

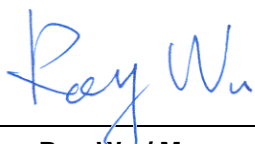
FCC RF Test Report

APPLICANT : CT Asia
EQUIPMENT : GSM mobile phone
BRAND NAME : BLU
MODEL NAME : Tattoo
FCC ID : YHLCTBLUTATTOO
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Spread Spectrum (DSS)

The product was received on May 25, 2010 and completely tested on Jun. 09, 2010. We, SPORTON INTERNATIONAL (KUNSHAN) 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 the 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 (KUNSHAN) 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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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR052523	Rev. 01	Initial issue of report	Jun. 25, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(1)	A8.4(2)	Number of Channels	$\geq 15\text{Chs}$	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	$\geq 2/3$ of 20dB BW	Pass	-
3.4	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	$\leq 0.4\text{sec}$ in 31.6sec period	Pass	-
3.5	15.247(b)(1)	A8.1(b)	Peak Output Power	$\leq 1\text{W}$	Pass	-
3.6	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.7	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.8	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 0.68 dB at 0.34 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.47 dB at 58.08 MHz
3.10	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

CT Asia

RMA2011, 20/F., GOLDEN CENTRAL TOWER, NO. 3037# JINTIAN ROAD, FUTIAN DISTRICT

1.2 Manufacturer

YAYUDA

The fifth Industrial Area of YULV, GONGMING, BAOAN District

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	GSM mobile phone
Brand Name	BLU
Model Name	Tattoo
FCC ID	YHLCTBLUTATTOO
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	0.65 dBm (1.16 mW)
Antenna Type	PCB Antenna with gain 1.6 dBi
HW Version	MTK6223D
SW Version	A051_8A_BLU_V154
Type of Modulation	GFSK
EUT Stage	Production Unit

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Spread Spectrum (DSS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
4. This product has two versions, Single SIM and Dual SIM. And the difference of SIM can't relate any RF effect, so only Dual SIM is used for the test.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.	
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958	
Test Site No.	Sporton Site No.	
	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.	Bluetooth Base Station	Anritsu	8852B	N/A	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 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).

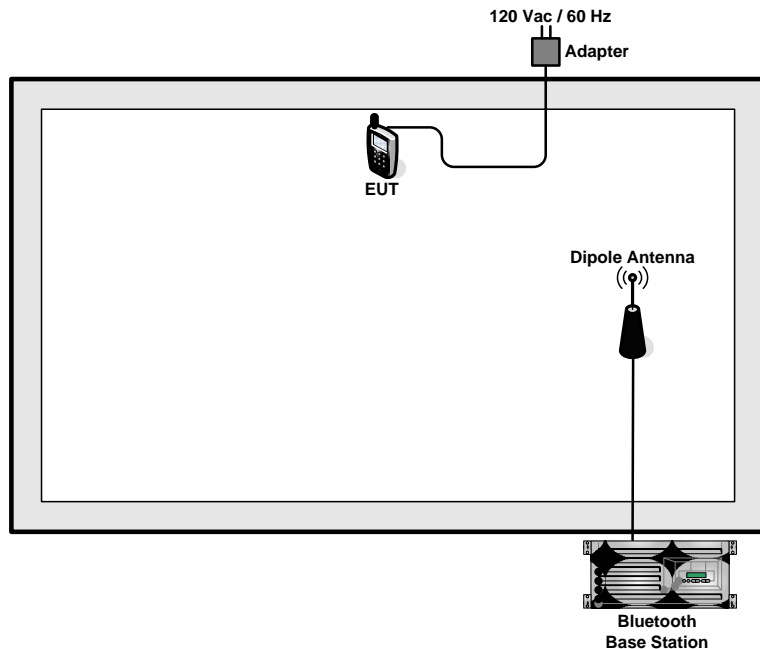
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

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

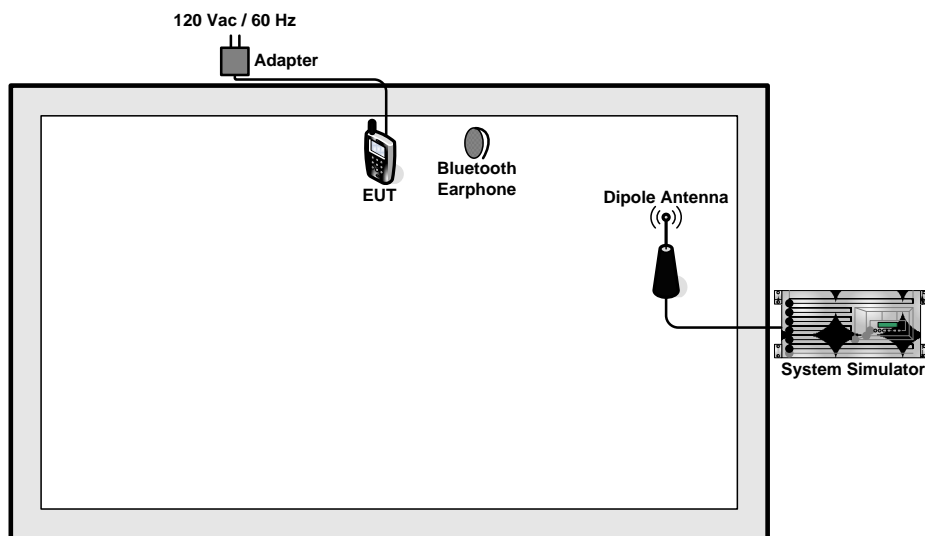
Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth 1Mbps GFSK
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
Radiated TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz
AC Conducted Emission	Mode 1 :GPRS 850 Idle + Bluetooth Link + Camera + Adapter

2.2 Connection Diagram of Test System

<Bluetooth Tx Mode>



<EUT with Adapter Mode>



2.3 RF Utility

For Bluetooth function, key in “* #4224876 #” on the EUT directly. Then, the EUT will get into the engineering modes to contact with Bluetooth 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.

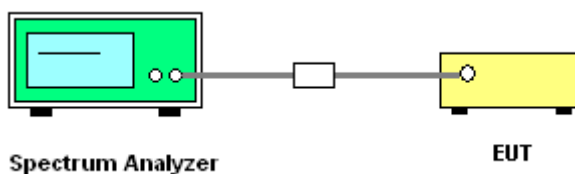
3.1.2 Measuring Instruments

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.

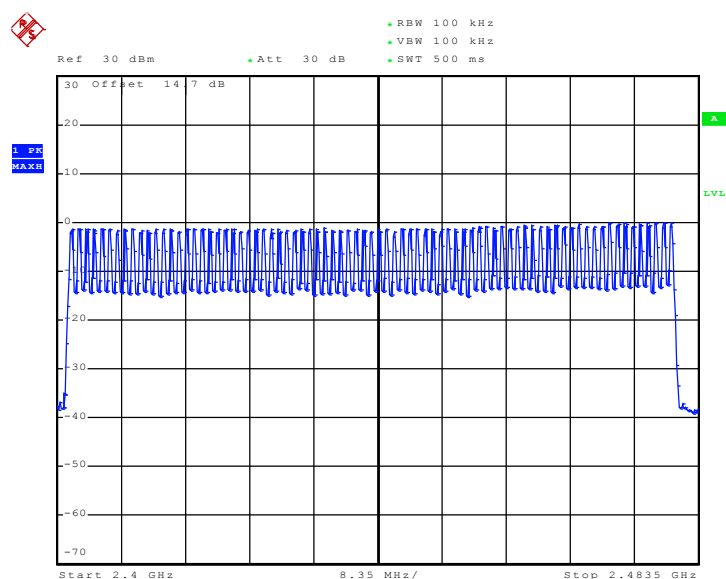
3.1.4 Test Setup



3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 1~3	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%
Number of Hopping Channels (Channel)		Limits (Channel)	Pass/Fail
79		> 15	Pass

Number of Hopping Channel Plot on Channel 00 - 78



Date: 31.MAY.2010 03:57:46

3.2 20dB Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

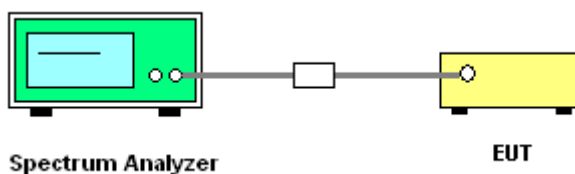
3.2.2 Measuring Instruments

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

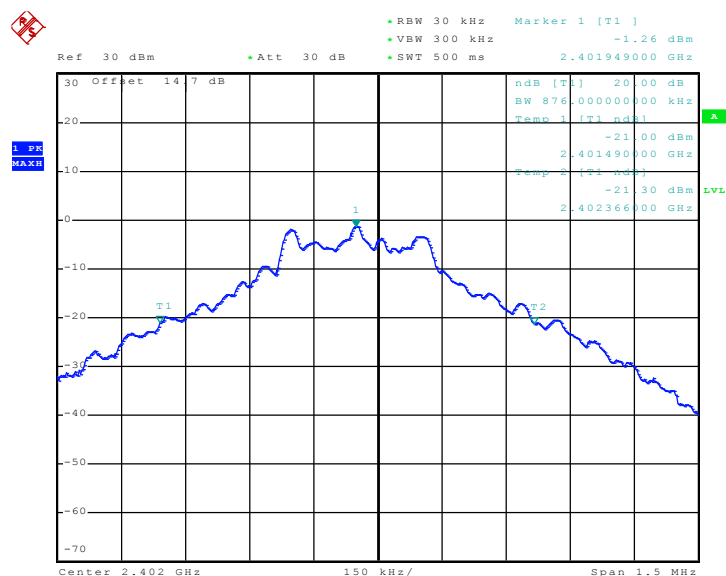


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

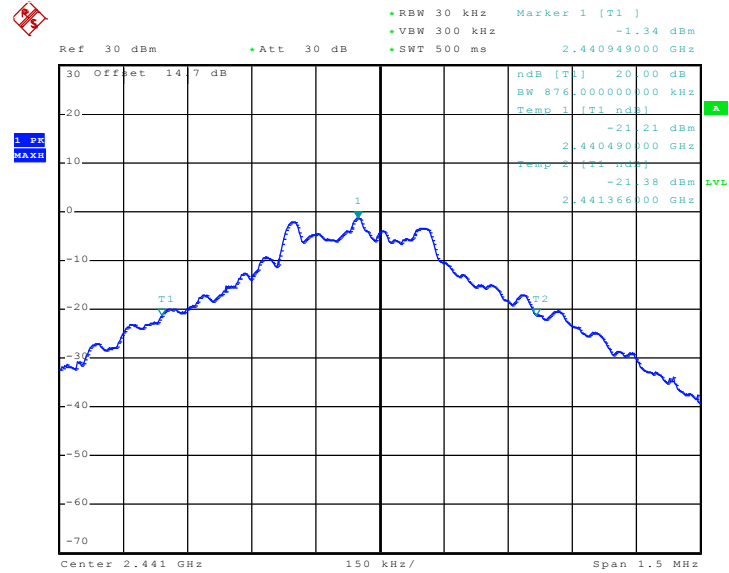
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.876
39	2441	0.876
78	2480	0.891

20 dB Bandwidth Plot on Channel 00



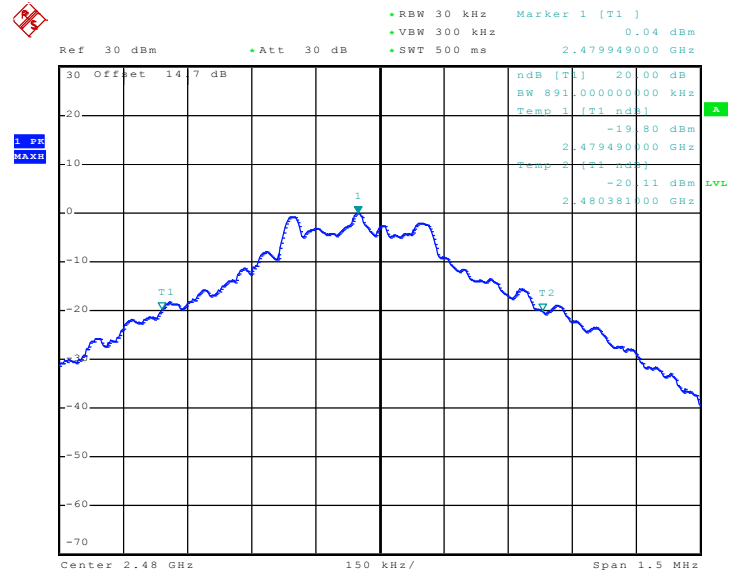
Date: 31.MAY.2010 04:21:54

20 dB Bandwidth Plot on Channel 39



Date: 31.MAY.2010 04:22:48

20 dB Bandwidth Plot on Channel 78



Date: 31.MAY.2010 04:24:19

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.

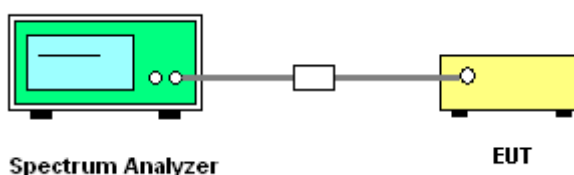
3.3.2 Measuring Instruments

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

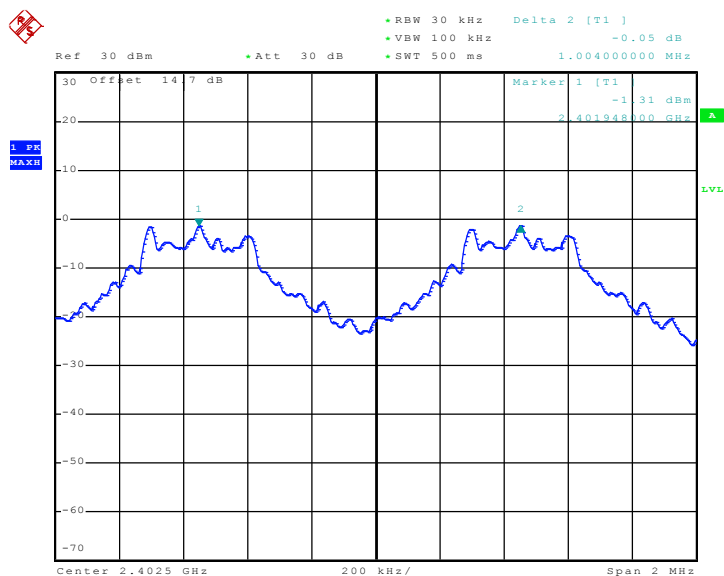


3.3.5 Test Result of Hopping Channel Separation

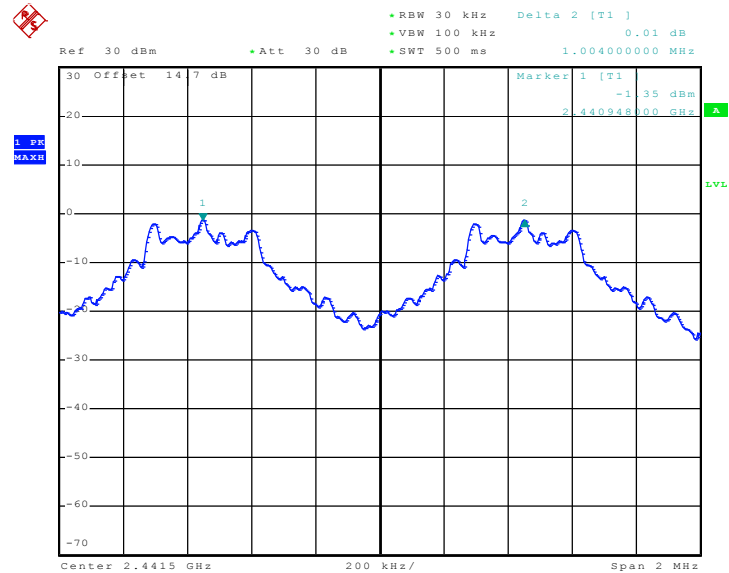
Test Mode :	Mode 1, 2, 3	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.004	0.584	Pass
39	2441	1.004	0.584	Pass
78	2480	1.004	0.594	Pass

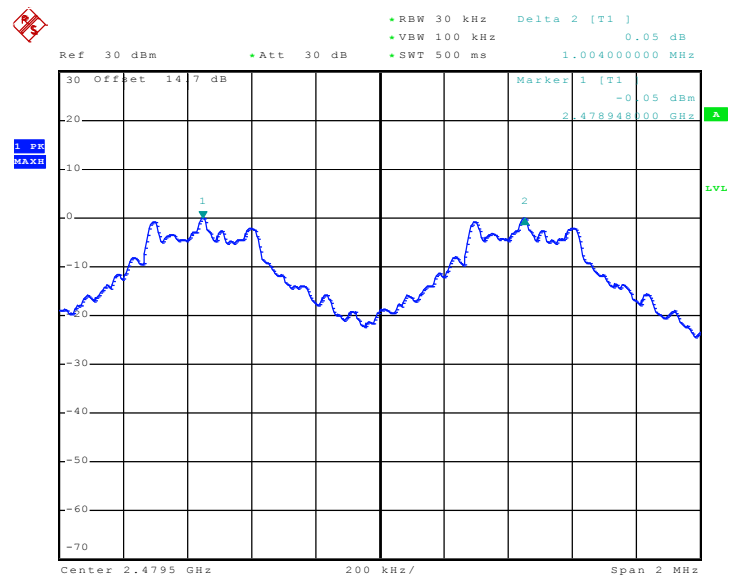
Channel Separation Plot on Channel 00 - 01



Date: 31.MAY.2010 04:00:20

Channel Separation Plot on Channel 39 - 40


Date: 31.MAY.2010 04:02:36

Channel Separation Plot on Channel 77 - 78


Date: 31.MAY.2010 04:05:19

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.

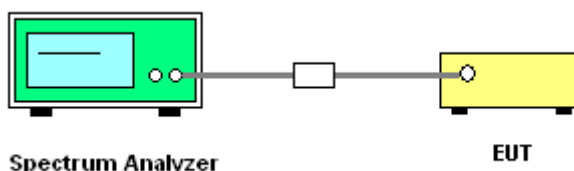
3.4.2 Measuring Instruments

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 \geq 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



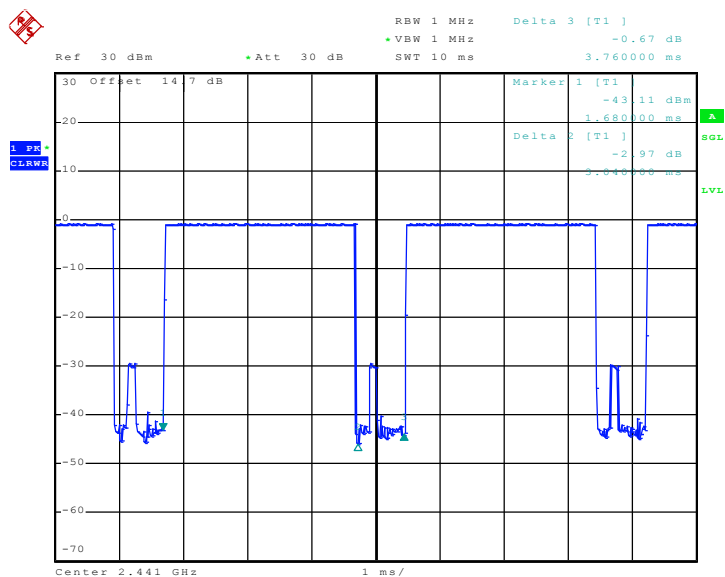
3.4.5 Test Result of Dwell Time

Test Mode :	Mode 2	Temperature :	20~21℃
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

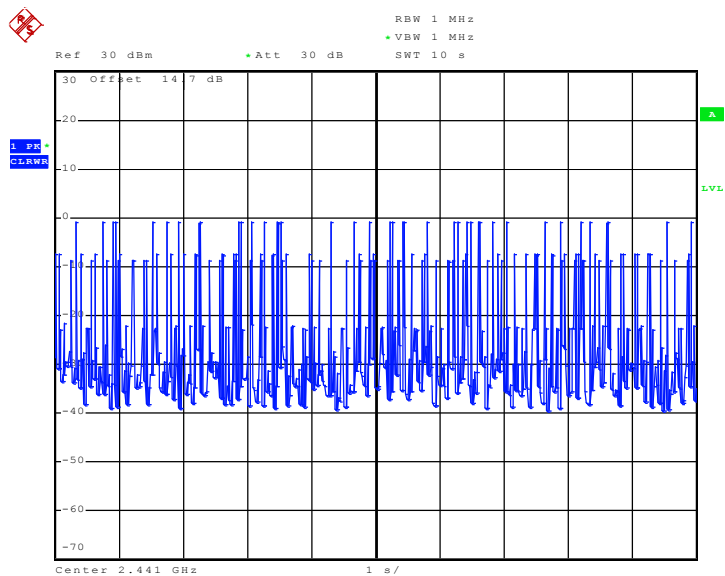
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
DH5	3.4	3040	0.33	0.4	Pass

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)

DH5 Dwell Time (One Pulse) Plot on Channel 39


Date: 31.MAY.2010 04:11:50

DH5 Dwell Time (Count Pulses) Plot on Channel 39


Date: 31.MAY.2010 04:14:16

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).

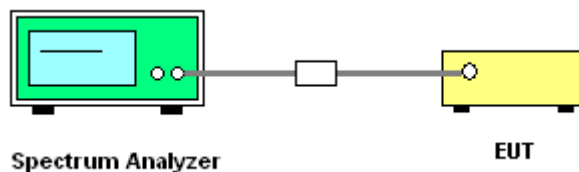
3.5.2 Measuring Instruments

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 spectrum analyzer by a low loss cable.

3.5.4 Test Setup

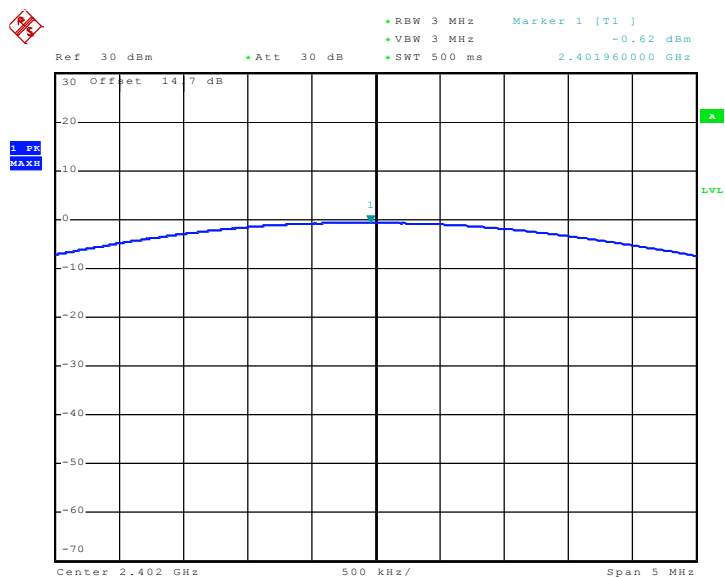


3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	20~21°C
Test Engineer :	Sky Liu	Relative Humidity :	40~41%

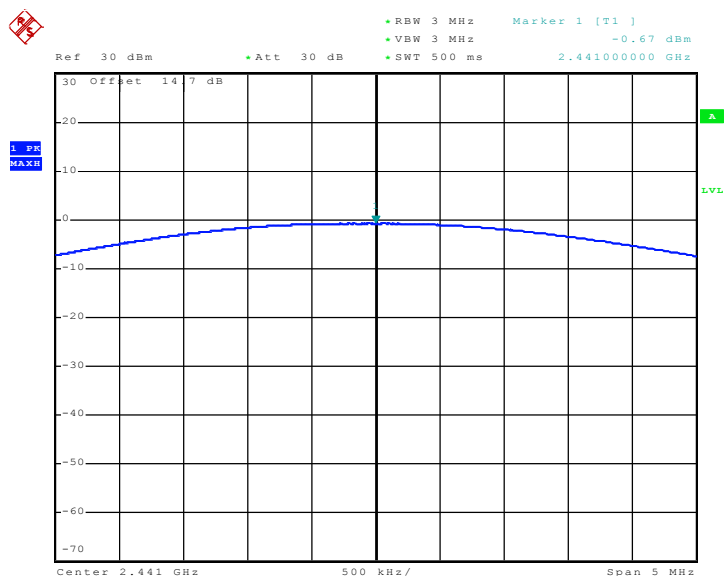
Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	-0.62	30	Pass
39	2441	-0.67	30	Pass
78	2480	0.65	30	Pass

Peak Output Power Plot on Channel 00



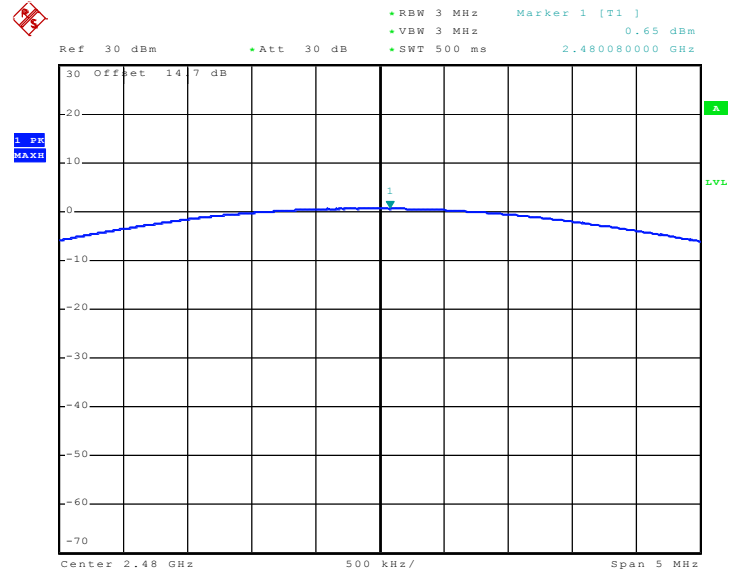
Date: 31.MAY.2010 05:01:25

Peak Output Power Plot on Channel 39



Date: 31.MAY.2010 05:01:53

Peak Output Power Plot on Channel 78



Date: 31.MAY.2010 04:57:11

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

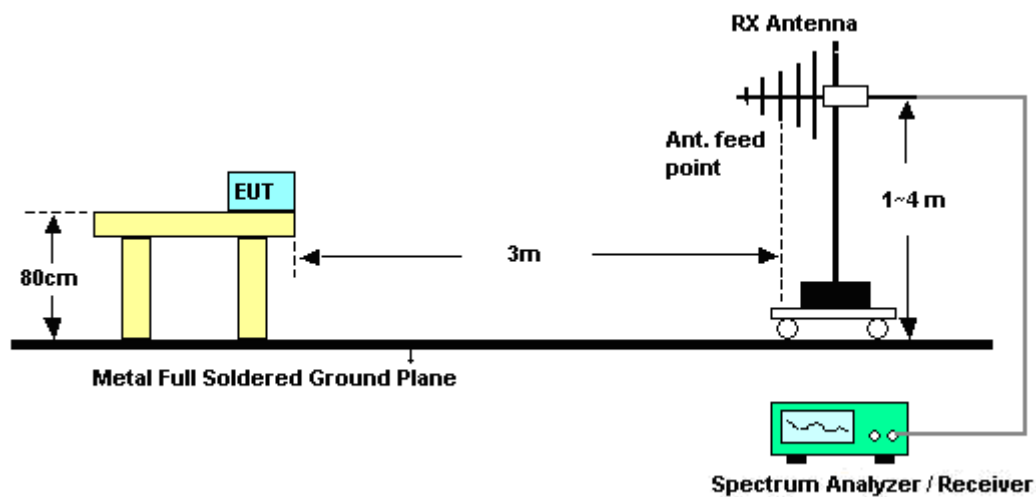
See list of measuring instruments of this test report.

3.6.3 Test Procedures

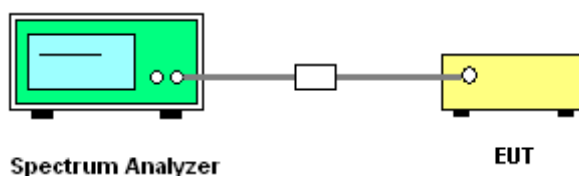
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 300kHz, Video bandwidth (VBW) \geq RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 300k Hz 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 = 1MHz, Sweep: Auto for Peak; set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto for Average. 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).
4. In case the emission is fail due to the used RBW / VBW is too wide, marker-delta method of FCC Public Notice DA 00-705 will be followed.

3.6.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.6.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	00	Relative Humidity :	41~42%
		Test Engineer :	Haitao Yin

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
2389.04	50.11	-23.89	74.00	48.96	32.86	3.13	34.84	100	170	Peak
2389.04	31.24	-22.76	54.00	30.09	32.86	3.13	34.84	100	170	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
2389.42	49.63	-24.37	74.00	48.48	32.86	3.13	34.84	185	249	Peak
2389.42	31.37	-22.63	54.00	30.22	32.86	3.13	34.84	185	249	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	41~42%
		Test Engineer :	Haitao Yin

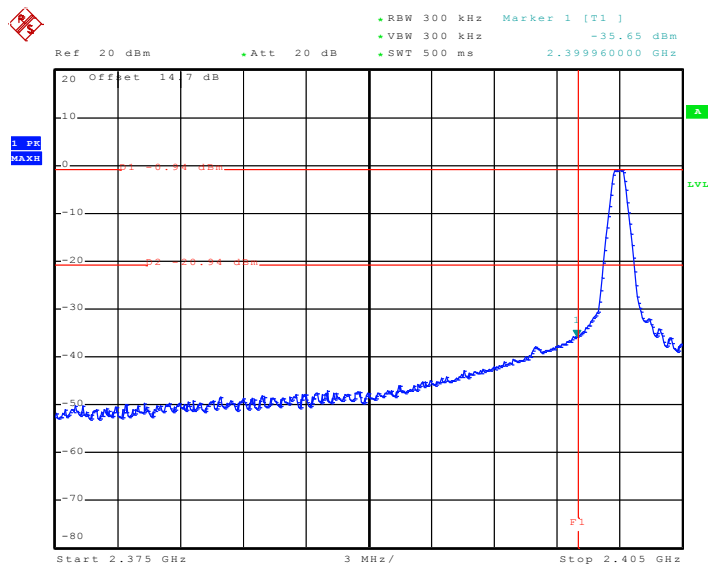
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	63.89	-10.11	74.00	62.53	33.01	3.20	34.85	104	342	Peak
2483.50	41.38	-12.62	54.00	40.02	33.01	3.20	34.85	104	342	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
2483.66	56.03	-17.97	74.00	54.67	33.01	3.20	34.85	100	30	Peak
2483.66	37.32	-16.68	54.00	35.96	33.01	3.20	34.85	100	30	Average

3.6.6 Test Result of Conducted Band Edges

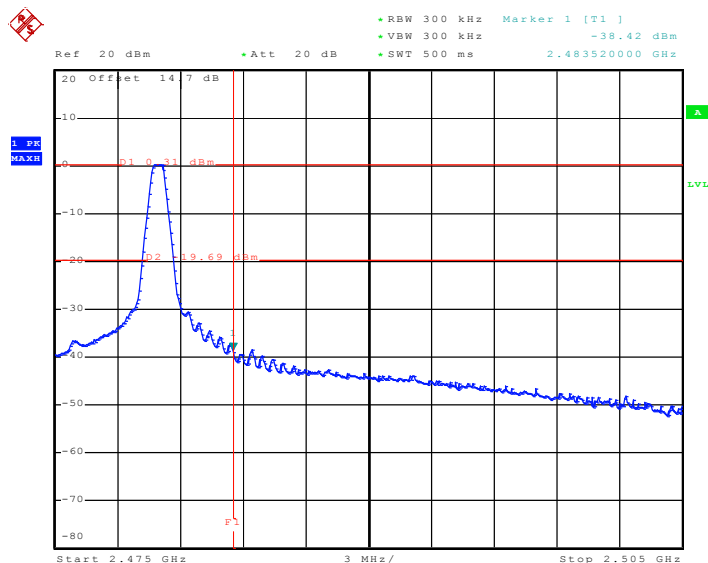
Test Mode :	Mode 1 and 3	Temperature :	20~21℃
Test Channel :	00 and 78	Relative Humidity :	40~41%
		Test Engineer :	Sky Liu

Low Band Edge Plot on Channel 00



Date: 31.MAY.2010 04:27:15

High Band Edge Plot on Channel 78



Date: 31.MAY.2010 04:37:30

3.7 Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band.

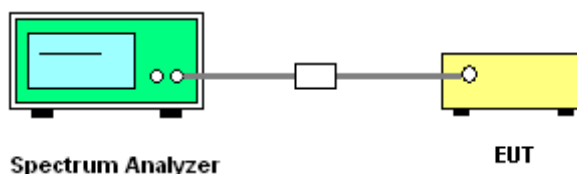
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW) \geq RBW, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

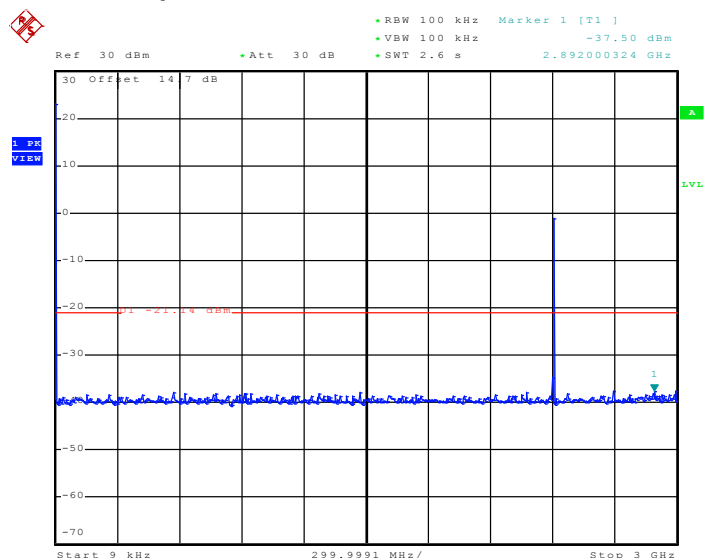
3.7.4 Test Setup



3.7.5 Test Result

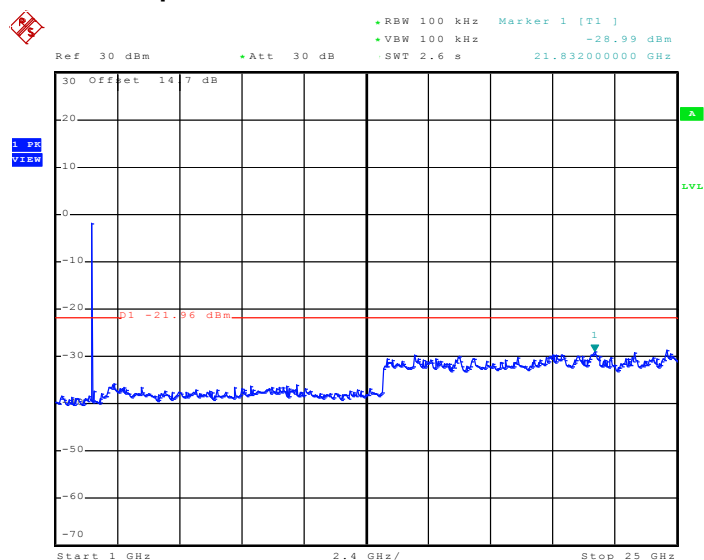
Test Mode :	Mode 1	Temperature :	20~21°C
Test Channel :	00	Relative Humidity :	40~41%
		Test Engineer :	Sky Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



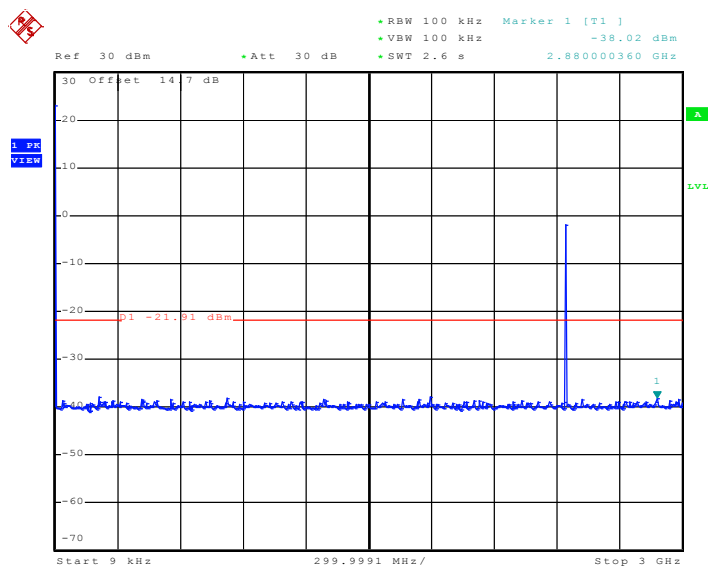
Date: 31.MAY.2010 04:46:43

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

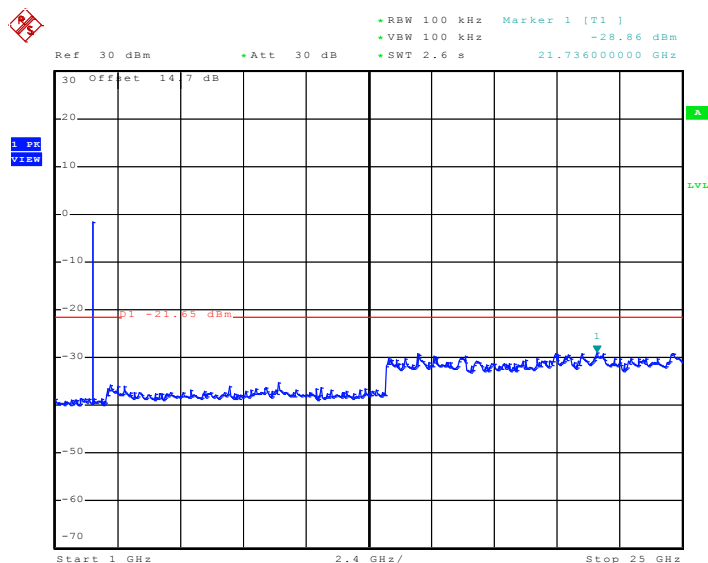


Date: 31.MAY.2010 04:41:12

Test Mode :	Mode 2	Temperature :	20~21°C
Test Channel :	39	Relative Humidity :	40~41%
		Test Engineer :	Sky Liu

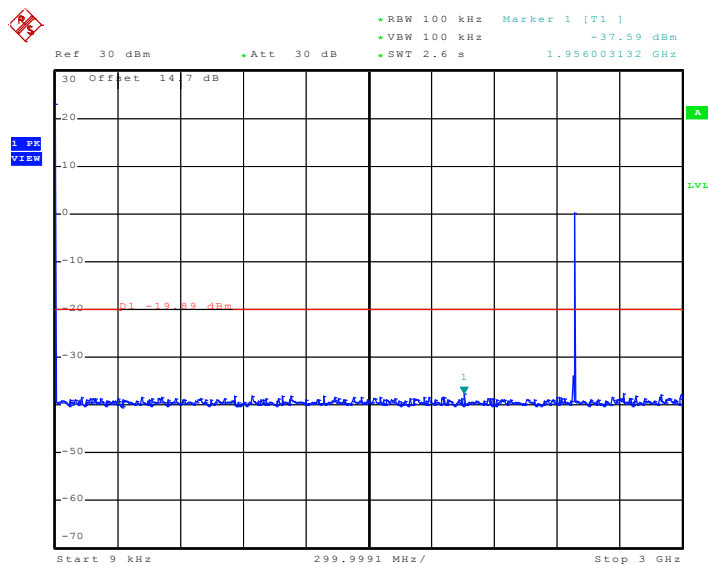
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 31.MAY.2010 04:47:42

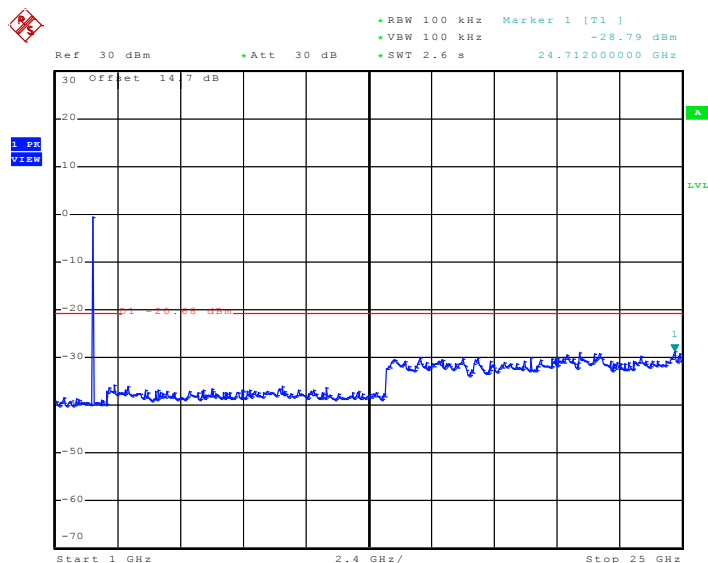
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 31.MAY.2010 04:42:35

Test Mode :	Mode 3	Temperature :	20~21°C
Test Channel :	78	Relative Humidity :	40~41%
		Test Engineer :	Sky Liu

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 31.MAY.2010 04:49:34

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 31.MAY.2010 04:44:52

3.8 AC Conducted Emission Measurement

3.8.1 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.

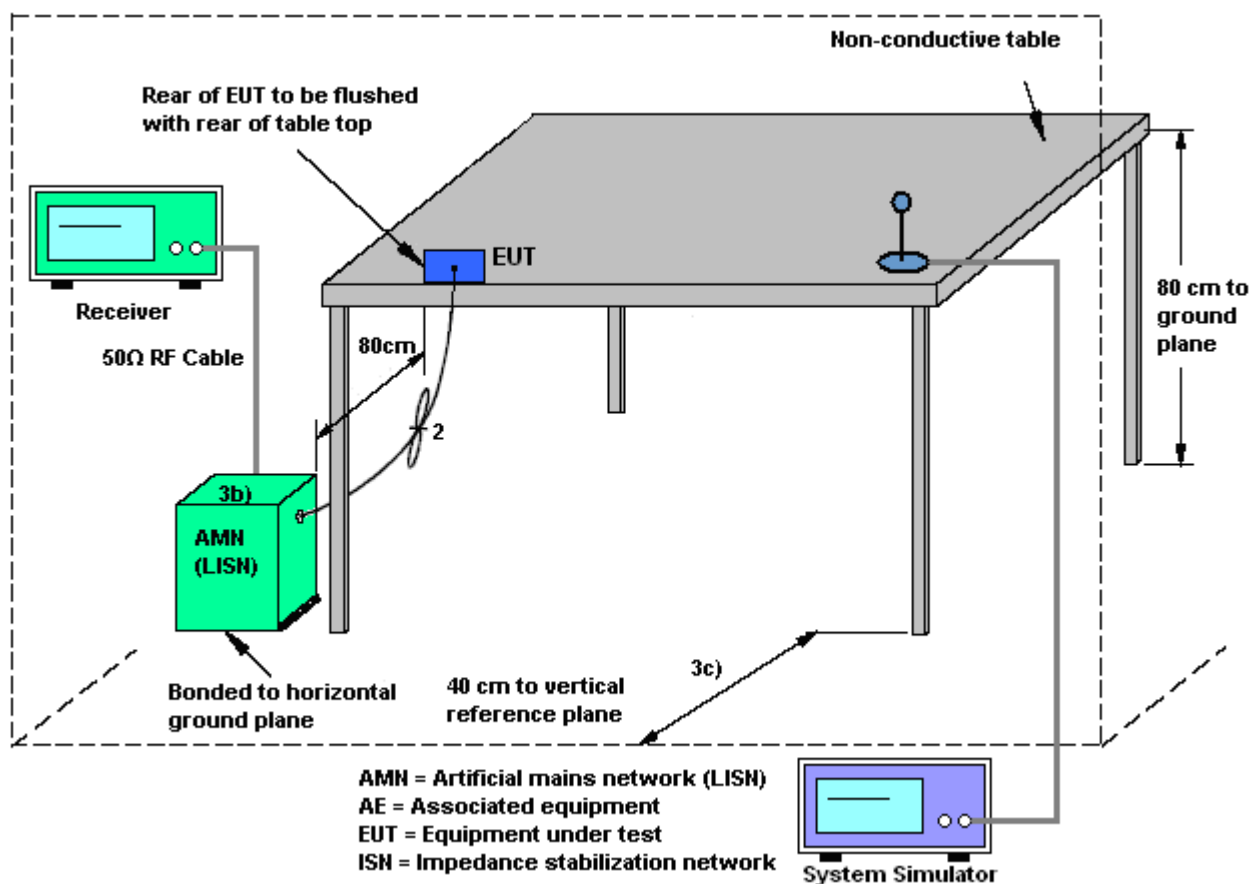
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

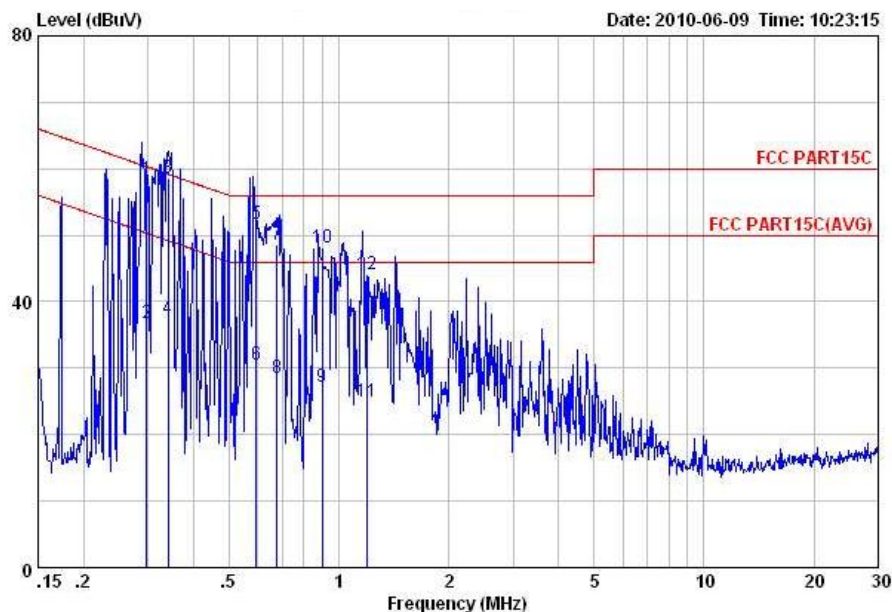
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All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

3.8.4 Test Setup



3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Haitao Yin	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GPRS 850 Idle + Bluetooth Link + Camera + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



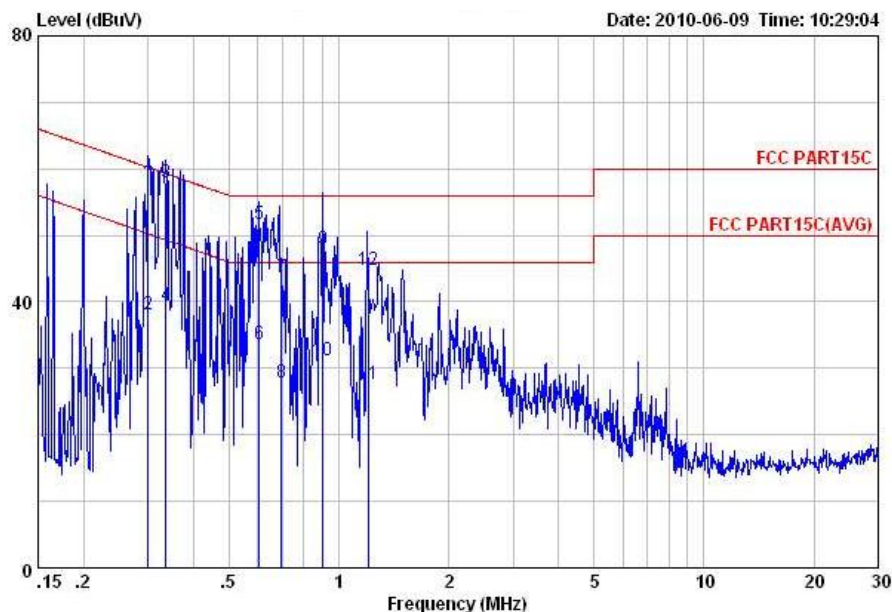
Site : C001-KS
Condition: FCC PART15C LISN-071001 LINE

Power : 120vac/60Hz
Model : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.30	58.40	-1.90	60.30	48.30	-0.07	10.17	QP
2	0.30	36.80	-13.50	50.30	26.70	-0.07	10.17	Average
3	0.34	58.50	-0.68	59.18	48.40	-0.08	10.18	QP
4	0.34	37.50	-11.68	49.18	27.40	-0.08	10.18	Average
5	0.59	51.64	-4.36	56.00	41.51	-0.09	10.22	QP
6	0.59	30.54	-15.46	46.00	20.41	-0.09	10.22	Average
7	0.68	48.64	-7.36	56.00	38.50	-0.09	10.23	QP
8	0.68	28.54	-17.46	46.00	18.40	-0.09	10.23	Average
9	0.90	27.16	-18.84	46.00	17.01	-0.10	10.25	Average
10	0.90	48.06	-7.94	56.00	37.91	-0.10	10.25	QP
11	1.20	24.88	-21.12	46.00	14.70	-0.10	10.28	Average
12	1.20	44.18	-11.82	56.00	34.00	-0.10	10.28	QP



Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Haitao Yin	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GPRS 850 Idle + Bluetooth Link + Camera + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-071001 NEUTRAL

Power : 120vac/60Hz
Model : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.30	57.90	-2.33	60.23	47.80	-0.07	10.17	QP
2	0.30	38.20	-12.03	50.23	28.10	-0.07	10.17	Average
3	0.34	58.00	-1.30	59.30	47.90	-0.08	10.18	QP
4	0.34	39.40	-9.90	49.30	29.30	-0.08	10.18	Average
5	0.60	51.74	-4.26	56.00	41.60	-0.08	10.22	QP
6	0.60	33.64	-12.36	46.00	23.50	-0.08	10.22	Average
7	0.69	43.65	-12.35	56.00	33.50	-0.08	10.23	QP
8	0.69	27.95	-18.05	46.00	17.80	-0.08	10.23	Average
9	0.91	47.87	-8.13	56.00	37.71	-0.09	10.25	QP
10	0.91	31.17	-14.83	46.00	21.01	-0.09	10.25	Average
11	1.21	27.69	-18.31	46.00	17.50	-0.09	10.28	Average
12	1.21	44.69	-11.31	56.00	34.50	-0.09	10.28	QP

3.9 Radiated Emission Measurement

3.9.1 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

3.9.2 Measuring Instruments

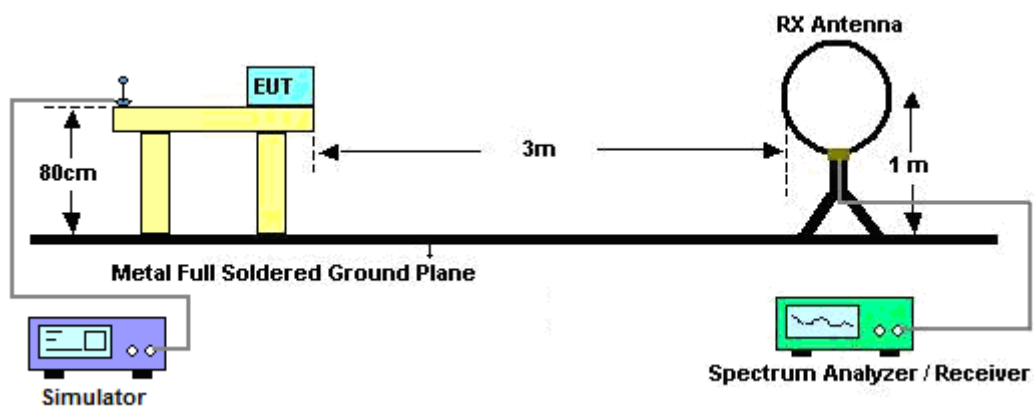
See list of measuring instruments of this test report.

3.9.3 Test Procedures

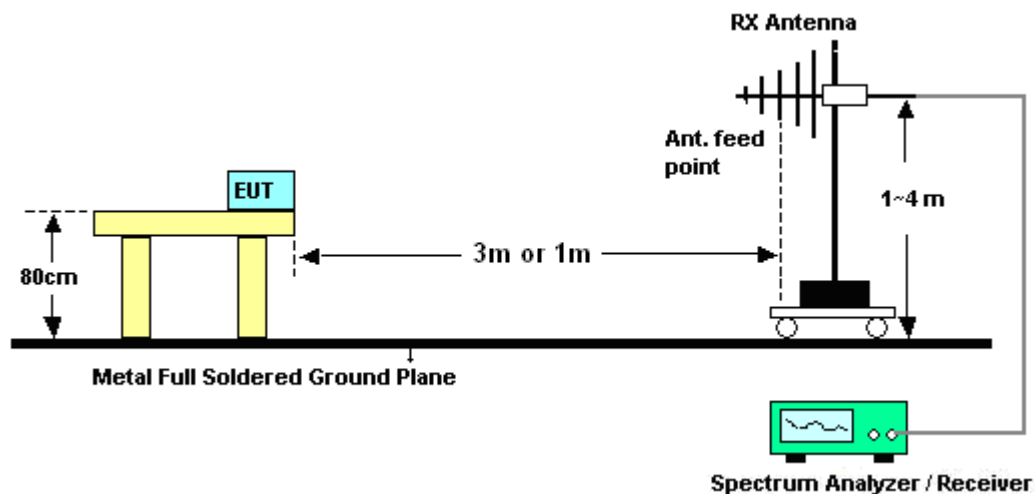
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
 - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
 - (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB)
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.

3.9.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



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

Test Engineer :	Haitao Yin	Temperature :	21~22°C	
		Relative Humidity :	41~42%	
Frequency (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.

3.9.6 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	00	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Horizontal
Remark :	2402 MHz is Fundamental Signals which can be ignored.		

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 (de-g)	Remark
48.36	18.45	-21.55	40.00	38.65	8.12	0.31	28.63	-	-	Peak
123.96	16.77	-26.73	43.50	33.15	11.76	0.48	28.62	-	-	Peak
260.04	21.04	-24.96	46.00	36.92	12.15	0.75	28.78	-	-	Peak
328.70	24.11	-21.89	46.00	38.29	13.91	0.80	28.89	-	-	Peak
692.70	25.87	-20.13	46.00	33.48	19.25	1.14	28.00	-	-	Peak
916.00	28.26	-17.74	46.00	33.39	20.53	1.30	26.96	100	22	Peak
2389.04	50.11	-23.89	74.00	48.96	32.86	3.13	34.84	100	170	Peak
2389.04	31.24	-22.76	54.00	30.09	32.86	3.13	34.84	100	170	Average
2402.00	89.58	-	-	88.41	32.86	3.15	34.84	111	352	Peak
2402.00	78.65	-	-	77.48	32.86	3.15	34.84	111	352	Average
2492.02	46.50	-27.50	74.00	45.09	33.05	3.21	34.85	100	189	Peak
2492.02	30.53	-23.47	54.00	29.12	33.05	3.21	34.85	100	189	Average

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	00	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Vertical
Remark :	2402 MHz is Fundamental Signals which can be ignored.		

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
36.48	34.64	-5.36	40.00	48.80	14.19	0.28	28.63	100	360	QP
50.79	33.28	-6.72	40.00	54.20	7.40	0.31	28.63	100	76	QP
58.08	36.53	-3.47	40.00	59.21	5.59	0.34	28.61	-	-	Peak
328.70	25.91	-20.09	46.00	40.09	13.91	0.80	28.89	-	-	Peak
663.30	26.25	-19.75	46.00	34.39	18.99	1.12	28.25	-	-	Peak
932.80	28.16	-17.84	46.00	33.03	20.65	1.31	26.83	-	-	Peak
2389.42	49.63	-24.37	74.00	48.48	32.86	3.13	34.84	185	249	Peak
2389.42	31.37	-22.63	54.00	30.22	32.86	3.13	34.84	185	249	Average
2402.00	87.66	-	-	86.49	32.86	3.15	34.84	200	234	Peak
2402.00	76.72	-	-	75.55	32.86	3.15	34.84	200	234	Average
2490.12	45.44	-28.56	74.00	44.04	33.05	3.20	34.85	100	236	Peak
2490.12	26.62	-27.38	54.00	25.22	33.05	3.20	34.85	100	236	Average

Test Mode :	Mode 2	Temperature :	21~22°C
Test Channel :	39	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Horizontal
Remark :	2441 MHz is Fundamental Signals which can be ignored.		

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
36.75	21.82	-18.18	40.00	35.98	14.19	0.28	28.63	100	230	Peak
182.01	19.21	-24.29	43.50	38.85	8.42	0.63	28.69	-	-	Peak
260.04	22.25	-23.75	46.00	38.13	12.15	0.75	28.78	-	-	Peak
328.70	23.47	-22.53	46.00	37.65	13.91	0.80	28.89	-	-	Peak
794.20	26.79	-19.21	46.00	33.42	19.85	1.23	27.71	-	-	Peak
901.30	27.52	-18.48	46.00	32.82	20.45	1.29	27.04	-	-	Peak
2364.00	44.53	-29.47	74.00	43.43	32.81	3.12	34.83	100	233	Peak
2364.00	31.07	-22.93	54.00	29.97	32.81	3.12	34.83	100	233	Average
2441.00	89.35	-	-	88.07	32.95	3.18	34.85	112	344	Peak
2441.00	79.00	-	-	77.72	32.95	3.18	34.85	112	344	Average
2492.00	44.93	-29.07	74.00	43.52	33.05	3.21	34.85	122	355	Peak
2492.00	28.29	-25.71	54.00	26.88	33.05	3.21	34.85	122	355	Average

Test Mode :	Mode 2	Temperature :	21~22°C
Test Channel :	39	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Vertical
Remark :	2441 MHz is Fundamental Signals which can be ignored.		

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
36.21	35.70	-4.30	40.00	49.40	14.65	0.28	28.63	100	37	QP
48.36	32.39	-7.61	40.00	52.59	8.12	0.31	28.63	100	176	QP
59.16	26.40	-13.60	40.00	49.23	5.44	0.34	28.61	-	-	Peak
415.50	23.86	-22.14	46.00	35.81	16.08	0.89	28.92	-	-	Peak
689.90	25.92	-20.08	46.00	33.57	19.23	1.13	28.01	-	-	Peak
869.10	27.35	-18.65	46.00	32.68	20.49	1.28	27.10	-	-	Peak
2352.00	44.55	-29.45	74.00	43.45	32.81	3.12	34.83	103	98	Peak
2352.00	32.08	-21.92	54.00	30.98	32.81	3.12	34.83	103	98	Average
2441.00	86.48	-	-	85.20	32.95	3.18	34.85	103	29	Peak
2441.00	75.19	-	-	73.91	32.95	3.18	34.85	103	29	Average
2486.00	44.31	-29.69	74.00	42.95	33.01	3.20	34.85	100	288	Peak
2486.00	29.00	-25.00	54.00	27.64	33.01	3.20	34.85	100	288	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Horizontal
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

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
48.09	28.58	-11.42	40.00	48.78	8.12	0.31	28.63	100	290	Peak
182.01	20.71	-22.79	43.50	40.35	8.42	0.63	28.69	-	-	Peak
260.04	20.55	-25.45	46.00	36.43	12.15	0.75	28.78	-	-	Peak
342.70	26.30	-19.70	46.00	40.03	14.33	0.82	28.88	-	-	Peak
651.40	25.75	-20.25	46.00	34.07	18.91	1.10	28.33	-	-	Peak
883.80	27.60	-18.40	46.00	32.92	20.47	1.28	27.07	-	-	Peak
2332.04	45.97	-28.03	74.00	44.94	32.76	3.10	34.83	100	128	Peak
2332.04	32.07	-21.93	54.00	31.04	32.76	3.10	34.83	100	128	Average
2480.00	92.36	-	-	91.00	33.01	3.20	34.85	104	343	Peak
2480.00	79.96	-	-	78.60	33.01	3.20	34.85	104	343	Average
2483.50	63.89	-10.11	74.00	62.53	33.01	3.20	34.85	104	342	Peak
2483.50	41.38	-12.62	54.00	40.02	33.01	3.20	34.85	104	342	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	78	Relative Humidity :	41~42%
Test Engineer :	Haitao Yin	Polarization :	Vertical
Remark :	2480 MHz is Fundamental Signals which can be ignored.		

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
36.21	34.90	-5.10	40.00	48.60	14.65	0.28	28.63	100	81	QP
48.36	32.39	-7.61	40.00	52.59	8.12	0.31	28.63	100	311	QP
71.58	23.26	-16.74	40.00	46.04	5.46	0.37	28.61	-	-	Peak
415.50	28.44	-17.56	46.00	40.39	16.08	0.89	28.92	-	-	Peak
703.20	26.57	-19.43	46.00	34.05	19.33	1.14	27.95	-	-	Peak
873.30	28.70	-17.30	46.00	34.03	20.48	1.28	27.09	-	-	Peak
2329.76	46.14	-27.86	74.00	45.11	32.76	3.10	34.83	100	255	Peak
2329.76	31.31	-22.69	54.00	30.28	32.76	3.10	34.83	100	255	Average
2480.00	88.14	-	-	86.78	33.01	3.20	34.85	133	337	Peak
2480.00	75.70	-	-	74.34	33.01	3.20	34.85	133	337	Average
2483.66	56.03	-17.97	74.00	54.67	33.01	3.20	34.85	100	30	Peak
2483.66	37.32	-16.68	54.00	35.96	33.01	3.20	34.85	100	30	Average

3.10 Antenna Requirements

3.10.1 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.

3.10.2 Antenna Connected Construction

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

3.10.3 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	Jan. 18, 2010	Jan. 17, 2011	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 27, 2009	Aug. 26, 2010	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 28, 2009	Aug. 27, 2010	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI	100534	9kHz~2.75GHz	Nov. 17, 2009	Nov. 16, 2010	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Jan. 18, 2010	Jan. 17, 2011	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Jan. 18, 2010	Jan. 17, 2011	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000811	N/A	Nov. 26, 2009	Nov. 25, 2010	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	Full-Band	Jan. 08, 2009	Jan. 07, 2011	Conduction (CO01-KS)
EMI Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 17, 2009	Nov. 16, 2010	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	75959	1GHz~18GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Amplifier	Wireless	FPA6592G	60004	30MHz~2GHz	Feb. 02, 2010	Feb. 01, 2011	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
Active horn antenna	com-power	AHA-118	701023	1G-18GHz	Nov. 18, 2009	Nov. 17, 2010	Radiation (03CH01-KS)
Signal Generator	R&S	SMR40	100455	10MHz~40GHz	Jan. 18, 2010	Jan. 17, 2011	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15-40GHz	Oct. 22, 2009	Oct. 21, 2010	Radiation (03CH01-KS)
Bluetooth Base Station	ANRITSU	MT8852B	6K00004935	BT EDR	Sep. 17, 2009	Sep. 16, 2010	Radiation (03CH01-KS)

5 Uncertainty of Evaluation

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

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 Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

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

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-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

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

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	± 0.10	Normal (k=2)	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 = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP052523 as below.