FCC RF Test Report

APPLICANT	:	Motorola Mobility LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	XT1941-5, XT1941-3
FCC ID	:	IHDT56XK1
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure

The product was received on Jun. 04, 2018 and testing was completed on Jun. 28, 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.

James Huang

Approved by: James Huang / Manager

TESTING
NVLAP LAB CODE 600155-0

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR860402F	Rev. 01	Initial issue of report	Jul. 12, 2018

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) &15.209(a)	Pass	Under limit 4.82 dB at 30.00 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 5.38 dB at 0.167 MHz
3.6	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.7	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.2 Manufacturer

Motorola Mobility LLC
222 W,Merchandise Mart Plaza, Chicago IL 60654 USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1941-5, XT1941-3
FCC ID	IHDT56XK1
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/NFC WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth BR/EDR/LE
IMEI Code	Conducted: 355542090027733/355542090027741 Conduction: 355542090025752/355542090025760 Radiation: 355542090027873/355542090027881
HW Version	DVT1B
SW Version	fastboot_deen_oem_userdebug_8.1.0_OPK28.26_f325_in tcfg-test-keys_oem
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two types of EUT sample 1 and sample 2, the differences between two samples are only for SIM slot, the sample 1(XT1941-3) is dual SIM slot, the sample 2(XT1941-5) is single SIM slot. We only choose dual SIM sample to perform full tests.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	802.11a : 11.98 dBm / 0.0158 W 802.11n HT20 : 11.58 dBm / 0.0144 W 802.11n HT40 : 11.52 dBm / 0.0142 W
99% Occupied Bandwidth	802.11a : 19.03 MHz 802.11n HT20 : 19.78 MHz 802.11n HT40 : 37.46 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
Antenna Type / Gain	PIFA Antenna with gain -5.35 dBi

1.5 Modification of EUT

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

1.6 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	Brand Name	Motorola(Salom)	Model Name	SC-51
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 1(EU)	Brand Name	Motorola(Salom)	Model Name	SC-52
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 1(UK)	Brand Name	Motorola(Salom)	Model Name	SC-53
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 1(India)	Brand Name	Motorola(Salom)	Model Name	SC-54
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 1(AU)	Brand Name	Motorola(Salom)	Model Name	SC-55
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 1(AR)	Brand Name	Motorola(Salom)	Model Name	SC-56
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 1(BR)	Brand Name	Motorola(Salom)	Model Name	SC-57
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 1(PRC)	Brand Name	Motorola(Salom)	Model Name	SC-58
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 1(Chile)	Brand Name	Motorola(Salom)	Model Name	SC-52
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 2(US)	Brand Name	Motorola(chenyang)	Model Name	SC-51
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 2(EU)	Brand Name	Motorola(chenyang)	Model Name	SC-52
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 2(UK)	Brand Name	Motorola(chenyang)	Model Name	SC-53
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 2(AU)	Brand Name	Motorola(chenyang)	Model Name	SC-55
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 2(AR)	Brand Name	Motorola(chenyang)	Model Name	SC-56
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 2(PRC)	Brand Name	Motorola(chenyang)	Model Name	SC-58
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 3(BR)	Brand Name	Motorola(Salom/Flex)	Model Name	SC-57
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
AC Adapter 4(BR)	Brand Name	Motorola (Tenpao/Cliptech)	Model Name	SC-57
	Power Rating	I/P: 100-240 Vac, 600mA, O/P: 5/9/12 Vdc, 3000/2000/1500 mA		
Battery	Brand Name	Motorola	Model Name	JE40
	Power Rating	3.8Vdc,2820mAh	Type	Li-ion
Earphone 1	Brand Name	Motorola (New Leader)	Model Name	NLD-EM307E-09SF
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core		
Earphone 2	Brand Name	Motorola	Model Name	SH38C16618 (L20)
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core		

USB Cable 1	**Brand Name**	Motorola (Liqi)	**Model Name**	LQ-03500079
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		
USB Cable 2	**Brand Name**	Motorola (Saibao)	**Model Name**	SLQ-A1111A
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		
USB Cable 3	**Brand Name**	Motorola (I SHENG)	**Model Name**	SC18C28955
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		

1.7 Testing Location

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

Test Site	Sporton International (Kunshan) Inc.			
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958			
Test Site No.	**Sporton Site No.**			**FCC Test Firm Registration No.**
	TH01-KS	CO01-KS	03CH02-KS	630927

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

1.8 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- 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 (Z 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)
5745-5825 MHz Band 4 (U-NII-3)	149	5745	159*	5795
	151*	5755	161	5805
	153	5765	165	5825
	157	5785		

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

2.2 Test Mode

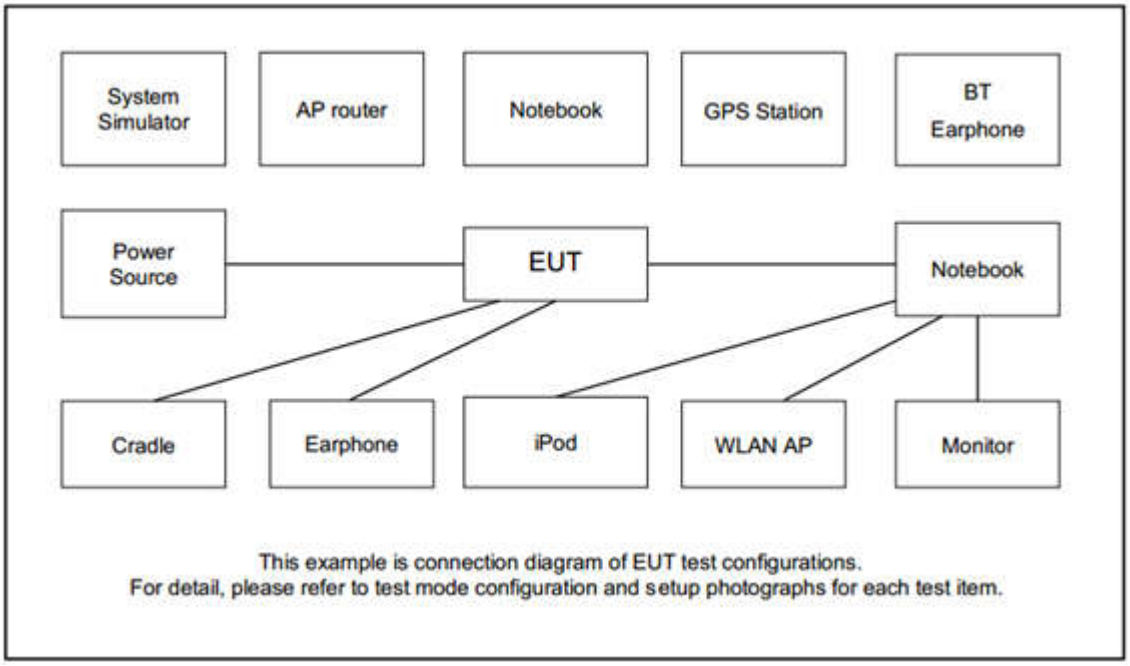
Final test modes are considering the modulation and worse data rates as below table.

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

AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link(5GHz) + USB Cable 1(Charging from Adapter 4) + Earphone
Remark: For Radiated Test Cases, The tests were performed with Adapter 1, Earphone and USB Cable 1.	

Ch. #		Band IV：5725-5850 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

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.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
3.	WLAN AP	D-link	DIR-855	KA2DIR855A2	N/A	Unshielded,1.8m
4.	Notebook	Lenovo	G480	PRC4	N/A	shielded cable DC O/P 1.8m , Unshielded AC I/P cable 1.8m
5.	SD Card	Kingston	8GB	N/A	N/A	N/A

2.5 EUT Operation Test Setup

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

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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 6.8 dB.

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

= 6.8 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

26dB and 99% Occupied bandwidth are reporting only.

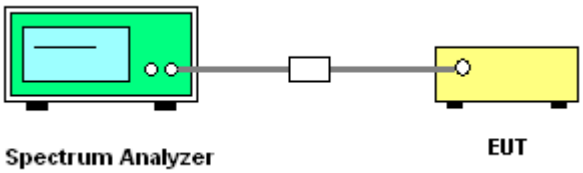
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

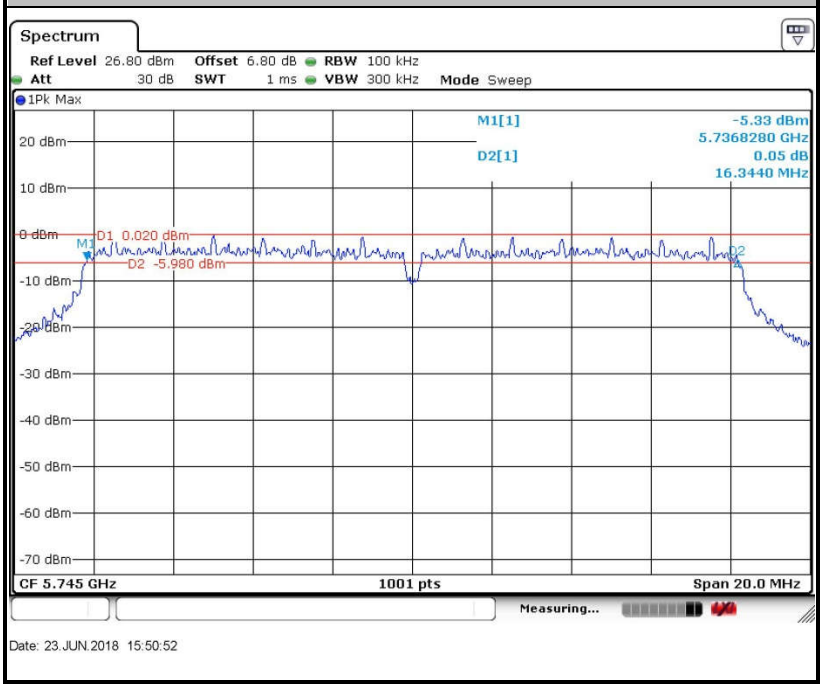
3.1.4 Test Setup



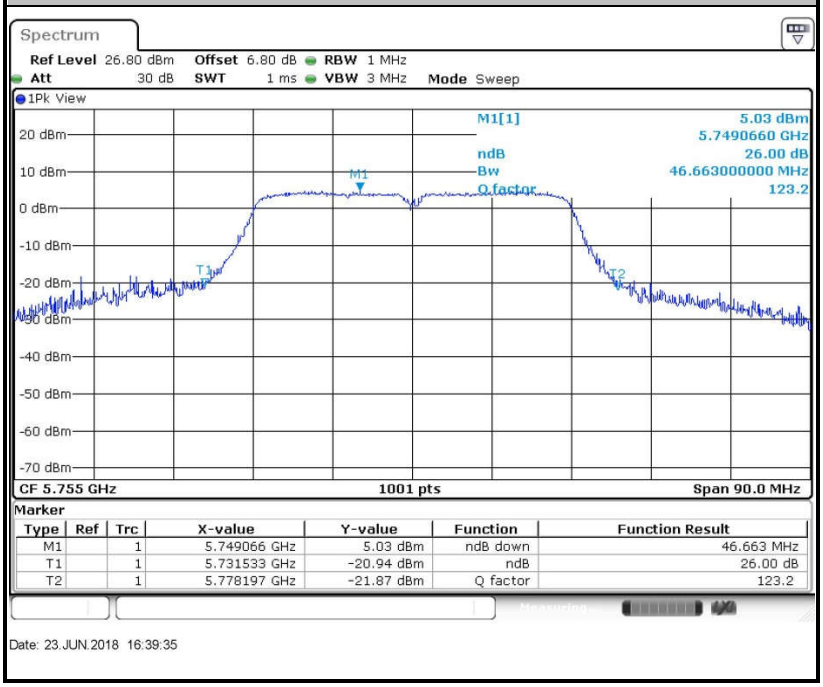
3.1.5 Test Result of 6dB and 26dB and 99% Occupied Bandwidth

Please refer to Appendix A.

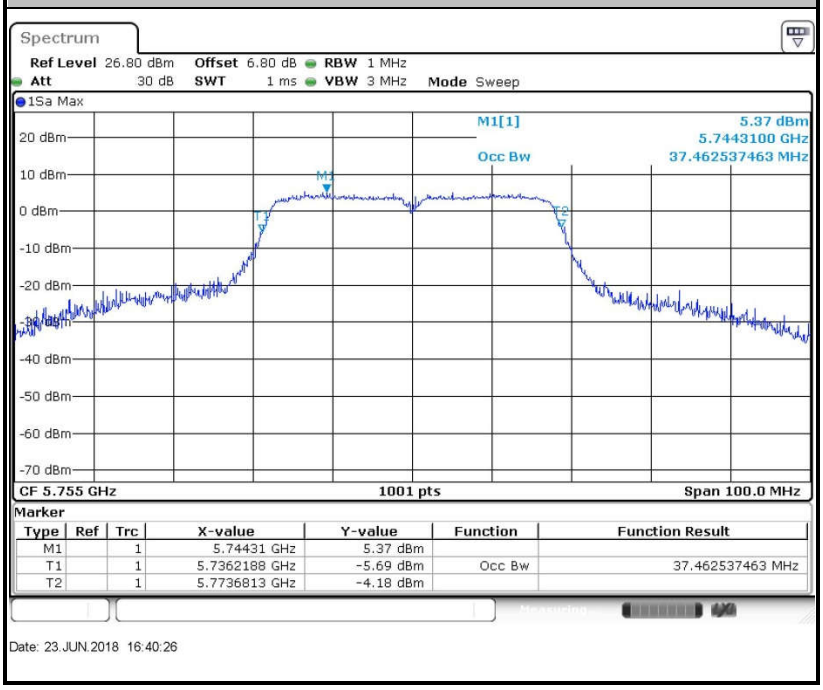
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth



Maximum 99% Occupied Bandwidth



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

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

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.

3.2.2 Measuring Instruments

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

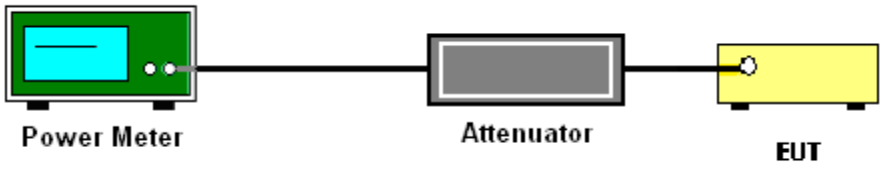
3.2.3 Test Procedures

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

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.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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.

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.

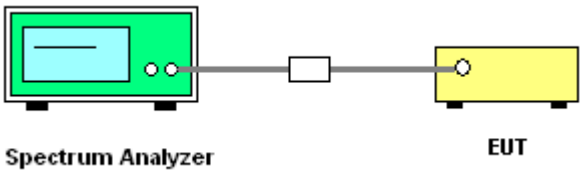
 # Method SA-2 #

(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 = 300 kHz.
- Set VBW ≥ 1 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(500kHz/RBW) to the test result.
- 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.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

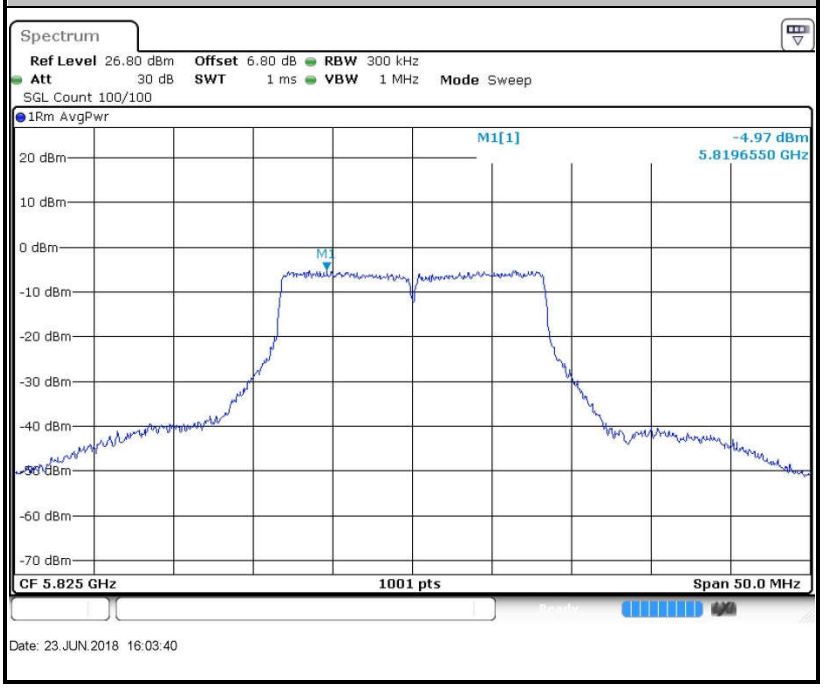
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/MHz)



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.

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5.725-5.85 GHz band:

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

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

EIRP (dBm)	Field Strength at 3m (dBµV/m)
- 27	68.2

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

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

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBµV/m

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

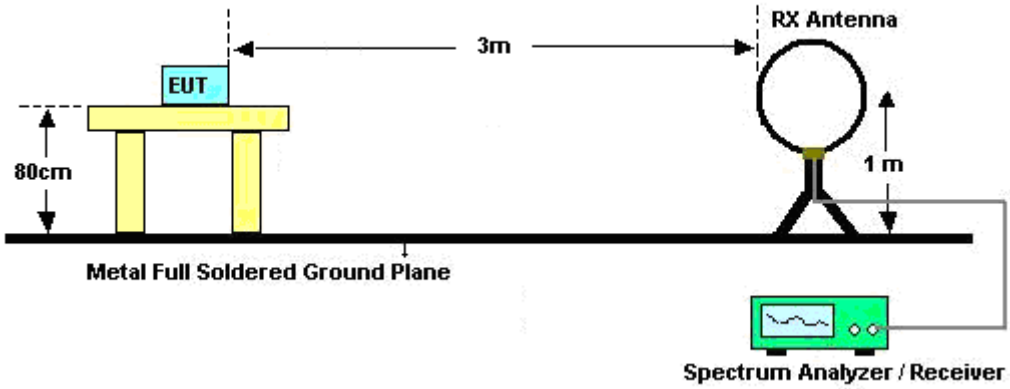
   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (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

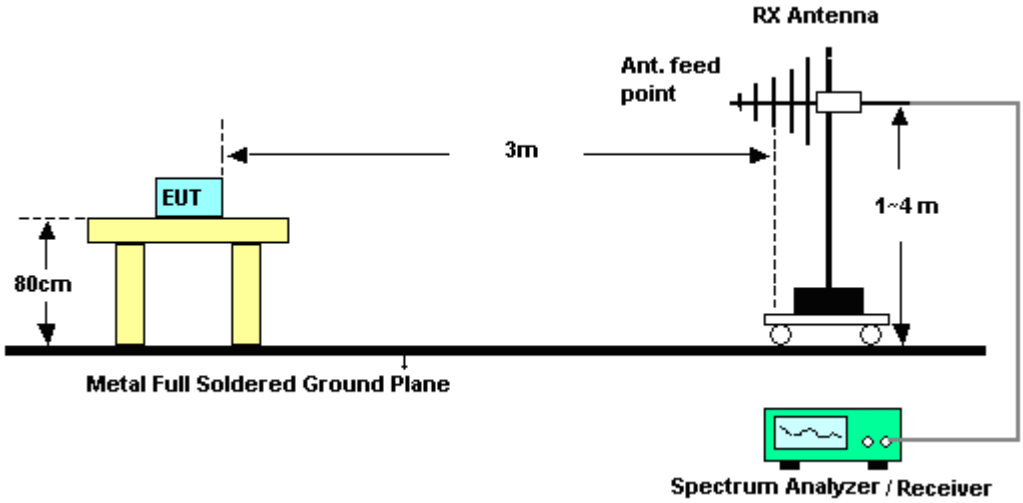
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting 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.
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.

3.4.4 Test Setup

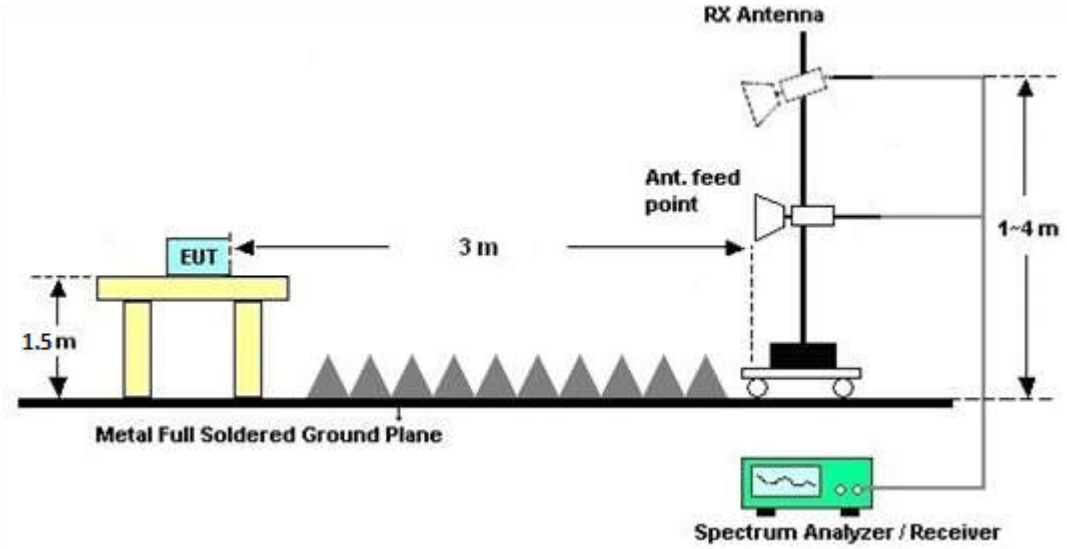
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated 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.

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 Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

3.4.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C.

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.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

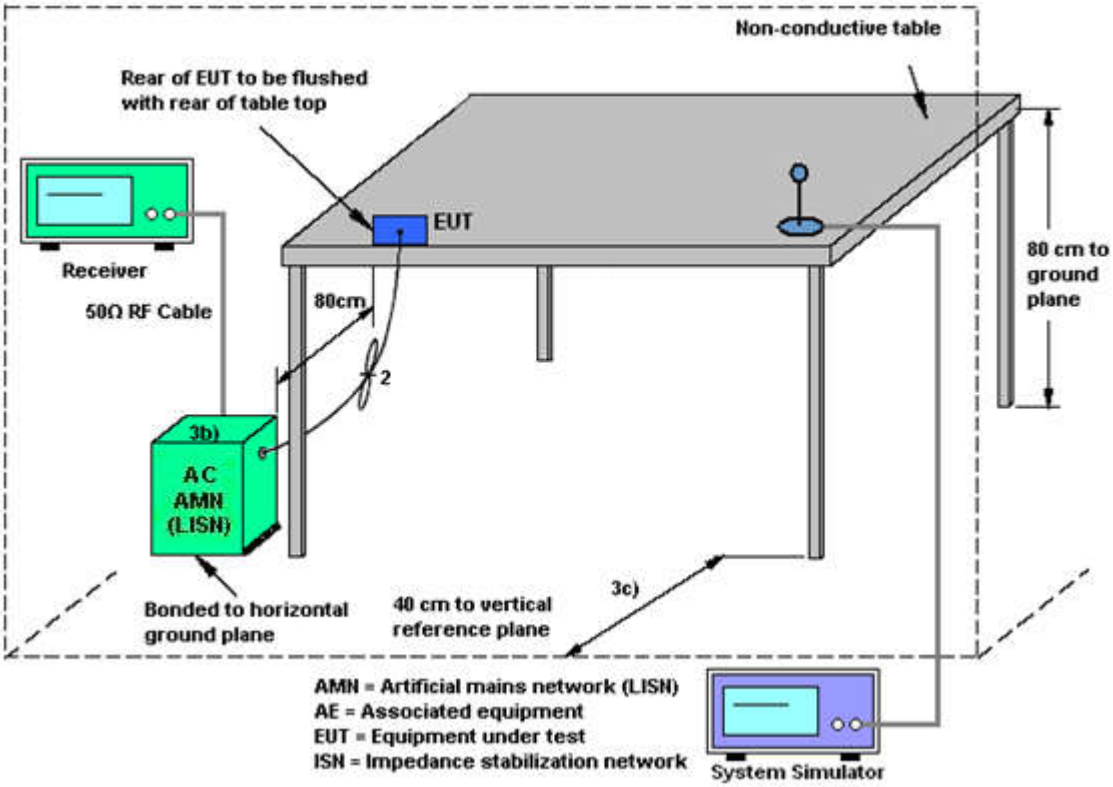
3.5.2 Measuring Instruments

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.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

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.

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.

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.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 08, 2017	Jun. 23, 2018	Aug. 07, 2018	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 18, 2018	Jun. 23, 2018	Jan. 17, 2019	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 18, 2018	Jun. 23, 2018	Jan. 17, 2019	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 12, 2017	Jun. 23, 2018	Oct. 11, 2018	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz;Max 30dBm	Aug. 08, 2017	Jun. 23, 2018~ Jun. 24, 2018	Aug. 07, 2018	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz-44G,MAX 30dB	Apr.17, 2018	Jun. 23, 2018~ Jun. 24, 2018	Apr. 16, 2019	Radiation (03CH02-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 22, 2017	Jun. 23, 2018~ Jun. 24, 2018	Oct.21, 2018	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz-2GHz	Jan. 29, 2018	Jun. 23, 2018~ Jun. 24, 2018	Jan. 28, 2019	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 21, 2017	Jun. 23, 2018~ Jun. 24, 2018	Oct. 20, 2018	Radiation (03CH02-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 07, 2018	Jun. 23, 2018~ Jun. 24, 2018	Feb. 06, 2019	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9KHz-1GHz	Aug. 07, 2017	Jun. 23, 2018~ Jun. 24, 2018	Aug. 06, 2018	Radiation (03CH02-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	100MHz-18GHz	Apr.17, 2018	Jun. 23, 2018~ Jun. 24, 2018	Apr.16, 2019	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1GHz~26.5GHz	Oct. 12, 2017	Jun. 23, 2018~ Jun. 24, 2018	Oct. 11, 2018	Radiation (03CH02-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18~40GHz	Oct. 12, 2017	Jun. 23, 2018~ Jun. 24, 2018	Oct. 11, 2018	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Jun. 23, 2018~ Jun. 24, 2018	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jun. 23, 2018~ Jun. 24, 2018	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jun. 23, 2018~ Jun. 24, 2018	NCR	Radiation (03CH02-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 19, 2018	Jun. 28, 2018	Apr. 18, 2019	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2017	Jun. 28, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2017	Jun. 28, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2017	Jun. 28, 2018	Oct. 11, 2018	Conduction (CO01-KS)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.2dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.2dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.7dB

Appendix A. Conducted Test Results

Report Number : FR860402F

Test Engineer:	Silent Hai	Temperature:	21~25	°C
Test Date:	2018/6/23	Relative Humidity:	51~55	%

Report Number : FR860402F

TEST RESULTS DATA
6dB and 26dB EBW and 99% OBW

Band IV									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	6 dB Bandwidth (MHz)	6dB Bandwidth min. Limit (MHz)	Pass/Fail
11a	6M bps	1	149	5745	19.03	24.925	16.344	0.5	Pass
11a	6Mbps	1	157	5785	18.78	23.576	16.364	0.5	Pass
11a	6Mbps	1	165	5825	18.43	23.676	16.344	0.5	Pass
HT20	MCS 0	1	149	5745	19.78	25.075	17.582	0.5	Pass
HT20	MCS 0	1	157	5785	19.53	24.076	17.582	0.5	Pass
HT20	MCS 0	1	165	5825	19.43	24.126	17.582	0.5	Pass
HT40	MCS 0	1	151	5755	37.46	46.663	36.044	0.5	Pass
HT40	MCS 0	1	159	5795	36.76	45.495	35.445	0.5	Pass

Report Number : FR860402F

TEST RESULTS DATA
Average Power Table

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	149	5745	0.60	11.98	30.00	-5.35		Pass
11a	6Mbps	1	157	5785	0.60	11.68	30.00	-5.35		Pass
11a	6Mbps	1	165	5825	0.60	11.91	30.00	-5.35		Pass
HT20	MCS 0	1	149	5745	0.62	11.43	30.00	-5.35		Pass
HT20	MCS 0	1	157	5785	0.62	11.05	30.00	-5.35		Pass
HT20	MCS 0	1	165	5825	0.62	11.58	30.00	-5.35		Pass
HT40	MCS 0	1	151	5755	0.67	11.52	30.00	-5.35		Pass
HT40	MCS 0	1	159	5795	0.67	8.09	30.00	-5.35		Pass

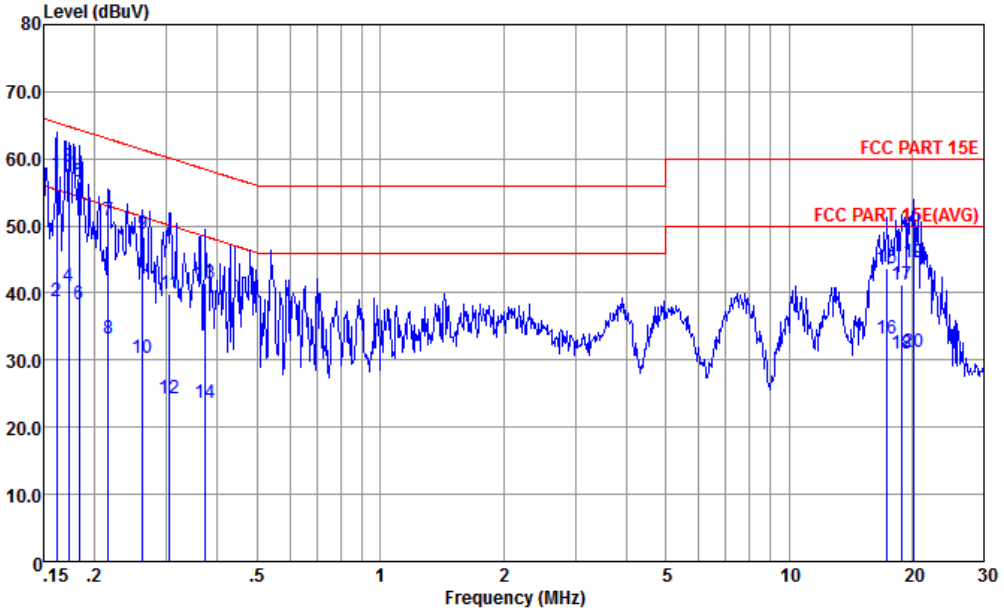
Report Number : FR860402F

TEST RESULTS DATA
Power Spectral Density

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	10log (500kHz /RBW) Factor (dB)	Average Power Density (dBm/500kHz)	Average PSD Limit (dBm/500kHz)	DG (dBi)	Pass/Fail
11a	6M bps	1	149	5745	0.60	2.22	-2.67	30.00	-5.35	Pass
11a	6Mbps	1	157	5785	0.60	2.22	-3.08	30.00	-5.35	Pass
11a	6Mbps	1	165	5825	0.60	2.22	-2.15	30.00	-5.35	Pass
HT20	MCS 0	1	149	5745	0.62	2.22	-3.23	30.00	-5.35	Pass
HT20	MCS 0	1	157	5785	0.62	2.22	-3.92	30.00	-5.35	Pass
HT20	MCS 0	1	165	5825	0.62	2.22	-3.27	30.00	-5.35	Pass
HT40	MCS 0	1	151	5755	0.67	2.22	-6.44	30.00	-5.35	Pass
HT40	MCS 0	1	159	5795	0.67	2.22	-9.71	30.00	-5.35	Pass

Appendix B. AC Conducted Emission Test Results

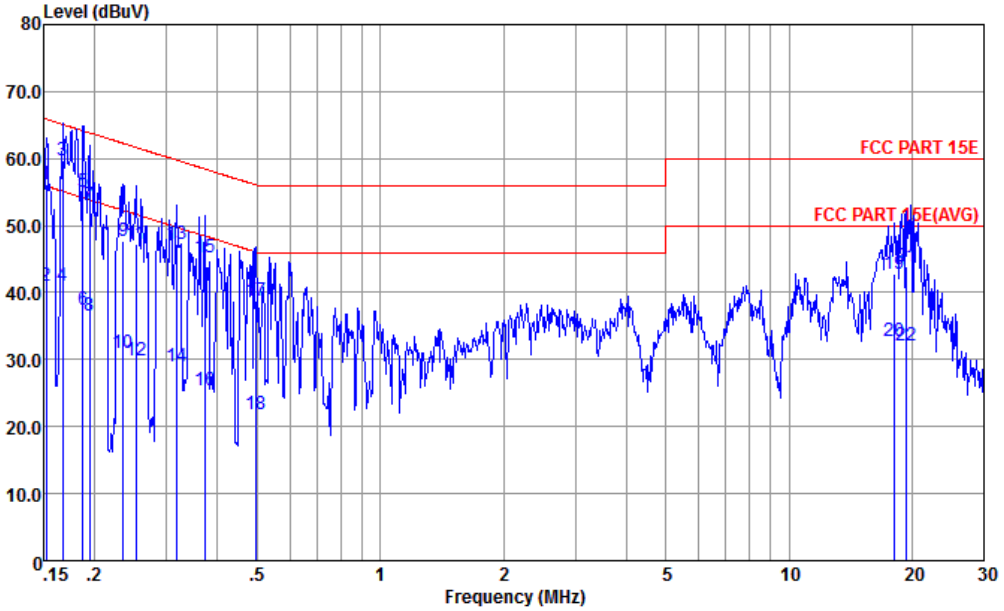
Test Engineer :	Amos Zhang	**Temperature :**	24.7~24.9℃
		Relative Humidity :	44~47%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line



Site : CO01-KS
Condition : FCC PART 15E LISN-L-171013-060103 LINE
Project : (FR) 860402
mode : Mode 1
: 355542090025752/355542090025760 #13

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.162	57.65	-7.73	65.38	46.90	0.17	10.58	QP
2		0.162	38.85	-16.53	55.38	28.10	0.17	10.58	Average
3	*	0.173	58.92	-5.89	64.81	48.20	0.18	10.54	QP
4		0.173	41.02	-13.79	54.81	30.30	0.18	10.54	Average
5		0.183	56.50	-7.83	64.33	45.80	0.19	10.51	QP
6		0.183	38.30	-16.03	54.33	27.60	0.19	10.51	Average
7		0.216	50.86	-12.10	62.96	40.20	0.21	10.45	QP
8		0.216	33.26	-19.70	52.96	22.60	0.21	10.45	Average
9		0.262	48.75	-12.63	61.38	38.09	0.22	10.44	QP
10		0.262	30.25	-21.13	51.38	19.59	0.22	10.44	Average
11		0.305	39.95	-20.15	60.10	29.29	0.23	10.43	QP
12		0.305	24.25	-25.85	50.10	13.59	0.23	10.43	Average
13		0.373	41.55	-16.88	58.43	30.90	0.24	10.41	QP
14		0.373	23.55	-24.88	48.43	12.90	0.24	10.41	Average
15		17.291	43.57	-16.43	60.00	32.91	0.22	10.44	QP
16		17.291	33.27	-16.73	50.00	22.61	0.22	10.44	Average
17		18.920	41.26	-18.74	60.00	30.59	0.20	10.47	QP
18		18.920	30.96	-19.04	50.00	20.29	0.20	10.47	Average
19		20.162	44.57	-15.43	60.00	33.90	0.19	10.48	QP
20		20.162	31.27	-18.73	50.00	20.60	0.19	10.48	Average

Test Engineer :	Amos Zhang	Temperature :	24.7~24.9℃
		Relative Humidity :	44~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : CO01-KS
Condition : FCC PART 15E LISN-N-171013-060103 NEUTRAL
Project : (FR) 860402
mode : Mode 1
: 355542090025752/355542090025760 #13

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.152	56.09	-9.78	65.87	45.20	0.28	10.61	QP
2		0.152	41.09	-14.78	55.87	30.20	0.28	10.61	Average
3	*	0.167	59.74	-5.38	65.12	48.90	0.28	10.56	QP
4		0.167	41.04	-14.08	55.12	30.20	0.28	10.56	Average
5		0.187	54.97	-9.18	64.15	44.20	0.28	10.49	QP
6		0.187	37.37	-16.78	54.15	26.60	0.28	10.49	Average
7		0.194	52.95	-10.89	63.84	42.20	0.28	10.47	QP
8		0.194	36.65	-17.19	53.84	25.90	0.28	10.47	Average
9		0.235	47.63	-14.63	62.26	36.91	0.28	10.44	QP
10		0.235	30.93	-21.33	52.26	20.21	0.28	10.44	Average
11		0.252	47.32	-14.37	61.69	36.60	0.28	10.44	QP
12		0.252	29.92	-21.77	51.69	19.20	0.28	10.44	Average
13		0.317	47.31	-12.49	59.80	36.60	0.29	10.42	QP
14		0.317	28.91	-20.89	49.80	18.20	0.29	10.42	Average
15		0.373	45.20	-13.23	58.43	34.50	0.29	10.41	QP
16		0.373	25.30	-23.13	48.43	14.60	0.29	10.41	Average
17		0.494	38.80	-17.30	56.10	28.20	0.29	10.31	QP
18		0.494	21.80	-24.30	46.10	11.20	0.29	10.31	Average
19		18.135	42.80	-17.20	60.00	32.20	0.14	10.46	QP
20		18.135	32.70	-17.30	50.00	22.10	0.14	10.46	Average
21		19.326	43.79	-16.21	60.00	33.20	0.12	10.47	QP
22		19.326	32.19	-17.81	50.00	21.60	0.12	10.47	Average

Appendix C. Radiated Spurious Emission

Band 4 - 5725~5850MHz

WIFI 802.11a (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)
802.11a CH 149 5745MHz		5620	51.4	-16.9	68.3	41.01	35.01	8.56	33.18	276	21	P	H
		5676	52.54	-35.04	87.58	42.17	34.97	8.57	33.17	276	21	P	H
		5719.2	54.18	-56.5	110.68	43.85	34.92	8.58	33.17	276	21	P	H
		5724.8	70.4	-51.44	121.84	60.07	34.92	8.58	33.17	276	21	P	H
		5742	93.08	-	-	82.75	34.91	8.59	33.17	276	21	P	H
		5742	85.29	-	-	74.96	34.91	8.59	33.17	276	21	A	H
		5629.6	51.8	-16.5	68.3	41.41	35.01	8.56	33.18	265	345	P	V
		5651.2	53.01	-16.18	69.19	42.63	34.98	8.57	33.17	265	345	P	V
		5719.2	55.81	-54.87	110.68	45.48	34.92	8.58	33.17	265	345	P	V
		5724.8	65.82	-56.02	121.84	55.49	34.92	8.58	33.17	265	345	P	V
		5742	98.14	-	-	87.81	34.91	8.59	33.17	265	345	P	V
		5742	90.02	-	-	79.69	34.91	8.59	33.17	265	345	A	V

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)
802.11a CH 165 5825MHz		5828	92.26	-	-	81.99	34.83	8.61	33.17	315	33	P	H
		5828	84.49	-	-	74.22	34.83	8.61	33.17	315	33	A	H
		5853.2	55.23	-59.77	115	44.97	34.82	8.61	33.17	315	33	P	H
		5869.6	51.94	-54.87	106.81	41.69	34.8	8.62	33.17	315	33	P	H
		5923.6	52.2	-17.13	69.33	41.95	34.81	8.64	33.2	315	33	P	H
		5946	52.73	-15.57	68.3	42.49	34.81	8.64	33.21	315	33	P	H
		5832	97.2	-	-	86.93	34.83	8.61	33.17	265	316	P	V
		5832	89.36	-	-	79.09	34.83	8.61	33.17	265	316	A	V
		5850.4	56.74	-64.65	121.39	46.48	34.82	8.61	33.17	265	316	P	V
		5861.2	52.68	-56.48	109.16	42.43	34.8	8.62	33.17	265	316	P	V
		5922.8	52.38	-17.54	69.92	42.13	34.81	8.64	33.2	265	316	P	V
		5935.2	52.46	-15.84	68.3	42.21	34.81	8.64	33.2	265	316	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11a (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)
802.11a CH 149 5745MHz		11490	46.34	-27.66	74	59.49	39.29	12.91	65.35	100	360	P	H
		11490	46.26	-27.74	74	59.41	39.29	12.91	65.35	100	360	P	V
802.11a CH 157 5785MHz		11570	47.05	-26.95	74	60.28	39.37	12.84	65.44	100	360	P	H
		11570	45.55	-28.45	74	58.78	39.37	12.84	65.44	100	360	P	V
802.11a CH 165 5825MHz		11650	46.1	-27.9	74	59.42	39.44	12.78	65.54	100	360	P	H
		11650	45.83	-28.17	74	59.15	39.44	12.78	65.54	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		5643.2	51.74	-16.56	68.3	41.35	35	8.56	33.17	313	12	P	H
		5659.2	52.4	-22.73	75.13	42.02	34.98	8.57	33.17	313	12	P	H
		5715.2	60.96	-48.6	109.56	50.61	34.94	8.58	33.17	313	12	P	H
		5720.01	59.92	-51	110.92	49.59	34.92	8.58	33.17	313	12	P	H
		5744	87.83	-	-	77.5	34.91	8.59	33.17	313	12	P	H
		5744	80.27	-	-	69.94	34.91	8.59	33.17	313	12	A	H
		5648.4	52.25	-16.05	68.3	41.86	35	8.56	33.17	333	5	P	V
		5678.8	52.21	-37.44	89.65	41.84	34.97	8.57	33.17	333	5	P	V
		5716.4	65.5	-44.39	109.89	55.15	34.94	8.58	33.17	333	5	P	V
		5724.8	63.23	-58.61	121.84	52.9	34.92	8.58	33.17	333	5	P	V
		5758	91.74	-	-	81.43	34.89	8.59	33.17	333	5	P	V
		5758	84.28	-	-	73.97	34.89	8.59	33.17	333	5	A	V

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 165 5825MHz		5780	84.23	-	-	73.92	34.88	8.6	33.17	308	11	P	H
		5780	76.89	-	-	66.58	34.88	8.6	33.17	308	11	A	H
		5850	50.89	-71.41	122.3	40.63	34.82	8.61	33.17	308	11	P	H
		5858.8	51.4	-58.43	109.83	41.15	34.8	8.62	33.17	308	11	P	H
		5881.2	51.49	-49.2	100.69	41.25	34.8	8.62	33.18	308	11	P	H
		5926	51.54	-16.76	68.3	41.29	34.81	8.64	33.2	308	11	P	H
		5804	89.98	-	-	79.7	34.85	8.6	33.17	289	347	P	V
		5804	82.13	-	-	71.85	34.85	8.6	33.17	289	347	A	V
		5850.4	50.69	-70.7	121.39	40.43	34.82	8.61	33.17	289	347	P	V
		5870.8	50.94	-55.53	106.47	40.7	34.8	8.62	33.18	289	347	P	V
		5904.8	51.9	-31.31	83.21	41.65	34.81	8.63	33.19	289	347	P	V
		5960.8	51.75	-16.55	68.3	41.51	34.81	8.65	33.22	289	347	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

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 149 5745MHz		11490	46.67	-27.33	74	59.82	39.29	12.91	65.35	100	360	P	H
		11490	45.85	-28.15	74	59	39.29	12.91	65.35	100	360	P	V
802.11n HT20 CH 157 5785MHz		11570	45.57	-28.43	74	58.8	39.37	12.84	65.44	100	360	P	H
		11570	45.75	-28.25	74	58.98	39.37	12.84	65.44	100	360	P	V
802.11n HT20 CH 165 5825MHz		11650	46.32	-27.68	74	59.64	39.44	12.78	65.54	100	360	P	H
		11650	45	-29	74	58.32	39.44	12.78	65.54	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

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)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		5642.4	52.97	-15.33	68.3	42.58	35	8.56	33.17	300	0	P	H
		5696.8	53.84	-49.1	102.94	43.49	34.95	8.57	33.17	300	0	P	H
		5716	63.64	-46.14	109.78	53.29	34.94	8.58	33.17	300	0	P	H
		5724.8	62.71	-59.13	121.84	52.38	34.92	8.58	33.17	300	0	P	H
		5752	88.59	-	-	78.28	34.89	8.59	33.17	300	0	P	H
		5752	81.01	-	-	70.7	34.89	8.59	33.17	300	0	A	H
		5854.8	50.75	-60.61	111.36	40.5	34.8	8.62	33.17	300	0	P	H
		5856.8	51.47	-58.93	110.4	41.22	34.8	8.62	33.17	300	0	P	H
		5895.2	53.23	-37.08	90.31	42.98	34.8	8.63	33.18	300	0	P	H
		5953.2	52.32	-15.98	68.3	42.08	34.81	8.64	33.21	300	0	P	H
		5608.4	51.63	-16.67	68.3	41.23	35.03	8.55	33.18	144	0	P	V
		5699.2	54.03	-50.68	104.71	43.68	34.95	8.57	33.17	144	0	P	V
		5717.2	66.39	-43.73	110.12	56.04	34.94	8.58	33.17	144	0	P	V
		5723.2	69.23	-48.97	118.2	58.9	34.92	8.58	33.17	144	0	P	V
		5766	93.8	-	-	83.49	34.89	8.59	33.17	144	0	P	V
		5766	85.98	-	-	75.67	34.89	8.59	33.17	144	0	A	V
		5854	51.71	-61.47	113.18	41.46	34.8	8.62	33.17	144	0	P	V
		5870.8	50.97	-55.5	106.47	40.73	34.8	8.62	33.18	144	0	P	V
		5905.6	52.57	-30.05	82.62	42.32	34.81	8.63	33.19	144	0	P	V
		5978.4	53.19	-15.11	68.3	42.96	34.81	8.65	33.23	144	0	P	V

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 HT40 CH 159 5795MHz		5642.8	51.9	-16.4	68.3	41.51	35	8.56	33.17	351	34	P	H
		5674.4	52.17	-34.23	86.4	41.8	34.97	8.57	33.17	351	34	P	H
		5712	52.39	-56.27	108.66	42.04	34.94	8.58	33.17	351	34	P	H
		5724.4	51.39	-69.54	120.93	41.06	34.92	8.58	33.17	351	34	P	H
		5810	85.9	-	-	75.62	34.85	8.6	33.17	351	34	P	H
		5810	77.62	-	-	67.34	34.85	8.6	33.17	351	34	A	H
		5851.2	50.49	-69.07	119.56	40.23	34.82	8.61	33.17	351	34	P	H
		5867.2	51.32	-56.16	107.48	41.07	34.8	8.62	33.17	351	34	P	H
		5916.4	53.26	-21.38	74.64	43.01	34.81	8.63	33.19	351	34	P	H
		5928.4	51.97	-16.33	68.3	41.72	34.81	8.64	33.2	351	34	P	H
		5600	52.47	-15.83	68.3	42.07	35.03	8.55	33.18	100	338	P	V
		5686.4	51.67	-43.6	95.27	41.32	34.95	8.57	33.17	100	338	P	V
		5718	51.53	-58.81	110.34	41.2	34.92	8.58	33.17	100	338	P	V
		5721.2	51.62	-62.02	113.64	41.29	34.92	8.58	33.17	100	338	P	V
		5804	89.46	-	-	79.18	34.85	8.6	33.17	100	338	P	V
		5804	81.72	-	-	71.44	34.85	8.6	33.17	100	338	A	V
		5854.8	50.81	-60.55	111.36	40.56	34.8	8.62	33.17	100	338	P	V
		5862	52.39	-56.55	108.94	42.14	34.8	8.62	33.17	100	338	P	V
		5876.8	52.17	-51.79	103.96	41.93	34.8	8.62	33.18	100	338	P	V
		5962.4	52.78	-15.52	68.3	42.54	34.81	8.65	33.22	100	338	P	V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

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 HT40 CH 151 5755MHz		11510	46.44	-27.56	74	59.58	39.3	12.9	65.34	100	360	P	H
		11510	46.4	-27.6	74	59.54	39.3	12.9	65.34	100	360	P	V
802.11n HT40 CH 159 5795MHz		11590	47.55	-26.45	74	60.81	39.39	12.82	65.47	100	360	P	H
		11590	46.69	-27.31	74	59.95	39.39	12.82	65.47	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF @ 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)
5GHz 802.11n HT40 LF		30.97	27.46	-12.54	40	33.31	24.65	0.58	31.08	100	69	P	H
		52.31	19.68	-20.32	40	36.76	13.64	0.78	31.5			P	H
		165.8	21.93	-21.57	43.5	35.56	15.93	1.4	30.96			P	H
		212.36	24.05	-19.45	43.5	38.48	15.12	1.57	31.12			P	H
		639.16	28.67	-17.33	46	30.7	25.91	2.85	30.79			P	H
		829.28	31.28	-14.72	46	30.55	28.5	3.22	30.99			P	H
		30	35.18	-4.82	40	40.51	25.2	0.57	31.1	200	214	P	V
		259.89	19.43	-26.57	46	28.93	20	1.76	31.26			P	V
		351.07	20.18	-25.82	46	29.21	20.43	2.04	31.5			P	V
		581.93	26.37	-19.63	46	29.93	25.27	2.67	31.5			P	V
		650.8	28.73	-17.27	46	30.45	26	2.89	30.61			P	V
		853.53	30.23	-15.77	46	29.48	28.67	3.27	31.19			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 **not under limit 6dB**.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

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

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

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

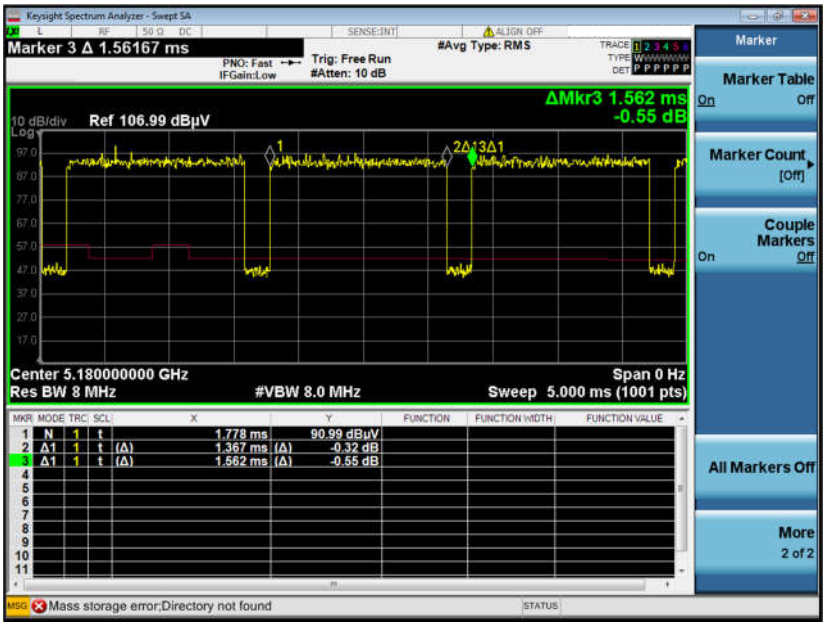
= -10.46(dB)

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

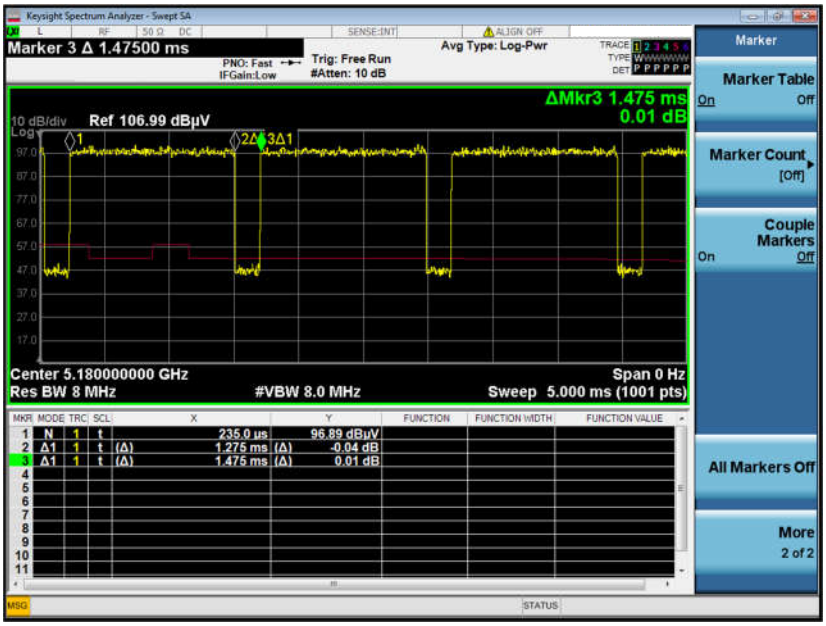
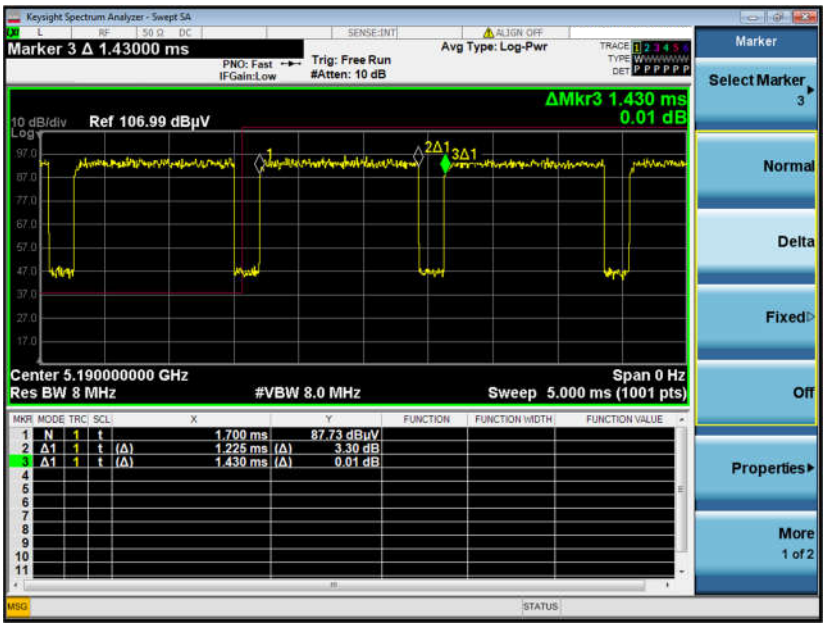
Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	87.52	1.367	0.732	0.75KHz
802.11 HT20	86.44	1.275	0.784	0.82KHz
802.11 HT40	85.66	1.225	0.816	0.82KHz

802.11a



802.11HT20



802.11HT40