

# **TEST REPORT**

## **FCC ID: 2AKMPHLB013**

### **IC: 22250-HLB013**

Product : Infant care capsule

Model Name : HLB-013

Brand : Hulubao

Report No. : PTCDQ021612109E-FC01

#### **Prepared for**

Guangdong Hulubao Culture Technology Co., Ltd.  
101, Tower 15, Headquarters, Xinzhu Road, SongshanLake, Dongguan, Guangdong

#### **Prepared by**

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## TEST RESULT CERTIFICATION

Applicant's name : Guangdong Hulubao Culture Technology Co., Ltd.  
Address : 101, Tower 15, Headquarters, Xinzhu Road, SongshanLake, Dongguan, Guangdong  
Manufacture's name : Guangdong Hulubao Culture Technology Co., Ltd.  
Address : 101, Tower 15, Headquarters, Xinzhu Road, SongshanLake, Dongguan, Guangdong  
Product name : Infant care capsule  
Model name : HLB-013  
Standards : FCC CFR47 Part 15 Section 15.247  
RSS 247 Issue 1  
Test procedure : ANSI C63.10:2013  
Test Date : Dec.12. 2016 ~ Dec.14. 2016  
Date of Issue : Dec.14. 2016  
Test Result : Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Testing Engineer

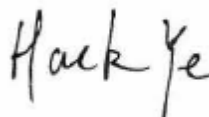
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Authorized Signatory

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## 2 Test Summary

<b>FCC Part15 (15.247) RSS 247, Subpart C</b>			
Standard Section		Test Item	Judgment
15.207	RSS-Gen Issue 4 8.8	Conducted Emission	PASS
15.247 (a)(2)	RSS-247 Issue 5 (5.2)	6dB&99% Bandwidth	PASS
15.247 (b) (3)	RSS-247 Issue 5 (5.4.4)	Peak Output Power	PASS
15.247 (d)	RSS-247 Issue 5 (5.5) RSS-GEN ISSU4 8.9	Radiated Spurious Emission	PASS
15.247 (d)	RSS-247 Issue 5 (5.5)	Conducted Spurious Emission	PASS
15.247 (e)	RSS-247 Issue 5 (5.2)	Power Spectral Density	PASS
15.205	RSS-247 Issue 4 (8.10)	Band Edge Emission	PASS
15.203	RSS-Gen Issue 4 8.3	Antenna Requirement	PASS

### 3 General Information

#### 3.1 General Description of E.U.T.

Product Name	:	Infant care capsule
Model Name	:	HLB-013
Model Description	:	N/A
Operating frequency	:	2412-2462MHz, 11channels
Antenna installation:	:	Integral antenna
Antenna Gain:	:	WiFi: 0dBi
The lowest oscillator:	:	32.768KHz
Type of Modulation	:	For WIFI: IEEE 802.11b CCK/QPSK/BPSK IEEE 802.11g BPSK/QPSK/16QAM/64QAM IEEE 802.11n-HT20 BPSK/QPSK/16QAM/64QAM
Power supply	:	DC 19V 7.8A charging by AC adapter
Adapter	:	Input: AC 120V 60Hz 0.3A max Output: DC 19V 7.8A
Hardware Version	:	--
Software Version	:	--

### 3.2 Channel List

WIFI							
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452	/	/

### 3.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported. dutycycle>98%

Modulation	Test mode	Low channel	Middle channel	High channel
802.11b/g/n-HT20	Transmitting	2412MHz	2437MHz	2462MHz
Tests Carried Out Under FCC part 15.207				
Test Item		Test Mode		
Conduction Emission 0.15MHz to 30MHz		Charging+ Keeping TX Mode		

### 3.4 Test Site

Dongguan Precise Testing Service Co., Ltd.

Building D,Baoding Technology Park,Guangming Road2, Dongcheng District, Dongguan,

Guangdong, China, Dongguan, 523129

China

FCC Registration Number: 371540

IC Registration Number: 12191A-1

## 4 Equipment During Test

### 4.1 Equipments List

RF Conducted Test and Radiated Emissions							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMC Analyzer (9k~26.5GHz)	Agilent	E4407B	MY45109572	Aug.04, 2016	Aug.03, 2017	1 year
2	EXA Signal Analyzer	Keysight	N9010A	MY50520207 526B25MPB W7X	Aug.04, 2016	Aug.03, 2017	1 year
3	EMI Test Receiver	R&S	ESCI	101155	July 15, 2016	July 14, 2017	1 year
4	Humidity Chamber	GF	GTH-225-40-1P	IAA061225	July 15, 2016	July 14, 2017	1 year
5	USB RF power sensor	DARE	RPR3006W	15I00041SN 001	July 15, 2016	July 14, 2017	1 year
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	Rohde&Schwarz	ESCI	101417	July 15, 2016	July 14, 2017	1 year
2	Trilog Broadband Antenna	SCHWARZB ECK	VULB9160	9160-3355	July 15, 2016	July 14, 2017	1 year
3	Amplifier	EM	EM-30180	060538	July 15, 2016	July 14, 2017	1 year
4	Horn Antenna	SCHWARZB ECK	BBHA9120 D	9120D- 1246	July 15, 2016	July 14, 2017	1 year
5	Coaxial Cable(below 1GHz)	LARGE	CALB1	-	July 15, 2016	July 14, 2017	1 year
6	Coaxial Cable(above 1GHz)	LARGE	CALB2	-	July 15, 2016	July 14, 2017	1 year
Conducted Emissions							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	R&S	ESCI	101155	July 15, 2016	July 14, 2017	1 year
2	LISN	SCHWARZB ECK	NSLK 8128	8128-289	July 15, 2016	July 14, 2017	1 year
3	Cable	LARGE	RF300	-	July 15, 2016	July 14, 2017	1 year





## 4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	$\pm 1.0\text{dB}$
Power Spectral Density, conducted	$\pm 2.2\text{dB}$
Radio Frequency	$\pm 1 \times 10^{-6}$
Bandwidth	$\pm 1.5 \times 10^{-6}$
Time	$\pm 2\%$
Duty Cycle	$\pm 2\%$
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conducted Emissions(150kHz~30MHz)	$\pm 3.64\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 4.74\text{dB}$

## 5 Conducted Emission

Test Requirement:	: FCC CFR 47 Part 15 Section 15.207
Test Method:	: ANSI C63.4:2014
Test Result:	: PASS
FrequencyRange:	: 150kHz to 30MHz
Class/Severity:	: Class B
Limit:	: 66-56 dB $\mu$ V between 0.15MHz & 0.5MHz
	: 56 dB $\mu$ V between 0.5MHz & 5MHz
	: 60 dB $\mu$ V between 5MHz & 30MHz
Detector:	: Peak for pre-scan(9kHz Resolution Bandwidth)

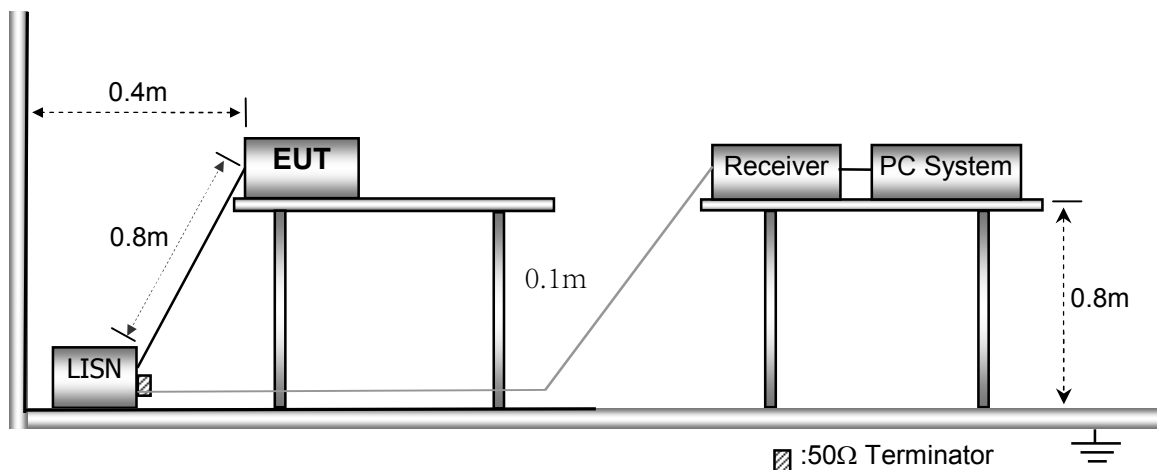
### 5.1 E.U.T. Operation

Operating Environment:

Temperature:	: 25.5 °C
Humidity:	: 51 % RH
Atmospheric Pressure:	: 101.2kPa
EUT Operation:	: Refer to section 3.3

### 5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.

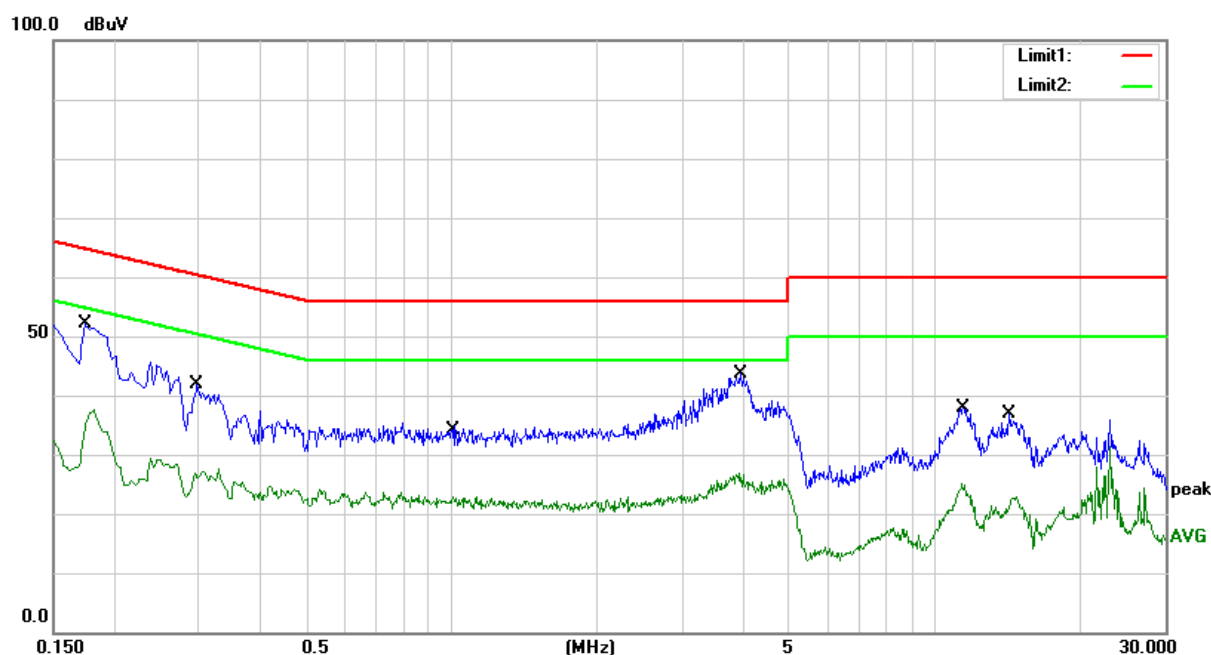


### 5.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

### 5.4 Conducted Emission Test Result

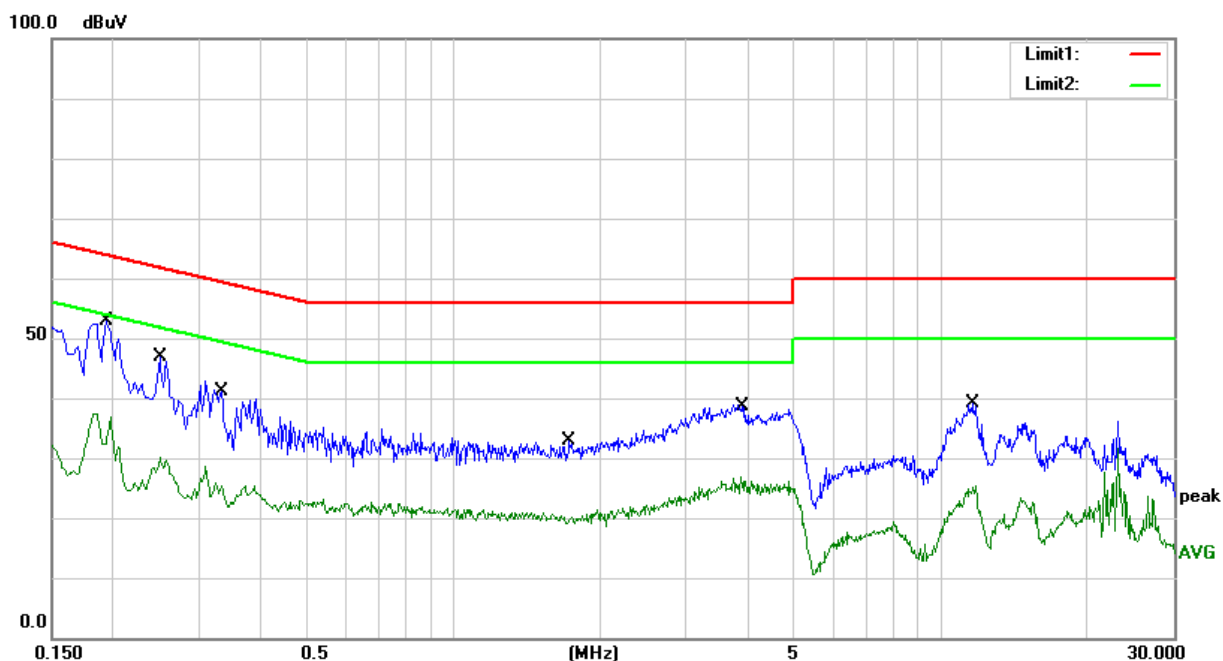
Live line:



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1735	32.91	10.00	42.91	64.79	-21.88	QP
0.1735	19.27	10.00	29.27	54.79	-25.52	AVG
0.2960	24.65	9.90	34.55	60.35	-25.80	QP
0.2960	15.13	9.90	25.03	50.35	-25.32	AVG
0.9906	20.46	9.90	30.36	56.00	-25.64	QP
0.9906	12.20	9.90	22.10	46.00	-23.90	AVG
3.9800	27.19	10.19	37.38	56.00	-18.62	QP
3.9800	13.79	10.19	23.98	46.00	-22.02	AVG
11.4998	21.53	10.37	31.90	60.00	-28.10	QP
11.4998	11.77	10.37	22.14	50.00	-27.86	AVG
14.1565	16.73	10.32	27.05	60.00	-32.95	QP
14.1565	8.43	10.32	18.75	50.00	-31.25	AVG

Remark:Emission Level=Receiver Reading+Cable Loss+AMN Factor

Neutral line:



Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1945	37.14	10.00	47.14	63.84	-16.70	QP
0.1945	22.46	10.00	32.46	53.84	-21.38	AVG
0.2487	32.98	9.95	42.93	61.80	-18.87	QP
0.2487	19.58	9.95	29.53	51.80	-22.27	AVG
0.3384	25.17	9.94	35.11	59.24	-24.13	QP
0.3384	13.30	9.94	23.24	49.24	-26.00	AVG
1.7122	17.51	10.00	27.51	56.00	-28.49	QP
1.7122	9.74	10.00	19.74	46.00	-26.26	AVG
3.8831	22.84	10.20	33.04	56.00	-22.96	QP
3.8831	15.01	10.20	25.21	46.00	-20.79	AVG
11.5473	21.23	10.30	31.53	60.00	-28.47	QP
11.5473	11.82	10.30	22.12	50.00	-27.88	AVG

Remark: Emission Level = Receiver Reading + Cable Loss + AMN Factor

## 6 Radiated Spurious Emissions

Test Requirement: : FCC CFR47 Part 15 Section 15.209 & 15.247  
 Test Method: : ANSI C63.10:2013,KDB 558074 D01 DTS MEAS GUIDANCE V03R03  
 Test Result: : PASS  
 Measurement Distance: : 3m  
 Limit: : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

### 6.1 EUT Operation

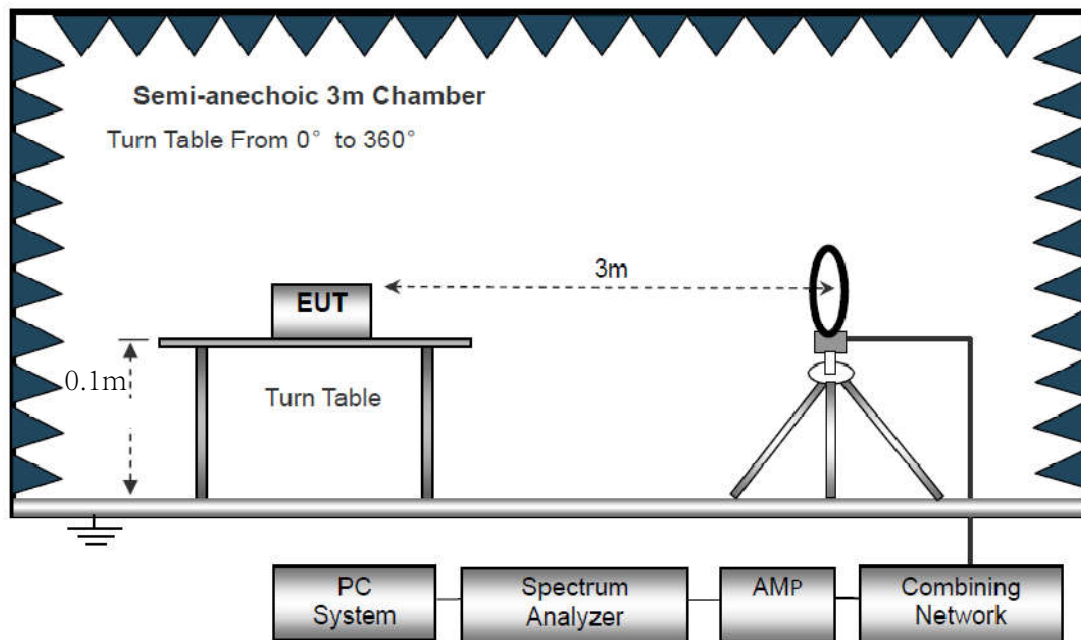
Operating Environment :

Temperature: : 23.5 °C  
 Humidity: : 51.1 % RH  
 Atmospheric Pressure: : 101.2kPa  
 EUT Operation : : Refer to section 3.3

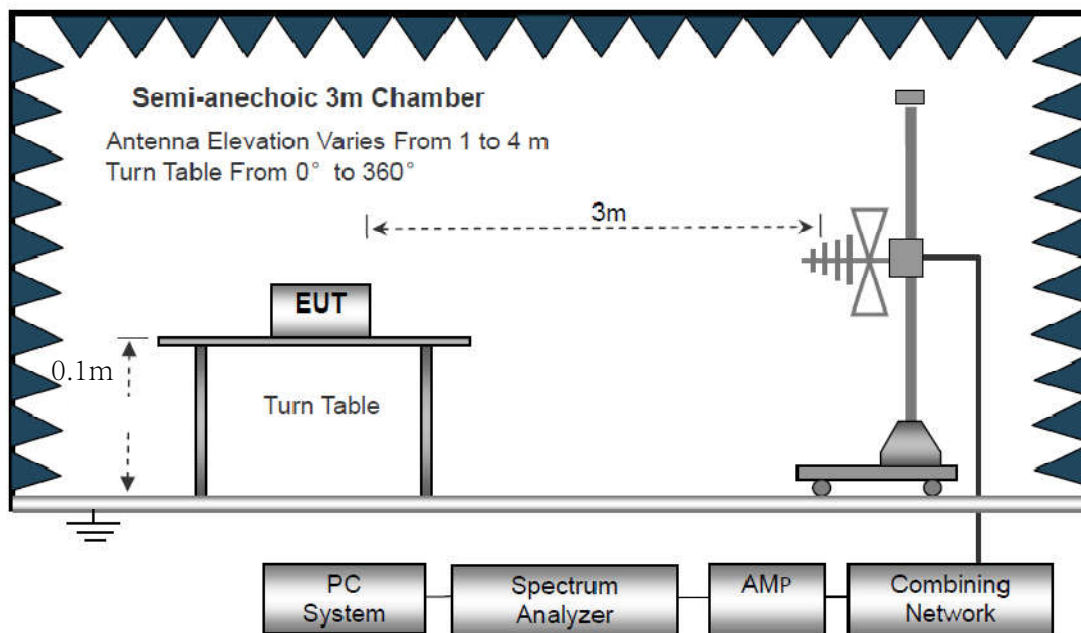
## 6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber testsite

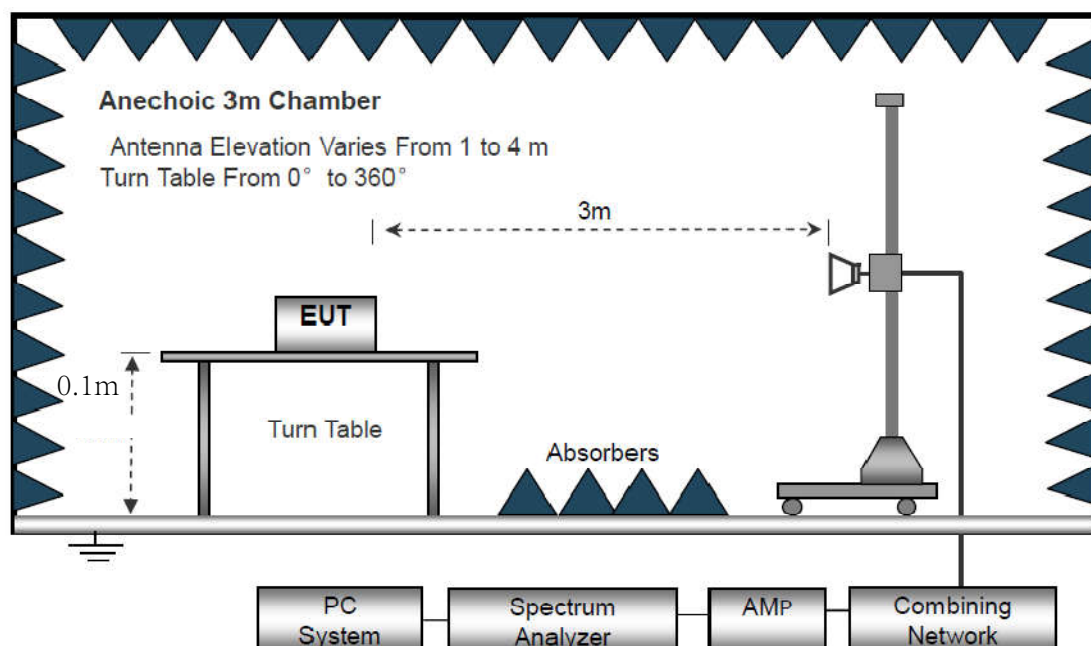
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



### 6.3 Spectrum Analyzer Setup

Below 30MHz

IF Bandwidth : 10kHz

Resolution Bandwidth : 10kHz

Video Bandwidth : 10kHz

30MHz ~ 1GHz

Detector : PK

Resolution Bandwidth : 100kHz

Video Bandwidth : 300kHz

Detector : QP

Resolution Bandwidth : 120kHz

Video Bandwidth : 300kHz

Above 1GHz

Detector : PK

Resolution Bandwidth : 1MHz

Video Bandwidth : 3MHz

Detector : RMS

Resolution Bandwidth : 1MHz

Video Bandwidth : 3MHz

## **6.4 Test Procedure**

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum 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. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
8. The test above 1GHz must be use the fully anechoic room and the test below 1GHz use the half anechoic room



## 6.5 Summary of Test Results

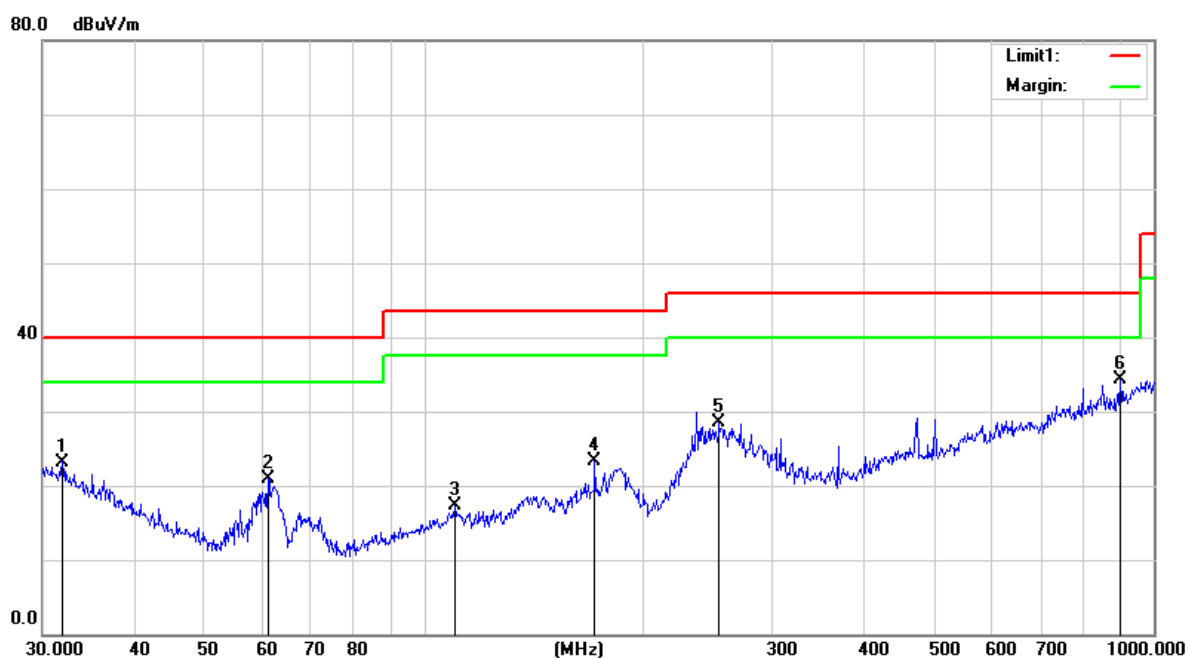
### Test Frequency: Below 30MHz

The measurements were more than 20 dB below the limit and not reported.

### Test Frequency: 30MHz ~ 1GHz

All applicable test modes have been tested and only the worst case (802.11b TX in middle channel) is recorded.

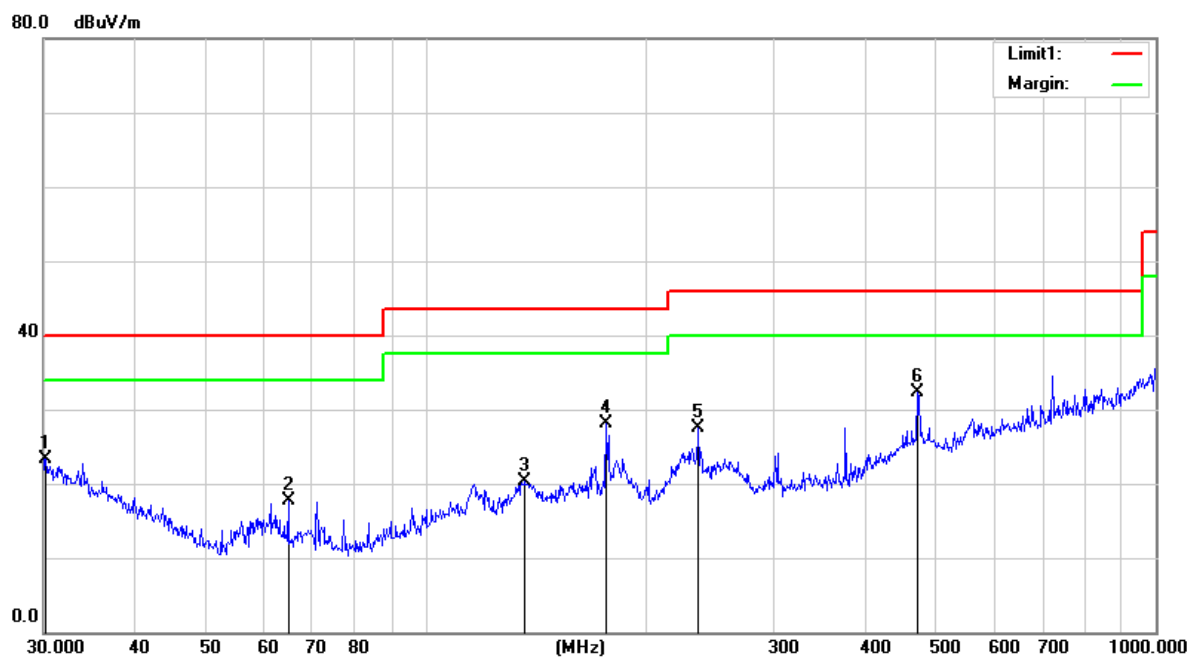
Antenna Polarization: Horizontal



Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
31.9545	5.52	17.68	23.20	40.00	-16.80	QP
61.1315	15.47	5.39	20.86	40.00	-19.14	QP
110.1816	5.95	11.28	17.23	43.50	-26.27	QP
171.3925	12.85	10.45	23.30	43.50	-20.20	QP
253.8367	14.31	14.23	28.54	46.00	-17.46	QP
900.1473	7.79	26.61	34.40	46.00	-11.60	QP

Remark: Emission Level = Receiver Reading + Cable Loss + ANT Factor - AMP Factor

Antenna Polarization: Vertical



Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
30.2110	4.78	18.60	23.38	40.00	-16.62	QP
64.8864	12.11	5.66	17.77	40.00	-22.23	QP
136.9391	7.79	12.55	20.34	43.50	-23.16	QP
176.8877	17.92	10.23	28.15	43.50	-15.35	QP
236.6447	16.13	11.41	27.54	46.00	-18.46	QP
472.1760	12.48	19.73	32.21	46.00	-13.79	QP

Remark:Emission Level=Receiver Reading+Cable Loss+ANT Factor-AMP Factor

**Test Frequency: 1GHz ~ 18GHz**

Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
Low Channel (802.11b/2412 MHz)							
4824.20	66.14	-3.58	62.56	74	-11.44	PK	Vertical
4824.22	46.86	-3.58	43.28	54	-10.72	AV	Vertical
7236.14	61.70	-0.8	60.9	74	-13.1	PK	Vertical
7236.12	41.27	-0.8	40.47	54	-13.53	AV	Vertical
4824.20	61.77	-3.58	58.19	74	-15.81	PK	Horizontal
4824.22	44.16	-3.58	40.58	54	-13.42	AV	Horizontal
Mid Channel (802.11b/2437 MHz)							
4874.08	64.89	-3.56	61.33	74	-12.67	PK	Vertical
4874.07	49.12	-3.56	45.56	54	-8.44	AV	Vertical
7311.21	60.70	-0.78	59.92	74	-14.08	PK	Vertical
7311.21	43.82	-0.78	43.04	54	-10.96	AV	Vertical
4874.18	61.39	-3.56	57.83	74	-16.17	PK	Horizontal
4874.14	44.96	-3.56	41.4	54	-12.6	AV	Horizontal
High Channel (802.11b/2462 MHz)							
4944.26	61.14	-3.54	57.6	74	-16.4	PK	Vertical
4944.30	45.04	-3.54	41.5	54	-12.5	AV	Vertical
7416.33	61.01	-0.75	60.26	74	-13.74	PK	Vertical
7416.30	45.06	-0.75	44.31	54	-9.69	AV	Vertical
4944.26	60.88	-3.54	57.34	74	-16.66	PK	Horizontal
4944.30	45.28	-3.54	41.74	54	-12.26	AV	Horizontal
Remark: 1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



**Radiated band edge:**

Frequency (MHz)	Reading (dBuV)	Factor (dB)	Emission Level (dBμV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Comment
802.11 b							
2399.9	67.91	-12.99	54.92	74	-19.08	PK	Vertical
2399.9	53.86	-12.99	40.87	54	-13.13	AV	Vertical
2399.9	69.09	-12.99	56.1	74	-17.9	PK	Horizontal
2399.9	52.95	-12.99	39.96	54	-14.04	AV	Horizontal
2483.6	70.04	-12.78	57.26	74	-16.74	PK	Vertical
2483.6	52.81	-12.78	40.03	54	-13.97	AV	Vertical
2483.6	70.20	-12.78	57.42	74	-16.58	PK	Horizontal
2483.6	52.69	-12.78	39.91	54	-14.09	AV	Horizontal
802.11 g							
2399.9	67.71	-12.99	54.72	74	-19.28	PK	Vertical
2399.9	53.80	-12.99	40.81	54	-13.19	AV	Vertical
2399.9	68.90	-12.99	55.91	74	-18.09	PK	Horizontal
2399.9	52.89	-12.99	39.9	54	-14.1	AV	Horizontal
2483.6	69.92	-12.78	57.14	74	-16.86	PK	Vertical
2483.6	53.26	-12.78	40.48	54	-13.52	AV	Vertical
2483.6	69.99	-12.78	57.21	74	-16.79	PK	Horizontal
2483.6	53.07	-12.78	40.29	54	-13.71	AV	Horizontal



802.11 n20							
2399.9	67.89	-12.99	54.9	74	-19.1	PK	Vertical
2399.9	53.79	-12.99	40.8	54	-13.2	AV	Vertical
2399.9	68.71	-12.99	55.72	74	-18.28	PK	Horizontal
2399.9	52.83	-12.99	39.84	54	-14.16	AV	Horizontal
2483.6	69.85	-12.78	57.07	74	-16.93	PK	Vertical
2483.6	52.63	-12.78	39.85	54	-14.15	AV	Vertical
2483.6	69.83	-12.78	57.05	74	-16.95	PK	Horizontal
2483.6	53.11	-12.78	40.33	54	-13.67	AV	Horizontal

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Low measurement frequencies is range from 2310 to 2400 MHz, high measurement frequencies is range from 2483.5 to 2500 MHz.

Only show the worst point data of the emissions in the frequency 2310-2400 MHz and 2483.5-2500 MHz.

#### Test Frequency :Above 18GHz

The measurements were more than 20 dB below the limit and not reported

Remark1.The testing has been conformed to  $10 \times 2480 = 24800\text{MHz}$ .

2.All other emissions more than 30dB below the limit.

## 7 Conducted Spurious Emission

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013,KDB 558074 D01 DTS MEAS GUIDANCE V03R05

Test Limit : Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

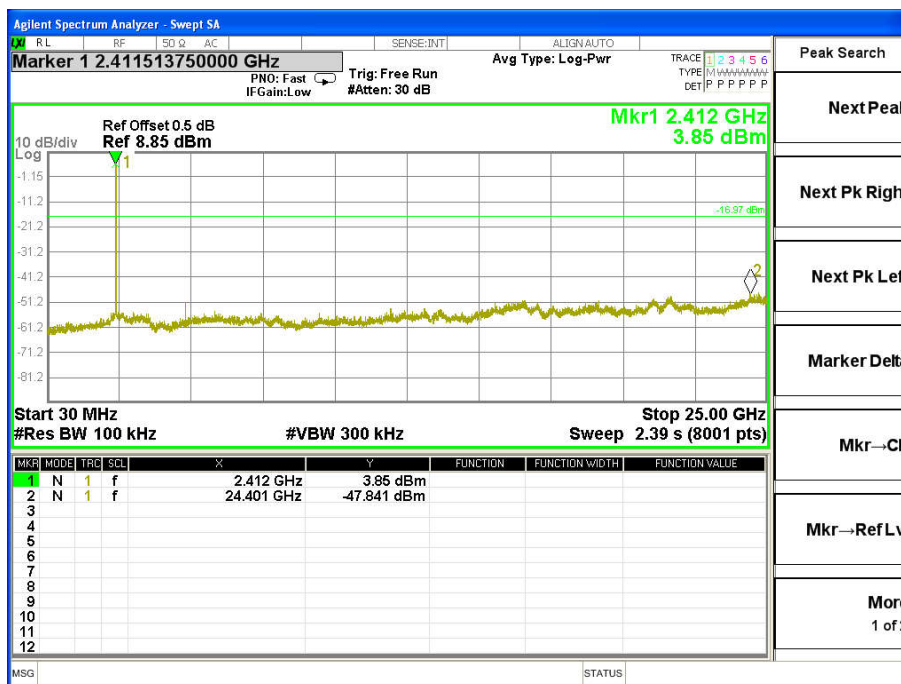
Test Mode : Refer to section 3.3

### 7.1 Test Procedure

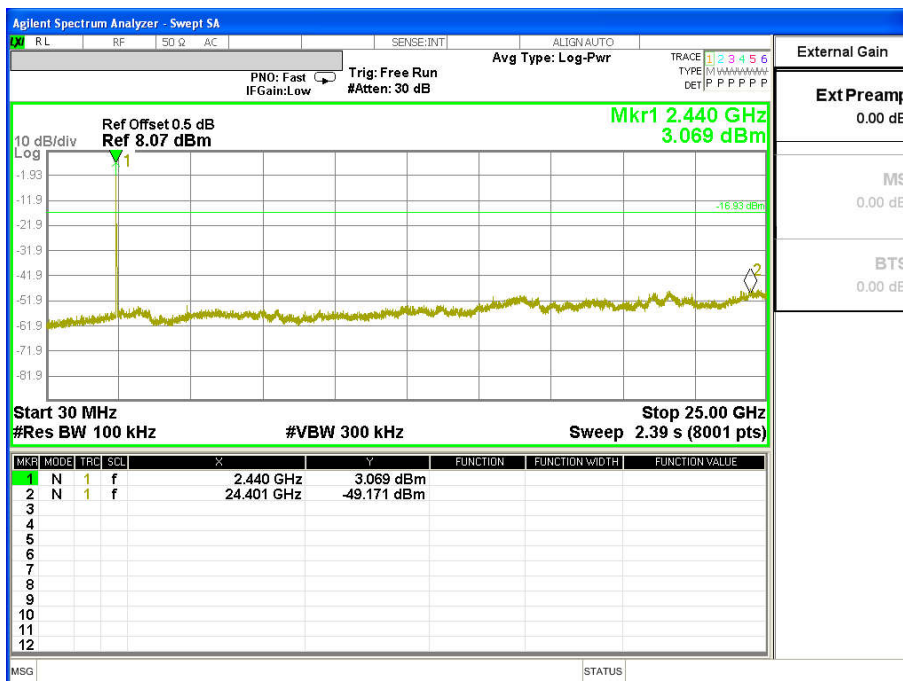
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto  
Detector function = peak, Trace = max hold

### 7.2 Test Result

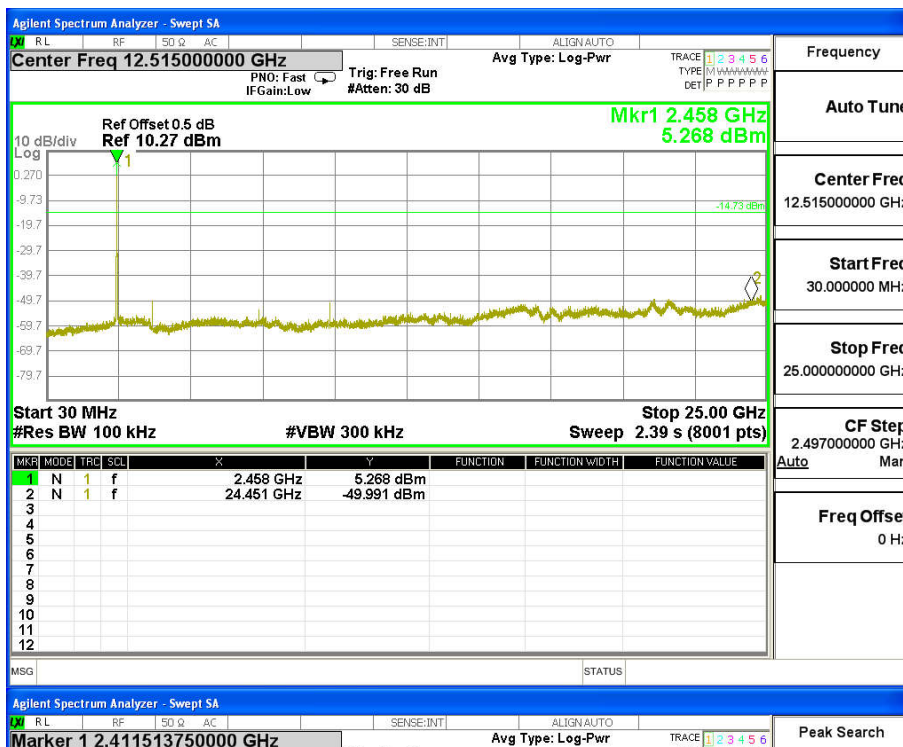
802.11b Low Channel



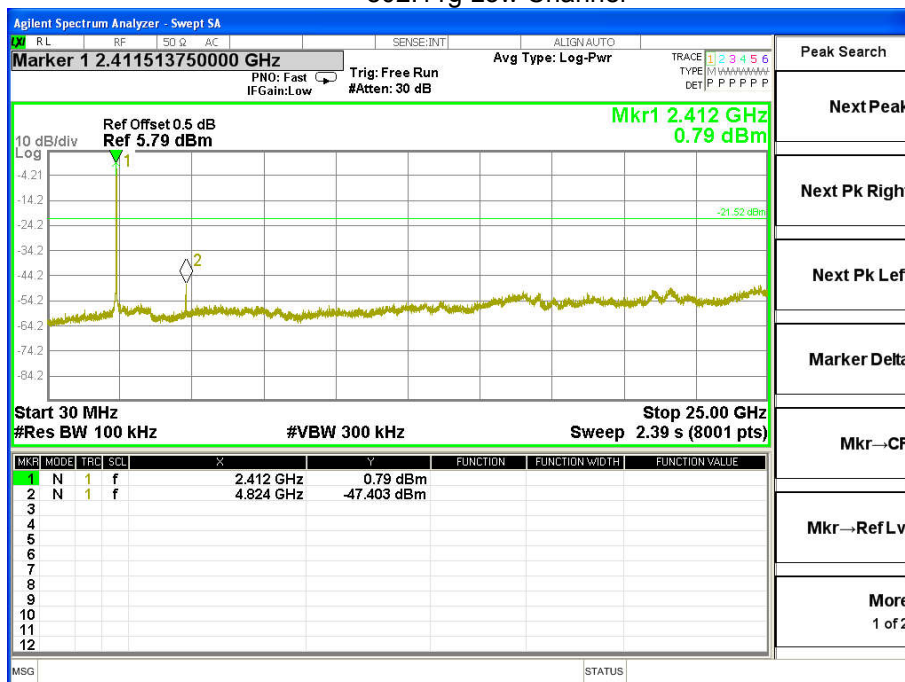
### 802.11b Middle Channel



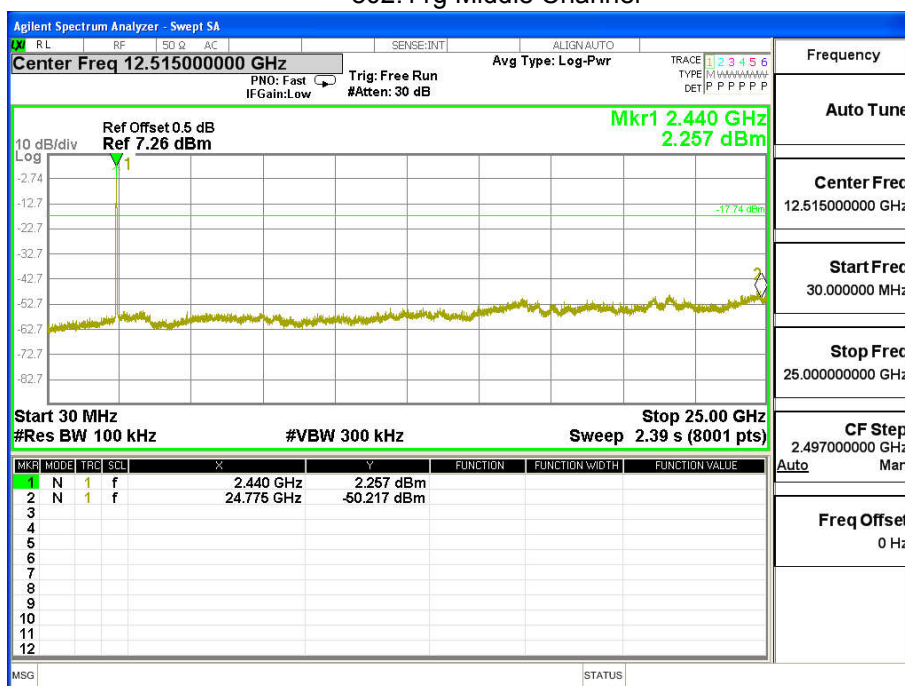
### 802.11b High Channel



### 802.11g Low Channel

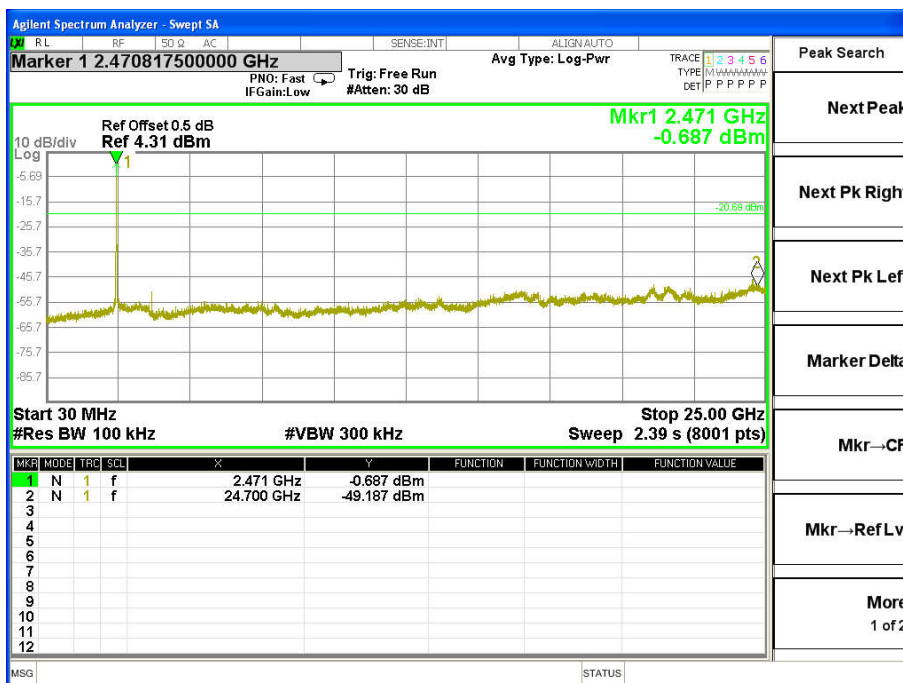


### 802.11g Middle Channel

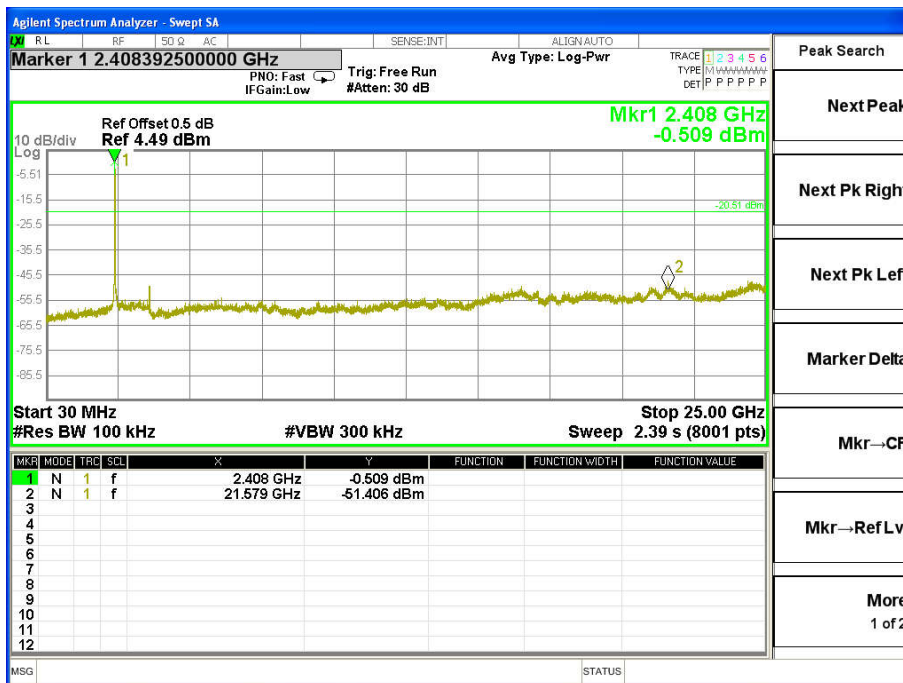




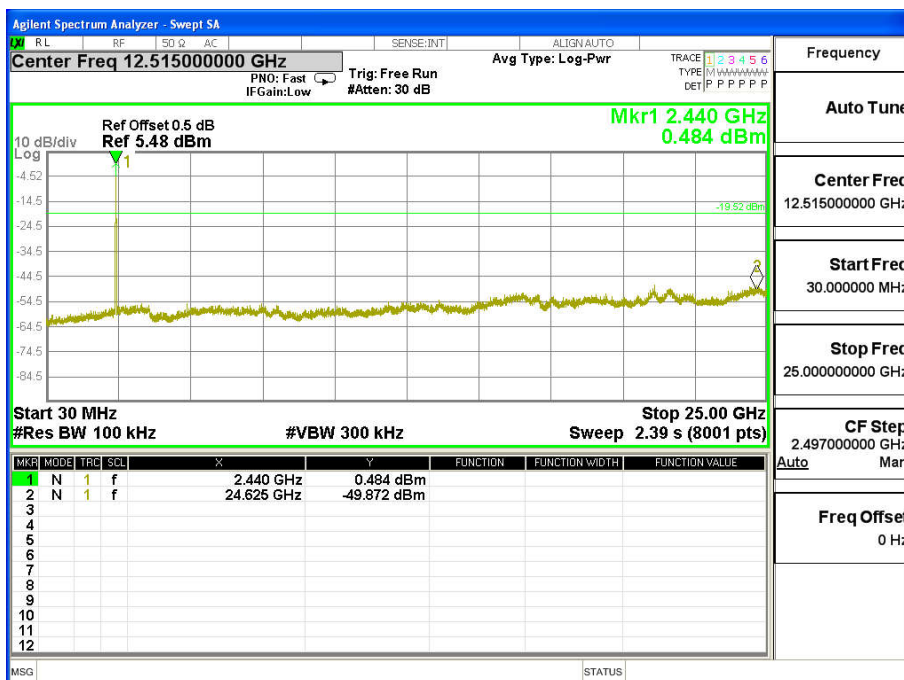
### 802.11g High Channel



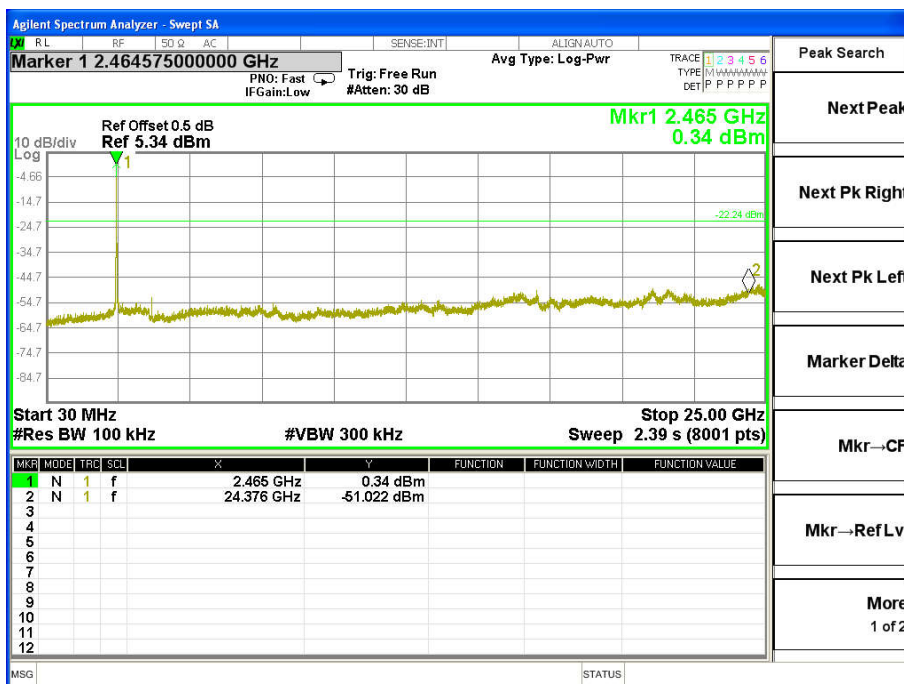
### 802.11HT20 Low Channel



### 802.11HT20 Middle Channel



### 802.11HT20 High Channel



## 8 Band Edge Measurement

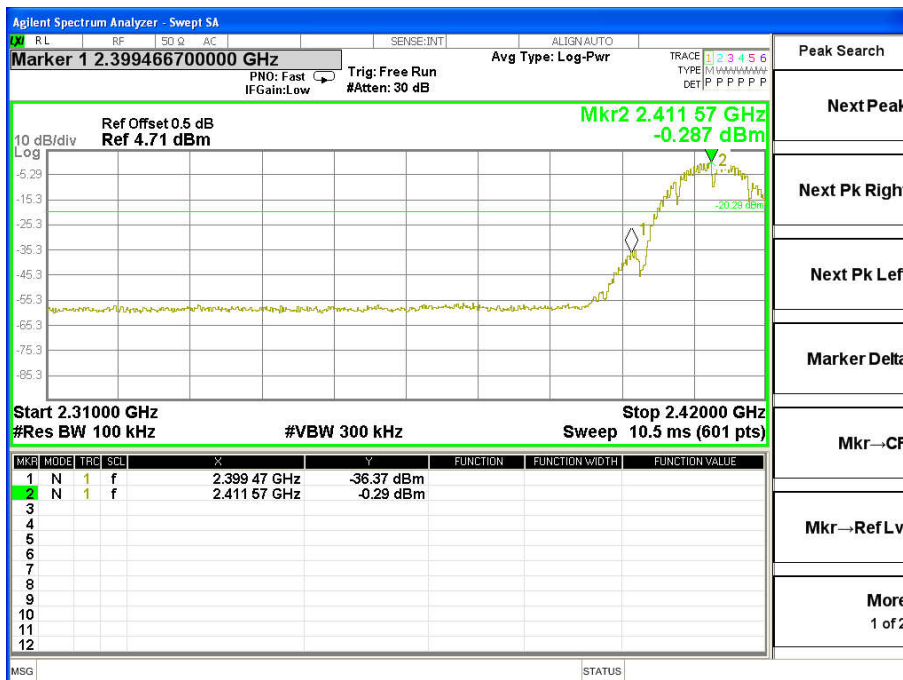
Test Requirement	: Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	: ANSI C63.10:2013,KDB 558074 D01 DTS MEAS GUIDANCE V03R03
Test Limit	: Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode	: Refer to section 3.3

### 8.1 Test Procedure

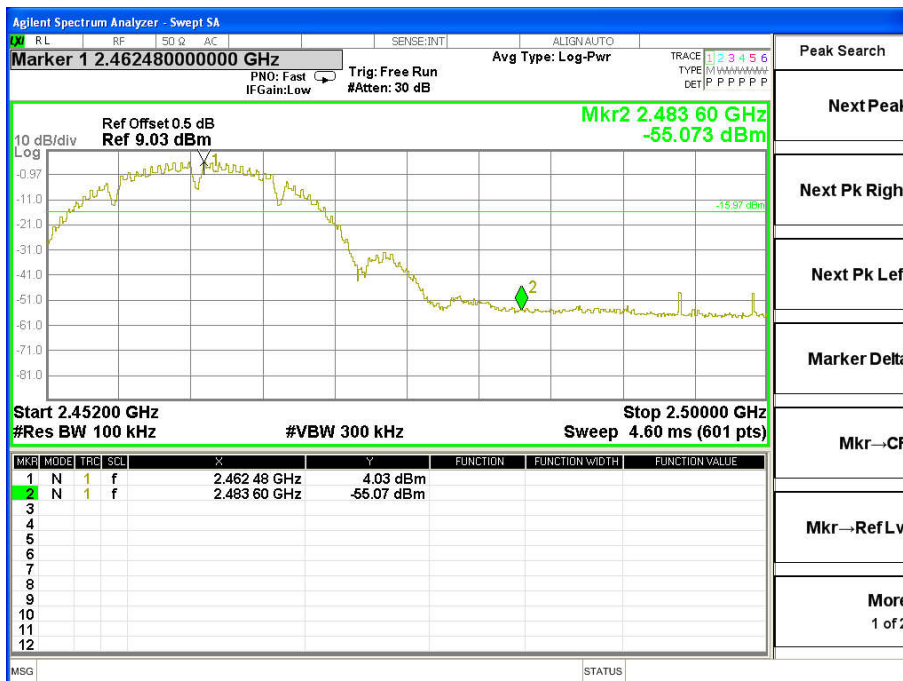
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto  
Detector function = peak, Trace = max hold

## 8.2 Test Result

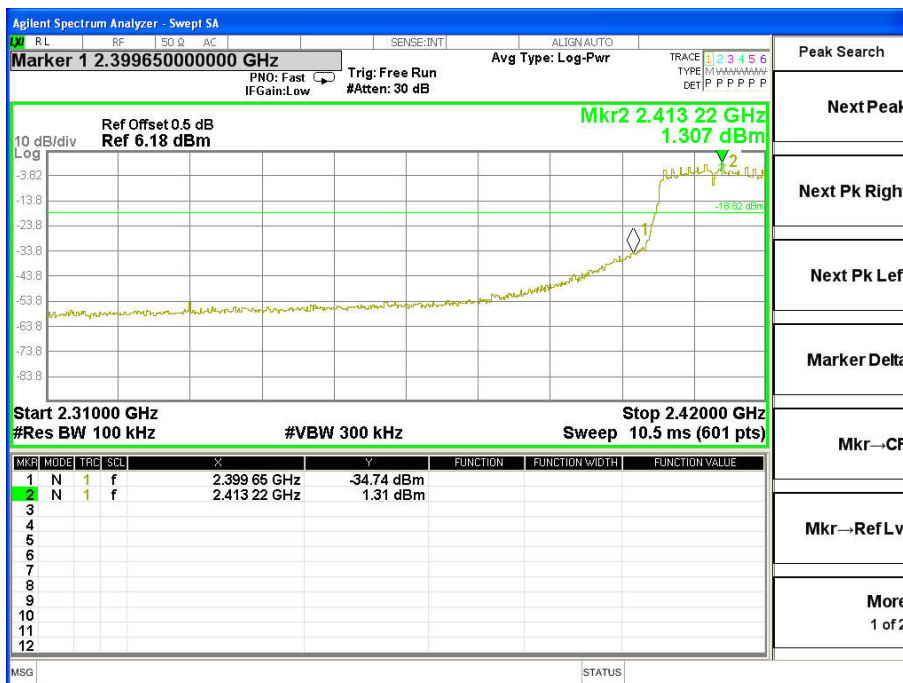
802.11b Band edge-left side



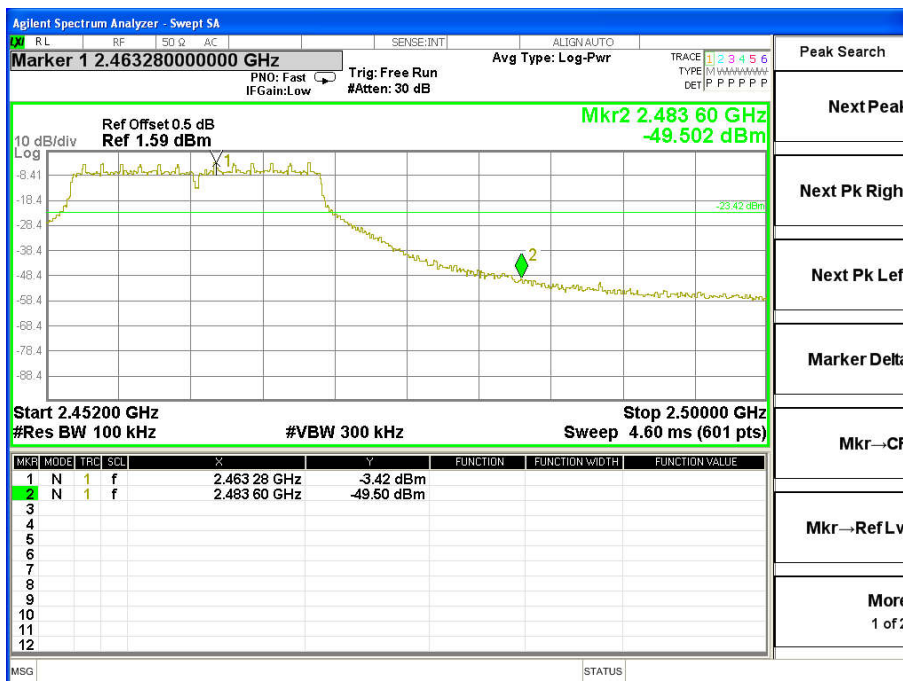
802.11b Band edge-right side



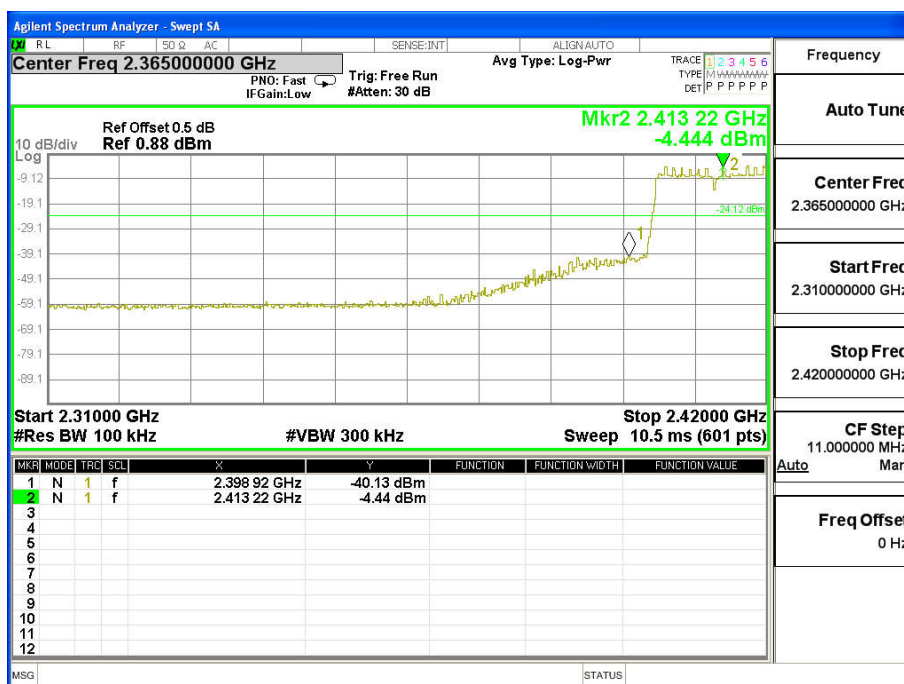
802.11g Band edge-left side



802.11g Band edge-right side



802.11n-HT20 Band edge-left side



802.11n-HT20 edge-right side

