

FCC RF Test Report

APPLICANT : CT Asia
EQUIPMENT : GSM mobile phone
BRAND NAME : ACE
MODEL NAME : Caracas Pro
FCC ID : YHLACECCSPR
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Dec. 13, 2011 and completely tested on Jan. 10, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR1D1302B	Rev. 01	Initial issue of report	Jan. 10, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	Power Output	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 12.74 dB at 3.42 MHz
3.7	15.247(d)	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 2.28 dB at 190.65 MHz
3.8	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

CT Asia

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

1.2 Manufacturer

Shenzhen SanmengCommunication Technolo GY CO., LTD

1503, Blk. East, Shengtang Bldg.Tairan 9th Road, Chegongmiao, Futian District, Shenzhen, Guangdong

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	GSM mobile phone
Brand Name	ACE
Model Name	Caracas Pro
FCC ID	YHLACECCSPR
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 15.31 dBm (0.034 W) 802.11g : 20.25 dBm (0.106 W)
Antenna Type	PIFA Antenna with gain -1 dBi
HW Version	HEXING36_10A_GEMINI_HW
SW Version	E200_BLU_LEN_BT_FM_FL_SC_004_V017
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.
4. There are two different types of EUT. They are single SIM card mobile and dual SIM card mobile. The others are the same including circuit design, PCB board, structure and all components. It is special to declare. After pre-scan two types of EUT, we found test result of the sample that dual SIM was the worst, so we choose dual SIM card mobile to perform all test. For the dual SIM card mobile, after pre-scan two SIM cards, we found test result with SIM1 card was the worst, so we choose SIM1 card to perform all test.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		
	TH01-KS	CO01-KS	03CH01-KS

1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ANSI C63.4-2003

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 (certification), recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
3.	Router	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
4.	Notebook	Acer	Trave Imate 2413Lci	QDS-BRCM1016	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m

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	15.31	15.29	15.12	15.28
CH 06	2437 MHz	15.07	15.04	14.82	15.08
CH 11	2462 MHz	15.04	15.02	14.81	15.04

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	20.25	20.21	20.22	20.24	20.18	20.24	20.22	20.123
CH 06	2437 MHz	20.16	20.15	20.13	20.14	20.13	20.11	20.15	20.14
CH 11	2462 MHz	20.05	20.02	20.03	19.98	19.96	19.98	20.01	19.98

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.

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).

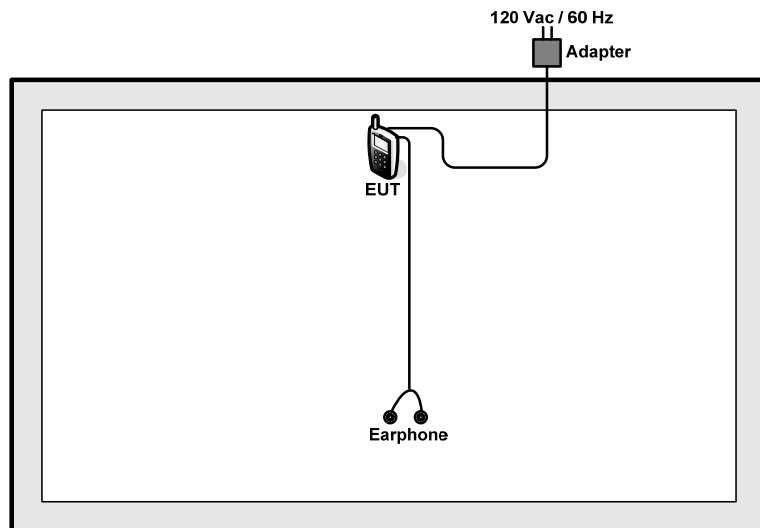
Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases (H plane) and recorded in this report.

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

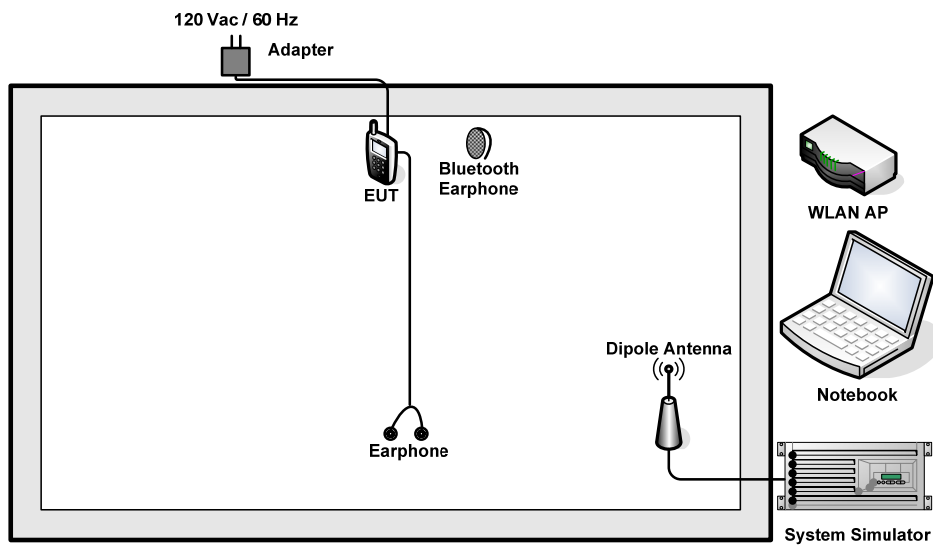
Test Cases		
Test Item	802.11b	802.11g
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g CH01_2412 MHz
	Mode 2 : 802.11b CH06_2437 MHz	Mode 5 : 802.11g CH06_2437 MHz
	Mode 3 : 802.11b CH11_2462 MHz	Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g 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 : GSM 850 Idle + Bluetooth Link + WLAN Link (2.4 GHz) + Adapter + Earphone + Camera	
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.		

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

The programmed RF utility, “**#336633#” 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.

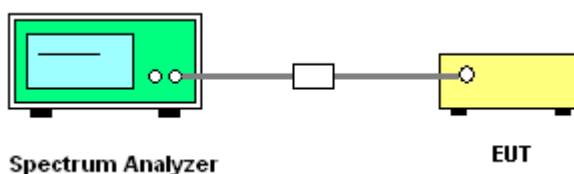
3.1.2 Measuring Instruments

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

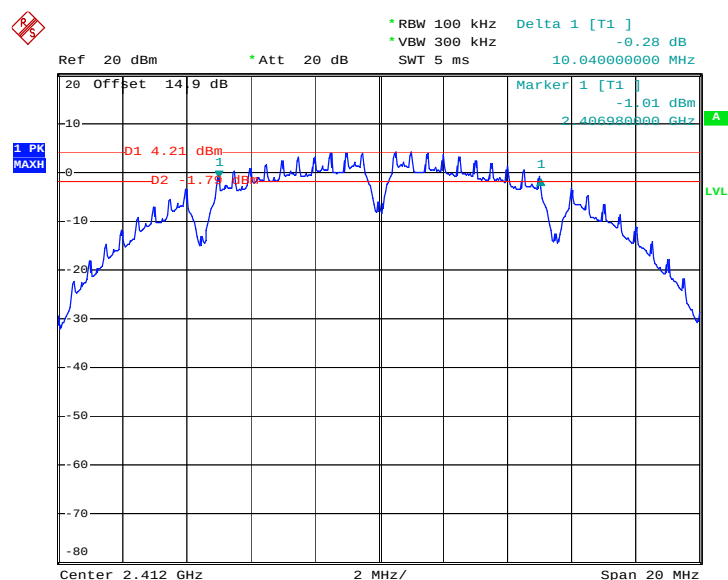


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~25℃
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	10.04	0.5	Pass
06	2437	10.08	0.5	Pass
11	2462	10.04	0.5	Pass

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



Date: 16.DEC.2011 21:32:42



Ref 20 dBm * Att 20 dB Delta 1 [T1] 0.04 dB
 * RBW 100 kHz * VBW 300 kHz SWT 5 ms 10.08000000 MHz

20 Offset 14.9 dB Marker 1 [T1] -2.03 dBm A
 2.431960000 GHz 1 LVL

1 PK MAX D1 3.79 dBm D2 -2.21 dBm

Center 2.437 GHz 2 MHz/ Span 20 MHz

Date: 16.DEC.2011 21:46:59

Ref 20 dBm * Att 20 dB Delta 1 [T1] -0.12 dB
 * RBW 100 kHz * VBW 300 kHz SWT 5 ms 10.04000000 MHz

20 Offset 14.9 dB

1 PK MAX

D1 3.59 dBm D2 -2.41 dBm

Marker 1 [T1] -1.41 dBm 2 456960000 GHz

Center 2.462 GHz 2 MHz/ Span 20 MHz

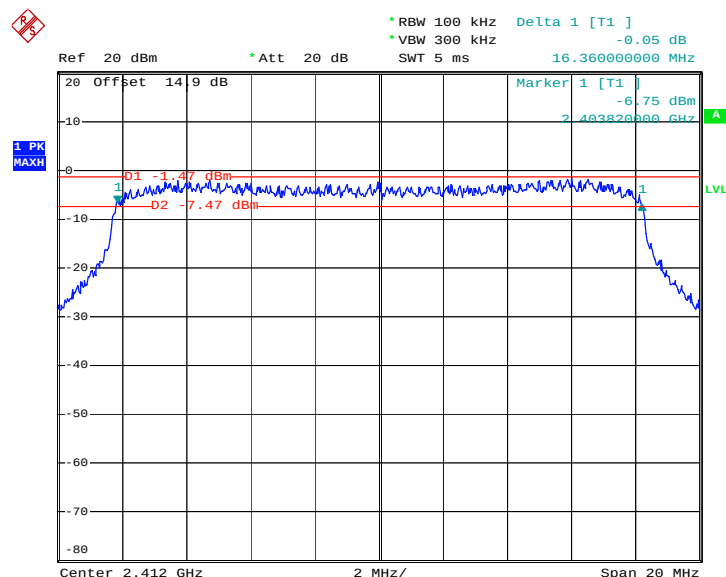
Date: 16.DEC.2011 22:00:45



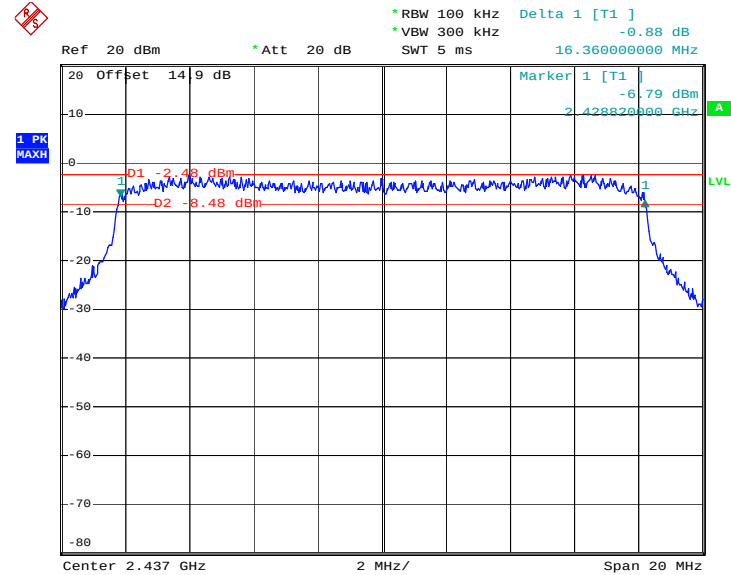
Test Mode :	Mode 4, 5, 6	Temperature :	24~25°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.36	0.5	Pass
06	2437	16.36	0.5	Pass
11	2462	16.36	0.5	Pass

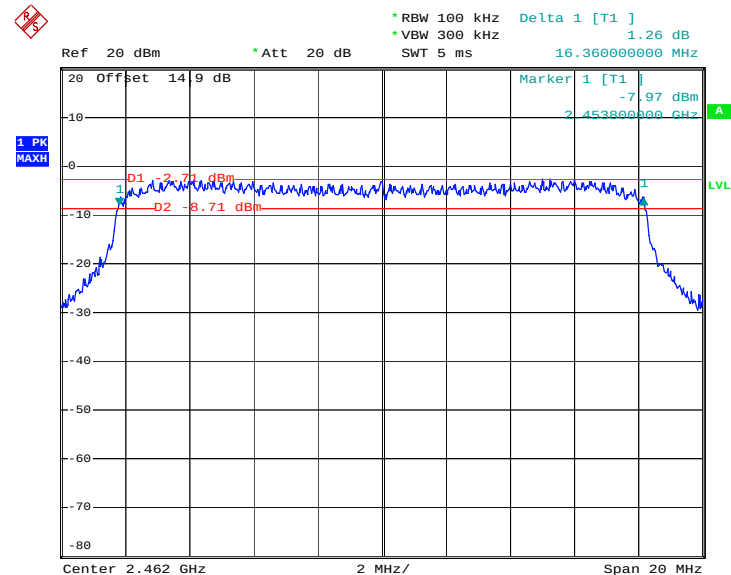
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 16.DEC.2011 22:18:26

Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06


Date: 16.DEC.2011 22:31:15

Mode 6 : 6 dB Bandwidth Plot on 802.11g Channel 11


Date: 16.DEC.2011 22:43:31

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.

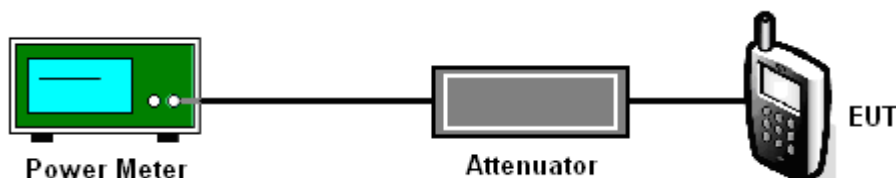
3.2.2 Measuring Instruments

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.
3. 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 :	24~25℃
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	15.31	30	Pass
06	2437	15.07	30	Pass
11	2462	15.04	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	24~25℃
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.25	30	Pass
06	2437	20.16	30	Pass
11	2462	20.05	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

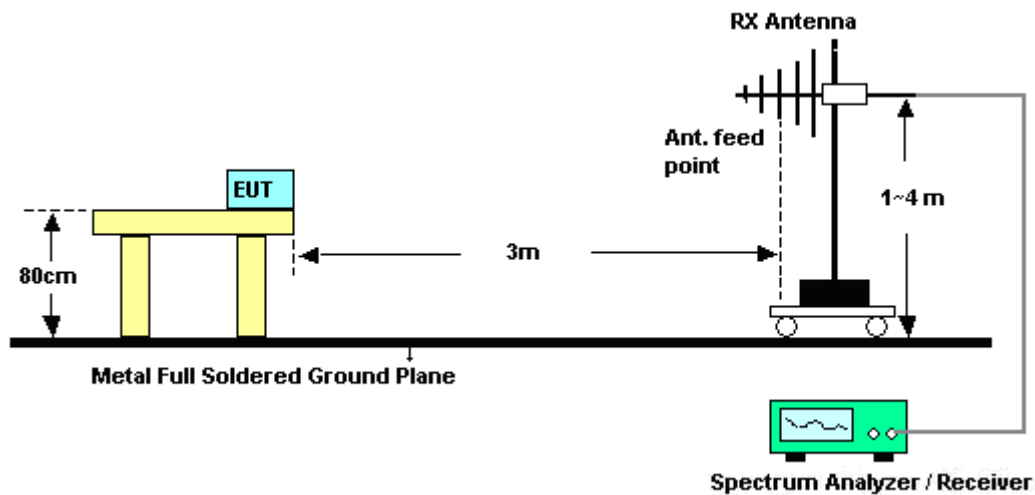
See list of measuring instruments of this test report.

3.3.3 Test Procedures

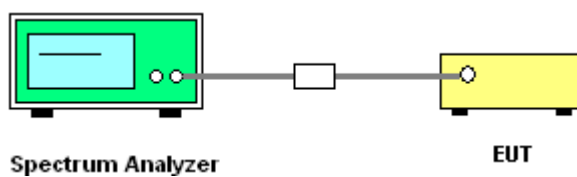
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	20~21℃
Test Band :	802.11b	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Cloud Peng

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
2386	52	-22	74	49.72	32.86	3.47	34.05	200	345	Peak
2386	42.46	-11.54	54	40.18	32.86	3.47	34.05	200	345	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
2385.81	52.83	-21.17	74	50.55	32.86	3.47	34.05	100	0	Peak
2385.81	37.3	-16.7	54	35.02	32.86	3.47	34.05	100	0	Average

Test Mode :	Mode 3	Temperature :	20~21℃
Test Band :	802.11b	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Cloud Peng

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	48.69	-25.31	74	46.2	33.01	3.68	34.2	120	0	Peak
2483.5	35.94	-18.06	54	33.45	33.01	3.68	34.2	120	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
2496.77	49.65	-24.35	74	47.11	33.05	3.72	34.23	134	267	Peak
2496.77	37.21	-16.79	54	34.67	33.05	3.72	34.23	134	267	Average



Test Mode :	Mode 4	Temperature :	20~21℃
Test Band :	802.11g	Relative Humidity :	41~42%
Test Channel :	01	Test Engineer :	Cloud Peng

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
2390	60.22	-13.78	74	57.94	32.86	3.47	34.05	106	241	Peak
2390	44.15	-9.85	54	41.87	32.86	3.47	34.05	106	241	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
2390	60.09	-13.91	74	57.81	32.86	3.47	34.05	100	271	Peak
2390	44.79	-9.21	54	42.51	32.86	3.47	34.05	100	271	Average

Test Mode :	Mode 6	Temperature :	20~21℃
Test Band :	802.11g	Relative Humidity :	41~42%
Test Channel :	11	Test Engineer :	Cloud Peng

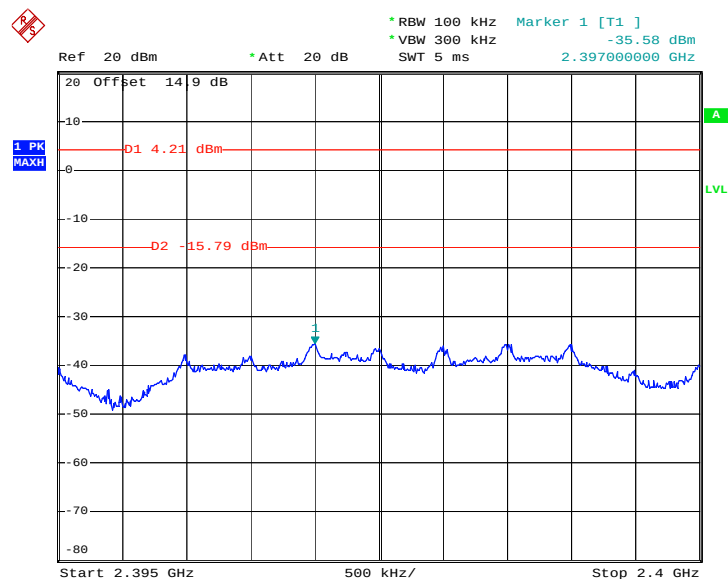
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	54.11	-19.89	74	54.11	0	0	0	200	58	Peak
2483.5	47.43	-6.57	54	47.43	0	0	0	200	58	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	51.02	-22.98	74	51.02	0	0	0	200	312	Peak
2483.5	37.34	-16.66	54	37.34	0	0	0	200	312	Average

3.3.6 Test Plots of Conducted Band Edges

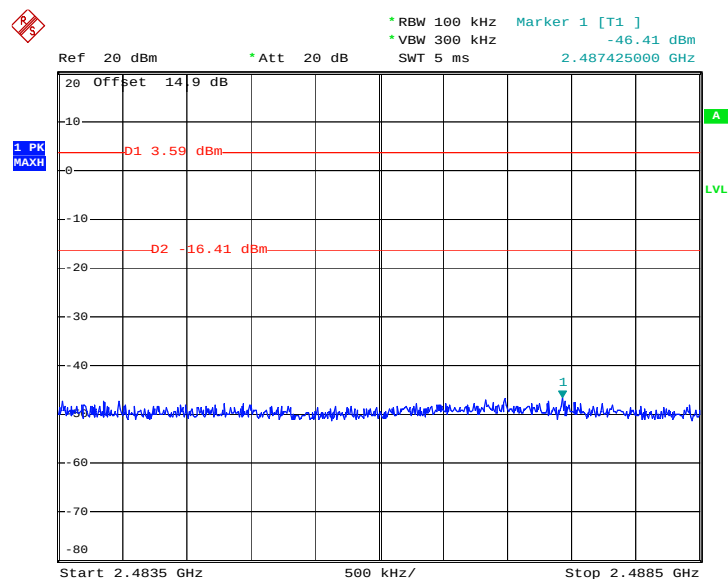
Test Mode :	Mode 1 and 3	Temperature :	24~25°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11b Channel 01



Date: 16.DEC.2011 21:33:51

High Band Edge Plot on 802.11b Channel 11

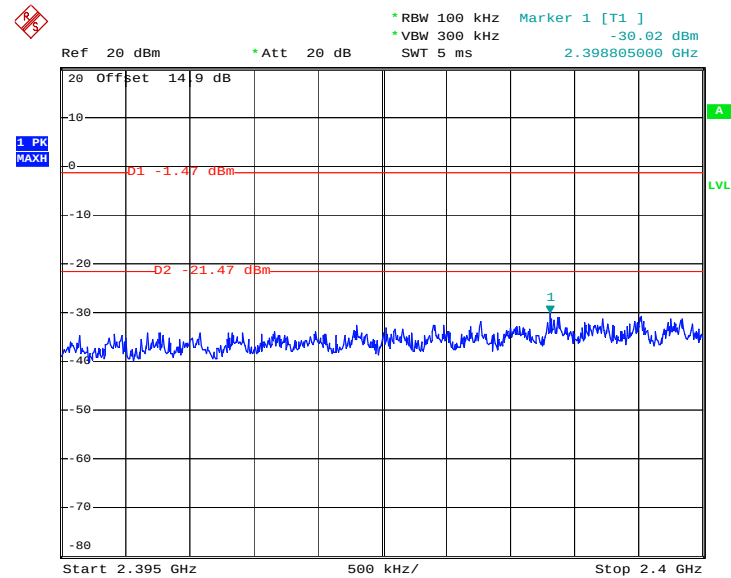


Date: 16.DEC.2011 22:01:33



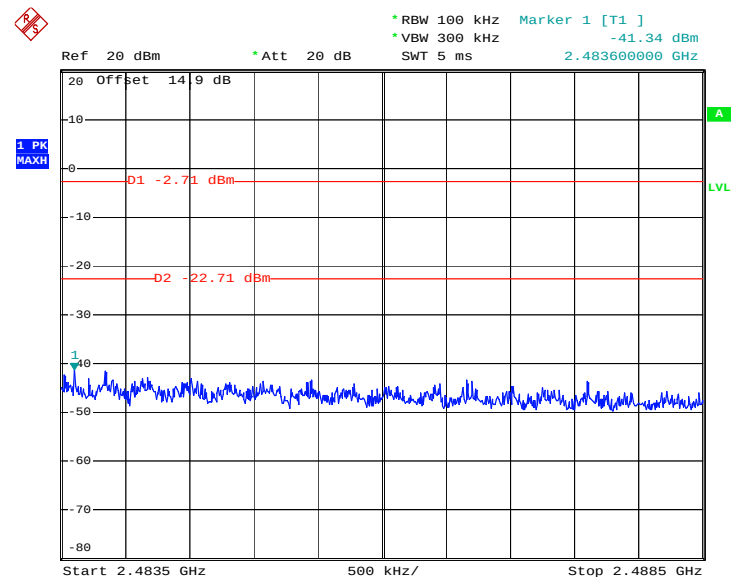
Test Mode :	Mode 4 and 6	Temperature :	24~25°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11g Channel 01



Date: 16.DEC.2011 22:19:34

High Band Edge Plot on 802.11g Channel 11



Date: 16.DEC.2011 22:44:20

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.

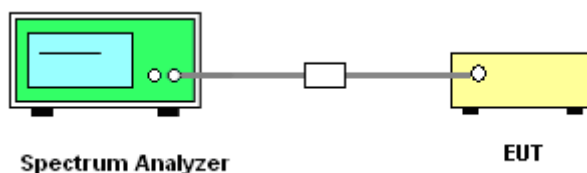
3.4.2 Measuring Instruments

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.

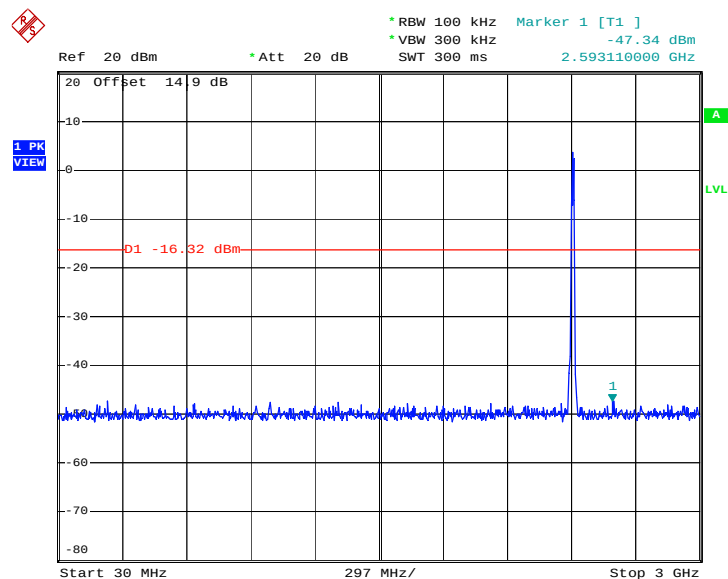
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

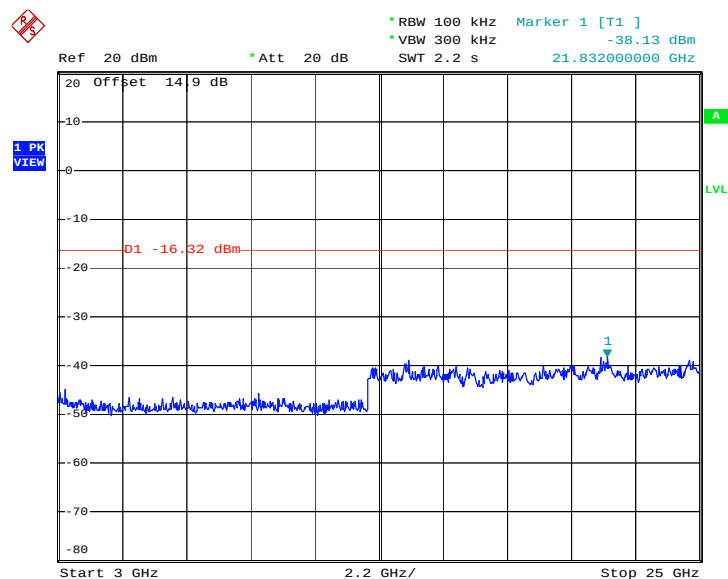
Test Mode :	Mode 1	Temperature :	24~25°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



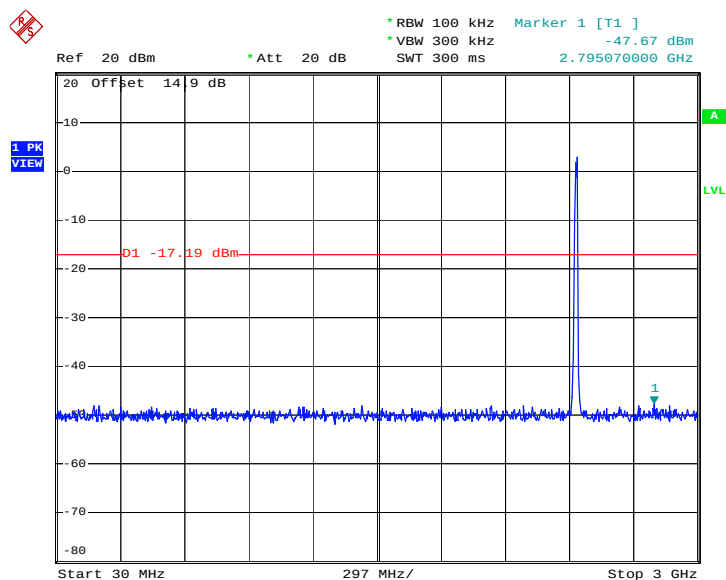
Date: 16.DEC.2011 21:35:08

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

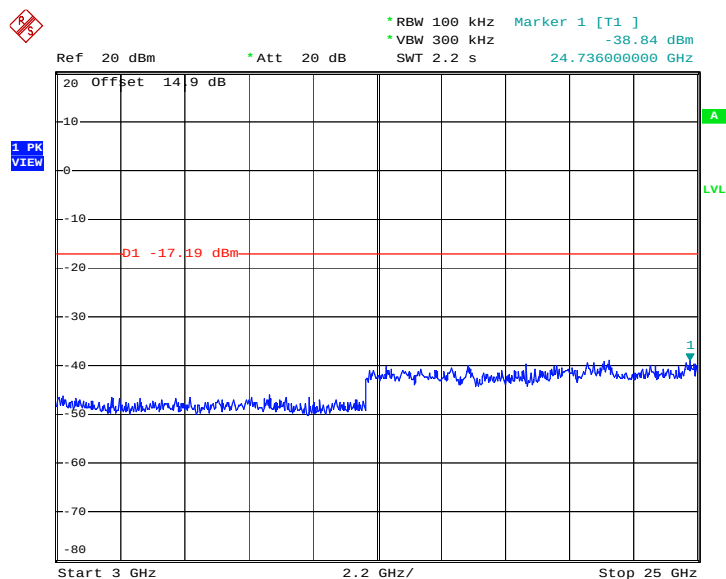


Date: 16.DEC.2011 21:35:25

Test Mode :	Mode 2	Temperature :	24~25°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Zhi Lu

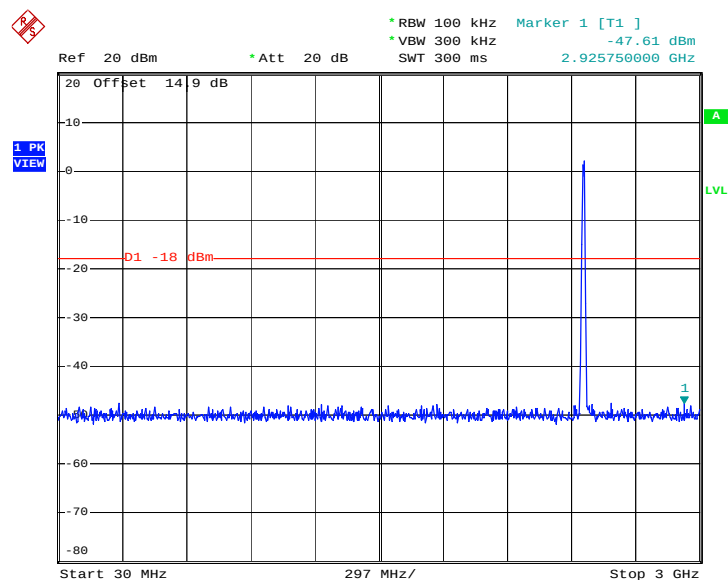
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


Date: 16.DEC.2011 21:47:56

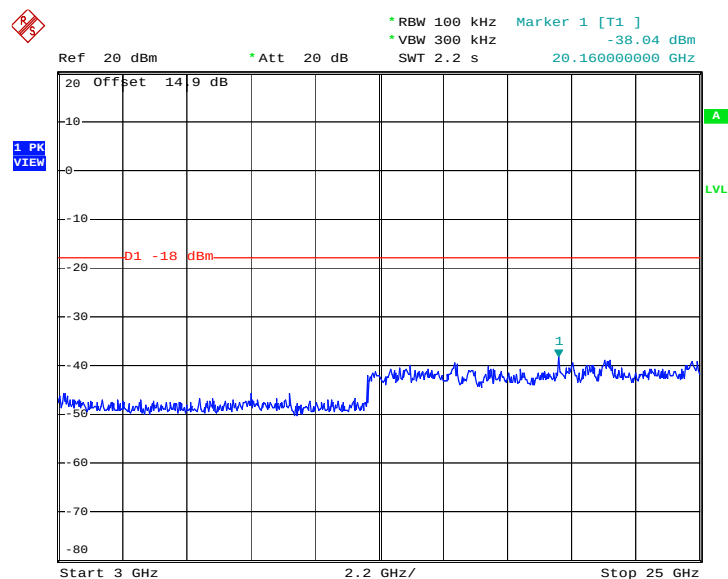
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


Date: 16.DEC.2011 21:48:13

Test Mode :	Mode 3	Temperature :	24~25°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


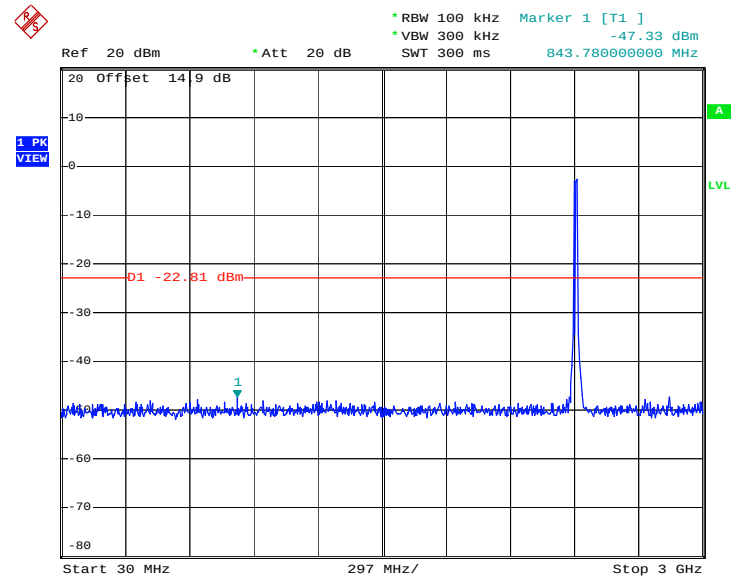
Date: 16.DEC.2011 22:03:32

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


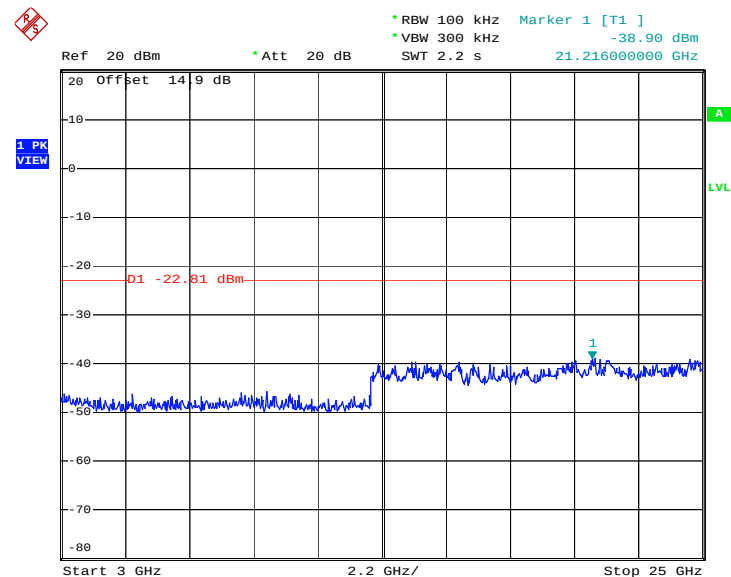
Date: 16.DEC.2011 22:03:49



Test Mode :	Mode 4	Temperature :	24~25°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz

Date: 16.DEC.2011 22:20:24

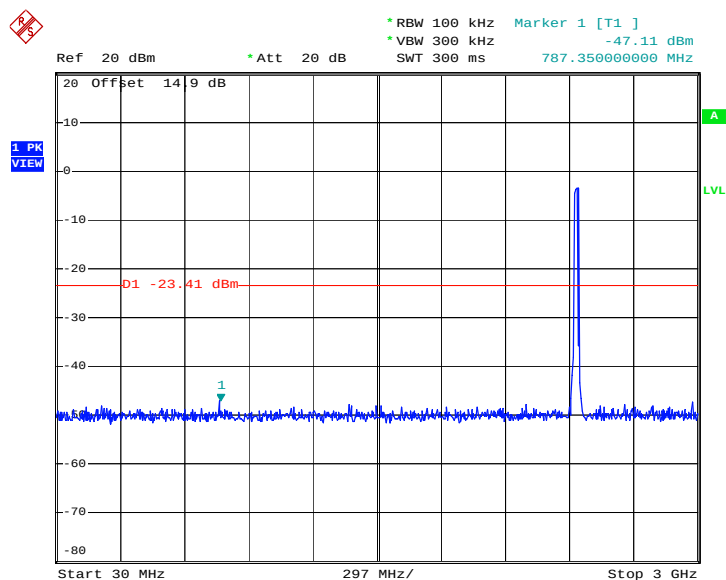
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

Date: 16.DEC.2011 22:20:41



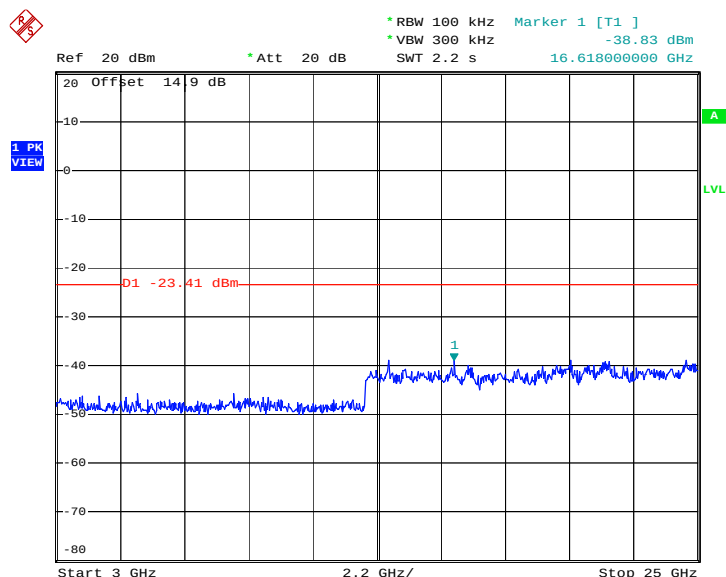
Test Mode :	Mode 5	Temperature :	24~25°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 16.DEC.2011 22:32:40

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

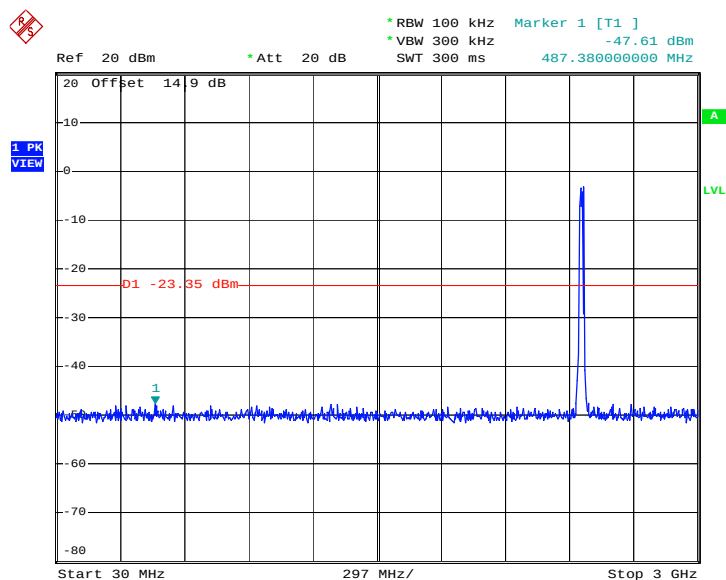


Date: 16.DEC.2011 22:32:57



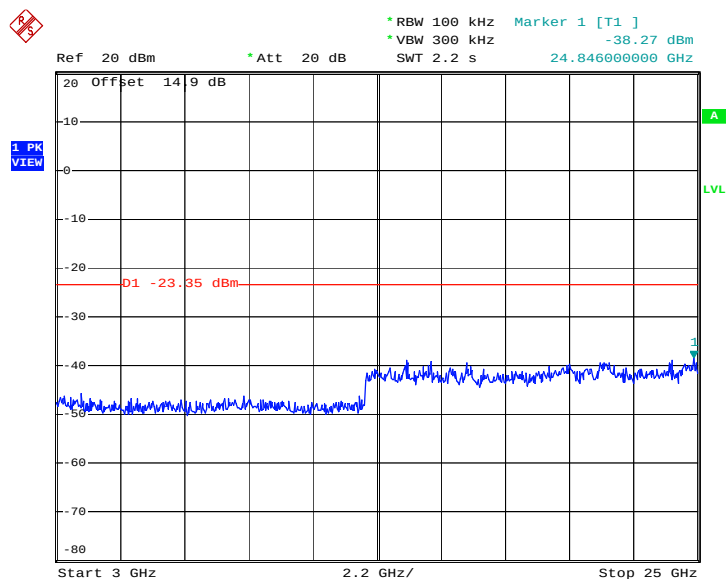
Test Mode :	Mode 6	Temperature :	24~25°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 16.DEC.2011 22:45:06

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 16.DEC.2011 22:45:23

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.

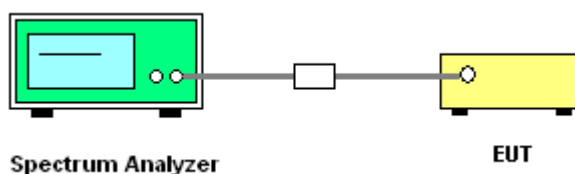
3.5.2 Measuring Instruments

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

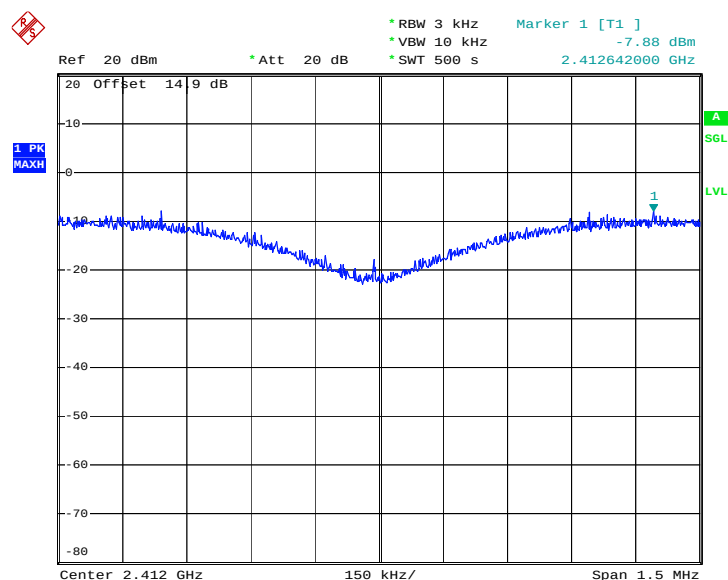


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	24~25℃
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

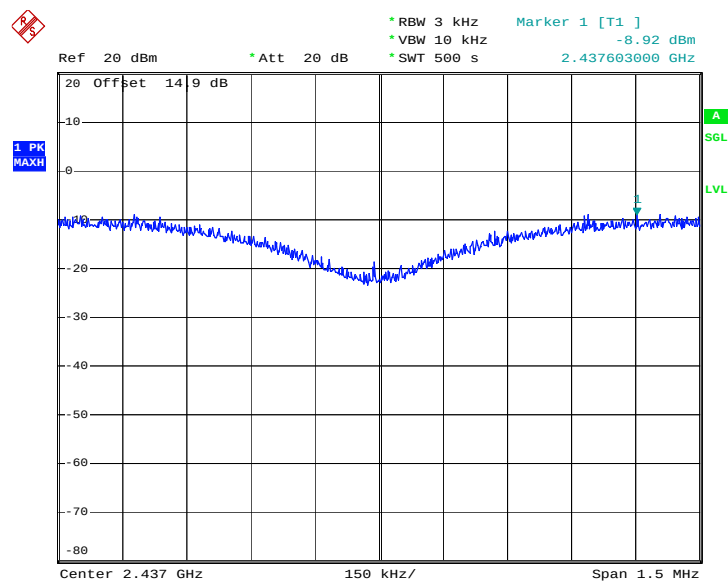
Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-7.88	8	Pass
06	2437	-8.92	8	Pass
11	2462	-7.83	8	Pass

Mode 1 : PSD Plot on 802.11b Channel 01



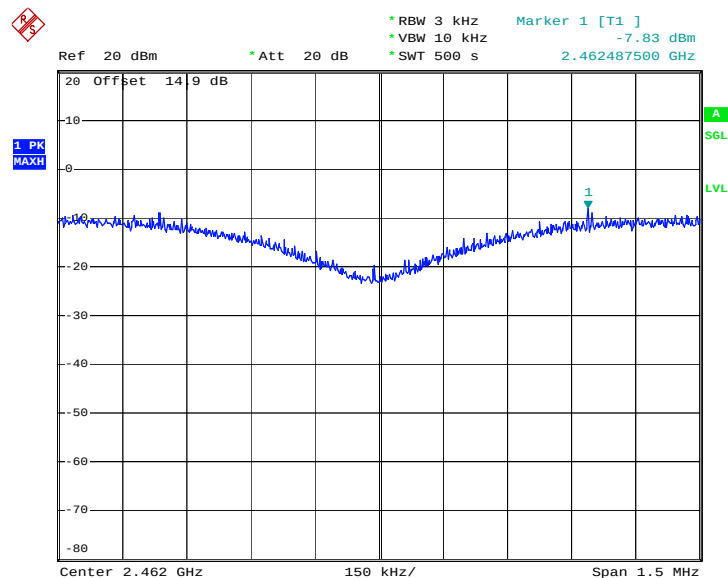
Date: 16.DEC.2011 21:44:27

Mode 2 : PSD Plot on 802.11b Channel 06



Date: 16.DEC.2011 21:58:40

Mode 3 : PSD Plot on 802.11b Channel 11



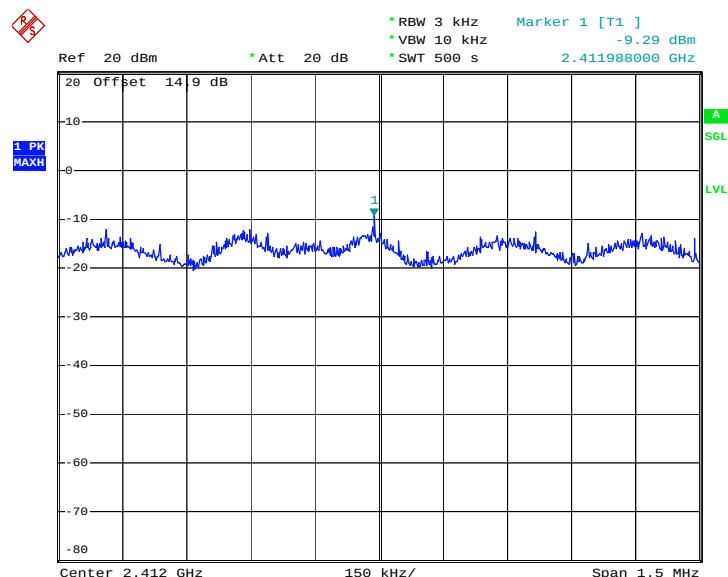
Date: 16.DEC.2011 22:14:39



Test Mode :	Mode 4, 5, 6	Temperature :	24~25°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

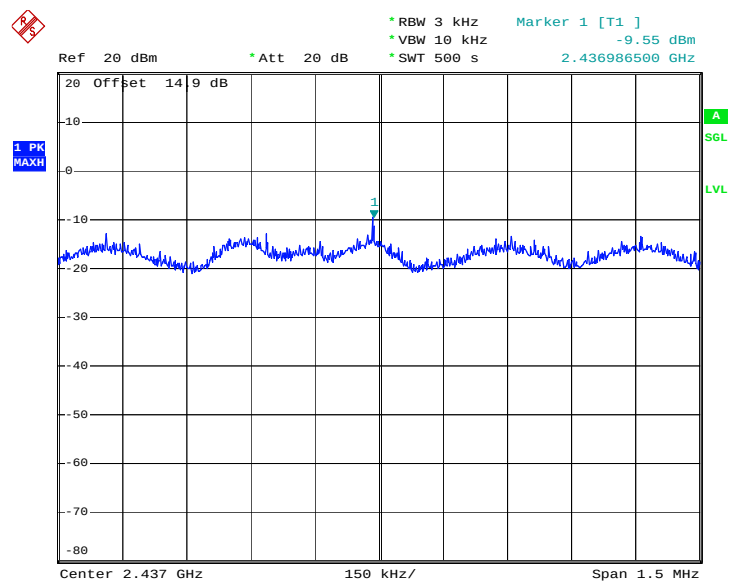
Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-9.29	8	Pass
06	2437	-9.55	8	Pass
11	2462	-10.93	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01



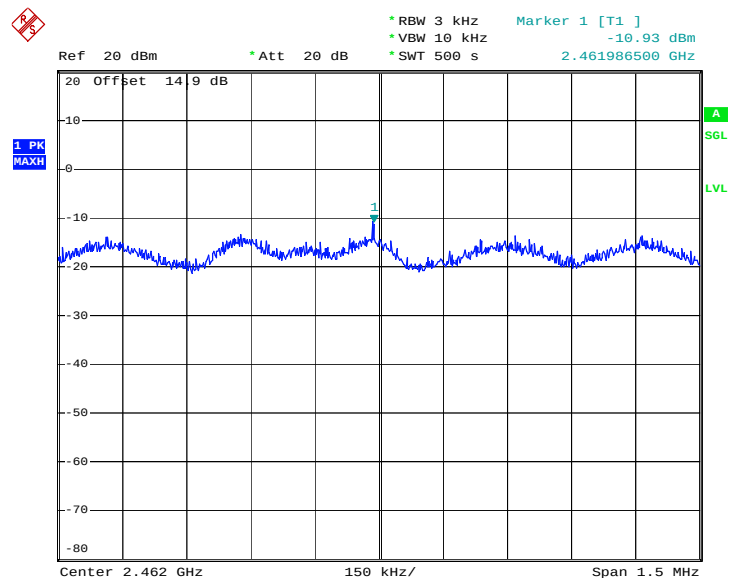
Date: 16.DEC.2011 22:29:30

Mode 5 : PSD Plot on 802.11g Channel 06



Date: 16.DEC.2011 22:41:54

Mode 6 : PSD Plot on 802.11g Channel 11



Date: 16.DEC.2011 22:57:43

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.

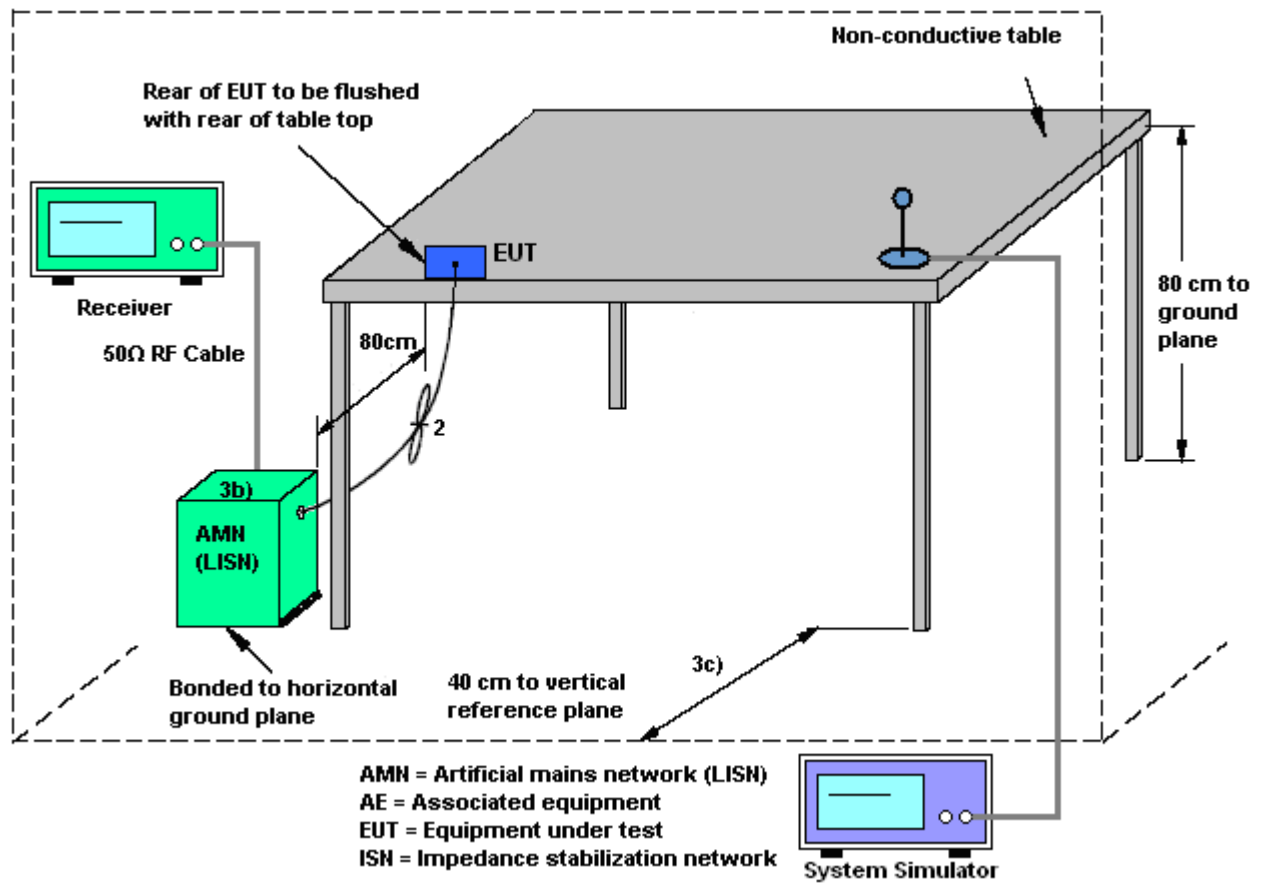
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

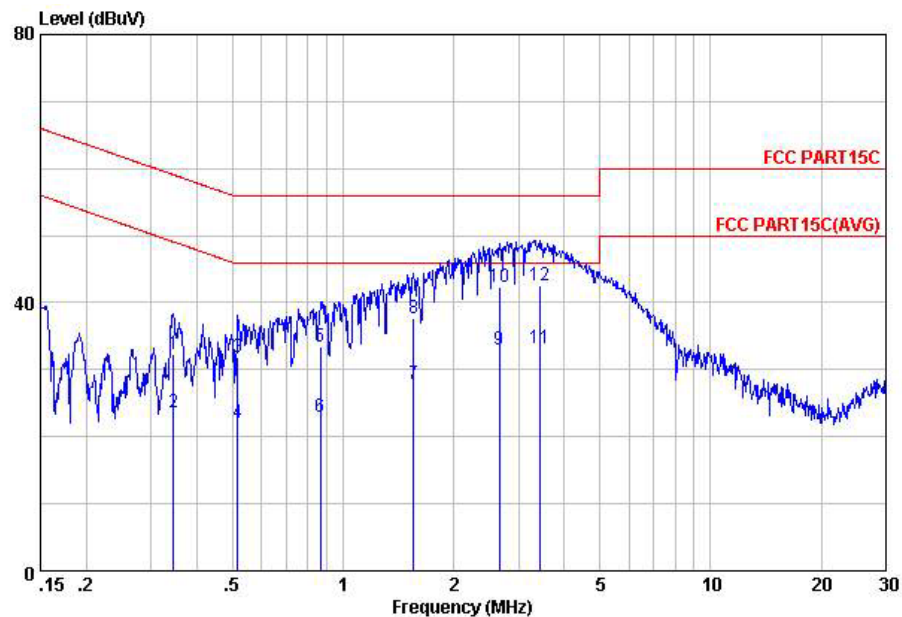
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network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

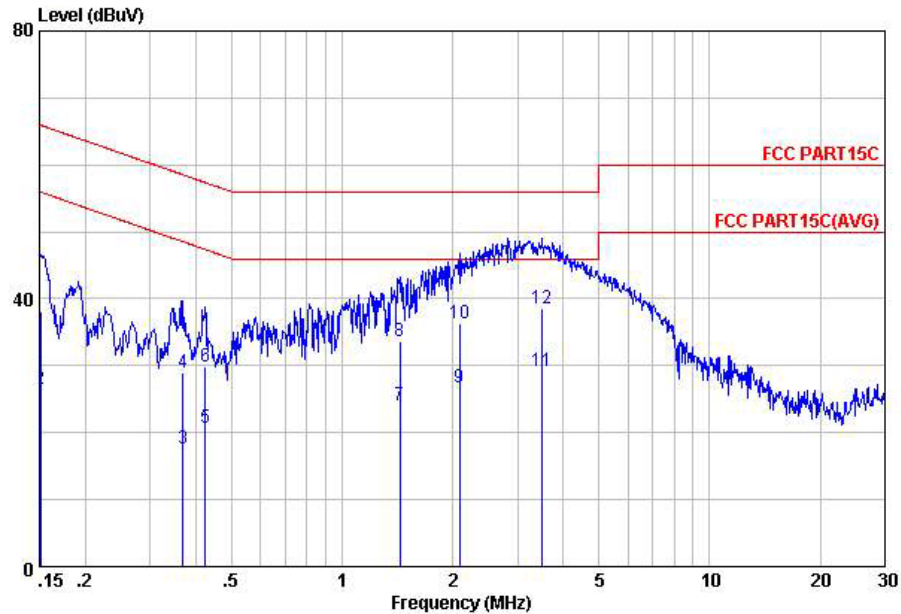
Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Alva Guo	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM 850 Idle + Bluetooth Link + WLAN Link (2.4 GHz) + Adapter + Earphone + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
Condition: FCC PART15C LISN-100807 LINE
Project : (FR) 1D1302
mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.34	32.20	-26.89	59.09	22.10	-0.08	10.18	QP
2	0.34	23.70	-25.39	49.09	13.60	-0.08	10.18	Average
3	0.52	31.83	-24.17	56.00	21.70	-0.08	10.21	QP
4	0.52	22.03	-23.97	46.00	11.90	-0.08	10.21	Average
5	0.87	33.45	-22.55	56.00	23.30	-0.10	10.25	QP
6	0.87	23.05	-22.95	46.00	12.90	-0.10	10.25	Average
7	1.55	27.90	-18.10	46.00	17.71	-0.11	10.30	Average
8	1.55	37.60	-18.40	56.00	27.41	-0.11	10.30	QP
9	2.66	33.04	-12.96	46.00	22.79	-0.11	10.36	Average
10	2.66	42.34	-13.66	56.00	32.09	-0.11	10.36	QP
11	3.42	33.26	-12.74	46.00	23.00	-0.12	10.38	Average
12	3.42	42.46	-13.54	56.00	32.20	-0.12	10.38	QP

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Alva Guo	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM 850 Idle + Bluetooth Link + WLAN Link (2.4 GHz) + Adapter + Earphone + Camera		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
 Condition: FCC PART15C LISN-100807 NEUTRAL
 Project : (FR) 1D1302
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	38.15	-27.81	65.96	28.10	-0.09	10.14	QP
2	0.15	26.45	-29.51	55.96	16.40	-0.09	10.14	Average
3	0.37	17.61	-30.91	48.52	7.51	-0.08	10.18	Average
4	0.37	29.01	-29.51	58.52	18.91	-0.08	10.18	QP
5	0.42	20.72	-26.65	47.37	10.60	-0.08	10.20	Average
6	0.42	29.82	-27.55	57.37	19.70	-0.08	10.20	QP
7	1.43	24.00	-22.00	46.00	13.80	-0.10	10.30	Average
8	1.43	33.60	-22.40	56.00	23.40	-0.10	10.30	QP
9	2.09	26.82	-19.18	46.00	16.60	-0.11	10.33	Average
10	2.09	36.22	-19.78	56.00	26.00	-0.11	10.33	QP
11	3.51	29.26	-16.74	46.00	19.00	-0.12	10.38	Average
12	3.51	38.56	-17.44	56.00	28.30	-0.12	10.38	QP

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

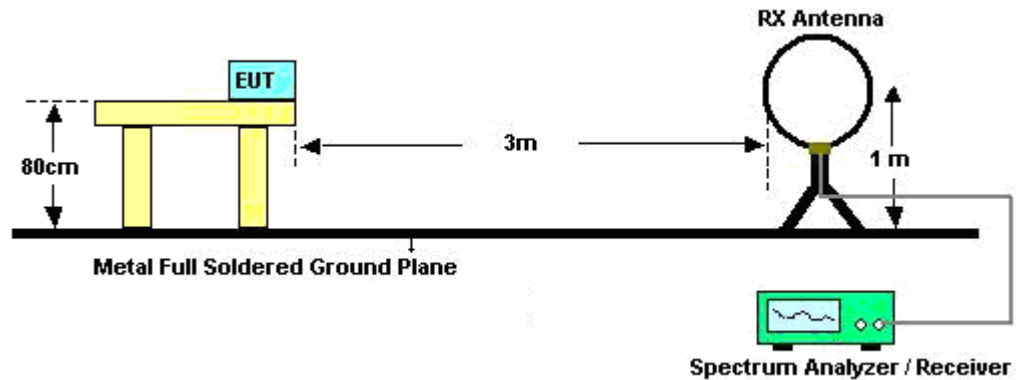
See list of measuring instruments of this test report.

3.7.3 Test Procedures

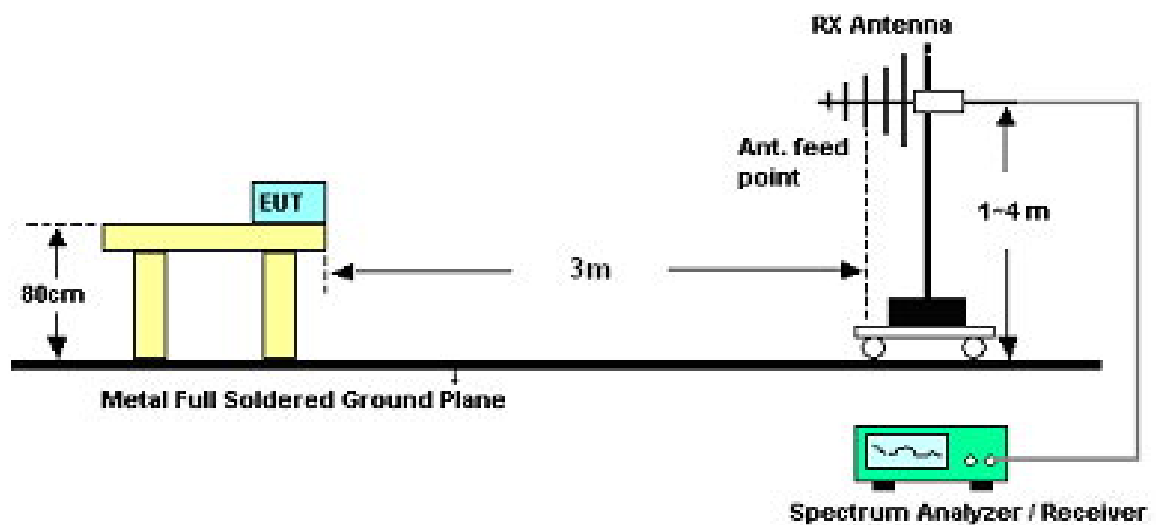
1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
 - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold.
 - (2) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.
Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB)
3. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

3.7.4 Test Setup

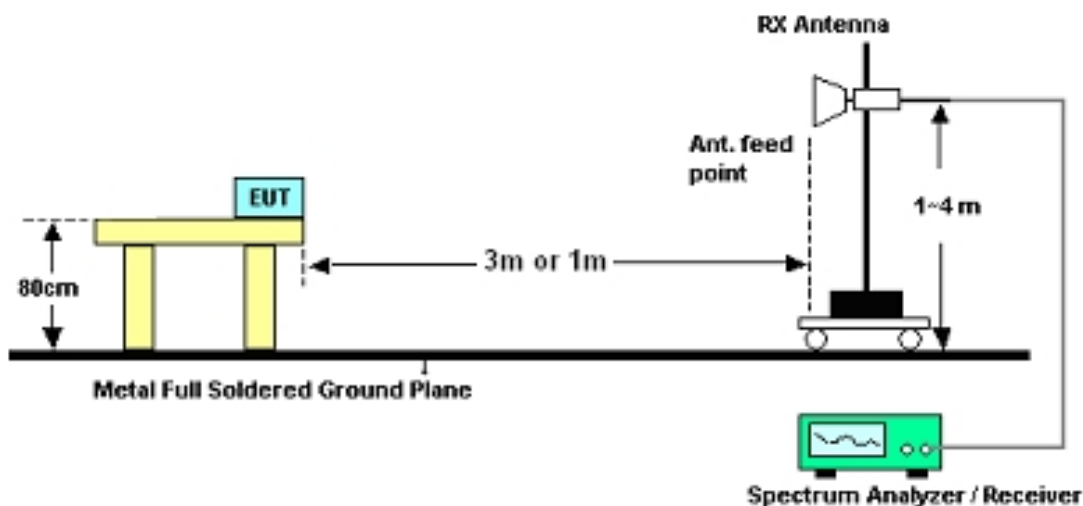
For radiated emissions below 30MHz



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 :	Cloud Peng	Temperature :	20~21℃	
		Relative Humidity :	41~42%	

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

Note:

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

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

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

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

Test Mode :	Mode 1	Temperature :	20~21℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	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
96.15	33.29	-10.21	43.5	52.95	9.91	0.4	29.97	122	348	Peak
144.75	28.84	-14.66	43.5	47.88	10.45	0.5	29.99	-	-	Peak
260.04	26.95	-19.05	46	43.98	12.15	0.68	29.86	-	-	Peak
311.9	24.82	-21.18	46	40.73	13.3	0.74	29.95	-	-	Peak
872.6	27.92	-18.08	46	35.73	20.48	1.29	29.58	-	-	Peak
936.3	28.61	-17.39	46	36.15	20.67	1.32	29.53	-	-	Peak
2386	52	-22	74	49.72	32.86	3.47	34.05	200	345	Peak
2386	42.46	-11.54	54	40.18	32.86	3.47	34.05	200	345	Average
2412	103.61	-	-	101.28	32.89	3.52	34.08	110	0	Peak
2412	99.35	-	-	97.02	32.89	3.52	34.08	110	0	Average
2483.5	48.68	-25.32	74	46.19	33.01	3.68	34.2	100	0	Peak
2483.5	37.46	-16.54	54	34.97	33.01	3.68	34.2	100	0	Average

Test Mode :	Mode 1	Temperature :	20~21℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	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
42.69	33.45	-6.55	40	52.8	10.48	0.26	30.09	101	2	QP
94.26	30.69	-12.81	43.5	50.61	9.66	0.4	29.98	-	-	Peak
190.65	38.5	-5	43.5	59.32	8.55	0.58	29.95	-	-	Peak
546.4	27.23	-18.77	46	37.48	18.43	1	29.68	-	-	Peak
825	26.32	-19.68	46	34.5	20.18	1.26	29.62	-	-	Peak
936.3	28.55	-17.45	46	36.09	20.67	1.32	29.53	-	-	Peak
2385.81	52.83	-21.17	74	50.55	32.86	3.47	34.05	100	0	Peak
2385.81	37.3	-16.7	54	35.02	32.86	3.47	34.05	100	0	Average
2412	103.03	-	-	100.7	32.89	3.52	34.08	112	0	Peak
2412	99.73	-	-	97.4	32.89	3.52	34.08	112	0	Average
2495.06	49.52	-24.48	74	46.98	33.05	3.72	34.23	100	0	Peak
2495.06	38.99	-15.01	54	36.45	33.05	3.72	34.23	100	0	Average

Test Mode :	Mode 2	Temperature :	20~21℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Horizontal
Remark :	2437 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
96.42	33.55	-9.95	43.5	53.21	9.91	0.4	29.97	164	360	Peak
143.94	29.09	-14.41	43.5	48.03	10.55	0.5	29.99	-	-	Peak
157.98	28.61	-14.89	43.5	48.36	9.67	0.53	29.95	-	-	Peak
311.9	31.45	-14.55	46	47.36	13.3	0.74	29.95	-	-	Peak
821.5	28.79	-17.21	46	37.04	20.11	1.26	29.62	-	-	Peak
911.8	29.76	-16.24	46	37.44	20.5	1.31	29.49	-	-	Peak
2365.1	50.05	-23.95	74	47.84	32.81	3.38	33.98	190	302	Peak
2365.1	37.37	-16.63	54	35.16	32.81	3.38	33.98	190	302	Average
2437	101.35	-	-	98.95	32.95	3.6	34.15	200	354	Peak
2437	97.86	-	-	95.46	32.95	3.6	34.15	200	354	Average
2484.04	49.39	-24.61	74	46.9	33.01	3.68	34.2	167	294	Peak
2484.04	35.65	-18.35	54	33.16	33.01	3.68	34.2	167	294	Average
4874	51.83	-22.17	74	43.94	35.18	4.98	32.27	136	358	Peak
4874	46.58	-7.42	54	38.69	35.18	4.98	32.27	136	358	Average

Test Mode :	Mode 2	Temperature :	20~21℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Vertical
Remark :	2437 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
41.34	34.13	-5.87	40	53	10.95	0.26	30.08	102	26	QP
94.26	30.59	-12.91	43.5	50.51	9.66	0.4	29.98	-	-	Peak
199.56	33.83	-9.67	43.5	54.25	9	0.59	30.01	-	-	Peak
544.3	21.11	-24.89	46	31.4	18.39	1	29.68	-	-	Peak
848.8	25.67	-20.33	46	33.55	20.5	1.28	29.66	-	-	Peak
936.3	29.32	-16.68	46	36.86	20.67	1.32	29.53	-	-	Peak
2336.98	49.75	-24.25	74	47.58	32.78	3.33	33.94	100	0	Peak
2336.98	35.54	-18.46	54	33.37	32.78	3.33	33.94	100	0	Average
2437	98.5	-	-	96.1	32.95	3.6	34.15	101	30	Peak
2437	94.83	-	-	92.43	32.95	3.6	34.15	101	30	Average
2492.78	49.53	-24.47	74	46.99	33.05	3.72	34.23	134	203	Peak
2492.78	35.3	-18.7	54	32.76	33.05	3.72	34.23	134	203	Average

Test Mode :	Mode 3	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Horizontal
Remark :	2462 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
40.8	27.42	-12.58	40	45.58	11.64	0.25	30.05	-	-	Peak
96.42	34.92	-8.58	43.5	54.58	9.91	0.4	29.97	103	360	Peak
190.65	30.94	-12.56	43.5	51.76	8.55	0.58	29.95	-	-	Peak
530.3	24.15	-21.85	46	34.81	18.05	0.99	29.7	-	-	Peak
849.5	28.46	-17.54	46	36.33	20.51	1.28	29.66	-	-	Peak
883.1	28.31	-17.69	46	36.08	20.47	1.29	29.53	-	-	Peak
2341.35	49.4	-24.6	74	47.23	32.78	3.33	33.94	153	105	Peak
2341.35	36.33	-17.67	54	34.16	32.78	3.33	33.94	153	105	Average
2462	101.92	-	-	99.47	32.98	3.64	34.17	163	37	Peak
2462	97.04	-	-	94.59	32.98	3.64	34.17	163	37	Average
2483.5	48.69	-25.31	74	46.2	33.01	3.68	34.2	120	0	Peak
2483.5	35.94	-18.06	54	33.45	33.01	3.68	34.2	120	0	Average

Test Mode :	Mode 3	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Vertical
Remark :	2462 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
41.88	34.93	-5.07	40	53.8	10.95	0.26	30.08	100	0	QP
138	32.57	-10.93	43.5	51.03	11.05	0.49	30	-	-	Peak
190.65	40.02	-3.48	43.5	60.84	8.55	0.58	29.95	-	-	Peak
763.4	23.47	-22.53	46	31.93	19.89	1.2	29.55	-	-	Peak
900.6	24.83	-21.17	46	32.56	20.45	1.3	29.48	-	-	Peak
936.3	28.28	-17.72	46	35.82	20.67	1.32	29.53	-	-	Peak
2330.14	49.53	-24.47	74	47.4	32.76	3.27	33.9	120	100	Peak
2330.14	37.15	-16.85	54	35.02	32.76	3.27	33.9	120	100	Average
2462	90.07	-	-	87.62	32.98	3.64	34.17	128	93	Average
2462	92.63	-	-	90.18	32.98	3.64	34.17	128	93	Peak
2496.77	49.65	-24.35	74	47.11	33.05	3.72	34.23	134	267	Peak
2496.77	37.21	-16.79	54	34.67	33.05	3.72	34.23	134	267	Average

Test Mode :	Mode 4	Temperature :	20~21℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	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
95.88	33.59	-9.91	43.5	53.25	9.91	0.4	29.97	-	-	Peak
144.48	28.71	-14.79	43.5	47.75	10.45	0.5	29.99	-	-	Peak
190.65	34.69	-8.81	43.5	55.51	8.55	0.58	29.95	100	0	Peak
533.8	23.38	-22.62	46	33.94	18.14	0.99	29.69	-	-	Peak
825.7	30.06	-15.94	46	38.24	20.18	1.26	29.62	-	-	Peak
936.3	28.88	-17.12	46	36.42	20.67	1.32	29.53	-	-	Peak
2390	60.22	-13.78	74	57.94	32.86	3.47	34.05	106	241	Peak
2390	44.15	-9.85	54	41.87	32.86	3.47	34.05	106	241	Average
2412	90.52	-	-	88.19	32.89	3.52	34.08	100	269	Average
2412	101	-	-	98.67	32.89	3.52	34.08	100	269	Peak
2483.5	48.28	-25.72	74	45.79	33.01	3.68	34.2	100	0	Peak
2483.5	35.59	-18.41	54	33.1	33.01	3.68	34.2	100	0	Average

Test Mode :	Mode 4	Temperature :	20~21℃
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	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
41.07	33.35	-6.65	40	51.51	11.64	0.25	30.05	100	0	QP
93.99	30.14	-13.36	43.5	50.06	9.66	0.4	29.98	-	-	Peak
190.65	41.22	-2.28	43.5	62.04	8.55	0.58	29.95	100	0	QP
580.7	27.11	-18.89	46	37.13	18.57	1.05	29.64	-	-	Peak
824.3	26.94	-19.06	46	35.14	20.16	1.26	29.62	-	-	Peak
936.3	28.74	-17.26	46	36.28	20.67	1.32	29.53	-	-	Peak
2390	60.09	-13.91	74	57.81	32.86	3.47	34.05	100	271	Peak
2390	44.79	-9.21	54	42.51	32.86	3.47	34.05	100	271	Average
2412	87.78	-	-	85.45	32.89	3.52	34.08	100	145	Average
2412	98	-	-	95.67	32.89	3.52	34.08	100	145	Peak
2483.5	47.08	-26.92	74	44.59	33.01	3.68	34.2	100	0	Peak
2483.5	34.59	-19.41	54	32.1	33.01	3.68	34.2	100	0	Average

Test Mode :	Mode 5	Temperature :	20~21℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Horizontal
Remark :	2437 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
95.61	33.34	-10.16	43.5	53	9.91	0.4	29.97	-	-	Peak
190.65	38.55	-4.95	43.5	59.37	8.55	0.58	29.95	100	0	Peak
234.12	28.1	-17.9	46	46.14	11.17	0.65	29.86	-	-	Peak
528.9	31.99	-14.01	46	42.72	17.99	0.98	29.7	-	-	Peak
825	29.9	-16.1	46	38.08	20.18	1.26	29.62	-	-	Peak
936.3	29.66	-16.34	46	37.2	20.67	1.32	29.53	-	-	Peak
2390	47.59	-26.41	74	45.31	32.86	3.47	34.05	100	0	Peak
2390	36.68	-17.32	54	34.4	32.86	3.47	34.05	100	0	Average
2437	90.69	-	-	88.29	32.95	3.6	34.15	100	44	Average
2437	99.9	-	-	97.5	32.95	3.6	34.15	100	44	Peak
2483.5	47.16	-26.84	74	44.67	33.01	3.68	34.2	100	0	Peak
2483.5	36.29	-17.71	54	33.8	33.01	3.68	34.2	100	0	Average

Test Mode :	Mode 5	Temperature :	20~21℃
Test Channel :	06	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Vertical
Remark :	2437 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
40.8	32.65	-7.35	40	50.81	11.64	0.25	30.05	102	360	QP
138.54	31.32	-12.18	43.5	49.86	10.97	0.49	30	-	-	Peak
190.65	38.88	-4.62	43.5	59.7	8.55	0.58	29.95	-	-	Peak
570.9	23.84	-22.16	46	33.93	18.54	1.03	29.66	-	-	Peak
825.7	27.03	-18.97	46	35.21	20.18	1.26	29.62	-	-	Peak
936.3	27.83	-18.17	46	35.37	20.67	1.32	29.53	-	-	Peak
2390	47.48	-26.52	74	45.2	32.86	3.47	34.05	100	0	Peak
2390	35.78	-18.22	54	33.5	32.86	3.47	34.05	100	0	Average
2437	83.96	-	-	81.56	32.95	3.6	34.15	100	95	Average
2437	94.91	-	-	92.51	32.95	3.6	34.15	100	95	Peak
2483.5	48.24	-25.76	74	45.75	33.01	3.68	34.2	100	0	Peak
2483.5	34.59	-19.41	54	32.1	33.01	3.68	34.2	100	0	Average

Test Mode :	Mode 6	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Horizontal
Remark :	2462 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
96.96	33.06	-10.44	43.5	52.6	10.03	0.4	29.97	-	-	Peak
144.48	28.53	-14.97	43.5	47.57	10.45	0.5	29.99	-	-	Peak
190.65	39.1	-4.4	43.5	59.92	8.55	0.58	29.95	100	0	Peak
528.9	26.41	-19.59	46	37.14	17.99	0.98	29.7	-	-	Peak
818.7	25.9	-20.1	46	34.19	20.06	1.26	29.61	-	-	Peak
936.3	27.58	-18.42	46	35.12	20.67	1.32	29.53	-	-	Peak
2390	46.66	-27.34	74	46.66	0	0	0	100	0	Peak
2390	35.78	-18.22	54	35.78	0	0	0	100	0	Average
2462	91.01	-	-	91.01	0	0	0	100	88	Average
2462	97.55	-	-	97.55	0	0	0	100	88	Peak
2483.5	54.11	-19.89	74	54.11	0	0	0	200	58	Peak
2483.5	47.43	-6.57	54	47.43	0	0	0	200	58	Average

Test Mode :	Mode 6	Temperature :	20~21℃
Test Channel :	11	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Vertical
Remark :	2462 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
41.88	33.13	-6.87	40	52	10.95	0.26	30.08	103	10	QP
94.26	30.32	-13.18	43.5	50.24	9.66	0.4	29.98	-	-	Peak
190.65	38.38	-5.12	43.5	59.2	8.55	0.58	29.95	-	-	Peak
710.9	28.58	-17.42	46	37.74	19.4	1.14	29.7	-	-	Peak
824.3	27.19	-18.81	46	35.39	20.16	1.26	29.62	-	-	Peak
936.3	28.42	-17.58	46	35.96	20.67	1.32	29.53	-	-	Peak
2390	48.29	-25.71	74	48.29	0	0	0	100	0	Peak
2390	34.13	-19.87	54	34.13	0	0	0	100	0	Average
2462	79.96	-	-	79.96	0	0	0	200	180	Average
2462	93	-	-	93	0	0	0	200	180	Peak
2483.5	51.02	-22.98	74	51.02	0	0	0	200	312	Peak
2483.5	37.34	-16.66	54	37.34	0	0	0	200	312	Average

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 PIFA 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	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Jan. 10, 2012	Dec. 29, 2012	Conducted (TH01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 30, 2011	Jan. 10, 2012	Dec. 29, 2012	Conducted (TH01-KS)
DC Power Supply	TOPWARD	GPS-3030D	E1884515	N/A	Aug. 23, 2011	Jan. 10, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Jan. 10, 2012	Dec. 29, 2012	Conducted (TH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 02, 2011	Jan. 09, 2012	Jun. 01, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 30, 2011	Jan. 09, 2012	Dec. 29, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 30, 2011	Jan. 09, 2012	Dec. 29, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 16, 2011	Jan. 09, 2012	Nov. 15, 2012	Conduction (CO01-KS)
System Simulator	R&S	CMU200	837587/066	2G Full-Band	Dec. 30, 2011	Jan. 09, 2012	Dec. 29, 2012	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Jan. 10, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Jan. 10, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Jan. 10, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/00	9 kHz~30 MHz	Jul. 28, 2011	Jan. 10, 2012	Jul. 27, 2012	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Jan. 10, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Jan. 10, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Jan. 10, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	Jan. 10, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	Jan. 10, 2012	Oct.10, 2012	Radiation (03CH01-KS)

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

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

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	± 0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	± 1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	± 0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site Imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP1D1302B as below.