

FCC RF Test Report

APPLICANT : Doro AB
EQUIPMENT : GSM /WCDMA Mobile Telephone
BRAND NAME : doro
MODEL NAME : Doro Liberto 820
FCC ID : WS5DORO820
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was received on May 29, 2014 and testing was completed on Aug. 24, 2014. We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (SHENZHEN) INC.

No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C.



TABLE OF CONTENTS

REVISION HISTORY.....	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant.....	5
1.2 Manufacturer.....	5
1.3 Product Feature of Equipment Under Test.....	5
1.4 Product Specification subjective to this standard	5
1.5 Modification of EUT	6
1.6 Testing Location	6
1.7 Applicable Standards.....	6
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	7
2.1 Carrier Frequency Channel	7
2.2 Pre-Scanned RF Power.....	8
2.3 Test Mode.....	9
2.4 Connection Diagram of Test System.....	10
2.5 Support Unit used in test configuration and system	11
2.6 EUT Operation Test Setup	11
2.7 Measurement Results Explanation Example.....	11
3 TEST RESULT.....	12
3.1 6dB Bandwidth Measurement	12
3.2 Output Power Measurement.....	14
3.3 Power Spectral Density Measurement	17
3.4 Conducted Band Edges and Spurious Emission Measurement	19
3.5 Radiated Band Edges and Spurious Emission Measurement	32
3.6 AC Conducted Emission Measurement.....	54
3.7 Antenna Requirements.....	60
4 LIST OF MEASURING EQUIPMENT	61
5 UNCERTAINTY OF EVALUATION	62
APPENDIX A. SETUP PHOTOGRAPHS	
APPENDIX B. PHOTOGRAPHS OF EUT	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR452903C	Rev. 01	Initial issue of report	Sep. 04, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.2	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	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 1.27 dB at 268.620 MHz for Quasi-Peak
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 10.18 dB at 1.410 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Doro AB

Magistratsvägen 10 SE-226 43 Lund Sweden

1.2 Manufacturer

CK TELECOM LTD.

Technology Road. High-Tech Development Zone. Heyuan, Guangdong, P. R. China.

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM /WCDMA Mobile Telephone
Brand Name	doro
Model Name	Doro Liberto 820
FCC ID	WS5DORO820
EUT supports Radios application	GSM/GPRS/WLAN 24GHz 802.11b/g/n HT20/HT40 Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
HW Version	FUTURE-V2.0
SW Version	FUTURE-S01B_DORO_L21EN_213_USER_140825
EUT Stage	Production Unit

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

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to Antenna	802.11b : 18.30 dBm (0.0676 W) 802.11g : 23.92 dBm (0.2466 W) 802.11n HT20 : 23.34 dBm (0.2158 W) 802.11n HT40 : 23.41 dBm (0.2193 W)
Antenna Type	Dipole Antenna with gain -2.00 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 Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.		
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755- 3320-2398		
Test Site No.	Sporton Site No.		FCC Registration No.
	TH01-SZ	CO01-SZ	831040

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.
	03CH01-KS		149928

1.7 Applicable 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 v03r02
- 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.

2.4GHz 802.11b RF Output Power (dBm)						
Power vs. Channel			Power vs. Data Rate			
Channel	Frequency (MHz)	Data Rate 1Mbps	Channel	2Mbps	5.5Mbps	11Mbps
CH 01	2412 MHz	17.81	CH 11	18.29	18.21	18.02
CH 06	2437 MHz	18.04				
CH 11	2462 MHz	18.30				

2.4GHz 802.11g RF Output Power (dBm)										
Power vs. Channel			Power vs. Data Rate							
Channel	Frequency (MHz)	Data Rate 6Mbps	Channel	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 01	2412 MHz	22.13	CH 11	23.88	23.85	23.84	23.81	23.79	23.77	23.75
CH 06	2437 MHz	23.56								
CH 11	2462 MHz	23.92								

2.4GHz 802.11n HT20 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 01	2412 MHz	22.58	CH 11	23.04	23.01	22.14	23.16	22.19	23.14	22.63
CH 06	2437 MHz	22.76								
CH 11	2462 MHz	23.34								

2.4GHz 802.11n HT40 RF Output Power (dBm)										
Power vs. Channel			Power vs. MCS Index							
Channel	Frequency (MHz)	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 03	2422 MHz	23.04	CH 09	22.40	22.28	22.46	21.67	22.26	21.87	21.65
CH 06	2437 MHz	23.04								
CH 09	2452 MHz	23.41								

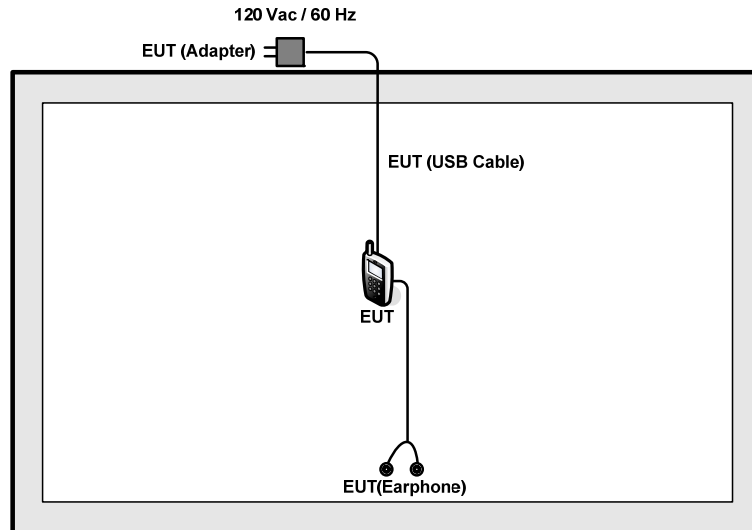
2.3 Test Mode

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

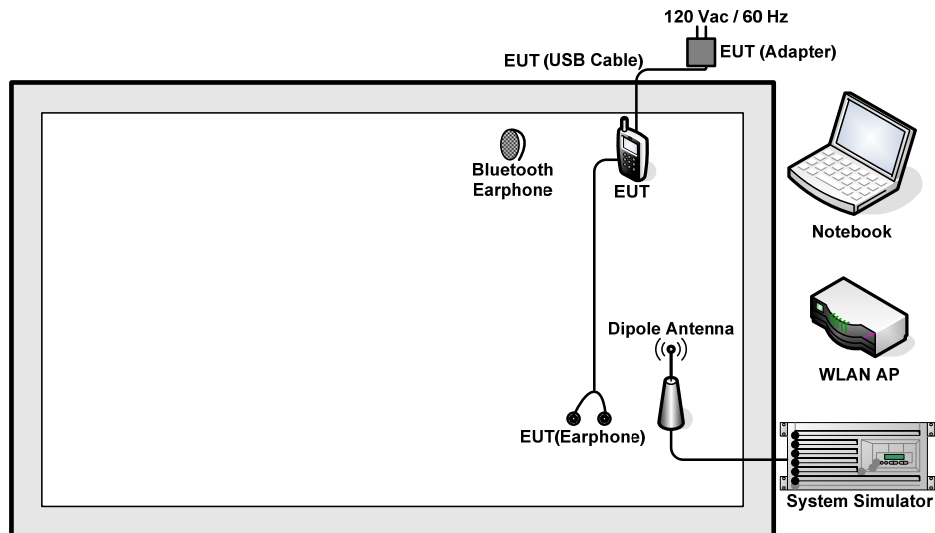
Test Cases				
Conducted TCs	Test Items	Mode	Data Rate	Test Channel
	6dB BW Power Spectral Density	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
	Output Power	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
	Conducted Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
		802.11n HT40	MCS0	3/9
	Conducted Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
802.11n HT40		MCS0	3/6/9	
Radiated TCs	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
		802.11n HT40	MCS0	3/9
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11
		802.11n HT40	MCS0	3/6/9
AC Conducted Emission	Mode 1 : GSM1900 Idle + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter 1)			
Remark: For Radiated TCs, the tests were performe with adapter 1, earphone and USB cable.				

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



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	CMW 500	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	G480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Nokia	BH-108	PYAHS-107W	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN function, the 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 7.5 dB and 10dB attenuator.

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\
 &= 7.5 + 10 = 17.5 \text{ (dB)}
 \end{aligned}$$

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

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v03r02.
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

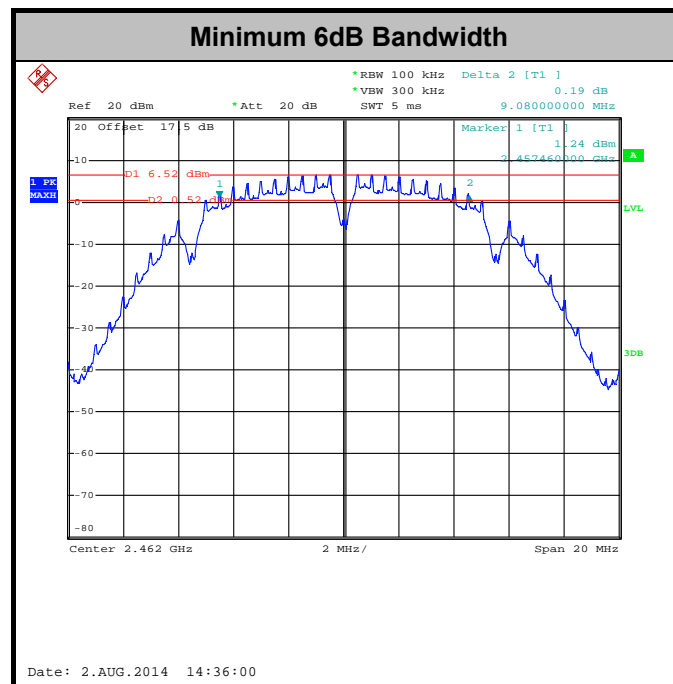




3.1.5 Test Result of 6dB Bandwidth

Test Band :	2.4GHz	Temperature :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Min. Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	9.52	0.50	Pass
11b	1Mbps	1	6	2437	9.52	0.50	Pass
11b	1Mbps	1	11	2462	9.08	0.50	Pass
11g	6Mbps	1	1	2412	16.36	0.50	Pass
11g	6Mbps	1	6	2437	16.32	0.50	Pass
11g	6Mbps	1	11	2462	16.40	0.50	Pass
HT20	MCS0	1	1	2412	17.56	0.50	Pass
HT20	MCS0	1	6	2437	17.60	0.50	Pass
HT20	MCS0	1	11	2462	17.60	0.50	Pass
HT40	MCS0	1	3	2422	36.08	0.50	Pass
HT40	MCS0	1	6	2437	36.32	0.50	Pass
HT40	MCS0	1	9	2452	36.08	0.50	Pass



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

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.

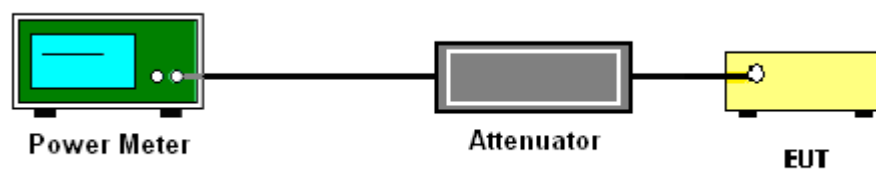
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 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 v03r02.
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 :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	RF Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	17.81	30.00	-2.00	Pass
11b	1Mbps	1	6	2437	18.04	30.00	-2.00	Pass
11b	1Mbps	1	11	2462	18.30	30.00	-2.00	Pass
11g	6Mbps	1	1	2412	22.13	30.00	-2.00	Pass
11g	6Mbps	1	6	2437	23.56	30.00	-2.00	Pass
11g	6Mbps	1	11	2462	23.92	30.00	-2.00	Pass
HT20	MCS0	1	1	2412	22.58	30.00	-2.00	Pass
HT20	MCS0	1	6	2437	22.76	30.00	-2.00	Pass
HT20	MCS0	1	11	2462	23.34	30.00	-2.00	Pass
HT40	MCS0	1	3	2422	23.04	30.00	-2.00	Pass
HT40	MCS0	1	6	2437	23.04	30.00	-2.00	Pass
HT40	MCS0	1	9	2452	23.41	30.00	-2.00	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 :	24~26℃
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Output Power (dBm)	Power Limit (dBm)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	0.08	14.84	30.00	-2.00	Pass
11b	1Mbps	1	6	2437	0.08	15.02	30.00	-2.00	Pass
11b	1Mbps	1	11	2462	0.08	15.25	30.00	-2.00	Pass
11g	6Mbps	1	1	2412	0.50	11.17	30.00	-2.00	Pass
11g	6Mbps	1	6	2437	0.50	13.06	30.00	-2.00	Pass
11g	6Mbps	1	11	2462	0.50	13.68	30.00	-2.00	Pass
HT20	MCS0	1	1	2412	0.51	10.73	30.00	-2.00	Pass
HT20	MCS0	1	6	2437	0.51	11.33	30.00	-2.00	Pass
HT20	MCS0	1	11	2462	0.51	11.73	30.00	-2.00	Pass
HT40	MCS0	1	3	2422	1.01	11.13	30.00	-2.00	Pass
HT40	MCS0	1	6	2437	1.01	11.36	30.00	-2.00	Pass
HT40	MCS0	1	9	2452	1.01	11.57	30.00	-2.00	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

The measuring equipment is listed in the section 4 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 v03r02
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



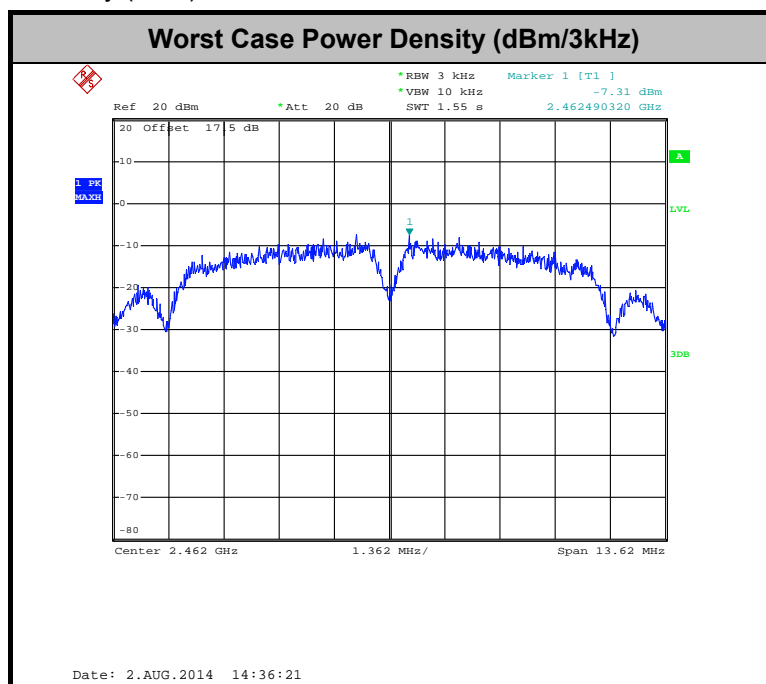


3.3.5 Test Result of Power Spectral Density

Test Mode :	2.4GHz	Temperature :	24~26°C
Test Engineer :	Fly Liang	Relative Humidity :	50~53%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Peak Power Density (dBm/3kHz)	Max. Limits (dBm/3kHz)	DG (dBi)	Pass/Fail
11b	1Mbps	1	1	2412	-8.27	8.00	-2.00	Pass
11b	1Mbps	1	6	2437	-8.08	8.00	-2.00	Pass
11b	1Mbps	1	11	2462	-7.31	8.00	-2.00	Pass
11g	6Mbps	1	1	2412	-14.28	8.00	-2.00	Pass
11g	6Mbps	1	6	2437	-11.84	8.00	-2.00	Pass
11g	6Mbps	1	11	2462	-13.59	8.00	-2.00	Pass
HT20	MCS0	1	1	2412	-14.28	8.00	-2.00	Pass
HT20	MCS0	1	6	2437	-14.76	8.00	-2.00	Pass
HT20	MCS0	1	11	2462	-13.97	8.00	-2.00	Pass
HT40	MCS0	1	3	2422	-17.84	8.00	-2.00	Pass
HT40	MCS0	1	6	2437	-17.46	8.00	-2.00	Pass
HT40	MCS0	1	9	2452	-17.83	8.00	-2.00	Pass

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



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).

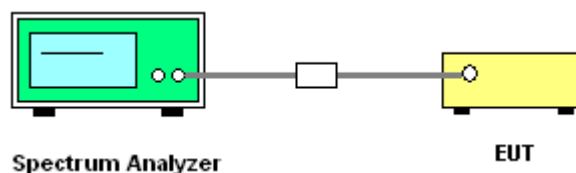
3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
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



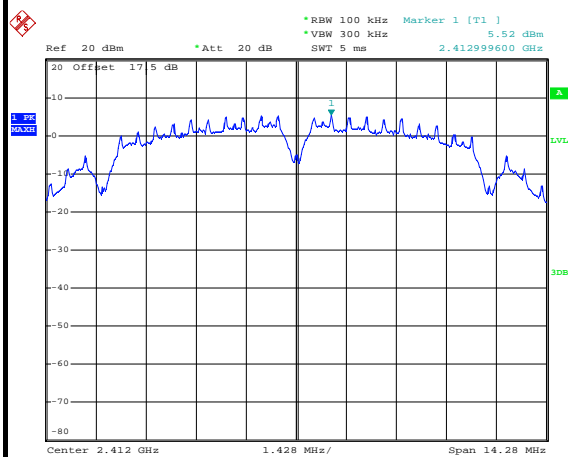


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Fly Liang

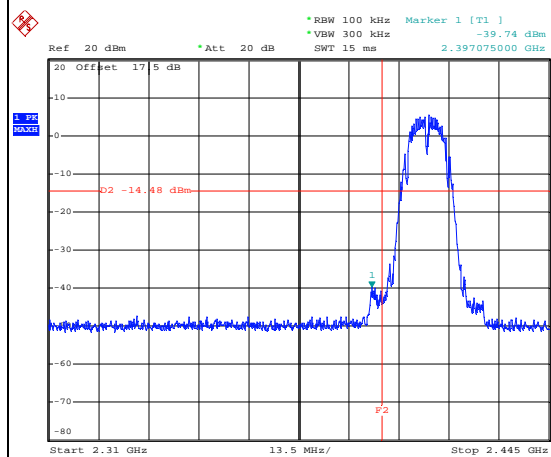
WLAN 802.11b Channel 01

100kHz PSD reference Level



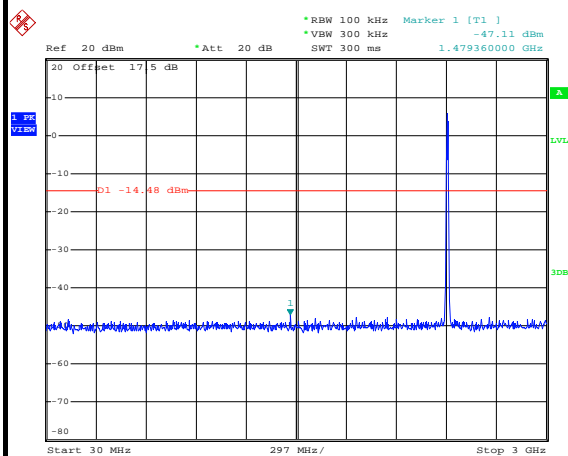
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Low Channel Plot



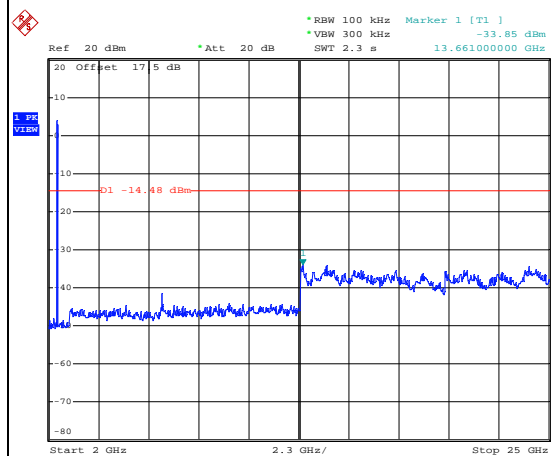
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Spurious Emission 30MHz~3GHz



Date: 2.AUG.2014 14:26:45

Spurious Emission 2GHz~25GHz



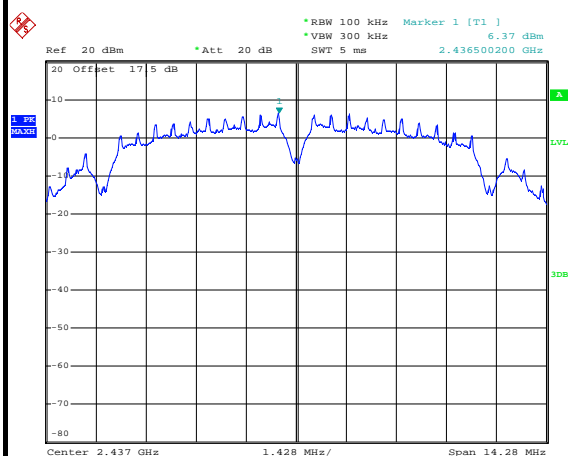
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Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Fly Liang

WLAN 802.11b Channel 06

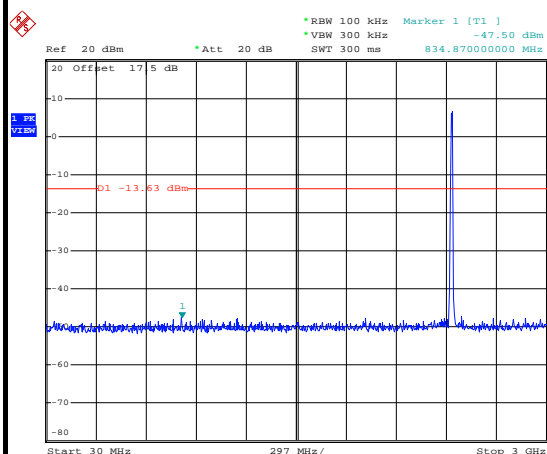
100kHz PSD reference Level



Date: 2.AUG.2014 14:31:02

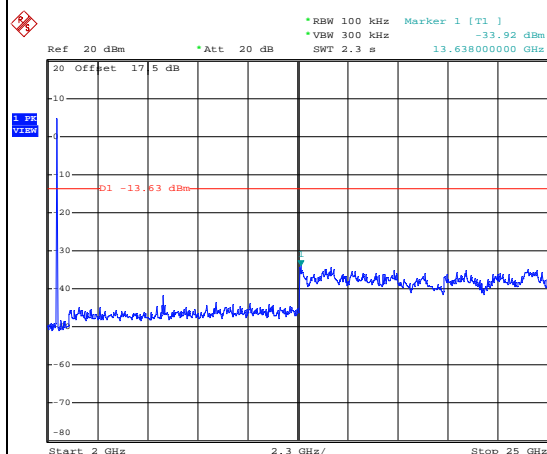
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 2.AUG.2014 14:31:21

Spurious Emission 2GHz~25GHz



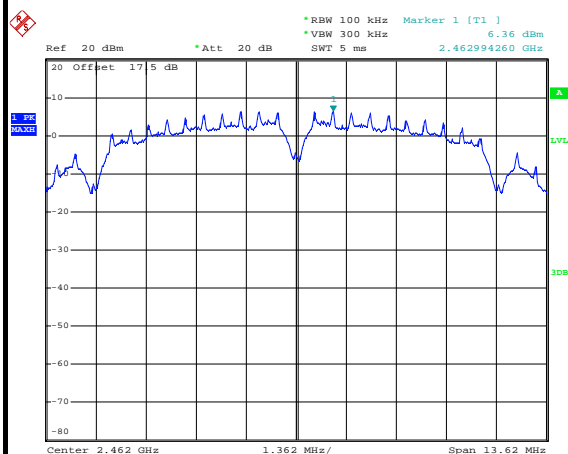
Date: 2.AUG.2014 14:31:40



Test Mode :	802.11b	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Fly Liang

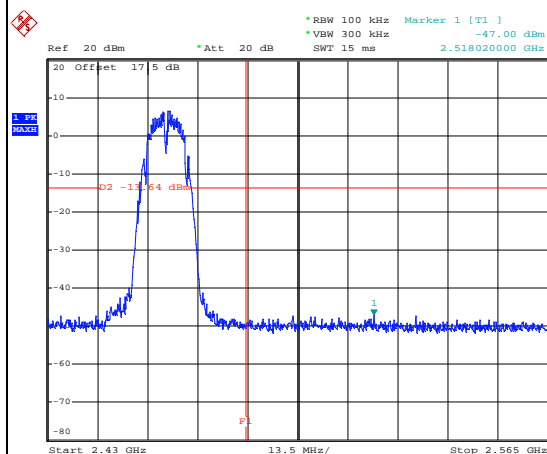
WLAN 802.11b Channel 11

100kHz PSD reference Level



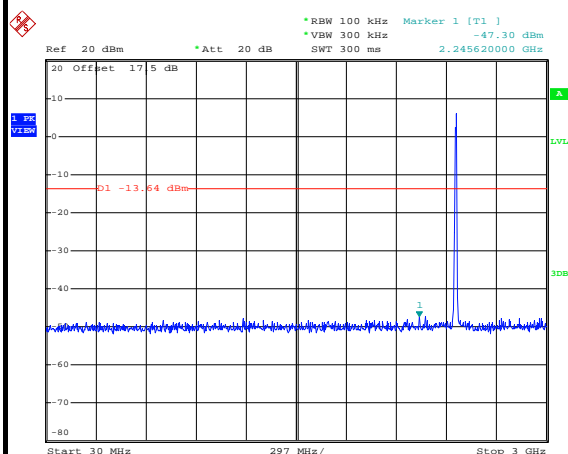
Date: 2.AUG.2014 14:36:30

High Channel Plot



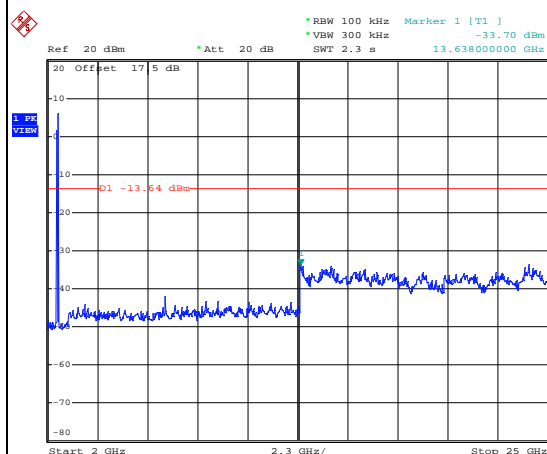
Date: 2.AUG.2014 14:36:44

Spurious Emission 30MHz~3GHz



Date: 2.AUG.2014 14:37:03

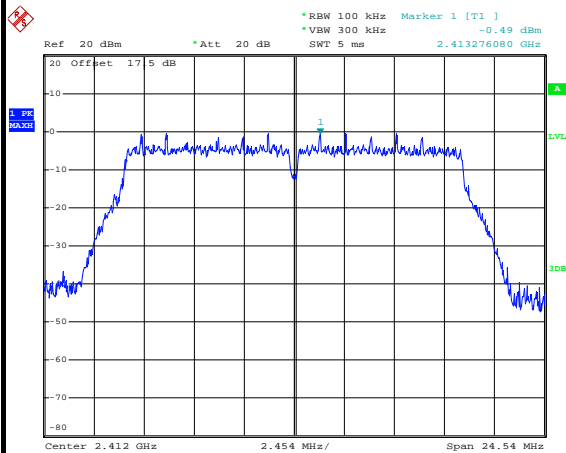
Spurious Emission 2GHz~25GHz



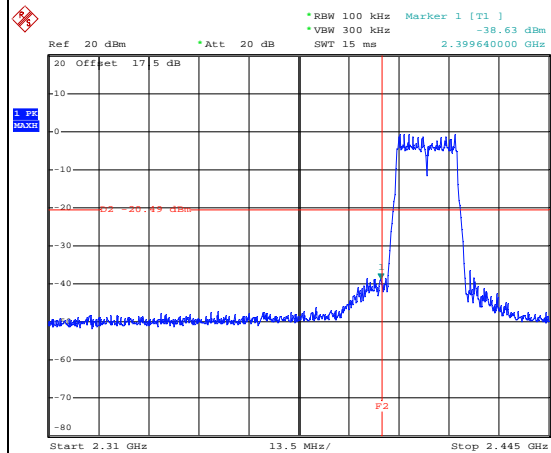
Date: 2.AUG.2014 14:37:22



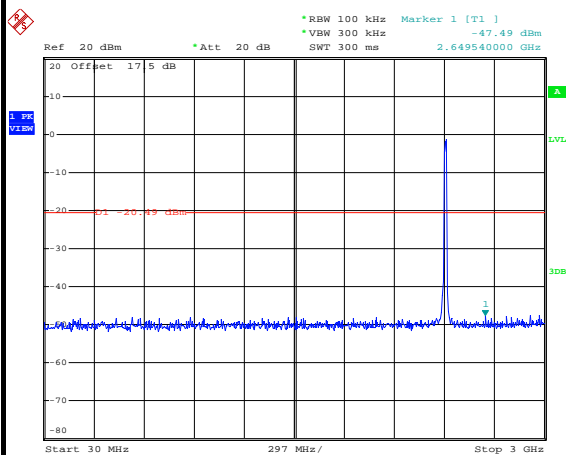
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Fly Liang

WLAN 802.11g Channel 01**100kHz PSD reference Level**

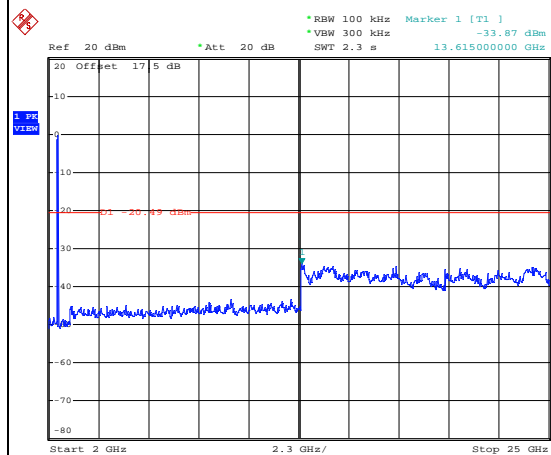
Date: 21.AUG.2014 11:47:52

Low Channel Plot

Date: 21.AUG.2014 11:48:06

Spurious Emission 30MHz~3GHz

Date: 21.AUG.2014 11:48:25

Spurious Emission 2GHz~25GHz

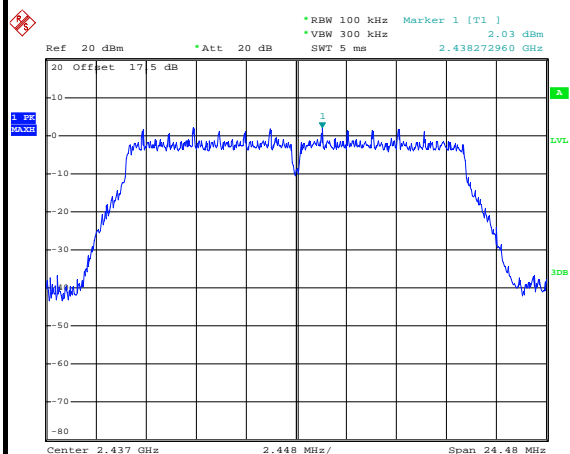
Date: 21.AUG.2014 11:48:44



Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Fly Liang

WLAN 802.11g Channel 06

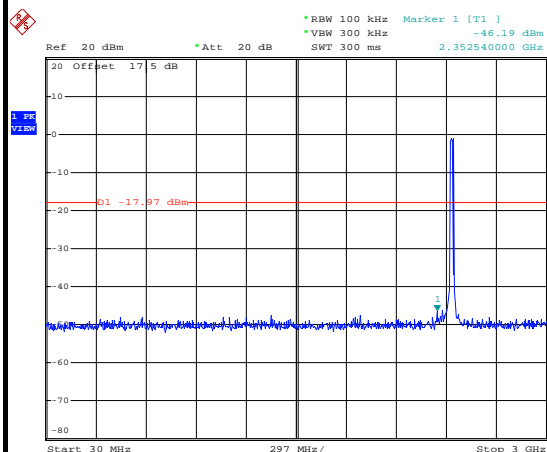
100kHz PSD reference Level



Date: 21.AUG.2014 12:38:55

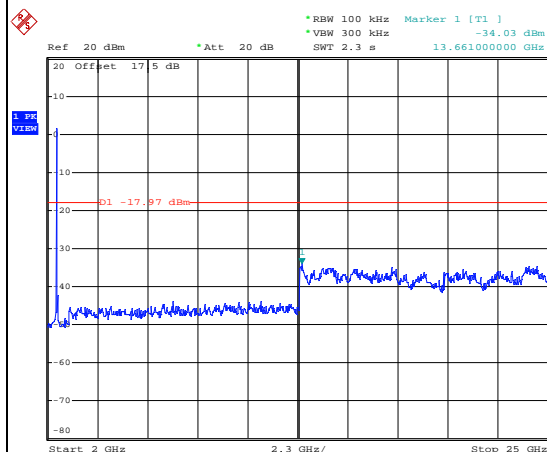
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 12:39:15

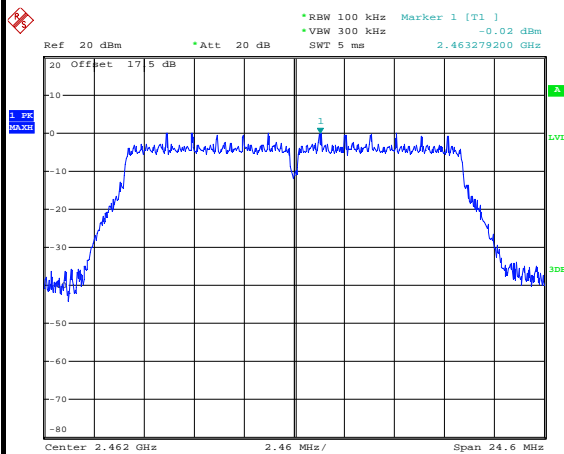
Spurious Emission 2GHz~25GHz



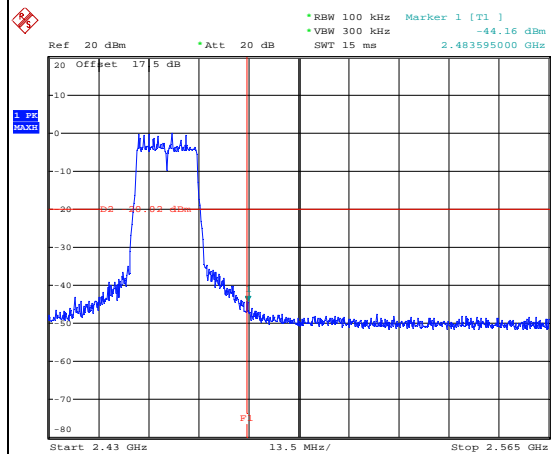
Date: 21.AUG.2014 12:39:33



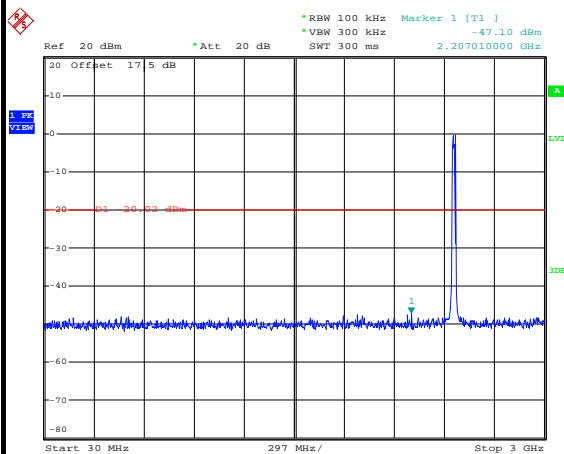
Test Mode :	802.11g	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Fly Liang

WLAN 802.11g Channel 11**100kHz PSD reference Level**

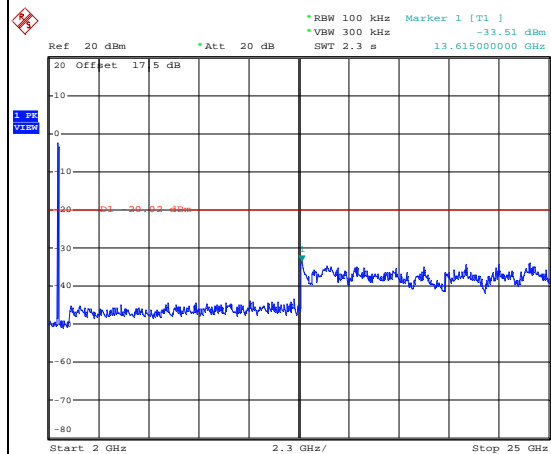
Date: 21.AUG.2014 09:58:44

High Channel Plot

Date: 21.AUG.2014 14:33:14

Spurious Emission 30MHz~3GHz

Date: 21.AUG.2014 09:59:18

Spurious Emission 2GHz~25GHz

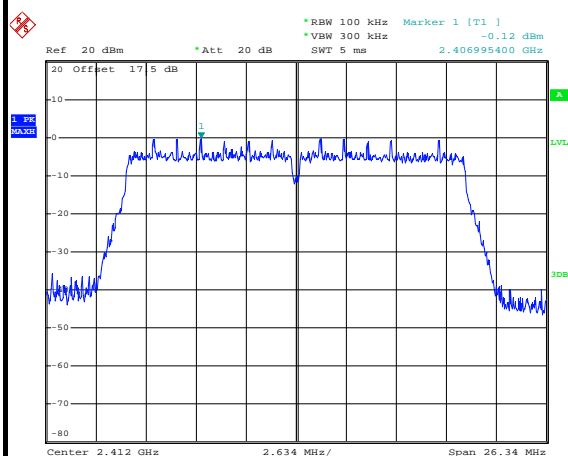
Date: 21.AUG.2014 09:59:36



Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Fly Liang

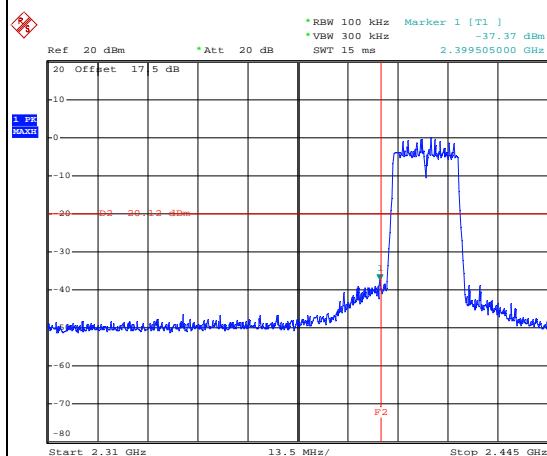
WLAN 802.11n HT20 Channel 01

100kHz PSD reference Level



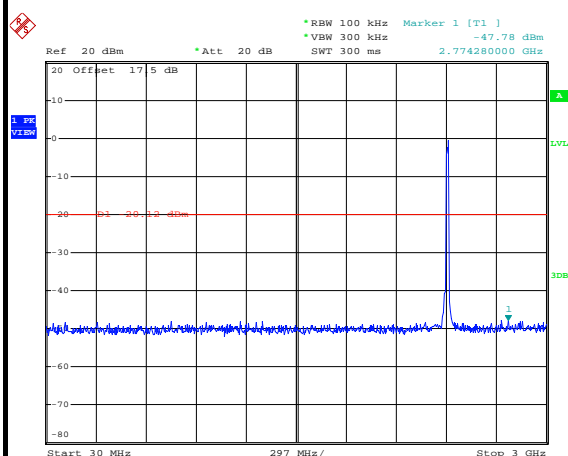
Date: 21.AUG.2014 09:30:46

Low Channel Plot



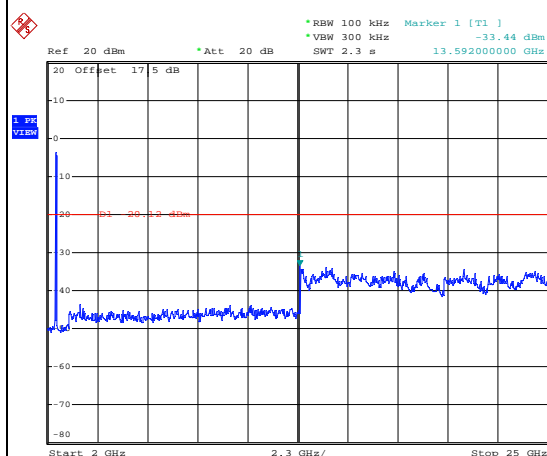
Date: 21.AUG.2014 09:31:00

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 09:31:19

Spurious Emission 2GHz~25GHz



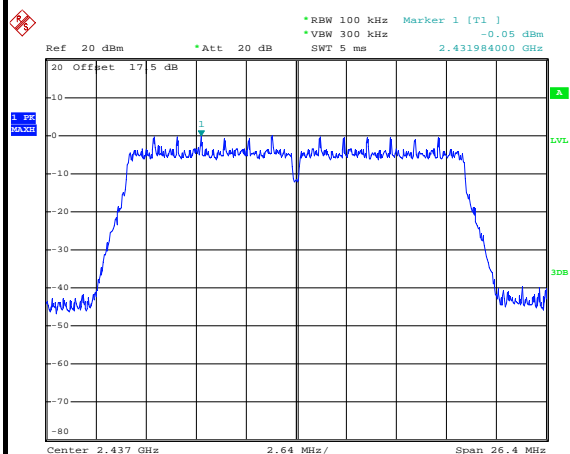
Date: 21.AUG.2014 09:31:38



Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Fly Liang

WLAN 802.11n HT20 Channel 06

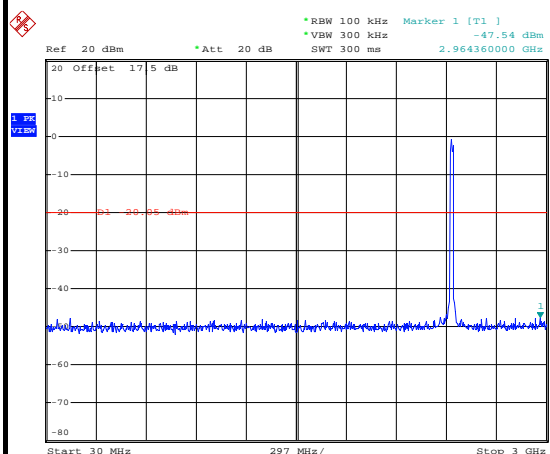
100kHz PSD reference Level



Date: 21.AUG.2014 09:37:01

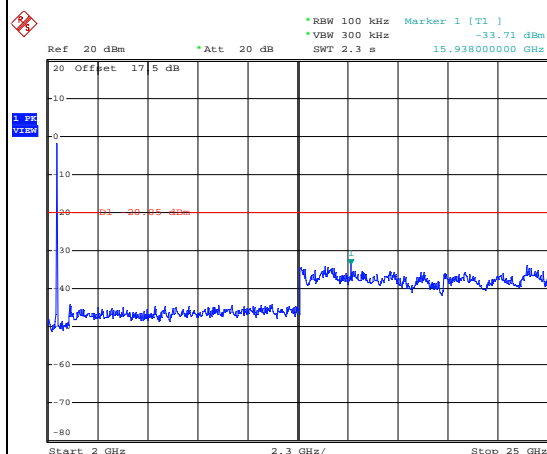
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 09:37:21

Spurious Emission 2GHz~25GHz



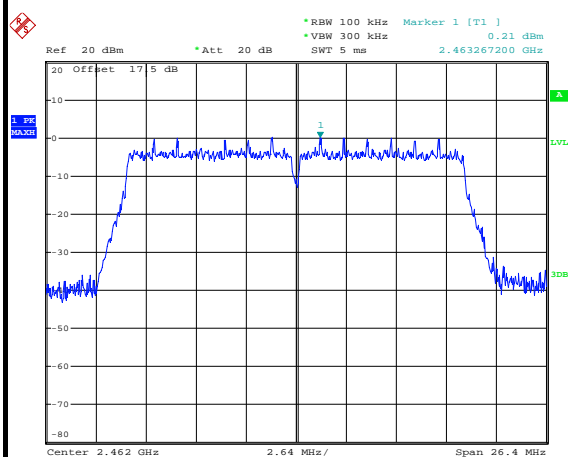
Date: 21.AUG.2014 09:37:39



Test Mode :	802.11n HT20	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Fly Liang

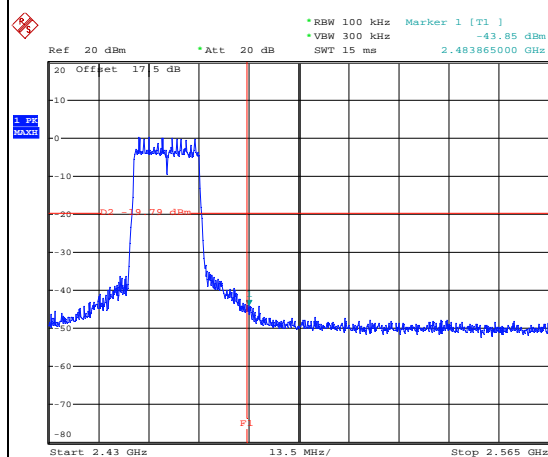
WLAN 802.11n HT20 Channel 11

100kHz PSD reference Level



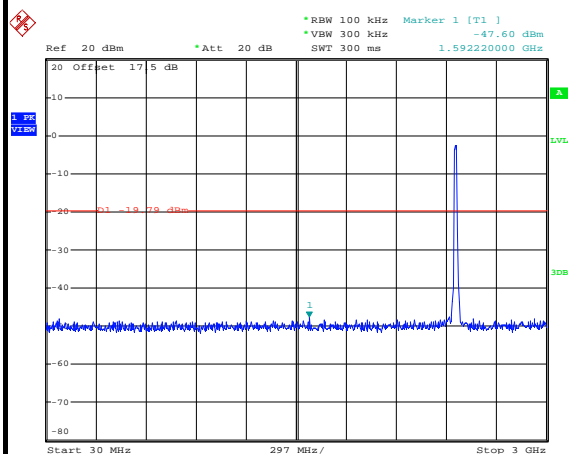
Date: 21.AUG.2014 09:42:45

High Channel Plot



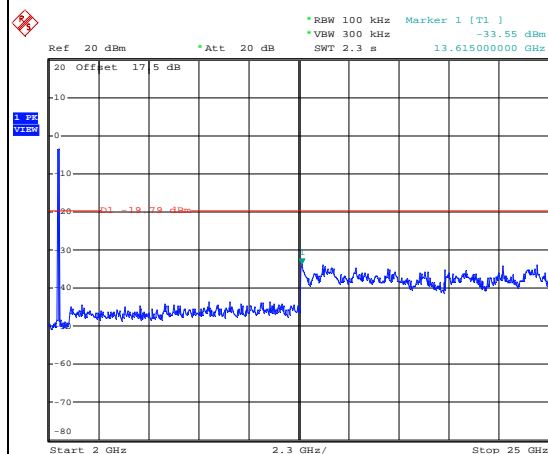
Date: 21.AUG.2014 09:42:59

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 09:43:18

Spurious Emission 2GHz~25GHz



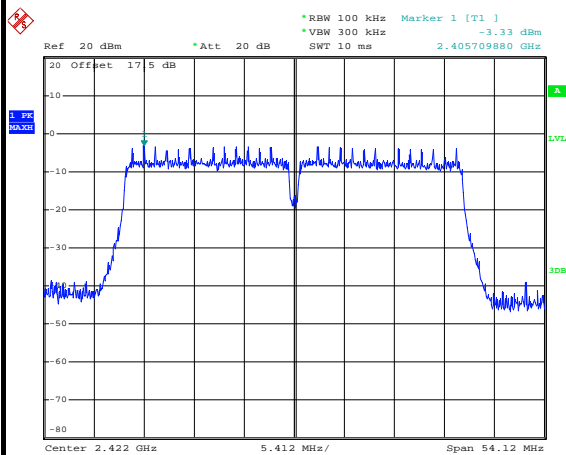
Date: 21.AUG.2014 09:43:37



Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	03	Test Engineer :	Fly Liang

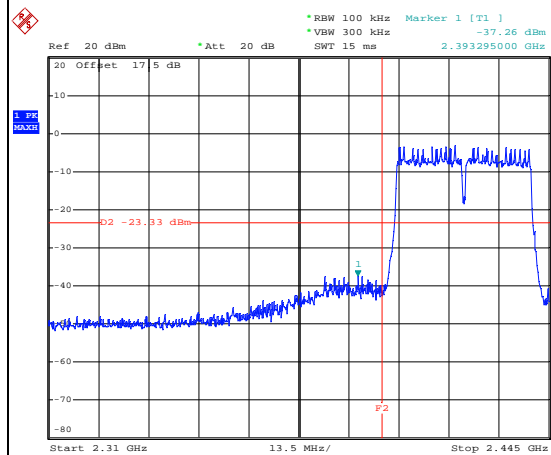
WLAN 802.11n HT40 Channel 03

100kHz PSD reference Level



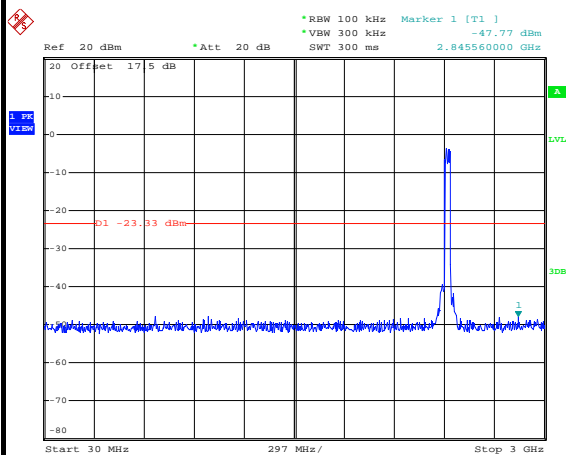
Date: 21.AUG.2014 11:02:27

Low Channel Plot



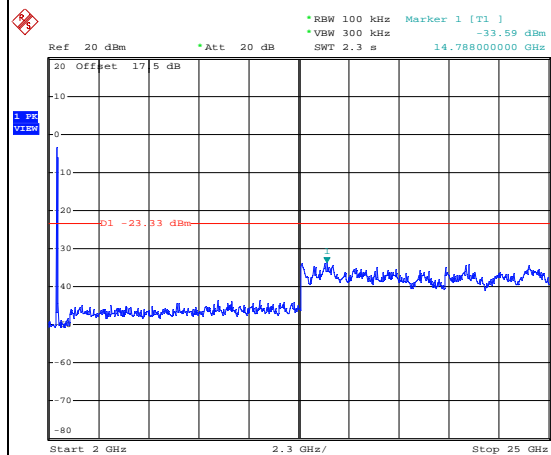
Date: 21.AUG.2014 11:02:41

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 11:37:28

Spurious Emission 2GHz~25GHz



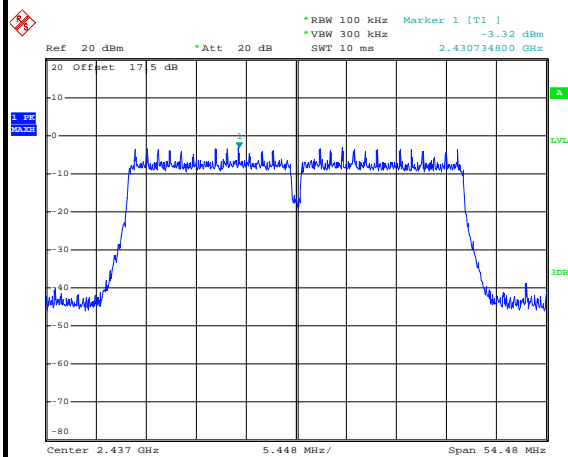
Date: 21.AUG.2014 11:03:19



Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Fly Liang

WLAN 802.11n HT40 Channel 06

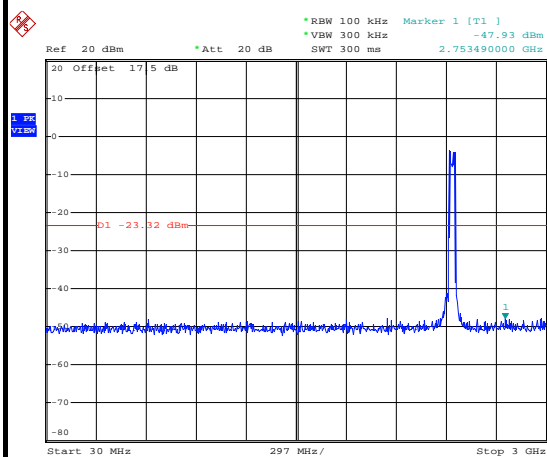
100kHz PSD reference Level



Date: 21.AUG.2014 11:09:54

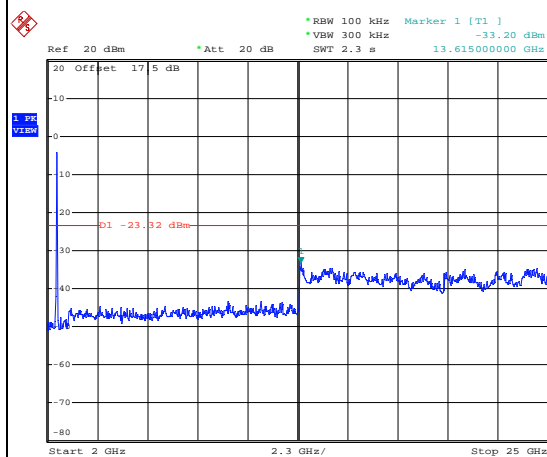
Mid Channel Plot

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 11:36:00

Spurious Emission 2GHz~25GHz



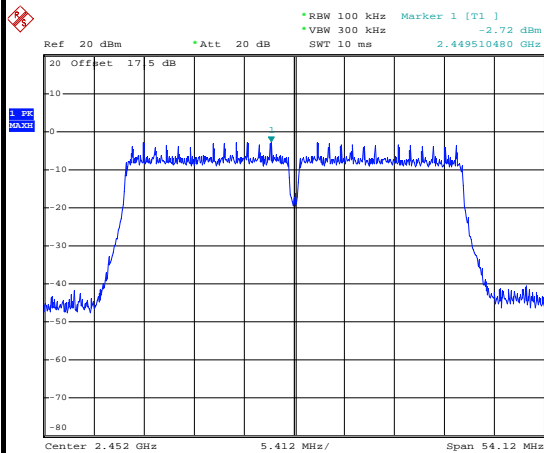
Date: 21.AUG.2014 11:10:32



Test Mode :	802.11n HT40	Temperature :	24~26°C
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	09	Test Engineer :	Fly Liang

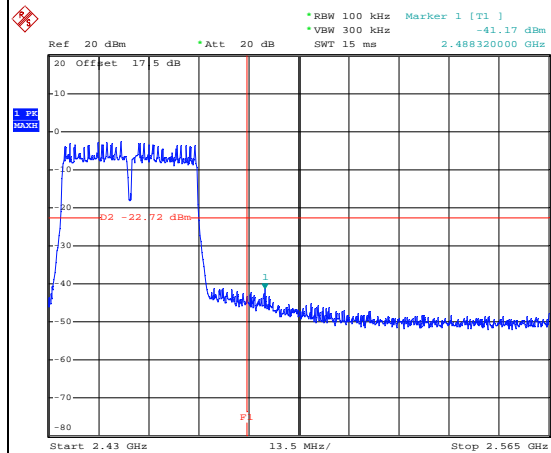
WLAN 802.11n HT40 Channel 09

100kHz PSD reference Level



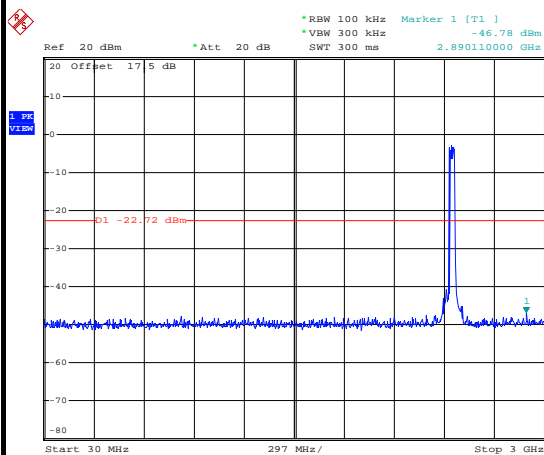
Date: 21.AUG.2014 11:14:25

High Channel Plot



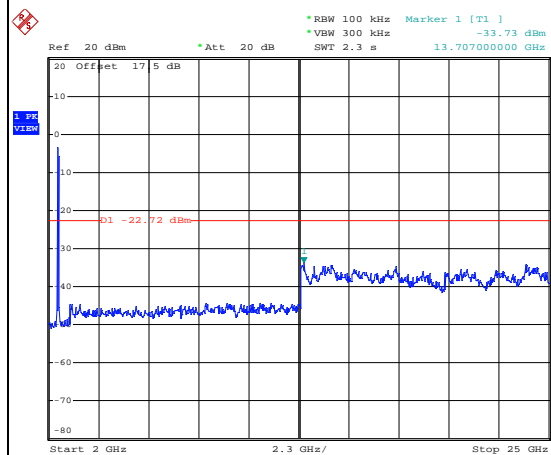
Date: 21.AUG.2014 11:14:39

Spurious Emission 30MHz~3GHz



Date: 21.AUG.2014 11:31:39

Spurious Emission 2GHz~25GHz



Date: 21.AUG.2014 11:27:32

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

The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
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 \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

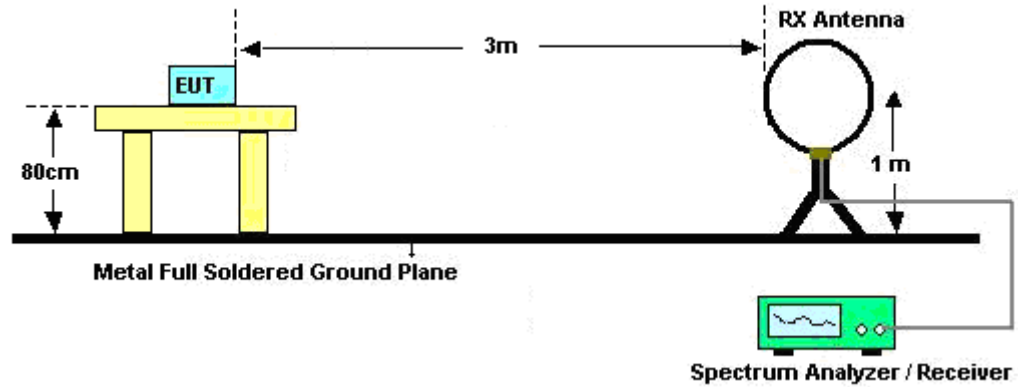
For average measurement:

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

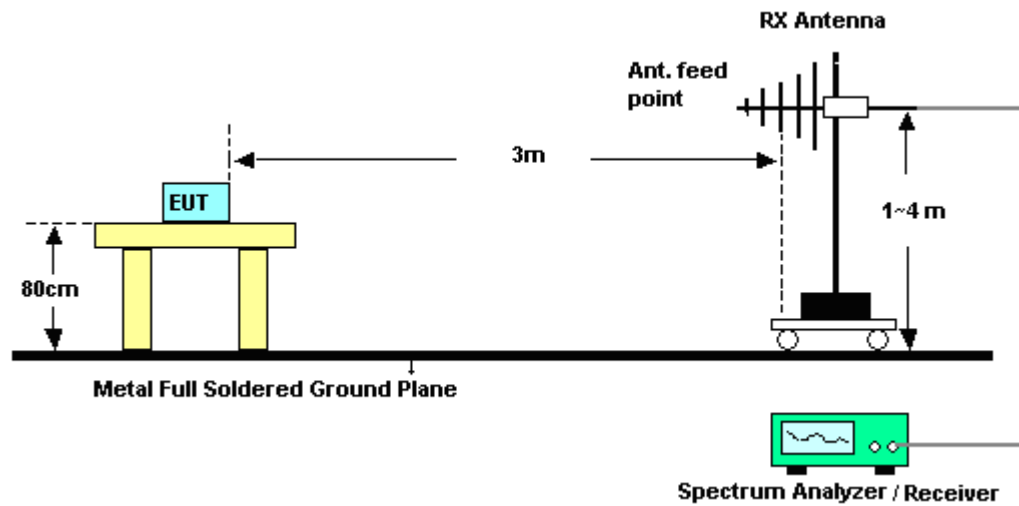
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	98.25	-	-	10Hz
802.11g	89.12	1.392	0.718	1kHz
2.4GHz 802.11n HT20	88.96	1.306	0.766	1kHz
2.4GHz 802.11n HT40	79.23	0.656	1.524	3kHz

3.5.4 Test Setup

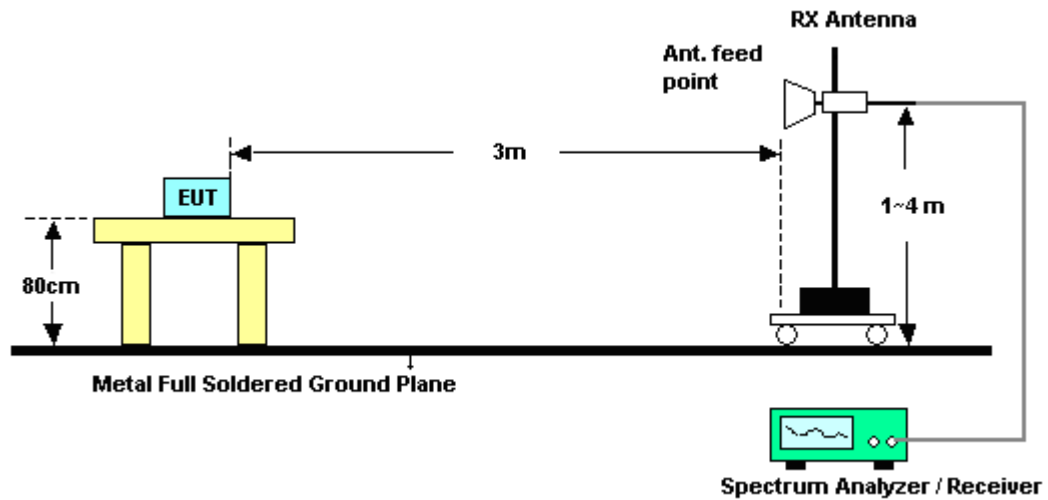
For radiated emissions below 30MHz



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 :	42~43%
Test Channel :	01	Test Engineer :	Simon Lu

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
2387.4	57.53	-16.47	74	58.96	32.01	2.64	36.08	102	320	Peak
2376.78	41.23	-12.77	54	42.8	31.95	2.64	36.16	102	320	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
2369.31	52.68	-21.32	74	54.27	31.95	2.62	36.16	100	306	Peak
2390	37.02	-16.98	54	38.45	32.01	2.64	36.08	100	306	Average

Test Mode :	802.11b	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

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
2498.17	57.45	-16.55	74	58.11	32.4	2.68	35.74	101	341	Peak
2483.98	41.62	-12.38	54	42.39	32.34	2.68	35.79	101	341	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2487.91	54.24	-19.76	74	54.9	32.4	2.68	35.74	118	115	Peak
2484.01	38.17	-15.83	54	38.94	32.34	2.68	35.79	118	115	Average



Test Mode :	802.11g	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Simon Lu

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
2389.92	63.3	-10.7	74	64.73	32.01	2.64	36.08	100	303	Peak
2390	46.2	-7.8	54	47.63	32.01	2.64	36.08	100	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
2389.92	60.55	-13.45	74	61.98	32.01	2.64	36.08	100	310	Peak
2390	42.79	-11.21	54	44.22	32.01	2.64	36.08	100	310	Average

Test Mode :	802.11g	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

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	67.07	-6.93	74	67.84	32.34	2.68	35.79	100	295	Peak
2483.5	44	-10	54	44.77	32.34	2.68	35.79	100	295	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
2486.68	61.72	-12.28	74	62.49	32.34	2.68	35.79	100	310	Peak
2484.97	38.89	-15.11	54	39.66	32.34	2.68	35.79	100	310	Average



Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	01	Test Engineer :	Simon Lu

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
2389.92	67.72	-6.28	74	69.15	32.01	2.64	36.08	100	200	Peak
2390	48.2	-5.8	54	49.63	32.01	2.64	36.08	100	200	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	62.22	-11.78	74	63.65	32.01	2.64	36.08	100	323	Peak
2390	44.38	-9.62	54	45.81	32.01	2.64	36.08	100	323	Average

Test Mode :	802.11n HT20	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	11	Test Engineer :	Simon Lu

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
2484.28	68.01	-5.99	74	68.78	32.34	2.68	35.79	153	178	Peak
2484.22	43.64	-10.36	54	44.41	32.34	2.68	35.79	153	178	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.9	62.79	-11.21	74	63.56	32.34	2.68	35.79	119	61	Peak
2483.5	41.24	-12.76	54	42.01	32.34	2.68	35.79	119	61	Average



Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Band :	Low	Relative Humidity :	42~43%
Test Channel :	03	Test Engineer :	Simon Lu

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
2388.48	70.12	-3.88	74	71.55	32.01	2.64	36.08	133	333	Peak
2389.65	51.96	-2.04	54	53.39	32.01	2.64	36.08	133	333	Average
2483.5	52.18	-21.82	74	52.95	32.34	2.68	35.79	133	333	Peak
2484.1	38.78	-15.22	54	39.55	32.34	2.68	35.79	133	333	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
2388.3	68.03	-5.97	74	69.46	32.01	2.64	36.08	116	60	Peak
2386.68	49.78	-4.22	54	51.21	32.01	2.64	36.08	116	60	Average
2487.04	57.12	-16.88	74	57.89	32.34	2.68	35.79	116	60	Peak
2483.68	39.13	-14.87	54	39.9	32.34	2.68	35.79	116	60	Average



Test Mode :	802.11n HT40	Temperature :	22~23°C
Test Band :	High	Relative Humidity :	42~43%
Test Channel :	09	Test Engineer :	Simon Lu

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	56.86	-17.14	74	58.29	32.01	2.64	36.08	100	328	Peak
2390	41.84	-12.16	54	43.27	32.01	2.64	36.08	100	328	Average
2487.79	66.39	-7.61	74	67.05	32.4	2.68	35.74	100	328	Peak
2484.28	42.54	-11.46	54	43.31	32.34	2.68	35.79	100	328	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
2389.38	54.62	-19.38	74	56.05	32.01	2.64	36.08	117	10	Peak
2388.03	40.15	-13.85	54	41.58	32.01	2.64	36.08	117	10	Average
2487.37	66.14	-7.86	74	66.91	32.34	2.68	35.79	117	10	Peak
2483.65	42.82	-11.18	54	43.59	32.34	2.68	35.79	117	10	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 :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	106.41	-	-	107.69	32.08	2.66	36.02	102	320	Peak
2412	101.41	-	-	102.69	32.08	2.66	36.02	102	320	Average
4824	45.49	-28.51	74	44.16	34.2	3.78	36.65	100	34	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	102.53	-	-	103.81	32.08	2.66	36.02	100	306	Peak
2412	97.5	-	-	98.78	32.08	2.66	36.02	100	306	Average
4824	49.05	-24.95	74	47.72	34.2	3.78	36.65	100	65	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	107.15	-	-	108.19	32.21	2.66	35.91	127	302	Peak
2437	102.42	-	-	103.46	32.21	2.66	35.91	127	302	Average
4874	43.28	-30.72	74	42.14	34.2	3.78	36.84	114	25	Peak
7312	45.74	-28.26	74	44.15	35.72	4.73	38.86	122	14	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	105.27	-	-	106.31	32.21	2.66	35.91	172	18	Peak
2437	100.7	-	-	101.74	32.21	2.66	35.91	172	18	Average
4874	45.69	-28.31	74	44.55	34.2	3.78	36.84	100	68	Peak
7312	45.78	-28.22	74	44.19	35.72	4.73	38.86	100	36	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	108.03	-	-	108.94	32.27	2.67	35.85	101	341	Peak
2462	103.03	-	-	103.94	32.27	2.67	35.85	101	341	Average
4924	44.63	-29.37	74	43.68	34.2	3.78	37.03	110	66	Peak
7386	45.86	-28.14	74	44.52	35.76	4.77	39.19	113	54	Peak

Test Mode :	802.11b	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	105.19	-	-	106.1	32.27	2.67	35.85	118	115	Peak
2462	100.08	-	-	100.99	32.27	2.67	35.85	118	115	Average
4924	46.8	-27.2	74	45.85	34.2	3.78	37.03	112	21	Peak
7386	47.29	-26.71	74	45.95	35.76	4.77	39.19	100	354	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	106.22	-	-	107.5	32.08	2.66	36.02	100	303	Peak
2412	94.85	-	-	96.13	32.08	2.66	36.02	100	303	Average
4824	45.09	-28.91	74	43.76	34.2	3.78	36.65	100	55	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	101.86	-	-	103.14	32.08	2.66	36.02	100	310	Peak
2412	90.84	-	-	92.12	32.08	2.66	36.02	100	310	Average
4824	45.9	-28.1	74	44.57	34.2	3.78	36.65	100	98	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	108.18	-	-	109.22	32.21	2.66	35.91	100	331	Peak
2437	97.18	-	-	98.22	32.21	2.66	35.91	100	331	Average
4874	43.97	-30.03	74	42.83	34.2	3.78	36.84	101	100	Peak
7312	46.83	-27.17	74	45.24	35.72	4.73	38.86	100	0	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	104.49	-	-	105.53	32.21	2.66	35.91	109	0	Peak
2437	93.4	-	-	94.44	32.21	2.66	35.91	109	0	Average
4874	43.86	-30.14	74	42.72	34.2	3.78	36.84	100	218	Peak
7312	48.32	-25.68	74	46.73	35.72	4.73	38.86	100	60	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	105.64	-	-	106.55	32.27	2.67	35.85	100	295	Peak
2462	95.02	-	-	95.93	32.27	2.67	35.85	100	295	Average
4924	43.2	-30.8	74	42.25	34.2	3.78	37.03	141	0	Peak
7386	44.43	-29.57	74	43.09	35.76	4.77	39.19	126	120	Peak

Test Mode :	802.11g	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	100.8	-	-	101.71	32.27	2.67	35.85	100	310	Peak
2462	88.49	-	-	89.4	32.27	2.67	35.85	100	310	Average
4924	43.59	-30.41	74	42.64	34.2	3.78	37.03	120	65	Peak
7386	45.81	-28.19	74	44.47	35.76	4.77	39.19	110	54	Peak



Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	106.66	-	-	107.94	32.08	2.66	36.02	100	197	Peak
2412	95.08	-	-	96.36	32.08	2.66	36.02	100	197	Average
4824	44.14	-29.86	74	42.81	34.2	3.78	36.65	100	26	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	01	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2412	102.18	-	-	103.46	32.08	2.66	36.02	100	323	Peak
2412	90.48	-	-	91.76	32.08	2.66	36.02	100	323	Average
4824	43.84	-30.16	74	42.51	34.2	3.78	36.65	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	104.48	-	-	105.52	32.21	2.66	35.91	100	96	Peak
2437	93.28	-	-	94.32	32.21	2.66	35.91	100	96	Average
4874	44.16	-29.84	74	43.02	34.2	3.78	36.84	100	88	Peak
7312	44.45	-29.55	74	42.86	35.72	4.73	38.86	100	31	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	101.94	-	-	102.98	32.21	2.66	35.91	105	193	Peak
2437	90.57	-	-	91.61	32.21	2.66	35.91	105	193	Average
4874	44.11	-29.89	74	42.97	34.2	3.78	36.84	100	324	Peak
7312	43.48	-30.52	74	41.89	35.72	4.73	38.86	110	352	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2462 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2462	105.63	-	-	106.54	32.27	2.67	35.85	153	178	Peak
2462	93.79	-	-	94.7	32.27	2.67	35.85	153	178	Average
4924	44.01	-29.99	74	43.06	34.2	3.78	37.03	100	33	Peak
7386	46.38	-27.62	74	45.04	35.76	4.77	39.19	123	120	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	22~23°C
Test Channel :	11	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	104.64	-	-	105.55	32.27	2.67	35.85	119	61	Peak
2462	92.35	-	-	93.26	32.27	2.67	35.85	119	61	Average
4924	43.67	-30.33	74	42.72	34.2	3.78	37.03	100	45	Peak
7386	45.45	-28.55	74	44.11	35.76	4.77	39.19	100	211	Peak



Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~23°C
Test Channel :	03	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2422 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
148.34	36.5	-7	43.5	58	10.24	0.82	32.56	200	100	QP
195.87	38.45	-5.05	43.5	61.21	9	0.71	32.47	-	-	Peak
238.55	42.96	-3.04	46	63.9	10.7	0.84	32.48	178	256	QP
268.62	44.73	-1.27	46	63.81	12.53	0.83	32.44	128	269	QP
314.21	41.63	-4.37	46	59.7	13.49	0.84	32.4	100	184	QP
365.62	38.31	-7.69	46	54.88	14.85	0.93	32.35	-	-	Peak
2422	102.4	-	-	103.56	32.14	2.66	35.96	100	311	Peak
2422	90.98	-	-	92.14	32.14	2.66	35.96	100	311	Average
4844	43.98	-30.02	74	42.72	34.2	3.78	36.72	125	120	Peak
7266	45.05	-28.95	74	43.35	35.71	4.72	38.73	200	0	Peak



Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~23°C
Test Channel :	03	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2422 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
42.61	24.49	-15.51	40	45.95	10.87	0.31	32.64	-	-	Peak
102.75	26.86	-16.64	43.5	48.02	11.05	0.43	32.64	-	-	Peak
198.78	31.64	-11.86	43.5	54.4	9	0.71	32.47	-	-	Peak
241.46	36.39	-9.61	46	56.91	11.12	0.84	32.48	100	0	Peak
274.44	36.14	-9.86	46	55.26	12.5	0.82	32.44	-	-	Peak
314.21	33.08	-12.92	46	51.15	13.49	0.84	32.4	-	-	Peak
2422	100.83	-	-	101.99	32.14	2.66	35.96	116	60	Peak
2422	90.52	-	-	91.68	32.14	2.66	35.96	116	60	Average
4844	44.52	-29.48	74	43.26	34.2	3.78	36.72	190	237	Peak
7266	44.8	-29.2	74	43.1	35.71	4.72	38.73	163	65	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2437 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2437	103.87	-	-	104.91	32.21	2.66	35.91	103	309	Peak
2437	92.27	-	-	93.31	32.21	2.66	35.91	103	309	Average
4874	43.14	-30.86	74	42	34.2	3.78	36.84	137	246	Peak
7312	44.42	-29.58	74	42.83	35.72	4.73	38.86	120	0	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~23°C
Test Channel :	06	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	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	98.36	-	-	99.4	32.21	2.66	35.91	100	337	Peak
2437	87.86	-	-	88.9	32.21	2.66	35.91	100	337	Average
4874	43.07	-30.93	74	41.93	34.2	3.78	36.84	125	326	Peak
7312	43.63	-30.37	74	42.04	35.72	4.73	38.86	123	271	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~23°C
Test Channel :	09	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Horizontal
Remark :	1. 2452 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
2452	103.18	-	-	104.21	32.21	2.67	35.91	100	328	Peak
2452	91.42	-	-	92.45	32.21	2.67	35.91	100	328	Average
4904	42.8	-31.2	74	41.78	34.2	3.78	36.96	123	138	Peak
7356	44.22	-29.78	74	42.78	35.74	4.76	39.06	200	190	Peak

Test Mode :	2.4GHz 802.11n HT40	Temperature :	22~23°C
Test Channel :	09	Relative Humidity :	42~43%
Test Engineer :	Simon Lu	Polarization :	Vertical
Remark :	1. 2452 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
2452	100.95	-	-	101.98	32.21	2.67	35.91	117	10	Peak
2452	89.84	-	-	90.87	32.21	2.67	35.91	117	10	Average
4904	42.48	-31.52	74	41.46	34.2	3.78	36.96	150	149	Peak
7356	44.69	-29.31	74	43.25	35.74	4.76	39.06	170	90	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 (dB μ V)	
	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

The measuring equipment is listed in the section 4 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 (IF bandwidth = 9kHz) with Maximum Hold Mode.

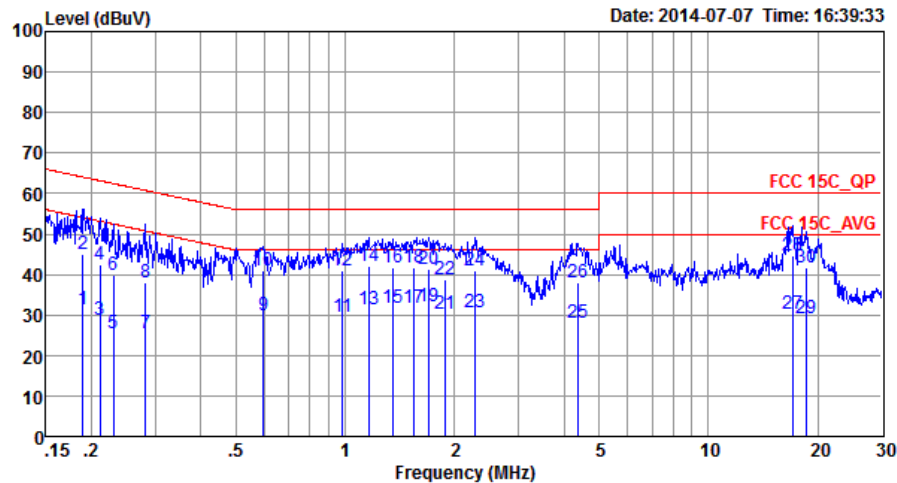
3.6.4 Test Setup





3.6.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter 1)		



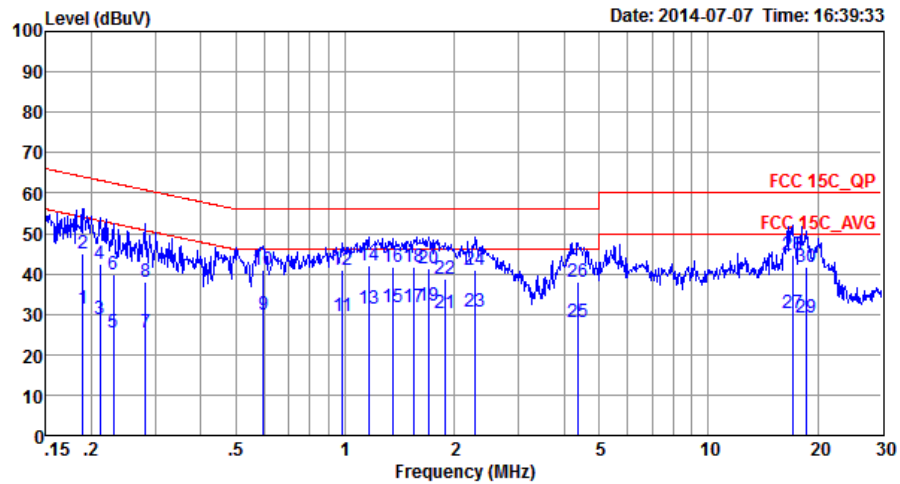
Site : CO01-SZ
Condition: FCC 15C_QP LISN_L_20140304 LINE

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	31.33	-22.73	54.06	20.80	0.22	10.31	Average
2	0.19	44.93	-19.13	64.06	34.40	0.22	10.31	QP
3	0.21	28.61	-24.53	53.14	18.11	0.22	10.28	Average
4	0.21	42.51	-20.63	63.14	32.01	0.22	10.28	QP
5	0.23	25.49	-26.95	52.44	15.00	0.23	10.26	Average
6	0.23	39.69	-22.75	62.44	29.20	0.23	10.26	QP
7	0.28	25.57	-25.19	50.76	15.11	0.25	10.21	Average
8	0.28	37.97	-22.79	60.76	27.51	0.25	10.21	QP
9	0.59	29.99	-16.01	46.00	19.60	0.24	10.15	Average
10	0.59	40.89	-15.11	56.00	30.50	0.24	10.15	QP
11	0.98	29.51	-16.49	46.00	19.10	0.26	10.15	Average
12	0.98	40.81	-15.19	56.00	30.40	0.26	10.15	QP
13	1.16	31.51	-14.49	46.00	21.10	0.25	10.16	Average
14 *	1.16	42.21	-13.79	56.00	31.80	0.25	10.16	QP
15	1.35	31.81	-14.19	46.00	21.40	0.24	10.17	Average
16	1.35	41.61	-14.39	56.00	31.20	0.24	10.17	QP
17	1.54	31.71	-14.29	46.00	21.30	0.24	10.17	Average
18	1.54	41.71	-14.29	56.00	31.30	0.24	10.17	QP
19	1.70	32.01	-13.99	46.00	21.60	0.23	10.18	Average
20	1.70	41.41	-14.59	56.00	31.00	0.23	10.18	QP
21	1.88	30.31	-15.69	46.00	19.90	0.22	10.19	Average
22	1.88	38.91	-17.09	56.00	28.50	0.22	10.19	QP
23	2.28	30.55	-15.45	46.00	20.10	0.25	10.20	Average
24	2.28	41.05	-14.95	56.00	30.60	0.25	10.20	QP



Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter 1)		



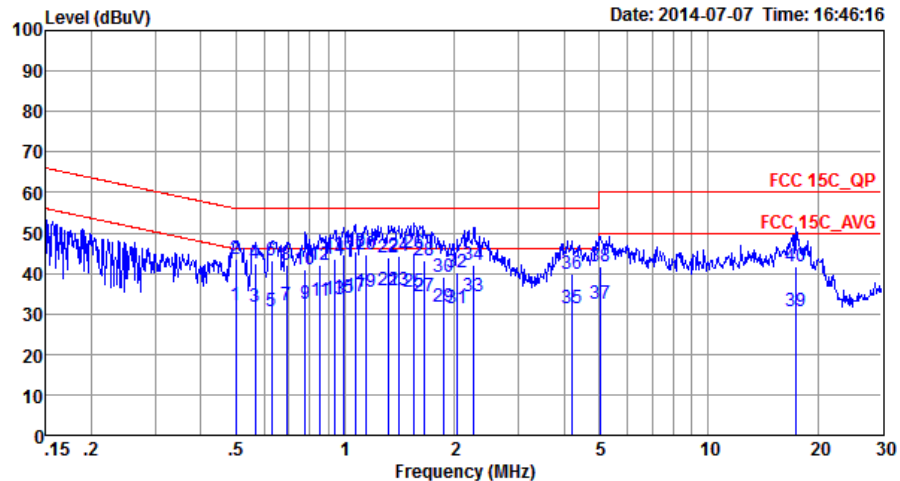
Site : C001-SZ
Condition: FCC 15C_QP LISN_L_20140304 LINE

Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
25	4.38	28.22	-17.78	46.00	17.60	0.39	10.23	Average
26	4.38	38.12	-17.88	56.00	27.50	0.39	10.23	QP
27	17.02	30.12	-19.88	50.00	18.00	1.55	10.57	Average
28	17.02	44.62	-15.38	60.00	32.50	1.55	10.57	QP
29	18.62	29.03	-20.97	50.00	16.80	1.62	10.61	Average
30	18.62	41.53	-18.47	60.00	29.30	1.62	10.61	QP



Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter 1)		

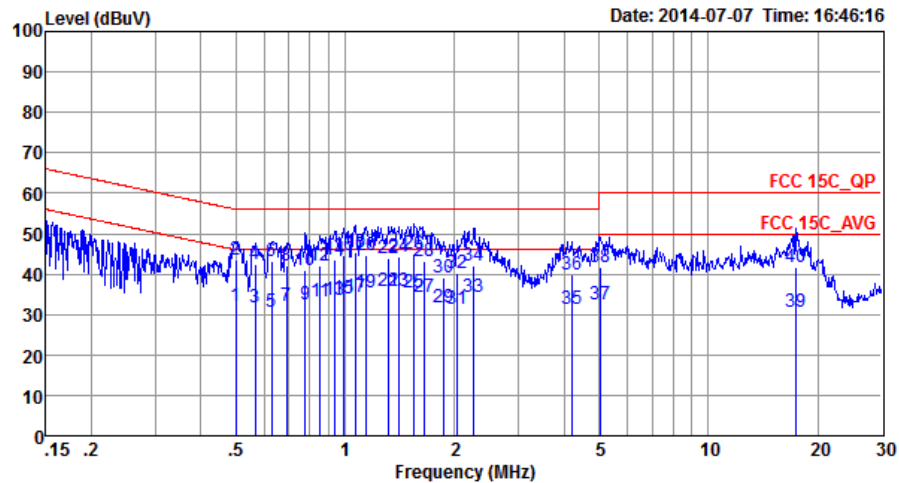


Site : CO01-SZ
Condition: FCC 15C_QP LISN_N_20140304 NEUTRAL
Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.50	31.97	-14.04	46.01	21.40	0.41	10.16	Average
2	0.50	43.57	-12.44	56.01	33.00	0.41	10.16	QP
3	0.56	31.91	-14.09	46.00	21.41	0.35	10.15	Average
4	0.56	42.61	-13.39	56.00	32.11	0.35	10.15	QP
5	0.63	30.55	-15.45	46.00	20.10	0.30	10.15	Average
6	0.63	43.05	-12.95	56.00	32.60	0.30	10.15	QP
7	0.69	32.21	-13.79	46.00	21.80	0.26	10.15	Average
8	0.69	41.91	-14.09	56.00	31.50	0.26	10.15	QP
9	0.78	32.42	-13.58	46.00	22.00	0.27	10.15	Average
10	0.78	41.12	-14.88	56.00	30.70	0.27	10.15	QP
11	0.85	33.24	-12.76	46.00	22.80	0.29	10.15	Average
12	0.85	42.04	-13.96	56.00	31.60	0.29	10.15	QP
13	0.93	33.76	-12.24	46.00	23.30	0.31	10.15	Average
14	0.93	43.36	-12.64	56.00	32.90	0.31	10.15	QP
15	0.99	33.98	-12.02	46.00	23.50	0.33	10.15	Average
16	0.99	44.58	-11.42	56.00	34.10	0.33	10.15	QP
17	1.07	34.39	-11.61	46.00	23.91	0.33	10.15	Average
18	1.07	45.29	-10.71	56.00	34.81	0.33	10.15	QP
19	1.14	35.39	-10.61	46.00	24.89	0.34	10.16	Average
20	1.14	44.79	-11.21	56.00	34.29	0.34	10.16	QP
21	1.31	35.61	-10.39	46.00	25.09	0.35	10.17	Average
22	1.31	43.91	-12.09	56.00	33.39	0.35	10.17	QP
23 *	1.41	35.82	-10.18	46.00	25.30	0.35	10.17	Average
24	1.41	44.32	-11.68	56.00	33.80	0.35	10.17	QP



Test Mode :	Mode 1	Temperature :	21~22℃
Test Engineer :	Jack Tian	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM1900 Idle + Bluetooth Link + WLAN Link + Earphone + USB Cable (Charging from Adapter 1)		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_N_20140304 NEUTRAL

Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
25	1.55	35.53	-10.47	46.00	25.00	0.36	10.17	Average
26	1.55	45.13	-10.87	56.00	34.60	0.36	10.17	QP
27	1.65	34.14	-11.86	46.00	23.60	0.36	10.18	Average
28	1.65	43.24	-12.76	56.00	32.70	0.36	10.18	QP
29	1.86	31.75	-14.25	46.00	21.20	0.37	10.18	Average
30	1.86	39.25	-16.75	56.00	28.70	0.37	10.18	QP
31	2.03	31.26	-14.74	46.00	20.70	0.37	10.19	Average
32	2.03	40.26	-15.74	56.00	29.70	0.37	10.19	QP
33	2.26	34.38	-11.62	46.00	23.79	0.39	10.20	Average
34	2.26	41.98	-14.02	56.00	31.39	0.39	10.20	QP
35	4.20	31.50	-14.50	46.00	20.80	0.47	10.23	Average
36	4.20	39.90	-16.10	56.00	29.20	0.47	10.23	QP
37	5.03	32.43	-17.57	50.00	21.70	0.49	10.24	Average
38	5.03	41.53	-18.47	60.00	30.80	0.49	10.24	QP
39	17.38	30.45	-19.55	50.00	18.20	1.67	10.58	Average
40	17.38	41.75	-18.25	60.00	29.50	1.67	10.58	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	FSP30	101400	9kHz~30GHz	Mar. 03, 2014	Aug. 02, 2014~ Aug. 21, 2014	Mar. 02, 2015	Conducted (TH01-SZ)
Power Meter	Dare	RPR3006W	TH01SZ00 018	0.3GHz~6GHz	Mar. 14, 2014	Aug. 02, 2014~ Aug. 21, 2014	Mar. 13, 2015	Conducted (TH01-SZ)
Power Sensor	Dare	RPR3006W	TH01SZ00 019	0.3GHz~6GHz	Mar. 14, 2014	Aug. 02, 2014~ Aug. 21, 2014	Mar. 13, 2015	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 05, 2013	Aug. 24, 2014	Nov. 04, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz	May 04, 2014	Aug. 24, 2014	May 03, 2015	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 09, 2013	Aug. 24, 2014	Oct. 08, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Jan. 08, 2014	Aug. 24, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75959	1GHz~18GHz	Jan. 08, 2014	Aug. 24, 2014	Jan. 07, 2015	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz	Nov. 18, 2013	Aug. 24, 2014	Nov. 17, 2014	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA1702 49	15GHz~40GHz	Mar. 10, 2014	Aug. 24, 2014	Mar. 09, 2015	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161073	1MHz~1GHz	May 04, 2014	Aug. 24, 2014	May 03, 2015	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A023 71	1GHz~26.5GHz	Dec. 10, 2013	Aug. 24, 2014	Dec. 09, 2014	Radiation (03CH01-KS)
AC Power Source	Chroma	61601	F1040900 04	N/A	NCR	Aug. 24, 2014	NCR	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Aug. 24, 2014	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Aug. 24, 2014	NCR	Radiation (03CH01-KS)
ESCIO TEST Receiver	R&S	ESCI	100724	9kHz~3GHz	Feb. 21, 2014	Jul. 07, 2014	Feb. 20, 2015	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Mar. 04, 2014	Jul. 07, 2014	Mar. 03, 2015	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Mar. 04, 2014	Jul. 07, 2014	Mar. 03, 2015	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Dec. 17, 2013	Jul. 07, 2014	Dec. 16, 2014	Conduction (CO01-SZ)



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.3
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.5
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Appendix B. Photographs of EUT

Please refer to Sporton report number EP452903 which is issued separately.