

FCC RF Test Report

APPLICANT : Honeywell International Inc
EQUIPMENT : Dolphin 7800
BRAND NAME : Honeywell
MODEL NAME : Dolphin® 7800
FCC ID : HD57800L0
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. 20, 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
FR162005-02B	Rev. 01	Initial issue of report	Nov. 28, 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 13.2 dB at 0.17 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 7.35 dB at 5725 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	HD57800L0
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 2.4 dBi 802.11a/n : PIFA Antenna with gain 2.8 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	03CH07HY	722060/4086B-1

1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- 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.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Notebook	DELL	P20G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
6.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
7.	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	22.3	22.21	22.2	22.3	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. 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, laptop / tablet modes.

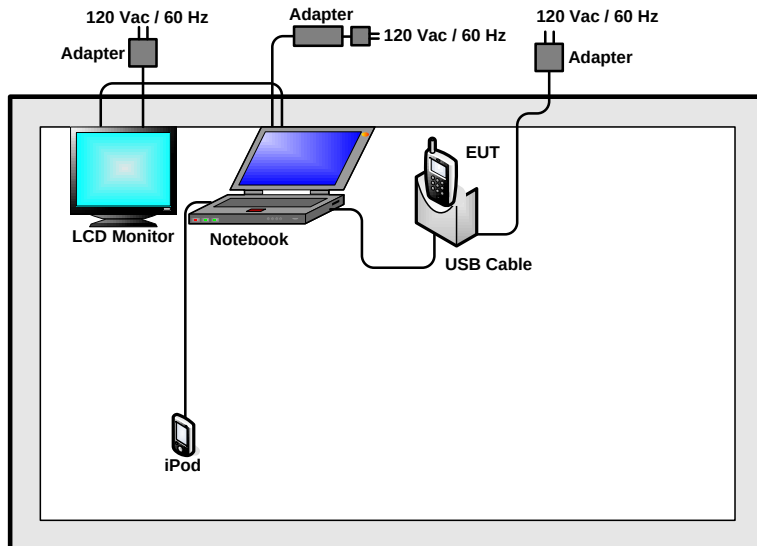
The following table is showing the total pre-scanned test modes, and the worst cases (E2plane) are recorded in this report only.

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)

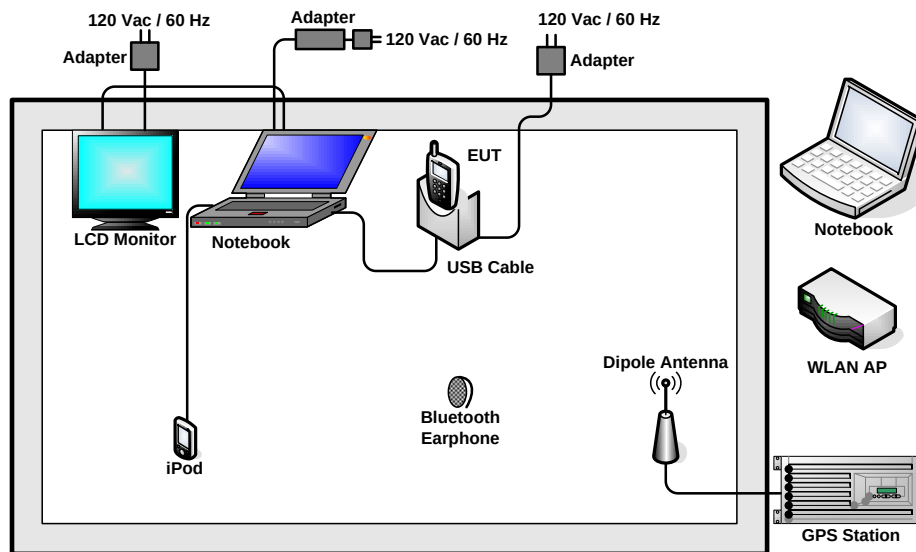
Test Cases		
Radiated TCs	Mode 1: 802.11b_CH01_2412 MHz with Keypad 1 and Battery 1	Mode 10: 802.11a_CH149_5745 MHz with Keypad 1 and Battery 1
	Mode 2: 802.11b_CH06_2437 MHz with Keypad 1 and Battery 1	Mode 11: 802.11a_CH157_5785 MHz with Keypad 1 and Battery 1
	Mode 3: 802.11b_CH11_2462 MHz with Keypad 1 and Battery 1	Mode 12: 802.11a_CH165_5825 MHz with Keypad 1 and Battery 1
	Mode 4: 802.11g_CH01_2412 MHz with Keypad 1 and Battery 1	Mode 13: 802.11a_CH149_5745 MHz with Keypad 2 and Battery 2
	Mode 5: 802.11g_CH06_2437 MHz with Keypad 1 and Battery 1	Mode 14: 802.11n_CH149_5745 MHz (BW 20M) with Keypad 1 and Battery 1
	Mode 6: 802.11g_CH11_2462 MHz with Keypad 1 and Battery 1	Mode 15: 802.11n_CH157_5785 MHz (BW 20M) with Keypad 1 and Battery 1
	Mode 7: 802.11n_CH01_2412 MHz (BW 20M) with Keypad 1 and Battery 1	Mode 16: 802.11n_CH165_5825 MHz (BW 20M) with Keypad 1 and Battery 1
	Mode 8: 802.11n_CH06_2437 MHz (BW 20M) with Keypad 1 and Battery 1	
	Mode 9: 802.11n_CH11_2462 MHz (BW 20M) with Keypad 1 and Battery 1	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN Link (2.4G) + GPS Rx + USB Charging Cable with AC Power + USB Cable (Data Link with Notebook) + Battery 1 for Keypad 1	
	Mode 2 : Bluetooth Link + WLAN Link (5G) + GPS Rx + USB Charging Cable with AC Power + USB Cable (Data Link with Notebook) + Battery 2 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.		

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 RF Utility

The programmed RF utility "TI1273 WLAN FCC", 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.

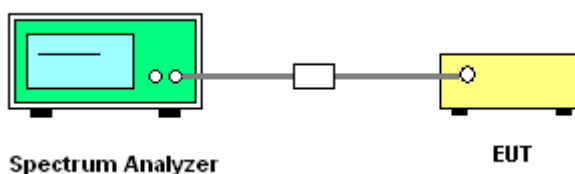
3.1.2 Measuring Instruments

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℃
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℃
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℃
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℃
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℃
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℃
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℃
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℃
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



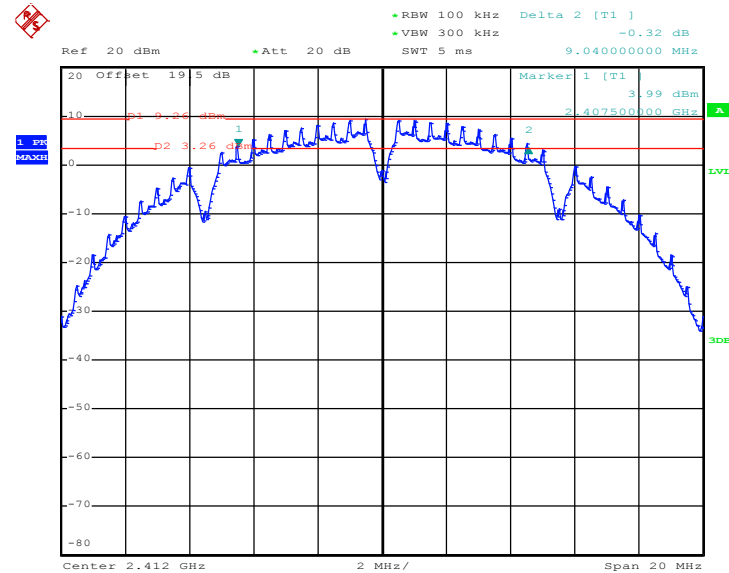
Test Mode :	Mode 13, 14, 15	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

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



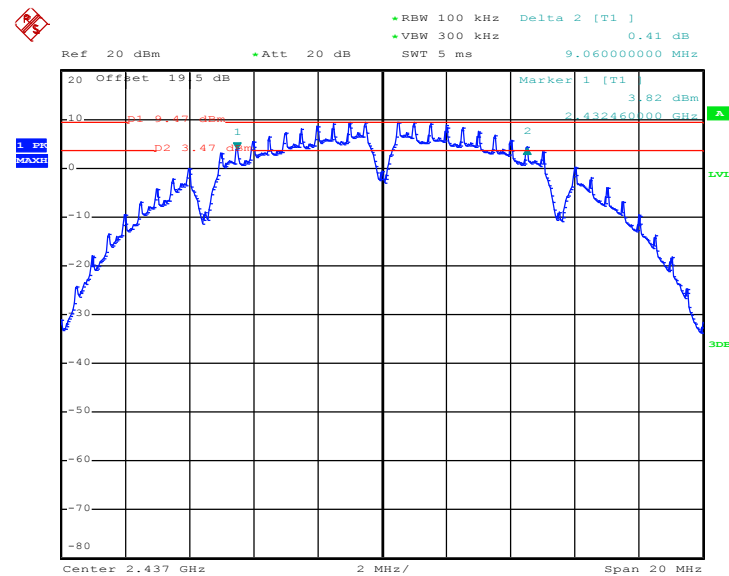
3.1.7 Test Result of 6dB Bandwidth Plots

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

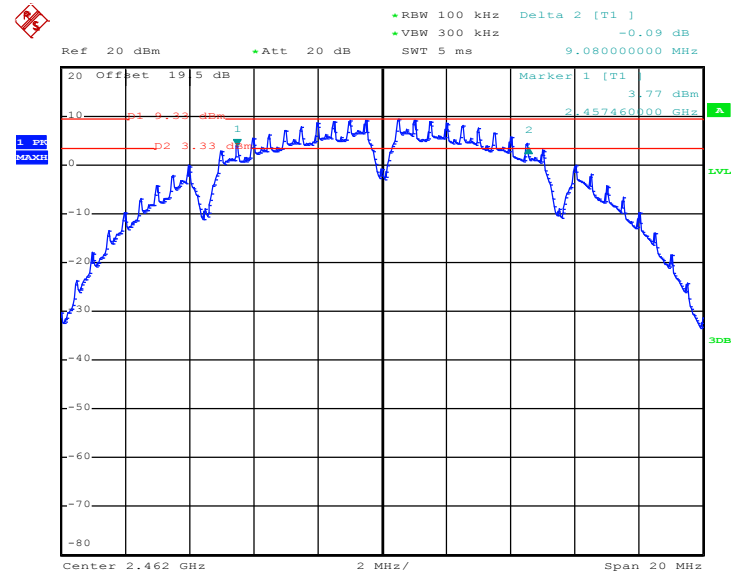


Date: 12.OCT.2011 01:10:02

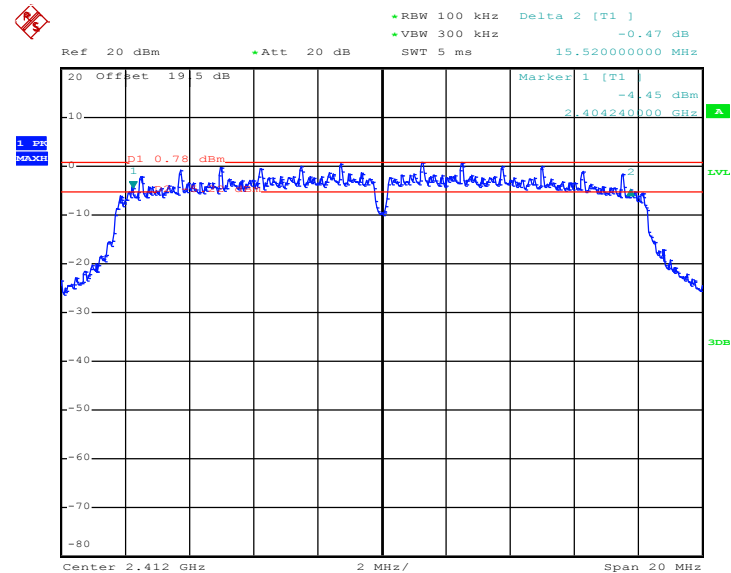
Mode 2 : 6 dB Bandwidth Plot on 802.11b Channel 06



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

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


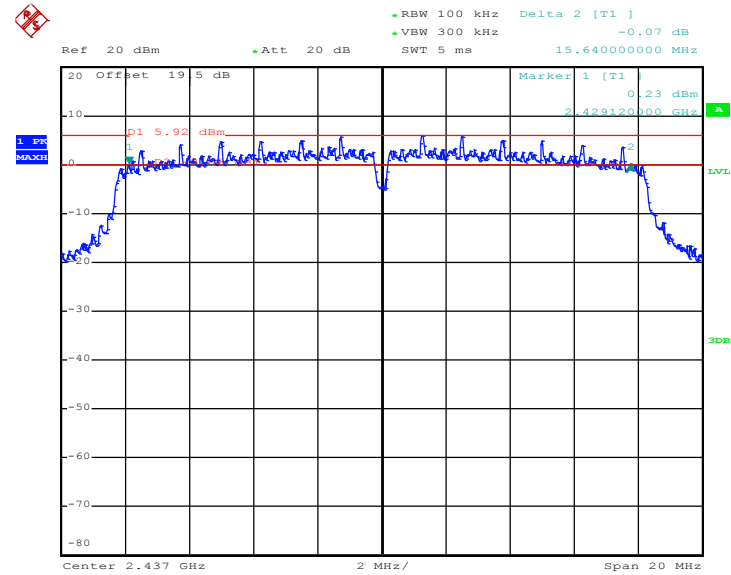
Date: 11.OCT.2011 23:30:06

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


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

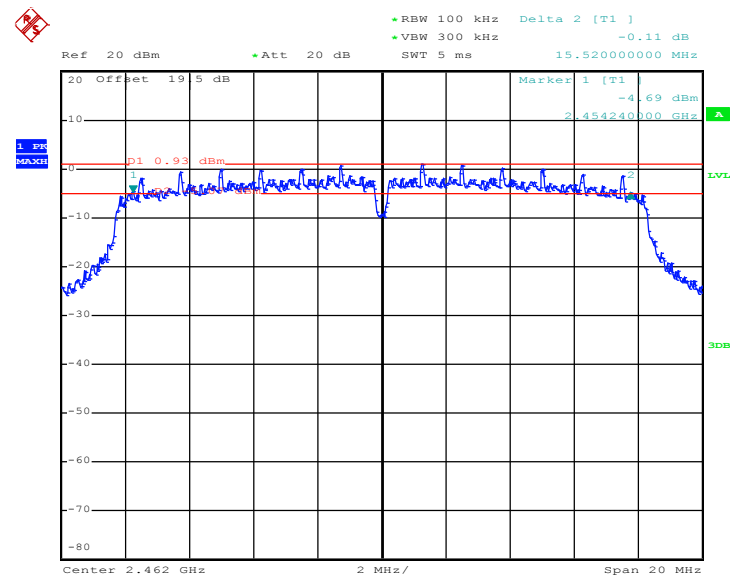


Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



Date: 11.OCT.2011 23:59:38

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



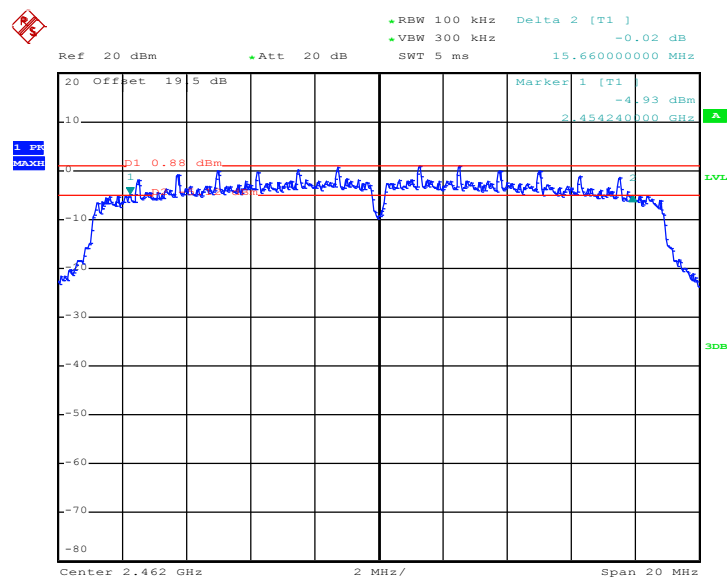
Date: 12.OCT.2011 00:12:27



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

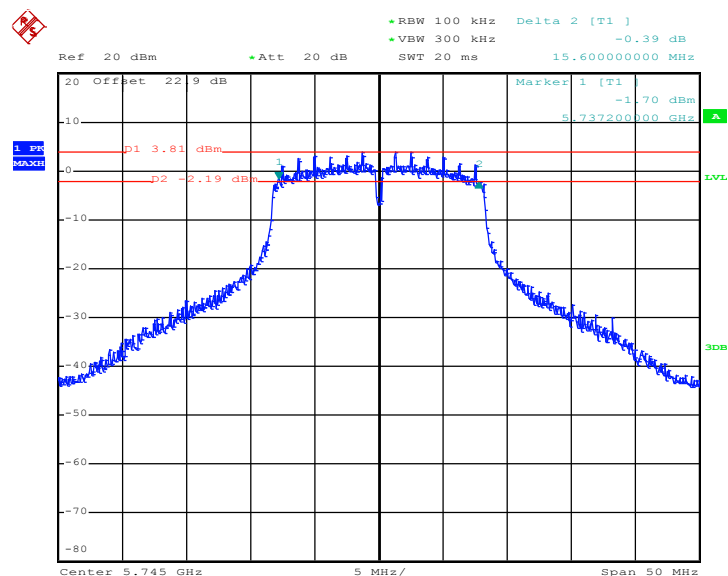


Mode 9 : 6 dB Bandwidth Plot on 802.11n Channel 11



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

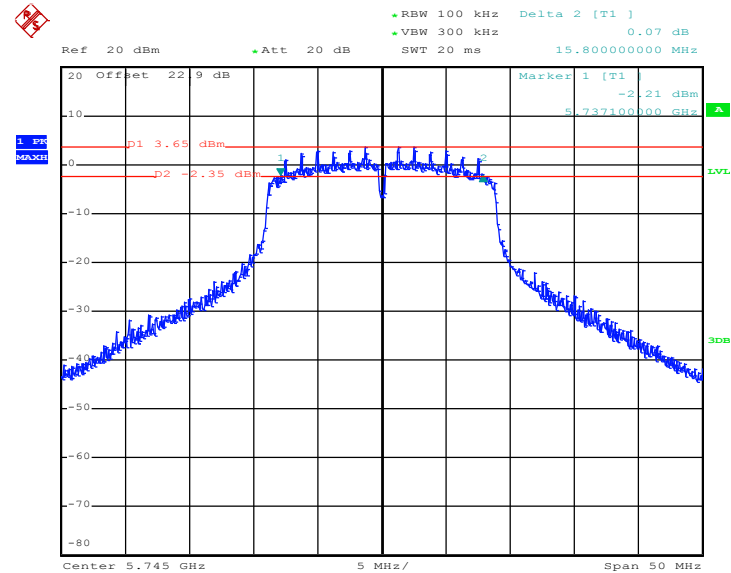


Mode 12: 6 dB Bandwidth Plot on 802.11a Channel 165



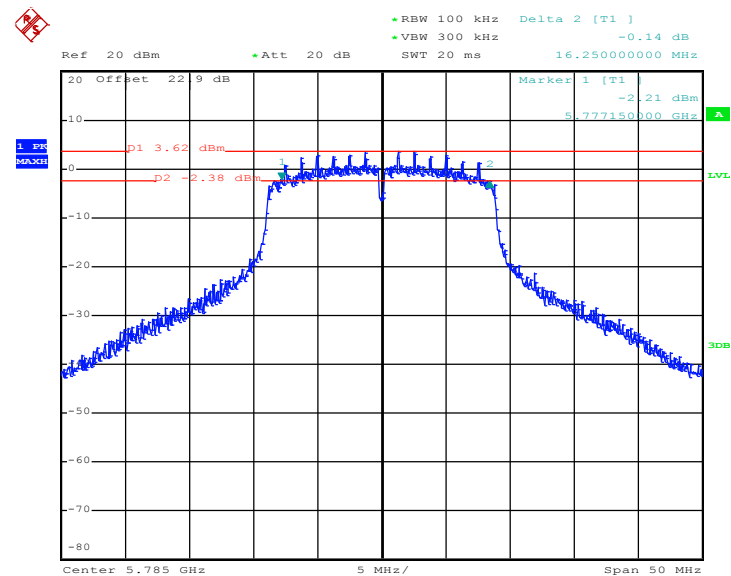


Mode 13: 6 dB Bandwidth Plot on 802.11n Channel 149



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

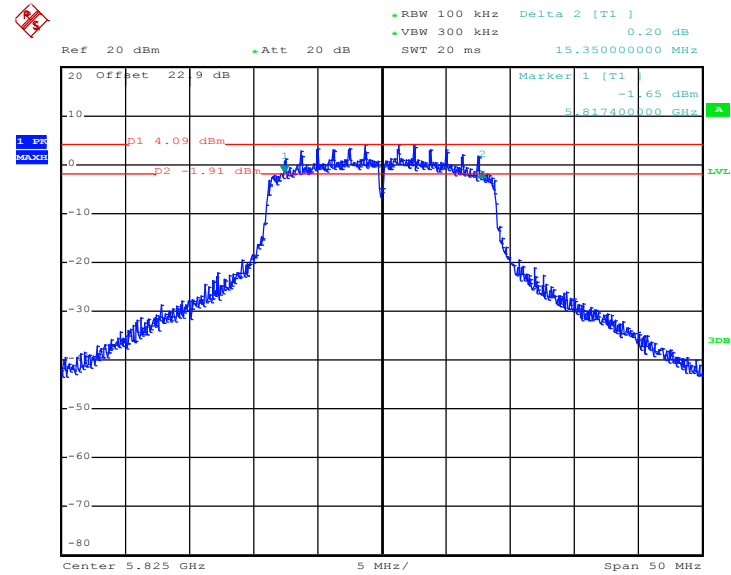
Mode 14: 6 dB Bandwidth Plot on 802.11n Channel 157



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



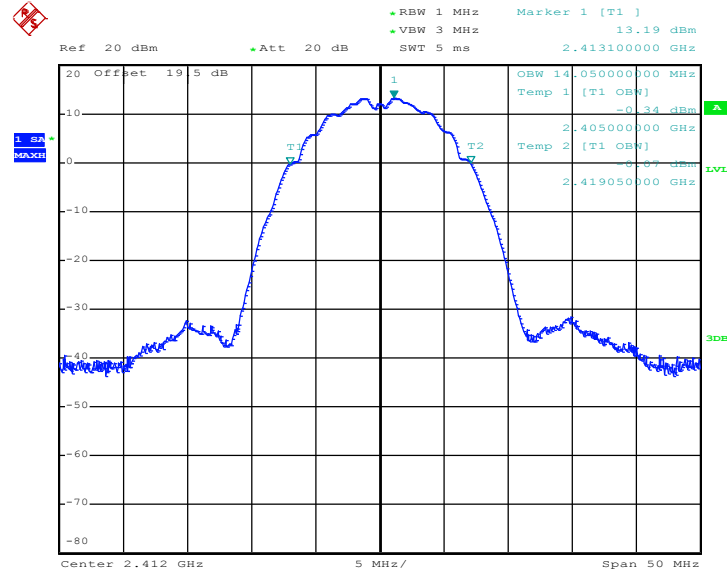
Mode 15: 6 dB Bandwidth Plot on 802.11n Channel 165



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

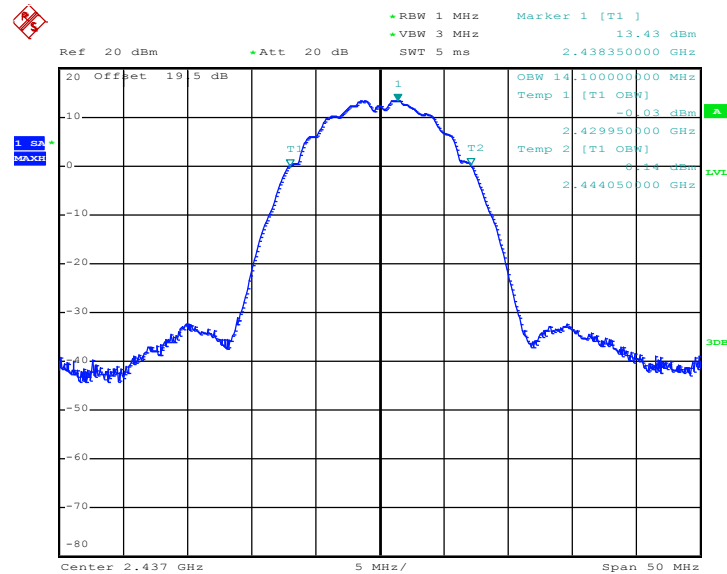
3.1.8 Test Result of 99% Bandwidth Plots

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



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

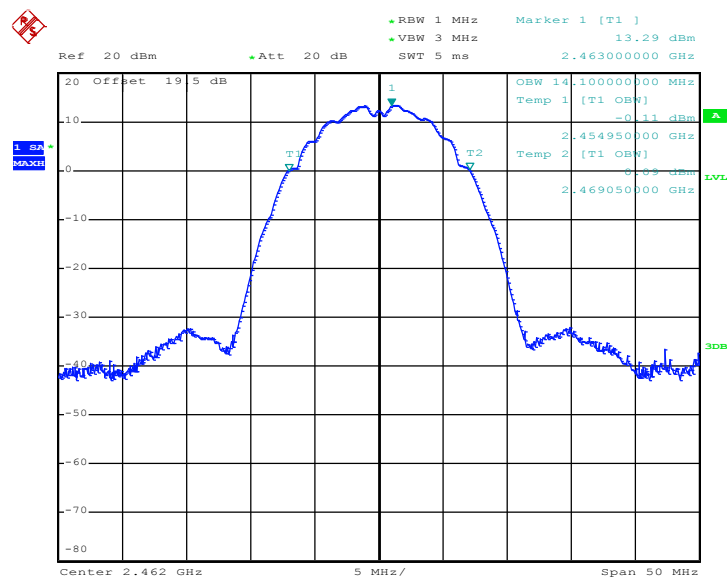
Mode 2 : 99% Occupied Bandwidth Plot on 802.11b Channel 06



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

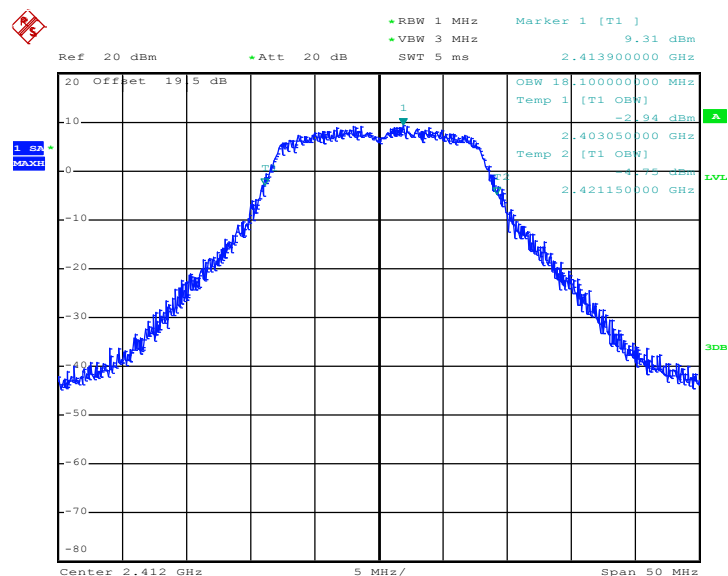


Mode 3 : 99% Occupied Bandwidth Plot on 802.11b Channel 11



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

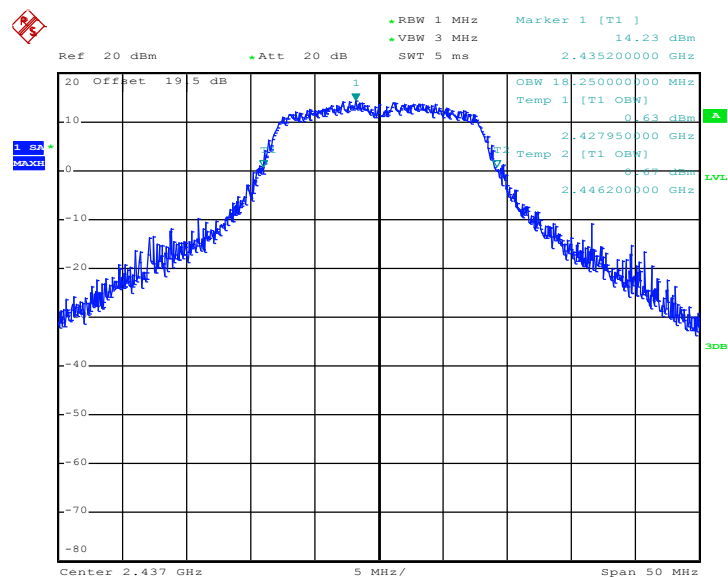
Mode 4 : 99% Occupied Bandwidth Plot on 802.11g Channel 01



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

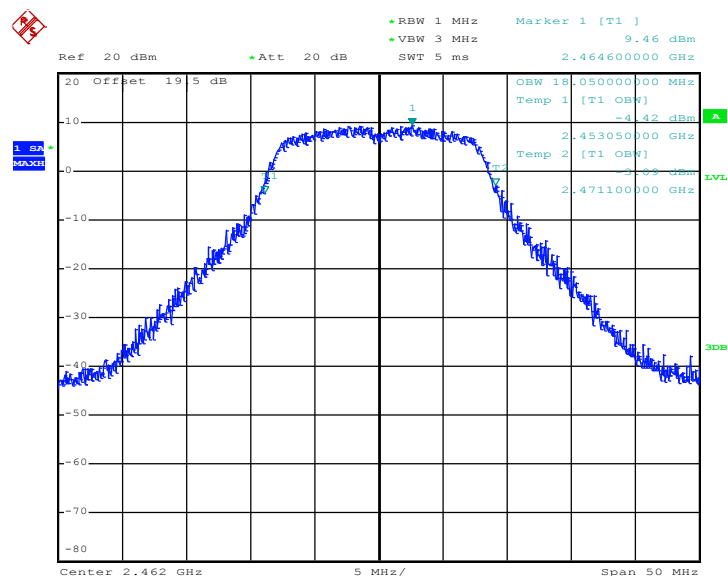


Mode 5 : 99% Occupied Bandwidth Plot on 802.11g Channel 06

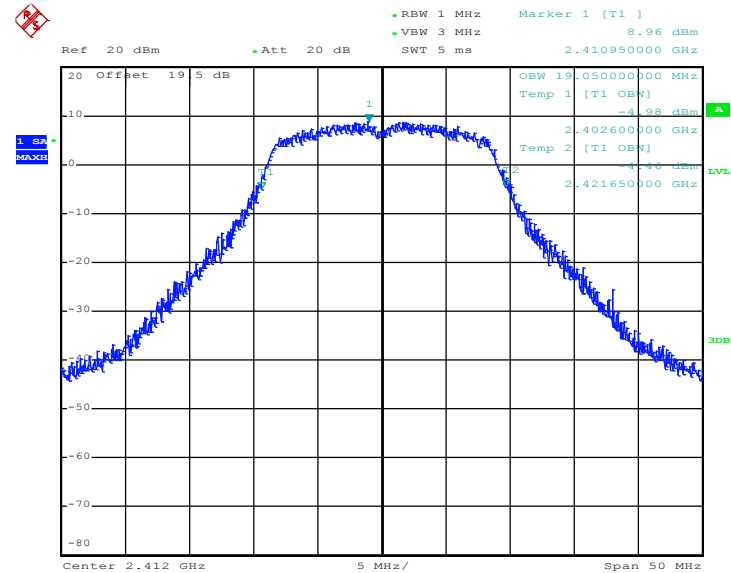


Date: 12.OCT.2011 00:00:08

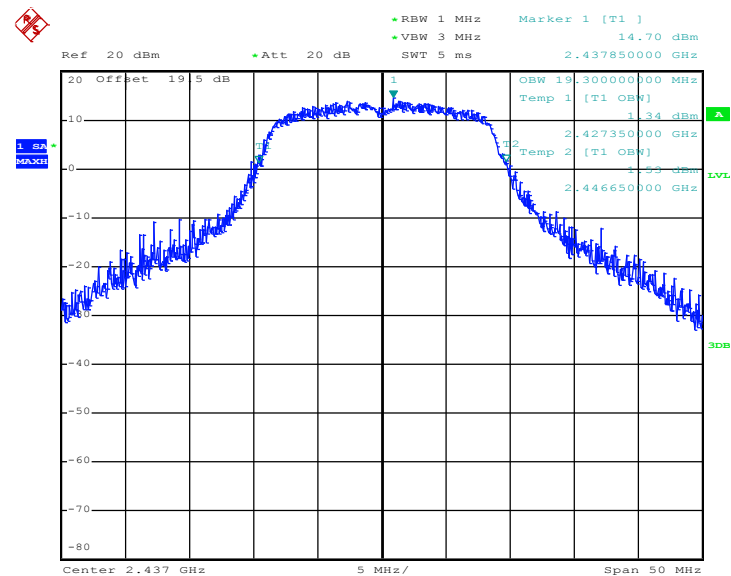
Mode 6 : 99% Occupied Bandwidth Plot on 802.11g Channel 11



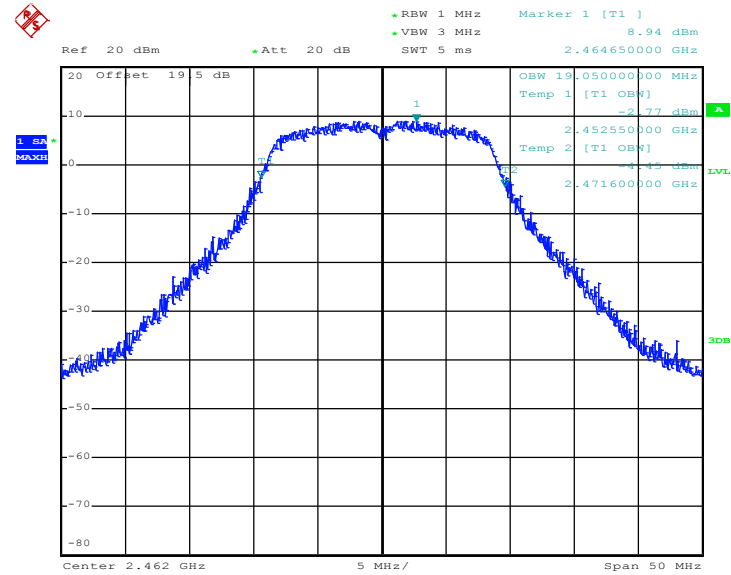
Date: 12.OCT.2011 00:13:40

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


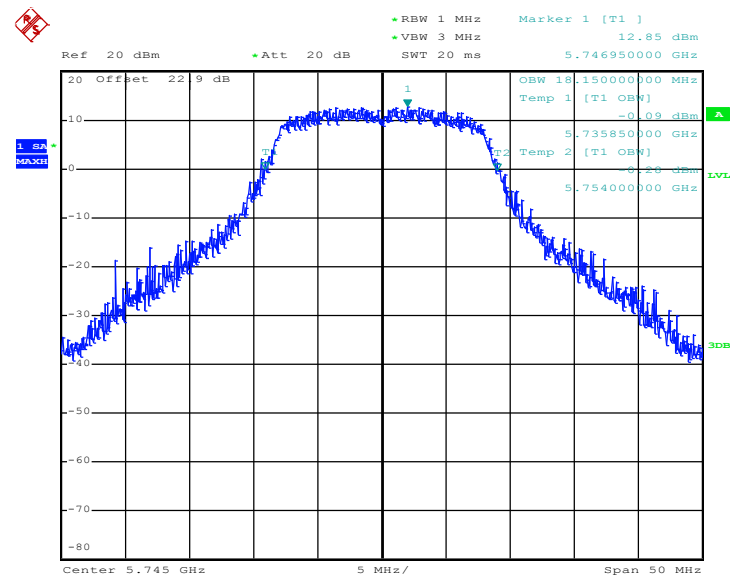
Date: 12.OCT.2011 00:27:17

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


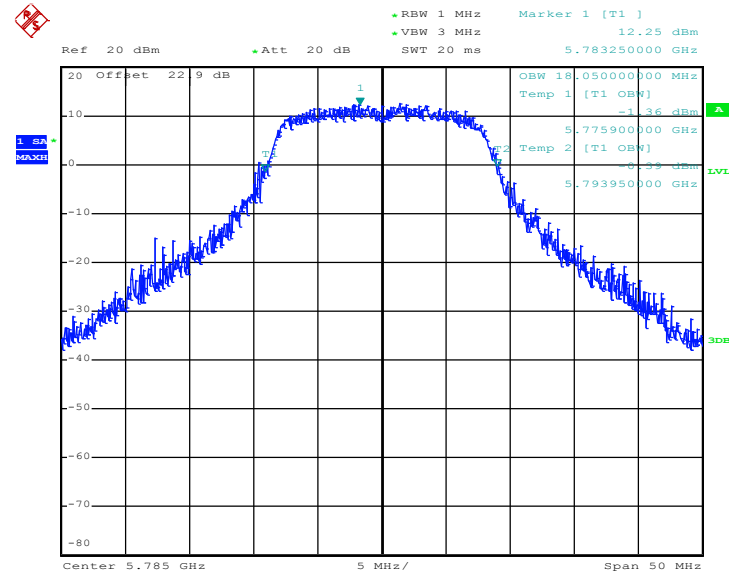
Date: 12.OCT.2011 00:54:45

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


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

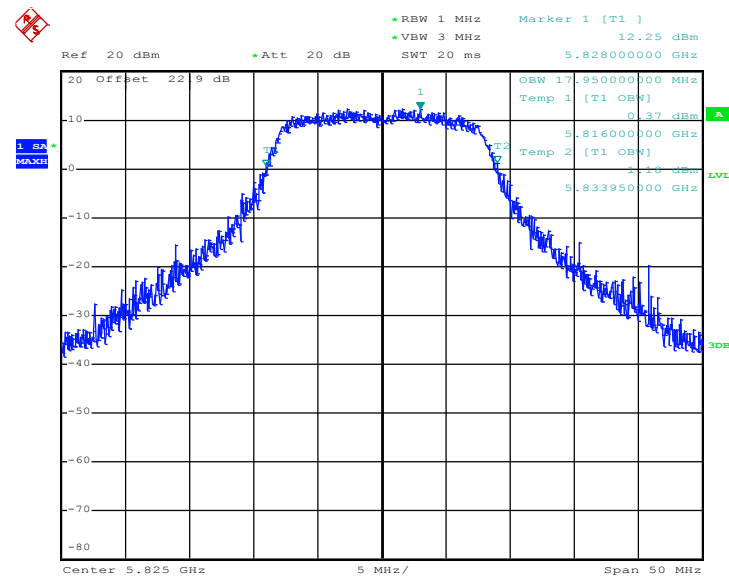


Mode 11: 99% Occupied Bandwidth Plot on 802.11a Channel 157



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

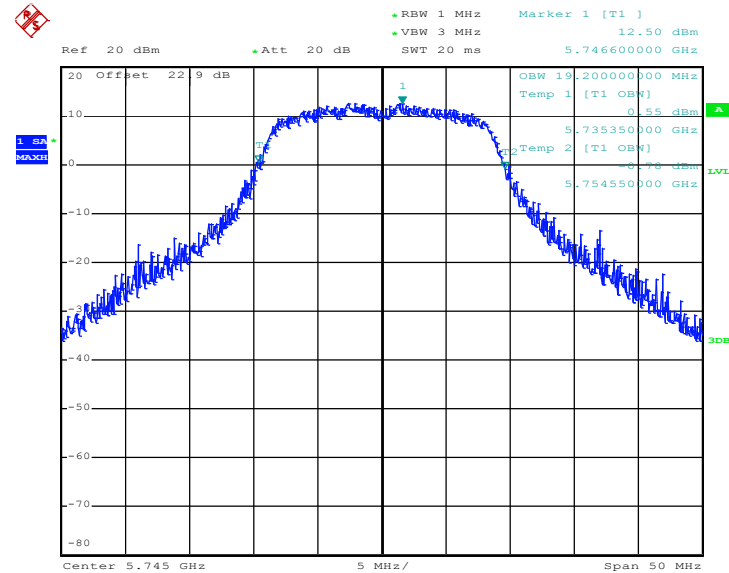
Mode 12: 99% Occupied Bandwidth Plot on 802.11a Channel 165



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

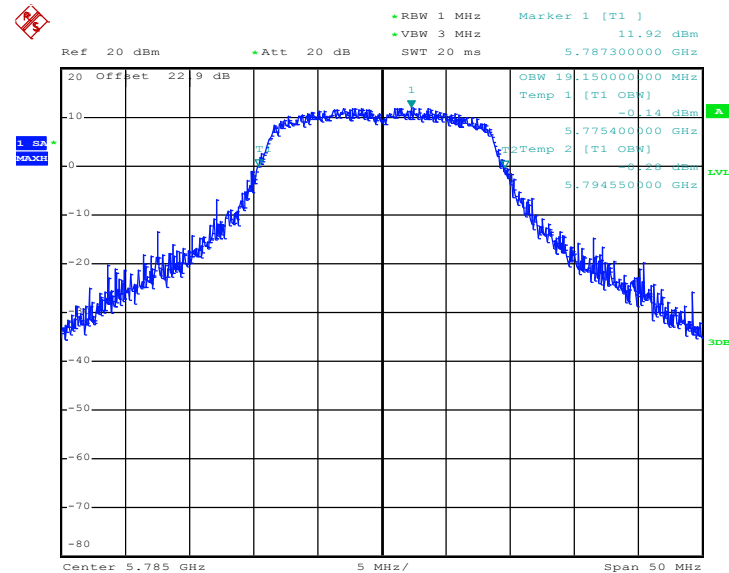


Mode 13: 99% Occupied Bandwidth Plot on 802.11n Channel 149



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

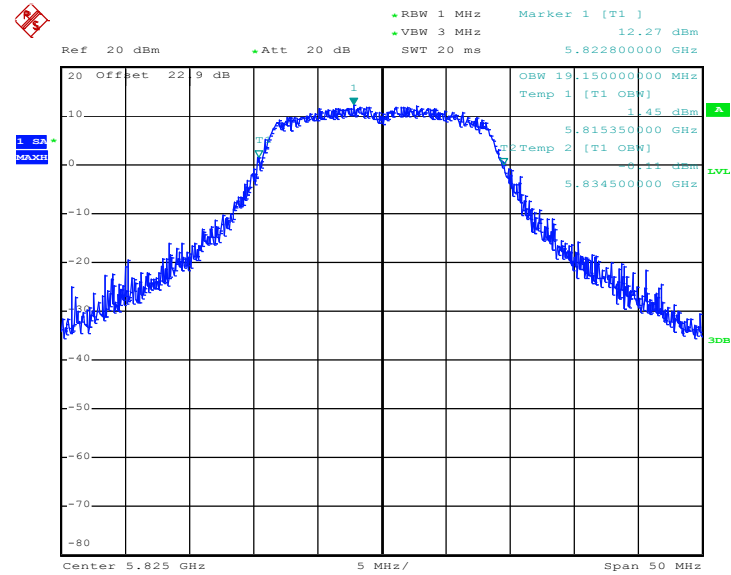
Mode 14: 99% Occupied Bandwidth Plot on 802.11n Channel 157



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.

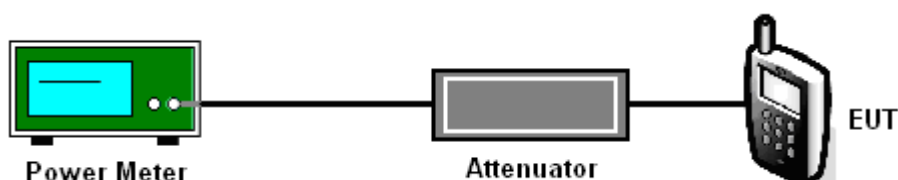
3.2.2 Measuring Instruments

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°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
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

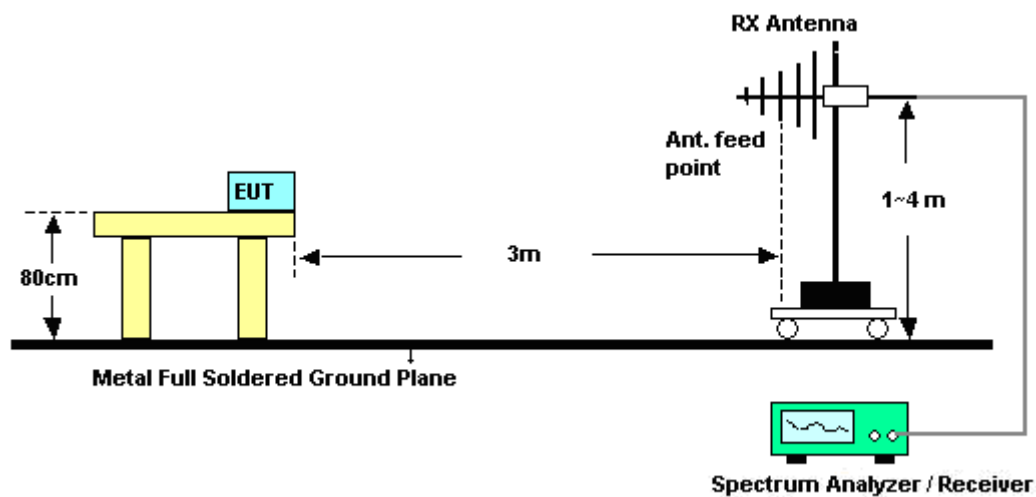
See list of measuring instruments of this test report.

3.3.3 Test Procedures

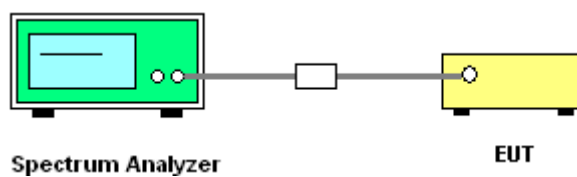
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) > RBW. Band edge emissions must be at least 20 dB below the highest emission level within the authorized band 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 :	22~24°C
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	David Yang

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
2378.21	53.37	-20.63	74	49.19	32.03	5.99	33.84	197	225	Peak
2378.21	41.66	-12.34	54	37.48	32.03	5.99	33.84	197	225	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384.1	55.01	-18.99	74	50.8	32.03	6.03	33.85	109	73	Peak
2384.1	44.18	-9.82	54	39.97	32.03	6.03	33.85	109	73	Average

Test Mode :	Mode 3	Temperature :	22~24°C
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	51.73	-22.27	74	47.27	32.18	6.18	33.9	131	223	Peak
2483.5	40.89	-13.11	54	36.43	32.18	6.18	33.9	131	223	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	54.74	-19.26	74	50.28	32.18	6.18	33.9	105	64	Peak
2483.5	42.29	-11.71	54	37.83	32.18	6.18	33.9	105	64	Average



Test Mode :	Mode 4	Temperature :	22~24°C
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.66	56.35	-17.65	74	52.11	32.06	6.03	33.85	100	228	Peak
2388.66	40.15	-13.85	54	35.91	32.06	6.03	33.85	100	228	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	57.13	-16.87	74	52.89	32.06	6.03	33.85	108	73	Peak
2389.61	40.96	-13.04	54	36.72	32.06	6.03	33.85	108	73	Average

Test Mode :	Mode 6	Temperature :	22~24°C
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	56.37	-17.63	74	51.91	32.18	6.18	33.9	131	223	Peak
2483.5	41.03	-12.97	54	36.57	32.18	6.18	33.9	131	223	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	61.1	-12.9	74	56.64	32.18	6.18	33.9	127	344	Peak
2483.5	43.3	-10.7	54	38.84	32.18	6.18	33.9	127	344	Average



Test Mode :	Mode 7	Temperature :	22~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.42	55.77	-18.23	74	51.53	32.06	6.03	33.85	100	230	Peak
2389.42	40.38	-13.62	54	36.14	32.06	6.03	33.85	100	230	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	58.26	-15.74	74	54.02	32.06	6.03	33.85	109	72	Peak
2389.99	41.41	-12.59	54	37.17	32.06	6.03	33.85	109	72	Average

Test Mode :	Mode 9	Temperature :	22~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	David Yang

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	59.49	-14.51	74	55.03	32.18	6.18	33.9	130	223	Peak
2483.5	43.16	-10.84	54	38.7	32.18	6.18	33.9	130	223	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
2484.61	62.64	-11.36	74	58.18	32.18	6.18	33.9	100	66	Peak
2484.61	45.93	-8.07	54	41.47	32.18	6.18	33.9	100	66	Average



Test Mode :	Mode 10	Temperature :	22~24°C
Test Band :	802.11a	Relative Humidity :	48~50%
Test Channel :	149	Test Engineer :	David Yang

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	75.54	-8.3	83.84	63.99	34.81	9.92	33.18	140	221	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	84.42	-7.35	91.77	72.87	34.81	9.92	33.18	114	256	Peak

Test Mode :	Mode 12	Temperature :	22~24°C
Test Band :	802.11a	Relative Humidity :	48~50%
Test Channel :	165	Test Engineer :	David Yang

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	62.32	-22.56	84.88	50.79	34.98	9.87	33.32	100	208	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	69.86	-20.5	90.36	58.33	34.98	9.87	33.32	113	241	Peak



Test Mode :	Mode 13	Temperature :	22~24°C
Test Band :	802.11a	Relative Humidity :	48~50%
Test Channel :	149	Test Engineer :	David Yang

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	69.74	-15.32	85.06	58.19	34.81	9.92	33.18	109	41	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	81.48	-8.78	90.26	69.93	34.81	9.92	33.18	101	41	Peak



Test Mode :	Mode 14	Temperature :	22~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	48~50%
Test Channel :	149	Test Engineer :	David Yang

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	75.18	-9.89	85.07	63.63	34.81	9.92	33.18	102	216	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	77.26	-14.44	91.7	65.71	34.81	9.92	33.18	103	249	Peak

Test Mode :	Mode 16	Temperature :	22~24°C
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	48~50%
Test Channel :	165	Test Engineer :	David Yang

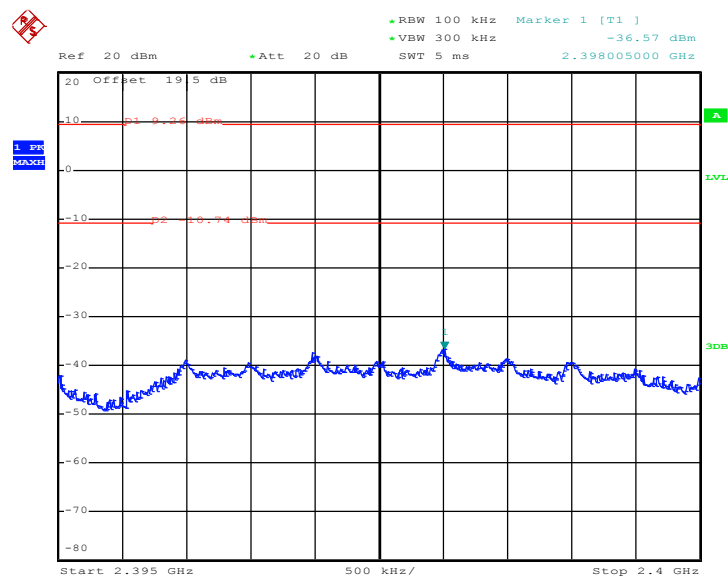
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
5850	64.41	-20.85	85.26	52.88	34.98	9.87	33.32	100	215	Peak

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	71.18	-20.37	91.55	59.65	34.98	9.87	33.32	113	243	Peak

3.3.6 Test Result of Conducted Band Edges

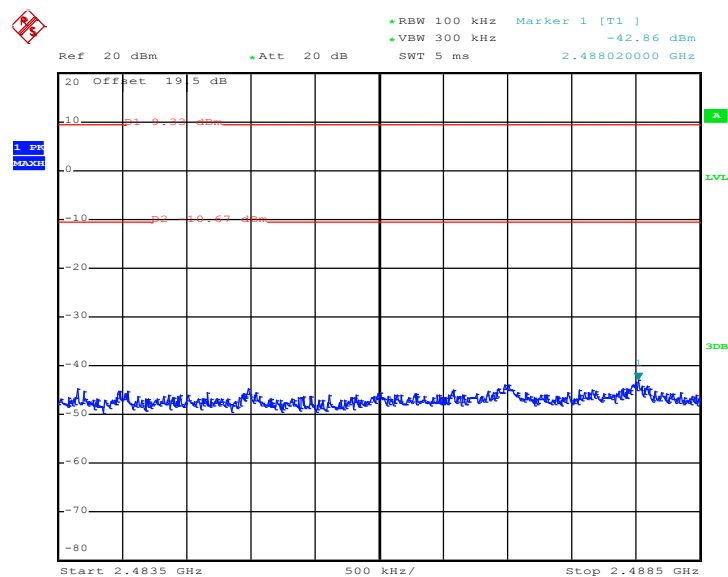
Test Mode :	Mode 1 and 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Alan Liu

Low Band Edge Plot on 802.11b Channel 01



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

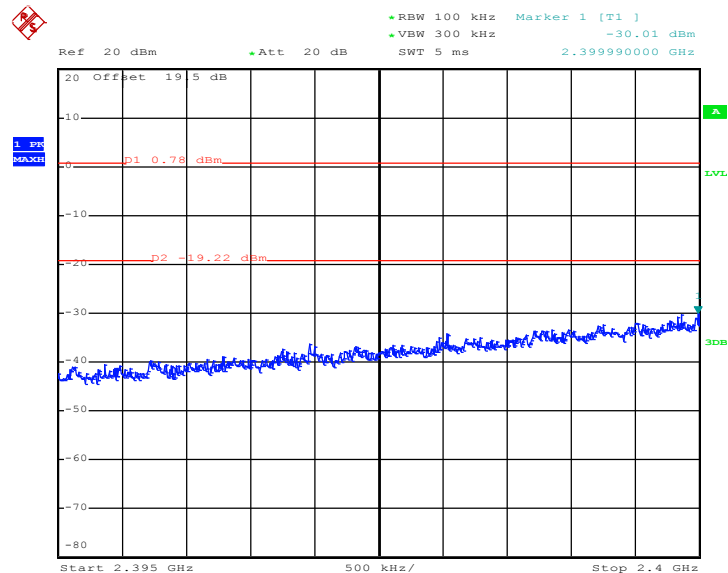
High Band Edge Plot on 802.11b Channel 11



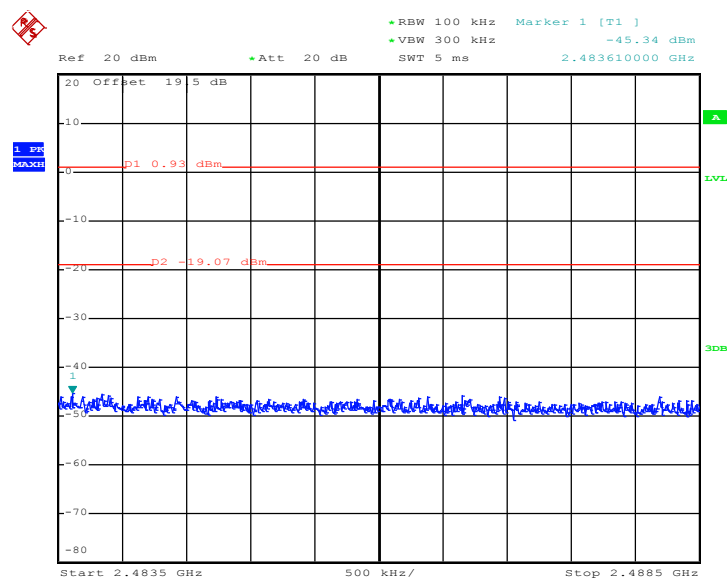
Date: 11.OCT.2011 23:30:53



Test Mode :	Mode 4 and 6	Temperature :	24~26℃
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

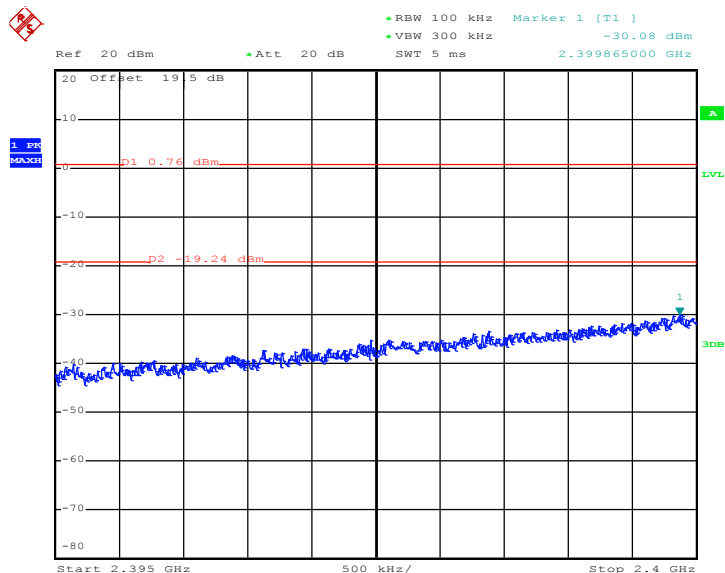
Date: 11.OCT.2011 23:44:40

High Band Edge Plot on 802.11g Channel 11

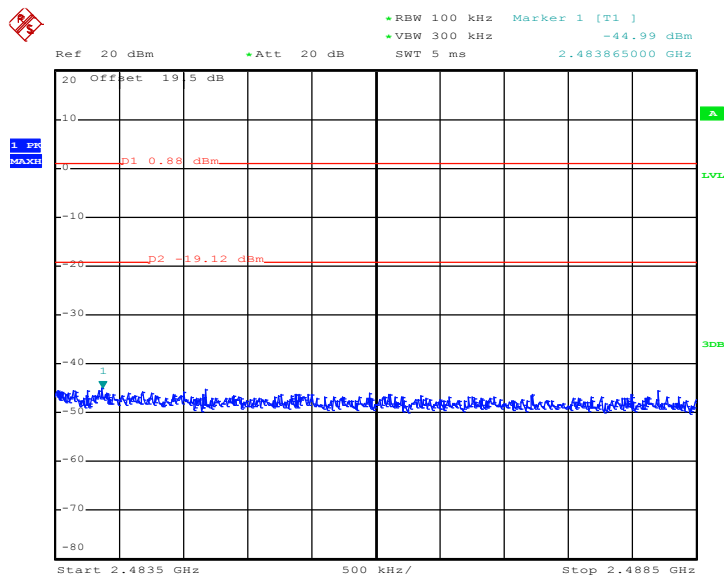
Date: 12.OCT.2011 00:13:14



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



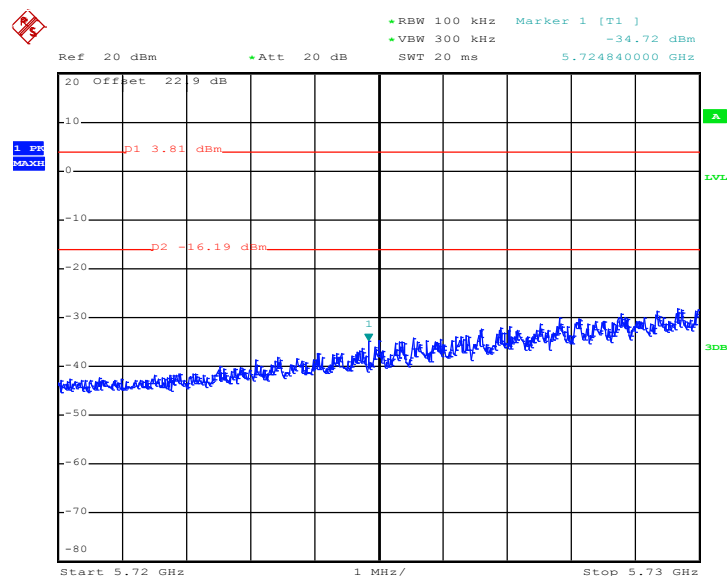
Date: 12.OCT.2011 00:26:52



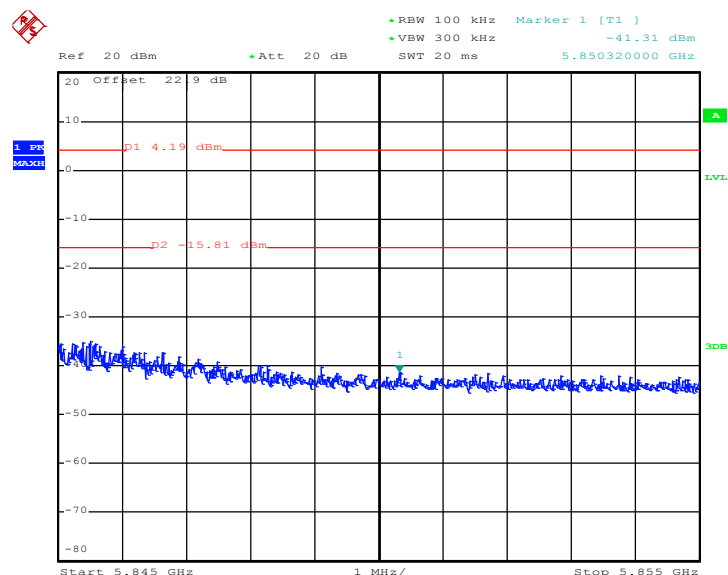
Date: 13.OCT.2011 09:18:14



Test Mode :	Mode 10 and 12	Temperature :	24~26°C
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

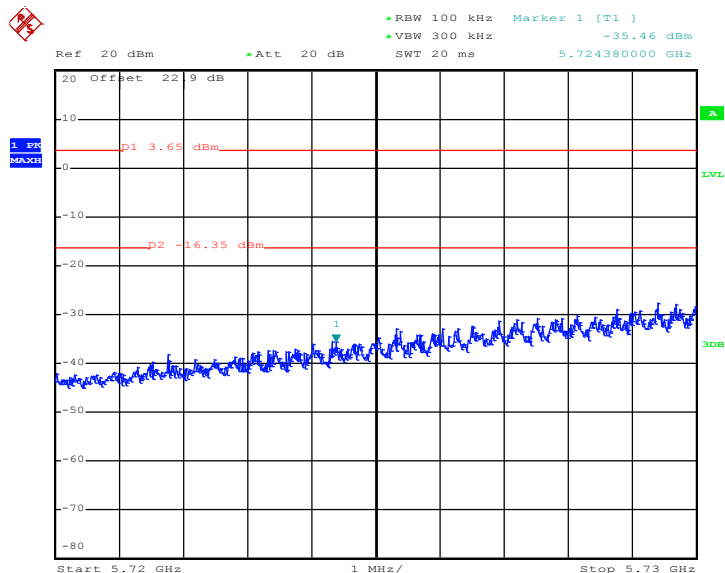
Date: 13.OCT.2011 09:28:48

High Band Edge Plot on 802.11a Channel 165

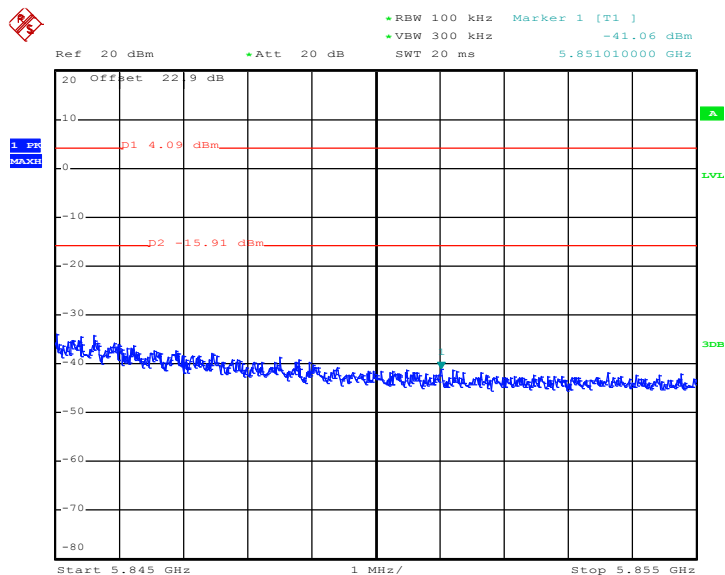
Date: 13.OCT.2011 10:02:39



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



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



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.

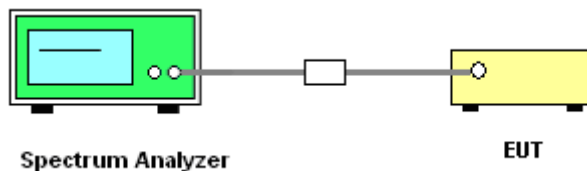
3.4.2 Measuring Instruments

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.

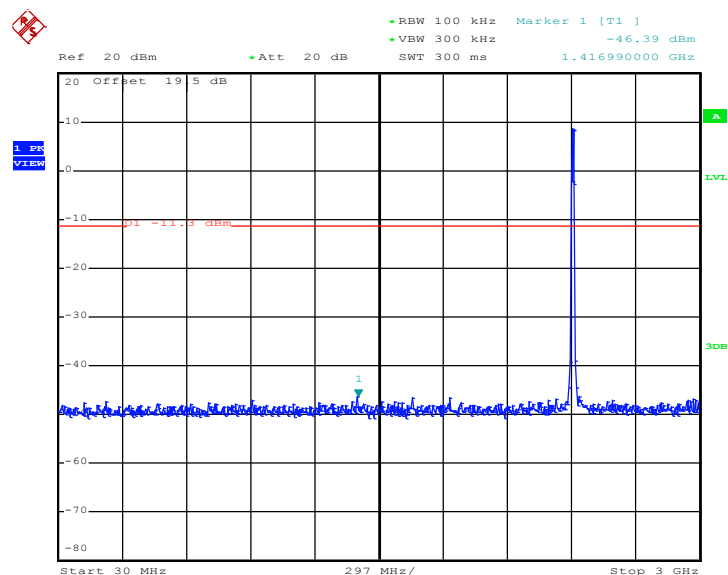
3.4.4 Test Setup



3.4.5 Test Result

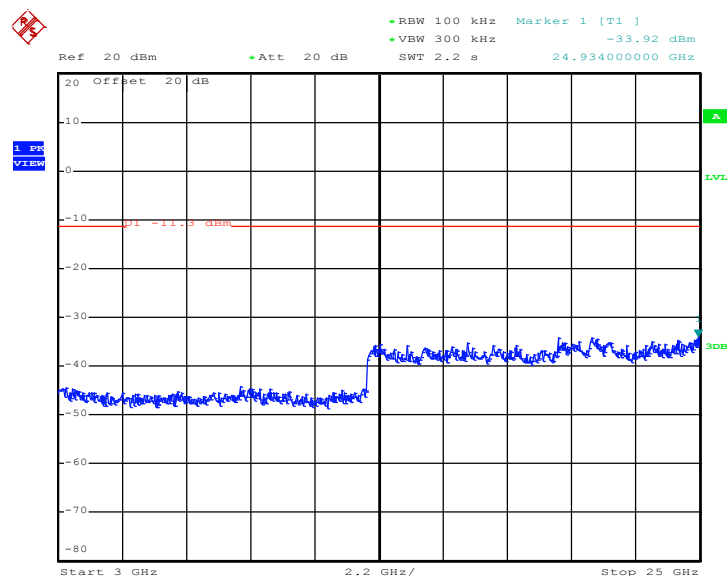
Test Mode :	Mode 1	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 3 GHz



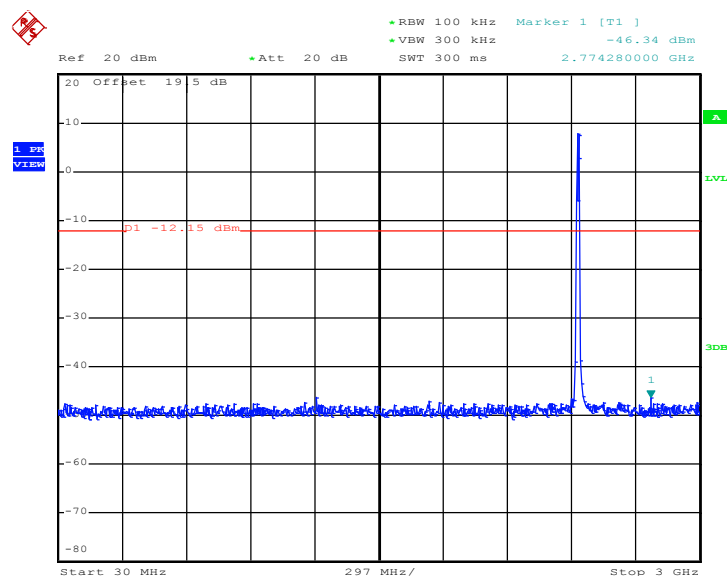
Date: 11.OCT.2011 22:47:01

Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz

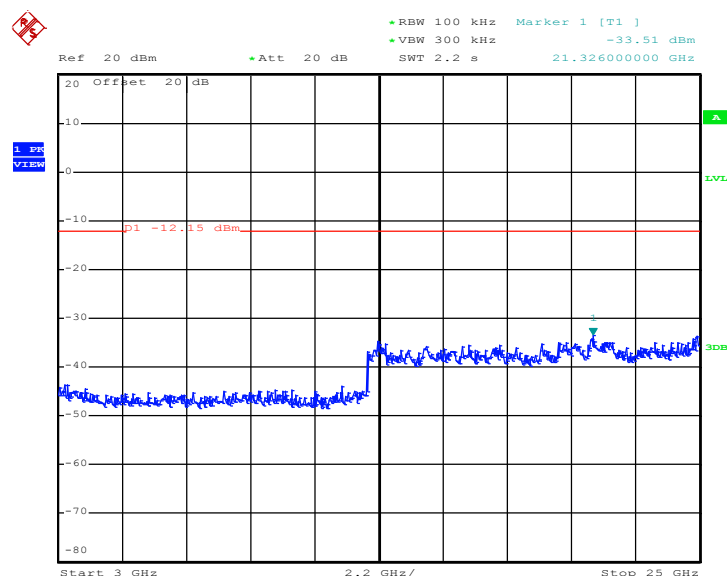


Date: 11.OCT.2011 22:47:18

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

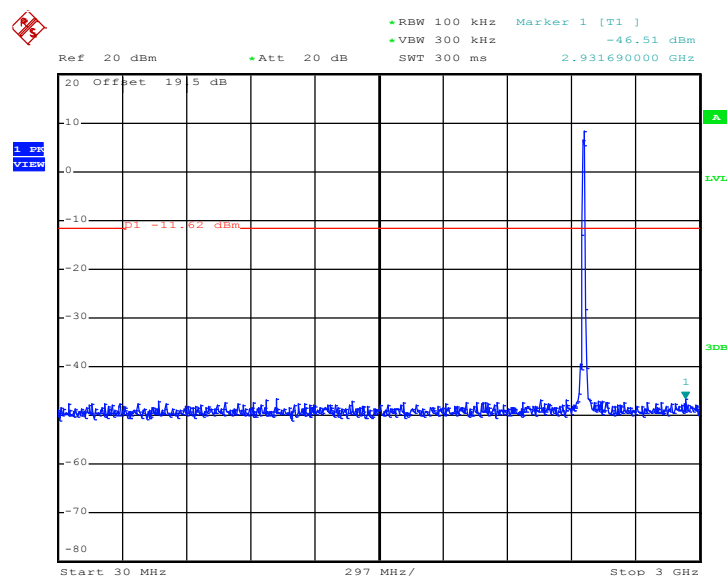
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


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

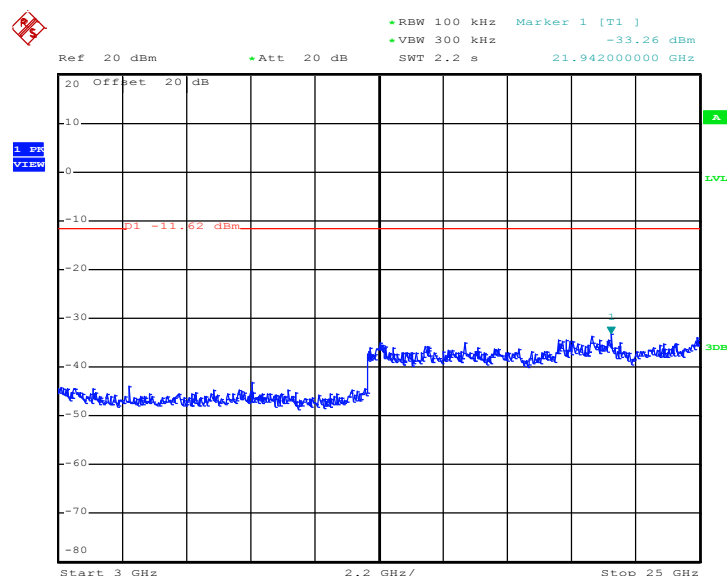
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


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

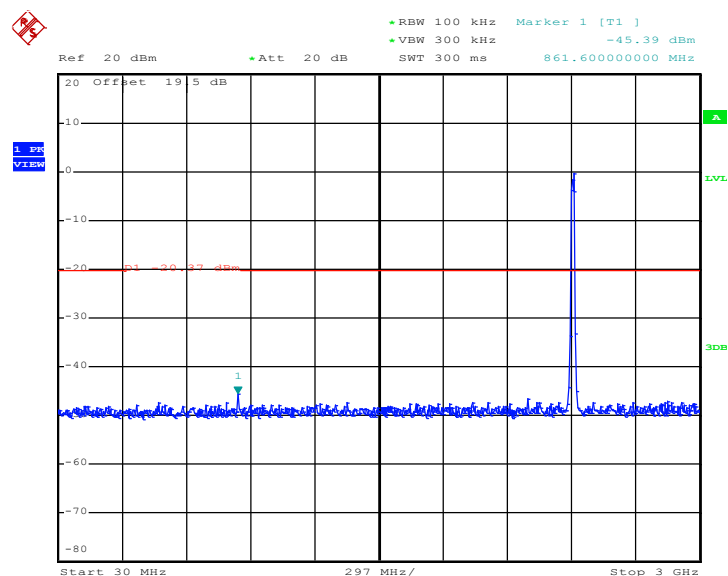
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


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

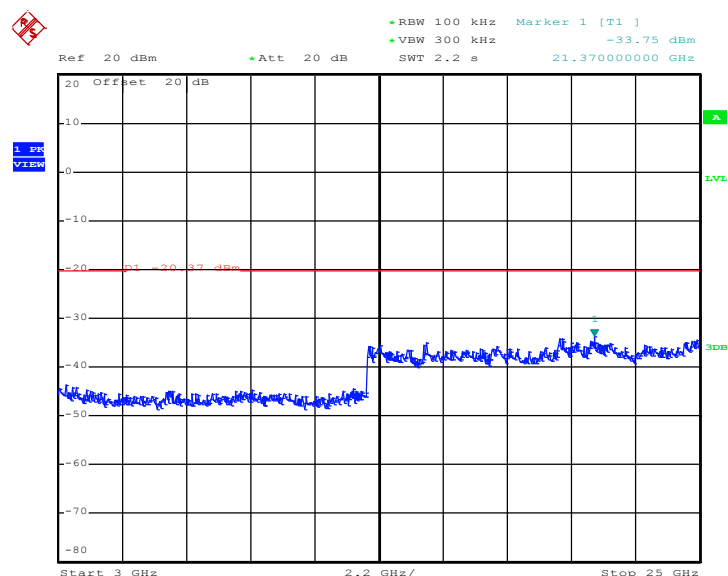
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


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

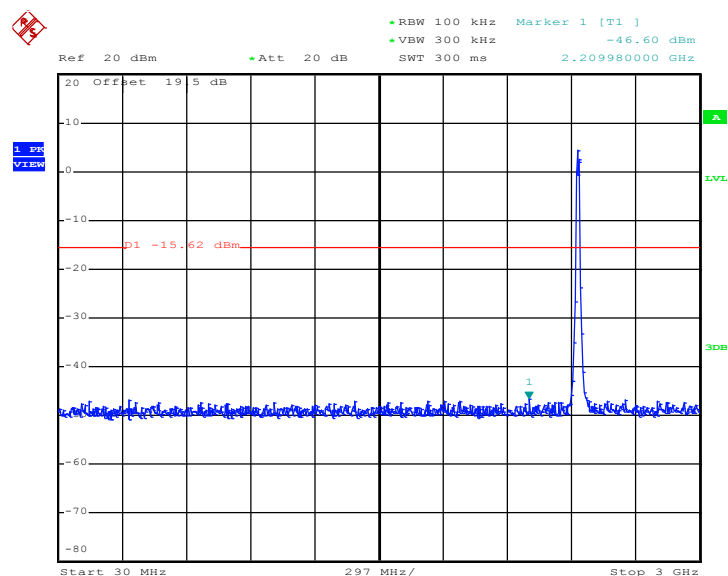
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


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

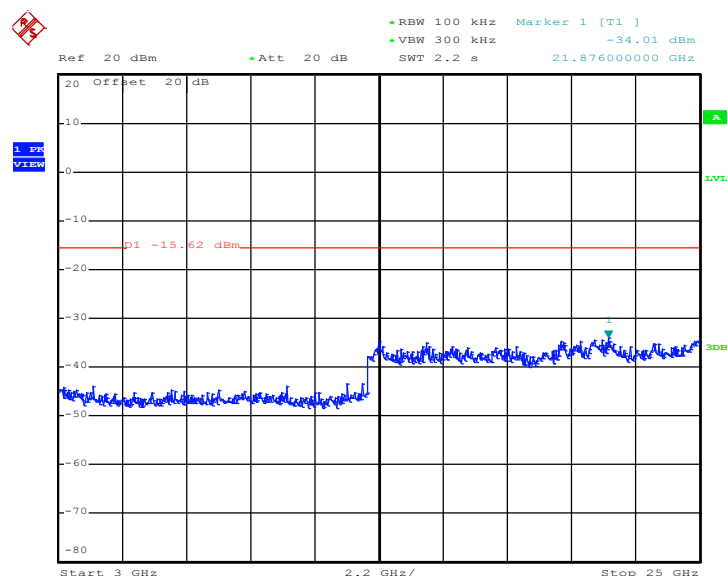
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


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

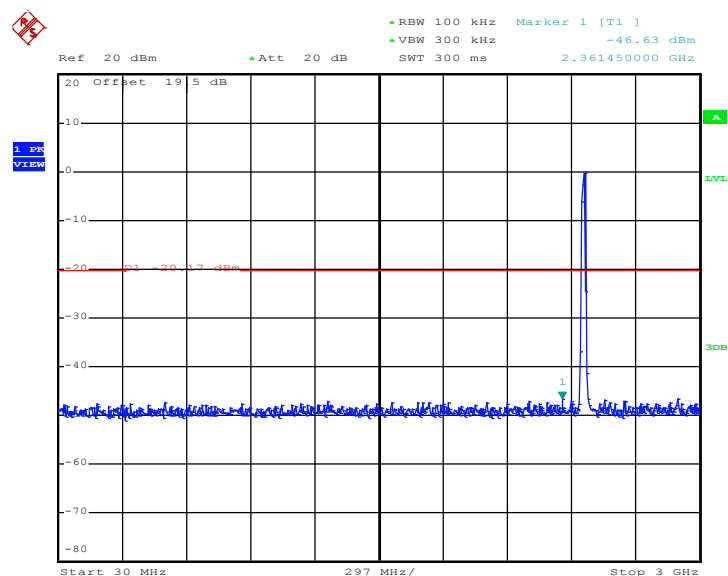
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


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

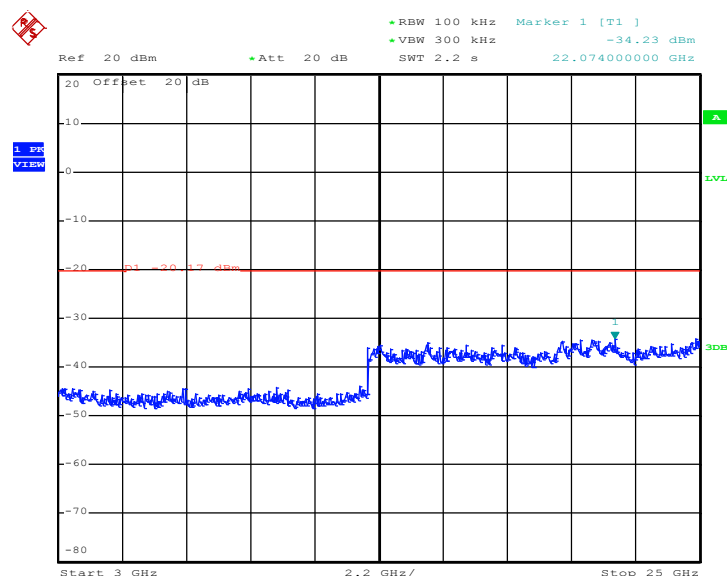
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


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

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

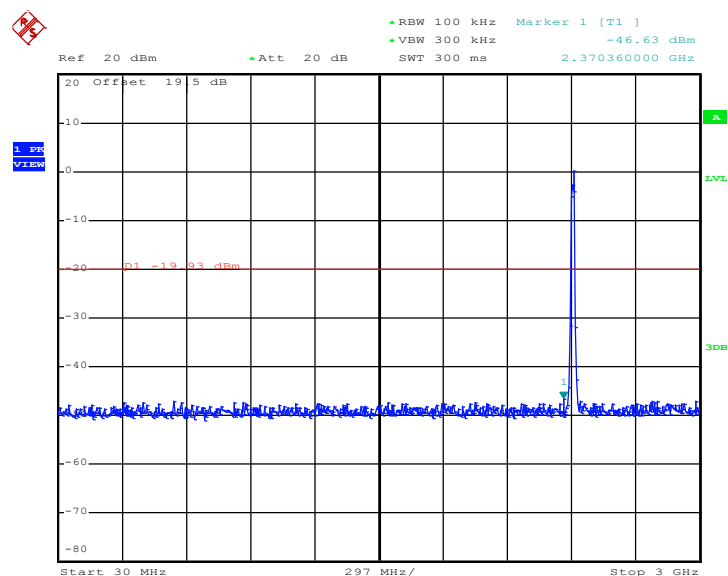
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


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

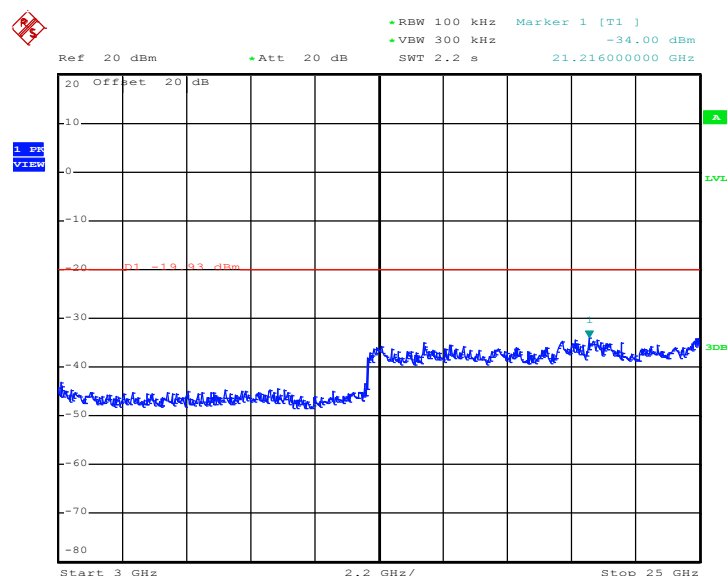
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


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

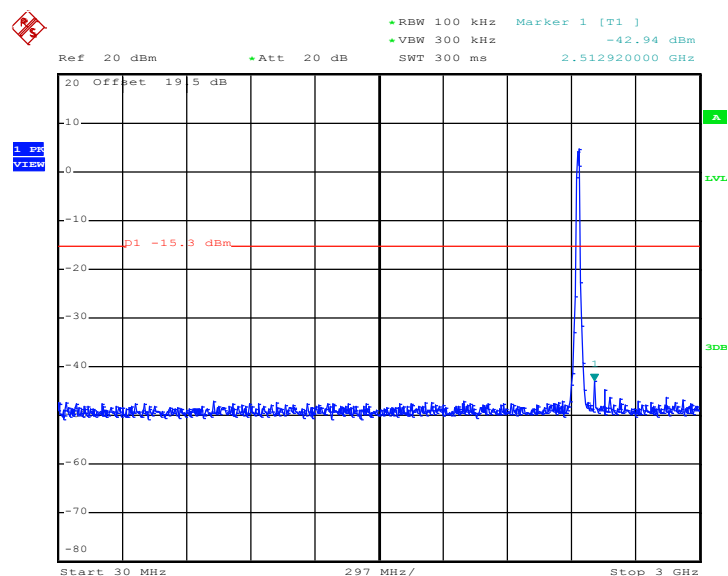
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


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

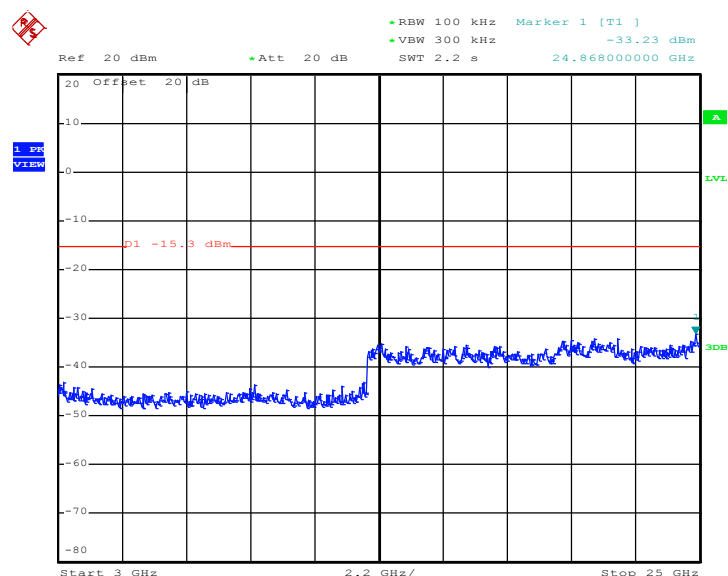
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


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

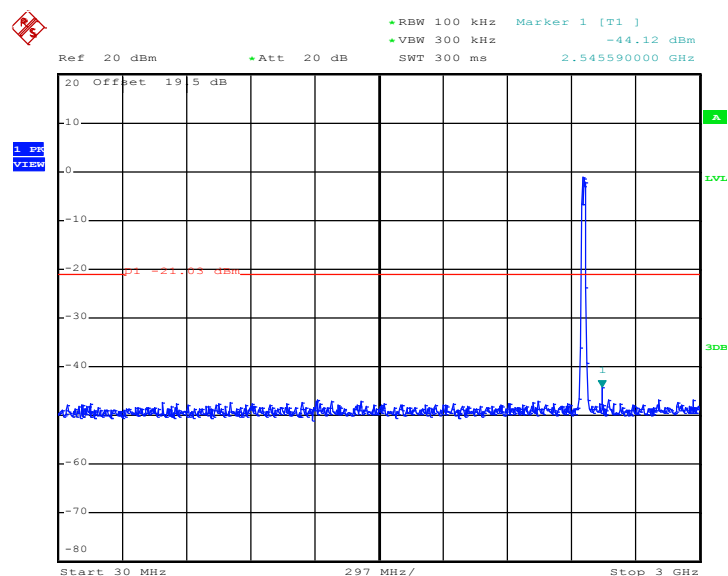
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


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

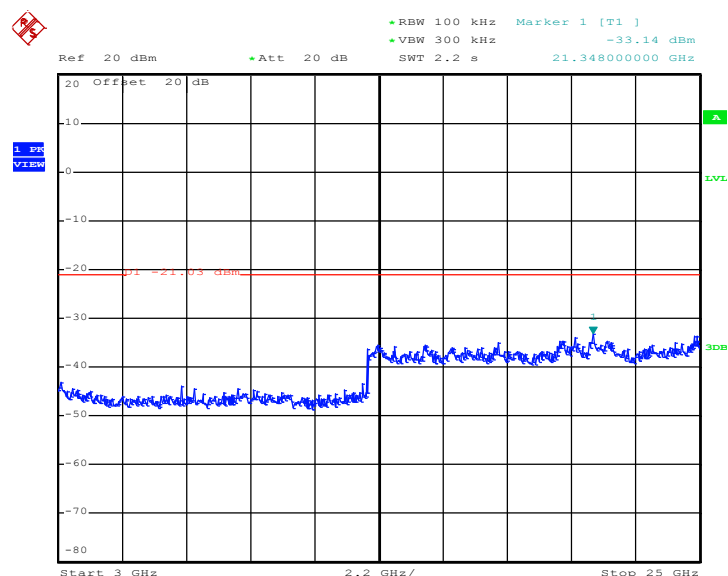
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


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

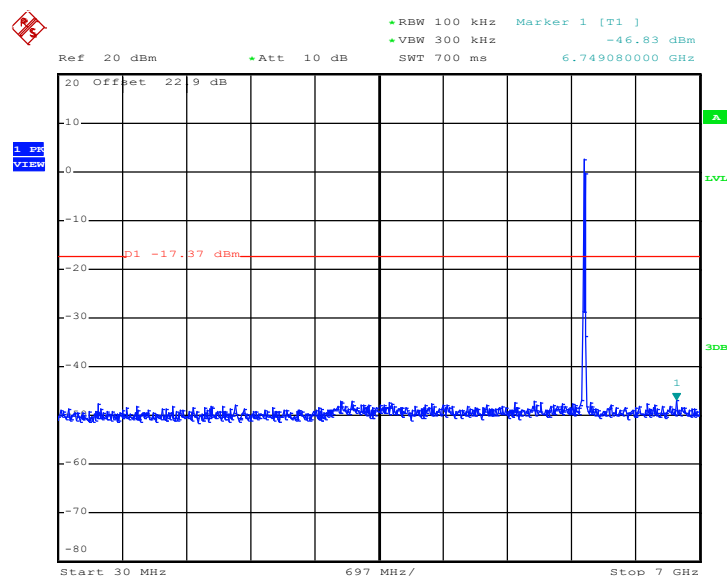
Conducted Spurious Emission Plot between 30MHz ~ 3 GHz


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

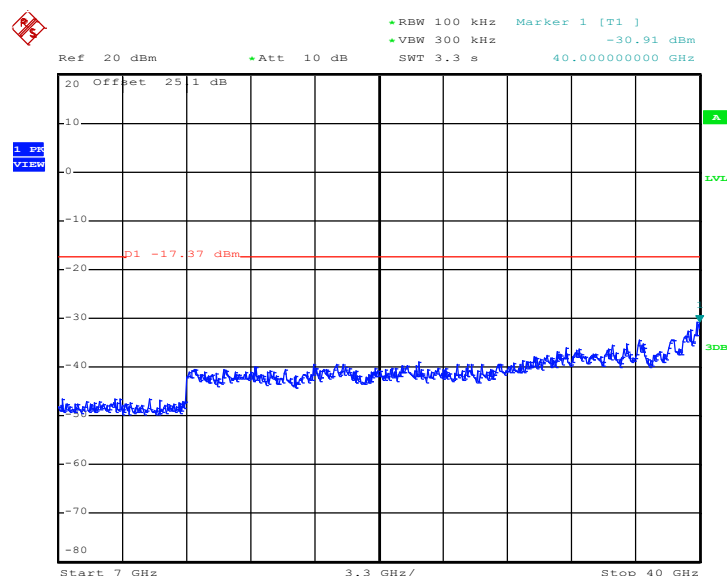
Conducted Spurious Emission Plot between 3 GHz ~ 25 GHz


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 30MHz ~ 7 GHz


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

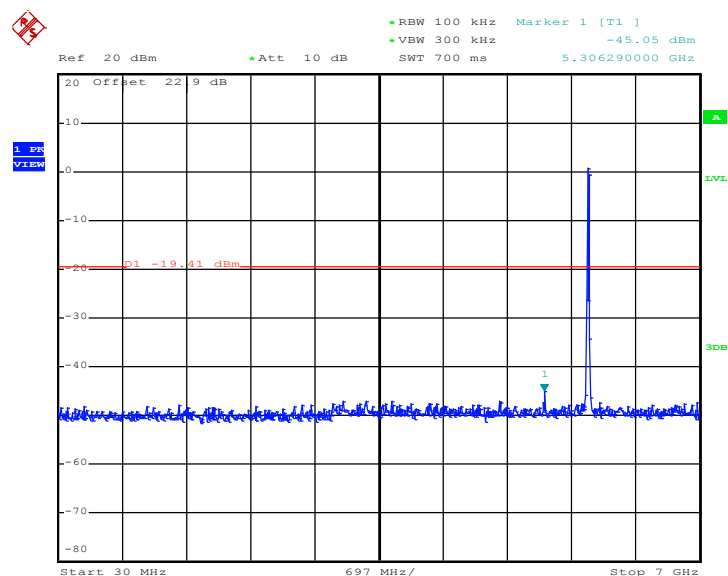
Conducted Spurious Emission Plot between 7 GHz ~ 40 GHz


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



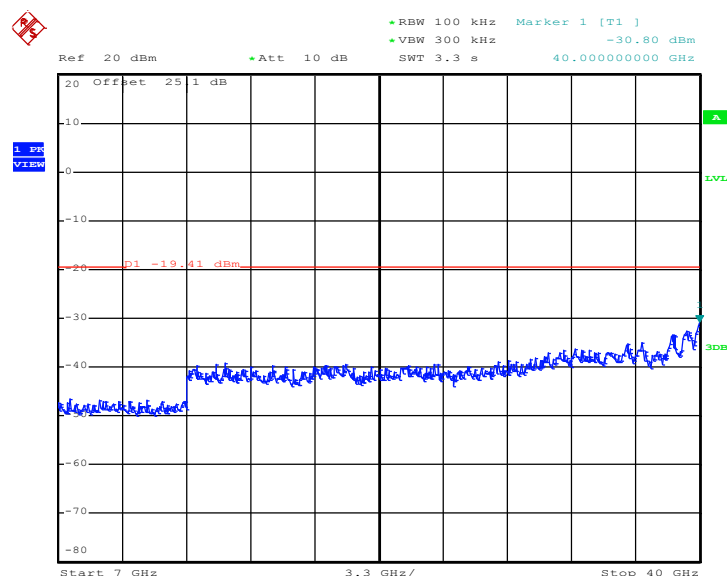
Test Mode :	Mode 11	Temperature :	24~26℃
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	157	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 7 GHz



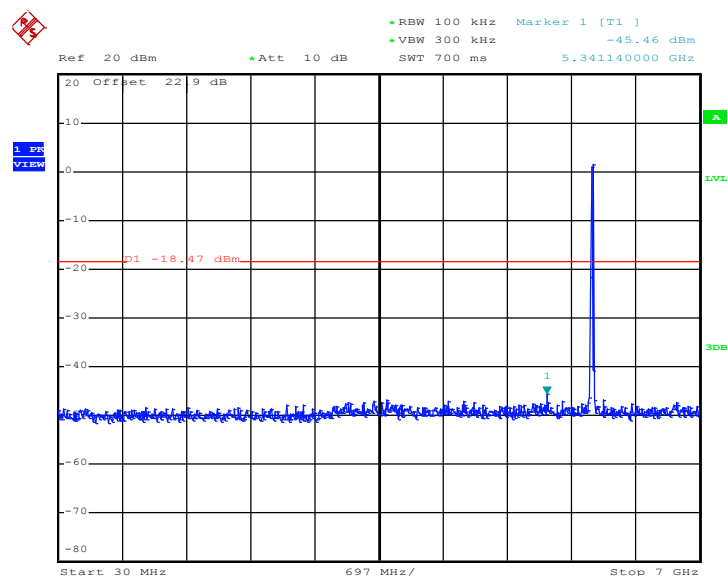
Date: 13.OCT.2011 09:53:42

Conducted Spurious Emission Plot between 7 GHz ~ 40 GHz

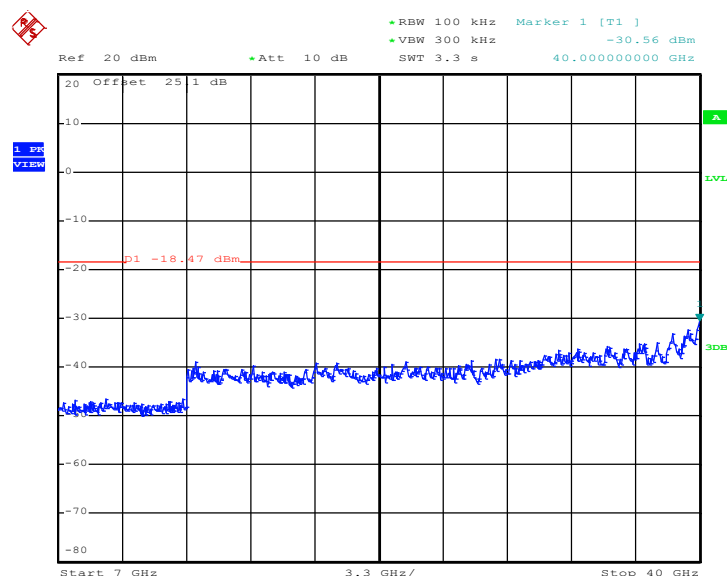


Date: 13.OCT.2011 09:53:59

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 30MHz ~ 7 GHz


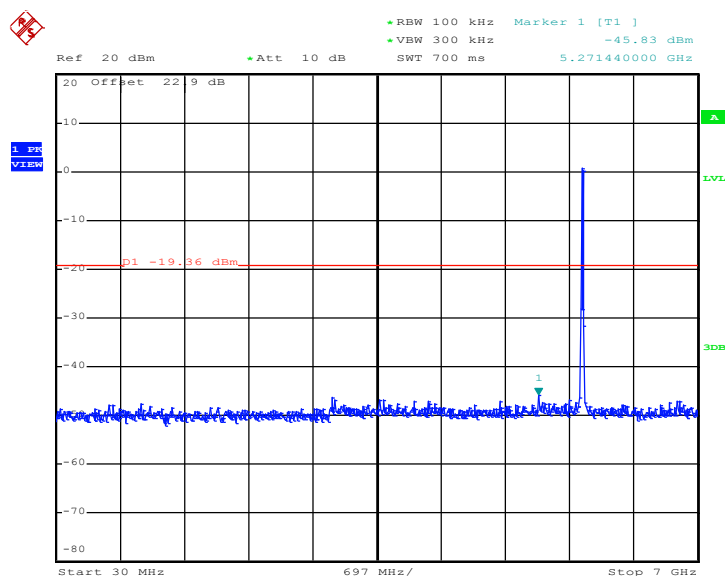
Date: 13.OCT.2011 10:03:10

Conducted Spurious Emission Plot between 7 GHz ~ 40 GHz


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

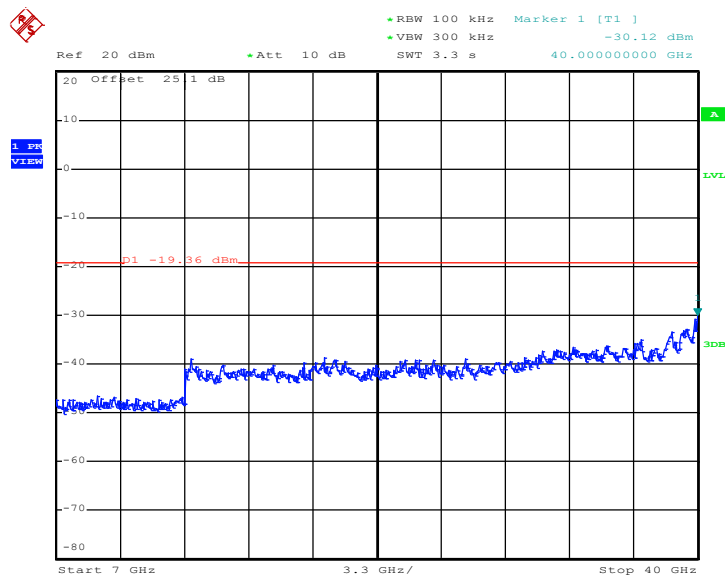
Test Mode :	Mode 13	Temperature :	24~26℃
Test Band :	802.11n (BW 20MHz)	Relative Humidity :	50~53%
Test Channel :	149	Test Engineer :	Alan Liu

Conducted Spurious Emission Plot between 30MHz ~ 7 GHz



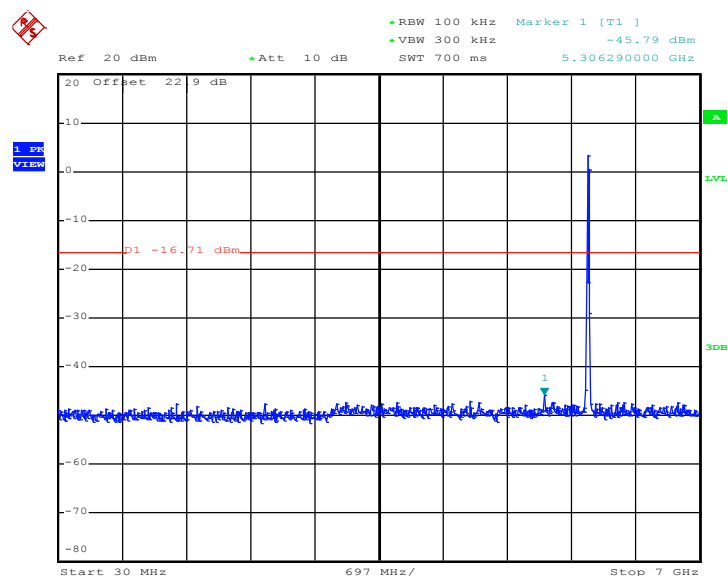
Date: 13.OCT.2011 09:49:48

Conducted Spurious Emission Plot between 7 GHz ~ 40 GHz

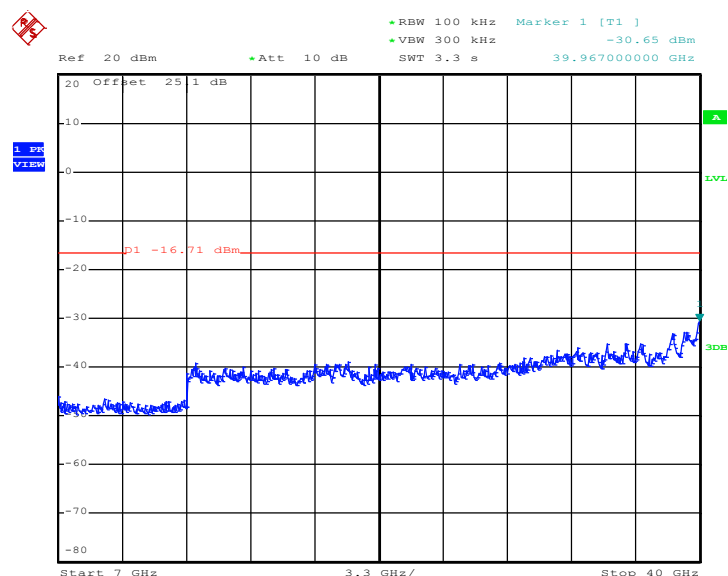


Date: 13.OCT.2011 09:50:05

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

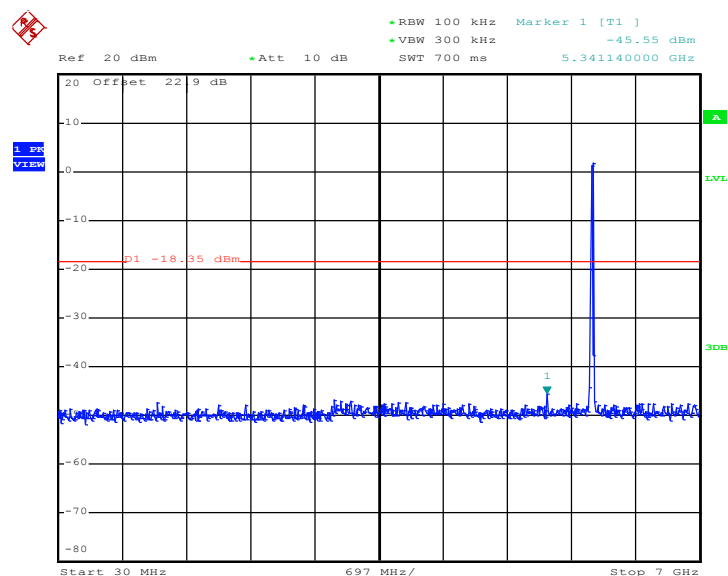
Conducted Spurious Emission Plot between 30MHz ~ 7 GHz


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

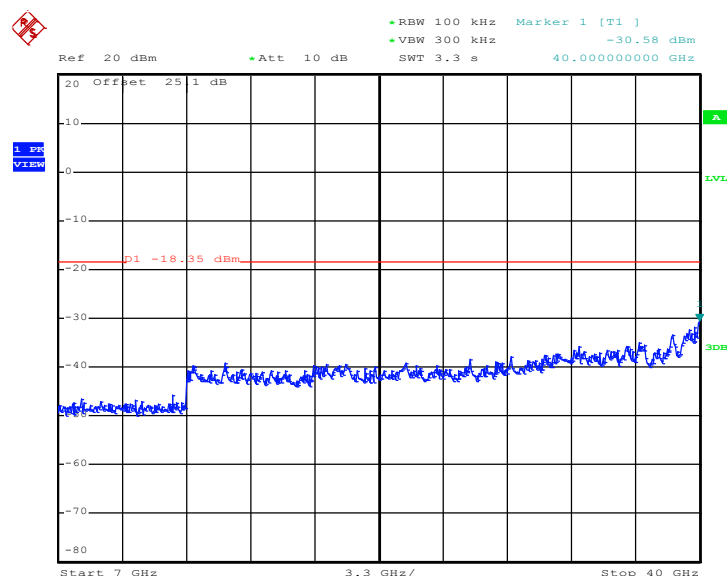
Conducted Spurious Emission Plot between 7 GHz ~ 40 GHz


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 30MHz ~ 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.

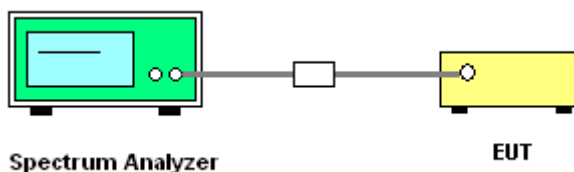
3.5.2 Measuring Instruments

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



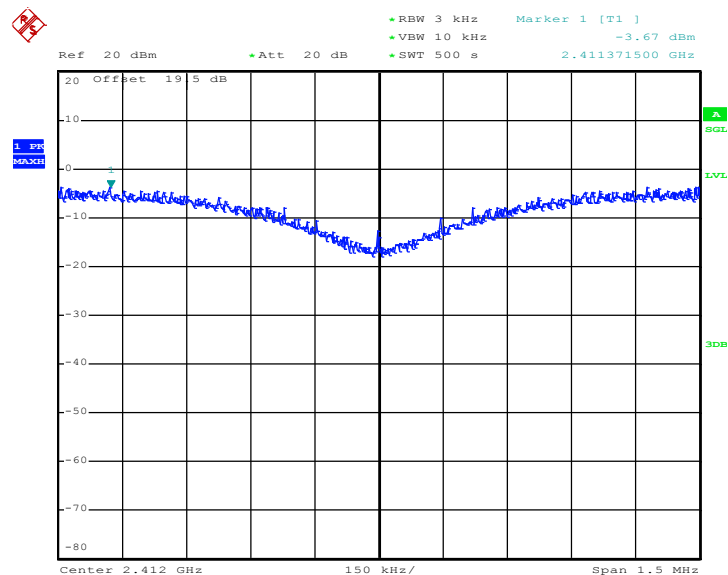
Test Mode :	Mode 13, 14, 15	Temperature :	24~26°C
Test Engineer :	Alan Liu	Relative Humidity :	50~53%

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



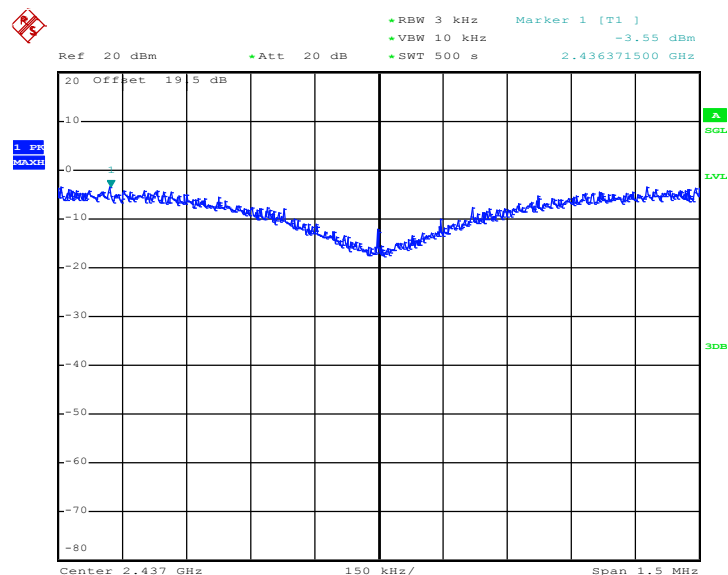
3.5.6 Test Result of Power Spectral Density Plots

Mode 1 : PSD Plot on 802.11b Channel 01

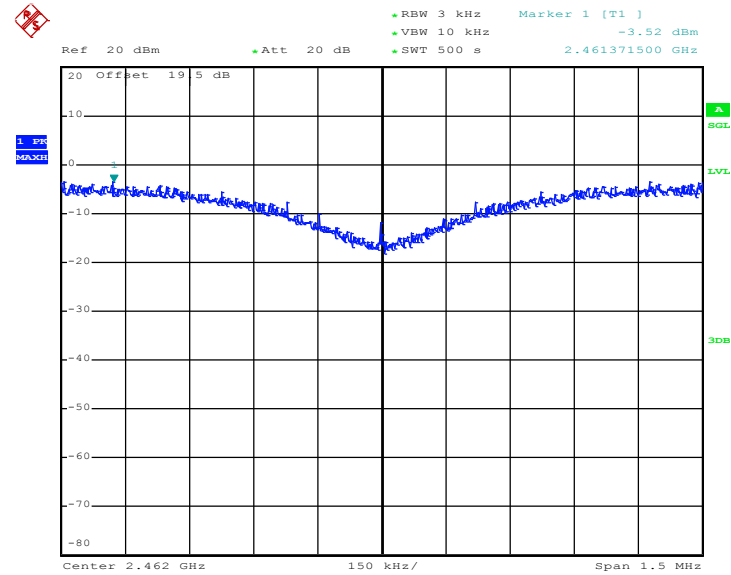


Date: 11.OCT.2011 22:46:21

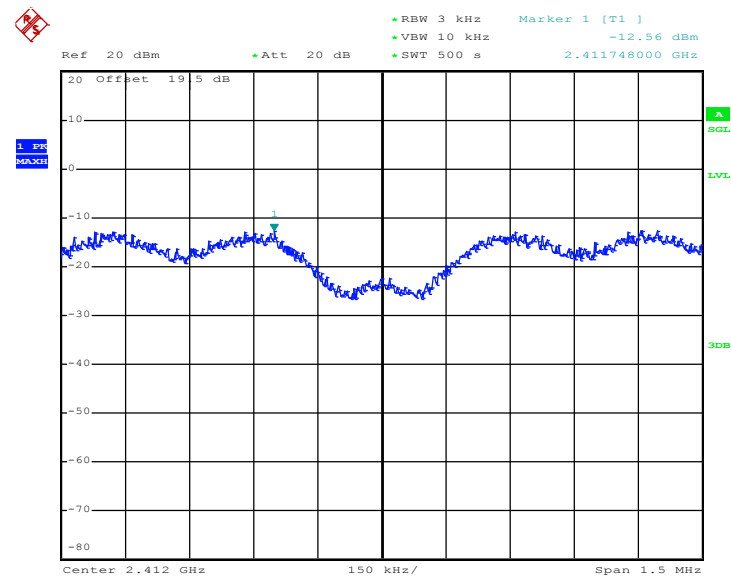
Mode 2 : PSD Plot on 802.11b Channel 06



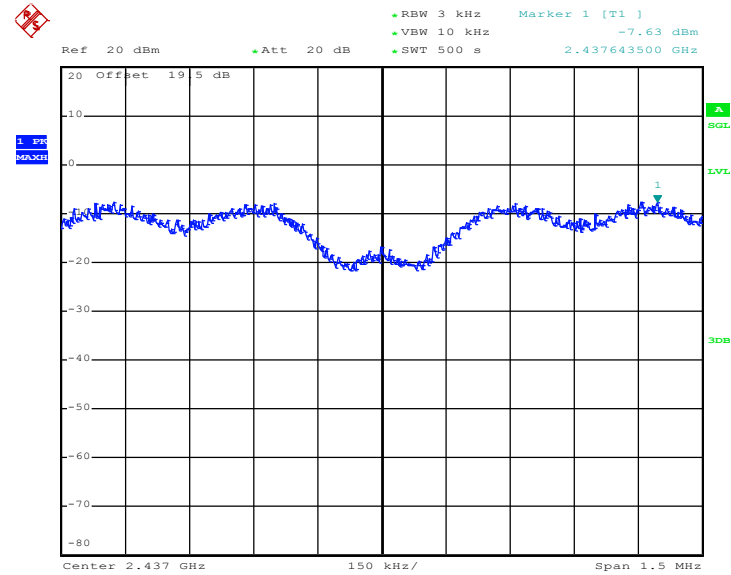
Date: 11.OCT.2011 23:22:54

Mode 3 : PSD Plot on 802.11b Channel 11


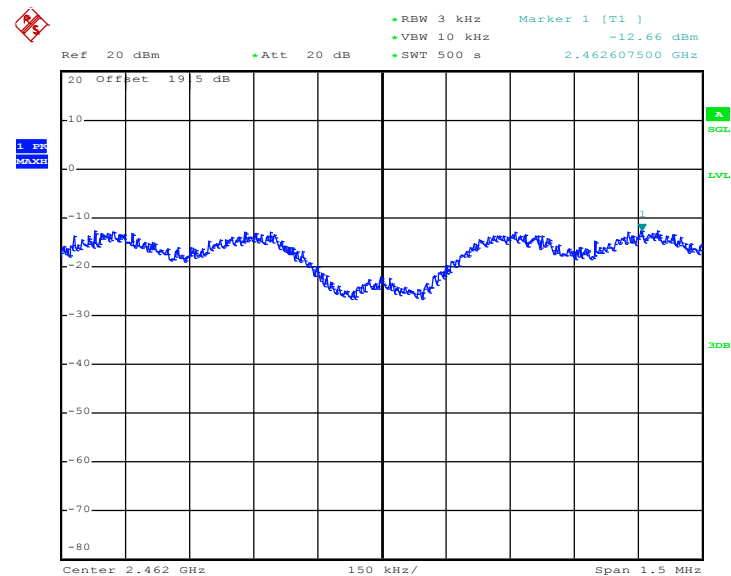
Date: 11.OCT.2011 23:40:03

Mode 4 : PSD Plot on 802.11g Channel 01


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

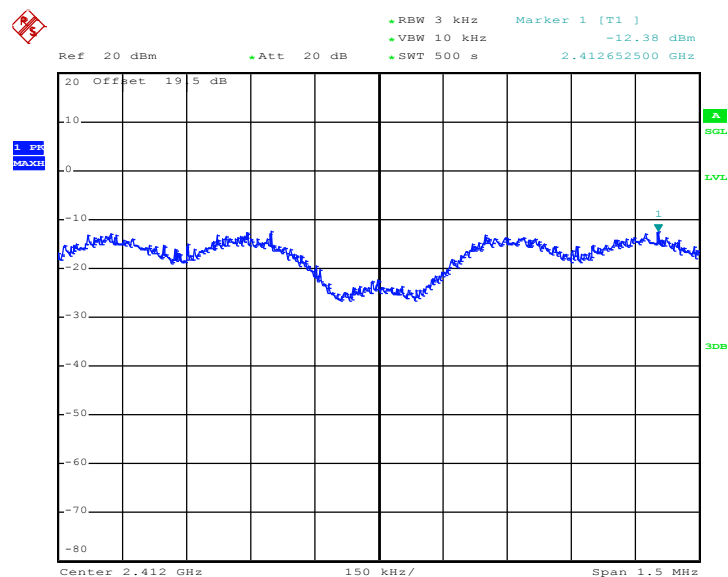
Mode 5 : PSD Plot on 802.11g Channel 06


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

Mode 6 : PSD Plot on 802.11g Channel 11


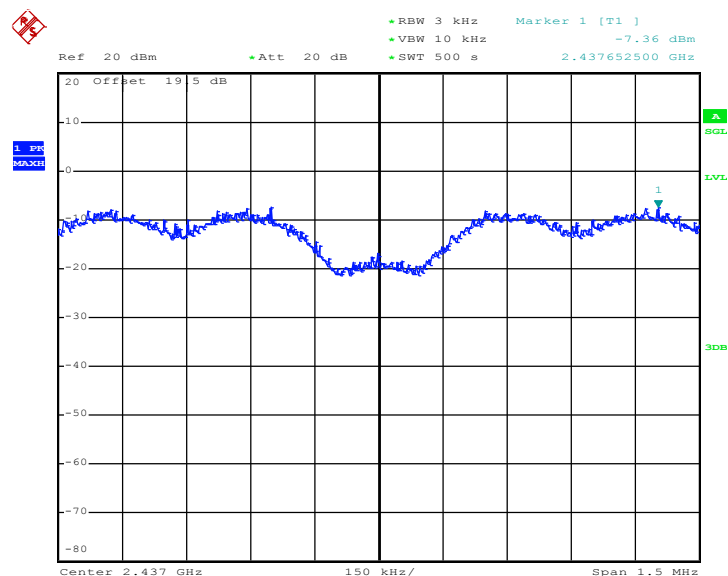
Date: 12.OCT.2011 00:22:14

Mode 7 : PSD Plot on 802.11n Channel 01



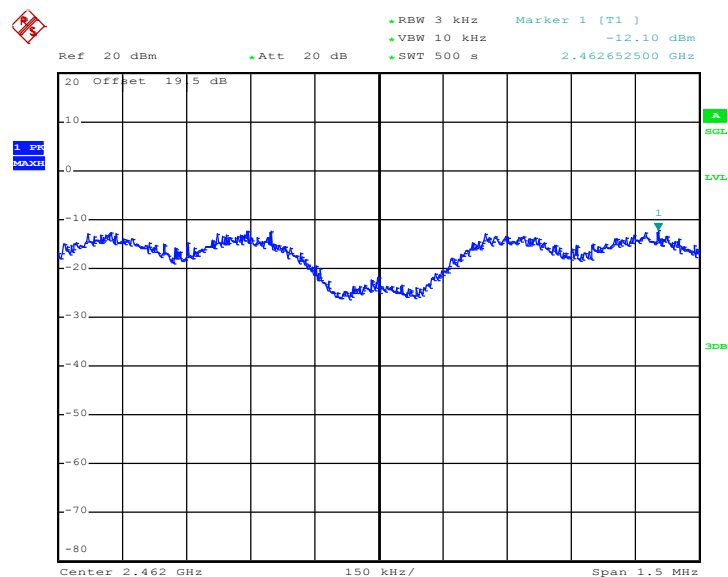
Date: 12.OCT.2011 00:35:54

Mode 8 : PSD Plot on 802.11n Channel 06



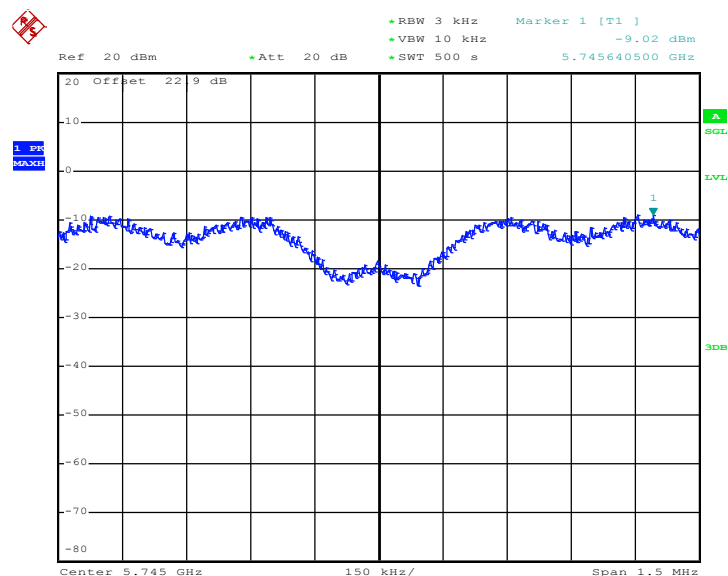
Date: 12.OCT.2011 00:49:21

Mode 9 : PSD Plot on 802.11n Channel 11

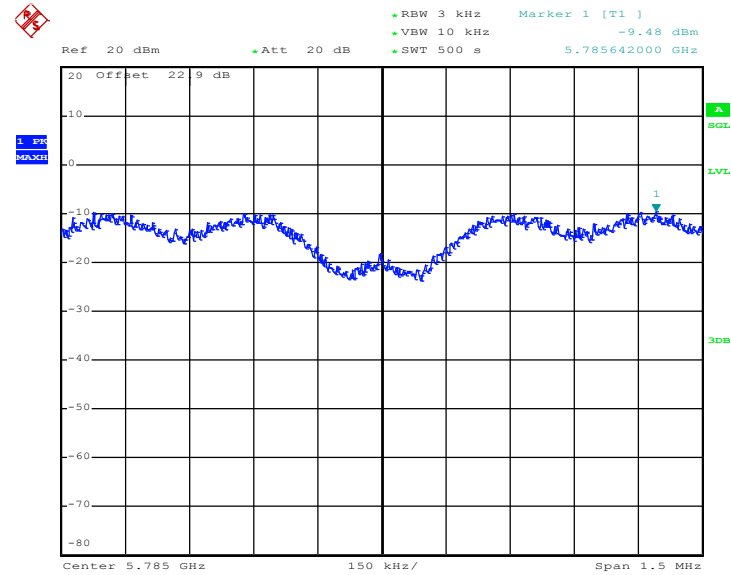


Date: 12.OCT.2011 01:03:48

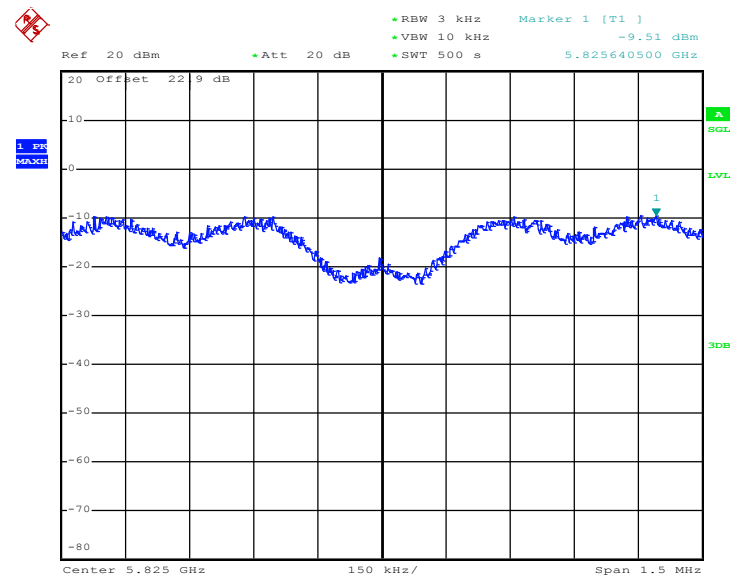
Mode 10: PSD Plot on 802.11a Channel 149



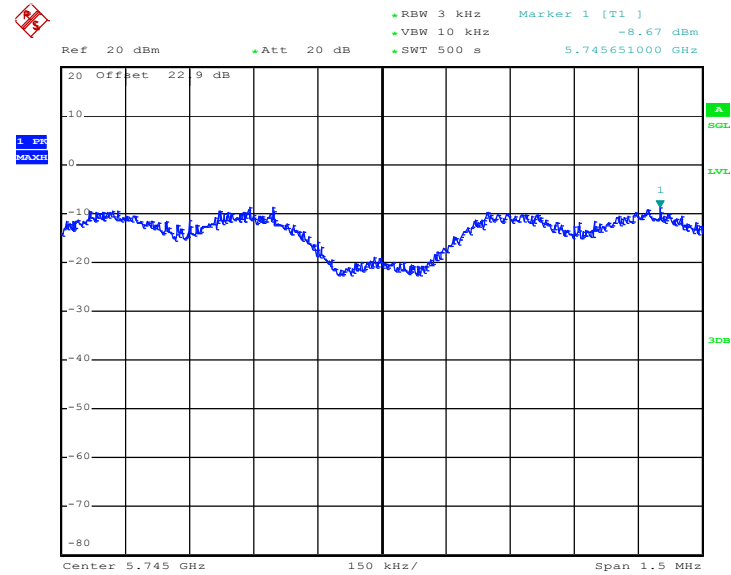
Date: 13.OCT.2011 00:10:07

Mode 11: PSD Plot on 802.11a Channel 157


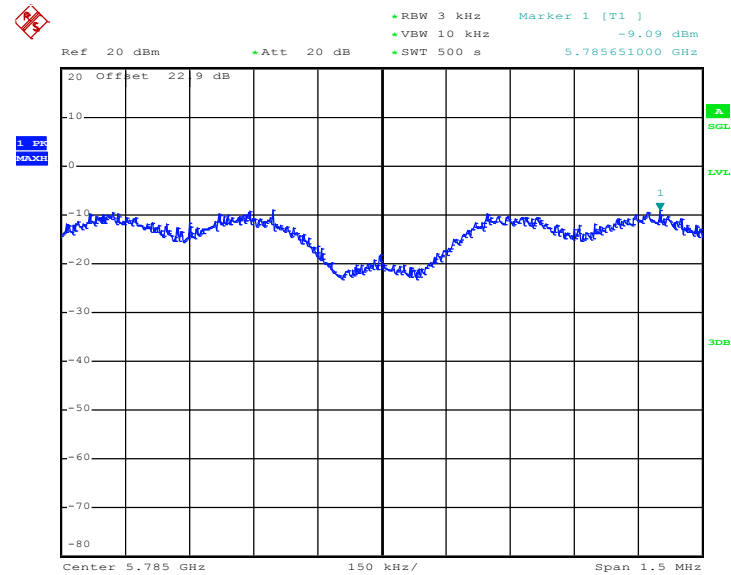
Date: 13.OCT.2011 00:23:10

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


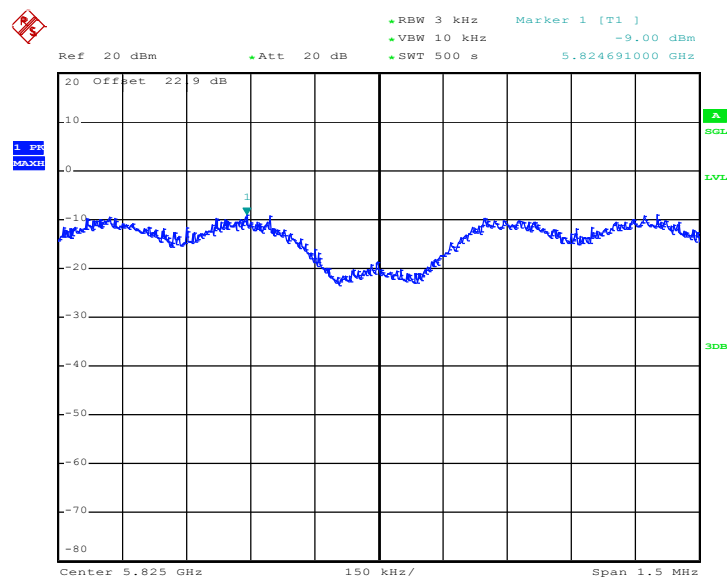
Date: 13.OCT.2011 00:53:28

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.

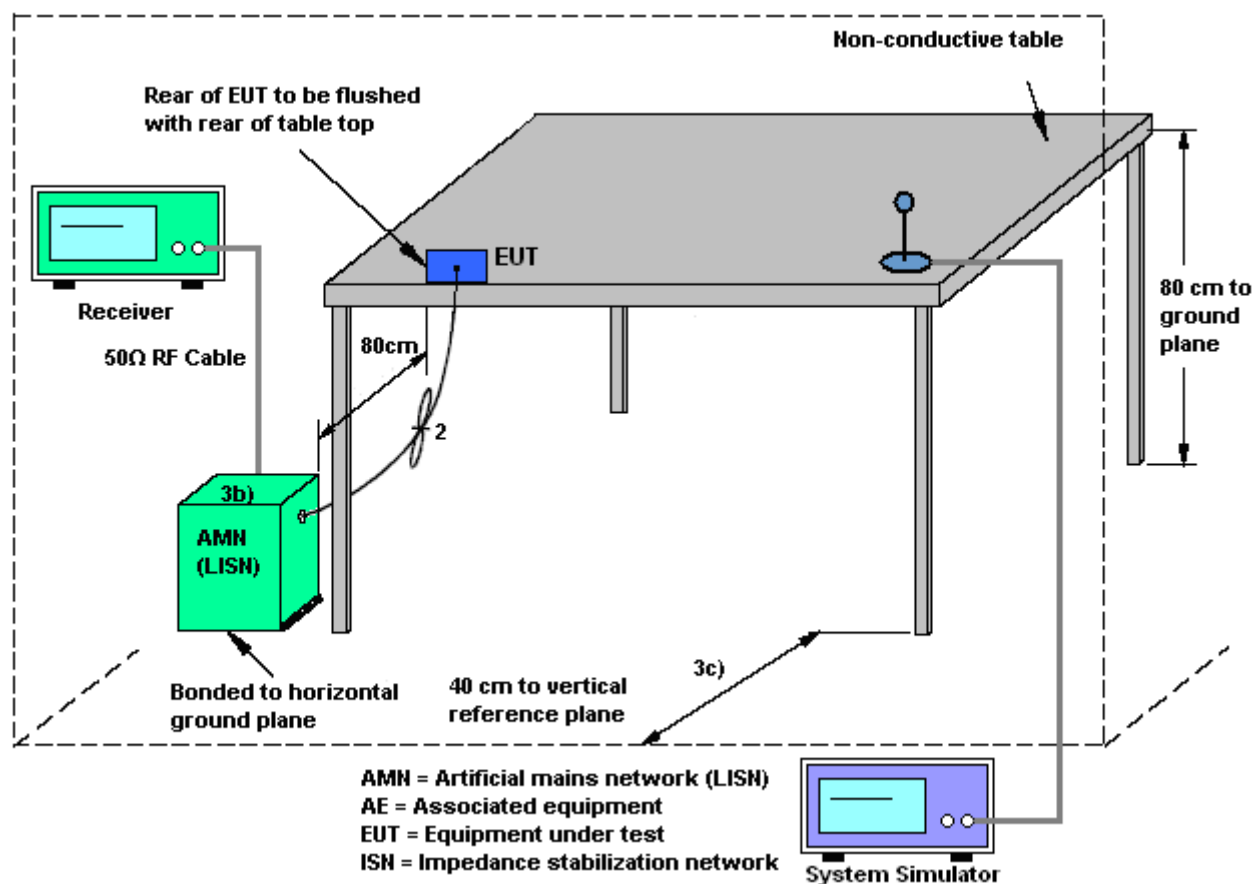
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

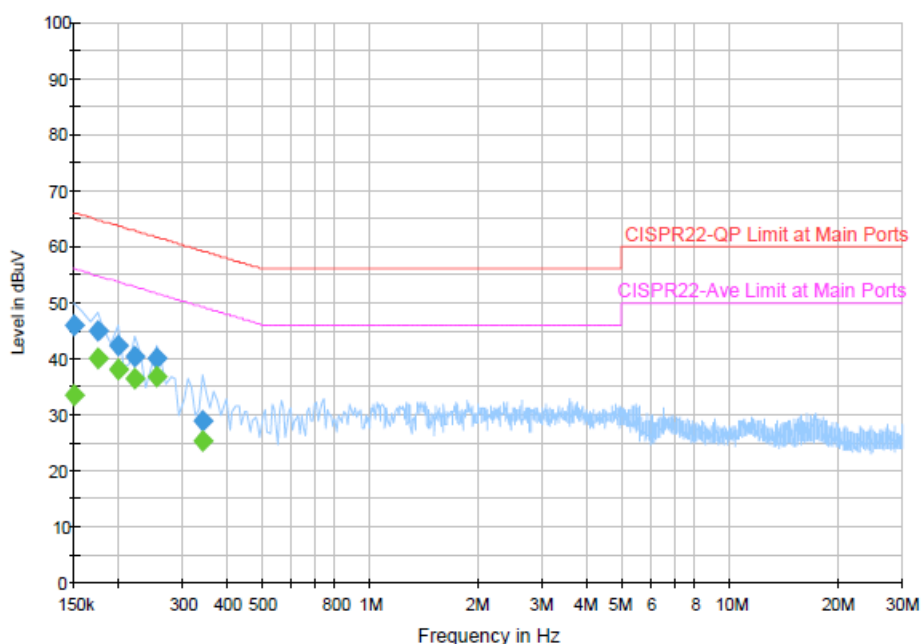
4. The testing follows the guidelines in ANSI C63.4-2003.
5. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
6. Connect EUT to the power mains through a line impedance stabilization network (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 :	21~23℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN Link (5G) + GPS Rx + USB Charging Cable with AC Power + USB Cable (Data Link with Notebook) + Battery 2 for Keypad 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



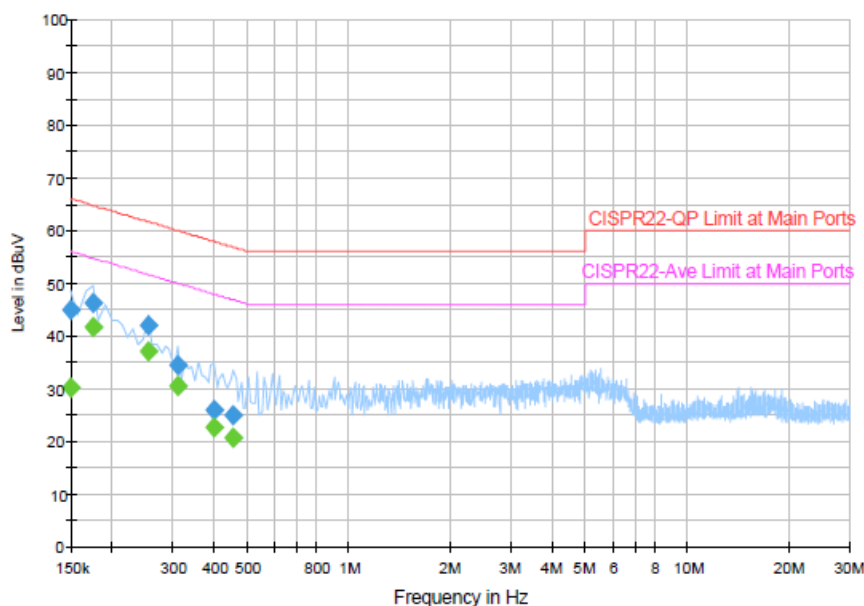
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	45.9	Off	L1	19.4	20.1	66.0
0.174000	44.8	Off	L1	19.4	20.0	64.8
0.198000	42.1	Off	L1	19.4	21.6	63.7
0.222000	40.4	Off	L1	19.4	22.3	62.7
0.254000	40.1	Off	L1	19.4	21.5	61.6
0.342000	29.0	Off	L1	19.4	30.2	59.2

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	33.6	Off	L1	19.4	22.4	56.0
0.174000	39.9	Off	L1	19.4	14.9	54.8
0.198000	38.0	Off	L1	19.4	15.7	53.7
0.222000	36.4	Off	L1	19.4	16.3	52.7
0.254000	36.6	Off	L1	19.4	15.0	51.6
0.342000	25.2	Off	L1	19.4	24.0	49.2

Test Mode :	Mode 2	Temperature :	21~23°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN Link (5G) + GPS Rx + USB Charging Cable with AC Power + USB Cable (Data Link with Notebook) + Battery 2 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	45.0	Off	N	19.4	21.0	66.0
0.174000	46.2	Off	N	19.4	18.6	64.8
0.254000	42.0	Off	N	19.4	19.6	61.6
0.310000	34.5	Off	N	19.4	25.5	60.0
0.398000	26.0	Off	N	19.5	31.9	57.9
0.454000	24.9	Off	N	19.4	31.9	56.8

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	30.1	Off	N	19.4	25.9	56.0
0.174000	41.6	Off	N	19.4	13.2	54.8
0.254000	37.0	Off	N	19.4	14.6	51.6
0.310000	30.6	Off	N	19.4	19.4	50.0
0.398000	22.7	Off	N	19.5	25.2	47.9
0.454000	20.8	Off	N	19.4	26.0	46.8

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

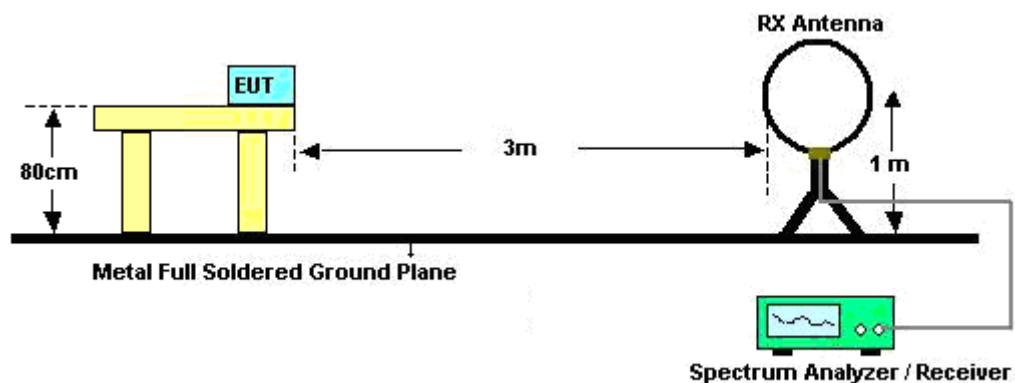
See list of measuring instruments of this test report.

3.7.3 Test Procedures

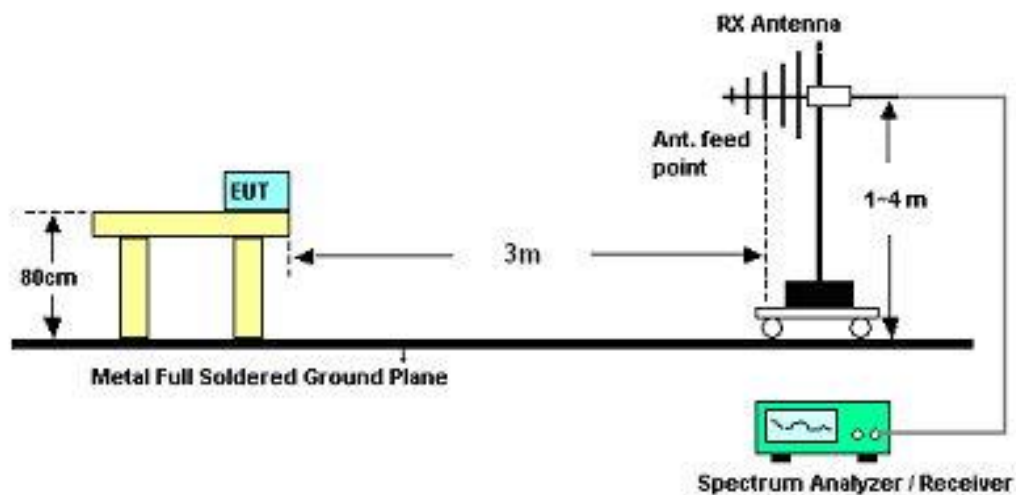
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep =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

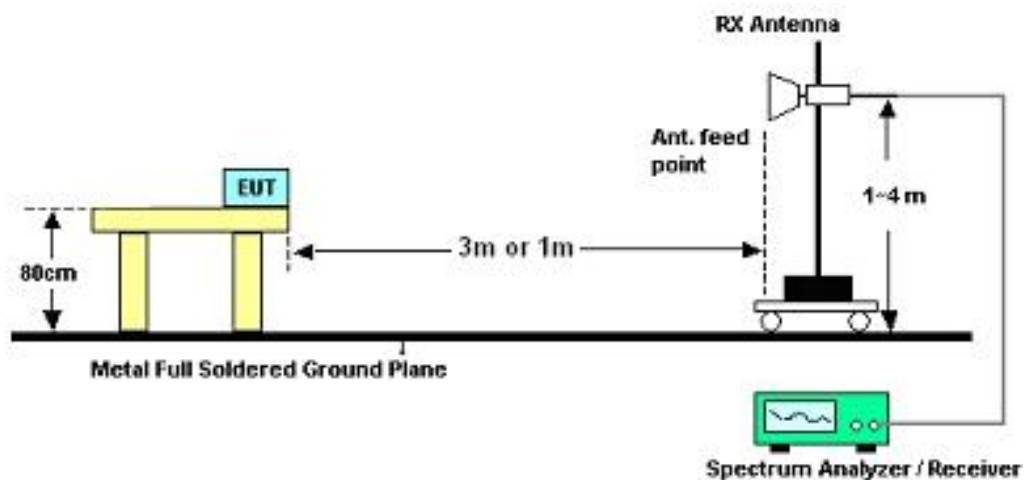
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

Test Engineer :	David Yang	Temperature :	22~24℃	
		Relative Humidity :	48~50%	

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 :	22~24°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
91.02	22.45	-21.05	43.5	44.23	8.79	0.95	31.52	-	-	Peak
216.3	24.44	-21.56	46	44.23	10.27	1.4	31.46	-	-	Peak
240.06	27.99	-18.01	46	45.9	11.98	1.53	31.42	120	83	Peak
374.9	25.94	-20.06	46	39.29	15.81	2.09	31.25	-	-	Peak
416.2	25.72	-20.28	46	37.85	16.83	2.2	31.16	-	-	Peak
890.1	25.9	-20.1	46	29.76	23.52	3.33	30.71	-	-	Peak
2378.21	41.66	-12.34	54	37.48	32.03	5.99	33.84	197	225	Average
2378.21	53.37	-20.63	74	49.19	32.03	5.99	33.84	197	225	Peak
2412	108.28	-	-	104	32.08	6.07	33.87	197	225	Peak
2412	105	-	-	100.72	32.08	6.07	33.87	197	225	Average
2494	38.51	-15.49	54	34.03	32.2	6.18	33.9	197	225	Average
2494	56.97	-17.03	74	52.49	32.2	6.18	33.9	197	225	Peak



Test Mode :	Mode 1	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
40.53	27.71	-12.29	40	46.09	12.5	0.63	31.51	130	60	Peak
106.41	23.32	-20.18	43.5	43.47	10.37	1.03	31.55	-	-	Peak
271.65	28.19	-17.81	46	44.91	13.01	1.64	31.37	-	-	Peak
335.7	27.04	-18.96	46	41.9	14.57	1.87	31.3	-	-	Peak
687.8	23.39	-22.61	46	30.56	20.75	2.91	30.83	-	-	Peak
951.7	25.91	-20.09	46	28.74	24.28	3.46	30.57	-	-	Peak
2384.1	55.01	-18.99	74	50.8	32.03	6.03	33.85	109	73	Peak
2384.1	44.18	-9.82	54	39.97	32.03	6.03	33.85	109	73	Average
2412	108.61	-	-	104.33	32.08	6.07	33.87	109	73	Peak
2412	104.93	-	-	100.65	32.08	6.07	33.87	109	73	Average
2494	38.83	-15.17	54	34.35	32.2	6.18	33.9	109	73	Average
2494	60.22	-13.78	74	55.74	32.2	6.18	33.9	109	73	Peak

Test Mode :	Mode 2	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2518, 2558, and 2598 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
40.53	23.77	-16.23	40	42.15	12.5	0.63	31.51	145	90	Peak
216.3	23.99	-22.01	46	43.78	10.27	1.4	31.46	-	-	Peak
240.06	27.14	-18.86	46	45.05	11.98	1.53	31.42	-	-	Peak
383.3	24.49	-21.51	46	37.56	16.05	2.11	31.23	-	-	Peak
416.2	26.77	-19.23	46	38.9	16.83	2.2	31.16	-	-	Peak
830.6	25.44	-20.56	46	30.11	22.82	3.22	30.71	-	-	Peak
2358	51.35	-22.65	74	47.19	32.01	5.99	33.84	195	227	Peak
2358	36.81	-17.19	54	32.65	32.01	5.99	33.84	195	227	Average
2437	109	-	-	104.64	32.13	6.11	33.88	195	227	Peak
2437	105.16	-	-	100.8	32.13	6.11	33.88	195	227	Average
2484	55.32	-18.68	74	50.86	32.18	6.18	33.9	195	227	Peak
2484	39.79	-14.21	54	35.33	32.18	6.18	33.9	195	227	Average
2518	61.27	-27.73	89	56.78	32.22	6.21	33.94	100	0	Peak
2558	57.33	-31.67	89	52.81	32.27	6.26	34.01	100	0	Peak
2598	54.28	-34.72	89	49.75	32.3	6.31	34.08	100	0	Peak

Test Mode :	Mode 2	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2518, 2558, and 2596 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
40.26	29.08	-10.92	40	47.46	12.5	0.63	31.51	150	110	Peak
106.41	22.2	-21.3	43.5	42.35	10.37	1.03	31.55	-	-	Peak
262.74	26.23	-19.77	46	43.16	12.87	1.61	31.41	-	-	Peak
377.7	24.97	-21.03	46	38.25	15.87	2.09	31.24	-	-	Peak
808.9	24.85	-21.15	46	29.81	22.57	3.16	30.69	-	-	Peak
937	26.34	-19.66	46	29.42	24.09	3.43	30.6	-	-	Peak
2390	51.03	-22.97	74	46.79	32.06	6.03	33.85	107	71	Peak
2390	38.78	-15.22	54	34.54	32.06	6.03	33.85	107	71	Average
2437	109.19	-	-	104.83	32.13	6.11	33.88	107	71	Peak
2437	105.35	-	-	100.99	32.13	6.11	33.88	107	71	Average
2484	40.39	-13.61	54	35.93	32.18	6.18	33.9	107	71	Average
2484	53.98	-20.02	74	49.52	32.18	6.18	33.9	107	71	Peak
2518	60.34	-28.85	89.19	55.85	32.22	6.21	33.94	100	0	Peak
2558	59.24	-29.95	89.19	54.72	32.27	6.26	34.01	100	0	Peak
2596	64.48	-24.71	89.19	59.94	32.3	6.28	34.04	100	0	Peak

Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
89.13	26.1	-17.4	43.5	48.16	8.53	0.93	31.52	170	132	Peak
216.3	25.5	-20.5	46	45.29	10.27	1.4	31.46	-	-	Peak
240.06	26.64	-19.36	46	44.55	11.98	1.53	31.42	-	-	Peak
363	24.97	-21.03	46	38.75	15.42	2.07	31.27	-	-	Peak
416.2	25.78	-20.22	46	37.91	16.83	2.2	31.16	-	-	Peak
934.9	26.32	-19.68	46	29.44	24.07	3.42	30.61	-	-	Peak
2382	52.35	-21.65	74	48.14	32.03	6.03	33.85	131	223	Peak
2382	34.47	-19.53	54	30.26	32.03	6.03	33.85	131	223	Average
2462	108.98	-	-	104.58	32.15	6.14	33.89	131	223	Peak
2462	105.19	-	-	100.79	32.15	6.14	33.89	131	223	Average
2483.5	40.89	-13.11	54	36.43	32.18	6.18	33.9	131	223	Average
2483.5	51.73	-22.27	74	47.27	32.18	6.18	33.9	131	223	Peak

Test Mode :	Mode 3	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 2582 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
38.37	26.02	-13.98	40	43.48	13.43	0.61	31.5	112	64	Peak
106.41	22.97	-20.53	43.5	43.12	10.37	1.03	31.55	-	-	Peak
261.93	24.43	-21.57	46	41.38	12.86	1.6	31.41	-	-	Peak
318.9	24.01	-21.99	46	39.46	14.06	1.81	31.32	-	-	Peak
710.9	23.57	-22.43	46	30.33	21.06	2.97	30.79	-	-	Peak
892.9	26.11	-19.89	46	29.93	23.55	3.33	30.7	-	-	Peak
2390	46.46	-27.54	74	42.22	32.06	6.03	33.85	105	64	Peak
2390	34.51	-19.49	54	30.27	32.06	6.03	33.85	105	64	Average
2462	110.21	-	-	105.81	32.15	6.14	33.89	105	64	Peak
2462	106.35	-	-	101.95	32.15	6.14	33.89	105	64	Average
2483.5	42.29	-11.71	54	37.83	32.18	6.18	33.9	105	64	Average
2483.5	54.74	-19.26	74	50.28	32.18	6.18	33.9	105	64	Peak
2582	59.55	-30.66	90.21	55.03	32.28	6.28	34.04	100	0	Peak

Test Mode :	Mode 4	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 2574 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
91.02	23.37	-20.13	43.5	45.15	8.79	0.95	31.52	-	-	Peak
216.3	24.97	-21.03	46	44.76	10.27	1.4	31.46	-	-	Peak
240.06	27.29	-18.71	46	45.2	11.98	1.53	31.42	112	103	Peak
374.2	25.25	-20.75	46	38.63	15.78	2.09	31.25	-	-	Peak
416.2	24.81	-21.19	46	36.94	16.83	2.2	31.16	-	-	Peak
864.9	25.78	-20.22	46	29.99	23.22	3.29	30.72	-	-	Peak
2388.66	40.15	-13.85	54	35.91	32.06	6.03	33.85	100	228	Average
2388.66	56.35	-17.65	74	52.11	32.06	6.03	33.85	100	228	Peak
2412	94.9	-	-	90.62	32.08	6.07	33.87	100	228	Average
2412	105.02	-	-	100.74	32.08	6.07	33.87	100	228	Peak
2494	53.13	-20.87	74	48.65	32.2	6.18	33.9	100	228	Peak
2494	35.28	-18.72	54	30.8	32.2	6.18	33.9	100	228	Average
2574	54.89	-30.13	85.02	50.37	32.28	6.28	34.04	100	0	Peak



Test Mode :	Mode 4	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2412 MHz is Fundamental Signals which can be ignored. 2. 2580 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
39.45	25.13	-14.87	40	43.06	12.96	0.62	31.51	154	132	Peak
118.29	23.61	-19.89	43.5	42.72	11.36	1.09	31.56	-	-	Peak
245.73	22.61	-23.39	46	40.17	12.33	1.53	31.42	-	-	Peak
374.9	23.58	-22.42	46	36.93	15.81	2.09	31.25	-	-	Peak
836.2	25.98	-20.02	46	30.58	22.89	3.23	30.72	-	-	Peak
928.6	26.04	-19.96	46	29.27	23.98	3.41	30.62	-	-	Peak
2389.61	40.96	-13.04	54	36.72	32.06	6.03	33.85	108	73	Average
2389.61	57.13	-16.87	74	52.89	32.06	6.03	33.85	108	73	Peak
2412	105.42	-	-	101.14	32.08	6.07	33.87	108	73	Peak
2412	94.08	-	-	89.8	32.08	6.07	33.87	108	73	Average
2494	36.07	-17.93	54	31.59	32.2	6.18	33.9	108	73	Average
2494	55.21	-18.79	74	50.73	32.2	6.18	33.9	108	73	Peak
2580	58.8	-26.62	85.42	54.28	32.28	6.28	34.04	100	0	Peak

Test Mode :	Mode 5	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2604 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
40.26	21.06	-18.94	40	39.44	12.5	0.63	31.51	130	215	Peak
91.02	21.78	-21.72	43.5	43.56	8.79	0.95	31.52	-	-	Peak
216.3	24.41	-21.59	46	44.2	10.27	1.4	31.46	-	-	Peak
374.9	26.69	-19.31	46	40.04	15.81	2.09	31.25	-	-	Peak
416.2	25.75	-20.25	46	37.88	16.83	2.2	31.16	-	-	Peak
791.4	24.47	-21.53	46	29.69	22.33	3.13	30.68	-	-	Peak
2388	52.16	-21.84	74	47.92	32.06	6.03	33.85	100	214	Peak
2388	37.2	-16.8	54	32.96	32.06	6.03	33.85	100	214	Average
2437	107.46	-	-	103.1	32.13	6.11	33.88	100	214	Peak
2437	96.64	-	-	92.28	32.13	6.11	33.88	100	214	Average
2484	52.72	-21.28	74	48.26	32.18	6.18	33.9	100	214	Peak
2484	39.4	-14.6	54	34.94	32.18	6.18	33.9	100	214	Average
2604	56.66	-30.8	87.46	52.13	32.3	6.31	34.08	100	0	Peak



Test Mode :	Mode 5	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
39.45	24.16	-15.84	40	42.09	12.96	0.62	31.51	112	190	Peak
85.62	23.14	-16.86	40	45.82	7.95	0.91	31.54	-	-	Peak
253.29	21.3	-24.7	46	38.44	12.72	1.55	31.41	-	-	Peak
372.1	23.36	-22.64	46	36.81	15.72	2.08	31.25	-	-	Peak
738.2	23.69	-22.31	46	29.9	21.49	3.03	30.73	-	-	Peak
797.7	23.99	-22.01	46	29.11	22.42	3.14	30.68	-	-	Peak
2390	53.31	-20.69	74	49.07	32.06	6.03	33.85	128	352	Peak
2390	38.77	-15.23	54	34.53	32.06	6.03	33.85	128	352	Average
2437	108.63	-	-	104.27	32.13	6.11	33.88	128	352	Peak
2437	98.43	-	-	94.07	32.13	6.11	33.88	128	352	Average
2484	40.81	-13.19	54	36.35	32.18	6.18	33.9	128	352	Average
2484	54.39	-19.61	74	49.93	32.18	6.18	33.9	128	352	Peak



Test Mode :	Mode 6	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
91.02	22.7	-20.8	43.5	44.48	8.79	0.95	31.52	-	-	Peak
216.3	23.45	-22.55	46	43.24	10.27	1.4	31.46	-	-	Peak
240.06	26.43	-19.57	46	44.34	11.98	1.53	31.42	114	96	Peak
363	24.87	-21.13	46	38.65	15.42	2.07	31.27	-	-	Peak
416.2	25.13	-20.87	46	37.26	16.83	2.2	31.16	-	-	Peak
841.8	25.81	-20.19	46	30.33	22.95	3.25	30.72	-	-	Peak
2382	33.88	-20.12	54	29.67	32.03	6.03	33.85	131	223	Average
2382	48.7	-25.3	74	44.49	32.03	6.03	33.85	131	223	Peak
2462	94.09	-	-	89.69	32.15	6.14	33.89	131	223	Average
2462	105.16	-	-	100.76	32.15	6.14	33.89	131	223	Peak
2483.5	41.03	-12.97	54	36.57	32.18	6.18	33.9	131	223	Average
2483.5	56.37	-17.63	74	51.91	32.18	6.18	33.9	131	223	Peak

Test Mode :	Mode 6	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 2542 and 2628 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
106.41	22.17	-21.33	43.5	42.32	10.37	1.03	31.55	-	-	Peak
177.42	20.26	-23.24	43.5	41.29	9.26	1.24	31.53	-	-	Peak
253.29	27.25	-18.75	46	44.39	12.72	1.55	31.41	130	210	Peak
374.2	25.38	-20.62	46	38.76	15.78	2.09	31.25	-	-	Peak
739.6	23.31	-22.69	46	29.48	21.52	3.04	30.73	-	-	Peak
920.9	25.74	-20.26	46	29.11	23.89	3.39	30.65	-	-	Peak
2382	51.04	-22.96	74	46.83	32.03	6.03	33.85	127	344	Peak
2382	34.32	-19.68	54	30.11	32.03	6.03	33.85	127	344	Average
2462	107.15	-	-	102.75	32.15	6.14	33.89	127	344	Peak
2462	95.7	-	-	91.3	32.15	6.14	33.89	127	344	Average
2483.5	43.3	-10.7	54	38.84	32.18	6.18	33.9	127	344	Average
2483.5	61.1	-12.9	74	56.64	32.18	6.18	33.9	127	344	Peak
2542	56.75	-30.4	87.15	52.24	32.25	6.23	33.97	100	0	Peak
2628	55.39	-31.76	87.15	50.84	32.33	6.33	34.11	100	0	Peak



Test Mode :	Mode 7	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
89.13	22.25	-21.25	43.5	44.31	8.53	0.93	31.52	-	-	Peak
207.93	22.62	-20.88	43.5	43.09	9.65	1.35	31.47	-	-	Peak
240.06	26.81	-19.19	46	44.72	11.98	1.53	31.42	114	75	Peak
372.1	24.73	-21.27	46	38.18	15.72	2.08	31.25	-	-	Peak
416.2	25.82	-20.18	46	37.95	16.83	2.2	31.16	-	-	Peak
705.3	23.02	-22.98	46	29.91	20.97	2.95	30.81	-	-	Peak
2389.42	40.38	-13.62	54	36.14	32.06	6.03	33.85	100	230	Average
2389.42	55.77	-18.23	74	51.53	32.06	6.03	33.85	100	230	Peak
2412	105.67	-	-	101.39	32.08	6.07	33.87	100	230	Peak
2412	95	-	-	90.72	32.08	6.07	33.87	100	230	Average
2494	35.6	-18.4	54	31.12	32.2	6.18	33.9	100	230	Average
2494	55.58	-18.42	74	51.1	32.2	6.18	33.9	100	230	Peak



Test Mode :	Mode 7	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	48~50%
Test Engineer :	David Yang	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
35.13	27.65	-12.35	40	43.21	15.33	0.58	31.47	145	167	Peak
124.77	20.78	-22.72	43.5	39.66	11.56	1.12	31.56	-	-	Peak
250.05	24.35	-21.65	46	41.56	12.67	1.53	31.41	-	-	Peak
316.1	21.51	-24.49	46	37.06	13.97	1.8	31.32	-	-	Peak
382.6	23.36	-22.64	46	36.43	16.05	2.11	31.23	-	-	Peak
772.5	23.86	-22.14	46	29.42	22.03	3.1	30.69	-	-	Peak
2389.99	41.41	-12.59	54	37.17	32.06	6.03	33.85	109	72	Average
2389.99	58.26	-15.74	74	54.02	32.06	6.03	33.85	109	72	Peak
2412	106.16	-	-	101.88	32.08	6.07	33.87	109	72	Peak
2412	94.97	-	-	90.69	32.08	6.07	33.87	109	72	Average
2492	35.83	-18.17	54	31.35	32.2	6.18	33.9	109	72	Average
2492	55.66	-18.34	74	51.18	32.2	6.18	33.9	109	72	Peak

Test Mode :	Mode 8	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2516, 2554, and 2604 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
89.13	22.34	-21.16	43.5	44.4	8.53	0.93	31.52	-	-	Peak
216.3	24.98	-21.02	46	44.77	10.27	1.4	31.46	-	-	Peak
240.06	26.2	-19.8	46	44.11	11.98	1.53	31.42	-	-	Peak
377	26.88	-19.12	46	40.16	15.87	2.09	31.24	130	174	Peak
416.2	25.27	-20.73	46	37.4	16.83	2.2	31.16	-	-	Peak
758.5	23.54	-22.46	46	29.36	21.81	3.07	30.7	-	-	Peak
2390	55.73	-18.27	74	51.49	32.06	6.03	33.85	194	229	Peak
2390	38.38	-15.62	54	34.14	32.06	6.03	33.85	194	229	Average
2437	96.83	-	-	92.47	32.13	6.11	33.88	194	229	Average
2437	107.32	-	-	102.96	32.13	6.11	33.88	194	229	Peak
2484	55.71	-18.29	74	51.25	32.18	6.18	33.9	194	229	Peak
2484	41.01	-12.99	54	36.55	32.18	6.18	33.9	194	229	Average
2516	57.16	-30.16	87.32	52.67	32.22	6.21	33.94	100	0	Peak
2554	55.78	-31.54	87.32	51.28	32.25	6.26	34.01	100	0	Peak
2604	58.44	-28.88	87.32	53.91	32.3	6.31	34.08	100	0	Peak

Test Mode :	Mode 8	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 2518, 2556, and 2604 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
39.18	23.61	-16.39	40	41.08	13.43	0.61	31.51	110	198	Peak
106.41	21.31	-22.19	43.5	41.46	10.37	1.03	31.55	-	-	Peak
216.3	20.19	-25.81	46	39.98	10.27	1.4	31.46	-	-	Peak
374.2	25.02	-20.98	46	38.4	15.78	2.09	31.25	-	-	Peak
688.5	22.58	-23.42	46	29.73	20.76	2.92	30.83	-	-	Peak
822.2	24.7	-21.3	46	29.47	22.73	3.2	30.7	-	-	Peak
2390	56.64	-17.36	74	52.4	32.06	6.03	33.85	100	65	Peak
2390	36.9	-17.1	54	32.66	32.06	6.03	33.85	100	65	Average
2437	108.47	-	-	104.11	32.13	6.11	33.88	100	65	Peak
2437	97.2	-	-	92.84	32.13	6.11	33.88	100	65	Average
2484	60.82	-13.18	74	56.36	32.18	6.18	33.9	100	65	Peak
2484	43.06	-10.94	54	38.6	32.18	6.18	33.9	100	65	Average
2518	60.47	-28	88.47	55.98	32.22	6.21	33.94	100	0	Peak
2556	59.05	-29.42	88.47	54.53	32.27	6.26	34.01	100	0	Peak
2604	64.38	-24.09	88.47	59.85	32.3	6.31	34.08	100	0	Peak

Test Mode :	Mode 9	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 2542 and 2580 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
89.13	22.22	-21.28	43.5	44.28	8.53	0.93	31.52	-	-	Peak
216.3	24.2	-21.8	46	43.99	10.27	1.4	31.46	-	-	Peak
240.06	25.47	-20.53	46	43.38	11.98	1.53	31.42	-	-	Peak
372.1	27.02	-18.98	46	40.47	15.72	2.08	31.25	105	80	Peak
615	21.48	-24.52	46	29.73	19.93	2.73	30.91	-	-	Peak
733.3	22.77	-23.23	46	29.08	21.41	3.02	30.74	-	-	Peak
2380	49.2	-24.8	74	44.99	32.03	6.03	33.85	130	223	Peak
2380	34.26	-19.74	54	30.05	32.03	6.03	33.85	130	223	Average
2462	105.86	-	-	101.46	32.15	6.14	33.89	130	223	Peak
2462	94.42	-	-	90.02	32.15	6.14	33.89	130	223	Average
2483.5	59.49	-14.51	74	55.03	32.18	6.18	33.9	130	223	Peak
2483.5	43.16	-10.84	54	38.7	32.18	6.18	33.9	130	223	Average
2542	55.69	-30.17	85.86	51.18	32.25	6.23	33.97	100	0	Peak
2580	51.96	-33.9	85.86	47.44	32.28	6.28	34.04	100	0	Peak

Test Mode :	Mode 9	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 2462 MHz is Fundamental Signals which can be ignored. 2. 2540, 2582, and 2628 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
40.26	23.67	-16.33	40	42.05	12.5	0.63	31.51	147	203	Peak
106.41	23.29	-20.21	43.5	43.44	10.37	1.03	31.55	-	-	Peak
282.18	26.29	-19.71	46	42.8	13.18	1.65	31.34	-	-	Peak
382.6	22.52	-23.48	46	35.59	16.05	2.11	31.23	-	-	Peak
691.3	22.56	-23.44	46	29.68	20.79	2.92	30.83	-	-	Peak
771.8	23.58	-22.42	46	29.14	22.03	3.1	30.69	-	-	Peak
2382	46.29	-27.71	74	42.08	32.03	6.03	33.85	100	66	Peak
2382	33.83	-20.17	54	29.62	32.03	6.03	33.85	100	66	Average
2462	94.76	-	-	90.36	32.15	6.14	33.89	100	66	Average
2462	106.29	-	-	101.89	32.15	6.14	33.89	100	66	Peak
2484.61	45.93	-8.07	54	41.47	32.18	6.18	33.9	100	66	Average
2484.61	62.64	-11.36	74	58.18	32.18	6.18	33.9	100	66	Peak
2540	55.99	-30.3	86.29	51.48	32.25	6.23	33.97	100	0	Peak
2582	55.96	-30.33	86.29	51.44	32.28	6.28	34.04	100	0	Peak
2628	58.87	-27.42	86.29	54.32	32.33	6.33	34.11	100	0	Peak

Test Mode :	Mode 10	Temperature :	22~24°C
Test Channel :	149	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 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
42.69	22.48	-17.52	40	41.76	11.59	0.64	31.51	130	116	Peak
89.13	23.64	-19.86	43.5	45.7	8.53	0.93	31.52	-	-	Peak
216.3	23.42	-22.58	46	43.21	10.27	1.4	31.46	-	-	Peak
377	26.07	-19.93	46	39.35	15.87	2.09	31.24	-	-	Peak
713.7	23.26	-22.74	46	29.98	21.1	2.97	30.79	-	-	Peak
808.2	24.84	-21.16	46	29.81	22.56	3.16	30.69	-	-	Peak
5725	75.54	-8.3	83.84	63.99	34.81	9.92	33.18	140	221	Peak
5745	103.84	-	-	92.3	34.84	9.91	33.21	140	221	Peak
5745	94.34	-	-	82.8	34.84	9.91	33.21	140	221	Average
5850	52.02	-31.82	83.84	40.49	34.98	9.87	33.32	140	221	Peak

Test Mode :	Mode 10	Temperature :	22~24°C
Test Channel :	149	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 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
40.53	23.9	-16.1	40	42.28	12.5	0.63	31.51	110	186	Peak
106.41	23.55	-19.95	43.5	43.7	10.37	1.03	31.55	-	-	Peak
246.81	22.31	-23.69	46	39.73	12.46	1.53	31.41	-	-	Peak
382.6	24.92	-21.08	46	37.99	16.05	2.11	31.23	-	-	Peak
708.1	23.03	-22.97	46	29.86	21.01	2.96	30.8	-	-	Peak
778.1	23.71	-22.29	46	29.18	22.12	3.1	30.69	-	-	Peak
5725	84.42	-7.35	91.77	72.87	34.81	9.92	33.18	114	256	Peak
5745	111.77	-	-	100.23	34.84	9.91	33.21	114	256	Peak
5745	101.59	-	-	90.05	34.84	9.91	33.21	114	256	Average
5850	51.88	-39.89	91.77	40.35	34.98	9.87	33.32	114	256	Peak

Test Mode :	Mode 11	Temperature :	22~24°C
Test Channel :	157	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 5785 MHz is Fundamental Signals which can be ignored. 2. 5725 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
89.13	21.95	-21.55	43.5	44.01	8.53	0.93	31.52	-	-	Peak
216.3	24.57	-21.43	46	44.36	10.27	1.4	31.46	-	-	Peak
240.06	26.03	-19.97	46	43.94	11.98	1.53	31.42	-	-	Peak
369.3	27.22	-18.78	46	40.77	15.63	2.08	31.26	135	80	Peak
559.7	20.57	-25.43	46	29.82	19.14	2.58	30.97	-	-	Peak
759.9	22.85	-23.15	46	28.64	21.83	3.08	30.7	-	-	Peak
5725	53.15	-31.61	84.76	41.6	34.81	9.92	33.18	100	217	Peak
5785	104.76	-	-	93.2	34.89	9.9	33.23	100	217	Peak
5785	94.53	-	-	82.97	34.89	9.9	33.23	100	217	Average
5850	53.06	-31.7	84.76	41.53	34.98	9.87	33.32	100	217	Peak

Test Mode :	Mode 11	Temperature :	22~24°C
Test Channel :	157	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 5785 MHz is Fundamental Signals which can be ignored. 2. 5725 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
41.34	25.24	-14.76	40	44.08	12.04	0.63	31.51	147	112	Peak
106.41	23.23	-20.27	43.5	43.38	10.37	1.03	31.55	-	-	Peak
258.42	25.06	-20.94	46	42.11	12.79	1.58	31.42	-	-	Peak
379.8	22.63	-23.37	46	35.81	15.96	2.1	31.24	-	-	Peak
645.8	22.05	-23.95	46	29.81	20.28	2.83	30.87	-	-	Peak
716.5	23.06	-22.94	46	29.71	21.15	2.98	30.78	-	-	Peak
5725	56.08	-35.11	91.19	44.53	34.81	9.92	33.18	100	255	Peak
5785	111.19	-	-	99.63	34.89	9.9	33.23	100	255	Peak
5785	101.05	-	-	89.49	34.89	9.9	33.23	100	255	Average
5850	55.7	-35.49	91.19	44.17	34.98	9.87	33.32	100	255	Peak

Test Mode :	Mode 12	Temperature :	22~24°C
Test Channel :	165	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 5825 MHz is Fundamental Signals which can be ignored. 2. 5725 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
91.02	27.07	-16.43	43.5	48.85	8.79	0.95	31.52	110	172	Peak
207.93	21.95	-21.55	43.5	42.42	9.65	1.35	31.47	-	-	Peak
240.06	25.85	-20.15	46	43.76	11.98	1.53	31.42	-	-	Peak
374.2	25.72	-20.28	46	39.1	15.78	2.09	31.25	-	-	Peak
467.3	22.29	-23.71	46	33.34	17.68	2.34	31.07	-	-	Peak
691.3	22.16	-23.84	46	29.28	20.79	2.92	30.83	-	-	Peak
5725	52.51	-32.37	84.88	40.96	34.81	9.92	33.18	100	208	Peak
5825	104.88	-	-	93.33	34.96	9.88	33.29	100	208	Peak
5825	94.68	-	-	83.13	34.96	9.88	33.29	100	208	Average
5850	62.32	-22.56	84.88	50.79	34.98	9.87	33.32	100	208	Peak

Test Mode :	Mode 12	Temperature :	22~24°C
Test Channel :	165	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 5825 MHz is Fundamental Signals which can be ignored. 2. 5725 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
40.26	24.45	-15.55	40	42.83	12.5	0.63	31.51	144	120	Peak
106.41	23.67	-19.83	43.5	43.82	10.37	1.03	31.55	-	-	Peak
246.54	28.63	-17.37	46	46.11	12.4	1.53	31.41	-	-	Peak
385.4	22.54	-23.46	46	35.54	16.11	2.11	31.22	-	-	Peak
651.4	22.13	-23.87	46	29.81	20.35	2.84	30.87	-	-	Peak
744.5	23.5	-22.5	46	29.56	21.6	3.05	30.71	-	-	Peak
5725	53.49	-36.87	90.36	41.94	34.81	9.92	33.18	113	241	Peak
5825	110.36	-	-	98.81	34.96	9.88	33.29	113	241	Peak
5825	100.29	-	-	88.74	34.96	9.88	33.29	113	241	Average
5850	69.86	-20.5	90.36	58.33	34.98	9.87	33.32	113	241	Peak

Test Mode :	Mode 13	Temperature :	22~24°C
Test Channel :	149	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 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
89.13	23.64	-19.86	43.5	45.7	8.53	0.93	31.52	141	131	Peak
207.93	22.16	-21.34	43.5	42.63	9.65	1.35	31.47	-	-	Peak
259.77	22.57	-23.43	46	39.58	12.82	1.59	31.42	-	-	Peak
377	26.07	-19.93	46	39.35	15.87	2.09	31.24	-	-	Peak
713.7	23.26	-22.74	46	29.98	21.1	2.97	30.79	-	-	Peak
808.2	24.84	-21.16	46	29.81	22.56	3.16	30.69	-	-	Peak
5725	69.74	-15.32	85.06	58.19	34.81	9.92	33.18	109	41	Peak
5745	94.48	-	-	82.94	34.84	9.91	33.21	109	41	Average
5745	105.06	-	-	93.52	34.84	9.91	33.21	109	41	Peak
5850	50.24	-34.82	85.06	38.71	34.98	9.87	33.32	109	41	Peak

Test Mode :	Mode 13	Temperature :	22~24°C
Test Channel :	149	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 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
45.93	23.6	-16.4	40	44.17	10.27	0.66	31.5	100	192	Peak
216.3	21.76	-24.24	46	41.55	10.27	1.4	31.46	-	-	Peak
285.69	24.56	-21.44	46	40.98	13.24	1.67	31.33	-	-	Peak
382.6	24.92	-21.08	46	37.99	16.05	2.11	31.23	-	-	Peak
708.1	23.03	-22.97	46	29.86	21.01	2.96	30.8	-	-	Peak
778.1	23.71	-22.29	46	29.18	22.12	3.1	30.69	-	-	Peak
5725	81.48	-8.78	90.26	69.93	34.81	9.92	33.18	101	41	Peak
5745	99.48	-	-	87.94	34.84	9.91	33.21	101	41	Average
5745	110.26	-	-	98.72	34.84	9.91	33.21	101	41	Peak
5850	51.85	-38.41	90.26	40.32	34.98	9.87	33.32	101	41	Peak

Test Mode :	Mode 14	Temperature :	22~24°C
Test Channel :	149	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 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
89.13	23.23	-20.27	43.5	45.29	8.53	0.93	31.52	-	-	Peak
216.3	25.11	-20.89	46	44.9	10.27	1.4	31.46	-	-	Peak
240.06	25.63	-20.37	46	43.54	11.98	1.53	31.42	-	-	Peak
374.9	26.46	-19.54	46	39.81	15.81	2.09	31.25	120	181	Peak
690.6	22.74	-23.26	46	29.87	20.78	2.92	30.83	-	-	Peak
772.5	23.75	-22.25	46	29.31	22.03	3.1	30.69	-	-	Peak
5725	75.18	-9.89	85.07	63.63	34.81	9.92	33.18	102	216	Peak
5745	105.07	-	-	93.53	34.84	9.91	33.21	102	216	Peak
5745	94.34	-	-	82.8	34.84	9.91	33.21	102	216	Average
5850	52.3	-32.77	85.07	40.77	34.98	9.87	33.32	102	216	Peak

Test Mode :	Mode 14	Temperature :	22~24°C
Test Channel :	149	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 5745 MHz is Fundamental Signals which can be ignored. 2. 5725 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
106.41	23.41	-20.09	43.5	43.56	10.37	1.03	31.55	135	214	Peak
132.33	20.76	-22.74	43.5	39.59	11.58	1.16	31.57	-	-	Peak
261.66	24.44	-21.56	46	41.39	12.86	1.6	31.41	-	-	Peak
380.5	22.9	-23.1	46	36.08	15.96	2.1	31.24	-	-	Peak
615.7	21.74	-24.26	46	29.96	19.94	2.74	30.9	-	-	Peak
743.8	23.28	-22.72	46	29.37	21.58	3.05	30.72	-	-	Peak
5725	77.26	-14.44	91.7	65.71	34.81	9.92	33.18	103	249	Peak
5745	111.7	-	-	100.16	34.84	9.91	33.21	103	249	Peak
5745	100.63	-	-	89.09	34.84	9.91	33.21	103	249	Average
5850	51.7	-40	91.7	40.17	34.98	9.87	33.32	103	249	Peak

Test Mode :	Mode 15	Temperature :	22~24°C
Test Channel :	157	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 5785 MHz is Fundamental Signals which can be ignored. 2. 5725 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
89.13	21.72	-21.78	43.5	43.78	8.53	0.93	31.52	-	-	Peak
216.3	23.08	-22.92	46	42.87	10.27	1.4	31.46	-	-	Peak
240.06	26.33	-19.67	46	44.24	11.98	1.53	31.42	130	178	Peak
377.7	26.68	-19.32	46	39.96	15.87	2.09	31.24	-	-	Peak
416.2	26.57	-19.43	46	38.7	16.83	2.2	31.16	-	-	Peak
607.3	21.65	-24.35	46	30	19.85	2.71	30.91	-	-	Peak
5725	53.96	-31.89	85.85	42.41	34.81	9.92	33.18	100	217	Peak
5785	105.85	-	-	94.29	34.89	9.9	33.23	100	217	Peak
5785	94.72	-	-	83.16	34.89	9.9	33.23	100	217	Average
5850	53.03	-32.82	85.85	41.5	34.98	9.87	33.32	100	217	Peak

Test Mode :	Mode 15	Temperature :	22~24°C
Test Channel :	157	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 5785 MHz is Fundamental Signals which can be ignored. 2. 5725 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
40.53	25.18	-14.82	40	43.56	12.5	0.63	31.51	147	219	Peak
106.41	23.3	-20.2	43.5	43.45	10.37	1.03	31.55	-	-	Peak
254.1	22.2	-23.8	46	39.33	12.73	1.55	31.41	-	-	Peak
379.8	23.56	-22.44	46	36.74	15.96	2.1	31.24	-	-	Peak
590.5	22.48	-23.52	46	31.13	19.62	2.66	30.93	-	-	Peak
766.2	23.39	-22.61	46	29.06	21.93	3.09	30.69	-	-	Peak
5725	56.53	-35.16	91.69	44.98	34.81	9.92	33.18	100	255	Peak
5785	111.69	-	-	100.13	34.89	9.9	33.23	100	255	Peak
5785	101.05	-	-	89.49	34.89	9.9	33.23	100	255	Average
5850	55.61	-36.08	91.69	44.08	34.98	9.87	33.32	100	255	Peak

Test Mode :	Mode 16	Temperature :	22~24°C
Test Channel :	165	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Horizontal
Remark :	1. 5825 MHz is Fundamental Signals which can be ignored. 2. 5725 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
89.13	22.09	-21.41	43.5	44.15	8.53	0.93	31.52	-	-	Peak
216.3	24.09	-21.91	46	43.88	10.27	1.4	31.46	-	-	Peak
240.06	25.51	-20.49	46	43.42	11.98	1.53	31.42	-	-	Peak
372.1	25.56	-20.44	46	39.01	15.72	2.08	31.25	115	137	Peak
615	21.55	-24.45	46	29.8	19.93	2.73	30.91	-	-	Peak
710.9	22.48	-23.52	46	29.24	21.06	2.97	30.79	-	-	Peak
5725	52.53	-32.73	85.26	40.98	34.81	9.92	33.18	100	215	Peak
5825	105.26	-	-	93.71	34.96	9.88	33.29	100	215	Peak
5825	94.68	-	-	83.13	34.96	9.88	33.29	100	215	Average
5850	64.41	-20.85	85.26	52.88	34.98	9.87	33.32	100	215	Peak

Test Mode :	Mode 16	Temperature :	22~24°C
Test Channel :	165	Relative Humidity :	48~50%
Test Engineer :	David Yang	Polarization :	Vertical
Remark :	1. 5825 MHz is Fundamental Signals which can be ignored. 2. 5725 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
40.53	24.52	-15.48	40	42.9	12.5	0.63	31.51	135	164	Peak
106.41	23.26	-20.24	43.5	43.41	10.37	1.03	31.55	-	-	Peak
218.46	22.87	-23.13	46	42.52	10.4	1.41	31.46	-	-	Peak
379.8	23.4	-22.6	46	36.58	15.96	2.1	31.24	-	-	Peak
638.1	21.89	-24.11	46	29.78	20.19	2.8	30.88	-	-	Peak
685	22.39	-23.61	46	29.59	20.72	2.91	30.83	-	-	Peak
5725	54.11	-37.44	91.55	42.56	34.81	9.92	33.18	113	243	Peak
5825	111.55	-	-	100	34.96	9.88	33.29	113	243	Peak
5825	100.29	-	-	88.74	34.96	9.88	33.29	113	243	Average
5850	71.18	-20.37	91.55	59.65	34.98	9.87	33.32	113	243	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)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 30, 2010	Oct. 29, 2011	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 03, 2010	Dec. 02, 2011	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 06, 2010	Dec. 05, 2011	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 29, 2011	Mar. 28, 2012	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz~7GHz	Aug. 22, 2011	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159088	1GHz ~ 18GHz	Feb. 21, 2011	Feb. 20, 2012	Radiation (03CH07-HY)

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 EP162005-02 as below.