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## FCC PART 15 SUBPART C TEST REPORT

### FCC Part 15.247

Report Reference No.....: **CTL130122127-WW**

Compiled by

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Name of the organization performing the tests

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*Tracy Qi*

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Approved by

( position+printed name+signature)...: Manager Tracy Qi

*Tracy Qi*

Date of issue.....: Mar. 08, 2013

Representative Laboratory Name.: **Shenzhen CTL Electromagnetic Technology Co., Ltd.**

Address.....: Zone B, 4/F, Block 20, Guangqian Industrial Park, Longzhu Road, Nanshan, Shenzhen 518055 China.

Test Firm.....: **Bontek Compliance Testing Laboratory Ltd**

Address.....: 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

Applicant's name.....: **SHENZHEN SANGFEI CONSUMER COMMUNICATIONS CO., LTD**

Address.....: 11 Science and Technology Road, Shenzhen Hi-tech Industrial Park Nanshan District. Shenzhen, PRC

#### Test specification:

Standard.....: FCC Part 15.247: Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.

TRF Originator.....: Shenzhen CTL Electromagnetic Technology Co., Ltd.

Master TRF.....: Dated 2011-01

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Test item description.....: **Smartphone**

FCC ID.....: **VQR-W5510**

Trade Mark.....: PHILIPS

Model/Type reference.....: W5510

#### GSM/WCDMA

Transmit .....: 2G:GSM 850: 824~849MHz, PCS 1900: 1850~1910MHz

3G:WCDMA Band II: 1850-1910MHz,

WCDMA Band V: 824~849MHz

Receive .....: 2G:GSM 850: 869~894MHz, PCS 1900: 1930~1990MHz  
3G:WCDMA Band II: 1930~1990MHz,  
WCDMA Band V: 869~894MHz

Release Version .....: 2G:R99  
3G:UMTS FDD: Rel-6

Type of modulation.....: 2G: GMSK for GSM/GPRS/EDGE  
3G: QPSK

GPRS Type .....: Class B

GPRS Class .....: Class 12

#### GPS

work frequency.....: 1575.42MHz

Type of modulation.....: BPSK

#### Bluetooth

Work frequency.....: 2402~2480MHz

Version.....: V3.0

Type of modulation.....: FHSS

Data Rate.....: 1Mbps(GFSK), 2Mbps(Pi/4 DQPSK), 3Mbps(8DPSK)

#### Wi-Fi

Work frequency.....: 802.11b/g/n(20MHz): 2412~2462MHz

Type of modulation.....: 802.11b DSSS, 802.11g/n: OFDM

Data Rate.....: 802.11b: 1/2/5.5/11 Mbps  
802.11g: 6/9/12/18/24/36/48/54 Mbps  
802.11n: up to 65 Mbps

Antenna Gain .....: -1.5 dBi for GSM850 and WCDMA Band V  
-0.5 dBi for PCS1900 and WCDMA Band II  
-2.5 dBi for Bluetooth and Wi-Fi

Antenna type.....: Internal

IMEI.....: 911131205416242

Hardware version.....: SR701\_V2.0

Software version.....: PhilipsW5510-user 4.0.4 IMM76D eng.root.20130122.224030 test-keys

Result.....: **Positive**

**TEST REPORT**

<b>Test Report No. :</b>	<b>CTL130122127-WW</b>	Mar. 08, 2013 Date of issue
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**Equipment under Test** : Smartphone

**Model /Type** : W5510

**Applicant** : **SHENZHEN SANGFEI CONSUMER COMMUNICATIONS CO.,LTD**

**Address** : 11 Science and Technology Road, Shenzhen Hi-tech Industrial Park Nanshan District.Shenzhen,PRC

**Manufacturer** : **SHENZHEN SANGFEI CONSUMER COMMUNICATIONS CO.,LTD**

**Address** : 11 Science and Technology Road, Shenzhen Hi-tech Industrial Park Nanshan District.Shenzhen,PRC

<b>Test Result</b> according to the standards on page 5:	<b>Positive</b>
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The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## **1. TEST STANDARDS**

The tests were performed according to following standards:

**FCC Part 15.247:** Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

**ANSI C63.10-2009:** American National Standard for Testing Unlicensed Wireless Devices.

**ANSI C63.4-2009**

**KDB Publication No. 558074 Guidance on Measurements for Digital Transmission Systems**





## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample	:	Jan. 28, 2013
Testing commenced on	:	Jan. 29, 2013
Testing concluded on	:	Feb. 28, 2013

### 2.2. Equipment Under Test

#### Power supply system utilised

Power supply voltage	:	<input type="radio"/> 120V / 60 Hz	<input type="radio"/> 115V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below)	

DC 3.7V from battery

#### Description of the test mode

IEEE 802.11b/g/n: Thirteen channels are provided to the EUT, but only eleventh channels used for USA.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

### 2.3. Short description of the Equipment under Test (EUT)

A Smartphone (W5510 ) with UMTS/GSM, Bluetooth, GPS and wifi function.

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

### 2.4. EUT operation mode

Test Mode:

1. The EUT has been tested under normal operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed. Channel low (2412MHz), mid (2442MHz) and high (2462MHz) with highest data rate are chosen for full testing.
3. Test Mode:

Test Mode(TM)	Description	Remark
TM1	Playing	Color Bar with 1KHz Audio
TM2	Downloading	Connect to PC
TM3	Charging	Charged by Adapter

## 2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

○ - supplied by the manufacturer

● - supplied by the lab

● Notebook PC

Manufacturer : SONY Corporation

Model No. : PCG-41216W

## 2.6. NOTE

1. The EUT is an 802.11b/g/n Smartphone, The functions of the EUT listed as below:

	Test Standards	Reference Report
WLAN 802.11b/g, 802.11n	FCC Part 15 Subpart C (Section 15.247)	CTL130122127-WW
WLAN 802.11b/g, 802.11n	FCC Per 47 CFR 2.1091(b)	131S054R-HP-US-P03V01

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
802.11b	✓	—	—	—
802.11g	✓	—	—	—
802.11n(20MHz)	✓	—	—	—
802.11n(40MHz)	—	—	—	—

3. The EUT incorporates a SISO function, Physically, the EUT provides two completed transmitter and two completed receivers.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	—

## 2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **VQR-W5510** filing to comply with of the FCC Part 15.247 Rules.

## 2.8. Modifications

No modifications were implemented to meet testing criteria.

### 3. TEST ENVIRONMENT

#### 3.1. Address of the test laboratory

Bontek Compliance Testing Laboratory Ltd  
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

#### 3.2. Test Facility

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

##### IC Registration No.: 7631A

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2011.

##### FCC-Registration No.: 338263

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

#### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

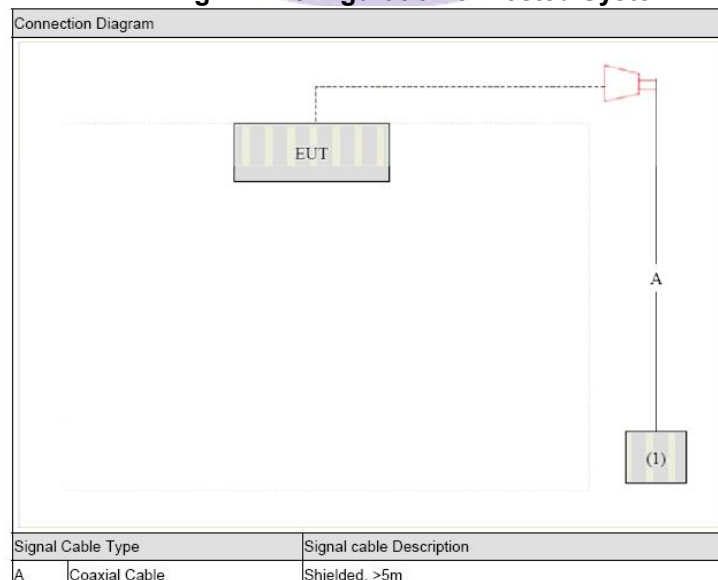
Temperature: 15-35 °C

Humidity: 30-60 %

Atmospheric pressure: 950-1050mbar

#### 3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System





### 3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Bontek Compliance Testing Laboratory Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Bontek laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



### 3.6. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Last Cal.	Due. Date
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	2012/04/14	2013/04/13
2	Radio Communication Tester	ROHDE & SCHWARZ	CMU200	2012/04/14	2013/04/13
3	Dual Directional Coupler	Agilent	778D	2012/04/14	2013/04/13
4	10dB attenuator	SCHWARZBECK	MTAIMP-136	2012/04/14	2013/04/13
5	Tunable Bandreject filter	K&L	3TNF-800	2012/04/14	2013/04/13
6	Tunable Bandreject filter	K&L	5TNF-1700	2012/04/14	2013/04/13
7	High-Pass Filter	K&L	9SH10-2700/X12750-O/O	2012/04/14	2013/04/13
8	High-Pass Filter	K&L	41H10-1375/U12750-O/O	2012/04/14	2013/04/13
9	Coaxial Cable	Huber+Suhner	AC4-RF-H	2012/04/14	2013/04/13
10	AC Power Supply	IDRC	CF-500TP	2012/04/14	2013/04/13
11	DC Power Supply	IDRC	CD-035-020PR	2012/04/14	2013/04/13
12	RF Current Probe	FCC	F-33-4	2012/04/14	2013/04/13
13	Temperature /Humidity Meter	zhicheng	ZC1-2	2012/04/14	2013/04/13
14	MICROWAVE AMPLIFIER	HP	8349B	2012/04/14	2013/04/13
15	Amplifier	HP	8447D	2012/04/14	2013/04/13
16	SIGNAL GENERATOR	HP	8647A	2012/04/14	2013/04/13
17	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	2012/04/14	2013/04/13
18	Horn Antenna	Schwarzbeck	BBHA9120A	2012/04/14	2013/04/13
19	EMI Test Receiver	R&S	ESPI	2012/04/14	2013/04/13
20	Loop Antenna	ZHINAN	ZN30900A	2012/04/14	2013/04/13
21	Horn Antenna	Schwarzbeck	BBHA9120D	2012/04/14	2013/04/13
22	Horn Antenna	Schwarzbeck	BBHA9170	2012/04/14	2013/04/13
23	Spectrum Analyzer	Agilent	E4446A	2012/04/14	2013/04/13
24	Wideband Peak Power Meter	Anritsu	ML2495A	2012/04/14	2013/04/13
25	Power Sensor	Anritsu	MA2411B	2012/04/14	2013/04/13

### 3.7. Summary of Test Result

FCC PART 15		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge Compliance of RF Emission	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS
FCC Per 47 CFR 2.1091(b)	MPE Evaluation	PASS

Remark: The measurement uncertainty is not included in the test result.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

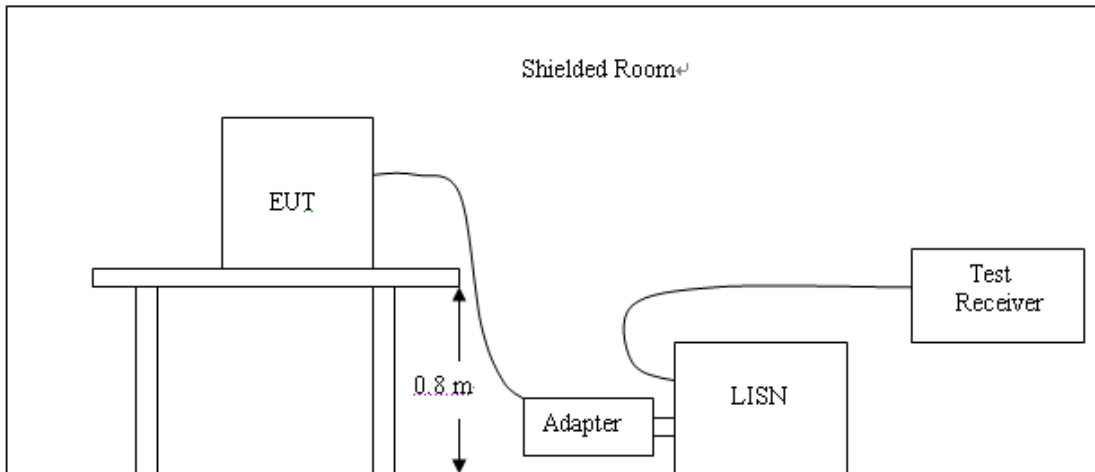
Test Items	Mode	Data Rate	Channel
AC Power Conducted Emission	Normal Link	11 Mbps	1
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission	11b/DSSS	11 Mbps	1/6/11
	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
	11n(40MHz)/OFDM	--	--
Radiated Emission 30MHz~1GHz	11b/DSSS	11 Mbps	1/6/11
	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
	11n(40MHz)/OFDM	--	--
Radiated Emission 1GHz~10th Harmonic	11b/DSSS	11 Mbps	1/6/11
	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
	11n(40MHz)/OFDM	--	--
Band Edge Compliance of RF Emission	11b/DSSS	11 Mbps	1/11
	11g/OFDM	54 Mbps	1/11
	11n(20MHz)/OFDM	65Mbps	1/11
	11n(40MHz)/OFDM	--	--

Note1: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

## 4. TEST CONDITIONS AND RESULTS

### 4.1. Conducted Emissions Test

#### TEST CONFIGURATION



#### TEST PROCEDURE

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following:

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

\* Decreasing linearly with the logarithm of the frequency

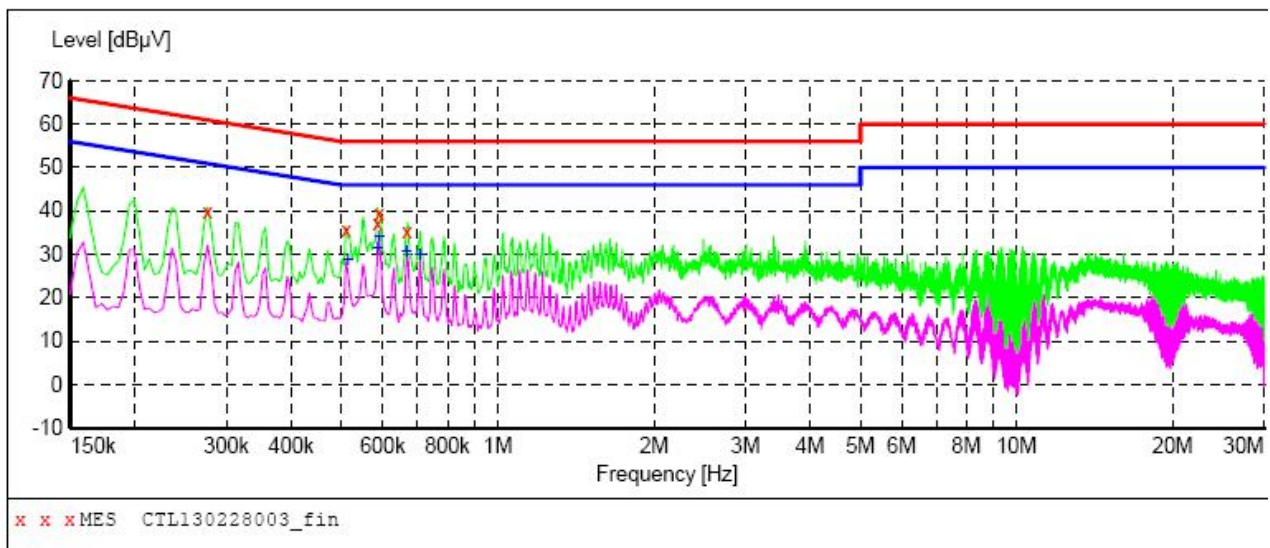
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

**The RBW/VBW for 150KHz to 30MHz: 9KHz**

**TEST RESULTS****SCAN TABLE: "Voltage (9K-30M) FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL130228003\_fin"**

2/28/2013 3:00PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.276000	39.70	10.2	61	21.2	QP	L1	GND
0.510000	35.60	10.2	56	20.4	QP	L1	GND
0.586500	37.30	10.2	56	18.7	QP	L1	GND
0.591000	39.30	10.2	56	16.7	QP	L1	GND
0.667500	35.40	10.2	56	20.6	QP	L1	GND

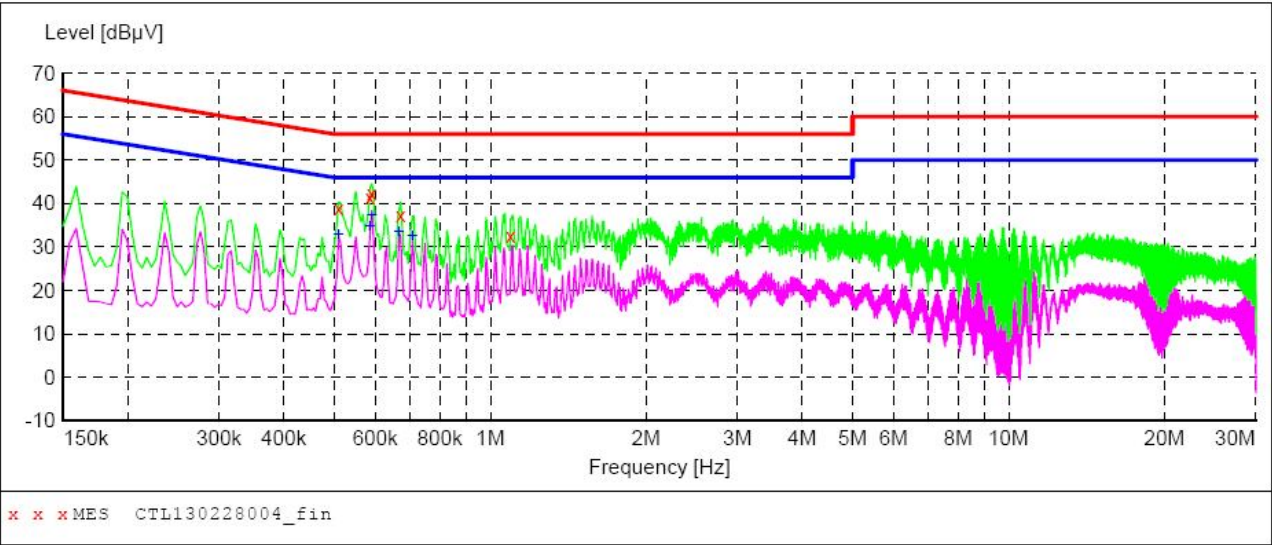
**MEASUREMENT RESULT: "CTL130228003\_fin2"**

2/28/2013 3:00PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.514500	28.80	10.2	46	17.2	AV	L1	GND
0.586500	31.30	10.2	46	14.7	AV	L1	GND
0.591000	34.20	10.2	46	11.8	AV	L1	GND
0.667500	30.70	10.2	46	15.3	AV	L1	GND
0.708000	29.90	10.2	46	16.1	AV	L1	GND



SCAN TABLE: "Voltage (9K-30M) FIN"  
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL130228004\_fin"

2/28/2013 3:03PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.510000	39.00	10.2	56	17.0	QP	N	GND
0.586500	41.30	10.2	56	14.7	QP	N	GND
0.591000	42.50	10.2	56	13.5	QP	N	GND
0.672000	37.30	10.2	56	18.7	QP	N	GND
1.095000	32.60	10.3	56	23.4	QP	N	GND

MEASUREMENT RESULT: "CTL130228004\_fin2"

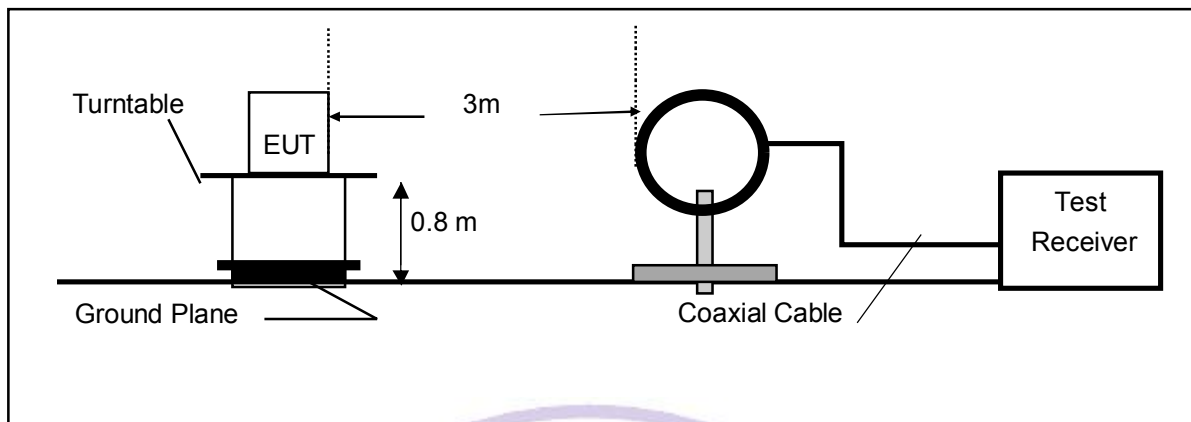
2/28/2013 3:03PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.510000	33.00	10.2	46	13.0	AV	N	GND
0.586500	34.70	10.2	46	11.3	AV	N	GND
0.591000	37.40	10.2	46	8.6	AV	N	GND
0.667500	33.50	10.2	46	12.5	AV	N	GND
0.708000	32.40	10.2	46	13.6	AV	N	GND

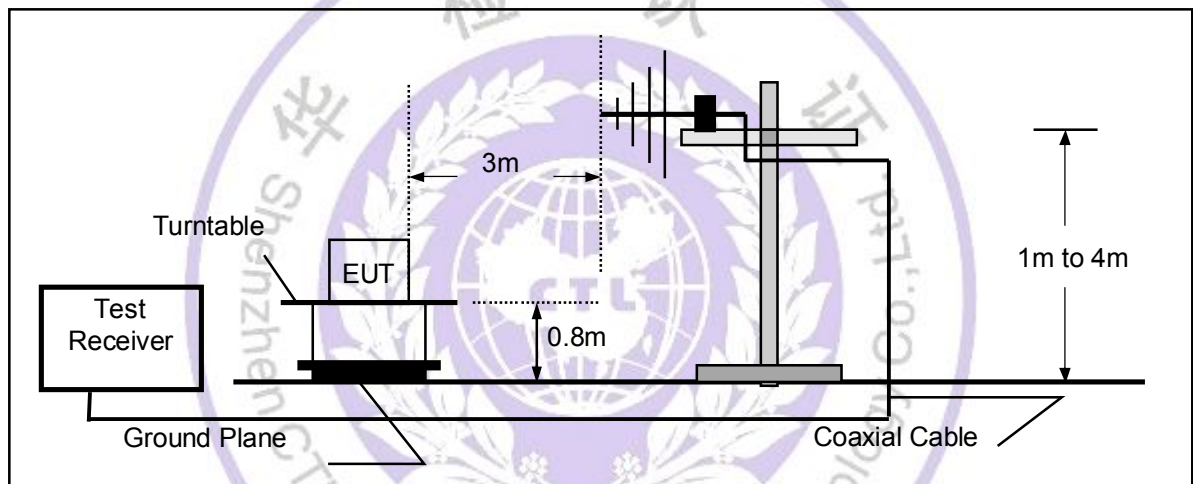
## 4.2. Radiated Emission Test

### TEST CONFIGURATION

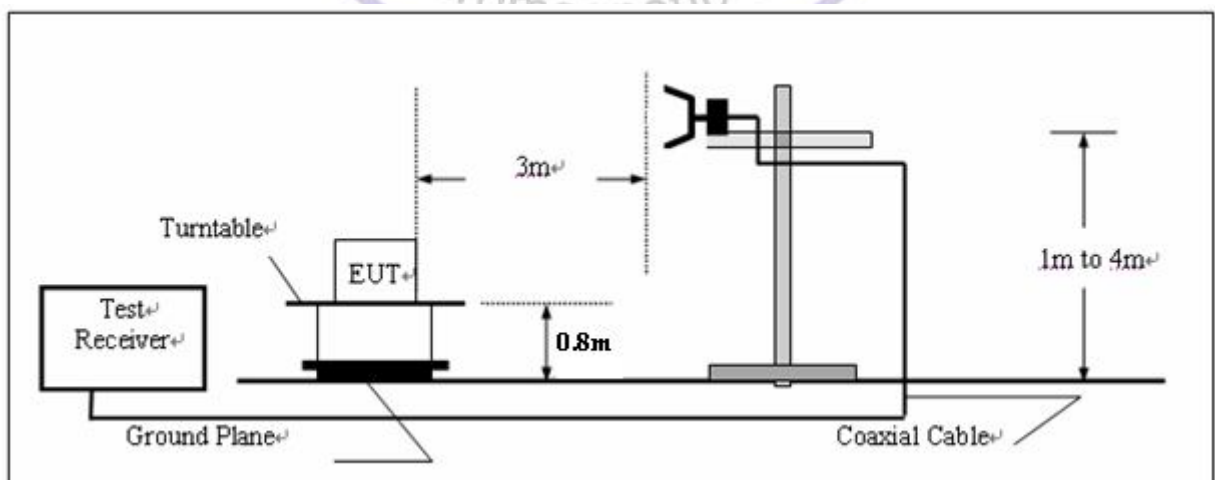
#### (A) Radiated Emission Test Set-Up, Frequency Below 30MHz



#### (B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



#### (C) Radiated Emission Test Set-Up, Frequency above 1000MHz



**FIELD STRENGTH CALCULATION**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

**TEST PROCEDURE**

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS), the EUT was setup according to ANSI C63.4: and tested according to ANSI C63.10 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f > 1$  GHz, 120 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. Repeat above procedures until all frequency measurements have been completed.

Note:

When doing emission measurement above 1GHz, the horn antenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the antenna in the “cone of radiation” of EUT. The 3dB beamwidth is 60 degrees for H-plane and 90 degrees for E-plane.

**LIMIT**

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

**TEST RESULTS**

Mode 1: Transmit by 802.11b

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2413.4	80.0	31.2	111.2	Fundamental	/	PK
	V	340.0	-0.9	14.5	13.6	46	-32.4	QP
	H	550.0	-0.8	19.4	18.6	46	-27.4	QP
	H	3200.0	42.6	-5.7	36.9	54(Note 2)	-17.1	PK
	H	4824.0	40.9	-2.5	38.4	54(Note 2)	-15.6	PK
	V	7236.0	42.0	2.6	44.6	54(Note 2)	-9.4	PK
	H	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK
6	V	2438.5	80.5	31.3	111.8	Fundamental	/	PK
	V	287.5	1.4	13.5	14.9	46	-31.1	QP
	V	543.8	-0.7	19.3	18.6	46	-27.4	QP
	H	3200.0	42.1	-5.7	36.4	54(Note 2)	-17.6	PK
	V	4874.0	41.6	-2.4	39.2	54(Note 2)	-14.8	PK
	V	7311.0	43.6	2.7	46.3	54(Note 2)	-7.7	PK
	H	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK
11	V	2463.3	80.9	31.6	112.5	Fundamental	/	PK
	V	350.0	-1.7	14.8	13.1	46	-32.9	QP
	V	540.0	-0.6	19.1	18.5	46	-27.5	QP
	H	3200.0	42.3	-5.6	36.7	54(Note 2)	-17.3	PK
	H	4924.0	41.3	-2.2	39.1	54(Note 2)	-14.9	PK
	V	7386.0	47.4	2.7	50.1	54(Note 2)	-3.9	PK
	V	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK

Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Mode 2: Transmit by 802.11g

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	H	2415.3	75.9	31.3	107.2	Fundamental	/	PK
	H	543.8	-1.5	19.3	17.8	46	-28.2	QP
	V	543.8	-1.1	19.3	18.2	46	-27.8	QP
	V	3200.0	42.8	-5.6	37.2	54(Note 2)	-16.8	PK
	V	4824.0	40.9	-2.4	38.5	54(Note 2)	-15.5	PK
	V	7236.0	41.4	2.7	44.1	54(Note 2)	-9.9	PK
	H	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK
6	H	2438.5	76.1	31.7	107.8	Fundamental	/	PK
	H	540.0	-1.7	19.2	17.5	46	-28.5	QP
	V	540.0	-0.9	19.2	18.3	46	-27.7	QP
	H	3200.0	42.8	-5.6	37.2	54(Note 2)	-16.8	PK
	H	4874.0	40.9	-2.3	38.6	54(Note 2)	-15.4	PK
	V	7311.0	41.7	2.7	44.4	54(Note 2)	-9.6	PK
	H	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK
11	H	2463.5	76.5	31.6	108.1	Fundamental	/	PK
	H	539.3	-2.5	19.1	16.6	46	-29.4	QP
	V	539.3	3.3	19.2	22.5	46	-23.5	QP
	V	3200.0	42.5	-5.6	36.9	54(Note 2)	-17.1	PK
	V	4924.0	41.4	-2.2	39.2	54(Note 2)	-14.8	PK
	V	7386.0	47.1	2.8	49.9	54(Note 2)	-4.1	PK
	H	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK

Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.



Mode 3: Transmit by 802.11n(20MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	H	2416.3	76.0	31.2	107.2	Fundamental	/	PK
	H	350.0	-0.4	14.8	14.4	46	-31.6	QP
	H	550.0	0.1	19.5	19.6	46	-26.4	QP
	V	3200.0	42.8	-5.6	37.2	54(Note 2)	-16.8	PK
	V	4824.0	41.3	-2.5	38.8	54(Note 2)	-15.2	PK
	V	7236.0	40.9	2.6	43.5	54(Note 2)	-10.5	PK
	H	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK
6	H	2438.5	75.5	31.3	106.8	Fundamental	/	PK
	H	350.0	-0.2	14.8	14.6	46	-31.4	QP
	V	540.9	-0.5	19.2	18.7	46	-27.3	QP
	H	3200.0	42.5	-5.6	36.9	54(Note 2)	-17.1	PK
	H	4874.0	40.9	-2.3	38.6	54(Note 2)	-15.4	PK
	V	7311.0	42.1	2.7	44.8	54(Note 2)	-9.2	PK
	H	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK
11	H	2466.3	74.5	31.6	106.1	Fundamental	/	PK
	H	555.0	-2.7	19.5	16.8	46	-29.2	QP
	V	555.0	-1.3	19.4	18.1	46	-27.9	QP
	H	3200.0	42.5	-5.6	36.9	54(Note 2)	-17.1	PK
	V	4924.0	41.0	-2.1	38.9	54(Note 2)	-15.1	PK
	V	7386.0	44.4	2.8	47.2	54(Note 2)	-6.8	PK
	H	24000.0	59.1	-8.9	50.2	54(Note 2)	-3.8	PK

Note 1: The test trace is same as the ambient noise (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

### 4.3. 6dB Bandwidth Measurement

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

#### LIMIT

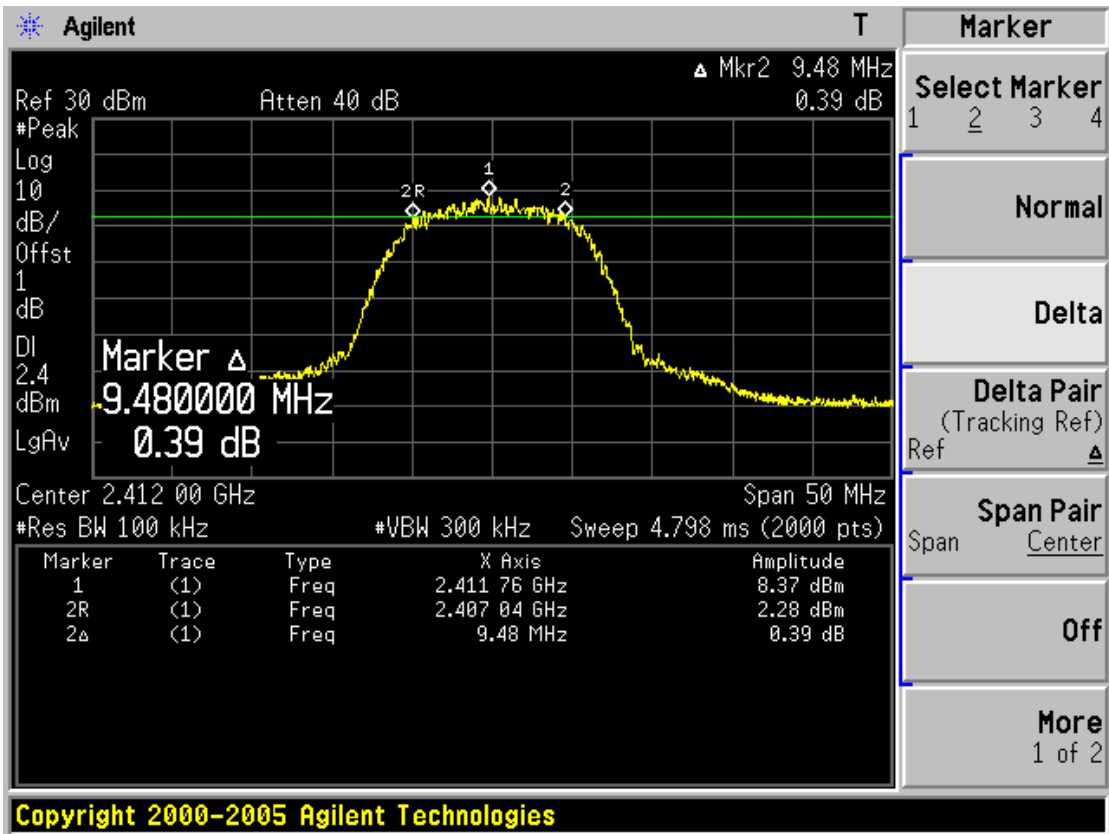
For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### TEST RESULTS

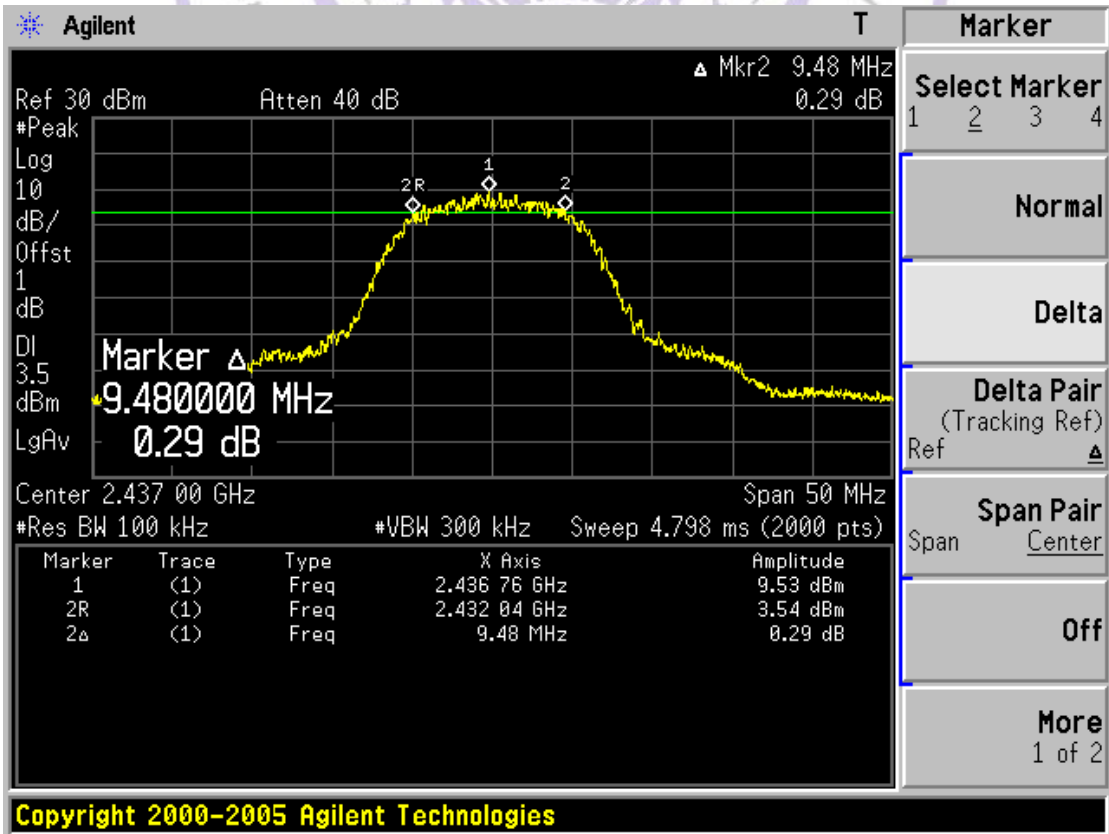
Mode	CHANNEL	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
802.11b	1	9.48	0.5	PASS
	6	9.48	0.5	PASS
	11	9.50	0.5	PASS
802.11g	1	16.58	0.5	PASS
	6	16.58	0.5	PASS
	11	16.58	0.5	PASS
802.11n HT20	1	17.81	0.5	PASS
	6	17.81	0.5	PASS
	11	17.81	0.5	PASS

For 802.11b:

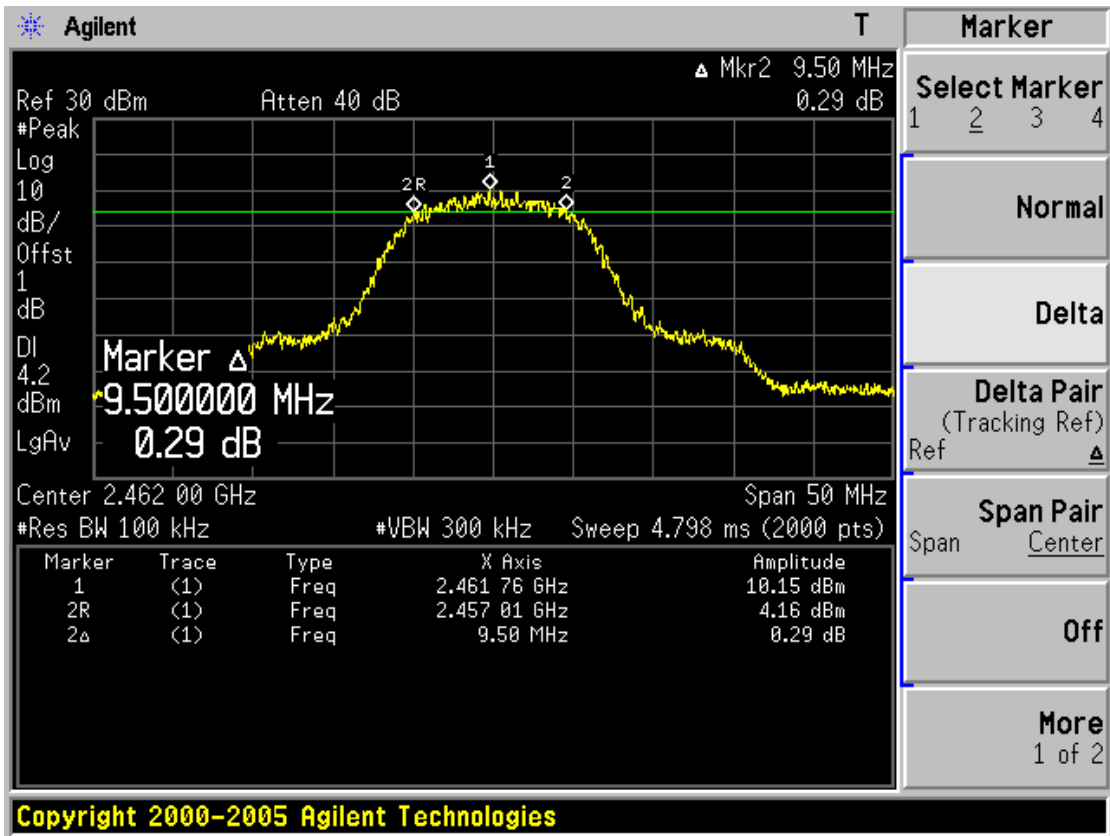
CH1



CH6

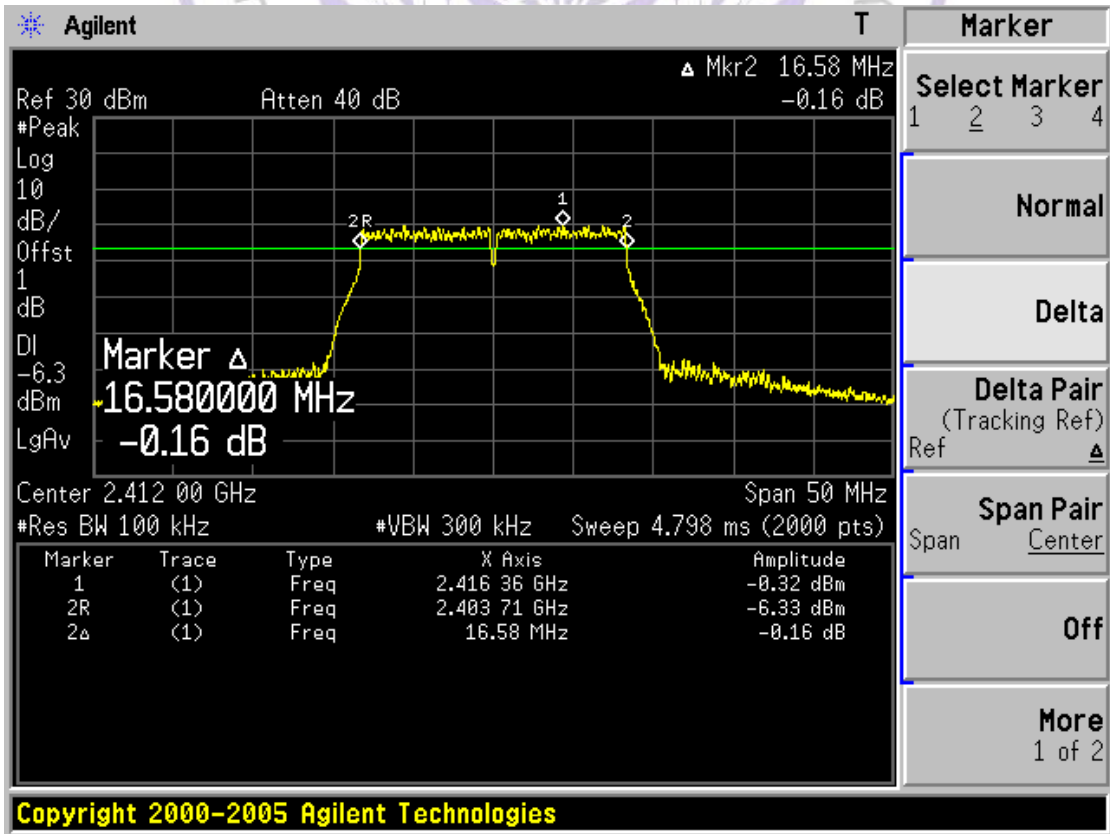


CH11

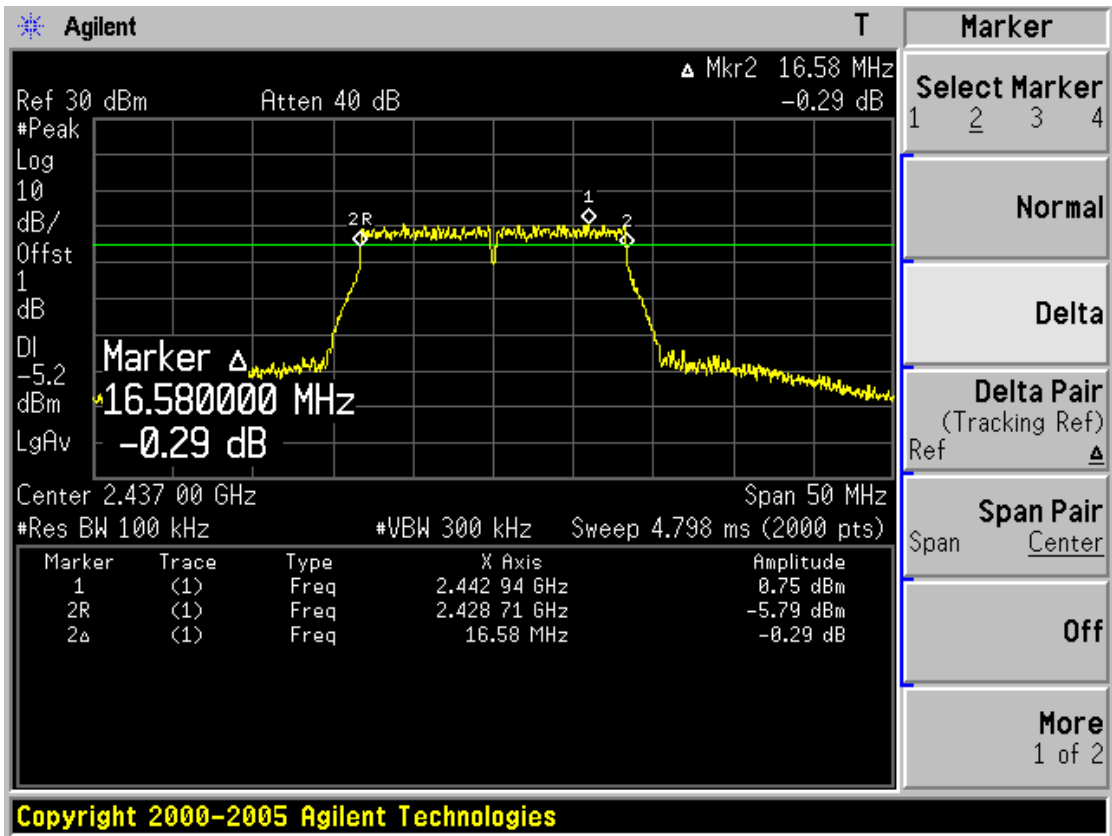


For 802.11g:

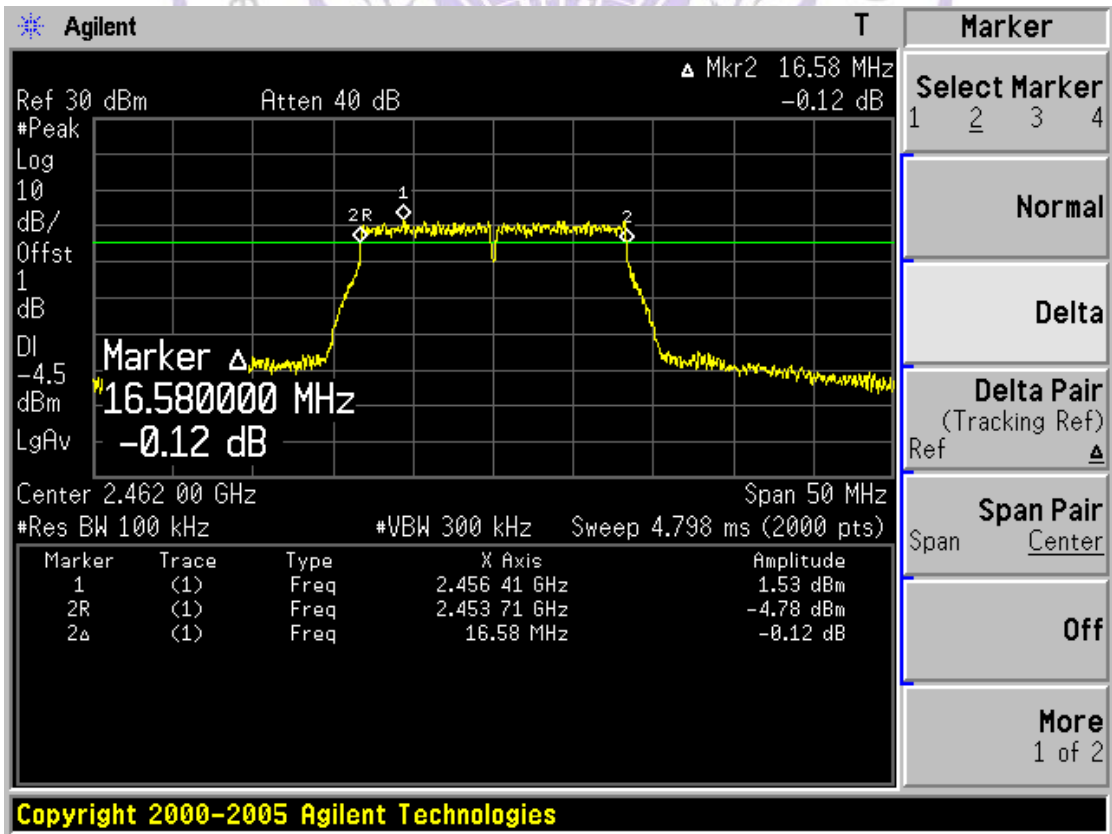
CH1



CH6



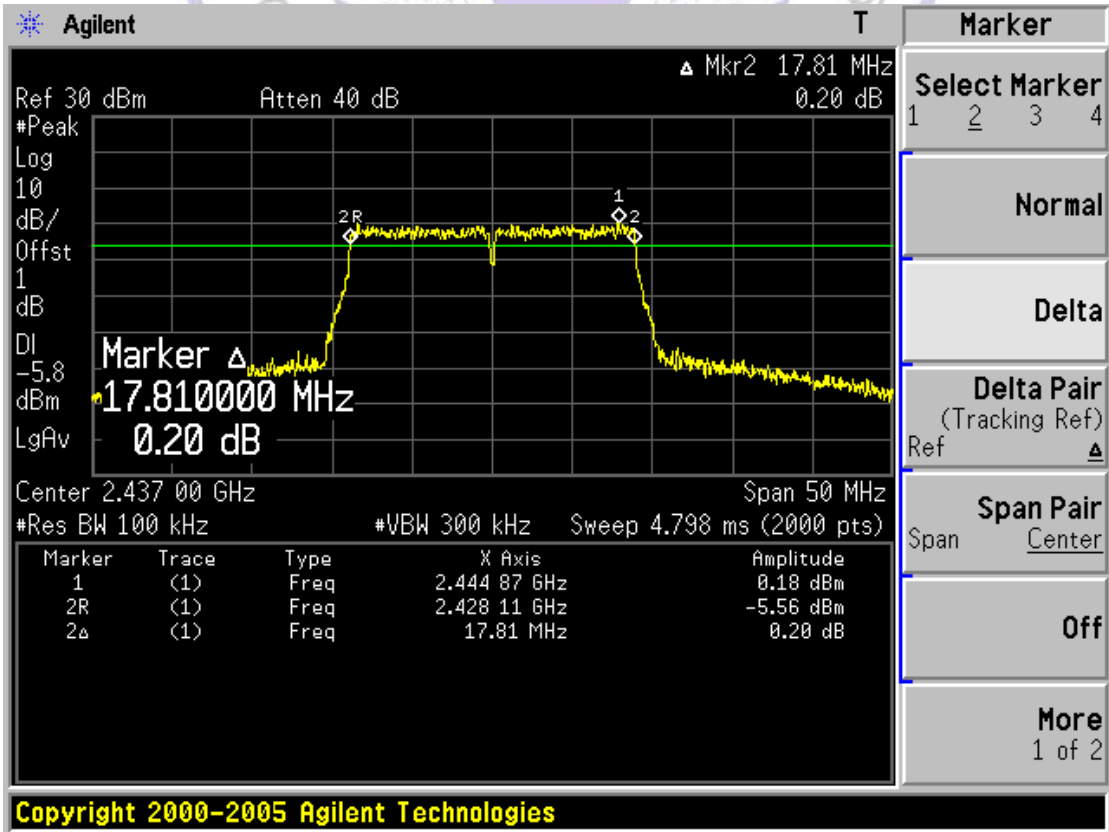
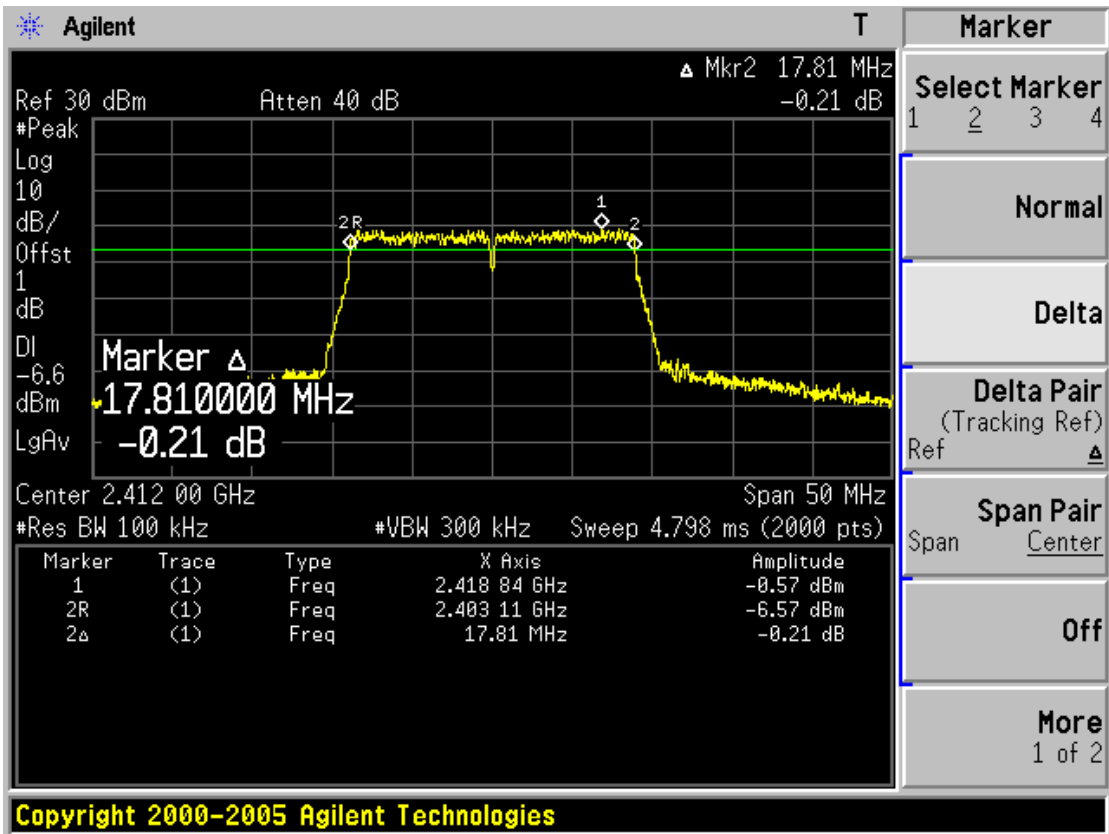
CH11



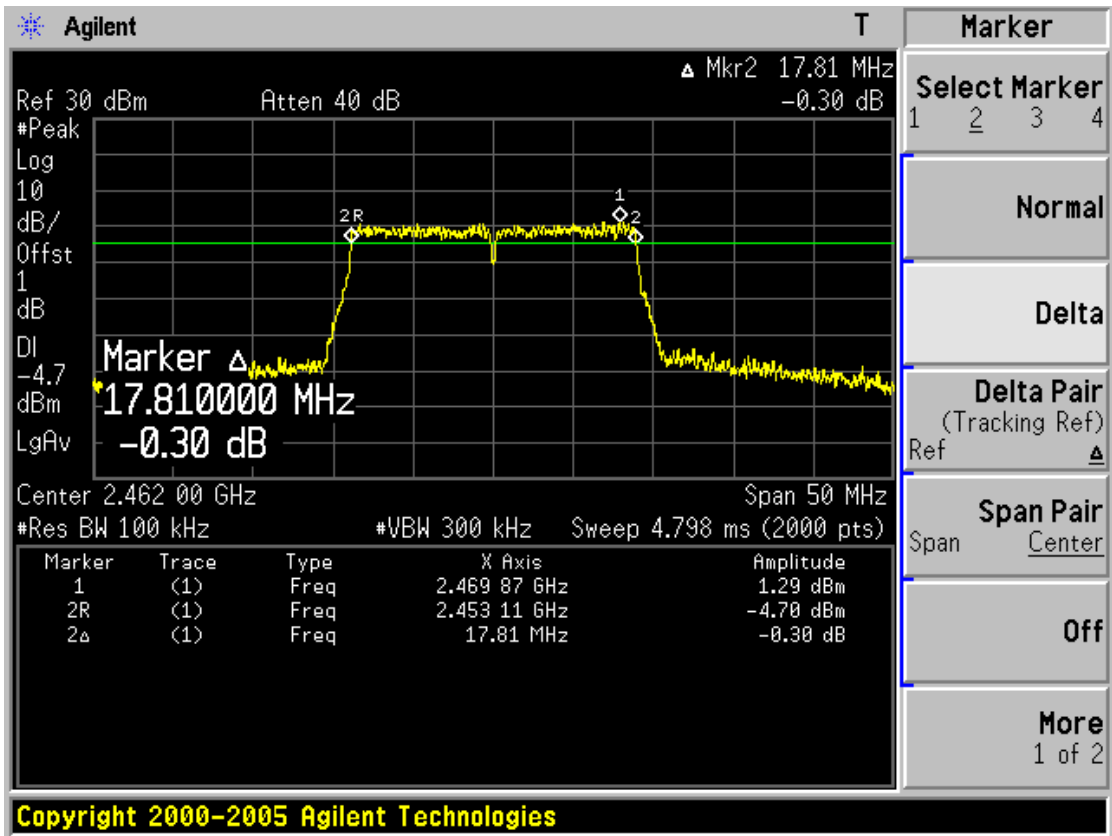


For 802.11n (20MHz) Mode:

CH1



CH11



#### 4.4. Maximum Peak Output Power

##### TEST CONFIGURATION



##### TEST PROCEDURE

According to C63.10 -2009 and KDB558074, The EUT was directly connected to the power meter / spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

Use the wideband power meter to test peak power and record the result.

##### LIMIT

The Peak Output Power Measurement limits are 30dBm.

##### TEST RESULTS

Power output at various data rates:

Test Mode	Bandwidth	Frequency (MHz)	Channel	Data Rate	Peak Power (dBm)
802.11b	20	2437	6	1	18.36
				5.5	17.74
				11	16.58
802.11g	20	2437	6	6	17.29
				24	16.39
				54	15.53
802.11n (20MHz)	20	2437	6	6.5	17.23
				39	16.24
				65	15.52

Product	:	Smartphone
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
01	2412	18.16	30.00	Pass
06	2437	18.37	30.00	Pass
11	2462	17.75	30.00	Pass



Product	:	Smartphone
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
01	2412	17.22	30.00	Pass
06	2437	17.29	30.00	Pass
11	2462	16.93	30.00	Pass





Product	:	Smartphone
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
01	2412	17.17	30.00	Pass
06	2437	17.23	30.00	Pass
11	2462	16.86	30.00	Pass

*Note: The test results including the cable lose.*



## 4.5. Band Edge Measurement

### TEST CONFIGURATION



### TEST PROCEDURE

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS) with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBM= 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW and VBW to 100 kHz, to measure the conducted peak band edge.

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below (be sure to enter all losses between the unlicensed wireless device output and the spectrum analyzer).

- Span: Set Span for minimum 50 MHz - Reference Level: 110 dB  $\mu$  V (corrected for gains and losses of test antenna factor, preamp gain and cable loss) - Attenuation: 10 dB
- Sweep Time: Coupled - Resolution Bandwidth: Up to and including 1 GHz =  $\geq$  100 kHz
- Resolution Bandwidth: Above 1 GHz = 1 MHz - Video Bandwidth: Below 1 GHz = 300 kHz
- Video Bandwidth: Up to and including 1 GHz =  $\geq$  3 MHz for peak and 10 Hz for average
- Detector: Peak

Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel.

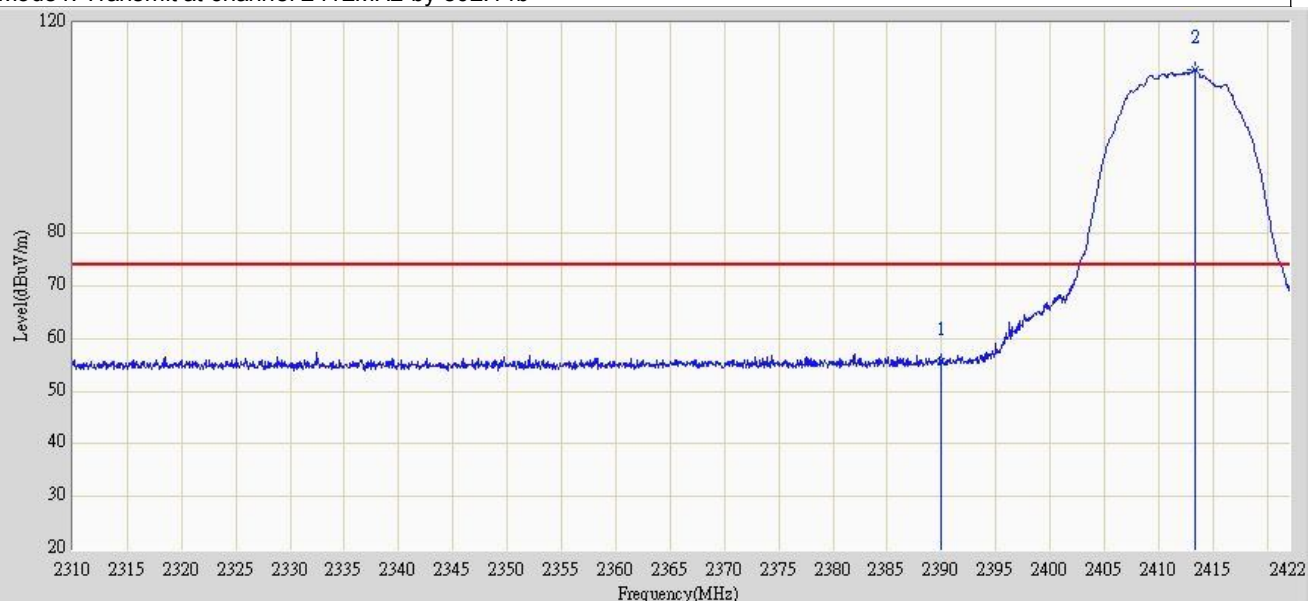
### LIMIT

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209(see Section 15.205(c)).

Frequency (MHz)	Limit Average (dBuV/m)	Limit Peak (dBuV/m)
Below 2390 or Above 2483.5	54	74

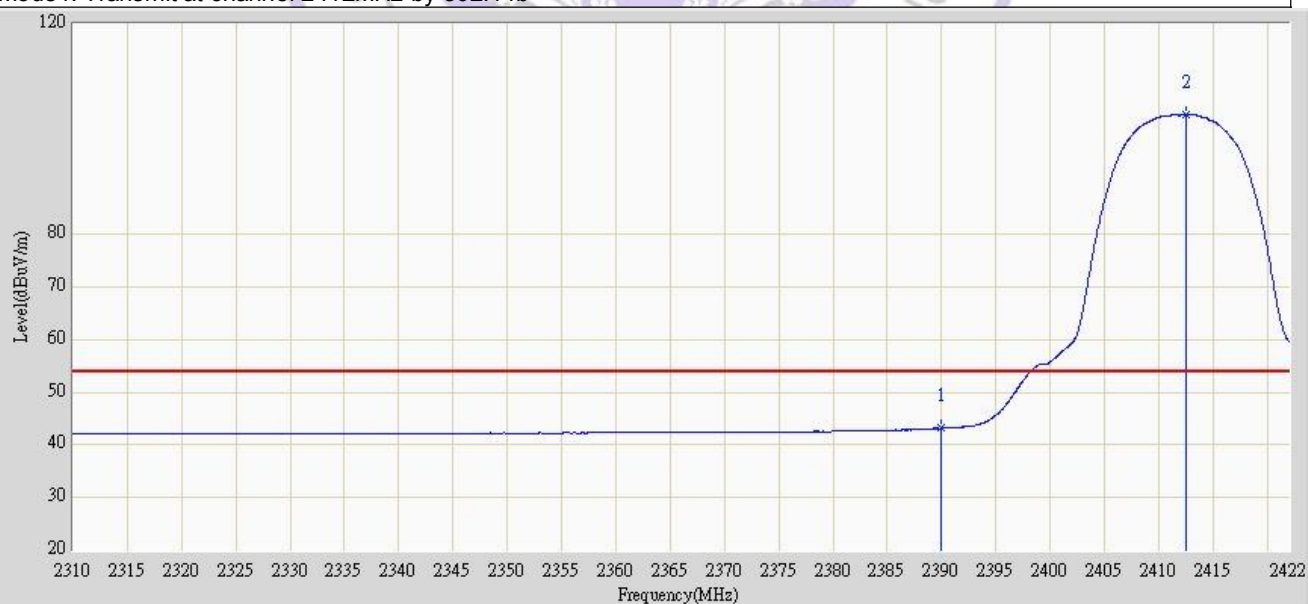
**TEST RESULTS**

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 19:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode1: Transmit at channel 2412MHz by 802.11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	55.715	24.627	-18.285	74.000	31.088	PK
2	*	2413.376	111.224	79.981	N/A	N/A	31.243	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 19:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode1: Transmit at channel 2412MHz by 802.11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	43.155	12.067	-10.845	54.000	31.088	AV
2	*	2412.480	102.771	71.536	N/A	N/A	31.235	AV

Engineer: Sunny

Site: AC5

Time: 2013/02/16 - 19:32

Limit: FCC Part15.209 RE(3m)

Margin: 0

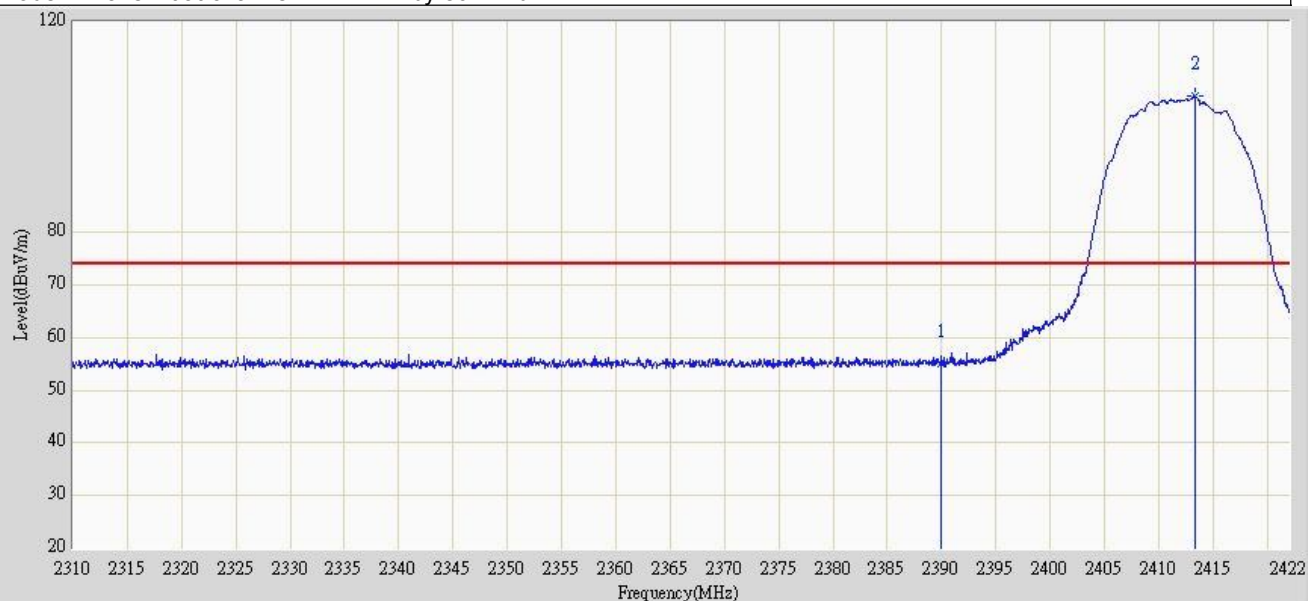
Probe: BBHA 9120D\_499(1-18GHz)

Polarity: Vertical

EUT: Smartphone

Power: By Battery

Note: Mode1: Transmit at channel 2412MHz by 802.11b



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	54.965	23.877	-19.035	74.000	31.088	PK
2	*	2413.376	105.927	74.684	N/A	N/A	31.243	PK

Engineer: Sunny

Site: AC5

Time: 2013/02/16 - 19:35

Limit: FCC Part15.209 RE(3m)

Margin: 0

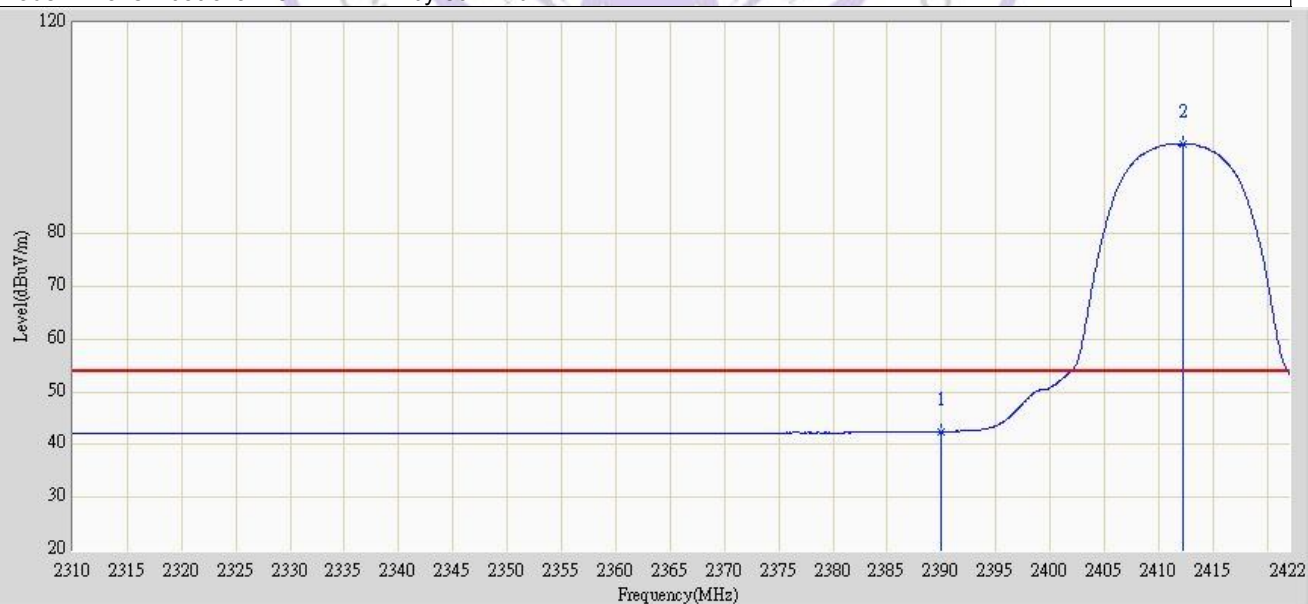
Probe: BBHA 9120D\_499(1-18GHz)

Polarity: Vertical

EUT: Smartphone

Power: By Battery

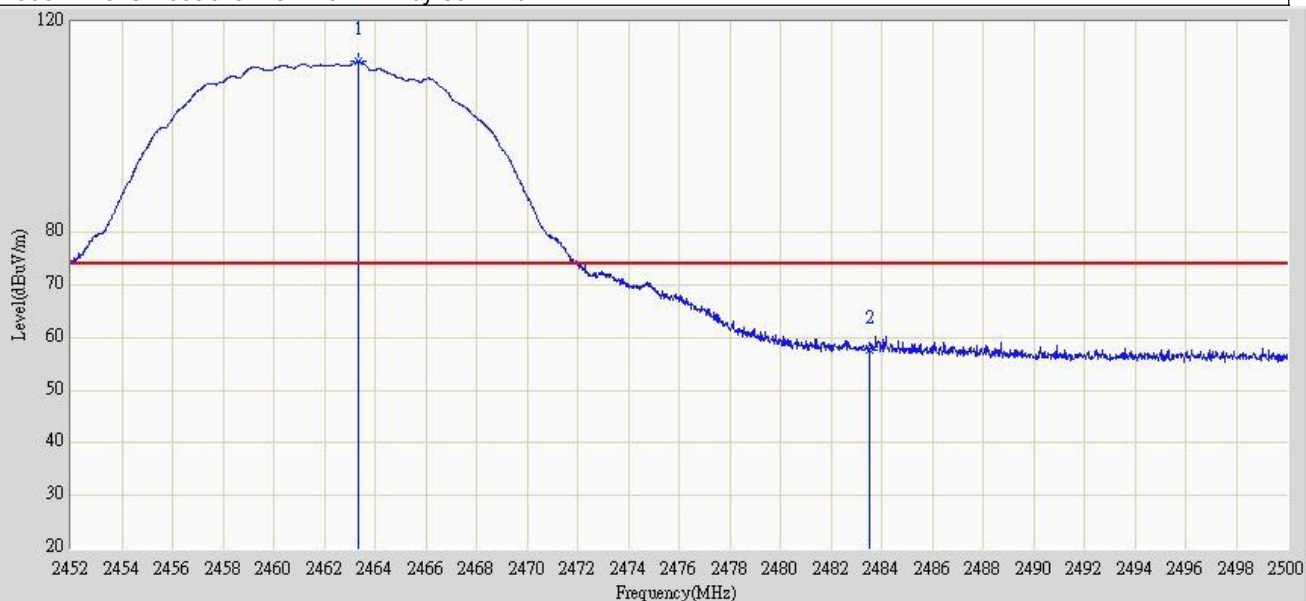
Note: Mode1: Transmit at channel 2412MHz by 802.11b



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	42.481	11.393	-11.519	54.000	31.088	AV
2	*	2412.312	96.974	65.741	N/A	N/A	31.233	AV

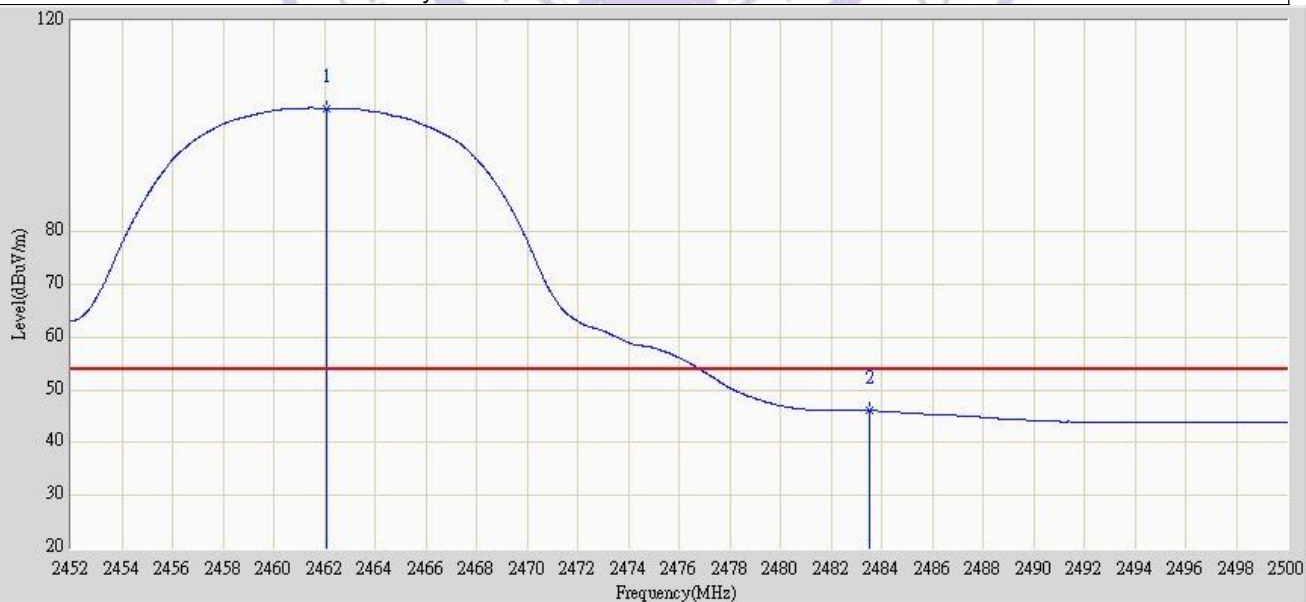


Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 19:41
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode1: Transmit at channel 2462MHz by 802.11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.328	112.452	80.859	N/A	N/A	31.593	PK
2		2483.500	57.616	26.003	-16.384	74.000	31.613	PK

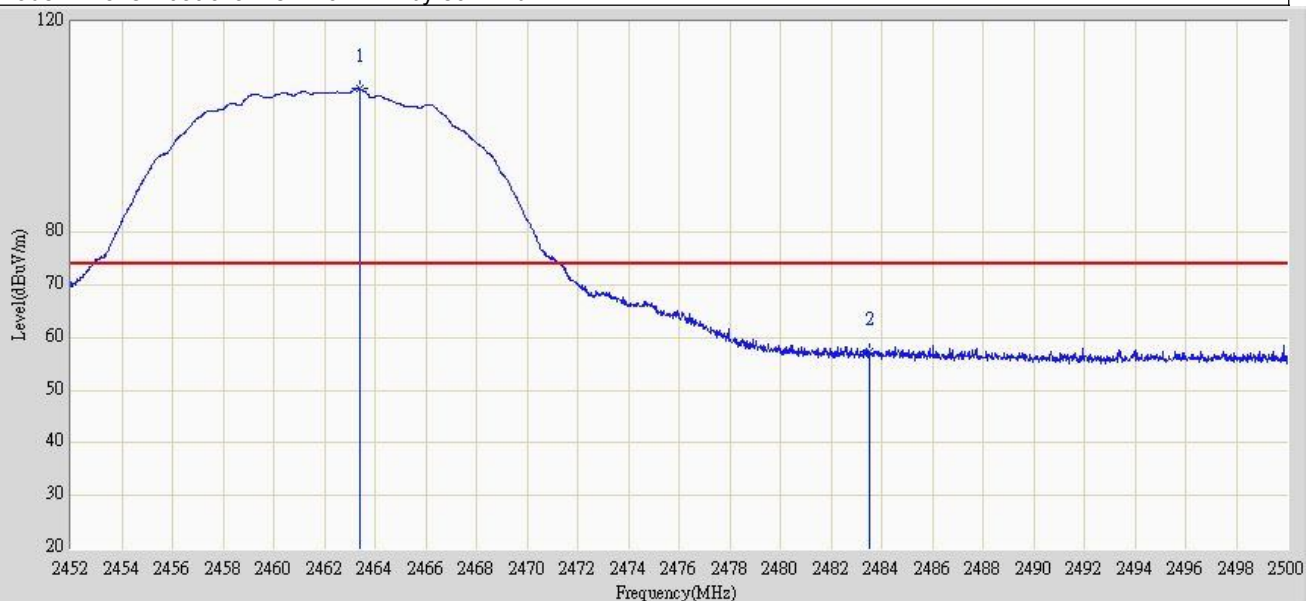
Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 19:49
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode1: Transmit at channel 2462MHz by 802.11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2462.104	103.389	71.797	N/A	N/A	31.592	AV
2		2483.500	46.117	14.504	-7.883	54.000	31.613	AV

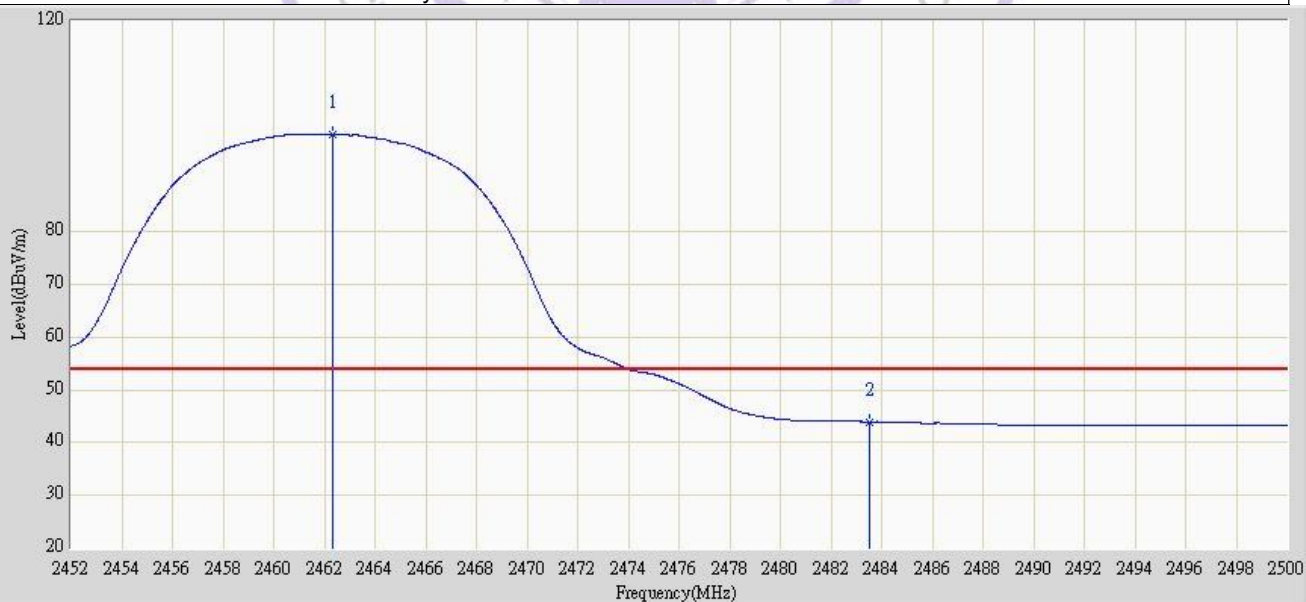


Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:03
Limit: FCC Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode1: Transmit at channel 2462MHz by 802.11b	



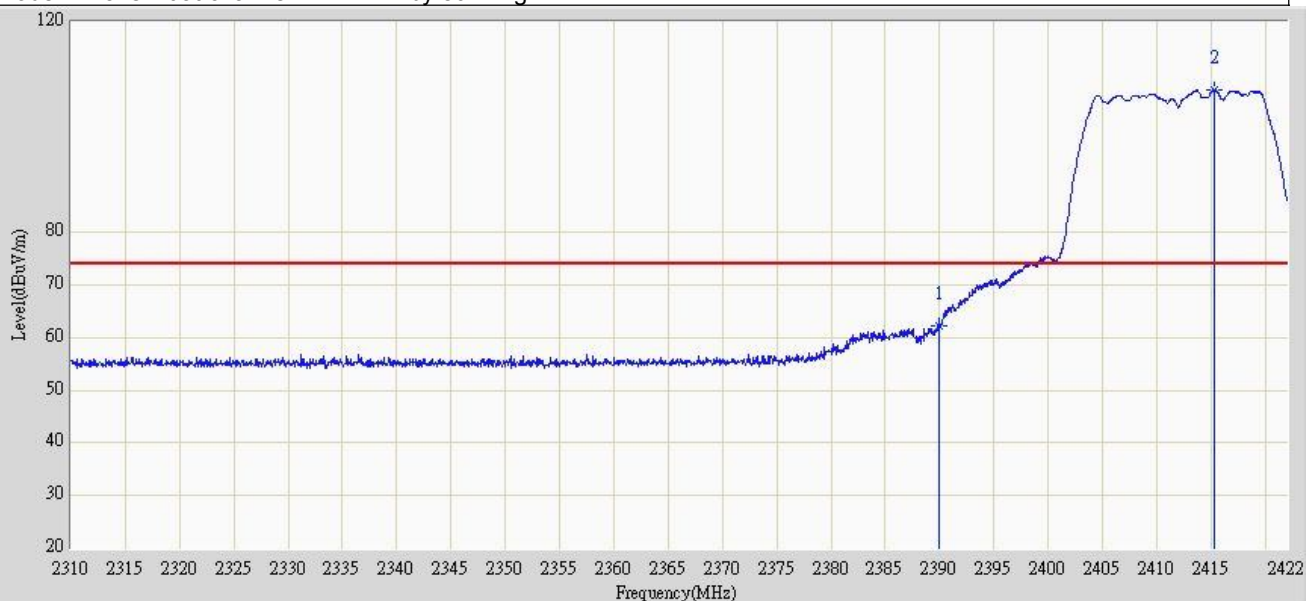
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.400	107.253	75.660	N/A	N/A	31.593	PK
2		2483.500	57.348	25.734	-16.652	74.000	31.613	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:05
Limit: FCC Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode1: Transmit at channel 2462MHz by 802.11b	



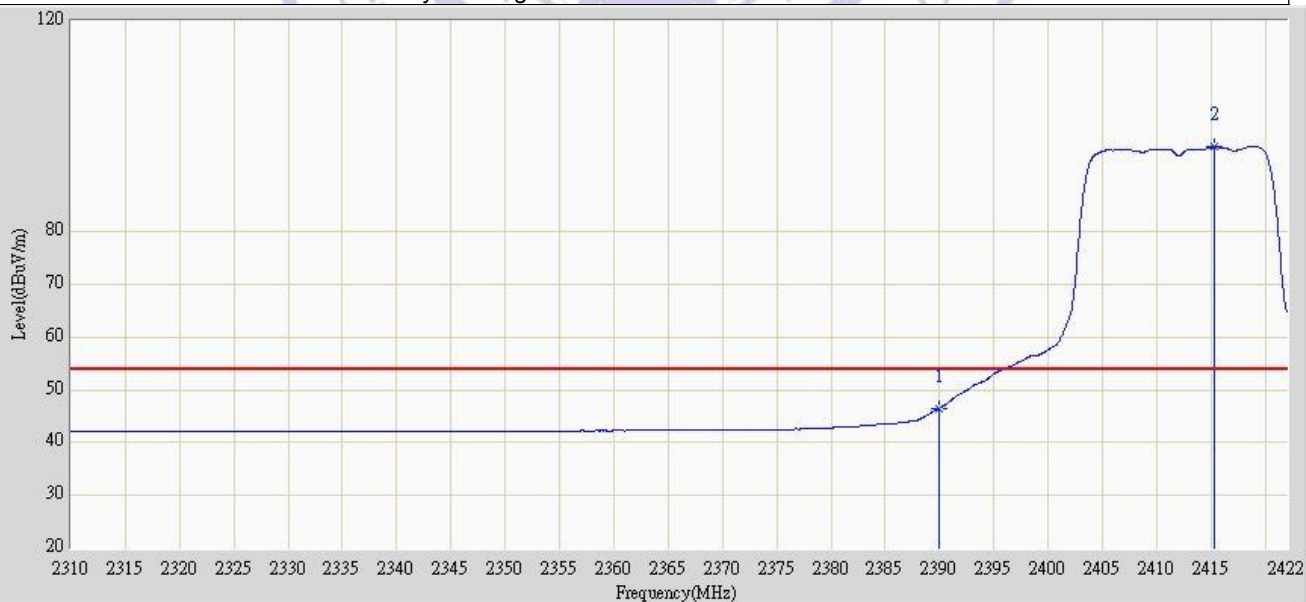
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2462.344	98.479	66.887	N/A	N/A	31.592	AV
2		2483.500	43.931	12.318	-10.069	54.000	31.613	AV

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:09
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode2: Transmit at channel 2412MHz by 802.11g	



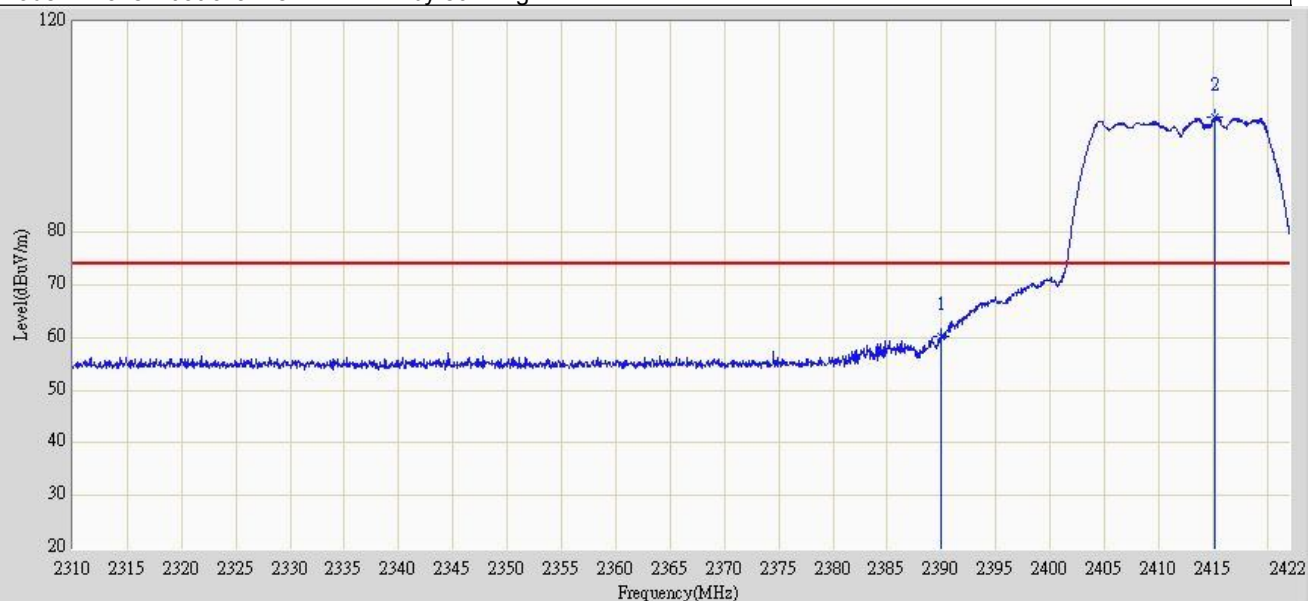
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	62.162	31.074	-11.838	74.000	31.088	PK
2	*	2415.280	107.157	75.897	N/A	N/A	31.260	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:14
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode2: Transmit at channel 2412MHz by 802.11g	



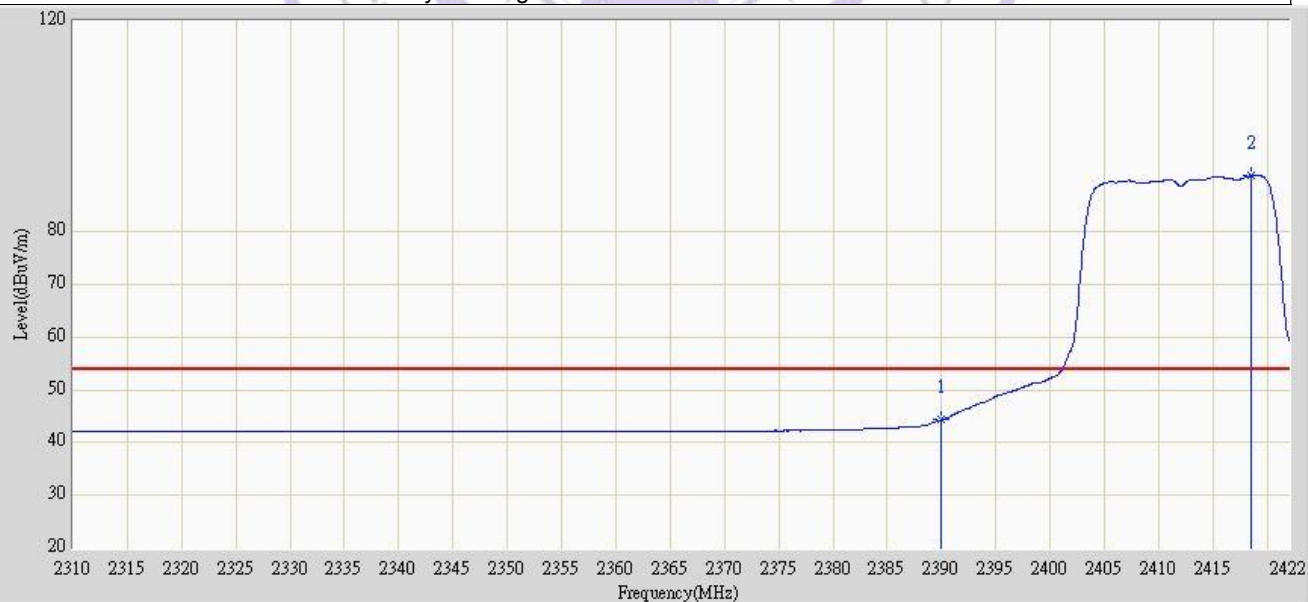
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	46.546	15.458	-7.454	54.000	31.088	AV
2	*	2415.280	96.112	64.852	N/A	N/A	31.260	AV

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:21
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode2: Transmit at channel 2412MHz by 802.11g	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	60.170	29.082	-13.830	74.000	31.088	PK
2	*	2415.224	101.841	70.581	N/A	N/A	31.260	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:23
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode2: Transmit at channel 2412MHz by 802.11g	



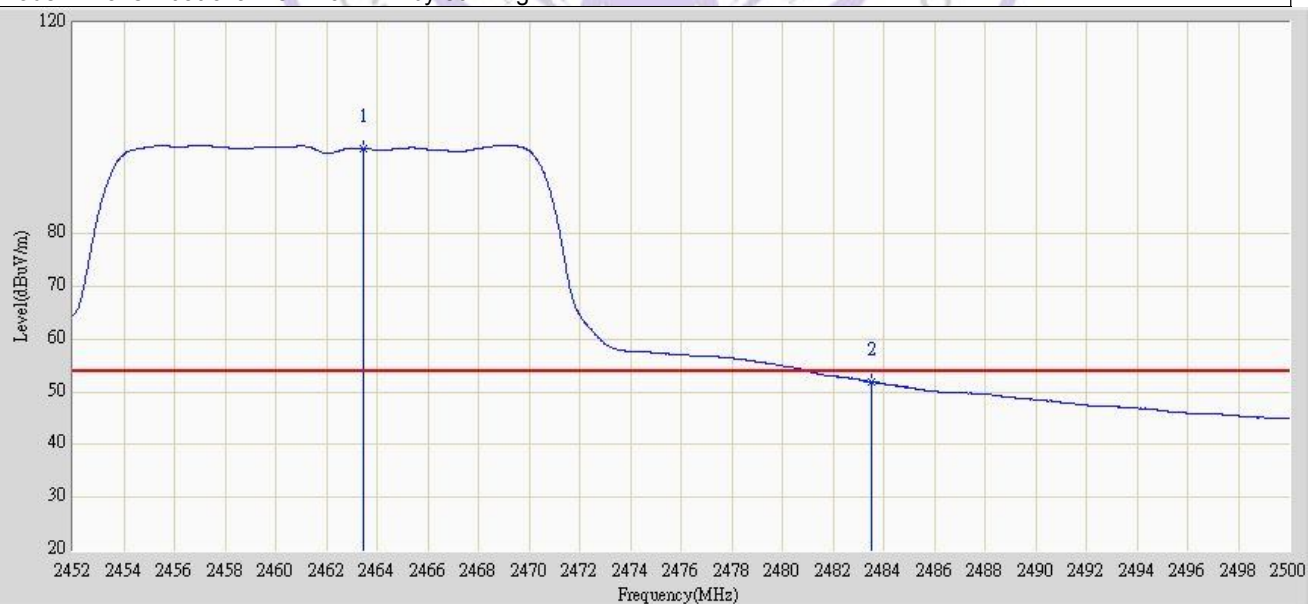
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	44.357	13.269	-9.643	54.000	31.088	AV
2	*	2418.584	90.671	59.380	N/A	N/A	31.291	AV

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:25
Limit: FCC Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode2: Transmit at channel 2462MHz by 802.11g	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.544	108.093	76.499	N/A	N/A	31.594	PK
2		2483.500	72.019	40.405	-1.981	74.000	31.613	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:30
Limit: FCC Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode2: Transmit at channel 2462MHz by 802.11g	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.472	96.153	64.560	N/A	N/A	31.594	AV
2		2483.500	51.905	20.292	-2.095	54.000	31.613	AV

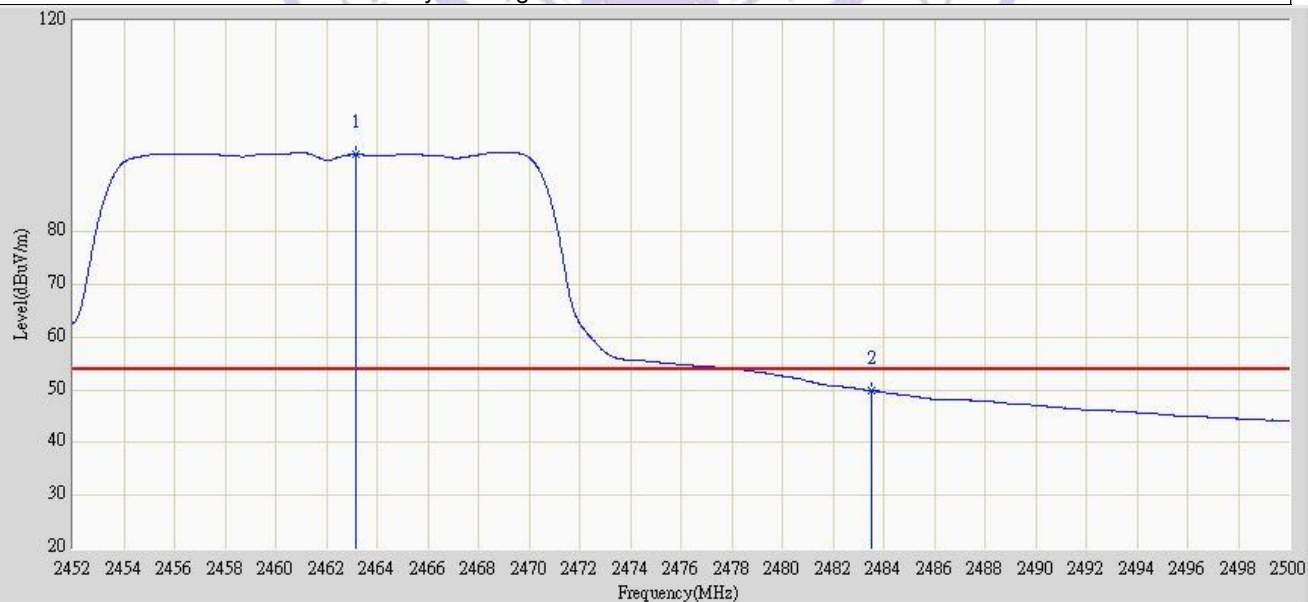


Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:35
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode2: Transmit at channel 2462MHz by 802.11g	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.472	105.908	74.315	N/A	N/A	31.594	PK
2		2483.500	70.881	39.267	-3.119	74.000	31.613	PK

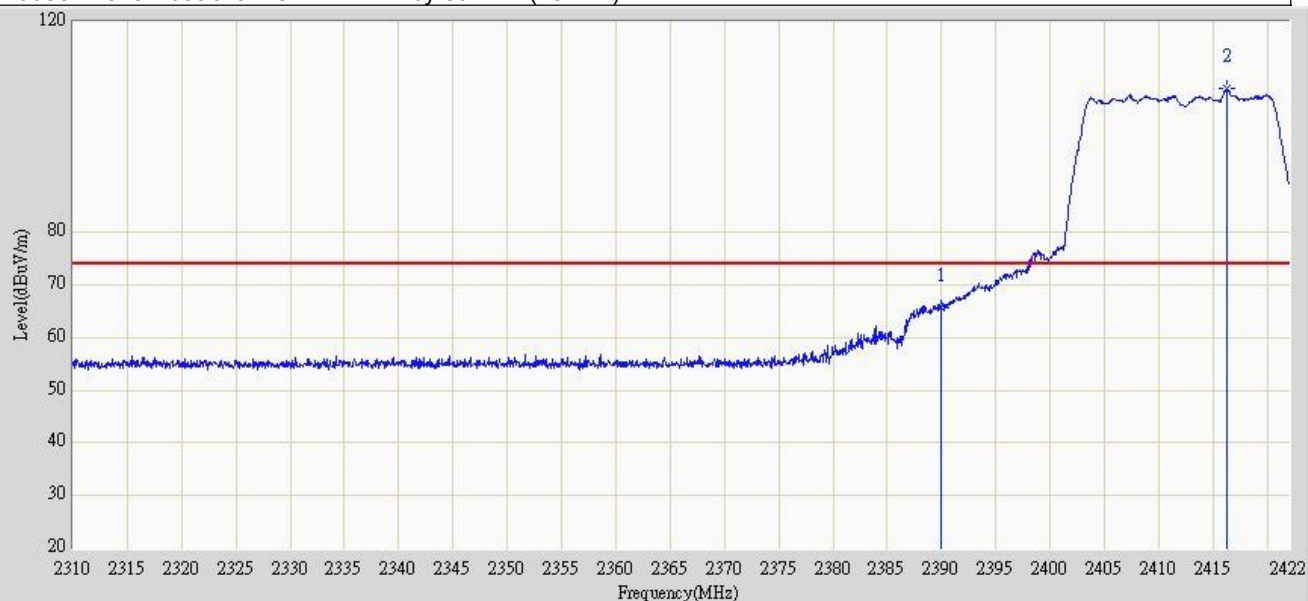
Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:39
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode2: Transmit at channel 2462MHz by 802.11g	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.160	94.574	62.981	N/A	N/A	31.593	AV
2		2483.500	49.892	18.279	-4.108	54.000	31.613	AV

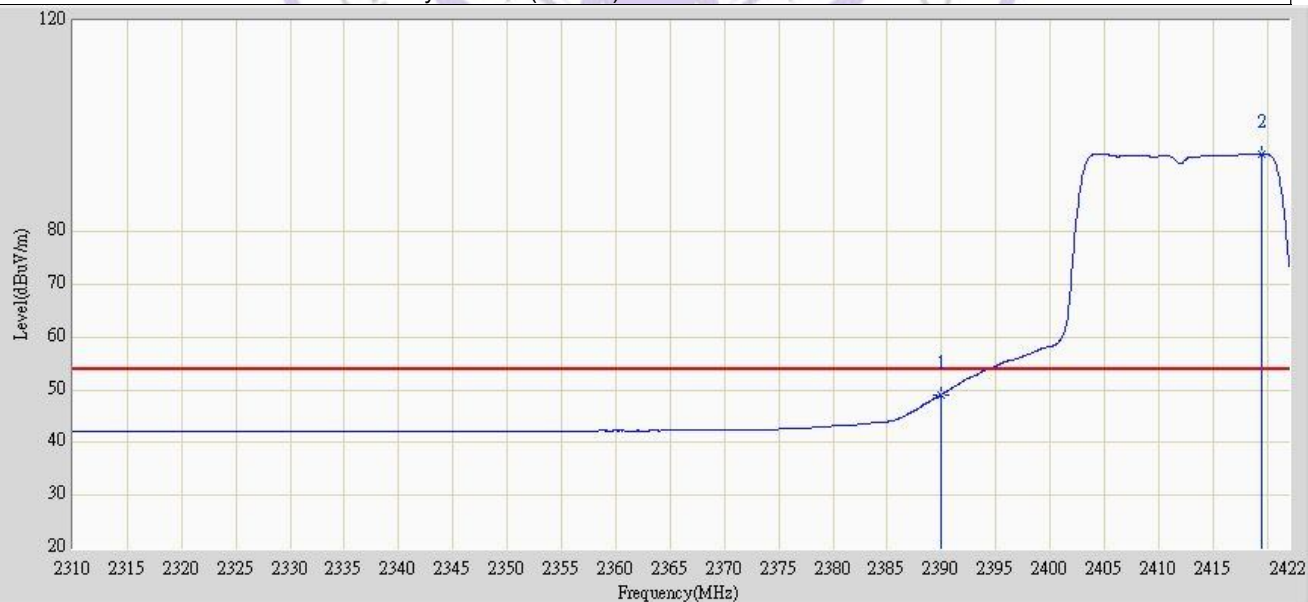


Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:41
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode3: Transmit at channel 2412MHz by 802.11n(20MHz)	



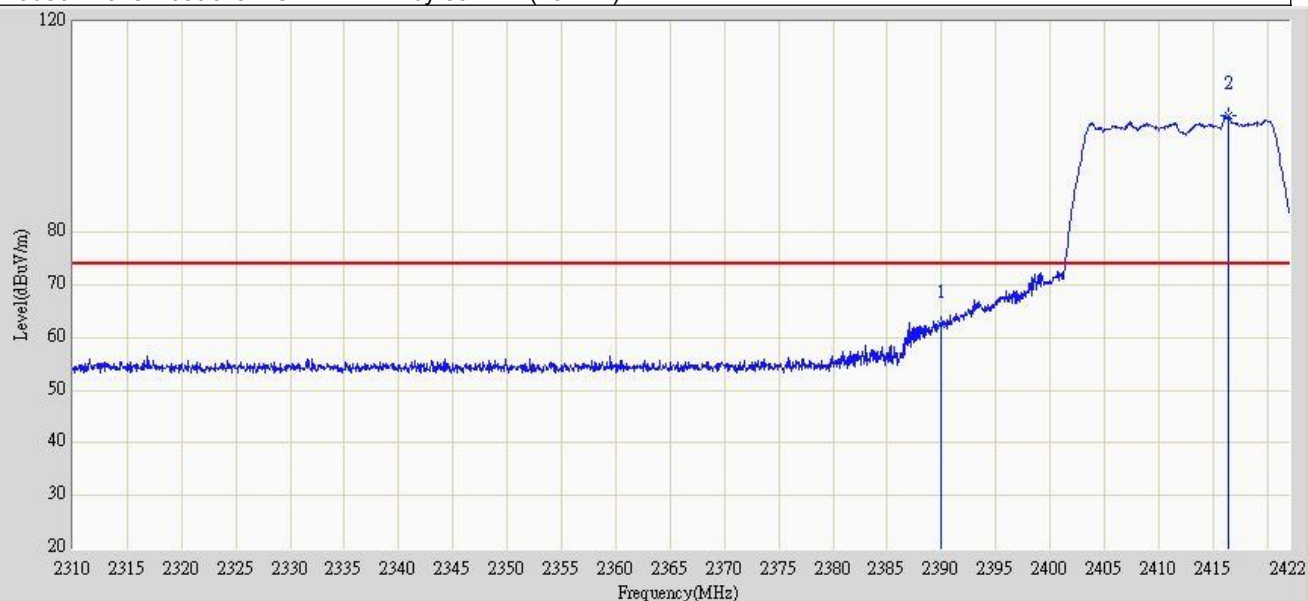
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	65.819	34.731	-8.181	74.000	31.088	PK
2	*	2416.344	107.247	75.977	N/A	N/A	31.270	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:47
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode3: Transmit at channel 2412MHz by 802.11n(20MHz)	



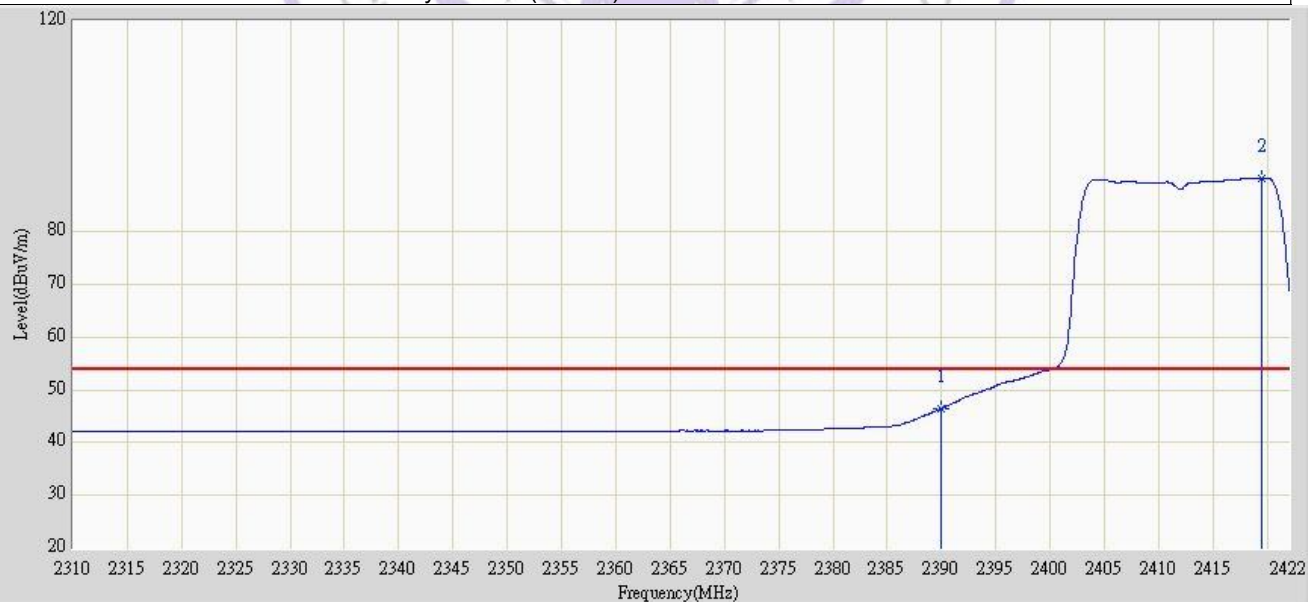
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	49.126	18.038	-4.874	54.000	31.088	AV
2	*	2419.480	94.714	63.415	N/A	N/A	31.299	AV

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:49
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode3: Transmit at channel 2412MHz by 802.11n(20MHz)	



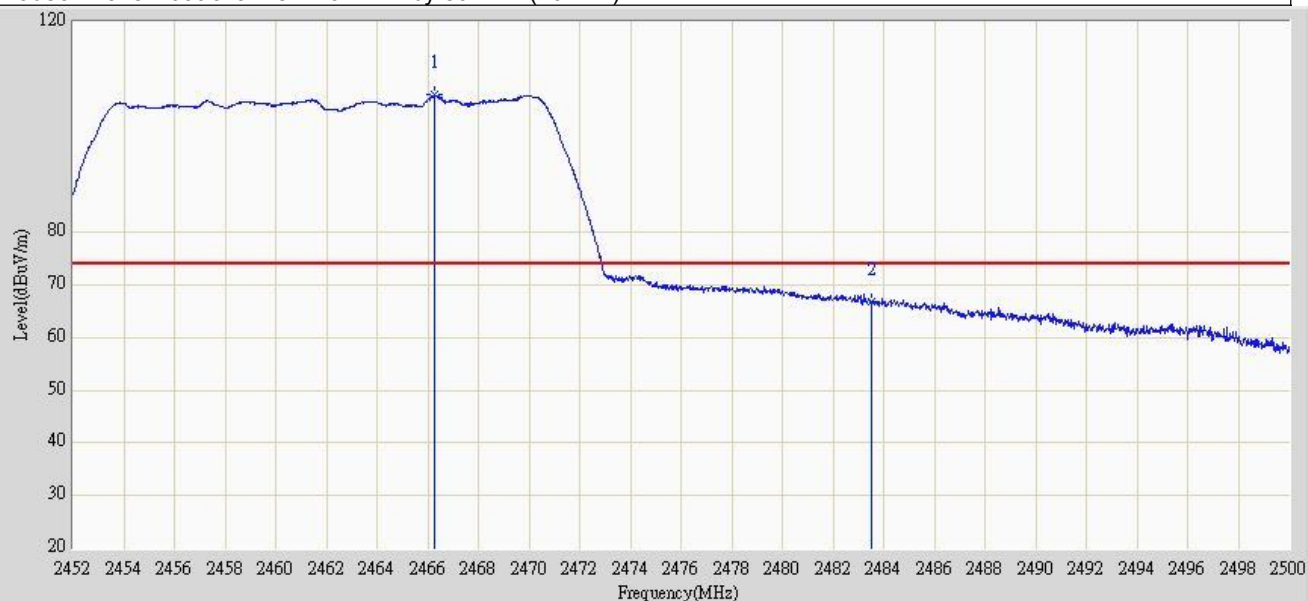
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	62.406	31.318	-11.594	74.000	31.088	PK
2	*	2416.400	102.170	70.899	N/A	N/A	31.270	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 20:51
Limit: FCC Part15.209 RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode3: Transmit at channel 2412MHz by 802.11n(20MHz)	



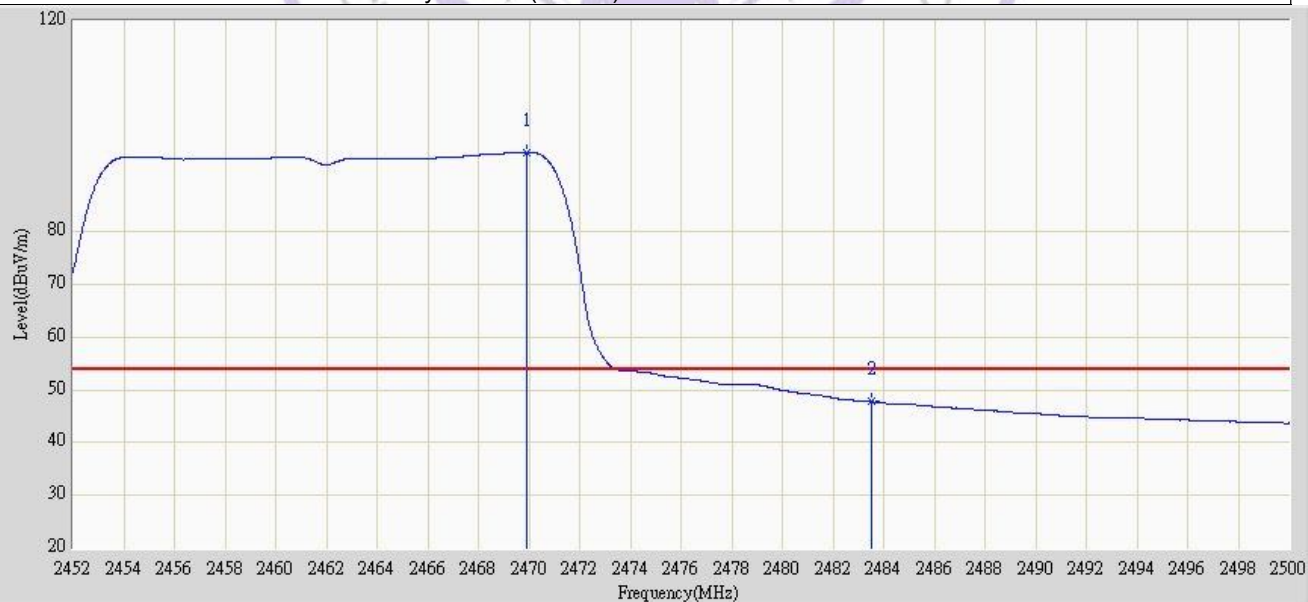
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	46.428	15.340	-7.572	54.000	31.088	AV
2	*	2419.480	90.181	58.882	N/A	N/A	31.299	AV

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 21:00
Limit: FCC Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode3: Transmit at channel 2462MHz by 802.11n(20MHz)	



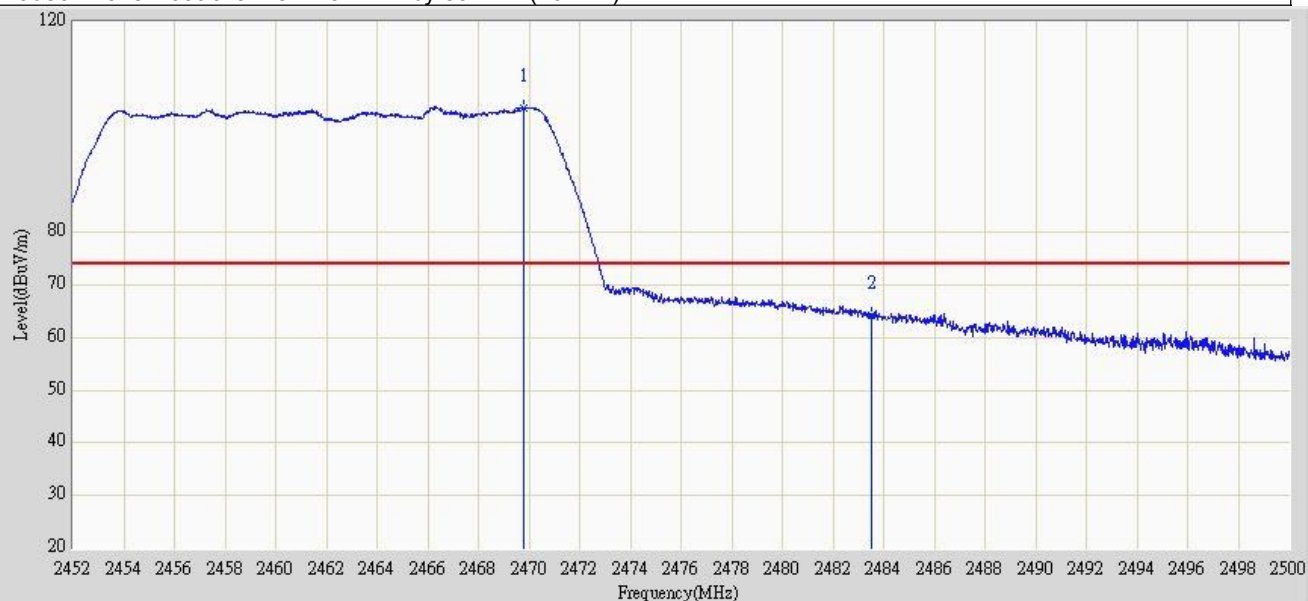
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2466.280	106.112	74.516	N/A	N/A	31.596	PK
2		2483.500	66.955	35.341	-7.045	74.000	31.613	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 21:09
Limit: FCC Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smartphone	Power: By Battery
Note: Mode3: Transmit at channel 2462MHz by 802.11n(20MHz)	



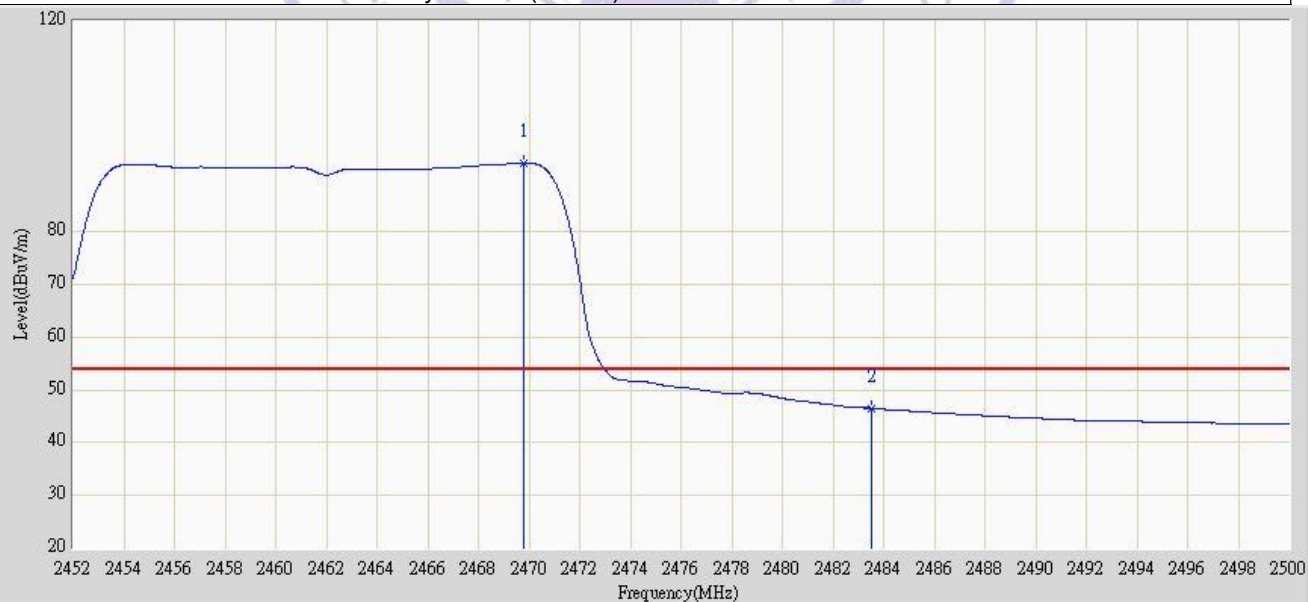
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2469.928	95.025	63.425	N/A	N/A	31.600	AV
2		2483.500	47.794	16.180	-6.206	54.000	31.613	AV

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 21:11
Limit: FCC Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode3: Transmit at channel 2462MHz by 802.11n(20MHz)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2469.784	103.755	72.155	N/A	N/A	31.599	PK
2		2483.500	64.184	32.570	-9.816	74.000	31.613	PK

Engineer: Sunny	
Site: AC5	Time: 2013/02/16 - 21:13
Limit: FCC Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smartphone	Power: By Battery
Note: Mode3: Transmit at channel 2462MHz by 802.11n(20MHz)	

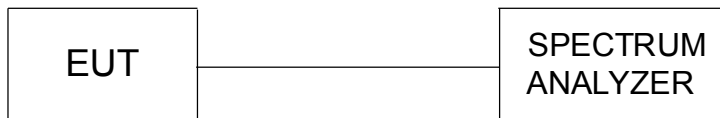


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2469.784	92.938	61.338	N/A	N/A	31.599	AV
2		2483.500	46.544	14.931	-7.456	54.000	31.613	AV



## 4.6. Power Spectral Density Measurement

### TEST CONFIGURATION



### TEST PROCEDURE

The EUT was tested according to KDB558074 D01 V02 10/04/2012 for compliance to FCC 47CFR 15.247 requirements. Set RBW= 3 kHz, VBW $\geq$ 10KHz, SPAN to 1.5 times greater than the EBW,.

### LIMIT

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.

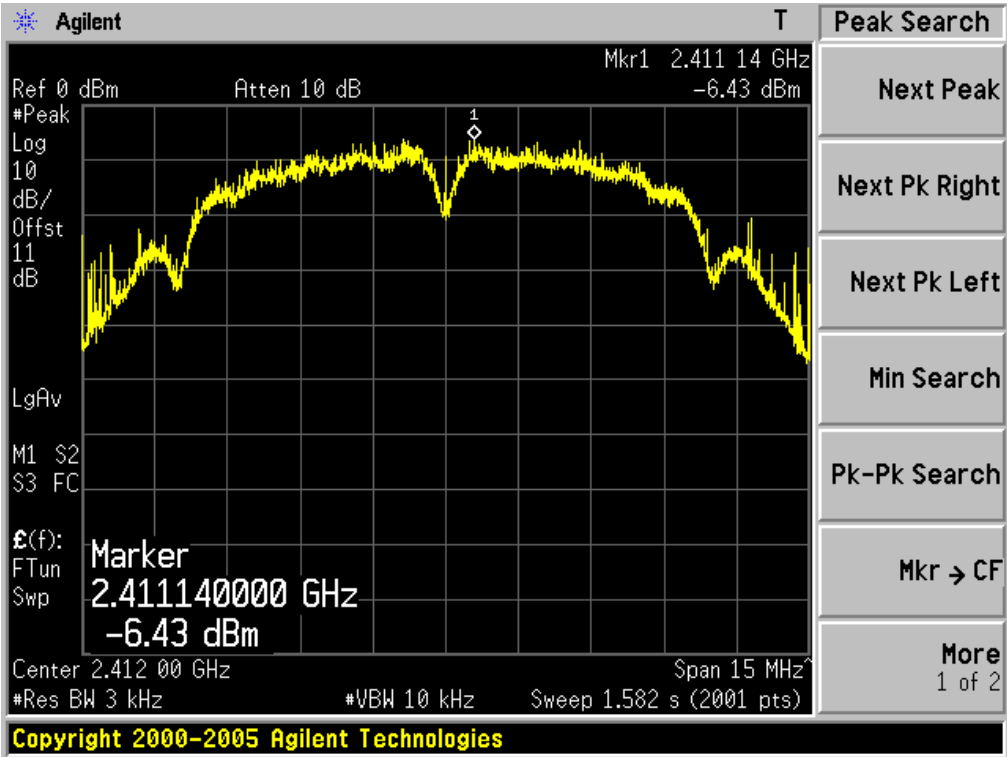
### TEST RESULTS

Modulation Mode	Channel	Channel Frequency (MHz)	PSD (dBm/3KHz)	Maximum limit (dBm/3KHz)	PASS / FAIL
802.11b	1	2412	-6.43	8	PASS
	6	2437	-6.70	8	PASS
	11	2462	-5.60	8	PASS
802.11g	1	2412	-14.81	8	PASS
	6	2437	-13.22	8	PASS
	11	2462	-11.86	8	PASS
802.11n HT20	1	2412	-14.66	8	PASS
	6	2437	-15.29	8	PASS
	11	2462	-10.85	8	PASS

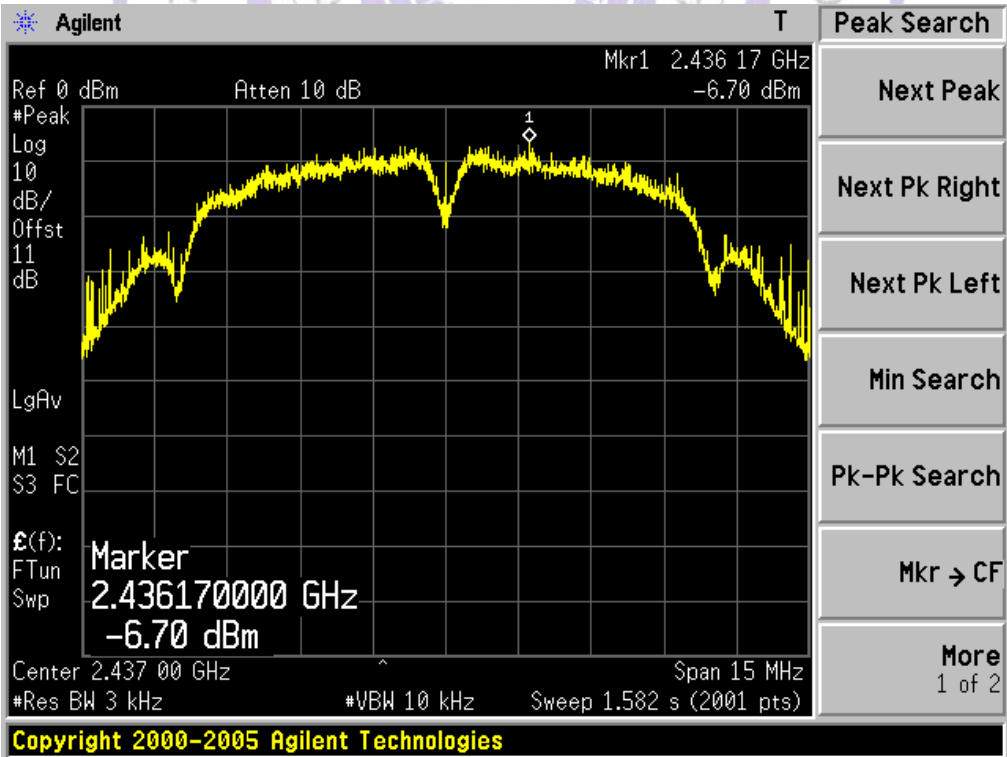


For 802.11b Mode:

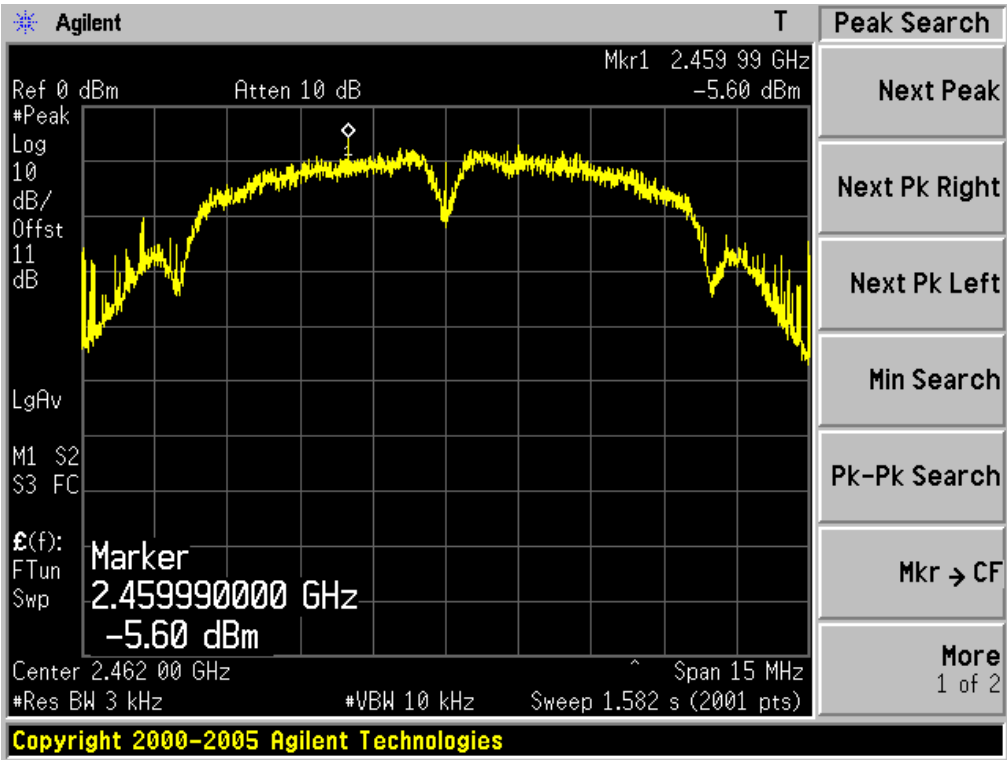
CH1



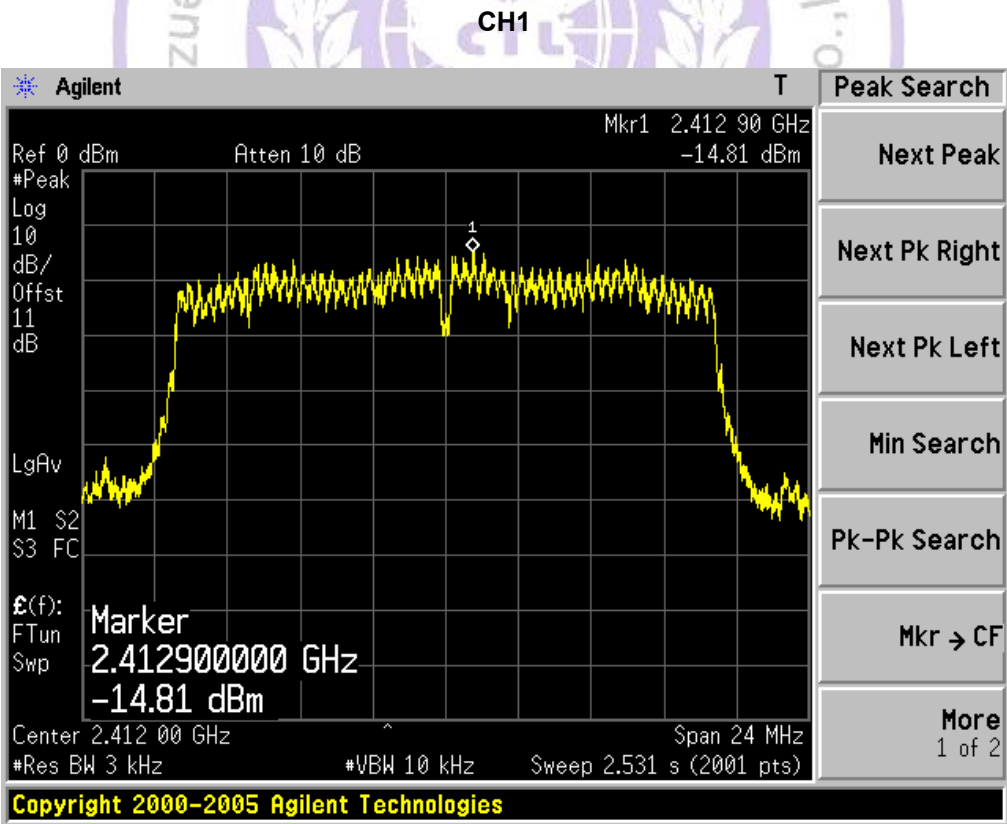
CH6



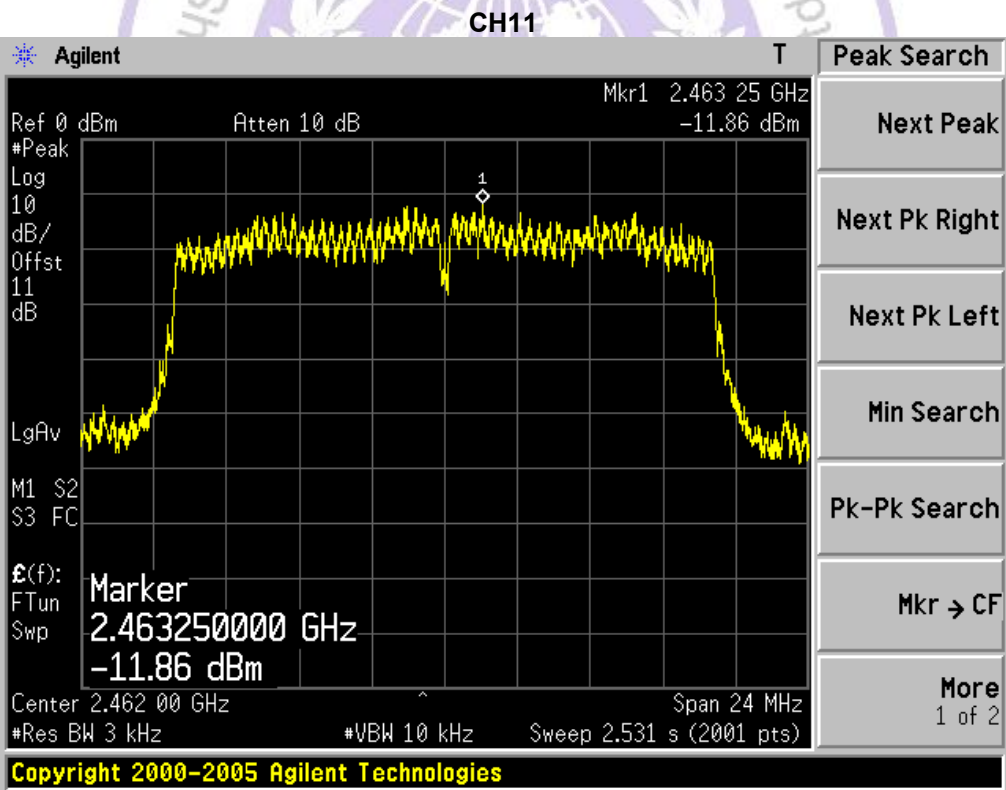
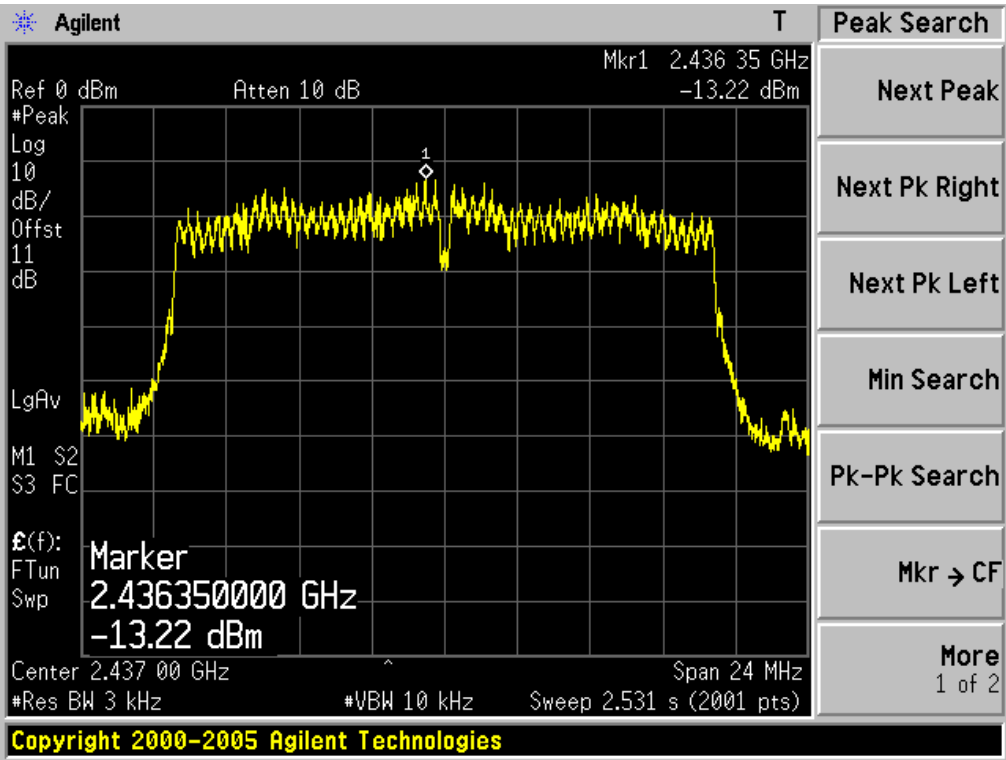
CH11



For 802.11g Mode:

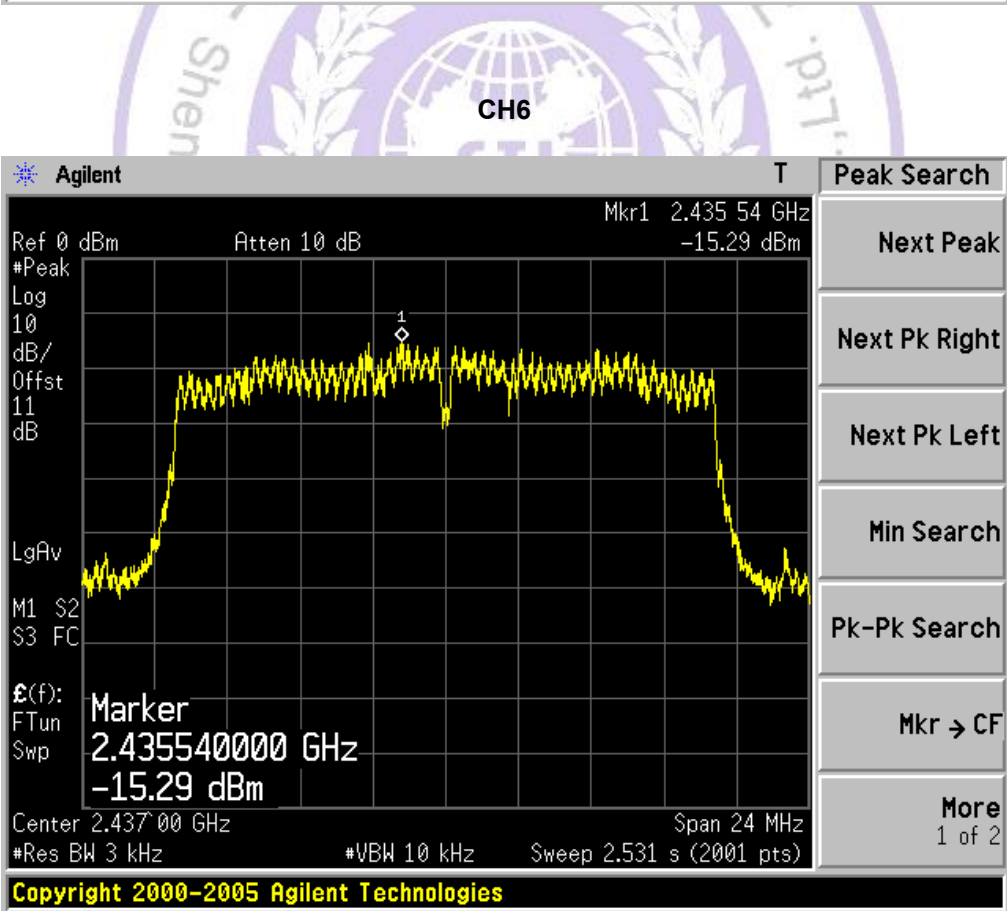
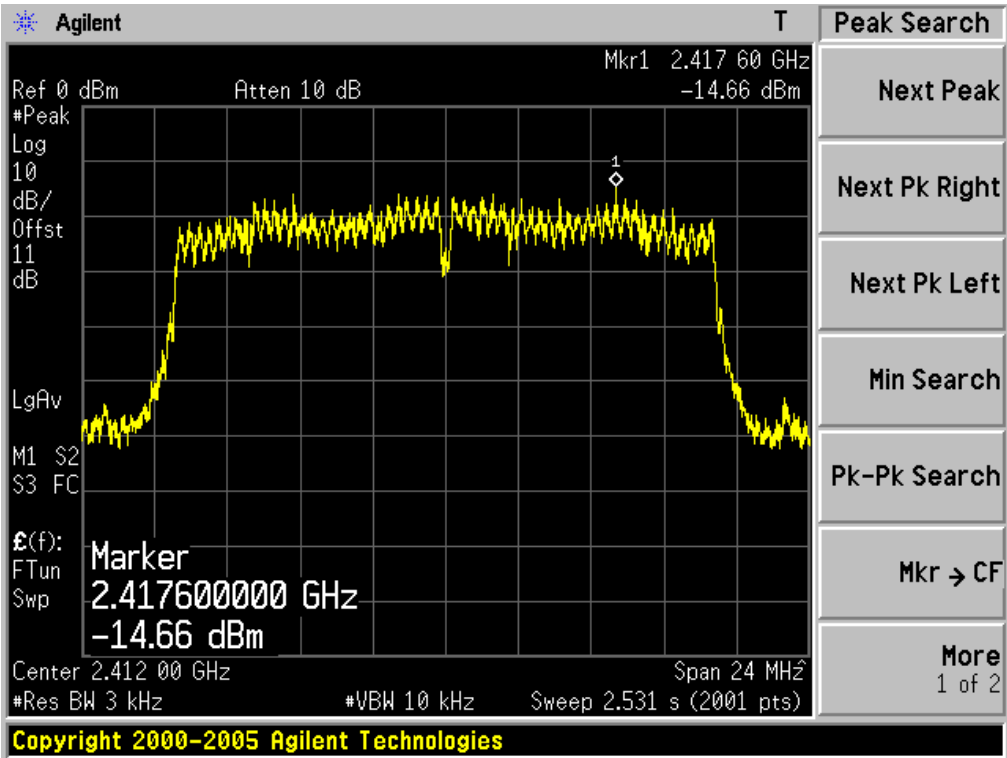


CH6

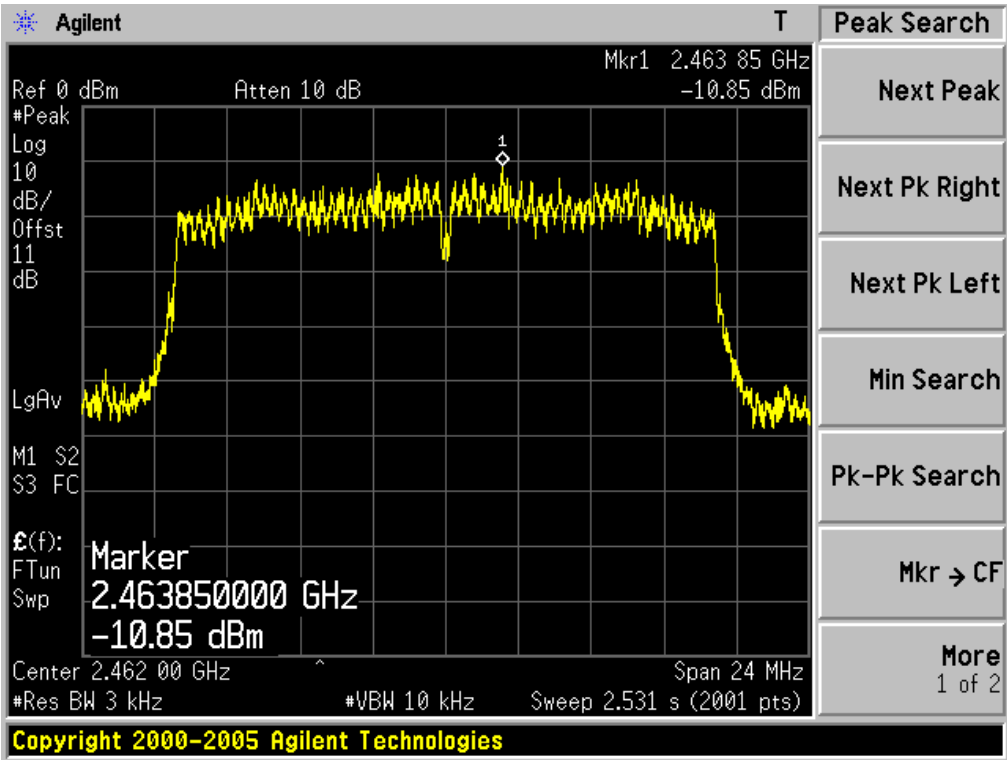


For 802.11n (20MHz) Mode:

CH1



CH11





## 4.7. Spurious RF Conducted Emission

### TEST CONFIGURATION



### TEST PROCEDURE

The EUT was tested according to KDB558074 D01 V02 10/04/2012 for compliance to FCC 47CFR 15.247 requirements.

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2009 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBM= 300kHz to measure the peak field strength, and measure frequency range from 30MHz to 26.5GHz.

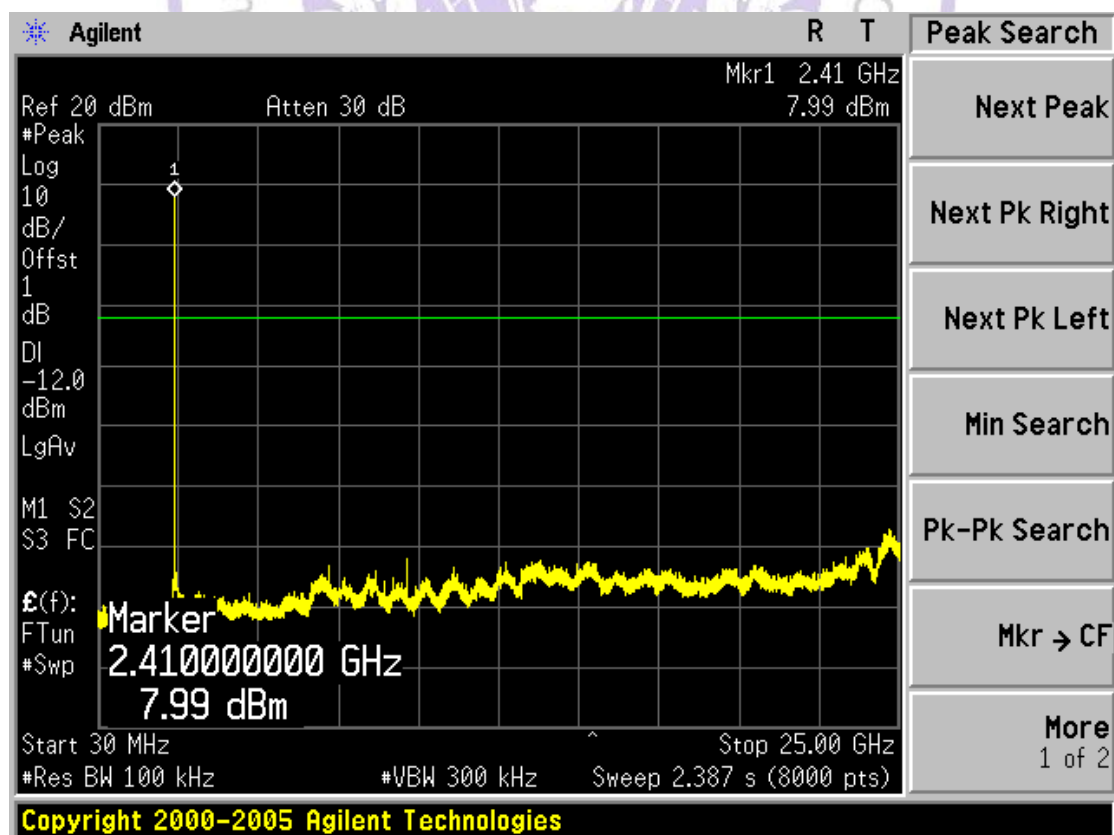
### LIMIT

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.

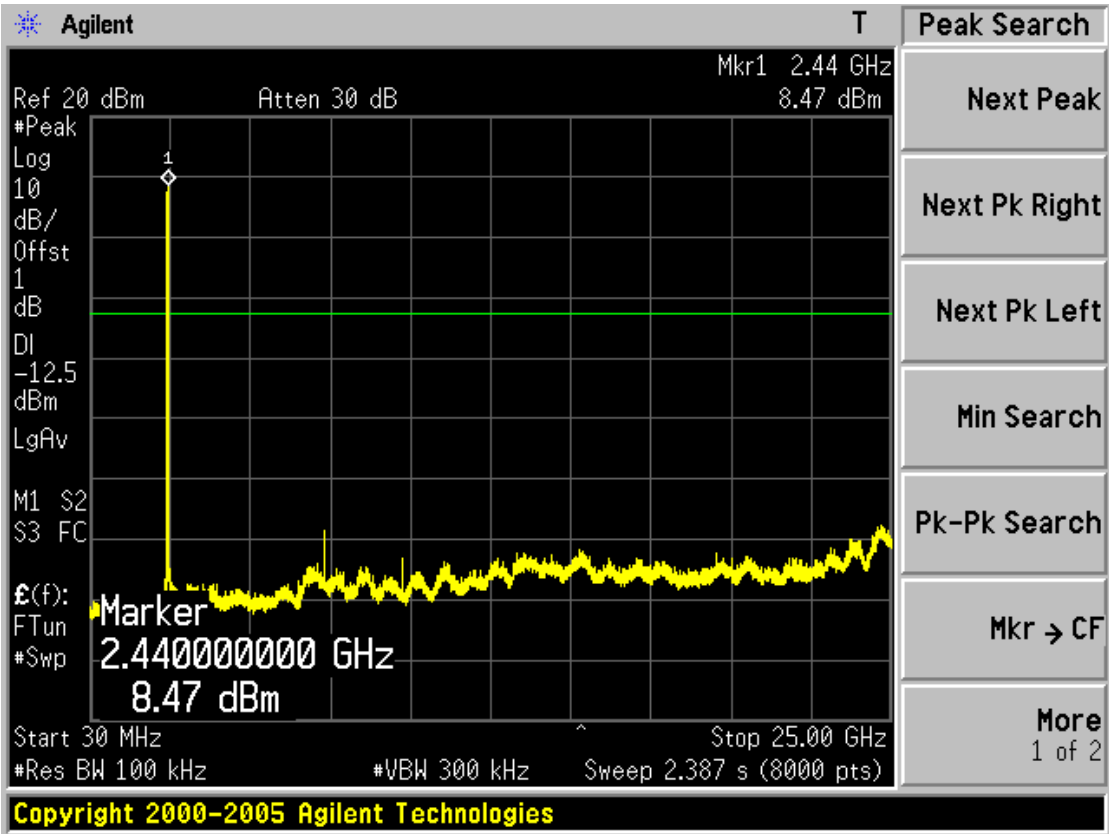
### TEST RESULTS

Photos of Spurious RF Conducted Emission Measurement

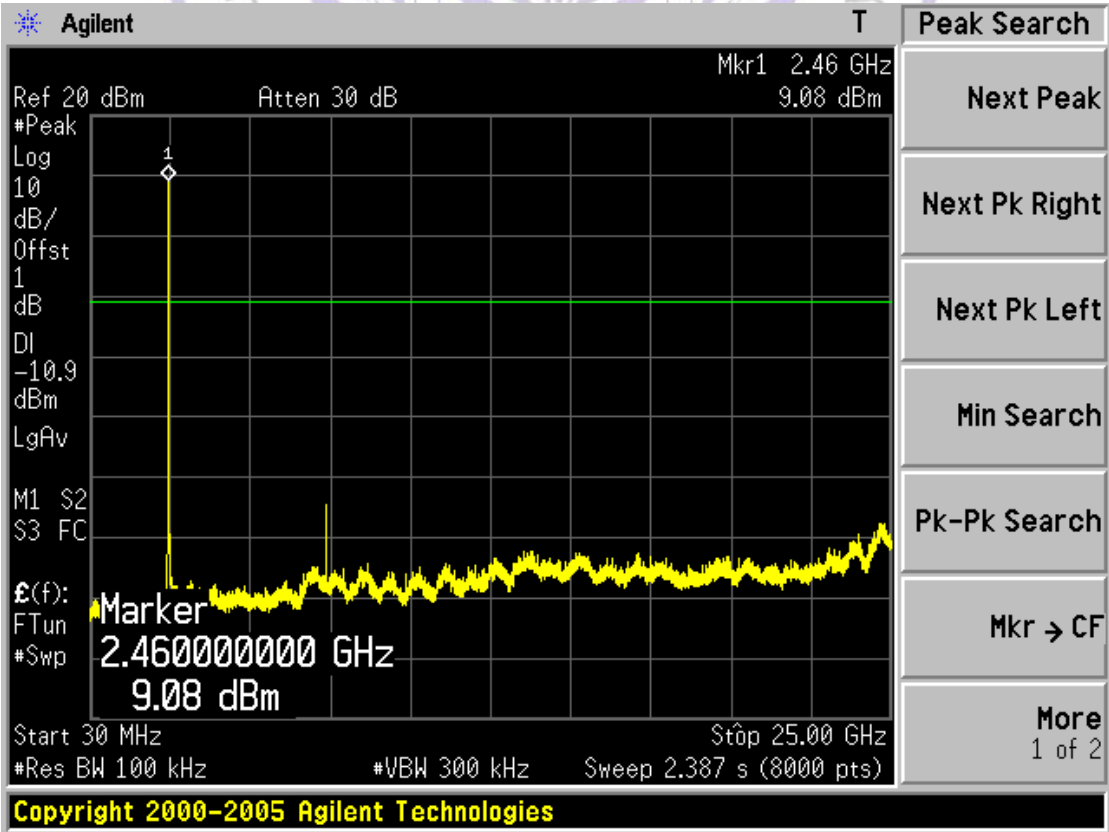
For 802.11b Mode:



CH6

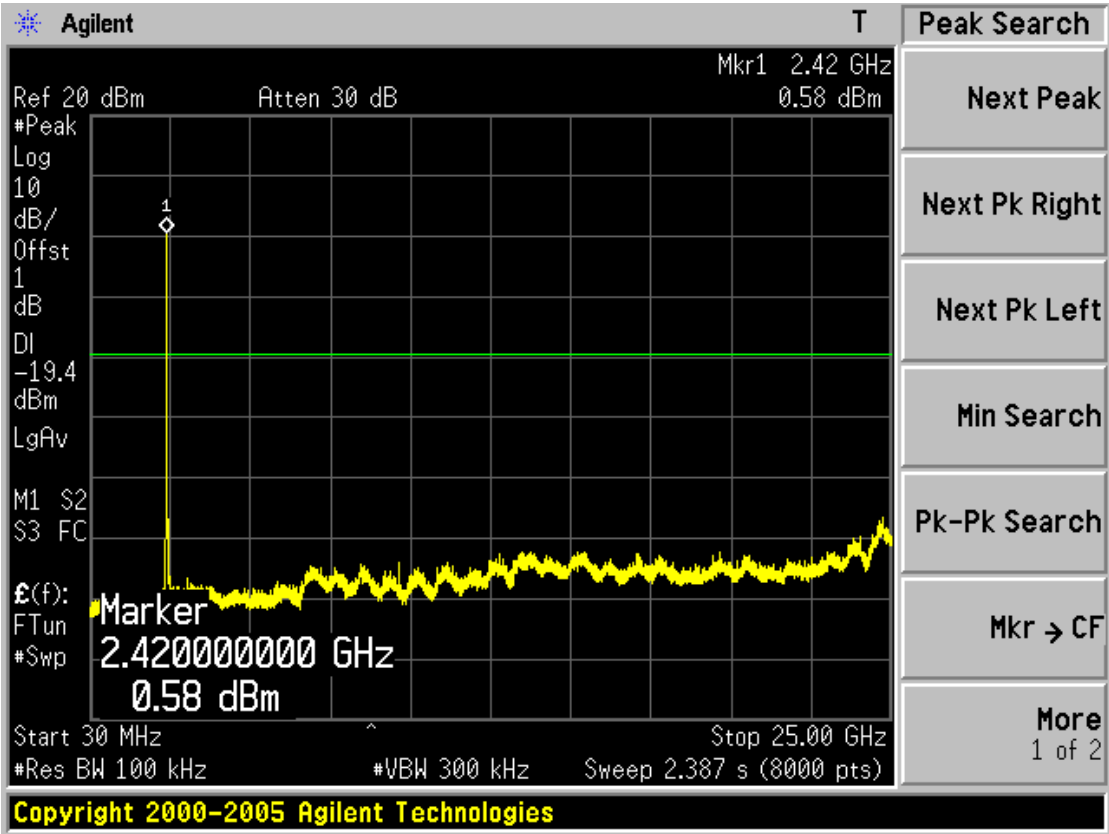


CH11

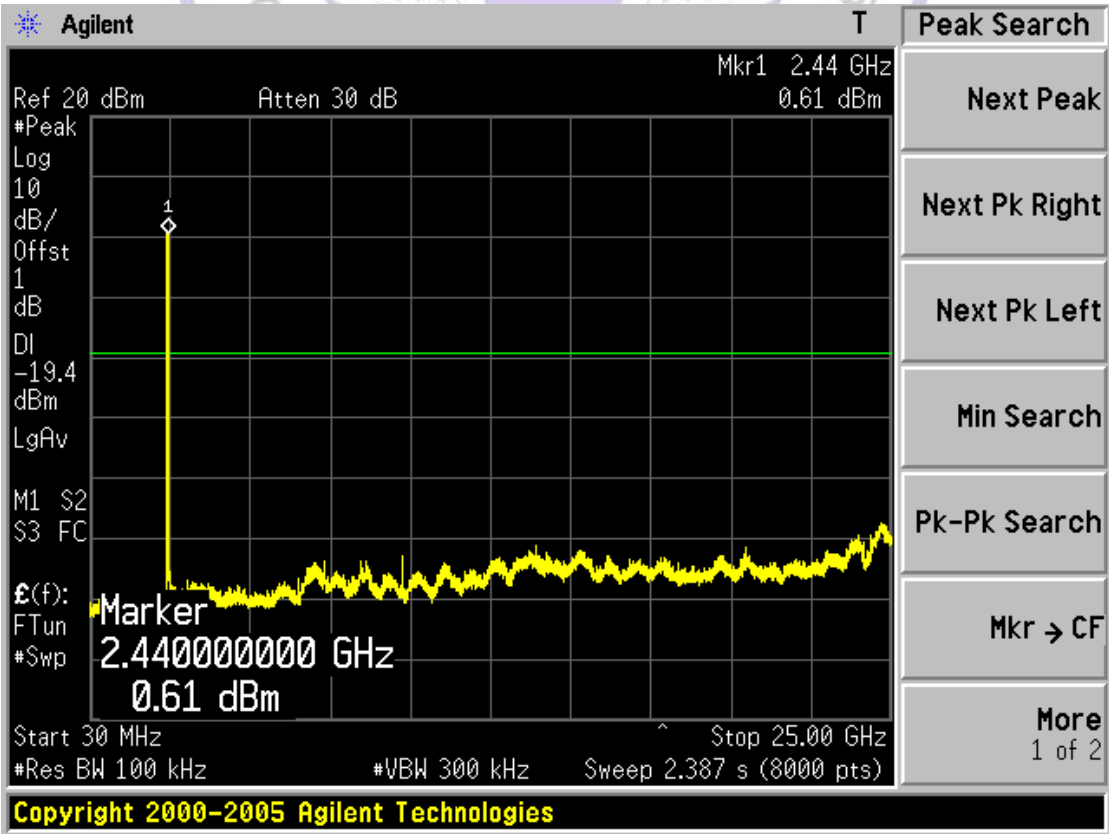


For 802.11g Mode:

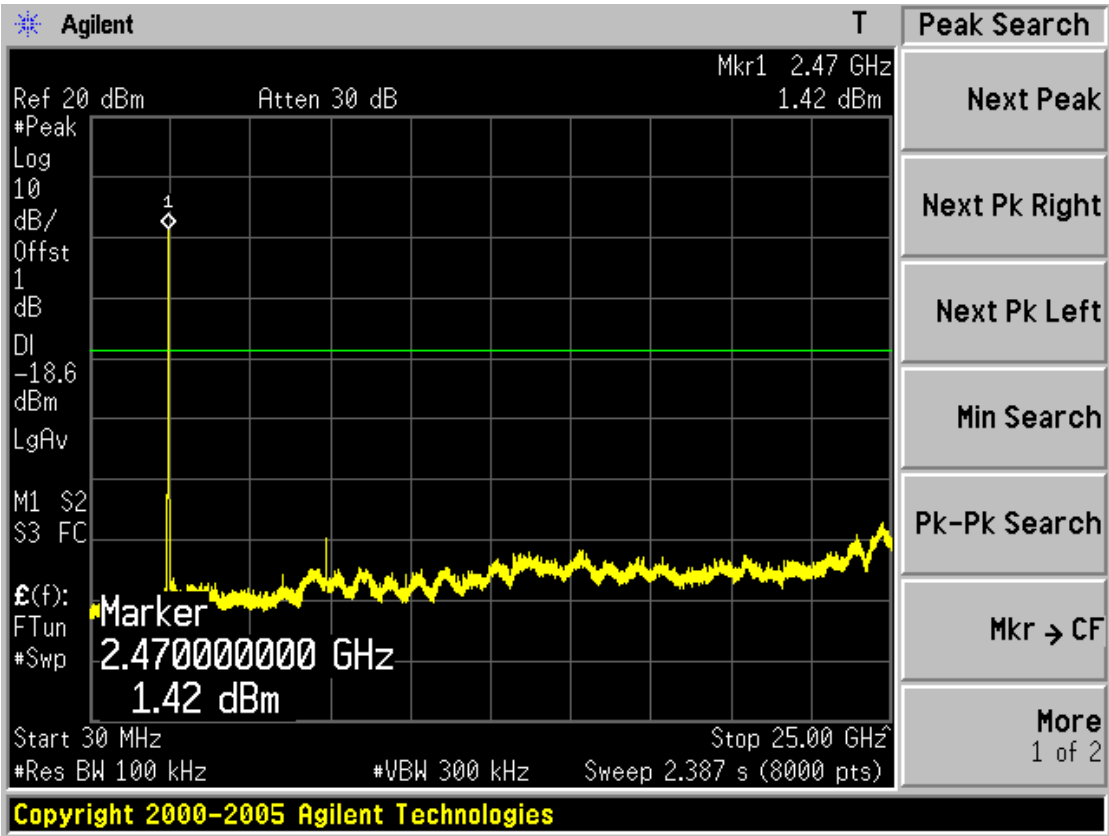
CH1



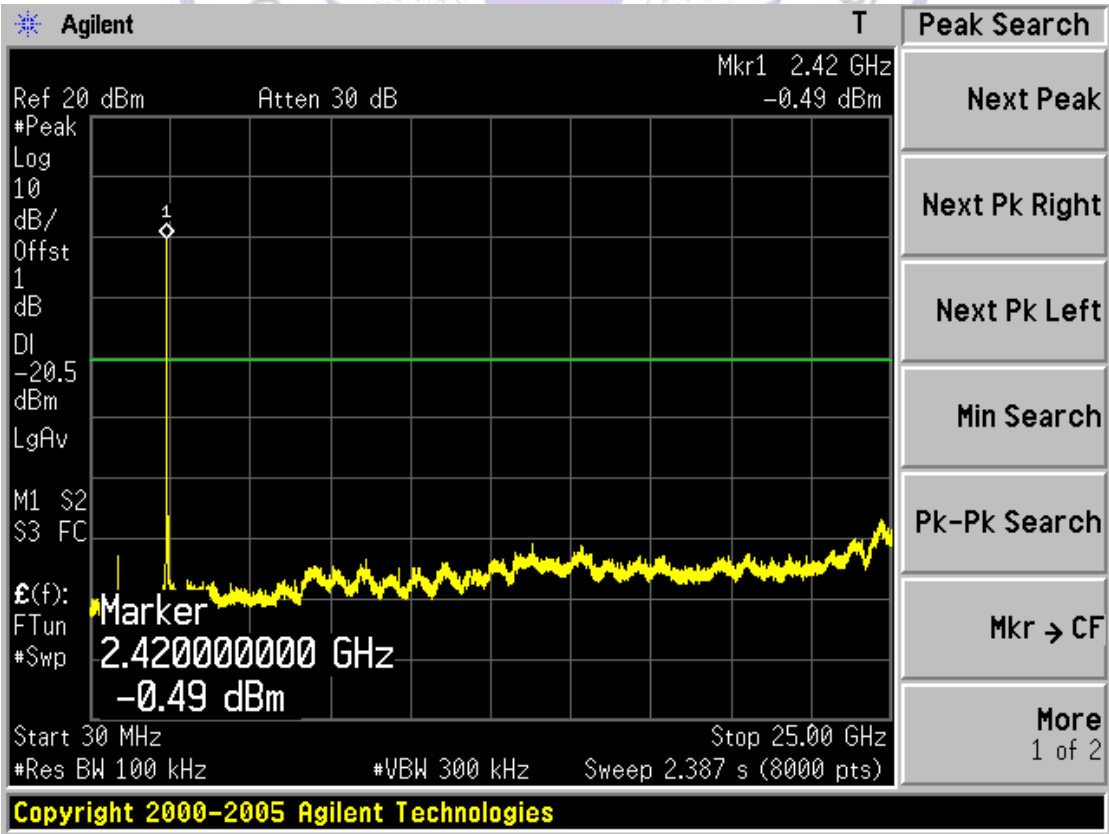
CH6



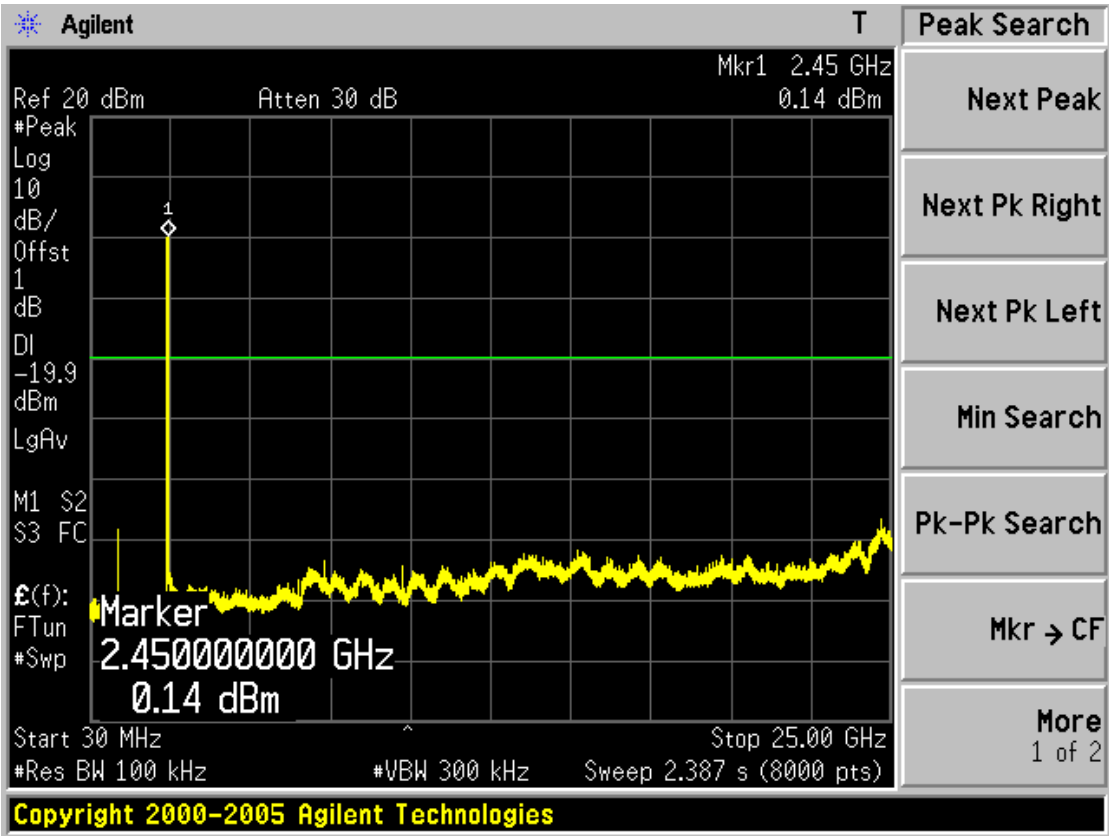
CH11



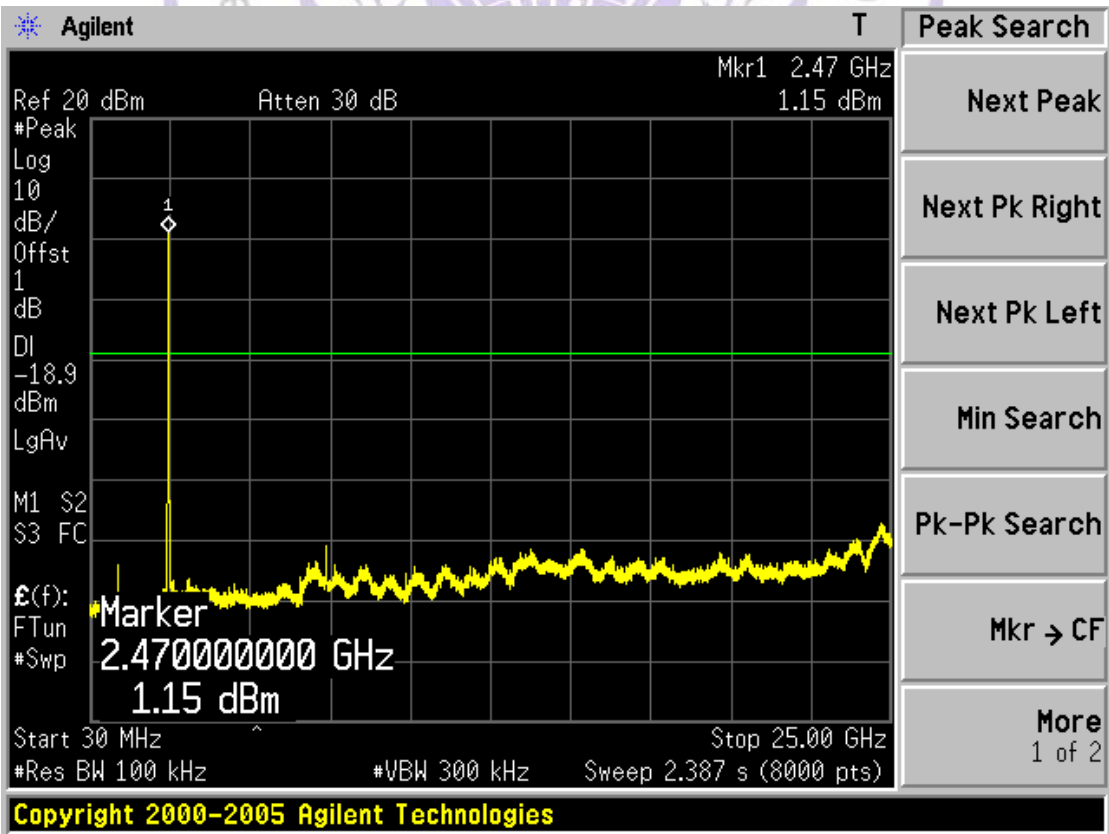
For 802.11n (20MHz) Mode:



CH6



CH11





4.8. Operation Frequency Range of 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

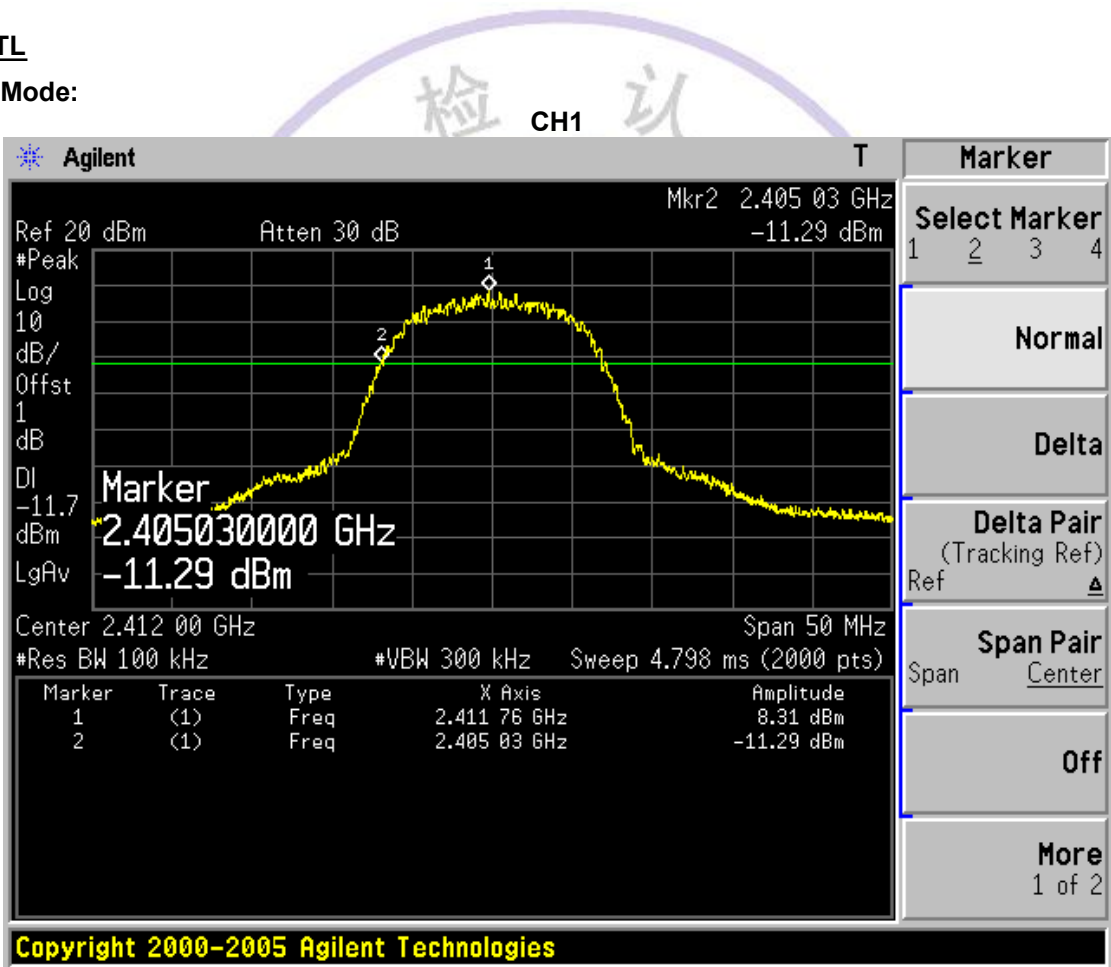
The EUT was tested according to KDB558074 D01 V02 10/04/2012 for compliance to FCC 47CFR 15.247 requirements. Set RBW = 100 kHz, Span greater than RBW.

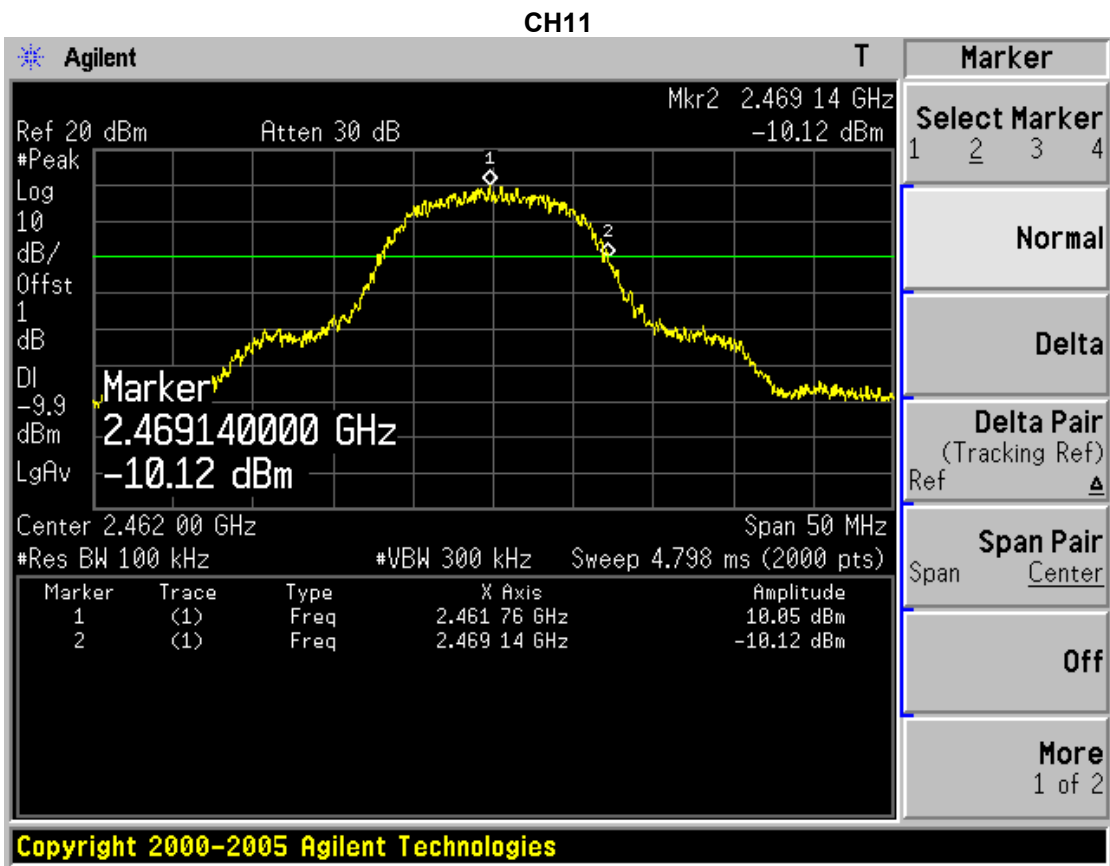
LIMIT

20 dB bandwidth of the emission is contained within the operation frequency band.

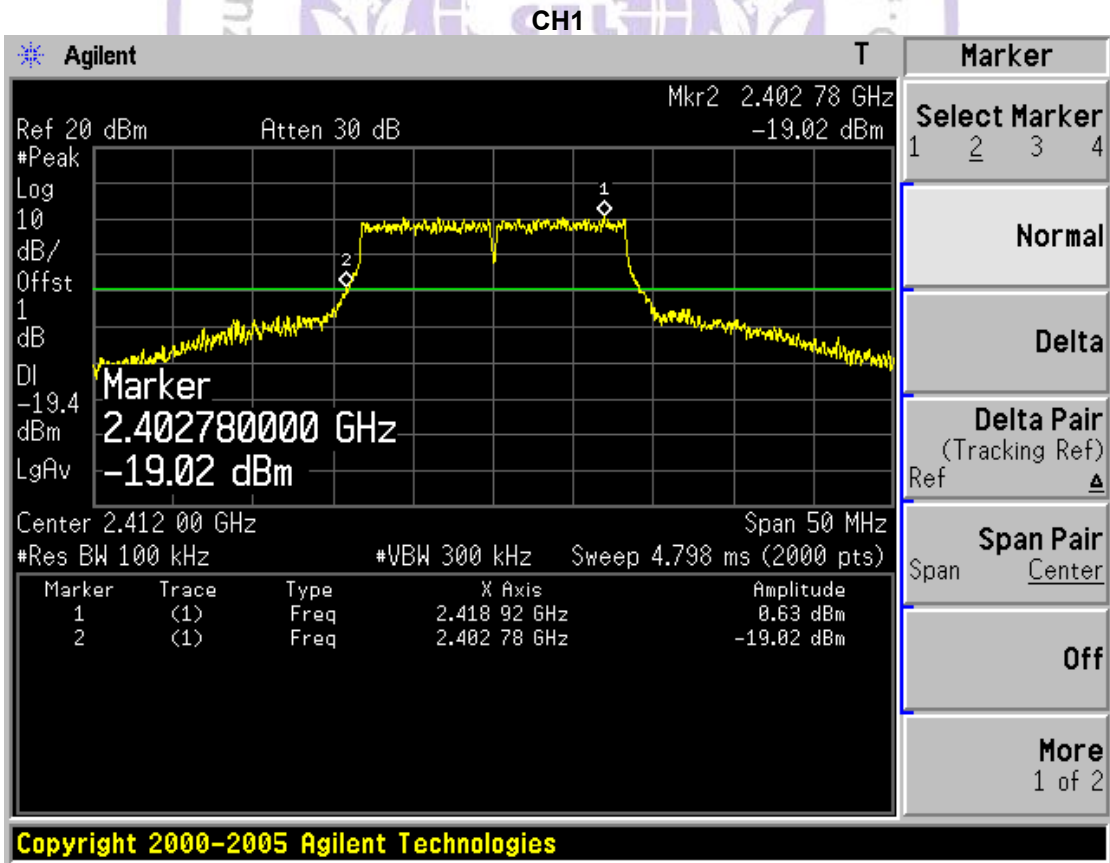
TEST RESULT

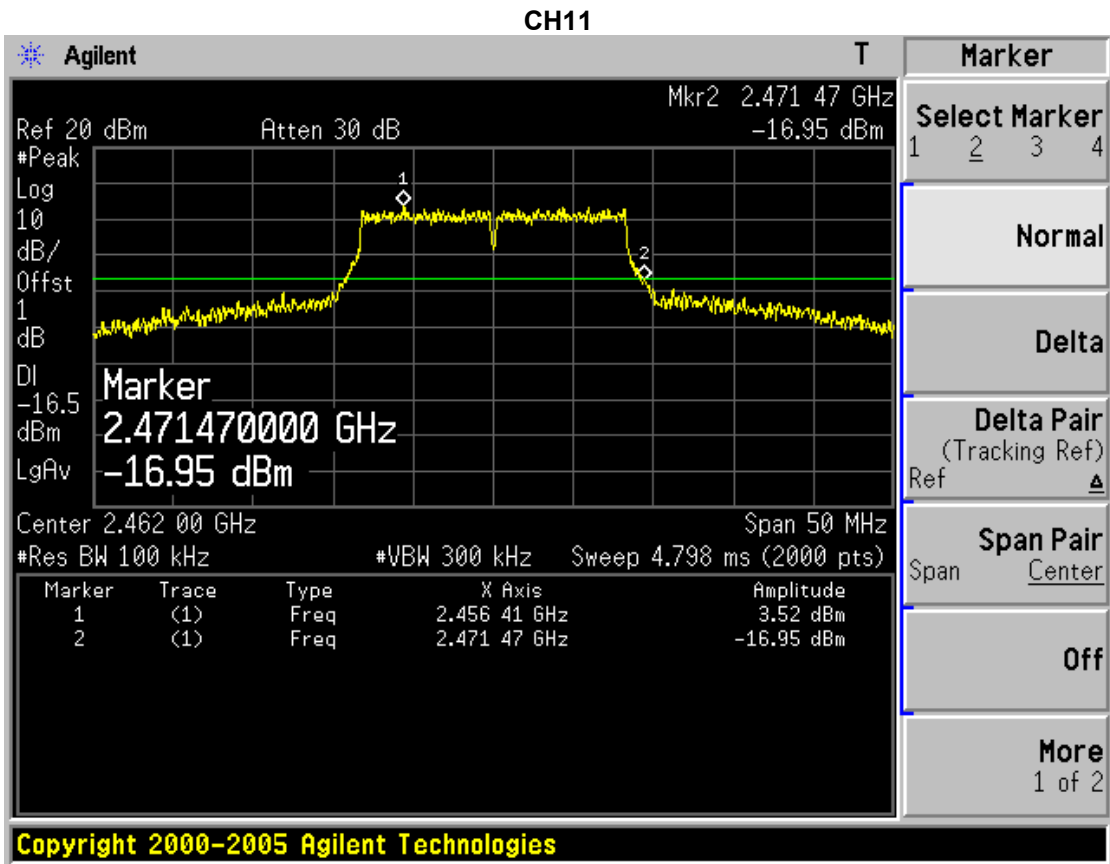
For 802.11b Mode:



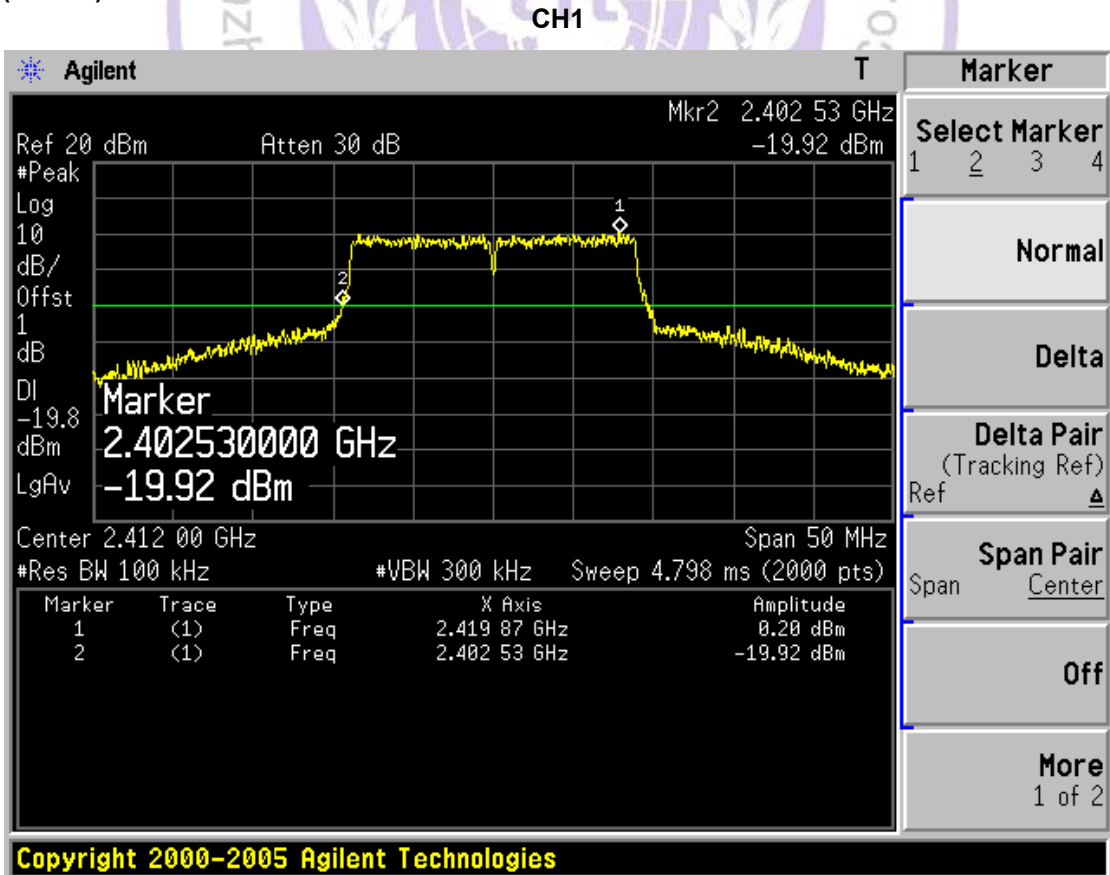


For 802.11g Mode:

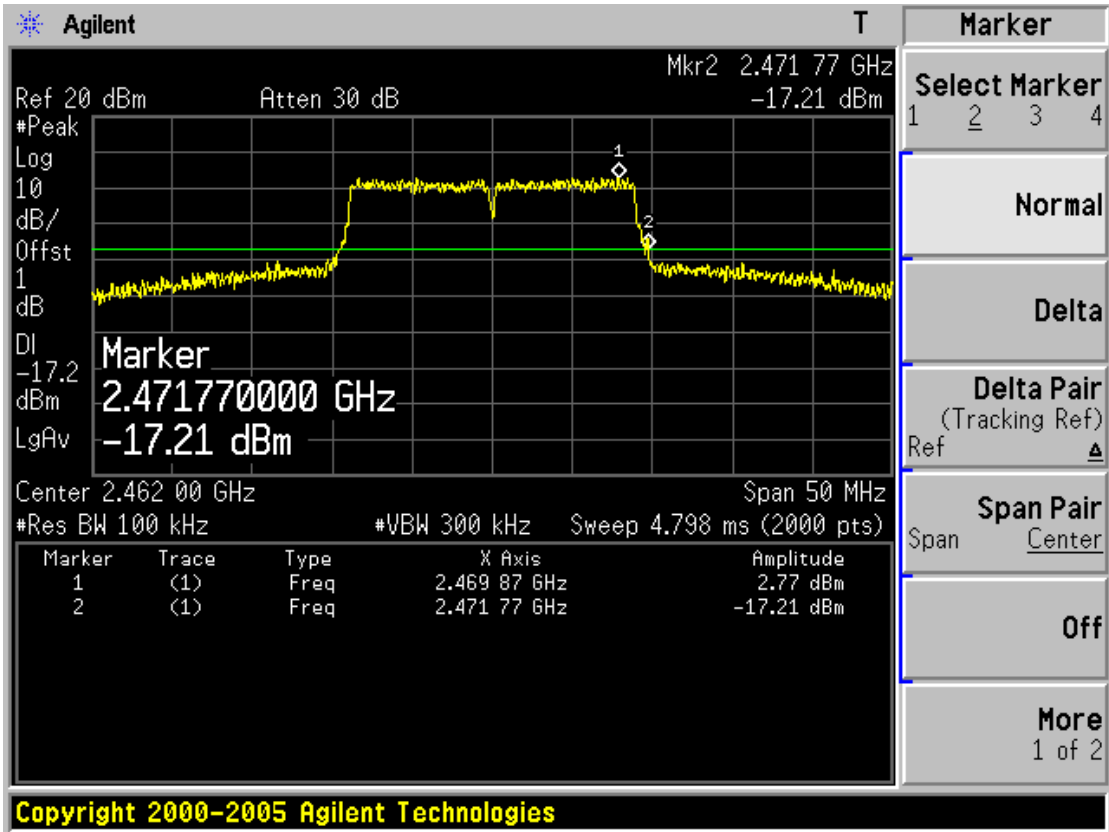




For 802.11n (20MHz) Mode:



CH11



## 4.9. Antenna Requirement

### **STANDARD APPLICABLE**

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

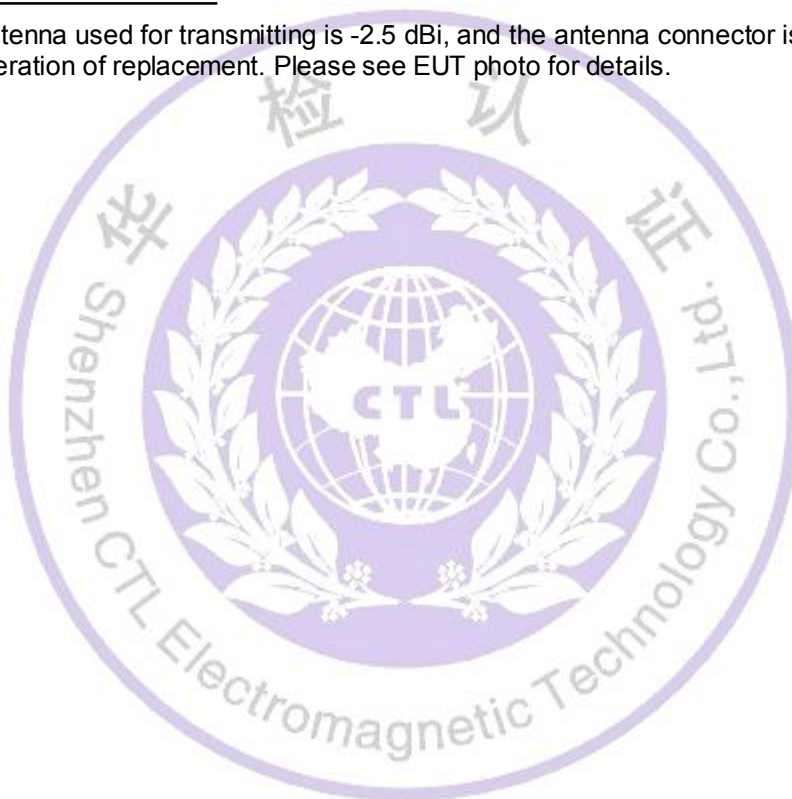
And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

**Refer to statement below for compliance.**

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

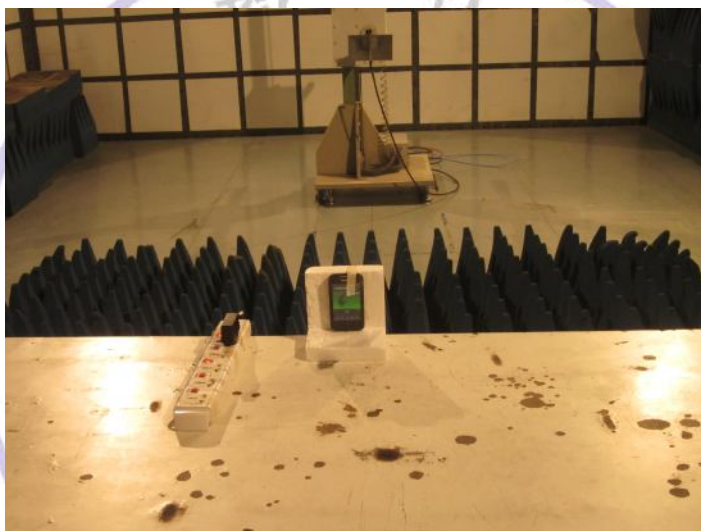
### **ANTENNA CONNECTED CONSTRUCTION**

The directional gains of antenna used for transmitting is -2.5 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.





## 5. Test Setup Photos of the EUT



## 6. External and Internal Photos of the EUT

### External Photos of EUT

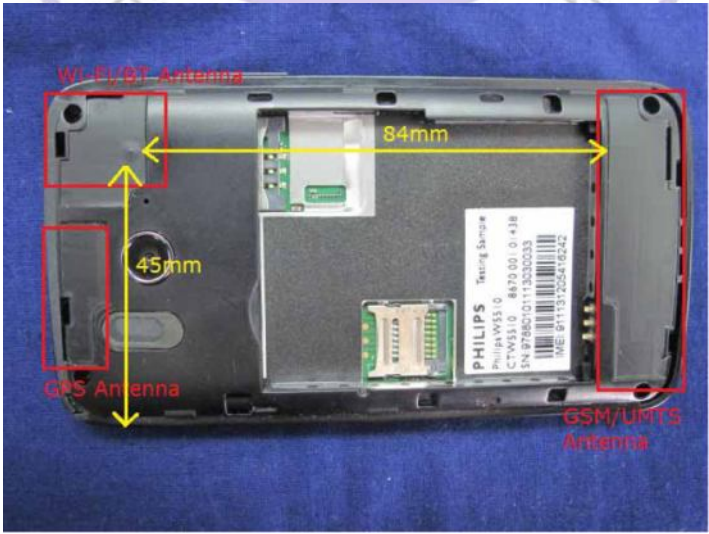






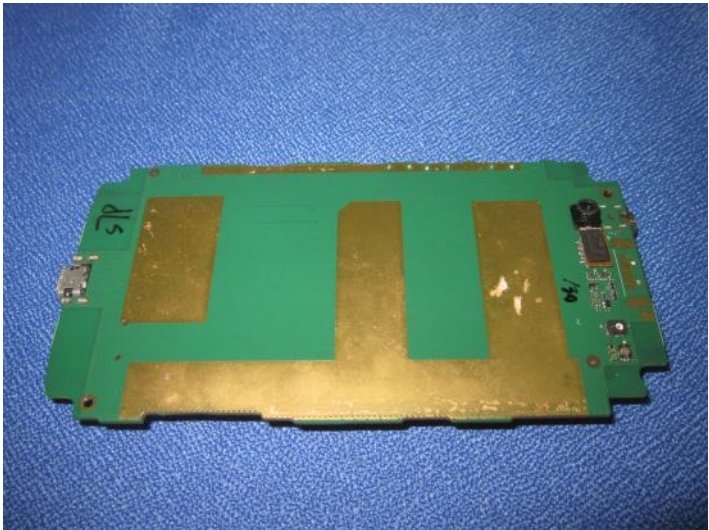


Internal Photos of EUT

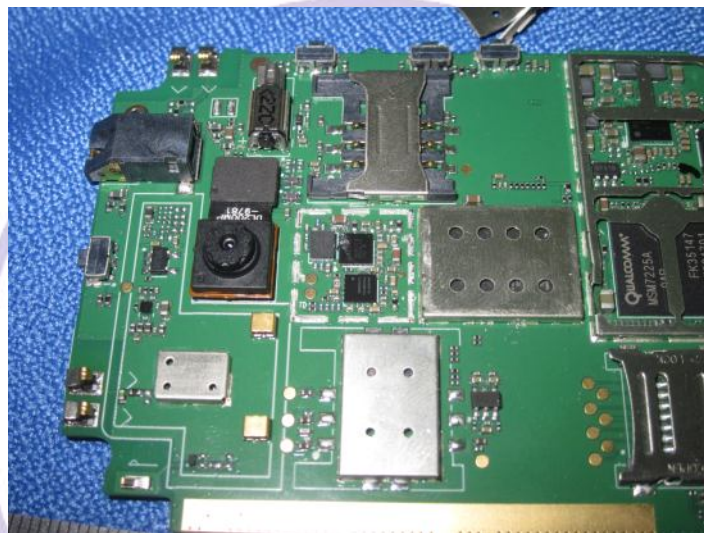












.....End of Report.....

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