

FCC RF Test Report

APPLICANT : Inventec Corporation
EQUIPMENT : Pharos 565 PDA
BRAND NAME : Pharos 565 PDA
MODEL NAME : PTL565
FCC ID : DGILOTUS1
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on Nov. 02, 2009 and completely tested on Feb. 03, 2010. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown the compliance with the applicable technical standards.

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

Reviewed by:



Roy Wu / Manager



SPORTON INTERNATIONAL INC.

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SPORTON INTERNATIONAL INC.

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FCC ID : DGILOTUS1

Page Number : 1 of 72

Report Issued Date : Feb. 04, 2010

Report Version : Rev. 01



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR9N0214B	Rev. 01	Initial issue of report	Feb. 04, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	Gen 4.4.1	99% Bandwidth	-	Pass	-
3.2	15.247(b)	A8.4	Output Power Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 8.6 dB at 0.31 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 6.02 dB at 453.30 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Inventec Corporation

Inventec Building, No. 66, Hou-Kang Street, Shihlin District, Taipei 11170, Taiwan

1.2 Manufacturer

Inventec Corporation

Inventec Building, No. 66, Hou-Kang Street, Shihlin District, Taipei 11170, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Pharos 565 PDA
Brand Name	Pharos 565 PDA
Model Name	PTL565
FCC ID	DGILOTUS1
Tx/Rx Frequency Range	802.11b/g : 2400 MHz ~ 2483.5 MHz 802.11a : 5725 MHz ~ 5850 MHz
Channel Spacing	802.11b/g : 5 MHz 802.11a : 20 MHz
Maximum Output Power to Antenna	802.11b : 14.30 dBm (26.92 mW) 802.11g : 20.85 dBm (121.62 mW) 802.11a : 21.84 dBm (152.76 mW)
Antenna Type	802.11b/g : PIFA Antenna with gain 0 dBi 802.11a : PIFA Antenna with gain 0 dBi
HW Version	LOTUS_6050A2299701_MB_X02
SW Version	CE OS 5.2.21840 (Build 21840.5.0.60) , BSP V10_4_1_2_003_20090817
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/a : 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.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH07HY	TW1022/4086B-1

1.5 Applied Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 (Measurement Guidelines of DTS)
- ANSI C63.4-2003
- IC RSS-210 Issue 7 Annex 8

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
5.	Bluetooth Earphone	Samsung	SBH500	A3LSBH500	N/A	N/A
6.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Power

Preliminary tests were performed in different data rate and recorded the RF Output Power in the following table:

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		At DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	12.57	12.55	12.00	12.40
CH 06	2437 MHz	14.30	13.83	13.38	13.95
CH 11	2462 MHz	14.14	14.10	13.64	13.97

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		At OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	19.40	18.82	19.04	18.47	19.39	19.14	19.20	18.98
CH 06	2437 MHz	20.63	19.65	20.09	19.34	20.37	20.05	20.36	19.77
CH 11	2462 MHz	20.85	20.38	20.53	19.80	20.80	20.56	20.63	20.30

Channel	Frequency	5GHz 802.11a RF Power (dBm)							
		At OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH149	5745 MHz	21.84	21.40	21.50	20.90	21.58	21.71	21.27	21.51
CH157	5785 MHz	20.27	19.63	19.78	19.06	20.03	19.82	19.77	19.16
CH165	5825 MHz	19.12	18.80	18.75	18.17	18.73	18.26	18.20	18.80

Remark:

1. The data rates of WLAN 802.11a/b/g were set in 1Mbps for 802.11b and 6Mbps for 802.11a/g for all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signal continuously for all testing.

2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

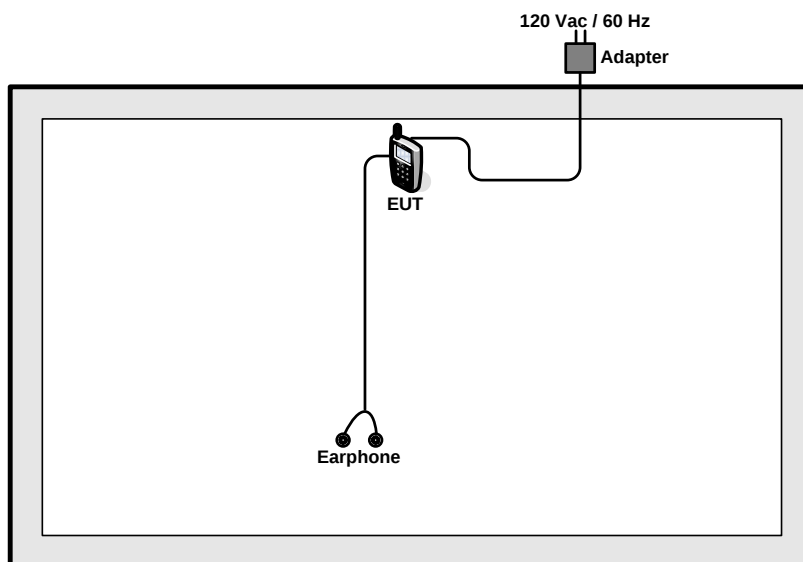
Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

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

Test Cases			
Test Item	802.11b (Modulation : DSSS)	802.11g (Modulation : OFDM)	802.11a Band III (Modulation : OFDM)
Conducted TCs	Mode 1: 802.11b_CH01_ 2412 MHz	Mode 4: 802.11g_CH01_ 2412 MHz	Mode 7: 802.11a_CH149_ 5745 MHz
	Mode 2: 802.11b_CH06_ 2437 MHz	Mode 5: 802.11g_CH06_ 2437 MHz	Mode 8: 802.11a_CH157_ 5785 MHz
	Mode 3: 802.11b_CH11_ 2462 MHz	Mode 6: 802.11g_CH11_ 2462 MHz	Mode 9: 802.11a_CH165_ 5825 MHz
Radiated TCs	Mode 1: 802.11b_CH01_ 2412 MHz	Mode 4: 802.11g_CH01_ 2412 MHz	Mode 7: 802.11a_CH149_ 5745 MHz
	Mode 2: 802.11b_CH06_ 2437 MHz	Mode 5: 802.11g_CH06_ 2437 MHz	Mode 8: 802.11a_CH157_ 5785 MHz
	Mode 3: 802.11b_CH11_ 2462 MHz	Mode 6: 802.11g_CH11_ 2462 MHz	Mode 9: 802.11a_CH165_ 5825 MHz
AC Conducted Emission	Mode 1 :WLAN (2.4G) Link + Bluetooth Link + GPS Rx + Earphone + Adapter		
	Mode 2 :WLAN (2.4G) Link + Bluetooth Link + MPEG4 + Earphone + USB Cable (Link with Notebook)		
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.			

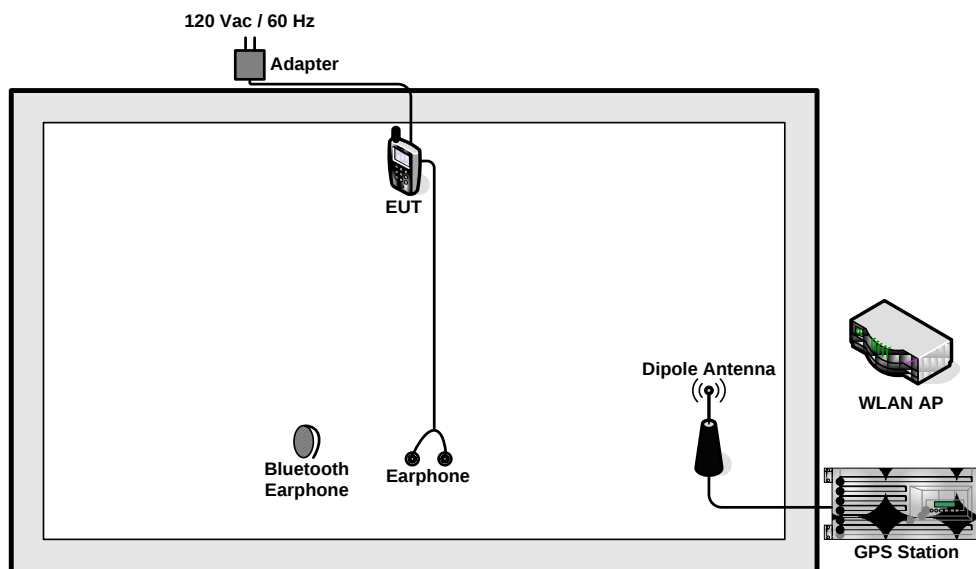
2.3 Connection Diagram of Test System

<Radiation Test>

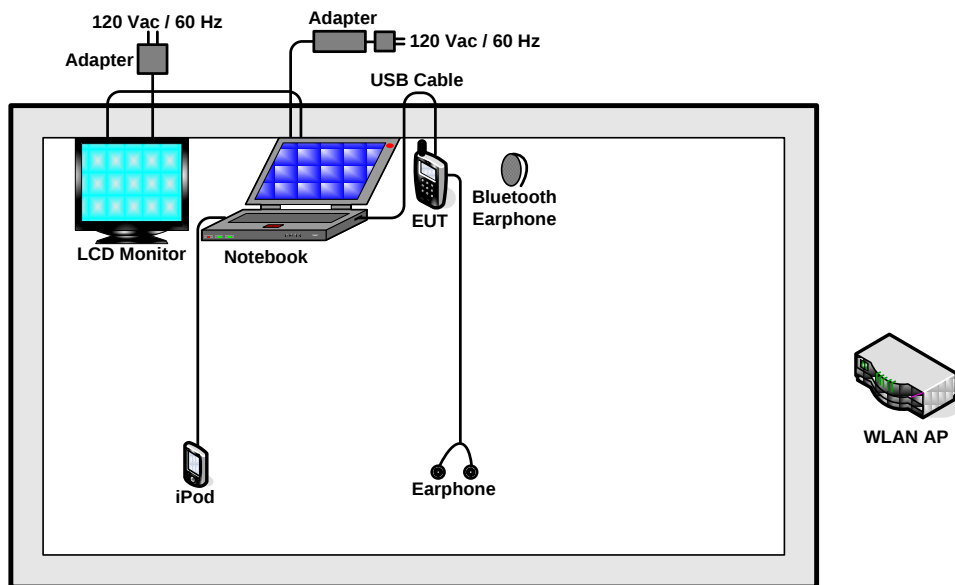


<Conduction Test>

EUT with Adapter Mode



EUT with USB Cable (Link with Notebook) Mode



2.4 RF Utility

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

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

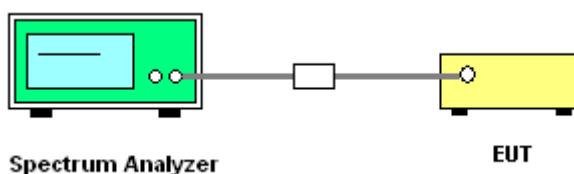
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

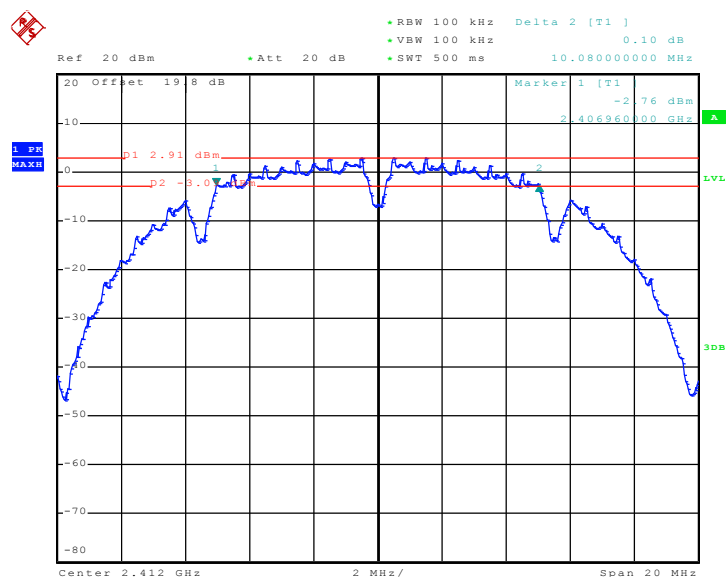


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	48~50%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	10.08	0.5	Pass
06	2437	10.08	0.5	Pass
11	2462	10.08	0.5	Pass

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



Date: 12..JAN..2010 17:35:29

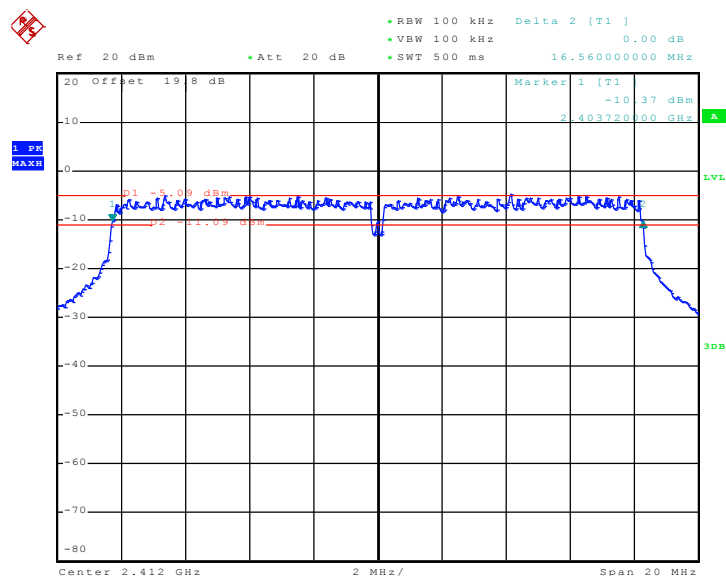


Mode 3 : 6 dB Bandwidth Plot on 802.11b Channel 11

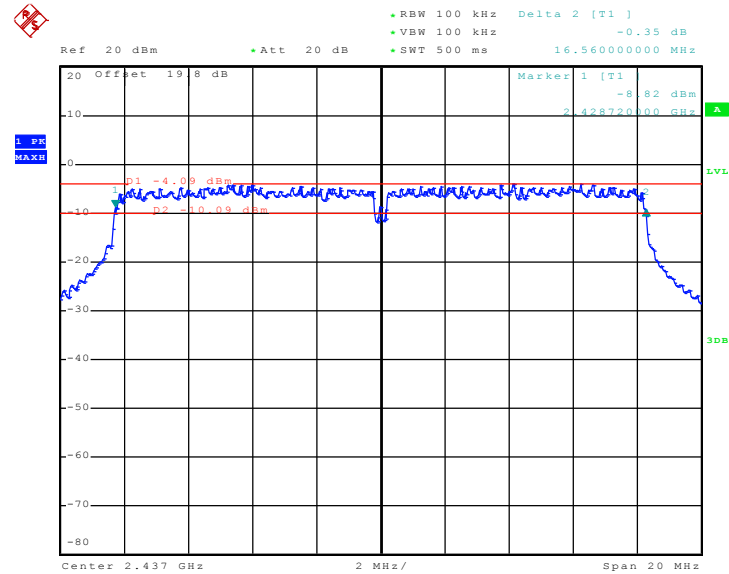


Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	48~50%

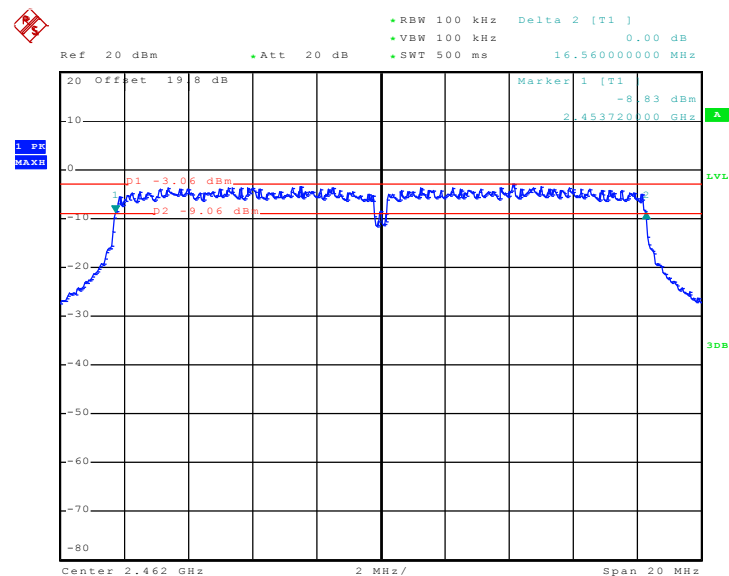
Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.56	0.5	Pass
06	2437	16.56	0.5	Pass
11	2462	16.56	0.5	Pass

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


Date: 12..JAN..2010 17:47:02

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


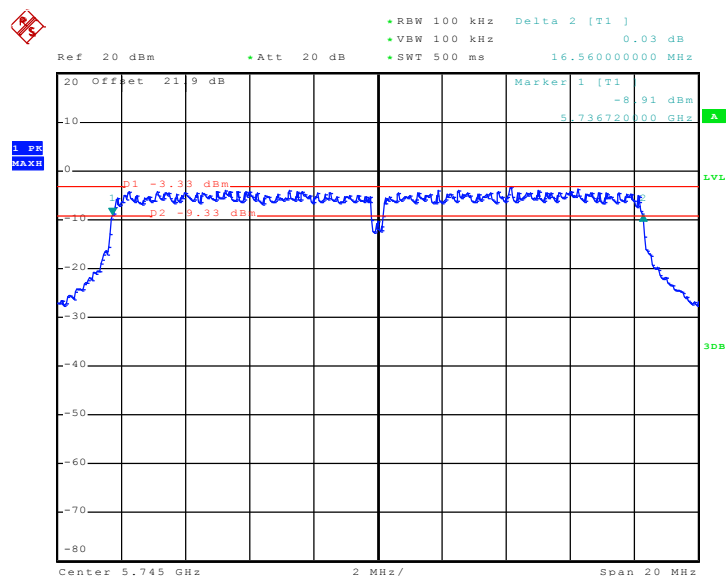
Date: 12.JAN.2010 17:49:40

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


Date: 12.JAN.2010 17:52:02

Test Mode :	Mode 7, 8, 9	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	48~50%

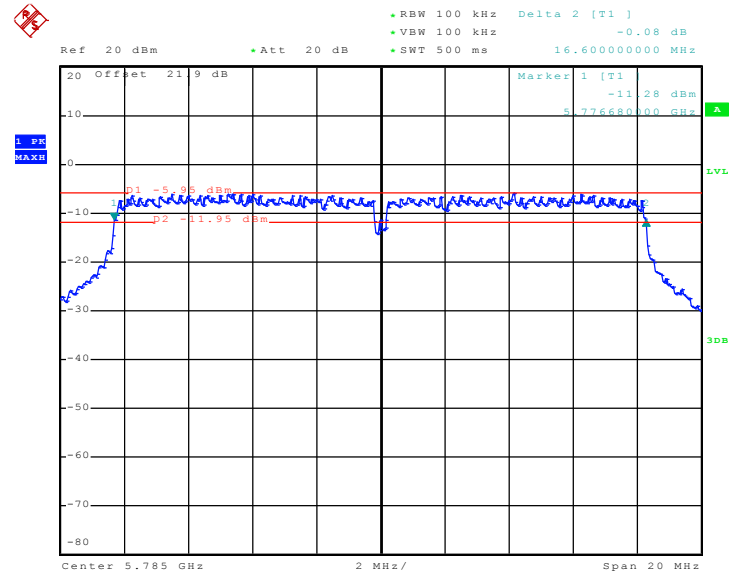
Channel	Frequency (MHz)	802.11a 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
149	5745	16.56	0.5	Pass
157	5785	16.60	0.5	Pass
165	5825	16.60	0.5	Pass

Mode 7: 6 dB Bandwidth Plot on 802.11a Channel 149


Date: 26..JAN.2010 05:18:10

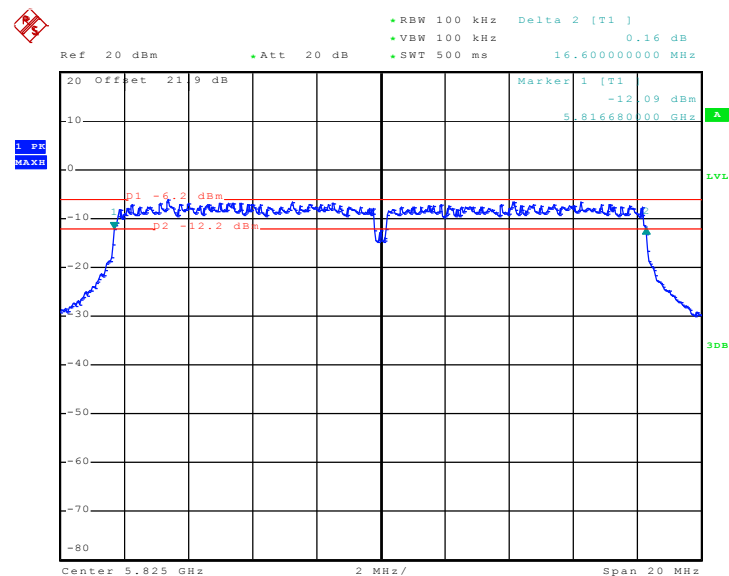


Mode 8: 6 dB Bandwidth Plot on 802.11a Channel 157



Date: 26.JAN.2010 05:20:57

Mode 9: 6 dB Bandwidth Plot on 802.11a Channel 165



Date: 26.JAN.2010 05:23:20

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

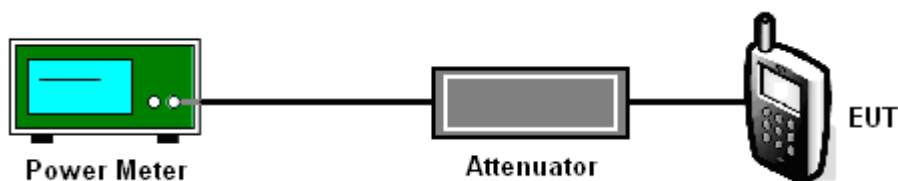
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	48~50%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	12.57	30	Pass
06	2437	14.30	30	Pass
11	2462	14.14	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	48~50%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	19.40	30	Pass
06	2437	20.63	30	Pass
11	2462	20.85	30	Pass

Test Mode :	Mode 7, 8, 9	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	48~50%

Channel	Frequency (MHz)	802.11a Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	21.84	30	Pass
157	5785	20.27	30	Pass
165	5825	19.12	30	Pass

3.3 Band Edges Measurement

3.3.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB.

3.3.2 Measuring Instruments

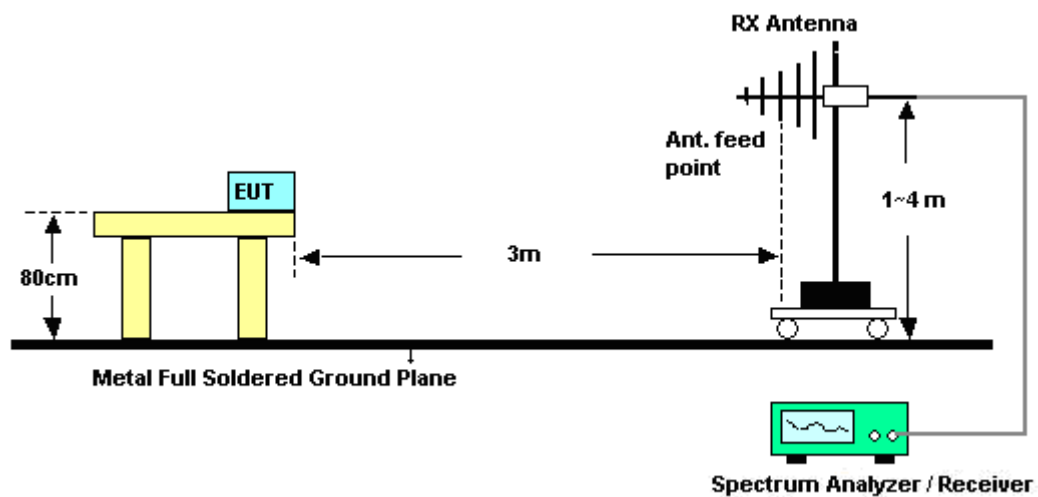
See list of measuring instruments of this test report.

3.3.3 Test Procedures

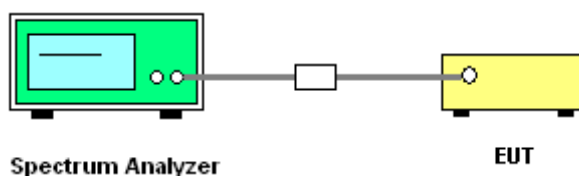
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) > RBW. Band edge emissions must be at least 20 dB below the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the output power of this device was measured by power meter, the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Apply to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep=Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation as in FCC Section 15.35(b) and (c).

3.3.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	23~25°C
Test Band :	802.11b	Relative Humidity :	48~52%
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
2384.29	49.73	-24.27	74	46.3	32.11	5.47	34.15	177	325	Peak
2384.29	36.71	-17.29	54	33.28	32.11	5.47	34.15	177	325	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
2388.09	46.87	-27.13	74	43.43	32.13	5.46	34.15	153	2	Peak
2388.09	34.84	-19.16	54	31.4	32.13	5.46	34.15	153	2	Average

Test Mode :	Mode 3	Temperature :	23~25°C
Test Band :	802.11b	Relative Humidity :	48~52%
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
2492.97	49.04	-24.96	74	45.57	32.3	5.37	34.2	118	302	Peak
2492.97	36.25	-17.75	54	32.78	32.3	5.37	34.2	118	302	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
2490.5	48.02	-25.98	74	44.54	32.3	5.37	34.19	100	357	Peak
2490.5	36.15	-17.85	54	32.67	32.3	5.37	34.19	100	357	Average

Test Mode :	Mode 4	Temperature :	23~25℃
Test Band :	802.11g	Relative Humidity :	48~52%
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
2381.25	51.57	-22.43	74	48.14	32.11	5.47	34.15	117	335	Peak
2381.25	38.1	-15.9	54	34.67	32.11	5.47	34.15	117	335	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.42	47.6	-26.4	74	44.16	32.13	5.46	34.15	105	324	Peak
2389.42	35.81	-18.19	54	32.37	32.13	5.46	34.15	105	324	Average

Test Mode :	Mode 6	Temperature :	23~25℃
Test Band :	802.11g	Relative Humidity :	48~52%
Test Channel :	11	Test Engineer :	Cona Huang

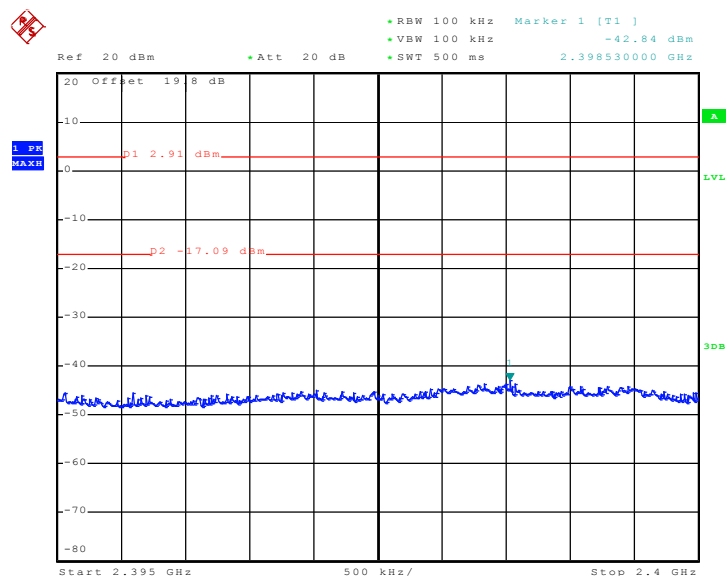
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	50	-24	74	46.54	32.27	5.38	34.19	100	301	Peak
2483.66	37.93	-16.07	54	34.47	32.27	5.38	34.19	100	301	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.61	47.8	-26.2	74	44.34	32.27	5.38	34.19	156	320	Peak
2484.61	35.08	-18.92	54	31.62	32.27	5.38	34.19	156	320	Average

3.3.6 Test Result of Conducted Band Edges

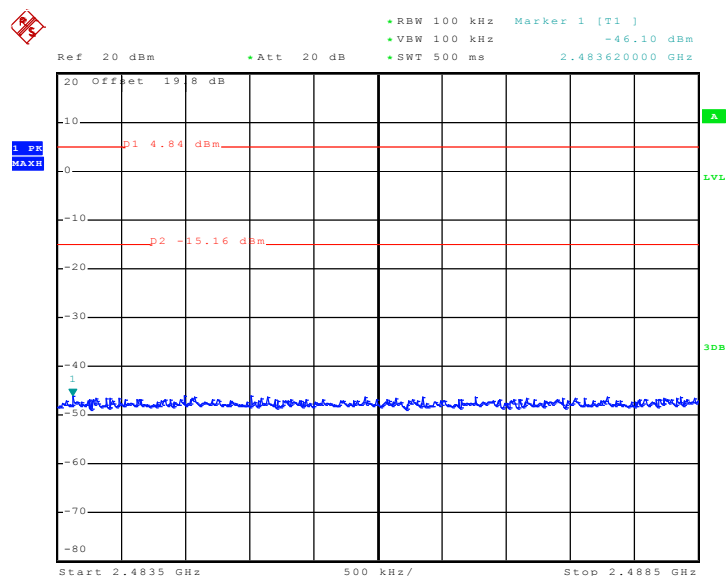
Test Mode :	Mode 1 and 3	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	01 and 11	Test Engineer :	Andy Yeh

Low Band Edge Plot on 802.11b Channel 01



Date: 12.JAN.2010 18:05:16

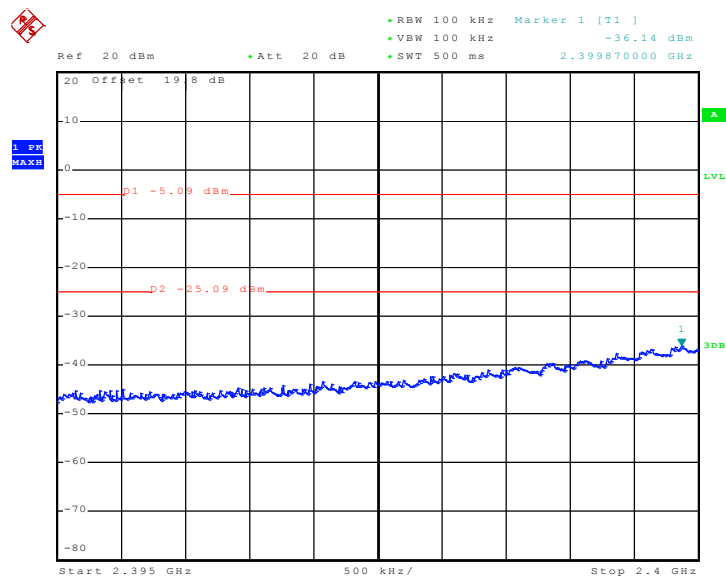
High Band Edge Plot on 802.11b Channel 11



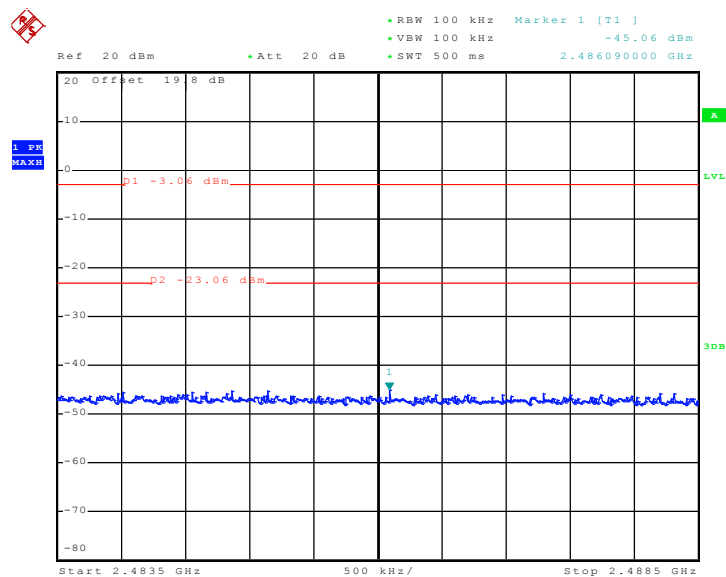
Date: 12.JAN.2010 18:07:46



Test Mode :	Mode 4 and 6	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	01 and 11	Test Engineer :	Andy Yeh

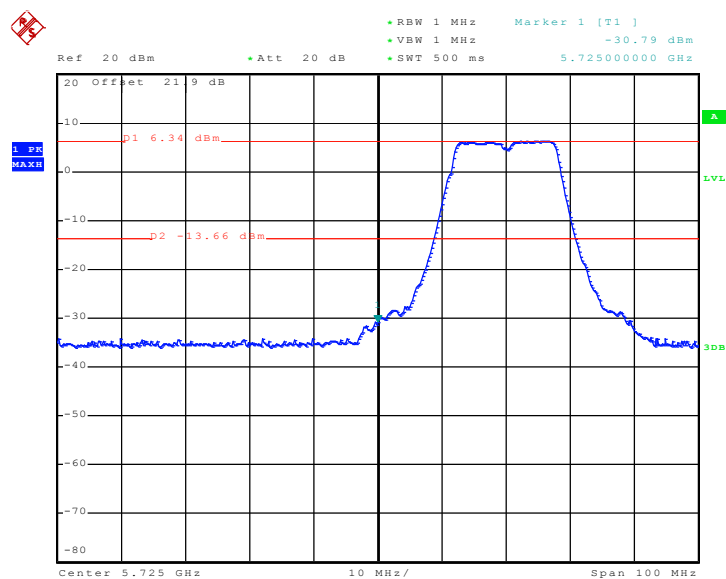
Low Band Edge Plot on 802.11g Channel 01

Date: 12.JAN.2010 18:03:26

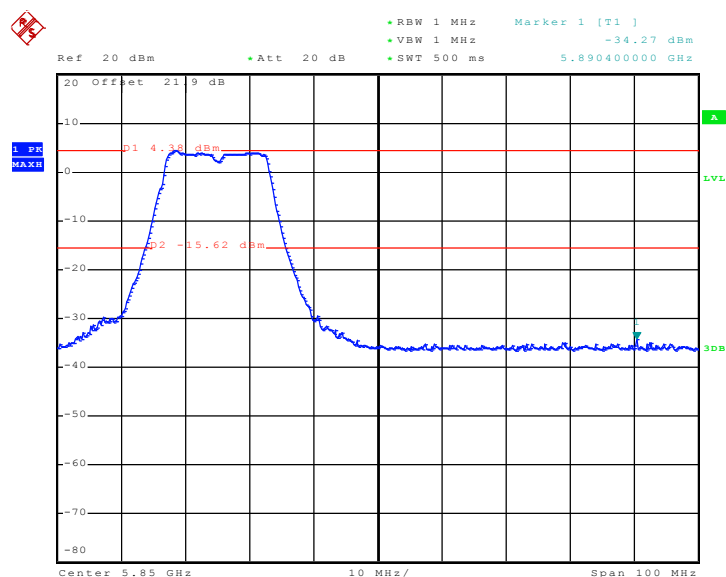
High Band Edge Plot on 802.11g Channel 11

Date: 12.JAN.2010 17:59:56

Test Mode :	Mode 7 and 9	Temperature :	25~27°C
Test Band :	802.11a	Relative Humidity :	48~50%
Test Channel :	149 and 165	Test Engineer :	Andy Yeh

Low Band Edge Plot on 802.11a Channel 149


Date: 26.JAN.2010 05:33:23

High Band Edge Plot on 802.11a Channel 165


Date: 26.JAN.2010 05:36:13

3.4 Spurious Emission Measurement

3.4.1 Limit of Spurious Emission Measurement

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

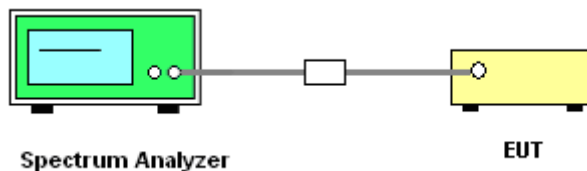
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

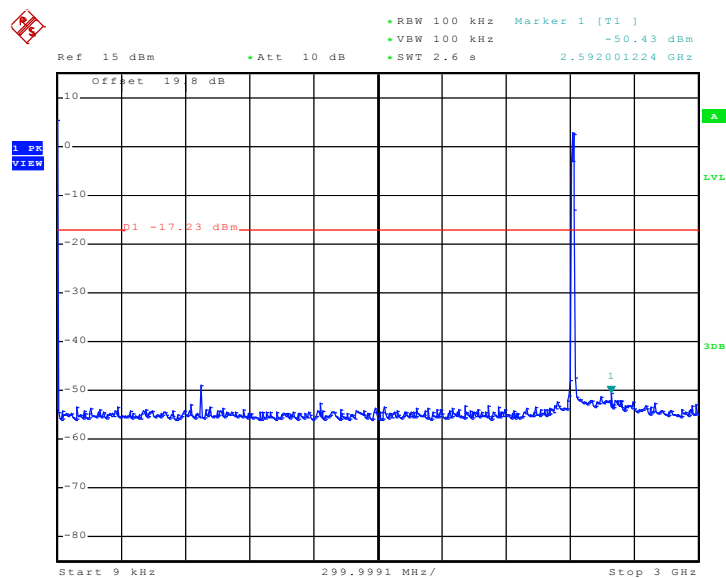
3.4.4 Test Setup



3.4.5 Test Result

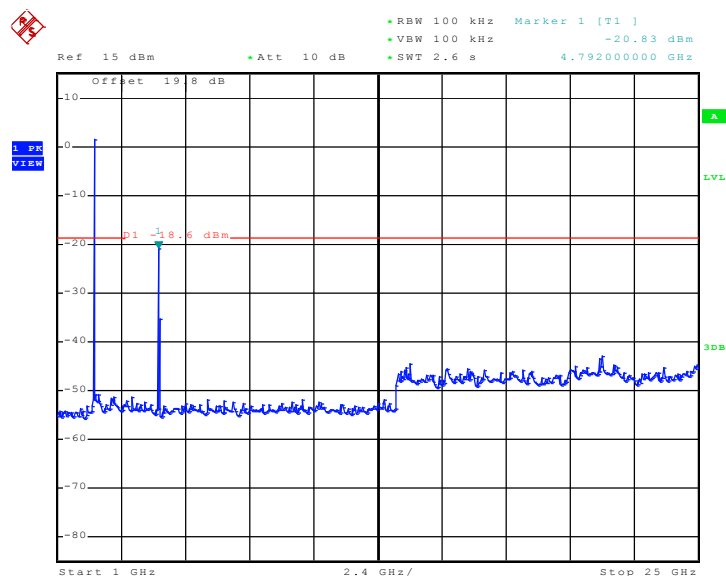
Test Mode :	Mode 1	Temperature :	25~27°C
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 13.JAN.2010 05:10:50

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



Date: 13.JAN.2010 05:11:19



Test Mode :	Mode 2	Temperature :	25~27℃
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	06	Test Engineer :	Andy Yeh

Ref 15 dBm Att 10 dB

- RBW 100 kHz
- VBW 100 kHz
- SWT 2.6 s

Marker 1 [T1] -51.30 dBm 2.550001350 GHz

Offset 19 8 dB

D1 -16.21 dBm

1. FM VIEW

Start 9 kHz Stop 3 GHz

299.9991 MHz/

Date: 13.JAN.2010 05:12:10

Ref 15 dBm • Att 10 dB • RBW 100 kHz Marker 1 [T1] -22.71 dBm
 • VBW 100 kHz • SWT 2.6 s 4.840000000 GHz

Offset 19.8 dB

1.98 GHz

P1 -16.99 dBm

Start 1.9 GHz 2.0 GHz/ Stop 2.0 GHz

Date: 13 JAN 2010 05:12:33



Test Mode :	Mode 3	Temperature :	25~27℃
Test Band :	802.11b	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	Andy Yeh

Offset 19 8 dB

Ref 15 dBm Att 10 dB

RBW 100 kHz VBW 100 kHz SWT 2.6 s

Marker 1 [T1] -51.55 dBm 2.622001134 GHz

1. FM VIEW

D1 -16.02 dBm

1

Start 9 kHz 299.9991 MHz/ Stop 3 GHz

Date: 13.JAN.2010 05:13:45

[illegible]

Date: 13 JAN 2010 05:14:09



Test Mode :	Mode 4	Temperature :	25~27℃
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	01	Test Engineer :	Andy Yeh

Ref 15 dBm • Att 10 dB • RBW 100 kHz Marker 1 [T1] -51.15 dBm
 • VBW 100 kHz • SWT 2.6 s 2.640001080 GHz

Offset 19 8 dB

1. FM
VIEW

D1 -25.5 dBm

1

Start 9 kHz 299.9991 MHz/ Stop 3 GHz

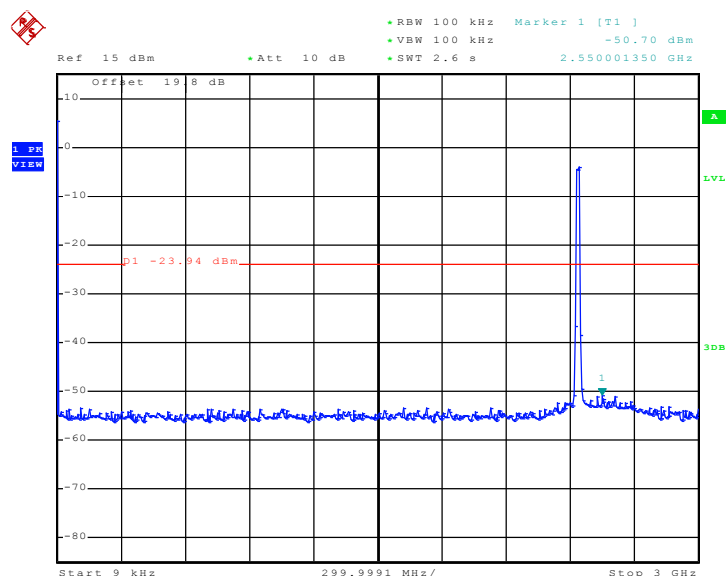
Date: 13.JAN.2010 05:15:05

The screenshot shows a Spectrum Analyzer interface with the following details:

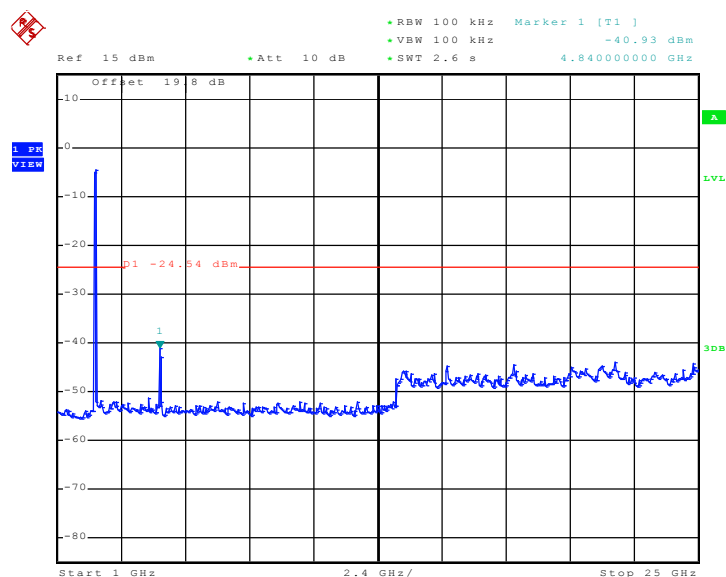
- Top Bar:**
 - Left: A red square icon with a white 'X' and a blue square icon with a white 'V'.
 - Right: A list of parameters:
 - RBW 100 kHz
 - VBW 100 kHz
 - SWT 2.6 s
- Header:**
 - Ref 15 dBm
 - Att 10 dB
 - Marker 1 [T1]
 - 39.08 dBm
 - 4.792000000 GHz
- Grid and Trace:**
 - The grid has a vertical axis from -80 to -10 dBm and a horizontal axis from 1 GHz to 2.5 GHz.
 - A blue trace shows a signal at approximately 1.98 GHz with a peak at -26.14 dBm.
 - A red horizontal line is drawn at -26.14 dBm.
 - A green triangle marker labeled '1' is placed on the trace at the peak.
- Bottom Bar:**
 - Start 1 GHz
 - 2.4 GHz/
 - Stop 2.5 GHz
- Right Side:**
 - A green 'A' button.
 - A green 'LVL' button.
 - A green '3dB' button.

Date: 13 JAN 2010 05:15:19

Test Mode :	Mode 5	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	06	Test Engineer :	Andy Yeh

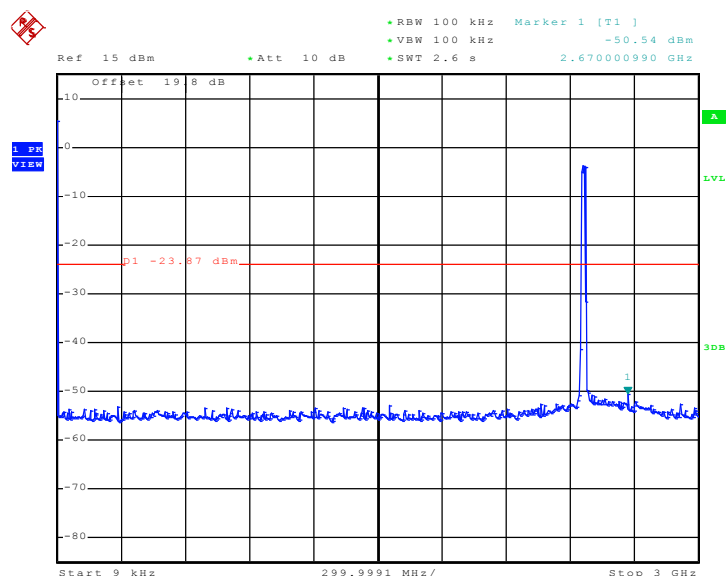
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 13.JAN.2010 05:16:08

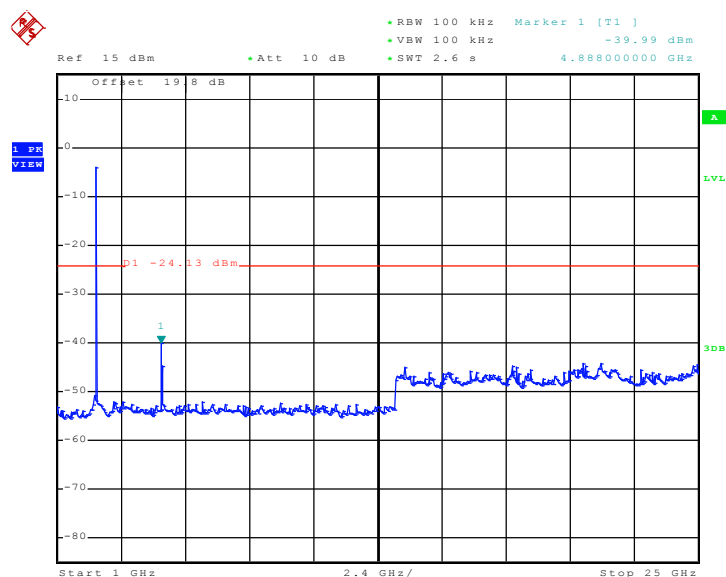
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 13.JAN.2010 05:16:23

Test Mode :	Mode 6	Temperature :	25~27°C
Test Band :	802.11g	Relative Humidity :	48~50%
Test Channel :	11	Test Engineer :	Andy Yeh

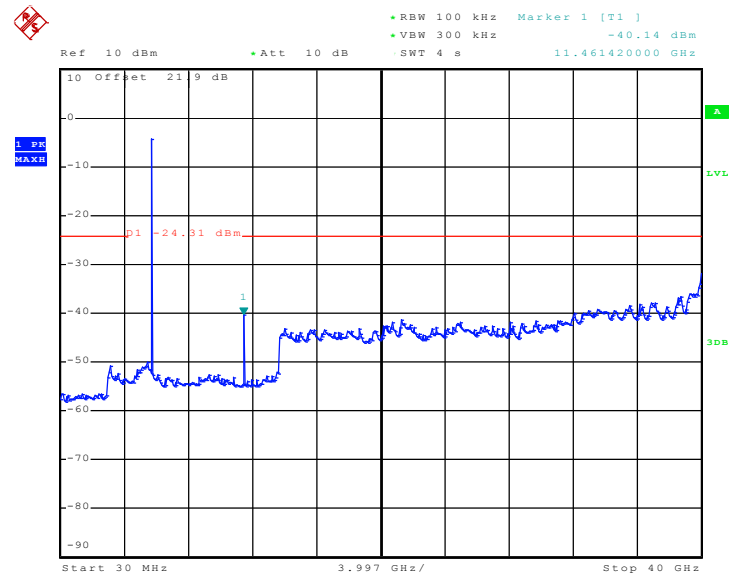
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 13.JAN.2010 05:17:00

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 13.JAN.2010 05:17:14

Test Mode :	Mode 7	Temperature :	25~27°C
Test Band :	802.11a	Relative Humidity :	48~50%
Test Channel :	149	Test Engineer :	Andy Yeh

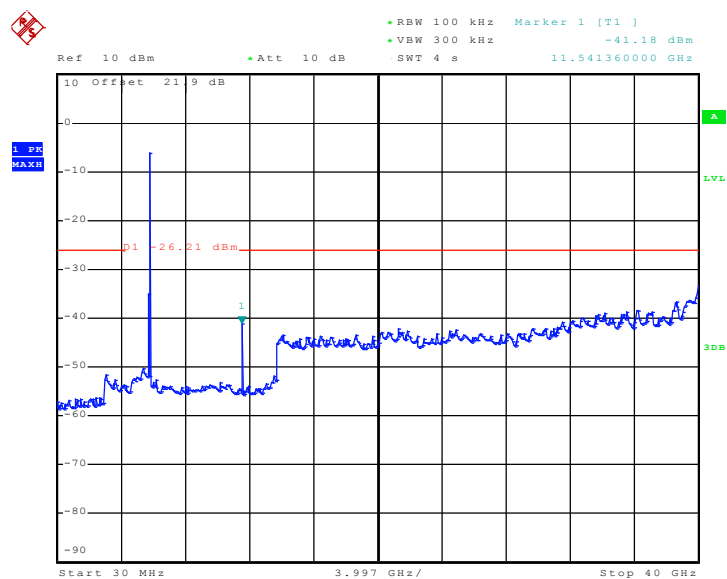
Conducted Spurious Emission Plot between 30 MHz ~ 40 GHz


Date: 26.JAN.2010 06:25:22



Test Mode :	Mode 8	Temperature :	25~27°C
Test Band :	802.11a	Relative Humidity :	48~50%
Test Channel :	157	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 30 MHz ~ 40 GHz

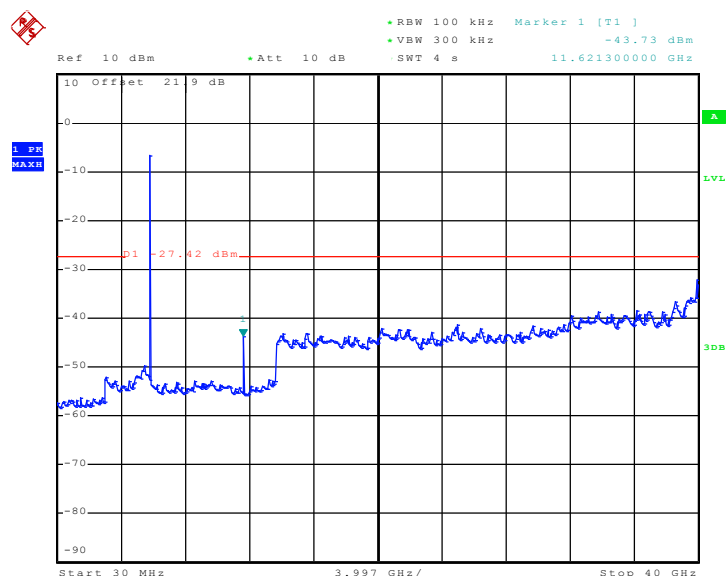


Date: 26.JAN.2010 06:27:21



Test Mode :	Mode 9	Temperature :	25~27°C
Test Band :	802.11a	Relative Humidity :	48~50%
Test Channel :	165	Test Engineer :	Andy Yeh

Conducted Spurious Emission Plot between 30 MHz ~ 40 GHz



Date: 26.JAN.2010 06:31:21

3.5 Power Spectral Density Measurement

3.5.1 Limit of Power Spectral Density

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

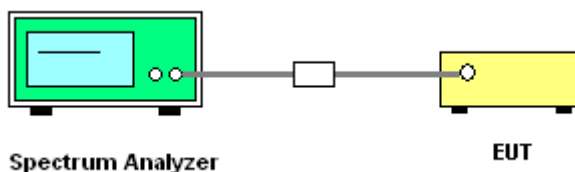
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup

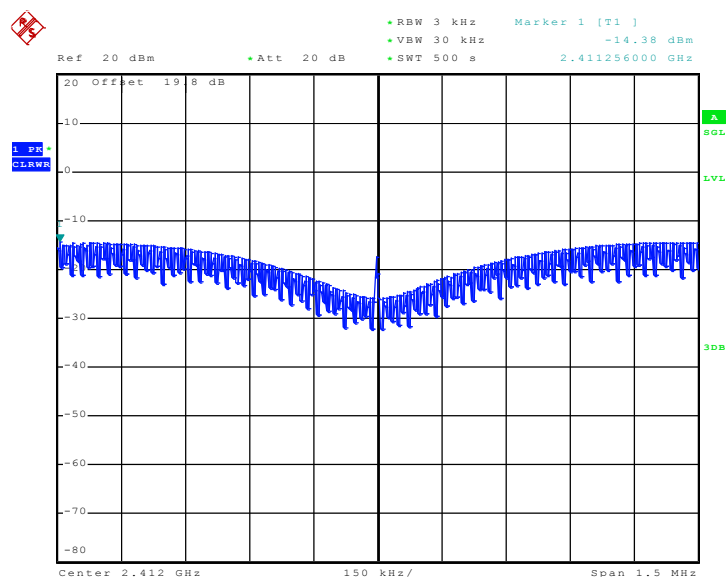


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	25~27°C
Test Engineer :	Andy Yeh	Relative Humidity :	48~50%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-14.38	8	Pass
06	2437	-13.17	8	Pass
11	2462	-12.80	8	Pass

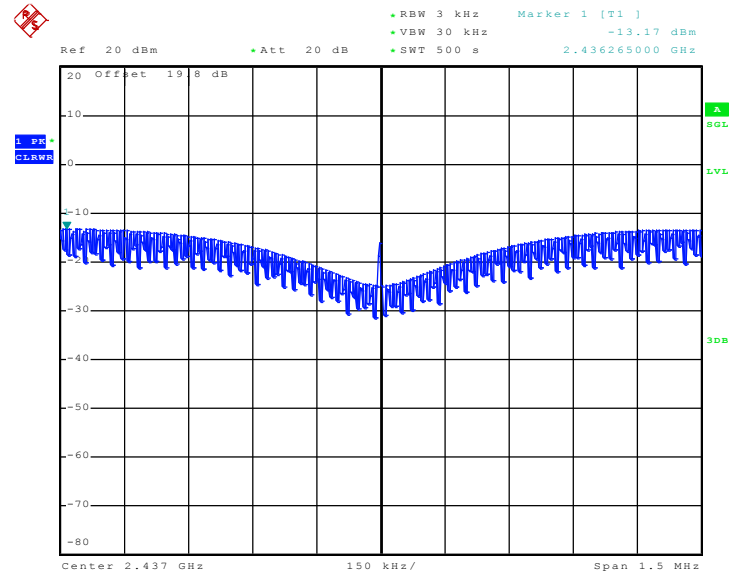
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 12.JAN.2010 19:21:39

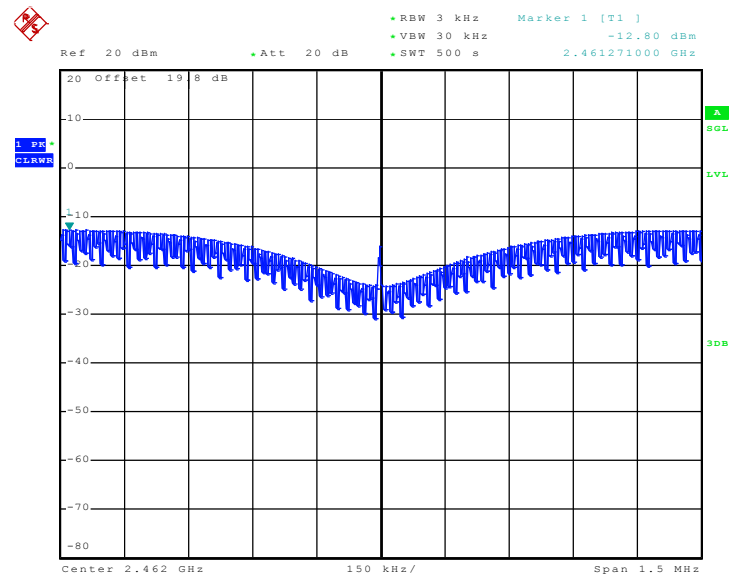


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 12.JAN.2010 19:35:38

Mode 3 : PSD Plot on 802.11b Channel 11



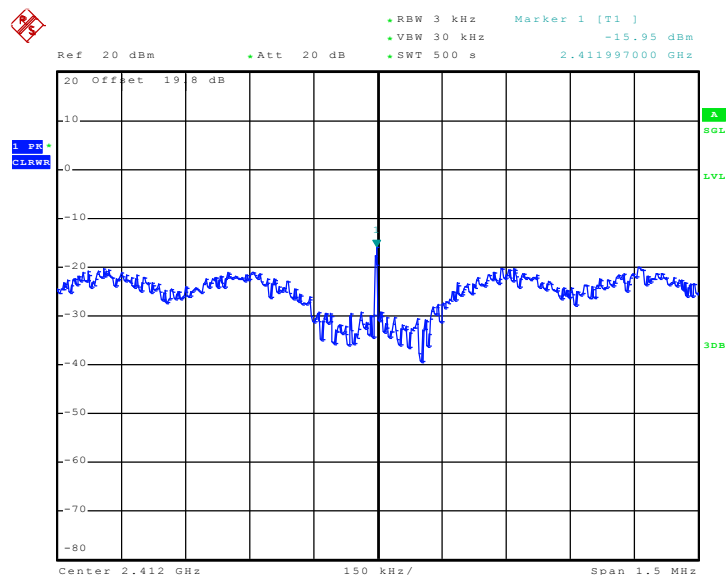
Date: 12.JAN.2010 19:47:21



Test Mode :	Mode 4, 5, 6	Temperature :	25~27℃
Test Engineer :	Andy Yeh	Relative Humidity :	48~50%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-15.95	8	Pass
06	2437	-15.86	8	Pass
11	2462	-13.67	8	Pass

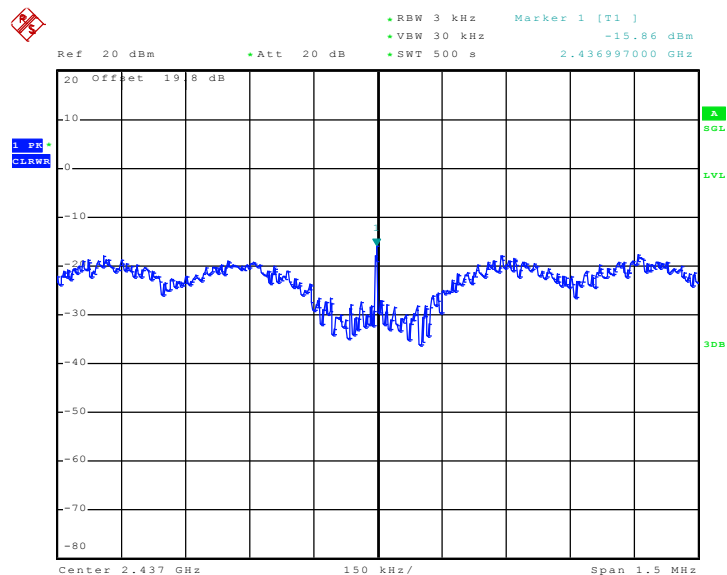
Mode 4 : PSD Plot on 802.11g Channel 01



Date: 12..JAN..2010 19:06:51

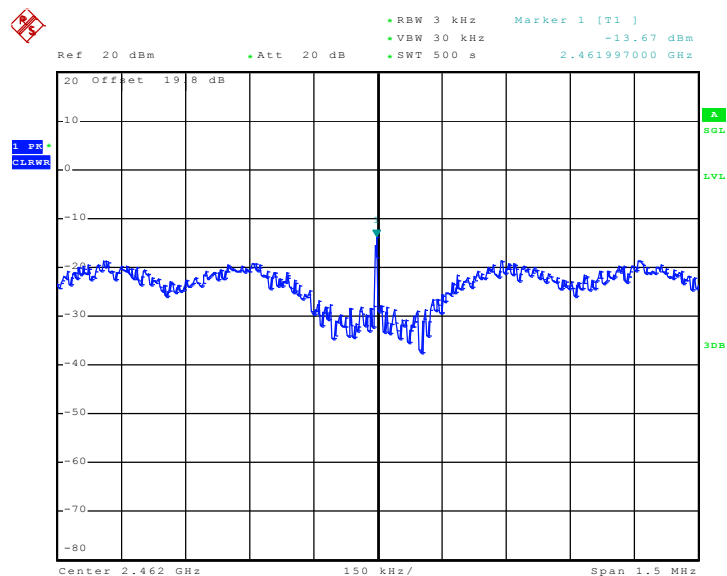


Mode 5 : PSD Plot on 802.11g Channel 06



Date: 12.JAN.2010 18:55:21

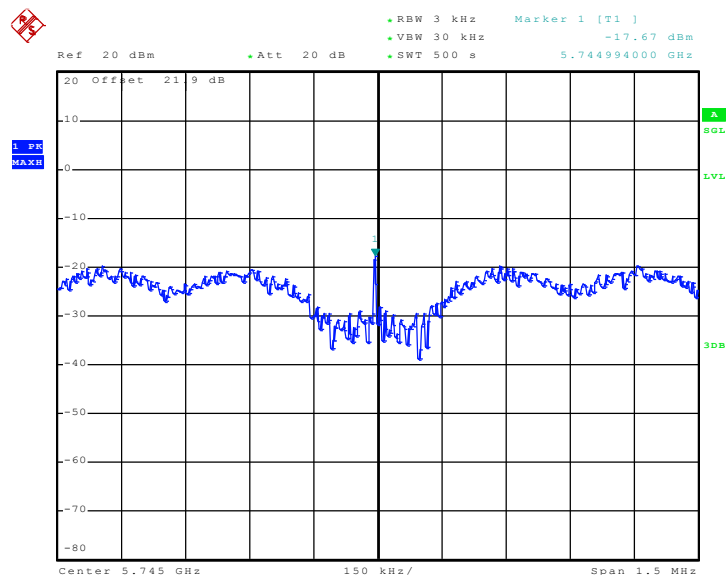
Mode 6 : PSD Plot on 802.11g Channel 11



Date: 12.JAN.2010 18:39:59

Test Mode :	Mode 7, 8, 9	Temperature :	25~27
Test Engineer :	Andy Yeh	Relative Humidity :	48~50

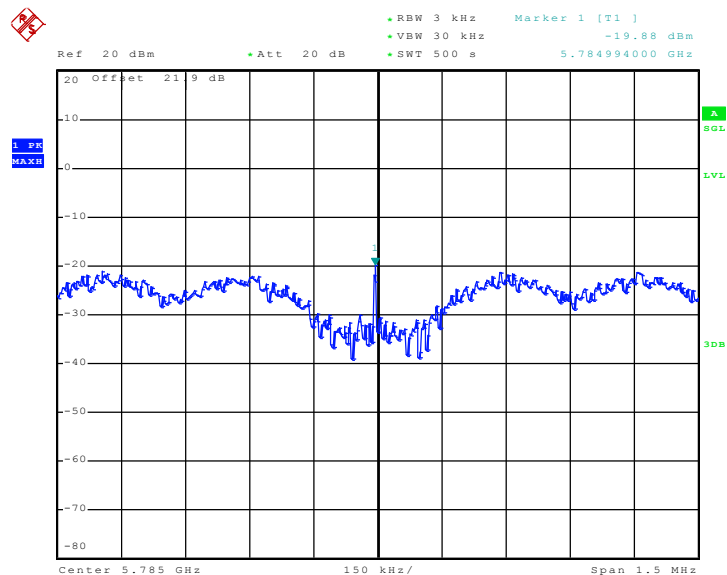
Channel	Frequency (MHz)	802.11a Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
149	5745	-17.67	8	Pass
157	5785	-19.88	8	Pass
165	5825	-20.36	8	Pass

Mode 7 : PSD Plot on 802.11a Channel 149


Date: 26..JAN..2010 06:10:41

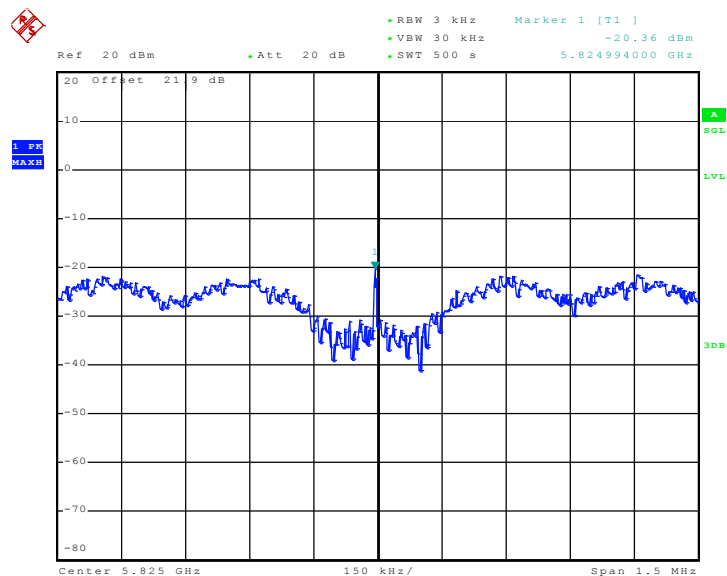


Mode 8 : PSD Plot on 802.11a Channel 157



Date: 26.JAN.2010 05:59:42

Mode 9 : PSD Plot on 802.11a Channel 165



Date: 26.JAN.2010 05:48:58

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

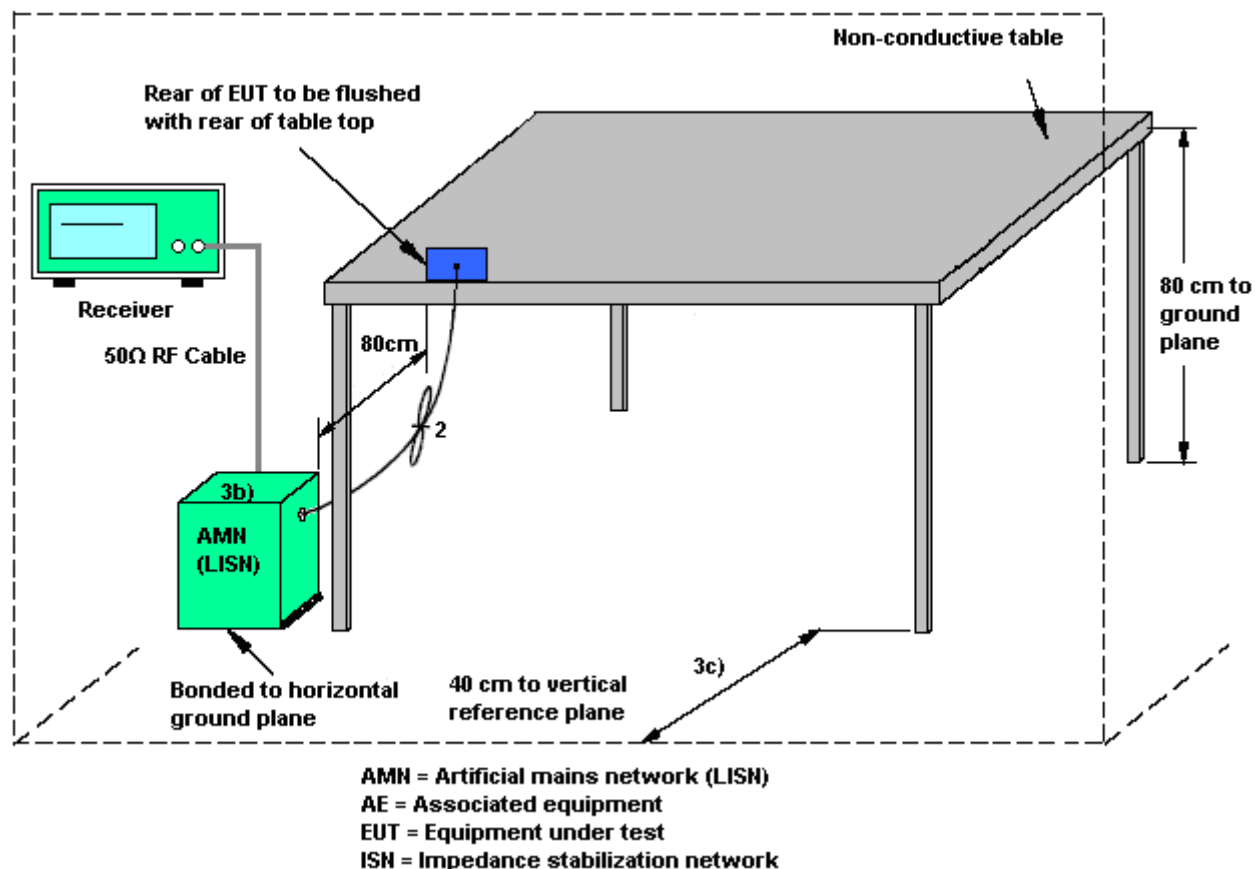
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

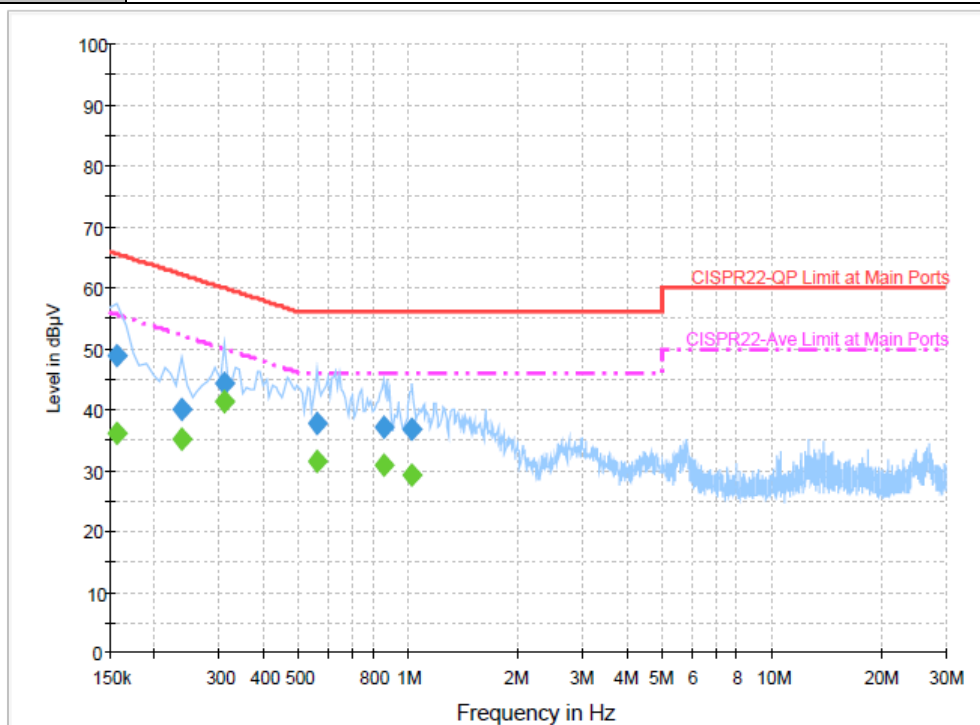
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Hayden Wu	Relative Humidity :	43~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4G) Link + Bluetooth Link + MPEG4 + Earphone + USB Cable (Link with Notebook)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



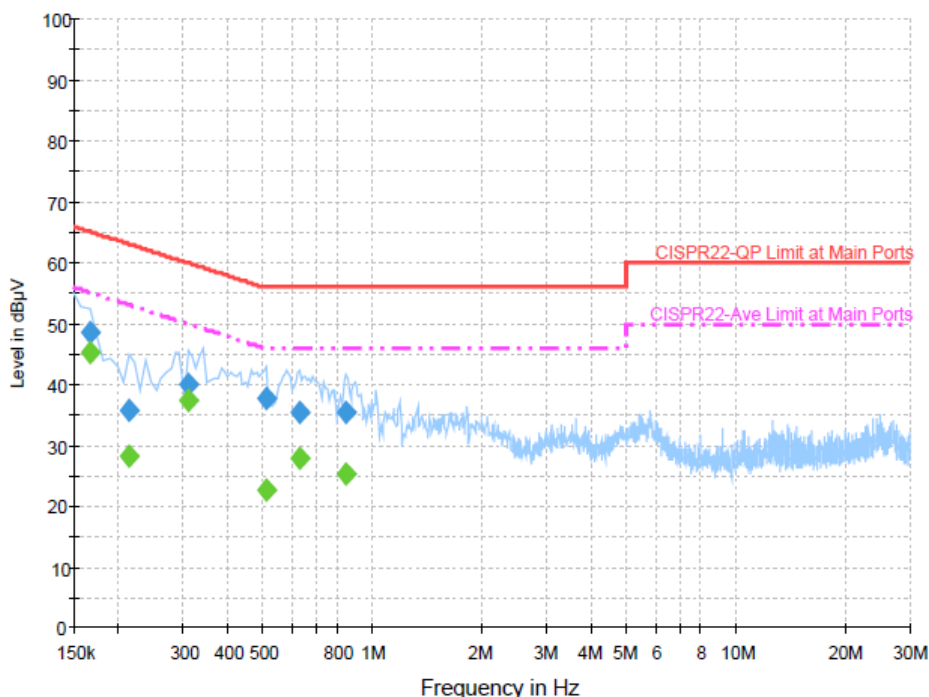
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	48.8	Off	L1	19.5	16.8	65.6
0.238000	39.9	Off	L1	19.5	22.3	62.2
0.310000	44.4	Off	L1	19.5	15.6	60.0
0.558000	37.7	Off	L1	19.5	18.3	56.0
0.854000	36.9	Off	L1	19.5	19.1	56.0
1.022000	36.6	Off	L1	19.4	19.4	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	35.9	Off	L1	19.5	19.7	55.6
0.238000	35.0	Off	L1	19.5	17.2	52.2
0.310000	41.4	Off	L1	19.5	8.6	50.0
0.558000	31.6	Off	L1	19.5	14.4	46.0
0.854000	30.9	Off	L1	19.5	15.1	46.0
1.022000	29.1	Off	L1	19.4	16.9	46.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Hayden Wu	Relative Humidity :	43~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (2.4G) Link + Bluetooth Link + MPEG4 + Earphone + USB Cable (Link with Notebook)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	48.5	Off	N	19.5	16.7	65.2
0.214000	35.7	Off	N	19.5	27.3	63.0
0.310000	40.0	Off	N	19.5	20.0	60.0
0.510000	37.6	Off	N	19.4	18.4	56.0
0.630000	35.4	Off	N	19.5	20.6	56.0
0.846000	35.3	Off	N	19.4	20.7	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	45.1	Off	N	19.5	10.1	55.2
0.214000	28.1	Off	N	19.5	24.9	53.0
0.310000	37.2	Off	N	19.5	12.8	50.0
0.510000	22.6	Off	N	19.4	23.4	46.0
0.630000	27.9	Off	N	19.5	18.1	46.0
0.846000	25.2	Off	N	19.4	20.8	46.0

3.7 Radiated Emission Measurement

3.7.1 Limit of Radiated Emission

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

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

3.7.2 Measuring Instruments

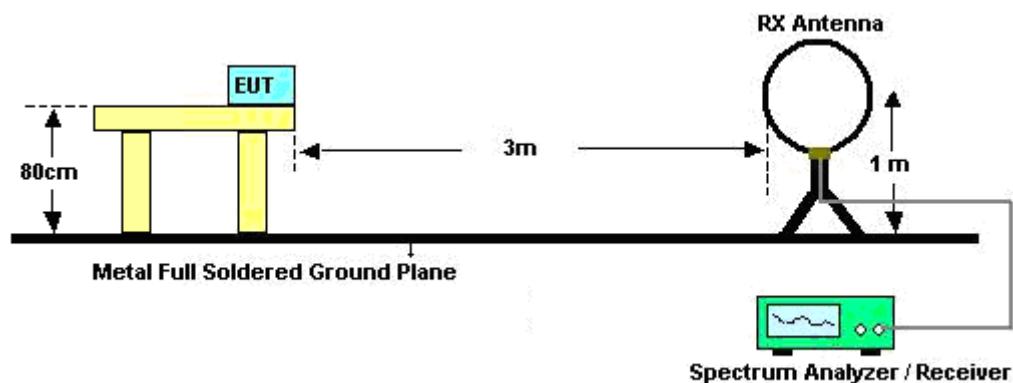
See list of measuring instruments of this test report.

3.7.3 Test Procedures

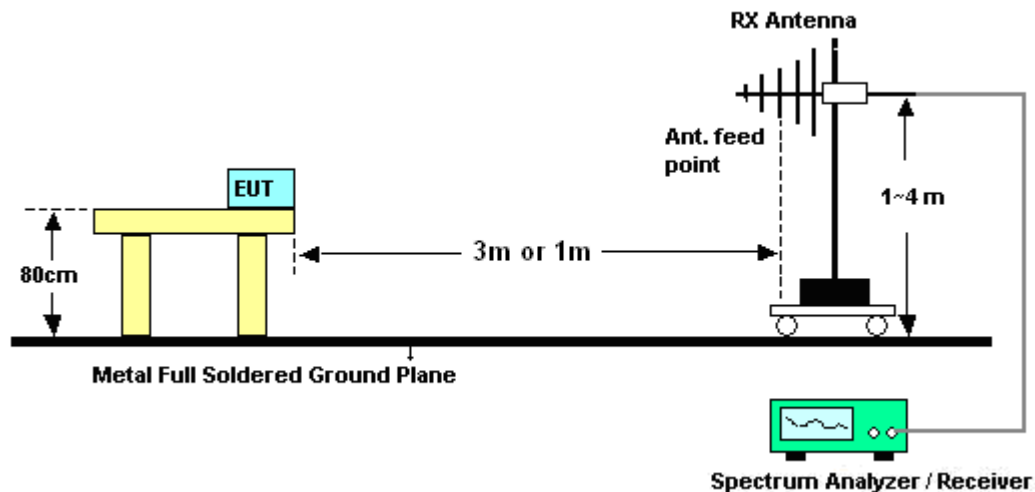
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep =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

3.7.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz



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

Test Engineer :	Cona Huang	Temperature :	23~25℃	
		Relative Humidity :	48~52%	
Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

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

Test Mode :	Mode 1	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	48~52%
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
91.02	27.81	-15.69	43.5	49.36	9.03	1.12	31.7	-	-	Peak
154.74	27.22	-16.28	43.5	46.58	10.79	1.49	31.64	-	-	Peak
248.97	27.07	-18.93	46	44	12.65	1.92	31.5	-	-	Peak
360.2	31.97	-14.03	46	45.8	15.06	2.39	31.28	100	110	Peak
637.4	23.74	-22.26	46	30.98	20.35	3.37	30.96	-	-	Peak
937	25.98	-20.02	46	28.67	23.74	4.23	30.66	-	-	Peak
2384.29	49.73	-24.27	74	46.3	32.11	5.47	34.15	177	325	Peak
2384.29	36.71	-17.29	54	33.28	32.11	5.47	34.15	177	325	Average
2412	98.81	-	-	95.37	32.16	5.44	34.16	177	325	Peak
2412	94.86	-	-	91.42	32.16	5.44	34.16	177	325	Average
2486	34.47	-19.53	54	31.01	32.27	5.38	34.19	177	325	Average
2486	49.91	-24.09	74	46.45	32.27	5.38	34.19	177	325	Peak
8457	54.57	-19.43	74	43.51	36	10.16	35.1	100	78	Peak
8457	42.76	-11.24	54	31.7	36	10.16	35.1	100	78	Average



Test Mode :	Mode 1	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	48~52%
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
32.97	30.95	-9.05	40	44.15	17.84	0.66	31.7	131	40	Peak
91.02	30.34	-13.16	43.5	51.89	9.03	1.12	31.7	-	-	Peak
194.97	30.07	-13.43	43.5	51.13	8.86	1.68	31.6	-	-	Peak
377	26.33	-19.67	46	39.57	15.52	2.48	31.24	-	-	Peak
637.4	26.87	-19.13	46	34.11	20.35	3.37	30.96	-	-	Peak
845.3	26.26	-19.74	46	30.35	22.66	3.95	30.7	-	-	Peak
2388.09	46.87	-27.13	74	43.43	32.13	5.46	34.15	153	2	Peak
2388.09	34.84	-19.16	54	31.4	32.13	5.46	34.15	153	2	Average
2412	96.12	-	-	92.68	32.16	5.44	34.16	153	2	Peak
2412	92.58	-	-	89.14	32.16	5.44	34.16	153	2	Average
2492	33.94	-20.06	54	30.47	32.3	5.37	34.2	153	2	Average
2492	48.31	-25.69	74	44.84	32.3	5.37	34.2	153	2	Peak
8361	54.16	-19.84	74	43.17	36	10.09	35.1	120	61	Peak
8361	41.76	-12.24	54	30.77	36	10.09	35.1	120	61	Average

Test Mode :	Mode 2	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	48~52%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
98.58	29.5	-14	43.5	49.86	10.19	1.15	31.7	-	-	Peak
161.22	26.8	-16.7	43.5	46.62	10.31	1.51	31.64	-	-	Peak
253.29	23.81	-22.19	46	40.56	12.81	1.93	31.49	-	-	Peak
377	31.93	-14.07	46	45.17	15.52	2.48	31.24	-	-	Peak
453.3	39.51	-6.49	46	50.65	17.2	2.81	31.15	133	229	Peak
480.6	35.41	-10.59	46	45.88	17.78	2.87	31.12	-	-	Peak
2390	49.46	-24.54	74	46.03	32.13	5.46	34.16	100	302	Peak
2390	34.77	-19.23	54	31.34	32.13	5.46	34.16	100	302	Average
2437	99.23	-	-	95.77	32.22	5.41	34.17	100	302	Peak
2437	92.85	-	-	89.39	32.22	5.41	34.17	100	302	Average
2486	48.7	-25.3	74	45.24	32.27	5.38	34.19	100	302	Peak
2486	35.28	-18.72	54	31.82	32.27	5.38	34.19	100	302	Average
8289	55.07	-18.93	74	44.13	36	10.04	35.1	141	36	Peak
8289	43.45	-10.55	54	32.51	36	10.04	35.1	141	36	Average

Test Mode :	Mode 2	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	48~52%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
35.94	29.25	-10.75	40	44.06	16.2	0.69	31.7	-	-	Peak
65.37	24.78	-15.22	40	49.28	6.26	0.94	31.7	-	-	Peak
154.74	23.25	-20.25	43.5	42.61	10.79	1.49	31.64	-	-	Peak
377	33.4	-12.6	46	46.64	15.52	2.48	31.24	-	-	Peak
453.3	37.46	-8.54	46	48.6	17.2	2.81	31.15	100	21	Peak
480.6	36.13	-9.87	46	46.6	17.78	2.87	31.12	-	-	Peak
2390	46.76	-27.24	74	43.33	32.13	5.46	34.16	102	6	Peak
2390	34.17	-19.83	54	30.74	32.13	5.46	34.16	102	6	Average
2437	95.75	-	-	92.29	32.22	5.41	34.17	102	6	Peak
2437	92.63	-	-	89.17	32.22	5.41	34.17	102	6	Average
2492	46.58	-27.42	74	43.11	32.3	5.37	34.2	102	6	Peak
2492	33.58	-20.42	54	30.11	32.3	5.37	34.2	102	6	Average
8418	54.43	-19.57	74	43.41	36	10.12	35.1	100	32	Peak
8418	42.71	-11.29	54	31.69	36	10.12	35.1	100	32	Average

Test Mode :	Mode 3	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	48~52%
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
88.05	29.91	-13.59	43.5	51.9	8.62	1.09	31.7	-	-	Peak
98.58	28.98	-14.52	43.5	49.34	10.19	1.15	31.7	-	-	Peak
168.78	27.07	-16.43	43.5	47.41	9.74	1.55	31.63	-	-	Peak
377	34	-12	46	47.24	15.52	2.48	31.24	-	-	Peak
453.3	39.98	-6.02	46	51.12	17.2	2.81	31.15	100	269	Peak
480.6	36.05	-9.95	46	46.52	17.78	2.87	31.12	-	-	Peak
2358	48.61	-25.39	74	45.18	32.08	5.49	34.14	118	302	Peak
2358	32.92	-21.08	54	29.49	32.08	5.49	34.14	118	302	Average
2462	99.23	-	-	95.77	32.24	5.4	34.18	118	302	Peak
2462	94.96	-	-	91.5	32.24	5.4	34.18	118	302	Average
2492.97	49.04	-24.96	74	45.57	32.3	5.37	34.2	118	302	Peak
2492.97	36.25	-17.75	54	32.78	32.3	5.37	34.2	118	302	Average
8313	54.22	-19.78	74	43.27	36	10.05	35.1	152	46	Peak
8313	41.05	-12.95	54	30.1	36	10.05	35.1	152	46	Average

Test Mode :	Mode 3	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	48~52%
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
33.78	29.14	-10.86	40	42.88	17.29	0.67	31.7	-	-	Peak
44.85	25.81	-14.19	40	45.87	10.92	0.72	31.7	-	-	Peak
155.82	23.72	-19.78	43.5	43.16	10.71	1.49	31.64	-	-	Peak
377	33.54	-12.46	46	46.78	15.52	2.48	31.24	-	-	Peak
453.3	36.58	-9.42	46	47.72	17.2	2.81	31.15	100	52	Peak
480.6	35.95	-10.05	46	46.42	17.78	2.87	31.12	-	-	Peak
2388	47.44	-26.56	74	44	32.13	5.46	34.15	100	357	Peak
2388	33.8	-20.2	54	30.36	32.13	5.46	34.15	100	357	Average
2462	92.84	-	-	89.38	32.24	5.4	34.18	100	357	Average
2462	96.57	-	-	93.11	32.24	5.4	34.18	100	357	Peak
2490.5	48.02	-25.98	74	44.54	32.3	5.37	34.19	100	357	Peak
2490.5	36.15	-17.85	54	32.67	32.3	5.37	34.19	100	357	Average
8349	55.42	-18.58	74	44.45	36	10.07	35.1	116	84	Peak
8349	43.07	-10.93	54	32.1	36	10.07	35.1	116	84	Average

Test Mode :	Mode 4	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	48~52%
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
69.69	23.65	-16.35	40	47.8	6.59	0.96	31.7	-	-	Peak
97.77	28.87	-14.63	43.5	49.37	10.05	1.15	31.7	-	-	Peak
168.78	26.33	-17.17	43.5	46.67	9.74	1.55	31.63	-	-	Peak
377	33.77	-12.23	46	47.01	15.52	2.48	31.24	-	-	Peak
453.3	39.55	-6.45	46	50.69	17.2	2.81	31.15	100	310	Peak
480.6	36.32	-9.68	46	46.79	17.78	2.87	31.12	-	-	Peak
2381.25	51.57	-22.43	74	48.14	32.11	5.47	34.15	117	335	Peak
2381.25	38.1	-15.9	54	34.67	32.11	5.47	34.15	117	335	Average
2412	98.45	-	-	95.01	32.16	5.44	34.16	117	335	Peak
2412	90.31	-	-	86.87	32.16	5.44	34.16	117	335	Average
2492	38.83	-15.17	54	35.36	32.3	5.37	34.2	117	335	Average
2492	50.44	-23.56	74	46.97	32.3	5.37	34.2	117	335	Peak
8421	54.26	-19.74	74	43.23	36	10.13	35.1	100	15	Peak
8421	42.8	-11.2	54	31.77	36	10.13	35.1	100	15	Average

Test Mode :	Mode 4	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	48~52%
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
31.89	30.14	-9.86	40	42.78	18.4	0.66	31.7	-	-	Peak
143.13	24.69	-18.81	43.5	43.4	11.52	1.43	31.66	-	-	Peak
194.97	23.93	-19.57	43.5	44.99	8.86	1.68	31.6	-	-	Peak
377	33.88	-12.12	46	47.12	15.52	2.48	31.24	-	-	Peak
453.3	36.68	-9.32	46	47.82	17.2	2.81	31.15	100	116	Peak
480.6	35.55	-10.45	46	46.02	17.78	2.87	31.12	-	-	Peak
2389.42	47.6	-26.4	74	44.16	32.13	5.46	34.15	105	324	Peak
2389.42	35.81	-18.19	54	32.37	32.13	5.46	34.15	105	324	Average
2412	95.79	-	-	92.35	32.16	5.44	34.16	105	324	Peak
2412	86.67	-	-	83.23	32.16	5.44	34.16	105	324	Average
2484	33.17	-20.83	54	29.71	32.27	5.38	34.19	105	324	Average
2484	48	-26	74	44.54	32.27	5.38	34.19	105	324	Peak
8430	54.55	-19.45	74	43.52	36	10.13	35.1	139	48	Peak
8430	42.11	-11.89	54	31.08	36	10.13	35.1	139	48	Average

Test Mode :	Mode 5	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	48~52%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
47.01	24.38	-15.62	40	45.86	9.45	0.77	31.7	-	-	Peak
98.58	30.3	-13.2	43.5	50.66	10.19	1.15	31.7	-	-	Peak
168.78	27.33	-16.17	43.5	47.67	9.74	1.55	31.63	-	-	Peak
377	33.19	-12.81	46	46.43	15.52	2.48	31.24	-	-	Peak
453.3	39.53	-6.47	46	50.67	17.2	2.81	31.15	100	201	Peak
480.6	36.26	-9.74	46	46.73	17.78	2.87	31.12	-	-	Peak
2382	60.4	-13.6	74	56.97	32.11	5.47	34.15	140	322	Peak
2382	34.93	-19.07	54	31.5	32.11	5.47	34.15	140	322	Average
2437	95.75	-	-	92.29	32.22	5.41	34.17	140	322	Peak
2437	88.96	-	-	85.5	32.22	5.41	34.17	140	322	Average
2492	55.55	-18.45	74	52.08	32.3	5.37	34.2	140	322	Peak
2492	37.11	-16.89	54	33.64	32.3	5.37	34.2	140	322	Average
8385	54.81	-19.19	74	43.81	36	10.1	35.1	126	115	Peak
8385	42.94	-11.06	54	31.94	36	10.1	35.1	126	115	Average

Test Mode :	Mode 5	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	48~52%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	2437 MHz is Fundamental Signals which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
32.97	31.57	-8.43	40	44.77	17.84	0.66	31.7	100	235	Peak
131.25	28.18	-15.32	43.5	46.71	11.77	1.37	31.67	-	-	Peak
194.97	28.4	-15.1	43.5	49.46	8.86	1.68	31.6	-	-	Peak
377	34.07	-11.93	46	47.31	15.52	2.48	31.24	-	-	Peak
453.3	36.93	-9.07	46	48.07	17.2	2.81	31.15	-	-	Peak
480.6	35.87	-10.13	46	46.34	17.78	2.87	31.12	-	-	Peak
2388	49.81	-24.19	74	46.37	32.13	5.46	34.15	103	6	Peak
2388	34.34	-19.66	54	30.9	32.13	5.46	34.15	103	6	Average
2437	95.83	-	-	92.37	32.22	5.41	34.17	103	6	Peak
2437	87.51	-	-	84.05	32.22	5.41	34.17	103	6	Average
2484	51.21	-22.79	74	47.75	32.27	5.38	34.19	103	6	Peak
2484	35.76	-18.24	54	32.3	32.27	5.38	34.19	103	6	Average
8454	54.11	-19.89	74	43.07	36	10.14	35.1	120	37	Peak
8454	41.44	-12.56	54	30.4	36	10.14	35.1	120	37	Average

Test Mode :	Mode 6	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	48~52%
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
32.7	23.84	-16.16	40	37.04	17.84	0.66	31.7	-	-	Peak
98.58	29.25	-14.25	43.5	49.61	10.19	1.15	31.7	-	-	Peak
168.78	27.14	-16.36	43.5	47.48	9.74	1.55	31.63	-	-	Peak
377	33.08	-12.92	46	46.32	15.52	2.48	31.24	-	-	Peak
453.3	39.4	-6.6	46	50.54	17.2	2.81	31.15	100	51	Peak
480.6	36.24	-9.76	46	46.71	17.78	2.87	31.12	-	-	Peak
2390	49.57	-24.43	74	46.14	32.13	5.46	34.16	100	301	Peak
2390	35.47	-18.53	54	32.04	32.13	5.46	34.16	100	301	Average
2462	101.45	-	-	97.99	32.24	5.4	34.18	100	301	Peak
2462	89.51	-	-	86.05	32.24	5.4	34.18	100	301	Average
2483.66	50	-24	74	46.54	32.27	5.38	34.19	100	301	Peak
2483.66	37.93	-16.07	54	34.47	32.27	5.38	34.19	100	301	Average
8445	54.17	-19.83	74	43.13	36	10.14	35.1	142	75	Peak
8445	41.25	-12.75	54	30.21	36	10.14	35.1	142	75	Average

Test Mode :	Mode 6	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	48~52%
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
32.97	30.96	-9.04	40	44.16	17.84	0.66	31.7	100	95	Peak
49.17	26.45	-13.55	40	48.87	8.47	0.81	31.7	-	-	Peak
194.97	27.66	-15.84	43.5	48.72	8.86	1.68	31.6	-	-	Peak
377	33.38	-12.62	46	46.62	15.52	2.48	31.24	-	-	Peak
453.3	36.7	-9.3	46	47.84	17.2	2.81	31.15	-	-	Peak
480.6	36.04	-9.96	46	46.51	17.78	2.87	31.12	-	-	Peak
2350	47.37	-26.63	74	43.96	32.05	5.5	34.14	156	320	Peak
2350	33.7	-20.3	54	30.29	32.05	5.5	34.14	156	320	Average
2462	96.72	-	-	93.26	32.24	5.4	34.18	156	320	Peak
2462	87.22	-	-	83.76	32.24	5.4	34.18	156	320	Average
2484.61	35.08	-18.92	54	31.62	32.27	5.38	34.19	156	320	Average
2484.61	47.8	-26.2	74	44.34	32.27	5.38	34.19	156	320	Peak
8289	54.2	-19.8	74	43.26	36	10.04	35.1	118	76	Peak
8289	42.78	-11.22	54	31.84	36	10.04	35.1	118	76	Average

Test Mode :	Mode 7	Temperature :	23~25℃
Test Channel :	149	Relative Humidity :	48~52%
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
99.66	28.26	-15.24	43.5	48.46	10.34	1.16	31.7	-	-	Peak
161.22	26.69	-16.81	43.5	46.51	10.31	1.51	31.64	-	-	Peak
265.17	25.22	-20.78	46	41.75	12.97	1.97	31.47	-	-	Peak
377	34.58	-11.42	46	47.82	15.52	2.48	31.24	131	100	Peak
441.4	27.41	-18.59	46	38.83	16.97	2.77	31.16	-	-	Peak
914.6	26.36	-19.64	46	29.46	23.4	4.19	30.69	-	-	Peak
5745	100.82	-	-	91.87	35.04	8.41	34.5	100	113	Peak
5745	91.11	-	-	82.16	35.04	8.41	34.5	100	113	Average
8398	54.75	-19.25	74	43.74	36	10.11	35.1	100	220	Peak
8398	42.88	-11.12	54	31.87	36	10.11	35.1	100	220	Average
11490	33.22	-40.78	74	67.9	-11.73	11.65	34.6	100	78	Peak
11490	22.1	-31.9	54	56.78	-11.73	11.65	34.6	100	78	Average

Test Mode :	Mode 7	Temperature :	23~25℃
Test Channel :	149	Relative Humidity :	48~52%
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
32.97	30.45	-9.55	40	43.65	17.84	0.66	31.7	100	210	Peak
83.46	26.78	-13.22	40	49.49	7.96	1.03	31.7	-	-	Peak
194.97	27.17	-16.33	43.5	48.23	8.86	1.68	31.6	-	-	Peak
402.2	26.59	-19.41	46	39.06	16.17	2.56	31.2	-	-	Peak
584.2	25.7	-20.3	46	33.76	19.76	3.2	31.02	-	-	Peak
953.8	27.11	-18.89	46	29.5	23.99	4.27	30.65	-	-	Peak
5745	96.77	-	-	87.82	35.04	8.41	34.5	100	46	Peak
5745	88.05	-	-	79.1	35.04	8.41	34.5	100	46	Average
8438	54.28	-19.72	74	43.24	36	10.14	35.1	112	38	Peak
8438	42.05	-11.95	54	31.01	36	10.14	35.1	112	38	Average
11490	38.23	-35.77	74	72.91	-11.73	11.65	34.6	100	110	Peak
11490	26.71	-27.29	54	61.39	-11.73	11.65	34.6	100	110	Average

Test Mode :	Mode 8	Temperature :	23~25℃
Test Channel :	157	Relative Humidity :	48~52%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	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
67.26	23.82	-16.18	40	48.19	6.39	0.94	31.7	-	-	Peak
101.01	27.6	-15.9	43.5	47.7	10.43	1.17	31.7	-	-	Peak
168.78	26.22	-17.28	43.5	46.56	9.74	1.55	31.63	-	-	Peak
377	34.31	-11.69	46	47.55	15.52	2.48	31.24	100	117	Peak
441.4	27.45	-18.55	46	38.87	16.97	2.77	31.16	-	-	Peak
897.8	27.47	-18.53	46	30.86	23.16	4.15	30.7	-	-	Peak
5785	100.93	-	-	91.94	35.09	8.42	34.52	100	115	Peak
5785	91	-	-	82.01	35.09	8.42	34.52	100	115	Average
8326	54.77	-19.23	74	43.81	36	10.06	35.1	131	74	Peak
8326	42.94	-11.06	54	31.98	36	10.06	35.1	131	74	Average
11570	32.83	-41.17	74	67.26	-11.49	11.69	34.63	100	44	Peak
11570	21.35	-32.65	54	55.78	-11.49	11.69	34.63	100	44	Average

Test Mode :	Mode 8	Temperature :	23~25℃
Test Channel :	157	Relative Humidity :	48~52%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	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
32.97	30.93	-9.07	40	44.13	17.84	0.66	31.7	100	104	Peak
83.46	27.49	-12.51	40	50.2	7.96	1.03	31.7	-	-	Peak
194.97	27.38	-16.12	43.5	48.44	8.86	1.68	31.6	-	-	Peak
402.2	25.23	-20.77	46	37.7	16.17	2.56	31.2	-	-	Peak
584.2	25.28	-20.72	46	33.34	19.76	3.2	31.02	-	-	Peak
897.8	28.06	-17.94	46	31.45	23.16	4.15	30.7	-	-	Peak
5785	97.44	-	-	88.45	35.09	8.42	34.52	100	46	Peak
5785	87.79	-	-	78.8	35.09	8.42	34.52	100	46	Average
8470	54.22	-19.78	74	43.16	36	10.16	35.1	100	136	Peak
8470	41.84	-12.16	54	30.78	36	10.16	35.1	100	136	Average
11570	38.72	-35.28	74	73.15	-11.49	11.69	34.63	100	61	Peak
11570	27.65	-26.35	54	62.08	-11.49	11.69	34.63	100	61	Average

Test Mode :	Mode 9	Temperature :	23~25℃
Test Channel :	165	Relative Humidity :	48~52%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	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
50.25	30.21	-9.79	40	53.1	7.98	0.83	31.7	134	100	Peak
99.93	28.02	-15.48	43.5	48.22	10.34	1.16	31.7	-	-	Peak
225.21	26.71	-19.29	46	46.71	9.73	1.82	31.55	-	-	Peak
377	34.06	-11.94	46	47.3	15.52	2.48	31.24	-	-	Peak
559	29.74	-16.26	46	38.38	19.28	3.12	31.04	-	-	Peak
897.8	27.64	-18.36	46	31.03	23.16	4.15	30.7	-	-	Peak
5825	99.76	-	-	90.7	35.16	8.43	34.53	100	117	Peak
5825	89.71	-	-	80.65	35.16	8.43	34.53	100	117	Average
8286	55.28	-18.72	74	44.34	36	10.04	35.1	120	100	Peak
8286	43.35	-10.65	54	32.41	36	10.04	35.1	120	100	Average
11650	31.59	-42.41	74	65.65	-11.14	11.74	34.66	100	109	Peak
11650	19.52	-34.48	54	53.58	-11.14	11.74	34.66	100	109	Average

Test Mode :	Mode 9	Temperature :	23~25
Test Channel :	165	Relative Humidity :	48~52
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	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
32.97	30.31	-9.69	40	43.51	17.84	0.66	31.7	100	110	Peak
81.57	29.77	-10.23	40	52.76	7.7	1.01	31.7	-	-	Peak
194.97	27.4	-16.1	43.5	48.46	8.86	1.68	31.6	-	-	Peak
402.2	26.56	-19.44	46	39.03	16.17	2.56	31.2	-	-	Peak
662.6	25.1	-20.9	46	32.04	20.55	3.45	30.94	-	-	Peak
914.6	28.96	-17.04	46	32.06	23.4	4.19	30.69	-	-	Peak
5825	95.04	-	-	85.98	35.16	8.43	34.53	100	59	Peak
5825	86.02	-	-	76.96	35.16	8.43	34.53	100	59	Average
8446	55.15	-18.85	74	44.11	36	10.14	35.1	136	29	Peak
8446	43.52	-10.48	54	32.48	36	10.14	35.1	136	29	Average
11650	35.23	-38.77	74	69.29	-11.14	11.74	34.66	100	151	Peak
11650	23.08	-30.92	54	57.14	-11.14	11.74	34.66	100	151	Average

3.8 Antenna Requirements

3.8.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.8.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

3.8.3 Antenna Gain

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 23, 2009	Jun. 22, 2010	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 17, 2009	Sep. 16, 2010	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 10, 2009	Sep. 09, 2010	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Aug. 05, 2009	Aug. 04, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz~30MHz	Nov. 30, 2009	Nov. 29, 2010	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 23, 2009	Nov. 22, 2010	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 31, 2009	Oct. 30, 2010	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP	101067	9KHz ~ 30GHz	Dec. 04, 2009	Dec. 03, 2010	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec.09,2009	Dec. 08, 2010	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32 dB.GAIN	Mar. 27, 2009	Mar. 26, 2010	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 KHz~30 MHz	May 22, 2008	May 21, 2010	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.10	Normal (k=2)	0.05
Cable Loss	0.10	Normal (k=2)	0.05
AMN Insertion Loss	2.50	Rectangular	0.63
Receiver Specification	1.50	Rectangular	0.43
Site Imperfection	1.39	Rectangular	0.80
Mismatch	+0.34 / -0.35	U-Shape	0.24
Combined Standard Uncertainty $U_c(y)$	1.13		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.26		

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	± 0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	± 1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	± 0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site Imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1*\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP9N0214 as below.