



FCC RF Test Report

APPLICANT : OnePlus Technology (Shenzhen) Co., Ltd
EQUIPMENT : Smart Phone
BRAND NAME : ONEPLUS
MODEL NAME : AC2003
FCC ID : 2ABZ2-EF014
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Apr. 20, 2020 and testing was completed on May 19, 2020. 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.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager



Sporton International (ShenZhen) Inc.

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 People's Republic of China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR042007-02F	Rev. 01	Initial issue of report	Jun. 05, 2020
FR042007-02F	Rev. 02	Reduce 11ac VHT80-CH 58 power	Jul. 06, 2020



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 3.67 dB at 5459.920 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 16.16 dB at 8.240 MHz
3.6	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.7	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



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	AC2003
FCC ID	2ABZ2-EF014
EUT supports Radios application	GSM/WCDMA/LTE/5G NR WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE / ANT+ GNSS/NFC
IMEI Code	Conducted: 001004119993252 Conduction: 867958040036791/867958040036783 Radiation: 867958040036536/867958040036528
HW Version	14
SW Version	Oxygen OS 10.5.0.AC01BA
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	<p><MIMO Ant.1+2></p> <p><5180 MHz ~ 5240 MHz> 802.11a : 19.93 dBm / 0.0984 W 802.11n HT20 : 19.75 dBm / 0.0944 W 802.11n HT40 : 19.63 dBm / 0.0918 W 802.11ac VHT20 : 19.69 dBm / 0.0931 W 802.11ac VHT40 : 19.58 dBm / 0.0908 W 802.11ac VHT80 : 17.70 dBm / 0.0589 W</p> <p><5260 MHz ~ 5320 MHz> 802.11a : 19.95 dBm / 0.0989 W 802.11n HT20 : 19.61 dBm / 0.0914 W 802.11n HT40 : 19.57 dBm / 0.0906 W 802.11ac VHT20 : 19.55 dBm / 0.0902 W 802.11ac VHT40 : 19.52 dBm / 0.0895 W 802.11ac VHT80 : 15.62 dBm / 0.0365 W</p> <p><5500 MHz ~ 5720 MHz > 802.11a : 20.32 dBm / 0.1076 W 802.11n HT20 : 20.11 dBm / 0.1026 W 802.11n HT40 : 20.28 dBm / 0.1067 W 802.11ac VHT20 : 20.05 dBm / 0.1012 W 802.11ac VHT40 : 20.23 dBm / 0.1054 W 802.11ac VHT80 : 19.22 dBm / 0.0836 W</p>
99% Occupied Bandwidth	<p><MIMO Ant.1+2></p> <p><5180 MHz ~ 5240 MHz> 802.11a : 16.78 MHz 802.11n HT20 : 17.93 MHz 802.11n HT40 : 36.56 MHz 802.11ac VHT80 : 76.72 MHz</p> <p><5260 MHz ~ 5320 MHz> 802.11a : 16.73 MHz 802.11n HT20 : 17.88 MHz 802.11n HT40 : 36.56 MHz 802.11ac VHT80 : 76.96 MHz</p> <p><5500 MHz ~ 5720 MHz > 802.11a : 16.73 MHz 802.11n HT20 : 17.88 MHz 802.11n HT40 : 36.56 MHz 802.11ac VHT80 : 76.84 MHz</p>
Antenna Type / Gain	<p><5180 MHz ~ 5240 MHz> <Ant. 1> : Monopole Antenna with gain -3.00 dBi <Ant. 2> : Monopole Antenna with gain -3.00 dBi</p> <p><5260 MHz ~ 5320 MHz> <Ant. 1> : Monopole Antenna with gain -3.00 dBi <Ant. 2> : Monopole Antenna with gain -3.00 dBi</p> <p><5500 MHz ~ 5720 MHz> <Ant. 1> : Monopole Antenna with gain -3.00 dBi <Ant. 2> : Monopole Antenna with gain -3.00 dBi</p>



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

Note:

1. For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing have assessed only 802.11n HT20/ HT40 by referring to their maximum conducted power.
2. The EUT supports for MIMO mode only.

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/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-SZ TH01-SZ	CN1256	421272

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan Shenzhen, 518055 People's Republic of China TEL: +86-755-33202398		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-SZ	CN1256	421272

1.7 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b

1.8 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 (X 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 1(Charging from Adapter 1)
Remark: For Radiated Test Cases, The tests were performed with Adapter 1 and USB Cable 1.	



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

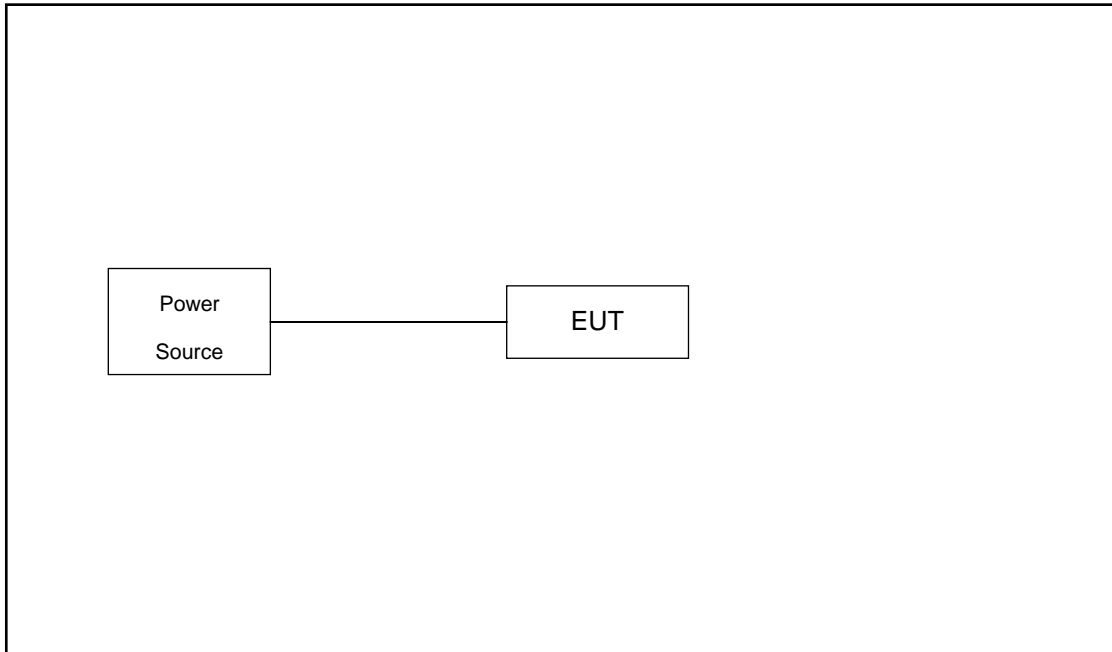
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5720MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

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

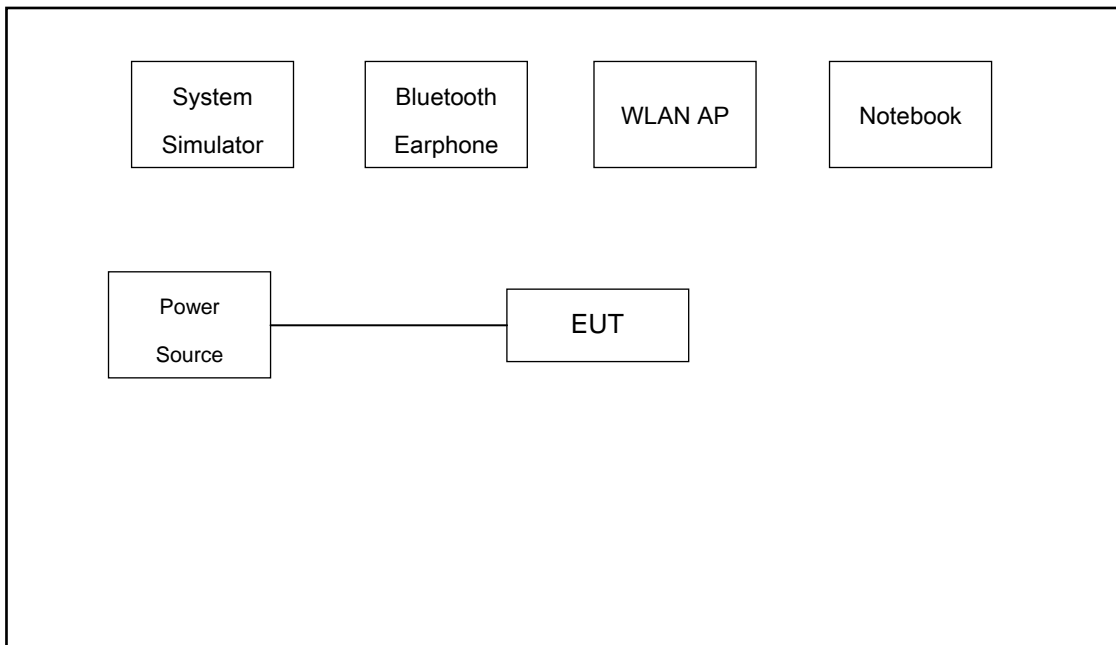
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5720MHz
		802.11ac VHT80	802.11ac VHT80	802.11ac VHT80
L	Low	-	-	106
M	Middle	42	58	-
H	High	-	-	122
Straddle		-	-	138

2.3 Connection Diagram of Test System

For Radiation



For Conducted Emission



2.4 Support Unit used in test configuration and system

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

2.5 EUT Operation Test Setup

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

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

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss 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 2.5 dB and 20dB attenuator.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 2.5 + 20 = 22.5 \text{ (dB)} \end{aligned}$$

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.

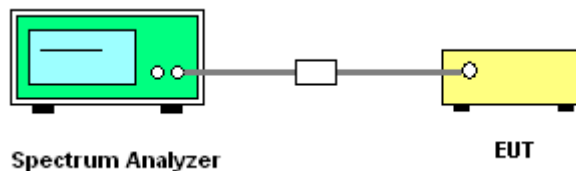
3.1.2 Measuring Instruments

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.

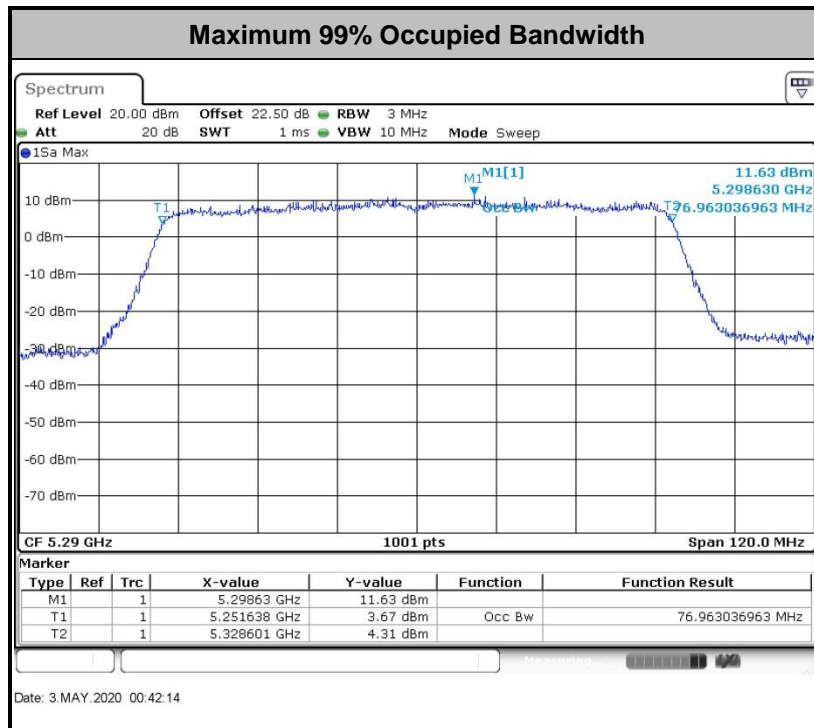
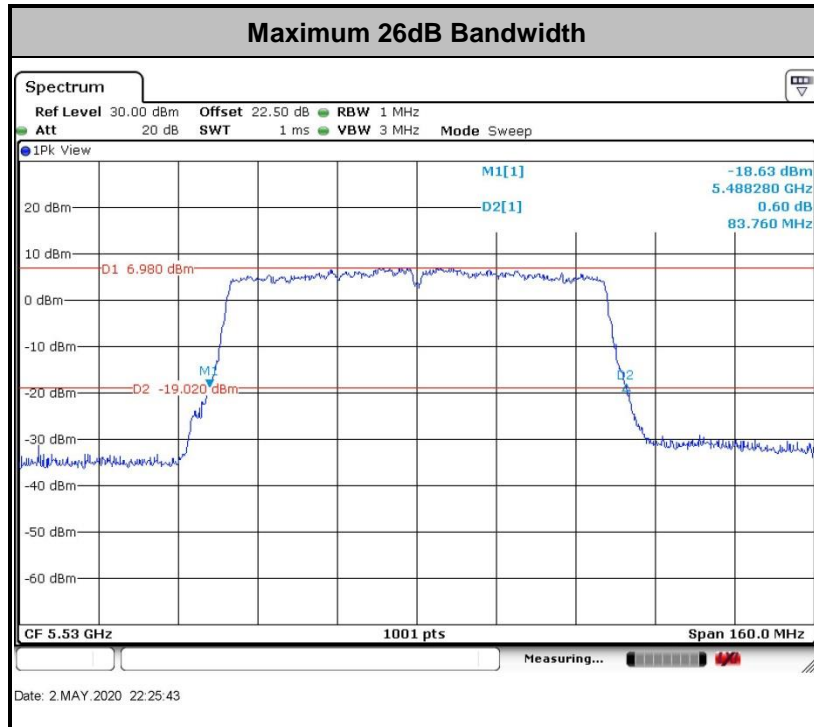
3.1.4 Test Setup





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 $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz.

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

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

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

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

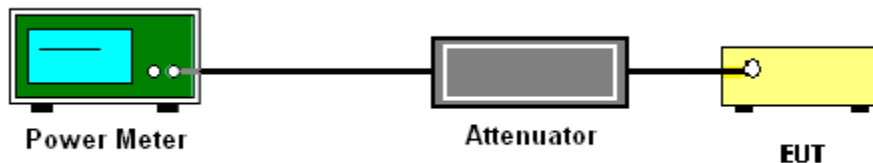
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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

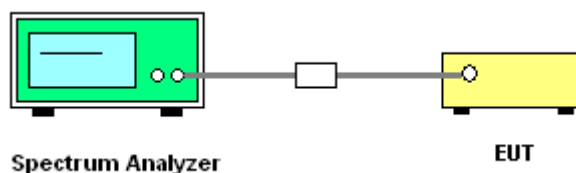
(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- 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.

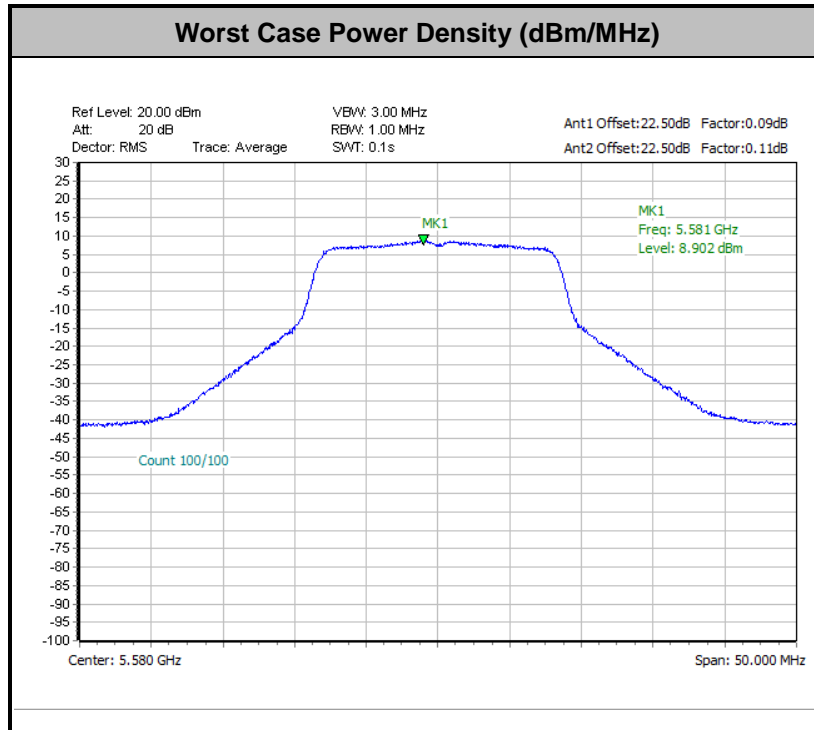
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.





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	68.3

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

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

where

EIRP is the equivalent isotropically radiated power, in dBm

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

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

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

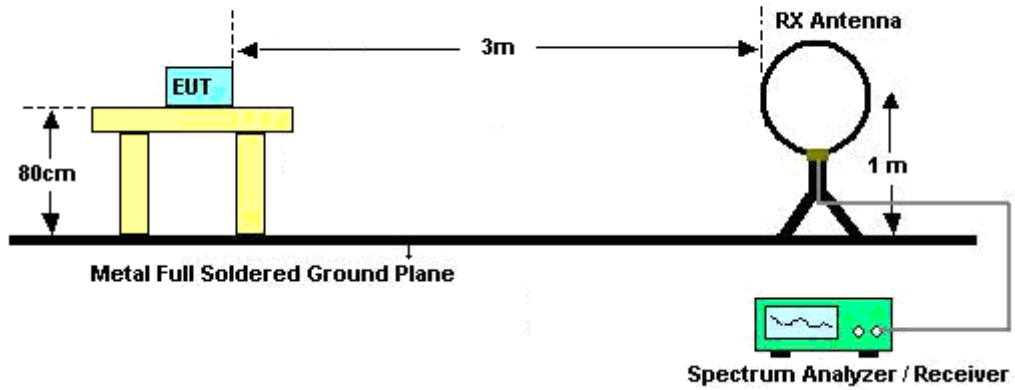


3.4.3 Test Procedures

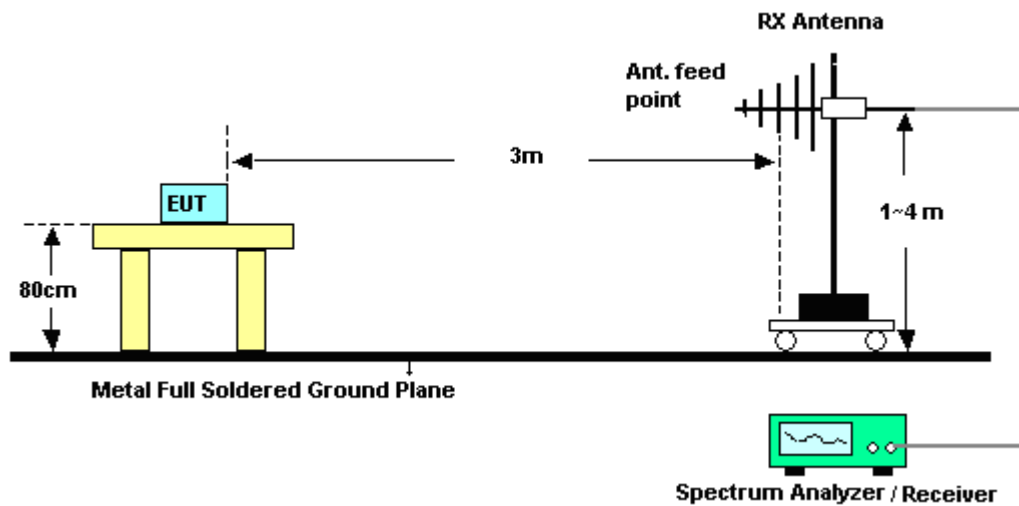
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW \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

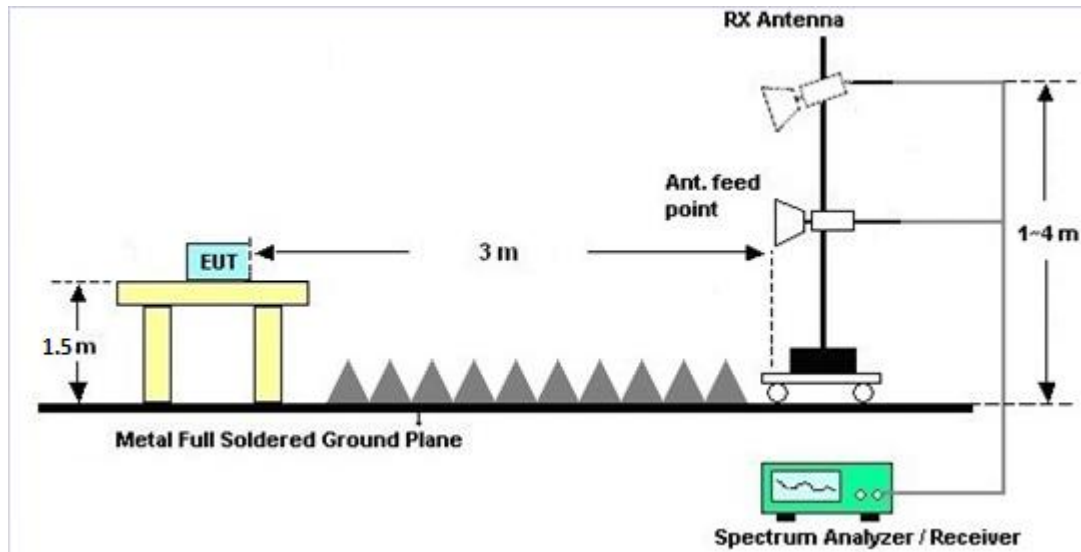
For radiated emissions below 30MHz



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

*Decreases with the logarithm of the frequency.

3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

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

3.6.2 Measuring Instruments

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

3.6.3 Test Result of Automatically Discontinue Transmission

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



3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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

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(NANT/NSS=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 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>						
	Ant. 1	Ant. 2	DG	DG	Power	PSD
	(dBi)	(dBi)	for	for	Limit	Limit
			Power	PSD	Reduction	Reduction
			(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. 16, 2020	May 02, 2020~ May 03, 2020	Apr. 15, 2021	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 26, 2019	May 02, 2020~ May 03, 2020	Dec. 25, 2020	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 26, 2019	May 02, 2020~ May 03, 2020	Dec. 25, 2020	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Apr. 17, 2020	May 15, 2020	Apr. 16, 2021	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY551502 13	10Hz~44GHz	Apr. 17, 2020	May 15, 2020	Apr. 16, 2021	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 29, 2019	May 15, 2020	May 28, 2020	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Aug. 27, 2019	May 15, 2020	Aug. 26, 2020	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBE CK	BBHA9120D	9120D-147 4	1GHz~18GHz	Apr. 01, 2020	May 15, 2020	Mar. 31, 2021	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBE CK	BBHA9170	9170#679	15GHz~40GHz	Apr. 17, 2020	May 15, 2020	Apr. 16, 2021	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz ~3000MHz	Oct. 18, 2019	May 15, 2020	Oct. 17, 2020	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P- R	1943528	1GHz~18GHz	Oct. 18, 2019	May 15, 2020	Oct. 17, 2020	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz	Jul. 22, 2019	May 15, 2020	Jul. 21, 2020	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY532701 56	500MHz~26.5G Hz	Aug. 26, 2019	May 15, 2020	Aug. 25, 2020	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	May 15, 2020	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	May 15, 2020	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	May 15, 2020	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 26, 2019	May 19, 2020	Dec. 25, 2020	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Oct. 17, 2019	May 19, 2020	Oct. 16, 2020	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 17, 2019	May 19, 2020	Oct. 16, 2020	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Jul. 23, 2019	May 19, 2020	Jul. 22, 2020	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
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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))	5.0dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.8dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1dB
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Appendix A. Conducted Test Results

Report Number : FR042007-02F

Test Engineer:	Zhang Jiang	Temperature:	21~25	°C
Test Date:	2020/5/2~2020/5/3	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	16.73	16.63	24.48	23.28	-	-	22.21	22.21	
11a	6Mbps	2	44	5220	16.78	16.63	24.53	23.73	-	-	22.21	22.21	
11a	6Mbps	2	48	5240	16.68	16.63	24.03	23.38	-	-	22.21	22.21	
HT20	MCS0	2	36	5180	17.93	17.83	25.52	24.93	-	-	22.51	22.51	
HT20	MCS0	2	44	5220	17.83	17.88	25.87	24.88	-	-	22.51	22.51	
HT20	MCS0	2	48	5240	17.93	17.83	25.87	25.18	-	-	22.51	22.51	
HT40	MCS0	2	38	5190	36.56	36.46	41.90	41.90	-	-	23.01	23.01	
HT40	MCS0	2	46	5230	36.56	36.46	41.81	41.72	-	-	23.01	23.01	
VHT80	MCS0	2	42	5210	76.72	76.72	83.44	82.80	-	-	23.01	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	0.09	0.11	16.90	16.94	19.93	24.00		-3.00	Pass	
11a	6Mbps	2	44	5220	0.09	0.11	16.82	16.85	19.84	24.00		-3.00	Pass	
11a	6Mbps	2	48	5240	0.09	0.11	16.77	16.95	19.87	24.00		-3.00	Pass	
HT20	MCS0	2	36	5180	0.14	0.18	16.63	16.84	19.75	24.00		-3.00	Pass	
HT20	MCS0	2	44	5220	0.14	0.18	16.54	16.82	19.69	24.00		-3.00	Pass	
HT20	MCS0	2	48	5240	0.14	0.18	16.45	16.71	19.59	24.00		-3.00	Pass	
HT40	MCS0	2	38	5190	0.30	0.30	15.56	15.58	18.58	24.00		-3.00	Pass	
HT40	MCS0	2	46	5230	0.30	0.30	16.67	16.58	19.63	24.00		-3.00	Pass	
VHT20	MCS0	2	36	5180	0.27	0.34	16.56	16.80	19.69	24.00		-3.00	Pass	
VHT20	MCS0	2	44	5220	0.27	0.34	16.47	16.78	19.63	24.00		-3.00	Pass	
VHT20	MCS0	2	48	5240	0.27	0.34	16.38	16.67	19.53	24.00		-3.00	Pass	
VHT40	MCS0	2	38	5190	0.48	0.59	15.51	15.60	18.57	24.00		-3.00	Pass	
VHT40	MCS0	2	46	5230	0.48	0.59	16.60	16.54	19.58	24.00		-3.00	Pass	
VHT80	MCS0	2	42	5210	0.92	0.91	14.82	14.56	17.70	24.00		-3.00	Pass	

TEST RESULTS DATA
Power Spectral Density

FCC Band I														
Mod.	Data Rate	N _{TX}	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	0.09	0.11			8.11	11.00	0.01		Pass	
11a	6Mbps	2	44	5220	0.09	0.11			8.00	11.00	0.01		Pass	
11a	6Mbps	2	48	5240	0.09	0.11			7.95	11.00	0.01		Pass	
HT20	MCS0	2	36	5180	0.14	0.18			7.78	11.00	0.01		Pass	
HT20	MCS0	2	44	5220	0.14	0.18			7.56	11.00	0.01		Pass	
HT20	MCS0	2	48	5240	0.14	0.18			7.75	11.00	0.01		Pass	
HT40	MCS0	2	38	5190	0.30	0.30			4.58	11.00	0.01		Pass	
HT40	MCS0	2	46	5230	0.30	0.30			4.66	11.00	0.01		Pass	
VHT80	MCS0	2	42	5210	0.92	0.91			0.57	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	16.68	16.58	24.13	24.08	23.20		29.20		23.98		
11a	6Mbps	2	60	5300	16.73	16.63	24.03	23.68	23.21		29.21		23.98		
11a	6Mbps	2	64	5320	16.63	16.63	24.03	23.28	23.21		29.21		23.98		
HT20	MCS0	2	52	5260	17.83	17.83	25.38	25.82	23.51		29.51		23.98		
HT20	MCS0	2	60	5300	17.88	17.83	25.52	25.33	23.51		29.51		23.98		
HT20	MCS0	2	64	5320	17.88	17.83	25.52	25.03	23.51		29.51		23.98		
HT40	MCS0	2	54	5270	36.56	36.46	41.54	41.81	23.98		30.00		23.98		
HT40	MCS0	2	62	5310	36.56	36.36	41.63	41.90	23.98		30.00		23.98		
VHT80	MCS0	2	58	5290	76.72	76.96	83.12	82.64	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	0.09	0.11	16.94	16.94	19.95	23.98		-3.00	26.99	Pass	
11a	6Mbps	2	60	5300	0.09	0.11	16.77	16.48	19.64	23.98		-3.00	26.99	Pass	
11a	6Mbps	2	64	5320	0.09	0.11	16.88	16.50	19.70	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	52	5260	0.14	0.18	16.61	16.59	19.61	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	60	5300	0.14	0.18	16.54	16.26	19.41	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	64	5320	0.14	0.18	16.72	16.22	19.49	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	54	5270	0.30	0.30	16.60	16.53	19.57	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	62	5310	0.30	0.30	13.45	12.77	16.13	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	52	5260	0.27	0.34	16.54	16.55	19.55	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	60	5300	0.27	0.34	16.47	16.22	19.35	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	64	5320	0.27	0.34	16.65	16.18	19.43	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	54	5270	0.48	0.59	16.53	16.49	19.52	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	62	5310	0.48	0.59	13.44	12.75	16.12	23.98		-3.00	26.99	Pass	
VHT80	MCS0	2	58	5290	0.92	0.91	12.87	12.33	15.62	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	0.09	0.11			7.83	11.00		0.01		Pass
11a	6Mbps	2	60	5300	0.09	0.11			7.93	11.00		0.01		Pass
11a	6Mbps	2	64	5320	0.09	0.11			8.01	11.00		0.01		Pass
HT20	MCS0	2	52	5260	0.14	0.18			7.59	11.00		0.01		Pass
HT20	MCS0	2	60	5300	0.14	0.18			7.36	11.00		0.01		Pass
HT20	MCS0	2	64	5320	0.14	0.18			7.40	11.00		0.01		Pass
HT40	MCS0	2	54	5270	0.30	0.30			4.93	11.00		0.01		Pass
HT40	MCS0	2	62	5310	0.30	0.30			4.47	11.00		0.01		Pass
VHT80	MCS0	2	58	5290	0.92	0.91			0.42	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	16.68	16.58	24.43	23.58	23.20		29.20		23.98		
11a	6Mbps	2	116	5580	16.73	16.63	24.38	23.58	23.21		29.21		23.98		
11a	6Mbps	2	140	5700	16.68	16.58	24.03	23.48	23.20		29.20		23.98		
11a	6Mbps	2	144	5720	16.68	16.58	23.93	23.28	23.20		29.20		23.98		
HT20	MCS0	2	100	5500	17.78	17.83	25.38	24.98	23.50		29.50		23.98		
HT20	MCS0	2	116	5580	17.88	17.78	25.52	24.78	23.50		29.50		23.98		
HT20	MCS0	2	140	5700	17.88	17.78	25.62	25.03	23.50		29.50		23.98		
HT20	MCS0	2	144	5720	17.88	17.78	25.57	24.93	23.50		29.50		23.98		
HT40	MCS0	2	102	5510	36.56	36.46	41.81	41.90	23.98		30.00		23.98		
HT40	MCS0	2	110	5550	36.56	36.46	41.63	41.99	23.98		30.00		23.98		
HT40	MCS0	2	134	5670	36.56	36.46	41.81	41.99	23.98		30.00		23.98		
HT40	MCS0	2	142	5710	36.56	36.46	41.81	42.08	23.98		30.00		23.98		
VHT80	MCS0	2	106	5530	76.72	76.72	83.76	82.64	23.98		30.00		23.98		
VHT80	MCS0	2	122	5610	76.72	76.84	83.44	82.64	23.98		30.00		23.98		
VHT80	MCS0	2	138	5690	76.72	76.72	83.44	83.12	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	0.09	0.11	17.82	16.59	20.26	23.98		-3.00	26.99	Pass	
11a	6Mbps	2	116	5580	0.09	0.11	17.57	17.04	20.32	23.98		-3.00	26.99	Pass	
11a	6Mbps	2	140	5700	0.09	0.11	17.40	17.12	20.27	23.98		-3.00	26.99	Pass	
11a	6Mbps	2	144	5720	0.09	0.11	17.29	17.00	20.16	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	100	5500	0.14	0.18	17.58	16.37	20.03	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	116	5580	0.14	0.18	17.34	16.82	20.10	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	140	5700	0.14	0.18	17.26	16.93	20.11	23.98		-3.00	26.99	Pass	
HT20	MCS0	2	144	5720	0.14	0.18	17.25	16.89	20.08	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	102	5510	0.30	0.30	17.60	16.50	20.09	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	110	5550	0.30	0.30	17.59	16.67	20.16	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	134	5670	0.30	0.30	17.34	17.20	20.28	23.98		-3.00	26.99	Pass	
HT40	MCS0	2	142	5710	0.30	0.30	17.22	16.87	20.05	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	100	5500	0.27	0.34	17.51	16.33	19.97	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	116	5580	0.27	0.34	17.27	16.78	20.04	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	140	5700	0.27	0.34	17.19	16.89	20.05	23.98		-3.00	26.99	Pass	
VHT20	MCS0	2	144	5720	0.27	0.34	17.18	16.85	20.02	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	102	5510	0.48	0.59	17.53	16.46	20.04	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	110	5550	0.48	0.59	17.52	16.63	20.11	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	134	5670	0.48	0.59	17.27	17.16	20.23	23.98		-3.00	26.99	Pass	
VHT40	MCS0	2	142	5710	0.48	0.59	17.15	16.83	20.01	23.98		-3.00	26.99	Pass	
VHT80	MCS0	2	106	5530	0.92	0.91	13.17	12.38	15.81	23.98		-3.00	26.99	Pass	
VHT80	MCS0	2	122	5610	0.92	0.91	16.51	15.83	19.20	23.98		-3.00	26.99	Pass	
VHT80	MCS0	2	138	5690	0.92	0.91	16.37	16.04	19.22	23.98		-3.00	26.99	Pass	

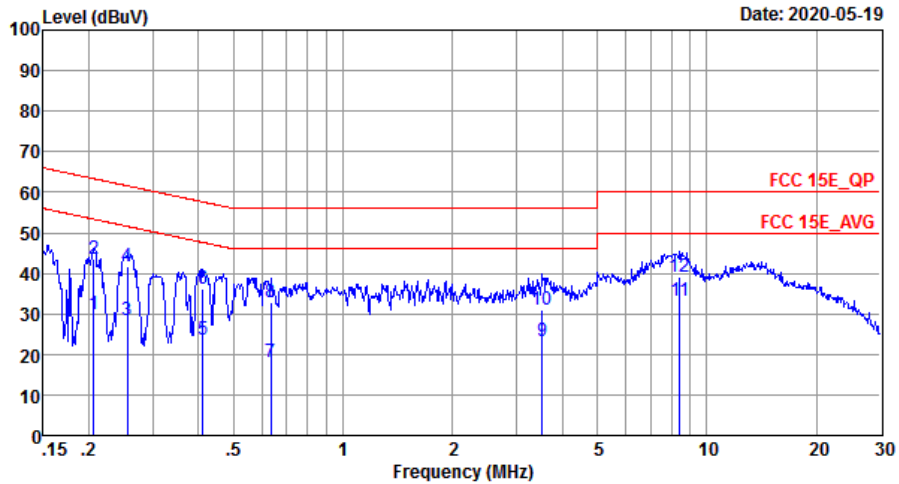
TEST RESULTS DATA
Power Spectral Density

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	0.09	0.11			8.62	11.00		0.01		Pass
11a	6Mbps	2	116	5580	0.09	0.11			8.90	11.00		0.01		Pass
11a	6Mbps	2	140	5700	0.09	0.11			8.79	11.00		0.01		Pass
11a	6Mbps	2	144	5720	0.09	0.11			8.82	11.00		0.01		Pass
HT20	MCS0	2	100	5500	0.14	0.18			8.17	11.00		0.01		Pass
HT20	MCS0	2	116	5580	0.14	0.18			8.42	11.00		0.01		Pass
HT20	MCS0	2	140	5700	0.14	0.18			8.56	11.00		0.01		Pass
HT20	MCS0	2	144	5720	0.14	0.18			8.56	11.00		0.01		Pass
HT40	MCS0	2	102	5510	0.30	0.30			5.15	11.00		0.01		Pass
HT40	MCS0	2	110	5550	0.30	0.30			5.54	11.00		0.01		Pass
HT40	MCS0	2	134	5670	0.30	0.30			5.26	11.00		0.01		Pass
HT40	MCS0	2	142	5710	0.30	0.30			5.22	11.00		0.01		Pass
VHT80	MCS0	2	106	5530	0.92	0.91			0.93	11.00		0.01		Pass
VHT80	MCS0	2	122	5610	0.92	0.91			1.20	11.00		0.01		Pass
VHT80	MCS0	2	138	5690	0.92	0.91			0.91	11.00		0.01		Pass



Appendix B. AC Conducted Emission Test Results

Test Engineer :	Doom Wu	Temperature :	22~25°C
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

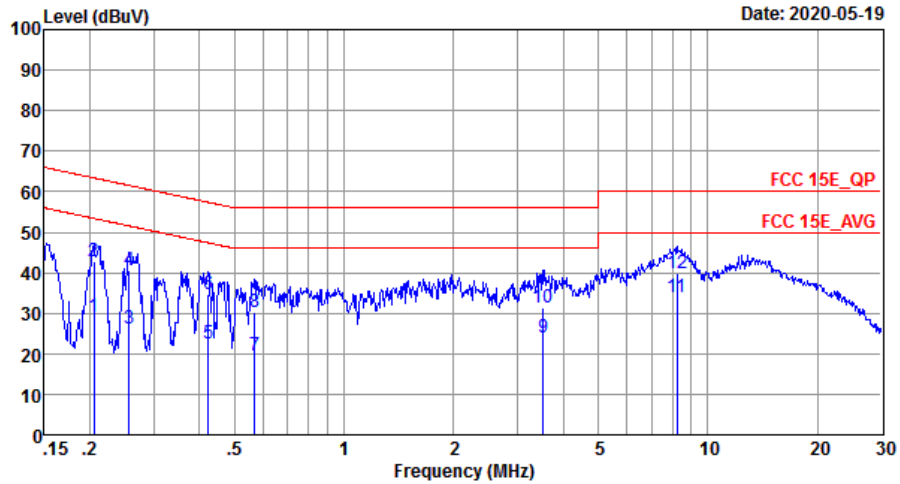


Site : CO01-SZ
 Condition: FCC 15E QP LISN 20190719 L LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.21	29.74	-23.62	53.36	19.70	0.03	10.01	Average
2	0.21	43.64	-19.72	63.36	33.60	0.03	10.01	QP
3	0.25	28.34	-23.26	51.60	18.30	0.03	10.01	Average
4	0.25	41.64	-19.96	61.60	31.60	0.03	10.01	QP
5	0.41	23.55	-24.04	47.59	13.50	0.03	10.02	Average
6	0.41	36.05	-21.54	57.59	26.00	0.03	10.02	QP
7	0.63	18.09	-27.91	46.00	8.00	0.02	10.07	Average
8	0.63	32.69	-23.31	56.00	22.60	0.02	10.07	QP
9	3.53	23.38	-22.62	46.00	13.10	0.17	10.11	Average
10	3.53	30.98	-25.02	56.00	20.70	0.17	10.11	QP
11 *	8.41	33.13	-16.87	50.00	22.60	0.30	10.23	Average
12	8.41	39.03	-20.97	60.00	28.50	0.30	10.23	QP



Test Engineer :	Doom Wu	Temperature :	22~25°C
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : C001-SZ
 Condition: FCC 15E_QP LISN_20190719_N NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.21	29.14	-24.26	53.40	19.10	0.03	10.01	Average
2	0.21	42.84	-20.56	63.40	32.80	0.03	10.01	QP
3	0.26	26.24	-25.32	51.56	16.20	0.03	10.01	Average
4	0.26	40.64	-20.92	61.56	30.60	0.03	10.01	QP
5	0.42	22.34	-25.03	47.37	12.30	0.02	10.02	Average
6	0.42	34.84	-22.53	57.37	24.80	0.02	10.02	QP
7	0.57	19.68	-26.32	46.00	9.60	0.02	10.06	Average
8	0.57	30.08	-25.92	56.00	20.00	0.02	10.06	QP
9	3.53	23.96	-22.04	46.00	13.81	0.04	10.11	Average
10	3.53	31.36	-24.64	56.00	21.21	0.04	10.11	QP
11 *	8.24	33.84	-16.16	50.00	23.50	0.11	10.23	Average
12	8.24	39.74	-20.26	60.00	29.40	0.11	10.23	QP

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



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	Preamp 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		5145.08	54.38	-19.62	74	46.19	32.24	8.51	32.56	105	73	P	H
		5150	46.51	-7.49	54	38.32	32.24	8.51	32.56	105	73	A	H
		5180	111.3	-	-	103.04	32.25	8.58	32.57	105	73	P	H
		5180	104.58	-	-	96.32	32.25	8.58	32.57	105	73	A	H
		5149.99	51.69	-22.31	74	43.5	32.24	8.51	32.56	386	96	P	V
		5150	43.68	-10.32	54	35.49	32.24	8.51	32.56	386	96	A	V
		5180	108.53	-	-	100.27	32.25	8.58	32.57	386	96	P	V
		5180	103.77	-	-	95.51	32.25	8.58	32.57	386	96	A	V
802.11a CH 44 5220MHz		5141.44	50.88	-23.12	74	42.68	32.24	8.51	32.55	100	68	P	H
		5150	41.92	-12.08	54	33.73	32.24	8.51	32.56	100	68	A	H
		5220	110.73	-	-	102.4	32.26	8.65	32.58	100	68	P	H
		5220	106.03	-	-	97.7	32.26	8.65	32.58	100	68	A	H
		5432.16	50.87	-23.13	74	41.53	32.34	9.68	32.68	100	68	P	H
		5361.6	40.86	-13.14	54	31.74	32.31	9.46	32.65	100	68	A	H
		5062.4	49.45	-24.55	74	41.39	32.22	8.36	32.52	384	100	P	V
		5149.76	39.94	-14.06	54	31.75	32.24	8.51	32.56	384	100	A	V
		5220	109.03	-	-	100.7	32.26	8.65	32.58	384	100	P	V
		5220	103.49	-	-	95.16	32.26	8.65	32.58	384	100	A	V
		5411.04	49.25	-24.75	74	39.94	32.32	9.66	32.67	384	100	P	V
	5366.16	40.12	-13.88	54	31	32.31	9.46	32.65	384	100	A	V	



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 48 5240MHz		5040.56	49.99	-24.01	74	41.93	32.21	8.36	32.51	100	73	P	H
		5150	40	-14	54	31.81	32.24	8.51	32.56	100	73	A	H
		5240	110.9	-	-	102.37	32.27	8.85	32.59	100	73	P	H
		5240	106.16	-	-	97.63	32.27	8.85	32.59	100	73	A	H
		5368.56	51.01	-22.99	74	41.89	32.31	9.46	32.65	100	73	P	H
		5362.08	40.8	-13.2	54	31.68	32.31	9.46	32.65	100	73	A	H
		5043.42	48.89	-25.11	74	40.84	32.21	8.36	32.52	380	100	P	V
		5101.92	39.54	-14.46	54	31.42	32.23	8.43	32.54	380	100	A	V
		5240	108.37	-	-	99.84	32.27	8.85	32.59	380	100	P	V
		5240	103.56	-	-	95.03	32.27	8.85	32.59	380	100	A	V
		5455.2	49.55	-24.45	74	40.22	32.34	9.68	32.69	380	100	P	V
		5397.36	40.24	-13.76	54	30.92	32.32	9.66	32.66	380	100	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	48.32	-19.98	68.3	57	38.25	12.06	58.99	121	225	P	H
		15540	50.71	-23.29	74	56.11	38.94	14.59	58.93	159	0	P	H
		10360	48.13	-20.17	68.3	56.81	38.25	12.06	58.99	152	260	P	V
		15540	50.14	-23.86	74	55.54	38.94	14.59	58.93	189	238	P	V
802.11a CH 44 5220MHz		10440	48.29	-20.01	68.3	56.78	38.31	12.12	58.92	150	230	P	H
		15660	49.2	-24.8	74	55.08	38.54	14.64	59.06	160	225	P	H
		10440	47.82	-20.48	68.3	56.31	38.31	12.12	58.92	110	230	P	V
		15660	50.37	-23.63	74	56.25	38.54	14.64	59.06	160	228	P	V
802.11a CH 48 5240MHz		10480	48.62	-19.68	68.3	56.97	38.36	12.15	58.86	150	120	P	H
		15720	49.52	-24.48	74	55.67	38.31	14.66	59.12	200	89	P	H
		10480	48.57	-19.73	68.3	56.92	38.36	12.15	58.86	189	12	P	V
		15720	49.42	-24.58	74	55.57	38.31	14.66	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		5147.68	57.14	-16.86	74	48.95	32.24	8.51	32.56	106	71	P	H	
		5149.76	47.66	-6.34	54	39.47	32.24	8.51	32.56	106	71	A	H	
		5180	111.31	-	-	103.05	32.25	8.58	32.57	106	71	P	H	
		5180	105.26	-	-	97	32.25	8.58	32.57	106	71	A	H	
		5150.02	53.87	-20.13	74	45.68	32.24	8.51	32.56	388	96	P	V	
		5149.76	45.67	-8.33	54	37.48	32.24	8.51	32.56	388	96	A	V	
		5180	107.99	-	-	99.73	32.25	8.58	32.57	388	96	P	V	
		5180	102.06	-	-	93.8	32.25	8.58	32.57	388	96	A	V	
802.11n HT20 CH 44 5220MHz		5147.16	49.9	-24.1	74	41.71	32.24	8.51	32.56	100	71	P	H	
		5149.76	42	-12	54	33.81	32.24	8.51	32.56	100	71	A	H	
		5220	111.46	-	-	103.13	32.26	8.65	32.58	100	71	P	H	
		5220	104.23	-	-	95.9	32.26	8.65	32.58	100	71	A	H	
		5355.36	49.31	-24.69	74	40.19	32.31	9.46	32.65	100	71	P	H	
		5365.44	41.19	-12.81	54	32.07	32.31	9.46	32.65	100	71	A	H	
		5097.76	51.19	-22.81	74	43.07	32.23	8.43	32.54	383	95	P	V	
		5149.76	40.61	-13.39	54	32.42	32.24	8.51	32.56	383	95	A	V	
			5220	109.29	-	-	100.96	32.26	8.65	32.58	383	95	P	V
			5220	102.83	-	-	94.5	32.26	8.65	32.58	383	95	A	V
		5425.68	49.37	-24.63	74	40.06	32.33	9.66	32.68	383	95	P	V	
		5365.92	40.72	-13.28	54	31.6	32.31	9.46	32.65	383	95	A	V	



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 48 5240MHz		5014.56	49.94	-24.06	74	41.95	32.2	8.29	32.5	100	70	P	H
		5147.94	40.87	-13.13	54	32.68	32.24	8.51	32.56	100	70	A	H
		5240	110.54	-	-	102.01	32.27	8.85	32.59	100	70	P	H
		5240	105.13	-	-	96.6	32.27	8.85	32.59	100	70	A	H
		5362.56	50.46	-23.54	74	41.34	32.31	9.46	32.65	100	70	P	H
		5362.32	41.44	-12.56	54	32.32	32.31	9.46	32.65	100	70	A	H
		5081.38	49.06	-24.94	74	40.94	32.22	8.43	32.53	380	94	P	V
		5094.64	40.28	-13.72	54	32.16	32.23	8.43	32.54	380	94	A	V
		5240	107.69	-	-	99.16	32.27	8.85	32.59	380	94	P	V
		5240	102.03	-	-	93.5	32.27	8.85	32.59	380	94	A	V
		5432.64	50.02	-23.98	74	40.68	32.34	9.68	32.68	380	94	P	V
		5433.12	40.77	-13.23	54	31.43	32.34	9.68	32.68	380	94	A	V
Remark	<ol style="list-style-type: none"> No other spurious found. 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		10360	48.03	-20.27	68.3	56.71	38.25	12.06	58.99	121	225	P	H
		15540	49.87	-24.13	74	55.27	38.94	14.59	58.93	185	210	P	H
5180MHz		10360	48.36	-19.94	68.3	57.04	38.25	12.06	58.99	152	260	P	V
		15540	49.49	-24.51	74	54.89	38.94	14.59	58.93	189	238	P	V
802.11n HT20 CH 44		10440	48.82	-19.48	68.3	57.31	38.31	12.12	58.92	110	230	P	H
		15660	49.11	-24.89	74	54.99	38.54	14.64	59.06	160	228	P	H
		10440	47.65	-20.65	68.3	56.14	38.31	12.12	58.92	150	230	P	V
		15660	50.41	-23.59	74	56.29	38.54	14.64	59.06	160	225	P	V
5220MHz		10480	48.42	-19.88	68.3	56.77	38.36	12.15	58.86	150	120	P	H
		15720	49.21	-24.79	74	55.36	38.31	14.66	59.12	200	89	P	H
		10480	48.36	-19.94	68.3	56.71	38.36	12.15	58.86	189	12	P	V
		15720	49.27	-24.73	74	55.42	38.31	14.66	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		5143.78	55.98	-18.02	74	47.79	32.24	8.51	32.56	100	70	P	H
		5142.22	48.02	-5.98	54	39.82	32.24	8.51	32.55	100	70	A	H
		5190	107.25	-	-	98.99	32.25	8.58	32.57	100	70	P	H
		5190	101.81	-	-	93.55	32.25	8.58	32.57	100	70	A	H
		5360.6	50.72	-23.28	74	41.6	32.31	9.46	32.65	100	70	P	H
		5452.44	41.71	-12.29	54	32.38	32.34	9.68	32.69	100	70	A	H
		5147.94	54.96	-19.04	74	46.77	32.24	8.51	32.56	369	98	P	V
		5148.72	47.05	-6.95	54	38.86	32.24	8.51	32.56	369	98	A	V
		5190	103.87	-	-	95.61	32.25	8.58	32.57	369	98	P	V
		5190	97.26	-	-	89	32.25	8.58	32.57	369	98	A	V
		5423.04	49.22	-24.78	74	39.9	32.33	9.66	32.67	369	98	P	V
		5443.2	41.18	-12.82	54	31.84	32.34	9.68	32.68	369	98	A	V
802.11n HT40 CH 46 5230MHz		5149.24	51.47	-22.53	74	43.28	32.24	8.51	32.56	100	71	P	H
		5149.5	43.8	-10.2	54	35.61	32.24	8.51	32.56	100	71	A	H
		5230	107.54	-	-	99.21	32.27	8.65	32.59	100	71	P	H
		5230	102.03	-	-	93.7	32.27	8.65	32.59	100	71	A	H
		5370.96	51.21	-22.79	74	42.09	32.31	9.46	32.65	100	71	P	H
		5358.24	43.26	-10.74	54	34.14	32.31	9.46	32.65	100	71	A	H
		5108.68	50.46	-23.54	74	42.34	32.23	8.43	32.54	384	100	P	V
		5146.38	41.96	-12.04	54	33.77	32.24	8.51	32.56	384	100	A	V
		5230	106.38	-	-	98.05	32.27	8.65	32.59	384	100	P	V
		5230	100.81	-	-	92.48	32.27	8.65	32.59	384	100	A	V
	5351.76	50.96	-23.04	74	41.84	32.31	9.46	32.65	384	100	P	V	
	5365.68	42.16	-11.84	54	33.04	32.31	9.46	32.65	384	100	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)

Table with 14 columns: 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). Rows include data for 802.11n HT40 CH 38 (5190MHz) and 802.11n HT40 CH 46 (5230MHz).

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)

Table with 14 columns: 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). Rows include test data for 802.11ac VHT80 CH 42 5210MHz and a Remark section.



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

Table with 14 columns: 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). Rows include 802.11ac VHT80 CH 42 5210MHz and a Remark section.



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		5019.95	49.79	-24.21	74	41.81	32.2	8.29	32.51	105	70	P	H
		5099.05	39.75	-14.25	54	31.63	32.23	8.43	32.54	105	70	A	H
		5260	110.56	-	-	102.04	32.28	8.85	32.61	105	70	P	H
		5260	105.89	-	-	97.37	32.28	8.85	32.61	105	70	A	H
		5458.56	50.67	-23.33	74	41.34	32.34	9.68	32.69	105	70	P	H
		5358.24	41.72	-12.28	54	32.6	32.31	9.46	32.65	105	70	A	H
		5079.8	48.94	-25.06	74	40.82	32.22	8.43	32.53	376	100	P	V
		5022.4	39.56	-14.44	54	31.57	32.21	8.29	32.51	376	100	A	V
		5260	108.16	-	-	99.64	32.28	8.85	32.61	376	100	P	V
		5260	103.69	-	-	95.17	32.28	8.85	32.61	376	100	A	V
		5452.56	50.63	-23.37	74	41.3	32.34	9.68	32.69	376	100	P	V
		5410.32	40.46	-13.54	54	31.15	32.32	9.66	32.67	376	100	A	V
802.11a CH 60 5300MHz		5018.2	49.25	-24.75	74	41.27	32.2	8.29	32.51	102	73	P	H
		5025.9	39.63	-14.37	54	31.64	32.21	8.29	32.51	102	73	A	H
		5300	111.48	-	-	102.77	32.29	9.05	32.63	102	73	P	H
		5300	105.48	-	-	96.77	32.29	9.05	32.63	102	73	A	H
		5356.56	53.11	-20.89	74	43.99	32.31	9.46	32.65	102	73	P	H
		5357.28	44.15	-9.85	54	35.03	32.31	9.46	32.65	102	73	A	H
		5059.85	49.76	-24.24	74	41.7	32.22	8.36	32.52	372	100	P	V
		5026.6	39.53	-14.47	54	31.54	32.21	8.29	32.51	372	100	A	V
		5300	107.46	-	-	98.75	32.29	9.05	32.63	372	100	P	V
		5300	103.89	-	-	95.18	32.29	9.05	32.63	372	100	A	V
		5354.16	50.88	-23.12	74	41.76	32.31	9.46	32.65	372	100	P	V
		5354.16	42.12	-11.88	54	33	32.31	9.46	32.65	372	100	A	V



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 64 5320MHz		5320	110.72	-	-	101.79	32.3	9.26	32.63	104	71	P	H
		5320	106.34	-	-	97.41	32.3	9.26	32.63	104	71	A	H
		5350.08	54.55	-19.45	74	45.43	32.31	9.46	32.65	104	71	P	H
		5352.32	45.15	-8.85	54	36.03	32.31	9.46	32.65	104	71	A	H
		5320	107.3	-	-	98.37	32.3	9.26	32.63	389	99	P	V
		5320	103.95	-	-	95.02	32.3	9.26	32.63	389	99	A	V
		5352.96	51.76	-22.24	74	42.64	32.31	9.46	32.65	389	99	P	V
		5352.96	43.12	-10.88	54	34	32.31	9.46	32.65	389	99	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	48.02	-20.28	68.3	56.28	38.39	12.17	58.82	120	298	P	H
		15780	49.59	-24.41	74	55.94	38.14	14.69	59.18	192	39	P	H
		10520	48.54	-19.76	68.3	56.8	38.39	12.17	58.82	150	220	P	V
		15780	49.07	-24.93	74	55.42	38.14	14.69	59.18	159	345	P	V
802.11a CH 60 5300MHz		10600	48.27	-25.73	74	56.3	38.47	12.23	58.73	185	215	P	H
		15900	49	-25	74	55.81	37.74	14.75	59.3	196	190	P	H
		10600	48.48	-25.52	74	56.51	38.47	12.23	58.73	182	215	P	V
		15900	48.76	-25.24	74	55.57	37.74	14.75	59.3	196	18	P	V
802.11a CH 64 5320MHz		10640	48.08	-25.92	74	56.01	38.5	12.26	58.69	152	135	P	H
		15960	47.74	-26.26	74	54.82	37.51	14.78	59.37	173	245	P	H
		10640	48.18	-25.82	74	56.11	38.5	12.26	58.69	185	135	P	V
		15960	48.18	-25.82	74	55.26	37.51	14.78	59.37	173	296	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		5001.82	50.27	-23.73	74	42.32	32.16	8.29	32.5	107	70	P	H
		5063.44	40.63	-13.37	54	32.57	32.22	8.36	32.52	107	70	A	H
		5260	112.06	-	-	103.54	32.28	8.85	32.61	107	70	P	H
		5260	105.53	-	-	97.01	32.28	8.85	32.61	107	70	A	H
		5361.84	50.61	-23.39	74	41.49	32.31	9.46	32.65	107	70	P	H
		5359.68	42.22	-11.78	54	33.1	32.31	9.46	32.65	107	70	A	H
		5056.16	49.38	-24.62	74	41.32	32.22	8.36	32.52	377	95	P	V
		5094.38	40.34	-13.66	54	32.22	32.23	8.43	32.54	377	95	A	V
		5260	108.26	-	-	99.74	32.28	8.85	32.61	377	95	P	V
		5260	101.83	-	-	93.31	32.28	8.85	32.61	377	95	A	V
		5436.48	50.26	-23.74	74	40.92	32.34	9.68	32.68	377	95	P	V
		5408.88	41.23	-12.77	54	31.92	32.32	9.66	32.67	377	95	A	V
802.11n HT20 CH 60 5300MHz		5026.25	49.19	-24.81	74	41.2	32.21	8.29	32.51	100	95	P	H
		5095.9	40.48	-13.52	54	32.36	32.23	8.43	32.54	100	95	A	H
		5300	111.24	-	-	102.53	32.29	9.05	32.63	100	95	P	H
		5300	105.72	-	-	97.01	32.29	9.05	32.63	100	95	A	H
		5358.96	52.97	-21.03	74	43.85	32.31	9.46	32.65	100	95	P	H
		5356.56	44.59	-9.41	54	35.47	32.31	9.46	32.65	100	95	A	H
		5019.95	49.69	-24.31	74	41.71	32.2	8.29	32.51	393	106	P	V
		5029.4	40.52	-13.48	54	32.53	32.21	8.29	32.51	393	106	A	V
		5300	108.79	-	-	100.08	32.29	9.05	32.63	393	106	P	V
		5300	102.72	-	-	94.01	32.29	9.05	32.63	393	106	A	V
	5356.56	50.76	-23.24	74	41.64	32.31	9.46	32.65	393	106	P	V	
	5359.92	42.66	-11.34	54	33.54	32.31	9.46	32.65	393	106	A	V	



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 64 5320MHz		5320	111.02	-	-	102.09	32.3	9.26	32.63	104	94	P	H
		5320	105.23	-	-	96.3	32.3	9.26	32.63	104	94	A	H
		5350.56	53.57	-20.43	74	44.45	32.31	9.46	32.65	104	94	P	H
		5355.36	45.51	-8.49	54	36.39	32.31	9.46	32.65	104	94	A	H
		5320	108.64	-	-	99.71	32.3	9.26	32.63	389	105	P	V
		5320	102.73	-	-	93.8	32.3	9.26	32.63	389	105	A	V
		5360.64	52.85	-21.15	74	43.73	32.31	9.46	32.65	389	105	P	V
	5354.56	44.5	-9.5	54	35.38	32.31	9.46	32.65	389	105	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 HT20 CH 52		10520	48.25	-20.05	68.3	56.51	38.39	12.17	58.82	150	220	P	H
		15780	49.63	-24.37	74	55.98	38.14	14.69	59.18	159	345	P	H
5260MHz		10520	48.69	-19.61	68.3	56.95	38.39	12.17	58.82	120	298	P	V
		15780	49.78	-24.22	74	56.13	38.14	14.69	59.18	192	39	P	V
802.11n HT20 CH 60		10600	49.15	-24.85	74	57.18	38.47	12.23	58.73	185	215	P	H
		15900	48.92	-25.08	74	55.73	37.74	14.75	59.3	196	190	P	H
		10600	47.98	-26.02	74	56.01	38.47	12.23	58.73	182	215	P	V
		15900	49.11	-24.89	74	55.92	37.74	14.75	59.3	196	18	P	V
5300MHz		10640	48.4	-25.6	74	56.33	38.5	12.26	58.69	152	135	P	H
		15960	49.09	-24.91	74	56.17	37.51	14.78	59.37	173	245	P	H
		10640	48.29	-25.71	74	56.22	38.5	12.26	58.69	185	135	P	V
		15960	48.04	-25.96	74	55.12	37.51	14.78	59.37	173	296	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		5089.25	49.48	-24.52	74	41.35	32.23	8.43	32.53	106	71	P	H
		5103.95	41.31	-12.69	54	33.19	32.23	8.43	32.54	106	71	A	H
		5270	108.37	-	-	99.85	32.28	8.85	32.61	106	71	P	H
		5270	102.53	-	-	94.01	32.28	8.85	32.61	106	71	A	H
		5356.8	53.27	-20.73	74	44.15	32.31	9.46	32.65	106	71	P	H
		5350.32	45.74	-8.26	54	36.62	32.31	9.46	32.65	106	71	A	H
		5093.45	49.2	-24.8	74	41.08	32.23	8.43	32.54	399	101	P	V
		5104.65	40.98	-13.02	54	32.86	32.23	8.43	32.54	399	101	A	V
		5270	105.31	-	-	96.79	32.28	8.85	32.61	399	101	P	V
		5270	99.08	-	-	90.56	32.28	8.85	32.61	399	101	A	V
		5442.48	50.82	-23.18	74	41.48	32.34	9.68	32.68	399	101	P	V
		5350.08	42.86	-11.14	54	33.74	32.31	9.46	32.65	399	101	A	V
802.11n HT40 CH 62 5310MHz		5147.7	49.25	-24.75	74	41.06	32.24	8.51	32.56	100	71	P	H
		5101.5	41.13	-12.87	54	33.01	32.23	8.43	32.54	100	71	A	H
		5310	105.37	-	-	96.44	32.3	9.26	32.63	100	71	P	H
		5310	99.81	-	-	90.88	32.3	9.26	32.63	100	71	A	H
		5352	56.97	-17.03	74	47.85	32.31	9.46	32.65	100	71	P	H
		5350.56	49.19	-4.81	54	40.07	32.31	9.46	32.65	100	71	A	H
		5088.2	49.49	-24.51	74	41.37	32.22	8.43	32.53	371	102	P	V
		5025.9	40.83	-13.17	54	32.84	32.21	8.29	32.51	371	102	A	V
		5310	101.7	-	-	92.77	32.3	9.26	32.63	371	102	P	V
		5310	95.93	-	-	87	32.3	9.26	32.63	371	102	A	V
	5350.32	53	-21	74	43.88	32.31	9.46	32.65	371	102	P	V	
	5350.32	46.85	-7.15	54	37.73	32.31	9.46	32.65	371	102	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 HT40		10540	48.94	-19.36	68.3	57.14	38.4	12.2	58.8	189	86	P	H
		15810	49.55	-24.45	74	56.02	38.03	14.71	59.21	186	39	P	H
CH 54 5270MHz		10540	48.22	-20.08	68.3	56.42	38.4	12.2	58.8	150	220	P	V
		15810	49.68	-24.32	74	56.15	38.03	14.71	59.21	168	345	P	V
802.11n HT40 CH 62 5310MHz		10620	49.3	-24.7	74	57.27	38.48	12.26	58.71	180	220	P	H
		15930	50.11	-23.89	74	57.05	37.63	14.76	59.33	160	169	P	H
		10620	48.97	-25.03	74	56.94	38.48	12.26	58.71	150	220	P	V
		15930	49.43	-24.57	74	56.37	37.63	14.76	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)

Table with 14 columns: 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). Rows include data for 802.11ac VHT80 CH 58 5290MHz and a Remark section.



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	48.38	-19.92	68.3	56.45	38.45	12.23	58.75	160	360	P	H
VHT80		15870	49.23	-24.77	74	55.98	37.8	14.73	59.28	182	116	P	H
CH 58		10580	48.67	-19.63	68.3	56.74	38.45	12.23	58.75	158	43	P	V
5290MHz		15870	49.29	-24.71	74	56.04	37.8	14.73	59.28	125	322	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		5451.92	53.48	-20.52	74	44.15	32.34	9.68	32.69	102	74	P	H
		5467.92	55.34	-12.96	68.3	45.98	32.35	9.7	32.69	102	74	P	H
		5458.16	44.13	-9.87	54	34.8	32.34	9.68	32.69	102	74	A	H
		5500	112.38	-	-	103.02	32.36	9.7	32.7	102	74	P	H
		5500	106.62	-	-	97.26	32.36	9.7	32.7	102	74	A	H
		5458.48	52.09	-21.91	74	42.76	32.34	9.68	32.69	310	104	P	V
		5469.36	53.22	-15.08	68.3	43.86	32.35	9.7	32.69	310	104	P	V
		5460	42.96	-11.04	54	33.63	32.34	9.68	32.69	310	104	A	V
		5500	109.29	-	-	99.93	32.36	9.7	32.7	310	104	P	V
		5500	102.78	-	-	93.42	32.36	9.7	32.7	310	104	A	V
802.11a CH 116 5580MHz		5429.92	49.02	-24.98	74	39.68	32.34	9.68	32.68	102	91	P	H
		5468.32	52.43	-15.87	68.3	43.07	32.35	9.7	32.69	102	91	P	H
		5452.72	40.69	-13.31	54	31.36	32.34	9.68	32.69	102	91	A	H
		5580	113.33	-	-	103.89	32.38	9.74	32.68	102	91	P	H
		5580	106.54	-	-	97.1	32.38	9.74	32.68	102	91	A	H
		5731.61	49.46	-18.84	68.3	39.62	32.48	10.01	32.65	102	91	P	H
		5431.12	49.2	-24.8	74	39.86	32.34	9.68	32.68	350	102	P	V
		5468.8	48.27	-20.03	68.3	38.91	32.35	9.7	32.69	350	102	P	V
		5440.96	40.07	-13.93	54	30.73	32.34	9.68	32.68	350	102	A	V
		5580	109.56	-	-	100.12	32.38	9.74	32.68	350	102	P	V
	5580	103.78	-	-	94.34	32.38	9.74	32.68	350	102	A	V	
	5729.72	49.93	-18.37	68.3	40.09	32.48	10.01	32.65	350	102	P	V	



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 140 5700MHz		5700	111.06	-	-	101.26	32.45	10.01	32.66	106	90	P	H
		5700	106.1	-	-	96.3	32.45	10.01	32.66	106	90	A	H
		5725.48	59.91	-8.39	68.3	50.07	32.48	10.01	32.65	106	90	P	H
		5700	109.59	-	-	99.79	32.45	10.01	32.66	376	97	P	V
		5700	104.11	-	-	94.31	32.45	10.01	32.66	376	97	A	V
		5729.96	56.93	-11.37	68.3	47.09	32.48	10.01	32.65	376	97	P	V
Remark	<ol style="list-style-type: none"> No other spurious found. 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	48.84	-25.16	74	55.8	38.83	12.51	58.3	185	230	P	H
		16500	50.15	-18.15	68.3	54.36	39.48	15.15	58.84	178	291	P	H
		11000	47.77	-26.23	74	54.73	38.83	12.51	58.3	163	230	P	V
		16500	49.79	-18.51	68.3	54	39.48	15.15	58.84	178	296	P	V
802.11a CH 116 5580MHz		11160	49.69	-24.31	74	56.16	38.99	12.65	58.11	170	200	P	H
		16740	50.01	-18.29	68.3	52.77	40.46	15.36	58.58	156	350	P	H
		11160	49.3	-24.7	74	55.77	38.99	12.65	58.11	141	200	P	V
		16740	49.6	-18.7	68.3	52.36	40.46	15.36	58.58	156	354	P	V
802.11a CH 140 5700MHz		11400	49.56	-24.44	74	55.38	39.21	12.82	57.85	152	285	P	H
		17100	49.78	-18.52	68.3	50.16	42.16	15.62	58.16	165	298	P	H
		11400	49.24	-24.76	74	55.06	39.21	12.82	57.85	157	285	P	V
		17100	49.46	-18.84	68.3	49.84	42.16	15.62	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		5456.88	54.83	-19.17	74	45.5	32.34	9.68	32.69	107	72	P	H
		5468.56	55.99	-12.31	68.3	46.63	32.35	9.7	32.69	107	72	P	H
		5459.76	45.57	-8.43	54	36.24	32.34	9.68	32.69	107	72	A	H
		5500	111.56	-	-	102.2	32.36	9.7	32.7	107	72	P	H
		5500	106.02	-	-	96.66	32.36	9.7	32.7	107	72	A	H
		5454.64	51.05	-22.95	74	41.72	32.34	9.68	32.69	384	99	P	V
		5469.84	53.48	-14.82	68.3	44.12	32.35	9.7	32.69	384	99	P	V
		5459.76	43.64	-10.36	54	34.31	32.34	9.68	32.69	384	99	A	V
		5500	109.97	-	-	100.61	32.36	9.7	32.7	384	99	P	V
	5500	103.76	-	-	94.4	32.36	9.7	32.7	384	99	A	V	
802.11n HT20 CH 116 5580MHz		5421.76	49.9	-24.1	74	40.58	32.33	9.66	32.67	100	73	P	H
		5466.4	50.16	-18.14	68.3	40.8	32.35	9.7	32.69	100	73	P	H
		5457.28	41.24	-12.76	54	31.91	32.34	9.68	32.69	100	73	A	H
		5580	112.9	-	-	103.46	32.38	9.74	32.68	100	73	P	H
		5580	106.66	-	-	97.22	32.38	9.74	32.68	100	73	A	H
		5738.855	49.48	-18.82	68.3	39.55	32.49	10.09	32.65	100	73	P	H
		5445.04	49.59	-24.41	74	40.25	32.34	9.68	32.68	396	98	P	V
		5467.84	47.92	-20.38	68.3	38.56	32.35	9.7	32.69	396	98	P	V
		5435.68	40.98	-13.02	54	31.64	32.34	9.68	32.68	396	98	A	V
		5580	109.65	-	-	100.21	32.38	9.74	32.68	396	98	P	V
	5580	103.91	-	-	94.47	32.38	9.74	32.68	396	98	A	V	
	5731.61	49.1	-19.2	68.3	39.26	32.48	10.01	32.65	396	98	P	V	



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		5700	112.23	-	-	102.43	32.45	10.01	32.66	102	61	P	H
		5700	106.49	-	-	96.69	32.45	10.01	32.66	102	61	A	H
HT20		5725.48	60.99	-7.31	68.3	51.15	32.48	10.01	32.65	102	61	P	H
CH 140 5700MHz		5700	110.34	-	-	100.54	32.45	10.01	32.66	398	97	P	V
		5700	103.79	-	-	93.99	32.45	10.01	32.66	398	97	A	V
		5725	55.24	-13.06	68.3	45.4	32.48	10.01	32.65	398	97	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 HT20		11000	48.11	-25.89	74	55.07	38.83	12.51	58.3	185	230	P	H
		16500	50.85	-17.45	68.3	55.06	39.48	15.15	58.84	178	291	P	H
CH 100 5500MHz		11000	49.44	-24.56	74	56.4	38.83	12.51	58.3	163	230	P	V
		16500	50.48	-17.82	68.3	54.69	39.48	15.15	58.84	178	296	P	V
802.11n HT20 CH 116 5580MHz		11160	48.94	-25.06	74	55.41	38.99	12.65	58.11	141	200	P	H
		16740	50.18	-18.12	68.3	52.94	40.46	15.36	58.58	156	354	P	H
		11160	48.71	-25.29	74	55.18	38.99	12.65	58.11	170	200	P	V
		16740	50.43	-17.87	68.3	53.19	40.46	15.36	58.58	156	350	P	V
802.11n HT20 CH 140 5700MHz		11400	50.43	-23.57	74	56.25	39.21	12.82	57.85	157	285	P	H
		17100	50.59	-17.71	68.3	50.97	42.16	15.62	58.16	165	246	P	H
		11400	49.26	-24.74	74	55.08	39.21	12.82	57.85	152	285	P	V
		17100	50.21	-18.09	68.3	50.59	42.16	15.62	58.16	165	298	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		5457.52	58.22	-15.78	74	48.89	32.34	9.68	32.69	106	73	P	H
		5469.52	62.4	-5.9	68.3	53.04	32.35	9.7	32.69	106	73	P	H
		5459.92	50.33	-3.67	54	41	32.34	9.68	32.69	106	73	A	H
		5510	109.96	-	-	100.57	32.36	9.72	32.69	106	73	P	H
		5510	103.38	-	-	93.99	32.36	9.72	32.69	106	73	A	H
		5729.405	50.21	-18.09	68.3	40.37	32.48	10.01	32.65	106	73	P	H
		5459.68	55.51	-18.49	74	46.18	32.34	9.68	32.69	385	99	P	V
		5469.04	61.48	-6.82	68.3	52.12	32.35	9.7	32.69	385	99	P	V
		5459.92	48.93	-5.07	54	39.6	32.34	9.68	32.69	385	99	A	V
		5510	107.15	-	-	97.76	32.36	9.72	32.69	385	99	P	V
		5510	101.08	-	-	91.69	32.36	9.72	32.69	385	99	A	V
	5733.815	49.83	-18.47	68.3	39.99	32.48	10.01	32.65	385	99	P	V	
802.11n HT40 CH 110 5550MHz		5435.92	50.86	-23.14	74	41.52	32.34	9.68	32.68	100	72	P	H
		5463.76	52.56	-15.74	68.3	43.22	32.35	9.68	32.69	100	72	P	H
		5459.92	43.56	-10.44	54	34.23	32.34	9.68	32.69	100	72	A	H
		5550	109.61	-	-	100.19	32.37	9.74	32.69	100	72	P	H
		5550	103.42	-	-	94	32.37	9.74	32.69	100	72	A	H
		5729.72	50.36	-17.94	68.3	40.52	32.48	10.01	32.65	100	72	P	H
		5416	49.84	-24.16	74	40.52	32.33	9.66	32.67	358	97	P	V
		5467.36	50.92	-17.38	68.3	41.56	32.35	9.7	32.69	358	97	P	V
		5451.52	42.37	-11.63	54	33.04	32.34	9.68	32.69	358	97	A	V
		5550	107.63	-	-	98.21	32.37	9.74	32.69	358	97	P	V
		5550	102.3	-	-	92.88	32.37	9.74	32.69	358	97	A	V
	5725.31	49.45	-18.85	68.3	39.61	32.48	10.01	32.65	358	97	P	V	



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 134 5670MHz		5422.8	49.33	-24.67	74	40.01	32.33	9.66	32.67	100	72	P	H
		5466.55	49.95	-18.35	68.3	40.59	32.35	9.7	32.69	100	72	P	H
		5441.7	41.44	-12.56	54	32.1	32.34	9.68	32.68	100	72	A	H
		5670	110.07	-	-	100.39	32.43	9.92	32.67	100	72	P	H
		5670	103.69	-	-	94.01	32.43	9.92	32.67	100	72	A	H
		5725.1	56.7	-11.6	68.3	46.86	32.48	10.01	32.65	100	72	P	H
		5458.15	50.1	-23.9	74	40.77	32.34	9.68	32.69	362	97	P	V
		5464.8	49.75	-18.55	68.3	40.41	32.35	9.68	32.69	362	97	P	V
		5430.5	41.07	-12.93	54	31.73	32.34	9.68	32.68	362	97	A	V
		5670	108.88	-	-	99.2	32.43	9.92	32.67	362	97	P	V
		5670	102.13	-	-	92.45	32.43	9.92	32.67	362	97	A	V
		5725.975	55.15	-13.15	68.3	45.31	32.48	10.01	32.65	362	97	P	V
Remark	<ol style="list-style-type: none"> No other spurious found. 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	49.46	-24.54	74	56.36	38.84	12.54	58.28	170	86	P	H
HT40		16530	49.92	-18.38	68.3	53.92	39.62	15.18	58.8	160	59	P	H
CH 102		11020	48.27	-25.73	74	55.17	38.84	12.54	58.28	170	230	P	V
5510MHz		16530	50.51	-17.79	68.3	54.51	39.62	15.18	58.8	160	300	P	V
802.11n		11100	48.26	-25.74	74	54.93	38.92	12.6	58.19	196	200	P	H
HT40		16650	50.98	-17.32	68.3	54.27	40.11	15.27	58.67	180	314	P	H
CH 110		11100	48.54	-25.46	74	55.21	38.92	12.6	58.19	185	200	P	V
5550MHz		16650	50.44	-17.86	68.3	53.73	40.11	15.27	58.67	180	325	P	V
802.11n		11340	48.54	-25.46	74	54.57	39.14	12.76	57.93	200	360	P	H
HT40		17010	50.63	-17.67	68.3	51.74	41.61	15.56	58.28	147	360	P	H
CH 134		11340	48.29	-25.71	74	54.32	39.14	12.76	57.93	100	360	P	V
5670MHz		17010	50.2	-18.1	68.3	51.31	41.61	15.56	58.28	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		5436.16	55.62	-18.38	74	46.28	32.34	9.68	32.68	100	86	P	H
		5466.16	57.01	-11.29	68.3	47.65	32.35	9.7	32.69	100	86	P	H
		5459.68	49.15	-4.85	54	39.82	32.34	9.68	32.69	100	86	A	H
		5530	101.59	-	-	92.2	32.36	9.72	32.69	100	86	P	H
		5530	95.08	-	-	85.69	32.36	9.72	32.69	100	86	A	H
		5747.36	49.87	-18.43	68.3	39.94	32.49	10.09	32.65	100	86	P	H
		5447.2	52.59	-21.41	74	43.25	32.34	9.68	32.68	362	95	P	V
		5466.88	52.93	-15.37	68.3	43.57	32.35	9.7	32.69	362	95	P	V
		5447.2	45.61	-8.39	54	36.27	32.34	9.68	32.68	362	95	A	V
		5530	98.96	-	-	89.57	32.36	9.72	32.69	362	95	P	V
		5530	93.33	-	-	83.94	32.36	9.72	32.69	362	95	A	V
		5739.8	49.31	-18.99	68.3	39.38	32.49	10.09	32.65	362	95	P	V
802.11ac VHT80 CH 122 5610MHz		5446	50.69	-23.31	74	41.35	32.34	9.68	32.68	102	83	P	H
		5468.32	50.56	-17.74	68.3	41.2	32.35	9.7	32.69	102	83	P	H
		5452.72	43.06	-10.94	54	33.73	32.34	9.68	32.69	102	83	A	H
		5610	104.35	-	-	94.87	32.39	9.76	32.67	102	83	P	H
		5610	98.81	-	-	89.33	32.39	9.76	32.67	102	83	A	H
		5741.375	50.7	-17.6	68.3	40.77	32.49	10.09	32.65	102	83	P	H
		5446	49.03	-24.97	74	39.69	32.34	9.68	32.68	390	104	P	V
		5466.4	49.97	-18.33	68.3	40.61	32.35	9.7	32.69	390	104	P	V
		5413.36	42.2	-11.8	54	32.88	32.33	9.66	32.67	390	104	A	V
		5610	101.67	-	-	92.19	32.39	9.76	32.67	390	104	P	V
	5610	95.96	-	-	86.48	32.39	9.76	32.67	390	104	A	V	
	5738.225	49.67	-18.63	68.3	39.82	32.49	10.01	32.65	390	104	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)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac		11060	49.29	-24.71	74	56.06	38.89	12.57	58.23	104	64	P	H
VHT80		16590	50.94	-17.36	68.3	54.62	39.83	15.24	58.75	123	222	P	H
CH 106		11060	49.94	-24.06	74	56.71	38.89	12.57	58.23	154	214	P	V
5530MHz		16590	50.22	-18.08	68.3	53.9	39.83	15.24	58.75	100	46	P	V
802.11ac		11220	48.67	-25.33	74	55.02	39.03	12.68	58.06	160	255	P	H
VHT80		16830	50.05	-18.25	68.3	52.31	40.81	15.42	58.49	123	154	P	H
CH 122		11220	48.89	-25.11	74	55.24	39.03	12.68	58.06	281	143	P	V
5610MHz		16830	50.07	-18.23	68.3	52.33	40.81	15.42	58.49	160	10	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 (Band Edge @ 3m)

Table with 14 columns: WIFI, Note, Frequency, Level, Over, Limit, Read, Antenna, Cable, Preamp, Ant, Table, Peak, Pol. It contains test data for 802.11a CH 144 and a Remark section.



Band 3 - Straddle Channel
WIFI 802.11n HT20 (Band Edge @ 3m)

Table with 14 columns: 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). Rows include 802.11n HT20 CH 144 5720MHz and a Remark section.



Band 3 - Straddle Channel
WIFI 802.11n HT40 (Band Edge @ 3m)

Table with 14 columns: 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). Rows include 802.11n HT40 CH 142 5710MHz and a Remark section.



Band 3 - Straddle Channel
WIFI 802.11ac VHT80 (Band Edge @ 3m)

Table with 14 columns: 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). Rows include 802.11ac VHT80 and CH 138 5690MHz.

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



Emission below 1GHz
WIFI 802.11n HT40 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 LF		34.85	22.5	-17.5	40	30.73	21.8	0.57	30.6	-	-	P	H
		62.01	20.17	-19.83	40	39.64	12.34	0.79	32.6	-	-	P	H
		100.81	22.94	-20.56	43.5	37.66	16.86	1.02	32.6	-	-	P	H
		208.48	20.64	-22.86	43.5	35.87	15.47	1.47	32.17	-	-	P	H
		288.99	28.65	-17.35	46	39.89	18.99	1.77	32	-	-	P	H
		404.42	30.36	-15.64	46	38.46	21.69	2.11	31.9	100	64	P	H
		40.67	27.47	-12.53	40	40.51	18.94	0.62	32.6	-	-	P	V
		57.16	31.65	-8.35	40	50.59	12.9	0.76	32.6	100	135	P	V
		99.84	24.76	-18.74	43.5	39.54	16.8	1.02	32.6	-	-	P	V
		167.74	21.47	-22.03	43.5	36.78	15.7	1.32	32.33	-	-	P	V
		403.45	24.36	-21.64	46	32.48	21.67	2.11	31.9	-	-	P	V
	510.15	25.75	-20.25	46	31.98	23.53	2.36	32.12	-	-	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	Peak or Average
H/V	Horizontal or Vertical



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

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

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

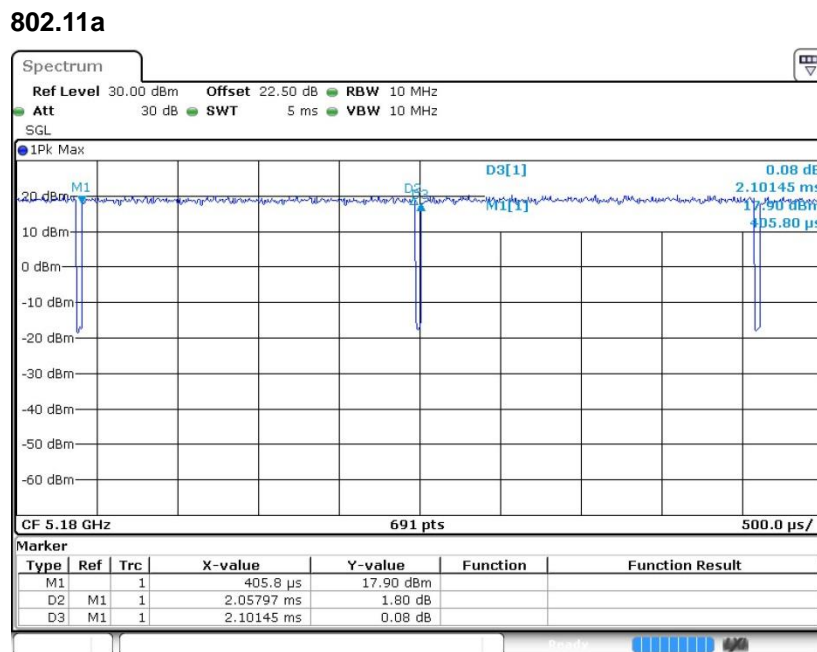
Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix D. Duty Cycle Plots

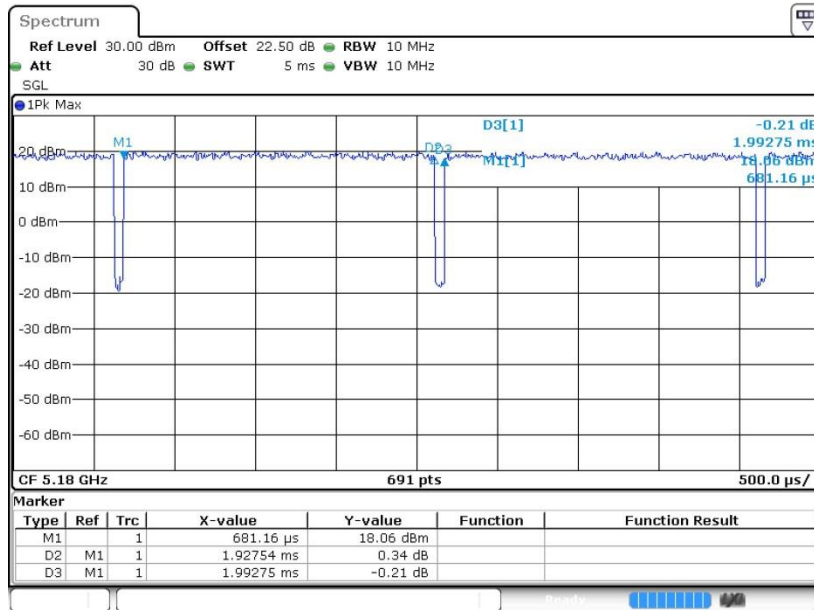
Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1+2	802.11a	97.93	2.058	0.486	1kHz
1+2	802.11n HT20	96.73	1.928	0.519	1kHz
1+2	802.11n HT40	93.41	0.945	1.058	3kHz
1+2	802.11ac VHT80	80.82	0.257	3.898	10kHz

<MIMO Ant.1+2>

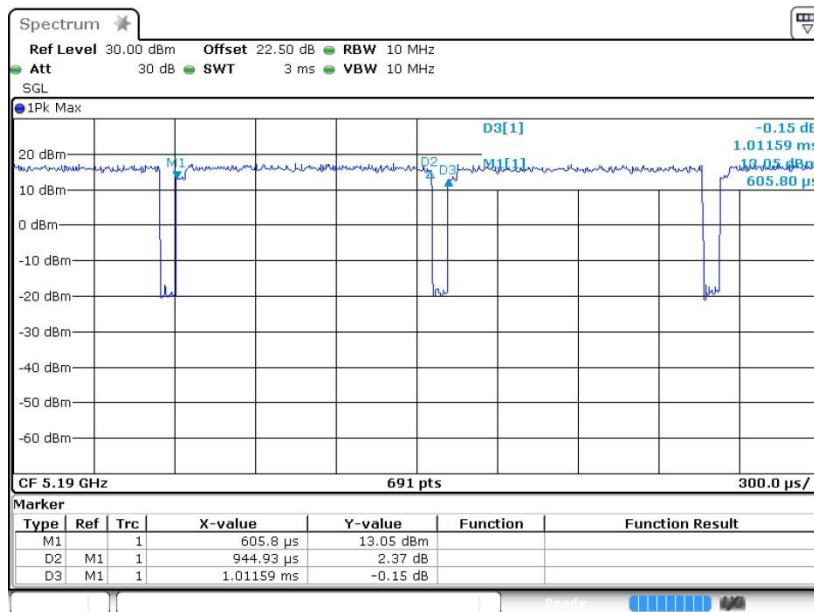




802.11n HT20



802.11n HT40





802.11ac VHT80

