

FCC Test Report

EQUIPMENT : iPAQ Voice Messenger
BRAND NAME : HP
MODEL NO. : HSTNH-F20C-85
FCC ID : B94HHF20C85
STANDARD : 47 CFR FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)
APPLICANT : Hewlett-Packard Company
10955 Tantau Ave., CupertinoCA, 95014-0770, USA

The product sample received on May 22, 2008 and completely tested on Nov. 17, 2008. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Roy Wu
/ Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
	RSS-210				
4.1	15.247(a)(2)	6dB Bandwidth	> 0.5MHz	Pass	-
	A8.2(a)				
4.2	15.247(b)	Power Output	< 30dBm	Pass	-
	A8.4				
4.3	15.247(d)	Frequency Band Edges	< 20dBc	Pass	-
	A8.5				
4.4	15.247(e)	Power Spectral Density	< 8dBm	Pass	-
	A8.2(b)				
4.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 12.6 dB at 0.43 MHz
	Gen 7.2.2				
4.6	15.247(d)	Transmitter Radiated Emission	15.209(a)	Pass	Under limit 7.41 dB at 30.54 MHz
	A8.5				
4.7	15.203	Antenna Requirement	N/A	Pass	-
	15.247(b)/(c)				
	A8.4(5)/(6)				

1 General Description

1.1 Applicant

Hewlett-Packard Company
10955 Tantau Ave., CupertinoCA, 95014-0770, USA

1.2 Manufacturer

FOXCONN Technology Group
4F G5 No.2,2nd Donghuan Road, 10th Yousong Industrial District, Longhua, Baoan, Shenzhen City, Guangdong Province, China 518109

1.3 Basic Description of Accessories

AC Adapter 1	Brand Name	HP
	Model Name	PSAA05-050
	Power Rating	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 1A
	AC Power Cord Type	1.8 meter shielded cable without ferrite core
AC Adapter 2	Brand Name	HP
	Model Name	PSB05R-050Q
	Power Rating	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 1A
Battery 1	Brand Name	HP
	Model Name	HSTNH-T20B-S
	Power Rating	3.7Vdc, 1200mAh
	Type	Li-ion
Battery 2	Brand Name	HP
	Model Name	HSTNH-K20B-H
	Power Rating	3.7Vdc, 1940mAh
	Type	Li-ion
Earphone	Brand Name	FOSTER
	Model Name	480052
	Signal Line Type	1.45 meter non-shielded cable without ferrite core
USB Cable	Brand Name	Foxconn
	Model Name	CUNC005B-T45-EF
	Signal Line Type	1.4 meter shielded cable without ferrite core
LCD Panel	Brand Name	SAMSUNG
	Model Name	LMS241GF17
Camera	Brand Name	SAMSUNG
	Model Name	MOMBE547G6A

Remark: Above EUT's information was declared by manufacturer. Please refer to the specifications of manufacturer or User's Manual for more detailed features description.

1.4 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	iPAQ Voice Messenger
Brand Name	HP
Model No.	HSTNH-F20C-85
Frequency Range	2400 - 2483.5 MHz
Number of Channels	11
Channel Spacing	5 MHz
Power Output to Antenna	802.11b : 14.60 dBm 802.11g : 13.09 dBm
Antenna Type	PIFA antenna with gain 2 dBi
Antenna Connector Type	NA
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
DUT Stage	Identical Prototype

Remark:

- The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
- This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
- For accessories equipped with this EUT, please refer to the appendix of the external photo.
- For other wireless features of this EUT, test report will be issued separately.
- The differences between two adapters and batteries provided to the testing:

AC Adapter 1	Brand Name	HP
	Model Name	PSAA05-050
	Power Rating	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 1A
	AC Power Cord Type	1.8 meter shielded cable without ferrite core
AC Adapter 2	Brand Name	HP
	Model Name	PSB05R-050Q
	Power Rating	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 1A
Battery 1	Brand Name	HP
	Model Name	HSTNH-T20B-S
	Power Rating	3.7Vdc, 1200mAh
	Type	Li-ion
Battery 2	Brand Name	HP
	Model Name	HSTNH-K20B-H
	Power Rating	3.7Vdc, 1940mAh
	Type	Li-ion

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003

Remark:

- ♦ All test items were verified and recorded according to the standards and without any deviation during the test.
- ♦ This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC) which recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable / Power Cord
1	BT Base Station	Anritus	8852B	N/A	Unshielded, 1.8 m
2	Bluetooth Earphone	Engotech	ET-BH111	PQY471087	N/A

1.7 Testing Facility

Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C TEL: +886-3-3273456 / FAX: +886-3-3284978		
	Sporton Site No.		IC Registration No.
Test Site No.	CO04-HY / CO05-HY	03CH06-HY	4086B-1

2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437		

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and recorded the RF power output in the following table:

Channel	Frequency (MHz)	RF Power (dBm)			
		2.4GHz 802.11b DSSS Data Rate (Mbps)			
		1	2	5.5	11
01	2412	14.56	14.59	14.60	14.59
06	2437	12.34	12.37	12.36	12.35
11	2462	14.23	14.40	14.40	14.21

Channel	Frequency (MHz)	RF Power (dBm)							
		2.4GHz 802.11g OFDM Data Rate (Mbps)							
		6	9	12	18	24	36	48	54
01	2412	12.64	12.80	12.87	12.80	12.67	12.54	12.88	12.95
06	2437	10.80	10.77	10.63	10.55	10.69	10.81	11.06	10.74
11	2462	12.77	13.09	12.82	12.85	12.72	12.87	12.91	12.90

- ♦ **Remark:**
- ♦ The 802.11b data rate was set in 5.5Mbps and 802.11g set in 9Mbps due to the highest RF output power.
- ♦ The EUT is programmed to transmit signal continuously for all testing.

2.3 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases and recorded in this report.

EUT Configure Mode	Mode Description	Test Condition			
		EMI AC	EMI RE<1G	EMI RE≥1G	EMI RF
1	Operating Mode (802.11b)	Note 1	✓	✓	✓
2	Operating Mode (802.11g)	Note 1	Note 2	✓	✓
3	Charging Mode (BT Link + WLAN Link + Earphone + Adapter 1 + Battery 1)	✓	✓	Note 2	Note 2
4	Charging Mode (BT Link + WLAN Link + Earphone + Adapter 2 + Battery 2)	✓	✓	Note 2	Note 2

Abbreviations:

EMI AC: AC conducted emissions ; EMI RE<1G: EUT radiated emissions ≥ 1GHz;

EMI RE<1G: EUT radiated emissions < 1GHz ; EMI RF: EUT RF conducted emissions;

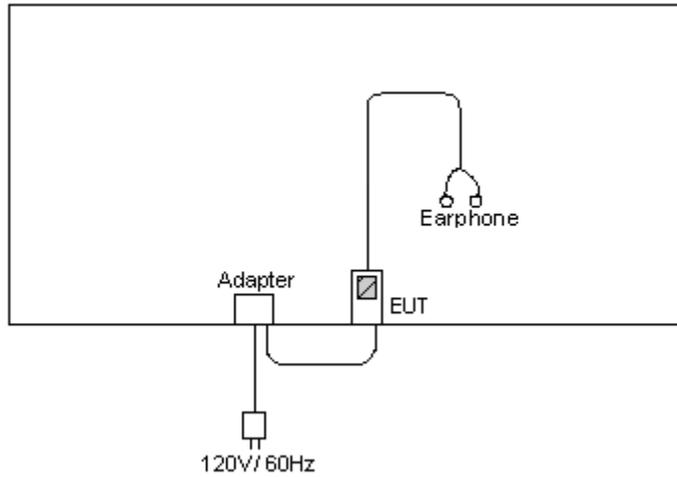
Note 1: Fulfill no test criteria, EUT is powered by battery.

Note 2: Test results are uninfluenced by this EUT configuration mode.

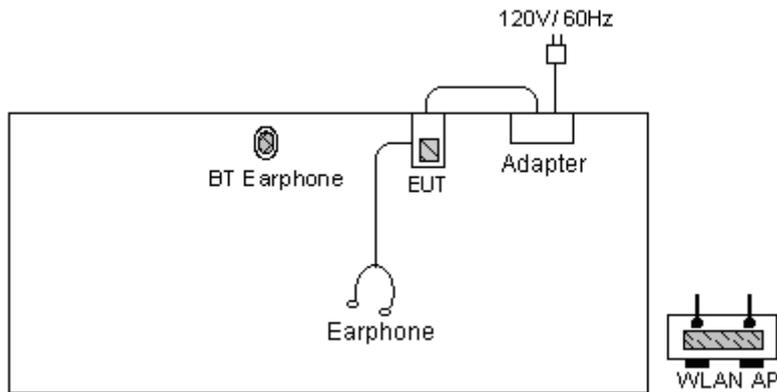
Test Items	EUT Mode	Modulation Type	802.11b/g Data Rate (Mbps)	802.11b/g Test Channel
6dB Bandwidth	1/2	QPSK/BPSK	5.5/9	01/06/11
Power Output	1/2	QPSK/BPSK	5.5/9	01/06/11
Frequency Band Edges	1/2	QPSK/BPSK	5.5/9	01/11
Power Spectral Density	1/2	QPSK/BPSK	5.5/9	01/06/11
AC Conducted Emission	3/4	QPSK	5.5	06
Radiated Emissions < 1GHz	1/2	QPSK/BPSK	5.5/9	06
Radiated Emissions ≥ 1GHz	1/2	QPSK/BPSK	5.5/9	01/06/11

2.4 Connection Diagram of Test System

<Radiated Emission>



<Conducted Emission>



2.5 RF Utility

The programmed RF Utility is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

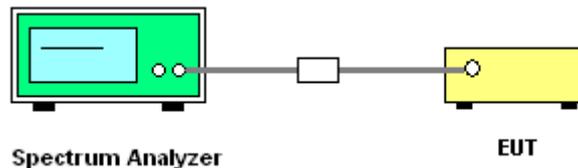
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. Please refer 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.

3.1.4 Test Setup





3.1.5 Test Result of 6dB Bandwidth

EUT Mode :	1 (802.11b)	Temperature :	29~30°C
Test Engineer :	Darren Lin	Relative Humidity :	45~46%

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	12.28	0.5	Pass
06	2437	12.28	0.5	Pass
11	2462	12.32	0.5	Pass

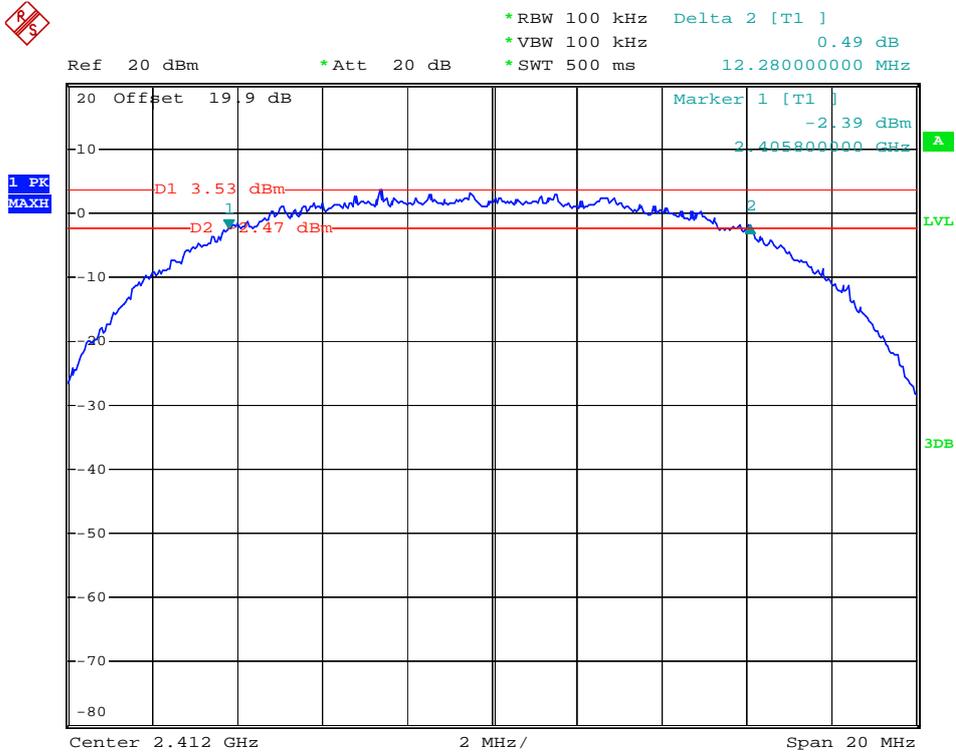
EUT Mode :	2 (802.11g)	Temperature :	29~30°C
Test Engineer :	Darren Lin	Relative Humidity :	45~46%

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.52	0.5	Pass
06	2437	16.52	0.5	Pass
11	2462	16.52	0.5	Pass

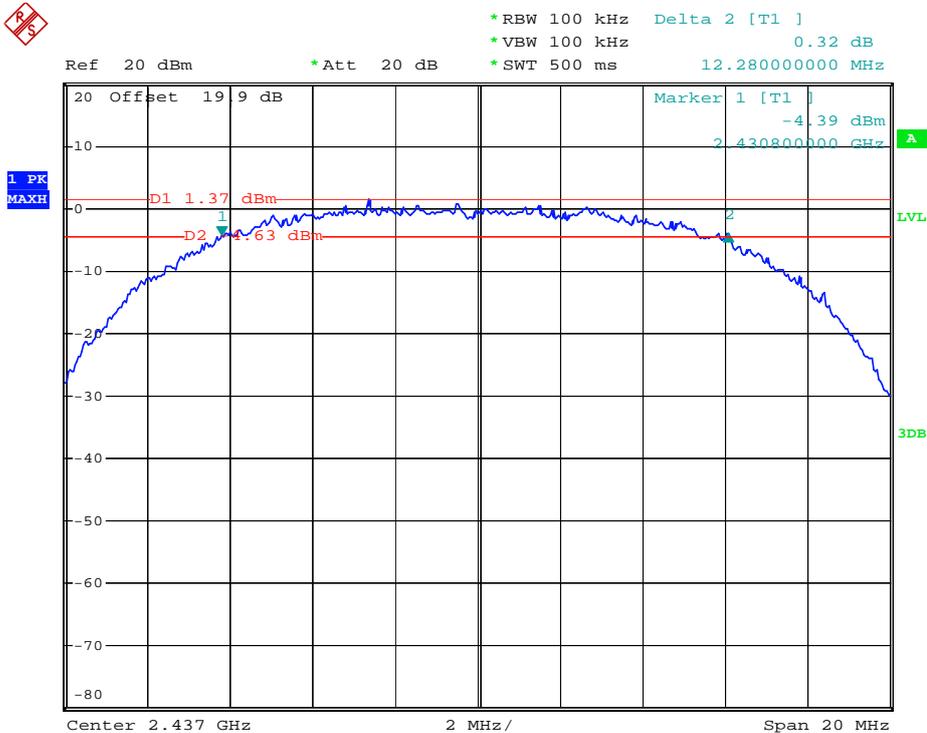


3.1.6 Test Result of 6dB Bandwidth Plots

Mode 1 : 6 dB Bandwidth Plot on Channel 01

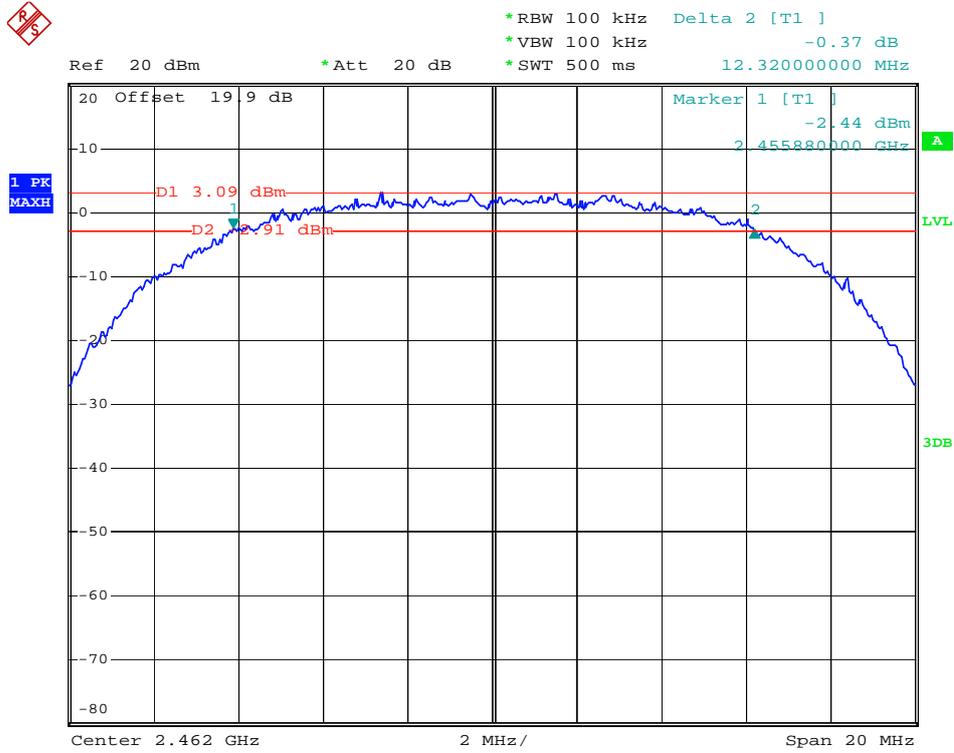


Mode 1 : 6 dB Bandwidth Plot on Channel 06

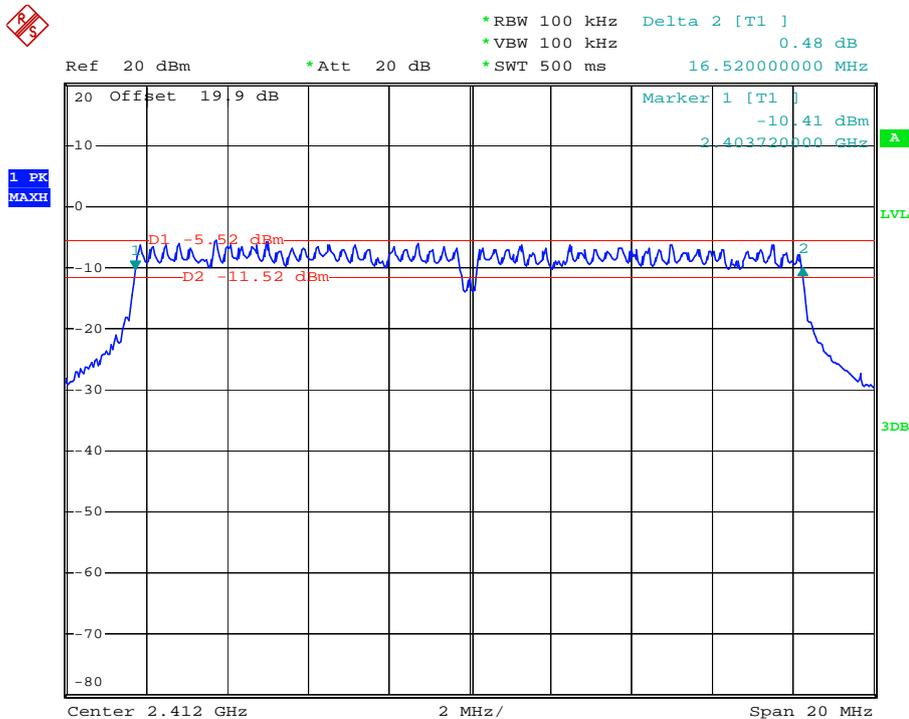




Mode 1 : 6 dB Bandwidth Plot on Channel 11

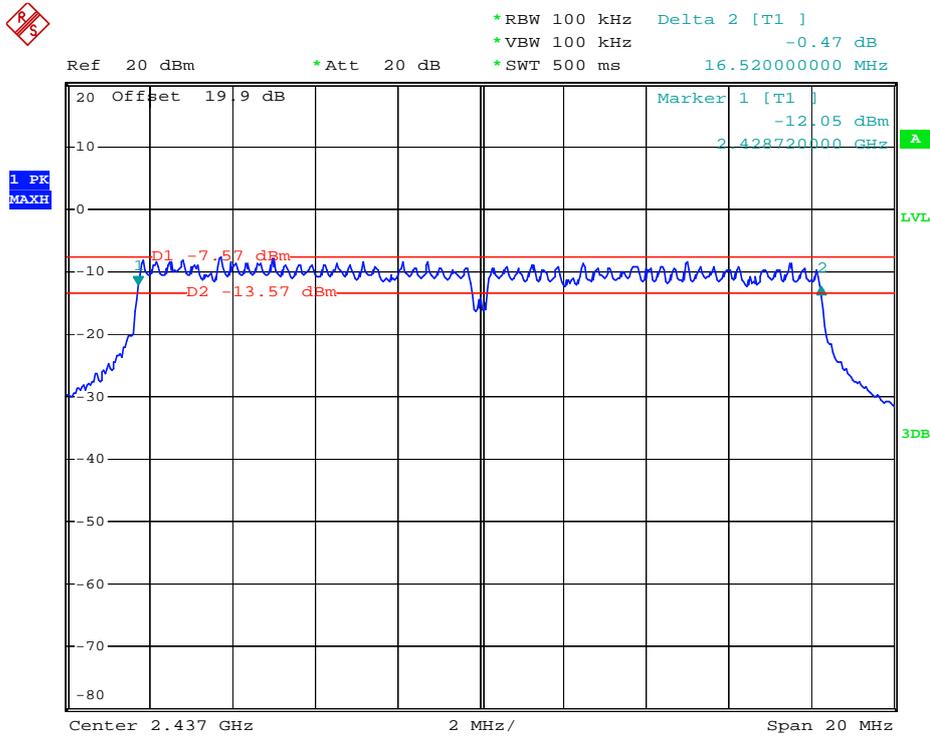


Mode 2 : 6 dB Bandwidth Plot on Channel 01

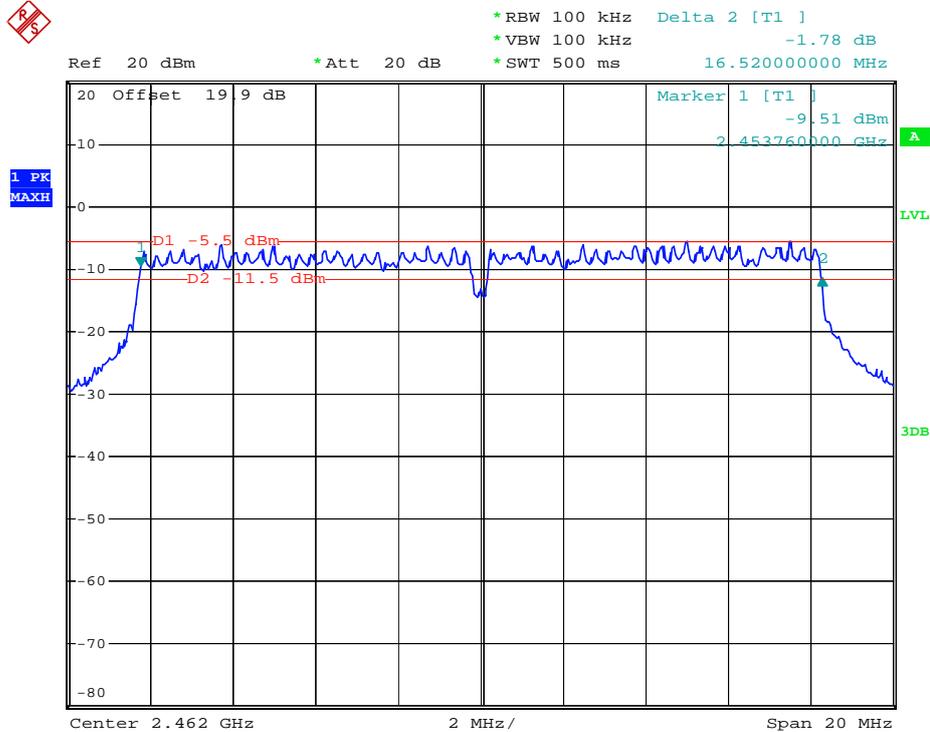




Mode 2 : 6 dB Bandwidth Plot on Channel 06



Mode 2 : 6 dB Bandwidth Plot on Channel 11



3.2 Power Output Measurement

3.2.1 Limit of Power Output

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

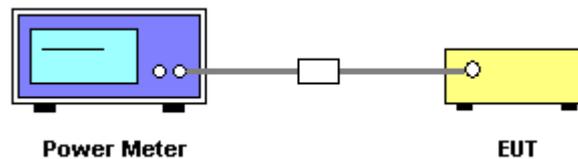
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

5. Please refer FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
6. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
7. Measure the guidelines of "Power Output Option 1".

3.2.4 Test Setup





3.2.5 Test Result of Power Output

EUT Mode :	1 (802.11b)	Temperature :	29~30°C
Test Engineer :	Darren Lin	Relative Humidity :	45~46%

Channel	Frequency (MHz)	Measured Power Output (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	14.60	30	Pass
06	2437	12.36	30	Pass
11	2462	14.40	30	Pass

EUT Mode :	2 (802.11g)	Temperature :	29~30°C
Test Engineer :	Darren Lin	Relative Humidity :	45~46%

Channel	Frequency (MHz)	Measured Power Output (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	12.80	30	Pass
06	2437	10.77	30	Pass
11	2462	13.09	30	Pass

3.3 Band Edges Measurement

3.3.1 Limit of Band Edges

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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. If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.

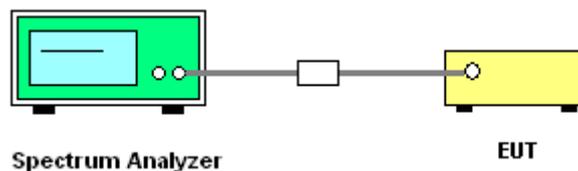
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. Please follow the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. RF antenna conducted test: Set RBW = 100 kHz, Video bandwidth (VBW) > RBW, scan up through 10th harmonic. Bandedge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Applies to bandedge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp (and possibly a high-pass filter) is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See FCC Section 15.35(b) and (c).

3.3.4 Test Setup





3.3.5 Test Result of Radiated Band Edges

EUT Mode :	1 (802.11b)	Temperature :	24~26°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	Darren Lin		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.09	56.28	-17.72	74.00	56.06	31.98	3.92	35.68	100	0	Peak
2388.09	38.66	-15.34	54.00	38.44	31.98	3.92	35.68	195	15	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	51.44	-22.56	74.00	51.22	31.98	3.92	35.68	100	0	Peak
2389.99	35.73	-18.27	54.00	35.51	31.98	3.92	35.68	100	318	Average

EUT Mode :	1 (802.11b)	Temperature :	29~30°C
Test Channel :	11	Relative Humidity :	45~46%
Test Engineer :	Darren Lin		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2494.49	45.88	-28.12	74.00	45.55	31.98	4.05	35.70	100	0	Peak
2494.49	32.87	-21.13	54.00	32.52	32.00	4.05	35.70	197	245	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2497.34	46.38	-27.62	74.00	46.05	31.98	4.05	35.70	100	0	Peak
2497.34	33.86	-20.14	54.00	33.51	32.00	4.05	35.70	107	345	Average



EUT Mode :	2 (802.11g)	Temperature :	29~30°C
Test Channel :	01	Relative Humidity :	45~46%
Test Engineer :	Darren Lin		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.61	59.53	-14.47	74.00	59.43	31.86	3.92	35.68	100	0	Peak
2389.61	38.72	-15.28	54.00	38.62	31.85	3.92	35.68	161	26	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.61	51.22	-22.78	74.00	51.12	31.86	3.92	35.68	100	0	Peak
2389.61	34.42	-19.58	54.00	34.32	31.85	3.92	35.68	100	324	Average

EUT Mode :	2 (802.11g)	Temperature :	29~30°C
Test Channel :	11	Relative Humidity :	45~46%
Test Engineer :	Darren Lin		

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.42	60.38	-13.62	74.00	60.05	31.98	4.05	35.70	100	0	Peak
2484.42	42.05	-11.95	54.00	41.72	31.98	4.05	35.70	100	25	Average

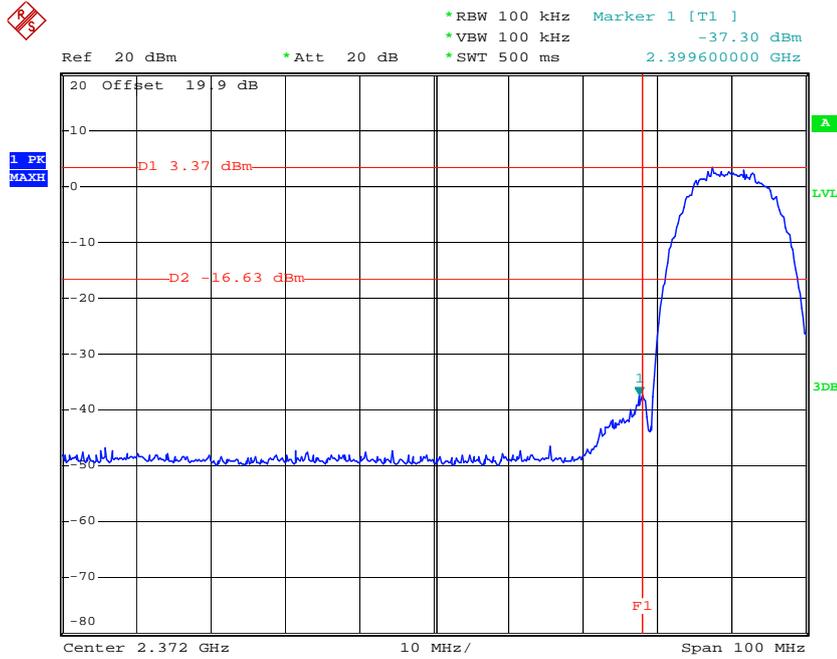
ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.85	58.31	-15.69	74.00	57.98	31.98	4.05	35.70	100	0	Peak
2483.85	38.62	-15.38	54.00	38.29	31.98	4.05	35.70	100	330	Average



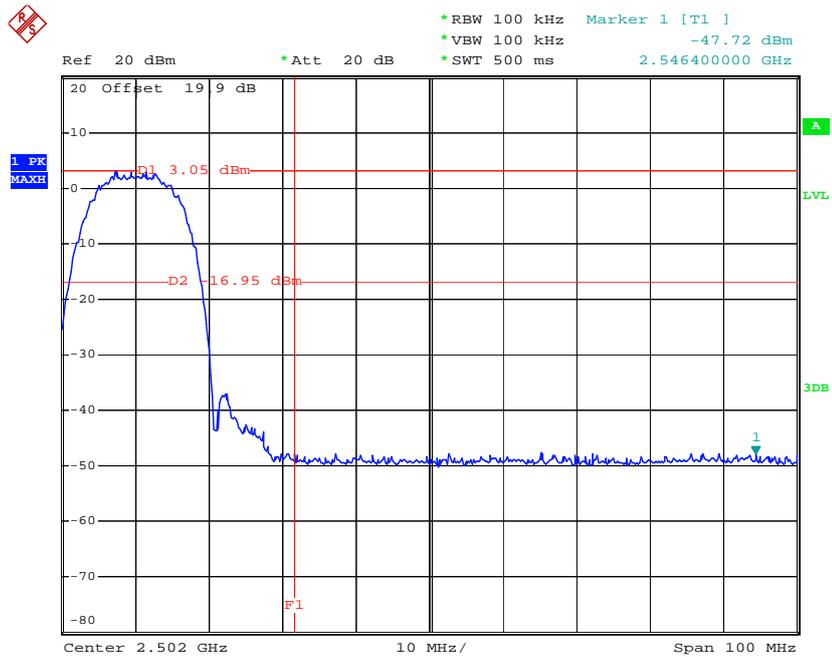
3.3.6 Test Result of Conducted Band Edges

EUT Mode :	1 (802.11b)	Temperature :	29~30°C
Test Engineer :	Darren Lin	Relative Humidity :	45~46%

Low Band Edge Plot on Channel 1



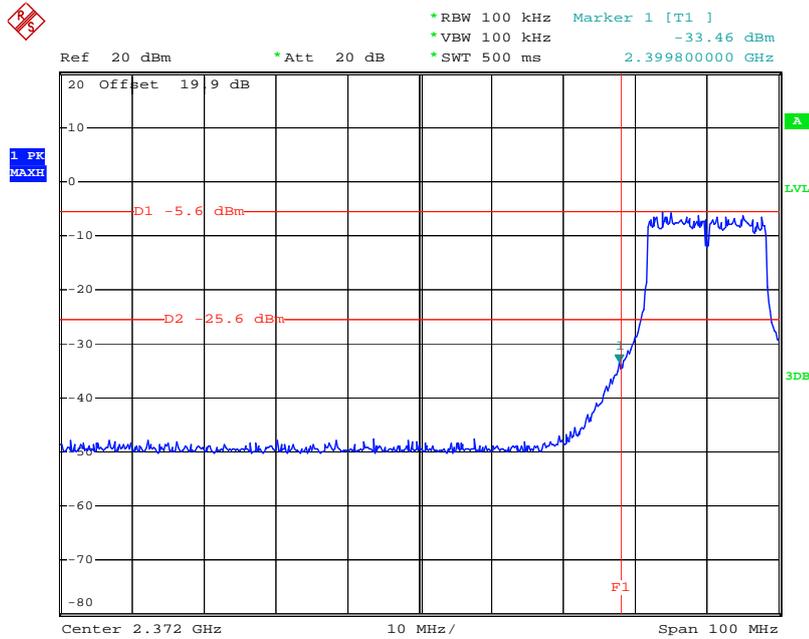
High Band Edge Plot on Channel 11



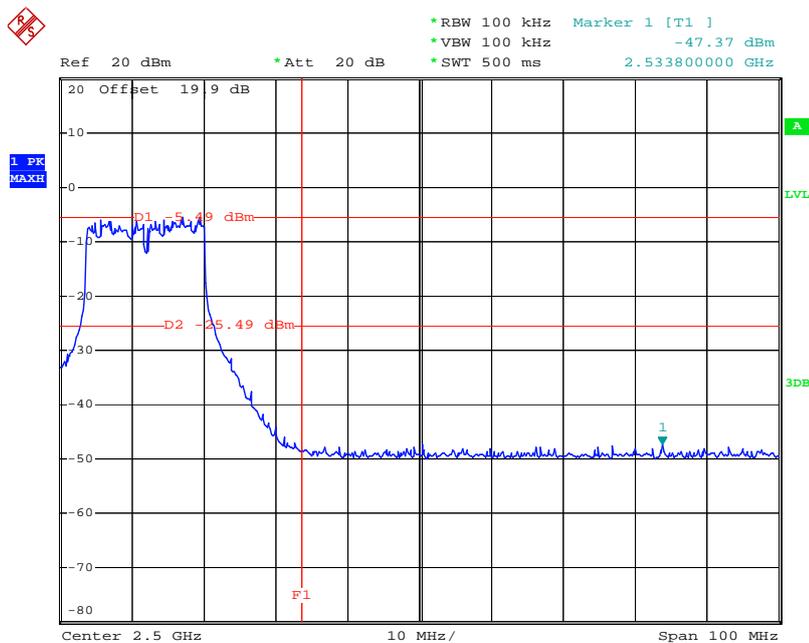


EUT Mode :	2 (802.11g)	Temperature :	29~30°C
Test Engineer :	Darren Lin	Relative Humidity :	45~46%

Low Band Edge Plot on Channel 1



High Band Edge Plot on Channel 11



3.3.7 Power Spectral Density Measurement

3.3.8 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

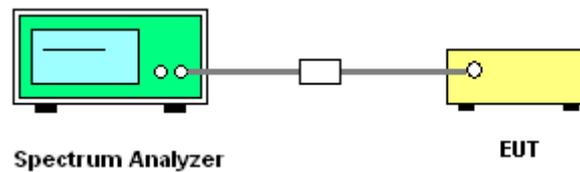
3.3.9 Measuring Instruments

See list of measuring instruments of this test report.

3.3.10 Test Procedures

1. Please refer 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. Measure the guidelines of "PSD Option 1".

3.3.11 Test Setup





3.3.12 Test Result of Power Spectral Density

EUT Mode :	1 (802.11b)	Temperature :	29~30°C
Test Engineer :	Darren Lin	Relative Humidity :	45~46%

Channel	Frequency (MHz)	Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-10.45	8	Pass
06	2437	-13.49	8	Pass
11	2462	-10.59	8	Pass

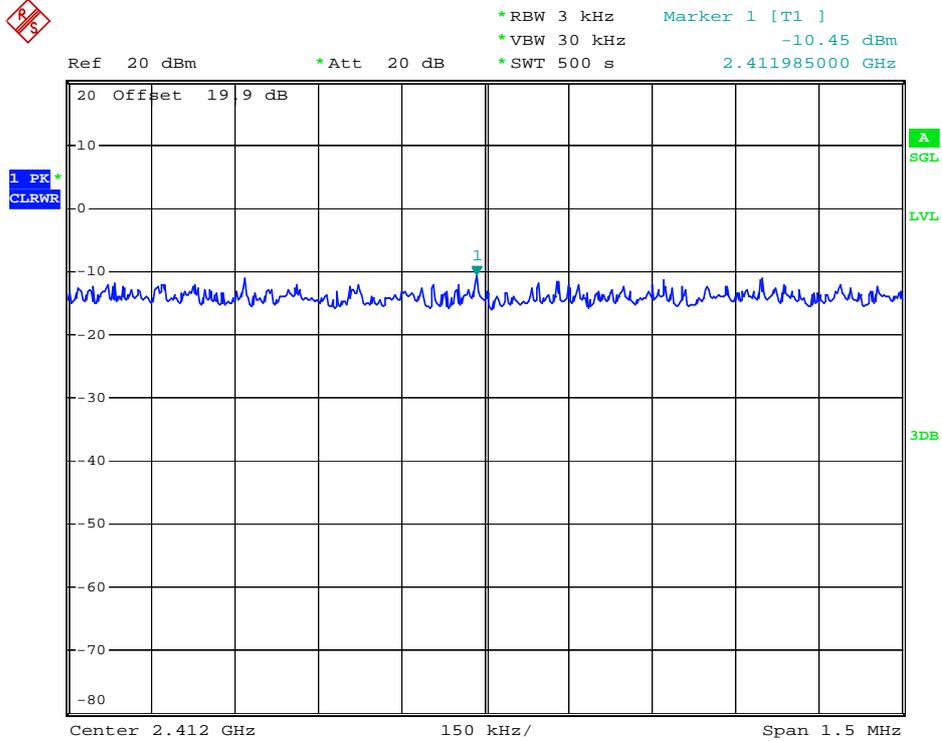
EUT Mode :	2 (802.11g)	Temperature :	29~30°C
Test Engineer :	Darren Lin	Relative Humidity :	45~46%

Channel	Frequency (MHz)	Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-17.66	8	Pass
06	2437	-20.79	8	Pass
11	2462	-19.49	8	Pass

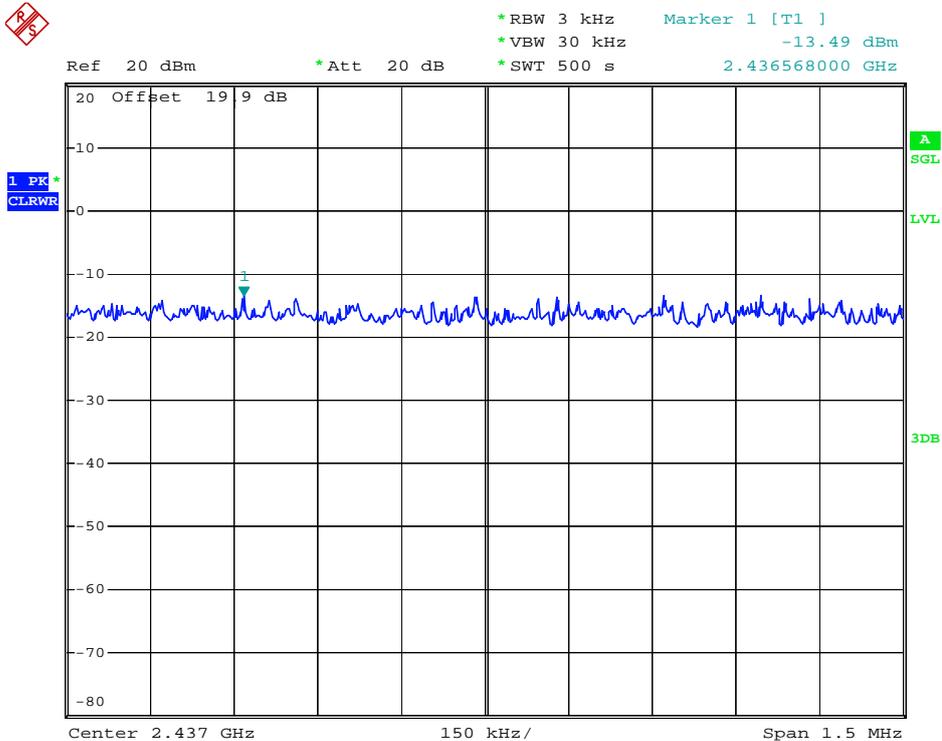


3.3.13 Test Result of Power Spectral Density Plots

Mode 1 : PSD Plot on Channel 01

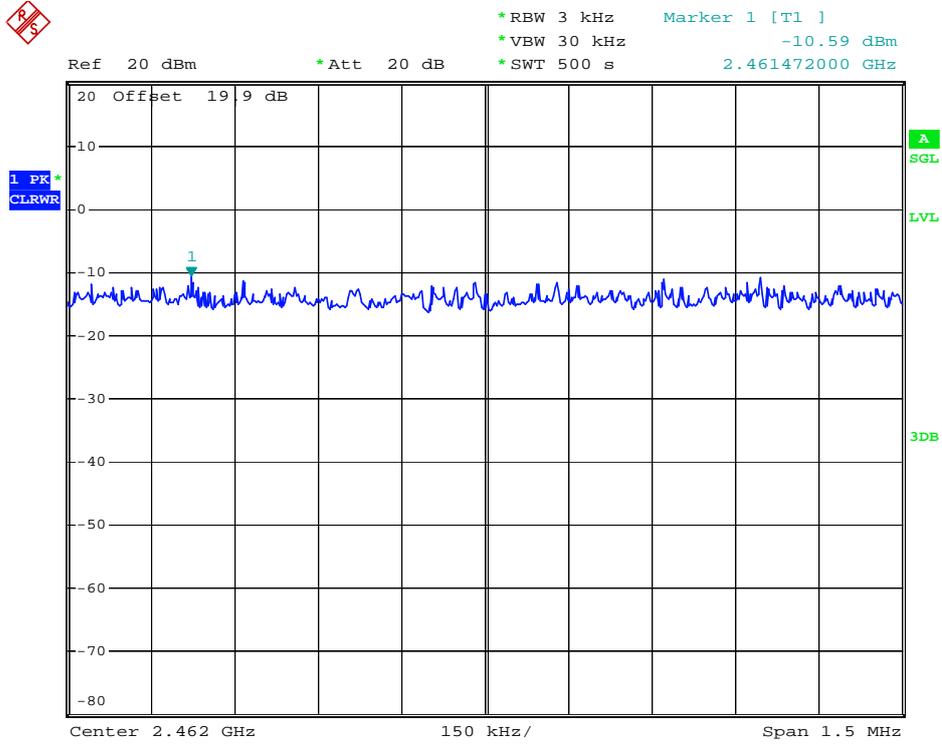


Mode 1 : PSD Plot on Channel 06

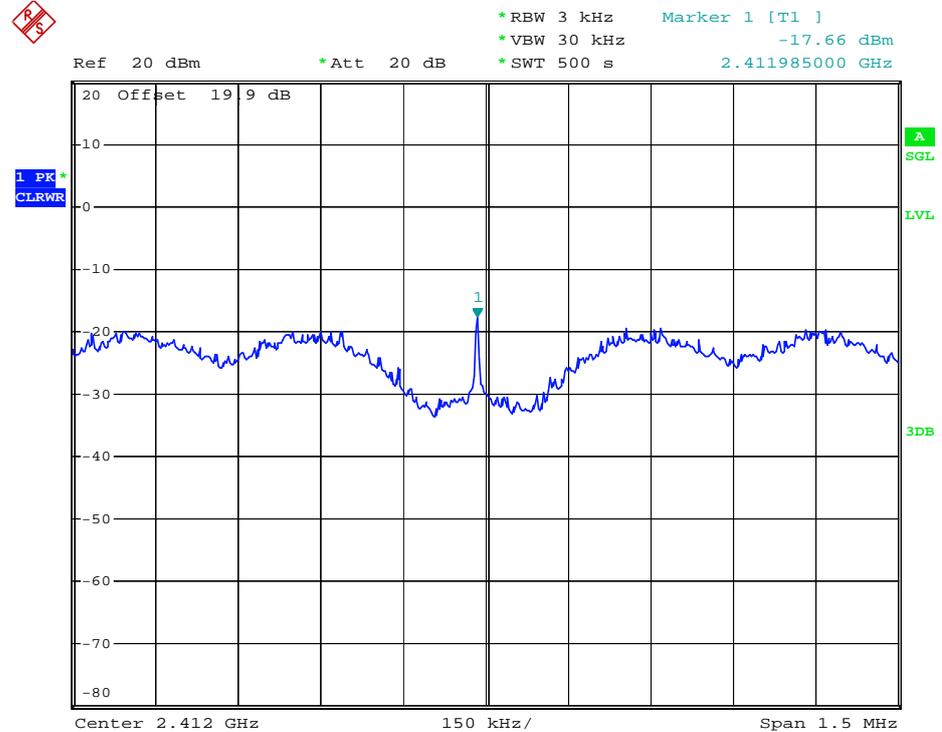




Mode 1 : PSD Plot on Channel 11

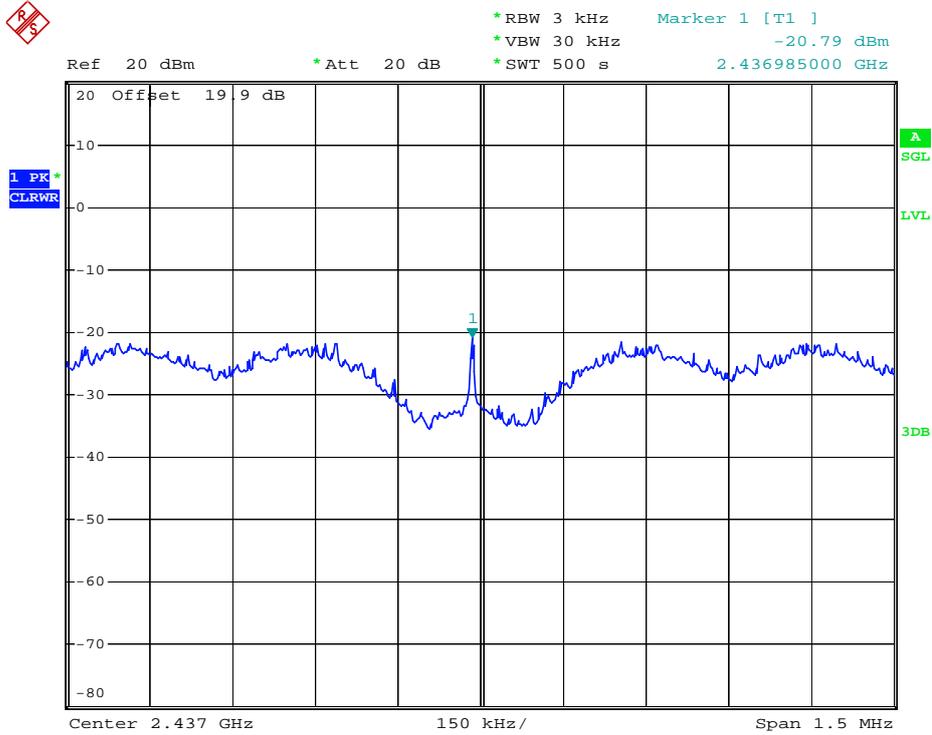


Mode 2 : PSD Plot on Channel 01

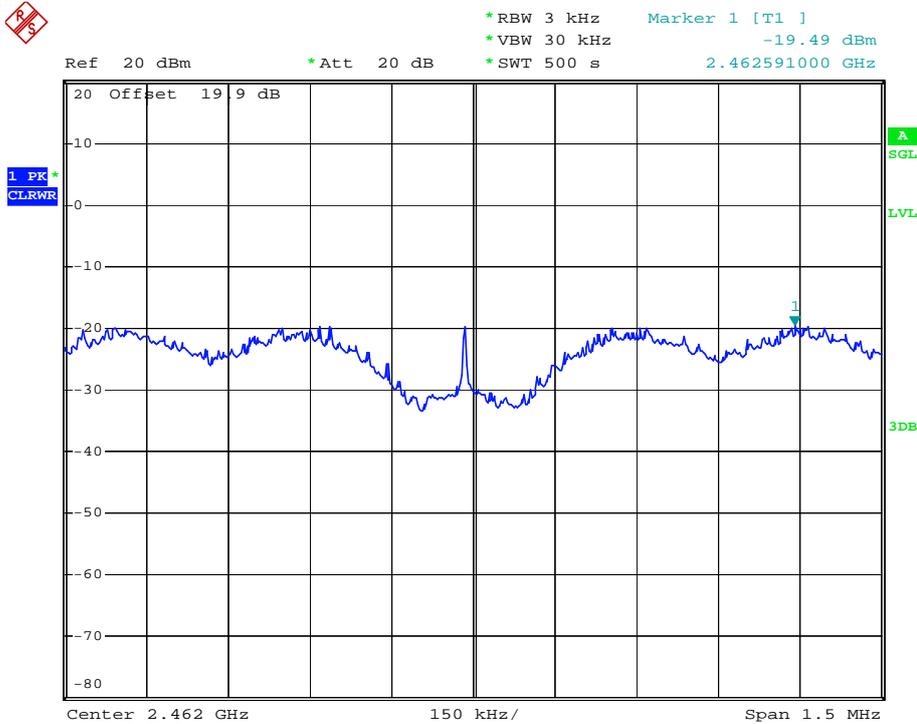




Mode 2 : PSD Plot on Channel 06



Mode 2 : PSD Plot on Channel 11



3.4 AC Conducted Emission Measurement

3.4.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

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

*Decreases with the logarithm of the frequency.

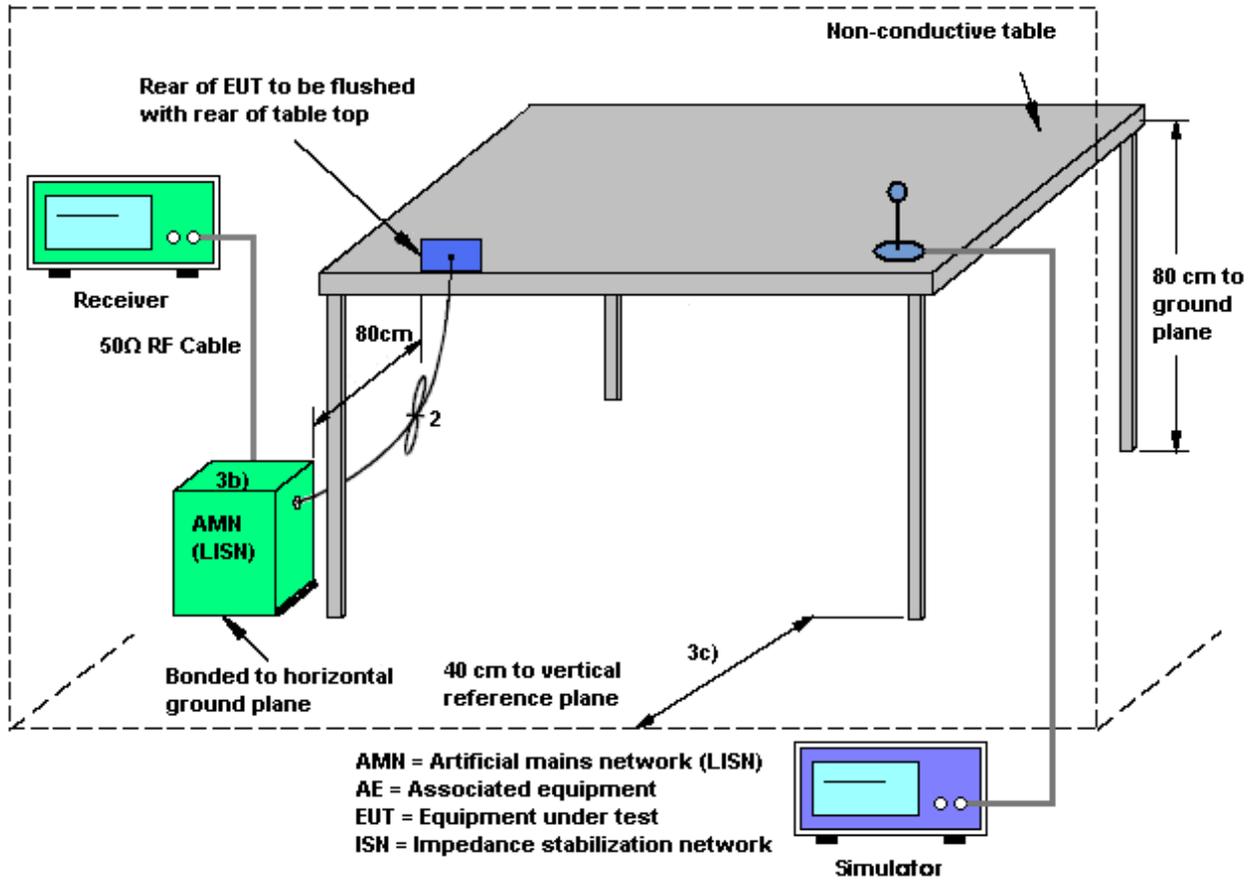
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

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.

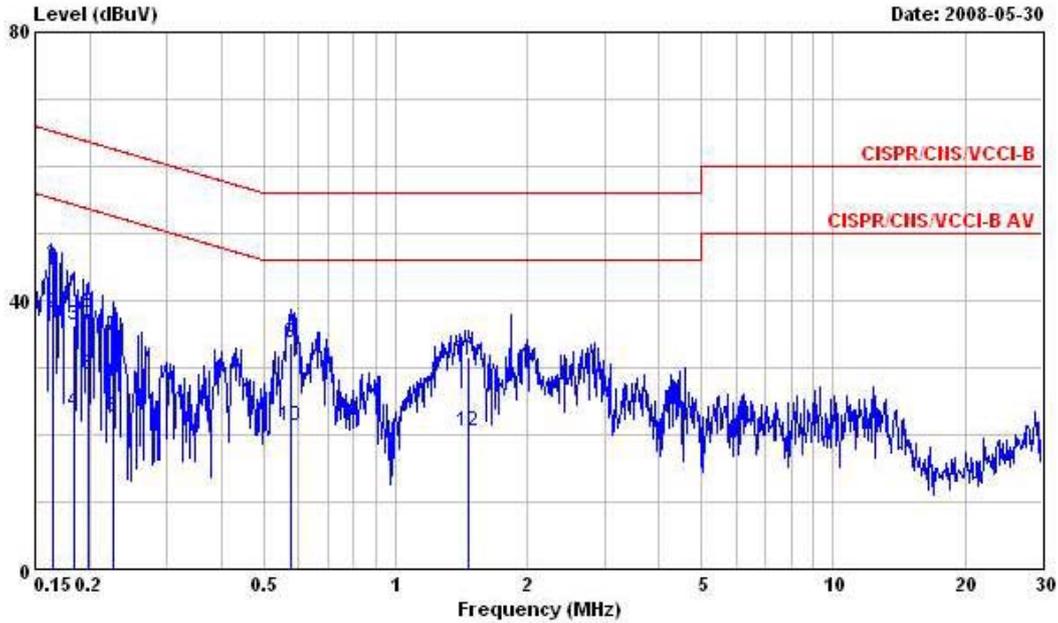
3.4.4 Test Setup





3.4.5 Test Result of AC Conducted Emission

Test Mode :	3	Temperature :	29~30°C
Test Channel :	06	Relative Humidity :	45~46%
Test Engineer :	Darren Lin	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



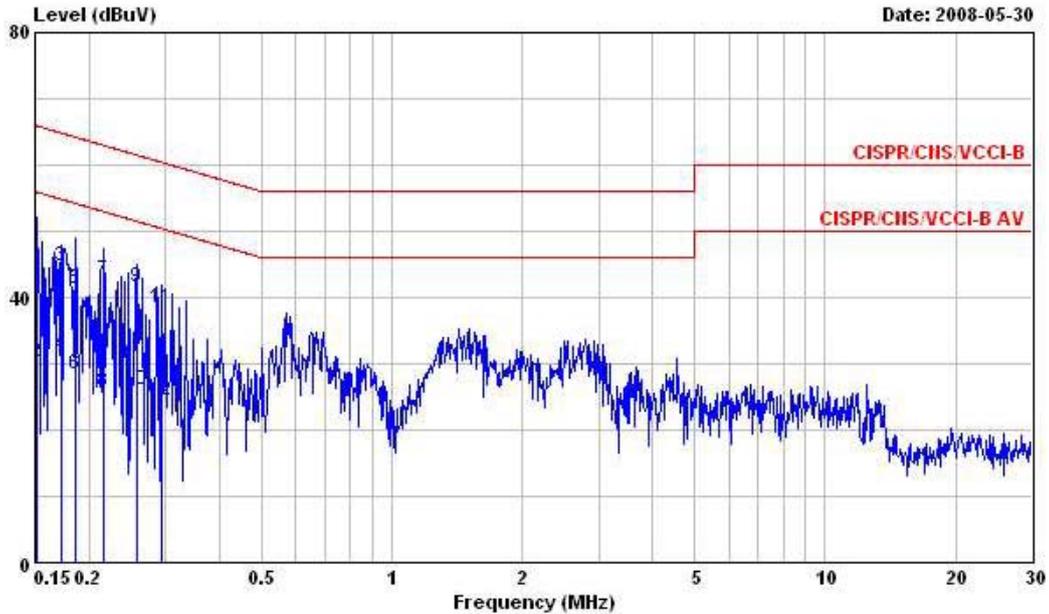
Site : CO04-HY
 Condition : CISPR/CNS/VCCI-B LISN 2008 0416 99041 LINE
 EUT : Mobile Phone
 POWER: 120V/60Hz
 Model : FR852219

IMEI : 359979010017574

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.1641380	45.52	-19.73	65.25	45.29	0.09	0.14	QP
2	@0.1641380	38.03	-17.22	55.25	37.80	0.09	0.14	Average
3	0.1834550	36.22	-28.11	64.33	35.99	0.09	0.14	QP
4	0.1834550	23.43	-30.90	54.33	23.20	0.09	0.14	Average
5	0.1986310	38.22	-25.45	63.67	37.99	0.09	0.14	QP
6	0.1986310	29.07	-24.60	53.67	28.84	0.09	0.14	Average
7	0.2267630	34.77	-27.80	62.57	34.43	0.09	0.25	QP
8	0.2267630	22.56	-30.01	52.57	22.22	0.09	0.25	Average
9	0.5761730	33.72	-22.28	56.00	33.01	0.10	0.61	QP
10	0.5761730	21.30	-24.70	46.00	20.59	0.10	0.61	Average
11	1.470	31.52	-24.48	56.00	30.97	0.12	0.43	QP
12	1.470	20.54	-25.46	46.00	19.99	0.12	0.43	Average



Test Mode :	3	Temperature :	29~30°C
Test Channel :	06	Relative Humidity :	45~46%
Test Engineer :	Darren Lin	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

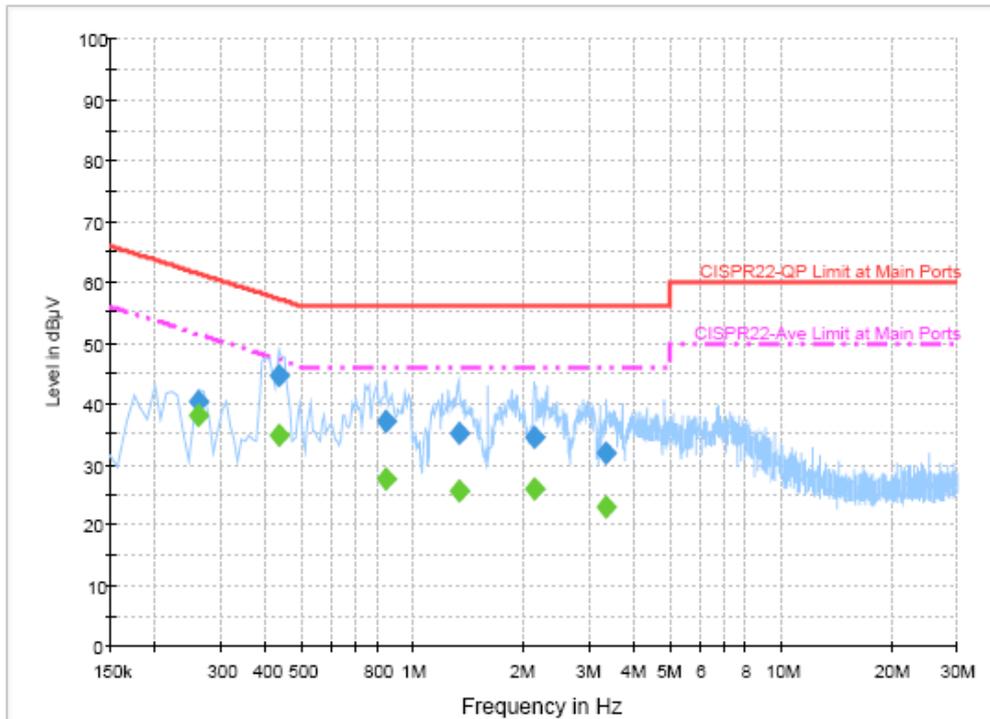


Site : CO04-HY
 Condition : CISPR/CNS/VCCI-B LISN 2008 0416 99041 NEUTRAL
 EUT : Mobile Phone
 POWER: 120V/60Hz
 Model : FR852219

IMEI : 359979010017574

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1515980	45.76	-20.15	65.91	45.53	0.09	0.14	QP
2	0.1515980	30.30	-25.61	55.91	30.07	0.09	0.14	Average
3	0.1730690	44.61	-20.20	64.81	44.39	0.08	0.14	QP
4	0.1730690	31.30	-23.51	54.81	31.08	0.08	0.14	Average
5	0.1863950	41.40	-22.80	64.20	41.18	0.08	0.14	QP
6	0.1863950	28.37	-25.83	54.20	28.15	0.08	0.14	Average
7	0.2162030	42.52	-20.44	62.96	42.23	0.08	0.21	QP
8	0.2162030	25.73	-27.23	52.96	25.44	0.08	0.21	Average
9	0.2588790	41.49	-19.98	61.47	41.05	0.08	0.36	QP
10	0.2588790	26.18	-25.29	51.47	25.74	0.08	0.36	Average
11	0.2939830	38.35	-22.06	60.41	37.79	0.09	0.47	QP
12	0.2939830	24.54	-25.87	50.41	23.98	0.09	0.47	Average

Test Mode :	4	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Darren Lin	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



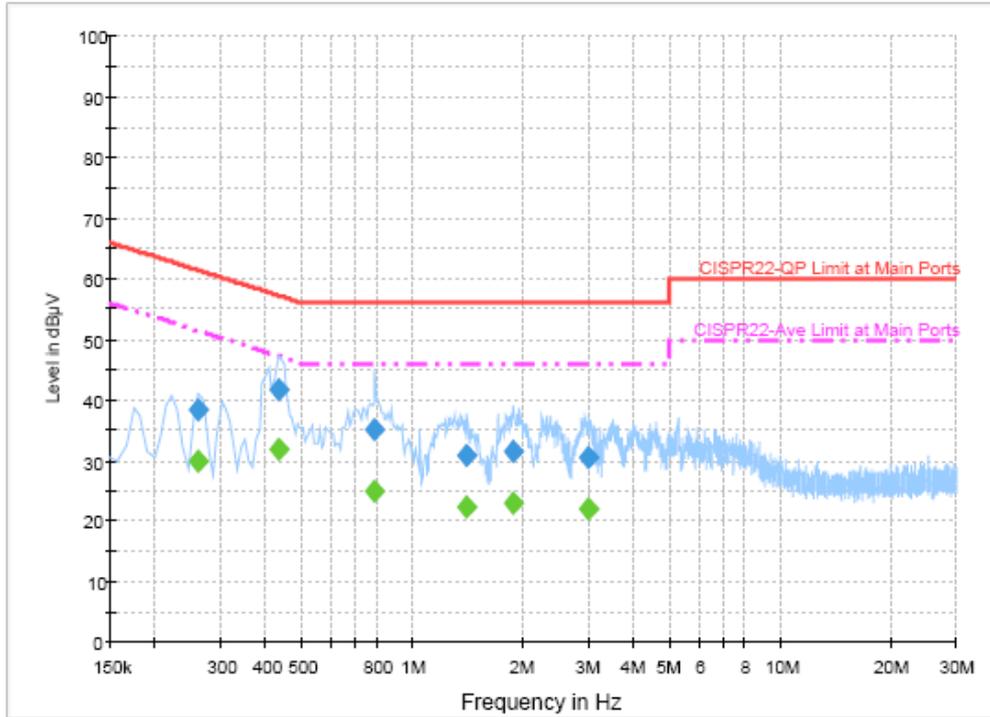
Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.262000	40.4	Off	L1	19.3	21.0	61.4
0.430000	44.7	Off	L1	19.4	12.6	57.3
0.846000	37.0	Off	L1	19.5	19.0	56.0
1.326000	35.0	Off	L1	19.4	21.0	56.0
2.126000	34.4	Off	L1	19.4	21.6	56.0
3.350000	31.8	Off	L1	19.5	24.2	56.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.262000	38.0	Off	L1	19.3	13.4	51.4
0.430000	34.6	Off	L1	19.4	12.7	47.3
0.846000	27.4	Off	L1	19.5	18.6	46.0
1.326000	25.6	Off	L1	19.4	20.4	46.0
2.126000	25.8	Off	L1	19.4	20.2	46.0
3.350000	22.9	Off	L1	19.5	23.1	46.0

Test Mode :	4	Temperature :	24~25°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Darren Lin	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.262000	38.5	Off	N	19.4	22.9	61.4
0.430000	41.6	Off	N	19.4	15.7	57.3
0.790000	35.0	Off	N	19.4	21.0	56.0
1.406000	30.7	Off	N	19.4	25.3	56.0
1.886000	31.4	Off	N	19.5	24.6	56.0
2.998000	30.4	Off	N	19.5	25.6	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.262000	29.7	Off	N	19.4	21.7	51.4
0.430000	32.0	Off	N	19.4	15.3	47.3
0.790000	24.9	Off	N	19.4	21.1	46.0
1.406000	22.2	Off	N	19.4	23.8	46.0
1.886000	22.8	Off	N	19.5	23.2	46.0
2.998000	22.0	Off	N	19.5	24.0	46.0

3.5 Radiated Emission Measurement

3.5.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band. If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

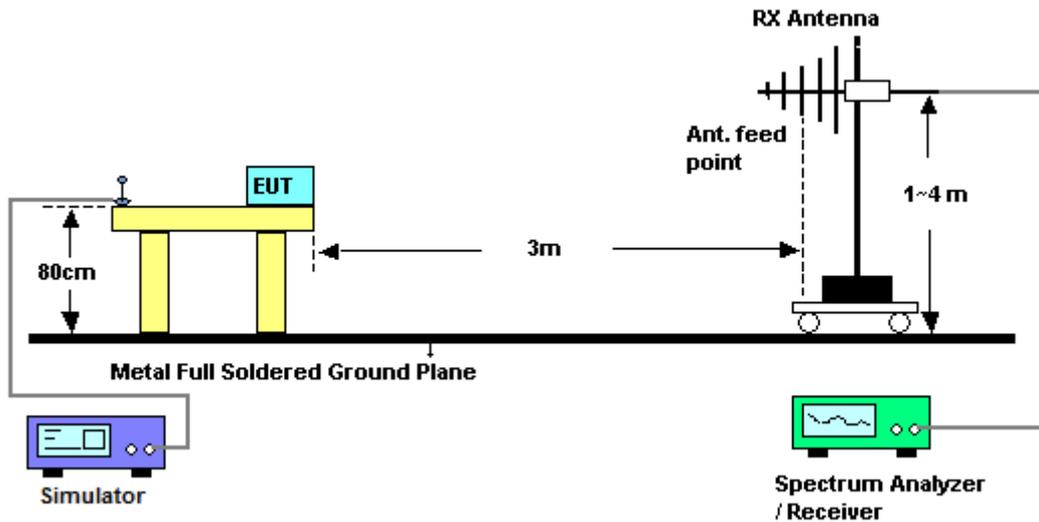
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. Please follow the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
3. Follow the guidelines in ANSI C63.4-2003 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. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength.
4. Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in FCC 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from $20\log(\text{dwell time}/100 \text{ ms})$,
5. If the emission on which a radiated measurement must be made is located at the edge of the authorized band of operation, then the alternative “marker-delta” method, listed at the end of this document, may be employed.

3.5.4 Test Setup



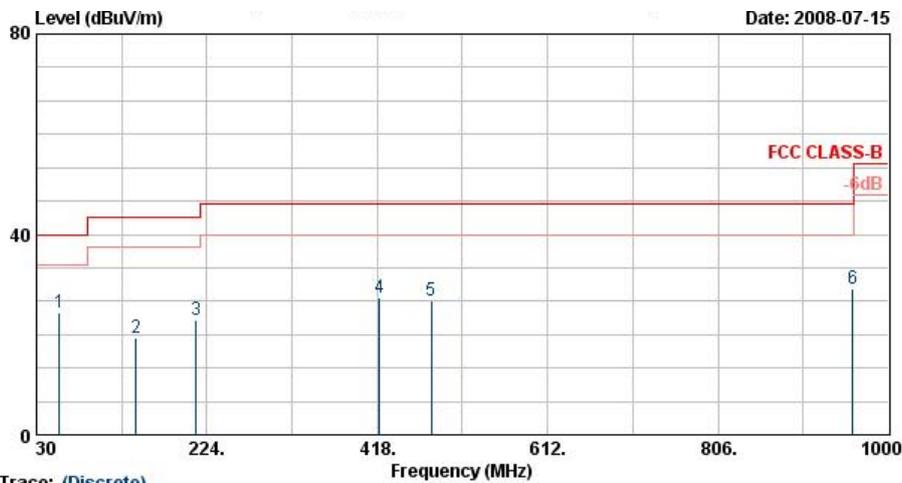
3.5.5 Test Result of Radiated Emission (9kHz - 30MHz)

Test Mode :	1	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	All amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported		



3.5.6 Test Result of Radiated Emission < 1GHz

Test Mode :	1	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :			

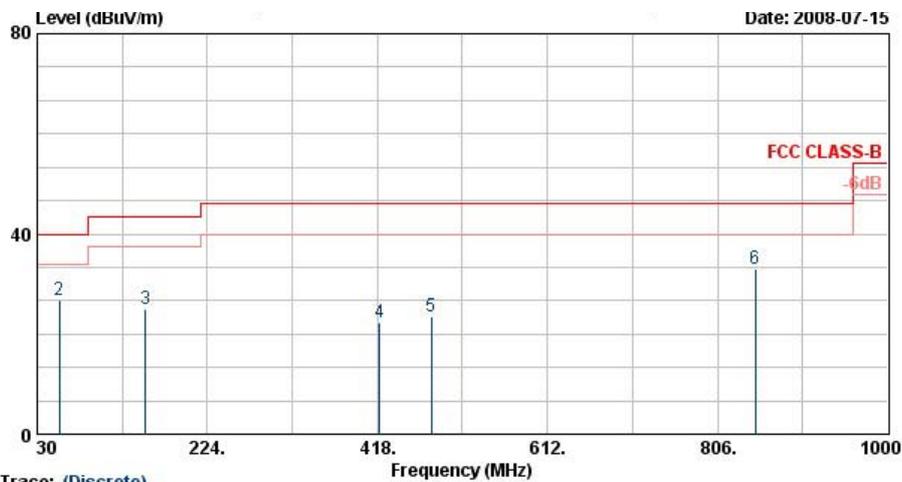


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 5
 Data Rate : 5.5
 Plane : E2
 TIME : 350979010012641

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	56.19	24.25	-15.75	40.00	48.58	7.20	0.40	31.93	100	325	Peak
2	143.13	19.22	-24.28	43.50	40.09	10.30	0.54	31.71	---	---	Peak
3	211.44	23.03	-20.47	43.50	44.63	9.99	0.61	32.19	---	---	Peak
4	420.40	27.42	-18.58	46.00	42.48	16.10	0.80	31.95	---	---	Peak
5	479.90	26.73	-19.27	46.00	40.70	17.09	1.00	32.06	---	---	Peak
6	959.40	29.03	-16.97	46.00	38.08	20.95	1.29	31.30	---	---	Peak



Test Mode :	1	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :			

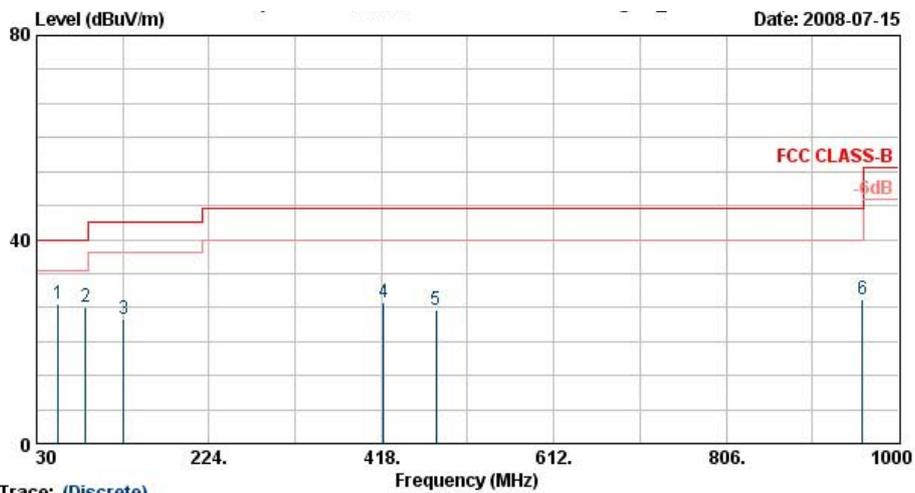


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) VERTICAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 5
 Data Rate : 5.5
 Plane : E2
 TIME1 : 359979010012641

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	30.00	29.27	-10.73	40.00	40.87	19.66	0.30	31.56	100	335	Peak
2 @	54.84	26.82	-13.18	40.00	50.97	7.35	0.40	31.90	---	---	Peak
3	153.39	24.85	-18.65	43.50	45.69	10.32	0.60	31.76	---	---	Peak
4	420.40	22.35	-23.65	46.00	37.41	16.10	0.80	31.95	---	---	Peak
5	479.90	23.55	-22.45	46.00	37.52	17.09	1.00	32.06	---	---	Peak
6 @	848.80	32.96	-13.04	46.00	43.99	20.16	1.20	32.40	---	---	Peak



Test Mode :	2	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :			



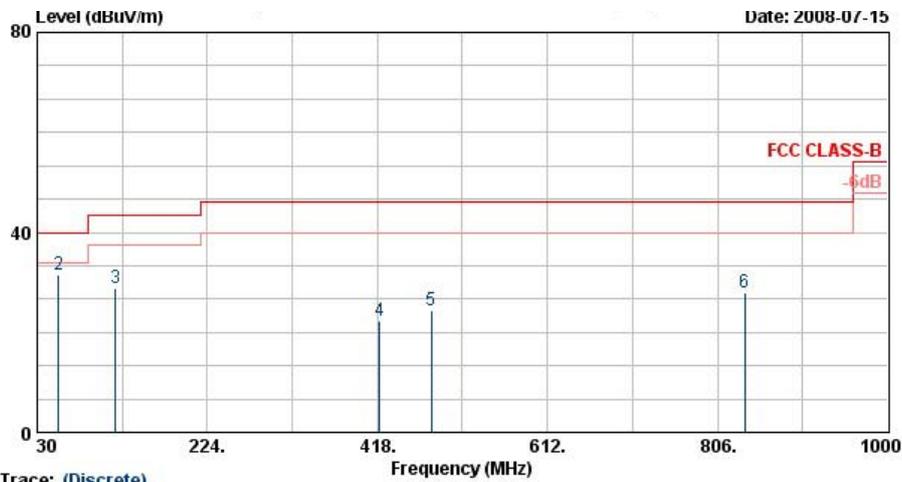
Trace: (Discrete)

Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(051121) HORIZONTAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 8
 Data Rate : 9
 Plane : E2
 TMET : 359979010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	54.03	27.25	-12.75	40.00	51.30	7.50	0.38	31.92	100	236	Peak
2	85.08	26.65	-13.35	40.00	50.05	8.28	0.40	32.07	---	---	Peak
3	128.28	24.44	-19.06	43.50	43.46	12.18	0.50	31.70	---	---	Peak
4	420.40	27.75	-18.25	46.00	42.80	16.10	0.80	31.95	---	---	Peak
5	479.90	26.16	-19.84	46.00	40.13	17.09	1.00	32.06	---	---	Peak
6	959.40	28.15	-17.85	46.00	37.21	20.95	1.29	31.30	---	---	Peak



Test Mode :	2	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :			



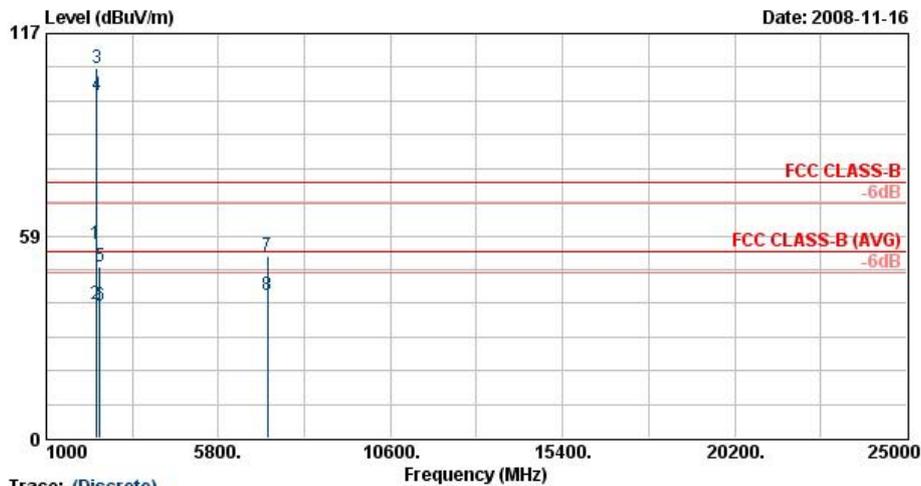
Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m LF-ANT(951121) VERTICAL
 EDT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 8
 Data Rate : 9
 Plane : E2
 IMET : 359979010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	30.54	32.59	-7.41	40.00	44.95	18.95	0.30	31.61	100	325	Peak
2 @	54.03	31.42	-8.58	40.00	55.47	7.50	0.38	31.92	---	---	Peak
3	119.64	28.81	-14.69	43.50	47.55	12.50	0.50	31.74	---	---	Peak
4	420.40	22.34	-23.66	46.00	37.39	16.10	0.80	31.95	---	---	Peak
5	479.90	24.34	-21.66	46.00	38.31	17.09	1.00	32.06	---	---	Peak
6	836.90	27.93	-18.07	46.00	38.99	20.08	1.20	32.34	---	---	Peak



3.5.7 Test Result of Radiated Emission ≥ 1 GHz

Test Mode :	1 (802.11b)	Temperature :	24~26°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		



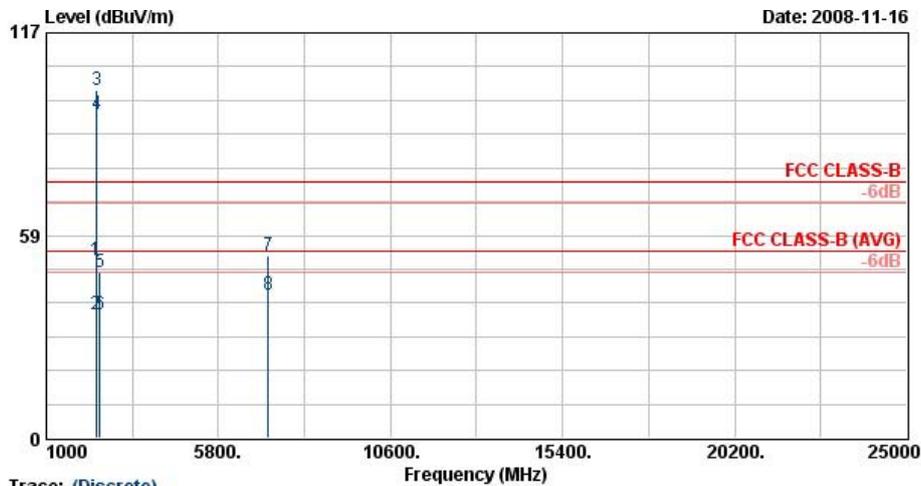
Trace: (Discrete)

Site : 03CR06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Model : FR 852219-04
 Memo : Mode 2

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2388.09	56.28	-17.72	74.00	56.06	31.98	3.92	35.68	100		0 Peak
2	2388.09	38.66	-15.34	54.00	38.44	31.98	3.92	35.68	195		15 Average
3 X	2412.00	106.87			106.60	32.00	3.95	35.68	100		0 Peak
4 @	2412.00	99.17			98.90	32.00	3.95	35.68	195		15 Average
5	2486.00	49.58	-24.42	74.00	49.14	32.08	4.05	35.70	100		0 Peak
6	2486.00	38.19	-15.81	54.00	37.76	32.08	4.05	35.70	195		15 Average
7	7176.00	52.68	-21.32	74.00	45.97	35.63	7.15	36.07	100		0 Peak
8	7176.00	41.32	-12.68	54.00	34.61	35.63	7.15	36.07	100		225 Average



Test Mode :	1 (802.11b)	Temperature :	24~26°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals		

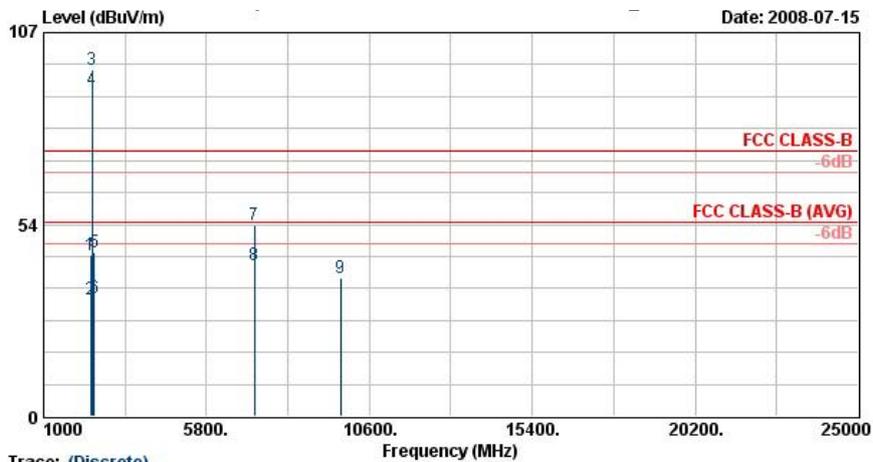


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 Model : FR 852219-04
 Memo : Mode 2

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2389.99	51.44	-22.56	74.00	51.22	31.98	3.92	35.68	100	0	Peak
2	2389.99	35.73	-18.27	54.00	35.51	31.98	3.92	35.68	100	318	Average
3 X	2412.00	100.40			100.13	32.00	3.95	35.68	100	0	Peak
4 @	2412.00	93.47			93.20	32.00	3.95	35.68	100	318	Average
5	2494.00	47.86	-26.14	74.00	47.41	32.10	4.05	35.70	100	0	Peak
6	2494.00	35.62	-18.38	54.00	35.17	32.10	4.05	35.70	100	318	Average
7	7182.00	52.68	-21.32	74.00	45.96	35.62	7.16	36.07	100	0	Peak
8	7182.00	41.53	-12.47	54.00	34.82	35.62	7.16	36.07	100	292	Average



Test Mode :	1 (802.11b)	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		



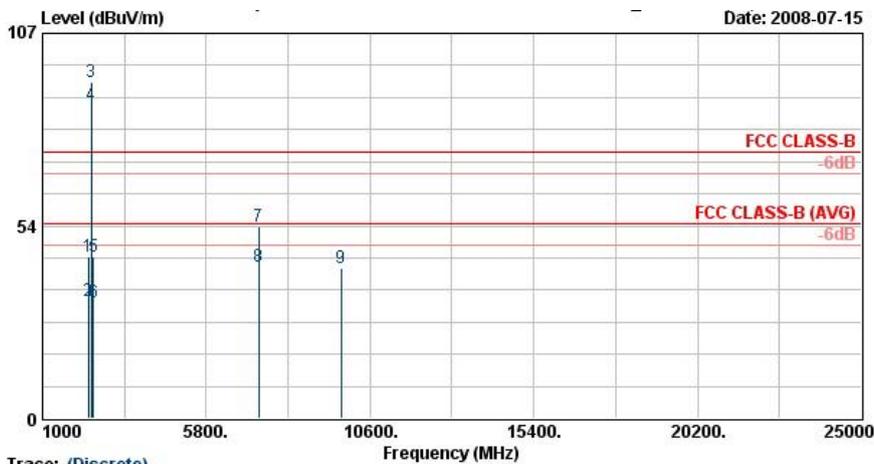
Trace: (Discrete)

Site : 08CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 5
 Data Rate : 5.5
 Plane : E2
 TARE : 359979010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2382.00	44.78	-29.22	74.00	44.71	31.83	3.92	35.68	100	0	Peak
2	2382.00	32.71	-21.29	54.00	32.63	31.83	3.92	35.68	185	24	Average
3 @	2437.00	96.86			96.65	31.90	3.99	35.69	100	0	Peak
4 @	2437.00	91.15			90.92	31.93	3.99	35.69	185	24	Average
5	2484.00	45.55	-28.45	74.00	45.22	31.98	4.05	35.70	100	0	Peak
6	2484.00	33.14	-20.86	54.00	32.81	31.98	4.05	35.70	185	24	Average
7	7212.00	53.49	-20.51	74.00	46.70	35.72	7.17	36.09	100	0	Peak
8 @	7212.00	42.21	-11.79	54.00	35.42	35.72	7.17	36.09	100	281	Average
9	9747.00	38.64	-35.36	74.00	77.25	-9.85	7.98	36.75	100	0	Peak



Test Mode :	1 (802.11b)	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals		

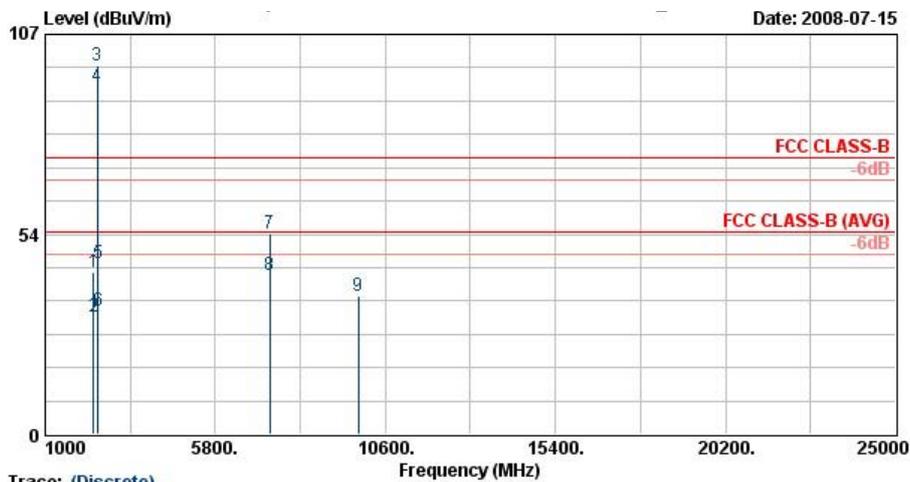


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 5
 Data Rate : 5.5
 Plane : E2
 IMET : 358879010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2350.00	44.75	-29.25	74.00	44.79	31.78	3.86	35.67	100	0	Peak
2	2350.00	32.67	-21.33	54.00	32.70	31.78	3.86	35.67	189	338	Average
3 @	2437.00	93.50			93.30	31.90	3.99	35.69	100	0	Peak
4 @	2437.00	87.16			86.93	31.93	3.99	35.69	189	338	Average
5	2486.00	44.90	-29.10	74.00	44.57	31.98	4.05	35.70	100	0	Peak
6	2486.00	32.04	-21.96	54.00	31.71	31.98	4.05	35.70	189	338	Average
7	7347.00	53.30	-20.70	74.00	46.57	35.66	7.21	36.14	100	0	Peak
8 @	7347.00	42.13	-11.87	54.00	35.40	35.66	7.21	36.14	100	126	Average
9	9747.00	41.88	-32.12	74.00	80.49	-9.85	7.98	36.75	100	0	Peak



Test Mode :	1 (802.11b)	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		

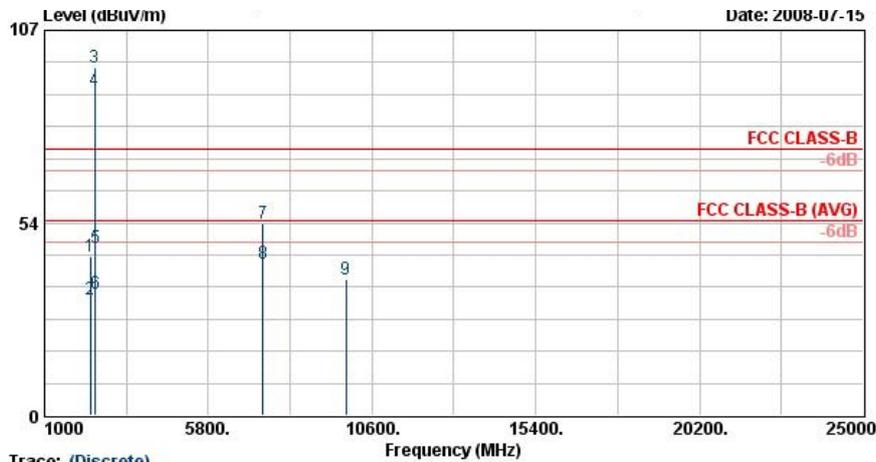


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 EDT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 6
 Data Rate : 5.5
 Plane : E2
 IMET : 350079010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2372.00	43.52	-30.48	74.00	43.48	31.83	3.89	35.68	100	0	Peak
2	2372.00	31.42	-22.58	54.00	31.38	31.83	3.89	35.68	197	245	Average
3 @	2462.00	98.82			98.54	31.95	4.02	35.69	100	0	Peak
4 @	2462.00	93.24			92.96	31.95	4.02	35.69	197	245	Average
5	2494.49	45.88	-28.12	74.00	45.55	31.98	4.05	35.70	100	0	Peak
6	2494.49	32.87	-21.13	54.00	32.52	32.00	4.05	35.70	197	245	Average
7	7347.00	53.62	-20.38	74.00	46.88	35.66	7.21	36.14	100	0	Peak
8 @	7347.00	42.44	-11.56	54.00	35.71	35.66	7.21	36.14	100	113	Average
9	9846.00	37.14	-36.86	74.00	75.51	-9.63	8.04	36.77	100	0	Peak



Test Mode :	1 (802.11b)	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals		

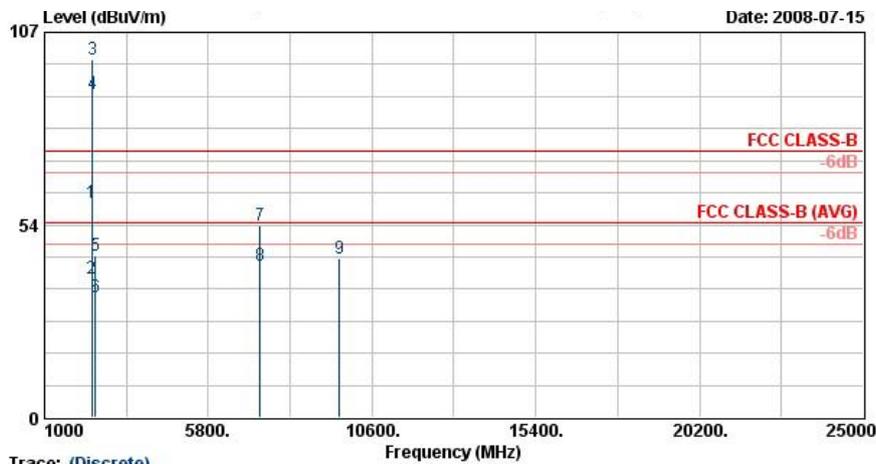


Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 6
 Data Rate : 5.5
 Plane : E2
 MET : 359979010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2350.00	44.34	-29.66	74.00	44.37	31.78	3.86	35.67	100	0	Peak
2	2350.00	32.18	-21.82	54.00	32.21	31.78	3.86	35.67	107	345	Average
3 @	2462.00	96.84			96.56	31.95	4.02	35.69	100	0	Peak
4 @	2462.00	90.25			89.97	31.95	4.02	35.69	107	345	Average
5	2497.34	46.38	-27.62	74.00	46.05	31.98	4.05	35.70	100	0	Peak
6	2497.34	33.86	-20.14	54.00	33.51	32.00	4.05	35.70	107	345	Average
7	7407.00	53.24	-20.76	74.00	46.53	35.63	7.24	36.16	100	0	Peak
8 @	7407.00	42.12	-11.88	54.00	35.41	35.63	7.24	36.16	100	291	Average
9	9846.00	37.67	-36.33	74.00	76.04	-9.63	8.04	36.77	100	0	Peak



Test Mode :	2 (802.11g)	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		

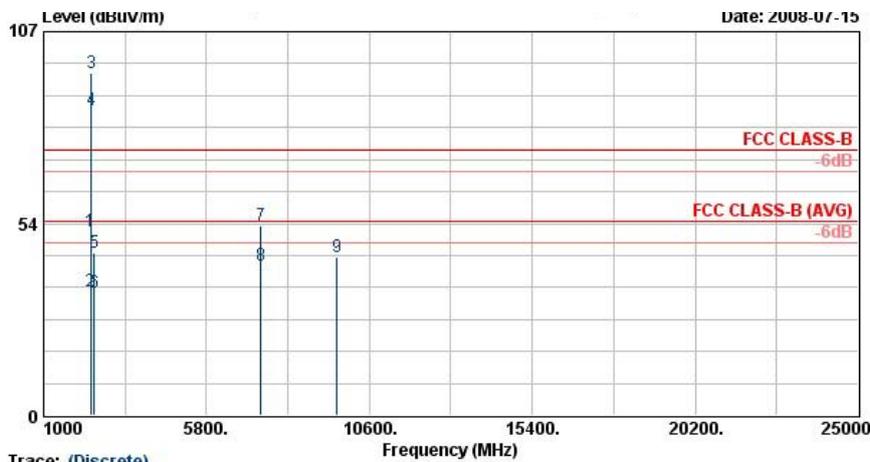


Trace: (Discrete)
 Site : D3CH06-HV
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 7
 Data Rate : 0
 Plane : E2
 TMET : 359979010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	dB	dBuV/m	Level	Factor	Loss	Factor	Pos	Pos	Remark
					dBuV	dB/m	dB	dB	cm	deg	
1 @	2389.61	59.53	-14.47	74.00	59.43	31.86	3.92	35.68	100	0	Peak
2 @	2389.61	38.72	-15.28	54.00	38.62	31.86	3.92	35.68	161	26	Average
3 @	2412.00	99.54			99.37	31.90	3.95	35.69	100	0	Peak
4 @	2412.00	89.96			89.81	31.88	3.95	35.68	161	26	Average
5	2500.00	44.98	-29.02	74.00	44.63	32.00	4.05	35.70	100	0	Peak
6	2500.00	33.34	-20.66	54.00	32.99	32.00	4.05	35.70	161	26	Average
7	7311.00	53.34	-20.66	74.00	46.58	35.68	7.20	36.12	100	0	Peak
8 @	7311.00	42.17	-11.83	54.00	35.41	35.68	7.20	36.12	100	171	Average
9	9651.00	44.17	-29.83	74.00	83.02	-10.07	7.94	36.73	100	0	Peak



Test Mode :	2 (802.11g)	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals		

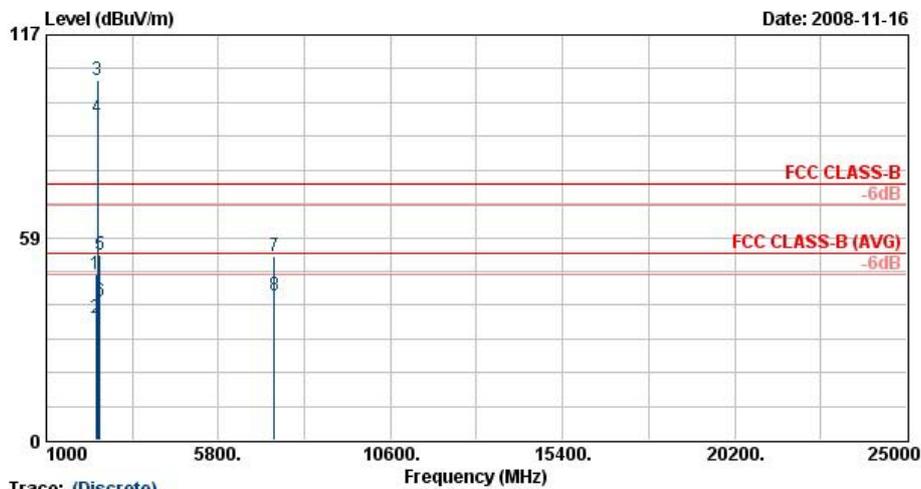


Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 7
 Data Rate : 9
 Plane : E2
 Table : 359979010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2389.61	51.22	-22.78	74.00	51.12	31.86	3.92	35.68	100	0	Peak
2	2389.61	34.42	-19.58	54.00	34.32	31.86	3.92	35.68	100	324	Average
3 @	2412.00	95.33			95.16	31.90	3.95	35.69	100	0	Peak
4 @	2412.00	85.16			85.01	31.88	3.95	35.68	100	324	Average
5	2494.00	45.51	-28.49	74.00	45.16	32.00	4.05	35.70	100	0	Peak
6	2494.00	34.10	-19.90	54.00	33.75	32.00	4.05	35.70	100	324	Average
7	7392.00	53.00	-21.00	74.00	46.29	35.64	7.23	36.16	100	0	Peak
8 @	7392.00	41.83	-12.17	54.00	35.12	35.64	7.23	36.16	100	229	Average
9	9651.00	44.29	-29.71	74.00	83.14	-10.07	7.94	36.73	100	0	Peak



Test Mode :	2 (802.11g)	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		



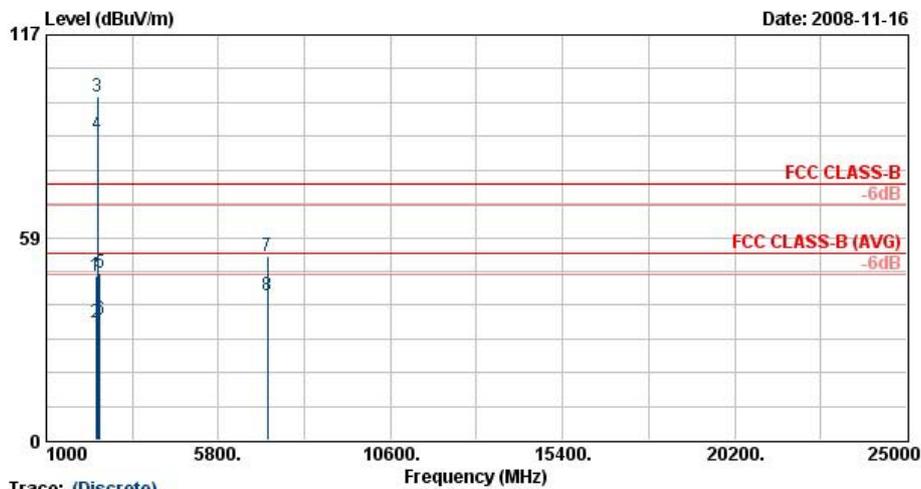
Trace: (Discrete)

Site : 03CR06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Model : FR 852219-04
 Memo : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2388.00	48.05	-25.95	74.00	47.83	31.98	3.92	35.68	100	0	Peak
2	2388.00	35.20	-18.80	54.00	34.98	31.98	3.92	35.68	155	23	Average
3 X	2437.00	104.05			103.72	32.04	3.99	35.69	100	0	Peak
4 @	2437.00	93.03			92.69	32.04	3.99	35.69	155	23	Average
5	2486.00	53.28	-20.72	74.00	52.85	32.08	4.05	35.70	100	0	Peak
6	2486.00	39.91	-14.09	54.00	39.48	32.08	4.05	35.70	155	23	Average
7	7356.00	53.04	-20.96	74.00	46.40	35.56	7.22	36.14	100	0	Peak
8	7356.00	41.83	-12.17	54.00	35.20	35.56	7.22	36.14	100	162	Average



Test Mode :	2 (802.11g)	Temperature :	24~26°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals		



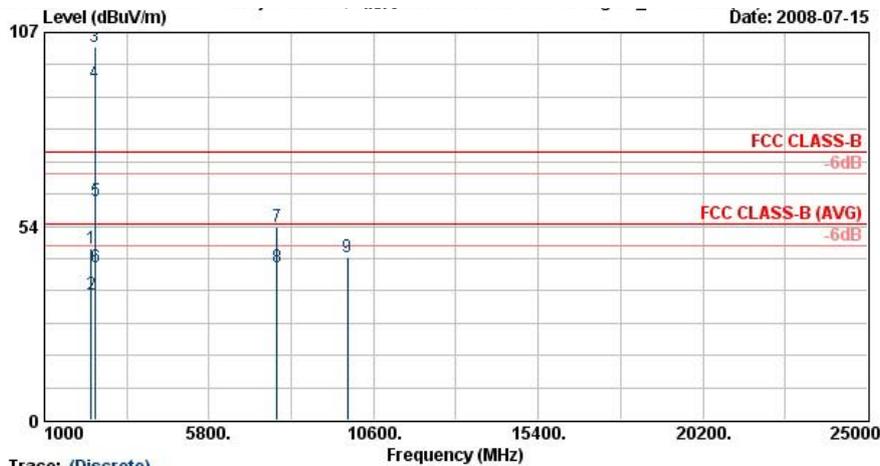
Trace: (Discrete)

Site : 03CR06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 Model : FR 852219-04
 Memo : Mode 3

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2382.00	47.40	-26.60	74.00	47.20	31.96	3.92	35.68	100	0	Peak
2	2382.00	34.01	-19.99	54.00	33.81	31.96	3.92	35.68	185	355	Average
3 X	2437.00	99.17			98.85	32.02	3.99	35.69	100	0	Peak
4 @	2437.00	88.45			88.11	32.04	3.99	35.69	185	355	Average
5	2484.00	48.39	-25.61	74.00	47.96	32.08	4.05	35.70	100	0	Peak
6	2484.00	35.00	-19.00	54.00	34.57	32.08	4.05	35.70	185	355	Average
7	7161.00	53.14	-20.86	74.00	46.43	35.64	7.15	36.07	100	0	Peak
8	7161.00	41.93	-12.07	54.00	35.21	35.64	7.15	36.07	100	301	Average



Test Mode :	2 (802.11g)	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		

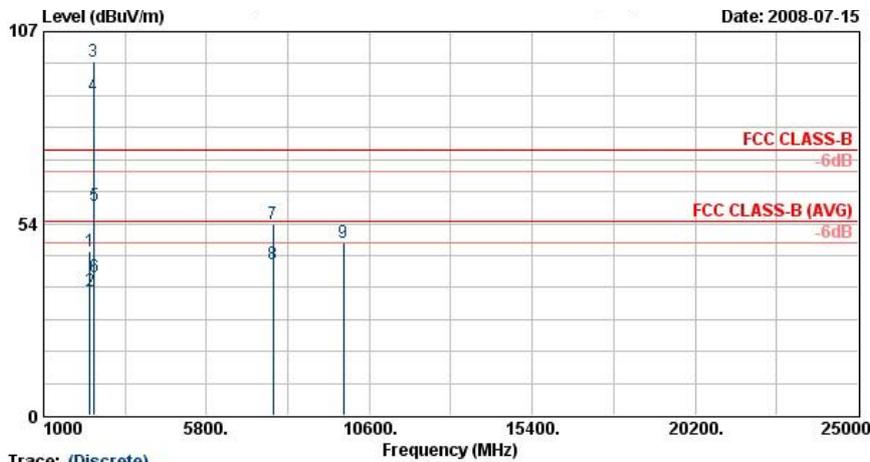


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 9
 Data Rate : 9
 Plane : E2
 TIME : 359979010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	Level	Factor	Loss	Factor	Pos	Pos	
					dBuV	dB/m	dB	dB	cm	deg	
1	2366.00	47.40	-26.60	74.00	47.38	31.81	3.89	35.68	100	0	Peak
2	2366.00	34.50	-19.50	54.00	34.48	31.81	3.89	35.68	100	25	Average
3 @	2462.00	103.04			102.77	31.95	4.02	35.70	100	0	Peak
4 @	2462.00	93.13			92.85	31.95	4.02	35.69	100	25	Average
5 @	2484.42	60.38	-13.62	74.00	60.05	31.98	4.05	35.70	100	0	Peak
6 @	2484.42	42.05	-11.95	54.00	41.72	31.98	4.05	35.70	100	25	Average
7	7776.00	53.34	-20.66	74.00	46.53	35.66	7.40	36.26	100	0	Peak
8 @	7776.00	42.11	-11.89	54.00	35.31	35.66	7.40	36.26	100	208	Average
9	9846.00	44.77	-29.23	74.00	83.14	-9.63	8.04	36.77	100	0	Peak



Test Mode :	2 (802.11g)	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals		



Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
 EUT : Mobile Phone
 Power : 120Vac/60Hz
 Model : FR 852219
 Memo : Mode 0
 Data Rate : 0
 Plane : E2
 Table : 359979010012641

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2366.00	45.67	-28.33	74.00	45.65	31.81	3.89	35.68	100	0	Peak
2	2366.00	34.50	-19.50	54.00	34.48	31.81	3.89	35.68	100	330	Average
3 @	2462.00	98.51			98.23	31.95	4.02	35.69	100	0	Peak
4 @	2462.00	88.92			88.64	31.95	4.02	35.69	100	330	Average
5	2483.85	58.31	-15.69	74.00	57.98	31.98	4.05	35.70	100	0	Peak
6	2483.85	38.62	-15.38	54.00	38.29	31.98	4.05	35.70	100	330	Average
7	7767.00	53.44	-20.56	74.00	46.63	35.65	7.40	36.25	100	0	Peak
8 @	7767.00	42.34	-11.66	54.00	35.54	35.65	7.40	36.25	100	107	Average
9	9846.00	48.05	-25.95	74.00	86.42	-9.63	8.04	36.77	100	0	Peak



3.6 Antenna Requirements

3.6.1 Standard Applicable

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

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. By the way, Fixed point-to-point operation: Transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

3.6.2 Antenna Connected Construction

The antennas type used in this product is PIFA antenna without connector and it is considered to meet antenna requirement of FCC

3.6.3 Antenna Gain

The antenna gain of EUT is 2 dBi, which is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100359	9kHz – 2.75GHz	Mar. 03, 2008	Mar. 02, 2009	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2008	Mar. 29, 2009	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2008	Mar. 21, 2009	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2008	Apr. 19, 2009	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz –30MHz	Mar. 27, 2008	Mar. 26, 2009	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	N/A	Conduction (CO04-HY)
EMI Receiver	R&S	ESCS 30	100356	9kH~2.75GHz	Aug. 01, 2008	Jul. 31, 2009	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kH~30MHz	Dec. 06, 2007	Dec. 05, 2008	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Dec. 06, 2007	Dec. 05, 2008	Conduction (CO05-HY)
DC- LISN	R&S	ESH3-26	1000485	0.1MHz~200MHz	Feb. 04, 2008	Feb. 03, 2009	Conduction (CO05-HY)
DC- LISN	R&S	ESH3-26	1000484	0.1MHz~200MHz	Feb. 04, 2008	Feb. 03, 2009	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
GSM Base Station	R&S	CMU200	106656	N/A	May 06, 2008	May 05, 2009	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz~26.5GHz	Oct. 24, 2008	Oct. 23, 2009	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz~40GHz	Oct. 16, 2008	Oct. 15, 2009	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz~1000MHz	Apr. 24, 2008	Apr. 23, 2009	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz~2GHz	Nov. 12, 2008	Nov. 11, 2009	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1G~18GHz	Aug. 18, 2008	Aug. 17, 2009	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AF-0801	95119	8G~18G	Oct. 28, 2008	Oct. 27, 2009	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-251	14G~40GHz	Oct. 16, 2008	Oct. 15, 2009	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G~26.5GHz	Nov. 11, 2008	Nov. 10, 2009	Radiation (03CH06-HY)
Pre Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 21, 2008	Apr. 20, 2009	Radiation (03CH06-HY)
Base Station	R&S	CMU200	105934	NA	Nov. 08, 2008	Nov. 07, 2009	Radiation (03CH06-HY)
BT Base Station	Anritsu	MT8852B	6K00005722	N/A	Oct. 23, 2007	Oct. 22, 2009	Radiation (03CH06-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
Combined standard uncertainty Uc(y)	1.13		
Measuring uncertainty for a level of Confidence of 95% U=2Uc(y)	2.26		

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
Combined standard uncertainty Uc(y)	1.27		
Measuring uncertainty for a level of Confidence of 95% U=2Uc(y)	2.54		

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	C_i	$C_i * u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 * \Gamma_2)$	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty $U_c(y)$	2.36				
Measuring uncertainty for a level of Confidence of 95% $U = 2U_c(y)$	4.72				

6 Certification of TAF Accreditation



Certificate No. : L1190-070110

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2007 to January 09, 2010
Accredited Scope	: Testing Field, see described in the Appendix
Specific Accreditation Program	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory

Jay-San Chen

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

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The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.



Appendix A. Photographs of EUT

Please refer to Sporton report number EP852219-04 as below