

FCC RF Test Report

APPLICANT : Honeywell International Inc
EQUIPMENT : Dolphin 7800
BRAND NAME : Honeywell
MODEL NAME : Dolphin® 7800
FCC ID : HD57800LG
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Jun. 20, 2011 and completely tested on Oct. 30, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR162005B	Rev. 01	Initial issue of report	Nov. 22, 2011

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	Gen 4.6.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	A8.4	Power Output Measurement	$\leq 30\text{dBm}$	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 15.7 dB at 0.158 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 7.61 dB at 2491.45 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Honeywell International Inc
9680 Old Bailes Road, Fort Mill, SC 29707 USA

1.2 Manufacturer

Honeywell International Inc
9680 Old Bailes Road, Fort Mill, SC 29707 USA

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Dolphin 7800
Brand Name	Honeywell
Model Name	Dolphin® 7800
FCC ID	HD57800LG
Integrated Module	Brand Name : Murata Model Name : LBEH1Z9PFC-TEMP
Tx/Rx Frequency Range	802.11b/g/n : 2400 MHz ~ 2483.5 MHz 802.11a/n : 5725 MHz ~ 5850 MHz
Channel Spacing	802.11b/g : 5 MHz 802.11a : 20 MHz
Maximum Output Power to Antenna	<2400 MHz ~ 2483.5 MHz> 802.11b : 19.88 dBm (0.0973 W) 802.11g : 23.78 dBm (0.2388 W) 802.11n (BW 20MHz) : 23.79 dBm (0.2393 W) <5725 MHz ~ 5850 MHz> 802.11a : 22.31 dBm (0.1702 W) 802.11n (BW 20MHz) : 22.29 dBm (0.1694 W)
Antenna Type	802.11b/g/n : PIFA Antenna with gain 2.95 dBi 802.11a/n : PIFA Antenna with gain 1.60 dBi
HW Version	010
SW Version	01
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978	
Test Site No.	Sporton Site No.	FCC/IC Registration No.
	CO05-HY	722060/4086B-1

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.	
	03CH01-KS	

1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003
- ♦ 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.	iPod	Apple	A1199	FCC DoC	Shielded, 1.2 m	N/A
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	Dell	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 1.84m DC O/P: Shielded, 0.9m
5.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	LCD Monitor	DELL	ST2220Lb	FCC DoC	N/A	Unshielded, 1.8 m
7.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
8.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
9.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
10.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	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	19.63	-	-	-
CH 06	2437 MHz	19.88	19.87	19.63	19.66
CH 11	2462 MHz	19.84	-	-	-

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	22.24	-	-	-	-	-	-	-
CH 06	2437 MHz	23.78	23.76	23.77	23.76	23.77	23.77	23.74	23.75
CH 11	2462 MHz	22.36	-	-	-	-	-	-	-

Channel	Frequency	2.4GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	22.34	-	-	-	-	-	-	-
CH 06	2437 MHz	23.79	23.78	23.76	23.72	23.76	23.77	23.75	23.64
CH 11	2462 MHz	22.55	-	-	-	-	-	-	-

Channel	Frequency	5GHz 802.11a RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH149	5745 MHz	22.31	22.30	22.21	22.20	22.30	22.21	22.07	22.11
CH157	5785 MHz	21.84	-	-	-	-	-	-	-
CH165	5825 MHz	22.11	-	-	-	-	-	-	-

Channel	Frequency	5GHz 802.11n (BW 20MHz) RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH149	5745 MHz	22.29	22.27	22.24	22.28	22.23	22.26	22.06	21.92
CH157	5785 MHz	21.72	-	-	-	-	-	-	-
CH165	5825 MHz	22.08	-	-	-	-	-	-	-

Remark:

1. The EUT is programmed to transmit signals continuously for all testing.
2. Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.
3. The data rates of WLAN 802.11a/b/g/n were set in 1Mbps for 802.11b, 6Mbps for 802.11g, MCS0 for 802.11n (BW 20MHz), 6Mbps for 802.11a, and MCS0 for 802.11n (BW 20MHz) for all the test cases due to the highest RF output power.

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

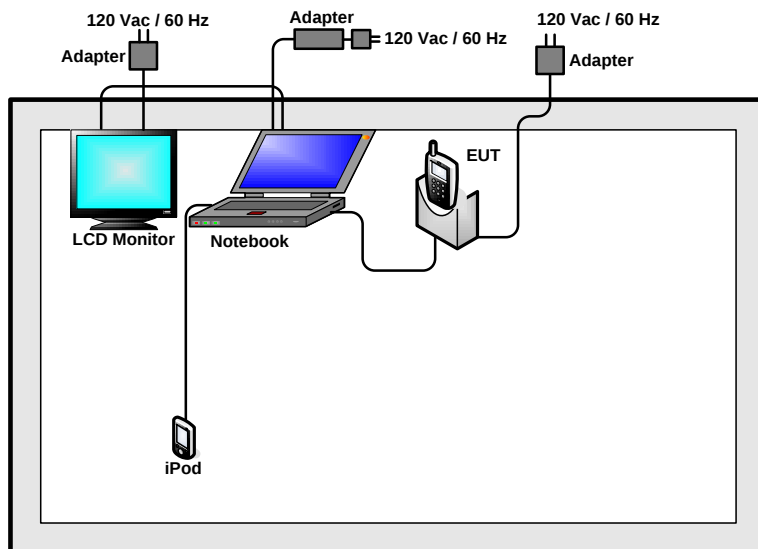
The following table is showing the total pre-scanned test modes, and the worst modes (H plane) are recorded in this report only.

Test Cases		
Test Item	802.11b (Modulation : DSSS) 802.11g/n (Modulation : OFDM)	802.11a/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_CH01_2412 MHz (BW 20M) Mode 8: 802.11n_CH06_2437 MHz (BW 20M) Mode 9: 802.11n_CH11_2462 MHz (BW 20M)	Mode 10: 802.11a_CH149_5745 MHz Mode 11: 802.11a_CH157_5785 MHz Mode 12: 802.11a_CH165_5825 MHz Mode 13: 802.11n_CH149_5745 MHz (BW 20M) Mode 14: 802.11n_CH157_5785 MHz (BW 20M) Mode 15: 802.11n_CH165_5825 MHz (BW 20M)
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: 802.11n_CH01_2412 MHz (BW 20M) Mode 8: 802.11n_CH06_2437 MHz (BW 20M) Mode 9: 802.11n_CH11_2462 MHz (BW 20M)	Mode 10: 802.11a_CH149_5745 MHz Mode 11: 802.11a_CH157_5785 MHz Mode 12: 802.11a_CH165_5825 MHz Mode 13: 802.11n_CH149_5745 MHz (BW 20M) Mode 14: 802.11n_CH157_5785 MHz (BW 20M) Mode 15: 802.11n_CH165_5825 MHz (BW 20M)

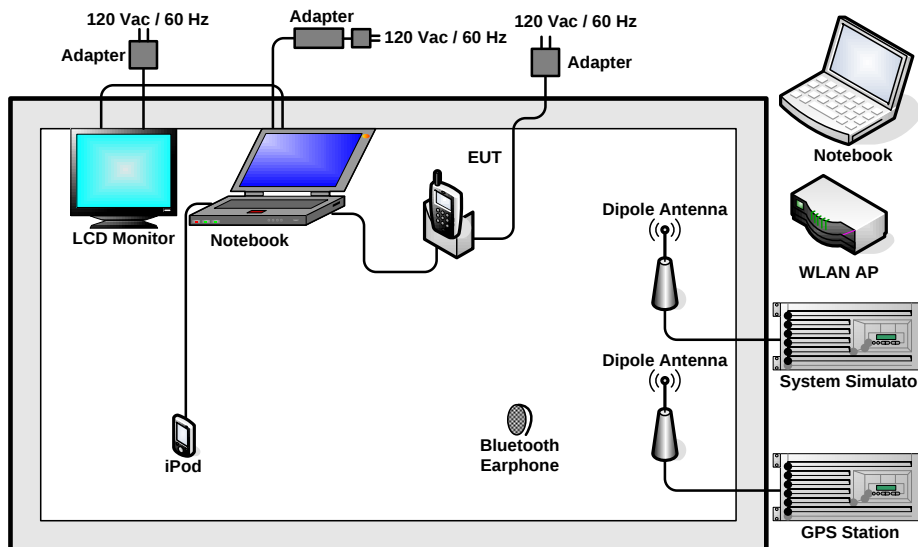
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 (GPRS 8) Idle + Bluetooth Link + WLAN Link (2.4G) + GPS Rx + USB Charging Cable with AC Power + USB Cable (Data Link with Notebook) for Keypad 1 Mode 2 : WCDMA Band IV Idle + Bluetooth Link + WLAN Link (5G) + GPS Rx + USB Charging Cable with AC Power + USB Cable (Data Link with Notebook) for Keypad 2
Remark: 1. The worst case of conducted emission is mode 2; only the test data of it was reported. 2. Link with Notebook means data application transferred mode between DUT and Notebook. 3. The cases of the Radiated Emission were performance with Keypad 1.	

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

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

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

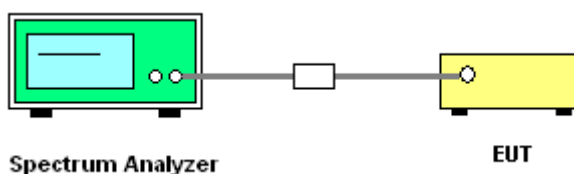
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	9.04	0.5	Pass
06	2437	9.06	0.5	Pass
11	2462	9.08	0.5	Pass

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

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.52	0.5	Pass
06	2437	15.64	0.5	Pass
11	2462	15.52	0.5	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.80	0.5	Pass
06	2437	15.32	0.5	Pass
11	2462	15.66	0.5	Pass

Test Mode :	Mode 10, 11, 12	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
149	5745	15.60	0.5	Pass
157	5785	15.55	0.5	Pass
165	5825	15.65	0.5	Pass



Test Mode :	Mode 13, 14, 15	Temperature :	24~26℃
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
149	5745	15.80	0.5	Pass
157	5785	16.25	0.5	Pass
165	5825	15.35	0.5	Pass

3.1.6 Test Result of 99% Occupied Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	14.05	Pass
06	2437	14.10	Pass
11	2462	14.10	Pass

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

Channel	Frequency (MHz)	802.11g 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	18.10	Pass
06	2437	18.25	Pass
11	2462	18.05	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	19.05	Pass
06	2437	19.30	Pass
11	2462	19.05	Pass

Test Mode :	Mode 10, 11, 12	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a 99% Occupied Bandwidth (MHz)	Pass/Fail
149	5745	18.15	Pass
157	5785	18.05	Pass
165	5825	17.95	Pass

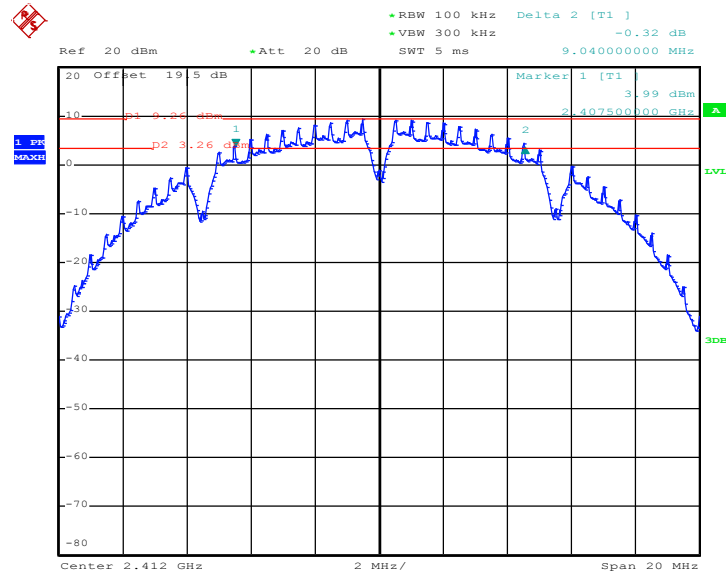


Test Mode :	Mode 13, 14, 15	Temperature :	24~26℃
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) 99% Occupied Bandwidth (MHz)	Pass/Fail
149	5745	19.20	Pass
157	5785	19.15	Pass
165	5825	19.15	Pass

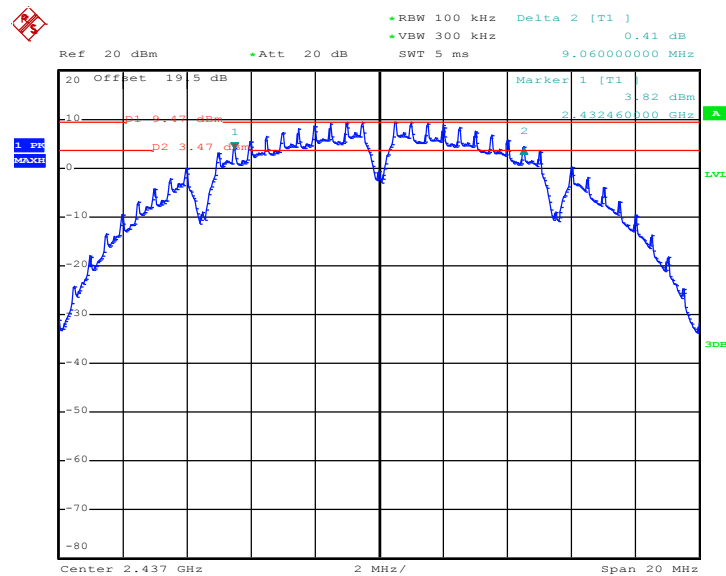
3.1.7 Test Result of 6dB Bandwidth Plots

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

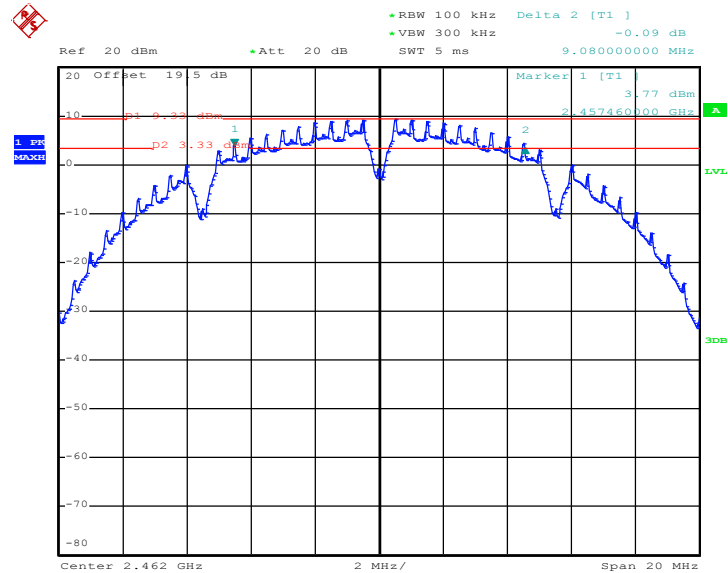


Date: 12.OCT.2011 01:10:02

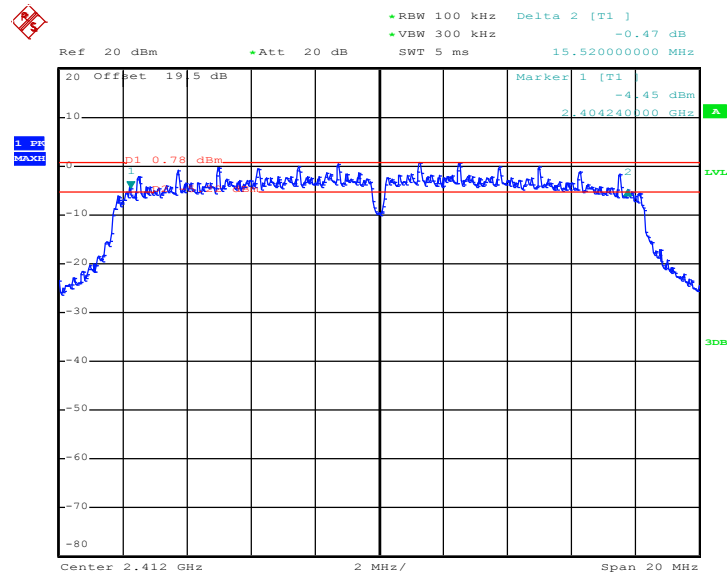
Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 11.OCT.2011 23:26:29

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


Date: 11.OCT.2011 23:30:06

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


Date: 11.OCT.2011 23:43:31

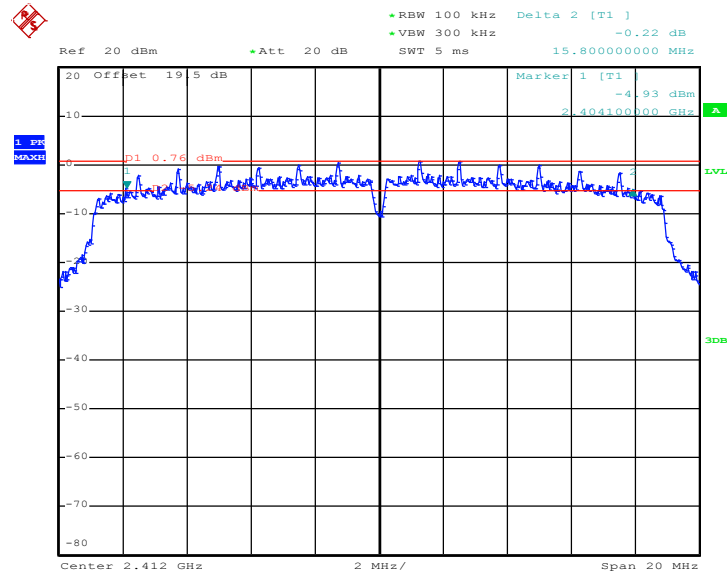


Mode 6 : 6 dB Bandwidth Plot on 802.11g Channel 11



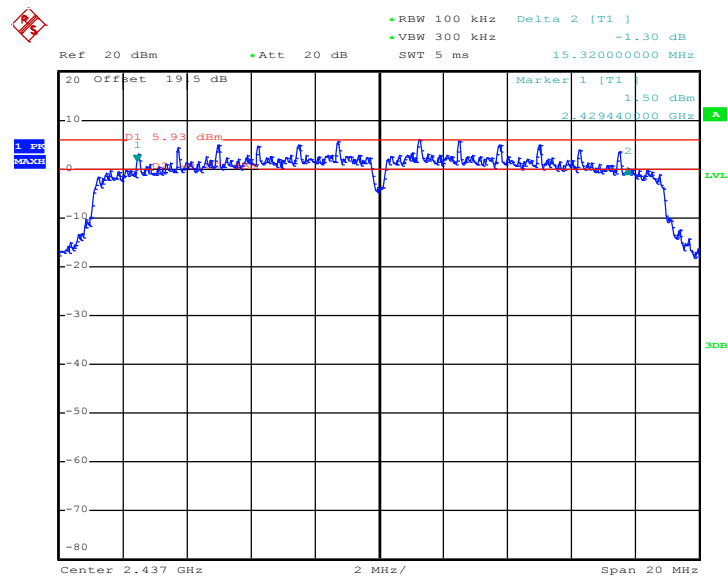


Mode 7 : 6 dB Bandwidth Plot on 802.11n Channel 01



Date: 12.OCT.2011 00:25:43

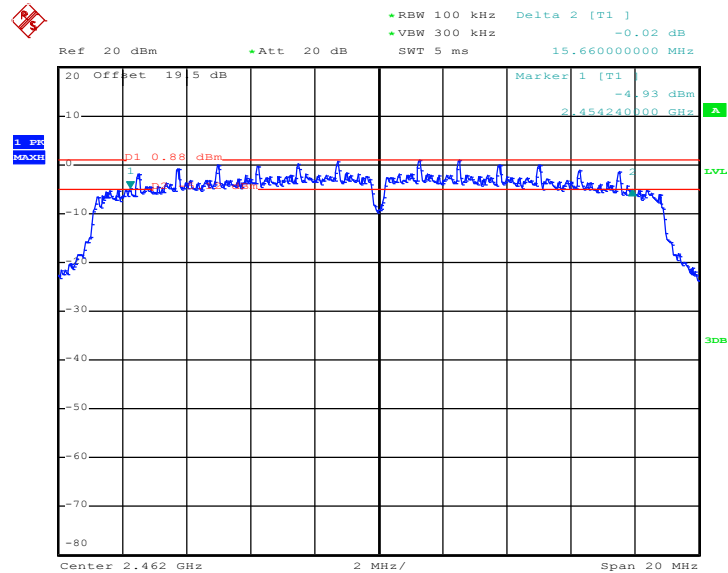
Mode 8 : 6 dB Bandwidth Plot on 802.11n Channel 06



Date: 12.OCT.2011 00:39:03

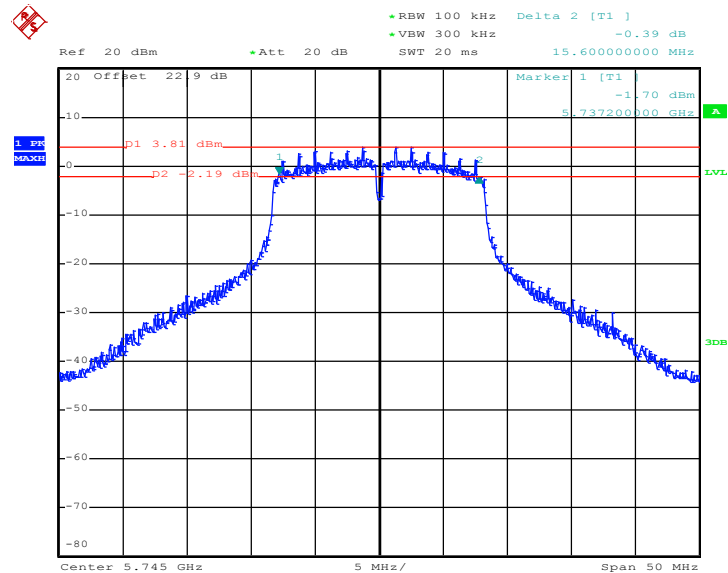


Mode 9 : 6 dB Bandwidth Plot on 802.11n Channel 11



Date: 13.OCT.2011 09:15:41

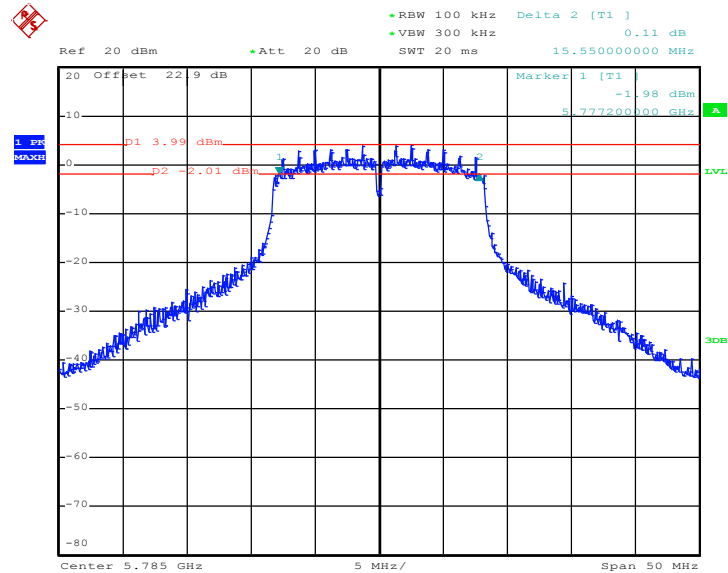
Mode 10 : 6 dB Bandwidth Plot on 802.11a Channel 149



Date: 13.OCT.2011 09:27:58

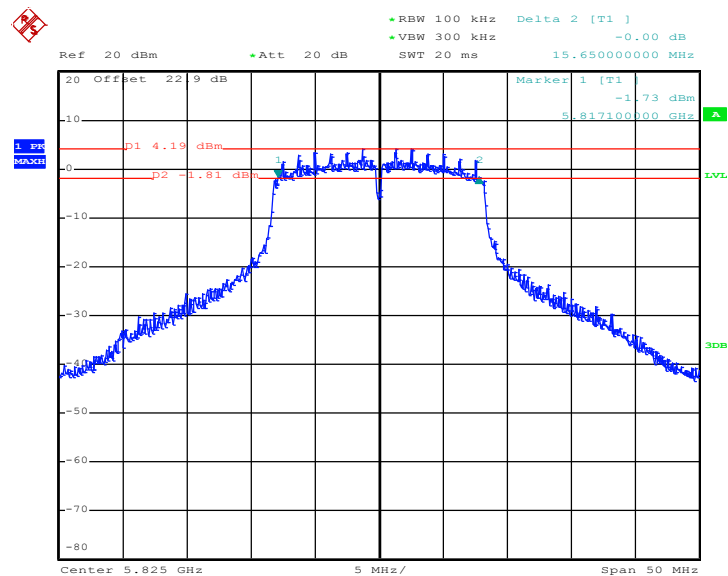


Mode 11 : 6 dB Bandwidth Plot on 802.11a Channel 157



Date: 13.OCT.2011 09:53:05

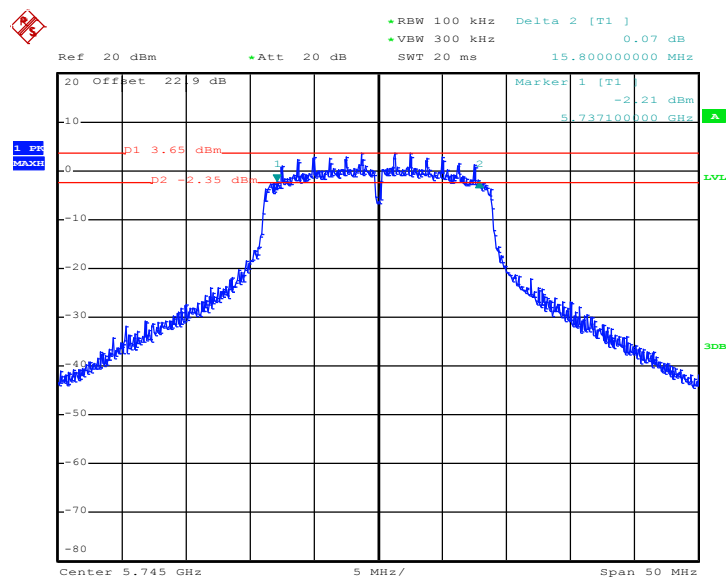
Mode 12 : 6 dB Bandwidth Plot on 802.11a Channel 165



Date: 13.OCT.2011 10:00:52

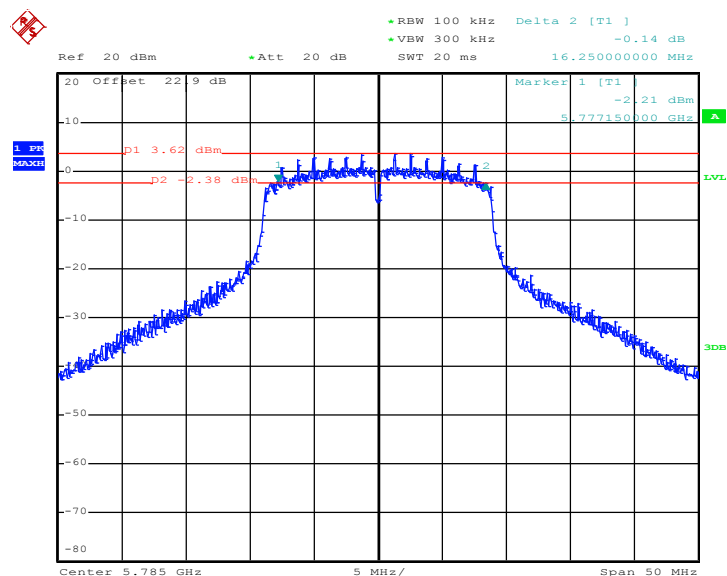


Mode 13 : 6 dB Bandwidth Plot on 802.11n Channel 149



Date: 13.OCT.2011 09:37:09

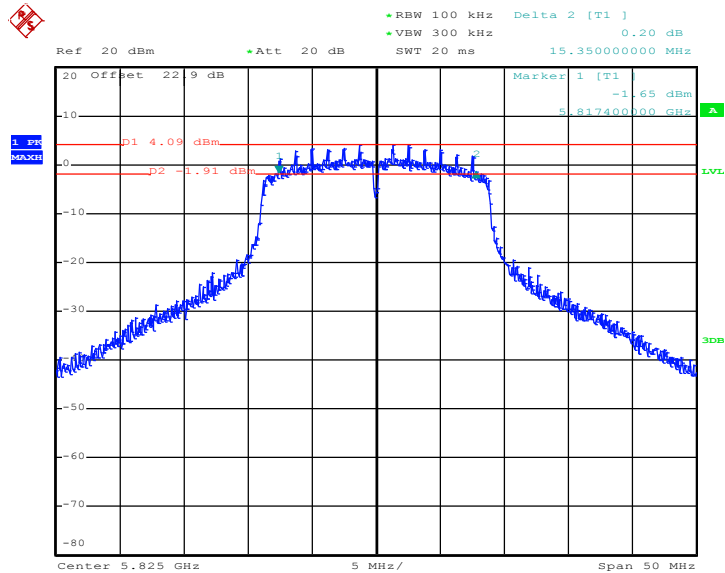
Mode 14: 6 dB Bandwidth Plot on 802.11n Channel 157



Date: 13.OCT.2011 11:32:36



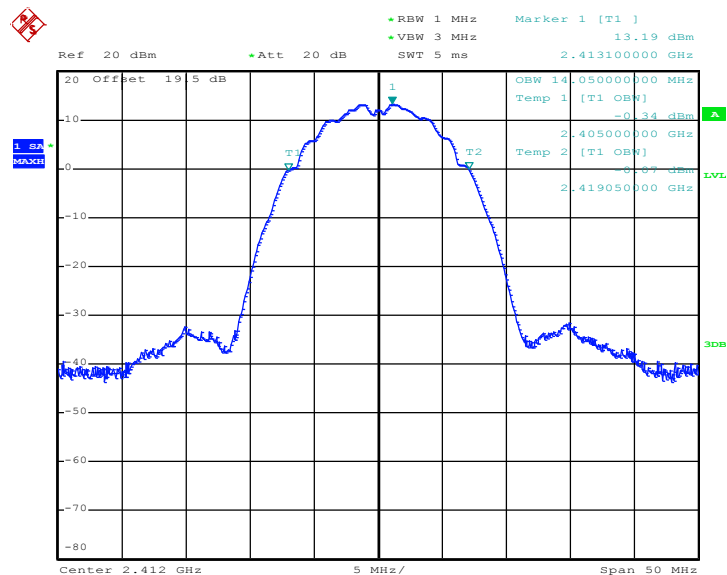
Mode 15: 6 dB Bandwidth Plot on 802.11n Channel 165



Date: 13.OCT.2011 10:06:24

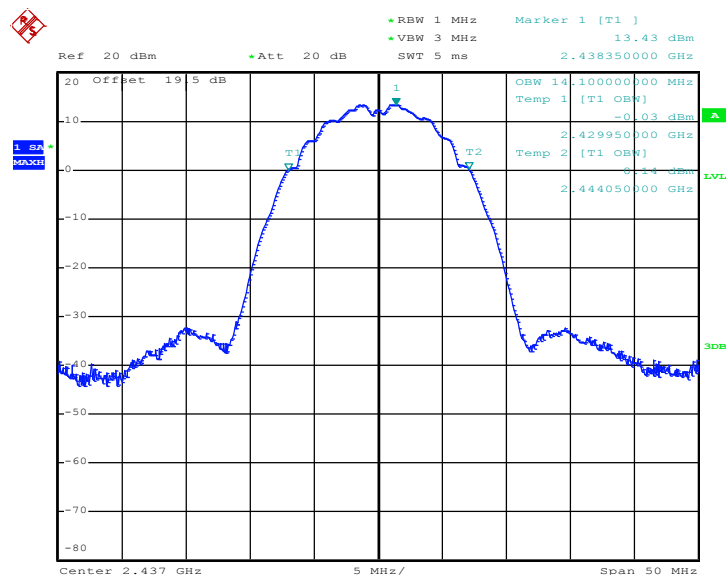
3.1.8 Test Result of 99% Bandwidth Plots

Mode 1 : 99% Occupied Bandwidth Plot on 802.11b Channel 01



Date: 11.OCT.2011 22:34:21

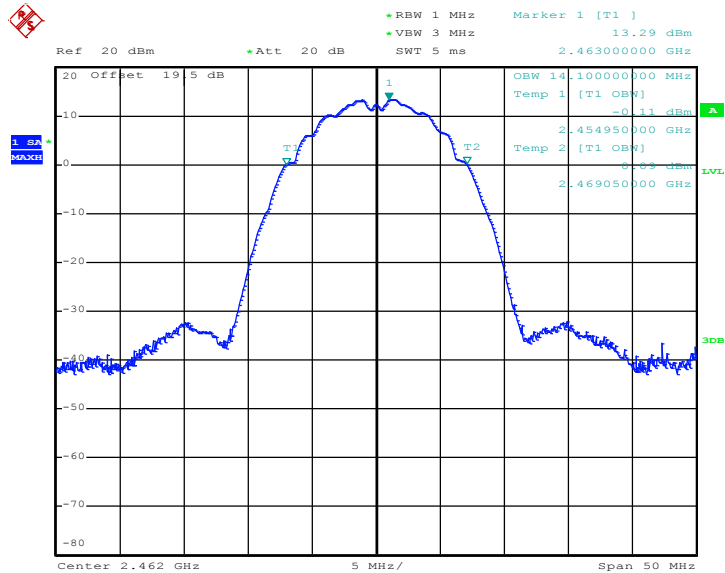
Mode 2 : 99% Occupied Bandwidth Plot on 802.11b Channel 06



Date: 11.OCT.2011 23:26:59

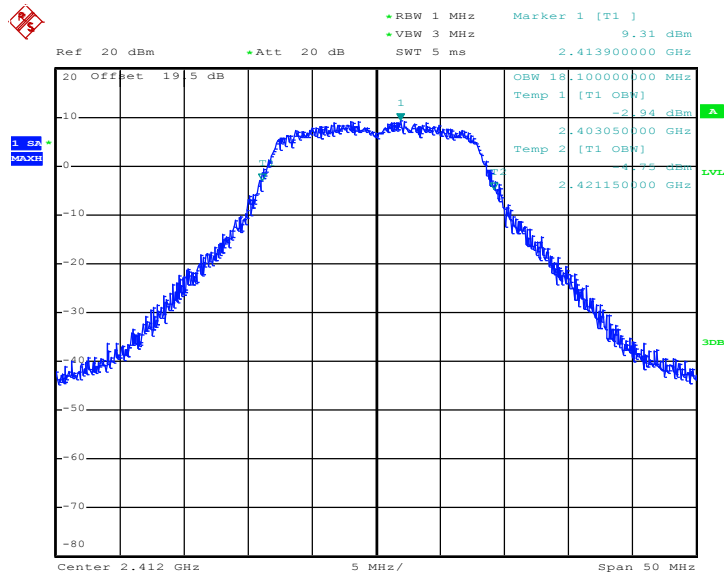


Mode 3 : 99% Occupied Bandwidth Plot on 802.11b Channel 11



Date: 11.OCT.2011 23:31:19

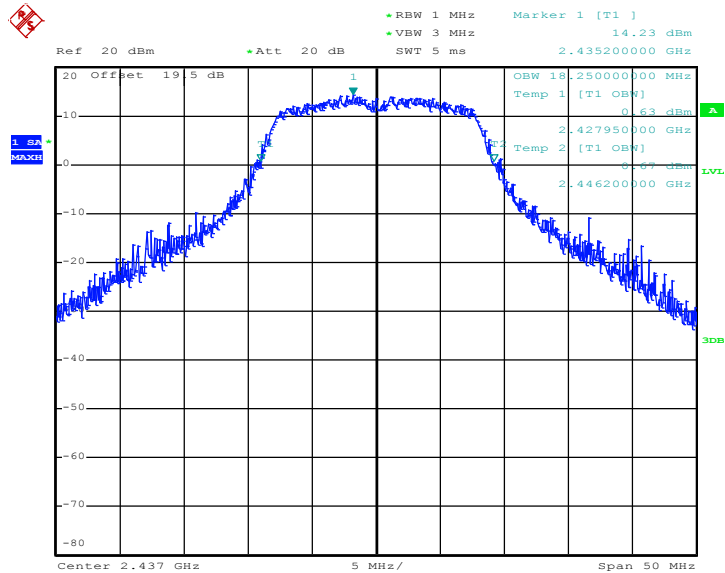
Mode 4 : 99% Occupied Bandwidth Plot on 802.11g Channel 01



Date: 11.OCT.2011 23:45:05

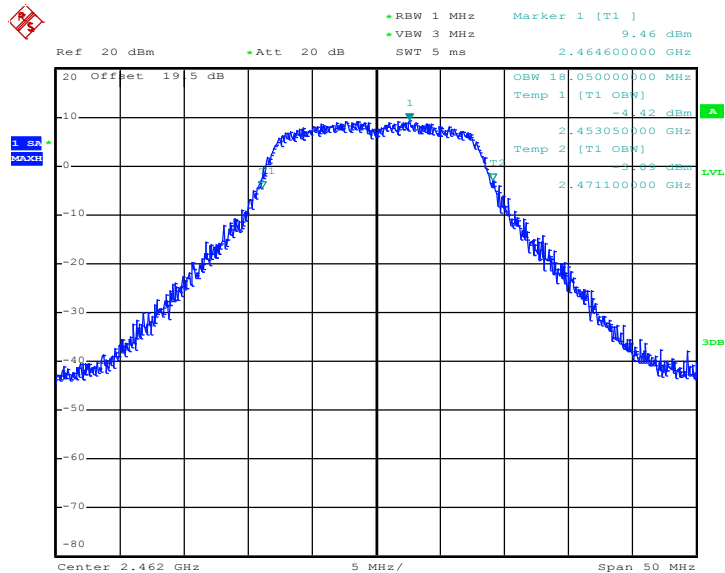


Mode 5 : 99% Occupied Bandwidth Plot on 802.11g Channel 06



Date: 12.OCT.2011 00:00:08

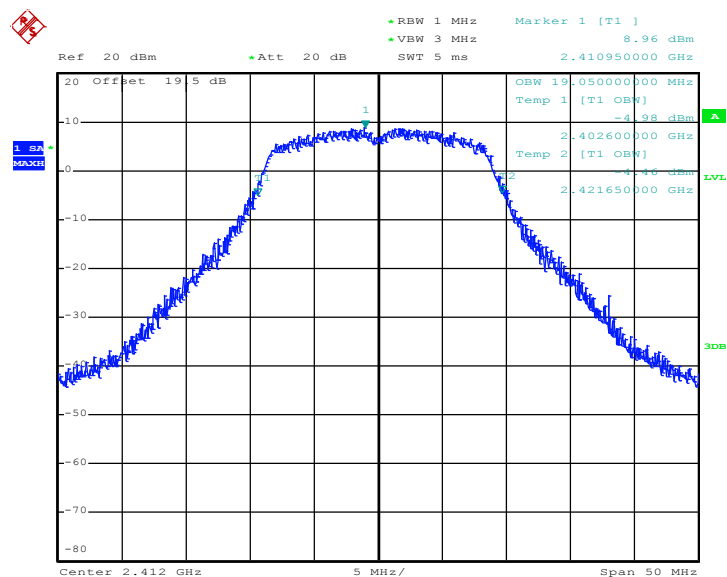
Mode 6 : 99% Occupied Bandwidth Plot on 802.11g Channel 11



Date: 12.OCT.2011 00:13:40

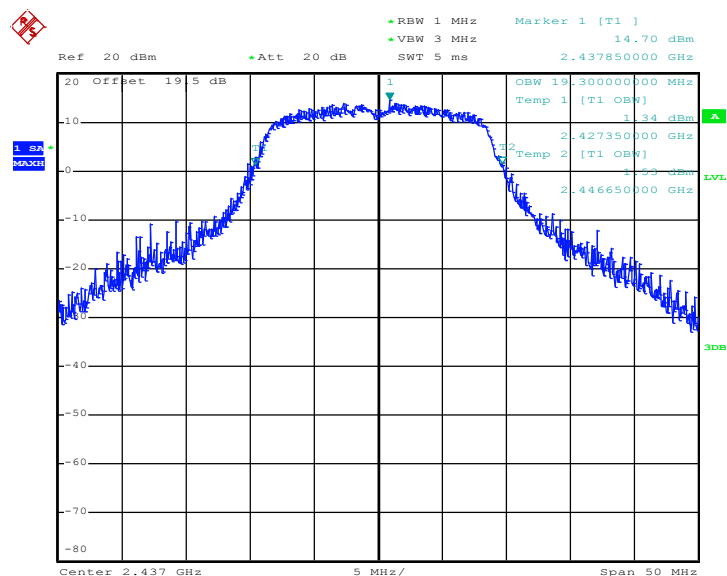


Mode 7 : 99% Occupied Bandwidth Plot on 802.11n Channel 01



Date: 12.OCT.2011 00:27:17

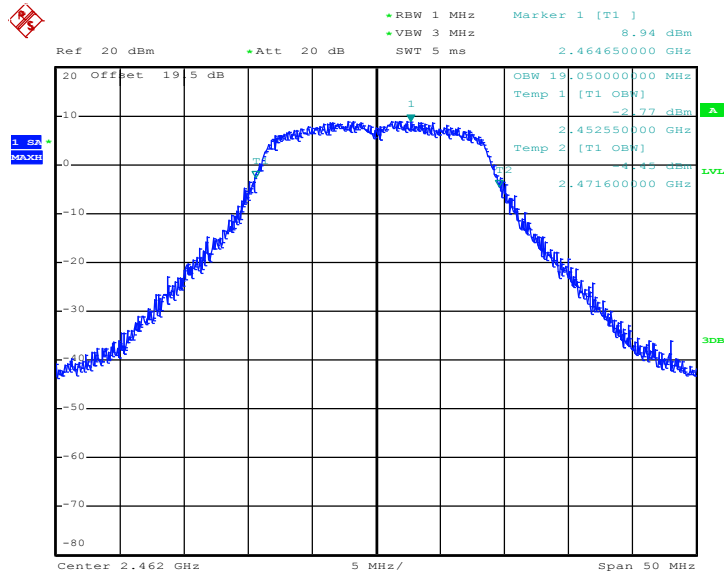
Mode 8 : 99% Occupied Bandwidth Plot on 802.11n Channel 06



Date: 12.OCT.2011 00:39:33

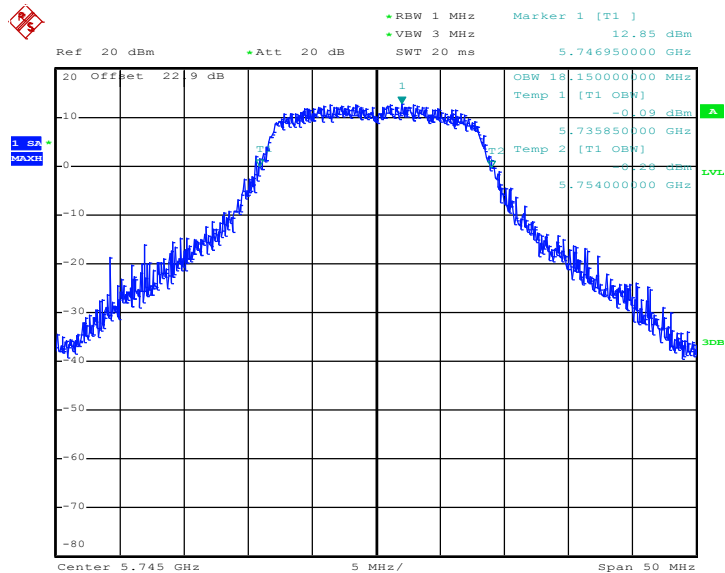


Mode 9 : 99% Occupied Bandwidth Plot on 802.11n Channel 11



Date: 12.OCT.2011 00:54:45

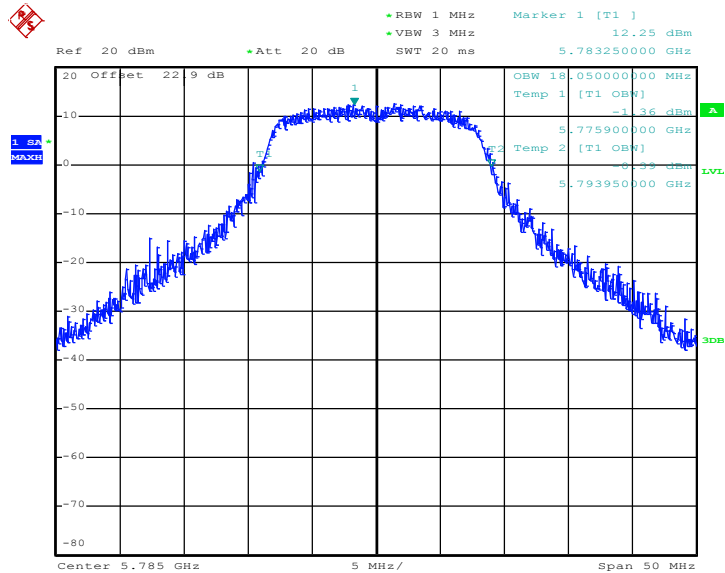
Mode 10 : 99% Occupied Bandwidth Plot on 802.11a Channel 149



Date: 13.OCT.2011 00:01:22

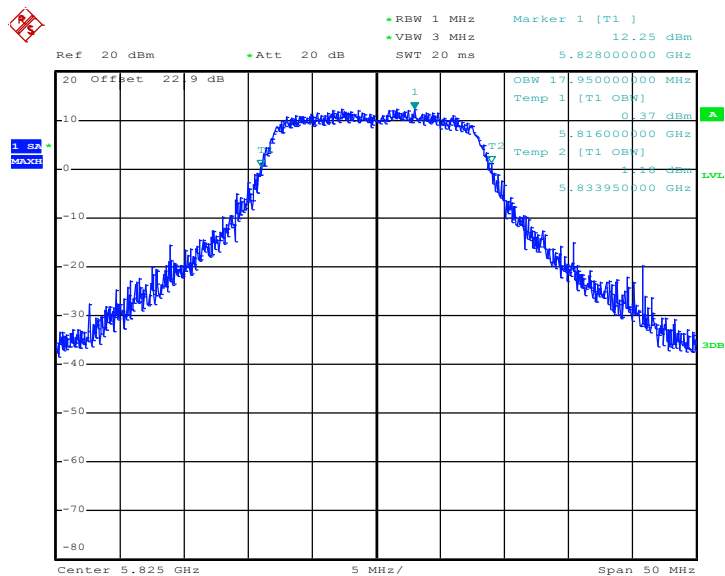


Mode 11 : 99% Occupied Bandwidth Plot on 802.11a Channel 157



Date: 13.OCT.2011 00:14:29

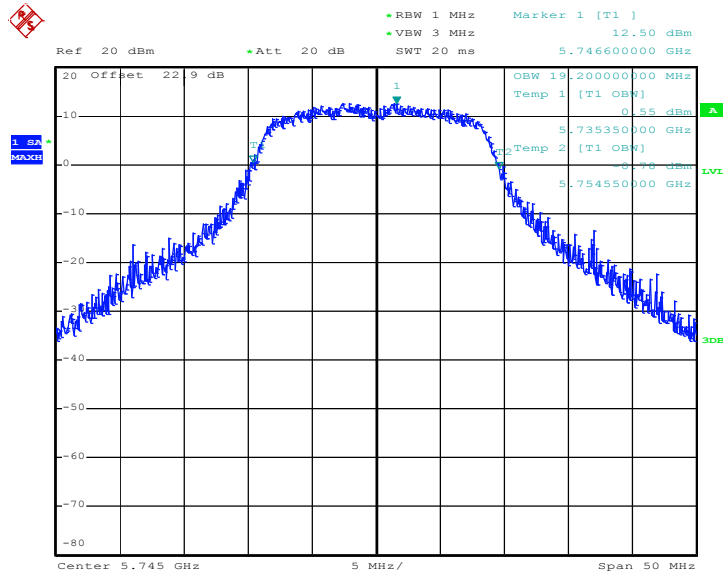
Mode 12 : 99% Occupied Bandwidth Plot on 802.11a Channel 165



Date: 13.OCT.2011 00:26:57

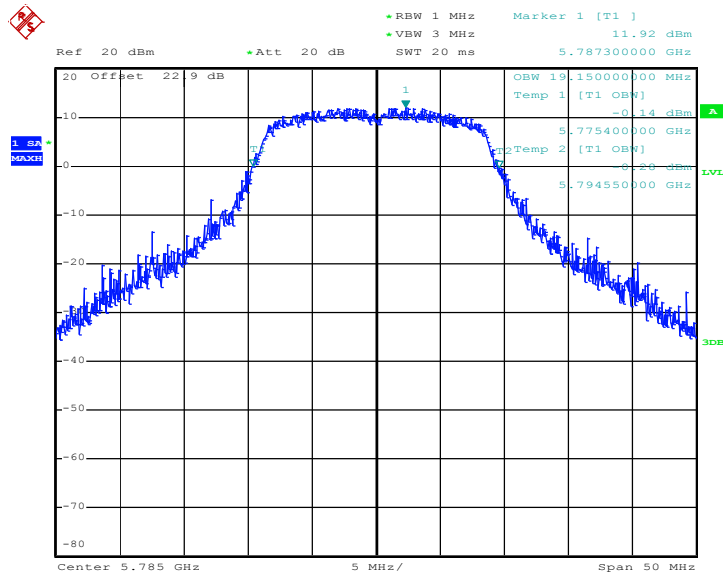


Mode 13 : 99% Occupied Bandwidth Plot on 802.11n Channel 149



Date: 13.OCT.2011 00:44:46

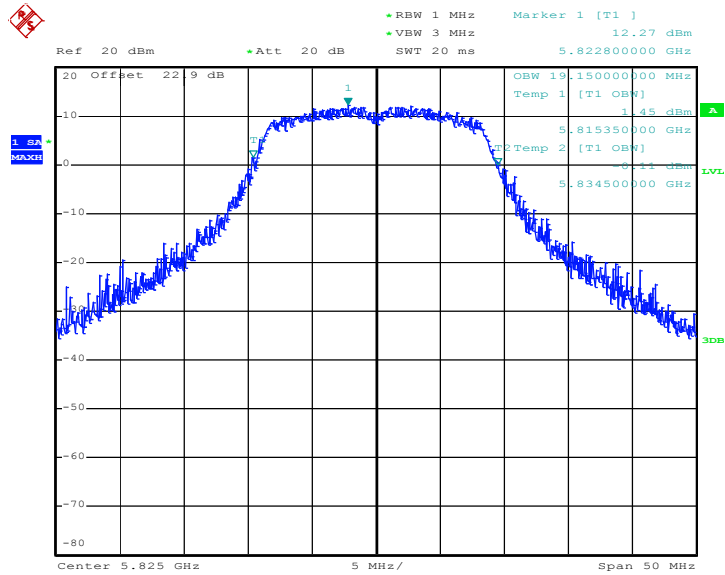
Mode 14 : 99% Occupied Bandwidth Plot on 802.11n Channel 157



Date: 13.OCT.2011 01:06:23



Mode 15 : 99% Occupied Bandwidth Plot on 802.11n Channel 165



Date: 13.OCT.2011 01:36:36

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz and 5725-5850MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

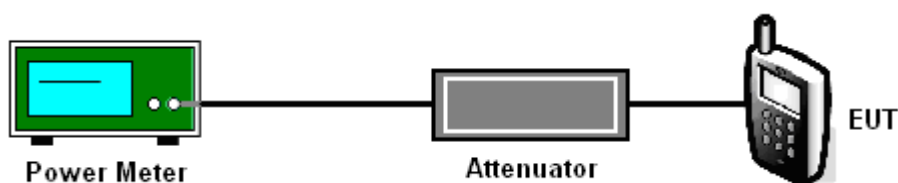
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.63	30	Pass
06	2437	19.88	30	Pass
11	2462	19.84	30	Pass

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

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.24	30	Pass
06	2437	23.78	30	Pass
11	2462	22.36	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	22.34	30	Pass
06	2437	23.79	30	Pass
11	2462	22.55	30	Pass

Test Mode :	Mode 10, 11, 12	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	22.31	30	Pass
157	5785	21.84	30	Pass
165	5825	22.11	30	Pass



Test Mode :	Mode 13, 14, 15	Temperature :	24~26℃
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	22.29	30	Pass
157	5785	21.72	30	Pass
165	5825	22.08	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

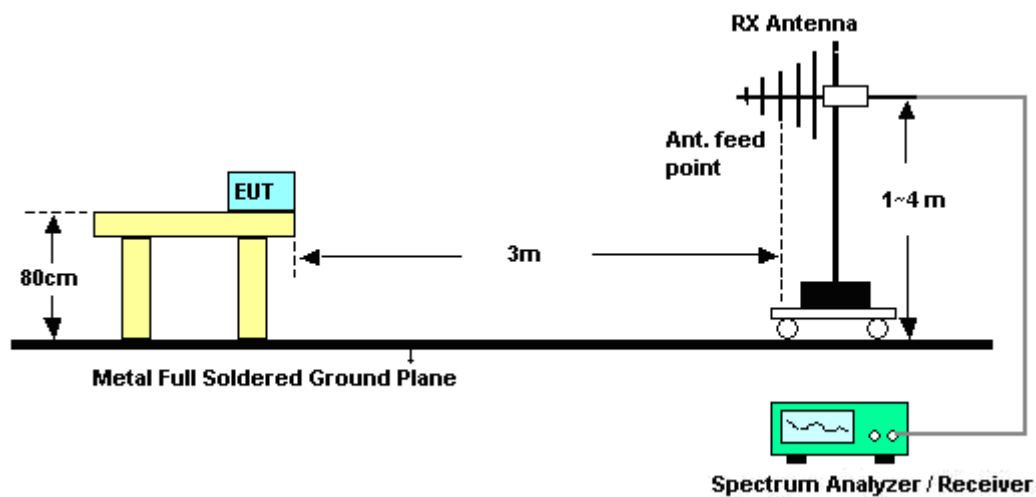
See list of measuring instruments of this test report.

3.3.3 Test Procedures

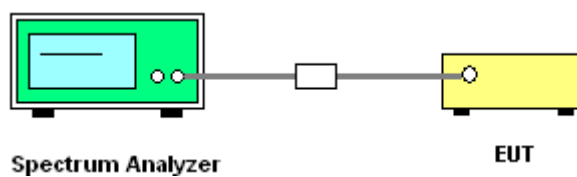
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) > RBW. Band edge emissions must be at least 20 dB below the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the output power of this device was measured by power meter, 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 :	22~23°C
Test Band :	802.11b	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2385.81	52.13	-21.87	74	49.85	32.86	3.47	34.05	115	339	Peak
2385.81	45.31	-8.69	54	43.03	32.86	3.47	34.05	115	339	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2385.24	52.75	-21.25	74	50.51	32.83	3.42	34.01	100	339	Peak
2385.24	42.4	-11.6	54	40.16	32.83	3.42	34.01	100	339	Average

Test Mode :	Mode 3	Temperature :	22~23°C
Test Band :	802.11b	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2491.45	55.36	-18.64	74	52.82	33.05	3.72	34.23	131	304	Peak
2491.45	46.39	-7.61	54	43.85	33.05	3.72	34.23	131	304	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
2488.98	52.14	-21.86	74	49.6	33.05	3.72	34.23	200	342	Peak
2488.98	41.83	-12.17	54	39.29	33.05	3.72	34.23	200	342	Average



Test Mode :	Mode 4	Temperature :	22~23°C
Test Band :	802.11g	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2336.79	49.54	-24.46	74	47.37	32.78	3.33	33.94	100	103	Peak
2336.79	36.43	-17.57	54	34.26	32.78	3.33	33.94	100	103	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
2362.44	49.47	-24.53	74	47.26	32.81	3.38	33.98	100	102	Peak
2362.44	36.73	-17.27	54	34.52	32.81	3.38	33.98	100	102	Average

Test Mode :	Mode 6	Temperature :	22~23°C
Test Band :	802.11g	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2483.85	54.4	-19.6	74	51.91	33.01	3.68	34.2	132	355	Peak
2483.85	40.47	-13.53	54	37.98	33.01	3.68	34.2	132	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
2486.51	52.93	-21.07	74	50.44	33.01	3.68	34.2	200	331	Peak
2486.51	39.37	-14.63	54	36.88	33.01	3.68	34.2	200	331	Average

Test Mode :	Mode 7	Temperature :	22~23°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2387.33	47.5	-26.5	74	45.22	32.86	3.47	34.05	112	301	Peak
2387.33	36.59	-17.41	54	34.31	32.86	3.47	34.05	112	301	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
2389.61	49.29	-24.71	74	47.01	32.86	3.47	34.05	110	102	Peak
2389.61	37.74	-16.26	54	35.46	32.86	3.47	34.05	110	102	Average

Test Mode :	Mode 9	Temperature :	22~23°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2483.66	53.66	-20.34	74	51.17	33.01	3.68	34.2	120	100	Peak
2483.66	39.95	-14.05	54	37.46	33.01	3.68	34.2	120	100	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
2483.66	54.29	-19.71	74	51.8	33.01	3.68	34.2	200	360	Peak
2483.66	40.61	-13.39	54	38.12	33.01	3.68	34.2	200	360	Average



Test Mode :	Mode 10	Temperature :	22~23°C
Test Band :	802.11a	Relative Humidity :	46~47%
Test Channel :	149	Test Engineer :	Chenmy Cheng

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
5725	66.99	-16.86	83.85	59.47	35.52	5.55	33.55	100	102	Peak

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
5725	63.35	-16.9	80.25	55.83	35.52	5.55	33.55	125	220	Peak

Test Mode :	Mode 12	Temperature :	22~23°C
Test Band :	802.11a	Relative Humidity :	46~47%
Test Channel :	165	Test Engineer :	Chenmy Cheng

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
5850	60.44	-26.12	86.56	53.01	35.56	5.64	33.77	100	129	Peak

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
5850	54.95	-25.43	80.38	47.52	35.56	5.64	33.77	163	291	Peak

Test Mode :	Mode 13	Temperature :	22~23°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~47%
Test Channel :	149	Test Engineer :	Chenmy Cheng

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
5725	68.89	-18.36	87.25	61.37	35.52	5.55	33.55	200	308	Peak

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
5725	65.29	-15.24	80.53	57.77	35.52	5.55	33.55	100	90	Peak

Test Mode :	Mode 15	Temperature :	22~23°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	46~47%
Test Channel :	165	Test Engineer :	Chenmy Cheng

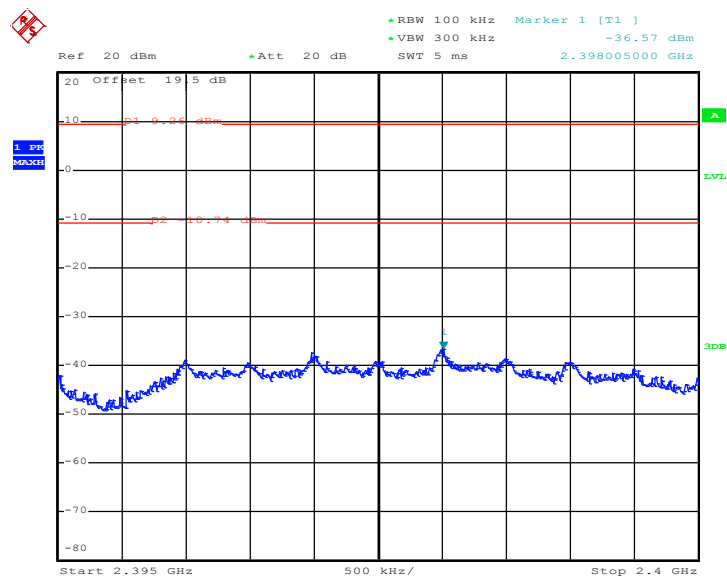
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5850	63.81	-21.62	85.43	56.38	35.56	5.64	33.77	100	100	Peak

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
5850	57.18	-23.37	80.55	49.75	35.56	5.64	33.77	100	30	Peak

3.3.6 Test Result of Conducted Band Edges

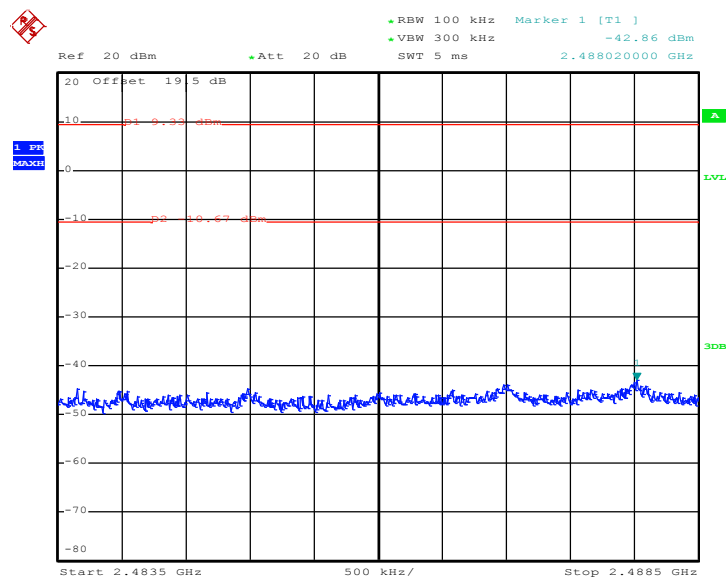
Test Mode :	Mode 1 and 3	Temperature :	24~26℃
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11b Channel 01



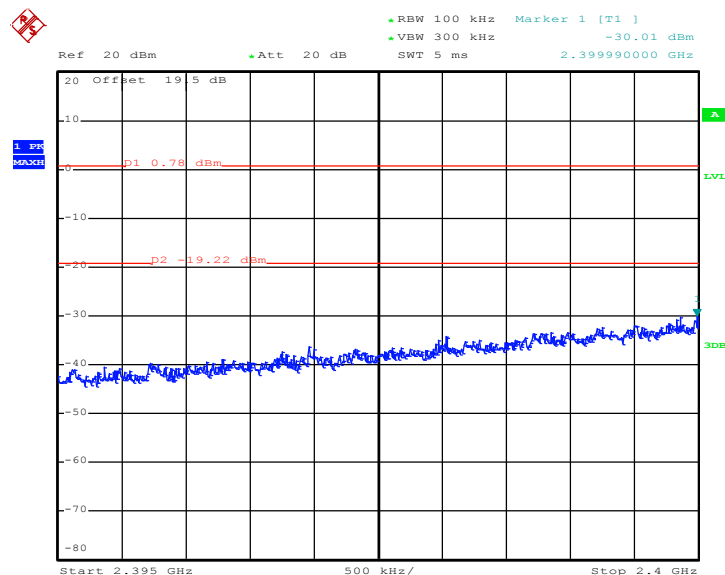
Date: 12.OCT.2011 01:11:11

High Band Edge Plot on 802.11b Channel 11

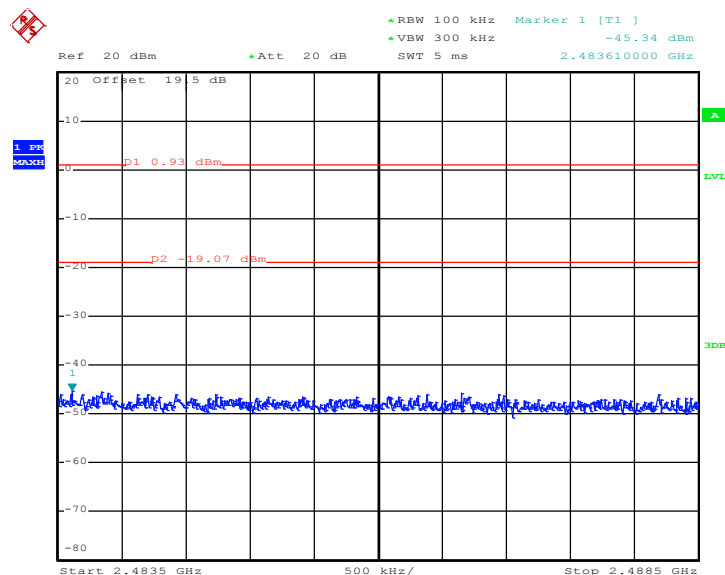


Date: 11.OCT.2011 23:30:53

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

Low Band Edge Plot on 802.11g Channel 01


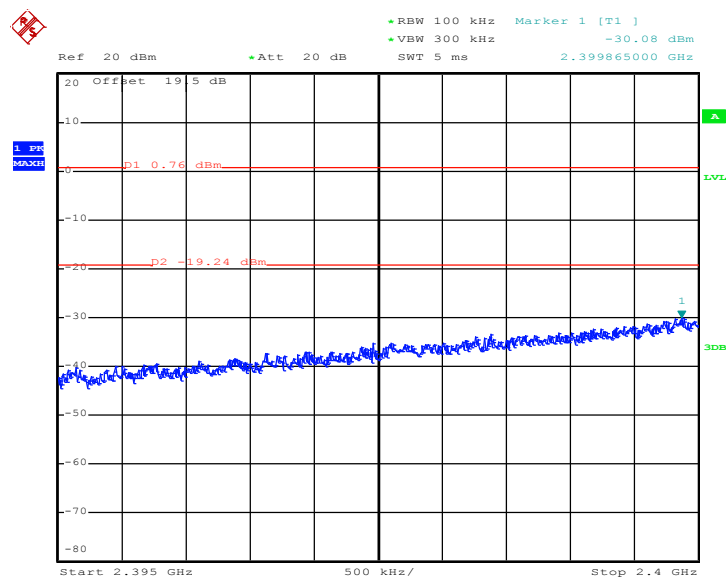
Date: 11.OCT.2011 23:44:40

High Band Edge Plot on 802.11g Channel 11


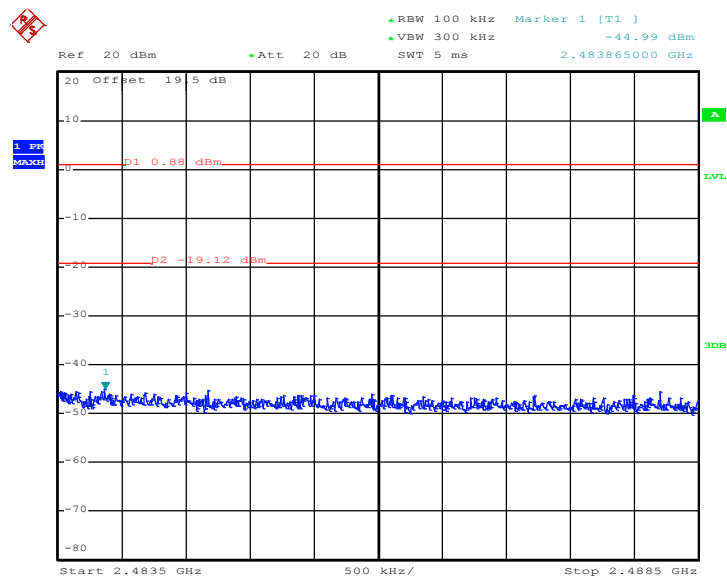
Date: 12.OCT.2011 00:13:14



Test Mode :	Mode 7 and 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11n Channel 01

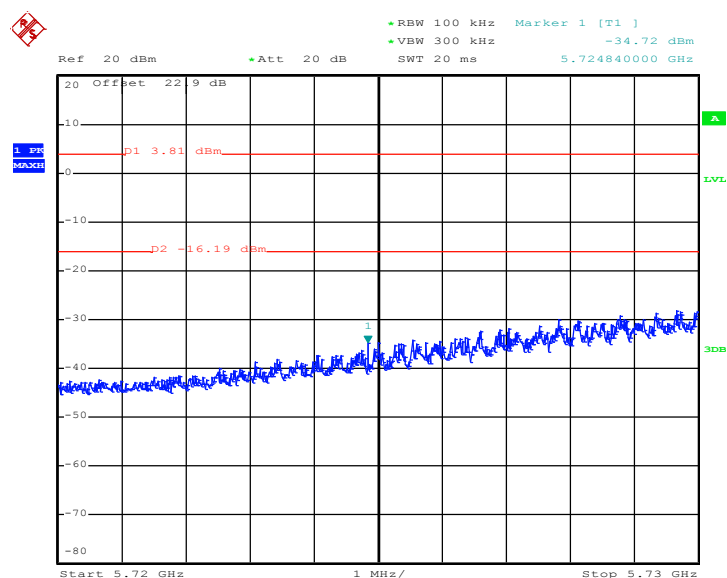
Date: 12.OCT.2011 00:26:52

High Band Edge Plot on 802.11n Channel 11

Date: 13.OCT.2011 09:18:14

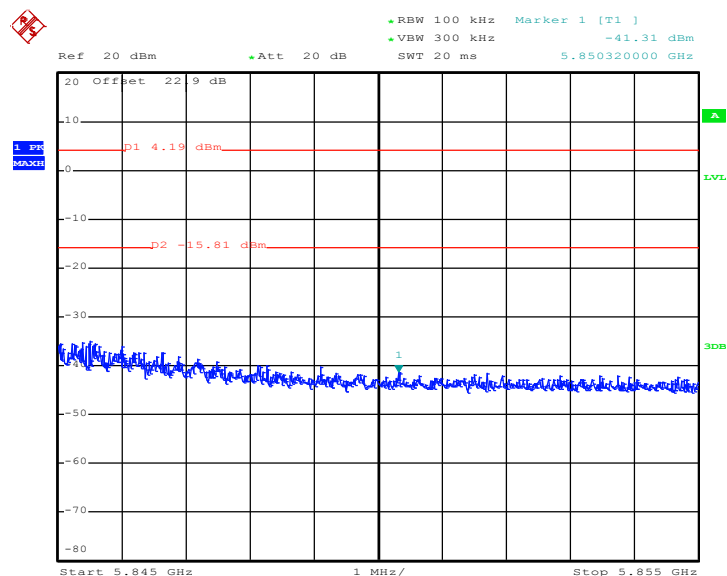
Test Mode :	Mode 10 and 12	Temperature :	24~26℃
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	149 and 165	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11a Channel 149



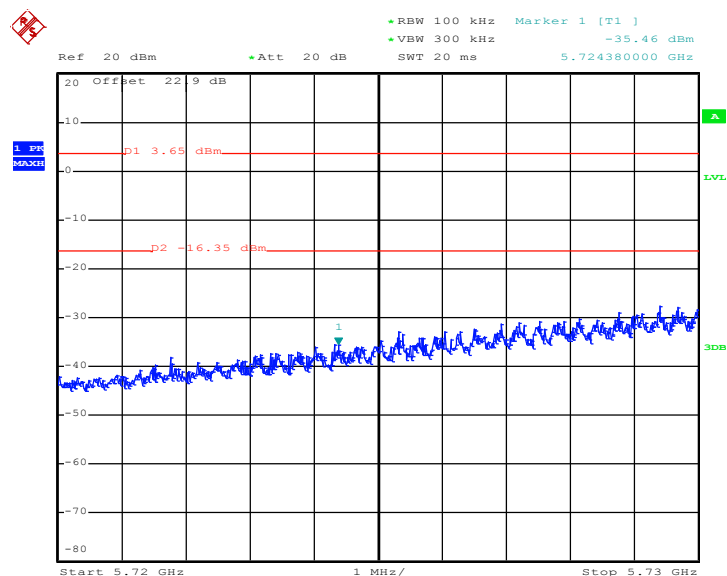
Date: 13.OCT.2011 09:28:48

High Band Edge Plot on 802.11a Channel 165

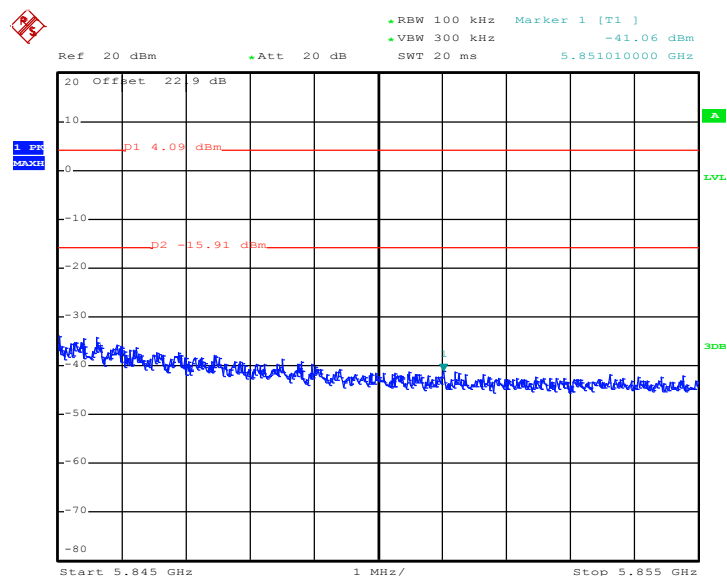


Date: 13.OCT.2011 10:02:39

Test Mode :	Mode 13 and 15	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	149 and 165	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11n Channel 149


Date: 13.OCT.2011 09:38:28

High Band Edge Plot on 802.11n Channel 165


Date: 13.OCT.2011 10:08:29

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.

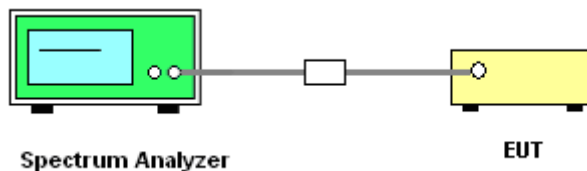
3.4.2 Measuring Instruments

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) > 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.

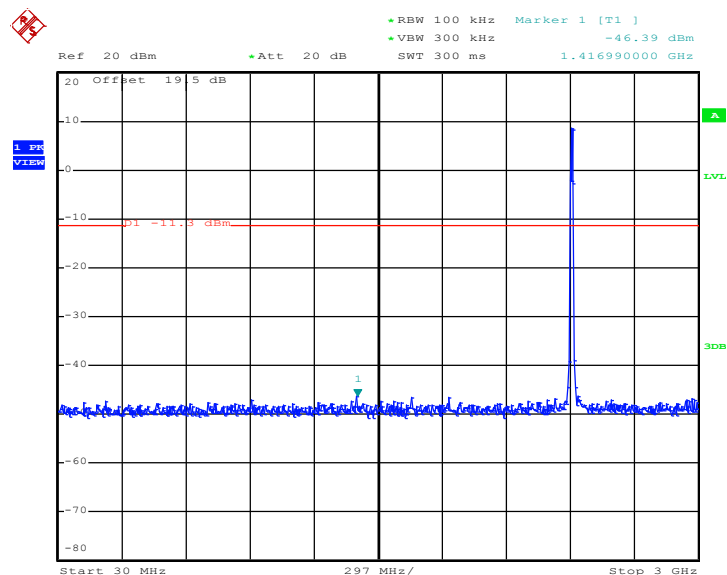
3.4.4 Test Setup



3.4.5 Test Result

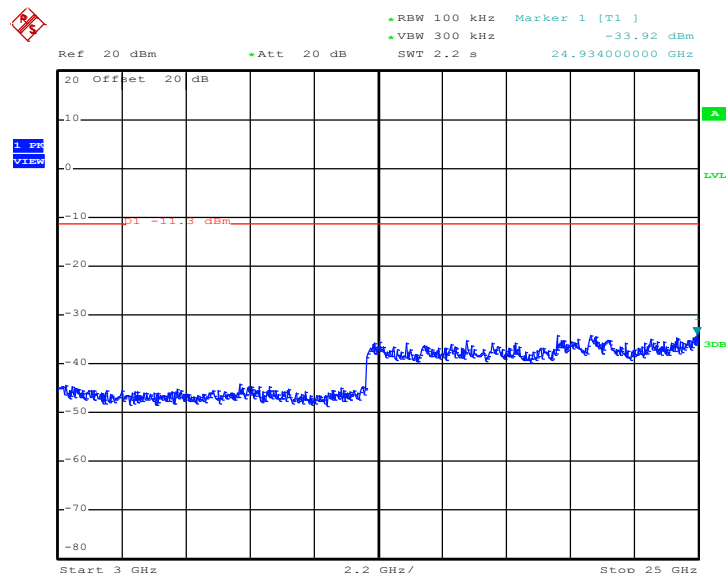
Test Mode :	Mode 1	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30 MHz~3 GHz



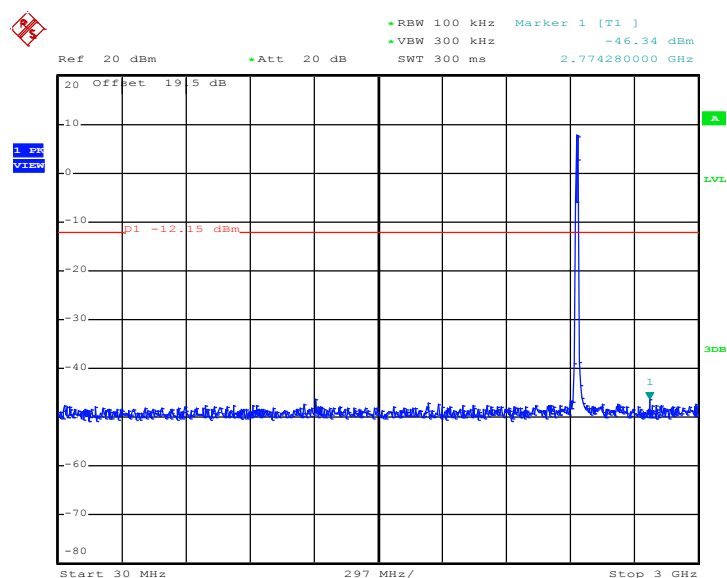
Date: 11.OCT.2011 22:47:01

Conducted Spurious Emission Plot between 3GHz~25 GHz

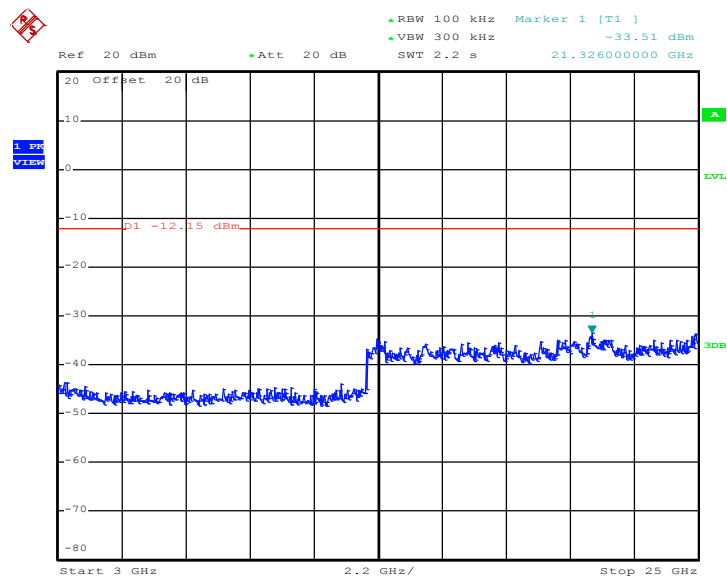


Date: 11.OCT.2011 22:47:18

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

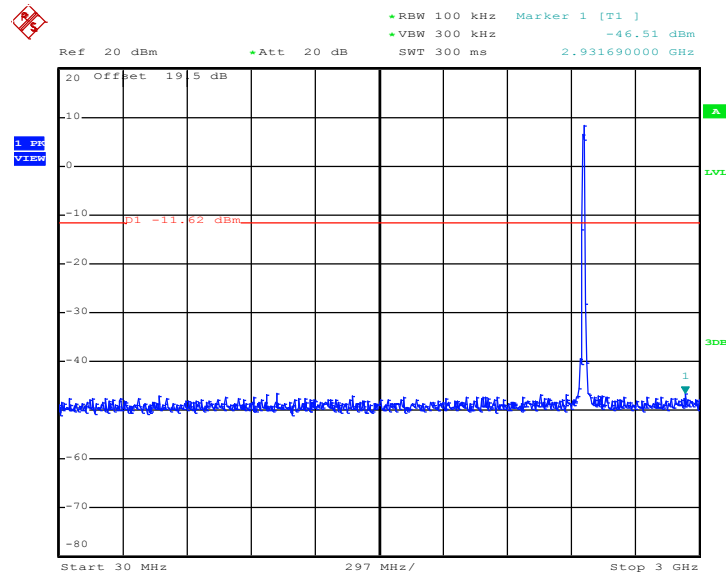
Conducted Spurious Emission Plot between 30 MHz~3 GHz


Date: 11.OCT.2011 23:27:20

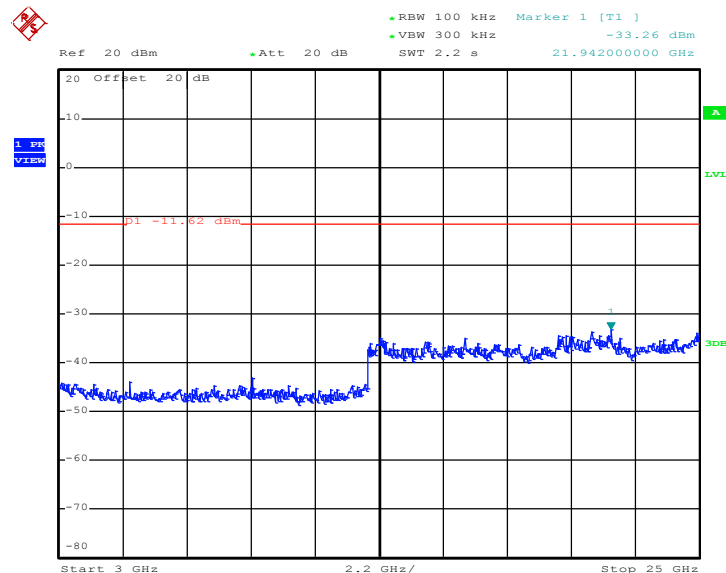
Conducted Spurious Emission Plot between 3GHz~25 GHz


Date: 11.OCT.2011 23:27:37

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

Conducted Spurious Emission Plot between 30 MHz~3 GHz


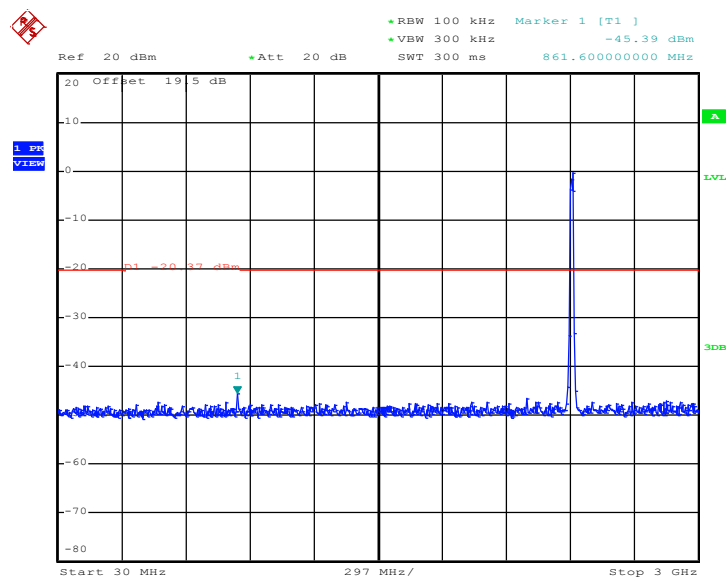
Date: 11.OCT.2011 23:40:24

Conducted Spurious Emission Plot between 3GHz~25 GHz


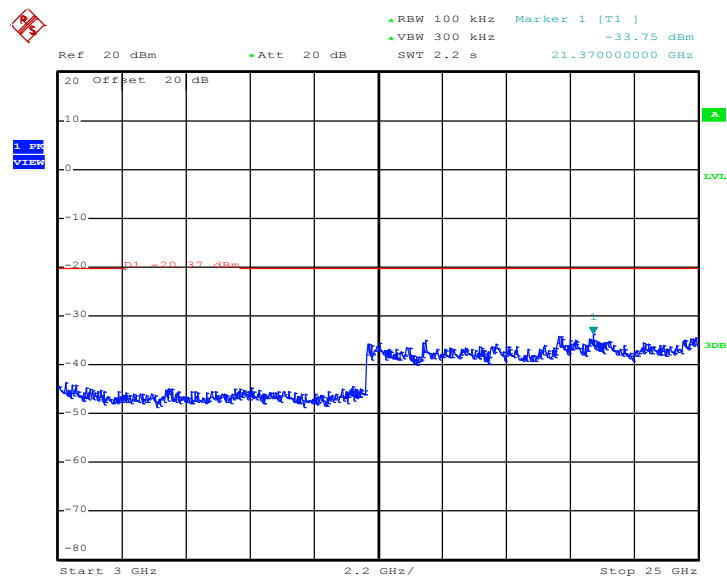
Date: 11.OCT.2011 23:40:41



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

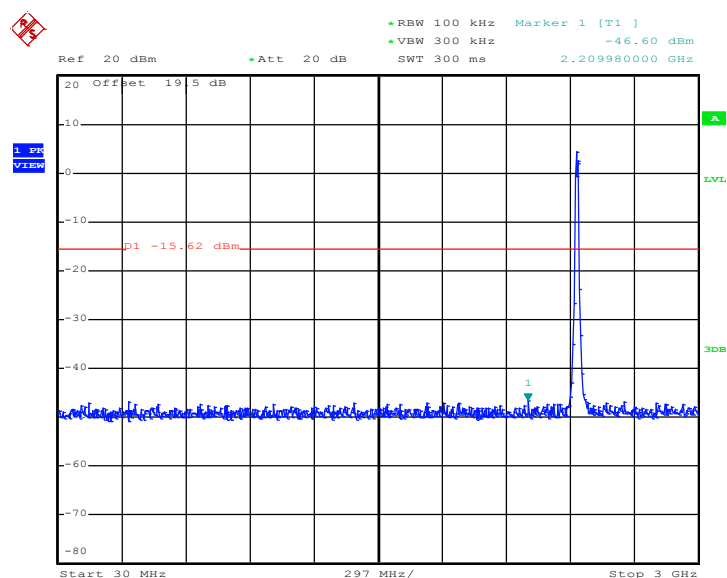
Conducted Spurious Emission Plot between 30 MHz~3 GHz

Date: 11.OCT.2011 23:54:00

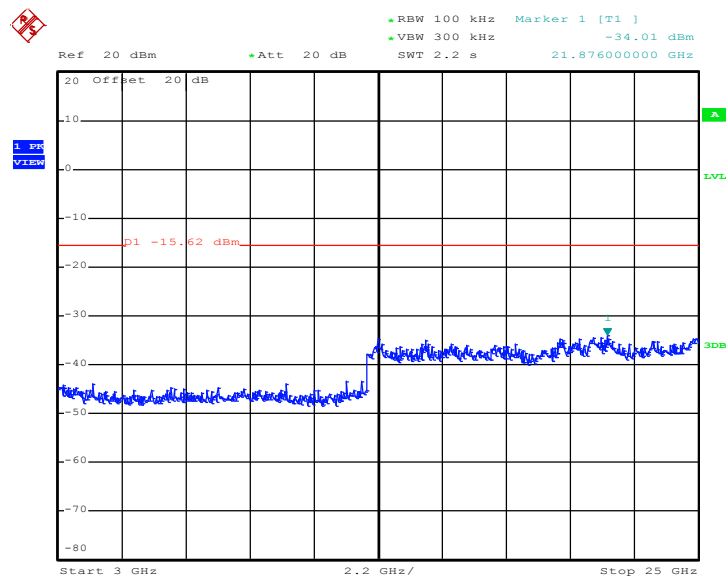
Conducted Spurious Emission Plot between 3GHz~25 GHz

Date: 11.OCT.2011 23:54:18

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

Conducted Spurious Emission Plot between 30 MHz~3 GHz


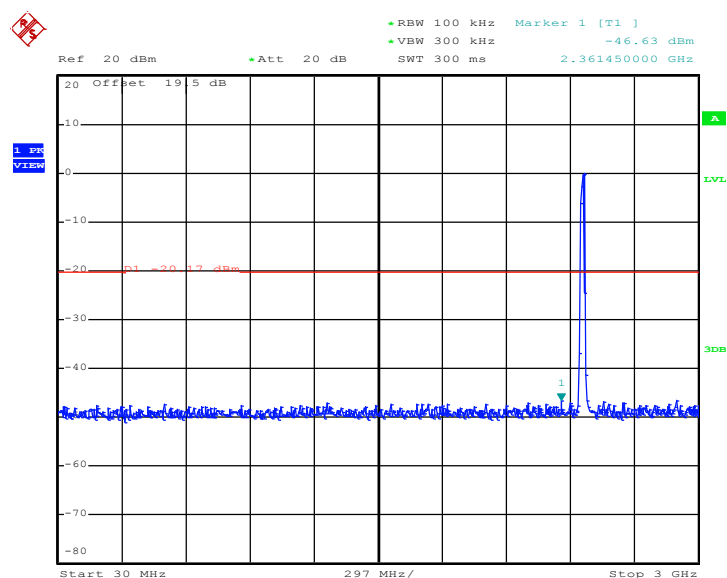
Date: 12.OCT.2011 00:09:49

Conducted Spurious Emission Plot between 3GHz~25 GHz


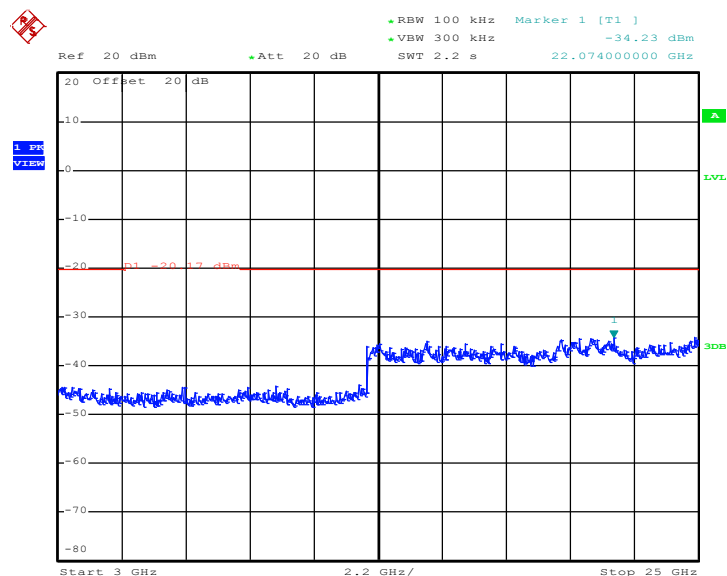
Date: 12.OCT.2011 00:10:07



Test Mode :	Mode 6	Temperature :	24~26℃
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30 MHz~3 GHz

Date: 12.OCT.2011 00:22:35

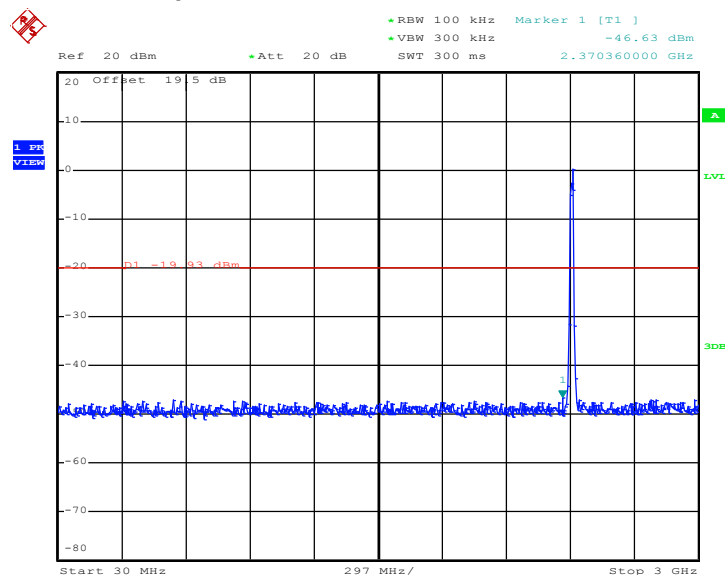
Conducted Spurious Emission Plot between 3GHz~25 GHz

Date: 12.OCT.2011 00:22:52



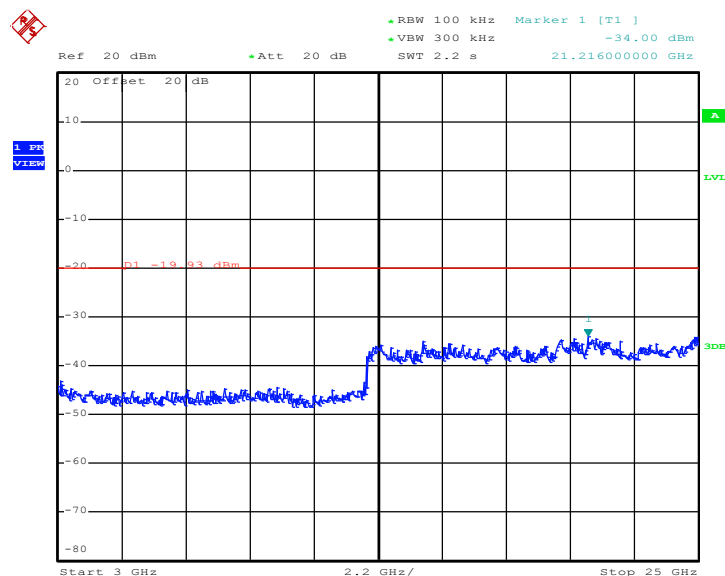
Test Mode :	Mode 7	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30 MHz~3 GHz



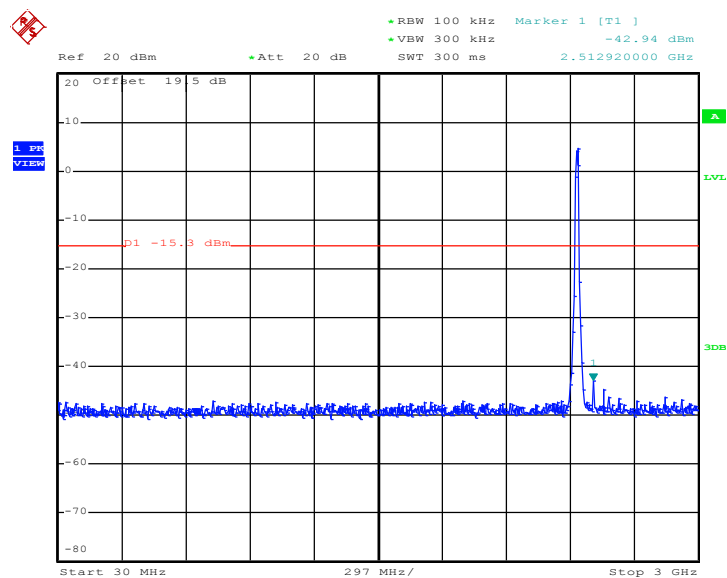
Date: 12.OCT.2011 00:36:15

Conducted Spurious Emission Plot between 3GHz~25 GHz

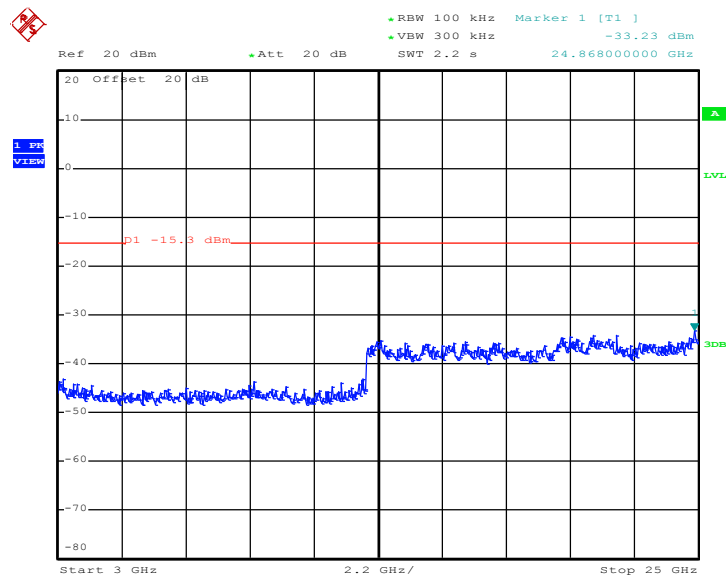


Date: 12.OCT.2011 00:36:32

Test Mode :	Mode 8	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Alan Liu

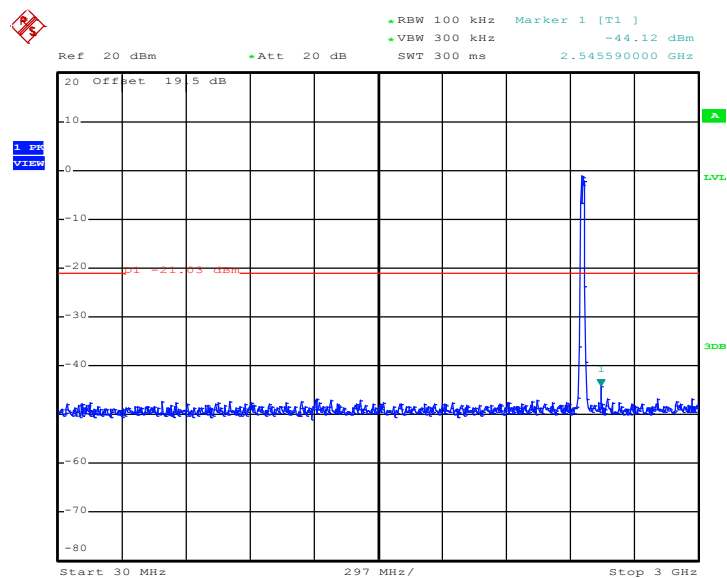
Conducted Spurious Emission Plot between 30 MHz~3 GHz


Date: 12.OCT.2011 00:50:28

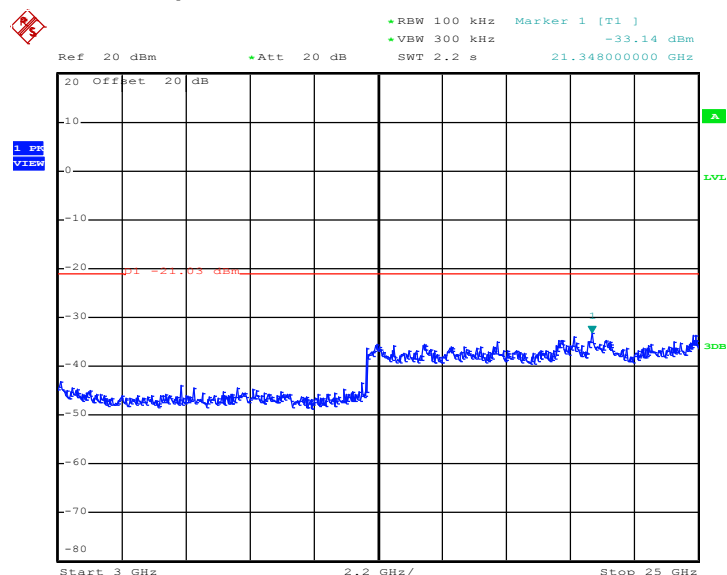
Conducted Spurious Emission Plot between 3GHz~25 GHz


Date: 12.OCT.2011 00:50:45

Test Mode :	Mode 9	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Alan Liu

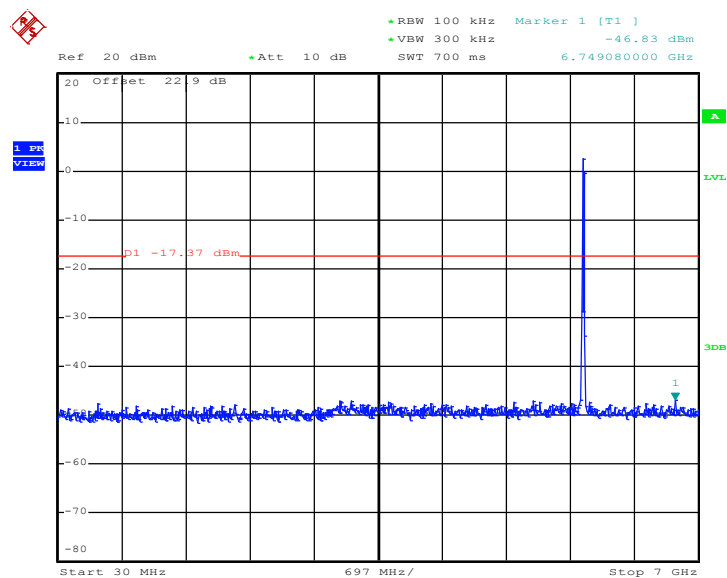
Conducted Spurious Emission Plot between 30 MHz~3 GHz


Date: 12.OCT.2011 01:04:56

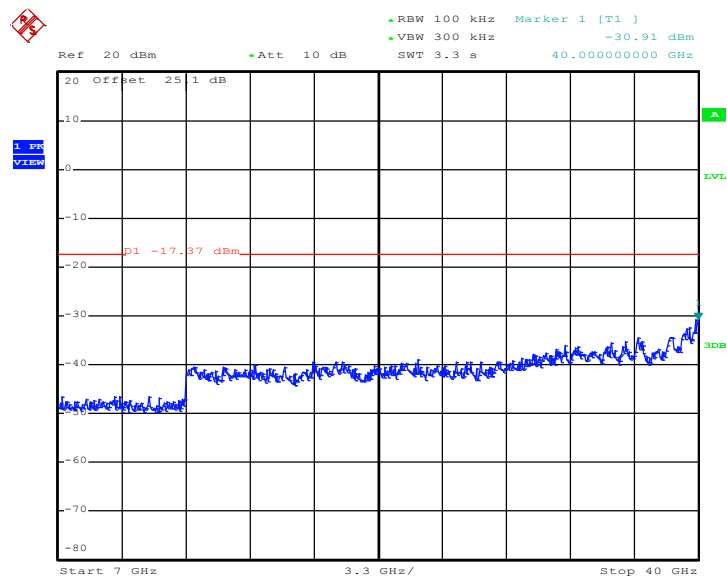
Conducted Spurious Emission Plot between 3GHz~25 GHz


Date: 12.OCT.2011 01:05:13

Test Mode :	Mode 10	Temperature :	24~26°C
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	149	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30 MHz~7 GHz


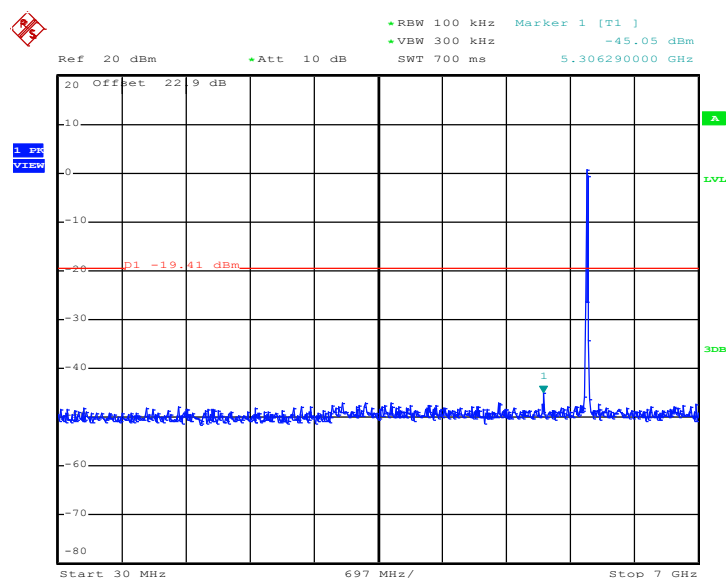
Date: 13.OCT.2011 09:50:43

Conducted Spurious Emission Plot between 7 GHz~40 GHz


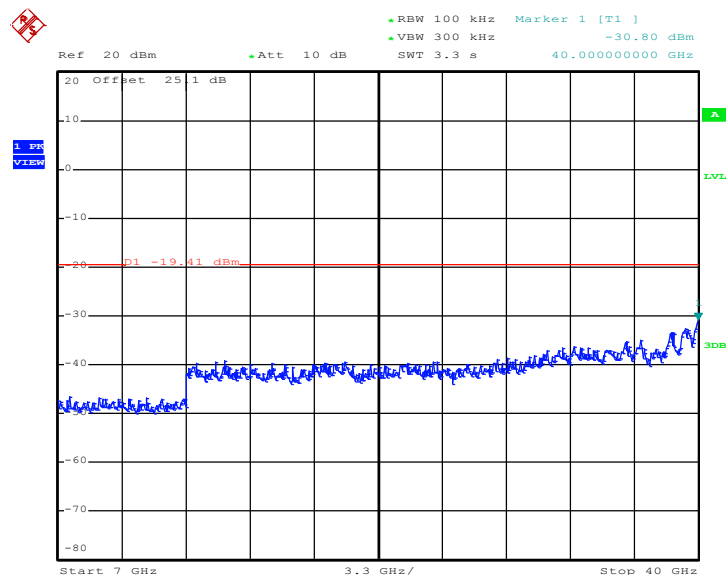
Date: 13.OCT.2011 09:51:01



Test Mode :	Mode 11	Temperature :	24~26°C
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	157	Test Engineer :	Alan Liu

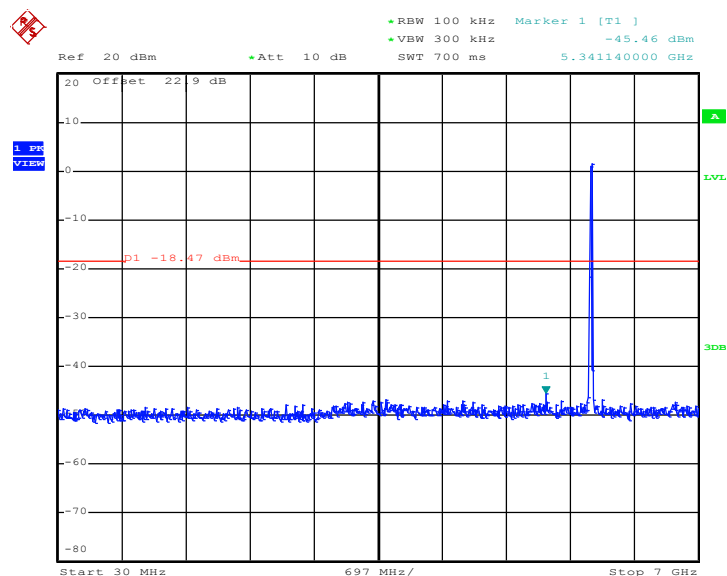
Conducted Spurious Emission Plot between 30 MHz~7 GHz

Date: 13.OCT.2011 09:53:42

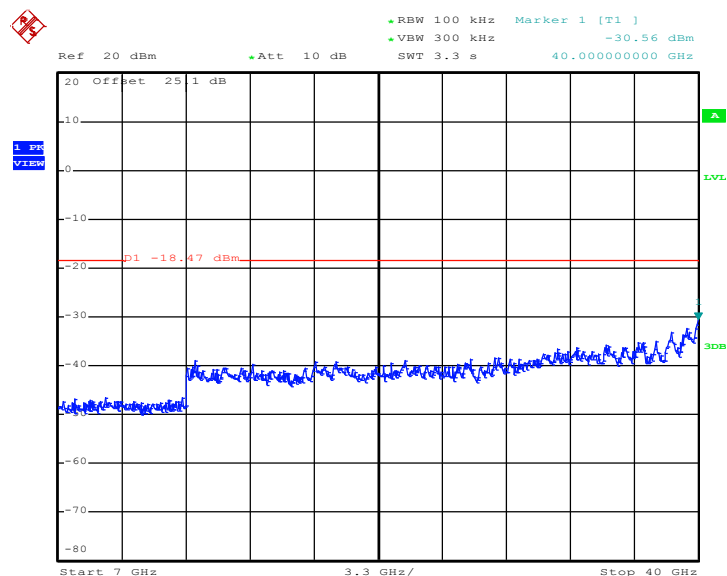
Conducted Spurious Emission Plot between 7 GHz~40 GHz

Date: 13 OCT 2011 09:53:59

Test Mode :	Mode 12	Temperature :	24~26°C
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	165	Test Engineer :	Alan Liu

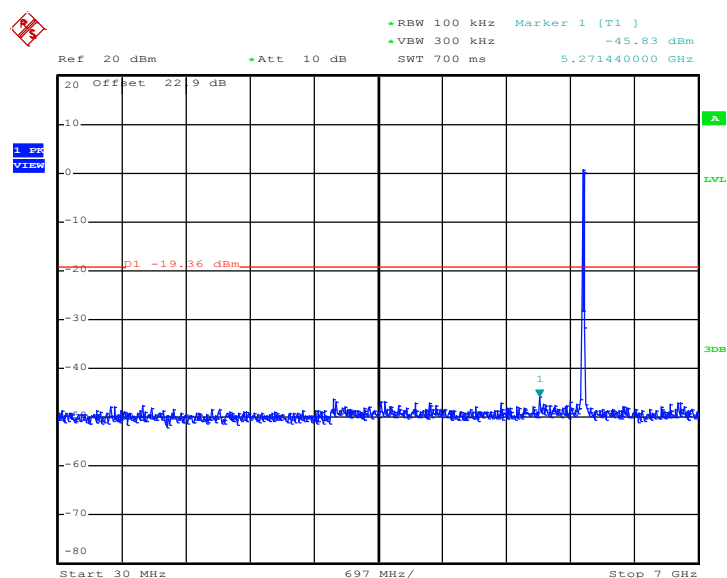
Conducted Spurious Emission Plot between 30 MHz~7 GHz


Date: 13.OCT.2011 10:03:10

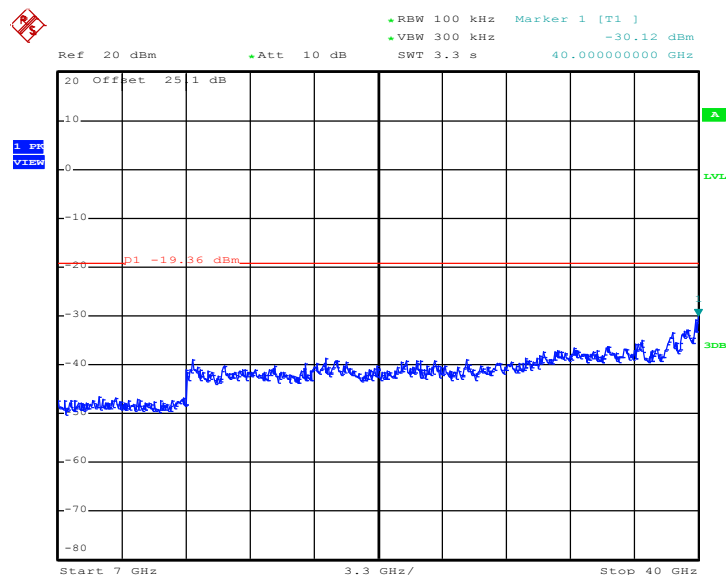
Conducted Spurious Emission Plot between 7 GHz~40 GHz


Date: 13.OCT.2011 10:03:27

Test Mode :	Mode 13	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	149	Test Engineer :	Alan Liu

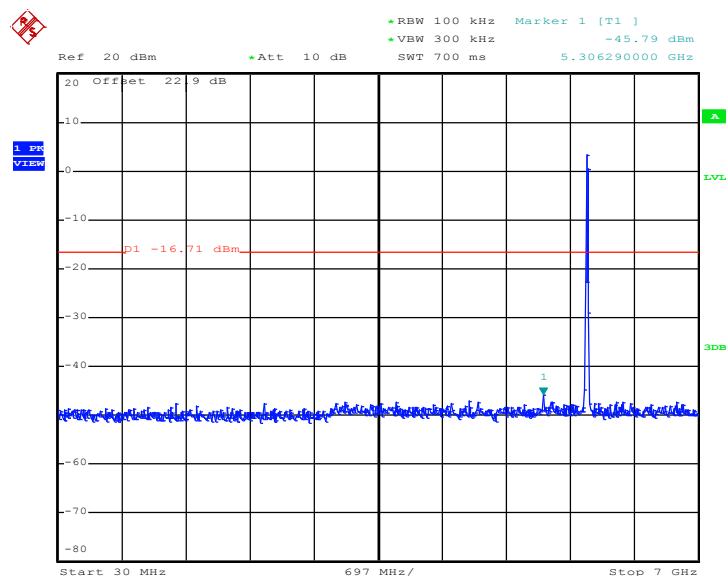
Conducted Spurious Emission Plot between 30 MHz~7 GHz


Date: 13.OCT.2011 09:49:48

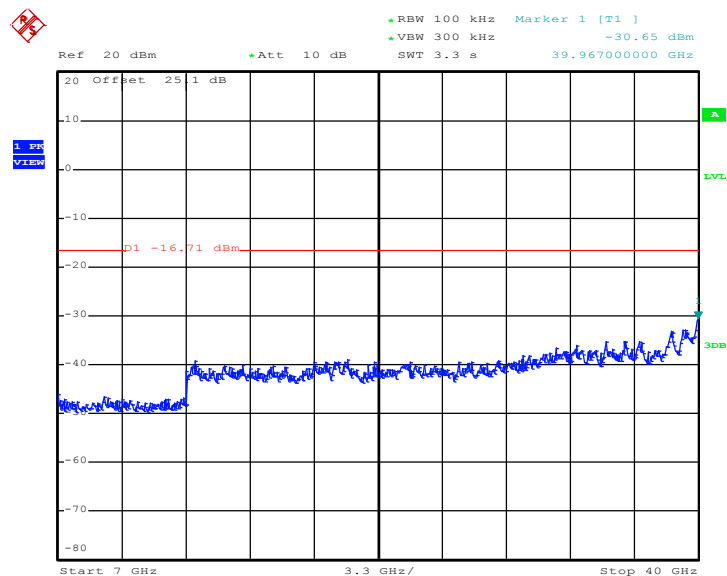
Conducted Spurious Emission Plot between 7 GHz~40 GHz


Date: 13 OCT 2011 09:50:05

Test Mode :	Mode 14	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	157	Test Engineer :	Alan Liu

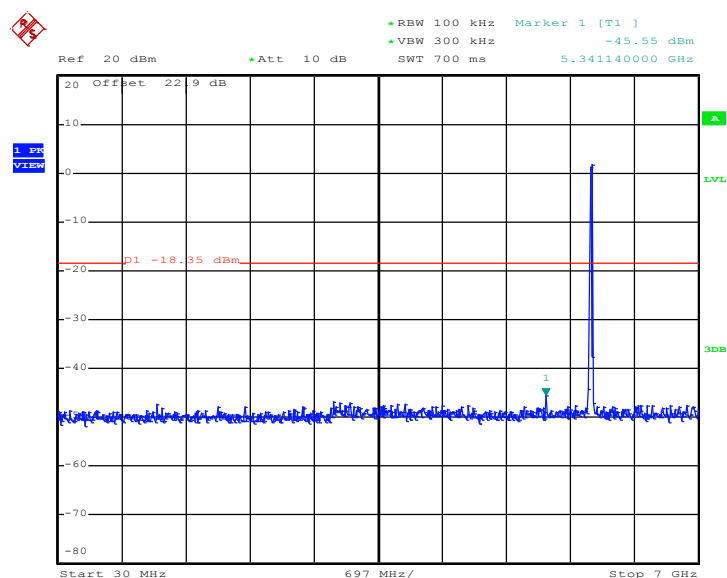
Conducted Spurious Emission Plot between 30 MHz~7 GHz


Date: 13.OCT.2011 09:48:49

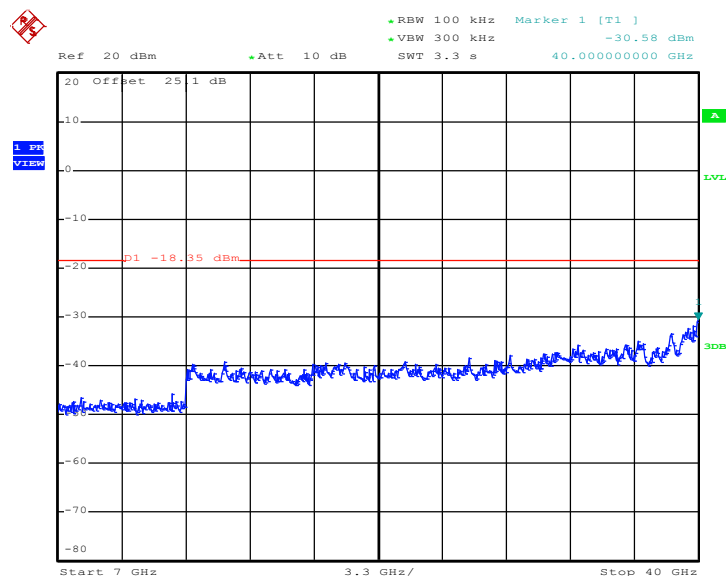
Conducted Spurious Emission Plot between 7 GHz~40 GHz


Date: 13.OCT.2011 09:49:06

Test Mode :	Mode 15	Temperature :	24~26°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	165	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30 MHz~7 GHz


Date: 13.OCT.2011 10:09:01

Conducted Spurious Emission Plot between 7 GHz~40 GHz


Date: 13.OCT.2011 10:09:18

3.5 Power Spectral Density Measurement

3.5.1 Limit of Power Spectral Density

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

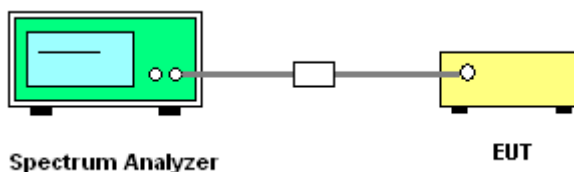
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-3.67	8	Pass
06	2437	-3.55	8	Pass
11	2462	-3.52	8	Pass

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

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-12.56	8	Pass
06	2437	-7.63	8	Pass
11	2462	-12.66	8	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-12.38	8	Pass
06	2437	-7.36	8	Pass
11	2462	-12.10	8	Pass

Test Mode :	Mode 10, 11, 12	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	-9.02	8	Pass
157	5785	-9.48	8	Pass
165	5825	-9.51	8	Pass

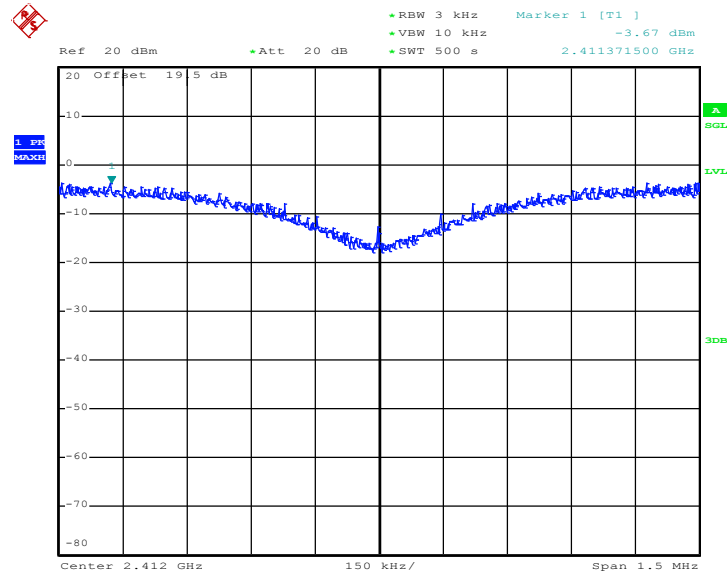


Test Mode :	Mode 13, 14, 15	Temperature :	24~26℃
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (BW 20MHz) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	-8.67	8	Pass
157	5785	-9.09	8	Pass
165	5825	-9.00	8	Pass

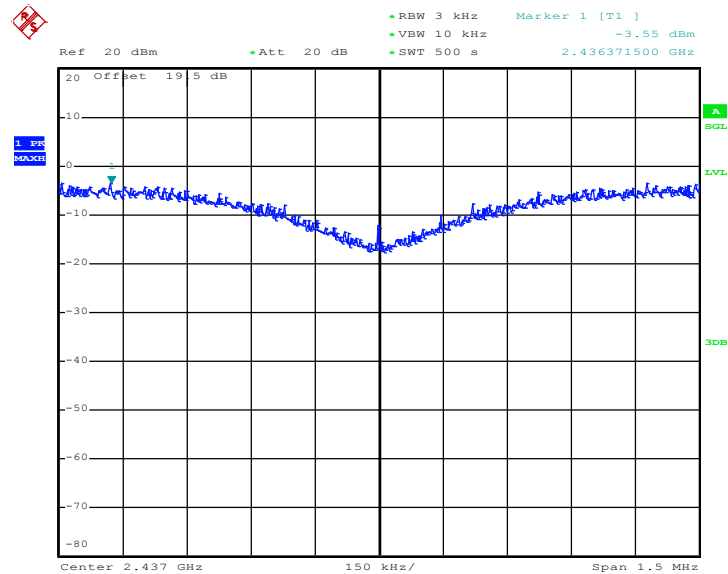
3.5.6 Test Result of Power Spectral Density Plots

Mode 1 : PSD Plot on 802.11b Channel 01



Date: 11.OCT.2011 22:46:21

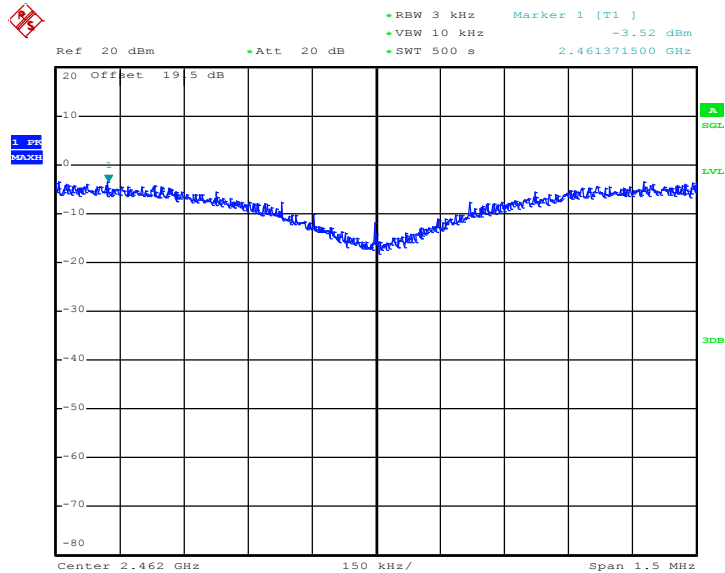
Mode 2 : PSD Plot on 802.11b Channel 06



Date: 11.OCT.2011 23:22:54

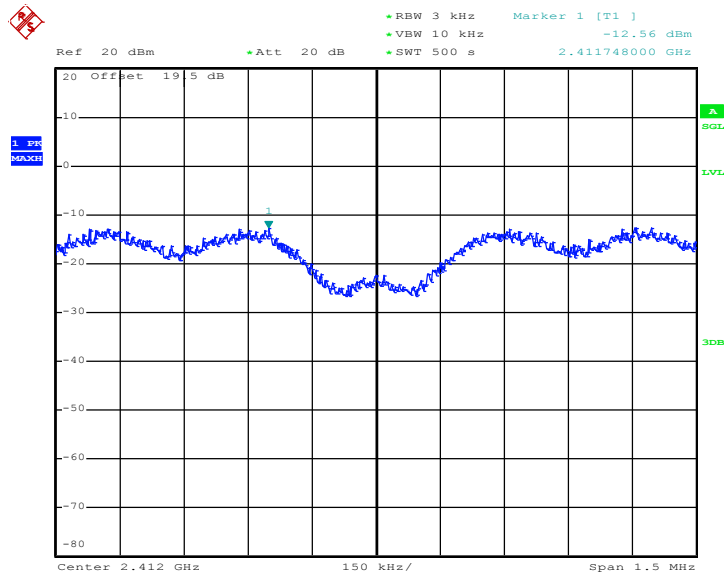


Mode 3 : PSD Plot on 802.11b Channel 11



Date: 11.OCT.2011 23:40:03

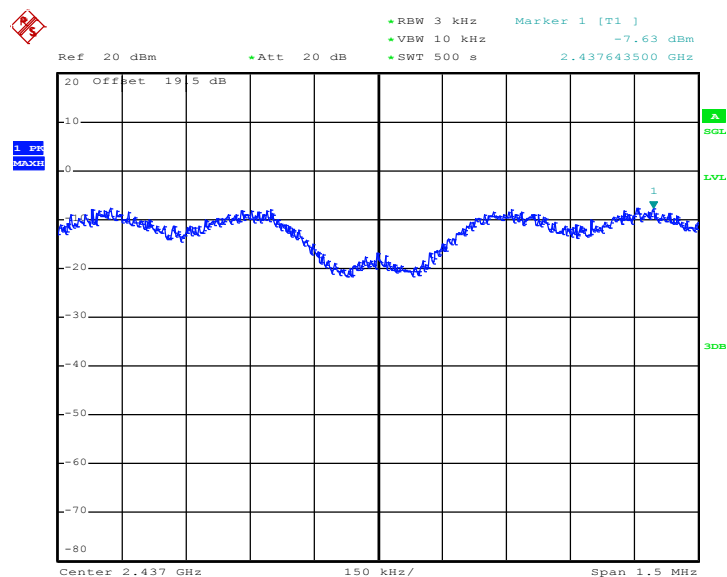
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 11.OCT.2011 23:53:39

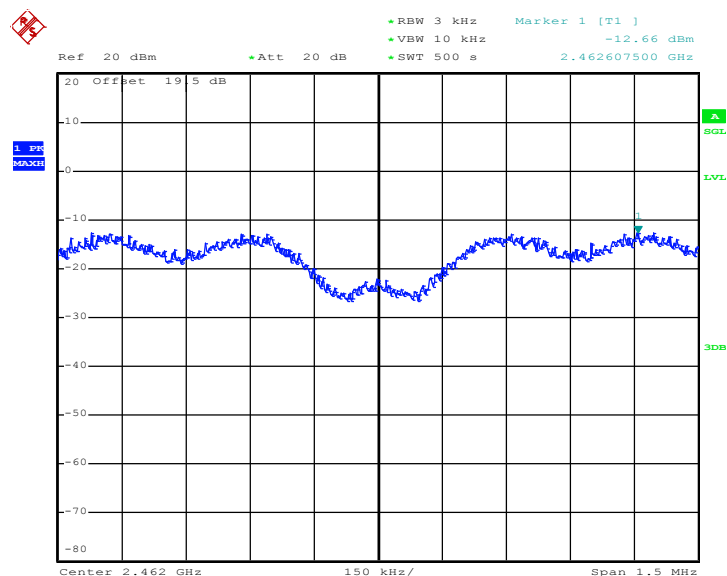


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 12.OCT.2011 00:08:42

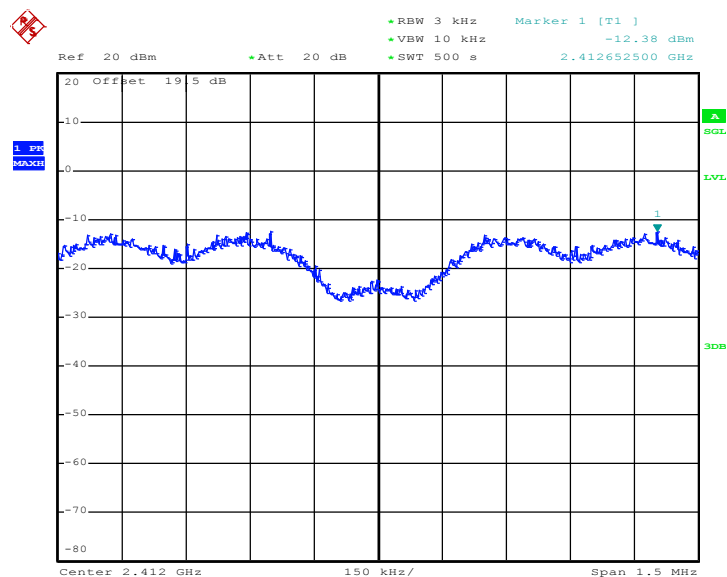
Mode 6 : PSD Plot on 802.11g Channel 11



Date: 12.OCT.2011 00:22:14

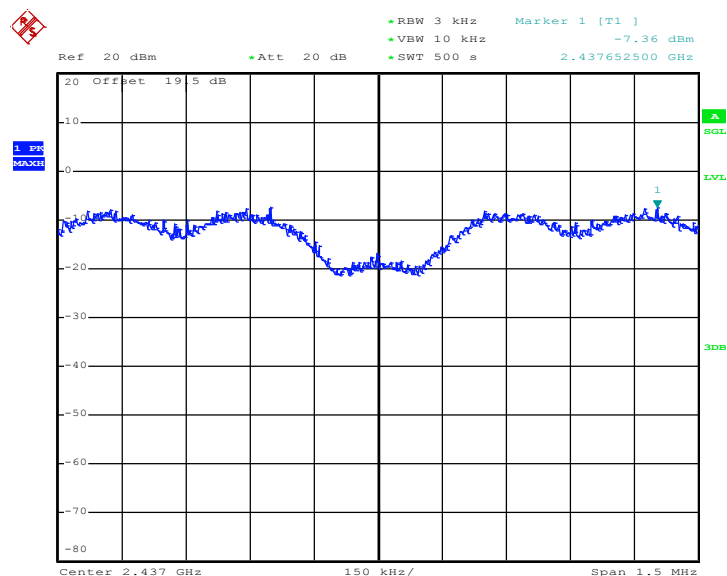


Mode 7 : PSD Plot on 802.11n Channel 01



Date: 12.OCT.2011 00:35:54

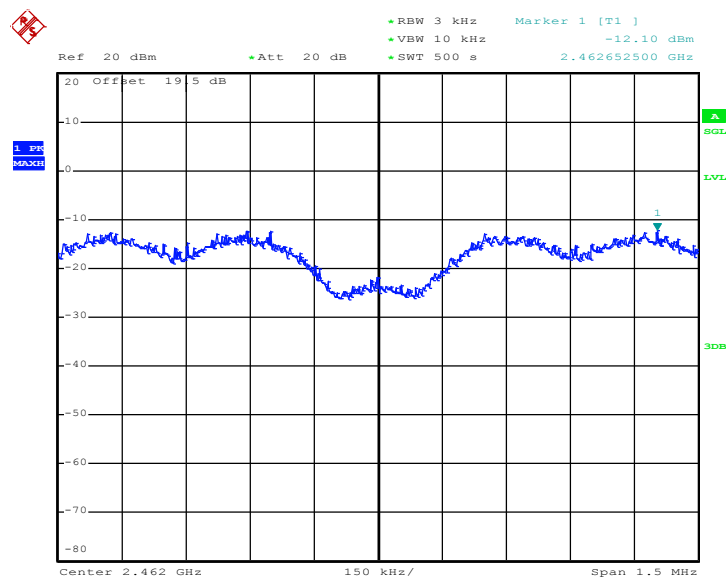
Mode 8 : PSD Plot on 802.11n Channel 06



Date: 12.OCT.2011 00:49:21

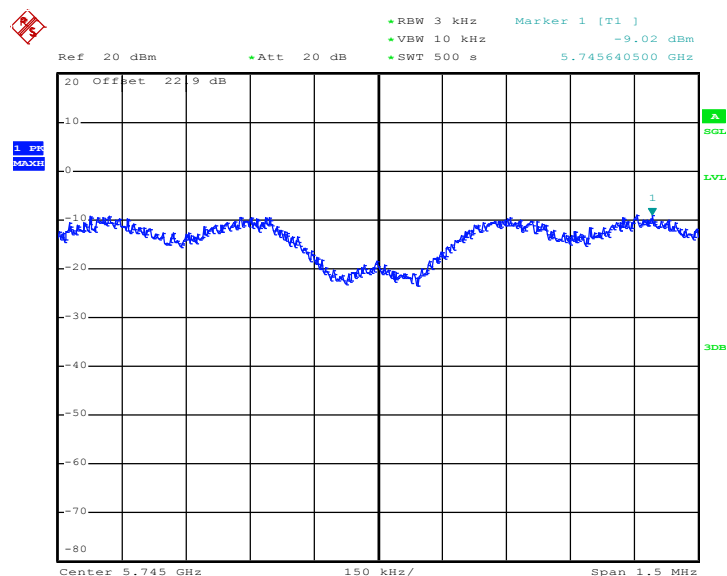


Mode 9 : PSD Plot on 802.11n Channel 11



Date: 12.OCT.2011 01:03:48

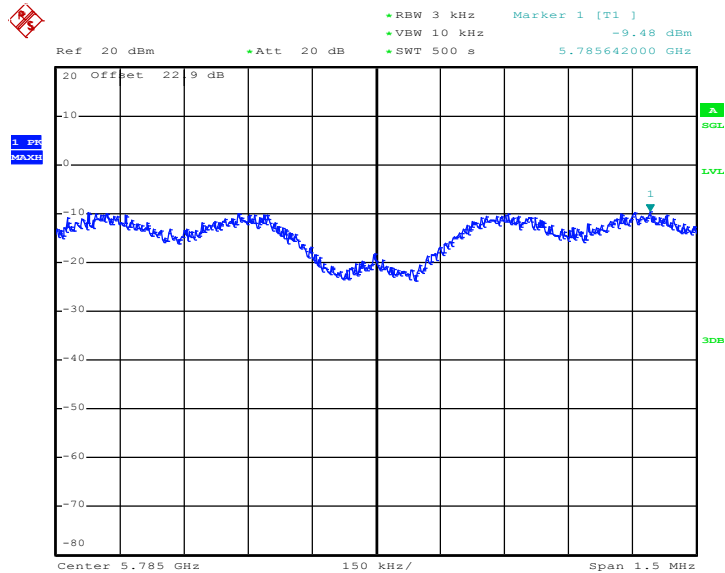
Mode 10 : PSD Plot on 802.11a Channel 149



Date: 13.OCT.2011 00:10:07

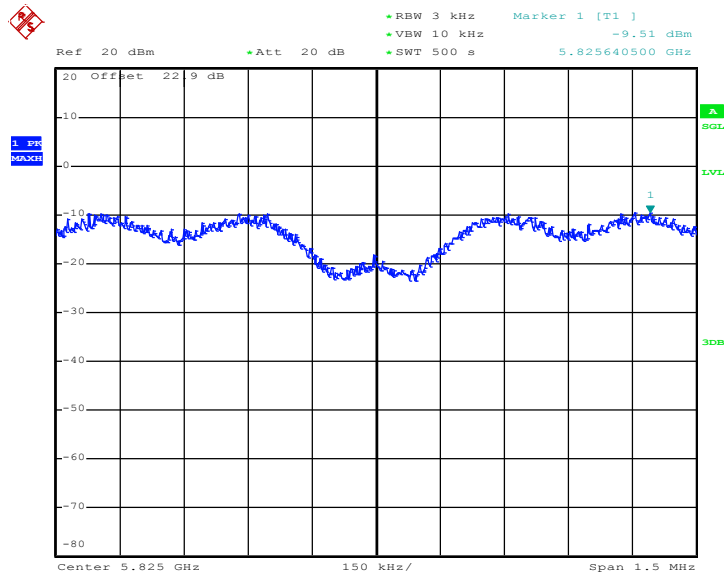


Mode 11 : PSD Plot on 802.11a Channel 157



Date: 13.OCT.2011 00:23:10

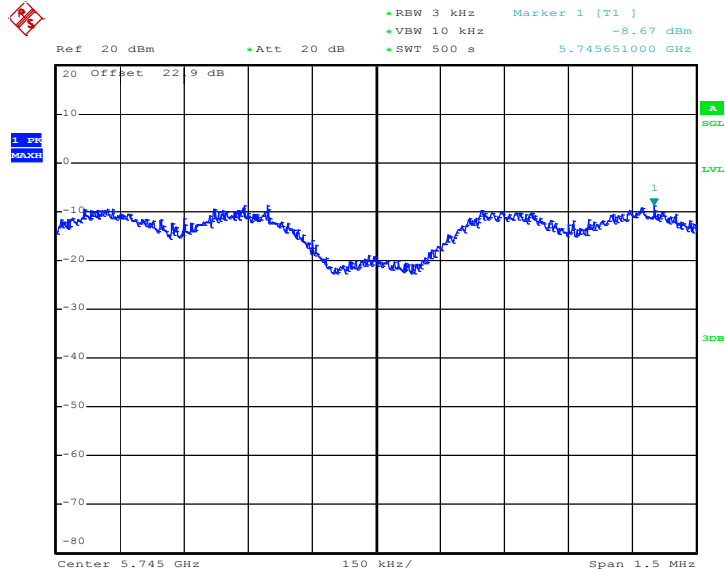
Mode 12: PSD Plot on 802.11a Channel 165



Date: 13.OCT.2011 00:35:42

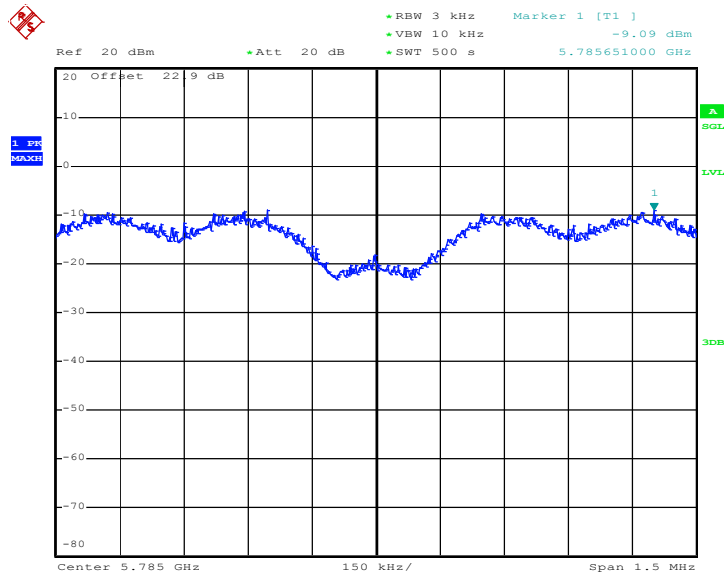


Mode 13: PSD Plot on 802.11n Channel 149



Date: 13.OCT.2011 00:53:28

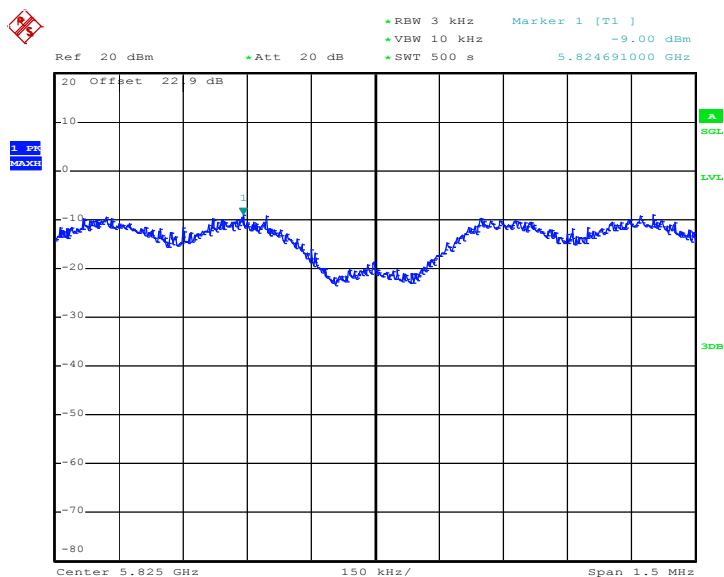
Mode 14: PSD Plot on 802.11n Channel 157



Date: 13.OCT.2011 01:15:00



Mode 15 : PSD Plot on 802.11n Channel 165



Date: 13.OCT.2011 01:45:16

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.

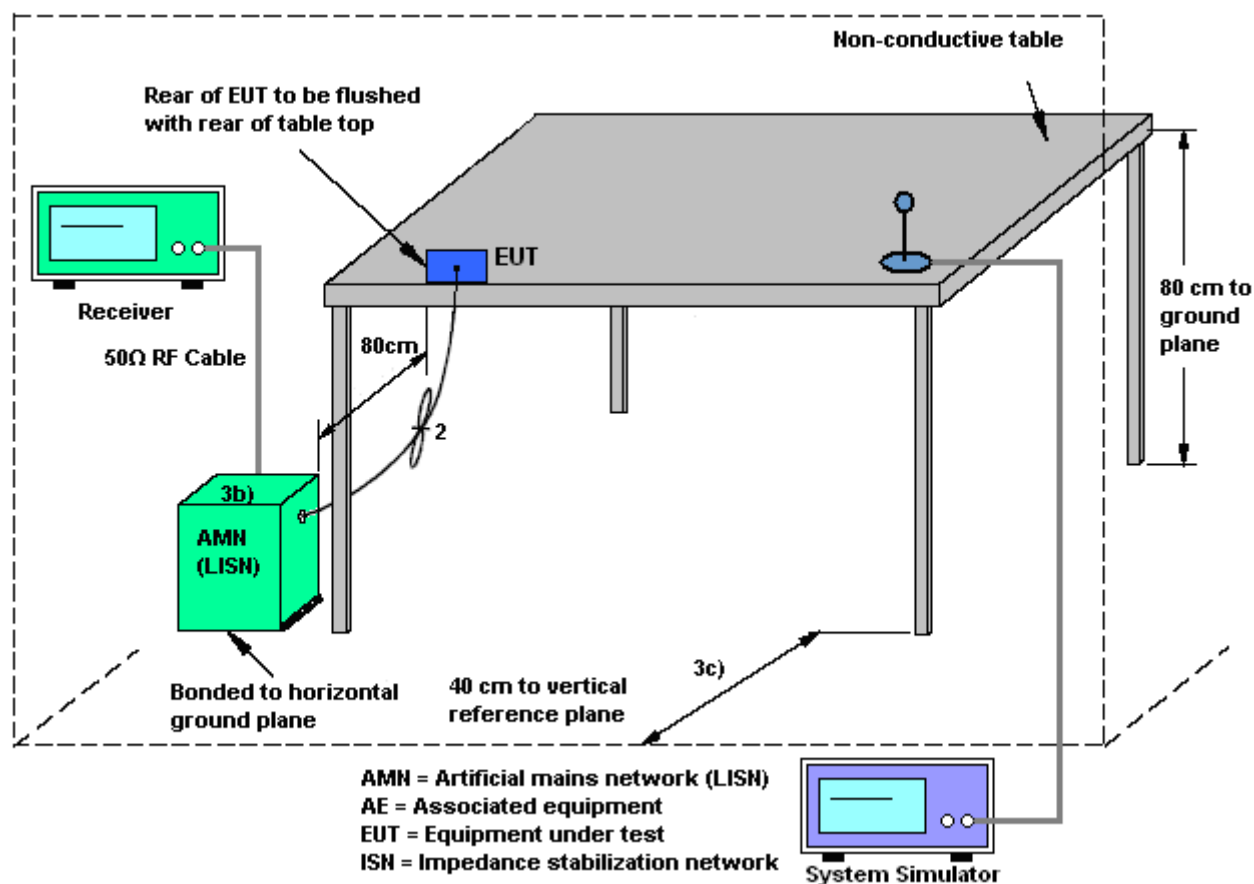
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

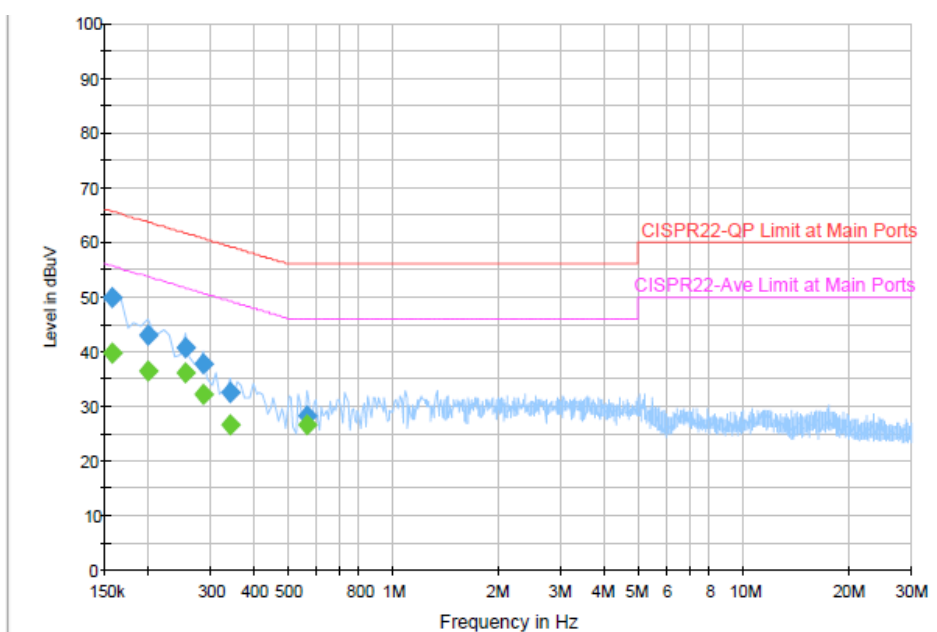
4. The testing follows the guidelines in ANSI C63.4-2003.
5. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
6. Connect EUT to the power mains through a line impedance stabilization network (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 2	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	36~38%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band IV Idle + Bluetooth Link + WLAN Link (5G) + GPS Rx + USB Charging Cable with AC Power + USB Cable (Data Link with Notebook) for Keypad 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



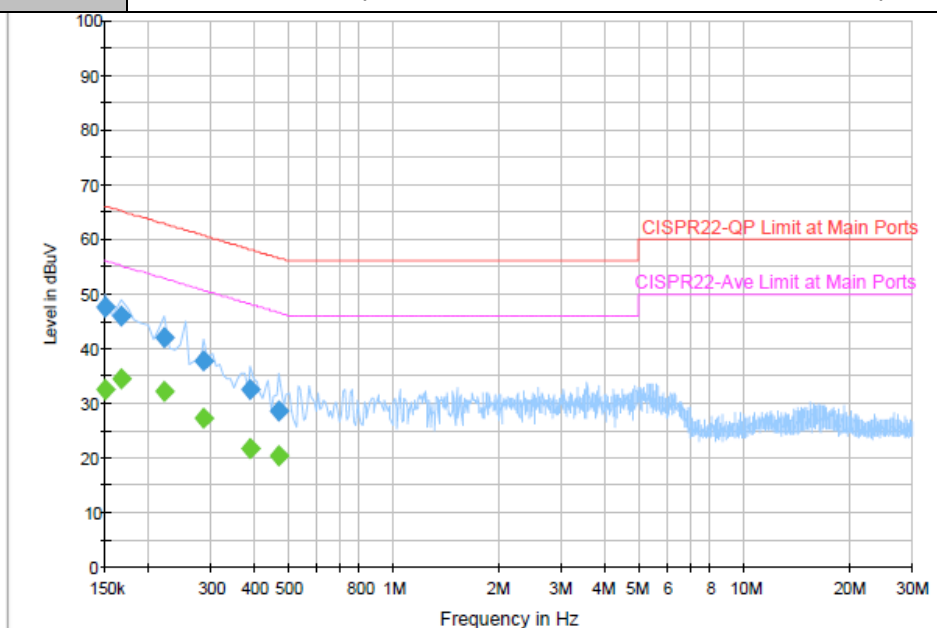
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	49.9	Off	L1	19.4	15.7	65.6
0.198000	43.0	Off	L1	19.4	20.7	63.7
0.254000	40.8	Off	L1	19.4	20.8	61.6
0.286000	37.7	Off	L1	19.4	22.9	60.6
0.342000	32.6	Off	L1	19.4	26.6	59.2
0.566000	28.4	Off	L1	19.4	27.6	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	39.6	Off	L1	19.4	16.0	55.6
0.198000	36.5	Off	L1	19.4	17.2	53.7
0.254000	35.9	Off	L1	19.4	15.7	51.6
0.286000	32.0	Off	L1	19.4	18.6	50.6
0.342000	26.6	Off	L1	19.4	22.6	49.2
0.566000	26.6	Off	L1	19.4	19.4	46.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	36~38%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band IV Idle + Bluetooth Link + WLAN Link (5G) + GPS Rx + USB Charging Cable with AC Power + USB Cable (Data Link with Notebook) for Keypad 2		
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)
0.150000	47.4	Off	N	19.4	18.6	66.0
0.166000	45.8	Off	N	19.4	19.4	65.2
0.222000	42.0	Off	N	19.4	20.7	62.7
0.286000	37.7	Off	N	19.4	22.9	60.6
0.390000	32.4	Off	N	19.4	25.7	58.1
0.470000	28.5	Off	N	19.4	28.0	56.5

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	32.5	Off	N	19.4	23.5	56.0
0.166000	34.3	Off	N	19.4	20.9	55.2
0.222000	32.1	Off	N	19.4	20.6	52.7
0.286000	27.1	Off	N	19.4	23.5	50.6
0.390000	21.6	Off	N	19.4	26.5	48.1
0.470000	20.4	Off	N	19.4	26.1	46.5

3.7 Radiated Emission Measurement

3.7.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.7.2 Measuring Instruments

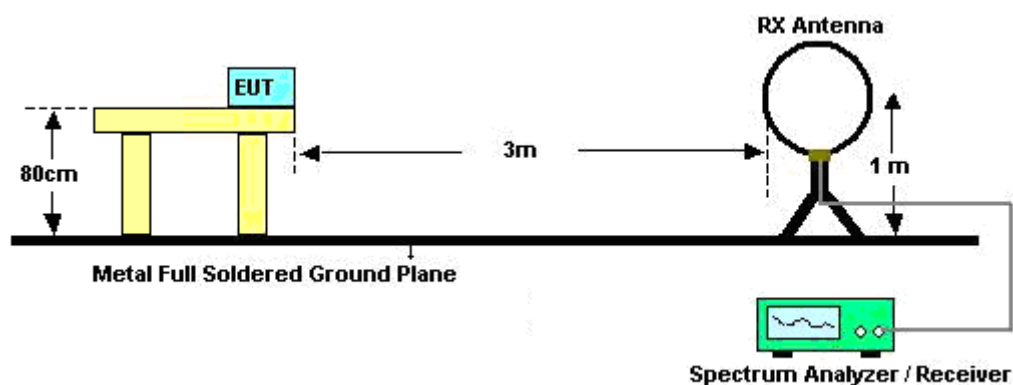
See list of measuring instruments of this test report.

3.7.3 Test Procedures

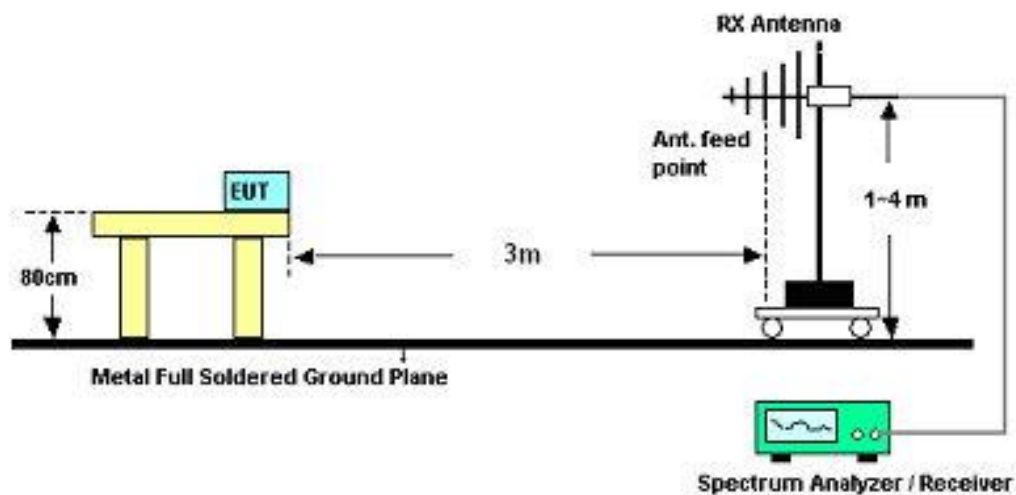
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep =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

3.7.4 Test Setup

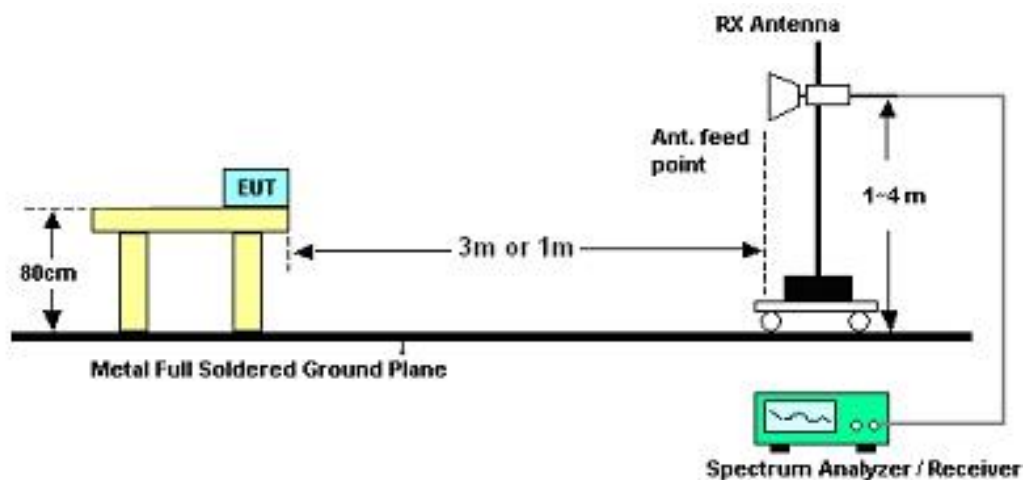
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

Test Engineer :	Chenmy Cheng	Temperature :	22~23°C	
		Relative Humidity :	46~47%	

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 (30MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
35.94	24.33	-15.67	40	39.53	14.65	0.23	30.08	-	-	Peak
126.12	19.51	-23.99	43.5	37.29	11.74	0.46	29.98	-	-	Peak
260.04	23.47	-22.53	46	40.5	12.15	0.68	29.86	-	-	Peak
356.7	30.22	-15.78	46	44.68	14.65	0.82	29.93	-	-	Peak
873.3	31.25	-14.75	46	39.06	20.48	1.29	29.58	100	0	Peak
949.6	38.05	-15.95	54	45.53	20.73	1.33	29.54	-	-	Peak
2385.81	52.13	-21.87	74	49.85	32.86	3.47	34.05	115	339	Peak
2385.81	45.31	-8.69	54	43.03	32.86	3.47	34.05	115	339	Average
2412	107.08	-	-	104.75	32.89	3.52	34.08	172	328	Peak
2412	108.47	-	-	106.14	32.89	3.52	34.08	172	328	Average
2492.78	59.35	-14.65	74	56.81	33.05	3.72	34.23	100	360	Peak
2492.78	38.2	-15.8	54	35.66	33.05	3.72	34.23	100	360	Average



Test Mode :	Mode 1	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	2412 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
32.16	26.61	-13.39	40	39.91	16.55	0.24	30.09	132	156	Peak
53.49	24.06	-15.94	40	47.1	6.8	0.29	30.13	-	-	Peak
126.12	23.33	-20.17	43.5	41.11	11.74	0.46	29.98	-	-	Peak
624.1	24.76	-21.24	46	34.58	18.73	1.08	29.63	-	-	Peak
873.3	32.01	-13.99	46	39.82	20.48	1.29	29.58	-	-	Peak
949.6	37.21	-16.79	54	44.69	20.73	1.33	29.54	-	-	Peak
2385.24	52.75	-21.25	74	50.51	32.83	3.42	34.01	100	339	Peak
2385.24	42.4	-11.6	54	40.16	32.83	3.42	34.01	100	339	Average
2412	105.74	-	-	103.41	32.89	3.52	34.08	102	35	Peak
2412	101.93	-	-	99.6	32.89	3.52	34.08	102	35	Average
2490.5	55.27	-18.73	74	52.73	33.05	3.72	34.23	108	21	Peak
2490.5	39.01	-14.99	54	36.47	33.05	3.72	34.23	108	21	Average

Test Mode :	Mode 2	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
32.16	23.7	-16.3	40	37	16.55	0.24	30.09	-	-	Peak
126.12	19.93	-23.57	43.5	37.71	11.74	0.46	29.98	-	-	Peak
260.04	23.27	-22.73	46	40.3	12.15	0.68	29.86	-	-	Peak
355.3	29.17	-16.83	46	43.68	14.6	0.82	29.93	-	-	Peak
873.3	31.62	-14.38	46	39.43	20.48	1.29	29.58	200	0	Peak
950.3	36.38	-17.62	54	43.86	20.73	1.33	29.54	-	-	Peak
2390	48.01	-25.99	74	45.73	32.86	3.47	34.05	100	0	Peak
2390	37.78	-16.22	54	35.5	32.86	3.47	34.05	100	0	Average
2437	108.82	-	-	106.42	32.95	3.6	34.15	102	322	Peak
2437	105.39	-	-	102.99	32.95	3.6	34.15	102	322	Average
2483.5	51	-23	74	48.51	33.01	3.68	34.2	100	0	Peak
2483.5	38.47	-15.53	54	35.98	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 2	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
52.95	23.59	-16.41	40	46.63	6.8	0.29	30.13	-	-	Peak
126.12	24.21	-19.29	43.5	41.99	11.74	0.46	29.98	-	-	Peak
162.03	23.16	-20.34	43.5	43.03	9.53	0.53	29.93	-	-	Peak
624.1	24.27	-21.73	46	34.09	18.73	1.08	29.63	-	-	Peak
872.6	32.85	-13.15	46	40.66	20.48	1.29	29.58	178	238	Peak
950.3	36.45	-17.55	54	43.93	20.73	1.33	29.54	-	-	Peak
2390	47.85	-26.15	74	45.57	32.86	3.47	34.05	100	0	Peak
2390	38.86	-15.14	54	36.58	32.86	3.47	34.05	100	0	Average
2437	106.37	-	-	103.97	32.95	3.6	34.15	174	17	Peak
2437	101.97	-	-	99.57	32.95	3.6	34.15	174	17	Average
2483.5	48.6	-25.4	74	46.11	33.01	3.68	34.2	100	0	Peak
2483.5	39.99	-14.01	54	37.5	33.01	3.68	34.2	100	0	Average



Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
32.43	25.82	-14.18	40	39.63	16.04	0.24	30.09	103	357	Peak
126.12	20.53	-22.97	43.5	38.31	11.74	0.46	29.98	-	-	Peak
260.04	23.2	-22.8	46	40.23	12.15	0.68	29.86	-	-	Peak
360.2	29.77	-16.23	46	44.15	14.72	0.82	29.92	-	-	Peak
872.6	31.47	-14.53	46	39.28	20.48	1.29	29.58	-	-	Peak
949.6	38.05	-15.95	54	45.53	20.73	1.33	29.54	-	-	Peak
2390	47.64	-26.36	74	45.36	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	110.27	-	-	107.82	32.98	3.64	34.17	122	304	Peak
2462	105.07	-	-	102.62	32.98	3.64	34.17	122	304	Average
2491.45	55.36	-18.64	74	52.82	33.05	3.72	34.23	131	304	Peak
2491.45	46.39	-7.61	54	43.85	33.05	3.72	34.23	131	304	Average

Test Mode :	Mode 3	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
32.43	24.43	-15.57	40	38.24	16.04	0.24	30.09	-	-	Peak
126.12	24.17	-19.33	43.5	41.95	11.74	0.46	29.98	-	-	Peak
162.03	21.93	-21.57	43.5	41.8	9.53	0.53	29.93	-	-	Peak
624.1	23.24	-22.76	46	33.06	18.73	1.08	29.63	-	-	Peak
873.3	31.14	-14.86	46	38.95	20.48	1.29	29.58	200	346	Peak
950.3	38.2	-15.8	54	45.68	20.73	1.33	29.54	-	-	Peak
2390	48.73	-25.27	74	46.45	32.86	3.47	34.05	100	0	Peak
2390	35.38	-18.62	54	33.1	32.86	3.47	34.05	100	0	Average
2462	106.98	-	-	104.53	32.98	3.64	34.17	177	16	Peak
2462	102.85	-	-	100.4	32.98	3.64	34.17	177	16	Average
2488.98	52.14	-21.86	74	49.6	33.05	3.72	34.23	200	342	Peak
2488.98	41.83	-12.17	54	39.29	33.05	3.72	34.23	200	342	Average

Test Mode :	Mode 4	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
30	19.67	-20.33	40	31.49	18	0.26	30.08	-	-	Peak
126.12	20.33	-23.17	43.5	38.11	11.74	0.46	29.98	-	-	Peak
260.04	22.39	-23.61	46	39.42	12.15	0.68	29.86	-	-	Peak
349	28.9	-17.1	46	43.54	14.48	0.82	29.94	-	-	Peak
873.3	30.16	-15.84	46	37.97	20.48	1.29	29.58	188	335	Peak
949.6	33.28	-20.72	54	40.76	20.73	1.33	29.54	-	-	Peak
2336.79	49.54	-24.46	74	47.37	32.78	3.33	33.94	100	103	Peak
2336.79	36.43	-17.57	54	34.26	32.78	3.33	33.94	100	103	Average
2412	98.1	-	-	95.77	32.89	3.52	34.08	178	245	Peak
2412	85.65	-	-	83.32	32.89	3.52	34.08	178	245	Average
2487.46	54.31	-19.69	74	51.82	33.01	3.68	34.2	100	228	Peak
2487.46	38.72	-15.28	54	36.23	33.01	3.68	34.2	100	228	Average



Test Mode :	Mode 4	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
53.49	23.86	-16.14	40	46.9	6.8	0.29	30.13	-	-	Peak
126.12	23.7	-19.8	43.5	41.48	11.74	0.46	29.98	-	-	Peak
162.03	23.74	-19.76	43.5	43.61	9.53	0.53	29.93	-	-	Peak
354.6	29.35	-16.65	46	43.86	14.6	0.82	29.93	-	-	Peak
872.6	29.89	-16.11	46	37.7	20.48	1.29	29.58	100	0	Peak
949.6	33.04	-20.96	54	40.52	20.73	1.33	29.54	-	-	Peak
2362.44	49.47	-24.53	74	47.26	32.81	3.38	33.98	100	102	Peak
2362.44	36.73	-17.27	54	34.52	32.81	3.38	33.98	100	102	Average
2412	100.48	-	-	98.15	32.89	3.52	34.08	100	55	Peak
2412	88.88	-	-	86.55	32.89	3.52	34.08	100	55	Average
2492.02	51.01	-22.99	74	48.47	33.05	3.72	34.23	100	126	Peak
2492.02	36.57	-17.43	54	34.03	33.05	3.72	34.23	100	126	Average



Test Mode :	Mode 5	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
30	21.75	-18.25	40	33.57	18	0.26	30.08	-	-	Peak
126.12	21.46	-22.04	43.5	39.24	11.74	0.46	29.98	-	-	Peak
240.06	22.47	-23.53	46	40.07	11.56	0.66	29.82	-	-	Peak
353.9	28.96	-17.04	46	43.49	14.58	0.82	29.93	103	346	Peak
873.3	28.65	-17.35	46	36.46	20.48	1.29	29.58	-	-	Peak
941.9	32.45	-21.55	54	39.95	20.7	1.33	29.53	-	-	Peak
2366.05	35.36	-18.64	54	33.15	32.81	3.38	33.98	122	47	Average
2366.05	46.72	-27.28	74	44.51	32.81	3.38	33.98	122	47	Peak
2437	102.21	-	-	99.81	32.95	3.6	34.15	130	37	Peak
2437	89.62	-	-	87.22	32.95	3.6	34.15	130	37	Average
2487.08	48.99	-25.01	74	46.5	33.01	3.68	34.2	103	344	Peak
2487.08	36.83	-17.17	54	34.34	33.01	3.68	34.2	103	344	Average



Test Mode :	Mode 5	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
54.03	20.41	-19.59	40	43.76	6.49	0.29	30.13	-	-	Peak
126.12	21.34	-22.16	43.5	39.12	11.74	0.46	29.98	-	-	Peak
162.03	18.76	-24.74	43.5	38.63	9.53	0.53	29.93	-	-	Peak
354.6	26.76	-19.24	46	41.27	14.6	0.82	29.93	-	-	Peak
872.6	28.63	-17.37	46	36.44	20.48	1.29	29.58	137	249	Peak
941.9	29.46	-24.54	54	36.96	20.7	1.33	29.53	-	-	Peak
2359.02	46.54	-27.46	74	44.33	32.81	3.38	33.98	125	298	Peak
2359.02	34.36	-19.64	54	32.15	32.81	3.38	33.98	125	298	Average
2437	102.38	-	-	99.98	32.95	3.6	34.15	133	236	Peak
2437	89.29	-	-	86.89	32.95	3.6	34.15	133	236	Average
2484.04	49.69	-24.31	74	47.2	33.01	3.68	34.2	102	334	Peak
2484.04	37.05	-16.95	54	34.56	33.01	3.68	34.2	102	334	Average



Test Mode :	Mode 6	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
32.16	25.91	-14.09	40	39.21	16.55	0.24	30.09	122	31	Peak
162.03	20	-23.5	43.5	39.87	9.53	0.53	29.93	-	-	Peak
260.04	22.1	-23.9	46	39.13	12.15	0.68	29.86	-	-	Peak
354.6	29.59	-16.41	46	44.1	14.6	0.82	29.93	-	-	Peak
872.6	30.61	-15.39	46	38.42	20.48	1.29	29.58	-	-	Peak
949.6	30.21	-23.79	54	37.69	20.73	1.33	29.54	-	-	Peak
2353.32	46.08	-27.92	74	43.87	32.81	3.38	33.98	120	0	Peak
2353.32	34.42	-19.58	54	32.21	32.81	3.38	33.98	120	0	Average
2462	100.53	-	-	98.08	32.98	3.64	34.17	102	341	Peak
2462	89.65	-	-	87.2	32.98	3.64	34.17	102	341	Average
2483.85	54.4	-19.6	74	51.91	33.01	3.68	34.2	132	355	Peak
2483.85	40.47	-13.53	54	37.98	33.01	3.68	34.2	132	355	Average

Test Mode :	Mode 6	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
54.03	23.76	-16.24	40	47.11	6.49	0.29	30.13	-	-	Peak
126.12	23.77	-19.73	43.5	41.55	11.74	0.46	29.98	-	-	Peak
162.03	22.64	-20.86	43.5	42.51	9.53	0.53	29.93	-	-	Peak
354.6	27.53	-18.47	46	42.04	14.6	0.82	29.93	-	-	Peak
873.3	30.1	-15.9	46	37.91	20.48	1.29	29.58	120	100	Peak
949.6	30.12	-23.88	54	37.6	20.73	1.33	29.54	-	-	Peak
2316.08	45.64	-28.36	74	43.55	32.73	3.22	33.86	188	3	Peak
2316.08	34.76	-19.24	54	32.67	32.73	3.22	33.86	188	3	Average
2462	100.13	-	-	97.68	32.98	3.64	34.17	177	48	Peak
2462	87.07	-	-	84.62	32.98	3.64	34.17	177	48	Average
2486.51	52.93	-21.07	74	50.44	33.01	3.68	34.2	200	331	Peak
2486.51	39.37	-14.63	54	36.88	33.01	3.68	34.2	200	331	Average

Test Mode :	Mode 7	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
31.08	19.4	-20.6	40	31.94	17.29	0.25	30.08	-	-	Peak
126.12	19.07	-24.43	43.5	36.85	11.74	0.46	29.98	-	-	Peak
260.04	21.87	-24.13	46	38.9	12.15	0.68	29.86	-	-	Peak
311.9	27.28	-18.72	46	43.19	13.3	0.74	29.95	-	-	Peak
350.4	30.52	-15.48	46	45.14	14.5	0.82	29.94	100	112	Peak
426	24.6	-21.4	46	37.38	16.16	0.87	29.81	-	-	Peak
2387.33	47.5	-26.5	74	45.22	32.86	3.47	34.05	112	301	Peak
2387.33	36.59	-17.41	54	34.31	32.86	3.47	34.05	112	301	Average
2412	97.28	-	-	94.95	32.89	3.52	34.08	108	334	Peak
2412	86.21	-	-	83.88	32.89	3.52	34.08	108	334	Average
2492.97	51.55	-22.45	74	49.01	33.05	3.72	34.23	100	360	Peak
2492.97	41.25	-12.75	54	38.71	33.05	3.72	34.23	100	360	Average



Test Mode :	Mode 7	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
53.49	23.68	-16.32	40	46.72	6.8	0.29	30.13	100	23	Peak
126.12	21.83	-21.67	43.5	39.61	11.74	0.46	29.98	-	-	Peak
240.06	23.79	-22.21	46	41.39	11.56	0.66	29.82	-	-	Peak
350.4	23.47	-22.53	46	38.09	14.5	0.82	29.94	-	-	Peak
580	22.44	-23.56	46	32.48	18.56	1.04	29.64	-	-	Peak
936.3	26.56	-19.44	46	34.1	20.67	1.32	29.53	-	-	Peak
2389.61	49.29	-24.71	74	47.01	32.86	3.47	34.05	110	102	Peak
2389.61	37.74	-16.26	54	35.46	32.86	3.47	34.05	110	102	Average
2412	96.94	-	-	94.61	32.89	3.52	34.08	103	36	Peak
2412	86.35	-	-	84.02	32.89	3.52	34.08	103	36	Average
2498.29	53.34	-20.66	74	50.8	33.05	3.72	34.23	112	23	Peak
2498.29	39.95	-14.05	54	37.41	33.05	3.72	34.23	112	23	Average

Test Mode :	Mode 8	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
30.54	20.04	-19.96	40	32.58	17.29	0.25	30.08	-	-	Peak
180.12	21.18	-22.32	43.5	42.1	8.4	0.56	29.88	-	-	Peak
240.06	22.65	-23.35	46	40.25	11.56	0.66	29.82	-	-	Peak
311.9	27.76	-18.24	46	43.67	13.3	0.74	29.95	-	-	Peak
363.7	30.28	-15.72	46	44.55	14.83	0.82	29.92	100	223	Peak
949.6	27.51	-26.49	54	34.99	20.73	1.33	29.54	-	-	Peak
2386.19	46.12	-27.88	74	43.84	32.86	3.47	34.05	132	155	Peak
2386.19	34.72	-19.28	54	32.44	32.86	3.47	34.05	132	155	Average
2437	101.92	-	-	99.52	32.95	3.6	34.15	105	323	Peak
2437	90.53	-	-	88.13	32.95	3.6	34.15	105	323	Average
2484.42	50.07	-23.93	74	47.58	33.01	3.68	34.2	200	0	Peak
2484.42	38.16	-15.84	54	35.67	33.01	3.68	34.2	200	0	Average

Test Mode :	Mode 8	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
53.49	23.01	-16.99	40	46.05	6.8	0.29	30.13	100	28	Peak
126.12	21.67	-21.83	43.5	39.45	11.74	0.46	29.98	-	-	Peak
240.06	23.65	-22.35	46	41.25	11.56	0.66	29.82	-	-	Peak
355.3	23.86	-22.14	46	38.37	14.6	0.82	29.93	-	-	Peak
675.9	22.96	-23.04	46	32.43	19.11	1.11	29.69	-	-	Peak
949.6	27.15	-26.85	54	34.63	20.73	1.33	29.54	-	-	Peak
2351.23	48.05	-25.95	74	45.88	32.78	3.33	33.94	109	67	Peak
2351.23	35.66	-18.34	54	33.49	32.78	3.33	33.94	109	67	Average
2437	101.7	-	-	99.3	32.95	3.6	34.15	102	119	Peak
2437	87.75	-	-	85.35	32.95	3.6	34.15	102	119	Average
2485.18	52.49	-21.51	74	50	33.01	3.68	34.2	123	241	Peak
2485.18	39.77	-14.23	54	37.28	33.01	3.68	34.2	123	241	Average

Test Mode :	Mode 9	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
31.35	20.3	-19.7	40	32.84	17.29	0.25	30.08	-	-	Peak
180.12	22.35	-21.15	43.5	43.27	8.4	0.56	29.88	-	-	Peak
240.06	22.22	-23.78	46	39.82	11.56	0.66	29.82	-	-	Peak
311.9	27.48	-18.52	46	43.39	13.3	0.74	29.95	-	-	Peak
351.1	28.41	-17.59	46	43.01	14.52	0.82	29.94	200	302	Peak
950.3	25.85	-28.15	54	33.33	20.73	1.33	29.54	-	-	Peak
2311.71	45.79	-28.21	74	43.7	32.73	3.22	33.86	156	360	Peak
2311.71	33.96	-20.04	54	31.87	32.73	3.22	33.86	156	360	Average
2462	98.76	-	-	96.31	32.98	3.64	34.17	105	339	Peak
2462	90.49	-	-	88.04	32.98	3.64	34.17	105	339	Average
2483.66	53.66	-20.34	74	51.17	33.01	3.68	34.2	120	100	Peak
2483.66	39.95	-14.05	54	37.46	33.01	3.68	34.2	120	100	Average

Test Mode :	Mode 9	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
53.22	24.02	-15.98	40	47.06	6.8	0.29	30.13	100	218	Peak
126.12	20.17	-23.33	43.5	37.95	11.74	0.46	29.98	-	-	Peak
240.06	21.99	-24.01	46	39.59	11.56	0.66	29.82	-	-	Peak
350.4	26.11	-19.89	46	40.73	14.5	0.82	29.94	-	-	Peak
519.8	22.95	-23.05	46	34.02	17.67	0.97	29.71	-	-	Peak
950.3	26.5	-27.5	54	33.98	20.73	1.33	29.54	-	-	Peak
2334.89	46.42	-27.58	74	44.25	32.78	3.33	33.94	194	346	Peak
2334.89	34.33	-19.67	54	32.16	32.78	3.33	33.94	194	346	Average
2462	100.08	-	-	97.63	32.98	3.64	34.17	177	48	Peak
2462	87.01	-	-	84.56	32.98	3.64	34.17	177	48	Average
2483.66	54.29	-19.71	74	51.8	33.01	3.68	34.2	200	360	Peak
2483.66	40.61	-13.39	54	38.12	33.01	3.68	34.2	200	360	Average

Test Mode :	Mode 10	Temperature :	22~23°C
Test Channel :	149	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.35	19.65	-20.35	40	32.19	17.29	0.25	30.08	-	-	Peak
180.12	20.29	-23.21	43.5	41.21	8.4	0.56	29.88	-	-	Peak
240.06	21.96	-24.04	46	39.56	11.56	0.66	29.82	-	-	Peak
311.9	26.41	-19.59	46	42.32	13.3	0.74	29.95	-	-	Peak
368.6	30.19	-15.81	46	44.28	14.98	0.83	29.9	100	220	Peak
949.6	25.88	-28.12	54	33.36	20.73	1.33	29.54	-	-	Peak
5725	66.99	-16.86	83.85	59.47	35.52	5.55	33.55	100	102	Peak
5745	103.85	-	-	96.35	35.52	5.56	33.58	154	353	Peak
5745	95.74	-	-	88.24	35.52	5.56	33.58	154	353	Average
5850	50.13	-33.72	83.85	42.7	35.56	5.64	33.77	100	223	Peak

Test Mode :	Mode 10	Temperature :	22~23°C
Test Channel :	149	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
32.97	21.94	-18.06	40	35.75	16.04	0.24	30.09	-	-	Peak
53.22	23.83	-16.17	40	46.87	6.8	0.29	30.13	100	126	Peak
126.12	22.05	-21.45	43.5	39.83	11.74	0.46	29.98	-	-	Peak
356	21.88	-24.12	46	36.36	14.63	0.82	29.93	-	-	Peak
580.7	22.81	-23.19	46	32.83	18.57	1.05	29.64	-	-	Peak
949.6	26.34	-27.66	54	33.82	20.73	1.33	29.54	-	-	Peak
5725	63.35	-16.9	80.25	55.83	35.52	5.55	33.55	125	220	Peak
5745	92.52	-	-	85.02	35.52	5.56	33.58	109	355	Average
5745	100.25	-	-	92.75	35.52	5.56	33.58	109	355	Peak
5850	50.26	-29.99	80.25	42.83	35.56	5.64	33.77	182	228	Peak

Test Mode :	Mode 11	Temperature :	22~23°C
Test Channel :	157	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	1. 5785 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.27	20.54	-19.46	40	32.36	18	0.26	30.08	-	-	Peak
180.12	21.67	-21.83	43.5	42.59	8.4	0.56	29.88	-	-	Peak
240.06	24.36	-21.64	46	41.96	11.56	0.66	29.82	-	-	Peak
311.9	28.35	-17.65	46	44.26	13.3	0.74	29.95	-	-	Peak
364.4	29.19	-16.81	46	43.42	14.86	0.82	29.91	100	328	Peak
936.3	26.41	-19.59	46	33.95	20.67	1.32	29.53	-	-	Peak
5725	52.03	-35.75	87.78	44.51	35.52	5.55	33.55	108	229	Peak
5785	107.78	-	-	100.3	35.53	5.59	33.64	102	351	Peak
5785	97.86	-	-	90.38	35.53	5.59	33.64	102	351	Average
5850	50.98	-36.8	87.78	43.55	35.56	5.64	33.77	103	228	Peak

Test Mode :	Mode 11	Temperature :	22~23°C
Test Channel :	157	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	1. 5785 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
53.22	24.52	-15.48	40	47.56	6.8	0.29	30.13	128	210	Peak
126.12	21.03	-22.47	43.5	38.81	11.74	0.46	29.98	-	-	Peak
240.06	22.37	-23.63	46	39.97	11.56	0.66	29.82	-	-	Peak
355.3	25.64	-20.36	46	40.15	14.6	0.82	29.93	-	-	Peak
871.2	25.02	-20.98	46	32.83	20.49	1.29	29.59	-	-	Peak
942.6	27.34	-26.66	54	34.84	20.7	1.33	29.53	-	-	Peak
5725	50.48	-30.46	80.94	42.96	35.52	5.55	33.55	100	12	Peak
5785	92.29	-	-	84.81	35.53	5.59	33.64	123	330	Average
5785	100.94	-	-	93.46	35.53	5.59	33.64	123	330	Peak
5850	50	-30.94	80.94	42.57	35.56	5.64	33.77	100	24	Peak

Test Mode :	Mode 12	Temperature :	22~23°C
Test Channel :	165	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	1. 5825 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
126.12	21.31	-22.19	43.5	39.09	11.74	0.46	29.98	-	-	Peak
180.12	24.75	-18.75	43.5	45.67	8.4	0.56	29.88	100	352	Peak
240.06	24.18	-21.82	46	41.78	11.56	0.66	29.82	-	-	Peak
311.9	25.07	-20.93	46	40.98	13.3	0.74	29.95	-	-	Peak
359.5	24.69	-21.31	46	39.07	14.72	0.82	29.92	-	-	Peak
943.3	26.04	-27.96	54	33.53	20.71	1.33	29.53	-	-	Peak
5725	51.96	-34.6	86.56	44.44	35.52	5.55	33.55	100	182	Peak
5825	106.56	-	-	99.12	35.55	5.63	33.74	100	335	Peak
5825	97.59	-	-	90.15	35.55	5.63	33.74	100	335	Average
5850	60.44	-26.12	86.56	53.01	35.56	5.64	33.77	100	129	Peak

Test Mode :	Mode 12	Temperature :	22~23°C
Test Channel :	165	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	1. 5825 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
52.95	23.42	-16.58	40	46.46	6.8	0.29	30.13	100	268	Peak
126.12	20.98	-22.52	43.5	38.76	11.74	0.46	29.98	-	-	Peak
180.12	19.82	-23.68	43.5	40.74	8.4	0.56	29.88	-	-	Peak
351.8	28.12	-17.88	46	42.7	14.54	0.82	29.94	-	-	Peak
871.9	26.01	-19.99	46	33.82	20.49	1.29	29.59	-	-	Peak
942.6	26.02	-27.98	54	33.52	20.7	1.33	29.53	-	-	Peak
5725	51.28	-29.1	80.38	43.76	35.52	5.55	33.55	117	263	Peak
5825	90.07	-	-	82.63	35.55	5.63	33.74	110	356	Average
5825	100.38	-	-	92.94	35.55	5.63	33.74	110	356	Peak
5850	54.95	-25.43	80.38	47.52	35.56	5.64	33.77	163	291	Peak

Test Mode :	Mode 13	Temperature :	22~23°C
Test Channel :	149	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
180.12	20.34	-23.16	43.5	41.26	8.4	0.56	29.88	-	-	Peak
240.06	20.49	-25.51	46	38.09	11.56	0.66	29.82	-	-	Peak
260.04	21.51	-24.49	46	38.54	12.15	0.68	29.86	-	-	Peak
311.9	27.09	-18.91	46	43	13.3	0.74	29.95	-	-	Peak
360.9	30.22	-15.78	46	44.57	14.75	0.82	29.92	156	225	Peak
936.3	27.68	-18.32	46	35.22	20.67	1.32	29.53	-	-	Peak
5725	68.89	-18.36	87.25	61.37	35.52	5.55	33.55	200	308	Peak
5745	97.23	-	-	89.73	35.52	5.56	33.58	102	330	Average
5745	107.25	-	-	99.75	35.52	5.56	33.58	102	330	Peak
5850	50.28	-36.97	87.25	42.85	35.56	5.64	33.77	152	331	Peak

Test Mode :	Mode 13	Temperature :	22~23°C
Test Channel :	149	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
52.95	24.19	-15.81	40	47.23	6.8	0.29	30.13	112	36	Peak
162.03	21.46	-22.04	43.5	41.33	9.53	0.53	29.93	-	-	Peak
240.06	22.12	-23.88	46	39.72	11.56	0.66	29.82	-	-	Peak
356	24.14	-21.86	46	38.62	14.63	0.82	29.93	-	-	Peak
573	22.75	-23.25	46	32.83	18.54	1.03	29.65	-	-	Peak
936.3	27.38	-18.62	46	34.92	20.67	1.32	29.53	-	-	Peak
5725	65.29	-15.24	80.53	57.77	35.52	5.55	33.55	100	90	Peak
5745	91.52	-	-	84.02	35.52	5.56	33.58	109	353	Average
5745	100.53	-	-	93.03	35.52	5.56	33.58	109	353	Peak
5850	50.98	-29.55	80.53	43.55	35.56	5.64	33.77	100	28	Peak

Test Mode :	Mode 14	Temperature :	22~23°C
Test Channel :	157	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	1. 5785 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
126.12	20.45	-23.05	43.5	38.23	11.74	0.46	29.98	-	-	Peak
180.12	20.79	-22.71	43.5	41.71	8.4	0.56	29.88	-	-	Peak
240.06	22.91	-23.09	46	40.51	11.56	0.66	29.82	-	-	Peak
311.9	27.58	-18.42	46	43.49	13.3	0.74	29.95	-	-	Peak
363.7	28.43	-17.57	46	42.7	14.83	0.82	29.92	200	206	Peak
936.3	27.86	-18.14	46	35.4	20.67	1.32	29.53	-	-	Peak
5725	53.59	-33.69	87.28	46.07	35.52	5.55	33.55	100	178	Peak
5785	98.24	-	-	90.76	35.53	5.59	33.64	147	349	Average
5785	107.28	-	-	99.8	35.53	5.59	33.64	147	349	Peak
5850	52.99	-34.29	87.28	45.56	35.56	5.64	33.77	200	289	Peak

Test Mode :	Mode 14	Temperature :	22~23°C
Test Channel :	157	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	1. 5785 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
53.49	24.28	-15.72	40	47.32	6.8	0.29	30.13	116	23	Peak
126.12	21.27	-22.23	43.5	39.05	11.74	0.46	29.98	-	-	Peak
240.06	23.42	-22.58	46	41.02	11.56	0.66	29.82	-	-	Peak
493.9	23.16	-22.84	46	34.84	17.11	0.95	29.74	-	-	Peak
871.2	24.3	-21.7	46	32.11	20.49	1.29	29.59	-	-	Peak
936.3	27.78	-18.22	46	35.32	20.67	1.32	29.53	-	-	Peak
5725	51.11	-29.9	81.01	43.59	35.52	5.55	33.55	100	178	Peak
5785	101.01	-	-	93.53	35.53	5.59	33.64	103	335	Peak
5785	91.14	-	-	83.66	35.53	5.59	33.64	103	335	Average
5850	50.57	-30.44	81.01	43.14	35.56	5.64	33.77	100	203	Peak

Test Mode :	Mode 15	Temperature :	22~23°C
Test Channel :	165	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Horizontal
Remark :	1. 5825 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
126.12	20.11	-23.39	43.5	37.89	11.74	0.46	29.98	-	-	Peak
180.12	23.19	-20.31	43.5	44.11	8.4	0.56	29.88	-	-	Peak
240.06	23.38	-22.62	46	40.98	11.56	0.66	29.82	-	-	Peak
351.8	29.23	-16.77	46	43.81	14.54	0.82	29.94	100	23	Peak
871.2	25.31	-20.69	46	33.12	20.49	1.29	29.59	-	-	Peak
949.6	27.62	-26.38	54	35.1	20.73	1.33	29.54	-	-	Peak
5725	51.14	-34.29	85.43	43.62	35.52	5.55	33.55	100	201	Peak
5825	105.43	-	-	97.99	35.55	5.63	33.74	101	335	Peak
5825	96.51	-	-	89.07	35.55	5.63	33.74	101	335	Average
5850	63.81	-21.62	85.43	56.38	35.56	5.64	33.77	100	100	Peak

Test Mode :	Mode 15	Temperature :	22~23°C
Test Channel :	165	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	Polarization :	Vertical
Remark :	1. 5825 MHz is Fundamental Signals which can be ignored. 2. 5725 MHz and 5850 MHz are not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
53.22	23.77	-16.23	40	46.81	6.8	0.29	30.13	100	223	Peak
126.12	21.06	-22.44	43.5	38.84	11.74	0.46	29.98	-	-	Peak
240.06	21.71	-24.29	46	39.31	11.56	0.66	29.82	-	-	Peak
355.3	27.83	-18.17	46	42.34	14.6	0.82	29.93	-	-	Peak
573.7	22.05	-23.95	46	32.12	18.55	1.03	29.65	-	-	Peak
949.6	27.3	-26.7	54	34.78	20.73	1.33	29.54	-	-	Peak
5725	50.73	-29.82	80.55	43.21	35.52	5.55	33.55	100	28	Peak
5825	100.55	-	-	93.11	35.55	5.63	33.74	152	354	Peak
5825	90.96	-	-	83.52	35.55	5.63	33.74	152	354	Average
5850	57.18	-23.37	80.55	49.75	35.56	5.64	33.77	100	30	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	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Jun. 12, 2012	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 18, 2011	Sep. 17, 2012	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 18, 2011	Sep. 17, 2012	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB41292344	N/A	Feb. 18, 2011	Feb. 17, 2012	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	N/A	Feb. 18, 2011	Feb. 17, 2012	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Aug. 21, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz – 30MHz	Dec. 03, 2010	Dec. 02, 2011	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz – 30MHz	Dec. 01, 2010	Nov. 30, 2011	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	112403	N/A	Feb. 22, 2011	Feb. 21, 2012	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 16, 2010	Nov. 15, 2011	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101400	9kHz~30GHz	Jun. 02, 2011	Jun. 01, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2010	Dec. 06, 2011	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060029	9KHz~2GHz	Jan. 10, 2011	Jan. 09, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Jan. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1G-18GHz	Nov. 09, 2010	Nov. 08, 2011	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15-40GHz	Oct. 11, 2011	Oct. 10, 2012	Radiation (03CH01-KS)

5 Uncertainty of Evaluation

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

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 (30MHz ~ 1000MHz)

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 (1GHz ~ 40GHz)

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 EP162005 as below.