

FCC RF Test Report

APPLICANT : Acer Incorporated
EQUIPMENT : Smart HandHeld
BRAND NAME : Acer
MODEL NAME : S120
FCC ID : HLZJMS120EU
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Aug. 19, 2010 and completely tested on Sep. 15, 2010. 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:



Anderson Chiu / Deputy 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
FR081915-04B	Rev. 01	Initial issue of report	Oct. 20, 2010

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 17.3 dB at 0.366 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.61 dB at 2483.50 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Acer Incorporated

8F., No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan

1.2 Manufacturer

Compal Communication (Nanjing)

Nanjing Jingning Export Processing Zone (South Area) No. 68-2 Suyuan Street

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Smart HandHeld
Brand Name	Acer
Model Name	S120
Sample 1	EUT with Memory 1
Sample 2	EUT with Memory 2
FCC ID	HLZJMS120EU
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 : 13.38 dBm (0.022 W) 802.11g : 17.48 dBm (0.056 W) 802.11n (BW 20MHz) : 14.65 dBm (0.029 W)
Antenna Type	PIFA Antenna with gain 2.0 dBi
HW Version	REV0E (DVT2)
SW Version	Android version: 2.2 Baseband version: A4-00.18.00 Build number:Acer_LiquidMetal_0.018.50
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : 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. The EUT have support 802.11n (BW 20 MHz) function only, not support 802.11n (BW 40 MHz) function.

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	03CH05-HY	TW1022/4086B-1

1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 7

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC), recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	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)			
		At DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	13.02	12.99	13.00	13.08
CH 06	2437 MHz	13.34	13.32	13.32	13.38
CH 11	2462 MHz	12.30	12.17	12.25	12.27

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		At OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	16.02	16.10	15.96	16.11	17.30	17.41	17.01	17.48
CH 06	2437 MHz	15.23	15.25	15.23	15.15	15.99	16.44	16.04	16.31
CH 11	2462 MHz	15.12	15.18	15.02	15.01	15.73	16.50	16.15	16.21

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		At OFDM Data Rate							
		m0	m1	m2	m3	m4	m5	m6	m7
CH 01	2412 MHz	13.37	13.05	13.59	12.10	13.85	13.77	14.65	13.68
CH 06	2437 MHz	13.52	13.13	13.60	12.06	13.72	13.67	14.48	13.76
CH 11	2462 MHz	12.52	12.40	12.57	10.89	12.28	12.37	13.40	11.66

Remark:

1. The data rates of WLAN 802.11b/g/n were set in 11Mbps for 802.11b, 54Mbps for 802.11g and m6 for 802.11n (BW 20MHz) 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).

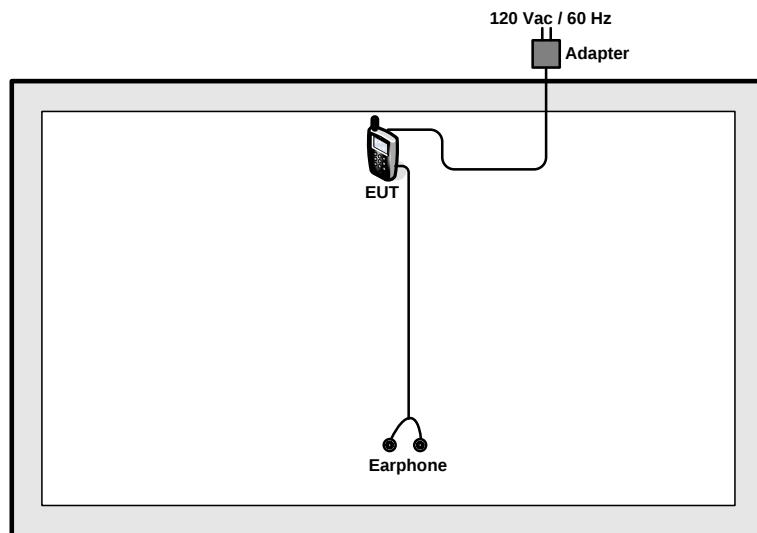
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

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

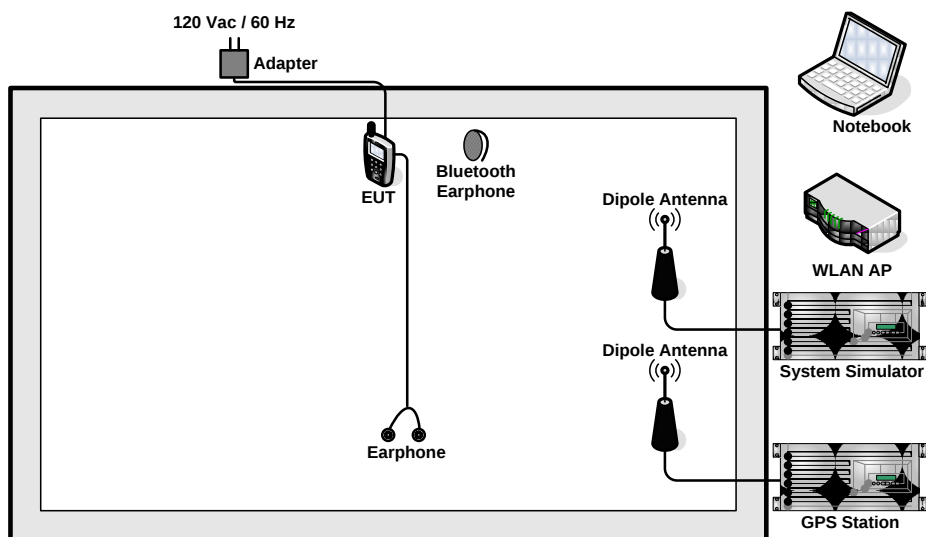
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11n (BW 20M)_CH01_2412 MHz Mode 8: 802.11n (BW 20M)_CH06_2437 MHz Mode 9: 802.11n (BW 20M)_CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz + Battery 1 Mode 2 : 802.11b CH06_2437 MHz + Battery 1 Mode 3 : 802.11b CH11_2462 MHz + Battery 1	Mode 4: 802.11g_CH01_2412 MHz + Battery 1 Mode 5: 802.11g_CH06_2437 MHz + Battery 1 Mode 6: 802.11g_CH11_2462 MHz + Battery 1 Mode 7: 802.11n (BW 20M)_CH01_2412 MHz + Battery 2 Mode 8: 802.11n (BW 20M)_CH06_2437 MHz + Battery 2 Mode 9: 802.11n (BW 20M)_CH11_2462 MHz + Battery 2
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Adapter + Earphone + Battery 1	
Remark: Sample 1 and Sample 2 are almost the same. The difference between these two samples is memory only. The difference is not related any RF effect, so only Sample 1 is used for all tests.		

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<EUT with Adapter Mode>



2.4 RF Utility

The RF utility "AT command" is installed in notebook 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.

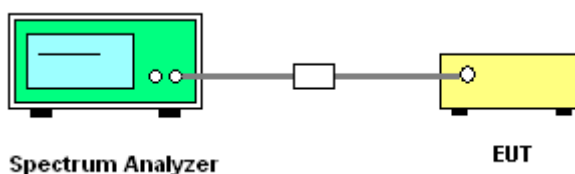
3.1.2 Measuring Instruments

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

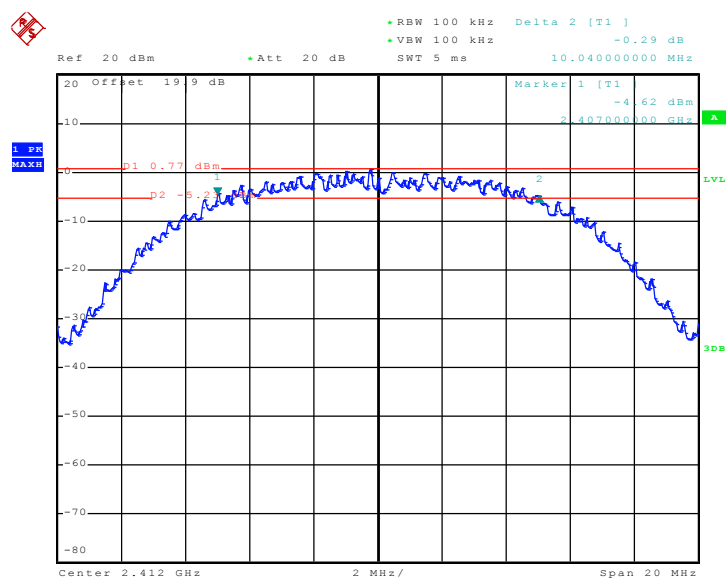


3.1.5 Test Result of 6dB Bandwidth

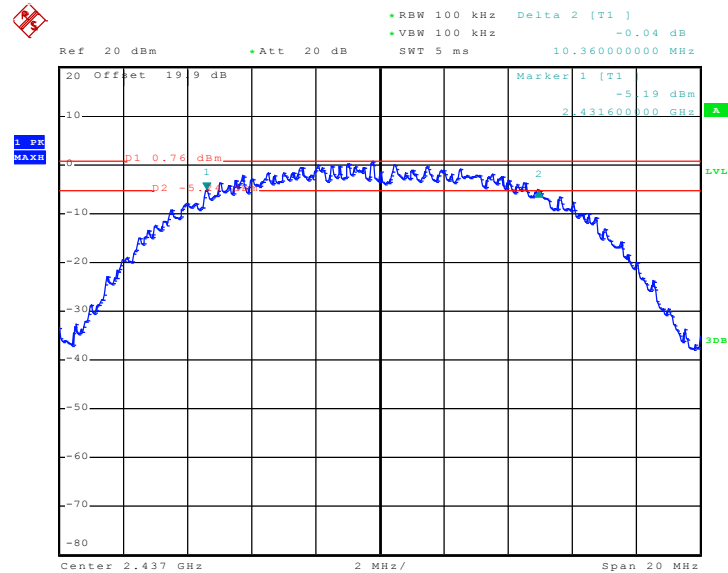
Test Mode :	Mode 1, 2, 3	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	10.04	0.5	Pass
06	2437	10.36	0.5	Pass
11	2462	10.04	0.5	Pass

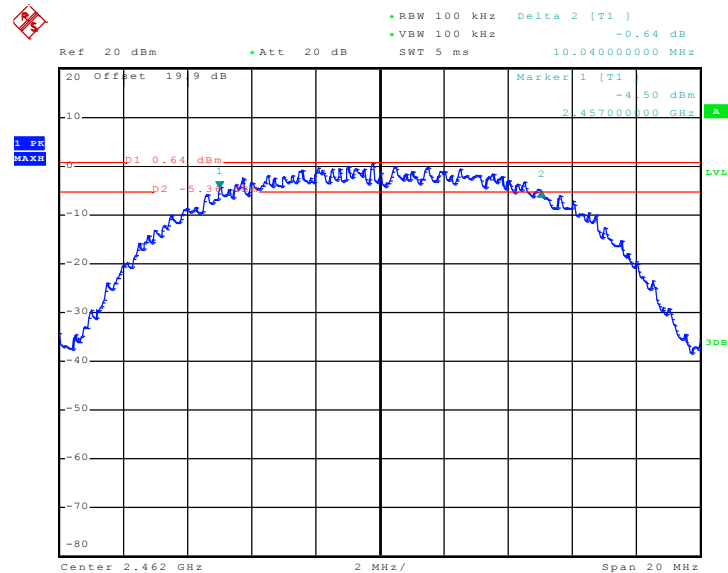
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 14.SEP.2010 22:06:55

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


Date: 14.SEP.2010 22:05:12

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


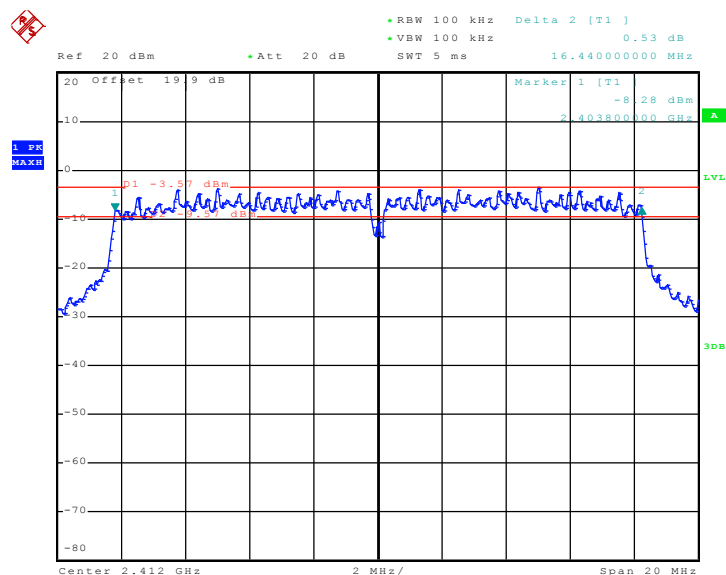
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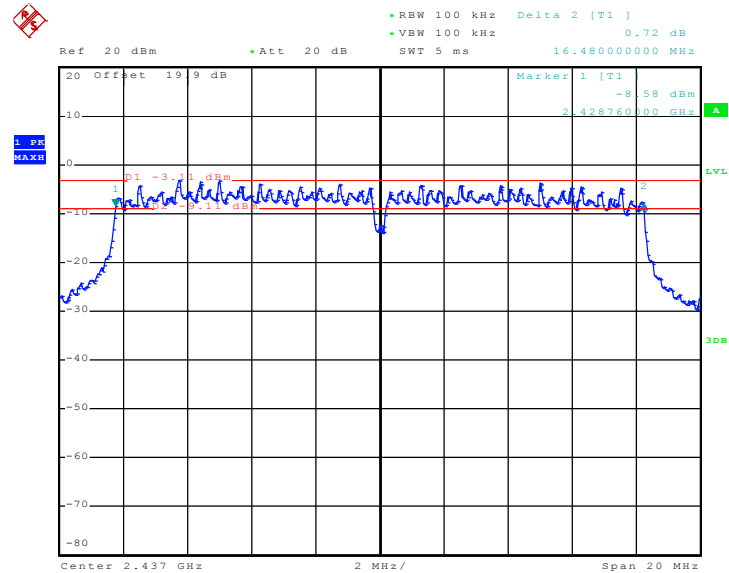
Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.44	0.5	Pass
06	2437	16.48	0.5	Pass
11	2462	16.52	0.5	Pass

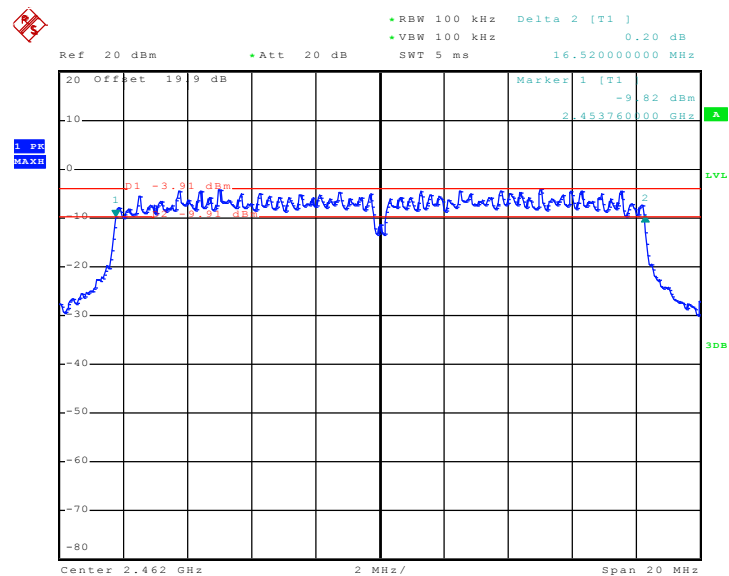
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 14.SEP.2010 22:45:06

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


Date: 14.SEP.2010 22:51:57

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


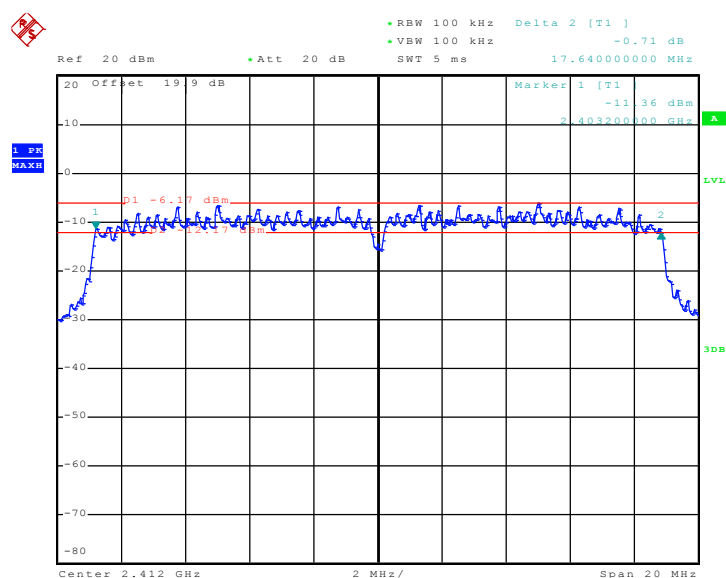
Date: 14.SEP.2010 23:12:43



Test Mode :	Mode 7, 8, 9	Temperature :	25~27°C
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.64	0.5	Pass
06	2437	17.32	0.5	Pass
11	2462	17.68	0.5	Pass

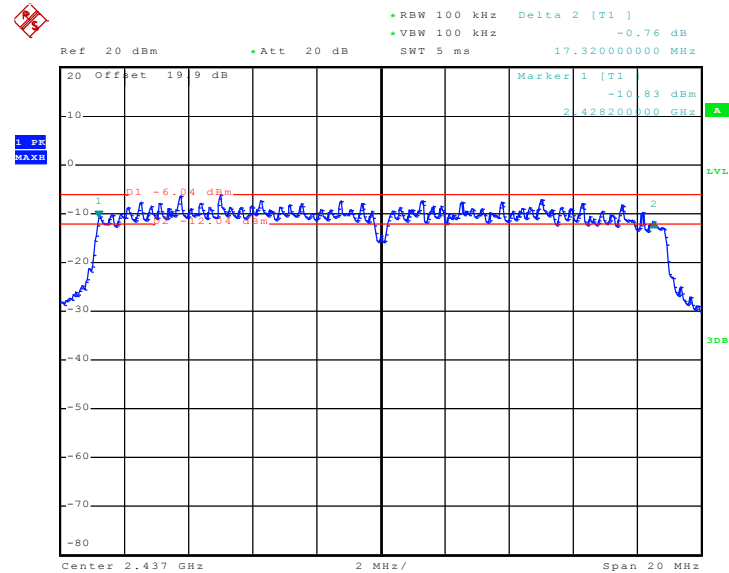
Mode 7 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 01



Date: 15.SEP.2010 01:48:01

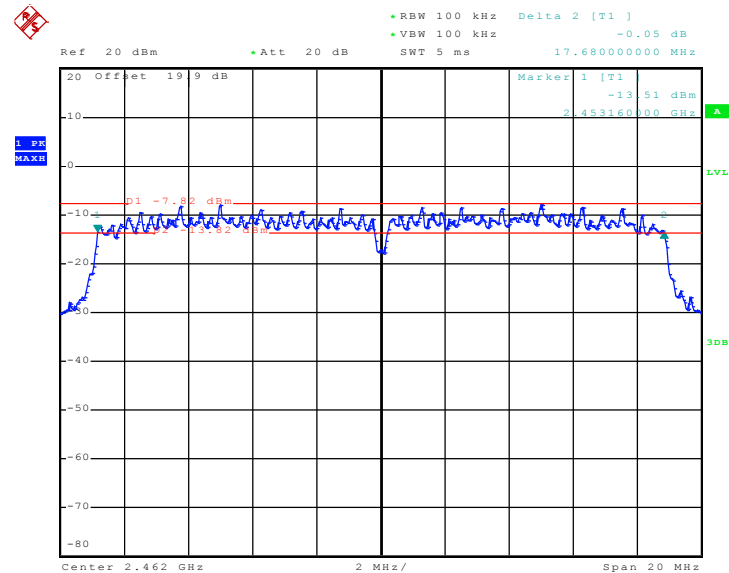


Mode 8 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 06



Date: 15.SEP.2010 01:19:49

Mode 9 : 6 dB Bandwidth Plot on 802.11n(BW 20MHz) Channel 11



Date: 15.SEP.2010 01:08:16

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.

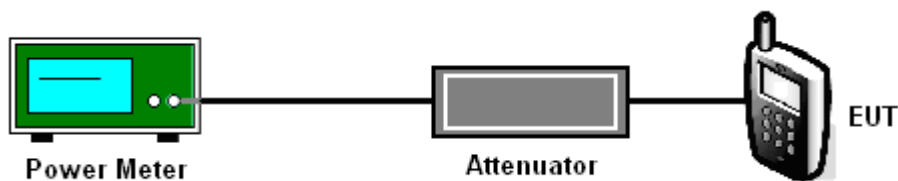
3.2.2 Measuring Instruments

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 :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	13.08	30	Pass
06	2437	13.38	30	Pass
11	2462	12.27	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	17.48	30	Pass
06	2437	16.31	30	Pass
11	2462	16.21	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	14.65	30	Pass
06	2437	14.48	30	Pass
11	2462	13.40	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

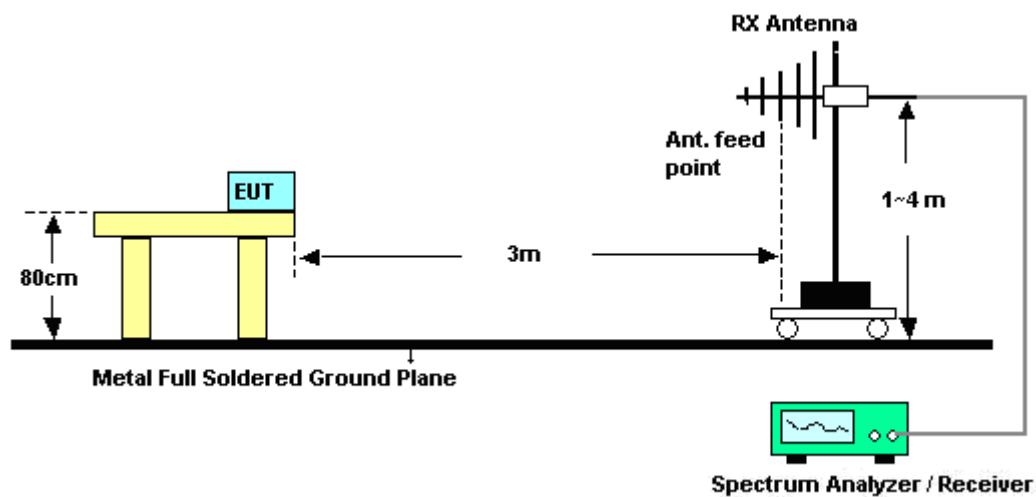
See list of measuring instruments of this test report.

3.3.3 Test Procedures

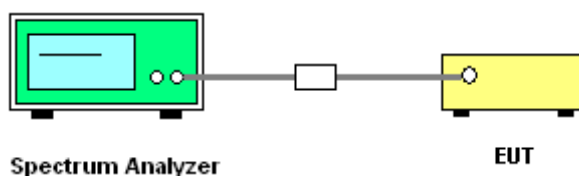
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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 :	26.1~27.8℃
Test Band :	802.11b	Relative Humidity :	51~57%
Test Channel :	01	Test Engineer :	Jason Wang

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	59.02	-14.98	74	56.93	31.7	4.47	34.08	138	355	Peak
2386	47.29	-6.71	54	45.2	31.7	4.47	34.08	138	355	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
2384.86	49.08	-24.92	74	47.01	31.68	4.47	34.08	100	201	Peak
2384.86	36.74	-17.26	54	34.67	31.68	4.47	34.08	100	201	Average

Test Mode :	Mode 3	Temperature :	26.1~27.8℃
Test Band :	802.11b	Relative Humidity :	51~57%
Test Channel :	11	Test Engineer :	Jason Wang

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
2487.84	56.52	-17.48	74	54.21	31.8	4.59	34.08	131	352	Peak
2487.84	45.59	-8.41	54	43.28	31.8	4.59	34.08	131	352	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
2488.03	49.97	-24.03	74	47.66	31.8	4.59	34.08	100	200	Peak
2488.03	38.63	-15.37	54	36.32	31.8	4.59	34.08	100	200	Average



Test Mode :	Mode 4	Temperature :	26.1~27.8℃
Test Band :	802.11g	Relative Humidity :	51~57%
Test Channel :	01	Test Engineer :	Jason Wang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	66.16	-7.84	74	64.04	31.7	4.5	34.08	197	360	Peak
2389.99	47.31	-6.69	54	45.19	31.7	4.5	34.08	197	360	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
2389.99	58.12	-15.88	74	56	31.7	4.5	34.08	111	10	Peak
2389.99	40.95	-13.05	54	38.83	31.7	4.5	34.08	111	10	Average

Test Mode :	Mode 6	Temperature :	26.1~27.8℃
Test Band :	802.11g	Relative Humidity :	51~57%
Test Channel :	11	Test Engineer :	Jason Wang

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	70.39	-3.61	74	68.1	31.78	4.59	34.08	191	356	Peak
2483.5	50.07	-3.93	54	47.78	31.78	4.59	34.08	191	356	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	65.66	-8.34	74	63.37	31.78	4.59	34.08	105	330	Peak
2483.5	45.83	-8.17	54	43.54	31.78	4.59	34.08	105	330	Average



Test Mode :	Mode 7	Temperature :	26.1~27.8℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	51~57%
Test Channel :	01	Test Engineer :	Jason Wang

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	60.73	-13.27	74	58.64	31.7	4.47	34.08	136	356	Peak
2389.61	43.05	-10.95	54	40.96	31.7	4.47	34.08	136	356	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
2389.33	53.87	-20.13	74	51.78	31.7	4.47	34.08	144	4	Peak
2389.33	39.27	-14.73	54	37.18	31.7	4.47	34.08	144	4	Average

Test Mode :	Mode 9	Temperature :	26.1~27.8℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	51~57%
Test Channel :	11	Test Engineer :	Jason Wang

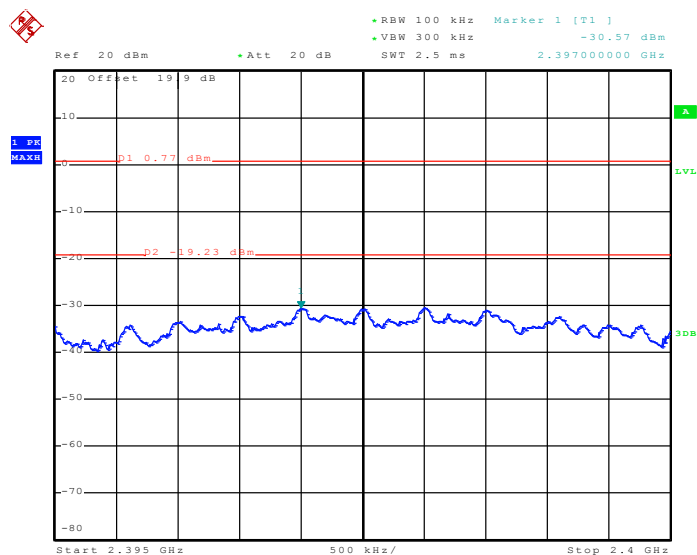
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	62.73	-11.27	74	60.44	31.78	4.59	34.08	131	353	Peak
2483.5	44.96	-9.04	54	42.67	31.78	4.59	34.08	131	353	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	57.05	-16.95	74	54.76	31.78	4.59	34.08	100	201	Peak
2483.5	39.21	-14.79	54	36.92	31.78	4.59	34.08	100	201	Average

3.3.6 Test Plots of Conducted Band Edges

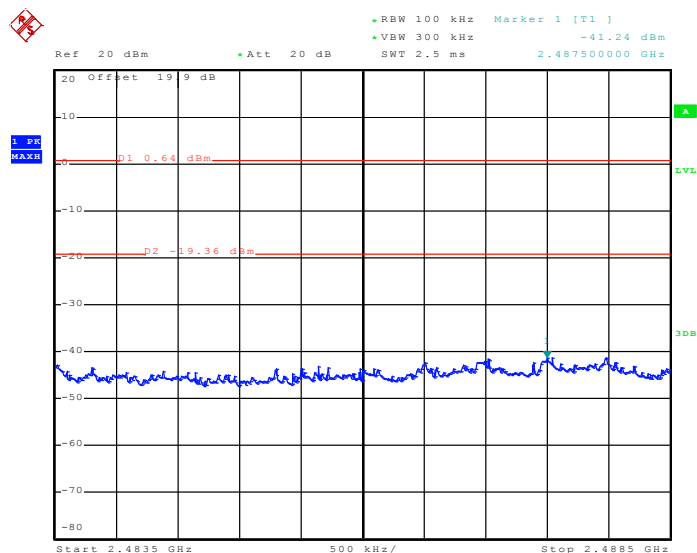
Test Mode :	Mode 1 and 3	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	45~48%
Test Channel :	01 and 11	Test Engineer :	Lancelot Chen

Low Band Edge Plot on 802.11b Channel 01



Date: 14.SEP.2010 22:07:57

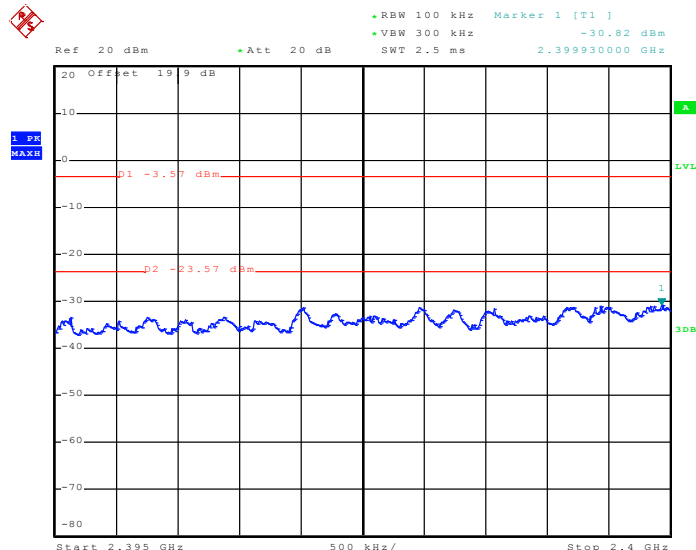
High Band Edge Plot on 802.11b Channel 11



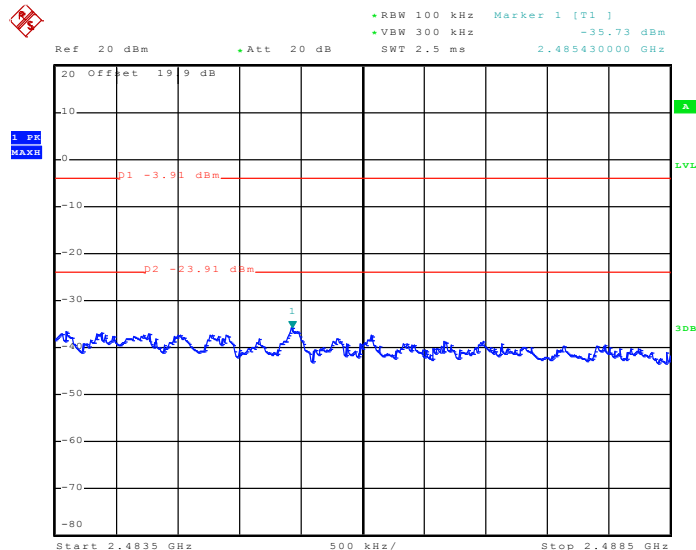
Date: 14.SEP.2010 21:30:24



Test Mode :	Mode 4 and 6	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	45~48%
Test Channel :	01 and 11	Test Engineer :	Lancelot Chen

Low Band Edge Plot on 802.11g Channel 01

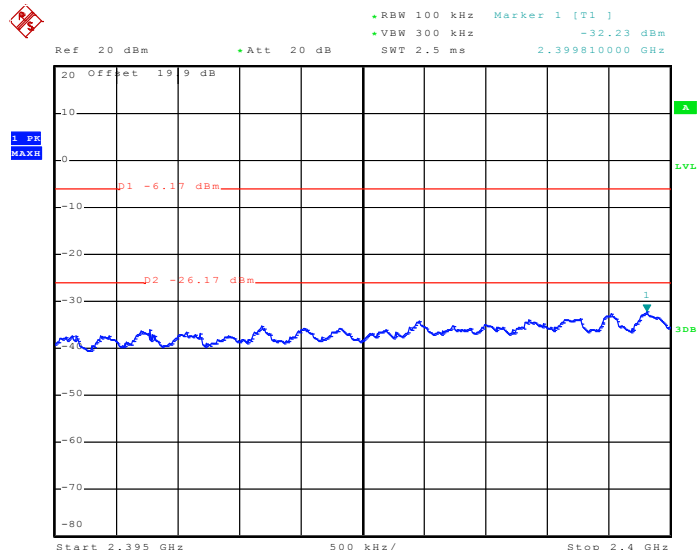
Date: 14.SEP.2010 22:45:54

High Band Edge Plot on 802.11g Channel 11

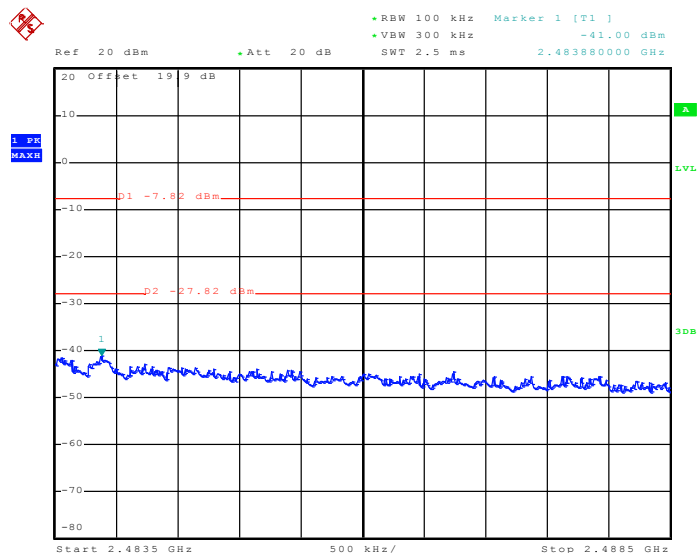
Date: 14.SEP.2010 23:13:21



Test Mode :	Mode 7 and 9	Temperature :	25~27°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	45~48%
Test Channel :	01 and 11	Test Engineer :	Lancelot Chen

Low Band Edge Plot on 802.11n (BW 20MHz) Channel 01

Date: 15.SEP.2010 01:53:21

High Band Edge Plot on 802.11n (BW 20MHz) Channel 11

Date: 15.SEP.2010 01:11:03

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

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

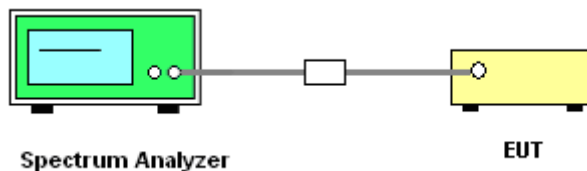
3.4.2 Measuring Instruments

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.

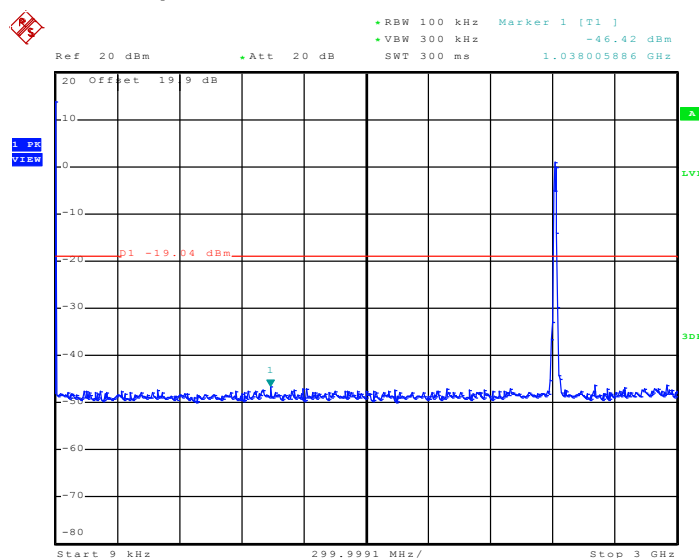
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

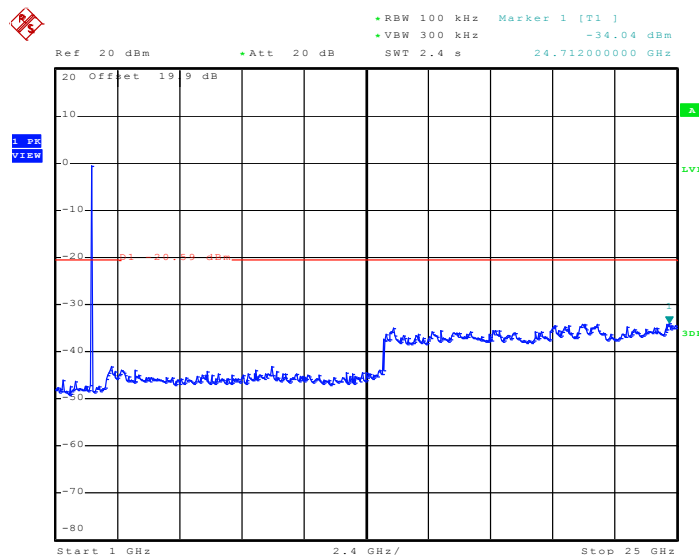
Test Mode :	Mode 1	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	45~48%
Test Channel :	01	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



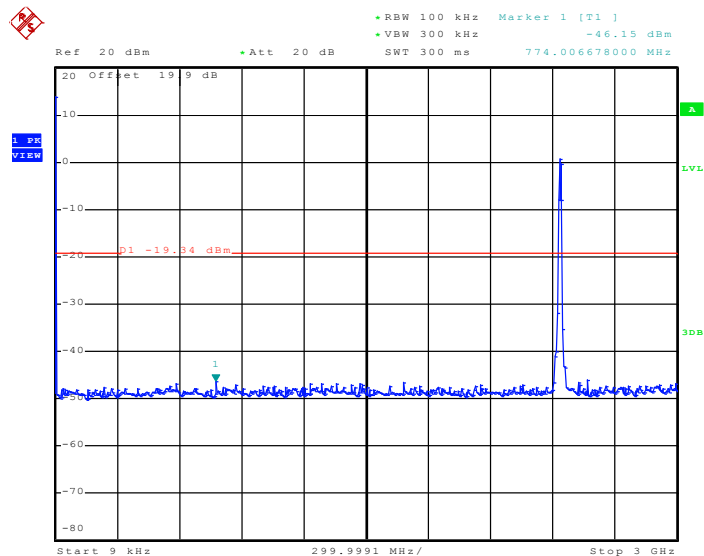
Date: 14.SEP.2010 22:09:58

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

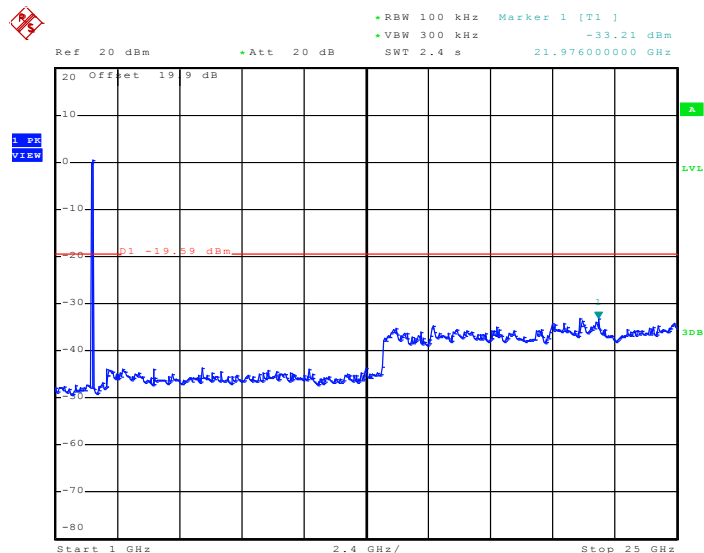


Date: 14.SEP.2010 22:10:59

Test Mode :	Mode 2	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	45~48%
Test Channel :	06	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


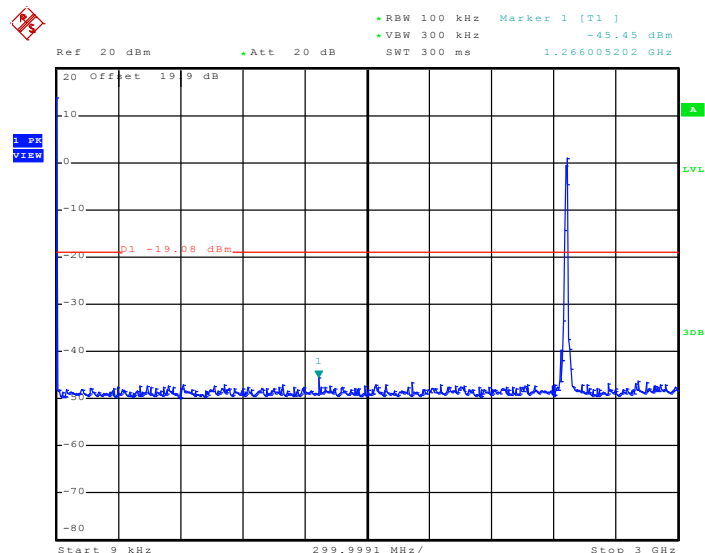
Date: 14.SEP.2010 22:02:57

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


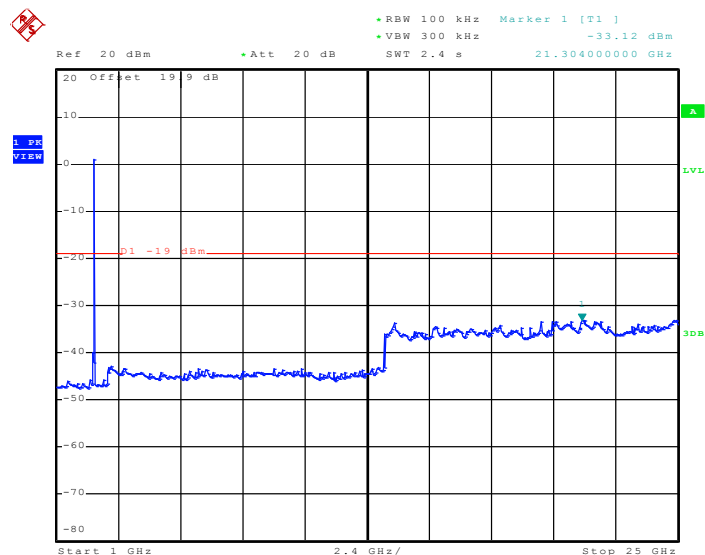
Date: 14.SEP.2010 22:03:52



Test Mode :	Mode 3	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	45~48%
Test Channel :	11	Test Engineer :	Lancelot Chen

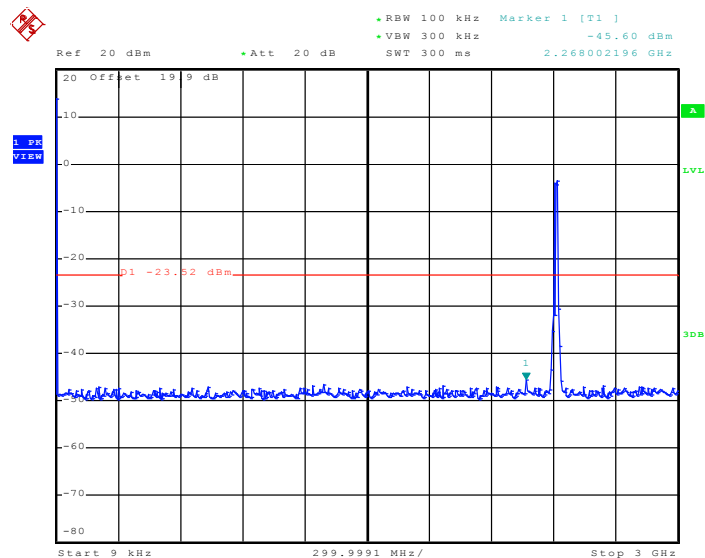
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz

Date: 14.SEP.2010 21:32:43

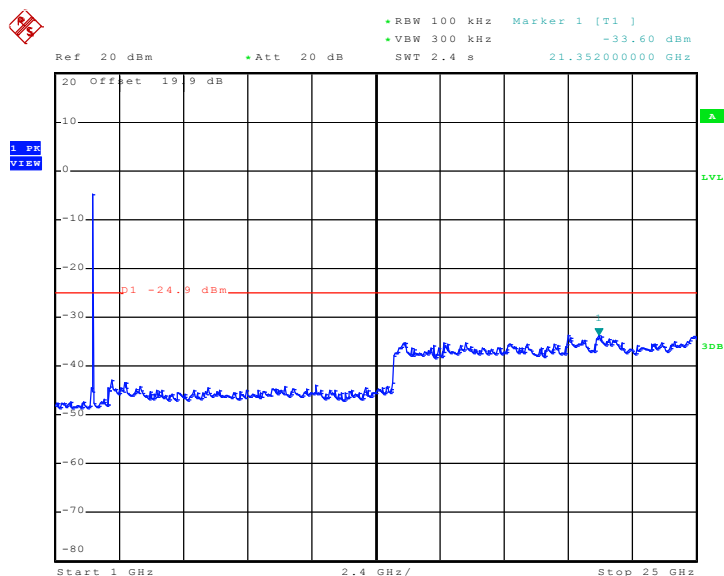
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

Date: 14.SEP.2010 21:42:11

Test Mode :	Mode 4	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	45~48%
Test Channel :	01	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


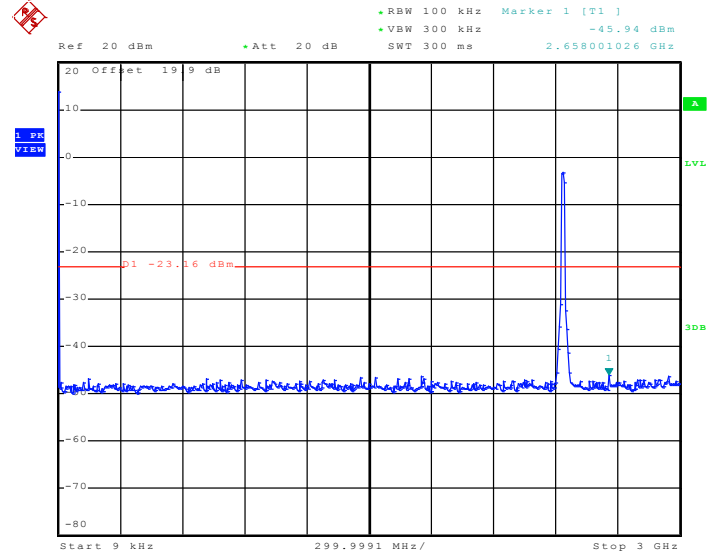
Date: 14.SEP.2010 22:47:42

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


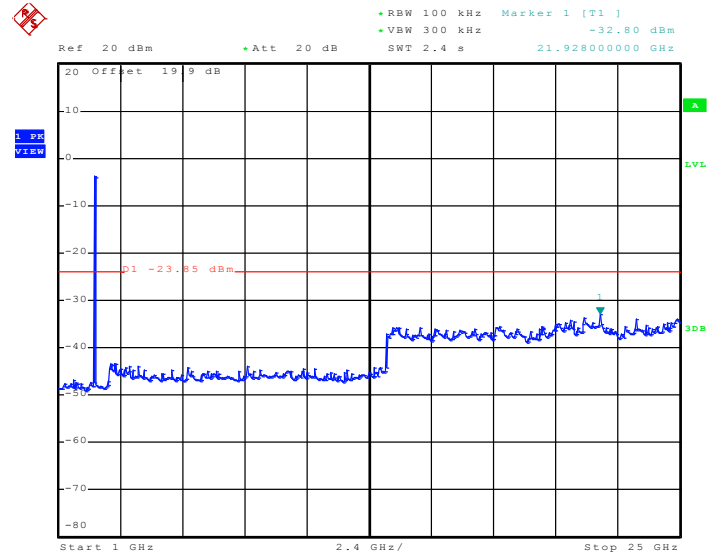
Date: 14.SEP.2010 22:48:50



Test Mode :	Mode 5	Temperature :	25~27
Test Band :	802.11g	Relative Humidity :	45~48
Test Channel :	06	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz

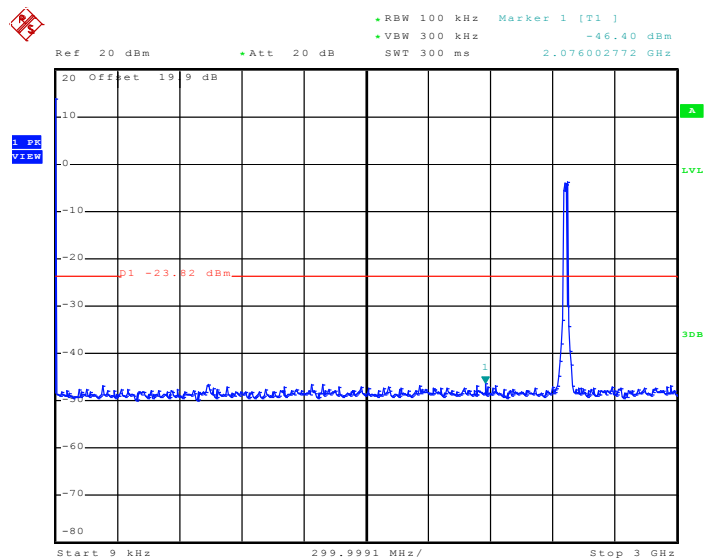
Date: 14.SEP.2010 22:50:40

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

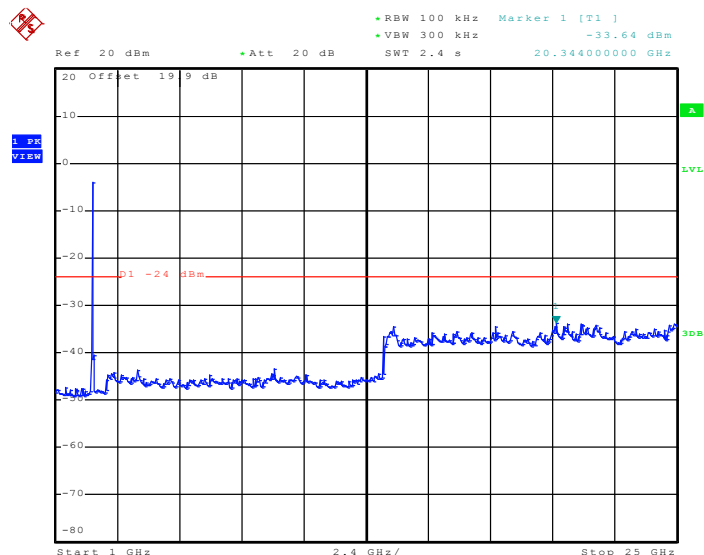
Date: 14.SEP.2010 22:49:42



Test Mode :	Mode 6	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	45~48%
Test Channel :	11	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz

Date: 14.SEP.2010 23:27:43

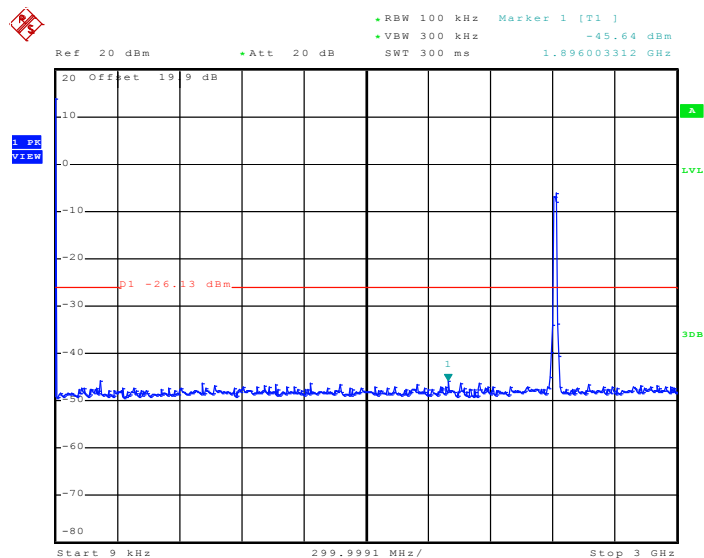
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

Date: 14.SEP.2010 23:24:57



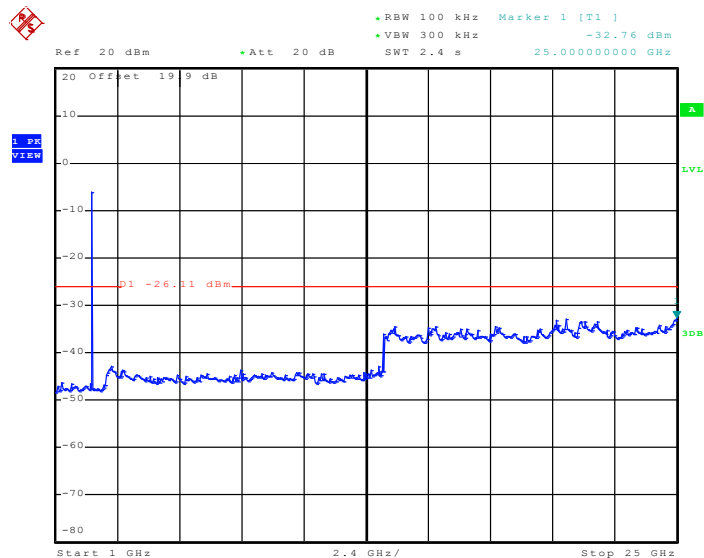
Test Mode :	Mode 7	Temperature :	25~27°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	45~48%
Test Channel :	01	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 15.SEP.2010 01:42:35

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

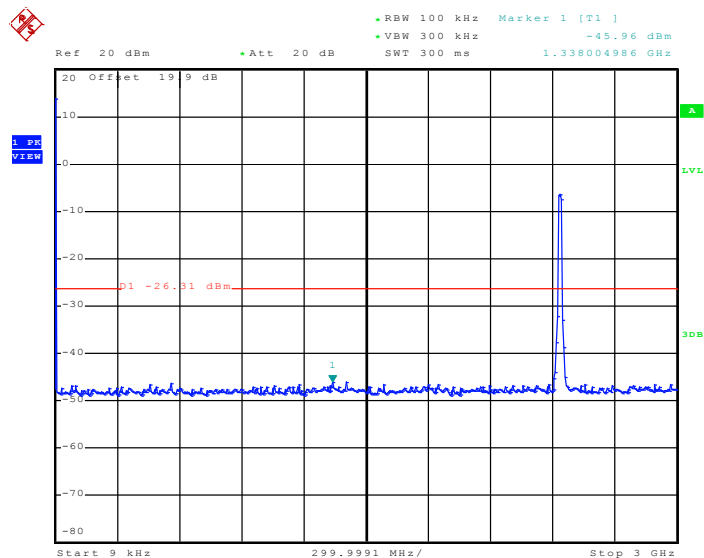


Date: 15.SEP.2010 01:44:58



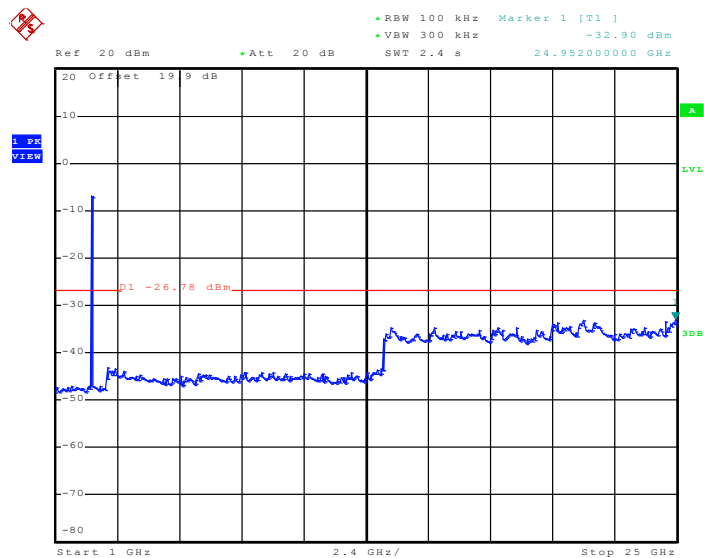
Test Mode :	Mode 8	Temperature :	25~27°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	45~48%
Test Channel :	06	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



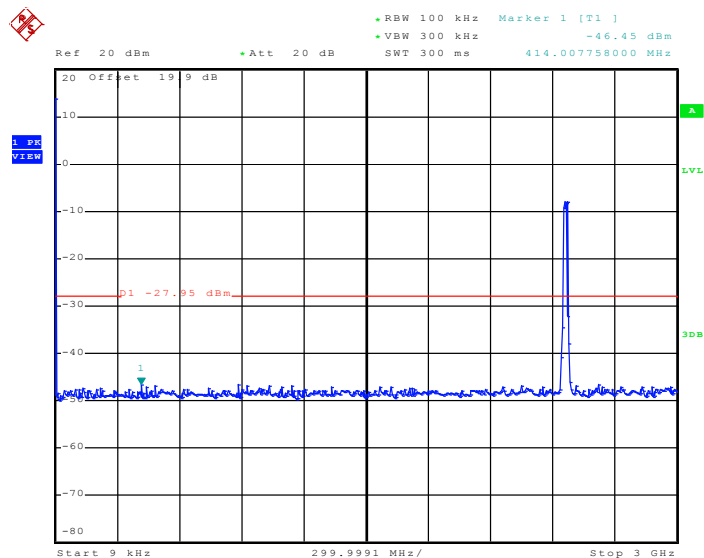
Date: 15.SEP.2010 01:17:42

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

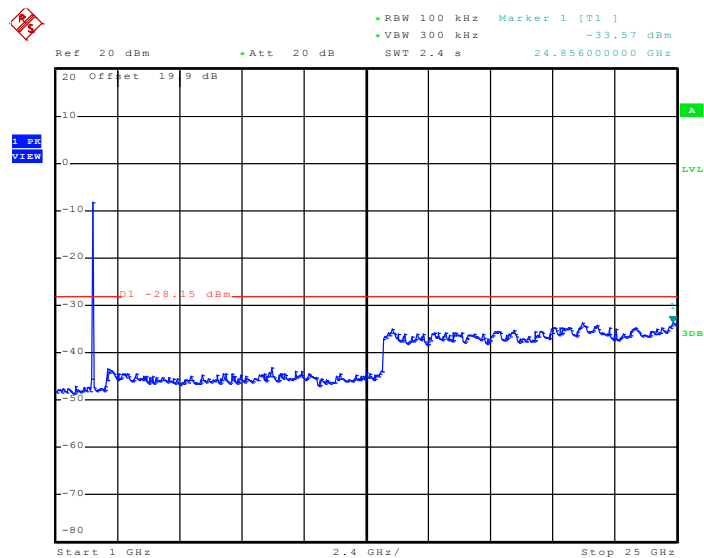


Date: 15.SEP.2010 01:15:45

Test Mode :	Mode 9	Temperature :	25~27°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	45~48%
Test Channel :	11	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 15.SEP.2010 01:12:09

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 15.SEP.2010 01:13:41

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.

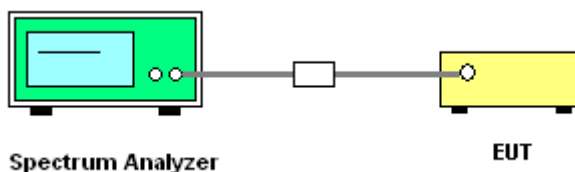
3.5.2 Measuring Instruments

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

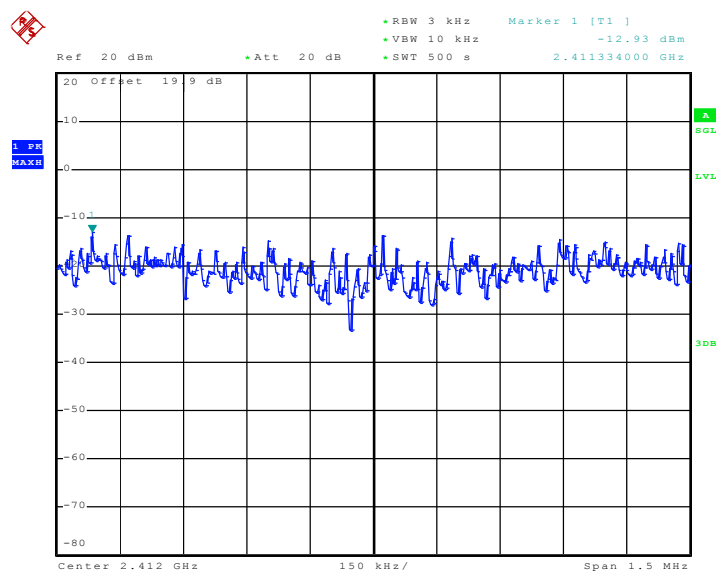


3.5.5 Test Result of Power Spectral Density

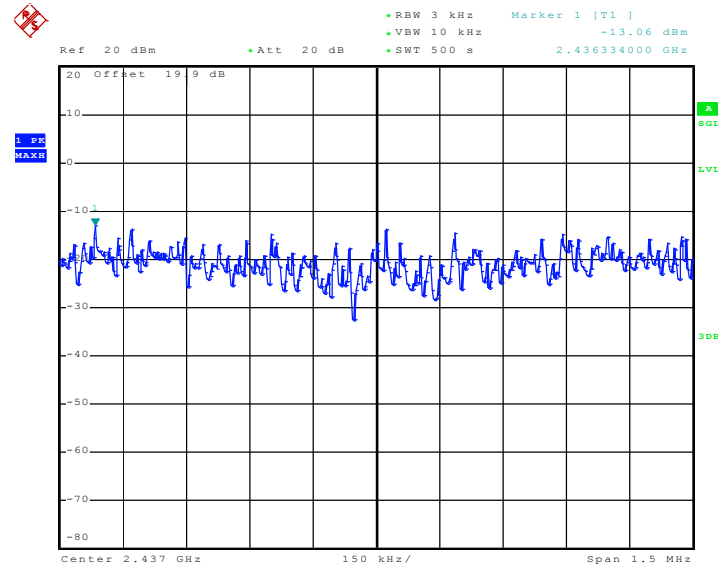
Test Mode :	Mode 1, 2, 3	Temperature :	25~27℃
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-12.93	8	Pass
06	2437	-13.06	8	Pass
11	2462	-13.23	8	Pass

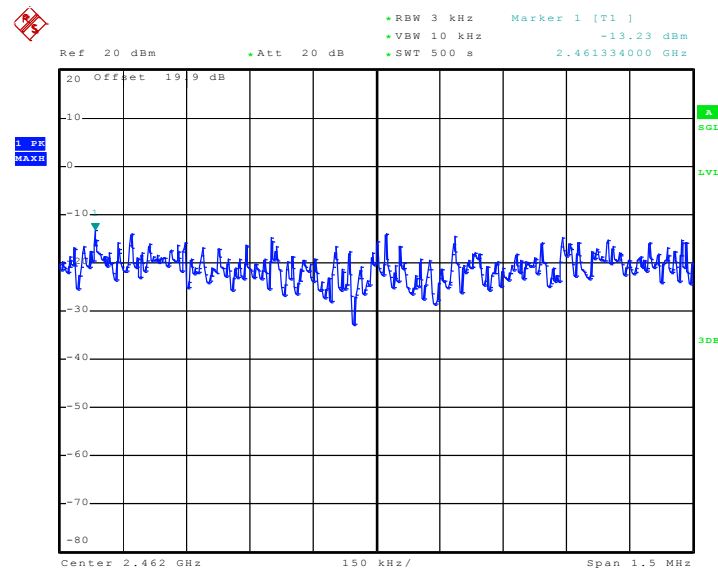
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 14.SEP.2010 22:33:36

Mode 2 : PSD Plot on 802.11b Channel 06


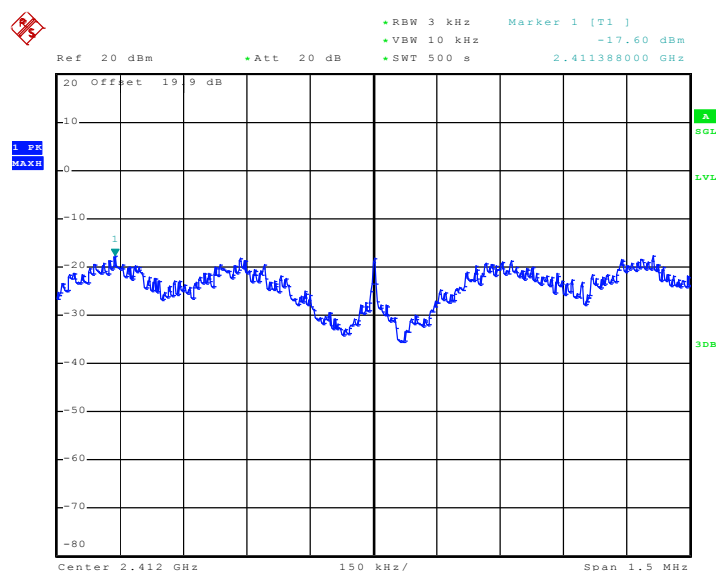
Date: 14.SEP.2010 22:01:22

Mode 3 : PSD Plot on 802.11b Channel 11


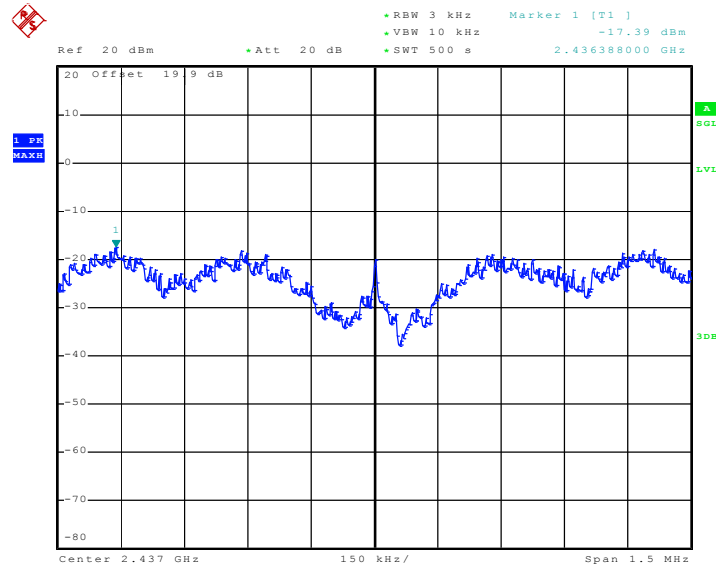
Date: 14.SEP.2010 21:52:09

Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

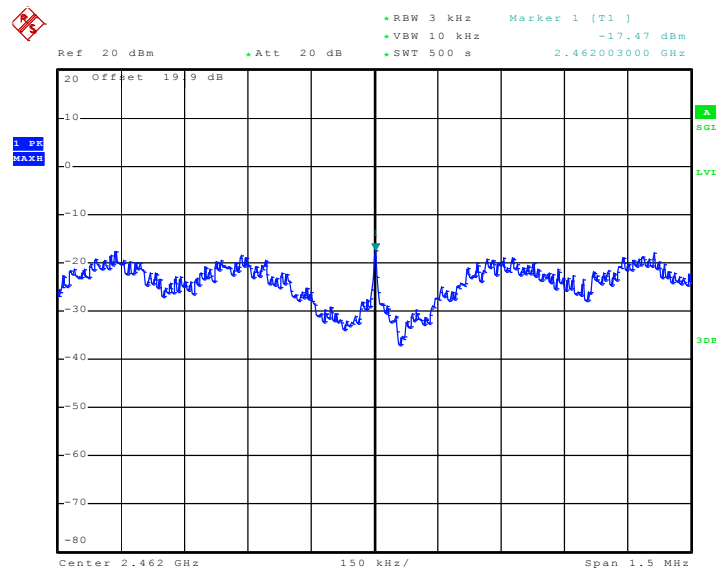
Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-17.60	8	Pass
06	2437	-17.39	8	Pass
11	2462	-17.47	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01


Date: 14.SEP.2010 22:43:17

Mode 5 : PSD Plot on 802.11g Channel 06


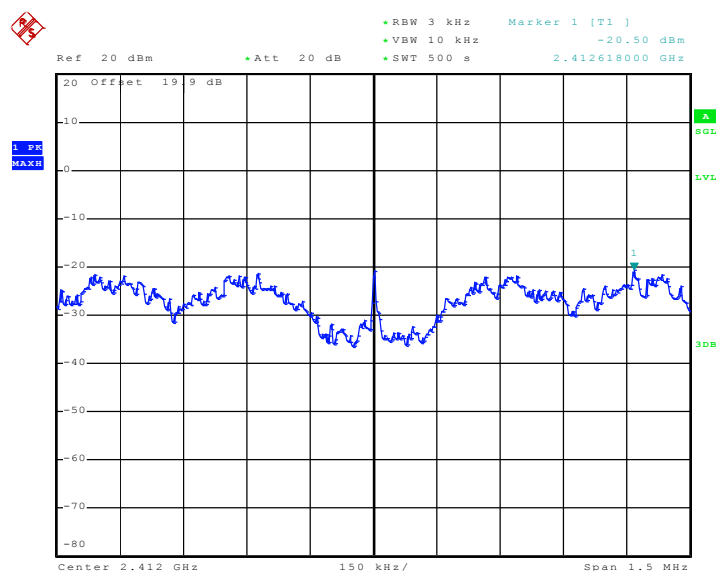
Date: 14.SEP.2010 23:01:30

Mode 6 : PSD Plot on 802.11g Channel 11


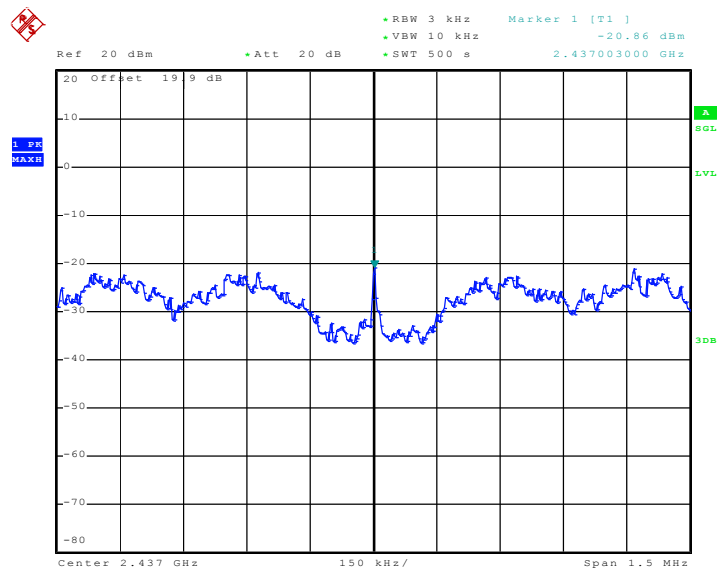
Date: 14.SEP.2010 23:10:36

Test Mode :	Mode 7, 8, 9	Temperature :	25~27°C
Test Engineer :	Lancelot Chen	Relative Humidity :	45~48%

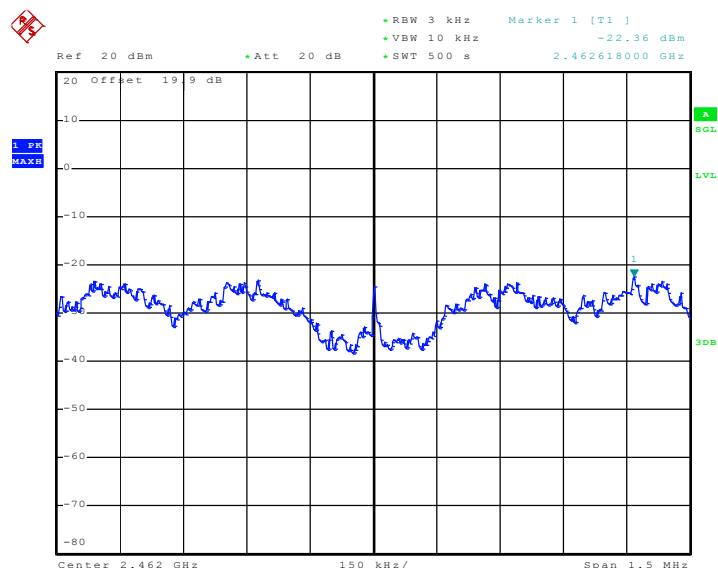
Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-20.50	8	Pass
06	2437	-20.86	8	Pass
11	2462	-22.36	8	Pass

Mode 7 : PSD Plot on 802.11n (BW 20MHz) Channel 01


Date: 15.SEP.2010 01:41:13

Mode 8 : PSD Plot on 802.11n (BW 20MHz) Channel 06


Date: 15.SEP.2010 01:31:13

Mode 9 : PSD Plot on 802.11n (BW 20MHz) Channel 11


Date: 15.SEP.2010 01:05:22

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.

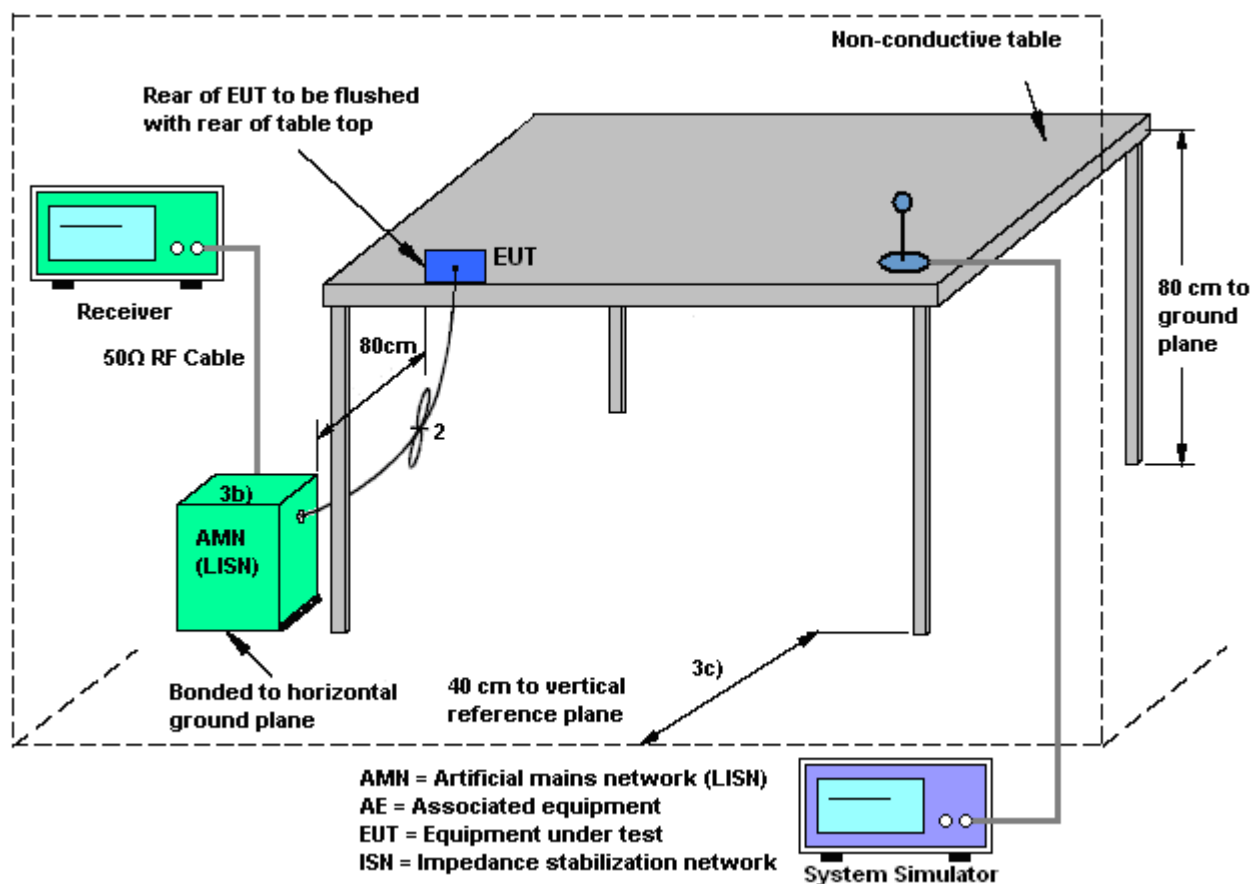
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

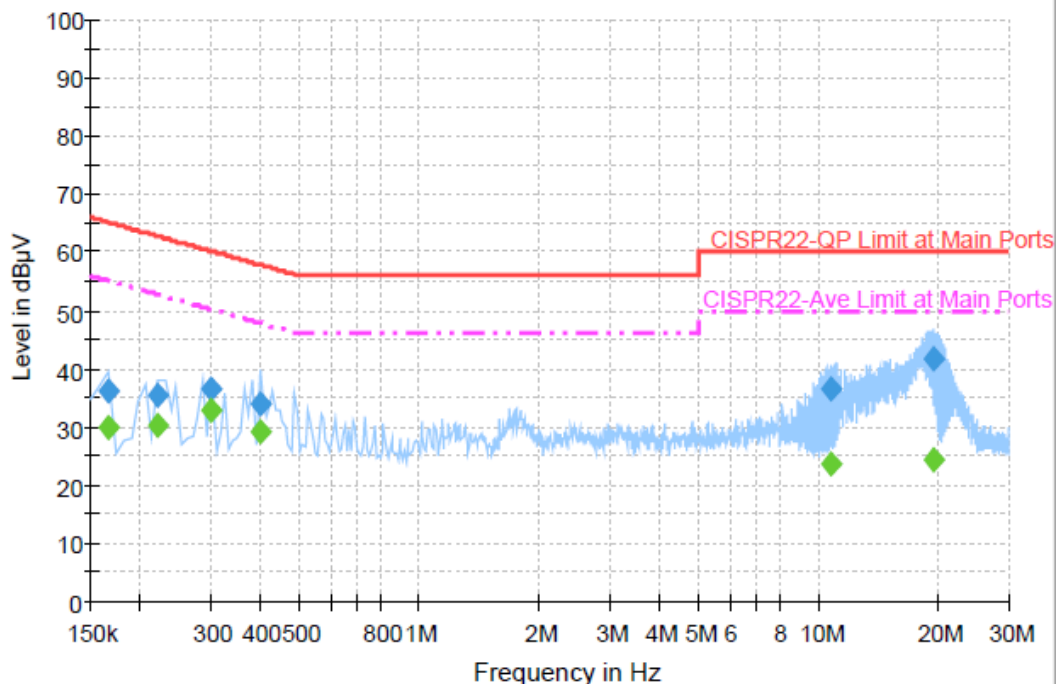
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 Jiang	Relative Humidity :	33~35%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Adapter + Earphone + Battery 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



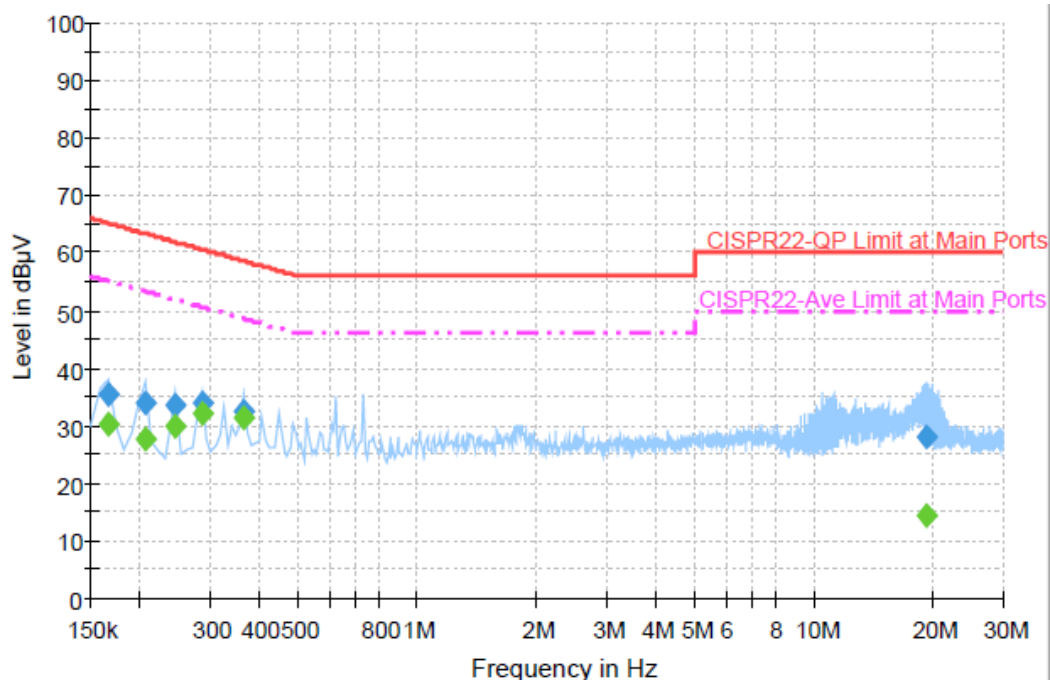
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	36.0	Off	L1	19.3	29.2	65.2
0.222000	35.4	Off	L1	19.3	27.3	62.7
0.302000	36.6	Off	L1	19.3	23.6	60.2
0.398000	33.9	Off	L1	19.4	24.0	57.9
10.702000	36.7	Off	L1	19.6	23.3	60.0
19.454000	41.6	Off	L1	19.7	18.4	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	29.9	Off	L1	19.3	25.3	55.2
0.222000	30.2	Off	L1	19.3	22.5	52.7
0.302000	32.7	Off	L1	19.3	17.5	50.2
0.398000	29.0	Off	L1	19.4	18.9	47.9
10.702000	23.7	Off	L1	19.6	26.3	50.0
19.454000	24.3	Off	L1	19.7	25.7	50.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Novic Jiang	Relative Humidity :	33~35%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link + GPS Rx + Adapter + Earphone + Battery 1		
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)
0.166000	35.3	Off	N	19.3	29.9	65.2
0.206000	34.0	Off	N	19.3	29.4	63.4
0.246000	33.8	Off	N	19.4	28.1	61.9
0.286000	34.0	Off	N	19.3	26.6	60.6
0.366000	32.5	Off	N	19.3	26.1	58.6
19.214000	28.0	Off	N	19.8	32.0	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	30.3	Off	N	19.3	24.9	55.2
0.206000	27.5	Off	N	19.3	25.9	53.4
0.246000	29.7	Off	N	19.4	22.2	51.9
0.286000	32.2	Off	N	19.3	18.4	50.6
0.366000	31.3	Off	N	19.3	17.3	48.6
19.214000	14.4	Off	N	19.8	35.6	50.0

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

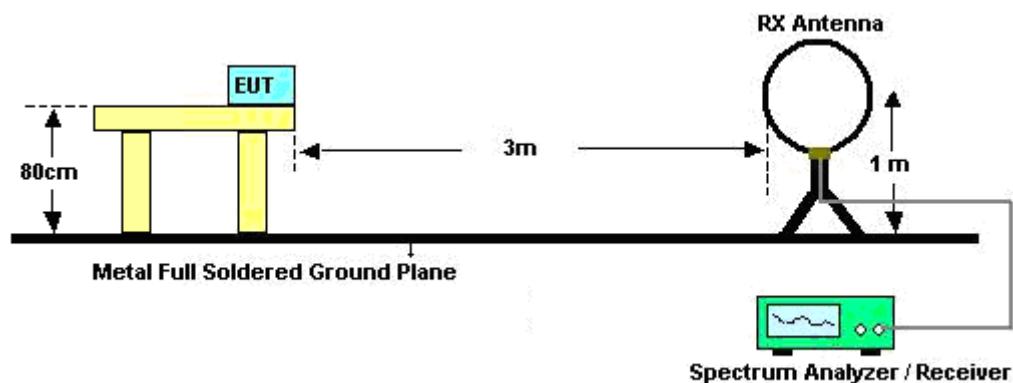
See list of measuring instruments of this test report.

3.7.3 Test Procedures

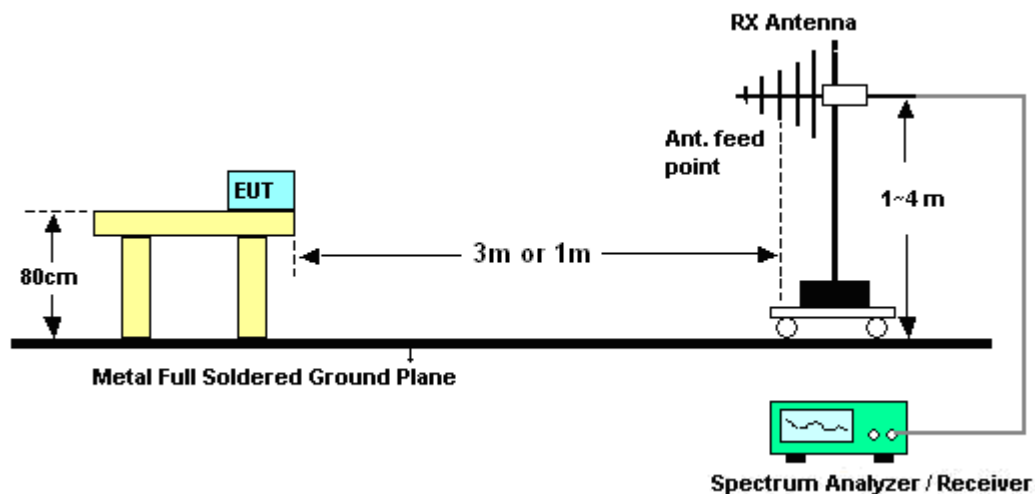
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = 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 above 30MHz



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

Test Engineer :	Jason Wang	Temperature :	26.1~27.8℃	
		Relative Humidity :	51~57%	

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 :	26.1~27.8℃
Test Channel :	01	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
40.53	22.67	-17.33	40	41.44	12.17	0.58	31.52	-	-	Peak
153.39	26.22	-17.28	43.5	46.27	10.31	1.14	31.5	100	317	Peak
257.61	27.24	-18.76	46	43.83	13.48	1.42	31.49	-	-	Peak
358.8	20.73	-25.27	46	35.11	15.2	1.71	31.29	-	-	Peak
552.7	20.46	-25.54	46	29.96	19.3	2.15	30.95	-	-	Peak
734.7	23.51	-22.49	46	31.17	20.49	2.45	30.6	-	-	Peak
2386	47.29	-6.71	54	45.2	31.7	4.47	34.08	138	355	Average
2386	59.02	-14.98	74	56.93	31.7	4.47	34.08	138	355	Peak
2412	94.38	-	-	92.25	31.71	4.5	34.08	138	355	Average
2412	103.23	-	-	101.1	31.71	4.5	34.08	138	355	Peak
2494	32.49	-21.51	54	30.15	31.8	4.62	34.08	138	355	Average
2494	43.97	-30.03	74	41.63	31.8	4.62	34.08	138	355	Peak



Test Mode :	Mode 1	Temperature :	26.1~27.8℃
Test Channel :	01	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
39.45	30.53	-9.47	40	48.88	12.58	0.58	31.51	100	268	Peak
158.25	33.35	-10.15	43.5	53.63	10.08	1.14	31.5	-	-	Peak
247.62	30.63	-15.37	46	48.36	12.38	1.42	31.53	-	-	Peak
361.6	20.21	-25.79	46	34.5	15.28	1.71	31.28	-	-	Peak
568.1	21.25	-24.75	46	30.69	19.3	2.18	30.92	-	-	Peak
707.4	22.52	-23.48	46	30.74	20.08	2.4	30.7	-	-	Peak
2384.86	36.74	-17.26	54	34.67	31.68	4.47	34.08	100	201	Average
2384.86	49.08	-24.92	74	47.01	31.68	4.47	34.08	100	201	Peak
2412	86.21	-	-	84.08	31.71	4.5	34.08	100	201	Average
2412	95.27	-	-	93.14	31.71	4.5	34.08	100	201	Peak
2486	32.23	-21.77	54	29.94	31.78	4.59	34.08	100	201	Average
2486	43.77	-30.23	74	41.48	31.78	4.59	34.08	100	201	Peak

Test Mode :	Mode 2	Temperature :	26.1~27.8℃
Test Channel :	06	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
40.26	25.51	-14.49	40	44.28	12.17	0.58	31.52	-	-	Peak
87.51	27.92	-12.08	40	49.77	8.86	0.84	31.55	100	163	Peak
151.5	29.14	-14.36	43.5	49.09	10.41	1.14	31.5	-	-	Peak
359.5	21.21	-24.79	46	35.55	15.23	1.71	31.28	-	-	Peak
474.3	20.36	-25.64	46	31.76	17.74	1.98	31.12	-	-	Peak
622.7	22.83	-23.17	46	31.95	19.45	2.25	30.82	-	-	Peak
2386	32.97	-21.03	54	30.88	31.7	4.47	34.08	166	344	Average
2386	44.37	-29.63	74	42.28	31.7	4.47	34.08	166	344	Peak
2437	95.93	-	-	93.73	31.75	4.53	34.08	166	344	Average
2437	105.04	-	-	102.84	31.75	4.53	34.08	166	344	Peak
2484	33.26	-20.74	54	30.97	31.78	4.59	34.08	166	344	Average
2484	45.61	-28.39	74	43.32	31.78	4.59	34.08	166	344	Peak



Test Mode :	Mode 2	Temperature :	26.1~27.8℃
Test Channel :	06	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
68.61	29.66	-10.34	40	54.3	6.02	0.84	31.5	-	-	Peak
160.68	33.39	-10.11	43.5	53.75	10	1.14	31.5	100	228	Peak
247.62	31.08	-14.92	46	48.81	12.38	1.42	31.53	-	-	Peak
356.7	19.92	-26.08	46	34.35	15.15	1.71	31.29	-	-	Peak
487.6	19.97	-26.03	46	31.1	17.99	1.98	31.1	-	-	Peak
593.3	21.87	-24.13	46	31.25	19.3	2.2	30.88	-	-	Peak
2354	32.48	-21.52	54	30.47	31.66	4.44	34.09	100	120	Average
2354	43.62	-30.38	74	41.61	31.66	4.44	34.09	100	120	Peak
2437	85.63	-	-	83.43	31.75	4.53	34.08	100	120	Average
2437	94.04	-	-	91.86	31.73	4.53	34.08	100	120	Peak
2500	32.25	-21.75	54	29.91	31.8	4.62	34.08	100	120	Average
2500	43.14	-30.86	74	40.8	31.8	4.62	34.08	100	120	Peak

Test Mode :	Mode 3	Temperature :	26.1~27.8℃
Test Channel :	11	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
87.78	22.75	-17.25	40	44.59	8.86	0.84	31.54	100	123	Peak
129.36	25.95	-17.55	43.5	44	12.4	1.07	31.52	-	-	Peak
257.61	26.67	-19.33	46	43.26	13.48	1.42	31.49	-	-	Peak
360.2	20.81	-25.19	46	35.13	15.25	1.71	31.28	-	-	Peak
500.9	19.99	-26.01	46	30.91	18.12	2.04	31.08	-	-	Peak
719.3	22.68	-23.32	46	30.63	20.25	2.45	30.65	-	-	Peak
2388	33.49	-20.51	54	31.4	31.7	4.47	34.08	131	352	Average
2388	45.47	-28.53	74	43.38	31.7	4.47	34.08	131	352	Peak
2462	96.19	-	-	93.94	31.77	4.56	34.08	131	352	Average
2462	105.31	-	-	103.06	31.77	4.56	34.08	131	352	Peak
2487.84	45.59	-8.41	54	43.28	31.8	4.59	34.08	131	352	Average
2487.84	56.52	-17.48	74	54.21	31.8	4.59	34.08	131	352	Peak

Test Mode :	Mode 3	Temperature :	26.1~27.8℃
Test Channel :	11	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
65.37	29.39	-10.61	40	54.01	6.16	0.73	31.51	-	-	Peak
144.75	33.29	-10.21	43.5	52.68	10.98	1.14	31.51	100	156	Peak
247.62	30.76	-15.24	46	48.49	12.38	1.42	31.53	-	-	Peak
364.4	20.32	-25.68	46	34.52	15.36	1.71	31.27	-	-	Peak
631.8	21.94	-24.06	46	30.99	19.51	2.25	30.81	-	-	Peak
807.5	23.69	-22.31	46	30.89	20.76	2.57	30.53	-	-	Peak
2326	32.48	-21.52	54	30.53	31.63	4.41	34.09	100	200	Average
2326	44.43	-29.57	74	42.48	31.63	4.41	34.09	100	200	Peak
2462	88.34	-	-	86.09	31.77	4.56	34.08	100	200	Average
2462	96.96	-	-	94.71	31.77	4.56	34.08	100	200	Peak
2488.03	38.63	-15.37	54	36.32	31.8	4.59	34.08	100	200	Average
2488.03	49.97	-24.03	74	47.66	31.8	4.59	34.08	100	200	Peak

Test Mode :	Mode 4	Temperature :	26.1~27.8℃
Test Channel :	01	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
87.78	21.92	-18.08	40	43.76	8.86	0.84	31.54	-	-	Peak
153.12	26.28	-17.22	43.5	46.28	10.36	1.14	31.5	100	122	Peak
257.61	26.11	-19.89	46	42.7	13.48	1.42	31.49	-	-	Peak
359.5	20.61	-25.39	46	34.95	15.23	1.71	31.28	-	-	Peak
572.3	20.95	-25.05	46	30.38	19.3	2.18	30.91	-	-	Peak
651.4	23.15	-22.85	46	31.98	19.64	2.3	30.77	-	-	Peak
2389.99	47.31	-6.69	54	45.19	31.7	4.5	34.08	197	360	Average
2389.99	66.16	-7.84	74	64.04	31.7	4.5	34.08	197	360	Peak
2412	84.2	-	-	82.07	31.71	4.5	34.08	197	360	Average
2412	102.42	-	-	100.29	31.71	4.5	34.08	197	360	Peak
2484	33.39	-20.61	54	31.1	31.78	4.59	34.08	197	360	Average
2484	44.89	-29.11	74	42.6	31.78	4.59	34.08	197	360	Peak

Test Mode :	Mode 4	Temperature :	26.1~27.8℃
Test Channel :	01	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
65.1	29.75	-10.25	40	54.37	6.16	0.73	31.51	100	314	Peak
158.25	32.83	-10.67	43.5	53.11	10.08	1.14	31.5	-	-	Peak
247.62	30.88	-15.12	46	48.61	12.38	1.42	31.53	-	-	Peak
358.1	20.9	-25.1	46	35.28	15.2	1.71	31.29	-	-	Peak
547.8	21.65	-24.35	46	31.21	19.25	2.15	30.96	-	-	Peak
675.9	22.54	-23.46	46	31.13	19.8	2.35	30.74	-	-	Peak
2389.99	40.95	-13.05	54	38.83	31.7	4.5	34.08	111	10	Average
2389.99	58.12	-15.88	74	56	31.7	4.5	34.08	111	10	Peak
2412	79.26	-	-	77.13	31.71	4.5	34.08	111	10	Average
2412	95.23	-	-	93.1	31.71	4.5	34.08	111	10	Peak
2496	32.89	-21.11	54	30.55	31.8	4.62	34.08	111	10	Average
2496	44.96	-29.04	74	42.62	31.8	4.62	34.08	111	10	Peak

Test Mode :	Mode 5	Temperature :	26.1~27.8℃
Test Channel :	06	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
88.05	22.97	-20.53	43.5	44.6	9.07	0.84	31.54	-	-	Peak
153.39	26.13	-17.37	43.5	46.18	10.31	1.14	31.5	100	153	Peak
257.34	27.18	-18.82	46	43.87	13.38	1.42	31.49	-	-	Peak
366.5	20.43	-25.57	46	34.58	15.41	1.71	31.27	-	-	Peak
629	21.8	-24.2	46	30.87	19.49	2.25	30.81	-	-	Peak
759.2	23.66	-22.34	46	30.96	20.73	2.51	30.54	-	-	Peak
2390	34.42	-19.58	54	32.3	31.7	4.5	34.08	138	346	Average
2390	49.01	-24.99	74	46.89	31.7	4.5	34.08	138	346	Peak
2437	85.94	-	-	83.74	31.75	4.53	34.08	138	346	Average
2437	103.37	-	-	101.14	31.75	4.56	34.08	138	346	Peak
2490	33.24	-20.76	54	30.9	31.8	4.62	34.08	138	346	Average
2490	46.03	-27.97	74	43.69	31.8	4.62	34.08	138	346	Peak

Test Mode :	Mode 5	Temperature :	26.1~27.8℃
Test Channel :	06	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
39.45	29.72	-10.28	40	48.07	12.58	0.58	31.51	100	147	Peak
64.56	29.66	-10.34	40	54.28	6.16	0.73	31.51	-	-	Peak
150.96	32.87	-10.63	43.5	52.78	10.45	1.14	31.5	-	-	Peak
363	20.36	-25.64	46	34.6	15.33	1.71	31.28	-	-	Peak
661.9	22.08	-23.92	46	30.83	19.71	2.3	30.76	-	-	Peak
834.1	23.61	-22.39	46	30.7	20.81	2.61	30.51	-	-	Peak
2368	32.93	-21.07	54	30.88	31.66	4.47	34.08	100	120	Average
2368	44.98	-29.02	74	42.93	31.66	4.47	34.08	100	120	Peak
2437	76.74	-	-	74.54	31.75	4.53	34.08	100	120	Average
2437	92.45	-	-	90.27	31.73	4.53	34.08	100	120	Peak
2500	32.62	-21.38	54	30.28	31.8	4.62	34.08	100	120	Average
2500	44.47	-29.53	74	42.13	31.8	4.62	34.08	100	120	Peak

Test Mode :	Mode 6	Temperature :	26.1~27.8℃
Test Channel :	11	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
86.97	22.78	-17.22	40	44.63	8.86	0.84	31.55	-	-	Peak
153.39	26.32	-17.18	43.5	46.37	10.31	1.14	31.5	100	106	Peak
247.62	26.97	-19.03	46	44.7	12.38	1.42	31.53	-	-	Peak
355.3	20.72	-25.28	46	35.18	15.13	1.71	31.3	-	-	Peak
652.8	22.13	-23.87	46	30.95	19.65	2.3	30.77	-	-	Peak
895.7	23.86	-22.14	46	30.62	21.02	2.7	30.48	-	-	Peak
2344	32.74	-21.26	54	30.75	31.64	4.44	34.09	191	356	Average
2344	44.81	-29.19	74	42.82	31.64	4.44	34.09	191	356	Peak
2462	85.62	-	-	83.37	31.77	4.56	34.08	191	356	Average
2462	103.46	-	-	101.21	31.77	4.56	34.08	191	356	Peak
2483.5	50.07	-3.93	54	47.78	31.78	4.59	34.08	191	356	Average
2483.5	70.39	-3.61	74	68.1	31.78	4.59	34.08	191	356	Peak



Test Mode :	Mode 6	Temperature :	26.1~27.8℃
Test Channel :	11	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
65.1	29.2	-10.8	40	53.82	6.16	0.73	31.51	-	-	Peak
159.87	33.3	-10.2	43.5	53.63	10.03	1.14	31.5	103	269	Peak
247.62	29.68	-16.32	46	47.41	12.38	1.42	31.53	-	-	Peak
421.1	19.72	-26.28	46	31.76	17.26	1.87	31.17	-	-	Peak
689.9	21.53	-24.47	46	30.01	19.9	2.35	30.73	-	-	Peak
735.4	23.14	-22.86	46	30.78	20.5	2.45	30.59	-	-	Peak
2346	32.72	-21.28	54	30.73	31.64	4.44	34.09	105	330	Average
2346	45.14	-28.86	74	43.15	31.64	4.44	34.09	105	330	Peak
2462	80.38	-	-	78.13	31.77	4.56	34.08	105	330	Average
2462	97.25	-	-	94.97	31.77	4.59	34.08	105	330	Peak
2483.5	45.83	-8.17	54	43.54	31.78	4.59	34.08	105	330	Average
2483.5	65.66	-8.34	74	63.37	31.78	4.59	34.08	105	330	Peak

Test Mode :	Mode 7	Temperature :	26.1~27.8℃
Test Channel :	01	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
87.78	22.18	-17.82	40	44.02	8.86	0.84	31.54	-	-	Peak
129.09	26.15	-17.35	43.5	44.2	12.4	1.07	31.52	110	152	Peak
154.2	26	-17.5	43.5	46.1	10.26	1.14	31.5	-	-	Peak
356.7	21.05	-24.95	46	35.48	15.15	1.71	31.29	-	-	Peak
574.4	21.82	-24.18	46	31.25	19.3	2.18	30.91	-	-	Peak
734.7	23.82	-22.18	46	31.48	20.49	2.45	30.6	-	-	Peak
2389.61	43.05	-10.95	54	40.96	31.7	4.47	34.08	136	356	Average
2389.61	60.73	-13.27	74	58.64	31.7	4.47	34.08	136	356	Peak
2412	81.18	-	-	79.06	31.7	4.5	34.08	136	356	Average
2412	97	-	-	94.87	31.71	4.5	34.08	136	356	Peak
2488	32.49	-21.51	54	30.18	31.8	4.59	34.08	136	356	Average
2488	43.98	-30.02	74	41.67	31.8	4.59	34.08	136	356	Peak



Test Mode :	Mode 7	Temperature :	26.1~27.8℃
Test Channel :	01	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
68.34	29.11	-10.89	40	53.72	6.05	0.84	31.5	-	-	Peak
159.87	33.27	-10.23	43.5	53.6	10.03	1.14	31.5	105	165	Peak
247.62	30.68	-15.32	46	48.41	12.38	1.42	31.53	-	-	Peak
379.8	20.81	-25.19	46	34.49	15.78	1.77	31.23	-	-	Peak
663.3	22.27	-23.73	46	31.01	19.72	2.3	30.76	-	-	Peak
808.2	23.74	-22.26	46	30.94	20.76	2.57	30.53	-	-	Peak
2389.33	39.27	-14.73	54	37.18	31.7	4.47	34.08	144	4	Average
2389.33	53.87	-20.13	74	51.78	31.7	4.47	34.08	144	4	Peak
2412	77.62	-	-	75.49	31.71	4.5	34.08	144	4	Average
2412	93.32	-	-	91.19	31.71	4.5	34.08	144	4	Peak
2488	32.28	-21.72	54	29.97	31.8	4.59	34.08	144	4	Average
2488	44.56	-29.44	74	42.25	31.8	4.59	34.08	144	4	Peak

Test Mode :	Mode 8	Temperature :	26.1~27.8℃
Test Channel :	06	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
84.27	22.66	-17.34	40	45.15	8.22	0.84	31.55	-	-	Peak
154.2	26.97	-16.53	43.5	47.07	10.26	1.14	31.5	100	143	Peak
250.32	26.95	-19.05	46	44.38	12.68	1.42	31.53	-	-	Peak
360.9	21.54	-24.46	46	35.83	15.28	1.71	31.28	-	-	Peak
517	20.04	-25.96	46	30.46	18.52	2.1	31.04	-	-	Peak
692.7	21.99	-24.01	46	30.41	19.91	2.4	30.73	-	-	Peak
2376	32.28	-21.72	54	30.21	31.68	4.47	34.08	138	347	Average
2376	44.89	-29.11	74	42.82	31.68	4.47	34.08	138	347	Peak
2437	81.55	-	-	79.35	31.75	4.53	34.08	138	347	Average
2437	97.51	-	-	95.33	31.73	4.53	34.08	138	347	Peak
2484	32.52	-21.48	54	30.23	31.78	4.59	34.08	138	347	Average
2484	45.9	-28.1	74	43.61	31.78	4.59	34.08	138	347	Peak

Test Mode :	Mode 8	Temperature :	26.1~27.8℃
Test Channel :	06	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
39.99	29.71	-10.29	40	48.06	12.58	0.58	31.51	-	-	Peak
65.1	29.89	-10.11	40	54.51	6.16	0.73	31.51	-	-	Peak
160.14	33.58	-9.92	43.5	53.94	10	1.14	31.5	102	173	Peak
359.5	19.66	-26.34	46	34	15.23	1.71	31.28	-	-	Peak
548.5	20.99	-25.01	46	30.51	19.28	2.15	30.95	-	-	Peak
799.1	22.92	-23.08	46	30.14	20.75	2.57	30.54	-	-	Peak
2356	32.61	-21.39	54	30.6	31.66	4.44	34.09	102	320	Average
2356	44.01	-29.99	74	42	31.66	4.44	34.09	102	320	Peak
2437	75.16	-	-	72.96	31.75	4.53	34.08	102	320	Average
2437	90.05	-	-	87.87	31.73	4.53	34.08	102	320	Peak
2490	32.4	-21.6	54	30.06	31.8	4.62	34.08	102	320	Average
2490	43.34	-30.66	74	41	31.8	4.62	34.08	102	320	Peak



Test Mode :	Mode 9	Temperature :	26.1~27.8℃
Test Channel :	11	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
87.78	22.31	-17.69	40	44.15	8.86	0.84	31.54	-	-	Peak
153.66	26.44	-17.06	43.5	46.49	10.31	1.14	31.5	100	122	Peak
247.62	27.15	-18.85	46	44.88	12.38	1.42	31.53	-	-	Peak
356.7	21.22	-24.78	46	35.65	15.15	1.71	31.29	-	-	Peak
589.1	21.09	-24.91	46	30.5	19.3	2.18	30.89	-	-	Peak
771.8	23.12	-22.88	46	30.39	20.73	2.54	30.54	-	-	Peak
2318	32.29	-21.71	54	30.34	31.63	4.41	34.09	131	353	Average
2318	44.57	-29.43	74	42.62	31.63	4.41	34.09	131	353	Peak
2462	80.04	-	-	77.79	31.77	4.56	34.08	131	353	Average
2462	96.43	-	-	94.18	31.77	4.56	34.08	131	353	Peak
2483.5	44.96	-9.04	54	42.67	31.78	4.59	34.08	131	353	Average
2483.5	62.73	-11.27	74	60.44	31.78	4.59	34.08	131	353	Peak

Test Mode :	Mode 9	Temperature :	26.1~27.8℃
Test Channel :	11	Relative Humidity :	51~57%
Test Engineer :	Jason Wang	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
64.83	29.92	-10.08	40	54.54	6.16	0.73	31.51	100	177	Peak
154.2	33.04	-10.46	43.5	53.14	10.26	1.14	31.5	-	-	Peak
247.62	31.56	-14.44	46	49.29	12.38	1.42	31.53	-	-	Peak
356.7	19.66	-26.34	46	34.09	15.15	1.71	31.29	-	-	Peak
558.3	21.49	-24.51	46	30.98	19.3	2.15	30.94	-	-	Peak
736.8	22.62	-23.38	46	30.24	20.52	2.45	30.59	-	-	Peak
2346	32.41	-21.59	54	30.42	31.64	4.44	34.09	100	201	Average
2346	43.89	-30.11	74	41.9	31.64	4.44	34.09	100	201	Peak
2462	72.98	-	-	70.73	31.77	4.56	34.08	100	201	Average
2462	87.68	-	-	85.43	31.77	4.56	34.08	100	201	Peak
2483.5	39.21	-14.79	54	36.92	31.78	4.59	34.08	100	201	Average
2483.5	57.05	-16.95	74	54.76	31.78	4.59	34.08	100	201	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 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	Due Date	Remark
Spectrum Analyzer	R&S	FSP30	101329	9kHz~30GHz	Apr. 26, 2010	Apr. 25, 2011	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 25, 2010	Feb. 24, 2011	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 25, 2010	Feb. 24, 2011	Conducted (TH02-HY)
EMI Test Receive	R&S	ESU	100211	9KHz – 2.75GHz	May 28, 2010	May 27, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz~30MHz	Nov. 30, 2009	Nov. 29, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 23, 2009	Nov. 22, 2010	Conduction (CO05-HY)
AC Power Source	APC	APC-1000 W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	105934	N/A	Nov. 11, 2008	Nov. 10, 2010	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 20, 2009	Oct. 19, 2010	Radiation (03CH05-HY)
Amplifier	COM-POWER	PA-103	161069	1KHz - 1GHz	Mar. 29, 2010	Mar. 28, 2011	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Nov. 11, 2009	Nov. 10, 2010	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 - 360 degree	N/A	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m - 4 m	N/A	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	00066584	1GHz ~ 18GHz	Aug. 05, 2010	Aug. 04, 2011	Radiation (03CH05-HY)
Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Nov. 02, 2009	Nov. 01, 2010	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH05-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 EP081915-02 as below.