

# FCC Test Report

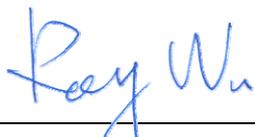
**EQUIPMENT** : GSM Mobile Phone  
**BRAND NAME** : HUAWEI  
**MODEL NAME** : G7000  
**FCC ID** : QISG7000  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : Digital Spread Spectrum (DSS)  
**APPLICANT** : HUAWEI TECHNOLOGIES CO., LTD.

Administration Building, Huawei Base, Bantian,  
Longgang District, Shenzhen 518129

The product sample received on Mar. 24, 2009 and completely tested on Mar. 30, 2009. We, SPORTON INTERNATIONAL INC., 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 (KUNSHAN) INC.**  
**No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.**



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APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS



## SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(b)(1)	A8.4(2)	Number of Channels	≥ 15Chs	Pass	
3.2	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.3	15.247(a)(1)	A8.1(b)	Channel Separation	≥ 2/3 of 20dB BW	Pass	-
3.4	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	≤ 0.4sec in 31.6sec period	Pass	-
3.5	15.247(a)(1)	A8.1(b)	Peak Output Power	≤ 1W	Pass	-
3.6	15.247(d)	A8.5	Frequency Band Edges	≤ 20dBc	Pass	-
3.7	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 7.60 dB at 0.15 MHz
3.8	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 12.08 dB at 2483.50 MHz
3.9	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



# 1 General Description

## 1.1 Applicant

HUAWEI TECHNOLOGIES CO., LTD.

Administration Building, Huawei Base, Bantian, Longgang District, Shenzhen 518129

## 1.2 Manufacturer

HUAWEI TECHNOLOGIES CO., LTD.

Administration Building, Huawei Base, Bantian, Longgang District, Shenzhen 518129

## 1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	GSM Mobile Phone
Brand Name	HUAWEI
Model Name	G7000
FCC ID	QISG7000
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Channel Spacing	1 MHz
Maximum Output Power to Antenna	Bluetooth (1Mbps) : 0.09 dBm (1.02 mW) Bluetooth EDR (2Mbps) : 0.17dBm (1.04 mW) Bluetooth EDR (3Mbps) : 0.41dBm (1.10 mW)
Antenna Type	Chip Antenna with gain 0 dBi
Antenna Connector Type	N/A
HW Version	4800003M300
SW Version	G7000_V100R001B005C00SP00
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Identical Prototype

**List of Accessories:**

Specification of Accessories		
<b>AC Adapter</b>	<b>Brand Name</b>	HUAWEI
	<b>Model Name</b>	HS-050040U6
	<b>Power Rating</b>	I/P:100-240Vac, 50-60Hz, 0.2A; O/P: 5.0Vdc, 400mA
<b>Battery</b>	<b>Brand Name</b>	HUAWEI
	<b>Manufacturer</b>	BYD
	<b>Model Name</b>	V80
	<b>Power Rating</b>	3.7Vdc, 800mAh
	<b>Type</b>	Li-ion
<b>Earphone</b>	<b>Brand Name</b>	LIAN CHUANG HONG SHENG
	<b>Model Name</b>	HSE757L
	<b>Signal Line Type</b>	1.65 meter non-shielded cable without ferrite core
<b>USB Cable</b>	<b>Brand Name</b>	KLC
	<b>Model Name</b>	KLC-0363
	<b>Signal Line Type</b>	1 meter shielded cable without ferrite core
<b>LCD Panel</b>	<b>Brand Name</b>	TRULY
	<b>Model Name</b>	TFT1P6060-E
<b>Camera</b>	<b>Brand Name</b>	SUNRISE
	<b>Model Name</b>	PCV265002B

**Remark:**

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This test report recorded only product characteristics and test results of Digital Spread Spectrum (DSS).
3. For accessories equipped with this EUT, please refer to the appendix of the external photo.
- 4.

**1.4 Testing Site**

<b>Test Site</b>	SPORTON INTERNATIONAL (KUNSHAN) INC.	
<b>Test Site Location</b>	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.	
	TEL: +86-0512-5790-0158	
	FAX: +86-0512-5790-0958	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	
	CO01-KS	03CH01-KS

## 1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC Public Notice DA 00-705
- ANSI C63.4-2003
- IC RSS-210 Issue 7

**Remark:**

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

## 1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	BT Base Station	Anritsu	8852B	N/A	N/A	Unshielded, 1.8 m
3.	PC	DELL	MT320	FCC DoC	N/A	Unshielded, 1.8 m
4.	Monitor	Hangs-G	Hangs-G	FCC DoC	Shielded, 1.2 m	Unshielded, 1.8 m
5.	(USB)Mouse	DELL	MO56UC	FCC DoC	Shielded, 1.8 m	N/A
6.	i-pod	Apple	A1199	FCC DoC	Shielded, 1.2 m	N/A
7.	(USB)Keyboard	DELL	L100	FCC DoC	Shielded, 1.8 m with core	N/A
1.	Printer	HP	Laser Jet 1018	FCC DoC	Shielded, 1.8 m	Unshielded, 1.8 m
2.	Bluetooth Earphone	Nokia	HS.12W	PYAHS.12W	N/A	N/A

## 2 Test Configuration of Equipment Under Test

### 2.1 RF Output Power

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

Channel	Frequency	Bluetooth RF Output Power		
		Data Rate / Modulation		
		GFSK	$\pi/4$ -DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	-0.84 dBm	-0.52 dBm	-0.35 dBm
Ch39	2441MHz	-2.42 dBm	-2.17 dBm	-2.00 dBm
Ch78	2480MHz	0.09 dBm	0.17 dBm	<b>0.41 dBm</b>

**Remark:**

1. The data rate 3Mbps was set for all the test cases, due to the highest RF output power.
2. The data rate 3Mbps was set for dwell time test case.
3. The EUT is programmed to transmit signal continuously for all testing.

## 2.2 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.

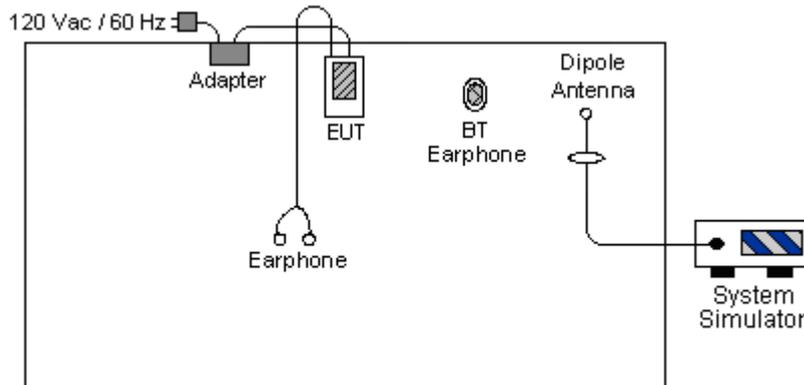
The following tables are showing the test modes as the worst cases and recorded in this report.

Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth 1Mbps GFSK	Bluetooth EDR 2Mbps $\pi/4$ -DQPSK	Bluetooth EDR 3Mbps 8-DPSK
Conducted TCs	<ul style="list-style-type: none"> <li>■ Mode 1: CH00_2402 MHz</li> <li>■ Mode 2: CH39_2441 MHz</li> <li>■ Mode 3: CH78_2480 MHz</li> </ul>	<ul style="list-style-type: none"> <li>■ Mode 4: CH00_2402 MHz</li> <li>■ Mode 5: CH39_2441 MHz</li> <li>■ Mode 6: CH78_2480 MHz</li> </ul>	<ul style="list-style-type: none"> <li>■ Mode 7: CH00_2402 MHz</li> <li>■ Mode 8: CH39_2441 MHz</li> <li>■ Mode 9: CH78_2480 MHz</li> </ul>
Radiated TCs	N/A	N/A	<ul style="list-style-type: none"> <li>■ Mode 1: CH00_2402 MHz</li> <li>■ Mode 2: CH39_2441 MHz</li> <li>■ Mode 3: CH78_2480 MHz</li> </ul>
AC Conducted Emission	<b>Mode 1 : GSM850 Idle + BT Link + Adapter + Earphone + Camera</b> Mode 2 : GSM1900 Idle + BT Link + Adapter + Earphone + MPEG4 Mode 3 : EDGE850 Idle + BT Link + Adapter + Earphone + Camera Mode 4 : GSM850 Idle + BT Link + USB Link + Earphone		
<b>Remark:</b> <ol style="list-style-type: none"> <li>1. The worst case of conducted TCs is Bluetooth 3Mbps, only the test data of these modes was reported.</li> <li>2. The worst cases of radiated emission were Bluetooth 3Mbps Tx modes; only the test data of these modes were reported.</li> <li>3. The worst case of conducted emission is mode 1; only the test data of this mode was reported.</li> </ol>			

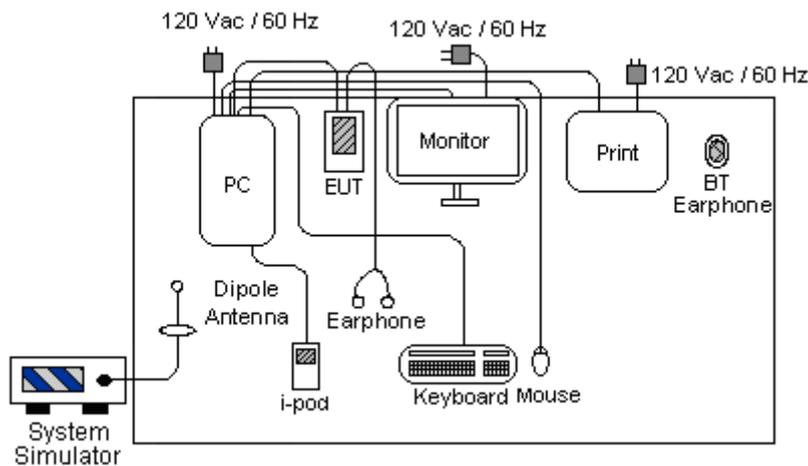
## 2.3 Connection Diagram of Test System

### <Conducted Emission>

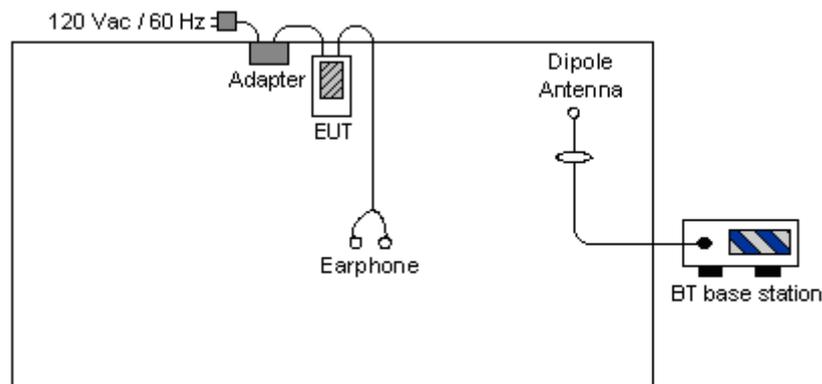
EUT with Adapter Mode



EUT with USB Link Mode



### <Radiated Emission>



## 2.4 RF Utility

For Bluetooth function, execute "Tat 7210 2.57" to make the EUT into the engineering modes to contact with BT base station for transmitting and receiving signals continuously.

### 3 Test Result

#### 3.1 Number of Channel Measurement

##### 3.1.1 Limits of Number of Hopping Frequency

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

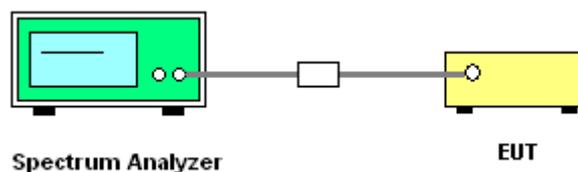
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The modulation types of EUT are irrelevant to number of hopping channels deviation.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:  
Span = the frequency band of operation; RBW  $\geq$  1% of the span; VBW  $\geq$  RBW; Sweep = auto;  
Detector function = peak; Trace = max hold.
5. The number of hopping frequency used is defined as the device has the numbers of total channel.

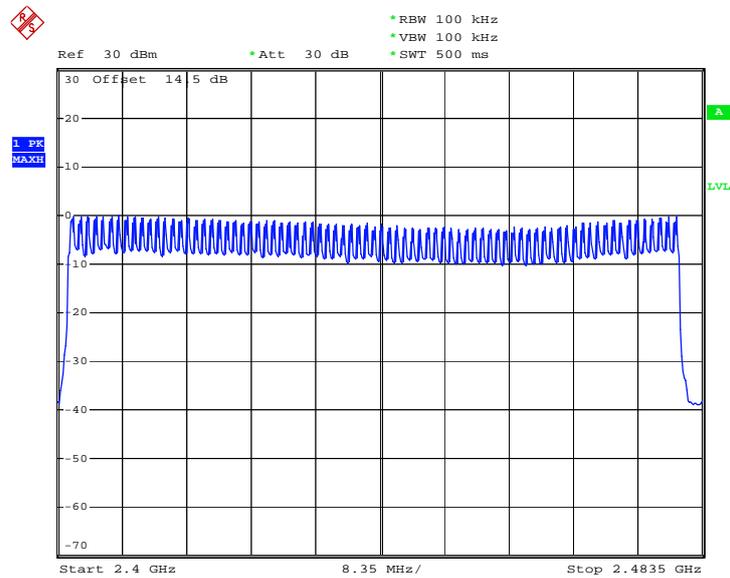
##### 3.1.4 Test Setup



3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 7~9	Temperature :	19~20°C
Test Engineer :	Alex Wang	Relative Humidity :	40~41%
Number of Hopping Channels (Channel)		Limits (Channel)	
79		> 15	
		Pass/Fail	
		Pass	

Number of Hopping Channel Plot on Channel 00 - 78



Date: 25.MAR.2009 10:13:03

## 3.2 20dB Bandwidth Measurement

### 3.2.1 Limit of 20dB Bandwidth

N/A

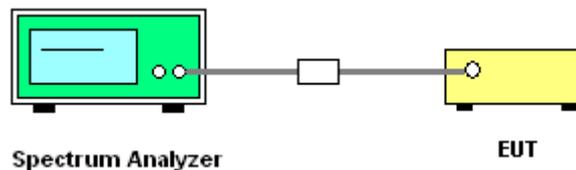
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:  
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;  
RBW  $\geq$  1% of the 20 dB bandwidth; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak;  
Trace = max hold.
5. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

### 3.2.4 Test Setup

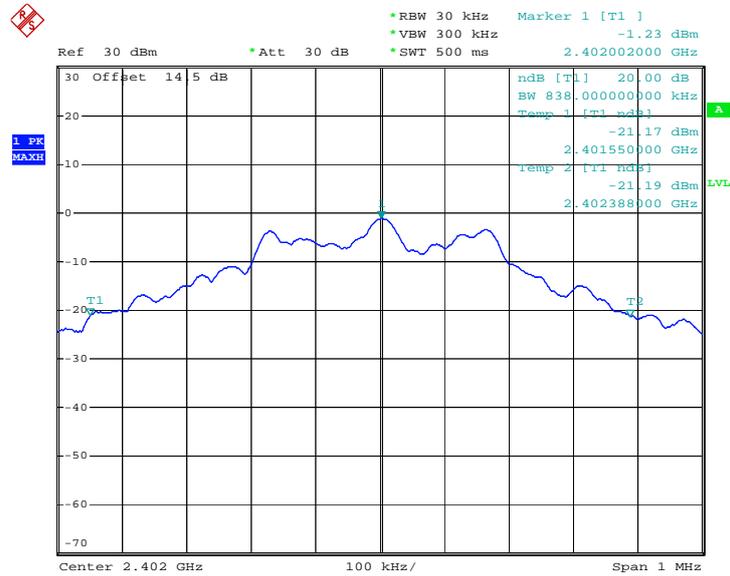


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	19~20°C
Test Engineer :	Alex Wang	Relative Humidity :	40~41%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.838
39	2441	0.840
78	2480	0.838

20 dB Bandwidth Plot on Channel 00



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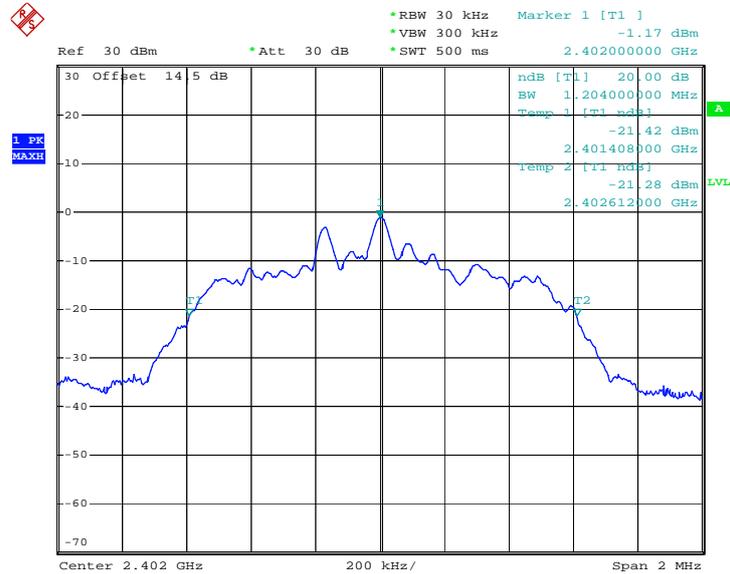




Test Mode :	Mode 7, 8, 9	Temperature :	19~20°C
Test Engineer :	Alex Wang	Relative Humidity :	40~41%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.204
39	2441	1.200
78	2480	1.204

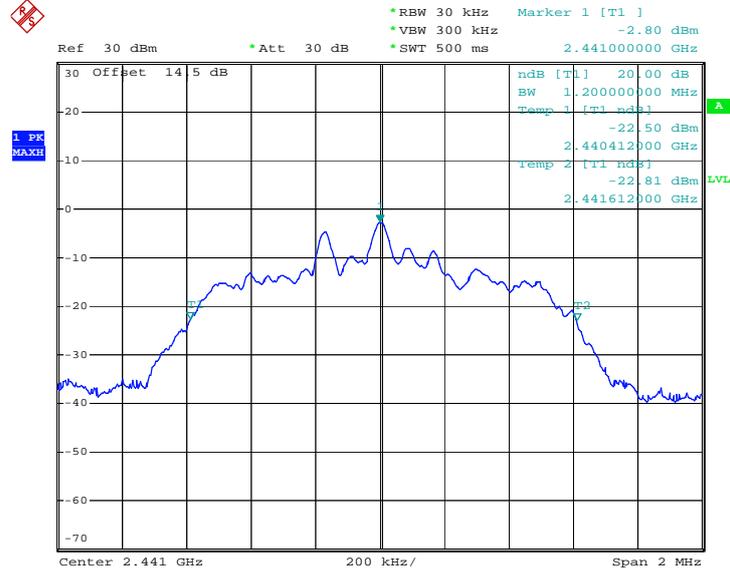
20 dB Bandwidth Plot on Channel 00



Date: 25.MAR.2009 10:00:11

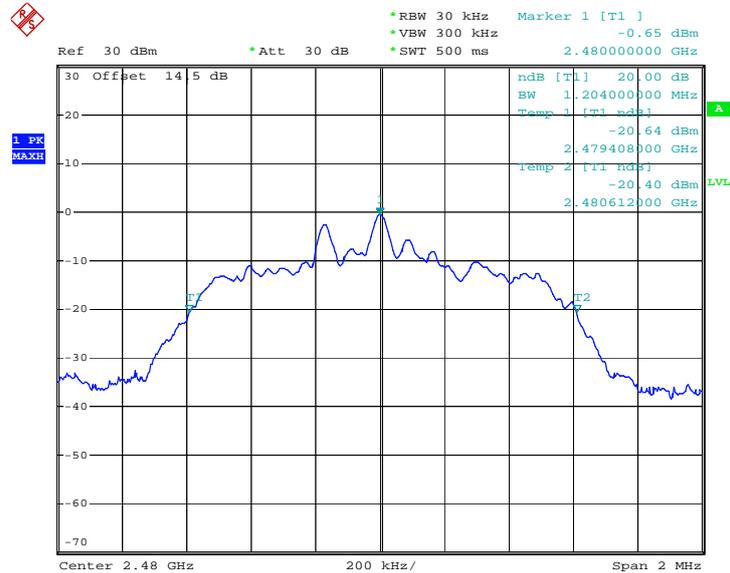


20 dB Bandwidth Plot on Channel 39



Date: 25.MAR.2009 10:00:43

20 dB Bandwidth Plot on Channel 78



Date: 25.MAR.2009 10:01:11

### 3.3 Hopping Channel Separation Measurement

#### 3.3.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

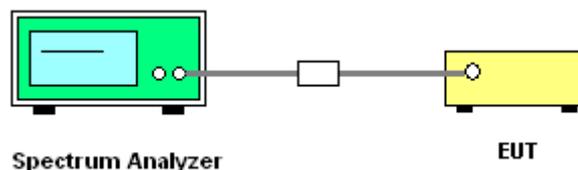
#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. Please refer FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:  
Span = wide enough to capture the peaks of two adjacent channels;  $RBW \geq 1\%$  of the span;  
 $VBW \geq RBW$ ; Sweep = auto; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

#### 3.3.4 Test Setup



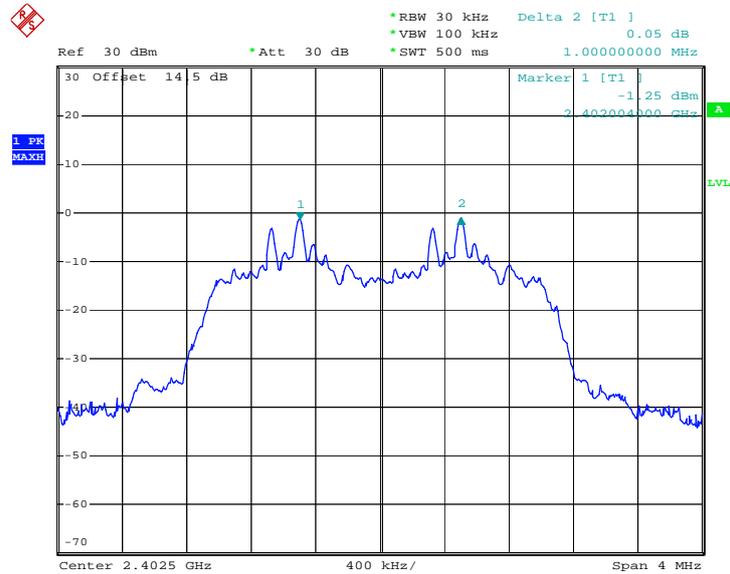


3.3.5 Test Result of Hopping Channel Separation

Test Mode :	Mode 7, 8, 9	Temperature :	19~20°C
Test Engineer :	Alex Wang	Relative Humidity :	40~41%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.000	0.803	Pass
39	2441	1.008	0.800	Pass
78	2480	1.008	0.803	Pass

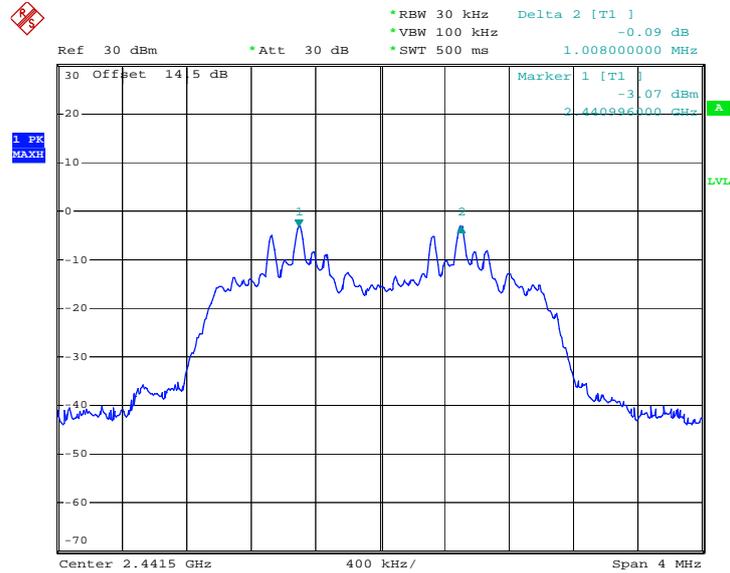
Channel Separation Plot on Channel 00 - 01



Date: 25.MAR.2009 10:14:10

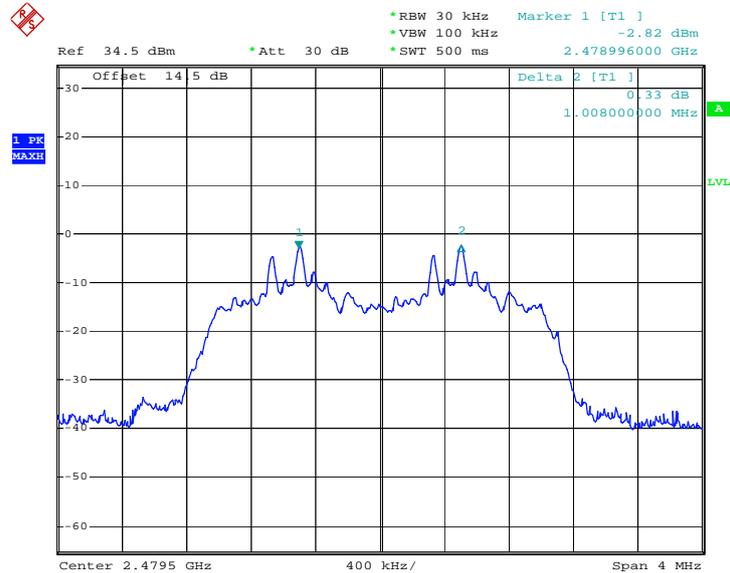


### Channel Separation Plot on Channel 39 - 40



Date: 25.MAR.2009 10:34:15

### Channel Separation Plot on Channel 77 - 78



Date: 29.MAR.2009 08:41:39

### 3.4 Dwell Time Measurement

#### 3.4.1 Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

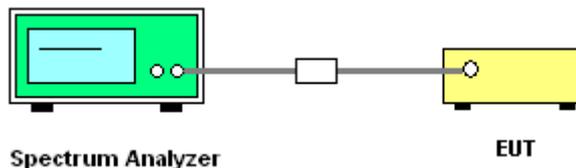
#### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.4.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:  
Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to calculate the dwell time.

#### 3.4.4 Test Setup



#### 3.4.5 Test Result of Dwell Time

Test Mode :	Mode 8	Temperature :	19~20°C
Test Engineer :	Alex Wang	Relative Humidity :	40~41%

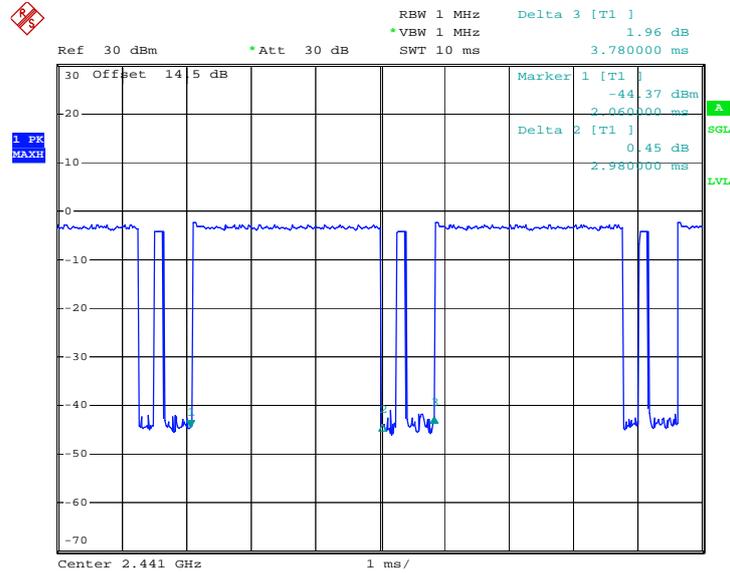
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
3DH5	3.00	2980.00	0.283	0.4	Pass

**Remark:**

1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)

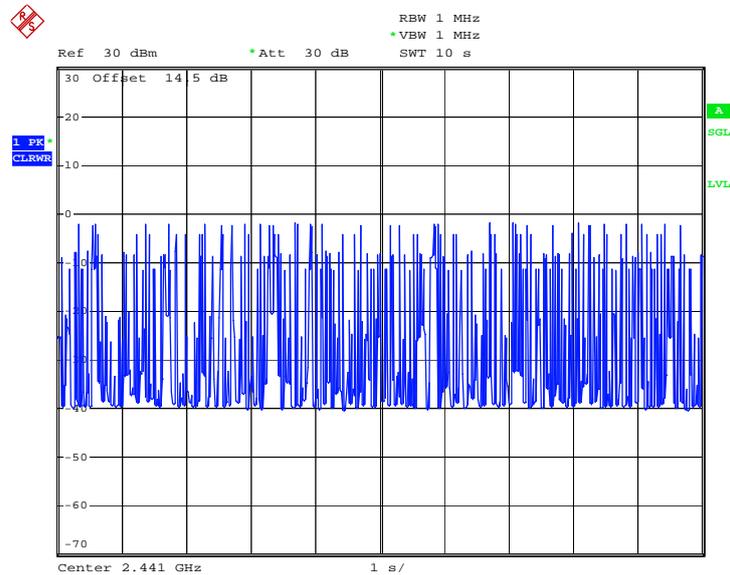


### 3DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 25.MAR.2009 10:19:32

### 3DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 25.MAR.2009 10:20:39

### 3.5 Peak Output Power Measurement

#### 3.5.1 Limit of Peak Output Power

Frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1W (30 dBm).

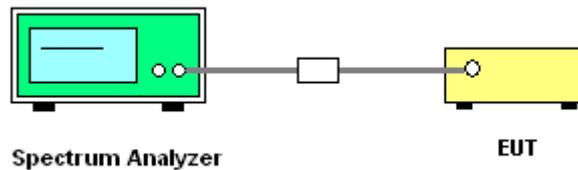
#### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.5.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the peak power meter by a low loss cable.

#### 3.5.4 Test Setup



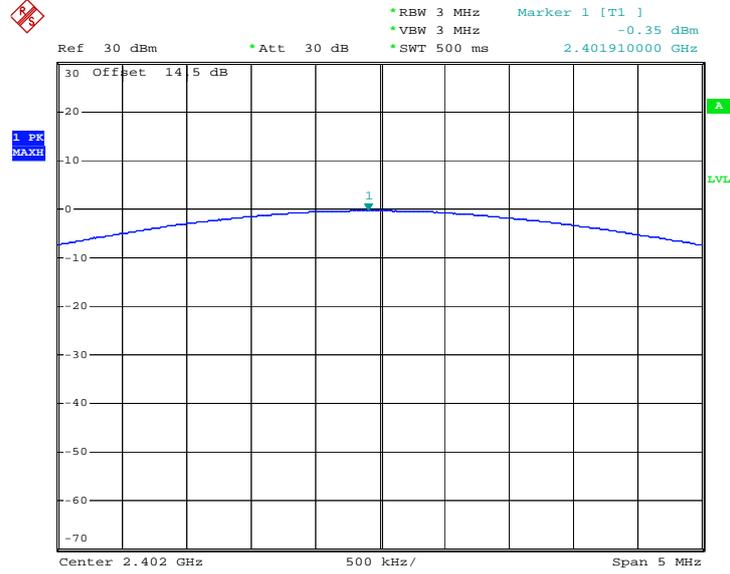
#### 3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 7, 8, 9	Temperature :	19~20°C
Test Engineer :	Alex Wang	Relative Humidity :	40~41%

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	-0.35	30	Pass
39	2441	-2.00	30	Pass
78	2480	0.41	30	Pass

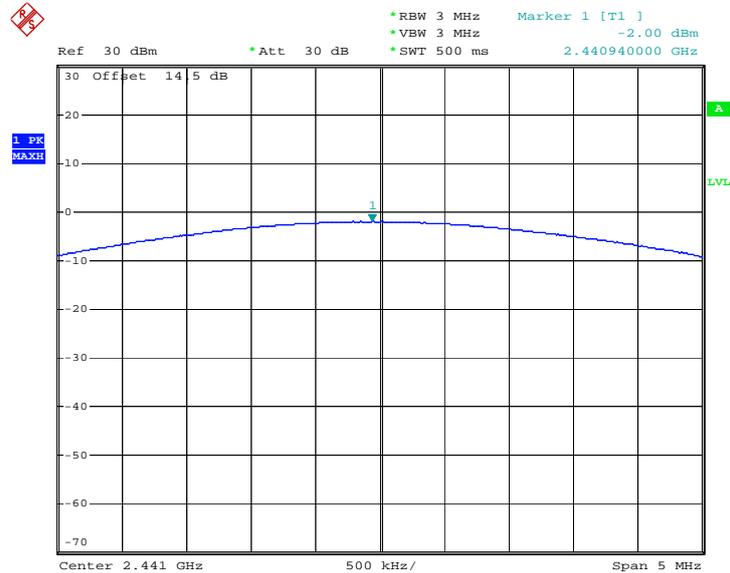


Peak Output Power Plot on Channel 00



Date: 25.MAR.2009 09:55:56

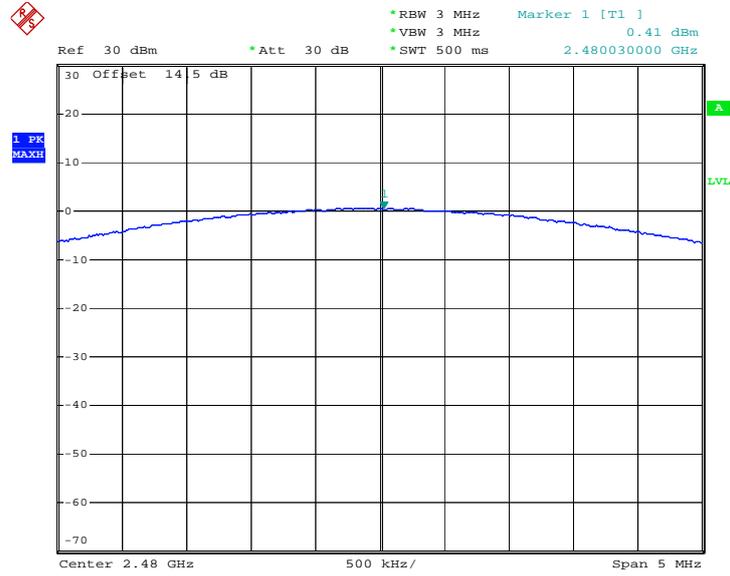
Peak Output Power Plot on Channel 39



Date: 25.MAR.2009 09:56:31



Peak Output Power Plot on Channel 78



Date: 25.MAR.2009 09:59:07

## 3.6 Band Edges Measurement

### 3.6.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

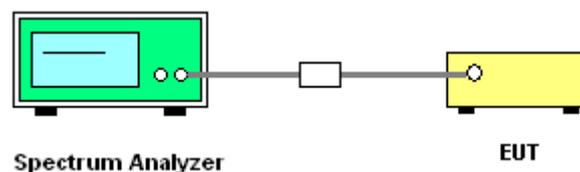
### 3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 100 kHz, Video bandwidth (VBW) > RBW, scan up through 10th harmonic. Band edge 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 band edge 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 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).

### 3.6.4 Test Setup





3.6.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	17~18°C
Test Channel :	00	Relative Humidity :	40~41%
Mode :	3Mbps	Test Engineer :	Peter Qiu

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	44.56	-29.44	74.00	44.56	31.93	3.25	35.18	100	0	Peak
2389.61	33.31	-20.69	54.00	33.31	31.93	3.25	35.18	146	10	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
2389.04	47.54	-26.46	74.00	47.54	31.93	3.25	35.18	100	0	Peak
2389.04	29.89	-24.11	54.00	29.89	31.93	3.25	35.18	105	265	Average

Test Mode :	Mode 3	Temperature :	17~18°C
Test Channel :	78	Relative Humidity :	40~41%
Mode :	3Mbps	Test Engineer :	Peter Qiu

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
2485.56	58.96	-15.04	74.00	58.63	32.24	3.29	35.20	100	0	Peak
2485.56	32.71	-21.29	54.00	32.38	32.24	3.29	35.20	169	360	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
2483.50	56.18	-17.82	74.00	55.85	32.24	3.29	35.20	100	0	Peak
2483.50	41.92	-12.08	54.00	41.59	32.24	3.29	35.20	196	78	Average



## 3.7 AC Conducted Emission Measurement

### 3.7.1 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.

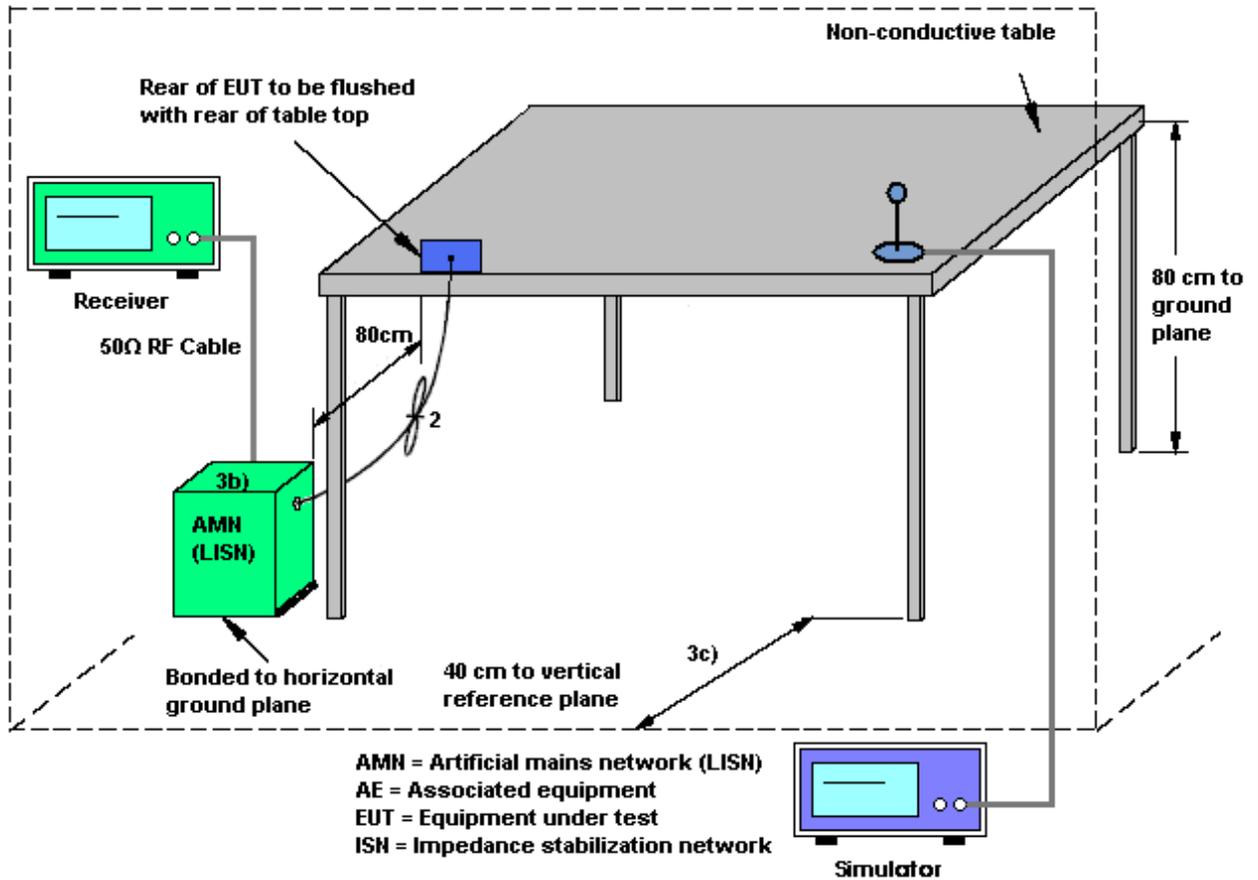
### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.7.3 Test Procedures

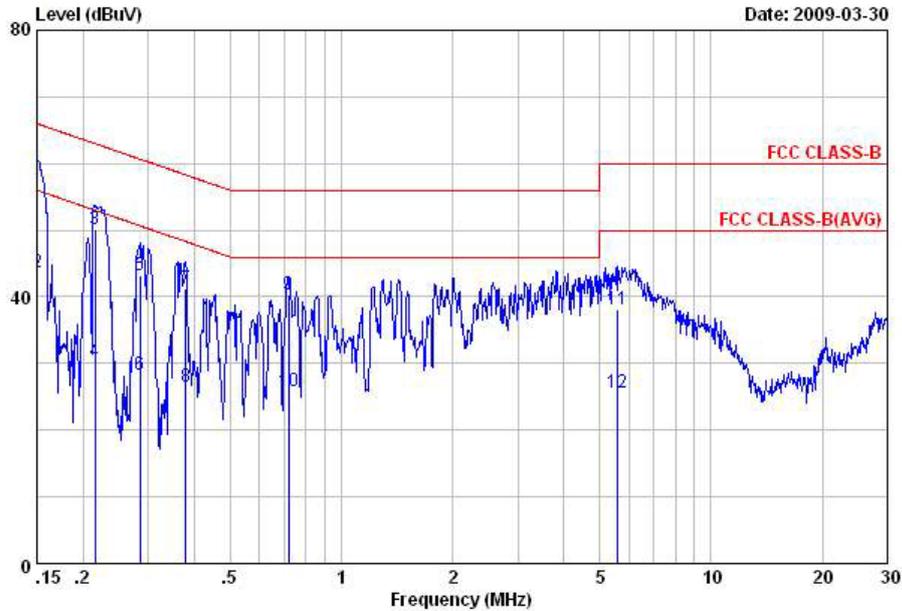
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All 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.

### 3.7.4 Test Setup



3.7.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Rain Zhou	Relative Humidity :	40~41%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + BT Link + Adapter + Earphone + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



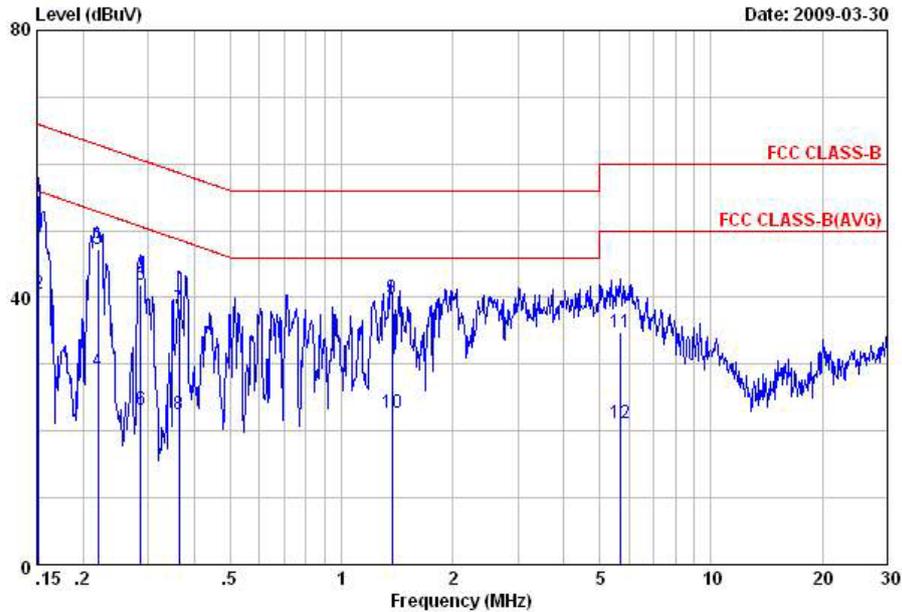
Site : C001-KS  
 Condition: FCC CLASS-B LISN-071001 LINE

Memo : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.15	58.37	-7.60	65.97	48.30	-0.07	10.14	QP
2	0.15	43.67	-12.30	55.97	33.60	-0.07	10.14	Average
3	0.22	50.18	-12.83	63.01	40.10	-0.07	10.15	QP
4	0.22	30.28	-22.73	53.01	20.20	-0.07	10.15	Average
5	0.28	43.19	-17.48	60.67	33.09	-0.07	10.17	QP
6	0.28	28.19	-22.48	50.67	18.09	-0.07	10.17	Average
7	0.38	41.21	-17.09	58.30	31.10	-0.08	10.19	QP
8	0.38	26.61	-21.69	48.30	16.50	-0.08	10.19	Average
9	0.72	40.25	-15.75	56.00	30.10	-0.09	10.24	QP
10	0.72	25.75	-20.25	46.00	15.60	-0.09	10.24	Average
11	5.57	38.18	-21.82	60.00	27.90	-0.13	10.41	QP
12	5.57	25.58	-24.42	50.00	15.30	-0.13	10.41	Average



Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Rain Zhou	Relative Humidity :	40~41%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + BT Link + Adapter + Earphone + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS  
 Condition: FCC CLASS-B LISN-071001 NEUTRAL

Memo : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.15	55.25	-10.66	65.91	45.20	-0.09	10.14	QP
2	0.15	40.65	-15.26	55.91	30.60	-0.09	10.14	Average
3	0.22	47.18	-15.67	62.85	37.10	-0.07	10.15	QP
4	0.22	28.88	-23.97	52.85	18.80	-0.07	10.15	Average
5	0.29	41.89	-18.72	60.61	31.79	-0.07	10.17	QP
6	0.29	23.09	-27.52	50.61	12.99	-0.07	10.17	Average
7	0.36	38.41	-20.24	58.65	28.31	-0.08	10.18	QP
8	0.36	22.41	-26.24	48.65	12.31	-0.08	10.18	Average
9	1.37	39.79	-16.21	56.00	29.60	-0.10	10.29	QP
10	1.37	22.69	-23.31	46.00	12.50	-0.10	10.29	Average
11	5.69	34.68	-25.32	60.00	24.40	-0.13	10.41	QP
12	5.69	21.18	-28.82	50.00	10.90	-0.13	10.41	Average

## 3.8 Radiated Emission Measurement

### 3.8.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

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

### 3.8.2 Measuring Instruments

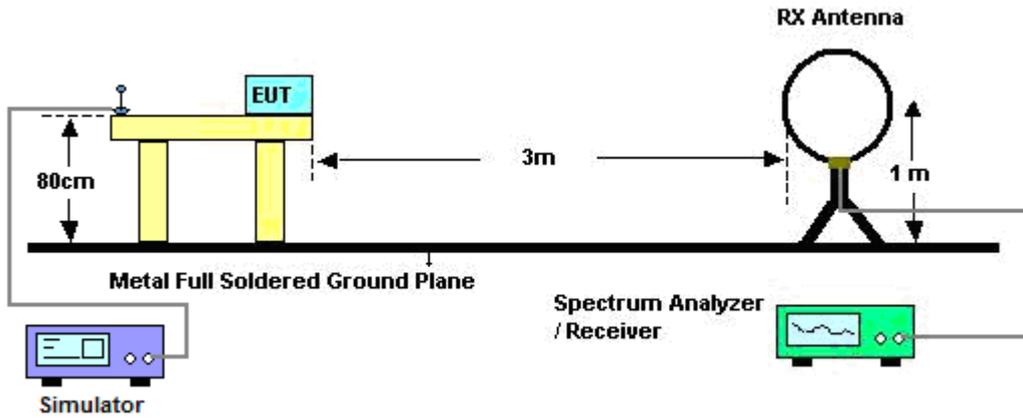
See list of measuring instruments of this test report.

### 3.8.3 Test Procedures

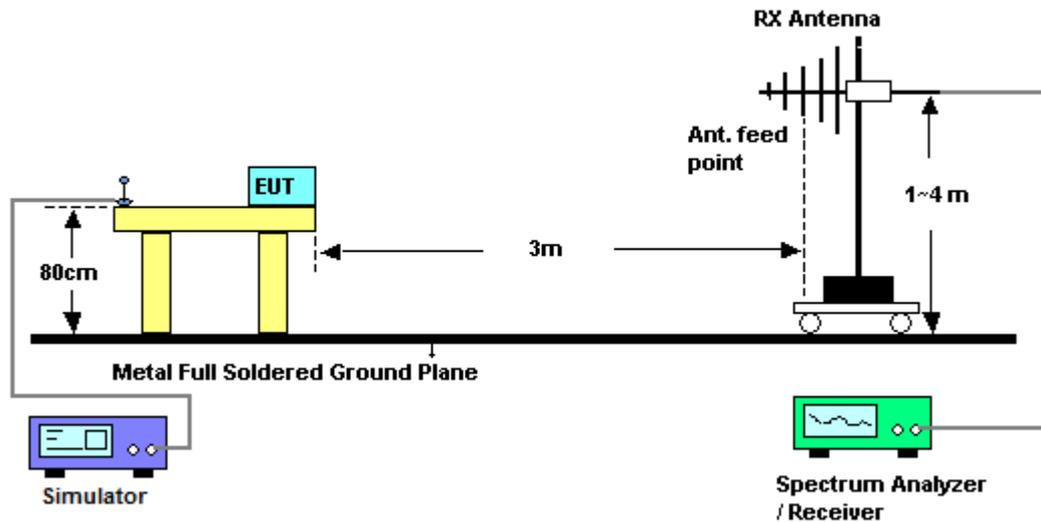
10. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
11. Use the following spectrum analyzer settings:  
Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
12. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

### 3.8.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



### 3.8.5 Test Results of Radiated Emissions (9kHz ~ 30MHz)

Temperature	17~18°C	Humidity	40~41%
Test Engineer	Peter Qiu		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

**Note:**

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

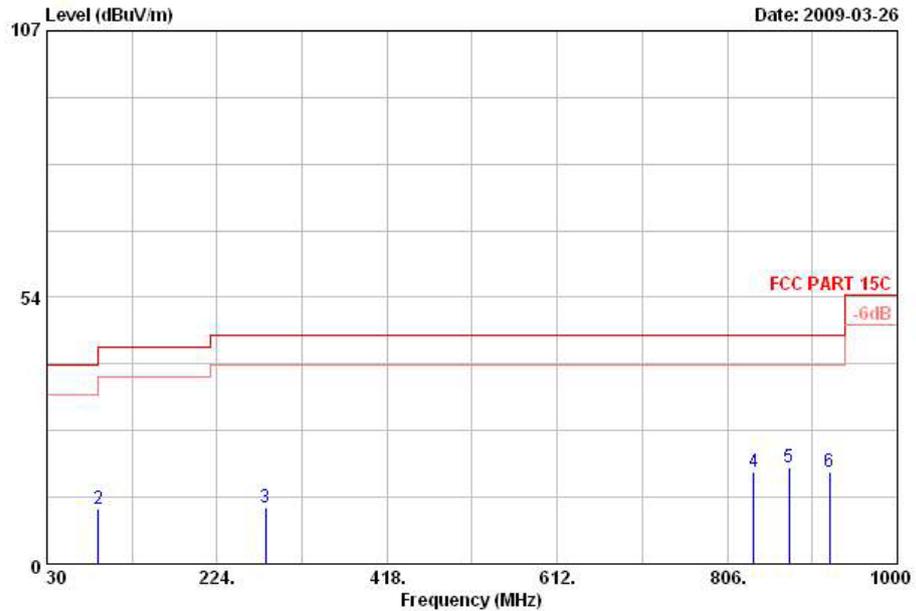
Distance extrapolation factor =  $40 \log(\text{specific distance} / \text{test distance})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.



3.8.6 Test Result of Radiated Emission (30MHz ~ 1GHz)

Test Mode :	Mode 1	Temperature :	17~18°C
Test Channel :	00	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Horizontal
Remark :			



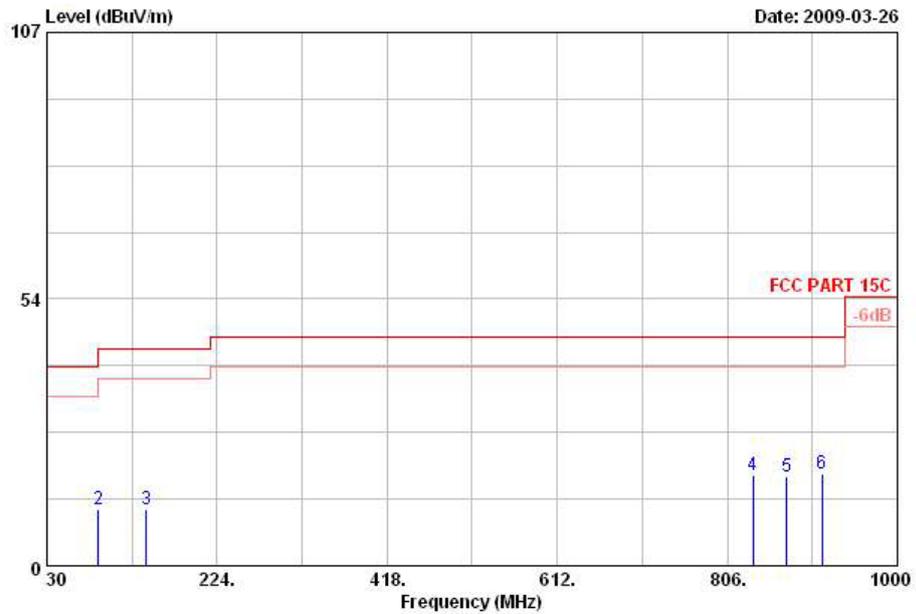
Site : 03CH01-KS  
 Condition: FCC PART 15C 3m LF ANT-070906 HORIZONTAL

Mode : Mode 1

	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	30.00	16.22	-23.78	40.00	26.00	18.00	0.23	28.01	106	33	Peak
2	88.86	11.08	-32.42	43.50	29.84	8.85	0.37	27.98	---	---	Peak
3	278.94	11.44	-34.56	46.00	26.59	12.50	0.66	28.31	---	---	Peak
4	836.20	18.33	-27.67	46.00	23.68	20.47	1.18	27.00	---	---	Peak
5	876.80	19.25	-26.75	46.00	24.66	20.16	1.21	26.78	---	---	Peak
6	922.30	18.36	-27.64	46.00	23.38	20.49	1.23	26.74	---	---	Peak



Test Mode :	Mode 1	Temperature :	17~18°C
Test Channel :	00	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Vertical
Remark :			



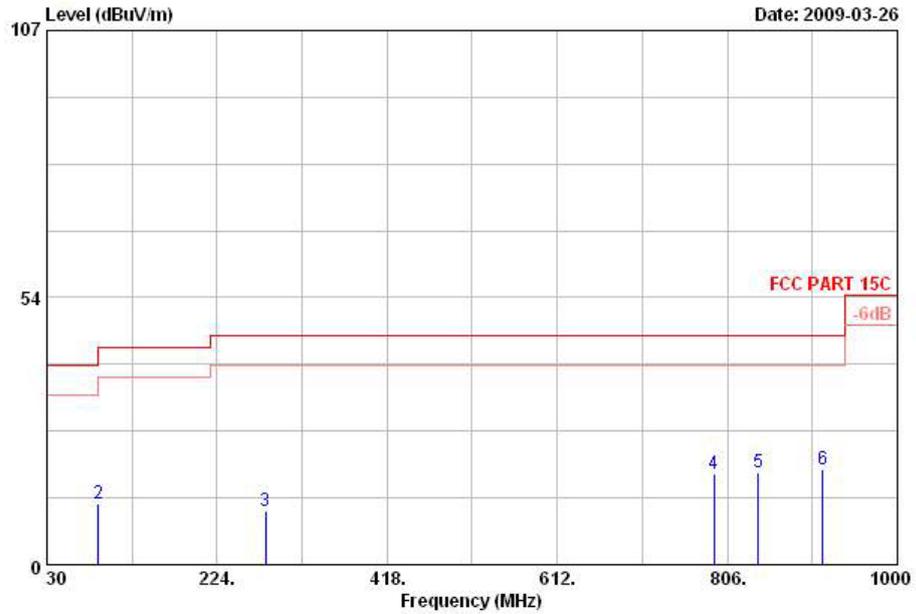
Site : 03CH01-K5  
 Condition: FCC PART 15C 3m LF ANT-070906 VERTICAL

Mode : Mode 1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	30.00	17.10	-22.90	40.00	26.88	18.00	0.23	28.01	100	323 Peak
2	88.86	11.27	-32.23	43.50	30.03	8.85	0.37	27.98	---	---
3	143.13	11.40	-32.10	43.50	28.36	10.62	0.47	28.05	---	---
4	835.50	18.28	-27.72	46.00	23.64	20.47	1.18	27.01	---	---
5	874.00	17.99	-28.01	46.00	23.39	20.19	1.20	26.79	---	---
6	913.90	18.58	-27.42	46.00	23.65	20.43	1.22	26.72	---	---



Test Mode :	Mode 2	Temperature :	17~18°C
Test Channel :	39	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Horizontal
Remark :			



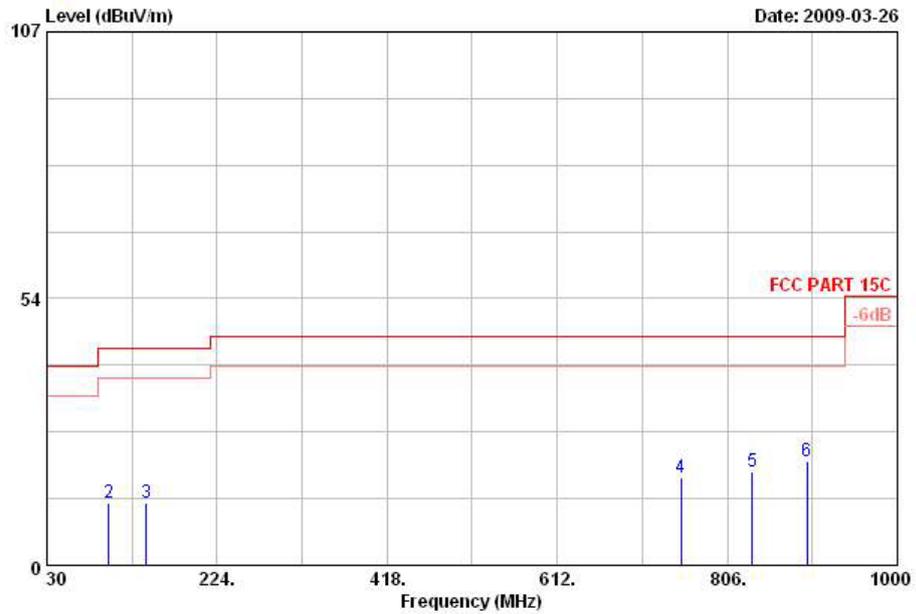
Site : 03CH01-K5  
 Condition: FCC PART 15C 3m LF ANT-070906 HORIZONTAL

Mode : Mode 2

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg	
1	30.00	16.58	-23.42	40.00	26.36	18.00	0.23	28.01	105	33 Peak
2	88.86	12.27	-31.23	43.50	31.03	8.85	0.37	27.98	---	Peak
3	278.94	10.84	-35.16	46.00	25.99	12.50	0.66	28.31	---	Peak
4	790.70	18.03	-27.97	46.00	24.39	19.70	1.14	27.20	---	Peak
5	841.10	18.61	-27.39	46.00	23.91	20.50	1.18	26.98	---	Peak
6	915.30	19.09	-26.91	46.00	24.16	20.43	1.23	26.73	---	Peak



Test Mode :	Mode 2	Temperature :	17~18°C
Test Channel :	39	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Vertical
Remark :			



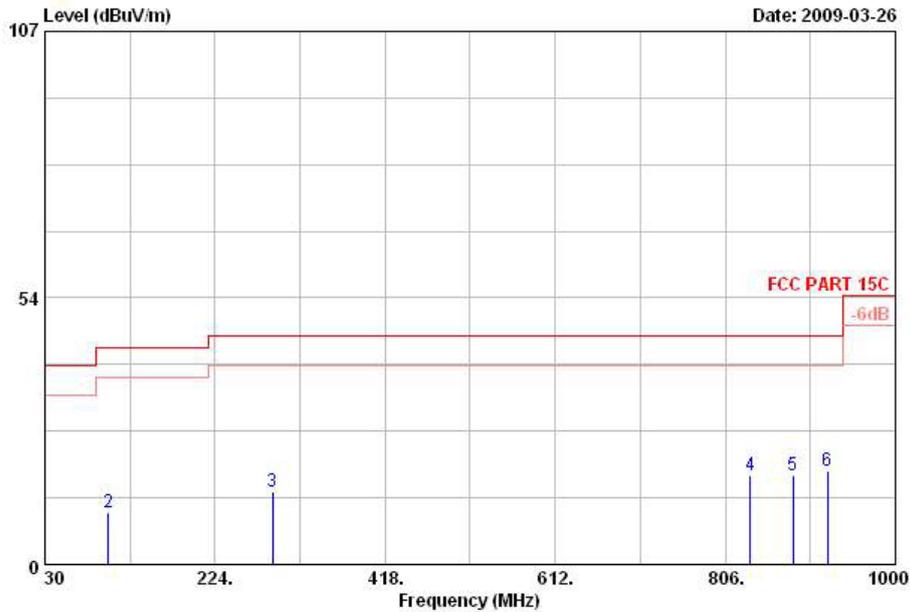
Site : 03CH01-KS  
 Condition: FCC PART 15C 3m LF ANT-070906 VERTICAL

Mode : Mode 2

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg	
1	30.54	16.04	-23.96	40.00	25.82	18.00	0.23	28.01	100	320 Peak
2	100.20	12.47	-31.03	43.50	29.59	10.50	0.39	28.01	---	Peak
3	143.13	12.39	-31.11	43.50	29.35	10.62	0.47	28.05	---	Peak
4	752.90	17.46	-28.54	46.00	24.11	19.86	1.11	27.62	---	Peak
5	834.10	18.74	-27.26	46.00	24.12	20.45	1.18	27.01	---	Peak
6	897.10	20.93	-25.07	46.00	26.09	20.33	1.22	26.71	---	Peak



Test Mode :	Mode 3	Temperature :	17~18°C
Test Channel :	78	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Horizontal
Remark :			



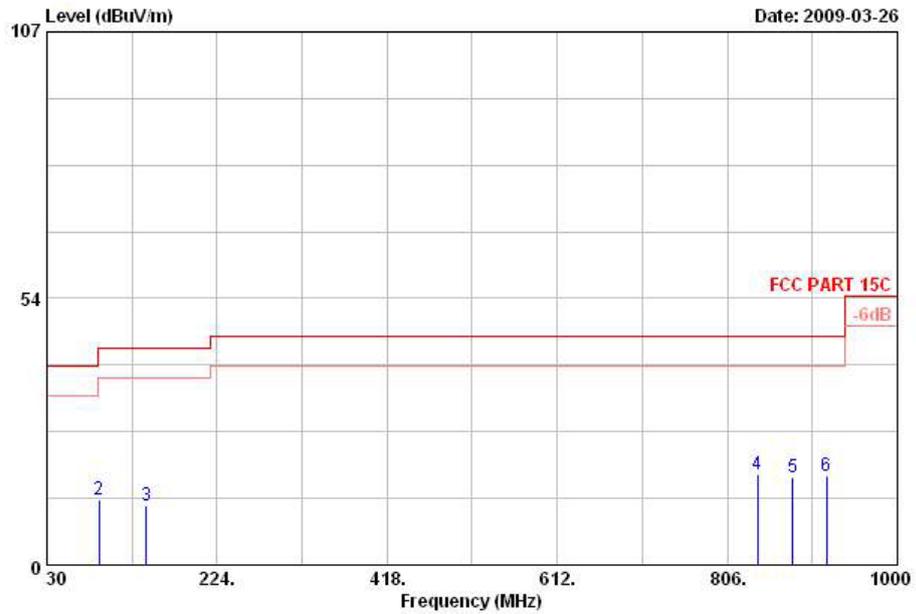
Site : 03CH01-KS  
 Condition: FCC PART 15C 3m LF ANT-070906 HORIZONTAL

Mode : Mode 3

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg	
1	30.54	16.27	-23.73	40.00	26.05	18.00	0.23	28.01	105	35 Peak
2	102.36	10.55	-32.95	43.50	27.29	10.88	0.39	28.01	---	Peak
3	290.01	14.46	-31.54	46.00	29.41	12.70	0.68	28.33	---	Peak
4	834.10	17.79	-28.21	46.00	23.17	20.45	1.18	27.01	---	Peak
5	883.10	17.86	-28.14	46.00	23.25	20.16	1.21	26.76	---	Peak
6	922.30	18.74	-27.26	46.00	23.76	20.49	1.23	26.74	---	Peak



Test Mode :	Mode 3	Temperature :	17~18°C
Test Channel :	78	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Vertical
Remark :			



Site : 03CH01-KS  
 Condition: FCC PART 15C 3m LF ANT-070906 VERTICAL

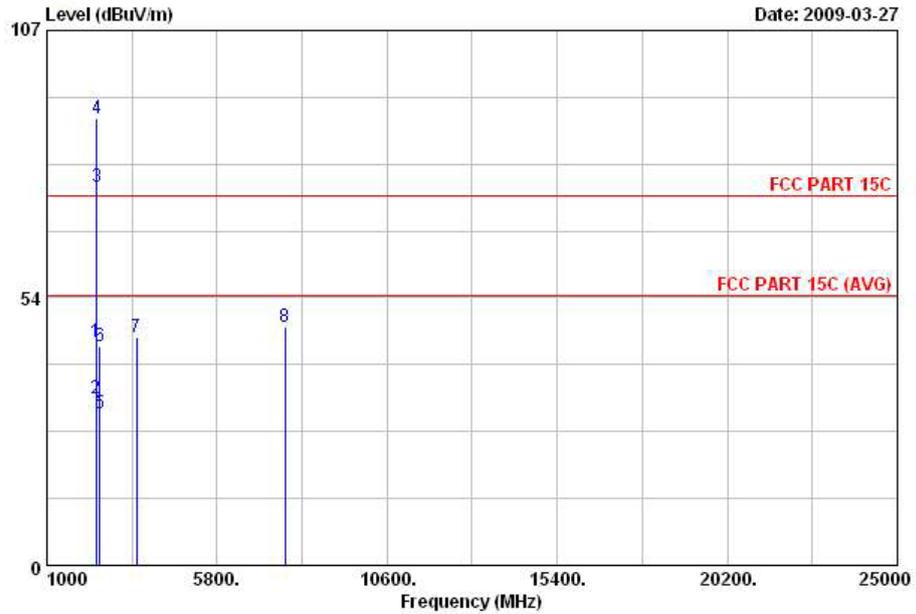
Mode : Mode 3

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	30.54	16.23	-23.77	40.00	26.01	18.00	0.23	28.01	100	320 Peak
2	89.13	13.10	-30.40	43.50	31.85	8.85	0.38	27.98	---	Peak
3	143.13	12.04	-31.46	43.50	29.00	10.62	0.47	28.05	---	Peak
4	840.40	18.27	-27.73	46.00	23.57	20.50	1.18	26.98	---	Peak
5	881.00	17.63	-28.37	46.00	23.04	20.15	1.21	26.77	---	Peak
6	919.50	17.90	-28.10	46.00	22.90	20.50	1.23	26.73	---	Peak



3.8.7 Test Result of Radiated Emission  $\geq 1$ GHz

Test Mode :	Mode 1	Temperature :	17~18°C
Test Channel :	00	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals which can be ignored.		



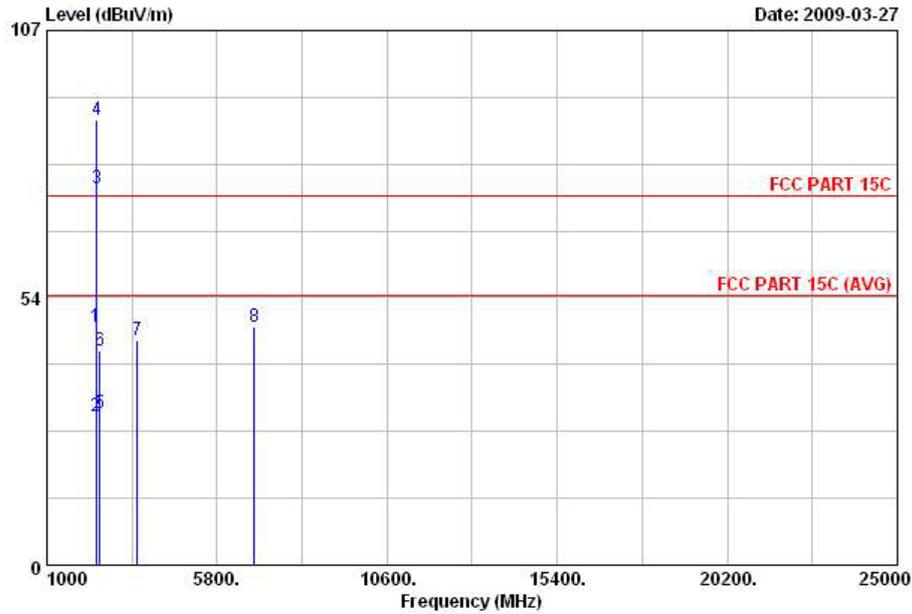
Site : 03CH01-KS  
 Condition: FCC PART 15C 3m HF ANT-070911 HORIZONTAL

Mode : Mode 1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	2389.61	44.56	-29.44	74.00	44.56	31.93	3.25	35.18	100	0 Peak
2	2389.61	33.31	-20.69	54.00	33.31	31.93	3.25	35.18	146	10 Average
3 X	2402.00	75.81			75.81	31.93	3.25	35.18	146	10 Average
4 X	2402.00	89.30			89.30	31.93	3.25	35.18	100	0 Peak
5	2492.00	30.40	-23.60	54.00	30.00	32.30	3.30	35.20	146	10 Average
6	2492.00	43.81	-30.19	74.00	43.41	32.30	3.30	35.20	100	0 Peak
7	3536.00	45.62	-28.38	74.00	43.52	33.42	3.97	35.29	---	--- Peak
8	7724.00	47.68	-26.32	74.00	40.99	35.84	6.34	35.49	---	--- Peak



Test Mode :	Mode 1	Temperature :	17~18°C
Test Channel :	00	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals which can be ignored.		



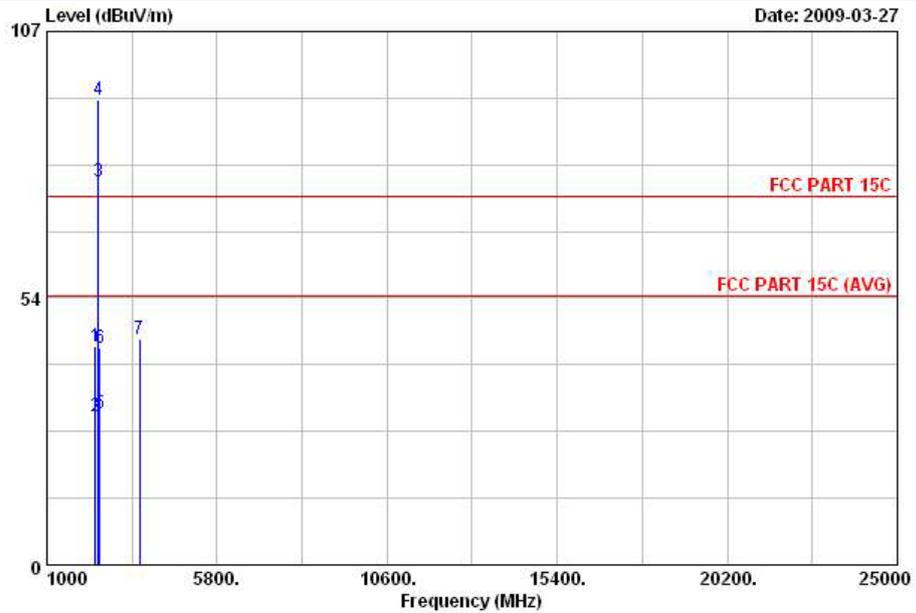
Site : 03CH01-KS  
 Condition: FCC PART 15C 3m HF ANT-070911 VERTICAL

Mode : Mode 1

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg	
1	2389.04	47.54	-26.46	74.00	47.54	31.93	3.25	35.18	100	0 Peak
2	2389.04	29.89	-24.11	54.00	29.89	31.93	3.25	35.18	105	265 Average
3 X	2402.00	75.36			75.36	31.93	3.25	35.18	105	265 Average
4 X	2402.00	89.12			89.12	31.93	3.25	35.18	100	0 Peak
5	2492.00	30.32	-23.68	54.00	29.92	32.30	3.30	35.20	105	265 Average
6	2492.00	42.78	-31.22	74.00	42.38	32.30	3.30	35.20	100	0 Peak
7	3540.00	45.05	-28.95	74.00	42.94	33.42	3.97	35.28	---	--- Peak
8	6860.00	47.71	-26.29	74.00	41.60	35.63	5.63	35.15	---	--- Peak



Test Mode :	Mode 2	Temperature :	17~18°C
Test Channel :	39	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals which can be ignored.		



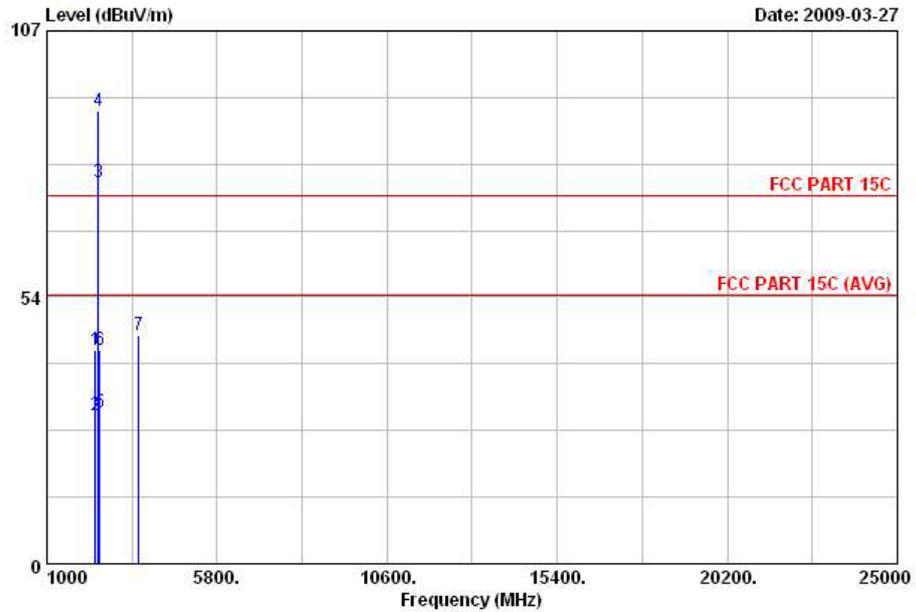
Site : 03CH01-KS  
 Condition: FCC PART 15C 3m HF ANT-070911 HORIZONTAL

Mode : Mode 2

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
			dB	dBuV/m	dBuV	dB	dB	cm	deg	
1	2366.00	43.75	-30.25	74.00	43.92	31.79	3.22	35.18	100	0 Peak
2	2366.00	29.76	-24.24	54.00	29.93	31.79	3.22	35.18	175	360 Average
3 X	2441.00	76.86			76.65	32.13	3.27	35.19	175	360 Average
4 X	2441.00	93.22			93.01	32.13	3.27	35.19	100	0 Peak
5	2494.00	30.37	-23.63	54.00	29.97	32.30	3.30	35.20	175	360 Average
6	2494.00	43.64	-30.36	74.00	43.24	32.30	3.30	35.20	100	0 Peak
7	3606.00	45.39	-28.61	74.00	43.19	33.45	4.01	35.26	---	--- Peak



Test Mode :	Mode 2	Temperature :	17~18°C
Test Channel :	39	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals which can be ignored.		



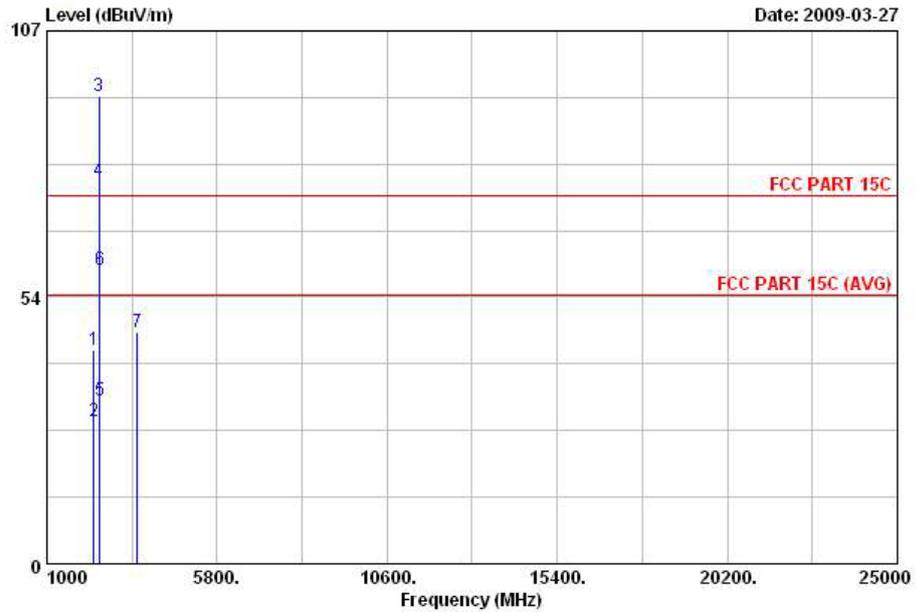
Site : 03CH01-KS  
 Condition: FCC PART 15C 3m HF ANT-070911 VERTICAL

Mode : 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	2356.00	42.98	-31.02	74.00	43.14	31.79	3.22	35.17	100		0 Peak
2	2356.00	29.78	-24.22	54.00	29.94	31.79	3.22	35.17	200	77	Average
3 X	2441.00	76.53			76.32	32.13	3.27	35.19	200	77	Average
4 X	2441.00	90.76			90.55	32.13	3.27	35.19	100		0 Peak
5	2486.00	30.48	-23.52	54.00	30.15	32.24	3.29	35.20	200	77	Average
6	2486.00	42.88	-31.12	74.00	42.55	32.24	3.29	35.20	100		0 Peak
7	3596.00	46.00	-28.00	74.00	43.80	33.45	4.01	35.26	---	---	Peak



Test Mode :	Mode 3	Temperature :	17~18°C
Test Channel :	78	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals which can be ignored.		



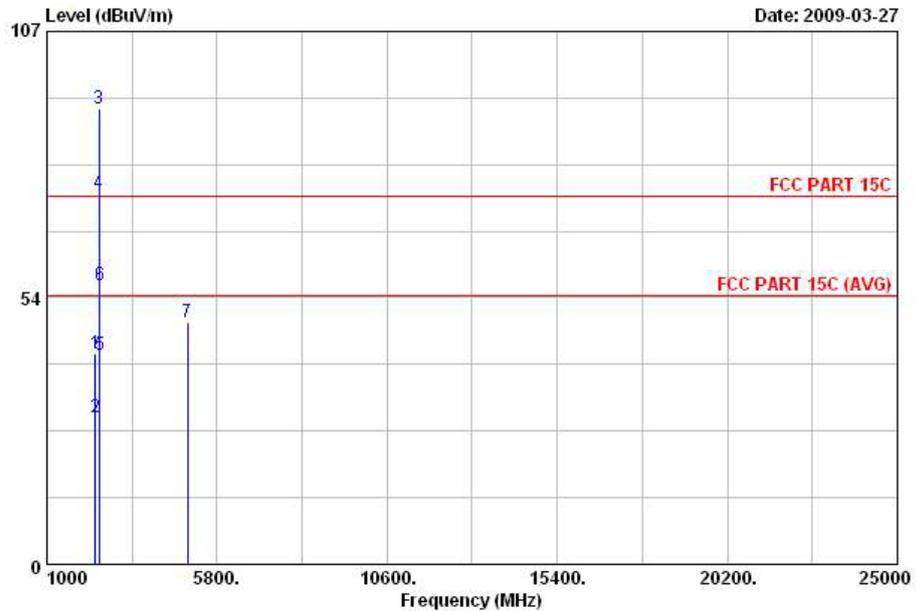
Site : 03CH01-KS  
 Condition: FCC PART 15C 3m HF ANT-070911 HORIZONTAL

Mode : 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	2314.00	42.95	-31.05	74.00	43.37	31.56	3.19	35.17	100	0	Peak
2	2314.00	28.76	-25.24	54.00	29.18	31.56	3.19	35.17	169	360	Average
3 X	2480.00			74.00	93.51	32.24	3.29	35.20	100	0	Peak
4 X	2480.00			54.00	76.64	32.24	3.29	35.20	169	360	Average
5	2485.56	32.71	-21.29	54.00	32.38	32.24	3.29	35.20	169	360	Average
6	2485.56	58.96	-15.04	74.00	58.63	32.24	3.29	35.20	100	0	Peak
7	3542.00	46.36	-27.64	74.00	44.24	33.42	3.98	35.28	---	---	Peak



Test Mode :	Mode 3	Temperature :	17~18°C
Test Channel :	78	Relative Humidity :	40~41%
Test Engineer :	Peter Qiu	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals which can be ignored.		



Site : 03CH01-KS  
 Condition: FCC PART 15C 3m HF ANT-070911 VERTICAL

Mode : 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	2356.00	42.31	-31.69	74.00	42.47	31.79	3.22	35.17	100	0	Peak
2	2356.00	29.48	-24.52	54.00	29.64	31.79	3.22	35.17	196	78	Average
3 X	2480.00			74.00	91.07	32.24	3.29	35.20	100	0	Peak
4 X	2480.00			54.00	74.04	32.24	3.29	35.20	196	78	Average
5	2483.50	41.92	-12.08	54.00	41.59	32.24	3.29	35.20	196	78	Average
6	2483.50	56.18	-17.82	74.00	55.85	32.24	3.29	35.20	100	0	Peak
7	4962.00	48.58	-25.42	74.00	44.85	34.08	4.66	35.01	---	---	Peak

## 3.9 Antenna Requirements

### 3.9.1 Standard Applicable

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.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

### 3.9.2 Antenna Connected Construction

The antennas type used in this product is Chip Antenna without connector and it is considered to meet antenna requirement.

### 3.9.3 Antenna Gain

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

## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 08, 2008	Dec. 07, 2009	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Jun. 18, 2007	Jun. 17, 2009	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Jun. 12, 2007	Jun. 11, 2009	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-930701	N/A	Dec. 15, 2008	Dec. 14, 2009	Conducted (TH01-KS)
DC Power Supply	TOPWARD	3306D	N/A	N/A	N/A	N/A	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI	100534	9kHz~2.75GHz	Dec. 08, 2008	Dec. 07, 2009	Conduction (CO01-KS)
LISN	MessTec	AN3016	060103	9kHz~30MHz	Dec. 18, 2008	Dec. 17, 2009	Conduction (CO01-KS)
LISN	MessTec	AN3016	060105	9kHz~30MHz	Dec. 18, 2008	Dec. 17, 2009	Conduction (CO01-KS)
DC- LISN	EM Test	AN20200	060102	0.1MHz~108MHz	Dec. 18, 2008	Dec. 17, 2009	Conduction (CO01-KS)
DC- LISN	EM Test	AN20200	060107	0.1MHz~108MHz	Dec. 18, 2008	Dec. 17, 2009	Conduction (CO01-KS)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO01-KS)
ISN	MessTec	AN3016	060103	9kHz – 30MHz	Dec. 18, 2008	Dec. 17, 2009	Conduction (CO01-HY)
System Simulator	R&S	CMU200	837587/066	Full-Band/BT	Jan. 08, 2009	Jan. 07, 2011	Conduction (CO01-KS)
BT Base Station	ANRITSU	MT8852B	N/A	BT EDR	N/A	N/A	Conduction (CO01-HY)
Spectrum Analyzer	R&S	ESCI	100534	9kHz – 2.75GHz	Dec. 08, 2008	Dec. 07, 2009	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 08, 2008	Dec. 07, 2009	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 17, 2008	Dec. 16, 2009	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	75959	1GHz~18GHz	Dec. 17, 2008	Dec. 16, 2009	Radiation (03CH01-KS)
Amplifier	Wireless	FPA6592G	600006	30MHz~2GHz	Dec. 17, 2008	Dec. 16, 2009	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 17, 2008	Dec. 16, 2009	Radiation (03CH01-KS)
Signal Generator	R&S	SMR40	100455	10MHz~40GHz	Aug. 29, 2007	Aug. 28, 2009	Radiation (03CH01-KS)

## 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
<b>Combined standard uncertainty Uc(y)</b>	<b>1.13</b>		
<b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b>	<b>2.26</b>		

### 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
<b>Combined standard uncertainty Uc(y)</b>	<b>1.27</b>		
<b>Measuring uncertainty for a level of confidence of 95% U=2Uc(y)</b>	<b>2.54</b>		

**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
<b>Combined standard uncertainty <math>U_c(y)</math></b>	<b>2.36</b>				
<b>Measuring uncertainty for a level of confidence of 95% <math>U = 2U_c(y)</math></b>	<b>4.72</b>				

## 6 Certification of TAF Accreditation



Certificate No. : L1190-081212

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**

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



Jay-San Chen  
President, Taiwan Accreditation Foundation  
Date : December 12, 2008

PI, total 18 pages

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



## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP932415 as below.