

FCC RF Test Report

APPLICANT : Cheng Uei Precision Industry Co., Ltd.
EQUIPMENT : Mobile phone
BRAND NAME : Foxlink
MODEL NAME : QB57L25
FCC ID : QVZ-QB57
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Jun. 15, 2011 and completely tested on Aug. 08, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown 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
FR161534B	Rev. 01	Initial issue of report	Aug. 11, 2011

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	-
3.2	15.247(b)	A8.4	Power Output	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 6.9 dB at 0.41 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.07 dB at 2494 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Cheng Uei Precision Industry Co., Ltd.

No. 49, Sec. 4, Zhongyang Rd., Tucheng Dist., New Taipei City 23675, Taiwan (R.O.C.)

1.2 Manufacturer

Cheng Uei Precision Industry Co., Ltd.

No. 49, Sec. 4, Zhongyang Rd., Tucheng Dist., New Taipei City 23675, Taiwan (R.O.C.)

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mobile phone
Brand Name	Foxlink
Model Name	QB57L25
FCC ID	QVZ-QB57
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	$2412+(n-1)*5$ MHz; $n=1\sim11$
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 14.50 dBm (0.0282 W) 802.11g : 22.04 dBm (0.1600 W)
Antenna Type	Chip Antenna with gain 2.61 dBi
HW Version	QB57L25-0B
SW Version	QB57L25.00.00.B25.13.08
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

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 Transmission System (DTS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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.
	CO05-HY	03CH07-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 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 8

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.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Power

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

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	14.50	14.45	14.38	14.47
CH 06	2437 MHz	13.79	-	-	-
CH 11	2462 MHz	13.21	-	-	-

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	22.04	21.81	21.46	21.27	21.26	21.35	21.27	21.60
CH 06	2437 MHz	21.90	-	-	-	-	-	-	-
CH 11	2462 MHz	20.83	-	-	-	-	-	-	-

Remark:

1. The data rates of WLAN 802.11b/g were set in 1Mbps for 802.11b and 6Mbps for 802.11g, for all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.
3. Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.

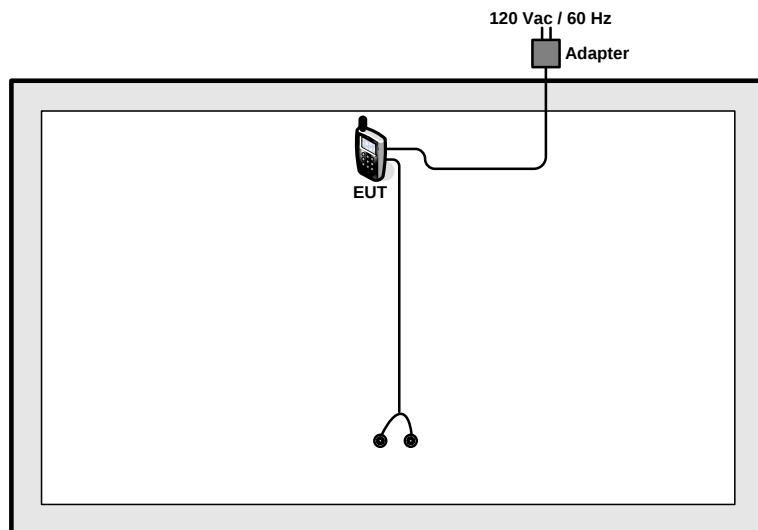
2.2 Test Mode

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: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz 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.

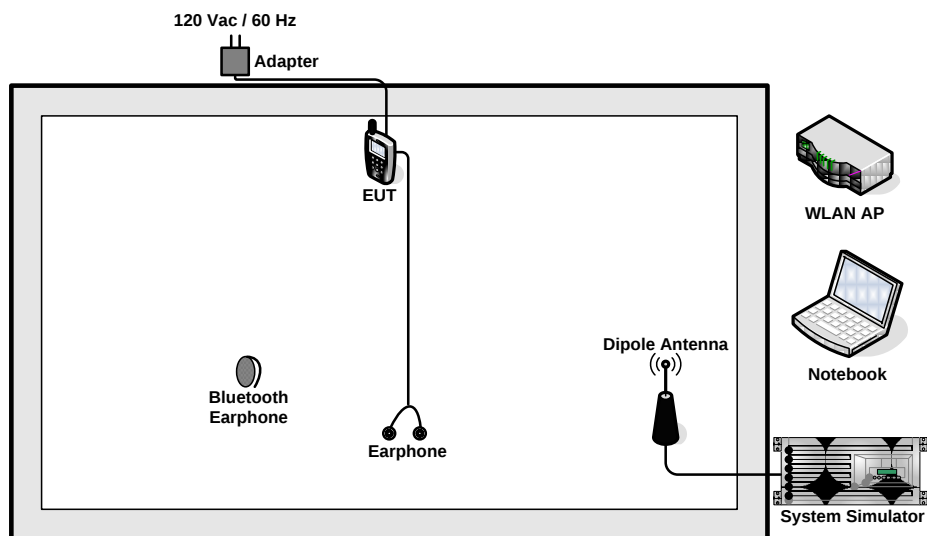
Test Cases		
Test Item	802.11b	802.11g
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g CH01_2412 MHz
	Mode 2 : 802.11b CH06_2437 MHz	Mode 5 : 802.11g CH06_2437 MHz
	Mode 3 : 802.11b CH11_2462 MHz	Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g CH01_2412 MHz
	Mode 2 : 802.11b CH06_2437 MHz	Mode 5 : 802.11g CH06_2437 MHz
	Mode 3 : 802.11b CH11_2462 MHz	Mode 6 : 802.11g CH11_2462 MHz
AC Conducted Emission	Mode 1 : GSM850 Idle + WLAN Link + Bluetooth Link + Earphone + MPEG4 + Adapter	

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>





2.4 RF Utility

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

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

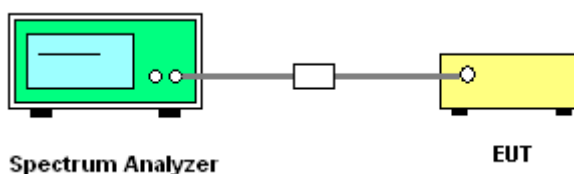
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz.
In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

3.1.4 Test Setup

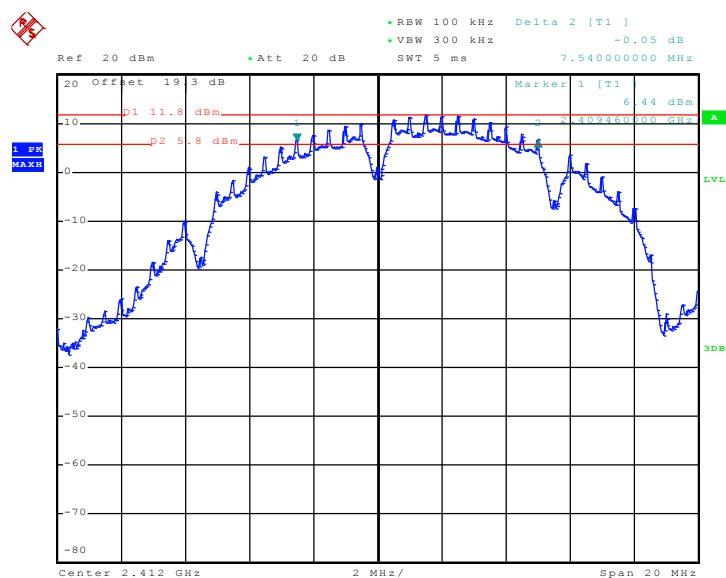


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	7.54	0.5	Pass
06	2437	7.56	0.5	Pass
11	2462	7.56	0.5	Pass

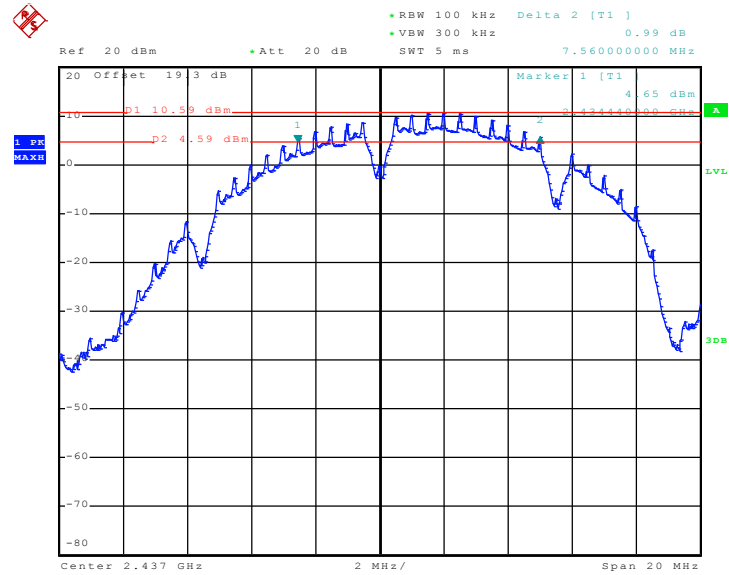
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 5.AUG.2011 18:31:25

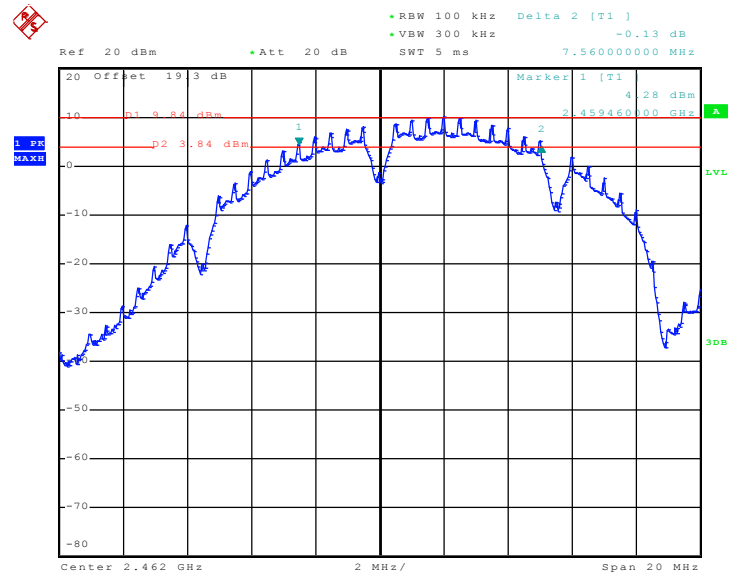


Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 8.AUG.2011 08:30:42

Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11



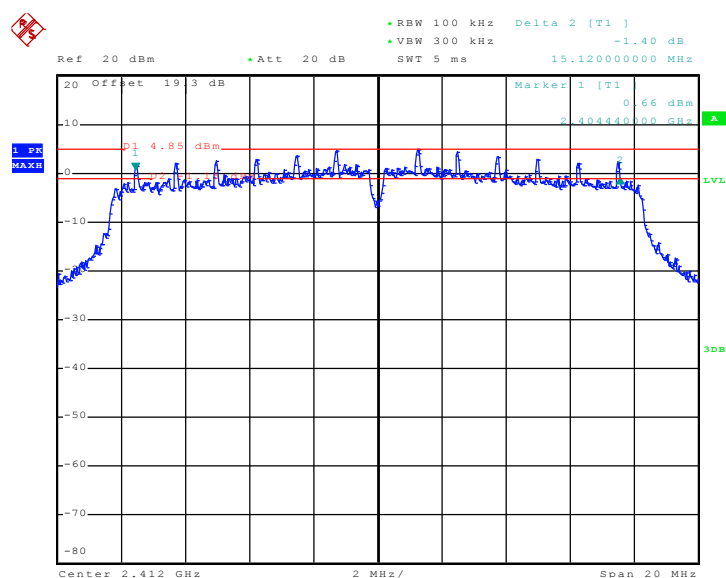
Date: 8.AUG.2011 08:46:27



Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.12	0.5	Pass
06	2437	15.12	0.5	Pass
11	2462	15.28	0.5	Pass

Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 8.AUG.2011 09:10:51



• RBW 100 kHz Delta 2 [T1]
 • VBW 300 kHz -0.84 dB
 Ref 20 dBm • Att 20 dB SWT 5 ms 15.12000000 MHz

20 Off set 19.3 dB
 Marker 1 [T1] -0.40 dBm
 2.42944000 GHz

1.99
 MAXM

01 3.94 dBm
 02 3.94 dBm

20
 -10
 -20
 -30
 -40
 -50
 -60
 -70
 -80

2.425 2.430 2.435 2.440 2.445 GHz

Center 2.437 GHz 2 MHz / Span 20 MHz

Date: 8.AUG.2011 09:40:16

• RBW 100 kHz Delta 2 [T1]
 • VSW 300 kHz -1.40 dB
 Ref 20 dBm Att 20 dB SWT 5 ms 15.280000000 MHz

20 Offset 19 3 dB
 Marker 1 (T1)
 -1.46 dBm
 2.454440000 GHz

1.9%
 MAX

p1 3.07 dBm
 p2 -2.91 dBm

Center 2.462 GHz 2 MHz/
 Span 20 MHz

Date: 8.AUG.2011 09:24:51

3.2 Output Power Measurement

3.2.1 Limit of 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.

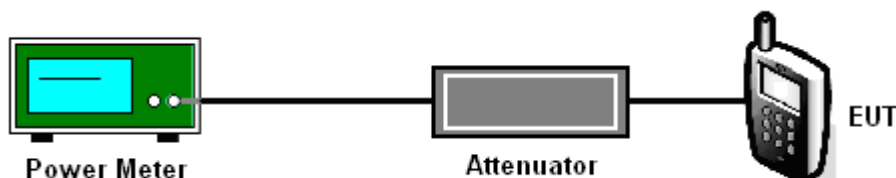
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the power meter by a low loss cable. Measure the power by power meter.

3.2.4 Test Setup



3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	14.50	30	Pass
06	2437	13.79	30	Pass
11	2462	13.21	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.04	30	Pass
06	2437	21.90	30	Pass
11	2462	20.83	30	Pass

3.3 Band Edges Measurement

3.3.1 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. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

3.3.2 Measuring Instruments

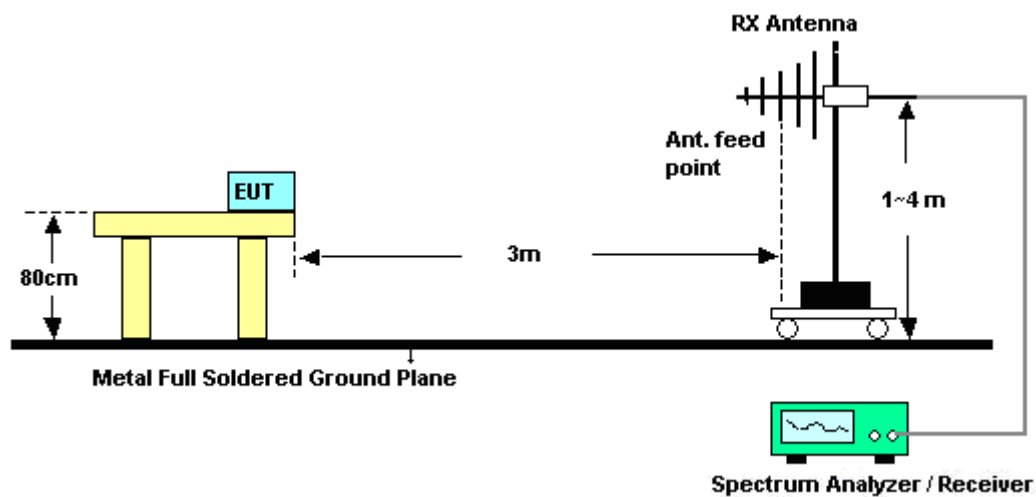
See list of measuring instruments of this test report.

3.3.3 Test Procedures

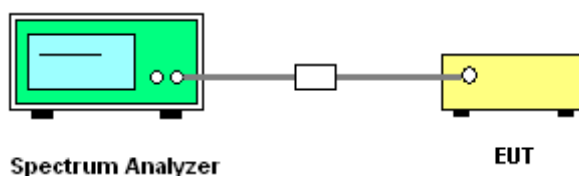
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized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

3.3.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	25~26℃
Test Band :	802.11b	Relative Humidity :	50~51%
Test Channel :	01	Test Engineer :	Ivan Chiang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.09	57.33	-16.67	74	52.97	32.18	6.03	33.85	131	0	Peak
2388.09	50.7	-3.3	54	46.34	32.18	6.03	33.85	131	0	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
2332.61	47.32	-6.68	54	43.11	32.09	5.95	33.83	101	84	Average
2332.61	54.64	-19.36	74	50.43	32.09	5.95	33.83	101	84	Peak

Test Mode :	Mode 3	Temperature :	25~26℃
Test Band :	802.11b	Relative Humidity :	50~51%
Test Channel :	11	Test Engineer :	Ivan Chiang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.18	58.46	-15.54	74	53.9	32.28	6.18	33.9	100	5	Peak
2485.18	47.88	-6.12	54	43.32	32.28	6.18	33.9	100	5	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
2483.5	52.98	-21.02	74	48.42	32.28	6.18	33.9	101	95	Peak
2483.5	43.15	-10.85	54	38.59	32.28	6.18	33.9	101	95	Average

Test Mode :	Mode 4	Temperature :	25~26°C
Test Band :	802.11g	Relative Humidity :	50~51%
Test Channel :	01	Test Engineer :	Ivan Chiang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.61	72.85	-1.15	74	68.49	32.18	6.03	33.85	107	22	Peak
2389.61	52.47	-1.53	54	48.11	32.18	6.03	33.85	107	22	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	70.35	-3.65	74	65.99	32.18	6.03	33.85	100	100	Peak
2389.42	48.16	-5.84	54	43.8	32.18	6.03	33.85	100	100	Average

Test Mode :	Mode 6	Temperature :	25~26°C
Test Band :	802.11g	Relative Humidity :	50~51%
Test Channel :	11	Test Engineer :	Ivan Chiang

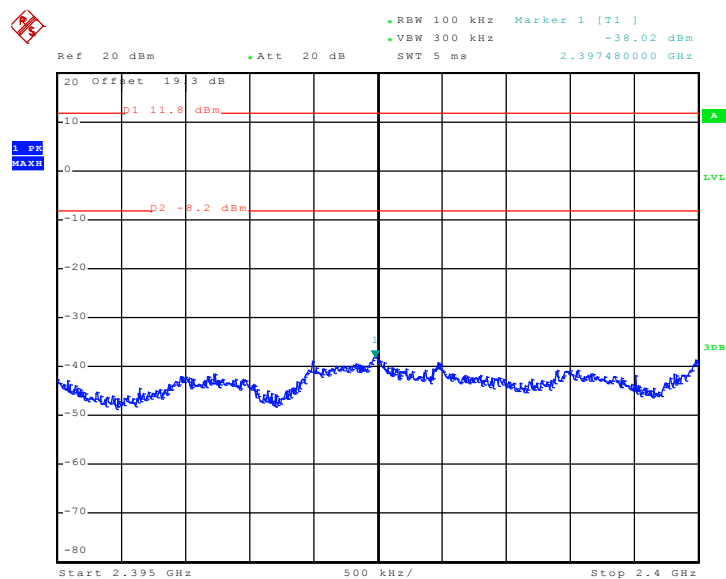
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	69.67	-4.33	74	65.11	32.28	6.18	33.9	103	22	Peak
2483.5	49.91	-4.09	54	45.35	32.28	6.18	33.9	103	22	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
2483.5	67.57	-6.43	74	63.01	32.28	6.18	33.9	101	93	Peak
2483.5	45.4	-8.6	54	40.84	32.28	6.18	33.9	101	93	Average

3.3.6 Test Plots of Conducted Band Edges

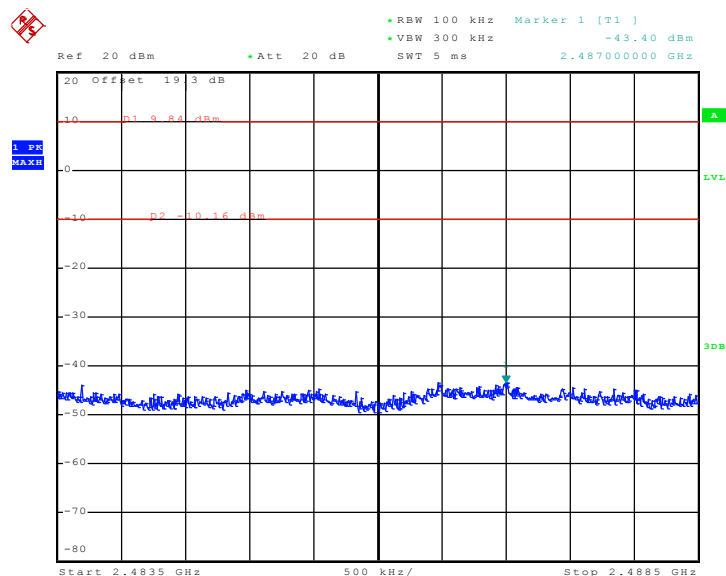
Test Mode :	Mode 1 and 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Pinkston Tu

Low Band Edge Plot on 802.11b Channel 01



Date: 5.AUG.2011 18:32:46

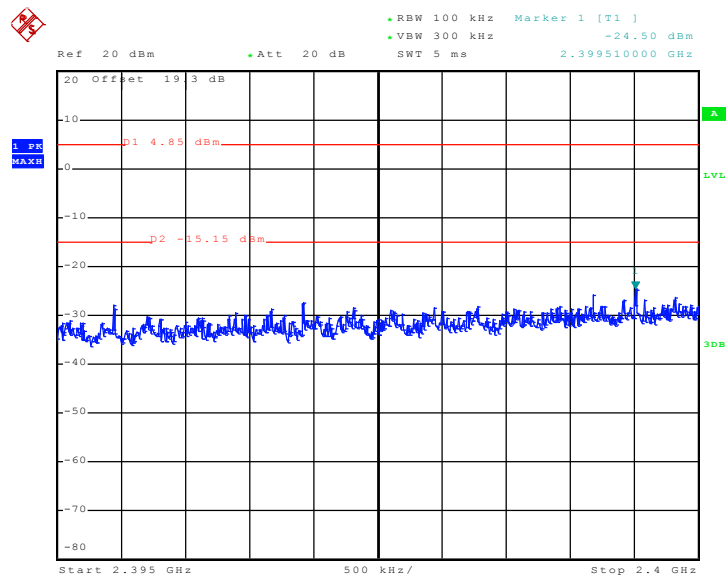
High Band Edge Plot on 802.11b Channel 11



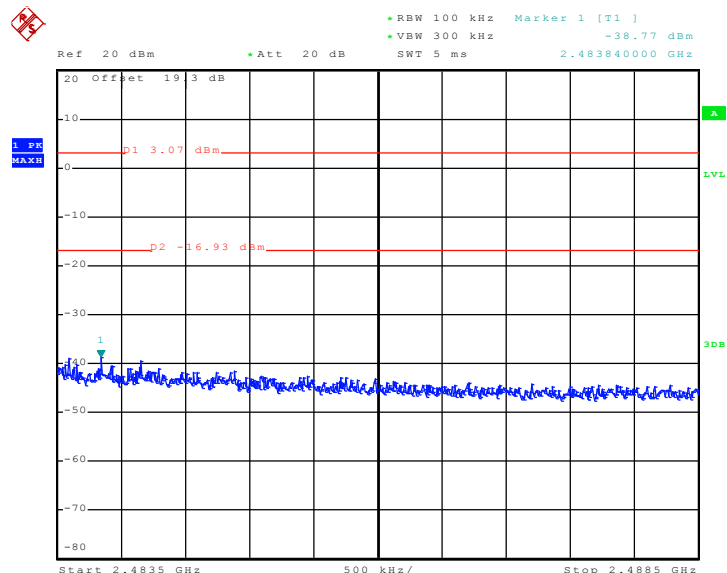
Date: 8.AUG.2011 08:47:13



Test Mode :	Mode 4 and 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Pinkston Tu

Low Band Edge Plot on 802.11g Channel 01

Date: 8.AUG.2011 09:11:59

High Band Edge Plot on 802.11g Channel 11

Date: 8.AUG.2011 09:25:37

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

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

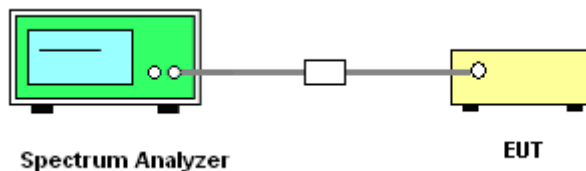
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

1. The 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.

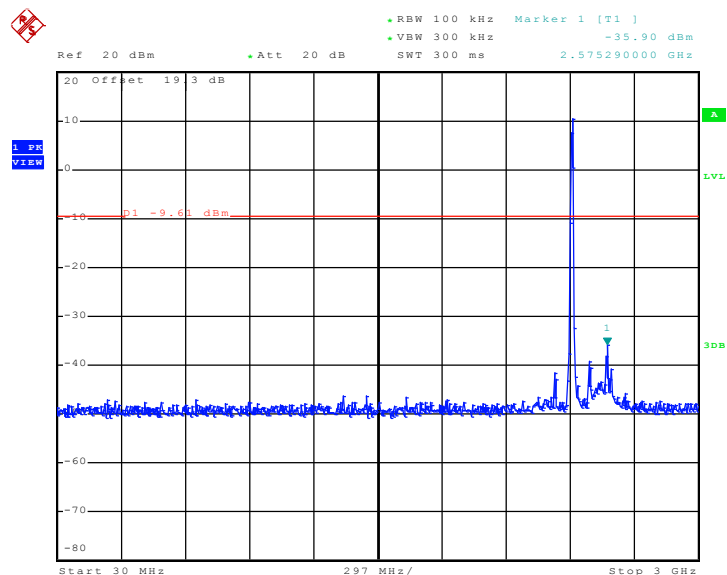
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

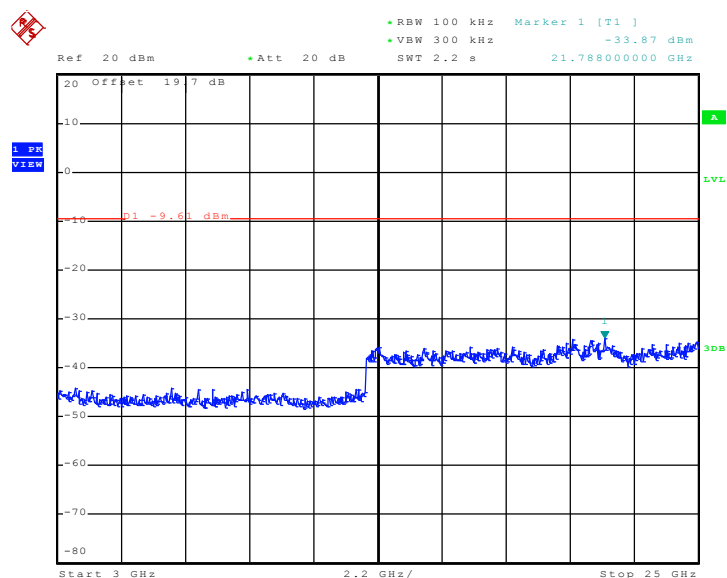
Test Mode :	Mode 1	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 5.AUG.2011 18:42:34

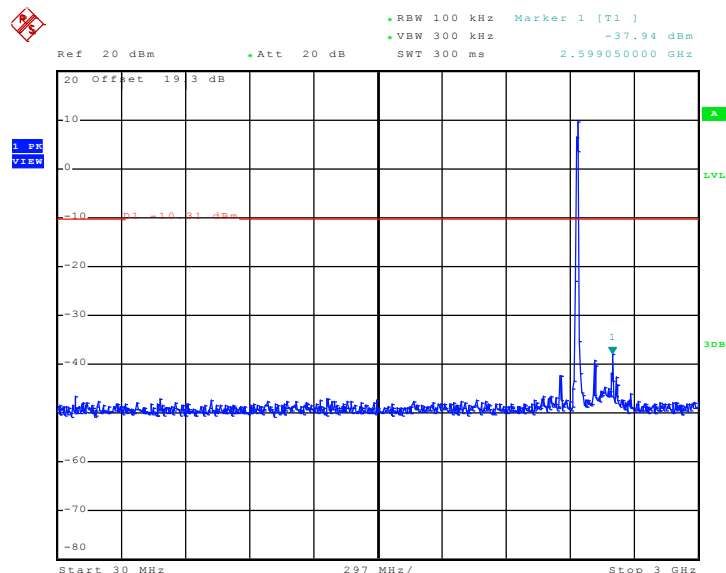
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



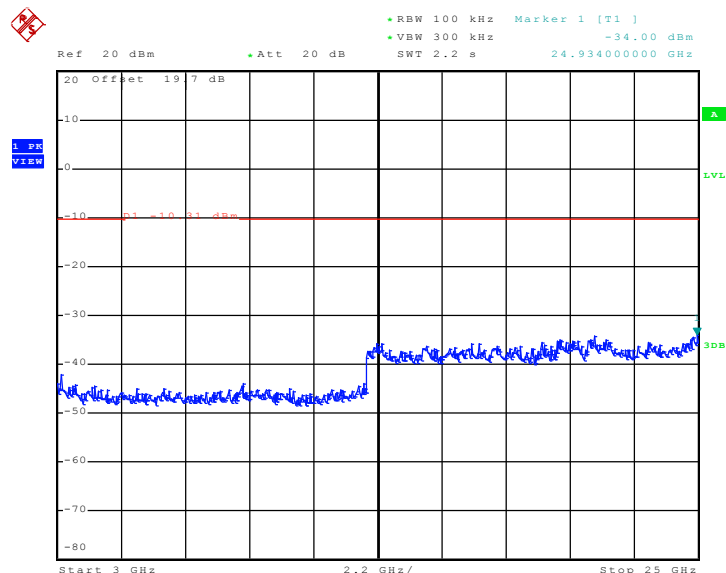
Date: 5.AUG.2011 18:42:51



Test Mode :	Mode 2	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

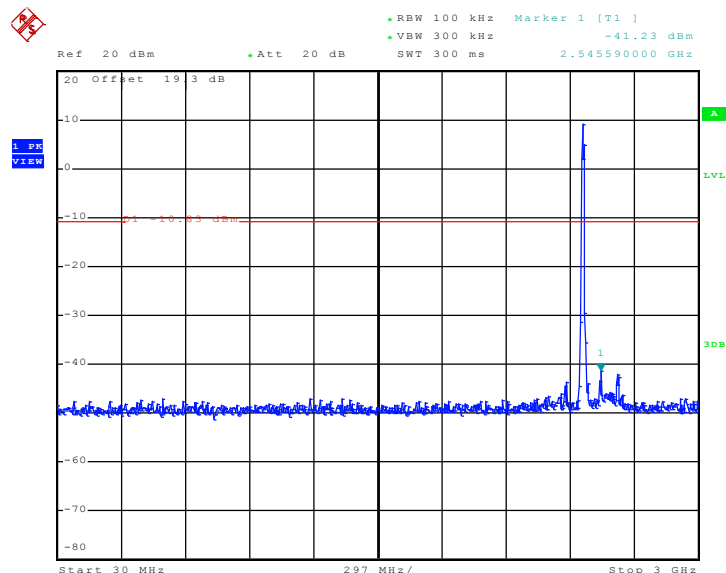
Date: 8.AUG.2011 08:42:24

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

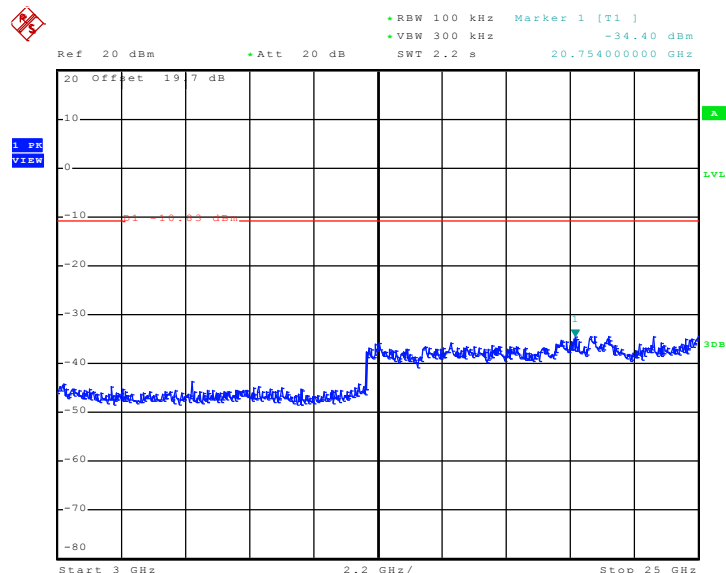
Date: 8.AUG.2011 08:42:41



Test Mode :	Mode 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

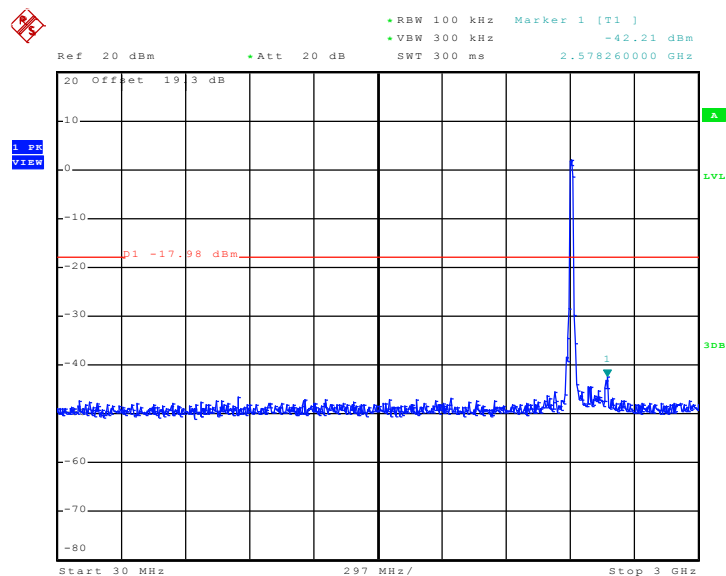
Date: 8.AUG.2011 08:56:39

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

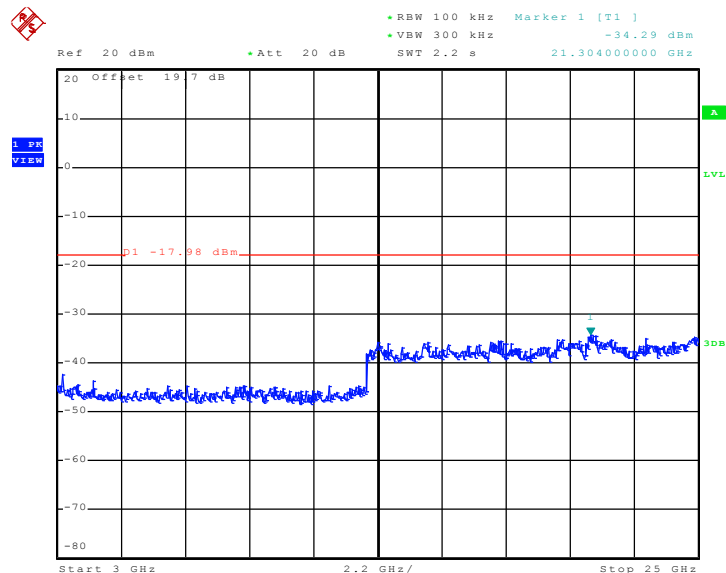
Date: 8.AUG.2011 08:56:56



Test Mode :	Mode 4	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

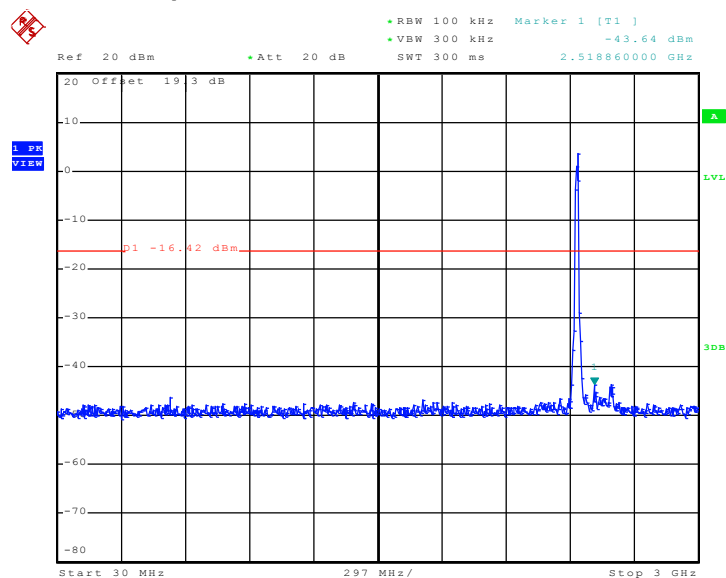
Date: 8.AUG.2011 09:21:44

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

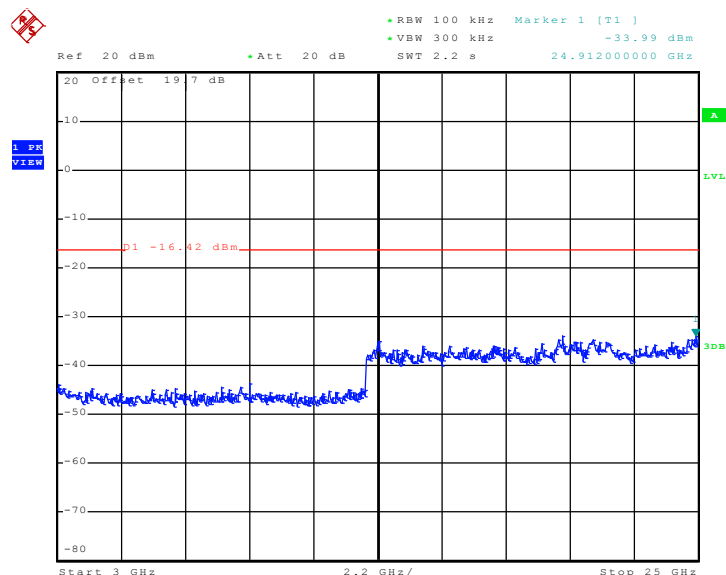
Date: 8.AUG.2011 09:22:01



Test Mode :	Mode 5	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

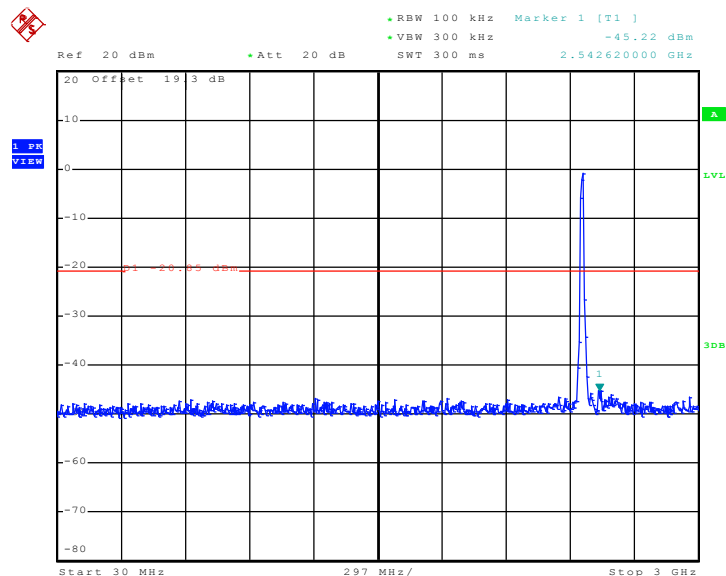
Date: 8.AUG.2011 09:50:16

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

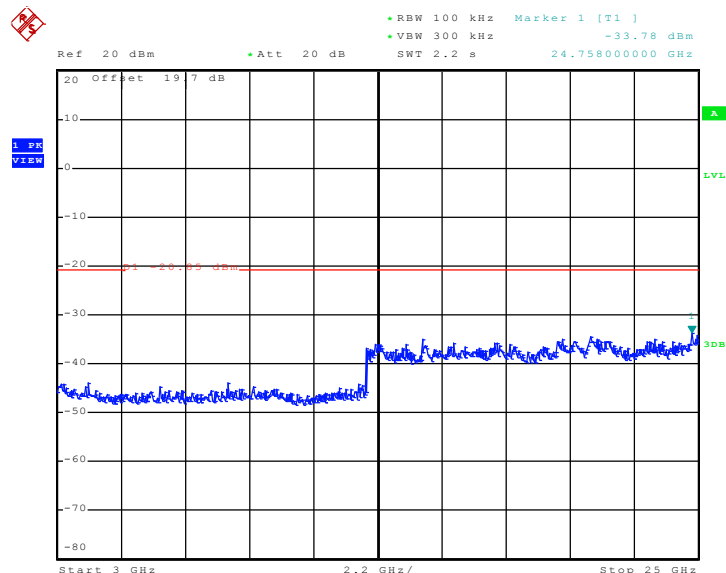
Date: 8.AUG.2011 09:50:33



Test Mode :	Mode 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Pinkston Tu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

Date: 8.AUG.2011 09:35:04

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

Date: 8.AUG.2011 09:35:21

3.5 Power Spectral Density Measurement

3.5.1 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.

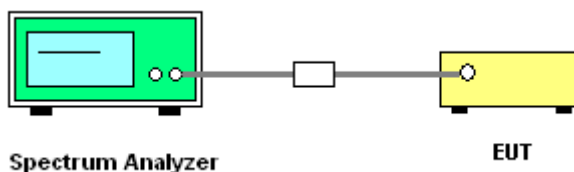
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The test follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Take the measured data from spectrum analyzer.

3.5.4 Test Setup

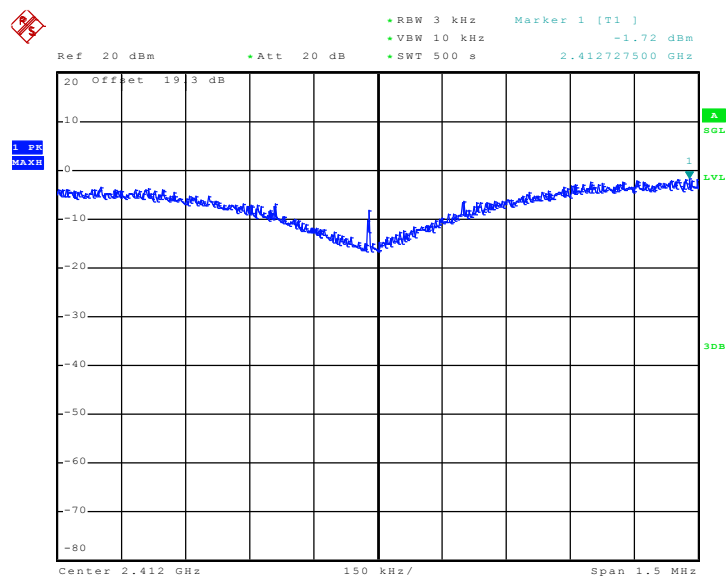


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-1.72	8	Pass
06	2437	-2.69	8	Pass
11	2462	-3.86	8	Pass

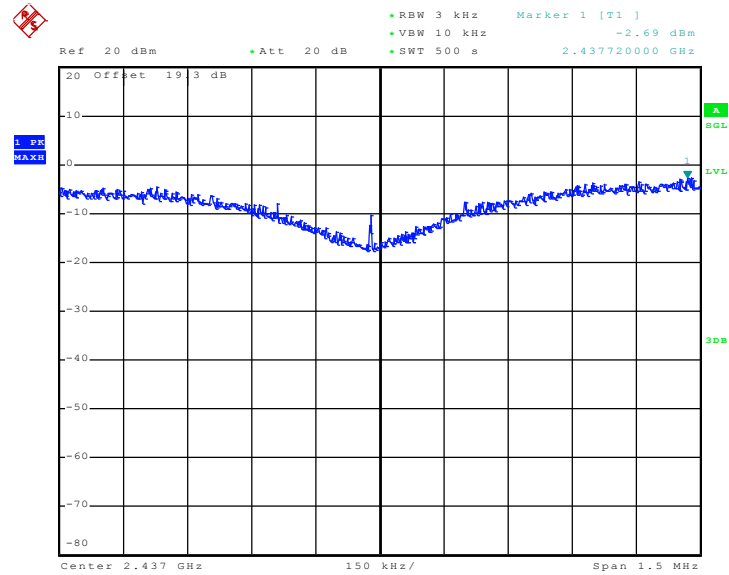
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 5.AUG.2011 18:42:10

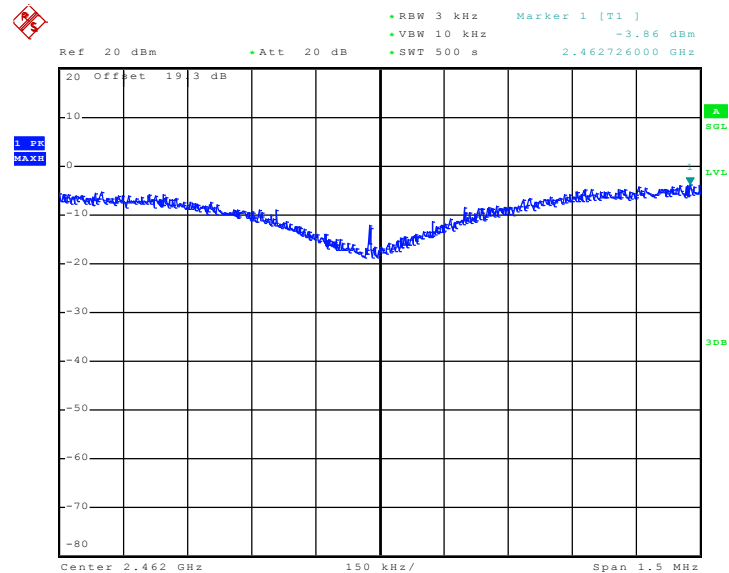


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 8.AUG.2011 08:39:54

Mode 3 : PSD Plot on 802.11b Channel 11



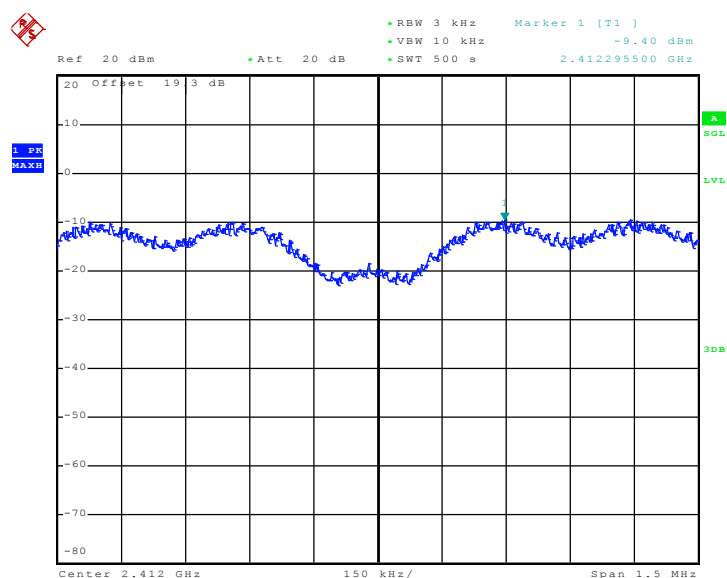
Date: 8.AUG.2011 08:56:18



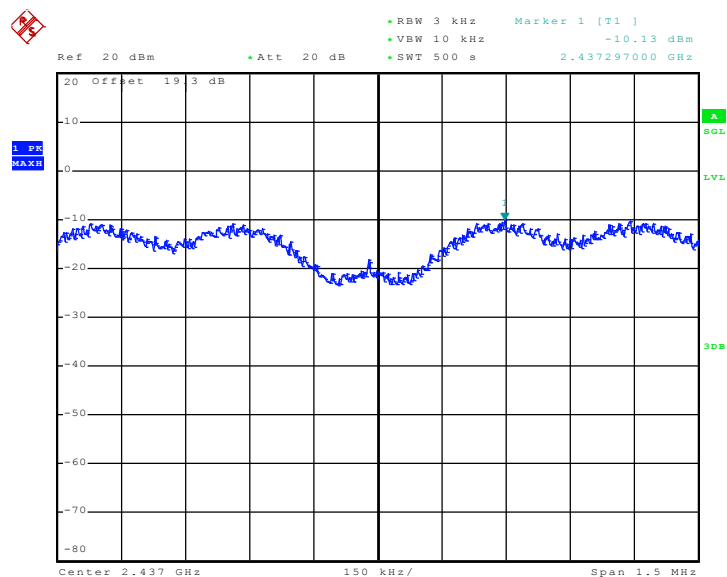
Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Pinkston Tu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-9.40	8	Pass
06	2437	-10.13	8	Pass
11	2462	-11.18	8	Pass

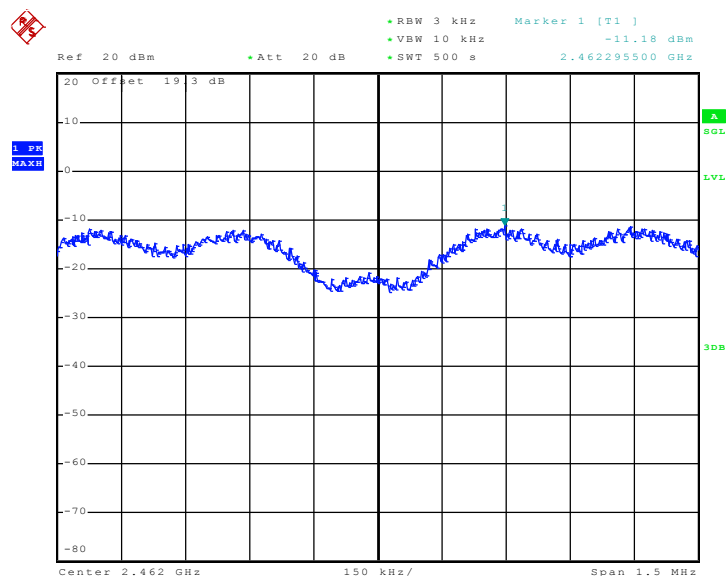
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 8.AUG.2011 09:21:23

Mode 5 : PSD Plot on 802.11g Channel 06


Date: 8.AUG.2011 09:49:55

Mode 6 : PSD Plot on 802.11g Channel 11


Date: 8.AUG.2011 09:34:43

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.

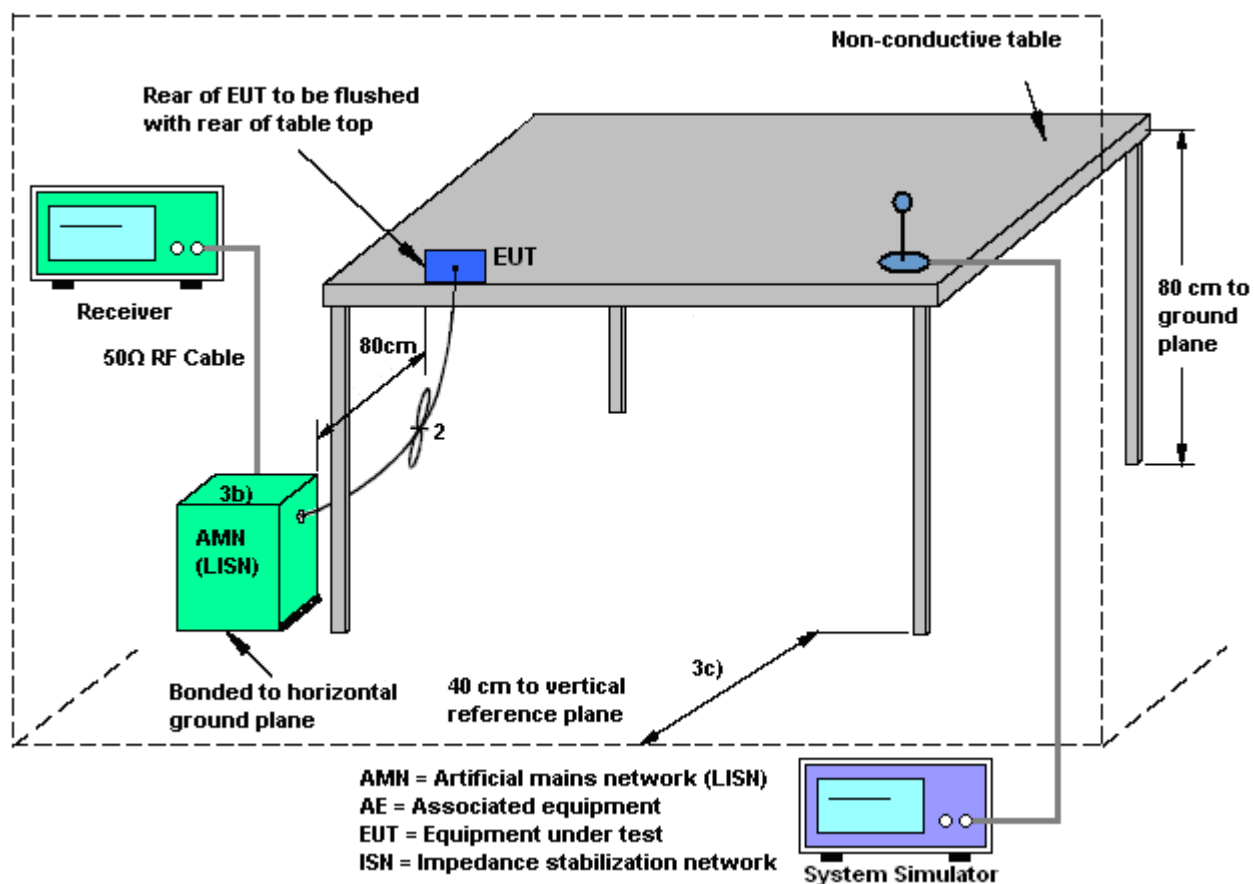
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

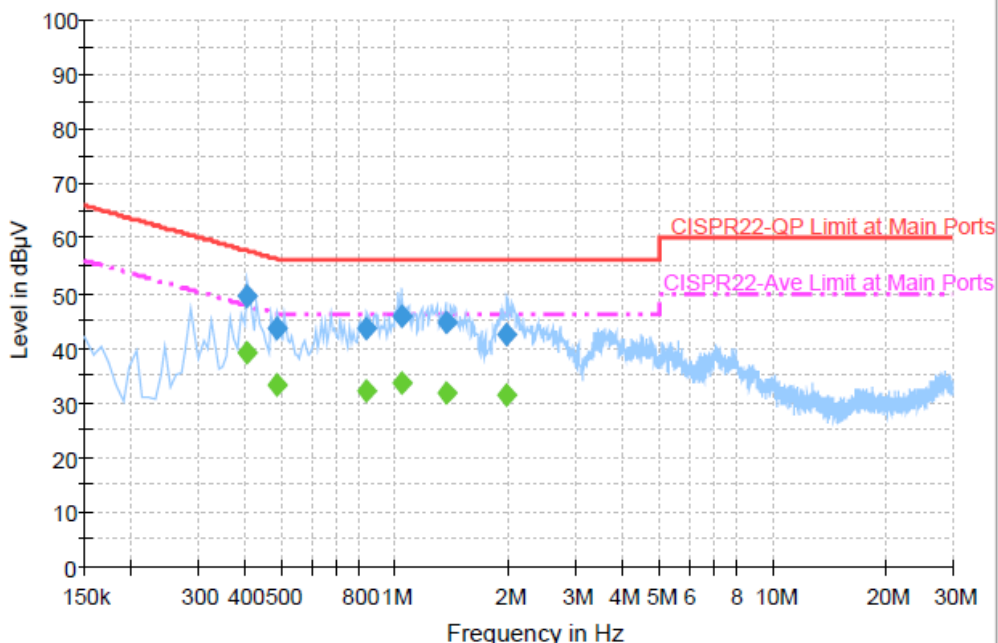
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 :	Novic Chiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + WLAN Link + Bluetooth Link + Earphone + MPEG4 + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



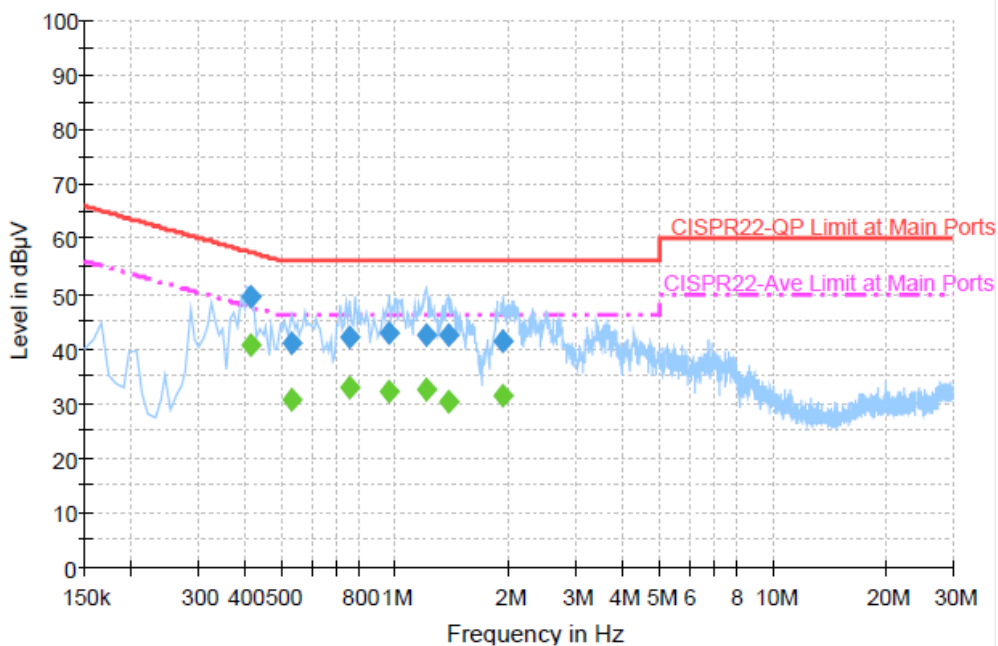
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.406000	49.5	Off	L1	19.4	8.2	57.7
0.486000	43.4	Off	L1	19.4	12.8	56.2
0.838000	43.5	Off	L1	19.5	12.5	56.0
1.038000	45.7	Off	L1	19.4	10.3	56.0
1.366000	44.8	Off	L1	19.4	11.2	56.0
1.974000	42.6	Off	L1	19.4	13.4	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.406000	39.0	Off	L1	19.4	8.7	47.7
0.486000	33.2	Off	L1	19.4	13.0	46.2
0.838000	31.9	Off	L1	19.5	14.1	46.0
1.038000	33.7	Off	L1	19.4	12.3	46.0
1.366000	31.8	Off	L1	19.4	14.2	46.0
1.974000	31.3	Off	L1	19.4	14.7	46.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Novic Chiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + WLAN Link + Bluetooth Link + Earphone + MPEG4 + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.414000	49.5	Off	N	19.4	8.1	57.6
0.534000	40.9	Off	N	19.3	15.1	56.0
0.758000	42.2	Off	N	19.4	13.8	56.0
0.966000	42.8	Off	N	19.4	13.2	56.0
1.206000	42.4	Off	N	19.5	13.6	56.0
1.382000	42.4	Off	N	19.5	13.6	56.0
1.926000	41.4	Off	N	19.5	14.6	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.414000	40.7	Off	N	19.4	6.9	47.6
0.534000	30.8	Off	N	19.3	15.2	46.0
0.758000	32.8	Off	N	19.4	13.2	46.0
0.966000	32.2	Off	N	19.4	13.8	46.0
1.206000	32.6	Off	N	19.5	13.4	46.0
1.382000	30.2	Off	N	19.5	15.8	46.0
1.926000	31.4	Off	N	19.5	14.6	46.0

3.7 Radiated Emission Measurement

3.7.1 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. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits 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

3.7.2 Measuring Instruments

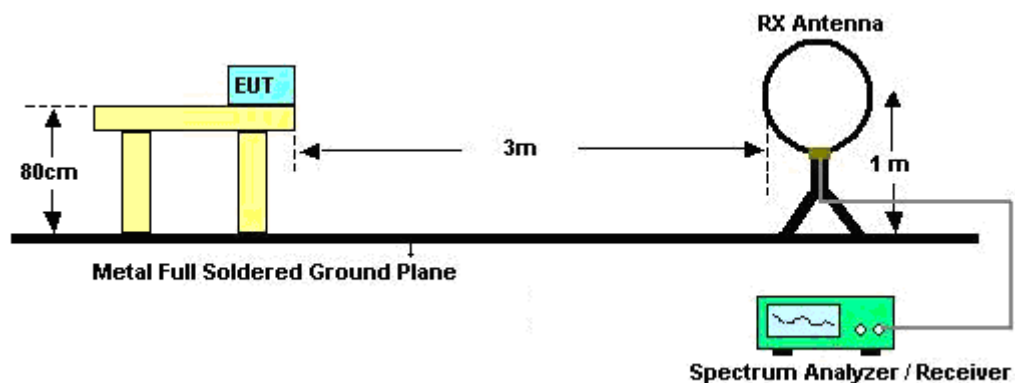
See list of measuring instruments of this test report.

3.7.3 Test Procedures

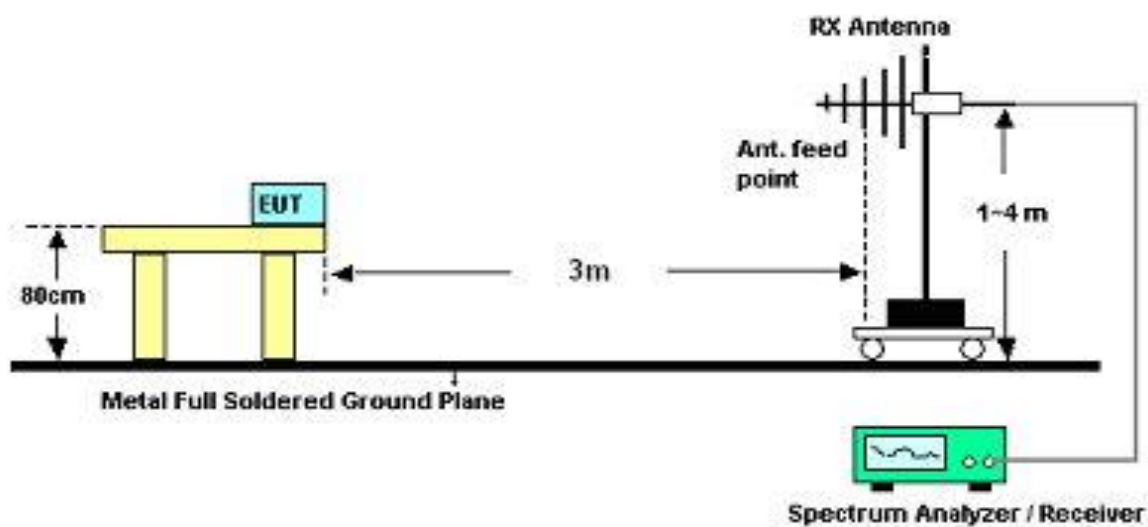
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
 - 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)
- 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.

3.7.4 Test Setup

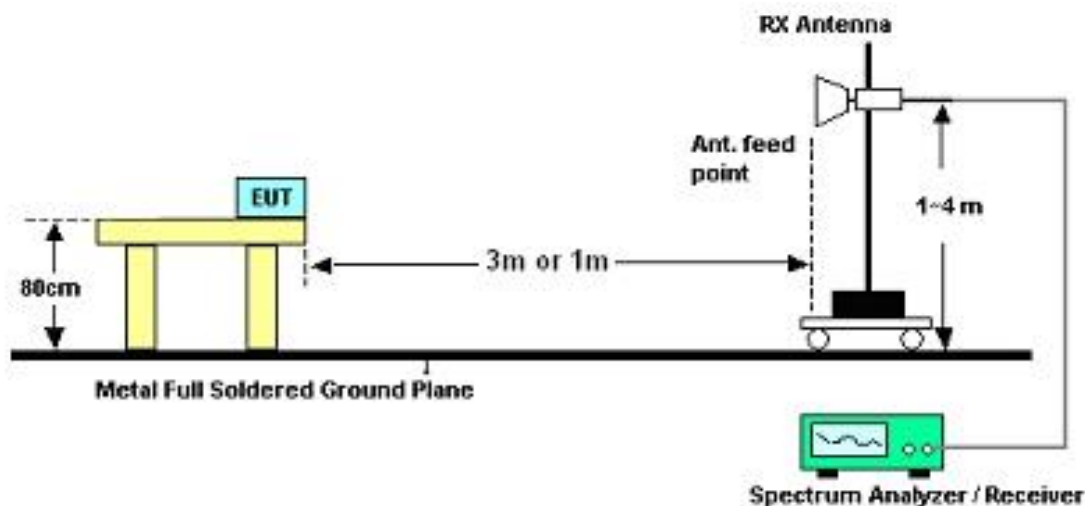
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

Test Engineer :	Ivan Chiang	Temperature :	25~26℃	
		Relative Humidity :	50~51%	

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.

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

Test Mode :	Mode 1	Temperature :	25~26℃
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Horizontal
Remark :	2412 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
42.69	23.94	-16.06	40	43.22	11.59	0.64	31.51	-	-	Peak
48.9	28.82	-11.18	40	50.59	9.08	0.68	31.53	100	77	Peak
286.5	24.97	-21.03	46	41.39	13.24	1.67	31.33	-	-	Peak
312.6	22.65	-23.35	46	38.33	13.85	1.79	31.32	-	-	Peak
425.3	20.73	-25.27	46	32.65	16.99	2.23	31.14	-	-	Peak
996.5	26.95	-27.05	54	29.18	24.84	3.51	30.58	-	-	Peak
2388.09	57.33	-16.67	74	52.97	32.18	6.03	33.85	131	0	Peak
2388.09	50.7	-3.3	54	46.34	32.18	6.03	33.85	131	0	Average
2412	105.94	-	-	101.54	32.2	6.07	33.87	131	0	Average
2412	110.76	-	-	106.36	32.2	6.07	33.87	131	0	Peak
2494	60.94	-13.06	74	56.36	32.3	6.18	33.9	131	0	Peak
2494	52.93	-1.07	54	48.35	32.3	6.18	33.9	131	0	Average
4824	44.12	-29.88	74	60.04	34.07	9.12	59.11	100	0	Peak

Test Mode :	Mode 1	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 2574 MHz is not within a restricted band.		

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
33.78	24.93	-15.07	40	40.26	15.57	0.57	31.47	-	-	Peak
48.9	28.47	-11.53	40	50.24	9.08	0.68	31.53	104	228	Peak
121.26	23.09	-20.41	43.5	42	11.54	1.11	31.56	-	-	Peak
349	22.64	-23.36	46	36.97	14.99	1.97	31.29	-	-	Peak
615.7	22.22	-23.78	46	30.44	19.94	2.74	30.9	-	-	Peak
987.4	27.31	-26.69	54	29.66	24.73	3.5	30.58	-	-	Peak
2332.61	47.32	-6.68	54	43.11	32.09	5.95	33.83	101	84	Average
2332.61	54.64	-19.36	74	50.43	32.09	5.95	33.83	101	84	Peak
2412	108.87	-	-	104.47	32.2	6.07	33.87	101	84	Peak
2412	103.95	-	-	99.55	32.2	6.07	33.87	101	84	Average
2494	60.01	-13.99	74	55.43	32.3	6.18	33.9	101	84	Peak
2494	52.18	-1.82	54	47.6	32.3	6.18	33.9	101	84	Average
2574	58.94	-29.93	88.87	54.3	32.4	6.28	34.04	101	84	Peak

Test Mode :	Mode 2	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2518 MHz and 2598 MHz is not within a restricted band.		

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
42.69	24.11	-15.89	40	43.39	11.59	0.64	31.51	-	-	Peak
48.9	28.68	-11.32	40	50.45	9.08	0.68	31.53	104	115	Peak
286.5	24.36	-21.64	46	40.78	13.24	1.67	31.33	-	-	Peak
312.6	22.72	-23.28	46	38.4	13.85	1.79	31.32	-	-	Peak
612.9	20.82	-25.18	46	29.09	19.91	2.73	30.91	-	-	Peak
780.2	24.26	-21.74	46	29.69	22.15	3.11	30.69	-	-	Peak
2358	55.92	-18.08	74	51.64	32.13	5.99	33.84	100	145	Peak
2358	49.11	-4.89	54	44.83	32.13	5.99	33.84	100	145	Average
2437	110.09	-	-	105.62	32.24	6.11	33.88	100	145	Peak
2437	105.73	-	-	101.26	32.24	6.11	33.88	100	145	Average
2500	54.58	-19.42	74	50	32.3	6.18	33.9	100	145	Peak
2500	42.24	-11.76	54	37.66	32.3	6.18	33.9	100	145	Average
2518	61.1	-28.99	90.09	56.51	32.32	6.21	33.94	100	145	Peak
2598	54.93	-35.16	90.09	50.28	32.42	6.31	34.08	100	145	Peak
4874	47.49	-26.51	74	63.32	34.08	9.13	59.04	100	0	Peak

Test Mode :	Mode 2	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2524 MHz and 2598 MHz is not within a restricted band.		

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
30	26.44	-13.56	40	40.86	16.51	0.53	31.46	-	-	Peak
48.9	29.97	-10.03	40	51.74	9.08	0.68	31.53	100	312	Peak
269.22	29.19	-16.81	46	45.95	12.98	1.64	31.38	-	-	Peak
421.8	20.04	-25.96	46	32.04	16.93	2.22	31.15	-	-	Peak
687.8	22.36	-23.64	46	29.53	20.75	2.91	30.83	-	-	Peak
974.1	27.62	-26.38	54	30.15	24.56	3.48	30.57	-	-	Peak
2358	56.18	-17.82	74	51.9	32.13	5.99	33.84	100	86	Peak
2358	49.81	-4.19	54	45.53	32.13	5.99	33.84	100	86	Average
2437	102.21	-	-	97.74	32.24	6.11	33.88	100	86	Average
2437	106.85	-	-	102.38	32.24	6.11	33.88	100	86	Peak
2492	54.04	-19.96	74	49.46	32.3	6.18	33.9	100	86	Peak
2492	42.87	-11.13	54	38.29	32.3	6.18	33.9	100	86	Average
2524	61.29	-25.56	86.85	56.69	32.34	6.23	33.97	100	86	Peak
2598	57.28	-29.57	86.85	52.63	32.42	6.31	34.08	100	86	Peak

Test Mode :	Mode 3	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 2542 MHz is not within a restricted band.		

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
39.45	23.32	-16.68	40	41.25	12.96	0.62	31.51	-	-	Peak
48.9	29.82	-10.18	40	51.59	9.08	0.68	31.53	100	163	Peak
285.69	24.31	-21.69	46	40.73	13.24	1.67	31.33	-	-	Peak
315.4	22.97	-23.03	46	38.55	13.94	1.8	31.32	-	-	Peak
587.7	22.18	-23.82	46	30.88	19.58	2.65	30.93	-	-	Peak
822.2	24.86	-21.14	46	29.63	22.73	3.2	30.7	-	-	Peak
2382	55.46	-18.54	74	51.12	32.16	6.03	33.85	100	5	Peak
2382	48.68	-5.32	54	44.34	32.16	6.03	33.85	100	5	Average
2462	109.81	-	-	105.3	32.26	6.14	33.89	100	5	Peak
2462	105.08	-	-	100.57	32.26	6.14	33.89	100	5	Average
2485.18	58.46	-15.54	74	53.9	32.28	6.18	33.9	100	5	Peak
2485.18	47.88	-6.12	54	43.32	32.28	6.18	33.9	100	5	Average
2542	58.35	-31.46	89.81	53.73	32.36	6.23	33.97	100	5	Peak
4924	47.52	-26.48	74	63.24	34.09	9.15	58.96	100	0	Peak

Test Mode :	Mode 3	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 2548 MHz is not within a restricted band.		

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
31.89	25.97	-14.03	40	40.84	16.04	0.55	31.46	-	-	Peak
48.9	29.1	-10.9	40	50.87	9.08	0.68	31.53	121	249	Peak
92.37	22.45	-21.05	43.5	44.11	8.9	0.96	31.52	-	-	Peak
458.9	19.21	-26.79	46	30.43	17.54	2.32	31.08	-	-	Peak
603.8	21.67	-24.33	46	30.08	19.81	2.7	30.92	-	-	Peak
985.3	27.16	-26.84	54	29.53	24.71	3.5	30.58	-	-	Peak
2382	53.37	-20.63	74	49.03	32.16	6.03	33.85	101	95	Peak
2382	46.42	-7.58	54	42.08	32.16	6.03	33.85	101	95	Average
2462	105.29	-	-	100.78	32.26	6.14	33.89	101	95	Peak
2462	100.51	-	-	96	32.26	6.14	33.89	101	95	Average
2483.5	52.98	-21.02	74	48.42	32.28	6.18	33.9	101	95	Peak
2483.5	43.15	-10.85	54	38.59	32.28	6.18	33.9	101	95	Average
2548	54.68	-30.61	85.29	50.06	32.36	6.23	33.97	101	95	Peak
4924	44.57	-29.43	74	60.29	34.09	9.15	58.96	100	0	Peak

Test Mode :	Mode 4	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Horizontal
Remark :	2412 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
42.69	23.8	-16.2	40	43.08	11.59	0.64	31.51	-	-	Peak
48.9	32.32	-7.68	40	54.09	9.08	0.68	31.53	100	200	Peak
292.17	22.82	-23.18	46	39.09	13.34	1.71	31.32	-	-	Peak
313.3	22.61	-23.39	46	38.25	13.88	1.8	31.32	-	-	Peak
749.4	24.18	-21.82	46	30.15	21.67	3.06	30.7	-	-	Peak
988.1	27.08	-26.92	54	29.42	24.74	3.5	30.58	-	-	Peak
2389.61	72.85	-1.15	74	68.49	32.18	6.03	33.85	107	22	Peak
2389.61	52.47	-1.53	54	48.11	32.18	6.03	33.85	107	22	Average
2412	108.25	-	-	103.85	32.2	6.07	33.87	107	22	Peak
2412	92.08	-	-	87.68	32.2	6.07	33.87	107	22	Average
2494	50.39	-3.61	54	45.81	32.3	6.18	33.9	107	22	Average
2494	61.65	-12.35	74	57.07	32.3	6.18	33.9	107	22	Peak

Test Mode :	Mode 4	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Vertical
Remark :	2412 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
32.7	25.47	-14.53	40	40.58	15.8	0.56	31.47	-	-	Peak
48.9	28.74	-11.26	40	50.51	9.08	0.68	31.53	131	106	Peak
276.78	23.48	-22.52	46	40.11	13.09	1.64	31.36	-	-	Peak
310.5	25.27	-20.73	46	41.01	13.79	1.79	31.32	-	-	Peak
386.1	23.55	-22.45	46	36.52	16.14	2.11	31.22	-	-	Peak
962.2	26.69	-27.31	54	29.38	24.41	3.47	30.57	-	-	Peak
2389.42	70.35	-3.65	74	65.99	32.18	6.03	33.85	100	100	Peak
2389.42	48.16	-5.84	54	43.8	32.18	6.03	33.85	100	100	Average
2412	106.19	-	-	101.79	32.2	6.07	33.87	100	100	Peak
2412	87.71	-	-	83.31	32.2	6.07	33.87	100	100	Average
2494	44.38	-9.62	54	39.8	32.3	6.18	33.9	100	100	Average
2494	56.89	-17.11	74	52.31	32.3	6.18	33.9	100	100	Peak

Test Mode :	Mode 5	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2516 MHz and 2598 MHz is not within a restricted band.		

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
48.9	29.5	-10.5	40	51.27	9.08	0.68	31.53	113	254	Peak
89.13	19.18	-24.32	43.5	41.24	8.53	0.93	31.52	-	-	Peak
296.49	24.35	-21.65	46	40.52	13.41	1.75	31.33	-	-	Peak
301.4	22.26	-23.74	46	38.3	13.52	1.77	31.33	-	-	Peak
425.3	21.2	-24.8	46	33.12	16.99	2.23	31.14	-	-	Peak
976.2	26.7	-27.3	54	29.21	24.58	3.49	30.58	-	-	Peak
2390	56.81	-17.19	74	52.45	32.18	6.03	33.85	128	22	Peak
2390	40.46	-13.54	54	36.1	32.18	6.03	33.85	128	22	Average
2437	108.32	-	-	103.85	32.24	6.11	33.88	128	22	Peak
2437	90.96	-	-	86.49	32.24	6.11	33.88	128	22	Average
2484	62.03	-11.97	74	57.47	32.28	6.18	33.9	128	22	Peak
2484	44.8	-9.2	54	40.24	32.28	6.18	33.9	128	22	Average
2516	61.37	-26.95	88.32	56.78	32.32	6.21	33.94	128	22	Peak
2598	54.22	-34.1	88.32	49.57	32.42	6.31	34.08	128	22	Peak

Test Mode :	Mode 5	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2518 MHz and 2596 MHz is not within a restricted band.		

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
48.9	29.51	-10.49	40	51.28	9.08	0.68	31.53	100	301	Peak
218.73	27.75	-18.25	46	47.33	10.47	1.41	31.46	-	-	Peak
290.82	23.52	-22.48	46	39.82	13.32	1.7	31.32	-	-	Peak
436.5	23.23	-22.77	46	34.92	17.17	2.27	31.13	-	-	Peak
730.5	23.2	-22.8	46	29.57	21.37	3.01	30.75	-	-	Peak
996.5	26.71	-27.29	54	28.94	24.84	3.51	30.58	-	-	Peak
2390	55.86	-18.14	74	51.5	32.18	6.03	33.85	100	55	Peak
2390	39.06	-14.94	54	34.7	32.18	6.03	33.85	100	55	Average
2437	105.67	-	-	101.2	32.24	6.11	33.88	100	55	Peak
2437	88.5	-	-	84.03	32.24	6.11	33.88	100	55	Average
2484	57.45	-16.55	74	52.89	32.28	6.18	33.9	100	55	Peak
2484	41.47	-12.53	54	36.91	32.28	6.18	33.9	100	55	Average
2518	59.21	-26.46	85.67	54.62	32.32	6.21	33.94	100	55	Peak
2596	54.84	-30.83	85.67	50.18	32.42	6.28	34.04	100	55	Peak

Test Mode :	Mode 6	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 2540 MHz MHz is not within a restricted band.		

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
47.82	31.69	-8.31	40	53.06	9.48	0.67	31.52	136	248	Peak
246.81	21.39	-24.61	46	38.81	12.46	1.53	31.41	-	-	Peak
285.69	25.58	-20.42	46	42	13.24	1.67	31.33	-	-	Peak
315.4	21.98	-24.02	46	37.56	13.94	1.8	31.32	-	-	Peak
508.6	18.84	-27.16	46	29.07	18.35	2.47	31.05	-	-	Peak
707.4	23.88	-22.12	46	30.72	21	2.96	30.8	-	-	Peak
2382	55.36	-18.64	74	51.02	32.16	6.03	33.85	103	22	Peak
2382	41.17	-12.83	54	36.83	32.16	6.03	33.85	103	22	Average
2462	107.45	-	-	102.94	32.26	6.14	33.89	103	22	Peak
2462	90.51	-	-	86	32.26	6.14	33.89	103	22	Average
2483.5	69.67	-4.33	74	65.11	32.28	6.18	33.9	103	22	Peak
2483.5	49.91	-4.09	54	45.35	32.28	6.18	33.9	103	22	Average
2540	56.98	-30.47	87.45	52.36	32.36	6.23	33.97	103	22	Peak

Test Mode :	Mode 6	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Ivan Chiang	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 2548 MHz is not within a restricted band.		

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
48.9	29.27	-10.73	40	51.04	9.08	0.68	31.53	112	187	Peak
91.02	22.49	-21.01	43.5	44.27	8.79	0.95	31.52	-	-	Peak
255.18	25.18	-20.82	46	42.29	12.75	1.56	31.42	-	-	Peak
309.8	17.31	-28.69	46	33.09	13.76	1.79	31.33	-	-	Peak
491.8	18.83	-27.17	46	29.39	18.09	2.42	31.07	-	-	Peak
758.5	22.99	-23.01	46	28.81	21.81	3.07	30.7	-	-	Peak
2382	53.76	-20.24	74	49.42	32.16	6.03	33.85	101	93	Peak
2382	40.55	-13.45	54	36.21	32.16	6.03	33.85	101	93	Average
2462	105.05	-	-	100.54	32.26	6.14	33.89	101	93	Peak
2462	88.07	-	-	83.56	32.26	6.14	33.89	101	93	Average
2483.5	67.57	-6.43	74	63.01	32.28	6.18	33.9	101	93	Peak
2483.5	45.4	-8.6	54	40.84	32.28	6.18	33.9	101	93	Average
2548	55.24	-29.81	85.05	50.62	32.36	6.23	33.97	101	93	Peak

3.8 Antenna Requirements

3.8.1 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. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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.

3.8.2 Antenna Connected Construction

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

3.8.3 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
System Simulator	R&S	CMU200	117995	N/A	Aug. 11, 2010	Aug.10, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9KHz~40GHz	Jun. 13, 2011	Jun. 12, 2012	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 16, 2010	Aug. 15, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz – 30MHz	Dec. 03, 2010	Dec. 02, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz – 30MHz	Dec. 01, 2010	Nov. 30, 2011	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 18, 2010	Oct. 17, 2011	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2010	Oct. 30, 2011	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 03, 2010	Dec. 02, 2011	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2010	Aug. 18, 2011	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 06, 2010	Dec. 05, 2011	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB.GAIN	Mar. 29, 2011	Mar. 28, 2012	Radiation (03CH07-HY)

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 EP161534 as below.