



FCC RF Test Report

APPLICANT : Verifone, Inc.
EQUIPMENT : Point of Sale Terminal
BRAND NAME : Verifone
MODEL NAME : X990
FCC ID : B32X990
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Dec. 14, 2019 and testing was completed on Mar. 10, 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.

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

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
FR9D1403E	Rev. 01	Initial issue of report	Apr. 03, 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 3.33 dB at 5350.320 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 7.11 dB at 0.680 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

Verifone, Inc.

Suite 200 1400 W Stanford Ranch Rd Rocklin CA 95765 USA

1.2 Manufacturer

Verifone Systems (China) Inc.

Rm 318, south of Bld C18, Startup Headquarters Base, North of Fuyuan Road, Wuqing Development Area, Tianjin, China, 301700.

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Point of Sale Terminal
Brand Name	Verifone
Model Name	X990
FCC ID	B32X990
EUT supports Radios application	GSM/WCDMA/LTE WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth BR / EDR / LE GNSS/NFC
IMEI Code	Conducted:N/A Conduction: 869091030298516/869091030298524 Radiation: 869091030296114/869091030296122
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are four types of EUT, the difference between them is different suppliers for the LCD Panel. We only choose the sample 1 to perform full tests.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5700 MHz
Maximum Output Power to Antenna	<5180 MHz ~ 5240 MHz> 802.11a : 11.30 dBm / 0.0135 W 802.11n HT20 : 10.94 dBm / 0.0124 W 802.11n HT40 : 11.25 dBm / 0.0133 W <5260 MHz ~ 5320 MHz> 802.11a : 11.24 dBm / 0.0133 W 802.11n HT20 : 11.23 dBm / 0.0133 W 802.11n HT40 : 11.51 dBm / 0.0142 W <5500 MHz ~ 5700 MHz > 802.11a : 12.18 dBm / 0.0165 W 802.11n HT20 : 12.17 dBm / 0.0165 W 802.11n HT40 : 12.31 dBm / 0.0170 W
99% Occupied Bandwidth	<5180 MHz ~ 5240 MHz> 802.11a : 18.48 MHz 802.11n HT20 : 19.53 MHz 802.11n HT40 : 36.66 MHz <5260 MHz ~ 5320 MHz> 802.11a : 18.58 MHz 802.11n HT20 : 19.23 MHz 802.11n HT40 : 36.76 MHz <5500 MHz ~ 5700 MHz > 802.11a : 18.88 MHz 802.11n HT20 : 19.58 MHz 802.11n HT40 : 36.96 MHz
Antenna Type / Gain	<5180 MHz ~ 5240 MHz> FPC Antenna with gain 2.97 dBi <5260 MHz ~ 5320 MHz> FPC Antenna with gain 2.47 dBi <5500 MHz ~ 5700 MHz> FPC Antenna with gain 2.00 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

Note: WLAN operation in 5600 MHz ~ 5650 MHz is notched.

1.5 Modification of EUT

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



1.6 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.
	TH01-KS	CN1257	314309

Note: Test data subcontracted: Conducted test items in section 3.1~3.3 of this report.

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	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.
	03CH02-SZ	CN1256	421272

1.7 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH02-SZ	AUDIX	E3	6.2009-8-24a
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.
- ♦ 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)
5180-5240 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	-	-		
Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5260-5320 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	54*	5270	62*	5310
	56	5280	64	5320
	-	-		
Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5500-5700 MHz Band 3 (U-NII-2C)	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	-	-	134*	5670
	108	5540	136	5680
	110*	5550	140	5700

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



2.2 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

Test Cases	
AC Conducted Emission	Mode 1 : GSM 850 Idle + Bluetooth Link + WLAN Link(5G) + Earphone + USB Cable (Charing from Adapter1) + SIM1
Remark: For Radiated Test Cases, The tests were performed with Adapter 1, Earphone and USB Cable	

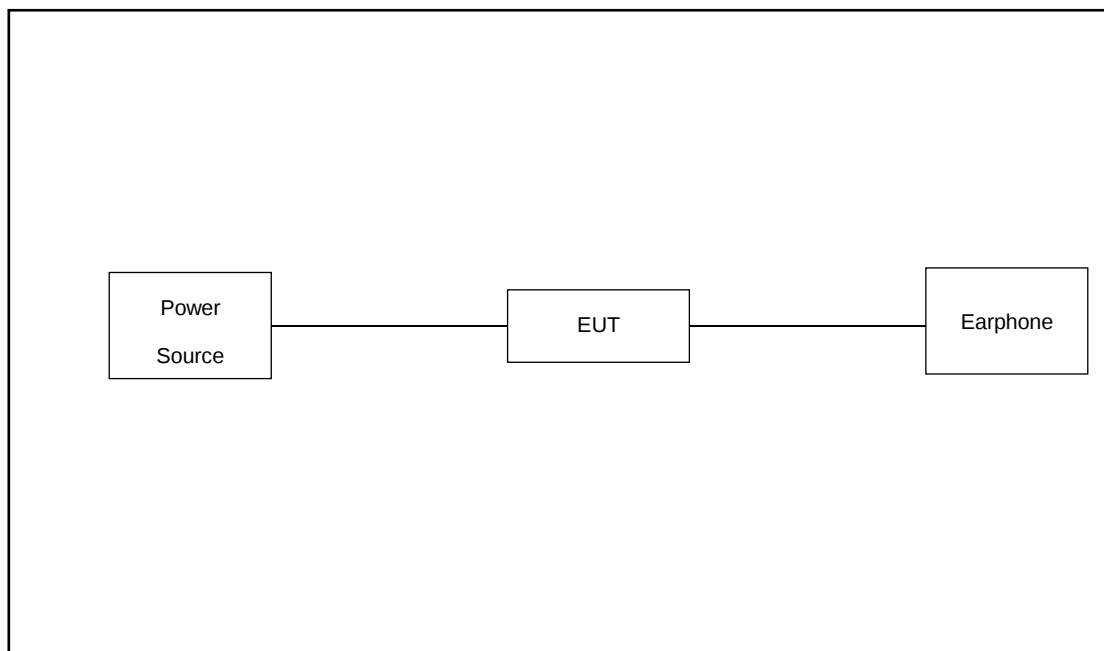
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5700MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	-

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

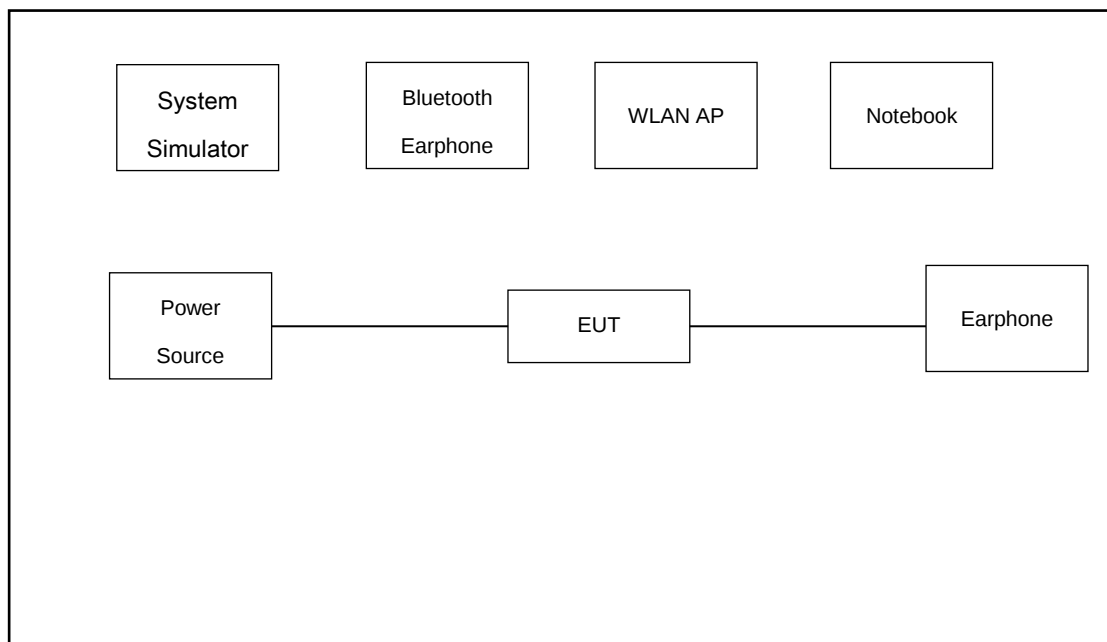
Ch. #		Band I : 5180-5240 MHz	Band II : 5260-5320 MHz	Band III : 5500-5700MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134
Straddle		-	-	-

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	D-link	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
3.	Bluetooth Earphone	Samsung	EO-MG900	N/A	N/A	N/A
4.	Earphone	apple	DCAY1V-A9007ZJW3-000	N/A	shielded,1.2m	N/A
5.	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

Offset = RF cable loss

Following shows an offset computation example with cable loss 6.8 dB.

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} \\
 &= 6.8 \text{ (dB)}
 \end{aligned}$$

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.

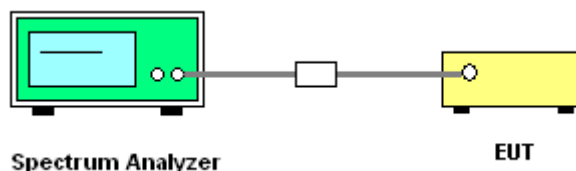
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) $\geq 3 * RBW$.
8. Measure and record the results in the test report.

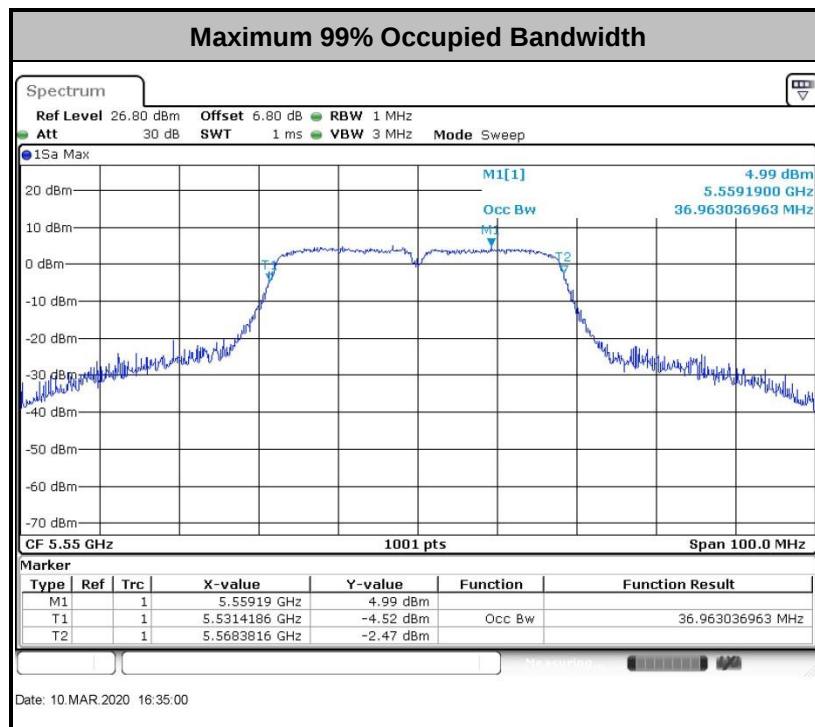
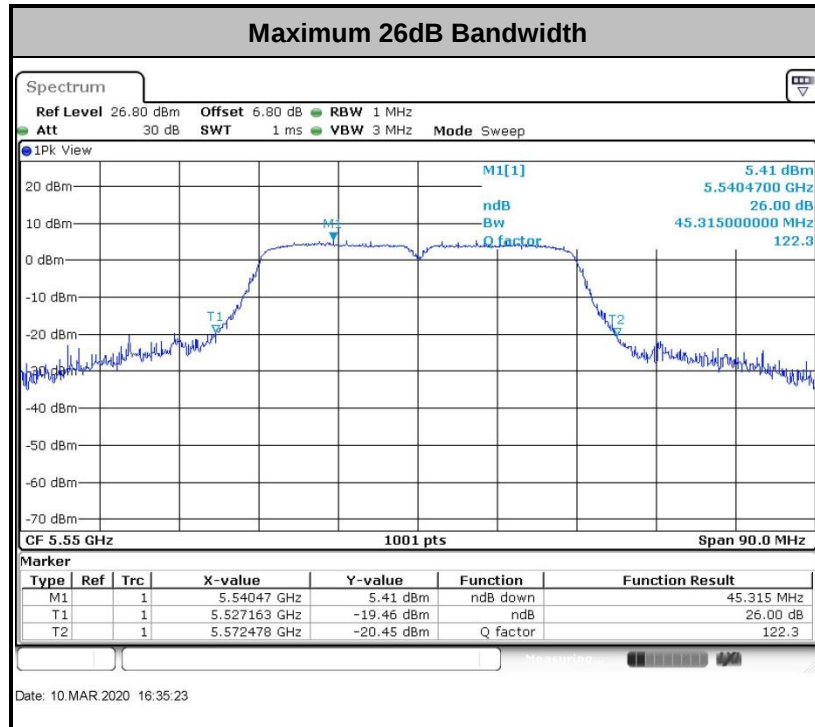
3.1.4 Test Setup





3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.



Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

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

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

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.

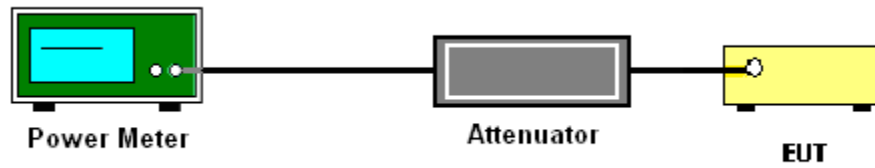
3.2.3 Test Procedures

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.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

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

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

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

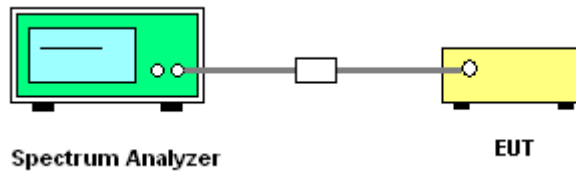
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section F) Maximum power spectral density.

Method SA-2

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

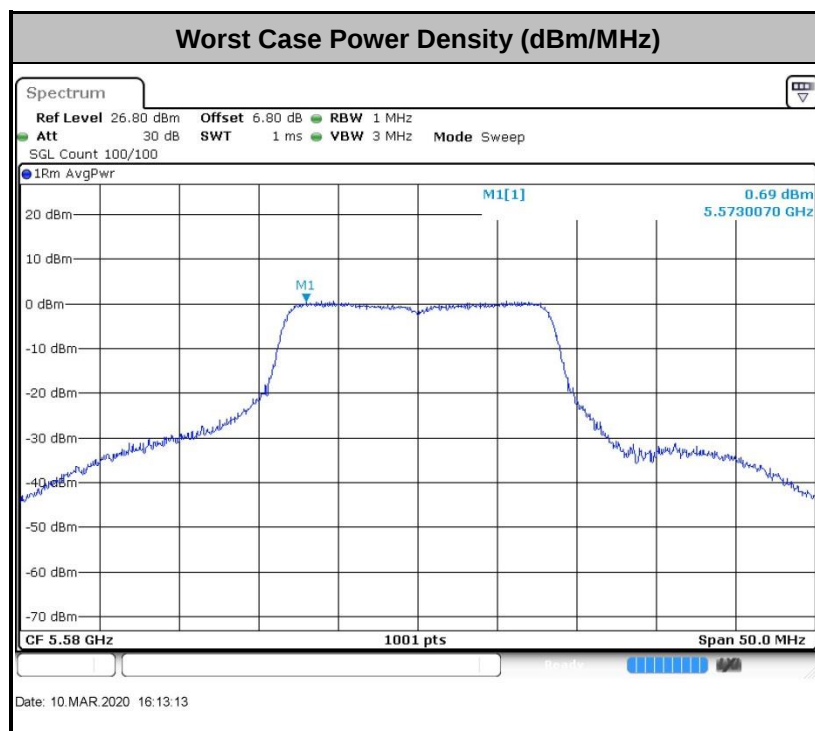
- Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW $\geq$ 3 MHz.
 - Number of points in sweep $\geq$ 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - 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	68.2

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

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

where

EIRP is the equivalent isotropically radiated power, in dBm

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

d_{Meas} is the measurement distance, in m

3.4.2 Measuring Instruments

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



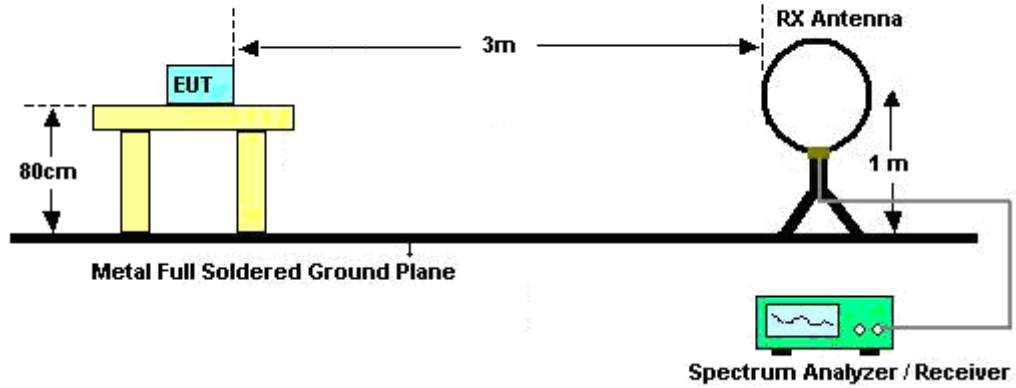
3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
 - (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
 - RBW = 1 MHz
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

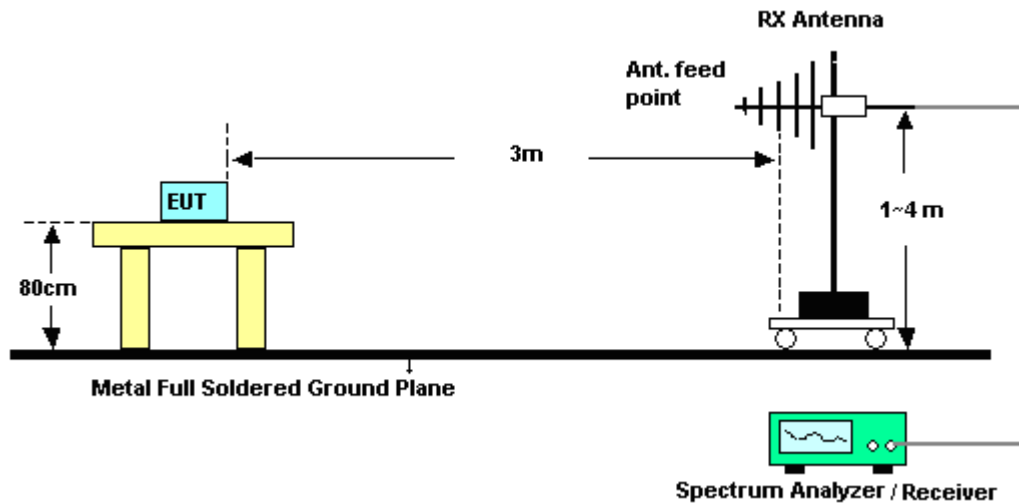


3.4.4 Test Setup

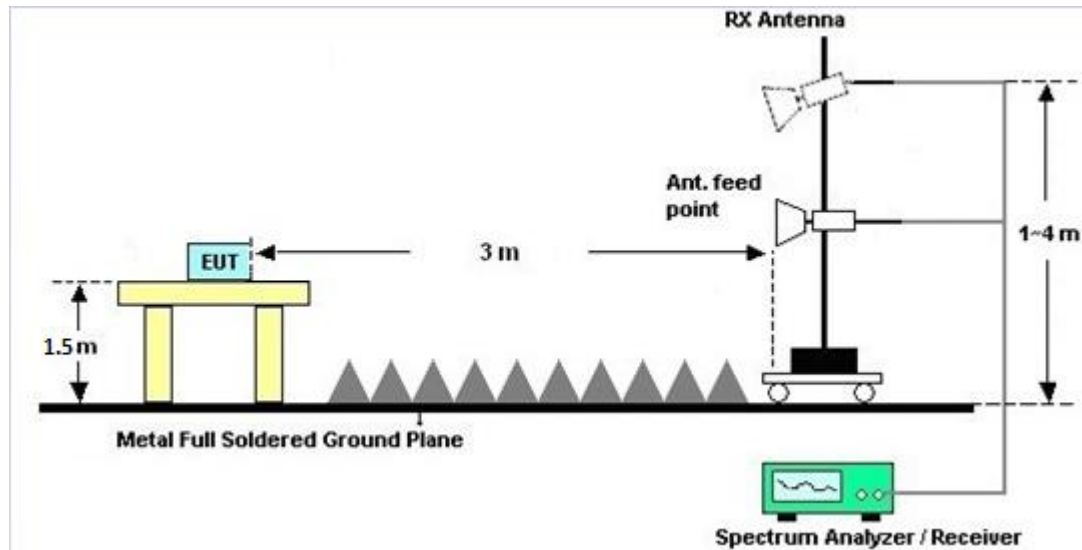
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

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

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix C.

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

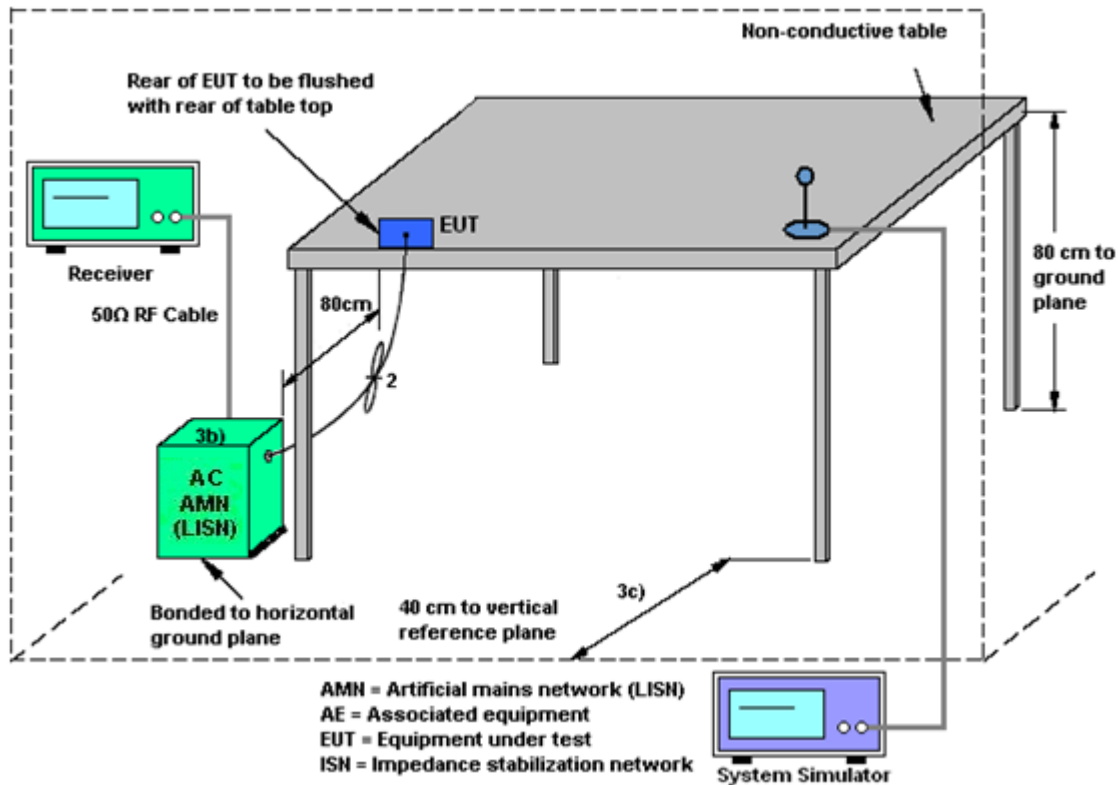
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

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

3.6.2 Measuring Instruments

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

3.6.3 Test Result of Automatically Discontinue Transmission

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



3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

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	101040	10Hz~40GHz	Nov. 02, 2019	Mar. 10, 2020	Nov. 01, 2020	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 08, 2020	Mar. 10, 2020	Jan. 07, 2021	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 08, 2020	Mar. 10, 2020	Jan. 07, 2021	Conducted (TH01-KS)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 19, 2019	Jan. 12, 2020	Apr. 18, 2020	Radiation (03CH02-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 29, 2019	Jan. 12, 2020	May 28, 2020	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz~2GHz	Jul. 19, 2019	Jan. 12, 2020	Jul. 18, 2020	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00119436	1GHz~18GHz	Aug. 27, 2019	Jan. 12, 2020	Aug. 26, 2020	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 22, 2019	Jan. 12, 2020	Jul. 21, 2020	Radiation (03CH02-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Apr. 18, 2019	Jan. 12, 2020	Apr. 17, 2020	Radiation (03CH02-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01~3000Mhz	Oct. 18, 2019	Jan. 12, 2020	Oct. 17, 2020	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 18, 2019	Jan. 12, 2020	Oct. 17, 2020	Radiation (03CH02-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270105	0.5GHz~26.5GHz	Oct. 18, 2019	Jan. 12, 2020	Oct. 17, 2020	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010002470	N/A	NCR	Jan. 12, 2020	NCR	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Jan. 12, 2020	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Jan. 12, 2020	NCR	Radiation (03CH02-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 26, 2019	Jan. 08, 2020	Dec. 25, 2020	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Oct. 17, 2019	Jan. 08, 2020	Oct. 16, 2020	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Dec. 26, 2019	Jan. 08, 2020	Dec. 25, 2020	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 23, 2019	Jan. 08, 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% ($U = 2Uc(y)$)	5.0dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.4dB
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Appendix A. Conducted Test Results

Report Number : FR9D1403E

Test Engineer:	Lex Wu	Temperature:	21~25	°C
Test Date:	2020/3/10	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	18.23	23.48	-	22.61		
11a	6Mbps	1	44	5220	18.43	23.48	-	22.66		
11a	6Mbps	1	48	5240	18.48	23.78	-	22.67		
HT20	MCS0	1	36	5180	19.53	23.53	-	22.91		
HT20	MCS0	1	44	5220	19.08	23.73	-	22.81		
HT20	MCS0	1	48	5240	19.23	23.93	-	22.84		
HT40	MCS0	1	38	5190	36.66	44.51	-	23.01		
HT40	MCS0	1	46	5230	36.46	44.48	-	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	0.58	11.14	24.00	2.97		Pass
11a	6Mbps	1	44	5220	0.58	11.19	24.00	2.97		Pass
11a	6Mbps	1	48	5240	0.58	11.30	24.00	2.97		Pass
HT20	MCS0	1	36	5180	0.62	10.86	24.00	2.97		Pass
HT20	MCS0	1	44	5220	0.62	10.94	24.00	2.97		Pass
HT20	MCS0	1	48	5240	0.62	10.73	24.00	2.97		Pass
HT40	MCS0	1	38	5190	1.49	11.23	24.00	2.97		Pass
HT40	MCS0	1	46	5230	1.49	11.25	24.00	2.97		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
11a	6Mbps	1	36	5180	0.58	0.77	11.00	2.97		Pass
11a	6Mbps	1	44	5220	0.58	0.78	11.00	2.97		Pass
11a	6Mbps	1	48	5240	0.58	0.76	11.00	2.97		Pass
HT20	MCS0	1	36	5180	0.62	-0.29	11.00	2.97		Pass
HT20	MCS0	1	44	5220	0.62	0.39	11.00	2.97		Pass
HT20	MCS0	1	48	5240	0.62	-0.61	11.00	2.97		Pass
HT40	MCS0	1	38	5190	1.49	-2.70	11.00	2.97		Pass
HT40	MCS0	1	46	5230	1.49	-3.11	11.00	2.97		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band II										
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)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	52	5260	18.38	23.53	23.64	29.64	23.98	
11a	6M bps	1	60	5300	18.43	23.58	23.66	29.66	23.98	
11a	6M bps	1	64	5320	18.58	23.63	23.69	29.69	23.98	
HT20	MCS 0	1	52	5260	19.18	23.53	23.83	29.83	23.98	
HT20	MCS 0	1	60	5300	19.23	23.98	23.84	29.84	23.98	
HT20	MCS 0	1	64	5320	19.23	24.18	23.84	29.84	23.98	
HT40	MCS 0	1	54	5270	36.76	44.51	23.98	30.00	23.98	
HT40	MCS 0	1	62	5310	36.46	44.24	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

FCC Band II										
Mod.	Data Rate	N _{TX}	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	0.58	10.83	23.98	2.47	26.99	Pass
11a	6M bps	1	60	5300	0.58	10.85	23.98	2.47	26.99	Pass
11a	6M bps	1	64	5320	0.58	11.24	23.98	2.47	26.99	Pass
HT20	MCS 0	1	52	5260	0.62	10.85	23.98	2.47	26.99	Pass
HT20	MCS 0	1	60	5300	0.62	11.15	23.98	2.47	26.99	Pass
HT20	MCS 0	1	64	5320	0.62	11.23	23.98	2.47	26.99	Pass
HT40	MCS 0	1	54	5270	1.49	11.28	23.98	2.47	26.99	Pass
HT40	MCS 0	1	62	5310	1.49	11.51	23.98	2.47	26.99	Pass

TEST RESULTS DATA
Power Spectral Density

Band II										
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
11a	6M bps	1	52	5260	0.58	-0.51	11.00	2.47		Pass
11a	6M bps	1	60	5300	0.58	-0.33	11.00	2.47		Pass
11a	6M bps	1	64	5320	0.58	0.00	11.00	2.47		Pass
HT20	MCS 0	1	52	5260	0.62	-0.63	11.00	2.47		Pass
HT20	MCS 0	1	60	5300	0.62	-0.10	11.00	2.47		Pass
HT20	MCS 0	1	64	5320	0.62	-0.06	11.00	2.47		Pass
HT40	MCS 0	1	54	5270	1.49	-3.81	11.00	2.47		Pass
HT40	MCS 0	1	62	5310	1.49	-3.24	11.00	2.47		Pass

TEST RESULTS DATA
26dB and 99% OBW

Band III										
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)	FCC 26dB Bandwidth Power Limit (dBm)	Note
11a	6M bps	1	100	5500	18.73	24.58	23.73	29.73	23.98	
11a	6M bps	1	116	5580	18.88	26.28	23.76	29.76	23.98	
11a	6M bps	1	140	5700	18.83	25.23	23.75	29.75	23.98	
HT20	MCS 0	1	100	5500	19.28	24.83	23.85	29.85	23.98	
HT20	MCS 0	1	116	5580	19.58	25.08	23.92	29.92	23.98	
HT20	MCS 0	1	140	5700	19.53	26.22	23.91	29.91	23.98	
HT40	MCS 0	1	102	5510	36.76	45.23	23.98	30.00	23.98	
HT40	MCS 0	1	110	5550	36.96	45.32	23.98	30.00	23.98	
HT40	MCS 0	1	134	5670	36.76	45.23	23.98	30.00	23.98	

TEST RESULTS DATA
Average Power Table

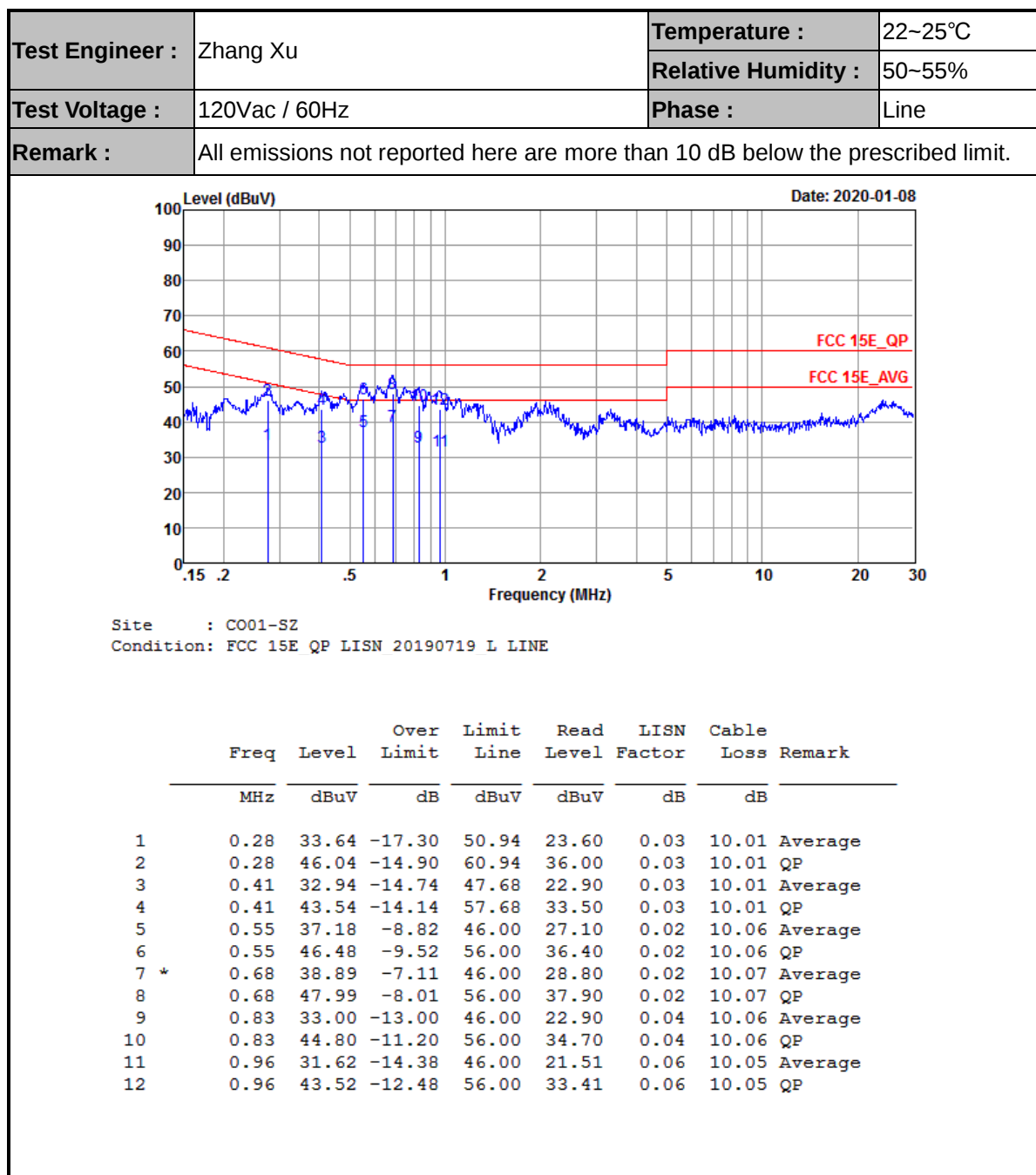
FCC Band III										
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	EIRP Power Limit (dBm)	Pass/Fail
11a	6M bps	1	100	5500	0.58	11.99	23.98	2.00	26.99	Pass
11a	6M bps	1	116	5580	0.58	12.18	23.98	2.00	26.99	Pass
11a	6M bps	1	140	5700	0.58	11.99	23.98	2.00	26.99	Pass
HT20	MCS 0	1	100	5500	0.62	11.99	23.98	2.00	26.99	Pass
HT20	MCS 0	1	116	5580	0.62	12.17	23.98	2.00	26.99	Pass
HT20	MCS 0	1	140	5700	0.62	12.02	23.98	2.00	26.99	Pass
HT40	MCS 0	1	102	5510	1.49	12.31	23.98	2.00	26.99	Pass
HT40	MCS 0	1	110	5550	1.49	11.75	23.98	2.00	26.99	Pass
HT40	MCS 0	1	134	5670	1.49	11.96	23.98	2.00	26.99	Pass

TEST RESULTS DATA
Power Spectral Density

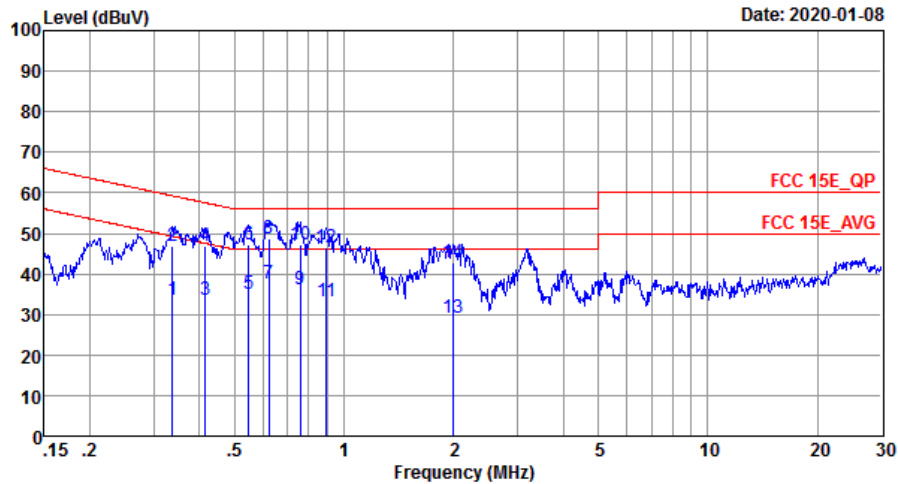
Band III										
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)		Pass/Fail
11a	6M bps	1	100	5500	0.58	0.71	11.00	2.00		Pass
11a	6M bps	1	116	5580	0.58	1.27	11.00	2.00		Pass
11a	6M bps	1	140	5700	0.58	0.45	11.00	2.00		Pass
HT20	MCS 0	1	100	5500	0.62	0.61	11.00	2.00		Pass
HT20	MCS 0	1	116	5580	0.62	0.59	11.00	2.00		Pass
HT20	MCS 0	1	140	5700	0.62	0.45	11.00	2.00		Pass
HT40	MCS 0	1	102	5510	1.49	-1.75	11.00	2.00		Pass
HT40	MCS 0	1	110	5550	1.49	-2.39	11.00	2.00		Pass
HT40	MCS 0	1	134	5670	1.49	-1.86	11.00	2.00		Pass



Appendix B. AC Conducted Emission Test Results



Test Engineer :	Zhang Xu	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	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.34	33.64	-15.63	49.27	23.60	0.03	10.01	Average
2	0.34	46.84	-12.43	59.27	36.80	0.03	10.01	QP
3	0.41	33.74	-13.81	47.55	23.70	0.02	10.02	Average
4	0.41	46.74	-10.81	57.55	36.70	0.02	10.02	QP
5	0.55	35.08	-10.92	46.00	25.00	0.02	10.06	Average
6	0.55	47.38	-8.62	56.00	37.30	0.02	10.06	QP
7	0.62	37.59	-8.41	46.00	27.50	0.02	10.07	Average
8 *	0.62	48.79	-7.21	56.00	38.70	0.02	10.07	QP
9	0.76	35.99	-10.01	46.00	25.89	0.03	10.07	Average
10	0.76	47.39	-8.61	56.00	37.29	0.03	10.07	QP
11	0.89	33.10	-12.90	46.00	23.00	0.04	10.06	Average
12	0.89	46.50	-9.50	56.00	36.40	0.04	10.06	QP
13	2.00	29.30	-16.70	46.00	19.20	0.05	10.05	Average
14	2.00	42.80	-13.20	56.00	32.70	0.05	10.05	QP

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. 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		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5148.46	49.58	-24.42	74	40.84	31.9	10.01	33.17	100	352	P	H
		5149.24	39.69	-14.31	54	30.95	31.9	10.01	33.17	100	352	A	H
	*	5180	96.09	-	-	87.52	31.7	10.03	33.16	100	352	P	H
		5180	88.64	-	-	80.07	31.7	10.03	33.16	100	352	A	H
		5149.24	50.66	-23.34	74	41.92	31.9	10.01	33.17	100	1	P	V
		5149.76	41.66	-12.34	54	32.92	31.9	10.01	33.17	100	1	A	V
	*	5180	101.05	-	-	92.48	31.7	10.03	33.16	100	1	P	V
		5180	94.17	-	-	85.6	31.7	10.03	33.16	100	1	A	V
802.11a CH 44 5220MHz		5114.4	47.28	-26.72	74	38.65	31.83	9.98	33.18	100	360	P	H
		5137.8	38.52	-15.48	54	29.81	31.87	10.01	33.17	100	360	A	H
	*	5220	95.13	-	-	86.72	31.5	10.07	33.16	100	360	P	H
		5220	88.12	-	-	79.71	31.5	10.07	33.16	100	360	A	H
		5419.96	45.55	-28.45	74	36.72	31.7	10.25	33.12	100	360	P	H
		5440.12	36.9	-17.1	54	28.03	31.7	10.28	33.11	100	360	A	H
		5134.42	48.15	-25.85	74	39.47	31.87	9.98	33.17	100	0	P	V
		5068.12	38.48	-15.52	54	29.99	31.73	9.94	33.18	100	0	A	V
	*	5220	100.35	-	-	91.94	31.5	10.07	33.16	100	0	P	V
		5220	92.8	-	-	84.39	31.5	10.07	33.16	100	0	A	V
		5441.52	45.39	-28.61	74	36.52	31.7	10.28	33.11	100	0	P	V
		5404.84	36.78	-17.22	54	27.97	31.7	10.23	33.12	100	0	A	V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 48 5240MHz		5097.24	47.26	-26.74	74	38.68	31.8	9.96	33.18	101	360	P	H
		5109.72	38.51	-15.49	54	29.9	31.83	9.96	33.18	101	360	A	H
	*	5240	95.03	-	-	86.68	31.4	10.1	33.15	101	360	P	H
		5240	86.95	-	-	78.6	31.4	10.1	33.15	101	360	A	H
		5438.44	45.73	-28.27	74	36.86	31.7	10.28	33.11	101	360	P	H
		5446	36.85	-17.15	54	27.98	31.7	10.28	33.11	101	360	A	H
		5040.04	47.37	-26.63	74	38.95	31.7	9.91	33.19	102	0	P	V
		5060.84	38.52	-15.48	54	30.07	31.73	9.91	33.19	102	0	A	V
	*	5240	100.64	-	-	92.29	31.4	10.1	33.15	102	0	P	V
		5240	91.83	-	-	83.48	31.4	10.1	33.15	102	0	A	V
		5446.28	45.11	-28.89	74	36.24	31.7	10.28	33.11	102	0	P	V
		5458.04	36.81	-17.19	54	27.94	31.7	10.28	33.11	102	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 36 5180MHz		10360	49.31	-18.89	68.2	54.05	39.67	14.58	58.99	188	112	P	H
		15540	48.79	-25.21	74	51.79	38.5	17.43	58.93	135	221	P	H
		10360	50.02	-18.18	68.2	54.76	39.67	14.58	58.99	160	122	P	V
		15540	49.47	-24.53	74	52.47	38.5	17.43	58.93	177	291	P	V
802.11a CH 44 5220MHz		10440	49.6	-18.6	68.2	54.07	39.8	14.65	58.92	186	145	P	H
		15660	49.18	-24.82	74	52.54	38.2	17.5	59.06	214	257	P	H
		10440	49.95	-18.25	68.2	54.42	39.8	14.65	58.92	166	134	P	V
		15660	48.55	-25.45	74	51.91	38.2	17.5	59.06	183	311	P	V
802.11a CH 48 5240MHz		10480	50.63	-17.57	68.2	55.02	39.8	14.67	58.86	157	146	P	H
		15720	48.2	-25.8	74	51.79	37.98	17.55	59.12	155	170	P	H
		10480	49.78	-18.42	68.2	54.17	39.8	14.67	58.86	172	267	P	V
		15720	47.59	-26.41	74	51.18	37.98	17.55	59.12	180	126	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 36 5180MHz		5094.64	47.56	-26.44	74	38.98	31.8	9.96	33.18	106	3	P	H
		5149.5	39.74	-14.26	54	31	31.9	10.01	33.17	106	3	A	H
	*	5180	95.77	-	-	87.2	31.7	10.03	33.16	106	3	P	H
		5180	88.42	-	-	79.85	31.7	10.03	33.16	106	3	A	H
		5146.9	50.26	-23.74	74	41.52	31.9	10.01	33.17	102	0	P	V
		5149.76	42.5	-11.5	54	33.76	31.9	10.01	33.17	102	0	A	V
	*	5180	101.19	-	-	92.62	31.7	10.03	33.16	102	0	P	V
		5180	93.95	-	-	85.38	31.7	10.03	33.16	102	0	A	V
802.11n HT20 CH 44 5220MHz		5097.76	47.47	-26.53	74	38.89	31.8	9.96	33.18	106	0	P	H
		5052.26	38.59	-15.41	54	30.17	31.7	9.91	33.19	106	0	A	H
	*	5220	95.33	-	-	86.92	31.5	10.07	33.16	106	0	P	H
		5220	87.87	-	-	79.46	31.5	10.07	33.16	106	0	A	H
		5353.44	45.64	-28.36	74	37.28	31.3	10.19	33.13	106	0	P	H
		5449.68	36.86	-17.14	54	27.99	31.7	10.28	33.11	106	0	A	H
		5026.26	47.08	-26.92	74	38.75	31.63	9.89	33.19	100	0	P	V
		5111.8	38.63	-15.37	54	30.02	31.83	9.96	33.18	100	0	A	V
	*	5220	101.26	-	-	92.85	31.5	10.07	33.16	100	0	P	V
		5220	94.26	-	-	85.85	31.5	10.07	33.16	100	0	A	V
		5411.28	45.15	-28.85	74	36.34	31.7	10.23	33.12	100	0	P	V
		5442	36.9	-17.1	54	28.03	31.7	10.28	33.11	100	0	A	V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 48 5240MHz		5065	46.94	-27.06	74	38.46	31.73	9.94	33.19	108	0	P	H
		5061.36	38.49	-15.51	54	30.04	31.73	9.91	33.19	108	0	A	H
	*	5240	94.72	-	-	86.37	31.4	10.1	33.15	108	0	P	H
		5240	87.7	-	-	79.35	31.4	10.1	33.15	108	0	A	H
		5403.36	44.68	-29.32	74	35.87	31.7	10.23	33.12	108	0	P	H
		5454.96	37.03	-16.97	54	28.16	31.7	10.28	33.11	108	0	A	H
		5050.96	47.5	-26.5	74	39.08	31.7	9.91	33.19	100	0	P	V
		5090.48	38.52	-15.48	54	29.94	31.8	9.96	33.18	100	0	A	V
	*	5240	101.51	-	-	93.16	31.4	10.1	33.15	100	0	P	V
		5240	94.3	-	-	85.95	31.4	10.1	33.15	100	0	A	V
		5411.04	45.99	-28.01	74	37.18	31.7	10.23	33.12	100	0	P	V
		5447.04	36.88	-17.12	54	28.01	31.7	10.28	33.11	100	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		10360	49.86	-18.34	68.2	54.6	39.67	14.58	58.99	183	158	P	H
HT20		15540	49.56	-24.44	74	52.56	38.5	17.43	58.93	244	256	P	H
CH 36		10360	49.28	-18.92	68.2	54.02	39.67	14.58	58.99	177	130	P	V
5180MHz		15540	49.85	-24.15	74	52.85	38.5	17.43	58.93	182	196	P	V
802.11n		10440	49.39	-18.81	68.2	53.86	39.8	14.65	58.92	181	165	P	H
HT20		15660	48.55	-25.45	74	51.91	38.2	17.5	59.06	254	175	P	H
CH 44		10440	49.16	-19.04	68.2	53.63	39.8	14.65	58.92	160	150	P	V
5220MHz		15660	48.31	-25.69	74	51.67	38.2	17.5	59.06	179	182	P	V
802.11n		10480	50.27	-17.93	68.2	54.66	39.8	14.67	58.86	193	167	P	H
HT20		15720	48.58	-25.42	74	52.17	37.98	17.55	59.12	242	175	P	H
CH 48		10480	50.64	-17.56	68.2	55.03	39.8	14.67	58.86	177	125	P	V
5240MHz		15720	49.38	-24.62	74	52.97	37.98	17.55	59.12	185	116	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 38 5190MHz		5149.76	51.23	-22.77	74	42.44	31.9	10.06	33.17	100	332	P	H
		5150	44.92	-9.08	54	36.13	31.9	10.06	33.17	100	332	A	H
	*	5190	89.38	-	-	80.75	31.7	10.09	33.16	100	332	P	H
		5190	83.09	-	-	74.46	31.7	10.09	33.16	100	332	A	H
		5460	45.18	-28.82	74	36.21	31.7	10.38	33.11	100	332	P	H
		5453.28	37.69	-16.31	54	28.72	31.7	10.38	33.11	100	332	A	H
		5149.76	55.07	-18.93	74	46.28	31.9	10.06	33.17	100	0	P	V
		5149.24	48.61	-5.39	54	39.82	31.9	10.06	33.17	100	0	A	V
	*	5190	94.41	-	-	85.78	31.7	10.09	33.16	100	0	P	V
		5190	87.18	-	-	78.55	31.7	10.09	33.16	100	0	A	V
		5420.8	45.92	-28.08	74	37	31.7	10.34	33.12	100	0	P	V
		5429.2	37.46	-16.54	54	28.49	31.7	10.38	33.11	100	0	A	V
802.11n HT40 CH 46 5230MHz		5087.36	47.18	-26.82	74	38.65	31.77	9.94	33.18	100	5	P	H
		5092.82	39.19	-14.81	54	30.61	31.8	9.96	33.18	100	5	A	H
	*	5230	91.83	-	-	83.51	31.4	10.07	33.15	100	5	P	H
		5230	84.18	-	-	75.86	31.4	10.07	33.15	100	5	A	H
		5459.52	45.75	-28.25	74	36.88	31.7	10.28	33.11	100	5	P	H
		5416.8	37.78	-16.22	54	28.95	31.7	10.25	33.12	100	5	A	H
		5125.84	47.34	-26.66	74	38.66	31.87	9.98	33.17	108	2	P	V
		5126.88	39.84	-14.16	54	31.16	31.87	9.98	33.17	108	2	A	V
	*	5230	96.95	-	-	88.63	31.4	10.07	33.15	108	2	P	V
		5230	89.55	-	-	81.23	31.4	10.07	33.15	108	2	A	V
		5389.44	45.95	-28.05	74	37.27	31.57	10.23	33.12	108	2	P	V
		5427.84	37.83	-16.17	54	28.99	31.7	10.25	33.11	108	2	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		10380	50.45	-17.75	68.2	55.43	39.73	14.26	58.97	180	160	P	H
HT40		15570	49.52	-24.48	74	51.23	38.4	18.86	58.97	186	143	P	H
CH 38		10380	50.07	-18.13	68.2	55.05	39.73	14.26	58.97	152	176	P	V
5190MHz		15570	48.71	-25.29	74	50.42	38.4	18.86	58.97	171	225	P	V
802.11n		10460	50.37	-17.83	68.2	54.82	39.8	14.65	58.9	153	69	P	H
HT40		15690	49.73	-24.27	74	53.16	38.13	17.53	59.09	120	56	P	H
CH 46		10460	50.66	-17.54	68.2	55.11	39.8	14.65	58.9	160	360	P	V
5230MHz		15690	49.21	-24.79	74	52.64	38.13	17.53	59.09	160	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 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 52 5260MHz		5033.25	47.19	-26.81	74	38.86	31.63	9.89	33.19	163	328	P	H
		5100.1	38.6	-15.4	54	30.02	31.8	9.96	33.18	163	328	A	H
	*	5260	95.42	-	-	87.17	31.3	10.1	33.15	163	328	P	H
		5260	88.03	-	-	79.78	31.3	10.1	33.15	163	328	A	H
		5441.76	45.32	-28.68	74	36.45	31.7	10.28	33.11	163	328	P	H
		5443.44	37.15	-16.85	54	28.28	31.7	10.28	33.11	163	328	A	H
		5128.1	47.71	-26.29	74	39.03	31.87	9.98	33.17	100	6	P	V
		5074.55	38.58	-15.42	54	30.05	31.77	9.94	33.18	100	6	A	V
	*	5260	100.01	-	-	91.76	31.3	10.1	33.15	100	6	P	V
		5260	91.81	-	-	83.56	31.3	10.1	33.15	100	6	A	V
		5398.56	44.91	-29.09	74	36.1	31.7	10.23	33.12	100	6	P	V
		5445.12	37.1	-16.9	54	28.23	31.7	10.28	33.11	100	6	A	V
802.11a CH 60 5300MHz		5018.2	47.67	-26.33	74	39.4	31.57	9.89	33.19	261	328	P	H
		5121.45	38.47	-15.53	54	29.83	31.83	9.98	33.17	261	328	A	H
	*	5300	95.98	-	-	87.68	31.3	10.14	33.14	261	328	P	H
		5300	87.94	-	-	79.64	31.3	10.14	33.14	261	328	A	H
		5450.88	45.9	-28.1	74	37.03	31.7	10.28	33.11	261	328	P	H
		5352.24	38.09	-15.91	54	29.73	31.3	10.19	33.13	261	328	A	H
		5017.85	46.88	-27.12	74	38.61	31.57	9.89	33.19	100	0	P	V
		5067.2	38.57	-15.43	54	30.09	31.73	9.94	33.19	100	0	A	V
	*	5300	99.75	-	-	91.45	31.3	10.14	33.14	100	0	P	V
		5300	91.49	-	-	83.19	31.3	10.14	33.14	100	0	A	V
		5351.52	46.36	-27.64	74	38	31.3	10.19	33.13	100	0	P	V
		5351.52	40.9	-13.1	54	32.54	31.3	10.19	33.13	100	0	A	V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 64 5320MHz	*	5320	95.43	-	-	87.11	31.3	10.16	33.14	275	328	P	H
		5320	87.8	-	-	79.48	31.3	10.16	33.14	275	328	A	H
		5350.4	46.83	-27.17	74	38.47	31.3	10.19	33.13	275	328	P	H
		5350.24	38.9	-15.1	54	30.54	31.3	10.19	33.13	275	328	A	H
	*	5320	98.91	-	-	90.59	31.3	10.16	33.14	100	14	P	V
		5320	90.99	-	-	82.67	31.3	10.16	33.14	100	14	A	V
		5352.64	50	-24	74	41.64	31.3	10.19	33.13	100	14	P	V
		5350.08	40.81	-13.19	54	32.45	31.3	10.19	33.13	100	14	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 52 5260MHz		10520	49.51	-18.69	68.2	53.83	39.8	14.7	58.82	147	120	P	H
		15780	48.16	-25.84	74	52.12	37.63	17.59	59.18	258	175	P	H
		10520	49.18	-19.02	68.2	53.5	39.8	14.7	58.82	173	236	P	V
		15780	47.35	-26.65	74	51.31	37.63	17.59	59.18	169	251	P	V
802.11a CH 60 5300MHz		10600	49.17	-24.83	74	53.34	39.8	14.76	58.73	283	334	P	H
		15900	48.41	-25.59	74	52.63	37.4	17.68	59.3	255	263	P	H
		10600	49.8	-24.2	74	53.97	39.8	14.76	58.73	164	111	P	V
		15900	49.31	-24.69	74	53.53	37.4	17.68	59.3	168	94	P	V
802.11a CH 64 5320MHz		10640	50.08	-23.92	74	54.18	39.8	14.79	58.69	239	147	P	H
		15960	48.02	-25.98	74	52.28	37.4	17.71	59.37	258	74	P	H
		10640	49.1	-24.9	74	53.2	39.8	14.79	58.69	175	74	P	V
		15960	47.59	-26.41	74	51.85	37.4	17.71	59.37	183	51	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 52 5260MHz		5088.2	47.05	-26.95	74	38.5	31.77	9.96	33.18	108	0	P	H
		5057.05	38.65	-15.35	54	30.2	31.73	9.91	33.19	108	0	A	H
	*	5260	94.26	-	-	86.01	31.3	10.1	33.15	108	0	P	H
		5260	87.4	-	-	79.15	31.3	10.1	33.15	108	0	A	H
		5429.52	46.6	-27.4	74	37.76	31.7	10.25	33.11	108	0	P	H
		5430.24	37.13	-16.87	54	28.29	31.7	10.25	33.11	108	0	A	H
		5029.75	47.29	-26.71	74	38.96	31.63	9.89	33.19	100	1	P	V
		5082.95	38.77	-15.23	54	30.24	31.77	9.94	33.18	100	1	A	V
	*	5260	101.47	-	-	93.22	31.3	10.1	33.15	100	1	P	V
		5260	94.14	-	-	85.89	31.3	10.1	33.15	100	1	A	V
		5423.28	44.87	-29.13	74	36.04	31.7	10.25	33.12	100	1	P	V
		5454.24	37.14	-16.86	54	28.27	31.7	10.28	33.11	100	1	A	V
802.11n HT20 CH 60 5300MHz		5144.55	47.46	-26.54	74	38.72	31.9	10.01	33.17	106	0	P	H
		5141.05	38.6	-15.4	54	29.86	31.9	10.01	33.17	106	0	A	H
	*	5300	93.78	-	-	85.48	31.3	10.14	33.14	106	0	P	H
		5300	87.25	-	-	78.95	31.3	10.14	33.14	106	0	A	H
		5408.64	45.11	-28.89	74	36.3	31.7	10.23	33.12	106	0	P	H
		5457.12	37.02	-16.98	54	28.15	31.7	10.28	33.11	106	0	A	H
		5123.9	47.04	-26.96	74	38.36	31.87	9.98	33.17	100	0	P	V
		5063	38.51	-15.49	54	30.03	31.73	9.94	33.19	100	0	A	V
	*	5300	101.32	-	-	93.02	31.3	10.14	33.14	100	0	P	V
		5300	93.93	-	-	85.63	31.3	10.14	33.14	100	0	A	V
		5351.52	46.36	-27.64	74	38	31.3	10.19	33.13	100	0	P	V
		5351.52	40.9	-13.1	54	32.54	31.3	10.19	33.13	100	0	A	V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 64 5320MHz	*	5320	94.66	-	-	86.34	31.3	10.16	33.14	163	328	P	H
		5320	85.86	-	-	77.54	31.3	10.16	33.14	163	328	A	H
		5352.64	47.52	-26.48	74	39.16	31.3	10.19	33.13	163	328	P	H
		5350.08	39.03	-14.97	54	30.67	31.3	10.19	33.13	163	328	A	H
	*	5320	100.68	-	-	92.36	31.3	10.16	33.14	105	0	P	V
		5320	93.65	-	-	85.33	31.3	10.16	33.14	105	0	A	V
		5352.8	52.33	-21.67	74	43.97	31.3	10.19	33.13	105	0	P	V
		5350.4	42.45	-11.55	54	34.09	31.3	10.19	33.13	105	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		10520	49.55	-18.65	68.2	53.87	39.8	14.7	58.82	331	188	P	H
HT20		15780	48.56	-25.44	74	52.52	37.63	17.59	59.18	262	309	P	H
CH 52		10520	49.29	-18.91	68.2	53.61	39.8	14.7	58.82	190	150	P	V
5260MHz		15780	48.56	-25.44	74	52.52	37.63	17.59	59.18	188	72	P	V
802.11n		10600	49.86	-24.14	74	54.03	39.8	14.76	58.73	244	148	P	H
HT20		15900	48.07	-25.93	74	52.29	37.4	17.68	59.3	293	175	P	H
CH 60		10600	49.39	-24.61	74	53.56	39.8	14.76	58.73	165	110	P	V
5300MHz		15900	47.72	-26.28	74	51.94	37.4	17.68	59.3	177	133	P	V
802.11n		10640	49.19	-24.81	74	53.29	39.8	14.79	58.69	329	248	P	H
HT20		15960	48.06	-25.94	74	52.32	37.4	17.71	59.37	259	232	P	H
CH 64		10640	49.92	-24.08	74	54.02	39.8	14.79	58.69	183	180	P	V
5320MHz		15960	49.11	-24.89	74	53.37	37.4	17.71	59.37	153	96	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 54 5270MHz		5054.6	47.27	-26.73	74	38.82	31.73	9.91	33.19	100	332	P	H
		5088.55	39.31	-14.69	54	30.73	31.8	9.96	33.18	100	332	A	H
	*	5270	93.5	-	-	85.23	31.3	10.12	33.15	100	332	P	H
		5270	84.77	-	-	76.5	31.3	10.12	33.15	100	332	A	H
		5453.04	46.07	-27.93	74	37.2	31.7	10.28	33.11	100	332	P	H
		5452.32	37.82	-16.18	54	28.95	31.7	10.28	33.11	100	332	A	H
		5023.45	47.33	-26.67	74	39	31.63	9.89	33.19	100	2	P	V
		5101.5	39.36	-14.64	54	30.78	31.8	9.96	33.18	100	2	A	V
	*	5270	97.25	-	-	88.98	31.3	10.12	33.15	100	2	P	V
		5270	91.5	-	-	83.23	31.3	10.12	33.15	100	2	A	V
		5371.92	45.19	-28.81	74	36.68	31.43	10.21	33.13	100	2	P	V
		5372.4	38.34	-15.66	54	29.83	31.43	10.21	33.13	100	2	A	V
802.11n HT40 CH 62 5310MHz		5093.45	46.91	-27.09	74	38.33	31.8	9.96	33.18	248	332	P	H
		5043.75	39.27	-14.73	54	30.85	31.7	9.91	33.19	248	332	A	H
	*	5310	92.34	-	-	84.04	31.3	10.14	33.14	248	332	P	H
		5310	84.3	-	-	76	31.3	10.14	33.14	248	332	A	H
		5351.28	52.67	-21.33	74	44.31	31.3	10.19	33.13	248	332	P	H
		5351.04	46.38	-7.62	54	38.02	31.3	10.19	33.13	248	332	A	H
		5037.1	48.06	-25.94	74	39.73	31.63	9.89	33.19	101	2	P	V
		5097.65	39.35	-14.65	54	30.77	31.8	9.96	33.18	101	2	A	V
	*	5310	96.99	-	-	88.69	31.3	10.14	33.14	101	2	P	V
		5310	88.79	-	-	80.49	31.3	10.14	33.14	101	2	A	V
		5350.8	58.14	-15.86	74	49.78	31.3	10.19	33.13	101	2	P	V
		5350.32	50.67	-3.33	54	42.31	31.3	10.19	33.13	101	2	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 2 5250~5350MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		10540	50.72	-17.48	68.2	55	39.8	14.72	58.8	160	360	P	H
HT40		15810	48.51	-25.49	74	52.71	37.4	17.61	59.21	160	152	P	H
CH 54		10540	50.48	-17.72	68.2	54.76	39.8	14.72	58.8	160	156	P	V
5270MHz		15810	48.33	-25.67	74	52.53	37.4	17.61	59.21	160	25	P	V
802.11n		10620	50.89	-23.11	74	55.02	39.8	14.78	58.71	186	186	P	H
HT40		15930	48.52	-25.48	74	52.75	37.4	17.7	59.33	196	153	P	H
CH 62		10620	50.4	-23.6	74	54.53	39.8	14.78	58.71	152	236	P	V
5310MHz		15930	47.52	-26.48	74	51.75	37.4	17.7	59.33	160	156	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		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 100 5500MHz		5430.16	45.98	-28.02	74	37.14	31.7	10.25	33.11	240	318	P	H
		5468.56	47.56	-20.64	68.2	38.6	31.77	10.3	33.11	240	318	P	H
		5447.76	37.82	-16.18	54	28.95	31.7	10.28	33.11	240	318	A	H
	*	5500	95.65	-	-	86.53	31.9	10.32	33.1	240	318	P	H
		5500	87.52	-	-	78.4	31.9	10.32	33.1	240	318	A	H
		5459.44	48.07	-25.93	74	39.2	31.7	10.28	33.11	100	311	P	V
		5468.56	48.46	-19.74	68.2	39.5	31.77	10.3	33.11	100	311	P	V
		5447.92	39.74	-14.26	54	30.87	31.7	10.28	33.11	100	311	A	V
	*	5500	100.52	-	-	91.4	31.9	10.32	33.1	100	311	P	V
		5500	93.36	-	-	84.24	31.9	10.32	33.1	100	311	A	V
802.11a CH 116 5580MHz		5448.16	46.32	-27.68	74	37.45	31.7	10.28	33.11	167	318	P	H
		5466.16	46.06	-22.14	68.2	37.1	31.77	10.3	33.11	167	318	P	H
		5457.52	36.88	-17.12	54	28.01	31.7	10.28	33.11	167	318	A	H
	*	5580	97.33	-	-	88.31	31.73	10.39	33.1	167	318	P	H
		5580	89.07	-	-	80.05	31.73	10.39	33.1	167	318	A	H
		5744.84	46.07	-22.13	68.2	36.52	32.1	10.55	33.1	167	318	P	H
		5383.36	45.31	-22.89	68.2	36.65	31.57	10.21	33.12	100	310	P	V
		5459.92	44.86	-29.14	74	35.99	31.7	10.28	33.11	100	310	P	V
		5440	36.87	-17.13	54	28	31.7	10.28	33.11	100	310	A	V
	*	5580	101.67	-	-	92.65	31.73	10.39	33.1	100	310	P	V
		5580	93.35	-	-	84.33	31.73	10.39	33.1	100	310	A	V
		5751.455	46.72	-21.48	68.2	37.17	32.1	10.55	33.1	100	310	P	V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 140 5700MHz	*	5700	97.09	-	-	87.69	32	10.5	33.1	291	319	P	H
		5700	88.46	-	-	79.06	32	10.5	33.1	291	319	A	H
		5725.56	56.56	-11.64	68.2	47.07	32.07	10.52	33.1	291	319	P	H
	*	5700	100.98	-	-	91.58	32	10.5	33.1	100	0	P	V
		5700	92.49	-	-	83.09	32	10.5	33.1	100	0	A	V
		5725.4	55.23	-12.97	68.2	45.74	32.07	10.52	33.1	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 100 5500MHz		11000	49.7	-24.3	74	52.85	40.1	15.05	58.3	243	285	P	H
		16500	47.43	-20.77	68.2	49.96	38.5	17.81	58.84	207	118	P	H
		11000	48.83	-25.17	74	51.98	40.1	15.05	58.3	182	56	P	V
		16500	47.98	-20.22	68.2	50.51	38.5	17.81	58.84	179	63	P	V
802.11a CH 116 5580MHz		11160	48.68	-25.32	74	52	39.67	15.12	58.11	116	167	P	H
		16740	49.51	-18.69	68.2	50.36	39.9	17.83	58.58	182	36	P	H
		11160	49.39	-24.61	74	52.71	39.67	15.12	58.11	192	96	P	V
		16740	48.63	-19.57	68.2	49.48	39.9	17.83	58.58	179	99	P	V
802.11a CH 140 5700MHz		11400	50.21	-23.79	74	52.93	39.9	15.23	57.85	293	237	P	H
		17100	50.7	-17.5	68.2	50.74	40.2	17.92	58.16	279	150	P	H
		11400	49.99	-24.01	74	52.71	39.9	15.23	57.85	186	69	P	V
		17100	50.35	-17.85	68.2	50.39	40.2	17.92	58.16	173	156	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 100 5500MHz		5448.56	46.52	-27.48	74	37.65	31.7	10.28	33.11	110	0	P	H
		5469.52	45.54	-22.66	68.2	36.58	31.77	10.3	33.11	110	0	P	H
		5447.76	37.44	-16.56	54	28.57	31.7	10.28	33.11	110	0	A	H
	*	5500	94.05	-	-	84.93	31.9	10.32	33.1	110	0	P	H
		5500	88.75	-	-	79.63	31.9	10.32	33.1	110	0	A	H
		5457.68	47.47	-26.53	74	38.6	31.7	10.28	33.11	100	0	P	V
		5469.36	49.48	-18.72	68.2	40.52	31.77	10.3	33.11	100	0	P	V
		5448.24	40.94	-13.06	54	32.07	31.7	10.28	33.11	100	0	A	V
	*	5500	100.61	-	-	91.49	31.9	10.32	33.1	100	0	P	V
		5500	94.17	-	-	85.05	31.9	10.32	33.1	100	0	A	V
802.11n HT20 CH 116 5580MHz		5353.84	44.97	-29.03	74	36.61	31.3	10.19	33.13	167	323	P	H
		5462.8	44.88	-23.32	68.2	35.92	31.77	10.3	33.11	167	323	P	H
		5444.32	37.03	-16.97	54	28.16	31.7	10.28	33.11	167	323	A	H
	*	5580	97.04	-	-	88.02	31.73	10.39	33.1	167	323	P	H
		5580	89.98	-	-	80.96	31.73	10.39	33.1	167	323	A	H
		5755.865	46.15	-22.05	68.2	36.57	32.13	10.55	33.1	167	323	P	H
		5426.32	45.59	-28.41	74	36.75	31.7	10.25	33.11	100	0	P	V
		5465.68	44.33	-23.87	68.2	35.37	31.77	10.3	33.11	100	0	P	V
		5455.12	37.18	-16.82	54	28.31	31.7	10.28	33.11	100	0	A	V
	*	5580	100.77	-	-	91.75	31.73	10.39	33.1	100	0	P	V
		5580	94.45	-	-	85.43	31.73	10.39	33.1	100	0	A	V
		5759.015	47.36	-20.84	68.2	37.78	32.13	10.55	33.1	100	0	P	V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 140 5700MHz	*	5700	96.76	-	-	87.36	32	10.5	33.1	167	323	P	H
		5700	90.6	-	-	81.2	32	10.5	33.1	167	323	A	H
		5727.48	55.89	-12.31	68.2	46.4	32.07	10.52	33.1	167	323	P	H
	*	5700	101.38	-	-	91.98	32	10.5	33.1	100	10	P	V
		5700	95.03	-	-	85.63	32	10.5	33.1	100	10	A	V
		5725	59.31	-8.89	68.2	49.82	32.07	10.52	33.1	100	10	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		11000	48.76	-25.24	74	51.91	40.1	15.05	58.3	191	150	P	H
HT20		16500	47.74	-20.46	68.2	50.27	38.5	17.81	58.84	204	185	P	H
CH 100		11000	50.44	-23.56	74	53.59	40.1	15.05	58.3	180	120	P	V
5500MHz		16500	48.3	-19.9	68.2	50.83	38.5	17.81	58.84	175	162	P	V
802.11n		11160	49.11	-24.89	74	52.43	39.67	15.12	58.11	299	248	P	H
HT20		16740	49.08	-19.12	68.2	49.93	39.9	17.83	58.58	177	191	P	H
CH 116		11160	50.43	-23.57	74	53.75	39.67	15.12	58.11	166	185	P	V
5580MHz		16740	49.21	-18.99	68.2	50.06	39.9	17.83	58.58	181	153	P	V
802.11n		11400	50.67	-23.33	74	53.39	39.9	15.23	57.85	188	96	P	H
HT20		17100	50.37	-17.83	68.2	50.41	40.2	17.92	58.16	179	155	P	H
CH 140		11400	50.48	-23.52	74	53.2	39.9	15.23	57.85	188	96	P	V
5700MHz		17100	50.52	-17.68	68.2	50.56	40.2	17.92	58.16	179	155	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 102 5510MHz		5457.04	47.2	-26.8	74	38.33	31.7	10.28	33.11	242	330	P	H
		5469.28	56.76	-11.44	68.2	47.8	31.77	10.3	33.11	242	330	P	H
		5459.92	41.5	-12.5	54	32.63	31.7	10.28	33.11	242	330	A	H
	*	5510	92.92	-	-	83.8	31.9	10.32	33.1	242	330	P	H
		5510	84.34	-	-	75.22	31.9	10.32	33.1	242	330	A	H
		5760.905	46.6	-21.6	68.2	37.02	32.13	10.55	33.1	242	330	P	H
		5453.44	48.53	-25.47	74	39.66	31.7	10.28	33.11	255	330	P	V
		5467.84	56.67	-11.53	68.2	47.71	31.77	10.3	33.11	255	330	P	V
		5459.92	42.11	-11.89	54	33.24	31.7	10.28	33.11	255	330	A	V
	*	5510	96.05	-	-	86.93	31.9	10.32	33.1	255	330	P	V
		5510	88.3	-	-	79.18	31.9	10.32	33.1	255	330	A	V
		5755.235	46.42	-21.78	68.2	36.84	32.13	10.55	33.1	255	330	P	V
802.11n HT40 CH 110 5550MHz		5410.48	45.22	-28.78	74	36.41	31.7	10.23	33.12	175	333	P	H
		5467.12	45.94	-22.26	68.2	36.98	31.77	10.3	33.11	175	333	P	H
		5445.52	38.19	-15.81	54	29.32	31.7	10.28	33.11	175	333	A	H
	*	5550	94.36	-	-	85.4	31.7	10.36	33.1	175	333	P	H
		5550	88.65	-	-	79.69	31.7	10.36	33.1	175	333	A	H
		5753.345	47.65	-20.55	68.2	38.07	32.13	10.55	33.1	175	333	P	H
		5445.52	46.68	-27.32	74	37.81	31.7	10.28	33.11	100	48	P	V
		5466.16	47.21	-20.99	68.2	38.25	31.77	10.3	33.11	100	48	P	V
		5446	38.67	-15.33	54	29.8	31.7	10.28	33.11	100	48	A	V
	*	5550	98.21	-	-	89.25	31.7	10.36	33.1	100	48	P	V
		5550	89.97	-	-	81.01	31.7	10.36	33.1	100	48	A	V
		5733.5	47.12	-21.08	68.2	37.63	32.07	10.52	33.1	100	48	P	V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 134 5670MHz		5408.1	45.88	-28.12	74	37.07	31.7	10.23	33.12	100	62	P	H
		5466.2	44.07	-24.13	68.2	35.11	31.77	10.3	33.11	100	62	P	H
		5444.85	37.72	-16.28	54	28.85	31.7	10.28	33.11	100	62	A	H
	*	5670	93.88	-	-	84.65	31.85	10.48	33.1	100	62	P	H
		5670	87.12	-	-	77.89	31.85	10.48	33.1	100	62	A	H
		5740.15	48.48	-19.72	68.2	38.93	32.1	10.55	33.1	100	62	P	H
		5434.35	44.86	-29.14	74	36.02	31.7	10.25	33.11	100	324	P	V
		5461.3	44.41	-23.79	68.2	35.54	31.7	10.28	33.11	100	324	P	V
		5458.85	37.9	-16.1	54	29.03	31.7	10.28	33.11	100	324	A	V
	*	5670	98.15	-	-	88.92	31.85	10.48	33.1	100	324	P	V
		5670	91.17	-	-	81.94	31.85	10.48	33.1	100	324	A	V
		5727.9	52.55	-15.65	68.2	43.06	32.07	10.52	33.1	100	324	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1	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	49.42	-24.58	74	52.59	40.05	15.06	58.28	152	63	P	H
HT40		16530	48.85	-19.35	68.2	51.17	38.67	17.81	58.8	160	0	P	H
CH 102		11020	50.5	-23.5	74	53.67	40.05	15.06	58.28	160	120	P	V
5510MHz		16530	48.28	-19.92	68.2	50.6	38.67	17.81	58.8	160	156	P	V
802.11n		11100	50.42	-23.58	74	53.71	39.8	15.1	58.19	186	153	P	H
HT40		16650	49.2	-19	68.2	50.6	39.45	17.82	58.67	186	26	P	H
CH 110		11100	49.46	-24.54	74	52.75	39.8	15.1	58.19	123	36	P	V
5550MHz		16650	49.82	-18.38	68.2	51.22	39.45	17.82	58.67	163	253	P	V
802.11n		11340	50.3	-23.7	74	53.19	39.83	15.21	57.93	125	156	P	H
HT40		17010	50.63	-17.57	68.2	50.52	40.53	17.86	58.28	189	123	P	H
CH 134		11340	50.54	-23.46	74	53.43	39.83	15.21	57.93	175	158	P	V
5670MHz		17010	50.62	-17.58	68.2	50.51	40.53	17.86	58.28	186	153	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

WIFI 802.11n 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		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 LF		30	28.93	-11.07	40	34.87	24.8	0.56	31.3	187	240	P	H
		131.85	28.67	-14.83	43.5	41.5	17.46	1.19	31.48	-	-	P	H
		231.76	25.61	-20.39	46	38.96	16.62	1.59	31.56	-	-	P	H
		331.67	23.52	-22.48	46	32.77	20.17	1.92	31.34	-	-	P	H
		506.27	26.91	-19.09	46	31.7	24.01	2.41	31.21	-	-	P	H
		618.79	27.46	-18.54	46	30.31	25.97	2.71	31.53	-	-	P	H
		30	28.55	-11.45	40	34.49	24.8	0.56	31.3	187	240	P	V
		81.41	21.58	-18.42	40	38.7	13.54	0.94	31.6	-	-	P	V
		130.88	25.88	-17.62	43.5	38.72	17.45	1.19	31.48	-	-	P	V
		240.49	25.51	-20.49	46	37.88	17.64	1.62	31.63	-	-	P	V
		566.41	28.83	-17.17	46	32.5	25.15	2.59	31.41	-	-	P	V
		912.7	30.86	-15.14	46	29.77	29.2	3.34	31.45	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

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



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

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

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

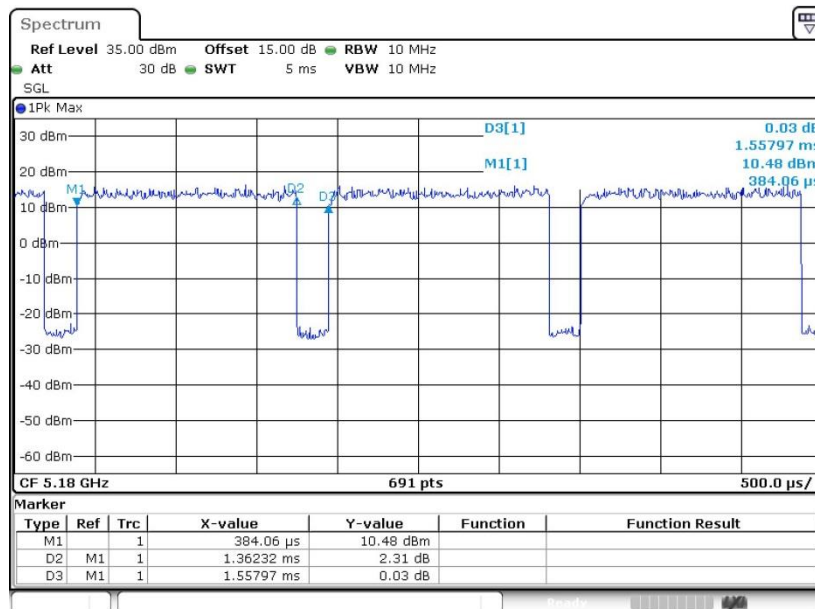
= -10.46(dB)

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

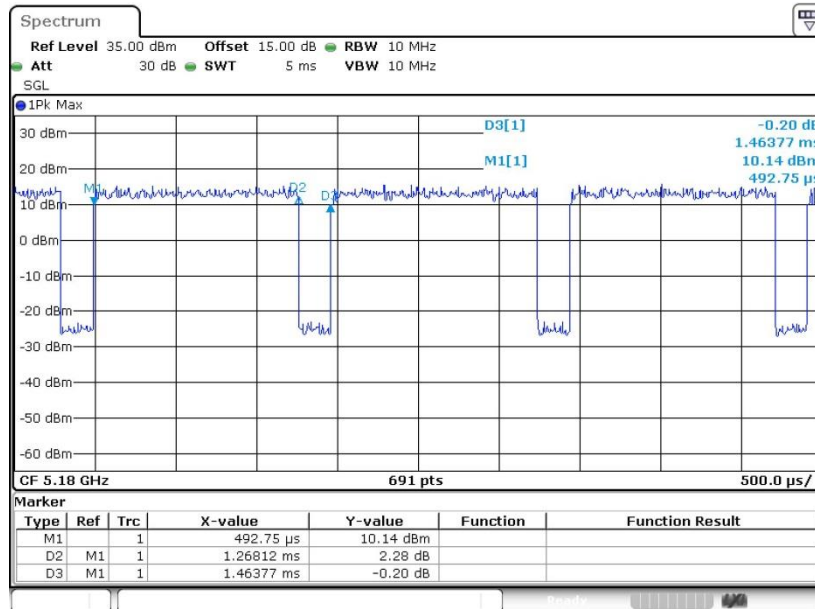
Appendix D. Duty Cycle Plots

Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	87.44	1.362	0.734	1kHz
802.11n HT20	86.63	1.268	0.789	1kHz
802.11n HT40	70.95	0.488	2.047	3kHz

802.11a



802.11n HT20



802.11n HT40

