FCC RF Test Report

APPLICANT	:	**PAX Technology Limited**
EQUIPMENT	:	**Encrypting PIN Pad**
BRAND NAME	:	**PAX**
MODEL NAME	:	**IM300**
MARKETING NAME	:	**IM300**
FCC ID	:	**V5PIM300BW**
STANDARD	:	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	:	**(DTS) Digital Transmission System**

The product was received on Jan. 15, 2018 and testing was completed on Jan. 23, 2018. 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.

TESTING
NVLAP LAB CODE 600156-0

Approved by: Eric Shih / Manager

Sporton International (Shenzhen) Inc.
1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City Guangdong Province 518055 China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR811505C	Rev. 01	Initial issue of report	Jan. 25, 2018

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 3.10 dB at 2389.59 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 6.61 dB at 0.50 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

PAX Technology Limited
Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Road, Wanchai, Hong Kong

1.2 Manufacturer

PAX Computer Technology (Shenzhen) Co., Ltd.
4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C.

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Encrypting PIN Pad
Brand Name	PAX
Model Name	IM300
Marketing Name	IM300
FCC ID	V5PIM300BW
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n HT20 Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
HW Version	IM300-XXX-XXX
SW Version	PED4.0
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 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 : 18.43 dBm (0.0697 W) 802.11g : 23.35 dBm (0.2163 W) 802.11n HT20 : 22.65 dBm (0.1841 W)
Antenna Type / Gain	External Monopole Antenna with gain 0.00 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

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0) and the FCC designation No are CN5018 and CN5019.

Test Site	Sporton International (Shenzhen) Inc.		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen City Guangdong Province 518055 China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595		
Test Site No.	**Sporton Site No.**		**FCC Test Firm Registration No.**
	TH01-SZ	CO01-SZ	251365

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 (Y 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

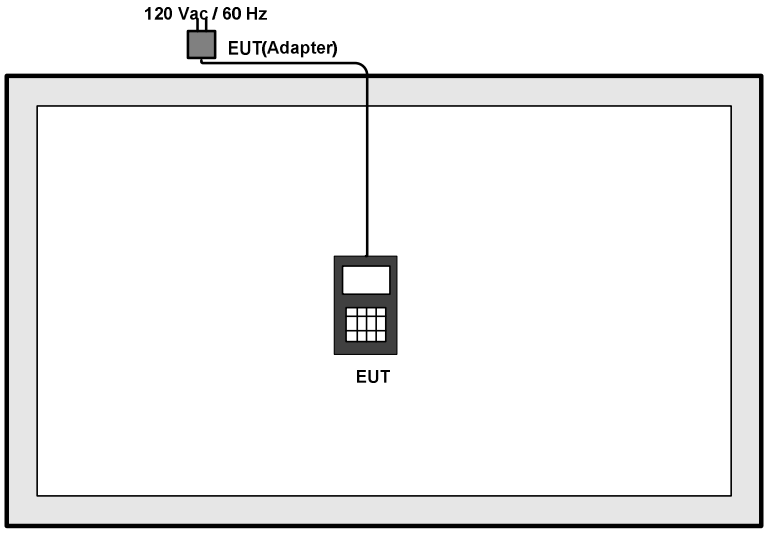
Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

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

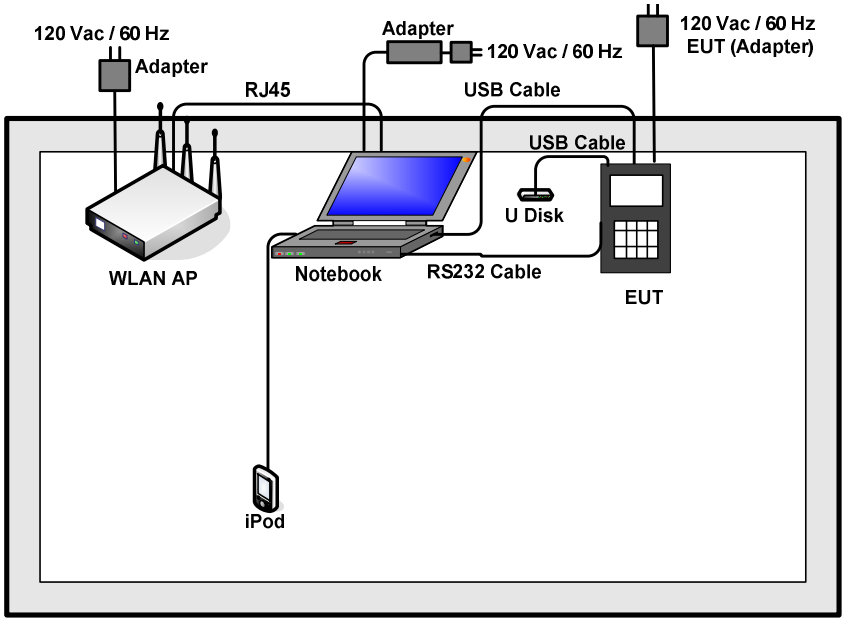
Test Cases	
AC Conducted Emission	Mode 1 : RS232 Port load (1-1) + DC power output load (2) + Earphone load (3+4) + LAN Link (5) + RJ45 port RS232 connection Notebook load (6) + Bluetooth Tx + RJ45 port RS232 connection Notebook load (10) + USB Mini-B load for Notebook (11) + AC Adapter to MDB port (12) + temperature control port load (13) + USB Type-A load for U disk (14) + RS232 Port load (1-2) Mode 2 : RS232 Port load (1-1) + DC power output load (2) + Earphone load (3+4) + LAN Link (5) + RJ45 port RS232 connection Notebook load (6) + WLAN Tx (2.4G) + RJ45 port RS232 connection Notebook load (10) + USB Mini-B load for Notebook (11) + AC Adapter to MDB port (12) + temperature control port load (13) + USB Type-A load for U disk (14) + RS232 Port load (1-2)
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.	

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.	Notebook	Lenovo	E450	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	WLAN AP	D-Link	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
3.	temperature control	PSX	IM700	N/A	N/A	N/A
4.	Speaker	N/A	N/A	N/A	N/A	N/A
5.	Microphone	N/A	N/A	N/A	N/A	N/A
6.	RS232 Cable	N/A	N/A	N/A	Shielded, 1.0m	N/A
7.	U-disk	Kingston	8G	N/A	N/A	N/A
8.	iPod	Apple	A1285	DoC	Shielded, 1.0m	N/A

2.5 EUT Operation Test Setup

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

For AC power line conducted emissions, the EUT was set to connect with the Notebook 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 and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4 dB and 10dB attenuator.

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

= 4 + 10 = 14 (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.

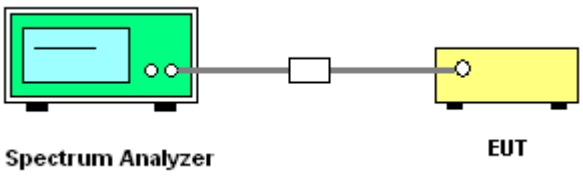
3.1.2 Measuring Instruments

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.

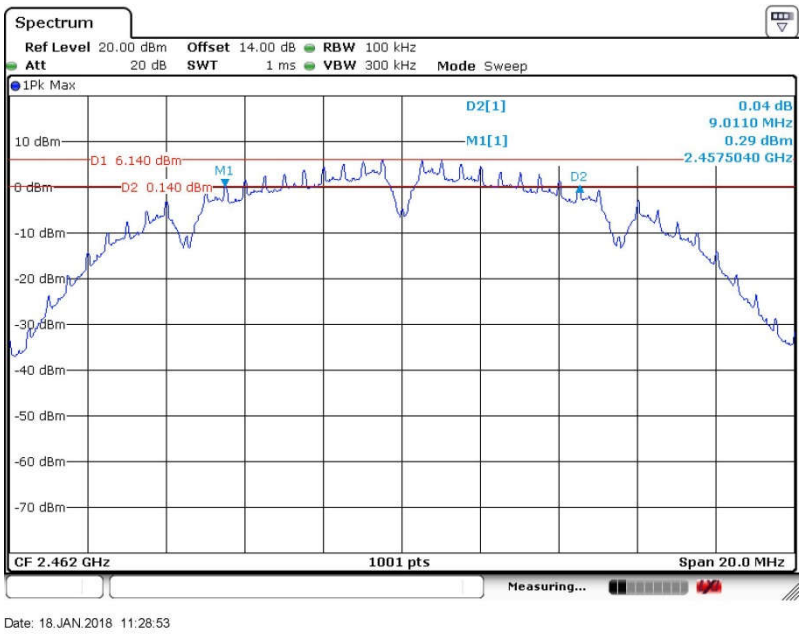
3.1.4 Test Setup



3.1.5 Test Result of 6dB 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.

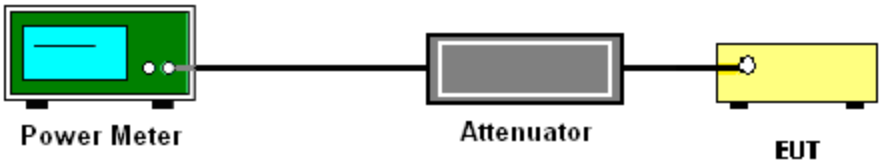
3.2.2 Measuring Instruments

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.

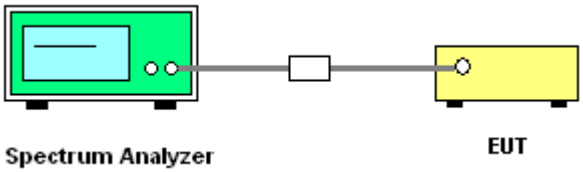
3.3.2 Measuring Instruments

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.

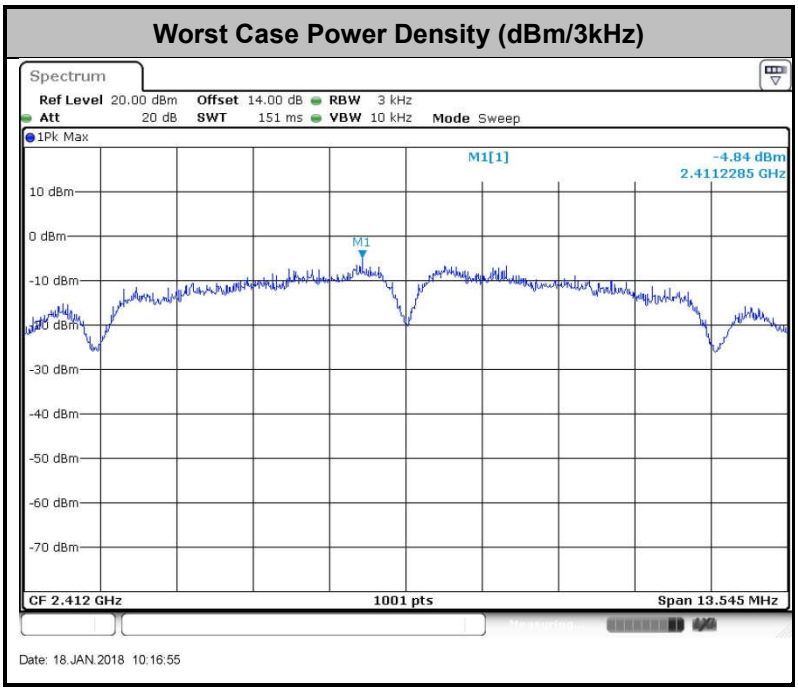
3.3.4 Test Setup



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.

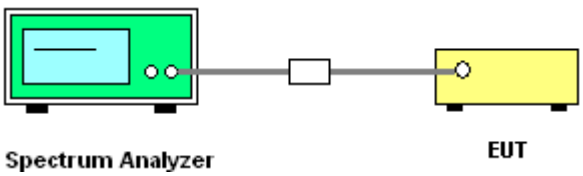
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

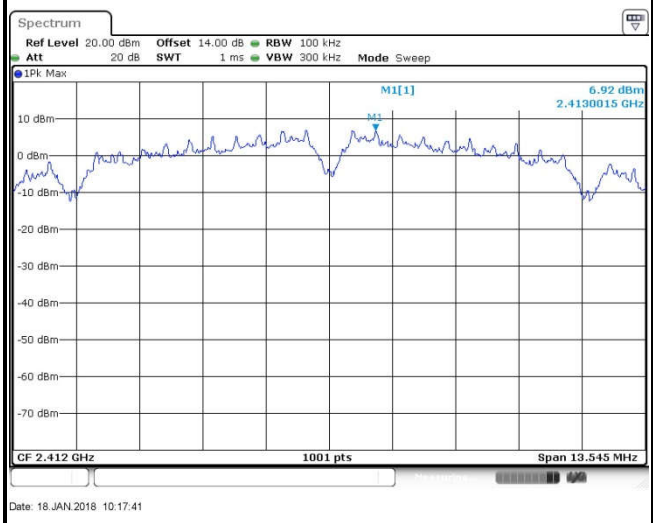
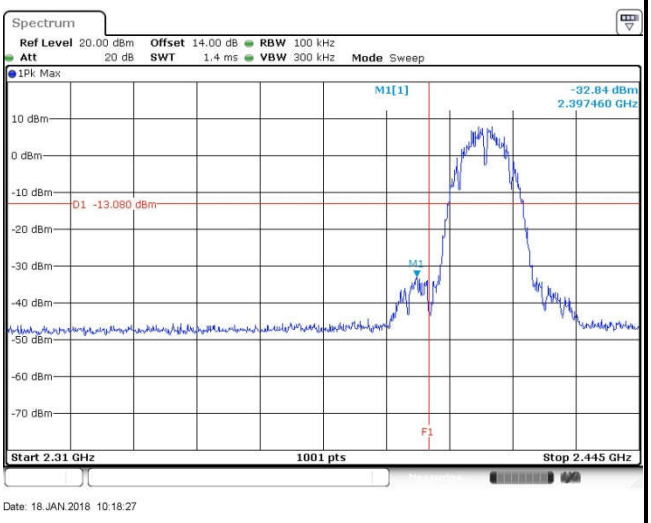
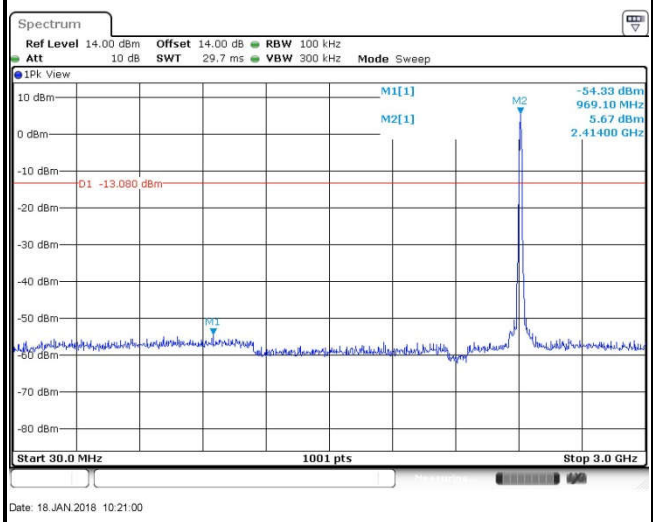
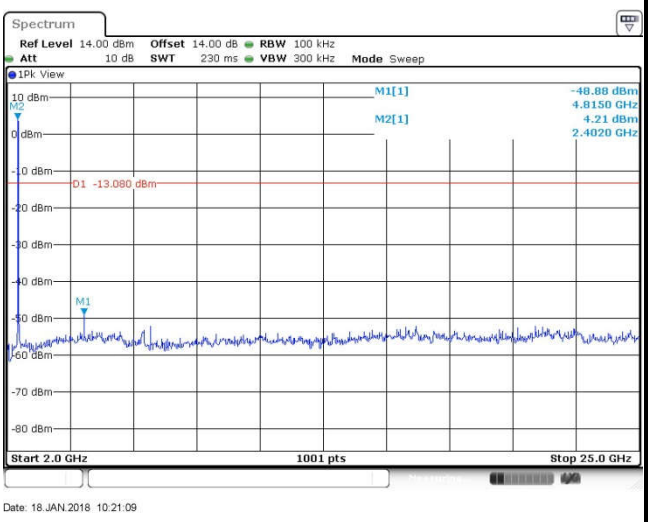
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit 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

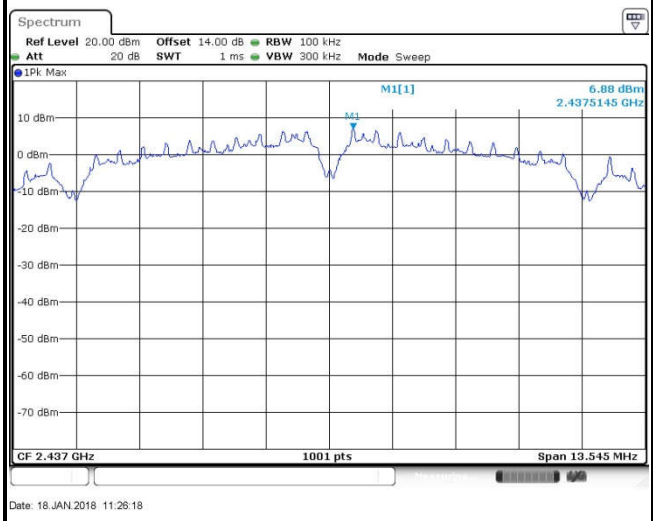
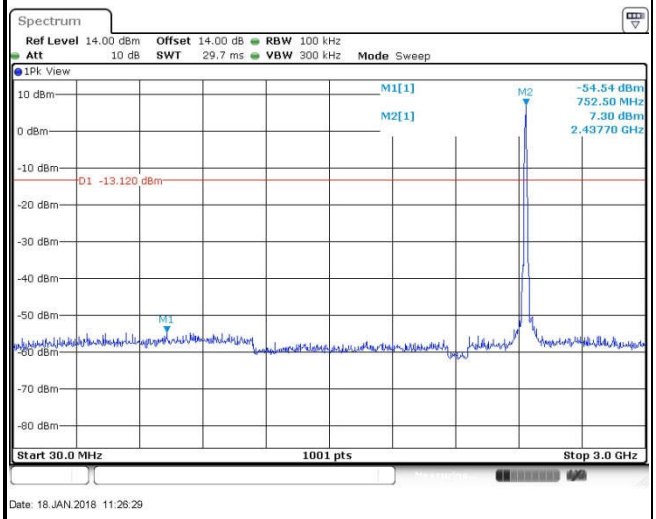
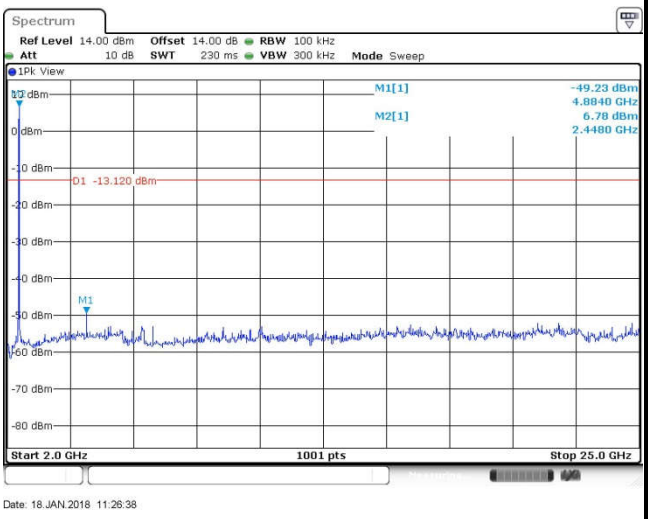


3.4.5 Test Result of Conducted Band Edges and Spurious Emission

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
	

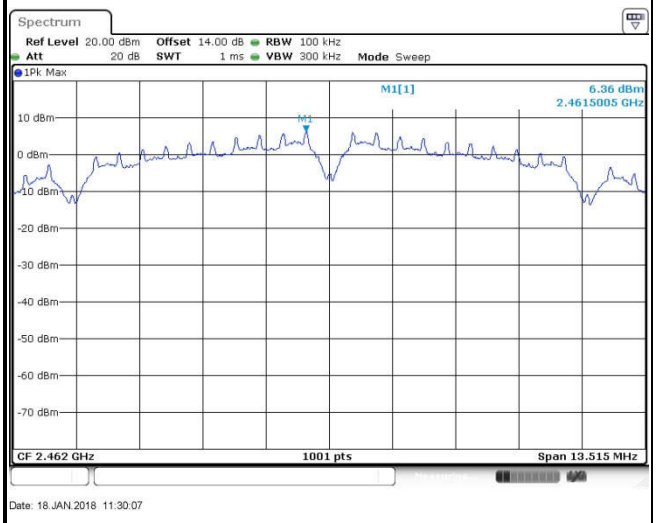
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Rain Wang

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

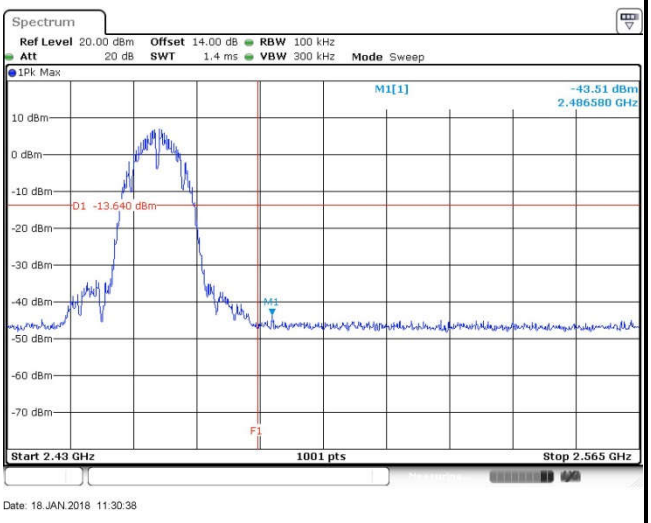
Test Mode :	802.11b	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Rain Wang

WLAN 802.11b Channel 11

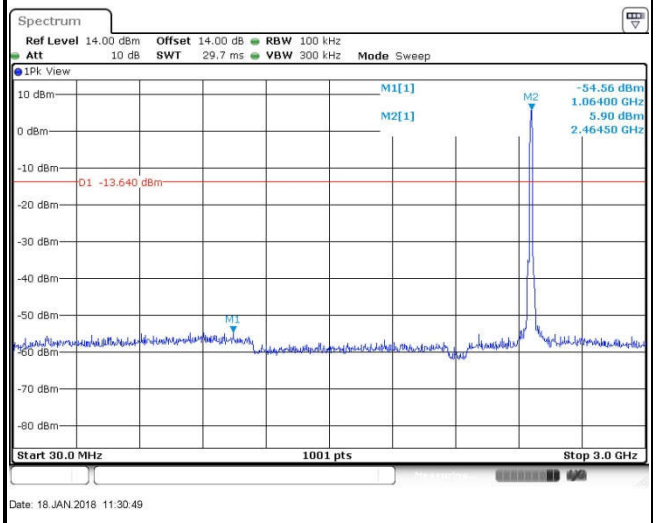
100kHz PSD reference Level



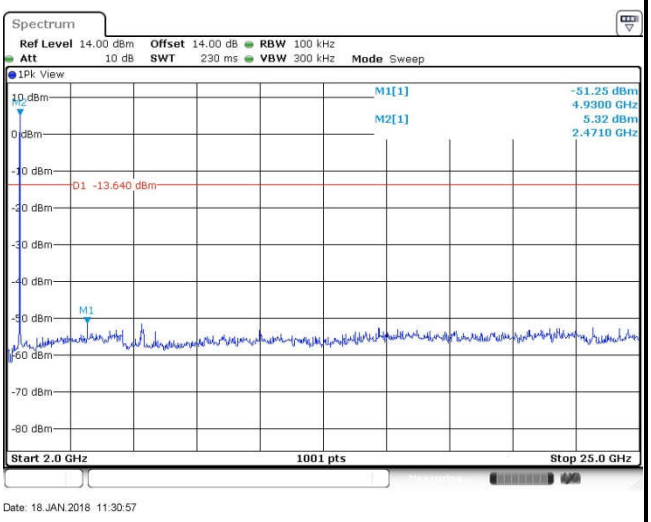
High Channel Plot



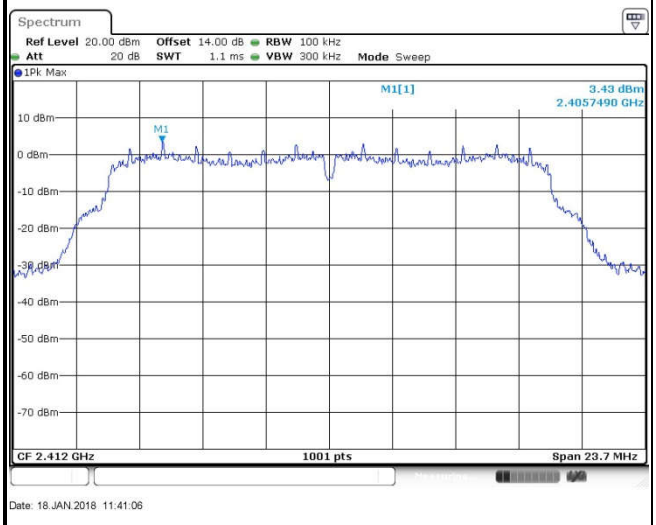
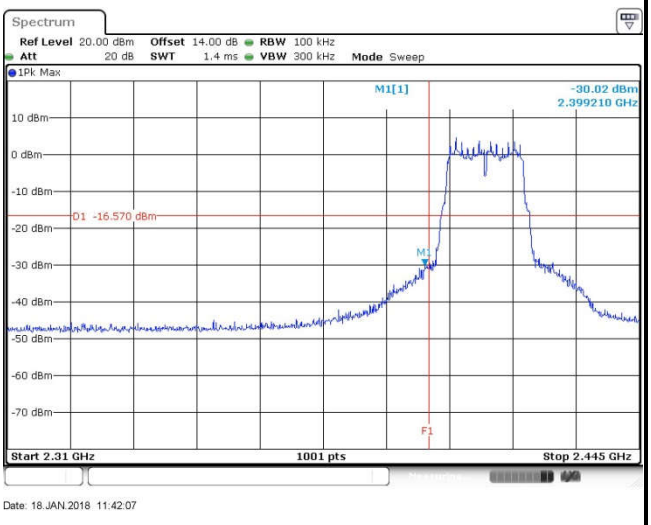
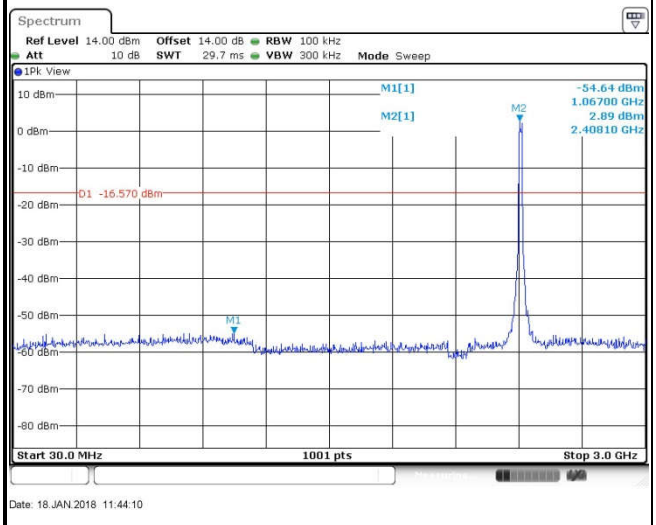
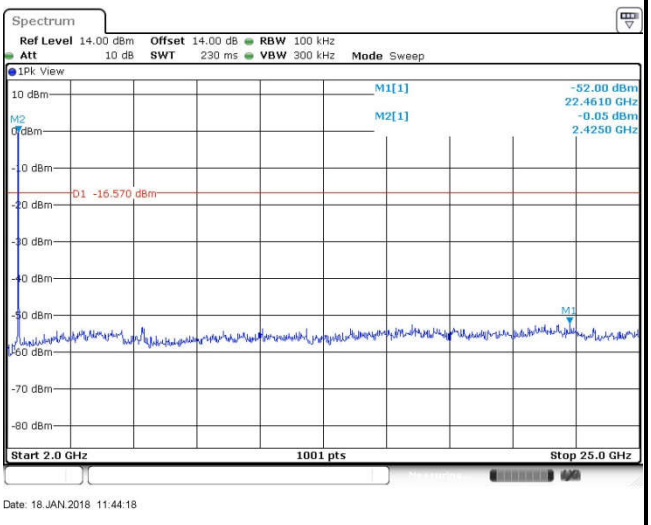
Spurious Emission 30MHz~3GHz



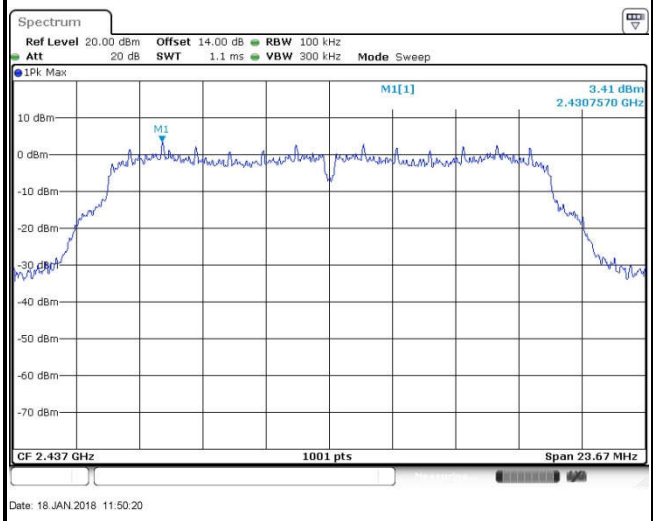
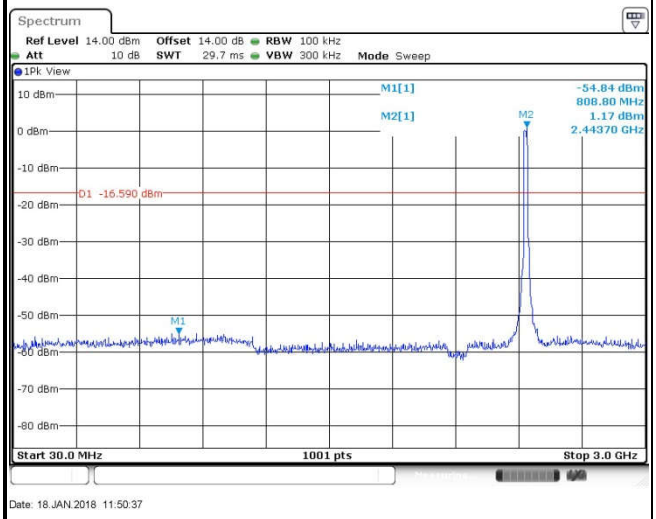
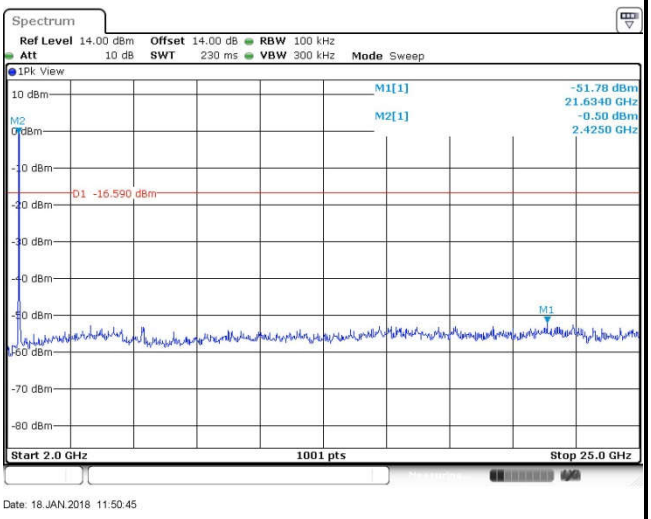
Spurious Emission 2GHz~25GHz



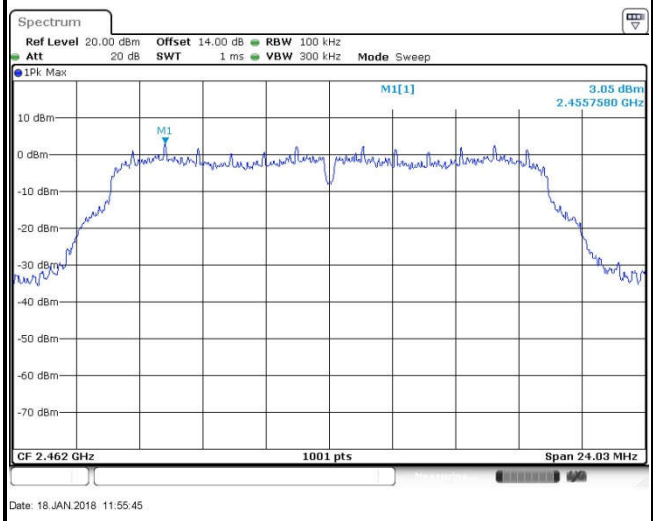
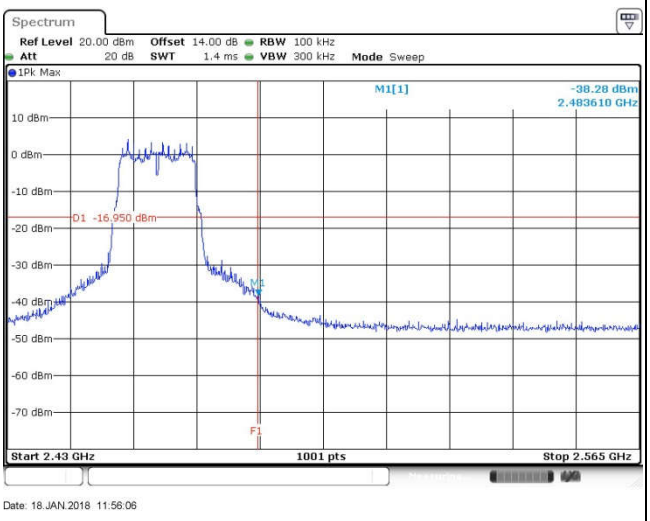
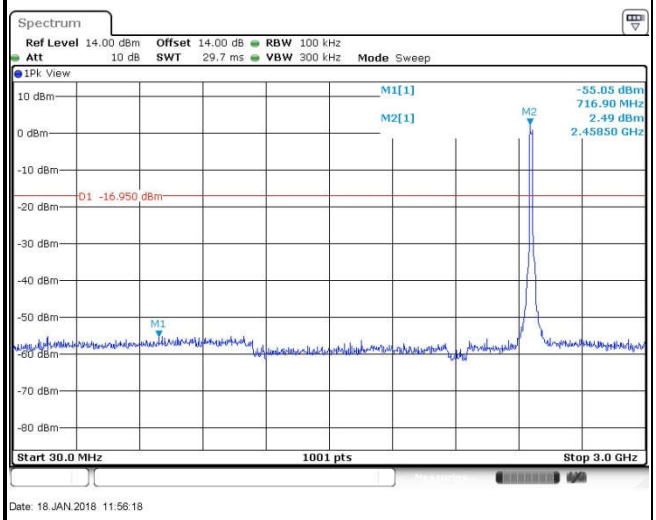
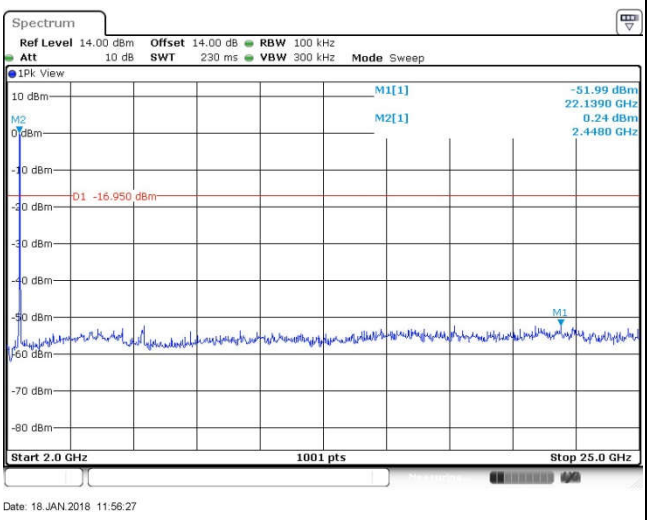
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Rain Wang

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

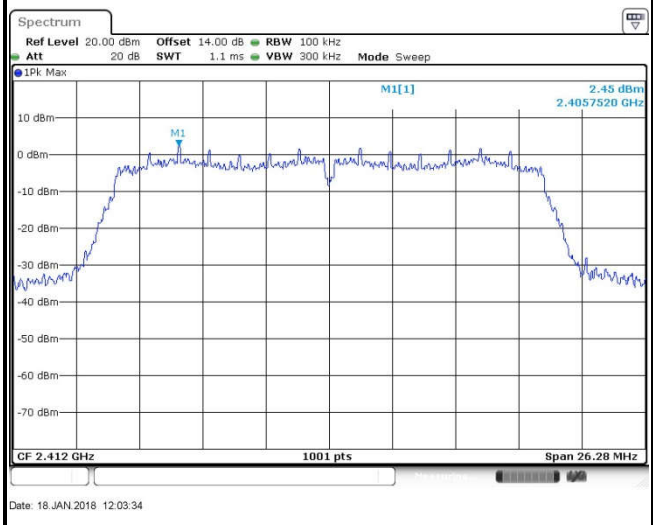
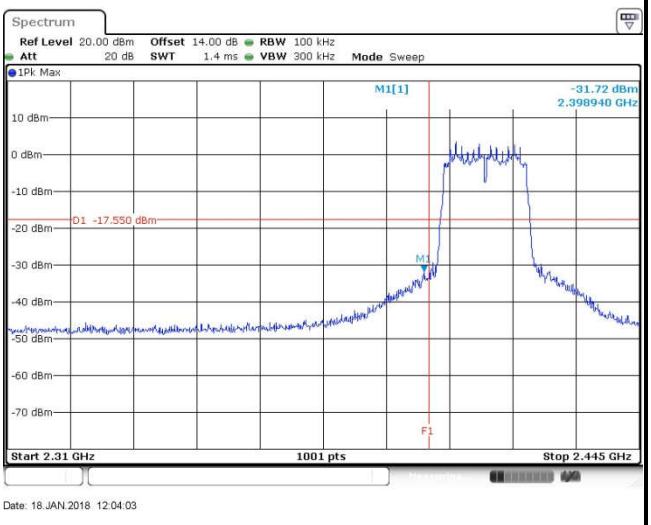
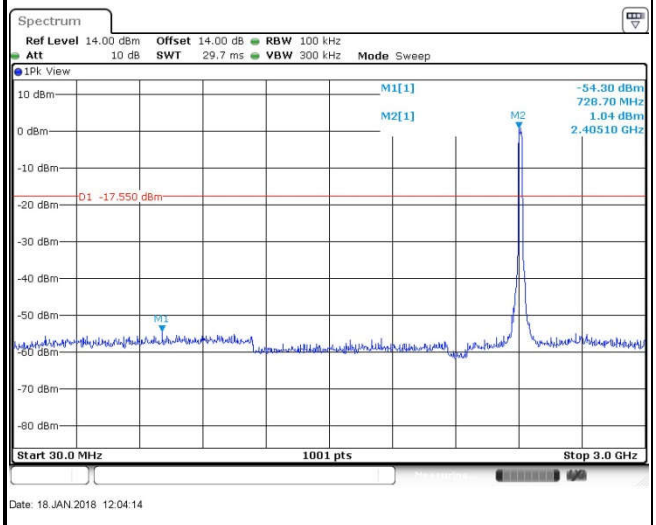
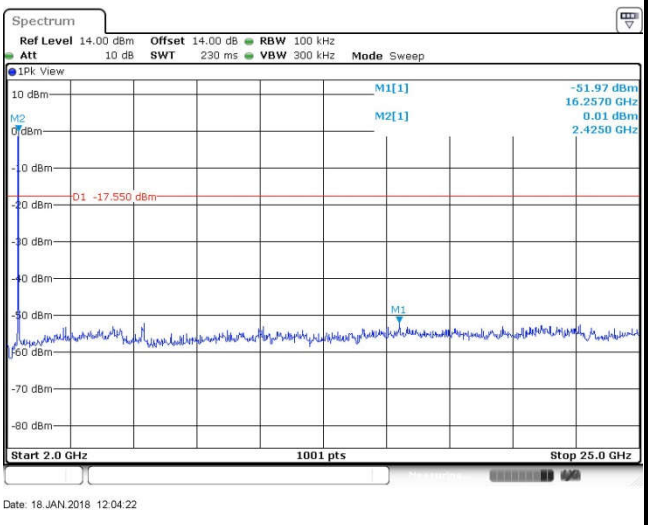
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz Mid	Relative Humidity :	50~53%
Test Channel :	06	Test Engineer :	Rain Wang

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

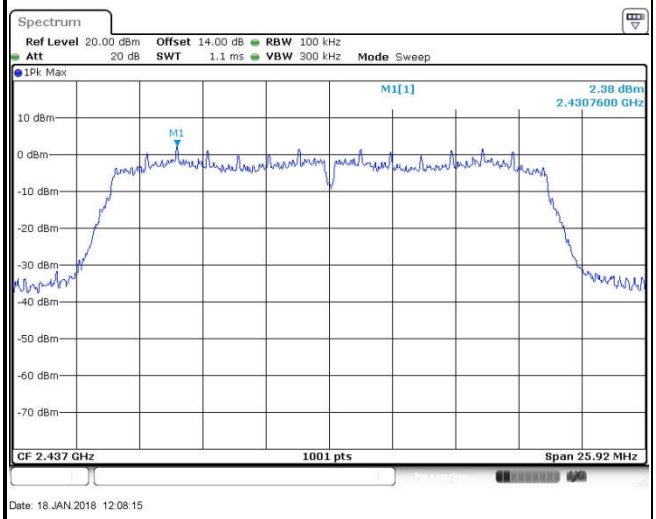
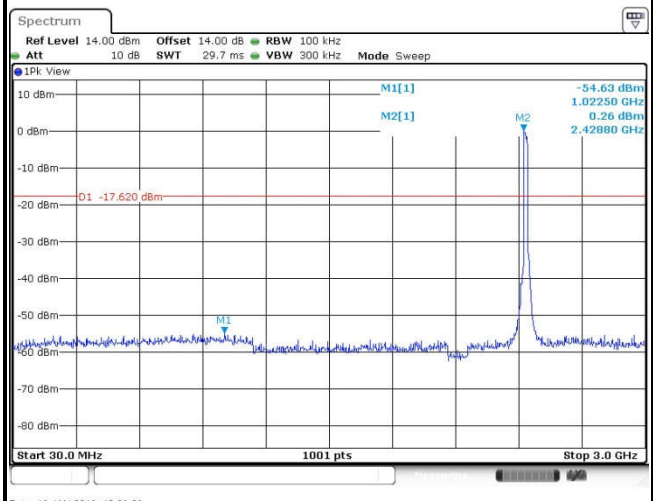
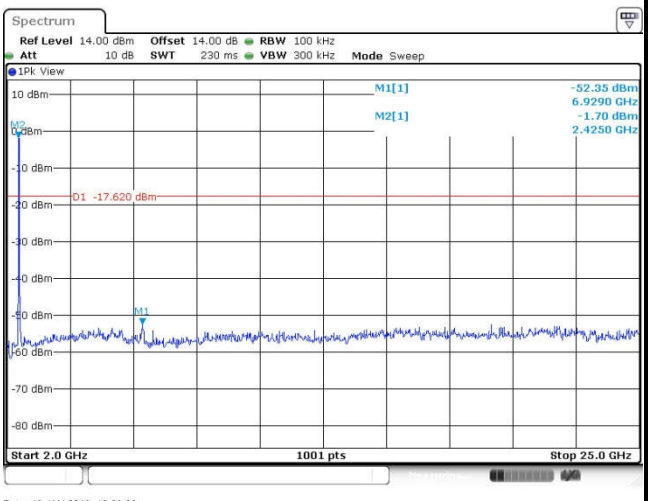
Test Mode :	802.11g	Temperature :	24~26℃
Test Band :	2.4GHz High	Relative Humidity :	50~53%
Test Channel :	11	Test Engineer :	Rain Wang

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

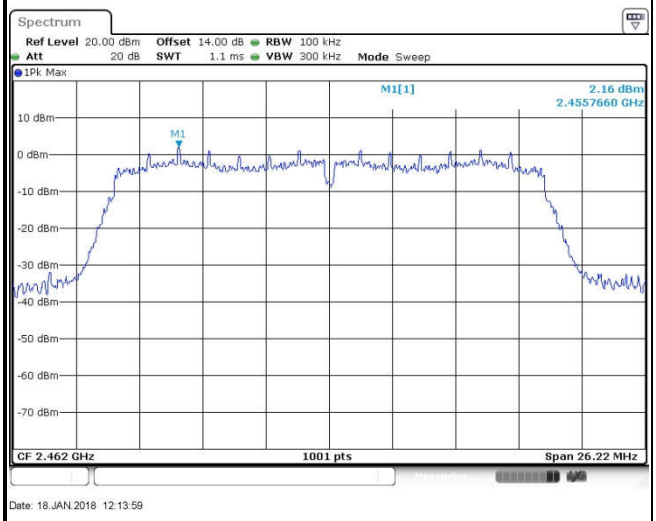
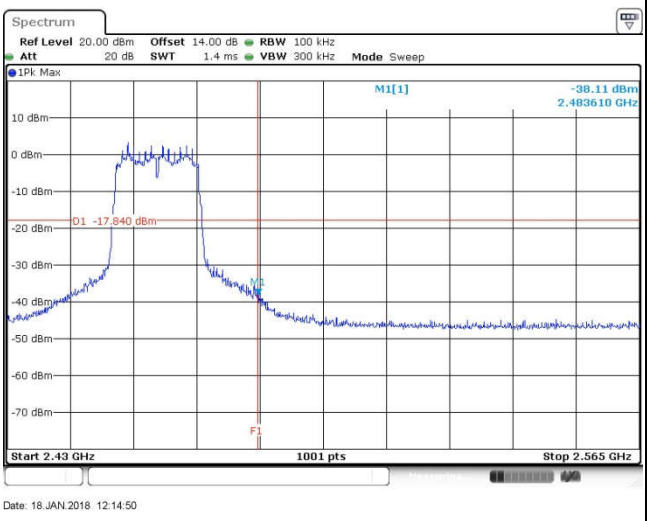
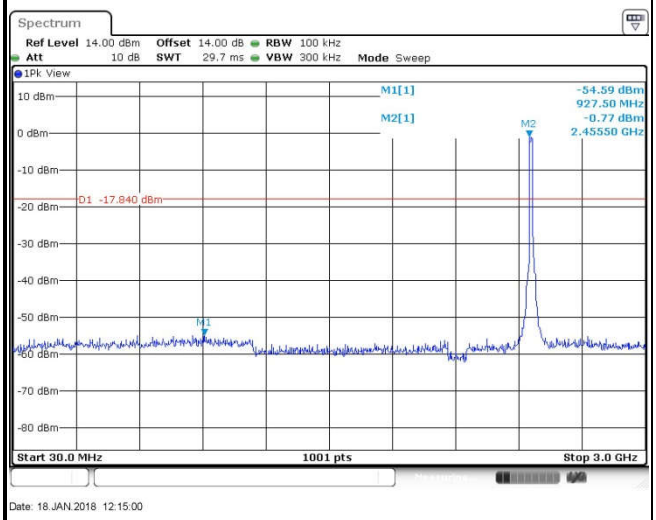
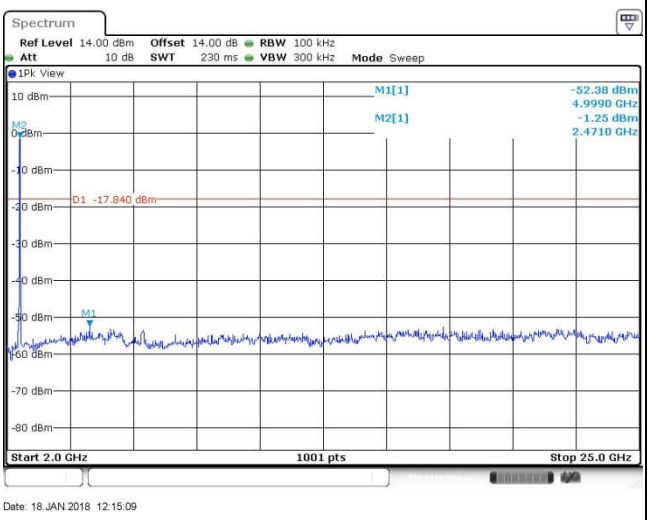
Test Mode :	802.11n HT20	Temperature :	24~26℃
Test Band :	2.4GHz Low	Relative Humidity :	50~53%
Test Channel :	01	Test Engineer :	Rain Wang

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 :	Rain Wang

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 :	Rain Wang

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

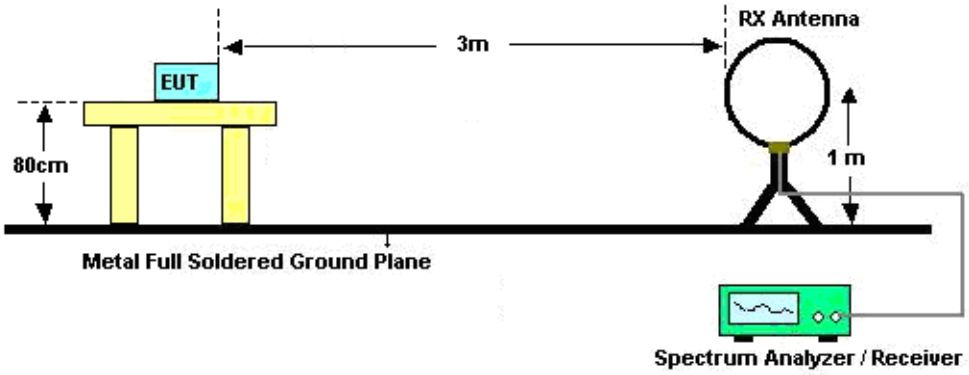
The measuring equipment is listed in the section 4 of this test report.

3.5.3 Test Procedures

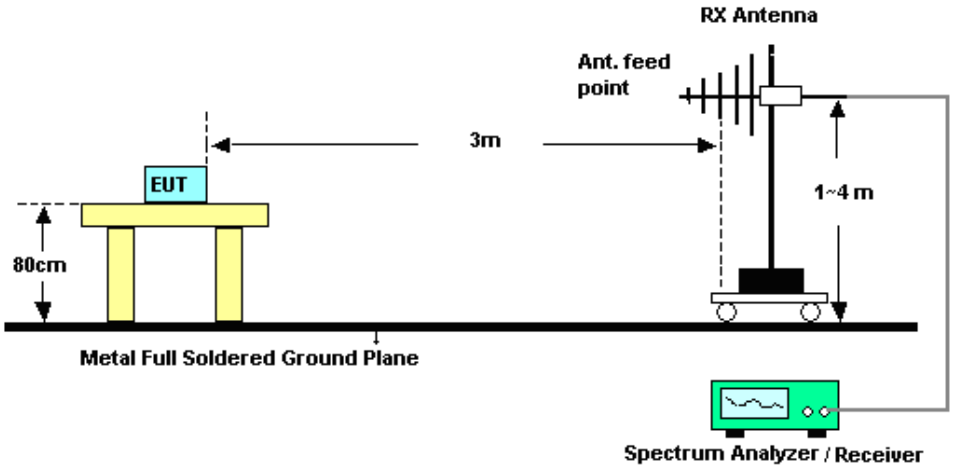
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test 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

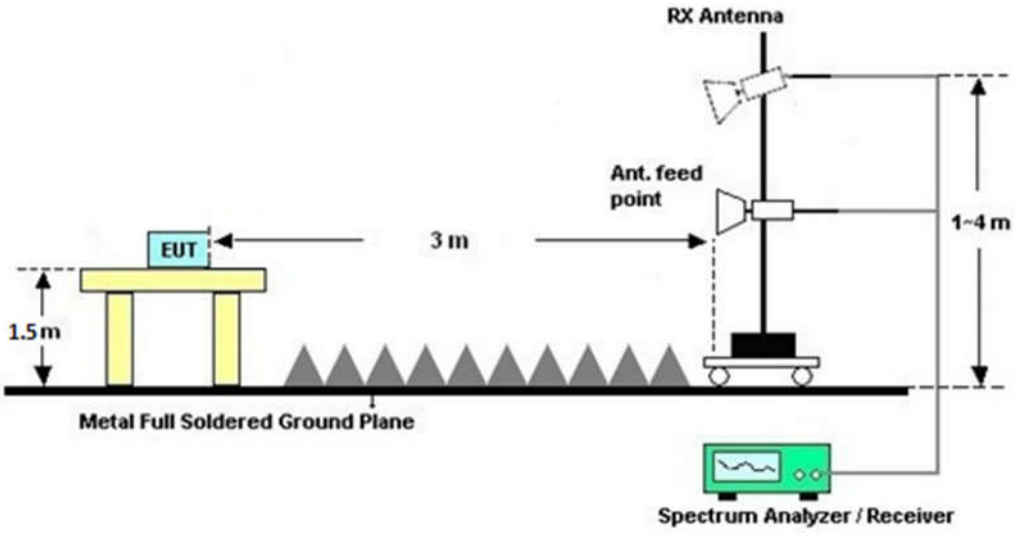
For radiated emissions below 30MHz



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.

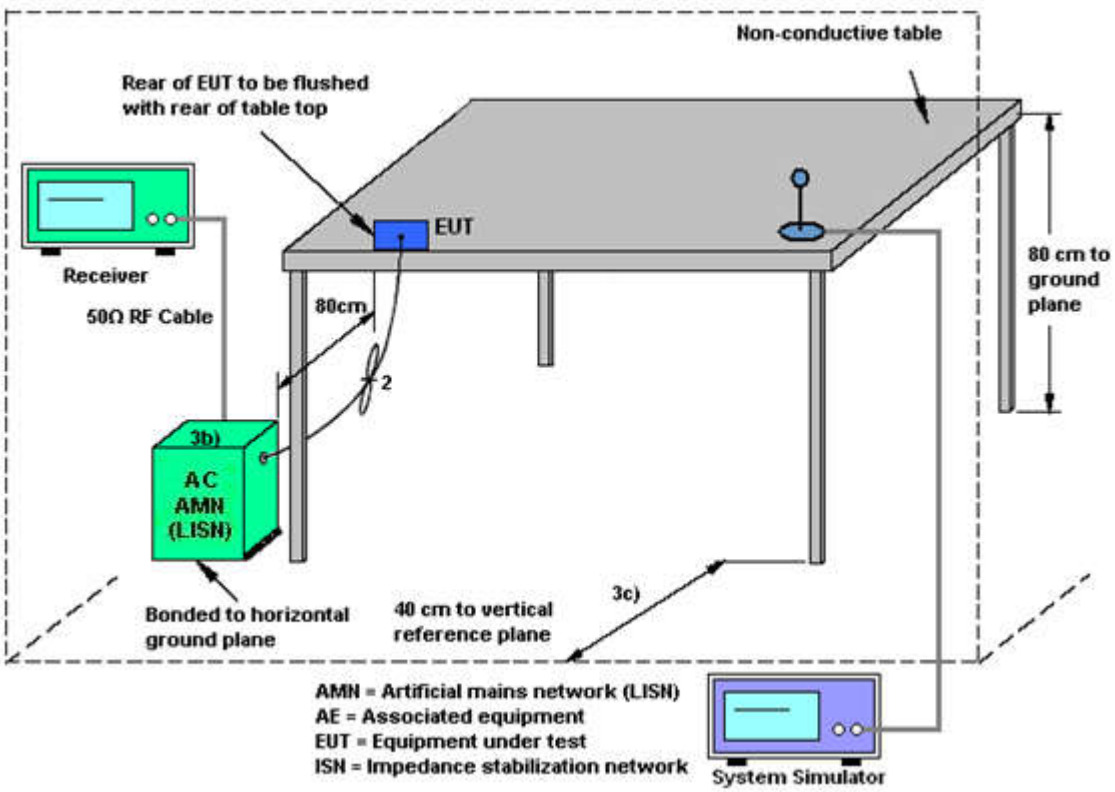
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

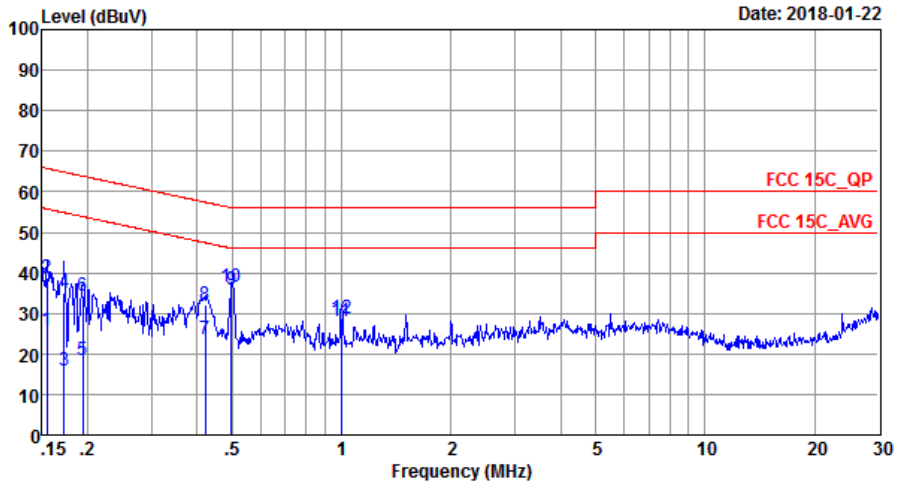
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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 2	**Temperature :**	24~25℃
Test Engineer :	Peng Wang	**Relative Humidity :**	50~55%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	RS232 Port load (1-1) + DC power output load (2) + Earphone load (3+4) + LAN Link (5) + RJ45 port RS232 connection Notebook load (6) + WLAN Tx (2.4G) + RJ45 port RS232 connection Notebook load (10) + USB Mini-B load for Notebook (11) + AC Adapter to MDB port (12) + temperature control port load (13) + USB Type-A load for U disk (14) + RS232 Port load (1-2)		

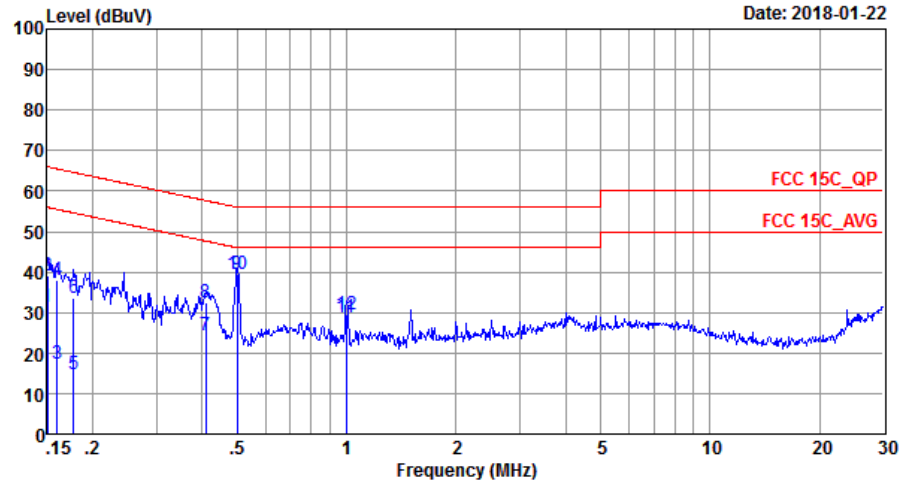



```
Site      : CO01-SZ
Condition: FCC 15C_QP LISN_20170907_L LINE

Mode      : Mode 2
Sample    : #5
```

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.15	25.79	-29.95	55.74	15.70	0.03	10.06	Average
2		0.15	38.69	-27.05	65.74	28.60	0.03	10.06	QP
3		0.17	15.70	-39.16	54.86	5.60	0.03	10.07	Average
4		0.17	34.99	-29.87	64.86	24.89	0.03	10.07	QP
5		0.19	18.40	-35.44	53.84	8.30	0.03	10.07	Average
6		0.19	34.30	-29.54	63.84	24.20	0.03	10.07	QP
7		0.42	23.71	-23.71	47.42	13.60	0.03	10.08	Average
8		0.42	32.01	-25.41	57.42	21.90	0.03	10.08	QP
9	*	0.50	35.80	-10.25	46.05	25.70	0.02	10.08	Average
10		0.50	36.40	-19.65	56.05	26.30	0.02	10.08	QP
11		1.00	27.96	-18.04	46.00	17.80	0.07	10.09	Average
12		1.00	28.76	-27.24	56.00	18.60	0.07	10.09	QP

Test Mode :	Mode 2	Temperature :	24~25℃
Test Engineer :	Peng Wang	Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	RS232 Port load (1-1) + DC power output load (2) + Earphone load (3+4) + LAN Link (5) + RJ45 port RS232 connection Notebook load (6) + WLAN Tx (2.4G) + RJ45 port RS232 connection Notebook load (10) + USB Mini-B load for Notebook (11) + AC Adapter to MDB port (12) + temperature control port load (13) + USB Type-A load for U disk (14) + RS232 Port load (1-2)		



Site : CO01-SZ
Condition: FCC 15C_QP LISN_20170907_N NEUTRAL

Mode : Mode 2
Sample : #5

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.15	31.19	-24.81	56.00	21.10	0.03	10.06	Average
2		0.15	38.99	-27.01	66.00	28.90	0.03	10.06	QP
3		0.16	17.49	-37.98	55.47	7.40	0.03	10.06	Average
4		0.16	38.09	-27.38	65.47	28.00	0.03	10.06	QP
5		0.18	14.70	-39.89	54.59	4.60	0.03	10.07	Average
6		0.18	33.69	-30.90	64.59	23.59	0.03	10.07	QP
7		0.41	24.30	-23.34	47.64	14.20	0.02	10.08	Average
8		0.41	32.40	-25.24	57.64	22.30	0.02	10.08	QP
9	*	0.50	39.40	-6.61	46.01	29.30	0.02	10.08	Average
10		0.50	39.50	-16.51	56.01	29.40	0.02	10.08	QP
11		1.00	28.74	-17.26	46.00	18.60	0.05	10.09	Average
12		1.00	29.44	-26.56	56.00	19.30	0.05	10.09	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. 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

The EUT is designed with SMA connector, connected with external Monopole antenna. And the EUT is professsionally installed in the Vending Machine.

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	FSV40	101078	9kHz~40GHz	Apr. 20, 2017	Jan. 18, 2018	Apr. 19, 2018	Conducted (TH01-SZ)
Pulse Power Senor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 26, 2017	Jan. 18, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 26, 2017	Jan. 18, 2018	Dec. 25, 2018	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Apr. 20, 2017	Jan. 23, 2018	Apr. 19, 2018	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 20, 2017	Jan. 23, 2018	Apr. 19, 2018	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 14, 2017	Jan. 23, 2018	May 13, 2018	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	May 16, 2017	Jan. 23, 2018	May 15, 2018	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1285	1GHz~18GHz	Dec. 13, 2017	Jan. 22, 2018	Dec. 12, 2018	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	May 17, 2017	Jan. 23, 2018	May 16, 2018	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct.19, 2017	Jan. 23, 2018	Oct 18, 2018	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1989346	1GHz~18GHz	Jul. 27, 2017	Jan. 23, 2018	Jul. 26, 2018	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1988315	18GHz~40GHz	Jul.27, 2017	Jan. 23, 2018	Jul.26, 2018	Radiation (03CH04-SZ
Amplifier	Agilent Technologies	83017A	MY53270156	500MHz~26.5GHz	Apr. 20, 2017	Jan. 23, 2018	Apr. 19, 2018	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Jan. 23, 2018	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jan. 23, 2018	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jan. 23, 2018	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 26, 2017	Jan. 22, 2018	Dec. 25, 2018	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Dec. 26, 2017	Jan. 22, 2018	Dec. 25, 2018	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	MessTec	3816/2SH	00103892	9kHz~30MHz	Nov. 01, 2017	Jan. 22, 2018	Oct. 31, 2018	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 19, 2017	Jan. 22, 2018	Jul. 18, 2018	Conduction (CO01-SZ)

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))	2.6dB

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 (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.8dB

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

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

Appendix A. Conducted Test Results

Report Number : FR811505C

A1 - DTS Part

Test Engineer:	Sam Zheng	Temperature:	24~26	°C
Test Date:	2018/1/18	Relative Humidity:	50~53	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
11b	1Mbps	1	1	2412	14.19	9.03	0.50	Pass
11b	1Mbps	1	6	2437	14.09	9.03	0.50	Pass
11b	1Mbps	1	11	2462	14.14	9.01	0.50	Pass
11g	6Mbps	1	1	2412	18.03	15.80	0.50	Pass
11g	6Mbps	1	6	2437	17.98	15.78	0.50	Pass
11g	6Mbps	1	11	2462	18.03	16.02	0.50	Pass
HT20	MCS0	1	1	2412	18.83	17.52	0.50	Pass
HT20	MCS0	1	6	2437	18.78	17.28	0.50	Pass
HT20	MCS0	1	11	2462	18.83	17.48	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	18.43	30.00	0.00	18.43	36.00	Pass
11b	1Mbps	1	6	2437	18.40	30.00	0.00	18.40	36.00	Pass
11b	1Mbps	1	11	2462	17.68	30.00	0.00	17.68	36.00	Pass
11g	6Mbps	1	1	2412	22.54	30.00	0.00	22.54	36.00	Pass
11g	6Mbps	1	6	2437	23.35	30.00	0.00	23.35	36.00	Pass
11g	6Mbps	1	11	2462	20.73	30.00	0.00	20.73	36.00	Pass
HT20	MCS0	1	1	2412	22.08	30.00	0.00	22.08	36.00	Pass
HT20	MCS0	1	6	2437	22.65	30.00	0.00	22.65	36.00	Pass
HT20	MCS0	1	11	2462	20.36	30.00	0.00	20.36	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	0.10	15.10
11b	1Mbps	1	6	2437	0.10	14.89
11b	1Mbps	1	11	2462	0.10	14.74
11g	6Mbps	1	1	2412	0.60	13.30
11g	6Mbps	1	6	2437	0.60	14.36
11g	6Mbps	1	11	2462	0.60	11.42
HT20	MCS0	1	1	2412	0.62	12.57
HT20	MCS0	1	6	2437	0.62	13.47
HT20	MCS0	1	11	2462	0.62	10.54

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	-4.84	0.00	8.00	Pass
11b	1Mbps	1	6	2437	-6.71	0.00	8.00	Pass
11b	1Mbps	1	11	2462	-6.34	0.00	8.00	Pass
11g	6Mbps	1	1	2412	-9.99	0.00	8.00	Pass
11g	6Mbps	1	6	2437	-9.85	0.00	8.00	Pass
11g	6Mbps	1	11	2462	-9.91	0.00	8.00	Pass
HT20	MCS0	1	1	2412	-10.76	0.00	8.00	Pass
HT20	MCS0	1	6	2437	-10.53	0.00	8.00	Pass
HT20	MCS0	1	11	2462	-11.23	0.00	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		2385.495	48.31	-25.69	74	44.64	27.37	4.78	28.48	240	60	P	H
		2381.295	35.38	-18.62	54	31.77	27.37	4.72	28.48	240	60	A	H
	*	2412	98.16	-	-	94.25	27.49	4.78	28.36	240	60	P	H
	*	2412	94.49	-	-	90.58	27.49	4.78	28.36	240	60	A	H
		2387.385	52.05	-21.95	74	48.32	27.43	4.78	28.48	252	39	P	V
		2381.61	40.84	-13.16	54	37.23	27.37	4.72	28.48	252	39	A	V
	*	2412	106.28	-	-	102.37	27.49	4.78	28.36	252	39	P	V
	*	2412	102.68	-	-	98.77	27.49	4.78	28.36	252	39	A	V
802.11b CH 06 2437MHz		2341.22	45.71	-28.29	74	42.4	27.24	4.66	28.59	194	60	P	H
		2387.98	33.39	-20.61	54	29.66	27.43	4.78	28.48	194	60	A	H
	*	2437	98.33	-	-	94.14	27.61	4.82	28.24	194	60	P	H
	*	2437	94.65	-	-	90.46	27.61	4.82	28.24	194	60	A	H
		2483.76	47.58	-26.42	74	43	27.74	4.85	28.01	194	60	P	H
		2484.74	34.88	-19.12	54	30.3	27.74	4.85	28.01	194	60	A	H
		2388.82	48.61	-25.39	74	44.88	27.43	4.78	28.48	227	36	P	V
		2387.7	37.21	-16.79	54	33.48	27.43	4.78	28.48	227	36	A	V
	*	2437	106.97	-	-	102.78	27.61	4.82	28.24	227	36	P	V
	*	2437	103.27	-	-	99.08	27.61	4.82	28.24	227	36	A	V
		2484.74	51.62	-22.38	74	47.04	27.74	4.85	28.01	227	36	P	V
		2484.6	38.73	-15.27	54	34.15	27.74	4.85	28.01	227	36	A	V

802.11b CH 11 2462MHz	*	2462	99.67	-	-	95.3	27.68	4.82	28.13	222	61	P	H
	*	2462	95.98	-	-	91.61	27.68	4.82	28.13	222	61	A	H
		2485.64	49.22	-24.78	74	44.64	27.74	4.85	28.01	222	61	P	H
		2489.92	36.56	-17.44	54	31.92	27.8	4.85	28.01	222	61	A	H
	*	2462	107.85	-	-	103.48	27.68	4.82	28.13	180	35	P	V
	*	2462	104.12	-	-	99.75	27.68	4.82	28.13	180	35	A	V
		2485.72	53.72	-20.28	74	49.14	27.74	4.85	28.01	180	35	P	V
		2485.72	41.76	-12.24	54	37.18	27.74	4.85	28.01	180	35	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	40.51	-33.49	74	61.66	31.49	5.55	58.19	152	260	P	H
		4824	41.16	-32.84	74	62.31	31.49	5.55	58.19	152	260	P	V
802.11b CH 06 2437MHz		4874	41.49	-32.51	74	62.33	31.61	5.65	58.1	152	260	P	H
		7311	45.29	-28.71	74	59.78	36.17	7.26	57.92	189	238	P	H
		4874	41.56	-32.44	74	62.4	31.61	5.65	58.1	152	260	P	V
		7311	44.91	-29.09	74	59.4	36.17	7.26	57.92	189	238	P	V
802.11b CH 11 2462MHz		4924	40.09	-33.91	74	60.52	31.73	5.86	58.02	152	260	P	H
		7386	45.33	-28.67	74	59.5	36.28	7.2	57.65	189	238	P	H
		4924	40.41	-33.59	74	60.84	31.73	5.86	58.02	152	260	P	V
		7386	45.77	-28.23	74	59.94	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		2382.765	55.92	-18.08	74	52.31	27.37	4.72	28.48	243	62	P	H
		2389.8	42.55	-11.45	54	38.7	27.43	4.78	28.36	243	62	A	H
	*	2412	99.62	-	-	95.71	27.49	4.78	28.36	243	62	P	H
	*	2412	89.93	-	-	86.02	27.49	4.78	28.36	243	62	A	H
		2382.45	63.92	-10.08	74	60.31	27.37	4.72	28.48	160	36	P	V
		2389.59	50.9	-3.1	54	47.17	27.43	4.78	28.48	160	36	A	V
	*	2412	107.89	-	-	103.98	27.49	4.78	28.36	160	36	P	V
	*	2412	98.64	-	-	94.73	27.49	4.78	28.36	160	36	A	V
802.11g CH 06 2437MHz		2384.9	51.21	-22.79	74	47.54	27.37	4.78	28.48	256	64	P	H
		2389.24	35.47	-18.53	54	31.74	27.43	4.78	28.48	256	64	A	H
	*	2437	100.95	-	-	96.76	27.61	4.82	28.24	256	64	P	H
	*	2437	91.08	-	-	86.89	27.61	4.82	28.24	256	64	A	H
		2484.25	50.92	-23.08	74	46.34	27.74	4.85	28.01	256	64	P	H
		2484.32	37.19	-16.81	54	32.61	27.74	4.85	28.01	256	64	A	H
		2387.42	57.6	-16.4	74	53.87	27.43	4.78	28.48	160	33	P	V
		2389.94	40.84	-13.16	54	36.99	27.43	4.78	28.36	160	33	A	V
	*	2437	108.29	-	-	104.1	27.61	4.82	28.24	160	33	P	V
	*	2437	98.94	-	-	94.75	27.61	4.82	28.24	160	33	A	V
		2493.84	60.25	-13.75	74	55.5	27.8	4.85	27.9	160	33	P	V
		2484.88	41.34	-12.66	54	36.76	27.74	4.85	28.01	160	33	A	V

802.11g CH 11 2462MHz	*	2462	98.34	-	-	93.97	27.68	4.82	28.13	251	62	P	H
	*	2462	88.58	-	-	84.21	27.68	4.82	28.13	251	62	A	H
		2483.64	59.13	-14.87	74	54.55	27.74	4.85	28.01	251	62	P	H
		2483.56	44.09	-9.91	54	39.51	27.74	4.85	28.01	251	62	A	H
	*	2462	106.22	-	-	101.85	27.68	4.82	28.13	171	38	P	V
	*	2462	97.09	-	-	92.72	27.68	4.82	28.13	171	38	A	V
		2483.84	66.74	-7.26	74	62.16	27.74	4.85	28.01	171	38	P	V
		2483.56	50.72	-3.28	54	46.14	27.74	4.85	28.01	171	38	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	40.37	-33.63	74	61.52	31.49	5.55	58.19	152	260	P	H
		4824	40.72	-33.28	74	61.87	31.49	5.55	58.19	152	260	P	V
802.11g CH 06 2437MHz		4874	39.65	-34.35	74	60.49	31.61	5.65	58.1	152	260	P	H
		7311	44.32	-29.68	74	58.81	36.17	7.26	57.92	189	238	P	H
		4874	39.97	-34.03	74	60.81	31.61	5.65	58.1	152	260	P	V
		7311	45.04	-28.96	74	59.53	36.17	7.26	57.92	189	238	P	V
802.11g CH 11 2462MHz		4924	38.7	-35.3	74	59.13	31.73	5.86	58.02	152	260	P	H
		7386	44.85	-29.15	74	59.02	36.28	7.2	57.65	189	238	P	H
		4924	38.8	-35.2	74	59.23	31.73	5.86	58.02	152	260	P	V
		7386	45.76	-28.24	74	59.93	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)
		2389.59	57.57	-16.43	74	53.84	27.43	4.78	28.48	239	61	P	H
		2389.8	42.71	-11.29	54	38.86	27.43	4.78	28.36	239	61	A	H
802.11n	*	2412	98.01	-	-	94.1	27.49	4.78	28.36	239	61	P	H
HT20	*	2412	88.64	-	-	84.73	27.49	4.78	28.36	239	61	A	H
CH 01		2388.225	65.3	-8.7	74	61.57	27.43	4.78	28.48	193	37	P	V
2412MHz		2389.8	50.73	-3.27	54	46.88	27.43	4.78	28.36	193	37	A	V
	*	2412	106.45	-	-	102.54	27.49	4.78	28.36	193	37	P	V
	*	2412	96.89	-	-	92.98	27.49	4.78	28.36	193	37	A	V
		2384.34	50.89	-23.11	74	47.28	27.37	4.72	28.48	255	60	P	H
		2389.38	35.43	-18.57	54	31.7	27.43	4.78	28.48	255	60	A	H
	*	2437	99.08	-	-	94.89	27.61	4.82	28.24	255	60	P	H
	*	2437	89.39	-	-	85.2	27.61	4.82	28.24	255	60	A	H
802.11n		2489.43	52.37	-21.63	74	47.73	27.8	4.85	28.01	255	60	P	H
HT20		2483.83	36.75	-17.25	54	32.17	27.74	4.85	28.01	255	60	A	H
CH 06		2382.1	60.54	-13.46	74	56.93	27.37	4.72	28.48	153	35	P	V
2437MHz		2389.94	40.51	-13.49	54	36.66	27.43	4.78	28.36	153	35	A	V
	*	2437	106.76	-	-	102.57	27.61	4.82	28.24	153	35	P	V
	*	2437	97.63	-	-	93.44	27.61	4.82	28.24	153	35	A	V
		2488.38	62.1	-11.9	74	57.46	27.8	4.85	28.01	153	35	P	V
		2483.5	41.2	-12.8	54	36.62	27.74	4.85	28.01	153	35	A	V

802.11n HT20 CH 11 2462MHz	*	2462	97.01	-	-	92.64	27.68	4.82	28.13	252	64	P	H
	*	2462	87.42	-	-	83.05	27.68	4.82	28.13	252	64	A	H
		2485	59.73	-14.27	74	55.15	27.74	4.85	28.01	252	64	P	H
		2483.56	44.01	-9.99	54	39.43	27.74	4.85	28.01	252	64	A	H
	*	2462	104.96	-	-	100.59	27.68	4.82	28.13	182	36	P	V
	*	2462	95.25	-	-	90.88	27.68	4.82	28.13	182	36	A	V
		2486	67.12	-6.88	74	62.54	27.74	4.85	28.01	182	36	P	V
		2483.52	50.75	-3.25	54	46.17	27.74	4.85	28.01	182	36	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	40.49	-33.51	74	61.64	31.49	5.55	58.19	152	260	P	H
		4824	40.11	-33.89	74	61.26	31.49	5.55	58.19	152	260	P	V
802.11n HT20 CH 06 2437MHz		4874	38.73	-35.27	74	59.57	31.61	5.65	58.1	152	260	P	H
		7311	44.45	-29.55	74	58.94	36.17	7.26	57.92	189	238	P	H
		4874	40.87	-33.13	74	61.71	31.61	5.65	58.1	152	260	P	V
		7311	45.86	-28.14	74	60.35	36.17	7.26	57.92	189	238	P	V
802.11n HT20 CH 11 2462MHz		4924	38.38	-35.62	74	58.81	31.73	5.86	58.02	152	260	P	H
		7386	44.37	-29.63	74	58.54	36.28	7.2	57.65	189	238	P	H
		4924	38.26	-35.74	74	58.69	31.73	5.86	58.02	152	260	P	V
		7386	44.74	-29.26	74	58.91	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.												

Emission below 1GHz

2.4GHz WIFI 802.11g (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 802.11g LF		30	24.63	-15.37	40	31.45	24.9	0.25	31.97	-	-	P	H
		106.63	20.28	-23.22	43.5	34.19	16.7	1.09	31.7	-	-	P	H
		310.33	22.98	-23.02	46	32.63	19.67	1.9	31.22	-	-	P	H
		387.93	24.64	-21.36	46	32.07	21.61	2.15	31.19	-	-	P	H
		481.05	25.15	-20.85	46	30.42	23.6	2.38	31.25	-	-	P	H
		947.62	32.04	-13.96	46	30.03	29.87	3.47	31.33	100	210	P	H
		30.97	22.95	-17.05	40	30.22	24.43	0.27	31.97	-	-	P	V
		108.57	18.39	-25.11	43.5	32.19	16.81	1.09	31.7	-	-	P	V
		149.31	18.51	-24.99	43.5	31.77	17.03	1.26	31.55	-	-	P	V
		283.17	21.32	-24.68	46	31.69	19.06	1.8	31.23	-	-	P	V
		685.72	27.79	-18.21	46	29.57	26.57	2.9	31.25	-	-	P	V
		880.69	29.64	-16.36	46	28.33	29.14	3.34	31.17	100	321	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

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)

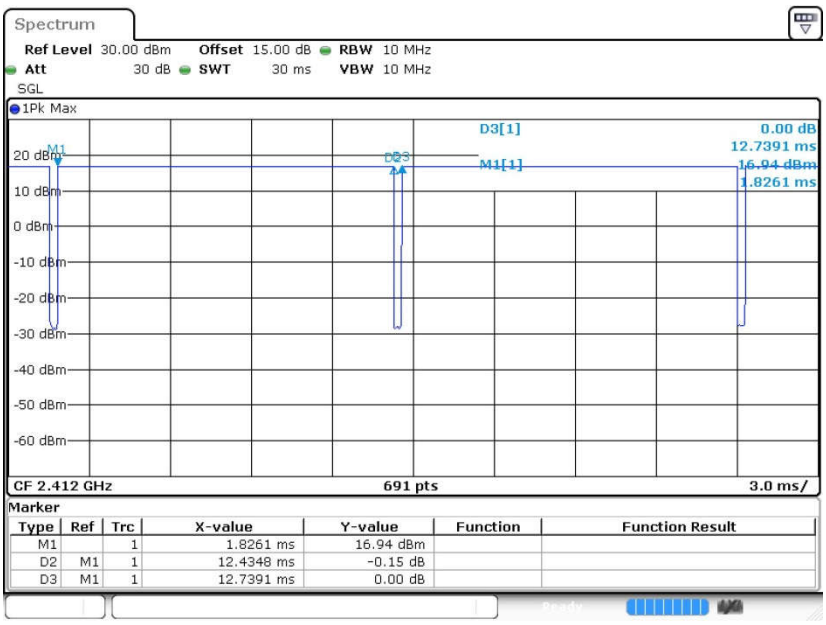
= -10.46(dB)

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

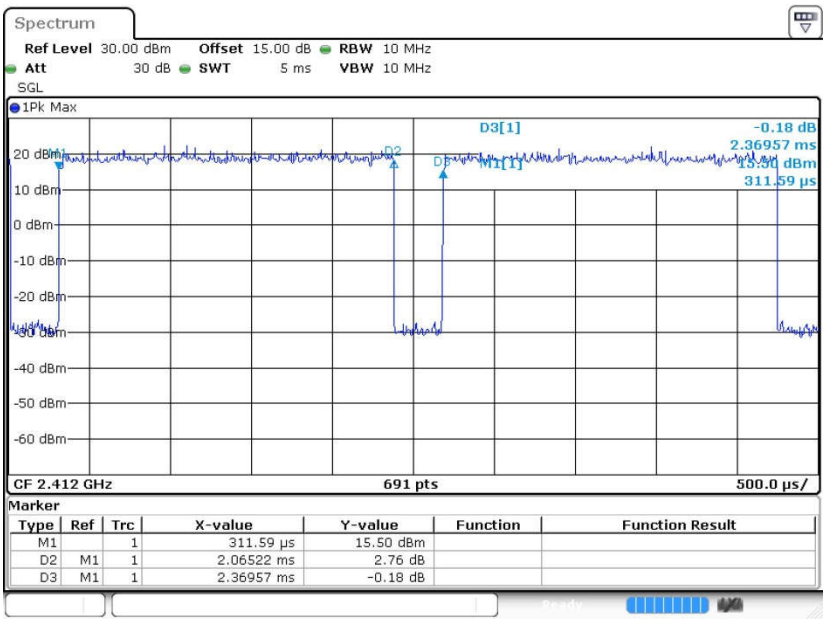
Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	97.61	12.435	0.080	100Hz
802.11g	87.16	2.065	0.484	1kHz
802.11n HT20	86.60	1.920	0.521	1kHz

802.11b



802.11g



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