



FCC RF Test Report

APPLICANT : Motorola Mobility LLC
EQUIPMENT : Mobile Cellular Phone
BRAND NAME : Motorola
MODEL NAME : XT2093-3, XT2093DL, XT2093-4, XT2093-2, XT2093-2PP
FCC ID : IHDT56ZD4
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Aug. 07, 2020 and testing was completed on Sep. 09, 2020. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

This report contains data that were produced under subcontract by Sporton International (ShenZhen) Inc.

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

Reviewed by: Jason Jia / Supervisor

Approved by: James Huang / Manager



Sporton International (Kunshan) Inc.

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China**



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR080709D	Rev. 01	Initial issue of report	Sep. 16, 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 3.09 dB at 5457.840 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 7.21 dB at 0.651 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

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

1.2 Manufacturer

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

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2093-3, XT2093DL, XT2093-4, XT2093-2, XT2093-2PP
FCC ID	IHDT56ZD4
EUT supports Radios application	CDMA/GSM/WCDMA/LTE WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE FM Receiver and GNSS
IMEI Code	Conducted: 355567110011144 Conduction: 355567110009700 Radiation: 355567110009494
HW Version	DVT2
SW Version	QZA30.32
EUT Stage	Identical Prototype

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



1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5720 MHz
Maximum Output Power to Antenna	<p><5180 MHz ~ 5240 MHz> 802.11a : 14.91 dBm / 0.0310 W 802.11n HT20 : 14.97 dBm / 0.0314 W 802.11n HT40 : 15.01 dBm / 0.0317 W 802.11ac VHT20 : 14.87 dBm / 0.0307 W 802.11ac VHT40 : 14.97 dBm / 0.0314 W 802.11ac VHT80 : 11.20 dBm / 0.0132 W</p> <p><5260 MHz ~ 5320 MHz> 802.11a : 16.42 dBm / 0.0439 W 802.11n HT20 : 16.28 dBm / 0.0425 W 802.11n HT40 : 16.47 dBm / 0.0444 W 802.11ac VHT20 : 16.06 dBm / 0.0404 W 802.11ac VHT40 : 16.43 dBm / 0.0440 W 802.11ac VHT80 : 12.33 dBm / 0.0171 W</p> <p><5500 MHz ~ 5720 MHz > 802.11a : 17.65 dBm / 0.0582 W 802.11n HT20 : 17.74 dBm / 0.0594 W 802.11n HT40 : 17.82 dBm / 0.0605 W 802.11ac VHT20 : 17.64 dBm / 0.0581 W 802.11ac VHT40 : 17.79 dBm / 0.0601 W 802.11ac VHT80 : 16.73 dBm / 0.0471 W</p>
99% Occupied Bandwidth	<p><5180 MHz ~ 5240 MHz> 802.11a : 18.78 MHz 802.11n HT20 : 19.73 MHz 802.11n HT40 : 37.66 MHz 802.11ac VHT80 : 72.77 MHz</p> <p><5260 MHz ~ 5320 MHz> 802.11a : 18.18 MHz 802.11n HT20 : 19.23 MHz 802.11n HT40 : 37.16 MHz 802.11ac VHT80 : 72.41 MHz</p> <p><5500 MHz ~ 5720 MHz > 802.11a : 18.98 MHz 802.11n HT20 : 19.83 MHz 802.11n HT40 : 37.46 MHz 802.11ac VHT80 : 72.77 MHz</p>
Antenna Type / Gain	<p><5150 MHz ~ 5250 MHz> PIFA Antenna with gain -5.22 dBi</p> <p><5250 MHz ~ 5350 MHz> PIFA Antenna with gain -5.05 dBi</p> <p><5470 MHz ~ 5725 MHz> PIFA Antenna with gain -5.10 dBi</p>
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

Note: For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing have



assessed only 802.11n HT20/ 11n HT40 by referring to the higher output power.

1.5 Modification of EUT

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

1.6 Specification of Accessory

Specification of Accessory				
AC Adapter 1	Brand Name	Motorola (Salcomp)	Model Name	MC-101
AC Adapter 2	Brand Name	Motorola (Chenyang)	Model Name	MC-101
Battery	Brand Name	Motorola (ATL)	Model Name	JK50
USB Cable 1	Brand Name	Motorola (saibao)	Model Name	SC18C24367
USB Cable 2	Brand Name	Motorola (BSC)	Model Name	SC18C24368



1.7 Testing Location

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International (Kunshan) Inc.		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CO01-KS 03CH05-KS	CN1257	314309

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.
	TH01-SZ	CN1256	421272

1.8 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH05-KS	AUDIX	E3	6.2009-8-24a1
2.	CO01-KS	AUDIX	E3	6.2009-8-24



1.9 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.
- ♦ ANSI C63.10-2013

Remark:

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

2 Test Configuration of Equipment Under Test

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42 [#]	5210		
5250-5350 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	54*	5270	62*	5310
	56	5280	64	5320
	58 [#]	5290		
5470-5725 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.

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

Co-location
WIFI 802.11ac VHT80 + WWAN LTE B13

Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + Bluetooth Link + WLAN Link (5G) + USB Cable 1(Charging from Adapter 2) + Earphone
Remark: For Radiated Test Cases, The tests were performance with Adapter 1, Earphone, USB Cable 1.	



Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5725MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

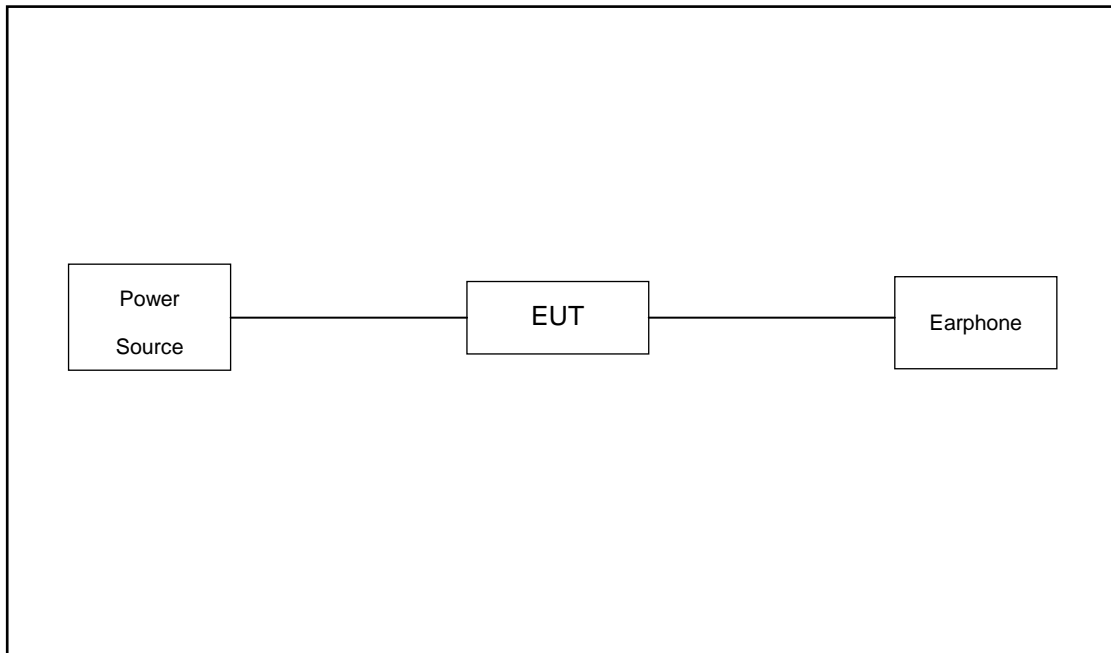
Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5725MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5725MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134
Straddle		-	-	142

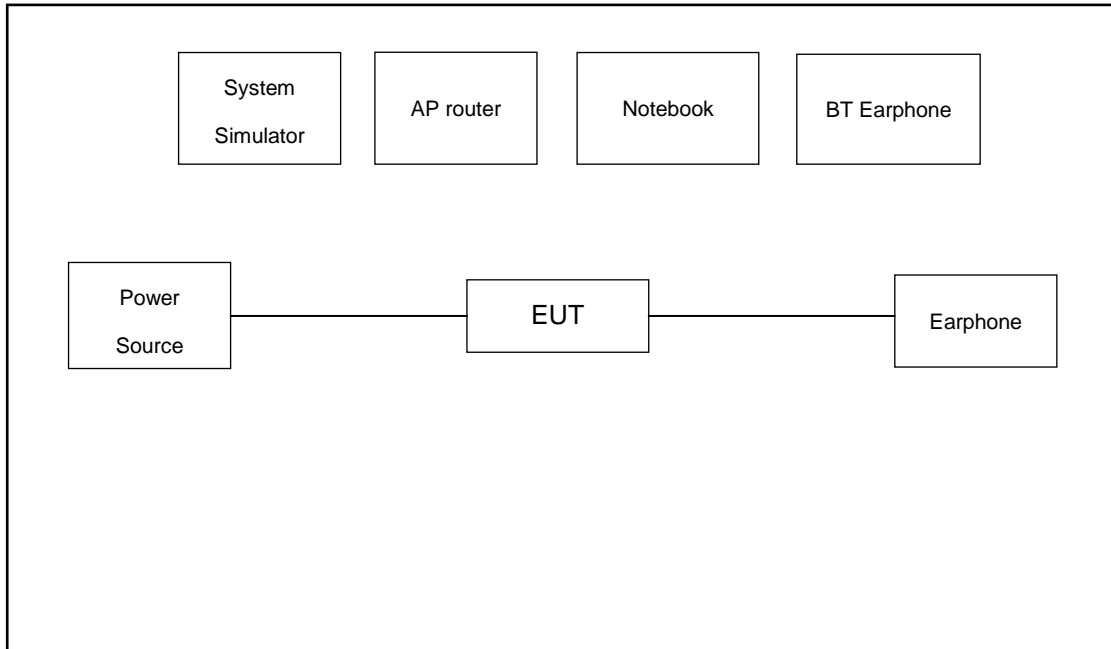
Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5725MHz
		802.11ac VHT80	802.11ac VHT80	802.11ac VHT80
L	Low	-	-	106
M	Middle	42	58	-
H	High	-	-	122
Straddle		-	-	138

2.3 Connection Diagram of Test System

For Radiated Emission:



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.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded, 1.8m
3.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
5.	SD Card	Kingston	8GB	N/A	N/A	N/A
6.	Earphone	N/A	N/A	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 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.

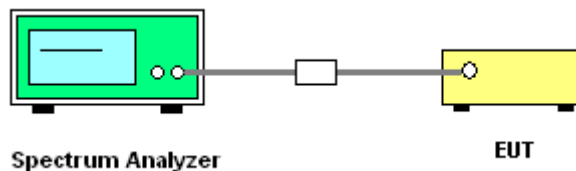
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

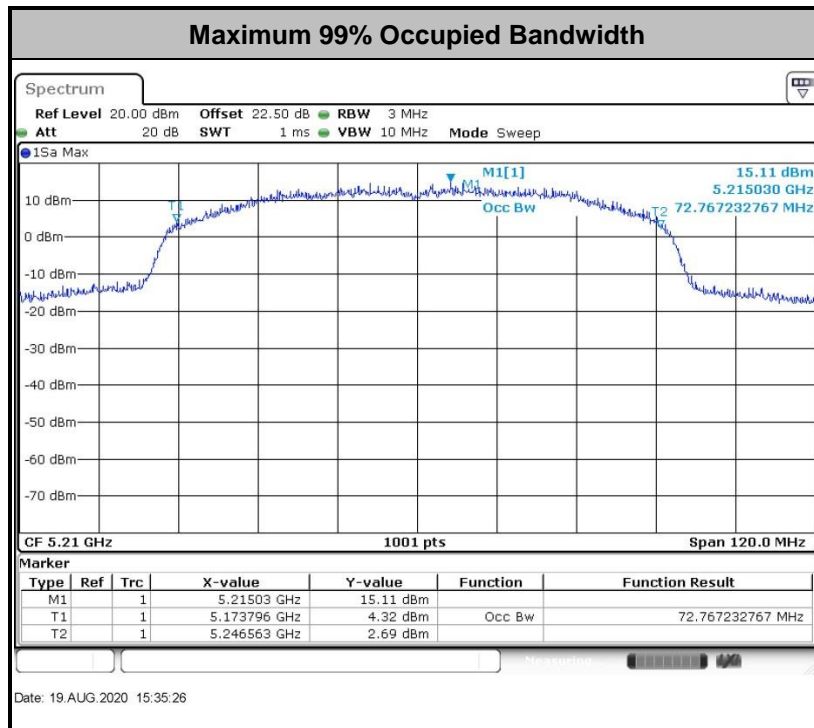
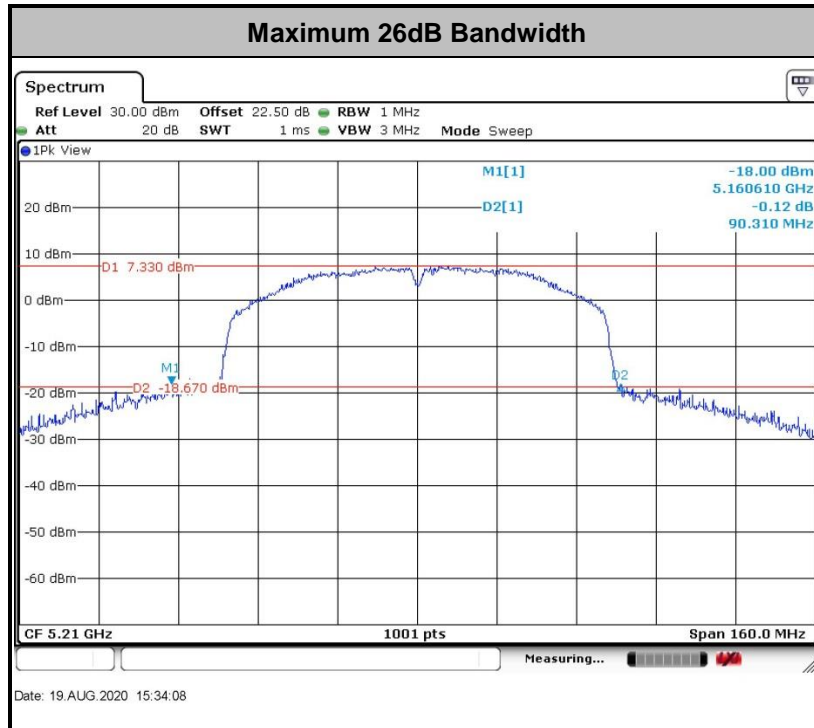
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB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

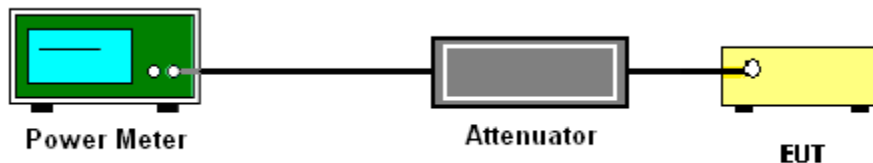
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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

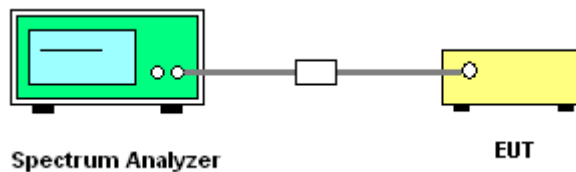
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section F) Maximum power spectral density.

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.

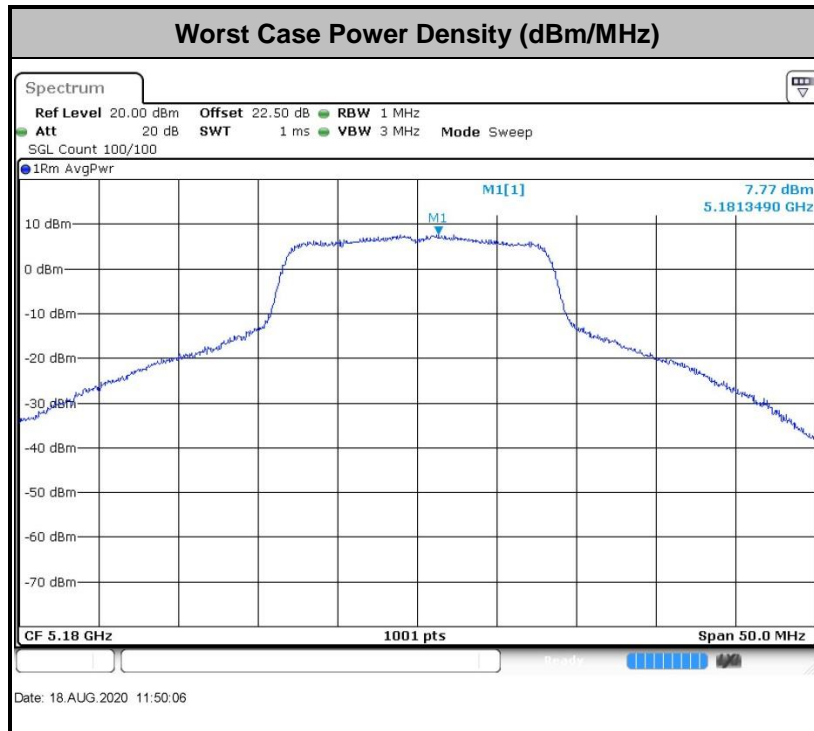
3.3.4 Test Setup





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	68.3

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

$$EIRP = E_{Meas} + 20\log (d_{Meas}) - 104.8$$

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.

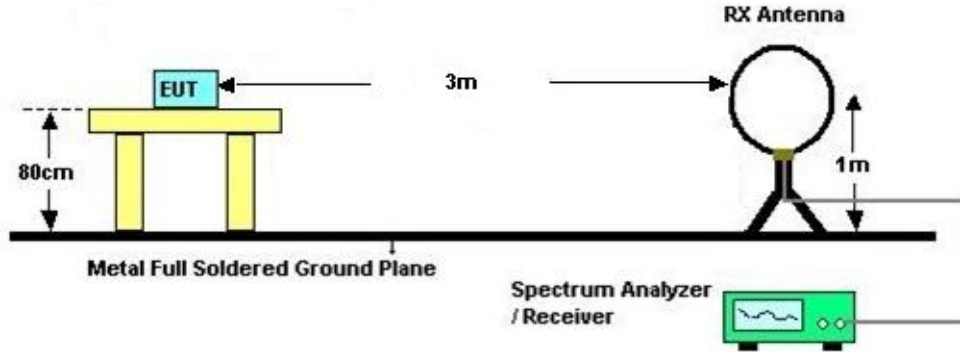


3.4.3 Test Procedures

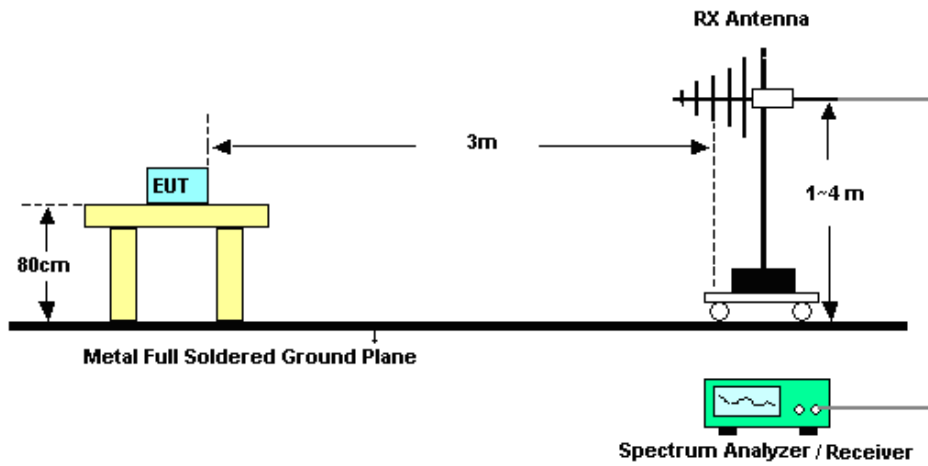
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak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

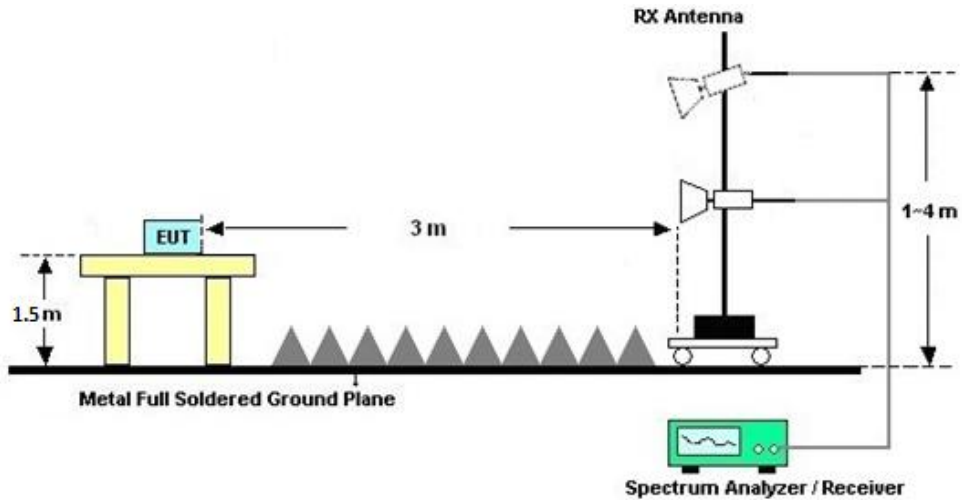
For radiated emissions below 30MHz



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.



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. 17, 2020	Aug. 18, 2020~ Aug. 19, 2020	Apr. 16, 2021	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1207253	30MHz~40GHz	Dec. 26, 2019	Aug. 18, 2020~ Aug. 19, 2020	Dec. 25, 2020	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Dec. 26, 2019	Aug. 18, 2020~ Aug. 19, 2020	Dec. 25, 2020	Conducted (TH01-SZ)
EMI Test Receiver	Keysight	N9038A	MY564000 04	3Hz~8.5GHz;M ax 30dBm	Oct. 18, 2019	Sep. 09, 2020	Oct. 17, 2020	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY551502 44	10Hz~44G,MAX 30dB	Apr. 15, 2020	Sep. 09, 2020	Apr. 14, 2021	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 10, 2019	Sep. 09, 2020	Nov. 09, 2020	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz~1GHz	May 30, 2020	Sep. 09, 2020	May 29, 2021	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 26, 2020	Sep. 09, 2020	Apr. 25, 2021	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2019	Sep. 09, 2020	Nov. 09, 2020	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	187289	9KHz~1GHz	Apr. 14, 2020	Sep. 09, 2020	Apr. 13, 2021	Radiation (03CH05-KS)
Amplifier	MITEQ	EM18G40GG A	060728	18~40GHz	Jan. 08, 2020	Sep. 09, 2020	Jan. 07, 2021	Radiation (03CH05-KS)
high gain Amplifier	MITEQ	AMF-7D-0010 1800-30-10P	2012228	1Ghz~18Ghz	Oct. 18, 2019	Sep. 09, 2020	Oct. 17, 2020	Radiation (03CH05-KS)
Amplifier	Keysight	83017A	MY532703 16	500MHz~26.5G Hz	Oct. 18, 2019	Sep. 09, 2020	Oct. 17, 2020	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F1040900 04	N/A	NCR	Sep. 09, 2020	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Sep. 09, 2020	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Sep. 09, 2020	NCR	Radiation (03CH05-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 14, 2020	Aug. 26, 2020	Apr. 13, 2021	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 18, 2019	Aug. 26, 2020	Oct. 17, 2020	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Oct. 28, 2019	Aug. 26, 2020	Oct. 27, 2020	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP00000 0811	AC 0V~300V, 45Hz~1000Hz	Oct. 18, 2019	Aug. 26, 2020	Oct. 17, 2020	Conduction (CO01-KS)

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))	2.94dB
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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))	5.0dB
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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))	5.0dB
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Appendix A. Conducted Test Results

Test Engineer:	Liu Qiu Qiu	Temperature:	21~25	°C
Test Date:	2020/8/18~2020/8/19	Relative Humidity:	51~54	%

TEST RESULTS DATA
26dB and 99% OBW

Band I										
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)		
11a	6Mbps	1	36	5180	18.78	33.52	-	22.74		
11a	6Mbps	1	44	5220	18.43	32.27	-	22.66		
11a	6Mbps	1	48	5240	18.28	32.17	-	22.62		
HT20	MCS0	1	36	5180	19.73	34.87	-	22.95		
HT20	MCS0	1	44	5220	19.23	32.12	-	22.84		
HT20	MCS0	1	48	5240	19.08	31.52	-	22.81		
HT40	MCS0	1	38	5190	37.66	79.39	-	23.01		
HT40	MCS0	1	46	5230	37.46	78.85	-	23.01		
VHT80	MCS0	1	42	5210	72.77	90.31	-	23.01		

TEST RESULTS DATA
Average Power Table

FCC Band I										
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6Mbps	1	36	5180	0.09	14.60	24.00	-5.22		Pass
11a	6Mbps	1	44	5220	0.09	14.91	24.00	-5.22		Pass
11a	6Mbps	1	48	5240	0.09	14.83	24.00	-5.22		Pass
HT20	MCS0	1	36	5180	0.10	13.87	24.00	-5.22		Pass
HT20	MCS0	1	44	5220	0.10	14.97	24.00	-5.22		Pass
HT20	MCS0	1	48	5240	0.10	14.69	24.00	-5.22		Pass
HT40	MCS0	1	38	5190	0.18	12.13	24.00	-5.22		Pass
HT40	MCS0	1	46	5230	0.18	15.01	24.00	-5.22		Pass
VHT20	MCS0	1	36	5180	0.11	13.42	24.00	-5.22		Pass
VHT20	MCS0	1	44	5220	0.11	14.87	24.00	-5.22		Pass
VHT20	MCS0	1	48	5240	0.11	14.59	24.00	-5.22		Pass
VHT40	MCS0	1	38	5190	0.18	12.08	24.00	-5.22		Pass
VHT40	MCS0	1	46	5230	0.18	14.97	24.00	-5.22		Pass
VHT80	MCS0	1	42	5210	0.33	11.20	24.00	-5.22		Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	-	Pass/Fail
11a	6Mbps	1	36	5180	0.09	7.86	11.00	-5.22		Pass
11a	6Mbps	1	44	5220	0.09	7.34	11.00	-5.22		Pass
11a	6Mbps	1	48	5240	0.09	7.26	11.00	-5.22		Pass
HT20	MCS0	1	36	5180	0.10	7.52	11.00	-5.22		Pass
HT20	MCS0	1	44	5220	0.10	6.33	11.00	-5.22		Pass
HT20	MCS0	1	48	5240	0.10	6.16	11.00	-5.22		Pass
HT40	MCS0	1	38	5190	0.18	3.79	11.00	-5.22		Pass
HT40	MCS0	1	46	5230	0.18	3.56	11.00	-5.22		Pass
VHT80	MCS0	1	42	5210	0.33	-0.87	11.00	-5.22		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	52	5260	18.18	32.22	23.60	29.60	23.98	
11a	6M bps	1	60	5300	18.18	33.22	23.60	29.60	23.98	
11a	6M bps	1	64	5320	17.58	28.92	23.45	29.45	23.98	
HT20	MCS 0	1	52	5260	19.08	31.87	23.81	29.81	23.98	
HT20	MCS 0	1	60	5300	19.23	31.97	23.84	29.84	23.98	
HT20	MCS 0	1	64	5320	18.83	32.57	23.75	29.75	23.98	
HT40	MCS 0	1	54	5270	37.16	66.80	23.98	30.00	23.98	
HT40	MCS 0	1	62	5310	36.96	63.75	23.98	30.00	23.98	
VHT80	MCS 0	1	58	5290	72.41	81.04	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

FCC Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	52	5260	0.09	16.27	23.98	-5.05	26.99	Pass
11a	6M bps	1	60	5300	0.09	16.42	23.98	-5.05	26.99	Pass
11a	6M bps	1	64	5320	0.09	16.21	23.98	-5.05	26.99	Pass
HT20	MCS 0	1	52	5260	0.10	16.12	23.98	-5.05	26.99	Pass
HT20	MCS 0	1	60	5300	0.10	16.28	23.98	-5.05	26.99	Pass
HT20	MCS 0	1	64	5320	0.10	15.99	23.98	-5.05	26.99	Pass
HT40	MCS 0	1	54	5270	0.18	16.47	23.98	-5.05	26.99	Pass
HT40	MCS 0	1	62	5310	0.18	12.90	23.98	-5.05	26.99	Pass
VHT20	MCS 0	1	52	5260	0.11	16.02	23.98	-5.05	26.99	Pass
VHT20	MCS 0	1	60	5300	0.11	16.06	23.98	-5.05	26.99	Pass
VHT20	MCS 0	1	64	5320	0.11	15.84	23.98	-5.05	26.99	Pass
VHT40	MCS 0	1	54	5270	0.18	16.43	23.98	-5.05	26.99	Pass
VHT40	MCS 0	1	62	5310	0.18	12.57	23.98	-5.05	26.99	Pass
VHT80	MCS 0	1	58	5290	0.33	12.33	23.98	-5.05	26.99	Pass

TEST RESULTS DATA
Power Spectral Density

Band II										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	52	5260	0.09	7.39	11.00	-5.05		Pass
11a	6M bps	1	60	5300	0.09	7.57	11.00	-5.05		Pass
11a	6M bps	1	64	5320	0.09	7.38	11.00	-5.05		Pass
HT20	MCS 0	1	52	5260	0.10	6.15	11.00	-5.05		Pass
HT20	MCS 0	1	60	5300	0.10	6.58	11.00	-5.05		Pass
HT20	MCS 0	1	64	5320	0.10	5.92	11.00	-5.05		Pass
HT40	MCS 0	1	54	5270	0.18	3.37	11.00	-5.05		Pass
HT40	MCS 0	1	62	5310	0.18	3.19	11.00	-5.05		Pass
VHT80	MCS 0	1	58	5290	0.33	-1.03	11.00	-5.05		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	IC 99% Bandwidth Power Limit (dBm)	IC 99% Bandwidth EIRP Limit (dBm)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	100	5500	17.63	30.47	23.46	29.46	23.98	
11a	6M bps	1	116	5580	18.73	32.47	23.73	29.73	23.98	
11a	6M bps	1	140	5700	18.98	33.07	23.78	29.78	23.98	
11a	6Mbps	1	144	5720	18.63	32.77	23.70	29.70	23.98	
HT20	MCS 0	1	100	5500	19.28	31.92	23.85	29.85	23.98	
HT20	MCS 0	1	116	5580	19.53	33.42	23.91	29.91	23.98	
HT20	MCS 0	1	140	5700	19.83	35.21	23.97	29.97	23.98	
HT20	MCS0	1	144	5720	19.53	32.27	23.91	29.91	23.98	
HT40	MCS 0	1	102	5510	37.06	52.42	23.98	30.00	23.98	
HT40	MCS 0	1	110	5550	37.26	71.30	23.98	30.00	23.98	
HT40	MCS 0	1	134	5670	37.46	75.88	23.98	30.00	23.98	
HT40	MCS0	1	142	5710	37.36	73.46	23.98	30.00	23.98	
VHT80	MCS 0	1	106	5530	72.53	86.47	23.98	30.00	23.98	
VHT80	MCS 0	1	122	5610	72.53	88.87	23.98	30.00	23.98	
VHT80	MCS0	1	138	5690	72.77	90.15	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

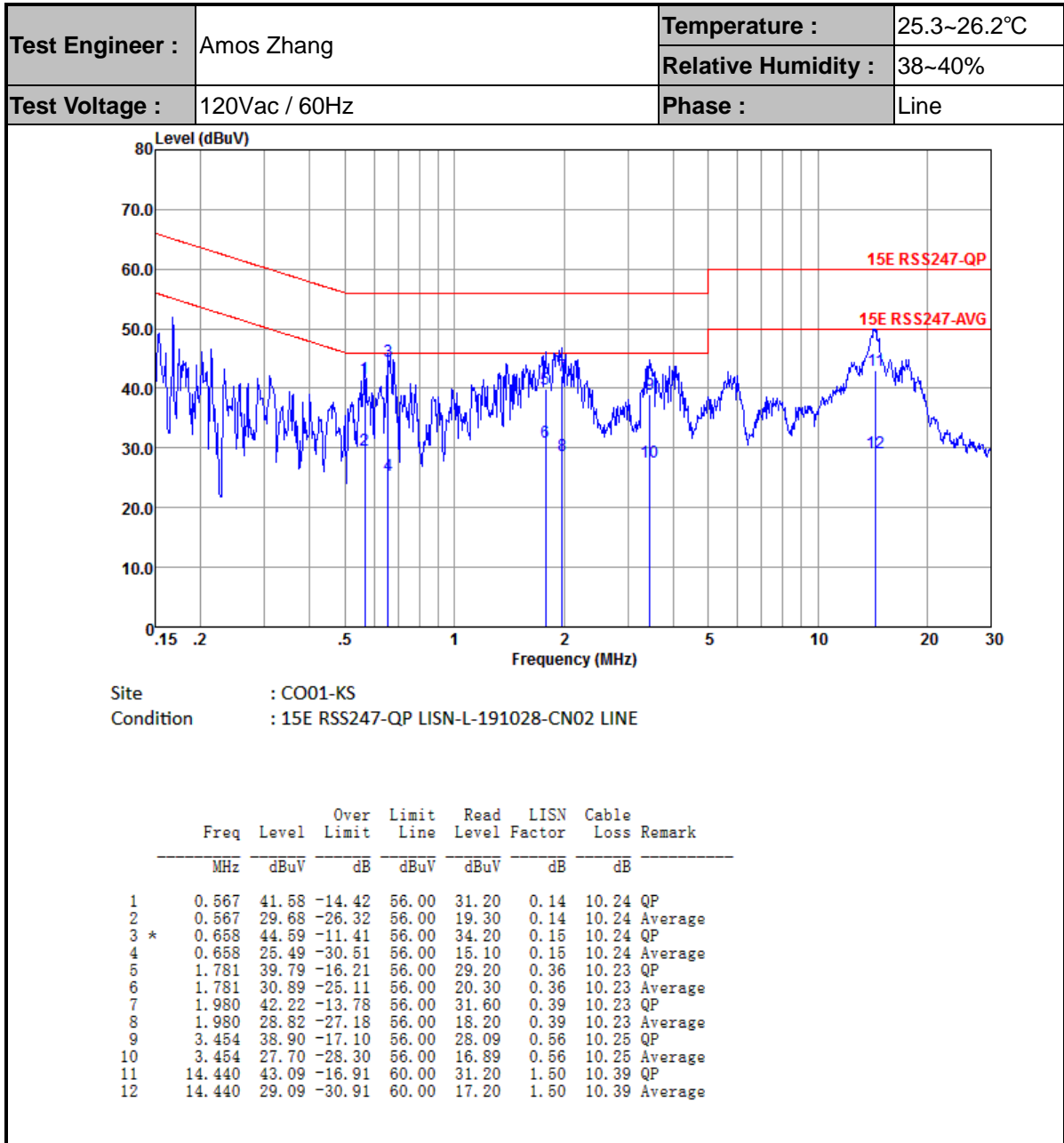
FCC Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	100	5500	0.09	17.45	23.98	-5.10	26.99	Pass
11a	6M bps	1	116	5580	0.09	17.65	23.98	-5.10	26.99	Pass
11a	6M bps	1	140	5700	0.09	15.36	23.98	-5.10	26.99	Pass
11a	6M bps	1	144	5720	0.09	17.38	23.98	-5.10	26.99	Pass
HT20	MCS 0	1	100	5500	0.10	17.74	23.98	-5.10	26.99	Pass
HT20	MCS 0	1	116	5580	0.10	17.52	23.98	-5.10	26.99	Pass
HT20	MCS 0	1	140	5700	0.10	13.40	23.98	-5.10	26.99	Pass
HT20	MCS 0	1	144	5720	0.10	17.25	23.98	-5.10	26.99	Pass
HT40	MCS 0	1	102	5510	0.18	15.24	23.98	-5.10	26.99	Pass
HT40	MCS 0	1	110	5550	0.18	17.82	23.98	-5.10	26.99	Pass
HT40	MCS 0	1	134	5670	0.18	17.28	23.98	-5.10	26.99	Pass
HT40	MCS 0	1	142	5710	0.18	17.56	23.98	-5.10	26.99	Pass
VHT20	MCS 0	1	100	5500	0.11	17.64	23.98	-5.10	26.99	Pass
VHT20	MCS 0	1	116	5580	0.11	17.42	23.98	-5.10	26.99	Pass
VHT20	MCS 0	1	140	5700	0.11	13.16	23.98	-5.10	26.99	Pass
VHT20	MCS 0	1	144	5720	0.11	17.19	23.98	-5.10	26.99	Pass
VHT40	MCS 0	1	102	5510	0.18	14.83	23.98	-5.10	26.99	Pass
VHT40	MCS 0	1	110	5550	0.18	17.79	23.98	-5.10	26.99	Pass
VHT40	MCS 0	1	134	5670	0.18	16.95	23.98	-5.10	26.99	Pass
VHT40	MCS 0	1	142	5710	0.18	17.51	23.98	-5.10	26.99	Pass
VHT80	MCS 0	1	106	5530	0.33	13.09	23.98	-5.10	26.99	Pass
VHT80	MCS 0	1	122	5610	0.33	16.73	23.98	-5.10	26.99	Pass
VHT80	MCS 0	1	138	5690	0.33	16.14	23.98	-5.10	26.99	Pass

TEST RESULTS DATA
Power Spectral Density

Band III										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	100	5500	0.09	6.85	11.00	-5.10		Pass
11a	6M bps	1	116	5580	0.09	7.43	11.00	-5.10		Pass
11a	6M bps	1	140	5700	0.09	7.30	11.00	-5.10		Pass
11a	6Mbps	1	144	5720	0.09	7.38	11.00	-5.10		Pass
HT20	MCS 0	1	100	5500	0.10	5.59	11.00	-5.10		Pass
HT20	MCS 0	1	116	5580	0.10	5.55	11.00	-5.10		Pass
HT20	MCS 0	1	140	5700	0.10	5.44	11.00	-5.10		Pass
HT20	MCS0	1	144	5720	0.10	5.25	11.00	-5.10		Pass
HT40	MCS 0	1	102	5510	0.18	2.37	11.00	-5.10		Pass
HT40	MCS 0	1	110	5550	0.18	2.99	11.00	-5.10		Pass
HT40	MCS 0	1	134	5670	0.18	2.47	11.00	-5.10		Pass
HT40	MCS0	1	142	5710	0.18	2.63	11.00	-5.10		Pass
VHT80	MCS 0	1	106	5530	0.33	-0.68	11.00	-5.10		Pass
VHT80	MCS 0	1	122	5610	0.33	-1.19	11.00	-5.10		Pass
VHT80	MCS0	1	138	5690	0.33	-1.05	11.00	-5.10		Pass

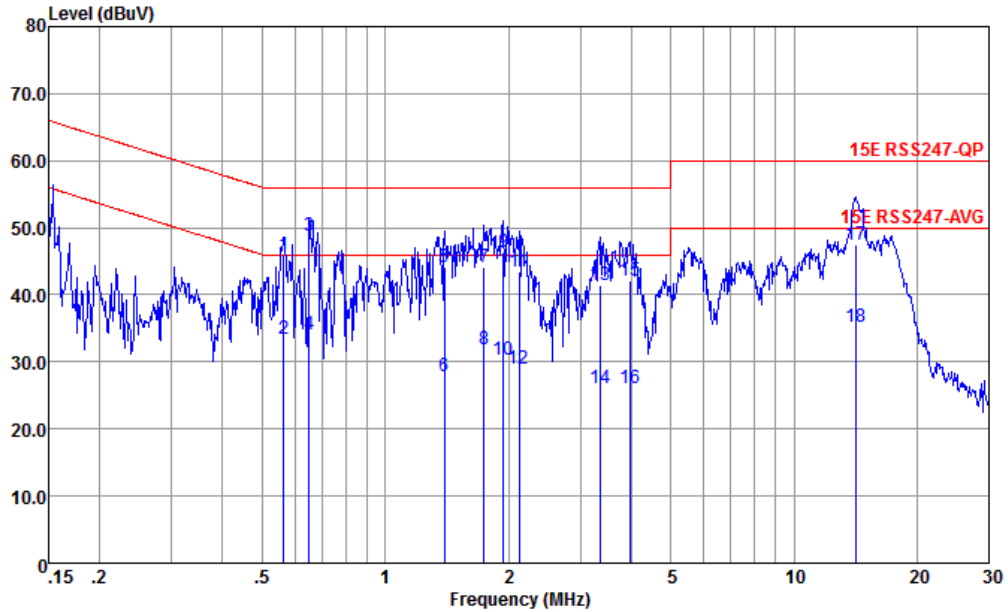


Appendix B. AC Conducted Emission Test Results





Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : CO01-KS
 Condition : 15E RSS247-QP LISN-N-191028-CN02 NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.564	45.97	-10.03	56.00	35.49	0.24	10.24	QP
2	0.564	33.37	-22.63	56.00	22.89	0.24	10.24	Average
3 *	0.651	48.79	-7.21	56.00	38.30	0.25	10.24	QP
4	0.651	33.99	-22.01	56.00	23.50	0.25	10.24	Average
5	1.396	44.23	-11.77	56.00	33.60	0.40	10.23	QP
6	1.396	27.93	-28.07	56.00	17.30	0.40	10.23	Average
7	1.744	44.20	-11.80	56.00	33.49	0.48	10.23	QP
8	1.744	31.90	-24.10	56.00	21.19	0.48	10.23	Average
9	1.949	46.34	-9.66	56.00	35.60	0.51	10.23	QP
10	1.949	30.24	-25.76	56.00	19.50	0.51	10.23	Average
11	2.121	43.37	-12.63	56.00	32.60	0.54	10.23	QP
12	2.121	28.97	-27.03	56.00	18.20	0.54	10.23	Average
13	3.346	41.54	-14.46	56.00	30.60	0.69	10.25	QP
14	3.346	26.04	-29.96	56.00	15.10	0.69	10.25	Average
15	3.964	42.20	-13.80	56.00	31.20	0.75	10.25	QP
16	3.964	26.10	-29.90	56.00	15.10	0.75	10.25	Average
17	14.138	47.51	-12.49	60.00	35.30	1.82	10.39	QP
18	14.138	35.11	-24.89	60.00	22.90	1.82	10.39	Average

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	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5148.48	61.27	-12.73	74	46.63	34.07	11.18	30.61	100	196	P	H
		5149.98	49.93	-4.07	54	35.29	34.07	11.18	30.61	100	196	A	H
	*	5182	108.16	-	-	93.45	34.12	11.21	30.62	100	196	P	H
		5182	100.79	-	-	86.08	34.12	11.21	30.62	100	196	A	H
		5149.6	60.31	-13.69	74	45.67	34.07	11.18	30.61	100	182	P	V
		5149.98	50.67	-3.33	54	36.03	34.07	11.18	30.61	100	182	A	V
	*	5182	109.76	-	-	95.05	34.12	11.21	30.62	100	182	P	V
		5182	102.54	-	-	87.83	34.12	11.21	30.62	100	182	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 36 5180MHz		10358.36	42.71	-25.59	68.3	50.27	37.01	16.11	60.68	300	0	P	H
		10358.36	45.32	-22.98	68.3	52.88	37.01	16.11	60.68	300	0	P	V
802.11a CH 44 5220MHz		10438.44	45.21	-23.09	68.3	52.62	37.06	16.19	60.66	100	360	P	H
		15660	55.5	-18.5	74	54.41	40.96	19.91	59.78	188	238	P	H
		15660	46.57	-7.43	54	45.48	40.96	19.91	59.78	188	238	A	H
		10443.44	51.74	-16.56	68.3	59.15	37.06	16.19	60.66	100	360	P	V
		15660	53.81	-20.19	74	52.72	40.96	19.91	59.78	220	138	P	V
		15660	44.04	-9.96	54	42.95	40.96	19.91	59.78	220	138	A	V
802.11a CH 48 5240MHz		10478.47	45.57	-22.73	68.3	52.89	37.09	16.24	60.65	100	360	P	H
		15720	56.79	-17.21	74	55.57	41.02	19.95	59.75	186	236	P	H
		15720	46.52	-7.48	54	45.3	41.02	19.95	59.75	186	236	A	H
		10478.47	50.23	-18.07	68.3	57.55	37.09	16.24	60.65	100	360	P	V
		15720	52.46	-21.54	74	51.24	41.02	19.95	59.75	100	116	P	V
		15720	44.5	-9.5	54	43.28	41.02	19.95	59.75	100	116	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 (Band Edge @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include test results for 802.11n HT20 CH 36 5180MHz and a Remark section.



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 36 5180MHz		10358.36	43.03	-25.27	68.3	50.59	37.01	16.11	60.68	100	360	P	H
		10358.36	45.77	-22.53	68.3	53.33	37.01	16.11	60.68	100	360	P	V
802.11n HT20 CH 44 5220MHz		10438.44	46.61	-21.69	68.3	54.02	37.06	16.19	60.66	100	360	P	H
		15666	58.08	-15.92	74	56.96	40.97	19.92	59.77	174	225	P	H
		15666	48.08	-5.92	54	46.96	40.97	19.92	59.77	174	225	A	H
		10438.44	51.64	-16.66	68.3	59.05	37.06	16.19	60.66	100	360	P	V
		15660	53.63	-20.37	74	52.54	40.96	19.91	59.78	113	142	P	V
		15660	45.27	-8.73	54	44.18	40.96	19.91	59.78	113	142	A	V
802.11n HT20 CH 48 5240MHz		10478.47	46.37	-21.93	68.3	53.69	37.09	16.24	60.65	100	360	P	H
		15720	57.08	-16.92	74	55.86	41.02	19.95	59.75	100	224	P	H
		15720	47.05	-6.95	54	45.83	41.02	19.95	59.75	100	224	A	H
		10478.47	48.14	-20.16	68.3	55.46	37.09	16.24	60.65	100	360	P	V
		15720	51.44	-22.56	74	50.22	41.02	19.95	59.75	100	112	P	V
		15720	44.24	-9.76	54	43.02	41.02	19.95	59.75	100	112	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 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 38 5190MHz		5148.48	59.43	-14.57	74	44.79	34.07	11.18	30.61	221	174	P	H
		5149.44	50.2	-3.8	54	35.56	34.07	11.18	30.61	221	174	A	H
	*	5194	104.13	-	-	89.39	34.14	11.23	30.63	221	174	P	H
		5194	97.1	-	-	82.36	34.14	11.23	30.63	221	174	A	H
		5366.7	55.12	-18.88	74	40.06	34.35	11.4	30.69	221	174	P	H
		5396.58	45.86	-8.14	54	30.72	34.4	11.43	30.69	221	174	A	H
		5144.96	59.5	-14.5	74	44.86	34.07	11.18	30.61	228	184	P	V
		5149.98	50.8	-3.2	54	36.16	34.07	11.18	30.61	228	184	A	V
	*	5188	105.71	-	-	91	34.12	11.21	30.62	228	184	P	V
		5188	98.75	-	-	84.04	34.12	11.21	30.62	228	184	A	V
		5398.92	56.08	-17.92	74	40.95	34.4	11.43	30.7	228	184	P	V
		5395.5	45.84	-8.16	54	30.7	34.4	11.43	30.69	228	184	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 38 5190MHz		10378.38	43.06	-25.24	68.3	50.55	37.03	16.15	60.67	300	0	P	H
		10378.38	42.81	-25.49	68.3	50.3	37.03	16.15	60.67	300	0	P	V
802.11n HT40 CH 46 5230MHz		10458.46	43.29	-25.01	68.3	50.67	37.07	16.21	60.66	300	0	P	H
		15690	50.49	-23.51	74	49.33	40.99	19.93	59.76	100	223	P	H
		15690	44.8	-9.2	54	43.64	40.99	19.93	59.76	100	223	A	H
		10458.46	46.92	-21.38	68.3	54.3	37.07	16.21	60.66	300	0	P	V
		15678	50.73	-23.27	74	49.61	40.97	19.92	59.77	100	0	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 42 5210MHz		5132.64	59.09	-14.91	74	44.49	34.05	11.16	30.61	233	176	P	H
		5149.6	49.67	-4.33	54	35.03	34.07	11.18	30.61	233	176	A	H
	*	5206	98.71	-	-	83.97	34.14	11.23	30.63	233	176	P	H
		5206	91.85	-	-	77.11	34.14	11.23	30.63	233	176	A	H
		5351.22	54.84	-19.16	74	39.81	34.33	11.38	30.68	233	176	P	H
		5376.78	46.28	-7.72	54	31.22	34.35	11.4	30.69	233	176	A	H
		5143.36	61.13	-12.87	74	46.49	34.07	11.18	30.61	227	188	P	V
		5149.92	50.48	-3.52	54	35.84	34.07	11.18	30.61	227	188	A	V
	*	5206	101.08	-	-	86.34	34.14	11.23	30.63	227	188	P	V
		5206	94.19	-	-	79.45	34.14	11.23	30.63	227	188	A	V
	5386.14	54.58	-19.42	74	39.48	34.38	11.41	30.69	227	188	P	V	
	5368.14	46.32	-7.68	54	31.26	34.35	11.4	30.69	227	188	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 42 5210MHz		10418.42	43.28	-25.02	68.3	50.72	37.05	16.18	60.67	100	360	P	H
		10418.42	42.87	-25.43	68.3	50.31	37.05	16.18	60.67	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 - 5250~5350MHz
WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 64 5320MHz	*	5320	106.28	-	-	91.31	34.29	11.35	30.67	100	194	P	H
		5320	98.48	-	-	83.51	34.29	11.35	30.67	100	194	A	H
		5350.6	55.86	-18.14	74	40.83	34.33	11.38	30.68	100	194	P	H
		5350	47.1	-6.9	54	32.07	34.33	11.38	30.68	100	194	A	H
	*	5314	109.79	-	-	94.82	34.29	11.35	30.67	111	184	P	V
		5314	102.35	-	-	87.38	34.29	11.35	30.67	111	184	A	V
		5350.8	58.78	-15.22	74	43.75	34.33	11.38	30.68	111	184	P	V
		5350	50.18	-3.82	54	35.15	34.33	11.38	30.68	111	184	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 52 5260MHz		10518.52	45.37	-22.93	68.3	52.64	37.11	16.27	60.65	100	360	P	H
		15780	56.17	-17.83	74	54.83	41.08	19.99	59.73	183	236	P	H
		15780	47.71	-6.29	54	46.37	41.08	19.99	59.73	183	236	A	H
		10518.52	49.54	-18.76	68.3	56.81	37.11	16.27	60.65	100	360	P	V
		15780	55.42	-18.58	74	54.08	41.08	19.99	59.73	100	119	P	V
802.11a CH 60 5300MHz		10600	47.45	-26.55	74	54.57	37.16	16.35	60.63	300	0	P	H
		15900	56.29	-17.71	74	54.72	41.2	20.06	59.69	175	243	P	H
		15900	46.95	-7.05	54	45.38	41.2	20.06	59.69	175	243	A	H
		10600	49.5	-24.5	74	56.62	37.16	16.35	60.63	300	0	P	V
		15900	53.94	-20.06	74	52.37	41.2	20.06	59.69	100	122	P	V
		15900	45.09	-8.91	54	43.52	41.2	20.06	59.69	100	122	A	V
802.11a CH 64 5320MHz		10638.63	44.47	-29.53	74	51.52	37.18	16.39	60.62	100	360	P	H
		15960	54.35	-19.65	74	52.63	41.27	20.11	59.66	143	238	P	H
		15960	45.96	-8.04	54	44.24	41.27	20.11	59.66	143	238	A	H
		10638.63	44.38	-29.62	74	51.43	37.18	16.39	60.62	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include test data for 802.11n HT20 CH 64 5320MHz and a Remark section.



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 52 5260MHz		10518.52	45.18	-23.12	68.3	52.45	37.11	16.27	60.65	100	360	P	H
		15780	58.2	-15.8	74	56.86	41.08	19.99	59.73	100	226	P	H
		15780	48.58	-5.42	54	47.24	41.08	19.99	59.73	100	226	A	H
		10518.52	47.85	-20.45	68.3	55.12	37.11	16.27	60.65	100	360	P	V
		15780	51.8	-22.2	74	50.46	41.08	19.99	59.73	101	135	P	V
802.11n HT20 CH 60 5300MHz		10600	46.11	-27.89	74	53.23	37.16	16.35	60.63	100	360	P	H
		15900	59.23	-14.77	74	57.66	41.2	20.06	59.69	100	225	P	H
		15900	50.24	-3.76	54	48.67	41.2	20.06	59.69	100	225	A	H
		10600	48.08	-25.92	74	55.2	37.16	16.35	60.63	100	360	P	V
		15900	55.18	-18.82	74	53.61	41.2	20.06	59.69	104	116	P	V
802.11n HT20 CH 64 5320MHz		15900	45.91	-8.09	54	44.34	41.2	20.06	59.69	104	116	A	V
		10638.63	44.15	-29.85	74	51.2	37.18	16.39	60.62	300	0	P	H
		15960	50.96	-23.04	74	49.24	41.27	20.11	59.66	167	221	P	H
		15960	44.02	-9.98	54	42.3	41.27	20.11	59.66	167	221	A	H
		10638.63	48.09	-25.91	74	55.14	37.18	16.39	60.62	300	0	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)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include frequencies like 5135.84, 5121.12, 5308, 5351.7, 5350.6, 5134.4, 5131.68, 5314, 5314, 5351.2, 5350.3.

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)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path 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 54 at 5270MHz and 802.11n HT40 CH 62 at 5310MHz.

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, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include frequencies like 5114.24, 5105.28, 5284, 5363.4, 5350.6, 5149.44, 5120.16, 5284, 5284, 5350.9, 5353.1.

Band 2 5250~5350MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include frequencies 10578.58 and 10578.58.



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 100 5500MHz		5434.64	56.59	-17.41	74	41.39	34.44	11.46	30.7	100	211	P	H
		5469.68	58.19	-10.11	68.3	42.93	34.48	11.5	30.72	100	211	P	H
		5459.98	45.96	-8.04	54	30.74	34.46	11.48	30.72	100	211	A	H
	*	5500	102.58	-	-	87.25	34.53	11.53	30.73	100	211	P	H
		5500	95.25	-	-	79.92	34.53	11.53	30.73	100	211	A	H
		5448.72	55.87	-18.13	74	40.64	34.46	11.48	30.71	125	184	P	V
		5469.68	64.58	-3.72	68.3	49.32	34.48	11.5	30.72	125	184	P	V
		5459.92	46.98	-7.02	54	31.76	34.46	11.48	30.72	125	184	A	V
	*	5500	109.42	-	-	94.09	34.53	11.53	30.73	125	184	P	V
		5500	101.76	-	-	86.43	34.53	11.53	30.73	125	184	A	V
802.11a CH 136 5680MHz	*	5738.76	56.28	-12.02	68.3	40.55	34.79	11.76	30.82	195	171	P	H
		5680	106.71	-	-	91.07	34.73	11.7	30.79	195	171	P	H
		5680	100.02	-	-	84.38	34.73	11.7	30.79	195	171	A	H
	*	5727	57.46	-10.84	68.3	41.75	34.78	11.75	30.82	174	174	P	V
		5680	113.76	-	-	98.12	34.73	11.7	30.79	174	174	P	V
		5680	106.47	-	-	90.83	34.73	11.7	30.79	174	174	A	V
802.11a CH 140 5700MHz	*	5704	105.83	-	-	90.15	34.76	11.73	30.81	100	246	P	H
		5704	98.38	-	-	82.7	34.76	11.73	30.81	100	246	A	H
		5725.96	60.33	-7.97	68.3	44.62	34.78	11.75	30.82	100	246	P	H
	*	5704	110.29	-	-	94.61	34.76	11.73	30.81	100	200	P	V
		5704	103.1	-	-	87.42	34.76	11.73	30.81	100	200	A	V
		5725.24	64.99	-3.31	68.3	49.28	34.78	11.75	30.82	100	200	P	V

Remark

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



Band 3 - 5470~5725MHz
WIFI 802.11a (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include channels 100, 116, 136, and 140 with their respective frequency and measurement data.

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



Band 3 - 5470~5725MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 100 5500MHz		5447.44	55.02	-18.98	74	39.79	34.46	11.48	30.71	100	211	P	H
		5469.36	59.54	-8.76	68.3	44.28	34.48	11.5	30.72	100	211	P	H
		5459.98	46.18	-7.82	54	30.96	34.46	11.48	30.72	100	211	A	H
	*	5500	104.07	-	-	88.74	34.53	11.53	30.73	100	211	P	H
		5500	95.57	-	-	80.24	34.53	11.53	30.73	100	211	A	H
		5452.88	56.06	-17.94	74	40.83	34.46	11.48	30.71	128	183	P	V
		5468.24	64.84	-3.46	68.3	49.58	34.48	11.5	30.72	128	183	P	V
		5459.92	47.63	-6.37	54	32.41	34.46	11.48	30.72	128	183	A	V
	*	5500	109.78	-	-	94.45	34.53	11.53	30.73	128	183	P	V
		5500	101.88	-	-	86.55	34.53	11.53	30.73	128	183	A	V
802.11n HT20 CH 136 5680MHz	*	5760.28	56.64	-11.66	68.3	40.89	34.81	11.78	30.84	232	114	P	H
		5680	107.95	-	-	92.31	34.73	11.7	30.79	232	114	P	H
		5680	100.59	-	-	84.95	34.73	11.7	30.79	232	114	A	H
	*	5728.76	56.85	-11.45	68.3	41.14	34.78	11.75	30.82	215	170	P	V
		5680	113.57	-	-	97.93	34.73	11.7	30.79	215	170	P	V
		5680	106.19	-	-	90.55	34.73	11.7	30.79	215	170	A	V
802.11n HT20 CH 140 5700MHz	*	5704	103.49	-	-	87.81	34.76	11.73	30.81	100	245	P	H
		5704	96.55	-	-	80.87	34.76	11.73	30.81	100	245	A	H
		5725.48	58.07	-10.23	68.3	42.36	34.78	11.75	30.82	100	245	P	H
	*	5698	108.31	-	-	92.65	34.75	11.71	30.8	100	200	P	V
		5698	101.43	-	-	85.77	34.75	11.71	30.8	100	200	A	V
		5725.32	63.68	-4.62	68.3	47.97	34.78	11.75	30.82	100	200	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 100 5500MHz		10999	42.62	-31.38	74	49.04	37.4	16.72	60.54	300	0	P	H
		10999	43.13	-30.87	74	49.55	37.4	16.72	60.54	300	0	P	V
802.11n HT20 CH 116 5580MHz		11159.16	42.67	-31.33	74	48.82	37.5	16.85	60.5	100	360	P	H
		11159.16	42.54	-31.46	74	48.69	37.5	16.85	60.5	100	360	P	V
802.11n HT20 CH 136 5680MHz		11360	43.24	-30.76	74	49.11	37.61	16.98	60.46	100	360	P	H
		11360	42.05	-31.95	74	47.92	37.61	16.98	60.46	100	360	P	V
802.11n HT20 CH 140 5700MHz		11399.39	43.83	-30.17	74	49.62	37.64	17.02	60.45	300	0	P	H
		11399.39	43.46	-30.54	74	49.25	37.64	17.02	60.45	300	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 802.11n HT40 (Band Edge @ 3m)

Table with 14 columns: WIFI Ant. 1, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include test data for 802.11n HT40 CH 102 (5510MHz) and CH 134 (5670MHz), and a Remark section.



Band 3 - 5470~5725MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 102		11019.02	42.73	-31.27	74	49.13	37.41	16.73	60.54	100	360	P	H
5510MHz		11019.02	42.4	-31.6	74	48.8	37.41	16.73	60.54	100	360	P	V
802.11n HT40 CH 110		11099.1	44.31	-29.69	74	50.57	37.46	16.8	60.52	300	0	P	H
5550MHz		11099.1	42.73	-31.27	74	48.99	37.46	16.8	60.52	300	0	P	V
802.11n HT40 CH 134		11339.33	44.64	-29.36	74	50.54	37.6	16.97	60.47	100	360	P	H
5670MHz		11339.33	43.67	-30.33	74	49.57	37.6	16.97	60.47	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 106 5530MHz		5456.72	57.15	-16.85	74	41.93	34.46	11.48	30.72	226	152	P	H
		5468.08	56.79	-11.51	68.3	41.53	34.48	11.5	30.72	226	152	P	H
		5458.16	48.11	-5.89	54	32.89	34.46	11.48	30.72	226	152	A	H
	*	5530	92.87	-	-	77.51	34.55	11.55	30.74	226	152	P	H
		5530	85.71	-	-	70.35	34.55	11.55	30.74	226	152	A	H
		5755.4	57.35	-10.95	68.3	41.59	34.81	11.78	30.83	226	152	P	H
		5447.28	61.39	-12.61	74	46.16	34.46	11.48	30.71	228	179	P	V
		5466.8	60.55	-7.75	68.3	45.29	34.48	11.5	30.72	228	179	P	V
		5457.84	50.91	-3.09	54	35.69	34.46	11.48	30.72	228	179	A	V
	*	5536	98.16	-	-	82.77	34.57	11.56	30.74	228	179	P	V
		5536	91.05	-	-	75.66	34.57	11.56	30.74	228	179	A	V
	5731.88	56.13	-12.17	68.3	40.42	34.78	11.75	30.82	228	179	P	V	
802.11ac VHT80 CH 122 5610MHz		5417.68	55.56	-18.44	74	40.39	34.42	11.45	30.7	219	112	P	H
		5464.4	55.39	-12.91	68.3	40.13	34.48	11.5	30.72	219	112	P	H
		5457.36	46.7	-7.3	54	31.48	34.46	11.48	30.72	219	112	A	H
	*	5620	98.35	-	-	82.79	34.68	11.65	30.77	219	112	P	H
		5620	91.15	-	-	75.59	34.68	11.65	30.77	219	112	A	H
		5729.96	57.29	-11.01	68.3	41.58	34.78	11.75	30.82	219	112	P	H
		5374.32	56.71	-17.29	74	41.65	34.35	11.4	30.69	183	167	P	V
		5463.12	55.96	-12.34	68.3	40.7	34.48	11.5	30.72	183	167	P	V
		5430.16	46.91	-7.09	54	31.71	34.44	11.46	30.7	183	167	A	V
	*	5620	104.71	-	-	89.15	34.68	11.65	30.77	183	167	P	V
	5620	97.46	-	-	81.9	34.68	11.65	30.77	183	167	A	V	
	5736.44	57.68	-10.62	68.3	41.95	34.79	11.76	30.82	183	167	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80		11059.05	43.73	-30.27	74	50.05	37.44	16.77	60.53	100	360	P	H
CH 106		11059.05	44.01	-29.99	74	50.33	37.44	16.77	60.53	100	360	P	V
5530MHz													
802.11ac VHT80		11219.21	43.55	-30.45	74	49.63	37.53	16.88	60.49	100	360	P	H
CH 122		11219.21	43.56	-30.44	74	49.64	37.53	16.88	60.49	100	360	P	V
5610MHz													
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)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 144 5720MHz	*	5722	108.89	-	-	93.18	34.78	11.75	30.82	202	113	P	H
		5722	101.5	-	-	85.79	34.78	11.75	30.82	202	113	A	H
	*	5722	113.66	-	-	97.95	34.78	11.75	30.82	213	162	P	V
		5722	106.78	-	-	91.07	34.78	11.75	30.82	213	162	A	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 (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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 144 5720MHz		11439.44	43.82	-30.18	74	49.55	37.66	17.05	60.44	100	360	P	H
		17160	53.89	-14.41	68.3	50.23	40.68	20.97	57.99	100	0	P	H
		11439.44	44.7	-29.3	74	50.43	37.66	17.05	60.44	100	360	P	V
		17160	55.15	-13.15	68.3	51.49	40.68	20.97	57.99	100	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 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 144 5720MHz		5722	108.2	-	-	92.49	34.78	11.75	30.82	227	110	P	H
		5722	101.1	-	-	85.39	34.78	11.75	30.82	227	110	A	H
		5716	112.95	-	-	97.27	34.76	11.73	30.81	214	165	P	V
		5716	106.4	-	-	90.72	34.76	11.73	30.81	214	165	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		11439.44	44.15	-29.85	74	49.88	37.66	17.05	60.44	100	360	P	H
HT20		17160	53.6	-14.7	68.3	49.94	40.68	20.97	57.99	100	0	P	H
CH 144		11439.44	44.06	-29.94	74	49.79	37.66	17.05	60.44	100	360	P	V
5720MHz		17160	52.62	-15.68	68.3	48.96	40.68	20.97	57.99	100	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 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n	*	5716	106.64	-	-	90.96	34.76	11.73	30.81	201	110	P	H
HT40		5716	98.08	-	-	82.4	34.76	11.73	30.81	201	110	A	H
CH 142	*	5710	111.16	-	-	95.48	34.76	11.73	30.81	200	178	P	V
5710MHz		5710	103.37	-	-	87.69	34.76	11.73	30.81	200	178	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		11419.42	43.19	-30.81	74	48.96	37.65	17.03	60.45	100	360	P	H
HT40		17130	49.37	-18.93	68.3	45.78	40.67	20.95	58.03	100	0	P	H
CH 142		11419.42	43.65	-30.35	74	49.42	37.65	17.03	60.45	100	360	P	V
5710MHz		17130	51.17	-17.13	68.3	47.58	40.67	20.95	58.03	100	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 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac	*	5698	101.52	-	-	85.86	34.75	11.71	30.8	225	113	P	H
VHT80		5698	93.89	-	-	78.23	34.75	11.71	30.8	225	113	A	H
CH 138	*	5680	106.28	-	-	90.64	34.73	11.7	30.79	202	175	P	V
5690MHz		5680	98.79	-	-	83.15	34.73	11.7	30.79	202	175	A	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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80		11379.38	43.95	-30.05	74	49.77	37.63	17.01	60.46	100	360	P	H
CH 138 5690MHz		11379.38	44.52	-29.48	74	50.34	37.63	17.01	60.46	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz
5GHz WIFI 802.11ac VHT80 (LF)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
5GHz 802.11ac VHT80 LF		30.97	19.82	-20.18	40	27.27	24.57	1.26	33.28	-	-	P	H
		52.31	17.41	-22.59	40	35.04	13.9	1.63	33.16	-	-	P	H
		152.22	21.06	-22.44	43.5	34.5	16.98	2.78	33.2	-	-	P	H
		270.56	26.12	-19.88	46	35.88	19.67	3.71	33.14	-	-	P	H
		461.65	21.57	-24.43	46	26.3	23.31	4.84	32.88	-	-	P	H
		866.14	28.1	-17.9	46	24.43	29.23	6.61	32.17	100	0	P	H
		30	23.51	-16.49	40	30.47	25.1	1.24	33.3	-	-	P	V
		53.28	24.09	-15.91	40	41.93	13.65	1.65	33.14	100	0	P	V
		96.93	19.94	-23.56	43.5	35.05	15.71	2.22	33.04	-	-	P	V
		267.65	20.01	-25.99	46	29.58	19.87	3.69	33.13	-	-	P	V
		727.43	26.23	-19.77	46	25.1	27.52	6.06	32.45	-	-	P	V
	933.07	28.57	-17.43	46	23.37	30.37	6.86	32.03	-	-	P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



For Co-location:

WIFI + WWAN (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 106 5530MHz + LTE B13 5M Middle CH		5459.98	57.4	-16.6	74	42.18	34.46	11.48	30.72	231	169	P	H
		5468.24	57.77	-10.53	68.3	42.51	34.48	11.5	30.72	231	169	P	H
		5458.32	49.11	-4.89	54	33.89	34.46	11.48	30.72	231	169	A	H
	*	5524	92.21	-	-	76.85	34.55	11.55	30.74	231	169	P	H
		5524	85.32	-	-	69.96	34.55	11.55	30.74	231	169	A	H
		5751.64	56.09	-12.21	68.3	40.33	34.81	11.78	30.83	231	169	P	H
		5459.92	62.1	-11.9	74	46.88	34.46	11.48	30.72	226	171	P	V
		5467.12	62.15	-6.15	68.3	46.89	34.48	11.5	30.72	226	171	P	V
		5458.32	50.86	-3.14	54	35.64	34.46	11.48	30.72	226	171	A	V
	*	5530	98.98	-	-	83.62	34.55	11.55	30.74	226	171	P	V
	5530	91.58	-	-	76.22	34.55	11.55	30.74	226	171	A	V	
	5730.12	56.31	-11.99	68.3	40.6	34.78	11.75	30.82	226	171	P	V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

WIFI + WWAN (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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 106 5530MHz + LTE B13 5M Middle CH		11060	43.14	-30.86	74	49.46	37.44	16.77	60.53	100	360	P	H
		11060	42.51	-31.49	74	48.83	37.44	16.77	60.53	100	360	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	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	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
= Antenna Factor(dB/m) + Path 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) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
= 43.54 (dBμV/m)
2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

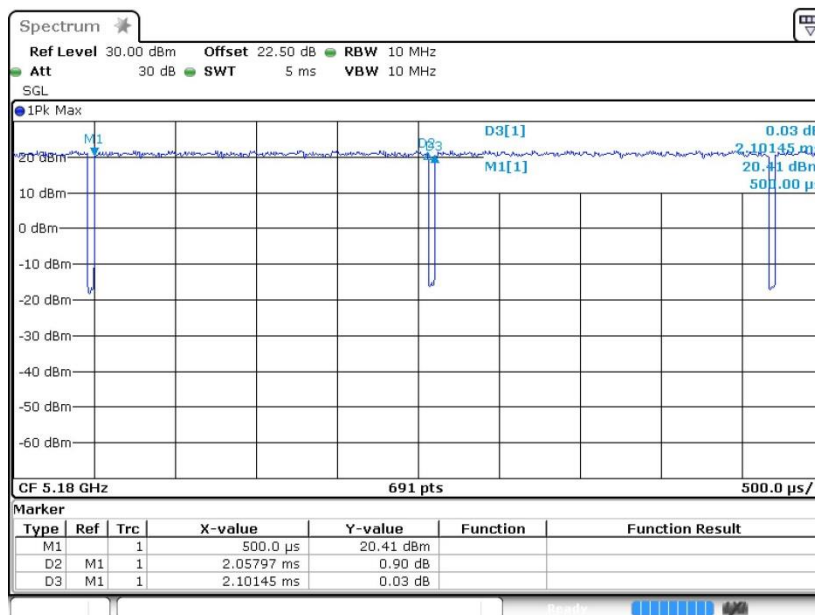
Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	97.93	2.058	0.486	0.51KHz
802.11n HT20	97.79	1.920	0.521	0.56KHz
802.11n HT40	96.03	0.946	1.057	1.1KHz
802.11ac VHT80	92.61	0.463	2.160	2.2KHz

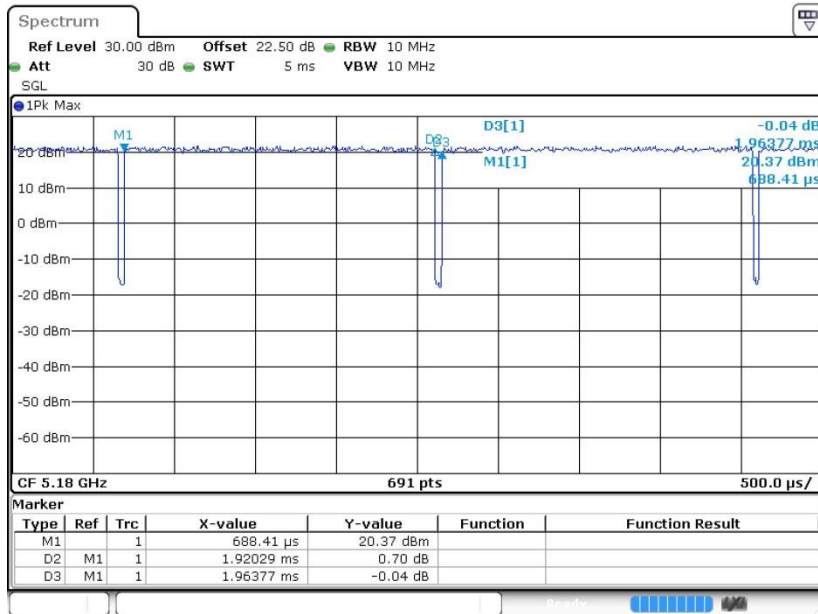
802.11a



Date: 17.AUG.2020 00:38:50

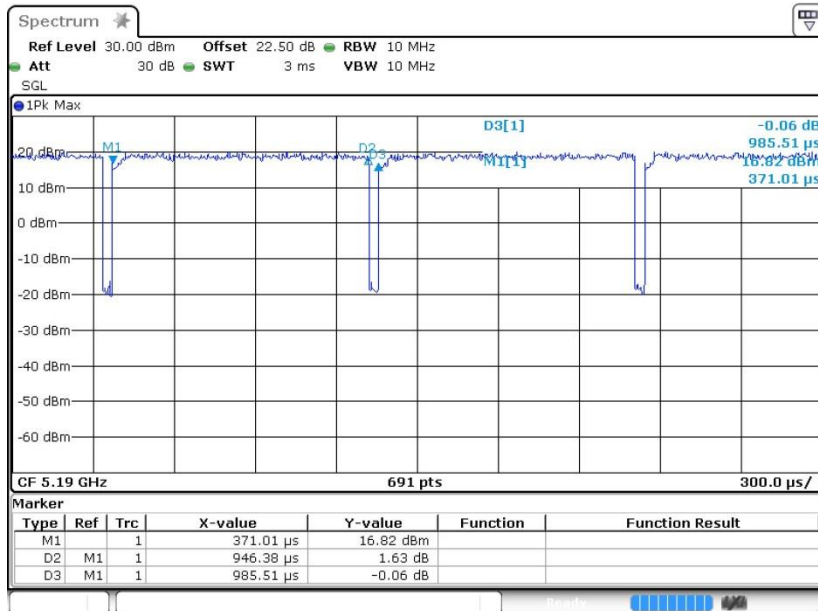


802.11n HT20



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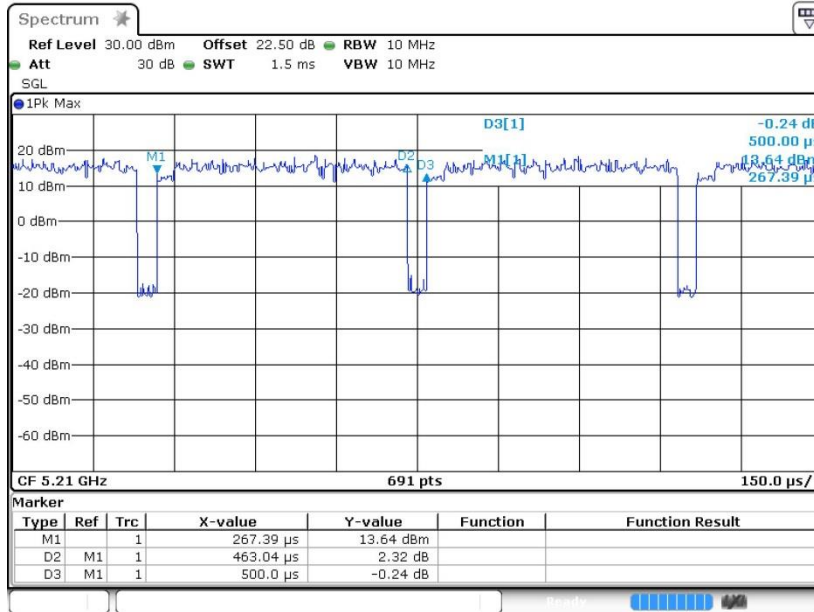
802.11n HT40



Date: 17.AUG.2020 01:05:38



802.11ac VHT80



Date: 17.AUG.2020 20:21:35