



FCC RF Test Report

APPLICANT : OnePlus Technology (shenzhen) Co., Ltd
EQUIPMENT : Smart Phone
BRAND NAME : ONEPLUS
MODEL NAME : GM1915
FCC ID : 2ABZ2-GM1915
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Dec. 25, 2018 and testing was completed on Feb. 27, 2019. We, Sporton International (Shenzhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Approved by: Eric Shih / Manager



Sporton International (Shenzhen) Inc.

***1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen City,
Guangdong Province 518055, China***



TABLE OF CONTENTS

REVISION HISTORY.....	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer.....	5
1.3 Product Feature of Equipment Under Test.....	5
1.4 Product Specification of Equipment Under Test.....	6
1.5 Modification of EUT	7
1.6 Testing Location	8
1.7 Applicable Standards.....	8
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	9
2.1 Carrier Frequency and Channel	9
2.2 Test Mode	11
2.3 Connection Diagram of Test System.....	13
2.4 Support Unit used in test configuration and system	13
2.5 EUT Operation Test Setup	14
2.6 Measurement Results Explanation Example.....	14
3 TEST RESULT.....	15
3.1 26dB & 99% Occupied Bandwidth Measurement	15
3.2 Maximum Conducted Output Power Measurement	17
3.3 Power Spectral Density Measurement	19
3.4 Unwanted Emissions Measurement	22
3.5 AC Conducted Emission Measurement.....	27
3.6 Automatically Discontinue Transmission	29
3.7 Antenna Requirements.....	30
4 LIST OF MEASURING EQUIPMENT	31
5 UNCERTAINTY OF EVALUATION	32
APPENDIX A. CONDUCTED TEST RESULTS	
APPENDIX B. AC CONDUCTED EMISSION TEST RESULT	
APPENDIX C. RADIATED SPURIOUS EMISSION	
APPENDIX D. DUTY CYCLE PLOTS	
APPENDIX E. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR8D2514-01E	Rev. 01	Initial issue of report	Mar. 21, 2019



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 & 15.403(i)	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 24 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 11 dBm	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b) & 15.209(a)	Pass	Under limit 3.87 dB at 5146.120 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 15.34 dB at 13.550 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

OnePlus Technology (shenzhen) Co., Ltd

18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen

1.2 Manufacturer

OnePlus Technology (shenzhen) Co., Ltd

18C02, 18C03, 18C04 and 18C05, Shum Yip Terra Building, Binhe Avenue North, Futian District, Shenzhen

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smart Phone
Brand Name	ONEPLUS
Model Name	GM1915
FCC ID	2ABZ2-GM1915
EUT supports Radios application	CDMA/EV-DO/GSM/GPRS/EGPRS/WCDMA/HSPA/ DC-HSDPA/HSPA+/LTE WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ac VHT20/VHT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE NFC/GNSS
IMEI Code	Conducted: 864737040224984 Conduction: 864737040223374 Radiation: 864737040228589
HW Version	13
SW Version	9.5.1.GM31CB
EUT Stage	Production Unit

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5720 MHz
Maximum Output Power to Antenna	MIMO<Ant.1+2> <5180 MHz ~ 5240 MHz> 802.11a : 20.89 dBm / 0.1227 W 802.11n HT20 : 20.76 dBm / 0.1191 W 802.11n HT40 : 20.79 dBm / 0.1199 W 802.11ac VHT20 : 20.74 dBm / 0.1186 W 802.11ac VHT40 : 20.72 dBm / 0.1180 W 802.11ac VHT80 : 17.71 dBm / 0.0590 W <5260 MHz ~ 5320 MHz> 802.11a : 19.73 dBm / 0.0940 W 802.11n HT20 : 19.66 dBm / 0.0925 W 802.11n HT40 : 19.51 dBm / 0.0893 W 802.11ac VHT20 : 19.61 dBm / 0.0914 W 802.11ac VHT40 : 19.45 dBm / 0.0881 W 802.11ac VHT80 : 18.84 dBm / 0.0766 W <5500 MHz ~ 5700 MHz > 802.11a : 20.25 dBm / 0.1059 W 802.11n HT20 : 20.14 dBm / 0.1033 W 802.11n HT40 : 20.08 dBm / 0.1019 W 802.11ac VHT20 : 20.06 dBm / 0.1014 W 802.11ac VHT40 : 20.04 dBm / 0.1009 W 802.11ac VHT80 : 19.44 dBm / 0.0879 W
99% Occupied Bandwidth	MIMO<Ant.1+2> <5180 MHz ~ 5240 MHz> 802.11a : 17.63 MHz 802.11n HT20 : 18.88 MHz 802.11n HT40 : 36.66 MHz 802.11ac VHT80 : 75.64 MHz <5260 MHz ~ 5320 MHz> 802.11a : 17.63 MHz 802.11n HT20 : 18.93 MHz 802.11n HT40 : 36.66 MHz 802.11ac VHT80 : 75.64 MHz <5500 MHz ~ 5700 MHz > 802.11a : 17.58 MHz 802.11n HT20 : 18.93 MHz 802.11n HT40 : 36.66 MHz 802.11ac VHT80 : 75.64 MHz
Antenna Gain / Gain	<5150 MHz ~ 5250 MHz> <Ant. 1> : PIFA Antenna with gain -3.00 dBi <Ant. 2> : PIFA Antenna with gain -3.00 dBi <5250 MHz ~ 5350 MHz> <Ant. 1> : PIFA Antenna with gain -3.00 dBi <Ant. 2> : PIFA Antenna with gain -3.00 dBi <5470 MHz ~ 5725 MHz> <Ant. 1> : PIFA Antenna with gain -3.00 dBi <Ant. 2> : PIFA Antenna with gain -3.00 dBi



Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)		
		Ant. 1	Ant. 2
Antenna Function Description	802.11 a/n/ac SISO	-	-
	802.11 a/n/ac MIMO	V	V

Note:

1. For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing have assessed only 802.11an HT20/ HT40 by referring to their maximum conducted power.
2. The 5GHz WLAN can transmit in MIMO antenna mode only and it has no SISO antenna mode.

1.5 Modification of EUT

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

1.6 Testing Location

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0).

Test Site	Sporton International (Shenzhen) Inc.		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen City, Guangdong Province 518055, China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595		
Test Site No.	Sporton Site No.	FCC designation No.	FCC Test Firm Registration No.
	TH01-SZ CO01-SZ	CN5018	337463

Test Site	Sporton International (Shenzhen) Inc.		
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan District, Shenzhen City, Guangdong Province 518055, China TEL: +86-755- 3320-2398		
Test Site No.	Sporton Site No.	FCC designation No.	FCC Test Firm Registration No.
	03CH04-SZ	CN5019	577730

1.7 Applicable Standards

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

- ♦ 47 CFR Part 15 Subpart E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5180-5240 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42 [#]	5210		
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
	58 [#]	5290		
Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5500-5720 MHz Band 3 (U-NII-2C)	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	106 [#]	5530	134*	5670
	108	5540	136	5680
	110*	5550	140	5700

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
TDWR Channel	118*	5590	124	5620
	120	5600	126*	5630
	122 [#]	5610	128	5640

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	138 [#]	5690	144	5720
	142*	5710		

Note:

1. The above Frequency and Channel in "*" were 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel in "[#]" were 802.11ac VHT80.

2.2 Test Mode

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

MIMO Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0

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



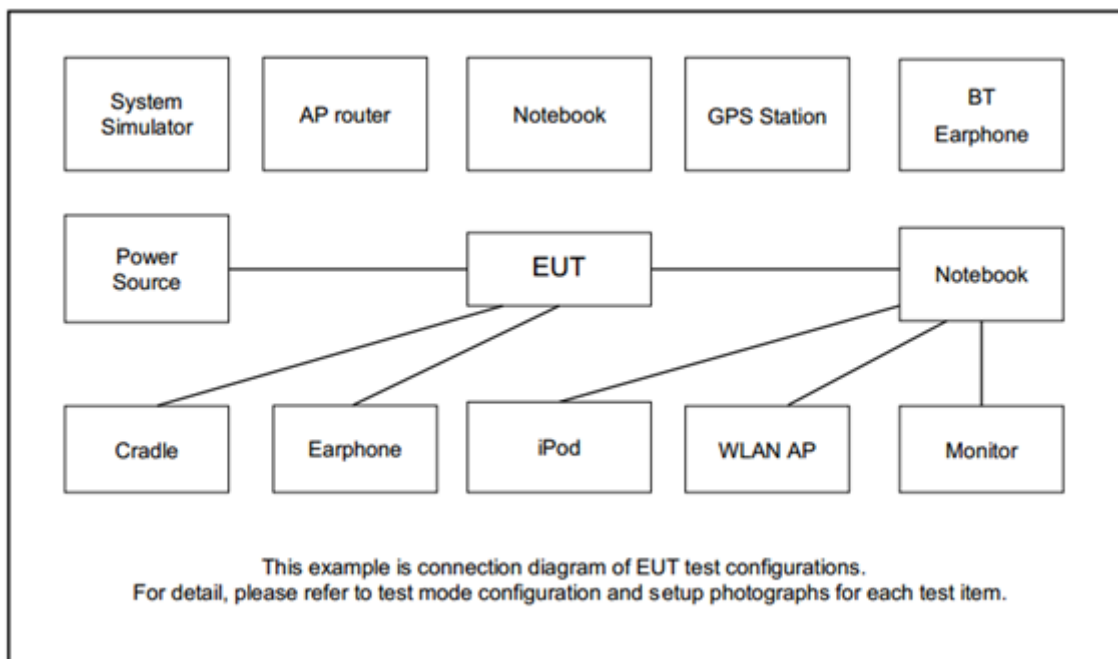
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5720MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5720MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5720MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134
Straddle		-	-	142

Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5720MHz
		802.11ac VHT80	802.11ac VHT80	802.11ac VHT80
L	Low	-	-	106
M	Middle	42	58	-
H	High	-	-	122
Straddle		-	-	138

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

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



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 WLAN AP under large package sizes transmission.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 6.6 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 6.6 + 10 = 16.6 \text{ (dB)}\end{aligned}$$

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.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

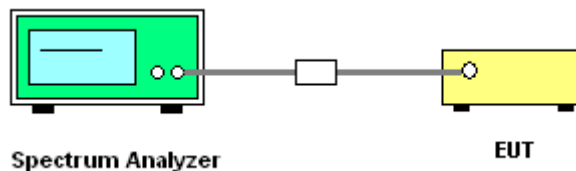
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

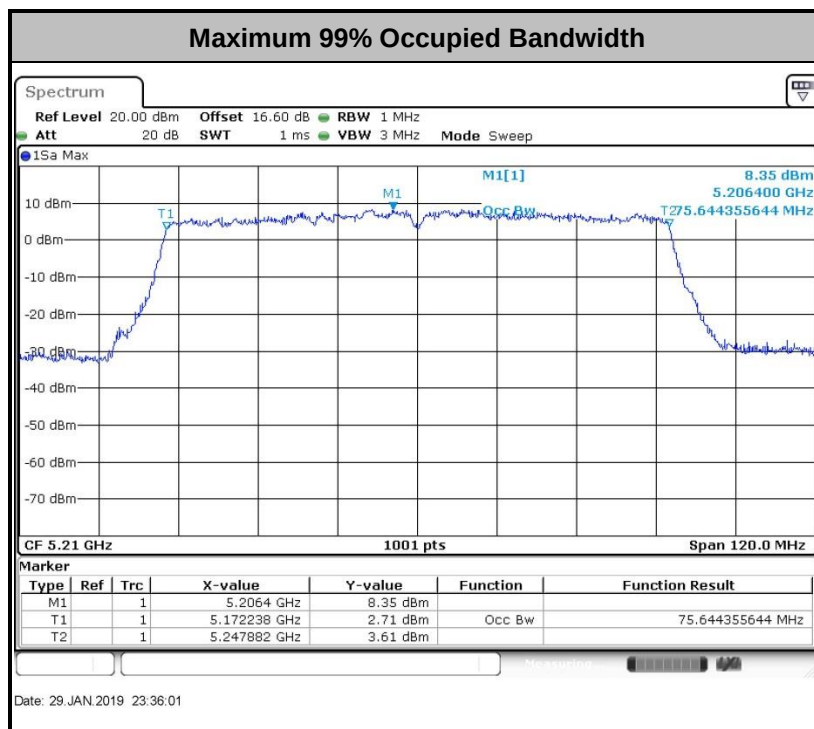
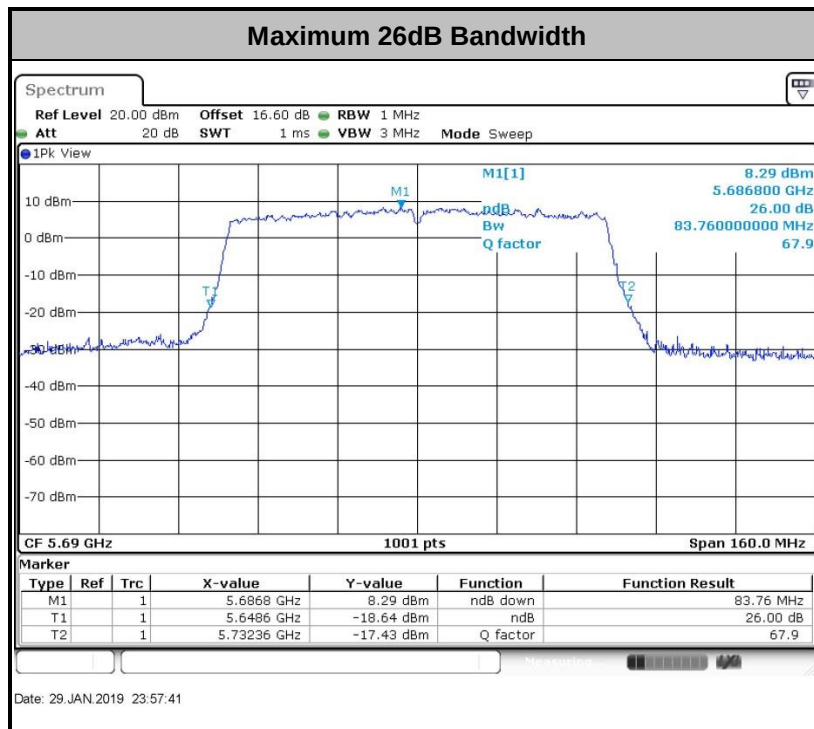
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB 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) $\geq 3 * RBW$.
8. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.



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 dBm $10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

For the 5.47–5.6 GHz and 5.65–5.725 GHz band, the maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever power is less. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

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

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

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

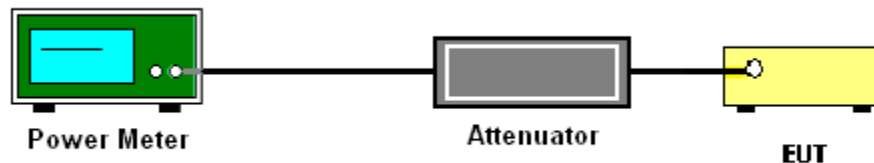
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

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.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

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

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

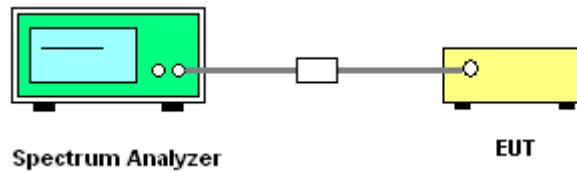
(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 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.
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. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (a): Measure and sum the spectra across the outputs.

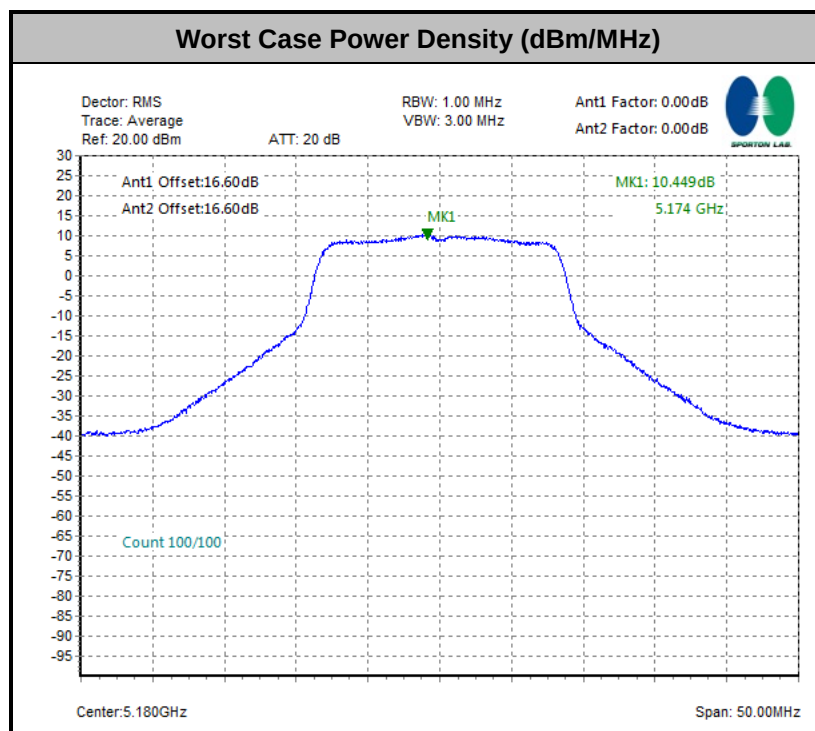
The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

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 Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

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

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

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

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3



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

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

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

where

EIRP is the equivalent isotropically radiated power, in dBm

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

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

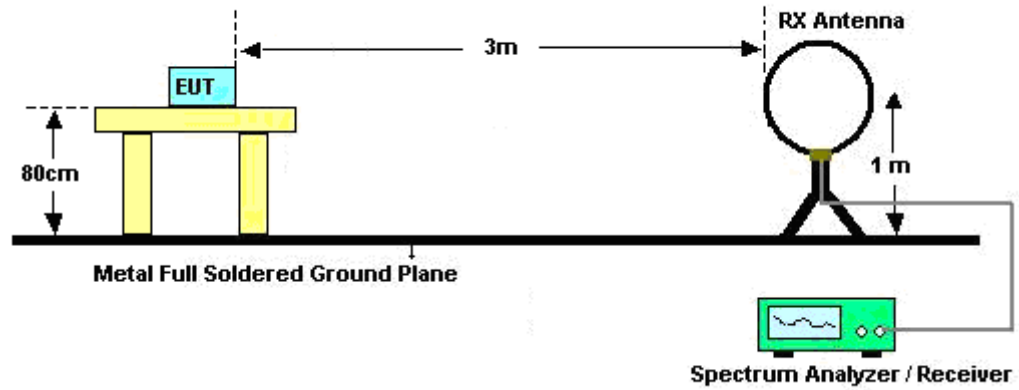
The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

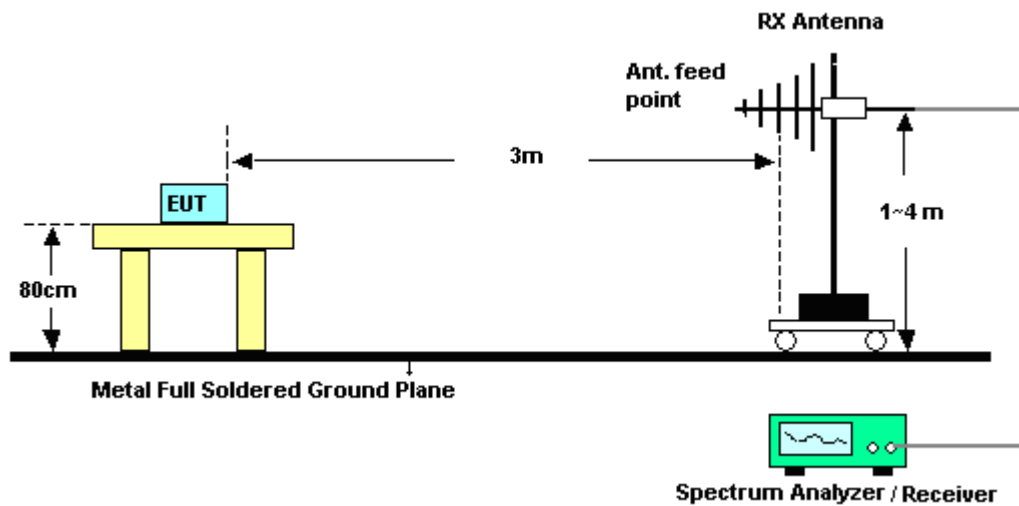
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 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 $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
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

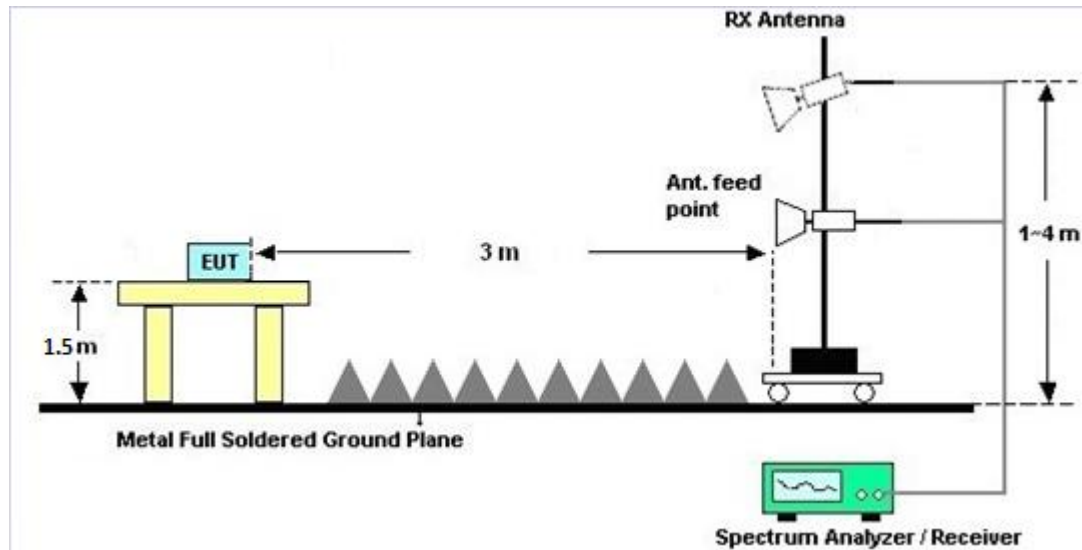
For radiated emissions below 30MHz



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.

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

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix C.

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.

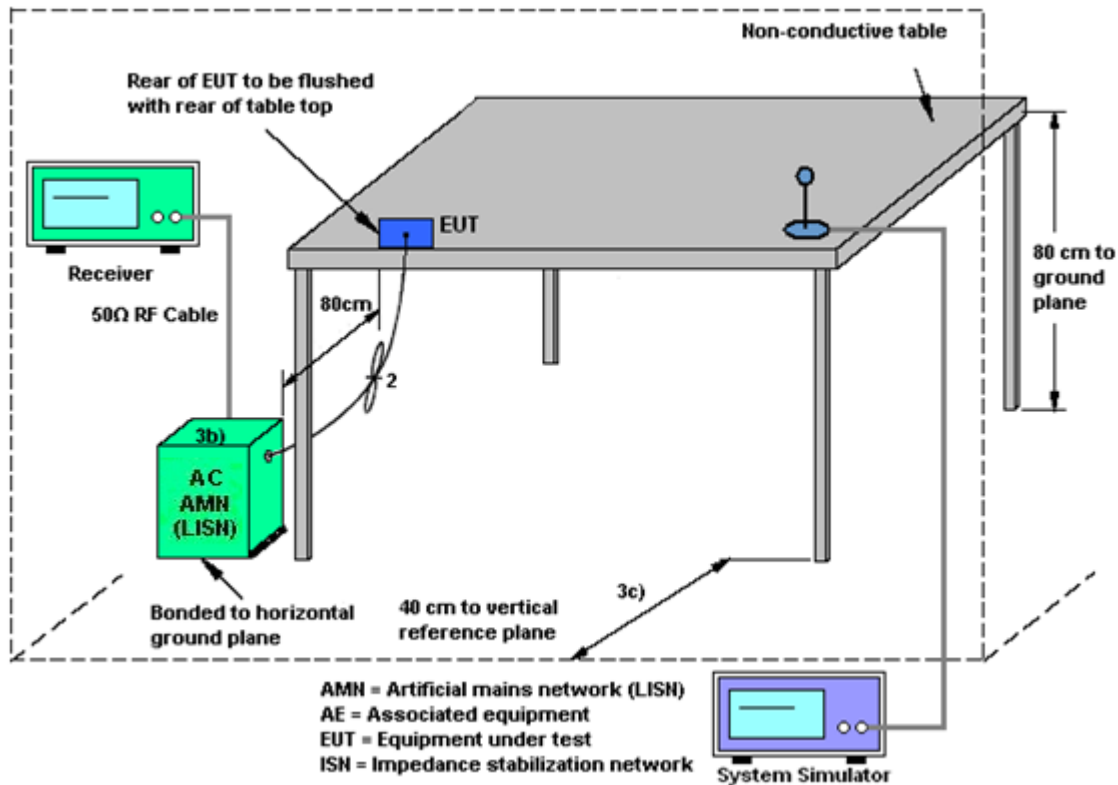
3.5.2 Measuring Instruments

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

Please refer to Appendix B.



3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

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

3.6.2 Measuring Instruments

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

3.6.3 Test Result of Automatically Discontinue Transmission

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

3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(\text{NANT}/\text{NSS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $\text{NANT} \leq 4$.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.

<CDD Modes>						
			DG for Power	DG for PSD	Power Limit Reduction	PSD Limit Reduction
	Ant. 1 (dBi)	Ant. 2 (dBi)	(dBi)	(dBi)	(dB)	(dB)
Band I	-3.00	-3.00	-3.00	0.01	0.00	0.00
Band II	-3.00	-3.00	-3.00	0.01	0.00	0.00
Band III	-3.00	-3.00	-3.00	0.01	0.00	0.00

Power limit reduction = Composite gain – 6dBi, (min = 0)

PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 19, 2018	Jan. 29, 2019	Apr. 18, 2019	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 22, 2018	Jan. 29, 2019	Dec. 21, 2019	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 22, 2018	Jan. 29, 2019	Dec. 21, 2019	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Apr. 19, 2018	Feb. 11, 2019~ Feb. 27, 2019	Apr. 18, 2019	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY551502 13	10Hz~44GHz	Apr. 19, 2018	Feb. 11, 2019~ Feb. 27, 2019	Apr. 18, 2019	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 14, 2018	Feb. 11, 2019~ Feb. 27, 2019	May 13, 2019	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Aug. 28, 2018	Feb. 11, 2019~ Feb. 27, 2019	Aug. 27, 2019	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-147 4	1GHz~18GHz	Feb. 04, 2019	Feb. 11, 2019~ Feb. 27, 2019	Feb. 03, 2020	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Apr. 20, 2018	Feb. 11, 2019~ Feb. 27, 2019	Apr. 19, 2019	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz~ ~3000MHz	Oct. 18, 2018	Feb. 11, 2019~ Feb. 27, 2019	Oct. 17, 2019	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1989346	1GHz~18GHz	Jul. 30, 2018	Feb. 11, 2019~ Feb. 27, 2019	Jul. 29, 2019	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1988315	18GHz~40GHz	Jul. 26, 2018	Feb. 11, 2019~ Feb. 27, 2019	Jul. 25, 2019	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY532701 56	500MHz~26.5G Hz	Apr. 19, 2018	Feb. 11, 2019~ Feb. 27, 2019	Apr. 18, 2019	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Feb. 11, 2019~ Feb. 27, 2019	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Feb. 11, 2019~ Feb. 27, 2019	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Feb. 11, 2019~ Feb. 27, 2019	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 23, 2018	Jan. 24, 2019	Dec. 22, 2019	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Oct. 18, 2018	Jan. 24, 2019	Oct. 17, 2019	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Dec. 23, 2018	Jan. 24, 2019	Dec. 22, 2019	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Jul. 18, 2018	Jan. 24, 2019	Jul. 17, 2019	Conduction (CO01-SZ)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.6dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.8dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1dB
---	-------

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Jensen Wu	Temperature:	21~25	°C
Test Date:	2019/1/29	Relative Humidity:	51~54	%

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)		Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180	17.53	17.48	23.78	22.98	-	-	22.43	-	
11a	6Mbps	2	44	5220	17.63	17.53	24.88	22.93	-	-	22.44	-	
11a	6Mbps	2	48	5240	17.58	17.53	23.98	22.78	-	-	22.44	-	
HT20	MCS0	2	36	5180	18.88	18.53	25.08	23.58	-	-	22.68	-	
HT20	MCS0	2	44	5220	18.73	18.68	25.77	24.28	-	-	22.71	-	
HT20	MCS0	2	48	5240	18.73	18.73	24.98	24.83	-	-	22.73	-	
HT40	MCS0	2	38	5190	36.56	36.56	41.63	41.99	-	-	23.01	-	
HT40	MCS0	2	46	5230	36.66	36.56	41.72	41.90	-	-	23.01	-	
VHT80	MCS0	2	42	5210	75.64	75.52	82.48	82.16	-	-	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
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	36	5180	0.08	0.09	17.72	17.69	20.72	24.00		-3.00			Pass
11a	6Mbps	2	44	5220	0.08	0.09	18.14	17.60	20.89	24.00		-3.00			Pass
11a	6Mbps	2	48	5240	0.08	0.09	18.21	17.51	20.88	24.00		-3.00			Pass
HT20	MCS0	2	36	5180	0.08	0.08	17.42	17.69	20.57	24.00		-3.00			Pass
HT20	MCS0	2	44	5220	0.08	0.08	18.06	17.38	20.75	24.00		-3.00			Pass
HT20	MCS0	2	48	5240	0.08	0.08	17.99	17.49	20.76	24.00		-3.00			Pass
HT40	MCS0	2	38	5190	0.16	0.17	17.66	17.45	20.57	24.00		-3.00			Pass
HT40	MCS0	2	46	5230	0.16	0.17	18.05	17.49	20.79	24.00		-3.00			Pass
VHT20	MCS0	2	36	5180	0.19	0.16	17.40	17.67	20.55	24.00		-3.00			Pass
VHT20	MCS0	2	44	5220	0.19	0.16	17.97	17.35	20.68	24.00		-3.00			Pass
VHT20	MCS0	2	48	5240	0.19	0.16	17.96	17.48	20.74	24.00		-3.00			Pass
VHT40	MCS0	2	38	5190	0.30	0.32	17.60	17.40	20.51	24.00		-3.00			Pass
VHT40	MCS0	2	46	5230	0.30	0.32	17.99	17.42	20.72	24.00		-3.00			Pass
VHT80	MCS0	2	42	5210	0.57	0.60	14.77	14.62	17.71	24.00		-3.00			Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)			Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	36	5180	0.08	0.09			10.54	11.00	0.01			Pass	
11a	6Mbps	2	44	5220	0.08	0.09			10.30	11.00	0.01			Pass	
11a	6Mbps	2	48	5240	0.08	0.09			10.36	11.00	0.01			Pass	
HT20	MCS0	2	36	5180	0.08	0.08			9.80	11.00	0.01			Pass	
HT20	MCS0	2	44	5220	0.08	0.08			9.63	11.00	0.01			Pass	
HT20	MCS0	2	48	5240	0.08	0.08			9.71	11.00	0.01			Pass	
HT40	MCS0	2	38	5190	0.16	0.17			6.87	11.00	0.01			Pass	
HT40	MCS0	2	46	5230	0.16	0.17			6.82	11.00	0.01			Pass	
VHT80	MCS0	2	42	5210	0.57	0.60			3.01	11.00	0.01			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
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	52	5260	17.53	17.53	24.48	22.83	23.44		29.44		23.98		
11a	6Mbps	2	60	5300	17.48	17.48	23.93	22.98	23.43		29.43		23.98		
11a	6Mbps	2	64	5320	17.63	17.43	24.48	22.83	23.41		29.41		23.98		
HT20	MCS0	2	52	5260	18.93	18.63	25.57	24.28	23.70		29.70		23.98		
HT20	MCS0	2	60	5300	18.93	18.63	25.62	24.38	23.70		29.70		23.98		
HT20	MCS0	2	64	5320	18.93	18.63	25.67	24.43	23.70		29.70		23.98		
HT40	MCS0	2	54	5270	36.66	36.46	41.72	41.63	23.98		30.00		23.98		
HT40	MCS0	2	62	5310	36.66	36.36	41.90	41.72	23.98		30.00		23.98		
VHT80	MCS0	2	58	5290	75.64	75.52	83.44	82.80	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
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	52	5260	0.08	0.09	17.08	16.33	19.73	23.98		-3.00		26.99	Pass
11a	6Mbps	2	60	5300	0.08	0.09	16.83	16.18	19.53	23.98		-3.00		26.99	Pass
11a	6Mbps	2	64	5320	0.08	0.09	16.74	16.24	19.51	23.98		-3.00		26.99	Pass
HT20	MCS0	2	52	5260	0.08	0.08	17.03	16.23	19.66	23.98		-3.00		26.99	Pass
HT20	MCS0	2	60	5300	0.08	0.08	16.78	16.14	19.48	23.98		-3.00		26.99	Pass
HT20	MCS0	2	64	5320	0.08	0.08	16.75	16.26	19.52	23.98		-3.00		26.99	Pass
HT40	MCS0	2	54	5270	0.16	0.17	16.82	16.12	19.50	23.98		-3.00		26.99	Pass
HT40	MCS0	2	62	5310	0.16	0.17	16.80	16.18	19.51	23.98		-3.00		26.99	Pass
VHT20	MCS0	2	52	5260	0.19	0.16	16.98	16.18	19.61	23.98		-3.00		26.99	Pass
VHT20	MCS0	2	60	5300	0.19	0.16	16.71	16.04	19.40	23.98		-3.00		26.99	Pass
VHT20	MCS0	2	64	5320	0.19	0.16	16.74	16.21	19.50	23.98		-3.00		26.99	Pass
VHT40	MCS0	2	54	5270	0.30	0.32	16.77	16.07	19.44	23.98		-3.00		26.99	Pass
VHT40	MCS0	2	62	5310	0.30	0.32	16.72	16.15	19.45	23.98		-3.00		26.99	Pass
VHT80	MCS0	2	58	5290	0.57	0.60	16.17	15.45	18.84	23.98		-3.00		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
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	52	5260	0.08	0.09			10.15	11.00	0.01			Pass	
11a	6Mbps	2	60	5300	0.08	0.09			10.13	11.00	0.01			Pass	
11a	6Mbps	2	64	5320	0.08	0.09			9.85	11.00	0.01			Pass	
HT20	MCS0	2	52	5260	0.08	0.08			9.62	11.00	0.01			Pass	
HT20	MCS0	2	60	5300	0.08	0.08			9.28	11.00	0.01			Pass	
HT20	MCS0	2	64	5320	0.08	0.08			9.24	11.00	0.01			Pass	
HT40	MCS0	2	54	5270	0.16	0.17			6.44	11.00	0.01			Pass	
HT40	MCS0	2	62	5310	0.16	0.17			6.44	11.00	0.01			Pass	
VHT80	MCS0	2	58	5290	0.57	0.60			2.74	11.00	0.01			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
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	100	5500	17.43	17.53	23.88	22.93	23.41		29.41		23.98		
11a	6Mbps	2	116	5580	17.53	17.48	23.98	23.38	23.43		29.43		23.98		
11a	6Mbps	2	140	5700	17.48	17.43	23.83	22.83	23.41		29.41		23.98		
11a	6Mbps	2	144	5720	17.58	17.43	23.83	22.93	23.41		29.41		23.98		
HT20	MCS0	2	100	5500	18.63	18.78	23.93	24.48	23.70		29.70		23.98		
HT20	MCS0	2	116	5580	18.93	18.63	25.87	24.33	23.70		29.70		23.98		
HT20	MCS0	2	140	5700	18.83	18.73	25.33	24.23	23.73		29.73		23.98		
HT20	MCS0	2	144	5720	18.68	18.78	24.93	24.63	23.71		29.71		23.98		
HT40	MCS0	2	102	5510	36.56	36.56	41.81	41.99	23.98		30.00		23.98		
HT40	MCS0	2	110	5550	36.56	36.46	41.72	41.99	23.98		30.00		23.98		
HT40	MCS0	2	134	5670	36.66	36.56	41.99	41.72	23.98		30.00		23.98		
HT40	MCS0	2	142	5710	36.66	36.46	41.72	41.99	23.98		30.00		23.98		
VHT80	MCS0	2	106	5530	75.64	75.52	83.44	82.96	23.98		30.00		23.98		
VHT80	MCS0	2	122	5610	75.64	75.52	83.44	83.28	23.98		30.00		23.98		
VHT80	MCS0	2	138	5690	75.64	75.52	83.76	82.96	23.98		30.00		23.98		

TEST RESULTS DATA
Average Power Table

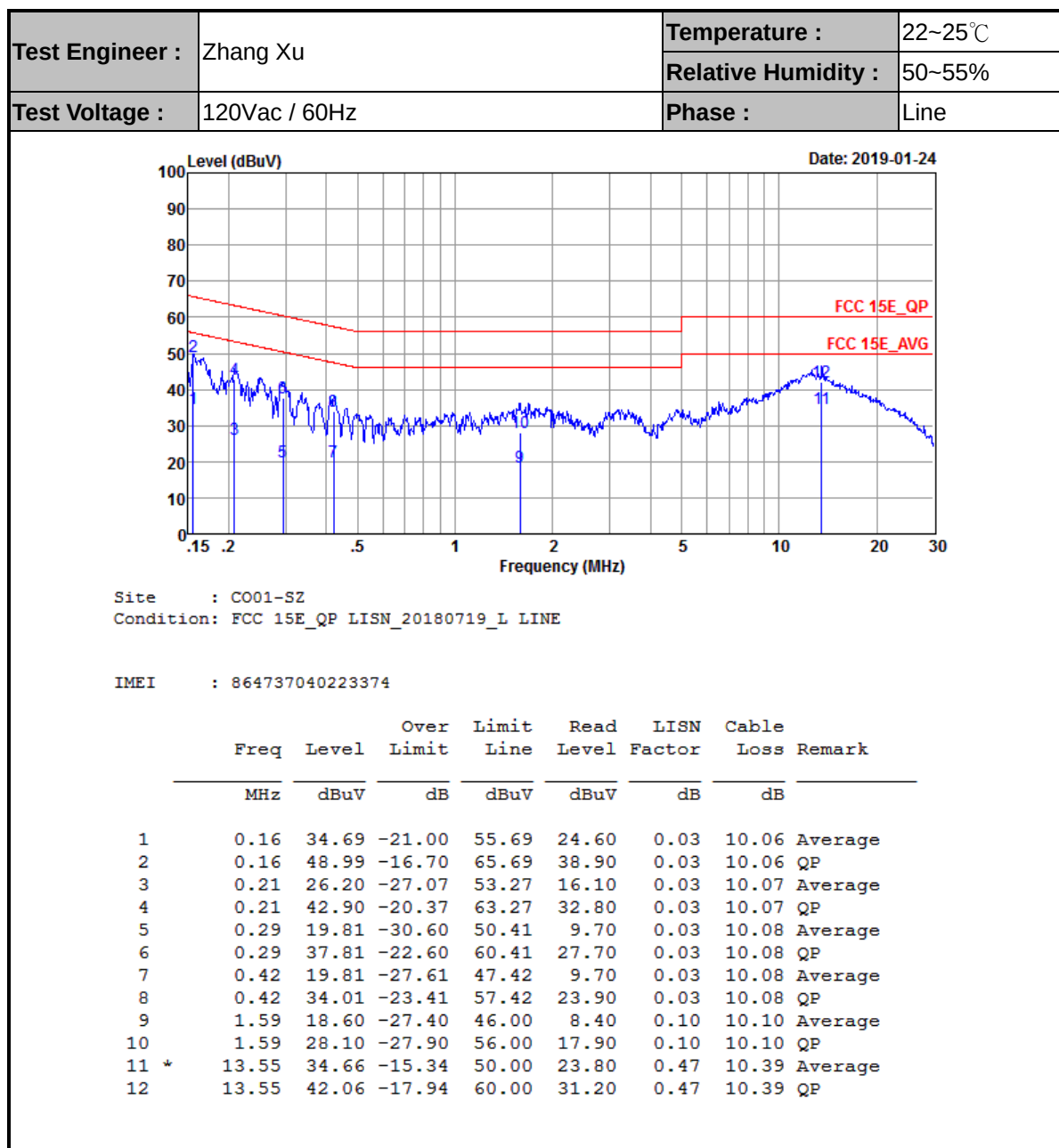
FCC Band III															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	100	5500	0.08	0.09	17.16	17.32	20.25	23.98		-3.00	26.99	Pass	
11a	6Mbps	2	116	5580	0.08	0.09	17.22	17.12	20.18	23.98		-3.00	26.99	Pass	
11a	6Mbps	2	140	5700	0.08	0.09	17.21	17.03	20.13	23.98		-3.00	26.99	Pass	
11a	6Mbps	2	144	5720	0.08	0.09	17.23	17.11	20.18	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	100	5500	0.08	0.08	17.06	17.19	20.14	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	116	5580	0.08	0.08	17.05	17.02	20.05	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	140	5700	0.08	0.08	17.01	16.99	20.01	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	144	5720	0.08	0.08	17.10	16.86	19.99	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	102	5510	0.16	0.17	16.11	16.05	19.09	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	110	5550	0.16	0.17	17.18	16.95	20.08	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	134	5670	0.16	0.17	17.14	17.00	20.08	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	142	5710	0.16	0.17	17.11	16.96	20.05	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	100	5500	0.19	0.16	16.94	17.15	20.06	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	116	5580	0.19	0.16	17.00	16.97	20.00	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	140	5700	0.19	0.16	16.96	16.95	19.97	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	144	5720	0.19	0.16	17.04	16.84	19.95	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	102	5510	0.30	0.32	16.03	15.98	19.02	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	110	5550	0.30	0.32	17.14	16.87	20.02	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	134	5670	0.30	0.32	17.10	16.95	20.04	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	142	5710	0.30	0.32	17.08	16.93	20.02	23.98		-3.00	26.99	Pass	
VHT80	MCS0	2	106	5530	0.57	0.60	14.79	14.27	17.55	23.98		-3.00	26.99	Pass	
VHT80	MCS0	2	122	5610	0.57	0.60	16.59	16.26	19.44	23.98		-3.00	26.99	Pass	
VHT80	MCS0	2	138	5690	0.57	0.60	16.46	16.20	19.34	23.98		-3.00	26.99	Pass	

TEST RESULTS DATA
Power Spectral Density

Band III														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	100	5500	0.08	0.09			10.31	11.00		0.01		Pass
11a	6Mbps	2	116	5580	0.08	0.09			10.27	11.00		0.01		Pass
11a	6Mbps	2	140	5700	0.08	0.09			10.03	11.00		0.01		Pass
11a	6Mbps	2	144	5720	0.08	0.09			10.42	11.00		0.01		Pass
HT20	MCS0	2	100	5500	0.08	0.08			9.81	11.00		0.01		Pass
HT20	MCS0	2	116	5580	0.08	0.08			9.36	11.00		0.01		Pass
HT20	MCS0	2	140	5700	0.08	0.08			9.43	11.00		0.01		Pass
HT20	MCS0	2	144	5720	0.08	0.08			9.53	11.00		0.01		Pass
HT40	MCS0	2	102	5510	0.16	0.17			6.51	11.00		0.01		Pass
HT40	MCS0	2	110	5550	0.16	0.17			6.63	11.00		0.01		Pass
HT40	MCS0	2	134	5670	0.16	0.17			6.62	11.00		0.01		Pass
HT40	MCS0	2	142	5710	0.16	0.17			6.60	11.00		0.01		Pass
VHT80	MCS0	2	106	5530	0.57	0.60			3.06	11.00		0.01		Pass
VHT80	MCS0	2	122	5610	0.57	0.60			3.01	11.00		0.01		Pass
VHT80	MCS0	2	138	5690	0.57	0.60			2.77	11.00		0.01		Pass

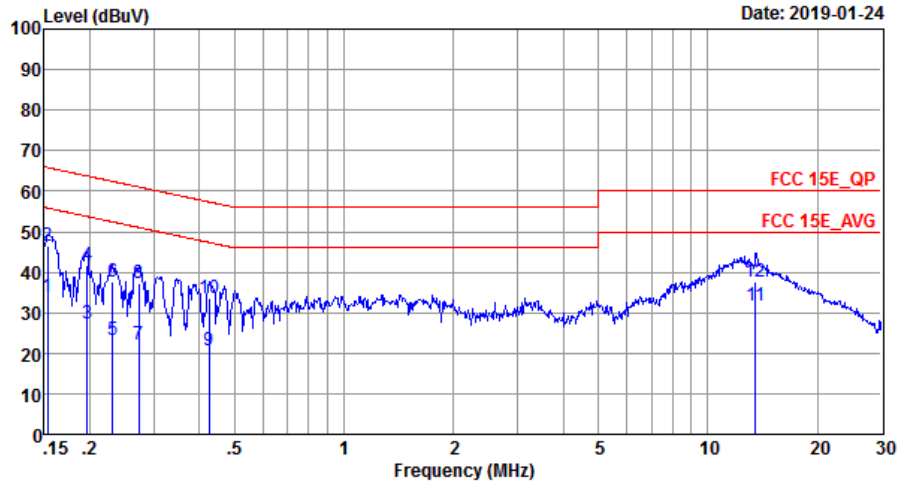


Appendix B. AC Conducted Emission Test Results





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



Site : C001-SZ
Condition: FCC 15E_QP LISN_20180719_N NEUTRAL

IMEI : 864737040223374

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	34.09	-21.73	55.82	24.00	0.03	10.06	Average
2	0.15	46.59	-19.23	65.82	36.50	0.03	10.06	QP
3	0.20	27.30	-26.46	53.76	17.20	0.03	10.07	Average
4	0.20	41.80	-21.96	63.76	31.70	0.03	10.07	QP
5	0.23	23.20	-29.19	52.39	13.10	0.03	10.07	Average
6	0.23	37.70	-24.69	62.39	27.60	0.03	10.07	QP
7	0.27	22.21	-28.82	51.03	12.10	0.03	10.08	Average
8	0.27	37.11	-23.92	61.03	27.00	0.03	10.08	QP
9	0.43	20.60	-26.73	47.33	10.50	0.02	10.08	Average
10	0.43	33.70	-23.63	57.33	23.60	0.02	10.08	QP
11 *	13.55	31.68	-18.32	50.00	21.00	0.29	10.39	Average
12	13.55	37.68	-22.32	60.00	27.00	0.29	10.39	QP



Appendix C. 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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5133.9	49.89	-24.11	74	44.39	32.24	6.04	32.78	228	360	P	H
		5150	41.57	-12.43	54	36.08	32.24	6.04	32.79	228	360	A	H
	*	5180	107.39	-	-	101.91	32.25	6.04	32.81	228	360	P	H
		5180	101.9	-	-	96.42	32.25	6.04	32.81	228	360	A	H
		5144.82	53.56	-20.44	74	48.07	32.24	6.04	32.79	120	347	P	V
		5149.76	42.12	-11.88	54	36.63	32.24	6.04	32.79	120	347	A	V
	*	5180	109.43	-	-	103.95	32.25	6.04	32.81	120	347	P	V
		5180	102.6	-	-	97.12	32.25	6.04	32.81	120	347	A	V
802.11a CH 44 5220MHz		5138.84	49.36	-24.64	74	43.86	32.24	6.04	32.78	224	359	P	H
		5144.56	38.6	-15.4	54	33.11	32.24	6.04	32.79	224	359	A	H
	*	5220	107.39	-	-	101.93	32.26	6.03	32.83	224	359	P	H
		5220	101.6	-	-	96.14	32.26	6.03	32.83	224	359	A	H
		5367.6	43.5	-30.5	74	38.1	32.31	6.01	32.92	224	359	P	H
		5453.28	35.91	-18.09	54	30.49	32.34	6.06	32.98	224	359	A	H
		5148.2	46.54	-27.46	74	41.05	32.24	6.04	32.79	115	347	P	V
		5148.2	39.08	-14.92	54	33.59	32.24	6.04	32.79	115	347	A	V
	*	5220	109.3	-	-	103.84	32.26	6.03	32.83	115	347	P	V
		5220	102.4	-	-	96.94	32.26	6.03	32.83	115	347	A	V
		5350.56	48.22	-25.78	74	42.82	32.31	6.01	32.92	115	347	P	V
		5452.8	35.88	-18.12	54	30.46	32.34	6.06	32.98	115	347	A	V



802.11a CH 48 5240MHz		5041.86	46.07	-27.93	74	40.54	32.21	6.05	32.73	224	359	P	H
		5145.08	37.55	-16.45	54	32.06	32.24	6.04	32.79	224	359	A	H
	*	5240	107.35	-	-	101.89	32.27	6.03	32.84	224	359	P	H
		5240	101.13	-	-	95.67	32.27	6.03	32.84	224	359	A	H
		5431.2	44.73	-29.27	74	39.3	32.34	6.06	32.97	224	359	P	H
		5352.96	35.97	-18.03	54	30.57	32.31	6.01	32.92	224	359	A	H
		5131.56	45.73	-28.27	74	40.23	32.24	6.04	32.78	112	347	P	V
		5146.9	37.56	-16.44	54	32.07	32.24	6.04	32.79	112	347	A	V
	*	5240	109.21	-	-	103.75	32.27	6.03	32.84	112	347	P	V
		5240	102.14	-	-	96.68	32.27	6.03	32.84	112	347	A	V
		5358.72	44.34	-29.66	74	38.94	32.31	6.01	32.92	112	347	P	V
		5375.76	35.7	-18.3	54	30.32	32.31	6.01	32.94	112	347	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+2	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 36 5180MHz		10360	45.06	-23.14	68.2	56.57	38.25	9.23	58.99	121	225	P	H
		15540	48.3	-25.7	74	56.36	38.94	11.93	58.93	185	210	P	H
		10360	44.7	-23.5	68.2	56.21	38.25	9.23	58.99	152	260	P	V
		15540	49.84	-24.16	74	57.9	38.94	11.93	58.93	189	238	P	V
802.11a CH 44 5220MHz		10440	45.58	-22.62	68.2	56.94	38.31	9.25	58.92	110	230	P	H
		15660	47.07	-26.93	74	55.52	38.54	12.07	59.06	160	228	P	H
		10440	45.25	-22.95	68.2	56.61	38.31	9.25	58.92	150	230	P	V
		15660	47	-27	74	55.45	38.54	12.07	59.06	160	225	P	V
802.11a CH 48 5240MHz		10480	45.97	-22.23	68.2	57.21	38.36	9.26	58.86	150	120	P	H
		15720	47.37	-26.63	74	56.07	38.31	12.11	59.12	200	89	P	H
		10480	46.45	-21.75	68.2	57.69	38.36	9.26	58.86	189	12	P	V
		15720	48.08	-25.92	74	56.78	38.31	12.11	59.12	198	226	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+2	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		5141.96	48.4	-25.6	74	42.9	32.24	6.04	32.78	227	354	P	H
		5145.6	39.7	-14.3	54	34.21	32.24	6.04	32.79	227	354	A	H
	*	5180	106.98	-	-	101.5	32.25	6.04	32.81	227	354	P	H
		5180	99.04	-	-	93.56	32.25	6.04	32.81	227	354	A	H
		5140.14	47.46	-26.54	74	41.96	32.24	6.04	32.78	103	341	P	V
		5150	38.9	-15.1	54	33.41	32.24	6.04	32.79	103	341	A	V
	*	5180	108.72	-	-	103.24	32.25	6.04	32.81	103	341	P	V
		5180	101.37	-	-	95.89	32.25	6.04	32.81	103	341	A	V
802.11n HT20 CH 44 5220MHz		5143.52	46.22	-27.78	74	40.72	32.24	6.04	32.78	227	354	P	H
		5145.86	37.35	-16.65	54	31.86	32.24	6.04	32.79	227	354	A	H
	*	5220	106.28	-	-	100.82	32.26	6.03	32.83	227	354	P	H
		5220	98.89	-	-	93.43	32.26	6.03	32.83	227	354	A	H
		5369.52	43.16	-30.84	74	37.76	32.31	6.01	32.92	227	354	P	H
		5451.6	34.9	-19.1	54	29.48	32.34	6.06	32.98	227	354	A	H
		5143	45.97	-28.03	74	40.47	32.24	6.04	32.78	107	340	P	V
		5149.5	37.83	-16.17	54	32.34	32.24	6.04	32.79	107	340	A	V
	*	5220	108.11	-	-	102.65	32.26	6.03	32.83	107	340	P	V
		5220	101.57	-	-	96.11	32.26	6.03	32.83	107	340	A	V
		5450.88	44.21	-29.79	74	38.79	32.34	6.06	32.98	107	340	P	V
		5452.8	35.7	-18.3	54	30.28	32.34	6.06	32.98	107	340	A	V



802.11n HT20 CH 48 5240MHz		5142.48	46.04	-27.96	74	40.54	32.24	6.04	32.78	227	354	P	H
		5145.6	36.4	-17.6	54	30.91	32.24	6.04	32.79	227	354	A	H
	*	5240	105.82	-	-	100.36	32.27	6.03	32.84	227	354	P	H
		5240	98.5	-	-	93.04	32.27	6.03	32.84	227	354	A	H
		5370	44.05	-29.95	74	38.65	32.31	6.01	32.92	227	354	P	H
		5370	34.49	-19.51	54	29.09	32.31	6.01	32.92	227	354	A	H
		5144.04	46.7	-27.3	74	41.21	32.24	6.04	32.79	107	340	P	V
		5145.6	36.69	-17.31	54	31.2	32.24	6.04	32.79	107	340	A	V
	*	5240	108.06	-	-	102.6	32.27	6.03	32.84	107	340	P	V
		5240	101.31	-	-	95.85	32.27	6.03	32.84	107	340	A	V
		5424.96	44.81	-29.19	74	39.44	32.33	6.01	32.97	107	340	P	V
		5452.8	35.27	-18.73	54	29.85	32.34	6.06	32.98	107	340	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+2	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	45.32	-22.88	68.2	56.83	38.25	9.23	58.99	121	225	P	H
		15540	48.37	-25.63	74	56.43	38.94	11.93	58.93	185	210	P	H
		10360	45.91	-22.29	68.2	57.42	38.25	9.23	58.99	152	260	P	V
		15540	48.22	-25.78	74	56.28	38.94	11.93	58.93	189	238	P	V
802.11n HT20 CH 44 5220MHz		10440	45.03	-23.17	68.2	56.39	38.31	9.25	58.92	110	230	P	H
		15660	46.91	-27.09	74	55.36	38.54	12.07	59.06	160	228	P	H
		10440	44.91	-23.29	68.2	56.27	38.31	9.25	58.92	150	230	P	V
		15660	48.21	-25.79	74	56.66	38.54	12.07	59.06	160	225	P	V
802.11n HT20 CH 48 5240MHz		10480	45.05	-23.15	68.2	56.29	38.36	9.26	58.86	150	120	P	H
		15720	46.9	-27.1	74	55.6	38.31	12.11	59.12	200	89	P	H
		10480	46.46	-21.74	68.2	57.7	38.36	9.26	58.86	189	12	P	V
		15720	47.43	-26.57	74	56.13	38.31	12.11	59.12	198	226	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+2	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		5148.2	52.2	-21.8	74	46.71	32.24	6.04	32.79	231	360	P	H
		5150	47.63	-6.37	54	42.14	32.24	6.04	32.79	231	360	A	H
	*	5190	104.45	-	-	98.97	32.25	6.04	32.81	231	360	P	H
		5190	98.19	-	-	92.71	32.25	6.04	32.81	231	360	A	H
		5412.12	43.31	-30.69	74	37.92	32.33	6.01	32.95	231	360	P	H
		5411.84	38.49	-15.51	54	33.1	32.33	6.01	32.95	231	360	A	H
		5142.74	56.16	-17.84	74	50.66	32.24	6.04	32.78	101	339	P	V
		5150	49.25	-4.75	54	43.76	32.24	6.04	32.79	101	339	A	V
	*	5190	106.12	-	-	100.64	32.25	6.04	32.81	101	339	P	V
		5190	99.63	-	-	94.15	32.25	6.04	32.81	101	339	A	V
		5424.16	43.21	-30.79	74	37.82	32.33	6.01	32.95	101	339	P	V
		5412.68	37.25	-16.75	54	31.86	32.33	6.01	32.95	101	339	A	V
802.11n HT40 CH 46 5230MHz		5135.72	45.56	-28.44	74	40.06	32.24	6.04	32.78	231	360	P	H
		5149.76	38.56	-15.44	54	33.07	32.24	6.04	32.79	231	360	A	H
	*	5230	102.28	-	-	96.82	32.27	6.03	32.84	231	360	P	H
		5230	96.05	-	-	90.59	32.27	6.03	32.84	231	360	A	H
		5453.04	43.9	-30.1	74	38.48	32.34	6.06	32.98	231	360	P	H
		5452.32	38.18	-15.82	54	32.76	32.34	6.06	32.98	231	360	A	H
		5143.26	45.65	-28.35	74	40.15	32.24	6.04	32.78	112	339	P	V
		5146.64	38.51	-15.49	54	33.02	32.24	6.04	32.79	112	339	A	V
	*	5230	106.72	-	-	101.26	32.27	6.03	32.84	112	339	P	V
		5230	98.71	-	-	93.25	32.27	6.03	32.84	112	339	A	V
		5453.52	45.7	-28.3	74	40.28	32.34	6.06	32.98	112	339	P	V
		5452.8	38.65	-15.35	54	65.57	0	6.06	32.98	112	339	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+2	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	45.85	-22.35	68.2	57.32	38.26	9.24	58.97	120	360	P	H
		15570	48.01	-25.99	74	56.18	38.82	11.98	58.97	155	32	P	H
		10380	46.59	-21.61	68.2	58.06	38.26	9.24	58.97	150	360	P	V
		15570	47.37	-26.63	74	55.54	38.82	11.98	58.97	155	360	P	V
802.11n HT40 CH 46 5230MHz		10460	44.97	-23.23	68.2	56.29	38.32	9.26	58.9	151	360	P	H
		15690	47.19	-26.81	74	55.75	38.42	12.11	59.09	159	241	P	H
		10460	45.21	-22.99	68.2	56.53	38.32	9.26	58.9	150	360	P	V
		15690	46.57	-27.43	74	55.13	38.42	12.11	59.09	150	225	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	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)
802.11ac VHT80 CH 42 5210MHz		5146.38	56.7	-17.3	74	51.21	32.24	6.04	32.79	141	360	P	H
		5146.12	50.13	-3.87	54	44.64	32.24	6.04	32.79	141	360	A	H
	*	5210	98.82	-	-	93.36	32.26	6.03	32.83	141	360	P	H
		5210	91.22	-	-	85.76	32.26	6.03	32.83	141	360	A	H
		5381.28	44.3	-29.7	74	38.91	32.32	6.01	32.94	141	360	P	H
		5372.16	37.15	-16.85	54	31.75	32.31	6.01	32.92	141	360	A	H
		5132.86	52.07	-21.93	74	46.57	32.24	6.04	32.78	100	337	P	V
		5146.38	46.69	-7.31	54	41.2	32.24	6.04	32.79	100	337	A	V
	*	5210	96.44	-	-	90.98	32.26	6.03	32.83	100	337	P	V
		5210	89.14	-	-	83.68	32.26	6.03	32.83	100	337	A	V
		5410.8	44.6	-29.4	74	39.22	32.32	6.01	32.95	100	337	P	V
		5443.44	38.3	-15.7	54	32.87	32.34	6.06	32.97	100	337	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**Band 1 5150~5250MHz****WIFI 802.11ac VHT80 (Harmonic @ 3m)**

WIFI Ant. 1+2	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)
802.11ac		10420	46.19	-22.01	68.2	57.58	38.29	9.25	58.93	150	360	P	H
VHT80		15630	49.28	-24.72	74	57.71	38.59	12.02	59.04	155	360	P	H
CH 42		10420	45.37	-22.83	68.2	56.76	38.29	9.25	58.93	150	360	P	V
5210MHz		15630	48.98	-25.02	74	57.41	38.59	12.02	59.04	155	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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 52 5260MHz		5096.2	45.68	-28.32	74	40.16	32.23	6.05	32.76	246	357	P	H
		5148.98	37.06	-16.94	54	31.57	32.24	6.04	32.79	246	357	A	H
	*	5260	106.4	-	-	100.95	32.28	6.03	32.86	246	357	P	H
		5260	100.68	-	-	95.23	32.28	6.03	32.86	246	357	A	H
		5396.16	44.85	-29.15	74	39.46	32.32	6.01	32.94	246	357	P	H
		5350.32	35.85	-18.15	54	30.45	32.31	6.01	32.92	246	357	A	H
		5015.6	45.12	-28.88	74	39.56	32.2	6.06	32.7	107	16	P	V
		5145.6	37.19	-16.81	54	31.7	32.24	6.04	32.79	107	16	A	V
	*	5260	108.81	-	-	103.36	32.28	6.03	32.86	107	16	P	V
		5260	101.34	-	-	95.89	32.28	6.03	32.86	107	16	A	V
		5350.56	45.3	-28.7	74	39.9	32.31	6.01	32.92	107	16	P	V
		5452.8	37.01	-16.99	54	31.59	32.34	6.06	32.98	107	16	A	V
802.11a CH 60 5300MHz		5149.45	44.97	-29.03	74	39.48	32.24	6.04	32.79	246	357	P	H
		5065.1	37.01	-16.99	54	31.47	32.22	6.05	32.73	246	357	A	H
	*	5300	106.23	-	-	100.81	32.29	6.02	32.89	246	357	P	H
		5300	100.77	-	-	95.35	32.29	6.02	32.89	246	357	A	H
		5356.32	49.06	-24.94	74	43.66	32.31	6.01	32.92	246	357	P	H
		5351.28	39.04	-14.96	54	33.64	32.31	6.01	32.92	246	357	A	H
		5033.6	44.9	-29.1	74	39.35	32.21	6.06	32.72	119	15	P	V
		5145.6	36.92	-17.08	54	31.43	32.24	6.04	32.79	119	15	A	V
	*	5300	108.79	-	-	103.37	32.29	6.02	32.89	119	15	P	V
		5300	101.76	-	-	96.34	32.29	6.02	32.89	119	15	A	V
		5396.16	49.62	-24.38	74	44.23	32.32	6.01	32.94	119	15	P	V
		5351.04	40.75	-13.25	54	35.35	32.31	6.01	32.92	119	15	A	V



802.11a CH 64 5320MHz	*	5320	106.3	-	-	100.87	32.3	6.02	32.89	246	357	P	H
	*	5320	100.81	-	-	95.38	32.3	6.02	32.89	246	357	A	H
		5354.88	47.49	-26.51	74	42.09	32.31	6.01	32.92	246	357	P	H
		5353.6	39.11	-14.89	54	33.71	32.31	6.01	32.92	246	357	A	H
	*	5320	108.66	-	-	103.23	32.3	6.02	32.89	119	15	P	V
		5320	101.66	-	-	96.23	32.3	6.02	32.89	119	15	A	V
		5366.88	49.65	-24.35	74	44.25	32.31	6.01	32.92	119	15	P	V
		5351.68	41.18	-12.82	54	35.78	32.31	6.01	32.92	119	15	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+2	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 52 5260MHz		10520	44.63	-23.57	68.2	55.79	38.39	9.27	58.82	120	298	P	H
		15780	48.04	-25.96	74	56.88	38.14	12.2	59.18	192	39	P	H
		10520	44.99	-23.21	68.2	56.15	38.39	9.27	58.82	150	220	P	V
		15780	47.61	-26.39	74	56.45	38.14	12.2	59.18	159	345	P	V
802.11a CH 60 5300MHz		10600	45.53	-28.47	74	56.5	38.47	9.29	58.73	182	215	P	H
		15900	47	-27	74	56.22	37.74	12.34	59.3	196	18	P	H
		10600	46.01	-27.99	74	56.98	38.47	9.29	58.73	185	215	P	V
		15900	46.33	-27.67	74	55.55	37.74	12.34	59.3	196	190	P	V
802.11a CH 64 5320MHz		10640	44.38	-29.62	74	55.27	38.5	9.3	58.69	185	135	P	H
		15960	46.79	-27.21	74	56.22	37.51	12.43	59.37	173	296	P	H
		10640	45.21	-28.79	74	56.1	38.5	9.3	58.69	152	135	P	V
		15960	46.12	-27.88	74	55.55	37.51	12.43	59.37	173	245	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+2	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		5121.94	45.67	-28.33	74	40.18	32.23	6.04	32.78	227	354	P	H
		5145.6	36.01	-17.99	54	30.52	32.24	6.04	32.79	227	354	A	H
	*	5260	106.05	-	-	100.6	32.28	6.03	32.86	227	354	P	H
		5260	98.53	-	-	93.08	32.28	6.03	32.86	227	354	A	H
		5457.6	44.14	-29.86	74	38.72	32.34	6.06	32.98	227	354	P	H
		5350.08	35	-19	54	29.6	32.31	6.01	32.92	227	354	A	H
		5055.64	45.08	-28.92	74	39.54	32.22	6.05	32.73	103	342	P	V
		5145.6	36.2	-17.8	54	30.71	32.24	6.04	32.79	103	342	A	V
	*	5260	108.46	-	-	103.01	32.28	6.03	32.86	103	342	P	V
		5260	101.66	-	-	96.21	32.28	6.03	32.86	103	342	A	V
		5361.36	44.66	-29.34	74	39.26	32.31	6.01	32.92	103	342	P	V
		5452.8	35.19	-18.81	54	29.77	32.34	6.06	32.98	103	342	A	V
802.11n HT20 CH 60 5300MHz		5057.4	45.26	-28.74	74	39.72	32.22	6.05	32.73	206	356	P	H
		5145.6	36.08	-17.92	54	30.59	32.24	6.04	32.79	206	356	A	H
	*	5300	104.97	-	-	99.55	32.29	6.02	32.89	206	356	P	H
		5300	98.4	-	-	92.98	32.29	6.02	32.89	206	356	A	H
		5351.52	45.86	-28.14	74	40.46	32.31	6.01	32.92	206	356	P	H
		5350.32	37.64	-16.36	54	32.24	32.31	6.01	32.92	206	356	A	H
		5123.9	44.97	-29.03	74	39.47	32.24	6.04	32.78	107	21	P	V
		5145.6	36.26	-17.74	54	30.77	32.24	6.04	32.79	107	21	A	V
	*	5300	107.98	-	-	102.56	32.29	6.02	32.89	107	21	P	V
		5300	101.18	-	-	95.76	32.29	6.02	32.89	107	21	A	V
		5377.44	47.34	-26.66	74	41.96	32.31	6.01	32.94	107	21	P	V
		5351.04	39.51	-14.49	54	34.11	32.31	6.01	32.92	107	21	A	V



802.11n HT20 CH 64 5320MHz	*	5320	104.9	-	-	99.47	32.3	6.02	32.89	191	355	P	H
		5320	97.74	-	-	92.31	32.3	6.02	32.89	191	355	A	H
		5364.48	46.85	-27.15	74	41.45	32.31	6.01	32.92	191	355	P	H
		5351.68	38.23	-15.77	54	32.83	32.31	6.01	32.92	191	355	A	H
	*	5320	108.26	-	-	102.83	32.3	6.02	32.89	107	21	P	V
		5320	101.61	-	-	96.18	32.3	6.02	32.89	107	21	A	V
		5365.92	48.19	-25.81	74	42.79	32.31	6.01	32.92	107	21	P	V
		5350.08	39.79	-14.21	54	34.39	32.31	6.01	32.92	107	21	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+2	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		10520	45.39	-22.81	68.2	56.55	38.39	9.27	58.82	120	298	P	H
HT20		15780	47.53	-26.47	74	56.37	38.14	12.2	59.18	192	39	P	H
CH 52		10520	45.22	-22.98	68.2	56.38	38.39	9.27	58.82	150	220	P	V
5260MHz		15780	47.86	-26.14	74	56.7	38.14	12.2	59.18	159	345	P	V
802.11n		10600	46.07	-27.93	74	57.04	38.47	9.29	58.73	182	215	P	H
HT20		15900	46.75	-27.25	74	55.97	37.74	12.34	59.3	196	18	P	H
CH 60		10600	45.28	-28.72	74	56.25	38.47	9.29	58.73	185	215	P	V
5300MHz		15900	46.59	-27.41	74	55.81	37.74	12.34	59.3	196	190	P	V
802.11n		10640	45.56	-28.44	74	56.45	38.5	9.3	58.69	185	135	P	H
HT20		15960	46.46	-27.54	74	55.89	37.51	12.43	59.37	173	296	P	H
CH 64		10640	45.11	-28.89	74	56	38.5	9.3	58.69	152	135	P	V
5320MHz		15960	47.34	-26.66	74	56.77	37.51	12.43	59.37	173	245	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+2	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		5124.54	45.92	-28.08	74	40.42	32.24	6.04	32.78	231	360	P	H
		5016.38	37.68	-16.32	54	32.14	32.2	6.06	32.72	231	360	A	H
	*	5270	102.5	-	-	97.05	32.28	6.03	32.86	231	360	P	H
		5270	96.7	-	-	91.25	32.28	6.03	32.86	231	360	A	H
		5353.44	43.51	-30.49	74	38.11	32.31	6.01	32.92	231	360	P	H
		5350.08	36.99	-17.01	54	31.59	32.31	6.01	32.92	231	360	A	H
		5048.1	46.24	-27.76	74	40.71	32.21	6.05	32.73	112	339	P	V
		5047.32	38.37	-15.63	54	32.84	32.21	6.05	32.73	112	339	A	V
	*	5270	106.02	-	-	100.57	32.28	6.03	32.86	112	339	P	V
		5270	98.55	-	-	93.1	32.28	6.03	32.86	112	339	A	V
		5369.52	43.78	-30.22	74	38.38	32.31	6.01	32.92	112	339	P	V
		5351.28	36.87	-17.13	54	31.47	32.31	6.01	32.92	112	339	A	V
802.11n HT40 CH 62 5310MHz		5023.45	47.5	-26.5	74	41.95	32.21	6.06	32.72	231	360	P	H
		5086.45	39.51	-14.49	54	33.99	32.22	6.05	32.75	231	360	A	H
	*	5310	103.33	-	-	97.9	32.3	6.02	32.89	231	360	P	H
		5310	96.4	-	-	90.97	32.3	6.02	32.89	231	360	A	H
		5366.4	50.01	-23.99	74	44.61	32.31	6.01	32.92	231	360	P	H
		5357.04	42.44	-11.56	54	37.04	32.31	6.01	32.92	231	360	A	H
		5099.75	45.36	-28.64	74	39.84	32.23	6.05	32.76	121	18	P	V
		5084.7	37.96	-16.04	54	32.44	32.22	6.05	32.75	121	18	A	V
	*	5310	106.14	-	-	100.71	32.3	6.02	32.89	121	18	P	V
		5310	98.06	-	-	92.63	32.3	6.02	32.89	121	18	A	V
		5350.08	58.68	-15.32	74	53.28	32.31	6.01	32.92	121	18	P	V
		5350.56	49.98	-4.02	54	44.58	32.31	6.01	32.92	121	18	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+2	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		10540	45.32	-22.88	68.2	56.44	38.4	9.28	58.8	189	86	P	H
HT40		15810	46.49	-27.51	74	55.42	38.03	12.25	59.21	186	39	P	H
CH 54		10540	45.28	-22.92	68.2	56.4	38.4	9.28	58.8	150	220	P	V
5270MHz		15810	46.52	-27.48	74	55.45	38.03	12.25	59.21	168	345	P	V
802.11n		10620	46.68	-27.32	74	57.61	38.48	9.3	58.71	180	220	P	H
HT40		15930	47.88	-26.12	74	57.2	37.63	12.38	59.33	160	169	P	H
CH 62		10620	47.15	-26.85	74	58.08	38.48	9.3	58.71	150	220	P	V
5310MHz		15930	48.31	-25.69	74	57.63	37.63	12.38	59.33	160	100	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	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)
802.11ac VHT80 CH 58 5290MHz		5071.76	45.67	-28.33	74	40.15	32.22	6.05	32.75	196	355	P	H
		5052.78	38.9	-15.1	54	33.37	32.21	6.05	32.73	196	355	A	H
	*	5290	99.27	-	-	93.83	32.29	6.02	32.87	196	355	P	H
		5290	91.16	-	-	85.72	32.29	6.02	32.87	196	355	A	H
		5353.92	54.91	-19.09	74	49.51	32.31	6.01	32.92	196	355	P	H
		5350.56	48.2	-5.8	54	42.8	32.31	6.01	32.92	196	355	A	H
		5050.44	47.51	-26.49	74	41.98	32.21	6.05	32.73	111	339	P	V
		5036.4	40.16	-13.84	54	34.61	32.21	6.06	32.72	111	339	A	V
	*	5290	98.26	-	-	92.82	32.29	6.02	32.87	111	339	P	V
		5290	91.56	-	-	86.12	32.29	6.02	32.87	111	339	A	V
		5351.28	55.69	-18.31	74	50.29	32.31	6.01	32.92	111	339	P	V
		5355.6	47.42	-6.58	54	42.02	32.31	6.01	32.92	111	339	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

**Band 2 5250~5350MHz****WIFI 802.11ac VHT80 (Harmonic @ 3m)**

WIFI Ant. 1+2	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)
802.11ac		10580	46.61	-21.59	68.2	57.62	38.45	9.29	58.75	161	360	P	H
VHT80		15870	49.03	-24.97	74	58.22	37.8	12.29	59.28	161	0	P	H
CH 58		10580	47.94	-20.26	68.2	58.95	38.45	9.29	58.75	161	360	P	V
5290MHz		15870	50	-24	74	59.19	37.8	12.29	59.28	161	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz

WIFI 802.11a (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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 100 5500MHz		5457.52	45.73	-28.27	74	40.31	32.34	6.06	32.98	109	355	P	H
		5469.52	47.75	-20.45	68.2	42.27	32.35	6.11	32.98	109	355	P	H
		5457.36	38.56	-15.44	54	33.14	32.34	6.06	32.98	109	355	A	H
	*	5500	106.51	-	-	101.04	32.36	6.11	33	109	355	P	H
	*	5500	100.15	-	-	94.68	32.36	6.11	33	109	355	A	H
		5459.6	46.26	-27.74	74	40.84	32.34	6.06	32.98	100	12	P	V
		5466.48	47.18	-21.02	68.2	41.7	32.35	6.11	32.98	100	12	P	V
		5452.88	38.14	-15.86	54	32.72	32.34	6.06	32.98	100	12	A	V
	*	5500	108.52	-	-	103.05	32.36	6.11	33	100	12	P	V
		5500	102.03	-	-	96.56	32.36	6.11	33	100	12	A	V
802.11a CH 116 5580MHz		5439.76	44.11	-29.89	74	38.68	32.34	6.06	32.97	103	352	P	H
		5469.76	43.61	-24.59	68.2	38.13	32.35	6.11	32.98	103	352	P	H
		5452.48	35.76	-18.24	54	30.34	32.34	6.06	32.98	103	352	A	H
	*	5580	105.36	-	-	99.72	32.38	6.22	32.96	103	352	P	H
		5580	98.99	-	-	93.35	32.38	6.22	32.96	103	352	A	H
		5737.91	44.04	-24.16	68.2	38.23	32.49	6.22	32.9	103	352	P	H
		5439.52	45.13	-28.87	74	39.7	32.34	6.06	32.97	100	13	P	V
		5466.64	44.65	-23.55	68.2	39.17	32.35	6.11	32.98	100	13	P	V
		5452.72	36.88	-17.12	54	31.46	32.34	6.06	32.98	100	13	A	V
	*	5580	107.93	-	-	102.29	32.38	6.22	32.96	100	13	P	V
		5580	101.46	-	-	95.82	32.38	6.22	32.96	100	13	A	V
		5760.275	45.12	-23.08	68.2	39.3	32.51	6.2	32.89	100	13	P	V



802.11a CH 140 5700MHz	*	5700	104.96	-	-	99.21	32.45	6.22	32.92	103	352	P	H
		5700	99.42	-	-	93.67	32.45	6.22	32.92	103	352	A	H
		5727.88	46.93	-21.27	68.2	41.14	32.48	6.22	32.91	103	352	P	H
	*	5700	108.43	-	-	102.68	32.45	6.22	32.92	100	13	P	V
		5700	102.06	-	-	96.31	32.45	6.22	32.92	100	13	A	V
		5755.4	48.6	-19.6	68.2	42.79	32.51	6.2	32.9	100	13	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1+2	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 100 5500MHz		11000	46.64	-27.36	74	56.73	38.83	9.38	58.3	185	230	P	H
		16500	49.72	-18.48	68.2	55.67	39.48	13.41	58.84	178	291	P	H
		11000	45.57	-28.43	74	55.66	38.83	9.38	58.3	163	230	P	V
		16500	49.92	-18.28	68.2	55.87	39.48	13.41	58.84	178	296	P	V
802.11a CH 116 5580MHz		11160	46.08	-27.92	74	55.77	38.99	9.43	58.11	141	200	P	H
		16740	50.81	-17.39	68.2	54.98	40.46	13.95	58.58	156	354	P	H
		11160	47.39	-26.61	74	57.08	38.99	9.43	58.11	170	200	P	V
		16740	50.7	-17.5	68.2	54.87	40.46	13.95	58.58	156	350	P	V
802.11a CH 140 5700MHz		11400	46.71	-27.29	74	55.87	39.21	9.48	57.85	152	285	P	H
		17100	50.4	-17.8	68.2	51.74	42.16	14.66	58.16	165	298	P	H
		11400	46.09	-27.91	74	55.25	39.21	9.48	57.85	157	285	P	V
		17100	50.6	-17.6	68.2	51.94	42.16	14.66	58.16	165	246	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+2	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		5452.88	43.64	-30.36	74	38.22	32.34	6.06	32.98	100	131	P	H
		5469.36	43.84	-24.36	68.2	38.36	32.35	6.11	32.98	100	354	P	H
		5452.72	37.28	-16.72	54	31.86	32.34	6.06	32.98	100	0	A	H
	*	5500	103.72	-	-	98.25	32.36	6.11	33	100	354	P	H
		5500	97.1	-	-	91.63	32.36	6.11	33	100	354	A	H
		5453.04	47.62	-26.38	74	42.2	32.34	6.06	32.98	100	7	P	V
		5465.2	47.9	-20.3	68.2	42.47	32.35	6.06	32.98	100	7	P	V
		5452.88	39.28	-14.72	54	33.86	32.34	6.06	32.98	100	7	A	V
	*	5500	107.34	-	-	101.87	32.36	6.11	33	100	7	P	V
		5500	100.32	-	-	94.85	32.36	6.11	33	100	7	A	V
802.11n HT20 CH 116 5580MHz		5448.88	43.16	-30.84	74	37.73	32.34	6.06	32.97	238	304	P	H
		5465.2	43.19	-25.01	68.2	37.76	32.35	6.06	32.98	238	304	P	H
		5452.72	34.07	-19.93	54	28.65	32.34	6.06	32.98	238	304	A	H
	*	5580	103.53	-	-	97.89	32.38	6.22	32.96	238	304	P	H
		5580	97	-	-	91.36	32.38	6.22	32.96	238	304	A	H
		5759.645	43.4	-24.8	68.2	37.58	32.51	6.2	32.89	238	304	P	H
		5451.52	44.08	-29.92	74	38.66	32.34	6.06	32.98	100	7	P	V
		5467.84	43.85	-24.35	68.2	38.37	32.35	6.11	32.98	100	7	P	V
		5452.72	36.35	-17.65	54	30.93	32.34	6.06	32.98	100	7	A	V
	*	5580	107.79	-	-	102.15	32.38	6.22	32.96	100	7	P	V
		5580	101.98	-	-	96.34	32.38	6.22	32.96	100	7	A	V
		5753.66	45.27	-22.93	68.2	39.46	32.51	6.2	32.9	100	7	P	V



802.11n HT20 CH 140 5700MHz	*	5700	103.32	-	-	97.57	32.45	6.22	32.92	229	302	P	H
		5700	96.2	-	-	90.45	32.45	6.22	32.92	229	302	A	H
		5725.08	47.55	-20.65	68.2	41.76	32.48	6.22	32.91	229	302	P	H
	*	5700	107.06	-	-	101.31	32.45	6.22	32.92	221	10	P	V
		5700	100.76	-	-	95.01	32.45	6.22	32.92	221	10	A	V
		5726.6	49.04	-19.16	68.2	43.25	32.48	6.22	32.91	221	10	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 (Harmonic @ 3m)

WIFI Ant. 1+2	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		11000	46.17	-27.83	74	56.26	38.83	9.38	58.3	185	230	P	H
HT20		16500	50.11	-18.09	68.2	56.06	39.48	13.41	58.84	178	291	P	H
CH 100		11000	46.26	-27.74	74	56.35	38.83	9.38	58.3	163	230	P	V
5500MHz		16500	49.45	-18.75	68.2	55.4	39.48	13.41	58.84	178	296	P	V
802.11n		11160	45.58	-28.42	74	55.27	38.99	9.43	58.11	141	200	P	H
HT20		16740	50.83	-17.37	68.2	55	40.46	13.95	58.58	156	354	P	H
CH 116		11160	47.43	-26.57	74	54.86	38.99	9.43	55.85	170	200	P	V
5580MHz		16740	50.4	-17.8	68.2	52.16	40.46	13.95	56.17	156	350	P	V
802.11n		11400	46.04	-27.96	74	55.2	39.21	9.48	57.85	152	285	P	H
HT20		17100	50.02	-18.18	68.2	51.36	42.16	14.66	58.16	165	298	P	H
CH 140		11400	48.25	-25.75	74	55.05	39.21	9.48	55.49	157	285	P	V
5700MHz		17100	50.26	-17.94	68.2	49.82	42.16	14.66	56.38	165	246	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+2	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		5435.68	44.68	-29.32	74	39.25	32.34	6.06	32.97	106	357	P	H
		5462.8	53.22	-14.98	68.2	47.79	32.35	6.06	32.98	106	357	P	H
		5459.68	41.68	-12.32	54	36.26	32.34	6.06	32.98	106	357	A	H
	*	5510	100.93	-	-	95.39	32.36	6.17	32.99	106	357	P	H
		5510	92.47	-	-	86.93	32.36	6.17	32.99	106	357	A	H
		5740.745	43.78	-24.42	68.2	37.99	32.49	6.2	32.9	106	357	P	H
		5458.96	54.18	-19.82	74	48.76	32.34	6.06	32.98	110	18	P	V
		5468.8	56.1	-12.1	68.2	50.62	32.35	6.11	32.98	110	18	P	V
		5460	45.31	-8.69	54	39.89	32.34	6.06	32.98	110	18	P	V
	*	5510	103.89	-	-	98.35	32.36	6.17	32.99	110	18	P	V
		5510	95.63	-	-	90.09	32.36	6.17	32.99	110	18	A	V
		5737.91	45.93	-22.27	68.2	40.12	32.49	6.22	32.9	110	18	P	V
802.11n HT40 CH 110 5550MHz		5450.08	43.46	-30.54	74	38.04	32.34	6.06	32.98	107	359	P	H
		5469.52	43.09	-25.11	68.2	37.61	32.35	6.11	32.98	107	359	P	H
		5458	35.94	-18.06	54	30.52	32.34	6.06	32.98	107	359	P	H
	*	5550	100.94	-	-	95.33	32.37	6.22	32.98	107	359	P	H
		5550	94.37	-	-	88.76	32.37	6.22	32.98	107	359	A	H
		5739.485	44.56	-23.64	68.2	38.77	32.49	6.2	32.9	107	359	P	H
		5441.92	43.92	-30.08	74	38.49	32.34	6.06	32.97	101	17	P	V
		5467.36	44.11	-24.09	68.2	38.63	32.35	6.11	32.98	101	17	P	V
		5452.72	37.6	-16.4	54	32.18	32.34	6.06	32.98	101	17	A	V
	*	5550	105.01	-	-	99.4	32.37	6.22	32.98	101	17	P	V
	*	5550	98.53	-	-	92.92	32.37	6.22	32.98	101	17	A	V
		5736.65	43.75	-24.45	68.2	37.94	32.49	6.22	32.9	101	17	P	V



802.11n HT40 CH 134 5670MHz		5454.3	43.58	-30.42	74	38.16	32.34	6.06	32.98	104	354	P	H
		5464.8	42.91	-25.29	68.2	37.48	32.35	6.06	32.98	104	354	P	H
		5445.9	36.2	-17.8	54	30.77	32.34	6.06	32.97	104	354	A	H
	*	5670	99.33	-	-	93.6	32.43	6.23	32.93	104	354	P	H
		5670	94.52	-	-	88.79	32.43	6.23	32.93	104	354	A	H
		5729.825	46.13	-22.07	68.2	40.34	32.48	6.22	32.91	104	354	P	H
		5425.95	42.63	-31.37	74	37.26	32.33	6.01	32.97	104	15	P	V
		5461.3	43.11	-25.09	68.2	37.69	32.34	6.06	32.98	104	15	P	V
		5452.9	36.08	-17.92	54	30.66	32.34	6.06	32.98	104	15	A	V
	*	5670	103.53	-	-	97.8	32.43	6.23	32.93	104	15	P	V
		5670	97.45	-	-	91.72	32.43	6.23	32.93	104	15	A	V
		5726.675	46.63	-21.57	68.2	40.84	32.48	6.22	32.91	104	15	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 (Harmonic @ 3m)

WIFI Ant. 1+2	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		11020	44.98	-29.02	74	55.03	38.84	9.39	58.28	170	86	P	H
HT40		16530	49.97	-18.23	68.2	55.67	39.62	13.48	58.8	160	59	P	H
CH 102		11020	47.18	-26.82	74	55.02	38.84	9.39	56.07	170	230	P	V
5510MHz		16530	50.74	-17.46	68.2	53.71	39.62	13.48	56.07	160	300	P	V
802.11n		11100	45.34	-28.66	74	55.2	38.92	9.41	58.19	196	200	P	H
HT40		16650	50.97	-17.23	68.2	55.81	40.11	13.72	58.67	180	314	P	H
CH 110		11100	48.36	-25.64	74	55.98	38.92	9.41	55.95	185	200	P	V
5550MHz		16650	50.54	-17.66	68.2	52.84	40.11	13.72	56.13	180	325	P	V
802.11n		11340	45.89	-28.11	74	55.22	39.14	9.46	57.93	200	360	P	H
HT40		17010	50.88	-17.32	68.2	53.05	41.61	14.5	58.28	200	360	P	H
CH 134		11340	47.99	-26.01	74	54.98	39.14	9.46	55.59	100	360	P	V
5670MHz		17010	50.56	-17.64	68.2	50.76	41.61	14.5	56.31	200	369	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	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)
802.11ac VHT80 CH 106 5530MHz		5458.48	53.55	-20.45	74	48.13	32.34	6.06	32.98	100	360	P	H
		5463.52	55.4	-12.8	68.2	49.97	32.35	6.06	32.98	100	360	P	H
		5452.48	47.27	-6.73	54	41.85	32.34	6.06	32.98	100	360	P	H
	*	5530	96.36	-	-	90.81	32.36	6.17	32.98	100	360	P	H
		5530	89.87	-	-	84.32	32.36	6.17	32.98	100	360	A	H
		5740.745	43.02	-25.18	68.2	37.23	32.49	6.2	32.9	100	360	P	H
		5448.88	42.17	-31.83	74	36.74	32.34	6.06	32.97	100	360	P	V
		5468.08	53.65	-14.55	68.2	48.17	32.35	6.11	32.98	100	360	P	V
		5457.28	45.67	-8.33	54	40.25	32.34	6.06	32.98	100	360	A	V
	*	5530	95.12	-	-	89.57	32.36	6.17	32.98	100	360	P	V
		5530	88.69	-	-	83.14	32.36	6.17	32.98	100	360	A	V
		5749.88	45.11	-23.09	68.2	39.32	32.49	6.2	32.9	100	360	P	V
802.11ac VHT80 CH 122 5610MHz		5452.48	44.94	-29.06	74	39.52	32.34	6.06	32.98	100	341	P	H
		5465.68	42.92	-25.28	68.2	37.44	32.35	6.11	32.98	100	341	P	H
		5452.24	37.31	-16.69	54	31.89	32.34	6.06	32.98	100	341	P	H
	*	5610	99.07	-	-	93.36	32.39	6.27	32.95	100	341	P	H
		5610	90.38	-	-	84.67	32.39	6.27	32.95	100	341	A	H
		5742.32	44.68	-23.52	68.2	38.89	32.49	6.2	32.9	100	341	P	H
		5450.08	43.06	-30.94	74	37.64	32.34	6.06	32.98	100	357	P	V
		5460.88	43.05	-25.15	68.2	37.63	32.34	6.06	32.98	100	357	P	V
		5452.96	37.66	-16.34	54	32.24	32.34	6.06	32.98	100	357	A	V
	*	5610	99.84	-	-	94.13	32.39	6.27	32.95	100	357	P	V
		5610	91.4	-	-	85.69	32.39	6.27	32.95	100	357	A	V
		5762.48	44.52	-23.68	68.2	38.7	32.51	6.2	32.89	100	357	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 5470~5725MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac		11060	45.74	-28.26	74	55.68	38.89	9.4	58.23	161	360	P	H
VHT80		16590	50.03	-18.17	68.2	55.31	39.83	13.64	58.75	161	0	P	H
CH 106		11060	48.71	-25.29	74	56.42	38.89	9.4	56	161	360	P	V
5530MHz		16590	49.07	-19.13	68.2	51.7	39.83	13.64	56.1	161	0	P	V
802.11ac		11220	46.45	-27.55	74	56.04	39.03	9.44	58.06	161	360	P	H
VHT80		16830	47.55	-20.65	68.2	51.12	40.81	14.11	58.49	161	0	P	H
CH 122		11220	47.62	-26.38	74	54.92	39.03	9.44	55.77	161	360	P	V
5610MHz		16830	45	-23.2	68.2	46.3	40.81	14.11	56.22	161	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

WIFI 802.11n VHT80 (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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n VHT80 LF		30	23.07	-16.93	40	30.12	24.8	0.25	32.1	100	52	P	H
		89.17	16.61	-26.89	43.5	32.47	14.66	0.98	31.5	-	-	P	H
		272.5	22.46	-23.54	46	33.05	19.53	1.77	31.89	-	-	P	H
		327.79	24.38	-21.62	46	34.36	20.08	1.99	32.05	-	-	P	H
		479.11	27.1	-18.9	46	33.33	23.46	2.38	32.07	-	-	P	H
		713.85	28	-18	46	29.48	26.94	2.96	31.38	-	-	P	H
		30	28.97	-11.03	40	36.02	24.8	0.25	32.1	100	109	P	V
		64.92	23.42	-16.58	40	41.82	12.2	0.8	31.4	-	-	P	V
		168.71	25.2	-18.3	43.5	39.89	15.8	1.35	31.84	-	-	P	V
		180.35	24.64	-18.86	43.5	40.09	15	1.41	31.86	-	-	P	V
		325.85	22.15	-23.85	46	32.19	20.03	1.98	32.05	-	-	P	V
		625.58	28.25	-17.75	46	31.14	26.03	2.76	31.68	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Band 3 - Straddle Channel

WIFI 802.11a (Harmonic @ 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 144 5720MHz		11440	50.18	-23.82	74	53.51	39.24	15.25	57.82	160	360	P	H
		17160	52.53	-15.67	68.2	50.04	42.6	17.95	58.06	160	0	P	H
		11440	49.02	-24.98	74	52.35	39.24	15.25	57.82	160	360	P	V
		17160	52.97	-15.23	68.2	50.48	42.6	17.95	58.06	160	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 3 - Straddle Channel

WIFI 802.11a HT20 (Harmonic @ 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 HT20 CH 144 5720MHz		11440	50.51	-23.49	74	54.8	40.09	15.25	59.63	150	360	P	H
		17160	50.7	-23.3	74	51.54	41.3	17.95	60.09	150	0	P	H
		11440	50.91	-23.09	74	55.2	40.09	15.25	59.63	150	360	P	V
		17160	50.17	-23.83	74	51.01	41.3	17.95	60.09	150	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - Straddle Channel
WIFI 802.11a 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)
802.11a		11420	49.56	-24.44	74	52.93	39.22	15.24	57.83	160	360	P	H
HT40		17130	52.54	-15.66	68.2	50.33	42.38	17.94	58.11	160	0	P	H
CH 142		11420	49.31	-24.69	74	52.68	39.22	15.24	57.83	160	360	P	V
5710MHz		17130	51.88	-16.32	68.2	49.67	42.38	17.94	58.11	160	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 3 - Straddle Channel
WIFI 802.11ac VHT80(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)
802.11ac		11380	49.23	-24.77	74	52.69	39.19	15.22	57.87	160	360	P	H
VHT80		17070	50.58	-17.62	68.2	48.94	41.94	17.91	58.21	160	0	P	H
CH 138		11380	49.57	-24.43	74	53.03	39.19	15.22	57.87	160	360	P	V
5690MHz		17070	50.54	-17.66	68.2	48.9	41.94	17.91	58.21	160	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average 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+2		(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”.

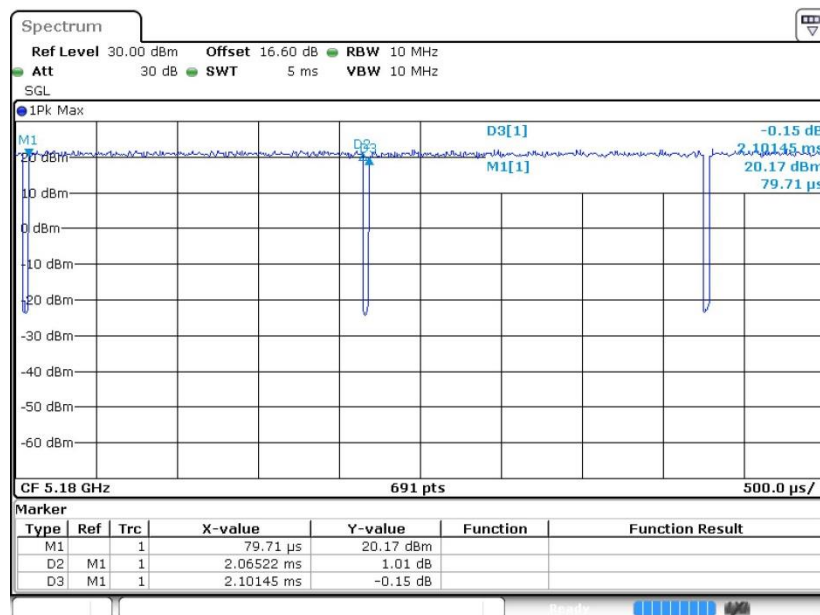
Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1+2	802.11a	98.28	-	-	10Hz
1+2	802.11n HT20	98.16	-	-	10Hz
1+2	802.11n HT40	96.32	0.949	1.053	3KHz
1+2	802.11acVHT80	87.66	0.257	3.887	10KHZ

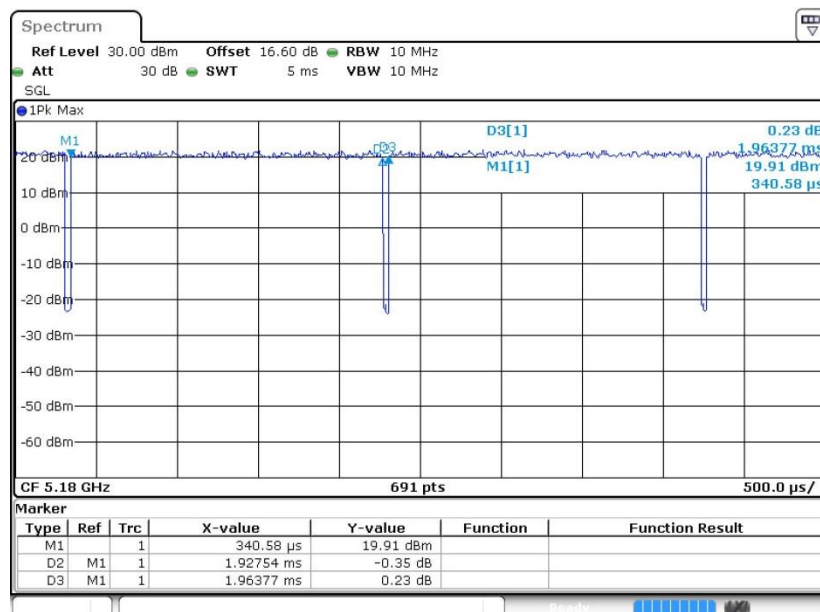


Ant.1+2

802.11a

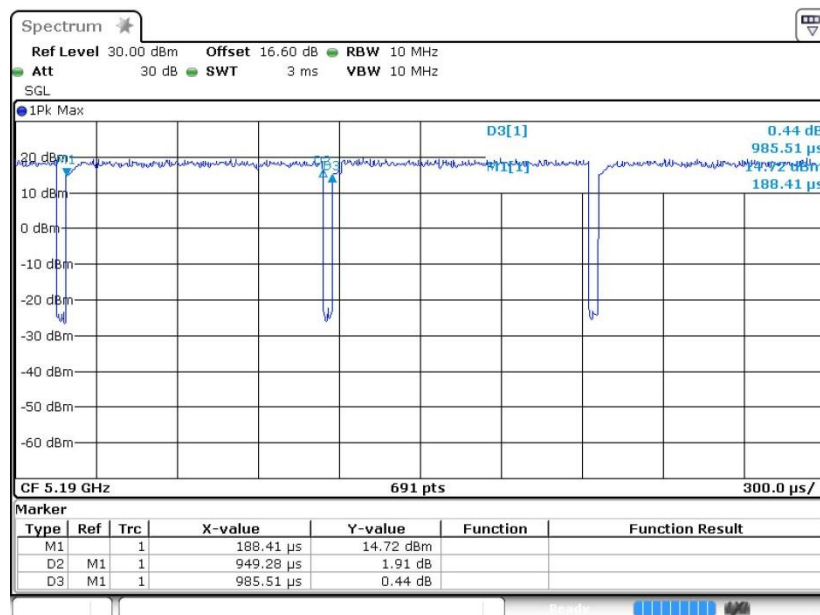


802.11n HT20





802.11n HT40



802.11ac VHT80

