

FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : Wireless Data Terminal
BRAND NAME : ZTE
MODEL NAME : K75
FCC ID : Q78-K75
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on Oct. 25, 2012 and completely tested on Nov. 21, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR202503B	Rev. 01	Initial issue of report	Nov. 29, 2012
FR202503B	Rev. 02	Update report for revising the Equipment Name	Dec. 05, 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 and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.3 dB at 549.020 MHz
3.6	15.207	Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 14.31 dB at 0.930 MHz
3.7	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Wireless Data Terminal
Brand Name	ZTE
Model Name	K75
FCC ID	Q78-K75
EUT supports Radios application	WLAN 11bgn / Bluetooth
HW Version	K75_V1MB_C
SW Version	K75_V1_BR1_W1G1_V002
EUT Stage	Identical Prototype

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=1~11
Maximum Output Power to Antenna	802.11b : 19.27 dBm (0.0845 W) 802.11g : 22.12 dBm (0.1629 W) 802.11n HT20 : 22.18 dBm (0.1652 W)
Antenna Type	PIFA Antenna with gain -1.00 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 (KUNSHAN) INC.			
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC/IC Registration No.
	TH01-KS	CO01-KS	03CH01-KS	149928/4086E-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
- ♦ 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.	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	P08S	QDS-BRCM1030	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	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 (Y 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.

Channel	Frequency	2.4GHz 802.11b RF Power (dBm)			
		DSSS Data Rate			
		1 Mbps	2 Mbps	5.5 Mbps	11 Mbps
CH 01	2412 MHz	18.19	17.05	17.23	17.12
CH 06	2437 MHz	18.68	18.01	18	18.09
CH 11	2462 MHz	19.27	19.08	19.09	19.26

Channel	Frequency	2.4GHz 802.11g RF Power (dBm)							
		OFDM Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 01	2412 MHz	20.14	20.05	20.08	19.96	20.12	19.72	20.08	20.13
CH 06	2437 MHz	21.52	21.05	21.07	20.78	21.15	21.22	20.93	21.01
CH 11	2462 MHz	22.12	22.04	22.03	21.89	22.03	22.02	21.72	22.08

Channel	Frequency	2.4GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		MCS=0	MCS=1	MCS=2	MCS=3	MCS=4	MCS=5	MCS=6	MCS=7
CH 01	2412 MHz	20.19	19.77	19.87	20.03	20.01	19.87	20.12	19.98
CH 06	2437 MHz	21.22	21.08	21.06	20.68	21.01	20.56	20.55	20.78
CH 11	2462 MHz	22.18	21.95	21.83	21.77	21.56	21.89	22.15	22.14

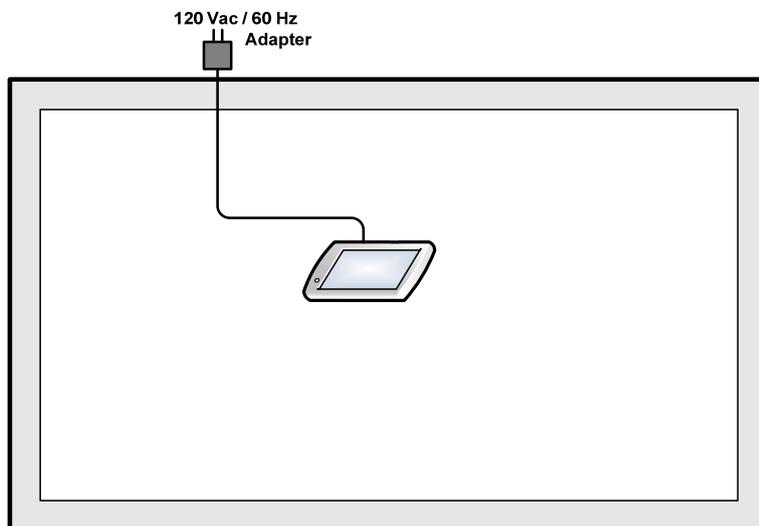
2.3 Test Mode

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

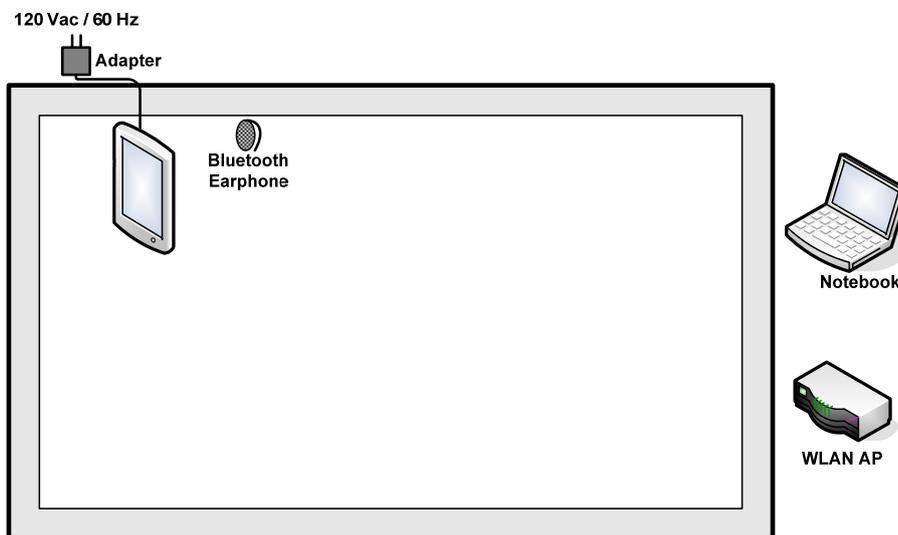
Test Cases				
	Test Items	Mode	Data Rate	Test Channel
Conducted TCs	6dB and BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	6.5 Mbps	1/6/11
	Conducted Band EDGE	802.11b	1 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 : Bluetooth Link + WLAN Link + USB Cable 1 (Charging from Adapter)			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 RF Utility

For WLAN function, programmed RF utility, “ADB” installed in the EUT make the EUT provides functions like channel selection and power level 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.

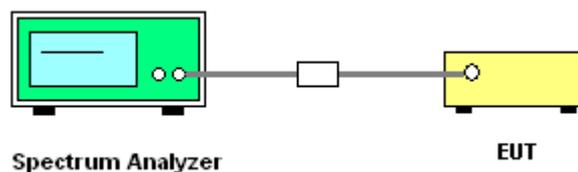
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows 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 RF cable and attenuator. 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. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.
5. Measure and record the results in the test report.

3.1.4 Test Setup

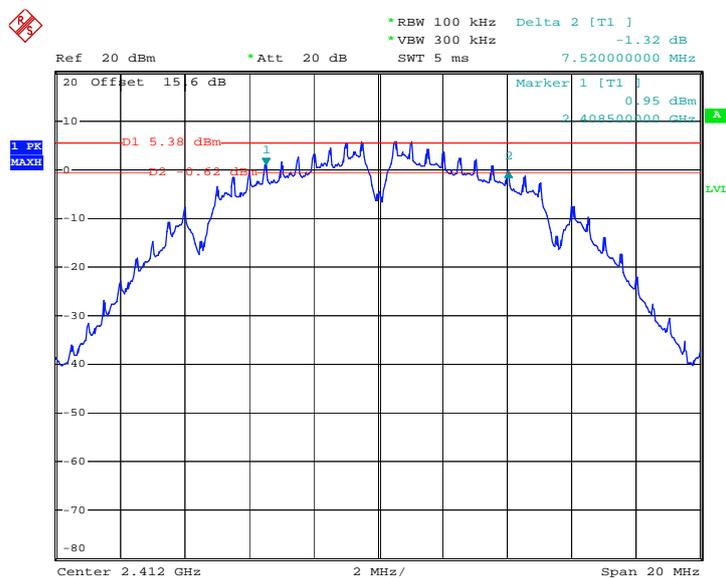


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	802.11b	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11b 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	7.52	0.5	Pass
06	2437	7.50	0.5	Pass
11	2462	7.52	0.5	Pass

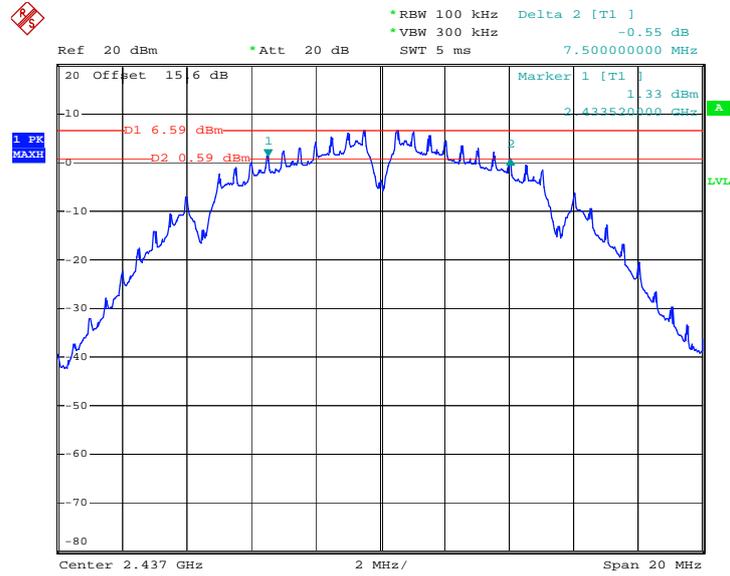
6 dB Bandwidth Plot on 802.11b Channel 01



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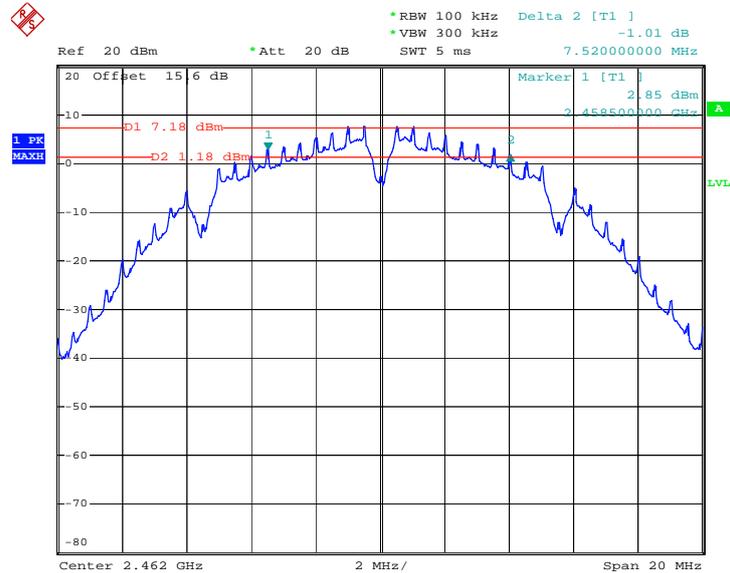


6 dB Bandwidth Plot on 802.11b Channel 06



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6 dB Bandwidth Plot on 802.11b Channel 11



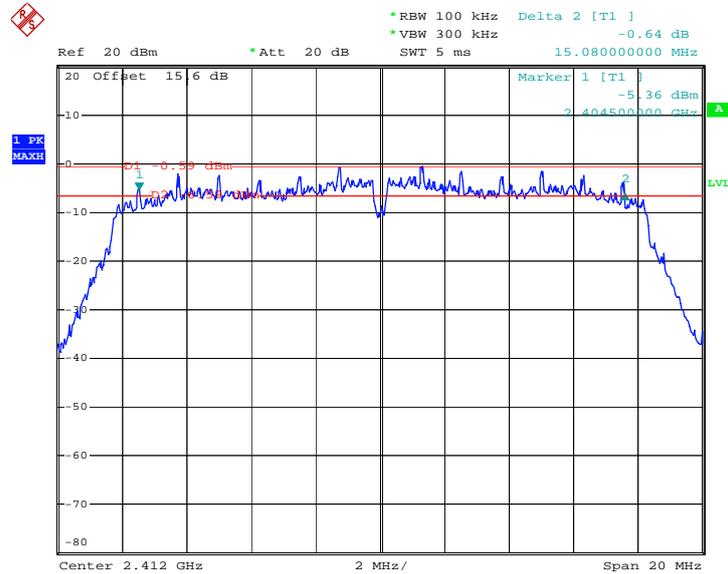
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Test Mode :	802.11g	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11g 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.08	0.5	Pass
06	2437	15.12	0.5	Pass
11	2462	15.12	0.5	Pass

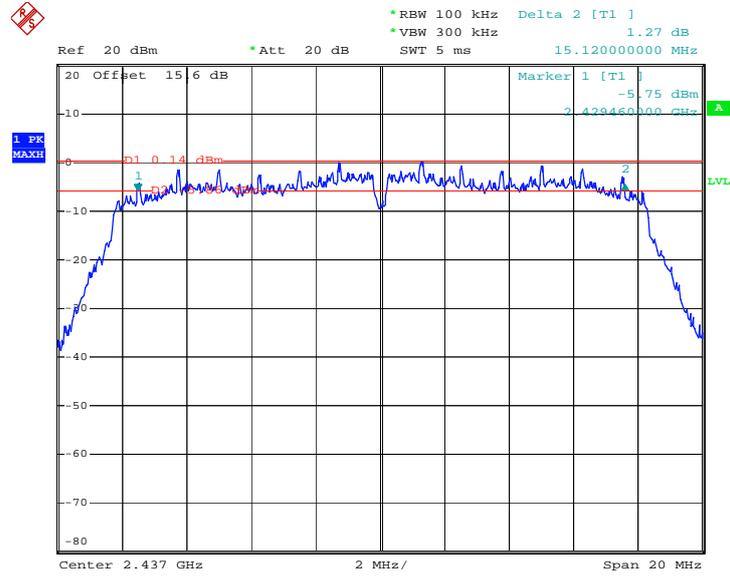
6 dB Bandwidth Plot on 802.11g Channel 01



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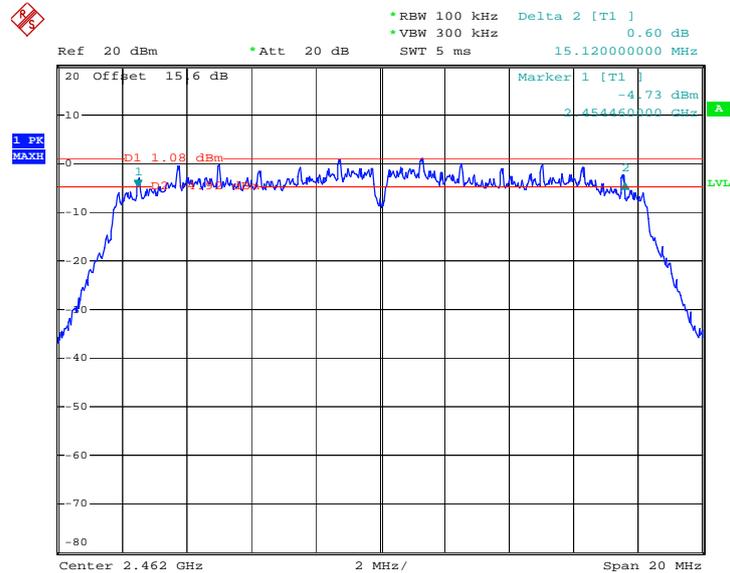


6 dB Bandwidth Plot on 802.11g Channel 06



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6 dB Bandwidth Plot on 802.11g Channel 11



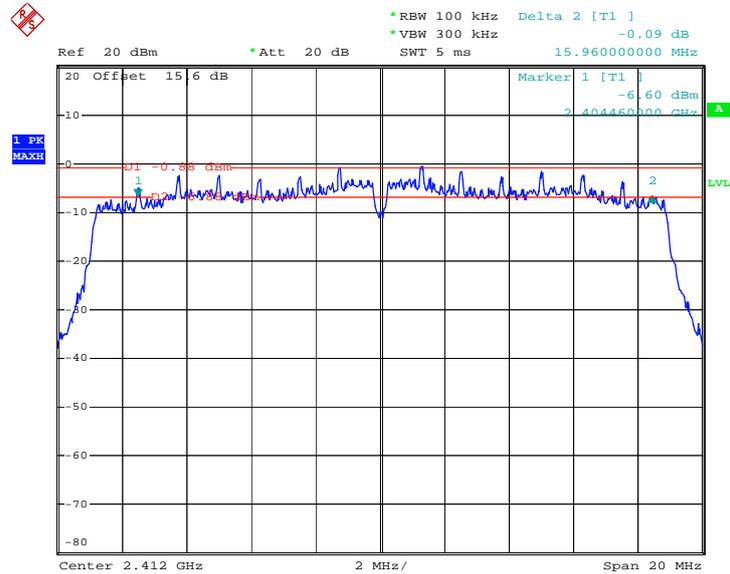
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Test Mode :	802.11n HT20	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
01	2412	15.96	0.5	Pass
06	2437	15.08	0.5	Pass
11	2462	15.12	0.5	Pass

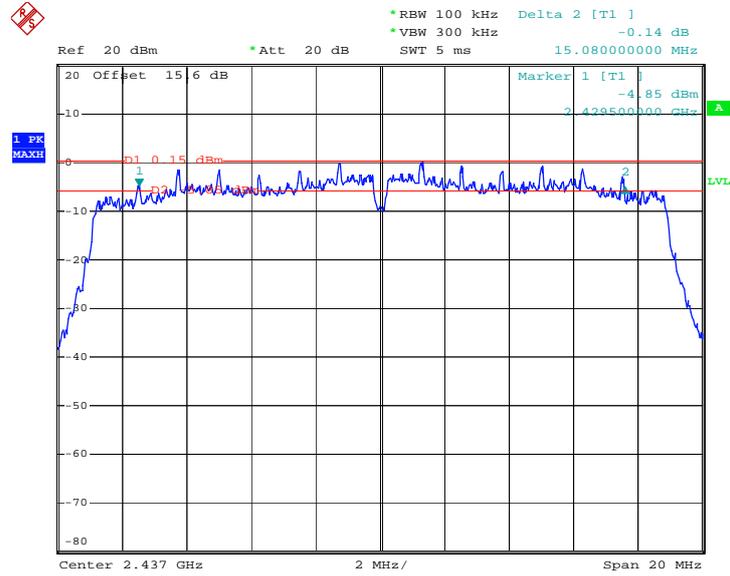
6 dB Bandwidth Plot on 802.11n HT20 Channel 01



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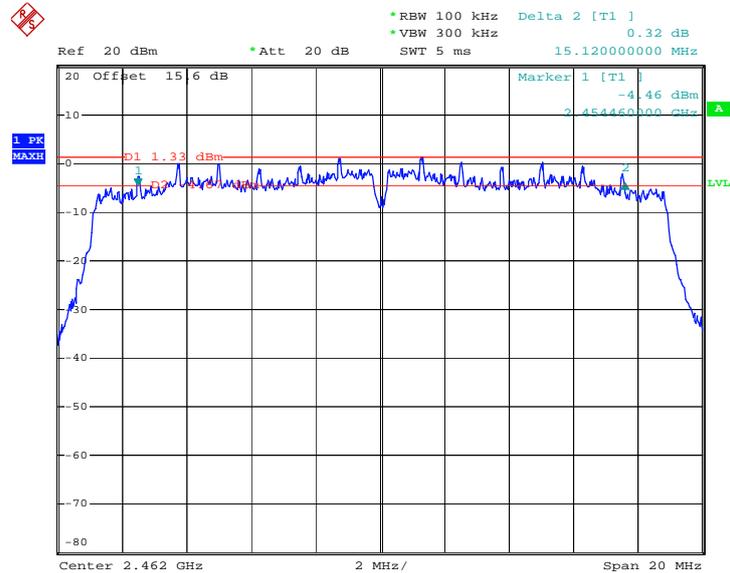


6 dB Bandwidth Plot on 802.11n HT20 Channel 06



Date: 11.NOV.2012 15:41:20

6 dB Bandwidth Plot on 802.11n HT20 Channel 11



Date: 11.NOV.2012 15:44:21

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.

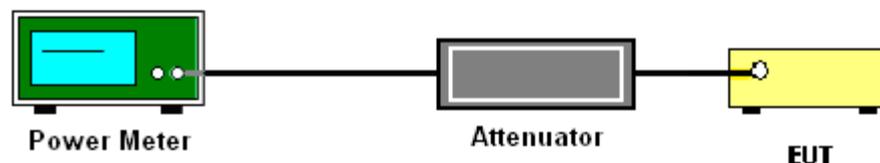
3.2.2 Measuring Instruments

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 :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11b Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	18.19	30	Pass
06	2437	18.68	30	Pass
11	2462	19.27	30	Pass

Test Mode :	802.11g	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11g Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.14	30	Pass
06	2437	21.52	30	Pass
11	2462	22.12	30	Pass

Test Mode :	802.11n HT20	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	2.4GHz 802.11n HT20 Peak Output Power (dBm)	Max. Limits (dBm)	Pass/Fail
01	2412	20.19	30	Pass
06	2437	21.22	30	Pass
11	2462	22.18	30	Pass



3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	802.11b	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%
Duty Cycle:	98.62%	Duty Factor:	0.06dB

Channel	Frequency (MHz)	802.11b Average Output Power (dBm)
01	2412	14.91
06	2437	15.82
11	2462	16.04

Test Mode :	802.11g	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%
Duty Cycle:	92.81%	Duty Factor:	0.32dB

Channel	Frequency (MHz)	802.11g Average Output Power (dBm)
01	2412	11.78
06	2437	11.51
11	2462	12.65

Test Mode :	802.11n HT20	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%
Duty Cycle:	51.48%	Duty Factor:	2.88dB

Channel	Frequency (MHz)	802.11n HT20 Average Output Power (dBm)
01	2412	11.35
06	2437	12.03
11	2462	13.16

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.

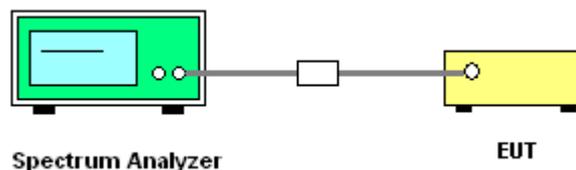
3.3.2 Measuring Instruments

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) = 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)
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.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Test Mode :	802.11b	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11b Power Density		Max. Limits (dBm)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	5.87	-7.85	8	Pass
06	2437	6.74	-6.99	8	Pass
11	2462	7.76	-6.66	8	Pass

Test Mode :	802.11g	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802.11g Power Density		Max. Limits (dBm)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-0.59	-14.78	8	Pass
06	2437	-0.09	-14.73	8	Pass
11	2462	1.08	-13.36	8	Pass

Test Mode :	802.11n HT20	Temperature :	20~21°C
Test Engineer :	Zhi Lu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	802. 11n HT20 Power Density		Max. Limits (dBm)	Pass/Fail
		PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2412	-0.55	-14.52	8	Pass
06	2437	-0.04	-13.59	8	Pass
11	2462	1.27	-11.94	8	Pass

Note:

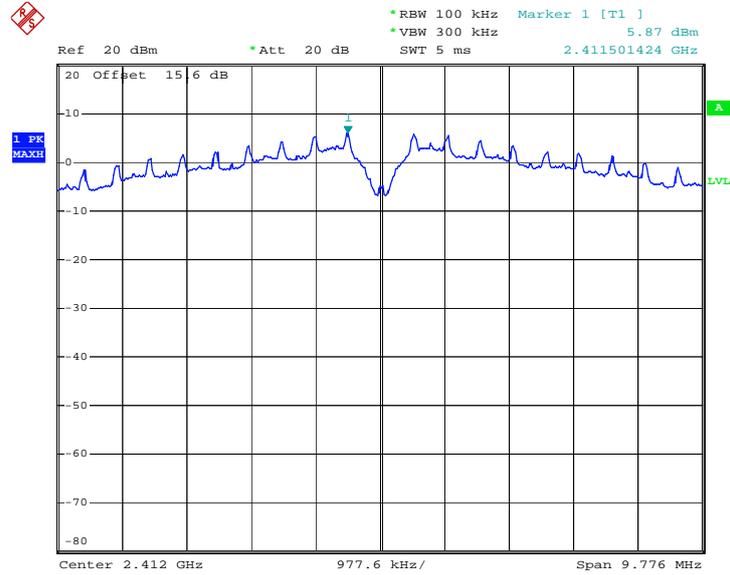
1. Measured power density (dBm) has offset with cable loss.
2. Measured power density (dBm)/ 100KHz is for 20dBc reference only



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

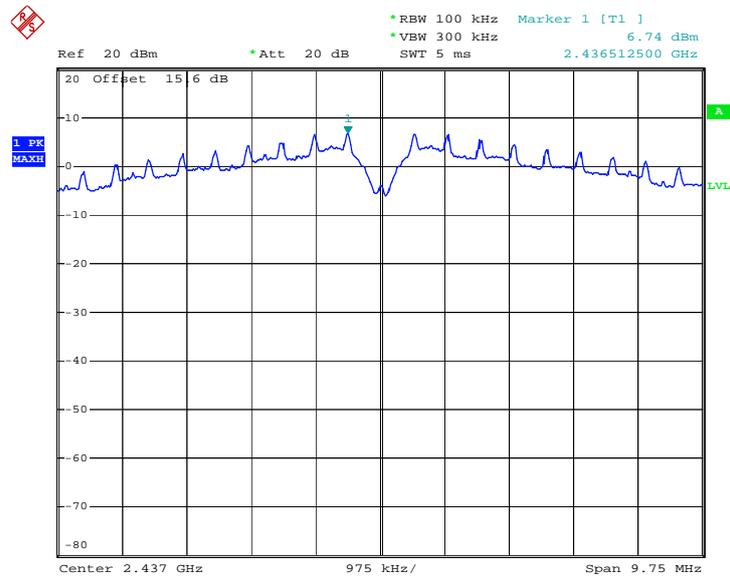
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PSD 100KHz Plot on 802.11b Channel 01



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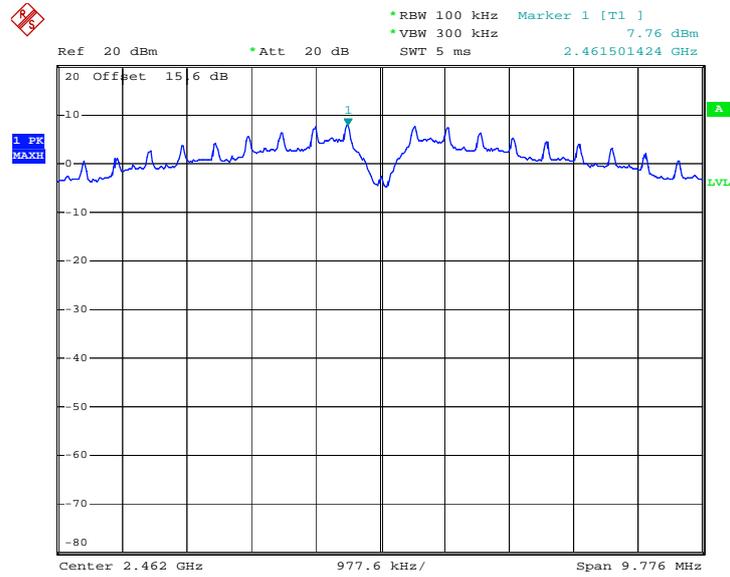
PSD 100KHz Plot on 802.11b Channel 06



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PSD 100KHz Plot on 802.11b Channel 11

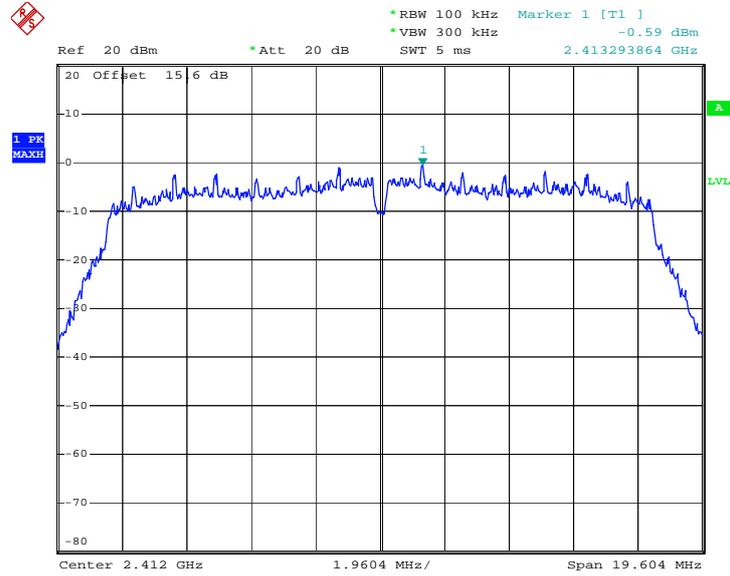


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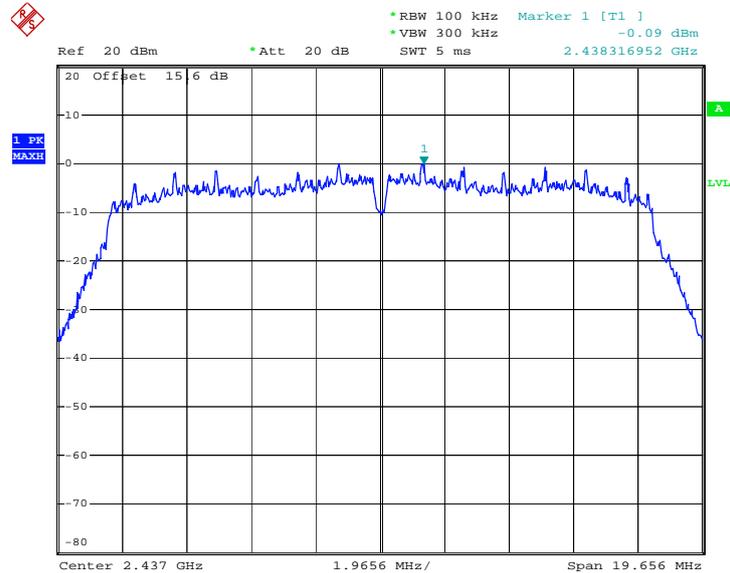
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PSD 100KHz Plot on 802.11g Channel 01



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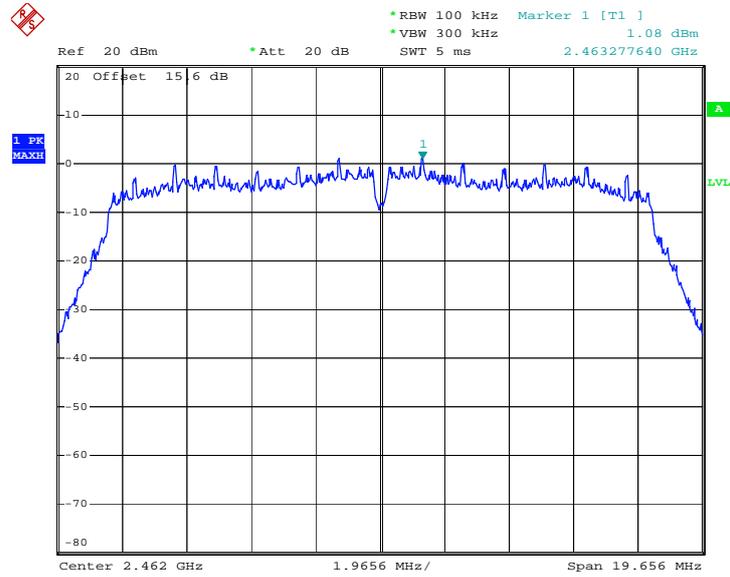
PSD 100KHz Plot on 802.11g Channel 06



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PSD 100KHz Plot on 802.11g Channel 11

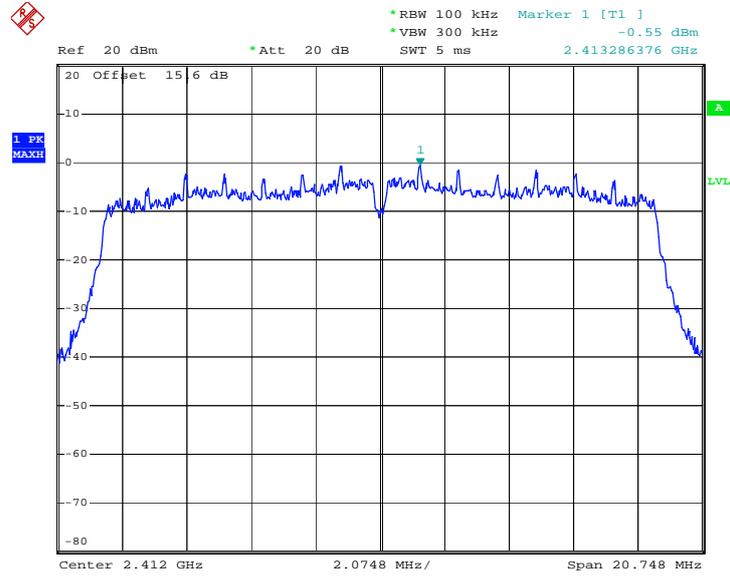


Date: 11.NOV.2012 15:34:00



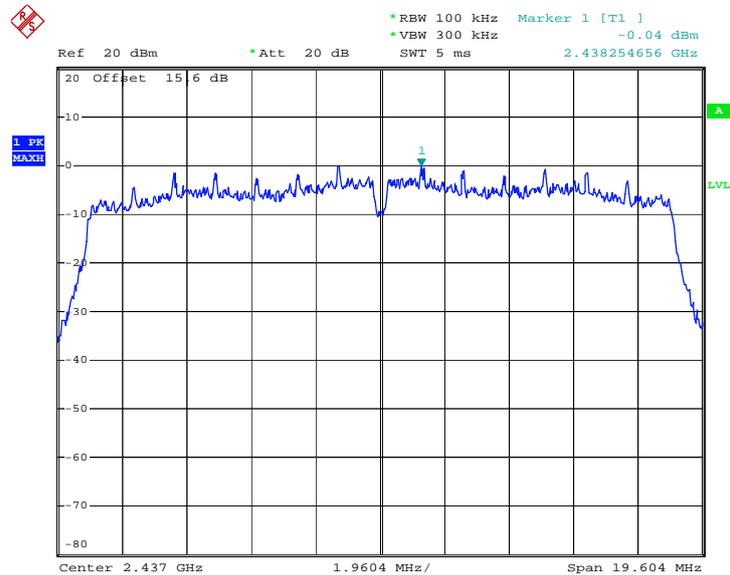
<2.4GHz 802.11n HT-20>

PSD 100KHz Plot on 2.4G 802.11n HT20 Channel 01



Date: 11.NOV.2012 15:38:48

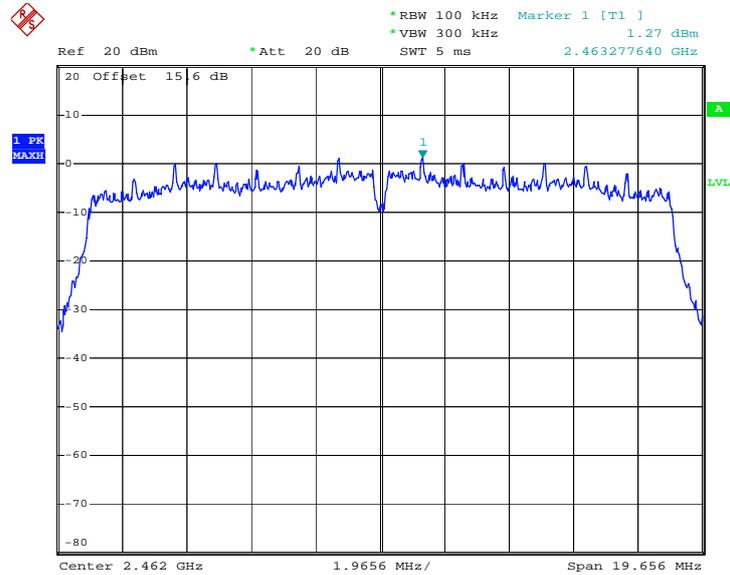
PSD 100KHz Plot on 2.4G 802.11n HT20 Channel 06



Date: 11.NOV.2012 15:41:41



PSD 100KHz Plot on 2.4G 802.11n HT20 Channel 11



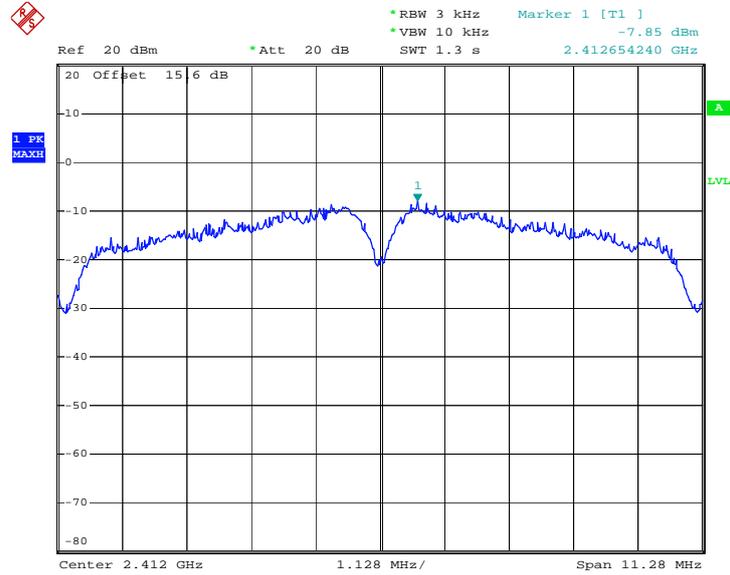
Date: 11.NOV.2012 15:44:44



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

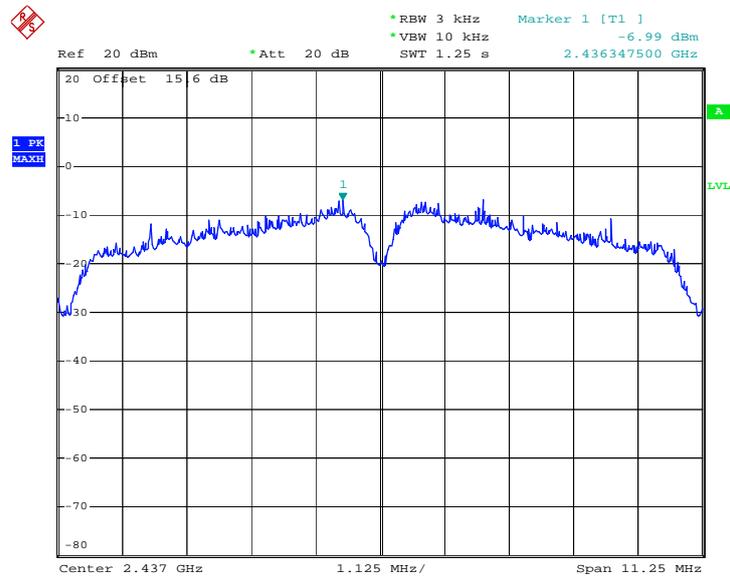
<802.11b>

PSD 3KHz Plot on 802.11b Channel 01



Date: 11.NOV.2012 16:06:10

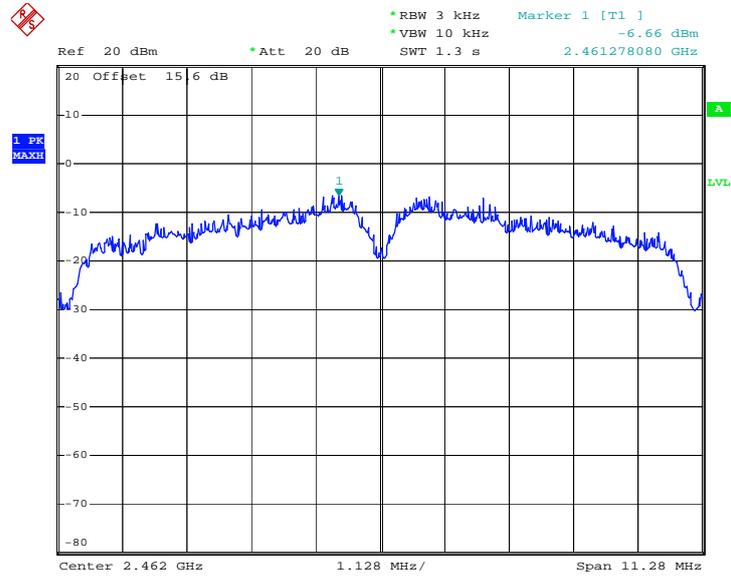
PSD 3KHz Plot on 802.11b Channel 06



Date: 11.NOV.2012 16:07:08



PSD 3KHz Plot on 802.11b Channel 11

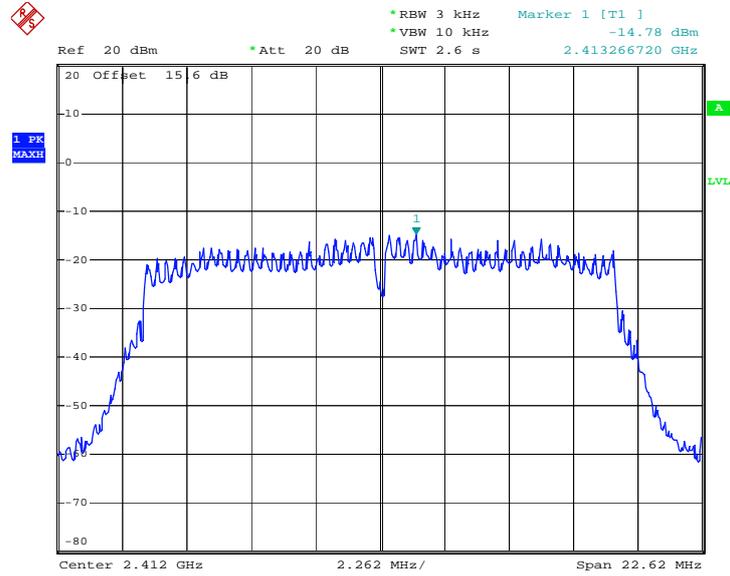


Date: 11.NOV.2012 16:07:53



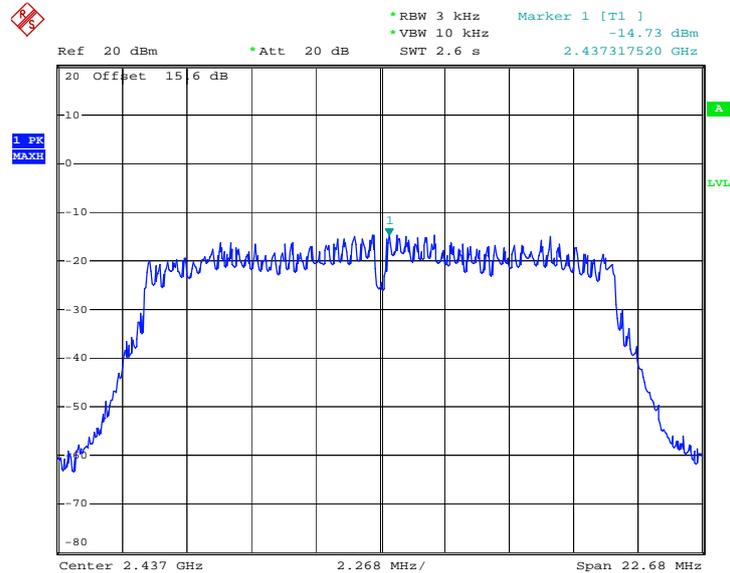
<802.11g>

PSD 3KHz Plot on 802.11g Channel 01



Date: 11.NOV.2012 16:03:36

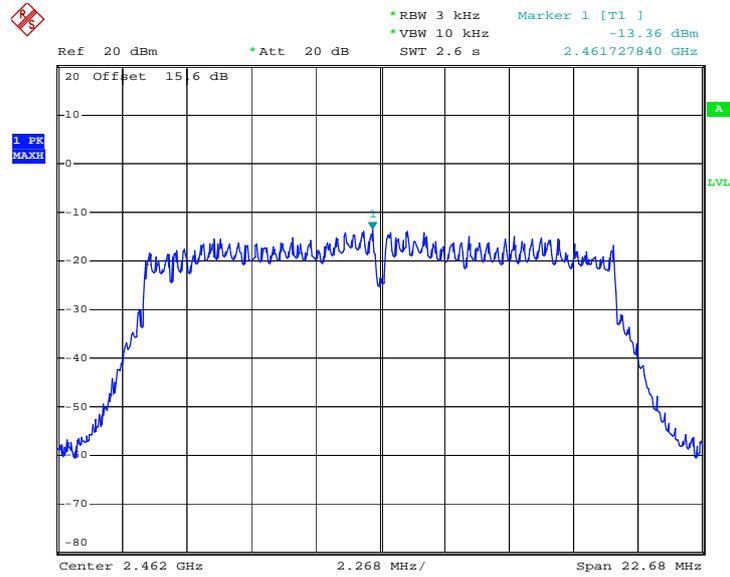
PSD 3KHz Plot on 802.11g Channel 06



Date: 11.NOV.2012 16:04:14



PSD 3KHz Plot on 802.11g Channel 11

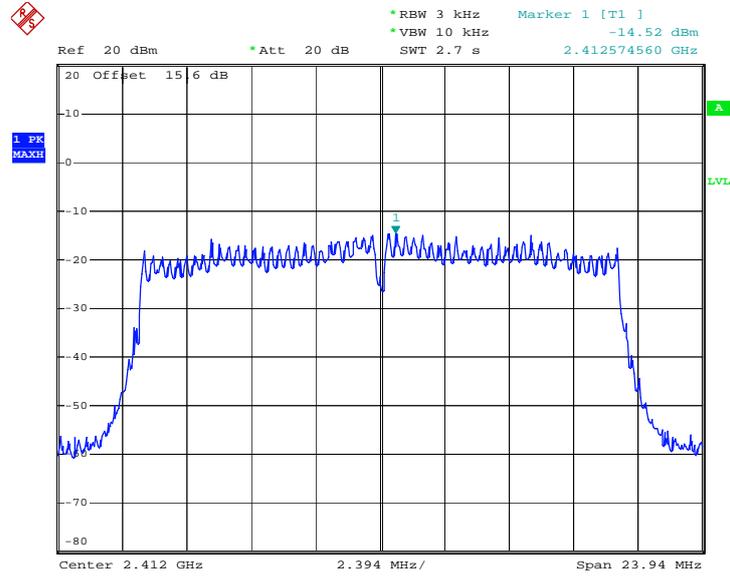


Date: 11.NOV.2012 16:04:47



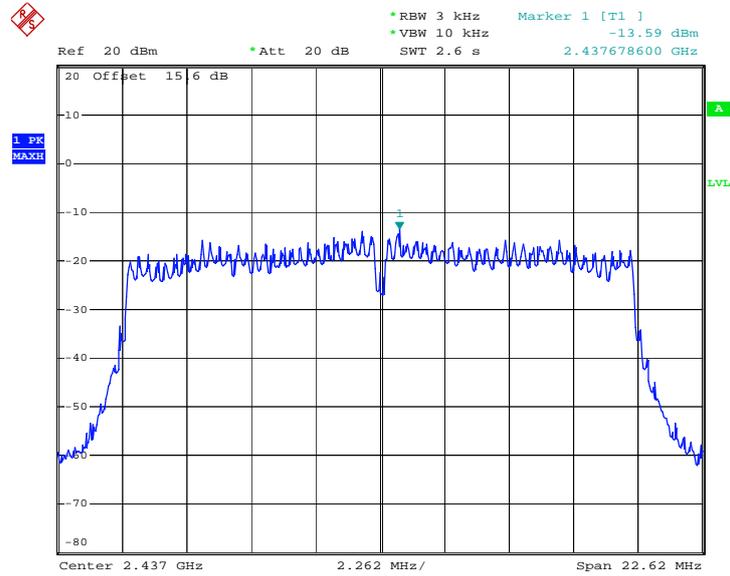
<2.4GHz 802.11n HT-20>

PSD 3KHz Plot on 2.4G 802.11n HT20 Channel 01



Date: 11.NOV.2012 16:00:29

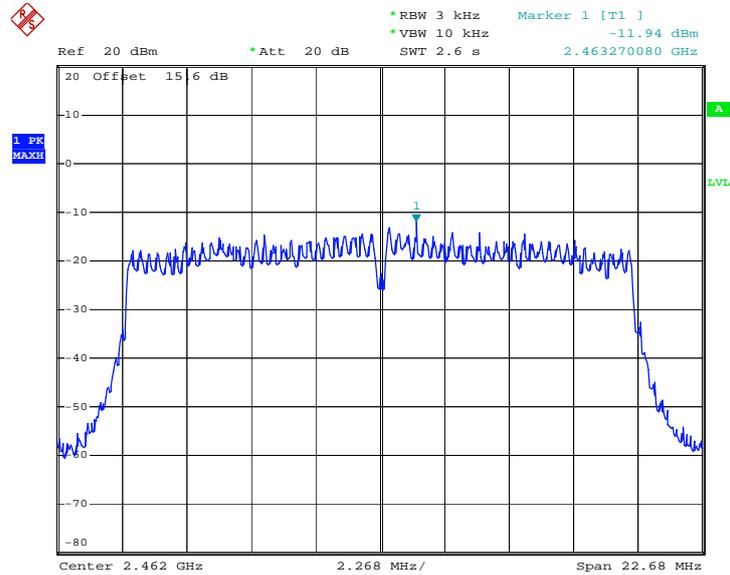
PSD 3KHz Plot on 2.4G 802.11n HT20 Channel 06



Date: 11.NOV.2012 16:01:27



PSD 3KHz Plot on 2.4G 802.11n HT20 Channel 11



Date: 11.NOV.2012 16:02:17

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).

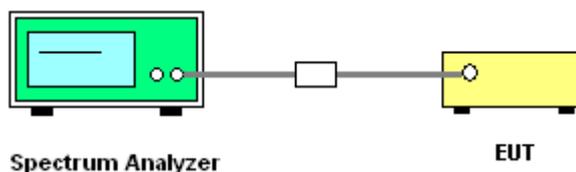
3.4.2 Measuring Instruments

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 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

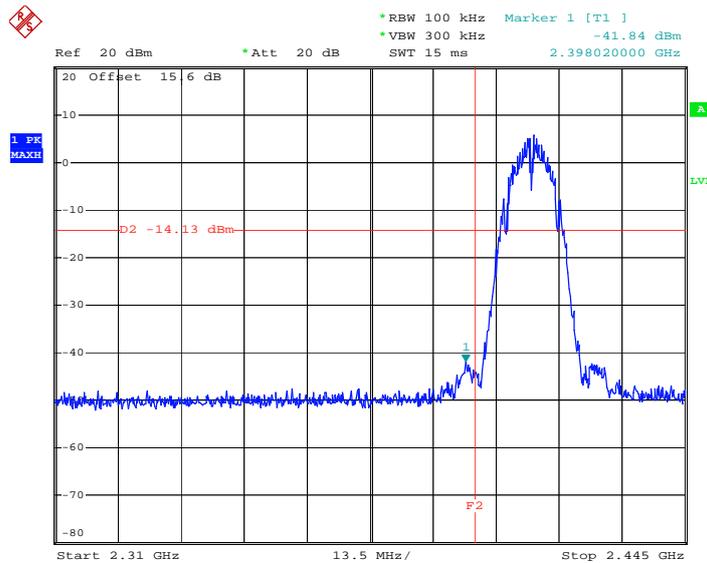




3.4.5 Test Plots of Conducted Band Edges

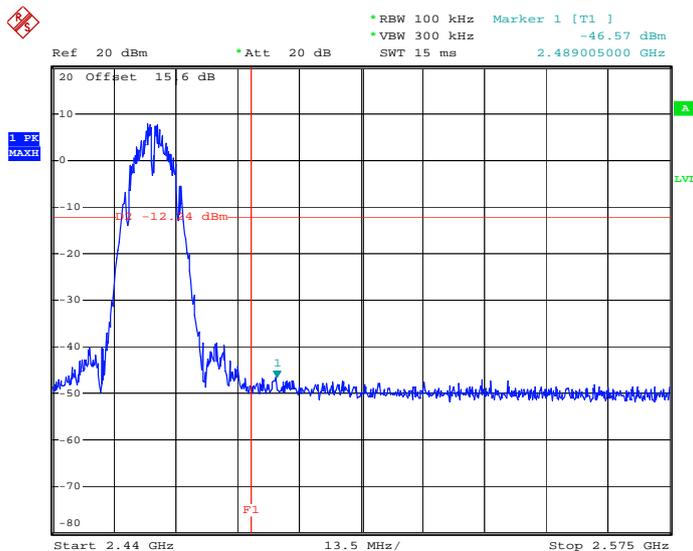
Test Mode :	802.11b	Temperature :	20~21°C
Test Band :	Low and High	Relative Humidity :	41~42%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11b Channel 01



Date: 11.NOV.2012 15:17:47

High Band Edge Plot on 802.11b Channel 11

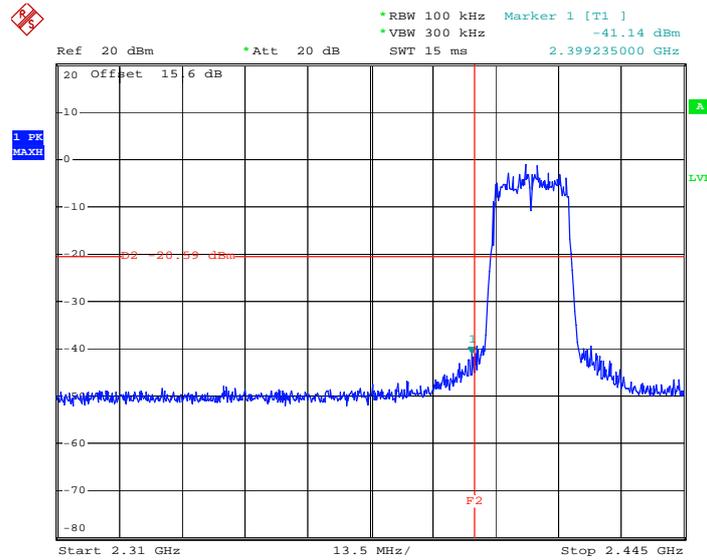


Date: 11.NOV.2012 15:24:47



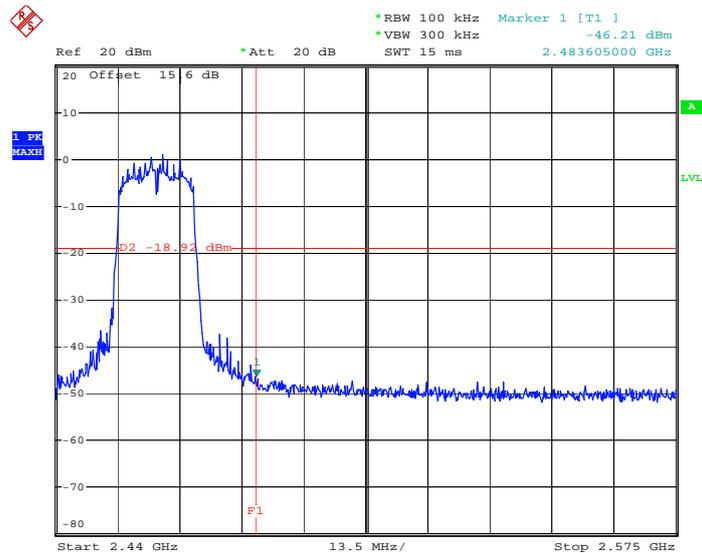
Test Mode :	802.11g	Temperature :	20~21°C
Test Band :	Low and High	Relative Humidity :	41~42%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11g Channel 01



Date: 11.NOV.2012 15:27:29

High Band Edge Plot on 802.11g Channel 11

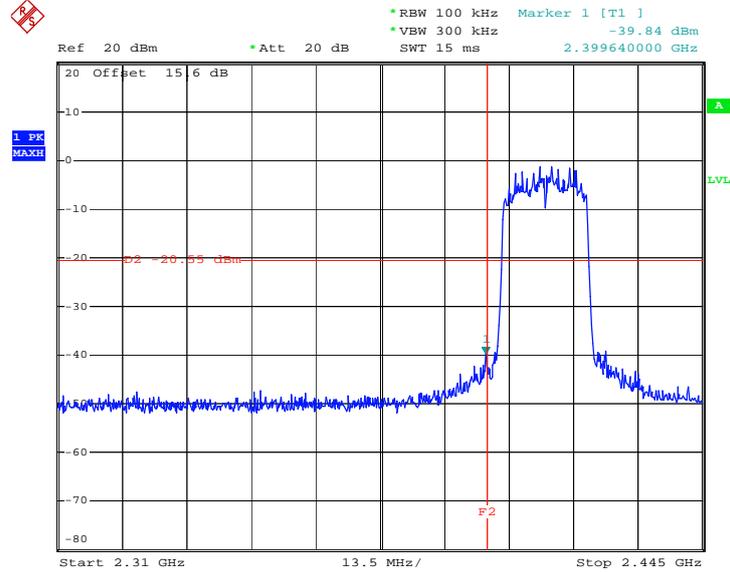


Date: 11.NOV.2012 15:34:51



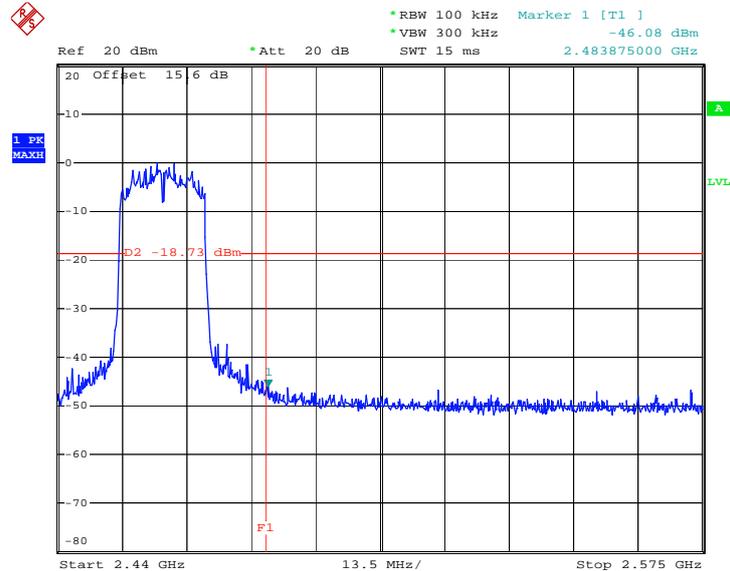
Test Mode :	802.11n HT20	Temperature :	20~21°C
Test Band :	Low and High	Relative Humidity :	41~42%
Test Channel :	01 and 11	Test Engineer :	Zhi Lu

Low Band Edge Plot on 802.11n HT20 Channel 01



Date: 11.NOV.2012 15:39:05

High Band Edge Plot on 802.11n HT20 Channel 11



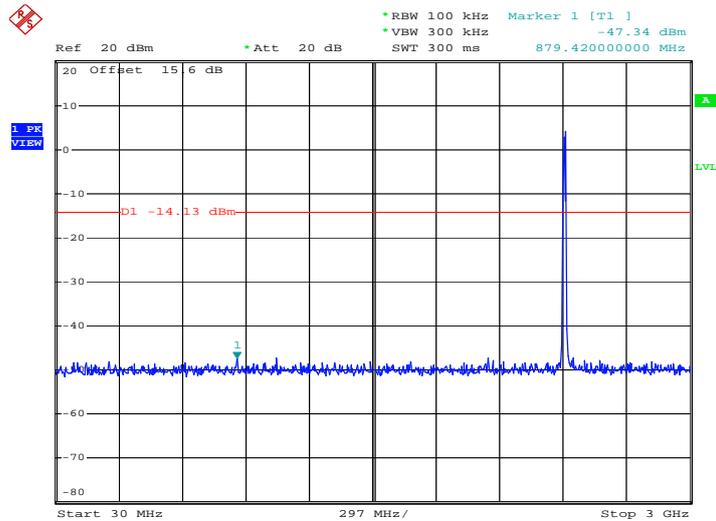
Date: 11.NOV.2012 15:45:13

3.4.6 Test Plots of Spurious Emission

Test Mode :	802.11b	Temperature :	20~21°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	41~42%
Test Channel :	01, 06, 11	Test Engineer :	Zhi Lu

802.11b 30 MHz~3 GHz

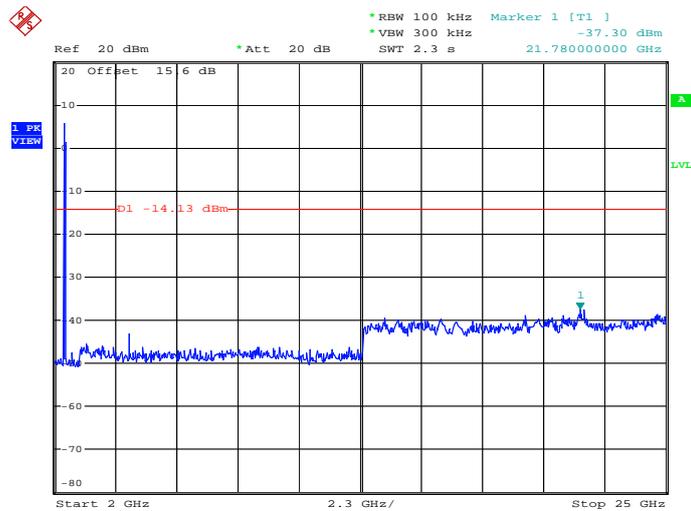
Conducted Spurious Emission Plot on Channel 01



Date: 11.NOV.2012 15:18:16

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

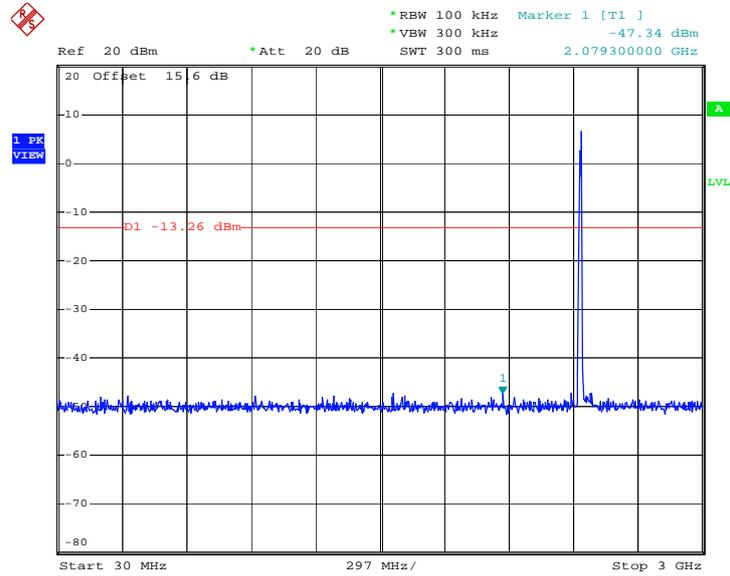


Date: 11.NOV.2012 15:18:35



802.11b 30 MHz~3 GHz

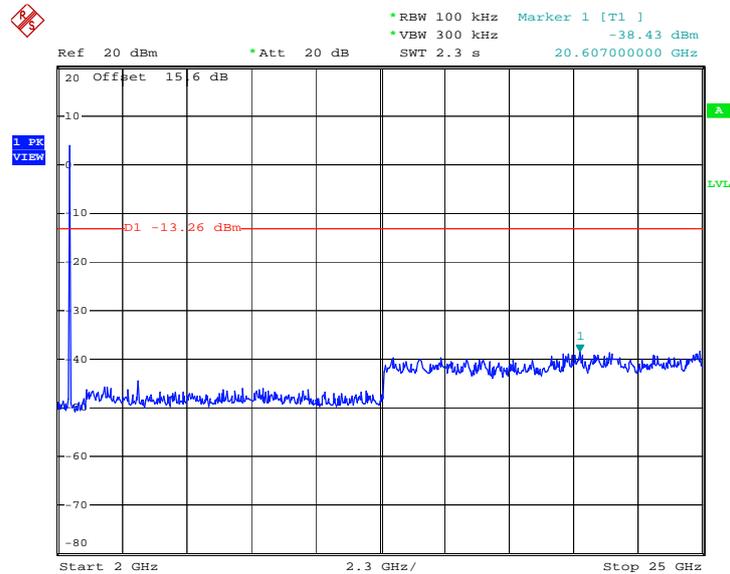
Conducted Spurious Emission Plot on Channel 06



Date: 11.NOV.2012 15:20:50

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

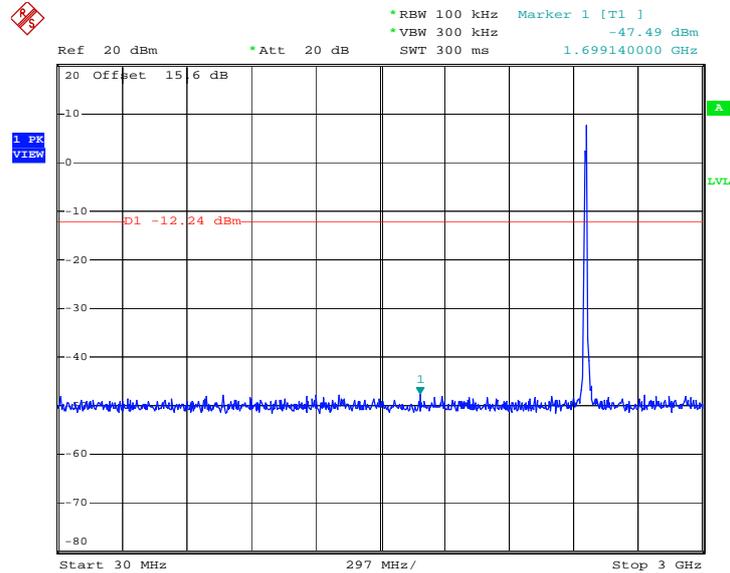


Date: 11.NOV.2012 15:21:08



802.11b 30 MHz~3 GHz

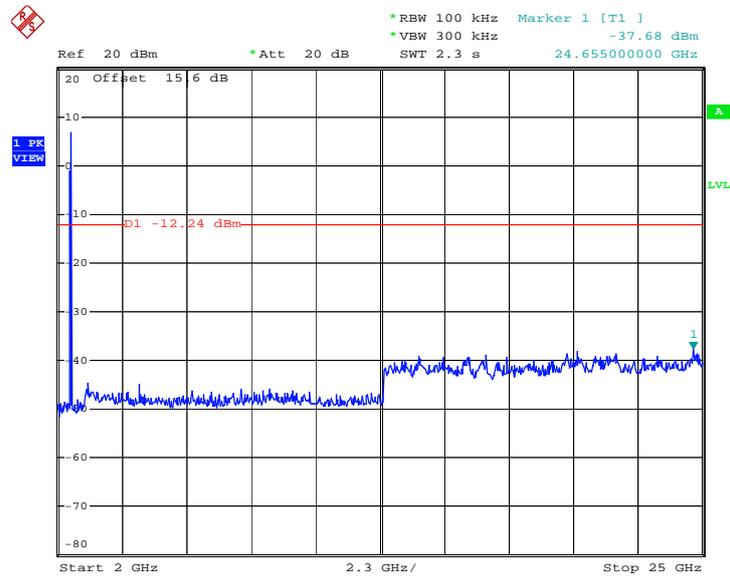
Conducted Spurious Emission Plot on Channel 11



Date: 11.NOV.2012 15:25:08

802.11b 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



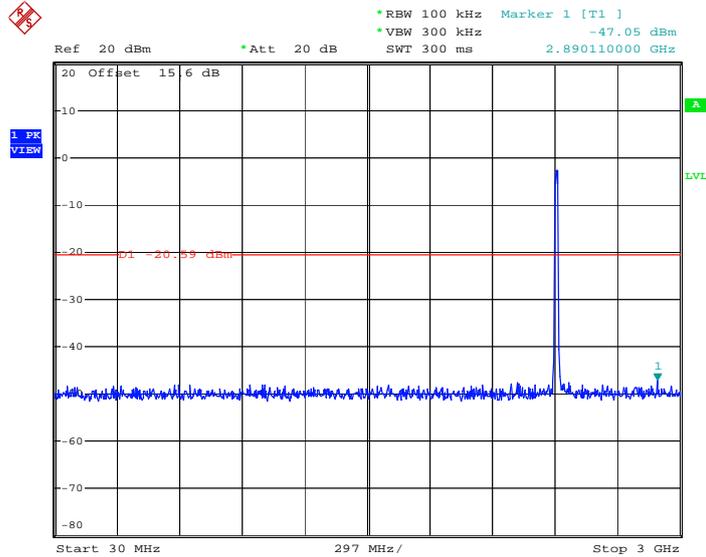
Date: 11.NOV.2012 15:25:26



Test Mode :	802.11g	Temperature :	20~21°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	41~42%
Test Channel :	01, 06, 11	Test Engineer :	Zhi Lu

802.11g 30 MHz~3 GHz

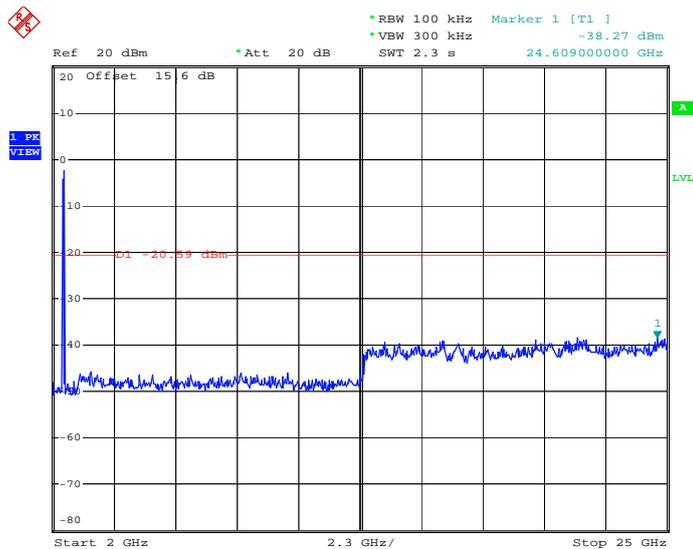
Conducted Spurious Emission Plot on Channel 01



Date: 11.NOV.2012 15:28:02

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

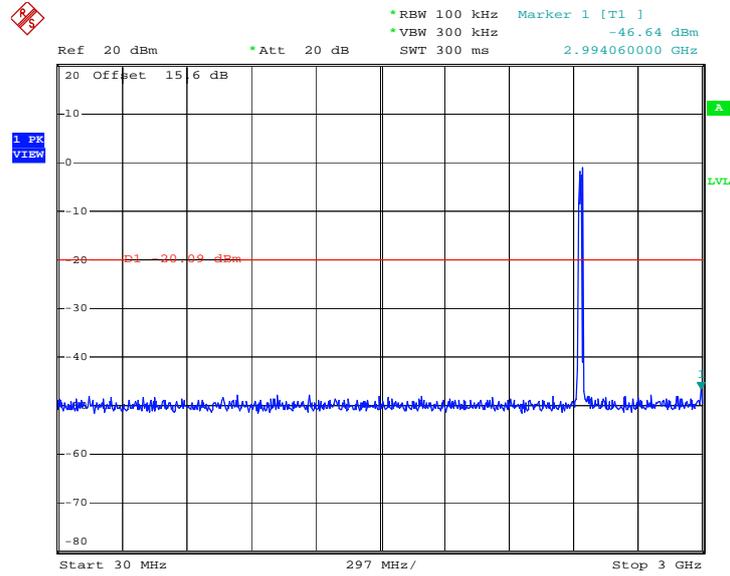


Date: 11.NOV.2012 15:28:20



802.11g 30 MHz~3 GHz

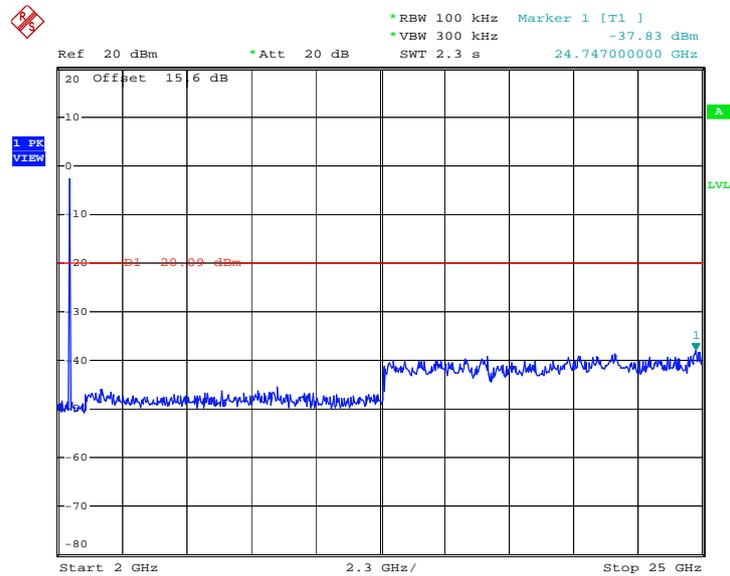
Conducted Spurious Emission Plot on Channel 06



Date: 11.NOV.2012 15:31:40

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

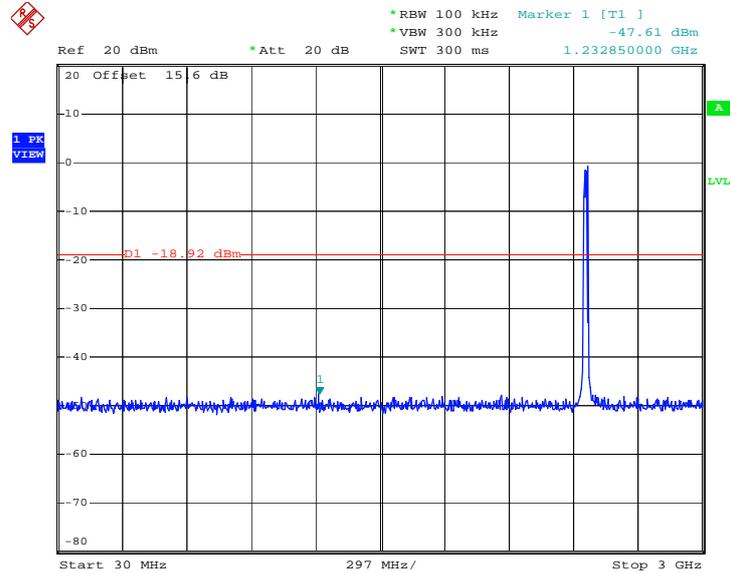


Date: 11.NOV.2012 15:31:58



802.11g 30 MHz~3 GHz

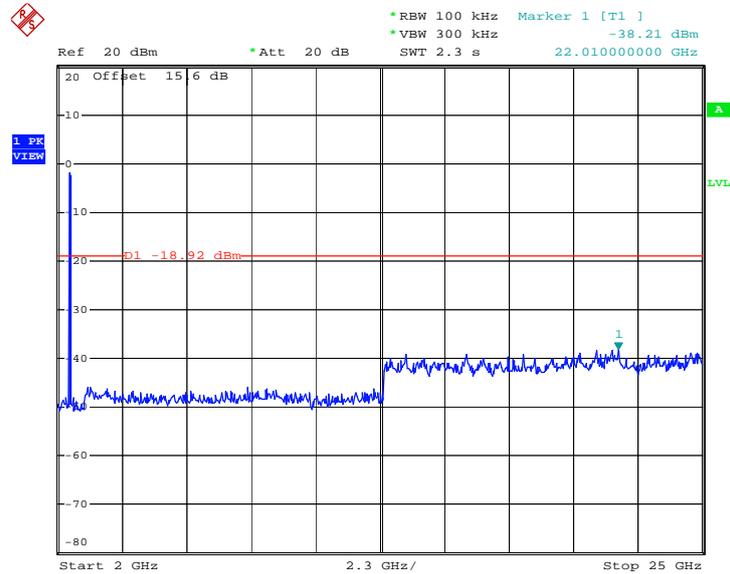
Conducted Spurious Emission Plot on Channel 11



Date: 11.NOV.2012 15:35:27

802.11g 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



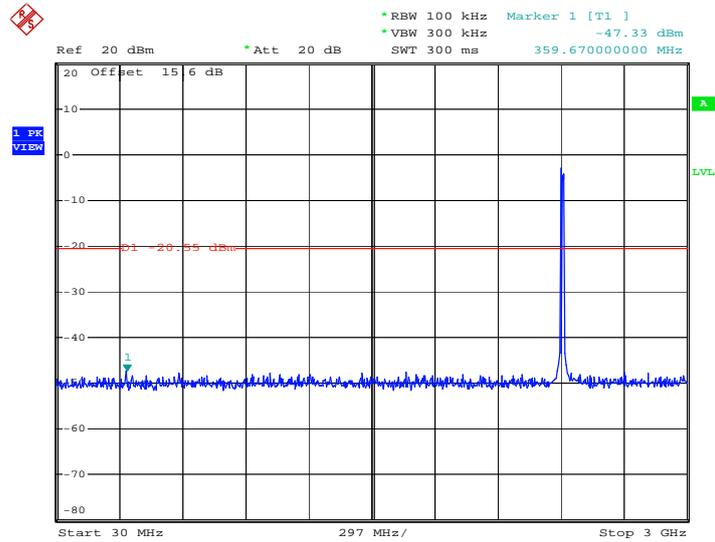
Date: 11.NOV.2012 15:35:46



Test Mode :	802.11n HT20	Temperature :	20~21°C
Test Band :	30MHz-3GHz and 2G-25GHz	Relative Humidity :	41~42%
Test Channel :	01, 06, 11	Test Engineer :	Zhi Lu

802.11n HT20 30 MHz~3 GHz

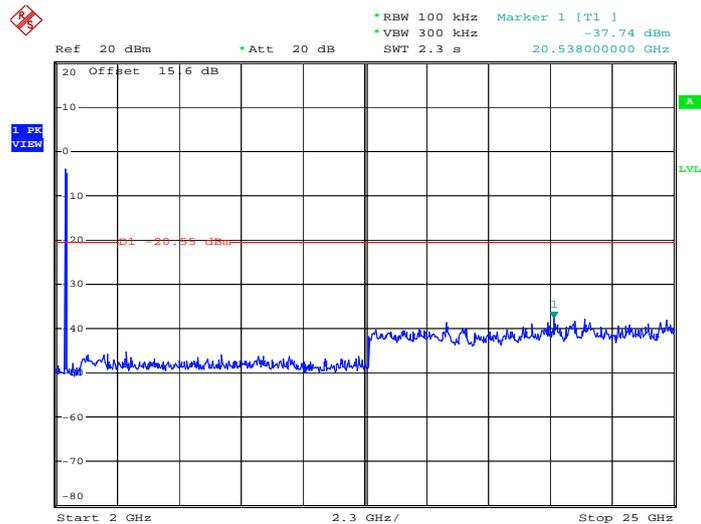
Conducted Spurious Emission Plot on Channel 01



Date: 11.NOV.2012 15:39:30

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 01

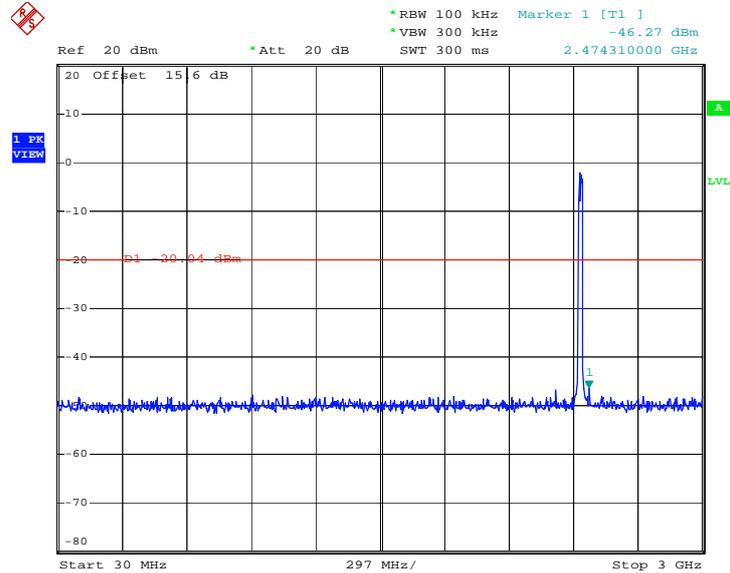


Date: 11.NOV.2012 15:39:48



802.11n HT20 30 MHz~3 GHz

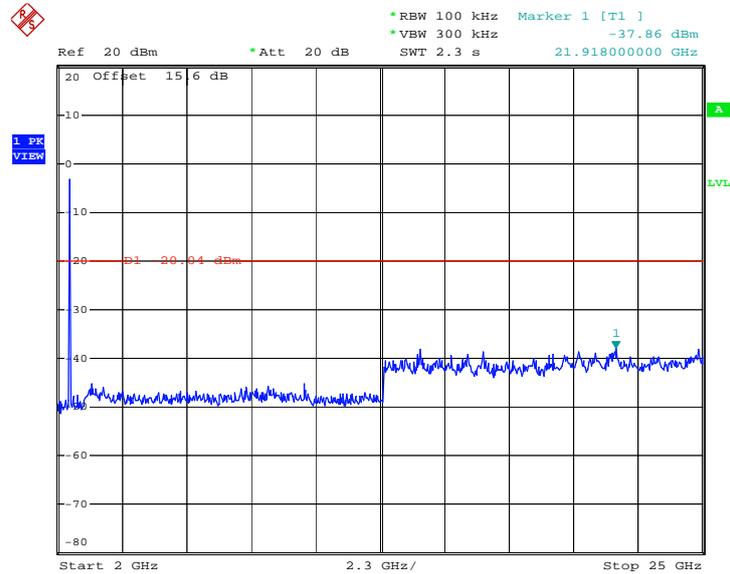
Conducted Spurious Emission Plot on Channel 06



Date: 11.NOV.2012 15:42:40

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 06

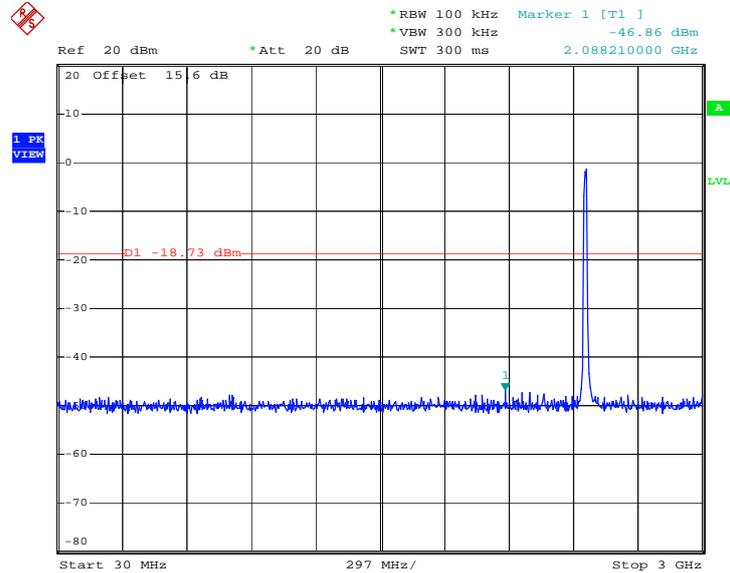


Date: 11.NOV.2012 15:42:58



802.11n HT20 30 MHz~3 GHz

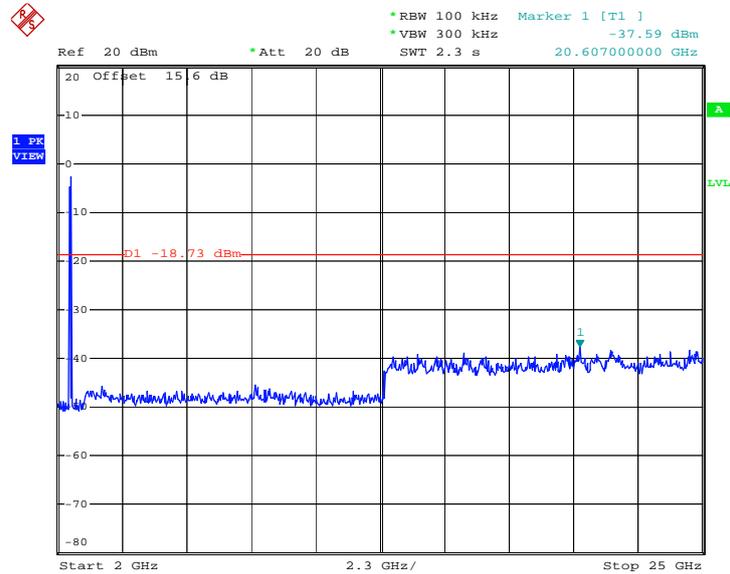
Conducted Spurious Emission Plot on Channel 11



Date: 11.NOV.2012 15:45:40

802.11n HT20 2 GHz~25 GHz

Conducted Spurious Emission Plot on Channel 11



Date: 11.NOV.2012 15:45:58



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

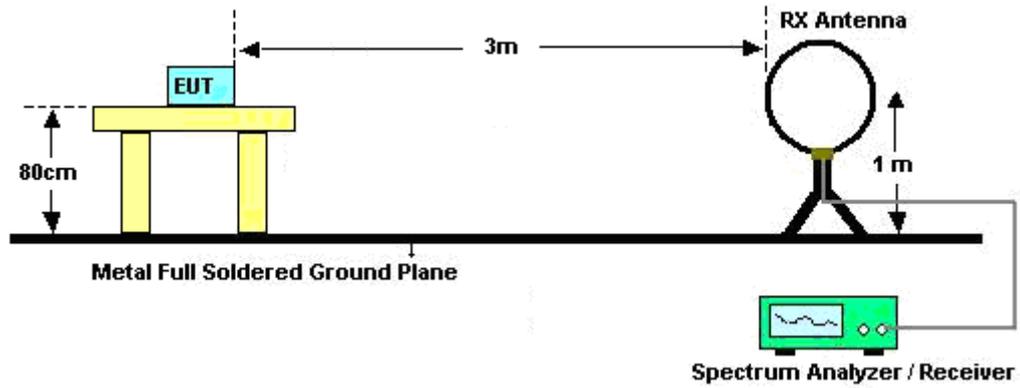
1. The testing follows TCB Workshop 2012, April and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) 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. Set to the maximum power setting and enable the EUT transmit continuously.
5. 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:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent while maintaining all of the other instrument settings for Average measurement.

Band	Duty Cycle(%)	T(ms)	1/T(KHz)	VBW Setting
802.11b	98.623853	-	-	10Hz
802.11g	92.810458	1.42	0.70422535	1KHz
2.4G 802.11n HT20	91.724138	1.33	0.75187970	1KHz

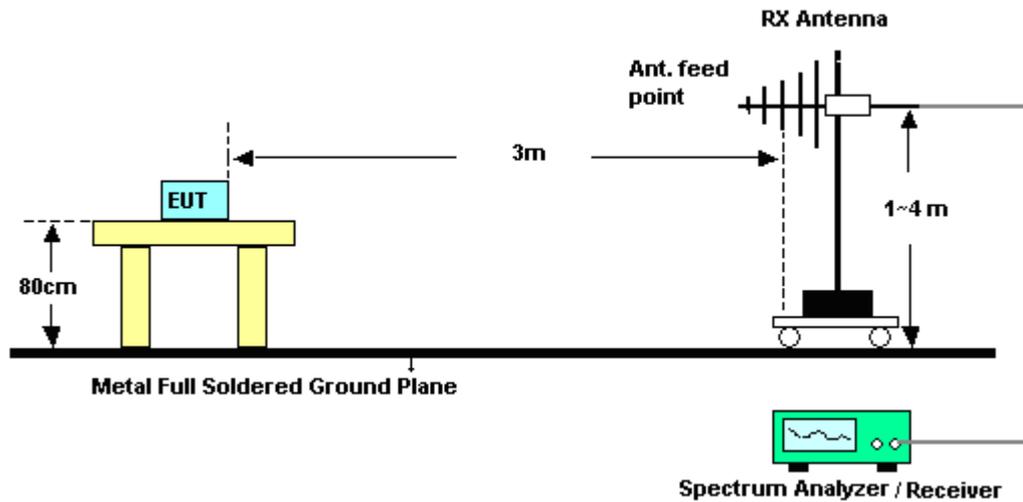
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. If the emission level of the EUT measured by the peak detector is more than 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be reported by using the quasi-peak detector.

3.5.4 Test Setup

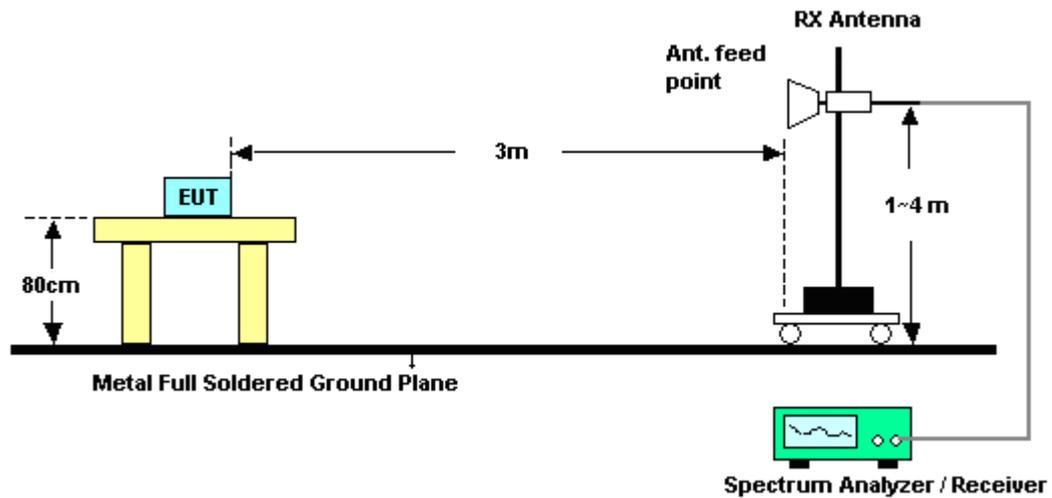
For radiated emissions below 30MHz



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 :	21~22°C
Test Band :	Low	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2389.74	53.19	-20.81	74	49.73	32.86	2.11	31.51	108	60	Peak
2389.65	41.87	-12.13	54	38.41	32.86	2.11	31.51	108	60	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
2389.56	56.59	-17.41	74	53.13	32.86	2.11	31.51	101	96	Peak
2389.65	45.83	-8.17	54	42.37	32.86	2.11	31.51	101	96	Average

Test Mode :	802.11b	Temperature :	21~22°C
Test Band :	High	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2483.5	52.78	-21.22	74	49.12	33.01	2.16	31.51	100	162	Peak
2483.5	40.89	-13.11	54	37.23	33.01	2.16	31.51	100	231	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
2483.5	52.62	-21.38	74	48.96	33.01	2.16	31.51	100	276	Peak
2483.5	42.29	-11.71	54	38.63	33.01	2.16	31.51	100	276	Average



Test Mode :	802.11g	Temperature :	21~22°C
Test Band :	Low	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2388.57	54.13	-19.87	74	50.67	32.86	2.11	31.51	100	251	Peak
2389.02	39.29	-14.71	54	35.83	32.86	2.11	31.51	106	204	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
2389.29	58.56	-15.44	74	55.1	32.86	2.11	31.51	100	271	Peak
2390	42.27	-11.73	54	38.81	32.86	2.11	31.51	100	271	Average

Test Mode :	802.11g	Temperature :	21~22°C
Test Band :	High	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2483.72	58.36	-15.64	74	54.7	33.01	2.16	31.51	103	228	Peak
2483.5	40.71	-13.29	54	37.05	33.01	2.16	31.51	100	228	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
2483.78	63.72	-10.28	74	60.06	33.01	2.16	31.51	100	251	Peak
2483.52	43.54	-10.46	54	39.88	33.01	2.16	31.51	100	250	Average



Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Band :	Low	Relative Humidity :	46~47%
Test Channel :	01	Test Engineer :	Chenmy Cheng

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
2370.12	49.42	-24.58	74	46.01	32.83	2.09	31.51	128	312	Peak
2390	36.51	-17.49	54	33.05	32.86	2.11	31.51	128	312	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
2386.77	52.22	-21.78	74	48.76	32.86	2.11	31.51	100	92	Peak
2382	39.92	-14.08	54	36.51	32.83	2.09	31.51	100	92	Average

Test Mode :	802.11n HT20	Temperature :	21~22°C
Test Band :	High	Relative Humidity :	46~47%
Test Channel :	11	Test Engineer :	Chenmy Cheng

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
2484.6	54.66	-19.34	74	51	33.01	2.16	31.51	124	132	Peak
2484.7	45.63	-8.37	54	41.97	33.01	2.16	31.51	124	132	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
2485.28	53.54	-20.46	74	49.88	33.01	2.16	31.51	145	106	Peak
2484.76	45.03	-8.97	54	41.37	33.01	2.16	31.51	145	106	Average



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

Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
304.61	32.12	-13.88	46	51.39	13.1	1	33.37	-	-	Peak
426.521	39.11	-6.89	46	55.01	16.17	1.18	33.25	-	-	Peak
487.315	34.98	-11.02	46	49.83	17	1.3	33.15	-	-	Peak
549.02	41.58	-4.42	46	54.79	18.48	1.33	33.02	100	0	Peak
609.922	35.96	-10.04	46	48.86	18.64	1.41	32.95	-	-	Peak
731.92	35.13	-10.87	46	46.66	19.72	1.56	32.81	-	-	Peak
2412	99.82	-	-	96.32	32.89	2.12	31.51	111	118	Average
2412	104.93	-	-	101.43	32.89	2.12	31.51	111	118	Peak

Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
75.977	28.07	-11.93	40	55.2	5.93	0.54	33.6	-	-	Peak
426.521	31.29	-14.71	46	47.19	16.17	1.18	33.25	-	-	Peak
487.315	28.76	-17.24	46	43.61	17	1.3	33.15	-	-	Peak
549.02	42.2	-3.8	46	55.41	18.48	1.33	33.02	100	214	Peak
609.922	36.32	-9.68	46	49.22	18.64	1.41	32.95	-	-	Peak
948.761	31.75	-14.25	46	41.71	20.73	1.75	32.44	-	-	Peak
2412	101.9	-	-	98.4	32.89	2.12	31.51	100	93	Average
2412	107.02	-	-	103.52	32.89	2.12	31.51	100	93	Peak



Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
304.61	34.42	-11.58	46	53.69	13.1	1	33.37	-	-	Peak
365.539	34.58	-11.42	46	51.94	14.88	1.11	33.35	-	-	Peak
426.521	40.21	-5.79	46	56.11	16.17	1.18	33.25	-	-	Peak
487.315	35.41	-10.59	46	50.26	17	1.3	33.15	-	-	Peak
549.02	42.7	-3.3	46	55.91	18.48	1.33	33.02	100	256	Peak
609.922	37.86	-8.14	46	50.76	18.64	1.41	32.95	-	-	Peak
2437	100.53	-	-	96.95	32.95	2.14	31.51	100	304	Average
2437	105.29	-	-	101.71	32.95	2.14	31.51	100	304	Peak

Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
75.711	27.5	-12.5	40	54.63	5.93	0.54	33.6	-	-	Peak
365.539	29.82	-16.18	46	47.18	14.88	1.11	33.35	-	-	Peak
426.521	36.39	-9.61	46	52.29	16.17	1.18	33.25	-	-	Peak
487.315	35.91	-10.09	46	50.76	17	1.3	33.15	-	-	Peak
549.02	43.9	-2.1	46	57.11	18.48	1.33	33.02	100	309	QP
609.922	37.7	-8.3	46	50.6	18.64	1.41	32.95	-	-	Peak
2437	101.12	-	-	97.54	32.95	2.14	31.51	103	281	Average
2437	106.03	-	-	102.45	32.95	2.14	31.51	103	281	Peak



Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
304.61	33.96	-12.04	46	53.23	13.1	1	33.37	-	-	Peak
426.521	35.52	-10.48	46	51.42	16.17	1.18	33.25	-	-	Peak
487.315	35.42	-10.58	46	50.27	17	1.3	33.15	-	-	Peak
549.02	41.04	-4.96	46	54.25	18.48	1.33	33.02	100	264	Peak
609.922	37.8	-8.2	46	50.7	18.64	1.41	32.95	-	-	Peak
731.92	31.65	-14.35	46	43.18	19.72	1.56	32.81	-	-	Peak
2462	102.87	-	-	99.25	32.98	2.15	31.51	100	231	Average
2462	107.59	-	-	103.97	32.98	2.15	31.51	100	231	Peak

Test Mode :	802.11b	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
34.882	31.01	-8.99	40	49.15	15.1	0.37	33.61	-	-	Peak
426.521	36.89	-9.11	46	52.79	16.17	1.18	33.25	-	-	Peak
487.315	35.63	-10.37	46	50.48	17	1.3	33.15	-	-	Peak
549.02	43.6	-2.4	46	56.81	18.48	1.33	33.02	100	300	QP
609.922	37.89	-8.11	46	50.79	18.64	1.41	32.95	-	-	Peak
833.317	34.56	-11.44	46	45.3	20.32	1.64	32.7	-	-	Peak
2462	101.96	-	-	98.34	32.98	2.15	31.51	101	275	Average
2462	106.41	-	-	102.79	32.98	2.15	31.51	101	275	Peak



Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
365.539	33.56	-12.44	46	50.92	14.88	1.11	33.35	-	-	Peak
426.521	40.88	-5.12	46	56.78	16.17	1.18	33.25	-	-	Peak
487.315	35.88	-10.12	46	50.73	17	1.3	33.15	-	-	Peak
549.02	42.11	-3.89	46	55.32	18.48	1.33	33.02	100	151	Peak
609.922	36.43	-9.57	46	49.33	18.64	1.41	32.95	-	-	Peak
948.761	32.36	-13.64	46	42.32	20.73	1.75	32.44	-	-	Peak
2412	92.76	-	-	89.26	32.89	2.12	31.51	105	235	Average
2412	103.39	-	-	99.89	32.89	2.12	31.51	105	235	Peak

Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
365.539	30.53	-15.47	46	47.89	14.88	1.11	33.35	-	-	Peak
426.521	37.24	-8.76	46	53.14	16.17	1.18	33.25	-	-	Peak
487.315	35.76	-10.24	46	50.61	17	1.3	33.15	-	-	Peak
549.02	43.6	-2.4	46	56.81	18.48	1.33	33.02	100	302	QP
609.922	38.73	-7.27	46	51.63	18.64	1.41	32.95	-	-	Peak
948.761	33.89	-12.11	46	43.85	20.73	1.75	32.44	-	-	Peak
2412	94.85	-	-	91.35	32.89	2.12	31.51	100	273	Average
2412	104.39	-	-	100.89	32.89	2.12	31.51	100	273	Peak



Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
100.934	30.86	-12.64	43.5	53.27	10.62	0.58	33.61	-	-	Peak
365.539	34.81	-11.19	46	52.17	14.88	1.11	33.35	-	-	Peak
426.521	36.69	-9.31	46	52.59	16.17	1.18	33.25	-	-	Peak
487.315	35.24	-10.76	46	50.09	17	1.3	33.15	-	-	Peak
549.02	41.48	-4.52	46	54.69	18.48	1.33	33.02	100	231	Peak
609.922	35.99	-10.01	46	48.89	18.64	1.41	32.95	-	-	Peak
2437	91.4	-	-	87.82	32.95	2.14	31.51	103	229	Average
2437	101.58	-	-	98	32.95	2.14	31.51	103	229	Peak

Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
33.211	29.62	-10.38	40	46.82	16.04	0.35	33.59	-	-	Peak
426.521	37.08	-8.92	46	52.98	16.17	1.18	33.25	-	-	Peak
487.315	28.06	-17.94	46	42.91	17	1.3	33.15	-	-	Peak
549.02	41.69	-4.31	46	54.9	18.48	1.33	33.02	100	201	Peak
609.922	34.18	-11.82	46	47.08	18.64	1.41	32.95	-	-	Peak
948.761	31.44	-14.56	46	41.4	20.73	1.75	32.44	-	-	Peak
2437	94.77	-	-	91.19	32.95	2.14	31.51	100	272	Average
2437	105.34	-	-	101.76	32.95	2.14	31.51	100	272	Peak



Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
304.61	33.2	-12.8	46	52.47	13.1	1	33.37	-	-	Peak
365.539	33.33	-12.67	46	50.69	14.88	1.11	33.35	-	-	Peak
426.521	41.04	-4.96	46	56.94	16.17	1.18	33.25	-	-	Peak
487.315	34.65	-11.35	46	49.5	17	1.3	33.15	-	-	Peak
549.02	41.94	-4.06	46	55.15	18.48	1.33	33.02	100	236	Peak
609.922	35.21	-10.79	46	48.11	18.64	1.41	32.95	-	-	Peak
2462	93.37	-	-	89.75	32.98	2.15	31.51	103	229	Average
2462	103.48	-	-	99.86	32.98	2.15	31.51	103	229	Peak

Test Mode :	802.11g	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
35.251	32.18	-7.82	40	50.32	15.1	0.37	33.61	-	-	Peak
365.539	30.21	-15.79	46	47.57	14.88	1.11	33.35	-	-	Peak
426.521	37.54	-8.46	46	53.44	16.17	1.18	33.25	-	-	Peak
487.315	36.37	-9.63	46	51.22	17	1.3	33.15	-	-	Peak
549.02	44.2	-1.8	46	57.41	18.48	1.33	33.02	100	301	QP
609.922	37.72	-8.28	46	50.62	18.64	1.41	32.95	-	-	Peak
2462	95.45	-	-	91.83	32.98	2.15	31.51	100	253	Average
2462	106.33	-	-	102.71	32.98	2.15	31.51	100	253	Peak



Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
304.61	33.55	-12.45	46	52.82	13.1	1	33.37	-	-	Peak
426.521	36.8	-9.2	46	52.7	16.17	1.18	33.25	-	-	Peak
487.315	33.72	-12.28	46	48.57	17	1.3	33.15	-	-	Peak
549.02	42.14	-3.86	46	55.35	18.48	1.33	33.02	100	254	Peak
609.922	36.46	-9.54	46	49.36	18.64	1.41	32.95	-	-	Peak
731.92	34.05	-11.95	46	45.58	19.72	1.56	32.81	-	-	Peak
2412	95.8	-	-	92.3	32.89	2.12	31.51	107	62	Average
2412	100.03	-	-	96.53	32.89	2.12	31.51	107	62	Peak

Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
365.539	30.4	-15.6	46	47.76	14.88	1.11	33.35	-	-	Peak
426.521	34.82	-11.18	46	50.72	16.17	1.18	33.25	-	-	Peak
457.507	29.48	-16.52	46	45.07	16.4	1.21	33.2	-	-	Peak
487.315	35.74	-10.26	46	50.59	17	1.3	33.15	-	-	Peak
549.02	43.6	-2.4	46	56.81	18.48	1.33	33.02	100	306	QP
609.922	36	-10	46	48.9	18.64	1.41	32.95	-	-	Peak
2412	98.35	-	-	94.85	32.89	2.12	31.51	100	98	Average
2412	102.74	-	-	99.24	32.89	2.12	31.51	100	98	Peak



Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
56.197	23.78	-16.22	40	50.92	5.98	0.46	33.58	-	-	Peak
304.61	33.07	-12.93	46	52.34	13.1	1	33.37	-	-	Peak
426.521	37.05	-8.95	46	52.95	16.17	1.18	33.25	-	-	Peak
487.315	34.45	-11.55	46	49.3	17	1.3	33.15	-	-	Peak
549.02	42.65	-3.35	46	55.86	18.48	1.33	33.02	100	254	Peak
609.922	35.35	-10.65	46	48.25	18.64	1.41	32.95	-	-	Peak
2437	98.04	-	-	94.46	32.95	2.14	31.51	106	120	Average
2437	102.08	-	-	98.5	32.95	2.14	31.51	106	120	Peak

Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	06	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
78.689	27.11	-12.89	40	53.82	6.34	0.55	33.6	-	-	Peak
365.539	29.41	-16.59	46	46.77	14.88	1.11	33.35	-	-	Peak
426.521	36.82	-9.18	46	52.72	16.17	1.18	33.25	-	-	Peak
487.315	35.62	-10.38	46	50.47	17	1.3	33.15	-	-	Peak
549.02	44.7	-1.3	46	57.91	18.48	1.33	33.02	100	308	QP
609.922	36.72	-9.28	46	49.62	18.64	1.41	32.95	-	-	Peak
2437	98.4	-	-	94.82	32.95	2.14	31.51	100	82	Average
2437	102.95	-	-	99.37	32.95	2.14	31.51	100	82	Peak



Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
304.61	32.18	-13.82	46	51.45	13.1	1	33.37	-	-	Peak
426.521	38.92	-7.08	46	54.82	16.17	1.18	33.25	-	-	Peak
487.315	35.8	-10.2	46	50.65	17	1.3	33.15	-	-	Peak
549.02	40.66	-5.34	46	53.87	18.48	1.33	33.02	100	264	Peak
609.922	36.1	-9.9	46	49	18.64	1.41	32.95	-	-	Peak
731.92	33.86	-12.14	46	45.39	19.72	1.56	32.81	-	-	Peak
2462	101.38	-	-	97.76	32.98	2.15	31.51	128	128	Average
2462	105.36	-	-	101.74	32.98	2.15	31.51	128	128	Peak

Test Mode :	802.11n-HT20	Temperature :	21~22°C
Test Channel :	11	Relative Humidity :	46~47%
Test Engineer :	Chenmy Cheng	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
365.539	30.47	-15.53	46	47.83	14.88	1.11	33.35	-	-	Peak
426.521	35.12	-10.88	46	51.02	16.17	1.18	33.25	-	-	Peak
487.315	36.22	-9.78	46	51.07	17	1.3	33.15	-	-	Peak
549.02	44.6	-1.4	46	57.81	18.48	1.33	33.02	100	325	QP
609.922	35.76	-10.24	46	48.66	18.64	1.41	32.95	-	-	Peak
948.761	32.26	-13.74	46	42.22	20.73	1.75	32.44	-	-	Peak
2462	100.72	-	-	97.1	32.98	2.15	31.51	120	88	Average
2462	105.07	-	-	101.45	32.98	2.15	31.51	120	88	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.

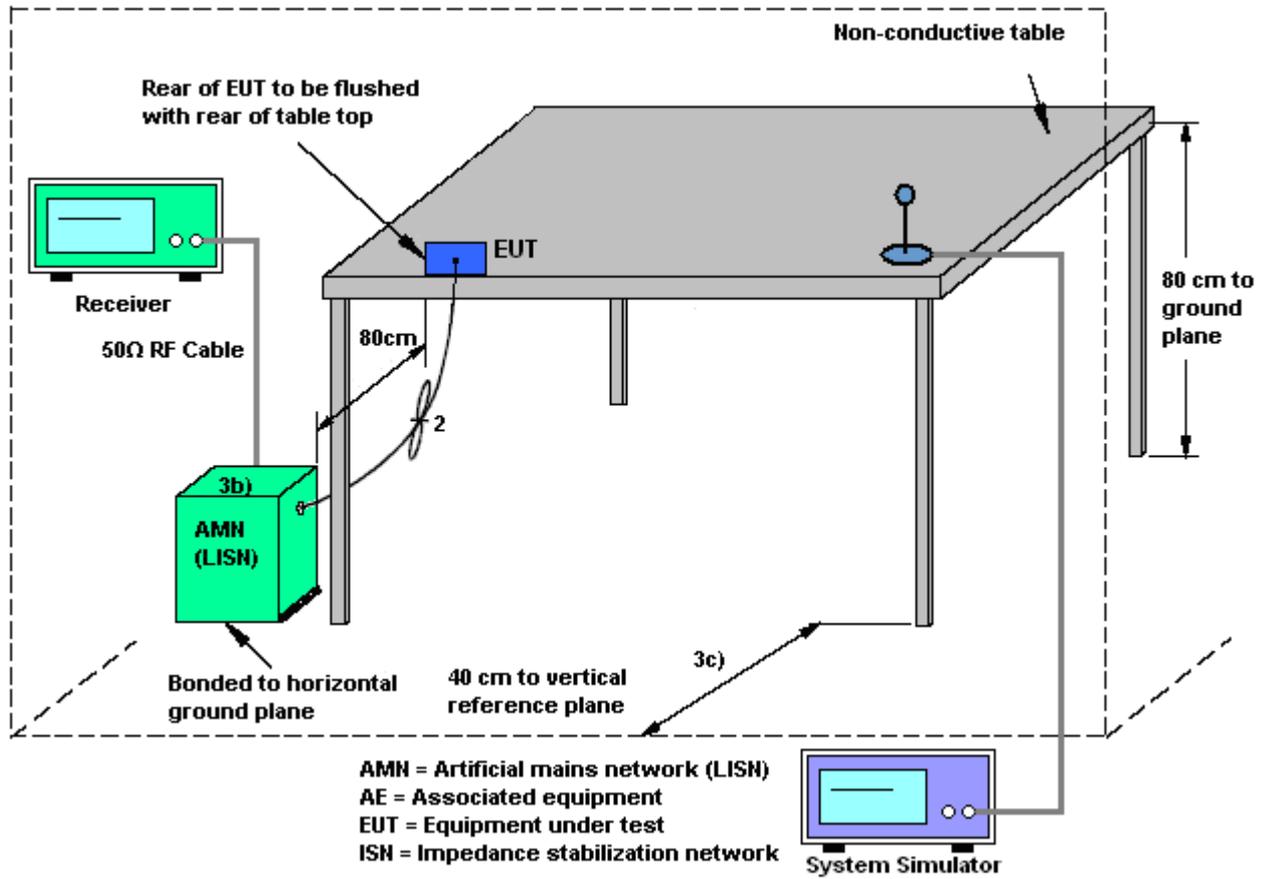
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

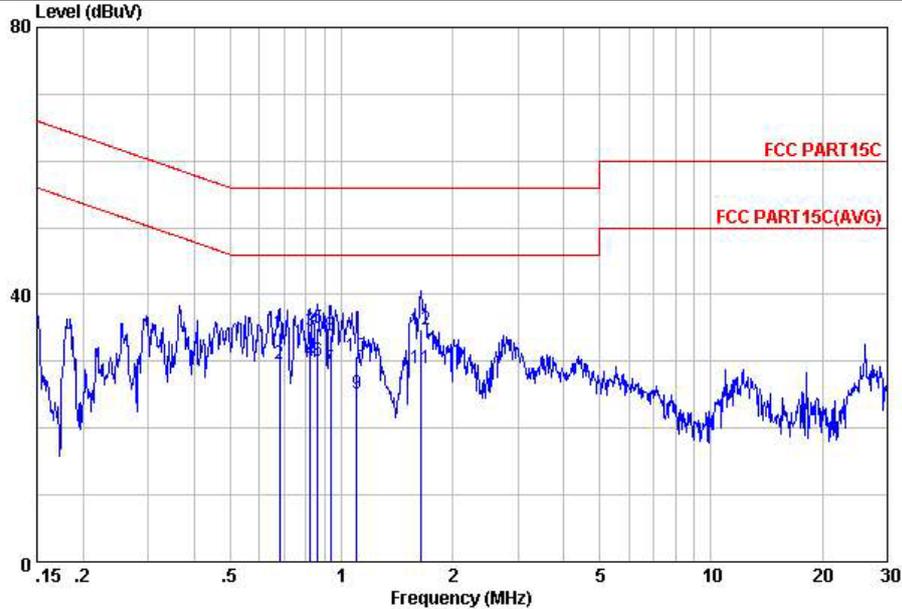
1. The testing follows the guidelines in FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v02
2. ANSI C63.4-2003 and ANSI C63.10-2009.
3. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
4. Connect EUT to the power mains through a line impedance stabilization network (LISN).
5. All the support units are connecting to the other LISN.
6. The LISN provides 50 ohm coupling impedance for the measuring instrument.
7. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
8. Both sides of AC line were checked for maximum conducted interference.
9. The frequency range from 150 KHz to 30 MHz was searched.
10. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.6.4 Test Setup



3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN Link + USB Cable 1 (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

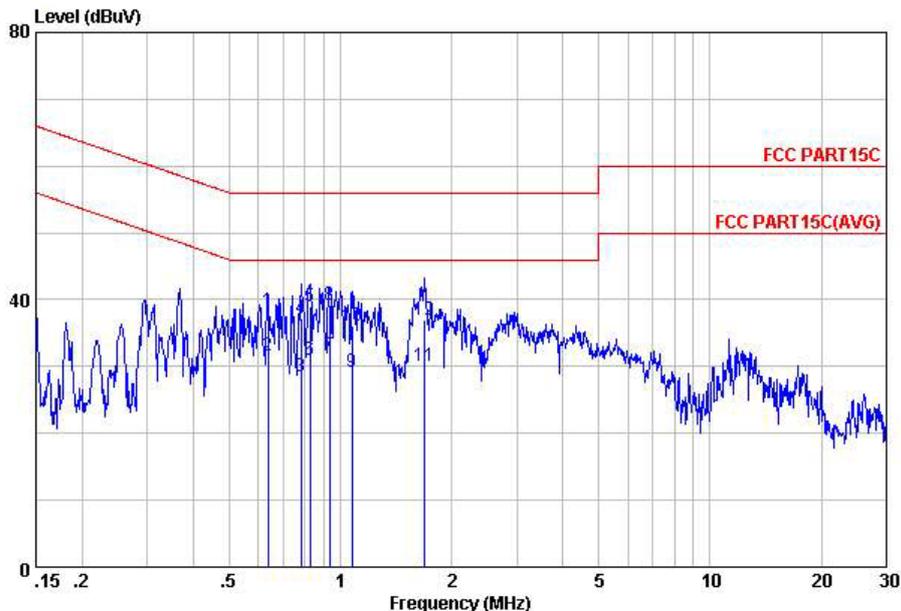


Site : C001-KS
 Condition: FCC PART15C LISN-111230 LINE
 mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.68	34.38	-21.62	56.00	24.20	-0.09	10.27	QP
2	0.68	29.58	-16.42	46.00	19.40	-0.09	10.27	Average
3	0.82	34.48	-21.52	56.00	24.29	-0.09	10.28	QP
4	0.82	30.08	-15.92	46.00	19.89	-0.09	10.28	Average
5	0.86	35.08	-20.92	56.00	24.90	-0.10	10.28	QP
6	0.86	30.18	-15.82	46.00	20.00	-0.10	10.28	Average
7	0.93	28.98	-17.02	46.00	18.80	-0.10	10.28	Average
8	0.93	33.88	-22.12	56.00	23.70	-0.10	10.28	QP
9	1.10	25.18	-20.82	46.00	15.00	-0.10	10.28	Average
10	1.10	30.78	-25.22	56.00	20.60	-0.10	10.28	QP
11	1.64	28.89	-17.11	46.00	18.70	-0.11	10.30	Average
12	1.64	34.79	-21.21	56.00	24.60	-0.11	10.30	QP



Test Mode :	Mode 1	Temperature :	19~20°C
Test Engineer :	Tom Wang	Relative Humidity :	39~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN Link + USB Cable 1 (Charging from Adapter)		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-KS
 Condition: FCC PART15C LISN-111230 NEUTRAL

mode : Mode 1

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.64	38.29	-17.71	56.00	28.10	-0.08	10.27	QP
2	0.64	31.59	-14.41	46.00	21.40	-0.08	10.27	Average
3	0.78	28.59	-17.41	46.00	18.40	-0.08	10.27	Average
4	0.78	37.19	-18.81	56.00	27.00	-0.08	10.27	QP
5	0.83	39.09	-16.91	56.00	28.89	-0.08	10.28	QP
6	0.83	30.99	-15.01	46.00	20.79	-0.08	10.28	Average
7	0.93	31.69	-14.31	46.00	21.50	-0.09	10.28	Average
8	0.93	39.19	-16.81	56.00	29.00	-0.09	10.28	QP
9	1.08	29.29	-16.71	46.00	19.10	-0.09	10.28	Average
10	1.08	36.09	-19.91	56.00	25.90	-0.09	10.28	QP
11	1.68	30.09	-15.91	46.00	19.90	-0.11	10.30	Average
12	1.68	37.09	-18.91	56.00	26.90	-0.11	10.30	QP



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	100319	9kHz~40GHz	Dec. 30, 2011	Nov. 11, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY451015 55	N/A	Aug. 22, 2012	Nov. 11, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY444211 98	N/A	Aug. 22, 2012	Nov. 11, 2012	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Nov. 11, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-9605 02	N/A	Dec. 30, 2011	Nov. 11, 2012	Dec. 29, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 08, 2012	Nov. 21, 2012	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Nov. 21, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Nov. 21, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/ 001	9 kHz~30 MHz	Jul. 03, 2012	Nov. 21, 2012	Jul. 02, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Nov. 21, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	Jun. 01, 2012	Nov. 21, 2012	May 31, 2013	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A023 70	1GHz~26.5GHz	Dec. 30, 2011	Nov. 21, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 06, 2012	Nov. 21, 2012	Nov. 05, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA1702 49	15GHz~40GHz	Oct. 12, 2012	Nov. 21, 2012	Oct. 11, 2013	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Jun. 01, 2012	Nov. 12, 2012	May 31, 2013	Conduction (CO01-KS)
LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 30, 2011	Nov. 12, 2012	Dec. 29, 2012	Conduction (CO01-KS)
LISN	MessTec	AN3016	60105	9kHz~30MHz	Dec. 30, 2011	Nov. 12, 2012	Dec. 29, 2012	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	N/A	Nov. 16, 2011	Nov. 12, 2012	Nov. 15, 2012	Conduction (CO01-KS)



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 EP2O2503 as below.