

FCC RF Test Report

APPLICANT : Advantech Co., Ltd.
EQUIPMENT : HandHeld Terminal
BRAND NAME : Advantech
MODEL NAME : PWS-430
FCC ID : M82-PWS-430
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Jun. 06, 2012 and completely tested on Jun. 17, 2012. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

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

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR260605B	Rev. 01	Initial issue of report	Oct. 04, 2012

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	-
3.2	15.247(b)	A8.4	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	A8.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	-
			Conducted Spurious Emission		Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges	15.209(a) & 15.247(d)	Pass	-
			Radiated Spurious Emission		Pass	Under limit 3.49 dB at 42.420 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 11.70 dB at 4.598 MHz
3.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Advantech Co., Ltd.

No. 1, Alley 20, Lane 26, Rueiguang Road, NeiHu District, Taipei 114, R.O.C.

1.2 Manufacturer

Advantech Co., Ltd.

No. 1, Alley 20, Lane 26, Rueiguang Road, NeiHu District, Taipei 114, R.O.C.

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	HandHeld Terminal
Brand Name	Advantech
Model Name	PWS-430
FCC ID	M82-PWS-430
EUT supports Radios application	WLAN 11bg / Bluetooth
HW Version	A101
SW Version	v307
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2412 MHz ~ 2462 MHz
Number of Channels	11
Carrier Frequency of Each Channel	$2412+(n-1)*5$ MHz; $n=1\sim11$
Maximum Output Power to Antenna	802.11b : 14.47 dBm (0.0280 W) 802.11g : 17.55 dBm (0.0569 W)
Antenna Type	Fixed Internal Antenna with gain 2.00 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g : OFDM (BPSK / QPSK / 16QAM / 64QAM)

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.
	TH02-HY	CO05-HY	03CH05-HY	722060/4086B-1

1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01
- ♦ FCC TCB Workshop 2012, April
- ♦ ANSI C63.4-2003 and ANSI C63.10-2009
- ♦ IC RSS-210 Issue 8
- ♦ IC RSS-Gen Issue 3

Remark:

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

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	P20G	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 Mobile Phone	Sony Ericsson	W595	PY7A3052191	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 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate as below table and the highest power data rates (11b, 11g modes) were chosen for full test in the following sections to demonstrate compliance to the FCC limit line.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	14.47	14.41	14.07	14.28

2.4GHz 802.11g mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	17.55	17.42	17.38	16.89	17.52	17.49	17.26	17.29

2.3 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and ANSI C63.10-2009 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 KHz to 30 MHz), radiated emission (30 MHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

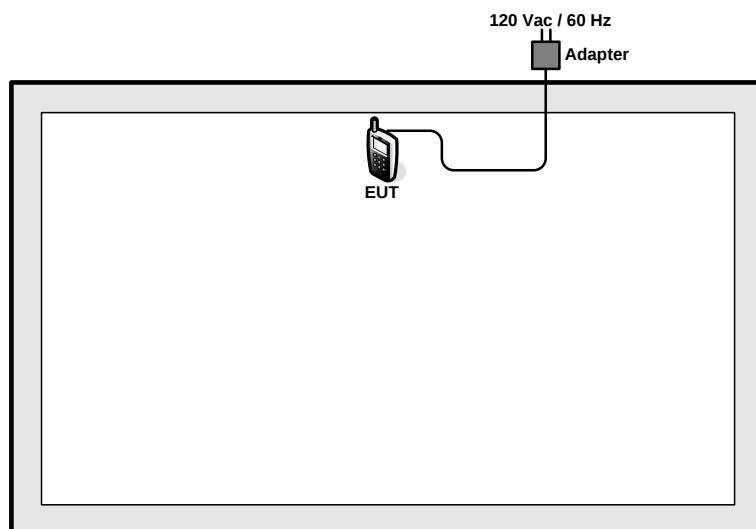
Pre-scanned tests, X, Y, Z in three orthogonal panels, were conducted to determine the final configuration from all possible combinations.

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

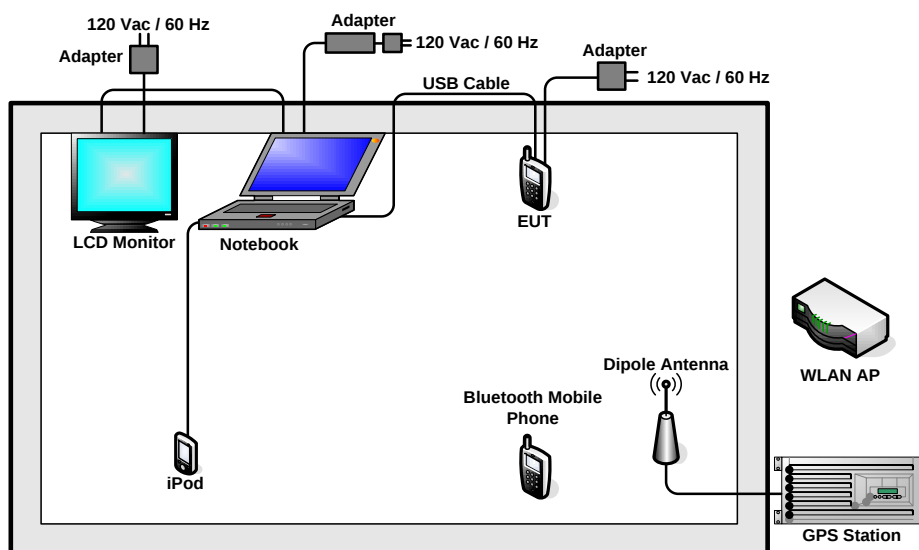
Test Cases			
Test Item	802.11b (Modulation : DSSS)		
	802.11g (Modulation : OFDM)		
Conducted TCs	Test Mode	802.11b	802.11g
	CH01	1	4
	CH06	2	5
	CH11	3	6
Radiated TCs	Test Mode	802.11b	802.11g
	CH01	1	4
	CH06	2	5
	CH11	3	6
AC Conducted Emission	Mode 1 :Bluetooth Link + WLAN Link + GPS Rx + Cradle + Battery + USB Cable (Data Link with Notebook) + Adapter 1		
	Mode 2 :Bluetooth Link + WLAN Link + GPS Rx + Cradle + Battery + USB Cable (Data Link with Notebook) + Adapter 2		
Remark:			
1. The worst case of conducted emission is mode 2; only the test data of it was reported.			
2. Link with Notebook means data application transferred mode between EUT and Notebook.			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 RF Utility

For WLAN function, execute “Command” to make the EUT contact with WLAN AP for continuous transmitting and receiving signals.

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.

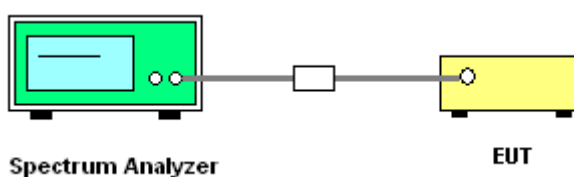
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 1-5% of the emission bandwidth (EBW). Set the Video bandwidth (VBW) $\geq 3 * RBW$. In order to make an accurate measurement. 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

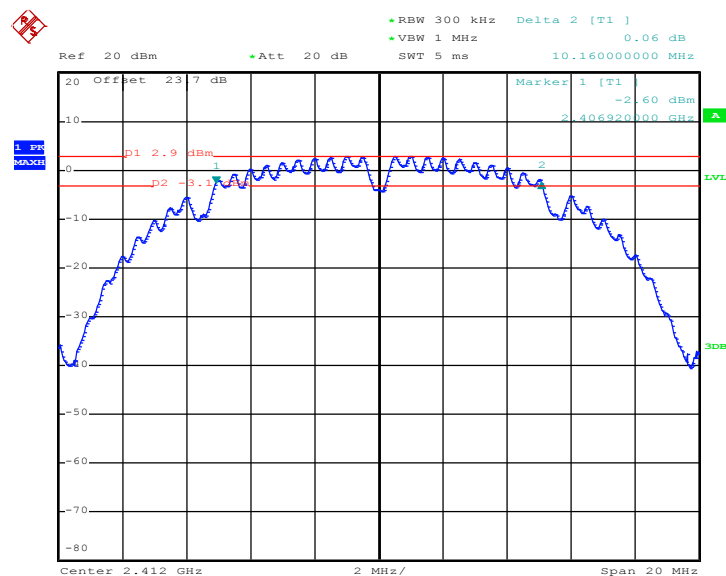


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

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

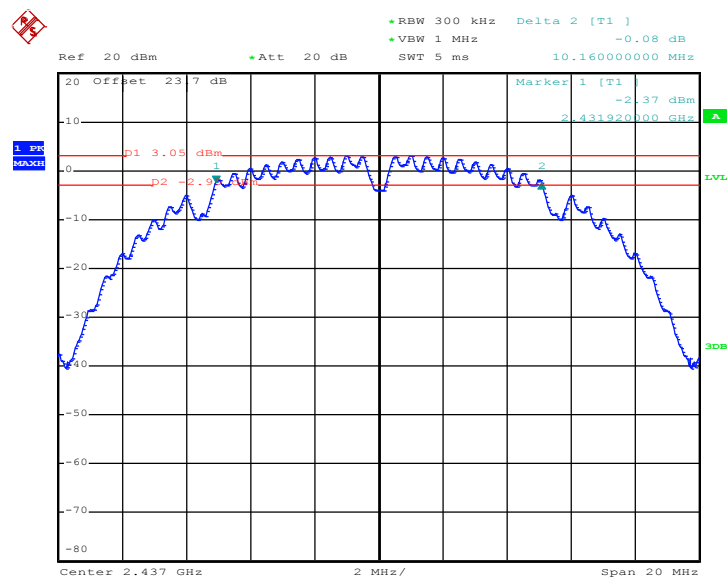
6 dB Bandwidth Plot on 802.11b Channel 01



Date: 17.JUN.2012 13:03:50

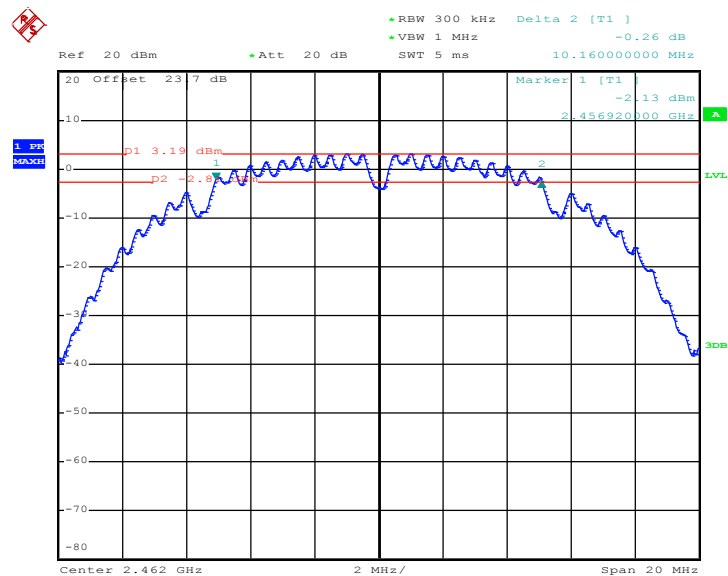


6 dB Bandwidth Plot on 802.11b Channel 06



Date: 17.JUN.2012 13:07:18

6 dB Bandwidth Plot on 802.11b Channel 11

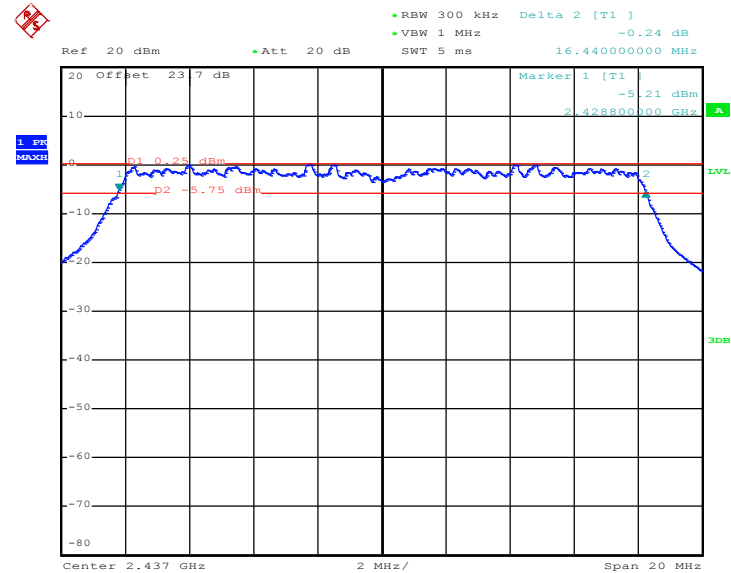


Date: 17.JUN.2012 13:10:01

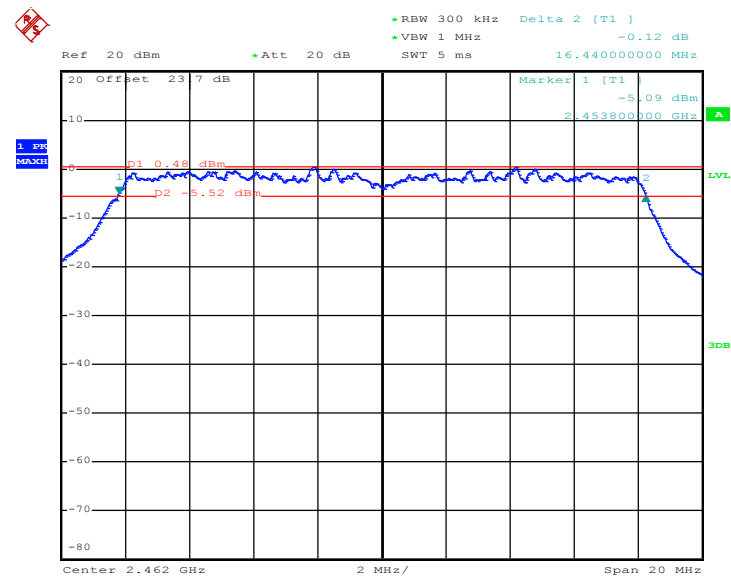


Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.44	0.5	Pass
06	2437	16.44	0.5	Pass
11	2462	16.44	0.5	Pass



6 dB Bandwidth Plot on 802.11g Channel 06


Date: 17.JUN.2012 13:16:45

6 dB Bandwidth Plot on 802.11g Channel 11


Date: 17.JUN.2012 13:13:56

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.

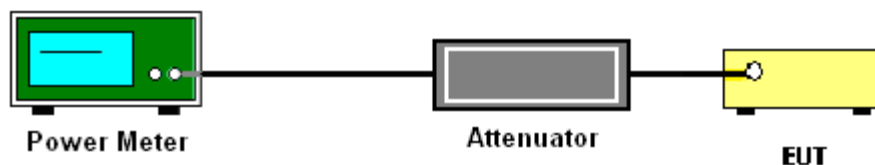
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance and TCB Workshop 2012, April.
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 Peak Output Power

Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	14.44	30	Pass
06	2437	14.23	30	Pass
11	2462	14.47	30	Pass

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	17.55	30	Pass
06	2437	17.15	30	Pass
11	2462	16.51	30	Pass

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	24~26
Test Engineer :	Bill Kuo	Relative Humidity :	50~53
Duty Cycle:	100.00%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	11.88
06	2437	11.63
11	2462	12.09

Test Mode :	802.11g	Temperature :	24~26
Test Engineer :	Bill Kuo	Relative Humidity :	50~53
Duty Cycle:	100.00%	Duty Factor:	0.00dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	8.59
06	2437	8.53
11	2462	8.39

3.3 Power Spectral Density Measurement

3.3.1 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.

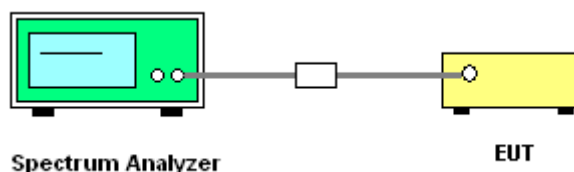
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 5.3.1 (Peak PSD) of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Record the measurement data derived from spectrum analyzer.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW) $\geq$ 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3\text{ kHz}/100\text{ kHz}) = -15.2\text{ dB}$.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

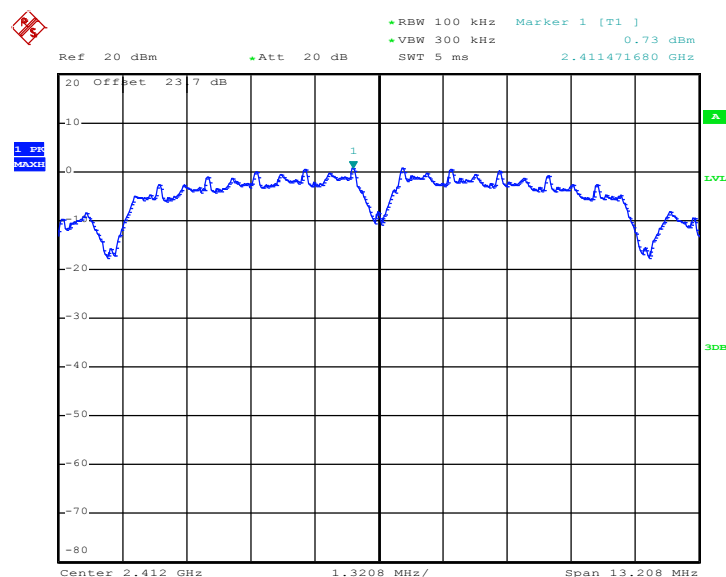
Test Mode :	802.11b	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	0.73	-14.47	8	Pass
06	2437	0.95	-14.25	8	Pass
11	2462	1.07	-14.13	8	Pass

Note:

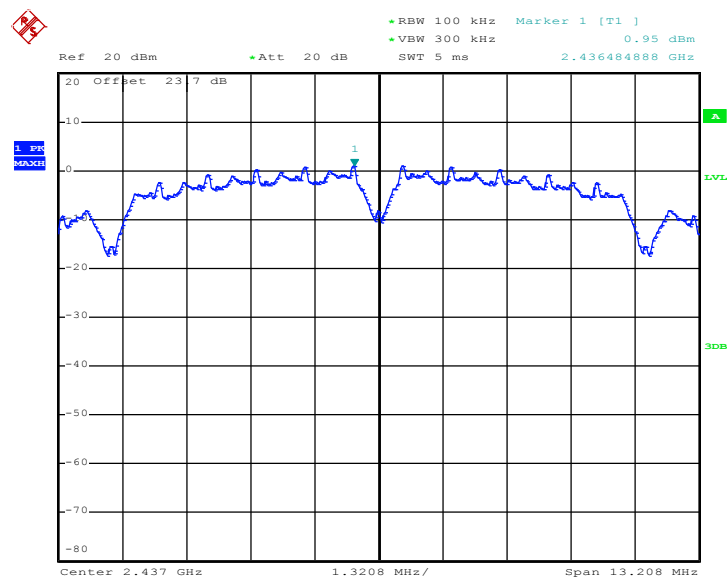
1. Measured power density (dBm) has offset with cable loss.
2. $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3. $\text{Power Density/ 3kHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

PSD Plot on 802.11b Channel 01



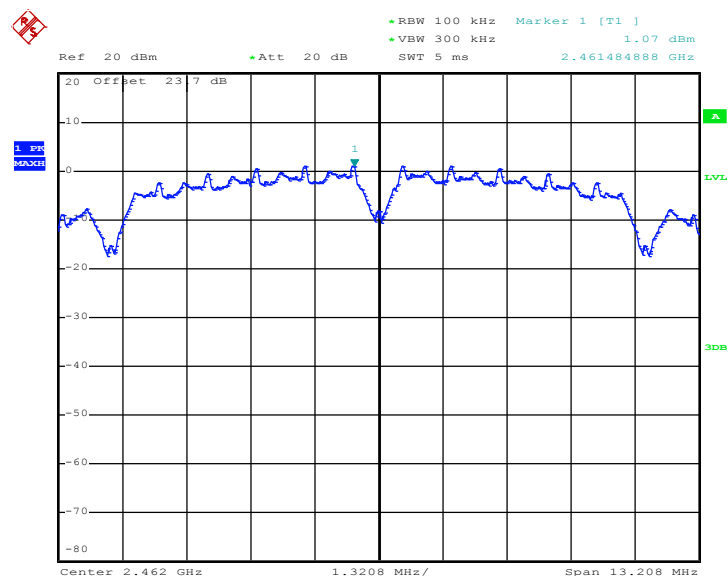
Date: 17.JUN.2012 13:04:09

PSD Plot on 802.11b Channel 06



Date: 17.JUN.2012 13:07:37

PSD Plot on 802.11b Channel 11



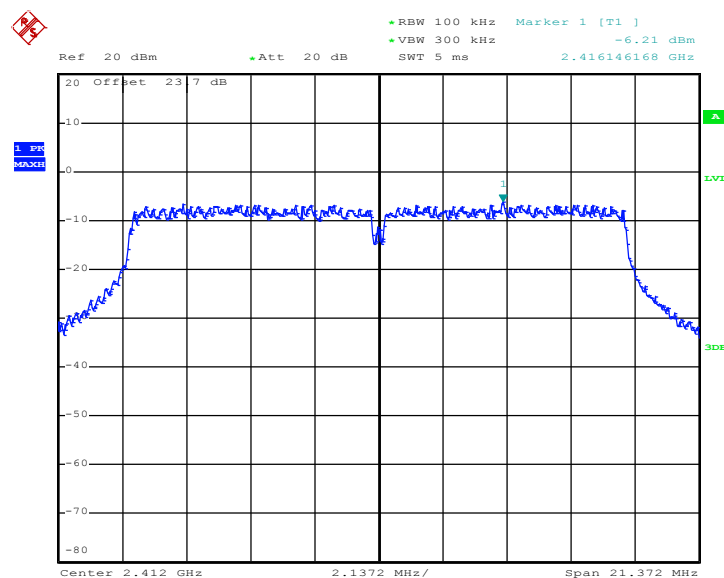
Date: 17.JUN.2012 13:10:21

Test Mode :	802.11g	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-6.21	-21.41	8	Pass
06	2437	-6.10	-21.30	8	Pass
11	2462	-6.03	-21.23	8	Pass

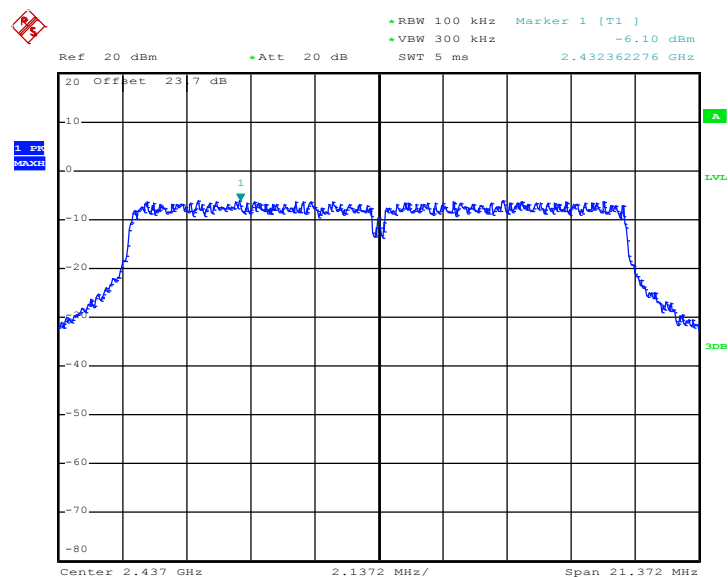
Note:

1. Measured power density (dBm) has offset with cable loss.
2. $BWCF (dB) = 10 \log (3k/100k) = -15.2 \text{ dB}$
3. $\text{Power Density/ 3KHz (dBm)} = \text{Measured power density/ 100KHz (dBm)} + BWCF (dB)$

PSD Plot on 802.11g Channel 01


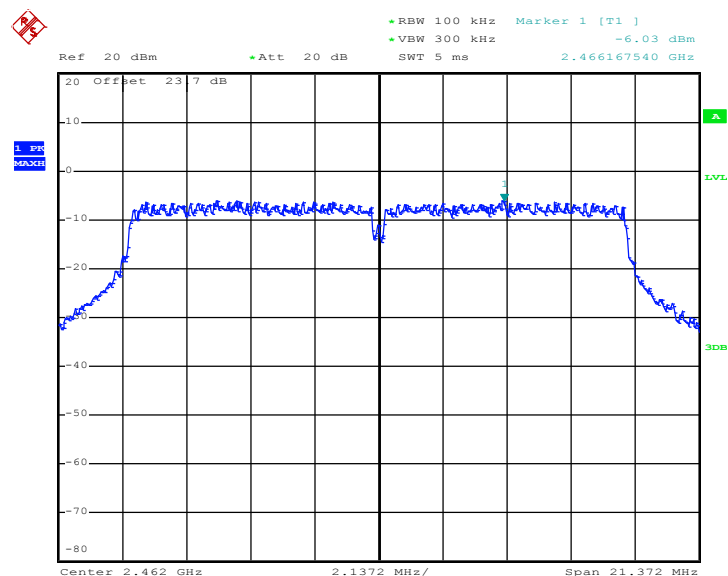
Date: 17.JUN.2012 13:19:26

PSD Plot on 802.11g Channel 06



Date: 17.JUN.2012 13:17:04

PSD Plot on 802.11g Channel 11



Date: 17.JUN.2012 13:14:14

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

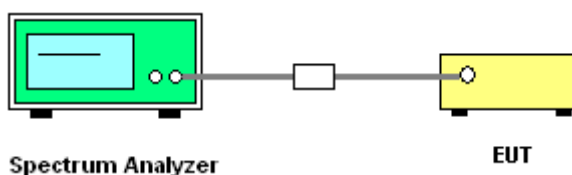
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows the guidelines in the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance and TCB Workshop 2012, April.
2. Set RBW = 100 KHz, VBW=300 KHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz, when maximum peak conducted output power procedure is used. The attenuation is set to 30dB, when maximum conducted output power procedure is used.

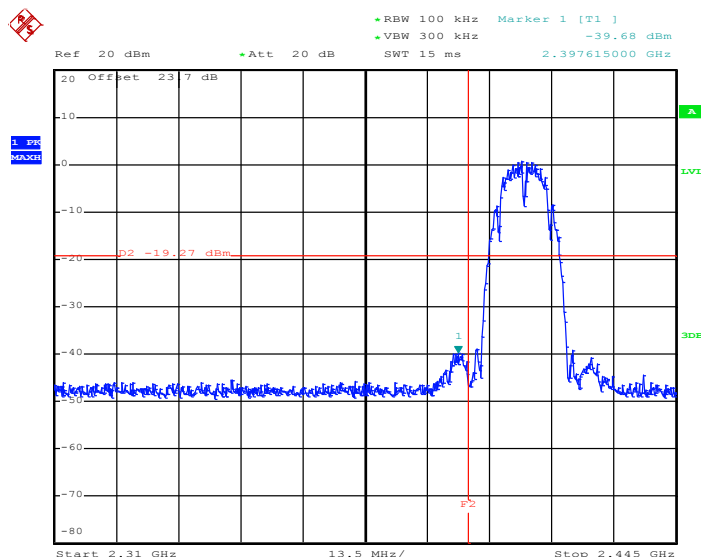
3.4.4 Test Setup



3.4.5 Test Plots of Conducted Band Edges

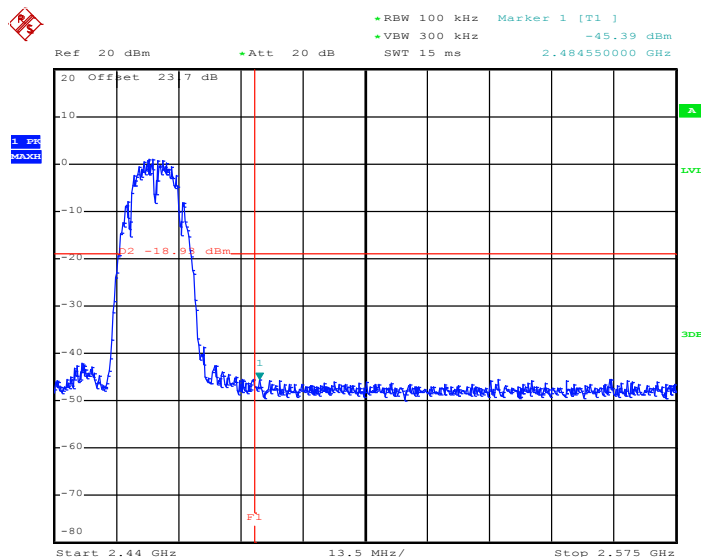
Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

Low Band Edge Plot on 802.11b Channel 01



Date: 17.JUN.2012 13:04:23

High Band Edge Plot on 802.11b Channel 11



Date: 17.JUN.2012 13:10:35



Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

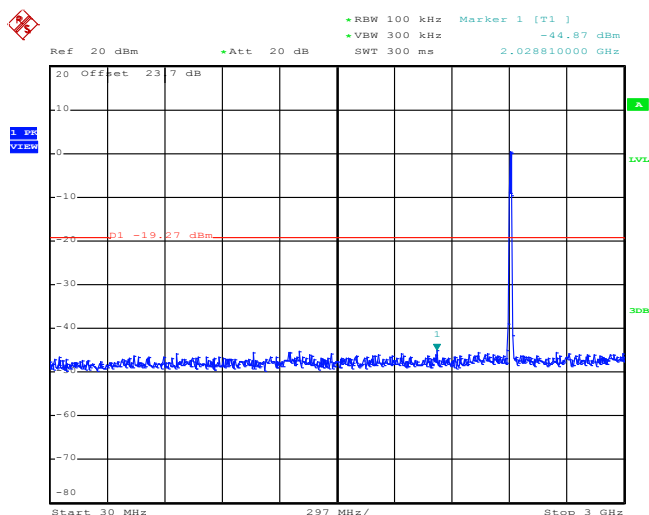


3.4.6 Test Plots of Spurious Emission

Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Bill Kuo

802.11b 30 MHz~3 GHz

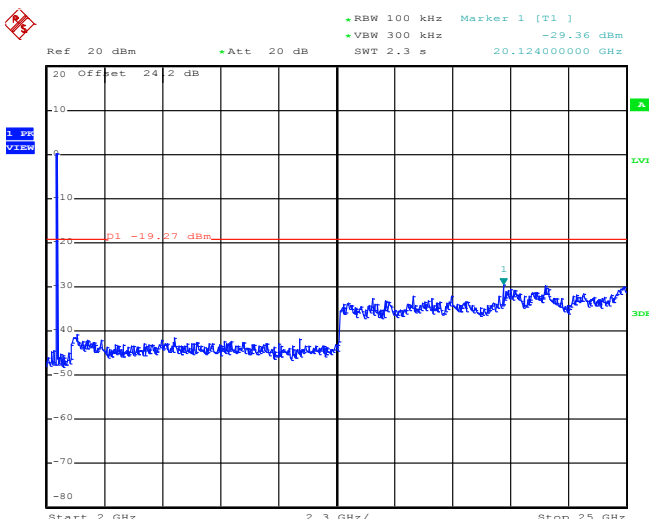
Conducted Spurious Emission Plot on Channel 01



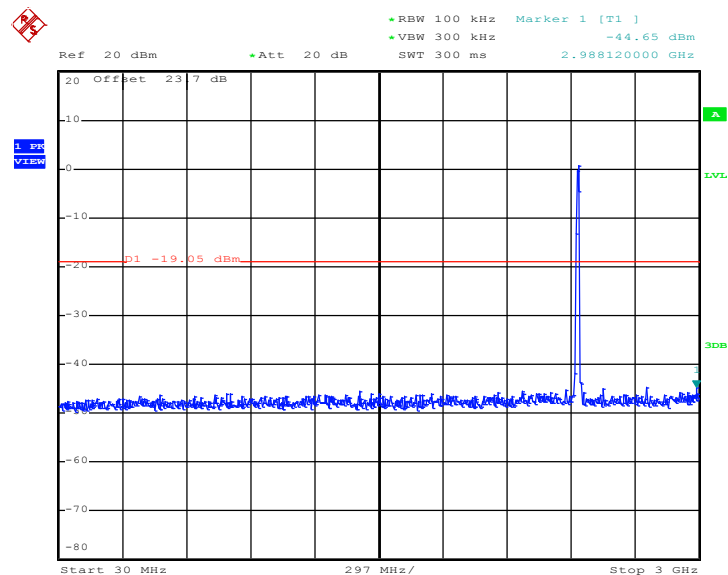
Date: 17.JUN.2012 13:04:58

802.11b 2 GHz~25 GHz

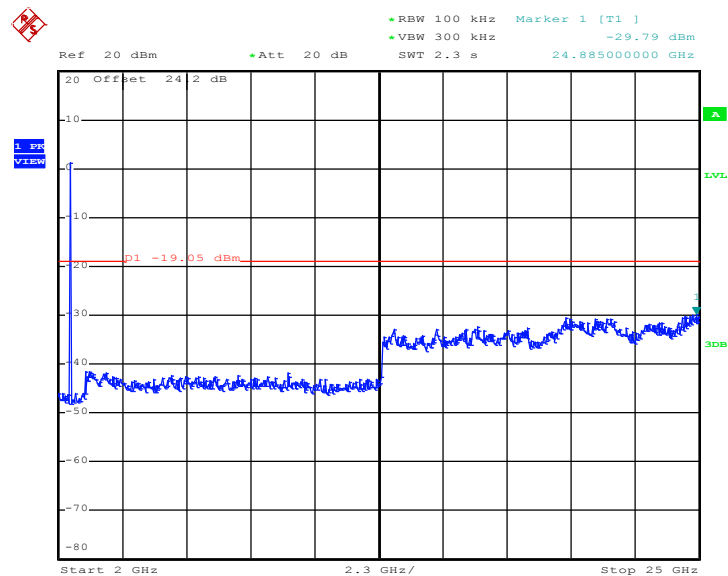
Conducted Spurious Emission Plot on Channel 01



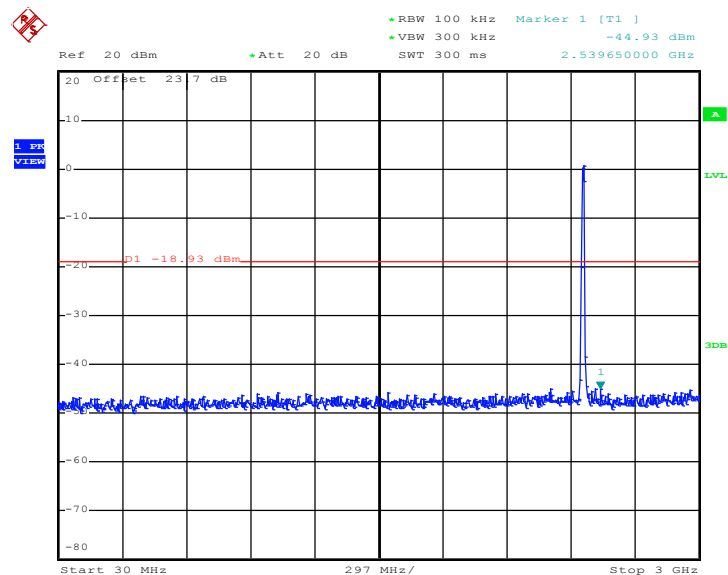
Date: 17.JUN.2012 13:05:16

802.11b 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


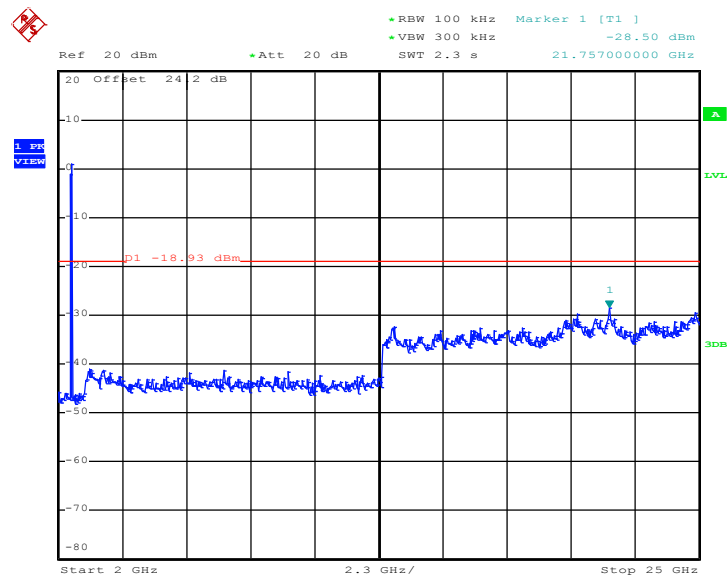
Date: 17.JUN.2012 13:07:57

802.11b 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 17.JUN.2012 13:08:15

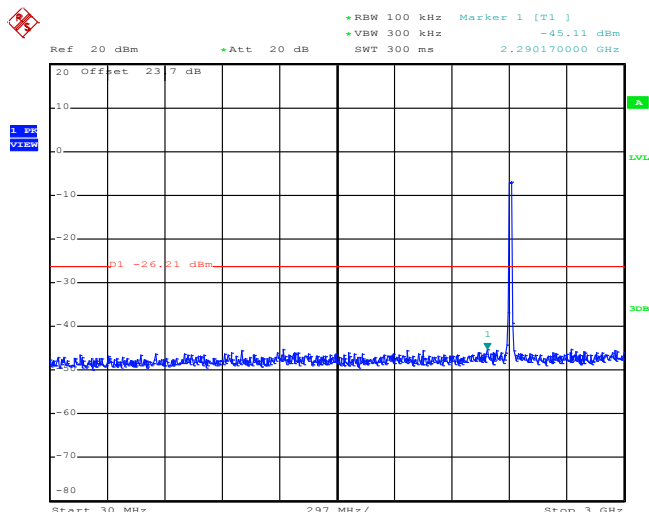
802.11b 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 17.JUN.2012 13:10:57

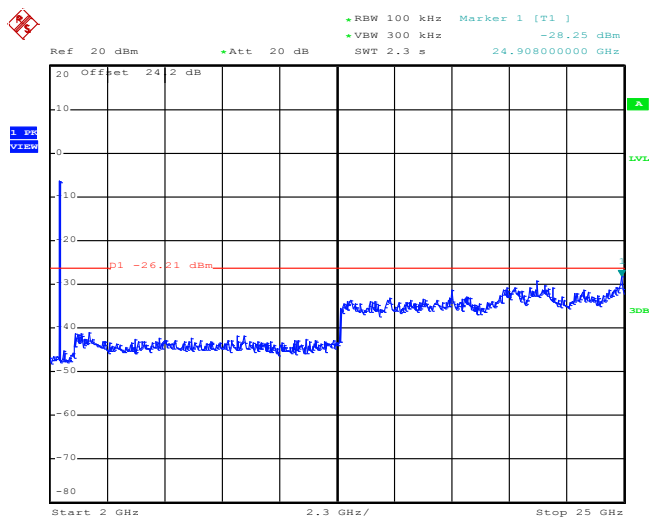
802.11b 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 17.JUN.2012 13:11:14

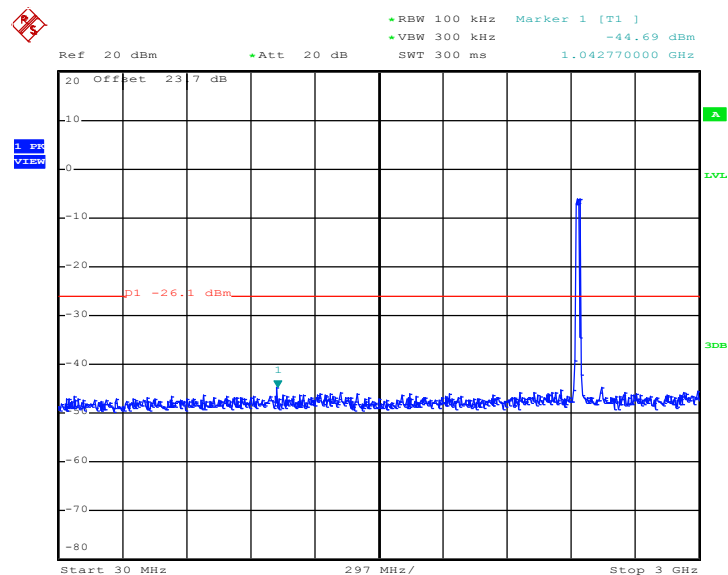
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Bill Kuo

802.11g 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 01


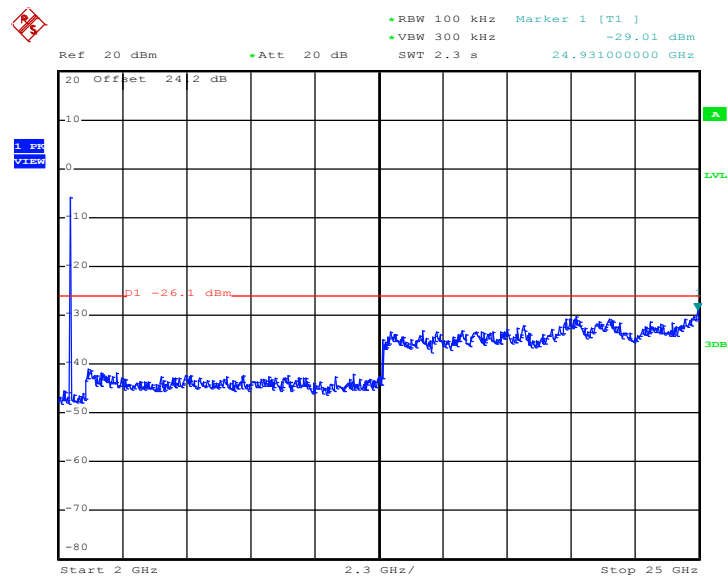
Date: 17.JUN.2012 13:19:59

802.11g 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 01


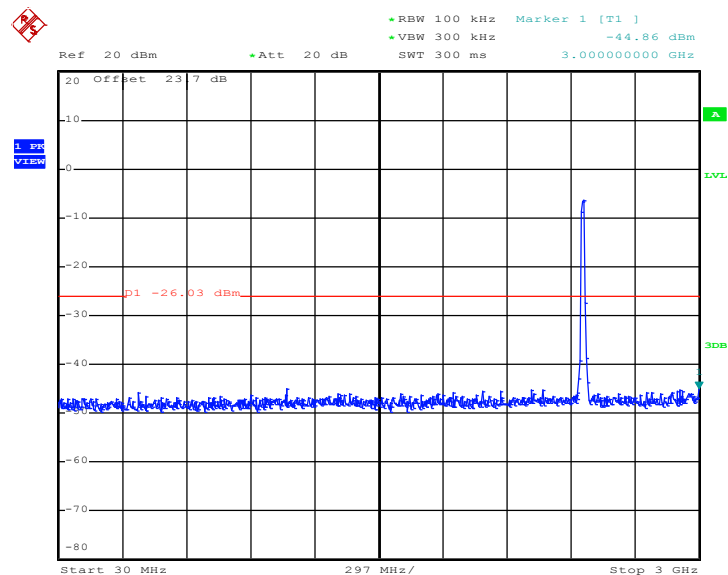
Date: 17.JUN.2012 13:20:16

802.11g 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


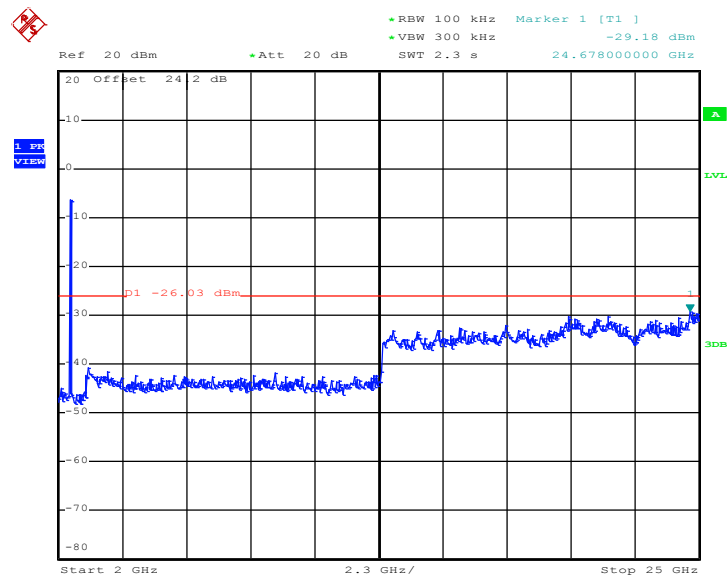
Date: 17.JUN.2012 13:17:24

802.11g 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


Date: 17.JUN.2012 13:17:41

802.11g 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 17.JUN.2012 13:14:51

802.11g 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


Date: 17.JUN.2012 13:15:09

3.5 Radiated Emission Measurement

3.5.1 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

3.5.2 Measuring Instruments

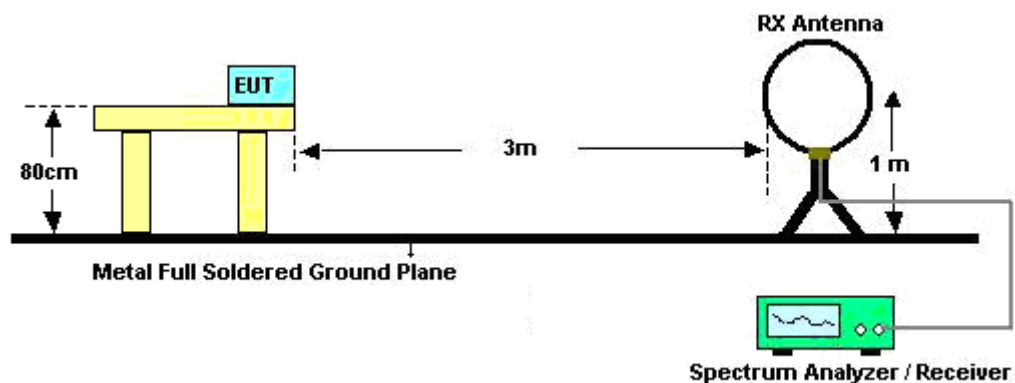
See list of measuring instruments of this test report.

3.5.3 Test Procedures

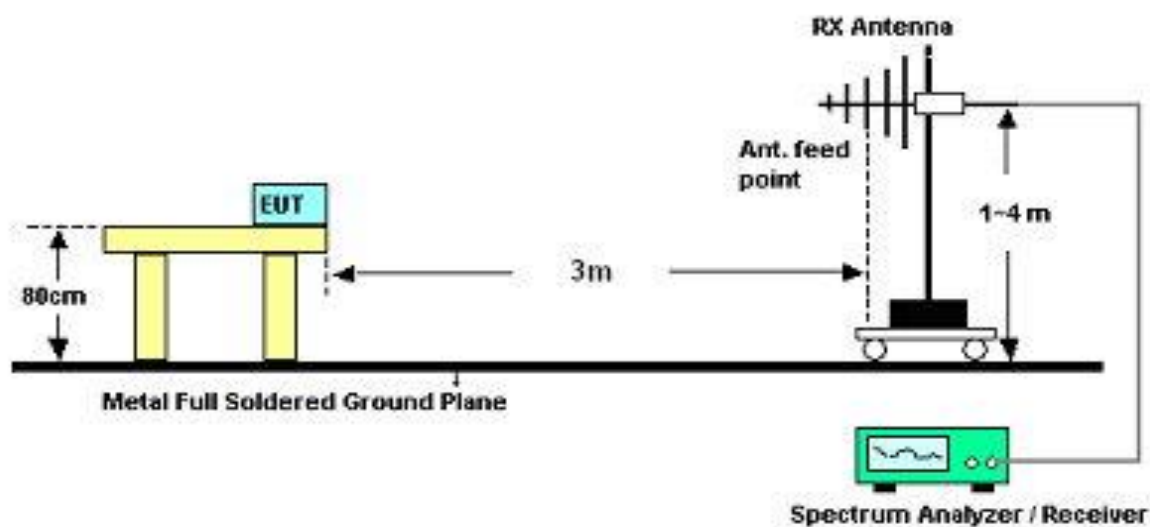
1. The testing follows TCB Workshop 2012, April and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving Antenna, which was mounted on the top of a variable height Antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest radiation.
5. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set 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;
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. If the emission level of the EUT measured by the peak detector is more than 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported

3.5.4 Test Setup

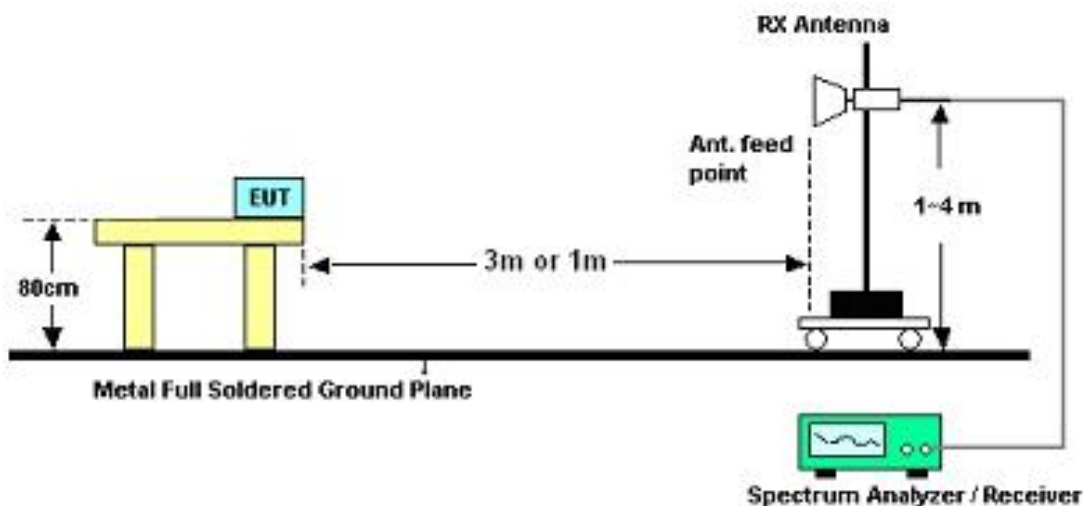
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Band Edges

Test Mode :	802.11b	Temperature :	22~23℃
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Hayden Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2370.48	51.19	-22.81	74	50.5	32	4.57	35.88	106	178	Peak
2370.48	36.74	-17.26	54	36.05	32	4.57	35.88	106	178	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2350.14	48.01	-25.99	74	47.37	31.98	4.55	35.89	188	267	Peak
2350.14	34.98	-19.02	54	34.34	31.98	4.55	35.89	188	267	Average

Test Mode :	802.11b	Temperature :	22~23℃
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Hayden Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2488.94	52.54	-21.46	74	51.61	32.1	4.64	35.81	128	177	Peak
2488.94	38.5	-15.5	54	37.57	32.1	4.64	35.81	128	177	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.46	48.56	-25.44	74	47.64	32.09	4.64	35.81	183	248	Peak
2484.46	34.96	-19.04	54	34.04	32.09	4.64	35.81	183	248	Average



Test Mode :	802.11g	Temperature :	22~23℃
Test Band :	Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Hayden Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.2	58.26	-15.74	74	57.54	32.02	4.58	35.88	106	177	Peak
2389.2	40.16	-13.84	54	39.44	32.02	4.58	35.88	106	177	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.02	50	-24	74	49.28	32.02	4.58	35.88	188	267	Peak
2389.02	35.52	-18.48	54	34.8	32.02	4.58	35.88	188	267	Average

Test Mode :	802.11g	Temperature :	22~23℃
Test Band :	High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Hayden Wu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.7	62.02	-11.98	74	61.1	32.09	4.64	35.81	104	169	Peak
2483.7	41.98	-12.02	54	41.06	32.09	4.64	35.81	104	169	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.68	53.31	-20.69	74	52.39	32.09	4.64	35.81	156	241	Peak
2483.68	37.01	-16.99	54	36.09	32.09	4.64	35.81	156	241	Average

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

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2370.48	36.74	-17.26	54	36.05	32	4.57	35.88	106	178	Average
2370.48	51.19	-22.81	74	50.5	32	4.57	35.88	106	178	Peak
2412	93.76	-	-	93	32.03	4.59	35.86	106	178	Average
2412	98.3	-	-	97.54	32.03	4.59	35.86	106	178	Peak
2498	35.73	-18.27	54	34.79	32.1	4.64	35.8	106	178	Average
2498	48.09	-25.91	74	47.15	32.1	4.64	35.8	106	178	Peak
4824	43.86	-30.14	74	62.54	33.83	6.51	59.02	100	0	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2350.14	34.98	-19.02	54	34.34	31.98	4.55	35.89	188	267	Average
2350.14	48.01	-25.99	74	47.37	31.98	4.55	35.89	188	267	Peak
2412	84.86	-	-	84.1	32.03	4.59	35.86	188	267	Average
2412	89.54	-	-	88.78	32.03	4.59	35.86	188	267	Peak
2500	34.74	-19.26	54	33.8	32.1	4.64	35.8	188	267	Average
2500	46.64	-27.36	74	45.7	32.1	4.64	35.8	188	267	Peak

Test Mode :	802.11b	Temperature :	22~23℃
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2310	35.39	-18.61	54	34.83	31.95	4.53	35.92	160	171	Average
2310	47.65	-26.35	74	47.09	31.95	4.53	35.92	160	171	Peak
2437	93.44	-	-	92.61	32.06	4.61	35.84	160	171	Average
2437	98.07	-	-	97.26	32.04	4.61	35.84	160	171	Peak
2484	35.88	-18.12	54	34.96	32.09	4.64	35.81	160	171	Average
2484	48.74	-25.26	74	47.82	32.09	4.64	35.81	160	171	Peak
4874	42.9	-31.1	74	61.43	33.82	6.53	58.88	100	0	Peak

Test Mode :	802.11b	Temperature :	22~23℃
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2344	34.94	-19.06	54	34.3	31.98	4.55	35.89	195	278	Average
2344	47.25	-26.75	74	46.61	31.98	4.55	35.89	195	278	Peak
2437	84.09	-	-	83.26	32.06	4.61	35.84	195	278	Average
2437	88.73	-	-	87.92	32.04	4.61	35.84	195	278	Peak
2488	34.74	-19.26	54	33.81	32.1	4.64	35.81	195	278	Average
2488	47.49	-26.51	74	46.56	32.1	4.64	35.81	195	278	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386	35.5	-18.5	54	34.78	32.02	4.58	35.88	128	177	Average
2386	48.14	-25.86	74	47.42	32.02	4.58	35.88	128	177	Peak
2462	93.48	-	-	92.62	32.07	4.62	35.83	128	177	Average
2462	98.23	-	-	97.37	32.07	4.62	35.83	128	177	Peak
2488.94	38.5	-15.5	54	37.57	32.1	4.64	35.81	128	177	Average
2488.94	52.54	-21.46	74	51.61	32.1	4.64	35.81	128	177	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2348	34.87	-19.13	54	34.23	31.98	4.55	35.89	183	248	Average
2348	47.83	-26.17	74	47.19	31.98	4.55	35.89	183	248	Peak
2462	83.81	-	-	82.95	32.07	4.62	35.83	183	248	Average
2462	88.9	-	-	88.04	32.07	4.62	35.83	183	248	Peak
2484.46	34.96	-19.04	54	34.04	32.09	4.64	35.81	183	248	Average
2484.46	48.56	-25.44	74	47.64	32.09	4.64	35.81	183	248	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Horizontal
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.2	40.16	-13.84	54	39.44	32.02	4.58	35.88	106	177	Average
2389.2	58.26	-15.74	74	57.54	32.02	4.58	35.88	106	177	Peak
2412	86.43	-	-	85.67	32.03	4.59	35.86	106	177	Average
2412	97.36	-	-	96.6	32.03	4.59	35.86	106	177	Peak
2486	35.74	-18.26	54	34.82	32.09	4.64	35.81	106	177	Average
2486	48.05	-25.95	74	47.13	32.09	4.64	35.81	106	177	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Vertical
Remark :	2412 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.02	35.52	-18.48	54	34.8	32.02	4.58	35.88	188	267	Average
2389.02	50	-24	74	49.28	32.02	4.58	35.88	188	267	Peak
2412	77.44	-	-	76.68	32.03	4.59	35.86	188	267	Average
2412	88.21	-	-	87.45	32.03	4.59	35.86	188	267	Peak
2490	34.63	-19.37	54	33.7	32.1	4.64	35.81	188	267	Average
2490	46.59	-27.41	74	45.66	32.1	4.64	35.81	188	267	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Horizontal
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	35.74	-18.26	54	35	32.02	4.58	35.86	104	182	Average
2390	47.99	-26.01	74	47.25	32.02	4.58	35.86	104	182	Peak
2437	86.83	-	-	86	32.06	4.61	35.84	104	182	Average
2437	97.38	-	-	96.54	32.06	4.61	35.83	104	182	Peak
2496	36.12	-17.88	54	35.18	32.1	4.64	35.8	104	182	Average
2496	49.06	-24.94	74	48.12	32.1	4.64	35.8	104	182	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Vertical
Remark :	2437 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	34.98	-19.02	54	34.24	32.02	4.58	35.86	185	255	Average
2390	47.34	-26.66	74	46.6	32.02	4.58	35.86	185	255	Peak
2437	77.49	-	-	76.66	32.06	4.61	35.84	185	255	Average
2437	88.29	-	-	87.46	32.06	4.61	35.84	185	255	Peak
2486	34.8	-19.2	54	33.88	32.09	4.64	35.81	185	255	Average
2486	46.34	-27.66	74	45.42	32.09	4.64	35.81	185	255	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Horizontal
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
144.21	34.34	-9.16	43.5	53.2	11.13	1.27	31.26	111	221	Peak
214.41	33.56	-9.94	43.5	53.89	9.24	1.52	31.09	-	-	Peak
253.56	34.43	-11.57	46	50.7	12.99	1.67	30.93	-	-	Peak
468	32.17	-13.83	46	43.33	17.56	2.17	30.89	-	-	Peak
487.6	34.36	-11.64	46	44.95	17.86	2.21	30.66	-	-	Peak
507.2	33.85	-12.15	46	44.1	18.17	2.24	30.66	-	-	Peak
2374	35.62	-18.38	54	34.93	32	4.57	35.88	104	169	Average
2374	48.71	-25.29	74	48.02	32	4.57	35.88	104	169	Peak
2462	87.2	-	-	86.34	32.07	4.62	35.83	104	169	Average
2462	97.64	-	-	96.78	32.07	4.62	35.83	104	169	Peak
2483.7	41.98	-12.02	54	41.06	32.09	4.64	35.81	104	169	Average
2483.7	62.02	-11.98	74	61.1	32.09	4.64	35.81	104	169	Peak



Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	47~48%
Test Engineer :	Hayden Wu	Polarization :	Vertical
Remark :	2462 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
42.42	36.51	-3.49	40	55.75	11.56	0.76	31.56	100	125	Peak
87.24	33.12	-6.88	40	55.11	8.34	1.05	31.38	-	-	Peak
143.4	38.28	-5.22	43.5	57.1	11.17	1.27	31.26	-	-	Peak
487.6	34.99	-11.01	46	45.58	17.86	2.21	30.66	-	-	Peak
507.2	34.93	-11.07	46	45.18	18.17	2.24	30.66	-	-	Peak
624.1	33.84	-12.16	46	41.06	20.54	2.5	30.26	-	-	Peak
2382	34.95	-19.05	54	34.25	32	4.58	35.88	156	241	Average
2382	46.94	-27.06	74	46.24	32	4.58	35.88	156	241	Peak
2462	78.48	-	-	77.62	32.07	4.62	35.83	156	241	Average
2462	88.27	-	-	87.41	32.07	4.62	35.83	156	241	Peak
2483.68	37.01	-16.99	54	36.09	32.09	4.64	35.81	156	241	Average
2483.68	53.31	-20.69	74	52.39	32.09	4.64	35.81	156	241	Peak

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.

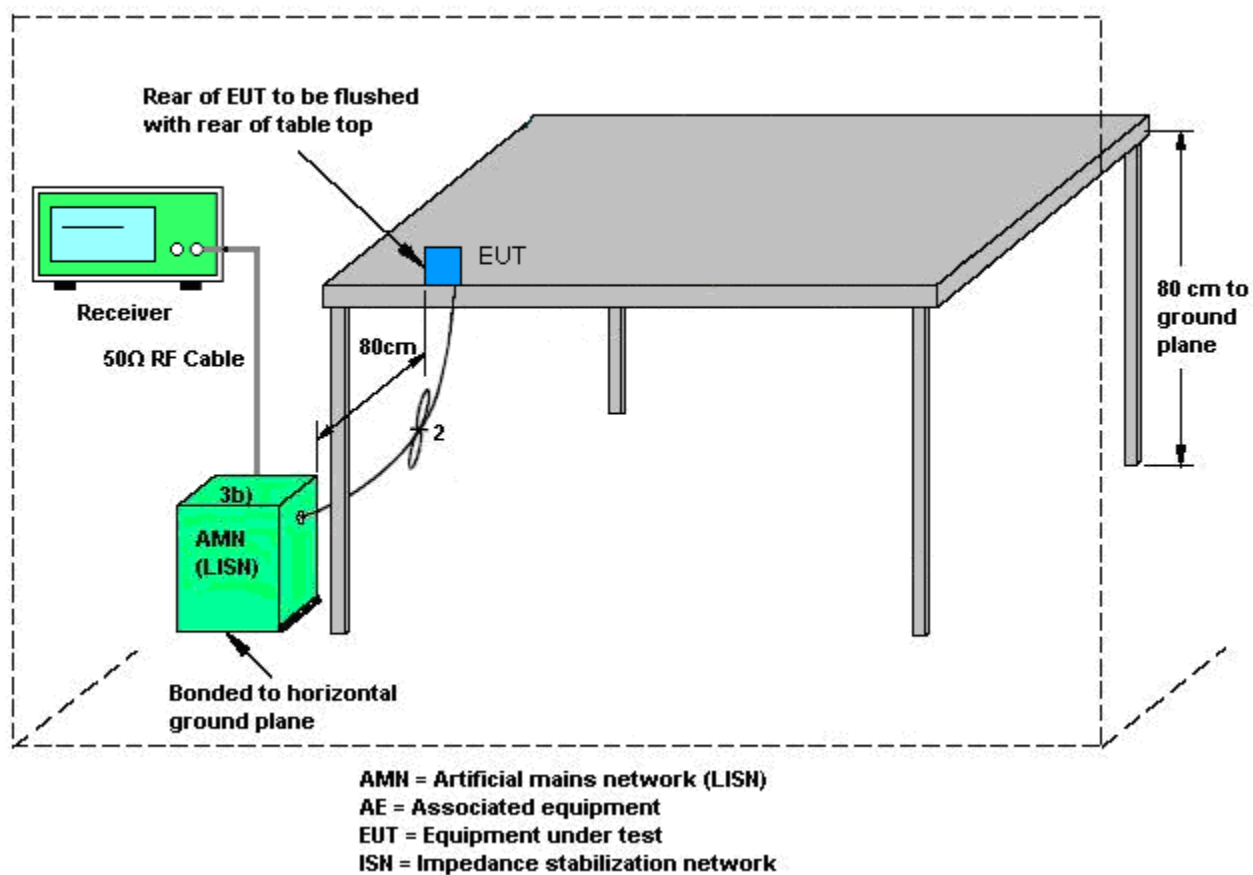
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

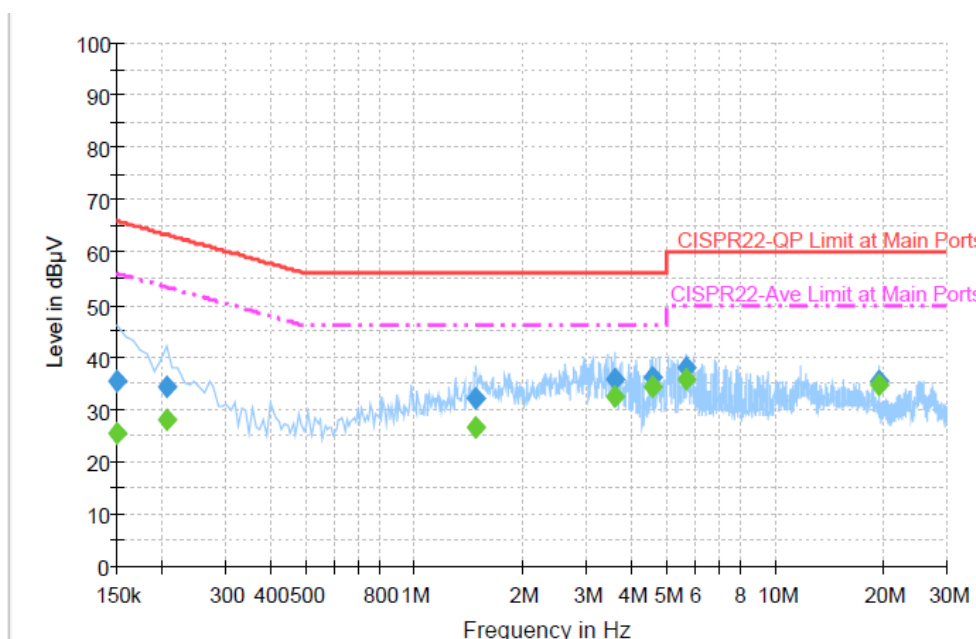
1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance 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℃
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN Link + GPS Rx + Cradle + Battery + USB Cable (Data Link with Notebook) + Adapter 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



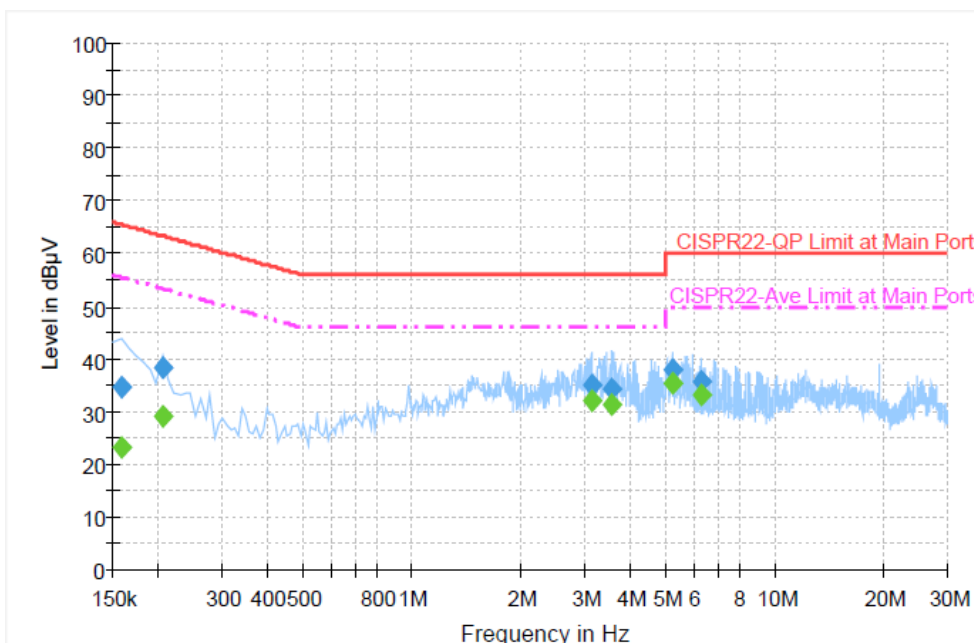
Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	35.6	Off	L1	19.4	30.4	66.0
0.206000	34.3	Off	L1	19.4	29.1	63.4
1.486000	32.0	Off	L1	19.5	24.0	56.0
3.614000	35.8	Off	L1	19.6	20.2	56.0
4.598000	36.1	Off	L1	19.7	19.9	56.0
5.710000	38.0	Off	L1	19.7	22.0	60.0
19.502000	35.3	Off	L1	19.8	24.7	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	25.5	Off	L1	19.4	30.5	56.0
0.206000	28.2	Off	L1	19.4	25.2	53.4
1.486000	26.6	Off	L1	19.5	19.4	46.0
3.614000	32.5	Off	L1	19.6	13.5	46.0
4.598000	34.3	Off	L1	19.7	11.7	46.0
5.710000	35.7	Off	L1	19.7	14.3	50.0
19.502000	34.7	Off	L1	19.8	15.3	50.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN Link + GPS Rx + Cradle + Battery + USB Cable (Data Link with Notebook) + Adapter 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	34.7	Off	N	19.3	30.9	65.6
0.206000	38.2	Off	N	19.4	25.2	63.4
3.126000	35.0	Off	N	19.7	21.0	56.0
3.582000	34.4	Off	N	19.6	21.6	56.0
5.222000	38.0	Off	N	19.5	22.0	60.0
6.294000	35.9	Off	N	19.7	24.1	60.0

Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	23.3	Off	N	19.3	32.3	55.6
0.206000	29.0	Off	N	19.4	24.4	53.4
3.126000	32.1	Off	N	19.7	13.9	46.0
3.582000	31.3	Off	N	19.6	14.7	46.0
5.222000	35.4	Off	N	19.5	14.6	50.0
6.294000	33.4	Off	N	19.7	16.6	50.0

3.7 Antenna Requirements

3.7.1 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.

3.7.2 Antenna Connected Construction

Non-standard connector used.

3.7.3 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	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Jun. 08, 2012~ Jun. 17, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 18, 2011	Jun. 08, 2012~ Jun. 17, 2012	Sep. 17, 2012	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	0846202	N/A	Sep. 18, 2011	Jun. 08, 2012~ Jun. 17, 2012	Sep. 17, 2012	Conducted (TH02-HY)
EMI Test Receive	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Jun. 14, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Jun. 14, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Jun. 14, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Jun. 14, 2012	N/A	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	Jun. 14, 2012	N/A	Conduction (CO05-HY)
Spectrum Analyzer	R&S	ESU26	100390	20Hz ~ 26.5GHz	Dec. 22, 2011	Jun. 14, 2012	Dec. 21, 2012	Radiation (03CH05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2725	30MHz ~ 2GHz	Oct. 22, 2011	Jun. 14, 2012	Oct. 21, 2012	Radiation (03CH05-HY)
Turn Table	HD	Deis HD 2000	420/611	0 ~ 360 degree	N/A	Jun. 14, 2012	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	MA 240	240/666	1 m ~ 4 m	N/A	Jun. 14, 2012	N/A	Radiation (03CH05-HY)
Horn Antenna	ESCO	3117	66584	1GHz ~ 18GHz	Aug. 04, 2011	Jun. 14, 2012	Aug. 03, 2012	Radiation (03CH05-HY)
Pre Amplifier	COM-POWER	PA-103A	161075	10Hz ~ 1000MHz Gain:32dB	Feb. 27, 2012	Jun. 14, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	159087	1GHz~18GHz	Feb. 27, 2012	Jun. 14, 2012	Feb. 26, 2013	Radiation (03CH05-HY)
Pre Amplifier	Agilent	8449B	3008A019 17	1GHz~26.5GHz	Aug. 30, 2011	Jun. 14, 2012	Aug. 29, 2012	Radiation (03CH05-HY)
Loop Antenna	R&S	HFH2-Z2	860004/00 1	9 kHz~30 MHz	Jul. 29, 2010	Jun. 14, 2012	Jul. 28, 2012	Radiation (03CH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.26
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP260605 as below.