

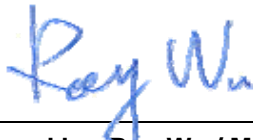
# FCC Test Report

**EQUIPMENT** : Pocket PC Phone  
**MODEL NAME** : QUAR100  
**FCC ID** : NM8QUAR100  
**STANDARD** : FCC Part 15 Subpart C §15.247  
**CLASSIFICATION** : Digital Spread Spectrum (DSS)  
**APPLICANT** : HTC Corporation

No. 23, Xinghua Rd., Taoyuan City, Taiwan

The product sample received on Feb. 07, 2009 and completely tested on Feb. 23, 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 INC.**

No. 52, Hwa Ya 1<sup>st</sup> 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	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 15.9 dB at 0.5420 MHz
3.8	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 10.42 dB at 50.79 MHz
3.9	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



# 1 General Description

## 1.1 Applicant

HTC Corporation  
No. 23, Xinghua Rd., Taoyuan City, Taiwan.

## 1.2 Manufacturer

HTC Corporation  
1F, No. 6-3, Baoqiang Rd., Xindian City, Taipei, Taiwan.

## 1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Pocket PC Phone
Model Name	QUAR100
FCC ID	NM8QUAR100
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) : 1.22 dBm (1.32 mW) Bluetooth EDR (2Mbps) : 2.15dBm (1.64 mW) Bluetooth EDR (3Mbps) : 0.99dBm (1.26 mW)
Antenna Type	PIFA Antenna with gain -1 dBi
Antenna Connector Type	N/A
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : /4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Production Unit

## 1.4 Testing Site

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	CO05-HY	03CH06-HY	TW1022/4086B-1

## 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.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	BT Base Station	Anritsu	8852B	N/A	N/A	Unshielded, 1.8 m
4.	WLAN AP	D-Link	DWL-7100AP	KA22003040018-1	N/A	Unshielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-100	PYA1YH	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	/4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	1.22 dBm	<b>2.15 dBm</b>	0.99 dBm
Ch39	2441MHz	0.95 dBm	1.82 dBm	0.71 dBm
Ch78	2480MHz	-0.02 dBm	0.99 dBm	-0.27 dBm

**Remark:**

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

## 2.2 Test Mode

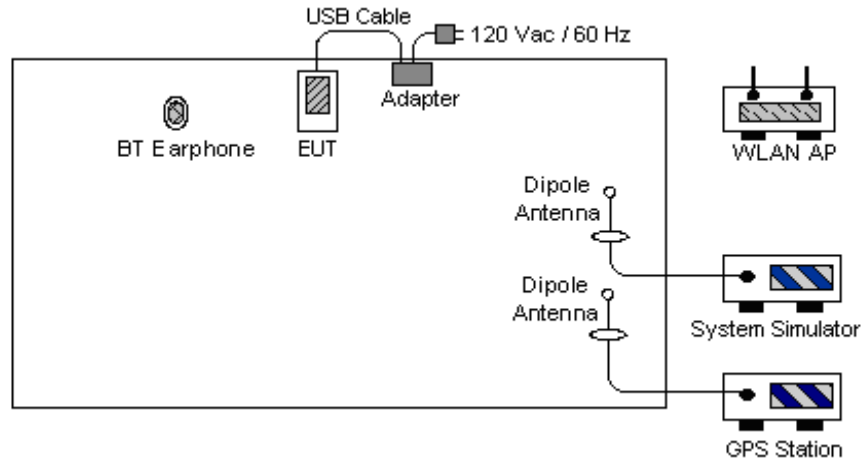
The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest 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 /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	<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>	N/A
AC Conducted Emission	<ul style="list-style-type: none"> <li>■ Mode 1 : GSM1900 Idle + WLAN Link + BT Link + Camera + Adapter + GPS Rx</li> </ul>		
<b>Remark:</b> <ol style="list-style-type: none"> <li>1. The worst mode of conducted TCs is Bluetooth 2Mbps, only the test data of this mode was reported.</li> <li>2. The worst mode of radiated emission is Bluetooth 2Mbps Tx mode; only the test data of this mode was reported.</li> </ol>			

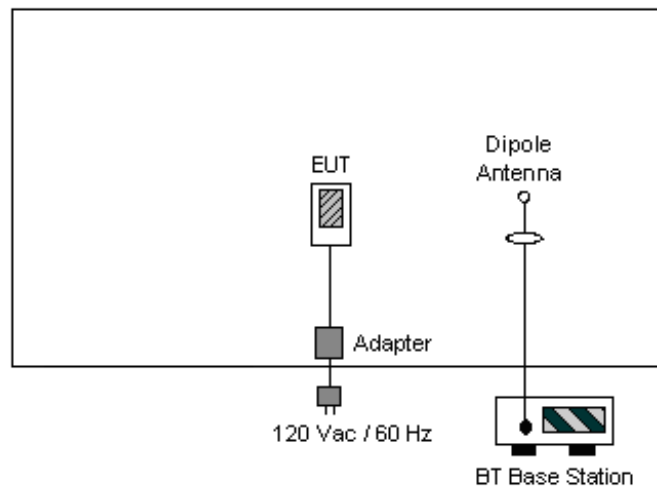


## 2.3 Connection Diagram of Test System

### <Conducted Emission>



### <Radiated Emission>



## 2.4 RF Utility

For Bluetooth function, the RF Utility, "BT Test" was installed in EUT which was programmed in order 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.

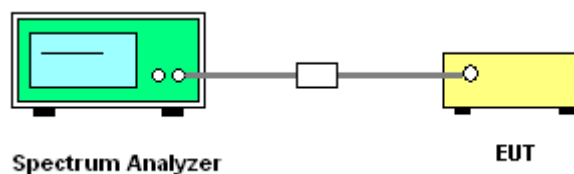
##### 3.1.2 Measuring Instruments

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

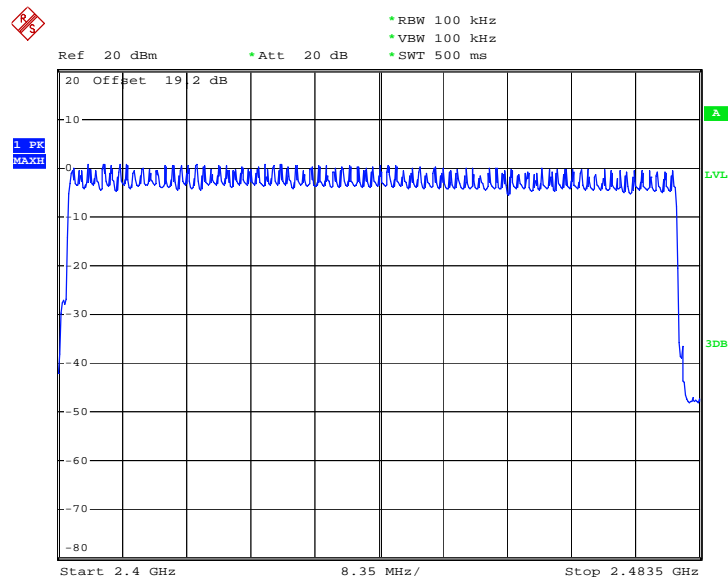




3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 4~6	Temperature :	21~23
Test Engineer :	Ken Hsu	Relative Humidity :	49~52%
Number of Hopping Channels (Channel)		Limits (Channel)	
79		> 15	
		Pass/Fail	
		Pass	

Number of Hopping Channel Plot on Channel 00 – 78



Date: 15.FEB.2009 17:17:18

## 3.2 20dB Bandwidth Measurement

### 3.2.1 Limit of 20dB Bandwidth

N/A

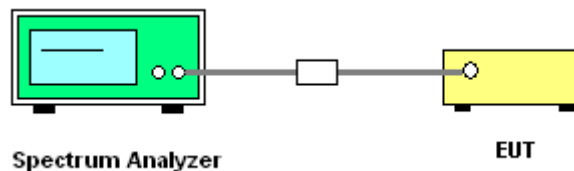
### 3.2.2 Measuring Instruments

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



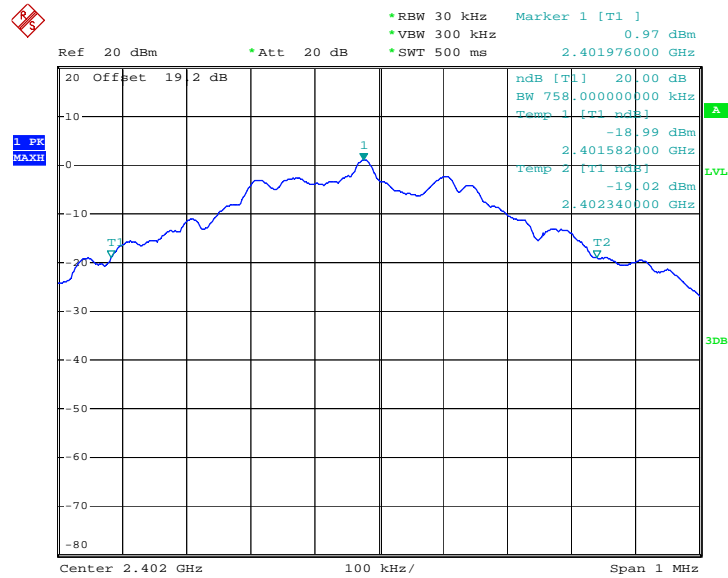


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	21~23
Test Engineer :	Ken Hsu	Relative Humidity :	49~52%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.758
39	2441	0.754
78	2480	0.754

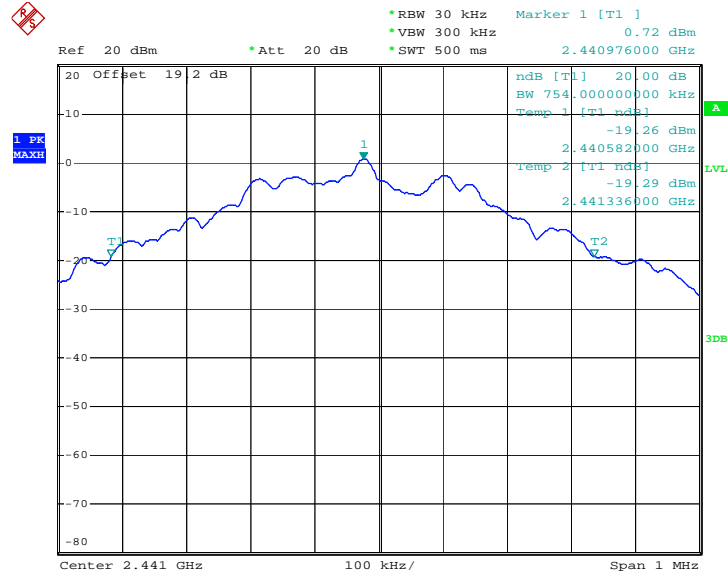
20 dB Bandwidth Plot on Channel 00



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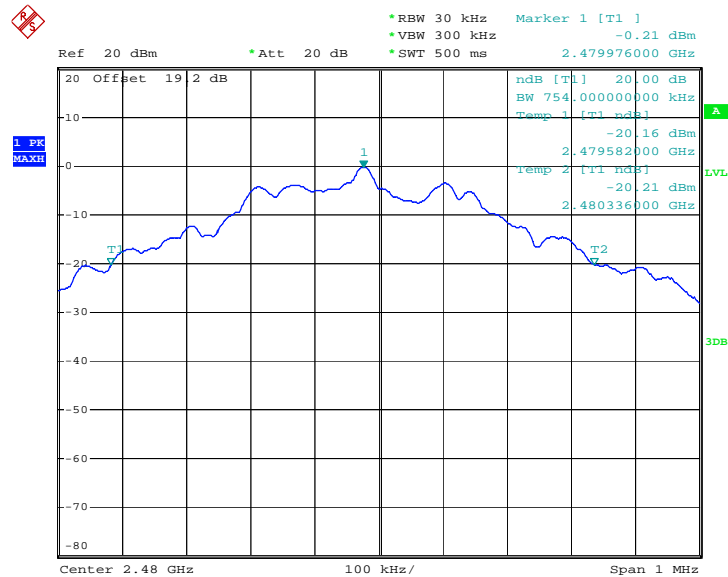


20 dB Bandwidth Plot on Channel 39



Date: 15.FEB.2009 16:23:59

20 dB Bandwidth Plot on Channel 78



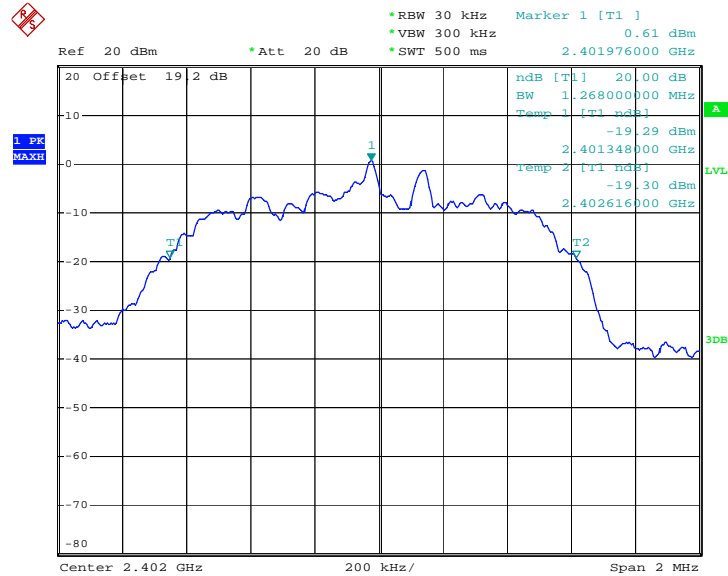
Date: 15.FEB.2009 16:24:11



Test Mode :	Mode 4, 5, 6	Temperature :	21~23
Test Engineer :	Ken Hsu	Relative Humidity :	49~52%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.268
39	2441	1.304
78	2480	1.276

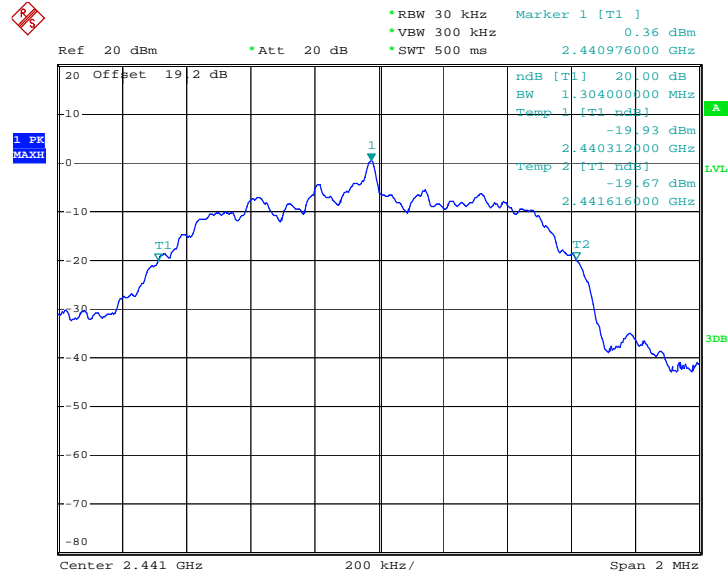
20 dB Bandwidth Plot on Channel 00



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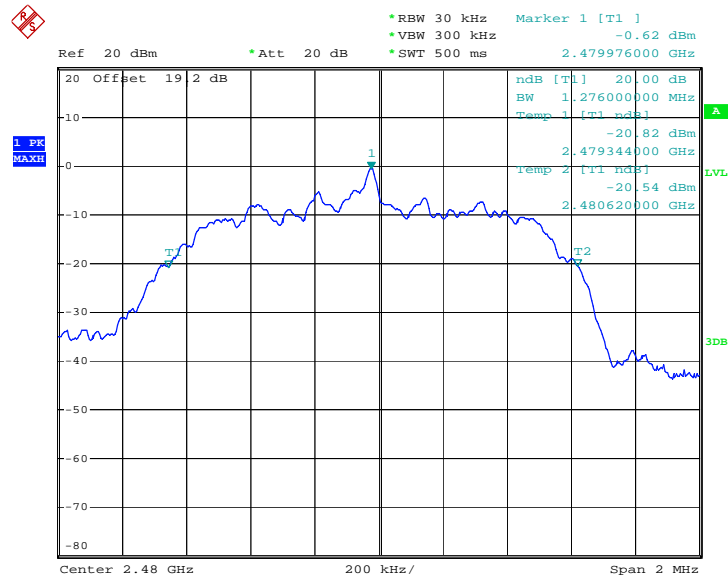


20 dB Bandwidth Plot on Channel 39



Date: 15.FEB.2009 16:25:09

20 dB Bandwidth Plot on Channel 78



Date: 15.FEB.2009 16:25:38

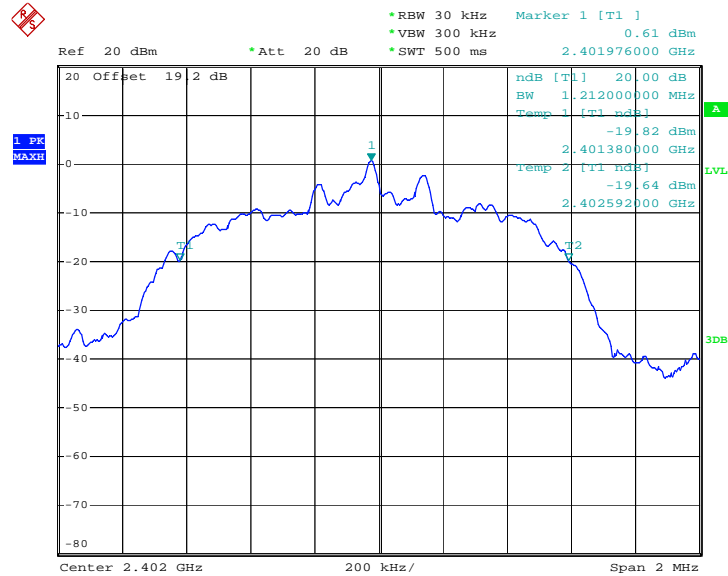




Test Mode :	Mode 7, 8, 9	Temperature :	21~23
Test Engineer :	Ken Hsu	Relative Humidity :	49~52%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.212
39	2441	1.204
78	2480	1.208

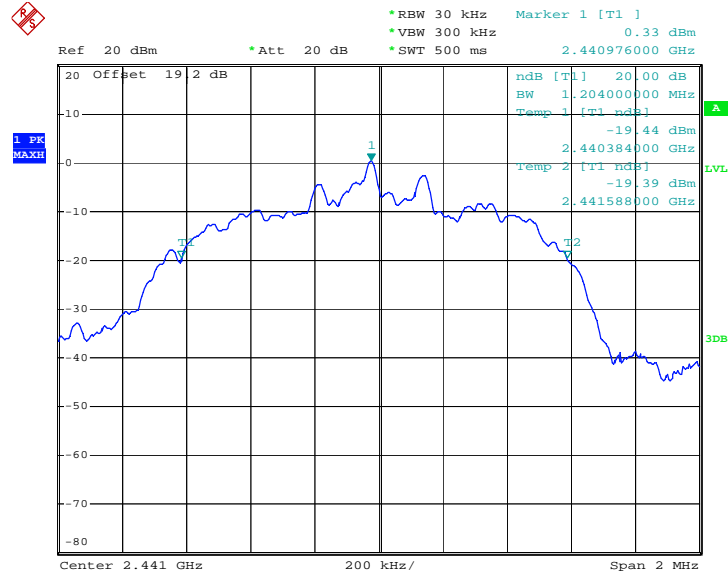
20 dB Bandwidth Plot on Channel 00



Date: 15.FEB.2009 16:27:07

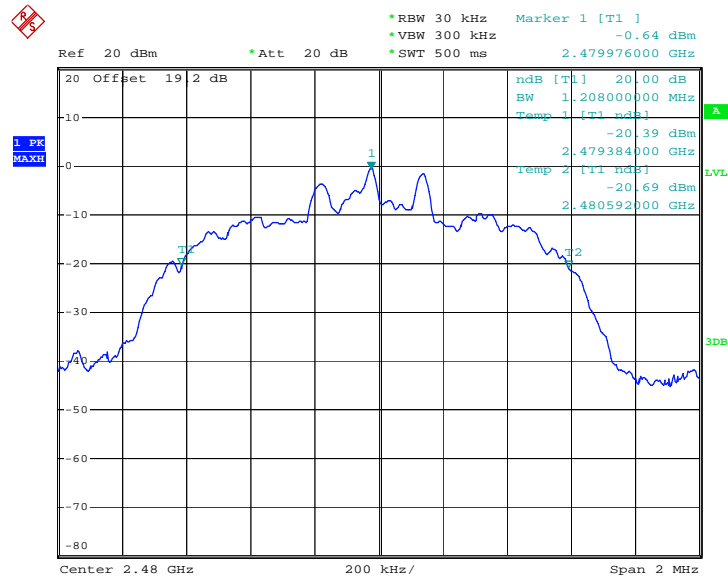


20 dB Bandwidth Plot on Channel 39



Date: 15.FEB.2009 16:26:34

20 dB Bandwidth Plot on Channel 78



Date: 15.FEB.2009 16:26:05

### 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.

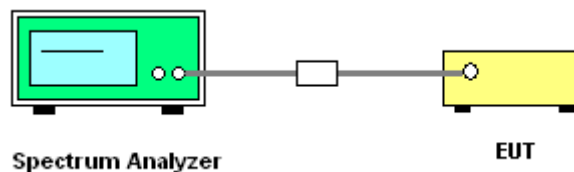
#### 3.3.2 Measuring Instruments

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





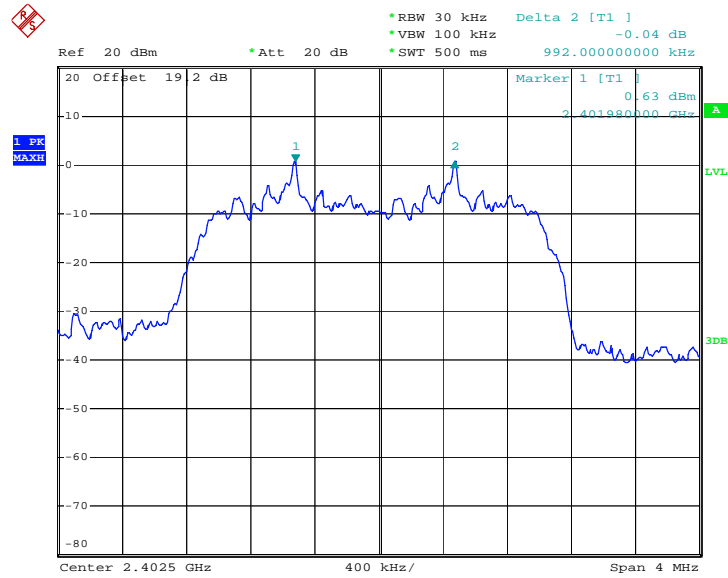
3.3.5 Test Result of Hopping Channel Separation

Test Mode :	Mode 4, 5, 6	Temperature :	21~23
Test Engineer :	Ken Hsu	Relative Humidity :	49~52%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	0.992	0.845	Pass
39	2441	0.992	0.869	Pass
78	2480	1.008	0.851	Pass

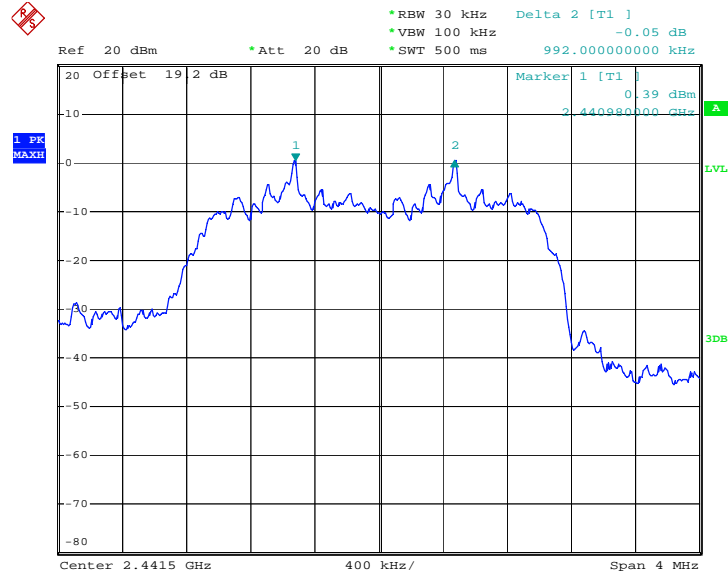
Channel Separation Plot on Channel 00 - 01



Date: 15.FEB.2009 16:51:31

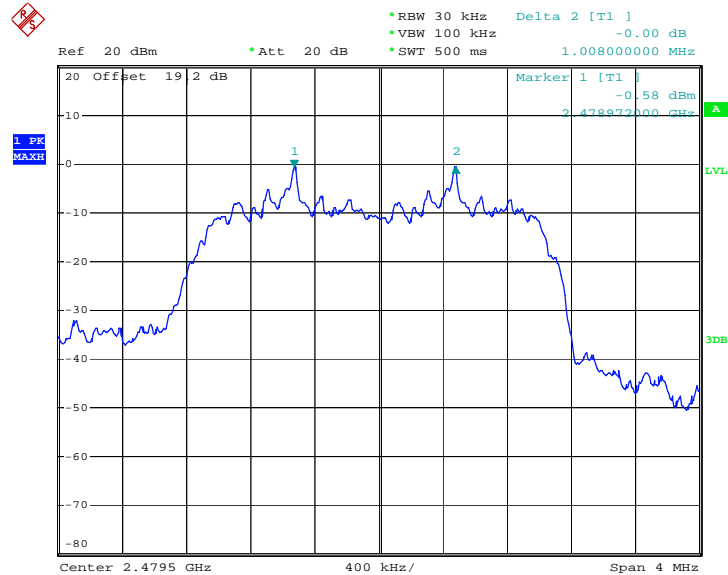


### Channel Separation Plot on Channel 39 - 40



Date: 15.FEB.2009 16:52:03

### Channel Separation Plot on Channel 77 - 78



Date: 15.FEB.2009 16:52:47

### 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.

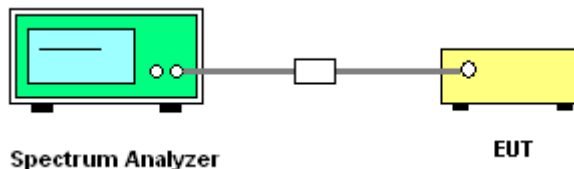
#### 3.4.2 Measuring Instruments

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 5	Temperature :	21~23
Test Engineer :	Ken Hsu	Relative Humidity :	49~52%

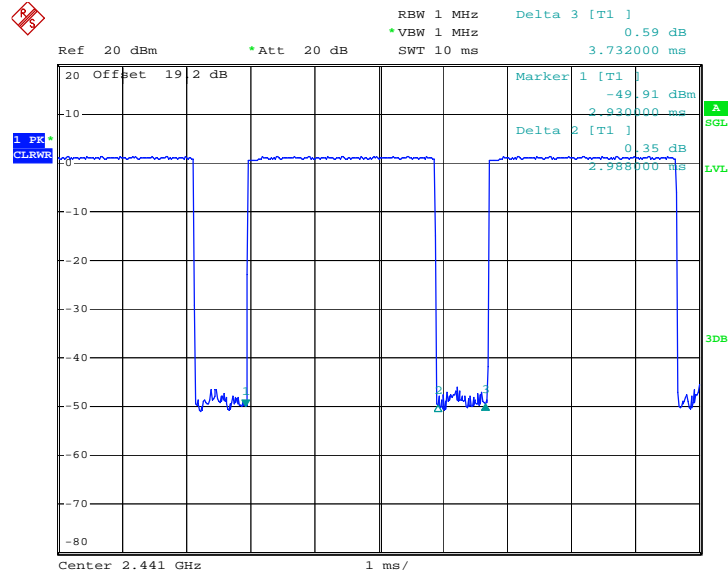
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
2DH5	3.20	2988.00	0.30	0.4	Pass

**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)

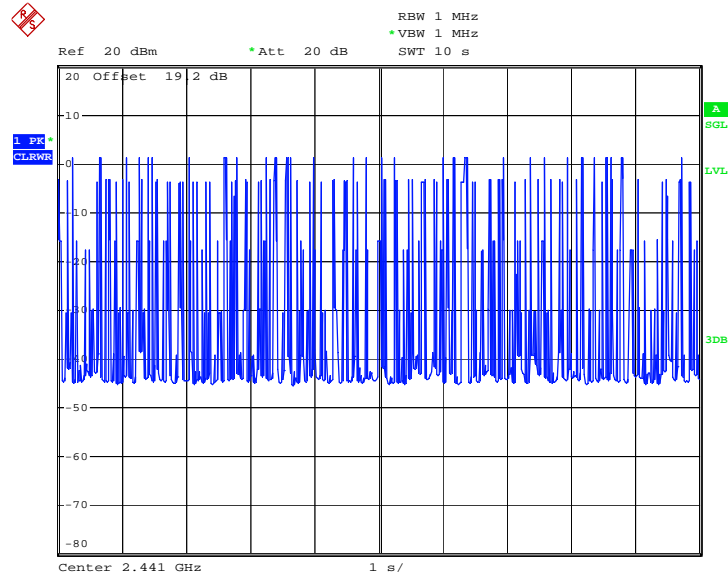


### 2DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 15.FEB.2009 16:58:19

### 2DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 15.FEB.2009 17:03:23

### 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).

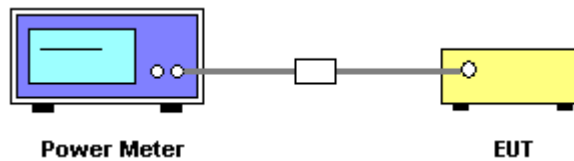
#### 3.5.2 Measuring Instruments

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

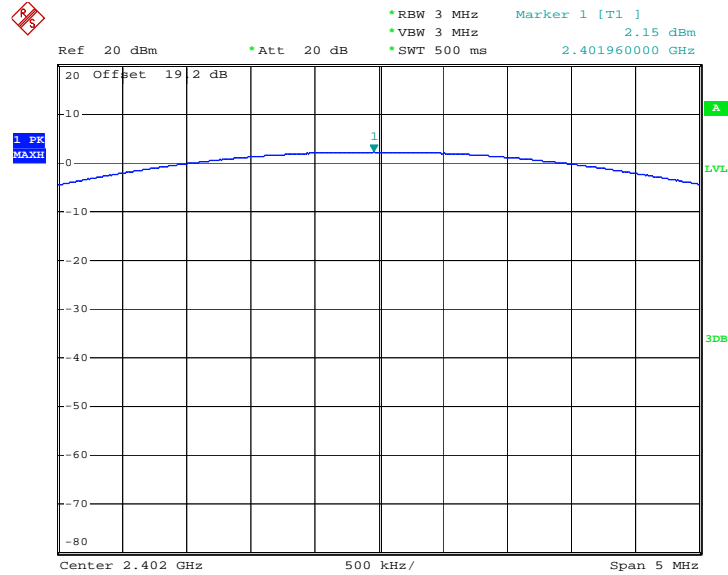
Test Mode :	Mode 4, 5, 6	Temperature :	21~23
Test Engineer :	Ken Hsu	Relative Humidity :	49~52%

Channel	Frequency (MHz)	RF Power (dBm)		
		/4-DQPSK	Max. Limits (dBm)	Pass/Fail
		2 Mbps		
00	2402	2.15	30	Pass
39	2441	1.82	30	Pass
78	2480	0.99	30	Pass



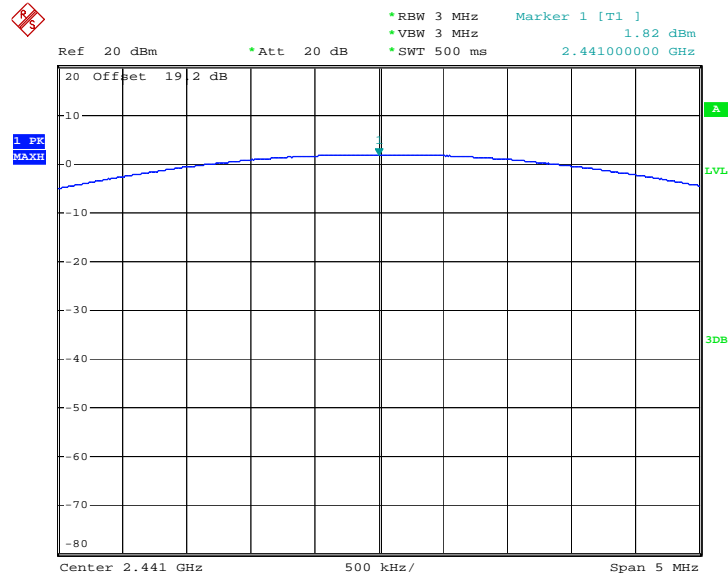


Peak Output Power Plot on Channel 00



Date: 15.FEB.2009 16:11:14

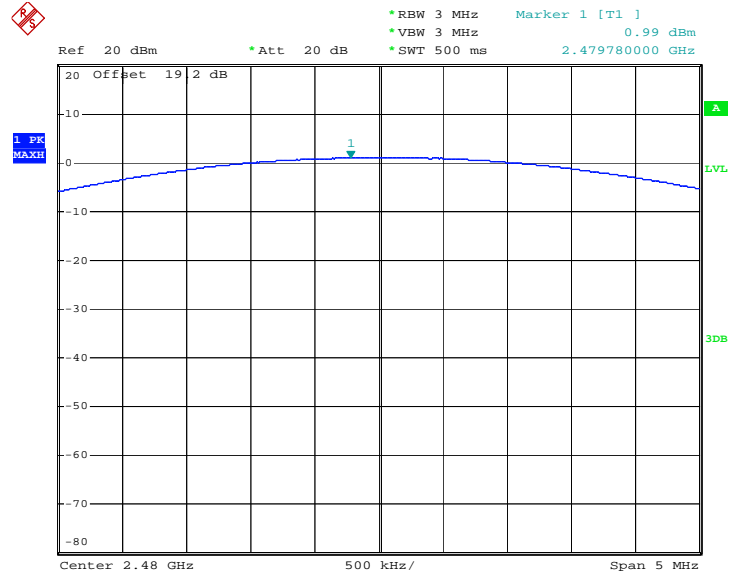
Peak Output Power Plot on Channel 39



Date: 15.FEB.2009 16:12:56



Peak Output Power Plot on Channel 78



Date: 15.FEB.2009 16:14:22

## 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.

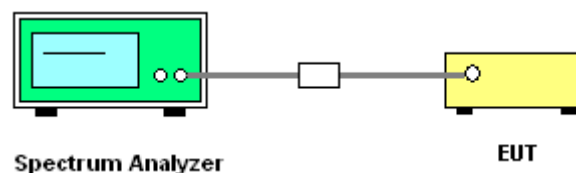
### 3.6.2 Measuring Instruments

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 :	21~23°C
Test Channel :	00	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao		

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
2389.99	50.75	-23.25	74.00	51.13	31.98	3.92	36.28	100	36	Peak
2389.99	10.36	-43.64	54.00	10.74	31.98	3.92	36.28	100	36	Average

Remark:

<Delta Marker>

Delta marker at 1% RBW of span = 42.03 dB

Peak band edge at 2389.99 MHz (RBW = VBW = 1MHz) = 92.78 dBuV/m – 42.03 dB = 50.75 dBuV/m

Duty factor = 20 log (Package Transfer Times x Avg Hopping Channel) = 20 log (0.002988 x 3.2) = -40.39

Average band edge = Peak band edge + Duty factor = 50.75 dBuV/m + (-40.39) = 10.36 dBuV/m

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	47.25	-26.75	74.00	47.63	31.98	3.92	36.28	100	148	Peak
2389.99	6.86	-47.14	54.00	7.24	31.98	3.92	36.28	100	148	Average

Remark:

<Delta Marker>

Delta marker at 1% RBW of span = 42.03 dB

Peak band edge at 2389.99 MHz (RBW = VBW = 1MHz) = 89.28 dBuV/m – 42.03 dB = 47.25 dBuV/m

Duty factor = 20 log (Package Transfer Times x Avg Hopping Channel) = 20 log (0.002988 x 3.2) = -40.39

Average band edge = Peak band edge + Duty factor = 47.25 dBuV/m + (-40.39) = 6.86 dBuV/m



Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao		

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
2483.50	52.09	-21.91	74.00	52.26	32.08	4.05	36.30	133	22	Peak
2483.50	11.70	-42.30	54.00	11.87	32.08	4.05	36.30	133	22	Average

Remark:

<Delta Marker>

Delta marker at 1% RBW of span = 44.98 dB

Peak band edge at 2483.50 MHz (RBW = VBW = 1MHz) = 97.07 dBuV/m – 44.98 dB = 52.09 dBuV/m

Duty factor = 20 log (Package Transfer Times x Avg Hopping Channel) = 20 log (0.0032988 x 3.2) = -40.39

Average band edge = Peak band edge + Duty factor = 52.09 dBuV/m + (-40.39) dB = 11.70 dBuV/m

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	45.49	-28.51	74.00	45.66	32.08	4.05	36.30	100	264	Peak
2483.50	5.10	-48.90	54.00	5.27	32.08	4.05	36.30	100	264	Average

Remark:

<Delta Marker>

Delta marker at 1% RBW of span = 44.98 dB

Peak band edge at 2483.50 MHz (RBW = VBW = 1MHz) = 90.47 dBuV/m – 44.98 dB = 45.49 dBuV/m

Duty factor = 20 log (Package Transfer Times x Avg Hopping Channel) = 20 log (0.002988 x 3.2) = -40.39

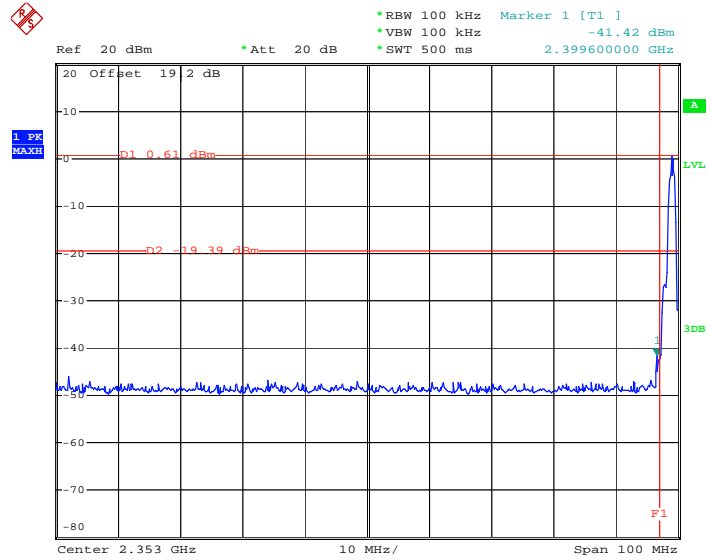
Average band edge = Peak band edge + Duty factor = 45.49 dBuV/m + (-40.39) dB = 5.10 dBuV/m



### 3.6.6 Test Result of Conducted Band Edges

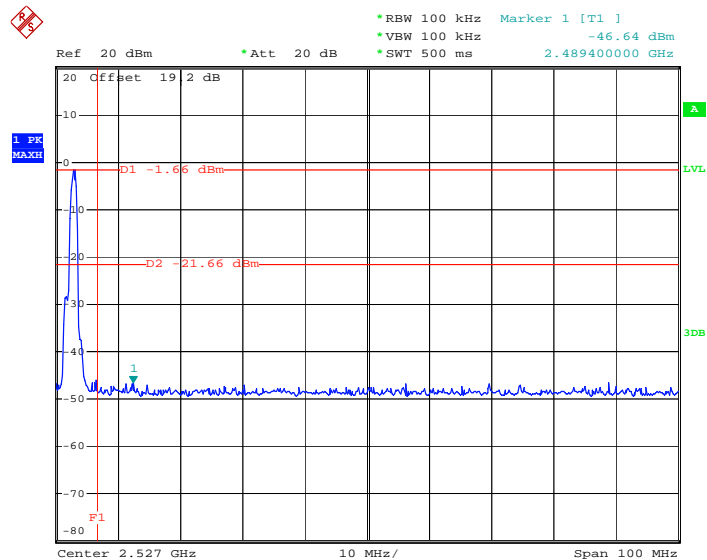
Test Mode :	Mode 4 and 6	Temperature :	21~23
Test Channel :	00 and 78	Relative Humidity :	49~52%
Test Engineer :	Ken Hsu		

#### Low Band Edge Plot on Channel 00



Date: 15.FEB.2009 16:46:04

#### High Band Edge Plot on Channel 78



Date: 15.FEB.2009 16:48:22

### 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.

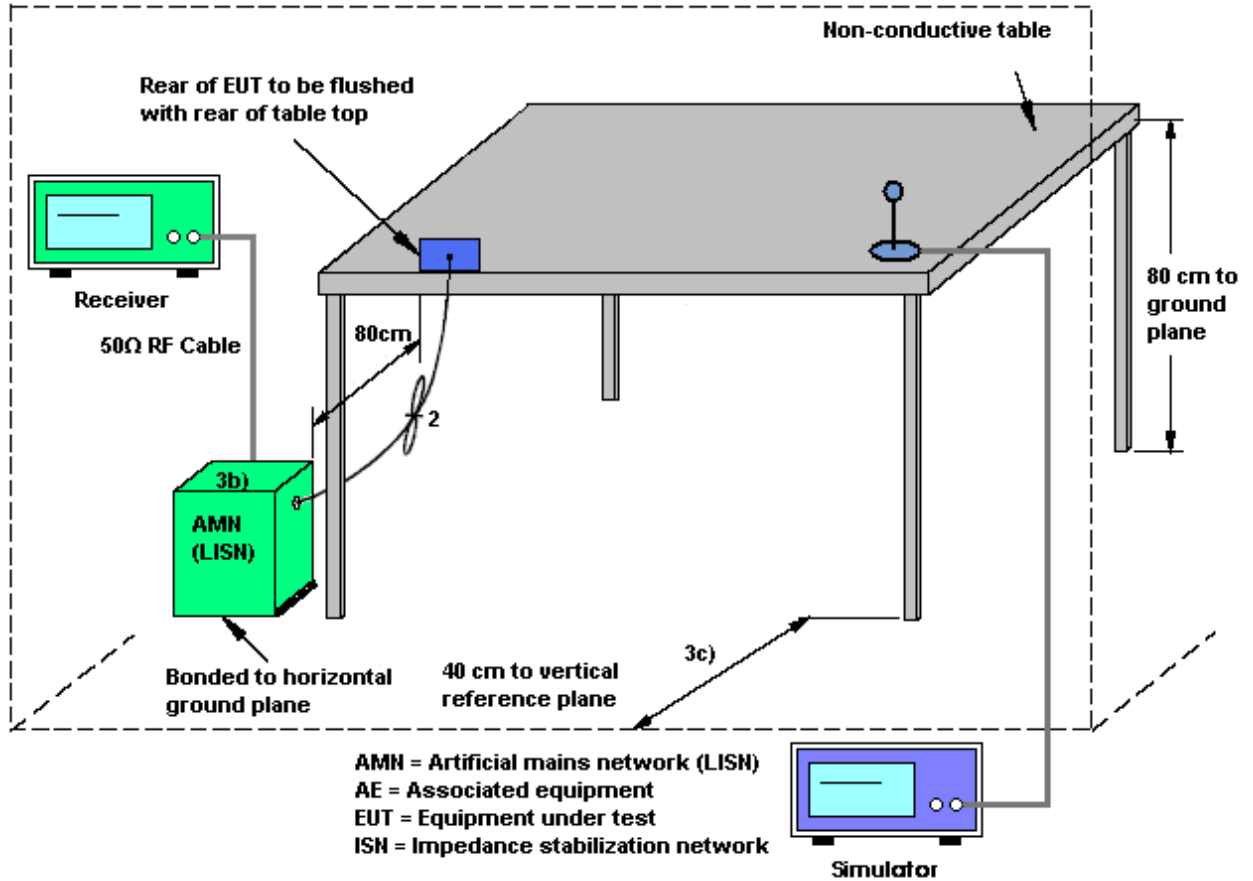
#### 3.7.2 Measuring Instruments

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.

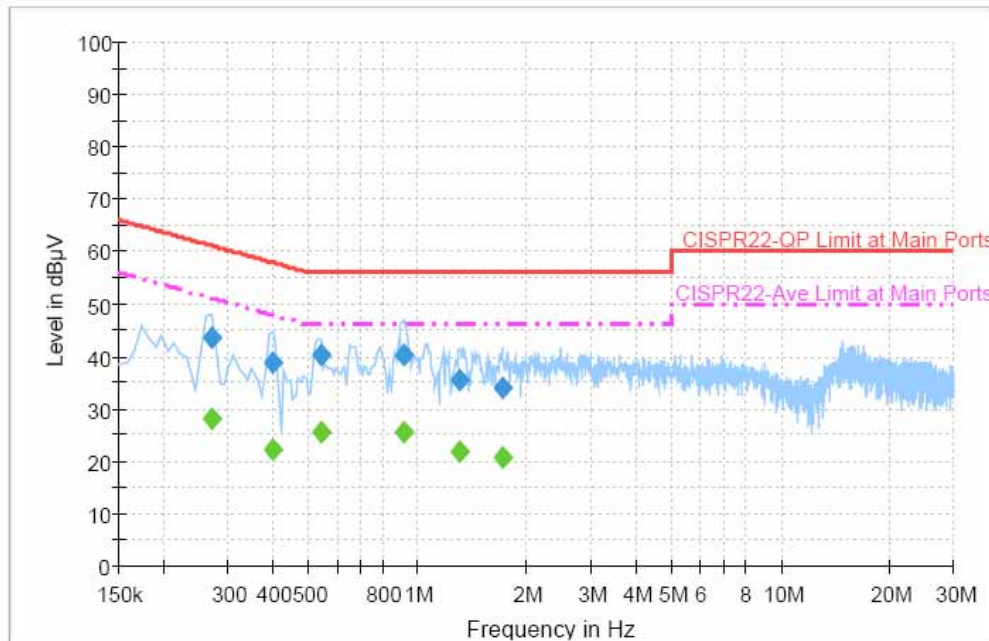
### 3.7.4 Test Setup





### 3.7.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	23~24
Test Engineer :	Cona Huang	Relative Humidity :	42~43%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + WLAN Link + BT Link + Camera + Adapter + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



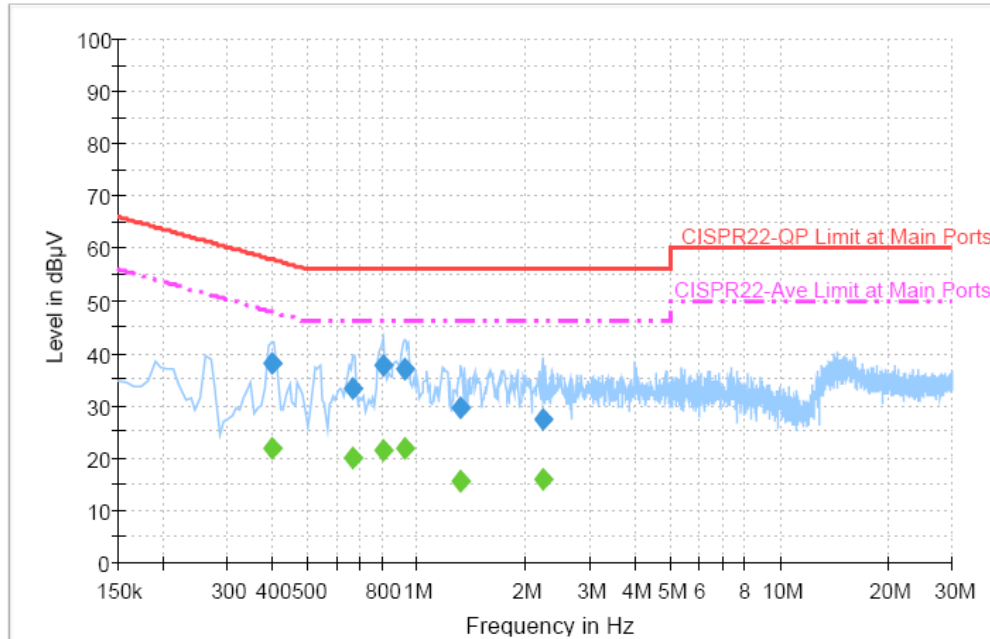
#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.270000	43.7	Off	L1	19.3	17.4	61.1
0.398000	38.7	Off	L1	19.4	19.2	57.9
0.542000	40.1	Off	L1	19.3	15.9	56.0
0.918000	40.1	Off	L1	19.4	15.9	56.0
1.302000	35.3	Off	L1	19.4	20.7	56.0
1.718000	33.8	Off	L1	19.4	22.2	56.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.270000	28.0	Off	L1	19.3	23.1	51.1
0.398000	22.2	Off	L1	19.4	25.7	47.9
0.542000	25.5	Off	L1	19.3	20.5	46.0
0.918000	25.5	Off	L1	19.4	20.5	46.0
1.302000	21.9	Off	L1	19.4	24.1	46.0
1.718000	20.6	Off	L1	19.4	25.4	46.0

Test Mode :	Mode 1	Temperature :	23~24
Test Engineer :	Cona Huang	Relative Humidity :	42~43%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + WLAN Link + BT Link + Camera + Adapter + GPS Rx		
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)
0.398000	38.1	Off	N	19.4	19.8	57.9
0.670000	33.3	Off	N	19.4	22.7	56.0
0.806000	37.6	Off	N	19.4	18.4	56.0
0.926000	36.7	Off	N	19.4	19.3	56.0
1.326000	29.6	Off	N	19.5	26.4	56.0
2.222000	27.2	Off	N	19.5	28.8	56.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.398000	21.9	Off	N	19.4	26.0	47.9
0.670000	19.9	Off	N	19.4	26.1	46.0
0.806000	21.5	Off	N	19.4	24.5	46.0
0.926000	21.7	Off	N	19.4	24.3	46.0
1.326000	15.3	Off	N	19.5	30.7	46.0
2.222000	15.8	Off	N	19.5	30.2	46.0

## 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

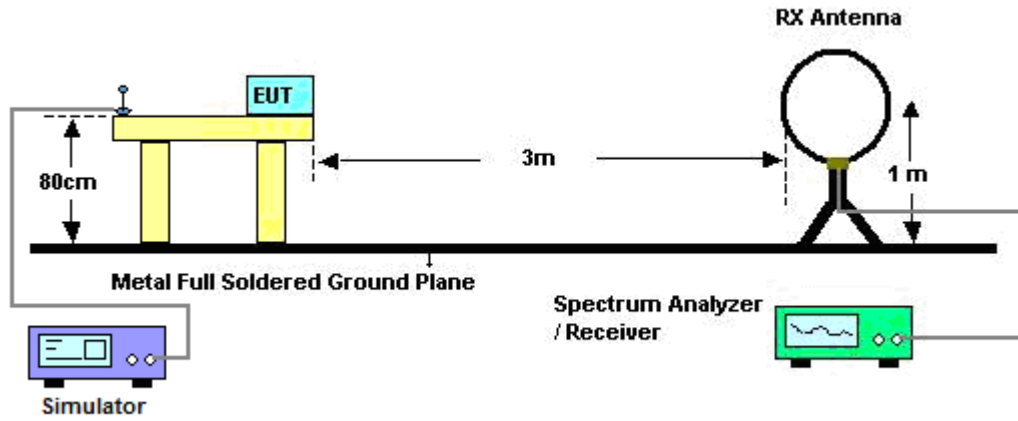
See list of measuring instruments of this test report.

### 3.8.3 Test Procedures

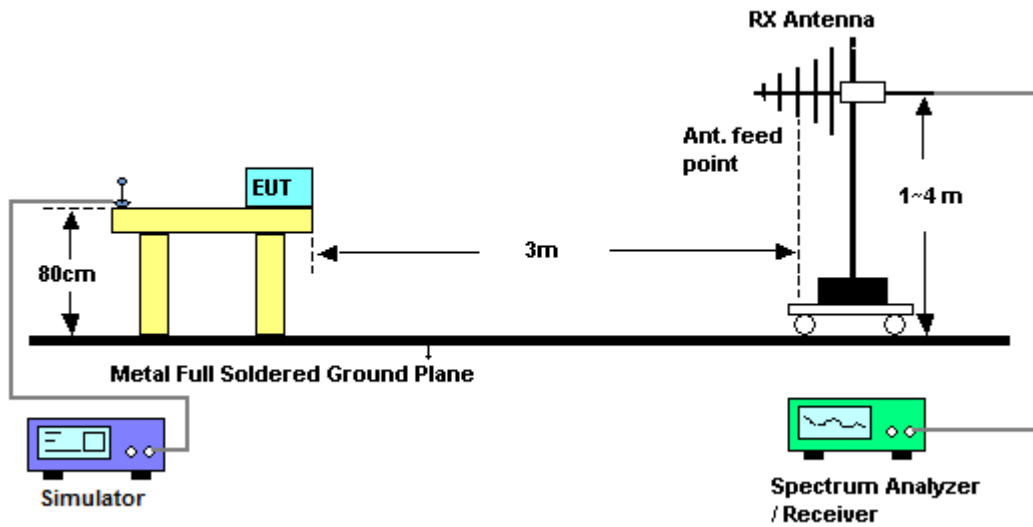
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:  
Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; 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 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	21~23°C	Humidity	49~52%
Test Engineer	Andrew Hsiao		

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.

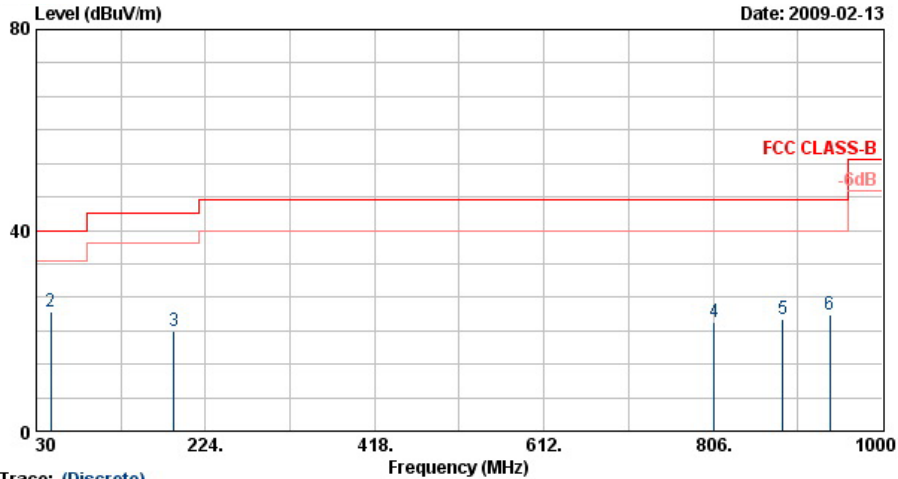
Distance extrapolation factor =  $40 \log(\text{specific distance} / \text{test distance})$  (dB);

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



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

Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal



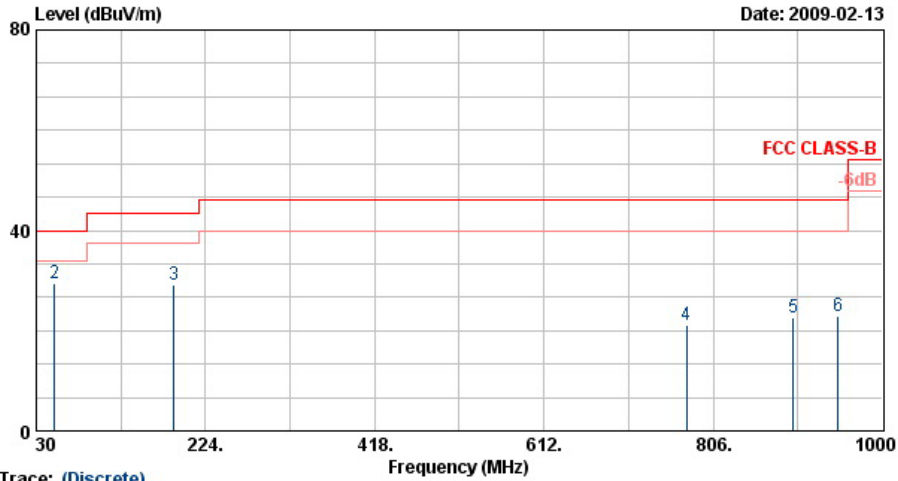
Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m BTLOG\_081124 HORIZONTAL  
 Project : FR 920713  
 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	27.84	-12.16	40.00	39.20	19.90	0.30	31.56	100	192	Peak
2	46.74	23.90	-16.10	40.00	45.09	10.33	0.30	31.82	---	---	Peak
3	187.68	20.04	-23.46	43.50	41.83	9.64	0.60	32.03	---	---	Peak
4	806.80	21.62	-24.38	46.00	31.74	20.88	1.20	32.21	---	---	Peak
5	885.90	22.41	-23.59	46.00	31.38	21.61	1.30	31.88	---	---	Peak
6	939.80	23.18	-22.82	46.00	31.43	22.02	1.20	31.48	---	---	Peak



Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical



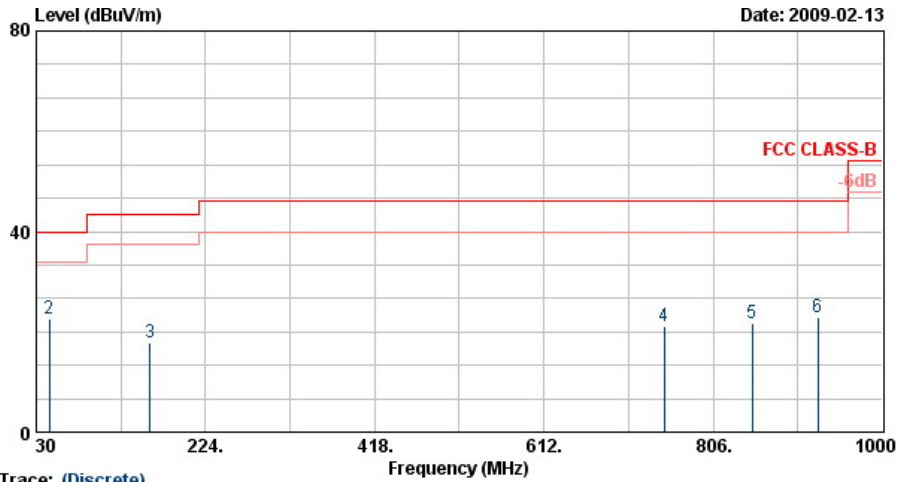
Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m BTLOC\_081124 VERTICAL  
 Project : FR 920713  
 Mode : Mode 1

	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 @	30.00	29.23	-10.77	40.00	40.59	19.90	0.30	31.56	---	---	Peak
2 @	50.79	29.33	-10.67	40.00	52.04	9.00	0.30	32.01	100	211	Peak
3	187.68	29.06	-14.44	43.50	50.85	9.64	0.60	32.03	---	---	Peak
4	775.30	21.15	-24.85	46.00	31.57	20.55	1.15	32.12	---	---	Peak
5	897.80	22.56	-23.44	46.00	31.27	21.69	1.30	31.70	---	---	Peak
6	948.90	22.77	-23.23	46.00	30.92	22.09	1.20	31.43	---	---	Peak



Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal



Trace: (Discrete)

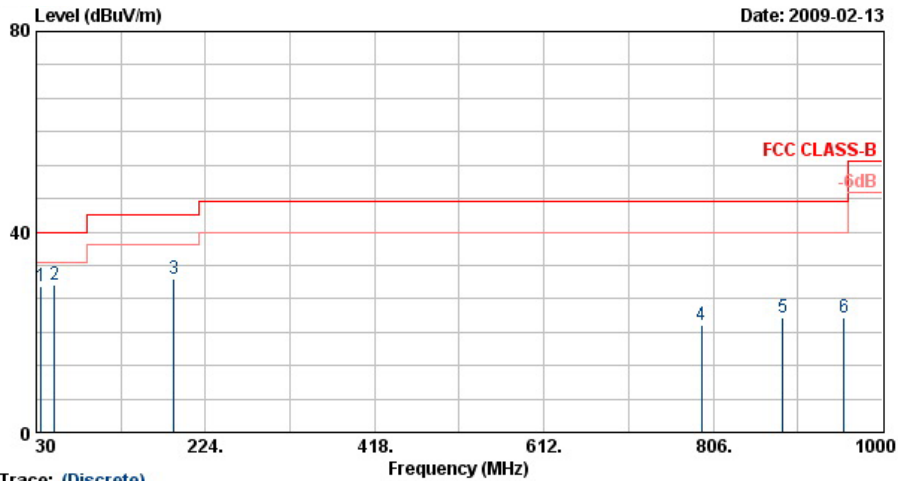
Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m BTLOC\_081124 HORIZONTAL  
 Project : FR 920713  
 Mode : Mode 2

	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	30.00	27.11	-12.89	40.00	38.47	19.90	0.30	31.56	100	332	Peak
2	44.58	22.50	-17.50	40.00	42.92	11.00	0.30	31.72	---	---	Peak
3	160.14	17.95	-25.55	43.50	38.58	10.70	0.60	31.93	---	---	Peak
4	749.40	21.09	-24.91	46.00	31.75	20.30	1.10	32.06	---	---	Peak
5	850.90	21.82	-24.18	46.00	31.60	21.41	1.20	32.39	---	---	Peak
6	925.80	22.80	-23.20	46.00	31.23	21.91	1.20	31.54	---	---	Peak





Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical



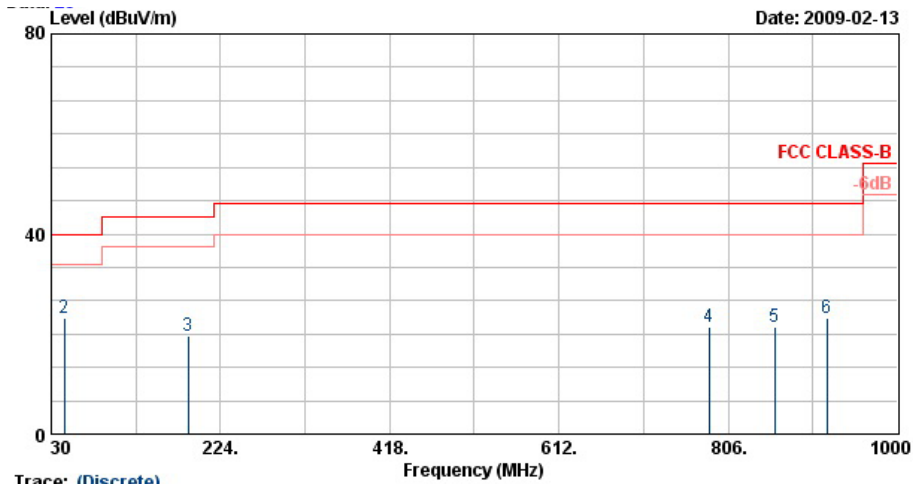
Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m BTLOC\_081124 VERTICAL  
 Project : FR 920713  
 Mode : 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	35.94	29.09	-10.91	40.00	44.30	16.30	0.30	31.80	---	---	Peak
2	50.79	29.58	-10.42	40.00	52.29	9.00	0.30	32.01	100	360	Peak
3	187.68	30.52	-12.98	43.50	52.32	9.64	0.60	32.03	---	---	Peak
4	792.80	21.54	-24.46	46.00	31.78	20.72	1.20	32.16	---	---	Peak
5	885.90	22.85	-23.15	46.00	31.81	21.61	1.30	31.88	---	---	Peak
6	955.90	22.98	-23.02	46.00	30.94	22.11	1.26	31.34	---	---	Peak



Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal



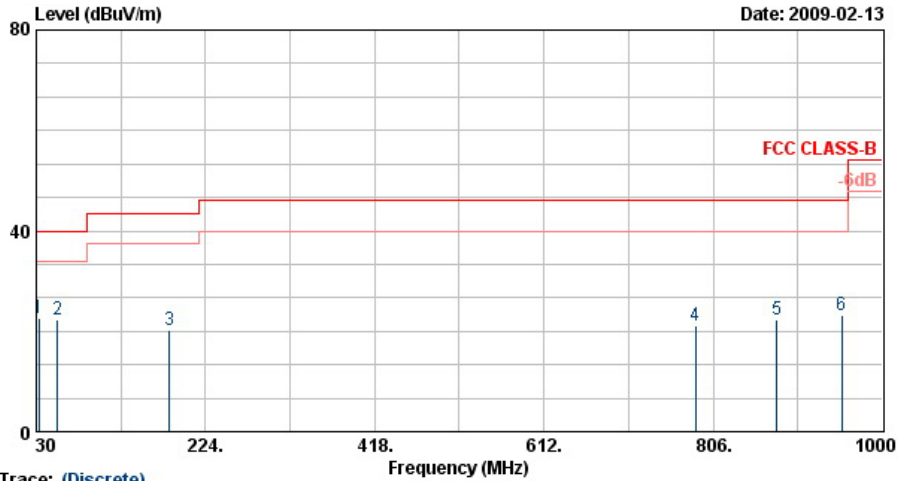
Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m BTLOC\_081124 HORIZONTAL  
 Project : FR 920713  
 Mode : Mode 3

	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 @	30.27	26.82	-13.18	40.00	38.18	19.90	0.30	31.56	100	223	Peak
2	44.58	23.05	-16.95	40.00	43.47	11.00	0.30	31.72	---	---	Peak
3	187.14	19.54	-23.96	43.50	41.32	9.66	0.60	32.04	---	---	Peak
4	784.40	21.45	-24.55	46.00	31.74	20.65	1.20	32.14	---	---	Peak
5	859.30	21.50	-24.50	46.00	31.10	21.46	1.20	32.26	---	---	Peak
6	918.80	23.25	-22.75	46.00	31.76	21.85	1.22	31.58	---	---	Peak



Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical



Trace: (Discrete)

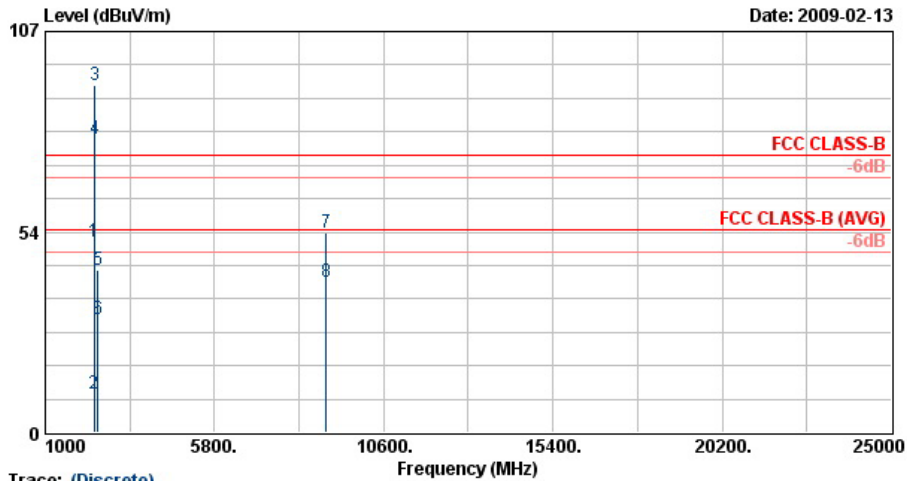
Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m BTLOC\_081124 VERTICAL  
 Project : FR 920713  
 Mode : Mode 3

	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	33.24	22.68	-17.32	40.00	36.00	18.10	0.30	31.72	100	352	Peak
2	54.03	22.19	-17.81	40.00	45.65	8.08	0.38	31.92	---	---	Peak
3	183.09	20.29	-23.21	43.50	42.02	9.74	0.60	32.07	---	---	Peak
4	785.80	21.07	-24.93	46.00	31.36	20.66	1.20	32.15	---	---	Peak
5	878.90	22.18	-23.82	46.00	31.29	21.57	1.30	31.98	---	---	Peak
6	953.80	23.16	-22.84	46.00	31.20	22.11	1.24	31.38	---	---	Peak



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

Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		



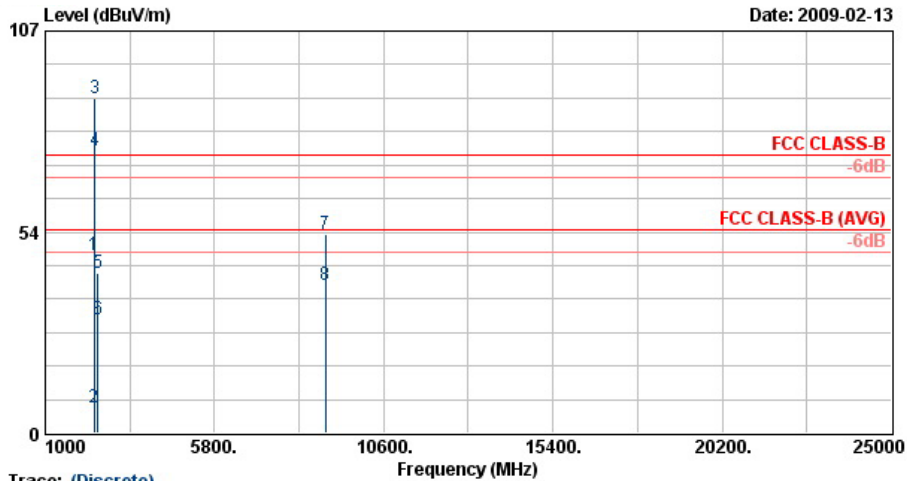
Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL  
 Project : FR 920713  
 Mode : Mode 1

	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	50.75	-23.25	74.00	51.13	31.98	3.92	36.28	100	36	Peak
2	2389.99	10.36	-43.64	54.00	10.74	31.98	3.92	36.28	100	36	Average
3 @	2402.00	92.78			93.17	31.98	3.92	36.28	100	36	Peak
4 @	2402.00	78.43			78.81	31.98	3.92	36.28	100	36	Average
5	2486.00	43.40	-30.60	74.00	43.57	32.08	4.05	36.30	100	36	Peak
6	2486.00	30.08	-23.92	54.00	30.25	32.08	4.05	36.30	100	36	Average
7	8967.00	53.11	-20.89	74.00	46.05	36.17	7.77	36.88	100	25	Peak
8	8967.00	40.33	-13.67	54.00	33.27	36.17	7.77	36.88	100	25	Average



Test Mode :	Mode 1	Temperature :	21~23°C
Test Channel :	00	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals		



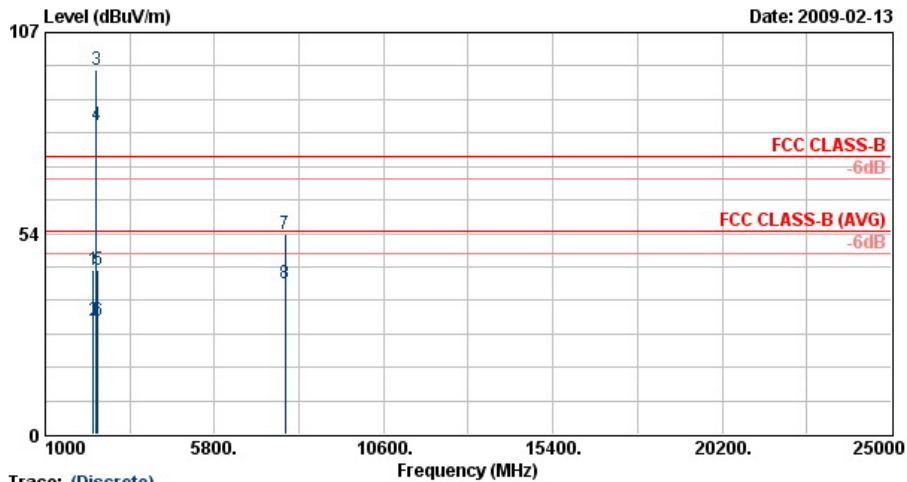
Trace: (Discrete)

Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL  
 Project : FR 920713  
 Mode : Mode 1

	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	2389.99	47.25	-26.75	74.00	47.63	31.98	3.92	36.28	100	148	Peak
2	2389.99	6.86	-47.14	54.00	7.24	31.98	3.92	36.28	100	148	Average
3 @	2402.00	89.28			89.67	31.98	3.92	36.28	100	148	Peak
4 @	2402.00	75.26			75.64	31.98	3.92	36.28	100	148	Average
5	2500.00	42.72	-31.28	74.00	42.87	32.10	4.05	36.30	100	148	Peak
6	2500.00	30.17	-23.83	54.00	30.32	32.10	4.05	36.30	100	148	Average
7	8937.00	52.72	-21.28	74.00	45.72	36.13	7.74	36.87	100	256	Peak
8	8937.00	39.55	-34.45	74.00	32.55	36.13	7.74	36.87	100	256	Average



Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		



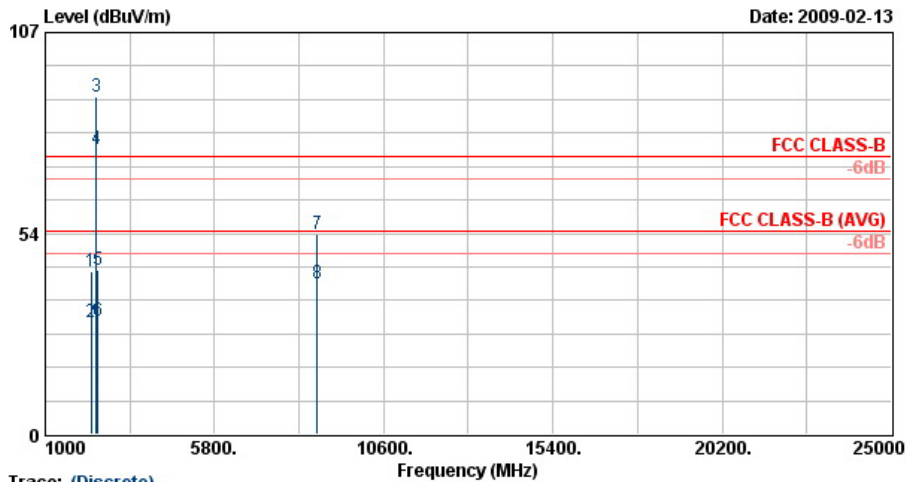
Site :  
Condition :  
Project :  
Mode :

Trace: (Discrete)  
: 03CH06-HY  
: FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL  
: FR 920713  
: Mode 2

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	2364.00	43.71	-30.29	74.00	44.15	31.93	3.89	36.27	106	20 Peak
2	2364.00	30.11	-23.89	54.00	30.56	31.93	3.89	36.27	106	20 Average
3 @	2441.00	96.94			97.20	32.04	3.99	36.29	106	20 Peak
4 @	2441.00	82.39			82.66	32.04	3.99	36.29	106	20 Average
5	2500.00	43.92	-30.08	74.00	44.07	32.10	4.05	36.30	106	20 Peak
6	2500.00	30.15	-23.85	54.00	30.30	32.10	4.05	36.30	106	20 Average
7	7806.00	53.19	-20.81	74.00	46.80	35.62	7.42	36.66	100	225 Peak
8	7806.00	40.21	-13.79	54.00	33.83	35.62	7.42	36.66	100	225 Average



Test Mode :	Mode 2	Temperature :	21~23°C
Test Channel :	39	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Vertical
Remark :	#3 and #4 are Fundamental Signals		



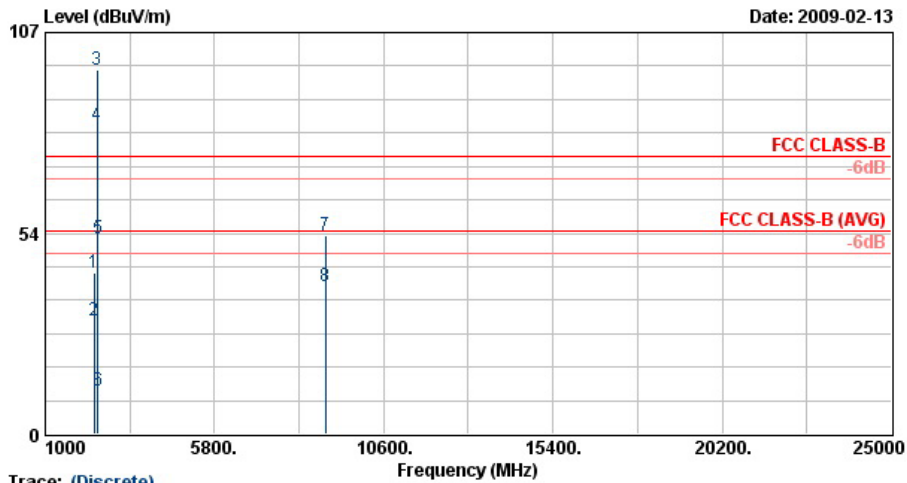
Site :  
Condition :  
Project :  
Mode :

Trace: (Discrete)  
: 03CH06-HY  
: FCC CLASS-B 3m SHF-EHF HORN VERTICAL  
: FR 920713  
: 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	2310.00	43.16	-30.84	74.00	43.73	31.87	3.82	36.26	168	264	Peak
2	2310.00	30.02	-23.98	54.00	30.59	31.87	3.82	36.26	168	264	Average
3 X	2441.00	89.83			90.10	32.04	3.99	36.29	168	264	Peak
4 @	2441.00	75.99			76.26	32.04	3.99	36.29	168	264	Average
5	2500.00	43.68	-30.32	74.00	43.83	32.10	4.05	36.30	168	264	Peak
6	2500.00	30.17	-23.83	54.00	30.32	32.10	4.05	36.30	168	264	Average
7	8712.00	53.30	-20.70	74.00	46.72	35.92	7.45	36.78	100	321	Peak
8	8712.00	40.30	-13.70	54.00	33.72	35.92	7.45	36.78	100	321	Average



Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~52%
Test Engineer :	Andrew Hsiao	Polarization :	Horizontal
Remark :	#3 and #4 are Fundamental Signals		



Trace: (Discrete)

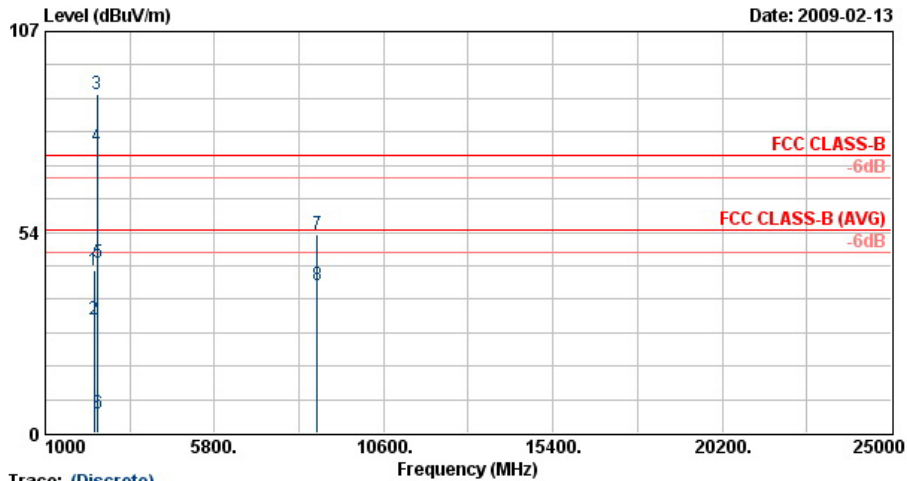
Site : 03CH06-HY  
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL  
 Project : FR 920713  
 Mode : Mode 3

	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	2390.00	42.97	-31.03	74.00	43.35	31.98	3.92	36.28	133	22	Peak
2	2390.00	30.23	-23.77	54.00	30.61	31.98	3.92	36.28	133	22	Average
3 @	2480.00	97.07			97.24	32.08	4.05	36.30	133	22	Peak
4 @	2480.00	82.32			82.49	32.08	4.05	36.30	133	22	Average
5	2483.50	52.09	-21.91	74.00	52.26	32.08	4.05	36.30	133	22	Peak
6	2483.50	11.70	-42.30	54.00	11.87	32.08	4.05	36.30	133	22	Average
7	8952.00	52.74	-21.26	74.00	45.73	36.15	7.74	36.88	100	225	Peak
8	8952.00	39.22	-14.78	54.00	32.21	36.15	7.74	36.88	100	225	Average





Test Mode :	Mode 3	Temperature :	21~23°C
Test Channel :	78	Relative Humidity :	49~52%
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  
 Project : FR 920713  
 Mode : Mode 3

	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	2388.00	43.51	-30.49	74.00	43.89	31.98	3.92	36.28	100	264	Peak
2	2388.00	30.27	-23.73	54.00	30.65	31.98	3.92	36.28	100	264	Average
3 @	2480.00	90.47			90.64	32.08	4.05	36.30	100	264	Peak
4 @	2480.00	76.27			76.44	32.08	4.05	36.30	100	264	Average
5	2483.50	45.49	-28.51	74.00	45.66	32.08	4.05	36.30	100	264	Peak
6	2483.50	5.10	-48.90	54.00	5.27	32.08	4.05	36.30	100	264	Average
7	8706.00	52.98	-21.02	74.00	46.42	35.90	7.45	36.78	100	14	Peak
8	8706.00	39.54	-14.46	54.00	32.97	35.90	7.45	36.78	100	14	Average



## **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 PIFA 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	100055	9kHz~40GHz	Jun. 26, 2008	Jun. 25, 2009	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 19, 2009	Feb. 18, 2010	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 19, 2009	Feb. 18, 2010	Conducted (TH02-HY)
EMI Receiver	R&S	ESCS 30	100356	9kHz~2.75GHz	Aug. 01, 2008	Jul. 31, 2009	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz~30MHz	Nov. 26, 2008	Nov. 25, 2009	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 26, 2008	Nov. 25, 2009	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	116457	N/A	Jun. 04, 2008	Jun. 03, 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~1000M Hz	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	BBHA9170251	15G - 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)
BT Base Station	Anritsu	MT8852B	6K00005722	N/A	Oct. 23, 2007	Oct. 22, 2009	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	May 22, 2008	May 21, 2010	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
<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 EP920713 as below.