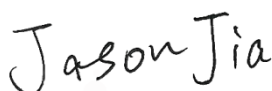


FCC RF Test Report

APPLICANT : Nokia Shanghai Bell Co., Ltd.
EQUIPMENT : NOK 5G21 GATEWAY GRY KIT
BRAND NAME : T-Mobile
MODEL NAME : 5G21-12W-A
FCC ID : 2ADZR5G2112WA
STANDARD : FCC Part 15 Subpart E § 15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Mar. 11, 2020 and testing was completed on Jul. 22, 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.

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
FR9D2703D	Rev. 01	Initial issue of report	Jul. 29, 2020

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) & 15.209(a)	Pass	Under limit 0.15 dB at 5635.200 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 11.87 dB at 0.367 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

Nokia Shanghai Bell Co., Ltd.

388#, Ningqiao Road, China (Shanghai) Pilot Free Trade Zone, Shanghai 201206, China

1.2 Manufacturer

Nokia Solutions and Networks Oy

Karakaari 7, 02610 Espoo, Finland

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	NOK 5G21 GATEWAY GRY KIT
Brand Name	T-Mobile
Model Name	5G21-12W-A
FCC ID	2ADZR5G2112WA
EUT supports Radios application	LTE/5G NR/GNSS WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 2.4GHz 802.11ax HE20/HE40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac/ax VHT20/VHT40/VHT80/HE20/HE40/HE80 Bluetooth LE
HW Version	3TG00739A
SW Version	HB5GGW_D010000B42T0101E0379.tar
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.

Specification of Accessory				
AC Adapter 1	Brand Name	DELTA	Model Name	UPD-480WNAB B
	Power Rating	I/P: 100-240Vac, 1600mA, O/P:12Vdc, 4000mA		
AC Adapter 2	Brand Name	FSP	Model Name	FSP048-A12U01
	Power Rating	I/P: 100-240Vac, 1300mA, O/P:12Vdc, 4000mA		

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification																				
Tx/Rx Channel Frequency Range		5745 MHz ~ 5825 MHz																		
Maximum Output Power		<5745 MHz ~ 5825 MHz> < SISO Ant. 1> 802.11a : 23.70 dBm / 0.2344 W <MIMO Ant. 1+2+3+4> 802.11n HT20 : 29.51 dBm / 0.8933 W 802.11n HT40 : 29.28 dBm / 0.8472 W 802.11ac VHT80: 28.84 dBm / 0.7656 W 802.11ax HE20 : 29.93 dBm / 0.9840 W 802.11ax HE 40 : 29.48 dBm / 0.8872 W 802.11ax HE 80 : 29.36 dBm / 0.8630 W																		
99% Occupied Bandwidth		< SISO Ant. 1> 802.11a : 17.13 MHz <MIMO Ant. 1+2+3+4> 802.11n HT20 : 18.38 MHz 802.11n HT40 : 36.56 MHz 802.11ac VHT80 : 75.52 MHz 802.11ax HE20 : 19.53 MHz 802.11ax HE 40 : 38.26 MHz 802.11ax HE 80 : 77.32 MHz																		
Type of Modulation		802.11a/n/ac/ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM/1024QAM)																		
Antenna Type / Gain		<Ant. 1> : PCB Antenna with gain 5.0 dBi <Ant. 2> : PCB Antenna with gain 5.0 dBi <Ant. 3> : PCB Antenna with gain 5.0 dBi <Ant. 4> : PCB Antenna with gain 5.0 dBi MIMO Gain (Ant. 1+2+3+4): 5.0 dBi Beamforming Gain (Ant. 1+2+3+4): 5.41 dBi																		
Antenna Function Description		<table><tr><td></td><td>Ant. 1</td><td>Ant. 2</td><td>Ant. 3</td><td>Ant. 4</td></tr><tr><td>802.11 a SISO</td><td>V</td><td>V</td><td>V</td><td>V</td></tr><tr><td>802.11 n/ac/ax MIMO/ Beamforming</td><td>V</td><td>V</td><td>V</td><td>V</td></tr></table>					Ant. 1	Ant. 2	Ant. 3	Ant. 4	802.11 a SISO	V	V	V	V	802.11 n/ac/ax MIMO/ Beamforming	V	V	V	V
	Ant. 1	Ant. 2	Ant. 3	Ant. 4																
802.11 a SISO	V	V	V	V																
802.11 n/ac/ax MIMO/ Beamforming	V	V	V	V																

Note:

- For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing have assessed only 802.11n HT20/ HT40 by referring to their maximum conducted power.
- For 11ax, manufacturer declared the EUT does not support OFDMA of Resource unit combination (26 tones, 52 tones, 106 tones, 242 tones...etc).
- The EUT supports for MIMO/ Beamforming mode for 802.11n/ac/ax mode only.
- The Tx Power of EUT will less than or equal to non-beamforming power when Beamforming mode is active. So we only evaluate RSE testing would be verified.
- For 802.11a mode, the whole testing has assessed only Ant. 1 by referring to their higher conducted power.

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.
	CO01-KS 03CH06-KS TH01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH06-KS	AUDIX	E3	6.2009-8-24a1
2.	CO01-KS	AUDIX	E3	6.2009-8-24



1.8 Applicable Standards

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

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

Remark:

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

2 Test Configuration of Equipment Under Test

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5745-5825 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155 [#]	5775	165	5825

Note:

- The above Frequency and Channel in "*" were 802.11n HT40 and 802.11ac VHT40 and 802.11ax HE40.
- The above Frequency and Channel in "[#]" were 802.11ac VHT80 and 802.11ax HE80.

2.2 Test Mode

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

Single Mode

Modulation	Data Rate
802.11a	6 Mbps

MIMO Mode

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802.11ax HE80	MCS0

TXBF Mode

Modulation	Data Rate
802.11ax HE20	MCS0
802.11ax HE40	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : LTE Band 5 Idle + Bluetooth Link + WLAN Link (5G) + Lan 1 Link + Lan 2 Link + RJ11 Link + Adapter 1
Remark: - For Radiated Test Cases, The tests were performed with Adapter 1. - Tx BF mode evaluation is to select the worst mode in the MIMO mode for testing.	

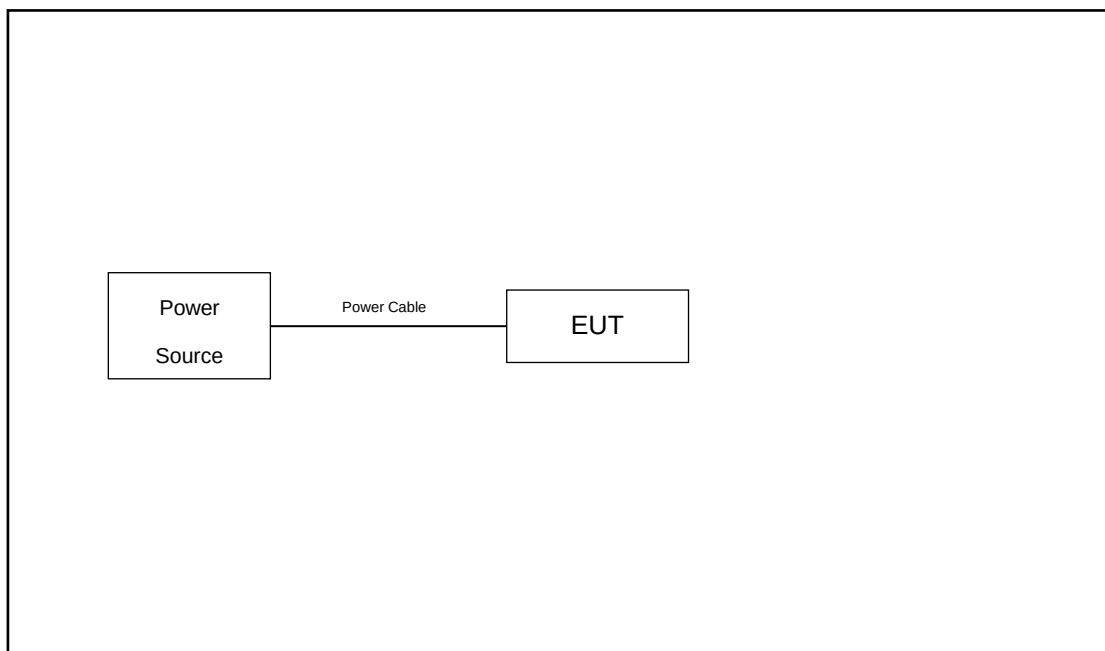


Ch. #		Band IV : 5745-5825 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

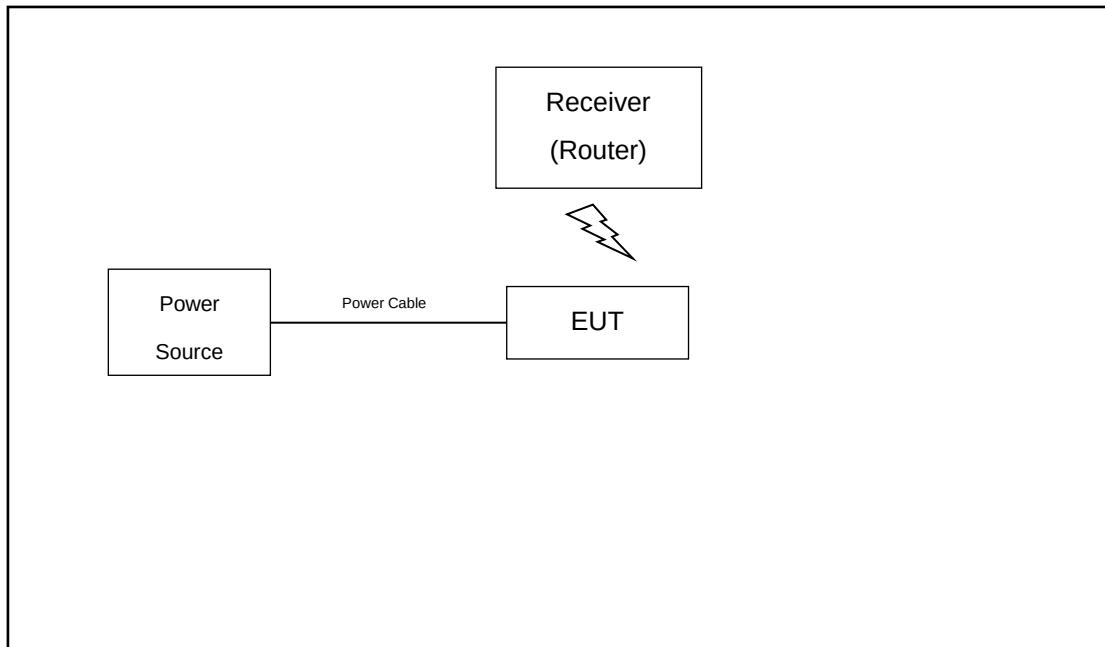
Ch. #		Band IV : 5745-5825 MHz		
		802.11ax HE20	802.11ax HE 40	802.11ax HE 80
L	Low	149	151	-
M	Middle	157	-	155
H	High	165	159	-

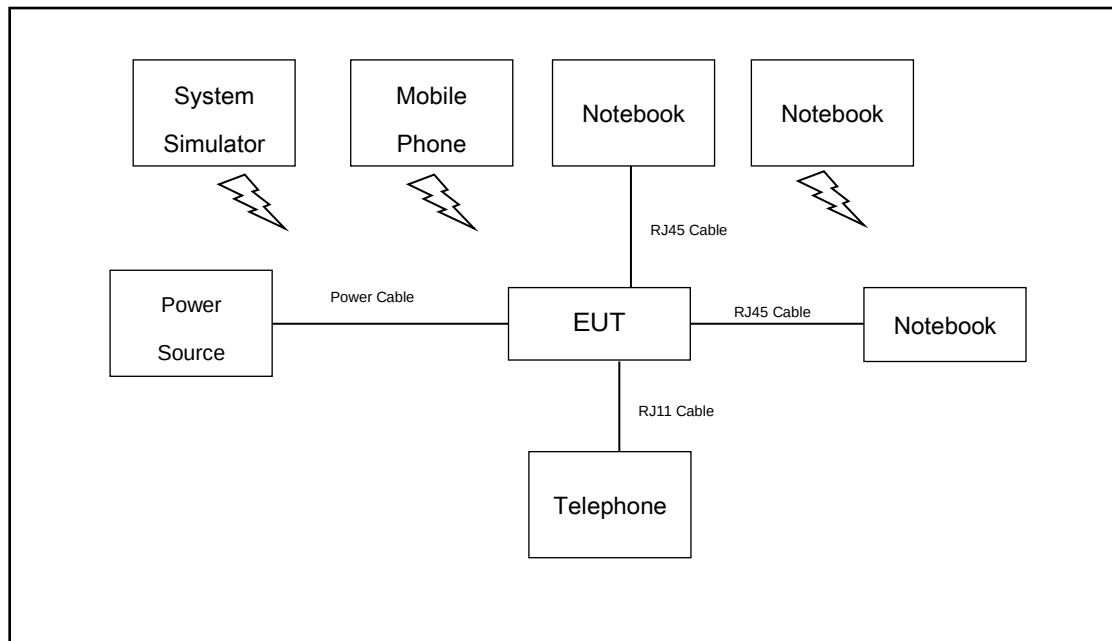
2.3 Connection Diagram of Test System

For Radiation (SISO/MIMO)



For Radiation (Beamforming)



For Conduction

2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station	Anritsu	MT8821C	N/A	N/A	Unshielded,1.8m
2.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
3.	Notebook	Lenovo	V130-15IKB005	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
4.	Telephone	bubugao	HCD007(6082)TSD	N/A	N/A	N/A
5.	Hard DISK	WD	C6B	N/A	N/A	N/A
6.	Earphone	Lenovo	P121	N/A	N/A	Unshielded,1.2m
7.	RJ45 cable	N/A	N/A	N/A	N/A	N/A
8.	RJ11 cable	N/A	N/A	N/A	N/A	N/A
9.	Phone	MOTO	XT1952-1	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 Notebook 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 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 6.9 dB.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)}. \\ &= 6.9 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

26dB and 99% Occupied bandwidth are reporting only.

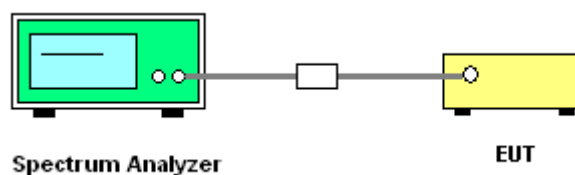
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

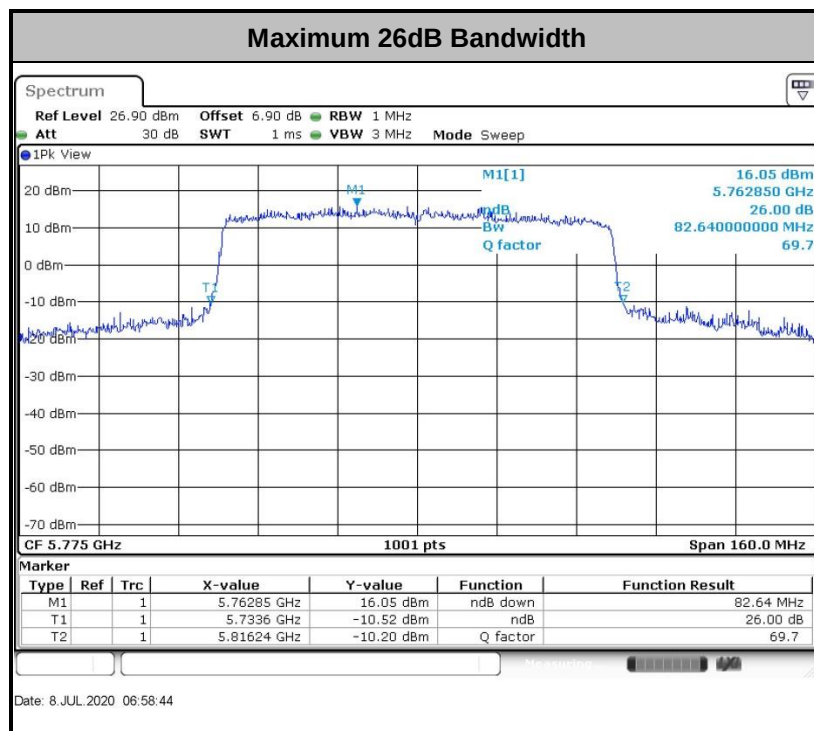
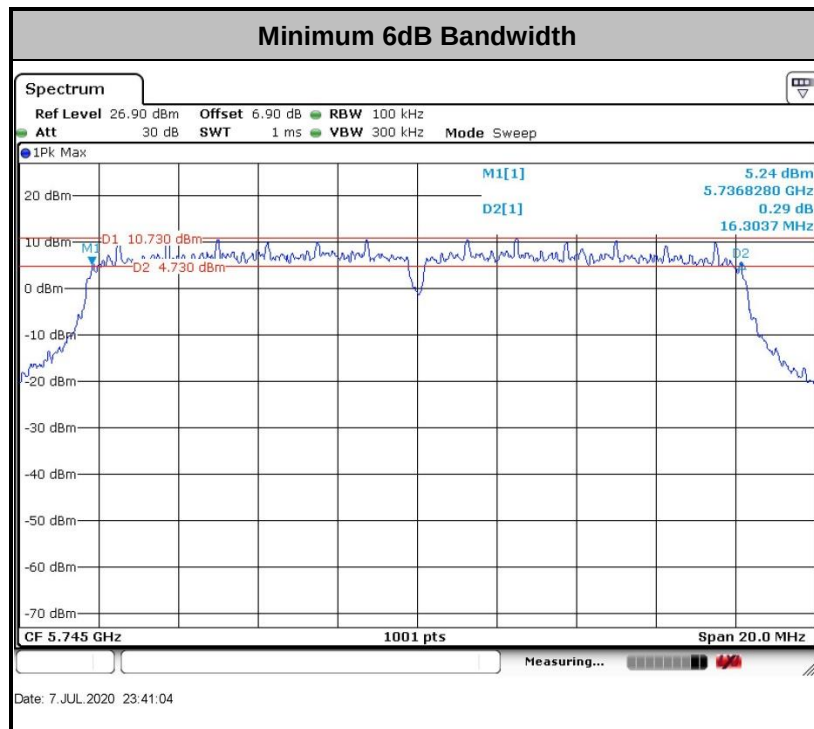
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

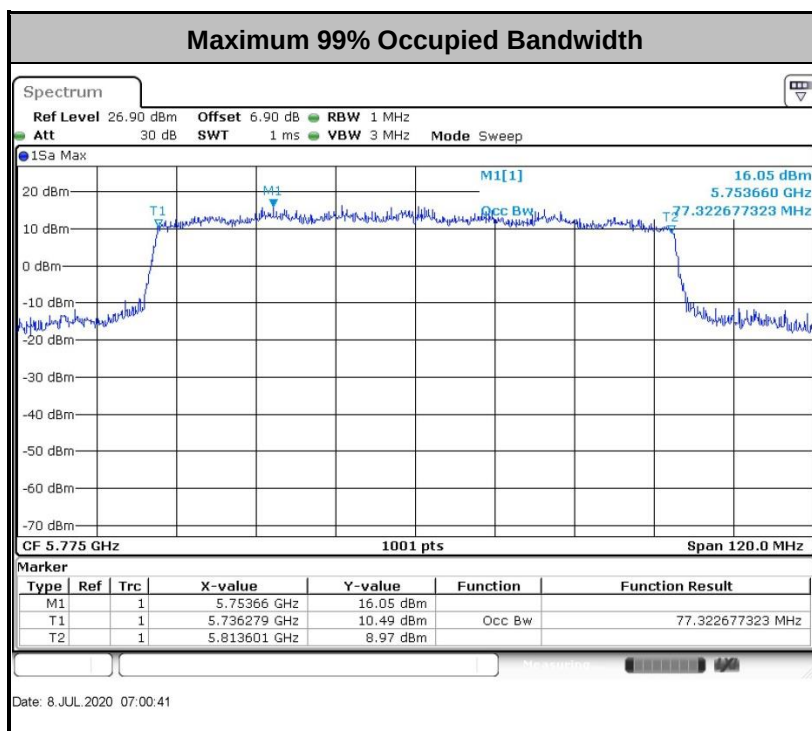
3.1.4 Test Setup



3.1.5 Test Result of 6dB 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

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

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.

3.2.2 Measuring Instruments

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

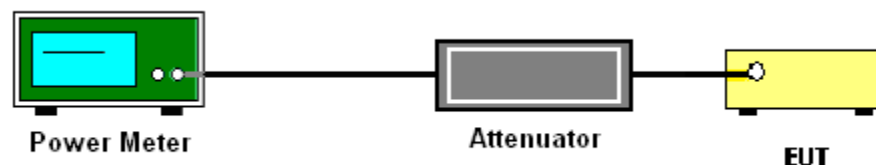
3.2.3 Test Procedures

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

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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).

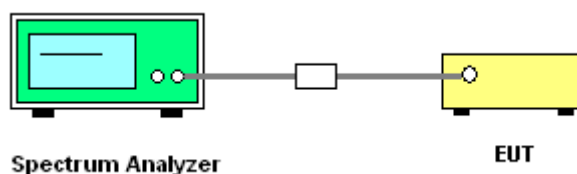
- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW $\geq$ 1 MHz.
- Number of points in sweep $\geq$ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add $10 \log(500\text{kHz}/\text{RBW})$ to the test result.
- Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (c): Measure and add $10 \log(N_{\text{ANT}})$ dB.

With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity $10 \log(N_{\text{ANT}})$ dB is added to each spectrum value before comparing to the emission limit. The addition of $10 \log(N_{\text{ANT}})$ dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{\text{ANT}}^{\text{th}}$ of the PSD limit.

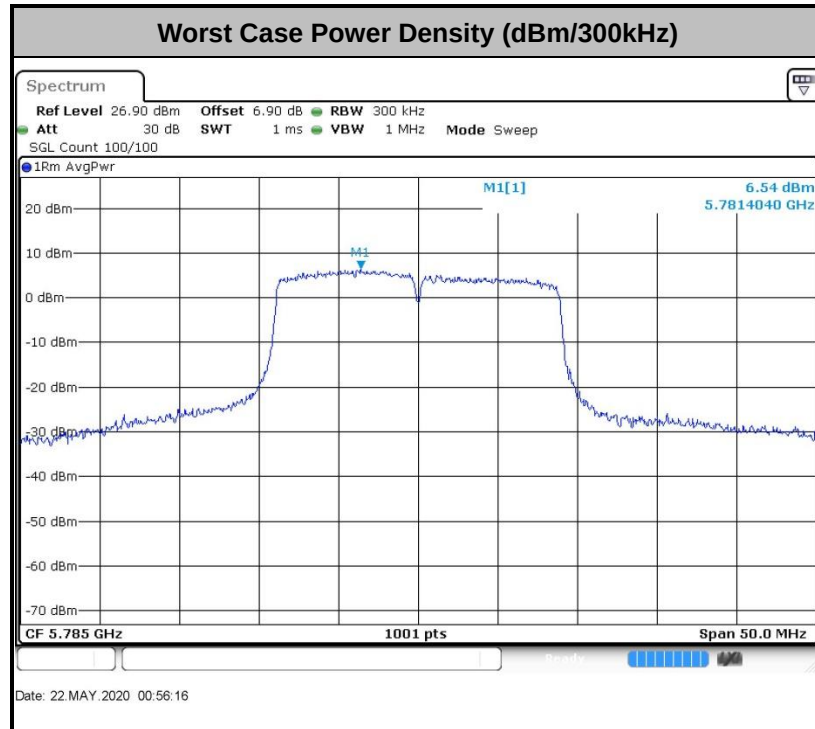
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



3.4 Unwanted Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

- (1) For transmitters operating in the 5.725-5.85 GHz band:

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

- (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.

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

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.

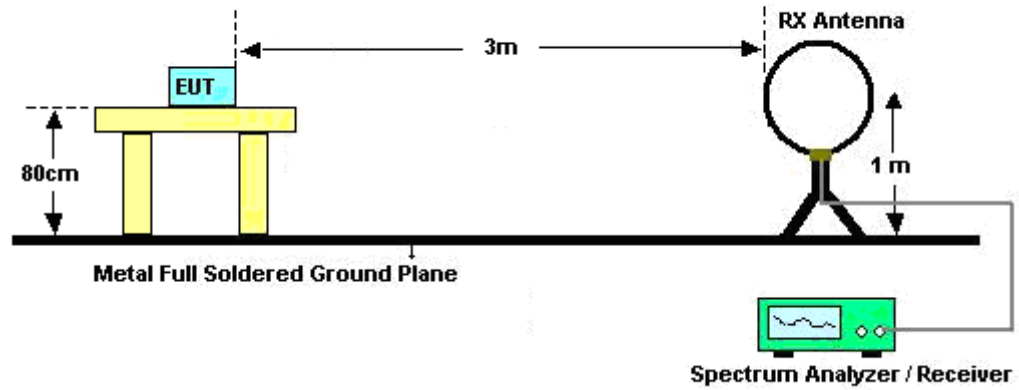


3.4.3 Test Procedures

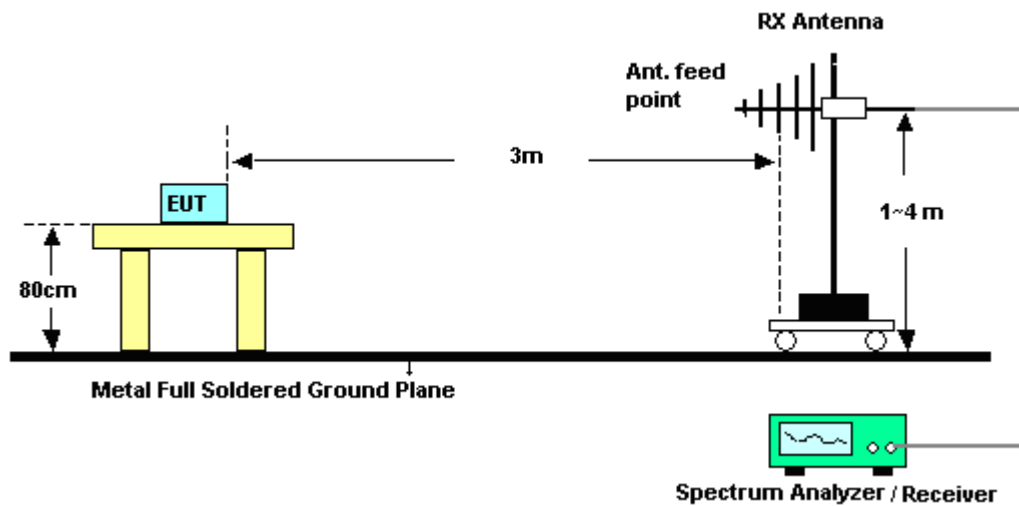
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak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

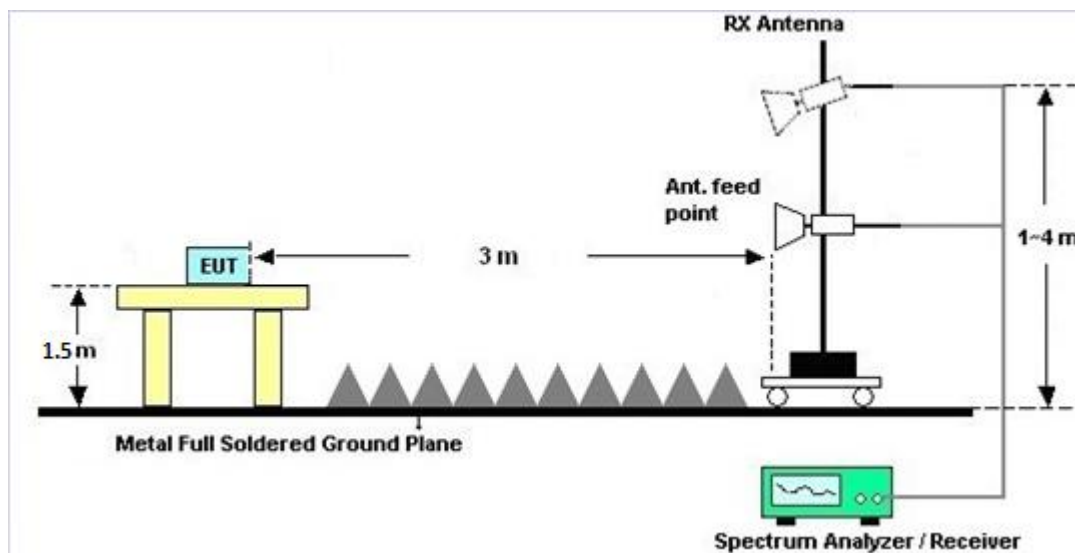
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated 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 Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

3.4.8 Test Result of Unwanted Radiated Emission (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.

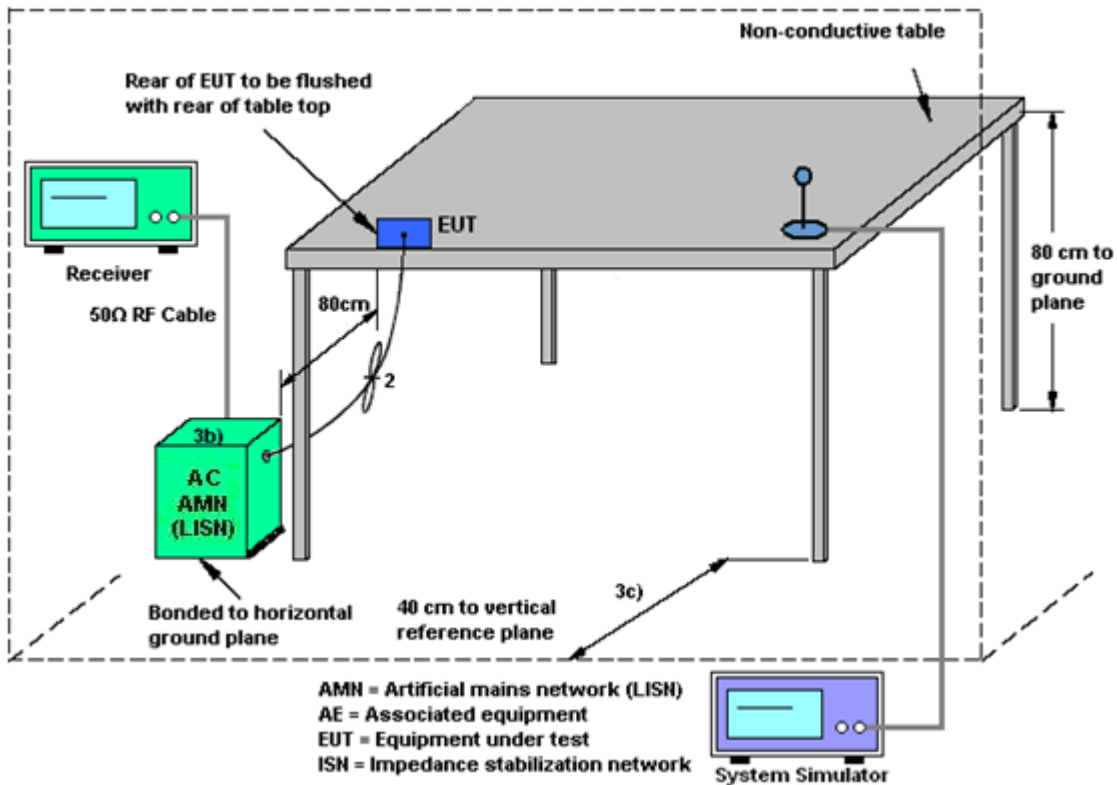
3.5.2 Measuring Instruments

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

選擇一個項目。

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power measurements on IEEE 802.11 devices,

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

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

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

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

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

					DG for Power	DG for PSD	Power Limit Reduction	PSD Limit Reduction
	Ant. 1 (dBi)	Ant. 2 (dBi)	Ant. 3 (dBi)	Ant. 4 (dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	5.00	5.00	5.00	5.00	5.00	5.41	0.00	0.00

$Power\ Limit\ Reduction = DG(Power) - 6dBi, (min = 0)$

$PSD\ Limit\ Reduction = DG(PSD) - 6dBi, (min = 0)$



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Nov. 02, 2019	May 22, 2020~Jul. 08, 2020	Nov. 01, 2020	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 15, 2020	May 22, 2020~Jul. 08, 2020	Jan. 14, 2021	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 08, 2020	May 22, 2020~Jul. 08, 2020	Jan. 07, 2021	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY57290157	3Hz~8.5GHz; Max 30dBm	Jul. 17, 2020	Jul. 22, 2020	Jul. 16, 2021	Radiation (03CH06-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44GHz	Apr. 15, 2020	Jul. 22, 2020	Apr. 14, 2021	Radiation (03CH06-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 10, 2019	Jul. 22, 2020	Nov. 09, 2020	Radiation (03CH06-KS)
Bilog Antenna	TeseQ	CBL6111D	49921	30MHz~1GHz	May 30, 2020	Jul. 22, 2020	May 29, 2021	Radiation (03CH06-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 27, 2020	Jul. 22, 2020	Apr. 26, 2021	Radiation (03CH06-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2019	Jul. 22, 2020	Nov. 09, 2020	Radiation (03CH06-KS)
Amplifier	SONOMA	310N	187289	9KHz ~1GHz	Aug. 06, 2019	Jul. 22, 2020	Aug. 05, 2020	Radiation (03CH06-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 08, 2020	Jul. 22, 2020	Jan. 07, 2021	Radiation (03CH06-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2025788	1Ghz-18Ghz	Aug. 16, 2019	Jul. 22, 2020	Aug. 15, 2020	Radiation (03CH06-KS)
Amplifier	Keysight	83017A	MY53270203	500MHz~26.5GHz	Apr. 15, 2020	Jul. 22, 2020	Apr. 14, 2021	Radiation (03CH06-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Jul. 22, 2020	NCR	Radiation (03CH06-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Jul. 22, 2020	NCR	Radiation (03CH06-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Jul. 22, 2020	NCR	Radiation (03CH06-KS)
EMI Receiver	R&S	ESC17	100768	9kHz~7GHz;	Apr. 14, 2020	Jul. 22, 2020	Apr. 13, 2021	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 18, 2019	Jul. 22, 2020	Oct. 17, 2020	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Oct. 28, 2019	Jul. 22, 2020	Oct. 27, 2020	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 18, 2019	Jul. 22, 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% ($U = 2Uc(y)$)	2.9dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
---	-------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0dB
---	-------



Appendix A. Conducted Test Results

Test Engineer:	weller liu	Temperature:	21~25	°C
Test Date:	2020/5/22~2020/7/8	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 99% OBW

Band IV														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	26dB Bandwidth (MHz)				6 dB Bandwidth (MHz)				6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 3	Ant 4	Ant 1	Ant 2	Ant 3	Ant 4		
11a	6Mbps	1	149	5745	20.88				16.30				0.5	Pass
11a	6Mbps	1	157	5785	21.28				16.30				0.5	Pass
11a	6Mbps	1	165	5825	21.08				16.30				0.5	Pass
HT20	MCS0	4	149	5745	21.98	21.78	22.48	21.78	17.18	17.16	17.54	17.54	0.5	Pass
HT20	MCS0	4	157	5785	21.98	21.93	22.48	22.48	17.14	16.544	17.16	17.54	0.5	Pass
HT20	MCS0	4	165	5825	21.88	22.23	21.93	21.93	17.20	17.562	17.56	17.52	0.5	Pass
HT40	MCS0	4	151	5755	41.18	40.91	41.45	40.73	35.52	35.445	35.68	35.88	0.5	Pass
HT40	MCS0	4	159	5795	41.72	41.72	41.27	41.54	35.48	36.324	36.28	35.72	0.5	Pass
AX20	MCS0	4	149	5745	22.33	22.98	22.63	22.83	18.94	18.94	18.94	18.72	0.5	Pass
AX20	MCS0	4	157	5785	22.73	22.58	22.63	22.98	18.56	18.781	18.66	18.86	0.5	Pass
AX20	MCS0	4	165	5825	22.23	22.08	22.73	22.18	18.82	18.601	18.90	18.78	0.5	Pass
AX40	MCS0	4	151	5755	42.08	41.90	41.90	41.72	37.24	36.364	36.96	37.80	0.5	Pass
AX40	MCS0	4	159	5795	41.99	42.44	41.90	42.17	37.72	37.722	37.80	37.88	0.5	Pass
VHT80	MCS0	4	155	5775	82.00	81.36	81.84	82.16	75.28	75.285	75.05	75.05	0.5	Pass
AX80	MCS0	4	155	5775	82.16	82.16	82.64	82.32	77.60	77.762	77.76	77.52	0.5	Pass

Band IV														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)				6 dB Bandwidth (MHz)				6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 3	Ant 4	Ant 1	Ant 2	Ant 3	Ant 4		
11a	6Mbps	1	149	5745	17.08								0.5	Pass
11a	6Mbps	1	157	5785	17.13								0.5	Pass
11a	6Mbps	1	165	5825	17.03								0.5	Pass
HT20	MCS0	4	149	5745	18.13	18.08	18.18	18.18					0.5	Pass
HT20	MCS0	4	157	5785	18.18	18.03	18.38	18.23					0.5	Pass
HT20	MCS0	4	165	5825	18.23	18.38	18.18	18.28					0.5	Pass
HT40	MCS0	4	151	5755	36.16	36.26	36.16	36.26					0.5	Pass
HT40	MCS0	4	159	5795	36.36	36.56	36.46	36.56					0.5	Pass
AX20	MCS0	4	149	5745	19.38	19.48	19.48	18.38					0.5	Pass
AX20	MCS0	4	157	5785	19.43	19.43	19.53	19.48					0.5	Pass
AX20	MCS0	4	165	5825	19.38	19.43	19.43	19.43					0.5	Pass
AX40	MCS0	4	151	5755	37.96	37.96	38.06	38.06					0.5	Pass
AX40	MCS0	4	159	5795	38.06	38.26	38.16	38.16					0.5	Pass
VHT80	MCS0	4	155	5775	75.28	75.52	75.52	75.52					0.5	Pass
AX80	MCS0	4	155	5775	77.32	77.32	77.32	77.32					0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power with duty factor (dBm)					FCC Conducted Power Limit (dBm)	DG (dBi)				Pass/ Fail
					Ant 1	Ant 2	Ant 3	Ant 4	SUM		Ant 1	Ant 2	Ant 3	Ant 4	
11a	6Mbps	1	149	5745	23.44	23.31	22.988	22.747	-	30.00	5.00	5.00	5.00	5.00	Pass
11a	6Mbps	1	157	5785	23.70	23.69	23.6	23.337	-	30.00	5.00	5.00	5.00	5.00	Pass
11a	6Mbps	1	165	5825	22.28	22.37	22.338	22.267	-	30.00	5.00	5.00	5.00	5.00	Pass
HT20	MCS0	4	149	5745	23.16	23.71	23.536	22.71	29.32	30.00	5.00				Pass
HT20	MCS0	4	157	5785	23.58	23.86	23.306	23.17	29.51	30.00	5.00				Pass
HT20	MCS0	4	165	5825	22.58	22.75	22.706	22.33	28.61	30.00	5.00				Pass
HT40	MCS0	4	151	5755	16.47	16.35	16.356	16.49	22.44	30.00	5.00				Pass
HT40	MCS0	4	159	5795	23.42	23.31	23.356	22.93	29.28	30.00	5.00				Pass
AX20	MCS0	4	149	5745	23.61	23.36	23.823	23.08	29.50	30.00	5.00				Pass
AX20	MCS0	4	157	5785	23.80	23.82	23.853	24.17	29.93	30.00	5.00				Pass
AX20	MCS0	4	165	5825	22.81	22.80	22.523	22.42	28.66	30.00	5.00				Pass
AX40	MCS0	4	151	5755	23.21	23.12	23.33	22.85	29.15	30.00	5.00				Pass
AX40	MCS0	4	159	5795	23.63	23.35	23.64	23.20	29.48	30.00	5.00				Pass
VHT80	MCS0	4	155	5775	22.93	22.88	22.643	22.82	28.84	30.00	5.00				Pass
AX80	MCS0	4	155	5775	23.23	23.20	23.416	23.51	29.36	30.00	5.00				Pass

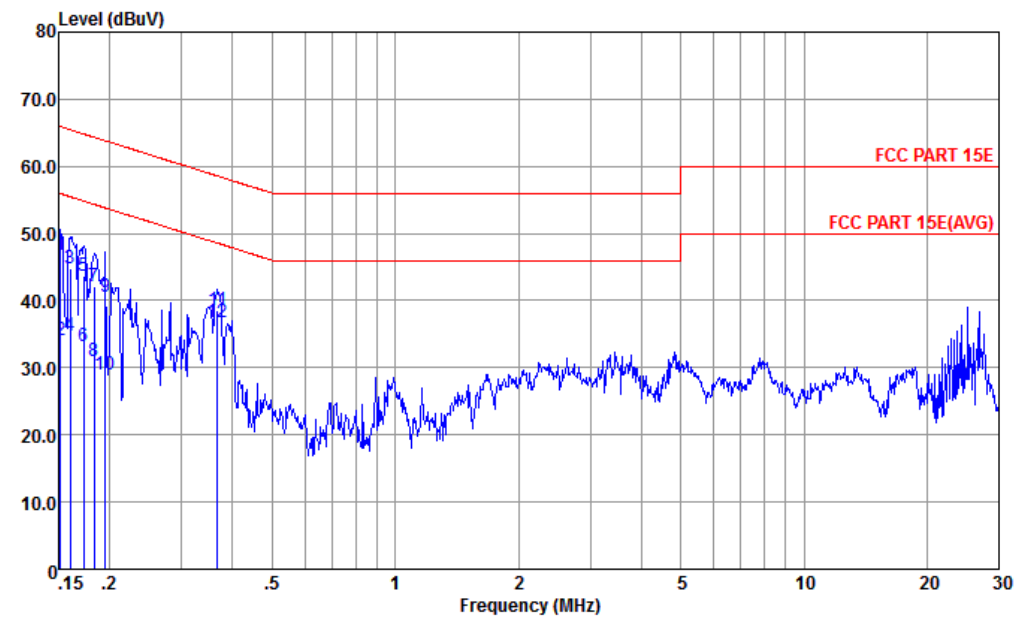
TEST RESULTS DATA
Power Spectral Density

FCC Band IV															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Power Density with RBW and duty factor (dBm/500kHz)					Average PSD Limit (dBm/500kHz)	DG (dBi)				Pass /Fail
					Ant 1	Ant 2	Ant 3	Ant 4	SUM		Ant 1	Ant 2	Ant 3	Ant 4	
11a	6Mbps	1	149	5745	8.62					30.00	5.00	5.00	5.00	5.00	Pass
11a	6Mbps	1	157	5785	9.08					30.00	5.00	5.00	5.00	5.00	Pass
11a	6Mbps	1	165	5825	8.47					30.00	5.00	5.00	5.00	5.00	Pass
HT20	MCS0	4	149	5745	9.14	9.90	9.18	7.80	15.92	30.00	5.41				Pass
HT20	MCS0	4	157	5785	8.66	10.64	9.00	9.42	16.66	30.00	5.41				Pass
HT20	MCS0	4	165	5825	8.24	8.75	8.49	8.21	14.77	30.00	5.41				Pass
HT40	MCS0	4	151	5755	6.47	5.71	5.77	5.72	12.49	30.00	5.41				Pass
HT40	MCS0	4	159	5795	6.50	5.67	6.16	5.78	12.52	30.00	5.41				Pass
AX20	MCS0	4	149	5745	10.13	9.69	10.19	8.55	16.21	30.00	5.41				Pass
AX20	MCS0	4	157	5785	9.31	10.18	9.60	9.29	16.20	30.00	5.41				Pass
AX20	MCS0	4	165	5825	8.80	8.28	9.43	7.91	15.45	30.00	5.41				Pass
AX40	MCS0	4	151	5755	6.47	5.71	5.73	5.92	12.49	30.00	5.41				Pass
AX40	MCS0	4	159	5795	7.49	6.04	5.35	6.62	13.51	30.00	5.41				Pass
VHT80	MCS0	4	155	5775	2.83	2.84	2.83	2.75	8.86	30.00	5.41				Pass
AX80	MCS0	4	155	5775	4.02	3.76	4.20	3.43	10.22	30.00	5.41				Pass



Appendix B. AC Conducted Emission Test Results

Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Test mode :	LTE Band 5 Idle + Bluetooth Link + WLAN Link (5G) + Lan 1 Link + Lan 2 Link + RJ11 Link + Adapter 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



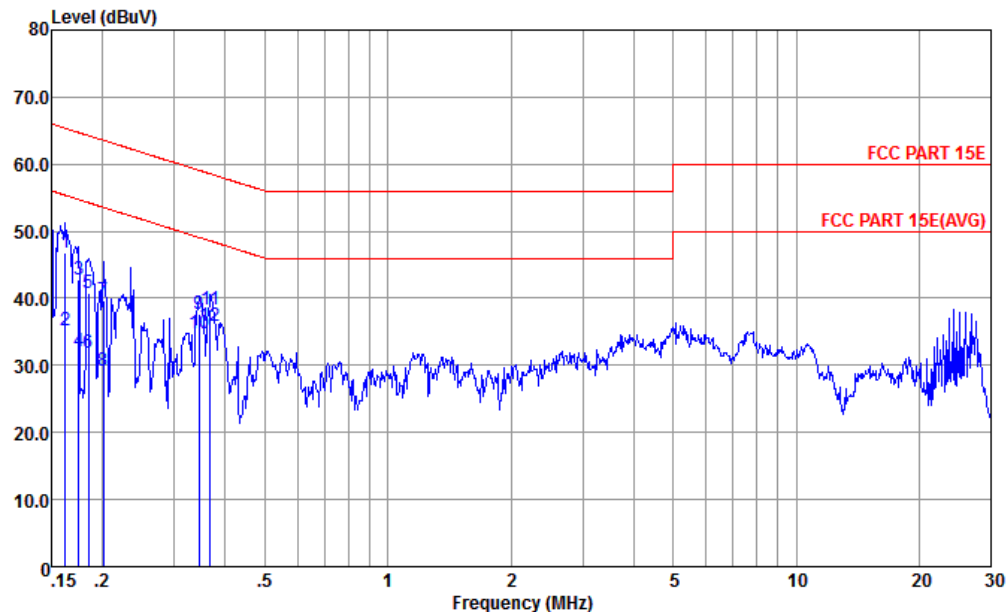
Site : CO01-KS
Condition : FCC PART 15E LISN-L-191028-CN02 LINE

: 004400152020002 #2

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	46.75	-19.16	65.91	36.20	0.07	10.48	QP
2	0.152	34.15	-21.76	55.91	23.60	0.07	10.48	Average
3	0.160	44.73	-20.74	65.47	34.21	0.07	10.45	QP
4	0.160	34.83	-20.64	55.47	24.31	0.07	10.45	Average
5	0.173	43.70	-21.11	64.81	33.20	0.08	10.42	QP
6	0.173	33.10	-21.71	54.81	22.60	0.08	10.42	Average
7	0.183	42.08	-22.25	64.33	31.60	0.08	10.40	QP
8	0.183	31.08	-23.25	54.33	20.60	0.08	10.40	Average
9	0.195	40.66	-23.14	63.80	30.20	0.09	10.37	QP
10	0.195	29.06	-24.74	53.80	18.60	0.09	10.37	Average
11	0.367	38.59	-19.97	58.56	28.19	0.12	10.28	QP
12 *	0.367	36.69	-11.87	48.56	26.29	0.12	10.28	Average



Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	37~39%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Test mode :	LTE Band 5 Idle + Bluetooth Link + WLAN Link (5G) + Lan 1 Link + Lan 2 Link + RJ11 Link + Adapter 1		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS
Condition : FCC PART 15E LISN-N-191028-CN02 NEUTRAL

: 004400152020002 #2

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.162	46.80	-18.54	65.34	36.20	0.15	10.45	QP
2	0.162	35.10	-20.24	55.34	24.50	0.15	10.45	Average
3	0.175	42.78	-21.94	64.72	32.20	0.16	10.42	QP
4	0.175	32.18	-22.54	54.72	21.60	0.16	10.42	Average
5	0.184	40.76	-23.52	64.28	30.20	0.16	10.40	QP
6	0.184	31.76	-22.52	54.28	21.20	0.16	10.40	Average
7	0.201	39.73	-23.85	63.58	29.20	0.17	10.36	QP
8	0.201	29.13	-24.45	53.58	18.60	0.17	10.36	Average
9	0.345	37.69	-21.40	59.09	27.20	0.20	10.29	QP
10	0.345	34.79	-14.30	49.09	24.30	0.20	10.29	Average
11	0.367	38.29	-20.27	58.56	27.80	0.21	10.28	QP
12 *	0.367	35.99	-12.57	48.56	25.50	0.21	10.28	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 4 - 5725~5850MHz

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 149 5745MHz		5650	59.63	-8.67	68.3	45.24	35.81	11.94	33.36	318	49	P	H
		5700	63.69	-41.61	105.3	49.29	35.82	11.95	33.37	318	49	P	H
		5714.8	77.97	-31.48	109.45	63.57	35.83	11.95	33.38	318	49	P	H
		5724.8	72.85	-48.99	121.84	58.44	35.84	11.95	33.38	318	49	P	H
		5746	122.43	-	-	108.01	35.85	11.96	33.39	318	49	P	H
		5746	116.32	-	-	101.9	35.85	11.96	33.39	318	49	A	H
		5642.4	58.2	-10.1	68.3	43.82	35.8	11.94	33.36	286	250	P	V
		5698	67.65	-36.18	103.83	53.25	35.82	11.95	33.37	286	250	P	V
		5713.6	76.09	-33.02	109.11	61.69	35.83	11.95	33.38	286	250	P	V
		5722.8	79.79	-37.49	117.28	65.38	35.84	11.95	33.38	286	250	P	V
		5746	121.08	-	-	106.66	35.85	11.96	33.39	286	250	P	V
		5746	113.54	-	-	99.12	35.85	11.96	33.39	286	250	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 165 5825MHz		5850.4	76.69	-47.46	124.15	62.18	35.89	12.04	33.42	242	360	P	H
		5856.4	75.13	-35.38	110.51	60.59	35.9	12.06	33.42	242	360	P	H
		5877.2	63.27	-40.4	103.67	48.7	35.92	12.08	33.43	242	360	P	H
		5927.6	57	-11.3	68.3	42.26	35.98	12.21	33.45	242	360	P	H
		5824	121.59	-	-	107.11	35.88	12.01	33.41	242	360	P	H
		5824	114.53	-	-	100.05	35.88	12.01	33.41	242	360	A	H
		5850.8	72.85	-50.15	123	58.34	35.89	12.04	33.42	267	234	P	V
		5859.2	70.02	-39.7	109.72	55.48	35.9	12.06	33.42	267	234	P	V
		5918.4	58.41	-14.76	73.17	43.74	35.96	12.16	33.45	267	234	P	V
		5926	57.74	-10.56	68.3	43	35.98	12.21	33.45	267	234	P	V
		5824	120.69	-	-	106.21	35.88	12.01	33.41	267	234	P	V
		5824	113.83	-	-	99.35	35.88	12.01	33.41	267	234	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

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 149 5745MHz		11490	45.3	-28.7	74	54.04	38.08	16.03	62.85	100	360	P	H
		11490	40.93	-33.07	74	49.67	38.08	16.03	62.85	100	360	P	V
802.11a CH 157 5785MHz		11570	42.22	-31.78	74	50.68	38.17	16.11	62.74	100	360	P	H
		11570	41.84	-32.16	74	50.3	38.17	16.11	62.74	100	360	P	V
802.11a CH 165 5825MHz		11650	42.31	-31.69	74	50.51	38.24	16.18	62.62	100	360	P	H
		11650	42.26	-31.74	74	50.46	38.24	16.18	62.62	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1+2+3+4	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 149 5745MHz		5646.4	58.87	-9.43	68.3	44.49	35.8	11.94	33.36	278	23	P	H
		5698.4	59.61	-44.51	104.12	45.21	35.82	11.95	33.37	278	23	P	H
		5718.4	66.22	-44.23	110.45	51.81	35.84	11.95	33.38	278	23	P	H
		5724.8	75.76	-46.08	121.84	61.35	35.84	11.95	33.38	278	23	P	H
		5742	119.13	-	-	104.71	35.85	11.96	33.39	278	23	P	H
		5742	113.69	-	-	99.27	35.85	11.96	33.39	278	23	A	H
		5623.2	57.01	-11.29	68.3	42.65	35.78	11.93	33.35	323	336	P	V
		5652.4	59.45	-10.63	70.08	45.06	35.81	11.94	33.36	323	336	P	V
		5710.8	67.7	-40.63	108.33	53.3	35.83	11.95	33.38	323	336	P	V
		5724	69.39	-50.63	120.02	54.98	35.84	11.95	33.38	323	336	P	V
		5750	117.1	-	-	102.68	35.85	11.96	33.39	323	336	P	V
		5750	111.47	-	-	97.05	35.85	11.96	33.39	323	336	A	V



WIFI Ant. 1+2+3+4	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 165 5825MHz		5850.4	77.93	-46.22	124.15	63.42	35.89	12.04	33.42	241	5	P	H
		5855.2	69.24	-41.6	110.84	54.7	35.9	12.06	33.42	241	5	P	H
		5878.4	60.23	-42.54	102.77	45.66	35.92	12.08	33.43	241	5	P	H
		5942.4	59.73	-8.57	68.3	44.92	36	12.26	33.45	241	5	P	H
		5828	121.45	-	-	106.97	35.88	12.01	33.41	241	5	P	H
		5828	114.6	-	-	100.12	35.88	12.01	33.41	241	5	A	H
		5850.4	71.35	-52.8	124.15	56.84	35.89	12.04	33.42	309	241	P	V
		5858.4	69.82	-40.13	109.95	55.28	35.9	12.06	33.42	309	241	P	V
		5919.2	58.14	-14.44	72.58	43.47	35.96	12.16	33.45	309	241	P	V
		5926.4	57.11	-11.19	68.3	42.37	35.98	12.21	33.45	309	241	P	V
		5820	118.3	-	-	103.82	35.88	12.01	33.41	309	241	P	V
		5820	110.98	-	-	96.5	35.88	12.01	33.41	309	241	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1+2+3+4	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		11490	41.8	-32.2	74	50.54	38.08	16.03	62.85	100	360	P	H
CH 149 5745MHz		11490	41.89	-32.11	74	50.63	38.08	16.03	62.85	100	360	P	V
802.11n HT20		11570	42.29	-31.71	74	50.75	38.17	16.11	62.74	100	360	P	H
CH 157 5785MHz		11570	41.68	-32.32	74	50.14	38.17	16.11	62.74	100	360	P	V
802.11n HT20		11650	41.82	-32.18	74	50.02	38.24	16.18	62.62	100	360	P	H
CH 165 5825MHz		11650	42.26	-31.74	74	50.46	38.24	16.18	62.62	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2+3+4	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 151 5755MHz		5635.2	68.15	-0.15	68.3	52	35.8	11.42	31.07	220	0	P	H
		5675.6	58.01	-29.27	87.28	42.04	34.7	11.48	30.21	220	0	P	H
		5716	66.29	-43.49	109.78	50.25	34.73	11.55	30.24	220	0	P	H
		5723.2	65.38	-52.82	118.2	49.27	34.77	11.58	30.24	220	0	P	H
		5854.4	55.4	-57.23	112.63	38.88	35.03	11.82	30.33	220	0	P	H
		5874.8	56.33	-49.03	105.36	39.76	35.07	11.84	30.34	220	0	P	H
		5883.2	56.85	-42.36	99.21	40.28	35.07	11.84	30.34	220	0	P	H
		5934.4	56.1	-12.2	68.3	39.44	35.17	11.88	30.39	220	0	P	H
		5758	110.94	-	-	94.75	34.83	11.64	30.28	220	0	P	H
		5758	104.33	-	-	88.14	34.83	11.64	30.28	220	0	A	H
		5635.6	60.89	-7.41	68.3	44.99	34.67	11.42	30.19	330	327	P	V
		5690.4	57.45	-40.77	98.22	41.46	34.7	11.52	30.23	330	327	P	V
		5716.8	60.47	-49.54	110.01	44.43	34.73	11.55	30.24	330	327	P	V
		5724.8	63.63	-58.21	121.84	47.52	34.77	11.58	30.24	330	327	P	V
		5850	55.05	-70.25	125.3	38.59	35	11.79	30.33	330	327	P	V
		5866.8	55.72	-51.87	107.59	39.21	35.03	11.82	30.34	330	327	P	V
		5913.2	55.93	-21.07	77	39.3	35.13	11.87	30.37	330	327	P	V
		5953.2	57.29	-11.01	68.3	40.58	35.2	11.9	30.39	330	327	P	V
		5746	109.06	-	-	92.91	34.8	11.61	30.26	330	327	P	V
		5746	102.08	-	-	85.93	34.8	11.61	30.26	330	327	A	V



WIFI Ant. 1+2+3+4	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 159 5795MHz		5608.8	58.94	-9.36	68.3	44.58	35.77	11.93	33.34	254	358	P	H
		5671.2	63.62	-20.41	84.03	49.22	35.82	11.94	33.36	254	358	P	H
		5720	64.1	-46.8	110.9	49.69	35.84	11.95	33.38	254	358	P	H
		5720.8	64.1	-48.62	112.72	49.69	35.84	11.95	33.38	254	358	P	H
		5851.2	67.93	-53.91	121.84	53.42	35.89	12.04	33.42	254	358	P	H
		5858.8	68.02	-41.81	109.83	53.48	35.9	12.06	33.42	254	358	P	H
		5880	62.32	-39.27	101.59	47.75	35.92	12.08	33.43	254	358	P	H
		5925.6	57.55	-10.75	68.3	42.81	35.98	12.21	33.45	254	358	P	H
		5788	118.73	-	-	104.29	35.87	11.97	33.4	254	358	P	H
		5788	112.11	-	-	97.67	35.87	11.97	33.4	254	358	A	H
		5621.2	56.31	-11.99	68.3	41.95	35.78	11.93	33.35	371	336	P	V
		5700	60.17	-45.13	105.3	45.77	35.82	11.95	33.37	371	336	P	V
		5717.6	62.34	-47.89	110.23	47.93	35.84	11.95	33.38	371	336	P	V
		5720	60.01	-50.89	110.9	45.6	35.84	11.95	33.38	371	336	P	V
		5850.4	61.09	-63.06	124.15	46.58	35.89	12.04	33.42	371	336	P	V
		5862	63.57	-45.37	108.94	49.03	35.9	12.06	33.42	371	336	P	V
		5880.8	61.21	-39.78	100.99	46.64	35.92	12.08	33.43	371	336	P	V
		5963.6	55.32	-12.98	68.3	40.45	36.02	12.31	33.46	371	336	P	V
		5800	115.9	-	-	101.47	35.87	11.97	33.41	371	336	P	V
		5800	109.14	-	-	94.71	35.87	11.97	33.41	371	336	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1+2+3+4	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		11510	41.41	-32.59	74	50.11	38.1	16.05	62.85	100	360	P	H
CH 151 5755MHz		11510	41.52	-32.48	74	50.22	38.1	16.05	62.85	100	360	P	V
802.11n HT40		11590	42.69	-31.31	74	51.09	38.18	16.13	62.71	100	360	P	H
CH 159 5795MHz		11590	41.23	-32.77	74	49.63	38.18	16.13	62.71	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802. 11ax HE 20 (Band Edge @ 3m)

WIFI Ant. 1+2+3+4	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)
802.11ax HE20 CH 149 5745MHz		5625.2	66.22	-2.08	68.3	51.86	35.78	11.93	33.35	261	0	P	H
		5697.6	63.57	-39.96	103.53	49.17	35.82	11.95	33.37	261	0	P	H
		5718.4	74.68	-35.77	110.45	60.27	35.84	11.95	33.38	261	0	P	H
		5724.4	78.46	-42.47	120.93	64.05	35.84	11.95	33.38	261	0	P	H
		5738	120.11	-	-	105.68	35.85	11.96	33.38	261	0	P	H
		5738	113.31	-	-	98.88	35.85	11.96	33.38	261	0	A	H
		5644.4	60.92	-7.38	68.3	46.54	35.8	11.94	33.36	304	145	P	V
		5698.8	61.71	-42.71	104.42	47.31	35.82	11.95	33.37	304	145	P	V
		5719.6	78.09	-32.7	110.79	63.68	35.84	11.95	33.38	304	145	P	V
		5721.2	80.87	-32.77	113.64	66.46	35.84	11.95	33.38	304	145	P	V
		5740	118.54	-	-	104.11	35.85	11.96	33.38	304	145	P	V
		5740	111.97	-	-	97.54	35.85	11.96	33.38	304	145	A	V



WIFI Ant. 1+2+3+4	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)
802.11ax HE 20 CH 165 5825MHz		5850.8	76.57	-46.43	123	62.06	35.89	12.04	33.42	304	183	P	H
		5855.6	71.54	-39.19	110.73	57	35.9	12.06	33.42	304	183	P	H
		5913.6	59.65	-17.06	76.71	44.97	35.96	12.16	33.44	304	183	P	H
		5925.2	60.58	-7.72	68.3	45.84	35.98	12.21	33.45	304	183	P	H
		5822	121	-	-	106.52	35.88	12.01	33.41	304	183	P	H
		5822	113.21	-	-	98.73	35.88	12.01	33.41	304	183	A	H
		5852	77.39	-42.15	119.54	62.88	35.89	12.04	33.42	302	230	P	V
		5855.4	71.77	-39.02	110.79	57.23	35.9	12.06	33.42	302	230	P	V
		5875.3	61.82	-43.26	105.08	47.25	35.92	12.08	33.43	302	230	P	V
		5928.8	58.03	-10.27	68.3	43.29	35.98	12.21	33.45	302	230	P	V
		5830	119.12	-	-	104.65	35.88	12.01	33.42	302	230	P	V
		5830	111.2	-	-	96.73	35.88	12.01	33.42	302	230	A	V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ax HE20 (Harmonic @ 3m)

WIFI Ant. 1+2+3+4	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)
802.11ax HE 20		11490	42.93	-31.07	74	51.67	38.08	16.03	62.85	100	360	P	H
CH 149 5745MHz		11490	42.13	-31.87	74	50.87	38.08	16.03	62.85	100	360	P	V
802.11ax HE 20		11570	42.4	-31.6	74	50.86	38.17	16.11	62.74	100	360	P	H
CH 157 5785MHz		11570	41.75	-32.25	74	50.21	38.17	16.11	62.74	100	360	P	V
802.11ax HE 20		11650	43.74	-30.26	74	51.94	38.24	16.18	62.62	100	360	P	H
CH 165 5825MHz		11650	42.19	-31.81	74	50.39	38.24	16.18	62.62	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802. 11ax HE 40 (Band Edge @ 3m)

WIFI Ant. 1+2+3+4	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)
802.11ax HE 40 CH 151 5755MHz		5636	63.66	-4.64	68.3	49.27	35.8	11.94	33.35	323	47	P	H
		5690	69.75	-28.18	97.93	55.35	35.82	11.95	33.37	323	47	P	H
		5712	79.59	-29.07	108.66	65.19	35.83	11.95	33.38	323	47	P	H
		5724	77.66	-42.36	120.02	63.25	35.84	11.95	33.38	323	47	P	H
		5850	62.57	-62.73	125.3	48.06	35.89	12.04	33.42	323	47	P	H
		5858.4	57.86	-52.09	109.95	43.32	35.9	12.06	33.42	323	47	P	H
		5877.2	60.86	-42.81	103.67	46.29	35.92	12.08	33.43	323	47	P	H
		5943.6	56.52	-11.78	68.3	41.71	36	12.26	33.45	323	47	P	H
		5752	120.3	-	-	105.88	35.85	11.96	33.39	323	47	P	H
		5752	111.96	-	-	97.54	35.85	11.96	33.39	323	47	A	H
		5649.6	61.5	-6.8	68.3	47.11	35.81	11.94	33.36	264	248	P	V
		5688.4	66.59	-30.15	96.74	52.19	35.82	11.95	33.37	264	248	P	V
		5710.4	76.68	-31.53	108.21	62.28	35.83	11.95	33.38	264	248	P	V
		5724.4	76.18	-44.75	120.93	61.77	35.84	11.95	33.38	264	248	P	V
		5850	59.12	-66.18	125.3	44.61	35.89	12.04	33.42	264	248	P	V
		5873.2	61.52	-44.28	105.8	46.95	35.92	12.08	33.43	264	248	P	V
		5887.6	54.71	-41.24	95.95	40.11	35.94	12.1	33.44	264	248	P	V
		5977.2	55.08	-13.22	68.3	40.14	36.04	12.36	33.46	264	248	P	V
		5752	117.09	-	-	102.67	35.85	11.96	33.39	264	248	P	V
		5752	109.89	-	-	95.47	35.85	11.96	33.39	264	248	A	V



WIFI Ant. 1+2+3+4	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)
802.11ax HE 40 CH 159 5795MHz		5648.8	58.97	-9.33	68.3	44.59	35.8	11.94	33.36	243	267	P	H
		5700	62.46	-42.84	105.3	48.06	35.82	11.95	33.37	243	267	P	H
		5716.4	66.17	-43.72	109.89	51.77	35.83	11.95	33.38	243	267	P	H
		5720.8	64.95	-47.77	112.72	50.54	35.84	11.95	33.38	243	267	P	H
		5850.8	70.94	-52.06	123	56.43	35.89	12.04	33.42	243	267	P	H
		5858.4	71.99	-37.96	109.95	57.45	35.9	12.06	33.42	243	267	P	H
		5880.8	66.02	-34.97	100.99	51.45	35.92	12.08	33.43	243	267	P	H
		5946	57.7	-10.6	68.3	42.89	36	12.26	33.45	243	267	P	H
		5800	119.95	-	-	105.52	35.87	11.97	33.41	243	267	P	H
		5800	112.78	-	-	98.35	35.87	11.97	33.41	243	267	A	H
		5606.4	57.57	-10.73	68.3	43.21	35.77	11.93	33.34	271	327	P	V
		5694.8	60.78	-40.69	101.47	46.38	35.82	11.95	33.37	271	327	P	V
		5713.6	64.48	-44.63	109.11	50.08	35.83	11.95	33.38	271	327	P	V
		5720	62.61	-48.29	110.9	48.2	35.84	11.95	33.38	271	327	P	V
		5854.8	66.66	-44.82	111.48	52.12	35.9	12.06	33.42	271	327	P	V
		5855.6	68.03	-42.7	110.73	53.49	35.9	12.06	33.42	271	327	P	V
		5875.3	61.44	-43.64	105.08	46.87	35.92	12.08	33.43	271	327	P	V
		5938	56.31	-11.99	68.3	41.57	35.98	12.21	33.45	271	327	P	V
		5800	117.24	-	-	102.81	35.87	11.97	33.41	271	327	P	V
		5800	110.28	-	-	95.85	35.87	11.97	33.41	271	327	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ax HE40 (Harmonic @ 3m)

WIFI Ant. 1+2+3+4	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)
802.11ax HE 40		11510	42.79	-31.21	74	51.49	38.1	16.05	62.85	100	360	P	H
CH 151 5755MHz		11510	41.44	-32.56	74	50.14	38.1	16.05	62.85	100	360	P	V
802.11ax HE 40		11590	42.75	-31.25	74	51.15	38.18	16.13	62.71	100	360	P	H
CH 159 5795MHz		11590	43.14	-30.86	74	51.54	38.18	16.13	62.71	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2+3+4	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		5650	61.97	-6.33	68.3	47.58	35.81	11.94	33.36	114	280	P	H
		5689.2	76.54	-20.8	97.34	62.14	35.82	11.95	33.37	114	280	P	H
		5707.6	81.85	-25.58	107.43	67.45	35.83	11.95	33.38	114	280	P	H
		5724	81.26	-38.76	120.02	66.85	35.84	11.95	33.38	114	280	P	H
		5850.4	73.94	-50.21	124.15	59.43	35.89	12.04	33.42	114	280	P	H
		5865.6	70.98	-36.95	107.93	56.45	35.9	12.06	33.43	114	280	P	H
		5886	64.36	-32.77	97.13	49.8	35.92	12.08	33.44	114	280	P	H
		5926	58.99	-9.31	68.3	44.25	35.98	12.21	33.45	114	280	P	H
		5770	114.74	-	-	100.31	35.86	11.97	33.4	114	280	P	H
		5770	107.5	-	-	93.07	35.86	11.97	33.4	114	280	A	H
		5636.4	59.2	-9.1	68.3	44.82	35.8	11.94	33.36	231	51	P	V
		5697.6	74.61	-28.92	103.53	60.21	35.82	11.95	33.37	231	51	P	V
		5716.4	78.84	-31.05	109.89	64.44	35.83	11.95	33.38	231	51	P	V
		5724.4	77.47	-43.46	120.93	63.06	35.84	11.95	33.38	231	51	P	V
		5854	70.18	-43.6	113.78	55.64	35.9	12.06	33.42	231	51	P	V
		5857.2	71.91	-38.37	110.28	57.37	35.9	12.06	33.42	231	51	P	V
		5878	68.99	-34.08	103.07	54.42	35.92	12.08	33.43	231	51	P	V
		5936.8	58.26	-10.04	68.3	43.52	35.98	12.21	33.45	231	51	P	V
		5758	112.76	-	-	98.34	35.85	11.96	33.39	231	51	P	V
		5758	105.54	-	-	91.12	35.85	11.96	33.39	231	51	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1+2+3+4	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80		11550	42.14	-31.86	74	50.66	38.15	16.1	62.77	100	360	P	H
CH 155 5775MHz		11550	40.76	-33.24	74	49.28	38.15	16.1	62.77	100	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802. 11ax HE 80 (Band Edge @ 3m)

WIFI Ant. 1+2+3+4	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)
802.11ax HE80 CH 155 5775MHz		5650	68.06	-0.24	68.3	53.67	35.81	11.94	33.36	228	180	P	H
		5700	82.35	-22.95	105.3	67.95	35.82	11.95	33.37	228	180	P	H
		5705.6	82.68	-24.19	106.87	68.27	35.83	11.95	33.37	228	180	P	H
		5720.8	82.76	-29.96	112.72	68.35	35.84	11.95	33.38	228	180	P	H
		5854	73.88	-39.9	113.78	59.34	35.9	12.06	33.42	228	180	P	H
		5862	80.72	-28.22	108.94	66.18	35.9	12.06	33.42	228	180	P	H
		5878.8	70.79	-31.69	102.48	56.22	35.92	12.08	33.43	228	180	P	H
		5959.6	65.4	-2.9	68.3	50.53	36.02	12.31	33.46	228	180	P	H
		5758	115	-	-	100.58	35.85	11.96	33.39	228	180	P	H
		5758	108.36	-	-	93.94	35.85	11.96	33.39	228	180	A	H
		5632.8	62.17	-6.13	68.3	47.78	35.8	11.94	33.35	312	230	P	V
		5693.6	78.5	-22.08	100.58	64.1	35.82	11.95	33.37	312	230	P	V
		5712	80.85	-27.81	108.66	66.45	35.83	11.95	33.38	312	230	P	V
		5722.8	75.98	-41.3	117.28	61.57	35.84	11.95	33.38	312	230	P	V
		5854.4	76.77	-35.86	112.63	62.23	35.9	12.06	33.42	312	230	P	V
		5870.4	77.16	-29.43	106.59	62.63	35.9	12.06	33.43	312	230	P	V
		5875.4	69.51	-35.49	105	54.94	35.92	12.08	33.43	312	230	P	V
		5932.4	62.32	-5.98	68.3	47.58	35.98	12.21	33.45	312	230	P	V
		5776	113.9	-	-	99.47	35.86	11.97	33.4	312	230	P	V
		5776	106.92	-	-	92.49	35.86	11.97	33.4	312	230	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ax HE80 (Harmonic @ 3m)

WIFI Ant. 1+2+3+4	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)
802.11ax HE80		11550	42.14	-31.86	74	50.66	38.15	16.1	62.77	100	360	P	H
CH 155 5775MHz		11550	40.76	-33.24	74	49.28	38.15	16.1	62.77	100	360	P	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

WIFI 802.11n HT40 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2+3+4		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT40 LF		46.49	29.49	-10.51	40	45.04	16.36	1.19	33.1	100	360	P	H
		240.49	27.65	-18.35	46	40.39	17.64	2.44	32.82	-	-	P	H
		450.01	26.47	-19.53	46	32.28	23.1	3.29	32.2	-	-	P	H
		549.92	29.19	-16.81	46	33.64	25.4	3.05	32.9	-	-	P	H
		649.83	27.14	-18.86	46	29.3	26.5	3.94	32.6	-	-	P	H
		929.19	29.77	-16.23	46	27.02	30.22	4.67	32.14	-	-	P	H
		31.94	31.5	-8.5	40	39.42	24.04	1.1	33.06	100	293	P	V
		56.19	25.36	-14.64	40	44.22	12.9	1.42	33.18	-	-	P	V
		131.85	25.23	-18.27	43.5	38.84	17.58	1.85	33.04	-	-	P	V
		247.28	21.7	-24.3	46	33.44	18.6	2.47	32.81	-	-	P	V
		573.2	32.25	-13.75	46	36.14	25.58	3.38	32.85	-	-	P	V
		895.24	28.4	-17.6	46	26.92	29.12	4.57	32.21	-	-	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.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

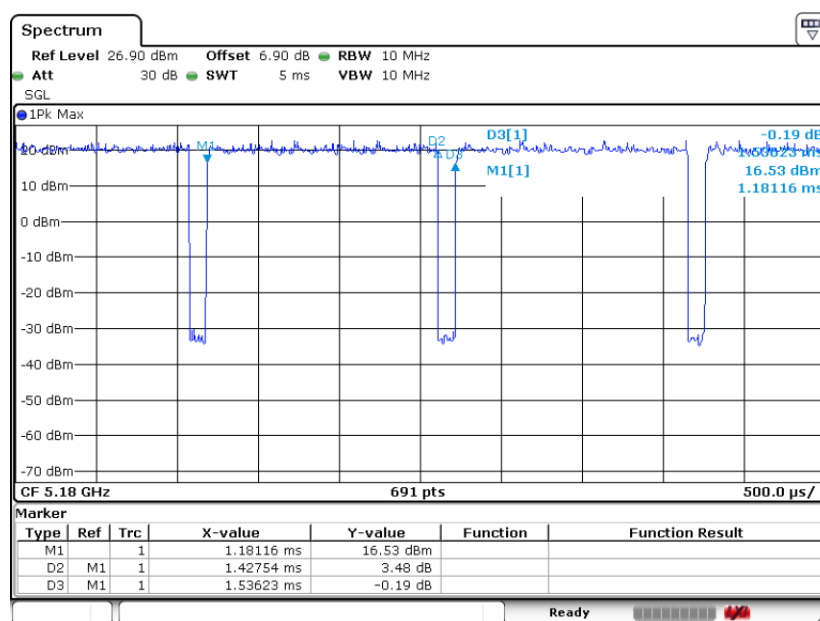
= -10.46(dB)

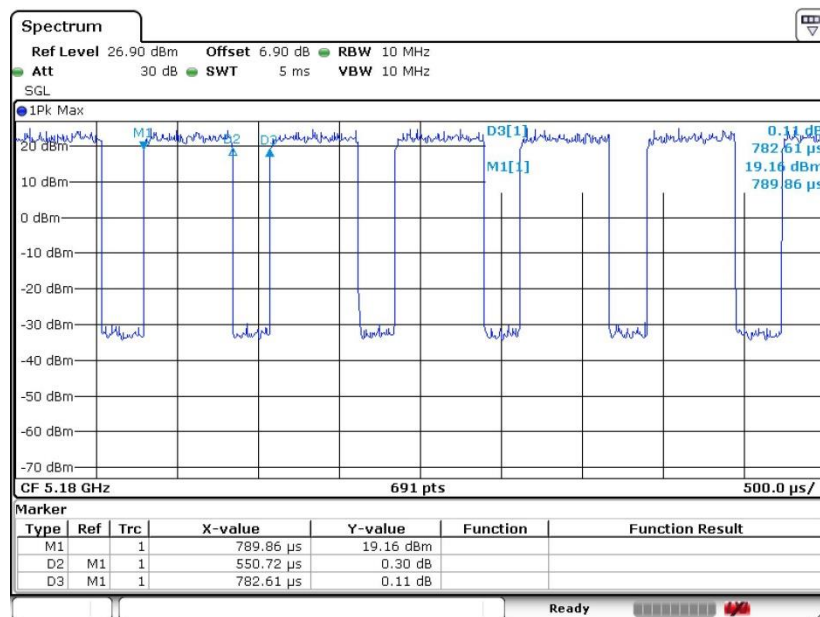
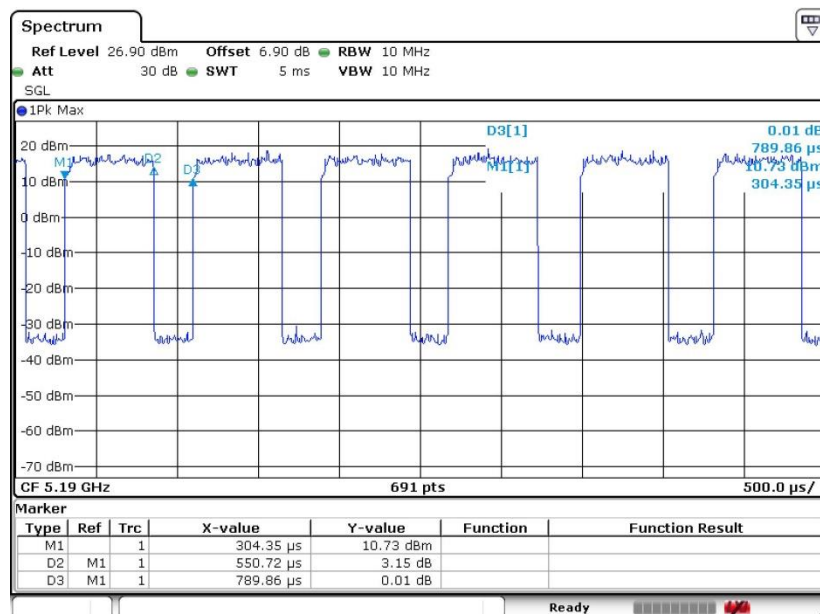
Both peak and average measured complies with the limit line, so test result is “PASS”.



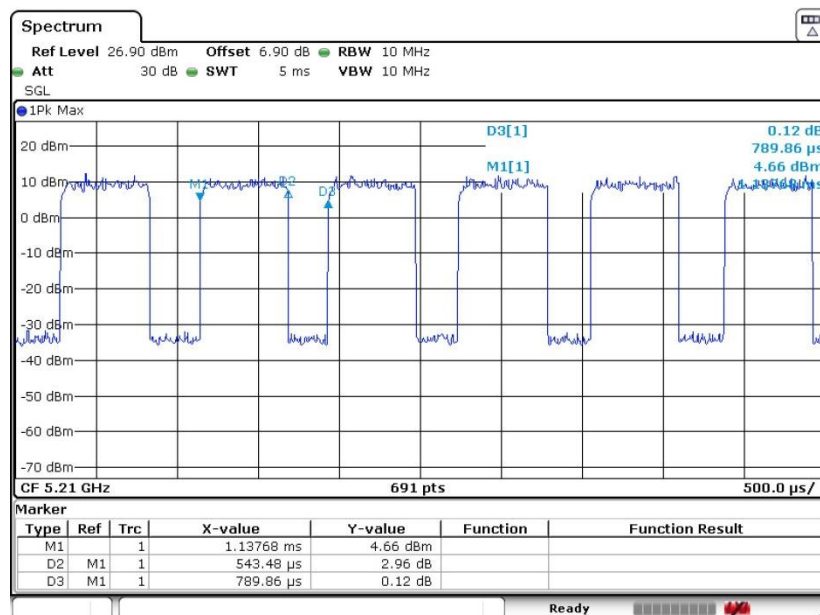
Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1	802.11a	92.92	1.428	0.700	0.75KHz
1+2+3+4	802.11n HT20	70.37	0.551	1.816	2.2KHz
1+2+3+4	802.11n HT40	69.72	0.551	1.816	2.2KHz
1+2+3+4	802.11ac VHT80	68.81	0.543	1.840	2.2KHz
1+2+3+4	802.11ax HE20	70.91	0.565	1.769	1.8KHz
1+2+3+4	802.11ax HE40	69.64	0.565	1.769	1.8KHz
1+2+3+4	802.11ax HE80	69.03	0.565	1.769	1.8KHz

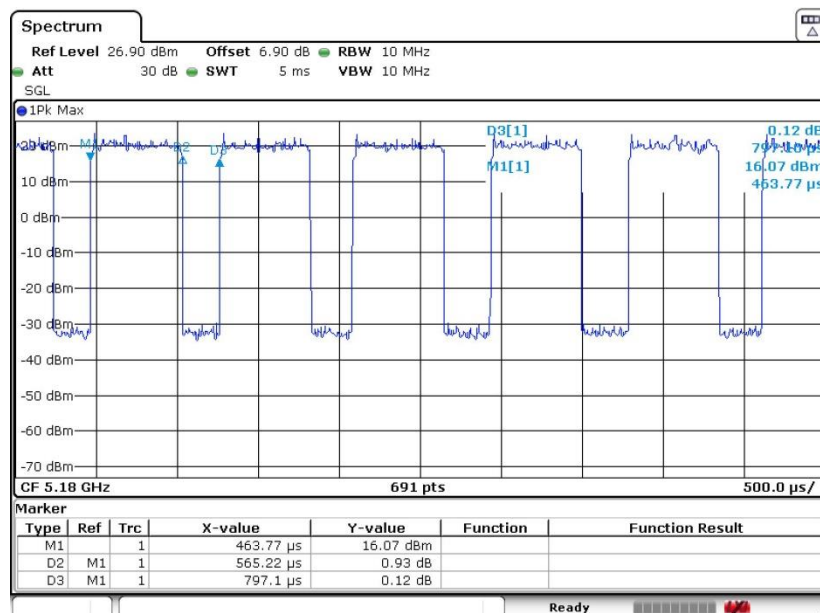
802.11a


802.11n HT20

802.11n HT40


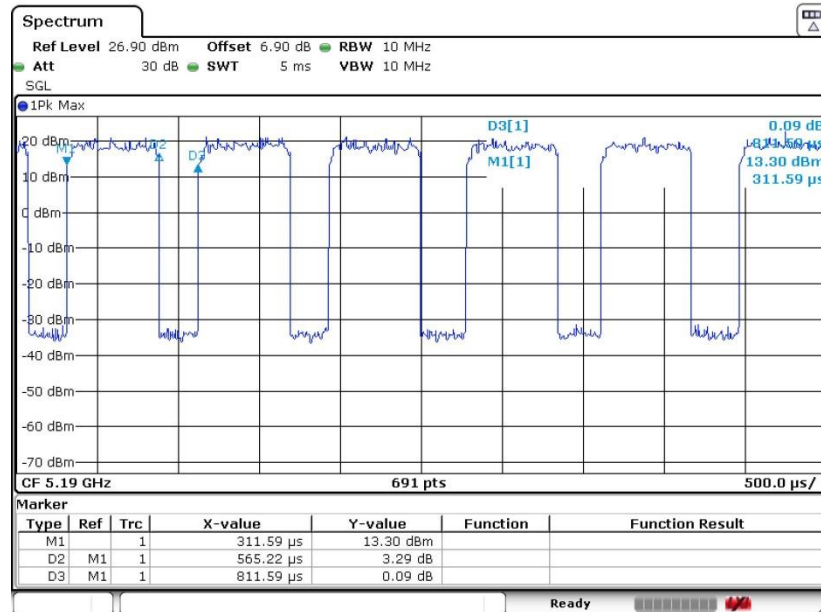
802.11ac VHT80



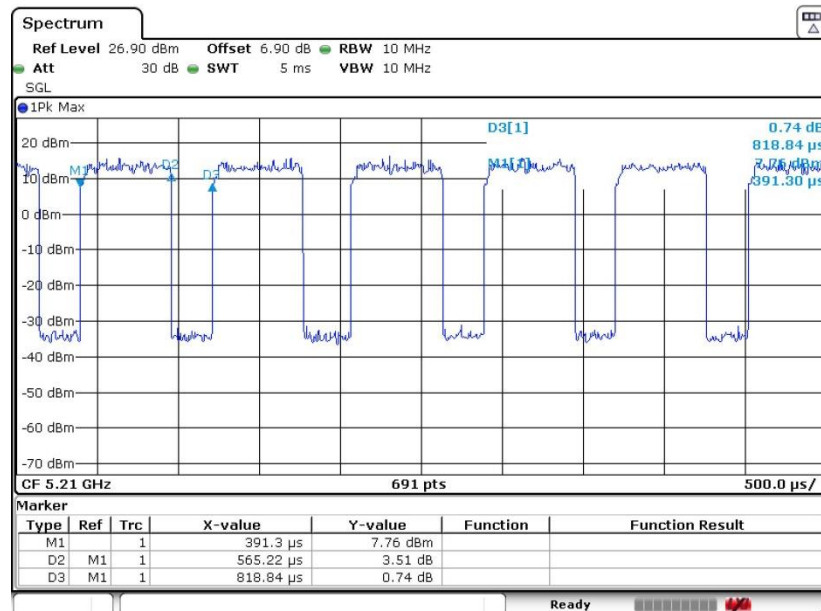
802.11ax HE20



802.11ax HE40



802.11ax HE80





Appendix E. Setup Photographs