FCC COMPLIANCE TEST REPORT

Technical Statement of Conformity

in accordance with 47 CFR Part 15 Subpart C

The product

Equipment Under Test	: powerlineECCO+
Model Number	: powerlineECCO+
Product Series	: N/A
Report Number	: HA150773-RA
Issue Date	: 01-Oct-2015
Test Result	: Compliance

is produced by

advanced PANMOBIL Systems GmbH & Co. KG

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

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Test Result Certification

Applicant	: advanced PANMOBIL Systems GmbH & Co. KG
Address of Applicant	: Hansestrasse 91, D-51149 Koeln, Germany
Manufacturer	: advanced PANMOBIL Systems GmbH & Co. KG
Address of Manufacturer	: Hansestrasse 91, D-51149 Koeln, Germany
Trade Name	: ECCO+
Equipment Under Test	: powerlineECCO+
Model Number	: powerlineECCO+
Product Series	: N/A
FCC ID	: 2AACD-EECCOPLUS
Filing Type	: Certification
Sample Received Date	: 28-Jul-2015
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 C63.10 (2013) 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: Kay Wang 2015-10-01

Kay Wang/ ADM. Dept Staff

Tested by: Eason.Hsieh 2015-09-07

Eason Hsieh / ENG. Dept. Staff

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

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	Not applicable
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	:	powerlineECCO+
Model Number of EUT	:	powerlineECCO+
Product Series	:	N/A
Power Supply	:	Li-Ploymer Battery DC 3.7 V, 1500mAh
Frequency Range	:	2402~2480 MHz
Transmit Power	:	-30.07 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	:	Chip-Ceramic Antenna/ Gain: 1.8 dBi
Modulation Technique	:	Bluetooth 2.1 + EDR FHSS Bluetooth : GFSK (Standard Rate); π/4-DQPSK (2Mbps); 8DPSK (3Mbps)
Transmit Data Rate	:	Bluetooth : 1Mbps

Specification	:	**Dimensions**：87 mm (L) X 48 mm (W) X 26 mm (H) **Weight**：90g **Function**：The EUT is a Bluetooth Barcode Scanner. **※For more detail specification, please refer to the User Manual.**

1.2 Test Instruments

HA2

Instrument Name	Manufacture Mode	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
RF Amplifier	Schaffner	CPA9231A	0405	01-JUN-2015	31-MAY-2016
EMI Receiver	R&S	ESCI	100931	25-JUL-2015	24-JUL-2016
Spectrum Analyzer	R&S	FSV	101629	27-JAN-2015	26-JAN-2016
Preamplifier	HD	HD17187	004	01-JUN-2015	31-MAY-2016
Bilog Antenna	TESEQ	CBL6111D	38521	04-JUN-2015	03-JUN-2016
Double-Ridged Waveguide Horn	EMCO	3115	9912-5992	01-JUN-2015	31-MAY-2016
Horn Antenna (18-40GHz)	Com-Power	AH-840	101042	02-JUN-2015	01-JUN-2016
Microwave Preamplifier	Com-Power	PAM-840	461269	04-JUN-2015	03-JUN-2016
L.I.S.N.	Rolf Heine Hochfrequenztechnik	NNB-4/32T	00001	18-MAR-2015	17-MAR-2016
L.I.S.N.	EMCO	3810/2NM	9702-1818	20-MAR-2015	19-MAR-2016

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

1.3 Auxiliary Equipments

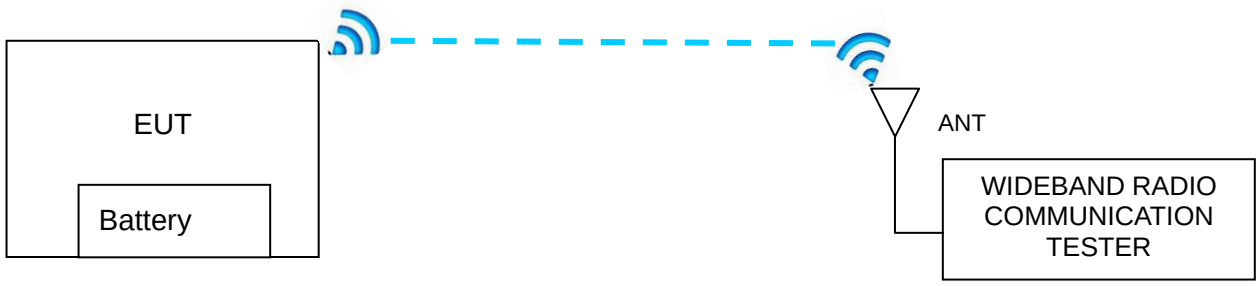
1.3.1. Provided by HongAn Technology Co., Ltd. for Emission Test.

N/A

1.3.2. Provided by the Manufacturer

N/A

1.4 EUT SETUP



Note: Main Test Sample: powerlineECCO+

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.
4. Mode 4: TX BT EDR mode (2Mbps) CH 00.
5. Mode 5: TX BT EDR mode (2Mbps) CH 39.
6. Mode 6: TX BT EDR mode (2Mbps) CH 78.
7. Mode 7: TX BT EDR mode (3Mbps) CH 00.
8. Mode 8: TX BT EDR mode (3Mbps) CH 39.
9. Mode 9: TX BT EDR mode (3Mbps) CH 78.
10. Mode 10 : RX mode.

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: N/A.
Field Strength: All Mode.
Radiated Emission (30~1000 MHz): Mode 2.
Radiated Emission (1~26.5GHz): All Mode.

1.7 Condition of Power Supply

Li-Polymer Battery, DC 3.7 V, 1500mAh

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 C63.10 (2013) 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 set according to the requirements in Section 6.2 of ANSI C63.10 (2013).

Radiated Emissions

The EUT is set according to the requirements in Section 6.3 of ANSI C63.10 (2013).

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

Not applicable.

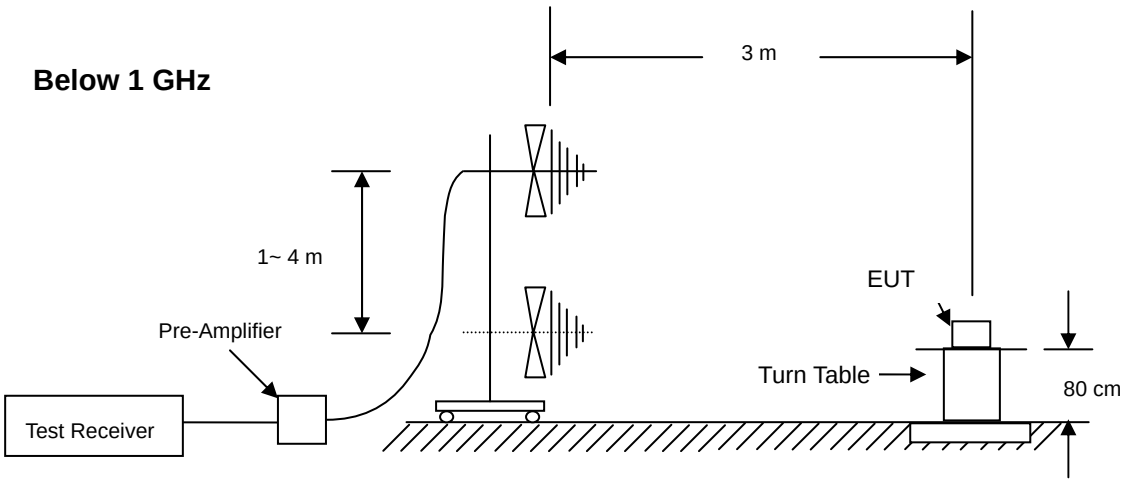
3 Radiated Emission Test

3.1 Test Instruments

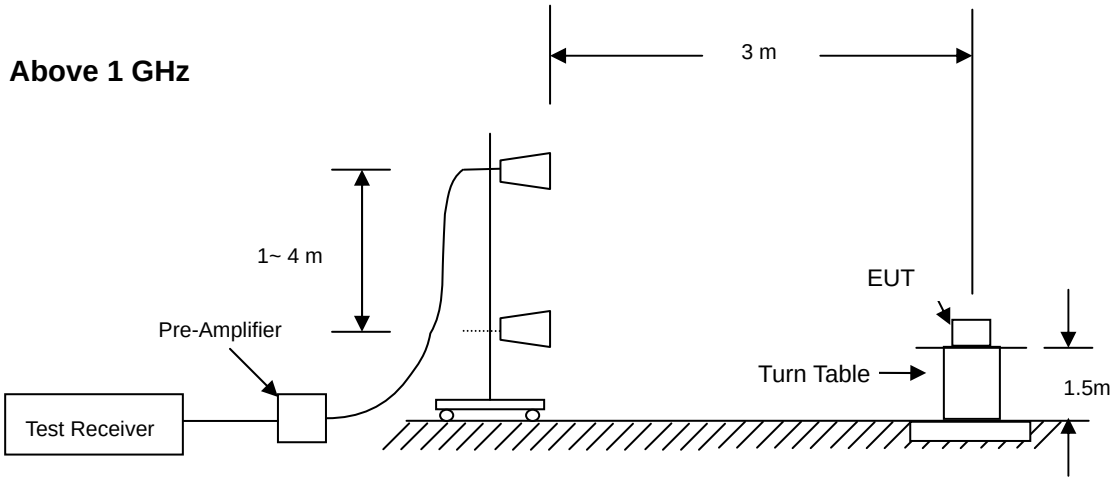
Refer to Sec. 1.2 Test Instruments.

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 (below 1GHz) and 1.5m (above 1GHz) 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.

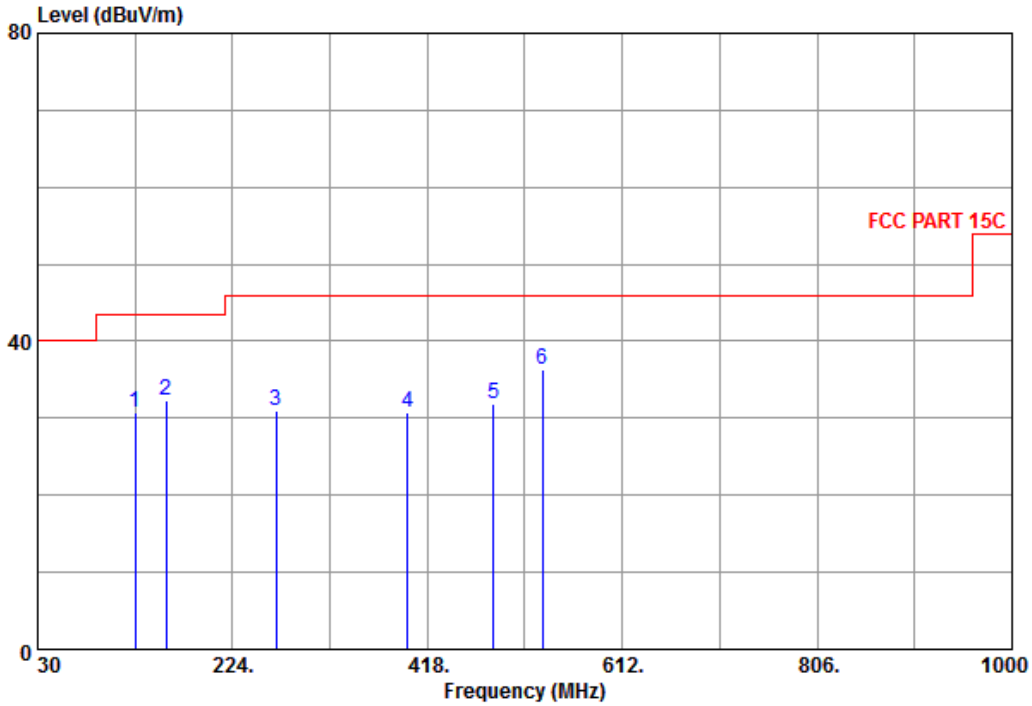
3.4 Test Result

Compliance

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

Radiated Emission Test Data (Below 1 GHz)

Temperature	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-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	127.000	54.51	-23.67	30.84	43.50	-12.66	---	---	
2	158.040	56.16	-23.76	32.40	43.50	-11.10	---	---	
3	267.650	51.47	-20.47	31.00	46.00	-15.00	---	---	
4	398.600	46.12	-15.39	30.73	46.00	-15.27	---	---	
5	483.960	45.55	-13.79	31.76	46.00	-14.24	---	---	
6 @	532.460	48.64	-12.42	36.22	46.00	-9.78	---	---	

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

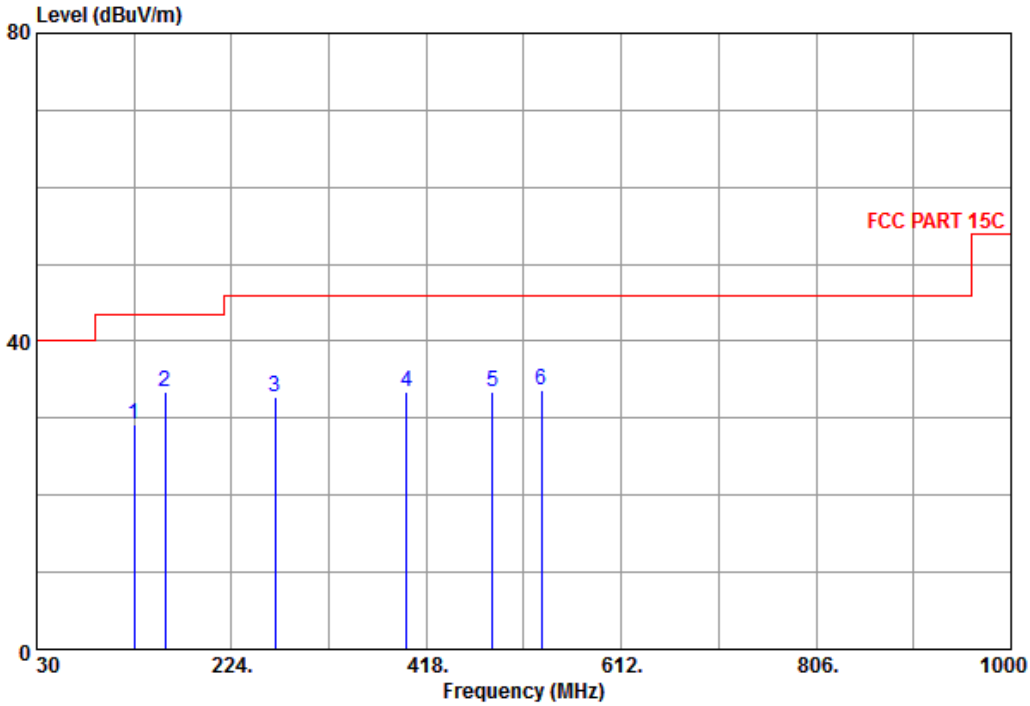
@ :Maximum Data x :Over Limit

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-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	127.000	52.96	-23.67	29.29	43.50	-14.21	---	---	
2 @	158.040	57.14	-23.76	33.38	43.50	-10.12	---	---	
3	267.650	53.25	-20.47	32.78	46.00	-13.22	---	---	
4	398.600	48.92	-15.39	33.53	46.00	-12.47	---	---	
5	483.960	47.28	-13.79	33.49	46.00	-12.51	---	---	
6	532.460	46.01	-12.42	33.59	46.00	-12.41	---	---	

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

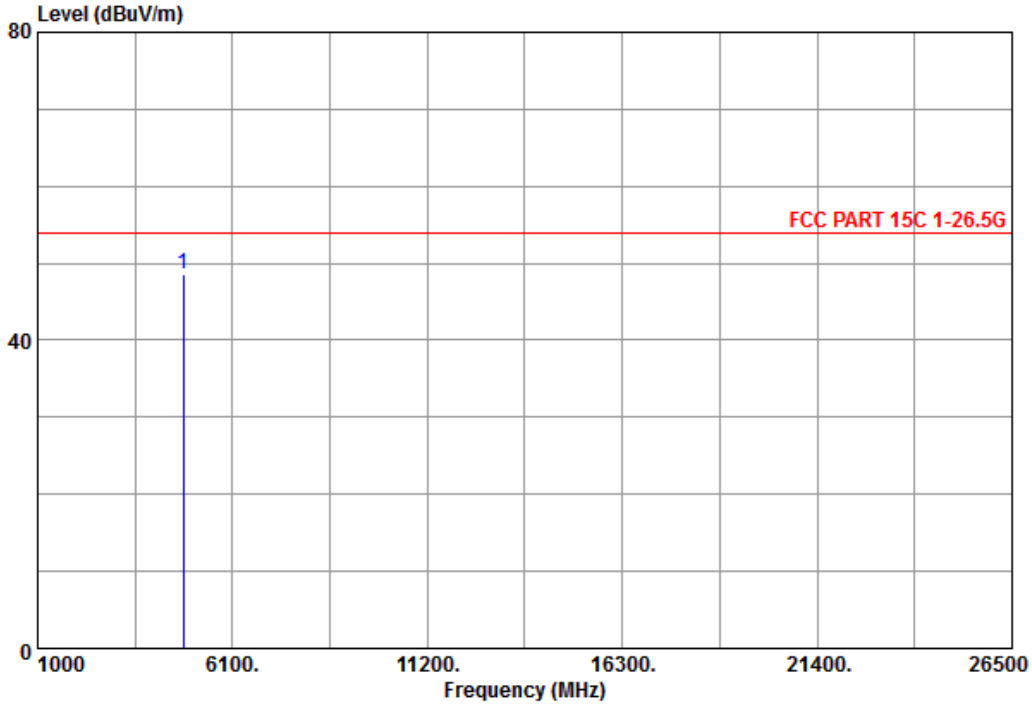
@ :Maximum Data x :Over Limit

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-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	48.06	0.49	48.55	54.00	-5.45	---	---	

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

@ :Maximum Data x :Over Limit

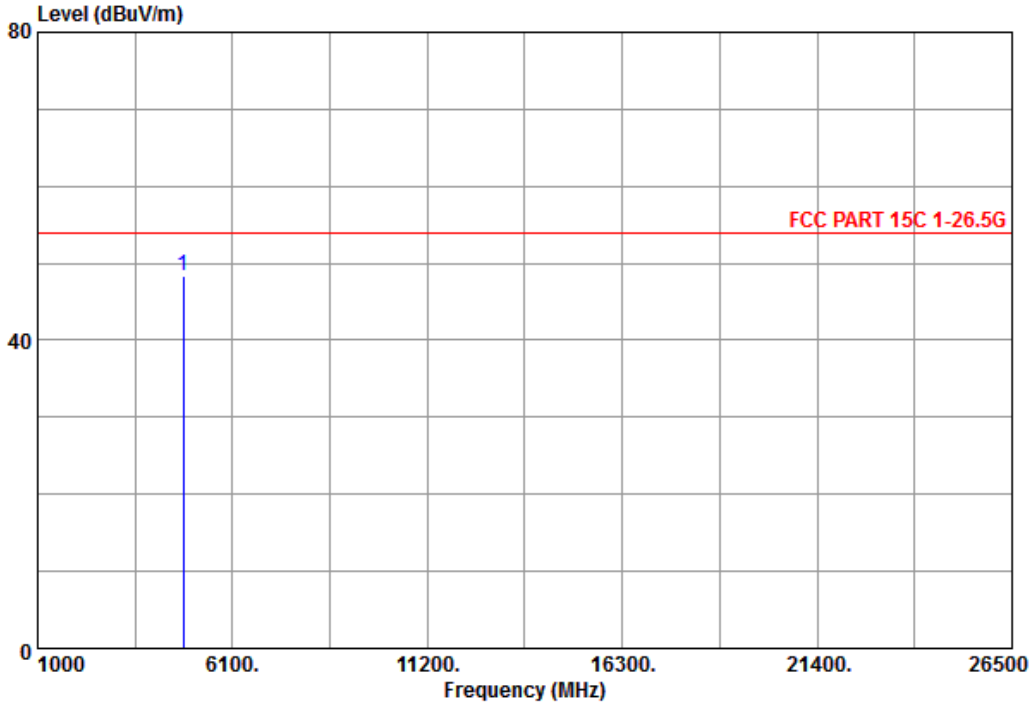
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-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	47.90	0.49	48.39	54.00	-5.61	---	---	

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

@ :Maximum Data x :Over Limit

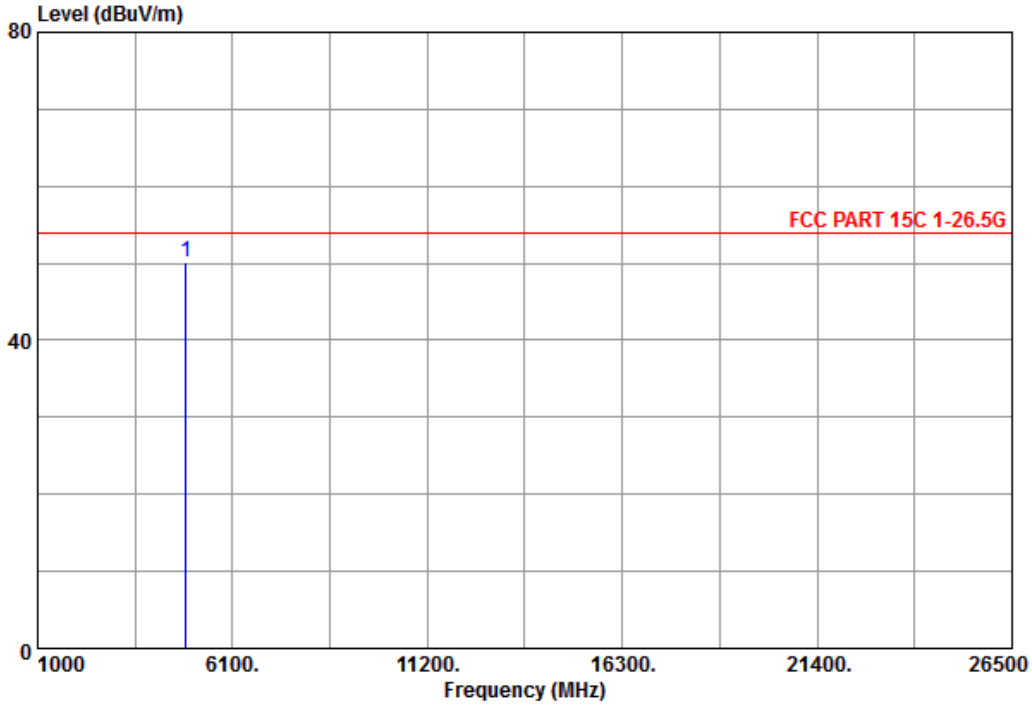
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-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	49.42	0.80	50.22	54.00	-3.78	---	---	

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

@ :Maximum Data x :Over Limit

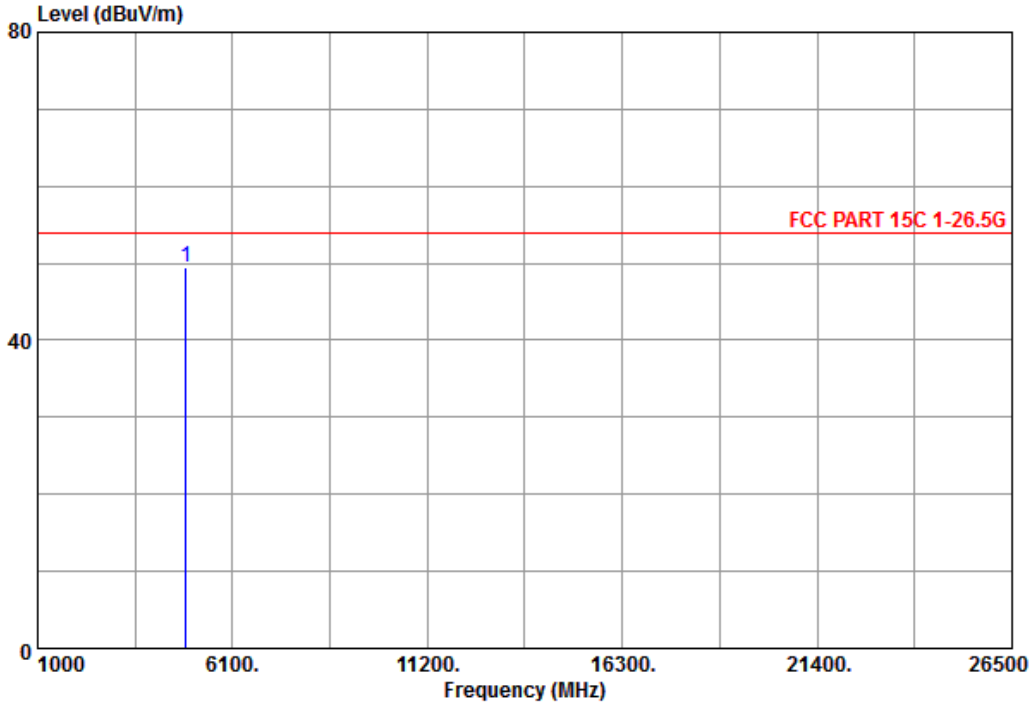
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-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	48.67	0.80	49.47	54.00	-4.53	---	---	

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

@ :Maximum Data x :Over Limit

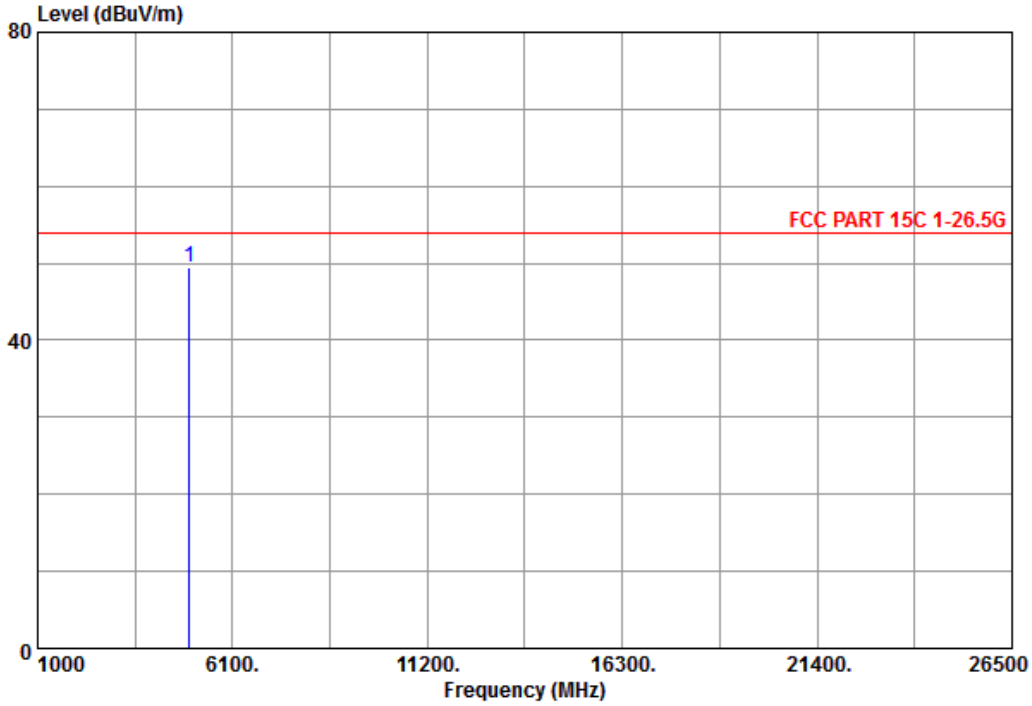
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-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	@4960.000	48.22	1.15	49.37	54.00	-4.63	---	---	

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

@ :Maximum Data x :Over Limit

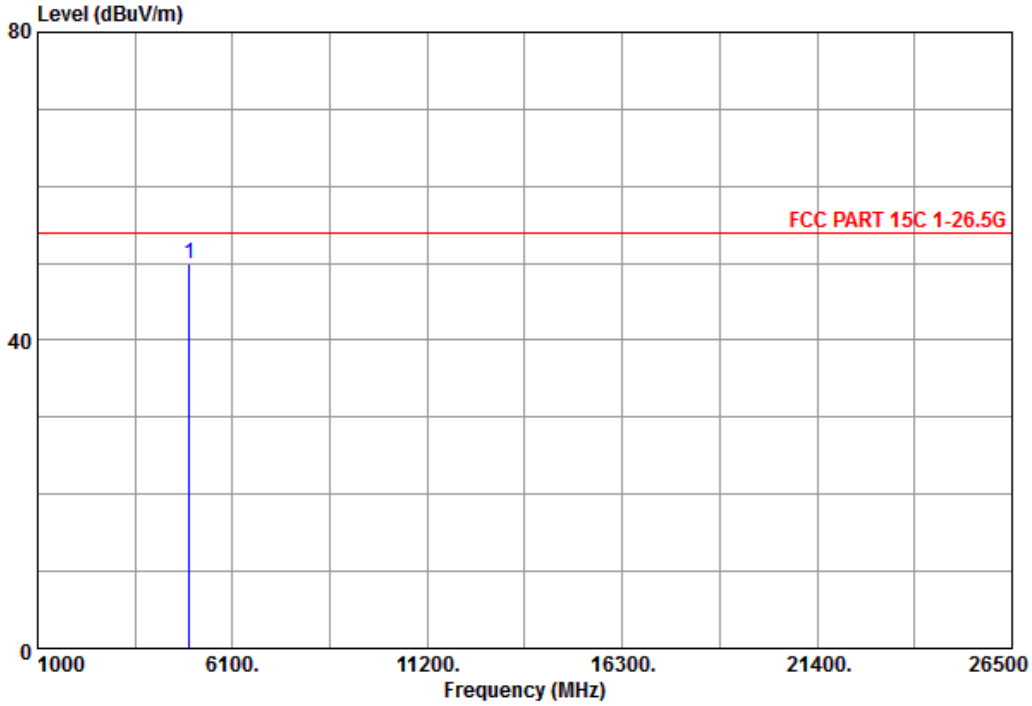
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-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	@4960.000	48.66	1.15	49.81	54.00	-4.19	---	---	

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

@ :Maximum Data x :Over Limit

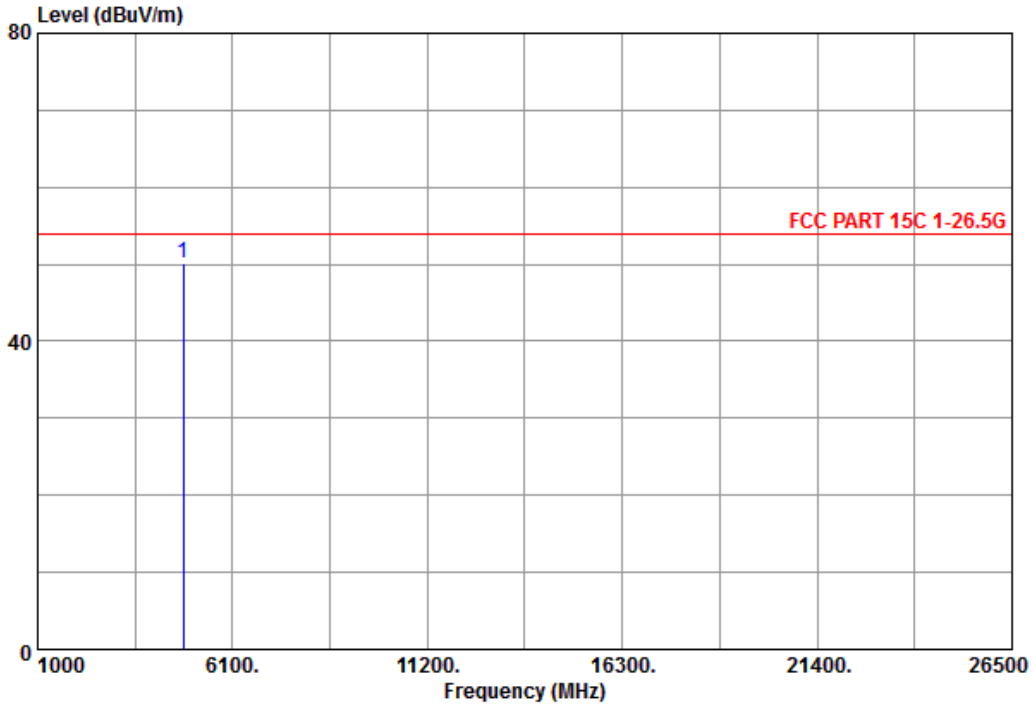
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Vertical	Channel	:	CH00 (2402MHz) EDR 2Mbps
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	49.54	0.49	50.03	54.00	-3.97	---	---	

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

@ :Maximum Data x :Over Limit

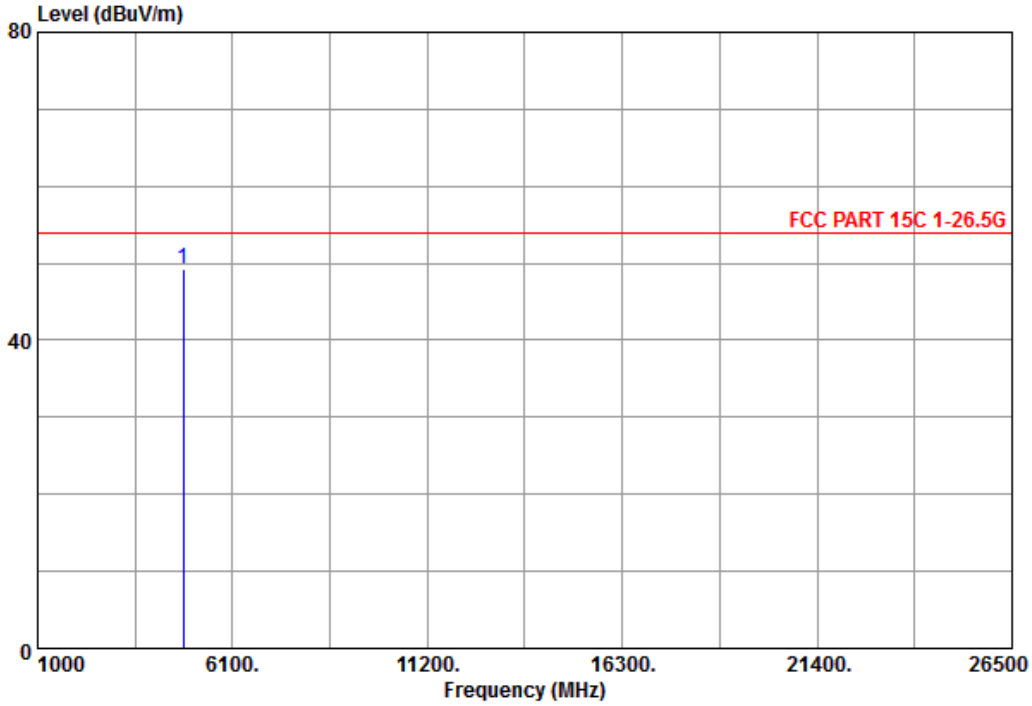
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Horizontal	Channel	:	CH00 (2402MHz) EDR 2Mbps
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	48.69	0.49	49.18	54.00	-4.82	---	---	

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

@ :Maximum Data x :Over Limit

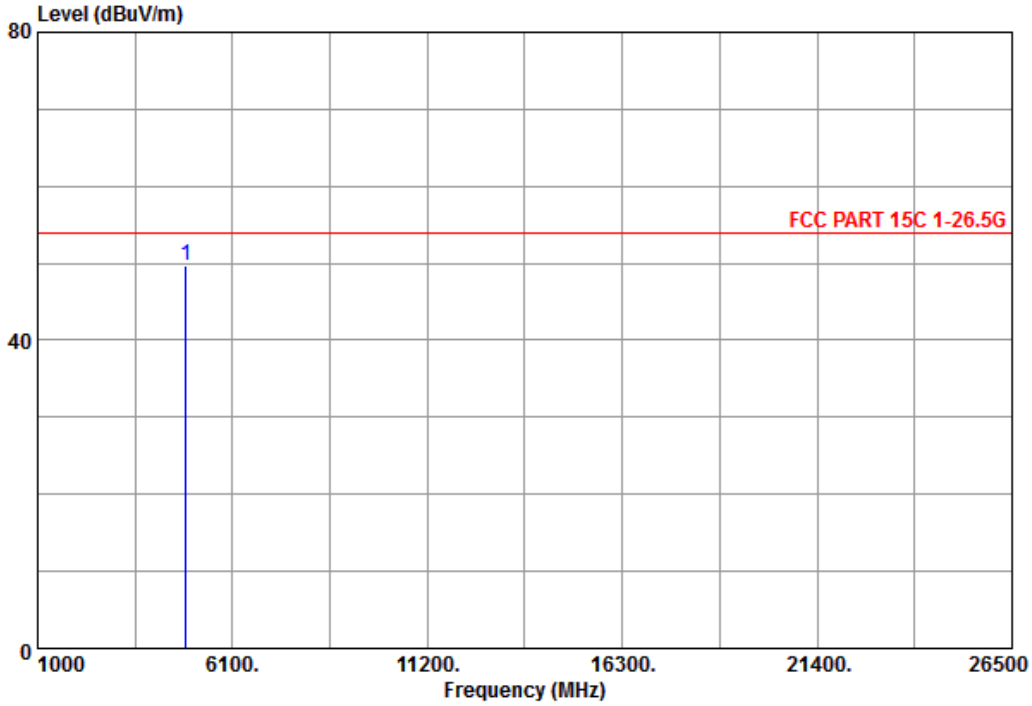
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Vertical	Channel	:	CH39 (2441MHz) EDR 2Mbps
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	48.99	0.80	49.79	54.00	-4.21	---	---	

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

@ :Maximum Data x :Over Limit

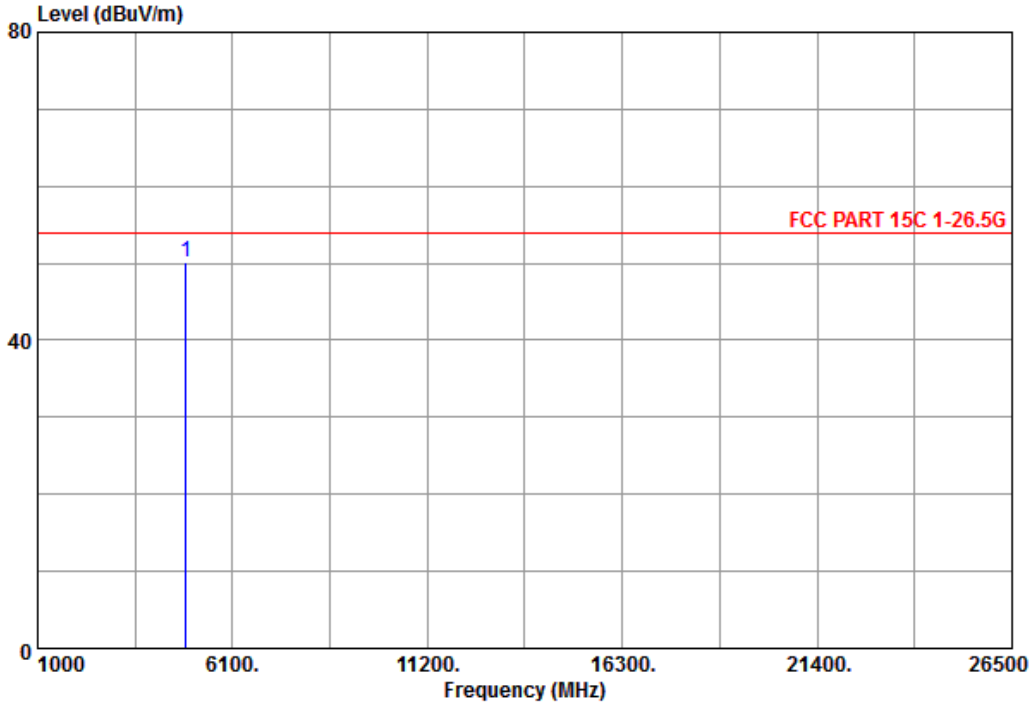
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Horizontal	Channel	:	CH39 (2441MHz) EDR 2Mbps
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	49.30	0.80	50.10	54.00	-3.90	---	---	

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

@ :Maximum Data x :Over Limit

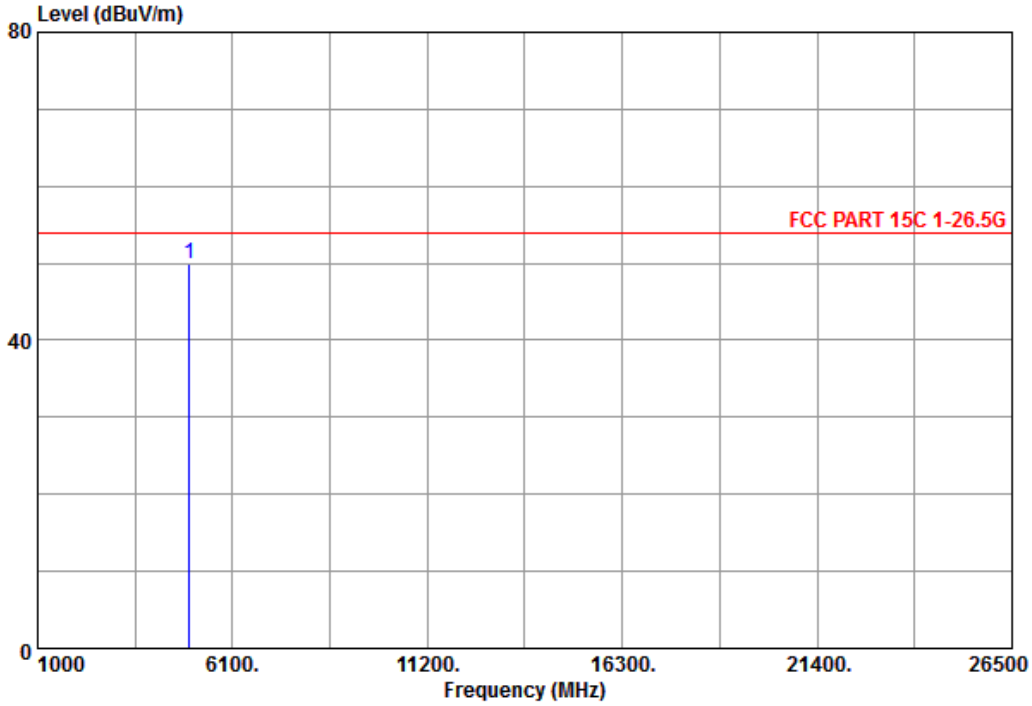
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Vertical	Channel	:	CH78 (2480MHz) EDR 2Mbps
EUT Position	:	Vertical			



Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1 @4960.000	48.74	1.15	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

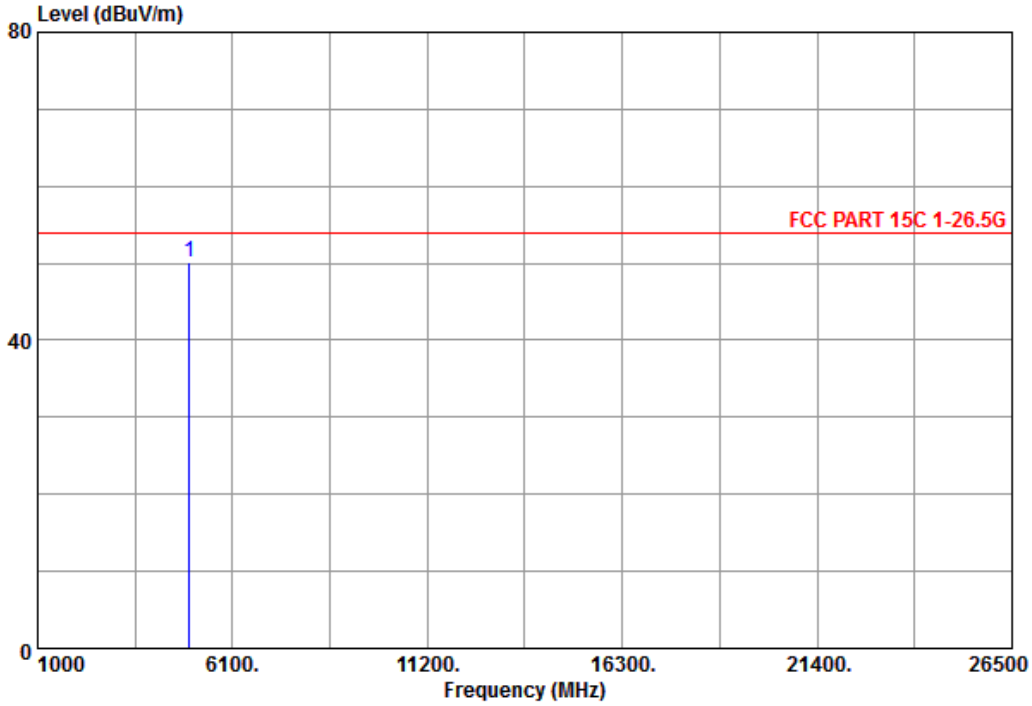
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Horizontal	Channel	:	CH78 (2480MHz) EDR 2Mbps
EUT Position	:	Vertical			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4960.000	48.93	1.15	50.08	54.00	-3.92	---	---	

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

@ :Maximum Data x :Over Limit

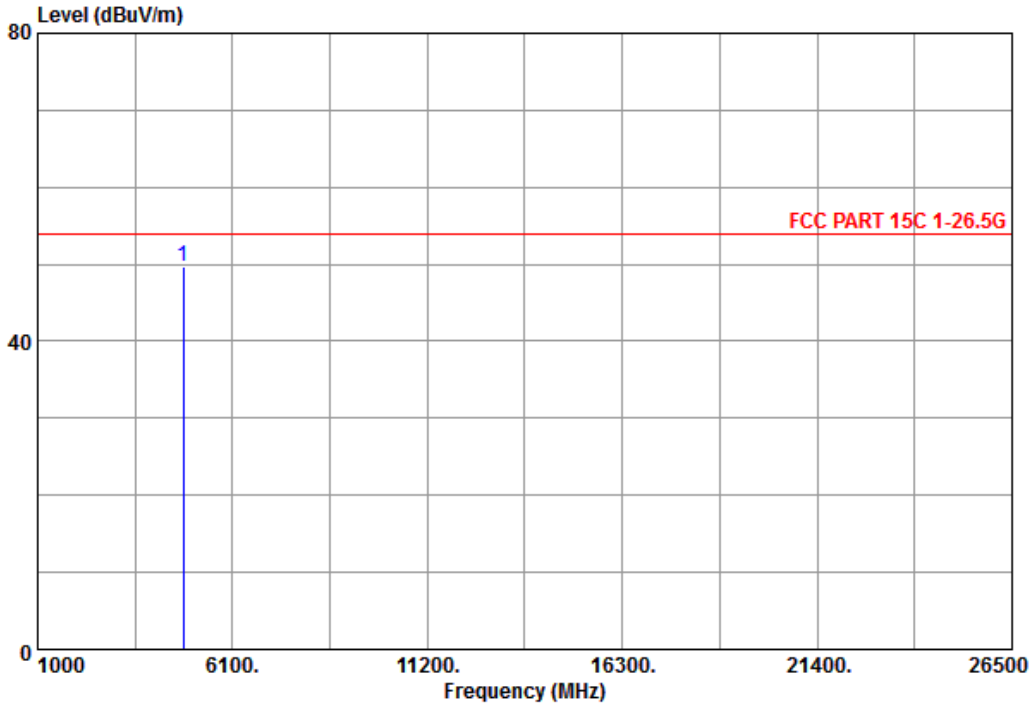
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Vertical	Channel	:	CH00 (2402MHz) EDR 3Mbps
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	49.30	0.49	49.79	54.00	-4.21	---	---	

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

@ :Maximum Data x :Over Limit

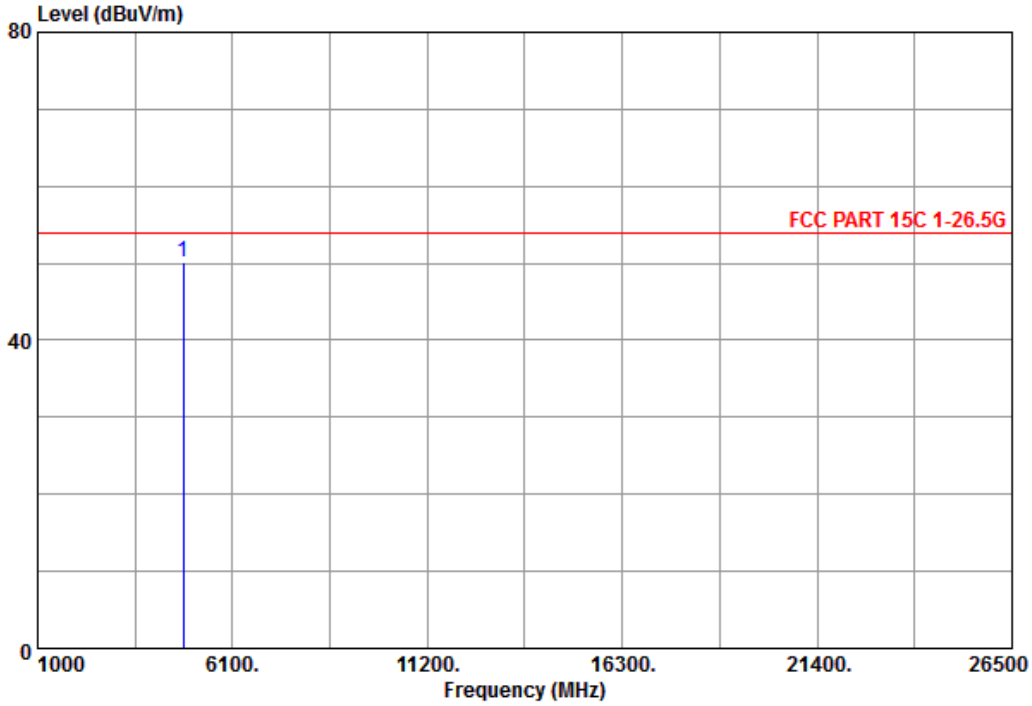
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Horizontal	Channel	:	CH00 (2402MHz) EDR 3Mbps
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	49.63	0.49	50.12	54.00	-3.88	---	---	

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

@ :Maximum Data x :Over Limit

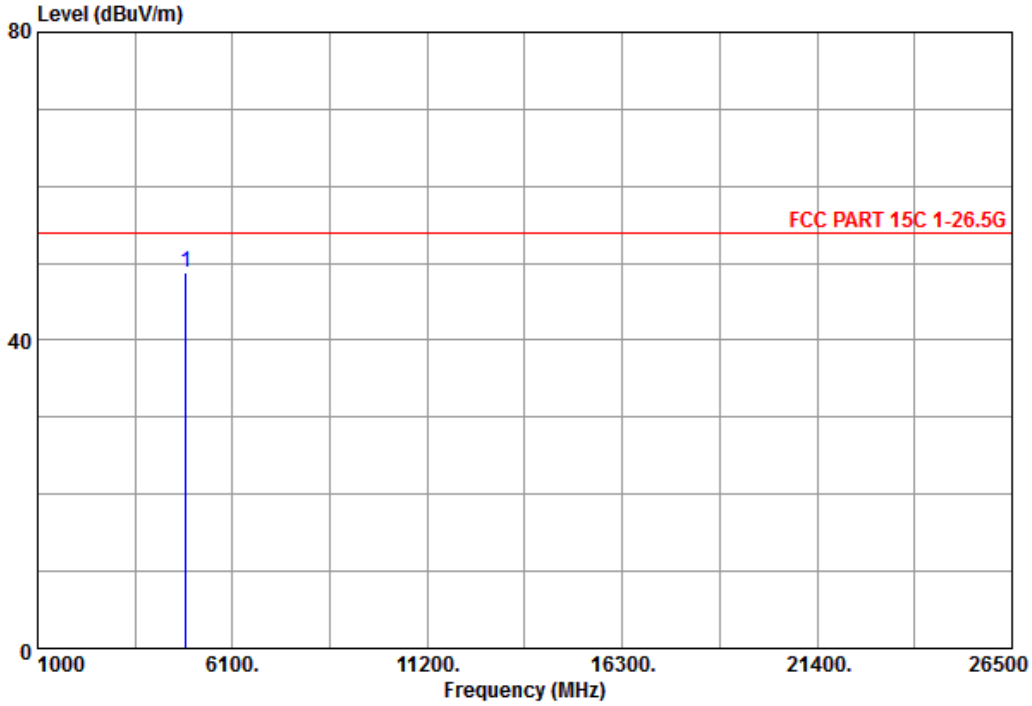
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Vertical	Channel	:	CH39 (2441MHz) EDR 3Mbps
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	47.99	0.80	48.79	54.00	-5.21	---	---	

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

@ :Maximum Data x :Over Limit

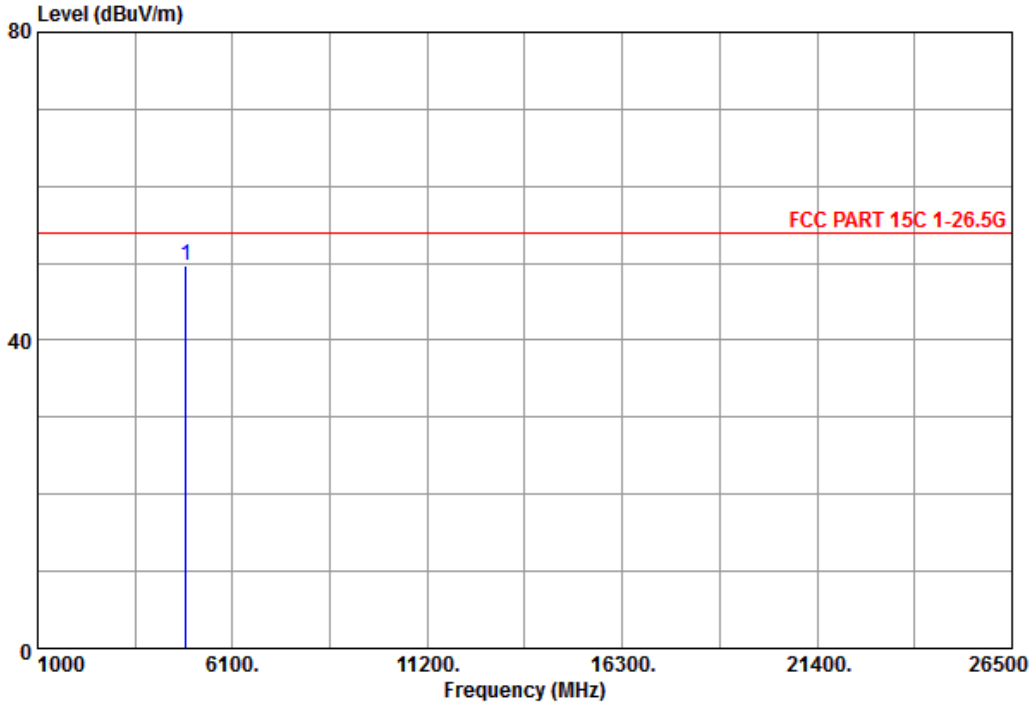
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Horizontal	Channel	:	CH39 (2441MHz) EDR 3Mbps
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	48.90	0.80	49.70	54.00	-4.30	---	---	

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

@ :Maximum Data x :Over Limit

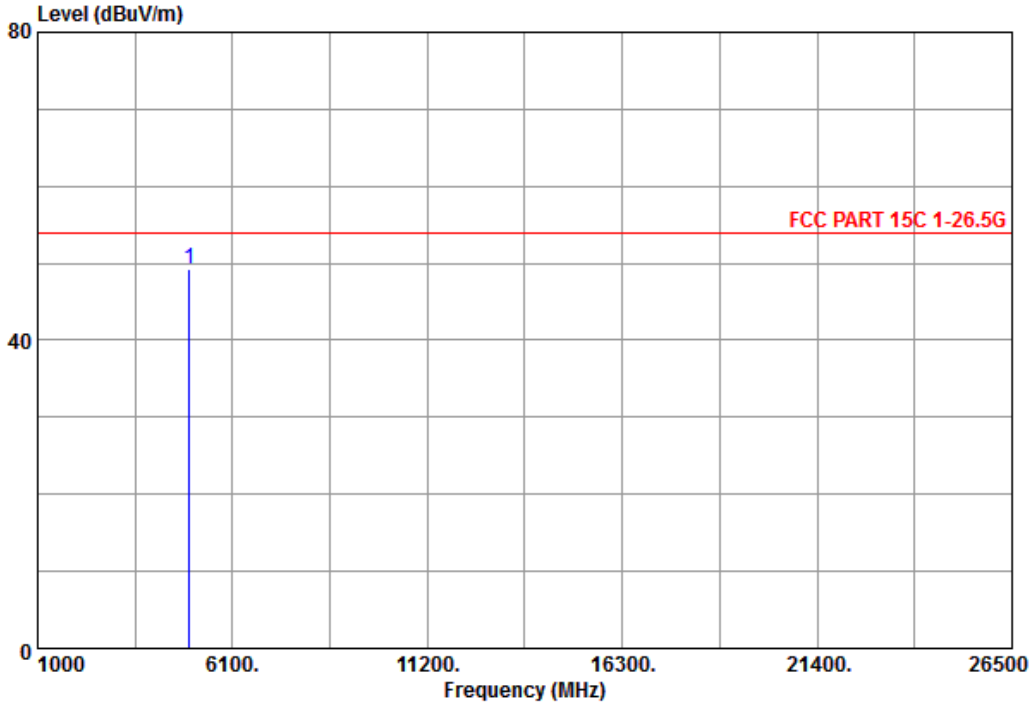
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Vertical	Channel	:	CH78 (2480MHz) EDR 3Mbps
EUT Position	:	Vertical			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4960.000	48.13	1.15	49.28	54.00	-4.72	---	---	

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

@ :Maximum Data x :Over Limit

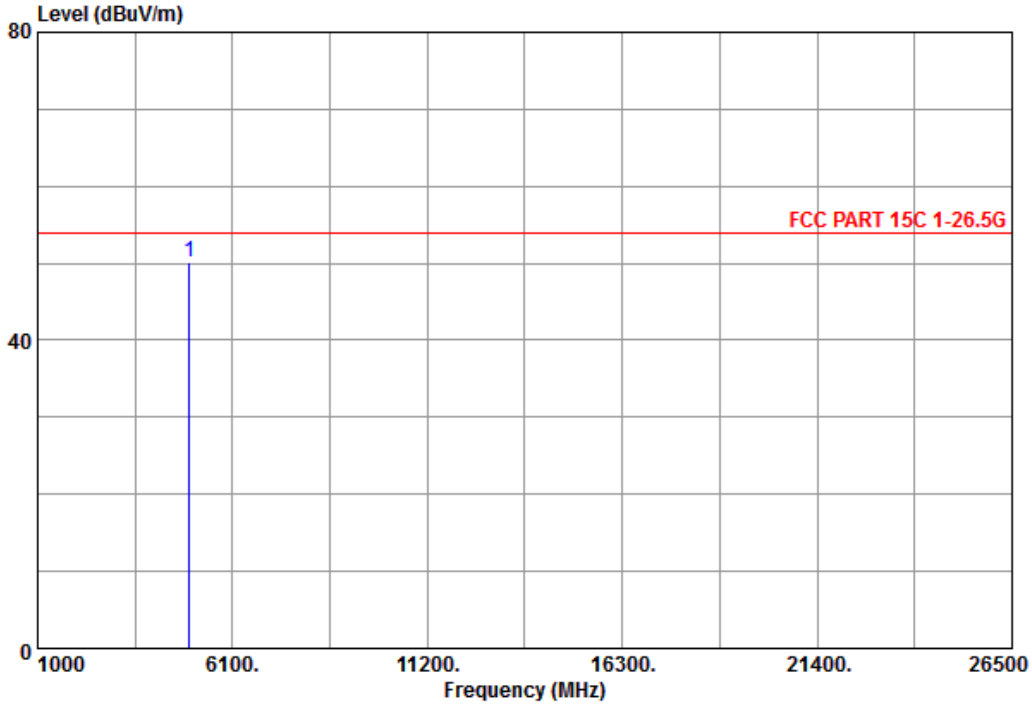
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Horizontal	Channel	:	CH78 (2480MHz) EDR 3Mbps
EUT Position	:	Vertical			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4960.000	48.96	1.15	50.11	54.00	-3.89	---	---	

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

@ :Maximum Data x :Over Limit

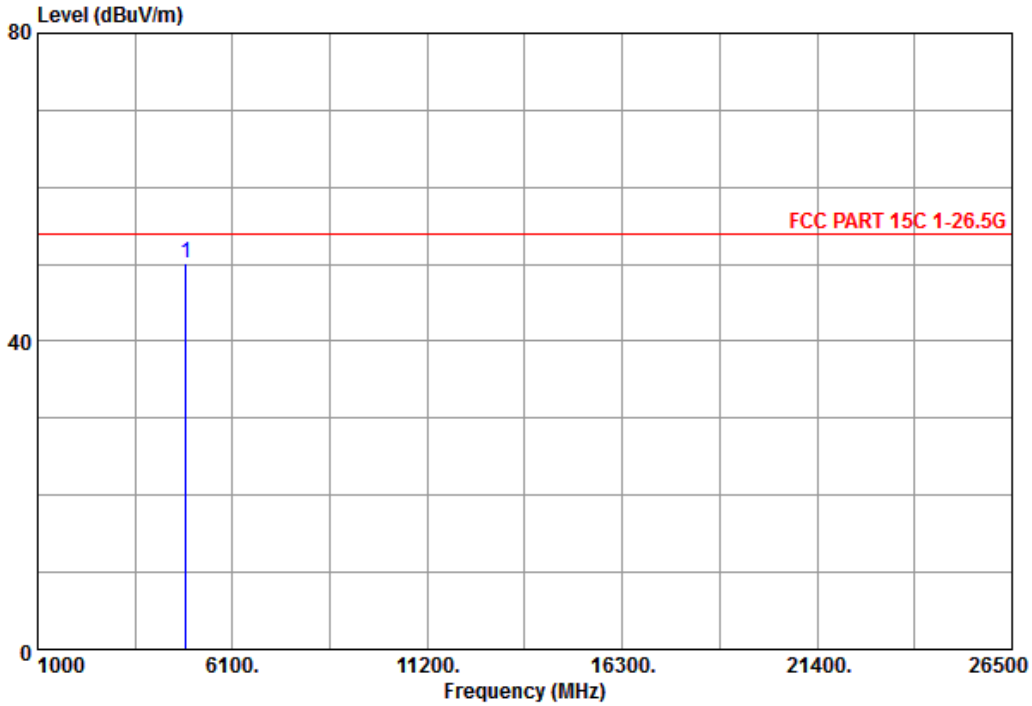
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Vertical	Channel	:	RX mode
EUT Position	:	Vertical			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4878.000	49.30	0.80	50.10	54.00	-3.90	---	---	

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

@ :Maximum Data x :Over Limit

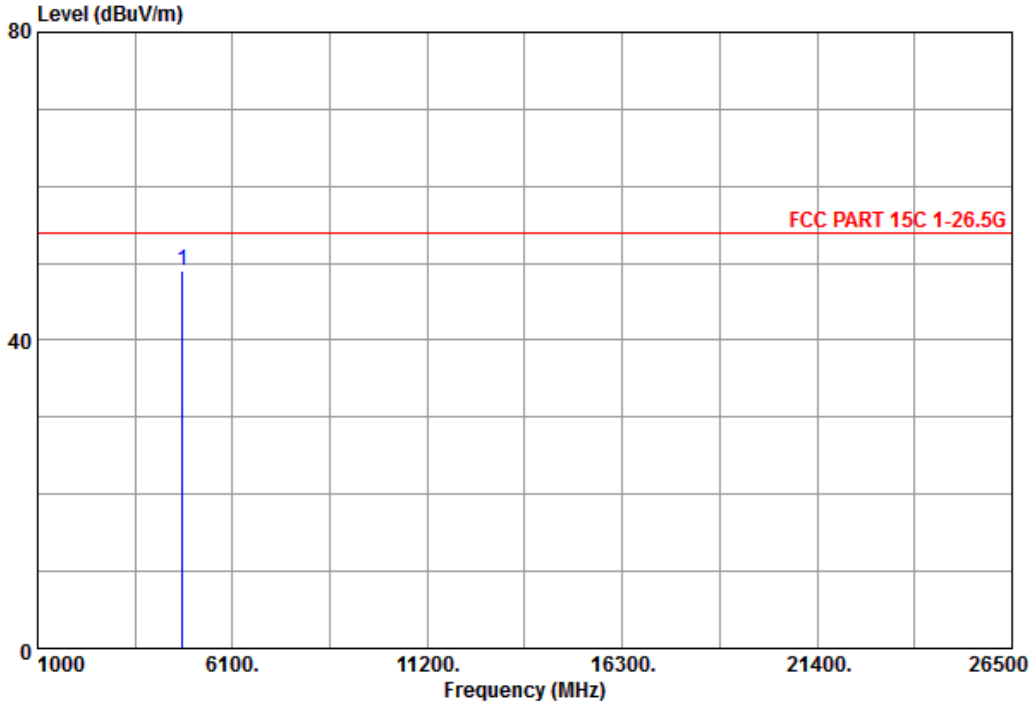
Remark：

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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Polarization	:	Horizontal	Channel	:	RX mode
EUT Position	:	Vertical			



	Freq	Reading	C.F	Result	Limit	Margin	A/pos	T/pos	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB			
1	@4799.800	48.62	0.49	49.11	54.00	-4.89	---	---	

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

@ :Maximum Data x :Over Limit

Remark：

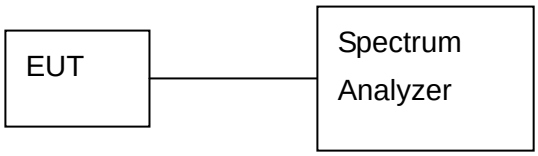
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already 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:

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.

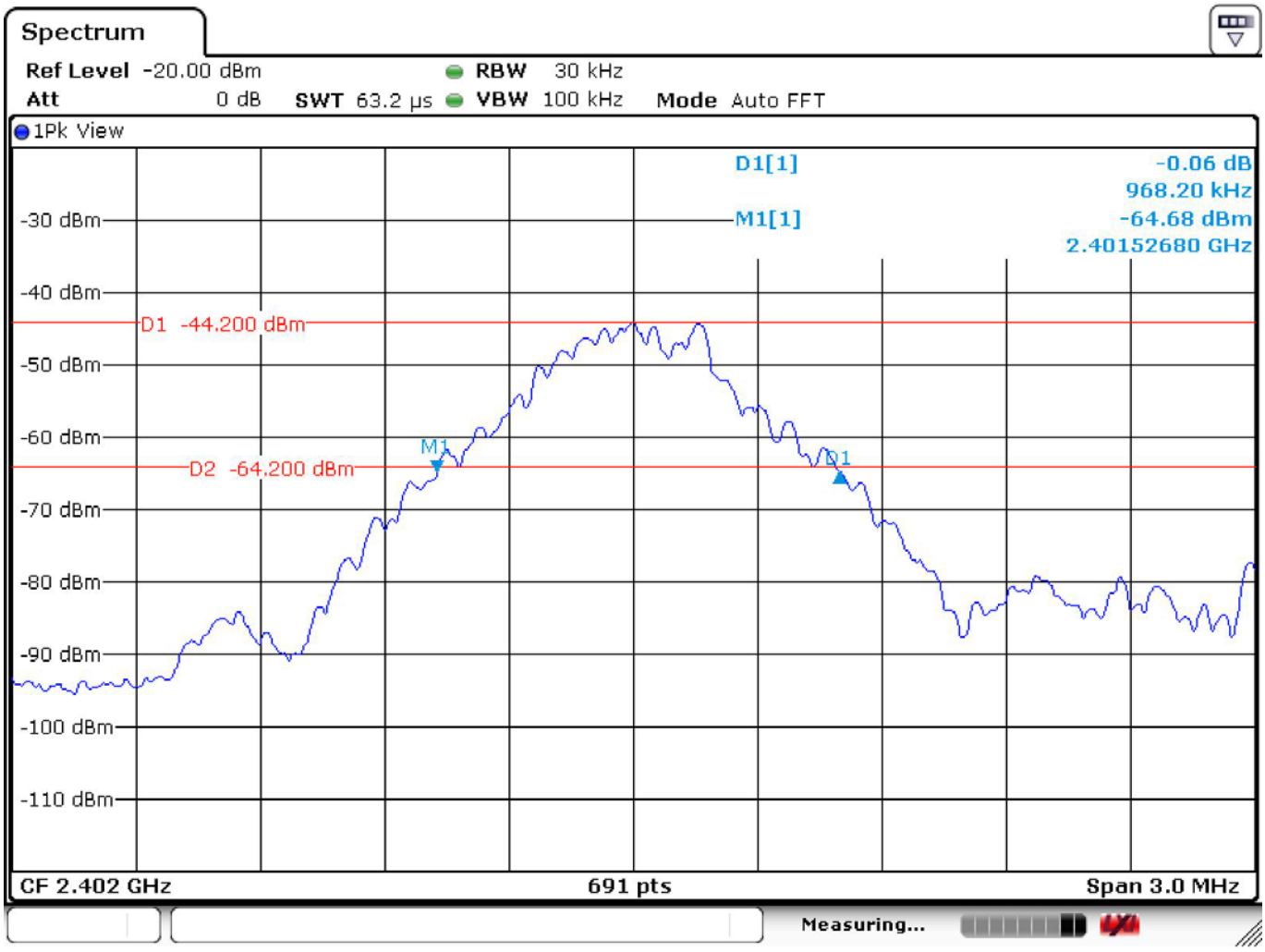
The final test data are shown on the following page(s).

Bluetooth 1 Mbps		
Channel	**Frequency (MHz)**	**20dB Bandwidth (MHz)**
Low	2402	0.9682
Middle	2441	0.9653
High	2480	0.9913

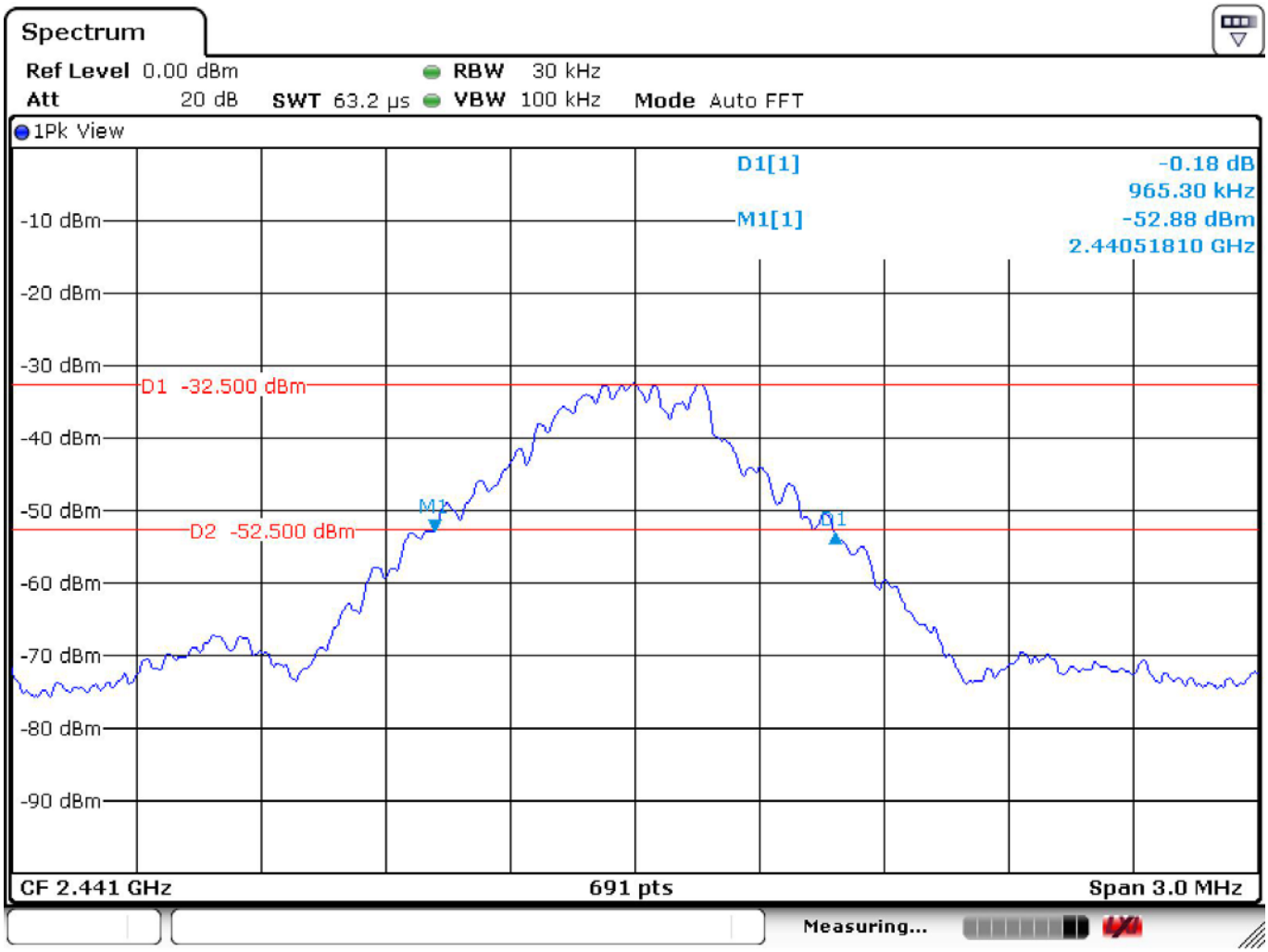
Bluetooth EDR 2 Mbps		
Channel	**Frequency (MHz)**	**20dB Bandwidth (MHz)**
Low	2402	1.2929
Middle	2441	1.2855
High	2480	1.3111

Bluetooth EDR 3 Mbps		
Channel	**Frequency (MHz)**	**20dB Bandwidth (MHz)**
Low	2402	0.8581
Middle	2441	0.8559
High	2480	0.8587

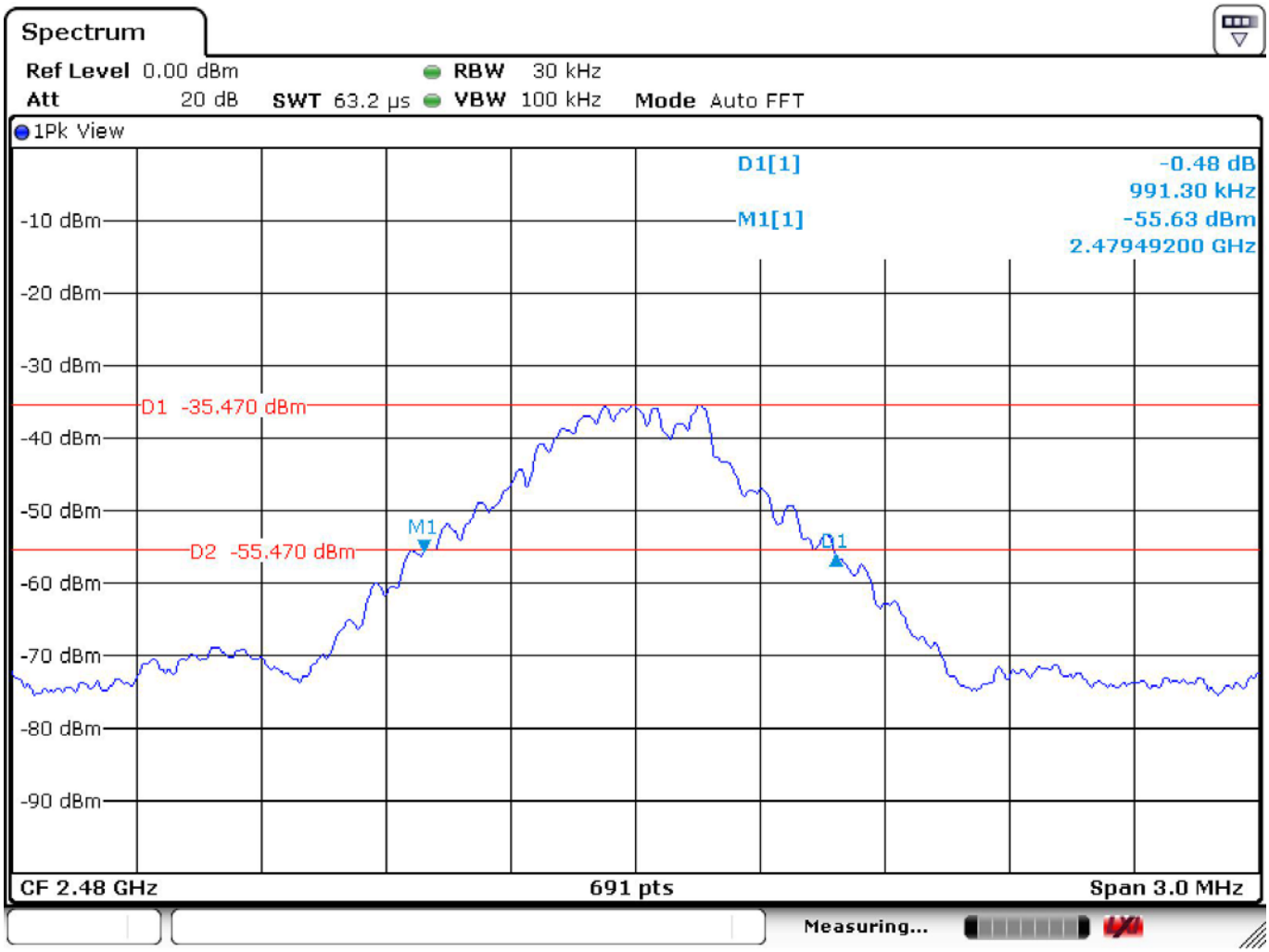
Temperature	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Test Mode	:	BT (1 Mbps)	Channel	:	00



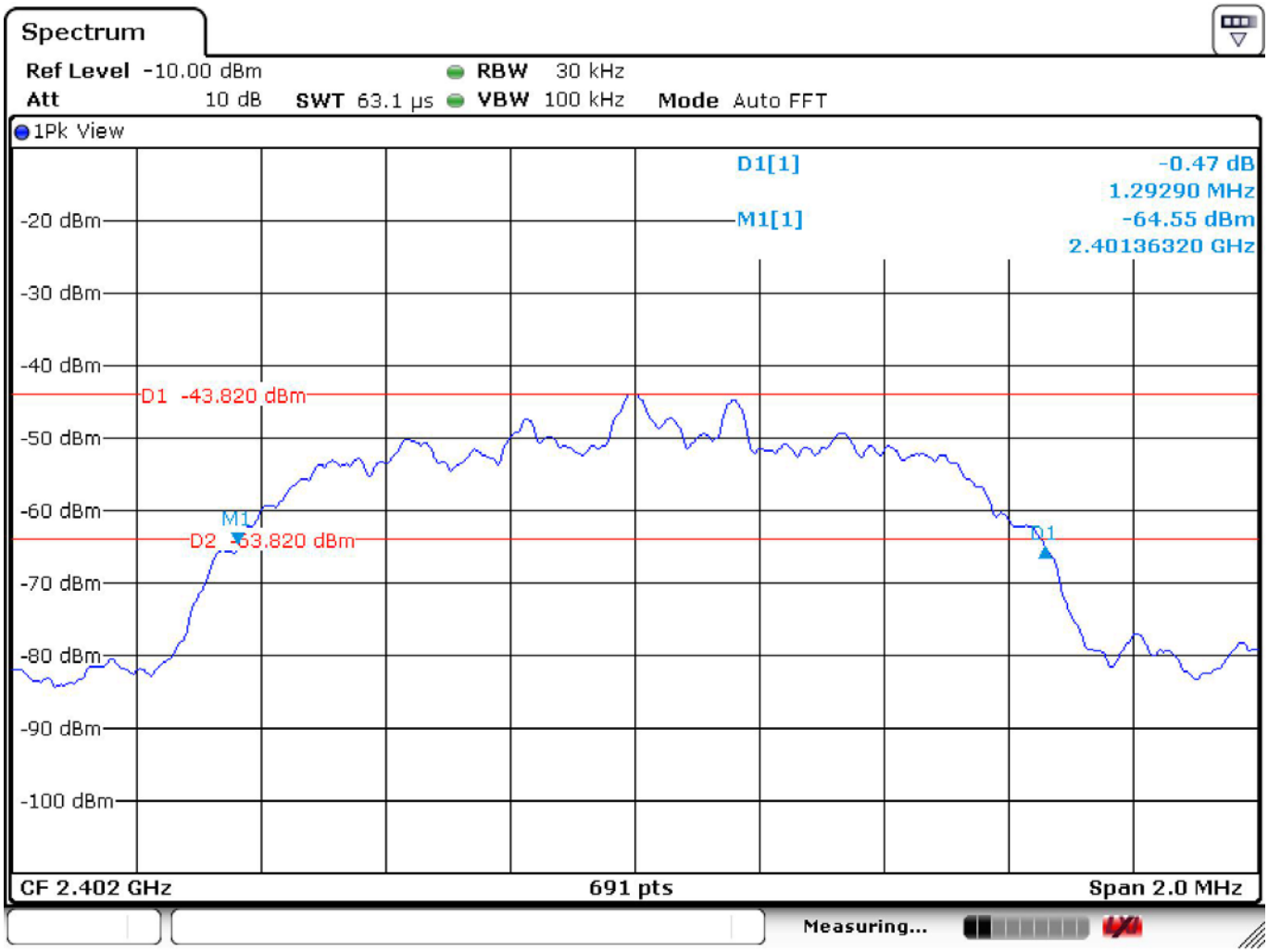
Test Mode	:	BT (1 Mbps)	Channel	:	39


Spectrum
Ref Level 0.00 dBm
RBW 30 kHz
Att 20 dB
SWT 63.2 µs
VBW 100 kHz
Mode Auto FFT
1Pk View
D1[1]
-0.18 dB
965.30 kHz
M1[1]
-52.88 dBm
2.44051810 GHz
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
D1 -32.500 dBm
D2 -52.500 dBm
M1
D1
CF 2.441 GHz
691 pts
Span 3.0 MHz
Measuring...

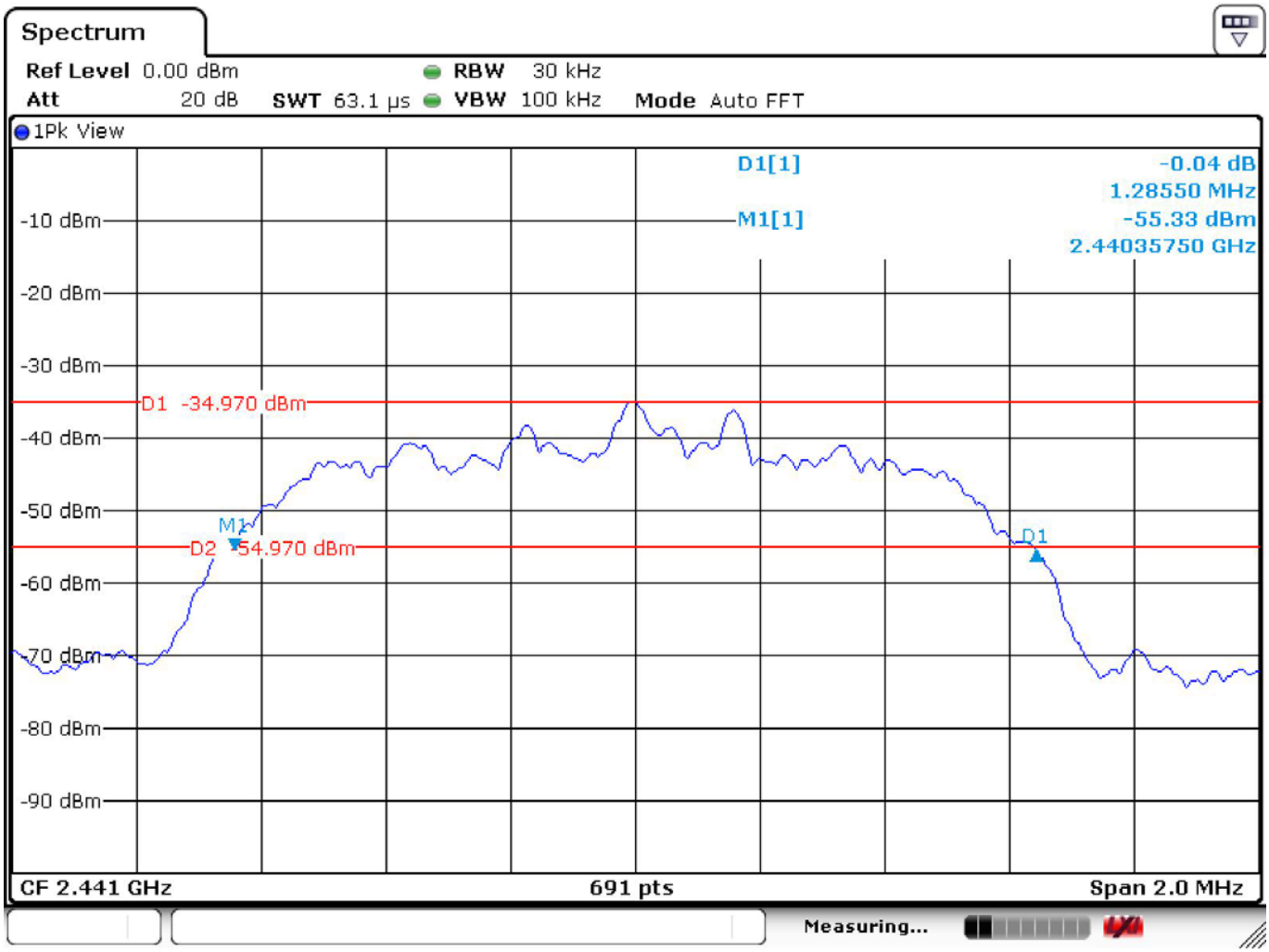
Test Mode : BT (1 Mbps) Channel : 78



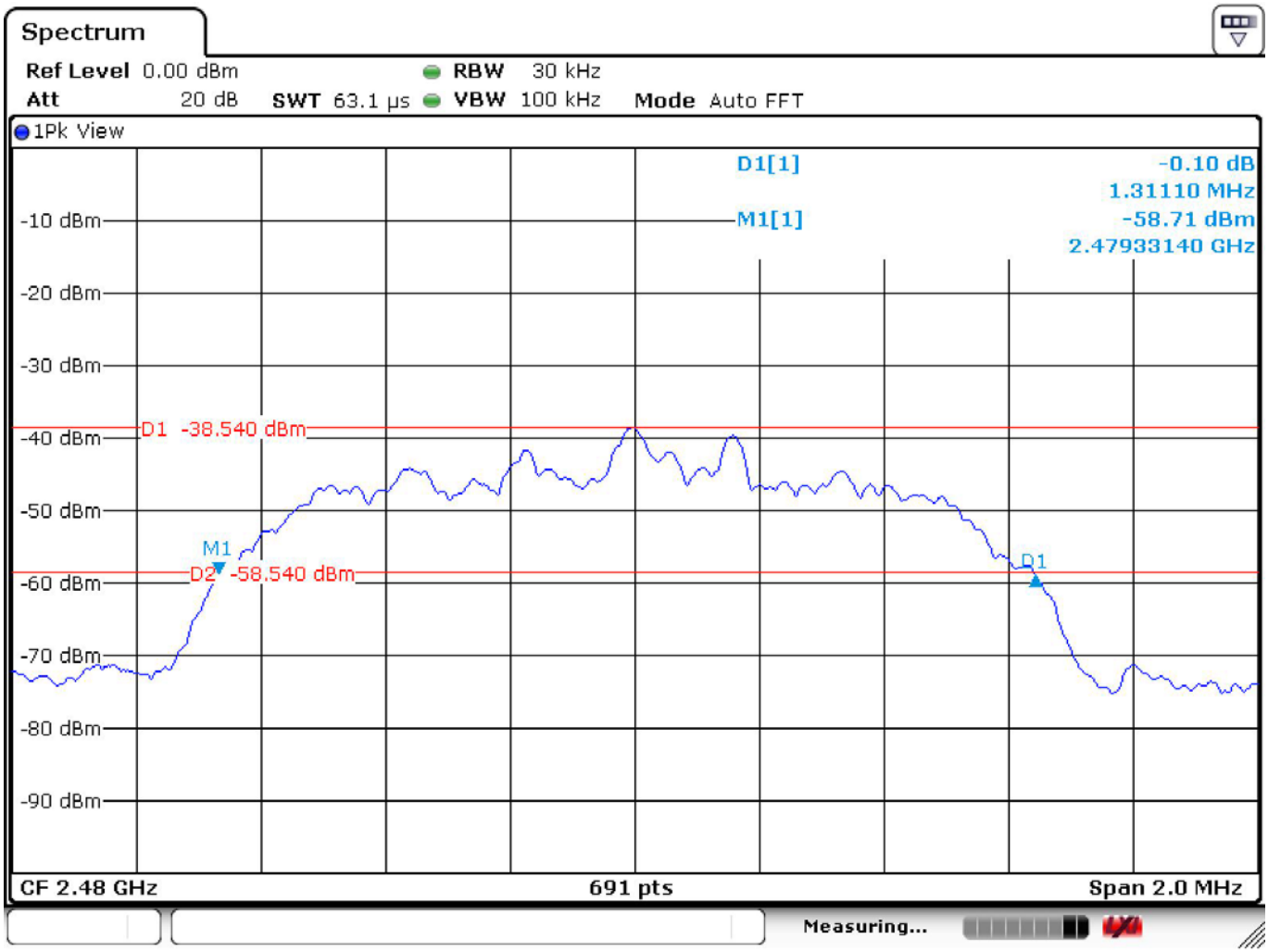
Test Mode : BT EDR (2 Mbps) Channel : 00


Spectrum
Ref Level -10.00 dBm
RBW 30 kHz
Att 10 dB
SWT 63.1 µs
VBW 100 kHz
Mode Auto FFT
1Pk View
D1[1]
-0.47 dB
1.29290 MHz
M1[1]
-64.55 dBm
2.40136320 GHz
-20 dBm
-30 dBm
-40 dBm
D1 -43.820 dBm
-50 dBm
-60 dBm
M1
D2 -63.820 dBm
-70 dBm
-80 dBm
-90 dBm
-100 dBm
CF 2.402 GHz
691 pts
Span 2.0 MHz
Measuring...

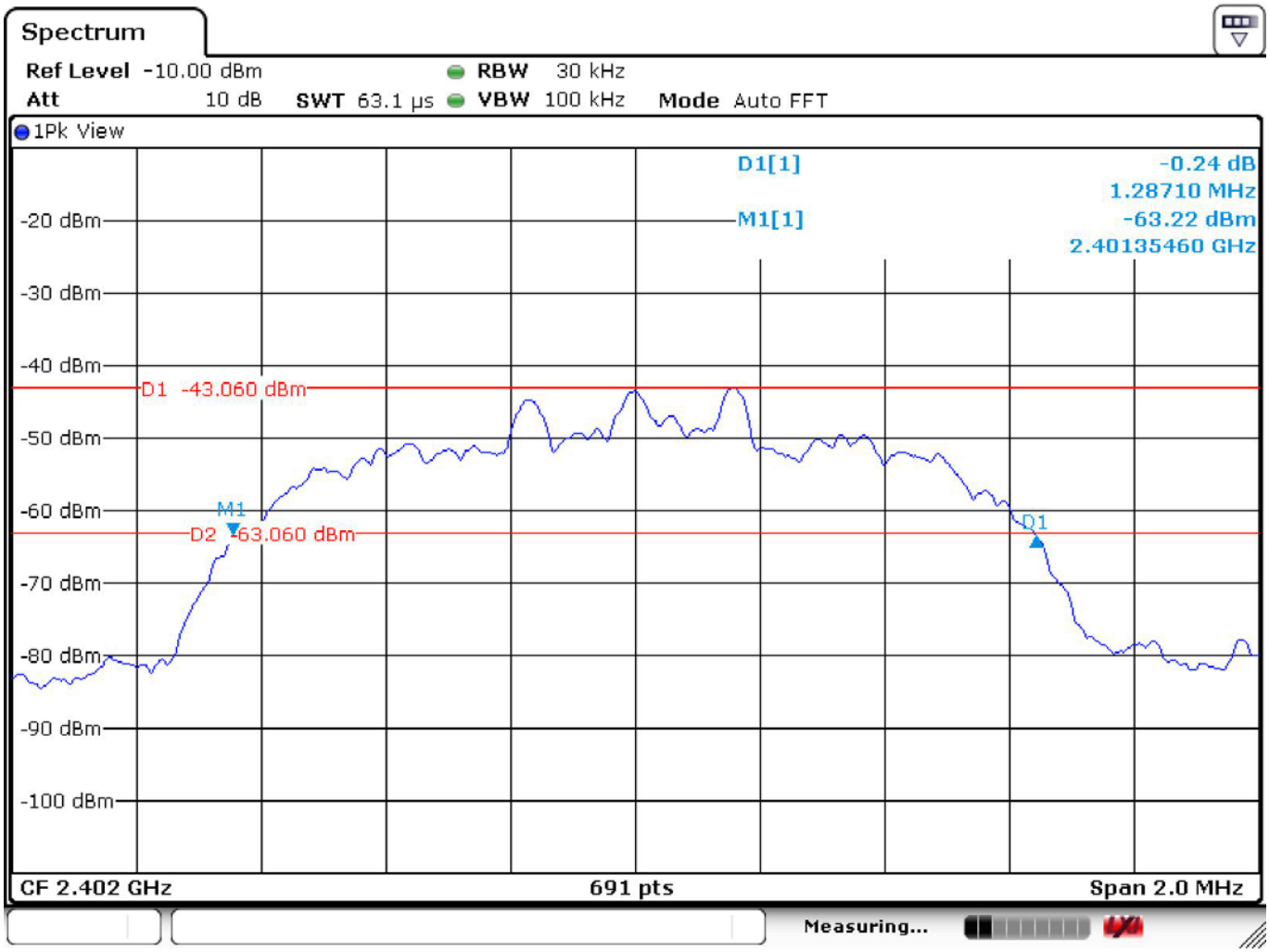
Test Mode : BT EDR (2 Mbps) Channel : 39



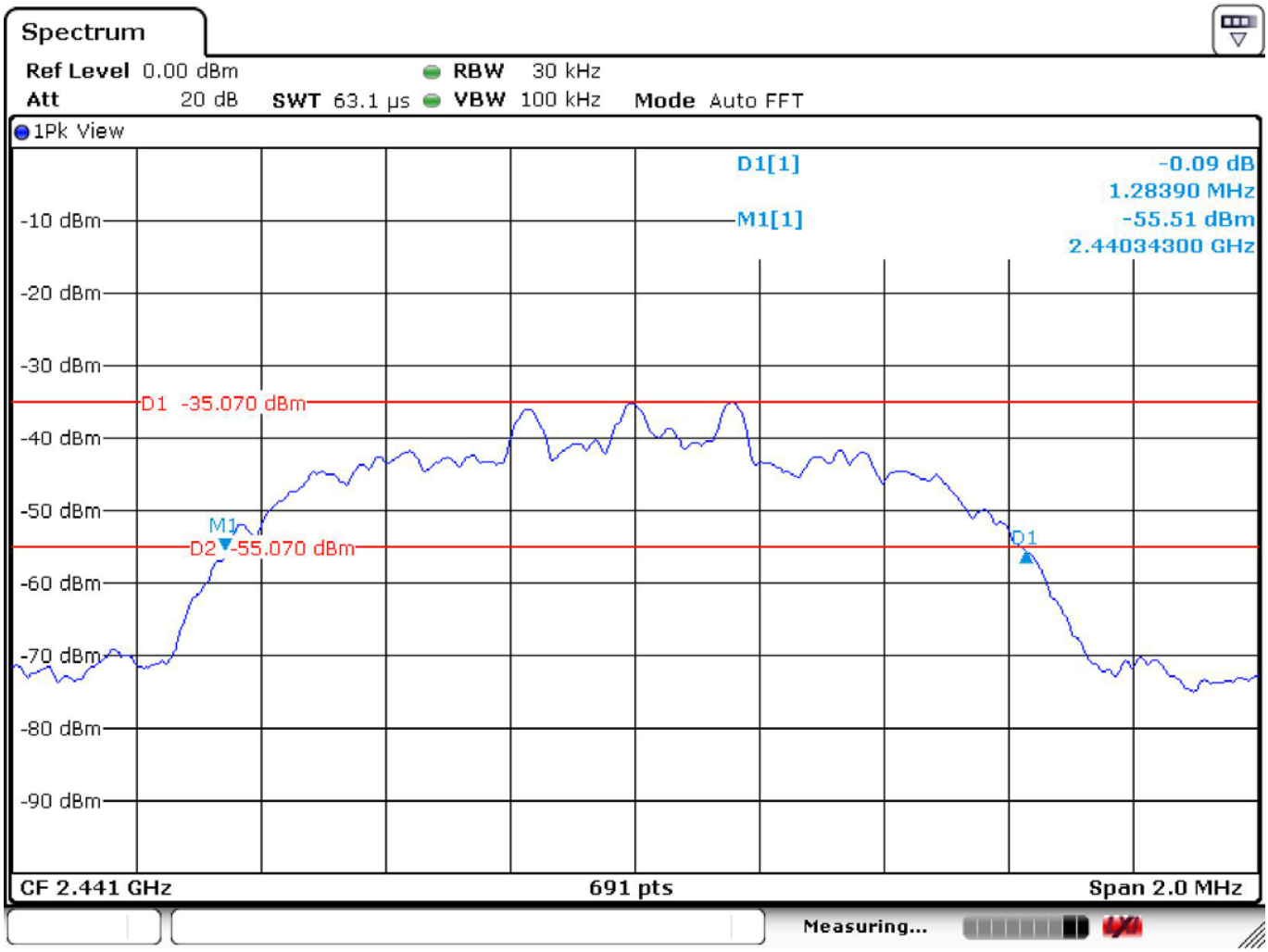
Test Mode : BT EDR (2 Mbps) Channel : 78


Spectrum
Ref Level 0.00 dBm
RBW 30 kHz
Att 20 dB
SWT 63.1 µs
VBW 100 kHz
Mode Auto FFT
1Pk View
D1[1]
-0.10 dB
1.31110 MHz
M1[1]
-58.71 dBm
2.47933140 GHz
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
D1 -38.540 dBm
M1
D2 -58.540 dBm
D1
CF 2.48 GHz
691 pts
Span 2.0 MHz
Measuring...

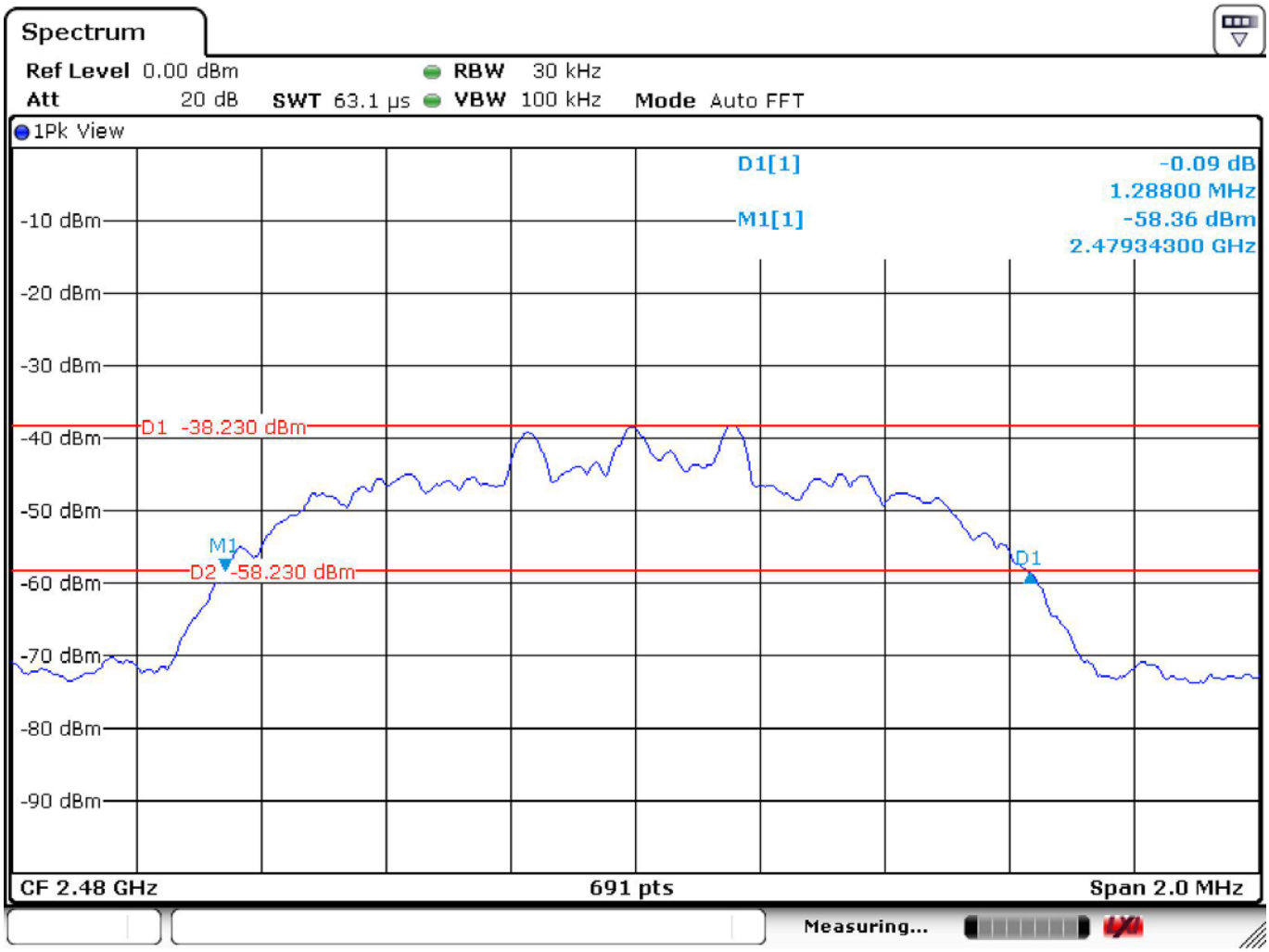
Test Mode : BT EDR (3 Mbps) Channel : 00



Test Mode : BT EDR (3 Mbps) Channel : 39


Spectrum
Ref Level 0.00 dBm
RBW 30 kHz
Att 20 dB
SWT 63.1 µs
VBW 100 kHz
Mode Auto FFT
1Pk View
D1[1]
-0.09 dB
1.28390 MHz
M1[1]
-55.51 dBm
2.44034300 GHz
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
D1 -35.070 dBm
M1
D2 -55.070 dBm
D1
CF 2.441 GHz
691 pts
Span 2.0 MHz
Measuring...

Test Mode : BT EDR (3 Mbps) Channel : 78

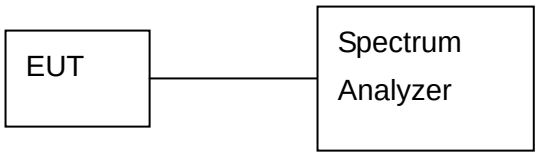


5 Hopping Frequency Separation

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.

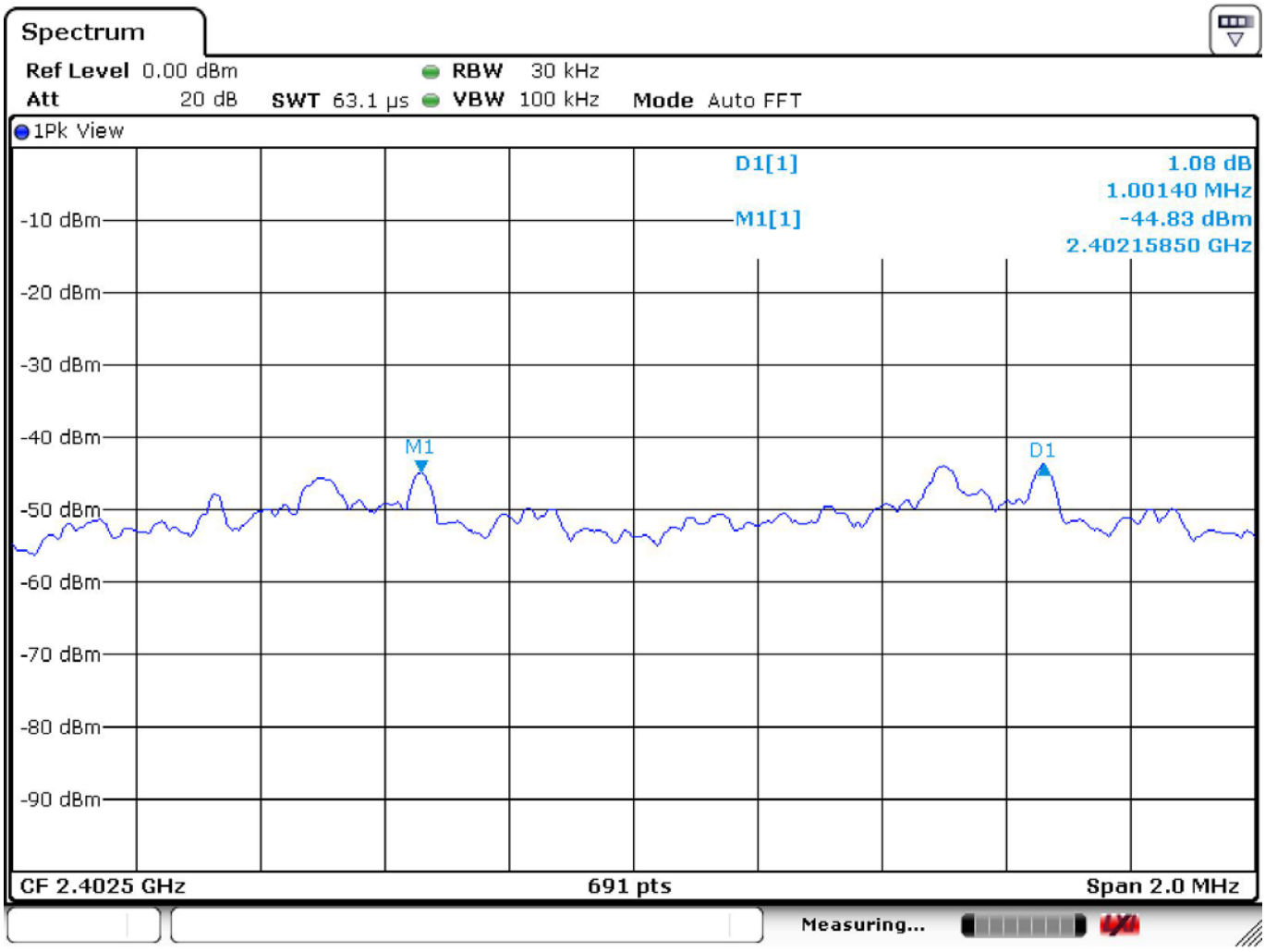
5.4 Test Result

Compliance.

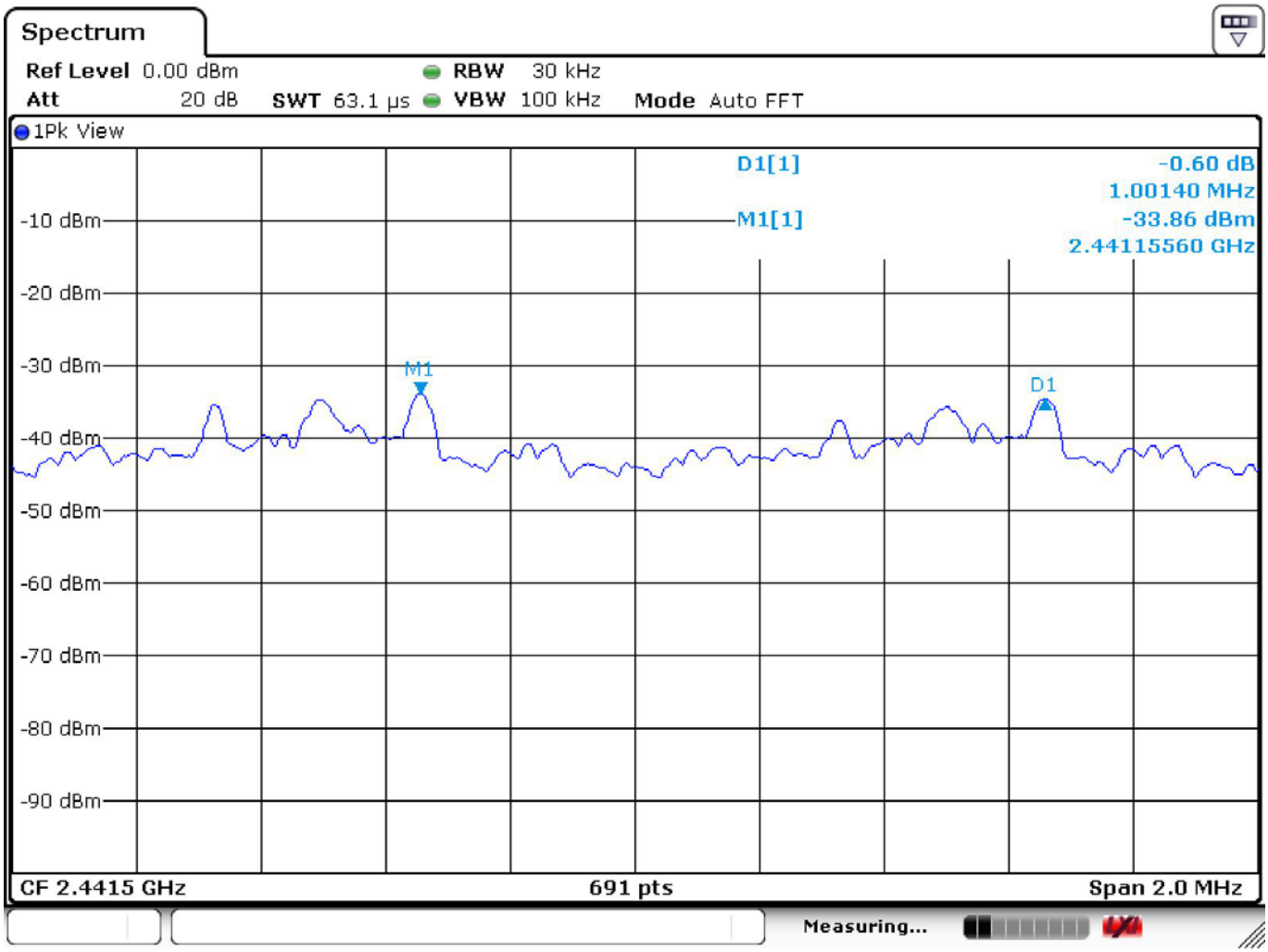
The final test data are shown on the following page(s).

Bluetooth EDR 3 Mbps					
Channel	**Frequency (MHz)**	**20 dB bandwidth (MHz)**	**Limit (2/3 of 20dB bandwidth) (MHz)**	**Result**	**Verdict**
Low	2402	1.2871	0.8581	1.0014	Pass
Middle	2441	1.2839	0.8559	1.0014	Pass
High	2480	1.2880	0.8587	1.0014	Pass

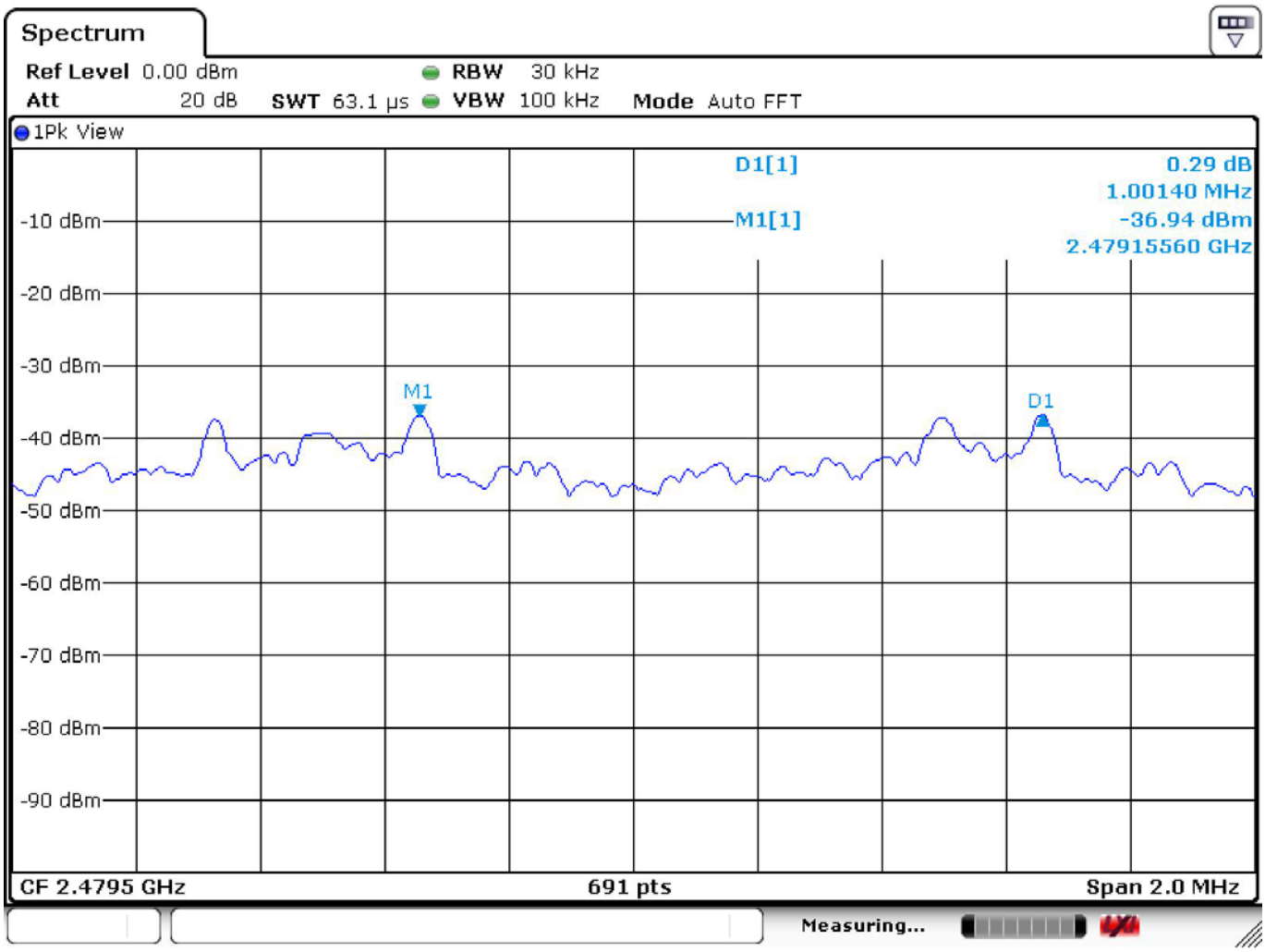
Temperature	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Test Mode	:	BT EDR (3 Mbps)	Channel	:	Low



Test Mode	:	BT EDR (3 Mbps)	Channel	:	Middle


Spectrum
Ref Level 0.00 dBm
RBW 30 kHz
Att 20 dB
SWT 63.1 µs
VBW 100 kHz
Mode Auto FFT
1Pk View
D1[1] -0.60 dB
1.00140 MHz
M1[1] -33.86 dBm
2.44115560 GHz
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
M1
D1
CF 2.4415 GHz
691 pts
Span 2.0 MHz
Measuring...

Test Mode : BT EDR (3 Mbps) Channel : High

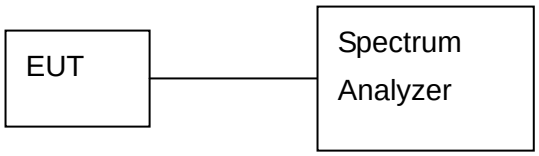


6 Number of Hopping Channels

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))

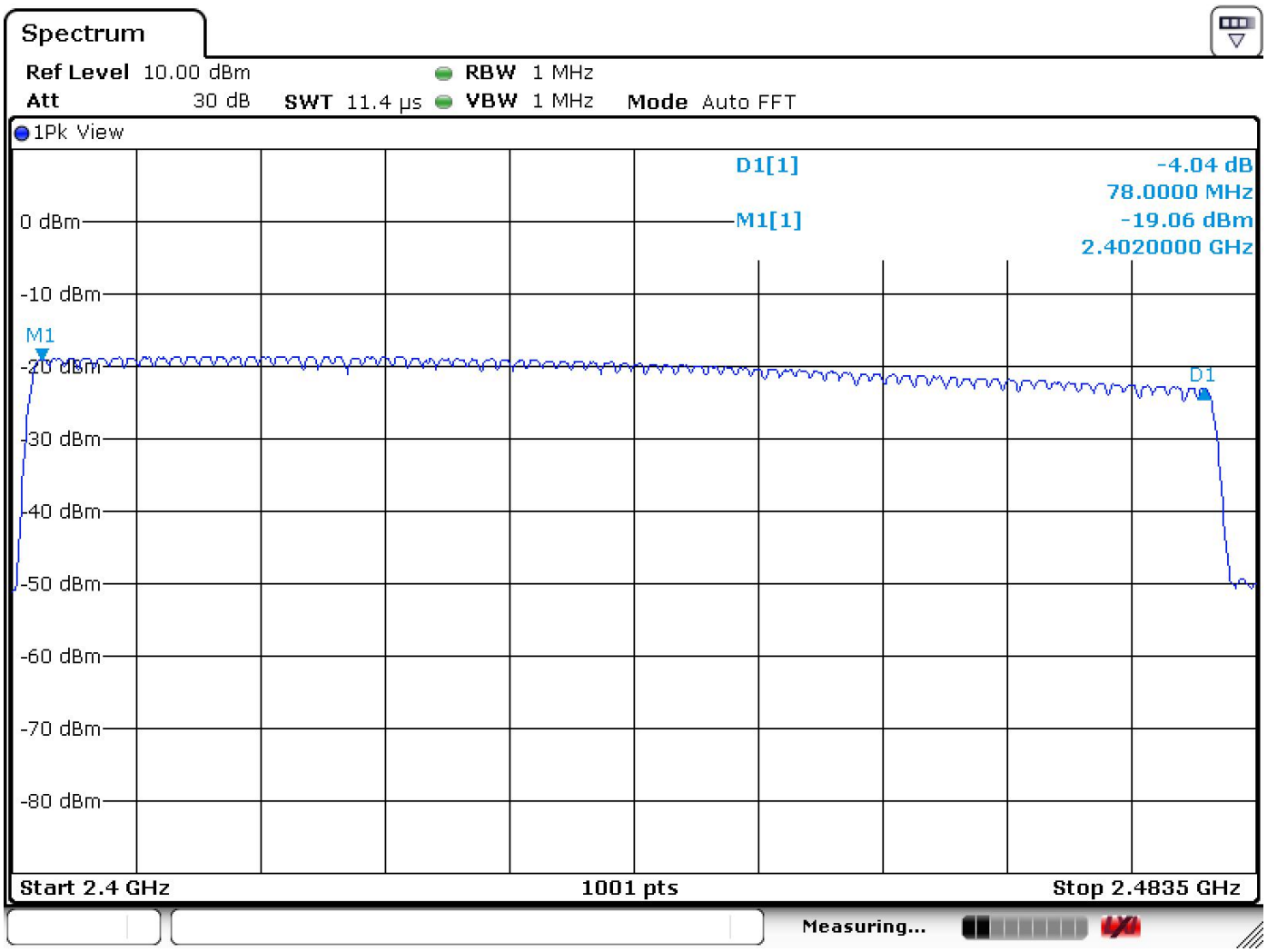
Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

6.4 Test Result

79 Channels have been used.

Compliance.

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

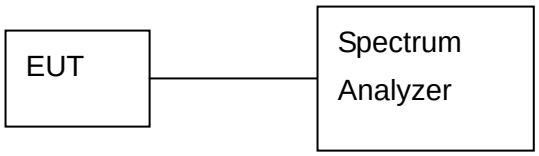

Spectrum
Ref Level 10.00 dBm
RBW 1 MHz
Att 30 dB
SWT 11.4 µs
VBW 1 MHz
Mode Auto FFT
1Pk View
D1[1]
-4.04 dB
78.0000 MHz
M1[1]
-19.06 dBm
2.4020000 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
D1
Start 2.4 GHz
1001 pts
Stop 2.4835 GHz
Measuring...

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).

The Test Graphics of the worst case, BT EDR (3 Mbps), have been selected to show on the following page(s).

Bluetooth (1 Mbps) Channel 00					
DH Packet	**Number of Hopping channels**	**Number of Pulses per 5 sec**	**Pulse Width (sec)**	**AV time of Occupancy (sec)**	**Limit (sec)**
DH1	79	51	0.0004058	0.13080	0.4
DH3	79	26	0.00166667	0.273867	0.4
DH5	79	17	0.00292754	0.314535	0.4

Bluetooth (1 Mbps) Channel 39					
DH Packet	**Number of Hopping channels**	**Number of Pulses per 5 sec**	**Pulse Width (sec)**	**AV time of Occupancy (sec)**	**Limit (sec)**
DH1	79	51	0.0004087	0.131732	0.4
DH3	79	25	0.00166667	0.263334	0.4
DH5	79	17	0.00291304	0.312977	0.4

Bluetooth (1 Mbps) Channel 78					
DH Packet	**Number of Hopping channels**	**Number of Pulses per 5 sec**	**Pulse Width (sec)**	**AV time of Occupancy (sec)**	**Limit (sec)**
DH1	79	51	0.0004058	0.130797	0.4
DH3	79	26	0.00165942	0.272676	0.4
DH5	79	16	0.00292754	0.296033	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.

Bluetooth EDR (2 Mbps) Channel 00					
DH Packet	Number of Hopping channels	Number of Pulses per 5 sec	Pulse Width (sec)	AV time of Occupancy (sec)	Limit (sec)
DH1	79	51	0.00042899	0.138272	0.4
DH3	79	26	0.00167391	0.275057	0.4
DH5	79	17	0.00292754	0.314535	0.4

Bluetooth EDR (2 Mbps) Channel 39					
DH Packet	Number of Hopping channels	Number of Pulses per 5 sec	Pulse Width (sec)	AV time of Occupancy (sec)	Limit (sec)
DH1	79	50	0.00042319	0.133728	0.4
DH3	79	26	0.00169565	0.278629	0.4
DH5	79	16	0.00294203	0.297498	0.4

Bluetooth EDR (2 Mbps) Channel 78					
DH Packet	Number of Hopping channels	Number of Pulses per 5 sec	Pulse Width (sec)	AV time of Occupancy (sec)	Limit (sec)
DH1	79	51	0.00042899	0.138272	0.4
DH3	79	26	0.00168116	0.276248	0.4
DH5	79	17	0.00292754	0.314535	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.

Bluetooth EDR (3 Mbps) Channel 00					
DH Packet	Number of Hopping channels	Number of Pulses per 5 sec	Pulse Width (sec)	AV time of Occupancy (sec)	Limit (sec)
DH1	79	50	0.00041739	0.13190	0.4
DH3	79	26	0.00167391	0.275057	0.4
DH5	79	17	0.00292029	0.313756	0.4

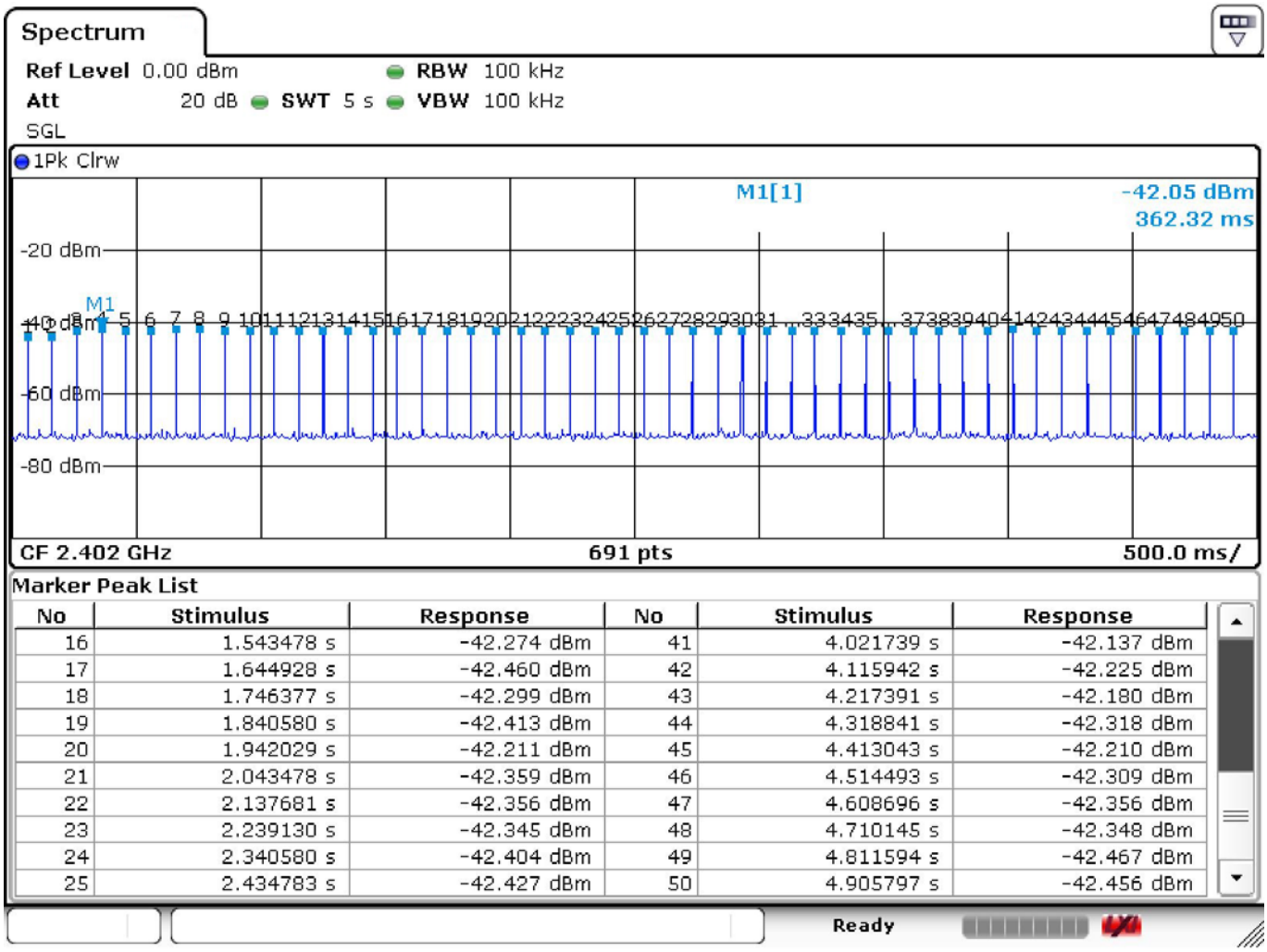
Bluetooth EDR (3 Mbps) Channel 39					
DH Packet	Number of Hopping channels	Number of Pulses per 5 sec	Pulse Width (sec)	AV time of Occupancy (sec)	Limit (sec)
DH1	79	50	0.00042319	0.133728	0.4
DH3	79	25	0.00168116	0.265623	0.4
DH5	79	17	0.00294203	0.316092	0.4

Bluetooth EDR (3 Mbps) Channel 78					
DH Packet	Number of Hopping channels	Number of Pulses per 5 sec	Pulse Width (sec)	AV time of Occupancy (sec)	Limit (sec)
DH1	79	51	0.00042029	0.135468	0.4
DH3	79	25	0.00167391	0.264478	0.4
DH5	79	17	0.00292754	0.314535	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	:	28.1℃	Humidity	:	35%
Test Date	:	07-Sep-2015	Tested by	:	Eason Hsieh
Test Mode	:	BT EDR (3 Mbps) DH1	Channel	:	00

Number of Pulses Per 5 sec



No	Stimulus	Response	No	Stimulus	Response
16	1.543478 s	-42.274 dBm	41	4.021739 s	-42.137 dBm
17	1.644928 s	-42.460 dBm	42	4.115942 s	-42.225 dBm
18	1.746377 s	-42.299 dBm	43	4.217391 s	-42.180 dBm
19	1.840580 s	-42.413 dBm	44	4.318841 s	-42.318 dBm
20	1.942029 s	-42.211 dBm	45	4.413043 s	-42.210 dBm
21	2.043478 s	-42.359 dBm	46	4.514493 s	-42.309 dBm
22	2.137681 s	-42.356 dBm	47	4.608696 s	-42.356 dBm
23	2.239130 s	-42.345 dBm	48	4.710145 s	-42.348 dBm
24	2.340580 s	-42.404 dBm	49	4.811594 s	-42.467 dBm
25	2.434783 s	-42.427 dBm	50	4.905797 s	-42.456 dBm

Pulse Width (sec)