FCC RF Test Report

APPLICANT	**:**	**FIH International Co., Ltd.**
EQUIPMENT	**:**	**GSM/WCDMA/LTE Mobile Phone**
BRAND NAME	**:**	**Nokia**
MODEL NAME	**:**	**TA-1060**
FCC ID	**:**	**2AJOTTA-1060**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**(DTS) Digital Transmission System**

The product was received on Oct. 26, 2017 and testing was completed on Dec. 04, 2017. We, Sporton International (Kunshan) 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 (Kunshan) Inc., the test report shall not be reproduced except in full.

James Huang

NVLAP®
TESTING
NVLAP LAB CODE 600155-0

Approved by: James Huang / Manager

Sporton International (Kunshan) Inc.
No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR7O2602-01C	Rev. 01	Initial issue of report	Dec. 13, 2017

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 13.01 dB at 2483.52 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 17.41 dB at 0.175 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

FIH International Co., Ltd.
No.18, Tongji zhonglu, Beijing Economic&Technological Development Area

1.2 Manufacturer

HMD Global Oy
Karaportti 2 02610 Espoo FINLAND

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM/WCDMA/LTE Mobile Phone
Brand Name	Nokia
Model Name	TA-1060
FCC ID	2AJOTTA-1060
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/HSPA+/LTE WLAN 2.4GHz 802.11b/g/n HT20 Bluetooth v2.1+EDR/ Bluetooth v4.2 LE
HW Version	HW0241
SW Version	000C_0_14A
EUT Stage	Identical Prototype

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. This is a variant report for TA-1060, the difference between TA-1047(FCC ID: 2AJOTTA-1047) and TA-1060(FCC ID: 2AJOTTA-1060) is change dual SIM card to single SIM card. Spot check measurements were performed on the subject device for radiated spurious emission, the test result were consistent with Sporton Report Number FR7O2602C, FCC ID: 2AJOTTA-1047, so all the test cases were leveraged on reference report.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b : 18.94 dBm (0.0783 W) 802.11g : 21.89 dBm (0.1545 W) 802.11n HT20 : 21.98 dBm (0.1578 W)
Antenna Type / Gain	PIFA Antenna with gain 0.13 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

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0) and the FCC designation No. is CN5013.

Test Site	Sporton International (Kunshan) Inc.		
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**		**FCC Test Firm Registration No.**
	TH01-KS	CO01-KS	630927

Note: The test site complies with ANSI C63.4 2014 requirement.

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0) and the FCC designation No. is CN5019

Test Site	Sporton International (Shenzhen) Inc.	
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan District Shenzhen City Guangdong Province 518055 China TEL: +86-755-3320-2398	
Test Site No.	**Sporton Site No.**	**FCC Test Firm Registration No.**
	03CH04-SZ	577730

Note: The test site complies with ANSI C63.4 2014 requirement.

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 v04
- ANSI C63.10-2013

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 (X plane) were recorded in this report.

2.1 Carrier Frequency and 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 Test Mode

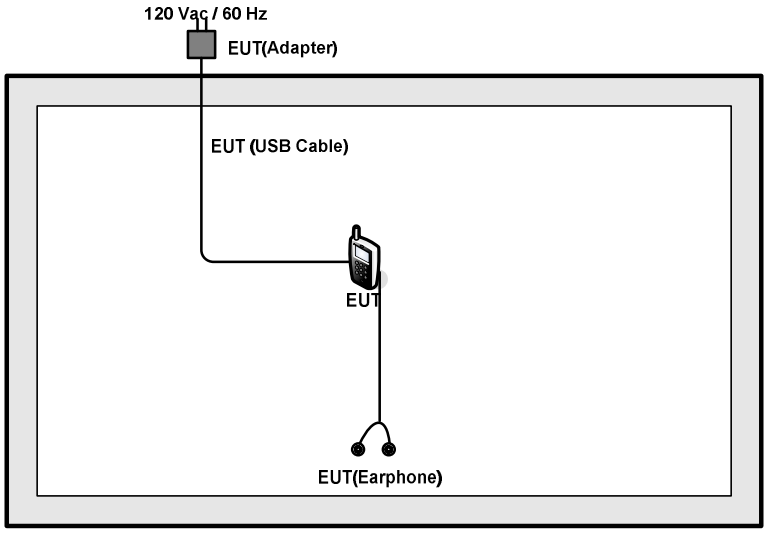
Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

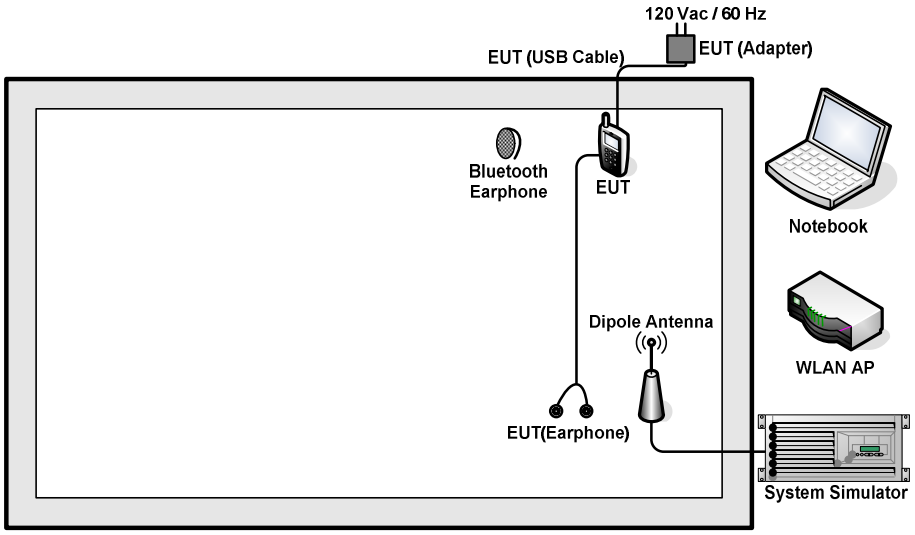
Test Cases	
AC Conducted Emission	Mode 1 :GSM850 Idle + Bluetooth Link + WLAN Link(2.4G) + Earphone + USB Cable (Charging from Adapter)
Remark: For Radiated Test Cases, The tests were performed with Adapter, Earphone and USB Cable.	

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
3.	Notebook	Lenovo	G480	PRC4	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
4.	WLAN AP	LINKSYS	WRT600N	Q87-WRT600NV11	N/A	shielded cable DC O/P1.8m , Unshielded AC I/P1.8m
5.	SD Card	Kingston	8GB	N/A	N/A	N/A

2.5 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.

2.6 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.
Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 5.5 dB.

Offset(dB) = RF cable loss(dB).
= 5.5 (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.

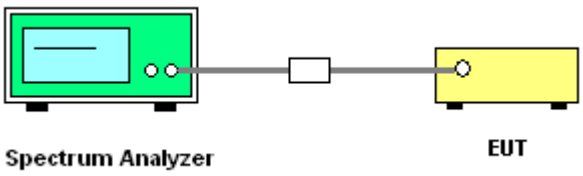
3.1.2 Measuring Instruments

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 v04.
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.

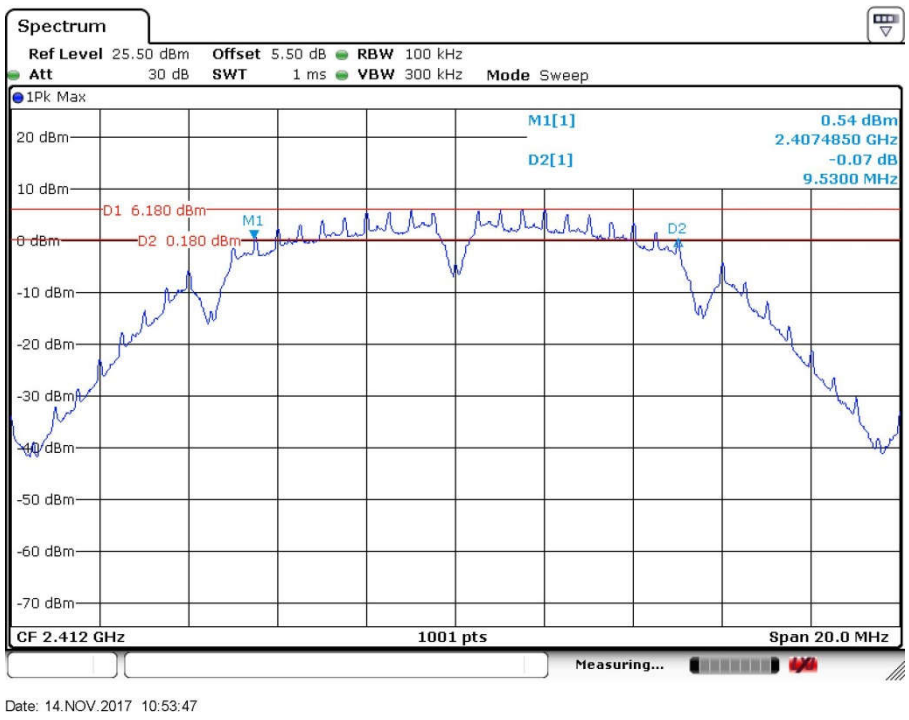
3.1.4 Test Setup



3.1.5 Test Result of 6dB Occupied Bandwidth

Please refer to Appendix A.

Minimum 6dB Bandwidth



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.

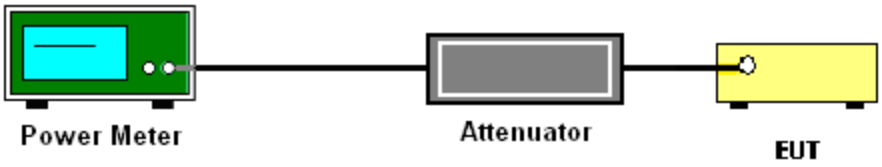
3.2.2 Measuring Instruments

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 v04 section 9.1.2 PKPM1 Peak power meter method.
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

Please refer to Appendix A.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

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.

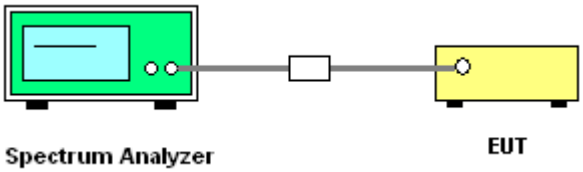
3.3.2 Measuring Instruments

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 v04
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.

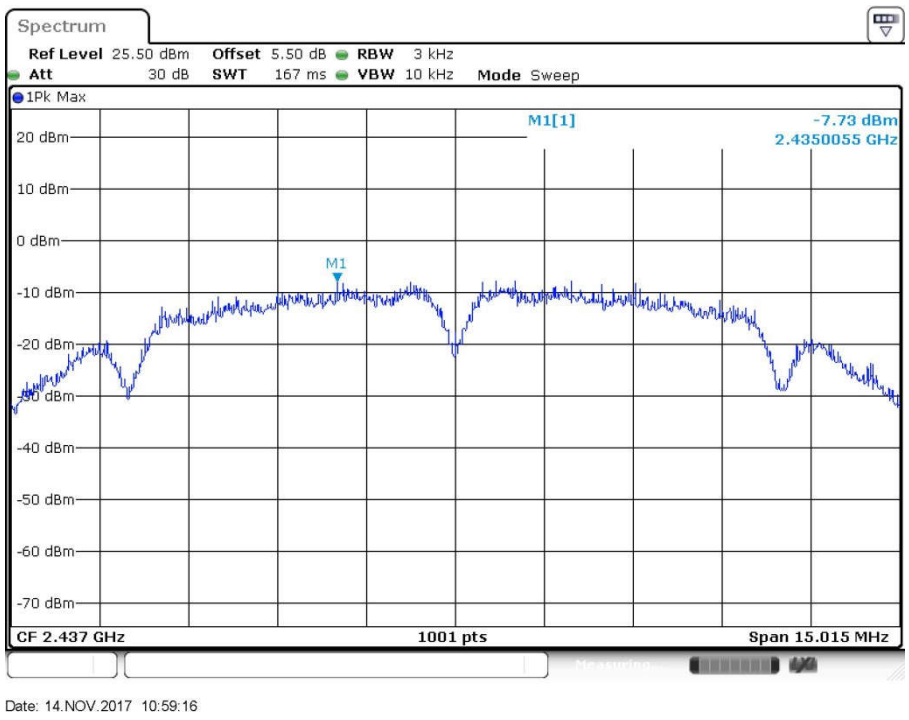
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

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.

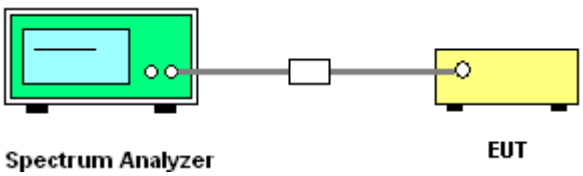
3.4.2 Measuring Instruments

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 v04.
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.
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

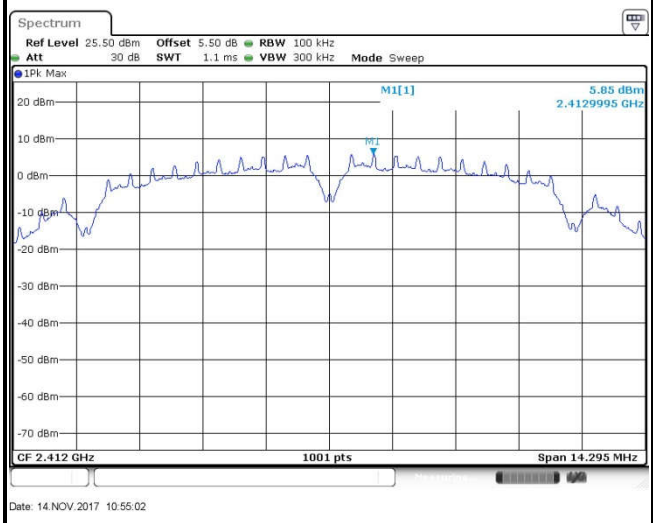


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

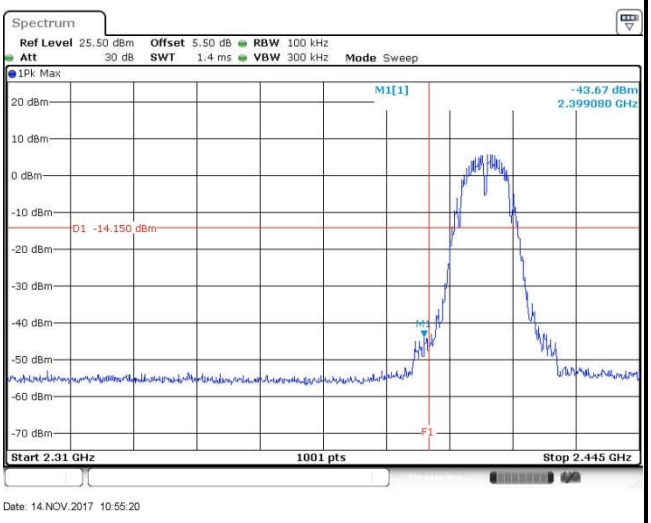
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Sam Zheng

WLAN 802.11b Channel 01

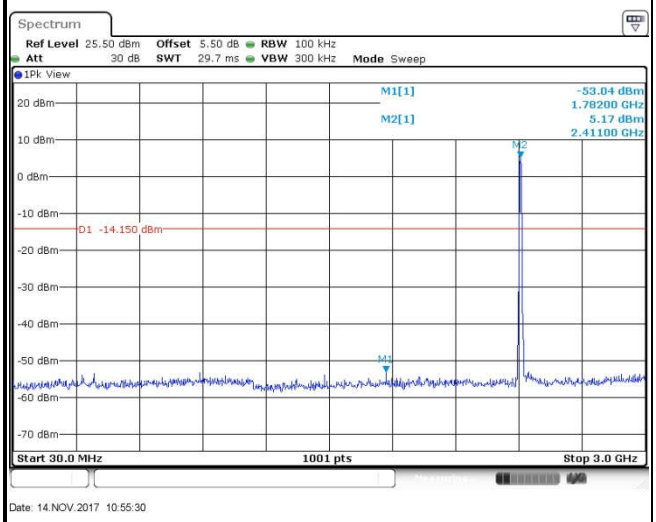
100kHz PSD reference Level



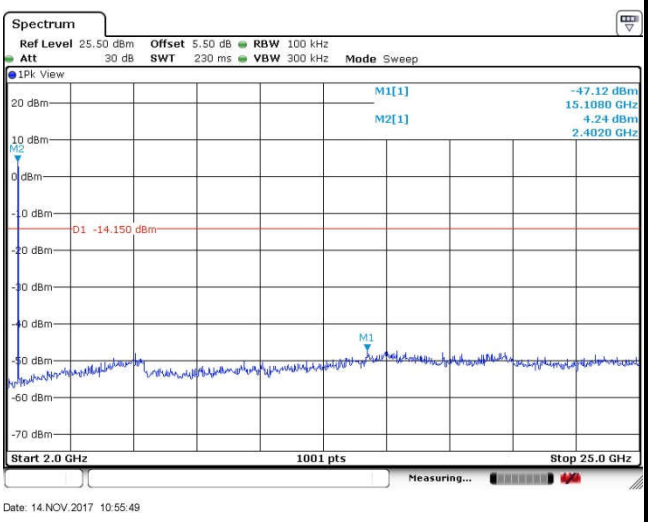
Low Channel Plot



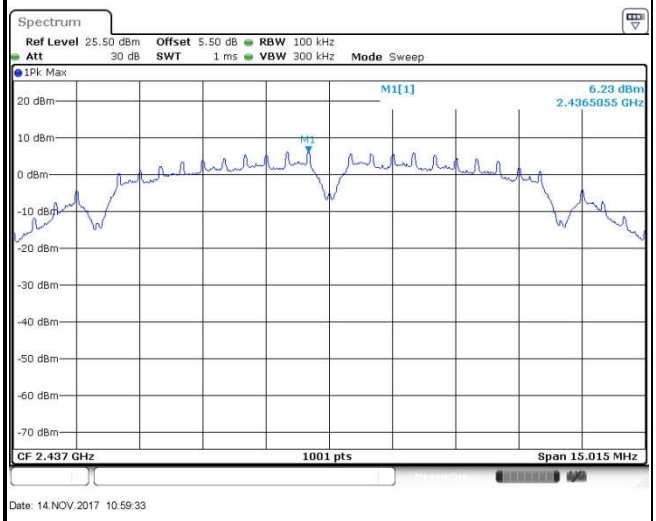
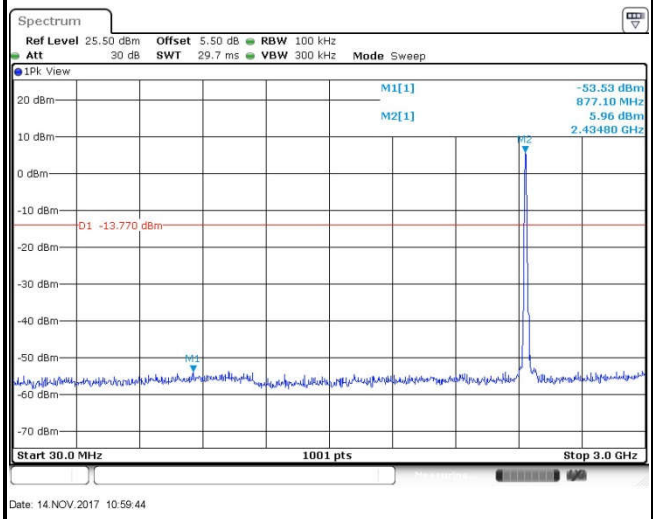
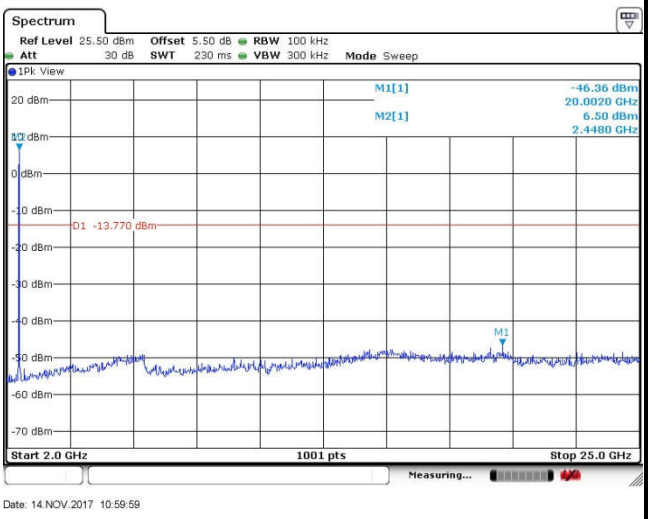
Spurious Emission 30MHz~3GHz



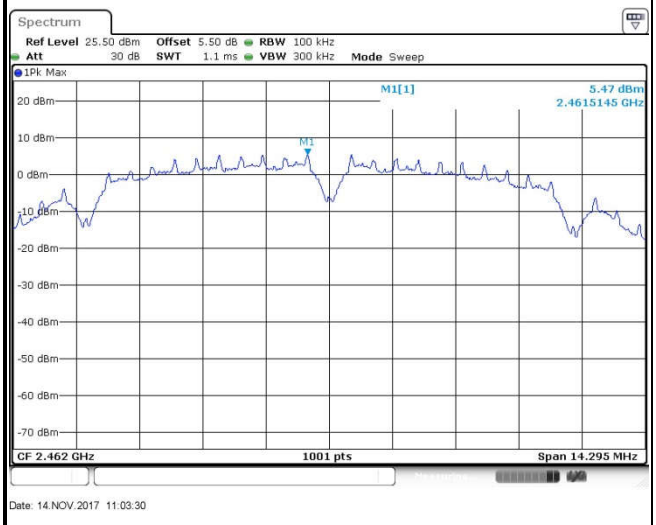
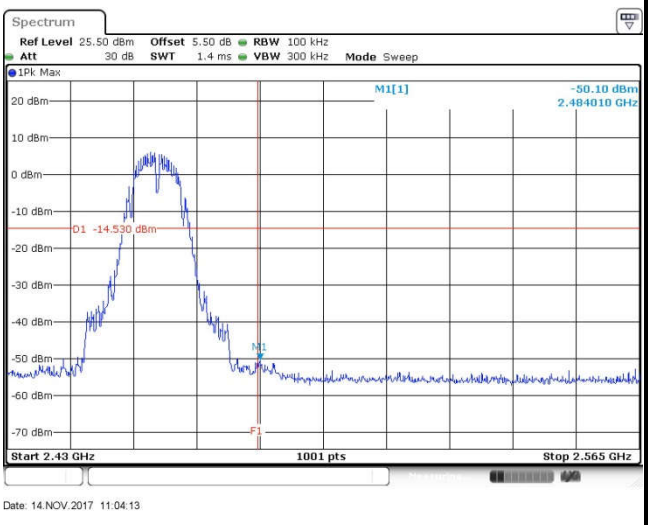
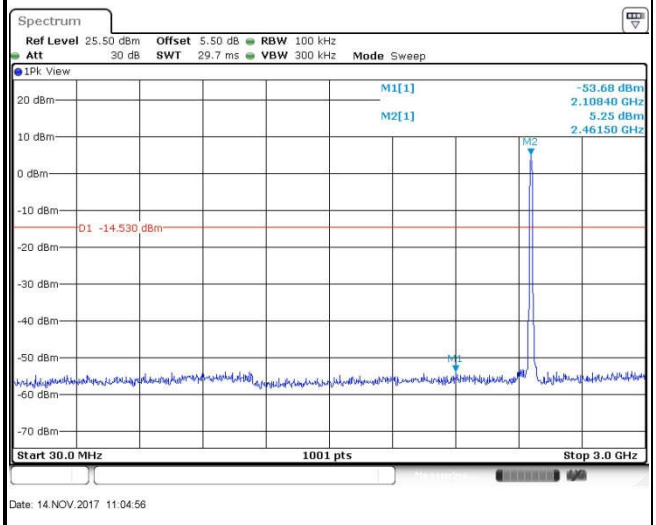
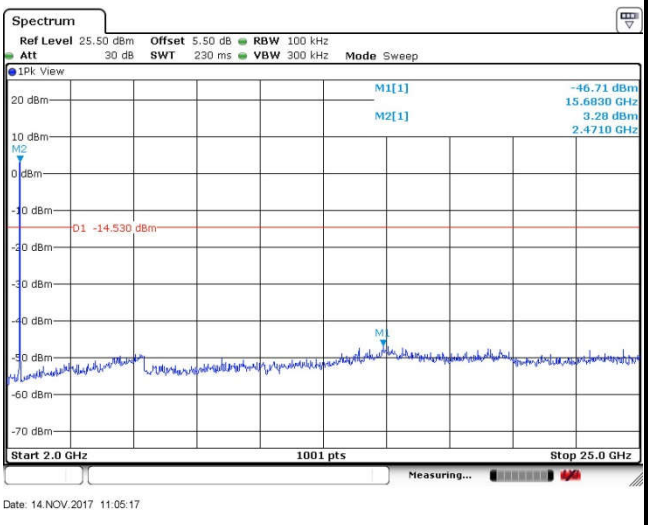
Spurious Emission 2GHz~25GHz



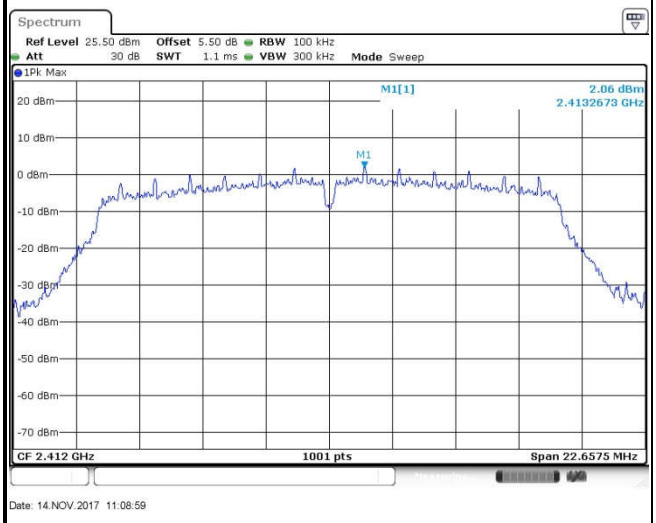
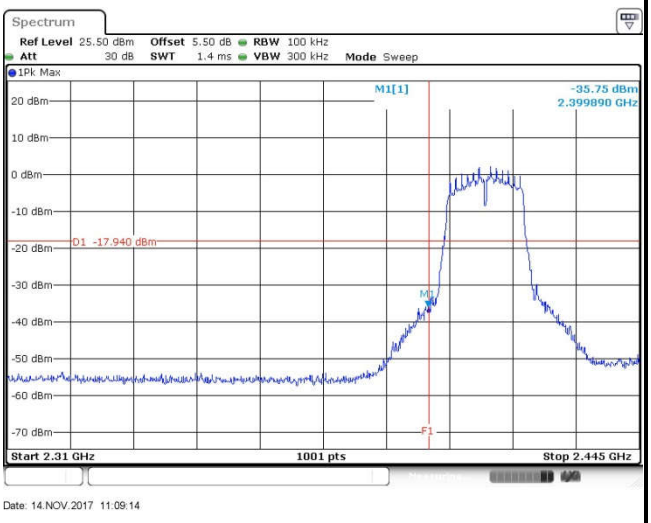
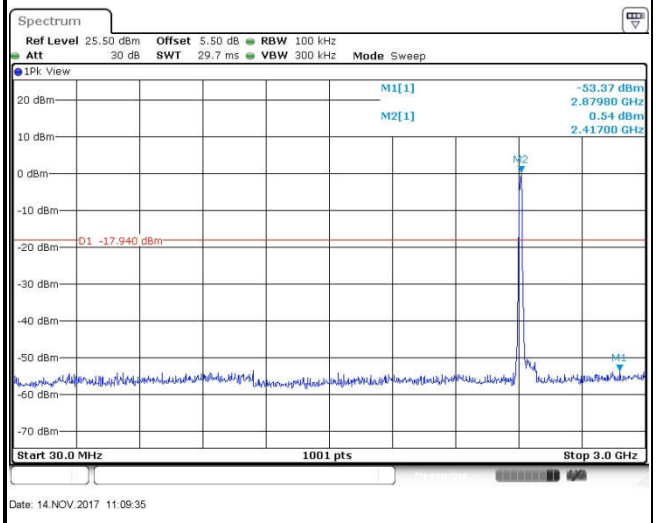
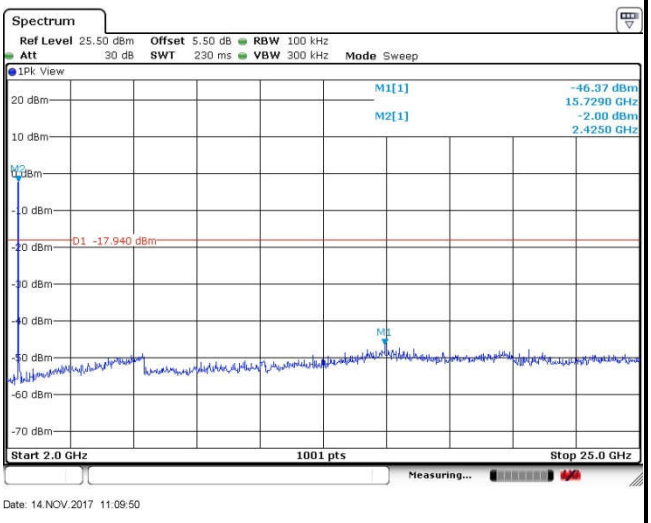
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Sam Zheng

WLAN 802.11b Channel 06	
100kHz PSD reference Level	
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

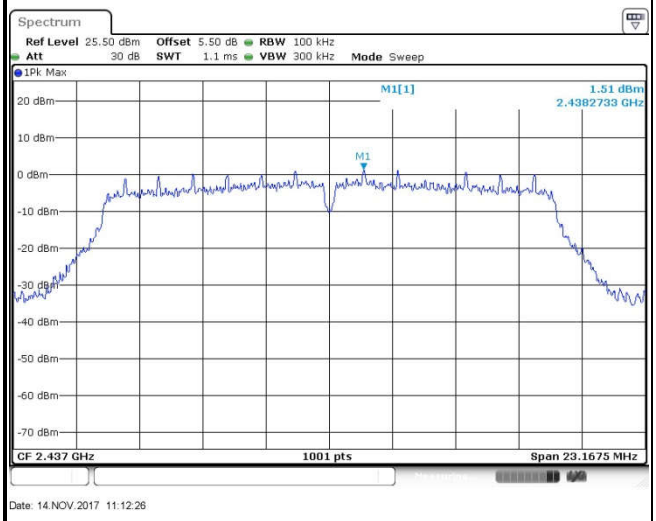
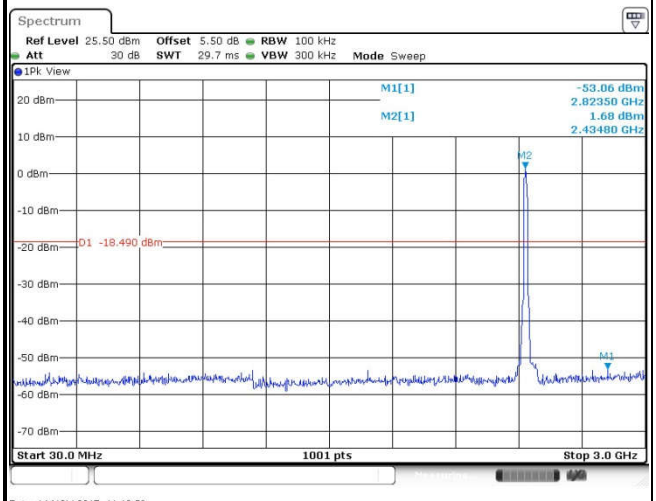
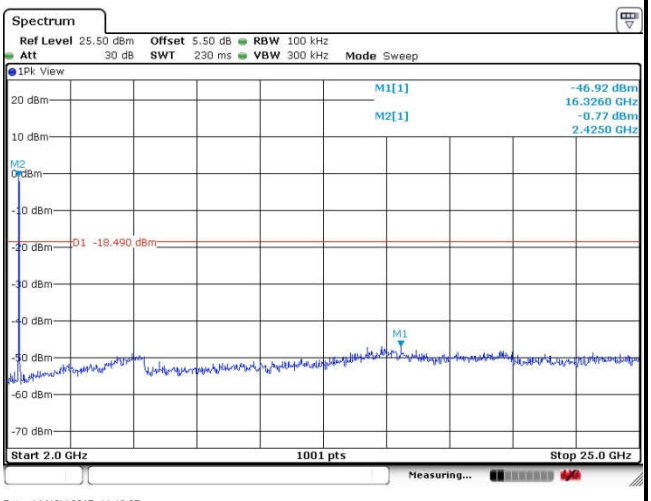
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Sam Zheng

WLAN 802.11b Channel 11	
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

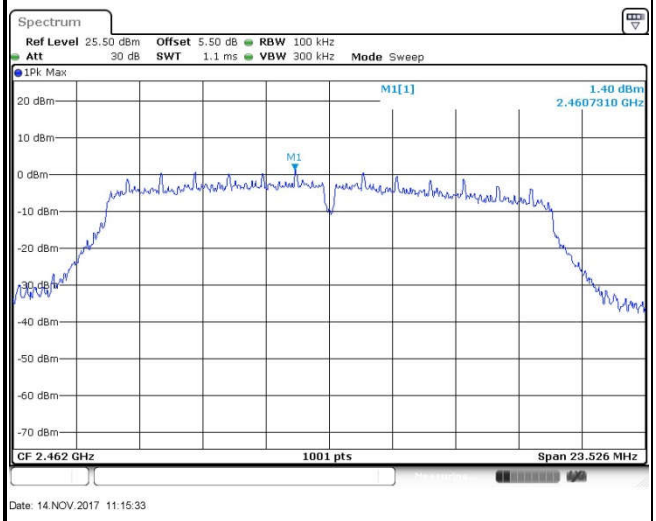
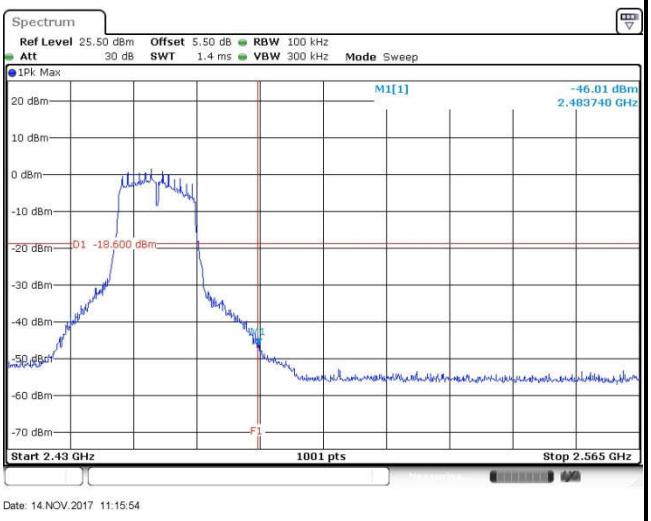
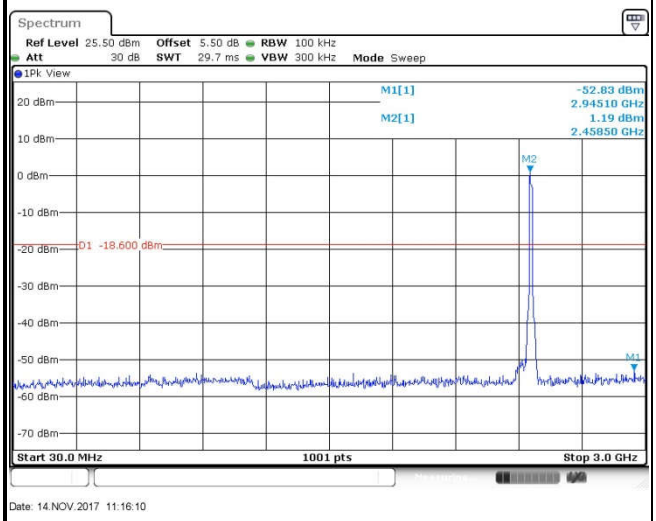
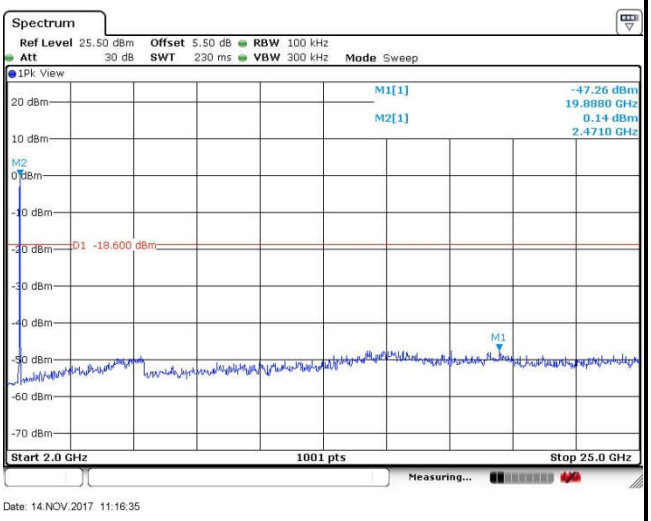
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Sam Zheng

WLAN 802.11g Channel 01	
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

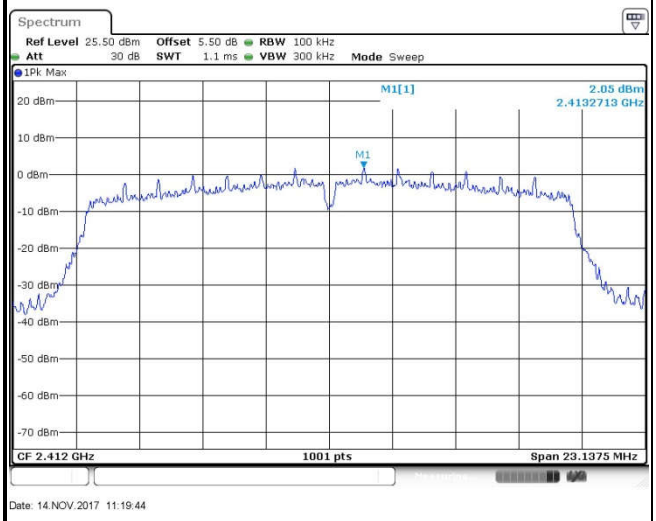
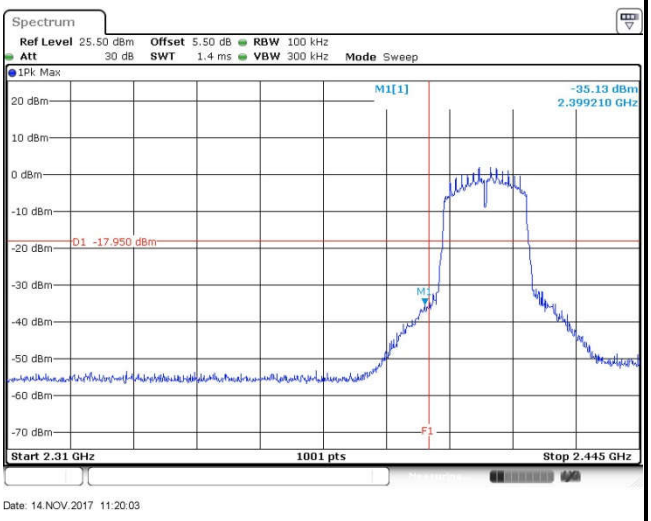
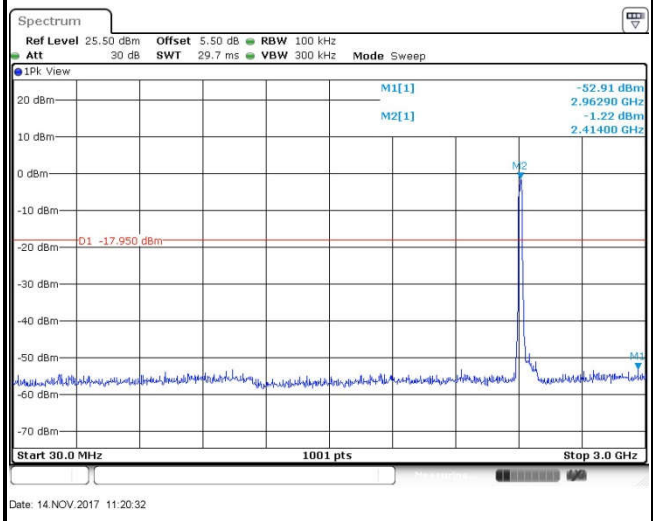
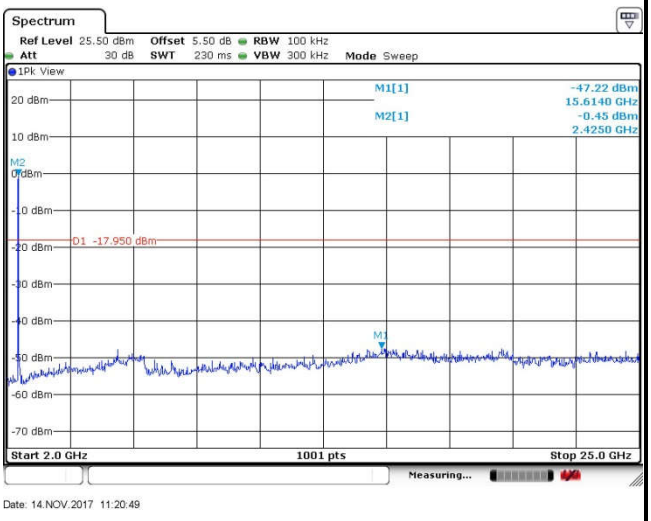
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Sam Zheng

WLAN 802.11g Channel 06	
100kHz PSD reference Level	
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Sam Zheng

WLAN 802.11g Channel 11	
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

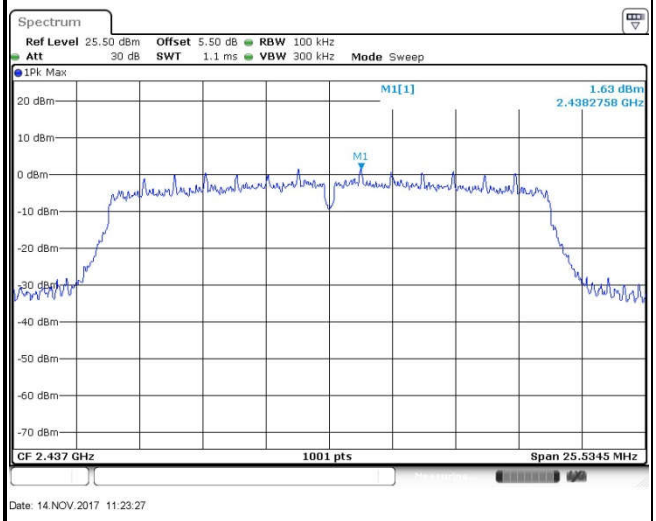
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Sam Zheng

WLAN 802.11n HT20 Channel 01	
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

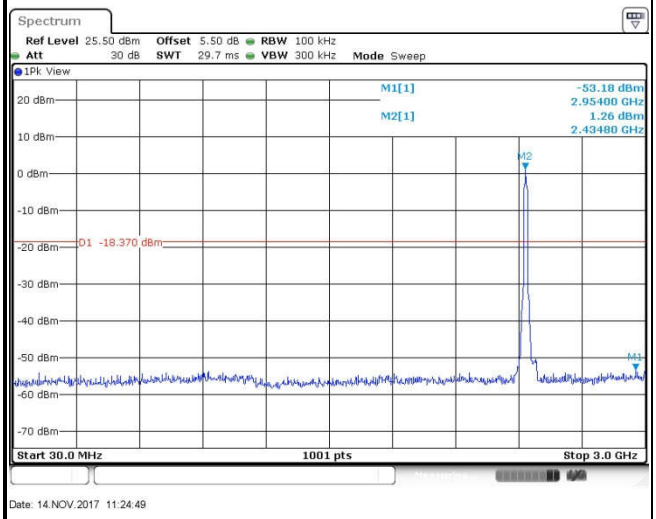
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Sam Zheng

WLAN 802.11n HT20 Channel 06

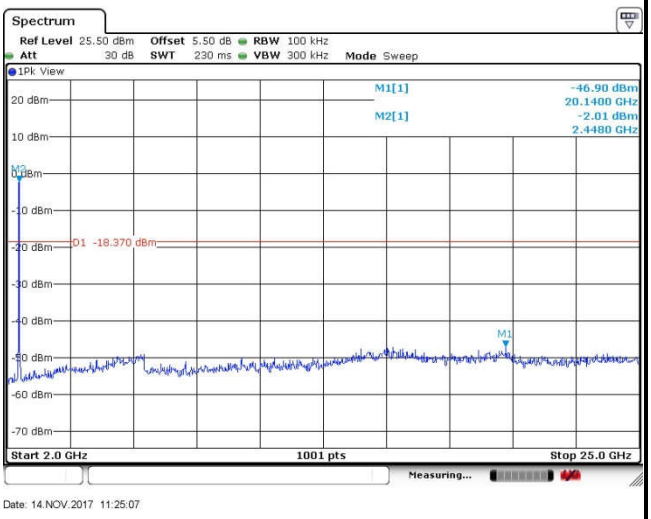
100kHz PSD reference Level



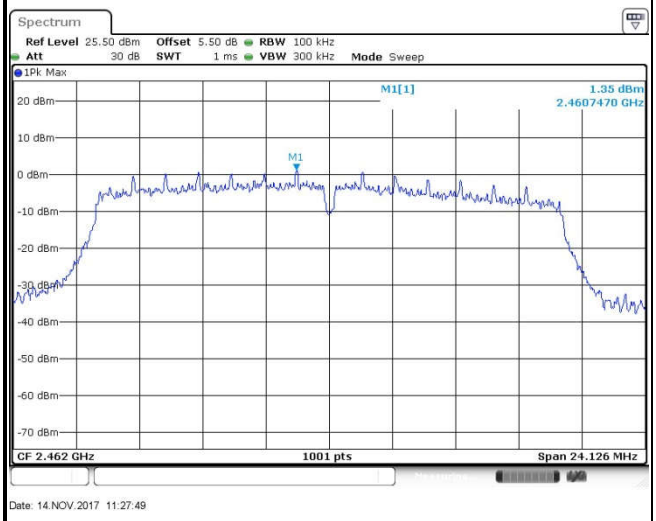
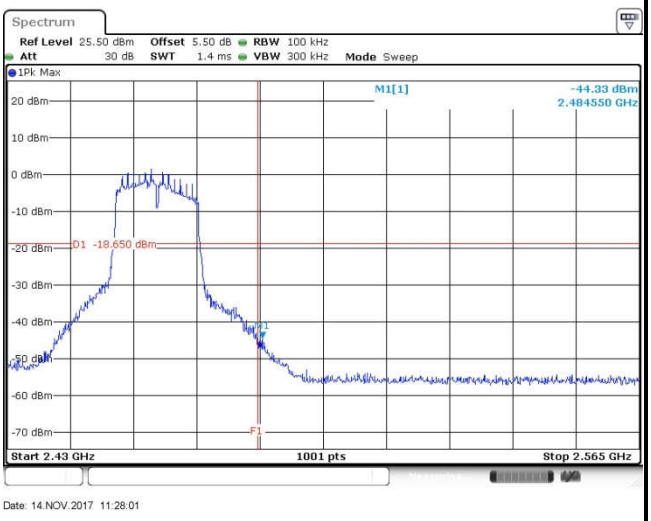
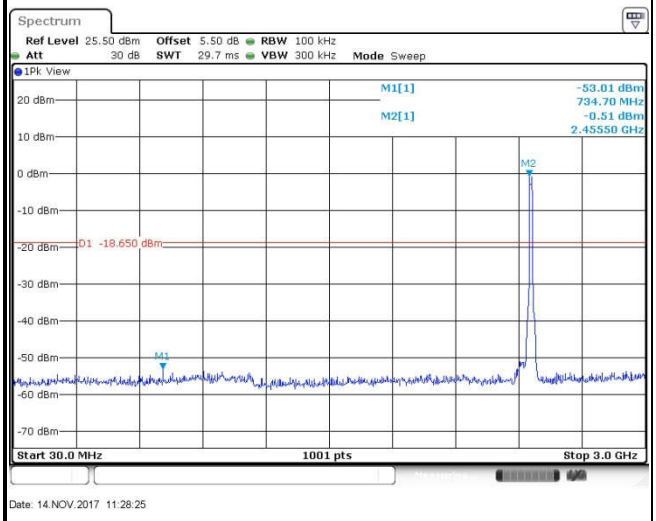
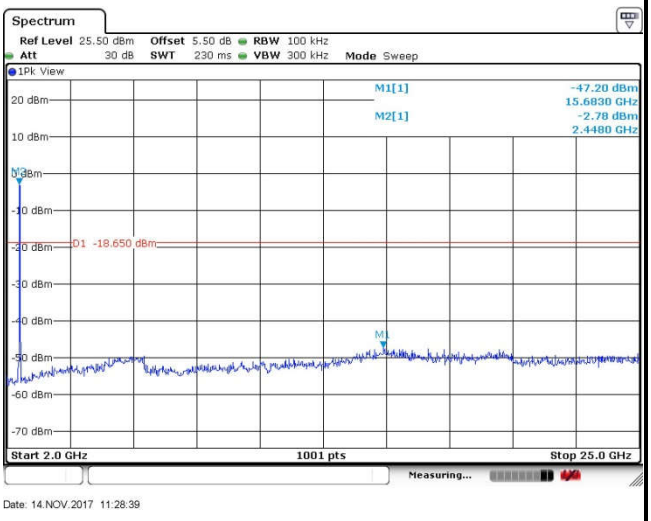
Spurious Emission 30MHz~3GHz



Spurious Emission 2GHz~25GHz



Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Sam Zheng

WLAN 802.11n HT20 Channel 11	
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

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 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

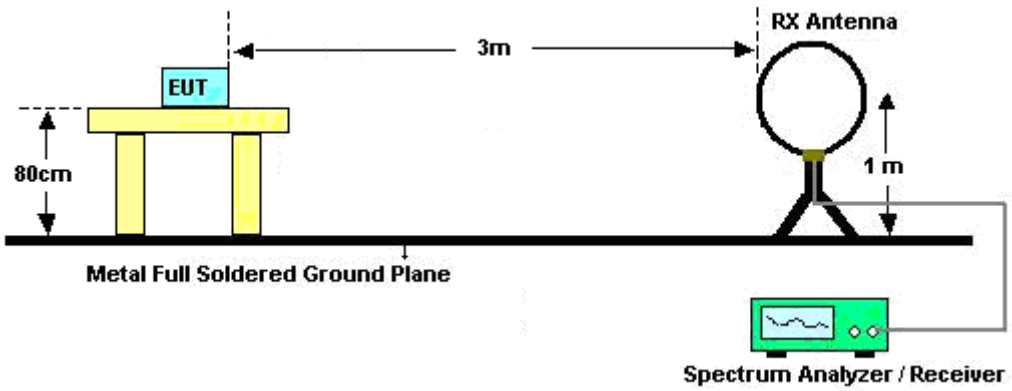
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

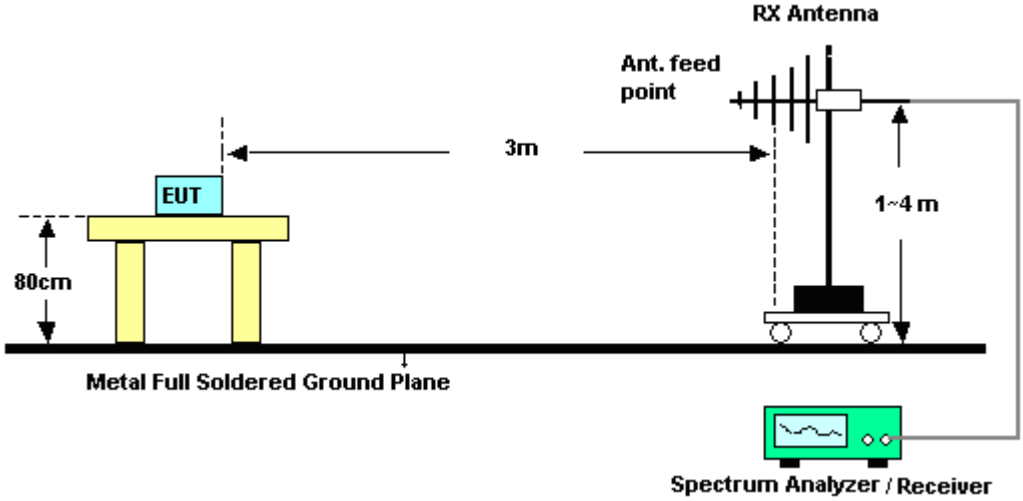
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively 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.

3.5.4 Test Setup

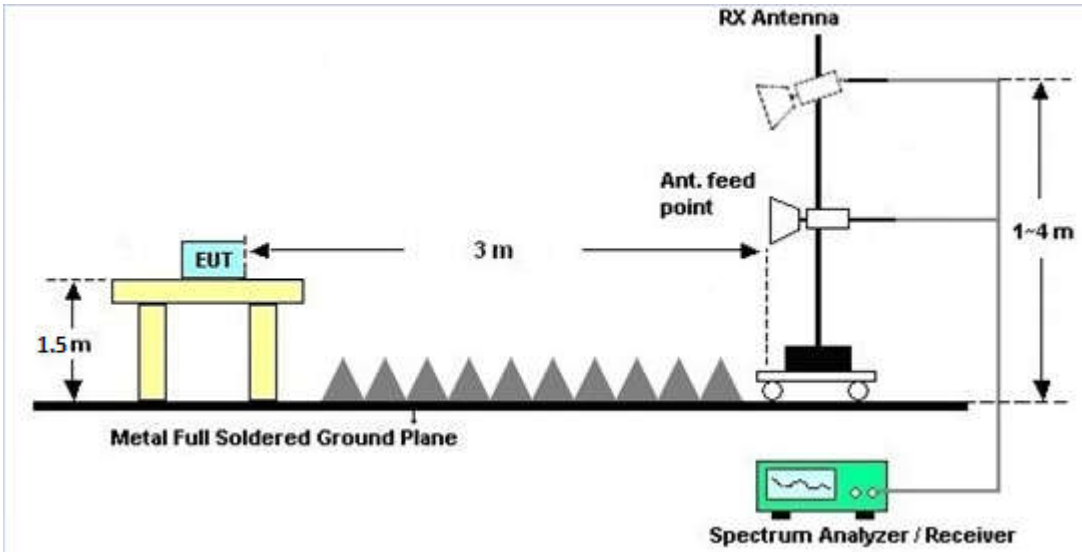
For radiated emissions below 30MHz



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 was not reported.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.5.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix B.

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.

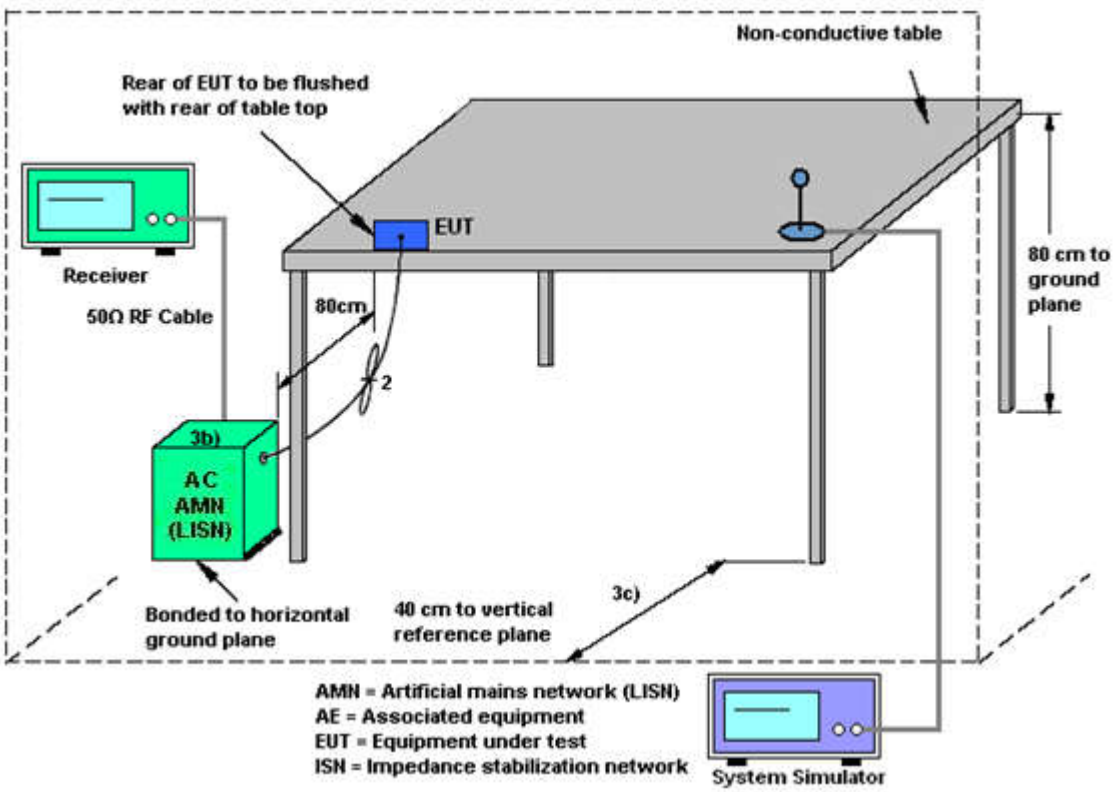
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

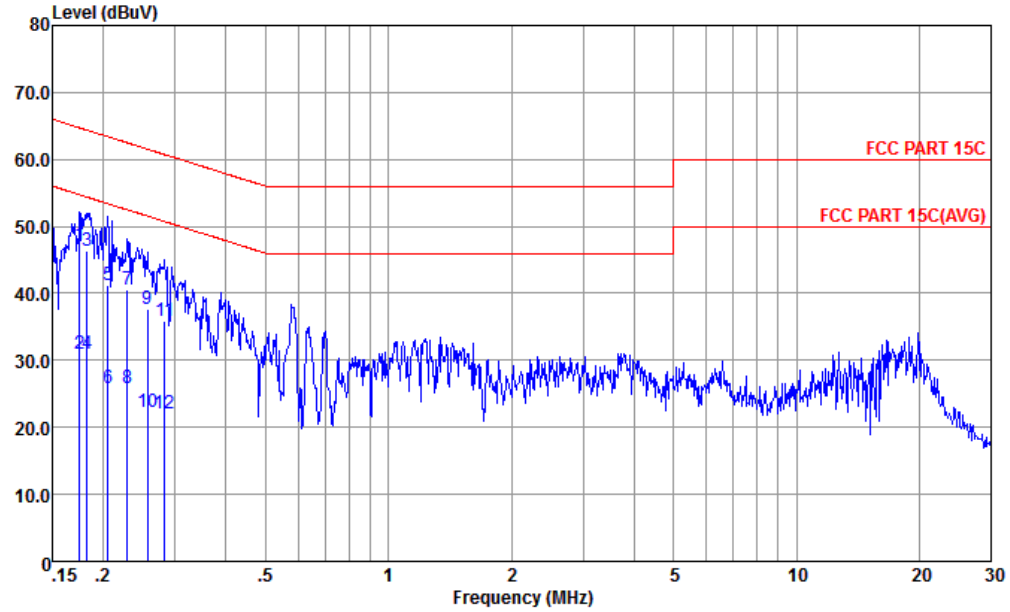
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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

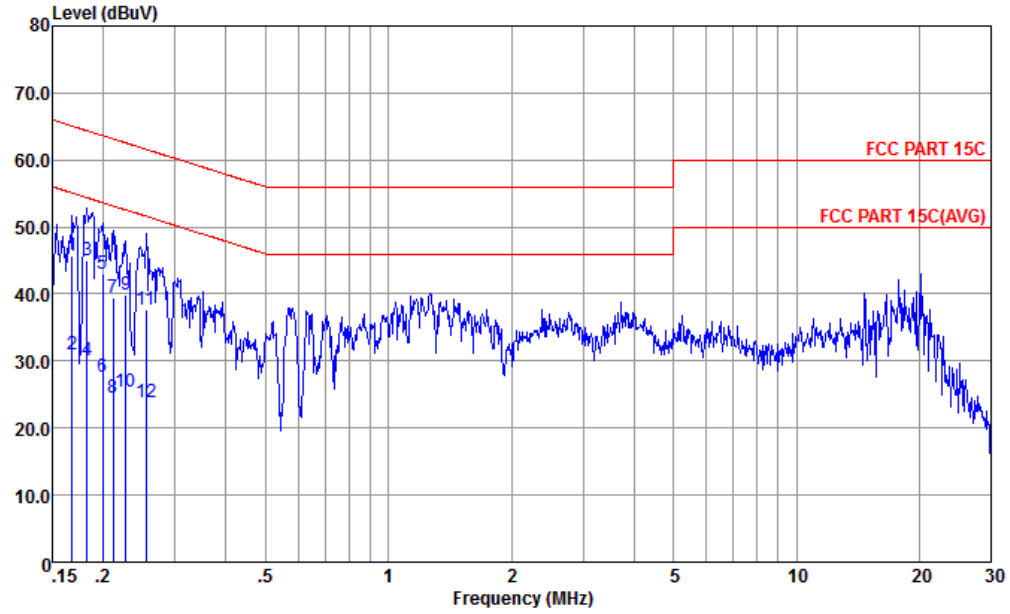
Test Mode :	Mode 1	**Temperature :**	22 ~24℃
Test Engineer :	Amos Zhang	**Relative Humidity :**	42~46%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link(2.4G) + Earphone + USB Cable (Charging from Adapter)		



Site : CO01-KS
Condition : FCC PART 15C LISN-L-171013-060103 LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	*	0.175	47.31	-17.41	64.72	36.60	0.18	10.53	QP
2		0.175	31.01	-23.71	54.72	20.30	0.18	10.53	Average
3		0.182	46.30	-18.07	64.37	35.60	0.19	10.51	QP
4		0.182	30.90	-23.47	54.37	20.20	0.19	10.51	Average
5		0.205	41.26	-22.14	63.40	30.61	0.20	10.45	QP
6		0.205	25.86	-27.54	53.40	15.21	0.20	10.45	Average
7		0.229	40.55	-21.93	62.48	29.89	0.21	10.45	QP
8		0.229	25.95	-26.53	52.48	15.29	0.21	10.45	Average
9		0.256	37.75	-23.81	61.56	27.09	0.22	10.44	QP
10		0.256	22.25	-29.31	51.56	11.59	0.22	10.44	Average
11		0.283	35.95	-24.77	60.72	25.30	0.22	10.43	QP
12		0.283	21.95	-28.77	50.72	11.30	0.22	10.43	Average

Test Mode :	Mode 1	Temperature :	22 ~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link(2.4G) + Earphone + USB Cable (Charging from Adapter)		



Site : CO01-KS
Condition : FCC PART 15C LISN-N-171013-060103 NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.168	45.63	-19.45	65.08	34.80	0.28	10.55	QP
2		0.168	31.03	-24.05	55.08	20.20	0.28	10.55	Average
3	*	0.182	45.09	-19.28	64.37	34.30	0.28	10.51	QP
4		0.182	29.99	-24.38	54.37	19.20	0.28	10.51	Average
5		0.200	43.04	-20.58	63.62	32.30	0.28	10.46	QP
6		0.200	27.64	-25.98	53.62	16.90	0.28	10.46	Average
7		0.212	39.33	-23.81	63.14	28.60	0.28	10.45	QP
8		0.212	24.53	-28.61	53.14	13.80	0.28	10.45	Average
9		0.227	39.93	-22.64	62.57	29.20	0.28	10.45	QP
10		0.227	25.33	-27.24	52.57	14.60	0.28	10.45	Average
11		0.255	37.62	-23.98	61.60	26.90	0.28	10.44	QP
12		0.255	23.92	-27.68	51.60	13.20	0.28	10.44	Average

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 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	Oct. 12, 2017	Nov. 24, 2017~ Nov. 28, 2017	Oct. 11, 2018	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSV30	101338	10Hz~30GHz	May 25, 2017	Nov. 24, 2017~ Nov. 28, 2017	May 24, 2018	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 19, 2017	Nov. 24, 2017~ Nov. 28, 2017	Jan. 18, 2018	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 19, 2017	Nov. 24, 2017~ Nov. 28, 2017	Jan. 18, 2018	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Apr. 20, 2017	Nov. 28, 2017	Apr. 19, 2018	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 20, 2017	Nov. 28, 2017	Apr. 19, 2018	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 14, 2017	Nov. 28, 2017	May 13, 2018	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	May 16, 2017	Nov. 28, 2017	May 15, 2018	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1474	1GHz~18GHz	Jan. 12, 2017	Nov. 28, 2017	Jan. 11, 2018	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	May 17, 2017	Nov. 28, 2017	May 16, 2018	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 19, 2017	Nov. 28, 2017	Oct. 18, 2018	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1989346	1GHz~18GHz	Jul. 27, 2017	Nov. 28, 2017	Jul. 26, 2018	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1988315	18GHz~40GHz	Jul. 27, 2017	Nov. 28, 2017	Jul. 26, 2018	Radiation (03CH04-SZ
Amplifier	Agilent Technologies	83017A	MY53270156	500MHz~26.5GHz	Apr. 20, 2017	Nov. 28, 2017	Apr. 19, 2018	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Nov. 28, 2017	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Nov. 28, 2017	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Nov. 28, 2017	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 20, 2017	Dec. 04, 2017	Apr. 19, 2018	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2017	Dec. 04, 2017	Oct. 12, 2018	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2017	Dec. 04, 2017	Oct. 12, 2018	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2017	Dec. 04, 2017	Oct. 11, 2018	Conduction (CO01-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.3dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.1dB**

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.1dB**

Appendix A. Conducted Test Results

Report Number : FR7O2602-01C

A1 - DTS Part

Test Engineer:	Silent Hai	Temperature:	21~25	°C
Test Date:	2017/11/28	Relative Humidity:	51~55	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band								
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	12.34	9.53	0.50	Pass
11b	1Mbps	1	6	2437	12.74	10.01	0.50	Pass
11b	1Mbps	1	11	2462	12.74	9.53	0.50	Pass
11g	6Mbps	1	1	2412	17.43	15.11	0.50	Pass
11g	6Mbps	1	6	2437	17.88	15.45	0.50	Pass
11g	6Mbps	1	11	2462	17.68	15.68	0.50	Pass
HT20	MCS0	1	1	2412	18.13	15.43	0.50	Pass
HT20	MCS0	1	6	2437	18.58	17.02	0.50	Pass
HT20	MCS0	1	11	2462	18.33	16.08	0.50	Pass

TEST RESULTS DATA
Peak Power Table

2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
11b	1Mbps	1	1	2412	18.74	30.00	0.13	18.87	36.00	Pass
11b	1Mbps	1	6	2437	18.94	30.00	0.13	19.07	36.00	Pass
11b	1Mbps	1	11	2462	18.53	30.00	0.13	18.66	36.00	Pass
11g	6Mbps	1	1	2412	21.76	30.00	0.13	21.89	36.00	Pass
11g	6Mbps	1	6	2437	21.89	30.00	0.13	22.02	36.00	Pass
11g	6Mbps	1	11	2462	20.92	30.00	0.13	21.05	36.00	Pass
HT20	MCS0	1	1	2412	21.92	30.00	0.13	22.05	36.00	Pass
HT20	MCS0	1	6	2437	21.98	30.00	0.13	22.11	36.00	Pass
HT20	MCS0	1	11	2462	21.18	30.00	0.13	21.31	36.00	Pass

TEST RESULTS DATA
Average Power Table
(Reporting Only)

2.4GHz Band						
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.00	15.73
11b	1Mbps	1	6	2437	0.00	16.04
11b	1Mbps	1	11	2462	0.00	15.76
11g	6Mbps	1	1	2412	0.11	13.17
11g	6Mbps	1	6	2437	0.11	13.39
11g	6Mbps	1	11	2462	0.11	12.36
HT20	MCS0	1	1	2412	0.12	13.15
HT20	MCS0	1	6	2437	0.12	13.43
HT20	MCS0	1	11	2462	0.12	12.73

TEST RESULTS DATA
Peak Power Density

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-8.70	0.13	8.00	Pass
11b	1Mbps	1	6	2437	-7.73	0.13	8.00	Pass
11b	1Mbps	1	11	2462	-8.36	0.13	8.00	Pass
11g	6Mbps	1	1	2412	-11.61	0.13	8.00	Pass
11g	6Mbps	1	6	2437	-12.46	0.13	8.00	Pass
11g	6Mbps	1	11	2462	-12.26	0.13	8.00	Pass
HT20	MCS0	1	1	2412	-11.96	0.13	8.00	Pass
HT20	MCS0	1	6	2437	-11.93	0.13	8.00	Pass
HT20	MCS0	1	11	2462	-13.17	0.13	8.00	Pass

Appendix B. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2375.835	46.44	-27.56	74	43.29	27.37	4.72	28.94	139	70	P	H
		2389.59	35.97	-18.03	54	32.7	27.43	4.78	28.94	139	70	A	H
	*	2412	98.9	-	-	95.57	27.49	4.78	28.94	139	70	P	H
	*	2412	95.9	-	-	92.57	27.49	4.78	28.94	139	70	A	H
		2348.43	46.06	-27.94	74	43.04	27.24	4.72	28.94	100	86	P	V
		2387.28	35.86	-18.14	54	32.59	27.43	4.78	28.94	100	86	A	V
	*	2412	91.52	-	-	88.19	27.49	4.78	28.94	100	86	P	V
	*	2412	88.55	-	-	85.22	27.49	4.78	28.94	100	86	A	V
802.11b CH 06 2437MHz		2388.26	47.3	-26.7	74	44.03	27.43	4.78	28.94	135	69	P	H
		2387.98	36.73	-17.27	54	33.46	27.43	4.78	28.94	135	69	A	H
	*	2437	99.44	-	-	95.95	27.61	4.82	28.94	135	69	P	H
	*	2437	96.4	-	-	92.91	27.61	4.82	28.94	135	69	A	H
		2483.83	47.65	-26.35	74	44.01	27.74	4.85	28.95	135	69	P	H
		2485.23	37.92	-16.08	54	34.28	27.74	4.85	28.95	135	69	A	H
		2389.24	45.42	-28.58	74	42.15	27.43	4.78	28.94	100	142	P	V
		2387.14	35.94	-18.06	54	32.67	27.43	4.78	28.94	100	142	A	V
	*	2437	93.68	-	-	90.19	27.61	4.82	28.94	100	142	P	V
	*	2437	90.67	-	-	87.18	27.61	4.82	28.94	100	142	A	V
		2497.9	46.63	-27.37	74	42.93	27.8	4.85	28.95	100	142	P	V
		2485.51	36.52	-17.48	54	32.88	27.74	4.85	28.95	100	142	A	V

802.11b CH 11 2462MHz	*	2462	99.4	-	-	95.85	27.68	4.82	28.95	135	353	P	H
	*	2462	96.25	-	-	92.7	27.68	4.82	28.95	135	353	A	H
		2490.32	47.02	-26.98	74	43.32	27.8	4.85	28.95	135	353	P	H
		2486.68	37.21	-16.79	54	33.57	27.74	4.85	28.95	135	353	A	H
	*	2462	93.68	-	-	90.13	27.68	4.82	28.95	100	232	P	V
	*	2462	90.52	-	-	86.97	27.68	4.82	28.95	100	232	A	V
		2492.04	47.87	-26.13	74	44.17	27.8	4.85	28.95	100	232	P	V
		2486.36	36.51	-17.49	54	32.87	27.74	4.85	28.95	100	232	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	41.87	-32.13	74	63.02	31.49	5.55	58.19	152	260	P	H
		4824	42.1	-31.9	74	63.25	31.49	5.55	58.19	152	260	P	V
802.11b CH 06 2437MHz		4874	41.2	-32.8	74	62.04	31.61	5.65	58.1	152	260	P	H
		7311	46.97	-27.03	74	61.46	36.17	7.26	57.92	189	238	P	H
		4874	41.31	-32.69	74	62.15	31.61	5.65	58.1	152	260	P	V
		7311	46.18	-27.82	74	60.67	36.17	7.26	57.92	189	238	P	V
802.11b CH 11 2462MHz		4924	41.46	-32.54	74	61.89	31.73	5.86	58.02	152	260	P	H
		7386	46.56	-27.44	74	60.73	36.28	7.2	57.65	189	238	P	H
		4924	40.54	-33.46	74	60.97	31.73	5.86	58.02	152	260	P	V
		7386	45.78	-28.22	74	59.95	36.28	7.2	57.65	189	238	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2362.815	46.82	-27.18	74	43.74	27.3	4.72	28.94	141	350	P	H
		2389.695	37.11	-16.89	54	33.84	27.43	4.78	28.94	141	350	A	H
	*	2412	99.64	-	-	96.31	27.49	4.78	28.94	141	350	P	H
	*	2412	91.11	-	-	87.78	27.49	4.78	28.94	141	350	A	H
		2375.31	45.8	-28.2	74	42.65	27.37	4.72	28.94	100	86	P	V
		2389.8	36.36	-17.64	54	33.09	27.43	4.78	28.94	100	86	A	V
	*	2412	92.67	-	-	89.34	27.49	4.78	28.94	100	86	P	V
	*	2412	85.25	-	-	81.92	27.49	4.78	28.94	100	86	A	V
802.11g CH 06 2437MHz		2485.37	38.48	-15.52	54	34.84	27.74	4.85	28.95	108	71	A	H
		2389.52	37.16	-16.84	54	33.89	27.43	4.78	28.94	112	71	A	H
	*	2437	99.84	-	-	96.35	27.61	4.82	28.94	112	71	P	H
	*	2437	91.87	-	-	88.38	27.61	4.82	28.94	112	71	A	H
		2484.67	48.27	-25.73	74	44.63	27.74	4.85	28.95	112	71	P	H
		2485.02	38.34	-15.66	54	34.7	27.74	4.85	28.95	112	71	A	H
		2366.84	45.88	-28.12	74	42.8	27.3	4.72	28.94	104	213	P	V
		2388.68	35.99	-18.01	54	32.72	27.43	4.78	28.94	104	213	A	V
	*	2437	92.76	-	-	89.27	27.61	4.82	28.94	104	213	P	V
	*	2437	85.18	-	-	81.69	27.61	4.82	28.94	104	213	A	V
		2488.31	47.57	-26.43	74	43.87	27.8	4.85	28.95	104	213	P	V
		2486.56	36.89	-17.11	54	33.25	27.74	4.85	28.95	104	213	A	V

802.11g CH 11 2462MHz	*	2462	99.04	-	-	95.49	27.68	4.82	28.95	114	284	P	H
	*	2462	91.45	-	-	87.9	27.68	4.82	28.95	114	284	A	H
		2484.16	53.05	-20.95	74	49.41	27.74	4.85	28.95	114	284	P	H
		2483.52	39.65	-14.35	54	36.01	27.74	4.85	28.95	114	284	A	H
	*	2462	93.35	-	-	89.8	27.68	4.82	28.95	104	213	P	V
	*	2462	85.63	-	-	82.08	27.68	4.82	28.95	104	213	A	V
		2484.08	48.4	-25.6	74	44.76	27.74	4.85	28.95	104	213	P	V
		2484.32	37.13	-16.87	54	33.49	27.74	4.85	28.95	104	213	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	40.95	-33.05	74	62.1	31.49	5.55	58.19	152	260	P	H
		4824	41.2	-32.8	74	62.35	31.49	5.55	58.19	152	260	P	V
802.11g CH 06 2437MHz		4874	39.09	-34.91	74	59.93	31.61	5.65	58.1	152	260	P	H
		7311	44.2	-29.8	74	58.69	36.17	7.26	57.92	189	238	P	H
		4874	39.98	-34.02	74	60.82	31.61	5.65	58.1	152	260	P	V
		7311	44.77	-29.23	74	59.26	36.17	7.26	57.92	189	238	P	V
802.11g CH 11 2462MHz		4924	38.34	-35.66	74	58.77	31.73	5.86	58.02	152	260	P	H
		7386	44.97	-29.03	74	59.14	36.28	7.2	57.65	189	238	P	H
		4924	38.34	-35.66	74	58.77	31.73	5.86	58.02	152	260	P	V
		7386	43.74	-30.26	74	57.91	36.28	7.2	57.65	189	238	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2389.695	48.01	-25.99	74	44.74	27.43	4.78	28.94	139	347	P	H
		2389.8	38	-16	54	34.73	27.43	4.78	28.94	139	347	A	H
802.11n	*	2412	98.84	-	-	95.51	27.49	4.78	28.94	139	347	P	H
HT20	*	2412	91.34	-	-	88.01	27.49	4.78	28.94	139	347	A	H
CH 01		2389.485	47.97	-26.03	74	44.7	27.43	4.78	28.94	100	84	P	V
2412MHz		2389.695	36.32	-17.68	54	33.05	27.43	4.78	28.94	100	84	A	V
	*	2412	92.46	-	-	89.13	27.49	4.78	28.94	100	84	P	V
	*	2412	84.73	-	-	81.4	27.49	4.78	28.94	100	84	A	V
		2388.68	46.52	-27.48	74	43.25	27.43	4.78	28.94	137	350	P	H
		2389.94	37.36	-16.64	54	34.09	27.43	4.78	28.94	137	350	A	H
	*	2437	98.38	-	-	94.89	27.61	4.82	28.94	137	350	P	H
	*	2437	90.85	-	-	87.36	27.61	4.82	28.94	137	350	A	H
802.11n		2485.16	48.91	-25.09	74	45.27	27.74	4.85	28.95	137	350	P	H
HT20		2486.98	38.38	-15.62	54	34.74	27.74	4.85	28.95	137	350	A	H
CH 06		2382.1	46.05	-27.95	74	42.9	27.37	4.72	28.94	124	269	P	V
2437MHz		2388.68	35.9	-18.1	54	32.63	27.43	4.78	28.94	124	269	A	V
	*	2437	92.97	-	-	89.48	27.61	4.82	28.94	124	269	P	V
	*	2437	85.36	-	-	81.87	27.61	4.82	28.94	124	269	A	V
		2486.91	46.76	-27.24	74	43.12	27.74	4.85	28.95	124	269	P	V
		2486.07	37.01	-16.99	54	33.37	27.74	4.85	28.95	124	269	A	V

802.11n HT20 CH 11 2462MHz	*	2462	99.16	-	-	95.61	27.68	4.82	28.95	116	289	P	H
	*	2462	91.77	-	-	88.22	27.68	4.82	28.95	116	289	A	H
		2484.04	54.48	-19.52	74	50.84	27.74	4.85	28.95	116	289	P	H
		2483.52	40.99	-13.01	54	37.35	27.74	4.85	28.95	116	289	A	H
	*	2462	92.47	-	-	88.92	27.68	4.82	28.95	100	269	P	V
	*	2462	85.49	-	-	81.94	27.68	4.82	28.95	100	269	A	V
		2483.8	50.72	-23.28	74	47.08	27.74	4.85	28.95	100	269	P	V
		2483.56	38.03	-15.97	54	34.39	27.74	4.85	28.95	100	269	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		4824	39.73	-34.27	74	60.88	31.49	5.55	58.19	152	260	P	H
		4824	40.53	-33.47	74	61.68	31.49	5.55	58.19	152	260	P	V
802.11n HT20 CH 06 2437MHz		4874	39.44	-34.56	74	60.28	31.61	5.65	58.1	152	260	P	H
		7311	44.89	-29.11	74	59.38	36.17	7.26	57.92	189	238	P	H
		4874	39.39	-34.61	74	60.23	31.61	5.65	58.1	152	260	P	V
		7311	43.98	-30.02	74	58.47	36.17	7.26	57.92	189	238	P	V
802.11n HT20 CH 11 2462MHz		4924	39.34	-34.66	74	59.77	31.73	5.86	58.02	152	260	P	H
		7386	44.67	-29.33	74	58.84	36.28	7.2	57.65	189	238	P	H
		4924	38.01	-35.99	74	58.44	31.73	5.86	58.02	152	260	P	V
		7386	44.69	-29.31	74	58.86	36.28	7.2	57.65	189	238	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
2.4GHz 802.11n HT20 LF		30.97	25.98	-14.02	40	32.97	24.52	0.27	31.78	100	321	P	H
		107.6	24.03	-19.47	43.5	37.76	16.73	1.09	31.55	-	-	P	H
		232.73	22.3	-23.7	46	35.03	16.87	1.68	31.28	-	-	P	H
		676.02	28.5	-17.5	46	31.38	25.46	2.88	31.22	-	-	P	H
		836.07	29.84	-16.16	46	30.25	27.61	3.23	31.25	-	-	P	H
		946.65	31.8	-14.2	46	30.73	28.87	3.47	31.27	-	-	P	H
		30.97	25	-15	40	31.99	24.52	0.27	31.78	-	-	P	V
		121.18	23.1	-20.4	43.5	36.34	17.13	1.14	31.51	-	-	P	V
		149.31	21.99	-21.51	43.5	34.18	17.97	1.26	31.42	-	-	P	V
		523.73	25.96	-20.04	46	30.98	23.66	2.49	31.17	-	-	P	V
		674.08	26.94	-19.06	46	29.86	25.44	2.87	31.23	-	-	P	V
		881.66	31.31	-14.69	46	31.06	28.18	3.34	31.27	100	214	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

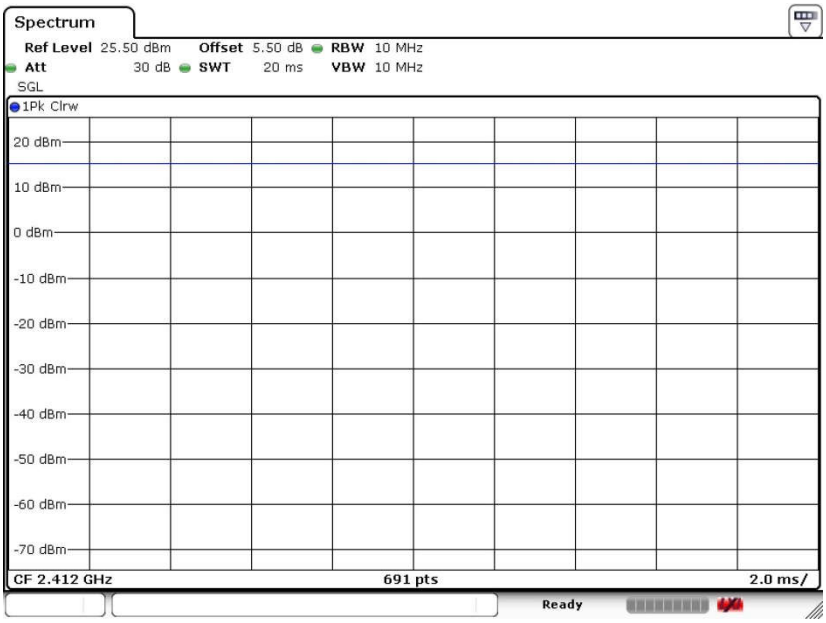
= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.

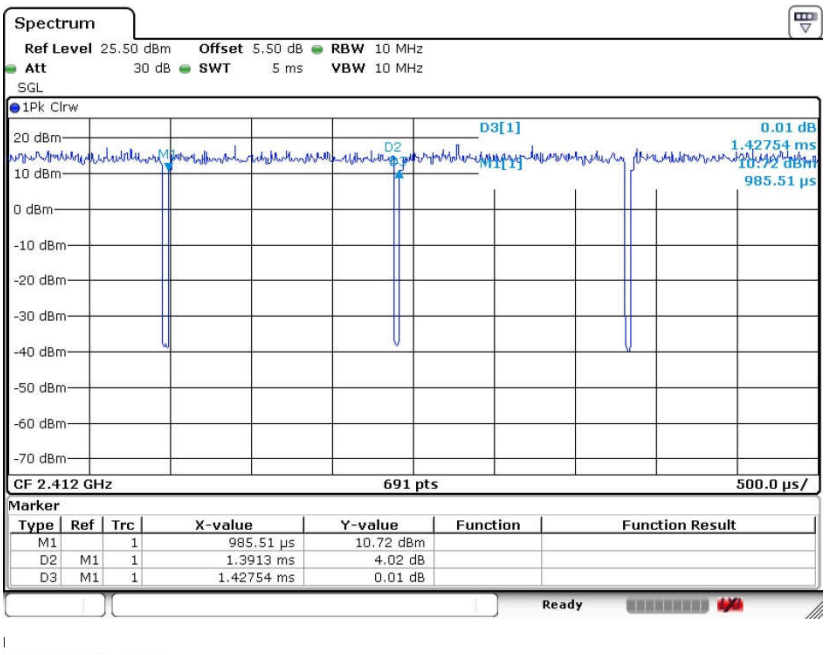
Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	100	-	-	10Hz
802.11g	97.46	1.391	0.719	1kHz
802.11n HT20	97.30	1.304	0.767	1kHz

802.11b



802.11g



802.11n HT20