

FCC RF Test Report

APPLICANT : HTC Corporation
EQUIPMENT : Windows Phone
MODEL NAME : PM59100
FCC ID : NM8PM59100
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Sep. 05, 2012 and completely tested on Oct. 25, 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
FR290531-01B	Rev. 01	Initial issue of report	Oct. 29, 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 0.19 dB at 2483.560 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 5.10 dB at 0.382 MHz
3.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

HTC Corporation

No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.

1.2 Manufacturer

HTC Corporation

No. 23, Xinghua Rd., Taoyuan City, Taoyuan County 330, Taiwan.

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Windows Phone
Model Name	PM59100
Sample 1	EUT with Main Camera 1, and Battery 1
Sample 2	EUT with Main Camera 2, and Battery 2
FCC ID	NM8PM59100
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/ WLAN 11bgn / Bluetooth
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 : 20.70 dBm (0.1175 W) 802.11g : 21.62 dBm (0.1452 W) 802.11n HT20 : 21.52 dBm (0.1419 W)
Antenna Type	PIFA Antenna type with gain -0.50 dBi
Type of Modulation	802.11b : DSSS (BPSK / QPSK / CCK) 802.11g/n : 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	03CH07-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 v02
- FCC KDB 662911 D01 Multiple Transmitter Output v01r02
- 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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals 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) and radiated emission (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

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 and antenna configurations as following table and the highest power data rates were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

2.4GHz 802.11b mode				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	20.70	20.68	20.69	20.68

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)	21.62	21.57	21.55	21.54	21.5	21.6	21.53	21.54

802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	21.52	21.42	21.49	21.42	21.23	21.24	21.5	21.26

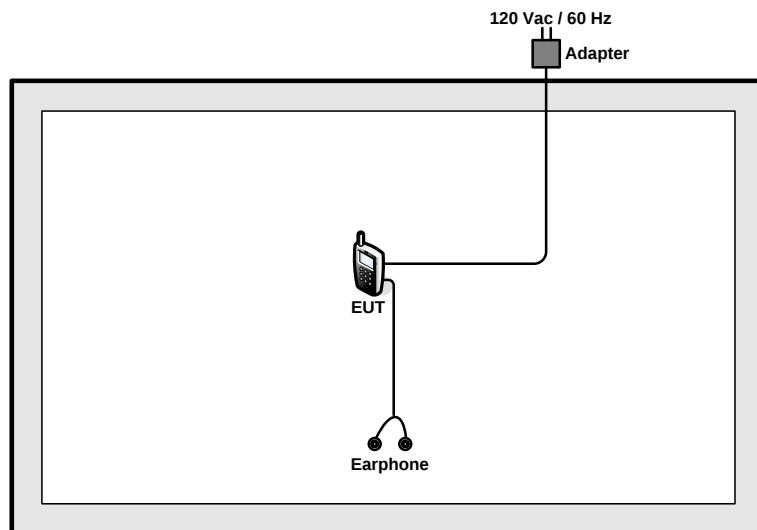
2.3 Test Mode

Final results of test modes, data rates and test channels are shown as following table.

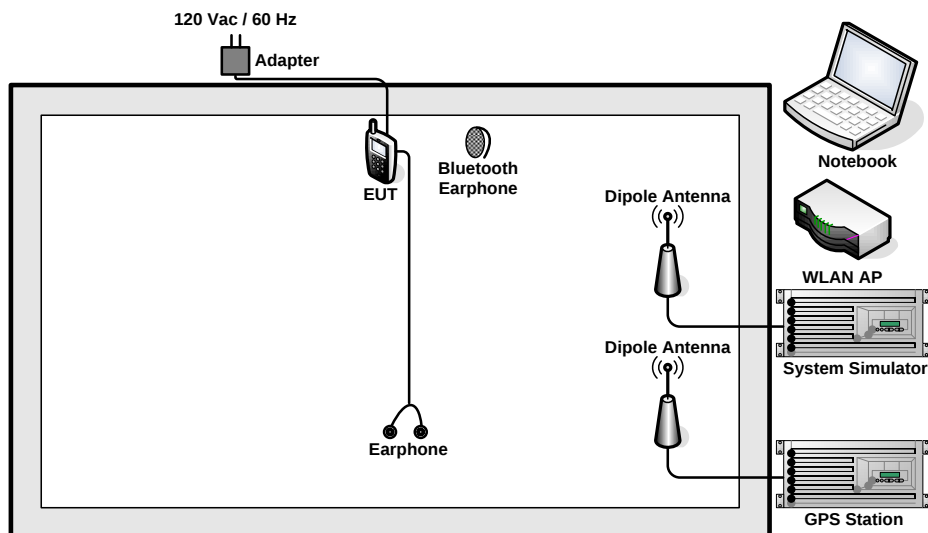
Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	6.5 Mbps	1/11
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
AC Conducted Emission	Mode 1 : WCDMA Band V Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + USB Cable 1 (Charging from Adapter 4) for Sample 1			
	Mode 2 : WCDMA Band V Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + USB Cable 1 (Charging from Adapter 4) for Sample 2			
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.				

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 RF Utility

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

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

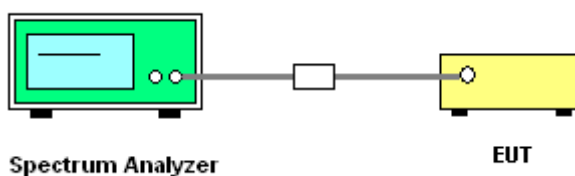
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
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. Set to the maximum power setting and enable the EUT transmit continuously.
4. 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.

3.1.4 Test Setup

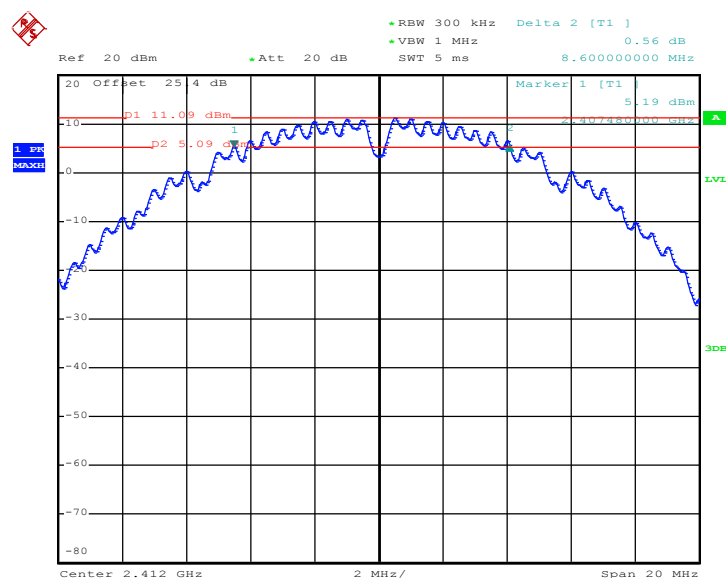


3.1.5 Test Result of 6dB Bandwidth

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	8.60	0.5	Pass
06	2437	9.04	0.5	Pass
11	2462	9.04	0.5	Pass

6 dB Bandwidth Plot on 802.11b Channel 01

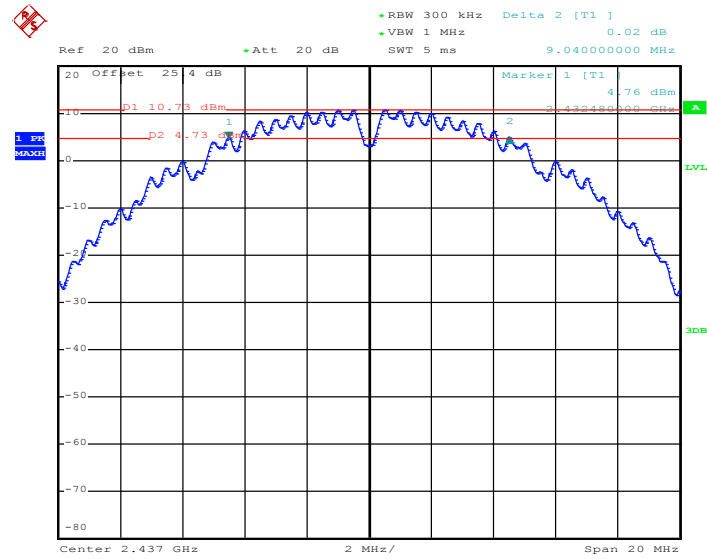


290531 15C 6dB.11b 2412 (ch01)

Date: 4.OCT.2012 22:19:22



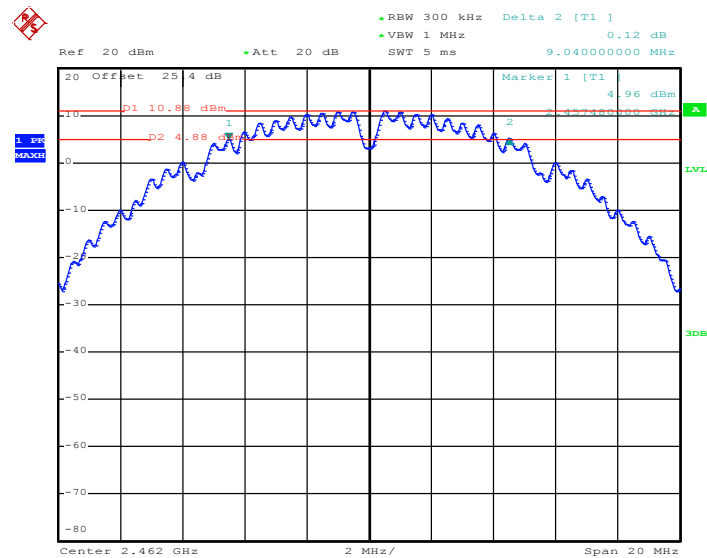
6 dB Bandwidth Plot on 802.11b Channel 06



290531 15C 6dB.11b 2437 (ch06)

Date: 4.OCT.2012 22:24:35

6 dB Bandwidth Plot on 802.11b Channel 11



290531 15C 6dB.11b 2462 (ch11)

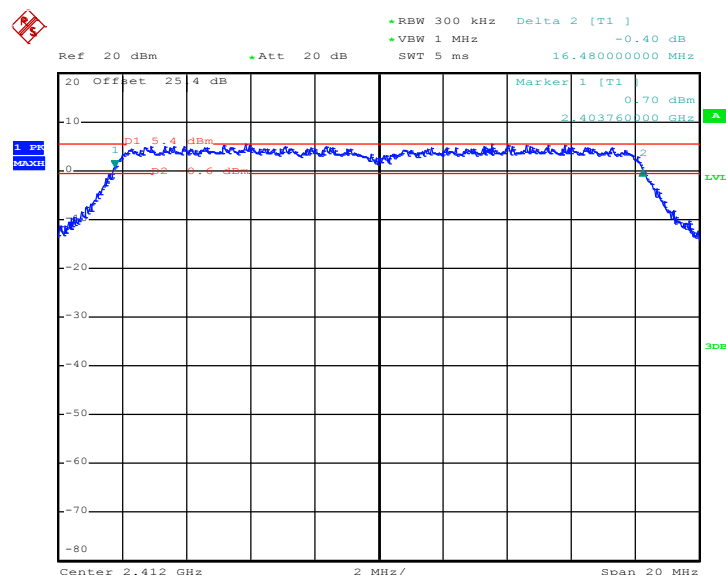
Date: 4.OCT.2012 22:26:58



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

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	16.48	0.5	Pass
06	2437	16.52	0.5	Pass
11	2462	16.56	0.5	Pass

6 dB Bandwidth Plot on 802.11g Channel 01

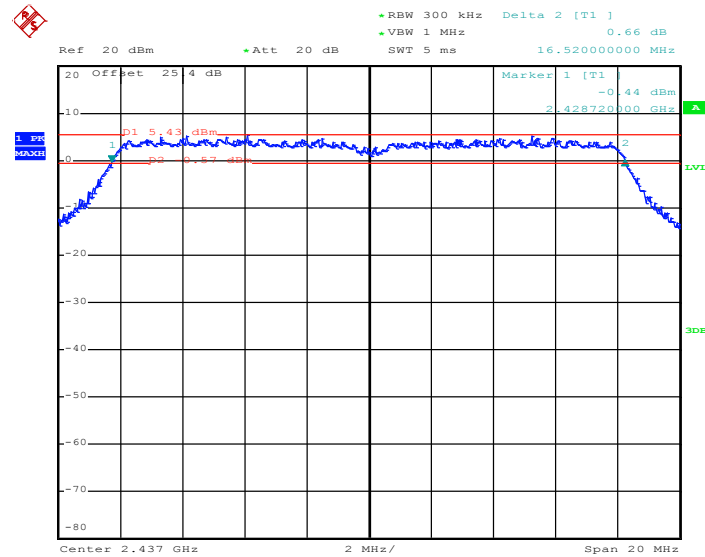


290531 15C 6dB.11g 2412 (ch01)

Date: 4.OCT.2012 22:41:16



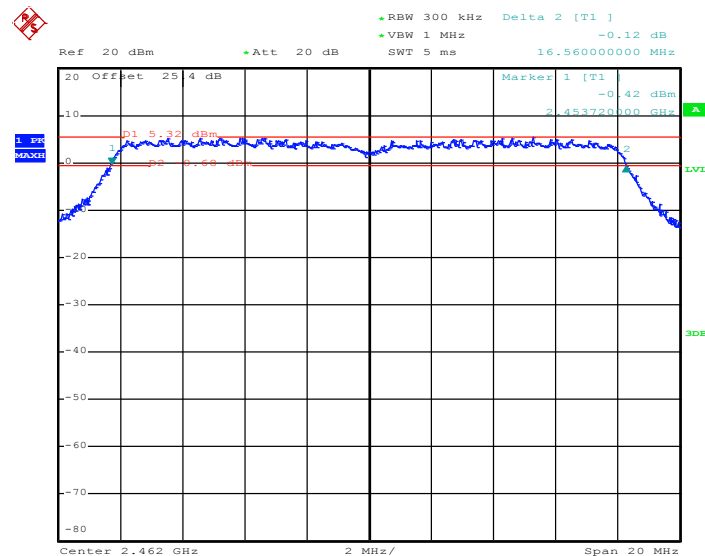
6 dB Bandwidth Plot on 802.11g Channel 06



290531 15C 6dB.11g 2437 (ch06)

Date: 4.OCT.2012 22:38:52

6 dB Bandwidth Plot on 802.11g Channel 11



290531 15C 6dB.11g 2462 (ch11)

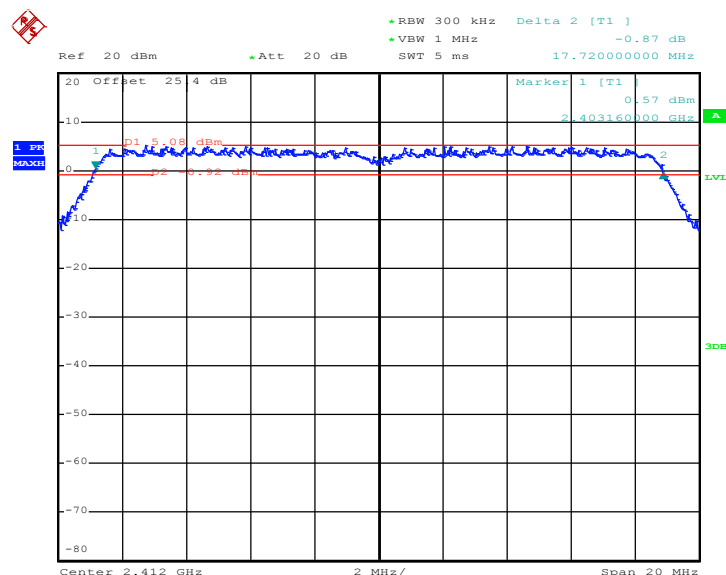
Date: 4.OCT.2012 22:36:08



Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	17.72	0.5	Pass
06	2437	17.80	0.5	Pass
11	2462	17.80	0.5	Pass

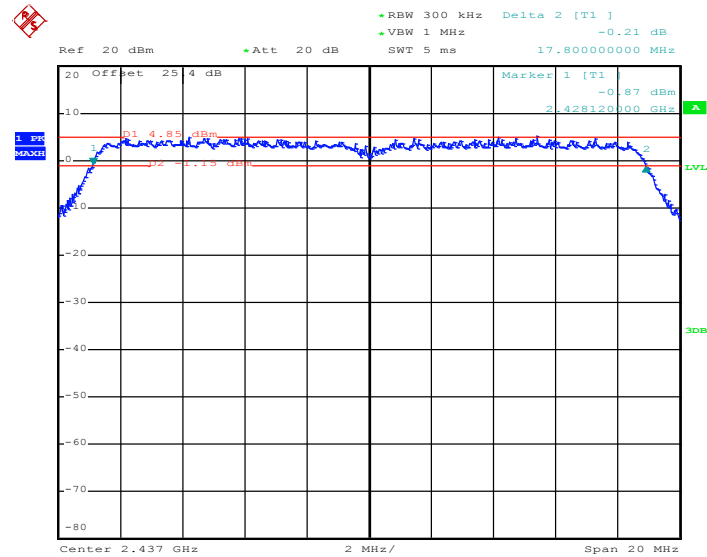
6 dB Bandwidth Plot on 802.11n HT20 Channel 01



290531 15C 6dB.11g_N20 2412 (ch01)
Date: 4.OCT.2012 22:59:09



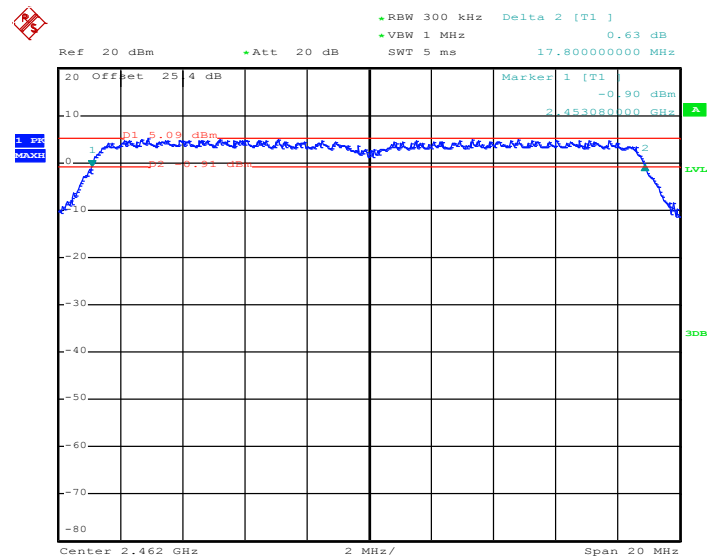
6 dB Bandwidth Plot on 802.11n HT20 Channel 06



290531 15C 6dB.11g_N20 2437 (ch06)

Date: 4.OCT.2012 22:55:28

6 dB Bandwidth Plot on 802.11n HT20 Channel 11



290531 15C 6dB.11g_N20 2462 (ch11)

Date: 4.OCT.2012 22:51:54

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.

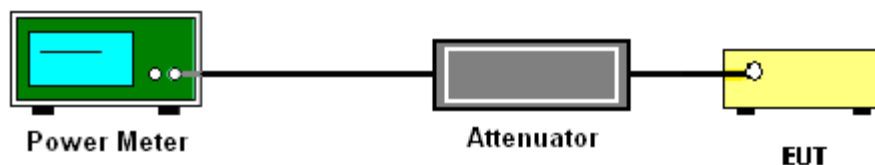
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

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

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.65	30	Pass
06	2437	20.44	30	Pass
11	2462	20.70	30	Pass

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

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	21.33	30	Pass
06	2437	21.24	30	Pass
11	2462	21.62	30	Pass

Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	21.43	30	Pass
06	2437	21.47	30	Pass
11	2462	21.52	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:	97.63%	Duty Factor:	0.10dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	18.16
06	2437	17.94
11	2462	18.31

Test Mode :	802.11g	Temperature :	24~26
Test Engineer :	Bill Kuo	Relative Humidity :	50~53
Duty Cycle:	87.18%	Duty Factor:	0.60dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	12.09
06	2437	11.84
11	2462	12.29

Test Mode :	802.11n HT20	Temperature :	24~26
Test Engineer :	Bill Kuo	Relative Humidity :	50~53
Duty Cycle:	86.21%	Duty Factor:	0.64dB

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)
01	2412	12.14
06	2437	11.89
11	2462	12.15

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.

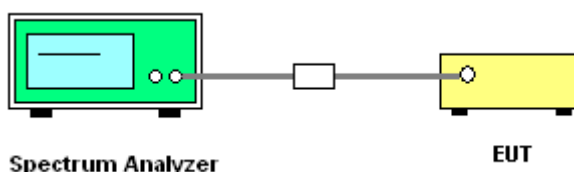
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 9.1 Option 1 of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
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. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
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.
6. Record the measurement data derived from spectrum analyzer.
7. If result of step 4. is fail to comply with PSD limit (dBm/3kHz)., repeat the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW). Compare the result with the PSD limit line.

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/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	10.55	-4.81	8	Pass
06	2437	10.16	-4.53	8	Pass
11	2462	10.42	-5.09	8	Pass

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/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	1.47	-	8	Pass
06	2437	1.23	-	8	Pass
11	2462	1.57	-	8	Pass

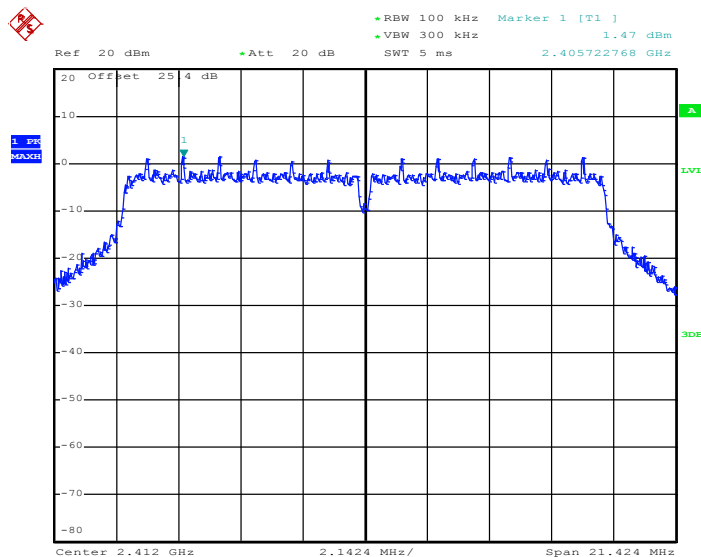
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Engineer :	Bill Kuo	Relative Humidity :	50~53%

Channel	Frequency (MHz)	802.11n HT20 Power Density		Max. Limits (dBm/3KHz)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	1.51	-	8	Pass
06	2437	1.28	-	8	Pass
11	2462	1.61	-	8	Pass

Note:

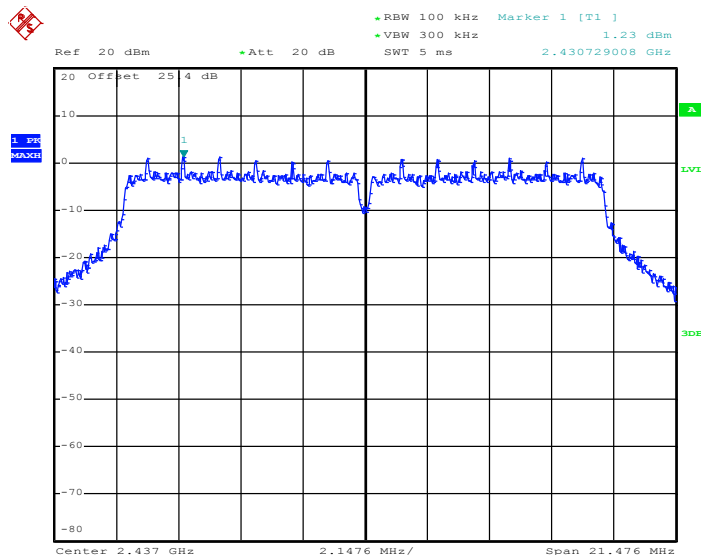
1. Measured power density (dBm) has offset with cable loss.
2. The Measured power density (dBm)/ 100KHz is reference level and used as 20dBc down for Conducted Band Edges and Conducted Spurious Emission limit line.

3.3.6 Test Result of Power Spectral Density Plots (100kHz)

PSD 100kHz Plot on 802.11g Channel 01


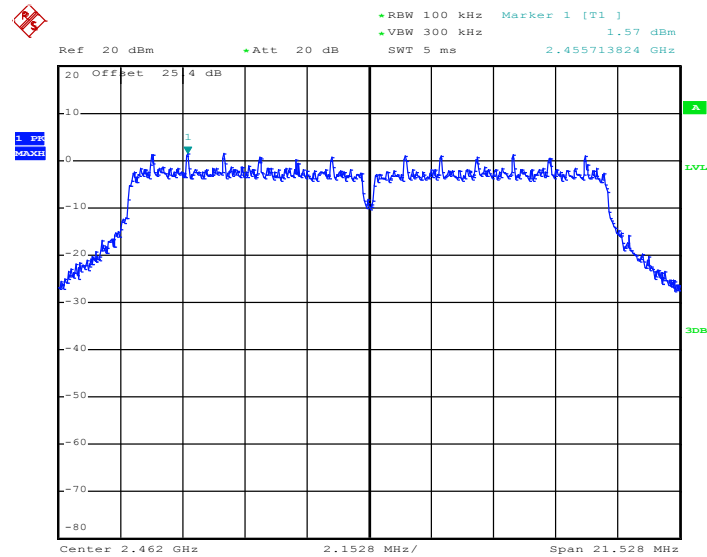
290531 15C PSD 802.11g 2412 (ch01)

Date: 4.OCT.2012 22:41:35

PSD 100kHz Plot on 802.11g Channel 06


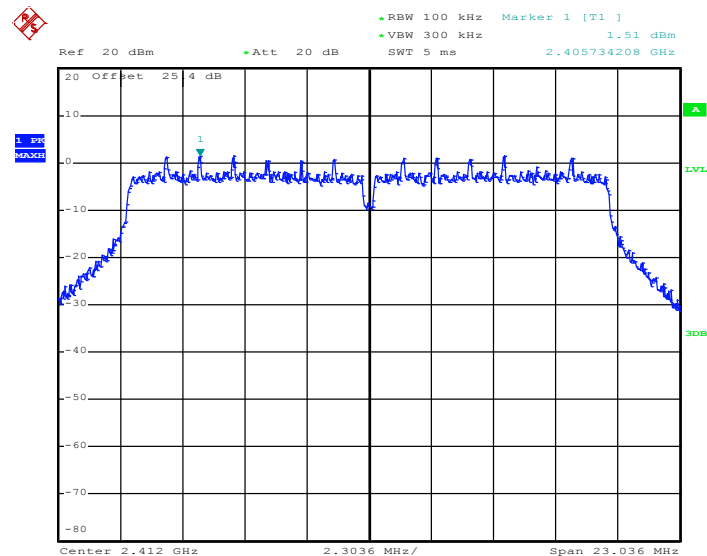
290531 15C PSD 802.11g 2437 (ch06)

Date: 4.OCT.2012 22:39:11

PSD 100kHz Plot on 802.11g Channel 11


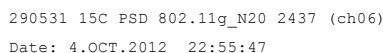
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Date: 4.OCT.2012 22:36:27

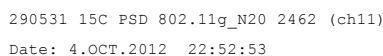
PSD 100kHz Plot on 802.11n HT20 Channel 01


290531 15C PSD 802.11g_N20 2412 (ch01)

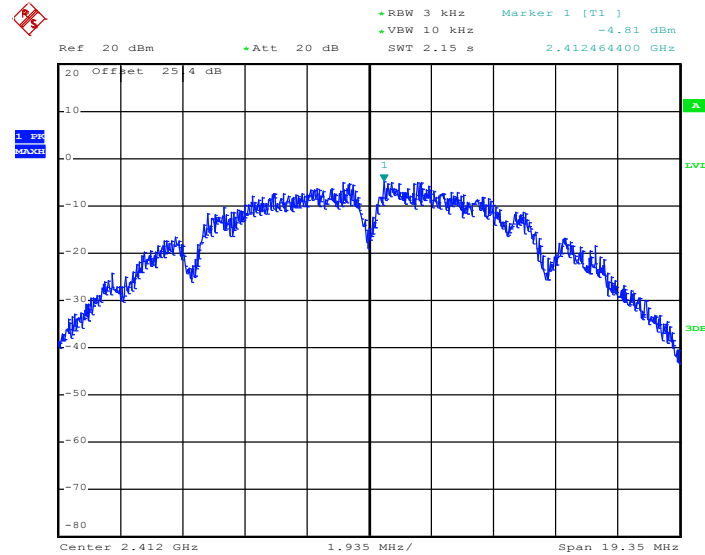
Date: 4.OCT.2012 22:59:28



PSD 100kHz Plot on 802.11n HT20 Channel 11

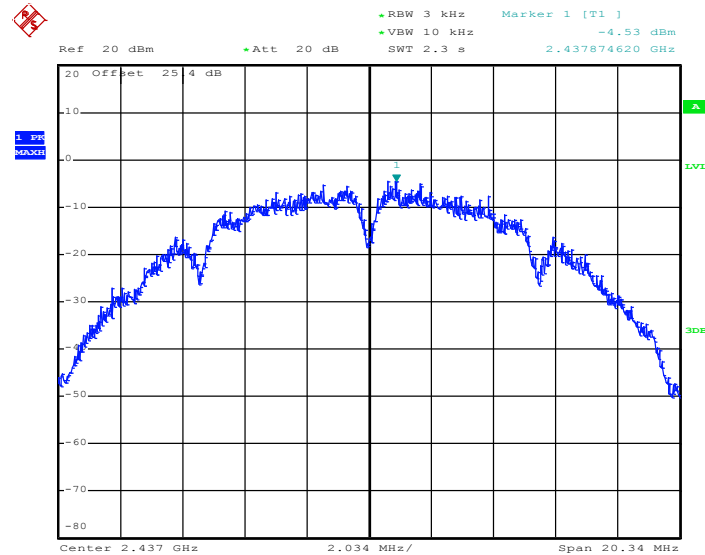


3.3.7 Test Result of Power Spectral Density Plots (3kHz)

PSD 3kHz Plot on 802.11b Channel 01


290531-01 15C PSD 802.11b 2412 (ch01)

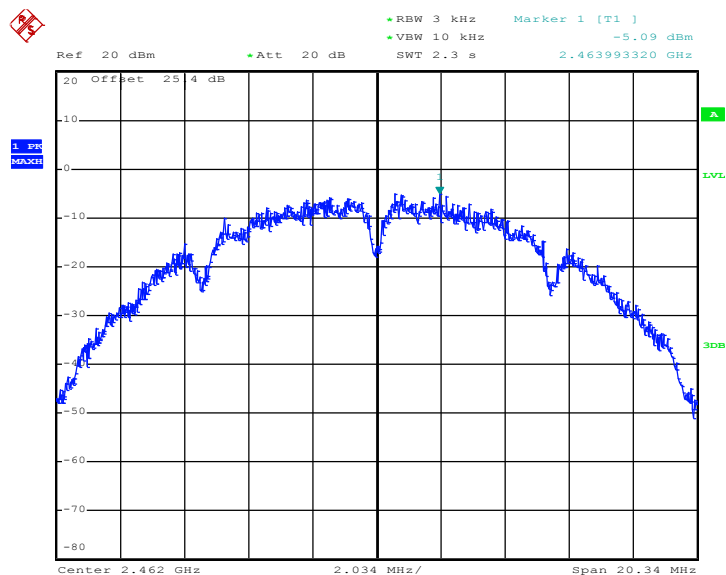
Date: 25.SEP.2012 16:02:17

PSD 3kHz Plot on 802.11b Channel 06


290531-01 15C PSD 802.11b 2437 (ch06)

Date: 25.SEP.2012 16:04:17

PSD 3kHz Plot on 802.11b Channel 11



290531-01 15C PSD 802.11b 2462 (ch11)

Date: 25.SEP.2012 16:05:03

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).

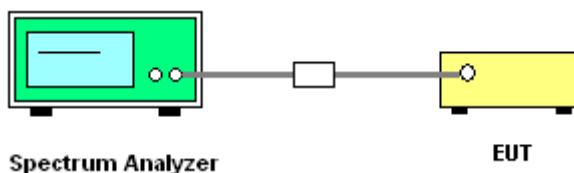
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v02.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. 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.
4. Measure and record the results in the test report.

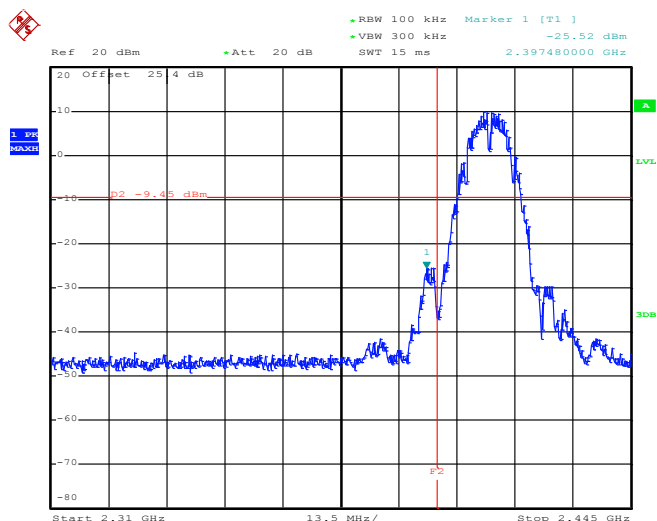
3.4.4 Test Setup



3.4.5 Test Plots of Conducted Band Edges

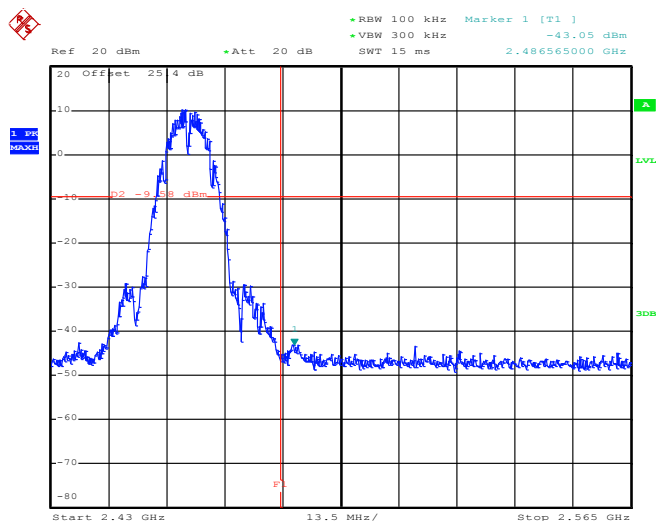
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

Low Band Edge Plot on 802.11b Channel 01



290531 15C BandEdge 802.11b 2412 (ch01)
Date: 4.OCT.2012 22:19:54

High Band Edge Plot on 802.11b Channel 11

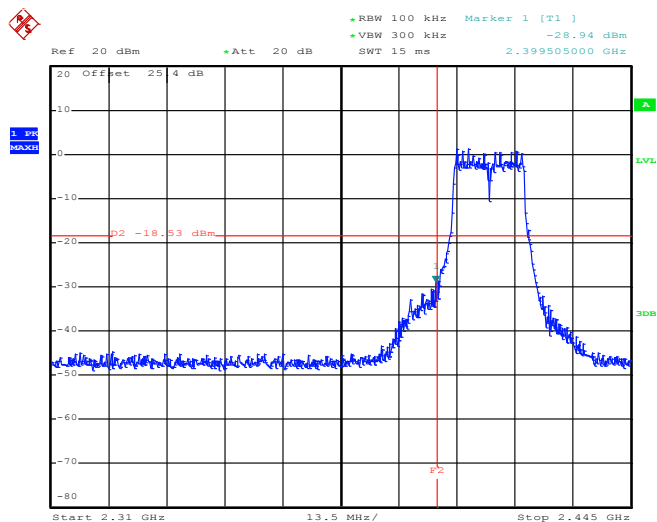


290531 15C BandEdge 802.11b 2462 (ch11)
Date: 4.OCT.2012 22:27:31



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

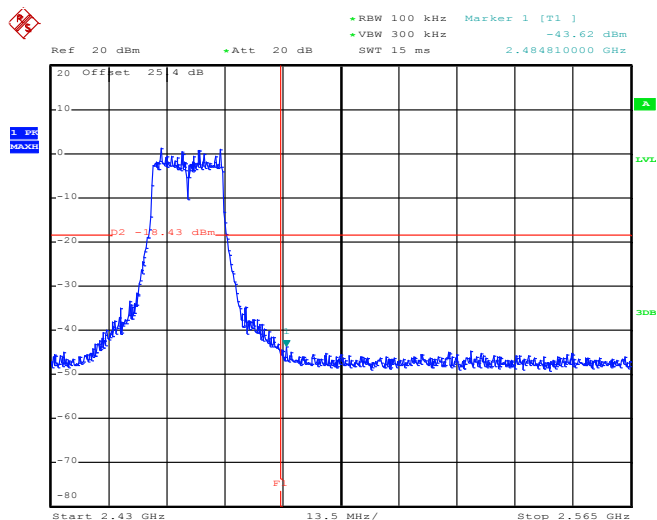
Low Band Edge Plot on 802.11g Channel 01



290531 15C BandEdge 802.11g 2412 (ch01)

Date: 4.OCT.2012 22:41:49

High Band Edge Plot on 802.11g Channel 11



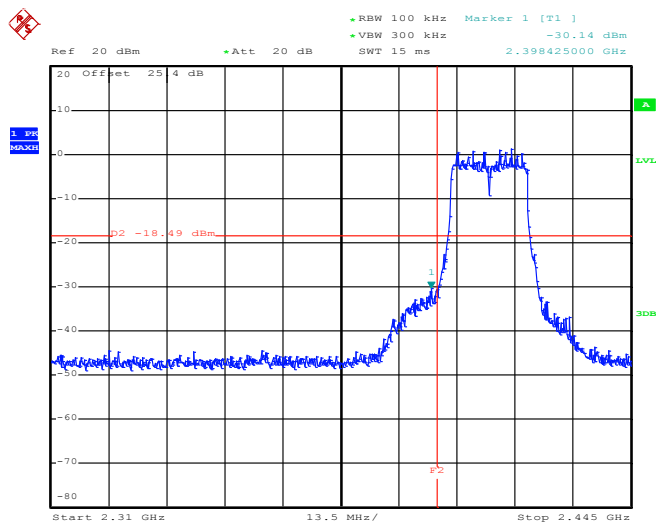
290531 15C BandEdge 802.11g 2462 (ch11)

Date: 4.OCT.2012 22:36:41



Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	Low and High	Relative Humidity :	50~53%
Test Channel :	01 and 11	Test Engineer :	Bill Kuo

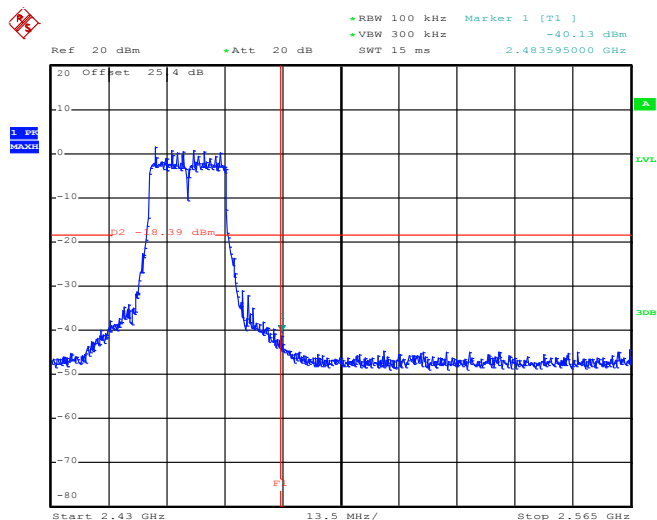
Low Band Edge Plot on 802.11n HT20 Channel 01



290531 15C BandEdge 802.11g_N20 2412 (ch01)

Date: 4.OCT.2012 22:59:42

High Band Edge Plot on 802.11n HT20 Channel 11



290531 15C BandEdge 802.11g_N20 2462 (ch11)

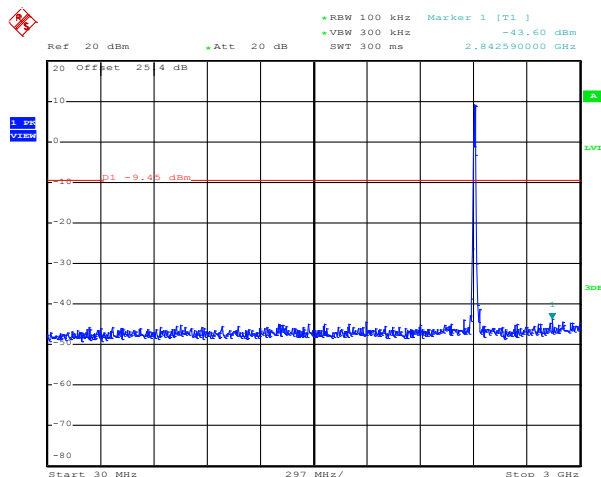
Date: 4.OCT.2012 22:53:08

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

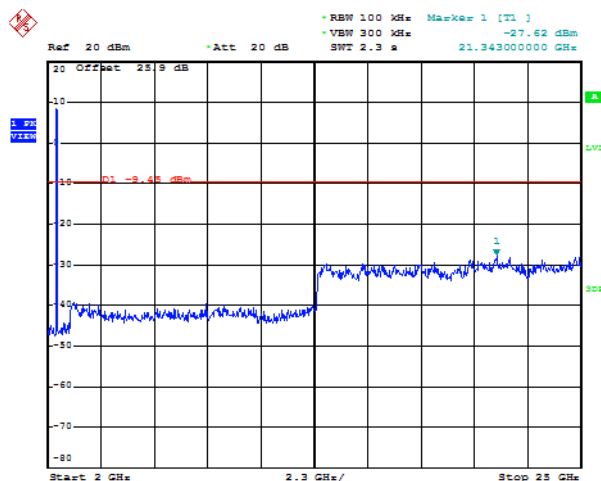


290531 15C Spurious 802.11b 2412 (ch01)

Date: 4.OCT.2012 22:23:09

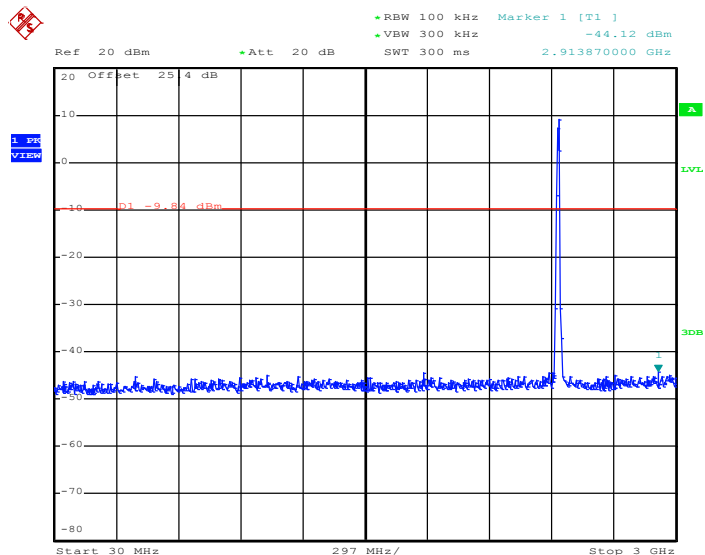
802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01



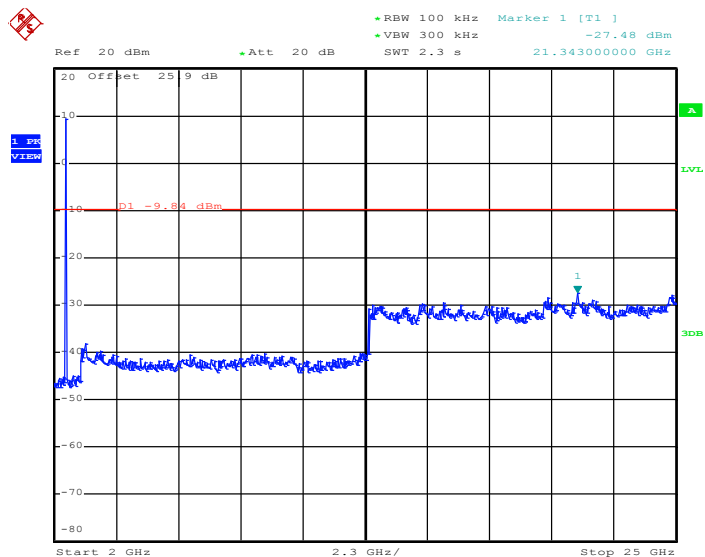
290531 15C Spurious 802.11b 2412 (ch01)

Date: 4.OCT.2012 22:23:27

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


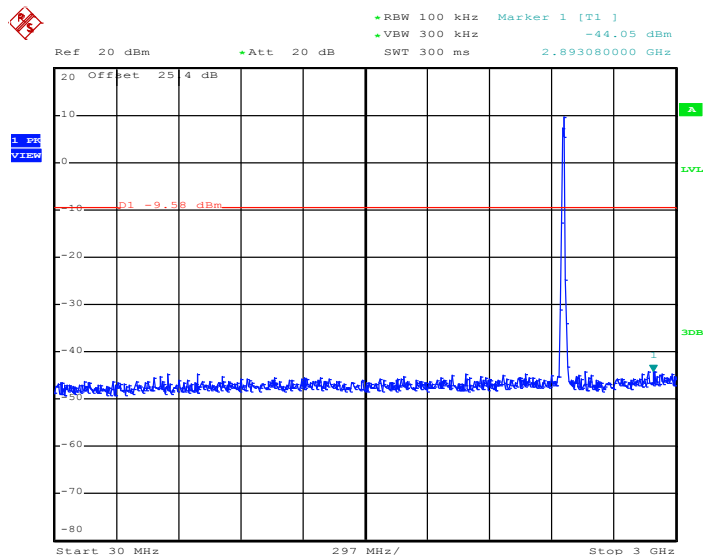
290531 15C Spurious 802.11b 2437 (ch06)

Date: 4.OCT.2012 22:25:12

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


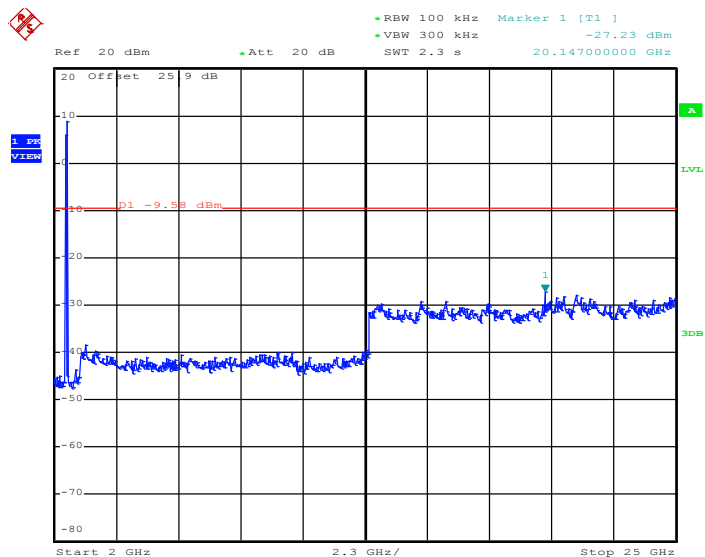
290531 15C Spurious 802.11b 2437 (ch06)

Date: 4.OCT.2012 22:25:30

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


290531 15C Spurious 802.11b 2462 (ch11)

Date: 4.OCT.2012 22:27:50

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


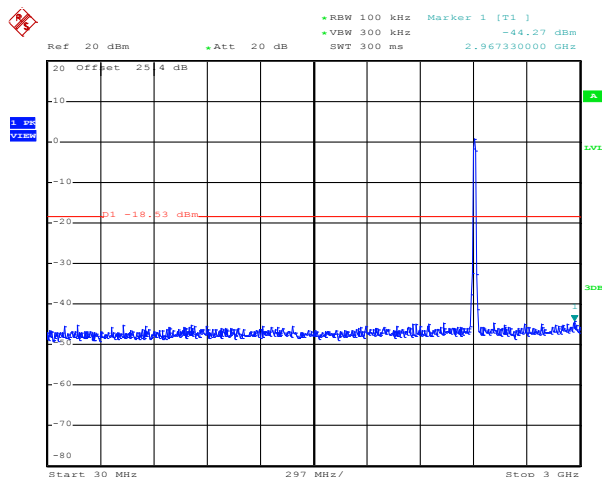
290531 15C Spurious 802.11b 2462 (ch11)

Date: 4.OCT.2012 22:28:07

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

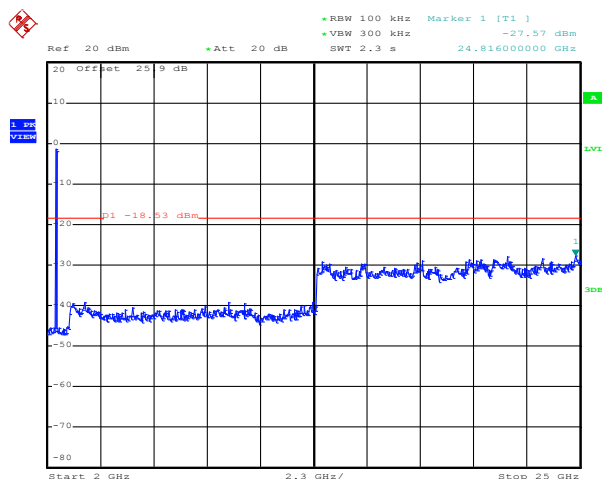


290531 15C Spurious 802.11g 2412 (ch01)

Date: 4.OCT.2012 22:42:11

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

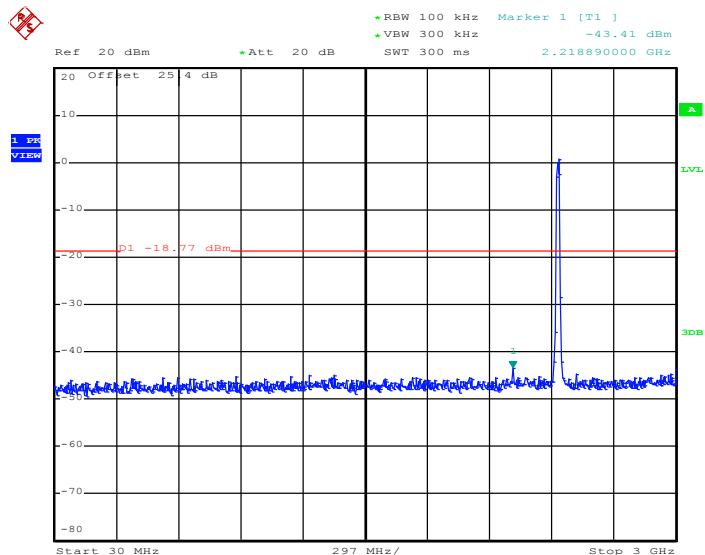


290531 15C Spurious 802.11g 2412 (ch01)

Date: 4.OCT.2012 22:42:28

802.11g 30 MHz~3 GHz

Conducted Spurious Emission Plot on Channel 06

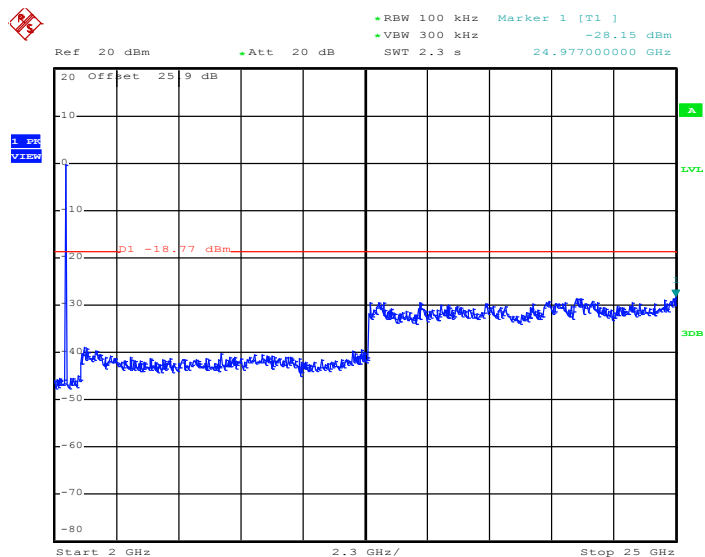


290531 15C Spurious 802.11g 2437 (ch06)

Date: 4.OCT.2012 22:39:30

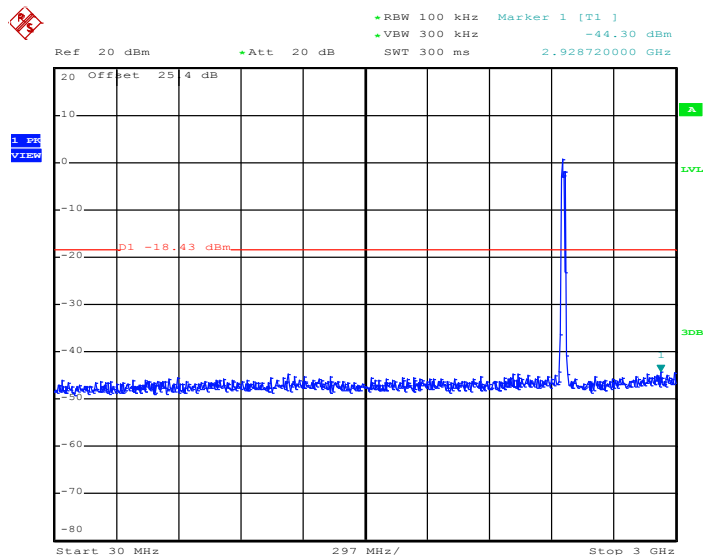
802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06



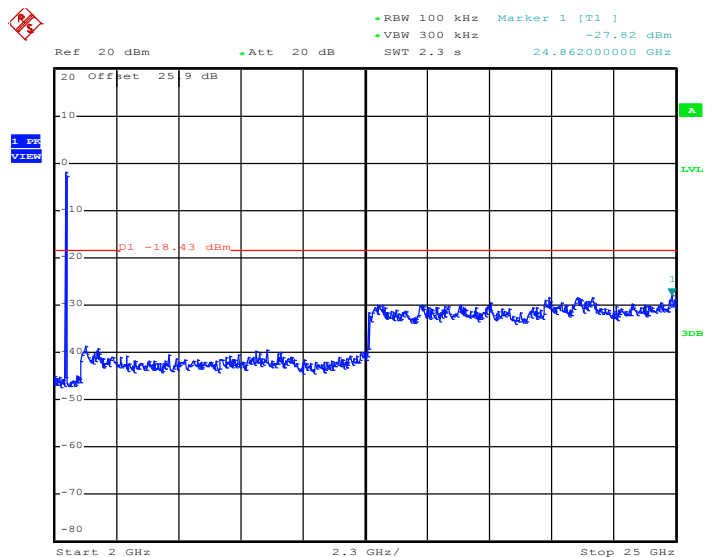
290531 15C Spurious 802.11g 2437 (ch06)

Date: 4.OCT.2012 22:39:47

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


290531 15C Spurious 802.11g 2462 (ch11)

Date: 4.OCT.2012 22:37:07

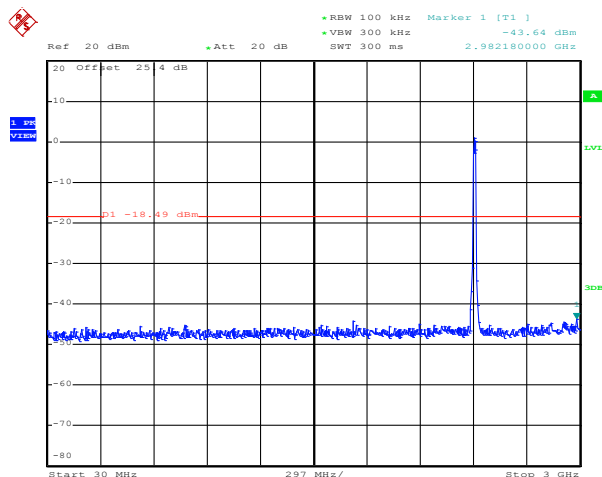
802.11g 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


290531 15C Spurious 802.11g 2462 (ch11)

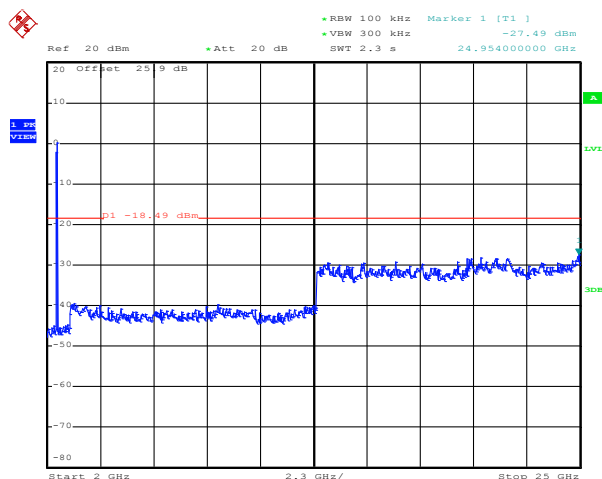
Date: 4.OCT.2012 22:37:25



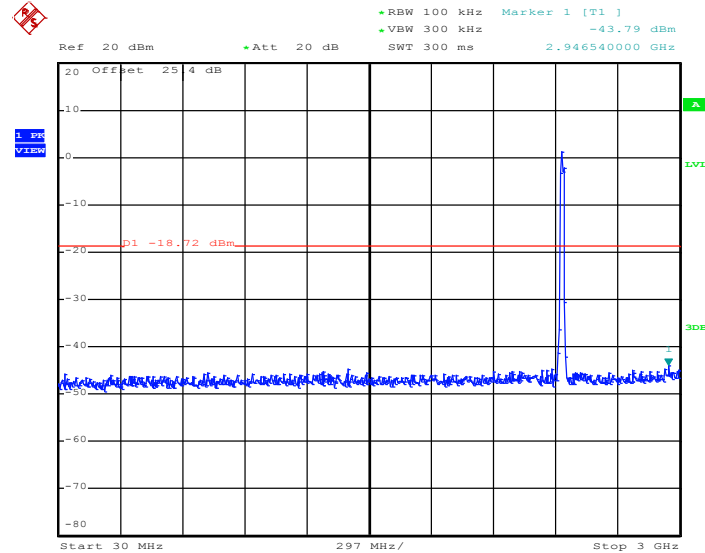
Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	50~53%
Test Channel :	01, 06, 11	Test Engineer :	Bill Kuo

802.11n HT20 30 MHz~3 GHz**Conducted Spurious Emission Plot on Channel 01**

290531 15C Spurious 802.11g_N20 2412 (ch01)
Date: 4.OCT.2012 23:00:02

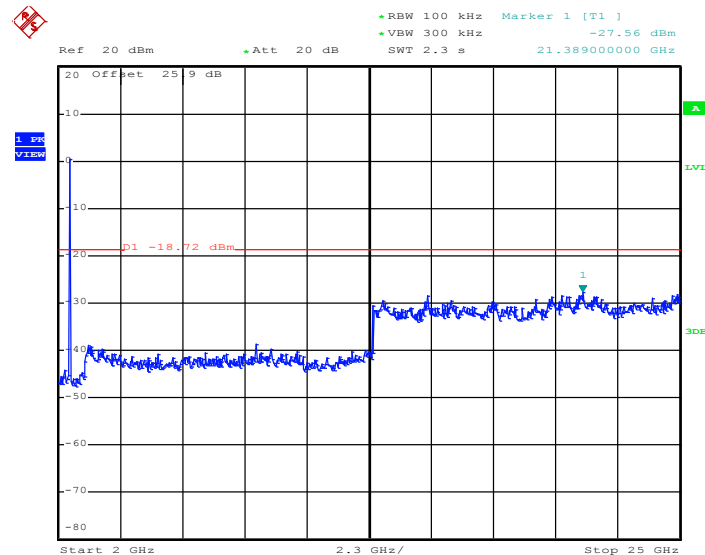
802.11n HT20 2 GHz~25 GHz**Conducted Spurious Emission Plot on Channel 01**

290531 15C Spurious 802.11g_N20 2412 (ch01)
Date: 4.OCT.2012 23:00:19

802.11n HT20 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 06


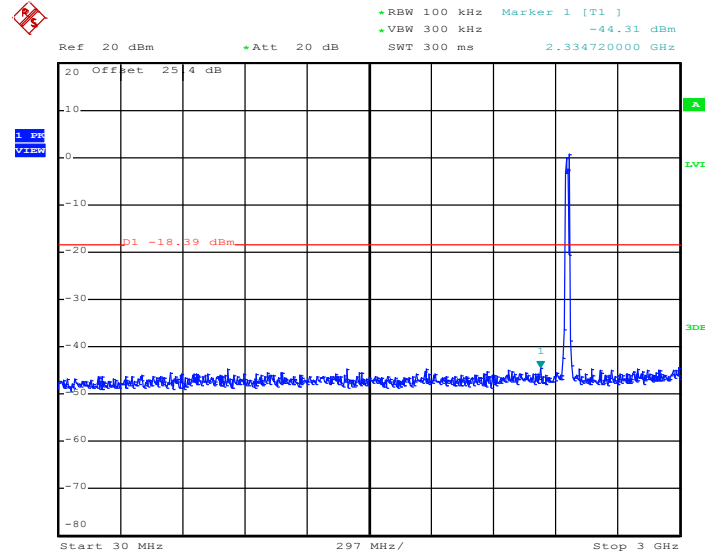
290531 15C Spurious 802.11g_N20 2437 (ch06)

Date: 4.OCT.2012 22:56:06

802.11n HT20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 06


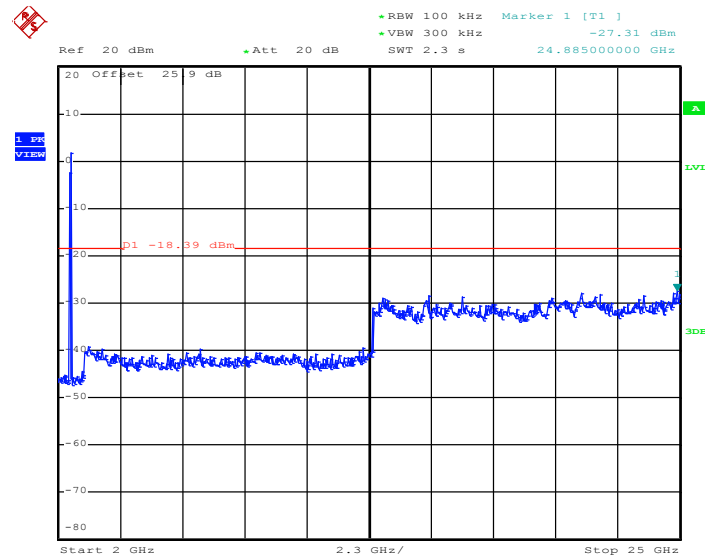
290531 15C Spurious 802.11g_N20 2437 (ch06)

Date: 4.OCT.2012 22:56:24

802.11n HT20 30 MHz~3 GHz
Conducted Spurious Emission Plot on Channel 11


290531 15C Spurious 802.11g_N20 2462 (ch11)

Date: 4.OCT.2012 22:53:27

802.11n HT20 2 GHz~25 GHz
Conducted Spurious Emission Plot on Channel 11


290531 15C Spurious 802.11g_N20 2462 (ch11)

Date: 4.OCT.2012 22:53:45

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 the guidelines in ANSI C63. 10-2009
2. 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.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamplifier Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 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.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 KHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

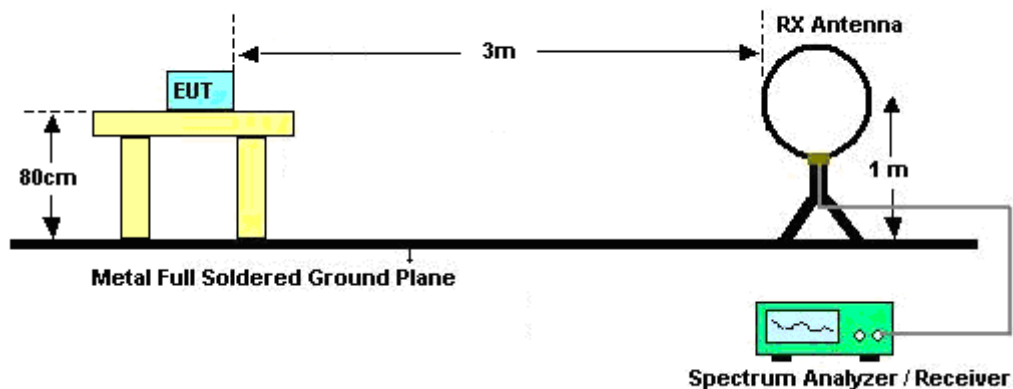
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(ms)	1/T(KHz)	VBW Setting
802.11b	97.63	8.24	0.121	300Hz
802.11g	87.18	1.36	0.735	1KHz
802.11n HT20	86.21	1.275	0.784	1KHz

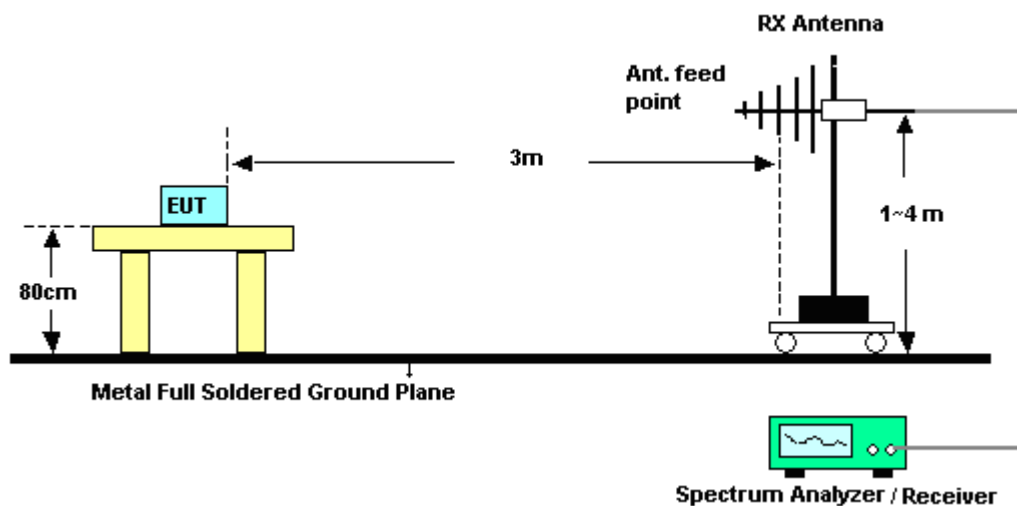
Note: For average measurement with duty cycle < 98%, use reduced VBW measurement method 4.2.3.2.3 in ANSI C63.10.

3.5.4 Test Setup

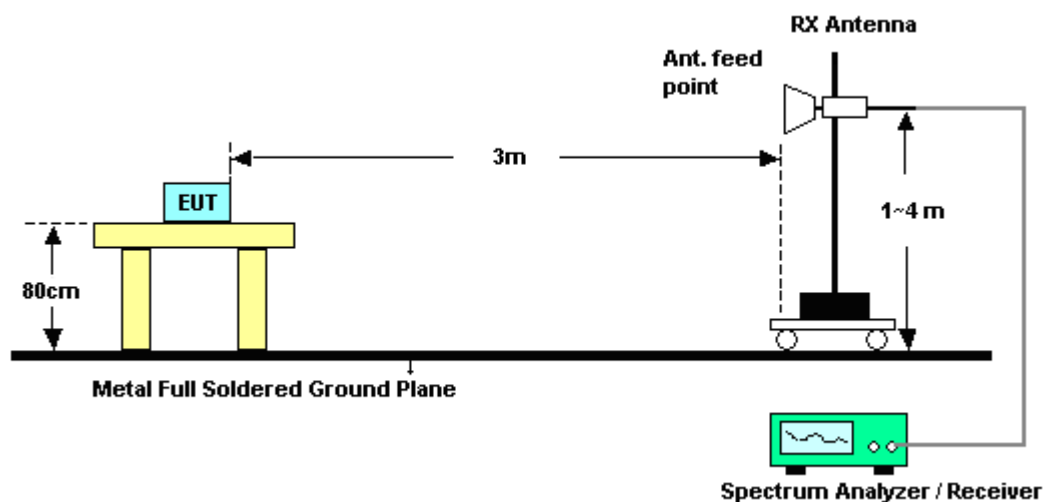
For radiated emissions below 30MHz



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

<Sample 1>

Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	Marlboro Hsu

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
2385.69	55.02	-18.98	74	50.65	32.3	6.03	33.96	123	222	Peak
2385.24	47.37	-6.63	54	43.02	32.28	6.03	33.96	123	222	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
2385.69	53.18	-20.82	74	48.81	32.3	6.03	33.96	164	101	Peak
2385.33	44.33	-9.67	54	39.98	32.28	6.03	33.96	164	101	Average

Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	Marlboro Hsu

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
2487.4	60.83	-13.17	74	56.27	32.38	6.18	34	150	149	Peak
2487.7	53.79	-0.21	54	49.21	32.4	6.18	34	150	149	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
2487.52	58.89	-15.11	74	54.31	32.4	6.18	34	133	291	Peak
2487.62	52.01	-1.99	54	47.43	32.4	6.18	34	133	291	Average



Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	Marlboro Hsu

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
2390	70.25	-3.75	74	65.88	32.3	6.03	33.96	151	0	Peak
2390	48.29	-5.71	54	43.92	32.3	6.03	33.96	151	0	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
2389.47	62.43	-11.57	74	58.06	32.3	6.03	33.96	130	355	Peak
2390	42.2	-11.8	54	37.83	32.3	6.03	33.96	130	355	Average

Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	Marlboro Hsu

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
2483.56	73.81	-0.19	74	69.25	32.38	6.18	34	100	43	Peak
2483.5	52.3	-1.7	54	47.74	32.38	6.18	34	100	43	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
2484.26	62.94	-11.06	74	58.38	32.38	6.18	34	133	60	Peak
2483.5	43.37	-10.63	54	38.81	32.38	6.18	34	133	60	Average



Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	Low	Relative Humidity :	50~52%
Test Channel :	01	Test Engineer :	Marlboro Hsu

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
2389.56	72.95	-1.05	74	68.58	32.3	6.03	33.96	144	84	Peak
2390	50.14	-3.86	54	45.77	32.3	6.03	33.96	144	84	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
2389.83	68.22	-5.78	74	63.85	32.3	6.03	33.96	104	57	Peak
2390	45.8	-8.2	54	41.43	32.3	6.03	33.96	104	57	Average

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	Marlboro Hsu

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
2484.26	72.38	-1.62	74	67.82	32.38	6.18	34	180	26	Peak
2483.6	50.76	-3.24	54	46.2	32.38	6.18	34	180	26	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
2484.34	70.78	-3.22	74	66.22	32.38	6.18	34	156	53	Peak
2483.52	49.06	-4.94	54	44.5	32.38	6.18	34	156	53	Average

**<Sample 2>**

Test Mode :	802.11g	Temperature :	23~24°C
Test Band :	High	Relative Humidity :	50~52%
Test Channel :	11	Test Engineer :	Marlboro Hsu

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
2484.86	70.84	-3.16	74	66.28	32.38	6.18	34	121	52	Peak
2483.5	48.07	-5.93	54	43.51	32.38	6.18	34	121	52	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
2483.54	65.69	-8.31	74	61.13	32.38	6.18	34	156	109	Peak
2483.56	43.52	-10.48	54	38.96	32.38	6.18	34	156	109	Average

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

<Sample 1>

Test Mode :	802.11b	Temperature :	23~24℃
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2412	103.08	-	-	98.67	32.31	6.07	33.97	123	222	Average
2412	107.77	-	-	103.36	32.31	6.07	33.97	123	222	Peak
4824	43.08	-30.92	74	57.46	33.97	9.12	57.47	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24℃
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2412	99.58	-	-	95.17	32.31	6.07	33.97	164	101	Average
2412	104.18	-	-	99.77	32.31	6.07	33.97	164	101	Peak
4824	42.69	-31.31	74	57.07	33.97	9.12	57.47	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	103.62	-	-	99.14	32.35	6.11	33.98	151	360	Average
2437	108.33	-	-	103.85	32.35	6.11	33.98	151	360	Peak
4875	41.79	-32.21	74	66.47	0	9.13	33.81	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	101.41	-	-	96.93	32.35	6.11	33.98	174	318	Average
2437	105.93	-	-	101.45	32.35	6.11	33.98	174	318	Peak
4875	41.9	-32.1	74	56.3	33.95	9.13	57.48	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	105.72	-	-	101.2	32.37	6.14	33.99	150	149	Average
2462	110.29	-	-	105.77	32.37	6.14	33.99	150	149	Peak
4923	43.34	-30.66	74	57.75	33.93	9.14	57.48	100	0	Peak

Test Mode :	802.11b	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	102.53	-	-	98.01	32.37	6.14	33.99	133	291	Average
2462	106.98	-	-	102.46	32.37	6.14	33.99	133	291	Peak
4923	42.5	-31.5	74	56.91	33.93	9.14	57.48	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2412	96.52	-	-	92.11	32.31	6.07	33.97	151	0	Average
2412	107.25	-	-	102.84	32.31	6.07	33.97	151	0	Peak
4824	42.71	-31.29	74	57.09	33.97	9.12	57.47	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2412	91.77	-	-	87.36	32.31	6.07	33.97	130	355	Average
2412	101.95	-	-	97.54	32.31	6.07	33.97	130	355	Peak
4824	42.74	-31.26	74	57.12	33.97	9.12	57.47	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 2520 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 105.57 - 20dB = 85.57 dBuV/m. 3. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	95.13	-	-	90.65	32.35	6.11	33.98	179	3	Average
2437	105.57	-	-	101.09	32.35	6.11	33.98	179	3	Peak
2520	53.66	-31.91	85.57	49.04	32.41	6.21	34	100	0	Peak
4875	42.24	-31.76	74	56.64	33.95	9.13	57.48	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. 2522 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. 3. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	90.81	-	-	86.33	32.35	6.11	33.98	100	0	Average
2437	101.01	-	-	96.53	32.35	6.11	33.98	100	0	Peak
2522	50.59	-30.42	81.01	45.95	32.43	6.21	34	100	0	Peak
4875	42.28	-31.72	74	56.68	33.95	9.13	57.48	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
151.23	32.43	-11.07	43.5	51.48	11.13	1.21	31.39	-	-	Peak
206.04	34.79	-8.71	43.5	55.33	9.5	1.34	31.38	-	-	Peak
213.06	36.33	-7.17	43.5	56.27	10.04	1.38	31.36	101	187	Peak
342	31.05	-14.95	46	46.1	14.45	1.91	31.41	-	-	Peak
348.3	29.9	-16.1	46	44.74	14.61	1.96	31.41	-	-	Peak
428.8	28.52	-17.48	46	40.87	16.61	2.24	31.2	-	-	Peak
2410	53.68	-20.32	74	49.27	32.31	6.07	33.97	100	0	Peak
2462	96.28	-	-	91.76	32.37	6.14	33.99	100	43	Average
2462	106.7	-	-	102.18	32.37	6.14	33.99	100	43	Peak
4923	42.31	-31.69	74	56.72	33.93	9.14	57.48	100	0	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
30.81	27.52	-12.48	40	39.57	19.28	0.54	31.87	105	214	Peak
43.23	27.13	-12.87	40	47.14	11.1	0.64	31.75	-	-	Peak
152.31	27.03	-16.47	43.5	46.15	11.06	1.21	31.39	-	-	Peak
425.3	26.53	-19.47	46	38.97	16.55	2.23	31.22	-	-	Peak
457.5	28.34	-17.66	46	39.97	17.21	2.32	31.16	-	-	Peak
467.3	27.54	-18.46	46	38.88	17.41	2.34	31.09	-	-	Peak
2462	92.94	-	-	88.42	32.37	6.14	33.99	133	60	Average
2462	102.83	-	-	98.31	32.37	6.14	33.99	133	60	Peak
4923	42.12	-31.88	74	56.53	33.93	9.14	57.48	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2412	94.09	-	-	89.68	32.31	6.07	33.97	144	84	Average
2412	106.53	-	-	102.12	32.31	6.07	33.97	144	84	Peak
4824	41.9	-32.1	74	56.28	33.97	9.12	57.47	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	01	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2412	92.47	-	-	88.06	32.31	6.07	33.97	104	57	Average
2412	102.37	-	-	97.96	32.31	6.07	33.97	104	57	Peak
4824	42.29	-31.71	74	56.67	33.97	9.12	57.47	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	96.49	-	-	92.01	32.35	6.11	33.98	123	27	Average
2437	106.42	-	-	101.94	32.35	6.11	33.98	123	27	Peak
4875	42.39	-31.61	74	56.79	33.95	9.13	57.48	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	06	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2437	90.28	-	-	85.8	32.35	6.11	33.98	149	98	Average
2437	100.54	-	-	96.06	32.35	6.11	33.98	149	98	Peak
4875	39.88	-34.12	74	56.58	33.95	9.13	59.78	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	95.54	-	-	91.02	32.37	6.14	33.99	180	26	Average
2462	105.3	-	-	100.78	32.37	6.14	33.99	180	26	Peak
4923	42.5	-31.5	74	56.91	33.93	9.14	57.48	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
2462	93.83	-	-	89.31	32.37	6.14	33.99	156	53	Average
2462	103.52	-	-	99	32.37	6.14	33.99	156	53	Peak
4923	40.5	-33.5	74	57.01	33.93	9.14	59.58	100	0	Peak

<Sample 2>

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
45.12	27.23	-12.77	40	48.19	10.1	0.66	31.72	-	-	Peak
151.23	33.43	-10.07	43.5	52.48	11.13	1.21	31.39	-	-	Peak
213.06	35.33	-8.17	43.5	55.27	10.04	1.38	31.36	101	187	Peak
342	30.05	-15.95	46	45.1	14.45	1.91	31.41	-	-	Peak
618.5	22.96	-23.04	46	30.73	19.95	2.75	30.47	-	-	Peak
792.1	24.5	-21.5	46	29.61	21.98	3.13	30.22	-	-	Peak
2462	98.51	-	-	93.99	32.37	6.14	33.99	100	52	Average
2462	108.3	-	-	103.78	32.37	6.14	33.99	100	52	Peak
4923	41.68	-32.32	74	56.09	33.93	9.14	57.48	200	360	Peak

Test Mode :	802.11g	Temperature :	23~24°C
Test Channel :	11	Relative Humidity :	50~52%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

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
30.81	27.52	-12.48	40	39.57	19.28	0.54	31.87	100	56	Peak
152.31	26.03	-17.47	43.5	45.15	11.06	1.21	31.39	-	-	Peak
207.93	25.55	-17.95	43.5	45.96	9.64	1.35	31.4	-	-	Peak
351.8	22.86	-23.14	46	37.56	14.72	1.99	31.41	-	-	Peak
457.5	27.34	-18.66	46	38.97	17.21	2.32	31.16	-	-	Peak
828.5	24.82	-21.18	46	29.6	22.38	3.21	30.37	-	-	Peak
2462	92.31	-	-	87.79	32.37	6.14	33.99	156	109	Average
2462	101.78	-	-	97.26	32.37	6.14	33.99	156	109	Peak
4923	40.27	-33.73	74	54.68	33.93	9.14	57.48	100	0	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.

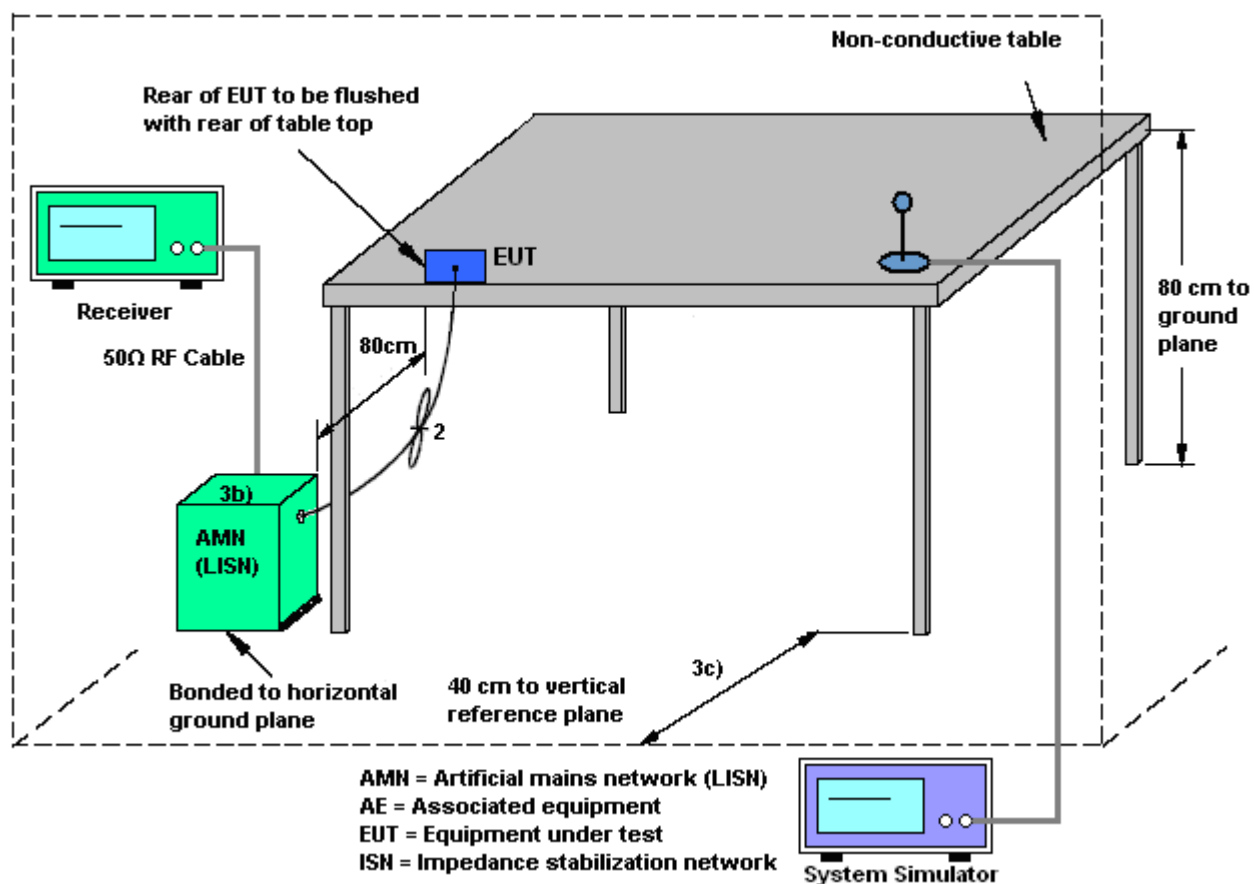
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

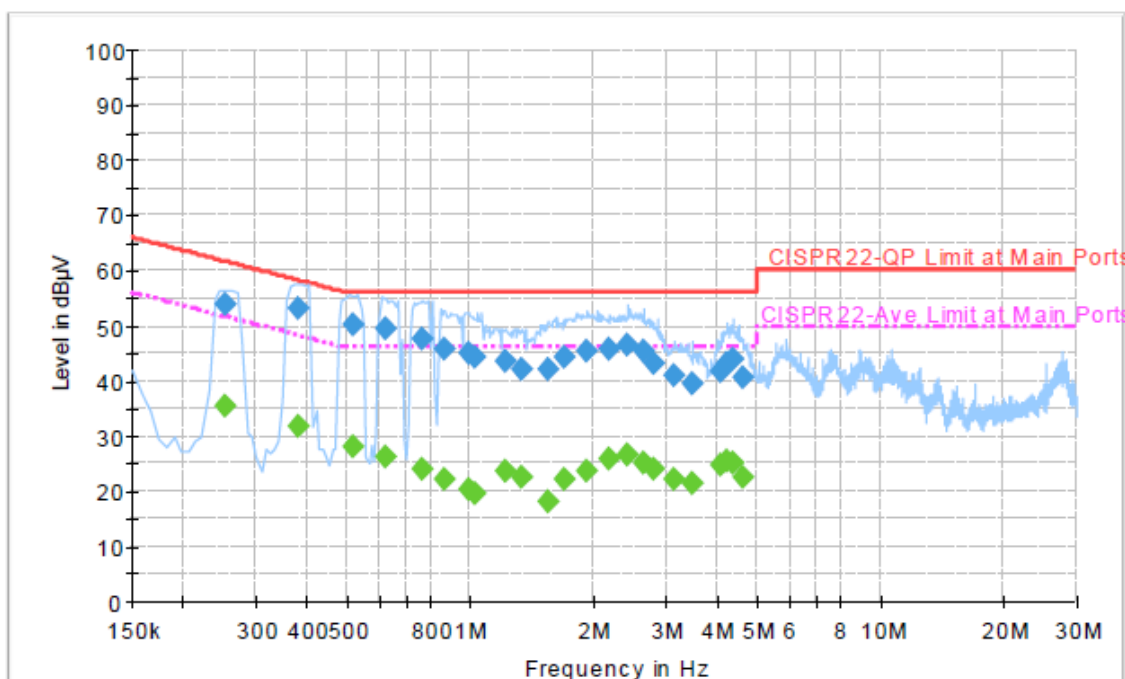
1. The testing follows the guidelines in ANSI C63.4-2003 and ANSI C63.10-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance 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

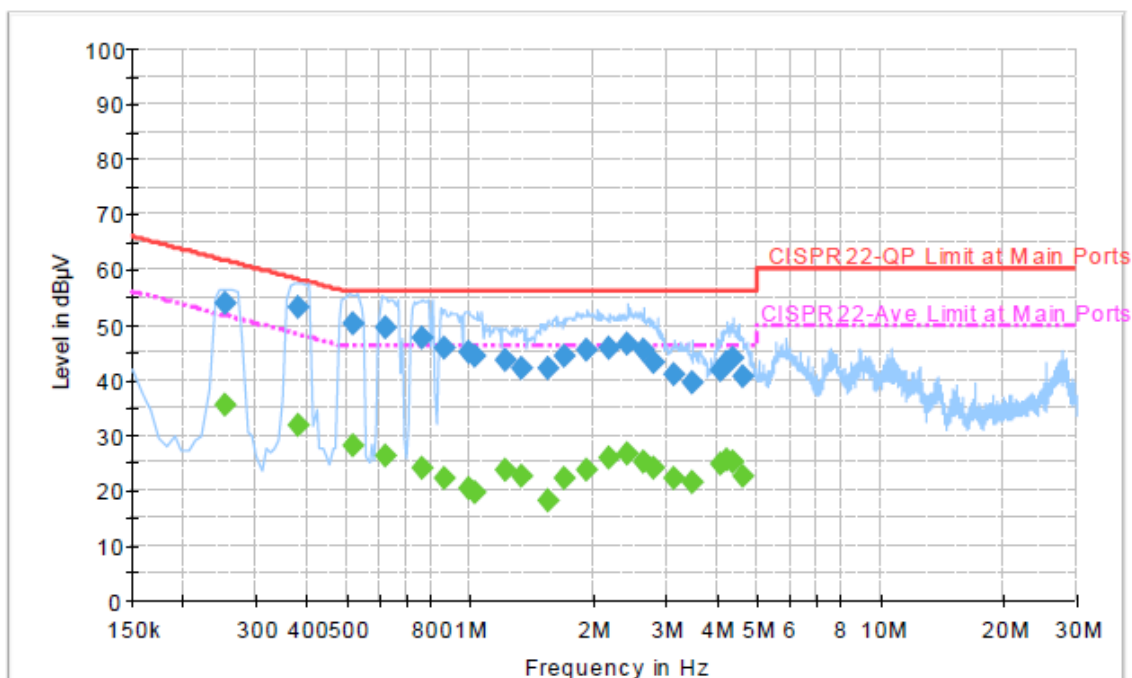
Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + USB Cable 1 (Charging from Adapter 4) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result : Quasi-Peak

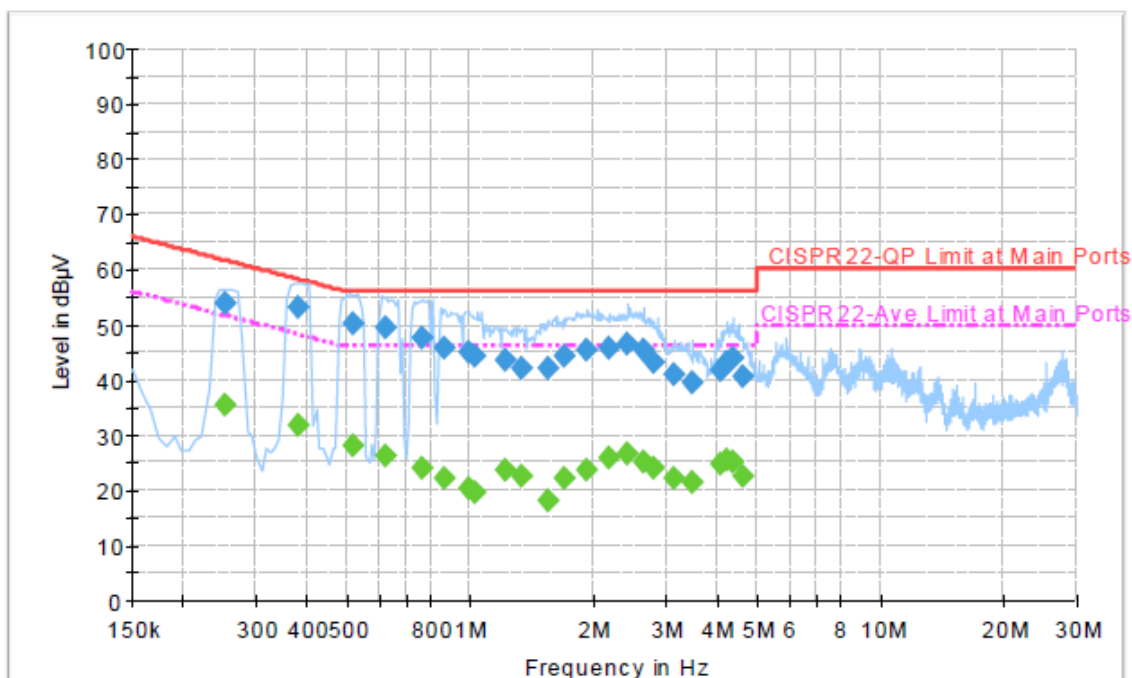
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.254000	54.0	Off	L1	19.5	7.6	61.6
0.382000	53.1	Off	L1	19.4	5.1	58.2
0.518000	50.2	Off	L1	19.4	5.8	56.0
0.622000	49.3	Off	L1	19.4	6.7	56.0
0.766000	47.6	Off	L1	19.5	8.4	56.0
0.870000	45.8	Off	L1	19.5	10.2	56.0
0.990000	45.1	Off	L1	19.4	10.9	56.0
1.030000	44.3	Off	L1	19.4	11.7	56.0
1.222000	43.5	Off	L1	19.5	12.5	56.0
1.334000	42.2	Off	L1	19.4	13.8	56.0
1.542000	41.9	Off	L1	19.4	14.1	56.0
1.694000	44.2	Off	L1	19.5	11.8	56.0
1.934000	45.5	Off	L1	19.5	10.5	56.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + USB Cable 1 (Charging from Adapter 4) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Quasi-Peak

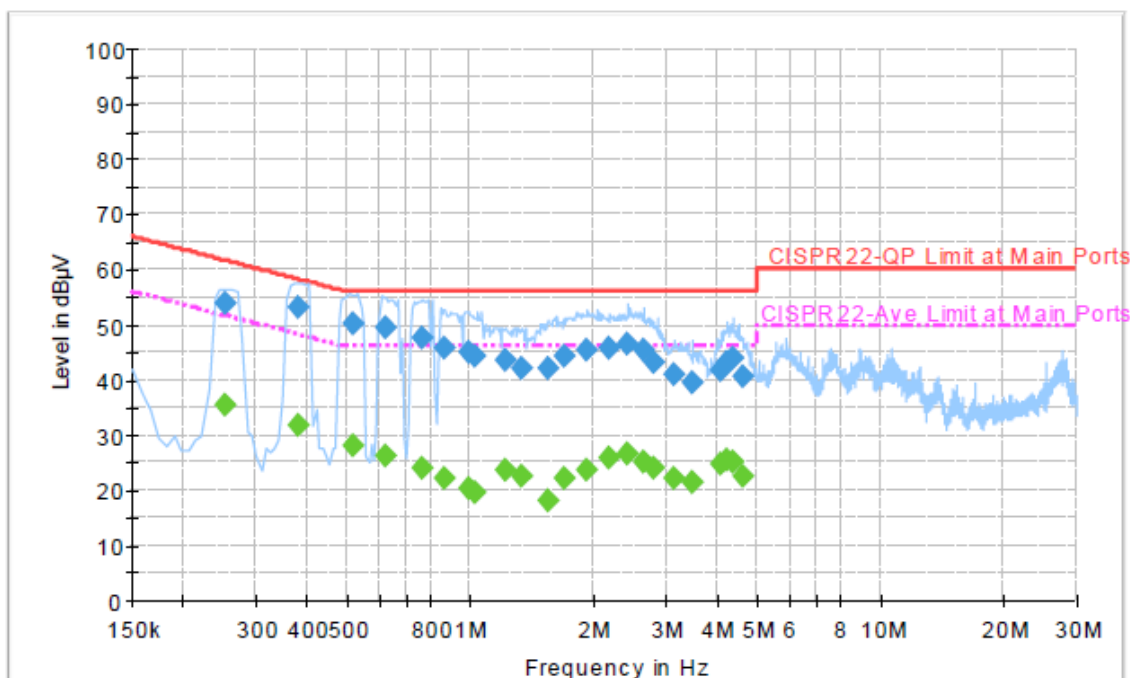
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.190000	45.9	Off	L1	19.6	10.1	56.0
2.414000	46.5	Off	L1	19.6	9.5	56.0
2.654000	45.6	Off	L1	19.5	10.4	56.0
2.806000	43.3	Off	L1	19.6	12.7	56.0
3.134000	41.0	Off	L1	19.6	15.0	56.0
3.494000	39.3	Off	L1	19.6	16.7	56.0
4.094000	41.8	Off	L1	19.6	14.2	56.0
4.214000	43.2	Off	L1	19.6	12.8	56.0
4.366000	43.7	Off	L1	19.6	12.3	56.0
4.646000	40.7	Off	L1	19.6	15.3	56.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + USB Cable 1 (Charging from Adapter 4) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

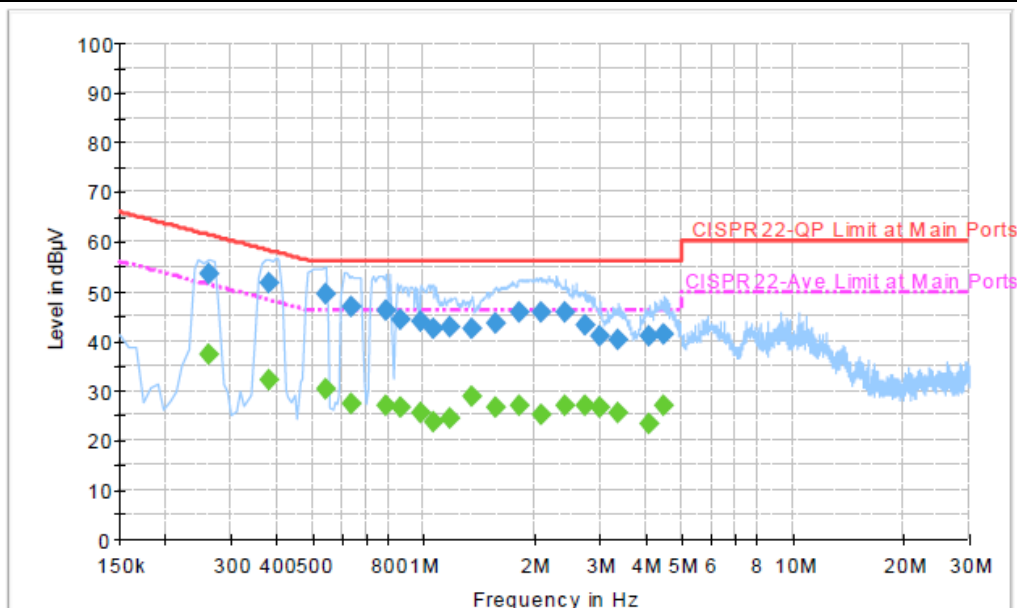
Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.254000	35.5	Off	L1	19.5	16.1	51.6
0.382000	31.6	Off	L1	19.4	16.6	48.2
0.518000	28.1	Off	L1	19.4	17.9	46.0
0.622000	26.0	Off	L1	19.4	20.0	46.0
0.766000	24.0	Off	L1	19.5	22.0	46.0
0.870000	22.3	Off	L1	19.5	23.7	46.0
0.990000	20.4	Off	L1	19.4	25.6	46.0
1.030000	19.7	Off	L1	19.4	26.3	46.0
1.222000	23.7	Off	L1	19.5	22.3	46.0
1.334000	22.5	Off	L1	19.4	23.5	46.0
1.542000	18.2	Off	L1	19.4	27.8	46.0
1.694000	22.1	Off	L1	19.5	23.9	46.0
1.934000	23.7	Off	L1	19.5	22.3	46.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + USB Cable 1 (Charging from Adapter 4) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

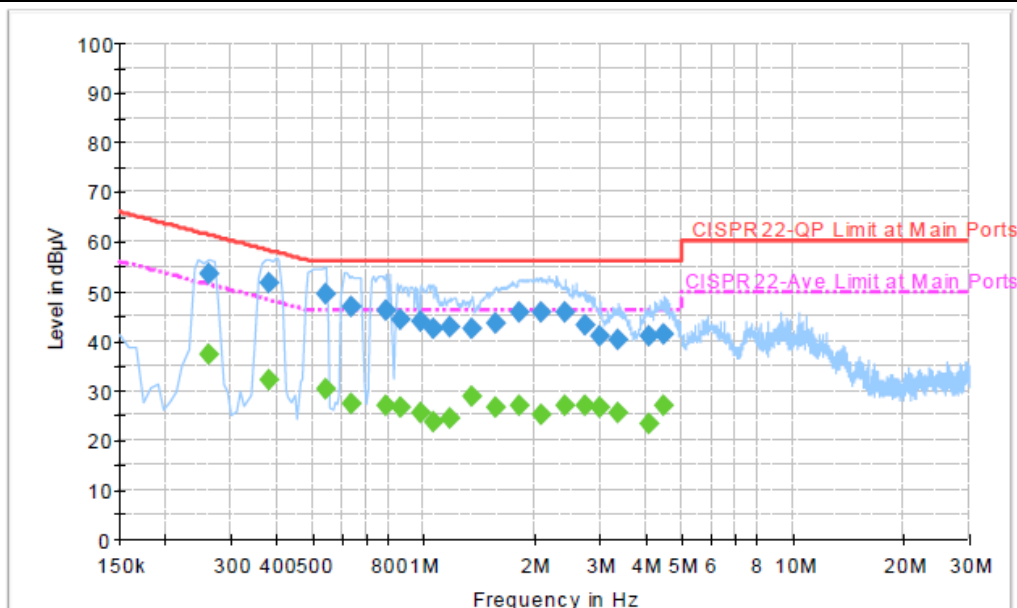
Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.190000	25.7	Off	L1	19.6	20.3	46.0
2.414000	26.6	Off	L1	19.6	19.4	46.0
2.654000	25.1	Off	L1	19.5	20.9	46.0
2.806000	24.0	Off	L1	19.6	22.0	46.0
3.134000	22.0	Off	L1	19.6	24.0	46.0
3.494000	21.5	Off	L1	19.6	24.5	46.0
4.094000	24.6	Off	L1	19.6	21.4	46.0
4.214000	25.4	Off	L1	19.6	20.6	46.0
4.366000	25.1	Off	L1	19.6	20.9	46.0
4.646000	22.4	Off	L1	19.6	23.6	46.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + USB Cable 1 (Charging from Adapter 4) for Sample 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)
0.262000	53.5	Off	N	19.4	7.9	61.4
0.382000	51.8	Off	N	19.4	6.4	58.2
0.542000	49.5	Off	N	19.4	6.5	56.0
0.638000	47.0	Off	N	19.4	9.0	56.0
0.790000	46.2	Off	N	19.5	9.8	56.0
0.870000	44.3	Off	N	19.5	11.7	56.0
0.982000	44.0	Off	N	19.5	12.0	56.0
1.062000	42.4	Off	N	19.4	13.6	56.0
1.182000	42.6	Off	N	19.5	13.4	56.0
1.358000	42.5	Off	N	19.5	13.5	56.0
1.566000	43.5	Off	N	19.4	12.5	56.0
1.814000	45.7	Off	N	19.5	10.3	56.0
2.094000	45.7	Off	N	19.6	10.3	56.0
2.414000	45.7	Off	N	19.7	10.3	56.0
2.726000	43.2	Off	N	19.6	12.8	56.0
2.998000	41.0	Off	N	19.6	15.0	56.0
3.374000	40.4	Off	N	19.7	15.6	56.0
4.102000	40.9	Off	N	19.6	15.1	56.0
4.462000	41.4	Off	N	19.6	14.6	56.0

Test Mode :	Mode 2	Temperature :	20~22°C
Test Engineer :	Slash Huang	Relative Humidity :	45~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link + GPS Rx + Earphone 1 + USB Cable 1 (Charging from Adapter 4) for Sample 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		


Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.262000	37.3	Off	N	19.4	14.1	51.4
0.382000	32.2	Off	N	19.4	16.0	48.2
0.542000	30.3	Off	N	19.4	15.7	46.0
0.638000	27.3	Off	N	19.4	18.7	46.0
0.790000	27.0	Off	N	19.5	19.0	46.0
0.870000	26.7	Off	N	19.5	19.3	46.0
0.982000	25.6	Off	N	19.5	20.4	46.0
1.062000	23.5	Off	N	19.4	22.5	46.0
1.182000	24.3	Off	N	19.5	21.7	46.0
1.358000	28.7	Off	N	19.5	17.3	46.0
1.566000	26.5	Off	N	19.4	19.5	46.0
1.814000	27.0	Off	N	19.5	19.0	46.0
2.094000	25.2	Off	N	19.6	20.8	46.0
2.414000	26.9	Off	N	19.7	19.1	46.0
2.726000	27.0	Off	N	19.6	19.0	46.0
2.998000	26.7	Off	N	19.6	19.3	46.0
3.374000	25.4	Off	N	19.7	20.6	46.0
4.102000	23.2	Off	N	19.6	22.8	46.0
4.462000	26.8	Off	N	19.6	19.2	46.0

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	Sep. 13, 2012 ~ Oct. 05, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Sep. 08, 2012	Sep. 13, 2012 ~ Oct. 05, 2012	Sep. 07, 2013	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Sep. 08, 2012	Sep. 13, 2012 ~ Oct. 05, 2012	Sep. 07, 2013	Conducted (TH02-HY)
EMI Test Receiver	R&S	ESCS 30	100356	9KHz ~ 2.75GHz	Oct. 27, 2011	Sep. 17, 2012 ~ Oct. 13, 2012	Oct. 26, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9KHz ~ 30MHz	Dec. 09, 2011	Sep. 17, 2012 ~ Oct. 13, 2012	Dec. 08, 2012	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9KHz ~ 30MHz	Dec. 06, 2011	Sep. 17, 2012 ~ Oct. 13, 2012	Dec. 05, 2012	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Sep. 17, 2012 ~ Oct. 13, 2012	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Sep. 17, 2012 ~ Oct. 13, 2012	Jul. 27, 2013	Conduction (CO05-HY)
GPS Station	T&E	GS-50	N/A	N/A	N/A	Sep. 17, 2012 ~ Oct. 13, 2012	N/A	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	Sep. 26, 2012 ~ Oct. 06, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 06, 2012	Oct. 06, 2012 ~ Oct. 25, 2012	Oct. 05, 2013	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	Sep. 26, 2012 ~ Oct. 25, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2012	Sep. 26, 2012 ~ Oct. 25, 2012	Jul. 31, 2013	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz ~ 26.5GHz	Dec. 05, 2011	Sep. 26, 2012 ~ Oct. 25, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB.GAIN	Feb. 27, 2012	Sep. 26, 2012 ~ Oct. 25, 2012	Feb. 26, 2013	Radiation (03CH07-HY)
Signal Analyzer	Rohde & Schwarz	FSQ	200578/026	20Hz~26.5GHz	Feb. 06, 2012	Sep. 26, 2012 ~ Oct. 25, 2012	Feb. 05, 2013	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-00101800-30-10P	159088	1GHz ~ 18GHz	Mar. 10, 2012	Sep. 26, 2012 ~ Oct. 25, 2012	Mar. 09, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Oct. 21, 2011	Sep. 26, 2012 ~ Sep. 28, 2012	Oct. 20, 2012	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Sep. 28, 2012 ~ Oct. 25, 2012	Sep. 27, 2013	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Sep. 26, 2012 ~ Oct. 25, 2012	Jul. 28, 2012	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72
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