

# FCC/IC RF Test Report

**APPLICANT** : Atheros Communications, Inc.  
**EQUIPMENT** : 802.11a/b/g/n WLAN + Bluetooth Combo module  
**BRAND NAME** : Atheros  
**MODEL NAME** : ARS42  
**FCC ID** : PPD-ARS42  
**IC** : 4104A-ARS42  
**STANDARD** : FCC Part 15 Subpart C §15.247  
IC RSS-210 Issue 8  
**CLASSIFICATION** : Digital Transmission System (DTS)

The WiFi + Bluetooth module was tested on extended card inserted to a host laptop PC. The product was received on Feb. 15, 2011 and completely tested on Mar. 30, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shows 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:



Roy Wu / Manager



## **SPORTON INTERNATIONAL INC.**

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

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SPORTON INTERNATIONAL INC.

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FCC ID : PPD-ARS42

IC : 4104A-ARS42

Page Number : 1 of 132

Report Issued Date : May 04, 2011

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## SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth Measurement	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	Gen 4.4.1	99% Bandwidth Measurement	-	N/A	-
3.2	15.247(e)	A8.2(b)	Power Spectral Density Measurement	$\leq 8\text{dBm}$	Pass	-
3.3	-	-	Average Power Measurement	-	N/A	-
3.4	15.247(b)	A8.4	Peak Power Measurement	$\leq 30\text{dBm}$	Pass	-
3.5	15.247(d)	A8.5	Conducted Spurious Emission Measurement	$< 20\text{ dBc}$	Pass	-
3.6	15.247(d)	A8.5	Band Edges Measurement	$\leq 20\text{dBc}$	Pass	-
3.7	15.247(d)	A8.5	Radiated Emission Measurement	15.209(a) & 15.247(d)	Pass	Under limit 0.52 dB at 2483.5 MHz
3.8	15.207	Gen 7.2.2	AC Conducted Emission Measurement	15.207(a)	Pass	Under limit 18.7 dB at 0.19 MHz



# 1 General Description

## 1.1 Applicant

**Atheros Communications, Inc.**  
1700 Technology Drive, San Jose, CA 95110, United States

## 1.2 Manufacturer

**Atheros Communications, Inc.**  
1700 Technology Drive, San Jose, CA 95110, United States

## 1.3 Testing Site Facilities

<b>Test Site</b>	SPORTON INTERNATIONAL INC.		
<b>Test Site Location</b>	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC/IC Registration No.</b>
	CO05-HY	03CH07-HY	TW1022/4086B-1

## 1.4 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
- ♦ RSS-210 Issue 8
- ♦ FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ♦ ANSI C63.4-2003

**Remark:**

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



### 1.5 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
2.	Notebook	DELL	Larirude E4300	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m



## 2 Equipment Under Test

### 2.1 General Information of EUT

Product Feature & Specification	
Equipment	802.11a/b/g/n WLAN + Bluetooth Combo module
Brand Name	Atheros
Model Name	ARS42
FCC ID	PPD-ARS42
IC	4104A-ARS42
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
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Identical Prototype

**Remark:**

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

## 2.2 Maximum Output Power

### 2.2.1 Average Conducted Power

The device has the maximum average conducted power as below:

Frequency Range (MHz)	Mode	2.4G band RF Power (dBm)
2412 ~ 2462	802.11b	18.21
2412 ~ 2462	802.11g	17.92
2412 ~ 2462	802.11n HT-20	18.14

Frequency Range (MHz)	Mode	5.8G band RF Power (dBm)
5745 ~ 5825	802.11a	17.15
5745 ~ 5825	802.11n HT-20	17.17
5755 ~ 5795	802.11n HT-40	13.21

### 2.2.2 Peak Power

The device has the maximum peak power as below:

Frequency Range (MHz)	Mode	2.4G band RF Power (dBm)
2412 ~ 2462	802.11b	20.62
2412 ~ 2462	802.11g	23.67
2412 ~ 2462	802.11n HT-20	23.64

Frequency Range (MHz)	Mode	5.8G band RF Power (dBm)
5745 ~ 5825	802.11a	21.30
5745 ~ 5825	802.11n HT-20	21.29
5755 ~ 5795	802.11n HT-40	21.57



## 2.3 Antenna Information

Brand / Model Name	Type	Frequency Range (MHz)	Antenna Gain (dBi)
Wistron Neweb Corporation / EBJ	PIFA	2400 ~ 2500	3.62
Wistron Neweb Corporation / EBJ	PIFA	5250 ~ 5350	3.08
Wistron Neweb Corporation / EBJ	PIFA	5470 ~ 5725	4.76
Wistron Neweb Corporation / EBJ	PIFA	5725 ~ 5850	4.76
Wistron Neweb Corporation / ED4	PIFA	2400 ~ 2500	1.48
Wistron Neweb Corporation / ED4	PIFA	5250 ~ 5350	5.56
Wistron Neweb Corporation / ED4	PIFA	5470 ~ 5725	5.34
Wistron Neweb Corporation / ED4	PIFA	5725 ~ 5850	3.14



## 2.4 Worst-case Configuration and Test Mode

The WiFi module was tested as a modular. The module was tested outside of the laptop via an extender.

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).

### WORST-CASE CONFIGURATION AND MODE

The worst-case data rates are determined to be as follows for each mode, based on the investigations by measuring the average power, peak power and PPSD across all the data rates, bandwidths, modulations and spatial stream modes.

Thus all tests were made with following data rates:

802.11b mode, 20 MHz Channel Bandwidth, 5.5 Mb/s, CCK Modulation:

802.11g mode, 20 MHz Channel Bandwidth, 9 Mb/s, OFDM Modulation:

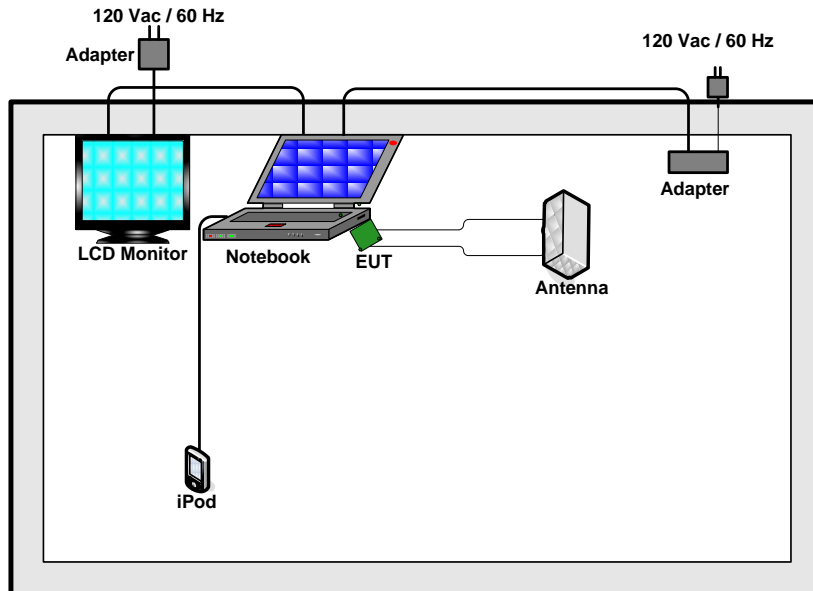
802.11a mode, 20 MHz Channel Bandwidth, 9 Mb/s, OFDM Modulation;

802.11n HT20 mode, 20 MHz Channel Bandwidth, MCS0, 6.5 Mb/s, OFDM Modulation;

802.11n HT40 mode, 40 MHz Channel Bandwidth, MCS0, 13.5 Mb/s, OFDM Modulation;

This device has been evaluated as module of mobile device, as well as portable device. Therefore, for radiated spurious emission, the EUT antenna has been tested in X, Y and Z axis to simulate mobile and portable position. The worst case position is Y-axis, only data from Y-axis was recorded in this report.

## 2.5 Connection Diagram of Test System



## 2.6 Test Software

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

### 3 Test Result

#### 3.1 6dB and 99% Bandwidth Measurement

##### 3.1.1 Limit of 6dB Bandwidth

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

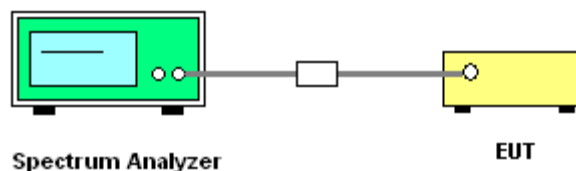
##### 3.1.2 Measuring Instruments

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

<b>Test Mode :</b>	802.11b L/M/H channel	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	10.28	0.5	Pass
06	2437	9.88	0.5	Pass
11	2462	10.16	0.5	Pass

<b>Test Mode :</b>	802.11g L/M/H channel	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.32	0.5	Pass
06	2437	16.04	0.5	Pass
11	2462	15.92	0.5	Pass

<b>Test Mode :</b>	802.11n (HT-20) L/M/H channel at 2.4G band	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.56	0.5	Pass
06	2437	16.62	0.5	Pass
11	2462	16.68	0.5	Pass



<b>Test Mode :</b>	802.11a L/M/H channels	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11a 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
149	5745	15.80	0.5	Pass
157	5785	16.10	0.5	Pass
165	5825	15.90	0.5	Pass

<b>Test Mode :</b>	802.11n (HT-20) L/M/H channels at 5.8G band	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
149	5745	16.60	0.5	Pass
157	5785	16.70	0.5	Pass
165	5825	16.90	0.5	Pass

<b>Test Mode :</b>	802.11n (HT-40) L/M/H channels at 5.8G band	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (HT-40) 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
151	5755	35.28	0.5	Pass
159	5795	35.64	0.5	Pass

3.1.6 Test Result of 99% Occupied Bandwidth

<b>Test Mode :</b>	802.11b L/M/H channel	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11b 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	14.16	Pass
06	2437	14.08	Pass
11	2462	14.52	Pass

<b>Test Mode :</b>	802.11g L/M/H channel	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11g 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	19.32	Pass
06	2437	22.32	Pass
11	2462	19.08	Pass

<b>Test Mode :</b>	802.11n (HT-20) L/M/H channel at 2.4G band	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	20.12	Pass
06	2437	22.56	Pass
11	2462	19.76	Pass



Test Mode :	802.11a L/M/H channel	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a 99% Occupied Bandwidth (MHz)	Pass/Fail
149	5745	22.25	Pass
157	5785	22.15	Pass
165	5825	22.20	Pass

Test Mode :	802.11n (HT-20) L/M/H channel at 5.8G band	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) 99% Occupied Bandwidth (MHz)	Pass/Fail
149	5745	22.25	Pass
157	5785	22.00	Pass
165	5825	22.45	Pass

Test Mode :	802.11n (HT-40) L/M/H channel at 5.8G band	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

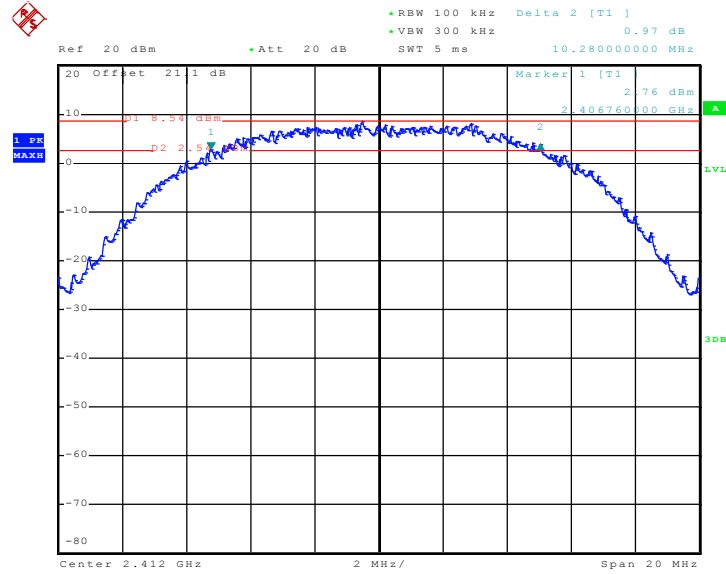
Channel	Frequency (MHz)	802.11n (HT-40) 99% Occupied Bandwidth (MHz)	Pass/Fail
151	5755	37.53	Pass
159	5795	37.62	Pass





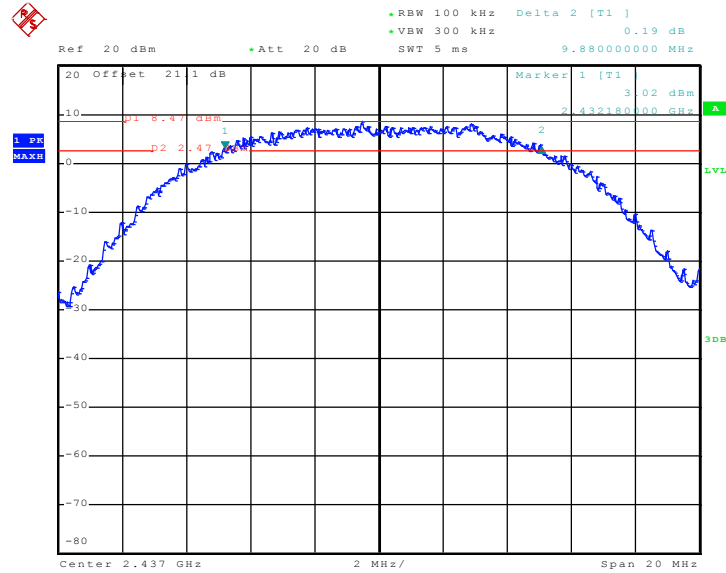
### 3.1.7 Test Result of 6dB Bandwidth Plots

#### 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 10.MAR.2011 15:22:06

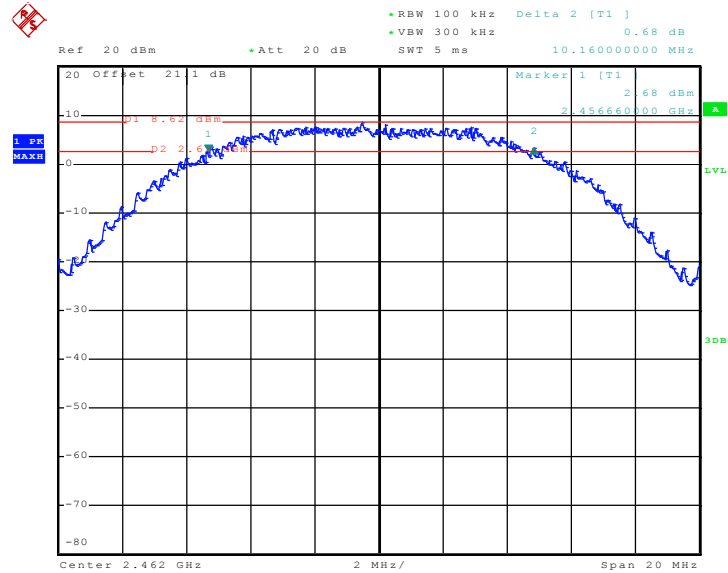
#### 6 dB Bandwidth Plot on 802.11b Channel 06



Date: 10.MAR.2011 15:47:35

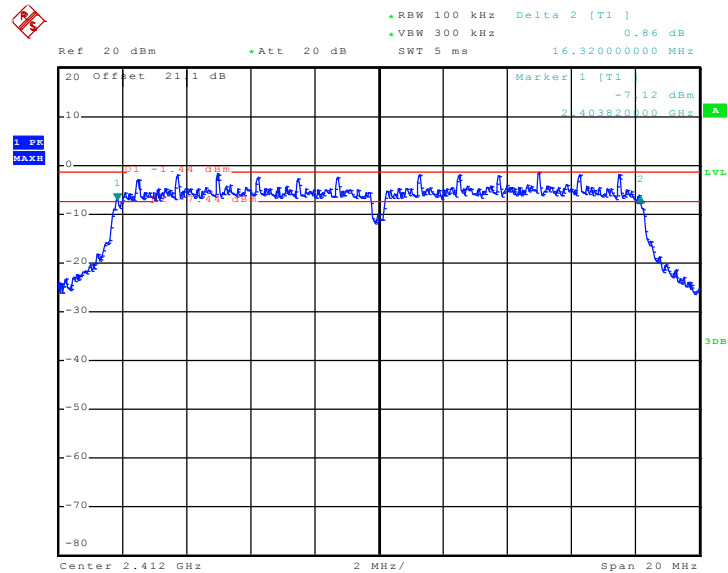


6 dB Bandwidth Plot on 802.11b Channel 11



Date: 10.MAR.2011 16:02:55

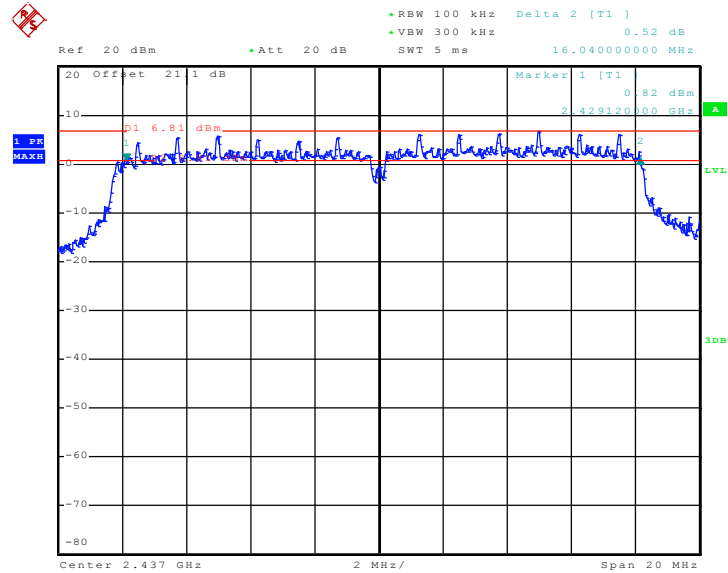
6 dB Bandwidth Plot on 802.11g Channel 01



Date: 10.MAR.2011 17:04:08

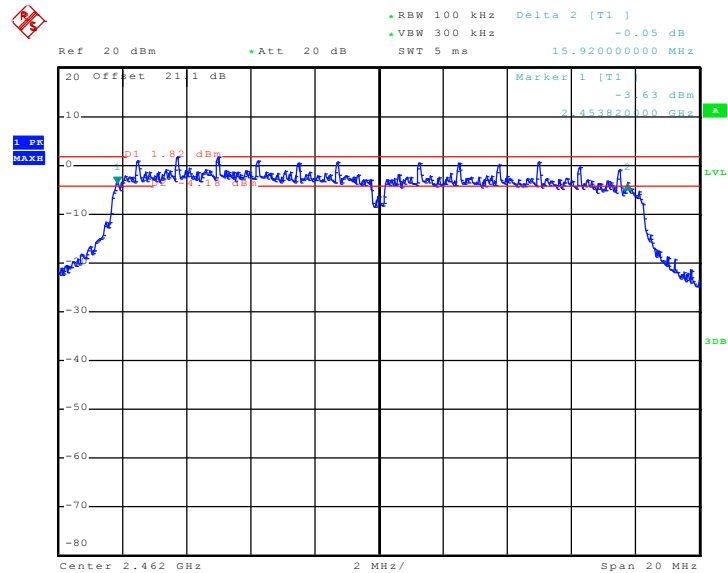


### 6 dB Bandwidth Plot on 802.11g Channel 06



Date: 10.MAR.2011 16:33:16

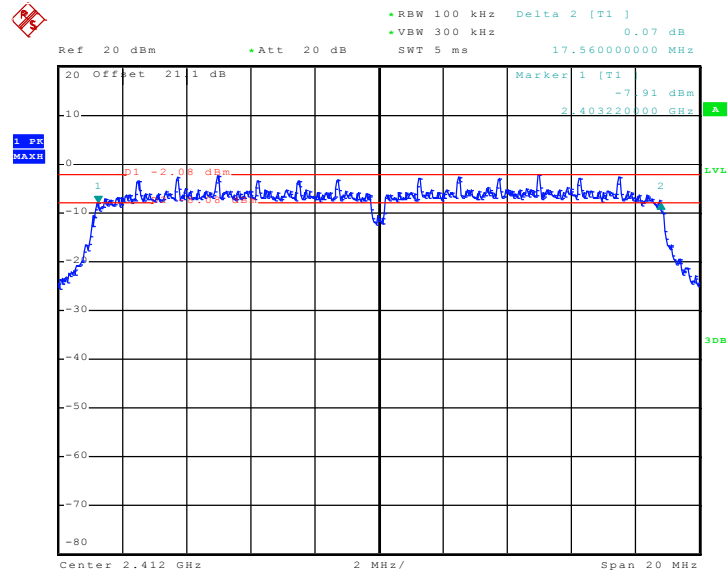
### 6 dB Bandwidth Plot on 802.11g Channel 11



Date: 10.MAR.2011 16:19:55

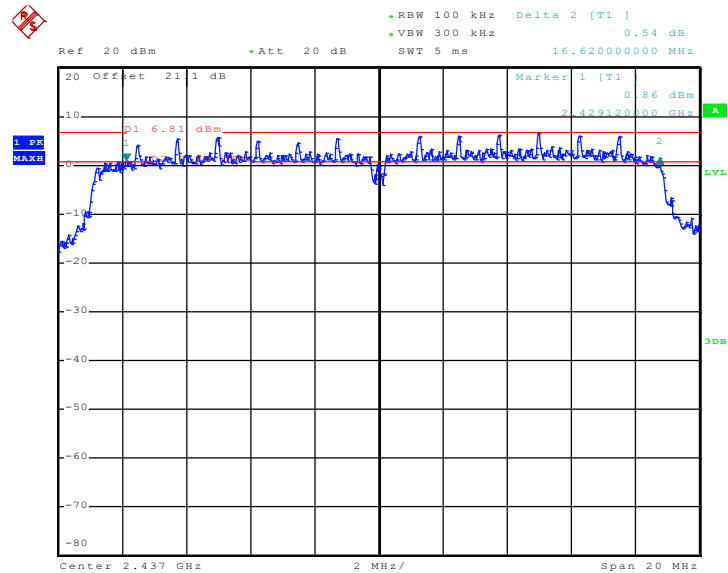


### 6 dB Bandwidth Plot on 802.11n (HT-20) Channel 01



Date: 10.MAR.2011 17:11:05

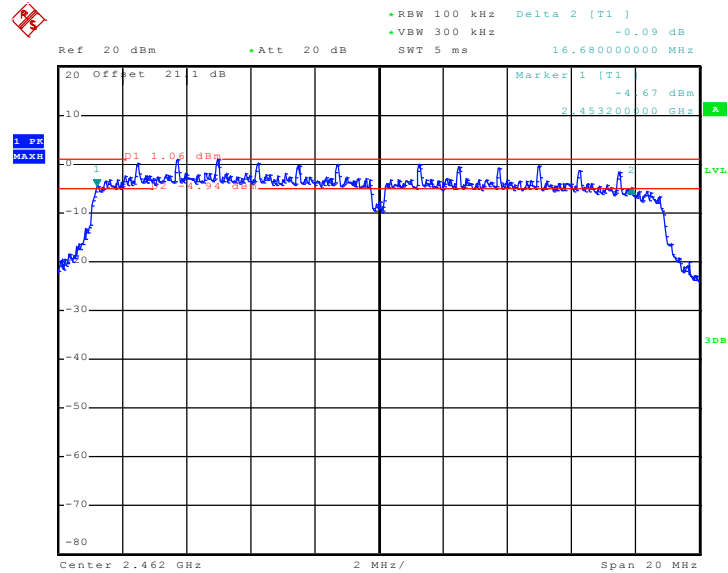
### 6 dB Bandwidth Plot on 802.11n (HT-20) Channel 06



Date: 10.MAR.2011 17:51:57

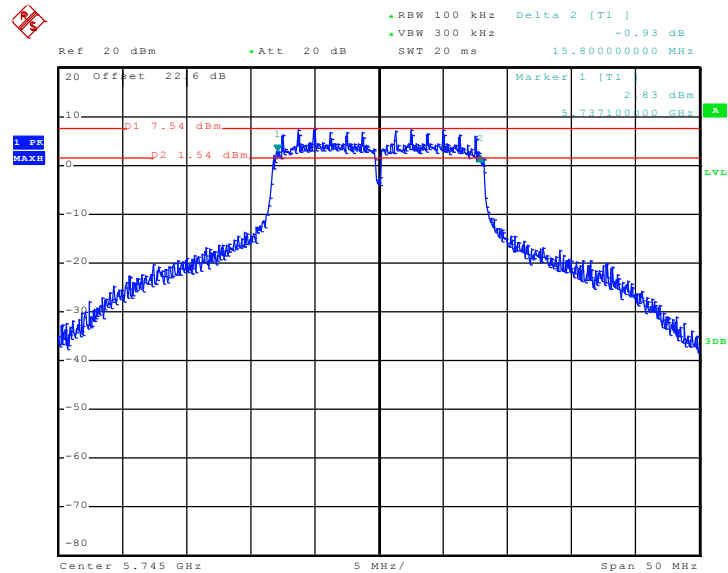


### 6 dB Bandwidth Plot on 802.11n (HT-20) Channel 11



Date: 10.MAR.2011 17:38:34

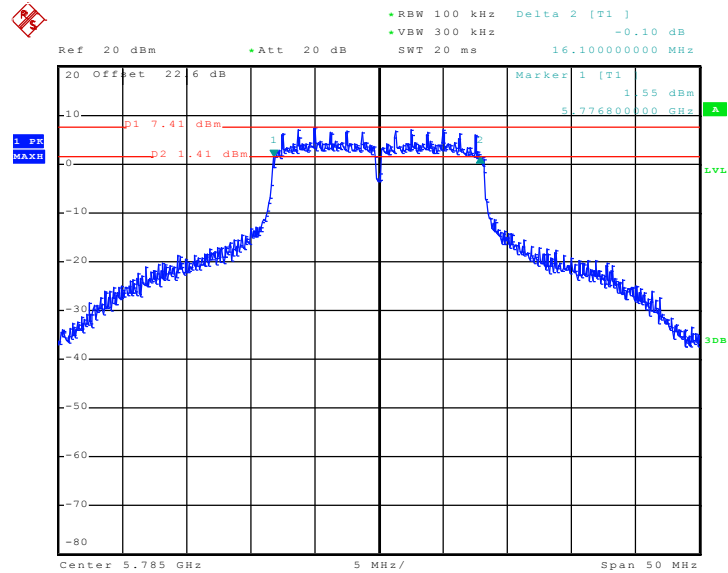
### 6 dB Bandwidth Plot on 802.11a Channel 149



Date: 18.MAR.2011 09:01:01

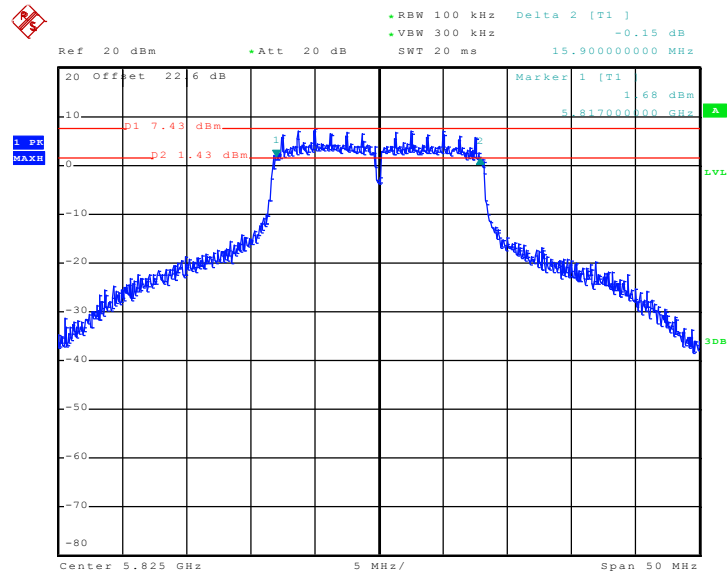


6 dB Bandwidth Plot on 802.11a Channel 157



Date: 18.MAR.2011 09:04:54

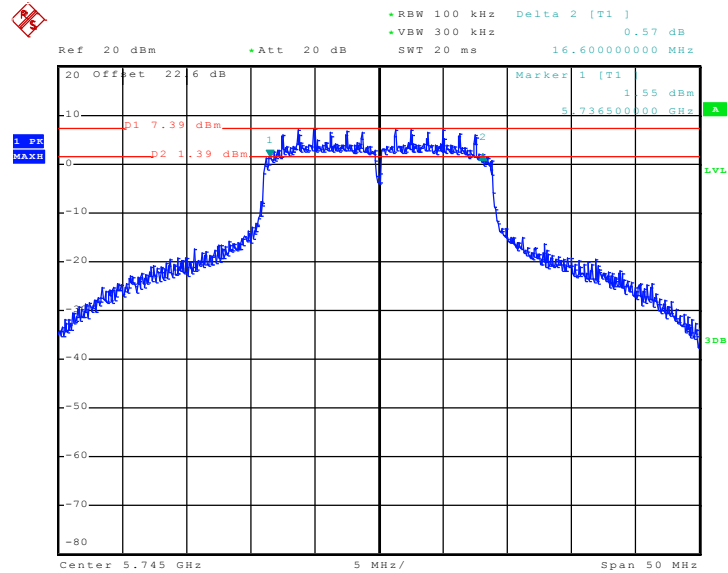
6 dB Bandwidth Plot on 802.11a Channel 165



Date: 18.MAR.2011 09:16:53

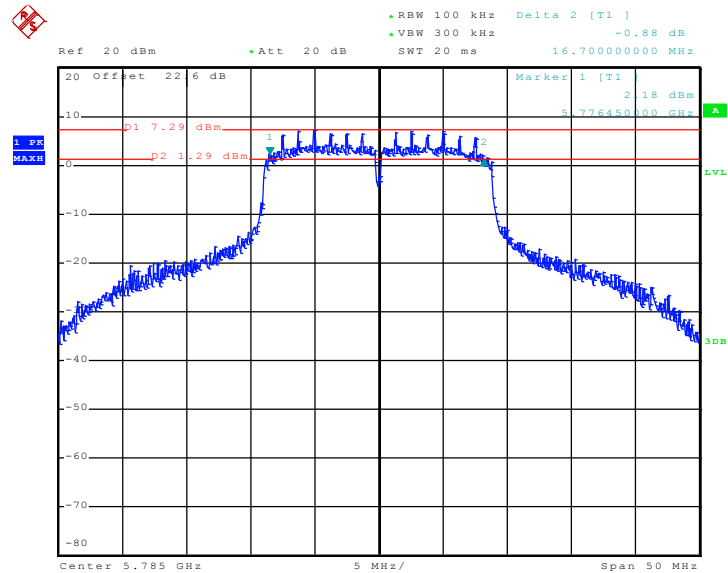


6 dB Bandwidth Plot on 802.11n (HT-20) Channel 149



Date: 18.MAR.2011 09:54:04

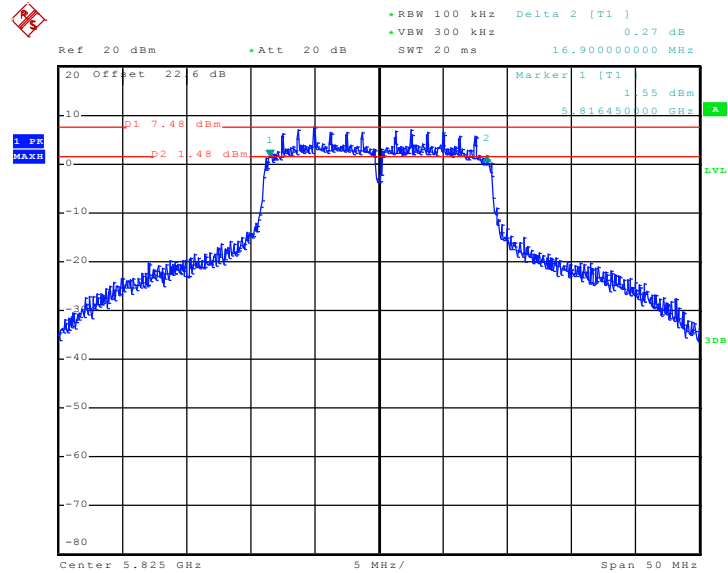
6 dB Bandwidth Plot on 802.11n (HT-20) Channel 157



Date: 18.MAR.2011 09:41:02

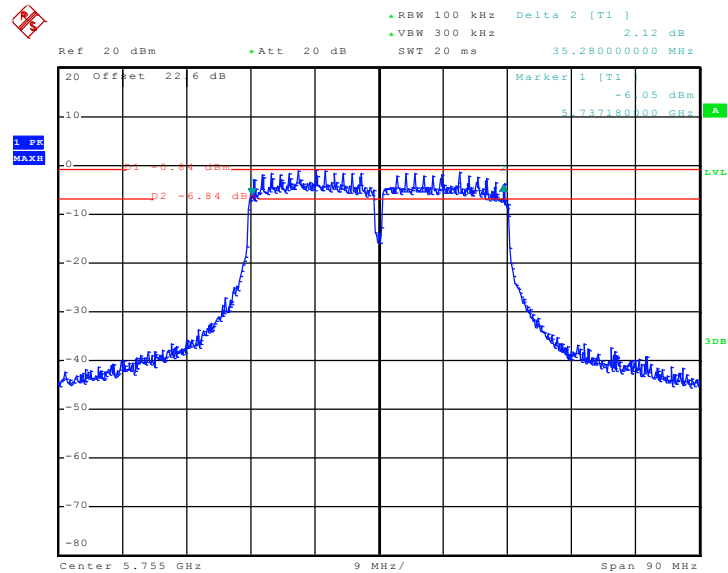


6 dB Bandwidth Plot on 802.11n (HT-20) Channel 165



Date: 18.MAR.2011 09:28:56

6 dB Bandwidth Plot on 802.11n (HT-40) Channel 151

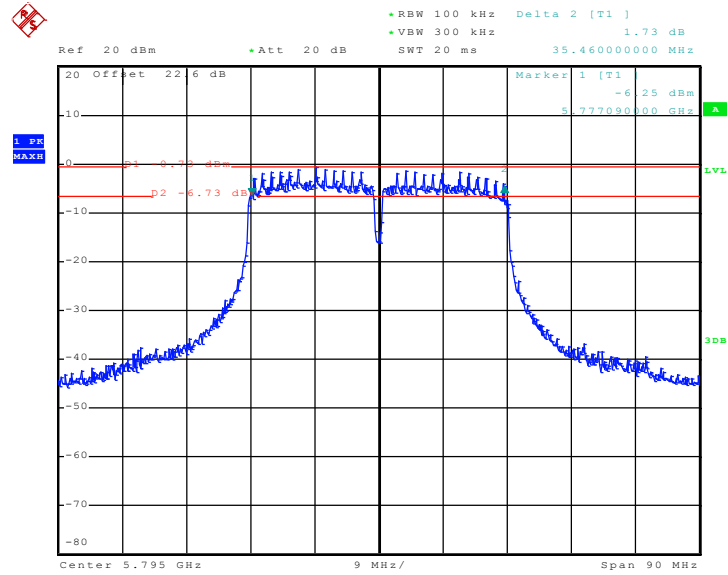


Date: 18.MAR.2011 10:09:08





6 dB Bandwidth Plot on 802.11n (HT-40) Channel 159

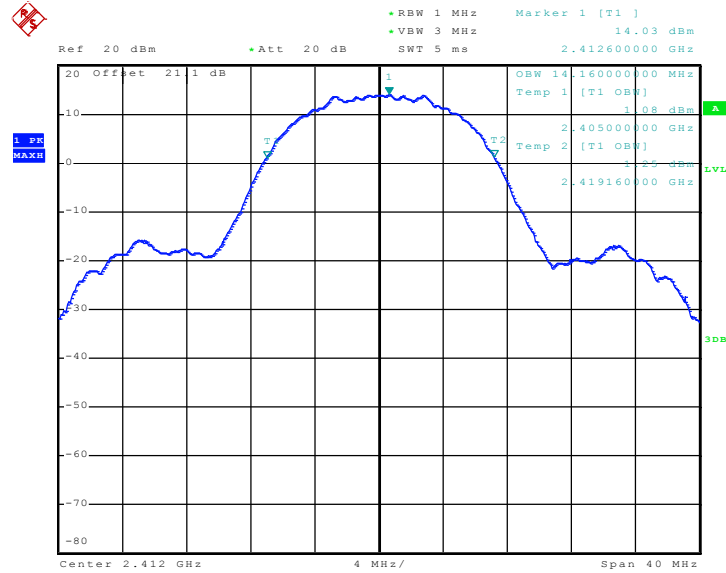


Date: 18.MAR.2011 10:24:01



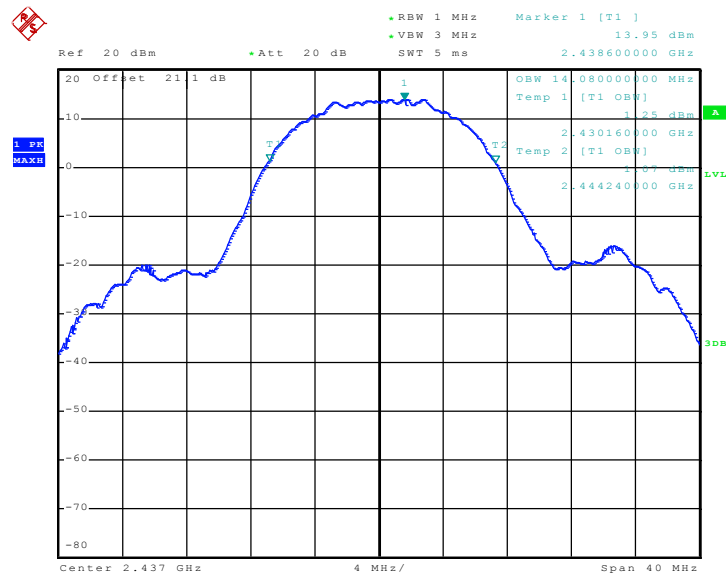
### 3.1.8 Test Result of 99% Bandwidth Plots

#### 99% Bandwidth Plot on 802.11b Channel 01



Date: 10.MAR.2011 15:23:58

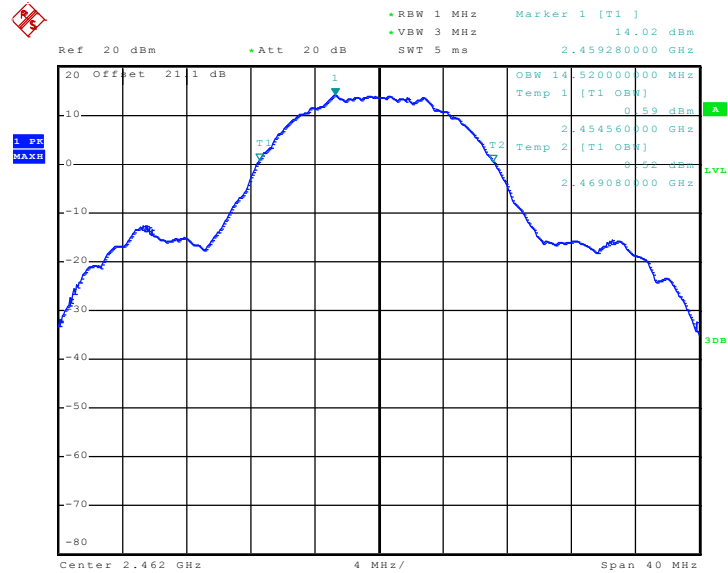
#### 99% Bandwidth Plot on 802.11b Channel 06



Date: 10.MAR.2011 15:48:20

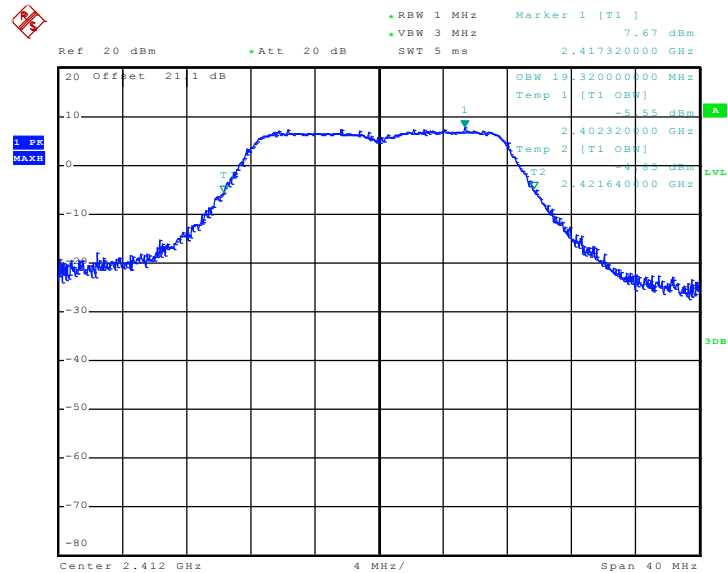


99% Bandwidth Plot on 802.11b Channel 11



Date: 10.MAR.2011 16:04:23

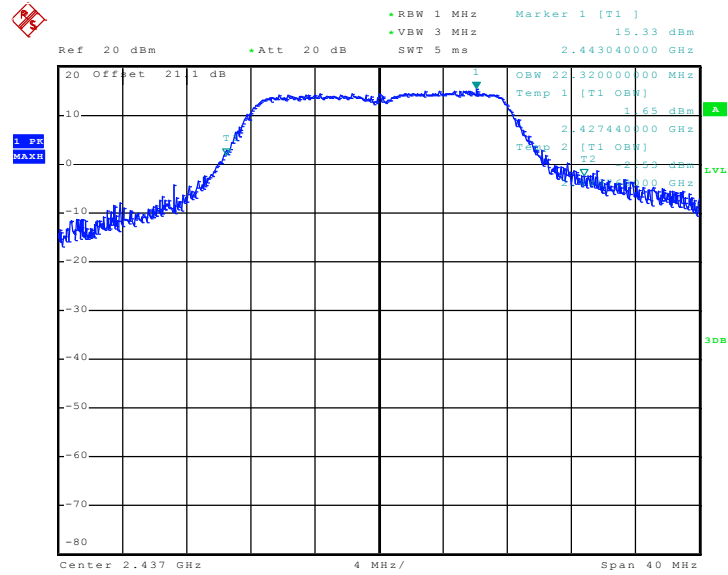
99% Bandwidth Plot on 802.11g Channel 01



Date: 10.MAR.2011 16:49:04

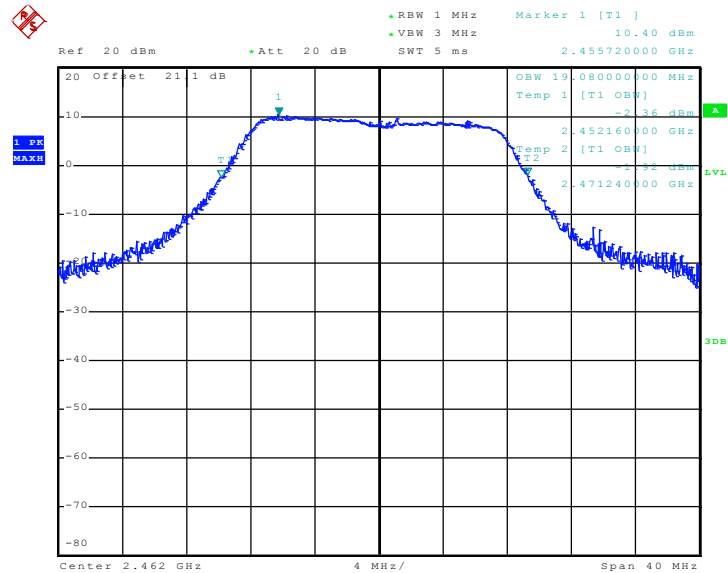


99% Bandwidth Plot on 802.11g Channel 06



Date: 10.MAR.2011 16:34:00

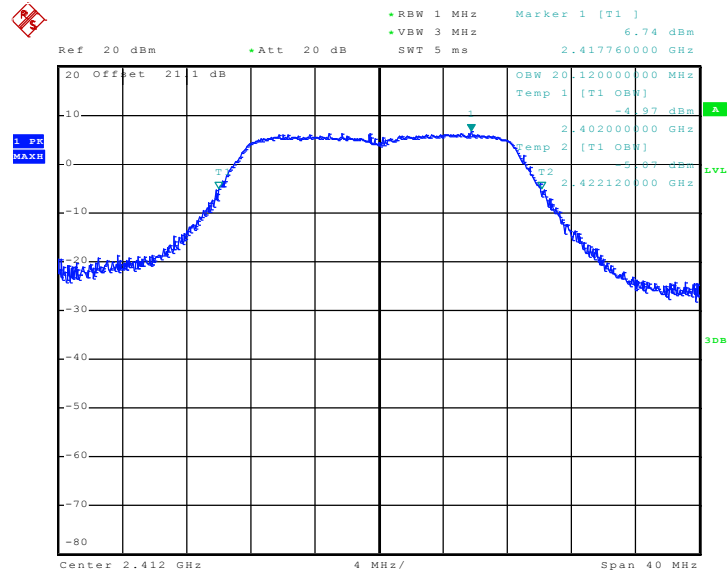
99% Bandwidth Plot on 802.11g Channel 11



Date: 10.MAR.2011 16:21:23

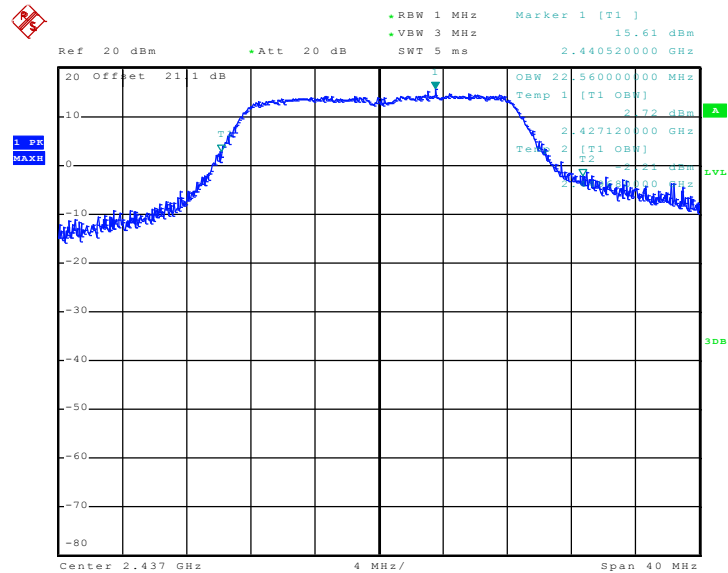


99% Bandwidth Plot on 802.11n (HT-20) Channel 01



Date: 10.MAR.2011 17:12:57

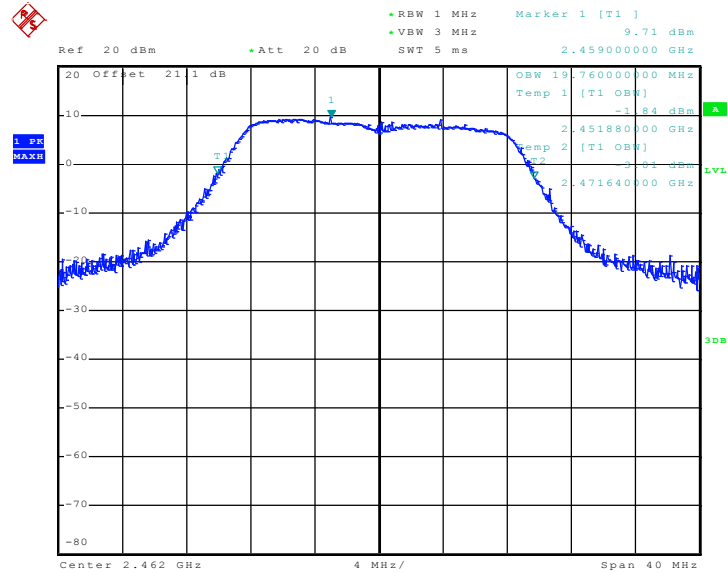
99% Bandwidth Plot on 802.11n (HT-20) Channel 06



Date: 10.MAR.2011 17:52:42

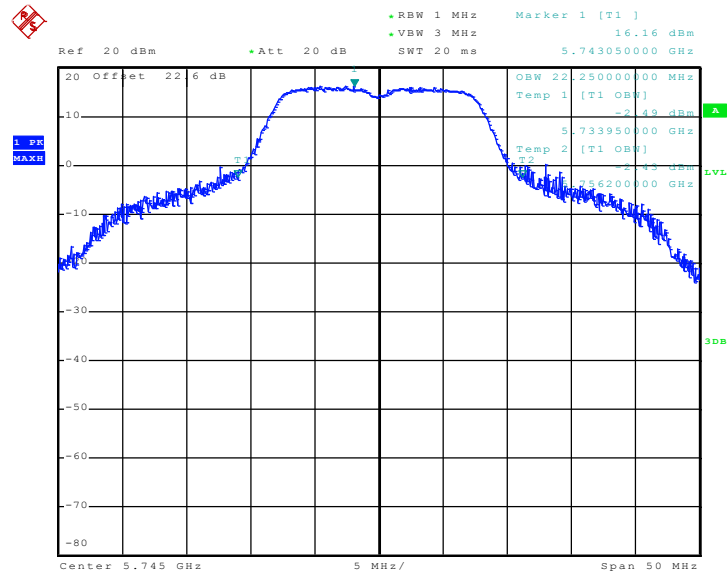


99% Bandwidth Plot on 802.11n (HT-20) Channel 11



Date: 10.MAR.2011 17:40:03

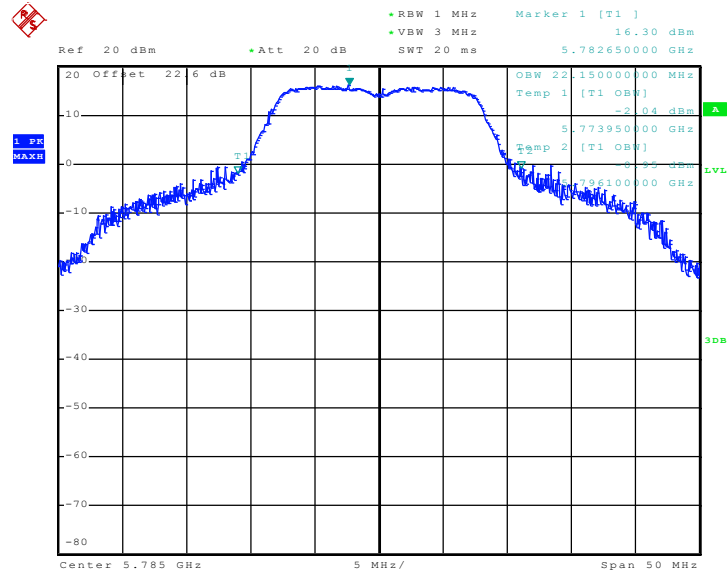
99% Bandwidth Plot on 802.11a Channel 149



Date: 18.MAR.2011 09:02:03

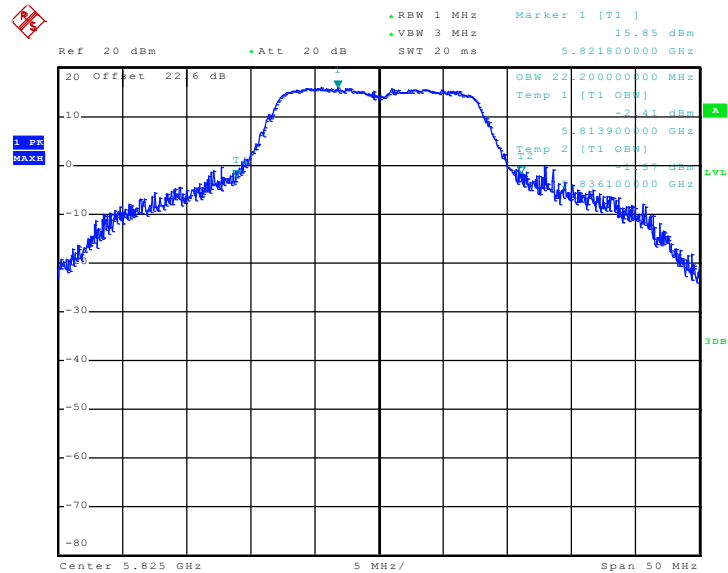


99% Bandwidth Plot on 802.11a Channel 157



Date: 18.MAR.2011 09:05:36

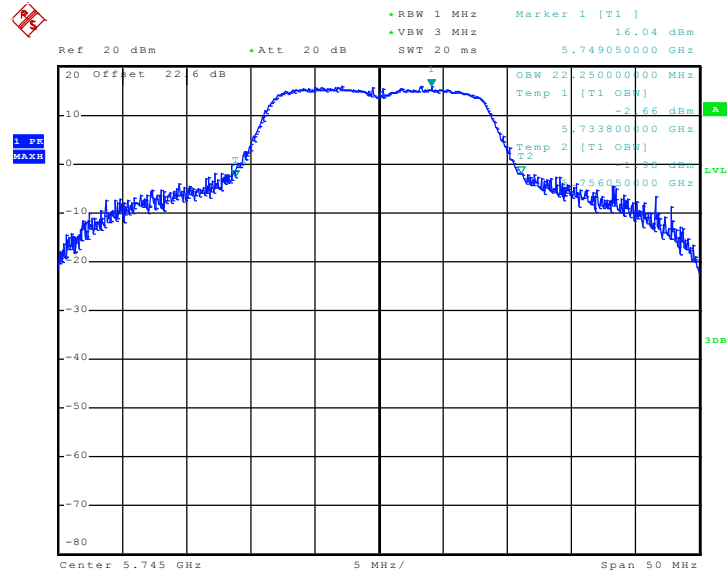
99% Bandwidth Plot on 802.11a Channel 165



Date: 18.MAR.2011 09:17:56

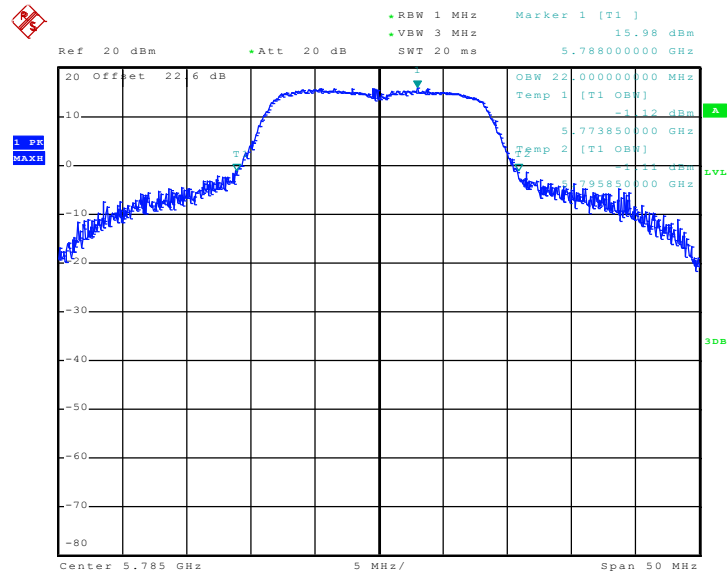


99% Bandwidth Plot on 802.11n (HT-20) Channel 149



Date: 18.MAR.2011 09:55:07

99% Bandwidth Plot on 802.11n (HT-20) Channel 157

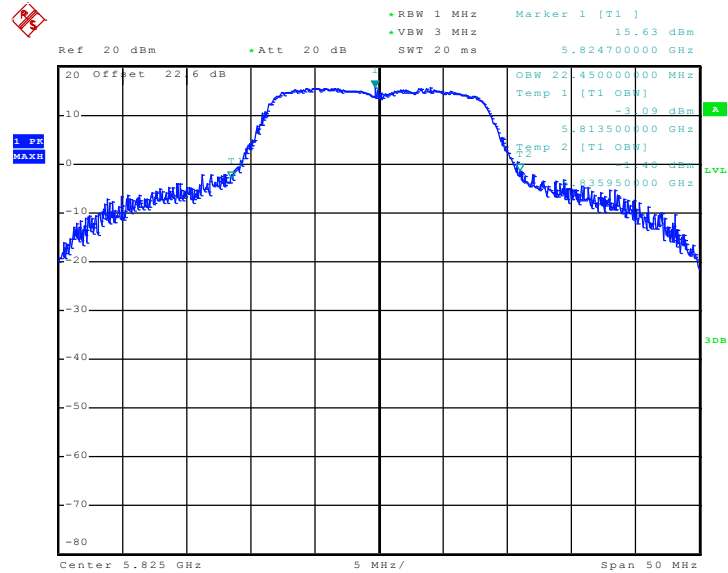


Date: 18.MAR.2011 09:41:43



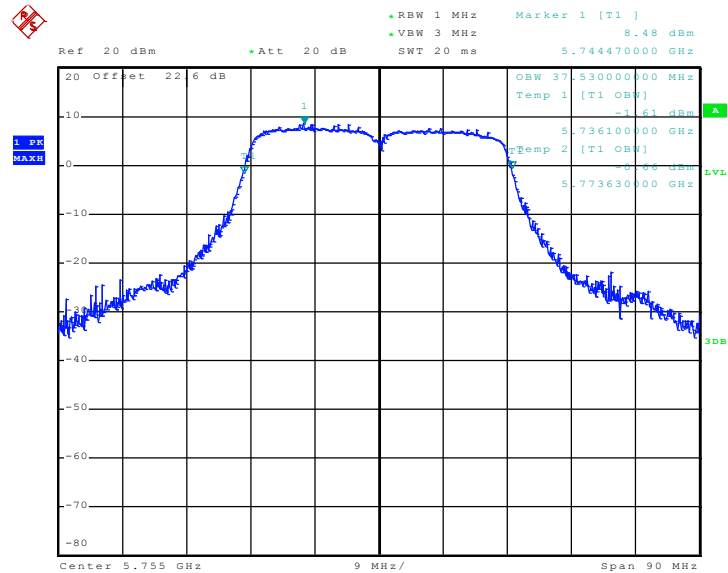


99% Bandwidth Plot on 802.11n (HT-20) Channel 157



Date: 18.MAR.2011 09:29:59

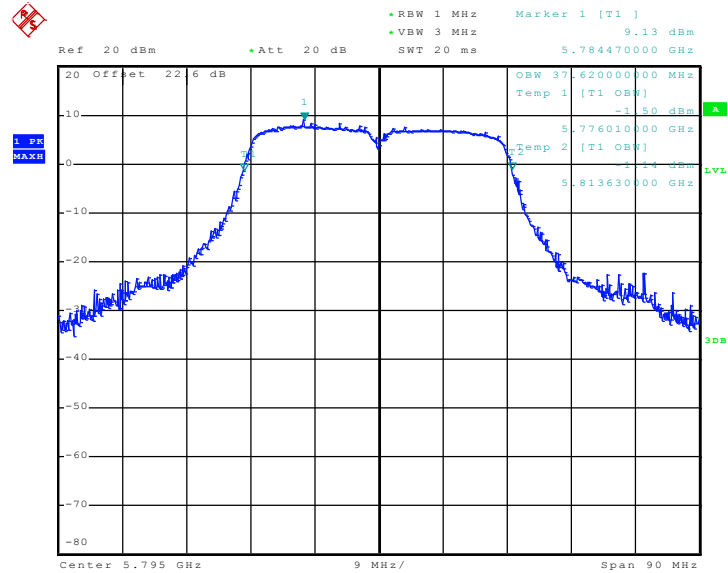
99% Bandwidth Plot on 802.11n (HT-40) Channel 151



Date: 18.MAR.2011 10:10:11



99% Bandwidth Plot on 802.11n (HT-40) Channel 159



Date: 18.MAR.2011 10:25:04

## 3.2 Power Spectral Density Measurement

### 3.2.1 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.

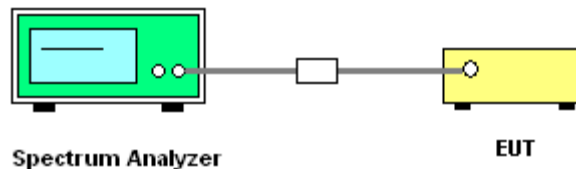
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 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.

### 3.2.4 Test Setup





3.2.5 Test Result of Power Spectral Density

Test Mode :	802.11b L/M/H channel	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-6.15	8	Pass
06	2437	-6.18	8	Pass
11	2462	-6.07	8	Pass

Test Mode :	802.11g L/M/H channels	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-15.02	8	Pass
06	2437	-6.75	8	Pass
11	2462	-12.11	8	Pass

Test Mode :	802.11n (HT-20) L/M/H channel at 2.4G band	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-15.94	8	Pass
06	2437	-4.99	8	Pass
11	2462	-13.32	8	Pass



Test Mode :	802.11 a L/M/H channel	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11a Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	-7.55	8	Pass
157	5785	-6.48	8	Pass
165	5825	-6.97	8	Pass

Test Mode :	802.11n (HT-20) L/M/H channel at 5.8G band	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	-7.03	8	Pass
157	5785	-6.69	8	Pass
165	5825	-6.66	8	Pass

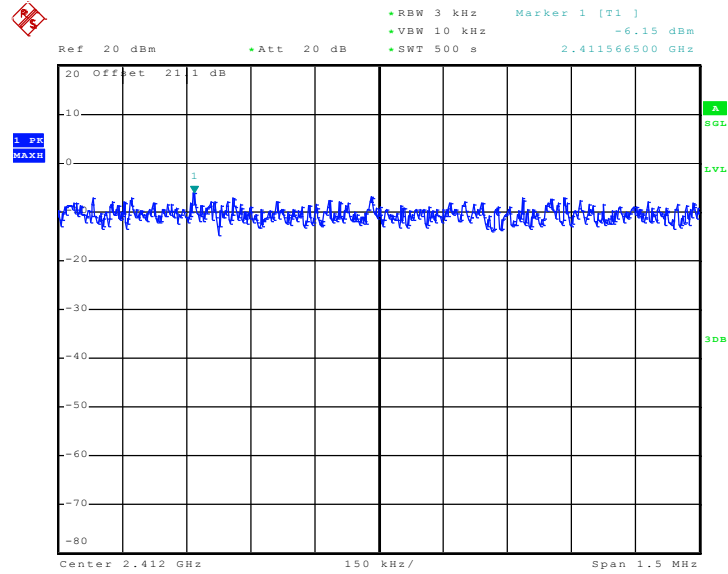
Test Mode :	802.11n (HT-40) L/M/H channel at 5.8G band	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (HT-40) Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
151	5755	-13.84	8	Pass
159	5795	-13.77	8	Pass



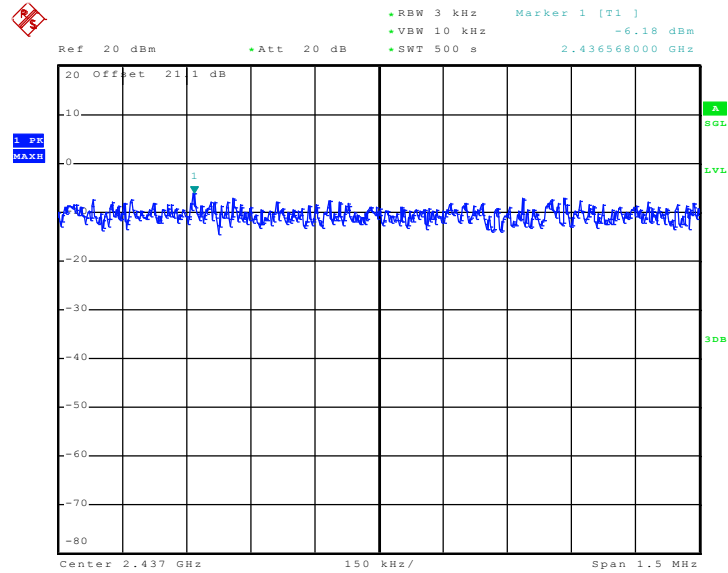
### 3.2.6 Test Result of Power Spectral Density Plots

PSD Plot on 802.11b Channel 01



Date: 10.MAR.2011 15:35:14

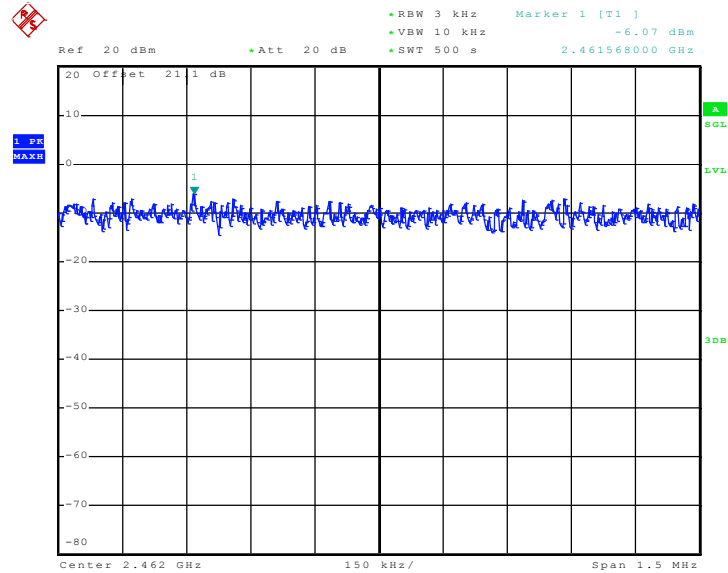
PSD Plot on 802.11b Channel 06



Date: 10.MAR.2011 15:57:06

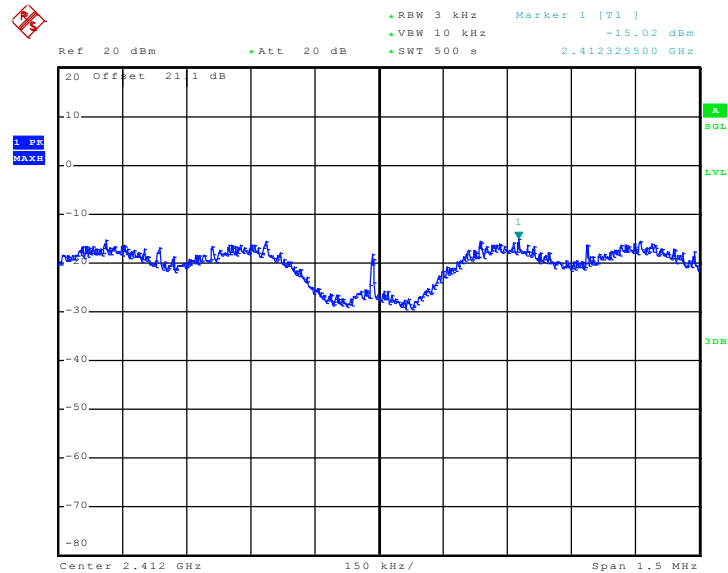


PSD Plot on 802.11b Channel 11



Date: 10.MAR.2011 16:13:29

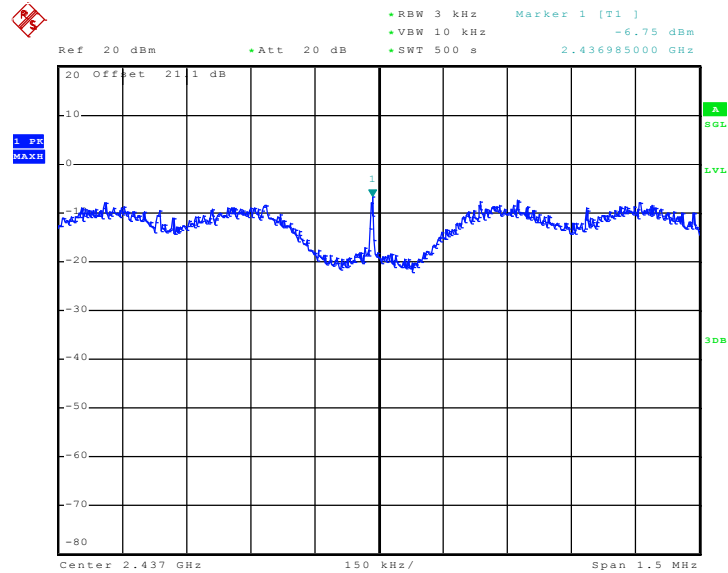
PSD Plot on 802.11g Channel 01



Date: 10.MAR.2011 17:00:03

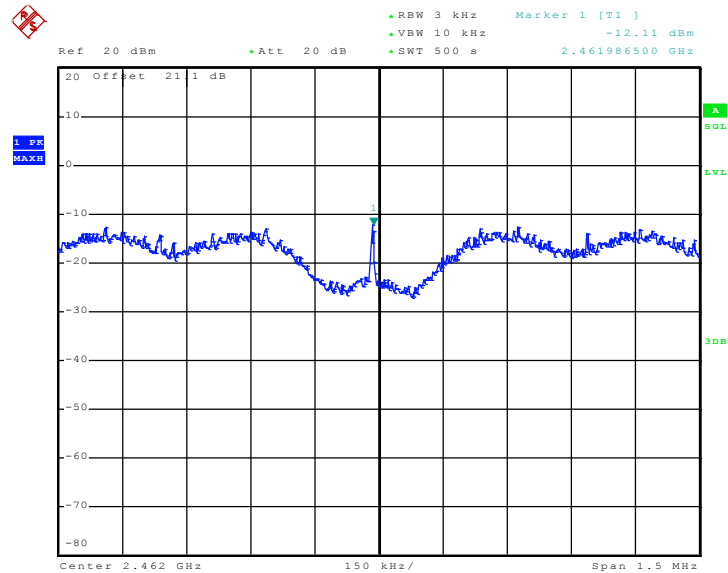


PSD Plot on 802.11g Channel 06



Date: 10.MAR.2011 16:43:18

PSD Plot on 802.11g Channel 11

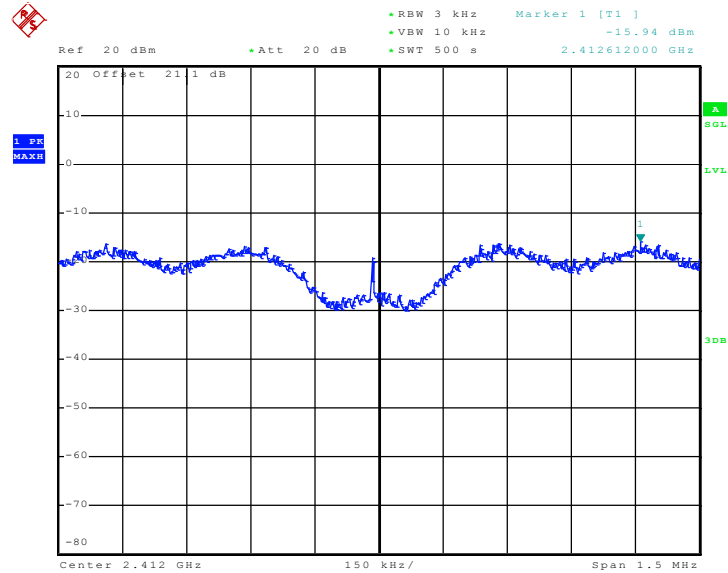


Date: 10.MAR.2011 16:30:19



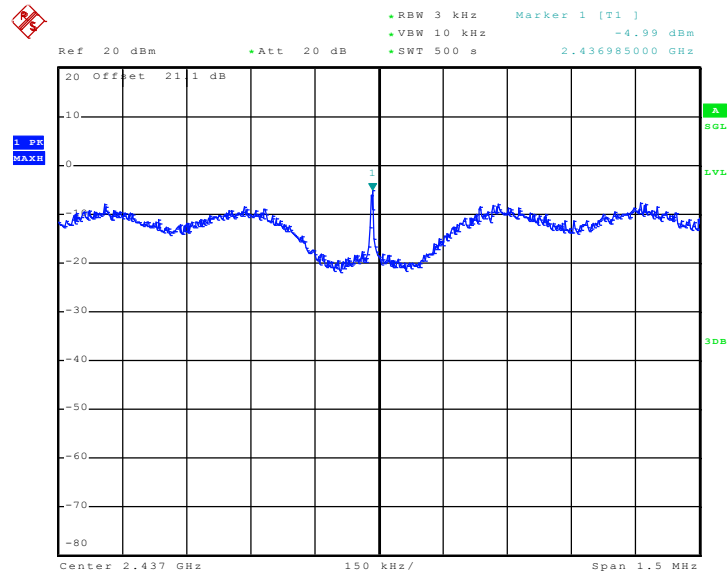


PSD Plot on 802.11n (HT-20) Channel 01



Date: 10.MAR.2011 17:30:29

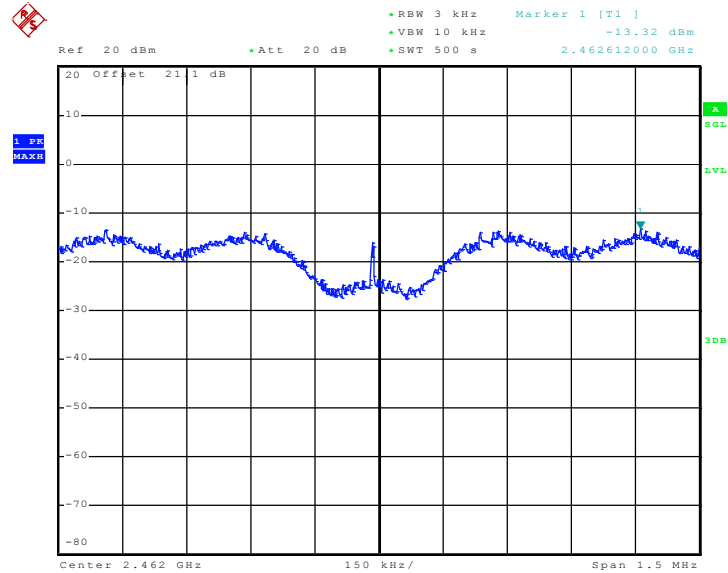
PSD Plot on 802.11n (HT-20) Channel 06



Date: 10.MAR.2011 18:01:55

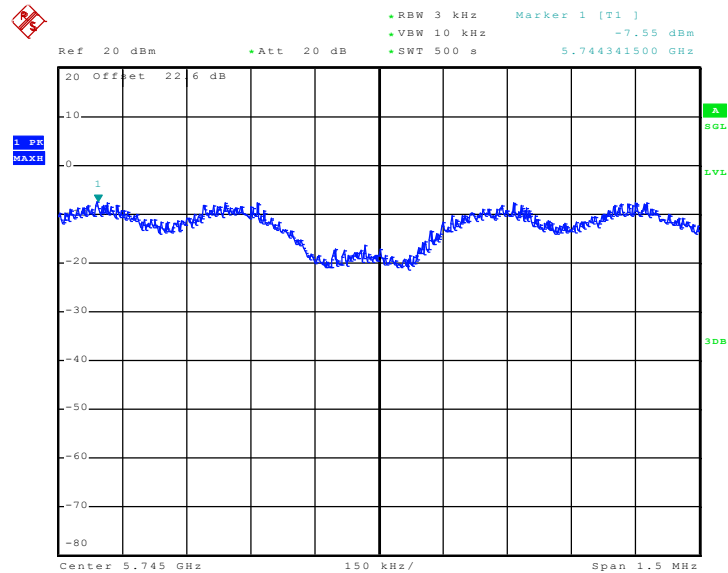


PSD Plot on 802.11n (HT-20) Channel 11



Date: 10.MAR.2011 17:48:43

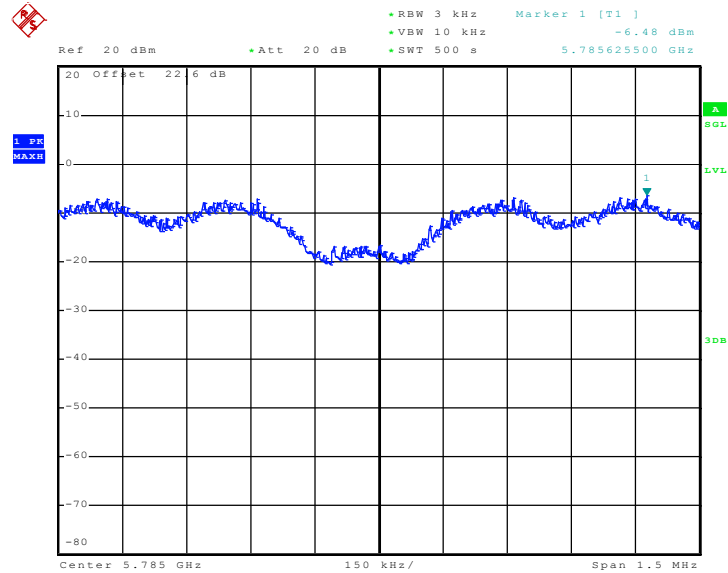
PSD Plot on 802.11a Channel 149



Date: 31.MAR.2011 00:50:13

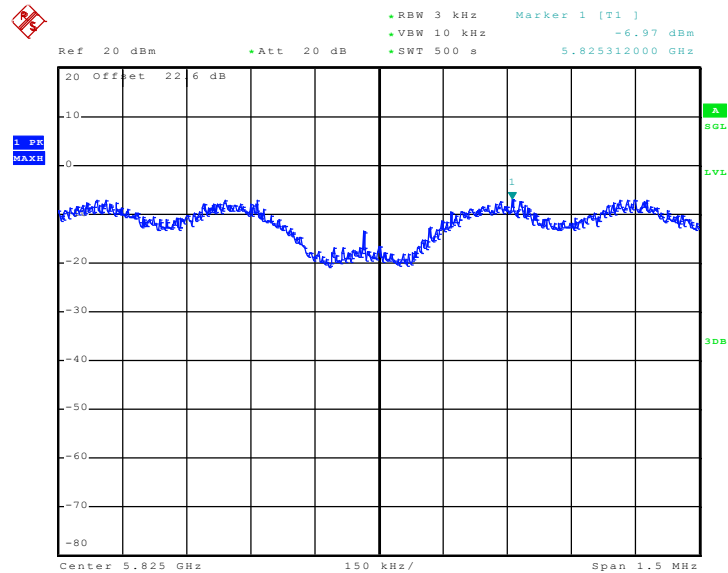


PSD Plot on 802.11a Channel 157



Date: 31.MAR.2011 00:19:02

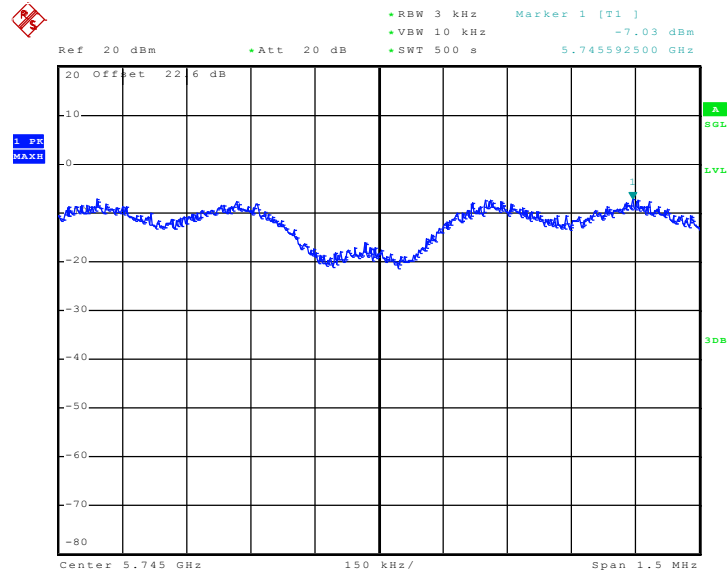
PSD Plot on 802.11a Channel 165



Date: 31.MAR.2011 00:06:38

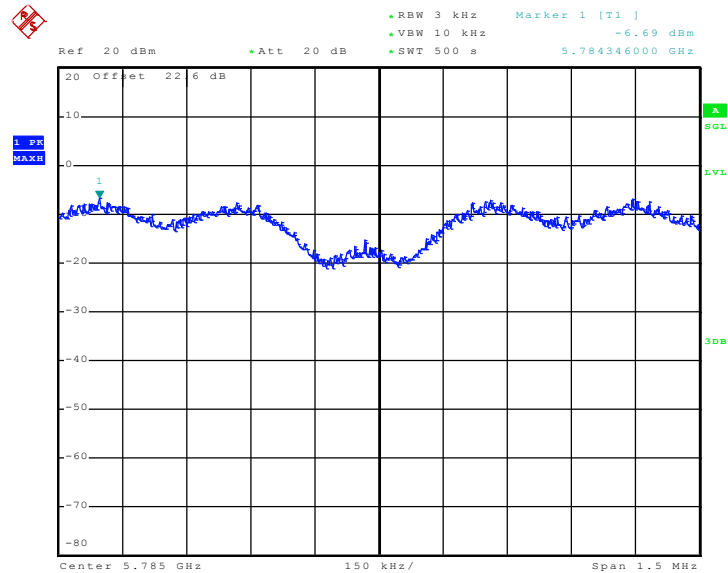


PSD Plot on 802.11n (HT-20) Channel 149



Date: 31.MAR.2011 00:41:27

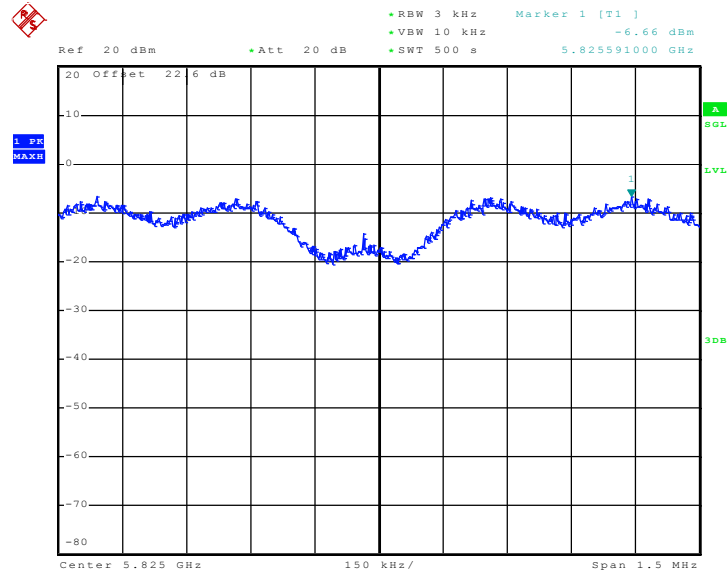
PSD Plot on 802.11n (HT-20) Channel 157



Date: 31.MAR.2011 00:30:59

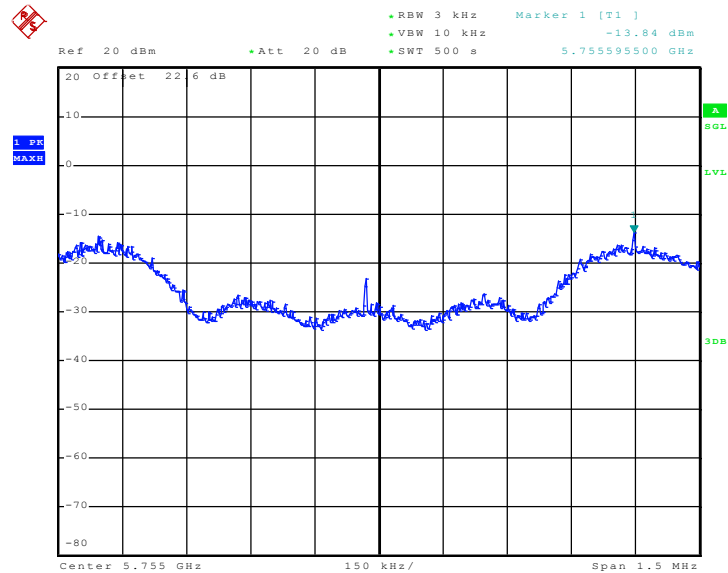


PSD Plot on 802.11n (HT-20) Channel 165



Date: 30.MAR.2011 23:56:51

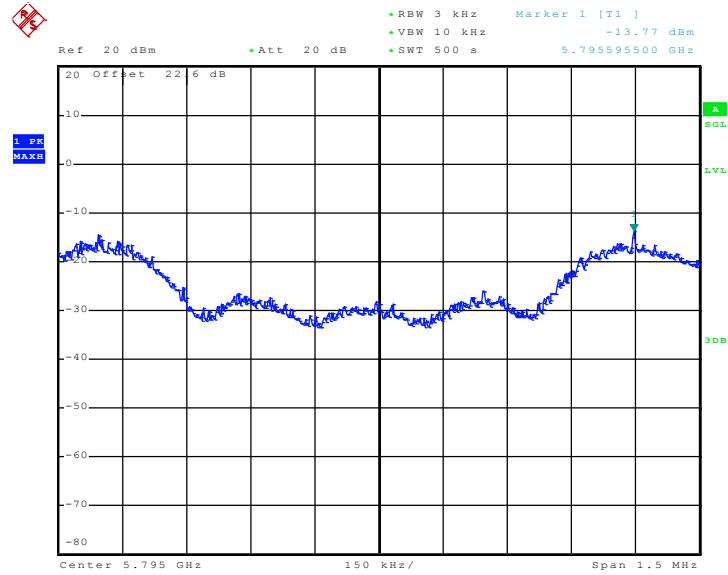
PSD Plot on 802.11n (HT-40) Channel 151



Date: 18.MAR.2011 10:19:07



PSD Plot on 802.11n (HT-40) Channel 159



Date: 18.MAR.2011 10:34:39

### 3.3 Average Power Measurement

#### 3.3.1 Limit of Average Power

None; for reporting purposes only.

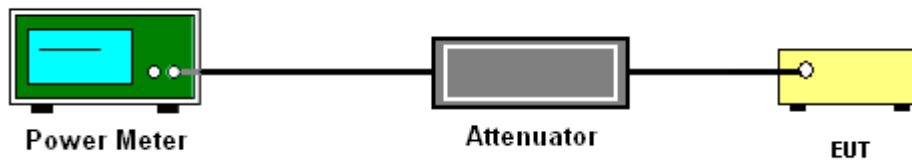
#### 3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.3.3 Test Procedures

1. The RF output of EUT was connected to the power meter by a low loss cable.
2. Measure the power by power meter.

#### 3.3.4 Test Setup





3.3.5 Test Result of Average Power

Test Mode :	802.11b L/M/H channels	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)
01	2412	17.94
06	2437	18.18
11	2462	18.21

Test Mode :	802.11g L/M/H channels	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)
01	2412	9.81
06	2437	17.92
11	2462	13.70

Test Mode :	802.11n (HT-20) L/M/H channels at 2.4G band	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) Measured Output Power (dBm)
01	2412	8.64
06	2437	18.14
11	2462	12.05





<b>Test Mode :</b>	802.11a L/M/H channels	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11a Measured Output Power (dBm)
149	5745	17.15
157	5785	16.99
165	5825	17.11

<b>Test Mode :</b>	802.11n (HT-20) L/M/H channels at 5.8G band	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) Measured Output Power (dBm)
149	5745	17.17
157	5785	17.12
165	5825	17.04

<b>Test Mode :</b>	802.11n (HT-40) L/M/H channels at 5.8G band	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (HT-40) Measured Output Power (dBm)
151	5755	13.21
159	5795	13.10

## 3.4 Peak Power Measurement

### 3.4.1 Limit of Peak 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 P-to-M operation, the limit has to be reduced by 1dB for every 1dB that the directional gain of the antenna exceeds 6dBi.

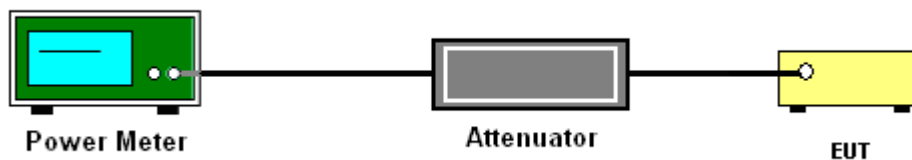
### 3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.4.3 Test Procedures

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

### 3.4.4 Test Setup





3.4.5 Test Result of Peak Power

Test Mode :	802.11b L/M/H channels	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.62	30	Pass
06	2437	20.39	30	Pass
11	2462	20.05	30	Pass

Test Mode :	802.11g L/M/H channels	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.82	30	Pass
06	2437	23.67	30	Pass
11	2462	21.52	30	Pass

Test Mode :	802.11n (HT-20) L/M/H channels at 2.4G band	Temperature :	24~26°C
Test Engineer :	Cona Huang	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.52	30	Pass
06	2437	23.64	30	Pass
11	2462	20.68	30	Pass



<b>Test Mode :</b>	802.11a L/M/H channels	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11a Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	21.28	30	Pass
157	5785	21.19	30	Pass
165	5825	21.30	30	Pass

<b>Test Mode :</b>	802.11n (HT-20) L/M/H channels at 5.8G band	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (HT-20) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	21.23	30	Pass
157	5785	21.21	30	Pass
165	5825	21.29	30	Pass

<b>Test Mode :</b>	802.11n (HT-40) L/M/H channels at 5.8G band	<b>Temperature :</b>	24~26°C
<b>Test Engineer :</b>	Cona Huang	<b>Relative Humidity :</b>	50~53%

Channel	Frequency (MHz)	802.11n (HT-40) Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
151	5755	21.51	30	Pass
159	5795	21.57	30	Pass

## 3.5 Conducted Spurious Emission Measurement

### 3.5.1 Limit of Spurious Emission Measurement

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

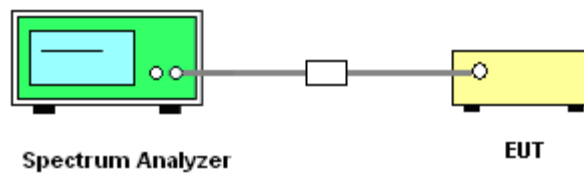
### 3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.5.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, VBW = 300kHz, 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.

### 3.5.4 Test Setup

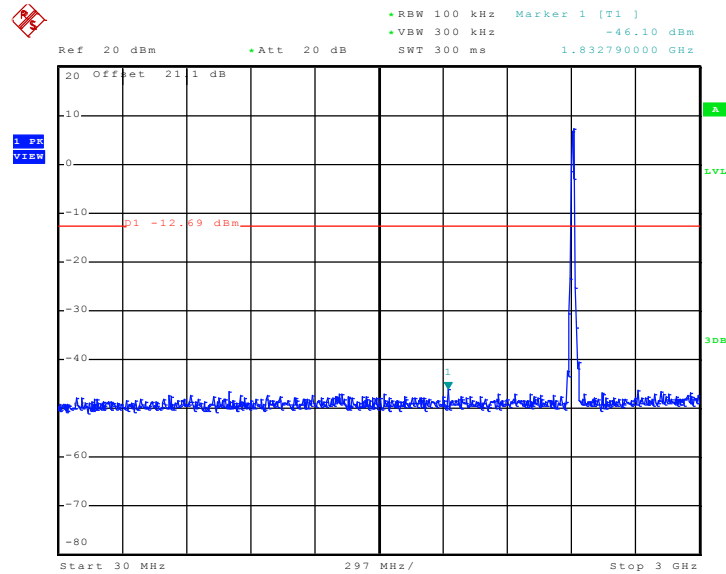




3.5.5 Test Result

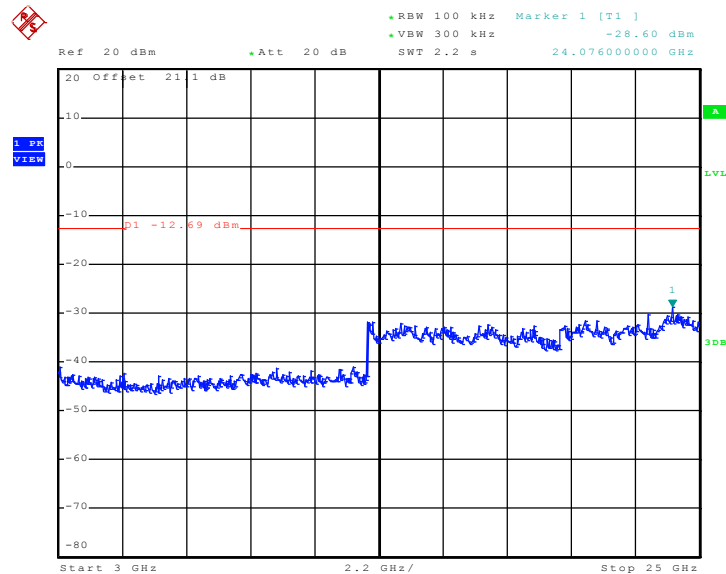
Test Mode :	802.11b L/M/H channels	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Cona Huang

Conducted Spurious Emission Plot on 802.11b Channel 01



Date: 10.MAR.2011 16:00:22

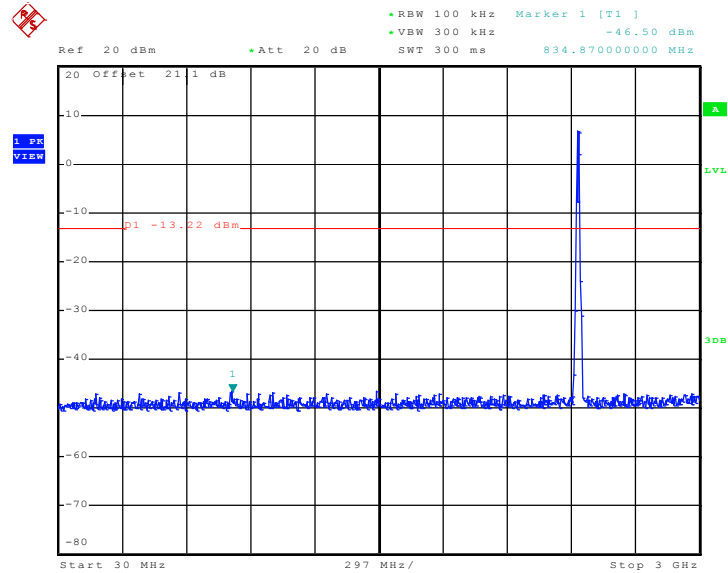
Conducted Spurious Emission Plot on 802.11b Channel 01



Date: 10.MAR.2011 16:00:40

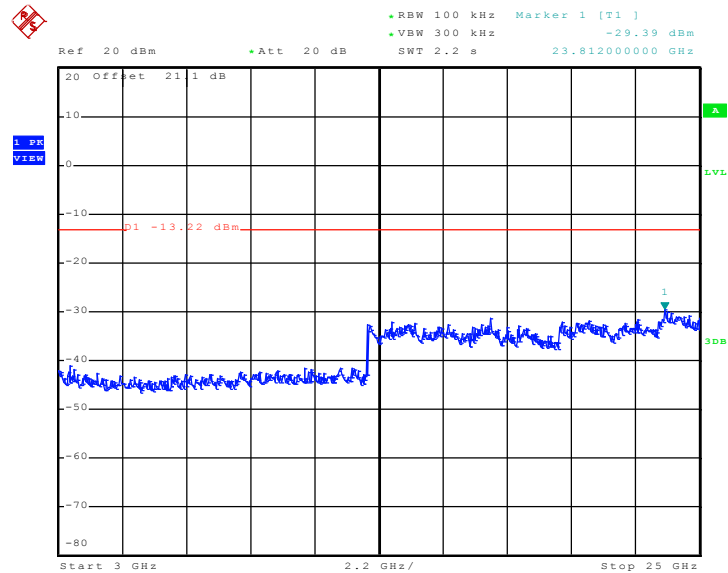


### Conducted Spurious Emission Plot on 802.11b Channel 06



Date: 10.MAR.2011 15:59:28

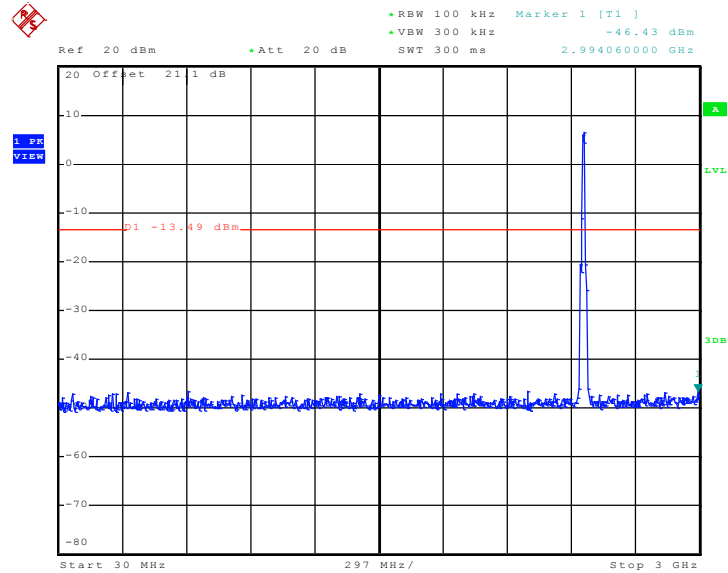
### Conducted Spurious Emission Plot on 802.11b Channel 06



Date: 10.MAR.2011 15:59:46

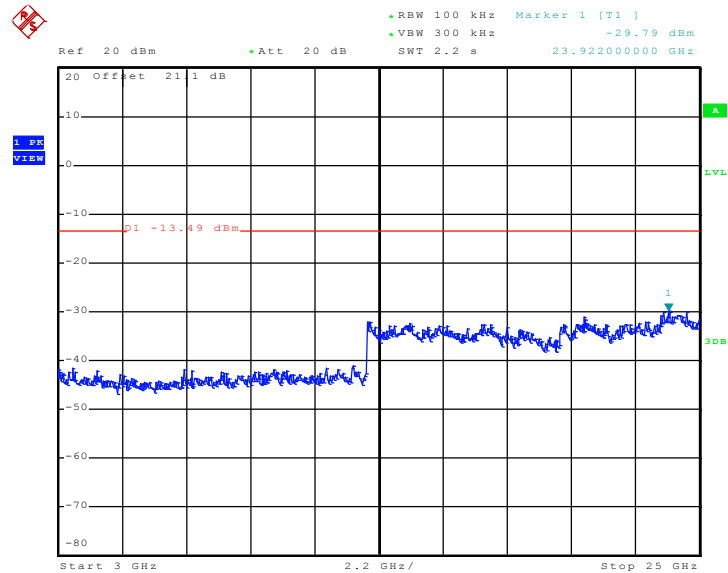


Conducted Spurious Emission Plot on 802.11b Channel 11



Date: 10.MAR.2011 16:14:35

Conducted Spurious Emission Plot on 802.11b Channel 11



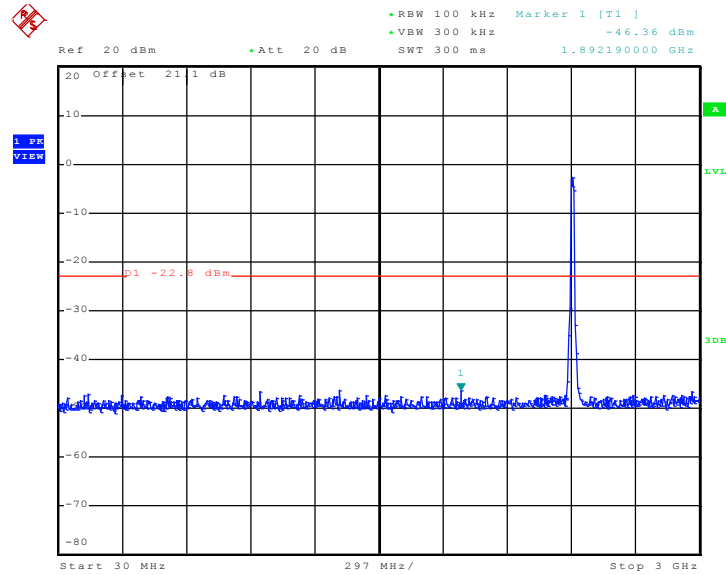
Date: 10.MAR.2011 16:14:53





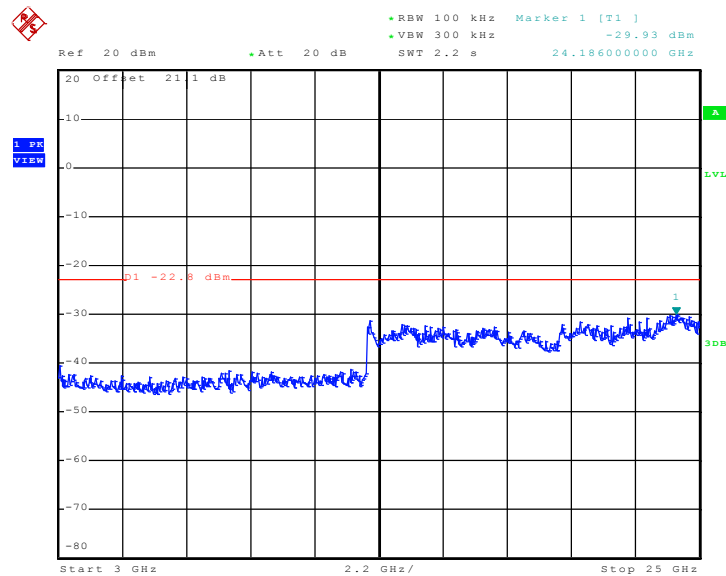
Test Mode :	802.11g L/M/H channels	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Cona Huang

Conducted Spurious Emission Plot on 802.11g Channel 01



Date: 10.MAR.2011 17:00:26

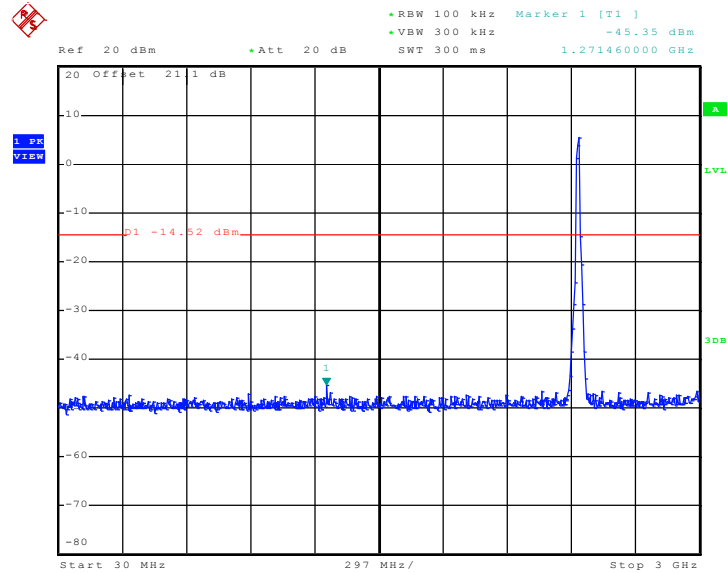
Conducted Spurious Emission Plot on 802.11g Channel 01



Date: 10.MAR.2011 17:00:44

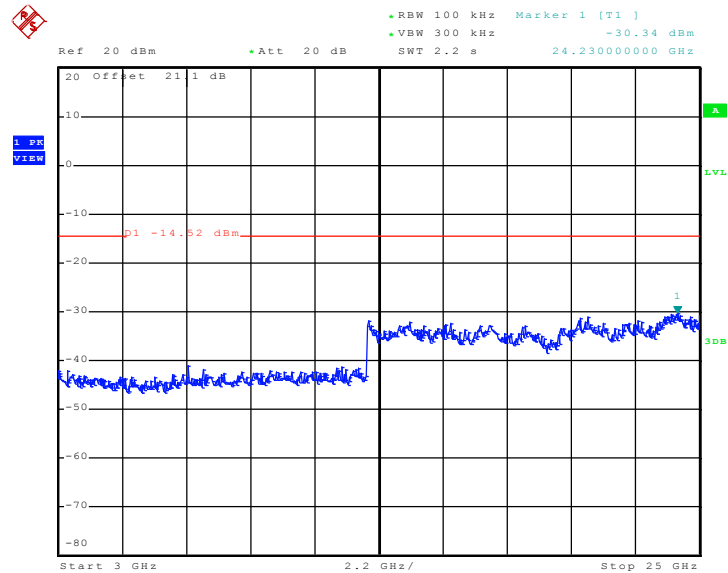


Conducted Spurious Emission Plot on 802.11g Channel 06



Date: 10.MAR.2011 16:43:41

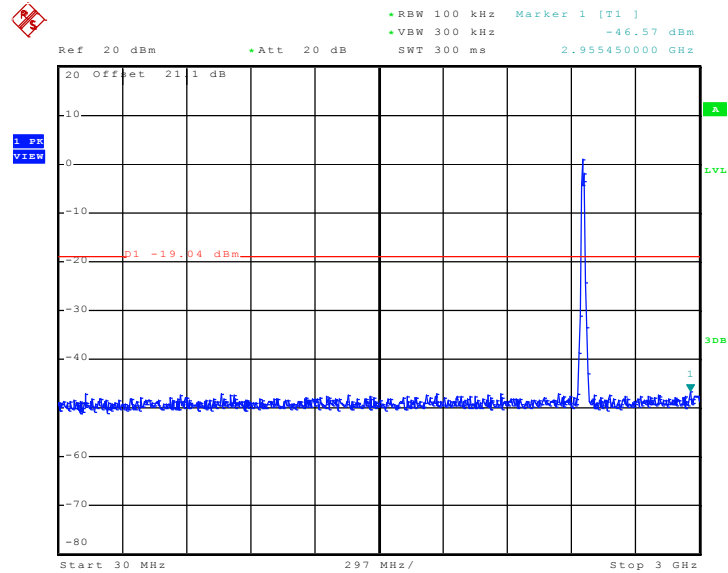
Conducted Spurious Emission Plot on 802.11g Channel 06



Date: 10.MAR.2011 16:43:59

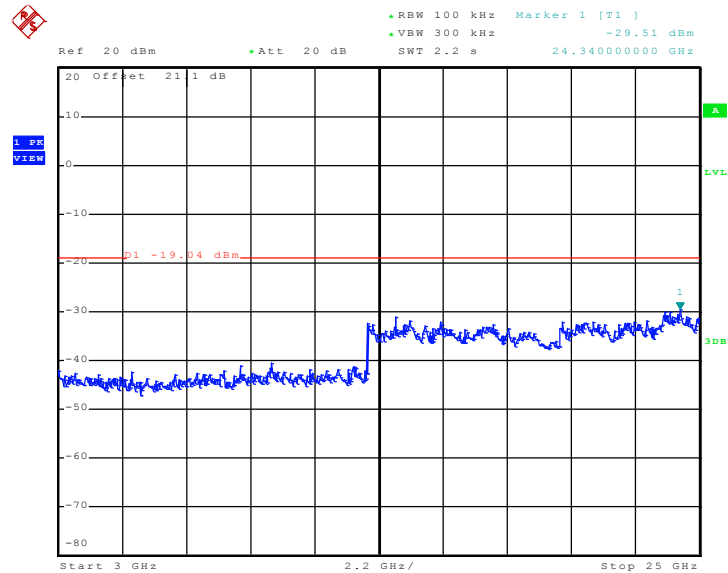


Conducted Spurious Emission Plot on 802.11g Channel 11



Date: 10.MAR.2011 16:30:41

Conducted Spurious Emission Plot on 802.11g Channel 11

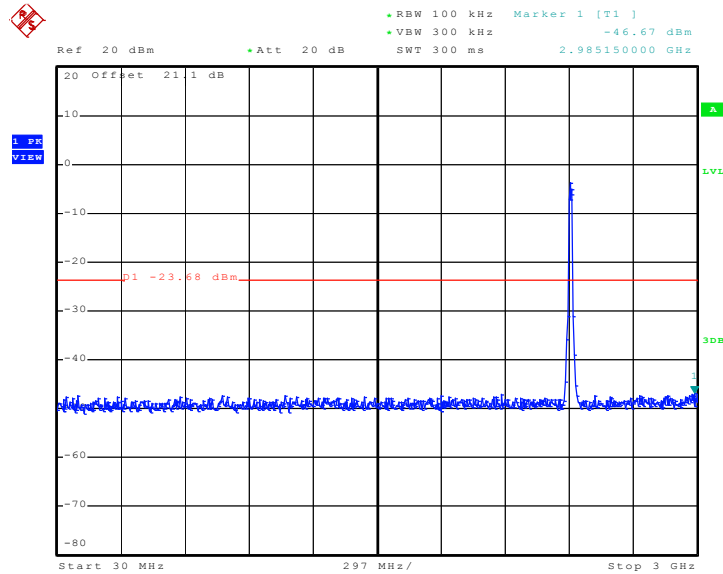


Date: 10.MAR.2011 16:30:59



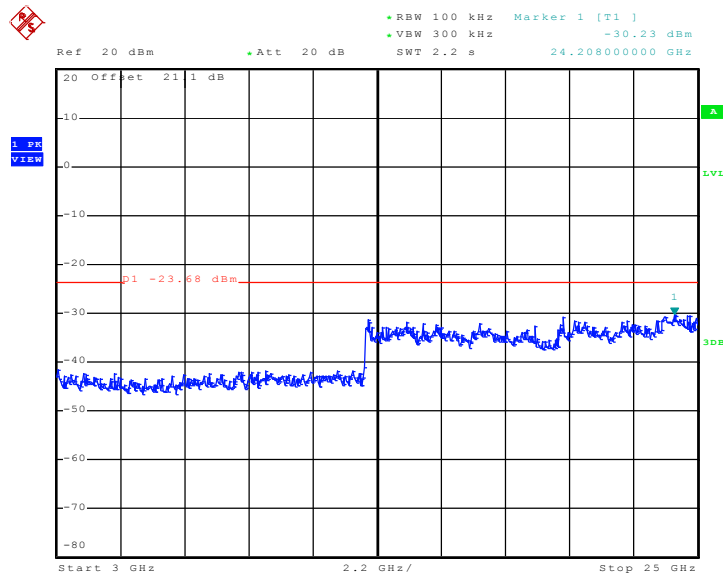
Test Mode :	802.11n (HT-20) L/M/H channel at 2.4G band	Temperature :	24~26°C
Test Band :	802.11n (HT-20)	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Cona Huang

Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 01



Date: 10.MAR.2011 17:30:51

Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 01

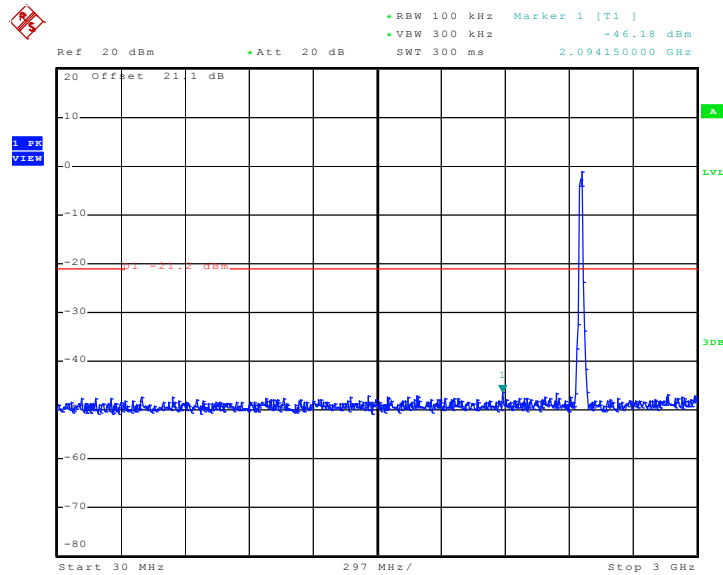


Date: 10.MAR.2011 17:31:09



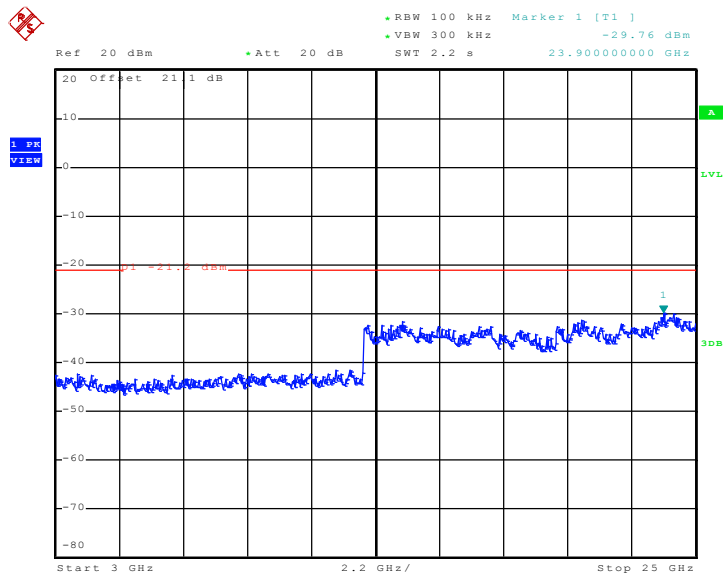


Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 11



Date: 10.MAR.2011 17:49:58

Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 11

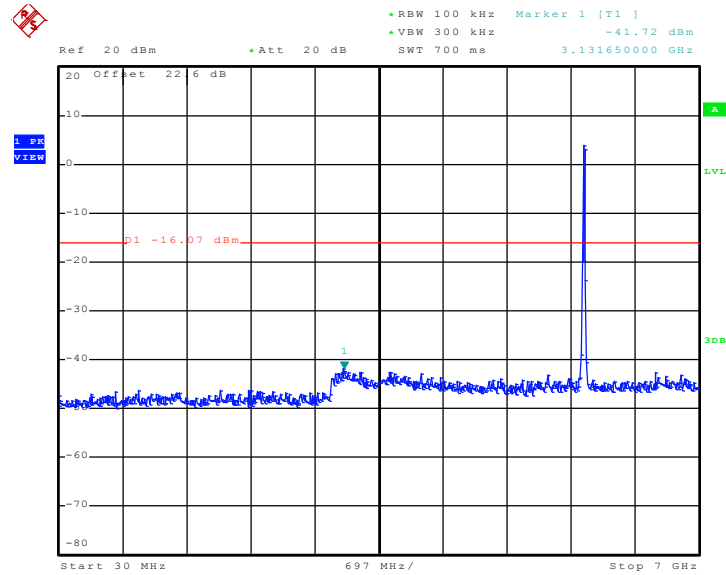


Date: 10.MAR.2011 17:50:16



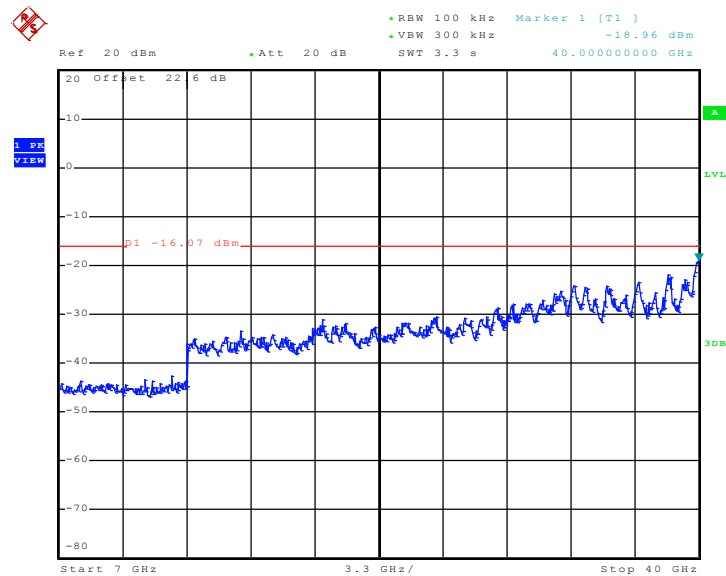
Test Mode :	802.11a L/M/H channels	Temperature :	24~26°C
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	149, 157, 165	Test Engineer :	Cona Huang

Conducted Spurious Emission Plot on 802.11a Channel 149



Date: 18.MAR.2011 09:02:25

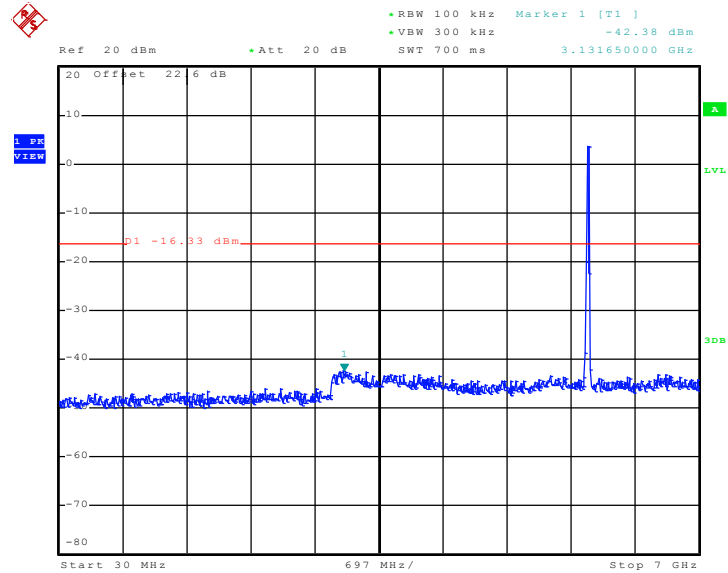
Conducted Spurious Emission Plot on 802.11a Channel 149



Date: 18.MAR.2011 09:02:42

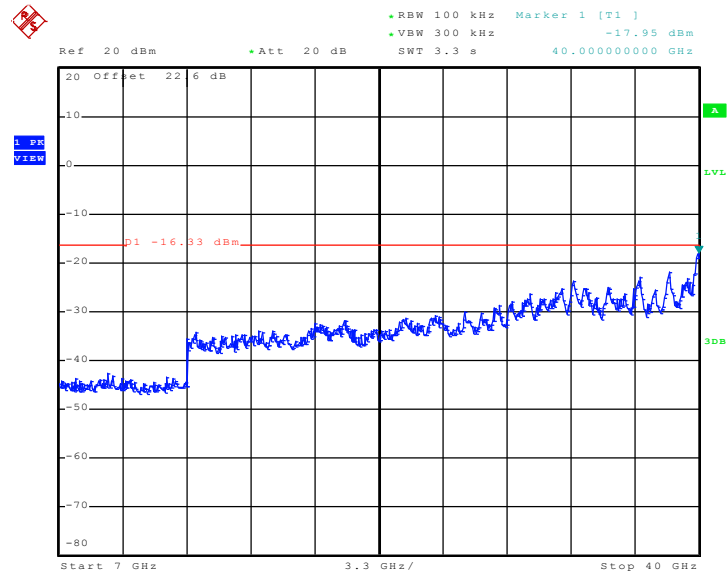


Conducted Spurious Emission Plot on 802.11a Channel 157



Date: 18.MAR.2011 09:15:03

Conducted Spurious Emission Plot on 802.11a Channel 157

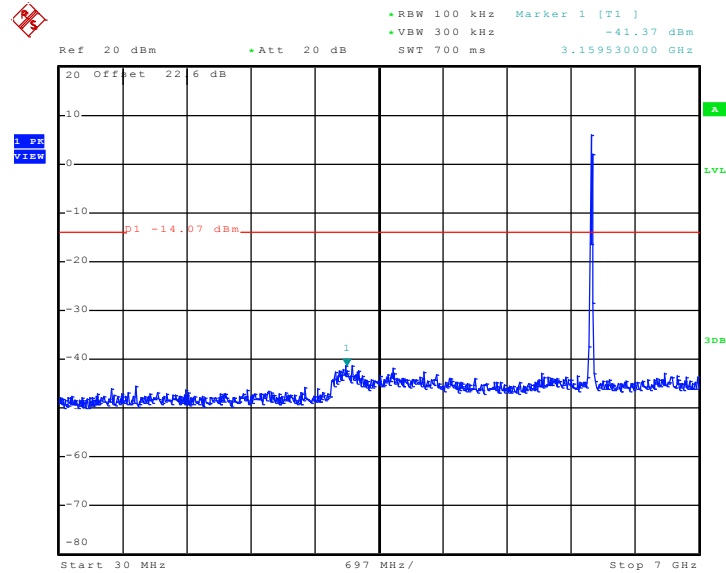


Date: 18.MAR.2011 09:15:20



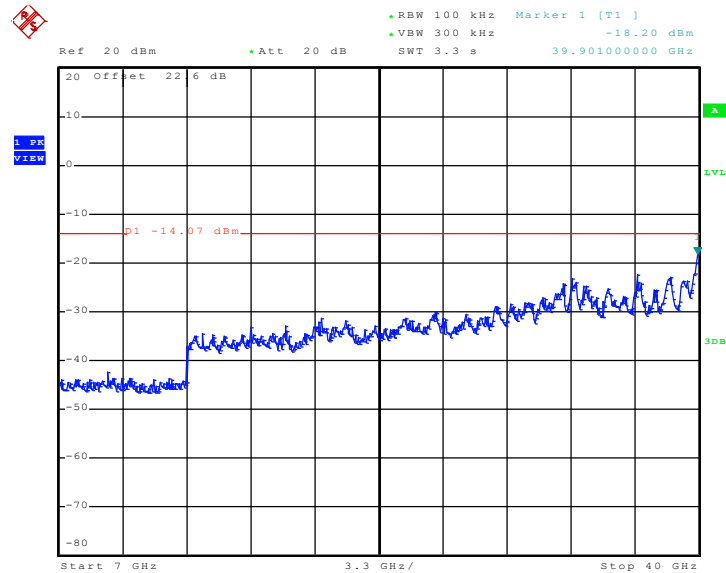


Conducted Spurious Emission Plot on 802.11a Channel 165



Date: 18.MAR.2011 09:27:31

Conducted Spurious Emission Plot on 802.11a Channel 165

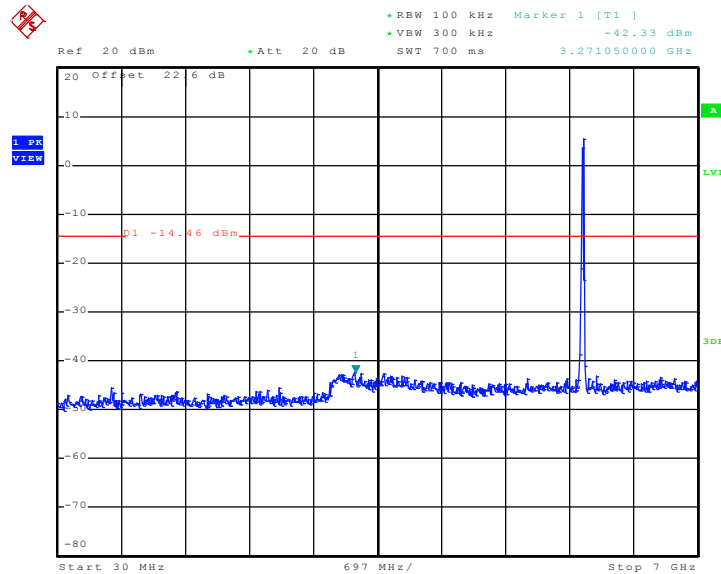


Date: 18.MAR.2011 09:27:48



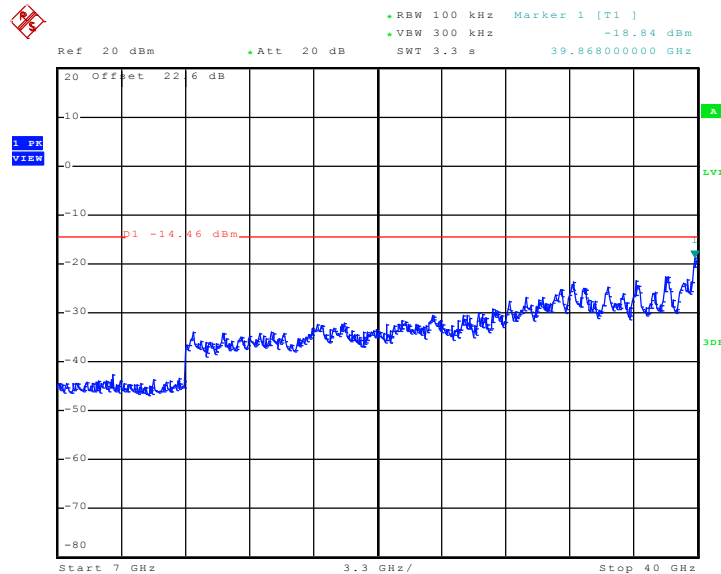
Test Mode :	802.11n (HT-20) L/M/H channel at 5.8G band	Temperature :	24~26°C
Test Band :	802.11n (HT-20)	Relative Humidity :	50~53%
Test Channel :	149, 157, 165	Test Engineer :	Cona Huang

Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 149



Date: 18.MAR.2011 10:04:48

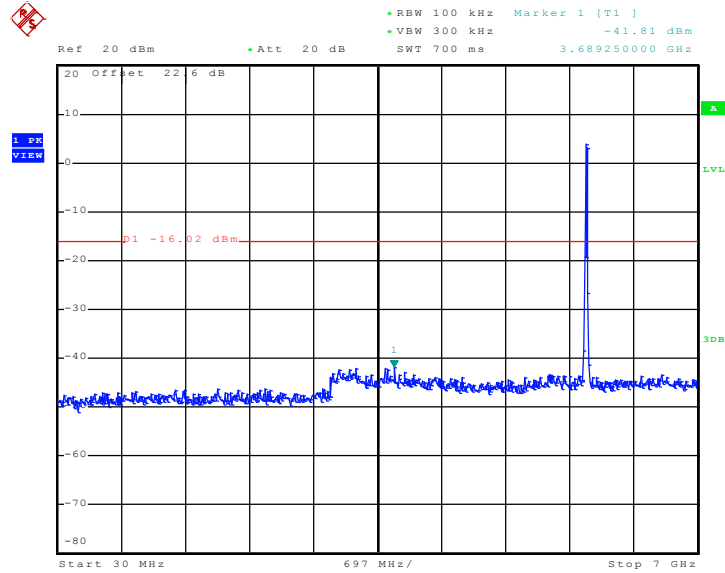
Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 149



Date: 18.MAR.2011 10:05:05

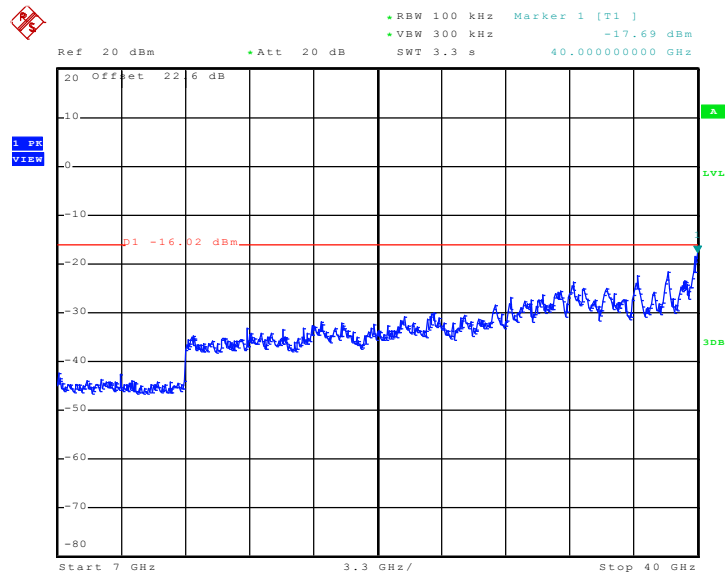


Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 157



Date: 18.MAR.2011 09:51:34

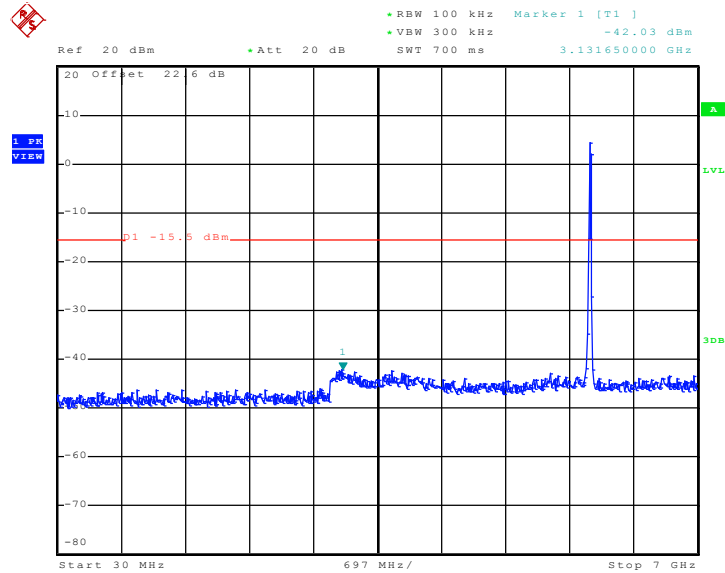
Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 157



Date: 18.MAR.2011 09:51:51

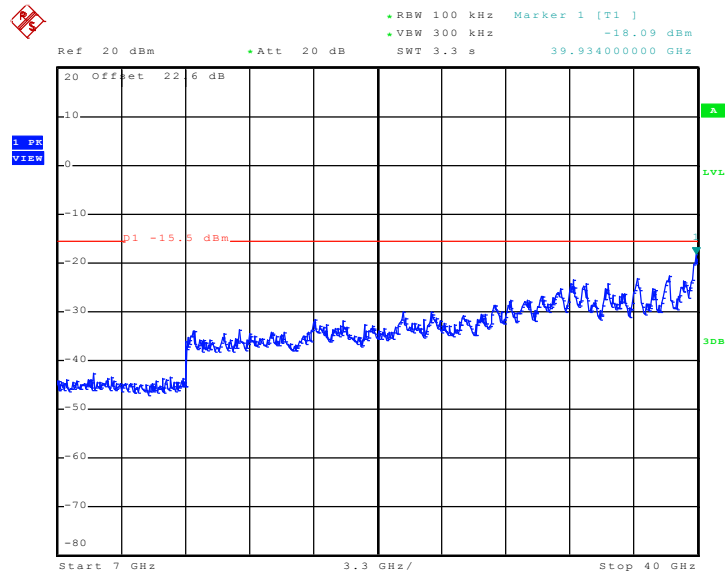


Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 165



Date: 18.MAR.2011 09:39:00

Conducted Spurious Emission Plot on 802.11n (HT-20) Channel 165

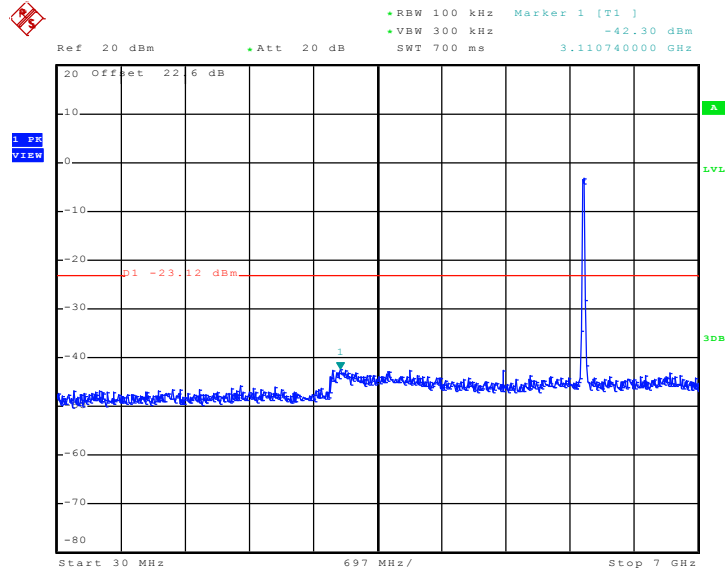


Date: 18.MAR.2011 09:39:17



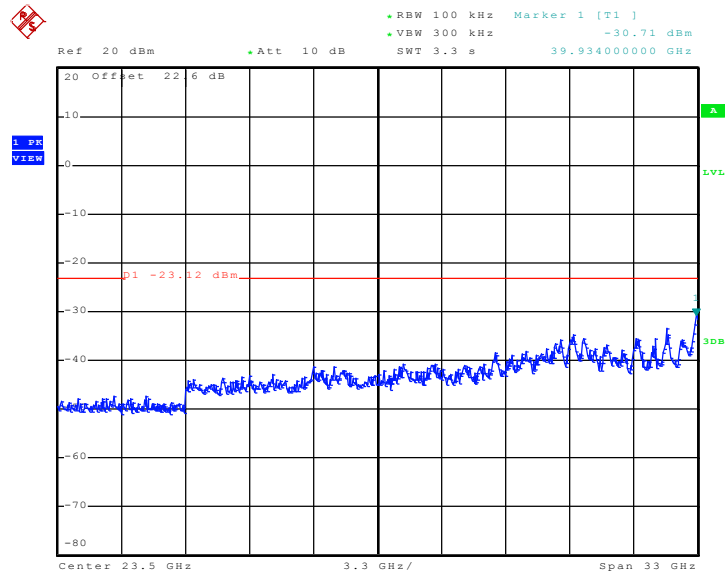
Test Mode :	802.11n (HT-40) L/M/H channel at 5.8G band	Temperature :	24~26°C
Test Band :	802.11n (HT-40)	Relative Humidity :	50~53%
Test Channel :	151 and 159	Test Engineer :	Cona Huang

Conducted Spurious Emission Plot on 802.11n (HT-40) Channel 151



Date: 18.MAR.2011 10:36:46

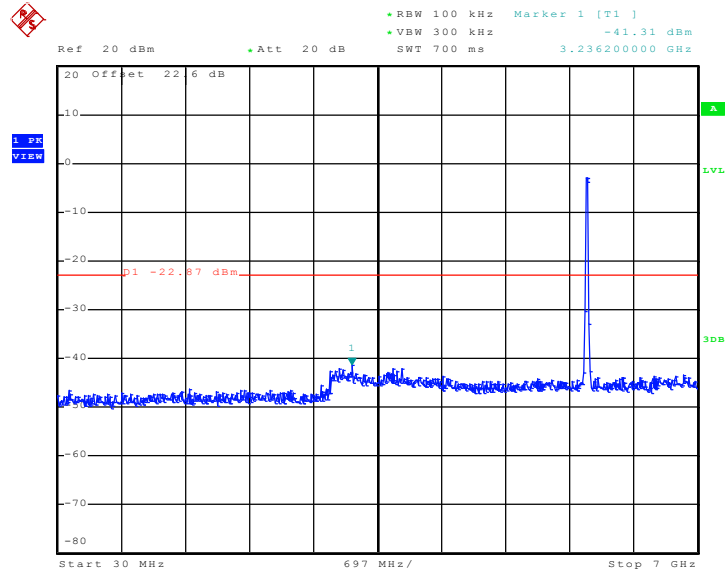
Conducted Spurious Emission Plot on 802.11n (HT-40) Channel 151



Date: 18.MAR.2011 10:37:03

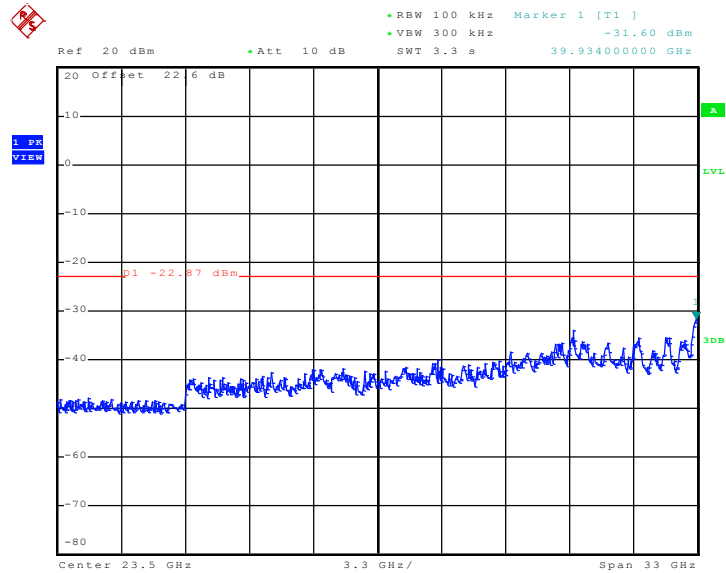


Conducted Spurious Emission Plot on 802.11n (HT-40) Channel 159



Date: 18.MAR.2011 10:35:00

Conducted Spurious Emission Plot on 802.11n (HT-40) Channel 159



Date: 18.MAR.2011 10:35:18

## 3.6 Band Edges Measurement

### 3.6.1 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.

### 3.6.2 Measuring Instruments

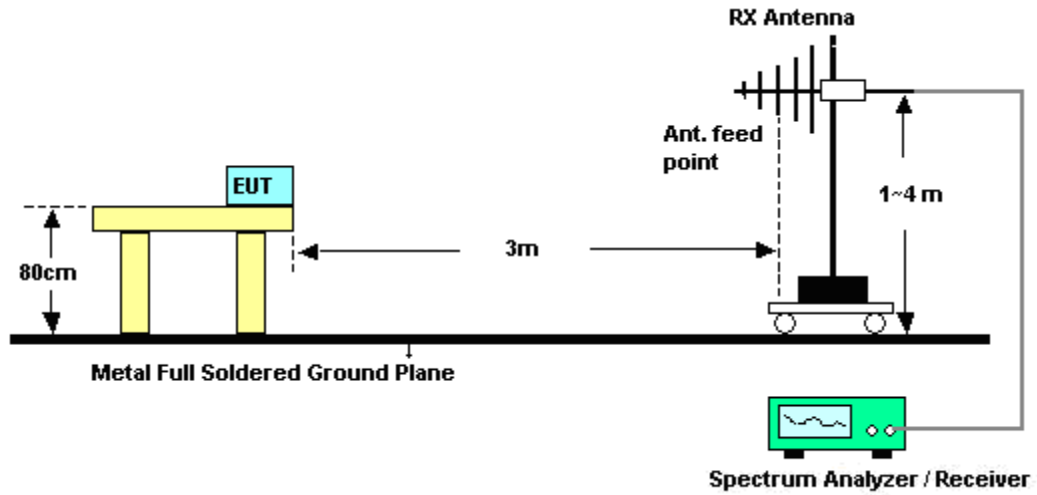
See list of measuring instruments of this test report.

### 3.6.3 Test Procedures

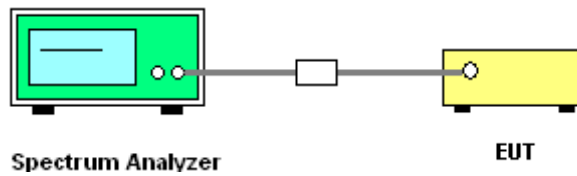
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW)  $\geq$  RBW. Band edge emissions must be at least 20 dB below the highest emission level within the authorized 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 = 1MHz, Sweep = Auto for Peak detector, RBW = 1MHz, VBW = 10 Hz, Sweep=Auto for Average detector. 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).

### 3.6.4 Test Setup

#### <Radiated Band Edges>



#### <Conducted Band Edges>







3.6.5 Test Result of Radiated Band Edges

Test Mode :	802.11 b L channel	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	45~50%
Test Channel :	01	Test Engineer :	Cona Huang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2386.57	58.26	-15.74	74	56.17	31.7	4.47	34.08	129	143	Peak
2386.57	44.4	-9.6	54	42.31	31.7	4.47	34.08	129	143	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
2386.76	65.29	-8.71	74	63.2	31.7	4.47	34.08	128	169	Peak
2386.76	51.32	-2.68	54	49.23	31.7	4.47	34.08	128	169	Average

Test Mode :	802.11b H channel	Temperature :	23~24°C
Test Band :	802.11b	Relative Humidity :	45~50%
Test Channel :	11	Test Engineer :	Cona Huang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	54.07	-19.93	74	51.78	31.78	4.59	34.08	119	151	Peak
2483.5	41.25	-12.75	54	38.96	31.78	4.59	34.08	119	151	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2488.03	58.4	-15.6	74	56.09	31.8	4.59	34.08	103	269	Peak
2488.03	42.74	-11.26	54	40.43	31.8	4.59	34.08	103	269	Average



Test Mode :	802.11g L channel	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	45~50%
Test Channel :	01	Test Engineer :	Cona Huang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	71.75	-2.25	74	69.63	31.7	4.5	34.08	129	143	Peak
2390	51.86	-2.14	54	49.74	31.7	4.5	34.08	129	143	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	72.68	-1.32	74	70.56	31.7	4.5	34.08	128	169	Peak
2390	53.47	-0.53	54	51.35	31.7	4.5	34.08	128	169	Average

Test Mode :	802.11g H channel	Temperature :	23~24°C
Test Band :	802.11g	Relative Humidity :	45~50%
Test Channel :	11	Test Engineer :	Cona Huang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2483.5	70.66	-3.34	74	68.37	31.78	4.59	34.08	119	151	Peak
2483.5	49.73	-4.27	54	47.44	31.78	4.59	34.08	119	151	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	72.01	-1.99	74	69.72	31.78	4.59	34.08	103	269	Peak
2483.5	53.48	-0.52	54	51.19	31.78	4.59	34.08	103	269	Average



Test Mode :	802.11n (HT-20) L channel at 2.4G band	Temperature :	23~24°C
Test Band :	802.11n (HT-20)	Relative Humidity :	45~50%
Test Channel :	01	Test Engineer :	Cona Huang

ANTENNA POLARITY : HORIZONTAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	70.77	-3.23	74	68.65	31.7	4.5	34.08	129	143	Peak
2390	51.74	-2.26	54	49.62	31.7	4.5	34.08	129	143	Average

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	72.75	-1.25	74	70.63	31.7	4.5	34.08	128	169	Peak
2390	53.22	-0.78	54	51.1	31.7	4.5	34.08	128	169	Average

Test Mode :	802.11n (HT-20) H channel at 2.4G band	Temperature :	23~24°C
Test Band :	802.11n (HT-20)	Relative Humidity :	45~50%
Test Channel :	11	Test Engineer :	Cona Huang

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	71.06	-2.94	74	68.77	31.78	4.59	34.08	119	151	Peak
2483.5	50.94	-3.06	54	48.65	31.78	4.59	34.08	119	151	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
2484.04	72.77	-1.23	74	70.48	31.78	4.59	34.08	103	269	Peak
2484.04	53.15	-0.85	54	50.86	31.78	4.59	34.08	103	269	Average



Test Mode :	802.11a L channel	Temperature :	23~24°C
Test Band :	802.11a	Relative Humidity :	45~50%
Test Channel :	149	Test Engineer :	Cona Huang

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	85.39	-7.39	92.78	77.06	34.51	7.01	33.19	100	175	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	78.2	-9.36	87.56	69.87	34.51	7.01	33.19	110	200	Peak

Test Mode :	802.11a H channel	Temperature :	23~24°C
Test Band :	802.11a	Relative Humidity :	45~50%
Test Channel :	165	Test Engineer :	Cona Huang

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	76.99	-17.43	94.42	68.42	34.68	7.09	33.2	101	349	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	71.6	-18.01	89.61	63.03	34.68	7.09	33.2	110	204	Peak



Test Mode :	802.11n (HT-20) L channel at 5.8G band	Temperature :	23~24°C
Test Band :	802.11n (HT-20)	Relative Humidity :	45~50%
Test Channel :	149	Test Engineer :	Cona Huang

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	86.02	-6.28	92.3	77.69	34.51	7.01	33.19	100	175	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	78.87	-8.6	87.47	70.54	34.51	7.01	33.19	110	200	Peak

Test Mode :	802.11n (HT-20) H channel at 5.8G band	Temperature :	23~24°C
Test Band :	802.11n (HT-20)	Relative Humidity :	45~50%
Test Channel :	165	Test Engineer :	Cona Huang

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	80.51	-13.34	93.85	71.94	34.68	7.09	33.2	101	349	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	75.34	-13.93	89.27	66.77	34.68	7.09	33.2	110	204	Peak



Test Mode :	802.11n (HT-40) L channel at 5.8G band	Temperature :	23~24°C
Test Band :	802.11n (HT-40)	Relative Humidity :	45~50%
Test Channel :	151	Test Engineer :	Cona Huang

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	70.24	-14.51	84.75	61.91	34.51	7.01	33.19	100	175	Peak

ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
5725	65.48	-16.71	82.19	57.15	34.51	7.01	33.19	147	43	Peak

Test Mode :	802.11n (HT-40) H channel at 5.8G band	Temperature :	23~24°C
Test Band :	802.11n (HT-40)	Relative Humidity :	45~50%
Test Channel :	159	Test Engineer :	Cona Huang

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	57.33	-28.85	86.18	48.76	34.68	7.09	33.2	102	353	Peak

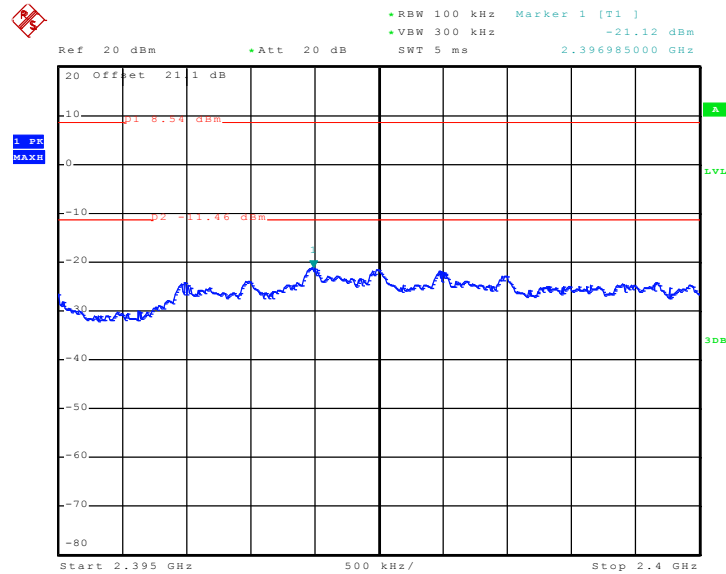
ANTENNA POLARITY : VERTICAL										
Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
5850	50.72	-29.75	80.47	42.15	34.68	7.09	33.2	100	209	Peak



3.6.6 Test Result of Conducted Band Edges

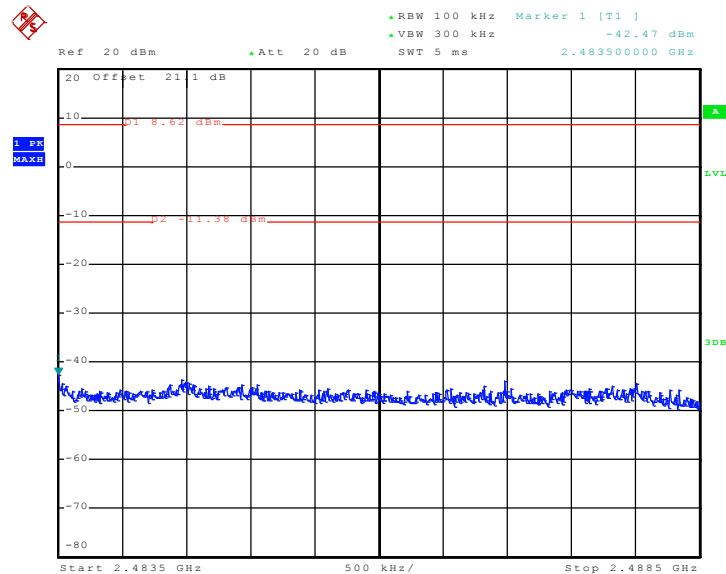
Test Mode :	802.11b L and H channel	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Cona Huang

Low Band Edge Plot on 802.11b Channel 01



Date: 10.MAR.2011 15:23:18

High Band Edge Plot on 802.11b Channel 11

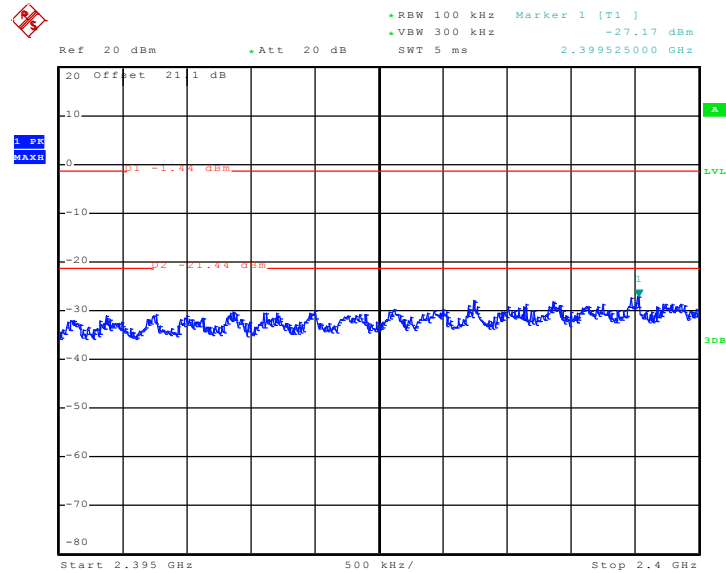


Date: 10.MAR.2011 16:03:44



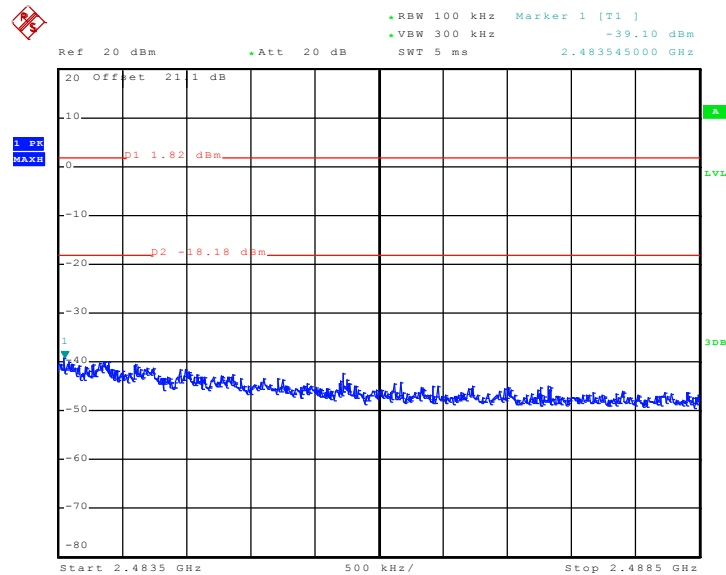
Test Mode :	802.11g L and H channels	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Cona Huang

Low Band Edge Plot on 802.11g Channel 01



Date: 10.MAR.2011 17:05:20

High Band Edge Plot on 802.11g Channel 11



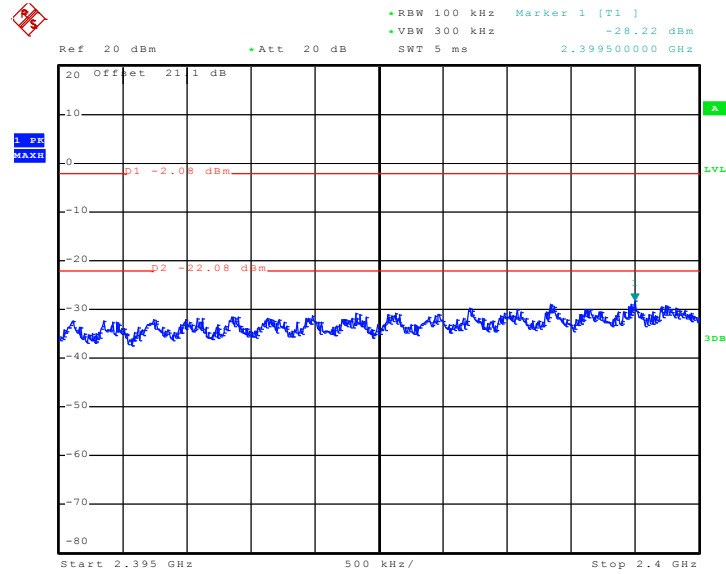
Date: 10.MAR.2011 16:20:43





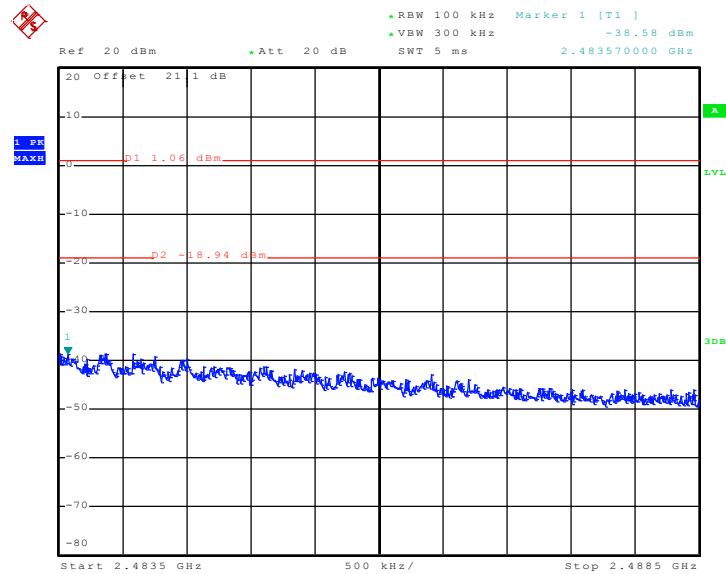
Test Mode :	802.11n (HT-20) L and H channel at 2.4G band	Temperature :	24~26°C
Test Band :	802.11n (HT-20)	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Cona Huang

Low Band Edge Plot on 802.11n Channel 01



Date: 10.MAR.2011 17:12:17

High Band Edge Plot on 802.11n Channel 11

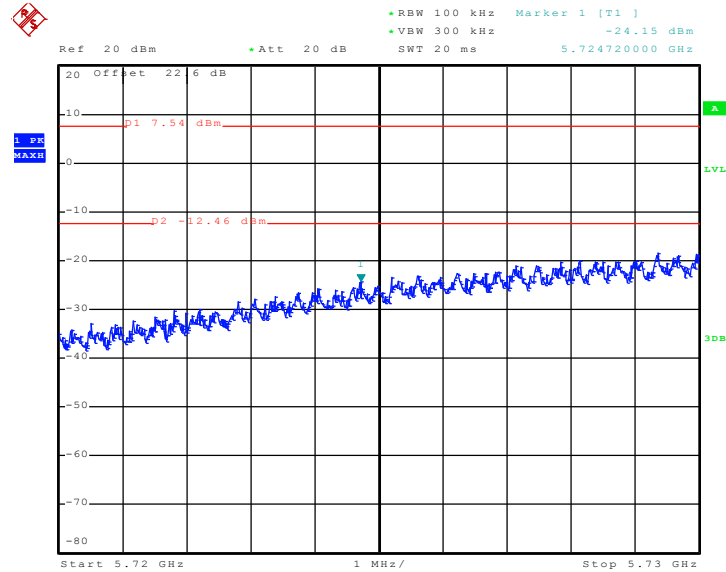


Date: 10.MAR.2011 17:39:23



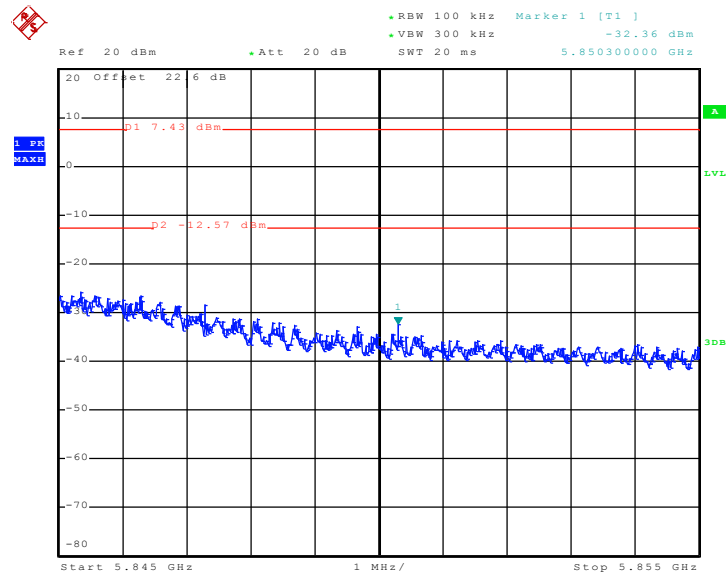
Test Mode :	802.11a L and H channel	Temperature :	24~26°C
Test Band :	802.11a	Relative Humidity :	50~53%
Test Channel :	149 and 165	Test Engineer :	Cona Huang

Low Band Edge Plot on 802.11a Channel 149



Date: 18.MAR.2011 09:03:09

High Band Edge Plot on 802.11a Channel 165

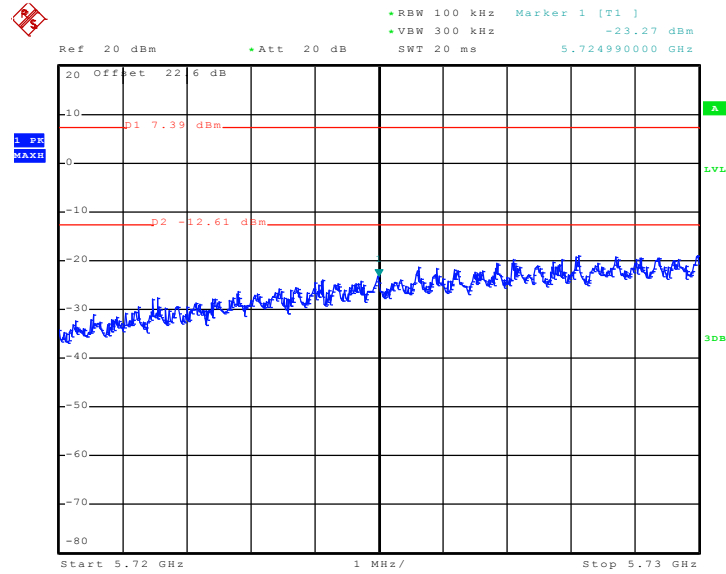


Date: 18.MAR.2011 09:17:19



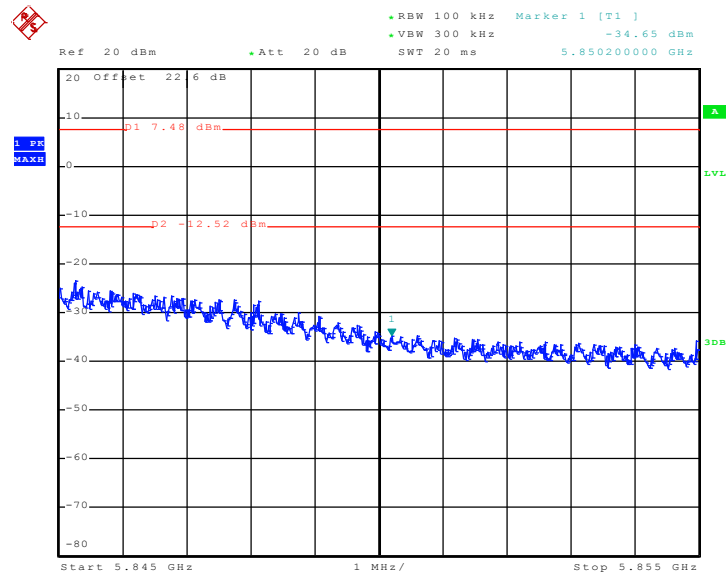
Test Mode :	802.11n (HT-20) L and H channel at 5.8G band	Temperature :	24~26°C
Test Band :	802.11n (HT-20)	Relative Humidity :	50~53%
Test Channel :	149 and 165	Test Engineer :	Cona Huang

Low Band Edge Plot on 802.11n Channel 149



Date: 18.MAR.2011 09:54:30

High Band Edge Plot on 802.11n Channel 165

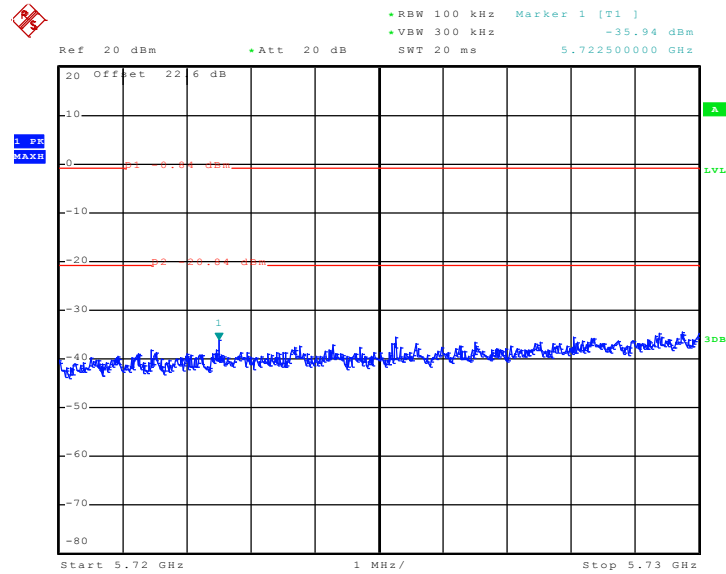


Date: 18.MAR.2011 09:29:22



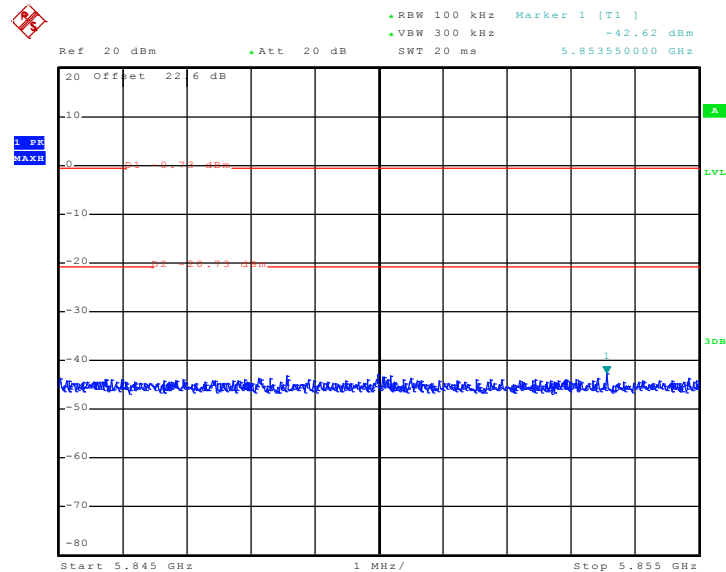
Test Mode :	802.11n (HT-40) L and H channel at 5.8G band	Temperature :	24~26°C
Test Band :	802.11n (HT-40)	Relative Humidity :	50~53%
Test Channel :	151 and 159	Test Engineer :	Cona Huang

Low Band Edge Plot on 802.11n Channel 151



Date: 18.MAR.2011 10:09:34

High Band Edge Plot on 802.11n Channel 159



Date: 18.MAR.2011 10:24:28

### 3.7 Radiated Emission Measurement

#### 3.7.1 Limit of Radiated Emission

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

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

#### 3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

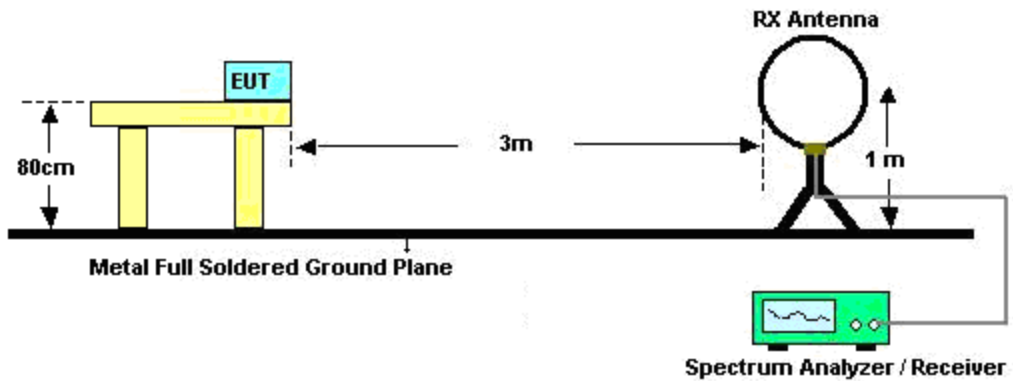
#### 3.7.3 Test Procedures

1. The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Use the following spectrum analyzer settings:
  - (1) If  $f < 1$  GHz,  
Span = wide enough to fully capture the emission being measured; RBW = 100 kHz; VBW = 300kHz; Sweep = auto; Detector function = peak; Trace = max hold.
  - (2) If  $f \geq 1$  GHz  
Span = wide enough to fully capture the emission being measured; RBW = 1 MHz, VBW = 1MHz for Peak mode, RBW = 1 MHz, VBW = 10Hz for Average mode; Sweep = auto; Detector function = peak; Trace = max hold.
  - (3) Above 18 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.  
Distance extrapolation factor =  $20 \log(\text{specific distance [3m]} / \text{test distance [1m]})$  (dB)

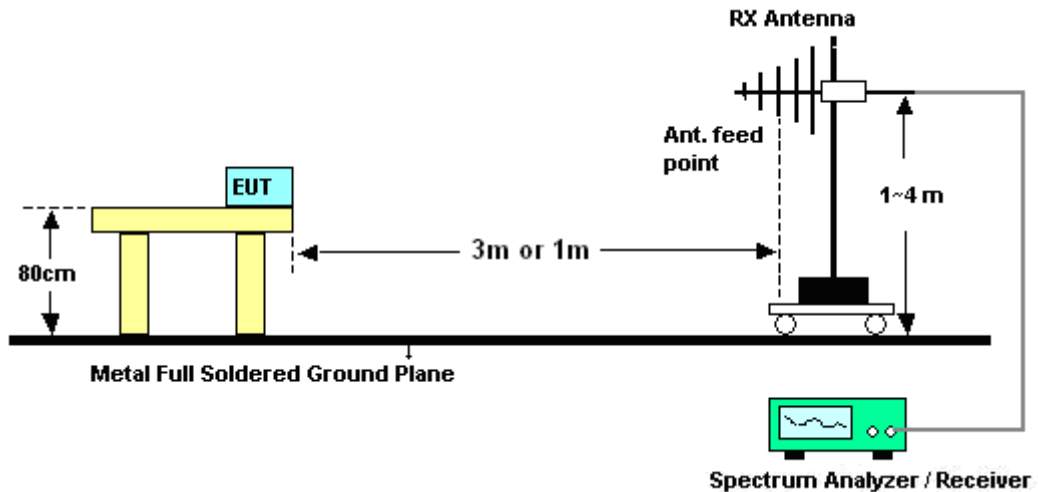
- Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

### 3.7.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz





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

Test Engineer :	Cona Huang	Temperature :	23~24°C	
		Relative Humidity :	45~50%	
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 ~ 1GHz)

Test Mode :	802.11b L channel	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	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
136.92	32.02	-11.48	43.5	51.71	10.75	1.07	31.51	-	-	Peak
160.14	38.31	-5.19	43.5	59.04	9.63	1.14	31.5	-	-	Peak
296.49	40.92	-5.08	46	58.53	12.13	1.55	31.29	-	-	Peak
302.8	38.41	-7.59	46	55.89	12.24	1.55	31.27	-	-	Peak
410.6	39.52	-6.48	46	53.86	15.01	1.82	31.17	-	-	Peak
498.1	40.93	-5.07	46	52.93	17.04	2.04	31.08	100	194	Peak





Test Mode :	802.11b L channel	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	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
40.8	32.75	-7.25	40	51.01	12.68	0.58	31.52	-	-	Peak
81.57	35.64	-4.36	40	59.55	6.8	0.84	31.55	100	263	Peak
131.79	34.9	-8.6	43.5	54.51	10.84	1.07	31.52	-	-	Peak
302.1	33.63	-12.37	46	51.11	12.24	1.55	31.27	-	-	Peak
388.9	38.61	-7.39	46	53.57	14.48	1.77	31.21	-	-	Peak
423.2	40.61	-5.39	46	54.61	15.3	1.87	31.17	100	0	Peak



Test Mode :	802.11a L channel	Temperature :	23~24°C
Test Channel :	149	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	5745 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV )	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
40.8	35.57	-4.43	40	53.83	12.68	0.58	31.52	105	113	Peak
153.93	38.26	-5.24	43.5	58.62	10	1.14	31.5	-	-	Peak
293.52	39.99	-6.01	46	57.64	12.1	1.55	31.3	-	-	Peak
302.1	38.98	-7.02	46	56.46	12.24	1.55	31.27	-	-	Peak
386.8	40.18	-5.82	46	55.19	14.43	1.77	31.21	-	-	Peak
444.9	41.33	-4.67	46	54.75	15.81	1.92	31.15	-	-	Peak



Test Mode :	802.11a L channel	Temperature :	23~24°C
Test Channel :	149	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	5745 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
49.98	30.05	-9.95	40	53.16	7.73	0.73	31.57	-	-	Peak
82.38	35.42	-4.58	40	59.15	6.98	0.84	31.55	-	-	Peak
133.41	34.24	-9.26	43.5	53.89	10.8	1.07	31.52	-	-	Peak
408.5	38.79	-7.21	46	53.18	14.96	1.82	31.17	-	-	Peak
497.4	41.2	-4.8	46	53.23	17.01	2.04	31.08	100	254	Peak
680.1	37.33	-8.67	46	46.67	19.05	2.35	30.74	-	-	Peak



**3.7.7 Test Result of Radiated Emission (1GHz ~ 10<sup>th</sup> Harmonic)**

<b>Test Mode :</b>	802.11b L channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
2386.57	44.4	-9.6	54	42.31	31.7	4.47	34.08	129	143	Average
2386.57	58.26	-15.74	74	56.17	31.7	4.47	34.08	129	143	Peak
2412	101.73	-	-	99.6	31.71	4.5	34.08	129	143	Average
2412	108.46	-	-	106.33	31.71	4.5	34.08	129	143	Peak
2488	37.73	-16.27	54	35.42	31.8	4.59	34.08	129	143	Average
2488	49.36	-24.64	74	47.05	31.8	4.59	34.08	129	143	Peak
4824	46.64	-7.36	54	64.89	33.77	6.44	58.46	100	161	Average
4824	54.35	-19.65	74	72.6	33.77	6.44	58.46	100	161	Peak



<b>Test Mode :</b>	802.11b L channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
2386.76	51.32	-2.68	54	49.23	31.7	4.47	34.08	128	169	Average
2386.76	65.29	-8.71	74	63.2	31.7	4.47	34.08	128	169	Peak
2412	104.42	-	-	102.29	31.71	4.5	34.08	128	169	Average
2412	111.94	-	-	109.81	31.71	4.5	34.08	128	169	Peak
2486	38.24	-15.76	54	35.95	31.78	4.59	34.08	128	169	Average
2486	49.03	-24.97	74	46.74	31.78	4.59	34.08	128	169	Peak
4824	49.49	-4.51	54	67.74	33.77	6.44	58.46	110	196	Average
4824	57.2	-16.8	74	75.45	33.77	6.44	58.46	110	196	Peak



<b>Test Mode :</b>	802.11b M channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
2364	37.84	-16.16	54	35.82	31.66	4.44	34.08	119	273	Average
2364	49.21	-24.79	74	47.19	31.66	4.44	34.08	119	273	Peak
2437	102.25	-	-	100.05	31.75	4.53	34.08	119	273	Average
2437	108.96	-	-	106.76	31.75	4.53	34.08	119	273	Peak
2500	37.94	-16.06	54	35.6	31.8	4.62	34.08	119	273	Average
2500	49.91	-24.09	74	47.57	31.8	4.62	34.08	119	273	Peak
4874	44.2	-9.8	54	62.29	33.78	6.49	58.36	100	174	Average
4874	51.96	-22.04	74	70.05	33.78	6.49	58.36	100	174	Peak



<b>Test Mode :</b>	802.11b M channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
2390	38.32	-15.68	54	36.2	31.7	4.5	34.08	126	268	Average
2390	52.14	-21.86	74	50.02	31.7	4.5	34.08	126	268	Peak
2437	107.43	-	-	105.23	31.75	4.53	34.08	126	268	Average
2437	113.7	-	-	111.5	31.75	4.53	34.08	126	268	Peak
2496	38.33	-15.67	54	35.99	31.8	4.62	34.08	126	268	Average
2496	49.46	-24.54	74	47.12	31.8	4.62	34.08	126	268	Peak
4874	46.91	-7.09	54	65	33.78	6.49	58.36	106	254	Average
4874	54.13	-19.87	74	72.22	33.78	6.49	58.36	106	254	Peak
2390	38.32	-15.68	54	36.2	31.7	4.5	34.08	126	268	Average
2390	52.14	-21.86	74	50.02	31.7	4.5	34.08	126	268	Peak



<b>Test Mode :</b>	802.11b H channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
2330	37.99	-16.01	54	36.04	31.63	4.41	34.09	119	151	Average
2330	49.67	-24.33	74	47.72	31.63	4.41	34.09	119	151	Peak
2462	104.05	-	-	101.8	31.77	4.56	34.08	119	151	Average
2462	110.33	-	-	108.08	31.77	4.56	34.08	119	151	Peak
2483.5	41.25	-12.75	54	38.96	31.78	4.59	34.08	119	151	Average
2483.5	54.07	-19.93	74	51.78	31.78	4.59	34.08	119	151	Peak
4924	44.56	-9.44	54	62.49	33.79	6.54	58.26	100	177	Average
4924	51.25	-22.75	74	69.18	33.79	6.54	58.26	100	177	Peak





<b>Test Mode :</b>	802.11b H channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
2388	37.88	-16.12	54	35.79	31.7	4.47	34.08	103	269	Average
2388	49.79	-24.21	74	47.7	31.7	4.47	34.08	103	269	Peak
2462	106.49	-	-	104.24	31.77	4.56	34.08	103	269	Average
2462	113.57	-	-	111.32	31.77	4.56	34.08	103	269	Peak
2488.03	42.74	-11.26	54	40.43	31.8	4.59	34.08	103	269	Average
2488.03	58.4	-15.6	74	56.09	31.8	4.59	34.08	103	269	Peak
4924	42.77	-11.23	54	60.7	33.79	6.54	58.26	100	159	Average
4924	49.5	-24.5	74	67.43	33.79	6.54	58.26	100	159	Peak



Test Mode :	802.11g L channel	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	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
2390	51.86	-2.14	54	49.74	31.7	4.5	34.08	129	143	Average
2390	71.75	-2.25	74	69.63	31.7	4.5	34.08	129	143	Peak
2412	91.52	-	-	89.39	31.71	4.5	34.08	129	143	Average
2412	103.4	-	-	101.27	31.71	4.5	34.08	129	143	Peak
2486	37.91	-16.09	54	35.62	31.78	4.59	34.08	129	143	Average
2486	49.25	-24.75	74	46.96	31.78	4.59	34.08	129	143	Peak
4824	37.67	-16.33	54	55.92	33.77	6.44	58.46	110	229	Average
4824	45.02	-28.98	74	63.27	33.77	6.44	58.46	110	229	Peak



<b>Test Mode :</b>	802.11g L channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
2390	53.47	-0.53	54	51.35	31.7	4.5	34.08	128	169	Average
2390	72.68	-1.32	74	70.56	31.7	4.5	34.08	128	169	Peak
2412	93.02	-	-	90.89	31.71	4.5	34.08	128	169	Average
2412	104.91	-	-	102.78	31.71	4.5	34.08	128	169	Peak
2500	38.47	-15.53	54	36.13	31.8	4.62	34.08	128	169	Average
2500	49.53	-24.47	74	47.19	31.8	4.62	34.08	128	169	Peak
4824	39.58	-14.42	54	57.83	33.77	6.44	58.46	100	158	Average
4824	47.91	-26.09	74	66.16	33.77	6.44	58.46	100	158	Peak



<b>Test Mode :</b>	802.11g M channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
2390	41.57	-12.43	54	39.45	31.7	4.5	34.08	119	273	Average
2390	60.23	-13.77	74	58.11	31.7	4.5	34.08	119	273	Peak
2437	98.67	-	-	96.47	31.75	4.53	34.08	119	273	Average
2437	109.1	-	-	106.9	31.75	4.53	34.08	119	273	Peak
2484	41.6	-12.4	54	39.31	31.78	4.59	34.08	119	273	Average
2484	57.04	-16.96	74	54.75	31.78	4.59	34.08	119	273	Peak
4874	41.39	-12.61	54	59.48	33.78	6.49	58.36	103	86	Average
4874	50.94	-23.06	74	69.03	33.78	6.49	58.36	103	86	Peak



<b>Test Mode :</b>	802.11g M channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
2390	46.4	-7.6	54	44.28	31.7	4.5	34.08	126	268	Average
2390	64.29	-9.71	74	62.17	31.7	4.5	34.08	126	268	Peak
2437	104.92	-	-	102.72	31.75	4.53	34.08	126	268	Average
2437	114.29	-	-	112.09	31.75	4.53	34.08	126	268	Peak
2486	44.33	-9.67	54	42.04	31.78	4.59	34.08	126	268	Average
2486	60.3	-13.7	74	58.01	31.78	4.59	34.08	126	268	Peak
4874	45.18	-8.82	54	63.27	33.78	6.49	58.36	133	196	Average
4874	52.2	-21.8	74	70.29	33.78	6.49	58.36	133	196	Peak



Test Mode :	802.11g H channel	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	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
2390	37.71	-16.29	54	35.59	31.7	4.5	34.08	119	151	Average
2390	50.02	-23.98	74	47.9	31.7	4.5	34.08	119	151	Peak
2462	94.49	-	-	92.24	31.77	4.56	34.08	119	151	Average
2462	105.26	-	-	103.01	31.77	4.56	34.08	119	151	Peak
2483.5	49.73	-4.27	54	47.44	31.78	4.59	34.08	119	151	Average
2483.5	70.66	-3.34	74	68.37	31.78	4.59	34.08	119	151	Peak



Test Mode :	802.11g H channel	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	2462 MHz is Fundamental Signals which can be ignored.		

Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level (dBuV)	Antenna Factor ( dB )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Remark
2390	37.65	-16.35	54	35.53	31.7	4.5	34.08	103	269	Average
2390	50.43	-23.57	74	48.31	31.7	4.5	34.08	103	269	Peak
2462	98	-	-	95.75	31.77	4.56	34.08	103	269	Average
2462	109.61	-	-	107.36	31.77	4.56	34.08	103	269	Peak
2483.5	53.48	-0.52	54	51.19	31.78	4.59	34.08	103	269	Average
2483.5	72.01	-1.99	74	69.72	31.78	4.59	34.08	103	269	Peak



<b>Test Mode :</b>	802.11n (HT-20) L channel at 2.4G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
2390	51.74	-2.26	54	49.62	31.7	4.5	34.08	129	143	Average
2390	70.77	-3.23	74	68.65	31.7	4.5	34.08	129	143	Peak
2412	90.39	-	-	88.26	31.71	4.5	34.08	129	143	Average
2412	102.94	-	-	100.81	31.71	4.5	34.08	129	143	Peak
2492	37.46	-16.54	54	35.12	31.8	4.62	34.08	129	143	Average
2492	48.85	-25.15	74	46.51	31.8	4.62	34.08	129	143	Peak





<b>Test Mode :</b>	802.11n (HT-20) L channel at 2.4G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	01	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
2390	53.22	-0.78	54	51.1	31.7	4.5	34.08	128	169	Average
2390	72.75	-1.25	74	70.63	31.7	4.5	34.08	128	169	Peak
2412	91.6	-	-	89.47	31.71	4.5	34.08	128	169	Average
2412	102.8	-	-	100.67	31.71	4.5	34.08	128	169	Peak
2490	37.97	-16.03	54	35.63	31.8	4.62	34.08	128	169	Average
2490	49.34	-24.66	74	47	31.8	4.62	34.08	128	169	Peak
4824	36.98	-17.02	54	55.23	33.77	6.44	58.46	127	211	Average
4824	45.56	-28.44	74	63.81	33.77	6.44	58.46	127	211	Peak



<b>Test Mode :</b>	802.11n (HT-20) M channel at 2.4G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
2390	42.2	-11.8	54	40.08	31.7	4.5	34.08	119	273	Average
2390	62.84	-11.16	74	60.72	31.7	4.5	34.08	119	273	Peak
2437	98.74	-	-	96.54	31.75	4.53	34.08	119	273	Average
2437	109.2	-	-	107	31.75	4.53	34.08	119	273	Peak
2486	41.18	-12.82	54	38.89	31.78	4.59	34.08	119	273	Average
2486	59.06	-14.94	74	56.77	31.78	4.59	34.08	119	273	Peak
4874	42.22	-11.78	54	60.31	33.78	6.49	58.36	109	222	Average
4874	50.71	-23.29	74	68.8	33.78	6.49	58.36	109	222	Peak



<b>Test Mode :</b>	802.11n (HT-20) M channel at 2.4G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	06	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
2384	48.35	-5.65	54	46.28	31.68	4.47	34.08	126	268	Average
2384	69.6	-4.4	74	67.53	31.68	4.47	34.08	126	268	Peak
2437	103.75	-	-	101.55	31.75	4.53	34.08	126	268	Average
2437	114.33	-	-	112.13	31.75	4.53	34.08	126	268	Peak
2484	45.78	-8.22	54	43.49	31.78	4.59	34.08	126	268	Average
2484	61.5	-12.5	74	59.21	31.78	4.59	34.08	126	268	Peak
4874	42.03	-11.97	54	60.12	33.78	6.49	58.36	128	157	Average
4874	52.44	-21.56	74	70.53	33.78	6.49	58.36	128	157	Peak



<b>Test Mode :</b>	802.11n (HT-20) H channel at 2.4G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	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
2326	37.57	-16.43	54	35.62	31.63	4.41	34.09	119	151	Average
2326	49.77	-24.23	74	47.82	31.63	4.41	34.09	119	151	Peak
2462	94.05	-	-	91.8	31.77	4.56	34.08	119	151	Average
2462	105.02	-	-	102.77	31.77	4.56	34.08	119	151	Peak
2483.5	50.94	-3.06	54	48.65	31.78	4.59	34.08	119	151	Average
2483.5	71.06	-2.94	74	68.77	31.78	4.59	34.08	119	151	Peak



<b>Test Mode :</b>	802.11n (HT-20) H channel at 2.4G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	11	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	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
2354	38.05	-15.95	54	36.04	31.66	4.44	34.09	103	269	Average
2354	49.34	-24.66	74	47.33	31.66	4.44	34.09	103	269	Peak
2462	97.21	-	-	94.96	31.77	4.56	34.08	103	269	Average
2462	107.53	-	-	105.28	31.77	4.56	34.08	103	269	Peak
2484.04	53.15	-0.85	54	50.86	31.78	4.59	34.08	103	269	Average
2484.04	72.77	-1.23	74	70.48	31.78	4.59	34.08	103	269	Peak



Test Mode :	802.11a L channel	Temperature :	23~24°C
Test Channel :	149	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	5745 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
5725	85.39	-7.39	92.78	77.06	34.51	7.01	33.19	100	175	Peak
5745	101.43	-	-	93.05	34.54	7.03	33.19	100	175	Average
5745	112.78	-	-	104.4	34.54	7.03	33.19	100	175	Peak
5850	52.29	-40.49	92.78	43.72	34.68	7.09	33.2	100	175	Peak
11490	48.26	-5.74	54	54.9	38.09	10.48	55.21	105	245	Average
11490	57.29	-16.71	74	63.93	38.09	10.48	55.21	105	245	Peak



Test Mode :	802.11a L channel	Temperature :	23~24°C
Test Channel :	149	Relative Humidity :	45~50%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	5745 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
5725	78.2	-9.36	87.56	69.87	34.51	7.01	33.19	110	200	Peak
5745	96.84	-	-	88.46	34.54	7.03	33.19	110	200	Average
5745	107.56	-	-	99.18	34.54	7.03	33.19	110	200	Peak
5850	50.01	-37.55	87.56	41.44	34.68	7.09	33.2	110	200	Peak
11490	38.64	-15.36	54	45.79	38.09	10.48	55.72	100	69	Average
11490	48.78	-25.22	74	55.93	38.09	10.48	55.72	100	69	Peak



<b>Test Mode :</b>	802.11a M channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	157	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	5785 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
2862	45.28	-28.72	74	41.79	32.39	4.93	33.83	100	0	Peak
3858	49.17	-24.83	74	44.41	32.78	5.56	33.58	100	0	Peak
5725	57.58	-35.46	93.04	49.25	34.51	7.01	33.19	102	360	Peak
5785	101.81	-	-	93.36	34.59	7.05	33.19	102	360	Average
5785	113.04	-	-	104.59	34.59	7.05	33.19	102	360	Peak
5850	52.4	-40.64	93.04	43.83	34.68	7.09	33.2	102	360	Peak
11570	47.51	-6.49	54	54.02	38.2	10.54	55.25	102	228	Average
11570	56.8	-17.2	74	63.31	38.2	10.54	55.25	102	228	Peak





<b>Test Mode :</b>	802.11a M channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	157	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	5785 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
2730	45.43	-28.57	74	42.36	32.17	4.82	33.92	100	0	Peak
3892	48.96	-25.04	74	44.11	32.83	5.6	33.58	100	0	Peak
5725	54.9	-32.43	87.33	46.57	34.51	7.01	33.19	100	257	Peak
5785	96.12	-	-	87.67	34.59	7.05	33.19	100	257	Average
5785	107.33	-	-	98.88	34.59	7.05	33.19	100	257	Peak
5850	51.23	-36.1	87.33	42.66	34.68	7.09	33.2	100	257	Peak
11570	40.37	-13.63	54	47.13	38.2	10.54	55.5	100	77	Average
11570	50.9	-23.1	74	57.66	38.2	10.54	55.5	100	77	Peak



<b>Test Mode :</b>	802.11a H channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	165	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	5825 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
2796	45.81	-28.19	74	42.52	32.28	4.89	33.88	100	0	Peak
3882	49.37	-24.63	74	44.54	32.83	5.58	33.58	100	0	Peak
5725	54.31	-40.11	94.42	45.98	34.51	7.01	33.19	101	349	Peak
5825	103.64	-	-	95.11	34.66	7.07	33.2	101	349	Average
5825	114.42	-	-	105.89	34.66	7.07	33.2	101	349	Peak
5850	76.99	-17.43	94.42	68.42	34.68	7.09	33.2	101	349	Peak
11650	43.51	-10.49	54	49.92	38.29	10.6	55.3	100	297	Average
11650	54.57	-19.43	74	60.98	38.29	10.6	55.3	100	297	Peak



<b>Test Mode :</b>	802.11a H channel	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	165	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	5825 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
2728	45.4	-28.6	74	42.33	32.17	4.82	33.92	100	0	Peak
3896	51.04	-22.96	74	46.18	32.83	5.6	33.57	100	0	Peak
5725	52.73	-36.88	89.61	44.4	34.51	7.01	33.19	110	204	Peak
5825	98.34	-	-	89.81	34.66	7.07	33.2	110	204	Average
5825	109.61	-	-	101.08	34.66	7.07	33.2	110	204	Peak
5850	71.6	-18.01	89.61	63.03	34.68	7.09	33.2	110	204	Peak
11650	40.29	-13.71	54	46.67	38.29	10.6	55.27	100	254	Average
11650	51.49	-22.51	74	57.87	38.29	10.6	55.27	100	254	Peak



<b>Test Mode :</b>	802.11n (HT-20) L channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	149	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	5745 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
2774	45.5	-28.5	74	42.29	32.23	4.87	33.89	100	0	Peak
3666	50.62	-23.38	74	46.35	32.48	5.42	33.63	100	0	Peak
5725	86.02	-6.28	92.3	77.69	34.51	7.01	33.19	100	175	Peak
5745	102.01	-	-	93.63	34.54	7.03	33.19	100	175	Average
5745	112.3	-	-	103.92	34.54	7.03	33.19	100	175	Peak
5850	51.91	-40.39	92.3	43.34	34.68	7.09	33.2	100	175	Peak
11490	43.28	-10.72	54	49.92	38.09	10.48	55.21	102	267	Average
11490	54.92	-19.08	74	61.56	38.09	10.48	55.21	102	267	Peak



<b>Test Mode :</b>	802.11n (HT-20) L channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	149	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	5745 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
2792	44.77	-29.23	74	41.51	32.25	4.89	33.88	100	0	Peak
3854	49.75	-24.25	74	44.99	32.78	5.56	33.58	100	0	Peak
5725	78.87	-8.6	87.47	70.54	34.51	7.01	33.19	110	200	Peak
5745	95.68	-	-	87.3	34.54	7.03	33.19	110	200	Average
5745	107.47	-	-	99.09	34.54	7.03	33.19	110	200	Peak
5850	50.28	-37.19	87.47	41.71	34.68	7.09	33.2	110	200	Peak
11490	37.39	-16.61	54	44.54	38.09	10.48	55.72	100	3	Average
11490	48.74	-25.26	74	55.89	38.09	10.48	55.72	100	3	Peak



<b>Test Mode :</b>	802.11n (HT-20) M channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	157	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	5785 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
2816	44.95	-29.05	74	41.59	32.31	4.91	33.86	100	0	Peak
3844	49.41	-24.59	74	44.69	32.75	5.56	33.59	100	0	Peak
5725	56.26	-37.32	93.58	47.93	34.51	7.01	33.19	102	360	Peak
5785	102.34	-	-	93.89	34.59	7.05	33.19	102	360	Average
5785	113.58	-	-	105.13	34.59	7.05	33.19	102	360	Peak
5850	51.14	-42.44	93.58	42.57	34.68	7.09	33.2	102	360	Peak
11570	45.88	-8.12	54	52.39	38.2	10.54	55.25	100	255	Average
11570	56.39	-17.61	74	62.9	38.2	10.54	55.25	100	255	Peak



<b>Test Mode :</b>	802.11n (HT-20) M channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	157	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	5785 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
2750	45.26	-28.74	74	42.12	32.2	4.85	33.91	100	0	Peak
3828	49.62	-24.38	74	44.95	32.72	5.54	33.59	100	0	Peak
5725	53.19	-34.3	87.49	44.86	34.51	7.01	33.19	100	257	Peak
5785	96.52	-	-	88.07	34.59	7.05	33.19	100	257	Average
5785	107.49	-	-	99.04	34.59	7.05	33.19	100	257	Peak
5850	50.72	-36.77	87.49	42.15	34.68	7.09	33.2	100	257	Peak
11570	39.45	-14.55	54	46.21	38.2	10.54	55.5	100	26	Average
11570	50.17	-23.83	74	56.93	38.2	10.54	55.5	100	26	Peak



<b>Test Mode :</b>	802.11n (HT-20) H channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	165	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	5825 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
2724	45.31	-28.69	74	42.26	32.15	4.82	33.92	100	0	Peak
3874	49.96	-24.04	74	45.15	32.81	5.58	33.58	100	0	Peak
5725	53.97	-39.88	93.85	45.64	34.51	7.01	33.19	101	349	Peak
5825	102.58	-	-	94.05	34.66	7.07	33.2	101	349	Average
5825	113.85	-	-	105.32	34.66	7.07	33.2	101	349	Peak
5850	80.51	-13.34	93.85	71.94	34.68	7.09	33.2	101	349	Peak
11650	43.68	-10.32	54	50.09	38.29	10.6	55.3	100	36	Average
11650	53.94	-20.06	74	60.35	38.29	10.6	55.3	100	36	Peak





<b>Test Mode :</b>	802.11n (HT-20) H channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	165	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	5825 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
2730	45.26	-28.74	74	42.19	32.17	4.82	33.92	100	0	Peak
3784	49.03	-24.97	74	44.46	32.67	5.5	33.6	100	0	Peak
5725	51.91	-37.36	89.27	43.58	34.51	7.01	33.19	110	204	Peak
5825	99.06	-	-	90.53	34.66	7.07	33.2	110	204	Average
5825	109.27	-	-	100.74	34.66	7.07	33.2	110	204	Peak
5850	75.34	-13.93	89.27	66.77	34.68	7.09	33.2	110	204	Peak
11650	41.28	-12.72	54	47.66	38.29	10.6	55.27	100	69	Average
11650	52.84	-21.16	74	59.22	38.29	10.6	55.27	100	69	Peak



<b>Test Mode :</b>	802.11n (HT-40) L channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	151	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	5755 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
2678	44.96	-29.04	74	42.04	32.09	4.78	33.95	100	0	Peak
3876	49.37	-24.63	74	44.56	32.81	5.58	33.58	100	0	Peak
5725	70.24	-14.51	84.75	61.91	34.51	7.01	33.19	100	175	Peak
5755	93.44	-	-	85.04	34.56	7.03	33.19	100	175	Average
5755	104.75	-	-	96.35	34.56	7.03	33.19	100	175	Peak
5850	52.47	-32.28	84.75	43.9	34.68	7.09	33.2	100	175	Peak



<b>Test Mode :</b>	802.11n (HT-40) L channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	151	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	5755 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
2708	45.54	-28.46	74	42.56	32.12	4.8	33.94	100	0	Peak
3784	49.9	-24.1	74	45.33	32.67	5.5	33.6	100	0	Peak
5725	65.48	-16.71	82.19	57.15	34.51	7.01	33.19	147	43	Peak
5755	91.29	-	-	82.89	34.56	7.03	33.19	147	43	Average
5755	102.19	-	-	93.79	34.56	7.03	33.19	147	43	Peak
5850	50.56	-31.63	82.19	41.99	34.68	7.09	33.2	147	43	Peak



<b>Test Mode :</b>	802.11n (HT-40) H channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	159	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Horizontal
<b>Remark :</b>	5795 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
2816	46.58	-27.42	74	43.22	32.31	4.91	33.86	100	0	Peak
3860	49.04	-24.96	74	44.28	32.78	5.56	33.58	100	0	Peak
5725	52.43	-33.75	86.18	44.1	34.51	7.01	33.19	102	353	Peak
5795	94.57	-	-	86.09	34.61	7.06	33.19	102	353	Average
5795	106.18	-	-	97.7	34.61	7.06	33.19	102	353	Peak
5850	57.33	-28.85	86.18	48.76	34.68	7.09	33.2	102	353	Peak



<b>Test Mode :</b>	802.11n (HT-40) H channel at 5.8G band	<b>Temperature :</b>	23~24°C
<b>Test Channel :</b>	159	<b>Relative Humidity :</b>	45~50%
<b>Test Engineer :</b>	Cona Huang	<b>Polarization :</b>	Vertical
<b>Remark :</b>	5795 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
2738	44.88	-29.12	74	41.81	32.17	4.82	33.92	100	0	Peak
3786	49.68	-24.32	74	45.11	32.67	5.5	33.6	100	0	Peak
5725	50.86	-29.61	80.47	42.53	34.51	7.01	33.19	100	209	Peak
5795	89.41	-	-	80.93	34.61	7.06	33.19	100	209	Average
5795	100.47	-	-	91.99	34.61	7.06	33.19	100	209	Peak
5850	50.72	-29.75	80.47	42.15	34.68	7.09	33.2	100	209	Peak

### 3.8 AC Conducted Emission Measurement

#### 3.8.1 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.

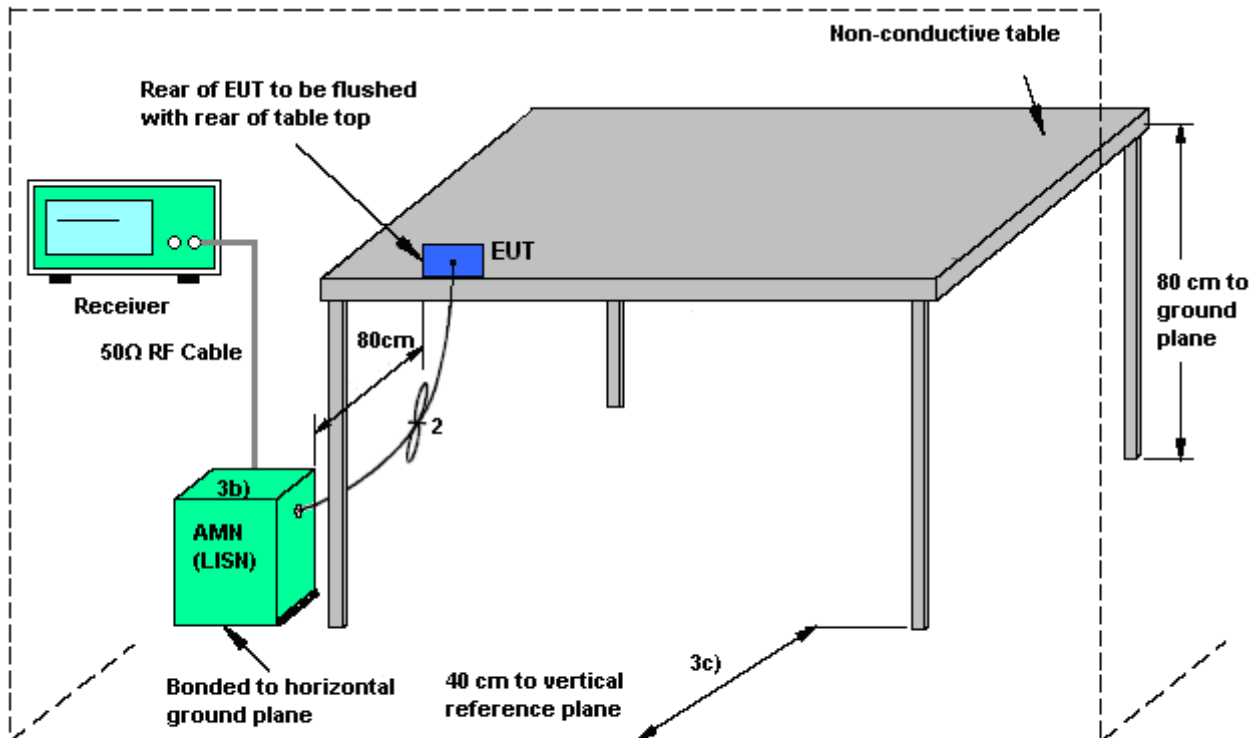
#### 3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

#### 3.8.3 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.

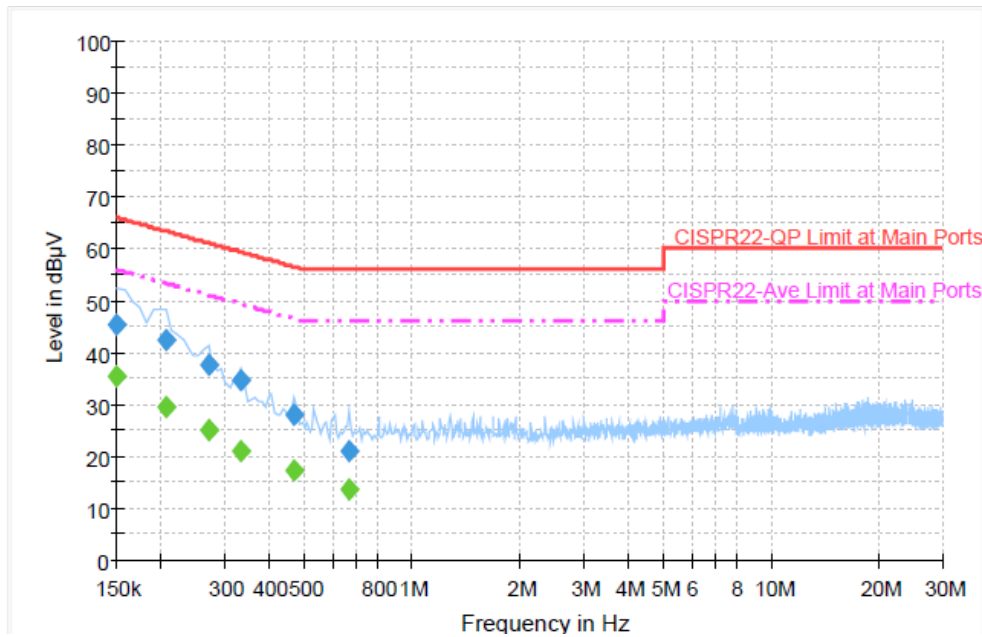
### 3.8.4 Test Setup



AMN = Artificial mains network (LISN)  
 AE = Associated equipment  
 EUT = Equipment under test  
 ISN = Impedance stabilization network

### 3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Cona Huang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Tx + Bluetooth Tx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



#### Final Result 1

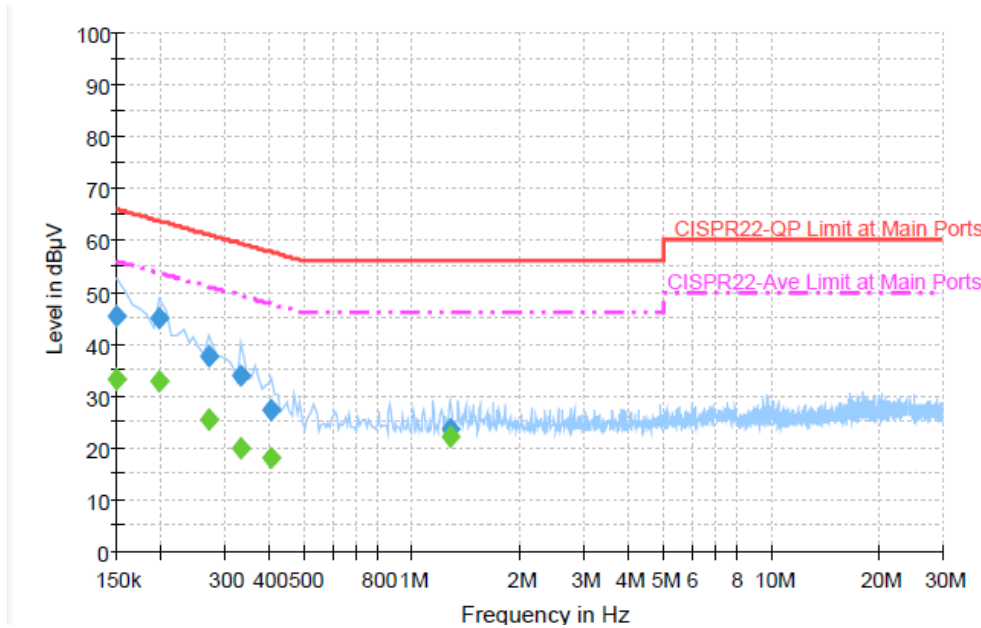
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	45.3	Off	L1	19.4	20.7	66.0
0.206000	42.3	Off	L1	19.3	21.1	63.4
0.270000	37.8	Off	L1	19.3	23.3	61.1
0.334000	34.5	Off	L1	19.3	24.9	59.4
0.470000	28.2	Off	L1	19.4	28.3	56.5
0.670000	21.0	Off	L1	19.4	35.0	56.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	35.5	Off	L1	19.4	20.5	56.0
0.206000	29.5	Off	L1	19.3	23.9	53.4
0.270000	25.2	Off	L1	19.3	25.9	51.1
0.334000	21.1	Off	L1	19.3	28.3	49.4
0.470000	17.2	Off	L1	19.4	29.3	46.5
0.670000	13.7	Off	L1	19.4	32.3	46.0



Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Novic Jiang	Relative Humidity :	48~50%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Tx + Bluetooth Tx		
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	45.3	Off	N	19.4	20.7	66.0
0.198000	45.0	Off	N	19.3	18.7	63.7
0.270000	37.7	Off	N	19.3	23.4	61.1
0.334000	33.8	Off	N	19.3	25.6	59.4
0.406000	27.5	Off	N	19.4	30.2	57.7
1.278000	23.8	Off	N	19.5	32.2	56.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	33.0	Off	N	19.4	23.0	56.0
0.198000	32.7	Off	N	19.3	21.0	53.7
0.270000	25.6	Off	N	19.3	25.5	51.1
0.334000	20.0	Off	N	19.3	29.4	49.4
0.406000	18.0	Off	N	19.4	29.7	47.7
1.278000	22.1	Off	N	19.5	23.9	46.0



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jun. 08, 2009	Jun. 07, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 11, 2010	Jun. 10, 2011	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 13, 2010	Sep. 12, 2011	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 14, 2010	Sep. 13, 2011	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)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 30,2010	Jul. 29, 2011	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 16, 2010	Aug. 15, 2011	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)
ISN	Teseq GmbH	ISN T400A	25696	N/A	Jun. 19, 2010	Jun. 18, 2011	Conduction (CO05-HY)
ISN	Teseq GmbH	ISN T800	27134	N/A	Jun. 19, 2010	Jun. 18, 2011	Conduction (CO05-HY)
DC- LISN	R&S	ESH3-26	1000485	0.1MHz~200MHz	Jun. 17, 2010	Jun. 16, 2011	Conduction (CO05-HY)
DC- LISN	R&S	ESH3-26	1000484	0.1MHz~200MHz	Jun. 17, 2010	Jun. 16, 2011	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2010	Oct. 30, 2011	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 03, 2010	Dec. 02, 2011	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2010	Aug. 18, 2011	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	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.32dB.GAIN	Mar. 29, 2010	Mar. 28, 2011	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	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
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.13</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.26</b>		

### 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
<b>Combined Standard Uncertainty <math>U_c(y)</math></b>	<b>1.27</b>		
<b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>	<b>2.54</b>		

**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
<b>Combined Standard Uncertainty Uc(y)</b>	<b>2.36</b>				
<b>Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))</b>	<b>4.72</b>				



## **Appendix A. Photographs of EUT**

Please refer to Sporton report number EP121516 as below.