FCC RF Test Report

APPLICANT : MeiG Smart Technology Co., Ltd

EQUIPMENT: SLM757

BRAND NAME : MeiG Smart Technology Co., Ltd

MODEL NAME : SLM757A

FCC ID : 2APJ4-SLM757A

STANDARD : 47 CFR Part 15 Subpart E §15.407

CLASSIFICATION: (NII) Unlicensed National Information Infrastructure

The product was received on Sep. 12, 2018 and testing was completed on Nov. 19, 2018. 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.



Approved by: James Huang / Manager



Sporton International (Kunshan) Inc.

No. 1098, Pengxi North Road, Kunshan Economic Development Zone, Jiangsu Province 215335, China

Sporton International (Kunshan) Inc.

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REVISION HISTORY

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REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR891203D	Rev. 01	Initial issue of report	Nov. 29, 2018

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 & 15.403(i)	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 24 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 11 dBm	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b) & 15.209(a)	Pass	Under limit 4.57 dB at 5350.01 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 6.67 dB at 0.561 MHz
3.6	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.7	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

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1 General Description

1.1 Applicant

MeiG Smart Technology Co., Ltd

3/F, No.88, Qinjiang Road, Xuhui District, Shanghai, China.

1.2 Manufacturer

MeiG Smart Technology Co., Ltd

3/F, No.88, Qinjiang Road, Xuhui District, Shanghai, China.

1.3 Product Feature of Equipment Under Test

Product Feature		
Equipment	SLM757	
Brand Name	MeiG Smart Technology Co., Ltd	
Model Name	SLM757A	
FCC ID	2APJ4-SLM757A	
	WCDMA/HSPA/DC-HSDPA/	
	HSPA+(16QAM uplink is not supported)/LTE	
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n HT20/HT40	
	WLAN 5GHz 802.11a/n HT20/HT40	
	Bluetooth BR/EDR/LE	
	Conducted: 868621028935553/868621028935561	
IMEI Code	Conduction: 868621028936577/868621028936585	
	Radiation: 868621028936577/868621028936585	
HW Version	SLM757PA_MB_V1.01_PCB	
SW Varaion	SLM757PQA_EQ000_2EE0.1F7D165.5C3175F_18092	
SW Version	4_100_V01_T07	
EUT Stage	Production Unit	

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

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1.4 Product Specification of Equipment Under Test

	ted Product Specification
;	E400 MIL
	5180 MHz ~ 5240 MHz
Tx/Rx Frequency Range	5260 MHz ~ 5320 MHz
	5500 MHz ~ 5700 MHz
	<5180 MHz ~ 5240 MHz>
	802.11a : 11.96 dBm / 0.0157 W
	802.11n HT20 : 11.10 dBm / 0.0129 W
	802.11n HT40 : 10.02 dBm / 0.0100 W
	<5260 MHz ~ 5320 MHz>
Maximum Output Power to Antenna	802.11a : 12.12 dBm / 0.0163 W
Maximum Output Fower to Antenna	802.11n HT20 : 11.14 dBm / 0.0130 W
	802.11n HT40 : 9.97 dBm / 0.0099 W
	<5500 MHz ~ 5700 MHz >
	802.11a : 12.16 dBm / 0.0164 W
	802.11n HT20 : 11.23 dBm / 0.0133 W
	802.11n HT40 : 10.16 dBm / 0.0104 W
	<5180 MHz ~ 5240 MHz>
	802.11a : 18.73 MHz
	802.11n HT20 : 19.43 MHz
	802.11n HT40 : 37.06 MHz
	<5260 MHz ~ 5320 MHz>
99% Occupied Bandwidth	802.11a : 18.83 MHz
•	802.11n HT20 : 19.48 MHz
	802.11n HT40 : 36.86 MHz
	<5500 MHz ~ 5700 MHz >
	802.11a : 18.83 MHz
	802.11n HT20 : 19.53 MHz
	802.11n HT40 : 37.16 MHz
	<5150 MHz ~ 5250 MHz>
!	Fixed External Antenna with gain 1.00 dBi
Automore Onlin (Onlin	<5250 MHz ~ 5350 MHz>
Antenna Gain / Gain	Fixed External Antenna with gain 1.00 dBi
	<5470 MHz ~ 5700 MHz>
	Fixed External Antenna with gain 1.00 dBi
	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

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

Sporton International (Kunshan) Inc.

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1.6 Testing Location

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0).

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Test Site	Sporton International (Kunshan) Inc.			
	No. 1098, Pengxi North Road, Kunshan Economic Development Zone,			
Test Site Location	Jiangsu Province 215335, China			
rest site Location	TEL: 86-512-57900158			
	FAX: 86-512-57900958			
	Sporton Site No.	FCC designation No.	FCC Test Firm Registration No.	
Test Site No.	TH01-KS			
lest Site No.	CO01-KS	CN5013	630927	
	03CH06-KS			

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 E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- ANSI C63.10-2013

Remark:

- 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.

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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, the worst cases 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)
5150-5250 MHz	36	5180	44	5220
Band 1	38*	5190	46*	5230
(U-NII-1)	40	5200	48	5240

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz	52	5260	60	5300
Band 2	54*	5270	62*	5310
(U-NII-2A)	56	5280	64	5320

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	100	5500	112	5560
	102*	5510	116	5580
5470-5725 MHz	104	5520	132	5660
Band 3 (U-NII-2C)	-	-	134*	5670
(8 1111 23)	108	5540	136	5680
	110*	5550	140	5700

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	118*	5590	124	5620
TDWR Channel	120	5600	126*	5630
	-	-	128	5640

Note: The above Frequency and Channel in "*" were 802.11n HT40.

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2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

Test Cases			
AC			
Conducted	Mode 1: GSM 850 Idle + Bluetooth Link + WLAN Link(5G) + Adapter		
Emission			
Remark: For Radiated Test Cases, The tests were performed with Adapter			

Ch. #		Band I: 5150-5250 MHz	Band II: 5250-5350 MHz	Band III:5470-5725MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
Н	High	48	64	140

	Ch #	Band I: 5150-5250 MHz	Band II: 5250-5350 MHz	Band III:5470-5725MHz	
Ch. #		802.11n HT20	802.11n HT20	802.11n HT20	
L	Low	36	52	100	
М	Middle	44	60	116	
Н	High	48	64	140	

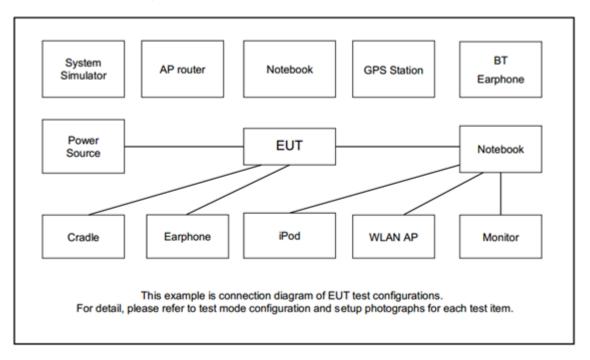
Ch. #		Band I: 5150-5250 MHz	Band II: 5250-5350 MHz	Band III: 5470-5725MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
М	Middle	-	-	110
Н	High	46	62	134

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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.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude E6320	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
5.	WLAN Antenna	N/A	N/A	N/A	N/A	N/A
6.	Test jig	N/A	N/A	N/A	N/A	N/A
7.	Adapter	N/A	N/A	N/A	Unshielded, 1.2 m	N/A

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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.

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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.

Following shows an offset computation example with cable loss 6.8dB

 $Offset(dB) = RF \ cable \ loss(dB).$ = 6.8 (dB)

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3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

3.1.2 Measuring Instruments

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

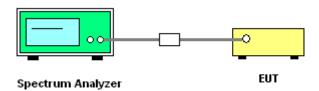
3.1.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
 Section C) Emission bandwidth

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- 2. Set RBW = approximately 1% of the emission bandwidth.
- 3. Set the VBW > RBW.
- 4. Detector = Peak.
- 5. Trace mode = max hold
- 6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
- 7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) ≥ 3 * RBW.
- 8. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

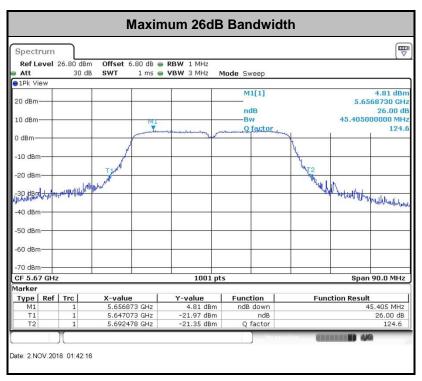
Please refer to Appendix A.

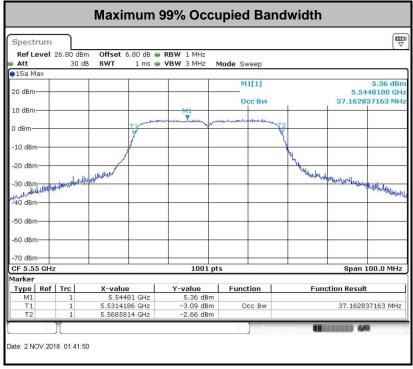
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Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

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3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output

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power over the frequency band of operation shall not exceed 250 mW.

For the 5.25-5.725 GHz bands, the maximum conducted output power over the frequency bands of

operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission

bandwidth in megahertz.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules

v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for

the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to

show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall

be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in

order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

3.2.2 Measuring Instruments

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

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3.2.3 Test Procedures

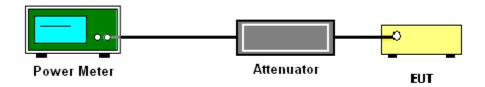
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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Method PM (Measurement using an RF average power meter):

- 1. Measurement is performed using a wideband RF power meter.
- 2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
- 3. Measure the average power of the transmitter, and the average power is corrected with duty factor, $10 \log(1/x)$, where x is the duty cycle.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

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3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

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

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3.3.3 Test Procedures

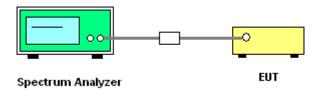
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section F) Maximum power spectral density.

Method SA-2

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

3.3.4 Test Setup



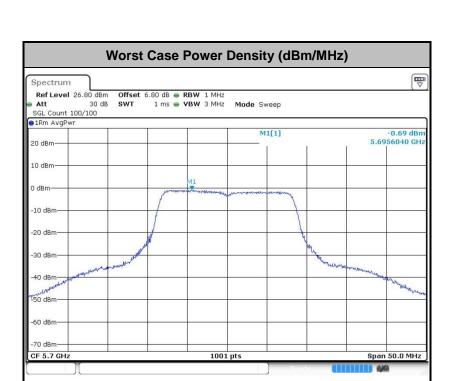
3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

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Note: Average Power Density (dB) = Measured value+ Duty Factor

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3.4 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

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3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table,

Frequency	Field Strength	Measurement Distance	
(MHz)	(microvolts/meter)	(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	

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EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

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Note: The following formula is used to convert the EIRP to field strength.

$$EIRP = E_{Meas} + 20log (d_{Meas}) - 104.7$$

where

EIRP is the equivalent isotropically radiated power, in dBm

 E_{Meas} is the field strength of the emission at the measurement distance, in $dB\mu V/m$

 d_{Meas} is the measurement distance, in \boldsymbol{m}

3.4.2 Measuring Instruments

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

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3.4.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.

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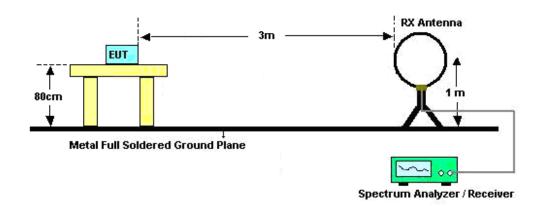
- (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
- (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW ≥ 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
- (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
 - RBW = 1 MHz
 - 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.
- 2. 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.
- 3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- 4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
- 5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
- 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.

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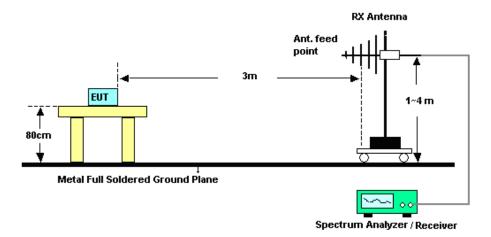
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3.4.4 Test Setup

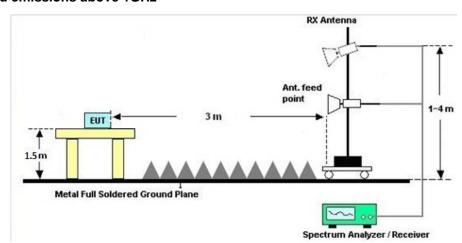
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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.

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

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

3.4.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix C.

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3.5 AC Conducted Emission Measurement

3.5.1 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.

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Eroquonov of omission (MUz)	Conducted limit (dBμV)		
Frequency of emission (MHz)	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.

3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other LISN.
- 4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- 5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- 6. Both sides of AC line were checked for maximum conducted interference.
- 7. The frequency range from 150 kHz to 30 MHz was searched.
- 8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

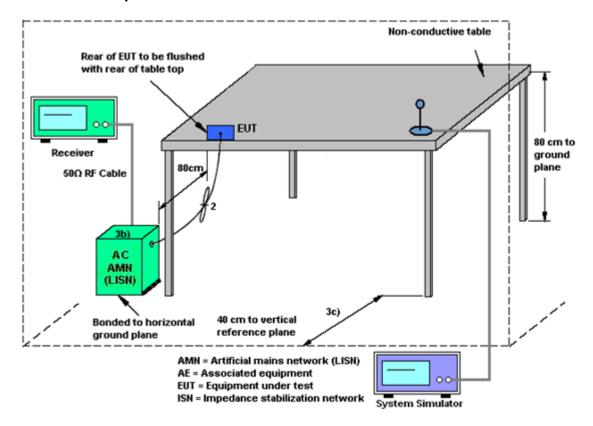
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3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

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3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

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3.6.2 Measuring Instruments

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

3.6.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

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3.7 Antenna Requirements

3.7.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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3.7.2 Antenna Anti-Replacement Construction

Non-standard antenna connector 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.

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4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 07, 2018	Nov. 02, 2018	Aug. 06, 2019	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Oct. 11, 2018	Nov. 02, 2018	Oct. 10, 2019	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GH z	Jan. 18, 2018	Nov. 02, 2018	Jan. 17, 2019	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 18, 2018	Nov. 02, 2018	Jan. 17, 2019	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY564000 23	3Hz~8.5GHz;M ax 30dBm	Oct.12, 2018	Nov. 05, 2018~ Nov. 08, 2018	Oct.11, 2019	Radiation (03CH06-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY574710 84	10Hz-44GHz	Jun. 25, 2018	Nov. 05, 2018~ Nov. 08, 2018	Jun. 24, 2019	Radiation (03CH06-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 19, 2018	Nov. 05, 2018~ Nov. 08, 2018	Oct. 18, 2019	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	44483	30MHz-1GHz	Jan. 29, 2018	Nov. 05, 2018~ Nov. 08, 2018	Jan 28, 2019	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 20, 2018	Nov. 05, 2018~ Nov. 08, 2018	Oct. 19, 2019	Radiation (03CH06-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA1702 49	15GHz~40GHz	Feb. 07, 2018	Nov. 05, 2018~ Nov. 08, 2018	Feb. 06, 2019	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	187289	9KHz ~1GHZ	Aug. 06, 2018	Nov. 05, 2018~ Nov. 08, 2018	Aug. 05, 2019	Radiation (03CH06-KS)
Amplifier	MITEQ	TTA1840-35- HG	2014749	18~40GHz	Feb. 08, 2018	Nov. 05, 2018~ Nov. 08, 2018	Feb. 07, 2019	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	2025788	1Ghz-18Ghz	Apr.17, 2018	Nov. 05, 2018~ Nov. 08, 2018	Apr.16, 2019	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY532702 03	500MHz~26.5G Hz	Dec. 16, 2017	Nov. 05, 2018~ Nov. 08, 2018	Dec. 15, 2018	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F1040900 04	N/A	NCR	Nov. 05, 2018~ Nov. 08, 2018	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Nov. 05, 2018~ Nov. 08, 2018	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Nov. 05, 2018~ Nov. 08, 2018	NCR	Radiation (03CH06-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 19, 2018	Nov. 19, 2018	Apr. 18, 2019	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 12, 2018	Nov. 19, 2018	Oct. 11, 2019	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Nov. 23, 2017	Nov. 19, 2018	Nov. 22, 2018	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2018	Nov. 19, 2018	Oct. 11, 2019	Conduction (CO01-KS)

NCR: No Calibration Required

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5 Uncertainty of Evaluation

<u>Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)</u>

Measuring Uncertainty for a Level of Confidence	2.9 dB
of 95% (U = 2Uc(y))	2.9 UB

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

Measuring Uncertainty for a Level of Confidence	5.0 dB
of 95% (U = 2Uc(y))	3.0 dB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

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

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

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

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Appendix A. Conducted Test Results

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Test Engineer:	Orion Li	Temperature:	21~25	°C
Test Date:	2018/11/2	Relative Humidity:	49~51	%

TEST RESULTS DATA 26dB and 99% OBW

	Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)			
11a	6Mbps	1	36	5180	18.68	23.38	-	22.71			
11a	6Mbps	1	44	5220	18.63	23.48	-	22.70			
11a	6Mbps	1	48	5240	18.73	23.63	-	22.73			
HT20	MCS0	1	36	5180	19.33	23.78	-	22.86			
HT20	MCS0	1	44	5220	19.43	23.68	-	22.88			
HT20	MCS0	1	48	5240	19.33	23.93	-	22.86			
HT40	MCS0	1	38	5190	36.96	44.51	-	23.01			
HT40	MCS0	1	46	5230	37.06	45.32	-	23.01			

TEST RESULTS DATA Average Power Table

	FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail	
11a	6Mbps	1	36	5180	0.58	11.96	24.00	1.00		Pass	
11a	6Mbps	1	44	5220	0.58	11.13	24.00	1.00		Pass	
11a	6Mbps	1	48	5240	0.58	10.87	24.00	1.00		Pass	
HT20	MCS0	1	36	5180	0.62	11.10	24.00	1.00		Pass	
HT20	MCS0	1	44	5220	0.62	10.18	24.00	1.00		Pass	
HT20	MCS0	1	48	5240	0.62	10.00	24.00	1.00		Pass	
HT40	MCS0	1	38	5190	0.64	10.02	24.00	1.00		Pass	
HT40	MCS0	1	46	5230	0.64	9.59	24.00	1.00		Pass	

TEST RESULTS DATA Power Spectral Density

	FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	-	Pass/Fail	
11a	6Mbps	1	36	5180	0.58	-0.14	11.00	1.00		Pass	
11a	6Mbps	1	44	5220	0.58	-0.63	11.00	1.00		Pass	
11a	6Mbps	1	48	5240	0.58	-0.94	11.00	1.00		Pass	
HT20	MCS0	1	36	5180	0.62	-1.08	11.00	1.00		Pass	
HT20	MCS0	1	44	5220	0.62	-1.98	11.00	1.00		Pass	
HT20	MCS0	1	48	5240	0.62	-2.01	11.00	1.00		Pass	
HT40	MCS0	1	38	5190	0.64	-5.14	11.00	1.00		Pass	
HT40	MCS0	1	46	5230	0.64	-5.48	11.00	1.00		Pass	

TEST RESULTS DATA 26dB and 99% OBW

	Band II										
Mod.	Data Rate	N⊤x	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note	
11a	6M bps	1	52	5260	18.68	23.73	23.71	29.71	23.98		
11a	6M bps	1	60	5300	18.63	23.43	23.70	29.70	23.98		
11a	6M bps	1	64	5320	18.83	23.73	23.75	29.75	23.98		
HT20	MCS 0	1	52	5260	19.48	23.78	23.90	29.90	23.98		
HT20	MCS 0	1	60	5300	19.38	23.78	23.87	29.87	23.98		
HT20	MCS 0	1	64	5320	19.43	23.68	23.88	29.88	23.98		
HT40	MCS 0	1	54	5270	36.76	44.60	23.98	30.00	23.98		
HT40	MCS 0	1	62	5310	36.86	45.14	23.98	30.00	23.98		

TEST RESULTS DATA Average Power Table

	FCC Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail	
11a	6M bps	1	52	5260	0.58	11.81	23.98	1.00	26.99	Pass	
11a	6M bps	1	60	5300	0.58	11.94	23.98	1.00	26.99	Pass	
11a	6M bps	1	64	5320	0.58	12.12	23.98	1.00	26.99	Pass	
HT20	MCS 0	1	52	5260	0.62	11.01	23.98	1.00	26.99	Pass	
HT20	MCS 0	1	60	5300	0.62	11.06	23.98	1.00	26.99	Pass	
HT20	MCS 0	1	64	5320	0.62	11.14	23.98	1.00	26.99	Pass	
HT40	MCS 0	1	54	5270	0.64	9.97	23.98	1.00	26.99	Pass	
HT40	MCS 0	1	62	5310	0.64	9.90	23.98	1.00	26.99	Pass	

TEST RESULTS DATA Power Spectral Density

						Band	П		
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	Pass/Fail
11a	6M bps	1	52	5260	0.58	-0.81	11.00	1.00	Pass
11a	6M bps	1	60	5300	0.58	-0.35	11.00	1.00	Pass
11a	6M bps	1	64	5320	0.58	-0.16	11.00	1.00	Pass
HT20	MCS 0	1	52	5260	0.62	-1.73	11.00	1.00	Pass
HT20	MCS 0	1	60	5300	0.62	-1.87	11.00	1.00	Pass
HT20	MCS 0	1	64	5320	0.62	-1.39	11.00	1.00	Pass
HT40	MCS 0	1	54	5270	0.64	-5.60	11.00	1.00	Pass
HT40	MCS 0	1	62	5310	0.64	-5.53	11.00	1.00	Pass

TEST RESULTS DATA 26dB and 99% OBW

						Band	III			
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	100	5500	18.78	23.78	23.74	29.74	23.98	
11a	6M bps	1	116	5580	18.83	23.63	23.75	29.75	23.98	
11a	6M bps	1	140	5700	18.83	23.98	23.75	29.75	23.98	
HT20	MCS 0	1	100	5500	19.48	23.88	23.90	29.90	23.98	
HT20	MCS 0	1	116	5580	19.48	23.83	23.90	29.90	23.98	
HT20	MCS 0	1	140	5700	19.53	24.18	23.91	29.91	23.98	
HT40	MCS 0	1	102	5510	36.86	45.41	23.98	30.00	23.98	
HT40	MCS 0	1	110	5550	37.16	44.96	23.98	30.00	23.98	
HT40	MCS 0	1	134	5670	37.06	45.41	23.98	30.00	23.98	

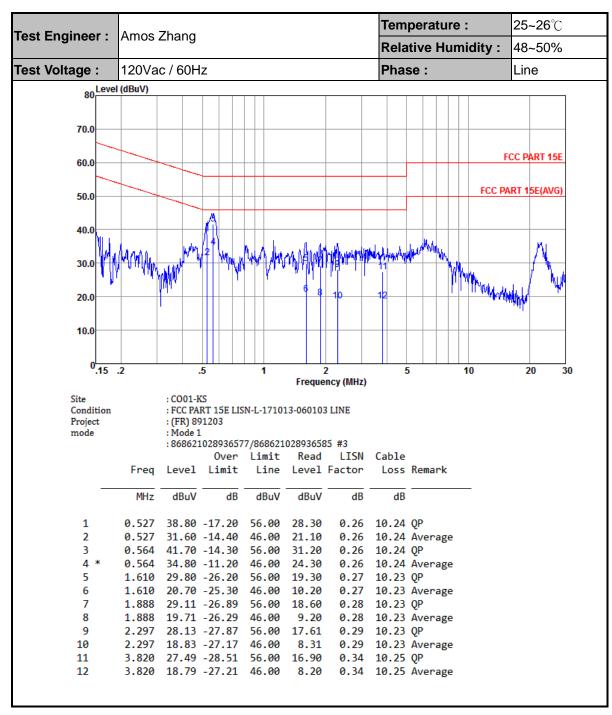
TEST RESULTS DATA Average Power Table

						FCC Ba	nd III			
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	100	5500	0.58	11.15	23.98	1.00	26.99	Pass
11a	6M bps	1	116	5580	0.58	11.63	23.98	1.00	26.99	Pass
11a	6M bps	1	140	5700	0.58	12.16	23.98	1.00	26.99	Pass
HT20	MCS 0	1	100	5500	0.62	10.26	23.98	1.00	26.99	Pass
HT20	MCS 0	1	116	5580	0.62	10.77	23.98	1.00	26.99	Pass
HT20	MCS 0	1	140	5700	0.62	11.23	23.98	1.00	26.99	Pass
HT40	MCS 0	1	102	5510	0.64	9.73	23.98	1.00	26.99	Pass
HT40	MCS 0	1	110	5550	0.64	10.16	23.98	1.00	26.99	Pass
HT40	MCS 0	1	134	5670	0.64	10.07	23.98	1.00	26.99	Pass

TEST RESULTS DATA Power Spectral Density

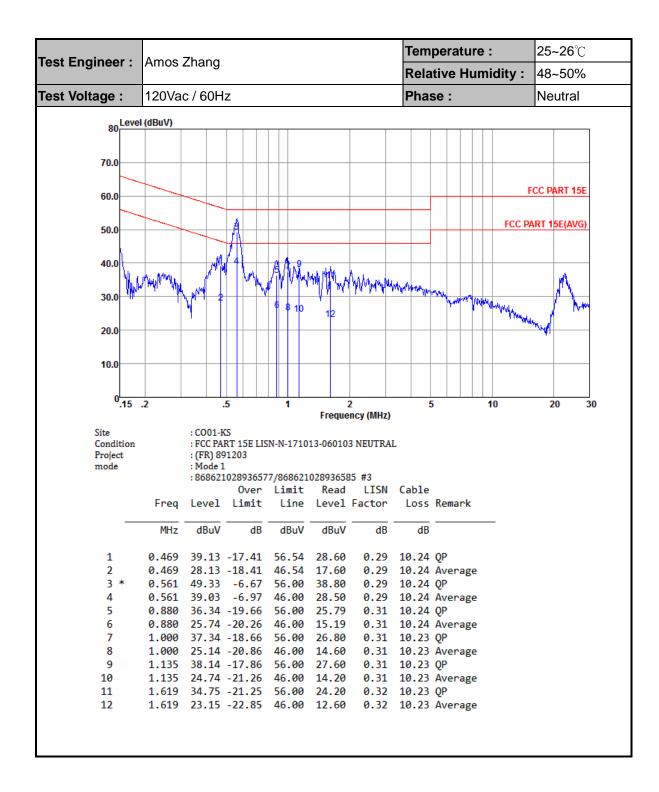
						Band	III		
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	Pass/Fail
11a	6M bps	1	100	5500	0.58	-1.33	11.00	1.00	Pass
11a	6M bps	1	116	5580	0.58	-1.02	11.00	1.00	Pass
11a	6M bps	1	140	5700	0.58	-0.11	11.00	1.00	Pass
HT20	MCS 0	1	100	5500	0.62	-2.43	11.00	1.00	Pass
HT20	MCS 0	1	116	5580	0.62	-2.24	11.00	1.00	Pass
HT20	MCS 0	1	140	5700	0.62	-1.47	11.00	1.00	Pass
HT40	MCS 0	1	102	5510	0.64	-5.33	11.00	1.00	Pass
HT40	MCS 0	1	110	5550	0.64	-5.01	11.00	1.00	Pass
HT40	MCS 0	1	134	5670	0.64	-5.23	11.00	1.00	Pass

Appendix B. AC Conducted Emission Test Results



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Appendix C. Radiated Spurious Emission

Band 1 - 5150~5250MHz

WIFI 802.11a (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)
		5148.32	51.03	-22.97	74	43.7	34.3	8.15	35.12	153	53	Р	Н
		5127.36	41.95	-12.05	54	34.65	34.27	8.15	35.12	153	53	Α	Н
	*	5184	101.4	-	-	93.99	34.37	8.16	35.12	153	53	Р	Н
802.11a		5184	93.42	-	-	86.01	34.37	8.16	35.12	153	53	Α	Н
CH 36 5180MHz		5125.28	50.92	-23.08	74	43.62	34.27	8.15	35.12	254	81	Р	V
3100WIF12		5149.76	40.66	-13.34	54	33.33	34.3	8.15	35.12	254	81	Α	V
	*	5184	96.84	-	-	89.43	34.37	8.16	35.12	254	81	Р	V
		5184	88.84	-	-	81.43	34.37	8.16	35.12	254	81	Α	V
Remark		other spurious											

^{2.} All results are PASS against Peak and Average limit line.

Sporton International (Kunshan) Inc.

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Report No.: FR891203D

Band 1 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)		Avg. (P/A)	(H/V)
802.11a		10360	40.36	-27.94	68.3	56.06	37.67	11.7	65.07	100	360	Р	Н
CH 36 5180MHz		10360	40.51	-27.79	68.3	56.21	37.67	11.7	65.07	100	360	Р	V
802.11a		10440	41.82	-26.48	68.3	57.45	37.7	11.76	65.09	100	360	Р	Н
CH 44 5220MHz		10440	41.02	-27.28	68.3	56.65	37.7	11.76	65.09	100	360	Р	٧
802.11a		10480	41.43	-26.87	68.3	57.05	37.7	11.79	65.11	100	360	Р	Н
CH 48 5240MHz		10480	40.51	-27.79	68.3	56.13	37.7	11.79	65.11	100	360	Р	V
Remark		other spurious		Peak and	l Average lim	it line.							

Sporton International (Kunshan) Inc.

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Report No.: FR891203D

Report Version : Rev. 01

Band 1 5150~5250MHz WIFI 802.11n HT20 (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
		5127.04	51.57	-22.43	74	44.27	34.27	8.15	35.12	186	360	Р	Н
		5128	41.96	-12.04	54	34.66	34.27	8.15	35.12	186	360	Α	Н
802.11n	*	5186	100.55	-	-	93.14	34.37	8.16	35.12	186	360	Р	Н
HT20		5186	92.24	-	-	84.83	34.37	8.16	35.12	186	360	Α	Н
CH 36		5122.56	50.8	-23.2	74	43.5	34.27	8.15	35.12	265	273	Р	V
5180MHz		5128.48	41	-13	54	33.7	34.27	8.15	35.12	265	273	Α	V
	*	5186	97.5	-	-	90.09	34.37	8.16	35.12	265	273	Р	V
		5186	89.14	-	-	81.73	34.37	8.16	35.12	265	273	Α	V

Remark

Sporton International (Kunshan) Inc.

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^{1.} No other spurious found.

^{2.} All results are PASS against Peak and Average limit line.

Band 1 5150~5250MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)		Avg. (P/A)	
802.11n HT20		10360	40.29	-28.01	68.3	55.99	37.67	11.7	65.07	100	360	Р	Н
CH 36 5180MHz		10360	40.5	-27.8	68.3	56.2	37.67	11.7	65.07	100	360	Р	V
802.11n HT20		10440	41.71	-26.59	68.3	57.34	37.7	11.76	65.09	100	360	Р	Н
CH 44 5220MHz		10440	42	-26.3	68.3	57.63	37.7	11.76	65.09	100	360	Р	V
802.11n HT20		10480	41.67	-26.63	68.3	57.29	37.7	11.79	65.11	100	360	Р	Н
CH 48 5240MHz		10480	41.98	-26.32	68.3	57.6	37.7	11.79	65.11	100	360	Р	V
Remark		o other spurious		eak and	l Average lim	it line.							,

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Band 1 5150~5250MHz WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
		5144.16	55.56	-18.44	74	48.23	34.3	8.15	35.12	166	345	Р	Н
		5149.76	44.93	-9.07	54	37.6	34.3	8.15	35.12	166	345	Α	Н
	*	5204	97.85	-	-	90.41	34.4	8.17	35.13	166	345	Р	Н
		5204	90.09	-	-	82.65	34.4	8.17	35.13	166	345	Α	Н
802.11n		5390.46	48.7	-25.3	74	40.88	34.67	8.31	35.16	166	345	Р	Н
HT40		5395.86	39.6	-14.4	54	31.75	34.7	8.31	35.16	166	345	Α	Н
CH 38		5141.12	51.95	-22.05	74	44.62	34.3	8.15	35.12	295	87	Р	V
5190MHz		5149.12	41.52	-12.48	54	34.19	34.3	8.15	35.12	295	87	Α	V
	*	5192	92.31	-	-	84.87	34.4	8.16	35.12	295	87	Р	V
		5192	84.05	-	-	76.61	34.4	8.16	35.12	295	87	Α	٧
		5365.8	48.64	-25.36	74	40.88	34.63	8.28	35.15	295	87	Р	V
		5392.26	39.49	-14.51	54	31.67	34.67	8.31	35.16	295	87	Α	V

Remark

Sporton International (Kunshan) Inc.

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Report Version : Rev. 01

^{1.} No other spurious found.

^{2.} All results are PASS against Peak and Average limit line.

Band 1 5150~5250MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)		Avg. (P/A)	
802.11n HT40		10380	40.22	-28.08	68.3	55.89	37.68	11.73	65.08	100	360	Р	Н
CH 38 5190MHz		10380	40.89	-27.41	68.3	56.56	37.68	11.73	65.08	100	360	Р	V
802.11n HT40		10460	41.15	-27.15	68.3	56.76	37.7	11.79	65.1	100	360	Р	Н
CH 46 5230MHz		10460	41.93	-26.37	68.3	57.54	37.7	11.79	65.1	100	360	Р	V
Remark		o other spurious		eak and	Average lim	it line.						,	

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Band 2 - 5250~5350MHz

WIFI 802.11a (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)
	*	5314	102.11	-	-	94.41	34.6	8.25	35.15	318	51	Р	Н
		5314	94.75	-	-	87.05	34.6	8.25	35.15	318	51	Α	Н
		5350	52.92	-21.08	74	45.19	34.6	8.28	35.15	318	51	Р	Н
802.11a		5350.01	41.79	-12.21	54	34.06	34.6	8.28	35.15	318	51	Α	Н
CH 64 5320MHz	*	5324	96.99	-	-	89.29	34.6	8.25	35.15	299	58	Р	V
3320WIT12		5324	89.41	-	-	81.71	34.6	8.25	35.15	299	58	Α	V
		5381.4	49.18	-24.82	74	41.39	34.67	8.28	35.16	299	58	Р	V
		5350.01	39.93	-14.07	54	32.2	34.6	8.28	35.15	299	58	Α	7
Remark		o other spurious								1			

All results are PASS against Peak and Average limit line.

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Band 2 5250~5350MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)		Avg. (P/A)	
802.11a		10520	42.22	-26.08	68.3	57.78	37.73	11.83	65.12	100	360	Р	Н
CH 52 5260MHz		10520	41.46	-26.84	68.3	57.02	37.73	11.83	65.12	100	360	Р	V
802.11a		10600	41.68	-26.62	68.3	57.04	37.9	11.89	65.15	100	360	Р	Н
CH 60 5300MHz		10600	41.07	-27.23	68.3	56.43	37.9	11.89	65.15	100	360	Р	V
802.11a		10640	40.9	-33.1	74	56.24	37.9	11.92	65.16	100	360	Р	Н
CH 64 5320MHz		10640	43.5	-30.5	74	58.84	37.9	11.92	65.16	100	360	Р	V
Remark		o other spurious		Peak and	l Average lim	it line.			,			,	

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Band 2 5250~5350MHz WIFI 802.11n HT20 (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)
	*	5322	103.26	-	-	95.56	34.6	8.25	35.15	171	360	Р	Н
		5322	95.89	-	-	88.19	34.6	8.25	35.15	171	360	Α	Н
802.11n		5350.7	56.03	-17.97	74	48.3	34.6	8.28	35.15	171	360	Р	Н
HT20		5371.7	44.57	-9.43	54	36.81	34.63	8.28	35.15	171	360	Α	Н
CH 64	*	5314	98.67	-	-	90.97	34.6	8.25	35.15	280	276	Р	٧
5320MHz		5314	91	-	-	83.3	34.6	8.25	35.15	280	276	Α	٧
		5350.7	49.75	-24.25	74	42.02	34.6	8.28	35.15	280	276	Р	٧
		5371.7	41.41	-12.59	54	33.65	34.63	8.28	35.15	280	276	Α	V

Remark

Sporton International (Kunshan) Inc.

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^{1.} No other spurious found.

^{2.} All results are PASS against Peak and Average limit line.

Band 2 5250~5350MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)		Avg. (P/A)	
802.11n HT20		10520	40.2	-28.1	68.3	55.76	37.73	11.83	65.12	100	360	Р	H
CH 52 5260MHz		10520	40.58	-27.72	68.3	56.14	37.73	11.83	65.12	100	360	Р	V
802.11n HT20		10600	41.85	-26.45	68.3	57.21	37.9	11.89	65.15	100	360	Р	Н
CH 60 5300MHz		10600	42.87	-25.43	68.3	58.23	37.9	11.89	65.15	100	360	Р	V
802.11n HT20		10640	41.1	-32.9	74	56.44	37.9	11.92	65.16	100	360	Р	Н
CH 64 5320MHz		10640	41.35	-32.65	74	56.69	37.9	11.92	65.16	100	360	Р	V
Remark		other spurious		eak and	l Average lim	it line.							

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Band 2 5250~5350MHz WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)		Avg. (P/A)	(H/V)
		5116.48	50.64	-23.36	74	43.38	34.23	8.15	35.12	136	0	Р	Н
		5124.8	40.49	-13.51	54	33.19	34.27	8.15	35.12	136	0	Α	Н
	*	5320	97.94	-	-	90.24	34.6	8.25	35.15	136	0	Р	Н
		5320	90.64	-	-	82.94	34.6	8.25	35.15	136	0	Α	Н
802.11n		5350.8	59.37	-14.63	74	51.64	34.6	8.28	35.15	136	0	Р	Н
HT40	!	5350.01	49.43	-4.57	54	41.7	34.6	8.28	35.15	136	0	Α	Н
CH 62		5133.44	50.66	-23.34	74	43.36	34.27	8.15	35.12	286	275	Р	V
5310MHz		5131.52	40.41	-13.59	54	33.11	34.27	8.15	35.12	286	275	Α	V
	*	5302	94.83	-	-	87.15	34.6	8.23	35.15	286	275	Р	٧
		5302	87.07	-	-	79.39	34.6	8.23	35.15	286	275	Α	٧
		5350.1	54.49	-19.51	74	46.76	34.6	8.28	35.15	286	275	Р	V
		5350.01	44.91	-9.09	54	37.18	34.6	8.28	35.15	286	275	Α	V

Remark

Sporton International (Kunshan) Inc.

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^{1.} No other spurious found.

^{2.} All results are PASS against Peak and Average limit line.

Band 2 5250~5350MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos		Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n		10540	39.94	-28.36	68.3	55.44	37.77	11.86	65.13	100	360	Р	Н
HT40													
CH 54		10540	40.78	-27.52	68.3	56.28	37.77	11.86	65.13	100	360	Р	V
5270MHz													
802.11n		10620	41.32	-32.68	74	56.65	37.9	11.92	65.15	100	360	Р	Н
HT40													
CH 62		10620	40.23	-33.77	74	55.56	37.9	11.92	65.15	100	360	Р	V
5310MHz													
Remark		o other spurious		eak and	l Average lim	it line.			,				

Sporton International (Kunshan) Inc.

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Band 3 - 5470~5725MHz

WIFI 802.11a (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)
		5447.6	50.26	-23.74	74	42.51	34.6	8.32	35.17	128	359	Р	Н
		5469.68	53.31	-14.99	68.3	45.56	34.6	8.32	35.17	128	359	Р	Н
		5447.76	42.57	-11.43	54	34.82	34.6	8.32	35.17	128	359	Α	Н
	*	5496	101.77	-	-	94.02	34.6	8.32	35.17	128	359	Р	Н
802.11a		5496	94.29	-	-	86.54	34.6	8.32	35.17	128	359	Α	Н
CH 100 5500MHz		5436.56	50.04	-23.96	74	42.26	34.63	8.32	35.17	336	274	Р	V
3300WIF12		5468.72	49.58	-18.72	68.3	41.83	34.6	8.32	35.17	336	274	Р	V
		5446.64	40.57	-13.43	54	32.82	34.6	8.32	35.17	336	274	Α	V
	*	5496	96.59	-	-	88.84	34.6	8.32	35.17	336	274	Р	V
		5496	89.2	-	-	81.45	34.6	8.32	35.17	336	274	Α	V
	*	5702	103.73	-	-	95.85	34.63	8.42	35.17	113	355	Р	Н
222.44		5702	95.25	-	-	87.37	34.63	8.42	35.17	113	355	Α	Н
802.11a		5725.48	59.82	-8.48	68.3	51.89	34.67	8.42	35.16	113	355	Р	Н
CH 140 5700MHz	*	5704	102.14	-	-	94.26	34.63	8.42	35.17	296	274	Р	V
5700WITI2		5704	93.7	-	-	85.82	34.63	8.42	35.17	296	274	Α	V
		5725.8	58.05	-10.25	68.3	50.12	34.67	8.42	35.16	296	274	Р	V
Remark		other spurious		Peak and	l Average lim	it line.							

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Band 3 - 5470~5725MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency	Level	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)		Avg.	
802.11a		11000	41.57	-32.43	74	56.52	38.1	12.21	65.26	100	360	P	Н
CH 100 5500MHz		11000	42.48	-31.52	74	57.43	38.1	12.21	65.26	100	360	Р	V
802.11a		11160	41.72	-32.28	74	56.59	38.1	12.35	65.32	100	360	Р	Н
CH 116 5580MHz		11160	42.12	-31.88	74	56.99	38.1	12.35	65.32	100	360	Р	V
802.11a		11400	42.72	-31.28	74	57.39	38.2	12.52	65.39	100	360	Р	Н
CH 140 5700MHz		11400	42.11	-31.89	74	56.78	38.2	12.52	65.39	100	360	Р	V
Remark		o other spurious		Peak and	Average lim	it line.							

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Band 3 - 5470~5725MHz WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V
		5447.76	50.85	-23.15	74	43.1	34.6	8.32	35.17	123	360	Р	Н
		5468.72	50.72	-17.58	68.3	42.97	34.6	8.32	35.17	123	360	Р	Н
		5448.4	43.34	-10.66	54	35.59	34.6	8.32	35.17	123	360	Α	Н
802.11n	*	5492	100.25	-	-	92.5	34.6	8.32	35.17	123	360	Р	Н
HT20		5492	92.95	-	-	85.2	34.6	8.32	35.17	123	360	Α	Н
CH 100		5451.12	49.42	-24.58	74	41.67	34.6	8.32	35.17	100	210	Р	V
5500MHz		5460.24	48.65	-19.65	68.3	40.9	34.6	8.32	35.17	100	210	Р	V
		5448.24	40.55	-13.45	54	32.8	34.6	8.32	35.17	100	210	Α	V
	*	5506	93.9	-	-	86.15	34.6	8.33	35.18	100	210	Р	V
		5506	86.41	-	-	78.66	34.6	8.33	35.18	100	210	Α	V
	*	5698	101.57	-	-	93.74	34.6	8.4	35.17	274	354	Р	Н
802.11n		5698	92.81	-	-	84.98	34.6	8.4	35.17	274	354	Α	Н
HT20		5725.56	60.16	-8.14	68.3	52.23	34.67	8.42	35.16	274	354	Р	Н
CH 140	*	5696	96.78	-	-	88.95	34.6	8.4	35.17	112	212	Р	V
5700MHz		5696	88.16	-	-	80.33	34.6	8.4	35.17	112	212	Α	V
		5725.64	53.87	-14.43	68.3	45.94	34.67	8.42	35.16	112	212	Р	V

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Band 3 - 5470~5725MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11n HT20		11000	42.68	-31.32	74	57.63	38.1	12.21	65.26	100	360	Р	Н
CH 100 5500MHz		11000	42.21	-31.79	74	57.16	38.1	12.21	65.26	100	360	Р	V
802.11n HT20		11160	41.46	-32.54	74	56.33	38.1	12.35	65.32	100	360	Р	Н
CH 116 5580MHz		11160	43.17	-30.83	74	58.04	38.1	12.35	65.32	100	360	Р	>
802.11n HT20		11400	42.45	-31.55	74	57.12	38.2	12.52	65.39	100	360	Р	Н
CH 140 5700MHz		11400	43.13	-30.87	74	57.8	38.2	12.52	65.39	100	360	Р	V
Remark		other spurious		eak and	l Average lim	it line.			-	ı	1	ı	

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Band 3 - 5470~5725MHz WIFI 802.11n HT40 (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)	, ,	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	
		5457.84	59.55	-14.45	74	51.8	34.6	8.32	35.17	113	32	P	Н
	!	5466.96	63.82	-4.48	68.3	56.07	34.6	8.32	35.17	113	32	Р	Н
		5459.76	45.52	-8.48	54	37.77	34.6	8.32	35.17	113	32	Α	Н
	*	5502	98.73	-	-	90.98	34.6	8.32	35.17	113	32	Р	Н
802.11n		5502	91.68	-	-	83.93	34.6	8.32	35.17	113	32	Α	Н
HT40		5753.4	50.23	-18.07	68.3	42.2	34.73	8.45	35.15	113	32	Р	Н
CH 102		5456.4	52.89	-21.11	74	45.14	34.6	8.32	35.17	267	273	Р	V
5510MHz	!	5469.2	62.66	-5.64	68.3	54.91	34.6	8.32	35.17	267	273	Р	V
		5459.99	44.26	-9.74	54	36.51	34.6	8.32	35.17	267	273	Α	V
	*	5522	97.07	-	-	89.35	34.57	8.33	35.18	267	273	Р	V
		5522	89.84	-	-	82.12	34.57	8.33	35.18	267	273	Α	V
		5759.64	50.35	-17.95	68.3	42.32	34.73	8.45	35.15	267	273	Р	V
		5362.48	48.98	-25.02	74	41.22	34.63	8.28	35.15	143	30	Р	Н
		5466.8	48.47	-19.83	68.3	40.72	34.6	8.32	35.17	143	30	Р	Н
		5455.6	39.71	-14.29	54	31.96	34.6	8.32	35.17	143	30	Α	Н
	*	5676	101.55	-	-	93.74	34.6	8.4	35.19	143	30	Р	Н
802.11n		5676	93.18	-	-	85.37	34.6	8.4	35.19	143	30	Α	Н
HT40		5725.16	61.52	-6.78	68.3	53.59	34.67	8.42	35.16	143	30	Р	Н
CH 134		5430.96	49.22	-24.78	74	41.44	34.63	8.32	35.17	310	269	Р	V
5670MHz		5467.76	48.13	-20.17	68.3	40.38	34.6	8.32	35.17	310	269	Р	V
		5451.6	39.7	-14.3	54	31.95	34.6	8.32	35.17	310	269	Α	V
	*	5672	101.24	-	-	93.43	34.6	8.4	35.19	310	269	Р	V
		5672	92.32	-	-	84.51	34.6	8.4	35.19	310	269	Α	V
	!	5726.12	62.85	-5.45	68.3	54.92	34.67	8.42	35.16	310	269	Р	V

2. All results are PASS against Peak and Average limit line.

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Band 3 - 5470~5725MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)		Avg. (P/A)	(H/V)
802.11n HT40		11020	41.88	-32.12	74	56.81	38.1	12.24	65.27	100	360	Р	Н
CH 102 5510MHz		11020	43.3	-30.7	74	58.23	38.1	12.24	65.27	100	360	Р	V
802.11n HT40		11100	42.7	-31.3	74	57.6	38.1	12.3	65.3	100	360	Р	Н
CH 110 5550MHz		11100	42.45	-31.55	74	57.35	38.1	12.3	65.3	100	360	Р	٧
802.11n HT40		11340	43.39	-30.61	74	58.16	38.13	12.47	65.37	100	360	Р	Н
CH 134 5670MHz		11340	41.32	-32.68	74	56.09	38.13	12.47	65.37	100	360	Р	٧
Remark		other spurious		eak and	l Average lim	it line.							

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Band 3 - 5470~5725MHz

Emission below 1GHz

WIFI 802.11n HT40 (LF @ 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)
		43.58	19.44	-20.56	40	34.53	16.7	0.63	32.42	100	360	Р	Н
		99.84	20.27	-23.23	43.5	34.56	16.9	1.01	32.2	-	-	Р	Н
		124.09	21.58	-21.92	43.5	34.57	18.02	1.14	32.15	-	-	Р	Н
		150.28	16.42	-27.08	43.5	30.73	16.51	1.28	32.1	-	-	Р	Н
000.44		219.15	16.33	-29.67	46	31.33	15.31	1.61	31.92	-	-	Р	Н
802.11n		844.8	26.14	-19.86	46	28.46	26.28	3.1	31.7	-	-	Р	Н
HT40 LF		67.83	18.46	-21.54	40	37.22	12.66	0.82	32.24	-	-	Р	V
LF		111.48	23.63	-19.87	43.5	37.09	17.64	1.08	32.18	-	-	Р	V
		125.06	24.54	-18.96	43.5	37.57	17.98	1.14	32.15	100	0	Р	V
		130.88	21.37	-22.13	43.5	34.64	17.7	1.17	32.14	-	-	Р	V
		547.01	23.71	-22.29	46	28.89	24.01	2.5	31.69	-	-	Р	٧
		885.54	26.41	-19.59	46	28.4	26.44	3.2	31.63	-	-	Р	V
Remark		other spurious		mit line.									

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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 not under limit 6dB .
P/A	Peak or Average
H/V	Horizontal or Vertical

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

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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)	(dB _µ V)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	Р	Н
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	Α	Н

1. Level($dB\mu V/m$) =

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

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

For Peak Limit @ 2390MHz:

- 1. Level(dBµV/m)
- = Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) Preamp Factor(dB)
- $= 32.22(dB/m) + 4.58(dB) + 54.51(dB\mu V) 35.86 (dB)$
- $= 55.45 (dB\mu V/m)$
- 2. Over Limit(dB)
- = Level(dBµV/m) Limit Line(dBµV/m)
- $= 55.45(dB\mu V/m) 74(dB\mu V/m)$
- = -18.55(dB)

For Average Limit @ 2390MHz:

- 1. Level(dBµV/m)
- = Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) Preamp Factor(dB)
- $= 32.22(dB/m) + 4.58(dB) + 42.6(dB\mu V) 35.86 (dB)$
- $= 43.54 (dB\mu V/m)$
- 2. Over Limit(dB)
- = Level($dB\mu V/m$) Limit Line($dB\mu V/m$)
- $= 43.54(dB\mu V/m) 54(dB\mu V/m)$
- = -10.46(dB)

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

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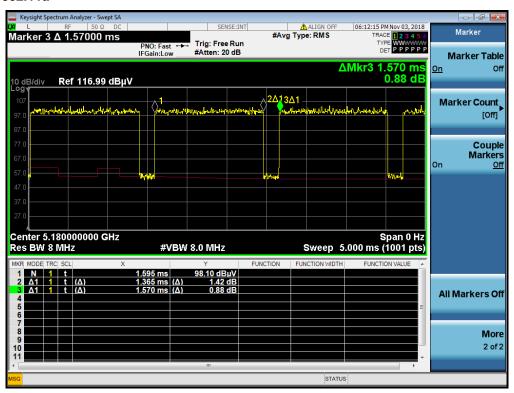
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Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting	
802.11a	86.94	1.365	0.733	0.75KHz	
802.11n HT20	86.44	1.275	0.784	0.82KHz	
802.11n HT40	85.61	1.220	0.820	0.82KHz	

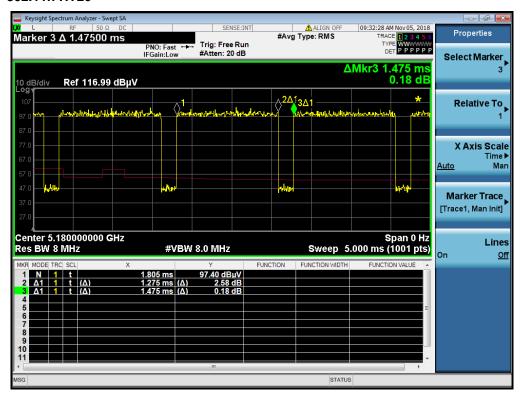
802.11a



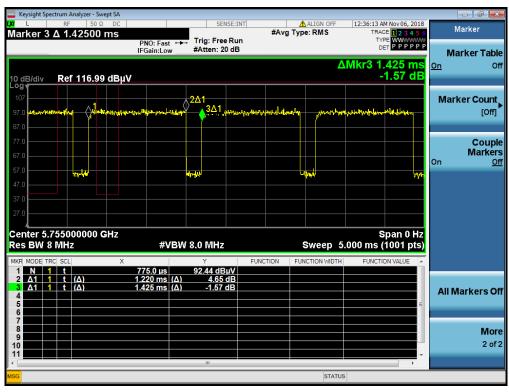
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802.11n HT20



802.11n HT40



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