

FCC RF Test Report

APPLICANT : Acer Incorporated
EQUIPMENT : Dual band WiFi LGA Module
BRAND NAME : Acer
MODEL NAME : T77H389
FCC ID : HLZ-T77H389
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jul. 10, 2012 and completely tested on Sep. 11, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures 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 INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR271030B	Rev. 01	Initial issue of report	Sep. 18, 2012
FR271030B	Rev. 02	Update report for adding Loop Antenna in the list of measuring equipment	Sep. 26, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)(1)	A8.1(b)	Peak Output Power	$\leq 30\text{dBm}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 6.62 dB at 133.140 MHz
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 18.40 dB at 2.574 MHz
0	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Acer Incorporated

8F., No. 88, Sec. 1, Xintai 5th Rd., New Taipei City 22181, Taiwan, R.O.C.

1.2 Manufacturer

1. AMBIT MICROSYSTEMS (SHANGHAI) LTD.

No. 1925, Nanle Road, Songjiang Export Process Zone, Shanghai, China

2. Hon Fu Jin Precision Industry (Shenzhen) Co., Ltd.

Communication Network Solution Business Group; No. 2, 2nd Donghuan Road, 10th Yousong Industrial District, Longhua Town, Baoan District, Shenzhen, Guangdong 518109 China

3. Hong Fu Jin Precision Electronics (YanTai) Co., Ltd.

CNSBG-CPE1; A11 Building, Export Processing Zone, Economic & Technologic, Development Area, YanTai, Shandong, 264006, China

4. Hong Fu Jin Precision Electronics (Chongqing) Co.,Ltd.

Building D02, No. 1, East Zone 1st Road , Shapingba District, Chongqing, 401332, China

5. Foxconn CMMSG Industrial Electronics Ltd.

N800, Marginal Rodovia dos Bandeirantes avenue, Engordadouro district, Jundiai City, Sao Paulo, Brazil, ZIP Code: 13213-008

6. Fenix Industrial Electronics Ltd.

N236, Jose de Palma Renno street, Centro district, Santa Rita do Sapucaí City , Minas Gerais, Brazil , ZIP Code: 37540-000

7. Foxconn MOEBG Industria De Eletronicos Ltda.

No. 1580a Acai Street, Industrial district, Manaus Amazonas, Brazil, ZIP Code: 69075-020

8. Nanning Fu Tai Hong Precision Electronic Co., Ltd.

HWV Product Division No. 13, Road, Keyuan East; High Technical Industrial, Development Zone, Nanning, Guangxi, 530007, China

9. Nanning Fu Tai Hong Precision Electronics Co., Ltd.

The Forth Building, China-ASEAN Advanced Business Part Phase Three, No. 18, Zongbu Road, High Technical Industrial Development Zone, Nanning, Guangxi, 530007, China

10. Nanning Fu Gui Precision Electronics Co., Ltd.

China-ASEAN Advanced Business Park Phase Three, No. 18, Zongbu Road, High Technical Industrial Development Zone, Nanning , Guangxi , 530007, China

11. FUNING Precision Component (Bac Ninh) Co., Ltd.

Que Vo industrial park, Van Duong commune, Bac Ninh city, BacNinh province, Vietnam

12. Fuhong Precision Component (Bac Giang) Limited

Dinh Tram Industrial Park, Viet Yen District Bac Giang Province 236100, Vietnam

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Dual band WiFi LGA Module
Brand Name	Acer
Model Name	T77H389
FCC ID	HLZ-T77H389
EUT supports Radios application	WLAN 11abgn / Bluetooth
HW Version	035
SW Version	045
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2402 MHz ~ 2480 MHz
Number of Channels	40
Carrier Frequency of Each Channel	40 Channel(37 hopping + 3 advertising channel)
Maximum Output Power to Antenna	Bluetooth 4.0 - LE : 5.59 dBm (0.0036 W)
99% Occupied Bandwidth	Bluetooth 4.0 - LE : 3.30MHz
Antenna Type	Antenna 1: PIFA Antenna type with gain -0.15 dBi Antenna 2: Chip Antenna type with gain 2.50 dBi
Type of Modulation	Bluetooth 4.0 - LE : GFSK

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.			
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH02-HY	CO05-HY	03CH05-HY	722060/4086B-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 KDB Publication No. 558074 D01 DTS Meas. Guidance v01
- FCC TCB Workshop 2012, April
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

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, recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	E6500	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
4.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Output Power

The RF output power was recorded in the following table:

Channel	Frequency	Bluetooth 4.0 – LE RF Output Power
		Data Rate / Modulation
		GFSK
		1Mbps
Ch00	2402MHz	4.58 dBm
Ch19	2440MHz	5.50 dBm
Ch39	2480MHz	5.59 dBm

2.2 Test Mode

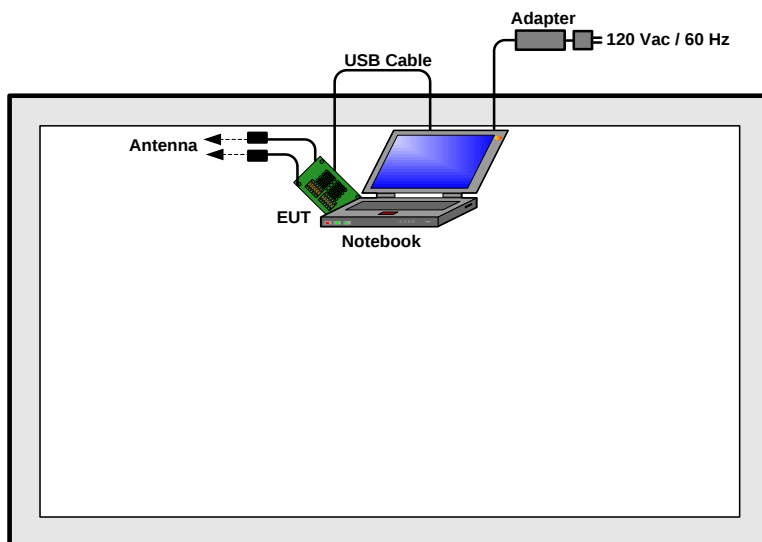
The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

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

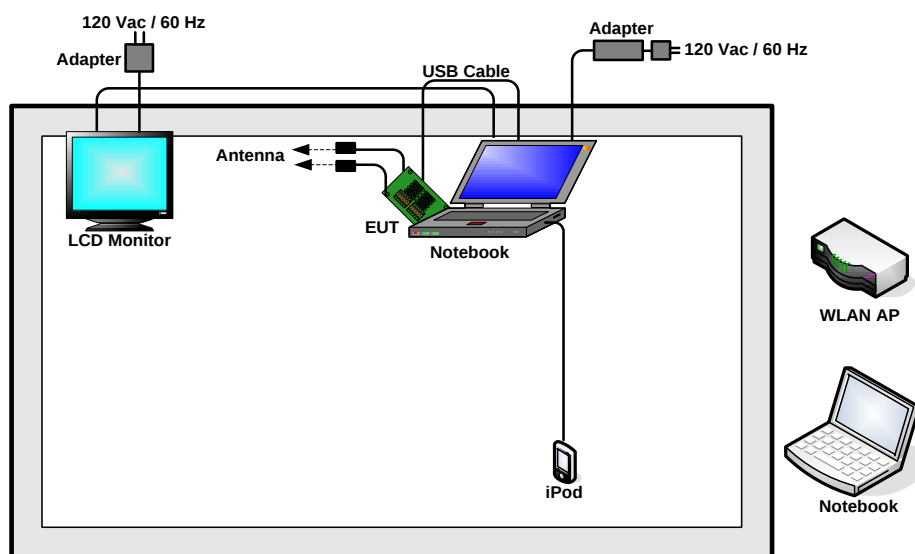
Test Cases	
Test Item	Data Rate / Modulation
	Bluetooth 4.0 – LE / GFSK
Conducted TCs	Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
Radiated TCs	<Antenna 1> Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps <Antenna 2> Mode 1: Bluetooth Tx CH00_2402 MHz_1Mbps Mode 2: Bluetooth Tx CH19_2440 MHz_1Mbps Mode 3: Bluetooth Tx CH39_2480 MHz_1Mbps
AC Conducted Emission	Mode 1 :Bluetooth Link + WLAN (2.4G) Link Mode 2 :Bluetooth Link + WLAN (5G) Link
Remark: - For conducted emission, the worst case is mode 1; only the test data of this mode was reported. - For radiated TCs, all the tests were performance with chain 0. - For conducted emission, all the tests were performance with Main Antenna: Chip Antenna and Aux. Antenna: PIFA Antenna	

2.3 Connection Diagram of Test System

<Bluetooth 4.0 – LE Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

For Bluetooth function, programmed RF utility, “Blue tool” installed in the notebook make the EUT provides functions like channel selection and power level for continuous transmitting and receiving signals.

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

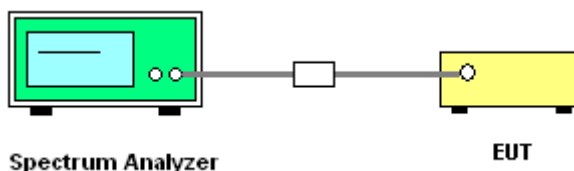
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.

3.1.4 Test Setup

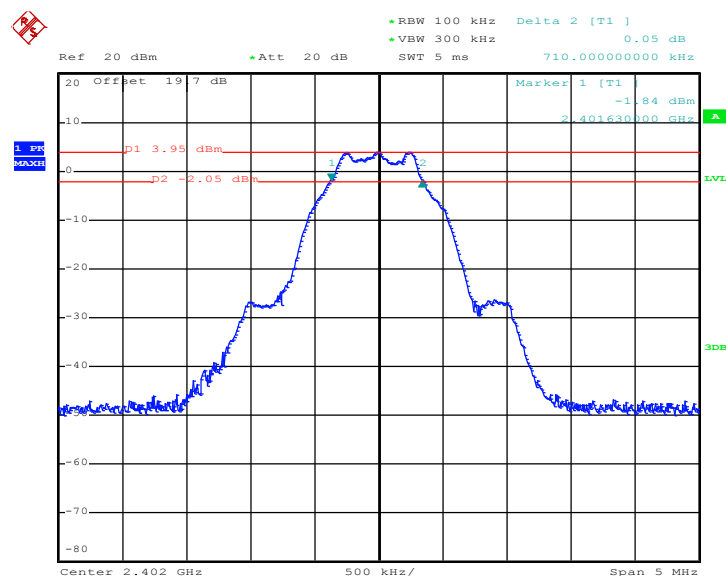


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

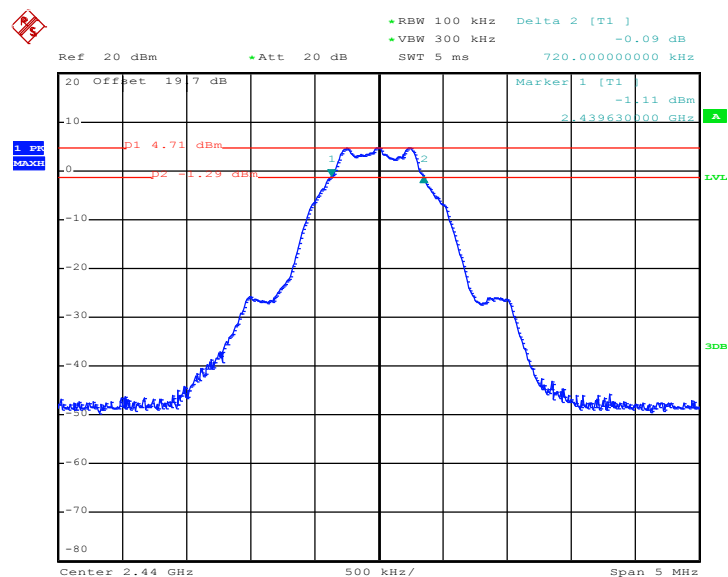
Channel	Frequency (MHz)	6dB Bandwidth (MHz)
00	2402	0.71
19	2440	0.72
39	2480	0.72

6 dB Bandwidth Plot on Channel 00



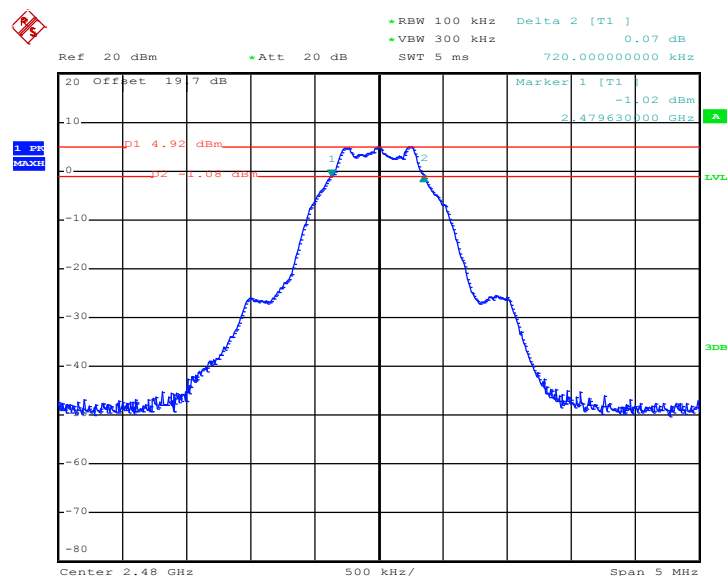
Date: 19.AUG.2012 18:34:59

6 dB Bandwidth Plot on Channel 19



Date: 19.AUG.2012 18:47:32

6 dB Bandwidth Plot on Channel 39



Date: 19.AUG.2012 18:55:56

3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

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

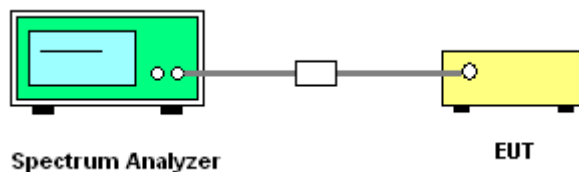
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup

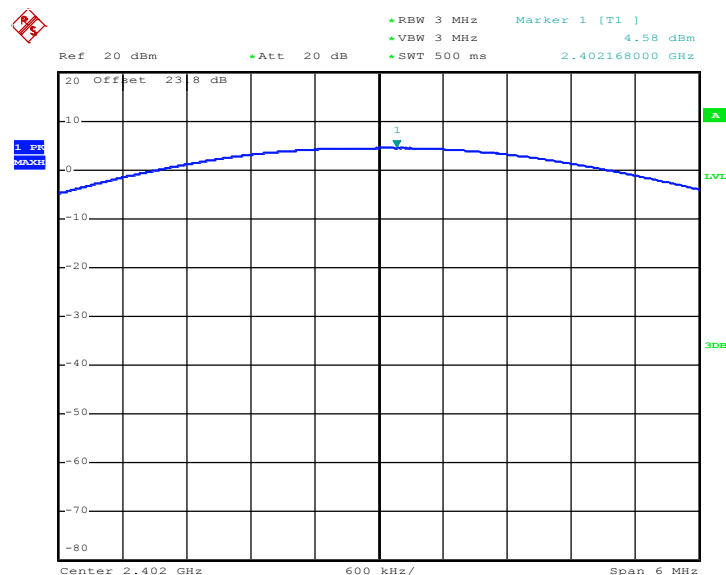


3.2.5 Test Result of Peak Output Power

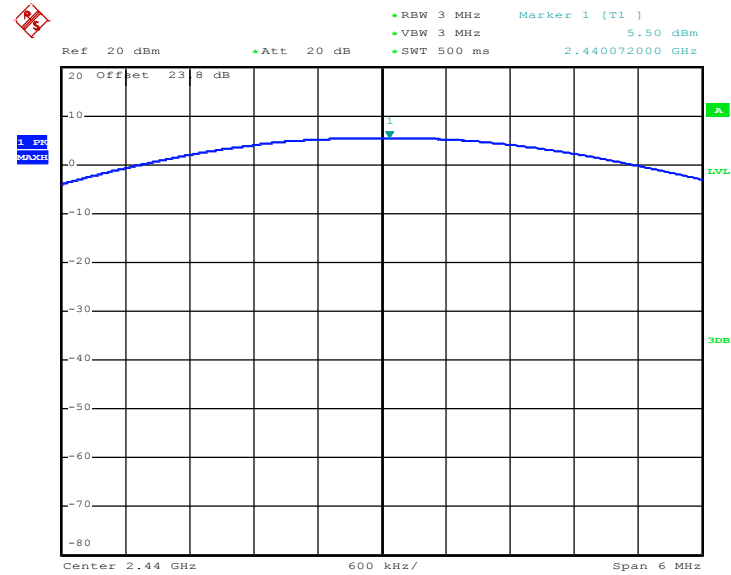
Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	4.58	30.00	Pass
19	2440	5.50	30.00	Pass
39	2480	5.59	30.00	Pass

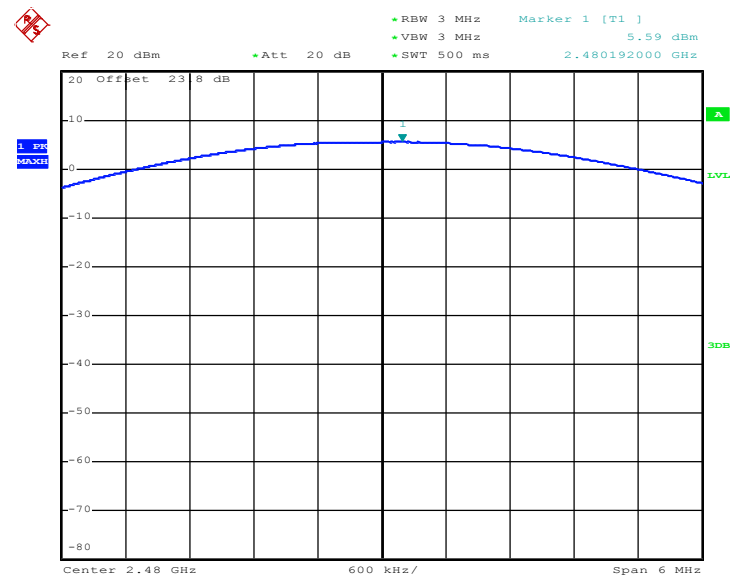
Peak Output Power Plot on Channel 00



Date: 31.JUL.2012 01:14:17

Peak Output Power Plot on Channel 19


Date: 31.JUL.2012 01:25:33

Peak Output Power Plot on Channel 39


Date: 31.JUL.2012 01:18:02

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

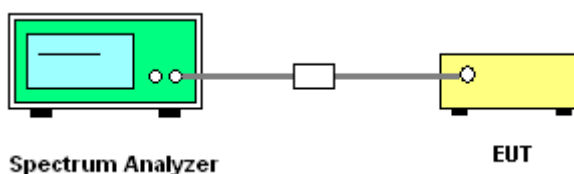
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW) $\geq$ 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Record the measurement data derived from spectrum analyzer.
7. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3\text{ kHz}/100\text{ kHz}) = -15.2\text{ dB}$.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

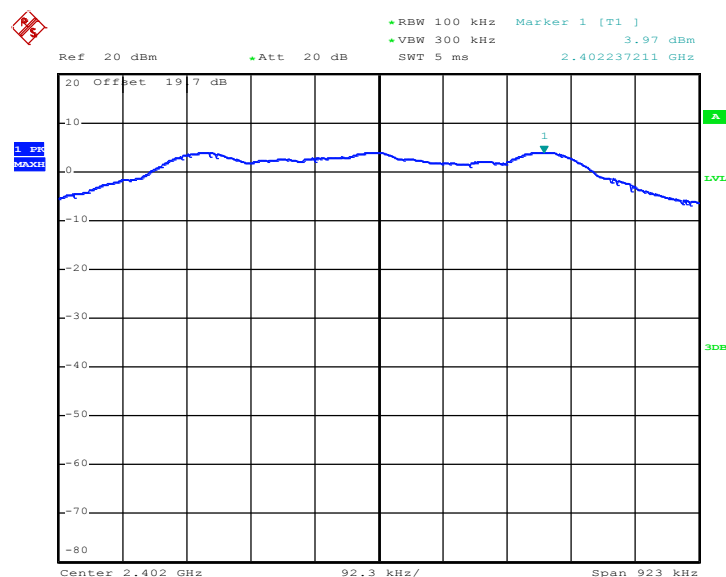
Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Engineer :	Reece Li	Relative Humidity :	50~53%

Channel	Frequency (MHz)	Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
00	2402	3.97	-11.23	8	Pass
19	2440	4.72	-10.48	8	Pass
39	2480	4.94	-10.26	8	Pass

Note:

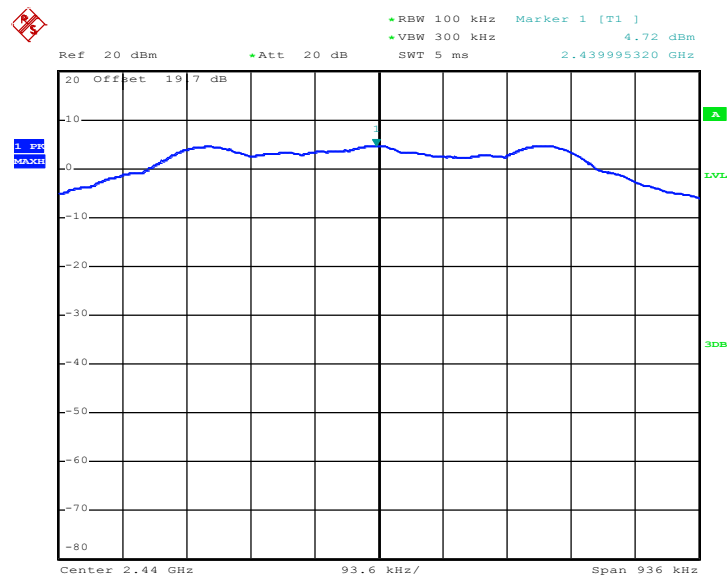
1. Measured power density (dBm) has offset with cable loss.
2. $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3. $\text{Power Density/ 3kHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

PSD Plot on Channel 00



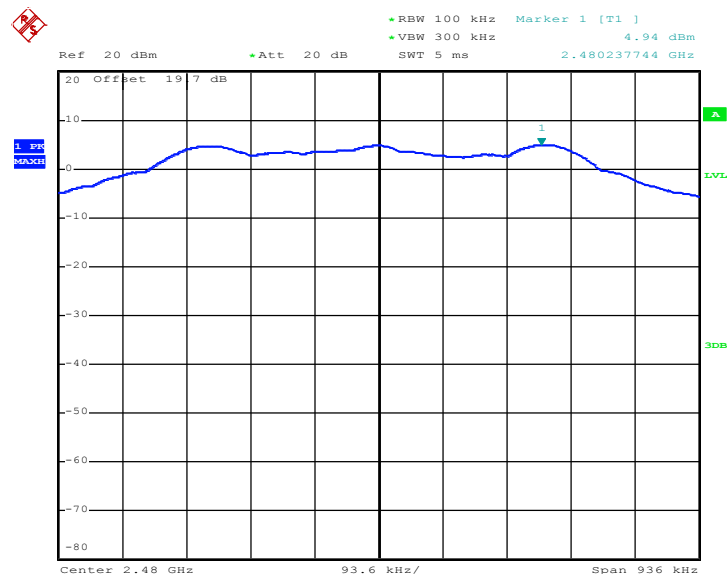
Date: 19.AUG.2012 18:35:43

PSD Plot on Channel 19



Date: 19.AUG.2012 18:48:05

PSD Plot on Channel 39



Date: 19.AUG.2012 18:56:23

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

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

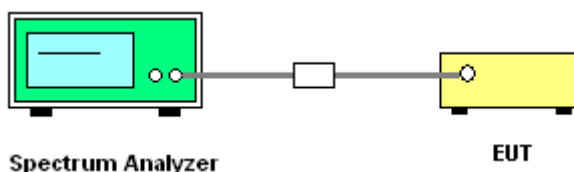
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

1. The testing follows the guidelines in ANSI C63.4-2003 and the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The transmitter output was connected to the spectrum analyzer via a low lose cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, Video bandwidth (VBW) $\geq$ RBW. Out of the authorized frequency band emissions must be at least 20 dB lower than the highest emission level within the authorized band as measured with a 100 KHz RBW. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).

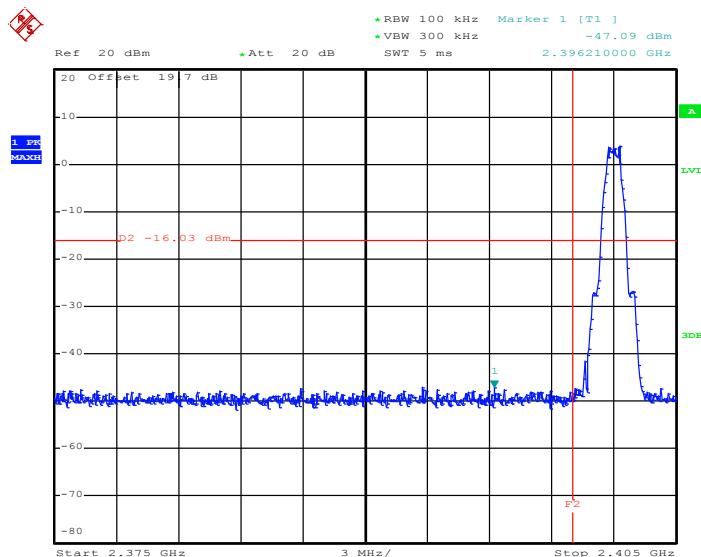
3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges

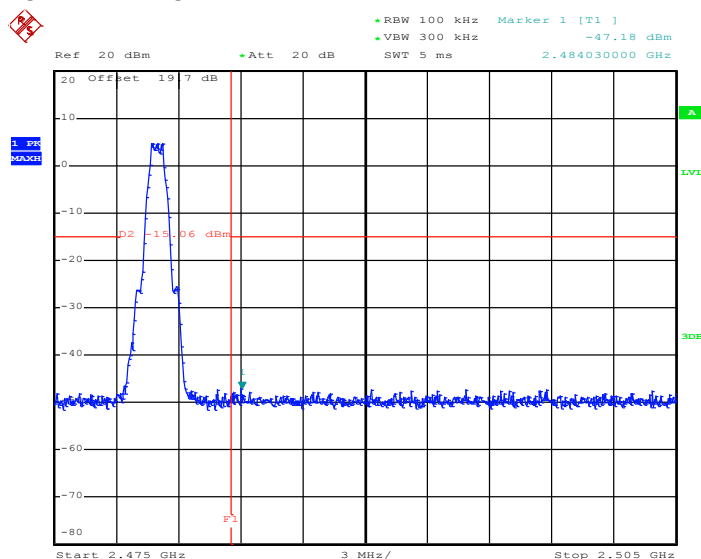
Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Channel :	00 and 39	Relative Humidity :	50~53%
		Test Engineer :	Reece Li

Low Band Edge Plot on Channel 00



Date: 19.AUG.2012 18:36:00

High Band Edge Plot on Channel 39



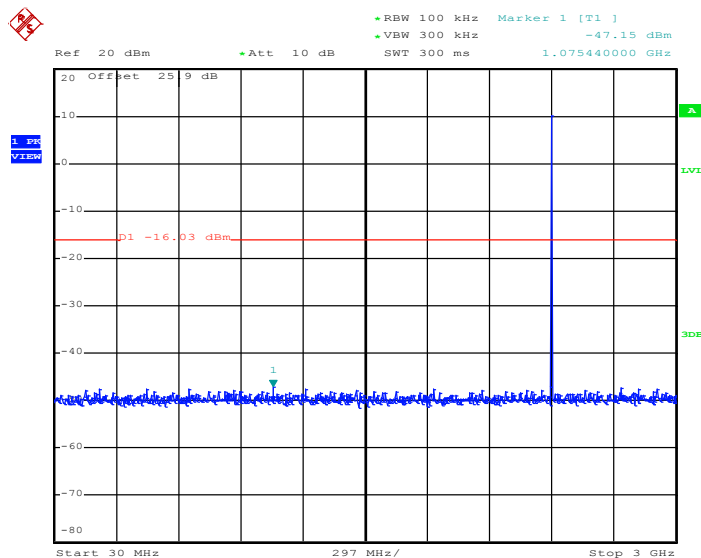
Date: 19.AUG.2012 18:56:44

3.4.6 Test Result of Conducted Spurious Emission

Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26℃
Test Channel :	00	Relative Humidity :	50~53%
		Test Engineer :	Reece Li

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

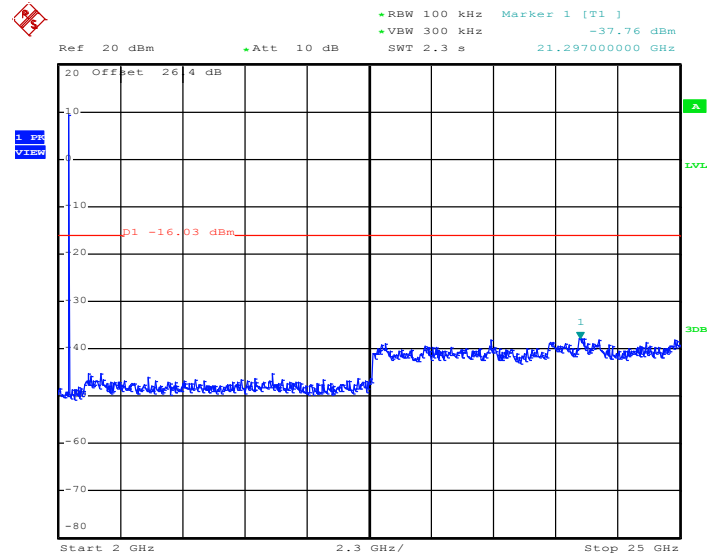
GFSK Channel 00



Date: 19.AUG.2012 18:39:58



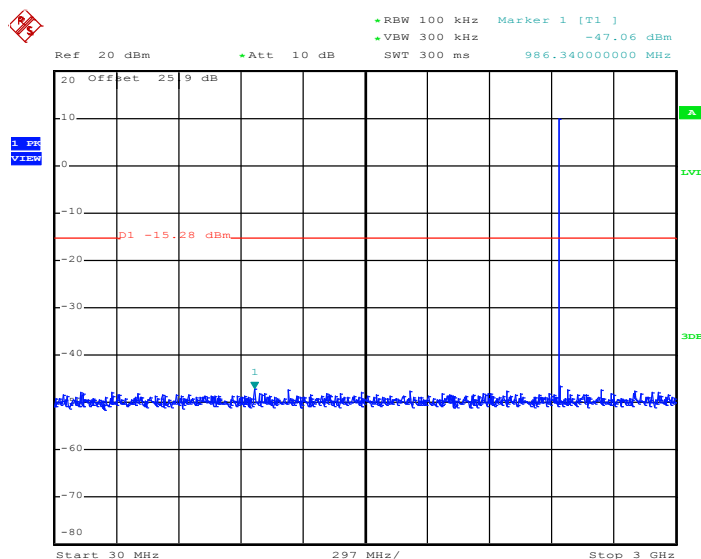
Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 00



Date: 19.AUG.2012 18:40:15

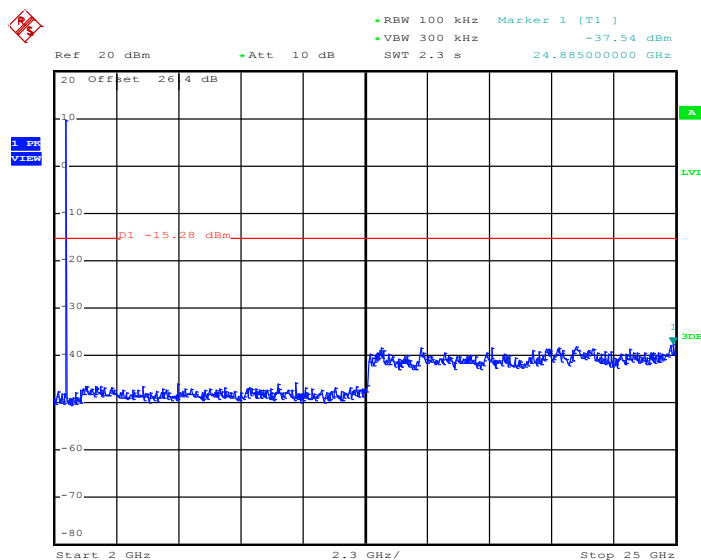
Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26°C
Test Channel :	19	Relative Humidity :	50~53%
		Test Engineer :	Reece Li

**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 19**



Date: 19.AUG.2012 18:48:27

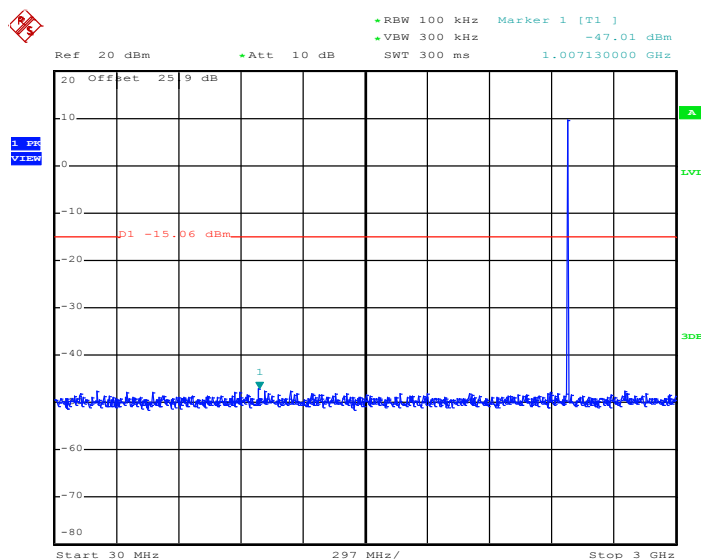
**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 19**



Date: 19.AUG.2012 18:48:45

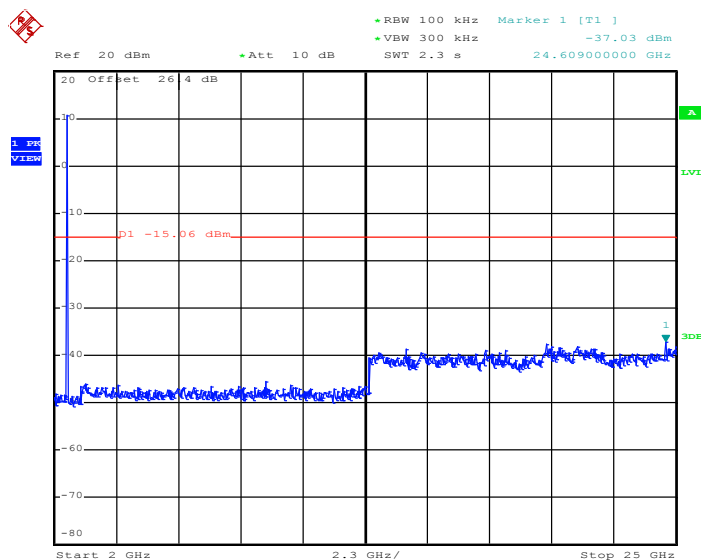
Test Mode :	Bluetooth 4.0 - LE	Temperature :	24~26°C
Test Channel :	39	Relative Humidity :	50~53%
		Test Engineer :	Reece Li

**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 39**



Date: 19.AUG.2012 18:57:07

**Conducted Spurious Emission Plot on Bluetooth LE 1Mbps
GFSK Channel 39**



Date: 19.AUG.2012 18:57:25

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious 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

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows the guidelines in ANSI C63. 10-2009
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 KHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

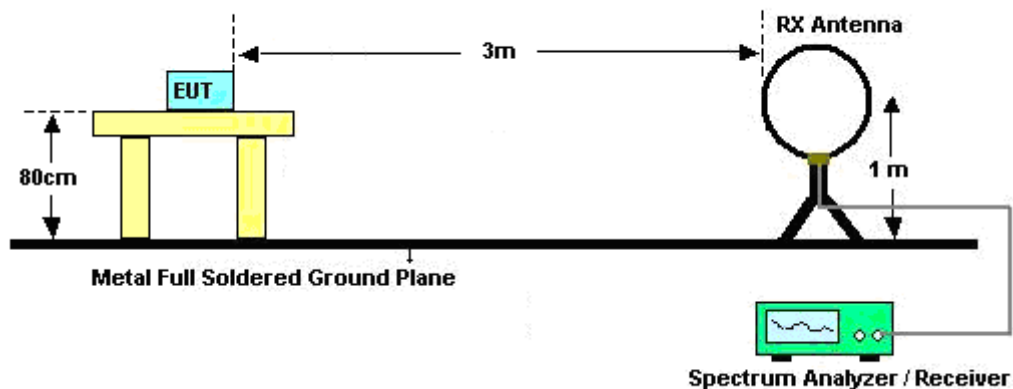
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(us)	1/T(KHz)	VBW Setting
Bluetooth 4.0 - LE	64.97	408.00	2.45	3KHz

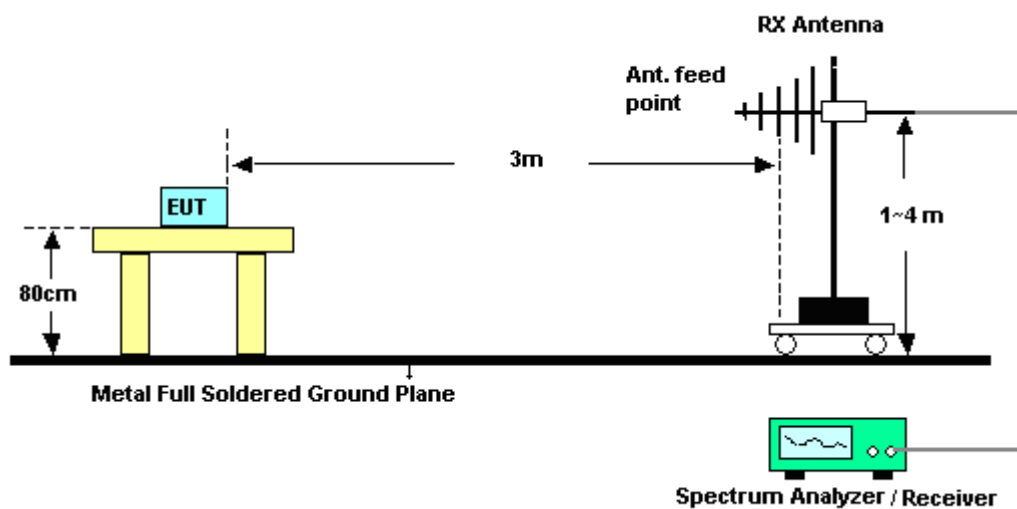
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

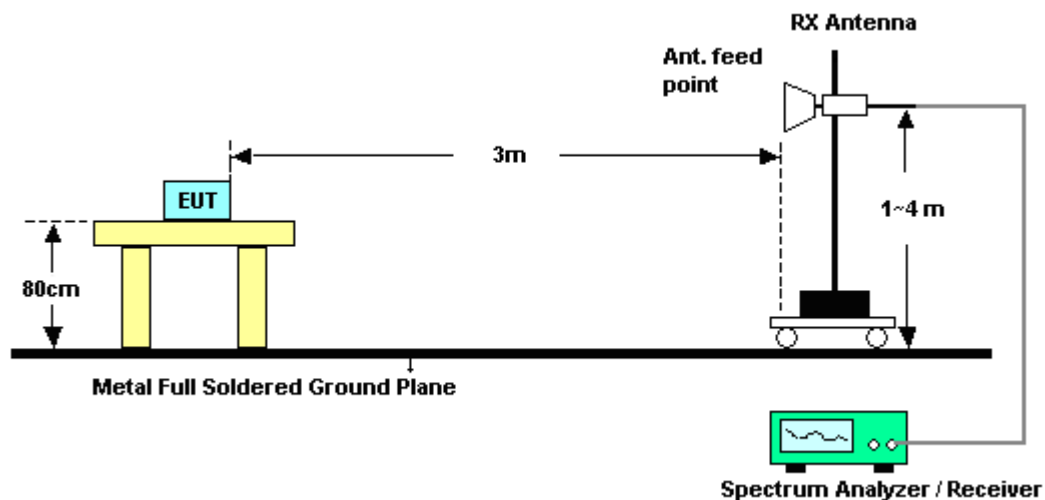
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Band Edges

<Antenna 1>

Test Mode :	Mode 1	Temperature :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
		Test Engineer :	David Ke

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
2381.37	47.88	-26.12	74	47.02	32.16	4.58	35.88	119	18	Peak
2350.05	35.58	-18.42	54	34.81	32.11	4.55	35.89	119	18	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
2350.95	47.18	-26.82	74	46.41	32.11	4.55	35.89	170	248	Peak
2349.69	35.6	-18.4	54	34.83	32.11	4.55	35.89	170	248	Average

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
		Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	56.35	-17.65	74	55.24	32.28	4.64	35.81	200	276	Peak
2483.5	51.6	-2.4	54	50.49	32.28	4.64	35.81	200	276	Average
2483.5	40.94	-33.06	74	-	-	-	-	-	-	Peak
2483.5	39.8	-14.2	54	-	-	-	-	-	-	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBμV/m)	Delta Result (dB)	Measurement Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
Peak	98.11	57.17	40.94	74	-33.06	Pass
Average	96.97	57.17	39.8	54	-14.2	Pass

Note : Measurement result = Maximum field strength – Delta result

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.54	52.79	-21.21	74	51.68	32.28	4.64	35.81	200	272	Peak
2483.5	47.51	-6.49	54	46.4	32.28	4.64	35.81	200	272	Average
2483.54	40.94	-33.06	74	-	-	-	-	-	-	Peak
2483.5	39.87	-14.13	54	-	-	-	-	-	-	Average

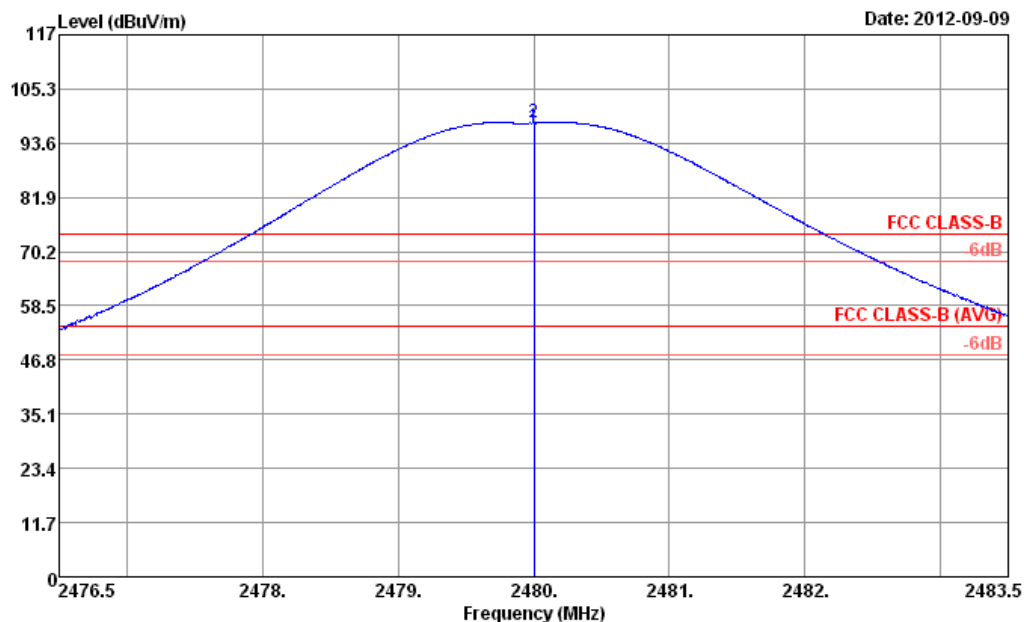
Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBμV/m)	Delta Result (dB)	Measurement Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
Peak	93.84	52.9	40.94	74	-33.06	Pass
Average	92.77	52.9	39.87	54	-14.13	Pass

Note : Measurement result = Maximum field strength – Delta result



Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal



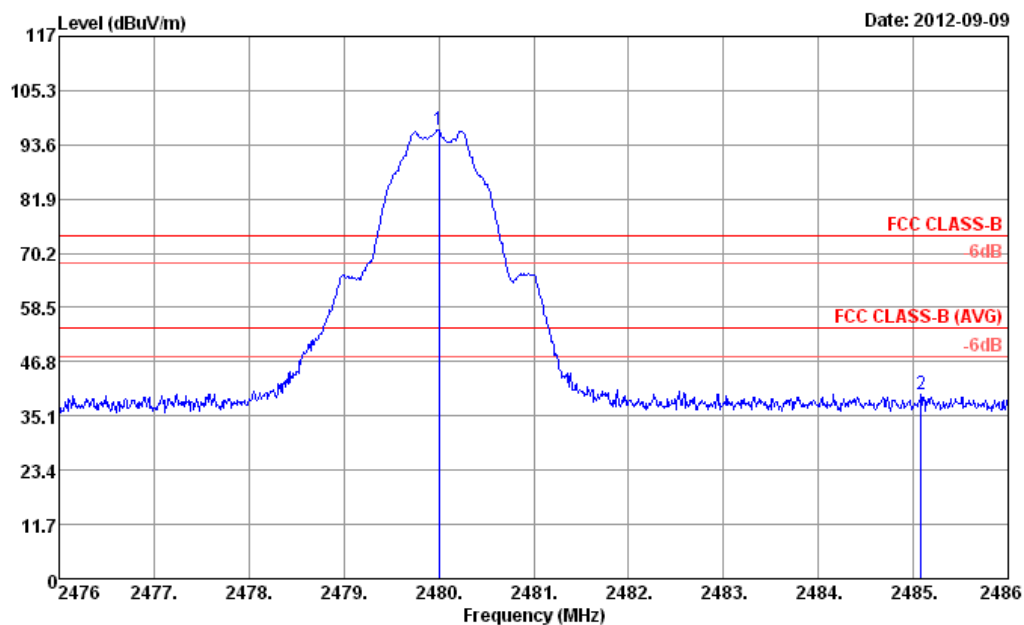
Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 HORIZONTAL
: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

Detector : Peak

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	cm	deg	
1 *	2480.00	96.97	42.97	54.00	95.86	32.28	4.64	35.81	200	276 Average
2 *	2480.00	98.11	24.11	74.00	97.00	32.28	4.64	35.81	200	276 Peak

* Maximum field strength of the fundamental emission

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal



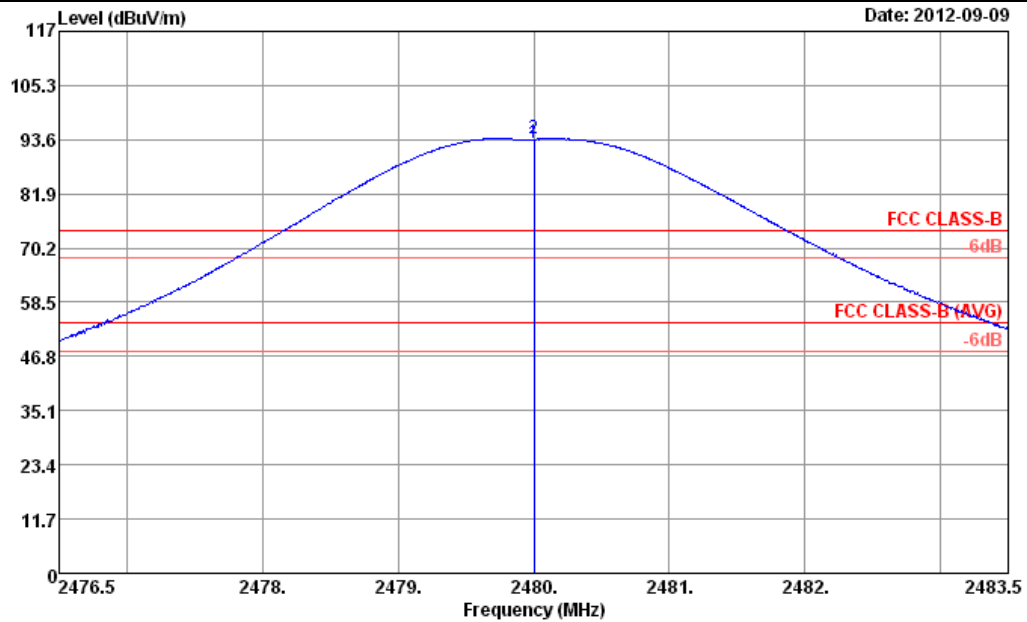
Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 HORIZONTAL
: RBW:100.000KHz VBW:100.000KHz SWT:Auto

Detector : Peak

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 *	2480.00	96.91	22.91	74.00	95.80	32.28	4.64	35.81	200	276	Peak
2	2485.08	39.74	-34.26	74.00	38.63	32.28	4.64	35.81	200	276	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 57.17 dB , single carrier Mode

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 VERTICAL
: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

Detector		: Peak										
		Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	*	2480.00	92.77	38.77	54.00	91.66	32.28	4.64	35.81	200	272	Average
2	*	2480.00	93.84	19.84	74.00	92.73	32.28	4.64	35.81	200	272	Peak

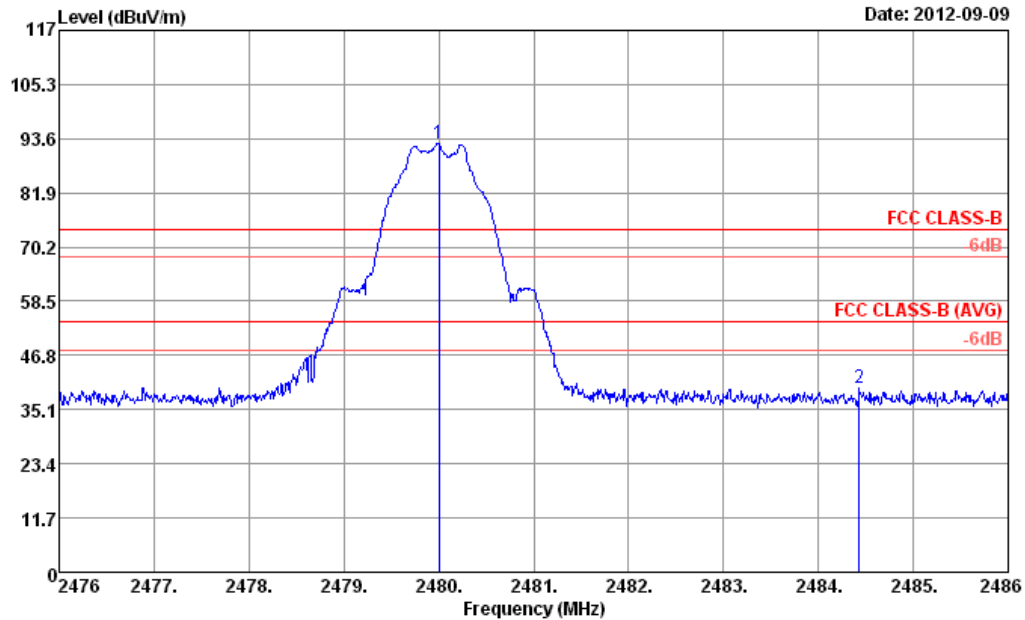
* Maximum field strength of the fundamental emission



FCC RF Test Report

Report No. : FR271030B

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 VERTICAL
: RBW:100.000kHz VBW:100.000kHz SWT:Auto

Detector : Peak

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss Factor	Preamp Loss Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 *	2480.00	92.59	18.59	74.00	91.48	32.28	4.64	35.81	200	272 Peak
2	2484.43	39.69	-34.31	74.00	38.58	32.28	4.64	35.81	200	272 Peak

* Marker-Delta Method (RBW/VBW=100KHz): 52.90 dB , single carrier Mode

<Antenna 2>

Test Mode :	Mode 1	Temperature :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
		Test Engineer :	David Ke

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
2326.83	48.46	-25.54	74	47.74	32.09	4.53	35.9	178	333	Peak
2323.77	35.64	-18.36	54	34.92	32.09	4.53	35.9	178	333	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
2341.95	47.67	-26.33	74	46.9	32.11	4.55	35.89	114	236	Peak
2389.74	35.66	-18.34	54	34.78	32.18	4.58	35.88	114	236	Average

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
		Test Engineer :	David Ke

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	62.15	-11.85	74	61.04	32.28	4.64	35.81	113	331	Peak
2483.5	58.35	4.35	54	57.24	32.28	4.64	35.81	113	331	Average
2483.5	41.31	-32.69	74	-	-	-	-	-	-	Peak
2483.5	40.23	-13.77	54	-	-	-	-	-	-	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBμV/m)	Delta Result (dB)	Measurement Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
Peak	104.62	63.31	41.31	74	-32.69	Pass
Average	103.54	63.31	40.23	54	-13.77	Pass

Note : Measurement result = Maximum field strength – Delta result

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.52	56.97	-17.03	74	55.86	32.28	4.64	35.81	200	250	Peak
2483.5	52.6	-1.4	54	51.49	32.28	4.64	35.81	200	250	Average
2483.52	42.30	-31.70	74	-	-	-	-	-	-	Peak
2483.5	41.21	-12.79	54	-	-	-	-	-	-	Average

Summary results of marker-delta method:

Test mode	Maximum field strength of the fundamental emission (dBμV/m)	Delta Result (dB)	Measurement Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
Peak	99.96	57.66	42.30	74	-31.70	Pass
Average	98.87	57.66	41.21	54	-12.79	Pass

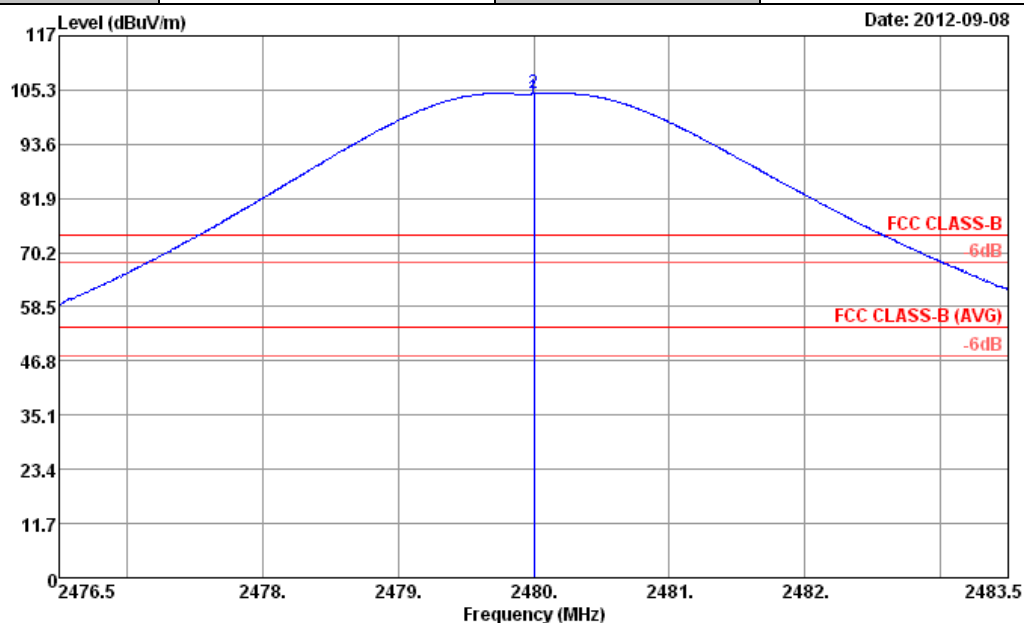
Note : Measurement result = Maximum field strength – Delta result



FCC RF Test Report

Report No. : FR271030B

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 HORIZONTAL
: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

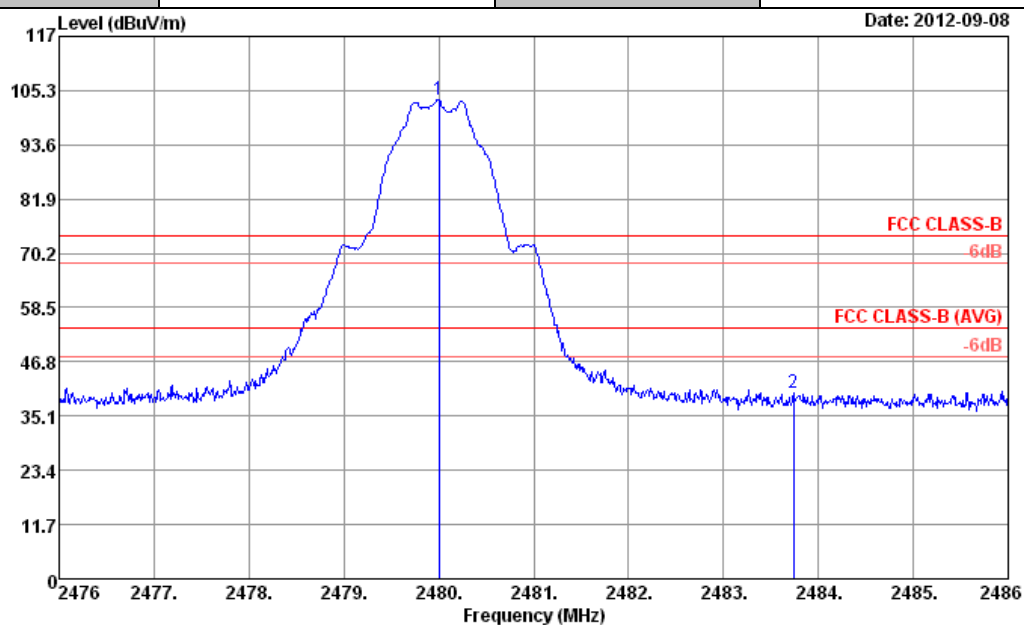
Detector : Peak

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 *	2480.00	103.54	49.54	54.00	102.43	32.28	4.64	35.81	113	331 Average
2 *	2480.00	104.62	30.62	74.00	103.51	32.28	4.64	35.81	113	331 Peak

* Maximum field strength of the fundamental emission



Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 HORIZONTAL
: RBW:100.000kHz VBW:100.000kHz SWT:Auto

Detector : Peak

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss Factor	Preamp Loss Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 *	2480.00	103.39	29.39	74.00	102.28	32.28	4.64	35.81	113	331 Peak
2	2483.74	40.08	-33.92	74.00	38.97	32.28	4.64	35.81	113	331 Peak

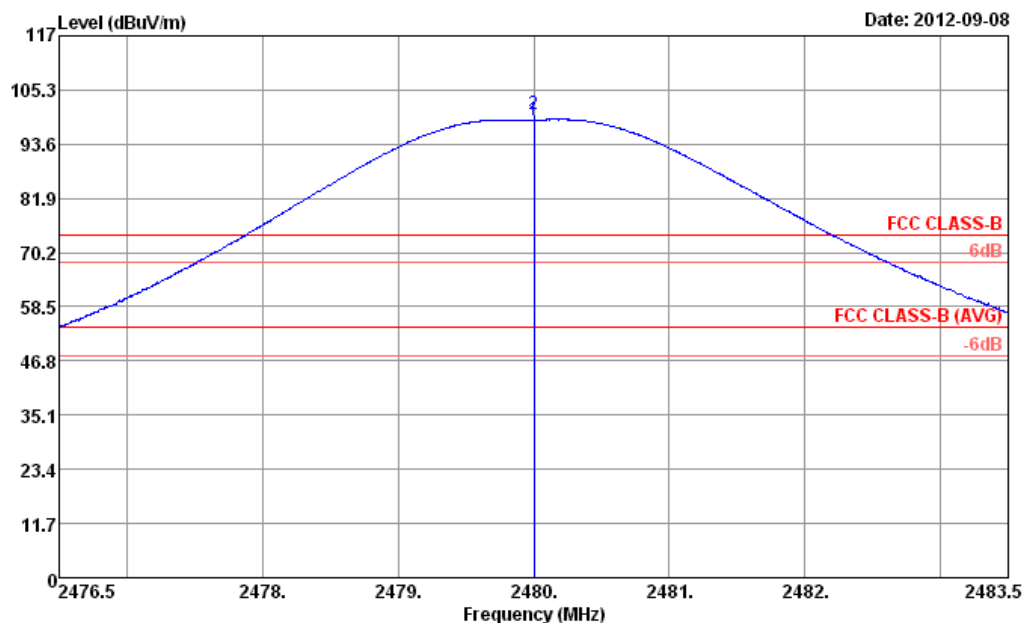
* Marker-Delta Method (RBW/VBW=100KHz): 63.31 dB , single carrier Mode



FCC RF Test Report

Report No. : FR271030B

Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 VERTICAL
RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

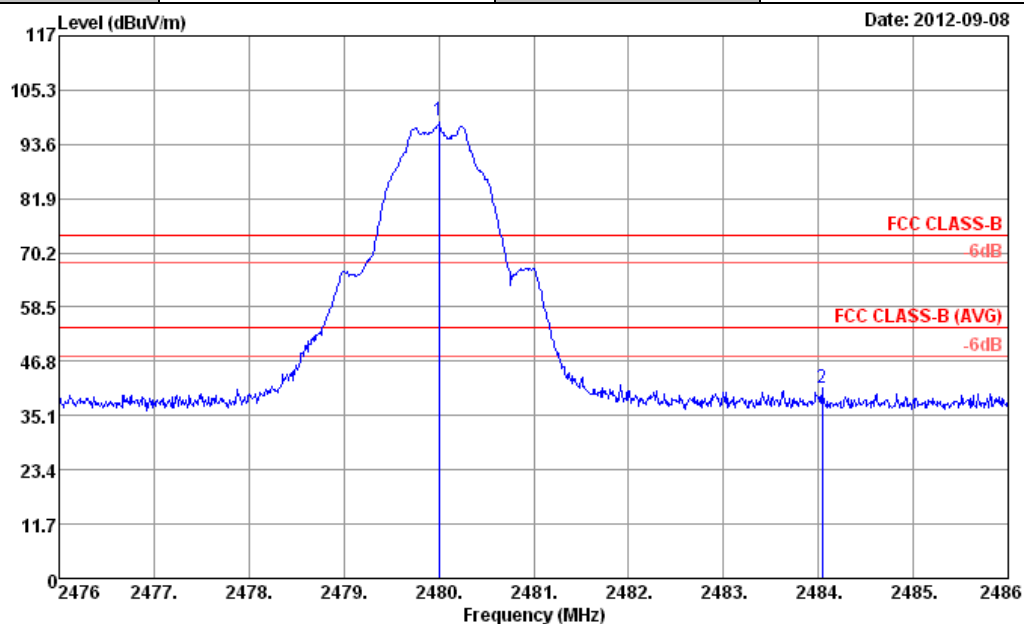
Detector : Peak

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 *	2480.00	98.87	44.87	54.00	97.76	32.28	4.64	35.81	200	250 Average
2 *	2480.00	99.96	25.96	74.00	98.85	32.28	4.64	35.81	200	250 Peak

* Maximum field strength of the fundamental emission



Test Mode :	Mode 3	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical



Site : 03CH05-HY
Condition : FCC CLASS-B 3m HF_ANT_584_20120809 VERTICAL
: RBW:100.000KHz VBW:100.000KHz SWT:Auto

Detector	: Peak										
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 *	2480.00	98.69	24.69	74.00	97.58	32.28	4.64	35.81	200	250	Peak
2	2484.04	41.03	-32.97	74.00	39.92	32.28	4.64	35.81	200	250	Peak

* Marker-Delta Method (RBW/VBW=100KHz): 57.66 dB , single carrier Mode

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

<Antenna 1>

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2402	96.22	-	-	95.32	32.18	4.58	35.86	119	18	Average
2402	97.23	-	-	96.33	32.18	4.58	35.86	119	18	Peak
4806	45.77	-28.23	74	64.06	34.26	6.51	59.06	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2402	91.75	-	-	90.85	32.18	4.58	35.86	170	248	Average
2402	92.83	-	-	91.93	32.18	4.58	35.86	170	248	Peak
4804	43.79	-30.21	74	62.09	34.26	6.5	59.06	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	19	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2440	96.25	-	-	95.24	32.24	4.61	35.84	200	275	Average
2440	97.29	-	-	96.28	32.24	4.61	35.84	200	275	Peak
4880	45.51	-28.49	74	63.57	34.28	6.54	58.88	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	19	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2440	92.04	-	-	91.03	32.24	4.61	35.84	175	276	Average
2440	93.07	-	-	92.06	32.24	4.61	35.84	175	276	Peak
4880	44.84	-29.16	74	62.9	34.28	6.54	58.88	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
93.45	32.94	-10.56	43.5	54.28	9	1.08	31.42	-	-	Peak
138	36.55	-6.95	43.5	55.23	11.34	1.26	31.28	-	-	Peak
253.29	35.06	-10.94	46	51.33	12.99	1.67	30.93	-	-	Peak
332.9	35.18	-10.82	46	50.5	13.88	1.86	31.06	-	-	Peak
396.6	39.19	-6.81	46	52.51	15.85	2	31.17	112	84	Peak
479.9	35.02	-10.98	46	45.83	17.7	2.19	30.7	-	-	Peak
2480	96.98	-	-	95.87	32.28	4.64	35.81	200	276	Average
2480	98.05	-	-	96.94	32.28	4.64	35.81	200	276	Peak
4962	44.63	-29.37	74	62.42	34.29	6.57	58.65	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
67.8	27.78	-12.22	40	52.27	6.14	0.9	31.53	-	-	Peak
143.94	32.76	-10.74	43.5	51.58	11.17	1.27	31.26	100	178	Peak
225.75	28.73	-17.27	46	48.26	9.84	1.56	30.93	-	-	Peak
365.1	31.02	-14.98	46	45.4	14.74	1.93	31.05	-	-	Peak
468	30.21	-15.79	46	41.37	17.56	2.17	30.89	-	-	Peak
746.6	29.97	-16.03	46	35.05	22.37	2.74	30.19	-	-	Peak
2480	92.77	-	-	91.66	32.28	4.64	35.81	200	272	Average
2480	93.85	-	-	92.74	32.28	4.64	35.81	200	272	Peak
4962	43.62	-30.38	74	61.41	34.29	6.57	58.65	100	0	Peak

<Antenna 2>

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2402	103.19	-	-	102.29	32.18	4.58	35.86	178	333	Average
2402	104.27	-	-	103.37	32.18	4.58	35.86	178	333	Peak
4803	40.45	-33.55	74	93.01	0	6.5	59.06	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	00	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2402 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2402	98.53	-	-	97.63	32.18	4.58	35.86	114	236	Average
2402	99.54	-	-	98.64	32.18	4.58	35.86	114	236	Peak
4803	40.49	-33.51	74	93.05	0	6.5	59.06	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	19	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2440	104.27	-	-	103.44	32.06	4.61	35.84	118	332	Average
2440	105.65	-	-	104.82	32.06	4.61	35.84	118	332	Peak
4881	41.27	-32.73	74	93.61	0	6.54	58.88	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	19	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2440 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2440	100.64	-	-	99.81	32.06	4.61	35.84	140	212	Average
2440	101.46	-	-	100.63	32.06	4.61	35.84	140	212	Peak
4881	40.29	-33.71	74	92.63	0	6.54	58.88	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Horizontal
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
32.97	32.39	-7.61	40	45.54	17.76	0.72	31.63	-	-	Peak
133.14	36.88	-6.62	43.5	55.55	11.4	1.24	31.31	131	174	Peak
143.94	35.92	-7.58	43.5	54.74	11.17	1.27	31.26	-	-	Peak
332.9	35.54	-10.46	46	50.86	13.88	1.86	31.06	-	-	Peak
382.6	37.58	-8.42	46	51.35	15.29	1.97	31.03	-	-	Peak
797	28.96	-17.04	46	33.92	22.04	2.83	29.83	-	-	Peak
2480	103.54	-	-	102.43	32.28	4.64	35.81	113	331	Average
2480	104.57	-	-	103.46	32.28	4.64	35.81	113	331	Peak
4960	44.96	-29.04	74	63.23	33.81	6.57	58.65	100	0	Peak

Test Mode :	1Mbps	Temperature :	20~22°C
Test Channel :	39	Relative Humidity :	40~42%
Test Engineer :	David Ke	Polarization :	Vertical
Remark :	1. 2480 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
68.88	28.67	-11.33	40	53.07	6.22	0.9	31.52	100	342	Peak
143.94	30.84	-12.66	43.5	49.66	11.17	1.27	31.26	-	-	Peak
156.09	29.36	-14.14	43.5	48.45	10.82	1.32	31.23	-	-	Peak
332.9	27.74	-18.26	46	43.06	13.88	1.86	31.06	-	-	Peak
456.1	34.08	-11.92	46	45.6	17.32	2.15	30.99	-	-	Peak
749.4	29.85	-16.15	46	34.89	22.4	2.75	30.19	-	-	Peak
2480	98.88	-	-	97.77	32.28	4.64	35.81	200	250	Average
2480	99.95	-	-	98.84	32.28	4.64	35.81	200	250	Peak
4962	41.69	-32.31	74	93.77	0	6.57	58.65	100	0	Peak

3.6 AC Conducted Emission Measurement

3.6.1 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.

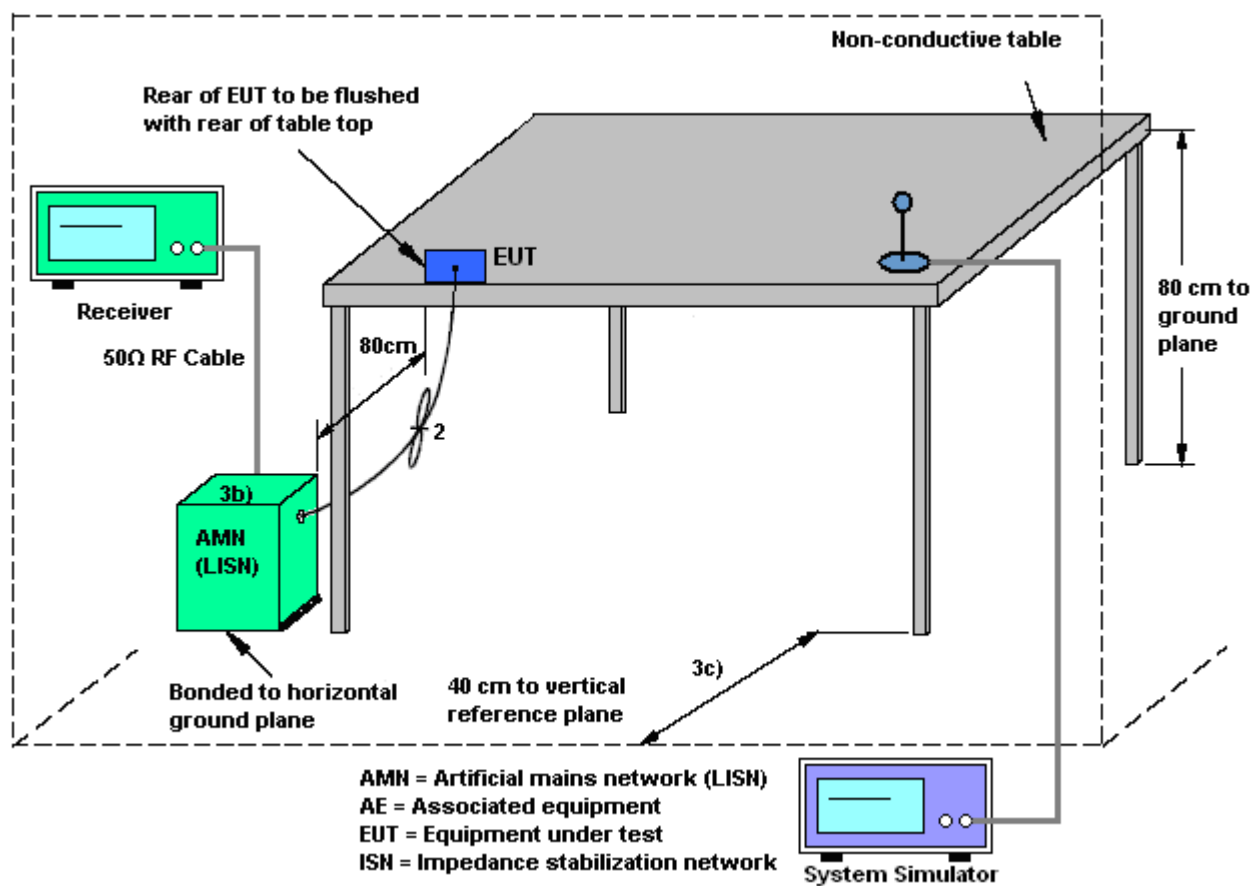
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

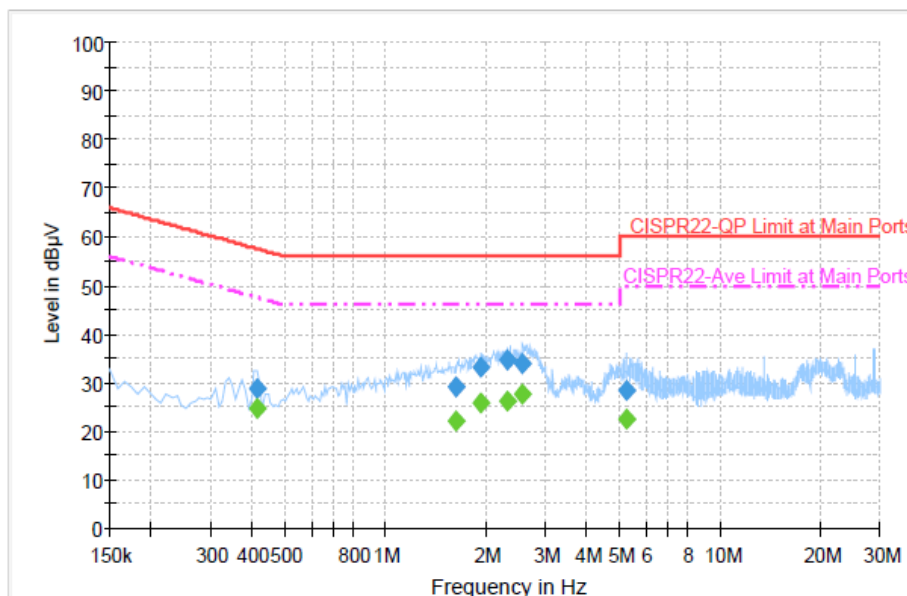
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All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

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (2.4G) Link		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



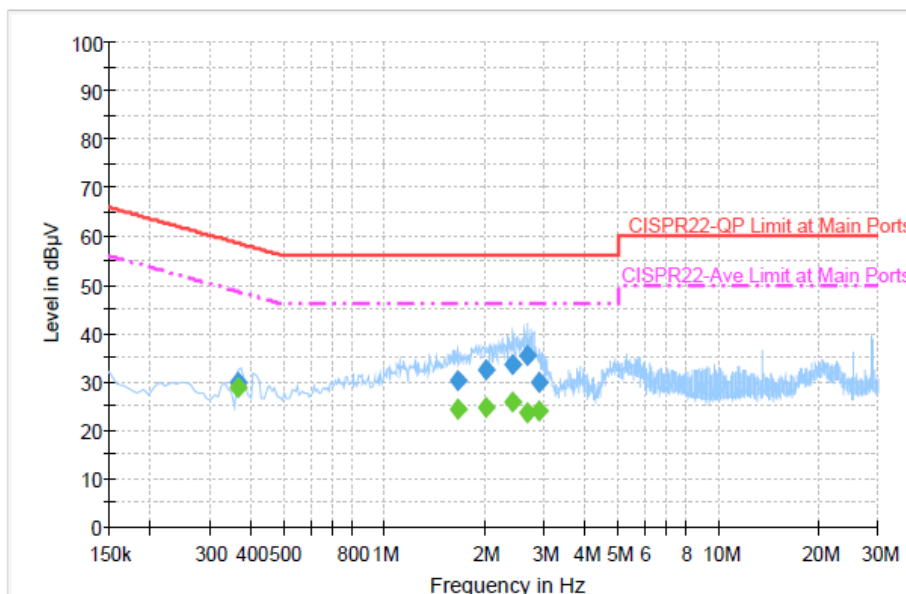
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.414000	28.7	Off	L1	19.4	28.9	57.6
1.622000	29.2	Off	L1	19.4	26.8	56.0
1.926000	33.4	Off	L1	19.5	22.6	56.0
2.302000	34.6	Off	L1	19.5	21.4	56.0
2.574000	34.0	Off	L1	19.6	22.0	56.0
5.262000	28.4	Off	L1	19.6	31.6	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.414000	24.6	Off	L1	19.4	23.0	47.6
1.622000	22.0	Off	L1	19.4	24.0	46.0
1.926000	25.8	Off	L1	19.5	20.2	46.0
2.302000	26.4	Off	L1	19.5	19.6	46.0
2.574000	27.6	Off	L1	19.6	18.4	46.0
5.262000	22.7	Off	L1	19.6	27.3	50.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (2.4G) Link		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.366000	29.8	Off	N	19.4	28.8	58.6
1.662000	30.3	Off	N	19.5	25.7	56.0
2.014000	32.5	Off	N	19.5	23.5	56.0
2.430000	33.4	Off	N	19.6	22.6	56.0
2.694000	35.5	Off	N	19.6	20.5	56.0
2.910000	30.0	Off	N	19.7	26.0	56.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.366000	28.6	Off	N	19.4	20.0	48.6
1.662000	24.3	Off	N	19.5	21.7	46.0
2.014000	24.7	Off	N	19.5	21.3	46.0
2.430000	25.8	Off	N	19.6	20.2	46.0
2.694000	23.7	Off	N	19.6	22.3	46.0
2.910000	24.1	Off	N	19.7	21.9	46.0

3.7 Antenna Requirements

3.7.1 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.

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 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	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Jul. 31, 2012~ Aug. 19, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	Jul. 27, 2012~ Sep. 11, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 2GHz	Oct. 22, 2011	Jul. 27, 2012~ Sep. 11, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	Jul. 27, 2012~ Sep. 11, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	Jul. 27, 2012~ Sep. 11, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz ~ 18GHz	Aug. 04, 2011	Jul. 27, 2012~ Aug. 03, 2012	Aug. 03, 2012	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz~18GHz	Aug. 10, 2012	Aug. 10, 2012~ Sep. 11, 2012	Aug. 09, 2013	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103A	161075	10Hz ~ 1000MHz Gain:32dB	Feb. 27, 2012	Jul. 27, 2012~ Sep. 11, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	Jul. 27, 2012~ Sep. 11, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A019 17	1GHz~26.5GHz	Aug. 30, 2011	Jul. 27, 2012~ Sep. 11, 2012	Aug. 29, 2012	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 251	15GHz ~ 40GHz	Oct. 21, 2011	Jul. 27, 2012~ Sep. 11, 2012	Oct. 20, 2012	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	100315	9KHz ~ 30MHz	May 14, 2012	Jul. 27, 2012~ Sep. 11, 2012	May 13, 2013	Radiation (03CH05-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Aug. 20, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Aug. 20, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Aug. 20, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Aug. 20, 2012	N/A	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.26
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP271030 as below.