

FCC RF Test Report

APPLICANT : Acer Inc.
EQUIPMENT : LumiRead
BRAND NAME : Acer
MODEL NAME : HEB00
MARKETING NAME : Acer LumiRead 600
FCC ID : HLZ-HEB00
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Transmission System (DTS)

The product was received on May 07, 2010 and completely tested on Jun. 19, 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.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR050749	Rev. 01	Initial issue of report	Jun. 28, 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	Power Output	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(d)	A8.5	Frequency Band Edges	$\leq 20\text{dBc}$	Pass	-
3.4	15.247(d)	A8.5	Spurious Emission	$< 20\text{ dBc}$	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}$	Pass	-
3.6	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 16.5 dB at 0.366 MHz
3.7	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.06 dB at 55.65 MHz
3.8	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Acer Inc.

8F., No. 88, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.

1.2 Manufacturer

1. Compal Electronics (China) Co., Ltd.

988 Tong Feng East Rd., Kunshan Economics & Technical Development Zone, Kunshan, Jiangsu, P.R. China

2. Compal Information (Kunshan) Co., Ltd.

The Third Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

3. Compal Information Technology (Kunshan) Co., Ltd.

No. 58, The 1st Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

4. Compal Electronics Technology (Kunshan) Co., Ltd.

No. 25, The Third Street, Kunshan Export Processing Zone, Jiangsu, P.R. China

5. Kunshang Botai Electronics Co., Ltd.

988 Tong Feng East Rd., Kunshan Economic & Technical Development Zone, Kunshan, Jiangsu, P.R. China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	LumiRead
Brand Name	Acer
Model Name	HEB00
Marketing Name	Acer LumiRead 600
FCC ID	HLZ-HEB00
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	11
Carrier Frequency of Each Channel	2412+(n-1)*5 MHz; n=1~11
Channel Spacing	5 MHz
Maximum Output Power to Antenna	802.11b : 15.87 dBm (38.64 mW) 802.11g : 20.52 dBm (112.72 mW)
Antenna Type	PIFA Antenna with gain 0.58 dBi
HW Version	M/B : LA-6252P
SW Version	BIOS : 0.02.01.0024
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)
EUT Stage	Production Unit

Remark:

1. This test report recorded only product characteristics and test results of Digital Transmission System (DTS).
2. 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	03CH05-HY	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

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.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.2 m	N/A

2 Test Configuration of Equipment Under Test

2.1 RF Power

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

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	15.32	15.35	15.32	15.37
CH 06	2437 MHz	15.83	15.82	15.79	15.87
CH 11	2462 MHz	14.84	14.82	14.84	14.87

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	20.33	20.10	20.43	20.23	20.41	20.26	20.22	20.52
CH 06	2437 MHz	19.86	19.66	19.90	19.69	19.90	19.79	19.79	20.00
CH 11	2462 MHz	18.94	18.89	19.07	18.85	19.16	18.92	18.90	19.16

Remark:

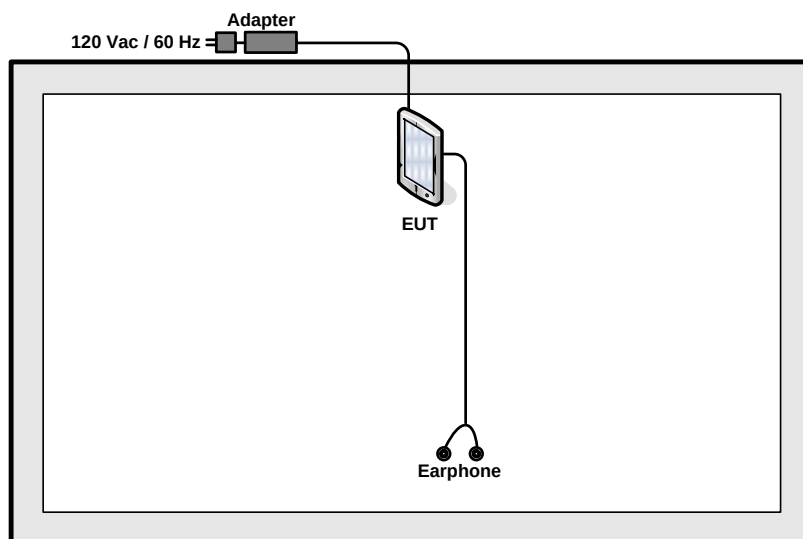
1. The data rates of WLAN 802.11b/g were set in 11Mbps for 802.11b and 54Mbps for 802.11g, for all the test cases due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.

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	802.11g
Conducted TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g CH01_2412 MHz
	Mode 2 : 802.11b CH06_2437 MHz	Mode 5 : 802.11g CH06_2437 MHz
	Mode 3 : 802.11b CH11_2462 MHz	Mode 6 : 802.11g CH11_2462 MHz
Radiated TCs	Mode 1 : 802.11b CH01_2412 MHz	Mode 4 : 802.11g CH01_2412 MHz
	Mode 2 : 802.11b CH06_2437 MHz	Mode 5 : 802.11g CH06_2437 MHz
	Mode 3 : 802.11b CH11_2462 MHz	Mode 6 : 802.11g CH11_2462 MHz
AC Conducted Emission	Mode 1 : WLAN Tx + Earphone + Adapter	

2.3 Connection Diagram of Test System



2.4 RF Utility

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

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

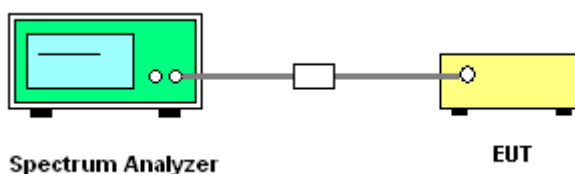
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

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

3.1.4 Test Setup

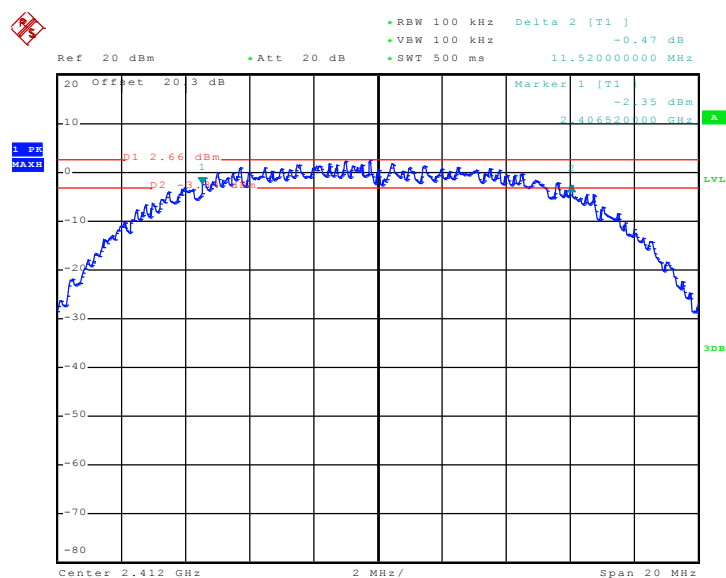


3.1.5 Test Result of 6dB Bandwidth

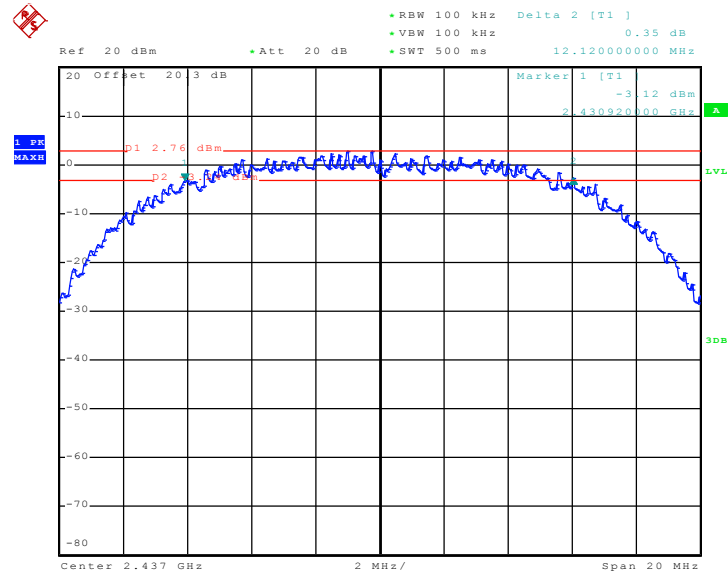
Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Lancelot Chen	Relative Humidity :	51~54%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	11.52	0.5	Pass
06	2437	12.12	0.5	Pass
11	2462	12.16	0.5	Pass

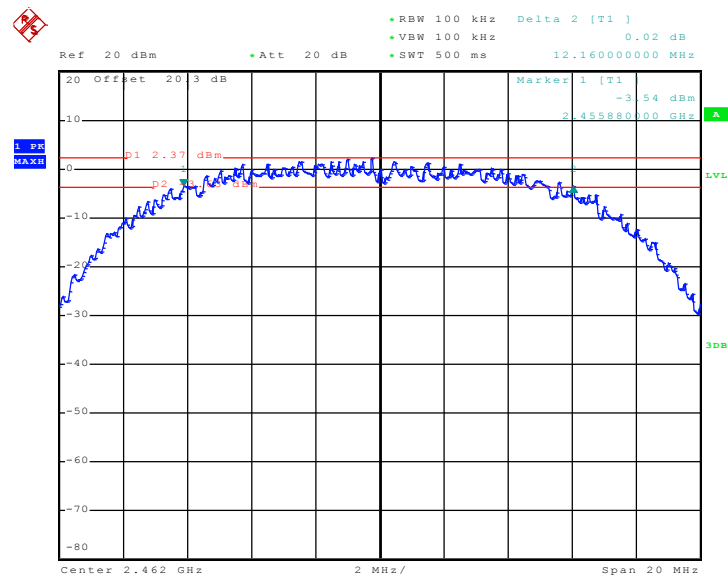
Mode 1 : 6 dB Bandwidth Plot on 802.11b Channel 01



Date: 18.JUN.2010 10:32:51

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


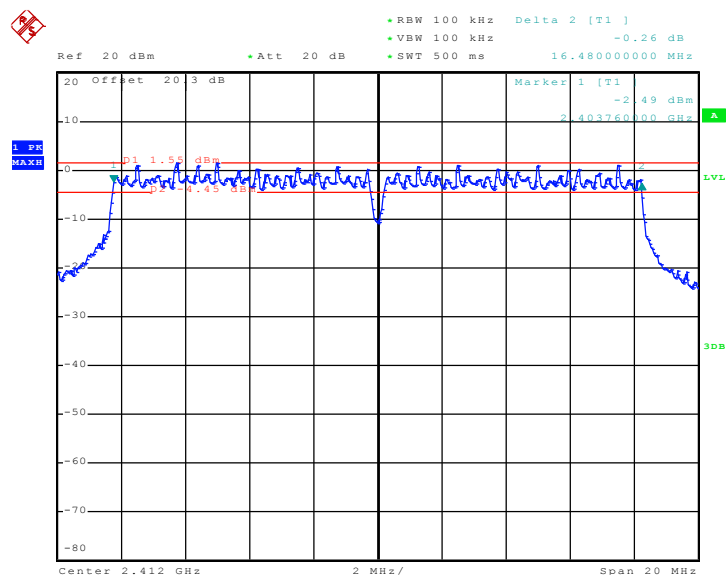
Date: 18.JUN.2010 10:18:25

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


Date: 18.JUN.2010 10:04:05

Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Lancelot Chen	Relative Humidity :	51~54%

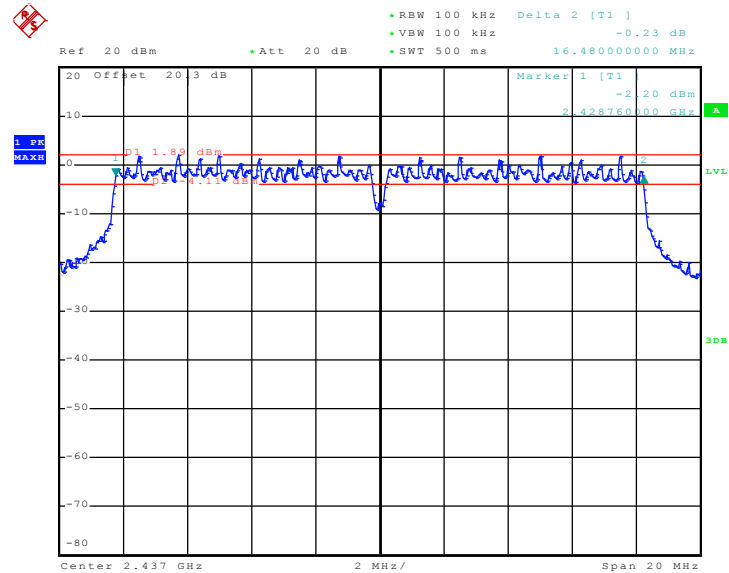
Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.48	0.5	Pass
06	2437	16.48	0.5	Pass
11	2462	16.48	0.5	Pass

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


Date: 18.JUN.2010 11:10:49

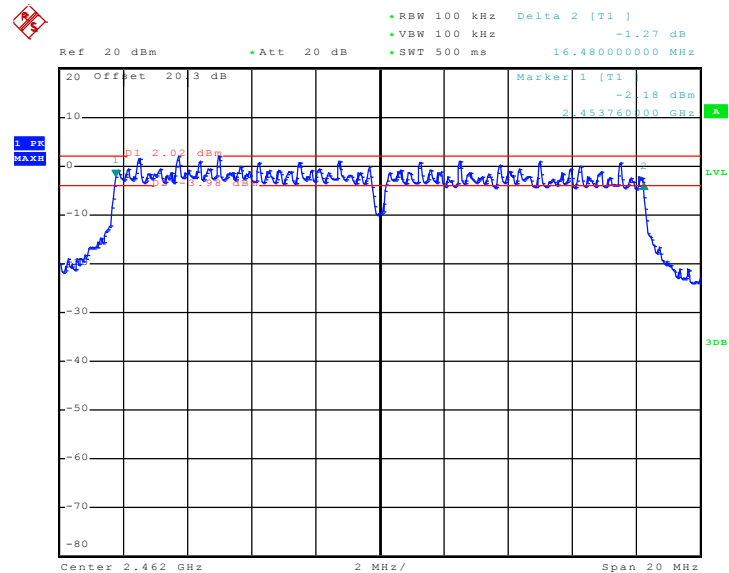


Mode 5 : 6 dB Bandwidth Plot on 802.11g Channel 06



Date: 18.JUN.2010 11:14:26

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



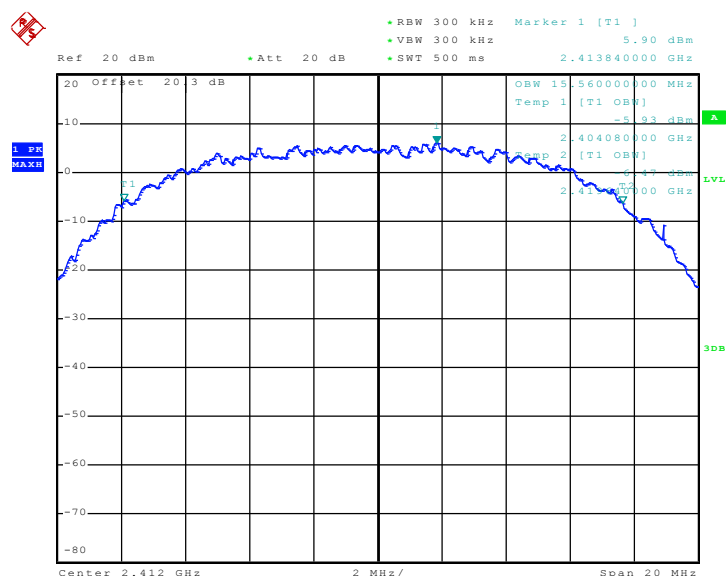
Date: 18.JUN.2010 11:21:03

3.1.6 Test Result of 99% Occupied Bandwidth

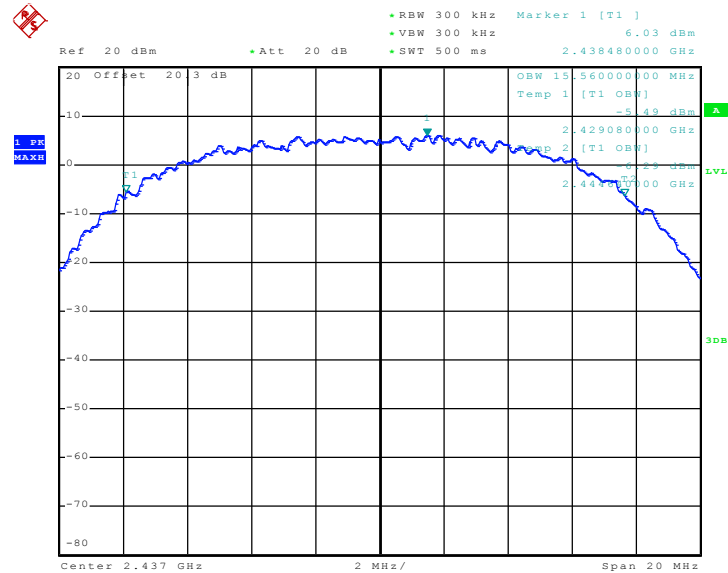
Test Mode :	Mode 1, 2, 3	Temperature :	24~26°C
Test Engineer :	Lancelot Chen	Relative Humidity :	51~54%

Channel	Frequency (MHz)	802.11b 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	15.56	Pass
06	2437	15.56	Pass
11	2462	15.56	Pass

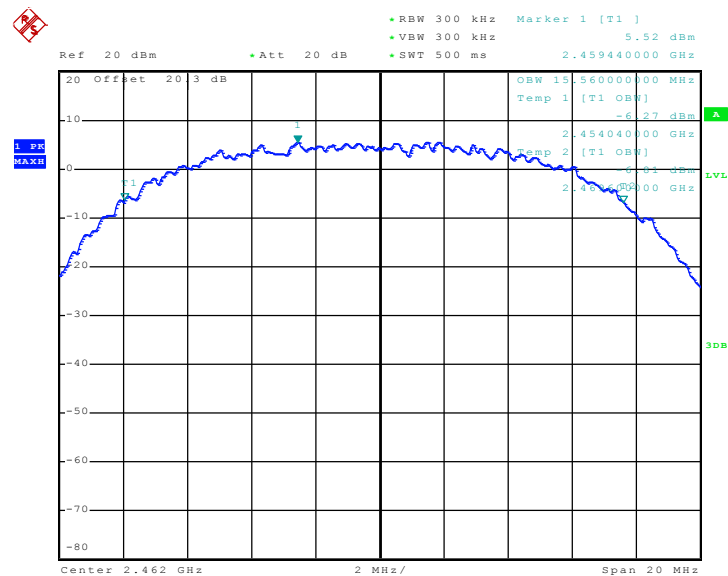
Mode 1 : 99% Occupied Bandwidth Plot on 802.11b Channel 01



Date: 18.JUN.2010 10:30:56

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


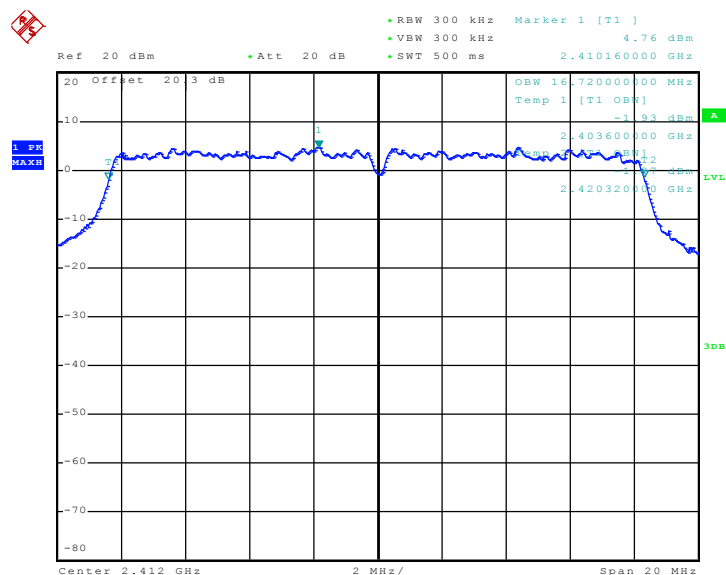
Date: 18.JUN.2010 10:28:59

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


Date: 18.JUN.2010 10:30:00

Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Lancelot Chen	Relative Humidity :	51~54%

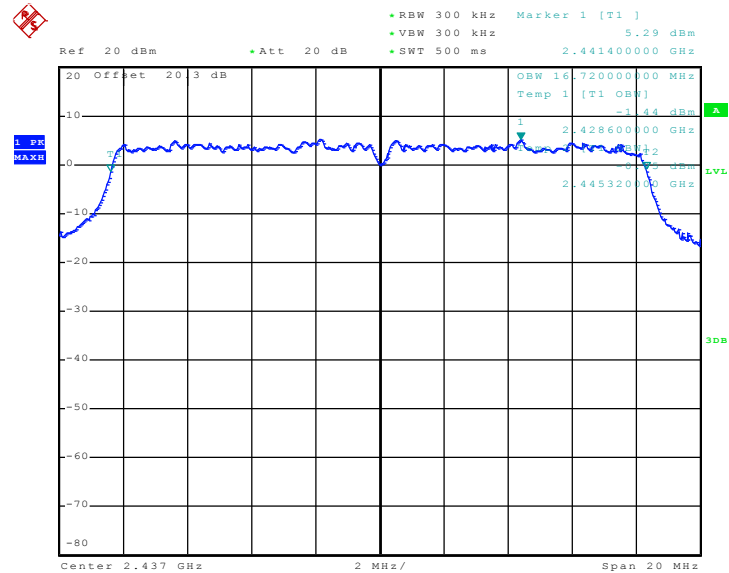
Channel	Frequency (MHz)	802.11g 99% Occupied Bandwidth (MHz)	Pass/Fail
01	2412	16.72	Pass
06	2437	16.72	Pass
11	2462	16.76	Pass

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


Date: 18.JUN.2010 11:16:26

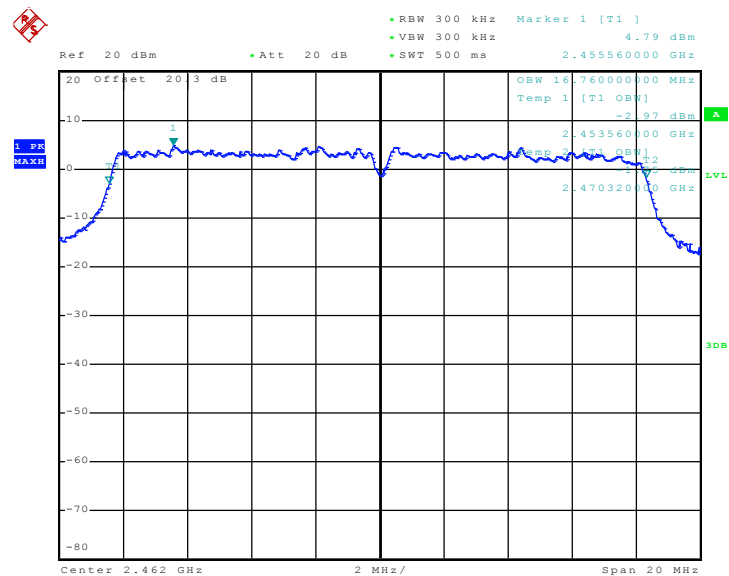


Mode 5 : 99% Occupied Bandwidth Plot on 802.11g Channel 06



Date: 18.JUN.2010 11:15:38

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



Date: 18.JUN.2010 11:18:05

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

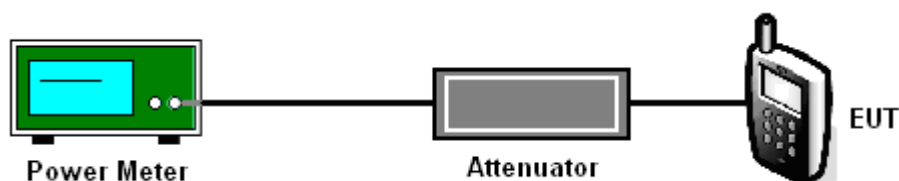
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Lancelot Chen	Relative Humidity :	51~54%

Channel	Frequency (MHz)	802.11b Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	15.37	30	Pass
06	2437	15.87	30	Pass
11	2462	14.87	30	Pass

Test Mode :	Mode 4, 5, 6	Temperature :	24~26℃
Test Engineer :	Lancelot Chen	Relative Humidity :	51~54%

Channel	Frequency (MHz)	802.11g Measured Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.52	30	Pass
06	2437	20.00	30	Pass
11	2462	19.16	30	Pass

3.3 Band Edges Measurement

3.3.1 Limit of Band Edges

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

3.3.2 Measuring Instruments

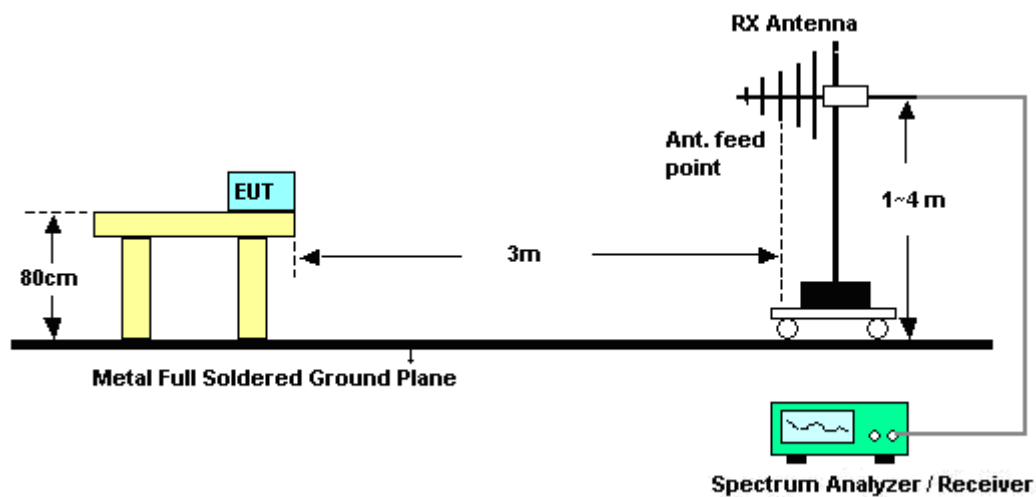
See list of measuring instruments of this test report.

3.3.3 Test Procedures

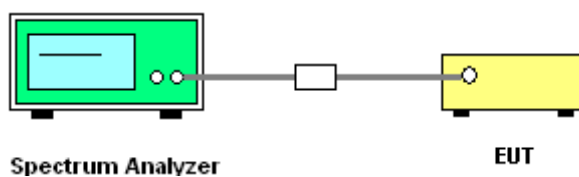
1. The testing follows the guidelines in ANSI C63.4-2003 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. Conducted emission test: Set RBW = 100 kHz, Video bandwidth (VBW) $\geq$ RBW. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized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

3.3.4 Test Setup

<Radiated Band Edges>



<Conducted Band Edges>



3.3.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	23~25℃
Test Band :	802.11b	Relative Humidity :	44~50%
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
2385.62	46.89	-27.11	74	55.12	31.86	5.54	45.63	129	28	Peak
2385.62	35.01	-18.99	54	43.24	31.86	5.54	45.63	129	28	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	45.85	-28.15	74	54.08	31.86	5.54	45.63	160	346	Peak
2389.42	34.02	-19.98	54	42.25	31.86	5.54	45.63	160	346	Average

Test Mode :	Mode 3	Temperature :	23~25℃
Test Band :	802.11b	Relative Humidity :	44~50%
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
2487.46	53.09	-20.91	74	52.62	31.98	4.59	36.1	125	28	Peak
2487.46	42.11	-11.89	54	41.64	31.98	4.59	36.1	125	28	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
2487.46	48.49	-25.51	74	48.02	31.98	4.59	36.1	158	175	Peak
2487.46	36.65	-17.35	54	36.18	31.98	4.59	36.1	158	175	Average

Test Mode :	Mode 4	Temperature :	23~25℃
Test Band :	802.11g	Relative Humidity :	44~50%
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	64.23	-9.77	74	72.46	31.86	5.54	45.63	101	31	Peak
2390	44.66	-9.34	54	52.89	31.86	5.54	45.63	101	31	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	62.26	-11.74	74	70.49	31.86	5.54	45.63	159	350	Peak
2390	41.62	-12.38	54	49.85	31.86	5.54	45.63	159	350	Average

Test Mode :	Mode 6	Temperature :	23~25℃
Test Band :	802.11g	Relative Humidity :	44~50%
Test Channel :	11	Test Engineer :	Cona Huang

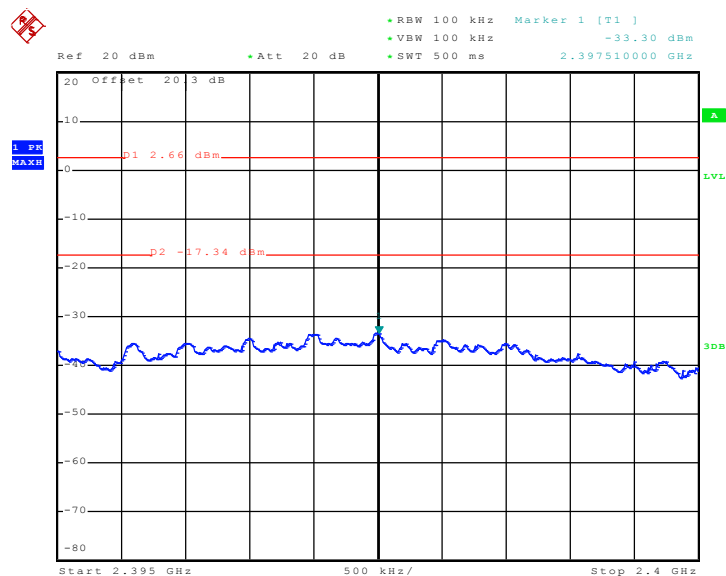
ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.5	69.66	-4.34	74	69.19	31.98	4.59	36.1	195	34	Peak
2483.5	48.19	-5.81	54	47.72	31.98	4.59	36.1	195	34	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	62.48	-11.52	74	62.01	31.98	4.59	36.1	132	173	Peak
2483.66	42.82	-11.18	54	42.35	31.98	4.59	36.1	132	173	Average

3.3.6 Test Plots of Conducted Band Edges

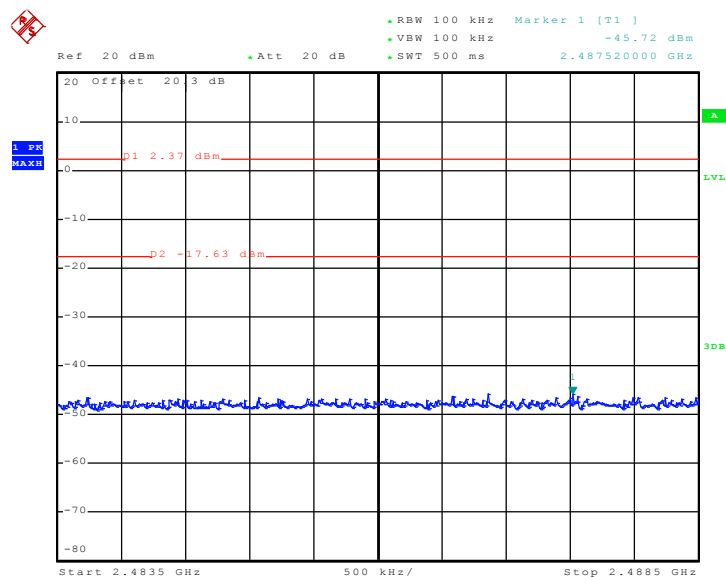
Test Mode :	Mode 1 and 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	51~54%
Test Channel :	01 and 11	Test Engineer :	Lancelot Chen

Low Band Edge Plot on 802.11b Channel 01



Date: 18.JUN.2010 10:33:24

High Band Edge Plot on 802.11b Channel 11

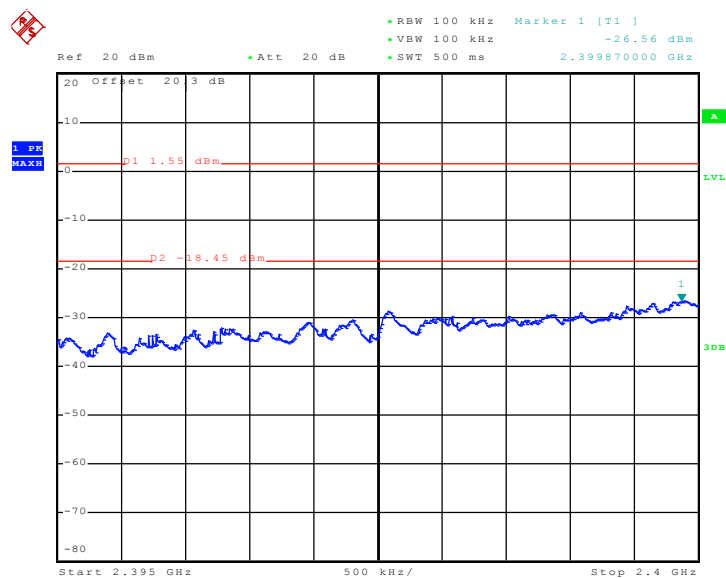


Date: 18.JUN.2010 10:04:55



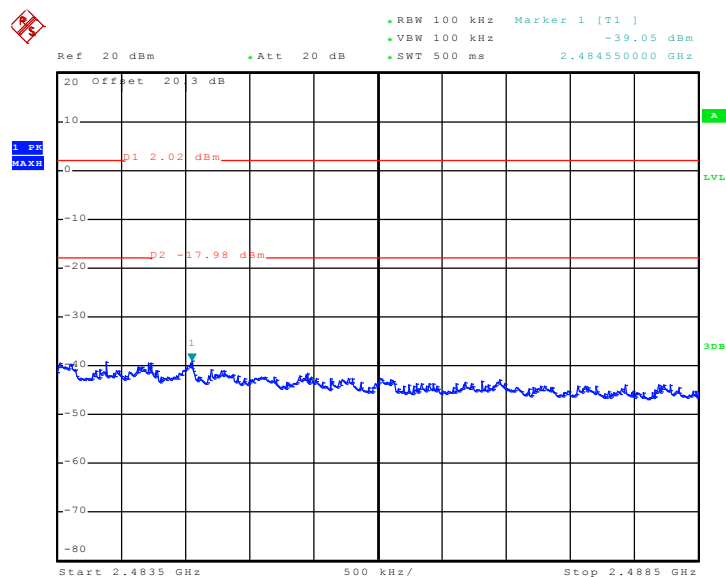
Test Mode :	Mode 4 and 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	51~54%
Test Channel :	01 and 11	Test Engineer :	Lancelot Chen

Low Band Edge Plot on 802.11g Channel 01



Date: 18.JUN.2010 11:11:40

High Band Edge Plot on 802.11g Channel 11



Date: 18.JUN.2010 11:22:11

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.

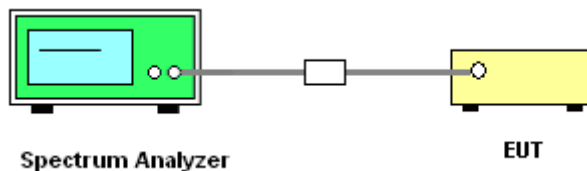
3.4.2 Measuring Instruments

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.

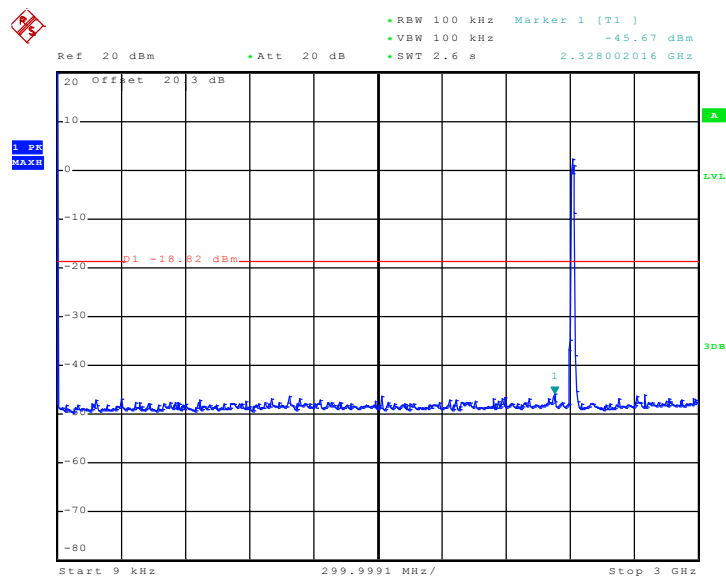
3.4.4 Test Setup



3.4.5 Test Plots of Spurious Emission

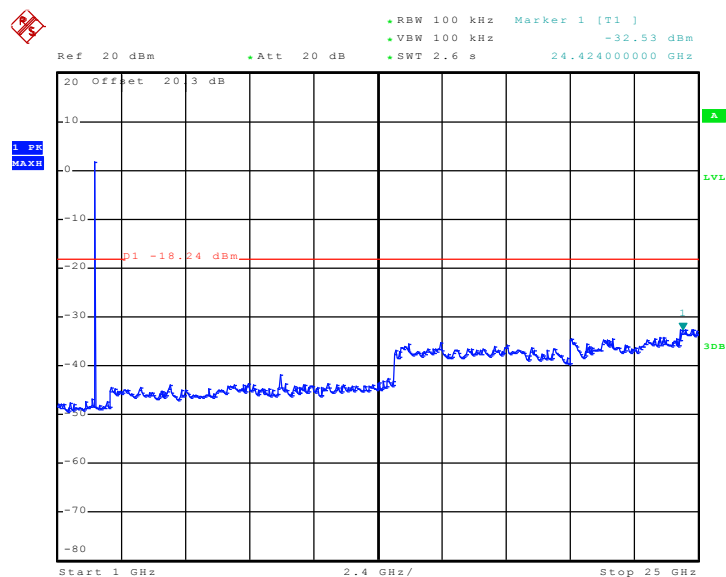
Test Mode :	Mode 1	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



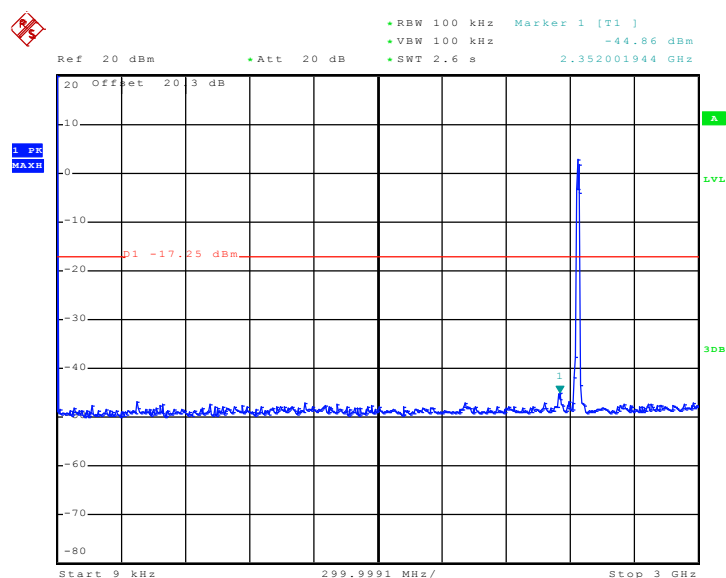
Date: 18.JUN.2010 12:45:35

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

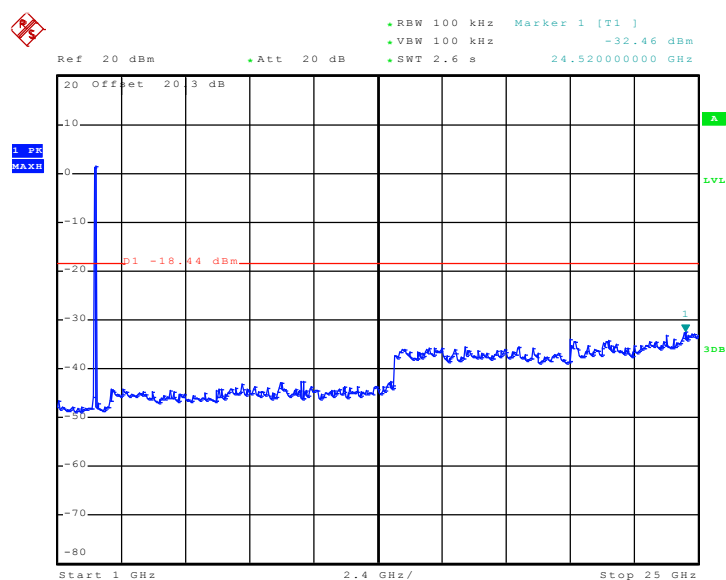


Date: 18.JUN.2010 12:39:07

Test Mode :	Mode 2	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Lancelot Chen

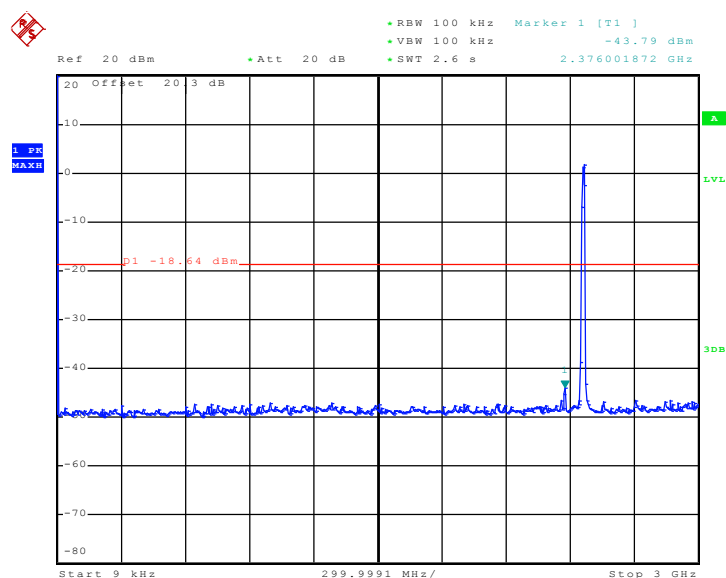
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 18.JUN.2010 12:43:26

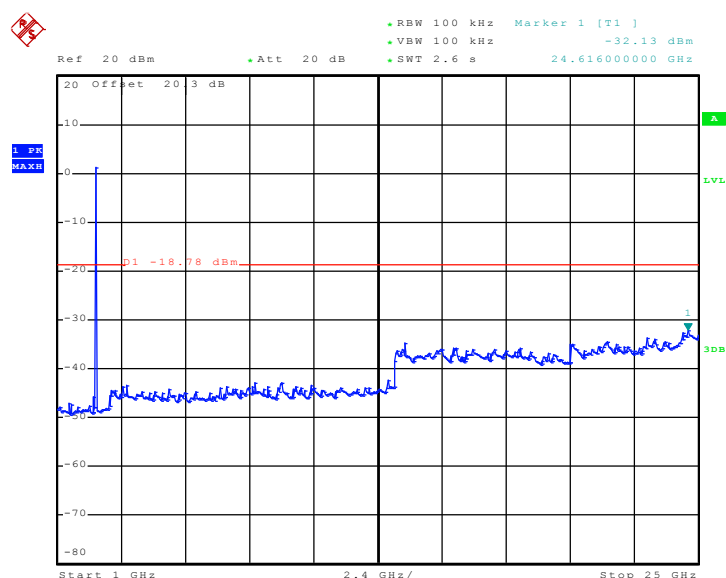
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 18.JUN.2010 12:40:11

Test Mode :	Mode 3	Temperature :	24~26°C
Test Band :	802.11b	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Lancelot Chen

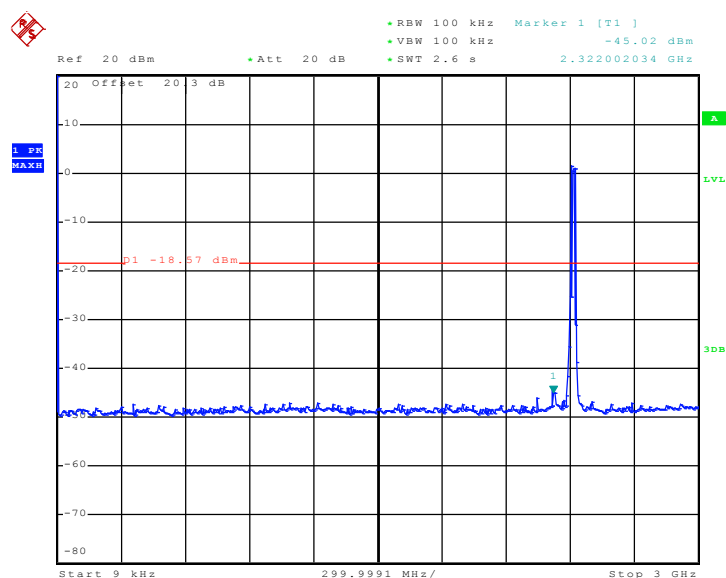
Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 18.JUN.2010 12:42:32

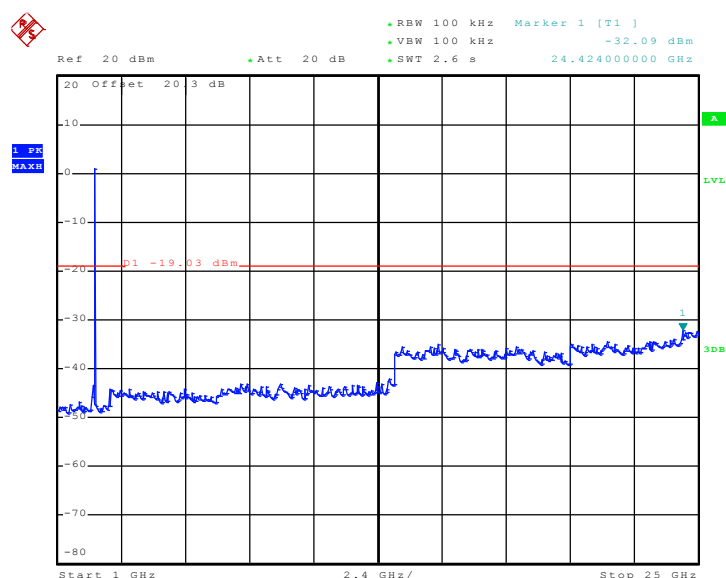
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 18.JUN.2010 12:41:05

Test Mode :	Mode 4	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz


Date: 18.JUN.2010 12:35:12

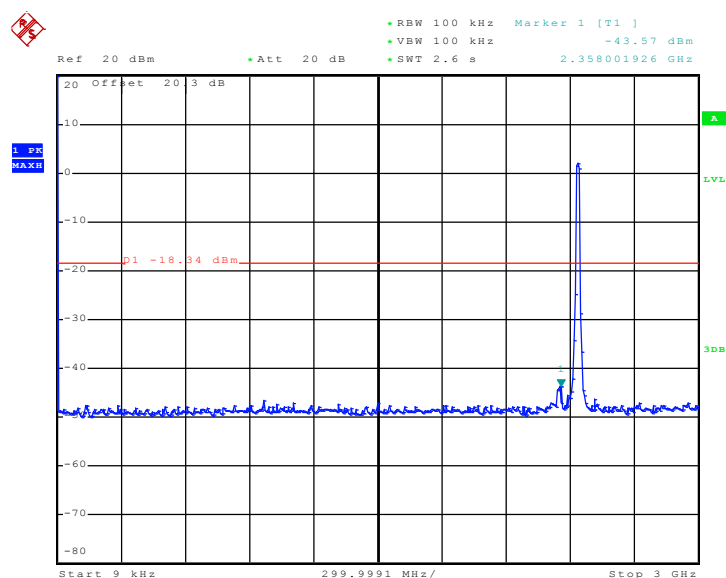
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz


Date: 18.JUN.2010 12:36:18



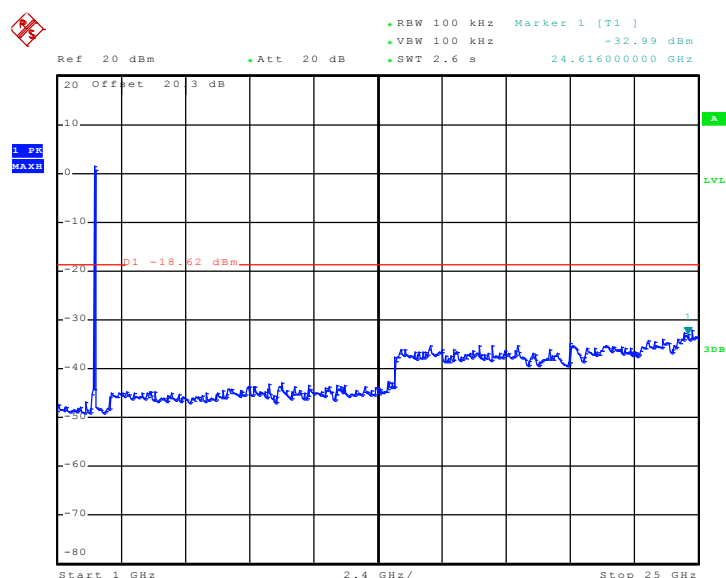
Test Mode :	Mode 5	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	51~54%
Test Channel :	06	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz



Date: 18.JUN.2010 12:33:58

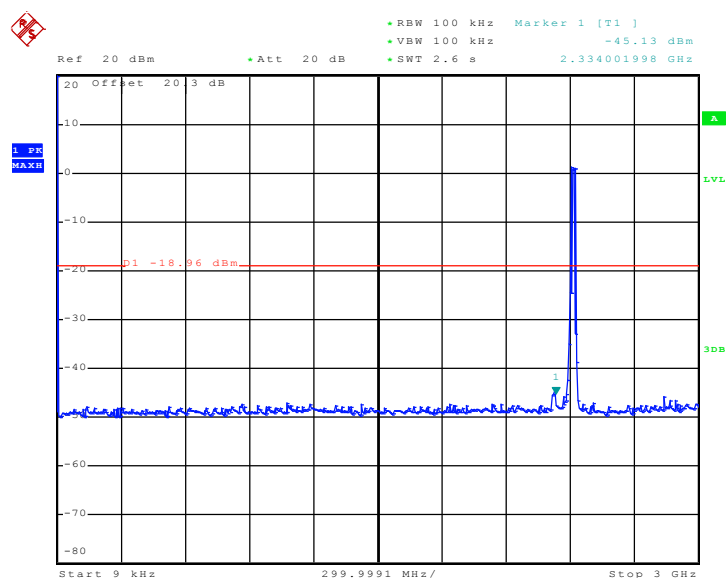
Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz



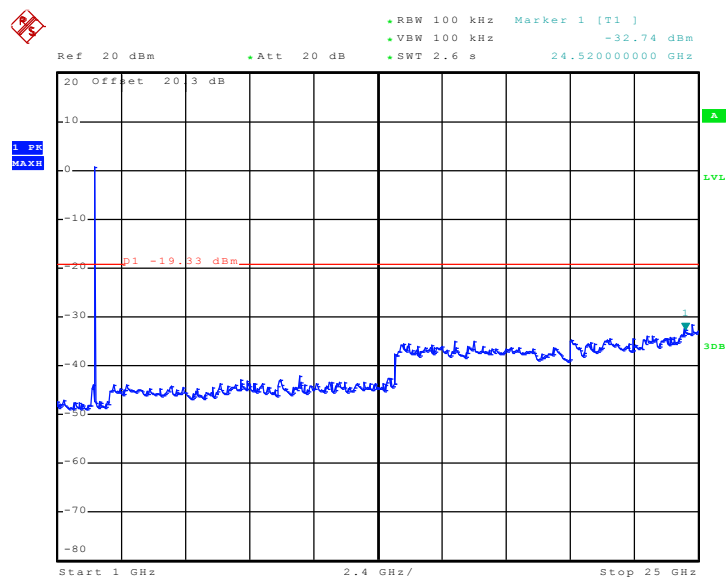
Date: 18.JUN.2010 12:37:34



Test Mode :	Mode 6	Temperature :	24~26°C
Test Band :	802.11g	Relative Humidity :	51~54%
Test Channel :	11	Test Engineer :	Lancelot Chen

Conducted Spurious Emission Plot between 9 kHz ~ 3 GHz

Date: 18.JUN.2010 12:23:58

Conducted Spurious Emission Plot between 1 GHz ~ 25 GHz

Date: 18.JUN.2010 12:22:43

3.5 Power Spectral Density Measurement

3.5.1 Limit of Power Spectral Density

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

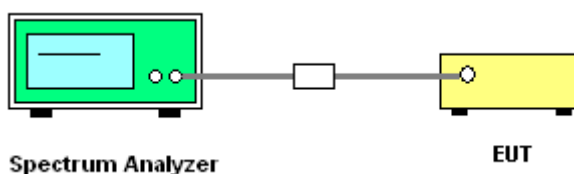
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup

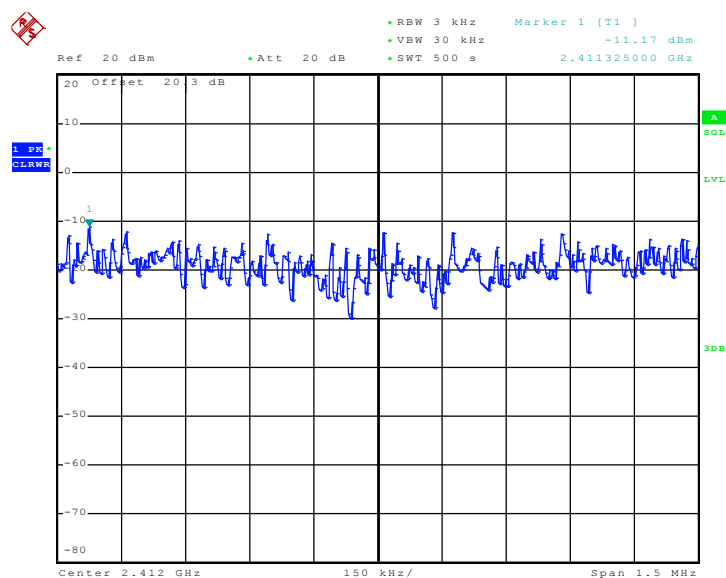


3.5.5 Test Result of Power Spectral Density

Test Mode :	Mode 1, 2, 3	Temperature :	24~26℃
Test Engineer :	Lancelot Chen	Relative Humidity :	51~54%

Channel	Frequency (MHz)	802.11b Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-11.17	8	Pass
06	2437	-10.74	8	Pass
11	2462	-11.36	8	Pass

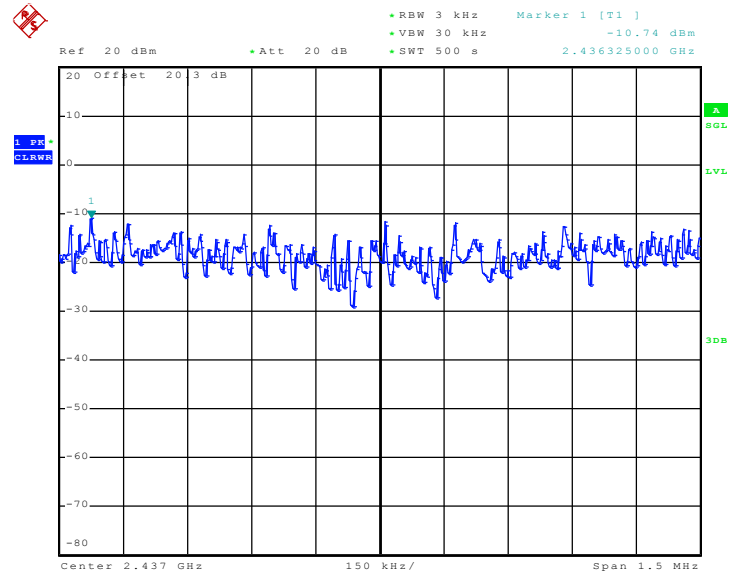
Mode 1 : PSD Plot on 802.11b Channel 01



Date: 18.JUN.2010 11:06:07

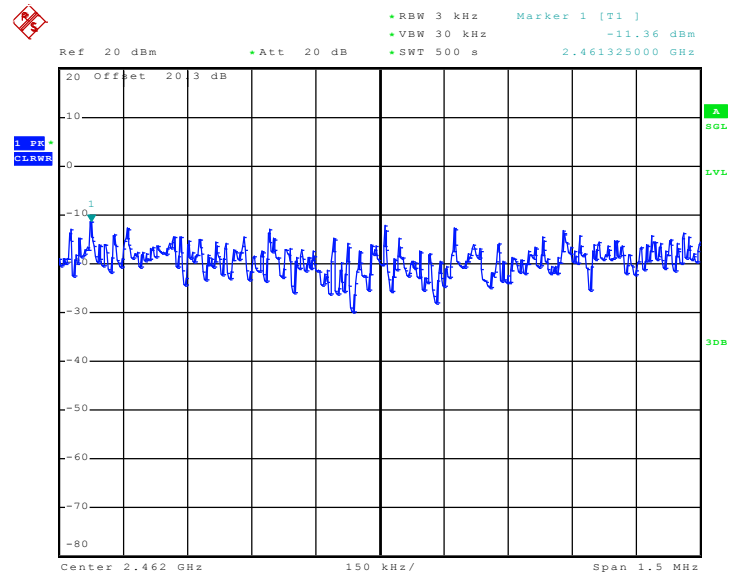


Mode 2 : PSD Plot on 802.11b Channel 06



Date: 18.JUN.2010 10:27:47

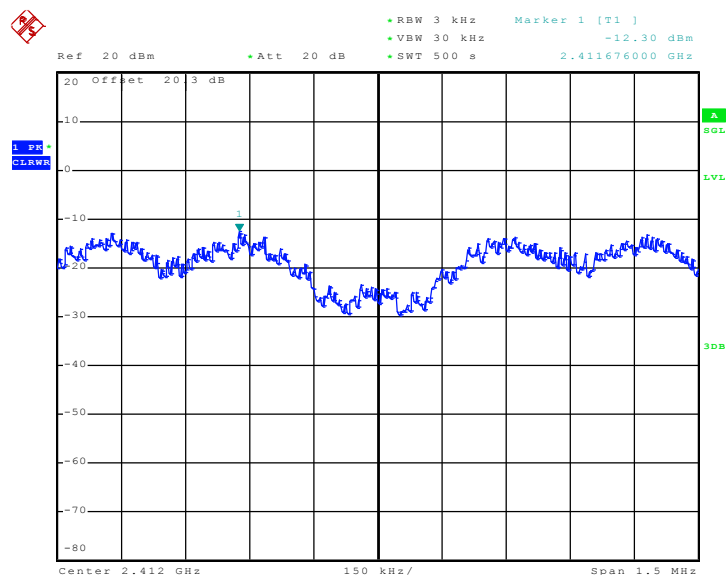
Mode 3 : PSD Plot on 802.11b Channel 11



Date: 18.JUN.2010 10:15:49

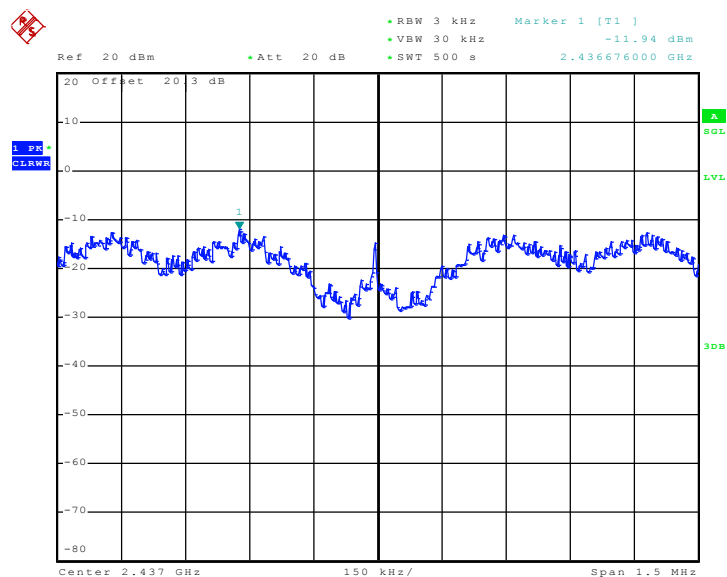
Test Mode :	Mode 4, 5, 6	Temperature :	24~26°C
Test Engineer :	Lancelot Chen	Relative Humidity :	51~54%

Channel	Frequency (MHz)	802.11g Measured PSD (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	-12.30	8	Pass
06	2437	-11.94	8	Pass
11	2462	-12.58	8	Pass

Mode 4 : PSD Plot on 802.11g Channel 01


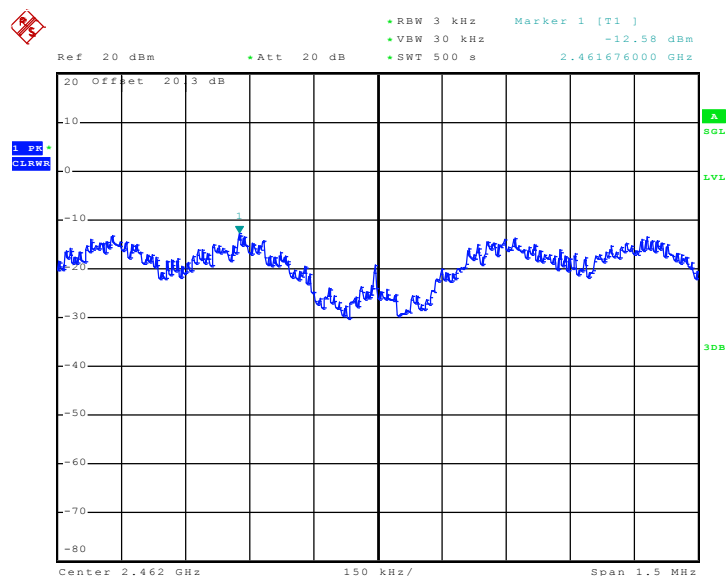
Date: 18.JUN.2010 12:10:56

Mode 5 : PSD Plot on 802.11g Channel 06



Date: 18.JUN.2010 12:00:57

Mode 6 : PSD Plot on 802.11g Channel 11



Date: 18.JUN.2010 11:44:59

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.

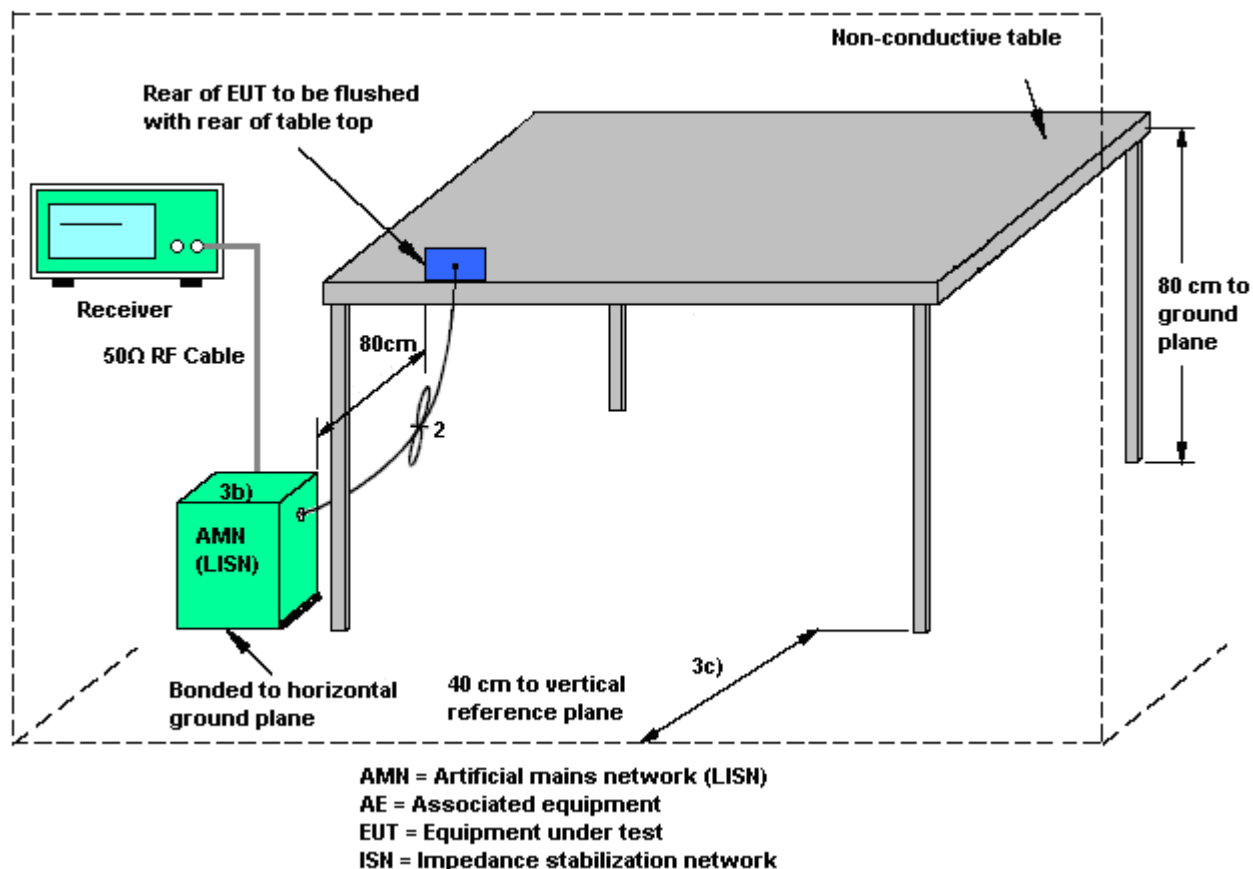
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

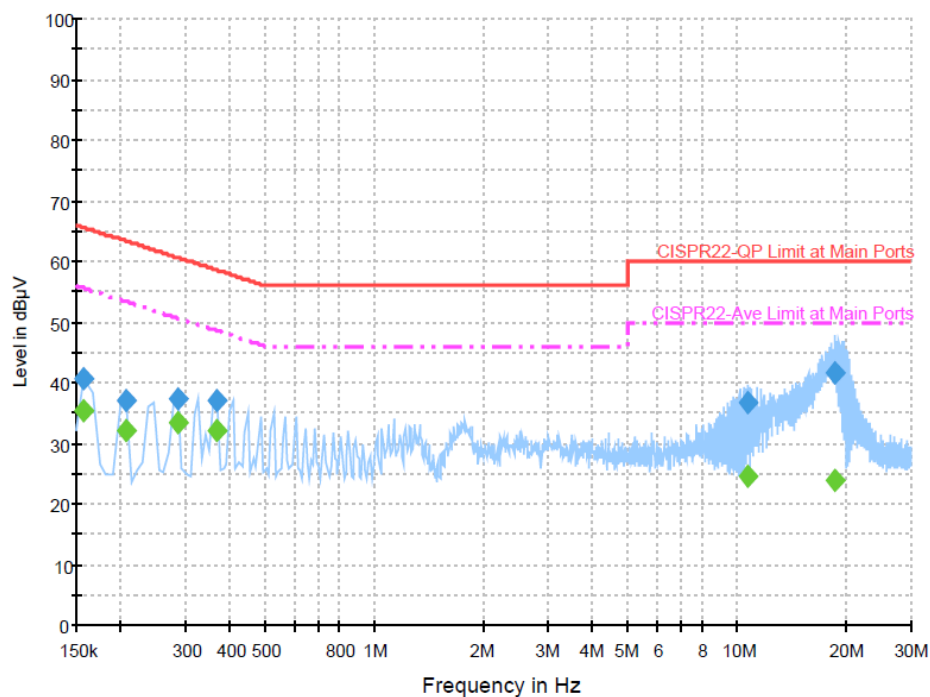
1. The testing follows the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (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 1	Temperature :	20~22°C
Test Engineer :	Novic Jiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Tx + Earphone + Adapter		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



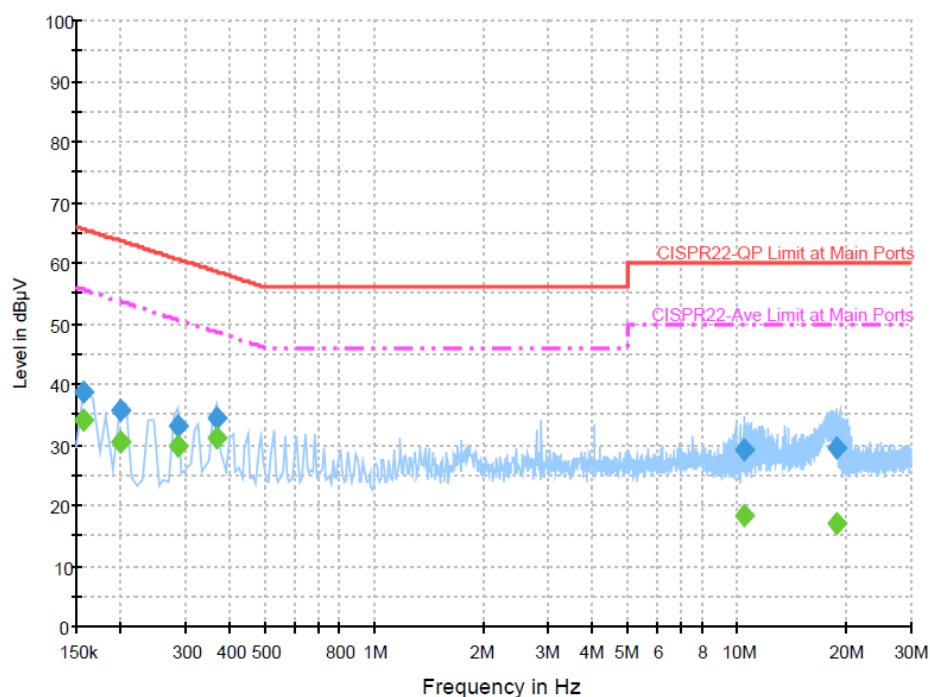
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	40.5	Off	L1	19.3	25.1	65.6
0.206000	37.0	Off	L1	19.3	26.4	63.4
0.286000	37.5	Off	L1	19.3	23.1	60.6
0.366000	37.1	Off	L1	19.3	21.5	58.6
10.646000	36.7	Off	L1	19.6	23.3	60.0
18.598000	41.6	Off	L1	19.8	18.4	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	35.3	Off	L1	19.3	20.3	55.6
0.206000	32.0	Off	L1	19.3	21.4	53.4
0.286000	33.5	Off	L1	19.3	17.1	50.6
0.366000	32.1	Off	L1	19.3	16.5	48.6
10.646000	24.6	Off	L1	19.6	25.4	50.0
18.598000	23.9	Off	L1	19.8	26.1	50.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Novic Jiang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Tx + Earphone + Adapter		
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	38.6	Off	N	19.4	27.0	65.6
0.198000	35.6	Off	N	19.3	28.1	63.7
0.286000	33.1	Off	N	19.3	27.5	60.6
0.366000	34.4	Off	N	19.3	24.2	58.6
10.406000	29.1	Off	N	19.7	30.9	60.0
18.798000	29.6	Off	N	19.8	30.4	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	34.0	Off	N	19.4	21.6	55.6
0.198000	30.6	Off	N	19.3	23.1	53.7
0.286000	30.0	Off	N	19.3	20.6	50.6
0.366000	31.3	Off	N	19.3	17.3	48.6
10.406000	18.4	Off	N	19.7	31.6	50.0
18.798000	17.0	Off	N	19.8	33.0	50.0

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

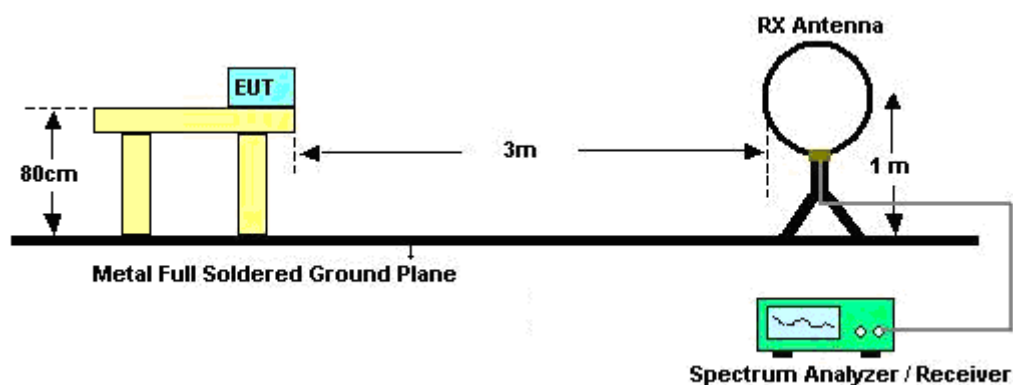
See list of measuring instruments of this test report.

3.7.3 Test Procedures

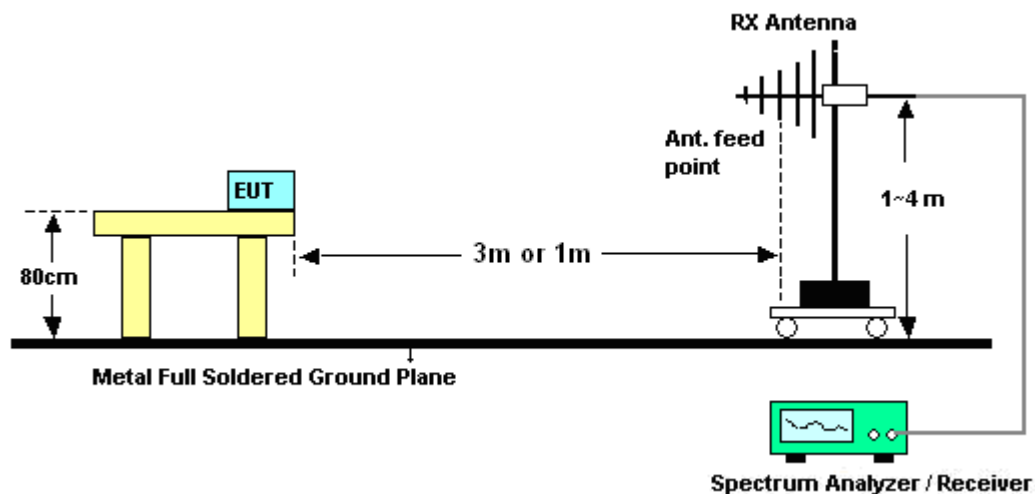
- The testing follows the guidelines in FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
- Use the following spectrum analyzer settings:
 - Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = 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 (9 kHz ~ 30 MHz)

Test Engineer :	Cona Huang	Temperature :	23~25℃	
		Relative Humidity :	44~50%	

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 (30 MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	23~25℃
Test Channel :	01	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.62	35.64	-4.36	40	49.09	17.3	31.54	0.79	120	225	Peak
36.48	31.23	-8.77	40	47.56	14.35	31.52	0.84	-	-	Peak
247.62	32.62	-13.38	46	49.76	12.38	31.53	2.01	-	-	Peak
340.6	28.39	-17.61	46	42.64	14.77	31.3	2.28	-	-	Peak
556.9	32.76	-13.24	46	41.59	19.3	30.94	2.81	-	-	Peak
721.4	33.95	-12.05	46	41.13	20.28	30.64	3.18	-	-	Peak
2385.62	46.89	-27.11	74	55.12	31.86	45.63	5.54	129	28	Peak
2385.62	35.01	-18.99	54	43.24	31.86	45.63	5.54	129	28	Average
2412	95.96	-	-	104.16	31.88	45.65	5.57	129	28	Peak
2412	88.56	-	-	96.76	31.88	45.65	5.57	129	28	Average
2500	42	-32	74	50.09	32	45.75	5.66	129	28	Peak
2500	31.2	-22.8	54	39.29	32	45.75	5.66	129	28	Average
8373	52.66	-21.34	74	50.57	35.72	44.44	10.81	100	154	Peak
8373	39.46	-14.54	54	37.37	35.72	44.44	10.81	100	154	Average

Test Mode :	Mode 1	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.81	35.71	-4.29	40	48.58	17.89	31.55	0.79	100	55	Peak
56.73	35.27	-4.73	40	58.89	6.85	31.54	1.07	-	-	Peak
111.81	35.71	-7.79	43.5	53.24	12.45	31.52	1.54	-	-	Peak
324.5	27.52	-18.48	46	42.18	14.43	31.29	2.2	-	-	Peak
458.9	31.88	-14.12	46	43.17	17.26	31.14	2.59	-	-	Peak
612.9	32.78	-13.22	46	41.33	19.38	30.84	2.91	-	-	Peak
2389.42	34.02	-19.98	54	42.25	31.86	45.63	5.54	160	346	Average
2389.42	45.85	-28.15	74	54.08	31.86	45.63	5.54	160	346	Peak
2412	94.61	-	-	102.81	31.88	45.65	5.57	160	346	Peak
2412	86.88	-	-	95.08	31.88	45.65	5.57	160	346	Average
2494	42.1	-31.9	74	50.19	32	45.75	5.66	160	346	Peak
2494	30.14	-23.86	54	38.23	32	45.75	5.66	160	346	Average
8337	52	-22	74	49.91	35.73	44.43	10.79	100	248	Peak
8337	40.89	-13.11	54	38.8	35.73	44.43	10.79	100	248	Average

Test Mode :	Mode 2	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	22.03	-17.97	40	34.53	18.48	31.56	0.58	-	-	Peak
149.61	28.14	-15.36	43.5	48	10.5	31.5	1.14	-	-	Peak
265.98	37.74	-8.26	46	54.22	13.55	31.45	1.42	100	49	Peak
349	26.82	-19.18	46	41.46	14.96	31.31	1.71	-	-	Peak
624.1	33.95	-12.05	46	43.06	19.46	30.82	2.25	-	-	Peak
724.9	29.53	-16.47	46	37.37	20.34	30.63	2.45	-	-	Peak
2350	54.43	-19.57	74	54.28	31.78	36.07	4.44	103	31	Peak
2350	45.83	-8.17	54	45.68	31.78	36.07	4.44	103	31	Average
2437	105.27	-	-	104.93	31.9	36.09	4.53	103	31	Peak
2437	97.17	-	-	96.8	31.93	36.09	4.53	103	31	Average
2486	45.62	-28.38	74	45.15	31.98	36.1	4.59	103	31	Peak
2486	34.3	-19.7	54	33.83	31.98	36.1	4.59	103	31	Average
8493	53.76	-20.24	74	45.48	35.7	36.7	9.28	100	15	Peak
8493	38.15	-15.85	54	29.87	35.7	36.7	9.28	100	15	Average

Test Mode :	Mode 2	Temperature :	23~25℃
Test Channel :	06	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
70.77	29.76	-10.24	40	54.33	6.1	31.51	0.84	-	-	Peak
149.61	33.12	-10.38	43.5	52.98	10.5	31.5	1.14	-	-	Peak
265.98	27.41	-18.59	46	43.89	13.55	31.45	1.42	-	-	Peak
573.7	32.34	-13.66	46	41.77	19.3	30.91	2.18	-	-	Peak
624.1	36.37	-9.63	46	45.48	19.46	30.82	2.25	100	19	Peak
775.3	26.34	-19.66	46	33.6	20.74	30.54	2.54	-	-	Peak
2348	51.09	-22.91	74	50.94	31.78	36.07	4.44	100	159	Peak
2348	42.27	-11.73	54	42.12	31.78	36.07	4.44	100	159	Average
2437	93.34	-	-	92.97	31.93	36.09	4.53	100	159	Average
2437	101.2	-	-	100.83	31.93	36.09	4.53	100	159	Peak
2486	42.99	-31.01	74	42.52	31.98	36.1	4.59	100	159	Peak
2486	32.22	-21.78	54	31.75	31.98	36.1	4.59	100	159	Average
8265	53.65	-20.35	74	45.55	35.75	36.65	9	100	174	Peak
8265	37.82	-16.18	54	29.72	35.75	36.65	9	100	174	Average

Test Mode :	Mode 3	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	22	-18	40	34.5	18.48	31.56	0.58	-	-	Peak
149.61	28.1	-15.4	43.5	47.96	10.5	31.5	1.14	-	-	Peak
265.98	37.82	-8.18	46	54.3	13.55	31.45	1.42	100	75	Peak
300	25.87	-20.13	46	42.01	13.58	31.27	1.55	-	-	Peak
624.1	34.11	-11.89	46	43.22	19.46	30.82	2.25	-	-	Peak
724.9	30.34	-15.66	46	38.18	20.34	30.63	2.45	-	-	Peak
2374	53.09	-20.91	74	52.86	31.83	36.07	4.47	125	28	Peak
2374	42.11	-11.89	54	41.88	31.83	36.07	4.47	125	28	Average
2462	105.5	-	-	105.08	31.95	36.09	4.56	125	28	Peak
2462	97.88	-	-	97.46	31.95	36.09	4.56	125	28	Average
2487.46	53.09	-20.91	74	52.62	31.98	36.1	4.59	125	28	Peak
2487.46	42.11	-11.89	54	41.64	31.98	36.1	4.59	125	28	Average
8106	53.9	-20.1	74	45.96	35.78	36.62	8.78	100	67	Peak
8106	37.8	-16.2	54	29.86	35.78	36.62	8.78	100	67	Average

Test Mode :	Mode 3	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
70.5	29.84	-10.16	40	54.41	6.1	31.51	0.84	-	-	Peak
149.61	33.06	-10.44	43.5	52.92	10.5	31.5	1.14	-	-	Peak
241.41	27.48	-18.52	46	45.88	11.78	31.52	1.34	-	-	Peak
475	20.15	-25.85	46	31.5	17.78	31.11	1.98	-	-	Peak
649.3	36.88	-9.12	46	45.73	19.62	30.77	2.3	100	117	Peak
775.3	27.5	-18.5	46	34.76	20.74	30.54	2.54	-	-	Peak
2374	48.49	-25.51	74	48.26	31.83	36.07	4.47	158	175	Peak
2374	36.65	-17.35	54	36.42	31.83	36.07	4.47	158	175	Average
2462	93.33	-	-	92.91	31.95	36.09	4.56	158	175	Average
2462	101.68	-	-	101.26	31.95	36.09	4.56	158	175	Peak
2487.46	48.49	-25.51	74	48.02	31.98	36.1	4.59	158	175	Peak
2487.46	36.65	-17.35	54	36.18	31.98	36.1	4.59	158	175	Average
8238	54.05	-19.95	74	45.98	35.75	36.65	8.97	100	197	Peak
8238	38.06	-15.94	54	29.99	35.75	36.65	8.97	100	197	Average

Test Mode :	Mode 4	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.89	36.68	-3.32	40	50.13	17.3	31.54	0.79	100	26	Peak
37.02	32.84	-7.16	40	49.17	14.35	31.52	0.84	-	-	Peak
124.5	32.38	-11.12	43.5	49.72	12.52	31.52	1.66	-	-	Peak
419.7	31.95	-14.05	46	43.38	17.28	31.17	2.46	-	-	Peak
710.2	34.44	-11.56	46	41.81	20.12	30.68	3.19	-	-	Peak
749.4	35.98	-10.02	46	42.65	20.71	30.54	3.16	-	-	Peak
2390	64.23	-9.77	74	72.46	31.86	45.63	5.54	101	31	Peak
2390	44.66	-9.34	54	52.89	31.86	45.63	5.54	101	31	Average
2412	98.1	-	-	106.3	31.88	45.65	5.57	101	31	Peak
2412	88.3	-	-	96.5	31.88	45.65	5.57	101	31	Average
2492	45.3	-28.7	74	53.39	32	45.75	5.66	101	31	Peak
2492	34.43	-19.57	54	42.52	32	45.75	5.66	101	31	Average
8214	52.24	-21.76	74	50.21	35.76	44.39	10.66	100	169	Peak
8214	42.11	-11.89	54	40.08	35.76	44.39	10.66	100	169	Average

Test Mode :	Mode 4	Temperature :	23~25°C
Test Channel :	01	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
31.89	36.88	-3.12	40	50.33	17.3	31.54	0.79	-	-	Peak
55.65	36.94	-3.06	40	60.2	7.19	31.52	1.07	100	54	Peak
111.54	37.51	-5.99	43.5	55.04	12.45	31.52	1.54	-	-	Peak
475	32.6	-13.4	46	43.36	17.78	31.11	2.57	-	-	Peak
624.1	35.56	-10.44	46	43.98	19.46	30.82	2.94	-	-	Peak
772.5	35.73	-10.27	46	42.33	20.73	30.54	3.21	-	-	Peak
2390	62.26	-11.74	74	70.49	31.86	45.63	5.54	159	350	Peak
2390	41.62	-12.38	54	49.85	31.86	45.63	5.54	159	350	Average
2412	97.2	-	-	105.4	31.88	45.65	5.57	159	350	Peak
2412	87.35	-	-	95.55	31.88	45.65	5.57	159	350	Average
2492	45.25	-28.75	74	53.34	32	45.75	5.66	159	350	Peak
2492	33.45	-20.55	54	41.54	32	45.75	5.66	159	350	Average
8223	52.22	-21.78	74	50.2	35.76	44.4	10.66	100	183	Peak
8223	42.16	-11.84	54	40.14	35.76	44.4	10.66	100	183	Average

Test Mode :	Mode 5	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	44~50%
Test Engineer :	Cona Huang	Polarization :	Horizontal
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 9748 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
149.61	28.17	-15.33	43.5	48.03	10.5	31.5	1.14	-	-	Peak
250.05	32.13	-13.87	46	49.56	12.68	31.53	1.42	-	-	Peak
265.98	38.31	-7.69	46	54.79	13.55	31.45	1.42	100	17	Peak
300	31.97	-14.03	46	48.11	13.58	31.27	1.55	-	-	Peak
624.1	34.32	-11.68	46	43.43	19.46	30.82	2.25	-	-	Peak
674.5	30.34	-15.66	46	38.95	19.79	30.75	2.35	-	-	Peak
2356	59.08	-14.92	74	58.9	31.81	36.07	4.44	132	33	Peak
2356	47.24	-6.76	54	47.06	31.81	36.07	4.44	132	33	Average
2437	106.73	-	-	106.39	31.9	36.09	4.53	132	33	Peak
2437	94.26	-	-	93.92	31.9	36.09	4.53	132	33	Average
2484	51.91	-22.09	74	51.44	31.98	36.1	4.59	132	33	Peak
2484	40.37	-13.63	54	39.9	31.98	36.1	4.59	132	33	Average
8217	53.4	-20.6	74	45.36	35.76	36.65	8.93	100	67	Peak
8217	37.51	-16.49	54	29.47	35.76	36.65	8.93	100	67	Average
9748	38.64	-48.09	86.73	75.4	-10.12	37.1	10.46	100	55	Peak

Test Mode :	Mode 5	Temperature :	23~25°C
Test Channel :	06	Relative Humidity :	44~50%
Test Engineer :	Cona Huang	Polarization :	Vertical
Remark :	1. 2437 MHz is Fundamental Signals which can be ignored. 2. 9748 MHz is not within a restricted band.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
70.77	30.03	-9.97	40	54.6	6.1	31.51	0.84	-	-	Peak
149.61	33.13	-10.37	43.5	52.99	10.5	31.5	1.14	-	-	Peak
265.98	28.74	-17.26	46	45.22	13.55	31.45	1.42	-	-	Peak
624.1	31.48	-14.52	46	40.59	19.46	30.82	2.25	-	-	Peak
649.3	36.44	-9.56	46	45.29	19.62	30.77	2.3	100	57	Peak
674.5	30.74	-15.26	46	39.35	19.79	30.75	2.35	-	-	Peak
2348	54.77	-19.23	74	54.62	31.78	36.07	4.44	101	175	Peak
2348	43.09	-10.91	54	42.94	31.78	36.07	4.44	101	175	Average
2437	102.55	-	-	102.21	31.9	36.09	4.53	101	175	Peak
2437	89.89	-	-	89.55	31.9	36.09	4.53	101	175	Average
2484	47.05	-26.95	74	46.58	31.98	36.1	4.59	101	175	Peak
2484	34.6	-19.4	54	34.13	31.98	36.1	4.59	101	175	Average
8205	53.75	-20.25	74	45.73	35.76	36.64	8.9	100	111	Peak
8205	37.9	-16.1	54	29.88	35.76	36.64	8.9	100	111	Average
9748	38.59	-43.96	82.55	75.33	-10.1	37.1	10.46	100	19	Peak

Test Mode :	Mode 6	Temperature :	23~25°C
Test Channel :	11	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30	22.59	-17.41	40	35.09	18.48	31.56	0.58	-	-	Peak
149.61	28.15	-15.35	43.5	48.01	10.5	31.5	1.14	-	-	Peak
265.98	39.29	-6.71	46	55.77	13.55	31.45	1.42	100	58	Peak
300	32.44	-13.56	46	48.58	13.58	31.27	1.55	-	-	Peak
624.1	33.94	-12.06	46	43.05	19.46	30.82	2.25	-	-	Peak
724.9	29.48	-16.52	46	37.32	20.34	30.63	2.45	-	-	Peak
2372	60.34	-13.66	74	60.11	31.83	36.07	4.47	195	34	Peak
2372	48.53	-5.47	54	48.3	31.83	36.07	4.47	195	34	Average
2462	106.66	-	-	106.24	31.95	36.09	4.56	195	34	Peak
2462	93.14	-	-	92.72	31.95	36.09	4.56	195	34	Average
2483.5	48.19	-5.81	54	47.72	31.98	36.1	4.59	195	34	Average
2483.5	69.66	-4.34	74	69.19	31.98	36.1	4.59	195	34	Peak
8169	53.69	-20.31	74	45.68	35.77	36.63	8.87	100	37	Peak
8169	37.86	-16.14	54	29.85	35.77	36.63	8.87	100	37	Average

Test Mode :	Mode 6	Temperature :	23~25℃
Test Channel :	11	Relative Humidity :	44~50%
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)	Preamp Factor (dB)	Cable Loss (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
70.5	29.87	-10.13	40	54.44	6.1	31.51	0.84	-	-	Peak
149.61	32.98	-10.52	43.5	52.84	10.5	31.5	1.14	-	-	Peak
201.18	29.3	-14.2	43.5	49.89	9.6	31.45	1.26	-	-	Peak
573.7	32.81	-13.19	46	42.24	19.3	30.91	2.18	-	-	Peak
624.1	36.24	-9.76	46	45.35	19.46	30.82	2.25	100	174	Peak
674.5	33.61	-12.39	46	42.22	19.79	30.75	2.35	-	-	Peak
2374	53.98	-20.02	74	53.75	31.83	36.07	4.47	132	173	Peak
2374	41.96	-12.04	54	41.73	31.83	36.07	4.47	132	173	Average
2462	88.12	-	-	87.7	31.95	36.09	4.56	132	173	Average
2462	101.16	-	-	100.74	31.95	36.09	4.56	132	173	Peak
2483.66	62.48	-11.52	74	62.01	31.98	36.1	4.59	132	173	Peak
2483.66	42.82	-11.18	54	42.35	31.98	36.1	4.59	132	173	Average
8070	53.92	-20.08	74	46	35.79	36.61	8.74	100	44	Peak
8070	37.7	-16.3	54	29.78	35.79	36.61	8.74	100	44	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)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 20, 2009	Oct. 19, 2010	Radiation (03CH05-HY)
Amplifier	COM-POWER	PA-103	161069	1KHz - 1GHz	Mar. 29, 2010	Mar. 28, 2011	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2727C	30 MHz - 1 GHz	Aug. 12, 2009	Aug. 11, 2010	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 14, 2009	Oct. 13, 2010	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Nov. 11, 2009	Nov. 10, 2010	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 - 360 degree	N/A	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m - 4 m	N/A	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	00066584	1GHz ~ 18GHz	Aug. 05, 2009	Aug. 04, 2010	Radiation (03CH05-HY)
Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Nov. 02, 2009	Nov. 01, 2010	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

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

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

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

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

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

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



Appendix A. Photographs of EUT

Please refer to Sporton report number EP050749 as below.