 Mbps) Channel 39				
DH Packet	**Number of Pulses per 5 sec**	**Pulse Width (sec)**	**AV time of Occupancy (sec)**	**Limit (sec)**
DH1	*50*	*0.00043478*	*0.129147*	*0.4*
DH3	*26*	*0.00170000*	*0.225624*	*0.4*
DH5	*17*	*0.00294348*	*0.335180*	*0.4*

Bluetooth (1 Mbps) Channel 78				
DH Packet	**Number of Pulses per 5 sec**	**Pulse Width (sec)**	**AV time of Occupancy (sec)**	**Limit (sec)**
DH1	*50*	*0.00043188*	*0.128286*	*0.4*
DH3	*26*	*0.00170725*	*0.226586*	*0.4*
DH5	*17*	*0.00294348*	*0.334850*	*0.4*

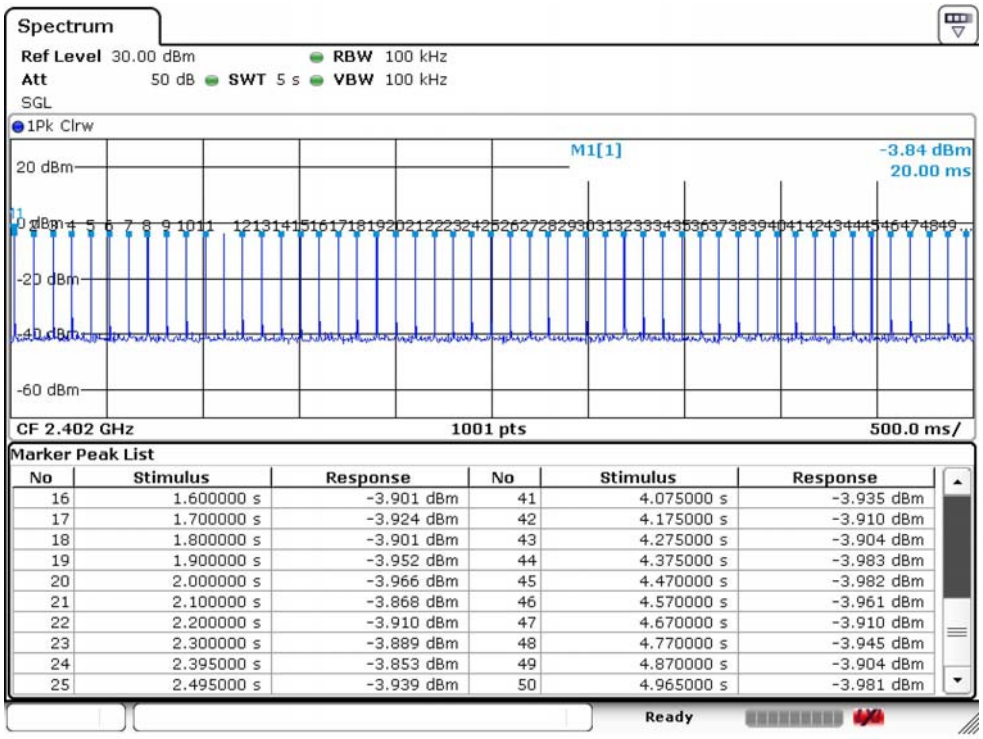
Remark:

*AV time of Occupancy (sec) = 79 (number of hopping channels) * 0.4 (sec) * Number of Pulses per 5 sec/ 5 * Pulse Width (sec)*

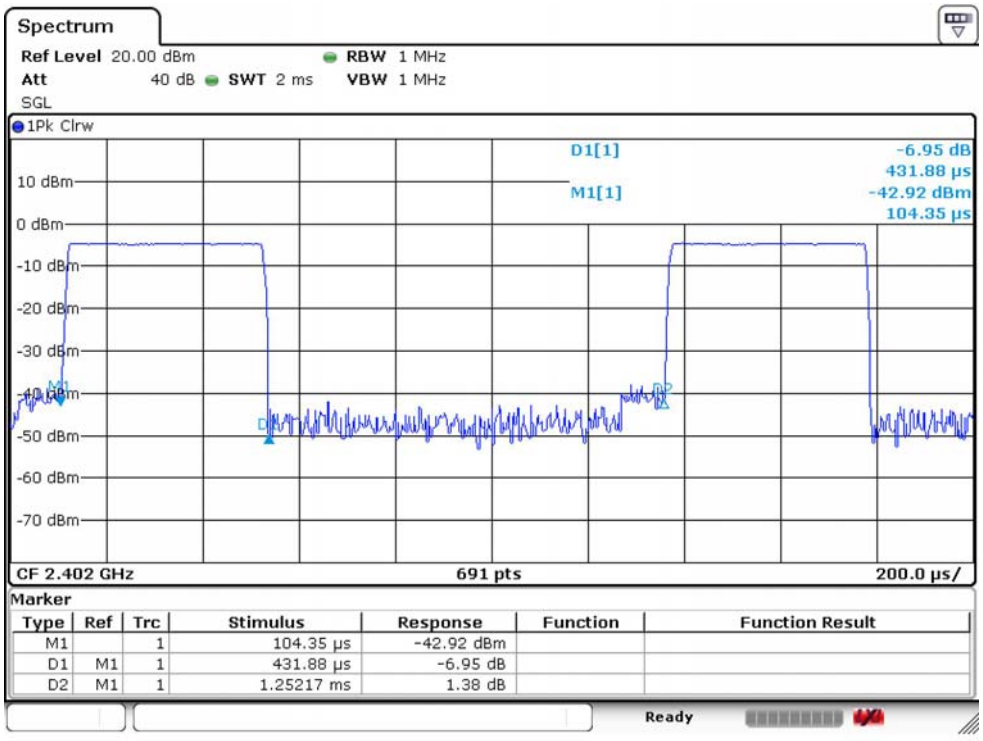
Note : 1. The EUT does not support AFH mode.

Temperature	:	24.9℃	Humidity	:	51%
Test Date	:	05-Jan-2015	Tested by	:	Eason Hsieh
Test Mode	:	BT (1 Mbps) DH1	Channel	:	00

Number of Pulses Per 5 sec

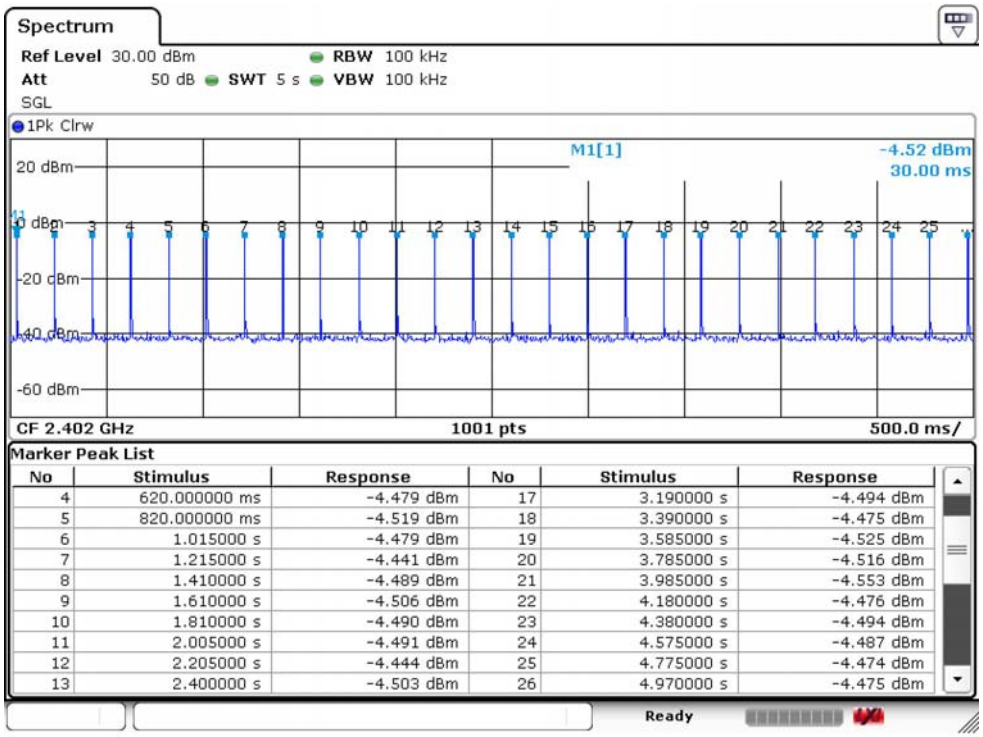


Pulse Width (sec)



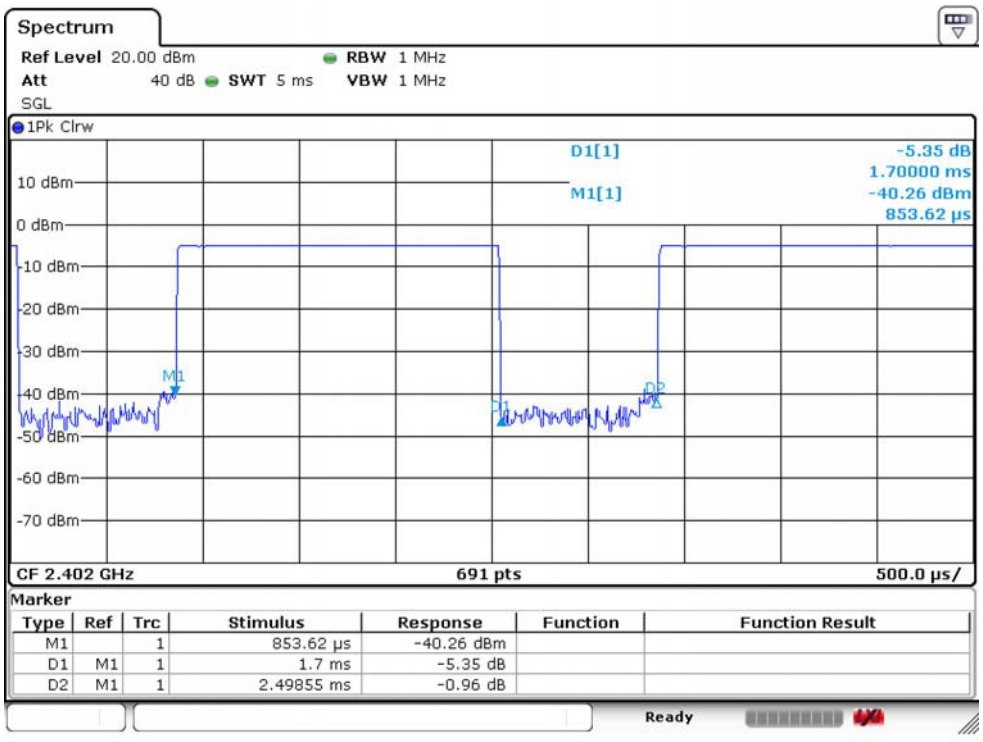
Test Mode : BT (1 Mbps) DH3 Channel : 00

Number of Pulses Per 5 sec



No	Stimulus	Response	No	Stimulus	Response
4	620.000000 ms	-4.479 dBm	17	3.190000 s	-4.494 dBm
5	820.000000 ms	-4.519 dBm	18	3.390000 s	-4.475 dBm
6	1.015000 s	-4.479 dBm	19	3.585000 s	-4.525 dBm
7	1.215000 s	-4.441 dBm	20	3.785000 s	-4.516 dBm
8	1.410000 s	-4.489 dBm	21	3.985000 s	-4.553 dBm
9	1.610000 s	-4.506 dBm	22	4.180000 s	-4.476 dBm
10	1.810000 s	-4.490 dBm	23	4.380000 s	-4.494 dBm
11	2.005000 s	-4.491 dBm	24	4.575000 s	-4.487 dBm
12	2.205000 s	-4.444 dBm	25	4.775000 s	-4.474 dBm
13	2.400000 s	-4.503 dBm	26	4.970000 s	-4.475 dBm

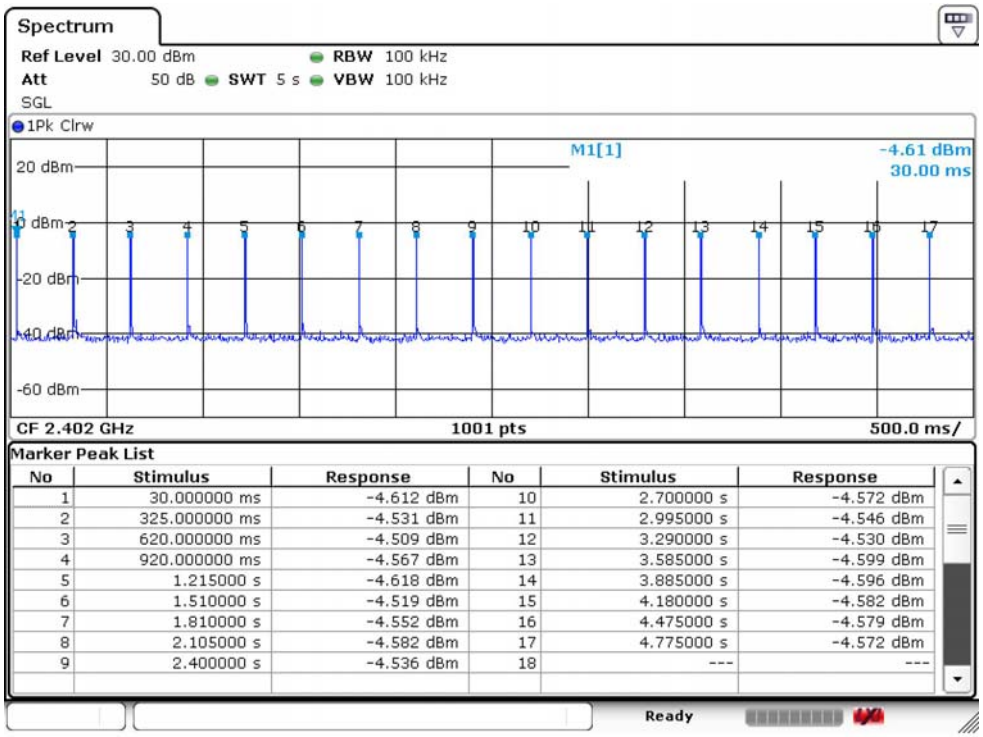
Pulse Width (sec)



Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	853.62 µs	-40.26 dBm		
D1	M1	1	1.7 ms	-5.35 dB		
D2	M1	1	2.49855 ms	-0.96 dB		

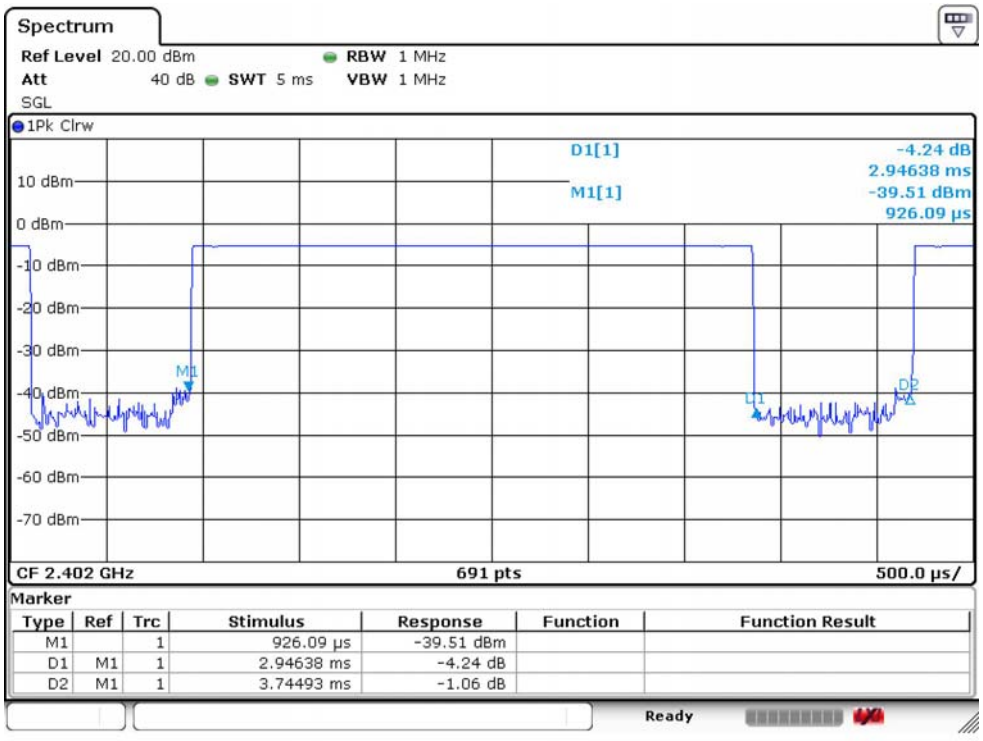
Test Mode : BT (1 Mbps) DH5 Channel : 00

Number of Pulses Per 5 sec



No	Stimulus	Response	No	Stimulus	Response
1	30.000000 ms	-4.612 dBm	10	2.700000 s	-4.572 dBm
2	325.000000 ms	-4.531 dBm	11	2.995000 s	-4.546 dBm
3	620.000000 ms	-4.509 dBm	12	3.290000 s	-4.530 dBm
4	920.000000 ms	-4.567 dBm	13	3.585000 s	-4.599 dBm
5	1.215000 s	-4.618 dBm	14	3.885000 s	-4.596 dBm
6	1.510000 s	-4.519 dBm	15	4.180000 s	-4.582 dBm
7	1.810000 s	-4.552 dBm	16	4.475000 s	-4.579 dBm
8	2.105000 s	-4.582 dBm	17	4.775000 s	-4.572 dBm
9	2.400000 s	-4.536 dBm	18	---	---

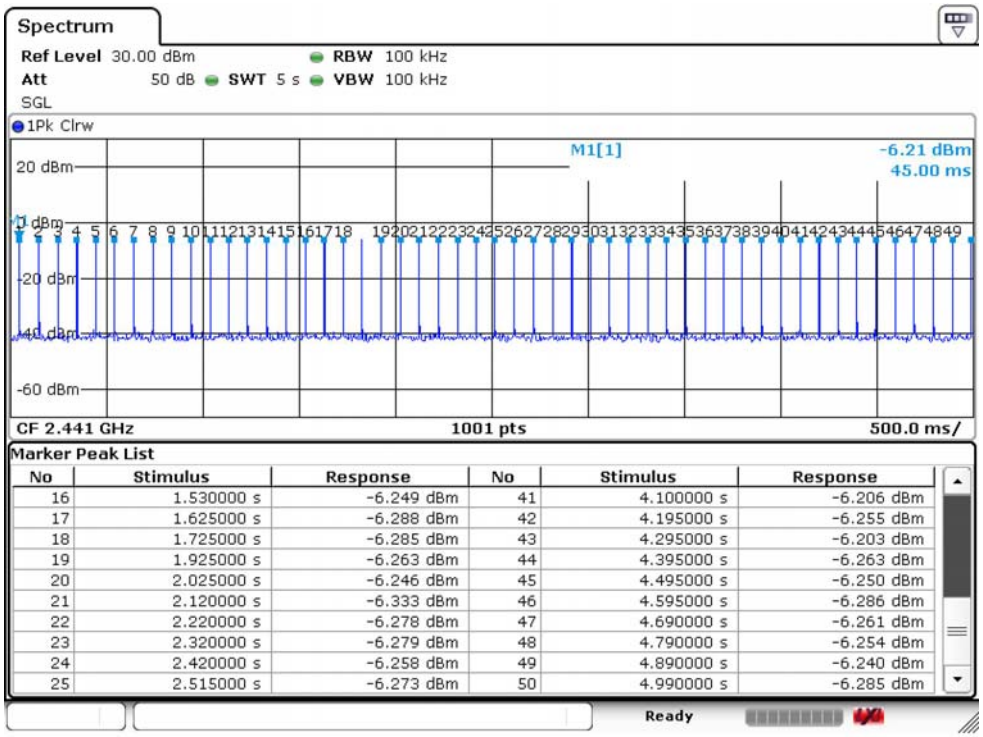
Pulse Width (sec)



Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	926.09 µs	-39.51 dBm		
D1	M1	1	2.94638 ms	-4.24 dB		
D2	M1	1	3.74493 ms	-1.06 dB		

Test Mode : BT (1 Mbps) DH1 Channel : 39

Number of Pulses Per 5 sec

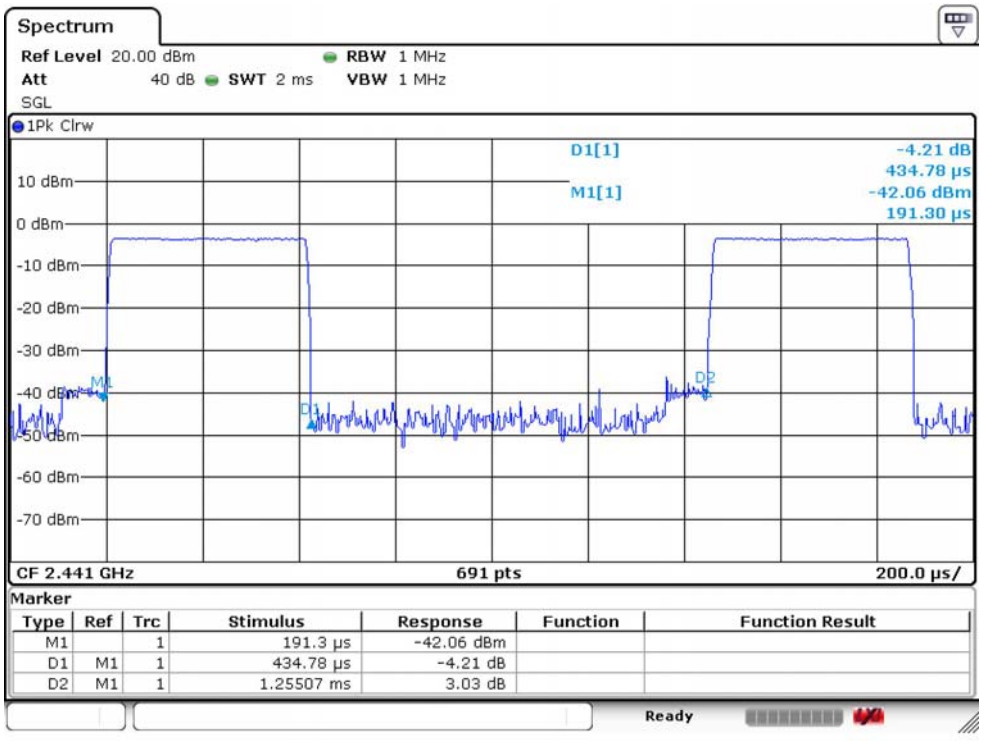


Marker Peak List

No	Stimulus	Response	No	Stimulus	Response
16	1.530000 s	-6.249 dBm	41	4.100000 s	-6.206 dBm
17	1.625000 s	-6.288 dBm	42	4.195000 s	-6.255 dBm
18	1.725000 s	-6.285 dBm	43	4.295000 s	-6.203 dBm
19	1.925000 s	-6.263 dBm	44	4.395000 s	-6.263 dBm
20	2.025000 s	-6.246 dBm	45	4.495000 s	-6.250 dBm
21	2.120000 s	-6.333 dBm	46	4.595000 s	-6.286 dBm
22	2.220000 s	-6.278 dBm	47	4.690000 s	-6.261 dBm
23	2.320000 s	-6.279 dBm	48	4.790000 s	-6.254 dBm
24	2.420000 s	-6.258 dBm	49	4.890000 s	-6.240 dBm
25	2.515000 s	-6.273 dBm	50	4.990000 s	-6.285 dBm

Ready

Pulse Width (sec)



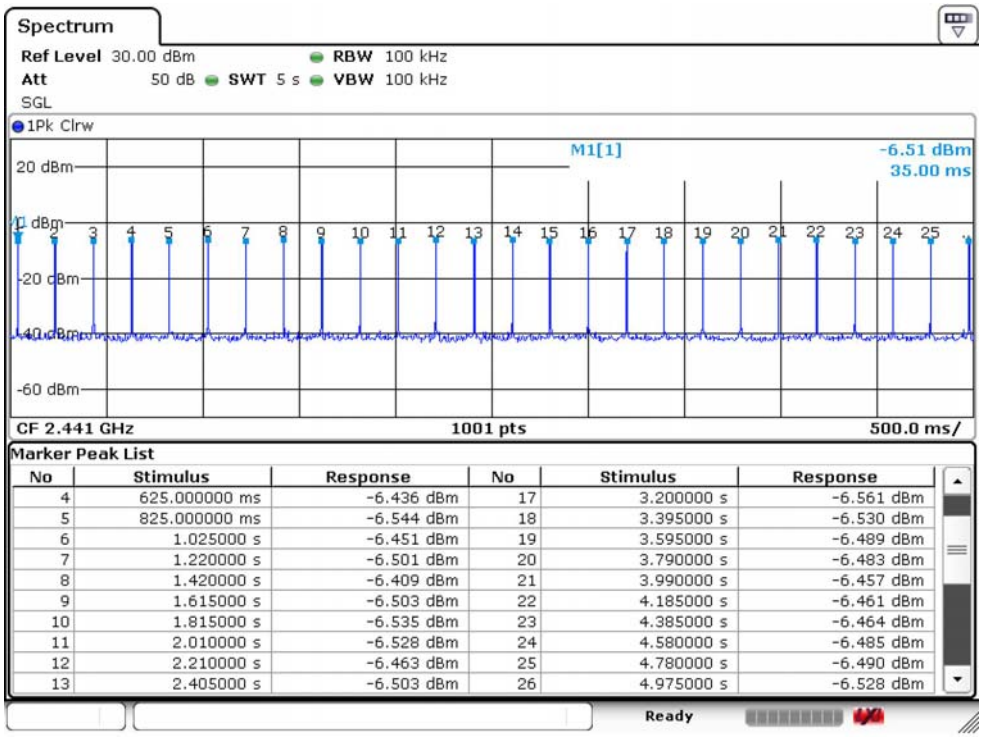
Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	191.3 µs	-42.06 dBm		
D1	M1	1	434.78 µs	-4.21 dB		
D2	M1	1	1.25507 ms	3.03 dB		

Ready

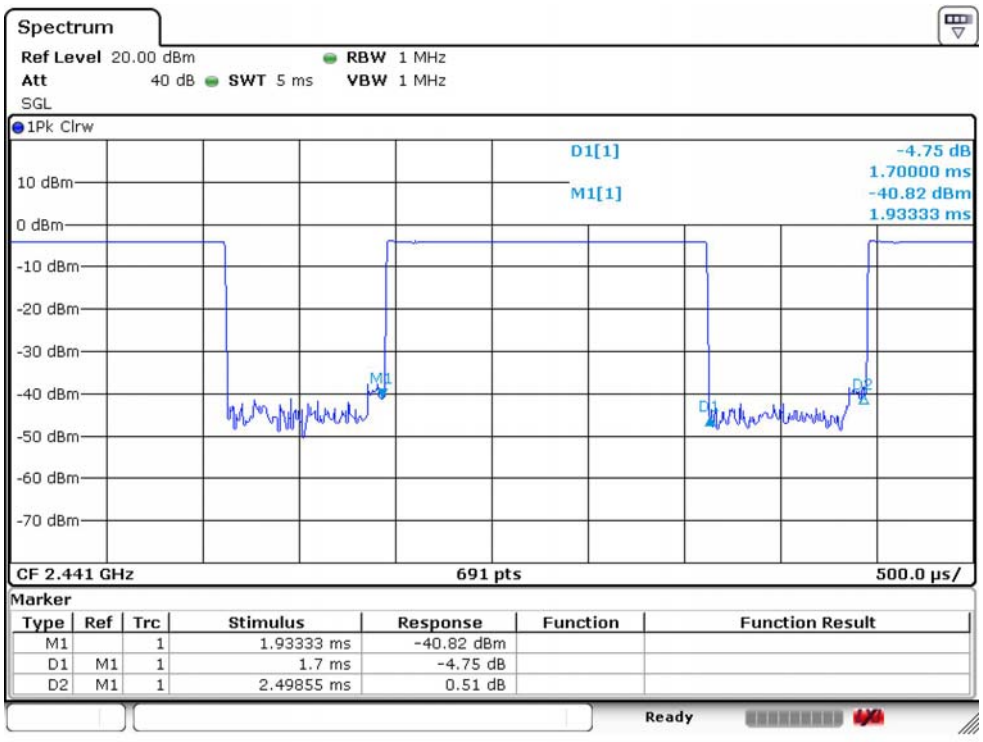
Test Mode : BT (1 Mbps) DH3 Channel : 39

Number of Pulses Per 5 sec



No	Stimulus	Response	No	Stimulus	Response
4	625.000000 ms	-6.436 dBm	17	3.200000 s	-6.561 dBm
5	825.000000 ms	-6.544 dBm	18	3.395000 s	-6.530 dBm
6	1.025000 s	-6.451 dBm	19	3.595000 s	-6.489 dBm
7	1.220000 s	-6.501 dBm	20	3.790000 s	-6.483 dBm
8	1.420000 s	-6.409 dBm	21	3.990000 s	-6.457 dBm
9	1.615000 s	-6.503 dBm	22	4.185000 s	-6.461 dBm
10	1.815000 s	-6.535 dBm	23	4.385000 s	-6.464 dBm
11	2.010000 s	-6.528 dBm	24	4.580000 s	-6.485 dBm
12	2.210000 s	-6.463 dBm	25	4.780000 s	-6.490 dBm
13	2.405000 s	-6.503 dBm	26	4.975000 s	-6.528 dBm

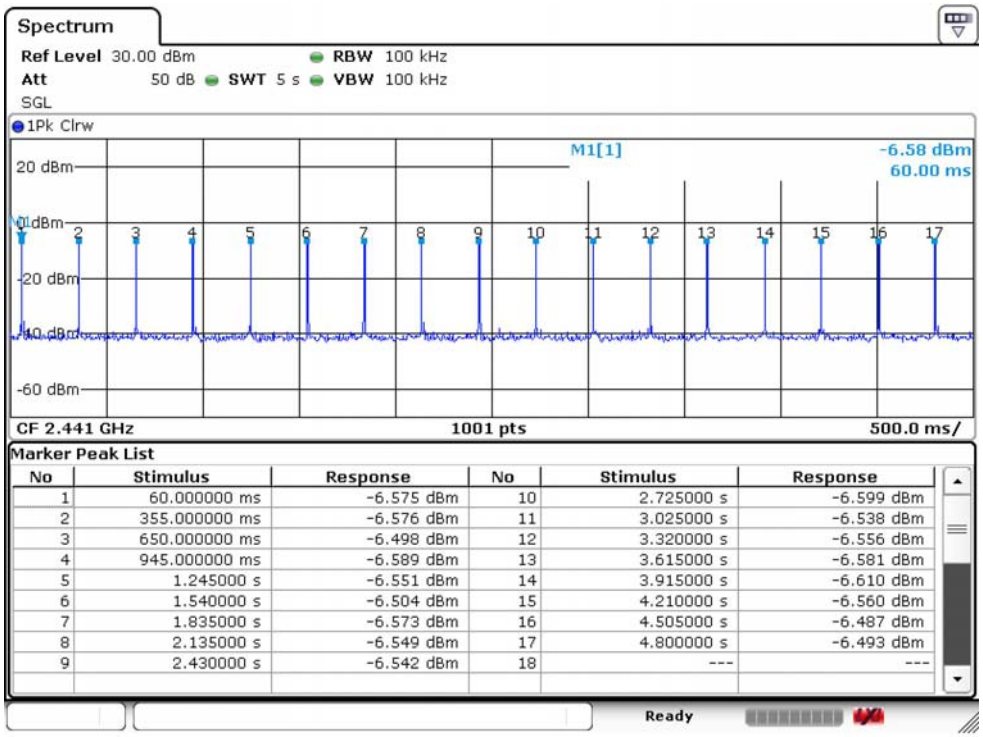
Pulse Width (sec)



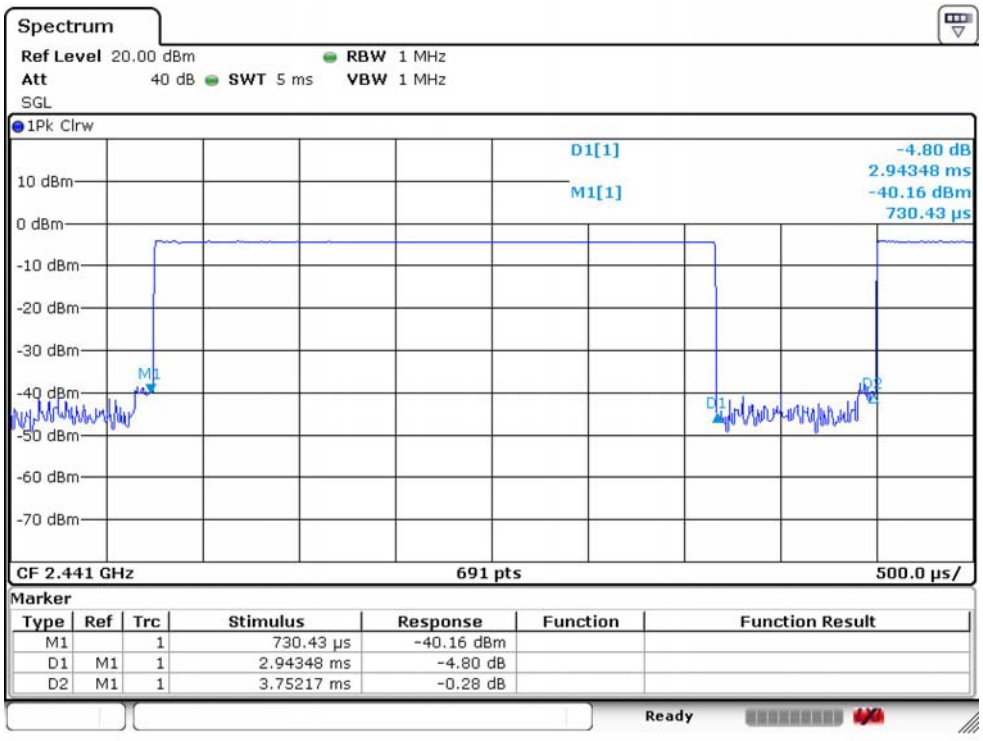
Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	1.93333 ms	-40.82 dBm		
D1	M1	1	1.7 ms	-4.75 dB		
D2	M1	1	2.49855 ms	0.51 dB		

Test Mode : BT (1 Mbps) DH5 Channel : 39

Number of Pulses Per 5 sec

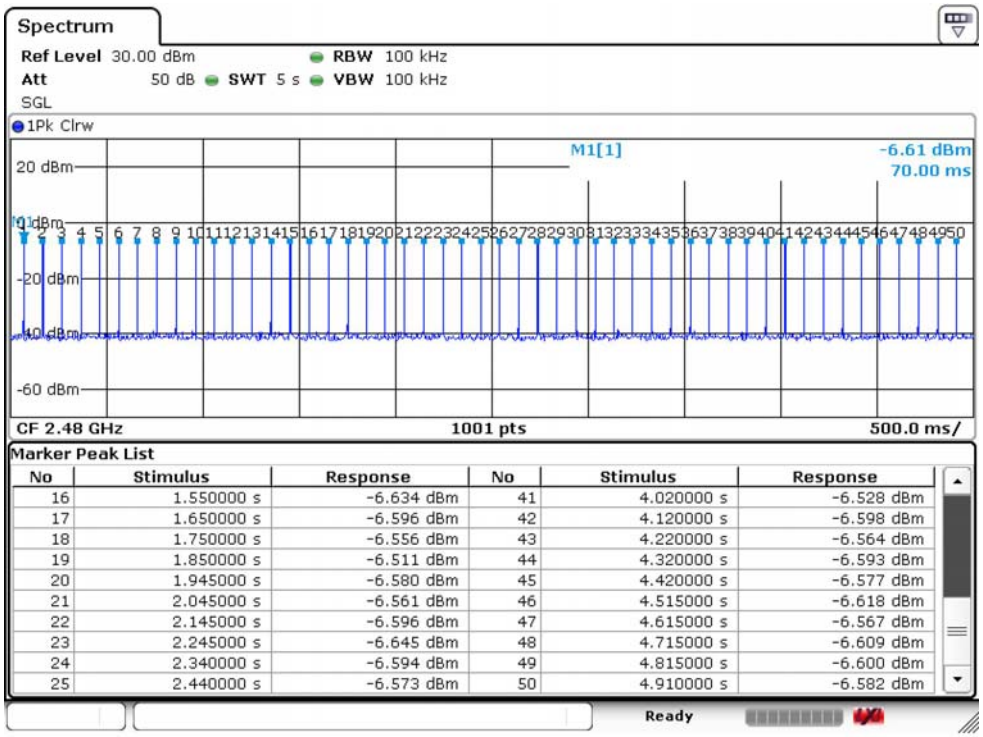


Pulse Width (sec)

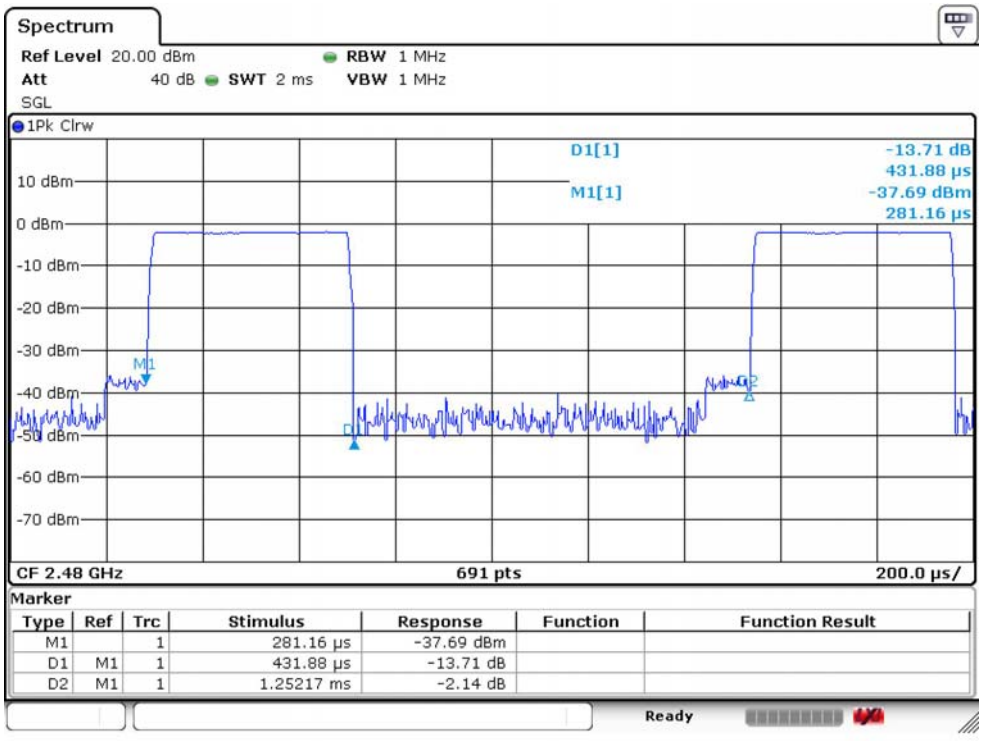


Test Mode : BT (1 Mbps) DH1 Channel : 78

Number of Pulses Per 5 sec

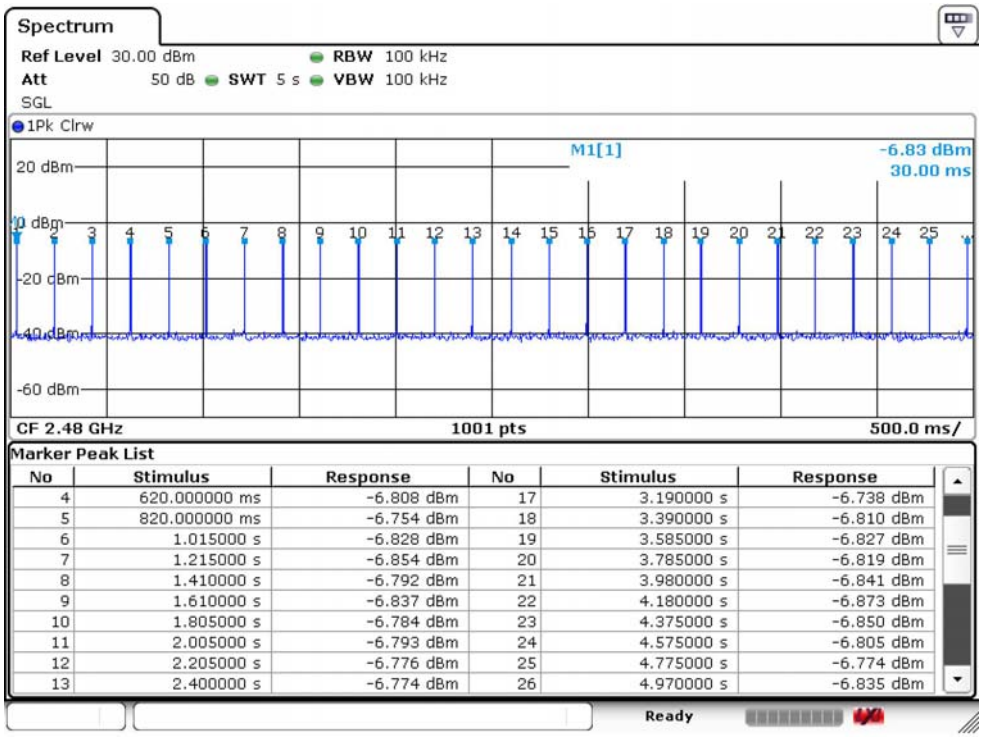


Pulse Width (sec)

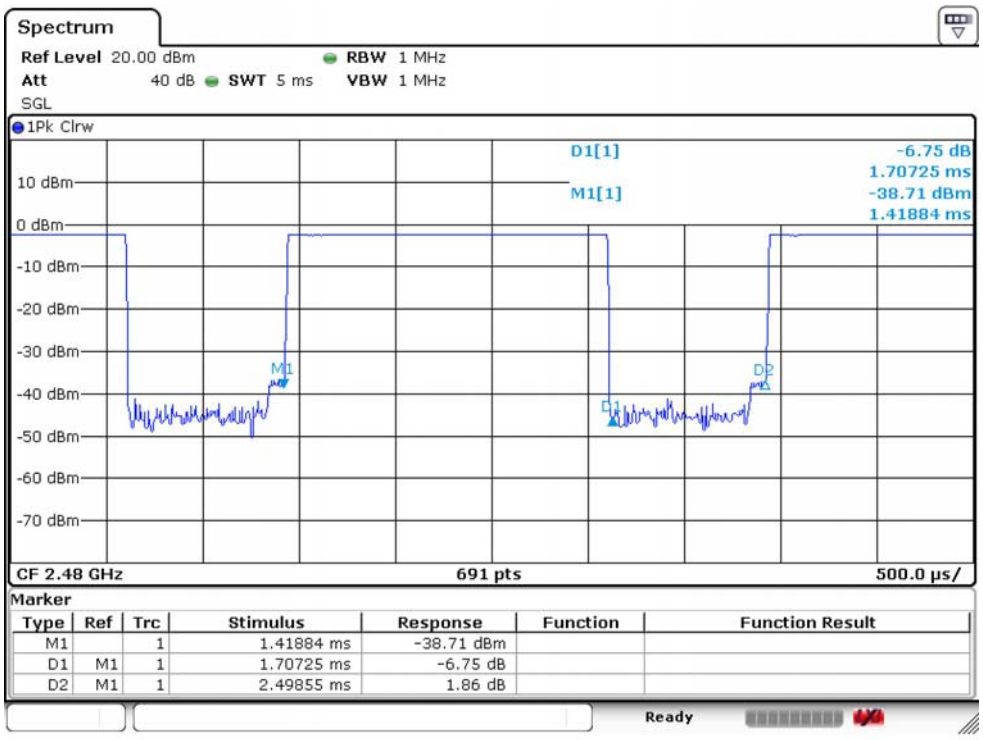


Test Mode : BT (1 Mbps) DH3 Channel : 78

Number of Pulses Per 5 sec

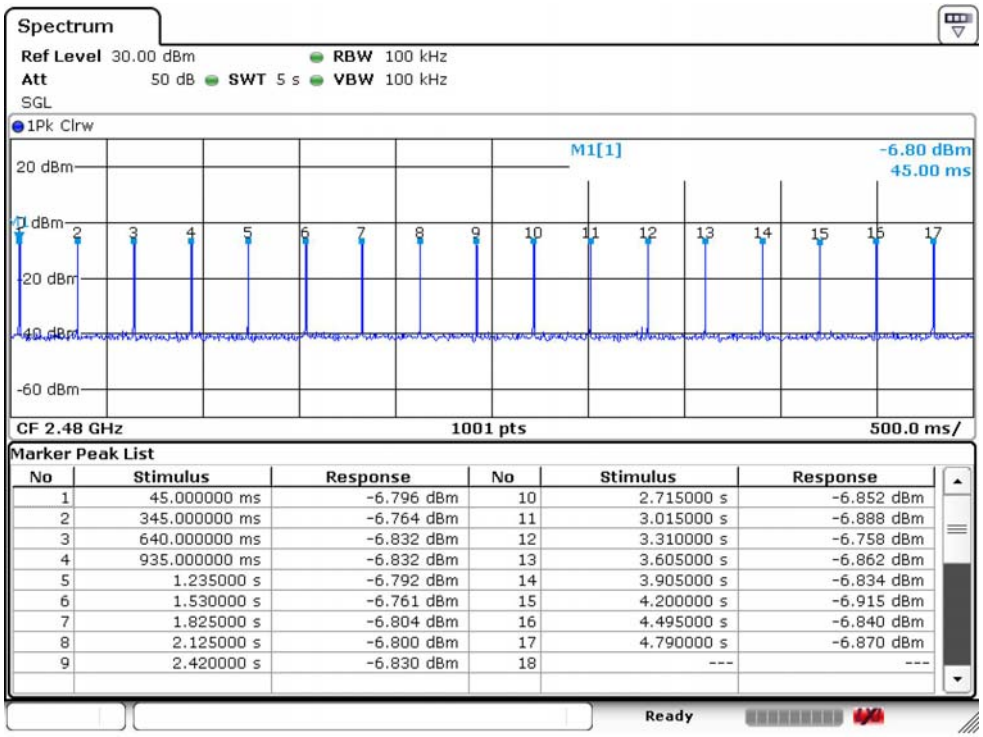


Pulse Width (sec)

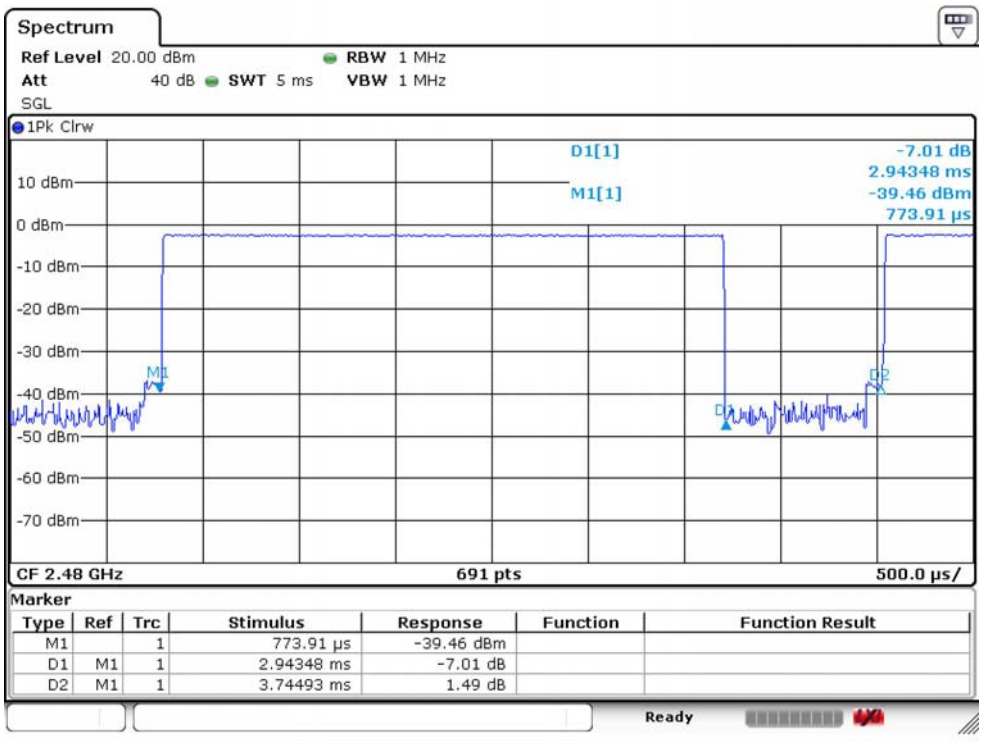


Test Mode : BT (1 Mbps) DH5 Channel : 78

Number of Pulses Per 5 sec



Pulse Width (sec)

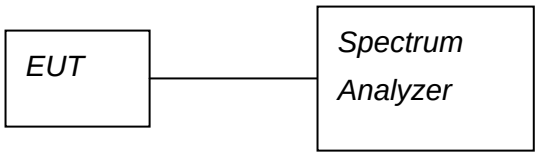


8 Peak Output Power

8.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

8.2 Test Arrangement and Procedure



1. *The transmitter output was connected to a spectrum analyzer (through an attenuator, if it's necessary).*
2. *The RBW is set to 3MHz and VBW is set to 3MHz. Span set to 5MHz.*
3. *Max Hold..*

8.3 Limit (§ 15.247(b))

15.247(b) - The maximum peak conducted output power of the intentional radiator shall not exceed the following:

15.247(b)(1) - For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

15.247(b)(4) - The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 2 dBi, therefore, the limit is 30 dBm.

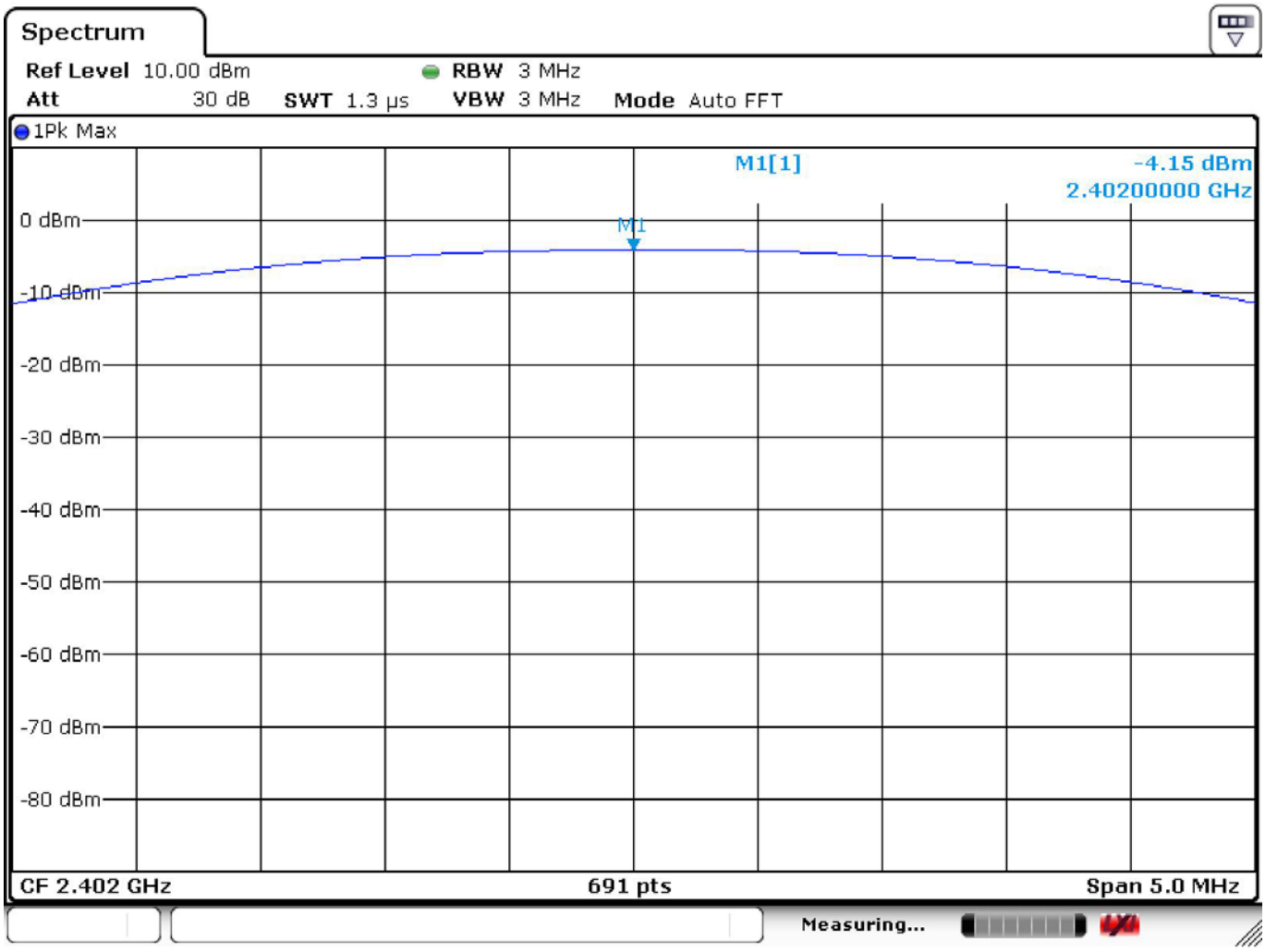
8.4 Test Result

Compliance.

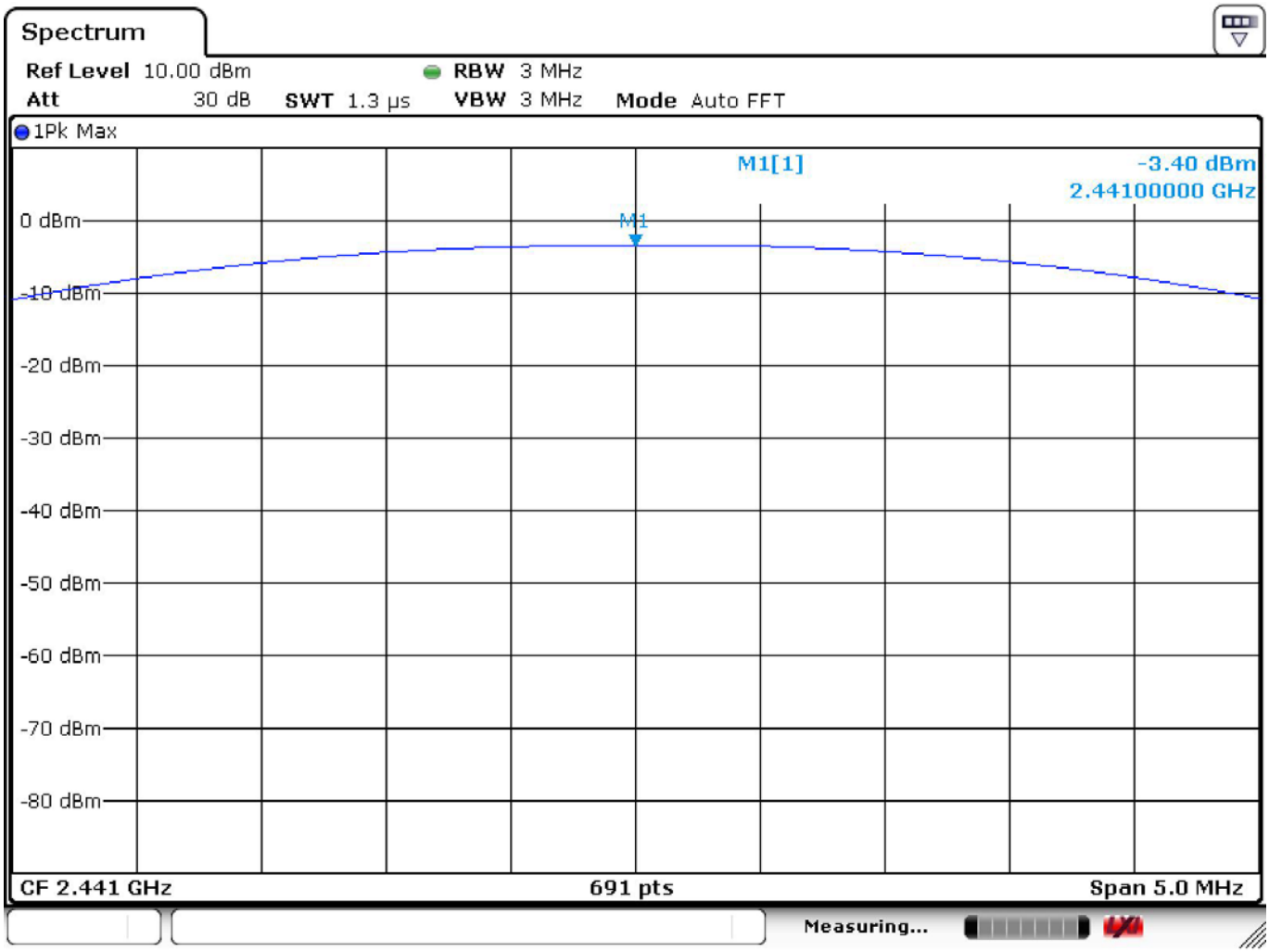
The final test data are shown on the following page(s).

Bluetooth 1 Mbps (DH1)			
Channel	**Frequency (MHz)**	**Result (dBm)**	**Limit (dBm)**
00	*2402*	*-4.15*	*30*
39	*2441*	*-3.40*	*30*
78	*2480*	*-2.39*	*30*

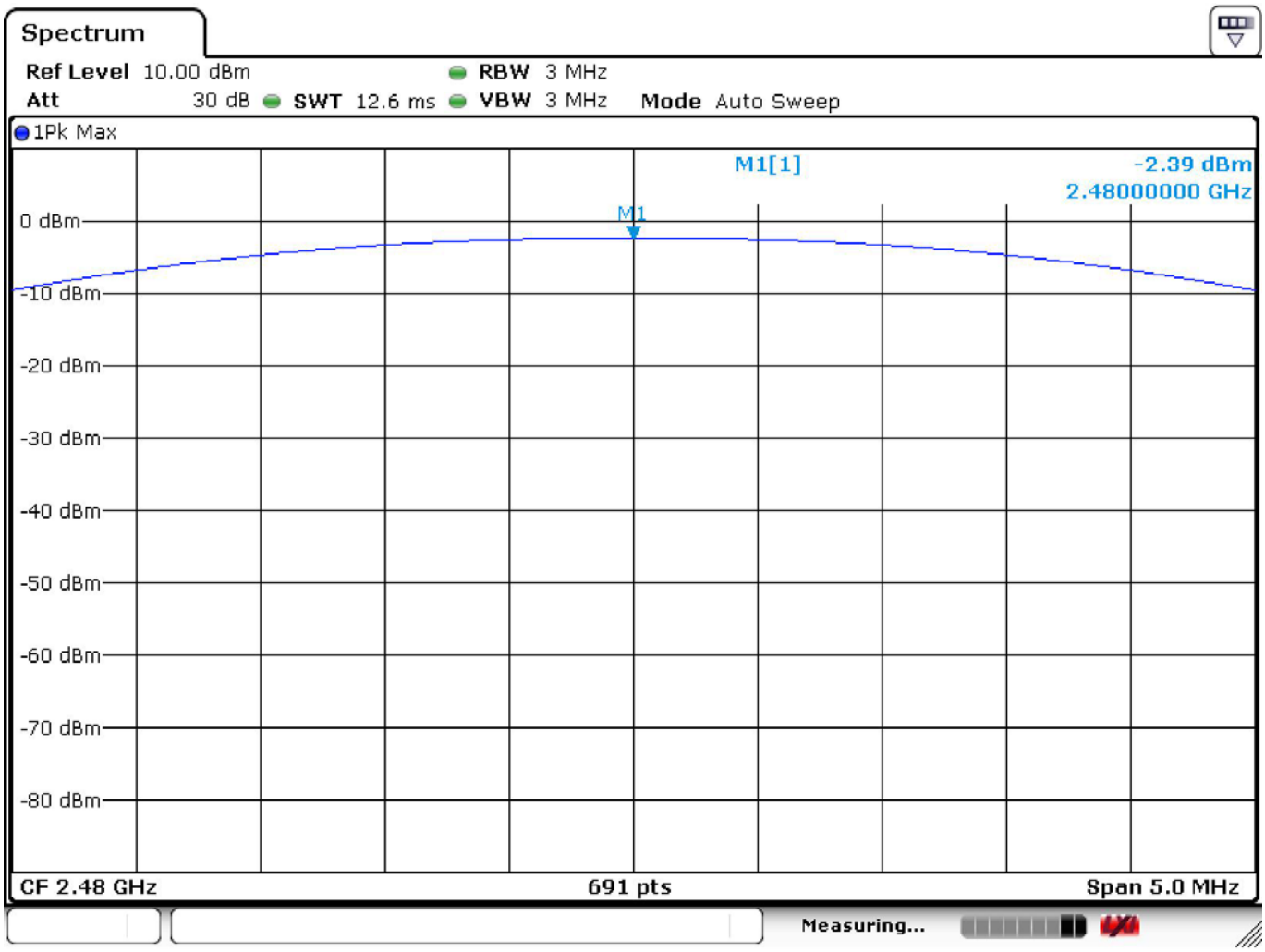
Temperature	:	24.9℃	Humidity	:	51%
Test Date	:	05-Jan-2015	Tested by	:	Eason Hsieh
Test Mode	:	BT (1Mbps) DH1	Channel	:	00



Test Mode : BT (1Mbps) DH1 Channel : 39



Test Mode : BT (1 Mbps) DH1 Channel : 78

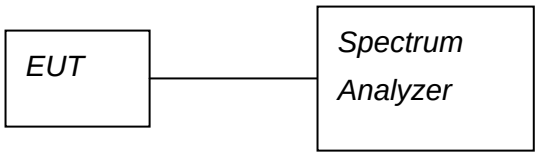


9 100kHz Bandwidth of Band Edges

9.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

9.2 Test Arrangement and Procedure



1. *Remove the antenna from the transmitter and connected it to a spectrum analyzer through a low loss RF cable (connect an attenuator, if it's necessary).*
2. *The RBW is set to 100 kHz and VBW is set to 100 kHz. Sweep set to Auto. Span set to 100MHz.*
3. *Max Hold. Mark Peak and record max level.*
4. *Keep the same instrument setting, perform the hopping function.*
5. *Max Hold. Mark Peak and record max level.*

9.3 Limit (§ 15.247(d))

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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 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)).

9.4 Test Result

Compliance.

The final test data are shown on the following page(s).

Since the fix channel mode is the worst case, data of the hopping mode were not recorded in this report.

Bluetooth (1Mbps) Channel: 00 non-Hopping mode					
Measured Result				Result (dB)	Limit (dB)
Lower Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Lower Band edge (MHz)	Max Peak Power at Lower Band edge (dBm)		
2402.05	-5.35	2399.95	-46.89	41.54	20

Remark: Result (dB) = Max Peak Power – Max Peak power at lower band edge. When Result > Limit, it's a pass.

Bluetooth (1Mbps) Channel: 00 Hopping mode					
Measured Result				Result (dB)	Limit (dB)
Lower Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Lower Band edge (MHz)	Max Peak Power at Lower Band edge (dBm)		
2403.15	-5.57	2356.15	-46.96	41.39	20

Remark: Result (dB) = Max Peak Power – Max Peak power at lower band edge. When Result > Limit, it's a pass.

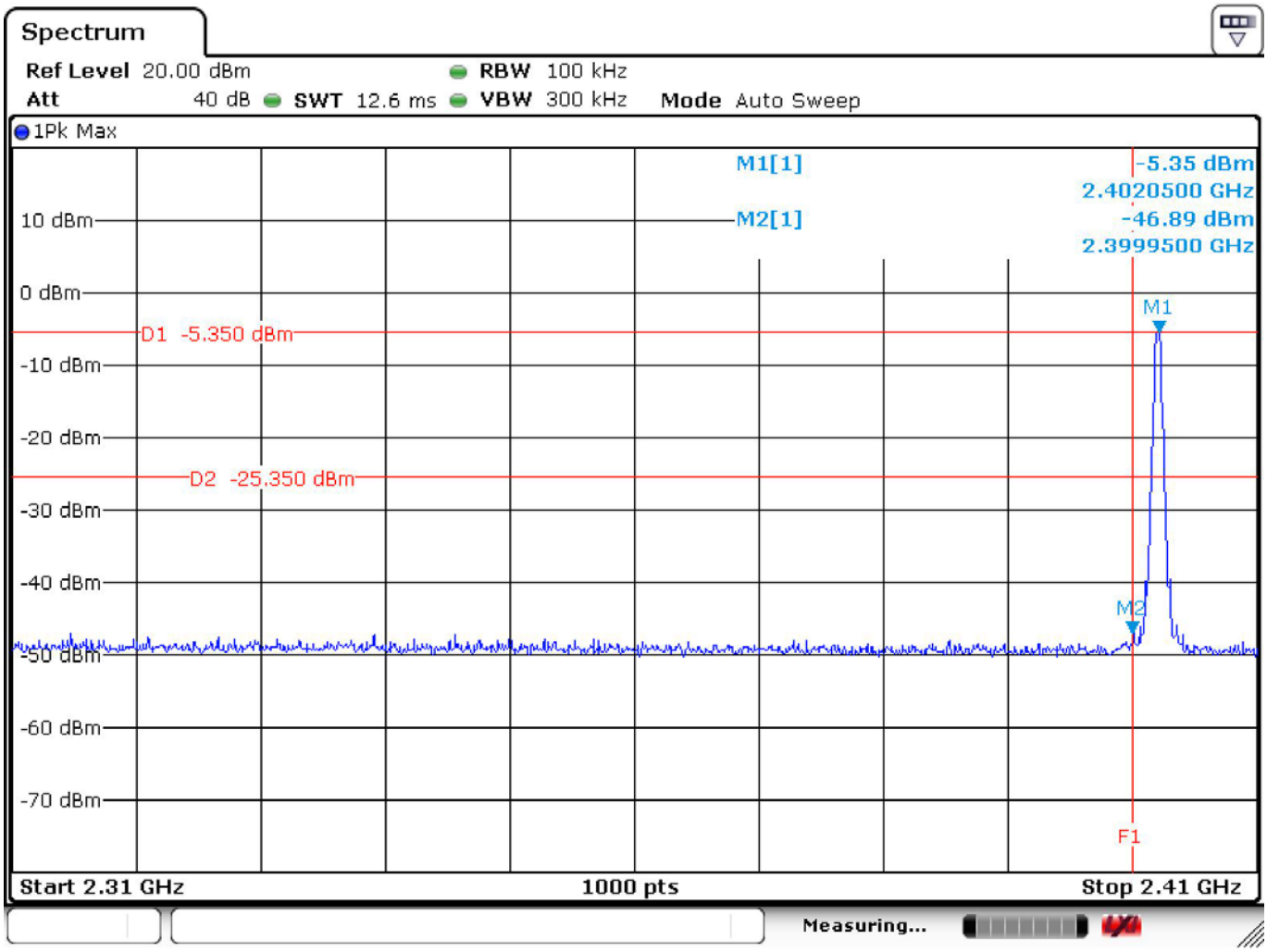
Bluetooth (1Mbps) Channel: 78 non-Hopping mode					
Measured Result				Result (dB)	Limit (dB)
Upper Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Upper Band edge (MHz)	Max Peak Power at Upper Band edge (dBm)		
2480.05	-2.6	2517.25	-47.49	44.89	20

Remark: Result (dB) = Max Peak Power – Max Peak power at upper band edge. When Result > Limit, it's a pass.

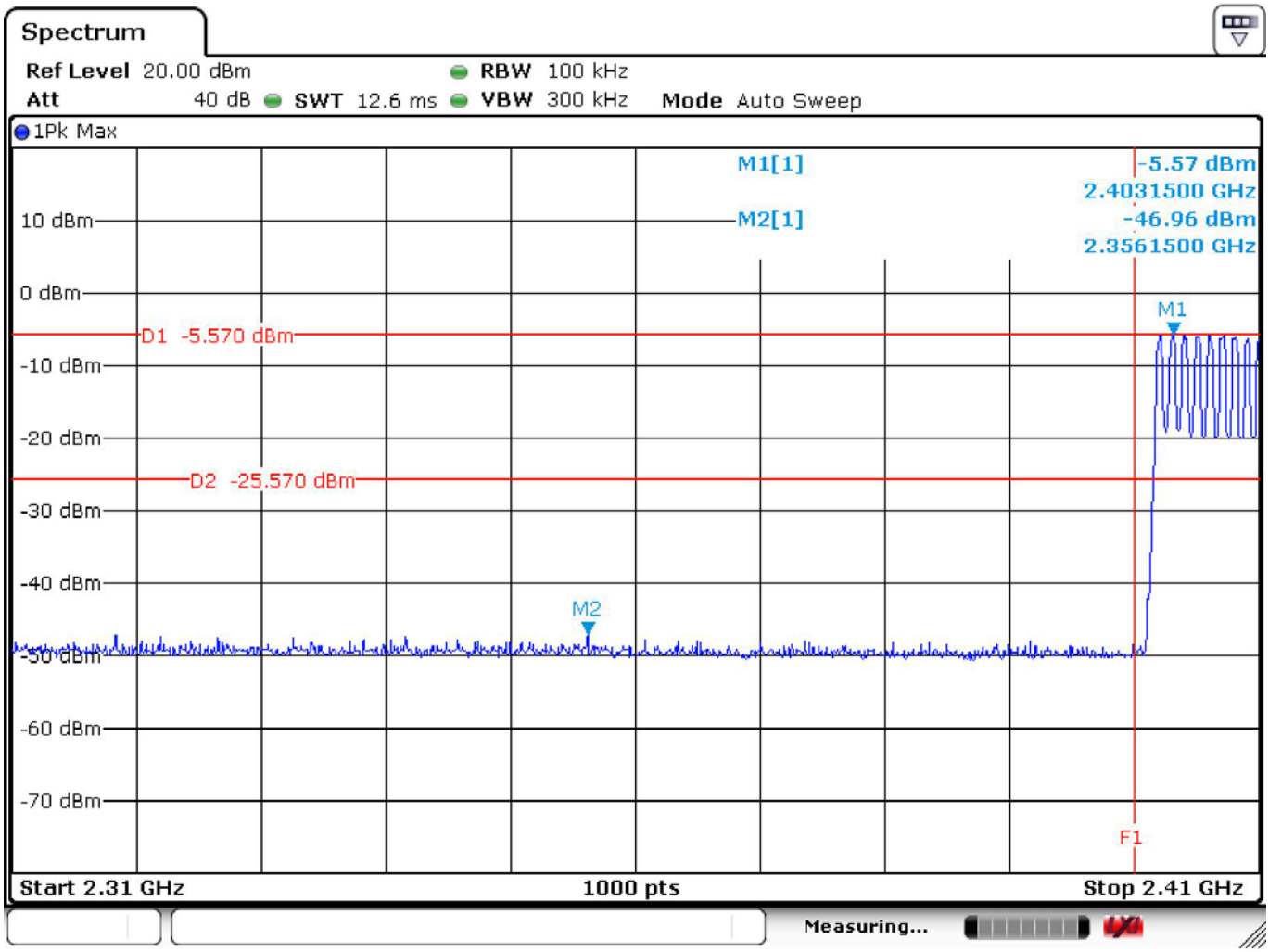
Bluetooth (1Mbps) Channel: 78 Hopping mode					
Measured Result				Result (dB)	Limit (dB)
Upper Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Upper Band edge (MHz)	Max Peak Power at Upper Band edge (dBm)		
2480.05	-2.66	2522.85	-47.01	44.35	20

Remark: Result (dB) = Max Peak Power – Max Peak power at Upper band edge. When Result > Limit, it's a pass.

Temperature	:	23.9℃	Humidity	:	35%
Test Date	:	21-Mar-2014	Tested by	:	Kidd Liao
Test Mode	:	BT (1Mbps) non-hopping mode	Channel	:	2402

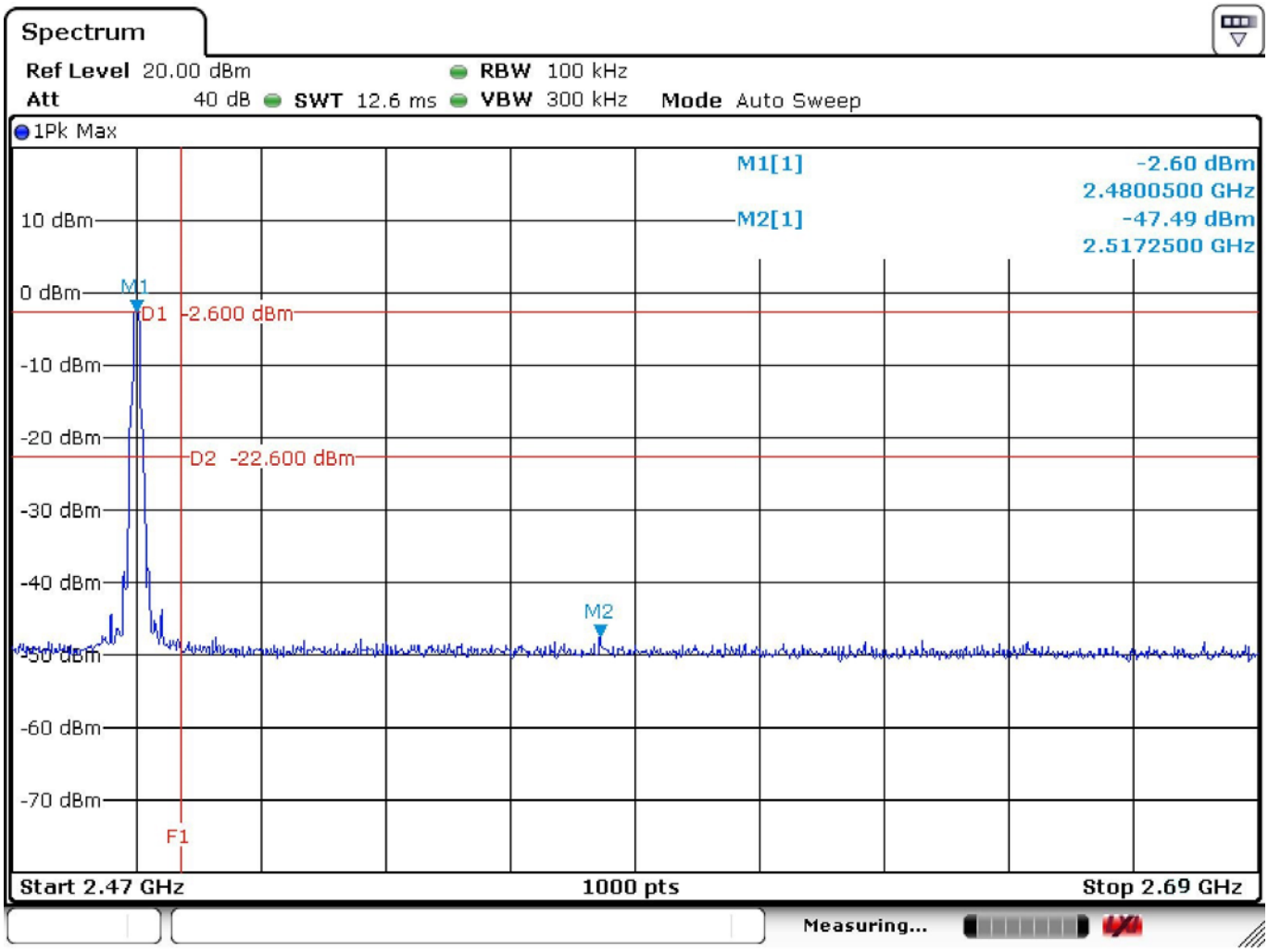


Test Mode : BT (1 Mbps) Hopping mode Channel : 2402

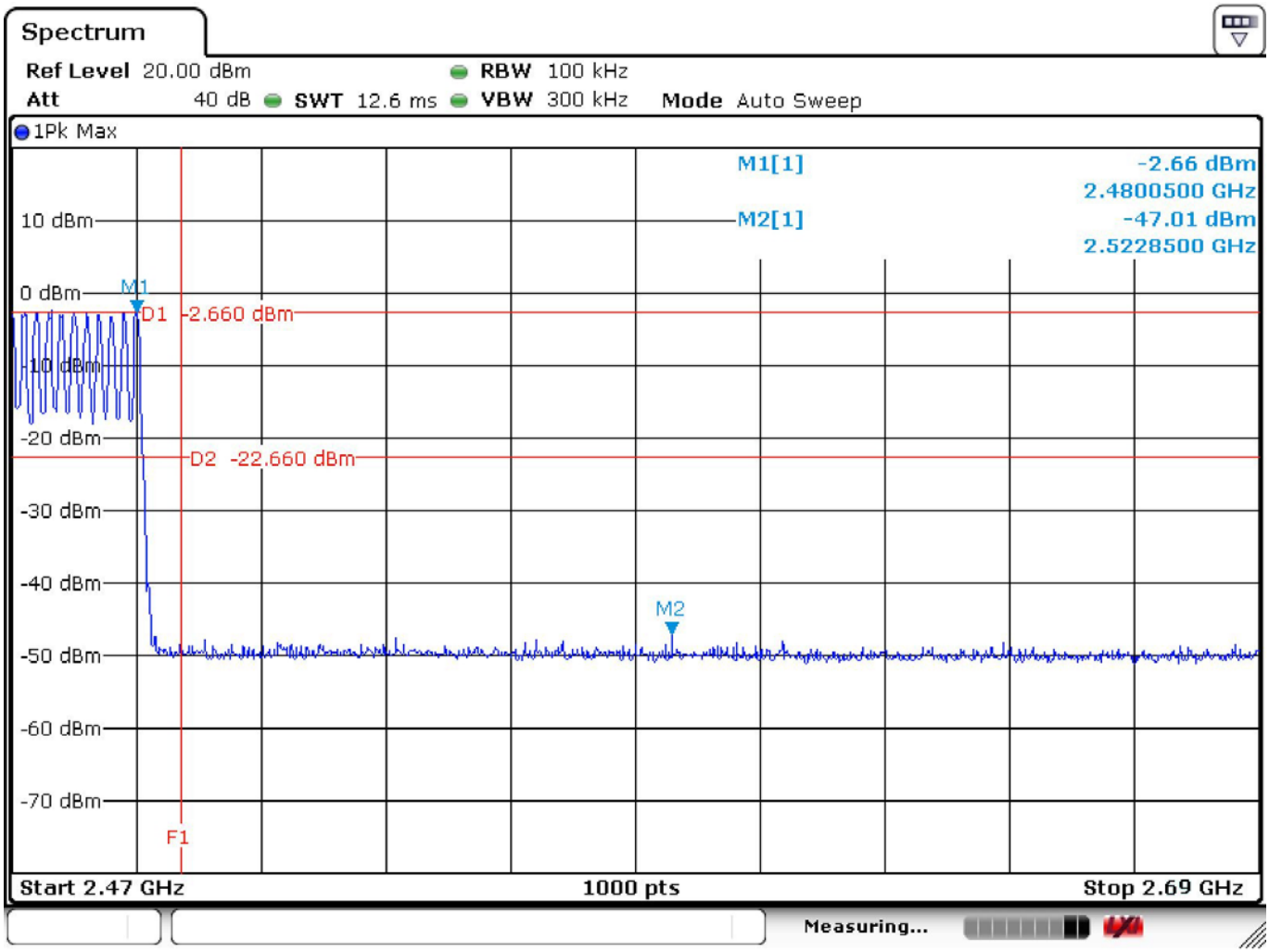


Test Mode : BT (1 Mbps)
non-hopping mode

Channel : 2480



Test Mode : BT (1 Mbps) Hopping mode Channel : 2480

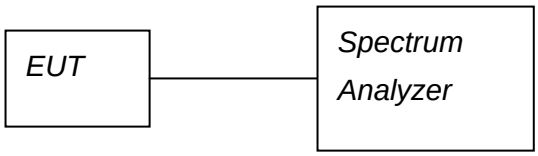


10 Spurious RF Conducted Emissions

10.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

10.2 Test Arrangement and Procedure



1. Remove the antenna from the transmitter and connected it to a spectrum analyzer through a low loss RF cable (connect an attenuator, if it's necessary).
2. Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic.
3. Typically, several plots are required to cover this entire span.
4. RBW = 100 kHz ; VBW ≧ RBW ; Sweep = auto
5. Detector function = peak ; Trace = max hold ; Allow the trace to stabilize.
6. Set the marker on the peak of any spurious emission recorded.
7. The level displayed must comply with the limit specified in this Section.
8. Submit these plots.

10.3 Limit (§ 15.247(d))

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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 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)).

10.4 Test Result

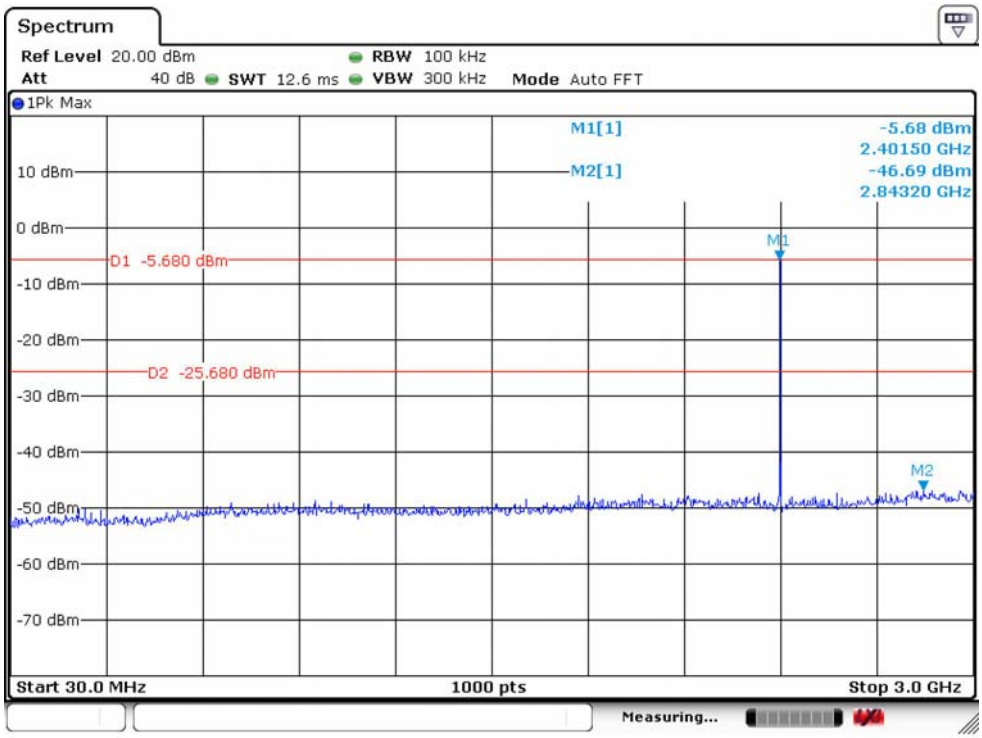
Compliance.

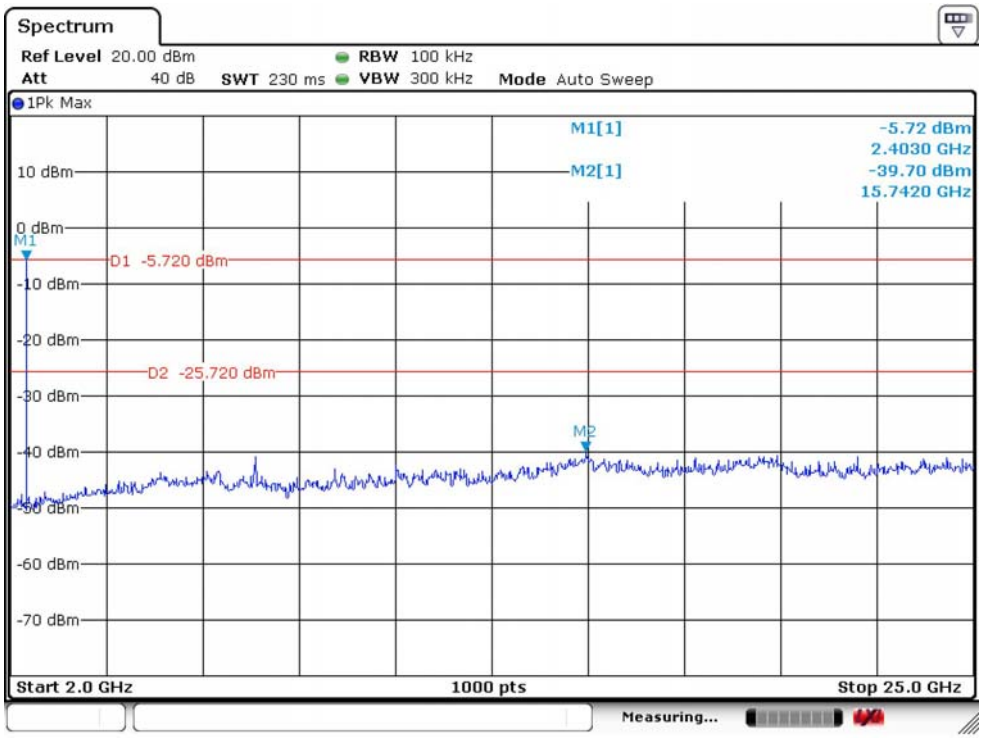
The final test data are shown on the following page(s).
Since the fix channel mode is the worst case, data of the hopping mode were not recorded in this report.

Bluetooth (1Mbps) Channel: 00					
Measured Result				Result (dB)	Limit (dB)
(GHz)	Max Peak Power (dBm)	Highest Freq. at spurious emissions (GHz)	Max Peak Power at spurious emissions (dBm)		
2.4015	-5.68	2.8432	-46.69	41.01	20
2.403	-5.72	15.742	-39.7	33.98	20

Remark: Result (dB) = Max Peak Power – Max Peak power at spurious emissions.

When Result > Limit, it's a pass.

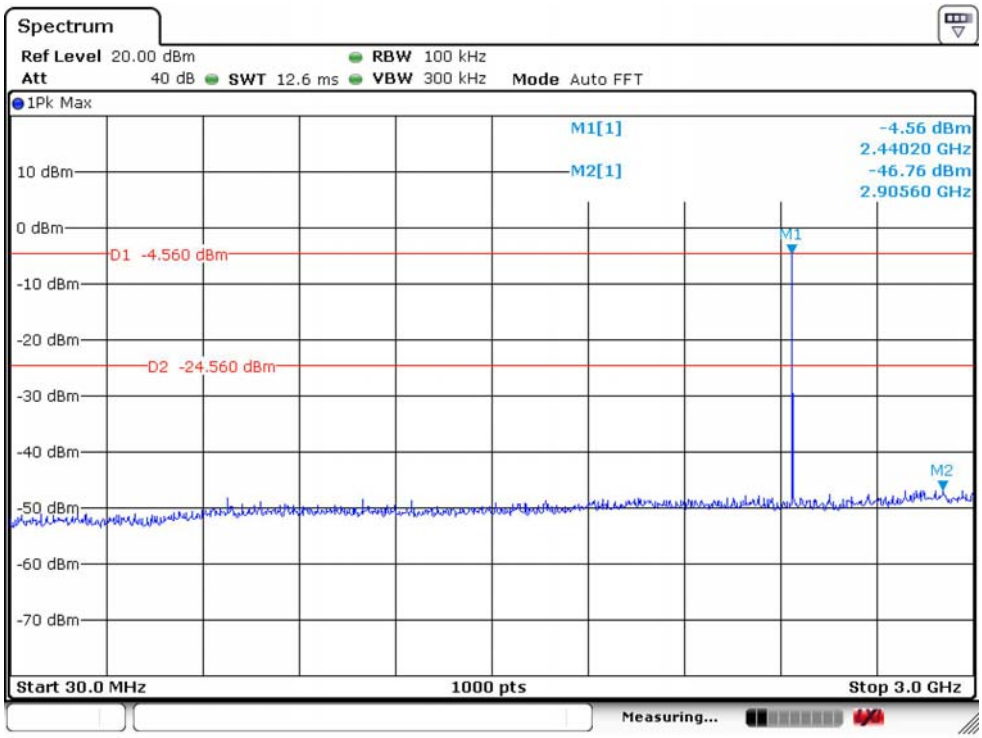


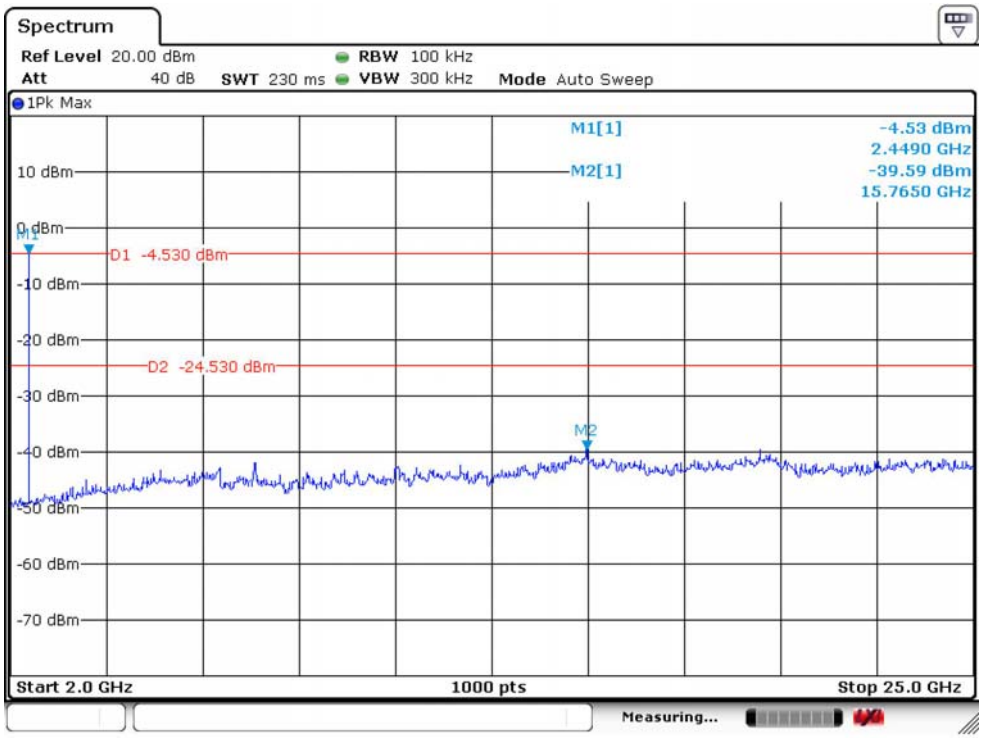


Bluetooth (1Mbps) Channel: 39					
Measured Result				Result (dB)	Limit (dB)
(GHz)	Max Peak Power (dBm)	Highest Freq. at spurious emissions (GHz)	Max Peak Power at spurious emissions (dBm)		
2.4402	-4.56	2.9056	-46.76	42.2	20
2.449	-4.53	15.765	-39.59	35.06	20

Remark: Result (dB) = Max Peak Power – Max Peak power at spurious emissions.

When Result > Limit, it's a pass.

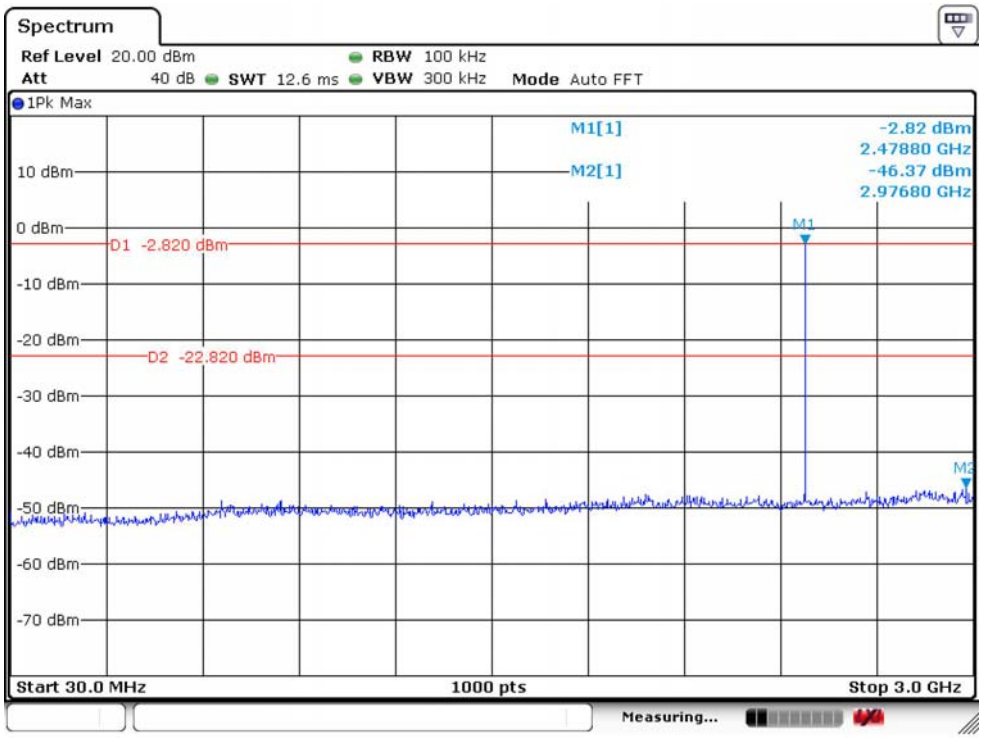


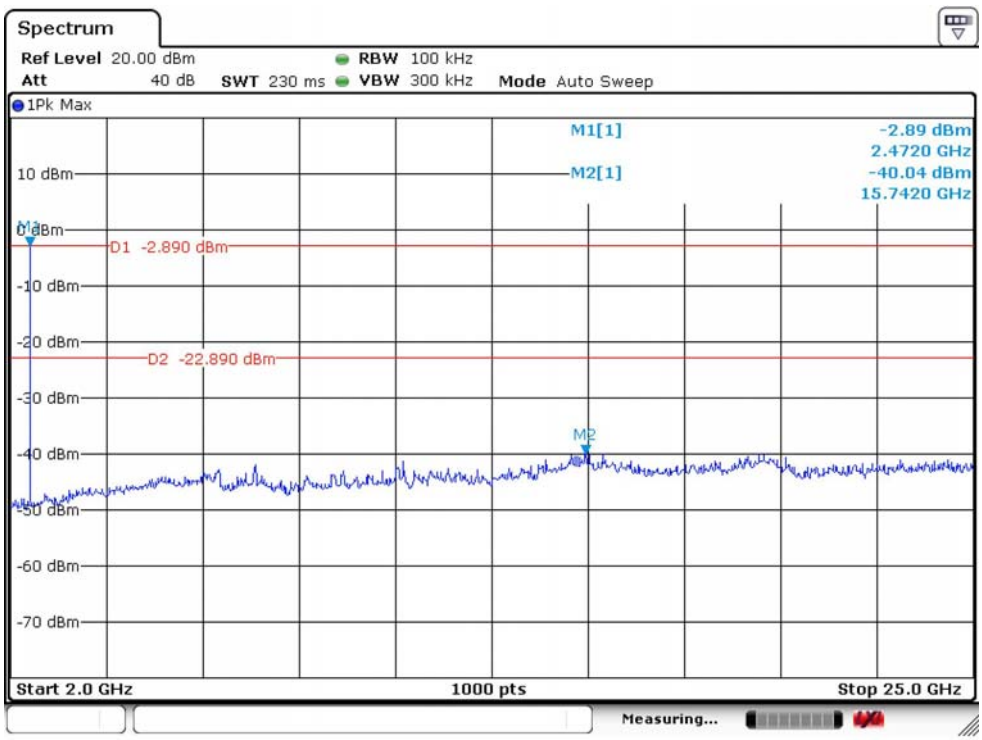


Bluetooth (1Mbps) Channel: 78					
Measured Result				Result (dB)	Limit (dB)
(GHz)	Max Peak Power (dBm)	Highest Freq. at spurious emissions (GHz)	Max Peak Power at spurious emissions (dBm)		
2.4788	-2.82	2.9768	-46.37	43.55	20
2.472	-2.89	15.742	-40.04	37.15	20

Remark: Result (dB) = Max Peak Power – Max Peak power at spurious emissions.

When Result > Limit, it's a pass.





11 Antenna requirement

11.1 Limit (§ 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. The use of a permanently attached antenna or of an antenna that uses a uniue coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

11.2 Test Result

Compliance.

The EUT applies a Dipole antenna with an unique SMA connector.