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FCC PART 15 SUBPART C & RSS-210 TEST REPORT

Report Reference No.: CTL1307161139-WW

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Tracy Qi

Date of issue: August 23, 2013

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

Address: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

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: ONTOP TECHNOLOGY LTD

Address: Unit 10, 21/F, Block B, New Trade Plaza, No.6 Ping Street, Shatin, N.T., H.K.

Test specification:

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

RSS-210 Issue 8 (2010): Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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

Master TRF: Dated 2011-01

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Test item description: Smart Phone

FCC ID: 2AANR-NUGGETD5

IC: 11302A-NUGGETD5

Trade Mark: ontop

Model/Type reference: NUGGET D5

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

802.11n(40MHz): 2422~2452

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 150 Mbps

Antenna Gain: -0.5 dBi for GSM850 and WCDMA Band V

1.0 dBi for PCS1900 and WCDMA Band II

1.0 dBi for Bluetooth and Wi-Fi

Antenna type: Internal

IMEI: 861052010000510

Result: **Positive**

TEST REPORT

Test Report No. : CTL1307161139-WW	August 23, 2013 Date of issue
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Equipment under Test : Smart Phone

Model /Type : NUGGET D5

Applicant : ONTOP TECHNOLOGY LTD

Address : Unit 10, 21/F, Block B, New Trade Plaza, No.6 Ping Street,
Shatin, N.T., H.K.

Manufacturer : ONTOP TECHNOLOGY LTD

Address : Unit 10, 21/F, Block B, New Trade Plaza, No.6 Ping Street,
Shatin, N.T., H.K.

Test Result according to the standards on page 5:	Positive
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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.

RSS-210 Issue 8 (2010): Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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

ANSI C63.4-2003

KDB Publication No. 558074 D01 v03r01 Guidance on Measurements for Digital Transmission Systems



2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	July 22, 2013
Testing commenced on	:	July 22, 2013
Testing concluded on	:	August 23, 2013

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage	:	<input checked="" 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 Smart Phone 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
1	Transmitting	802.11 b
2	Transmitting	802.11 g
3	Transmitting	802.11 n HT20
4	Transmitting	802.11 n HT40

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 : lenovo

Model No. : E43L

2.6. NOTE

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

	Test Standards	Reference Report
WLAN 802.11b/g, 802.11n	FCC Part 15 Subpart C RSS-210	CTL1307161139-WW
WLAN 802.11b/g, 802.11n	FCC Per 47 CFR 2.1091(b)	137S090R-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)	1TX

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

This submittal(s) (test report) is intended for FCC ID: **2AANR-NUGGETD5** and IC: **11302A-NUGGETD5** filing to comply with of the FCC Part 15.247 Rules and RSS-210.

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.

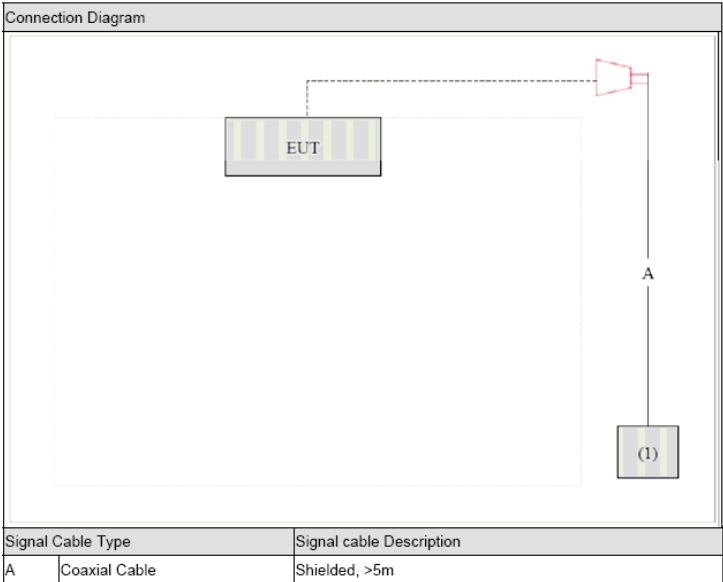
3.3. Environmental conditions

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	2013/04/14	2014/04/13
2	Radio Communication Tester	ROHDE & SCHWARZ	CMU200	2013/04/14	2014/04/13
3	Dual Directional Coupler	Agilent	778D	2013/04/14	2014/04/13
4	10dB attenuator	SCHWARZBECK	MTAIMP-136	2013/04/14	2014/04/13
5	Tunable Bandreject filter	K&L	3TNF-800	2013/04/14	2014/04/13
6	Tunable Bandreject filter	K&L	5TNF-1700	2013/04/14	2014/04/13
7	High-Pass Filter	K&L	9SH10-2700/X12750-O/O	2013/04/14	2014/04/13
8	High-Pass Filter	K&L	41H10-1375/U12750-O/O	2013/04/14	2014/04/13
9	Coaxial Cable	Huber+Suhner	AC4-RF-H	2013/04/14	2014/04/13
10	AC Power Supply	IDRC	CF-500TP	2013/04/14	2014/04/13
11	DC Power Supply	IDRC	CD-035-020PR	2013/04/14	2014/04/13
12	RF Current Probe	FCC	F-33-4	2013/04/14	2014/04/13
13	Temperature /Humidity Meter	zhicheng	ZC1-2	2013/04/14	2014/04/13
14	MICROWAVE AMPLIFIER	HP	8349B	2013/04/14	2014/04/13
15	Amplifier	HP	8447D	2013/04/14	2014/04/13
16	SIGNAL GENERATOR	HP	8647A	2013/04/14	2014/04/13
17	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	2013/04/14	2014/04/13
18	Horn Antenna	Schwarzbeck	BBHA9120A	2013/04/14	2014/04/13
19	EMI Test Receiver	R&S	ESPI	2013/04/14	2014/04/13
20	Loop Antenna	ZHINAN	ZN30900A	2013/04/14	2014/04/13
21	Horn Antenna	Schwarzbeck	BBHA9120D	2013/04/14	2014/04/13
22	Horn Antenna	Schwarzbeck	BBHA9170	2013/04/14	2014/04/13
23	Spectrum Analyzer	Agilent	E4446A	2013/04/14	2014/04/13
24	Wideband Peak Power Meter	Anritsu	ML2495A	2013/04/14	2014/04/13
25	Power Sensor	Anritsu	MA2411B	2013/04/14	2014/04/13

3.7. Summary of Test Result

FCC PART 15/ RSS-210	ITEM	RESULT
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

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.

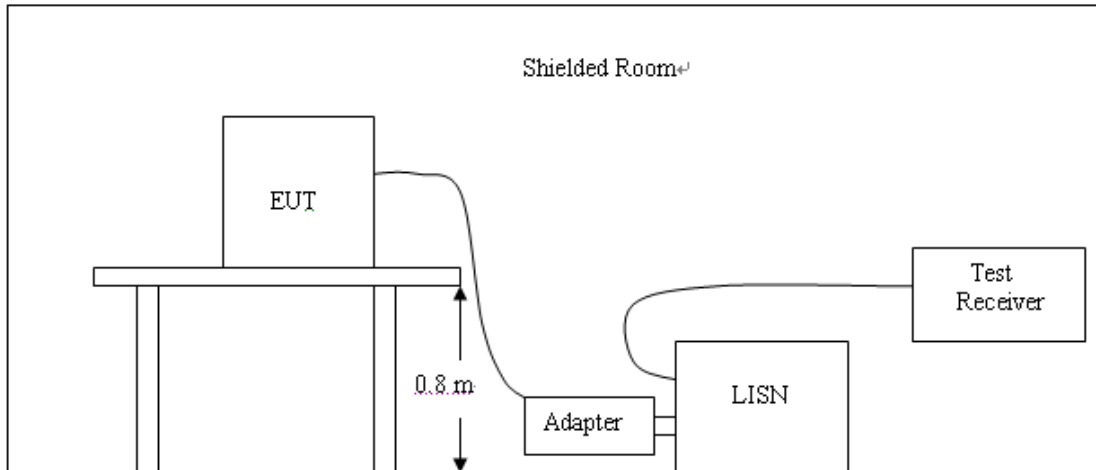
Test Items	Mode	Data Rate	Channel
AC Power Conducted Emission	Normal Link	11 Mbps	1
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission	11b/DSSS	11 Mbps	1/6/11
	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
	11n(40MHz)/OFDM	135Mbps	3/6/9
Radiated 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	135Mbps	3/6/9
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	135Mbps	3/6/9
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	135Mbps	3/9

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

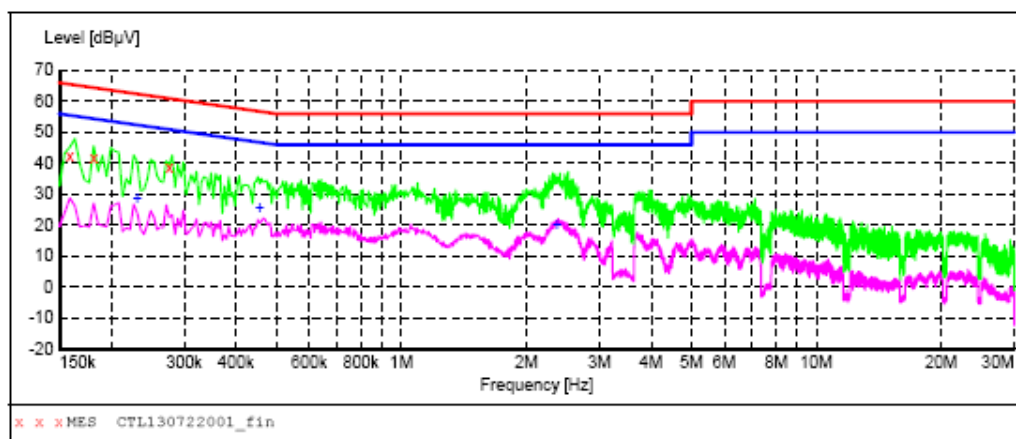
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

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: "CTL130722001_fin"**

7/22/2013 2:22PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.159000	42.60	9.8	66	22.9	QP	L1	GND
0.181500	41.50	9.8	64	22.9	QP	L1	GND
0.276000	38.40	9.8	61	22.5	QP	L1	GND

MEASUREMENT RESULT: "CTL130722001_fin2"

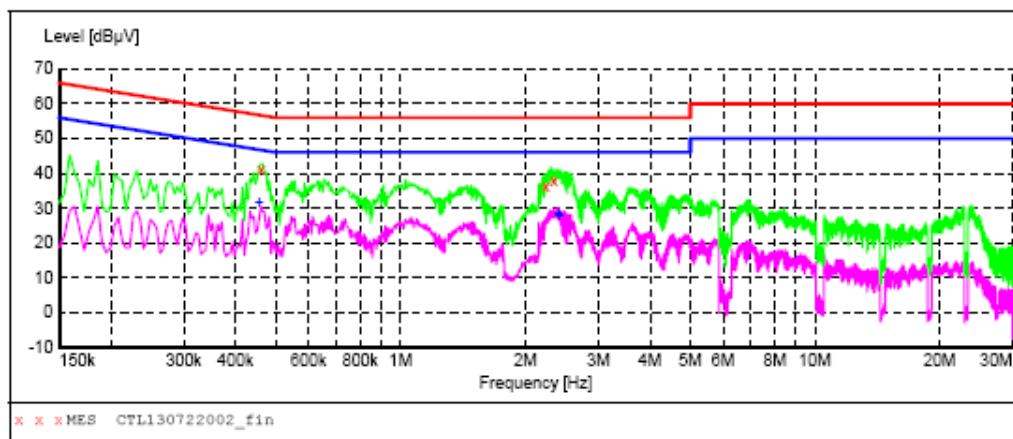
7/22/2013 2:22PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.231000	29.00	9.8	52	23.4	AV	L1	GND
0.456000	26.00	9.8	47	20.8	AV	L1	GND
2.373000	20.60	9.9	46	25.4	AV	L1	GND



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

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL130722002_fin"**

7/22/2013 2:27PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.460500	40.90	9.8	57	15.8	QP	N	GND
2.242500	36.30	9.9	56	19.7	QP	N	GND
2.346000	38.00	9.9	56	18.0	QP	N	GND

MEASUREMENT RESULT: "CTL130722002_fin2"

7/22/2013 2:27PM

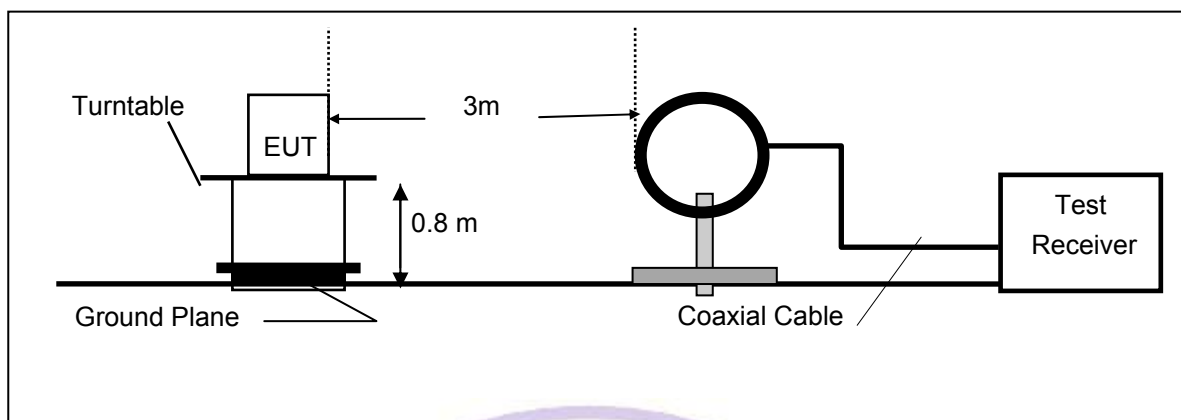
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.456000	31.90	9.8	47	14.9	AV	N	GND
2.409000	28.50	9.9	46	17.5	AV	N	GND
2.418000	28.40	9.9	46	17.6	AV	N	GND



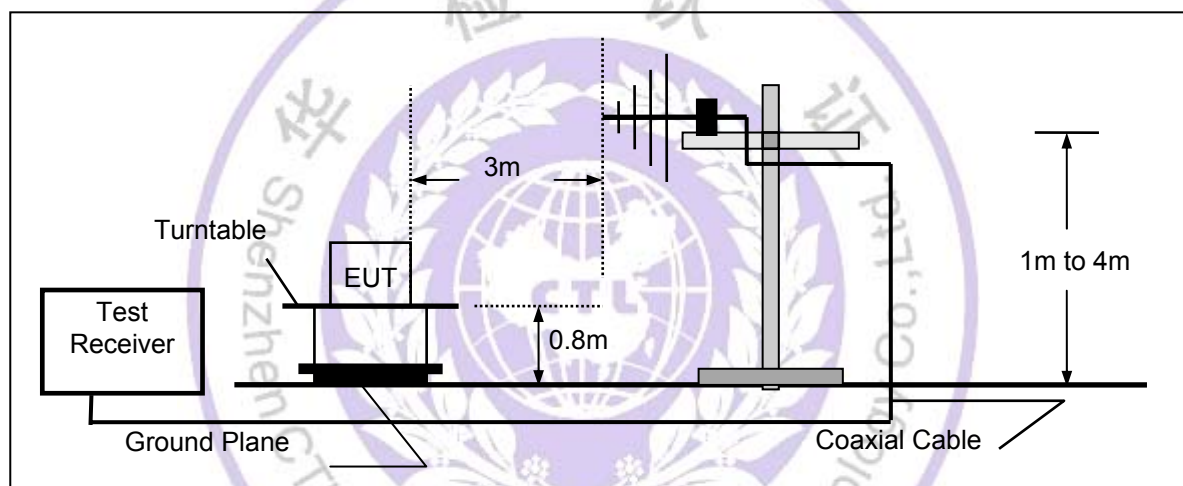
4.2. Radiated Emission Test

TEST CONFIGURATION

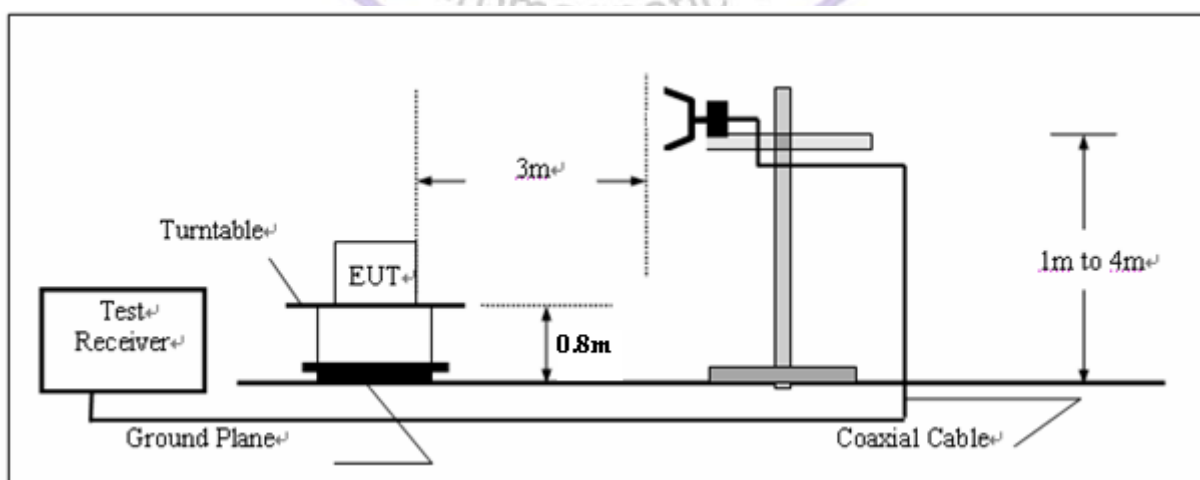
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(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 D01 v03r01 (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 and RSS-210 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 (dB μ V/m)	Radiated (μ V/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

802.11b

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2412.0	71.9	30.8	102.7	Fundamental	/	PK
	V	302.1	12.9	14.8	27.7	46	-18.3	QP
	V	500.0	15.0	19.7	34.7	46	-11.3	QP
	V	3200.0	42.8	-0.6	42.2	54(note3)	-11.8	PK
	V	4825.0	47.2	2.6	49.8	54(note3)	-4.2	PK
	V	7239.0	51.8	8.9	60.7	74	-13.3	PK
	V	7236.0	44.2	8.9	53.1	54	-0.9	AV
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK
6	V	2437.0	71.3	31.2	102.5	Fundamental	/	PK
	V	317.1	13.3	15.2	28.5	46	-17.5	QP
	V	572.2	13.1	21.2	34.3	46	-11.7	QP
	V	3200.0	43.6	-0.6	43.0	54(note3)	-11.0	PK
	V	4876.0	49.2	2.8	52.0	54(note3)	-2.0	PK
	V	7315.5	53.8	8.8	62.6	74	-11.4	PK
	V	7311.0	43.9	8.8	52.7	54	-1.3	AV
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK
11	V	2462.0	70.5	30.9	101.4	Fundamental	/	PK
	V	306.0	12.6	14.9	27.5	46	-18.5	QP
	H	580.0	12.9	21.2	34.1	46	-11.9	QP
	V	3200.0	44.1	-0.6	43.5	54(note3)	-10.5	PK
	V	4927.0	45.1	3.0	48.1	54(note3)	-5.9	PK
	V	7383.5	50.8	8.9	59.7	74	-14.3	PK
	V	7386.0	43.4	8.9	52.3	54	-1.7	AV
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK

Note: 1. Measure Level = Reading Level + Factor.

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

3. 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.

802.11g

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2411.9	69.7	30.8	100.5	Fundamental	/	PK
	H	296.8	13.4	14.7	28.1	46	-17.9	QP
	H	567.4	13.9	21.3	35.2	46	-10.8	QP
	V	3200	50.0	-13.4	36.6	54(note3)	-17.4	PK
	V	4824.0	43.3	2.6	45.9	54(note3)	-8.1	PK
	V	7236.0	36.7	8.9	45.6	54	-8.4	AV
	V	7239.0	50.2	8.9	59.1	74	-14.9	PK
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK
6	V	2437.0	70.0	31.2	101.2	Fundamental	/	PK
	V	302.6	12.7	14.8	27.5	46	-18.5	QP
	V	599.9	13.8	21.2	35.0	46	-11.0	QP
	V	3200.0	42.5	-0.6	41.9	54(note3)	-12.1	PK
	V	4876.0	45.6	2.8	48.4	54(note3)	-5.6	PK
	V	7298.5	44.2	8.8	53.0	54(note3)	-1.0	PK
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK
11	V	2462.3	70.9	30.9	101.8	Fundamental	/	PK
	H	589.7	13.7	21.2	34.9	46	-11.1	QP
	V	286.6	12.5	14.7	27.2	46	-18.8	QP
	V	3200.0	42.7	-0.6	42.1	54(note3)	-11.9	PK
	V	4927.0	45.9	3.0	48.9	54(note3)	-5.1	PK
	V	7386.0	37.4	8.9	46.3	54	-7.7	AV
	V	7392.0	51.8	8.9	60.7	74	-13.3	PK
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK

Note: 1. Measure Level = Reading Level + Factor.

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

3. 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.

802.11n(20MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2412.1	69.1	30.8	99.9	Fundamental	/	PK
	H	597.9	14.1	21.2	35.3	46	-10.7	QP
	H	311.8	12.5	15.1	27.6	46	-18.4	QP
	V	3200.0	42.4	-0.6	41.8	54(note3)	-12.2	PK
	V	4824.0	42.3	2.6	44.9	54(note3)	-9.1	PK
	V	7236.0	33.6	8.9	42.5	54	-11.5	AV
	V	7239.0	46.2	8.9	55.1	74	-18.9	PK
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK
6	V	2437.0	69.3	31.2	100.5	Fundamental	/	PK
	H	561.6	13.8	21.2	35.0	46	-11.0	QP
	H	343.3	13.2	16.0	29.2	46	-16.8	QP
	V	3200.0	42.5	-0.6	41.9	54(note3)	-12.1	PK
	V	4876.0	45.5	2.8	48.3	54(note3)	-5.7	PK
	V	7307.0	54.6	8.8	63.4	74	-10.6	PK
	V	7310.6	41.0	8.8	49.8	54	-4.2	AV
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK
11	V	2462.0	70.1	30.9	101.0	Fundamental	/	PK
	H	300.1	13.7	14.7	28.4	46	-17.6	QP
	H	553.8	13.5	21.2	34.7	46	-11.3	QP
	V	3200.0	43.2	-0.6	42.6	54(note3)	-11.4	PK
	V	4924.0	42.7	3.0	45.7	54(note3)	-8.3	PK
	V	7375.0	50.1	9.0	59.0	74	-15.0	PK
	V	7378.3	34.0	9.0	42.9	54	-11.1	AV
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK

Note: 1. Measure Level = Reading Level + Factor.

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

3. 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.

802.11n(40MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
3	V	2423.6	65.2	30.8	96.0	Fundamental	/	PK
	H	341.9	14.2	16.0	30.2	46	-15.8	QP
	H	564.0	14.5	21.2	35.7	46	-10.3	QP
	V	3200.0	42.5	-0.6	41.9	54(note3)	-12.1	PK
	V	4844.0	41.5	2.6	44.2	54(note3)	-9.8	PK
	V	7290.0	44.5	8.8	53.3	54(note3)	-0.7	PK
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK
6	V	2437.0	64.6	31.2	95.8	Fundamental	/	PK
	H	291.9	12.9	14.8	27.7	46	-18.3	QP
	H	553.3	13.6	21.2	34.8	46	-11.2	QP
	V	3200.0	42.1	-0.6	41.5	54(note3)	-12.5	PK
	V	4874.0	41.6	2.8	44.4	54(note3)	-9.6	PK
	V	7349.2	32.0	9.0	40.9	54	-13.1	AV
	V	7358.0	46.6	9.0	55.6	74	-18.4	PK
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK
9	V	2453.6	64.7	30.9	95.6	Fundamental	/	PK
	H	586.3	14.1	21.2	35.3	46	-10.7	QP
	H	294.3	13.4	14.8	28.2	46	-17.8	QP
	V	3200.0	42.6	-0.6	42.0	54(note3)	-12.0	PK
	V	4904.0	41.9	2.9	44.8	54(note3)	-9.2	PK
	V	7349.4	32.2	9.0	41.2	54	-12.8	AV
	V	7349.5	45.6	9.0	54.5	74	-19.5	PK
	H	24000.0	59.1	-8.9	50.2	54(note3)	-3.8	PK

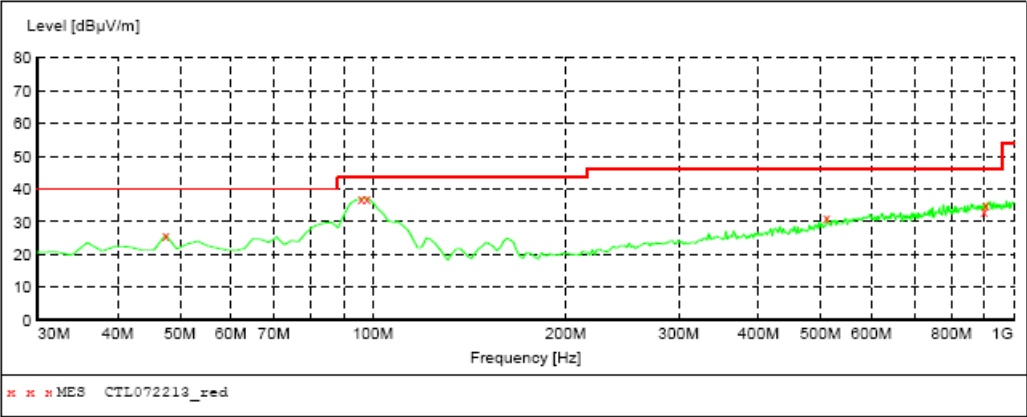
Note: 1. Measure Level = Reading Level + Factor.

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

3. 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.

The worst case of Receiver Radiated Emission below 1GHz:

SWEEP TABLE: "test (30M-1G)"
Short Description: Field Strength
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
30.0 MHz 1.0 GHz MaxPeak Coupled 100 kHz VULB9163 NEW



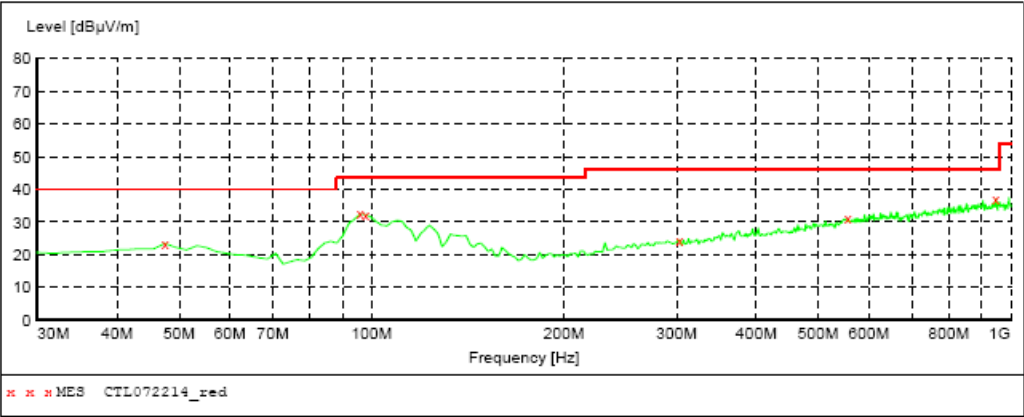
MEASUREMENT RESULT: "CTL072213_red"

7/22/2013 10:53									
Frequency	Level	Transd	Limit	Margin	Det.	Height	Azimuth	Polarization	
MHz	dBµV/m	dB	dBµV/m	dB		cm	deg		
47.460000	26.00	15.8	40.0	14.0	---	100.0	0.00	VERTICAL	
95.960000	36.90	17.2	43.5	6.6	---	100.0	0.00	VERTICAL	
97.900000	37.30	17.4	43.5	6.2	---	100.0	0.00	VERTICAL	
511.120000	31.40	24.1	46.0	14.6	---	100.0	0.00	VERTICAL	
899.120000	33.30	29.2	46.0	12.7	---	100.0	0.00	VERTICAL	
904.940000	35.30	29.2	46.0	10.7	---	100.0	0.00	VERTICAL	

Remark:

- (1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.
- (2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver between30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

SWEEP TABLE: "test (30M-1G)"
Short Description: Field Strength
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
30.0 MHz 1.0 GHz MaxPeak Coupled 100 kHz VULB9163 NEW



MEASUREMENT RESULT: "CTL072214_red"

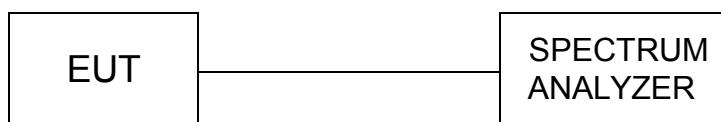
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	23.50	15.8	40.0	16.5	---	100.0	0.00	HORIZONTAL
95.960000	32.50	17.2	43.5	11.0	---	100.0	0.00	HORIZONTAL
97.900000	32.30	17.4	43.5	11.2	---	100.0	0.00	HORIZONTAL
303.540000	24.50	18.8	46.0	21.5	---	100.0	0.00	HORIZONTAL
555.740000	31.10	25.1	46.0	14.9	---	100.0	0.00	HORIZONTAL
947.620000	37.10	29.5	46.0	8.9	---	100.0	0.00	HORIZONTAL

Remark:

- (1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.
- (2) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

4.3. 6dB Bandwidth Measurement

TEST CONFIGURATION



TEST PROCEDURE

1. The testing follows FCC KDB Publication No. 558074 D01 v03r01 (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

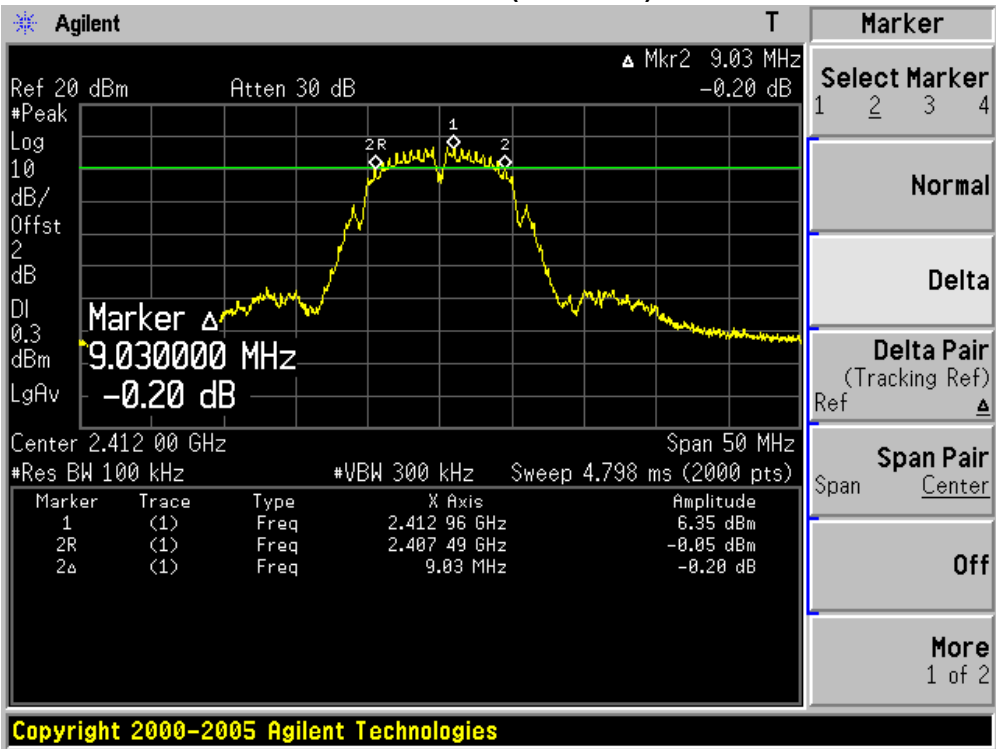
For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST RESULTS

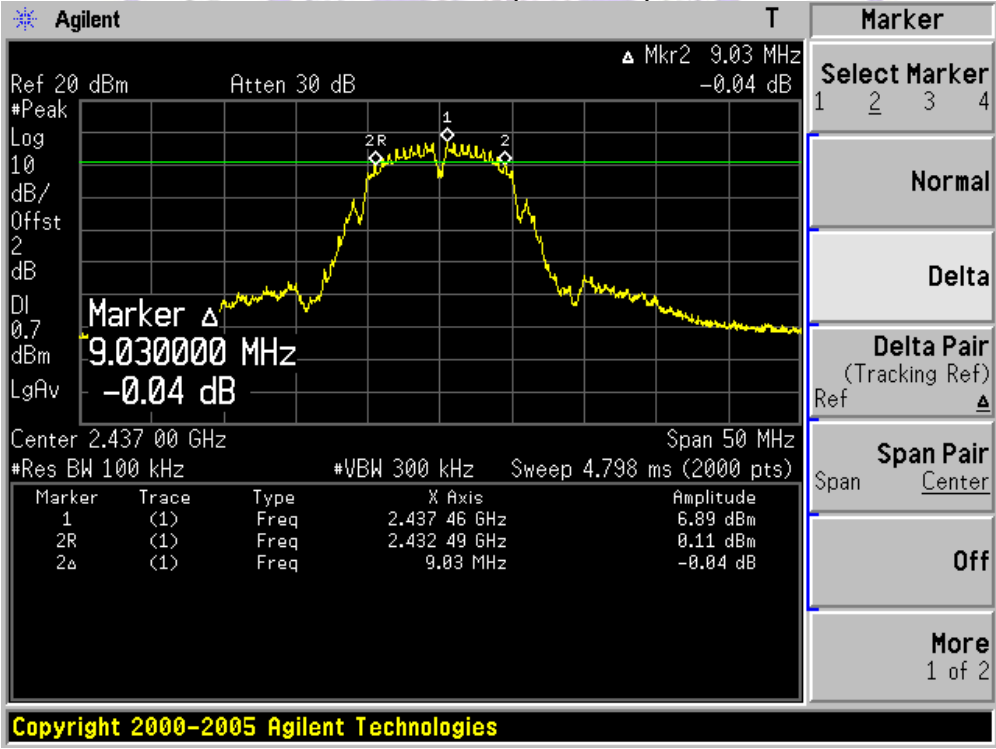
Product	:	Smart Phone
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	9030	500	Pass
06	2437	9030	500	Pass
11	2462	9000	500	Pass

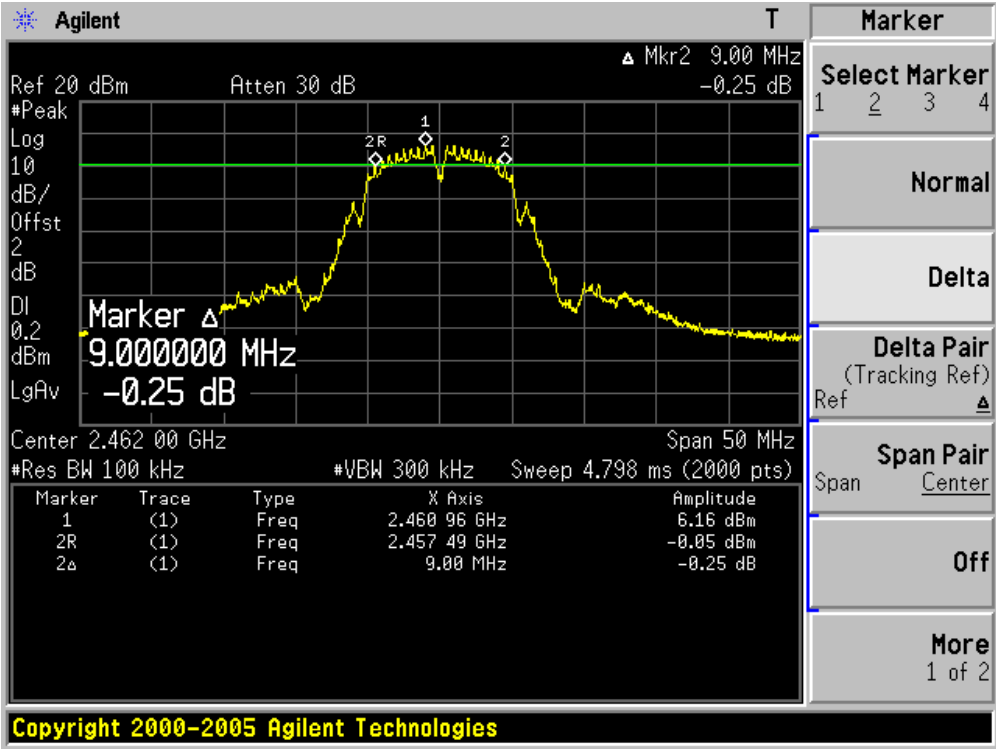
Channel 01 (2412MHz)



Channel 06 (2437MHz)

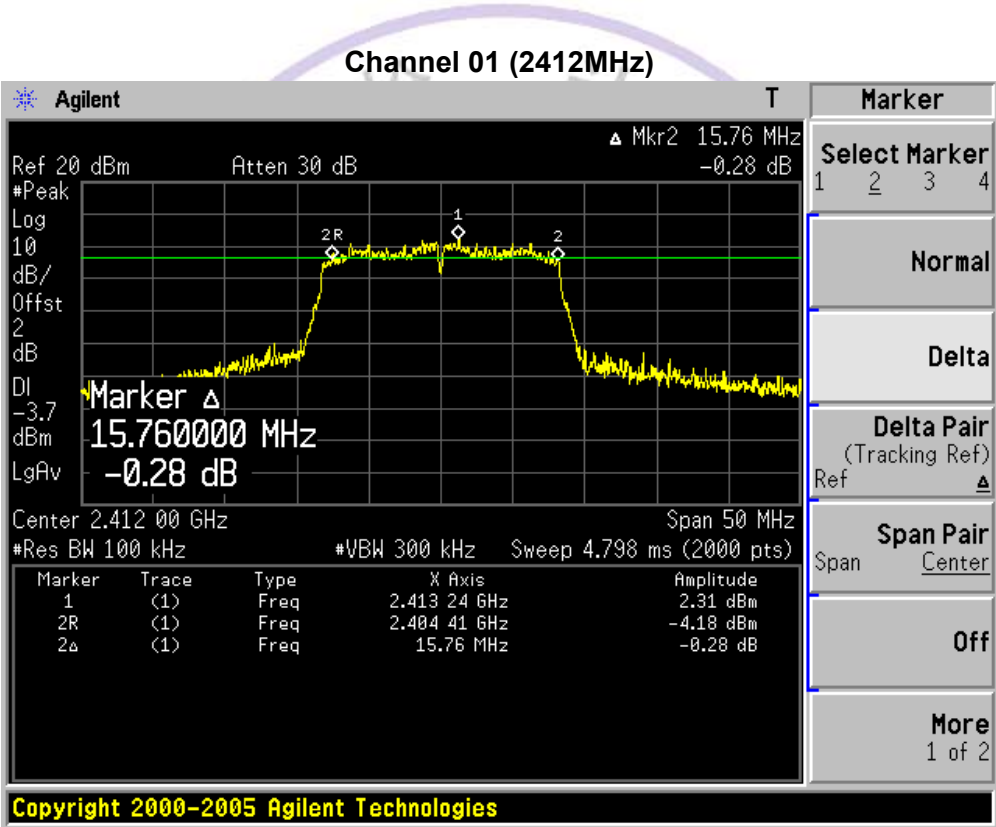


Channel 11 (2462MHz)

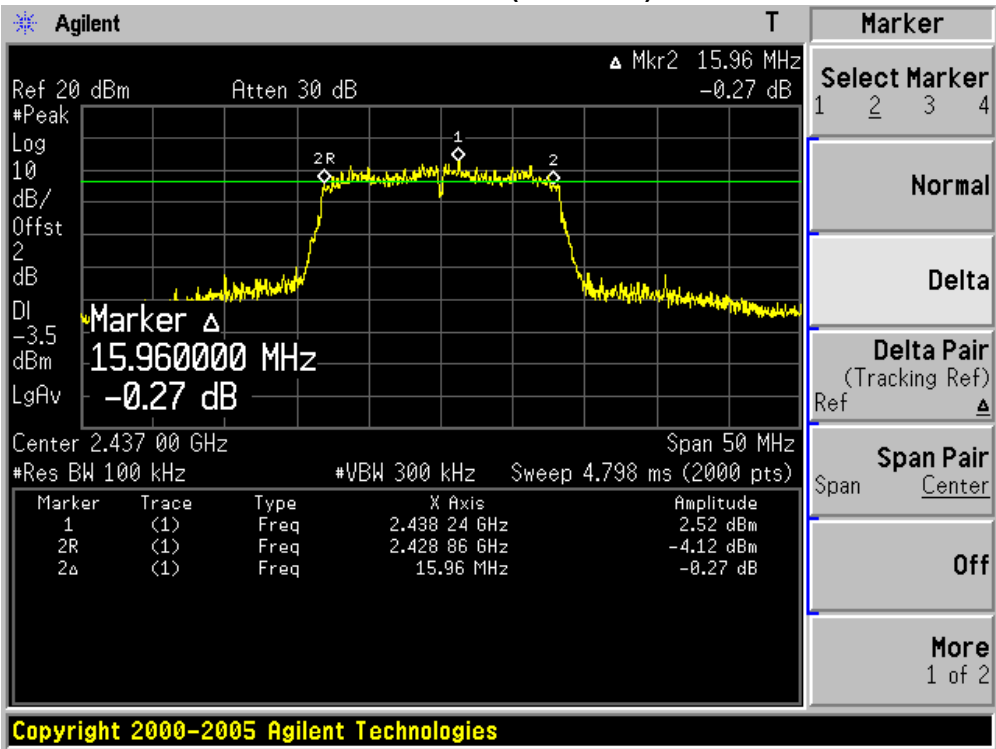


Product	:	Smart Phone
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

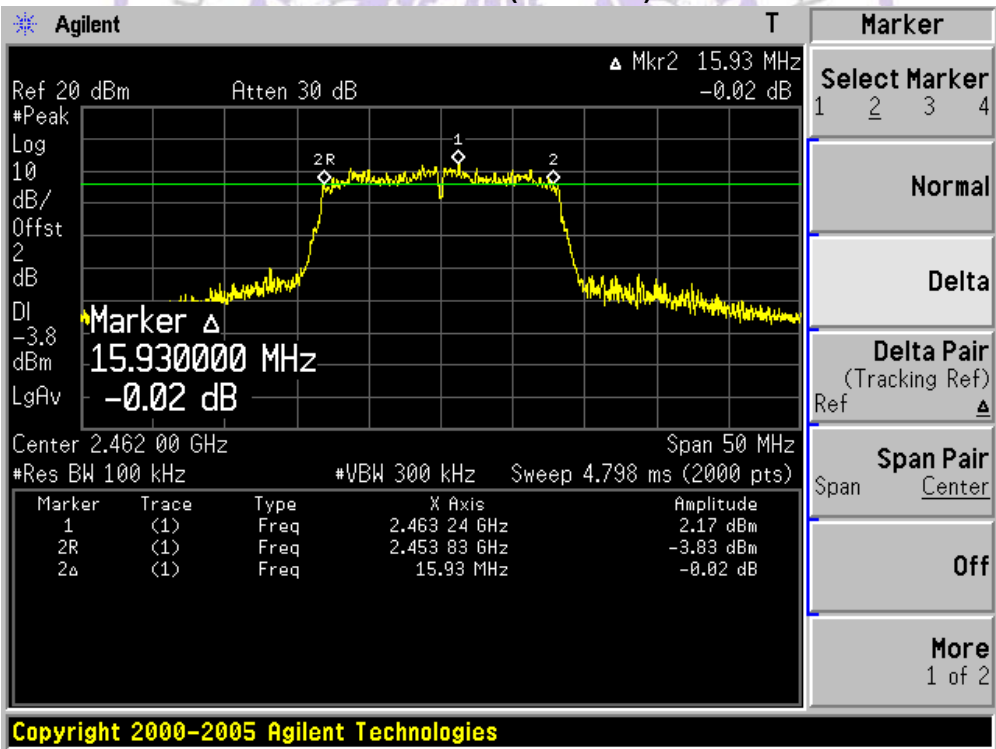
Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	15760	500	Pass
06	2437	15960	500	Pass
11	2462	15930	500	Pass



Channel 06 (2437MHz)

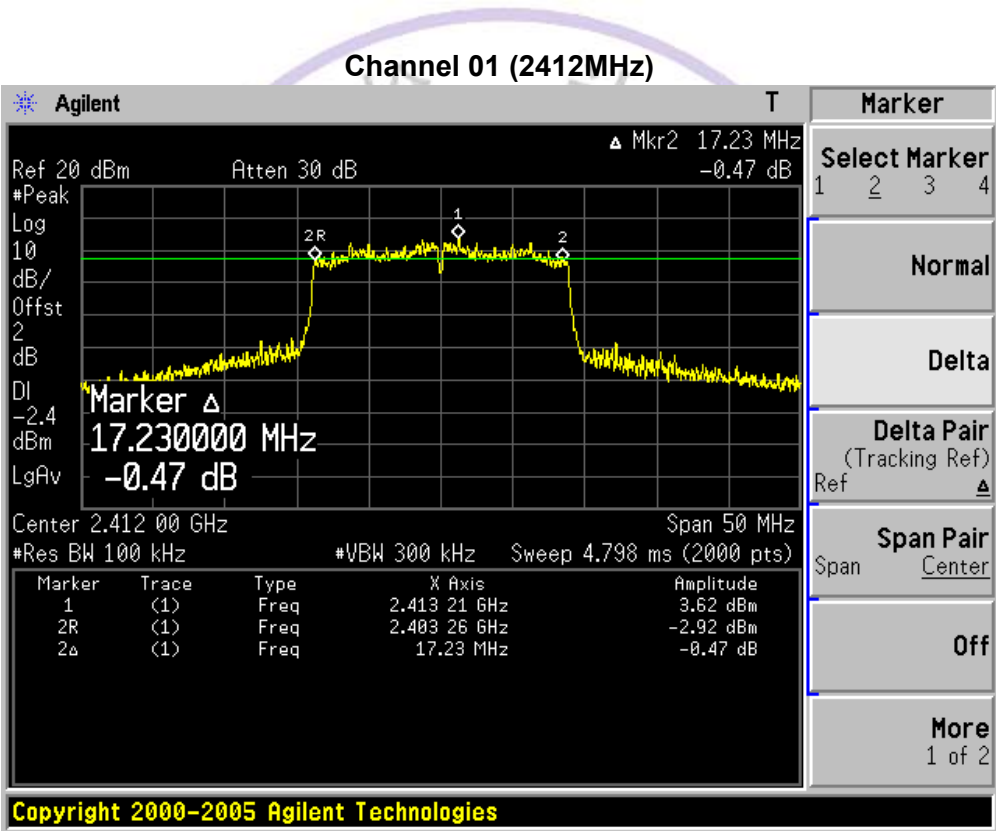


Channel 11 (2462MHz)

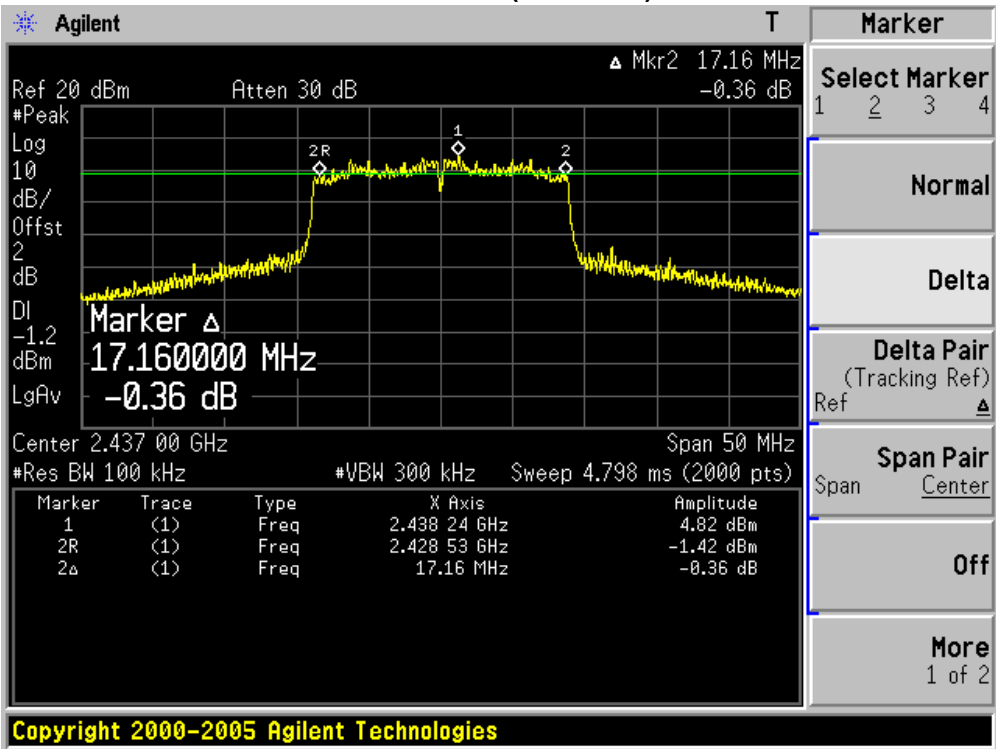


Product	:	Smart Phone
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz)

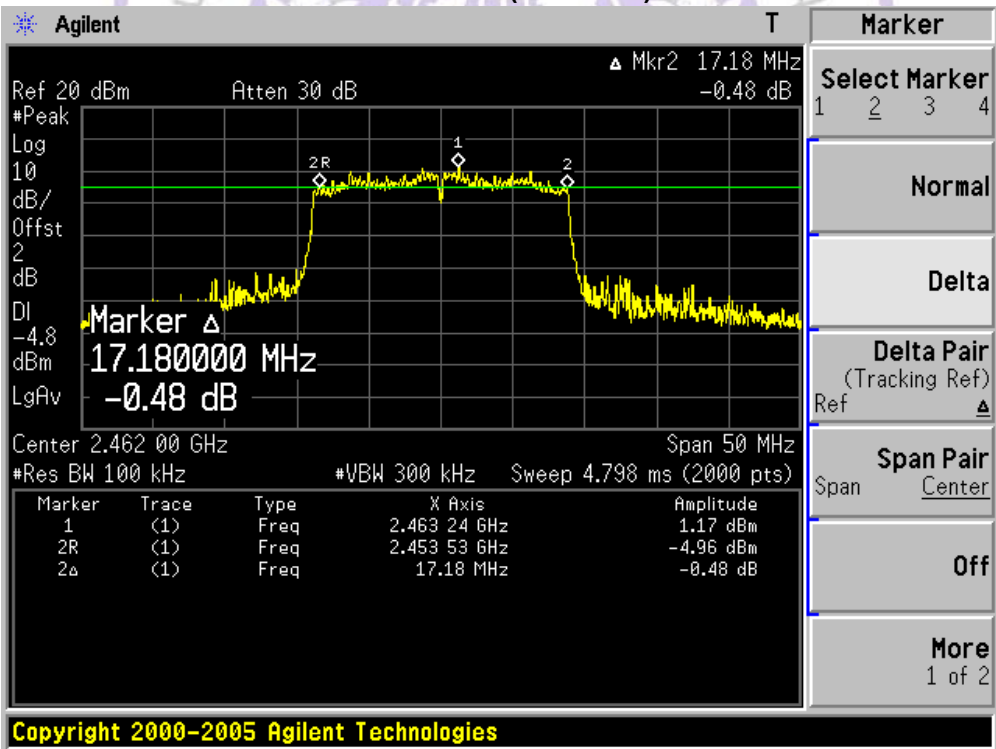
Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	17230	500	Pass
06	2437	17160	500	Pass
11	2462	17180	500	Pass



Channel 06 (2437MHz)

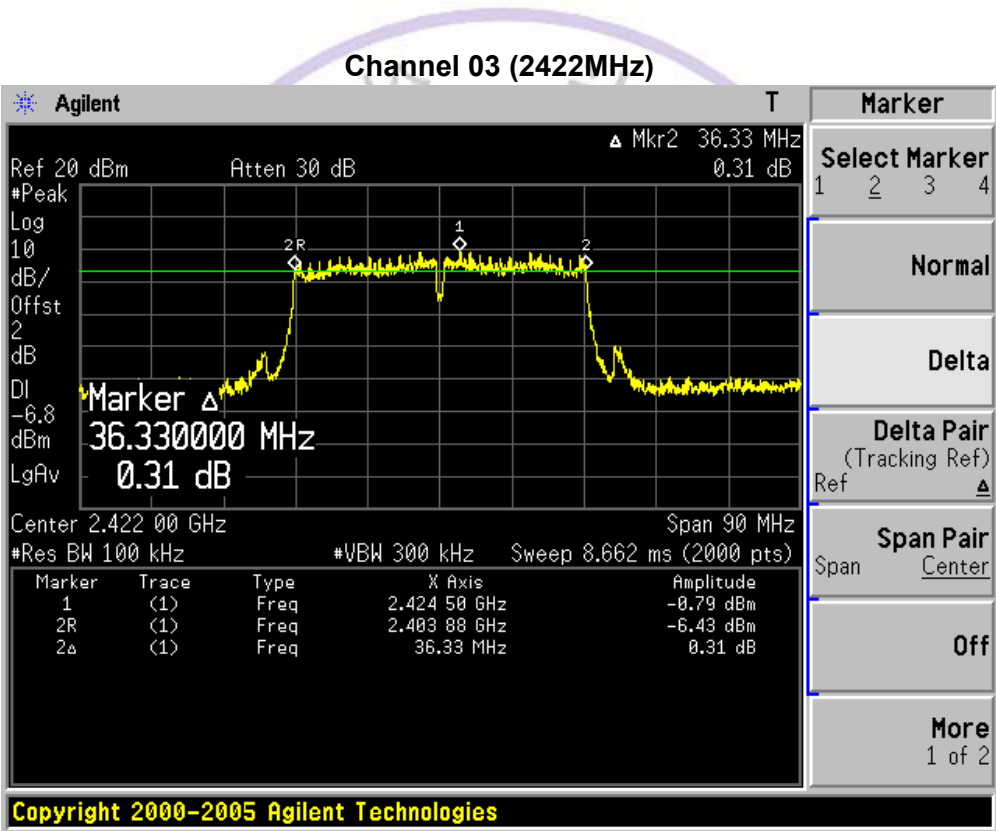


Channel 11 (2462MHz)

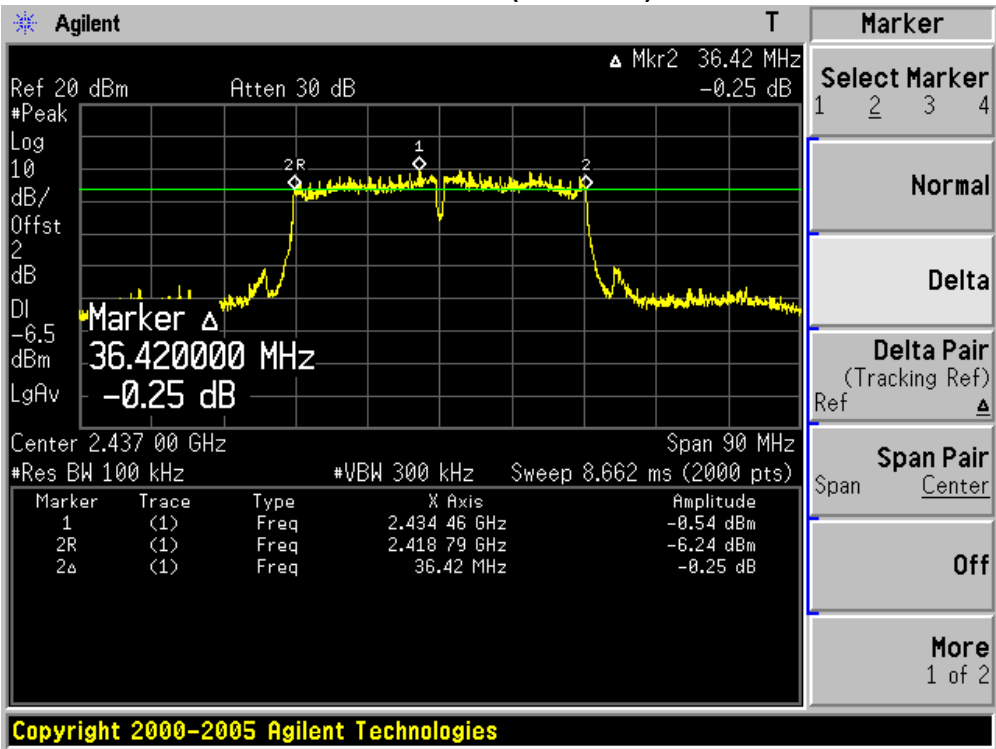


Product	:	Smart Phone
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11n (40MHz)

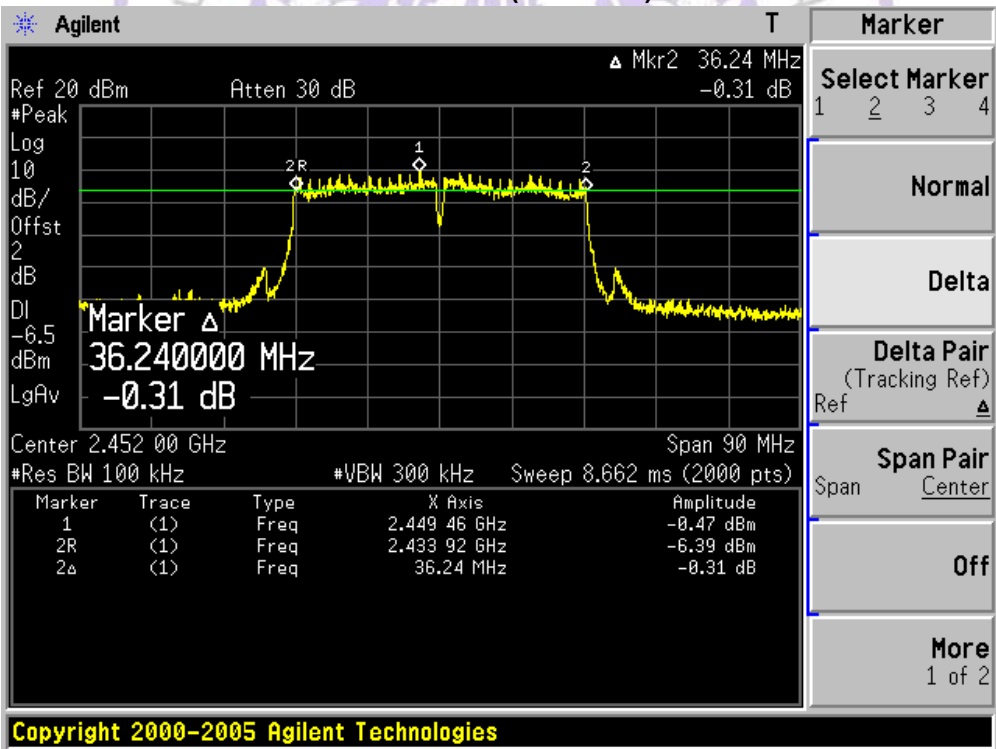
Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
03	2422	36330	500	Pass
06	2437	36420	500	Pass
09	2452	36240	500	Pass



Channel 06 (2437MHz)

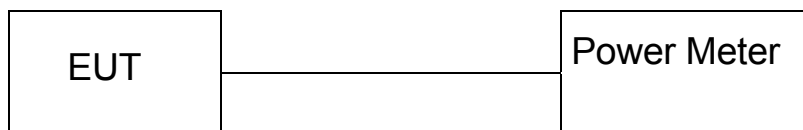


Channel 09 (2452MHz)



4.4. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to C63.10 -2009 and KDB558074 D01 v03r01, 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.

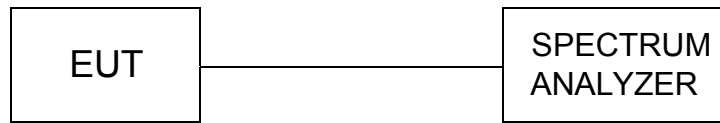
TEST RESULTS

Mode	Channel	Peak Power Output (dBm)	Peak Power Limit (dBm)	PASS / FAIL
802.11b	1	14.49	30	PASS
	6	15.22	30	PASS
	1	14.75	30	PASS
802.11g	1	12.81	30	PASS
	6	13.31	30	PASS
	1	13.01	30	PASS
802.11n HT20	1	11.50	30	PASS
	6	11.83	30	PASS
	1	11.44	30	PASS
802.11n HT40	3	11.45	30	PASS
	6	11.14	30	PASS
	9	11.44	30	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 D01 v03r01 (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 μ 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 (dB μ V/m)	Limit Peak (dB μ V/m)
Below 2390 or Above 2483.5	54	74

TEST RESULTS

Engineer: Brgant

Site: AC5

Time: 2013/07/24 - 17:43

Limit: FCC Part15.209 RE(3m)

Margin: 0

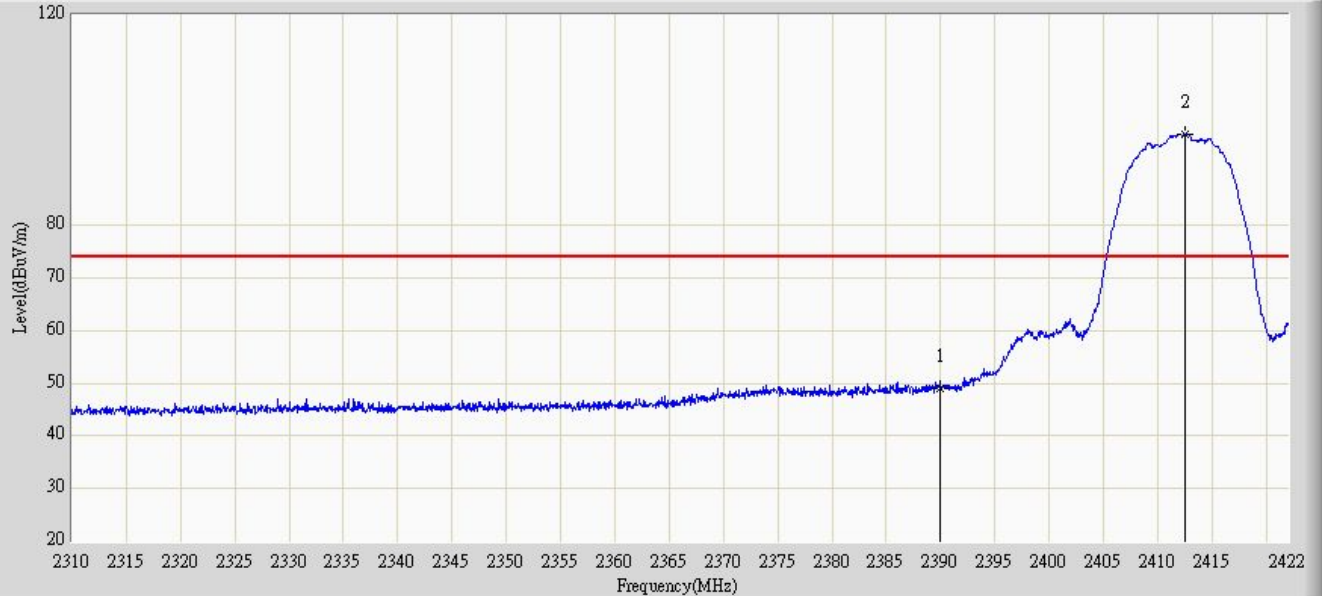
Probe: BBHA 9120D_499(1-18GHz)

Polarity: Horizontal

EUT: Smart Phone

Power: AC 120V/60Hz

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



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	49.158	18.418	-24.842	74.000	30.740	PK
2		*	2412.536	97.198	66.403	N/A	N/A	30.795	PK

Engineer: Brgant

Site: AC5

Time: 2013/07/24 - 19:16

Limit: FCC Part15.209 RE(3m)

Margin: 0

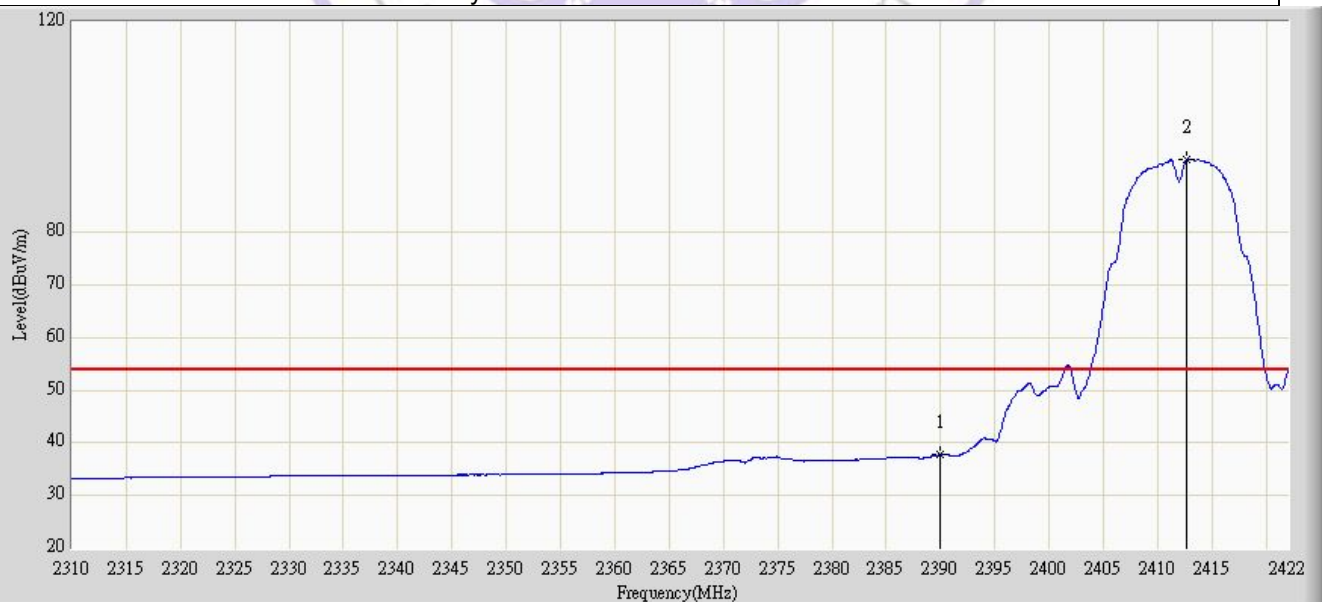
Probe: BBHA 9120D_499(1-18GHz)

Polarity: Horizontal

EUT: Smart Phone

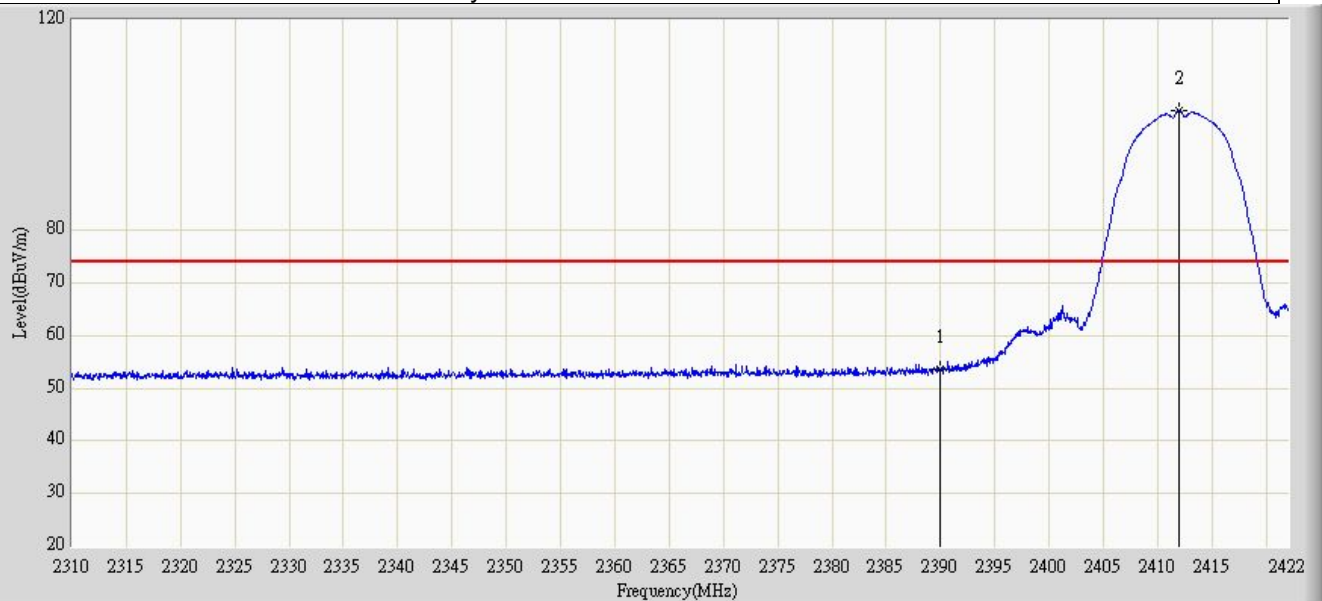
Power: AC 120V/60Hz

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



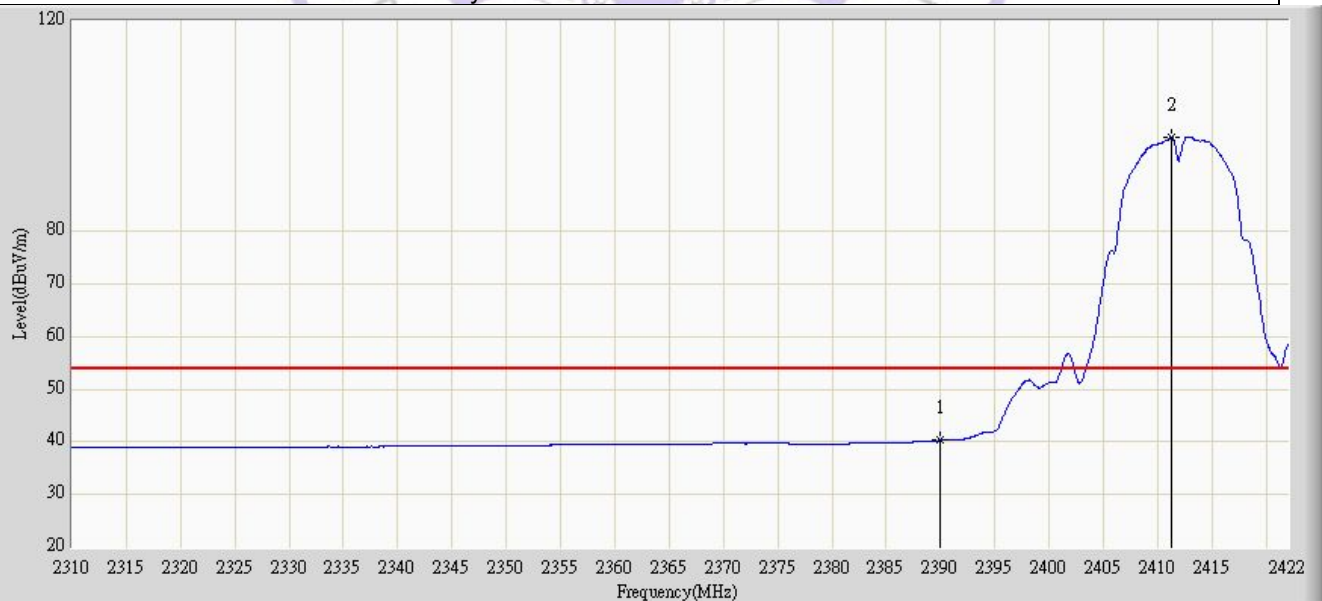
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	37.804	7.064	-16.196	54.000	30.740	AV
2		*	2412.704	93.986	63.191	N/A	N/A	30.795	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 19:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode1:Transmit at channel 2412MHz by 802.11b	



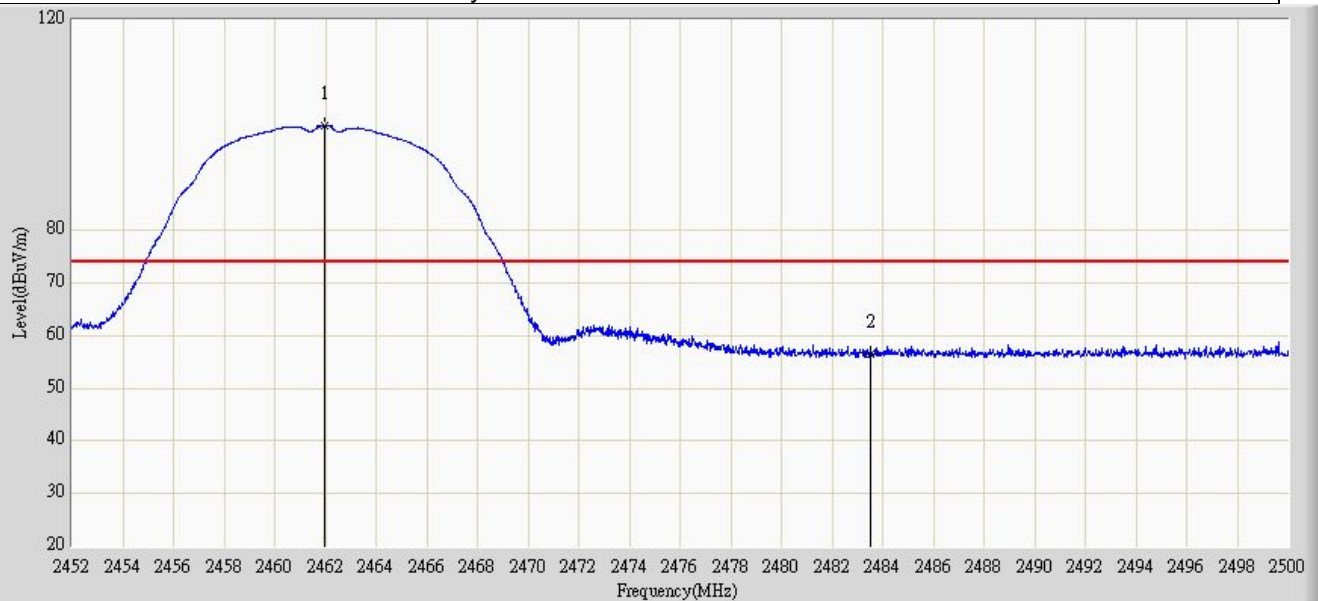
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	53.484	22.744	-20.516	74.000	30.740	PK
2		*	2412.032	102.719	71.926	N/A	N/A	30.793	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 19:22
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode1:Transmit at channel 2412MHz by 802.11b	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	40.283	9.543	-13.717	54.000	30.740	AV
2		*	2411.304	97.878	67.087	N/A	N/A	30.791	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 19:45
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode1:Transmit at channel 2462MHz by 802.11b	



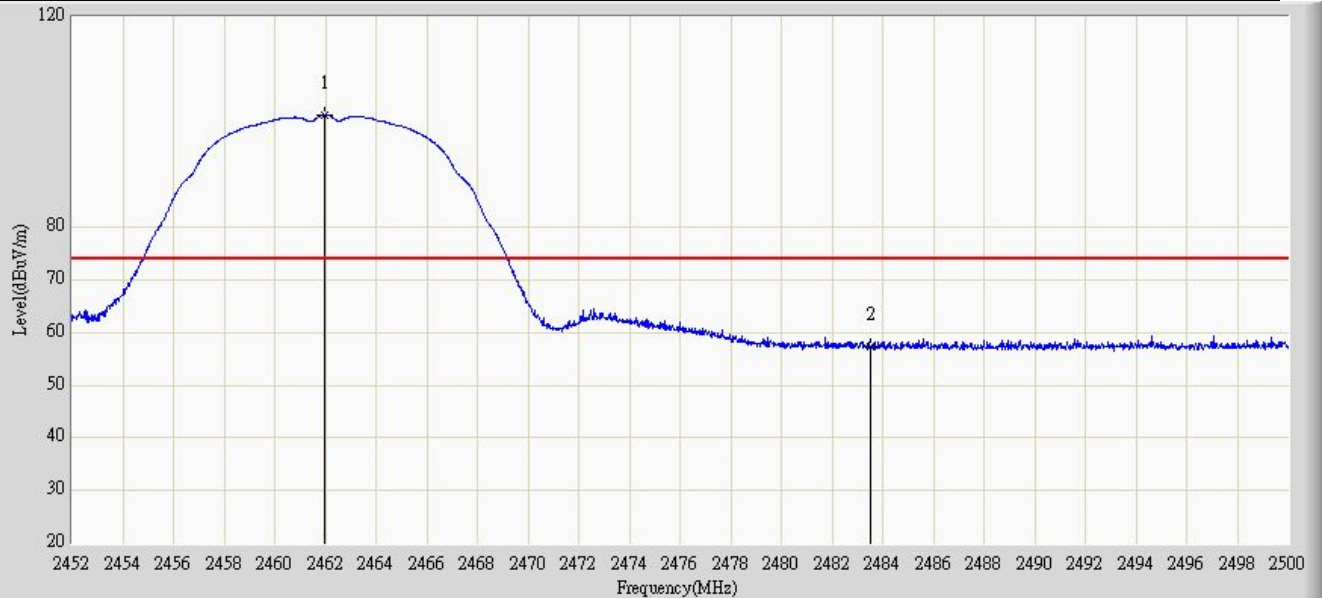
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2461.984	100.009	69.077	N/A	N/A	30.932	PK
2			2483.500	56.406	25.420	-17.594	74.000	30.985	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 19:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode1:Transmit at channel 2462MHz by 802.11b	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.800	96.268	65.334	N/A	N/A	30.933	AV
2			2483.500	43.915	12.930	-10.085	54.000	30.985	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:09
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode1:Transmit at channel 2462MHz by 802.11b	



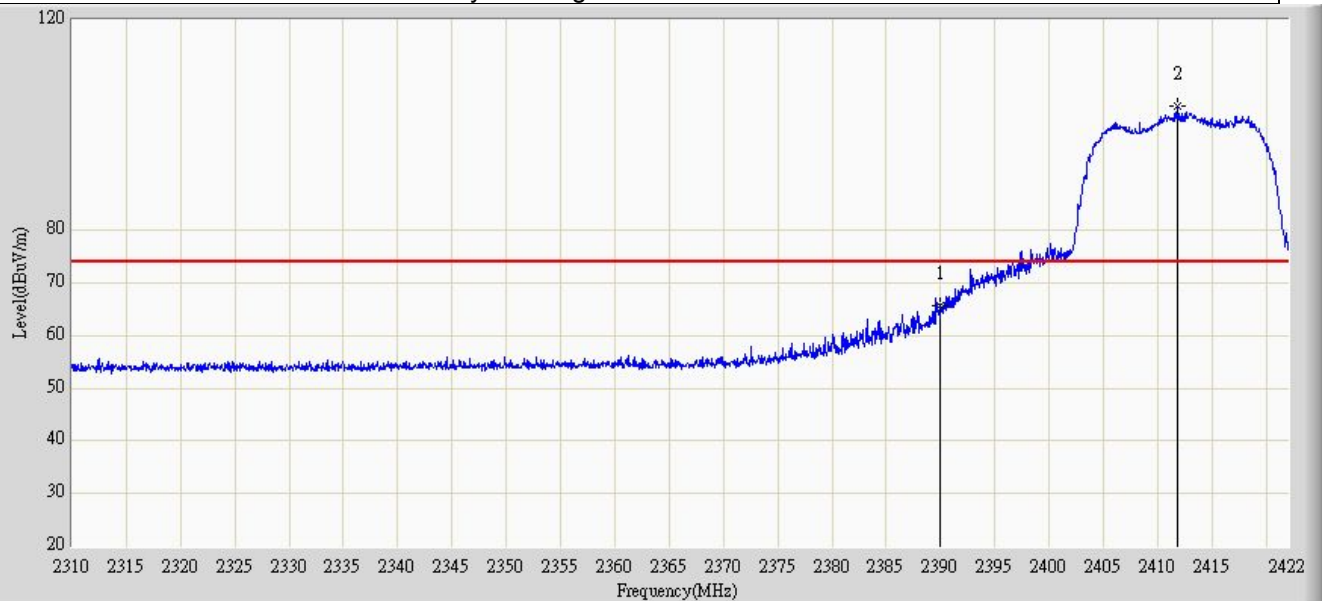
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2461.984	101.417	70.485	N/A	N/A	30.932	PK
2			2483.500	57.397	26.411	-16.603	74.000	30.985	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:15
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode1:Transmit at channel 2462MHz by 802.11b	



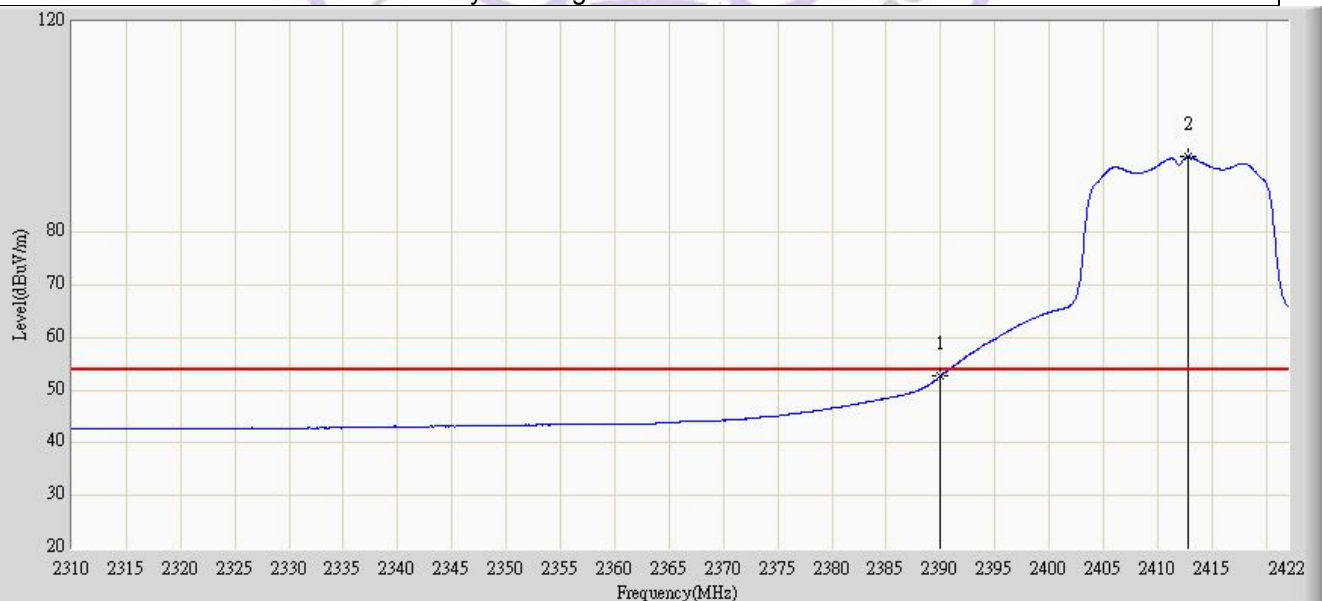
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.728	96.074	65.140	N/A	N/A	30.933	AV
2			2483.500	43.887	12.902	-10.113	54.000	30.985	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode2:Transmit at channel 2412MHz by 802.11g	



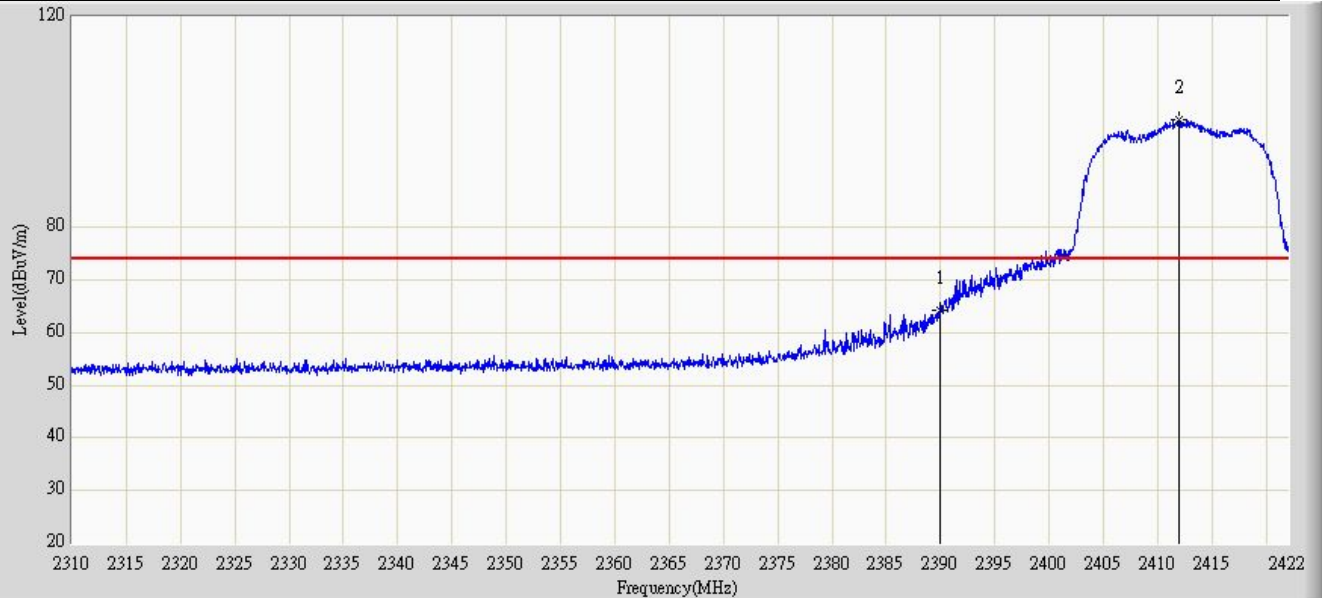
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	65.736	34.996	-8.264	74.000	30.740	PK
2		*	2411.808	103.738	72.946	N/A	N/A	30.792	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode2:Transmit at channel 2412MHz by 802.11g	



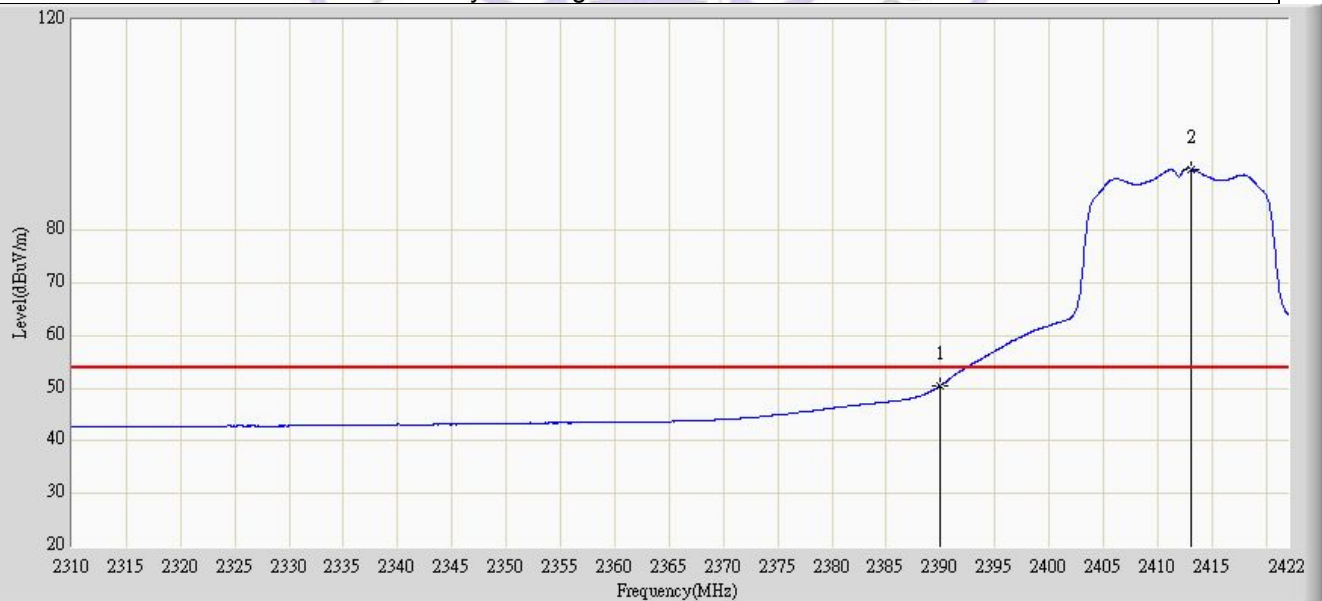
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	52.695	21.955	-1.305	54.000	30.740	AV
2		*	2412.872	94.319	63.523	N/A	N/A	30.795	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:35
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode2:Transmit at channel 2412MHz by 802.11g	



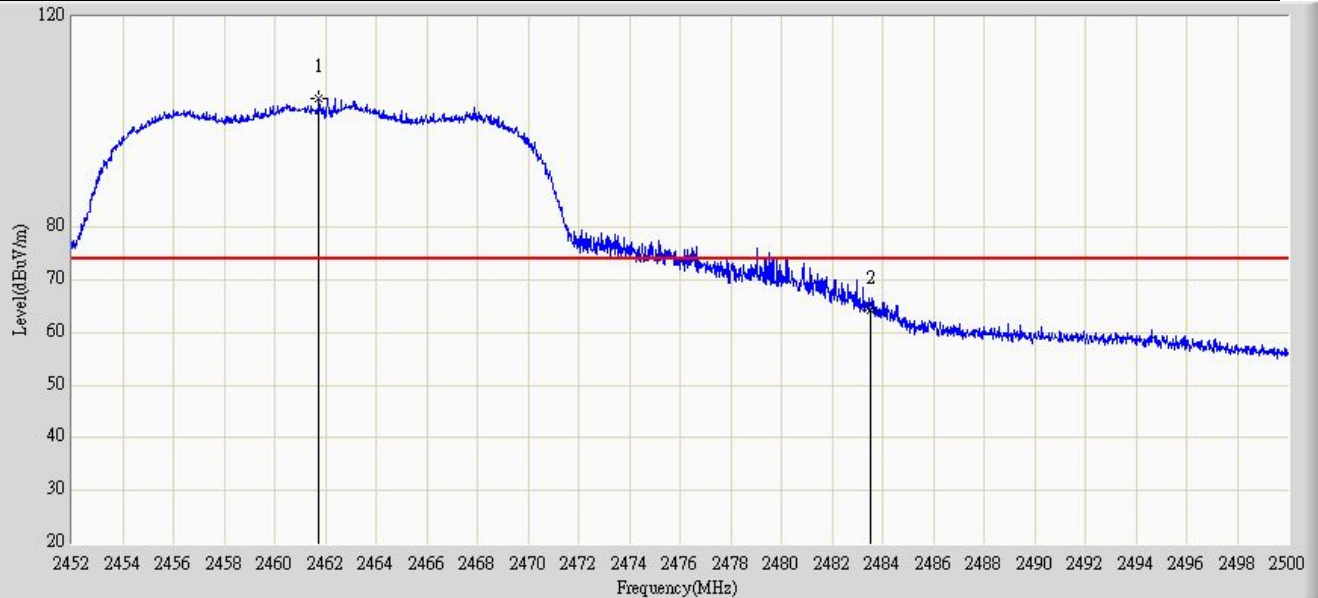
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	64.154	33.414	-9.846	74.000	30.740	PK
2		*	2411.920	100.460	69.667	N/A	N/A	30.793	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode2:Transmit at channel 2412MHz by 802.11g	



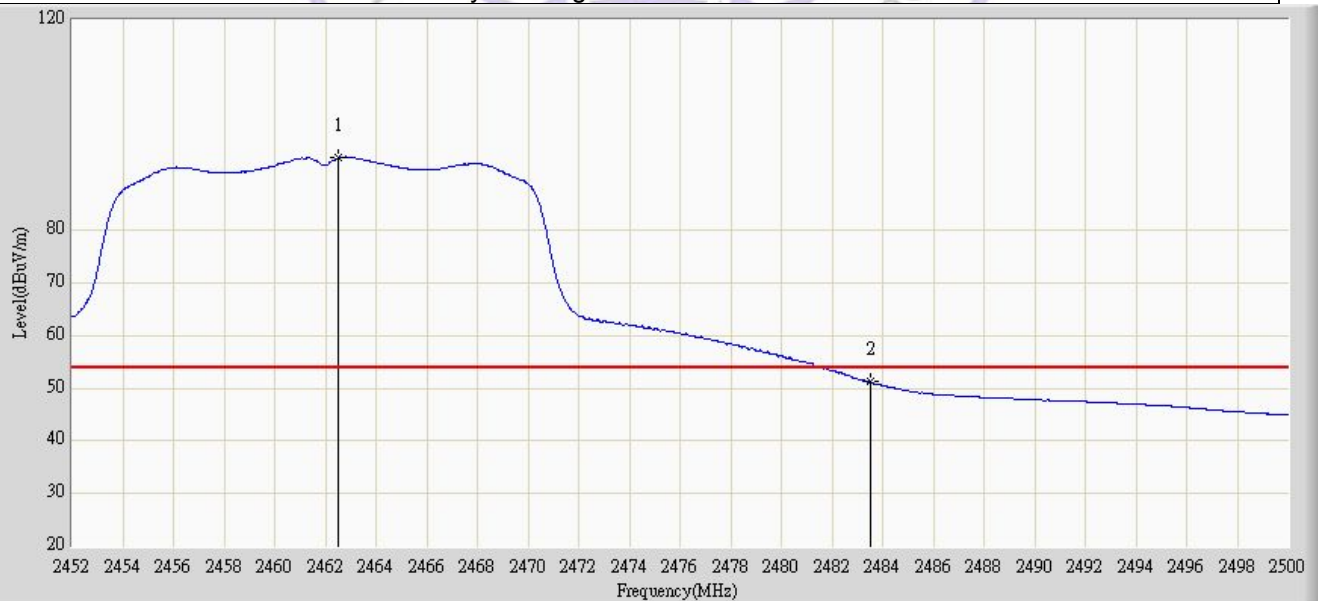
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	50.512	19.772	-3.488	54.000	30.740	AV
2		*	2413.040	91.683	60.887	N/A	N/A	30.796	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:48
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode2:Transmit at channel 2462MHz by 802.11g	



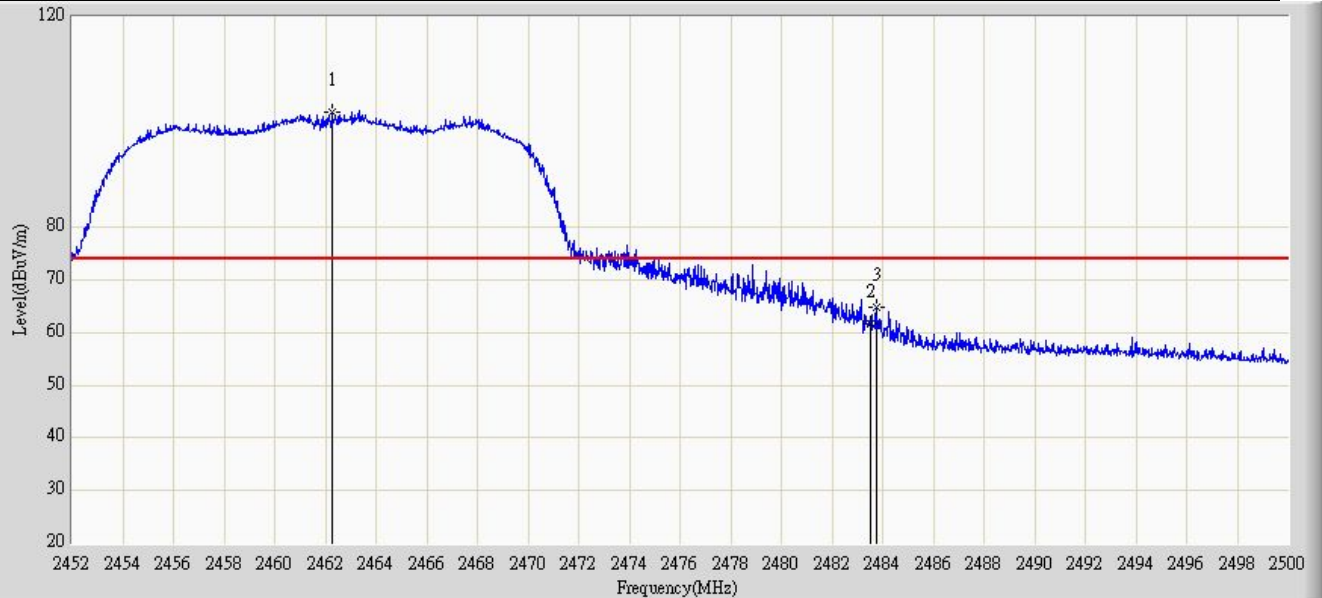
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2461.744	104.423	73.492	N/A	N/A	30.932	PK
2			2483.500	64.251	33.266	-9.749	74.000	30.985	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:52
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode2:Transmit at channel 2462MHz by 802.11g	



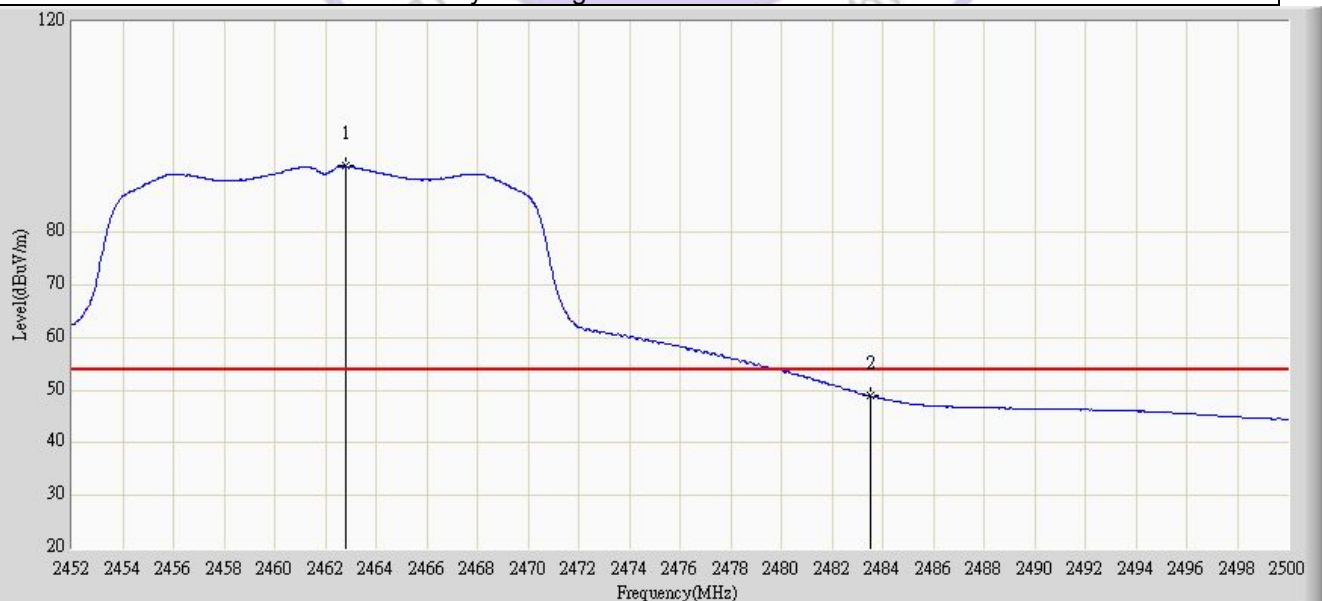
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.512	93.831	62.898	N/A	N/A	30.933	AV
2			2483.500	51.234	20.249	-2.766	54.000	30.985	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:53
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode2:Transmit at channel 2462MHz by 802.11g	



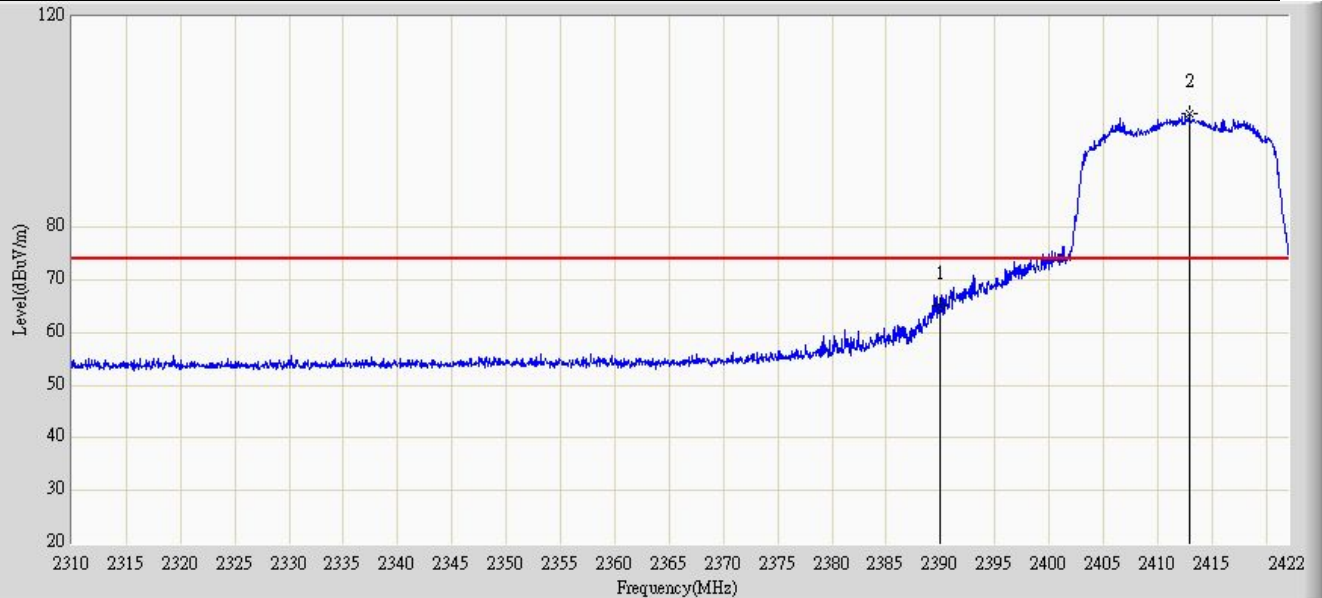
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.272	101.784	70.851	N/A	N/A	30.932	PK
2			2483.500	61.806	30.821	-12.194	74.000	30.985	PK
3			2483.752	64.740	33.754	-9.260	74.000	30.987	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 20:55
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode2:Transmit at channel 2462MHz by 802.11g	



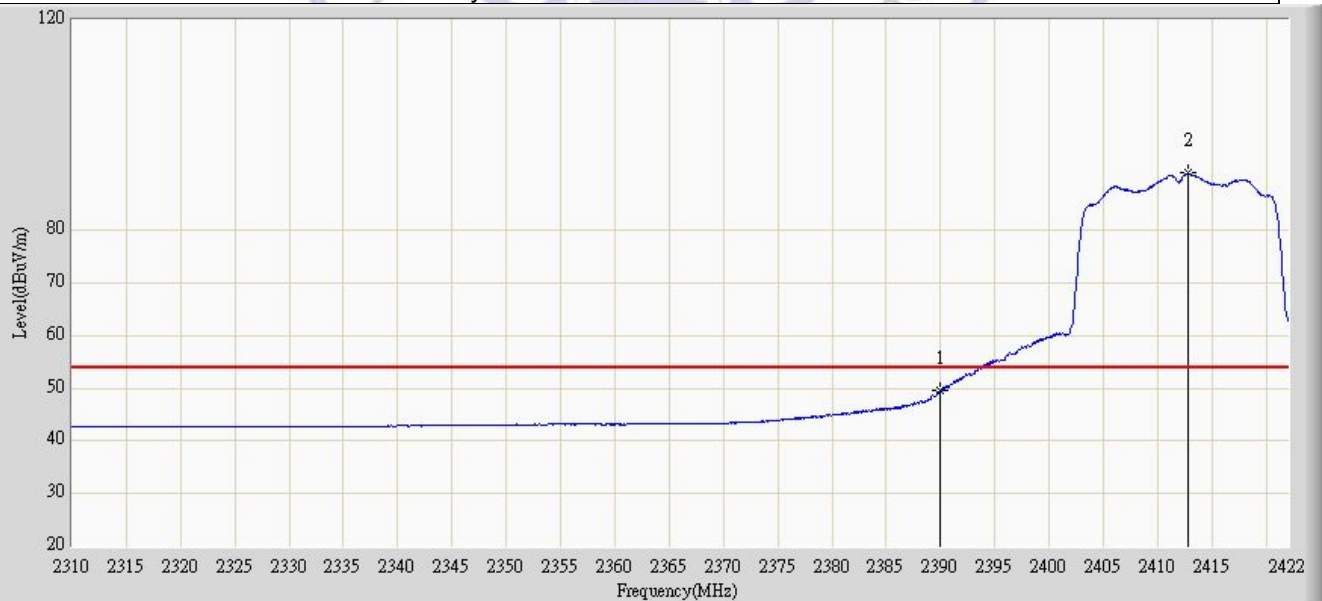
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.800	92.573	61.639	N/A	N/A	30.933	AV
2			2483.500	49.016	18.030	-4.984	54.000	30.985	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 21:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode3:Transmit at channel 2412MHz by 802.11n20MHz	



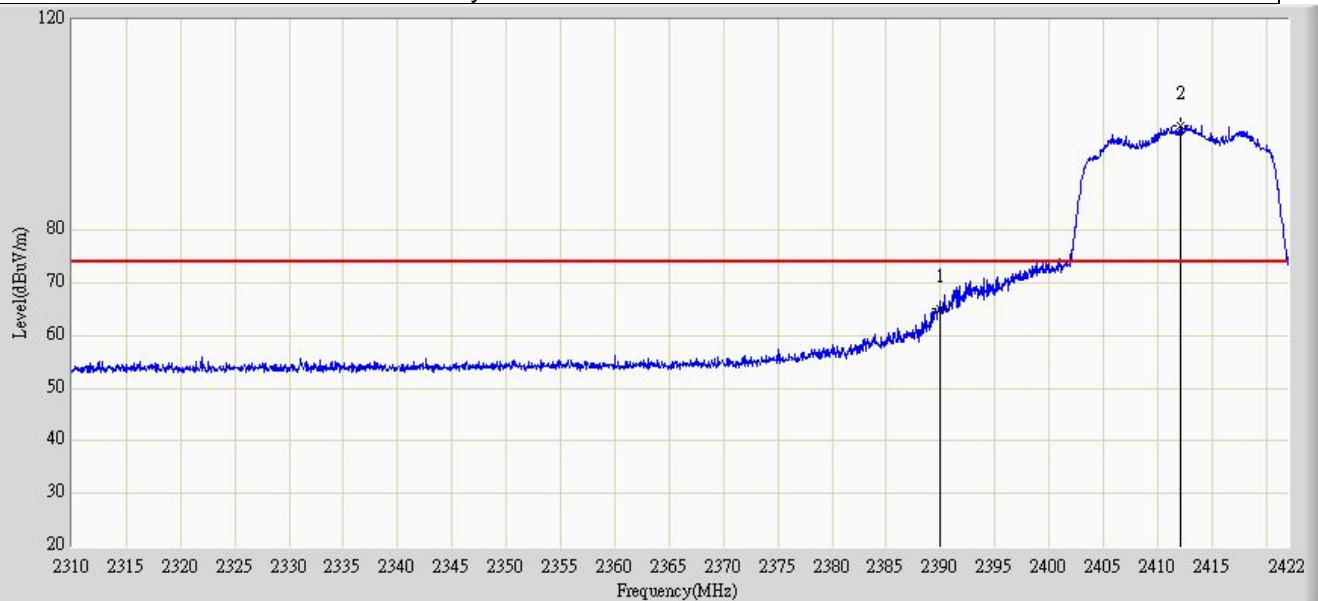
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	65.005	34.265	-8.995	74.000	30.740	PK
2		*	2412.928	101.610	70.814	N/A	N/A	30.795	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 21:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode3:Transmit at channel 2412MHz by 802.11n20MHz	



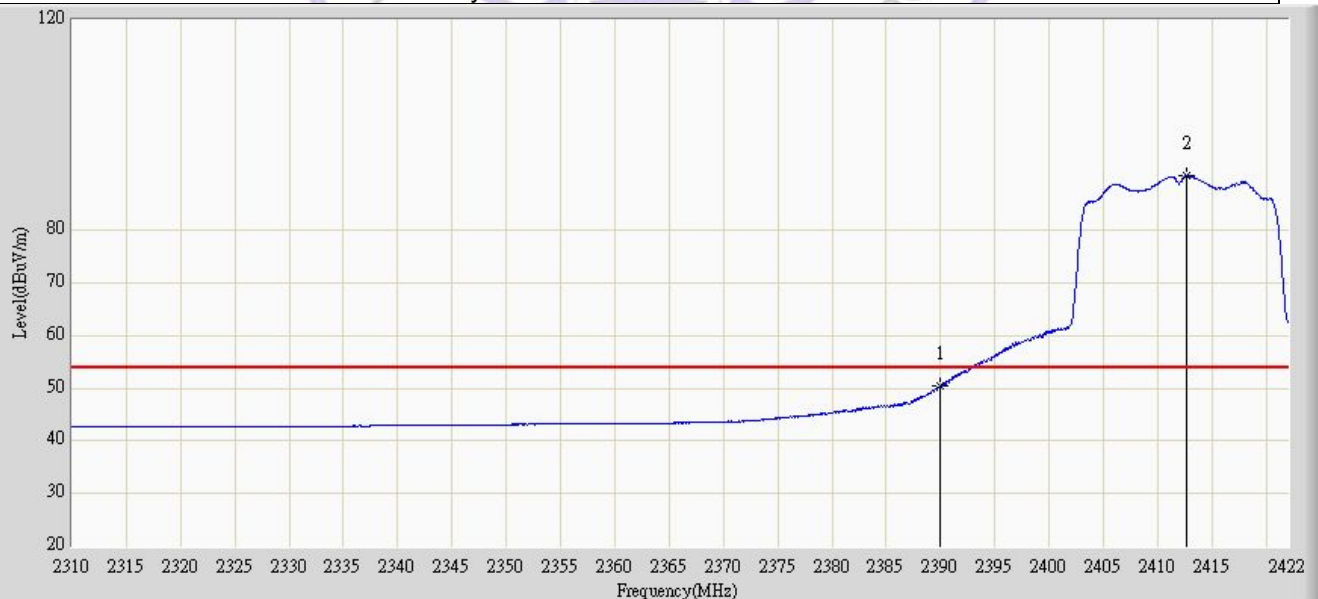
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	49.579	18.839	-4.421	54.000	30.740	AV
2		*	2412.872	90.855	60.059	N/A	N/A	30.795	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 21:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode3:Transmit at channel 2412MHz by 802.11n20MHz	



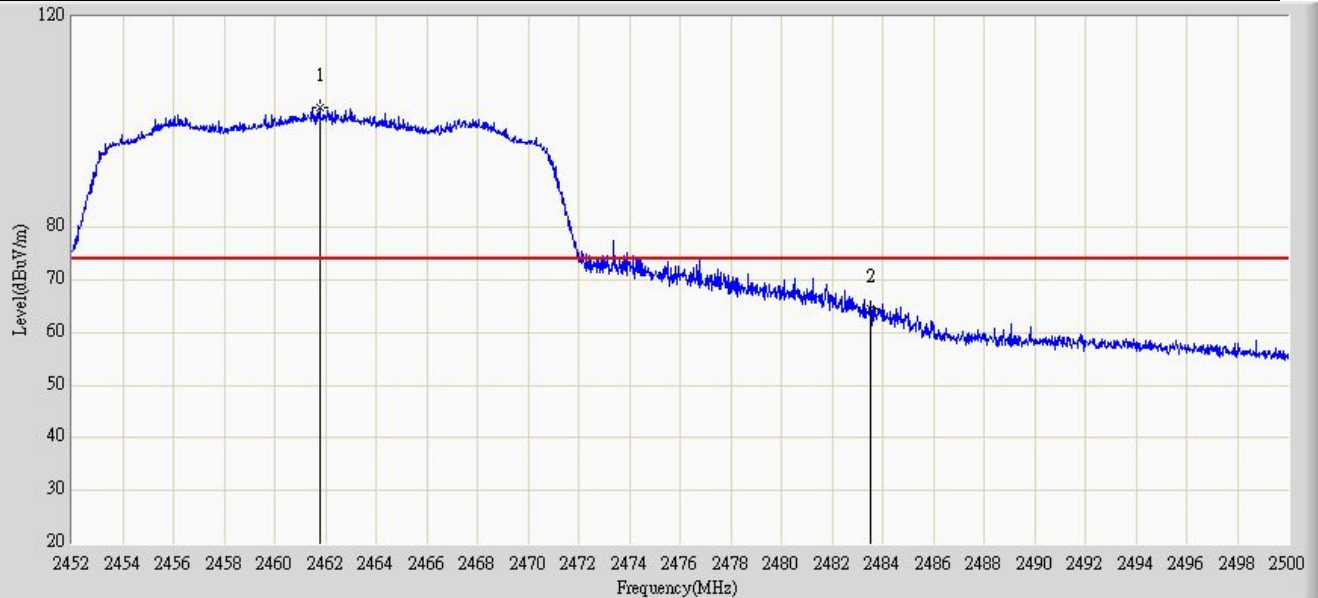
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	64.974	34.234	-9.026	74.000	30.740	PK
2		*	2412.144	99.850	69.057	N/A	N/A	30.793	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 21:16
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode3:Transmit at channel 2412MHz by 802.11n20MHz	



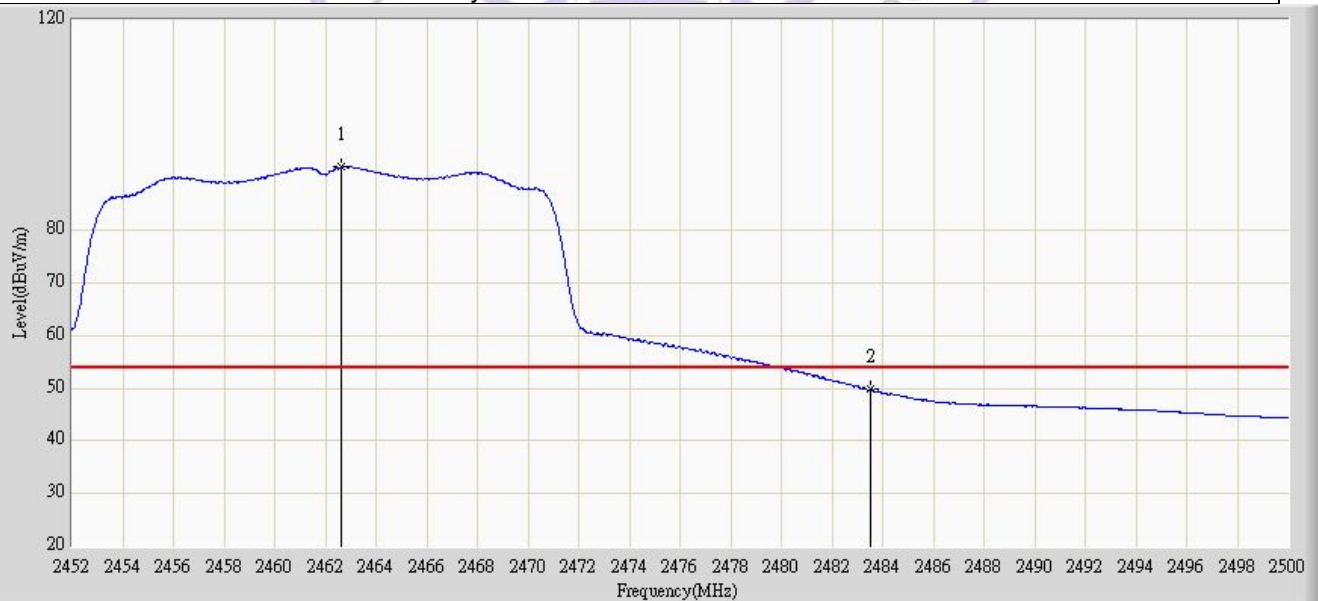
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	50.392	19.652	-3.608	54.000	30.740	AV
2		*	2412.648	90.387	59.592	N/A	N/A	30.795	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 21:29
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode3:Transmit at channel 2462MHz by 802.11n20MHz	



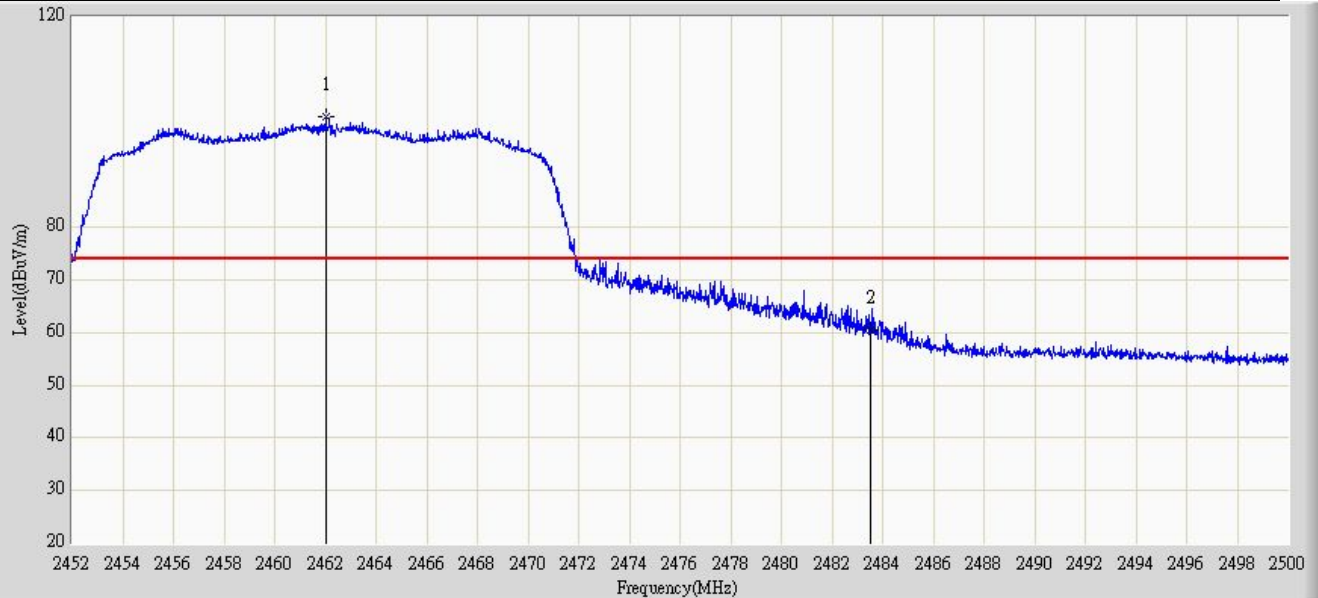
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2461.768	102.700	71.769	N/A	N/A	30.932	PK
2			2483.500	64.513	33.528	-9.487	74.000	30.985	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 21:31
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode3:Transmit at channel 2462MHz by 802.11n20MHz	



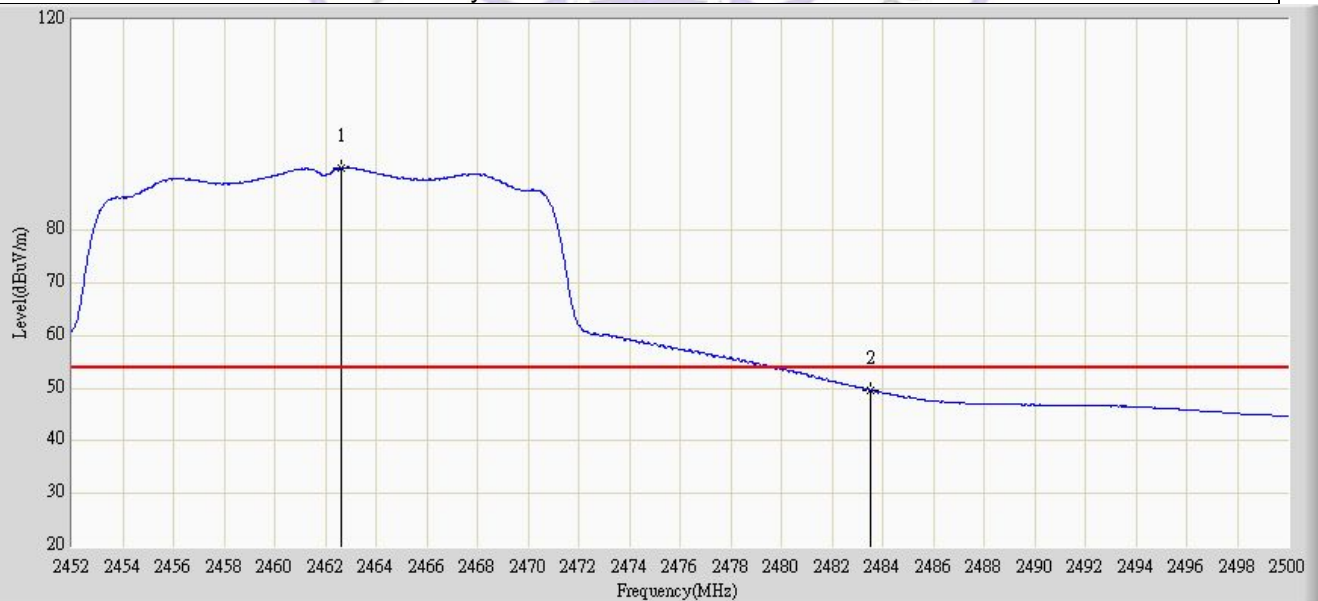
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.656	92.026	61.092	N/A	N/A	30.933	AV
2			2483.500	49.746	18.761	-4.254	54.000	30.985	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 21:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode3:Transmit at channel 2462MHz by 802.11n20MHz	



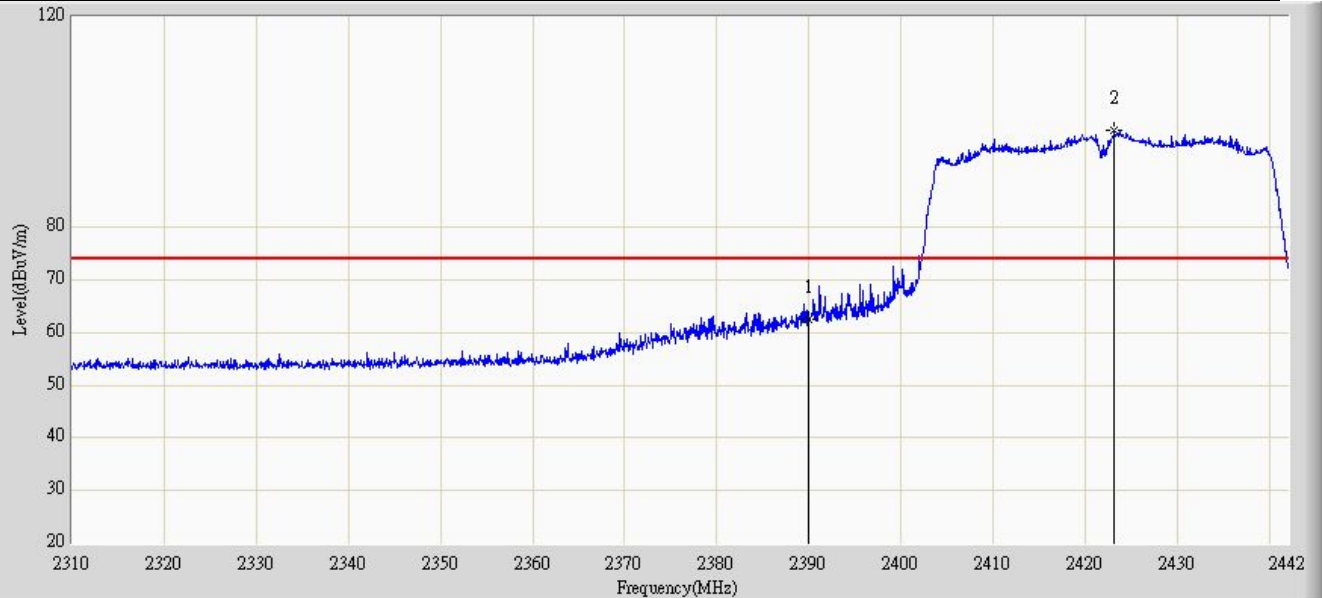
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.008	101.013	70.081	N/A	N/A	30.932	PK
2			2483.500	60.657	29.672	-13.343	74.000	30.985	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 21:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode3:Transmit at channel 2462MHz by 802.11n20MHz	



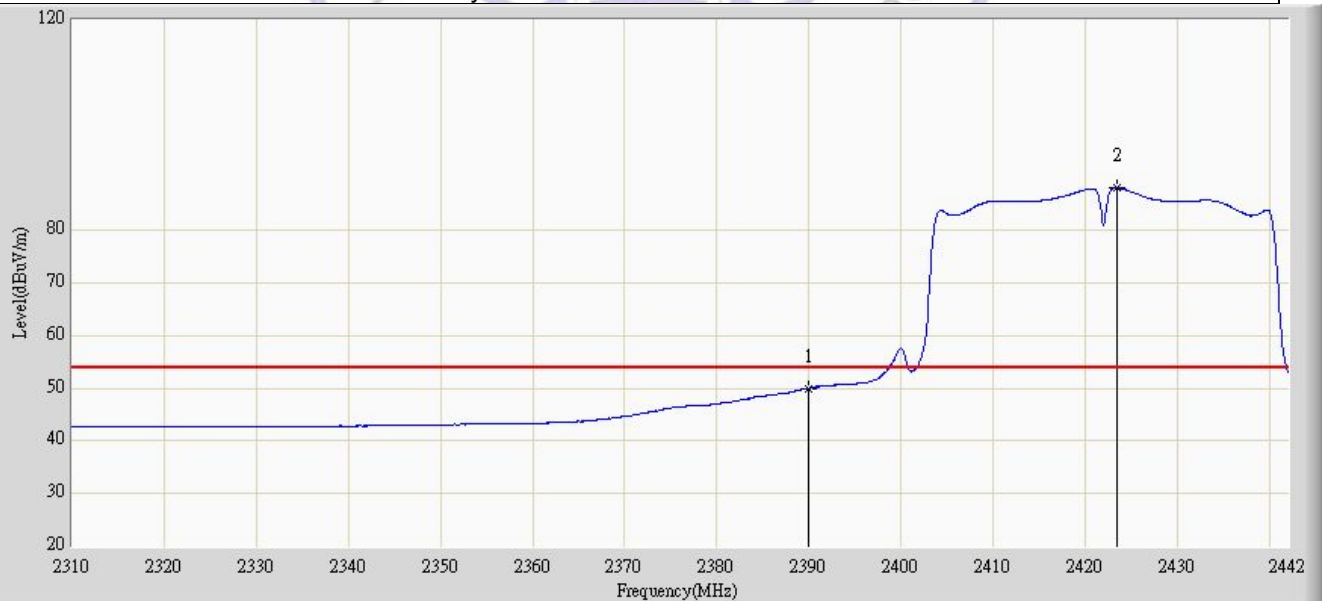
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.656	91.901	60.967	N/A	N/A	30.933	AV
2			2483.500	49.578	18.593	-4.422	54.000	30.985	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 22:04
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode4:Transmit at channel 2422MHz by 802.11n40MHz	



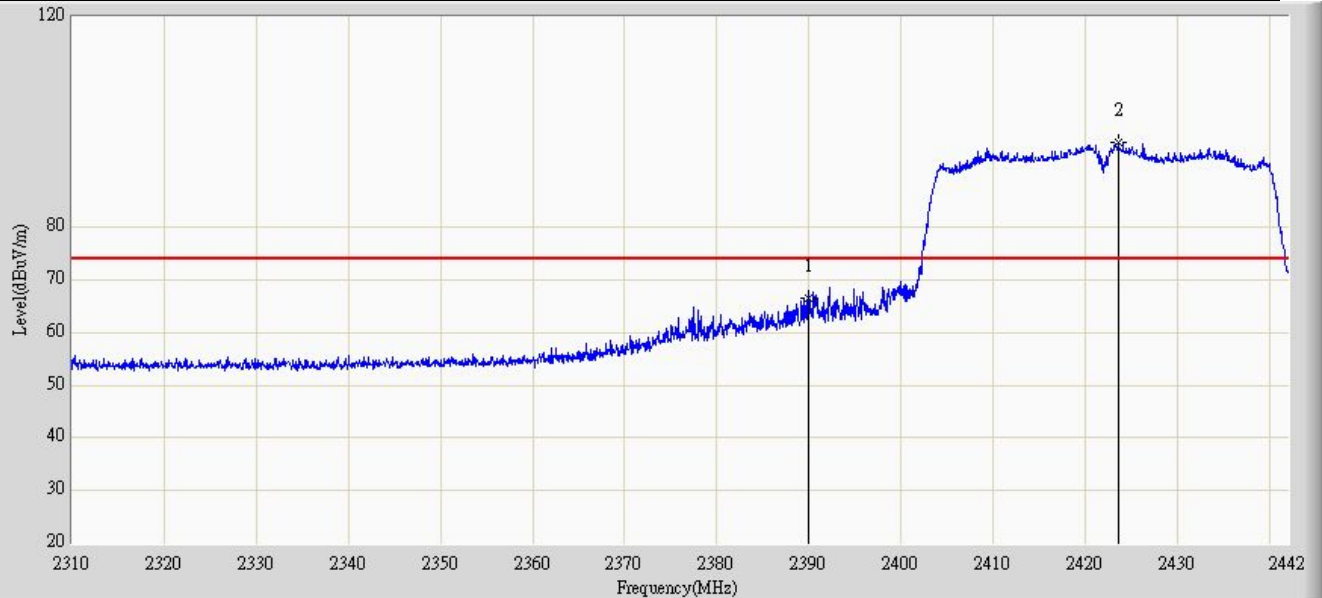
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	62.569	31.829	-11.431	74.000	30.740	PK
2		*	2423.124	98.456	67.630	N/A	N/A	30.825	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 22:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode4:Transmit at channel 2422MHz by 802.11n40MHz	



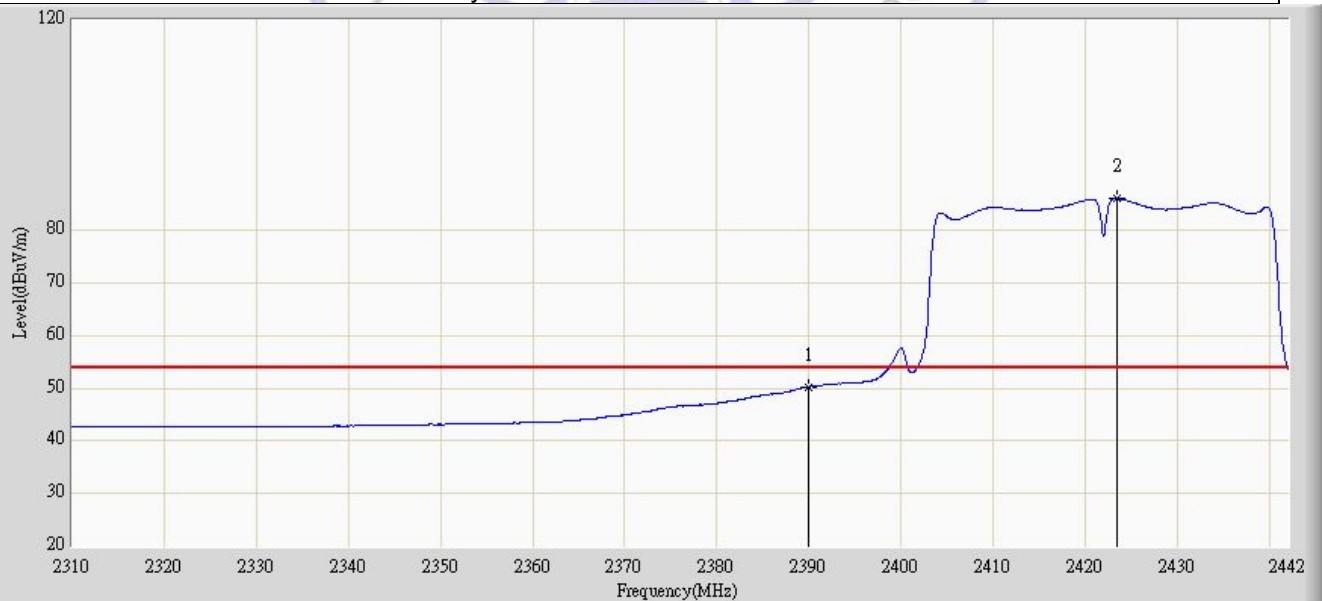
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	50.026	19.286	-3.974	54.000	30.740	AV
2		*	2423.454	88.067	57.240	N/A	N/A	30.827	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 22:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode4:Transmit at channel 2422MHz by 802.11n40MHz	



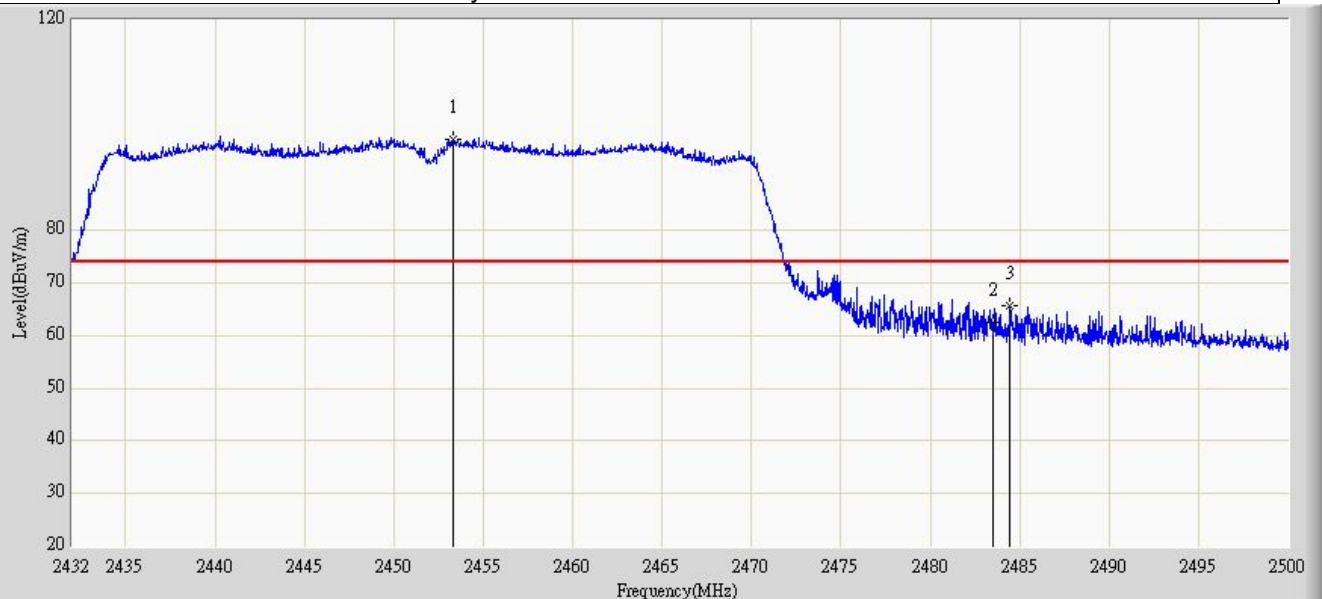
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	66.517	35.777	-7.483	74.000	30.740	PK
2		*	2423.586	96.046	65.219	N/A	N/A	30.827	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 22:12
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode4:Transmit at channel 2422MHz by 802.11n40MHz	



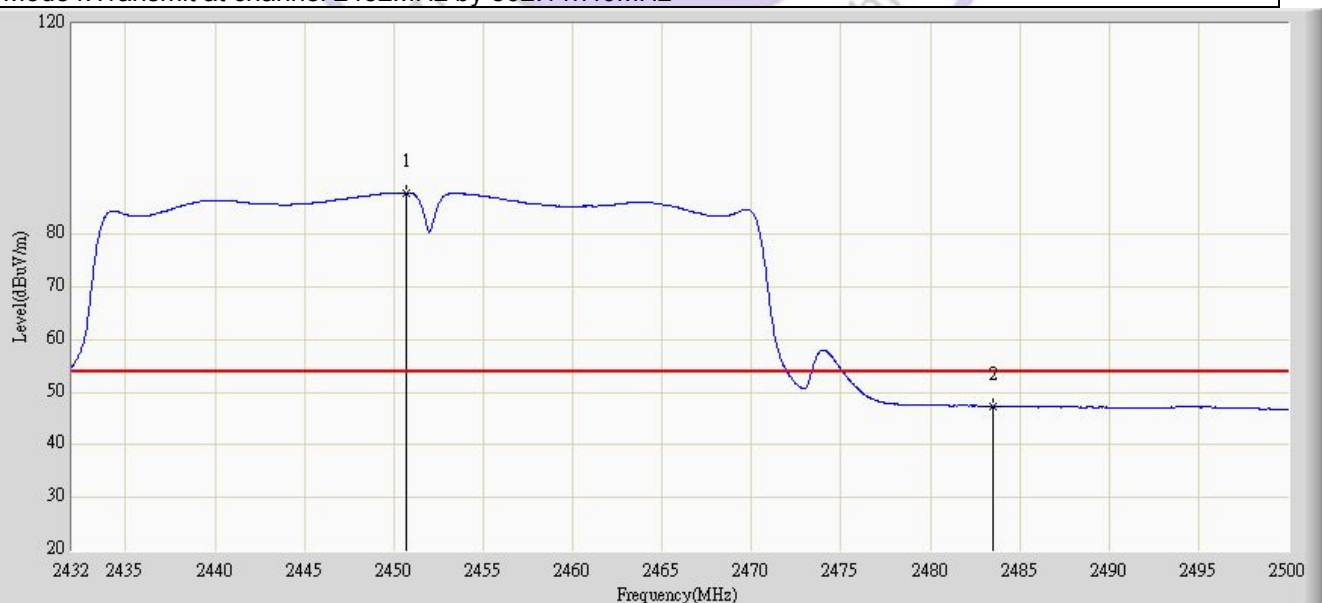
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	50.247	19.507	-3.753	54.000	30.740	AV
2		*	2423.454	86.032	55.205	N/A	N/A	30.827	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 22:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode4:Transmit at channel 2452MHz by 802.11n40MHz	



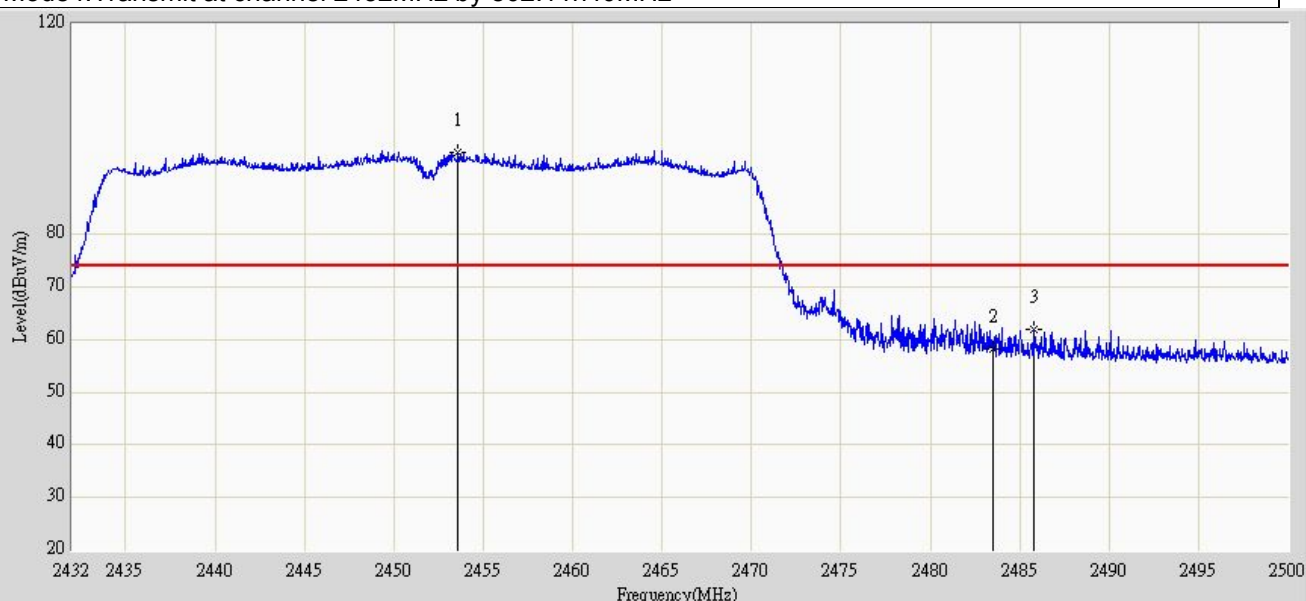
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2453.284	97.222	66.316	N/A	N/A	30.906	PK
2			2483.500	62.481	31.496	-11.519	74.000	30.985	PK
3			2484.462	65.735	34.747	-8.265	74.000	30.988	PK

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 22:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Horizontal
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode4:Transmit at channel 2452MHz by 802.11n40MHz	



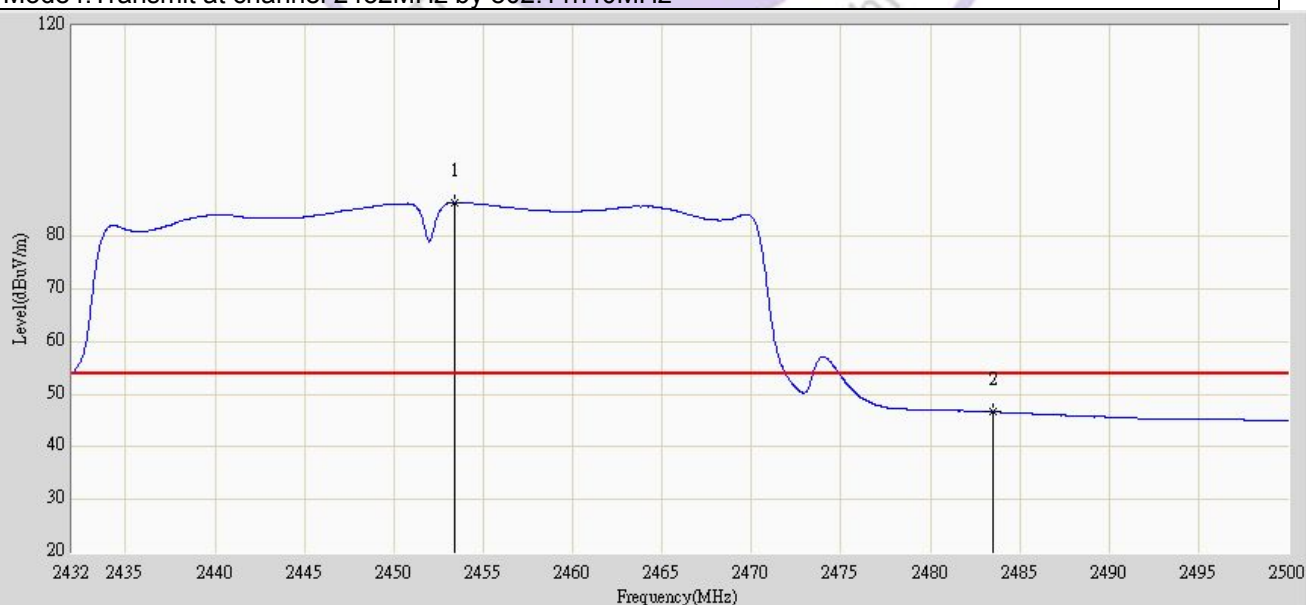
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2450.666	87.877	56.979	N/A	N/A	30.898	AV
2			2483.500	47.367	16.382	-6.633	54.000	30.985	AV

Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 22:29
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode4:Transmit at channel 2452MHz by 802.11n40MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2453.590	95.623	64.716	N/A	N/A	30.907	PK
2			2483.500	58.344	27.359	-15.656	74.000	30.985	PK
3			2485.788	62.028	31.036	-11.972	74.000	30.992	PK

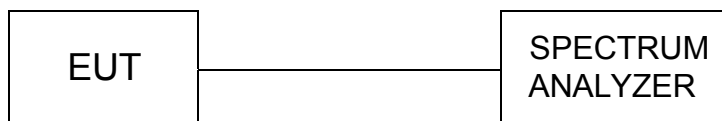
Engineer: Brgant	
Site: AC5	Time: 2013/07/24 - 22:31
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA 9120D_499(1-18GHz)	Polarity: Vertical
EUT: Smart Phone	Power: AC 120V/60Hz
Note: Mode4:Transmit at channel 2452MHz by 802.11n40MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2453.420	86.346	55.440	N/A	N/A	30.906	AV
2			2483.500	46.700	15.714	-7.300	54.000	30.985	AV

4.6. Power Spectral Density Measurement

TEST CONFIGURATION



TEST PROCEDURE

The EUT was tested according to KDB558074 D01 v03r01 for compliance to FCC 47CFR 15.247 and RSS-210 requirements.

Set RBW= 3 kHz, VBW \geq 10KHz, SPAN to 1.5 times greater than the EBW,.

LIMIT

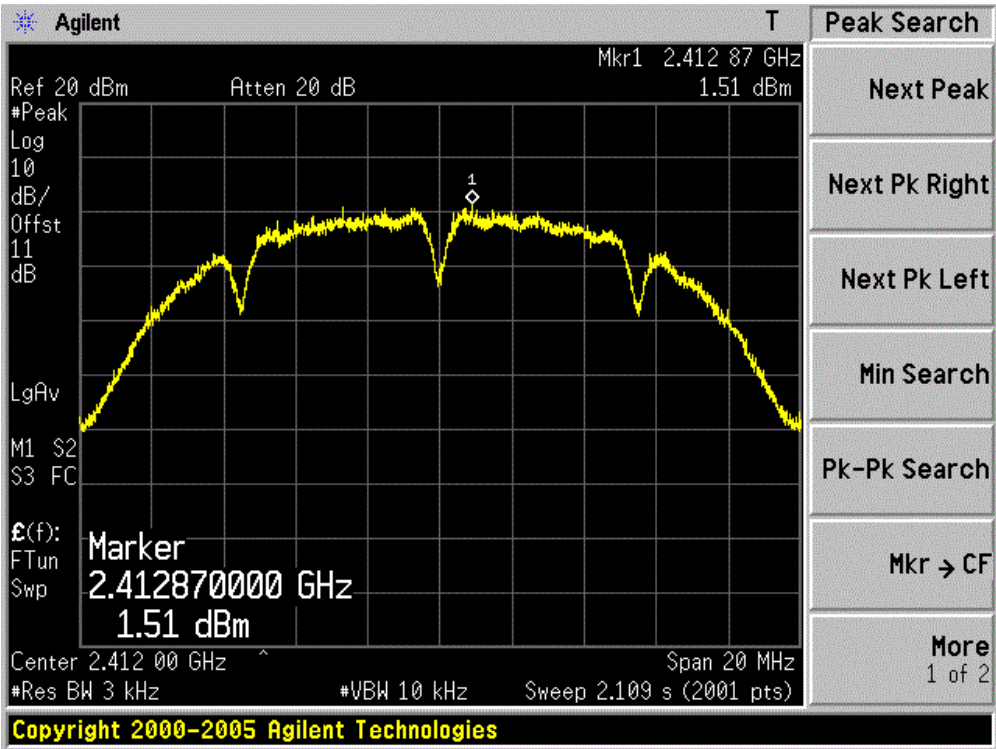
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST RESULTS

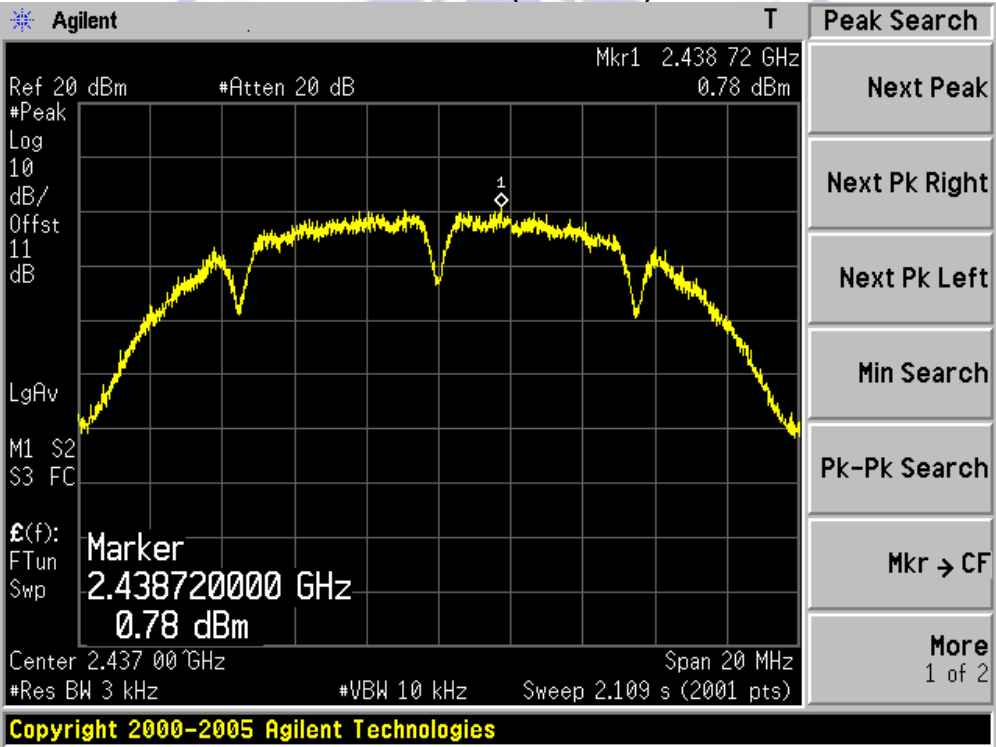
Product	:	Smart Phone
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Measurement PSD (dBm)	Limit (dBm)	Result
01	2412	1.51	8	Pass
06	2437	0.78	8	Pass
11	2462	2.89	8	Pass

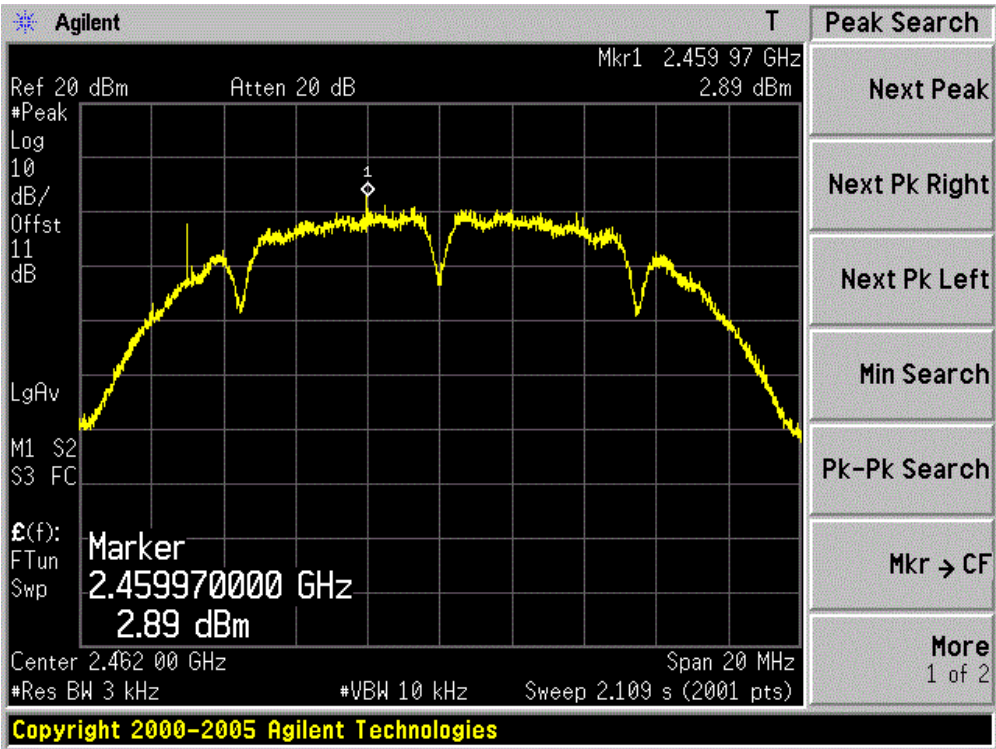
Channel 01 (2412MHz)



Channel 06 (2437MHz)



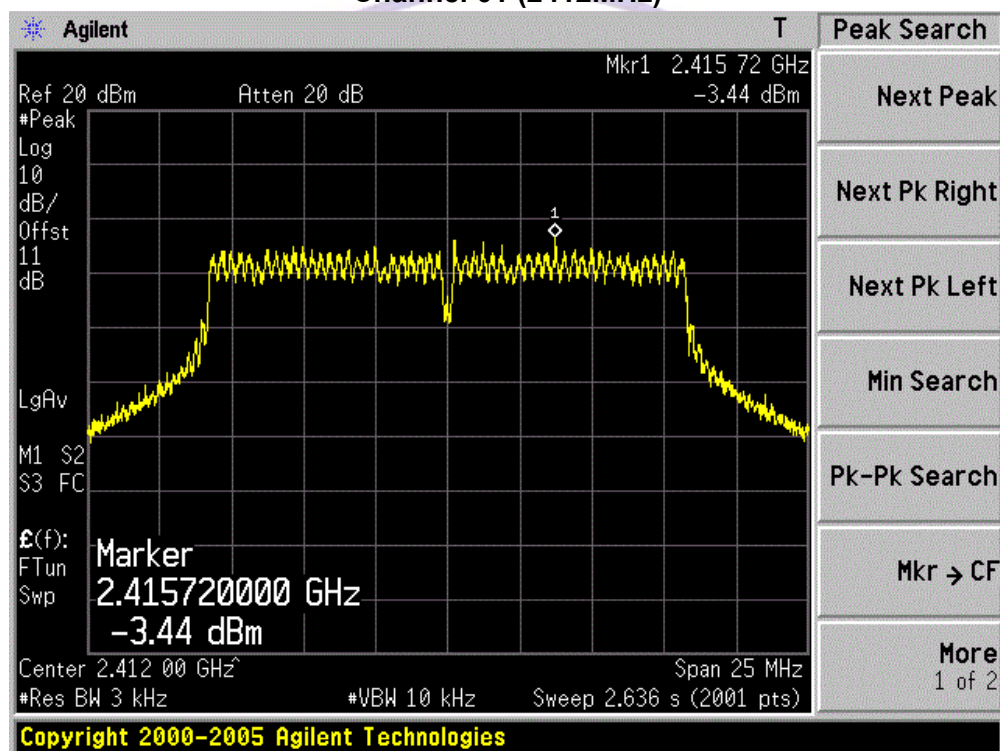
Channel 11 (2462MHz)



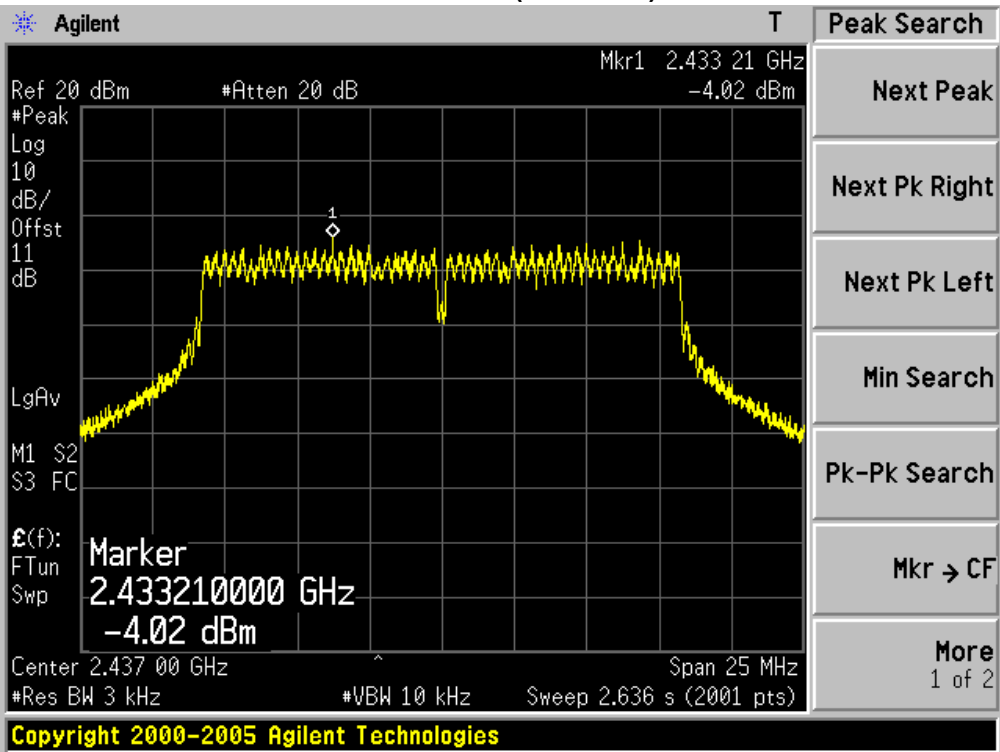
Product	:	Smart Phone
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Measurement PSD (dBm)	Limit (dBm)	Result
01	2412	-3.44	8	Pass
06	2437	-4.02	8	Pass
11	2462	-5.59	8	Pass

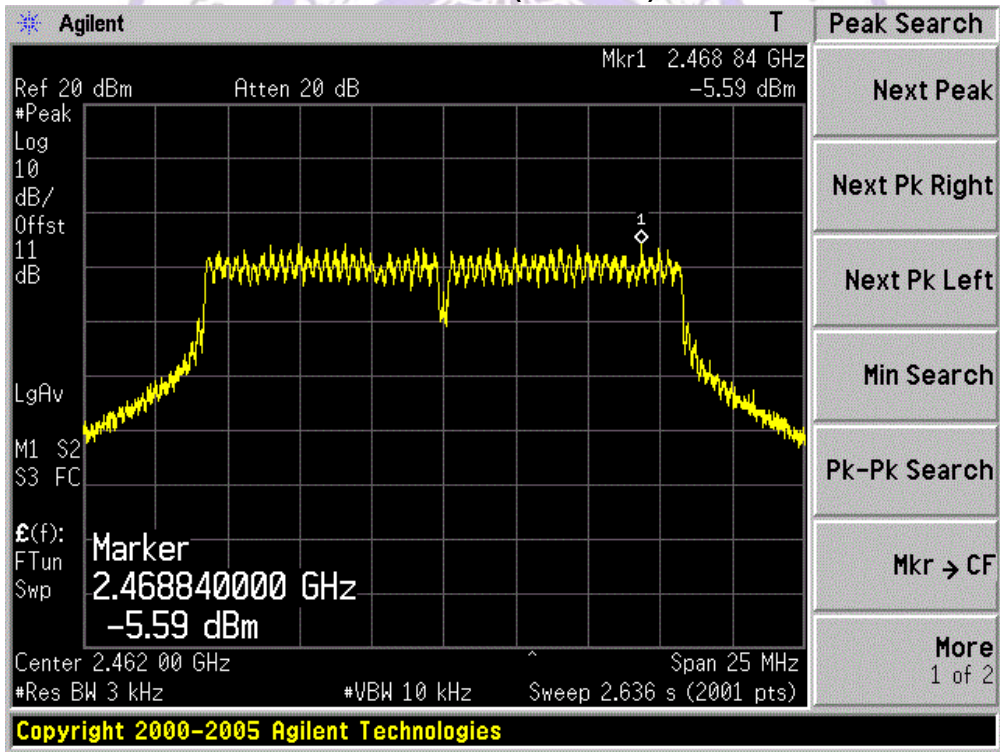
Channel 01 (2412MHz)



Channel 06 (2437MHz)

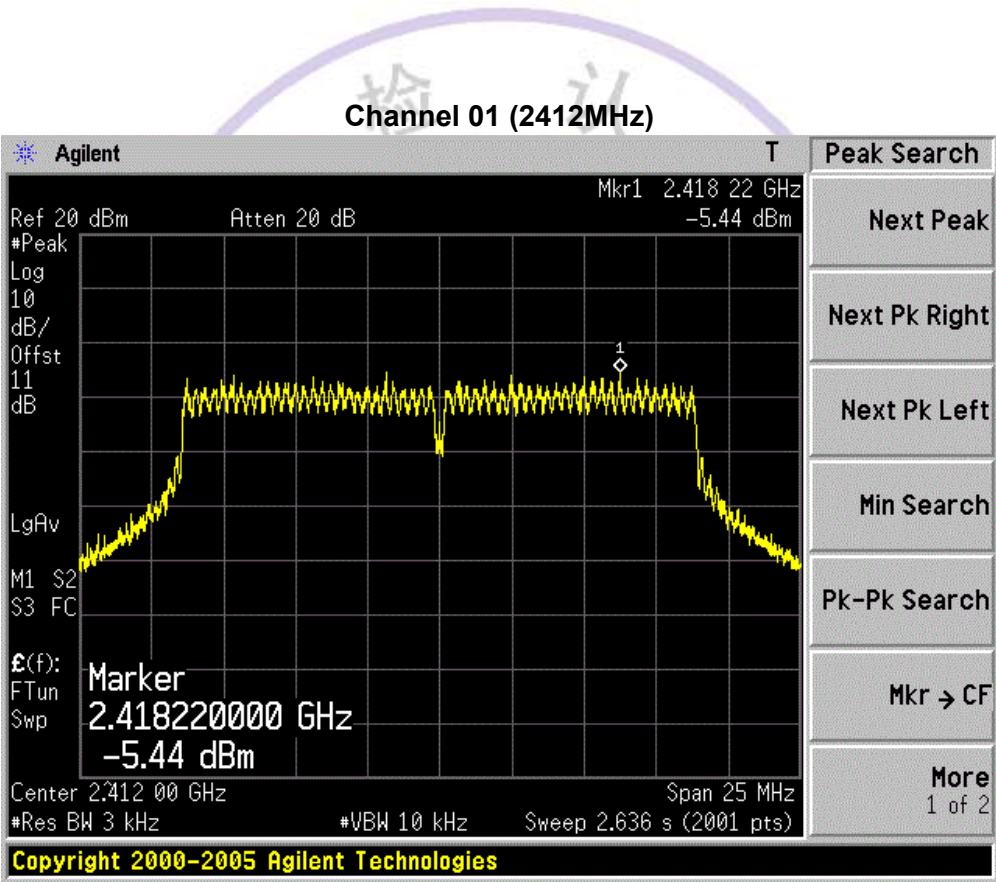


Channel 11 (2462MHz)

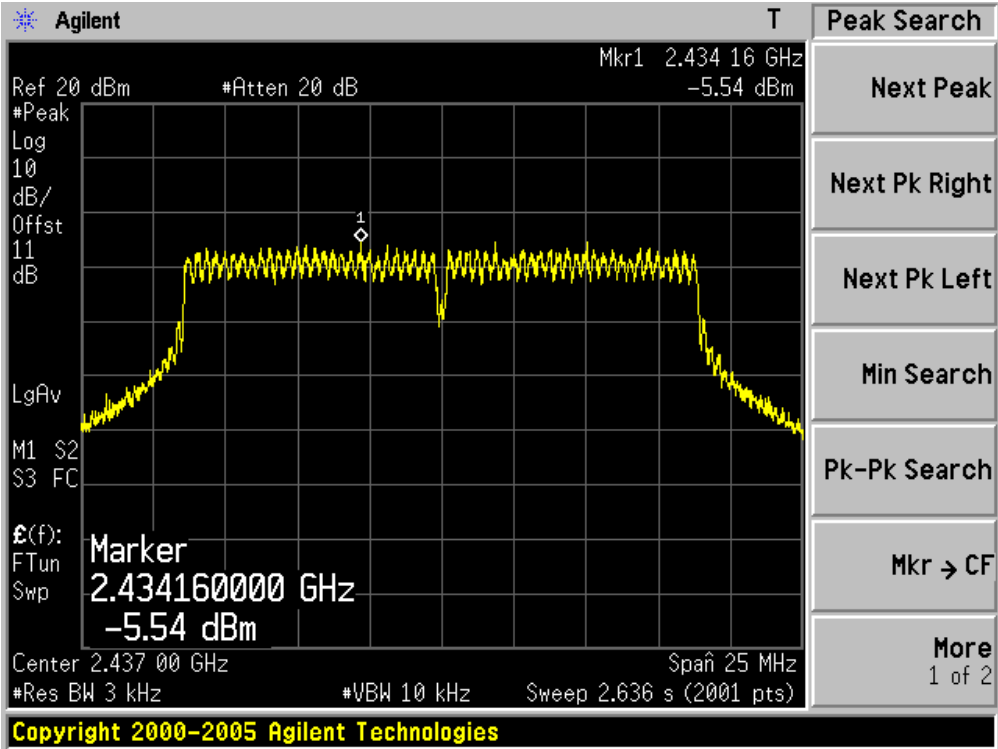


Product	:	Smart Phone
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz)

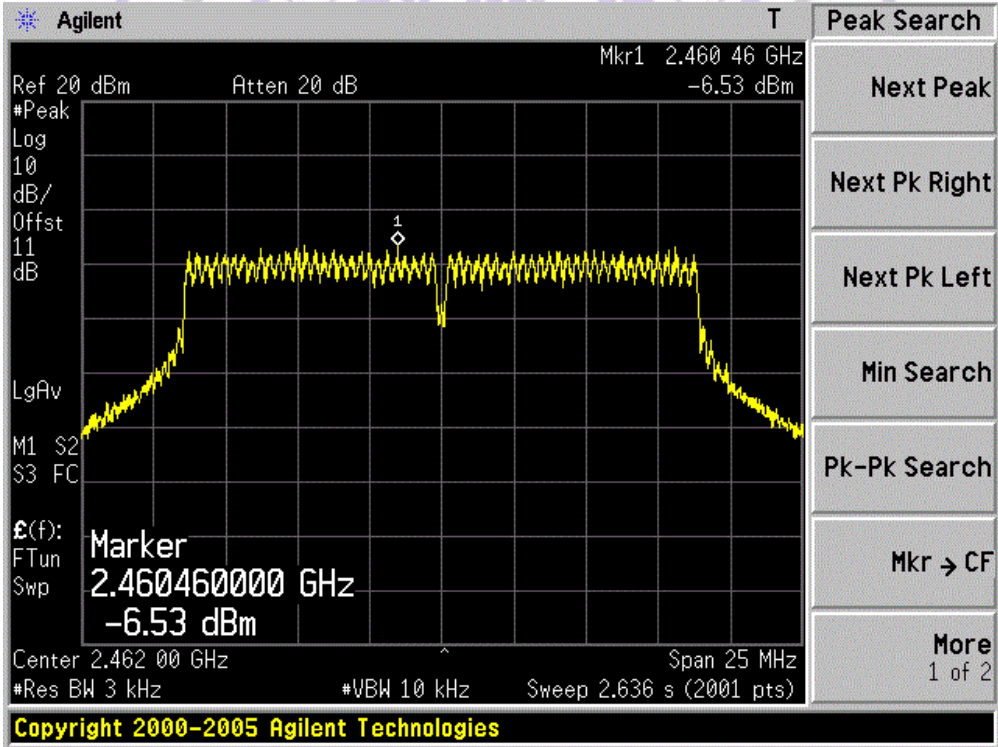
Channel No.	Frequency (MHz)	Measurement PSD (dBm)	Limit (dBm)	Result
01	2412	-5.44	8	Pass
06	2437	-5.54	8	Pass
11	2462	-6.53	8	Pass



Channel 06 (2437MHz)

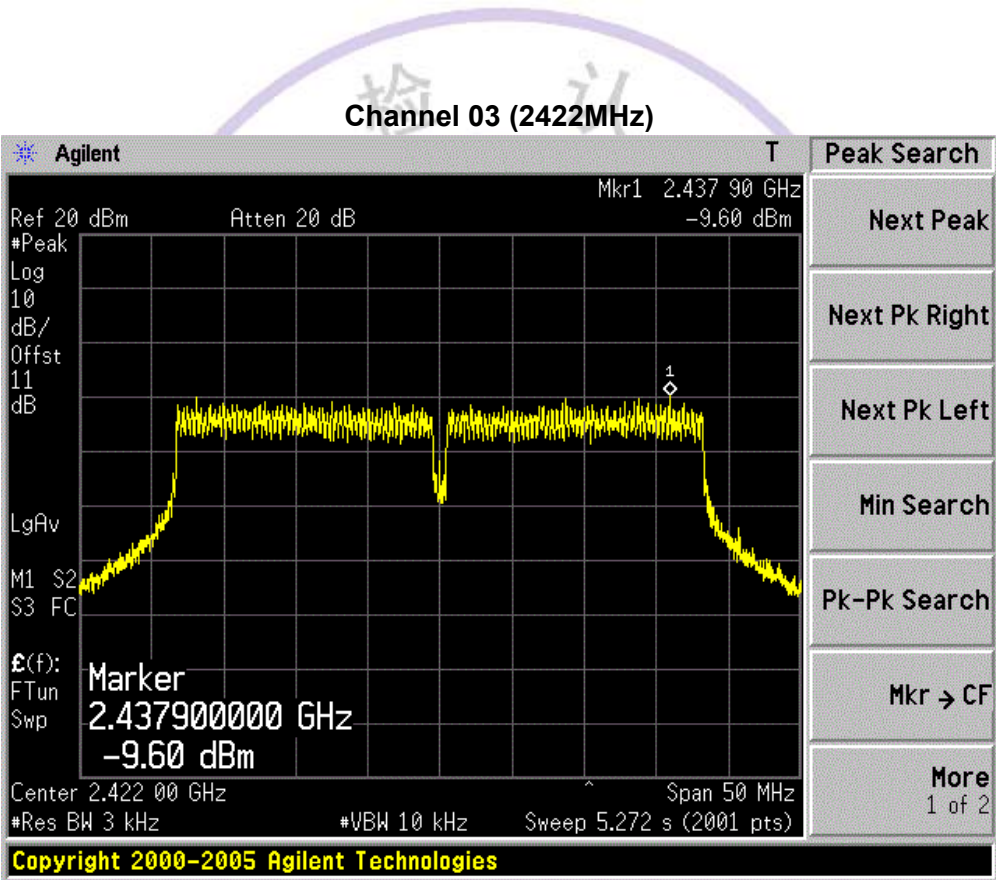


Channel 11 (2462MHz)

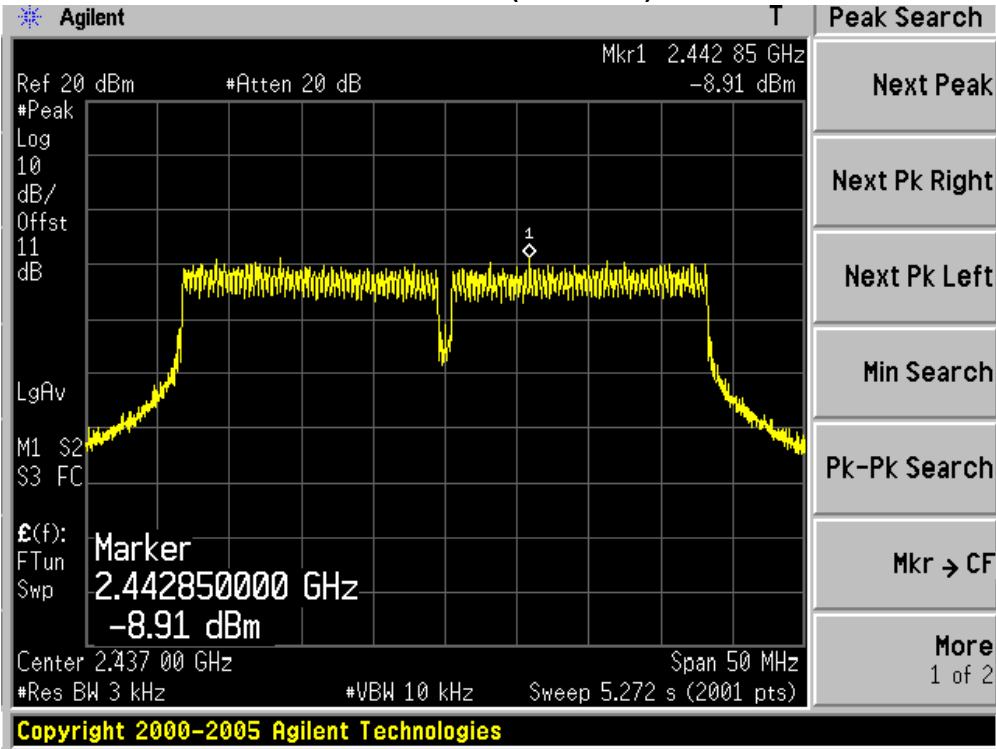


Product	:	Smart Phone
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11n (40MHz)

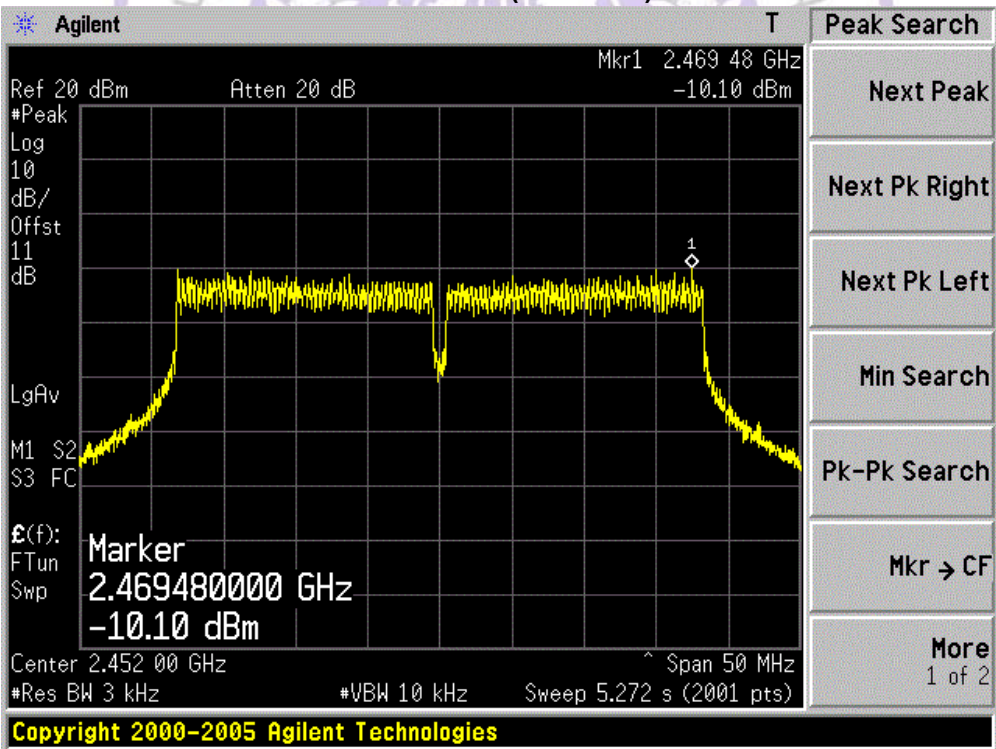
Channel No.	Frequency (MHz)	Measurement PSD (dBm)	Limit (dBm)	Result
03	2422	-9.60	8	Pass
06	2437	-8.91	8	Pass
09	2452	-10.10	8	Pass



Channel 06 (2437MHz)

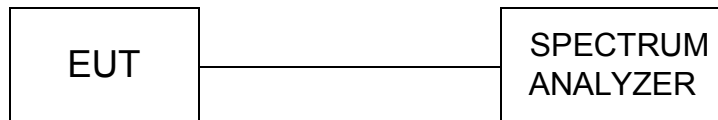


Channel 09 (2452MHz)



4.7. Spurious RF Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

The EUT was tested according to KDB558074 D01 v03r01 for compliance to FCC 47CFR 15.247 and RSS-210 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.

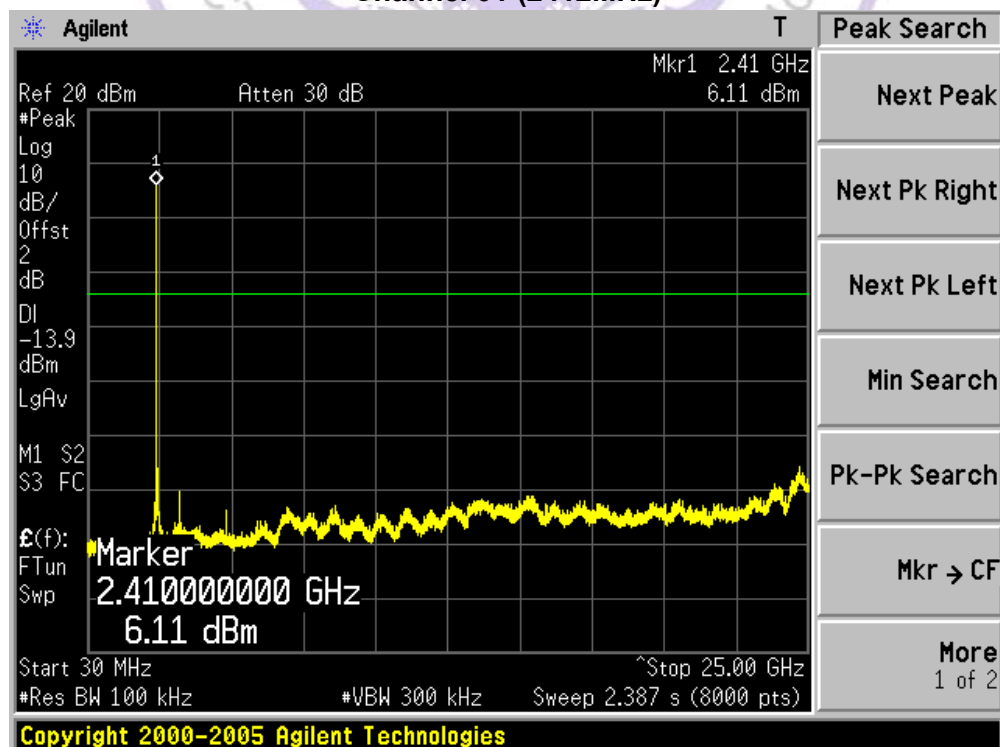
LIMIT

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.

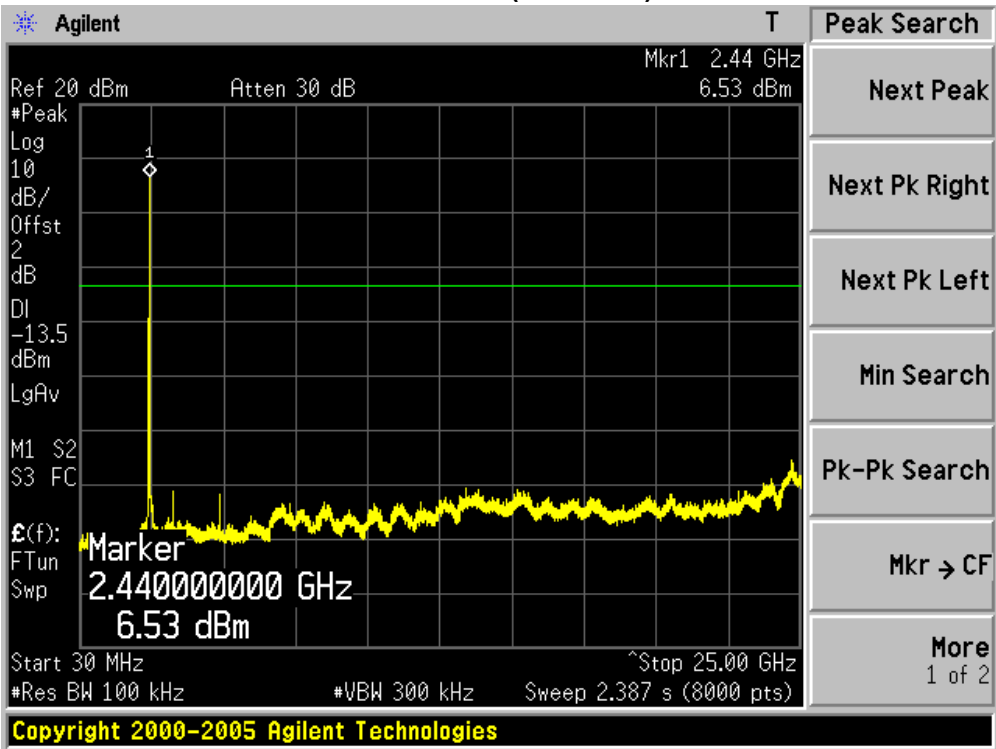
TEST RESULTS

Product	:	Smart Phone
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

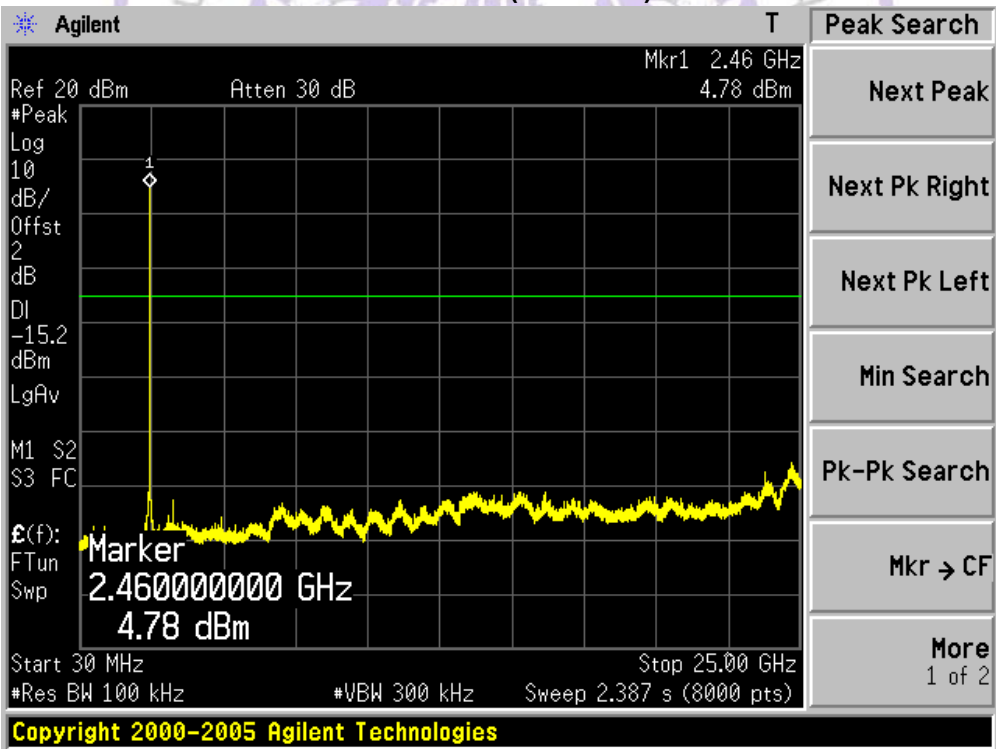
Channel 01 (2412MHz)



Channel 06 (2437MHz)

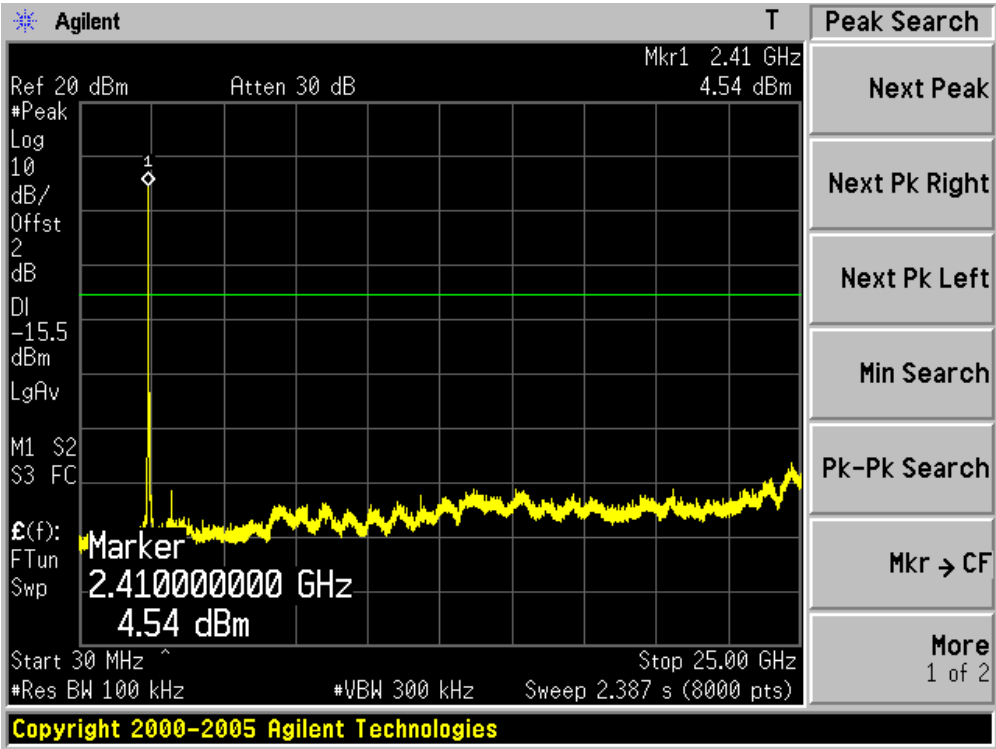


Channel 11 (2462MHz)

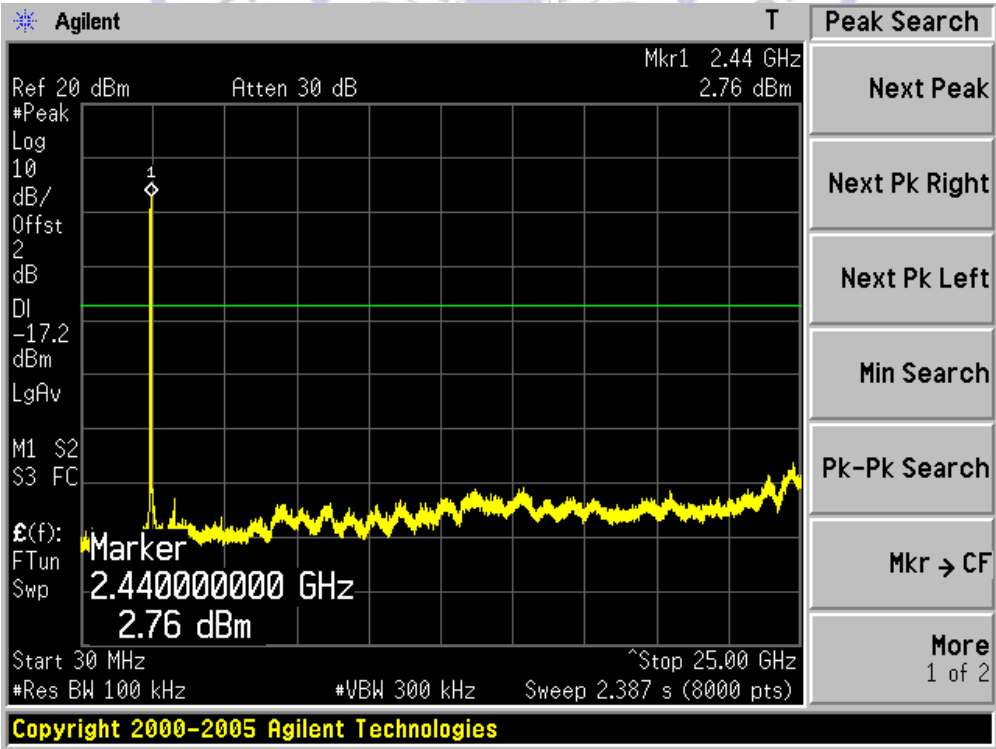


Product	:	Smart Phone
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

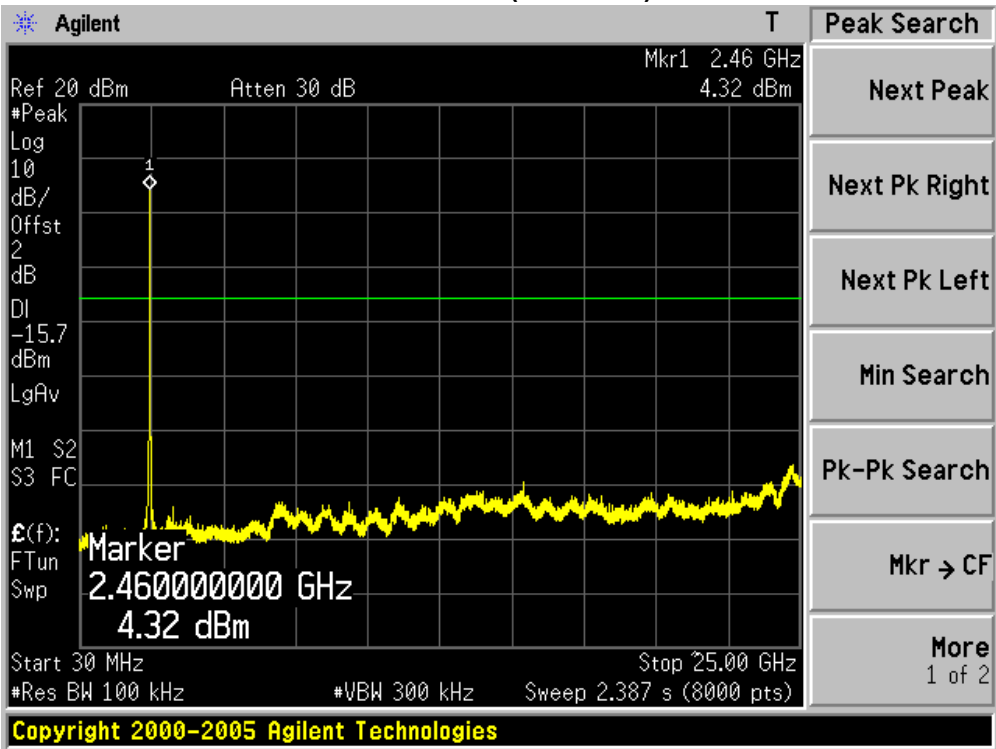
Channel 01 (2412MHz)



Channel 06 (2437MHz)

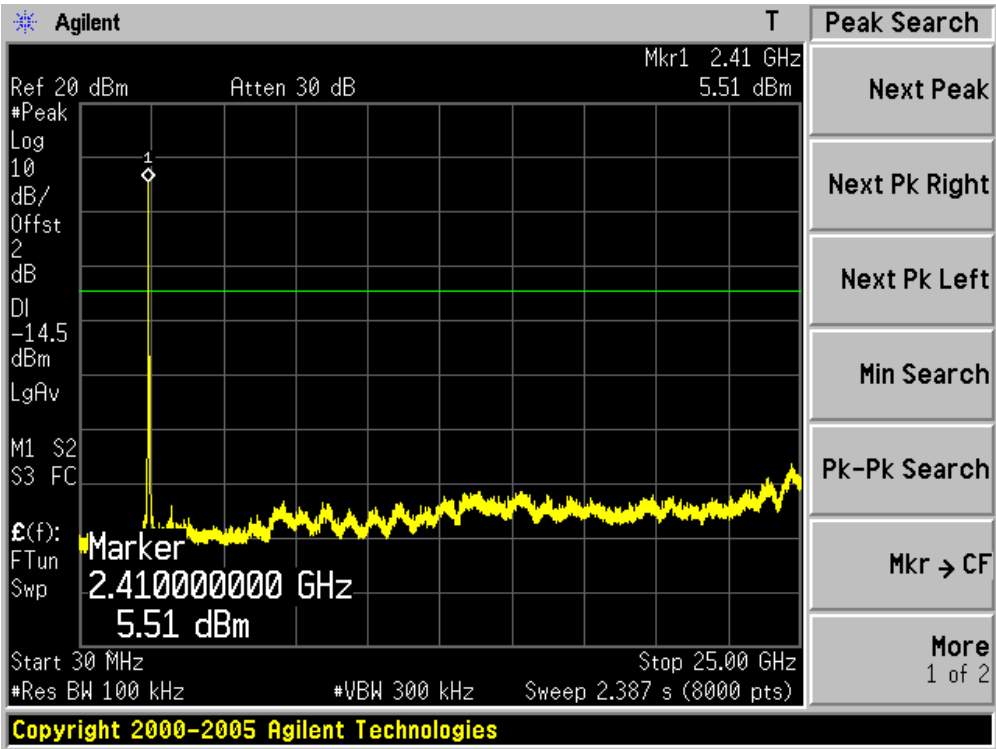


Channel 11 (2462MHz)

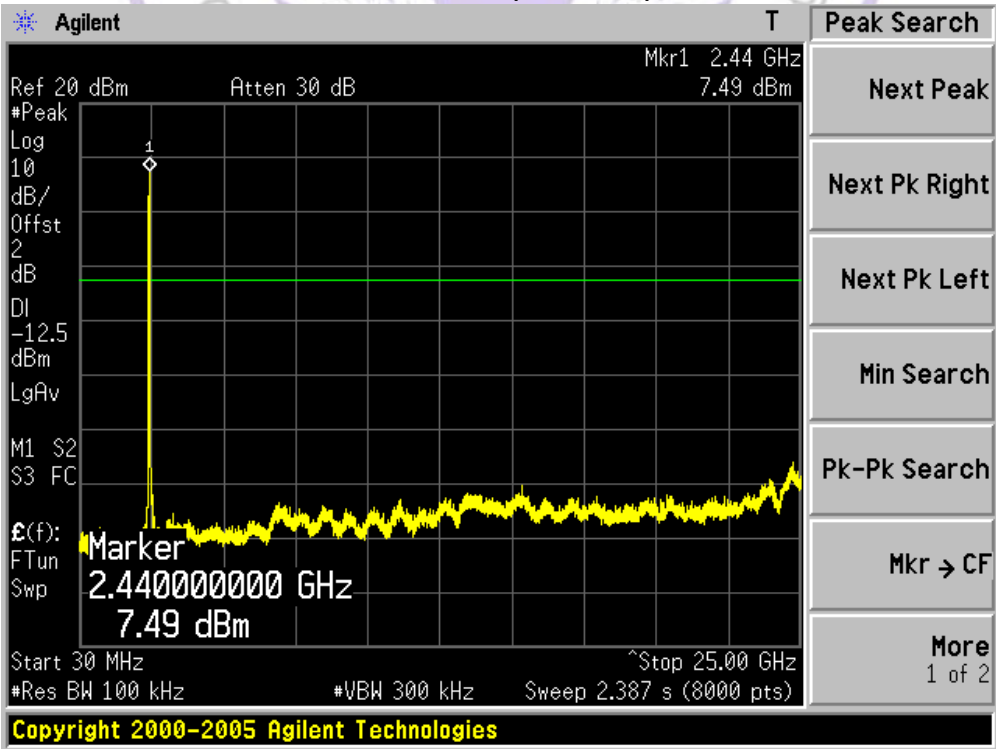


Product	:	Smart Phone
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz)

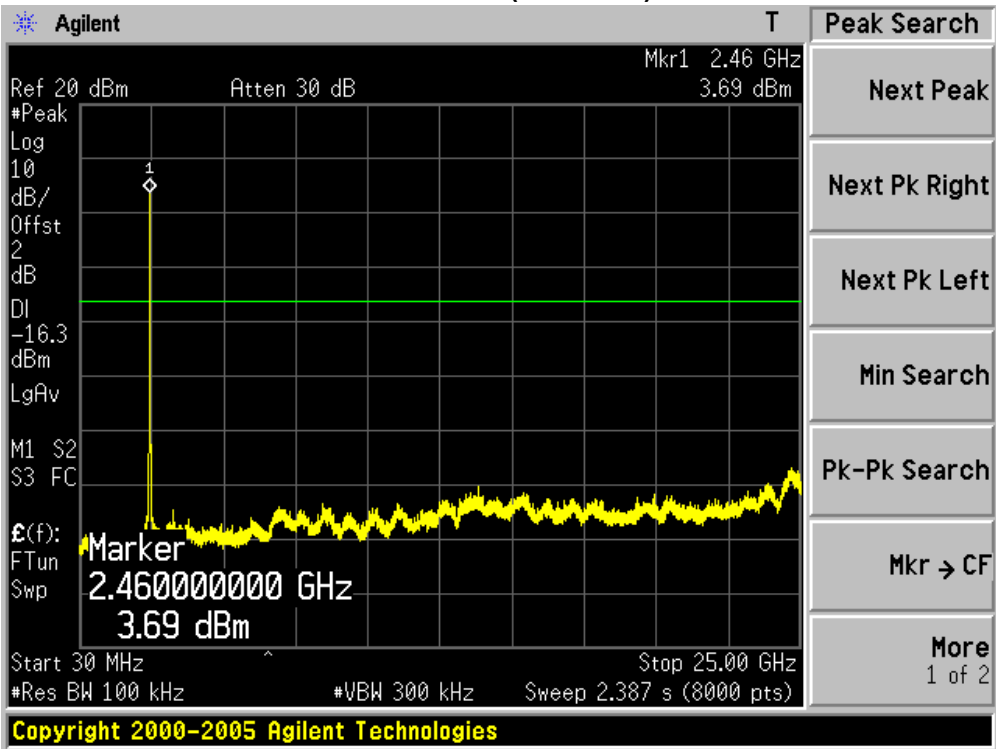
Channel 01 (2412MHz)



Channel 06 (2437MHz)

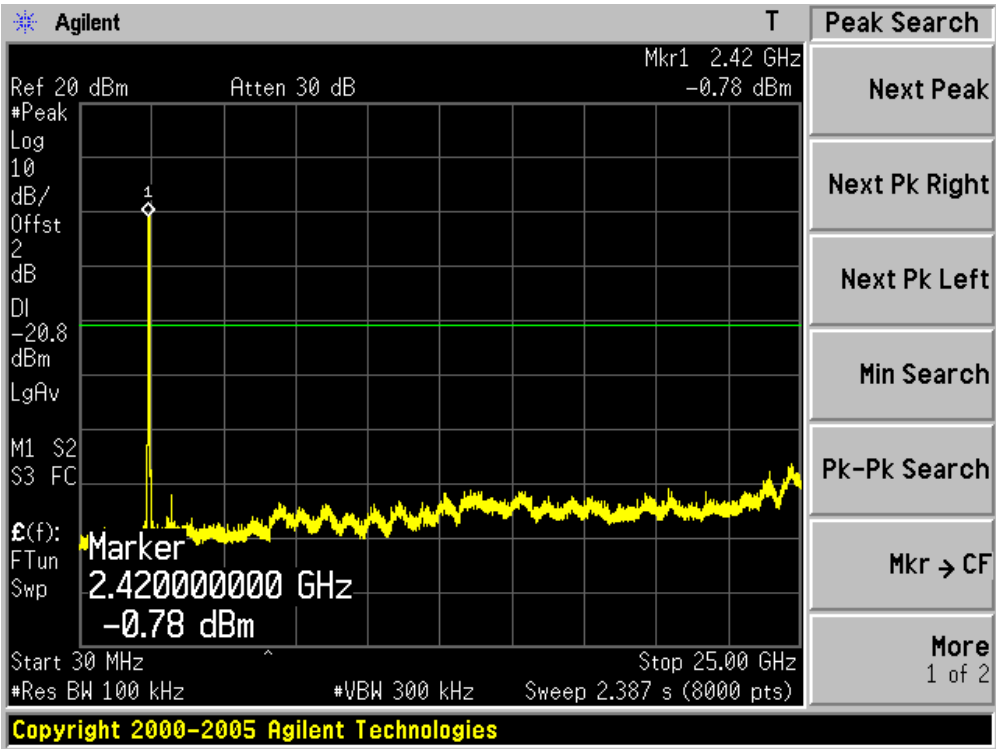


Channel 11 (2462MHz)

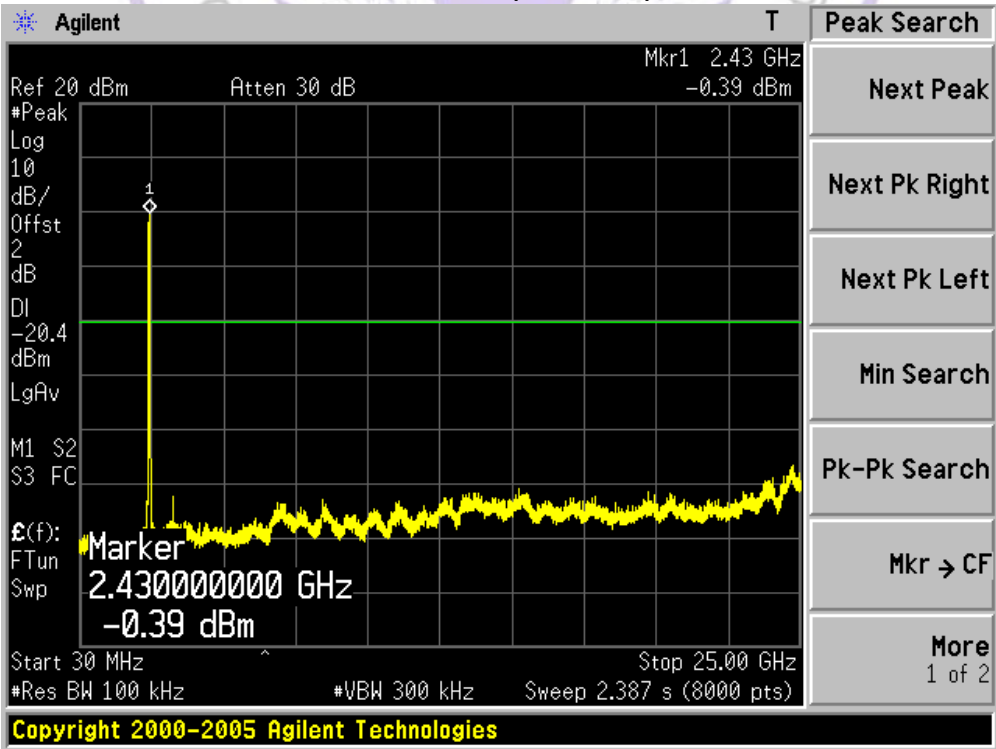


Product	:	Smart Phone
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11n (40MHz)

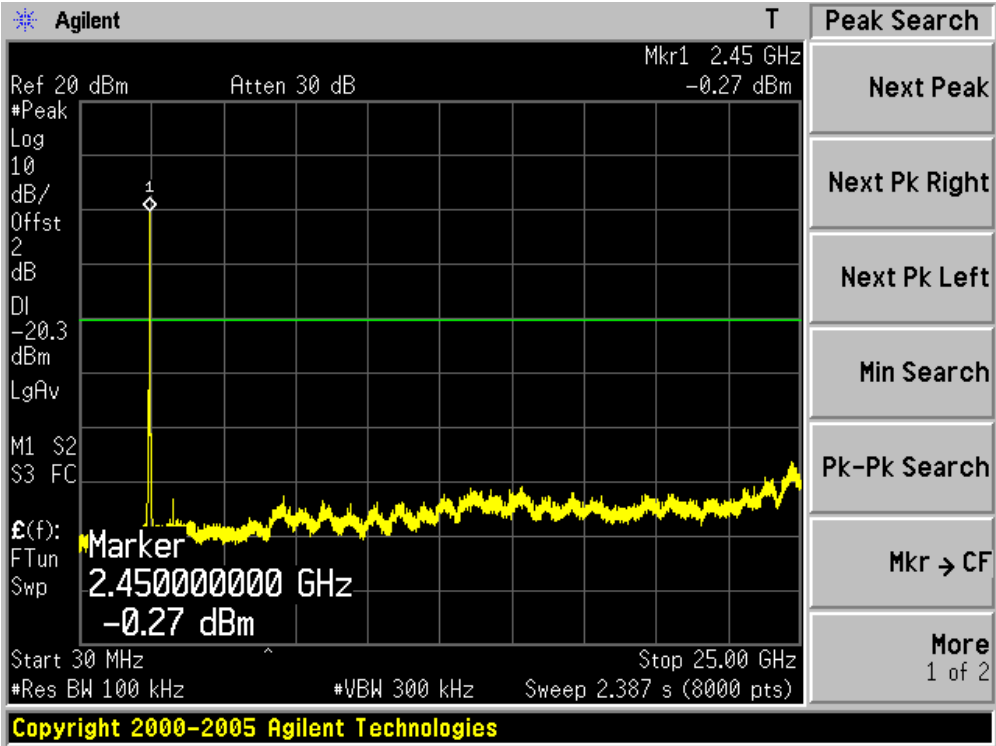
Channel 03 (2422MHz)



Channel 06 (2437MHz)

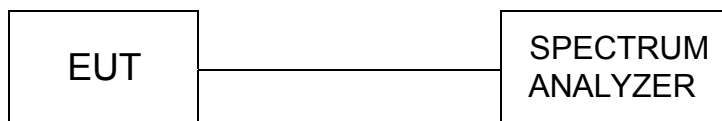


Channel 09 (2452MHz)



4.8. Operation Frequency Range of 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

The EUT was tested according to KDB558074 D01 v03r01 for compliance to FCC 47CFR 15.247 and RSS-210 requirements.

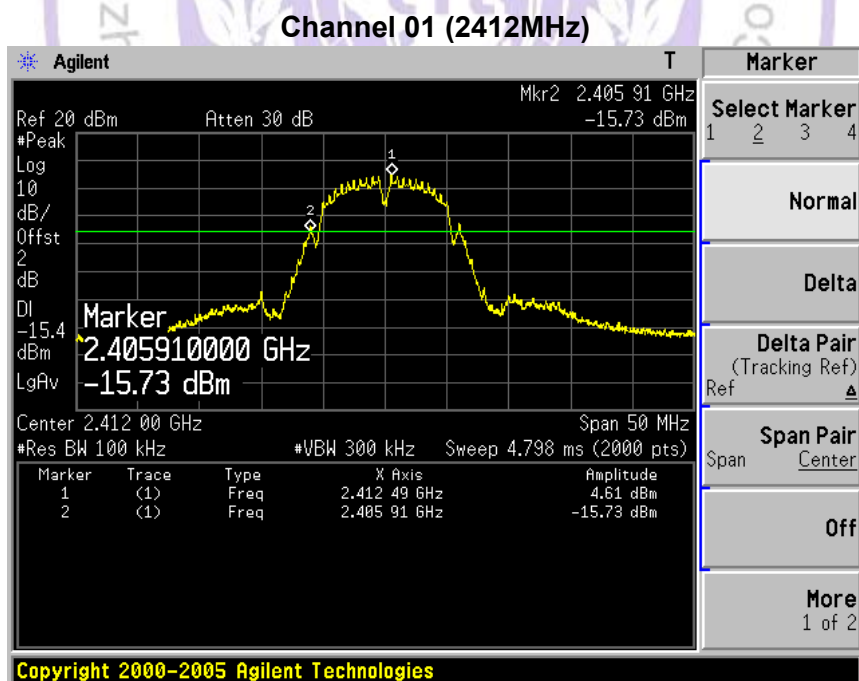
Set RBW = 100 kHz, Span greater than RBW.

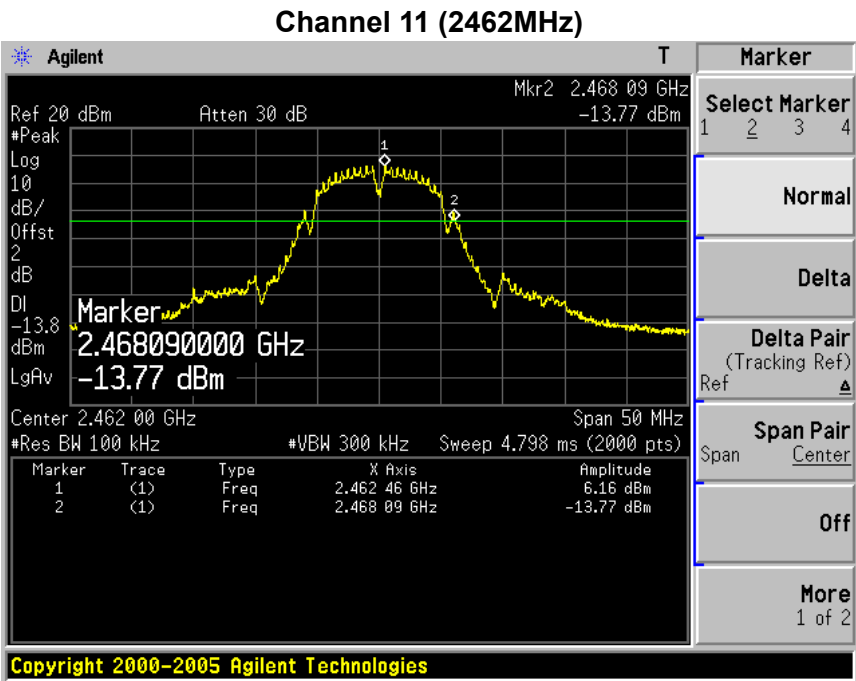
LIMIT

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

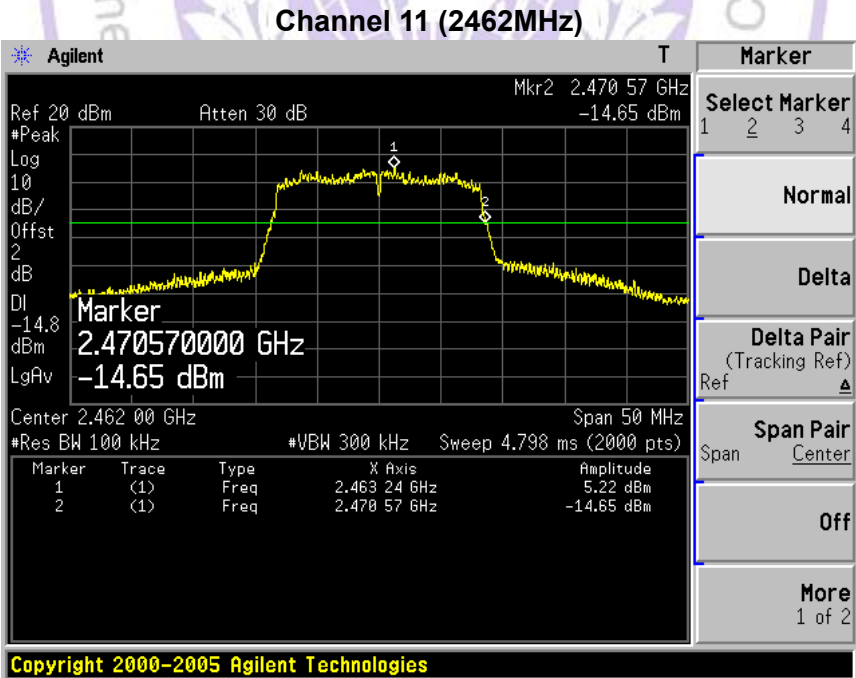
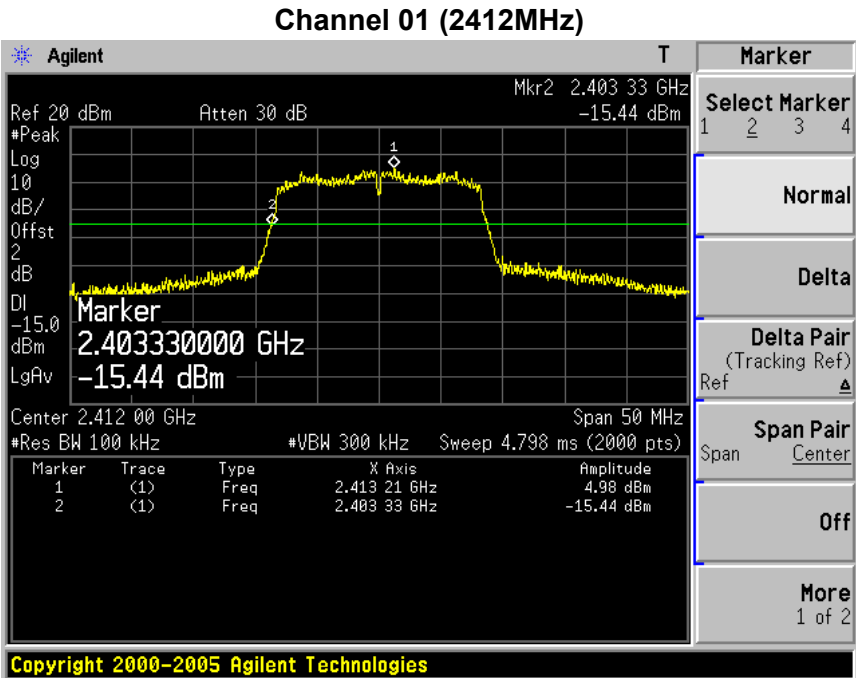
TEST RESULT

Product	:	Smart Phone
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b



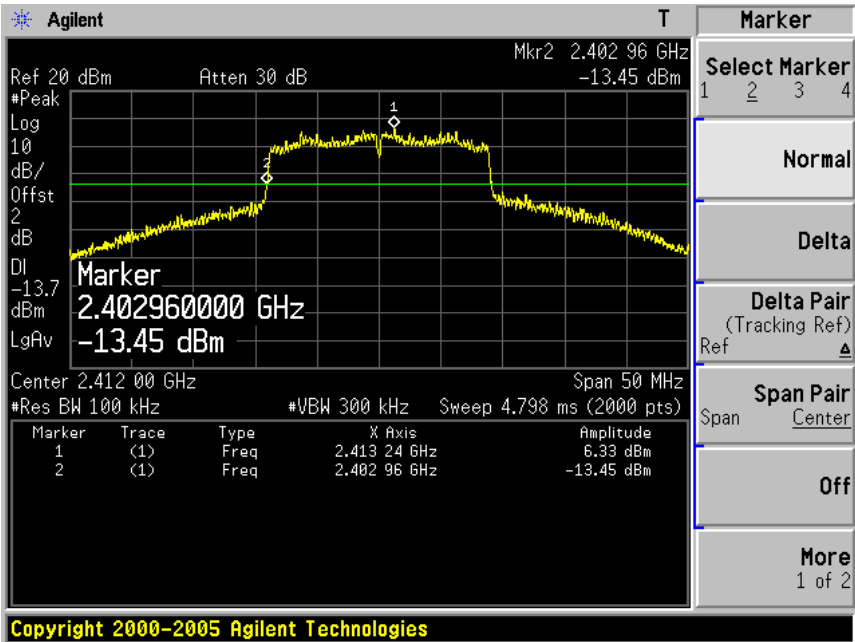


Product	:	Smart Phone
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

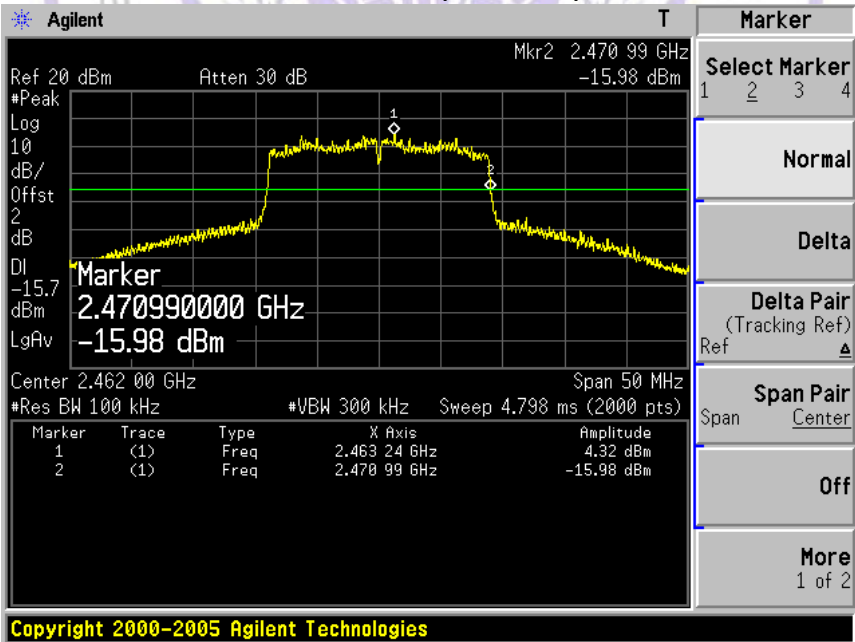


Product	:	Smart Phone
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz)

Channel 01 (2412MHz)

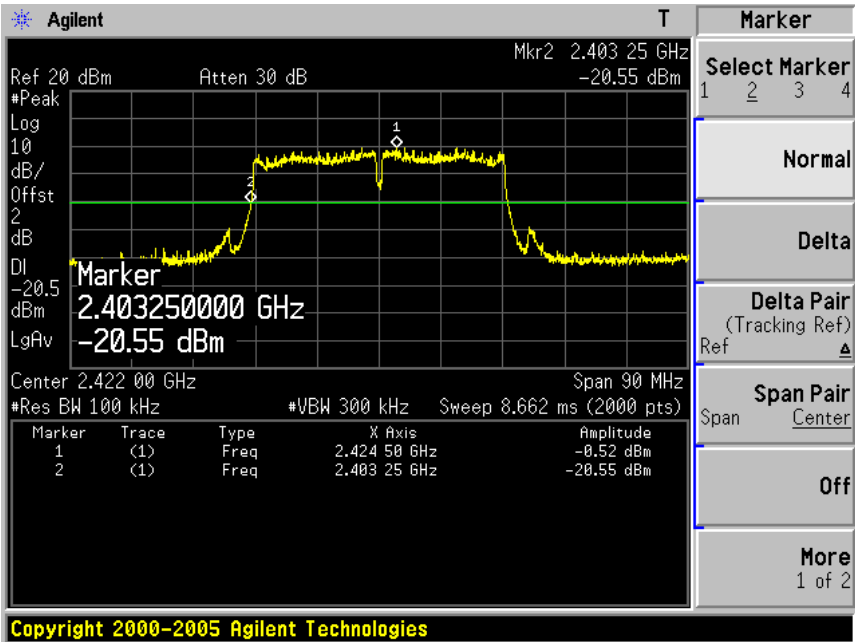


Channel 11 (2462MHz)

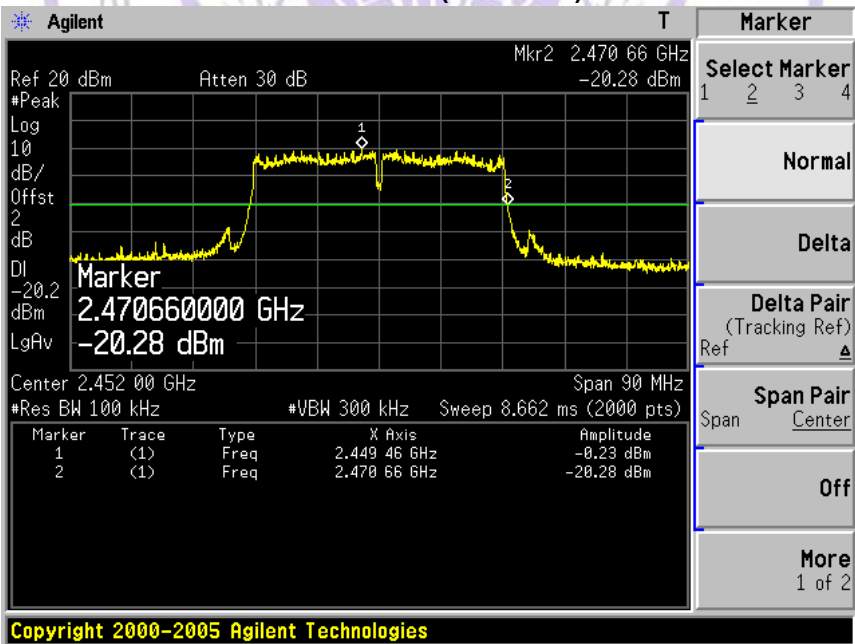


Product	:	Smart Phone
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 4: Transmit by 802.11n (40MHz)

Channel 03 (2422MHz)



Channel 09 (2452MHz)



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.

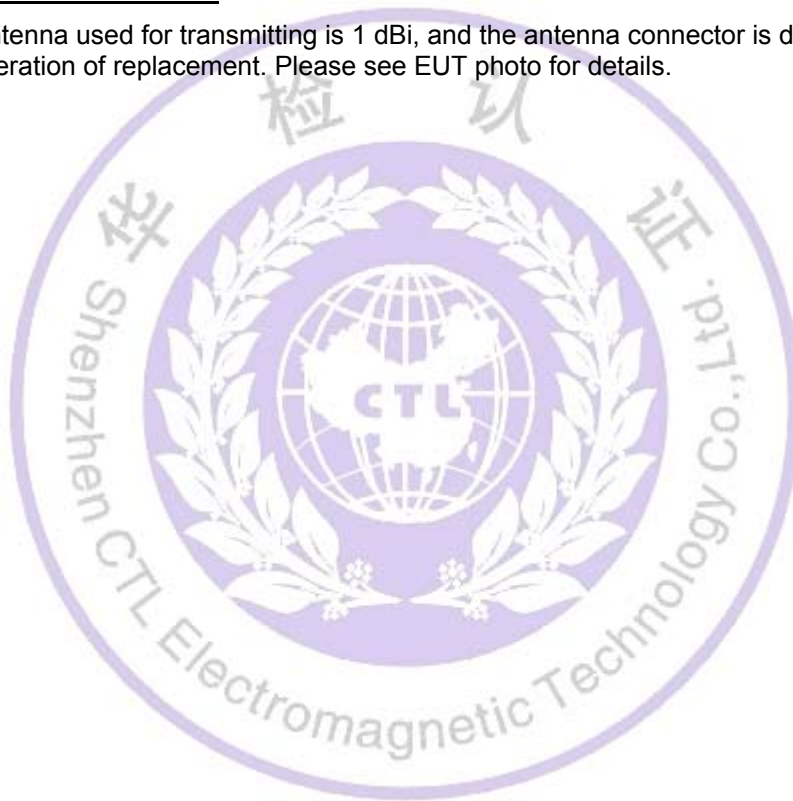
And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

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.

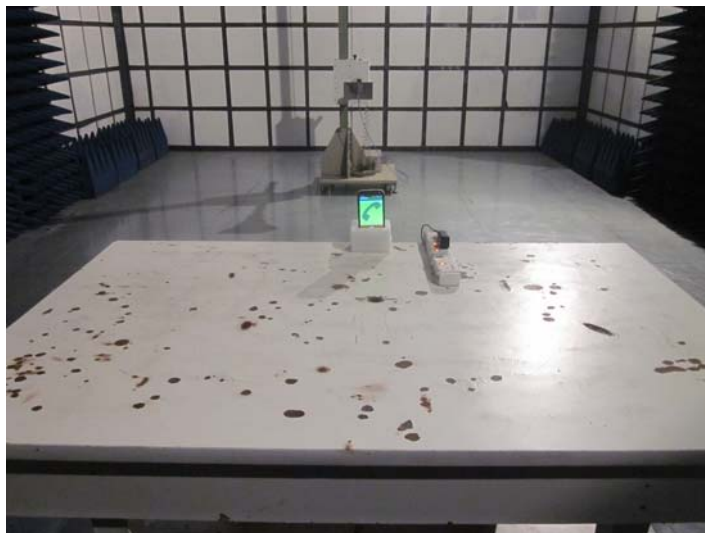
ANTENNA CONNECTED CONSTRUCTION

The directional gains of antenna used for transmitting is 1 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

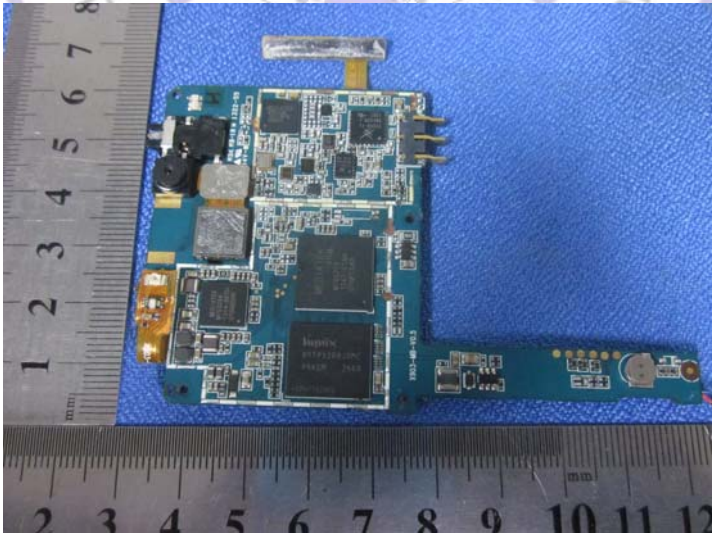
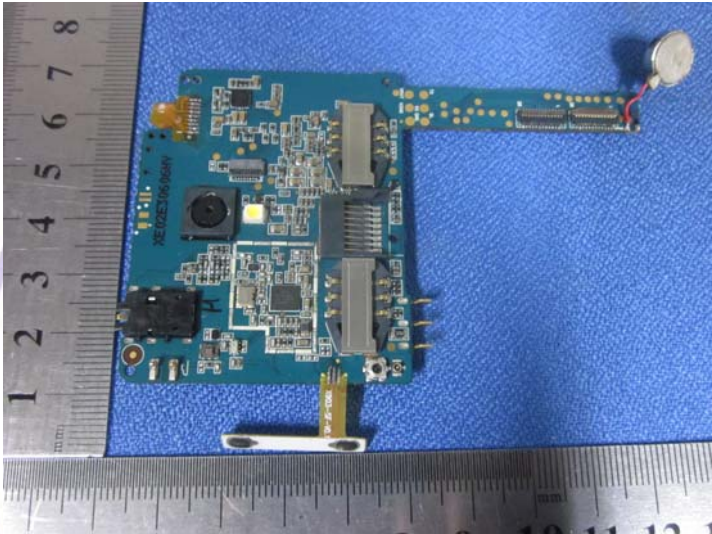


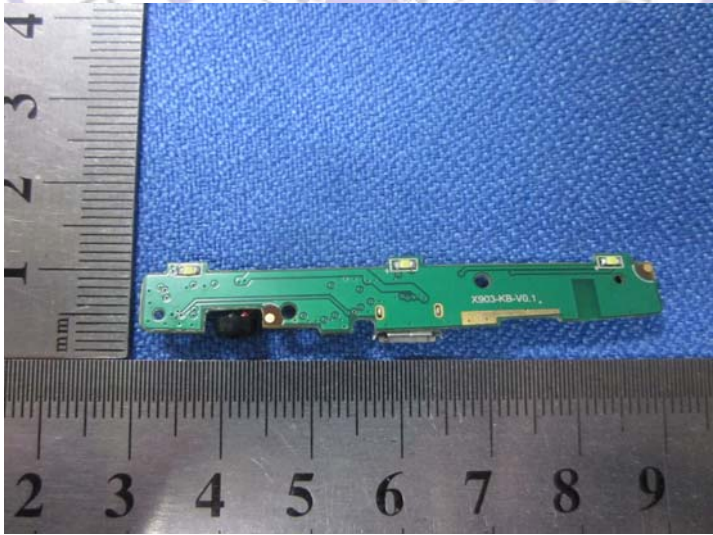
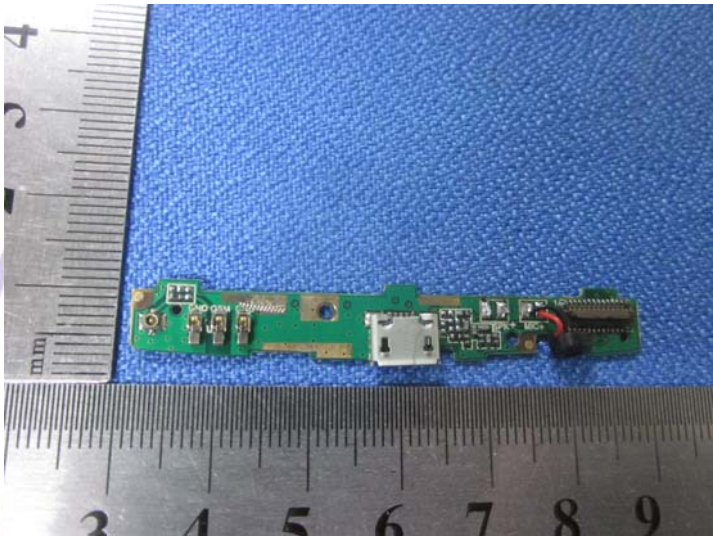




Internal Photos of EUT







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