



FCC RF Test Report

APPLICANT : Motorola Mobility, Inc.
EQUIPMENT : TD-SCDMA/GSM Dual-mode digit mobile phone with BT/
Wi-Fi
BRAND NAME : Motorola
MODEL NAME /
MARKETING NAME : MT680
TYPE NAME : M0D28
GPPD NUMBER : 3368
FCC ID : IHDT56NM5
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Feb. 08, 2012 and completely tested on Mar. 27, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

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

Reviewed by:

Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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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 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 7.88 dB at 1.990 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.28 dB at 359.800 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Motorola Mobility, Inc.

No. 1, Wang Jing East Road, Chao Yang District, 100102 Beijing, P. R. China

1.2 Manufacturer

Huizhou BYD Electronic Co., Ltd.

Xiangshui River, Economic Development Zone, Daya Bay, Huizhou, Guangdong

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	TD-SCDMA/GSM Dual-mode digit mobile phone with BT/ Wi-Fi
Brand Name	Motorola
Model Name / Marketing Name	MT680
Type Name	M0D28
FCC ID	IHDT56NM5
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 : 20.13 dBm (0.1030 W) 802.11g : 21.76 dBm (0.1500 W) 802.11g/n (BW 20MHz) : 21.53 dBm (0.1422 W) 802.11g/n (BW 40MHz) : 21.63 dBm (0.1455 W)
Antenna Type	Chip Antenna with gain -3.00 dBi
HW Version	P3
SW Version	IRMTD_6_02.1E.00IDS
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

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

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. :		FCC/IC Registration No.
	03CH01-KS	CO01-KS	149928/4086E-1

1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

Remark:

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



1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GW	GPC-60300	N/A	N/A	Unshielded, 1.8 m
3.	Router	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	PP42L	FCC DoC	N/A	AC I/P: Unshielded, 0.8 m DC O/P: Shielded, 1.77 m
5.	Notebook	Acer	Travel Mate 2413Lci	QDS-BRCM1016	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Power

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

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	18.78	18.76	18.69	18.75
CH 06	2437 MHz	19.43	19.39	19.27	19.35
CH 11	2462 MHz	20.13	20.11	20.04	20.09

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	20.86	20.69	20.38	20.51	20.79	20.64	20.61	20.75
CH 06	2437 MHz	21.11	20.86	20.92	20.68	20.96	20.67	20.68	20.86
CH 11	2462 MHz	21.76	21.42	21.67	21.21	21.69	21.56	21.52	21.65

Channel	Frequency	2.4GHz 802.11g/n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	20.87	20.82	20.67	20.58	20.56	20.49	20.47	20.64
CH 06	2437 MHz	21.14	20.98	20.89	20.85	20.86	20.95	20.98	21.07
CH 11	2462 MHz	21.53	21.48	21.39	21.36	21.26	21.19	21.25	21.42

Channel	Frequency	2.4GHz 802.11g/n (BW 40MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422 MHz	20.95	20.85	20.78	20.69	20.92	20.94	20.72	20.78
CH 06	2437 MHz	21.07	21.02	21.05	21.23	21.61	21.51	21.53	21.59
CH 09	2452 MHz	21.63	21.41	21.37	21.42	21.31	21.29	21.34	21.27

Remark: The EUT is programmed to transmit signals continuously for all testing.

2.2 Maximum Peak Conducted Output Power:

Band	2.4GHz 802.11b RF Power (dBm)			2.4GHz 802.11g RF Power (dBm)		
	1	6	11	1	6	11
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Peak Power	18.78	19.43	20.13	20.86	21.11	21.76

Band	2.4GHz 802.11g/n (BW 20MHz) RF Peak Power (dBm)		
Channel	1	6	11
Frequency (MHz)	2412	2437	2462
Peak Power	20.87	21.14	21.53

Band	2.4GHz 802.11g/n (BW 40MHz) RF Peak Power (dBm)		
Channel	3	6	9
Frequency (MHz)	2422	2437	2452
Peak Power	20.95	21.07	21.63

Remark:

The data rates of WLAN 802.11b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, MCS0 for 802.11g/n (BW 20MHz), MCS0 for 802.11g/n (BW 40MHz) for all the test cases due to the highest RF output power.

2.3 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).

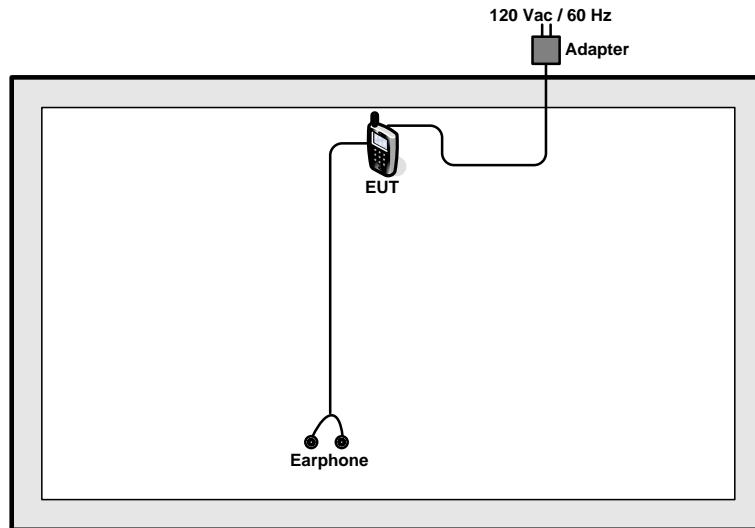
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

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

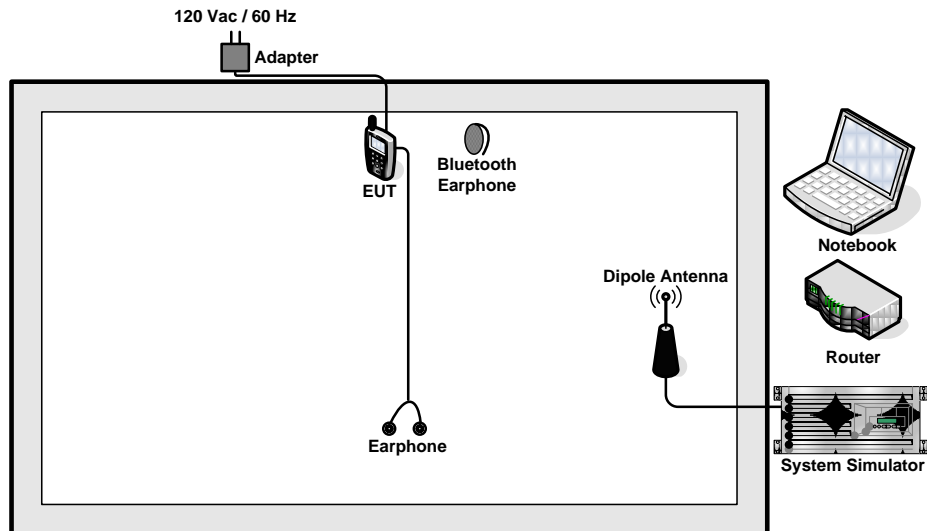
Test Cases		
Test Item	802.11b (Modulation : DSSS)	802.11g/n (Modulation : OFDM)
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz Mode 2 : 802.11b CH06_2437 MHz Mode 3 : 802.11b CH11_2462 MHz	Mode 4: 802.11g_CH01_2412 MHz Mode 5: 802.11g_CH06_2437 MHz Mode 6: 802.11g_CH11_2462 MHz Mode 7: 802.11g/n (BW 20M)_CH01_2412 MHz Mode 8: 802.11g/n (BW 20M)_CH06_2437 MHz Mode 9: 802.11g/n (BW 20M)_CH11_2462 MHz Mode 10: 802.11g/n (BW 40M)_CH03_2422 MHz Mode 11: 802.11g/n (BW 40M)_CH06_2437 MHz Mode 12: 802.11g/n (BW 40M)_CH09_2452 MHz
Radiated 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: 802.11g/n (BW 20M)_CH01_2412 MHz Mode 8: 802.11g/n (BW 20M)_CH06_2437 MHz Mode 9: 802.11g/n (BW 20M)_CH11_2462 MHz Mode 10: 802.11g/n (BW 40M)_CH03_2422 MHz Mode 11: 802.11g/n (BW 40M)_CH06_2437 MHz Mode 12: 802.11g/n (BW 40M)_CH09_2452 MHz
AC Conducted Emission	Mode 1 : GSM1900 Idle + Bluetooth Link + WLAN Link + Earphone + Camera + USB Cable (Charging from Adapter)	

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 RF Utility

For WLAN function, execute "ADB" to make the EUT contact with WLAN AP for transmitting and receiving signals continuously.

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.

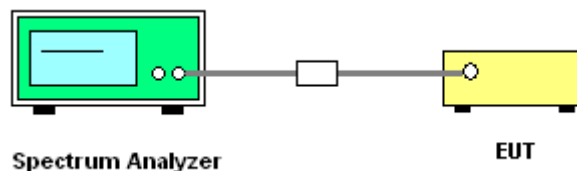
3.1.2 Measuring Instruments

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



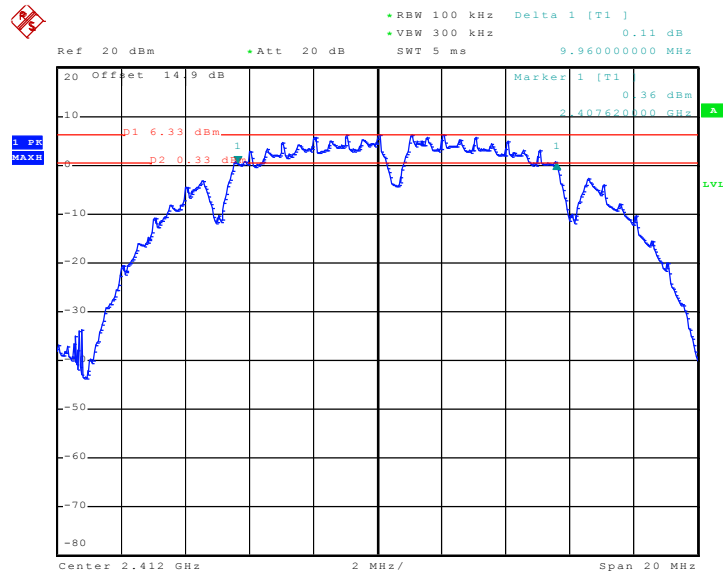


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
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	9.96	0.5	Pass
06	2437	9.72	0.5	Pass
11	2462	10.00	0.5	Pass

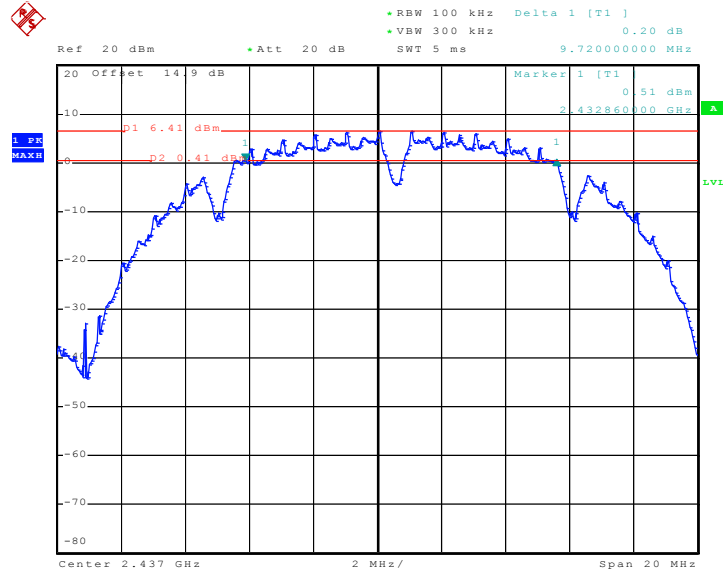
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 20.MAR.2012 09:30:59

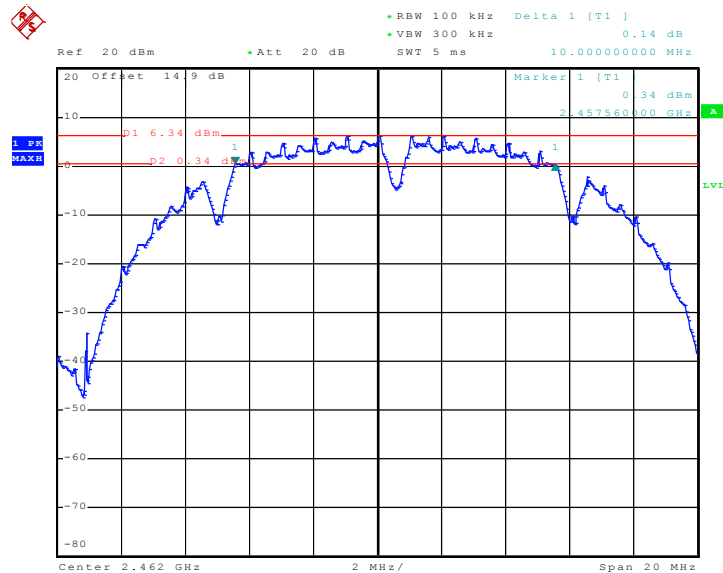


Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 20.MAR.2012 10:03:56

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



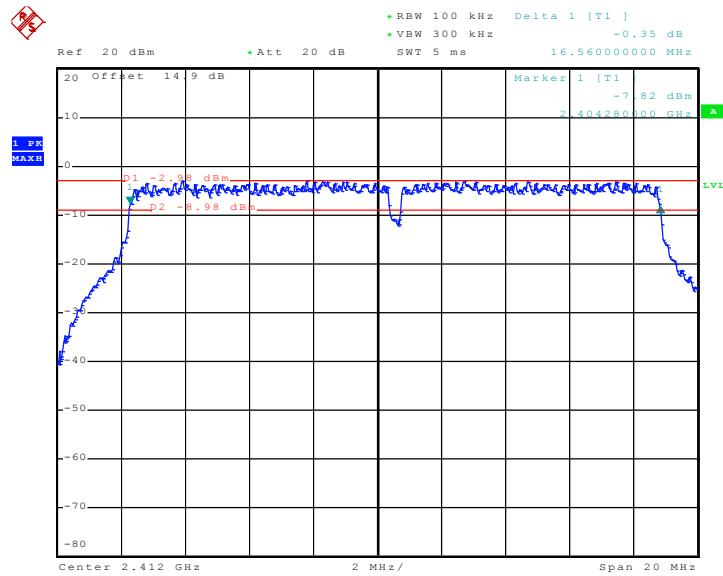
Date: 20.MAR.2012 10:24:26



Test Mode :	Mode 4, 5, 6	Temperature :	23~24°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	16.56	0.5	Pass
06	2437	16.56	0.5	Pass
11	2462	16.56	0.5	Pass

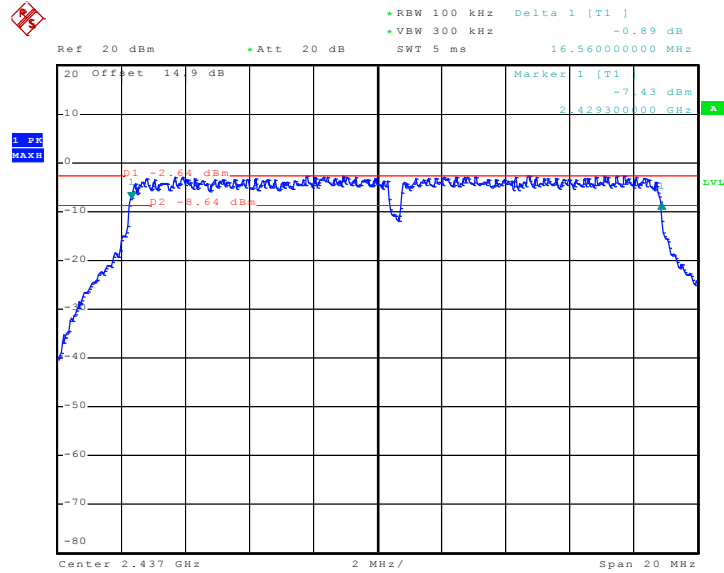
Mode 4 : 6 dB Bandwidth Plot on 802.11g Channel 01



Date: 20.MAR.2012 10:46:49

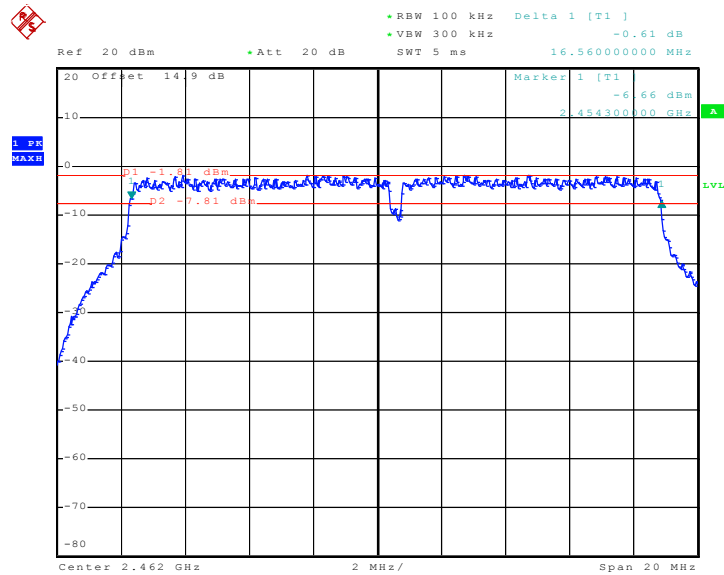


Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



Date: 20.MAR.2012 11:04:52

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



Date: 20.MAR.2012 11:17:08

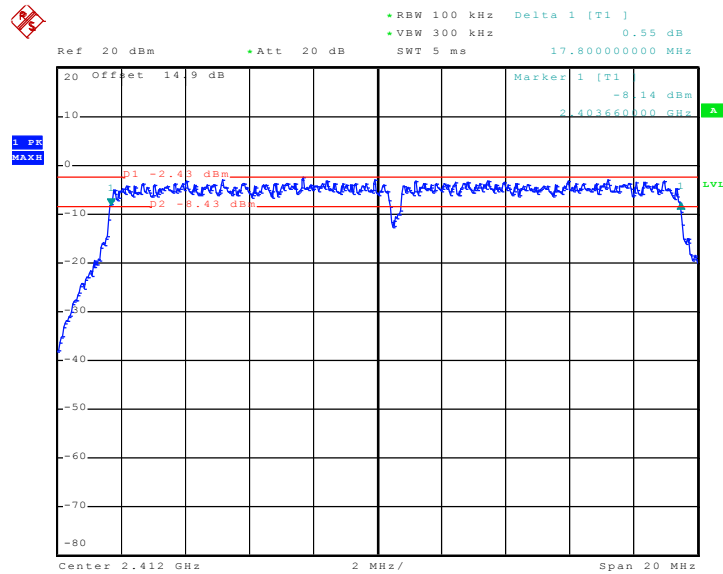


Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g/n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.80	0.5	Pass
06	2437	17.64	0.5	Pass
11	2462	17.72	0.5	Pass

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

01

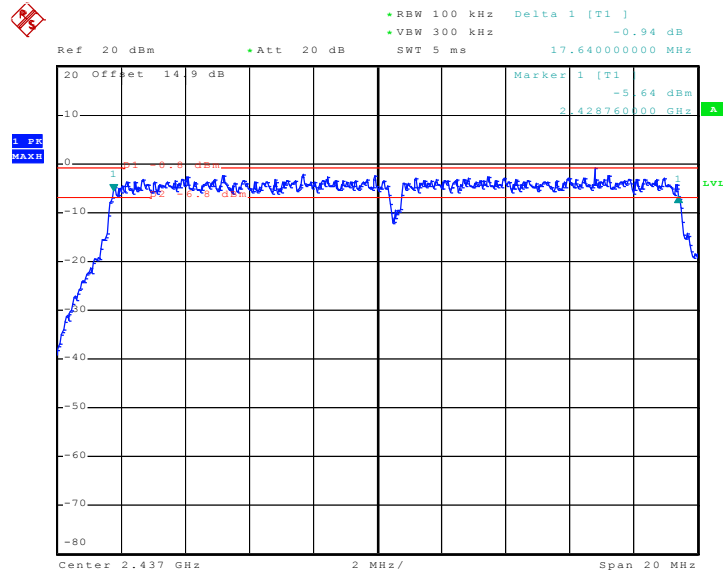


Date: 20.MAR.2012 11:31:50



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

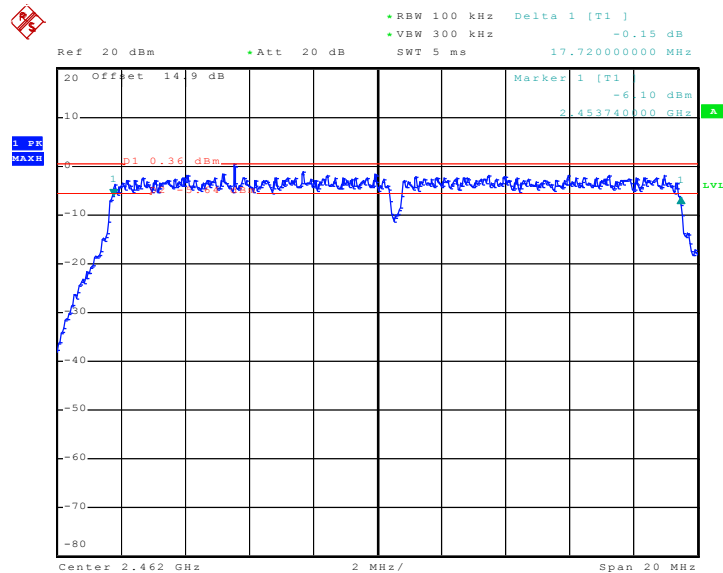
06



Date: 20.MAR.2012 11:49:27

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

11



Date: 20.MAR.2012 12:04:04

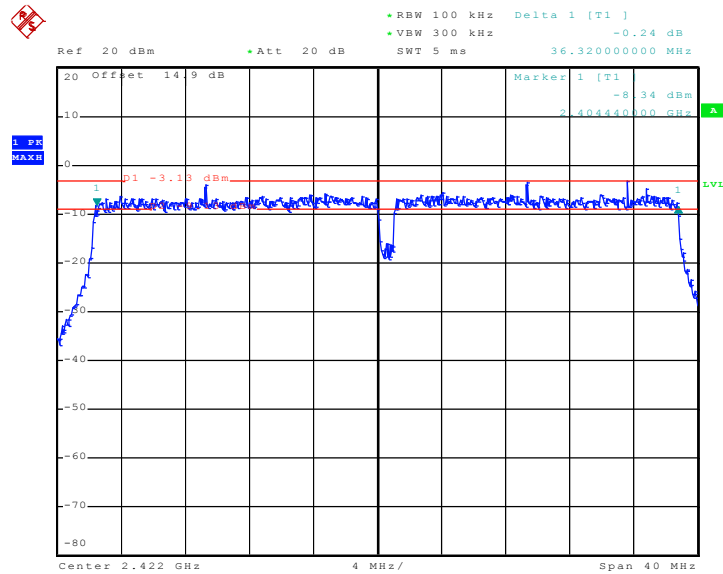


Test Mode :	Mode 10, 11, 12	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g/n (BW 40MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
03	2422	36.32	0.5	Pass
06	2437	36.40	0.5	Pass
09	2452	36.40	0.5	Pass

Mode 10 : 6 dB Bandwidth Plot on 802.11g/n(BW 40MHz) Channel

03

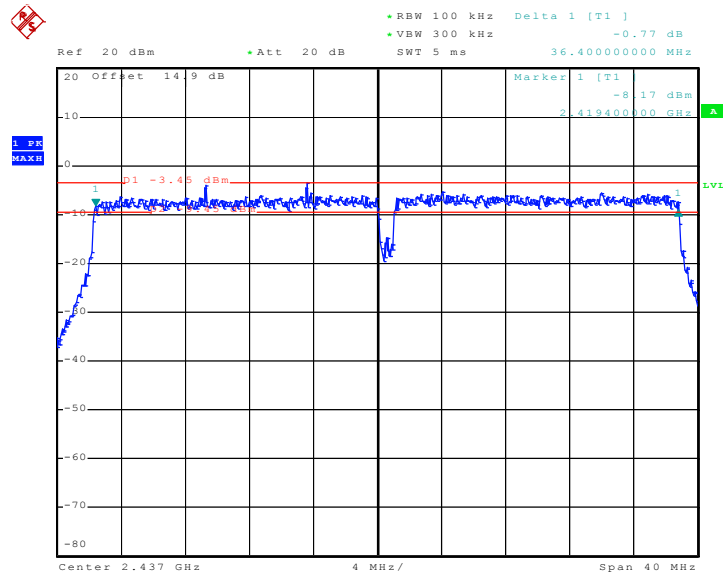


Date: 20.MAR.2012 13:18:20



Mode 11 : 6 dB Bandwidth Plot on 802.11g/n(BW 40MHz) Channel

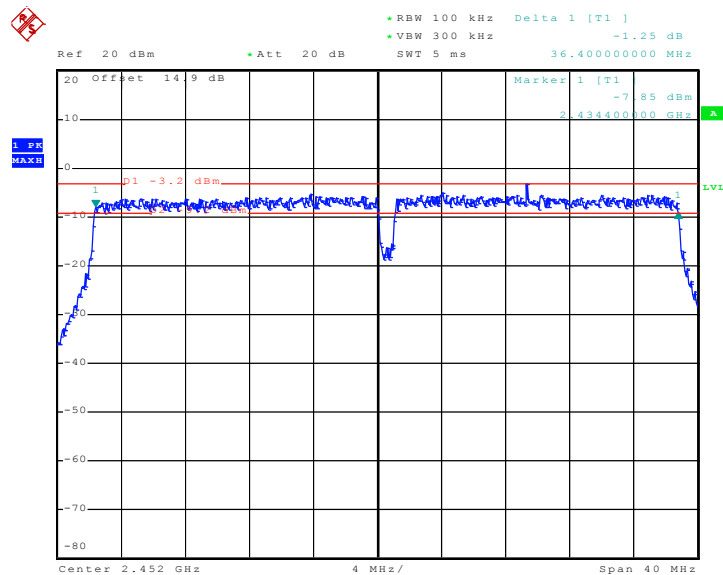
06



Date: 20.MAR.2012 13:33:21

Mode 12 : 6 dB Bandwidth Plot on 802.11g/n(BW 40MHz) Channel

09



Date: 20.MAR.2012 13:46:22

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.

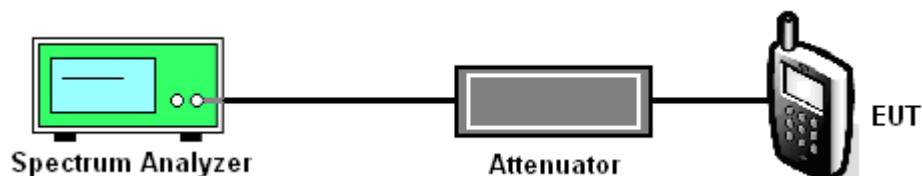
3.2.2 Measuring Instruments

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 :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.78	30	Pass
06	2437	19.43	30	Pass
11	2462	20.13	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.86	30	Pass
06	2437	21.11	30	Pass
11	2462	21.76	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g/n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.87	30	Pass
06	2437	21.14	30	Pass
11	2462	21.53	30	Pass



Test Mode :	Mode 10, 11, 12	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g/n (BW 40MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	20.95	30	Pass
06	2437	21.07	30	Pass
09	2452	21.63	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

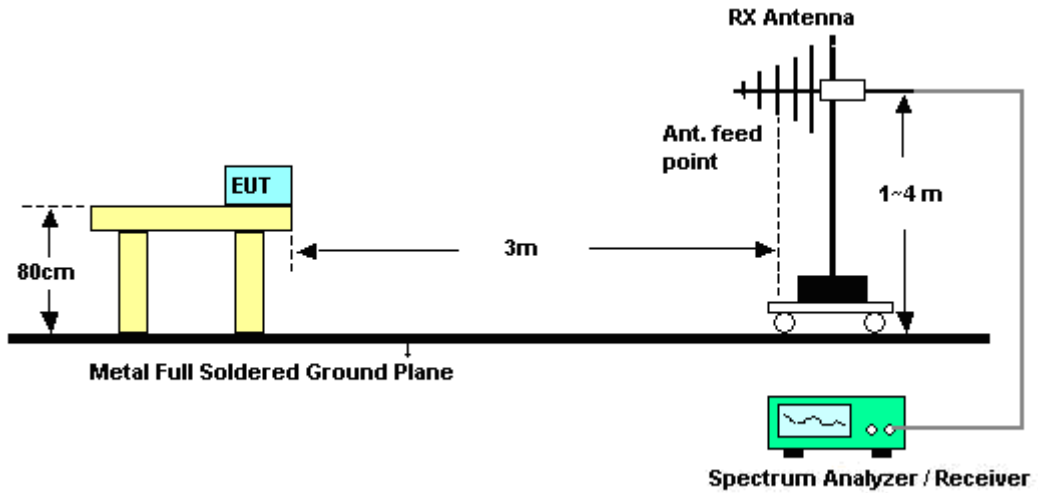
See list of measuring instruments of this test report.

3.3.3 Test Procedures

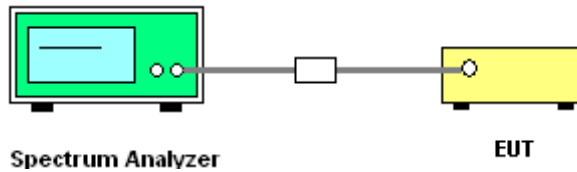
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 KHz, Video bandwidth (VBW) \geq RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized 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°C
Test Band :	802.11b	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	48.63	-25.37	74	46.35	32.86	3.47	34.05	100	0	Peak
2390	38.38	-15.62	54	36.1	32.86	3.47	34.05	100	0	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	48.58	-25.42	74	46.3	32.86	3.47	34.05	100	0	Peak
2390	38.48	-15.52	54	36.2	32.86	3.47	34.05	100	0	Average

Test Mode :	Mode 3	Temperature :	20~21°C
Test Band :	802.11b	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	49.44	-24.56	74	46.95	33.01	3.68	34.2	100	0	Peak
2483.5	41.05	-12.95	54	38.56	33.01	3.68	34.2	100	0	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.61	49.92	-24.08	74	47.43	33.01	3.68	34.2	100	0	Peak
2484.61	39.59	-14.41	54	37.1	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 4	Temperature :	20~21°C
Test Band :	802.11g	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	48.33	-25.67	74	46.05	32.86	3.47	34.05	100	0	Peak
2390	39.08	-14.92	54	36.8	32.86	3.47	34.05	100	0	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	49.21	-24.79	74	46.93	32.86	3.47	34.05	100	0	Peak
2390	40.38	-13.62	54	38.1	32.86	3.47	34.05	100	0	Average

Test Mode :	Mode 6	Temperature :	20~21°C
Test Band :	802.11g	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	58.75	-15.25	74	56.26	33.01	3.68	34.2	100	28	Peak
2483.66	45.39	-8.61	54	42.9	33.01	3.68	34.2	100	28	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.8	45.59	-8.41	54	43.1	33.01	3.68	34.2	100	322	Peak
2484.8	57.3	-16.7	74	54.81	33.01	3.68	34.2	100	322	Average



Test Mode :	Mode 7	Temperature :	20~21°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	43~44%
Test Channel :	01	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	48.87	-25.13	74	46.59	32.86	3.47	34.05	100	0	Peak
2390	39.38	-14.62	54	37.1	32.86	3.47	34.05	100	0	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	48.93	-25.07	74	46.65	32.86	3.47	34.05	100	0	Peak
2390	40.68	-13.32	54	38.4	32.86	3.47	34.05	100	0	Average

Test Mode :	Mode 9	Temperature :	20~21°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	43~44%
Test Channel :	11	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	60.81	-13.19	74	58.32	33.01	3.68	34.2	100	16	Peak
2483.66	44.67	-9.33	54	42.18	33.01	3.68	34.2	100	16	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.85	60.4	-13.6	74	57.91	33.01	3.68	34.2	100	261	Peak
2483.85	46.79	-7.21	54	44.3	33.01	3.68	34.2	100	261	Average



Test Mode :	Mode 10	Temperature :	20~21°C
Test Band :	802.11g/n (BW 40MHz)	Relative Humidity :	43~44%
Test Channel :	03	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.04	54.42	-19.58	74	52.14	32.86	3.47	34.05	200	276	Peak
2389.04	40.05	-13.95	54	37.77	32.86	3.47	34.05	200	276	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.28	56.01	-17.99	74	53.73	32.86	3.47	34.05	102	261	Peak
2388.28	41.44	-12.56	54	39.16	32.86	3.47	34.05	102	261	Average

Test Mode :	Mode 12	Temperature :	20~21°C
Test Band :	802.11g/n (BW 40MHz)	Relative Humidity :	43~44%
Test Channel :	09	Test Engineer :	Jack Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2488.79	63.07	-10.93	74	60.53	33.05	3.72	34.23	200	316	Peak
2488.79	44.75	-9.25	54	42.21	33.05	3.72	34.23	200	316	Average

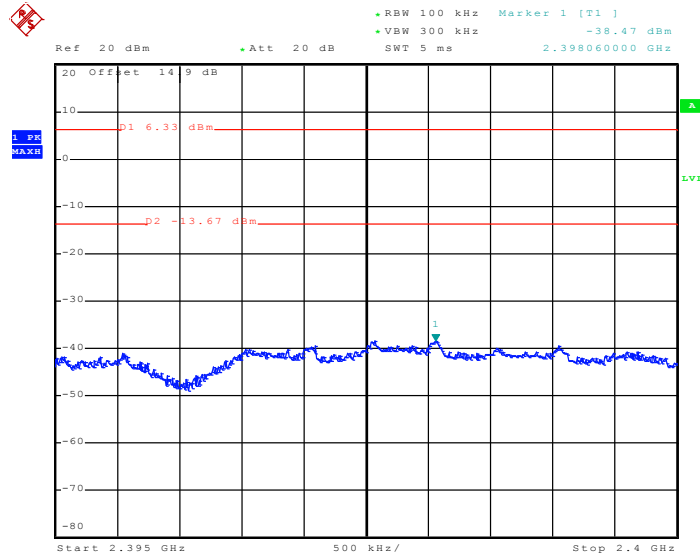
ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2487.65	62.9	-11.1	74	60.36	33.05	3.72	34.23	200	326	Peak
2487.65	45.37	-8.63	54	42.83	33.05	3.72	34.23	200	326	Average



3.3.6 Test Plots of Conducted Band Edges

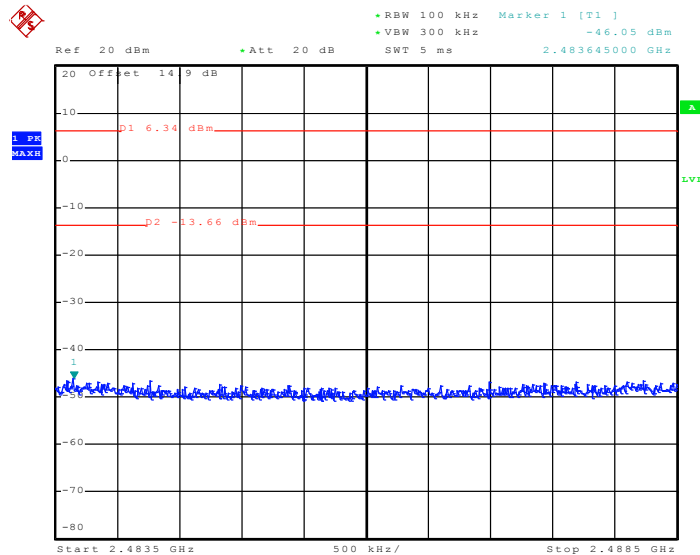
Test Mode :	Mode 1 and 3	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11b Channel 01



Date: 20.MAR.2012 09:32:07

High Band Edge Plot on 802.11b Channel 11

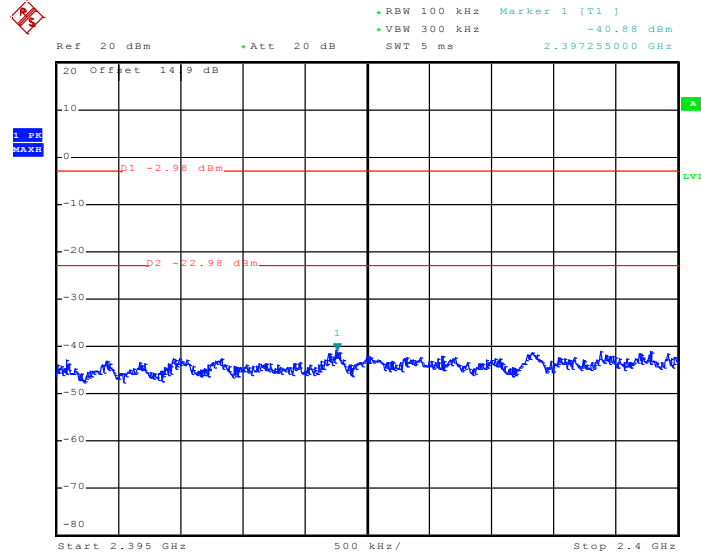


Date: 20.MAR.2012 10:25:12



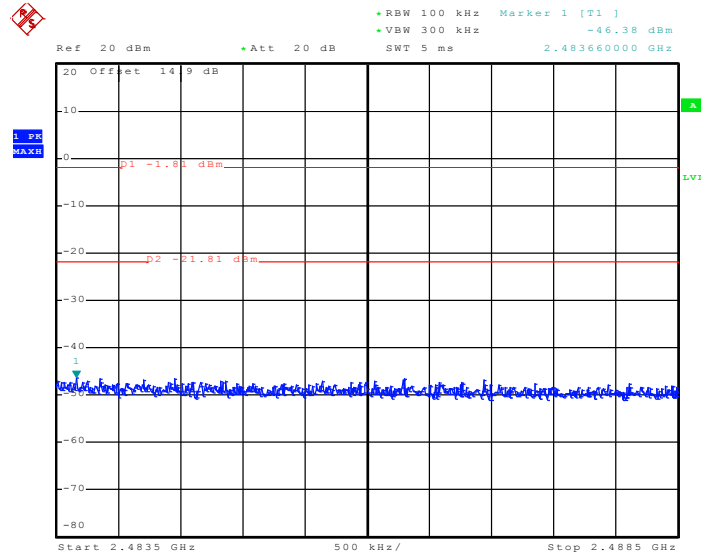
Test Mode :	Mode 4 and 6	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11g Channel 01



Date: 20.MAR.2012 10:47:59

High Band Edge Plot on 802.11g Channel 11

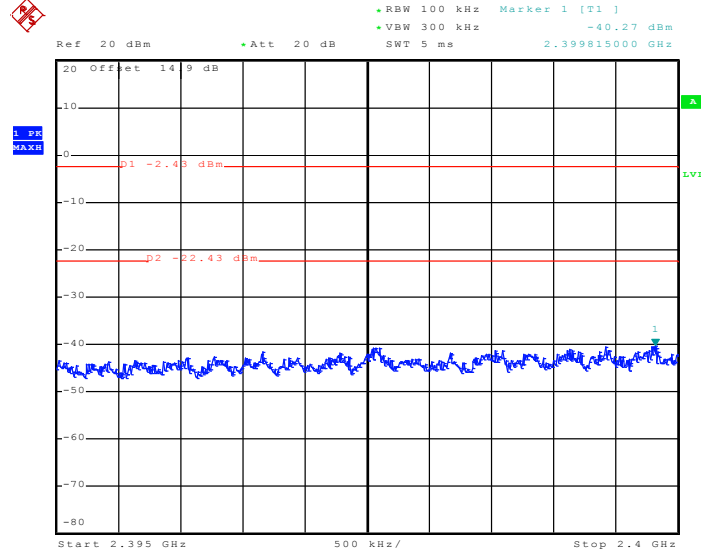


Date: 20.MAR.2012 11:17:56



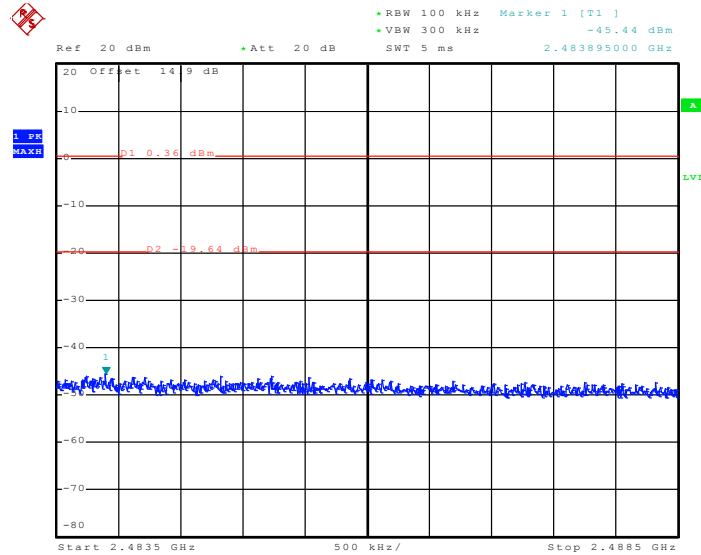
Test Mode :	Mode 7 and 9	Temperature :	23~24°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	47~48%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

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



Date: 20.MAR.2012 11:33:31

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

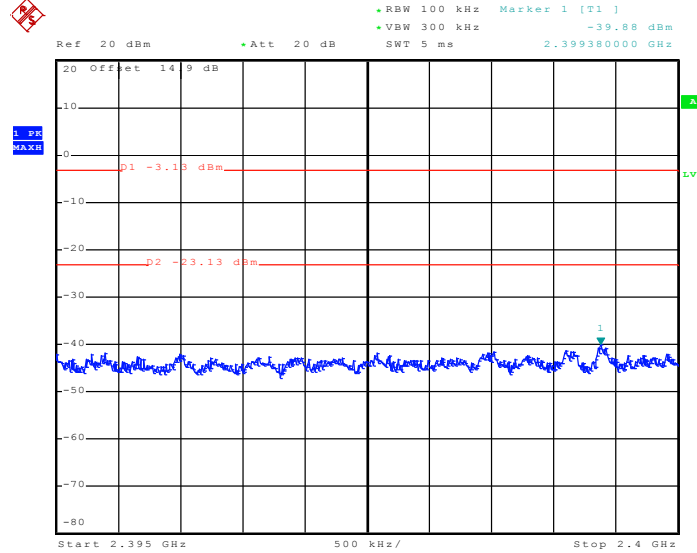


Date: 20.MAR.2012 12:04:52



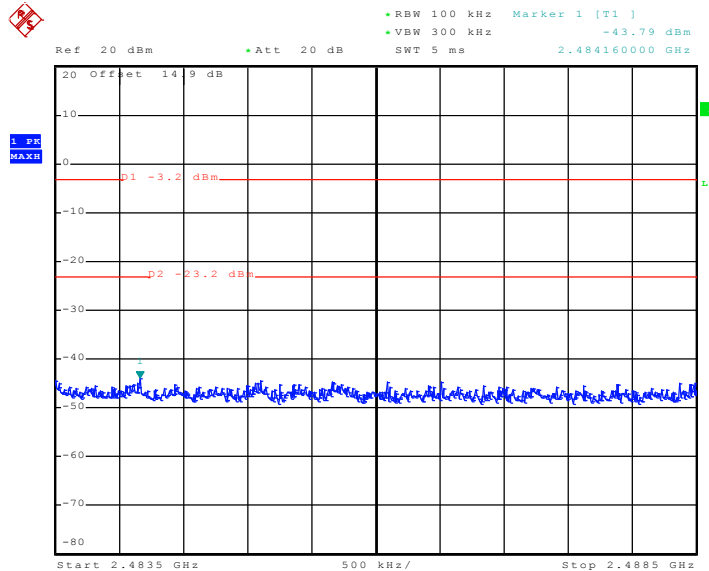
Test Mode :	Mode 10 and 12	Temperature :	23~24°C
Test Band :	802.11g/n (BW 40MHz)	Relative Humidity :	47~48%
Test Channel :	03 and 09	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11g/n (BW 40MHz) Channel 03



Date: 20.MAR.2012 13:20:12

High Band Edge Plot on 802.11g/n (BW 40MHz) Channel 09



Date: 20.MAR.2012 13:46:52

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.

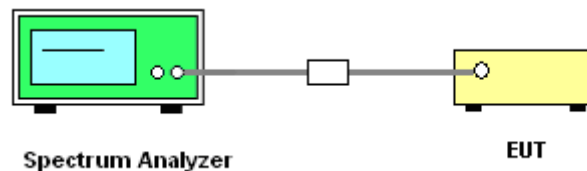
3.4.2 Measuring Instruments

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.

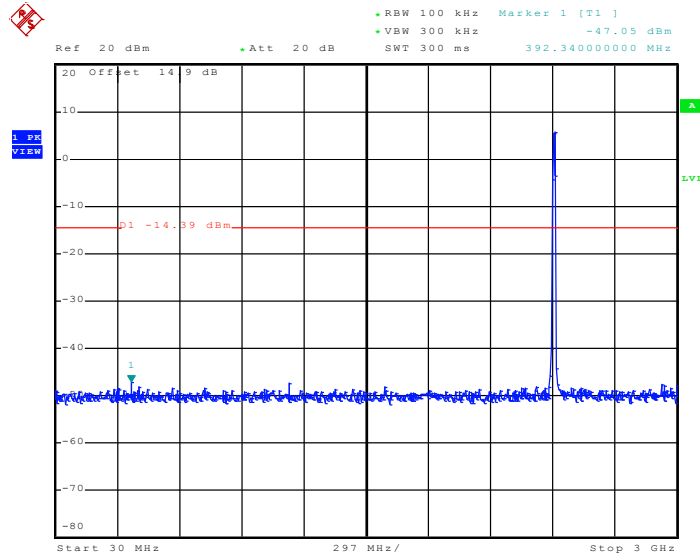
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

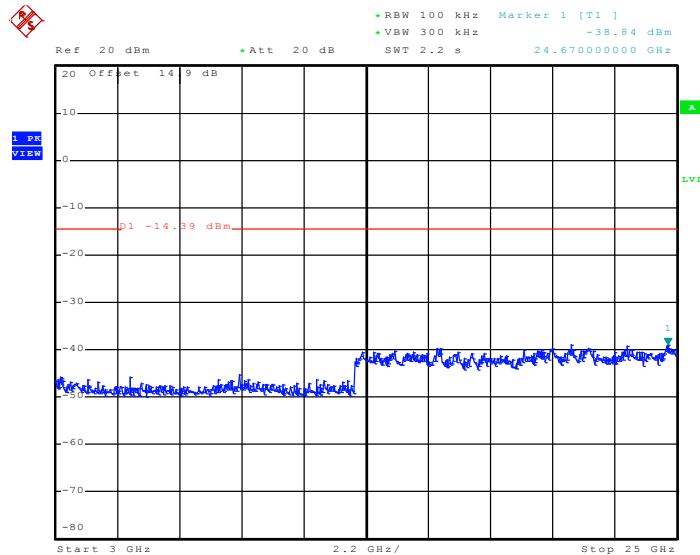
Test Mode :	Mode 1	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 09:34:20

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

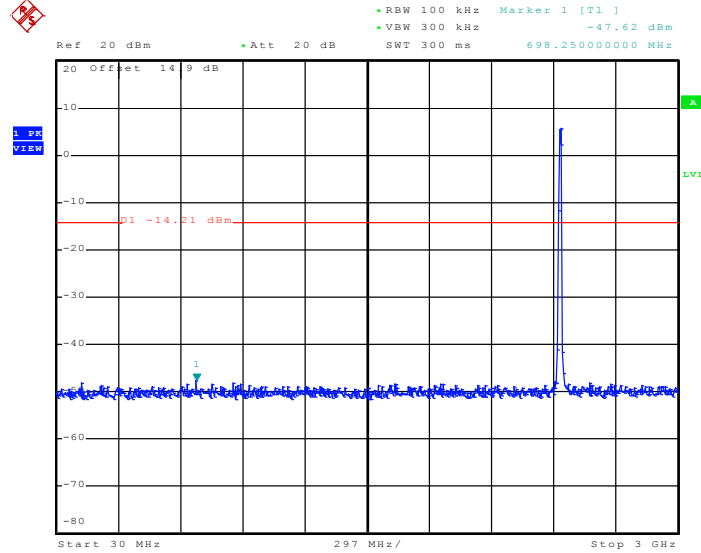


Date: 20.MAR.2012 09:34:37



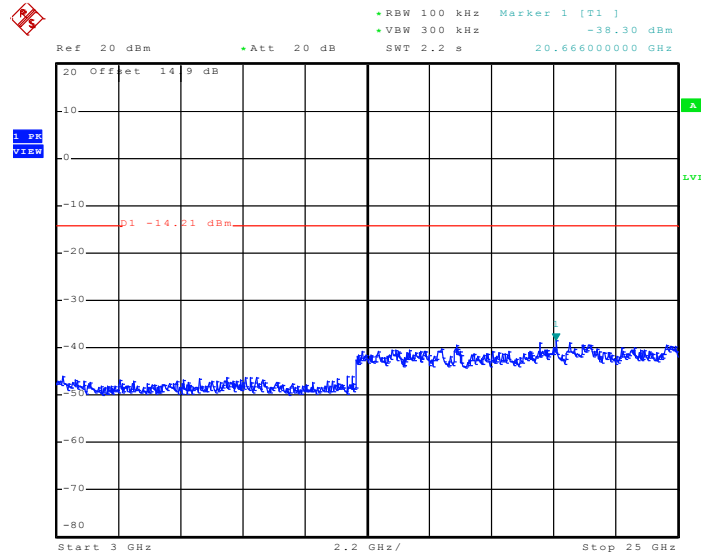
Test Mode :	Mode 2	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 10:06:28

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

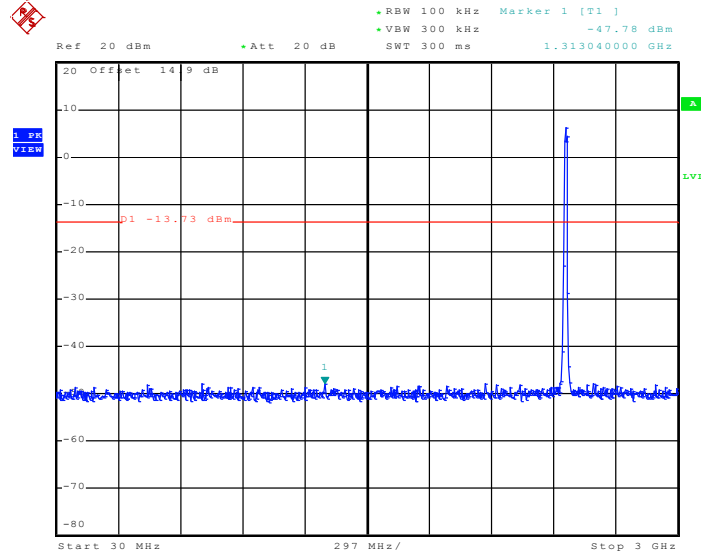


Date: 20.MAR.2012 10:06:45



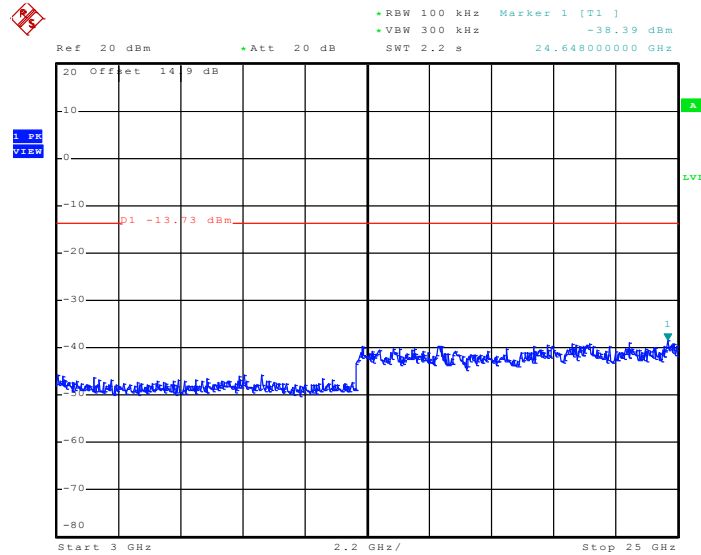
Test Mode :	Mode 3	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 10:32:14

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

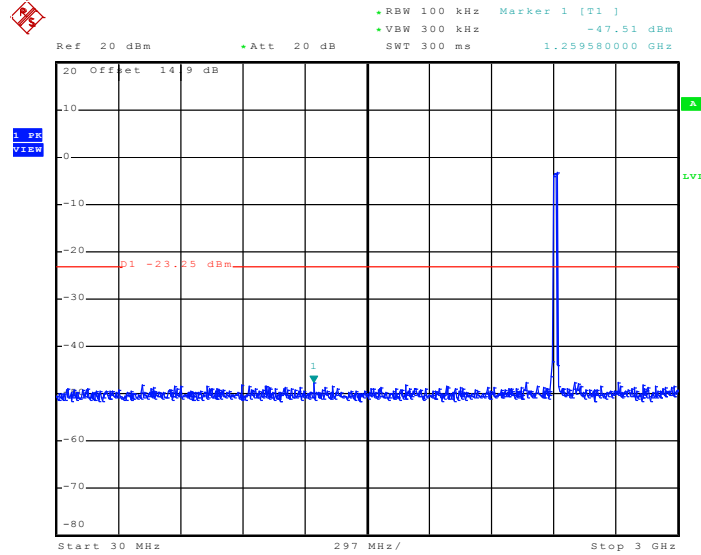


Date: 20.MAR.2012 10:32:31



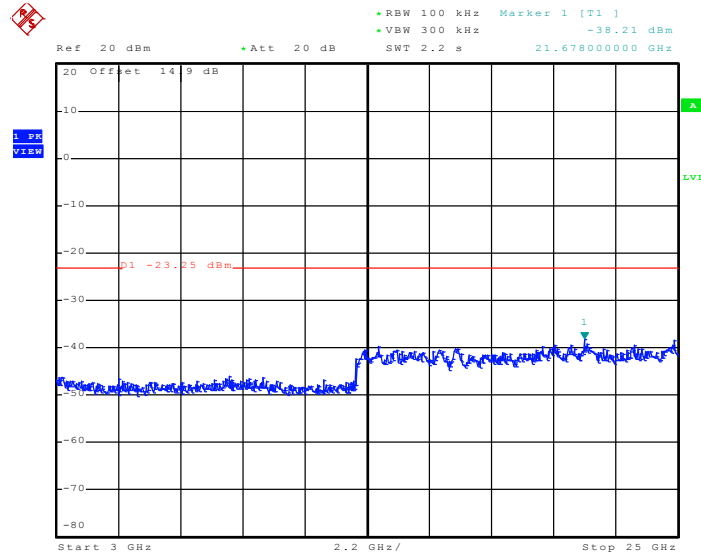
Test Mode :	Mode 4	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 10:51:04

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

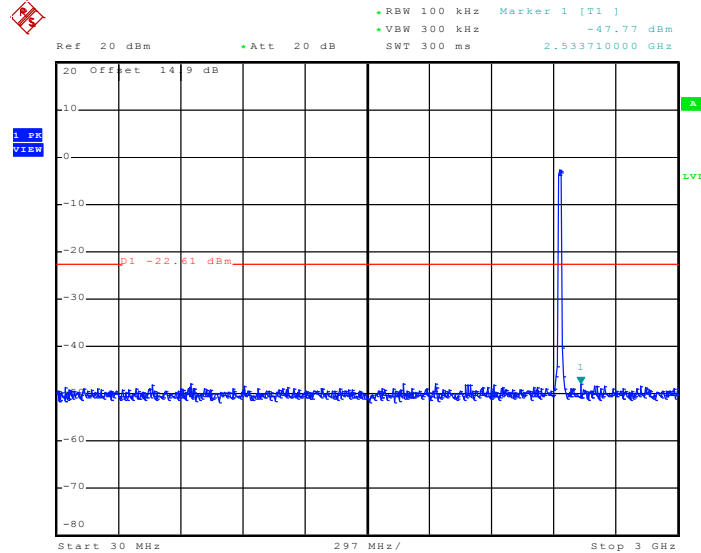


Date: 20.MAR.2012 10:51:21



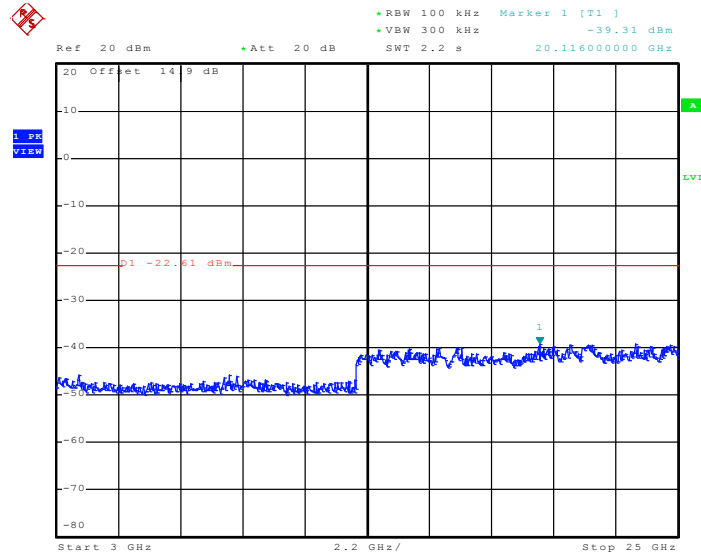
Test Mode :	Mode 5	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 11:05:40

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

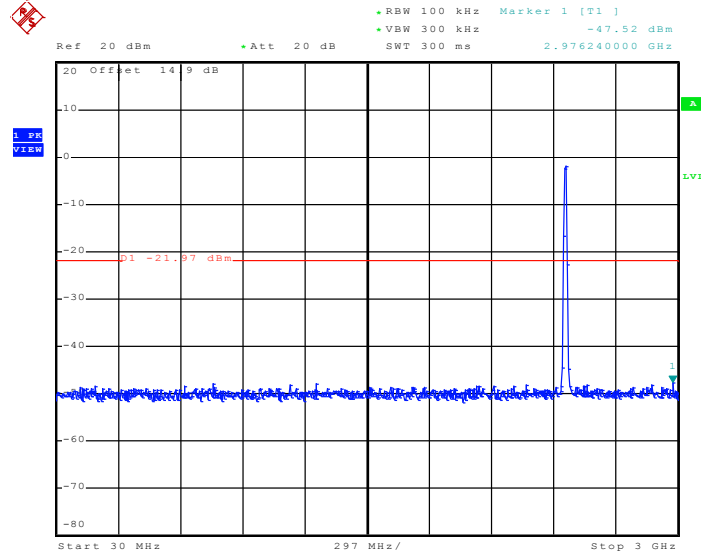


Date: 20.MAR.2012 11:05:57



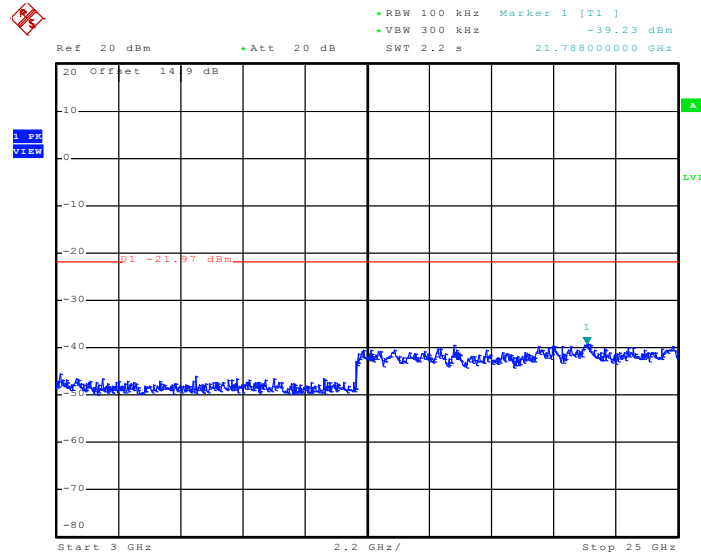
Test Mode :	Mode 6	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 11:19:13

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

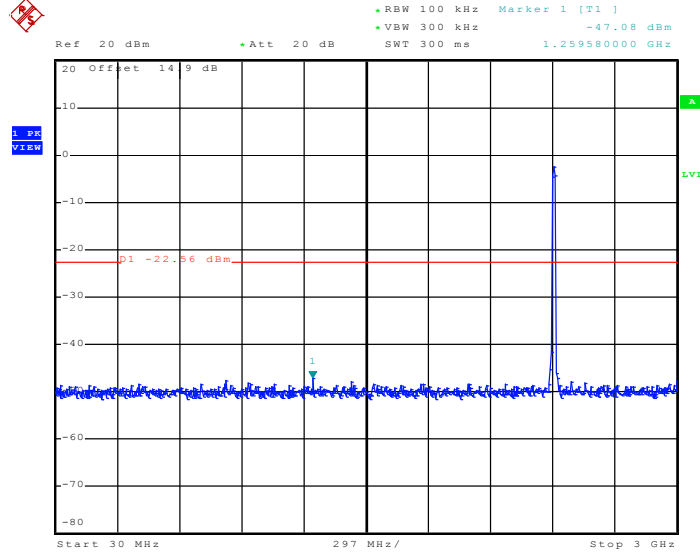


Date: 20.MAR.2012 11:19:30



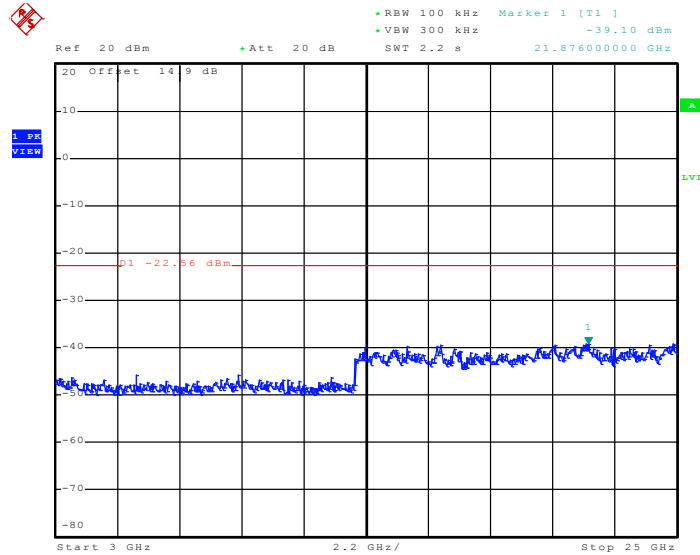
Test Mode :	Mode 7	Temperature :	23~24°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 11:35:30

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

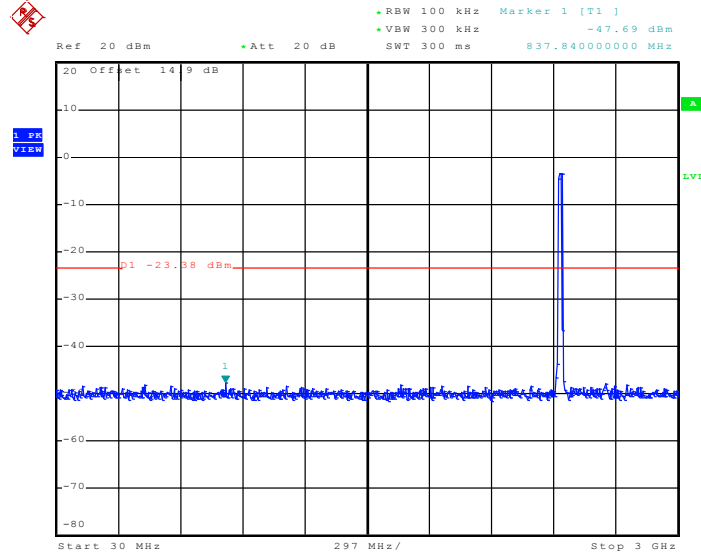


Date: 20.MAR.2012 11:35:47



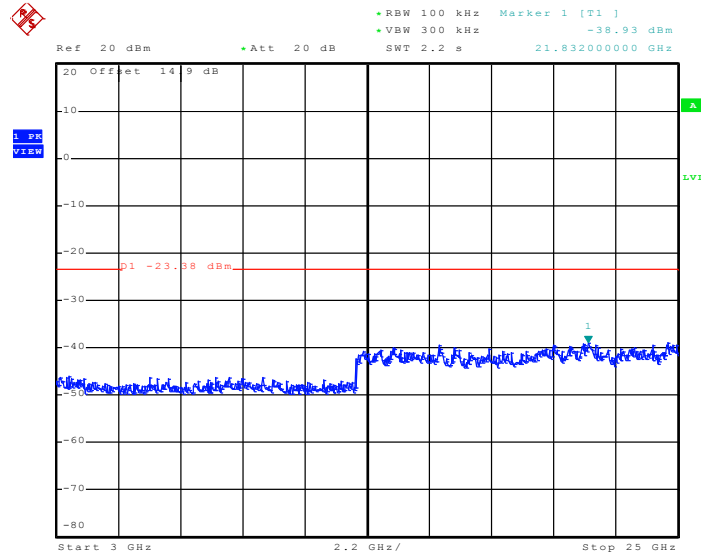
Test Mode :	Mode 8	Temperature :	23~24°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 11:50:33

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

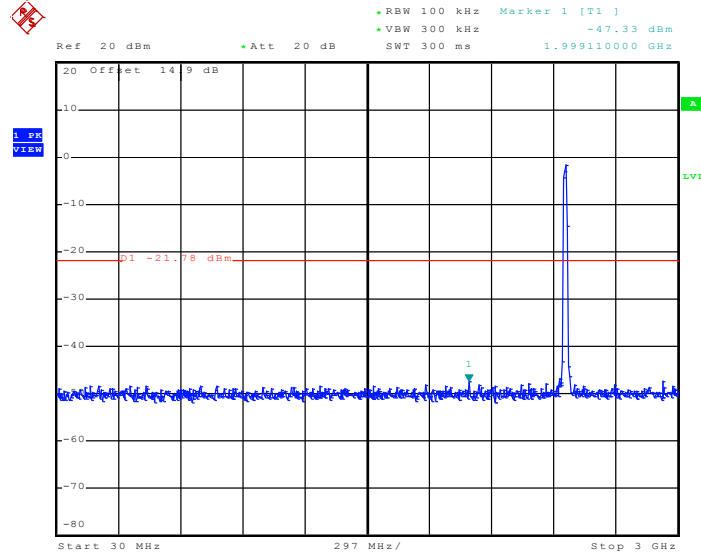


Date: 20.MAR.2012 11:50:49



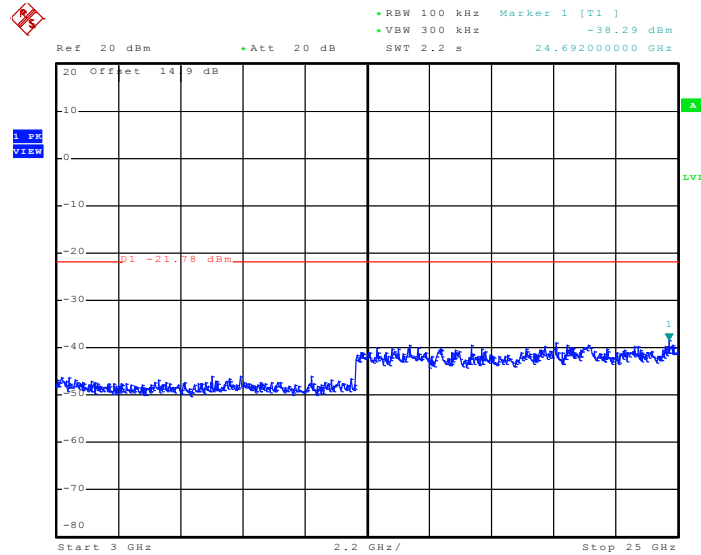
Test Mode :	Mode 9	Temperature :	23~24°C
Test Band :	802.11g/n (BW 20MHz)	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 12:05:35

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

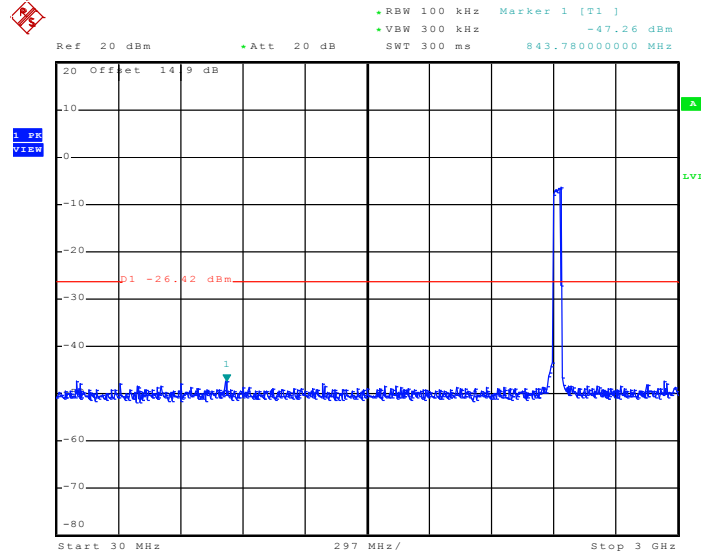


Date: 20.MAR.2012 12:05:52



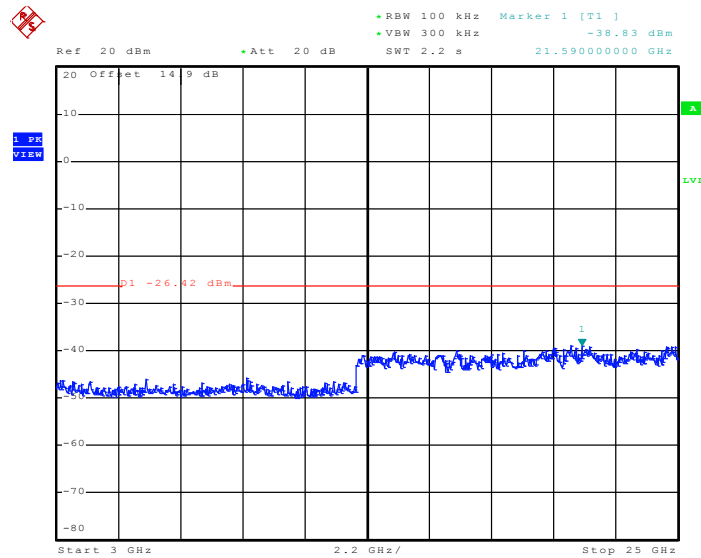
Test Mode :	Mode 10	Temperature :	23~24°C
Test Band :	802.11g/n (BW 40MHz)	Relative Humidity :	47~48%
Test Channel :	03	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 13:22:42

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

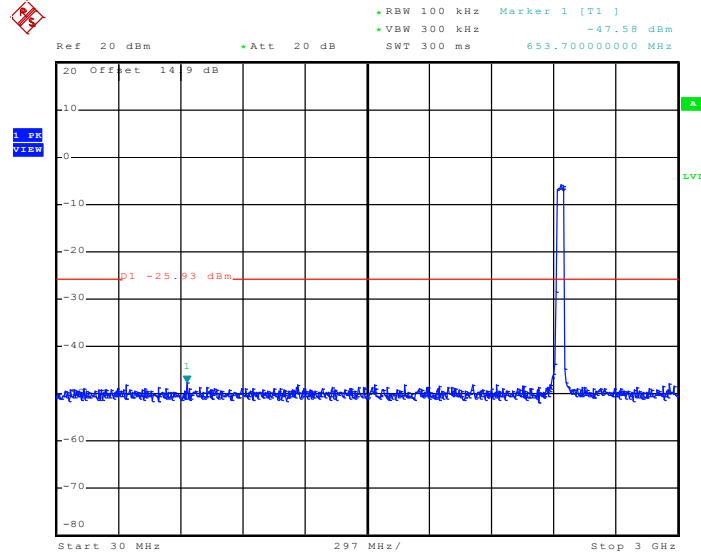


Date: 20.MAR.2012 13:22:59



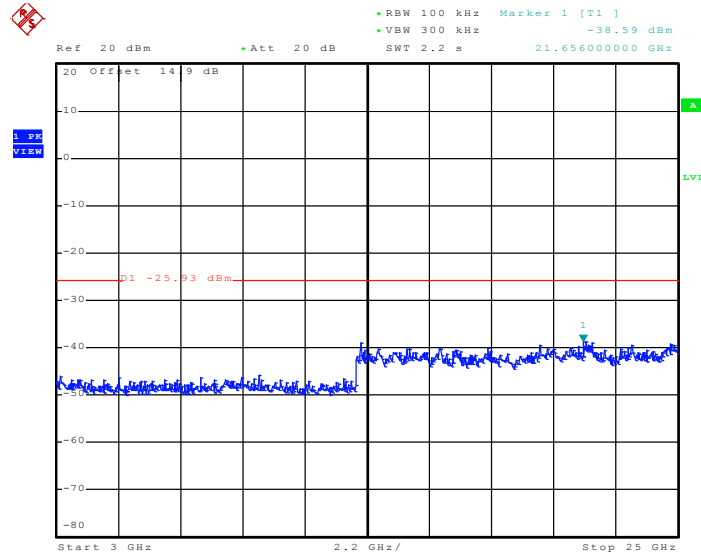
Test Mode :	Mode 11	Temperature :	23~24°C
Test Band :	802.11g/n (BW 40MHz)	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 13:34:19

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

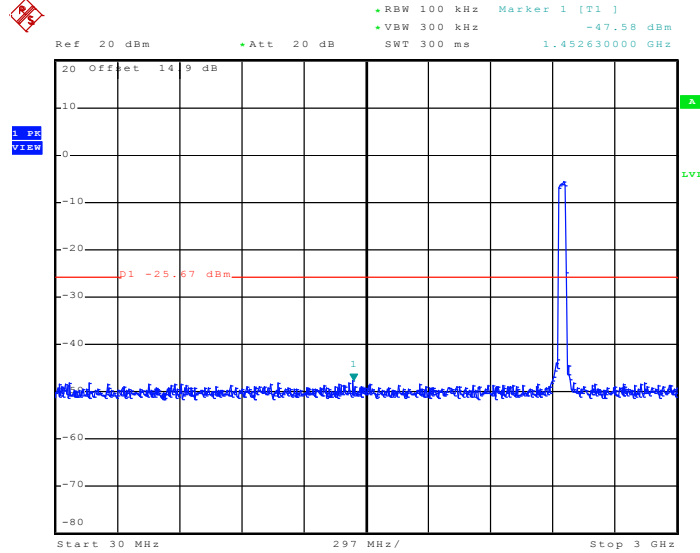


Date: 20.MAR.2012 13:34:36



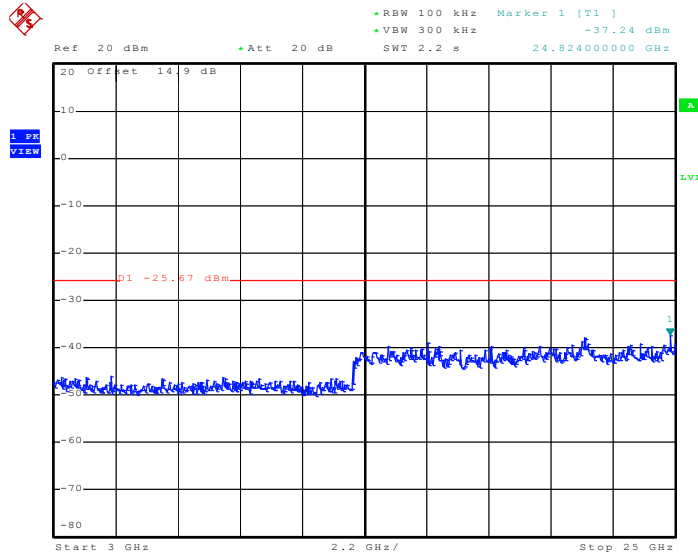
Test Mode :	Mode 12	Temperature :	23~24°C
Test Band :	802.11g/n (BW 40MHz)	Relative Humidity :	47~48%
Test Channel :	09	Test Engineer :	Zhi Lu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



Date: 20.MAR.2012 13:47:59

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz



Date: 20.MAR.2012 13:48:16

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.

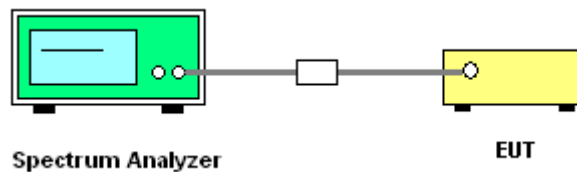
3.5.2 Measuring Instruments

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



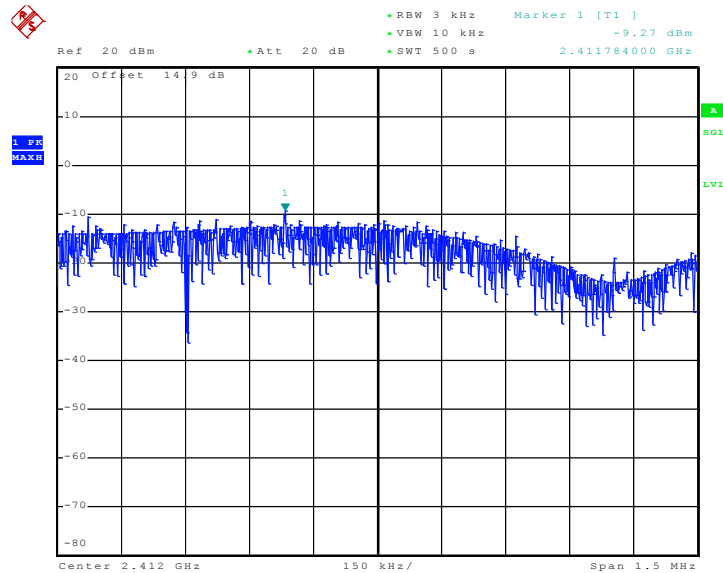


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-9.27	8	Pass
06	2437	-9.26	8	Pass
11	2462	-8.70	8	Pass

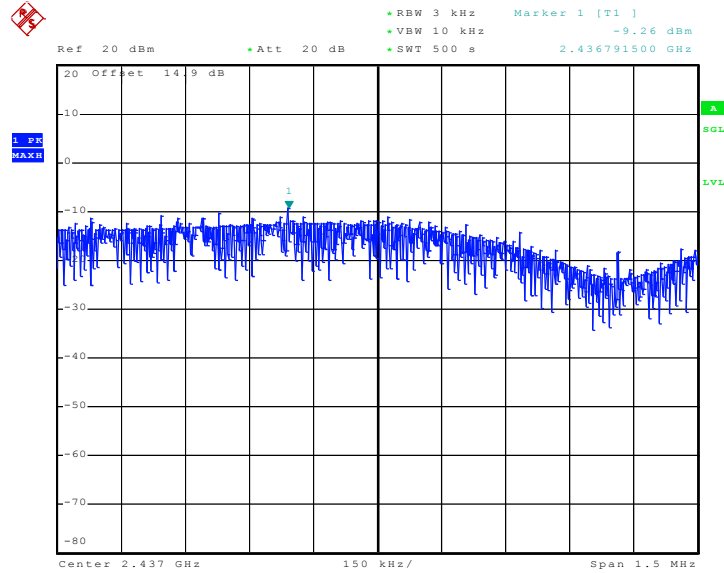
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 20.MAR.2012 09:44:37

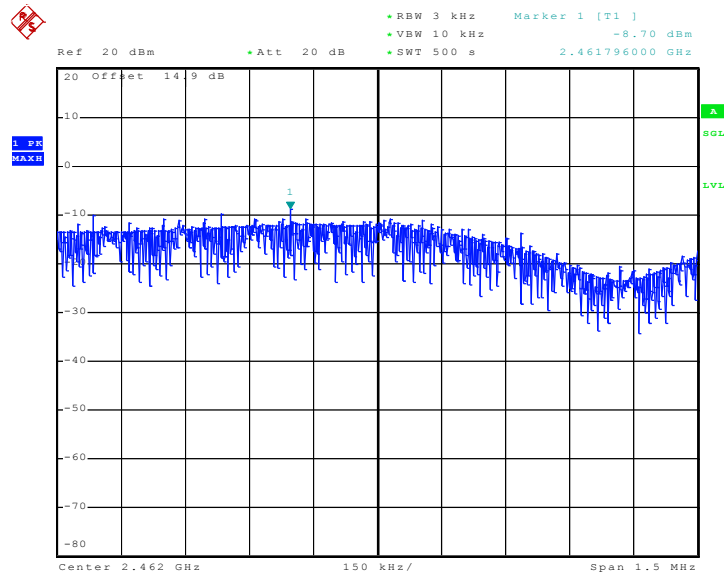


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 20.MAR.2012 10:22:53

Mode 3 : PSD Plot on 802.11b Channel 11



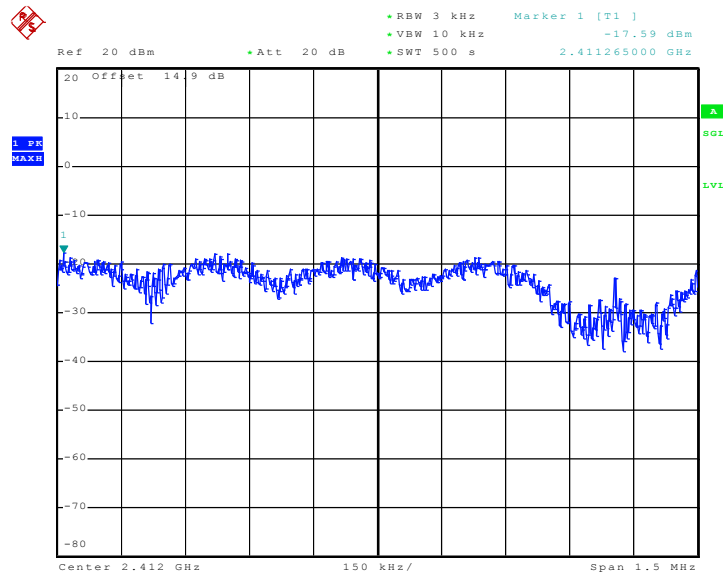
Date: 20.MAR.2012 10:44:10



Test Mode :	Mode 4, 5, 6	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-17.59	8	Pass
06	2437	-17.06	8	Pass
11	2462	-15.27	8	Pass

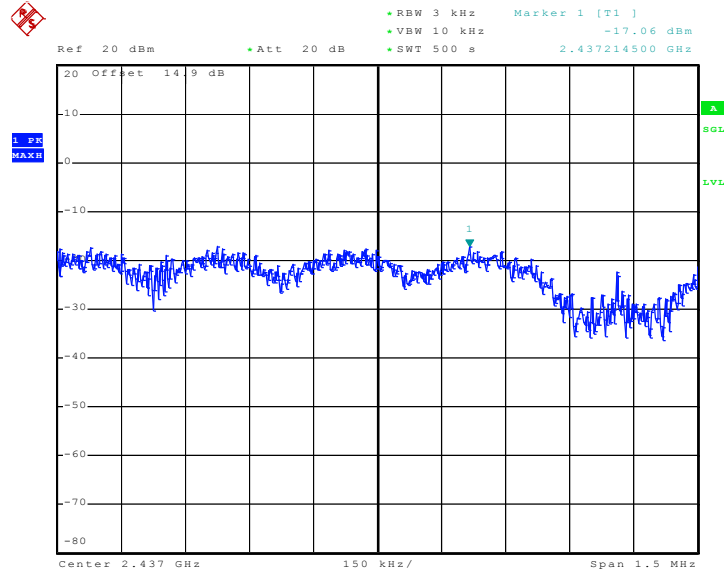
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 20.MAR.2012 11:02:44

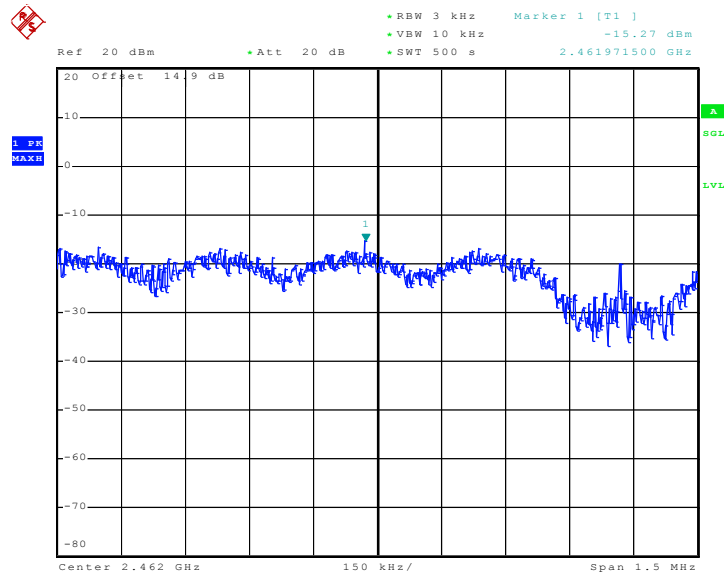


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 20.MAR.2012 11:15:41

Mode 6 : PSD Plot on 802.11g Channel 11



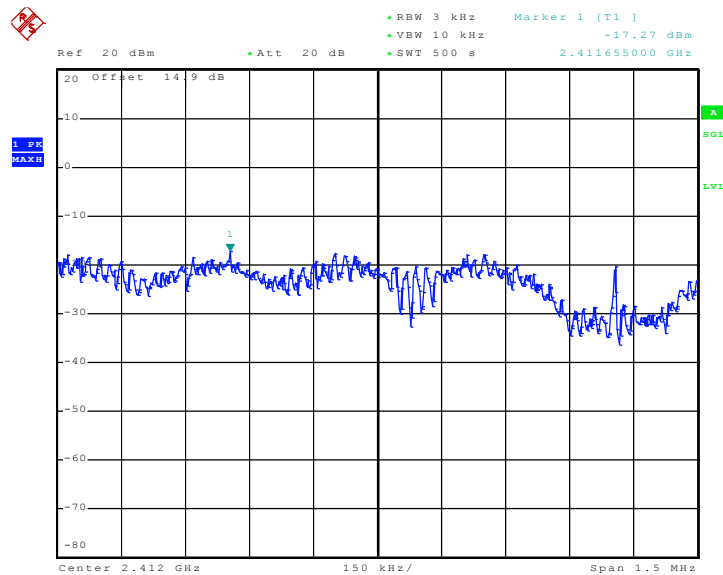
Date: 20.MAR.2012 11:28:34



Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g/n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-17.27	8	Pass
06	2437	-17.02	8	Pass
11	2462	-15.88	8	Pass

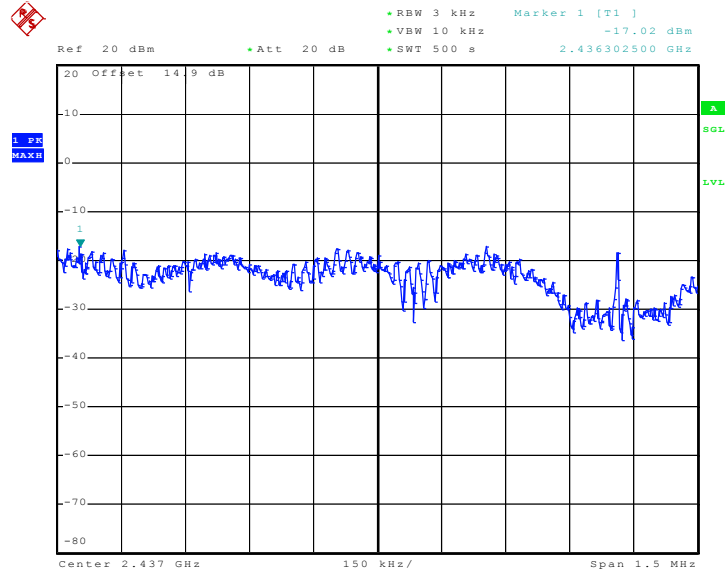
Mode 7 : PSD Plot on 802.11g/n (BW 20MHz) Channel 01



Date: 20.MAR.2012 11:47:18

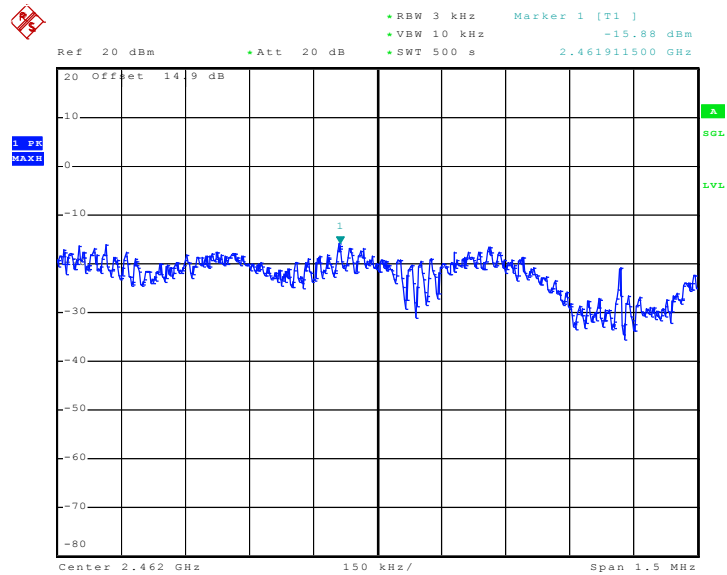


Mode 8 : PSD Plot on 802.11g/n (BW 20MHz) Channel 06



Date: 20.MAR.2012 12:02:25

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



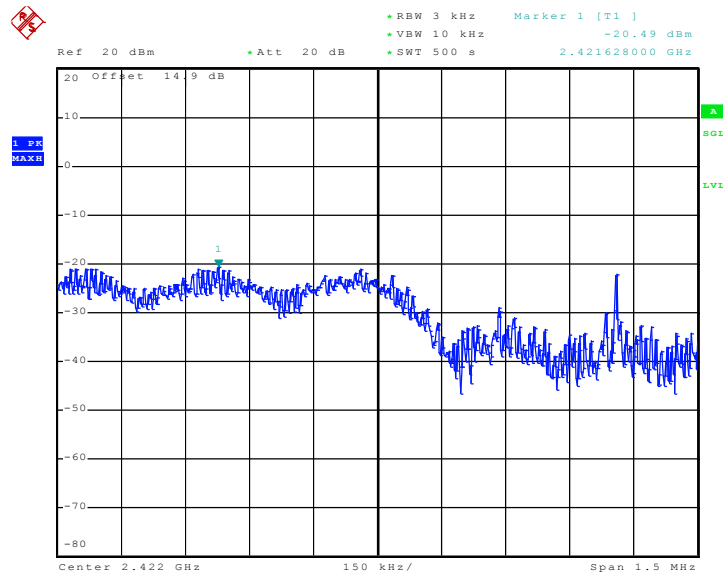
Date: 20.MAR.2012 12:52:59



Test Mode :	Mode 10, 11, 12	Temperature :	23~24°C
Test Engineer :	Zhi Lu	Relative Humidity :	47~48%

Channel	Frequency (MHz)	802.11g/n (BW 40MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
03	2422	-20.49	8	Pass
06	2437	-19.86	8	Pass
09	2452	-19.72	8	Pass

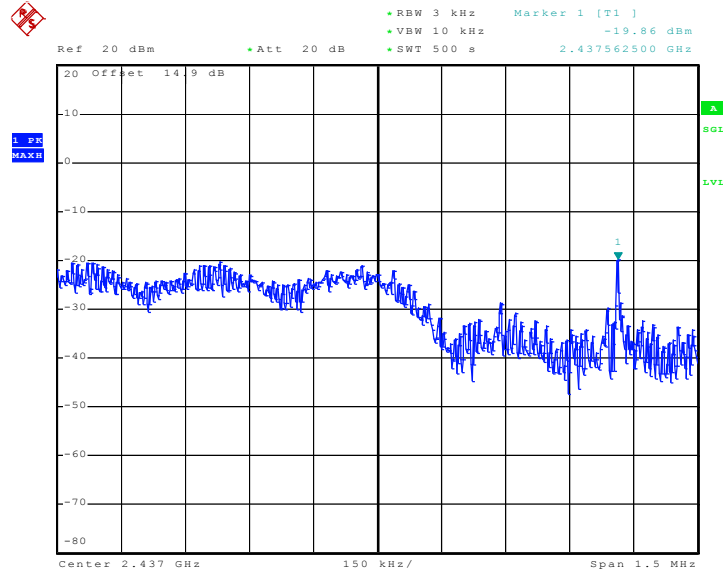
Mode 10 : PSD Plot on 802.11g/n (BW 40MHz) Channel 03



Date: 20.MAR.2012 13:31:55

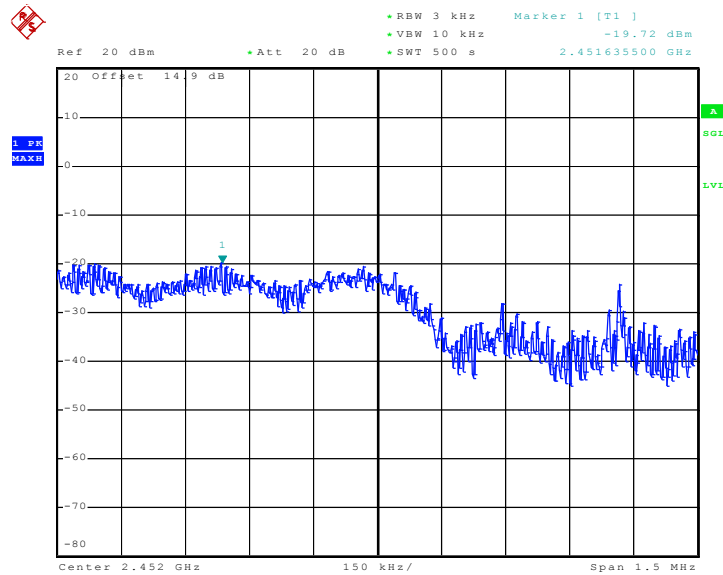


Mode 11 : PSD Plot on 802.11g/n (BW 40MHz) Channel 06



Date: 20.MAR.2012 13:43:16

Mode 12 : PSD Plot on 802.11g/n (BW 40MHz) Channel 09



Date: 20.MAR.2012 13:58:24

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.

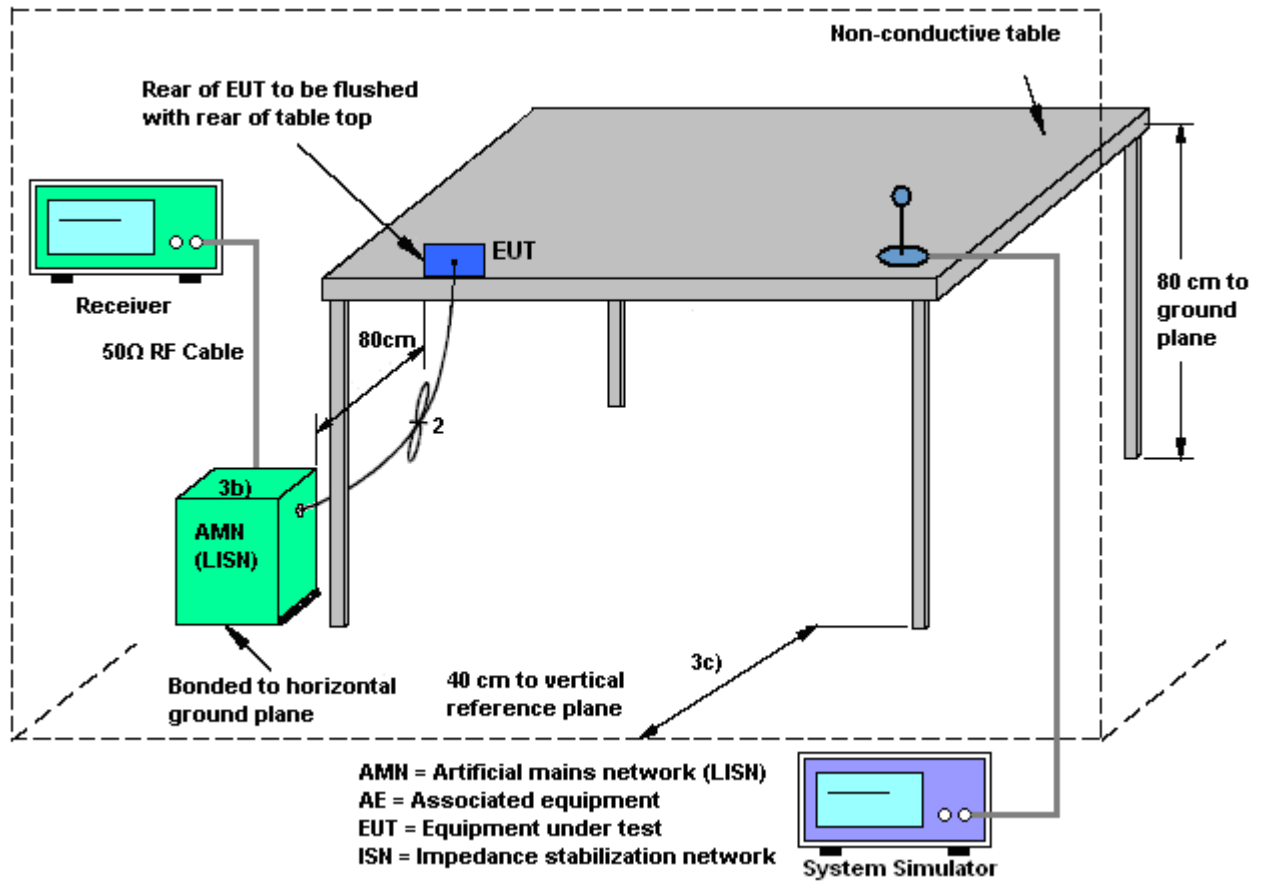
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

4. The testing follows the guidelines in ANSI C63.4-2003.
5. 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.
6. Connect EUT to the power mains through a line impedance stabilization network (LISN).
7. All the support units are connecting to the other LISN.
8. The LISN provides 50 ohm coupling impedance for the measuring instrument.
9. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
10. Both sides of AC line were checked for maximum conducted interference.
11. The frequency range from 150 KHz to 30 MHz was searched.
12. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

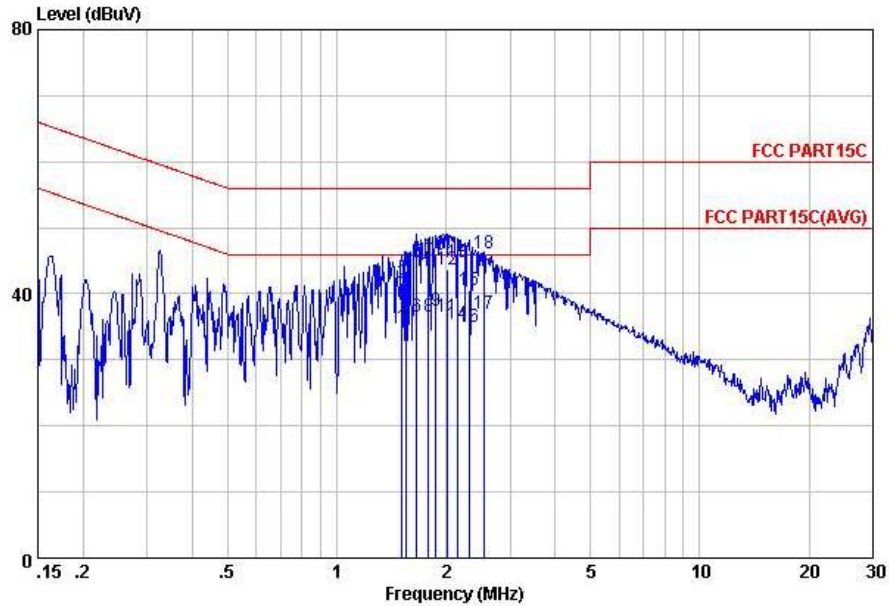
3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + Earphone + Camera + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

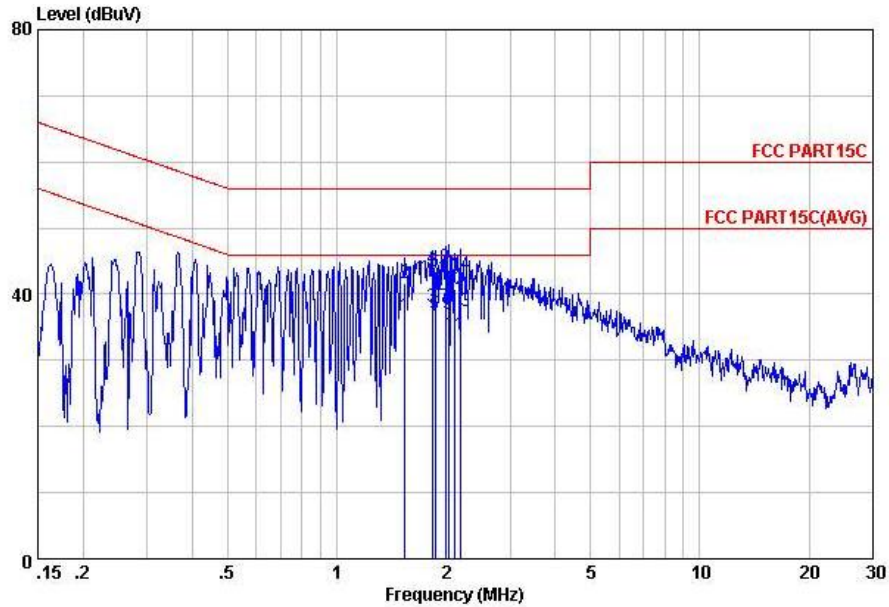


Site : C001-KS
 Condition: FCC PART15C LISN-100807 LINE
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	1.51	34.90	-11.10	46.00	24.71	-0.11	10.30	Average
2	1.51	41.60	-14.40	56.00	31.41	-0.11	10.30	QP
3	1.55	34.40	-11.60	46.00	24.21	-0.11	10.30	Average
4	1.55	43.50	-12.50	56.00	33.31	-0.11	10.30	QP
5	1.66	44.70	-11.30	56.00	34.50	-0.11	10.31	QP
6	1.66	36.50	-9.50	46.00	26.30	-0.11	10.31	Average
7	1.79	44.91	-11.09	56.00	34.70	-0.11	10.32	QP
8	1.79	36.61	-9.39	46.00	26.40	-0.11	10.32	Average
9	1.88	37.41	-8.59	46.00	27.20	-0.11	10.32	Average
10	1.88	46.01	-9.99	56.00	35.80	-0.11	10.32	QP
11	2.01	36.62	-9.38	46.00	26.40	-0.11	10.33	Average
12	2.01	43.62	-12.38	56.00	33.40	-0.11	10.33	QP
13	2.16	44.83	-11.17	56.00	34.60	-0.11	10.34	QP
14	2.16	35.33	-10.67	46.00	25.10	-0.11	10.34	Average
15	2.31	40.63	-15.37	56.00	30.40	-0.11	10.34	QP
16	2.31	34.93	-11.07	46.00	24.70	-0.11	10.34	Average
17	2.54	37.04	-8.96	46.00	26.80	-0.11	10.35	Average
18	2.54	46.14	-9.86	56.00	35.90	-0.11	10.35	QP



Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + Earphone + Camera + USB Cable (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
 Condition: FCC PART15C LISN-100807 NEUTRAL
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	1.54	36.70	-9.30	46.00	26.50	-0.10	10.30	Average
2	1.54	41.70	-14.30	56.00	31.50	-0.10	10.30	QP
3	1.83	38.01	-7.99	46.00	27.80	-0.11	10.32	Average
4	1.83	43.81	-12.19	56.00	33.60	-0.11	10.32	QP
5	1.87	37.01	-8.99	46.00	26.80	-0.11	10.32	Average
6	1.87	43.41	-12.59	56.00	33.20	-0.11	10.32	QP
7	1.99	38.12	-7.88	46.00	27.90	-0.11	10.33	Average
8	1.99	44.12	-11.88	56.00	33.90	-0.11	10.33	QP
9	2.03	36.92	-9.08	46.00	26.70	-0.11	10.33	Average
10	2.03	42.62	-13.38	56.00	32.40	-0.11	10.33	QP
11	2.11	33.92	-12.08	46.00	23.69	-0.11	10.34	Average
12	2.11	40.72	-15.28	56.00	30.49	-0.11	10.34	QP
13	2.20	37.33	-8.67	46.00	27.10	-0.11	10.34	Average
14	2.20	42.93	-13.07	56.00	32.70	-0.11	10.34	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

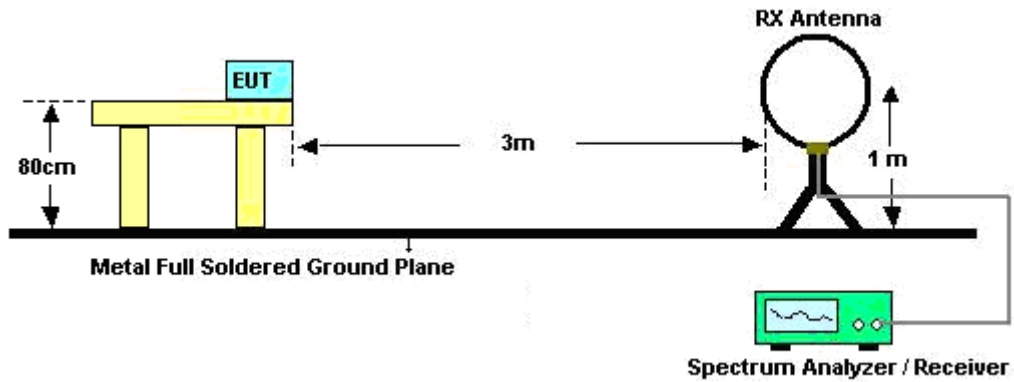
See list of measuring instruments of this test report.

3.7.3 Test Procedures

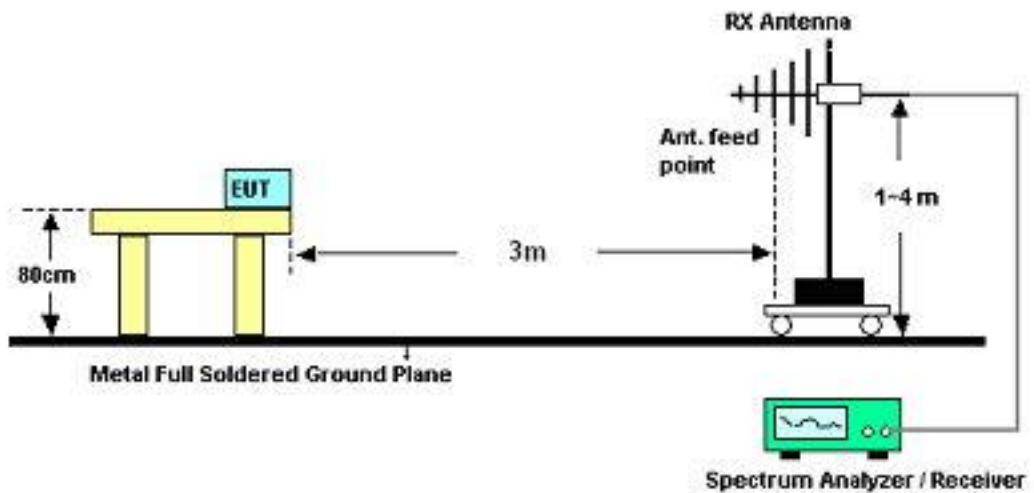
1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
 - (1) Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz; VBW \geq RBW; Sweep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

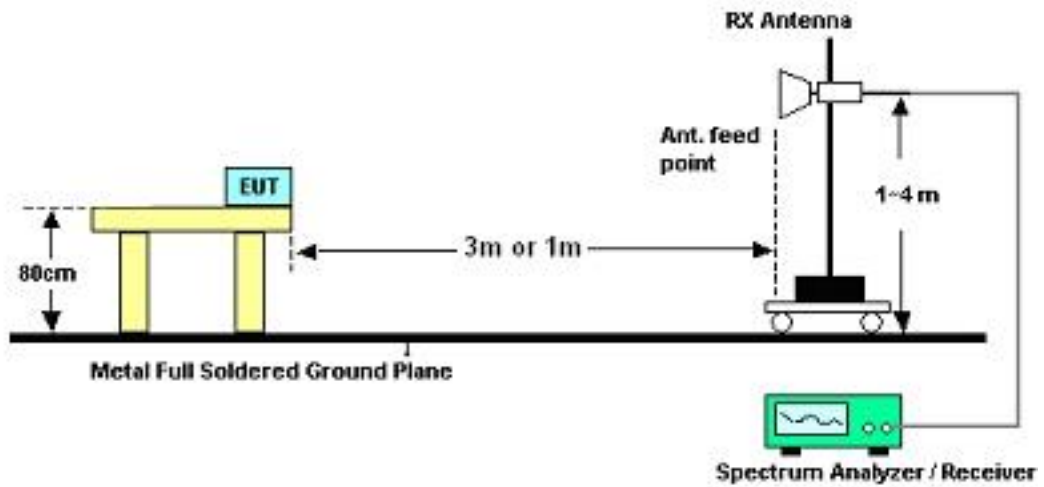
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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



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

Test Mode :	Mode 1	Temperature :	20~21°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
239.52	28.38	-17.62	46	46.03	11.51	0.66	29.82	-	-	Peak
359.8	40.84	-5.16	46	55.22	14.72	0.82	29.92	200	0	Peak
720.64	28.45	-17.55	46	37.43	19.53	1.15	29.66	-	-	Peak
750.71	35.19	-10.81	46	43.65	19.9	1.18	29.54	-	-	Peak
837.04	34.83	-11.17	46	42.84	20.37	1.27	29.65	-	-	Peak
944.71	26.38	-27.62	54	33.88	20.71	1.33	29.54	-	-	Peak
2390	48.63	-25.37	74	46.35	32.86	3.47	34.05	100	0	Peak
2390	38.38	-15.62	54	36.1	32.86	3.47	34.05	100	0	Average
2412	101.71	-	-	99.38	32.89	3.52	34.08	100	0	Peak
2412	97.44	-	-	95.11	32.89	3.52	34.08	100	0	Average
2483.5	48.15	-25.85	74	45.66	33.01	3.68	34.2	100	0	Peak
2483.5	37.09	-16.91	54	34.6	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 1	Temperature :	20~21°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
37.76	28.26	-11.74	40	44.38	13.7	0.24	30.06	-	-	Peak
61.04	31.87	-8.13	40	56.41	5.28	0.31	30.13	-	-	Peak
359.8	33.03	-12.97	46	47.41	14.72	0.82	29.92	-	-	Peak
750.71	30.32	-15.68	46	38.78	19.9	1.18	29.54	-	-	Peak
837.04	38.16	-7.84	46	46.17	20.37	1.27	29.65	102	167	Peak
960.23	27.9	-26.1	54	35.31	20.79	1.34	29.54	-	-	Peak
2390	48.58	-25.42	74	46.3	32.86	3.47	34.05	100	0	Peak
2390	38.48	-15.52	54	36.2	32.86	3.47	34.05	100	0	Average
2412	102.58	-	-	100.25	32.89	3.52	34.08	100	262	Peak
2412	98.61	-	-	96.28	32.89	3.52	34.08	100	262	Average
2483.5	36.62	-17.38	54	34.13	33.01	3.68	34.2	100	0	Average
2483.5	47.76	-26.24	74	45.27	33.01	3.68	34.2	100	0	Peak



Test Mode :	Mode 2	Temperature :	20~21°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
239.52	28.59	-17.41	46	46.24	11.51	0.66	29.82	-	-	Peak
359.8	41.6	-4.4	46	55.98	14.72	0.82	29.92	200	22	Peak
720.64	28.01	-17.99	46	36.99	19.53	1.15	29.66	-	-	Peak
750.71	34.83	-11.17	46	43.29	19.9	1.18	29.54	-	-	Peak
837.04	36.44	-9.56	46	44.45	20.37	1.27	29.65	-	-	Peak
944.71	27.86	-26.14	54	35.36	20.71	1.33	29.54	-	-	Peak
2390	48.52	-25.48	74	46.24	32.86	3.47	34.05	100	0	Peak
2390	36.26	-17.74	54	33.98	32.86	3.47	34.05	100	0	Average
2437	101.99	-	-	99.59	32.95	3.6	34.15	100	268	Peak
2437	95.7	-	-	93.3	32.95	3.6	34.15	100	268	Average
2483.5	48.36	-25.64	74	45.87	33.01	3.68	34.2	100	0	Peak
2483.5	36.59	-17.41	54	34.1	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 2	Temperature :	20~21°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	28	-12	40	43.64	14.19	0.24	30.07	-	-	Peak
60.07	31.97	-8.03	40	56.5	5.3	0.31	30.14	143	267	Peak
359.8	32.93	-13.07	46	47.31	14.72	0.82	29.92	-	-	Peak
720.64	28.64	-17.36	46	37.62	19.53	1.15	29.66	-	-	Peak
750.71	30.81	-15.19	46	39.27	19.9	1.18	29.54	-	-	Peak
837.04	34.07	-11.93	46	42.08	20.37	1.27	29.65	-	-	Peak
2390	49.13	-24.87	74	46.85	32.86	3.47	34.05	100	0	Peak
2390	37.58	-16.42	54	35.3	32.86	3.47	34.05	100	0	Average
2437	104.69	-	-	102.29	32.95	3.6	34.15	120	0	Peak
2437	98.52	-	-	96.12	32.95	3.6	34.15	120	0	Average
2483.5	49.08	-24.92	74	46.59	33.01	3.68	34.2	100	0	Peak
2483.5	38.61	-15.39	54	36.12	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 3	Temperature :	20~21°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
239.52	28.39	-17.61	46	46.04	11.51	0.66	29.82	-	-	Peak
359.8	41.03	-4.97	46	55.41	14.72	0.82	29.92	199	5	Peak
720.64	27.9	-18.1	46	36.88	19.53	1.15	29.66	-	-	Peak
750.71	35.01	-10.99	46	43.47	19.9	1.18	29.54	-	-	Peak
837.04	31.9	-14.1	46	39.91	20.37	1.27	29.65	-	-	Peak
944.71	27.55	-26.45	54	35.05	20.71	1.33	29.54	-	-	Peak
2390	48.07	-25.93	74	45.79	32.86	3.47	34.05	100	0	Peak
2390	38.58	-15.42	54	36.3	32.86	3.47	34.05	100	0	Average
2462	104.16	-	-	101.71	32.98	3.64	34.17	100	0	Peak
2462	96.95	-	-	94.5	32.98	3.64	34.17	100	0	Average
2483.5	49.44	-24.56	74	46.95	33.01	3.68	34.2	100	0	Peak
2483.5	41.05	-12.95	54	38.56	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 3	Temperature :	20~21°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	28.29	-11.71	40	43.93	14.19	0.24	30.07	-	-	Peak
60.07	32.7	-7.3	40	57.23	5.3	0.31	30.14	124	103	Peak
359.8	33.09	-12.91	46	47.47	14.72	0.82	29.92	-	-	Peak
480.08	27.76	-18.24	46	39.7	16.87	0.94	29.75	-	-	Peak
750.71	31.27	-14.73	46	39.73	19.9	1.18	29.54	-	-	Peak
837.04	32.59	-13.41	46	40.6	20.37	1.27	29.65	-	-	Peak
2390	48.36	-25.64	74	46.08	32.86	3.47	34.05	100	0	Peak
2390	38.78	-15.22	54	36.5	32.86	3.47	34.05	100	0	Average
2462	104.55	-	-	102.1	32.98	3.64	34.17	136	262	Peak
2462	97.37	-	-	94.92	32.98	3.64	34.17	136	262	Average
2484.61	49.92	-24.08	74	47.43	33.01	3.68	34.2	100	0	Peak
2484.61	39.59	-14.41	54	37.1	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 4	Temperature :	20~21°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
239.52	28.38	-17.62	46	46.03	11.51	0.66	29.82	-	-	Peak
359.8	41.72	-4.28	46	56.1	14.72	0.82	29.92	200	0	Peak
720.64	29.22	-16.78	46	38.2	19.53	1.15	29.66	-	-	Peak
750.71	34.95	-11.05	46	43.41	19.9	1.18	29.54	-	-	Peak
837.04	33.09	-12.91	46	41.1	20.37	1.27	29.65	-	-	Peak
944.71	27.78	-26.22	54	35.28	20.71	1.33	29.54	-	-	Peak
2390	48.33	-25.67	74	46.05	32.86	3.47	34.05	100	0	Peak
2390	39.08	-14.92	54	36.8	32.86	3.47	34.05	100	0	Average
2412	97.81	-	-	95.48	32.89	3.52	34.08	100	226	Peak
2412	85	-	-	82.67	32.89	3.52	34.08	100	226	Average
2483.5	48.23	-25.77	74	45.74	33.01	3.68	34.2	100	0	Peak
2483.5	36.49	-17.51	54	34	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 4	Temperature :	20~21°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	28.86	-11.14	40	44.5	14.19	0.24	30.07	-	-	Peak
60.07	32.32	-7.68	40	56.85	5.3	0.31	30.14	198	12	Peak
359.8	33.65	-12.35	46	48.03	14.72	0.82	29.92	-	-	Peak
480.08	28.05	-17.95	46	39.99	16.87	0.94	29.75	-	-	Peak
750.71	32.47	-13.53	46	40.93	19.9	1.18	29.54	-	-	Peak
837.04	32.28	-13.72	46	40.29	20.37	1.27	29.65	-	-	Peak
2390	49.21	-24.79	74	46.93	32.86	3.47	34.05	100	0	Peak
2390	40.38	-13.62	54	38.1	32.86	3.47	34.05	100	0	Average
2412	99.68	-	-	97.35	32.89	3.52	34.08	100	360	Peak
2412	87.48	-	-	85.15	32.89	3.52	34.08	100	360	Average
2483.5	48.36	-25.64	74	45.87	33.01	3.68	34.2	100	0	Peak
2483.5	38.89	-15.11	54	36.4	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 5	Temperature :	20~21°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
239.52	28.8	-17.2	46	46.45	11.51	0.66	29.82	-	-	Peak
359.8	41.22	-4.78	46	55.6	14.72	0.82	29.92	200	0	Peak
720.64	28.4	-17.6	46	37.38	19.53	1.15	29.66	-	-	Peak
750.71	35.22	-10.78	46	43.68	19.9	1.18	29.54	-	-	Peak
837.04	36.81	-9.19	46	44.82	20.37	1.27	29.65	-	-	Peak
944.71	26.79	-27.21	54	34.29	20.71	1.33	29.54	-	-	Peak
2390	48.08	-25.92	74	45.8	32.86	3.47	34.05	100	0	Peak
2390	36.62	-17.38	54	34.34	32.86	3.47	34.05	100	0	Average
2437	98.94	-	-	96.54	32.95	3.6	34.15	100	240	Peak
2437	87.55	-	-	85.15	32.95	3.6	34.15	100	240	Average
2483.5	47.86	-26.14	74	45.37	33.01	3.68	34.2	100	0	Peak
2483.5	38.09	-15.91	54	35.6	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 5	Temperature :	20~21°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	29.1	-10.9	40	44.74	14.19	0.24	30.07	-	-	Peak
60.07	32.9	-7.1	40	57.43	5.3	0.31	30.14	122	13	Peak
359.8	33.03	-12.97	46	47.41	14.72	0.82	29.92	-	-	Peak
480.08	27.89	-18.11	46	39.83	16.87	0.94	29.75	-	-	Peak
750.71	33	-13	46	41.46	19.9	1.18	29.54	-	-	Peak
837.04	32.99	-13.01	46	41	20.37	1.27	29.65	-	-	Peak
2390	48.65	-25.35	74	46.37	32.86	3.47	34.05	100	360	Peak
2390	36.08	-17.92	54	33.8	32.86	3.47	34.05	100	360	Average
2437	100.3	-	-	97.9	32.95	3.6	34.15	200	360	Peak
2437	89.05	-	-	86.65	32.95	3.6	34.15	200	360	Average
2483.5	48.24	-25.76	74	45.75	33.01	3.68	34.2	200	120	Peak
2483.5	37.39	-16.61	54	34.9	33.01	3.68	34.2	200	120	Average



Test Mode :	Mode 6	Temperature :	20~21°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
239.52	28.19	-17.81	46	45.84	11.51	0.66	29.82	-	-	Peak
312.27	24.38	-21.62	46	40.29	13.3	0.74	29.95	-	-	Peak
359.8	41.43	-4.57	46	55.81	14.72	0.82	29.92	200	0	Peak
720.64	28.06	-17.94	46	37.04	19.53	1.15	29.66	-	-	Peak
750.71	34.59	-11.41	46	43.05	19.9	1.18	29.54	-	-	Peak
840.92	28.78	-17.22	46	36.73	20.42	1.28	29.65	-	-	Peak
2390	48.91	-25.09	74	46.63	32.86	3.47	34.05	100	0	Peak
2390	37.48	-16.52	54	35.2	32.86	3.47	34.05	100	0	Average
2462	100.63	-	-	98.18	32.98	3.64	34.17	100	16	Peak
2462	88.6	-	-	86.15	32.98	3.64	34.17	100	16	Average
2483.66	58.75	-15.25	74	56.26	33.01	3.68	34.2	100	28	Peak
2483.66	45.39	-8.61	54	42.9	33.01	3.68	34.2	100	28	Average



Test Mode :	Mode 6	Temperature :	20~21°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	28.36	-11.64	40	44	14.19	0.24	30.07	-	-	Peak
60.07	32.39	-7.61	40	56.92	5.3	0.31	30.14	162	318	Peak
359.8	33.33	-12.67	46	47.71	14.72	0.82	29.92	-	-	Peak
720.64	28.68	-17.32	46	37.66	19.53	1.15	29.66	-	-	Peak
750.71	32.14	-13.86	46	40.6	19.9	1.18	29.54	-	-	Peak
840.92	28.99	-17.01	46	36.94	20.42	1.28	29.65	-	-	Peak
2390	48.24	-25.76	74	45.96	32.86	3.47	34.05	100	0	Peak
2390	37.29	-16.71	54	35.01	32.86	3.47	34.05	100	0	Average
2462	100.73	-	-	98.28	32.98	3.64	34.17	100	260	Peak
2462	92.46	-	-	90.01	32.98	3.64	34.17	100	260	Average
2484.8	45.59	-8.41	54	43.1	33.01	3.68	34.2	100	322	Average
2484.8	57.3	-16.7	74	54.81	33.01	3.68	34.2	100	322	Peak



Test Mode :	Mode 7	Temperature :	20~21°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
105.66	27.46	-16.04	43.5	45.71	11.29	0.42	29.96	-	-	Peak
239.52	28.06	-17.94	46	45.71	11.51	0.66	29.82	-	-	Peak
359.8	41.05	-4.95	46	55.43	14.72	0.82	29.92	198	10	Peak
720.64	29.37	-16.63	46	38.35	19.53	1.15	29.66	-	-	Peak
750.71	34.62	-11.38	46	43.08	19.9	1.18	29.54	-	-	Peak
840.92	29.99	-16.01	46	37.94	20.42	1.28	29.65	-	-	Peak
2390	48.87	-25.13	74	46.59	32.86	3.47	34.05	100	0	Peak
2390	39.38	-14.62	54	37.1	32.86	3.47	34.05	100	0	Average
2412	95.19	-	-	92.86	32.89	3.52	34.08	100	360	Peak
2412	80.97	-	-	78.64	32.89	3.52	34.08	100	360	Average
2483.5	48.12	-25.88	74	45.63	33.01	3.68	34.2	100	0	Peak
2483.5	38.69	-15.31	54	36.2	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 7	Temperature :	20~21°C
Test Channel :	01	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
43.58	33.64	-6.36	40	53.45	10.03	0.27	30.11	100	347	Peak
60.07	32.43	-7.57	40	56.96	5.3	0.31	30.14	-	-	Peak
93.05	26.32	-17.18	43.5	46.39	9.51	0.4	29.98	-	-	Peak
359.8	33.12	-12.88	46	47.5	14.72	0.82	29.92	-	-	Peak
750.71	31	-15	46	39.46	19.9	1.18	29.54	-	-	Peak
840.92	29.02	-16.98	46	36.97	20.42	1.28	29.65	-	-	Peak
2390	48.93	-25.07	74	46.65	32.86	3.47	34.05	100	0	Peak
2390	40.68	-13.32	54	38.4	32.86	3.47	34.05	100	0	Average
2412	98.42	-	-	96.09	32.89	3.52	34.08	100	340	Peak
2412	84.47	-	-	82.14	32.89	3.52	34.08	100	340	Average
2483.5	48.02	-25.98	74	45.53	33.01	3.68	34.2	100	0	Peak
2483.5	39.29	-14.71	54	36.8	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 8	Temperature :	20~21°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
239.52	28.41	-17.59	46	46.06	11.51	0.66	29.82	-	-	Peak
312.27	25.21	-20.79	46	41.12	13.3	0.74	29.95	-	-	Peak
359.8	41.11	-4.89	46	55.49	14.72	0.82	29.92	199	30	Peak
720.64	27.93	-18.07	46	36.91	19.53	1.15	29.66	-	-	Peak
750.71	34.99	-11.01	46	43.45	19.9	1.18	29.54	-	-	Peak
840.92	29.57	-16.43	46	37.52	20.42	1.28	29.65	-	-	Peak
2388.28	49.92	-24.08	74	47.64	32.86	3.47	34.05	130	15	Peak
2388.28	36.65	-17.35	54	34.37	32.86	3.47	34.05	130	15	Average
2437	98.17	-	-	95.77	32.95	3.6	34.15	135	9	Peak
2437	85.75	-	-	83.35	32.95	3.6	34.15	135	9	Average
2492.02	49.51	-24.49	74	46.97	33.05	3.72	34.23	200	320	Peak
2492.02	36.02	-17.98	54	33.48	33.05	3.72	34.23	200	320	Average



Test Mode :	Mode 8	Temperature :	20~21°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	28.4	-11.6	40	44.04	14.19	0.24	30.07	-	-	Peak
60.07	31.95	-8.05	40	56.48	5.3	0.31	30.14	152	297	Peak
92.08	26.57	-16.93	43.5	46.81	9.35	0.39	29.98	-	-	Peak
359.8	33.2	-12.8	46	47.58	14.72	0.82	29.92	-	-	Peak
480.08	28.05	-17.95	46	39.99	16.87	0.94	29.75	-	-	Peak
750.71	31.97	-14.03	46	40.43	19.9	1.18	29.54	-	-	Peak
2368.9	49.31	-24.69	74	47.07	32.83	3.42	34.01	112	305	Peak
2368.9	36.91	-17.09	54	34.67	32.83	3.42	34.01	112	305	Average
2437	99.07	-	-	96.67	32.95	3.6	34.15	101	264	Peak
2437	90.02	-	-	87.62	32.95	3.6	34.15	101	264	Average
2495.82	49.39	-24.61	74	46.85	33.05	3.72	34.23	200	13	Peak
2495.82	36	-18	54	33.46	33.05	3.72	34.23	200	13	Average



Test Mode :	Mode 9	Temperature :	20~21°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
223.03	22.67	-23.33	46	41.67	10.33	0.63	29.96	-	-	Peak
239.52	28.41	-17.59	46	46.06	11.51	0.66	29.82	-	-	Peak
359.8	41.28	-4.72	46	55.66	14.72	0.82	29.92	198	12	Peak
720.64	28.28	-17.72	46	37.26	19.53	1.15	29.66	-	-	Peak
750.71	34.63	-11.37	46	43.09	19.9	1.18	29.54	-	-	Peak
840.92	30.36	-15.64	46	38.31	20.42	1.28	29.65	-	-	Peak
2390	48.19	-25.81	74	45.91	32.86	3.47	34.05	100	0	Peak
2390	37.08	-16.92	54	34.8	32.86	3.47	34.05	100	0	Average
2462	100.14	-	-	97.69	32.98	3.64	34.17	100	20	Peak
2462	86.89	-	-	84.44	32.98	3.64	34.17	100	20	Average
2483.66	60.81	-13.19	74	58.32	33.01	3.68	34.2	100	16	Peak
2483.66	44.67	-9.33	54	42.18	33.01	3.68	34.2	100	16	Average



Test Mode :	Mode 9	Temperature :	20~21°C
Test Channel :	11	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	28.45	-11.55	40	44.09	14.19	0.24	30.07	-	-	Peak
60.07	32.5	-7.5	40	57.03	5.3	0.31	30.14	132	142	Peak
88.2	26.3	-17.2	43.5	47.62	8.3	0.38	30	-	-	Peak
359.8	33.4	-12.6	46	47.78	14.72	0.82	29.92	-	-	Peak
480.08	27.4	-18.6	46	39.34	16.87	0.94	29.75	-	-	Peak
750.71	32.27	-13.73	46	40.73	19.9	1.18	29.54	-	-	Peak
2390	47.71	-26.29	74	45.43	32.86	3.47	34.05	100	0	Peak
2390	37.94	-16.06	54	35.66	32.86	3.47	34.05	100	0	Average
2462	99.99	-	-	97.54	32.98	3.64	34.17	100	260	Peak
2462	85.55	-	-	83.1	32.98	3.64	34.17	100	260	Average
2483.85	60.4	-13.6	74	57.91	33.01	3.68	34.2	100	261	Peak
2483.85	46.79	-7.21	54	44.3	33.01	3.68	34.2	100	261	Average



Test Mode :	Mode 10	Temperature :	20~21°C
Test Channel :	03	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2422 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
162.89	24.9	-18.6	43.5	44.81	9.49	0.53	29.93	-	-	Peak
239.52	27.85	-18.15	46	45.5	11.51	0.66	29.82	-	-	Peak
359.8	41.01	-4.99	46	55.39	14.72	0.82	29.92	200	0	Peak
720.64	27.5	-18.5	46	36.48	19.53	1.15	29.66	-	-	Peak
750.71	34.79	-11.21	46	43.25	19.9	1.18	29.54	-	-	Peak
840.92	29.16	-16.84	46	37.11	20.42	1.28	29.65	-	-	Peak
2389.04	54.42	-19.58	74	52.14	32.86	3.47	34.05	200	276	Peak
2389.04	40.05	-13.95	54	37.77	32.86	3.47	34.05	200	276	Average
2422	96.5	-	-	94.14	32.92	3.56	34.12	191	315	Peak
2422	86.11	-	-	83.75	32.92	3.56	34.12	191	315	Average
2493.73	49.99	-24.01	74	47.45	33.05	3.72	34.23	136	276	Peak
2493.73	36.73	-17.27	54	34.19	33.05	3.72	34.23	136	276	Average



Test Mode :	Mode 10	Temperature :	20~21°C
Test Channel :	03	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2422 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	28.52	-11.48	40	44.16	14.19	0.24	30.07	-	-	Peak
59.1	31.81	-8.19	40	56.2	5.44	0.31	30.14	100	35	Peak
88.2	26.42	-17.08	43.5	47.74	8.3	0.38	30	-	-	Peak
359.8	33.17	-12.83	46	47.55	14.72	0.82	29.92	-	-	Peak
750.71	30.5	-15.5	46	38.96	19.9	1.18	29.54	-	-	Peak
840.92	28.48	-17.52	46	36.43	20.42	1.28	29.65	-	-	Peak
2388.28	56.01	-17.99	74	53.73	32.86	3.47	34.05	102	261	Peak
2388.28	41.44	-12.56	54	39.16	32.86	3.47	34.05	102	261	Average
2422	97.27	-	-	94.91	32.92	3.56	34.12	100	263	Peak
2422	88.12	-	-	85.76	32.92	3.56	34.12	100	263	Average
2492.78	49.53	-24.47	74	46.99	33.05	3.72	34.23	154	243	Peak
2492.78	35.73	-18.27	54	33.19	33.05	3.72	34.23	154	243	Average



Test Mode :	Mode 11	Temperature :	20~21°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
83.35	28.16	-11.84	40	50.49	7.34	0.36	30.03	-	-	Peak
239.52	27.87	-18.13	46	45.52	11.51	0.66	29.82	-	-	Peak
359.8	40.19	-5.81	46	54.57	14.72	0.82	29.92	200	3	Peak
720.64	28.5	-17.5	46	37.48	19.53	1.15	29.66	-	-	Peak
750.71	34.46	-11.54	46	42.92	19.9	1.18	29.54	-	-	Peak
840.92	29.59	-16.41	46	37.54	20.42	1.28	29.65	-	-	Peak
2387.33	49.94	-24.06	74	47.66	32.86	3.47	34.05	187	342	Peak
2387.33	37.46	-16.54	54	35.18	32.86	3.47	34.05	187	342	Average
2437	93.17	-	-	90.77	32.95	3.6	34.15	177	314	Peak
2437	82.17	-	-	79.77	32.95	3.6	34.15	177	314	Average
2483.5	49.02	-24.98	74	46.53	33.01	3.68	34.2	200	0	Peak
2483.5	35.77	-18.23	54	33.28	33.01	3.68	34.2	200	0	Average



Test Mode :	Mode 11	Temperature :	20~21°C
Test Channel :	06	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
43.58	29.42	-10.58	40	49.23	10.03	0.27	30.11	-	-	Peak
60.07	32.39	-7.61	40	56.92	5.3	0.31	30.14	134	206	Peak
92.08	26.95	-16.55	43.5	47.19	9.35	0.39	29.98	-	-	Peak
359.8	32.57	-13.43	46	46.95	14.72	0.82	29.92	-	-	Peak
750.71	32.18	-13.82	46	40.64	19.9	1.18	29.54	-	-	Peak
840.92	29.7	-16.3	46	37.65	20.42	1.28	29.65	-	-	Peak
2386.38	50.03	-23.97	74	47.75	32.86	3.47	34.05	167	318	Peak
2386.38	35.77	-18.23	54	33.49	32.86	3.47	34.05	167	318	Average
2437	93.7	-	-	91.3	32.95	3.6	34.15	200	177	Peak
2437	83.66	-	-	81.26	32.95	3.6	34.15	200	177	Average
2483.5	50.85	-23.15	74	48.36	33.01	3.68	34.2	122	302	Peak
2483.5	38.83	-15.17	54	36.34	33.01	3.68	34.2	122	302	Average



Test Mode :	Mode 12	Temperature :	20~21°C
Test Channel :	09	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	2452 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
92.08	21.29	-22.21	43.5	41.53	9.35	0.39	29.98	-	-	Peak
239.52	28.57	-17.43	46	46.22	11.51	0.66	29.82	-	-	Peak
359.8	41.37	-4.63	46	55.75	14.72	0.82	29.92	200	0	Peak
720.64	27.18	-18.82	46	36.16	19.53	1.15	29.66	-	-	Peak
750.71	34.15	-11.85	46	42.61	19.9	1.18	29.54	-	-	Peak
840.92	28.51	-17.49	46	36.46	20.42	1.28	29.65	-	-	Peak
2357.69	50.39	-23.61	74	48.18	32.81	3.38	33.98	189	342	Peak
2357.69	37.37	-16.63	54	35.16	32.81	3.38	33.98	189	342	Average
2452	97.66	-	-	95.26	32.95	3.6	34.15	199	321	Peak
2452	87.8	-	-	85.4	32.95	3.6	34.15	199	321	Average
2488.79	63.07	-10.93	74	60.53	33.05	3.72	34.23	200	316	Peak
2488.79	44.75	-9.25	54	42.21	33.05	3.72	34.23	200	316	Average



Test Mode :	Mode 12	Temperature :	20~21°C
Test Channel :	09	Relative Humidity :	43~44%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	2452 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
36.79	27.99	-12.01	40	43.63	14.19	0.24	30.07	-	-	Peak
60.07	29.57	-10.43	40	54.1	5.3	0.31	30.14	120	10	Peak
93.05	26.21	-17.29	43.5	46.28	9.51	0.4	29.98	-	-	Peak
359.8	33.36	-12.64	46	47.74	14.72	0.82	29.92	-	-	Peak
480.08	26.83	-19.17	46	38.77	16.87	0.94	29.75	-	-	Peak
750.71	30.98	-15.02	46	39.44	19.9	1.18	29.54	-	-	Peak
2366.81	50	-24	74	47.79	32.81	3.38	33.98	178	325	Peak
2366.81	37.52	-16.48	54	35.31	32.81	3.38	33.98	178	325	Average
2452	97.12	-	-	94.72	32.95	3.6	34.15	200	327	Peak
2452	88.3	-	-	85.9	32.95	3.6	34.15	200	327	Average
2487.65	62.9	-11.1	74	60.36	33.05	3.72	34.23	200	326	Peak
2487.65	45.37	-8.63	54	42.83	33.05	3.72	34.23	200	326	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 Chip Antenna without connector and it is considered to meet antenna requirement.

3.8.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Mar. 20, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 23, 2011	Mar. 20, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 23, 2011	Mar. 20, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Mar. 20, 2012	Dec. 29, 2012	Conducted (TH01-KS)
DC Power Supply	TOPWARD	GPS-3030 D	E1884515	N/A	Aug. 23, 2011	Mar. 20, 2012	Aug. 22, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESC17	100768	9kHz~7GHz	Jun. 02, 2011	Mar. 07, 2012	Jun. 01, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	060103	9kHz~30MHz	Dec. 30, 2011	Mar. 07, 2012	Dec. 29, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	060105	9kHz~30MHz	Dec. 30, 2011	Mar. 07, 2012	Dec. 29, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	N/A	Nov. 16, 2011	Mar. 07, 2012	Nov. 15, 2012	Conduction (CO01-KS)
System Simulator	R&S	CMU200	116456	Full-Band	Sep. 20, 2011	Mar. 07, 2012	Sep. 19, 2012	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Mar. 27, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Mar. 27, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101400	9kHz~30GHz	Jun. 02, 2011	Mar. 27, 2012	Jun. 01, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Mar. 27, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Mar. 27, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060029	9KHz~2GHz	Jan. 06, 2012	Mar. 27, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Mar. 27, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Mar. 27, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1G-18GHz	Nov. 07, 2011	Mar. 27, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15-40GHz	Oct. 11, 2011	Mar. 27, 2012	Oct. 10, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Mar. 27, 2012	Jul. 28, 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				