



FCC RF Test Report

APPLICANT : PAX Technology Limited
EQUIPMENT : Smart Tablet
BRAND NAME : PAX
MODEL NAME : Aries8
FCC ID : V5PAR8
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

The product was installed a WLAN module during the test (Brand Name: MeiG Smart Technology Co., Ltd, Model Name: SLM757A, FCC ID: 2APJ4-SLM757A)

The product was received on Dec. 06, 2018 and testing was completed on Feb. 18, 2019. 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.

Approved by: Eric Shih / Manager



Sporton International (Shenzhen) Inc.

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Guangdong Province 518055 China**



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR8D0615C	Rev. 01	Initial issue of report	Apr. 09, 2019

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
-	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	1
-	-	99% Bandwidth	-	Pass	1
3.1	15.247(b)	Power Output Measurement	$\leq 30\text{dBm}$	Pass	-
-	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	1
-	15.247(d)	Conducted Band Edges	$\leq 20\text{dBc}$	Pass	1
		Conducted Spurious Emission		Pass	1
3.2	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 5.70 dB at 2483.640 MHz
3.3	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 7.30 dB at 0.610 MHz
3.4	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-
Remark 1: Test items are performed on module RF report which can be referred to Sporton report number FR891203C					

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	Smart Tablet
Brand Name	PAX
Model Name	Aries8
FCC ID	V5PAR8
EUT supports Radios application	WCDMA/HSPA/DC-HSDPA/HSPA+(16QAM uplink is not supported)/LTE WLAN 2.4GHz 802.11b/g/n HT20/ HT40 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth BR / EDR / LE NFC/GNSS
IMEI Code	Conduction: 868621028940611/868621028939233 Radiation: 868621028940975/868621028940983 Conducted: 868621028942211/868621028932238
HW Version	N/A
SW Version	N/A
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 : 17.92 dBm (0.0619 W) 802.11g : 20.81 dBm (0.1205 W) 802.11n HT20 : 20.06 dBm (0.1014 W) 802.11n HT40 : 19.13 dBm (0.0818 W)
Antenna Type / Gain	FPC Antenna with gain 1.5 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).

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 designation No.	FCC Test Firm Registration No.
	CO01-SZ TH01-SZ	CN5018	337463

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 designation No.	FCC Test Firm Registration No.
	03CH03-SZ	CN5019	577730



1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 15 Subpart C §15.247
- ♦ FCC KDB 558074 D01 15.247 Meas Guidance v05r01
- ♦ 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

- a. 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: conduction emission (150 kHz to 30 MHz), radiation 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.
- b. AC power line Conducted Emission was tested under maximum output power.

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		

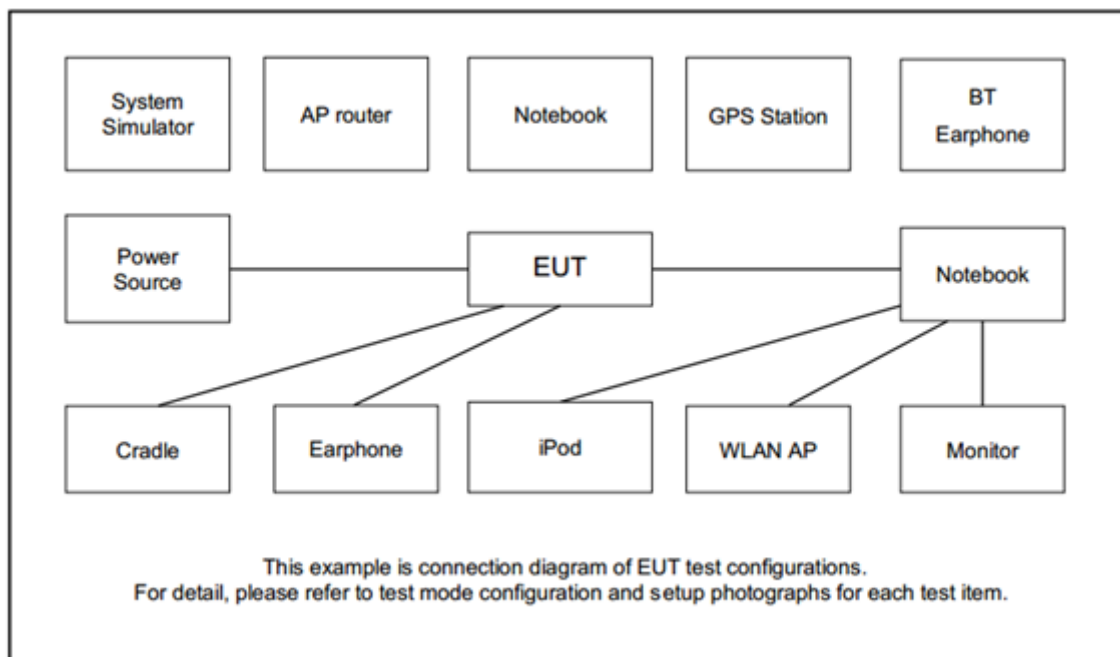
2.2 Test Mode

Final test modes 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
802.11n HT40	MCS0

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

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
2.	WLAN AP	D-Link	DIR-820L	KA2IR820LA1	N/A	Unshielded, 1.8m
3.	Notebook	Lenovo	E540	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Samsung	EO-MG900	N/A	N/A	N/A
5.	Earphone	Apple	MC690ZP/A	N/A	Shielded, 1.0m	N/A

3 Test Result

3.1 Output Power Measurement

3.1.1 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 with directional gain greater than 6dBi is 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.

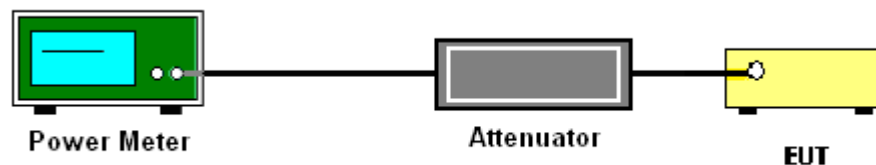
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 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.

3.1.4 Test Setup





3.1.5 Test Result of Peak Output Power

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	17.78	30.00	1.50	19.28	36.00	Pass
11b	1Mbps	1	6	2437	17.92	30.00	1.50	19.42	36.00	Pass
11b	1Mbps	1	11	2462	17.81	30.00	1.50	19.31	36.00	Pass
11g	6Mbps	1	1	2412	20.08	30.00	1.50	21.58	36.00	Pass
11g	6Mbps	1	6	2437	20.81	30.00	1.50	22.31	36.00	Pass
11g	6Mbps	1	11	2462	20.31	30.00	1.50	21.81	36.00	Pass
HT20	MCS0	1	1	2412	19.47	30.00	1.50	20.97	36.00	Pass
HT20	MCS0	1	6	2437	20.06	30.00	1.50	21.56	36.00	Pass
HT20	MCS0	1	11	2462	19.74	30.00	1.50	21.24	36.00	Pass
HT40	MCS0	1	3	2422	18.92	30.00	1.50	20.42	36.00	Pass
HT40	MCS0	1	6	2437	18.85	30.00	1.50	20.35	36.00	Pass
HT40	MCS0	1	9	2452	19.13	30.00	1.50	20.63	36.00	Pass



3.2 Radiated Band Edges and Spurious Emission Measurement

3.2.1 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

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

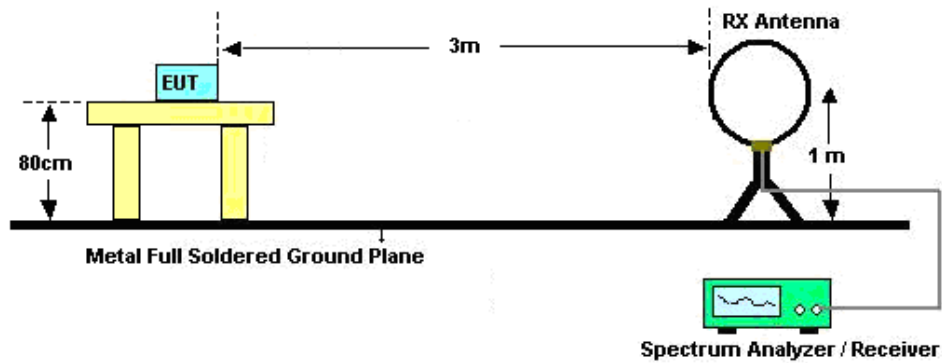
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better 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 testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

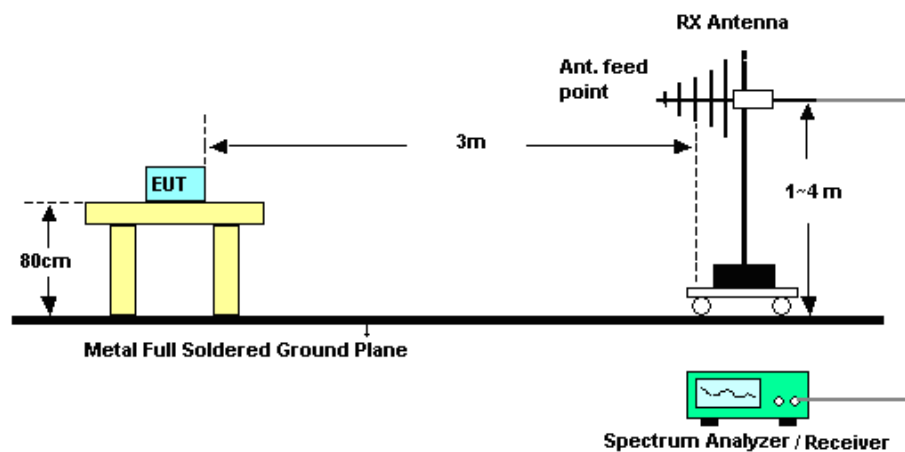
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.2.4 Test Setup

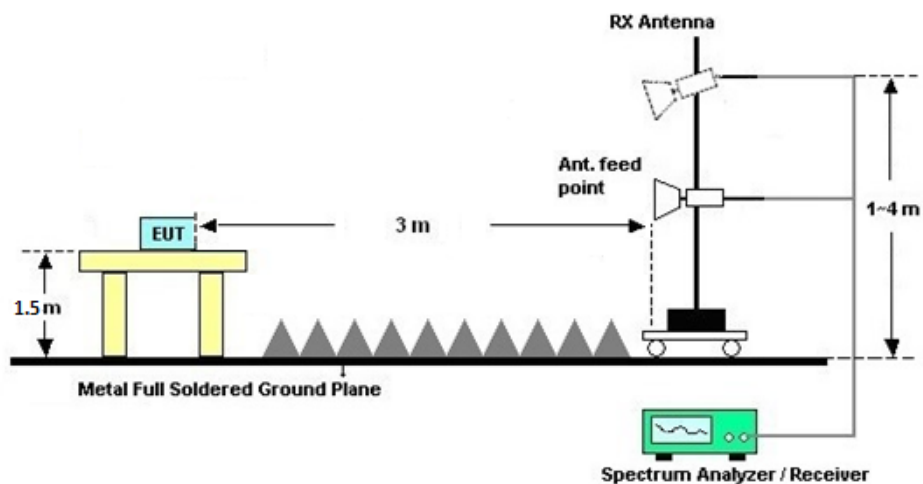
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





3.2.5 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.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.2.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix B.

3.3 AC Conducted Emission Measurement

3.3.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

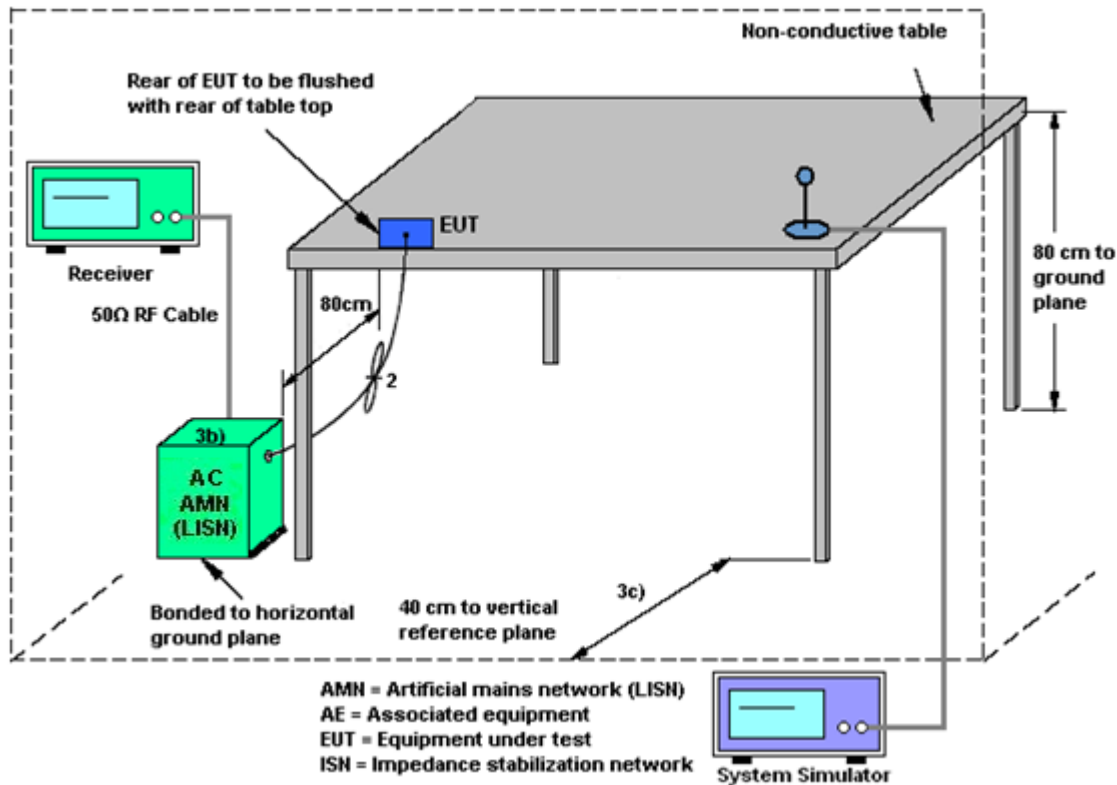
3.3.2 Measuring Instruments

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

3.3.3 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.

3.3.4 Test Setup



3.3.5 Test Result of AC Conducted Emission

Please refer to Appendix A.



3.4 Antenna Requirements

3.4.1 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.

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.4.3 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
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	Apr. 19, 2018	Feb. 18, 2019	Apr. 18, 2019	Radiation (03CH03-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	Apr. 19, 2018	Feb. 18, 2019	Apr. 18, 2019	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 14, 2018	Feb. 18, 2019	May 13, 2019	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	Apr. 19, 2018	Feb. 18, 2019	Apr. 18, 2019	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	Mar. 29, 2018	Feb. 18, 2019	Mar. 28, 2019	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 30, 2018	Feb. 18, 2019	Jul. 29, 2019	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz~40GHz	Mar. 30, 2018	Feb. 18, 2019	Mar. 29, 2019	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102210	0.01Hz~3000MHz	Oct. 18, 2018	Feb. 18, 2019	Oct. 17, 2019	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Dec. 23, 2018	Feb. 18, 2019	Dec. 22, 2019	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Feb. 18, 2019	NCR	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Feb. 18, 2019	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Feb. 18, 2019	NCR	Radiation (03CH03-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 23, 2018	Dec. 28, 2018	Dec. 22, 2019	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Oct. 18, 2018	Dec. 28, 2018	Oct. 17, 2019	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Dec. 23, 2018	Dec. 28, 2018	Dec. 22, 2019	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 18, 2018	Dec. 28, 2018	Jul. 17, 2019	Conduction (CO01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 22, 2018	Jan. 04, 2019	Dec. 21, 2019	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 22, 2018	Jan. 04, 2019	Dec. 21, 2019	Conducted (TH01-SZ)

NCR: No Calibration Required

5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage $K=2$ to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.6 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

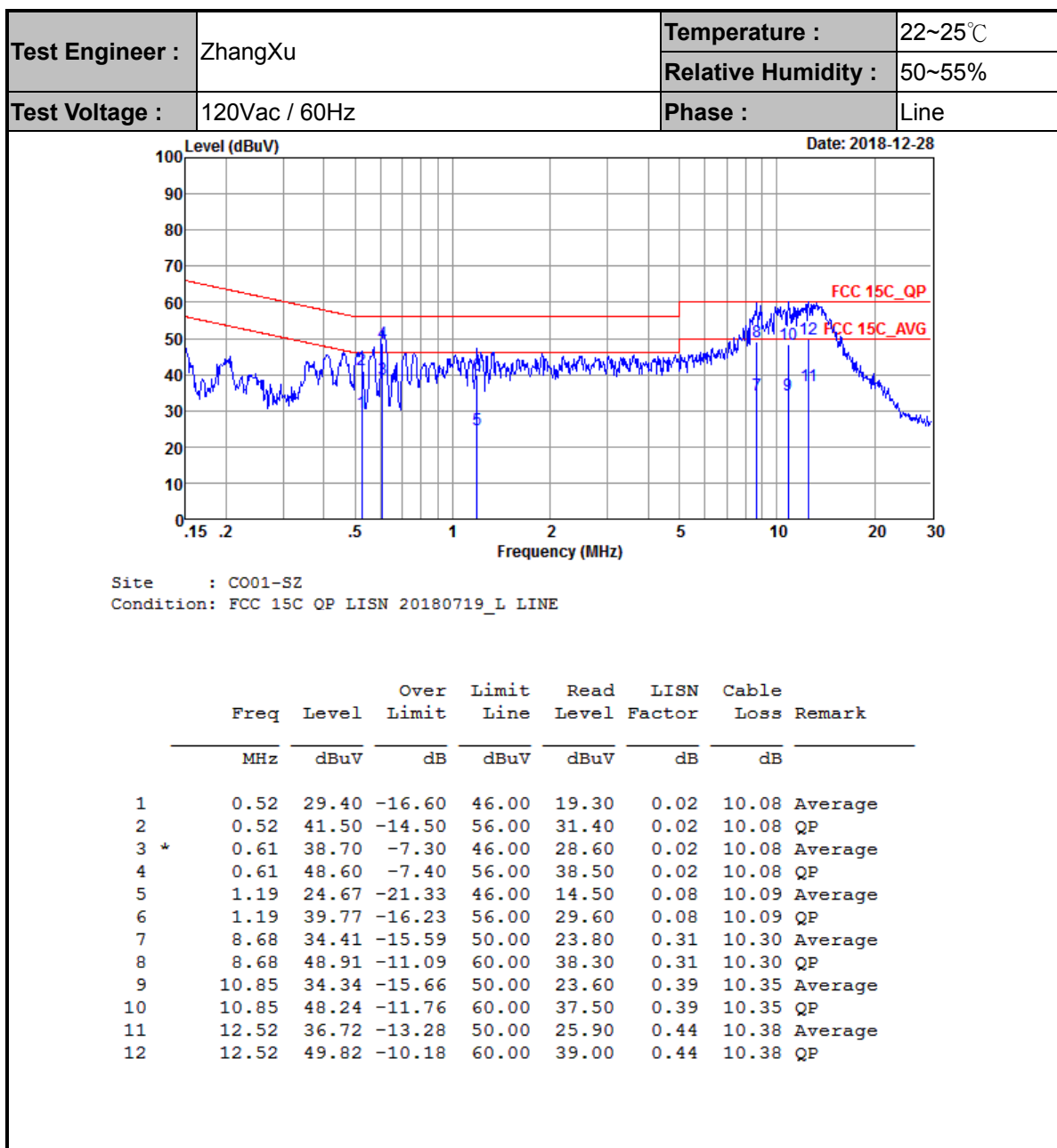
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.8 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.6 dB
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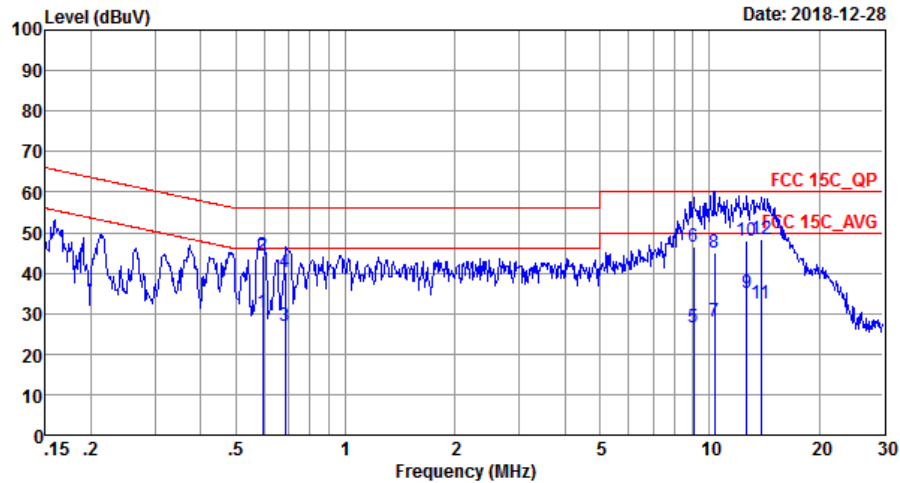


Appendix A. AC Conducted Emission Test Results





Test Engineer :	ZhangXu	Temperature :	22~25℃
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : CO01-SZ
Condition: FCC 15C QP LISN 20180719_N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.59	30.40	-15.60	46.00	20.30	0.02	10.08	Average
2	0.59	44.20	-11.80	56.00	34.10	0.02	10.08	QP
3	0.68	26.90	-19.10	46.00	16.80	0.02	10.08	Average
4	0.68	40.10	-15.90	56.00	30.00	0.02	10.08	QP
5	9.06	26.74	-23.26	50.00	16.30	0.13	10.31	Average
6	9.06	46.54	-13.46	60.00	36.10	0.13	10.31	QP
7	10.34	28.12	-21.88	50.00	17.61	0.17	10.34	Average
8	10.34	45.02	-14.98	60.00	34.51	0.17	10.34	QP
9	12.65	35.14	-14.86	50.00	24.50	0.26	10.38	Average
10	12.65	48.14	-11.86	60.00	37.50	0.26	10.38	QP
11	13.84	32.39	-17.61	50.00	21.70	0.30	10.39	Average
12 *	13.84	48.39	-11.61	60.00	37.70	0.30	10.39	QP



Appendix B. Radiated Spurious Emission

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2363.34	48.99	-25.01	74	50.36	27.85	5.02	34.24	127	84	P	H
		2347.8	38.2	-15.8	54	39.54	27.88	5.02	34.24	127	84	A	H
	*	2412	97.34	-	-	98.71	27.77	5.06	34.2	127	84	P	H
	*	2412	93.21	-	-	94.58	27.77	5.06	34.2	127	84	A	H
		2361.97	48.69	-25.31	74	50.06	27.85	5.02	34.24	154	343	P	V
		2337.19	38.29	-15.71	54	39.69	27.88	4.98	34.26	154	343	A	V
	*	2412	96.56	-	-	97.93	27.77	5.06	34.2	154	343	P	V
	*	2412	93.51	-	-	94.88	27.77	5.06	34.2	154	343	A	V
802.11b CH 06 2437MHz		2350.18	48.43	-25.57	74	49.77	27.88	5.02	34.24	175	84	P	H
		2345.28	38.17	-15.83	54	39.55	27.88	4.98	34.24	175	84	A	H
	*	2437	97.77	-	-	99.12	27.71	5.12	34.18	175	84	P	H
	*	2437	93.59	-	-	94.94	27.71	5.12	34.18	175	84	A	H
		2489.85	48.4	-25.6	74	49.71	27.63	5.19	34.13	175	84	P	H
		2492.09	39.62	-14.38	54	40.91	27.63	5.19	34.11	175	84	A	H
		2330.44	48.32	-25.68	74	49.69	27.91	4.98	34.26	149	341	P	V
		2381.96	37.99	-16.01	54	39.36	27.83	5.02	34.22	149	341	A	V
	*	2437	95.4	-	-	96.75	27.71	5.12	34.18	149	341	P	V
	*	2437	92.18	-	-	93.53	27.71	5.12	34.18	149	341	A	V
		2487.89	48.46	-25.54	74	49.77	27.63	5.19	34.13	149	341	P	V
		2493.63	38.26	-15.74	54	39.55	27.63	5.19	34.11	149	341	A	V



802.11b CH 11 2462MHz	*	2462	98.86	-	-	100.2	27.69	5.12	34.15	117	83	P	H
	*	2462	95.66	-	-	97	27.69	5.12	34.15	117	83	A	H
		2490.8	48.57	-25.43	74	49.88	27.63	5.19	34.13	117	83	P	H
		2487.52	38.89	-15.11	54	40.2	27.63	5.19	34.13	117	83	A	H
	*	2462	97.48	-	-	98.82	27.69	5.12	34.15	100	344	P	V
	*	2462	94.29	-	-	95.63	27.69	5.12	34.15	100	344	A	V
		2484.2	48.52	-25.48	74	49.8	27.66	5.19	34.13	100	344	P	V
		2483.72	38.61	-15.39	54	39.89	27.66	5.19	34.13	100	344	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	39.56	-34.44	74	57.33	31.12	8.59	57.48	145	274	P	H
		4824	39.36	-34.64	74	57.13	31.12	8.59	57.48	191	220	P	V
802.11b CH 06 2437MHz		4874	39.47	-34.53	74	57.22	31.17	8.6	57.52	112	229	P	H
		7311	44.87	-29.13	74	57.52	36.03	10.24	58.92	174	100	P	H
		4874	39.14	-34.86	74	56.89	31.17	8.6	57.52	251	0	P	V
		7311	45.63	-28.37	74	58.28	36.03	10.24	58.92	120	106	P	V
802.11b CH 11 2462MHz		4924	40.67	-33.33	74	58.36	31.22	8.64	57.55	133	180	P	H
		7386	44.33	-29.67	74	56.8	36.29	10.2	58.96	145	274	P	H
		4924	39.89	-34.11	74	57.58	31.22	8.64	57.55	251	0	P	V
		7386	43.88	-30.12	74	56.35	36.29	10.2	58.96	166	210	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		2390	49.92	-24.08	74	51.26	27.8	5.06	34.2	227	67	P	H
		2390	39.7	-14.3	54	41.04	27.8	5.06	34.2	227	67	A	H
	*	2412	96.3	-	-	97.67	27.77	5.06	34.2	227	67	P	H
	*	2412	88.54	-	-	89.91	27.77	5.06	34.2	227	67	A	H
		2390	52.24	-21.76	74	53.58	27.8	5.06	34.2	103	360	P	V
		2390	40.86	-13.14	54	42.2	27.8	5.06	34.2	103	360	A	V
	*	2412	93.44	-	-	94.81	27.77	5.06	34.2	103	360	P	V
	*	2412	87.09	-	-	88.46	27.77	5.06	34.2	103	360	A	V
802.11g CH 06 2437MHz		2342.9	47.29	-26.71	74	48.67	27.88	4.98	34.24	232	68	P	H
		2315.04	37.86	-16.14	54	39.2	27.94	4.98	34.26	232	68	A	H
	*	2437	96.23	-	-	97.58	27.71	5.12	34.18	232	68	P	H
	*	2437	89.64	-	-	90.99	27.71	5.12	34.18	232	68	A	H
		2491.81	48.18	-25.82	74	49.47	27.63	5.19	34.11	232	68	P	H
		2489.22	39.14	-14.86	54	40.45	27.63	5.19	34.13	232	68	A	H
		2356.9	47.29	-26.71	74	48.66	27.85	5.02	34.24	128	360	P	V
		2314.06	37.8	-16.2	54	39.14	27.94	4.98	34.26	128	360	A	V
	*	2437	93.7	-	-	95.05	27.71	5.12	34.18	128	360	P	V
	*	2437	87.65	-	-	89	27.71	5.12	34.18	128	360	A	V
		2488.73	47.68	-26.32	74	48.99	27.63	5.19	34.13	128	360	P	V
		2489.57	38.36	-15.64	54	39.67	27.63	5.19	34.13	128	360	A	V



802.11g CH 11 2462MHz	*	2462	96.65	-	-	97.99	27.69	5.12	34.15	194	86	P	H
	*	2462	89.98	-	-	91.32	27.69	5.12	34.15	194	86	A	H
		2483.84	62.59	-11.41	74	63.87	27.66	5.19	34.13	194	86	P	H
		2483.64	48.3	-5.7	54	49.58	27.66	5.19	34.13	194	86	A	H
	*	2462	94.47	-	-	95.81	27.69	5.12	34.15	149	349	P	V
	*	2462	86.95	-	-	88.29	27.69	5.12	34.15	149	349	A	V
		2483.72	60.97	-13.03	74	62.25	27.66	5.19	34.13	149	349	P	V
		2483.56	47.94	-6.06	54	49.22	27.66	5.19	34.13	149	349	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	38.66	-35.34	74	56.43	31.12	8.59	57.48	145	274	P	H
		4824	38.84	-35.16	74	56.61	31.12	8.59	57.48	191	220	P	V
802.11g CH 06 2437MHz		4874	39.03	-34.97	74	56.78	31.17	8.6	57.52	112	229	P	H
		7311	44.33	-29.67	74	56.98	36.03	10.24	58.92	174	100	P	H
		4874	38.61	-35.39	74	56.36	31.17	8.6	57.52	156	360	P	V
		7311	44.19	-29.81	74	56.84	36.03	10.24	58.92	120	106	P	V
802.11g CH 11 2462MHz		4924	39.11	-34.89	74	56.8	31.22	8.64	57.55	133	180	P	H
		7386	46.21	-27.79	74	58.68	36.29	10.2	58.96	145	274	P	H
		4924	39.41	-34.59	74	57.1	31.22	8.64	57.55	156	360	P	V
		7386	44.29	-29.71	74	56.76	36.29	10.2	58.96	166	210	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)	Preamplifier Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2326.8	48.46	-25.54	74	49.83	27.91	4.98	34.26	151	151	P	H
		2390	39.93	-14.07	54	41.27	27.8	5.06	34.2	151	151	A	H
	*	2412	96.43	-	-	97.8	27.77	5.06	34.2	151	151	P	H
	*	2412	89.48	-	-	90.85	27.77	5.06	34.2	151	151	A	H
		2389.90	49.58	-24.42	74	50.92	27.8	5.06	34.2	178	327	P	V
		2389.8	39.16	-14.84	54	40.5	27.8	5.06	34.2	178	327	A	V
	*	2412	94.04	-	-	95.41	27.77	5.06	34.2	178	327	P	V
	*	2412	87.3	-	-	88.67	27.77	5.06	34.2	178	327	A	V
802.11n HT20 CH 06 2437MHz		2356.06	48.33	-25.67	74	49.7	27.85	5.02	34.24	165	150	P	H
		2358.3	38.53	-15.47	54	39.9	27.85	5.02	34.24	165	150	A	H
	*	2437	96.69	-	-	98.04	27.71	5.12	34.18	165	150	P	H
	*	2437	90.63	-	-	91.98	27.71	5.12	34.18	165	150	A	H
		2493.63	48.25	-25.75	74	49.54	27.63	5.19	34.11	165	150	P	H
		2488.66	38.98	-15.02	54	40.29	27.63	5.19	34.13	165	150	A	H
		2375.66	48.23	-25.77	74	49.6	27.83	5.02	34.22	180	327	P	V
		2330.3	38.52	-15.48	54	39.89	27.91	4.98	34.26	180	327	A	V
	*	2437	94.51	-	-	95.86	27.71	5.12	34.18	180	327	P	V
	*	2437	88.13	-	-	89.48	27.71	5.12	34.18	180	327	A	V
		2497.83	47.75	-26.25	74	49.04	27.63	5.19	34.11	180	327	P	V
		2488.8	38.56	-15.44	54	39.87	27.63	5.19	34.13	180	327	A	V



802.11n HT20 CH 11 2462MHz	*	2462	97.8	-	-	99.14	27.69	5.12	34.15	138	148	P	H
	*	2462	90.88	-	-	92.22	27.69	5.12	34.15	138	148	A	H
		2483.64	60.42	-13.58	74	61.7	27.66	5.19	34.13	138	148	P	H
		2483.52	46.2	-7.8	54	47.48	27.66	5.19	34.13	138	148	A	H
	*	2462	94.42	-	-	95.76	27.69	5.12	34.15	203	360	P	V
	*	2462	87.57	-	-	88.91	27.69	5.12	34.15	203	360	A	V
		2483.76	54.53	-19.47	74	55.81	27.66	5.19	34.13	203	360	P	V
		2483.52	42.65	-11.35	54	43.93	27.66	5.19	34.13	203	360	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	39.2	-34.8	74	56.97	31.12	8.59	57.48	145	274	P	H
		4824	38.71	-35.29	74	56.48	31.12	8.59	57.48	191	220	P	V
802.11n HT20 CH 06 2437MHz		4874	39.1	-34.9	74	56.85	31.17	8.6	57.52	112	229	P	H
		7311	43.88	-30.12	74	56.53	36.03	10.24	58.92	174	100	P	H
		4874	38.76	-35.24	74	56.51	31.17	8.6	57.52	156	360	P	V
		7311	44.2	-29.8	74	56.85	36.03	10.24	58.92	120	106	P	V
802.11n HT20 CH 11 2462MHz		4924	40.39	-33.61	74	58.08	31.22	8.64	57.55	133	180	P	H
		7386	44.41	-29.59	74	56.88	36.29	10.2	58.96	145	274	P	H
		4924	39.51	-34.49	74	57.2	31.22	8.64	57.55	156	360	P	V
		7386	44.31	-29.69	74	56.78	36.29	10.2	58.96	166	210	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 HT40 (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)	Preamplifier Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 03 2422MHz		2369.78	48.69	-25.31	74	50.06	27.83	5.02	34.22	139	150	P	H
		2315.18	39.3	-14.7	54	40.64	27.94	4.98	34.26	139	150	A	H
	*	2422	93.05	-	-	94.43	27.74	5.06	34.18	139	150	P	H
	*	2422	86.37	-	-	87.75	27.74	5.06	34.18	139	150	A	H
		2487.75	48.5	-25.5	74	49.81	27.63	5.19	34.13	139	150	P	H
		2493.7	39.42	-14.58	54	40.71	27.63	5.19	34.11	139	150	A	H
		2348.22	48.66	-25.34	74	50	27.88	5.02	34.24	173	325	P	V
		2362.92	39.3	-14.7	54	40.67	27.85	5.02	34.24	173	325	A	V
	*	2422	90.95	-	-	92.33	27.74	5.06	34.18	173	325	P	V
	*	2422	83.97	-	-	85.35	27.74	5.06	34.18	173	325	A	V
		2491.46	48.09	-25.91	74	49.4	27.63	5.19	34.13	173	325	P	V
		2492.23	39.04	-14.96	54	40.33	27.63	5.19	34.11	173	325	A	V
802.11n HT40 CH 06 2437MHz		2381.26	48.31	-25.69	74	49.68	27.83	5.02	34.22	116	148	P	H
		2360.4	39.32	-14.68	54	40.69	27.85	5.02	34.24	116	148	A	H
	*	2437	91.92	-	-	93.27	27.71	5.12	34.18	116	148	P	H
	*	2437	86.13	-	-	87.48	27.71	5.12	34.18	116	148	A	H
		2484.88	49.4	-24.6	74	50.68	27.66	5.19	34.13	116	148	P	H
		2483.5	40.08	-13.92	54	41.36	27.66	5.19	34.13	116	148	A	H
		2349.76	48.82	-25.18	74	50.16	27.88	5.02	34.24	176	324	P	V
		2313.08	39.29	-14.71	54	40.66	27.94	4.98	34.29	176	324	A	V
	*	2437	89.97	-	-	91.32	27.71	5.12	34.18	176	324	P	V
	*	2437	83.65	-	-	85	27.71	5.12	34.18	176	324	A	V
		2483.9	48.17	-25.83	74	49.45	27.66	5.19	34.13	176	324	P	V
		2483.69	39.25	-14.75	54	40.53	27.66	5.19	34.13	176	324	A	V



802.11n HT40 CH 09 2452MHz		2314.9	48.73	-25.27	74	50.07	27.94	4.98	34.26	104	148	P	H
		2325.96	39.3	-14.7	54	40.67	27.91	4.98	34.26	104	148	A	H
	*	2452	93.82	-	-	95.14	27.71	5.12	34.15	104	148	P	H
	*	2452	87.8	-	-	89.12	27.71	5.12	34.15	104	148	A	H
		2484.04	59.59	-14.41	74	60.87	27.66	5.19	34.13	104	148	P	H
		2484.53	46.16	-7.84	54	47.44	27.66	5.19	34.13	104	148	A	H
		2327.5	48.41	-25.59	74	49.78	27.91	4.98	34.26	203	360	P	V
		2361.8	39.4	-14.6	54	40.77	27.85	5.02	34.24	203	360	A	V
	*	2452	91.63	-	-	92.95	27.71	5.12	34.15	203	360	P	V
	*	2452	84.4	-	-	85.72	27.71	5.12	34.15	203	360	A	V
		2486.42	51.63	-22.37	74	52.91	27.66	5.19	34.13	203	360	P	V
		2484.39	42.85	-11.15	54	44.13	27.66	5.19	34.13	203	360	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 HT40 (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		4844	38.68	-35.32	74	56.44	31.13	8.6	57.49	156	360	P	H
HT40		7266	45.14	-28.86	74	57.87	35.93	10.25	58.91	200	360	P	H
CH 03		4844	39.17	-34.83	74	56.93	31.13	8.6	57.49	156	360	P	V
2422MHz		7266	44.83	-29.17	74	57.56	35.93	10.25	58.91	200	360	P	V
802.11n		4874	39.31	-34.69	74	57.06	31.17	8.6	57.52	156	360	P	H
HT40		7311	44.12	-29.88	74	56.77	36.03	10.24	58.92	156	360	P	H
CH 06		4874	38.83	-35.17	74	56.58	31.17	8.6	57.52	156	360	P	V
2437MHz		7311	45.35	-28.65	74	58	36.03	10.24	58.92	156	360	P	V
802.11n		4904	39.12	-34.88	74	56.84	31.2	8.62	57.54	251	0	P	H
HT40		7356	44.64	-29.36	74	57.17	36.19	10.22	58.94	251	0	P	H
CH 09		4904	39.23	-34.77	74	56.95	31.2	8.62	57.54	251	0	P	V
2452MHz		7356	44.9	-29.1	74	57.43	36.19	10.22	58.94	251	0	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		30.97	22.64	-17.36	40	30.86	23.71	0.57	32.5	185	96	P	H
		88.2	17.72	-25.78	43.5	34.65	14.2	0.97	32.1	-	-	P	H
		145.43	22.35	-21.15	43.5	35.99	17	1.26	31.9	-	-	P	H
		252.13	23.94	-22.06	46	35.03	19.05	1.67	31.81	-	-	P	H
		399.57	27.05	-18.95	46	34.94	21.7	2.12	31.71	-	-	P	H
		1000	29.07	-24.93	54	29.69	27.3	3.48	31.4	-	-	P	H
		30.97	32.83	-7.17	40	41.05	23.71	0.57	32.5	124	77	P	V
		54.25	28.08	-11.92	40	46.57	13.26	0.75	32.5	-	-	P	V
		87.23	22.43	-17.57	40	39.26	14	0.97	31.8	-	-	P	V
		251.16	21.46	-24.54	46	32.67	18.93	1.66	31.8	-	-	P	V
		508.21	24.79	-21.21	46	30.34	23.59	2.41	31.55	-	-	P	V
		909.79	28.96	-17.04	46	29.94	26.76	3.33	31.07	-	-	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	Peak or Average
H/V	Horizontal or Vertical



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)

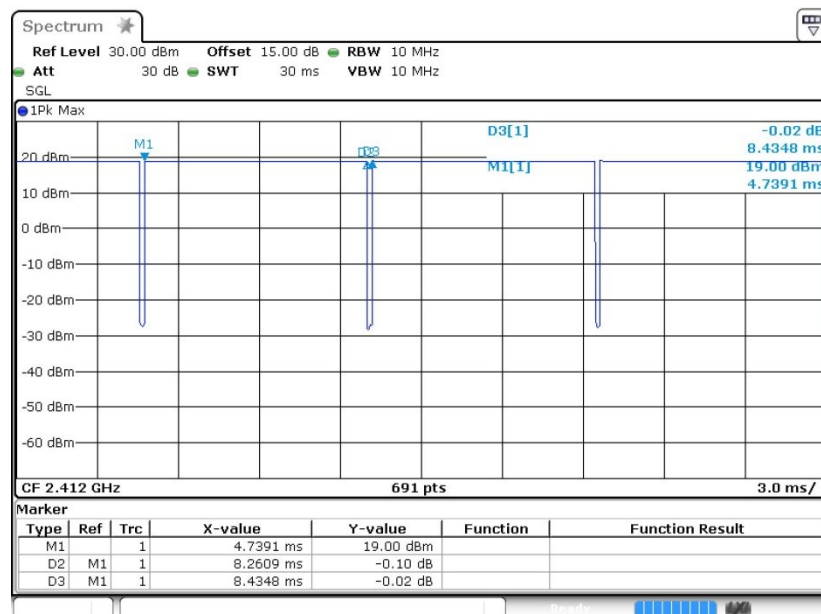
= -10.46(dB)

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

Appendix C. Duty Cycle Plots

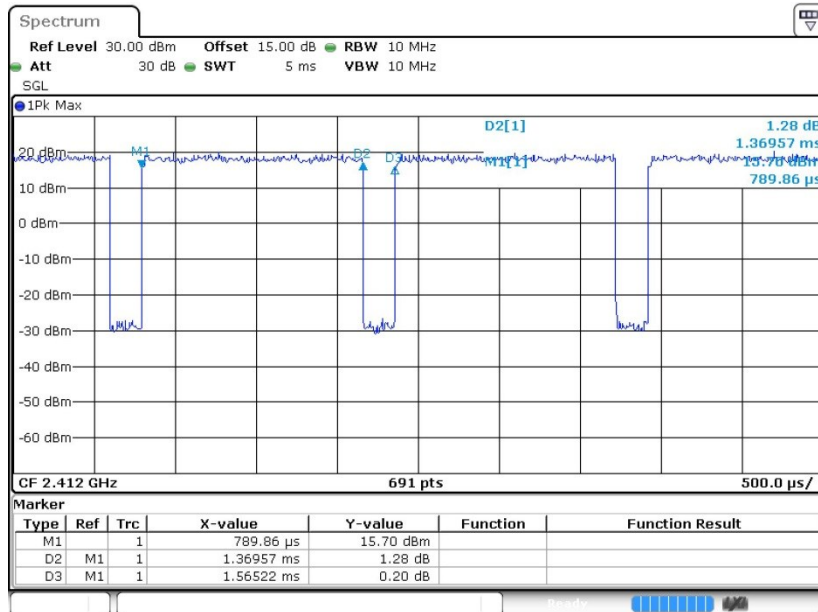
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	97.94	8.261	0.1210	300Hz
802.11g	87.50	1.370	0.7302	1kHz
802.11n HT20	86.27	1.275	0.7841	1kHz
802.11n HT40	76.12	0.638	1.568	3KHz

802.11b

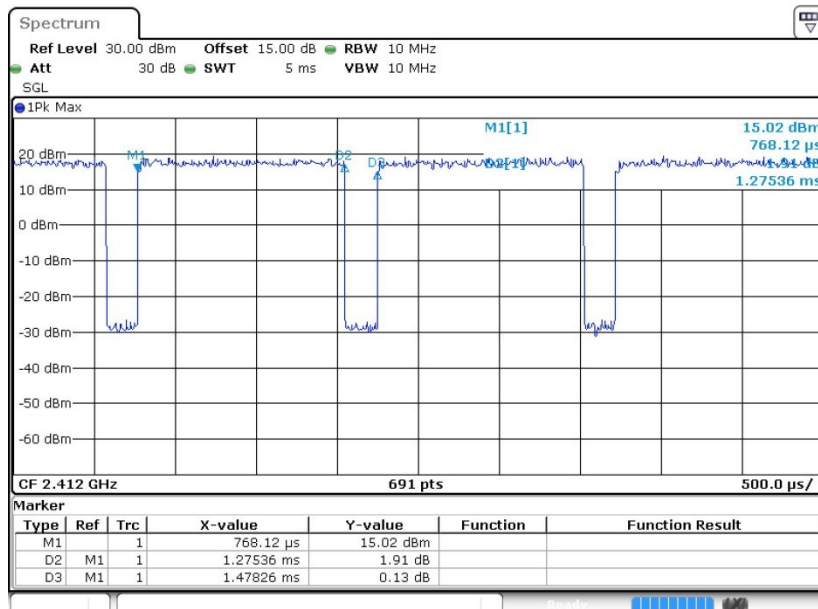




802.11g



802.11n HT20



802.11n HT40

