FCC Test Report

for

Wi-Fi module

Model Number	**:**	**FN402A**
FCC ID	**:**	**TFJAG1311**
Report Number	**:**	**RF-U010-1304-202**
Date of Receipt	**:**	**May 15, 2013**
Date of Report	**:**	**November 5, 2013**

Prepared for

Uniform Industrial Corp.

47436 Fremont Blvd., Fremont, CA 94538-6512, USA.

Prepared by

Central Research Technology Co.

EMC Test Laboratory

No.11, Lane41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

NVLAP LAB CODE 200575-0

Verification of Compliance

Equipment under Test	**:** Wi-Fi module
Model No.	**:** FN402A
FCC ID	**:** TFJAG1311
Manufacturer	**:** Uniform Industrial Corp.
Applicant	**:** Uniform Industrial Corp.
Address	**:** 47436 Fremont Blvd., Fremont, CA 94538-6512, USA
Applicable Standards	**:** 47 CFR part 15, Subpart C
Date of Testing	**:** May 22~ November 4, 2013
Deviation	**:** N/A
Condition of Test Sample	**:** Mass Production

We, **Central Research Technology Co**., hereby certify that one sample of the designated product was tested in our facility during the period mentioned above. The test records, data evaluation and Equipment Under Test (EUT) configurations shown in the present report are true and accurate representation of the measurements of the sample's RF characteristics under the conditions herein specified.

The test results show that the EUT as described in the present report is in compliance with the requirements set forth in the standards mentioned above and apply to the tested sample identified in the present report only. The test report shall not be reproduced, except in its entirety, without the written approval of Central Research Technology Co.

PREPARED BY : Cathy Chen , **DATE :** Nov. 6, 2013
(Cathy Chen/ Technical Manager)

APPROVED BY : T. Y. Shih , **DATE :** Nov. 8, 2013
(Tsun-Yu Shih/General Manager)

Contents

1 General Description

1.1 General Description of EUT

Equipment under Test	:	Wi-Fi module
Model No.	:	FN402A
Power in	:	5Vdc
Test Voltage	:	120Vac/60Hz to the power supply
Manufacturer	:	Uniform Industrial Corp.
Channel Numbers	:	11
Frequency Range	:	2412~2462MHz
Function Modulation	:	OFDM
Modular Function	:	IEEE 802.11n HT20
Antenna Spec	:	Antenna Gain : 0dBi
Function Description	:	

The EUT is used to transmit and receive data both. Please refer to the user's manual for the details.

Perform the functions of EUT continuously by executing the test program supplied by manufacturer.

Since the transmitter is considered a portable unit, it was pre-tested on the positioned in each of 3 axis. Therefor only the test data of the worse case - X axiz was used for Radiated test.

1.2 Applied standards

(1) Conduction Emission Requirement

For intentional device, according to §15.207(a) line conduction emission limit is as below table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

(2) Radiated Emission Requirement

For intentional device, according to §15.209, the general requirement of field strength of radiated emissions from intentional radiator at a distance of 3 meters shall not exceed the below table.

Frequency (MHz)	Measurement Distance (m)	Field Strength (uV/m)	Field Strength (dBuV/m)
30 – 88	3	100	40.0
88 – 216	3	150	43.5
216 – 960	3	200	46.0
960 – 1610	3	500	54.0
above 1610	3	500	54.0

Note 1- The lower limit shall apply at the transition frequency.

(3) 6dB Bandwidth

According to 15.247(a)(2), Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

(4) Maximun Peak Output Power

According to 15.247(b)(3), For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

(5) 100kHz Bandedge

According to 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

(6) Power spectral density

According to 15.247(e),for digitally modulated systems,the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

(7) Restricted Band

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (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	(2)
13.36 - 13.41			

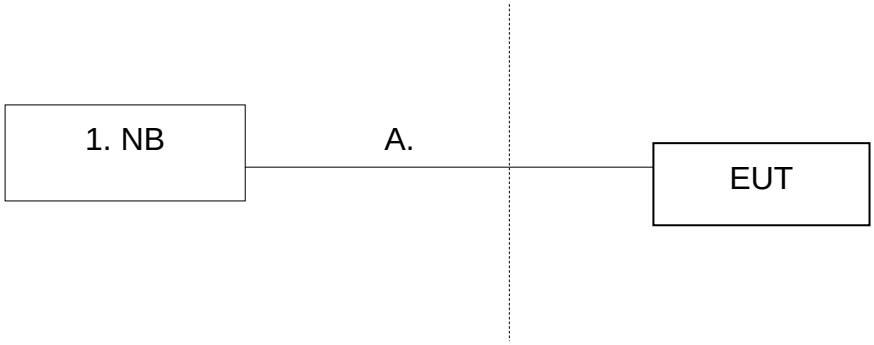
[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

1.3 The Support Units

No.	Unit	Model No./ Serial No.	Trade Name	Power Code	Supported by lab.
1.	NB	6520s	Compaq	N/A	

1.4 Layout of Setup



Connecting Cables :

No.	Cable	Length	Shielded	Core	Shielded Backshell	Supported by lab.	Note
A.	RJ45 Cable	1.1m				✓	

1.5 Test Capability

Test Facility

The test facility used for evaluating the conformance of the EUT with each standard in the present report meets what required in CISPR16-1-4, CISPR16-2-3 and ANSI C63.4:2009.

Test Room	Type of Test Room	Descriptions
TR1	10m semi-anechoic chamber (23m×14m×9m)	Complying with the NSA requirements in documents CISPR 22 and ANSI C63.4:2009. For the radiated emission measurement.
TR11	3m semi-anechoic chamber (9m × 6m × 6m)	
TR13	Test Site	For the RF conducted emission measurement.
TR5	Shielding Room (8m×5m×4m)	For the conducted emission measurement.

Test Laboratory Competence Information

Central Research Technology Co. has been accredited / filed / authorized by the agencies listed in the following table.

Certificate	Nation	Agency	Code	Mark
Accreditation Certificate	USA	NVLAP	200575-0	ISO/IEC 17025
	R.O.C. (Taiwan)	TAF	0905	ISO/IEC 17025
	R.O.C. (Taiwan)	BSMI	SL2-IN-E-0033, SL2-IS-E-0033, SL2-R1/R2-E-0033, SL2-A1-E-0033 SL2-L1-E-0033	ISO/IEC 17025
Site Filing Document	USA	FCC	474046, TW1053	Test facility list & NSA/SVSWR Data
	Canada	IC	4699A-1,-3	Test facility list & NSA Data
	Japan	VCCI	R-1527,C-1609,T-1441, G-10, C-4400, G-614, T-1334	Test facility list & NSA/SVSWR Data
Authorization Certificate	Germany	TUV	10021687	ISO/IEC 17025
	Norway	Nemko	ELA212	ISO/IEC 17025

The copy of each certificate can be downloaded from our web site: www.crc-lab.com

1.6 Measurement Uncertainty

The assessed measurement uncertainty with a suitable coverage factor K to ensure 95% confidence level for the normal distribution are shown as below, the values are less than U_{cispr} in table 1 of CISPR 16-4-2.

Test Item	Measurement Uncertainty	
Radiated Emission: (30MHz~200MHz)	Horizontal 3.5dB；Vertical 3.8dB	
Radiated Emission: (200MHz~1GHz)	Horizontal 3.9dB；Vertical 3.9dB	
Radiated Emission: (1GHz~18GHz)	Horizontal 3.5dB；Vertical 3.6dB	
Radiated Emission: (18GHz~26.5GHz)	Horizontal 4.4dB；Vertical 4.5dB	
Line Conducted Emission	ESH2-Z5	3.1dB
	ENV 4200	2.8dB

2 Conducted Emission Measurement

Test Result : PASS

2.1 Applied Standard

For intentional device, according to §15.207(a) line conduction emission limit is as below table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

Note:

For a device with a permanent antenna operating at or below 30 MHz, the FCC will accept measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

2.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Test Receiver	R&S	ESCI/ 100316	March 1, 2013	March 1, 2014
LISN	R&S	ESH2-Z5/ 836613/001	Aug. 5, 2013	Aug. 5, 2014
2nd LISN	EMCO	3816/2/ 29680	Nov. 15, 2012	Nov. 15, 2013
RF Cable	JYBAO	0214/ C0112	Sept. 11, 2013	Sept. 11, 2014
RF Cable	JYBAO	0214/ C0113	Sept. 11, 2013	Sept. 11, 2014
Test Software	Audix	e3/ Ver. 6.110303a	NCR	NCR
TR4 shielded room	ETS LINDGREN	TR4/ 15353-E	NCR	NCR

Note:
1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.

Instrument Setting

IF BW	Measurement Time	Detector	Trace	Comment
9kHz	1 second	Quasi-Peak / Average	Maxhold	

Climatic Condition

Ambient Temperature：26°C; Relative Humidity : 67%

2.3 Test Procedures

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. If the EUT is tabletop equipment, it was placed on a non-conducted table with a height of 0.8 meters above the reference ground plane and 0.4 meters from the conducting wall of the shielded room. Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane.

c. Connect the EUT's power source to the appropriate power mains through the LISN.

d. All the other peripherals are connected to the 2nd LISN, if any.

e. The LISN was placed 0.8 meters from the EUT and at least 0.8 meters from other units and other metal planes.

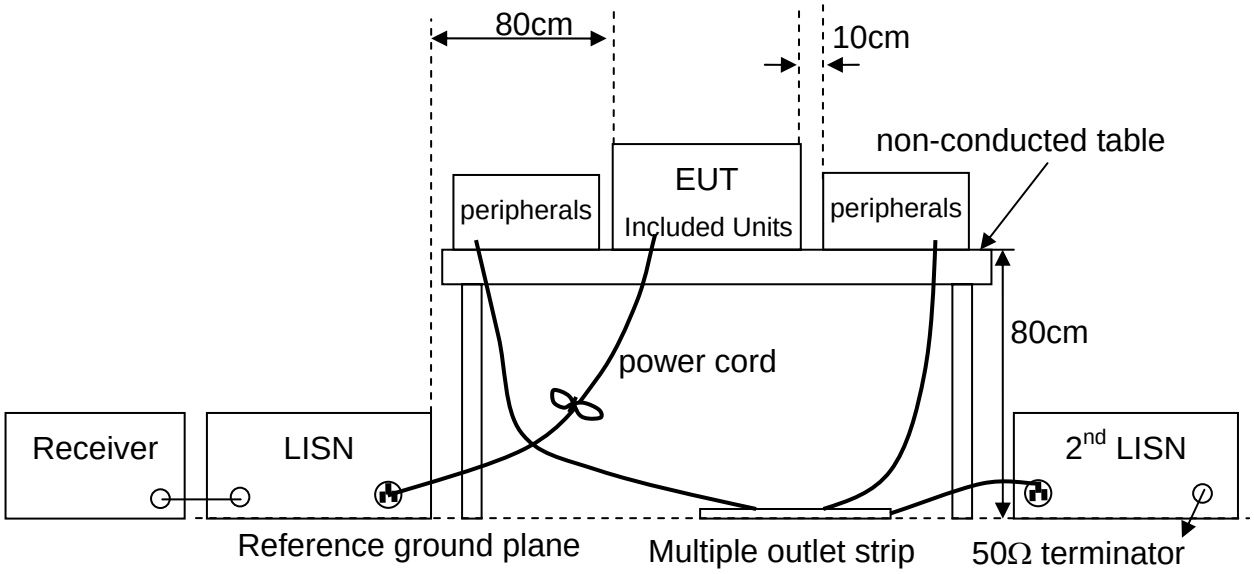
f. Measure the conducted emissions on each power line (Neutral Line and Line 1 – Hot side) of the EUT's power source by using the test receiver connected to the coupling RF output port of LISN.

g. Rapidly scan the signal from 150kHz to 30MHz by using the receiver through the Maximum-Peak detector to determine those frequencies associated with higher emission levels for each measured line.

h. Then measure the maximum level of conducted disturbance for each frequency found from step g. by using the receiver through the Quasi-Peak and Average detectors per CISPR 16-1.

i. Record the level for each frequency and compare with the required limit.

2.4 Test Configurations

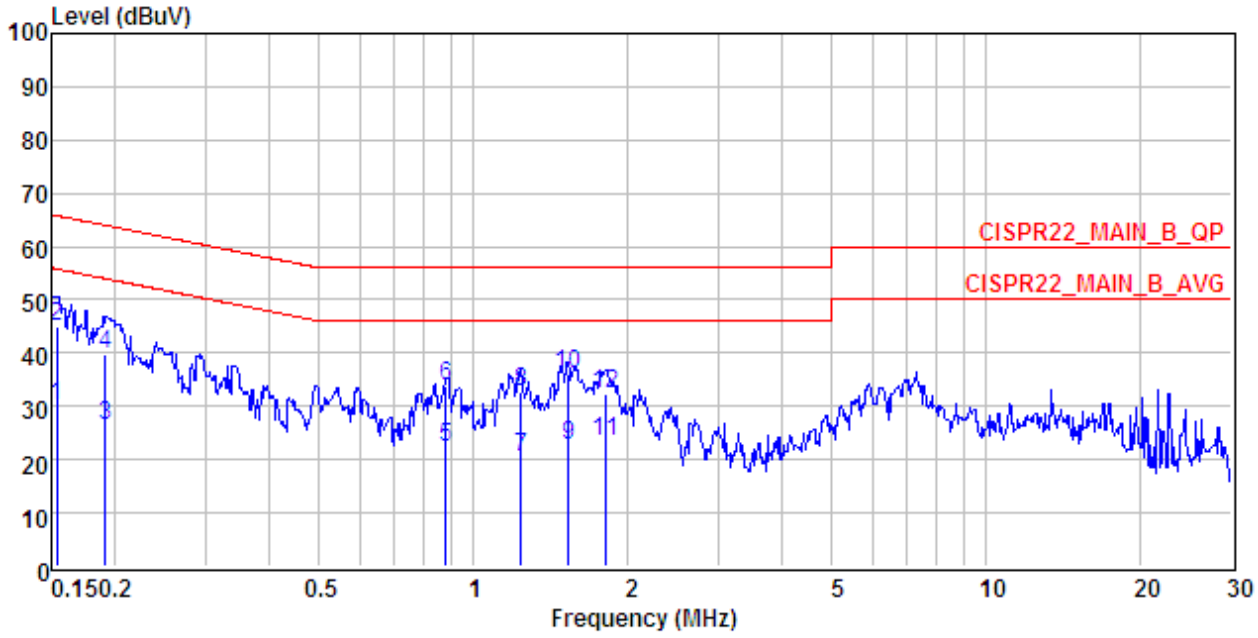


2.5 Test Results

Test Mode : **2412MHz, Continuous Transmitting, with antenna**

Tester : JUN **Frequency Range** : 150kHz~30MHz

Phase : **Line**



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.154	30.20	10.32	19.88	55.78	-25.58	LINE	Average
2	0.154	44.85	10.32	34.53	65.78	-20.93	LINE	QP
3	0.191	26.23	10.30	15.93	54.01	-27.78	LINE	Average
4	0.191	39.68	10.30	29.38	64.01	-24.33	LINE	QP
5	0.882	22.21	10.40	11.81	46.00	-23.79	LINE	Average
6	0.882	33.79	10.40	23.39	56.00	-22.21	LINE	QP
7	1.237	20.32	10.44	9.88	46.00	-25.68	LINE	Average
8	1.237	32.80	10.44	22.36	56.00	-23.20	LINE	QP
9	1.529	22.83	10.47	12.36	46.00	-23.17	LINE	Average
10	1.529	36.07	10.47	25.60	56.00	-19.93	LINE	QP
11	1.809	23.46	10.49	12.97	46.00	-22.54	LINE	Average
12	1.809	32.20	10.49	21.71	56.00	-23.80	LINE	QP

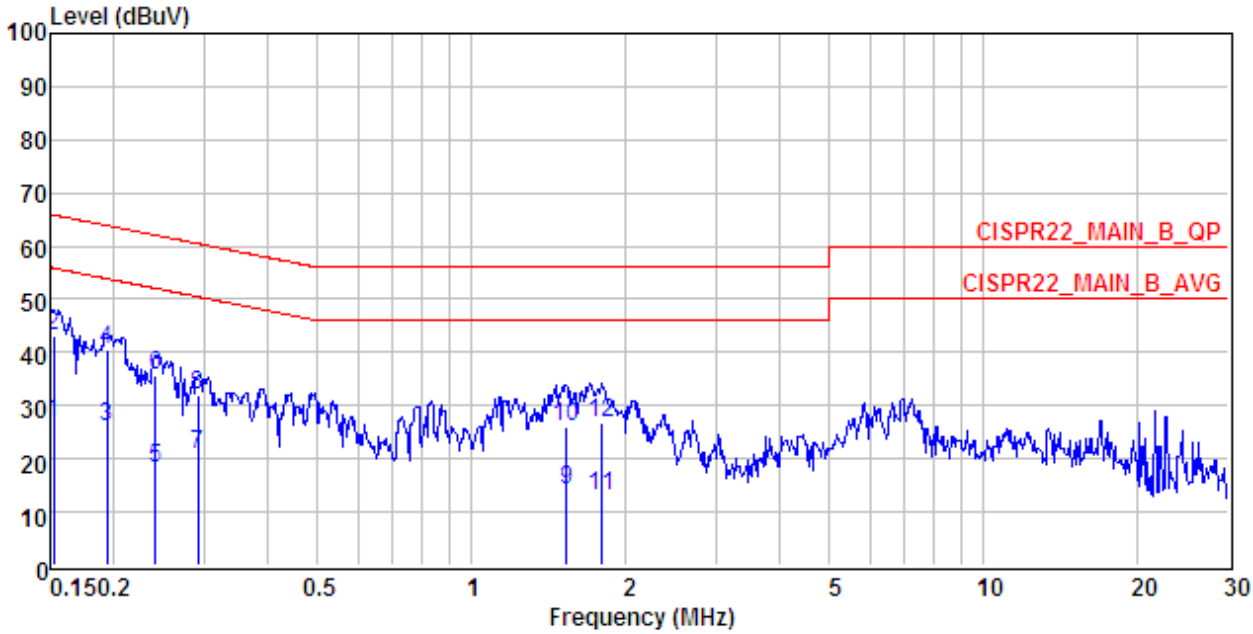
Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. Q.P. is abbreviation of quasi-peak.

Test Mode : **2412MHz, Continuous Transmitting, with dummy load**

Tester : JUN **Frequency Range** : 150kHz~30MHz

Phase : **Neutral**



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.152	26.60	10.36	16.24	55.87	-29.27	NEUTRAL	Average
2	0.152	43.09	10.36	32.73	65.87	-22.78	NEUTRAL	QP
3	0.194	25.96	10.34	15.62	53.88	-27.92	NEUTRAL	Average
4	0.194	40.39	10.34	30.05	63.88	-23.49	NEUTRAL	QP
5	0.241	18.26	10.34	7.92	52.06	-33.80	NEUTRAL	Average
6	0.241	35.51	10.34	25.17	62.06	-26.55	NEUTRAL	QP
7	0.292	20.66	10.34	10.32	50.46	-29.80	NEUTRAL	Average
8	0.292	31.82	10.34	21.48	60.46	-28.64	NEUTRAL	QP
9	1.527	14.08	10.51	3.57	46.00	-31.92	NEUTRAL	Average
10	1.527	26.16	10.51	15.65	56.00	-29.84	NEUTRAL	QP
11	1.793	12.97	10.53	2.44	46.00	-33.03	NEUTRAL	Average
12	1.793	26.65	10.53	16.12	56.00	-29.35	NEUTRAL	QP

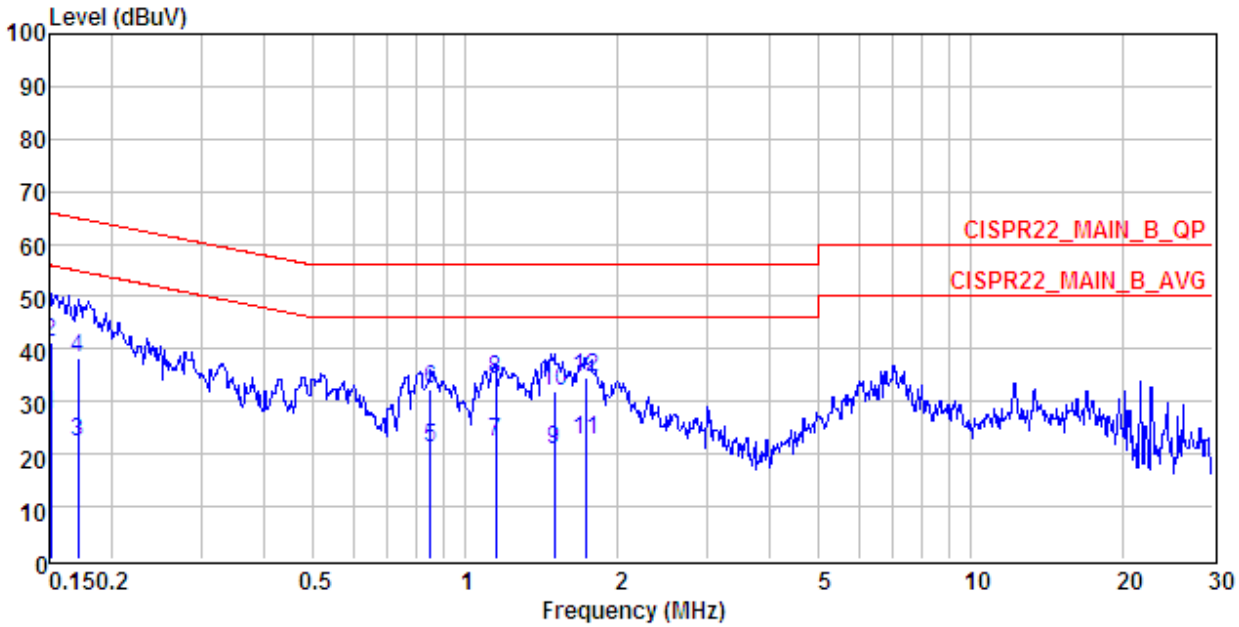
Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. Q.P. is abbreviation of quasi-peak.

Test Mode : **2437MHz, Continuous Transmitting, with antenna**

Tester : JUN **Frequency Range** : 150kHz~30MHz

Phase : **Line**



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.151	27.46	10.32	17.14	55.96	-28.50	LINE	Average
2	0.151	41.42	10.32	31.10	65.96	-24.54	LINE	QP
3	0.171	22.30	10.32	11.98	54.89	-32.59	LINE	Average
4	0.171	38.31	10.32	27.99	64.89	-26.58	LINE	QP
5	0.853	21.03	10.39	10.64	46.00	-24.97	LINE	Average
6	0.853	32.42	10.39	22.03	56.00	-23.58	LINE	QP
7	1.148	22.39	10.44	11.95	46.00	-23.61	LINE	Average
8	1.148	34.34	10.44	23.90	56.00	-21.66	LINE	QP
9	1.495	20.89	10.47	10.42	46.00	-25.11	LINE	Average
10	1.495	32.11	10.47	21.64	56.00	-23.89	LINE	QP
11	1.725	22.50	10.48	12.02	46.00	-23.50	LINE	Average
12	1.725	34.44	10.48	23.96	56.00	-21.56	LINE	QP

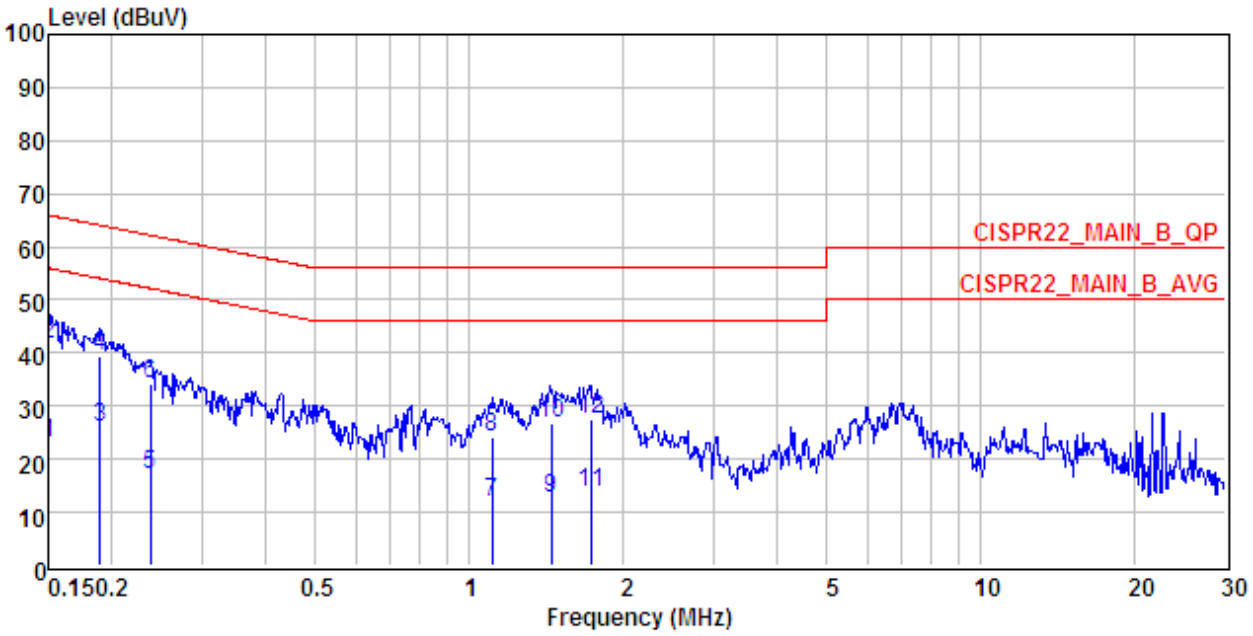
Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. Q.P. is abbreviation of quasi-peak.

Test Mode : **2437MHz, Continuous Transmitting, with dummy load**

Tester : JUN **Frequency Range** : 150kHz~30MHz

Phase : **Neutral**



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.150	22.90	10.36	12.54	55.98	-33.08	NEUTRAL	Average
2	0.150	41.62	10.36	31.26	65.98	-24.36	NEUTRAL	QP
3	0.189	25.84	10.34	15.50	54.08	-28.24	NEUTRAL	Average
4	0.189	39.43	10.34	29.09	64.08	-24.65	NEUTRAL	QP
5	0.238	16.96	10.34	6.62	52.17	-35.21	NEUTRAL	Average
6	0.238	34.24	10.34	23.90	62.17	-27.93	NEUTRAL	QP
7	1.106	12.03	10.46	1.57	46.00	-33.97	NEUTRAL	Average
8	1.106	24.22	10.46	13.76	56.00	-31.78	NEUTRAL	QP
9	1.441	12.68	10.51	2.17	46.00	-33.32	NEUTRAL	Average
10	1.441	26.82	10.51	16.31	56.00	-29.18	NEUTRAL	QP
11	1.725	13.68	10.51	3.17	46.00	-32.32	NEUTRAL	Average
12	1.725	27.52	10.51	17.01	56.00	-28.48	NEUTRAL	QP

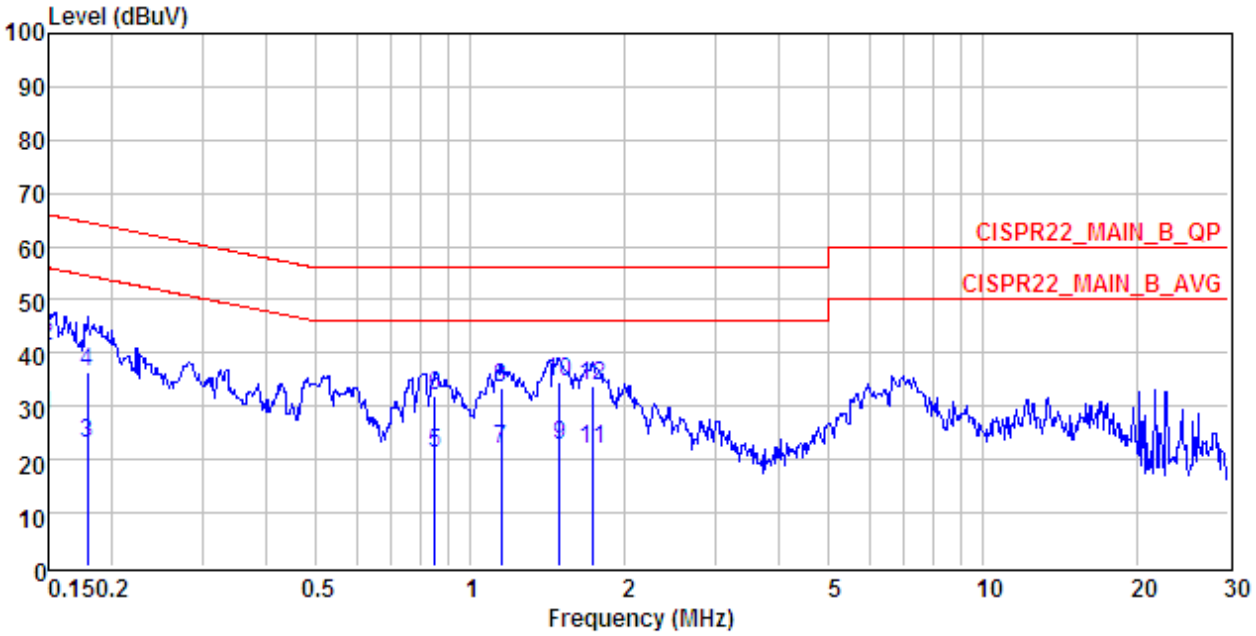
Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. Q.P. is abbreviation of quasi-peak.

Test Mode : **2462MHz, Continuous Transmitting, with antenna**

Tester : JUN **Frequency Range** : 150kHz~30MHz

Phase : **Line**



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.150	28.08	10.32	17.76	56.00	-27.92	LINE	Average
2	0.150	41.41	10.32	31.09	66.00	-24.59	LINE	QP
3	0.179	23.11	10.30	12.81	54.55	-31.44	LINE	Average
4	0.179	36.51	10.30	26.21	64.55	-28.04	LINE	QP
5	0.853	21.30	10.39	10.91	46.00	-24.70	LINE	Average
6	0.853	32.06	10.39	21.67	56.00	-23.94	LINE	QP
7	1.147	21.80	10.44	11.36	46.00	-24.20	LINE	Average
8	1.147	33.61	10.44	23.17	56.00	-22.39	LINE	QP
9	1.487	22.84	10.47	12.37	46.00	-23.16	LINE	Average
10	1.487	34.61	10.47	24.14	56.00	-21.39	LINE	QP
11	1.734	22.01	10.48	11.53	46.00	-23.99	LINE	Average
12	1.734	33.68	10.48	23.20	56.00	-22.32	LINE	QP

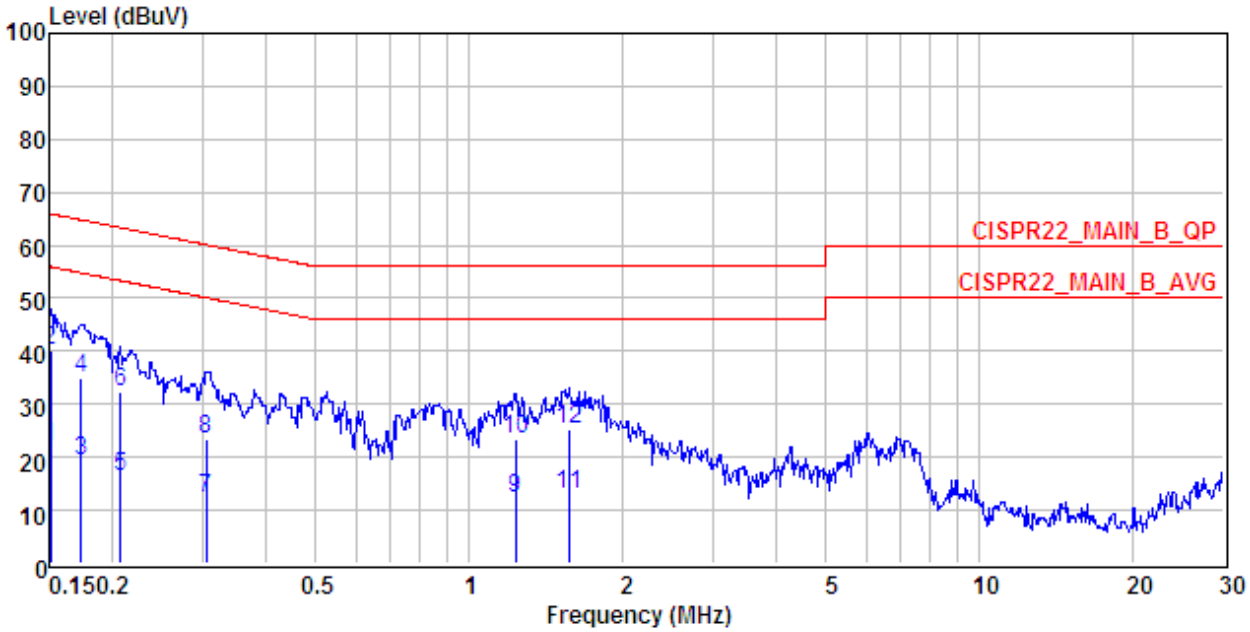
Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. Q.P. is abbreviation of quasi-peak.

Test Mode : **2462MHz, Continuous Transmitting, with dummy load**

Tester : JUN **Frequency Range** : 150kHz~30MHz

Phase : **Neutral**



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.151	21.75	10.36	11.39	55.96	-34.21	NEUTRAL	Average
2	0.151	40.15	10.36	29.79	65.96	-25.81	NEUTRAL	QP
3	0.173	19.20	10.36	8.84	54.81	-35.61	NEUTRAL	Average
4	0.173	34.76	10.36	24.40	64.81	-30.05	NEUTRAL	QP
5	0.207	16.19	10.34	5.85	53.32	-37.13	NEUTRAL	Average
6	0.207	32.41	10.34	22.07	63.32	-30.91	NEUTRAL	QP
7	0.305	12.18	10.34	1.84	50.10	-37.92	NEUTRAL	Average
8	0.305	23.57	10.34	13.23	60.10	-36.53	NEUTRAL	QP
9	1.229	12.13	10.48	1.65	46.00	-33.87	NEUTRAL	Average
10	1.229	23.33	10.48	12.85	56.00	-32.67	NEUTRAL	QP
11	1.568	12.90	10.51	2.39	46.00	-33.10	NEUTRAL	Average
12	1.568	25.40	10.51	14.89	56.00	-30.60	NEUTRAL	QP

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. Q.P. is abbreviation of quasi-peak.

3 6dB Bandwidth

Result: Pass

3.1 Applied standard

According to 15.247(a)(2), Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

3.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No. /Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	E4405B/ MY45106706	April 9, 2013	April 9, 2014
Test Site	N.A.	TR13	NCR	NCR

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
100kHz	300kHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：22℃ Relative Humidity :60%

3.3 Measurement Procedure

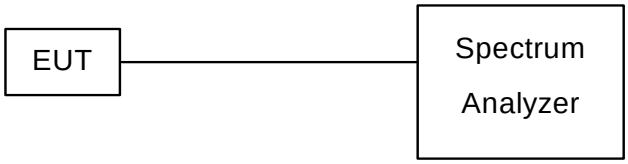
a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit data at low, middle and high channel frequencies individually.

c. Test procedures follow KDB 558074 D01 DTS Measurement Guidance v03r01 Section 8.1.

d. Measure the 6dB bandwidth and compare with the required limit.

3.4 Test configuration

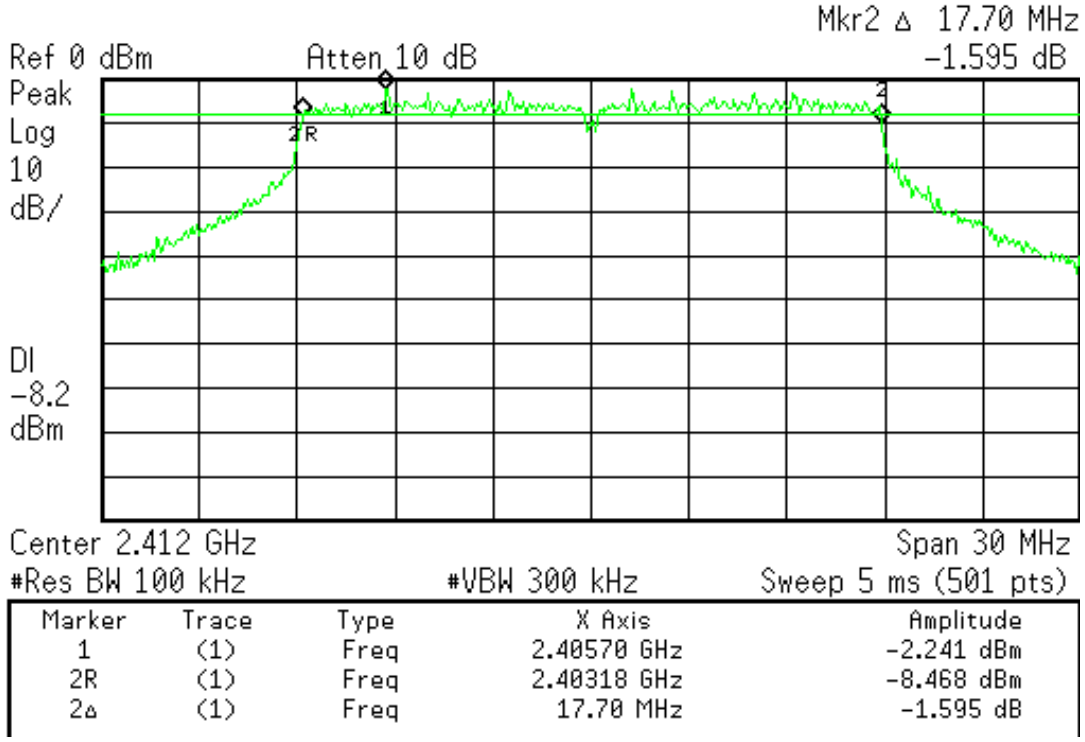


3.5 Test Data

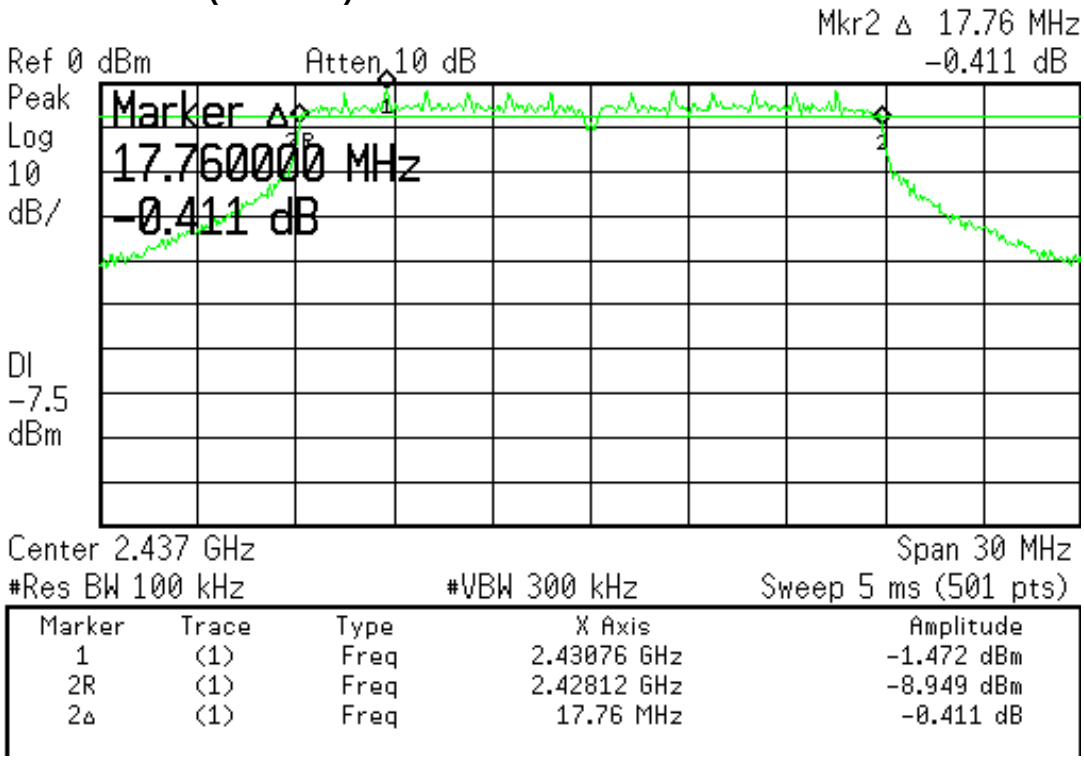
Test Mode : Continuous Transmitting **Tester** : Jun

Operating Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)
2412	17.70	500
2437	17.76	500
2462	17.76	500

Low Channel (2412MHz)

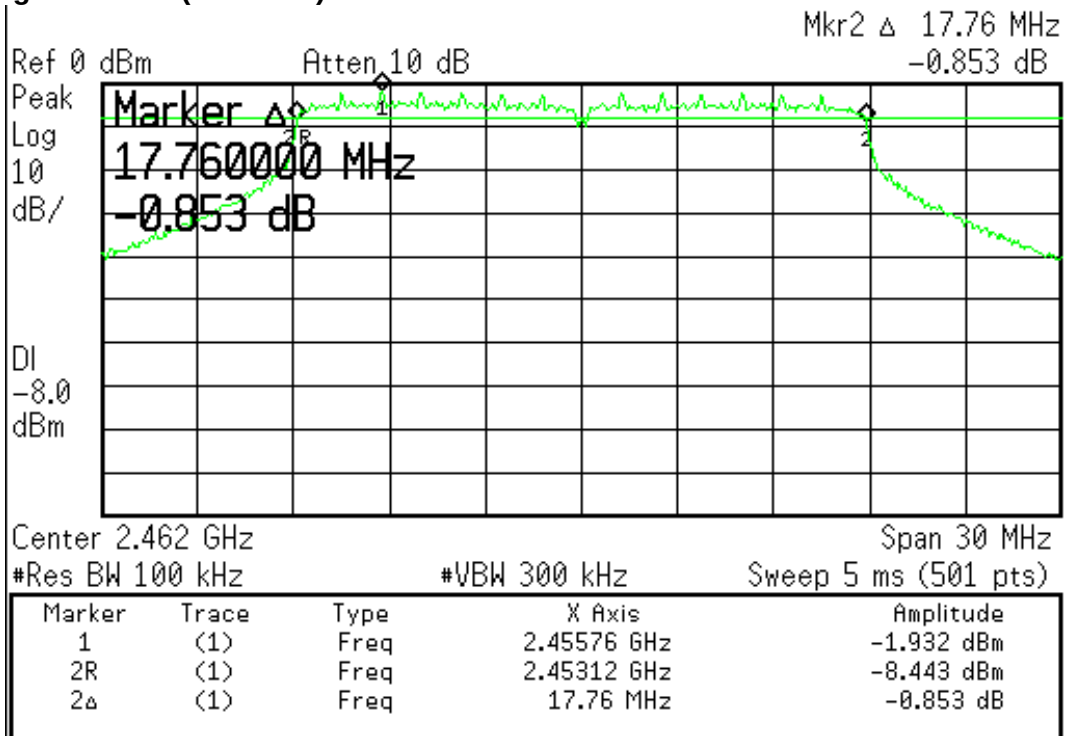


Middle Channel (2437MHz)



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.43076 GHz	-1.472 dBm
2R	(1)	Freq	2.42812 GHz	-8.949 dBm
2Δ	(1)	Freq	17.76 MHz	-0.411 dB

High Channel (2462MHz)



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45576 GHz	-1.932 dBm
2R	(1)	Freq	2.45312 GHz	-8.443 dBm
2Δ	(1)	Freq	17.76 MHz	-0.853 dB

4 Maximum Peak Output Power

Result: Pass

4.1 Applied standard

According to 15.247(b)(3), For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

4.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	E4405B/ MY45106706	April 9, 2013	April 9, 2014
Test Site	N.A.	TR13	NCR	NCR

Note:

1.The calibrations are traceable to NML/ROC.

2.NCR : No Calibration Required.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
1MHz	3MHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：25℃ Relative Humidity : 54%

4.3 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. The software provided by client enabled the EUT to transmit data at lowest, middle and highest channel frequencies individually.

c. Test procedures follow KDB 558074 D01 DTS Measurement Guidance v03r01 section 9.1.2.

d. Measurement the maximum peak output and compare with the required limit.

4.4 Test configuration

4.5 Test Data

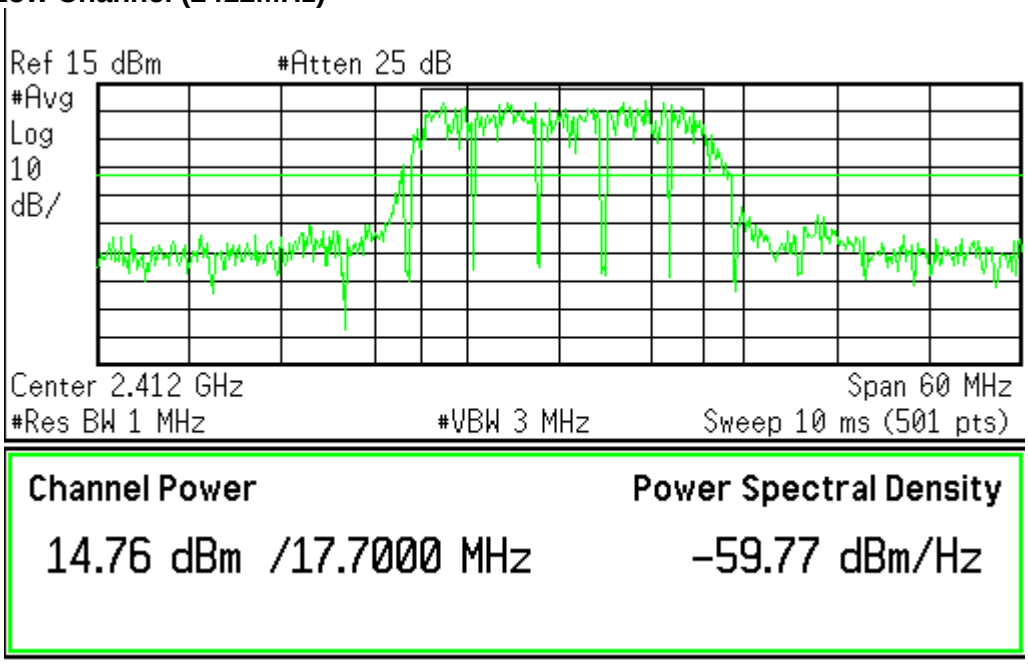
Test Mode : Continuous Transmitting **Tester :** Jun

Operating Frequency (MHz)	Reading Data (dBm)	Correction Factor (dB)	Emission (dBm)	Limit (dBm)	Margin (dB)
2412	14.76	1.5	16.26	30	13.74
2437	13.52	1.5	15.02	30	14.98
2462	13.06	1.5	14.56	30	15.44

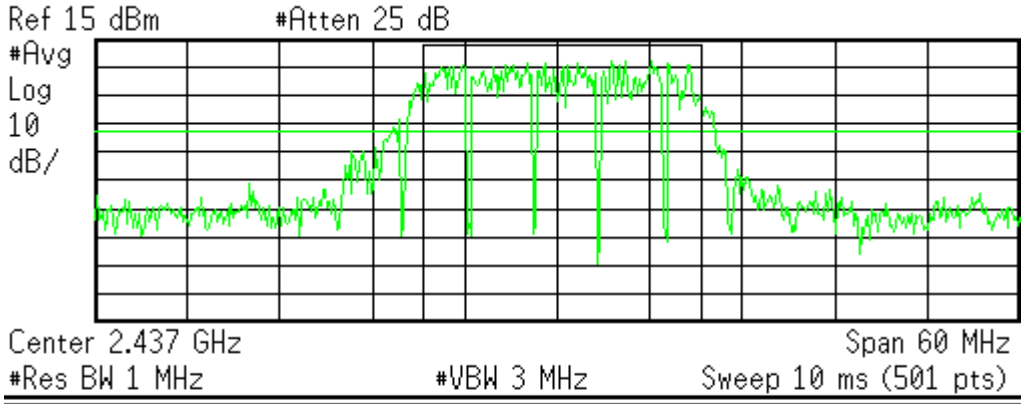
Note:

1. Correction Factor (dB) = Cable Loss + Attenuator
2. Emission (dBm) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission

Low Channel (2412MHz)

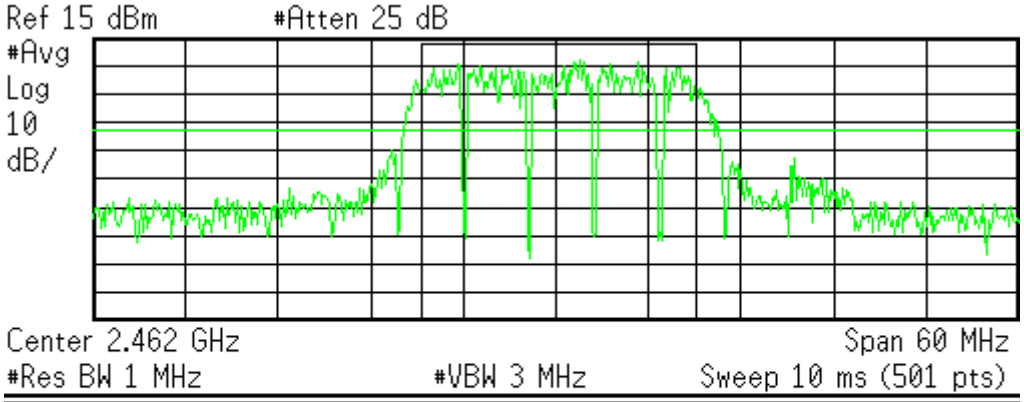


MiddleChannel (2437MHz)



Channel Power	Power Spectral Density
13.52 dBm /17.7600 MHz	-60.85 dBm/Hz

High Channel (2462MHz)



Channel Power	Power Spectral Density
13.06 dBm /17.7600 MHz	-61.31 dBm/Hz

5 Peak Power Spectral Density

Result: Pass

5.1 Applied standard

According to 15.247(e),for digitally modulated systems,the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No. /Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	E4405B/ MY45106706	April 9, 2013	April 9, 2014
Test Site	N.A.	TR13	NCR	NCR

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
3kHz	10kHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：26℃ Relative Humidity :60%

5.3 Measurement Procedure

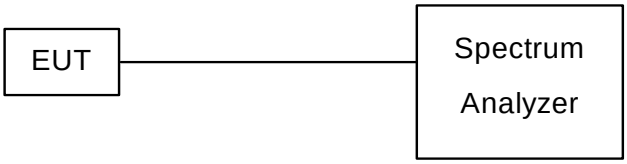
a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit data at low, middle and high channel frequencies individually.

c. Test procedures follow KDB 558074 D01 DTS Measurement Guidance v03r01 section 10.2.

d. Measure the peak power spectrum density and compare with the required limit.

5.4 Test configuration



5.5 Test Data

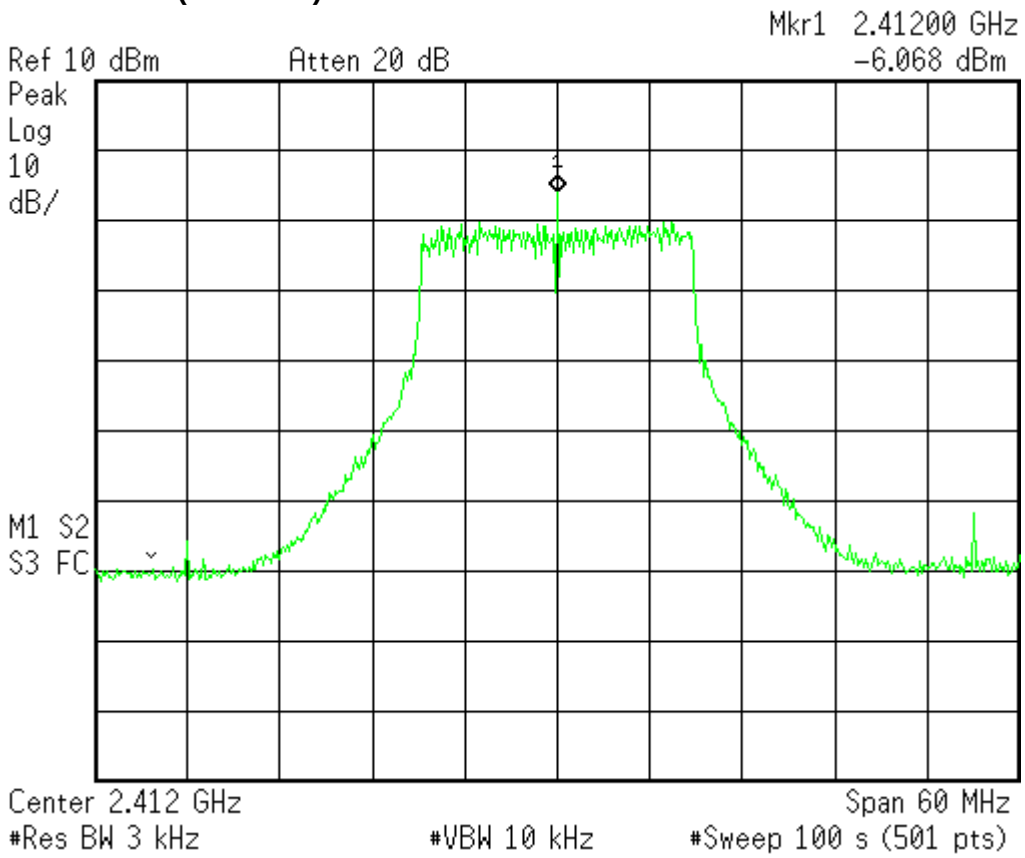
Test Mode : Continuous Transmitting **Tester** : Jun

Operating Frequency (MHz)	Reading Data (dBm)	Correction Factor (dB)	Emission (dBm)	Limit (dBm)	Margin (dBm)
2412	-6.06	1.5	-4.56	8	12.56
2437	-10.54	1.5	-9.04	8	17.04
2462	-10.62	1.5	-9.12	8	17.12

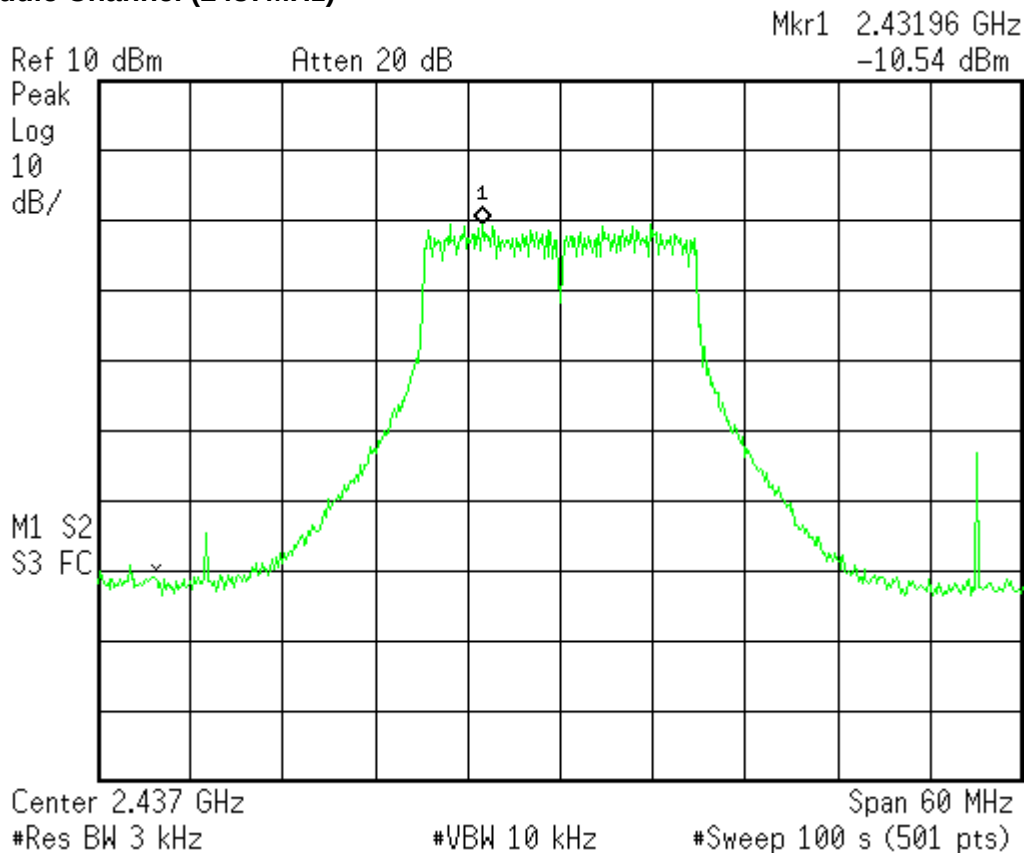
Note:

1. Correction Factor (dB) = Cable Loss + Attenuator
2. Emission (dBm) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission

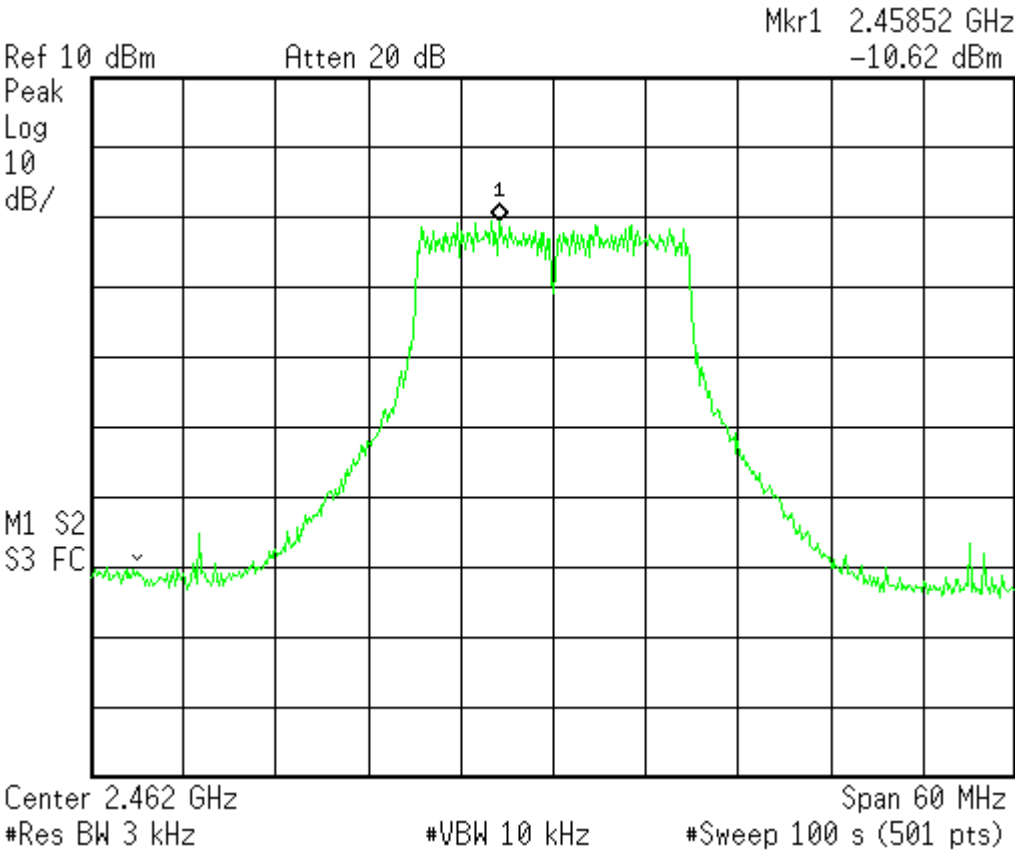
Low Channel (2412MHz)



Middle Channel (2437MHz)



High Channel (2462MHz)



6 RF Antenna Conducted spurious

Result: Pass

6.1 Applied standard

According to 15.247(c),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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

6.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	E4405B/ MY45106706	April 9, 2013	April 9, 2014
Test Site	N.A.	TR13	NCR	NCR

Note:

1.The calibrations are traceable to NML/ROC.

2.NCR : No Calibration Required.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
100kHz	300kHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：26℃ Relative Humidity : 54%

6.3 Measurement Procedure

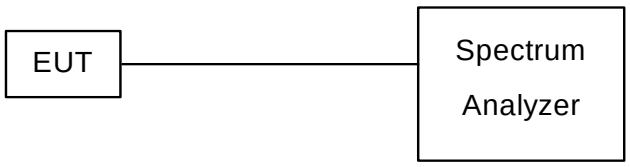
a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. The software provided by client enabled the EUT to transmit data at low, middle and high channel frequencies individually.

c. Test procedures follow KDB 558074 D01 DTS Measurement Guidance v03r01.

d. Measurement the conducted spurious and compare with the required limit.

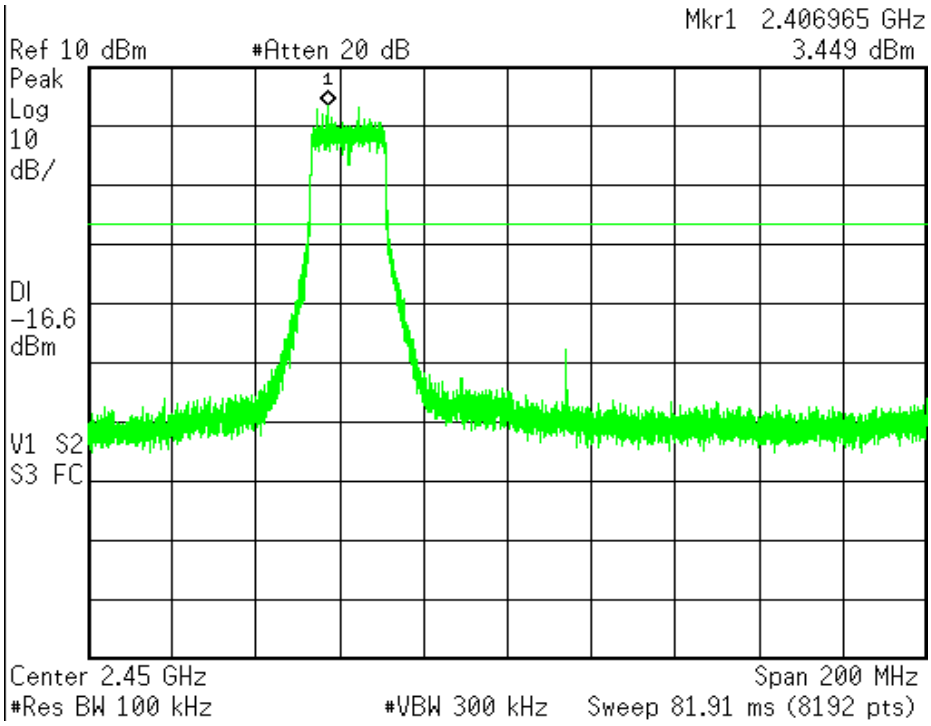
6.4 Test configuration

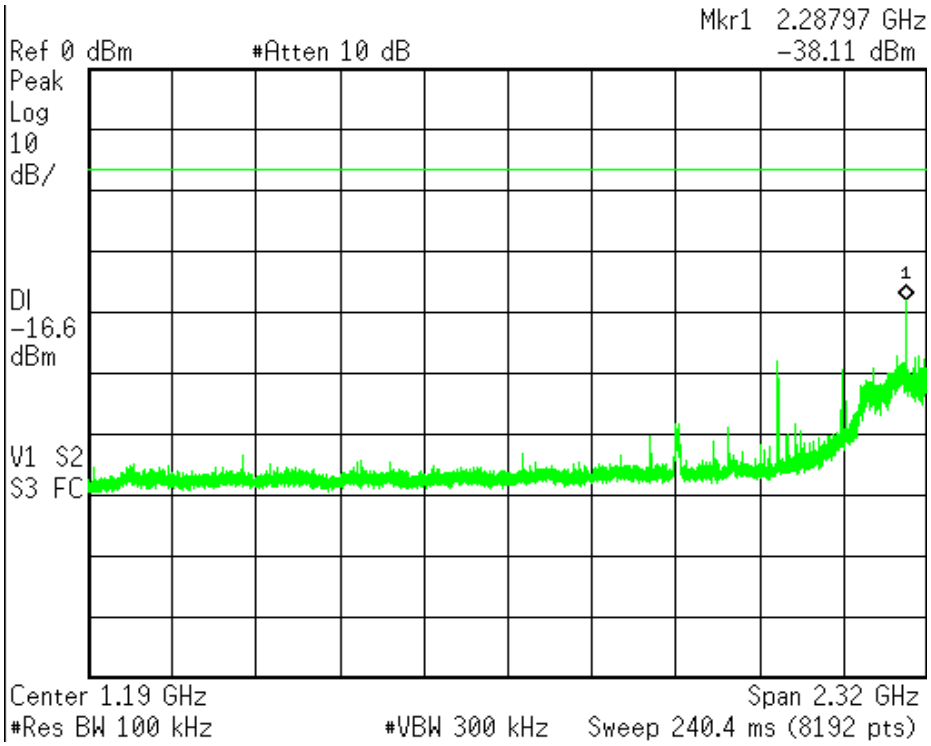


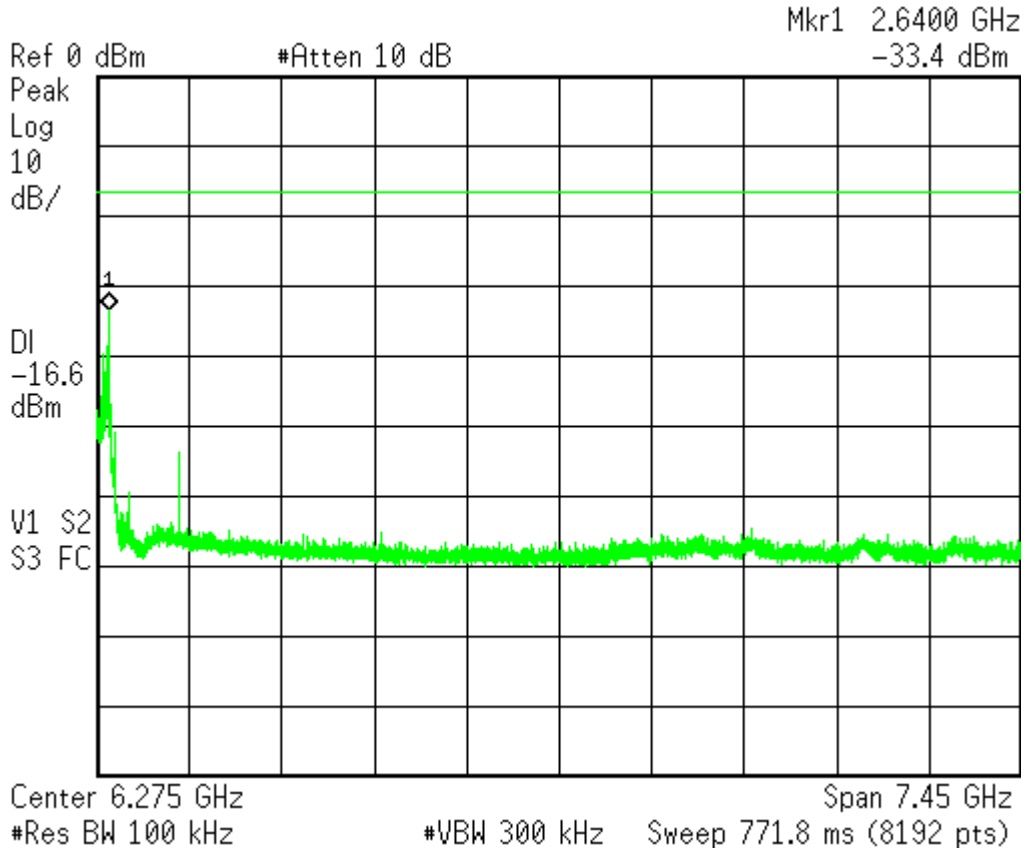
6.5 Test Data

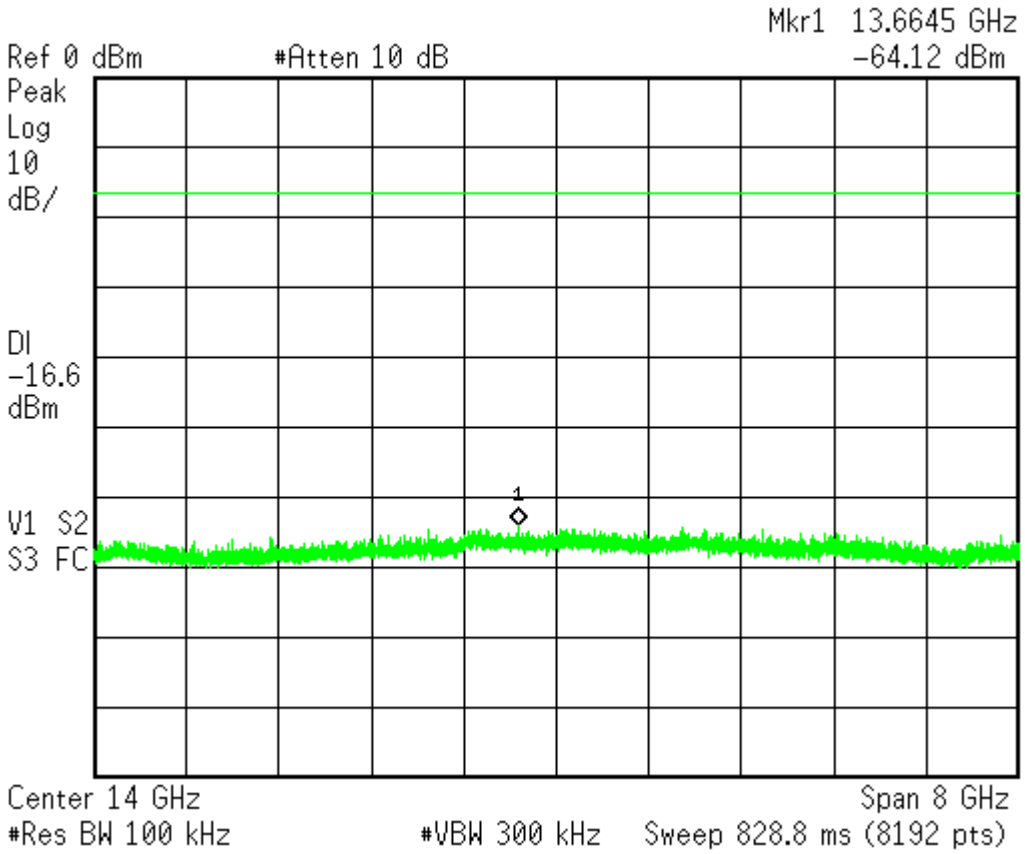
Test Mode : Continuous Transmitting **Tester : Jun**

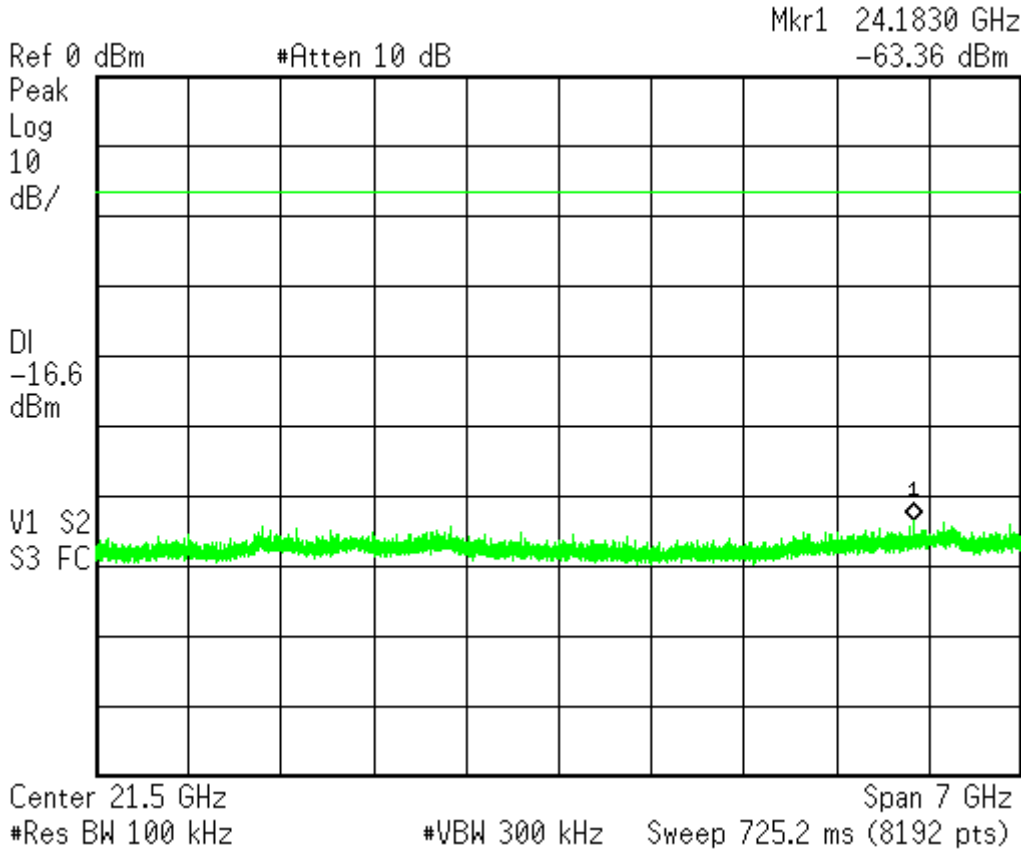
Test Frequency: Channel 1 (2412MHz) **Frequency Rang : 30MHz~25GHz**





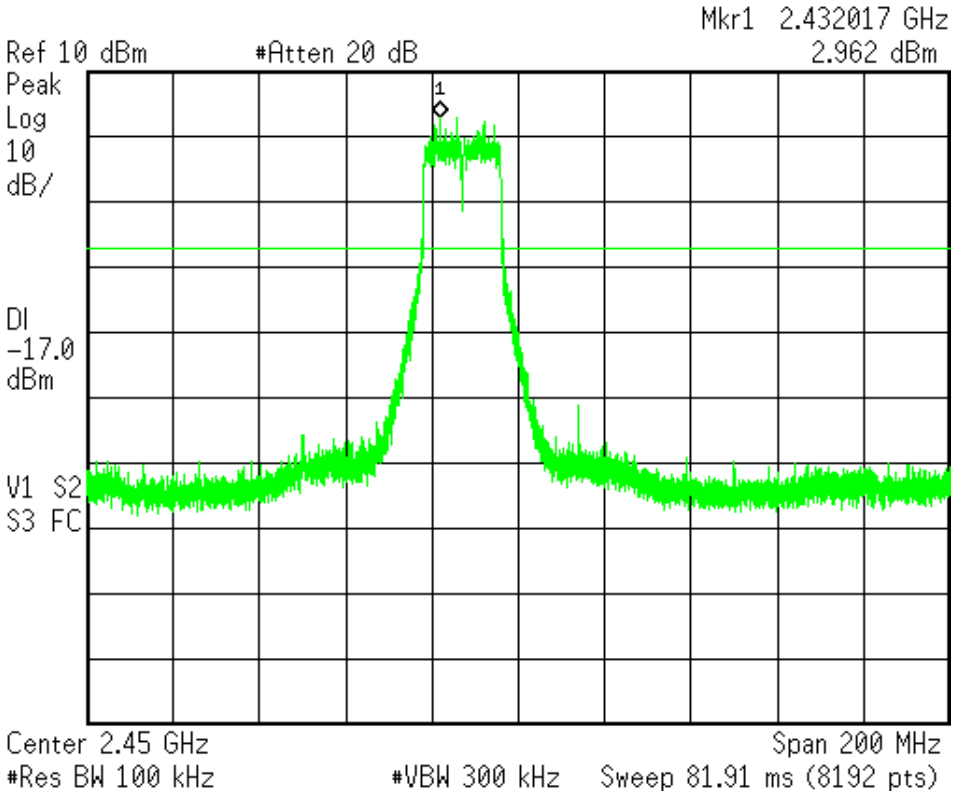

Mkr1 2.6400 GHz
-33.4 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Dl
-16.6
dBm
V1 S2
S3 FC
Center 6.275 GHz
Span 7.45 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 771.8 ms (8192 pts)

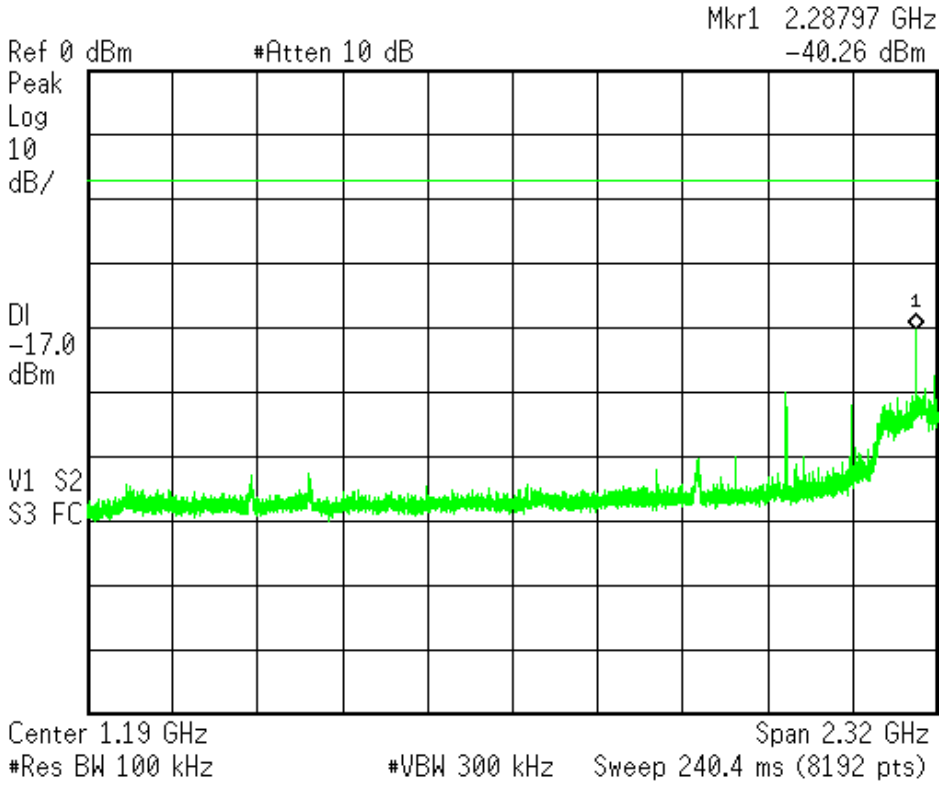

Mkr1 13.6645 GHz
-64.12 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Dl
-16.6
dBm
V1 S2
S3 FC
Center 14 GHz
Span 8 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 828.8 ms (8192 pts)

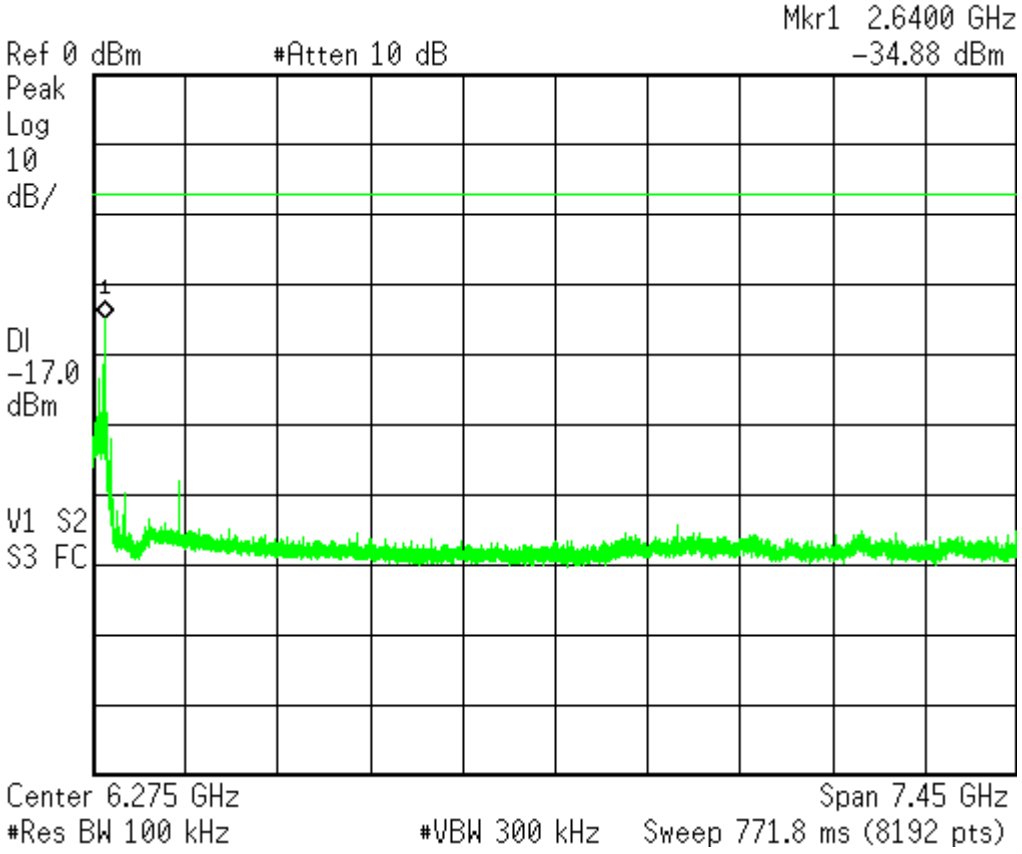

Mkr1 24.1830 GHz
-63.36 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Dl
-16.6
dBm
V1 S2
S3 FC
1
Center 21.5 GHz
Span 7 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 725.2 ms (8192 pts)

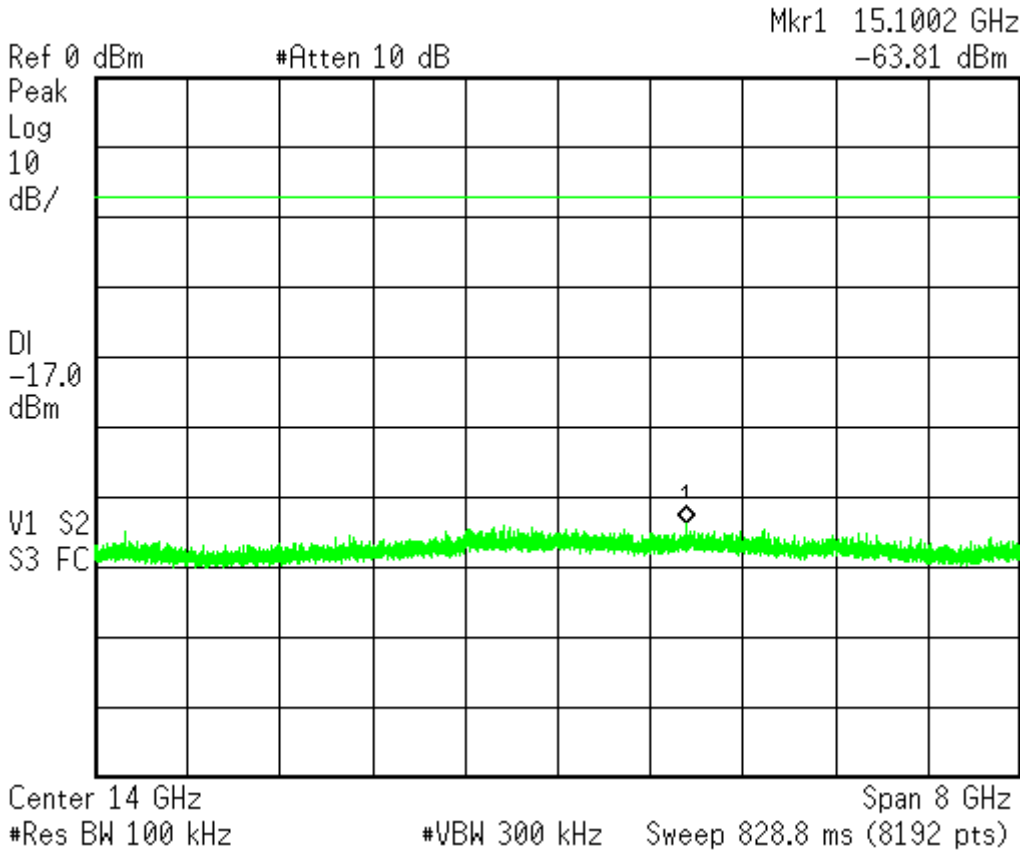
Test Mode : Continuous Transmitting **Tester : Jun**

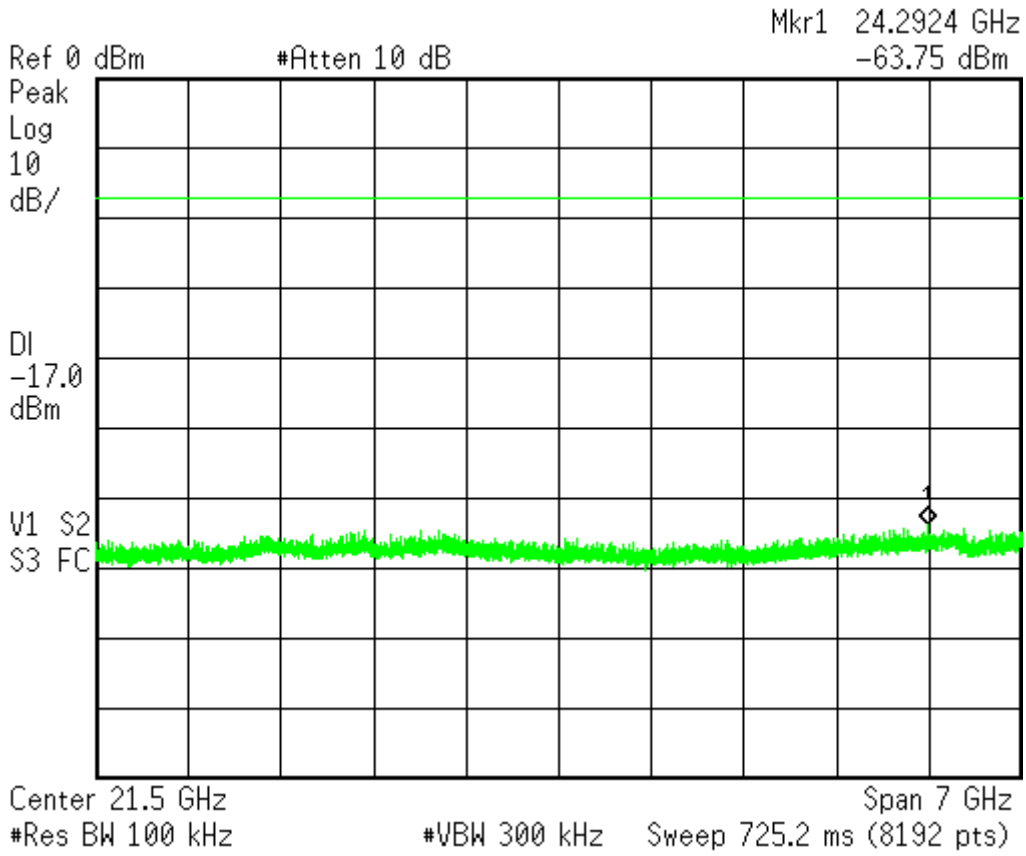
Test Frequency: Channel 6 (2437MHz) **Frequency Rang : 30MHz~25GHz**





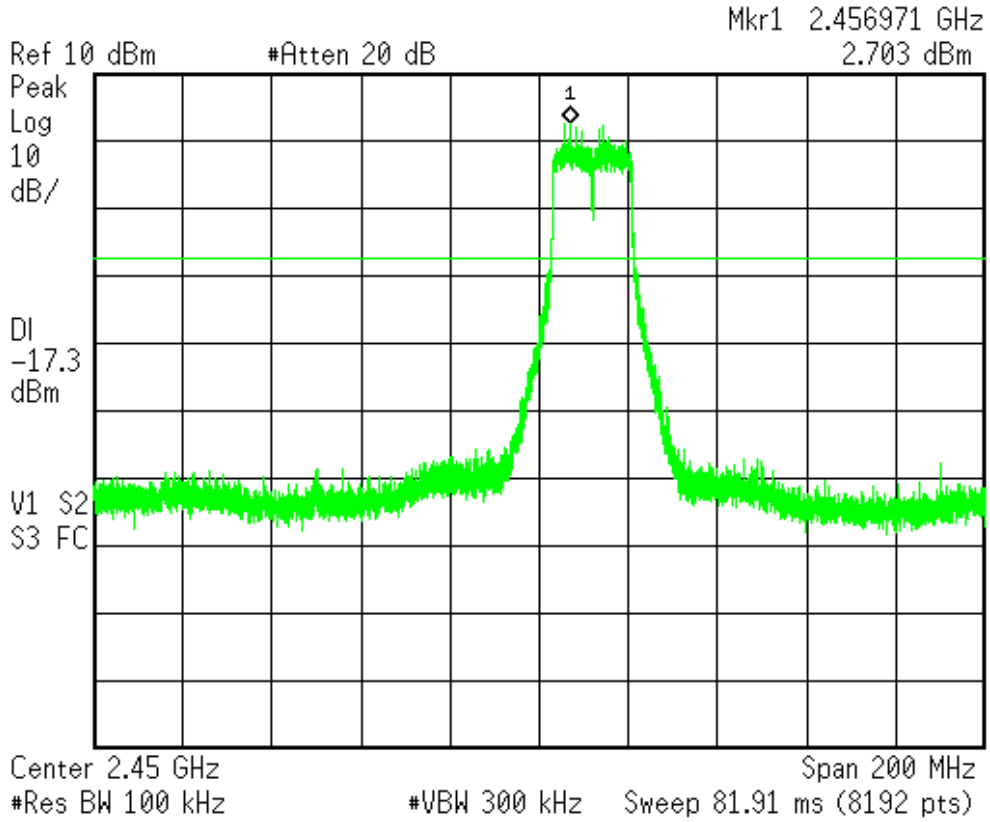

Mkr1 2.6400 GHz
-34.88 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Dl
-17.0
dBm
V1 S2
S3 FC
Center 6.275 GHz
Span 7.45 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 771.8 ms (8192 pts)

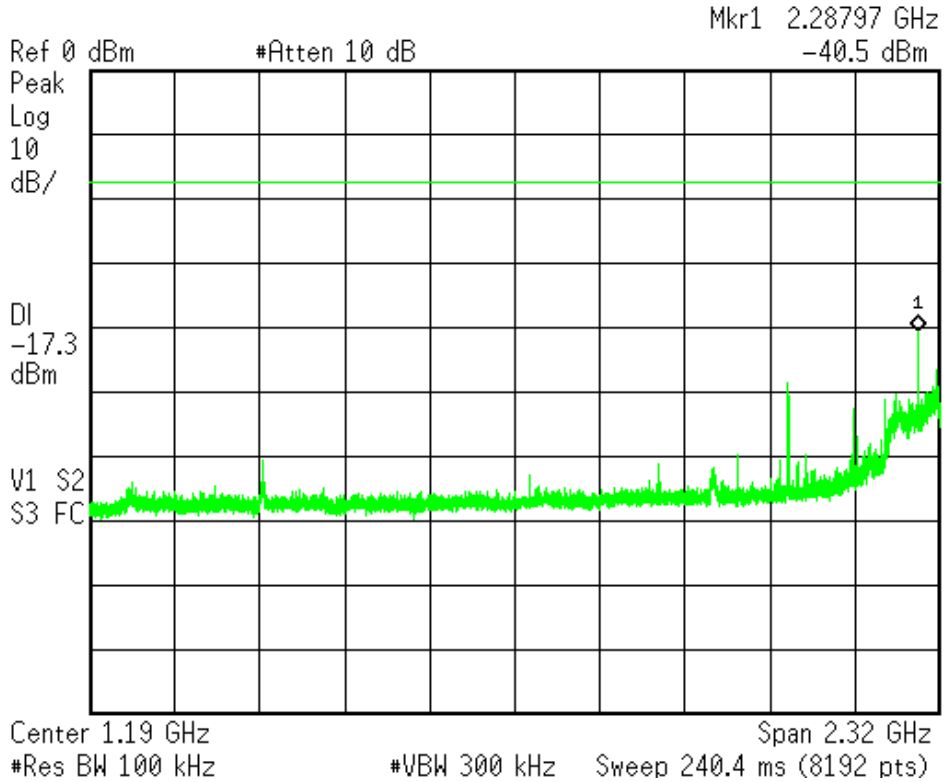

Mkr1 15.1002 GHz
-63.81 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Dl
-17.0
dBm
V1 S2
S3 FC
Center 14 GHz
Span 8 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 828.8 ms (8192 pts)

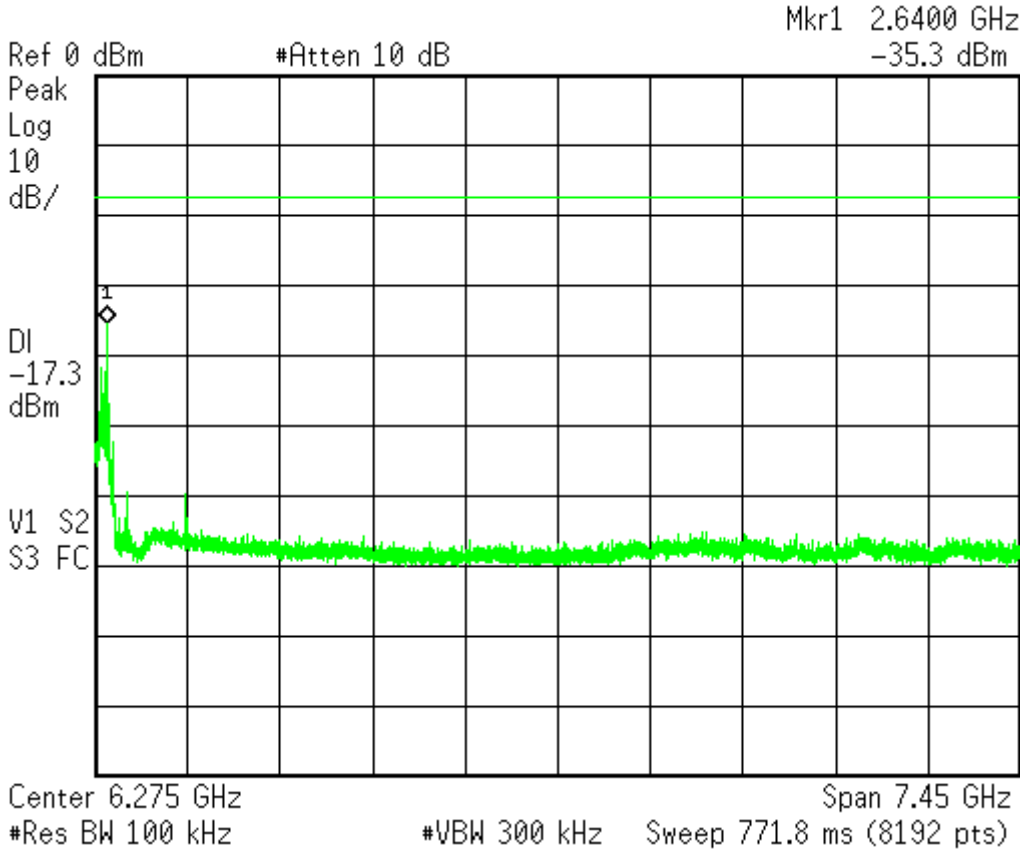

Mkr1 24.2924 GHz
Ref 0 dBm
#Atten 10 dB
-63.75 dBm
Peak
Log
10
dB/
Dl
-17.0
dBm
V1 S2
S3 FC
Center 21.5 GHz
Span 7 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 725.2 ms (8192 pts)

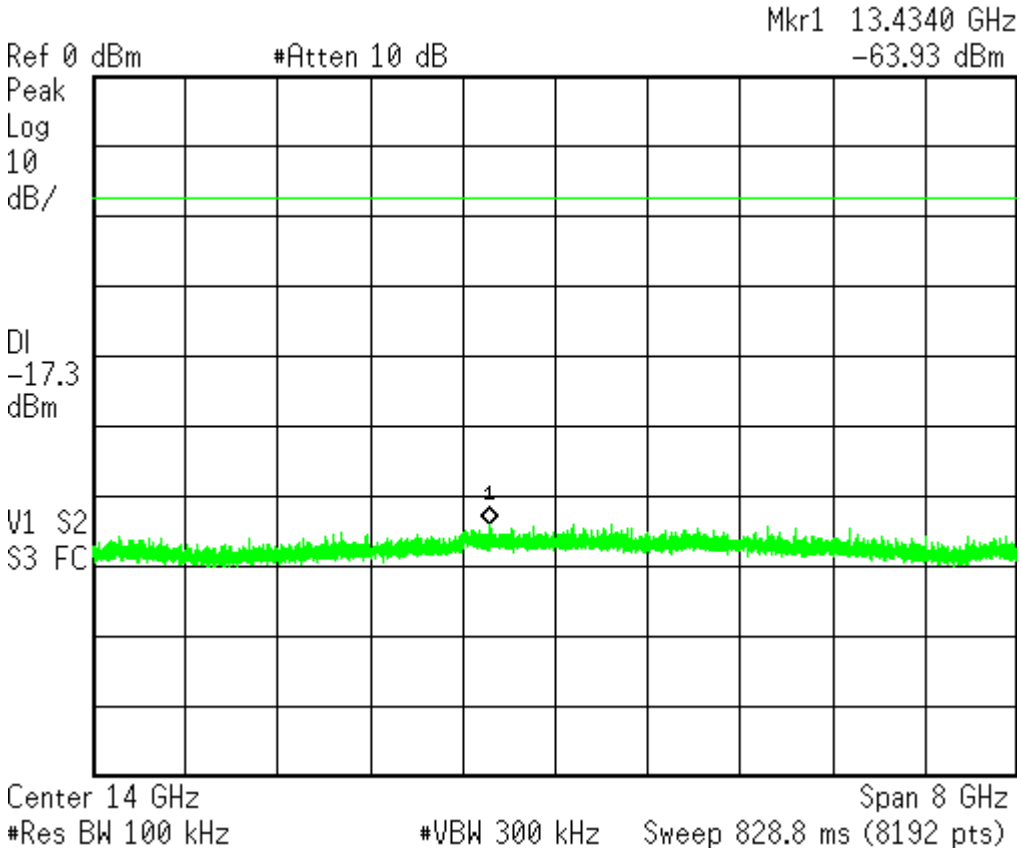
Test Mode : Continuous Transmitting **Tester : Jun**

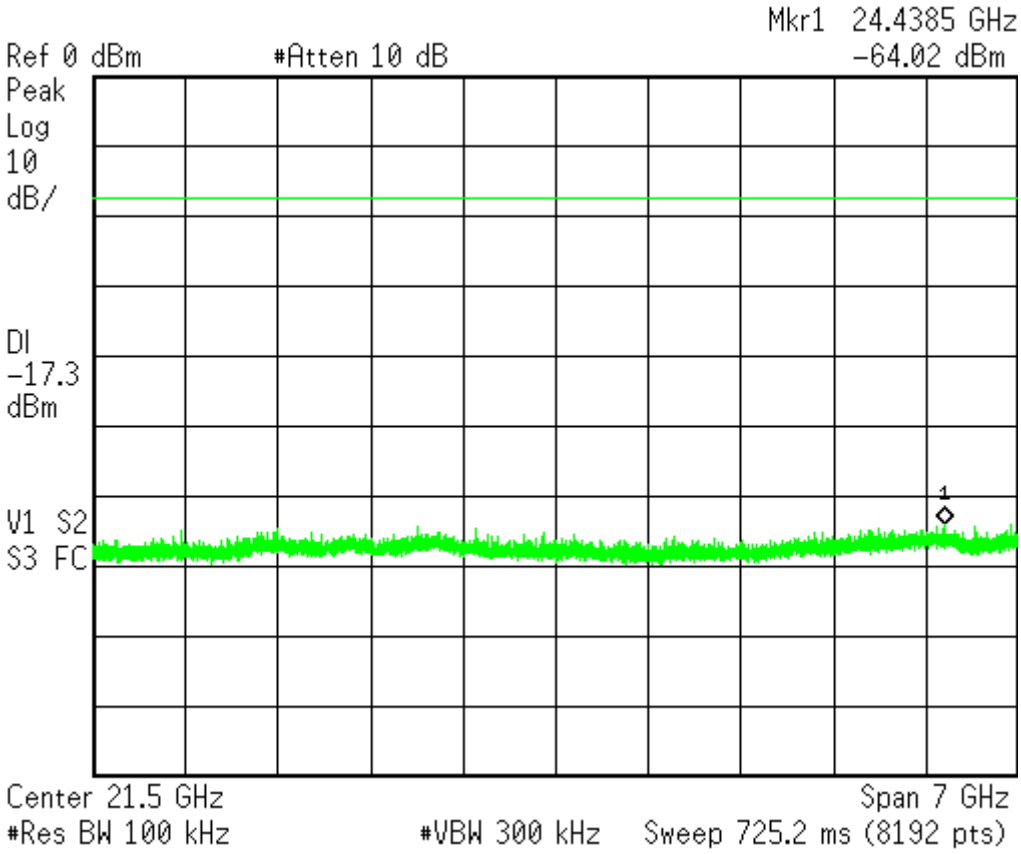
Test Frequency: Channel 11 (2462MHz) **Frequency Rang : 30MHz~25GHz**






Mkr1 2.6400 GHz
-35.3 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Dl
-17.3
dBm
V1 S2
S3 FC
Center 6.275 GHz
Span 7.45 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 771.8 ms (8192 pts)


Mkr1 13.4340 GHz
-63.93 dBm
Ref 0 dBm
#Atten 10 dB
Peak
Log
10
dB/
Dl
-17.3
dBm
V1 S2
S3 FC
Center 14 GHz
Span 8 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 828.8 ms (8192 pts)


Mkr1 24.4385 GHz
Ref 0 dBm
#Atten 10 dB
-64.02 dBm
Peak
Log
10
dB/
Dl
-17.3
dBm
V1 S2
S3 FC
1
Center 21.5 GHz
Span 7 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 725.2 ms (8192 pts)

7 Band Edge

Result: Pass

7.1 Applied standard

According to 15.247(c),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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

7.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	E4405B/ MY45106706	April 9, 2013	April 9, 2014
Test Site	N.A.	TR13	NCR	NCR
Spectrum Analyzer	Agilent	FSP40/ 100031	July 11, 2012	July 11, 2013
Antenna	EMCO	3117/ 00082847	March 5, 2013	March 5, 2014
PRE-AMPLIFIER	MITEQ	JS4-00101800-28 -5A/742309	Dec. 19, 2012	Dec. 19, 2013
PRE-AMPLIFIER	MITEQ	JS4-00101800-28 -5A/742229	Dec. 14, 2012	Dec. 14, 2013
Semi - anechoic Chamber	ETS. LINDGREN	TR11/ 906-A	May 11, 2013	May 11, 2014

Note:

1.The calibrations are traceable to NML/ROC.

2.NCR : No Calibration Required.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
100kHz	300kHz	Peak	Maxhold	non-Restricted Bands
1MHz	3MHz	Peak	Maxhold	Restricted Band Peak
1MHz	10Hz	Peak	Maxhold	Restricted Band Average

Climatic Condition

Ambient Temperature：26℃ Relative Humidity : 54%

7.3 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

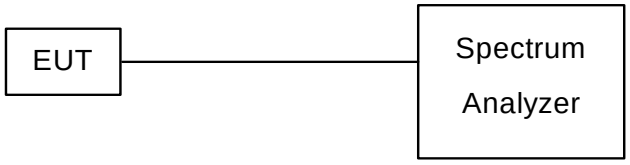
b. The software provided by client enabled the EUT to transmit data at lowest and highest channel frequencies individually.

c. Test procedures follow KDB 558074 D01 DTS Measurement Guidance v03r01.

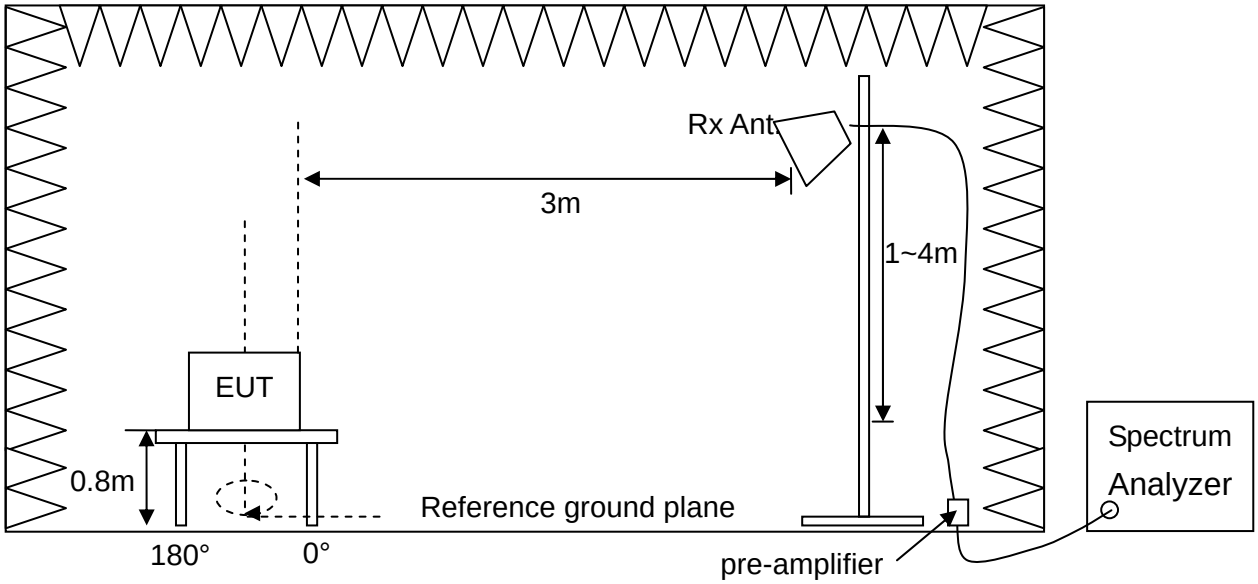
d. Measurement the band edge and compare with the required limit.

7.4 Test configuration

Non-Restricted Bands Measurement



Restricted Band Measurement



7.5 Test Data

Non-Restricted Bands Measurement

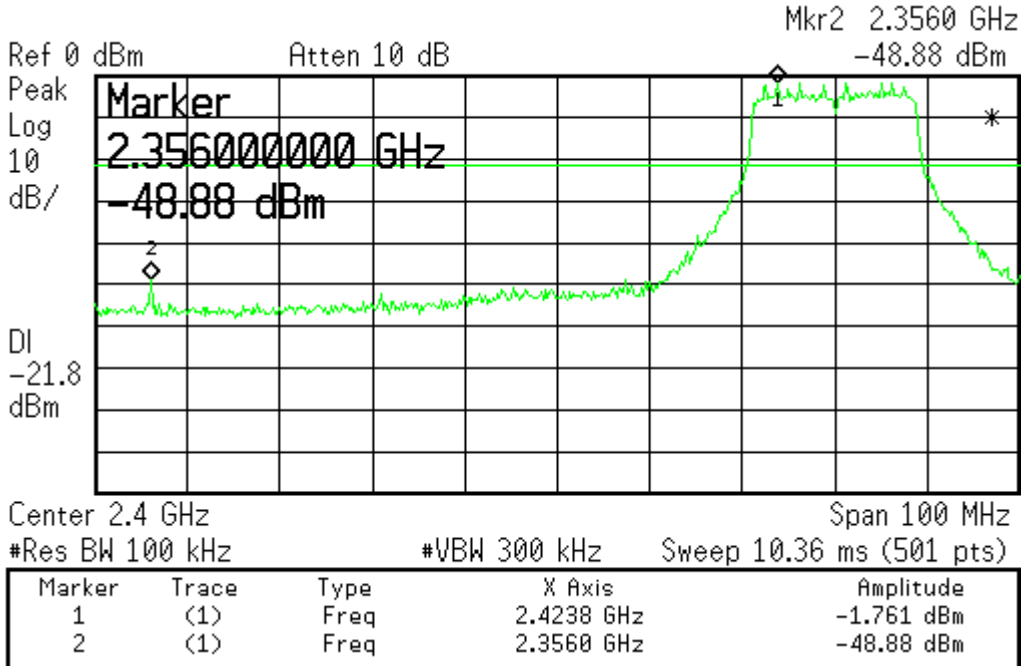
Test Mode : Continuous Transmitting **Tester :** Jun

Operation Frequency (MHz)	Maximum Emission Level (dBm)	Emission Frequency (MHz)	Emission Level of out band (dBm)	Attenuation (dB)	Limit (dB)	Margin (dB)
2412	-1.76	2356	-48.88	47.12	20	27.12
2462	-1.81	2514	-52.13	50.32	20	30.32

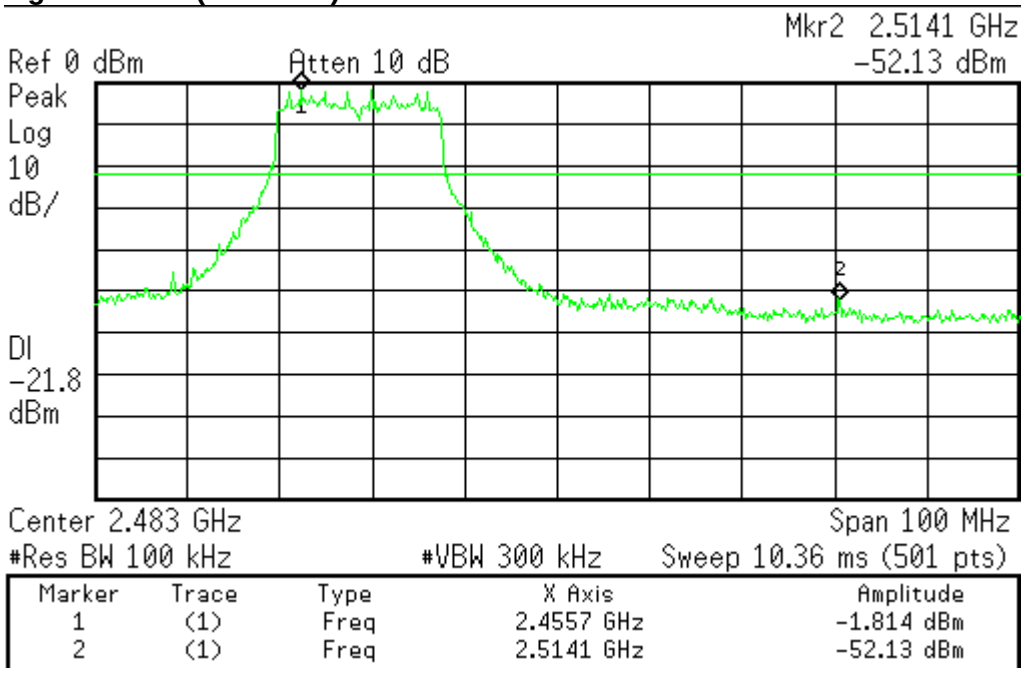
Note:

1. Attenuation (dB) = Maximum Emission Level - Emission Level
2. Margin (dB) = Attenuation – Limit

Low Channel (2412MHz)



High Channel (2462MHz)



Restricted Band Measurement

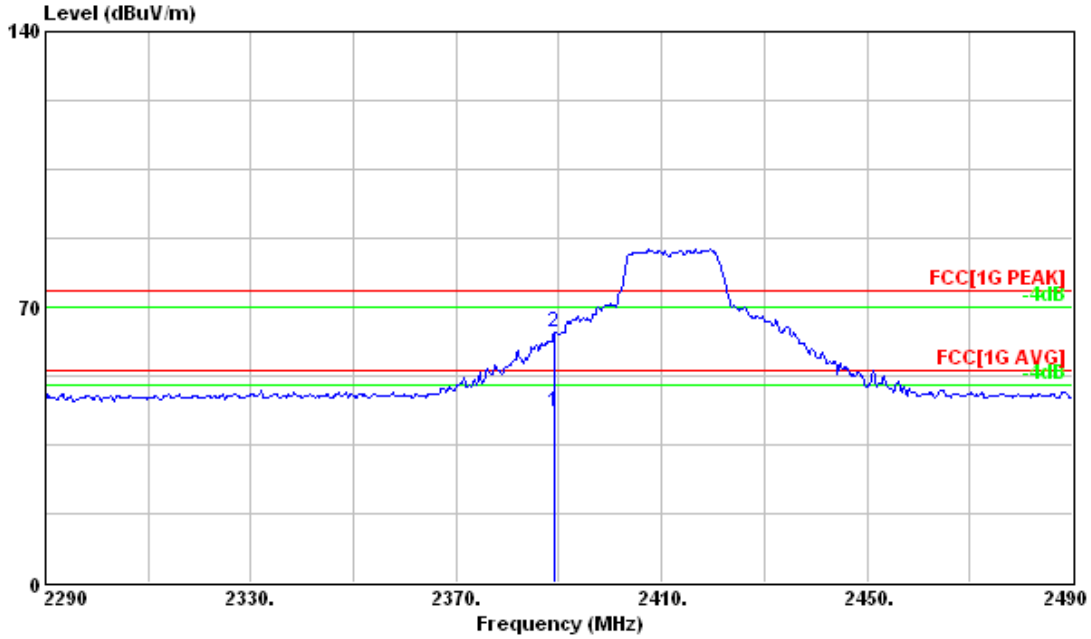
Test Mode : Continuous Transmitting **Tester :** Liu

Operation frequency : 2412MHz										
Frequency (MHz)	**Reading Data (dBuV)**		**Correction Factor (dB/m)**	**Emission (dBuV/m)**		**Limit (dBuV/m)**		**Margin (dB)**		**Polarization**
	Peak	**Av**		**Peak**	**Av**	**Peak**	**Av**	**Peak**	**Av**	
2389.00	99.11	78.88	-35.75	63.36	43.13	74	54	10.64	10.87	Horizontal
2389.00	104.74	82.66	-35.75	68.99	46.91	74	54	5.01	7.09	Vertical
Operation frequency : 2462MHz										
2484.15	102.21	81.33	-35.80	66.41	45.53	74	54	7.59	8.47	Horizontal
2484.15	106.21	83.16	-35.80	70.41	47.36	74	54	3.59	6.64	Vertical

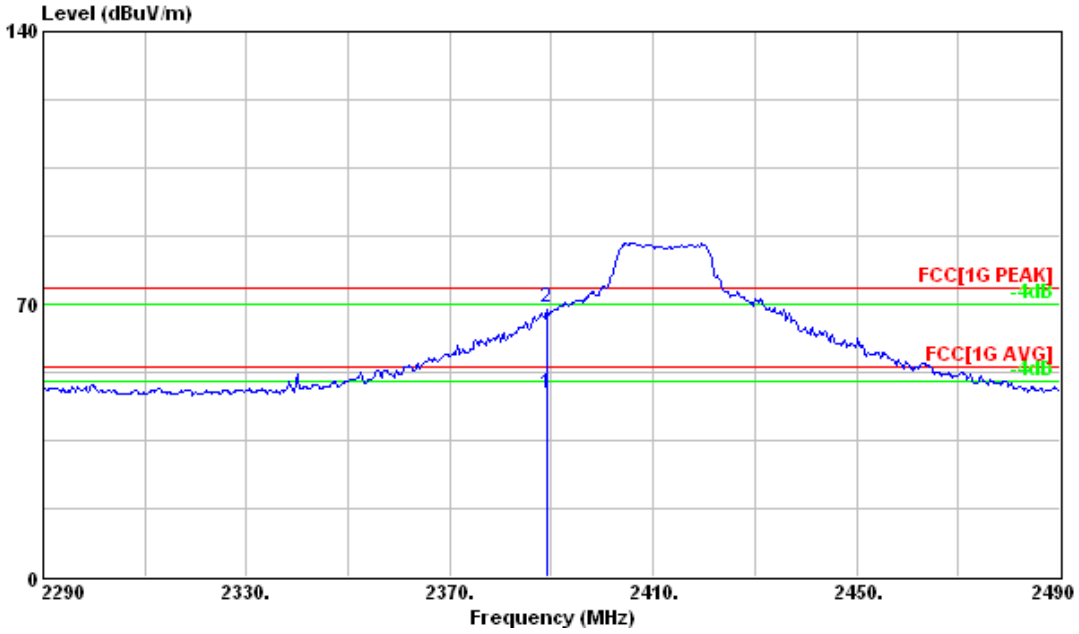
Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission (dBuV/m) = Reading Data + Correction Factor
3. Margin(dB) = Limit – Emission

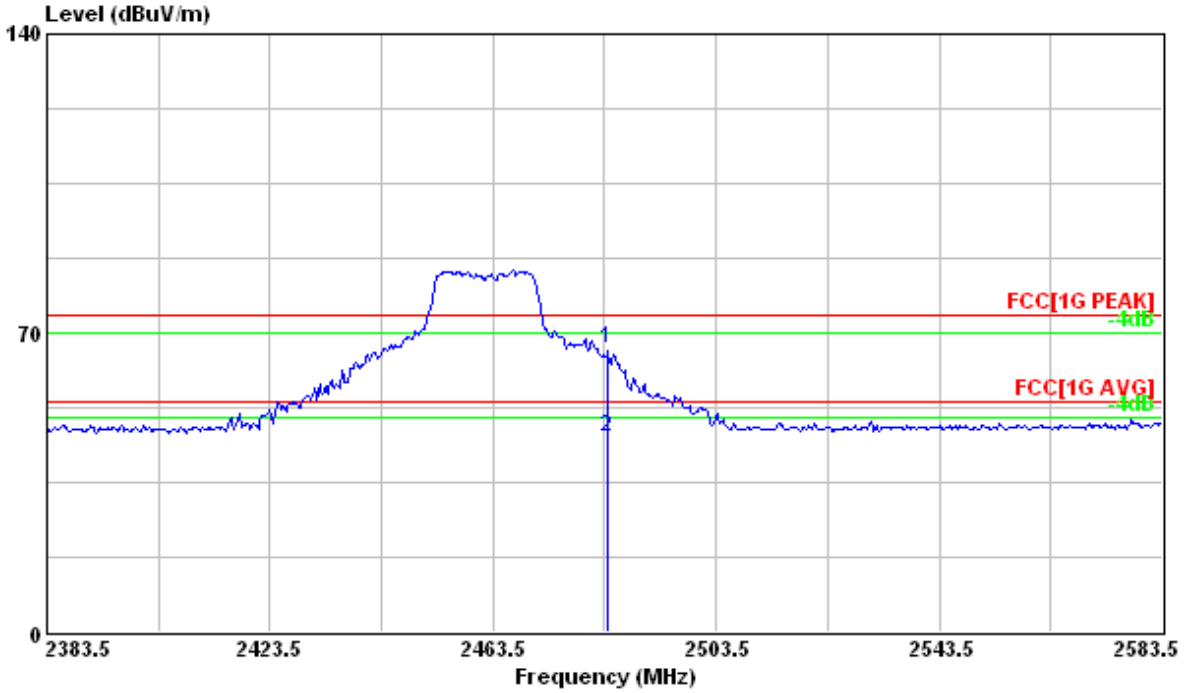
Low Channel (2412MHz), H Polarization



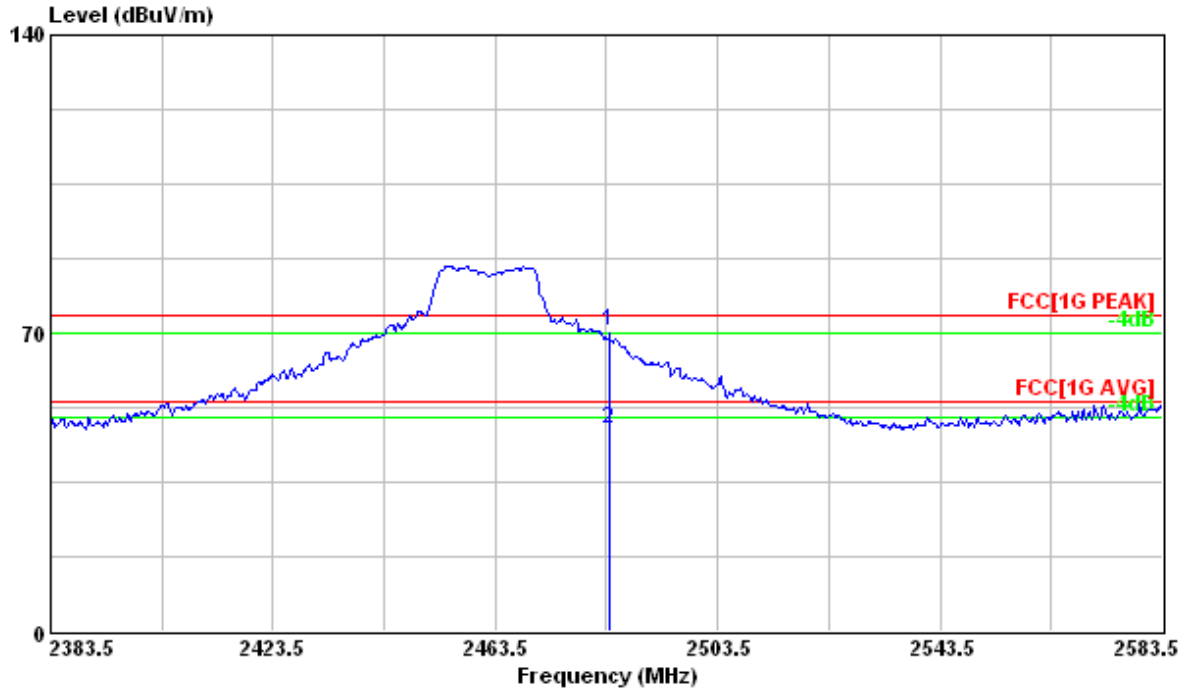
Low Channel (2412MHz), V Polarization



High Channel (2462MHz), H Polarization



High Channel (2462MHz), V Polarization



8 Radiated Emission

Result: Pass

8.1 Applied standard

According to 15.247(c),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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

8.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESCS 30/ 836858/020	Sept. 10, 2012	Sept. 10, 2013
Spectrum Analyzer	Agilent	FSP40/ 100031	July 11, 2012	July 11, 2013
Broadband Antenna	R&S	HL-562/ 830547/010	April 30, 2013	April 30, 2014
Antenna	EMCO	3117/ 00082847	March 5, 2013	March 5, 2014
Pre-Amplifier	Mini Circuit	ZKL-2/ 001	Jan. 15, 2013	July 15, 2013
Pre-Amplifier	Mini Circuit	ZKL-2/ 002	Jan. 15, 2013	July 15, 2013
PRE-AMPLIFIER	MITEQ	JS4-00101800-28-5 A/742309	Dec. 19, 2012	Dec. 19, 2013
PRE-AMPLIFIER	MITEQ	JS4-00101800-28-5 A/ 742229	Dec. 14, 2012	Dec. 14, 2013
RF Cable	JYEBAO	0214/ C0049	Jan. 15, 2013	July 15, 2013
RF Cable	JYEBAO	0214/ C0050	Jan. 15, 2013	July 15, 2013
RF Cable	H+S	Sucoflex 104/ C0081	April 15, 2013	Oct. 15, 2013
Semi - anechoic Chamber	ETS. LINDGREN	TR11/ 906-A	May 11, 2013	May 11, 2014

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the semi-anechoic chamber listed above is the date of NSA measurement.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
120kHz	N/A	Quasi-Peak	Maxhold	Below 1GHz
1MHz	3MHz	Peak	Maxhold	Above 1GHz, Peak
1MHz	10Hz	Peak	Maxhold	Above 1GHz, Average

Climatic Condition

Ambient Temperature：20℃ Relative Humidity :23%

8.3 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit and receive data at operating frequency.(if necessary)

c. If the EUT is tabletop equipment, it should be placed on a wooden table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it should be placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.

d. The EUT is set 3m away from the interference receiving antenna.

e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.

f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine at least six frequencies associated with higher emission levels and record them.

g. Then measure each frequency found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.

h. For measurement of frequency below 1000MHz, set the receiver detector to be Quasi-Peak per CISPR 16-1 to find out the maximum level occurred.

i. For measurement of frequency above 1000MHz, set the spectrum detector to be Peak or Average to find out the maximum level occurred, if any.

j. Record frequency, azimuth angle of the turntable, height, and polarization of the receiving antenna and compare the maximum level with the required limit.

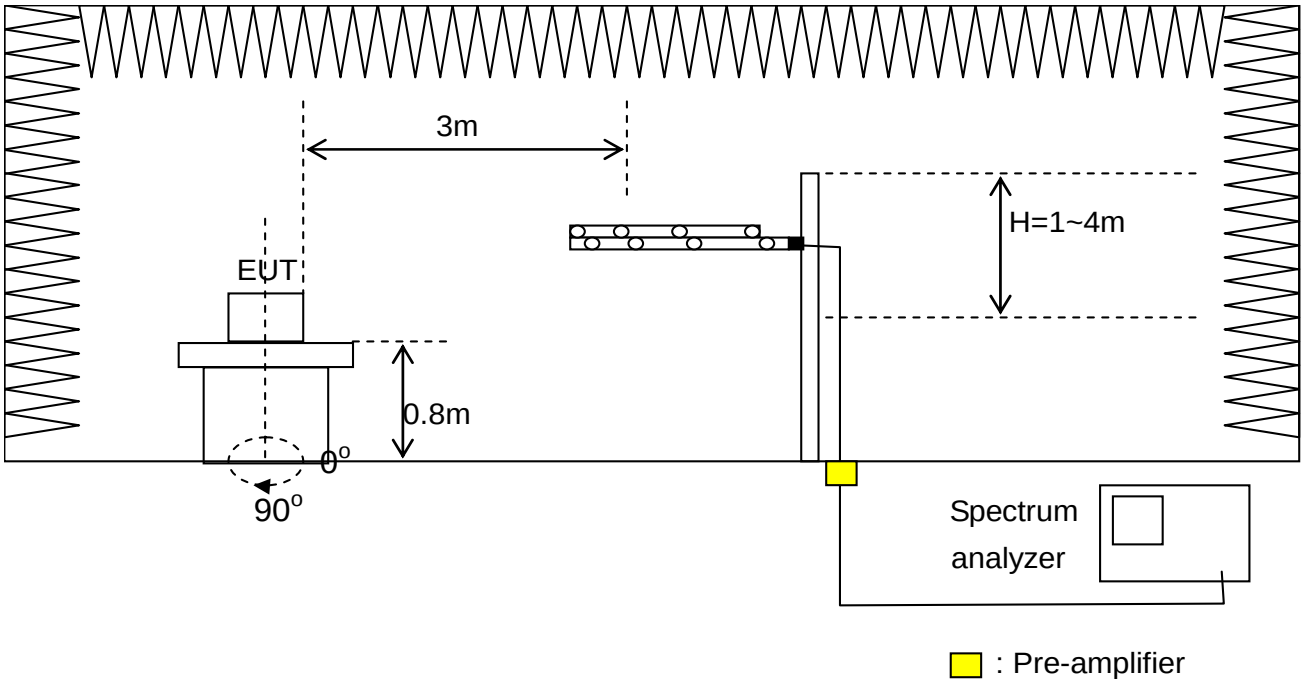
k. Change the receiving antenna to another polarization to measure radiated emission by following step e. to j. again.

l. If the peak emission level below 1000MHz measured from step f. is 4dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate Q.P. value will be measured and presented.

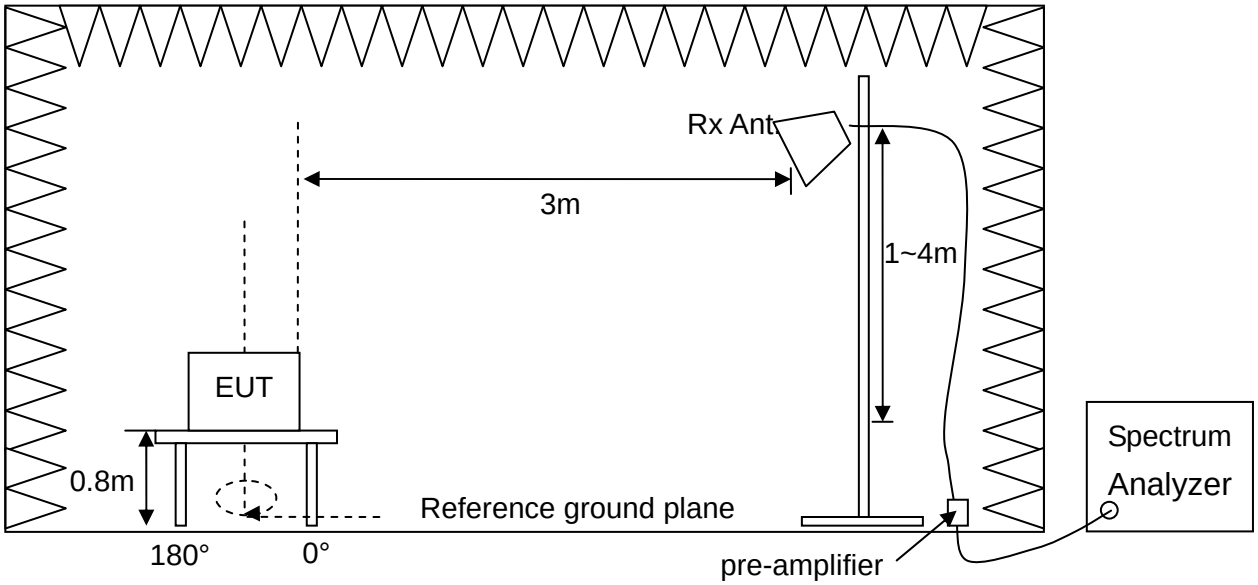
m. If the peak emission level above 1000MHz measured from step f. is 20dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate A.V. value will be measured and presented.

8.4 Test configuration

Below 1GHz



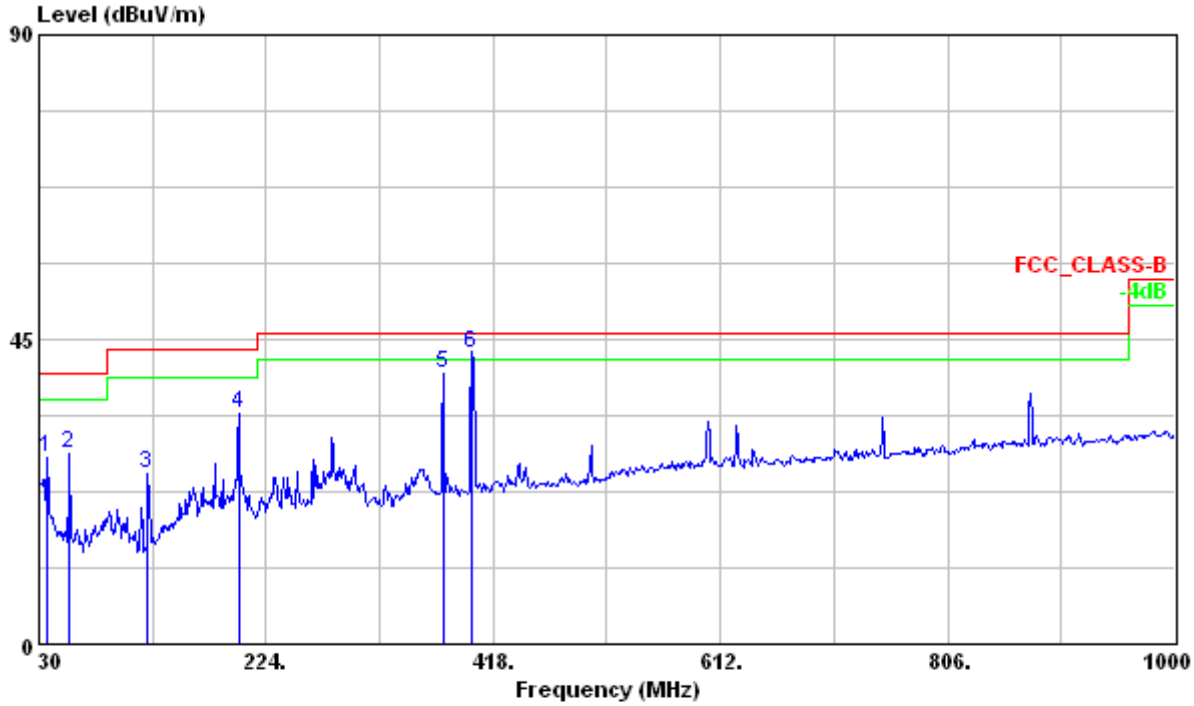
Above 1GHz



8.5 Test Data

Radiated Emission Measurement below 1000MHz

Test Mode	**: 2412MHz, Continuous Transmitting**		
Test Distance	**:** 3m	**Tester**	**:** Liu
Polarization	**:** Horizontal	**Frequency Range**	**:** 30MHz~1000MHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	36.480	27.50	39.33	-11.83	40.00	-12.50	---	---	HORIZONTAL	Peak
2	55.380	28.21	46.30	-18.09	40.00	-11.79	---	---	HORIZONTAL	Peak
3	123.150	25.30	44.35	-19.05	43.50	-18.20	---	---	HORIZONTAL	Peak
4	200.370	34.06	49.44	-15.38	43.50	-9.44	---	---	HORIZONTAL	Peak
5	374.900	39.83	49.46	-9.63	46.00	-6.17	---	---	HORIZONTAL	Peak
6 !	399.975	42.86	51.91	-9.05	46.00	-3.14	100	278	HORIZONTAL	QP

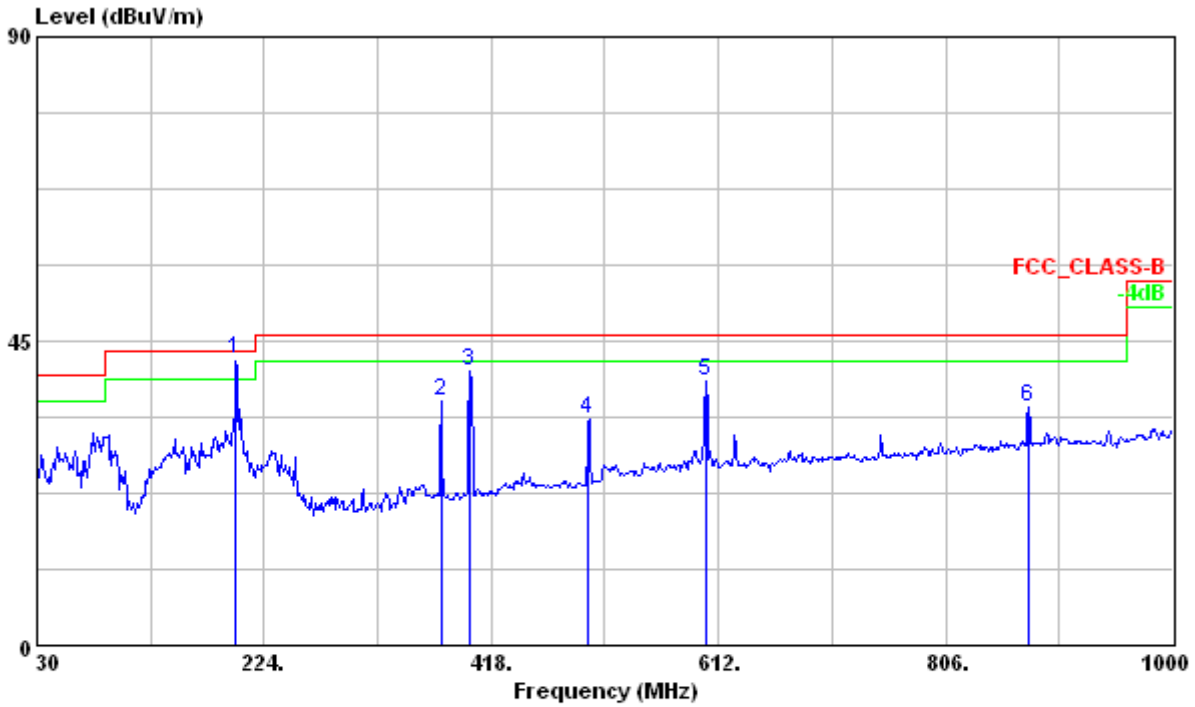
Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode : **2412MHz, Continuous Transmitting**

Test Distance : 3m **Tester** : Liu

Polarization : Vertical **Frequency Range** : 30MHz~1000MHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1 @	199.977	42.30	57.68	-15.38	43.50	-1.20	100	10	VERTICAL	QP
2	374.900	36.11	45.74	-9.63	46.00	-9.89	---	---	VERTICAL	Peak
3	399.400	40.53	49.59	-9.06	46.00	-5.47	---	---	VERTICAL	Peak
4	500.900	33.37	40.40	-7.03	46.00	-12.63	---	---	VERTICAL	Peak
5	601.000	38.94	43.45	-4.51	46.00	-7.06	---	---	VERTICAL	Peak
6	876.800	35.21	36.14	-0.93	46.00	-10.79	---	---	VERTICAL	Peak

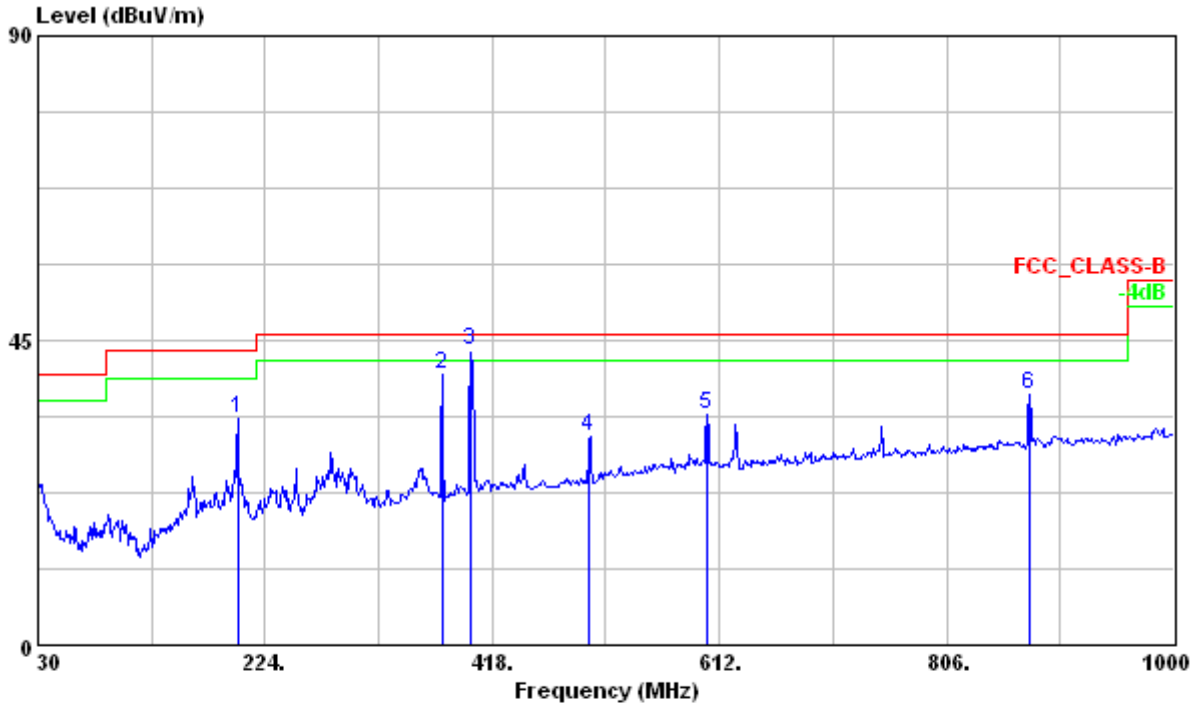
Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode : **2437MHz, Continuous Transmitting**

Test Distance : 3m **Tester** : Liu

Polarization : Horizontal **Frequency Range** : 30MHz~1000MHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	200.370	33.39	48.77	-15.38	43.50	-10.11	---	---	HORIZONTAL	Peak
2	374.900	40.05	49.68	-9.63	46.00	-5.95	---	---	HORIZONTAL	Peak
3 !	399.984	43.54	52.59	-9.05	46.00	-2.46	101	286	HORIZONTAL	QP
4	500.900	30.69	37.72	-7.03	46.00	-15.31	---	---	HORIZONTAL	Peak
5	601.000	34.09	38.60	-4.51	46.00	-11.91	---	---	HORIZONTAL	Peak
6	876.800	36.94	37.87	-0.93	46.00	-9.06	---	---	HORIZONTAL	Peak

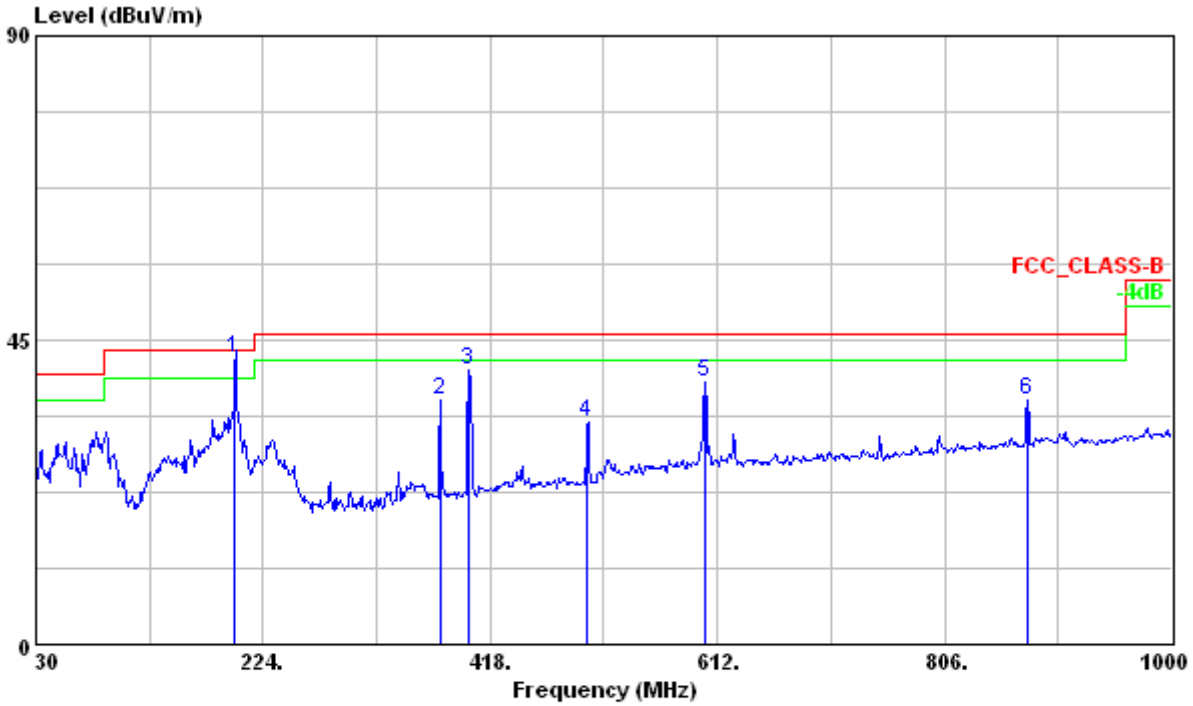
Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode : **2437MHz, Continuous Transmitting**

Test Distance : 3m **Tester** : Liu

Polarization : Vertical **Frequency Range** : 30MHz~1000MHz

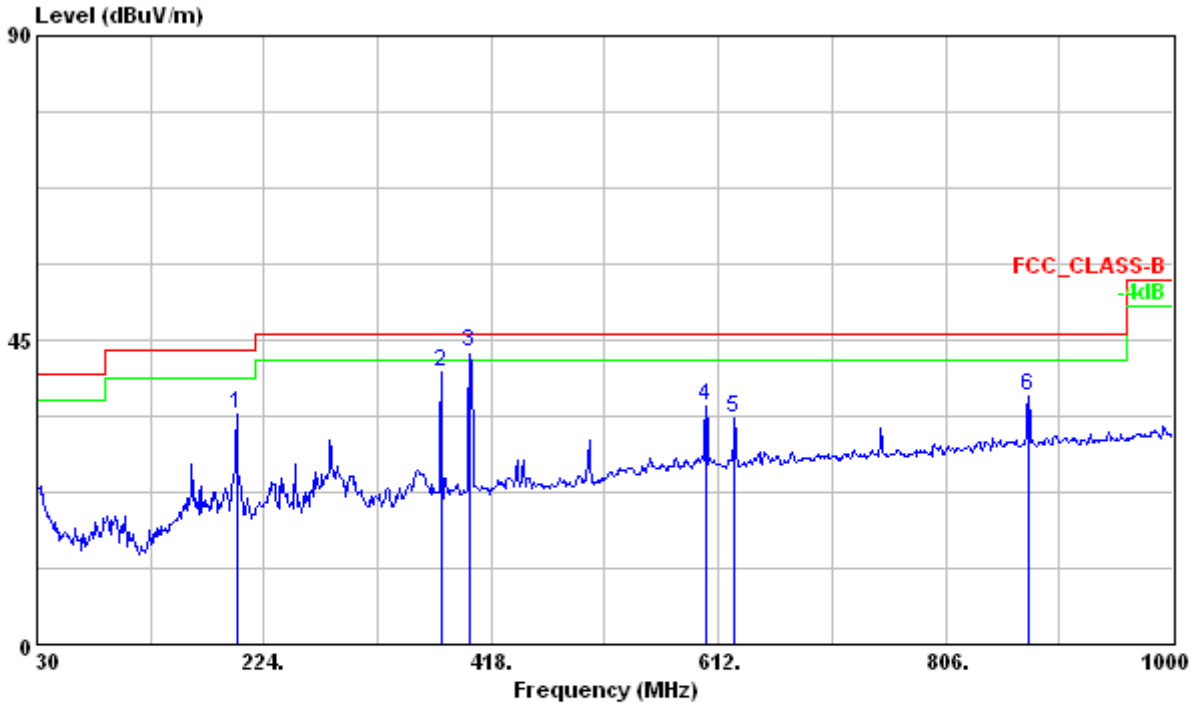


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1 @	199.978	42.43	57.81	-15.38	43.50	-1.07	100	360	VERTICAL	QP
2	374.900	36.16	45.79	-9.63	46.00	-9.84	---	---	VERTICAL	Peak
3	399.400	40.52	49.58	-9.06	46.00	-5.48	---	---	VERTICAL	Peak
4	500.900	32.98	40.01	-7.03	46.00	-13.02	---	---	VERTICAL	Peak
5	601.000	38.67	43.18	-4.51	46.00	-7.33	---	---	VERTICAL	Peak
6	876.800	36.05	36.98	-0.93	46.00	-9.95	---	---	VERTICAL	Peak

Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode	**: 2462MHz, Continuous Transmitting**		
Test Distance	**:** 3m	**Tester**	**:** Liu
Polarization	**:** Horizontal	**Frequency Range**	**:** 30MHz~1000MHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	200.370	34.05	49.43	-15.38	43.50	-9.45	---	---	HORIZONTAL	Peak
2	374.900	40.12	49.75	-9.63	46.00	-5.88	---	---	HORIZONTAL	Peak
3 !	399.986	43.08	52.13	-9.05	46.00	-2.92	101	58	HORIZONTAL	QP
4	601.000	35.11	39.62	-4.51	46.00	-10.89	---	---	HORIZONTAL	Peak
5	625.500	33.45	37.87	-4.42	46.00	-12.55	---	---	HORIZONTAL	Peak
6	876.800	36.76	37.69	-0.93	46.00	-9.24	---	---	HORIZONTAL	Peak

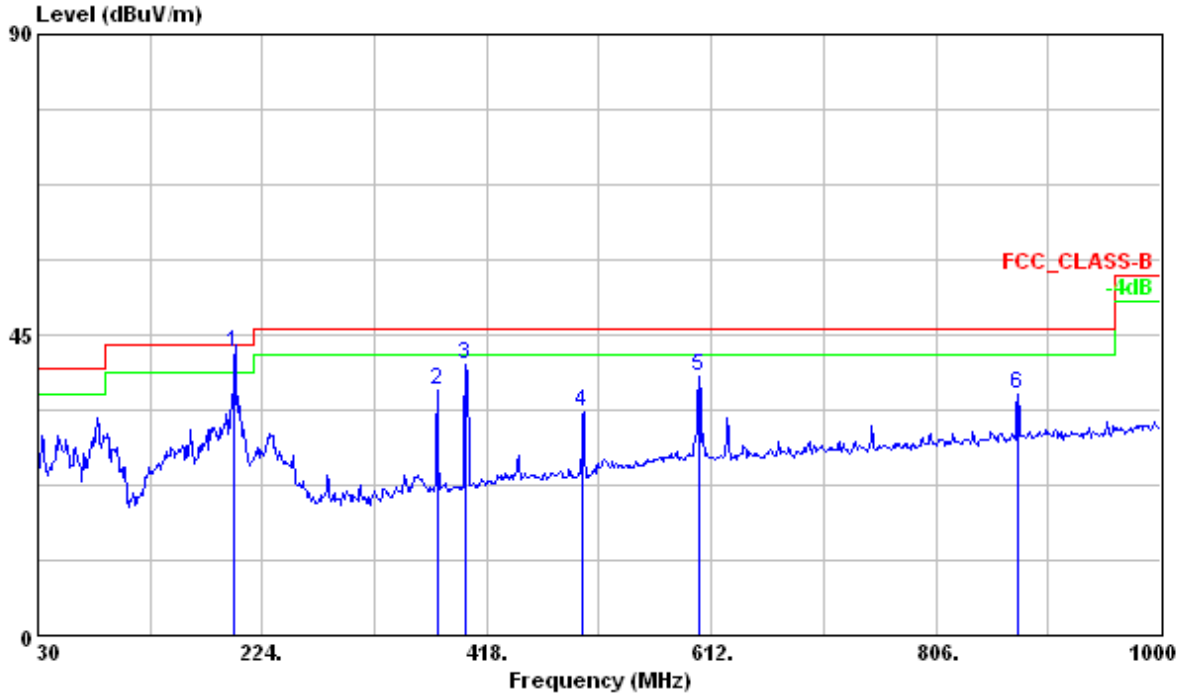
Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode : **2462MHz, Continuous Transmitting**

Test Distance : 3m **Tester** : Liu

Polarization : Vertical **Frequency Range** : 30MHz~1000MHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1 @	199.994	42.32	57.70	-15.38	43.50	-1.18	101	360	VERTICAL	QP
2	374.900	36.58	46.21	-9.63	46.00	-9.42	---	---	VERTICAL	Peak
3	399.400	40.45	49.51	-9.06	46.00	-5.55	---	---	VERTICAL	Peak
4	500.900	33.31	40.34	-7.03	46.00	-12.69	---	---	VERTICAL	Peak
5	601.000	38.70	43.21	-4.51	46.00	-7.30	---	---	VERTICAL	Peak
6	876.800	36.13	37.06	-0.93	46.00	-9.87	---	---	VERTICAL	Peak

Note：

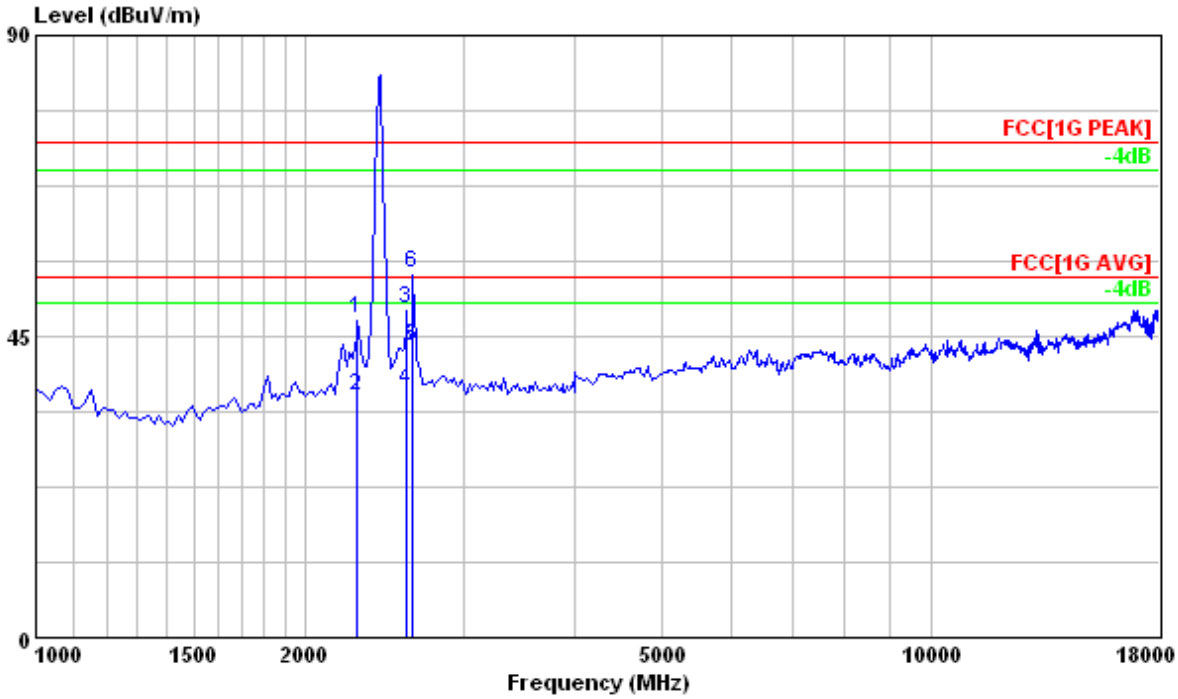
1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Radiated Emission Measurement above 1000MHz

Test Model **: 2412MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Liu

Antenna Polarization **:** Horizontal **Frequency Range :**1GHz~25GHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2288.020	47.75	84.07	-36.32	74.00	-26.25	100	221	HORIZONTAL	Peak
2	2288.020	36.10	72.42	-36.32	54.00	-17.90	100	221	HORIZONTAL	Average
3	2599.792	49.20	84.72	-35.52	74.00	-24.80	100	221	HORIZONTAL	Peak
4	2599.792	37.08	72.60	-35.52	54.00	-16.92	100	221	HORIZONTAL	Average
5 @	2639.925	43.60	79.04	-35.44	54.00	-10.40	101	30	HORIZONTAL	Average
6	2639.925	54.51	89.95	-35.44	74.00	-19.49	101	30	HORIZONTAL	Peak

Note:

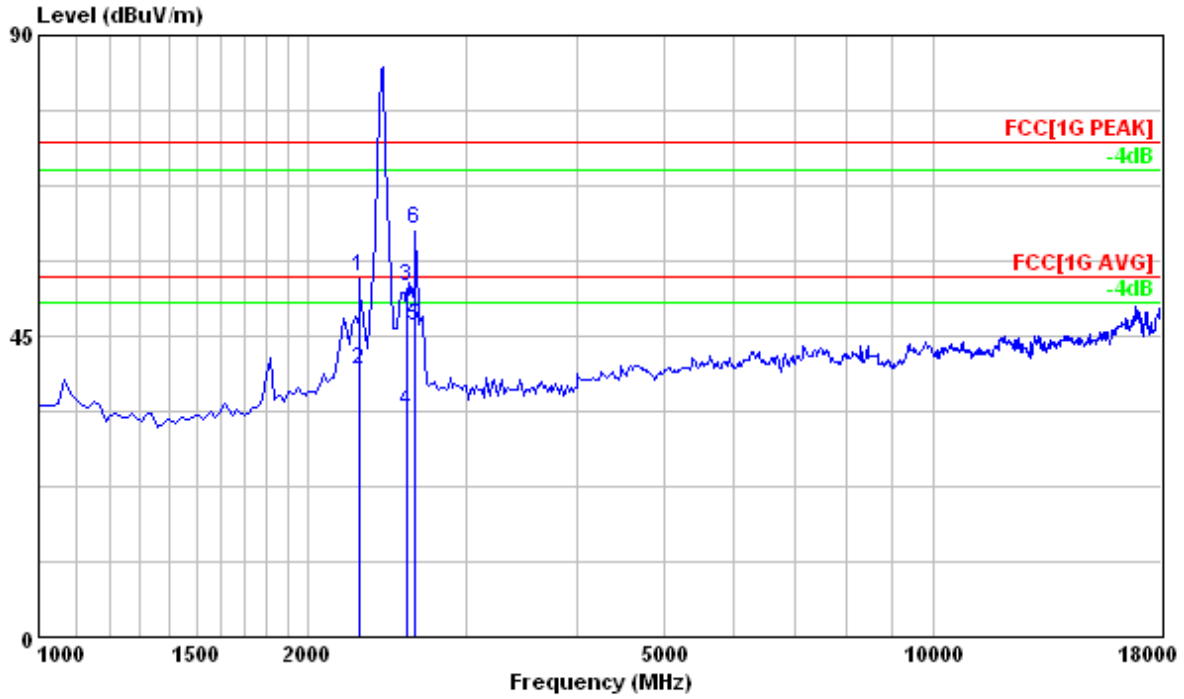
1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 18GHz to 25GHz, so the graphs are omitted above 18GHz.

Test Model **: 2412MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Liu

Antenna Polarization **:** Vertical **Frequency Range :**1GHz~25GHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2287.977	53.88	90.20	-36.32	74.00	-20.12	101	130	VERTICAL	Peak
2	2287.977	40.10	76.42	-36.32	54.00	-13.90	101	130	VERTICAL	Average
3	2580.749	52.39	87.96	-35.57	74.00	-21.61	101	319	VERTICAL	Peak
4	2580.749	33.64	69.21	-35.57	54.00	-20.36	101	319	VERTICAL	Average
5 @	2640.100	46.33	81.77	-35.44	54.00	-7.67	157	310	VERTICAL	Average
6	2640.100	60.87	96.31	-35.44	74.00	-13.13	157	310	VERTICAL	Peak

Note:

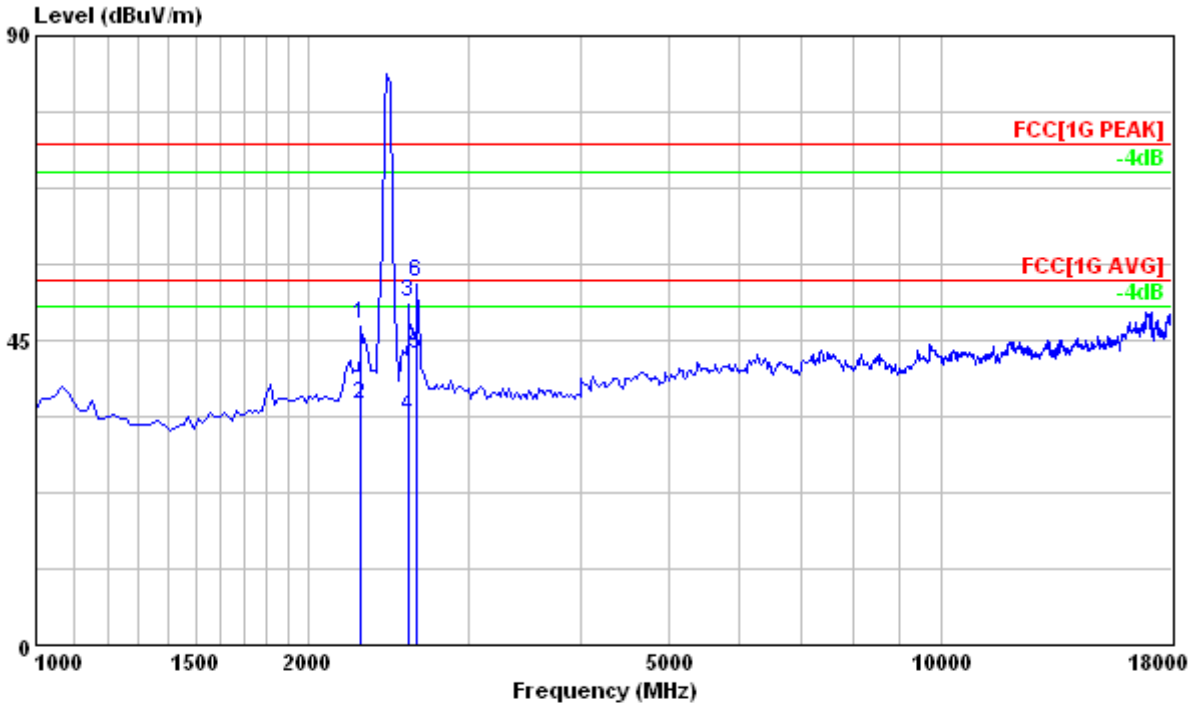
1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 18GHz to 25GHz, so the graphs are omitted above 18GHz.

Test Model **: 2437MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Liu

Antenna Polarization **:** Horizontal **Frequency Range :**1GHz~25GHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2288.449	47.24	83.56	-36.32	74.00	-26.76	132	337	HORIZONTAL	Peak
2	2288.449	35.41	71.73	-36.32	54.00	-18.59	132	337	HORIZONTAL	Average
3	2585.930	50.50	86.06	-35.56	74.00	-23.50	100	103	HORIZONTAL	Peak
4	2585.930	33.74	69.30	-35.56	54.00	-20.26	100	103	HORIZONTAL	Average
5 @	2639.970	42.88	78.32	-35.44	54.00	-11.12	100	31	HORIZONTAL	Average
6	2639.970	53.68	89.12	-35.44	74.00	-20.32	100	31	HORIZONTAL	Peak

Note:

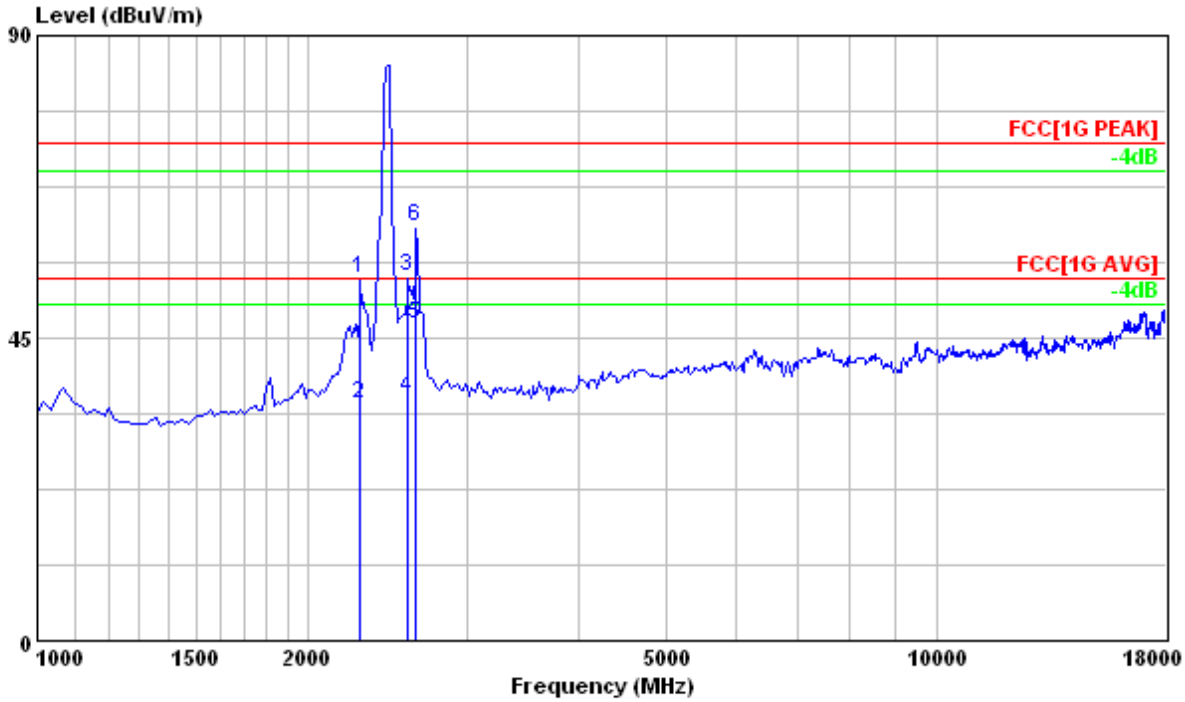
1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 18GHz to 25GHz, so the graphs are omitted above 18GHz.

Test Model **: 2437MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Liu

Antenna Polarization **:** Vertical **Frequency Range :**1GHz~25GHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2288.270	53.84	90.16	-36.32	74.00	-20.16	100	155	VERTICAL	Peak
2	2288.270	35.37	71.69	-36.32	54.00	-18.63	100	155	VERTICAL	Average
3	2577.756	54.30	89.89	-35.59	74.00	-19.70	100	277	VERTICAL	Peak
4	2577.756	36.21	71.80	-35.59	54.00	-17.79	100	277	VERTICAL	Average
5 @	2639.564	47.11	82.55	-35.44	54.00	-6.89	159	164	VERTICAL	Average
6	2639.564	61.59	97.03	-35.44	74.00	-12.41	159	164	VERTICAL	Peak

Note:

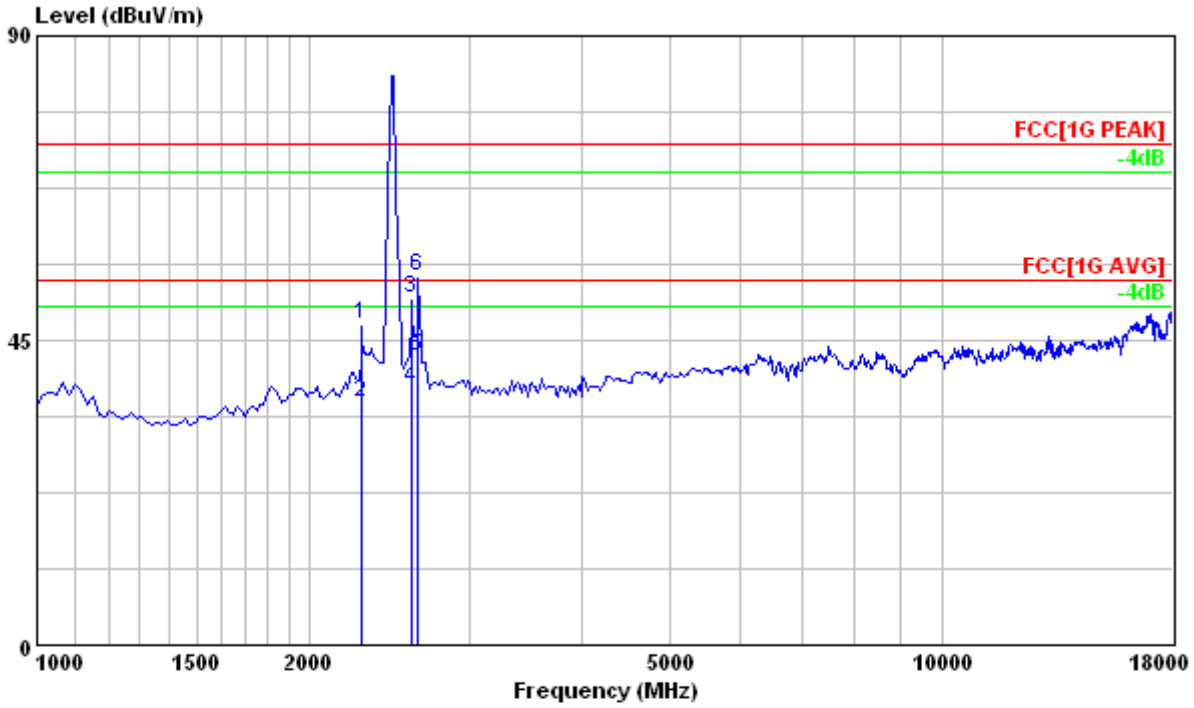
1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 18GHz to 25GHz, so the graphs are omitted above 18GHz.

Test Model **: 2462MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Liu

Antenna Polarization **:** Horizontal **Frequency Range :**1GHz~25GHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2288.010	47.26	83.58	-36.32	74.00	-26.74	100	21	HORIZONTAL	Peak
2	2288.010	35.96	72.28	-36.32	54.00	-18.04	100	21	HORIZONTAL	Average
3	2599.844	51.13	86.65	-35.52	74.00	-22.87	198	115	HORIZONTAL	Peak
4	2599.844	37.83	73.35	-35.52	54.00	-16.17	198	115	HORIZONTAL	Average
5 @	2640.110	42.65	78.09	-35.44	54.00	-11.35	131	109	HORIZONTAL	Average
6	2640.110	54.58	90.02	-35.44	74.00	-19.42	131	109	HORIZONTAL	Peak

Note:

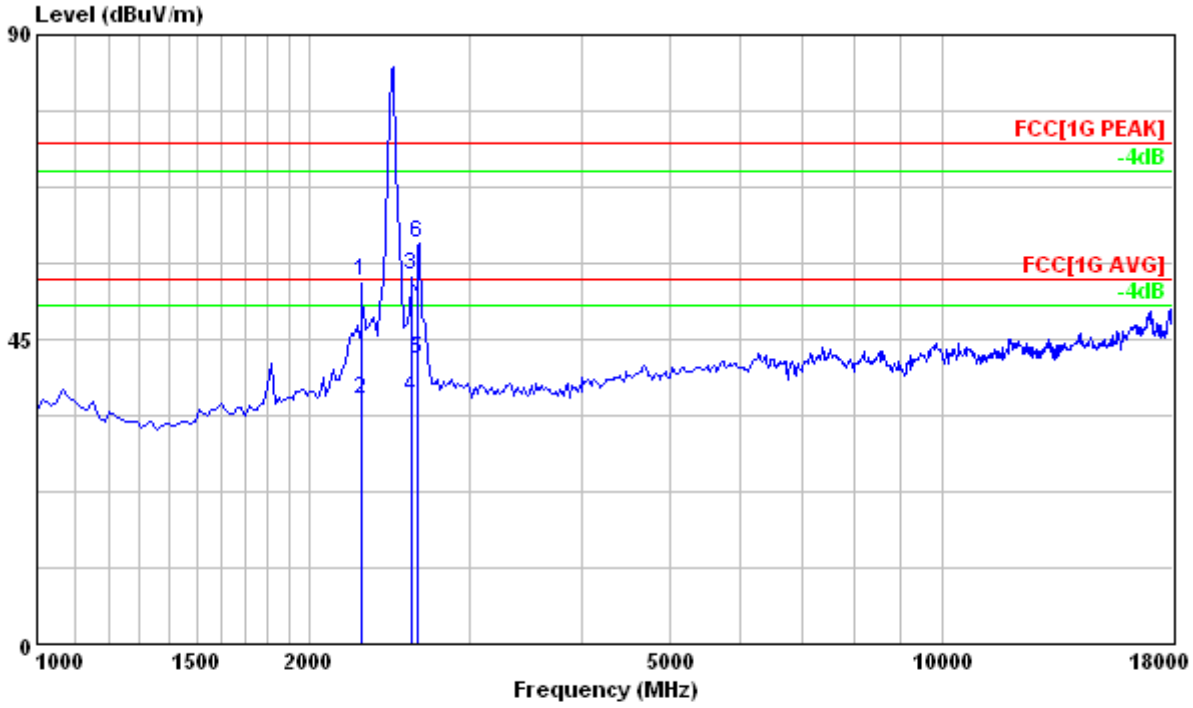
1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 18GHz to 25GHz, so the graphs are omitted above 18GHz.

Test Model **: 2462MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Liu

Antenna Polarization **:** Vertical **Frequency Range :**1GHz~25GHz



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2287.400	53.72	90.03	-36.31	74.00	-20.28	101	130	VERTICAL	Peak
2	2287.400	36.20	72.51	-36.31	54.00	-17.80	101	130	VERTICAL	Average
3	2598.862	54.39	89.91	-35.52	74.00	-19.61	125	344	VERTICAL	Peak
4	2598.862	36.46	71.98	-35.52	54.00	-17.54	125	344	VERTICAL	Average
5	2640.283	41.93	77.37	-35.44	54.00	-12.07	153	309	VERTICAL	Average
6	2640.283	59.27	94.71	-35.44	74.00	-14.73	153	309	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 18GHz to 25GHz, so the graphs are omitted above 18GHz.

9 Antenna Requirement

9.1 Applied standard

According to 15.247(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

9.2 Antenna Information

This antenna's relative information as follow:

Brand	Model	Frequency Range (MHz)	Gain (dBi)	Comment
M.gear	ANT DIPOLE	2.4GHz~2.5GHz	0	

9.3 Result

Gain of the antenna is less than 6dBi.