FCC RF Test Report

APPLICANT	:	**Motorola Mobility LLC**
EQUIPMENT	:	**Mobile Cellular Phone**
BRAND NAME	:	**Motorola**
MODEL NAME	:	**XT1924-6,XT1924-8**
FCC ID	:	**IHDT56XA1**
STANDARD	:	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	:	**(NII) Unlicensed National Information Infrastructure**

The product was received on Dec. 29, 2017 and testing was completed on Jan. 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.

This report contains data that were produced under subcontract by Laboratory SPORTON INTERNATIONAL INC.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

James Huang

NVLAP® TESTING
NVLAP LAB CODE 600155-0

Approved by: James Huang / Manager

Sporton International (Kunshan) Inc.
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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR7D2903-01E	Rev. 01	Initial issue of report	Feb. 14, 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 9.87 dB at 39.990 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 10.58 dB at 0.202 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	XT1924-6,XT1924-8
FCC ID	IHDT56XA1
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/CDMA/EV-DO/HSPA/DC-HSDPA /HSPA+(16QAM uplink is not supported)/ LTE/ WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/ HT40 Bluetooth v3.0 + EDR/ Bluetooth v 4.0 LE Bluetooth v4.1 LE/ Bluetooth v4.2 LE
IMEI Code	Conducted: 351892090018859 Conduction: 351892090020962 Radiation: 351892090021226
HW Version	DVT 1B
SW Version	hannah-userdebug 8.0.0 OPP27.66 1466 intcfg,test-keys
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	802.11a : 16.28 dBm / 0.0425 W 802.11n HT20 : 14.89 dBm / 0.0308 W 802.11n HT40 : 15.14 dBm / 0.0327 W
99% Occupied Bandwidth	802.11a : 18.53 MHz 802.11n HT20 : 19.23 MHz 802.11n HT40 : 36.76 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
Antenna Type / Gain	IFA Antenna with gain -3.1 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	**Brand Name**	Motorola (Salom)	**Model Name**	SPN5970A SC-22
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5 Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 2	**Brand Name**	Motorola (Chenyang)	**Model Name**	SPN5993A SC-22
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5 Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
Earphone	**Brand Name**	Motorola (NEW Leaders)	**Model Name**	NLD-EM300V-01SF
	Signal Line	1.25 meter, non-shielded cable, without ferrite core		
Battery	**Brand Name**	Motorola (Amperex)	**Model Name**	HE50
	Power Rating	3.8Vdc,4850/5000mAh	**Type**	Li-ion
USB Cable (Black/White)	**Brand Name**	Motorola (SaiBao)	**Model Name**	SLQ-A081A
	Signal Line	1.02 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	630927

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	03CH10-HY

Note:

1. The test site complies with ANSI C63.4 2014 requirement.
2. Test data subcontracted: radiated spurious emissions for section 3.4 of this report.

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

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5745-5825 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	-	-	165	5825

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

2.2 Test Mode

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

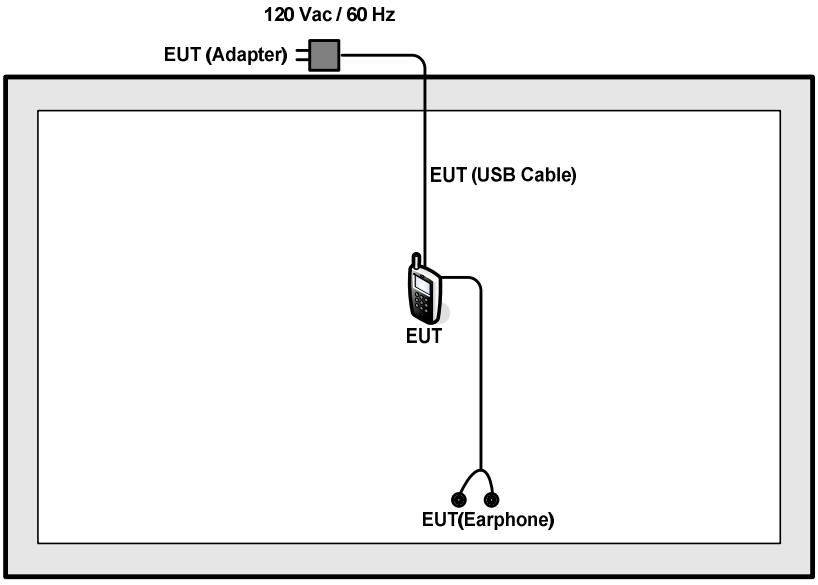
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

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

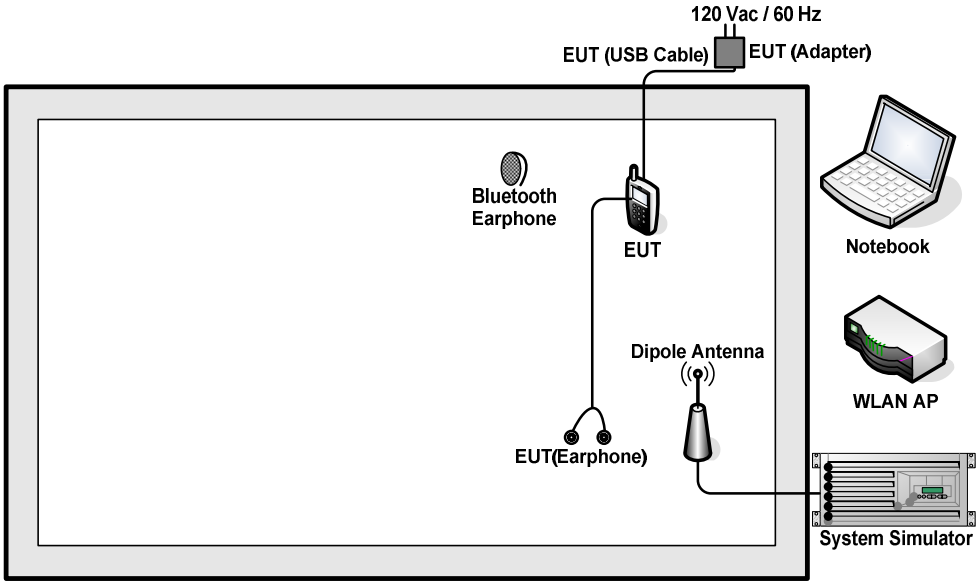
Ch. #		Band IV：5745-5825 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
3.	WLAN AP	Cisco	Air-CAP3702E-A-K9	LDK102087	N/A	Unshielded, 1.8 m
4.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
5.	Notebook	Lenovo	Edge E335	PPD-AR5B95	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
6.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
7.	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 continuously transmit/receive.

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

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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 6.5 dB.

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

= 6.5 (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.

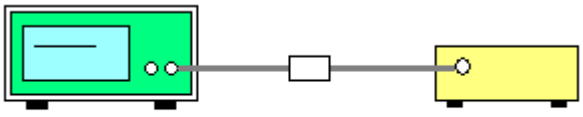
3.1.2 Measuring Instruments

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.

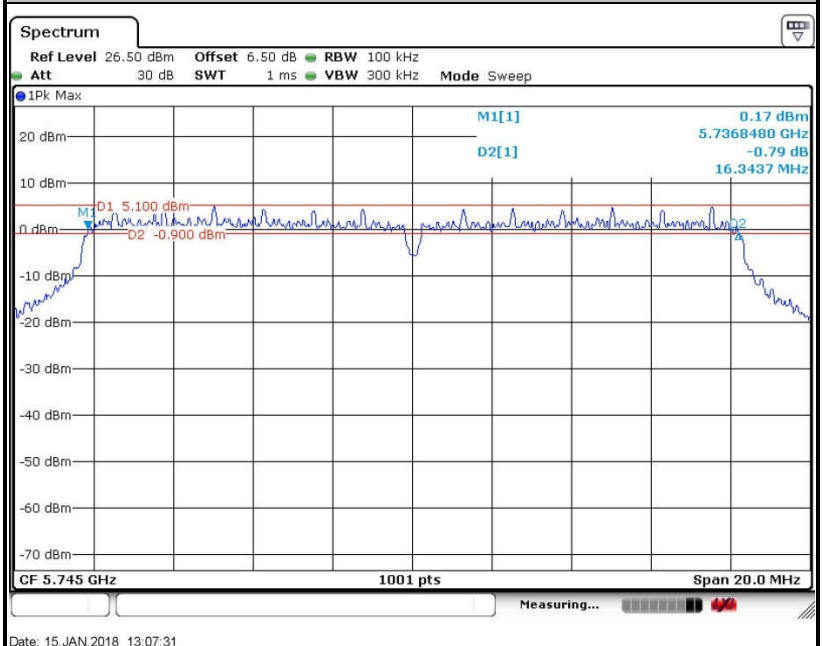
3.1.4 Test Setup



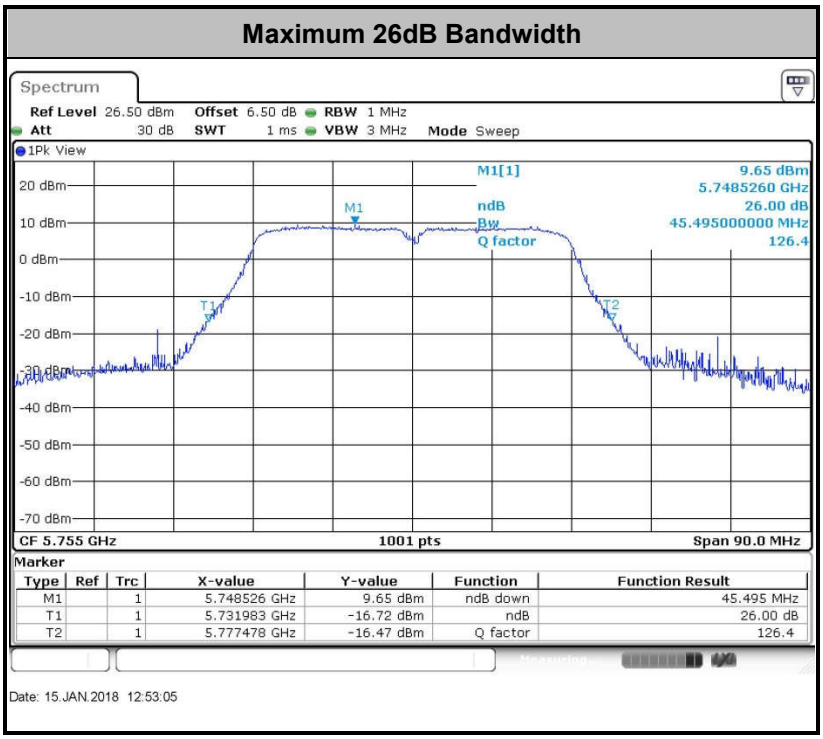
3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

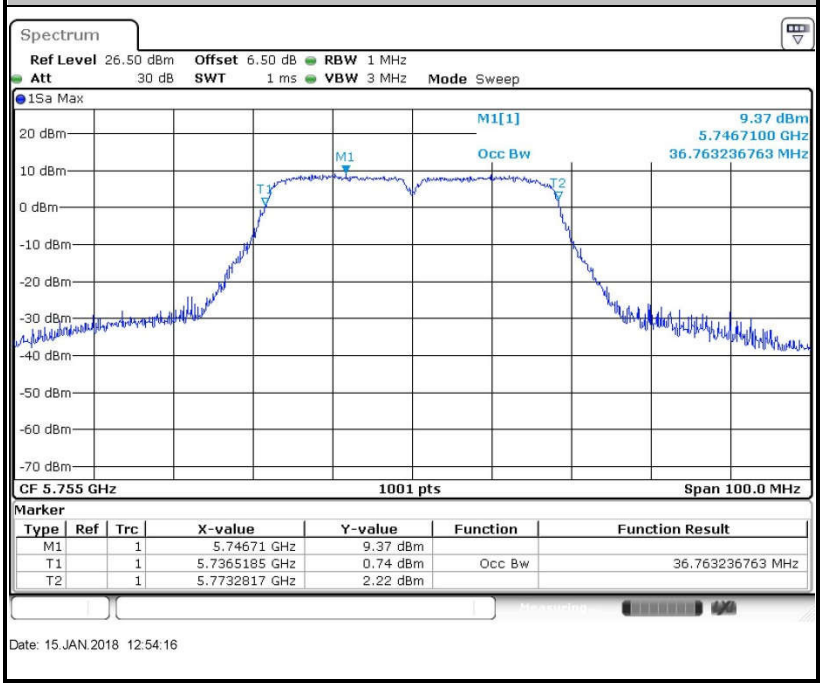
Minimum 6dB Bandwidth



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.

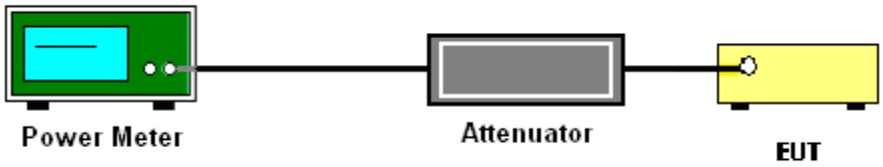
3.2.3 Test Procedures

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.

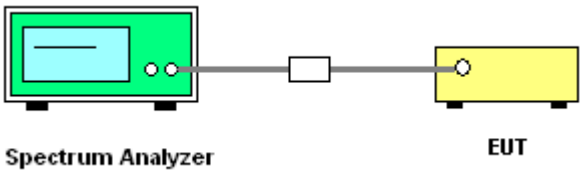
 # Method SA-2 #

(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.

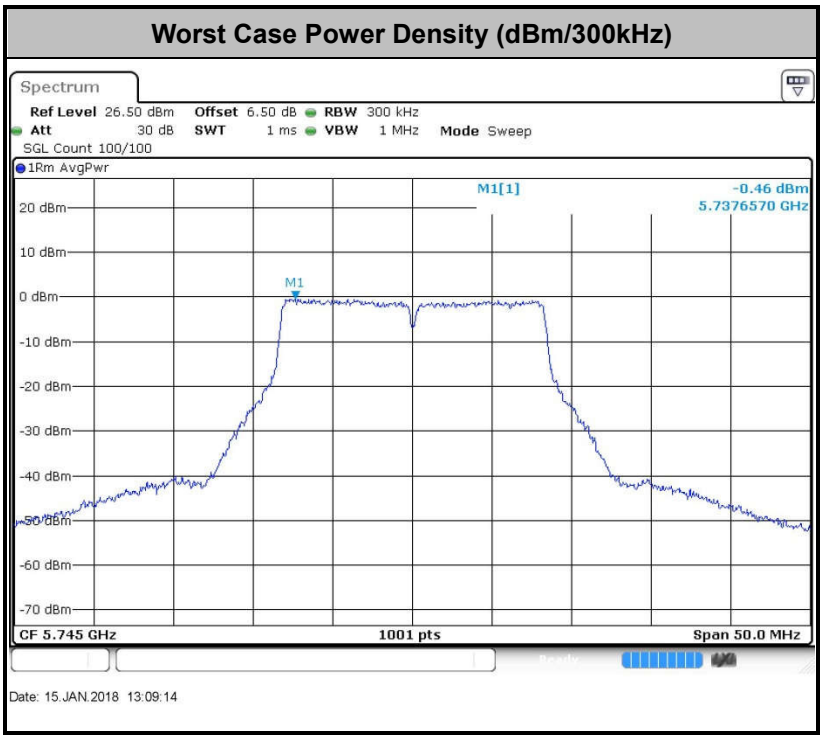
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/300kHz)



3.4 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

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 per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 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

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

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

(3) KDB789033 D02 v01r04 G)2)c)

(i) Section 15.407(b)(1) to (b)(3) specify the unwanted emission limits for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.[3]

(ii) Section 15.407(b)(4) specifies the unwanted emission limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are in terms of a Peak detector. An alternative to the band emissions mask is specified in Section 15.407(b)(4)(ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the devices using the alternative limit.[4]

Note 3: An out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz peak emission limit.

Note 4: Only devices with antenna gains of 10 dBi or less may be approved using the emission limits specified in Section 15.247(d) till March 2, 2018; all other devices operating in this band must use the mask specified in Section 15.407(b)(4)(i).

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

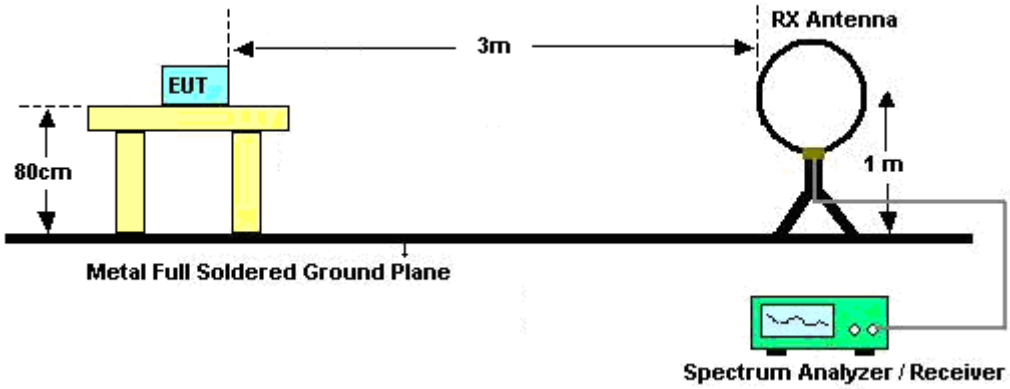
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - 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.

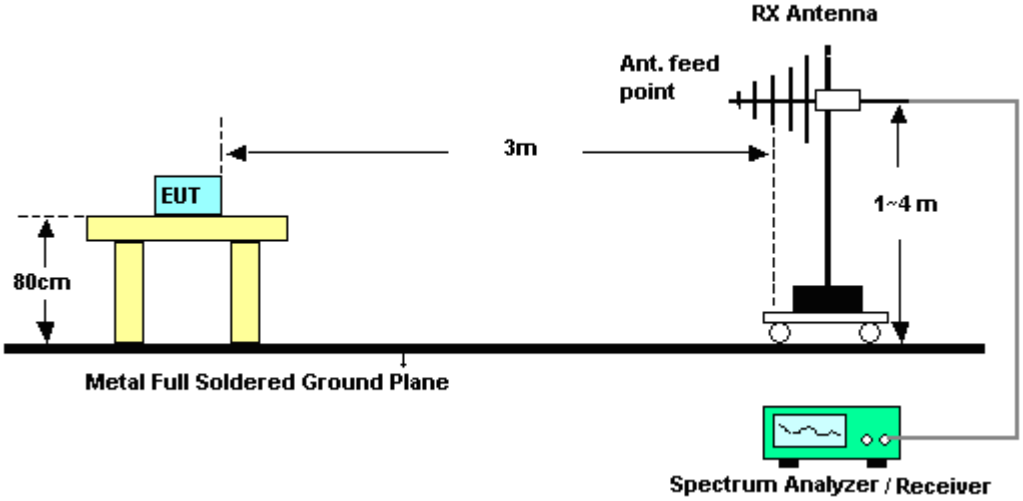
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband 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

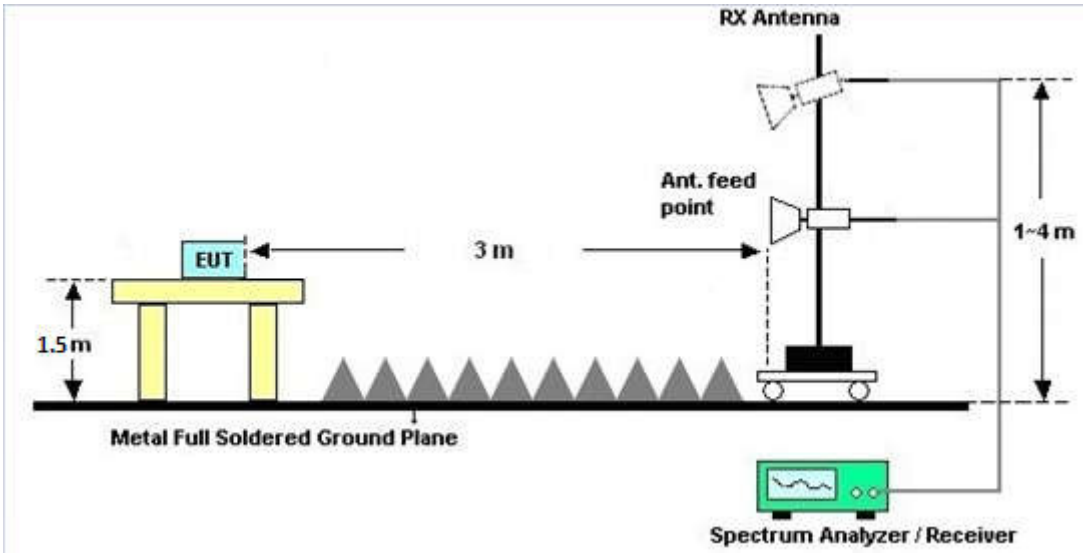
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated 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 per 15.31(o) was not reported.

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.4.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix B.

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.

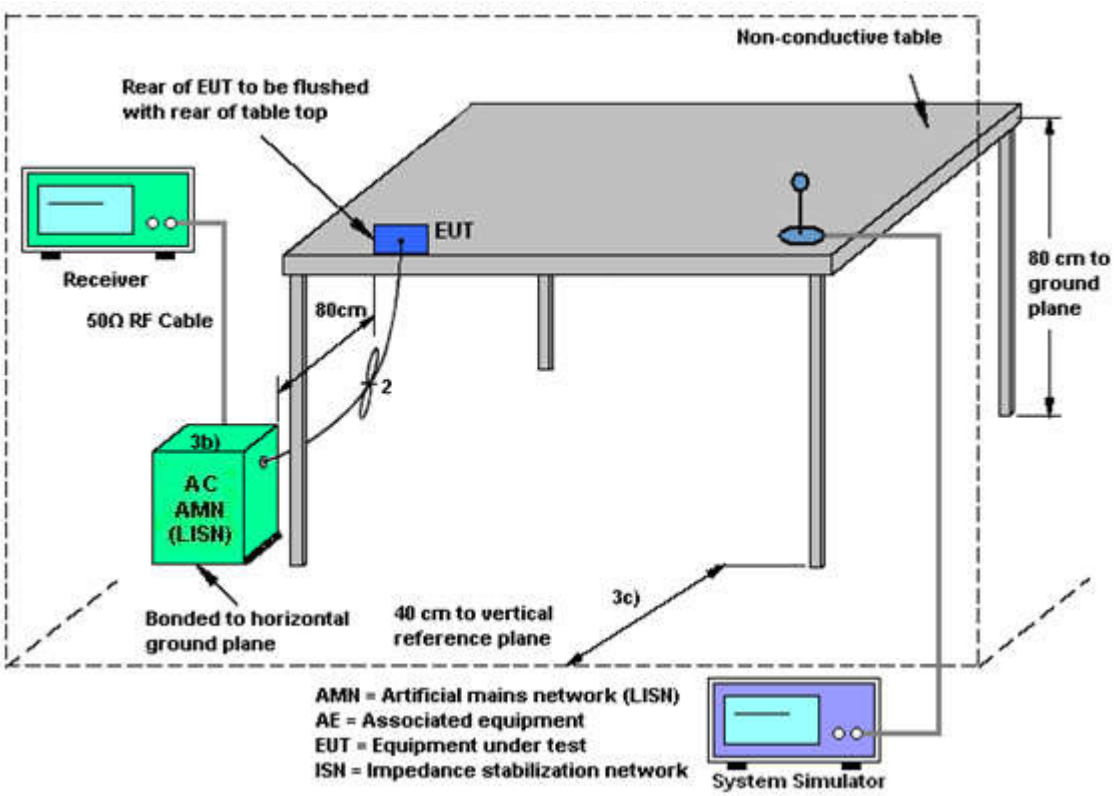
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

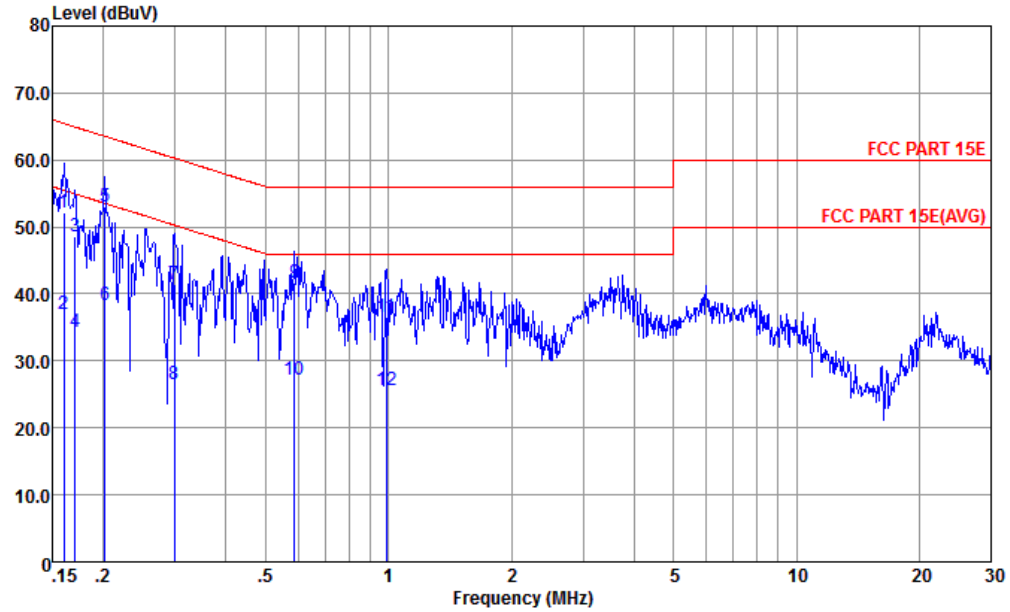
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.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

Test Mode :	Mode 1	**Temperature :**	22~24℃
Test Engineer :	Amos Zhang	**Relative Humidity :**	43~46%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link (5G) + USB Cable (Charging from Adapter 1) + Earphone		

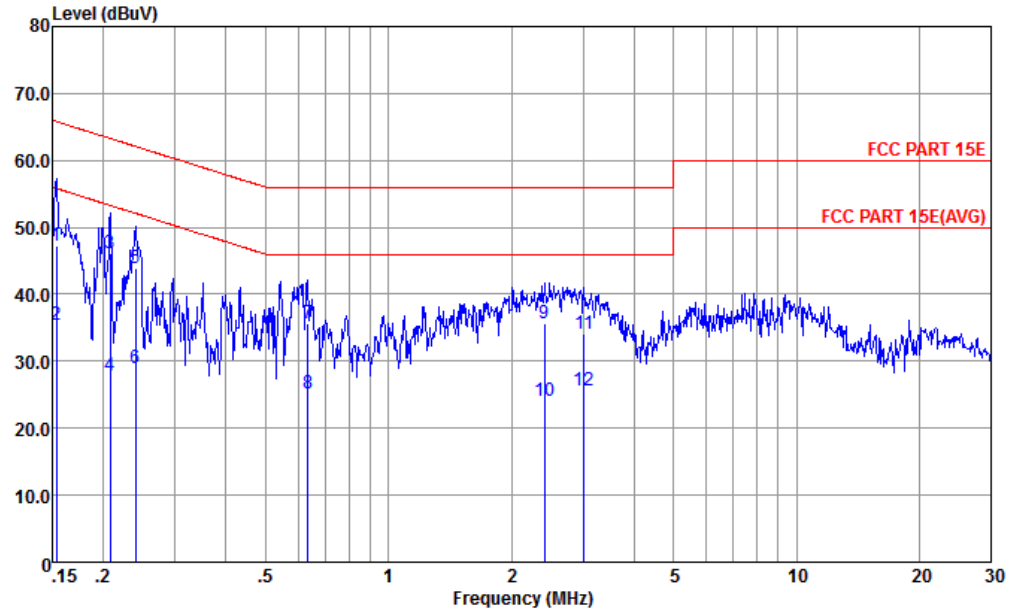


Site : CO01-KS
Condition : FCC PART 15E LISN-L-171013-060103 LINE

mode : Mode 1
: 351892090020962 #8

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.160	52.25	-13.22	65.47	41.50	0.17	10.58	QP
2		0.160	36.95	-18.52	55.47	26.20	0.17	10.58	Average
3		0.170	48.53	-16.41	64.94	37.80	0.18	10.55	QP
4		0.170	34.33	-20.61	54.94	23.60	0.18	10.55	Average
5	*	0.202	52.96	-10.58	63.54	42.31	0.20	10.45	QP
6		0.202	38.26	-15.28	53.54	27.61	0.20	10.45	Average
7		0.299	41.45	-18.83	60.28	30.79	0.23	10.43	QP
8		0.299	26.45	-23.83	50.28	15.79	0.23	10.43	Average
9		0.589	41.70	-14.30	56.00	31.20	0.26	10.24	QP
10		0.589	27.10	-18.90	46.00	16.60	0.26	10.24	Average
11		0.989	36.57	-19.43	56.00	26.20	0.26	10.11	QP
12		0.989	25.57	-20.43	46.00	15.20	0.26	10.11	Average

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	43~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link (5G) + USB Cable (Charging from Adapter 1) + Earphone		



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

mode : Mode 1
: 351892090020962 #8

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.153	47.19	-18.63	65.82	36.30	0.28	10.61	QP
2	0.153	35.39	-20.43	55.82	24.50	0.28	10.61	Average
3 *	0.208	46.23	-17.04	63.27	35.50	0.28	10.45	QP
4	0.208	27.93	-25.34	53.27	17.20	0.28	10.45	Average
5	0.240	43.92	-18.16	62.08	33.20	0.28	10.44	QP
6	0.240	28.92	-23.16	52.08	18.20	0.28	10.44	Average
7	0.634	35.70	-20.30	56.00	25.20	0.30	10.20	QP
8	0.634	25.10	-20.90	46.00	14.60	0.30	10.20	Average
9	2.409	35.72	-20.28	56.00	25.20	0.32	10.20	QP
10	2.409	24.02	-21.98	46.00	13.50	0.32	10.20	Average
11	3.009	34.11	-21.89	56.00	23.59	0.33	10.19	QP
12	3.009	25.71	-20.29	46.00	15.19	0.33	10.19	Average

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

According to FCC 47 CFR Section 15.407(a)(1)(2) ,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 gain 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	Jan. 09, 2018~ Jan. 15, 2018	Aug. 07, 2018	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 19, 2017	Jan. 09, 2018~ Jan. 15, 2018	Jan. 18, 2018	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 19, 2017	Jan. 09, 2018~ Jan. 15, 2018	Jan. 18, 2018	Conducted (TH01-KS)
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Oct. 19, 2017	Jan. 09, 2018~ Jan. 28, 2018	Oct. 18, 2018	Radiation (03CH10-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Jan. 09, 2018~ Jan. 28, 2018	Jul. 17, 2018	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35413&02	30MHz~1GHz	Dec. 18, 2017	Jan. 09, 2018~ Jan. 28, 2018	Dec. 17, 2018	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Sep. 27, 2017	Jan. 09, 2018~ Jan. 28, 2018	Sep. 26, 2018	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY53270078	1GHz~26.5GHz	Oct. 25, 2017	Jan. 09, 2018~ Jan. 28, 2018	Oct. 24, 2018	Radiation (03CH10-HY)
Preamplifier	Jet-Power	JAP00101800-30-10P	160118550004	1GHz~18GHz	Apr. 13, 2017	Jan. 09, 2018~ Jan. 28, 2018	Apr. 12, 2018	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHz	Oct. 31, 2017	Jan. 09, 2018~ Jan. 28, 2018	Oct. 30, 2018	Radiation (03CH10-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Jan. 09, 2018~ Jan. 28, 2018	N/A	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Jan. 09, 2018~ Jan. 28, 2018	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	Jan. 09, 2018~ Jan. 28, 2018	N/A	Radiation (03CH10-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	Jan. 09, 2018~ Jan. 28, 2018	Nov. 22, 2019	Radiation (03CH10-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz to 26.5GHz	Jan. 18, 2017 Jan. 16, 2018	Jan. 09, 2018~ Jan. 28, 2018	Jan. 17, 2018 Jan. 15, 2019	Radiation (03CH10-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 27, 2017	Jan. 09, 2018~ Jan. 28, 2018	Nov. 26, 2018	Radiation (03CH10-HY)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 20, 2017	Jan. 08, 2018	Apr. 19, 2018	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2017	Jan. 08, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2017	Jan. 08, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2017	Jan. 08, 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))	**2.3dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.6dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.9dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.2dB**

Appendix A. Conducted Test Results

Report Number : FR7D2903-01E

Test Engineer:	Silent Hai	Temperature:	21~25	°C
Test Date:	2018/1/9~2018/1/15	Relative Humidity:	51~55	%

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	18.53	23.73	16.34	0.5	Pass
11a	6Mbps	1	157	5785	18.53	23.58	16.34	0.5	Pass
11a	6Mbps	1	165	5825	18.43	23.38	16.34	0.5	Pass
HT20	MCS 0	1	149	5745	19.23	23.98	17.58	0.5	Pass
HT20	MCS 0	1	157	5785	19.23	23.78	17.58	0.5	Pass
HT20	MCS 0	1	165	5825	19.23	23.48	17.56	0.5	Pass
HT40	MCS 0	1	151	5755	36.76	45.50	35.44	0.5	Pass
HT40	MCS 0	1	159	5795	36.76	44.96	35.64	0.5	Pass

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	0.57	16.28	30.00	-3.10		Pass
11a	6Mbps	1	157	5785	0.57	15.19	30.00	-3.10		Pass
11a	6Mbps	1	165	5825	0.57	14.96	30.00	-3.10		Pass
HT20	MCS 0	1	149	5745	0.65	14.89	30.00	-3.10		Pass
HT20	MCS 0	1	157	5785	0.65	13.92	30.00	-3.10		Pass
HT20	MCS 0	1	165	5825	0.65	13.78	30.00	-3.10		Pass
HT40	MCS 0	1	151	5755	0.65	15.14	30.00	-3.10		Pass
HT40	MCS 0	1	159	5795	0.65	14.96	30.00	-3.10		Pass

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	0.57	2.22	2.33	30.00	-3.10	Pass
11a	6Mbps	1	157	5785	0.57	2.22	1.26	30.00	-3.10	Pass
11a	6Mbps	1	165	5825	0.57	2.22	1.23	30.00	-3.10	Pass
HT20	MCS 0	1	149	5745	0.65	2.22	0.48	30.00	-3.10	Pass
HT20	MCS 0	1	157	5785	0.65	2.22	-0.36	30.00	-3.10	Pass
HT20	MCS 0	1	165	5825	0.65	2.22	-0.14	30.00	-3.10	Pass
HT40	MCS 0	1	151	5755	0.65	2.22	-1.92	30.00	-3.10	Pass
HT40	MCS 0	1	159	5795	0.65	2.22	-1.80	30.00	-3.10	Pass

Appendix B. Radiated Spurious Emission

Test Engineer :	Daniel、Yun、JC	**Temperature :**	23°C
		Relative Humidity :	53%

Band 4 - 5725~5850MHz

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)
802.11a CH 149 5745MHz		5640.2	48.83	-19.37	68.2	40.44	32.24	8.7	32.55	100	304	P	H
		5691.8	51.53	-47.62	99.15	42.92	32.29	8.89	32.57	100	304	P	H
		5715.6	55.97	-53.6	109.57	47.29	32.31	8.95	32.58	100	304	P	H
		5724	64.09	-55.83	119.92	55.34	32.32	9.01	32.58	100	304	P	H
	*	5745	108.81	-	-	99.99	32.34	9.07	32.59	100	304	P	H
	*	5745	100.78	-	-	91.96	32.34	9.07	32.59	100	304	A	H
		5631.8	47.5	-20.7	68.2	39.13	32.22	8.7	32.55	302	64	P	V
		5692.8	48.25	-51.64	99.89	39.64	32.29	8.89	32.57	302	64	P	V
		5716.6	50.55	-59.3	109.85	41.87	32.31	8.95	32.58	302	64	P	V
		5723.8	60.6	-58.86	119.46	51.85	32.32	9.01	32.58	302	64	P	V
	*	5745	105.66	-	-	96.84	32.34	9.07	32.59	302	64	P	V
	*	5745	98.16	-	-	89.34	32.34	9.07	32.59	302	64	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 157 5785MHz		5611.6	47.36	-20.84	68.2	39.06	32.2	8.64	32.54	100	305	P	H
		5662.2	47.34	-29.92	77.26	38.87	32.26	8.77	32.56	100	305	P	H
		5717.8	49.18	-61	110.18	40.43	32.32	9.01	32.58	100	305	P	H
		5720.6	47.41	-64.76	112.17	38.66	32.32	9.01	32.58	100	305	P	H
	*	5785	109.07	-	-	100.1	32.38	9.2	32.61	100	305	P	H
	*	5785	101.38	-	-	92.41	32.38	9.2	32.61	100	305	A	H
		5852	47.75	-69.89	117.64	38.78	32.44	9.16	32.63	100	305	P	H
		5871.6	48.74	-57.41	106.15	39.77	32.48	9.13	32.64	100	305	P	H
		5917	48.64	-25.46	74.1	39.74	32.51	9.04	32.65	100	305	P	H
		5945	48.61	-19.59	68.2	39.71	32.55	9.01	32.66	100	305	P	H
		5649.8	47.8	-20.4	68.2	39.32	32.26	8.77	32.55	314	60	P	V
		5673.8	47.81	-38.04	85.85	39.27	32.27	8.83	32.56	314	60	P	V
		5717.6	47.56	-62.57	110.13	38.81	32.32	9.01	32.58	314	60	P	V
		5723.4	47.46	-71.09	118.55	38.71	32.32	9.01	32.58	314	60	P	V
	*	5785	106.59	-	-	97.62	32.38	9.2	32.61	314	60	P	V
	*	5785	99.01	-	-	90.04	32.38	9.2	32.61	314	60	A	V
		5851.6	47.96	-70.59	118.55	38.99	32.44	9.16	32.63	314	60	P	V
		5873.8	48.64	-56.9	105.54	39.67	32.48	9.13	32.64	314	60	P	V
		5878.2	50.13	-52.69	102.82	41.16	32.48	9.13	32.64	314	60	P	V
		5929	48.72	-19.48	68.2	39.8	32.53	9.04	32.65	314	60	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)
802.11a CH 165 5825MHz	*	5825	109.72	-	-	100.68	32.43	9.23	32.62	100	306	P	H
	*	5825	102.27	-	-	93.23	32.43	9.23	32.62	100	306	A	H
		5852.8	52.32	-63.5	115.82	43.35	32.44	9.16	32.63	100	306	P	H
		5861.2	48.84	-60.22	109.06	39.86	32.46	9.16	32.64	100	306	P	H
		5877.2	51.93	-51.64	103.57	42.96	32.48	9.13	32.64	100	306	P	H
		5927.8	48.77	-19.43	68.2	39.85	32.53	9.04	32.65	100	306	P	H
	*	5825	107.09	-	-	98.05	32.43	9.23	32.62	341	60	P	V
	*	5825	99.48	-	-	90.44	32.43	9.23	32.62	341	60	A	V
		5852	52.82	-64.82	117.64	43.85	32.44	9.16	32.63	341	60	P	V
		5874.2	48.6	-56.82	105.42	39.63	32.48	9.13	32.64	341	60	P	V
		5877.8	49.24	-53.88	103.12	40.27	32.48	9.13	32.64	341	60	P	V
		5925.2	48.46	-19.74	68.2	39.54	32.53	9.04	32.65	341	60	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	44.49	-29.51	74	58.15	39.81	12.74	66.21	100	0	P	H
		17235	45.44	-22.76	68.2	53.68	41.02	16.76	66.02	100	0	P	H
		11490	44.24	-29.76	74	57.9	39.81	12.74	66.21	100	0	P	V
		17235	45.49	-22.71	68.2	53.73	41.02	16.76	66.02	100	0	P	V
802.11a CH 157 5785MHz		11570	44.87	-29.13	74	58.57	39.69	12.8	66.19	100	0	P	H
		17355	46.09	-22.11	68.2	53.53	41.58	16.86	65.88	100	0	P	H
		11570	44.53	-29.47	74	58.23	39.69	12.8	66.19	100	0	P	V
		17355	45.64	-22.56	68.2	53.08	41.58	16.86	65.88	100	0	P	V
802.11a CH 165 5825MHz		11650	43.58	-30.42	74	57.3	39.58	12.87	66.17	100	0	P	H
		17475	47.03	-21.17	68.2	53.67	42.14	16.96	65.74	100	0	P	H
		11650	44.9	-29.1	74	58.62	39.58	12.87	66.17	100	0	P	V
		17475	46.54	-21.66	68.2	53.18	42.14	16.96	65.74	100	0	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		5646	48.29	-19.91	68.2	39.83	32.24	8.77	32.55	100	307	P	H
		5693.6	51.11	-49.37	100.48	42.5	32.29	8.89	32.57	100	307	P	H
		5719.6	50.33	-60.36	110.69	41.58	32.32	9.01	32.58	100	307	P	H
		5723	58.6	-59.04	117.64	49.85	32.32	9.01	32.58	100	307	P	H
	*	5745	107.97	-	-	99.15	32.34	9.07	32.59	100	307	P	H
	*	5745	99.33	-	-	90.51	32.34	9.07	32.59	100	307	A	H
		5611.4	46.07	-22.13	68.2	37.77	32.2	8.64	32.54	368	35	P	V
		5693.2	48.91	-51.28	100.19	40.3	32.29	8.89	32.57	368	35	P	V
		5720	48.43	-62.37	110.8	39.68	32.32	9.01	32.58	368	35	P	V
		5724.2	56.17	-64.21	120.38	47.42	32.32	9.01	32.58	368	35	P	V
	*	5745	104.77	-	-	95.95	32.34	9.07	32.59	368	35	P	V
	*	5745	97.56	-	-	88.74	32.34	9.07	32.59	368	35	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)
		5639.2	47.34	-20.86	68.2	38.95	32.24	8.7	32.55	100	306	P	H
		5689.8	48.44	-49.24	97.68	39.83	32.29	8.89	32.57	100	306	P	H
		5712	47.78	-60.78	108.56	39.1	32.31	8.95	32.58	100	306	P	H
		5720	47.46	-63.34	110.8	38.71	32.32	9.01	32.58	100	306	P	H
	*	5785	108.04	-	-	99.07	32.38	9.2	32.61	100	306	P	H
	*	5785	100.53	-	-	91.56	32.38	9.2	32.61	100	306	A	H
		5852.2	47.6	-69.58	117.18	38.63	32.44	9.16	32.63	100	306	P	H
		5862.8	48.59	-60.02	108.61	39.64	32.46	9.13	32.64	100	306	P	H
802.11n		5913.2	48.74	-28.16	76.9	39.81	32.51	9.07	32.65	100	306	P	H
HT20		5938.2	49.21	-18.99	68.2	40.33	32.53	9.01	32.66	100	306	P	H
CH 157		5603.8	47.84	-20.36	68.2	39.6	32.2	8.58	32.54	346	59	P	V
5785MHz		5675.2	48.16	-38.73	86.89	39.62	32.27	8.83	32.56	346	59	P	V
		5717.2	47.62	-62.4	110.02	38.94	32.31	8.95	32.58	346	59	P	V
		5721.6	47.18	-67.27	114.45	38.43	32.32	9.01	32.58	346	59	P	V
	*	5785	104.79	-	-	95.82	32.38	9.2	32.61	346	59	P	V
	*	5785	96.98	-	-	88.01	32.38	9.2	32.61	346	59	A	V
		5852.8	47.04	-68.78	115.82	38.07	32.44	9.16	32.63	346	59	P	V
		5864.8	48.68	-59.37	108.05	39.73	32.46	9.13	32.64	346	59	P	V
		5877.8	48.01	-55.11	103.12	39.04	32.48	9.13	32.64	346	59	P	V
		5942.2	48.3	-19.9	68.2	39.4	32.55	9.01	32.66	346	59	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 HT20 CH 165 5825MHz	*	5825	108.86	-	-	99.82	32.43	9.23	32.62	100	306	P	H
	*	5825	101	-	-	91.96	32.43	9.23	32.62	100	306	A	H
		5850.4	50.93	-70.36	121.29	41.96	32.44	9.16	32.63	100	306	P	H
		5862.2	49	-59.78	108.78	40.05	32.46	9.13	32.64	100	306	P	H
		5876.6	51.91	-52.1	104.01	42.94	32.48	9.13	32.64	100	306	P	H
		5930.2	49.13	-19.07	68.2	40.21	32.53	9.04	32.65	100	306	P	H
	*	5825	105.53	-	-	96.49	32.43	9.23	32.62	327	62	P	V
	*	5825	97.88	-	-	88.84	32.43	9.23	32.62	327	62	A	V
		5850.2	49.2	-72.54	121.74	40.23	32.44	9.16	32.63	327	62	P	V
		5867.8	48.32	-58.89	107.21	39.37	32.46	9.13	32.64	327	62	P	V
		5878.4	49.06	-53.61	102.67	40.09	32.48	9.13	32.64	327	62	P	V
		5946.2	47.92	-20.28	68.2	39.02	32.55	9.01	32.66	327	62	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		11490	44.49	-29.51	74	58.15	39.81	12.74	66.21	100	0	P	H
HT20		17235	44.92	-23.28	68.2	53.16	41.02	16.76	66.02	100	0	P	H
CH 149		11490	45.17	-28.83	74	58.83	39.81	12.74	66.21	100	0	P	V
5745MHz		17235	45.38	-22.82	68.2	53.62	41.02	16.76	66.02	100	0	P	V
802.11n		11570	44.66	-29.34	74	58.36	39.69	12.8	66.19	100	0	P	H
HT20		17355	45.34	-22.86	68.2	52.78	41.58	16.86	65.88	100	0	P	H
CH 157		11570	44.37	-29.63	74	58.07	39.69	12.8	66.19	100	0	P	V
5785MHz		17355	46.09	-22.11	68.2	53.53	41.58	16.86	65.88	100	0	P	V
802.11n		11650	44.47	-29.53	74	58.19	39.58	12.87	66.17	100	0	P	H
HT20		17475	45.85	-22.35	68.2	52.49	42.14	16.96	65.74	100	0	P	H
CH 165		11650	44.81	-29.19	74	58.53	39.58	12.87	66.17	100	0	P	V
5825MHz		17475	46.59	-21.61	68.2	53.23	42.14	16.96	65.74	100	0	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)
		5650	47.7	-20.5	68.2	39.22	32.26	8.77	32.55	100	306	P	H
		5697.2	49.51	-53.63	103.14	40.9	32.29	8.89	32.57	100	306	P	H
		5717.6	56.76	-53.37	110.13	48.01	32.32	9.01	32.58	100	306	P	H
		5724.6	58.65	-62.64	121.29	49.9	32.32	9.01	32.58	100	306	P	H
	*	5755	105.3	-	-	96.39	32.36	9.14	32.59	100	306	P	H
	*	5755	97.51	-	-	88.6	32.36	9.14	32.59	100	306	A	H
		5853.6	47.43	-66.56	113.99	38.44	32.46	9.16	32.63	100	306	P	H
		5859.4	48.47	-61.1	109.57	39.49	32.46	9.16	32.64	100	306	P	H
802.11n		5876.4	48.65	-55.51	104.16	39.68	32.48	9.13	32.64	100	306	P	H
HT40		5932.4	48.95	-19.25	68.2	40.03	32.53	9.04	32.65	100	306	P	H
CH 151		5600.8	47.63	-20.57	68.2	39.39	32.2	8.58	32.54	302	62	P	V
5755MHz		5693	48.68	-51.36	100.04	40.07	32.29	8.89	32.57	302	62	P	V
		5718.6	55.4	-55.01	110.41	46.65	32.32	9.01	32.58	302	62	P	V
		5724	58.23	-61.69	119.92	49.48	32.32	9.01	32.58	302	62	P	V
	*	5755	101.88	-	-	92.97	32.36	9.14	32.59	302	62	P	V
	*	5755	94.65	-	-	85.74	32.36	9.14	32.59	302	62	A	V
		5850.6	47.98	-72.85	120.83	39.01	32.44	9.16	32.63	302	62	P	V
		5867.4	48.43	-58.9	107.33	39.48	32.46	9.13	32.64	302	62	P	V
		5891.2	49.92	-43.26	93.18	40.96	32.5	9.1	32.64	302	62	P	V
		5926	47.55	-20.65	68.2	38.63	32.53	9.04	32.65	302	62	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		5603.6	47.69	-20.51	68.2	39.45	32.2	8.58	32.54	100	306	P	H
		5691	49.69	-48.87	98.56	41.08	32.29	8.89	32.57	100	306	P	H
		5715.8	47.9	-61.73	109.63	39.22	32.31	8.95	32.58	100	306	P	H
		5724.6	47.47	-73.82	121.29	38.72	32.32	9.01	32.58	100	306	P	H
	*	5795	107.44	-	-	98.4	32.39	9.26	32.61	100	306	P	H
	*	5795	99.35	-	-	90.31	32.39	9.26	32.61	100	306	A	H
		5851.6	52.28	-66.27	118.55	43.31	32.44	9.16	32.63	100	306	P	H
		5872.2	49.73	-56.25	105.98	40.76	32.48	9.13	32.64	100	306	P	H
		5905.4	49.37	-33.3	82.67	40.43	32.51	9.07	32.64	100	306	P	H
		5942.8	48.44	-19.76	68.2	39.54	32.55	9.01	32.66	100	306	P	H
		5648	47.86	-20.34	68.2	39.4	32.24	8.77	32.55	312	60	P	V
		5666.4	47.62	-32.75	80.37	39.09	32.26	8.83	32.56	312	60	P	V
		5716.2	48.58	-61.16	109.74	39.9	32.31	8.95	32.58	312	60	P	V
		5720.8	48.82	-63.8	112.62	40.07	32.32	9.01	32.58	312	60	P	V
	*	5795	103.78	-	-	94.74	32.39	9.26	32.61	312	60	P	V
	*	5795	96.02	-	-	86.98	32.39	9.26	32.61	312	60	A	V
		5851	47.4	-72.52	119.92	38.43	32.44	9.16	32.63	312	60	P	V
		5873.8	48.78	-56.76	105.54	39.81	32.48	9.13	32.64	312	60	P	V
		5887	48.14	-48.15	96.29	39.2	32.48	9.1	32.64	312	60	P	V
		5946.2	48.29	-19.91	68.2	39.39	32.55	9.01	32.66	312	60	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		11510	45.12	-28.88	74	58.77	39.8	12.75	66.2	100	0	P	H
HT40		17265	45.26	-22.94	68.2	53.27	41.18	16.79	65.98	100	0	P	H
CH 151		11510	44.35	-29.65	74	58	39.8	12.75	66.2	100	0	P	V
5755MHz		17265	45.57	-22.63	68.2	53.58	41.18	16.79	65.98	100	0	P	V
802.11n		11590	44.65	-29.35	74	58.36	39.66	12.81	66.18	100	0	P	H
HT40		17385	46.94	-21.26	68.2	54.15	41.74	16.89	65.84	100	0	P	H
CH 159		11590	44.55	-29.45	74	58.26	39.66	12.81	66.18	100	0	P	V
5795MHz		17385	46.09	-22.11	68.2	53.3	41.74	16.89	65.84	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

Emission below 1GHz

5GHz WIFI 802.11n HT20 (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)
5GHz 802.11n HT20 LF		161.49	26.77	-16.73	43.5	41.24	16.45	1.33	32.67	-	-	P	H
		253.56	27.43	-18.57	46	39.08	18.88	1.66	32.61	-	-	P	H
		271.65	28.04	-17.96	46	39.35	19.16	1.72	32.6	-	-	P	H
		590.5	26.82	-19.18	46	30.91	25.59	2.55	32.8	-	-	P	H
		777.4	30.44	-15.56	46	31.12	28.41	2.97	32.68	-	-	P	H
		858.6	31.3	-14.7	46	30.68	29.14	3.13	32.32	100	0	P	H
		39.99	30.13	-9.87	40	42.55	19.46	0.78	32.77	100	0	P	V
		81.3	27.44	-12.56	40	45.46	13.51	1	32.73	-	-	P	V
		118.56	24.64	-18.86	43.5	38.57	17.37	1.15	32.7	-	-	P	V
		491.8	24.67	-21.33	46	30.74	23.73	2.36	32.64	-	-	P	V
		720	28.7	-17.3	46	30.86	27.17	2.83	32.75	-	-	P	V
		857.2	32.51	-13.49	46	31.92	29.12	3.13	32.33	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

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

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

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

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

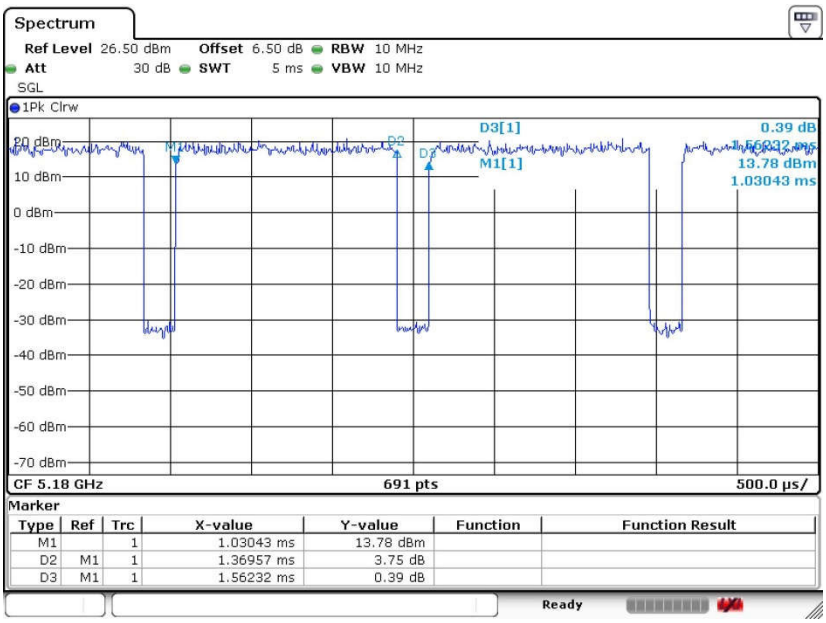
= -10.46(dB)

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

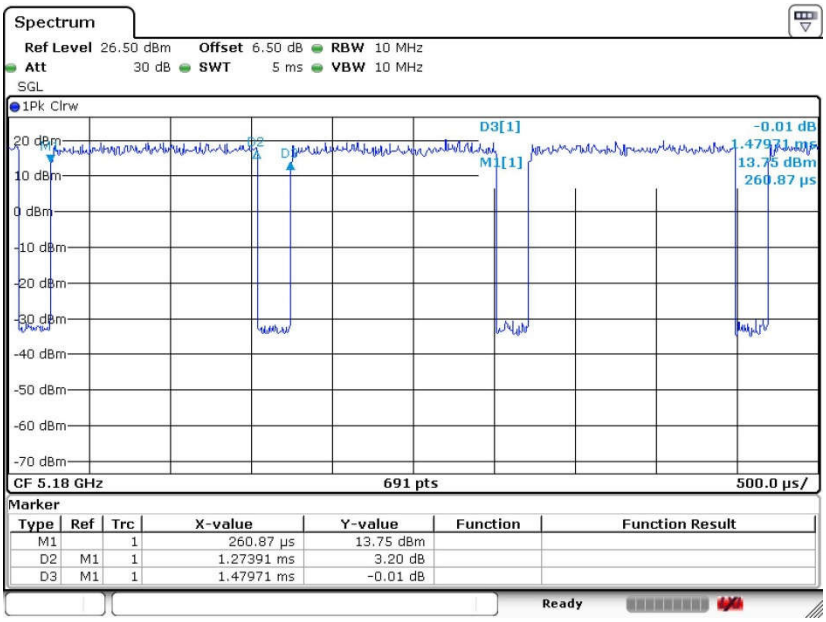
Appendix C. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	87.66	1.370	0.730	1 kHz
802.11n HT20	86.09	1.274	0.785	1 kHz
802.11n HT40	86.13	1.233	0.811	1 kHz

802.11a



802.11n HT20



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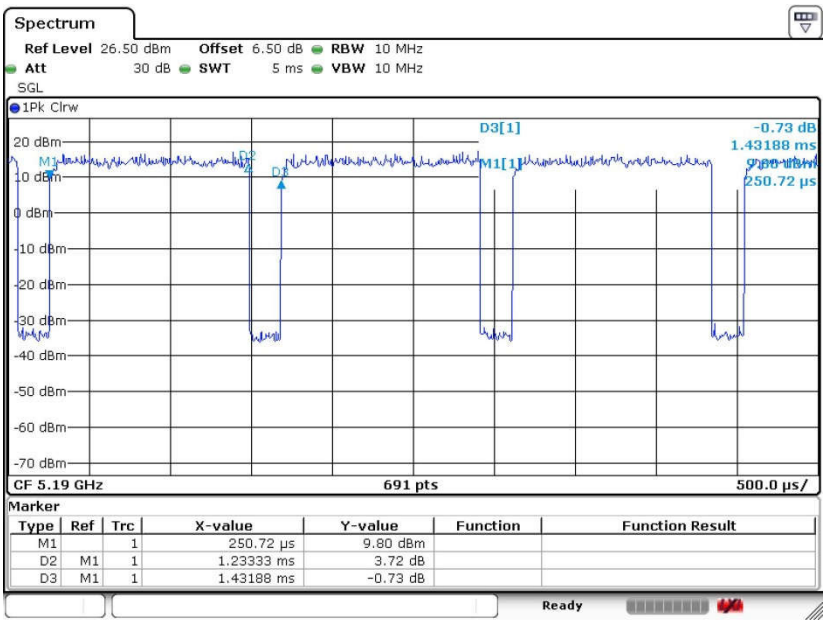
802.11n HT40



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