



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : 10807, 11154
FCC ID : IHDT56WJ4
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Mar. 08, 2017 and testing was completed on Apr. 02, 2017. 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.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR730825-02D	Rev. 01	Initial issue of report	Apr. 26, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 15.403(i)	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	FCC ≤ 24 dBm (depend on band)	Pass	-
3.3	15.407(a)	Power Spectral Density	FCC ≤ 11 dBm (depend on band)	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b) 15.209(a)	Pass	Under limit 3.36 dB at 5725.080 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 10.24 dB at 1.016 MHz
3.6	15.407(g)	Frequency Stability	Within Operation Band	Pass	-
3.7	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.8	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	10807, 11154
FCC ID	IHDT56WJ4
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/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: 355662080017858/355662080017866 for sample 1 Conduction: 355660080000658 for Sample 2 355662080018219/355662080018227 for Sample 1 Radiation: 355662080018078/355662080018086 for Sample 1
HW Version	DVT1
SW Version	montana_userdebug 7.11 NPP26.56 1473 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 Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5700 MHz
Maximum Output Power to Antenna	<5180 MHz ~ 5240 MHz> 802.11a : 14.93 dBm / 0.0311 W 802.11n HT20 : 12.00 dBm / 0.0158 W 802.11n HT40 : 12.03 dBm / 0.0160 W <5260 MHz ~ 5320 MHz> 802.11a : 15.46 dBm / 0.0352 W 802.11n HT20 : 11.84 dBm / 0.0153 W 802.11n HT40 : 11.80 dBm / 0.0151 W <5500 MHz ~ 5700 MHz > 802.11a : 15.28 dBm / 0.0337 W 802.11n HT20 : 12.60 dBm / 0.0182 W 802.11n HT40 : 13.20 dBm / 0.0209 W
99% Occupied Bandwidth	<5180 MHz ~ 5240 MHz> 802.11a : 19.73 MHz 802.11n HT20 : 19.58 MHz 802.11n HT40 : 36.96 MHz <5260 MHz ~ 5320 MHz> 802.11a : 21.38 MHz 802.11n HT20 : 19.48 MHz 802.11n HT40 : 37.16 MHz <5500 MHz ~ 5700 MHz > 802.11a : 21.18 MHz 802.11n HT20 : 19.68 MHz 802.11n HT40 : 37.16 MHz
Antenna Type / Gain	<5180 MHz ~ 5240 MHz > PIFA Antenna with gain 0.02 dBi <5260 MHz ~ 5320 MHz > PIFA Antenna with gain -0.38 dBi <5500 MHz ~ 5700 MHz > PIFA Antenna with gain -0.75 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Component List

Note: There are two types of EUT, the sample 1 (model name: 10807) is dual SIM slot and the sample 2(model name: 11154) is single SIM slot, the details refer the following table. According to the difference, we choose sample 1 to perform RF full test

Component	Sample 1	Sample 2
CPU	Qualcomm MSM-8937-4-727NSP-TR-00-1-AA	Qualcomm MSM-8937-4-727NSP-TR-00-1-AA
TLCM	Tianma TL052VVMP09-00 TL052VVMP13-00	Mutto 1010-0502-00009 1010-0502-00010
Memory	Hynix H9TQ26ABJTACUR-KUM	Samsung KMQX10013M-B419
Front Camera	Sunny D5V16C-0JG	O-film L5695F70
Rear Camera	Sunny AL6S05S-0JG	Q-tech F3P3MBK
Battery	ATL SB18C15119	Sunwoda SB18C15118

1.6 Specification of Accessory

Specification of Accessory				
AC Adapter 1	Brand Name	Motorola(Salom)	Model Name	SC-22
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc or 9Vdc or 12Vdc, 3000mA or 1600mA or 1200mA		
AC Adapter 2	Brand Name	Motorola(chenyang)	Model Name	SC-22
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc or 9Vdc or 12Vdc, 3000mA or 1600mA or 1200mA		
AC Adapter 3	Brand Name	Motorola(LiteOn)	Model Name	SC-22
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc or 9Vdc or 12Vdc, 3000mA or 1600mA or 1200mA		
Battery 1	Brand Name	Motorola (ATL)	Model Name	SB18C15119
	Power Rating	3.8Vdc,3000mAh	Type	Li-ion
Battery 2	Brand Name	Motorola (sunwoda)	Model Name	SB18C15118
	Power Rating	3.8Vdc,3000mAh	Type	Li-ion
Earphone 1	Brand Name	Motorola(Lian chuang)	Model Name	SJYN1181B
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core		
Earphone 2	Brand Name	Motorola(Lianyun)	Model Name	TS500-03AMS01WHR-M
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core		
Earphone 3	Brand Name	Motorola(Tianzhi)	Model Name	TJ101817
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core		
USB Cable 1	Brand Name	Motorola(Liqi)	Model Name	L25W-051000100AL
	Signal Line Type	1.0 meter, shielded cable, without core		
USB Cable 2	Brand Name	Motorola(Fukangyuan)	Model Name	F25W-051000100A
	Signal Line Type	1.0 meter, shielded cable, without core		

1.7 Modification of EUT

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



1.8 Testing Location

Test Site	Sporton International (KunShan) INC.			
Test Site Location	No.3-2, Pingxiang Road, Kunshan Development Zone, Jiangsu, China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958			
Test Site No.	Sporton Site No.			FCC Registration No.
	TH01-KS	03CH03-KS	CO01-KS	306251

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

1.9 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 v01r03
- ♦ 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 (Z plane) were recorded in this report.

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5180-5240 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	-	-	-	-

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

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

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



2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

WLAN 5GHz 802.11a Average Power (dBm)									
Power vs. Channel		Power vs. Data Rate							
Channel	Frequency (MHz)	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
CH 36	5180	14.93	14.90	14.87	14.85	14.44	12.55	12.52	12.50
CH 44	5220	14.16	14.14	14.11	14.09	13.55	11.66	11.62	11.61
CH 48	5240	14.25	14.23	14.21	14.20	13.61	11.71	11.69	11.67
CH 52	5260	15.42	15.39	15.35	15.31	14.79	12.21	12.19	12.16
CH 60	5300	15.35	15.31	15.29	15.28	14.84	12.15	12.11	12.05
CH 64	5320	15.46	15.42	15.39	15.37	14.89	12.26	12.21	12.18
CH 100	5500	14.95	14.87	14.84	14.93	13.70	12.87	12.84	12.65
CH 116	5580	15.16	15.11	15.12	15.09	13.93	13.30	13.28	13.26
CH 140	5700	15.28	15.12	15.09	15.26	14.67	13.28	13.36	13.39

WLAN 5GHz 802.11n-HT20 Average Power (dBm)									
Power vs. Channel		Power vs. Data Rate							
Channel	Frequency (MHz)	MCS 0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180	12.00	11.98	11.95	11.91	10.99	10.96	10.21	10.19
CH 44	5220	11.21	11.19	11.15	11.12	10.43	10.50	9.64	9.62
CH 48	5240	11.19	11.16	11.11	11.09	10.41	10.47	9.61	9.59
CH 52	5260	11.84	11.82	11.80	11.77	10.83	10.97	10.18	10.14
CH 60	5300	11.79	11.76	11.75	11.73	10.77	10.90	10.14	10.10
CH 64	5320	11.78	11.75	11.71	11.70	10.76	10.94	10.11	10.09
CH 100	5500	12.24	12.22	12.20	12.17	11.71	11.67	10.70	10.68
CH 116	5580	12.31	12.28	12.24	12.21	12.10	12.09	11.04	10.97
CH 140	5700	12.60	12.56	12.54	12.51	12.00	11.98	10.92	10.89

WLAN 5GHz 802.11n-HT40 Average Power (dBm)									
Power vs. Channel		Power vs. Data Rate							
Channel	Frequency (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 38	5190	12.03	12.00	10.87	10.83	10.04	9.12	9.11	9.09
CH 46	5230	11.85	11.83	10.69	10.67	9.97	9.08	9.07	9.05
CH 54	5270	11.80	11.78	10.77	10.76	9.85	9.01	8.99	8.96
CH 62	5310	11.68	11.66	10.64	10.63	9.77	8.94	8.92	8.91
CH 102	5510	12.45	12.43	11.33	11.31	10.15	9.58	9.54	9.52
CH 110	5550	12.31	12.30	11.20	11.17	10.08	9.56	9.55	9.51
CH 134	5670	13.20	13.19	12.04	12.02	11.12	10.15	10.12	10.10

2.3 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

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 1(Charging from Adapter 1) + Earphone 1 + Battery 1 for Sample 1
	Mode 2 : GSM850 Idle + Bluetooth Link + WLAN Link (5G) + USB Cable 1(Charging from Adapter 1) + Earphone 1 + Battery 2 for Sample 2
Remark: The worst case of conducted emission is mode 2; only the test data of it was reported.	



Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5700MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5700MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

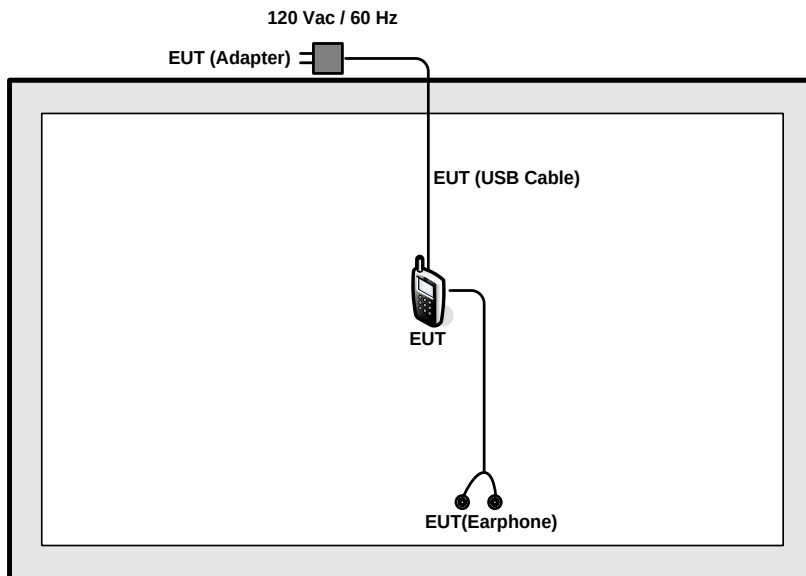
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5700MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134

2.4 Connection Diagram of Test System

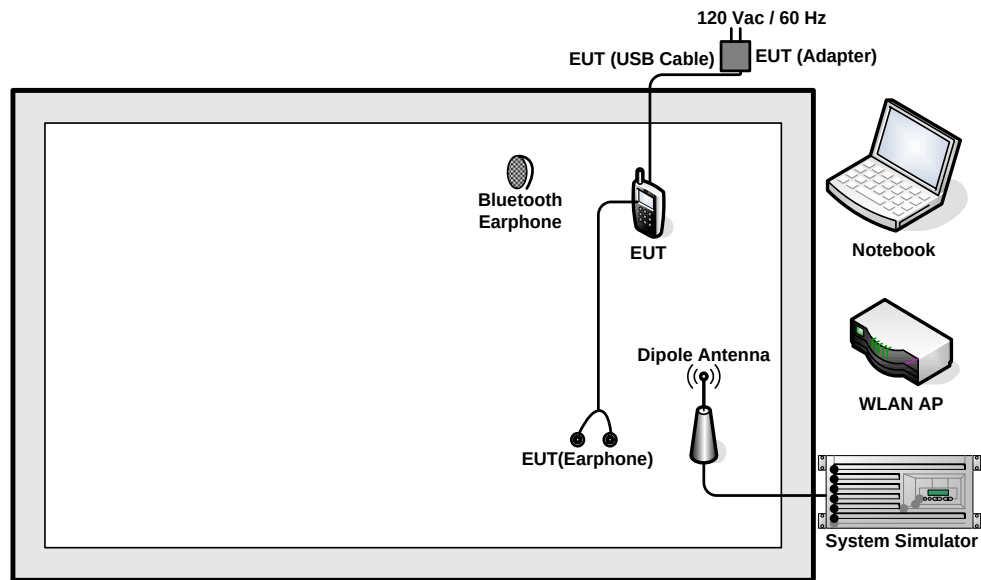
<WLAN 5GHz 802.11n HT20 Tx Mode>



<WLAN 5GHz 802.11a/n HT40 Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
3.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A

2.6 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.

2.7 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 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

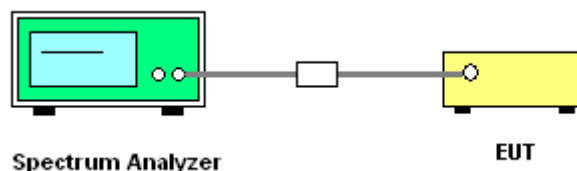
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$.
8. Measure and record the results in the test report.

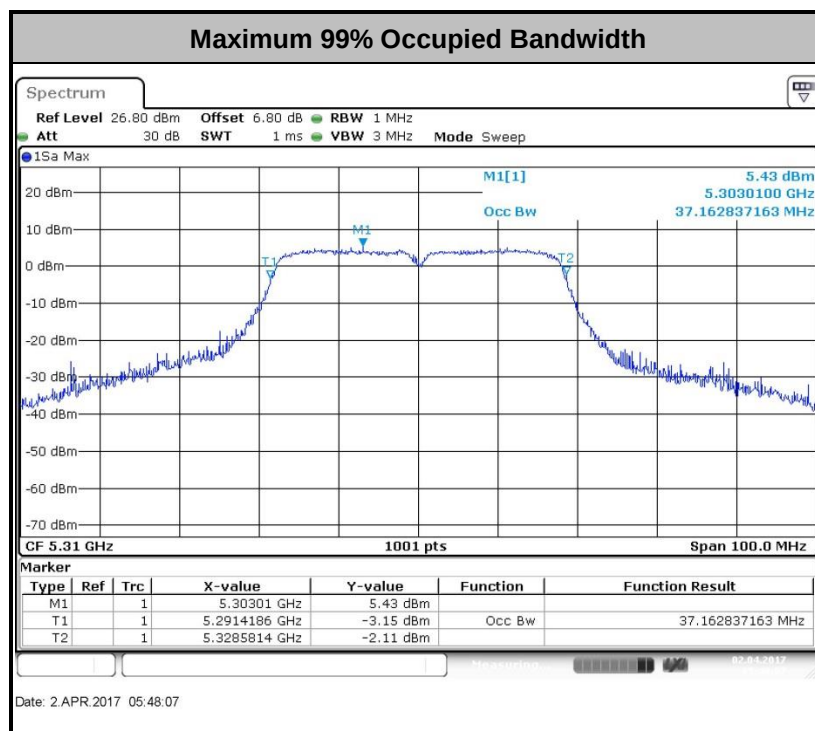
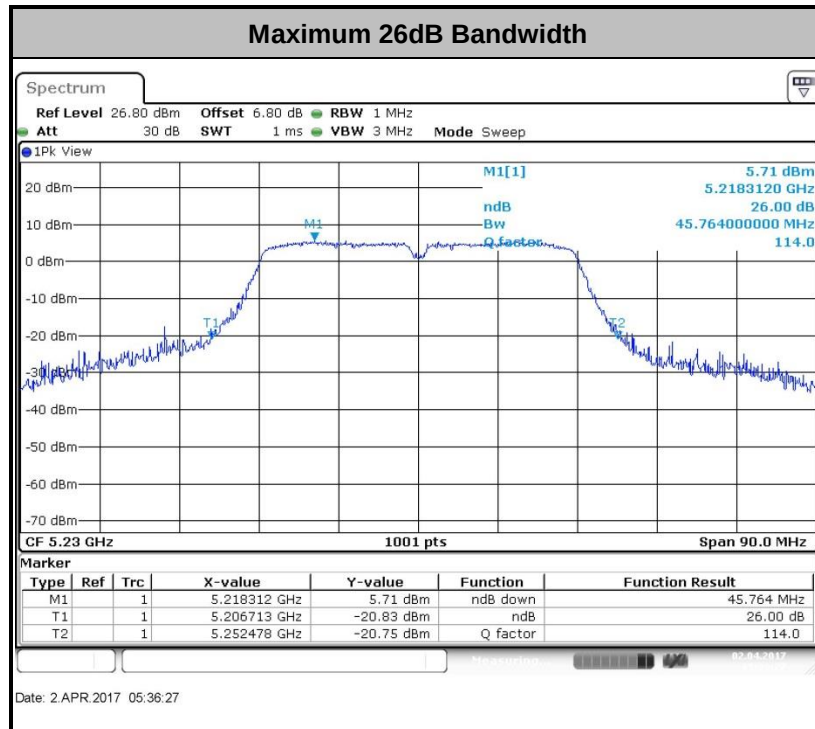
3.1.4 Test Setup





3.1.5 Test Result of 26dB & 99% Occupied Bandwidth Plots

Please refer to Appendix A.



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

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW.

For the 5.25–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

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

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

3.2.2 Measuring Instruments

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

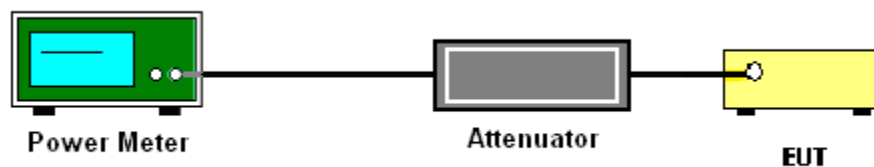
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.

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

<FCC 14-30 CFR 15.407>

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

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

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.

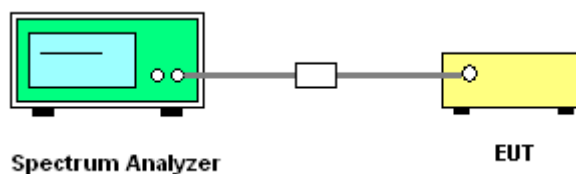
Section F) Maximum power spectral density.

Method SA-2

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

1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.
 - Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW $\geq$ 3 MHz.
 - Number of points in sweep $\geq$ 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

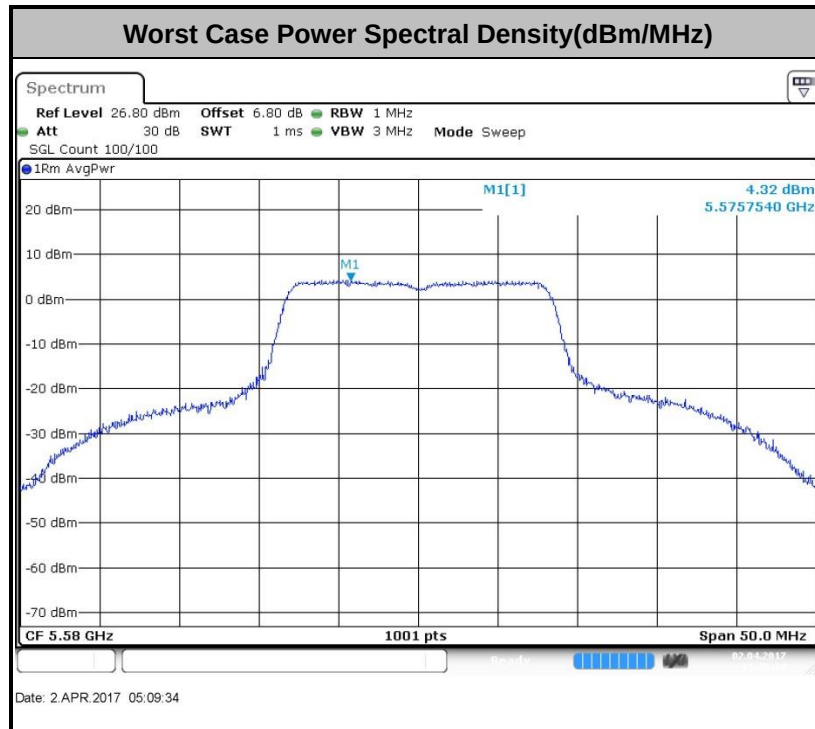
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



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

3.4 Unwanted Radiated Emission 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 Part 15.205.

3.4.1 Limit of Unwanted Emissions

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

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

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

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

Frequency (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.

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

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

- (3) KDB789033 D01 v01r03 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3.4.2 Measuring Instruments

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

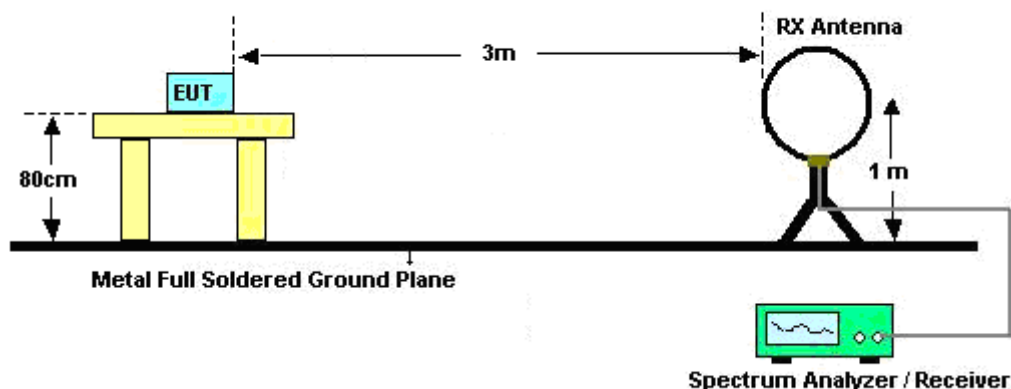
3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03. 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.

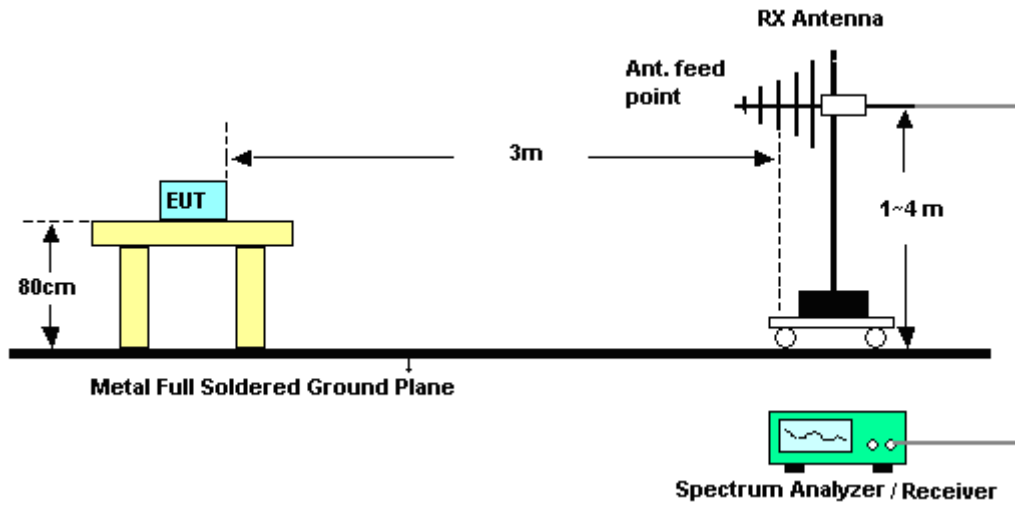
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

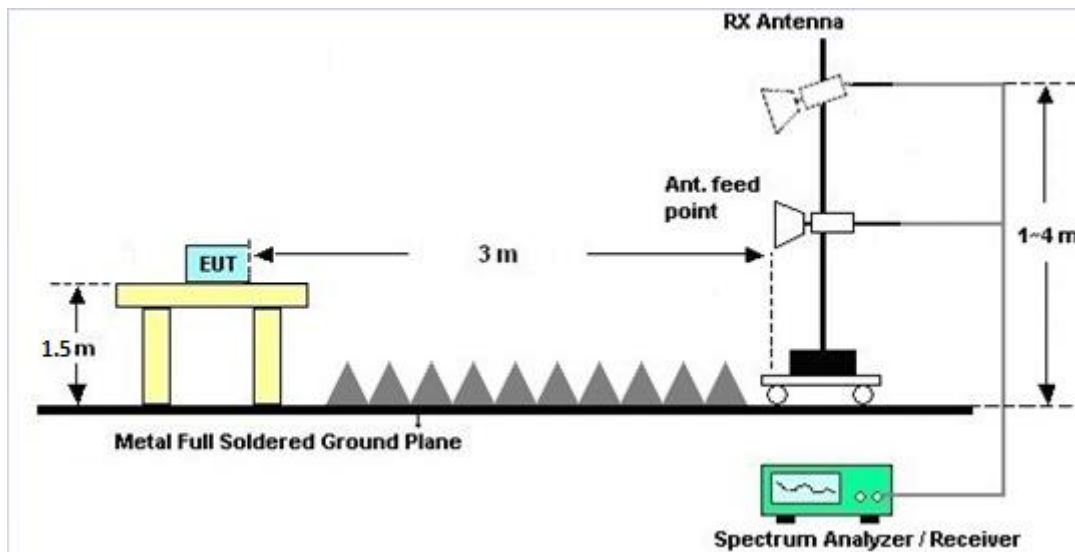
For radiated emissions below 30MHz



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 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 (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

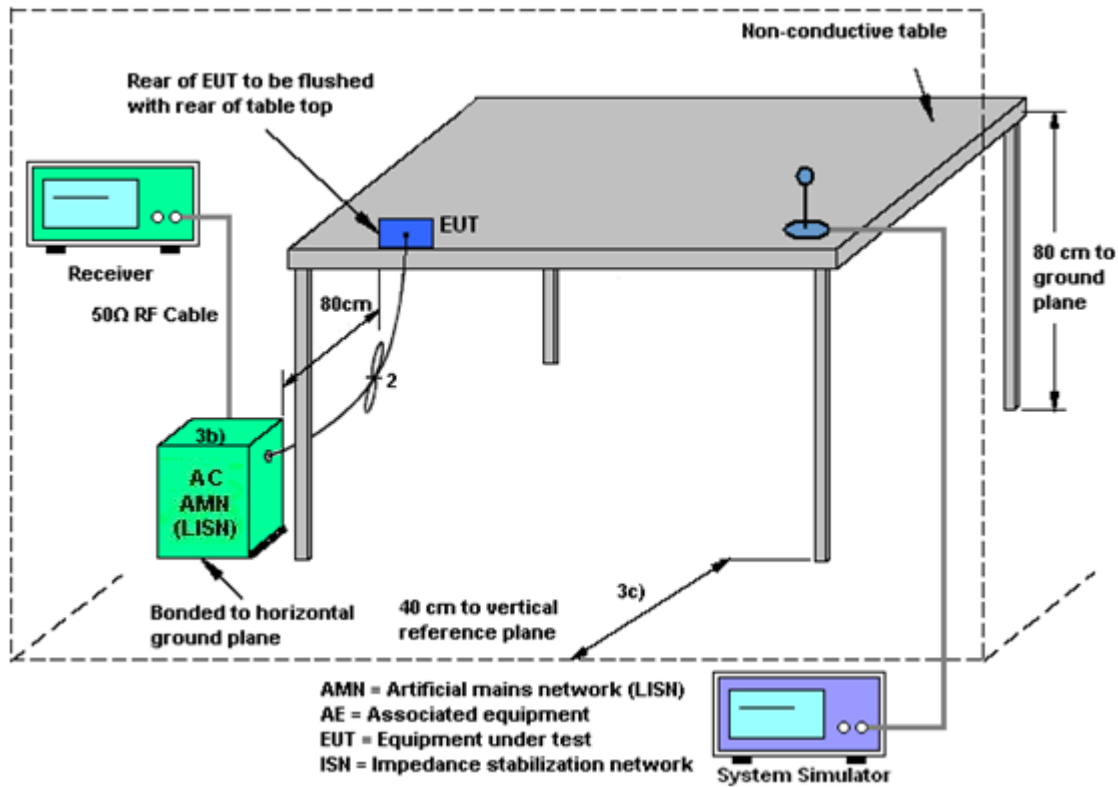
3.5.2 Measuring Instruments

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.

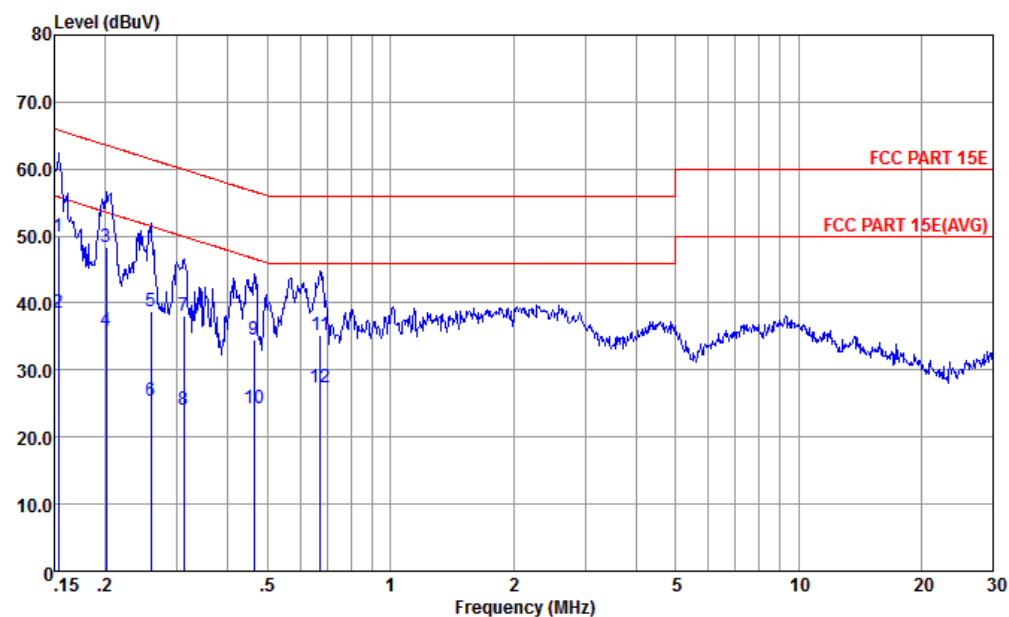
3.5.4 Test Setup





3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	Temperature :	22~24℃
Test Engineer :	Eligah Wang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link (5G) + USB Cable 1(Charging from Adapter 1) + Earphone 1 + Battery 2 for Sample 2		



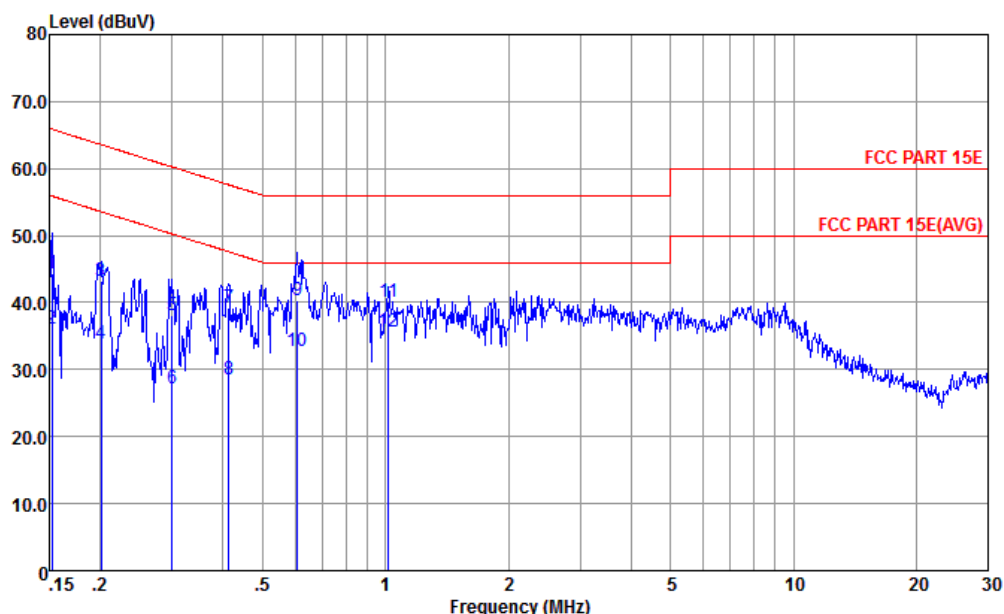
Site : CO01-KS
Condition : FCC PART 15E LISN-L-20151024 LINE

mode : Mode 2
IMEI : 355660080000658

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.153	50.00	-15.82	65.82	39.10	0.51	10.39	QP
2	0.153	38.50	-17.32	55.82	27.60	0.51	10.39	Average
3 *	0.201	48.45	-15.13	63.58	37.90	0.22	10.33	QP
4	0.201	35.85	-17.73	53.58	25.30	0.22	10.33	Average
5	0.259	38.81	-22.66	61.47	28.31	0.22	10.28	QP
6	0.259	25.41	-26.06	51.47	14.91	0.22	10.28	Average
7	0.312	38.07	-21.86	59.93	27.60	0.22	10.25	QP
8	0.312	24.07	-25.86	49.93	13.60	0.22	10.25	Average
9	0.464	34.52	-22.11	56.63	24.10	0.23	10.19	QP
10	0.464	24.32	-22.31	46.63	13.90	0.23	10.19	Average
11	0.672	35.32	-20.68	56.00	24.90	0.24	10.18	QP
12	0.672	27.32	-18.68	46.00	16.90	0.24	10.18	Average



Test Mode :	Mode 2	Temperature :	22~24℃
Test Engineer :	Eligah Wang	Relative Humidity :	40~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Link + WLAN Link (5G) + USB Cable 1(Charging from Adapter 1) + Earphone 1 + Battery 2 for Sample 2		



Site : CO01-KS
Condition : FCC PART 15E LISN-N-20151024 NEUTRAL

mode : Mode 2
IMEI : 355660080000658

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	44.29	-21.58	65.87	33.60	0.30	10.39	QP
2	0.152	35.99	-19.88	55.87	25.30	0.30	10.39	Average
3	0.201	43.24	-20.34	63.58	32.60	0.31	10.33	QP
4	0.201	33.94	-19.64	53.58	23.30	0.31	10.33	Average
5	0.300	38.17	-22.07	60.24	27.61	0.31	10.25	QP
6	0.300	27.17	-23.07	50.24	16.61	0.31	10.25	Average
7	0.413	39.12	-18.47	57.59	28.60	0.32	10.20	QP
8	0.413	28.42	-19.17	47.59	17.90	0.32	10.20	Average
9	0.608	40.31	-15.69	56.00	29.80	0.33	10.18	QP
10	0.608	32.81	-13.19	46.00	22.30	0.33	10.18	Average
11	1.016	40.16	-15.84	56.00	29.60	0.37	10.19	QP
12 *	1.016	35.76	-10.24	46.00	25.20	0.37	10.19	Average

3.6 Frequency Stability Measurement

3.6.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

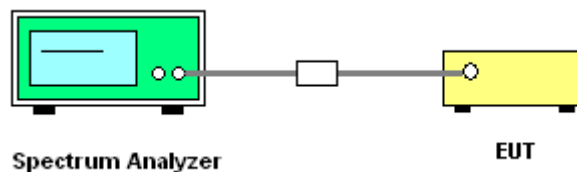
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.6.4 Test Setup



3.6.5 Test Result of Frequency Stability

Please refer to Appendix A.



3.7 Automatically Discontinue Transmission

3.7.1 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.

3.7.2 Measuring Instruments

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

3.7.3 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.



3.8 Antenna Requirements

3.8.1 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.

3.8.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.8.3 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 Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 09, 2016	Mar. 17, 2017~ Apr. 02, 2017	Aug. 08, 2017	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 19, 2017	Mar. 17, 2017~ Apr. 02, 2017	Jan. 18, 2018	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 19, 2017	Mar. 17, 2017~ Apr. 02, 2017	Jan. 18, 2018	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 13, 2016	Mar. 17, 2017~ Apr. 02, 2017	Oct. 12, 2017	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Aug. 09, 2016	Mar. 17, 2017~ Mar. 23, 2017	Aug. 08, 2017	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz~44GHz	Apr. 22, 2016	Mar. 17, 2017~ Mar. 23, 2017	Apr. 21, 2017	Radiation (03CH03-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 23, 2016	Mar. 17, 2017~ Mar. 23, 2017	Nov. 22, 2017	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	35406	25MHz~2GHz	Apr. 16, 2016	Mar. 17, 2017~ Mar. 23, 2017	Apr. 15, 2017	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1356	1GHz~18GHz	Apr. 16, 2016	Mar. 17, 2017~ Mar. 23, 2017	Apr. 15, 2017	Radiation (03CH03-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 15, 2017	Mar. 17, 2017~ Mar. 23, 2017	Feb. 14, 2018	Radiation (03CH03-KS)
Amplifier	SONOMA	310N	187289	9kHz~1GHz	Aug. 09, 2016	Mar. 17, 2017~ Mar. 23, 2017	Aug. 08, 2017	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 13, 2016	Mar. 17, 2017~ Mar. 23, 2017	Oct. 12, 2017	Radiation (03CH03-KS)
Amplifier	MITEQ	TTA1840-35-H G	1887435	18GHz~40GHz	Oct. 13, 2016	Mar. 17, 2017~ Mar. 23, 2017	Oct. 12, 2017	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 17, 2017~ Mar. 23, 2017	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 17, 2017~ Mar. 23, 2017	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 17, 2017~ Mar. 23, 2017	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz	Apr. 29, 2016	Mar. 30, 2017	Apr. 28, 2017	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2016	Mar. 30, 2017	Oct. 12, 2017	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2016	Mar. 30, 2017	Oct. 12, 2017	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 13, 2016	Mar. 30, 2017	Oct. 12, 2017	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
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.6dB
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Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.5dB
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Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.7dB
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Appendix A. Conducted Test Results

Test Engineer:	Ivan Zhang	Temperature:	24~25	°C
Test Date:	2017/3/17~2017/4/2	Relative Humidity:	54~55	%

TEST RESULTS DATA
26dB and 99% OBW

Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)		
11a	6Mbps	1	36	5180	19.73	24.78	-	22.95		
11a	6Mbps	1	44	5220	19.68	28.37	-	22.94		
11a	6Mbps	1	48	5240	19.33	27.47	-	22.86		
HT20	MCS0	1	36	5180	19.23	23.98	-	22.84		
HT20	MCS0	1	44	5220	19.58	24.03	-	22.92		
HT20	MCS0	1	48	5240	19.58	24.23	-	22.92		
HT40	MCS0	1	38	5190	36.76	45.41	-	23.01		
HT40	MCS0	1	46	5230	36.96	45.76	-	23.01		

TEST RESULTS DATA
Average Power Table

FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6Mbps	1	36	5180	0.60	14.93	24.00	0.02		Pass
11a	6Mbps	1	44	5220	0.60	14.16	24.00	0.02		Pass
11a	6Mbps	1	48	5240	0.60	14.25	24.00	0.02		Pass
HT20	MCS0	1	36	5180	0.63	12.00	24.00	0.02		Pass
HT20	MCS0	1	44	5220	0.63	11.21	24.00	0.02		Pass
HT20	MCS0	1	48	5240	0.63	11.19	24.00	0.02		Pass
HT40	MCS0	1	38	5190	0.67	12.03	24.00	0.02		Pass
HT40	MCS0	1	46	5230	0.67	11.85	24.00	0.02		Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	-	Pass/Fail
11a	6Mbps	1	36	5180	0.60	4.16	11.00	0.02		Pass
11a	6Mbps	1	44	5220	0.60	3.94	11.00	0.02		Pass
11a	6Mbps	1	48	5240	0.60	3.73	11.00	0.02		Pass
HT20	MCS0	1	36	5180	0.63	0.24	11.00	0.02		Pass
HT20	MCS0	1	44	5220	0.63	0.19	11.00	0.02		Pass
HT20	MCS0	1	48	5240	0.63	-0.10	11.00	0.02		Pass
HT40	MCS0	1	38	5190	0.67	-2.20	11.00	0.02		Pass
HT40	MCS0	1	46	5230	0.67	-2.82	11.00	0.02		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	52	5260	19.73	33.47	23.95	29.95	23.98	
11a	6M bps	1	60	5300	21.38	31.12	23.98	30.00	23.98	
11a	6M bps	1	64	5320	19.98	31.37	23.98	30.00	23.98	
HT20	MCS 0	1	52	5260	19.43	24.18	23.88	29.88	23.98	
HT20	MCS 0	1	60	5300	19.33	24.33	23.86	29.86	23.98	
HT20	MCS 0	1	64	5320	19.48	24.08	23.90	29.90	23.98	
HT40	MCS 0	1	54	5270	36.76	44.87	23.98	30.00	23.98	
HT40	MCS 0	1	62	5310	37.16	45.67	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

FCC Band II										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	52	5260	0.60	15.42	23.98	-0.38	26.99	Pass
11a	6M bps	1	60	5300	0.60	15.35	23.98	-0.38	26.99	Pass
11a	6M bps	1	64	5320	0.60	15.46	23.98	-0.38	26.99	Pass
HT20	MCS 0	1	52	5260	0.63	11.84	23.98	-0.38	26.99	Pass
HT20	MCS 0	1	60	5300	0.63	11.79	23.98	-0.38	26.99	Pass
HT20	MCS 0	1	64	5320	0.63	11.78	23.98	-0.38	26.99	Pass
HT40	MCS 0	1	54	5270	0.67	11.80	23.98	-0.38	26.99	Pass
HT40	MCS 0	1	62	5310	0.67	11.68	23.98	-0.38	26.99	Pass

TEST RESULTS DATA
Power Spectral Density

Band II										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	52	5260	0.60	4.62	11.00	-0.38		Pass
11a	6M bps	1	60	5300	0.60	4.28	11.00	-0.38		Pass
11a	6M bps	1	64	5320	0.60	4.37	11.00	-0.38		Pass
HT20	MCS 0	1	52	5260	0.63	0.08	11.00	-0.38		Pass
HT20	MCS 0	1	60	5300	0.63	-0.10	11.00	-0.38		Pass
HT20	MCS 0	1	64	5320	0.63	-0.18	11.00	-0.38		Pass
HT40	MCS 0	1	54	5270	0.67	-2.71	11.00	-0.38		Pass
HT40	MCS 0	1	62	5310	0.67	-3.40	11.00	-0.38		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	100	5500	21.18	31.57	23.98	30.00	23.98	
11a	6M bps	1	116	5580	20.88	36.21	23.98	30.00	23.98	
11a	6M bps	1	140	5700	20.93	35.17	23.98	30.00	23.98	
HT20	MCS 0	1	100	5500	19.38	23.83	23.87	29.87	23.98	
HT20	MCS 0	1	116	5580	19.68	24.53	23.94	29.94	23.98	
HT20	MCS 0	1	140	5700	19.53	24.03	23.91	29.91	23.98	
HT40	MCS 0	1	102	5510	36.76	45.23	23.98	30.00	23.98	
HT40	MCS 0	1	110	5550	36.96	44.87	23.98	30.00	23.98	
HT40	MCS 0	1	134	5670	37.16	44.51	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

FCC Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	100	5500	0.60	14.95	23.98	-0.75	26.99	Pass
11a	6M bps	1	116	5580	0.60	15.16	23.98	-0.75	26.99	Pass
11a	6M bps	1	140	5700	0.60	15.28	23.98	-0.75	26.99	Pass
HT20	MCS 0	1	100	5500	0.63	12.24	23.98	-0.75	26.99	Pass
HT20	MCS 0	1	116	5580	0.63	12.31	23.98	-0.75	26.99	Pass
HT20	MCS 0	1	140	5700	0.63	12.60	23.98	-0.75	26.99	Pass
HT40	MCS 0	1	102	5510	0.67	12.45	23.98	-0.75	26.99	Pass
HT40	MCS 0	1	110	5550	0.67	12.31	23.98	-0.75	26.99	Pass
HT40	MCS 0	1	134	5670	0.67	13.20	23.98	-0.75	26.99	Pass

TEST RESULTS DATA
Power Spectral Density

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	100	5500	0.60	4.89	11.00	-0.75		Pass
11a	6M bps	1	116	5580	0.60	4.92	11.00	-0.75		Pass
11a	6M bps	1	140	5700	0.60	4.57	11.00	-0.75		Pass
HT20	MCS 0	1	100	5500	0.63	0.70	11.00	-0.75		Pass
HT20	MCS 0	1	116	5580	0.63	0.93	11.00	-0.75		Pass
HT20	MCS 0	1	140	5700	0.63	0.65	11.00	-0.75		Pass
HT40	MCS 0	1	102	5510	0.67	-2.12	11.00	-0.75		Pass
HT40	MCS 0	1	110	5550	0.67	-2.22	11.00	-0.75		Pass
HT40	MCS 0	1	134	5670	0.67	-1.56	11.00	-0.75		Pass

TEST RESULTS DATA
Frequency Stability

Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	50	3.8	
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	-30	3.8	
11a	6Mbps	1	36	5180	5180.025	0.025	4.83	20	4.4	
11a	6Mbps	1	36	5180	5180.025	0.025	4.83	20	3.6	
11a	6Mbps	1	36	5180	5180.025	0.025	4.83	20	3.8	

Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	64	5320	5320.000	0.000	0.00	50	3.8	
11a	6Mbps	1	64	5320	5320.050	0.050	9.40	-30	3.8	
11a	6Mbps	1	64	5320	5320.025	0.025	4.70	20	4.4	
11a	6Mbps	1	64	5320	5320.025	0.025	4.70	20	3.6	
11a	6Mbps	1	64	5320	5320.025	0.025	4.70	20	3.8	

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	100	5500	5500.000	0.000	0.00	50	3.8	
11a	6Mbps	1	100	5500	5500.050	0.050	9.09	-30	3.8	
11a	6Mbps	1	100	5500	5500.025	0.025	4.55	20	4.4	
11a	6Mbps	1	100	5500	5500.000	0.000	0.00	20	3.6	
11a	6Mbps	1	100	5500	5500.000	0.000	0.00	20	3.8	



Appendix B. Radiated Spurious Emission

Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamplifier 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 36 5180MHz		5128	46.08	-27.92	74	43.35	31.36	7.91	36.54	308	151	P	H
		5128	37.36	-16.64	54	34.63	31.36	7.91	36.54	308	151	A	H
	*	5176	91.04	-	-	88.27	31.35	7.94	36.52	308	151	P	H
	*	5176	83.76	-	-	80.99	31.35	7.94	36.52	308	151	A	H
		5149.76	49.97	-24.03	74	47.22	31.36	7.92	36.53	371	80	P	V
		5149.99	39.06	-14.94	54	36.31	31.36	7.92	36.53	371	80	A	V
	*	5188	96.4	-	-	93.63	31.35	7.94	36.52	371	80	P	V
	*	5188	89.09	-	-	86.32	31.35	7.94	36.52	371	80	A	V
802.11a CH 44 5220MHz		5107.04	46.18	-27.82	74	43.45	31.37	7.91	36.55	100	56	P	H
		5104.8	36.07	-17.93	54	33.36	31.37	7.9	36.56	100	56	A	H
	*	5214	90.13	-	-	87.3	31.34	7.99	36.5	100	56	P	H
	*	5214	83.03	-	-	80.2	31.34	7.99	36.5	100	56	A	H
		5398.38	43.63	-30.37	74	40.28	31.28	8.48	36.41	100	56	P	H
		5370.12	35.45	-18.55	54	32.19	31.29	8.39	36.42	100	56	A	H
		5140.48	45.02	-28.98	74	42.27	31.36	7.92	36.53	309	84	P	V
		5101.92	36.24	-17.76	54	33.53	31.37	7.9	36.56	309	84	A	V
	*	5226	96.35	-	-	93.47	31.33	8.04	36.49	309	84	P	V
	*	5226	89.15	-	-	86.27	31.33	8.04	36.49	309	84	A	V
		5373.72	44.94	-29.06	74	41.68	31.29	8.39	36.42	309	84	P	V
		5399.28	35.57	-18.43	54	32.22	31.28	8.48	36.41	309	84	A	V



802.11a CH 48 5240MHz	*	5236	89.66	-	-	86.78	31.33	8.04	36.49	100	51	P	H
	*	5236	82.34	-	-	79.46	31.33	8.04	36.49	100	51	A	H
		5385.06	44.64	-29.36	74	41.35	31.28	8.43	36.42	100	51	P	H
		5399.99	35.52	-18.48	54	32.17	31.28	8.48	36.41	100	51	A	H
	*	5234	95.55	-	-	92.67	31.33	8.04	36.49	331	83	P	V
	*	5234	88.35	-	-	85.47	31.33	8.04	36.49	331	83	A	V
		5387.94	44.29	-29.71	74	41	31.28	8.43	36.42	331	83	P	V
		5389.92	35.5	-18.5	54	32.21	31.28	8.43	36.42	331	83	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

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		10360	41.79	-32.21	74	50.05	37.15	11.84	57.25	100	360	P	H
CH 36 5180MHz		10360	43.49	-30.51	74	51.75	37.15	11.84	57.25	100	360	P	V
802.11a		10440	41.61	-32.39	74	49.55	37.29	11.89	57.12	100	360	P	H
CH 44 5220MHz		10440	41.72	-32.28	74	49.66	37.29	11.89	57.12	100	360	P	V
802.11a		10480	41.95	-32.05	74	49.66	37.39	11.92	57.02	100	360	P	H
CH 48 5240MHz		10480	41.34	-32.66	74	49.05	37.39	11.92	57.02	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

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 36 5180MHz		5125.44	47.02	-26.98	74	44.29	31.36	7.91	36.54	297	122	P	H
		5128.48	37.85	-16.15	54	35.12	31.36	7.91	36.54	297	122	A	H
	*	5186	91.43	-	-	88.66	31.35	7.94	36.52	297	122	P	H
	*	5186	84.45	-	-	81.68	31.35	7.94	36.52	297	122	A	H
		5148.96	48.23	-25.77	74	45.48	31.36	7.92	36.53	400	81	P	V
		5128.32	39.98	-14.02	54	37.25	31.36	7.91	36.54	400	81	A	V
	*	5176	96.29	-	-	93.52	31.35	7.94	36.52	400	81	P	V
	*	5176	89.15	-	-	86.38	31.35	7.94	36.52	400	81	A	V
802.11n HT20 CH 44 5220MHz		5105.76	46.07	-27.93	74	43.34	31.37	7.91	36.55	100	115	P	H
		5108	36.42	-17.58	54	33.69	31.37	7.91	36.55	100	115	A	H
	*	5220	88.52	-	-	85.69	31.34	7.99	36.5	100	115	P	H
	*	5220	81.77	-	-	78.94	31.34	7.99	36.5	100	115	A	H
		5353.56	44.63	-29.37	74	41.43	31.29	8.34	36.43	100	115	P	H
		5397.84	35.76	-18.24	54	32.41	31.28	8.48	36.41	100	115	A	H
		5100.8	45.8	-28.2	74	43.09	31.37	7.9	36.56	335	81	P	V
		5107.2	36.54	-17.46	54	33.81	31.37	7.91	36.55	335	81	A	V
	*	5228	94.21	-	-	91.33	31.33	8.04	36.49	335	81	P	V
	*	5228	87.42	-	-	84.54	31.33	8.04	36.49	335	81	A	V
		5352.84	44.78	-29.22	74	41.58	31.29	8.34	36.43	335	81	P	V
		5367.96	35.66	-18.34	54	32.4	31.29	8.39	36.42	335	81	A	V



802.11n HT20 CH 48 5240MHz	*	5234	87.56	-	-	84.68	31.33	8.04	36.49	100	120	P	H
	*	5234	80.95	-	-	78.07	31.33	8.04	36.49	100	120	A	H
		5385.06	45.22	-28.78	74	41.93	31.28	8.43	36.42	100	120	P	H
		5396.94	35.73	-18.27	54	32.38	31.28	8.48	36.41	100	120	A	H
	*	5236	94.45	-	-	91.57	31.33	8.04	36.49	306	86	P	V
	*	5236	86.79	-	-	83.91	31.33	8.04	36.49	306	86	A	V
		5380.2	44.41	-29.59	74	41.12	31.28	8.43	36.42	306	86	P	V
		5385.96	35.72	-18.28	54	32.43	31.28	8.43	36.42	306	86	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI 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 36 5180MHz		10360	42.4	-31.6	74	50.66	37.15	11.84	57.25	100	360	P	H
		10360	41.24	-32.76	74	49.5	37.15	11.84	57.25	100	360	P	V
802.11n HT20 CH 44 5220MHz		10440	42.22	-31.78	74	50.16	37.29	11.89	57.12	100	360	P	H
		10440	41.29	-32.71	74	49.23	37.29	11.89	57.12	100	360	P	V
802.11n HT20 CH 48 5240MHz		10480	42.49	-31.51	74	50.2	37.39	11.92	57.02	100	360	P	H
		10480	42.76	-31.24	74	50.47	37.39	11.92	57.02	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

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 38 5190MHz		5147.2	49.44	-24.56	74	46.69	31.36	7.92	36.53	100	56	P	H
		5149.99	39.47	-14.53	54	36.72	31.36	7.92	36.53	100	56	A	H
	*	5186	85.54	-	-	82.77	31.35	7.94	36.52	100	56	P	H
	*	5186	78.36	-	-	75.59	31.35	7.94	36.52	100	56	A	H
		5368.14	44.94	-29.06	74	41.68	31.29	8.39	36.42	100	56	P	H
		5370.48	35.37	-18.63	54	32.11	31.29	8.39	36.42	100	56	A	H
		5148.8	54.14	-19.86	74	51.39	31.36	7.92	36.53	318	79	P	V
		5149.99	43.26	-10.74	54	40.51	31.36	7.92	36.53	318	79	A	V
	*	5184	91.61	-	-	88.84	31.35	7.94	36.52	318	79	P	V
	*	5184	84.56	-	-	81.79	31.35	7.94	36.52	318	79	A	V
		5391.72	44.64	-29.36	74	41.35	31.28	8.43	36.42	318	79	P	V
		5364.18	35.38	-18.62	54	32.12	31.29	8.39	36.42	318	79	A	V
802.11n HT40 CH 46 5230MHz		5149.76	45.08	-28.92	74	42.33	31.36	7.92	36.53	100	59	P	H
		5104.96	36.28	-17.72	54	33.57	31.37	7.9	36.56	100	59	A	H
	*	5220	85.23	-	-	82.4	31.34	7.99	36.5	100	59	P	H
	*	5220	82.78	-	-	79.95	31.34	7.99	36.5	100	59	A	H
		5388.84	44.3	-29.7	74	41.01	31.28	8.43	36.42	100	59	P	H
		5399.28	35.4	-18.6	54	32.05	31.28	8.48	36.41	100	59	A	H
		5130.08	45.86	-28.14	74	43.13	31.36	7.91	36.54	323	66	P	V
		5127.36	36.62	-17.38	54	33.89	31.36	7.91	36.54	323	66	A	V
	*	5218	90.38	-	-	87.55	31.34	7.99	36.5	323	66	P	V
	*	5218	82.94	-	-	80.11	31.34	7.99	36.5	323	66	A	V
		5372.28	44.78	-29.22	74	41.52	31.29	8.39	36.42	323	66	P	V
		5386.68	35.43	-18.57	54	32.14	31.28	8.43	36.42	323	66	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI 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 38 5190MHz		10380	42.32	-31.68	74	50.5	37.19	11.85	57.22	100	360	P	H
		10380	41.64	-32.36	74	49.82	37.19	11.85	57.22	100	360	P	V
802.11n HT40 CH 46 5230MHz		10460	43.59	-30.41	74	51.45	37.32	11.9	57.08	100	360	P	H
		10460	42.62	-31.38	74	50.48	37.32	11.9	57.08	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 - 5250~5350MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 52 5260MHz		5121.6	45.29	-28.71	74	42.56	31.37	7.91	36.55	120	58	P	H
		5100.64	36.17	-17.83	54	33.46	31.37	7.9	36.56	120	58	A	H
	*	5264	92.57	-	-	89.6	31.32	8.12	36.47	120	58	P	H
	*	5264	84.67	-	-	81.7	31.32	8.12	36.47	120	58	A	H
		5102.72	47.02	-26.98	74	44.31	31.37	7.9	36.56	329	97	P	V
		5101.44	36.3	-17.7	54	33.59	31.37	7.9	36.56	329	97	A	V
	*	5266	98.15	-	-	95.18	31.32	8.12	36.47	329	97	P	V
	*	5266	90.34	-	-	87.37	31.32	8.12	36.47	329	97	A	V
802.11a CH 60 5300MHz		5118.88	44.8	-29.2	74	42.07	31.37	7.91	36.55	375	116	P	H
		5100.8	36	-18	54	33.29	31.37	7.9	36.56	375	116	A	H
	*	5304	92.23	-	-	89.17	31.31	8.21	36.46	375	116	P	H
	*	5304	84.96	-	-	81.9	31.31	8.21	36.46	375	116	A	H
		5354.9	45.47	-28.53	74	42.27	31.29	8.34	36.43	375	116	P	H
		5352.3	35.87	-18.13	54	32.67	31.29	8.34	36.43	375	116	A	H
		5106.24	45.61	-28.39	74	42.88	31.37	7.91	36.55	394	87	P	V
		5106.24	36.18	-17.82	54	33.45	31.37	7.91	36.55	394	87	A	V
	*	5304	96.23	-	-	93.17	31.31	8.21	36.46	394	87	P	V
	*	5304	89.68	-	-	86.62	31.31	8.21	36.46	394	87	A	V
		5351.7	48.04	-25.96	74	44.84	31.29	8.34	36.43	394	87	P	V
		5352.3	38.16	-15.84	54	34.96	31.29	8.34	36.43	394	87	A	V



802.11a CH 64 5320MHz	*	5316	92.37	-	-	89.26	31.3	8.26	36.45	299	117	P	H
	*	5316	84.78	-	-	81.67	31.3	8.26	36.45	299	117	A	H
		5351.1	48.38	-25.62	74	45.18	31.29	8.34	36.43	299	117	P	H
		5350	38.74	-15.26	54	35.54	31.29	8.34	36.43	299	117	A	H
	*	5326	97.14	-	-	94.03	31.3	8.26	36.45	300	85	P	V
	*	5326	89.23	-	-	86.12	31.3	8.26	36.45	300	85	A	V
		5350.6	54.22	-19.78	74	51.02	31.29	8.34	36.43	300	85	P	V
		5350	42.86	-11.14	54	39.66	31.29	8.34	36.43	300	85	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

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		10520	43.91	-30.09	74	51.46	37.46	11.94	56.95	100	360	P	H
CH 52 5260MHz		10520	43.88	-30.12	74	51.43	37.46	11.94	56.95	100	360	P	V
802.11a		10600	42.73	-31.27	74	49.88	37.63	12	56.78	100	360	P	H
CH 60 5300MHz		10600	41.97	-32.03	74	49.12	37.63	12	56.78	100	360	P	V
802.11a		10640	41.77	-32.23	74	48.76	37.7	12.02	56.71	100	360	P	H
CH 64 5320MHz		10640	42.91	-31.09	74	49.9	37.7	12.02	56.71	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

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 52 5260MHz		5104	46.01	-27.99	74	43.3	31.37	7.9	36.56	100	55	P	H
		5105.76	36.4	-17.6	54	33.67	31.37	7.91	36.55	100	55	A	H
	*	5266	87.97	-	-	85	31.32	8.12	36.47	100	55	P	H
	*	5266	80.95	-	-	77.98	31.32	8.12	36.47	100	55	A	H
		5129.28	45.55	-28.45	74	42.82	31.36	7.91	36.54	325	88	P	V
		5121.6	36.3	-17.7	54	33.57	31.37	7.91	36.55	325	88	A	V
	*	5264	93.17	-	-	90.2	31.32	8.12	36.47	325	88	P	V
	*	5264	85.99	-	-	83.02	31.32	8.12	36.47	325	88	A	V
802.11n HT20 CH 60 5300MHz		5142.4	45.67	-28.33	74	42.92	31.36	7.92	36.53	100	58	P	H
		5110.08	36.3	-17.7	54	33.57	31.37	7.91	36.55	100	58	A	H
	*	5298	85.41	-	-	82.35	31.31	8.21	36.46	100	58	P	H
	*	5298	78.86	-	-	75.8	31.31	8.21	36.46	100	58	A	H
		5380.3	46.16	-27.84	74	42.87	31.28	8.43	36.42	100	58	P	H
		5353.2	35.55	-18.45	54	32.35	31.29	8.34	36.43	100	58	A	H
		5106.88	45.11	-28.89	74	42.38	31.37	7.91	36.55	318	96	P	V
		5107.52	36.17	-17.83	54	33.44	31.37	7.91	36.55	318	96	A	V
	*	5296	92.35	-	-	89.29	31.31	8.21	36.46	318	96	P	V
	*	5296	85.16	-	-	82.1	31.31	8.21	36.46	318	96	A	V
		5389.3	45.6	-28.4	74	42.31	31.28	8.43	36.42	318	96	P	V
		5352.1	36.69	-17.31	54	33.49	31.29	8.34	36.43	318	96	A	V



802.11n HT20 CH 64 5320MHz	*	5326	86.75	-	-	83.64	31.3	8.26	36.45	100	118	P	H
	*	5326	78.88	-	-	75.77	31.3	8.26	36.45	100	118	A	H
		5359.2	45.11	-28.89	74	41.91	31.29	8.34	36.43	100	118	P	H
		5371.8	35.98	-18.02	54	32.72	31.29	8.39	36.42	100	118	A	H
	*	5324	90.95	-	-	87.84	31.3	8.26	36.45	311	83	P	V
	*	5324	83.62	-	-	80.51	31.3	8.26	36.45	311	83	A	V
		5350.4	47.05	-26.95	74	43.85	31.29	8.34	36.43	311	83	P	V
		5371.6	36.72	-17.28	54	33.46	31.29	8.39	36.42	311	83	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI 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 52 5260MHz		10520	42.97	-31.03	74	50.52	37.46	11.94	56.95	100	360	P	H
		10520	42.74	-31.26	74	50.29	37.46	11.94	56.95	100	360	P	V
802.11n HT20 CH 60 5300MHz		10600	42.74	-31.26	74	49.89	37.63	12	56.78	100	360	P	H
		10600	43.17	-30.83	74	50.32	37.63	12	56.78	100	360	P	V
802.11n HT20 CH 64 5320MHz		10640	42.22	-31.78	74	49.21	37.7	12.02	56.71	100	360	P	H
		10640	42.69	-31.31	74	49.68	37.7	12.02	56.71	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

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 54 5270MHz		5130.88	45.99	-28.01	74	43.26	31.36	7.91	36.54	100	48	P	H
		5106.08	36.01	-17.99	54	33.28	31.37	7.91	36.55	100	48	A	H
	*	5262	84.64	-	-	81.67	31.32	8.12	36.47	100	48	P	H
	*	5262	77.15	-	-	74.18	31.32	8.12	36.47	100	48	A	H
		5372.1	45.11	-28.89	74	41.85	31.29	8.39	36.42	100	48	P	H
		5396.4	35.22	-18.78	54	31.87	31.28	8.48	36.41	100	48	A	H
		5112.48	45.06	-28.94	74	42.33	31.37	7.91	36.55	324	96	P	V
		5106.88	36.08	-17.92	54	33.35	31.37	7.91	36.55	324	96	A	V
	*	5258	90.67	-	-	87.75	31.32	8.08	36.48	324	96	P	V
	*	5258	83.02	-	-	80.1	31.32	8.08	36.48	324	96	A	V
		5398.6	45.67	-28.33	74	42.32	31.28	8.48	36.41	324	96	P	V
		5364	35.26	-18.74	54	32	31.29	8.39	36.42	324	96	A	V
802.11n HT40 CH 62 5310MHz		5146.24	44.64	-29.36	74	41.89	31.36	7.92	36.53	321	116	P	H
		5108.32	36.01	-17.99	54	33.28	31.37	7.91	36.55	321	116	A	H
	*	5300	84.43	-	-	81.37	31.31	8.21	36.46	321	116	P	H
	*	5300	77.31	-	-	74.25	31.31	8.21	36.46	321	116	A	H
		5352	51.03	-22.97	74	47.83	31.29	8.34	36.43	321	116	P	H
		5350.5	38.15	-15.85	54	34.95	31.29	8.34	36.43	321	116	A	H
		5146.88	45.15	-28.85	74	42.4	31.36	7.92	36.53	391	100	P	V
		5107.04	36.02	-17.98	54	33.29	31.37	7.91	36.55	391	100	A	V
	*	5300	89.59	-	-	86.53	31.31	8.21	36.46	391	100	P	V
	*	5300	82.27	-	-	79.21	31.31	8.21	36.46	391	100	A	V
		5350.1	52.88	-21.12	74	49.68	31.29	8.34	36.43	391	100	P	V
		5350.1	42.12	-11.88	54	38.92	31.29	8.34	36.43	391	100	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI 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 54 5270MHz		10540	43.04	-30.96	74	50.52	37.49	11.95	56.92	100	360	P	H
		10540	42.17	-31.83	74	49.65	37.49	11.95	56.92	100	360	P	V
802.11n HT40 CH 62 5310MHz		10620	43.66	-30.34	74	50.73	37.67	12.01	56.75	100	360	P	H
		10620	42.07	-31.93	74	49.14	37.67	12.01	56.75	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

Band 3 - 5470~5725MHz

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 100 5500MHz		5467.6	47.38	-26.62	74	44.15	31.25	8.35	36.37	100	117	P	H
		5469.84	37.36	-16.64	54	34.13	31.25	8.35	36.37	100	117	A	H
	*	5508	90.11	-	-	86.94	31.24	8.29	36.36	100	117	P	H
	*	5508	83.09	-	-	79.92	31.24	8.29	36.36	100	117	A	H
		5470	50.34	-23.66	74	47.11	31.25	8.35	36.37	381	84	P	V
		5470	39.33	-14.67	54	36.1	31.25	8.35	36.37	381	84	A	V
	*	5506	94.47	-	-	91.3	31.24	8.29	36.36	381	84	P	V
	*	5506	87.24	-	-	84.07	31.24	8.29	36.36	381	84	A	V
802.11a CH 116 5580MHz		5424.88	45.12	-28.88	74	41.81	31.27	8.44	36.4	100	117	P	H
		5447.92	35.58	-18.42	54	32.32	31.26	8.38	36.38	100	117	A	H
	*	5576	92.62	-	-	89.56	31.22	8.16	36.32	100	117	P	H
	*	5576	85.32	-	-	82.26	31.22	8.16	36.32	100	117	A	H
		5747.56	46.44	-27.56	74	42.72	31.66	8.34	36.28	100	117	P	H
		5759	36.35	-17.65	54	32.52	31.74	8.37	36.28	100	117	A	H
		5456.56	45.55	-28.45	74	42.29	31.26	8.38	36.38	381	82	P	V
		5455.28	35.69	-18.31	54	32.43	31.26	8.38	36.38	381	82	A	V
	*	5586	96.53	-	-	93.5	31.22	8.13	36.32	381	82	P	V
	*	5586	89.12	-	-	86.09	31.22	8.13	36.32	381	82	A	V
		5765	46.25	-27.75	74	42.42	31.74	8.37	36.28	381	82	P	V
		5752.84	36.36	-17.64	54	32.53	31.74	8.37	36.28	381	82	A	V



802.11a CH 140 5700MHz	*	5706	92.78	-	-	89.27	31.51	8.28	36.28	359	111	P	H
	*	5706	85.41	-	-	81.9	31.51	8.28	36.28	359	111	A	H
		5728.2	59.44	-14.56	74	55.83	31.58	8.31	36.28	359	111	P	H
		5725.56	44.81	-9.19	54	41.2	31.58	8.31	36.28	359	111	A	H
	*	5706	98.26	-	-	94.75	31.51	8.28	36.28	351	89	P	V
	*	5706	91.08	-	-	87.57	31.51	8.28	36.28	351	89	A	V
		5730.44	63.69	-10.31	74	60.08	31.58	8.31	36.28	351	89	P	V
	!	5725.08	50.64	-3.36	54	47.03	31.58	8.31	36.28	351	89	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz

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		11000	43.82	-30.18	74	49.15	38.42	12.25	56	100	360	P	H
CH 100 5500MHz		11000	44.05	-29.95	74	49.38	38.42	12.25	56	100	360	P	V
802.11a		11160	43.6	-30.4	74	48.82	38.76	12.36	56.34	100	360	P	H
CH 116 5580MHz		11160	43.19	-30.81	74	48.41	38.76	12.36	56.34	100	360	P	V
802.11a		11400	42.47	-31.53	74	47.98	38.78	12.52	56.81	100	360	P	H
CH 140 5700MHz		11400	42.01	-31.99	74	47.52	38.78	12.52	56.81	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz
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 100 5500MHz		5407.28	45.73	-28.27	74	42.38	31.28	8.48	36.41	100	110	P	H
		5469.52	37.16	-16.84	54	33.93	31.25	8.35	36.37	100	110	A	H
	*	5506	87.15	-	-	83.98	31.24	8.29	36.36	100	110	P	H
	*	5506	79.88	-	-	76.71	31.24	8.29	36.36	100	110	A	H
		5468.56	48.19	-25.81	74	44.96	31.25	8.35	36.37	315	84	P	V
		5469.99	38.46	-15.54	54	35.23	31.25	8.35	36.37	315	84	A	V
	*	5496	91.86	-	-	88.66	31.25	8.32	36.37	315	84	P	V
	*	5496	84.58	-	-	81.38	31.25	8.32	36.37	315	84	A	V
802.11n HT20 CH 116 5580MHz		5434.16	45.59	-28.41	74	42.31	31.26	8.41	36.39	100	53	P	H
		5463.92	36.08	-17.92	54	32.85	31.25	8.35	36.37	100	53	A	H
	*	5584	85.92	-	-	82.89	31.22	8.13	36.32	100	53	P	H
	*	5584	78.6	-	-	75.57	31.22	8.13	36.32	100	53	A	H
		5764.36	46.13	-27.87	74	42.3	31.74	8.37	36.28	100	53	P	H
		5752.52	36.57	-17.43	54	32.74	31.74	8.37	36.28	100	53	A	H
		5445.84	45.52	-28.48	74	42.26	31.26	8.38	36.38	376	88	P	V
		5450.64	36.11	-17.89	54	32.85	31.26	8.38	36.38	376	88	A	V
	*	5584	91.15	-	-	88.12	31.22	8.13	36.32	376	88	P	V
	*	5584	84.01	-	-	80.98	31.22	8.13	36.32	376	88	A	V
		5756.36	46.09	-27.91	74	42.26	31.74	8.37	36.28	376	88	P	V
		5764.28	36.56	-17.44	54	32.73	31.74	8.37	36.28	376	88	A	V



802.11n HT20 CH 140 5700MHz	*	5706	87.41	-	-	83.9	31.51	8.28	36.28	100	54	P	H
	*	5706	79.94	-	-	76.43	31.51	8.28	36.28	100	54	A	H
		5728.52	48.17	-25.83	74	44.56	31.58	8.31	36.28	100	54	P	H
		5725.32	38.99	-15.01	54	35.38	31.58	8.31	36.28	100	54	A	H
	*	5708	92.73	-	-	89.22	31.51	8.28	36.28	317	95	P	V
	*	5708	85.36	-	-	81.85	31.51	8.28	36.28	317	95	A	V
		5725.64	52.6	-21.4	74	48.99	31.58	8.31	36.28	317	95	P	V
		5725.08	42.94	-11.06	54	39.33	31.58	8.31	36.28	317	95	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz
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 100 5500MHz		11000	43.55	-30.45	74	48.88	38.42	12.25	56	100	360	P	H
		11000	42.89	-31.11	74	48.22	38.42	12.25	56	100	360	P	V
802.11n HT20 CH 116 5580MHz		11160	43.19	-30.81	74	48.41	38.76	12.36	56.34	100	360	P	H
		11160	42.62	-31.38	74	47.84	38.76	12.36	56.34	100	360	P	V
802.11n HT20 CH 140 5700MHz		11400	42.01	-31.99	74	47.52	38.78	12.52	56.81	100	360	P	H
		11400	42.13	-31.87	74	47.64	38.78	12.52	56.81	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz
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 102 5510MHz		5470	46.98	-27.02	74	43.75	31.25	8.35	36.37	100	112	P	H
		5469.68	37.79	-16.21	54	34.56	31.25	8.35	36.37	100	112	A	H
	*	5524	82.95	-	-	79.8	31.24	8.26	36.35	100	112	P	H
	*	5524	75.5	-	-	72.35	31.24	8.26	36.35	100	112	A	H
		5751.16	45.97	-28.03	74	42.25	31.66	8.34	36.28	100	112	P	H
		5747.56	36.32	-17.68	54	32.6	31.66	8.34	36.28	100	112	A	H
		5467.12	51.63	-22.37	74	48.4	31.25	8.35	36.37	301	84	P	V
		5470	40.69	-13.31	54	37.46	31.25	8.35	36.37	301	84	A	V
	*	5502	87.73	-	-	84.56	31.24	8.29	36.36	301	84	P	V
	*	5502	80.47	-	-	77.3	31.24	8.29	36.36	301	84	A	V
		5738.44	46.34	-27.66	74	42.62	31.66	8.34	36.28	301	84	P	V
		5750.36	36.31	-17.69	54	32.59	31.66	8.34	36.28	300	84	A	V
802.11n HT40 CH 110 5550MHz		5424.88	45.16	-28.84	74	41.85	31.27	8.44	36.4	100	110	P	H
		5461.68	35.58	-18.42	54	32.32	31.26	8.38	36.38	100	110	A	H
	*	5560	84.35	-	-	81.25	31.23	8.2	36.33	100	110	P	H
	*	5560	76.91	-	-	73.81	31.23	8.2	36.33	100	110	A	H
		5760.92	46	-28	74	42.17	31.74	8.37	36.28	100	110	P	H
		5760.84	36.22	-17.78	54	32.39	31.74	8.37	36.28	100	110	A	H
		5442	45.13	-28.87	74	41.85	31.26	8.41	36.39	311	66	P	V
		5468.88	35.66	-18.34	54	32.43	31.25	8.35	36.37	311	66	A	V
	*	5564	87.32	-	-	84.22	31.23	8.2	36.33	311	66	P	V
	*	5564	79.95	-	-	76.85	31.23	8.2	36.33	311	66	A	V
		5750.36	46.19	-27.81	74	42.47	31.66	8.34	36.28	311	66	P	V
		5747.96	36.27	-17.73	54	32.55	31.66	8.34	36.28	311	66	A	V



802.11n HT40 CH 134 5670MHz		5423.92	45.14	-28.86	74	41.83	31.27	8.44	36.4	301	106	P	H
		5448.56	35.66	-18.34	54	32.4	31.26	8.38	36.38	301	106	A	H
	*	5680	85.36	-	-	82.08	31.35	8.22	36.29	301	106	P	H
	*	5680	78.11	-	-	74.83	31.35	8.22	36.29	301	106	A	H
		5727.08	46.66	-27.34	74	43.05	31.58	8.31	36.28	301	106	P	H
		5725.16	37.05	-16.95	54	33.44	31.58	8.31	36.28	301	106	A	H
		5447.28	44.83	-29.17	74	41.57	31.26	8.38	36.38	337	72	P	V
		5470	35.75	-18.25	54	32.52	31.25	8.35	36.37	337	72	A	V
	*	5682	90.67	-	-	87.39	31.35	8.22	36.29	337	72	P	V
	*	5682	83.29	-	-	80.01	31.35	8.22	36.29	337	72	A	V
		5726.76	49.07	-24.93	74	45.46	31.58	8.31	36.28	337	72	P	V
		5725.24	38.76	-15.24	54	35.15	31.58	8.31	36.28	337	72	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz
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 102 5510MHz		11020	43.38	-30.62	74	48.7	38.45	12.26	56.03	100	360	P	H
		11020	43.64	-30.36	74	48.96	38.45	12.26	56.03	100	360	P	V
802.11n HT40 CH 110 5550MHz		11100	43.83	-30.17	74	49.09	38.62	12.32	56.2	100	360	P	H
		11100	44.25	-29.75	74	49.51	38.62	12.32	56.2	100	360	P	V
802.11n HT40 CH 134 5670MHz		11340	42.48	-31.52	74	47.78	38.91	12.47	56.68	100	360	P	H
		11340	42.01	-31.99	74	47.31	38.91	12.47	56.68	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz

Emission below 1GHz

WIFI 802.11a (LF @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamplifier 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 LF		33.88	33.61	-6.39	40	38.4	25.84	0.7	31.33	100	0	P	H
		147.37	27.11	-16.39	43.5	39.25	17.94	1.47	31.55	-	-	P	H
		200.72	34.47	-9.03	43.5	48.41	15.82	1.73	31.49	-	-	P	H
		214.3	33.84	-9.66	43.5	47.41	16.18	1.73	31.48	-	-	P	H
		257.95	27.06	-18.94	46	39.31	17.4	1.79	31.44	-	-	P	H
		930.16	31.89	-14.11	46	29.63	29.1	3.93	30.77	-	-	P	H
		34.85	36.01	-3.99	40	41.15	25.5	0.71	31.35	100	360	P	V
		56.19	29.11	-10.89	40	45.1	14.52	0.9	31.41	-	-	P	V
		64.92	31.14	-8.86	40	48.35	13.3	0.97	31.48	-	-	P	V
		200.72	26.87	-16.63	43.5	40.81	15.82	1.73	31.49	-	-	P	V
		323.91	27.52	-18.48	46	36.48	20.13	2.21	31.3	-	-	P	V
		456.8	26.3	-19.7	46	29.68	25.2	2.66	31.24	-	-	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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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)

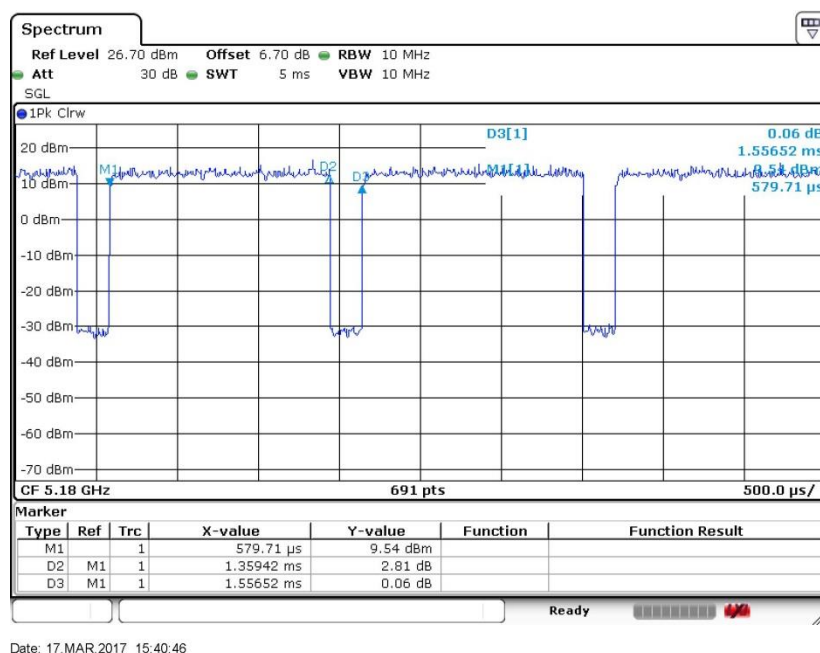
= -10.46(dB)

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	87.34	1.359	0.736	1kHz
802.11n HT20	86.56	1.278	0.782	1kHz
802.11n HT40	86.51	1.236	0.809	1kHz

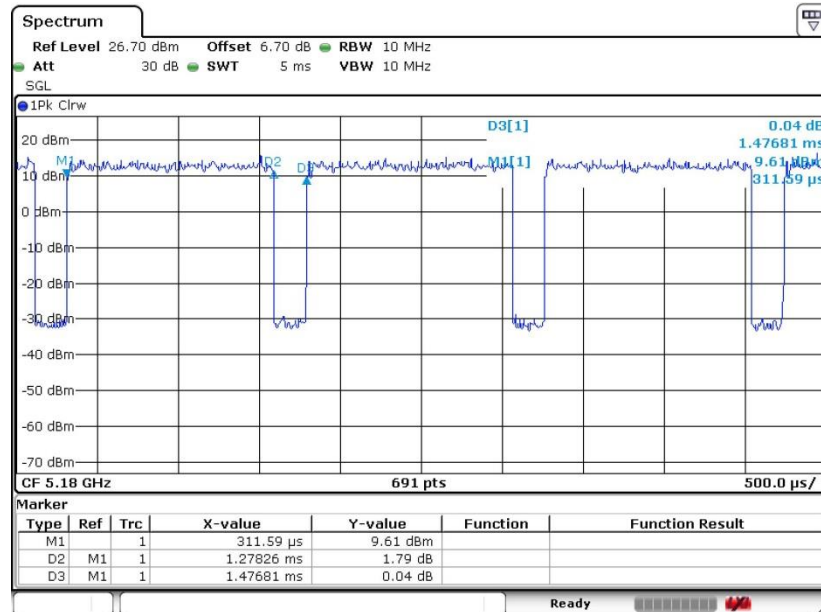
802.11a



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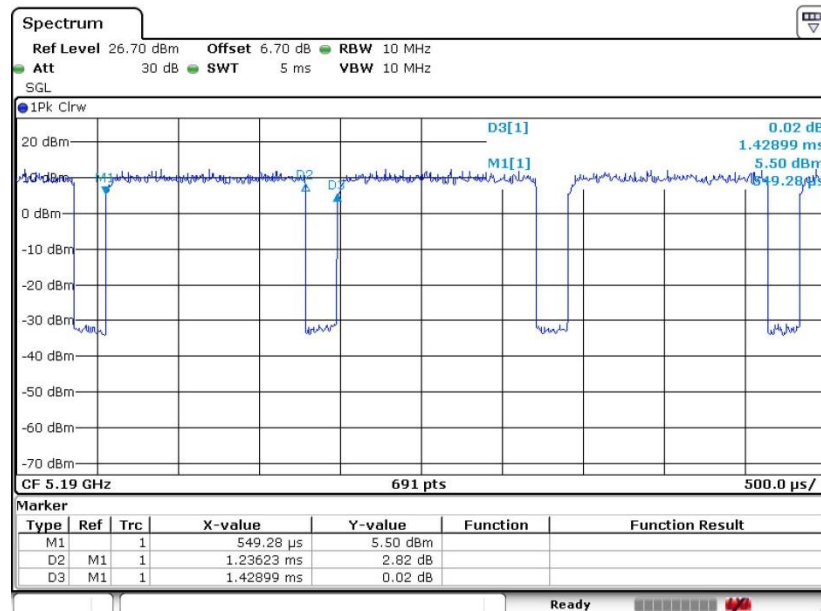


802.11n HT20



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802.11n HT40



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