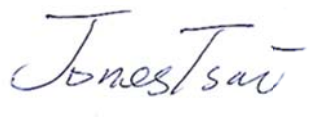
FCC RF Test Report

APPLICANT	:	Partner Tech Corp.
EQUIPMENT	:	Handheld POS Terminal(WCDMA Digital mobile)
BRAND NAME	:	Partner Tech Corp
MODEL NAME	:	OT-300
FCC ID	:	NDPOT-300
STANDARD	:	FCC Part 15 Subpart C §15.247
CLASSIFICATION	:	(DTS) Digital Transmission System

The product was received on Mar. 06, 2013 and testing was completed on Aug. 27, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant 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: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager

Testing Laboratory
2627

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
FR330654B	Rev. 01	Initial issue of report	Sep. 26 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.48 dB at 4924.000 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 14.17 dB at 24.790 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Partner Tech Corp.
10F, NO. 233-2, Pao Chiao Road Shin Tien, Taipei Taiwan

1.2 Manufacturer

Partner Tech Corp.
10F, NO. 233-2, Pao Chiao Road Shin Tien, Taipei Taiwan

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Handheld POS Terminal(WCDMA Digital mobile)
Brand Name	Partner Tech Corp
Model Name	OT-300
FCC ID	NDPOT-300
EUT supports Radios application	WCDMA/HSPA/WLAN 2.4GHz 802.11bgn HT20/ Bluetooth v2.1 + EDR/NFC
HW Version	V1.2
SW Version	R08
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are five types of EUT, the detail differences between them are refer to Appendix B.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz
Maximum Output Power to Antenna	802.11b : 14.80 dBm (0.0302 W) 802.11g : 17.10 dBm (0.0513 W) 802.11n HT20 : 17.11 dBm (0.0514 W)
Antenna Type	802.11b/g/n : Chip Antenna with gain 1.96 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 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 Registration No.
	TH01-KS	CO01-KS	03CH01-KS	149928

Note: The test site complies with ANSI C63.4 2003 requirement.

1.7 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 v03r01
- ANSI C63.4-2003

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.

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 data rate associated with the highest power were chosen for full test shown in the following tables.

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	14.50	14.78	**14.80**	14.72
CH 06	2437 MHz	13.46	14.48	14.67	14.44
CH 11	2462 MHz	13.46	13.76	14.22	14.06

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	16.39	16.26	16.02	16.19	16.22	16.36	16.33	16.21
CH 06	2437 MHz	**17.10**	17.05	16.91	17.07	16.79	16.89	17.08	16.95
CH 11	2462 MHz	16.26	16.18	16.06	16.01	16.05	16.09	16.07	16.03

Channel	Frequency	2.4GHz 802.11n HT20 RF Power (dBm)							
		OFDM Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	16.32	16.03	16.26	16.15	16.24	16.18.	16.15	16.16
CH 06	2437 MHz	**17.11**	16.92	16.78	17.05	16.91	17.05	16.98	16.76
CH 11	2462 MHz	16.09	15.93	15.94	16.00	15.98	15.92	16.06	16.01

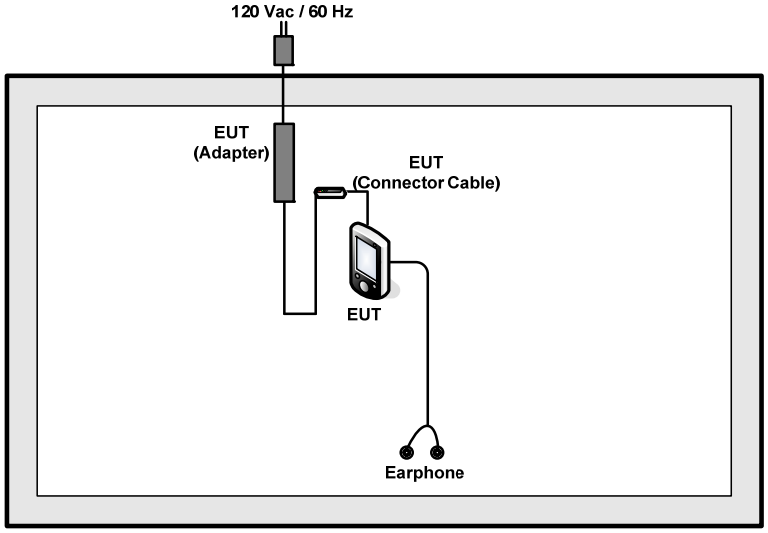
2.3 Test Mode

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 BW Power Spectral Density**	**802.11b**	**5.5 Mbps**	**1/6/11**
		802.11g	**6 Mbps**	**1/6/11**
		802.11n HT20	**MCS0**	**1/6/11**
	Output Power	**802.11b**	**5.5 Mbps**	**1/6/11**
		802.11g	**6 Mbps**	**1/6/11**
		802.11n HT20	**MCS0**	**1/6/11**
	Conducted Band Edge	**802.11b**	**5.5 Mbps**	**1/11**
		802.11g	**6 Mbps**	**1/11**
		802.11n HT20	**MCS0**	**1/11**
	Conducted Spurious Emission	**802.11b**	**5.5 Mbps**	**1/6/11**
		802.11g	**6 Mbps**	**1/6/11**
		802.11n HT20	**MCS0**	**1/6/11**
Radiated TCs	**Radiated Band Edge**	**802.11b**	**5.5 Mbps**	**1/11**
		802.11g	**6 Mbps**	**1/11**
		802.11n HT20	**MCS0**	**1/11**
	Radiated Spurious Emission	**802.11b**	**5.5 Mbps**	**1/6/11**
		802.11g	**6 Mbps**	**1/6/11**
		802.11n HT20	**MCS0**	**1/6/11**
AC Conducted Emission	Mode 1 : WCDMA Band V Idle + Bluetooth Link + WLAN Link + Earphone + Adapter + Cradle			

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



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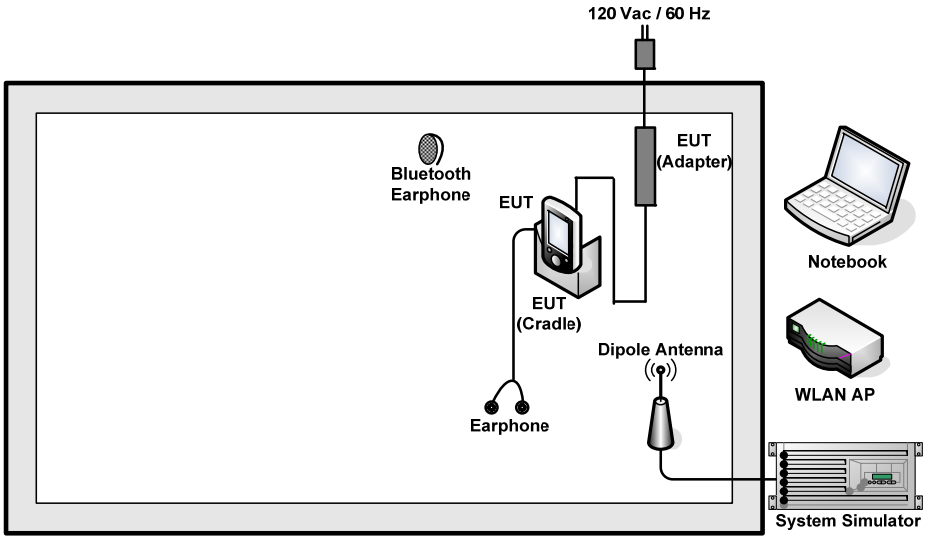


2.5 Support Unit used in test configuration and system

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.	DC Power Supply	GWINSTEK	GPS-3030D	FCC DoC	N/A	Unshielded, 1.8 m
3.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
4.	Notebook	Lenovo	G480	FCC DoC	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m
5.	Earphone	Lenovo	SH100	FCC DoC	N/A	N/A
6.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.7 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 1.5 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 1.5 + 10 = 11.5 (dB)

3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

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

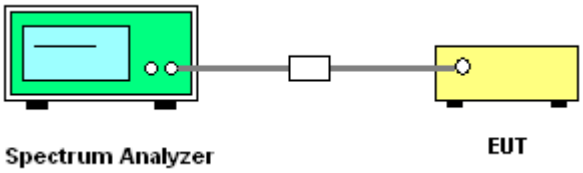
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r01.
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

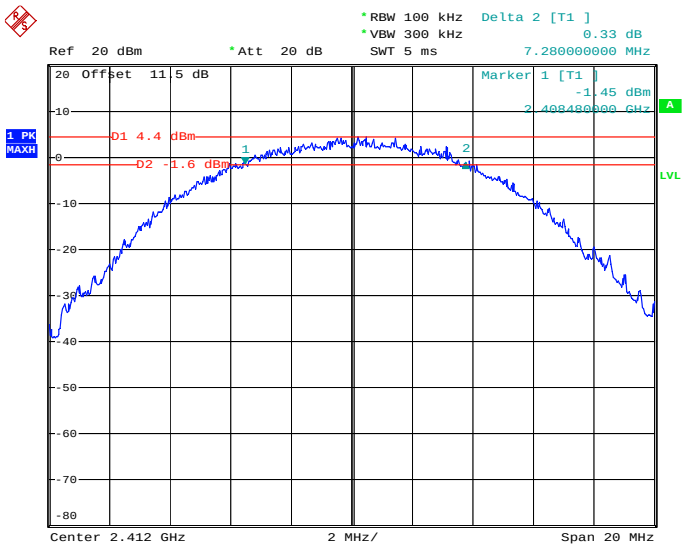


3.1.5 Test Result of 6dB Occupied Bandwidth

Test Band :	2.4GHz	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	5.5Mbps	1	1	2412	7.28	0.5	Pass
11b	5.5Mbps	1	6	2437	7.68	0.5	Pass
11b	5.5Mbps	1	11	2462	7.48	0.5	Pass
11g	6Mbps	1	1	2412	15.32	0.5	Pass
11g	6Mbps	1	6	2437	16.04	0.5	Pass
11g	6Mbps	1	11	2462	15.32	0.5	Pass
HT20	MCS0	1	1	2412	15.32	0.5	Pass
HT20	MCS0	1	6	2437	15.72	0.5	Pass
HT20	MCS0	1	11	2462	15.12	0.5	Pass

Minimum 6dB Bandwidth



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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.

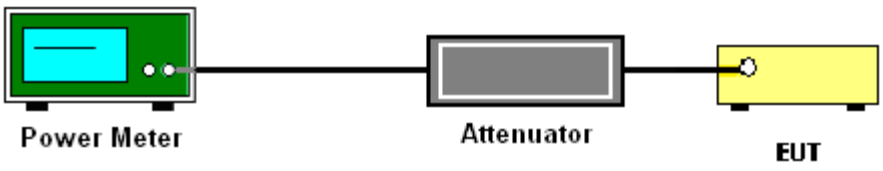
3.2.2 Measuring Instruments

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 v03r01.
2. The RF output of EUT was connected to the power meter 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. 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 :	2.4GHz	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	5.5Mbps	1	1	2412	14.80	30	1.96	Pass
11b	5.5Mbps	1	6	2437	14.67	30	1.96	Pass
11b	5.5Mbps	1	11	2462	14.22	30	1.96	Pass
11g	6Mbps	1	1	2412	16.39	30	1.96	Pass
11g	6Mbps	1	6	2437	17.10	30	1.96	Pass
11g	6Mbps	1	11	2462	16.26	30	1.96	Pass
HT20	MCS0	1	1	2412	16.32	30	1.96	Pass
HT20	MCS0	1	6	2437	17.11	30	1.96	Pass
HT20	MCS0	1	11	2462	16.09	30	1.96	Pass

Note: Measured power (dBm) has offset with cable loss.

3.2.6 Test Result of Average output Power (Reporting Only)

Test Mode :	2.4GHz	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	5.5Mbps	1	1	2412	0.00	11.95	30	1.96	Pass
11b	5.5Mbps	1	6	2437	0.00	10.89	30	1.96	Pass
11b	5.5Mbps	1	11	2462	0.00	10.72	30	1.96	Pass
11g	6Mbps	1	1	2412	0.00	9.40	30	1.96	Pass
11g	6Mbps	1	6	2437	0.00	9.60	30	1.96	Pass
11g	6Mbps	1	11	2462	0.00	8.36	30	1.96	Pass
HT20	MCS0	1	1	2412	0.00	9.39	30	1.96	Pass
HT20	MCS0	1	6	2437	0.00	9.16	30	1.96	Pass
HT20	MCS0	1	11	2462	0.00	8.40	30	1.96	Pass

Note: Measured power (dBm) has offset with cable loss and duty factor.

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.

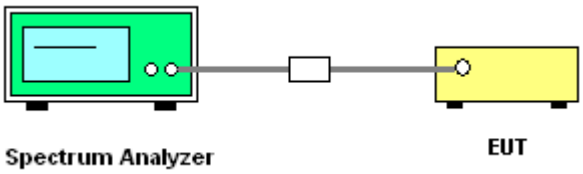
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
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) = 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. Measure and record the results in the test report.

3.3.4 Test Setup



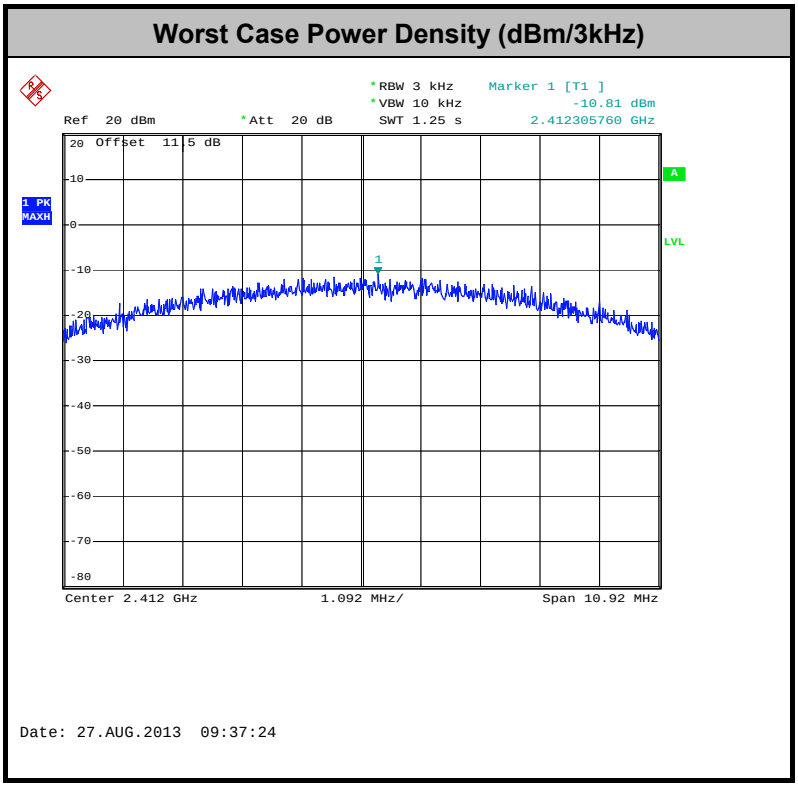
3.3.5 Test Result of Power Spectral Density

Test Mode :	2.4GHz	Temperature :	23~24℃
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N_{TX}	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11b	5.5Mbps	1	1	2412	-10.81	8	1.96	Pass
11b	5.5Mbps	1	6	2437	-11.95	8	1.96	Pass
11b	5.5Mbps	1	11	2462	-11.93	8	1.96	Pass
11g	6Mbps	1	1	2412	-15.29	8	1.96	Pass
11g	6Mbps	1	6	2437	-15.67	8	1.96	Pass
11g	6Mbps	1	11	2462	-15.14	8	1.96	Pass
HT20	MCS0	1	1	2412	-15.82	8	1.96	Pass
HT20	MCS0	1	6	2437	-15.92	8	1.96	Pass
HT20	MCS0	1	11	2462	-16.43	8	1.96	Pass

Note: Measured power density (dBm) has offset with cable loss.

Worst Case Power Density (dBm/3kHz)



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 FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
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. 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

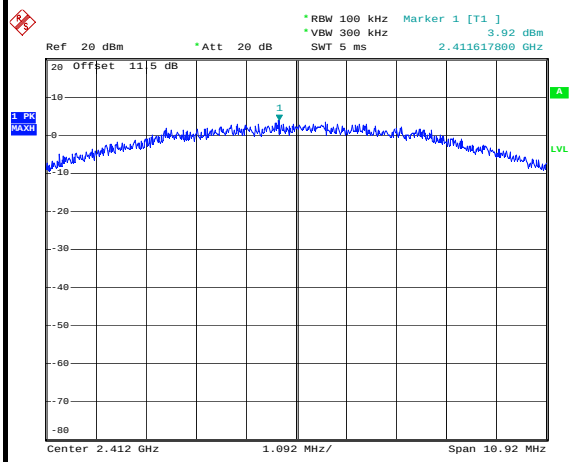
3.4.4 Test Setup

3.4.5 Test Result of Conducted Band Edges and Spurious Emission

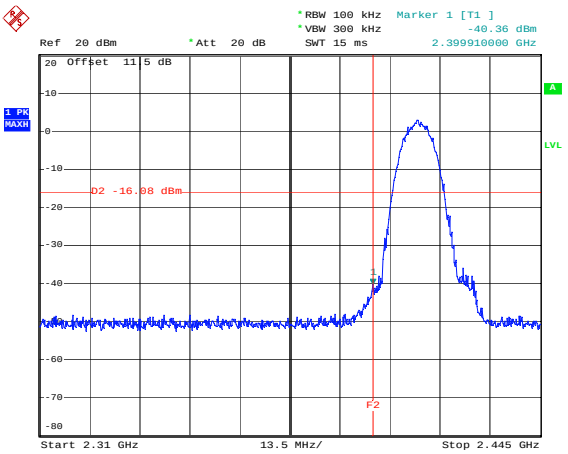
Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Adonis Li

WLAN 802.11b Channel 01

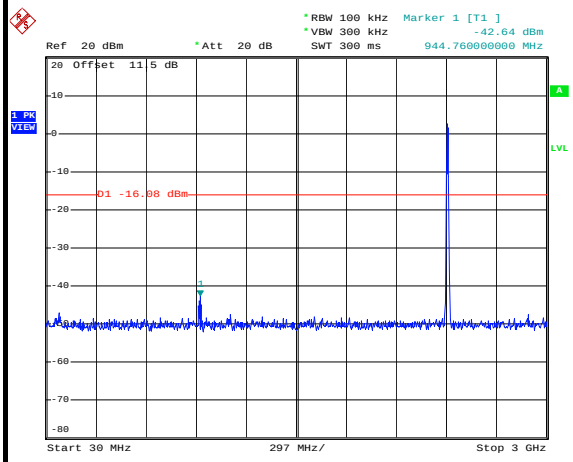
100kHz PSD reference Level



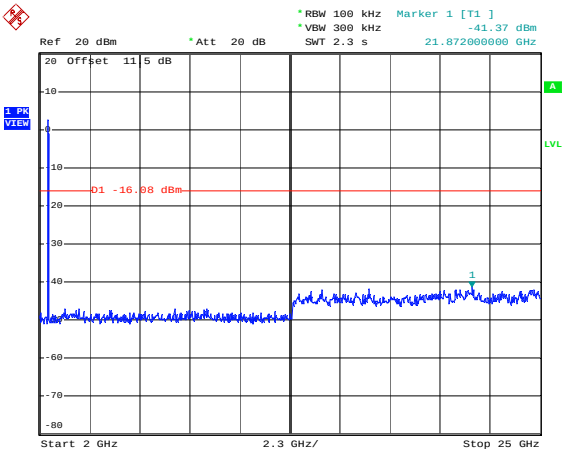
Low Channel Plot



Spurious Emission 30MHz~3GHz



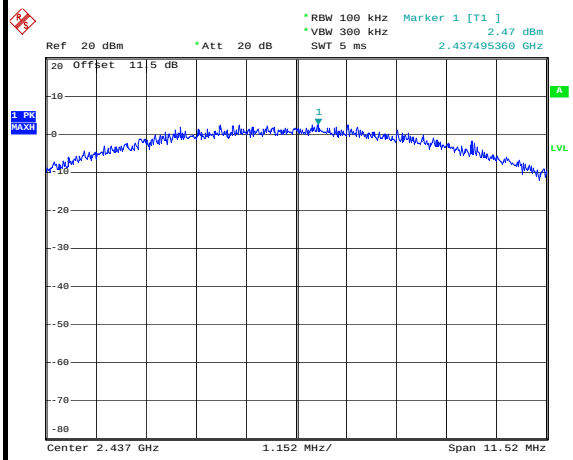
Spurious Emission 2GHz~25GHz



Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

WLAN 802.11b Channel 06

100kHz PSD reference Level



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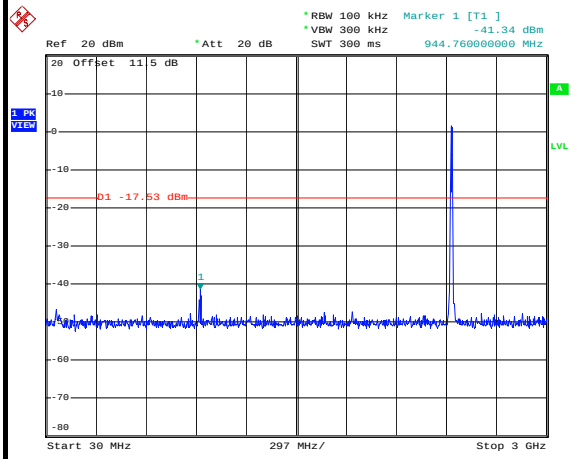
Spurious Emission 30MHz~3GHz



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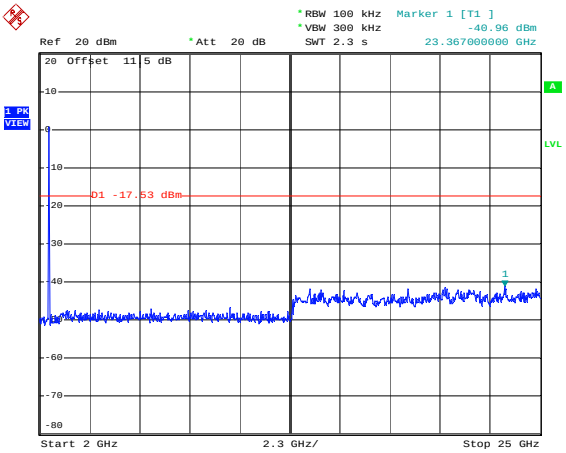
Spurious Emission 2GHz~25GHz

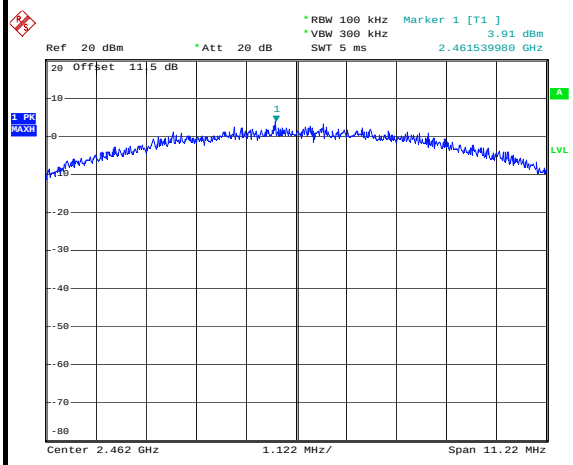


Date: 27.AUG.2013 10:21:15

Test Mode :	802.11b	Temperature :	23~24℃
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Adonis Li

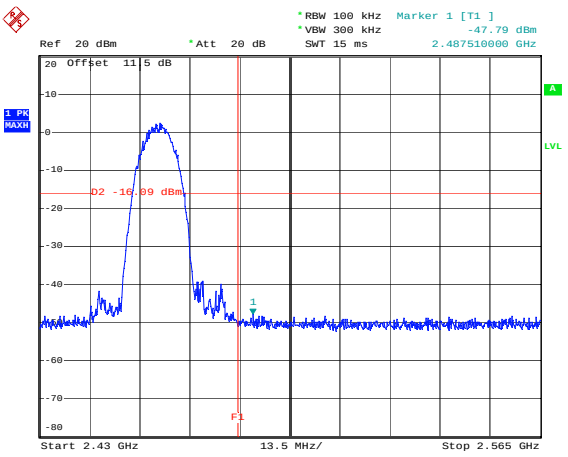
WLAN 802.11b Channel 11

100kHz PSD reference Level



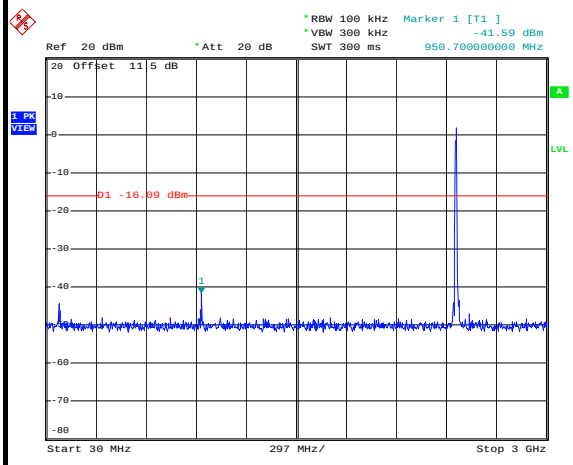
Date: 27.AUG.2013 10:30:37

High Channel Plot



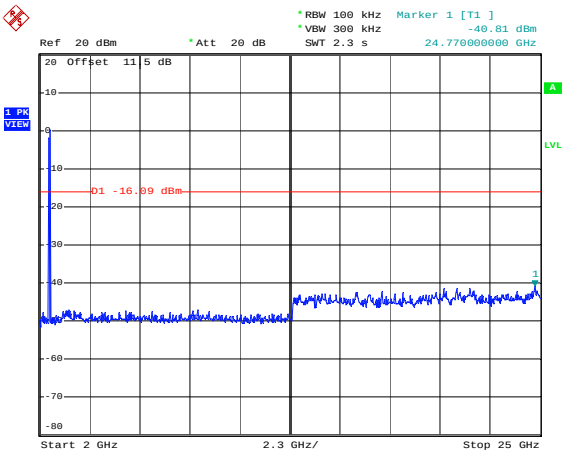
Date: 27.AUG.2013 10:31:03

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2013 10:36:05

Spurious Emission 2GHz~25GHz

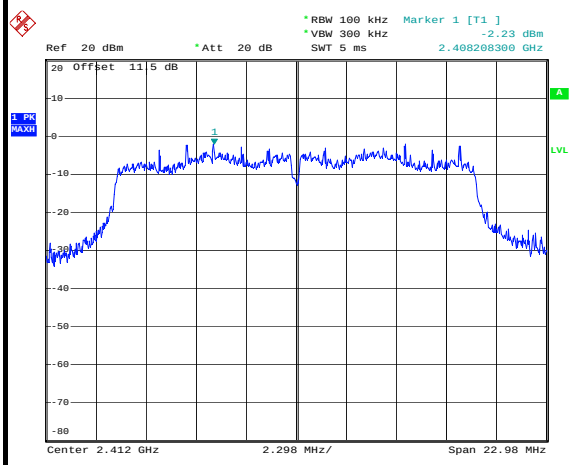


Date: 27.AUG.2013 10:36:24

Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Adonis Li

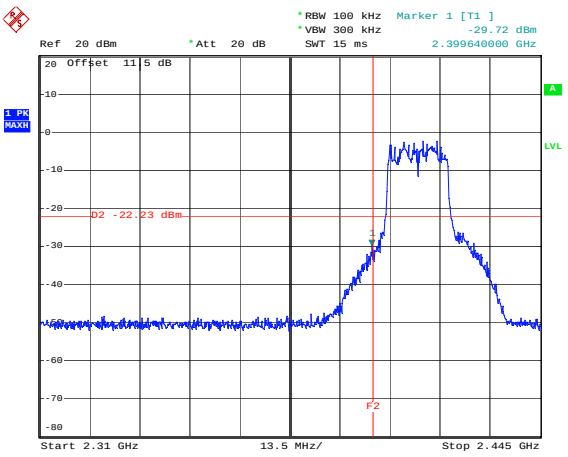
WLAN 802.11g Channel 01

100kHz PSD reference Level



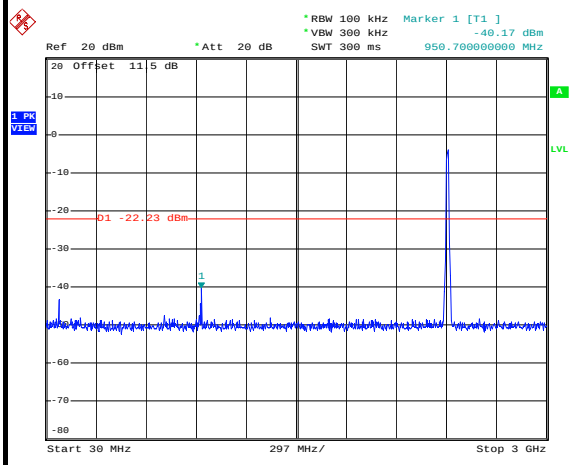
Date: 27.AUG.2013 09:55:25

Low Channel Plot



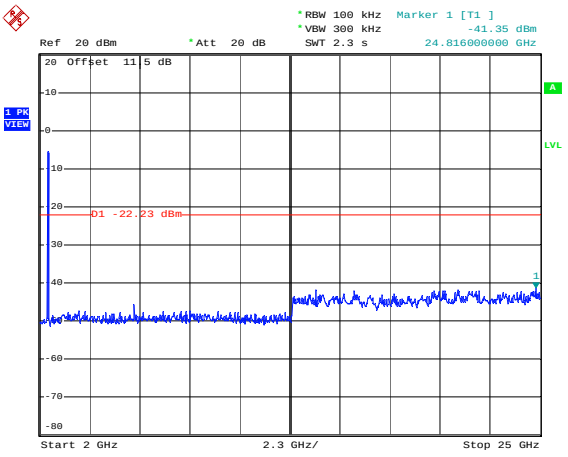
Date: 27.AUG.2013 10:39:32

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2013 09:56:39

Spurious Emission 2GHz~25GHz

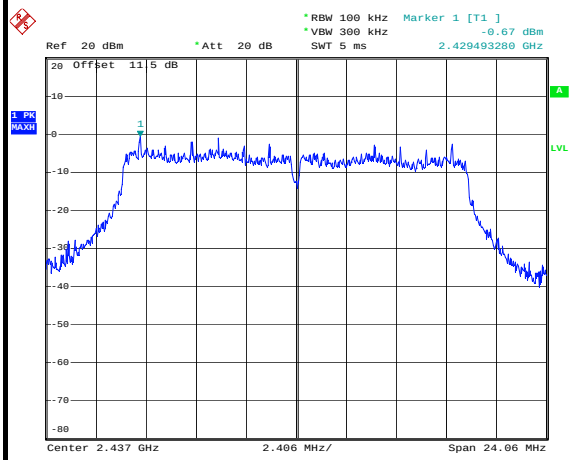


Date: 27.AUG.2013 09:56:58

Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

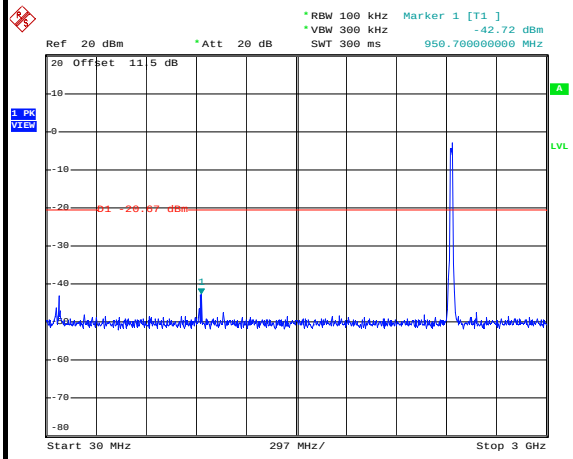
WLAN 802.11g Channel 06

100kHz PSD reference Level



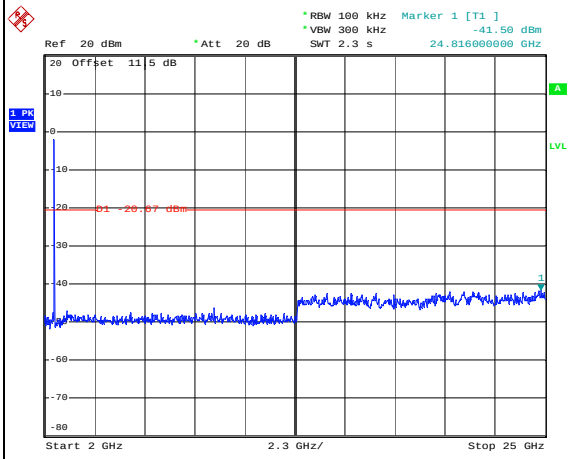
Date: 27.AUG.2013 09:59:16

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2013 09:59:39

Spurious Emission 2GHz~25GHz

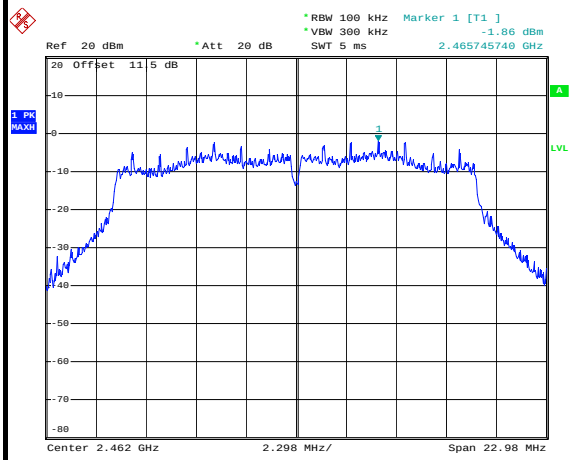


Date: 27.AUG.2013 09:59:58

Test Mode :	802.11g	Temperature :	23~24℃
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Adonis Li

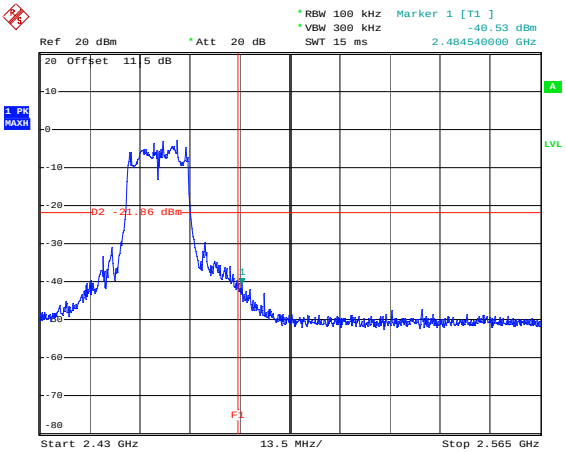
WLAN 802.11g Channel 11

100kHz PSD reference Level



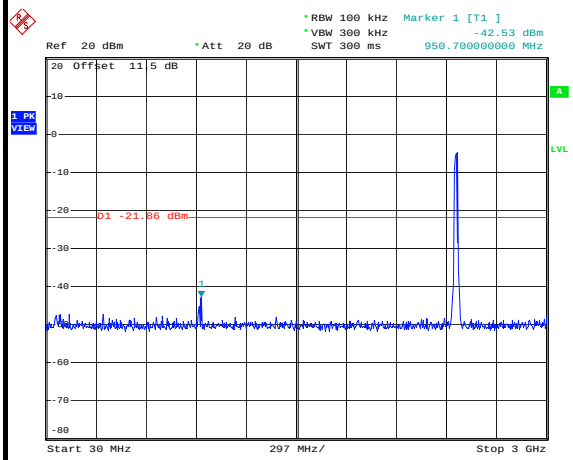
Date: 27.AUG.2013 10:02:06

High Channel Plot



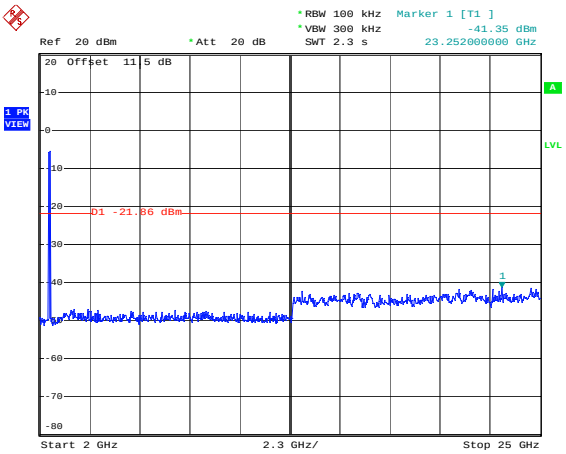
Date: 27.AUG.2013 10:02:23

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2013 10:02:44

Spurious Emission 2GHz~25GHz

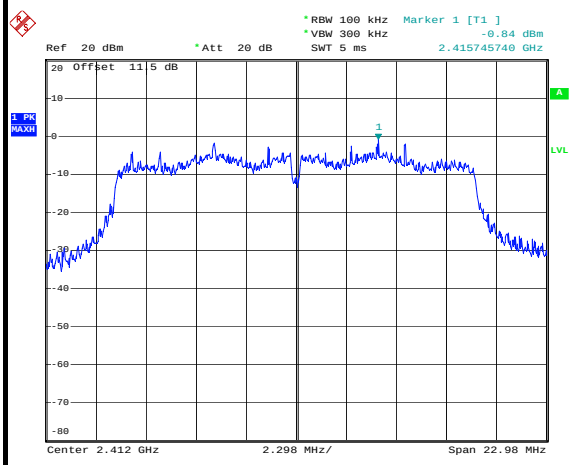


Date: 27.AUG.2013 10:03:03

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	2.4GHz Low	Relative Humidity :	47~48%
Test Channel :	01	Test Engineer :	Adonis Li

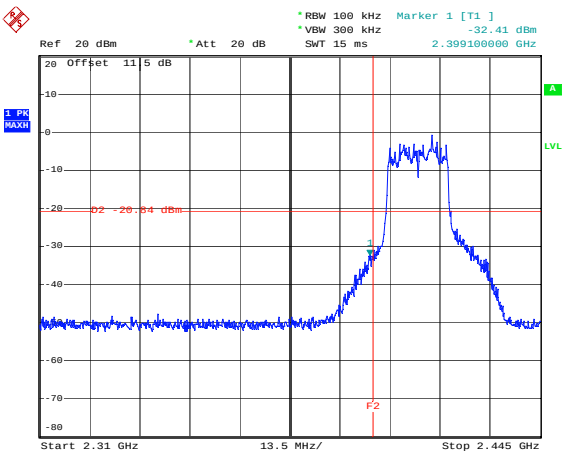
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



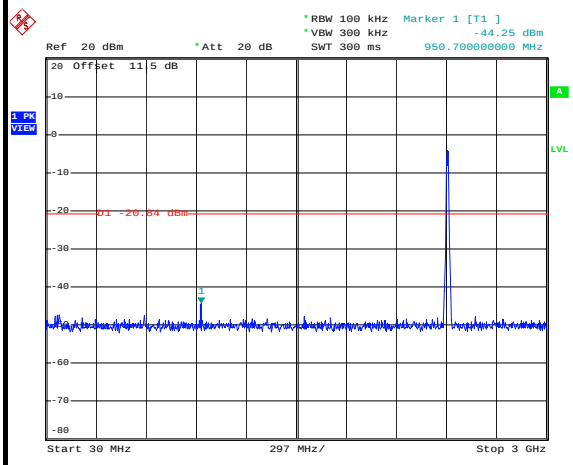
Date: 27.AUG.2013 10:06:16

Low Channel Plot



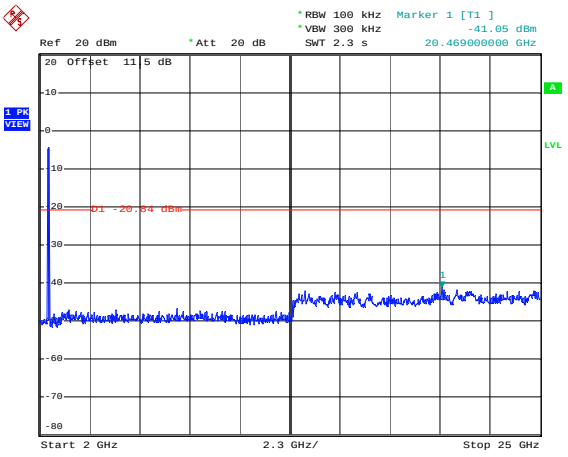
Date: 27.AUG.2013 10:06:32

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2013 10:06:54

Spurious Emission 2GHz~25GHz

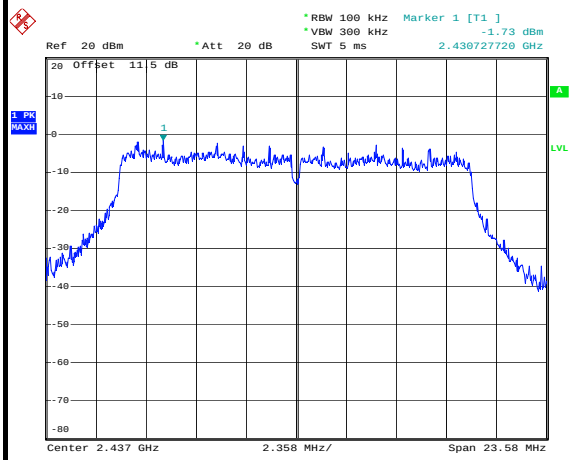


Date: 27.AUG.2013 10:07:14

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	2.4GHz Mid	Relative Humidity :	47~48%
Test Channel :	06	Test Engineer :	Adonis Li

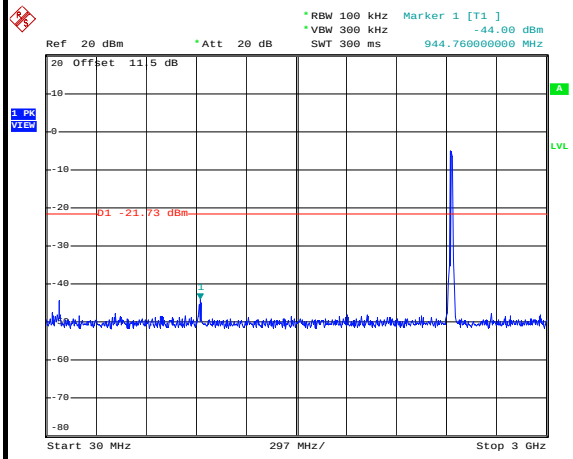
WLAN 802.11n HT20 Channel 06

100kHz PSD reference Level



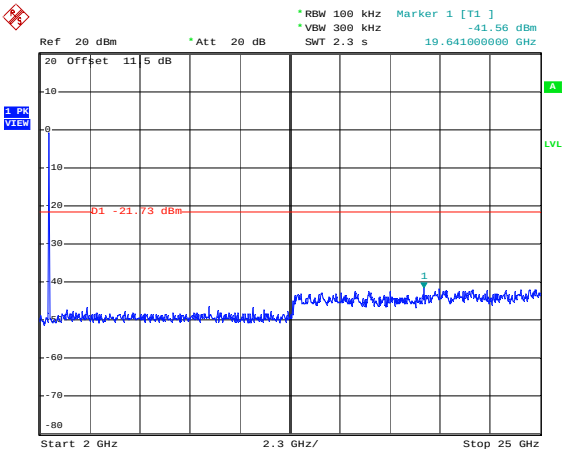
Date: 27.AUG.2013 10:10:05

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2013 10:10:44

Spurious Emission 2GHz~25GHz

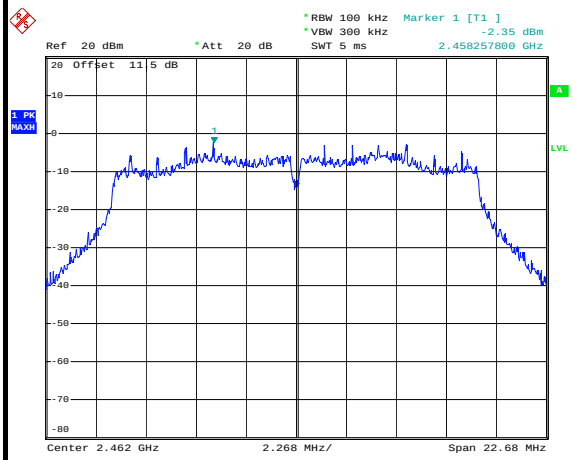


Date: 27.AUG.2013 10:11:03

Test Mode :	802.11n HT20	Temperature :	23~24℃
Test Band :	2.4GHz High	Relative Humidity :	47~48%
Test Channel :	11	Test Engineer :	Adonis Li

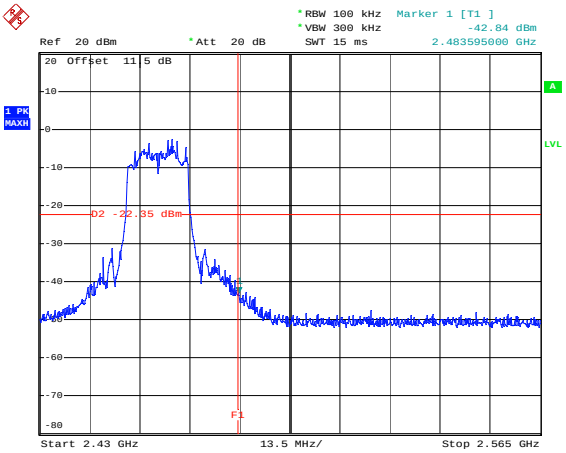
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



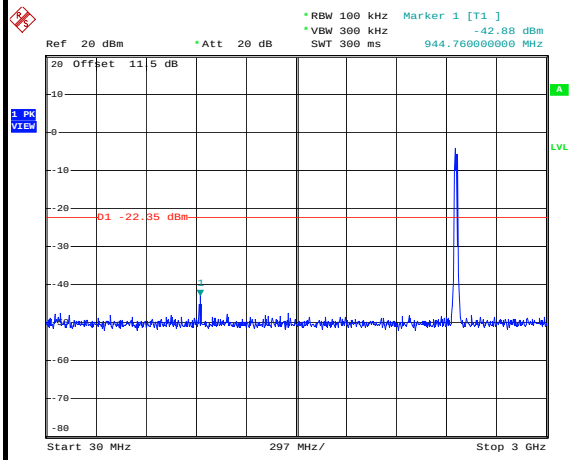
Date: 27.AUG.2013 10:13:33

High Channel Plot



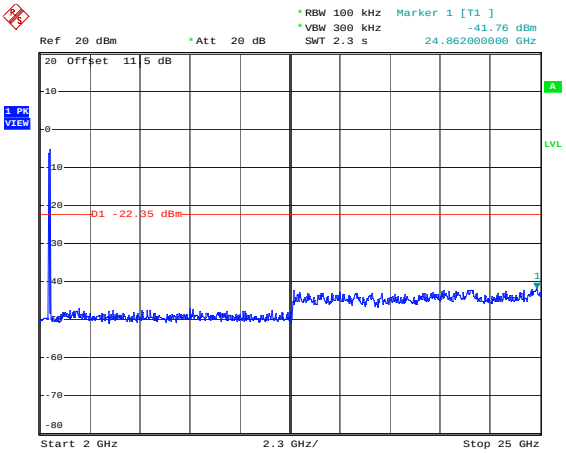
Date: 27.AUG.2013 10:14:07

Spurious Emission 30MHz~3GHz



Date: 27.AUG.2013 10:15:07

Spurious Emission 2GHz~25GHz



Date: 27.AUG.2013 10:15:26

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

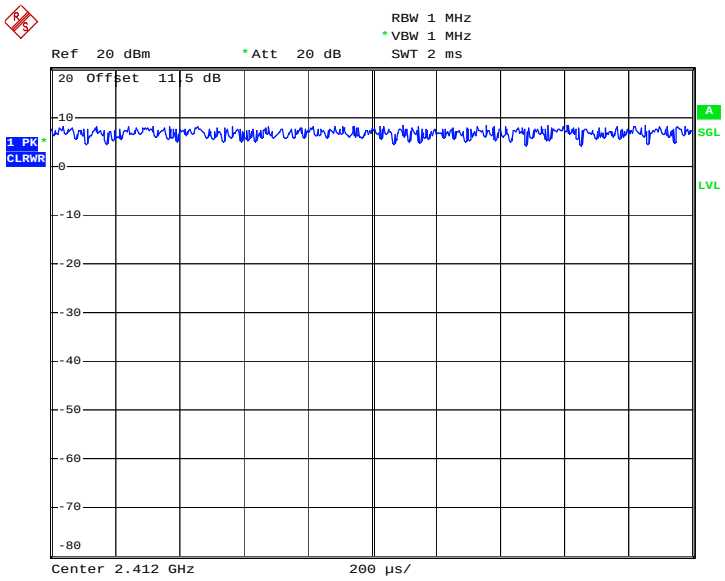
See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
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 - Preamp 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 ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 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(μs)	1/T(kHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	100.00	-	-	10Hz
2.4GHz 802.11n HT20	100.00	-	-	10Hz

802.11b Duty Cycle

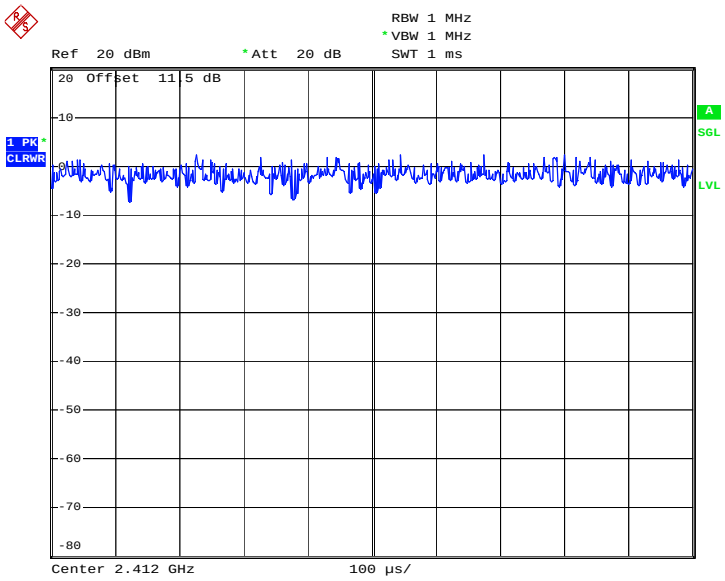


Date: 14.AUG.2013 17:20:52

Note:

The total loss is 11.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

802.11g Duty Cycle

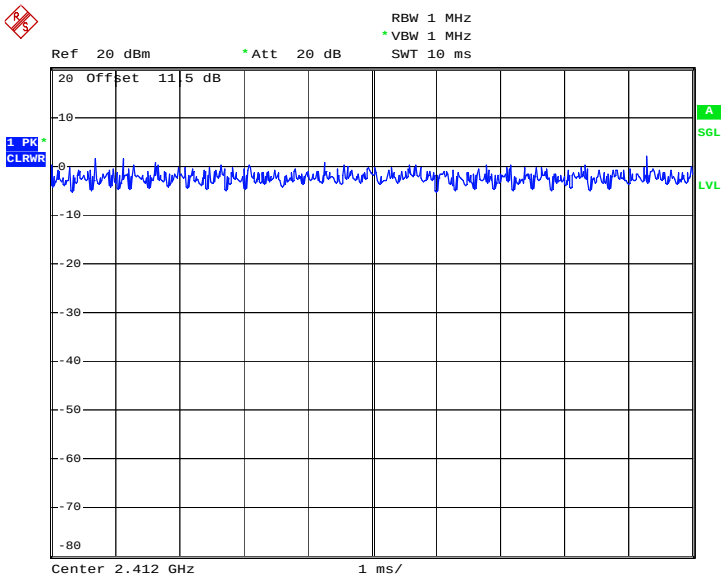


Date: 14.AUG.2013 17:24:32

Note:

The total loss is 11.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

2.4GHz 802.11n HT20 Duty Cycle



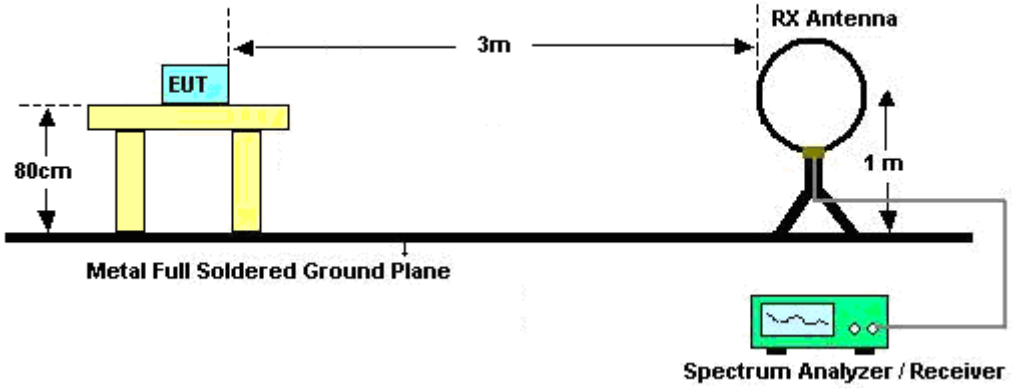
Date: 14.AUG.2013 18:06:06

Note:

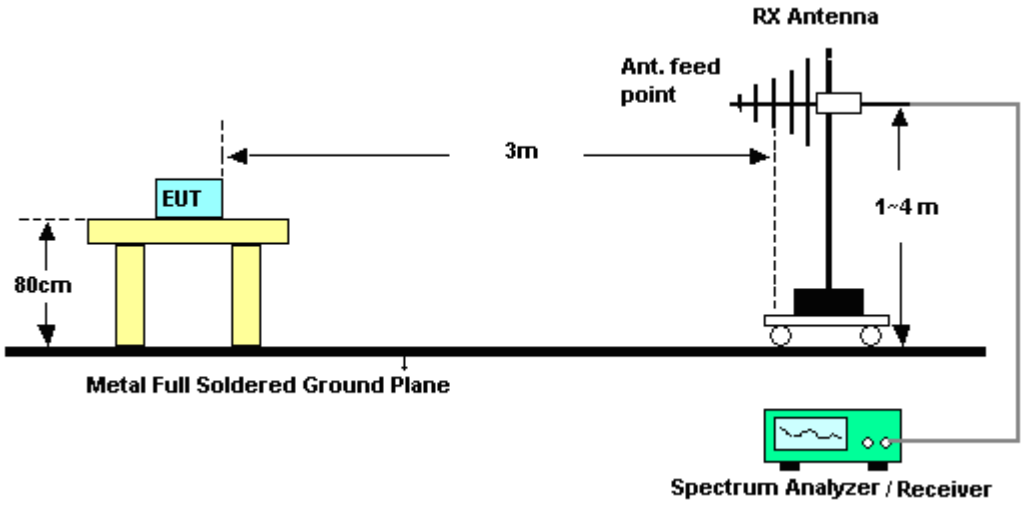
The total loss is 11.5dB of the RF cable and attenuator, and has been compensated to the spectrum analyzer by setting into the amplitude level offset. That means the measured result shown on the spectrum analyzer has added the total loss and been compliance with the limit line.

3.5.4 Test Setup

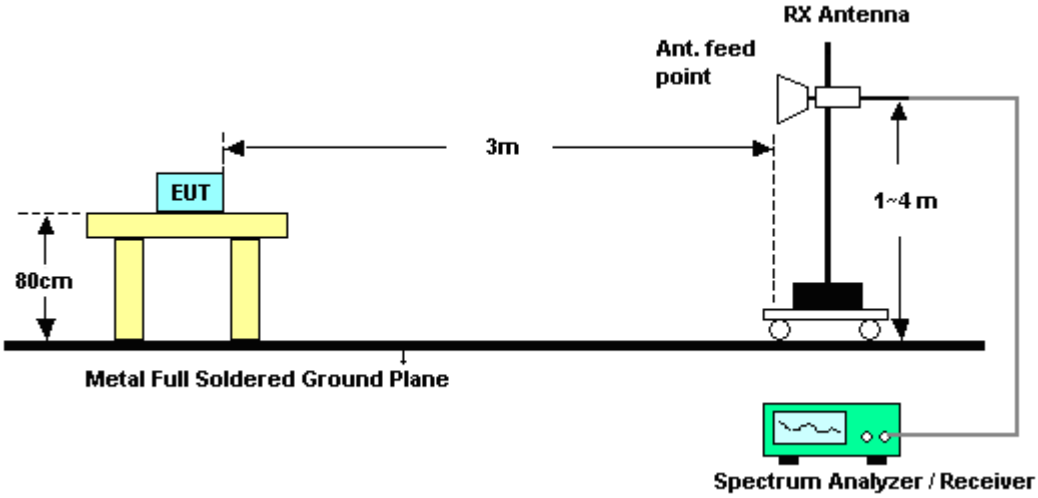
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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 Spurious at Band Edges

Test Mode :	802.11b	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	40~41%
Test Channel :	01	Test Engineer :	Jun Liu

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
2389.83	65.98	-8.02	74	60.63	32.86	3.17	30.68	187	25	Peak
2390	40.99	-13.01	54	35.64	32.86	3.17	30.68	187	25	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
2389.92	64.36	-9.64	74	59.01	32.86	3.17	30.68	102	278	Peak
2390	39.37	-14.63	54	34.02	32.86	3.17	30.68	102	278	Average

Test Mode :	802.11b	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	40~41%
Test Channel :	11	Test Engineer :	Jun Liu

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
2484.04	60.7	-13.3	74	55.07	33.01	3.22	30.6	121	76	Peak
2483.5	44.09	-9.91	54	38.46	33.01	3.22	30.6	121	76	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
2484.13	59.04	-14.96	74	53.41	33.01	3.22	30.6	100	46	Peak
2483.5	42.12	-11.88	54	36.49	33.01	3.22	30.6	100	46	Average

Test Mode :	802.11g	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	40~41%
Test Channel :	01	Test Engineer :	Jun Liu

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	62.42	-11.58	74	57.07	32.86	3.17	30.68	158	24	Peak
2390	40.68	-13.32	54	35.33	32.86	3.17	30.68	158	24	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	64.38	-9.62	74	59.03	32.86	3.17	30.68	100	278	Peak
2390	42.75	-11.25	54	37.4	32.86	3.17	30.68	100	278	Average

Test Mode :	802.11g	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	40~41%
Test Channel :	11	Test Engineer :	Jun Liu

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	69.02	-4.98	74	63.39	33.01	3.22	30.6	100	61	Peak
2483.53	44.58	-9.42	54	38.95	33.01	3.22	30.6	100	61	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
2485.48	67.27	-6.73	74	61.64	33.01	3.22	30.6	100	311	Peak
2483.53	44.26	-9.74	54	38.63	33.01	3.22	30.6	100	311	Average

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	40~41%
Test Channel :	01	Test Engineer :	Jun Liu

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
2378.49	50.85	-23.15	74	45.56	32.83	3.16	30.7	185	27	Peak
2390	37.29	-16.71	54	31.94	32.86	3.17	30.68	185	27	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
2376.87	50.75	-23.25	74	45.46	32.83	3.16	30.7	100	232	Peak
2390	37.21	-16.79	54	31.86	32.86	3.17	30.68	100	232	Average

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	40~41%
Test Channel :	11	Test Engineer :	Jun Liu

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
2483.89	51.92	-22.08	74	46.29	33.01	3.22	30.6	105	303	Peak
2483.5	38.93	-15.07	54	33.3	33.01	3.22	30.6	105	303	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
2483.92	51.26	-22.74	74	45.63	33.01	3.22	30.6	171	0	Peak
2483.5	37.95	-16.05	54	32.32	33.01	3.22	30.6	171	0	Average

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

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 1GHz.

Test Mode :	802.11b	**Temperature :**	22~23°C
Test Channel :	01	**Relative Humidity :**	40~41%
Test Engineer :	Jun Liu	**Polarization :**	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level. For example, 112.34dBμV/m - 20dB = 92.34dBμV/m.		

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	112.34	-	-	106.93	32.89	3.18	30.66	190	25	Peak
2412	105.26	-	-	99.85	32.89	3.18	30.66	190	25	Average
4824	65.49	-8.51	74	55.06	35.17	4.58	29.32	133	238	Peak
4824	48.46	-5.54	54	38.03	35.17	4.58	29.32	133	238	Average
7236	51.9	-40.44	92.34	40.25	36.18	5.62	30.15	100	44	Peak

Test Mode :	802.11b	**Temperature :**	22~23°C
Test Channel :	01	**Relative Humidity :**	40~41%
Test Engineer :	Jun Liu	**Polarization :**	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

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	111.89	-	-	106.48	32.89	3.18	30.66	125	275	Peak
2412	104.93	-	-	99.52	32.89	3.18	30.66	125	275	Average
4824	69.4	-4.6	74	58.97	35.17	4.58	29.32	185	301	Peak
4824	51.81	-2.19	54	41.38	35.17	4.58	29.32	185	301	Average
7236	53.71	-38.18	91.89	42.06	36.18	5.62	30.15	100	26	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	109.16	-	-	103.64	32.95	3.2	30.63	153	75	Peak
2437	102.12	-	-	96.6	32.95	3.2	30.63	153	75	Average
4874	65.59	-8.41	74	55.13	35.18	4.6	29.32	111	235	Peak
4874	49.26	-4.74	54	38.8	35.18	4.6	29.32	111	235	Average
7312	53.57	-20.43	74	41.91	36.2	5.64	30.18	100	159	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	109.9	-	-	104.38	32.95	3.2	30.63	100	243	Peak
2437	102.87	-	-	97.35	32.95	3.2	30.63	100	243	Average
4874	66.03	-7.97	74	55.57	35.18	4.6	29.32	126	302	Peak
4874	50.53	-3.47	54	40.07	35.18	4.6	29.32	126	302	Average
7312	51.77	-22.23	74	40.11	36.2	5.64	30.18	100	248	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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
30	19.77	-20.23	40	35.82	18	-0.48	33.57	-	-	Peak
143.49	24.73	-18.77	43.5	46.67	10.55	1.09	33.58	100	261	Peak
243.4	22.41	-23.59	46	42.72	11.7	1.44	33.45	-	-	Peak
541.19	23.57	-22.43	46	36.16	18.33	2.11	33.03	-	-	Peak
895.24	25.25	-20.75	46	34.55	20.45	2.7	32.45	-	-	Peak
946.65	26.73	-19.27	46	35.64	20.72	2.81	32.44	-	-	Peak
2462	114.03	-	-	108.46	32.98	3.21	30.62	151	33	Peak
2462	106.65	-	-	101.08	32.98	3.21	30.62	151	33	Average
4924	69.56	-4.44	74	59.07	35.19	4.61	29.31	100	244	Peak
4924	51.59	-2.41	54	41.1	35.19	4.61	29.31	100	244	Average
7386	53.5	-20.5	74	41.82	36.24	5.66	30.22	100	26	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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
47.46	31.98	-8.02	40	56.44	8.5	0.64	33.6	100	55	Peak
117.3	25.99	-17.51	43.5	46.78	11.8	1.01	33.6	-	-	Peak
143.49	24.75	-18.75	43.5	46.69	10.55	1.09	33.58	-	-	Peak
515	22.42	-23.58	46	35.96	17.53	2.03	33.1	-	-	Peak
705.12	24.6	-21.4	46	35.74	19.34	2.39	32.87	-	-	Peak
944.71	28.01	-17.99	46	36.93	20.71	2.81	32.44	-	-	Peak
2462	112.75	-	-	107.18	32.98	3.21	30.62	140	280	Peak
2462	105.7	-	-	100.13	32.98	3.21	30.62	140	280	Average
4924	68.43	-5.57	74	57.94	35.19	4.61	29.31	195	308	Peak
4924	52.52	-1.48	54	42.03	35.19	4.61	29.31	194	322	Average
7386	51.52	-22.48	74	39.84	36.24	5.66	30.22	100	62	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

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	106.9	-	-	101.49	32.89	3.18	30.66	158	24	Peak
2412	95.04	-	-	89.63	32.89	3.18	30.66	158	24	Average
4824	63.04	-10.96	74	52.61	35.17	4.58	29.32	130	184	Peak
4824	47.58	-6.42	54	37.15	35.17	4.58	29.32	130	184	Average
7236	53.49	-33.41	86.9	41.84	36.18	5.62	30.15	100	26	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 7236 MHz is not within a restricted band, and its limit line is 20dB below the highest emission level.		

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	109.25	-	-	103.84	32.89	3.18	30.66	100	273	Peak
2412	97.24	-	-	91.83	32.89	3.18	30.66	100	273	Average
4824	65.15	-8.85	74	54.72	35.17	4.58	29.32	183	162	Peak
4824	50.08	-3.92	54	39.65	35.17	4.58	29.32	183	162	Average
7236	53.09	-36.16	89.25	41.44	36.18	5.62	30.15	100	25	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	107.34	-	-	101.82	32.95	3.2	30.63	185	6	Peak
2437	95.85	-	-	90.33	32.95	3.2	30.63	185	6	Average
4874	58.48	-15.52	74	48.02	35.18	4.6	29.32	100	349	Peak
4874	43.82	-10.18	54	33.36	35.18	4.6	29.32	100	349	Average
7312	52.99	-21.01	74	41.33	36.2	5.64	30.18	100	61	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	106.58	-	-	101.06	32.95	3.2	30.63	100	250	Peak
2437	93.77	-	-	88.25	32.95	3.2	30.63	100	250	Average
4874	58.73	-15.27	74	48.27	35.18	4.6	29.32	100	173	Peak
4874	44.24	-9.76	54	33.78	35.18	4.6	29.32	100	173	Average
7312	52.99	-21.01	74	41.33	36.2	5.64	30.18	100	162	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	106.35	-	-	100.78	32.98	3.21	30.62	100	61	Peak
2462	94.32	-	-	88.75	32.98	3.21	30.62	100	61	Average
4924	60.47	-13.53	74	49.98	35.19	4.61	29.31	100	335	Peak
4924	46.69	-7.31	54	36.2	35.19	4.61	29.31	100	335	Average
7386	49.82	-24.18	74	38.14	36.24	5.66	30.22	100	256	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	107.5	-	-	101.93	32.98	3.21	30.62	100	311	Peak
2462	94.52	-	-	88.95	32.98	3.21	30.62	100	311	Average
4924	63.08	-10.92	74	52.59	35.19	4.61	29.31	200	322	Peak
4924	48.38	-5.62	54	37.89	35.19	4.61	29.31	200	322	Average
7386	48.91	-25.09	74	37.23	36.24	5.66	30.22	100	236	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 7236 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
2412	100.77	-	-	95.36	32.89	3.18	30.66	185	27	Peak
2412	88.42	-	-	83.01	32.89	3.18	30.66	185	27	Average
4824	50.88	-23.12	74	40.45	35.17	4.58	29.32	100	26	Peak
7236	53.22	-27.55	80.77	41.57	36.18	5.62	30.15	100	49	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. 7236 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
2412	99.66	-	-	94.25	32.89	3.18	30.66	100	270	Peak
2412	88.34	-	-	82.93	32.89	3.18	30.66	100	270	Average
4824	50.11	-23.89	74	39.68	35.17	4.58	29.32	100	79	Peak
7236	52.85	-26.81	79.66	41.2	36.18	5.62	30.15	120	162	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	97.19	-	-	91.67	32.95	3.2	30.63	100	49	Peak
2437	85.67	-	-	80.15	32.95	3.2	30.63	100	49	Average
4874	50.26	-23.74	74	39.8	35.18	4.6	29.32	100	46	Peak
7312	52.56	-21.44	74	40.9	36.2	5.64	30.18	100	245	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	99.28	-	-	93.76	32.95	3.2	30.63	100	289	Peak
2437	85.27	-	-	79.75	32.95	3.2	30.63	100	289	Average
4874	50.28	-23.72	74	39.82	35.18	4.6	29.32	100	161	Peak
7312	52.14	-21.86	74	40.48	36.2	5.64	30.18	102	59	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	100.4	-	-	94.83	32.98	3.21	30.62	105	53	Peak
2462	88.3	-	-	82.73	32.98	3.21	30.62	105	53	Average
4924	50.75	-23.25	74	40.26	35.19	4.61	29.31	100	164	Peak
7386	52.12	-21.88	74	40.44	36.24	5.66	30.22	100	161	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	40~41%
Test Engineer :	Jun Liu	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	99.69	-	-	94.12	32.98	3.21	30.62	171	0	Peak
2462	88.29	-	-	82.72	32.98	3.21	30.62	171	0	Average
4924	50.43	-23.57	74	39.94	35.19	4.61	29.31	100	49	Peak
7386	53.2	-20.8	74	41.52	36.24	5.66	30.22	100	214	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 (dBμV)	
	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.

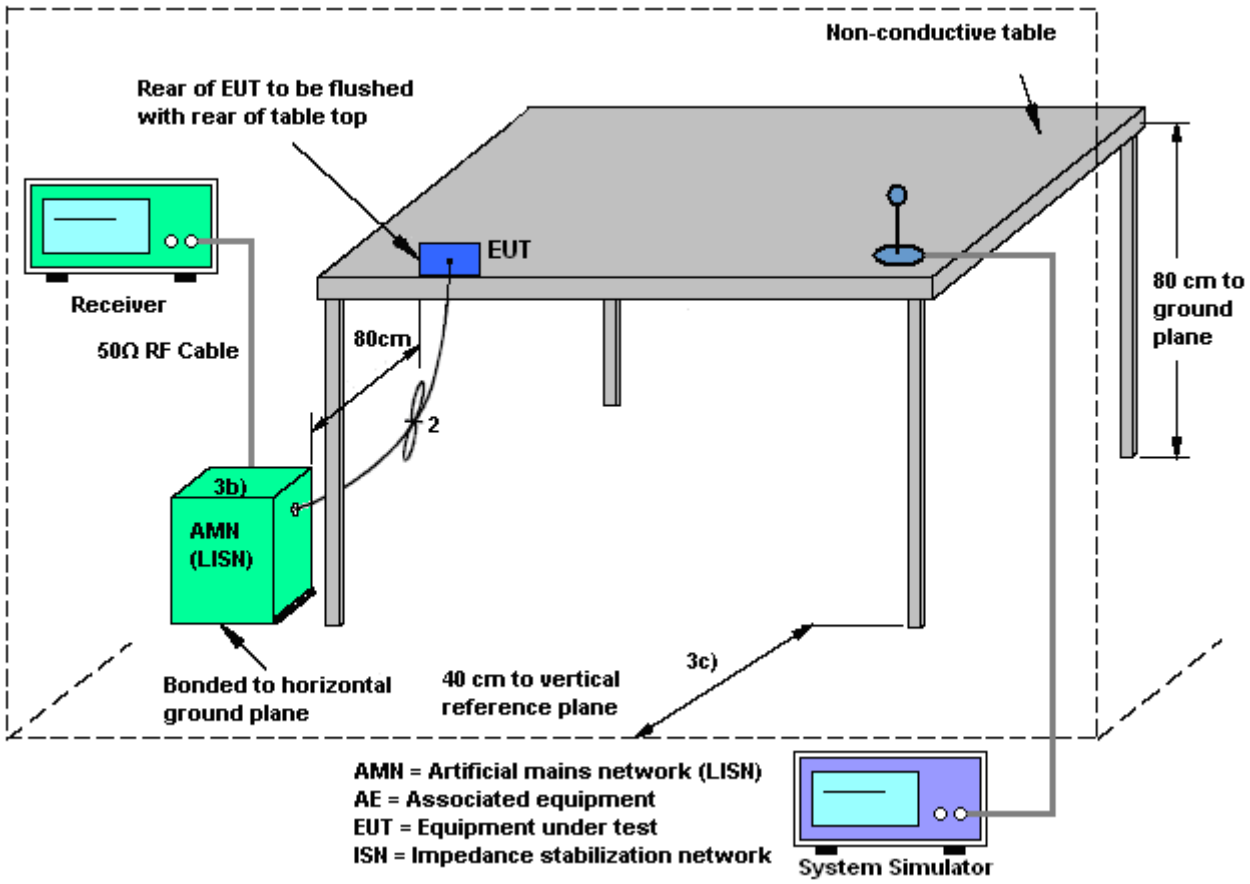
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

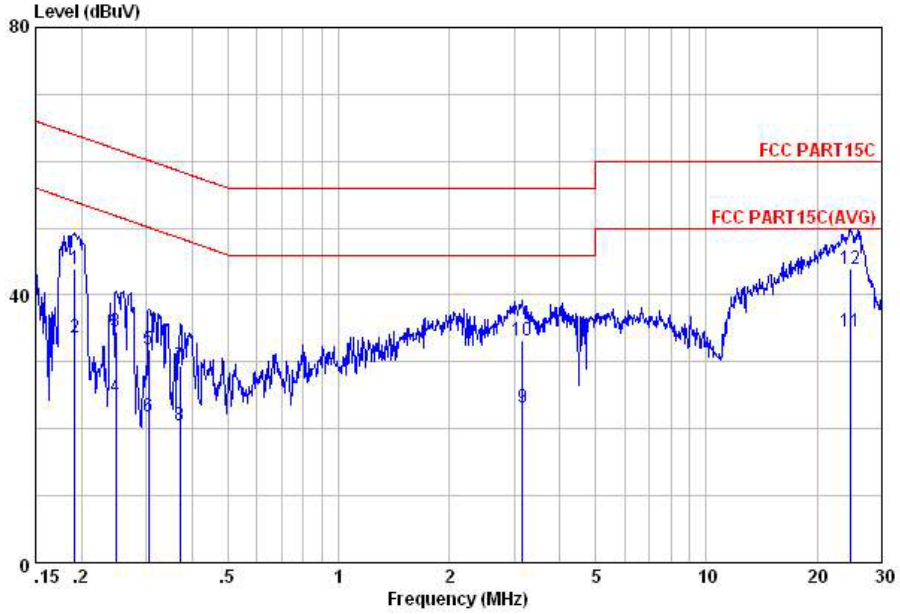
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. 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 :	22~24℃
Test Engineer :	Hawey Tang	Relative Humidity :	49~51%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link + Earphone + Adapter + Cradle		

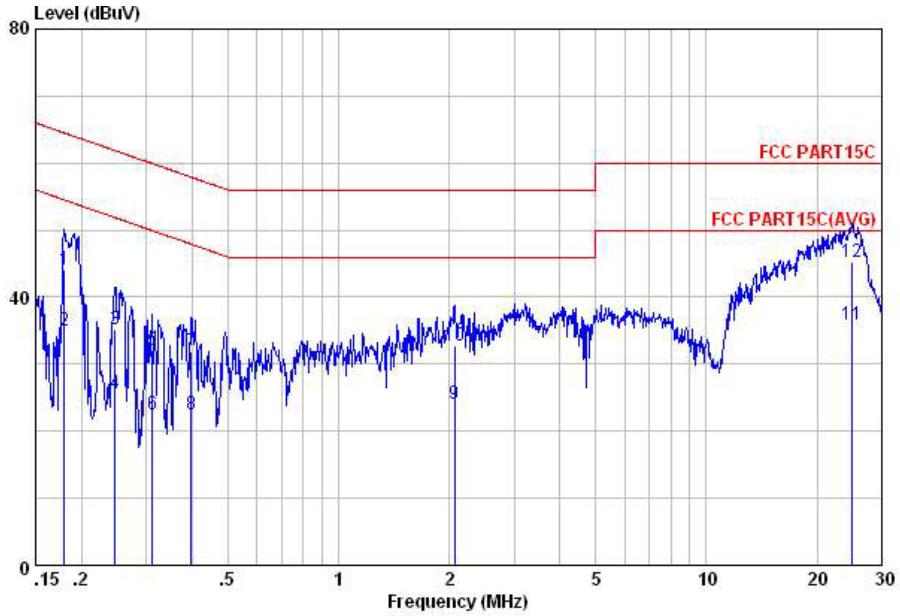


Site : C001-KS
Condition: FCC PART15C LISN-L20130306 LINE

mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.19	43.80	-20.18	63.98	32.11	1.10	10.59	QP
2	0.19	33.60	-20.38	53.98	21.91	1.10	10.59	Average
3	0.25	34.59	-27.23	61.82	23.20	0.88	10.51	QP
4	0.25	24.79	-27.03	51.82	13.40	0.88	10.51	Average
5	0.31	31.84	-28.26	60.10	20.80	0.66	10.38	QP
6	0.31	21.94	-28.16	50.10	10.90	0.66	10.38	Average
7	0.37	29.48	-28.99	58.47	18.80	0.38	10.30	QP
8	0.37	20.58	-27.89	48.47	9.90	0.38	10.30	Average
9	3.16	23.17	-22.83	46.00	12.79	0.15	10.23	Average
10	3.16	33.27	-22.73	56.00	22.89	0.15	10.23	QP
11	24.66	34.43	-15.57	50.00	23.80	0.10	10.53	Average
12	24.66	43.93	-16.07	60.00	33.30	0.10	10.53	QP

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Hawey Tang	Relative Humidity :	49~51%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + Bluetooth Link + WLAN Link + Earphone + Adapter + Cradle		



Site : C001-KS
Condition: FCC PART15C LISN-N20130306 NEUTRAL

mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.18	44.11	-20.39	64.50	32.20	1.29	10.62	QP
2	0.18	35.01	-19.49	54.50	23.10	1.29	10.62	Average
3	0.25	35.31	-26.55	61.86	23.90	0.90	10.51	QP
4	0.25	25.61	-26.25	51.86	14.20	0.90	10.51	Average
5	0.31	32.14	-27.79	59.93	21.10	0.67	10.37	QP
6	0.31	22.44	-27.49	49.93	11.40	0.67	10.37	Average
7	0.40	31.79	-26.11	57.90	21.10	0.41	10.28	QP
8	0.40	22.49	-25.41	47.90	11.80	0.41	10.28	Average
9	2.07	24.09	-21.91	46.00	13.80	0.10	10.19	Average
10	2.07	32.79	-23.21	56.00	22.50	0.10	10.19	QP
11	24.79	35.83	-14.17	50.00	25.10	0.20	10.53	Average
12	24.79	45.33	-14.67	60.00	34.60	0.20	10.53	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 Anti-Replacement Construction

An embedded-in antenna design is 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. 29, 2012	Aug. 27, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 21, 2013	Aug. 27, 2013	Aug. 20, 2014	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 21, 2013	Aug. 27, 2013	Aug. 20, 2014	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 08, 2012	Aug. 14, 2013	Nov. 07, 2013	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 23, 2013	Aug. 14, 2013	May 22, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2012	Aug. 14, 2013	Dec. 06, 2013	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 22, 2012	Aug. 14, 2013	Oct. 21, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2013	Aug. 14, 2013	Jan. 05, 2014	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	N/A	Aug. 14, 2013	N/A	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	N/A	Aug. 14, 2013	N/A	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz	May 23, 2013	Aug. 14, 2013	May 22, 2014	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 29, 2012	Aug. 14, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2012	Aug. 14, 2013	Nov. 06, 2013	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	9170249	15GHz~40GHz	Nov. 23, 2012	Aug. 14, 2013	Nov. 22, 2013	Radiation (03CH01-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	May 23, 2013	Aug. 02, 2013	May 22, 2014	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	60103	9kHz~30MHz	Dec. 29, 2012	Aug. 02, 2013	Dec. 28, 2013	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	60105	9kHz~30MHz	Dec. 29, 2012	Aug. 02, 2013	Dec. 28, 2013	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	N/A	Nov. 15, 2012	Aug. 02, 2013	Nov. 14, 2013	Conduction (CO01-KS)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.26

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.54

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

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

Appendix B. Product Equality Declaration

Partner Tech Corp.

10F, NO. 233-2, Pao Chiao Road Shin Tien, Taipei Taiwan

Date: September 26, 2013

Product Equality Declaration

We, Partner Tech Corp., declare on our sole responsibility for the product of OT-300 as below:

The differences between five kinds of OT-300 products are:

Sample 1-1D Barcode : Opticon MDL2001 1D barcode Only read 1D barcode
Sample 2-2D Barcode : Opticon MDI3100 2D Barcode Can rear 1D&2D barcode
Sample 3-IC CARD : USB9540 IC CARD Reader / Can read and write ISO 7816 Class A,B and C card T=0 T=1 protocol I2C Memory Card
Sample 4-MSR : CHD170HK Can read ANSI/ISO Standards 7810,7811-1~6, 7813 MagStripe Card
Sample 5-Encrypted MSR : MagneSafe OEM USB READER ISO 7810 and ISO 7811/ AAMVA* MagStripe Card and can Encrypts all track data and the MagnePrint value

The positioning of all modules does not affect the RF performance at all.

Except listings above, the others are all the same.

Should you have any questions or comments regarding this matter, please have my best attention.

Sincerely yours,

Jeff cheng

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