



FCC RF Test Report

APPLICANT : Acer Incorporated
EQUIPMENT : Tablet Computer
BRAND NAME : acer
MODEL NAME : N17H1
MARKETING NAME : Switch 3
FCC ID : HLZ7265D2W
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

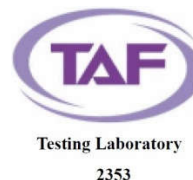
The product was integrated the Wireless Module (Model Name: 7265D2W, 7265D2W AN, FCC ID: PD97265D2) during the test.

The product was received on Mar. 15, 2017 and testing was completed on Apr. 18, 2017. We, SPORTON INTERNATIONAL (ShenZhen) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (ShenZhen) INC., the test report shall not be reproduced except in full.

Prepared by: Eric Shih / Manager

Approved by: Jones Tsai / Manager



SPORTON International (ShenZhen) INC.

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



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR731501E	Rev. 01	Initial issue of report	Apr. 25, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
-	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass	1
3.1	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
-	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	1
3.2	15.407(b)	Unwanted Emissions	15.407(b) 15.209(a)	Pass	Under limit 8.24 dB at 5650.000 MHz
3.3	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 7.98 dB at 1.000 MHz
-	15.407(g)	Frequency Stability	Within Operation Band	Pass	1
3.4	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.5	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

Note: 1: All conducted test items were leverage from module RF report which can refer to Report No.

"FCC_7265D2W_UNII_Report".



1 General Description

1.1 Applicant

Acer Incorporated

8F, 88, Sec.1 Xintai 5th Rd., Xizhi, New Taipei City 221, Taiwan, R.O.C

1.2 Manufacturer

Acer Incorporated

8F, 88, Sec.1 Xintai 5th Rd., Xizhi, New Taipei City 221, Taiwan, R.O.C

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Tablet Computer
Brand Name	acer
Model Name	N17H1
Marketing Name	Switch 3
FCC ID	HLZ7265D2W
EUT supports Radios application	WLAN2.4GHz 802.11b/g/n HT20/HT40 WLAN5GHz 802.11a/n HT20/HT40 WLAN5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth v3.0+EDR/ Bluetooth v4.0 LE
HW Version	T8202_MB_V4
SW Version	14393.5
EUT Stage	Pre-Production

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification												
Tx/Rx Channel Frequency Range		5745 MHz ~ 5825 MHz										
Maximum Output Power		<5745 MHz ~ 5825 MHz> <Ant. 1> 802.11a : 12.80 dBm / 0.0191 W 802.11n HT20 : 12.28 dBm / 0.0169 W 802.11n HT40 : 12.18 dBm / 0.0165 W 802.11ac VHT20: 12.26 dBm / 0.0168 W 802.11ac VHT40: 12.15 dBm / 0.0164 W 802.11ac VHT80: 12.07 dBm / 0.0161 W <Ant. 2> 802.11a : 13.35 dBm / 0.0216 W 802.11n HT20 : 12.98 dBm / 0.0199 W 802.11n HT40 : 12.85 dBm / 0.0193 W 802.11ac VHT20: 12.96 dBm / 0.0198 W 802.11ac VHT40: 12.83 dBm / 0.0192 W 802.11ac VHT80: 11.27 dBm / 0.0134 W MIMO <Ant. 1 + 2> 802.11n HT20 : 14.77 dBm / 0.0300 W 802.11n HT40 : 14.73 dBm / 0.0297 W 802.11ac VHT20: 14.68 dBm / 0.0294 W 802.11ac VHT40: 14.50 dBm / 0.0282 W 802.11ac VHT80: 13.95 dBm / 0.0248 W										
Type of Modulation		802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)										
Antenna Type / Gain		<Ant. 1> : PIFA Antenna with gain 3.17 dBi <Ant. 2> : PIFA Antenna with gain 4.89 dBi										
Antenna Function Description		<table><tr><td></td><td>Ant. 1</td><td>Ant. 2</td></tr><tr><td>802.11 a/n/ac</td><td>V</td><td>V</td></tr><tr><td>802.11 n/ac MIMO</td><td>V</td><td>V</td></tr></table>			Ant. 1	Ant. 2	802.11 a/n/ac	V	V	802.11 n/ac MIMO	V	V
	Ant. 1	Ant. 2										
802.11 a/n/ac	V	V										
802.11 n/ac MIMO	V	V										

Note:

1. MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.
2. 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.



1.5 Modification of EUT

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

1.6 Testing Location

Test Site	SPORTON International (ShenZhen) INC.	
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan District, Shenzhen City, Guangdong Province, China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595	
Test Site No.	Sporton Site No.	
	TH01-SZ	CO01-SZ

Test Site	SPORTON International (ShenZhen) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	Sporton Site No.	FCC Registration No.
	03CH03-SZ	565805

Note: The test site complies with ANSI C63.4 2014 requirement.

1.7 Applicable Standards

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

- ♦ FCC Part 15 Subpart E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ FCC KDB 644545 D03 Guidance for IEEE 802.11ac New Rules v01
- ♦ 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.

1.8 Component list

Note: There are two types of EUT, the details refer the following table. According to the difference, we choose sample 1 to perform full test.

Name	N17H1	
	Sample 1	Sample 2
PCB--MB	T8202_mainboard PCB_V4.0 (HUAXIN)	T8202_ mainboard PCB_V4.0 (RED BOARD)
CPU	N4200(INTEL)	N3350(INTEL)
Memory	4G+128G	4G+64G

2 Test Configuration of Equipment Under Test

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: conducted emission (150 kHz to 30 MHz) and radiated 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 were recorded in this report.

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:

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

2.2 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

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

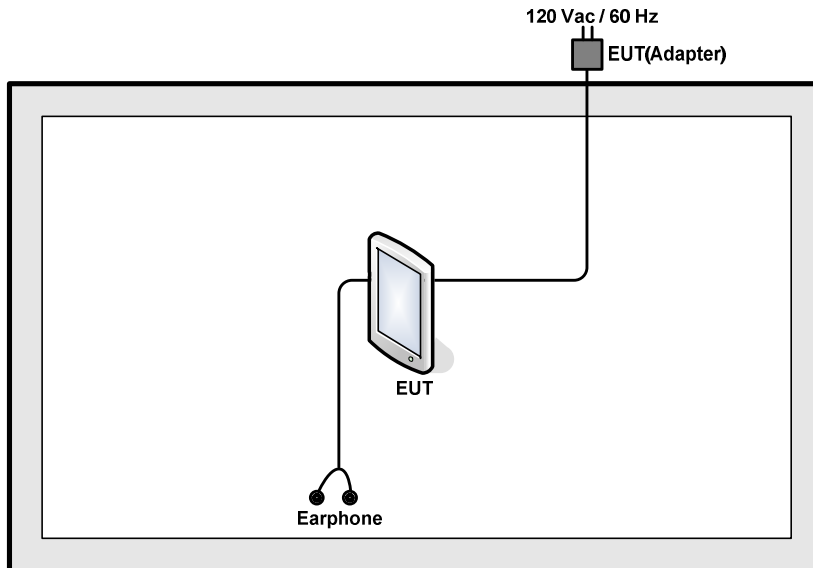
AC Conducted Emission	Mode 1 : WLAN Link (5G) + Bluetooth Link + Adapter 1 + Earphone Mode 2 : WLAN Link (5G) + Bluetooth Link + Adapter 2 + Earphone
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

Ch. #		Band IV : 5725-5850 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

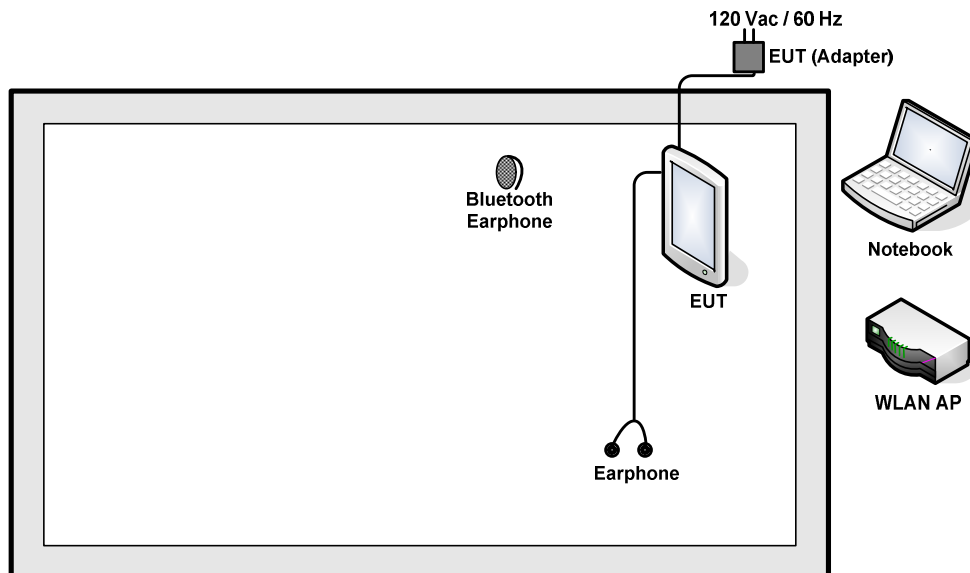
Ch. #		Band IV : 5745-5825 MHz	
		802.11ac VHT80	
L	Low	-	
M	Middle	155	
H	High	-	

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-Link	DIR-820L	KA2IR820LA1	N/A	Unshielded, 1.8 m
2.	Notebook	Lenovo	E540	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Bluetooth Earphone	Nokia	BH-108	PYAHS-107W	N/A	N/A
4.	Earphone	Apple	MC690ZP/A	FCC DoC	Shielded, 1.0 m	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.

3 Test Result

3.1 Maximum Conducted Output Power Measurement

3.1.1 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.

3.1.2 Measuring Instruments

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

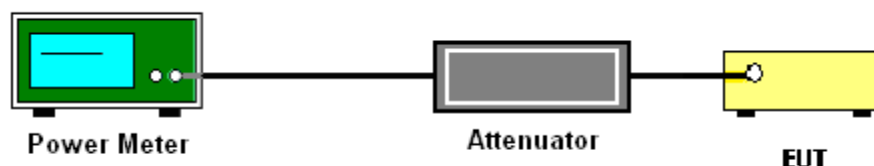
3.1.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.

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.

3.1.4 Test Setup



3.1.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.2 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part 15.205.

3.2.1 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

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

$$E = \frac{1000000\sqrt{30P}}{3} \text{ } \mu\text{V/m, where P is the eirp (Watts)}$$

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

- (3) KDB 789033 D02 General UNII Test Procedures New Rules v01r03 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3.2.2 Measuring Instruments

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

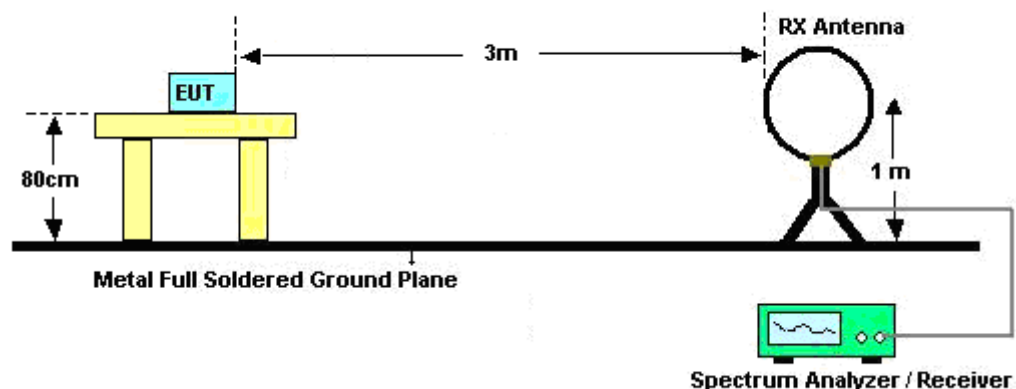
3.2.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03. 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.

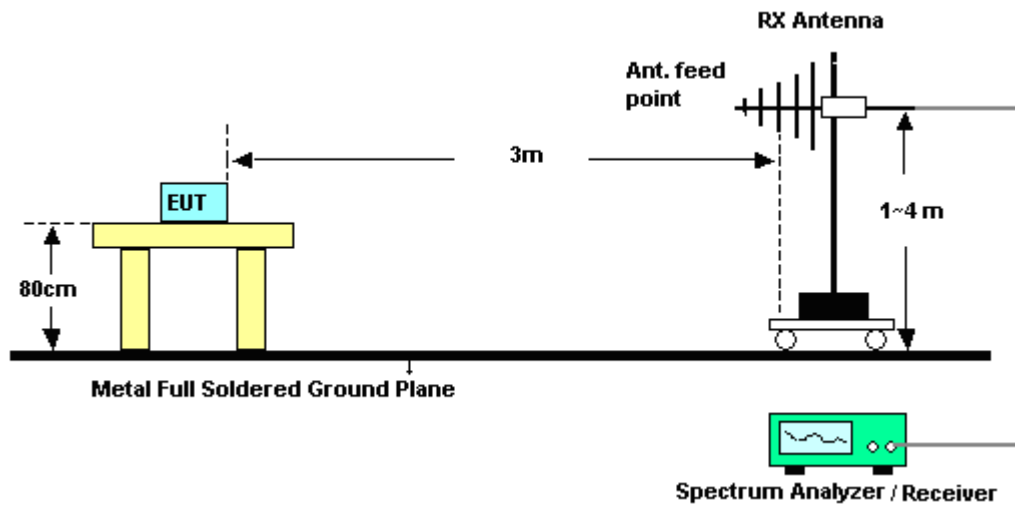
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband 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.

3.2.4 Test Setup

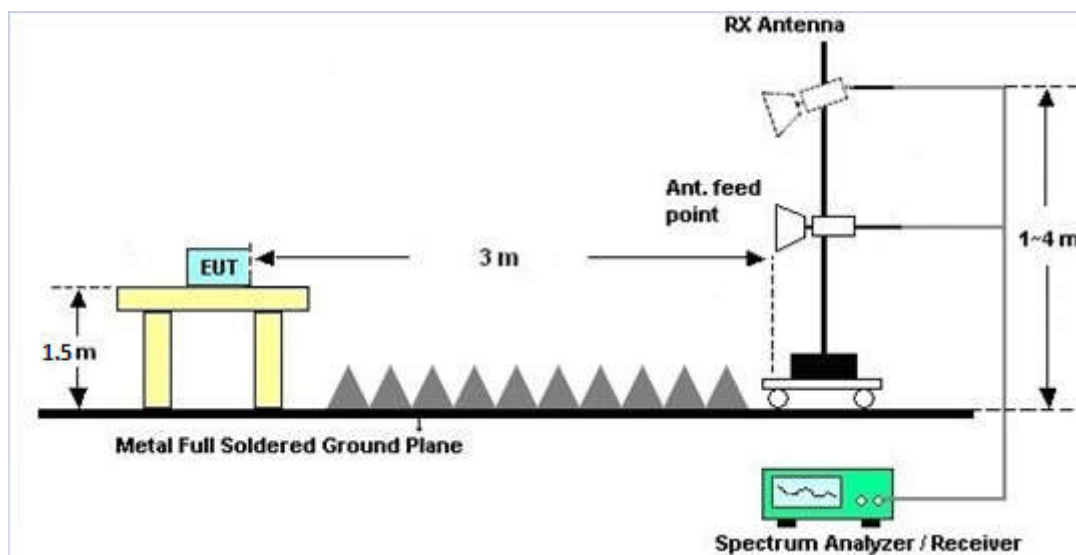
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



**3.2.5 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.

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B.

3.2.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix B.

3.2.9 Test Result of Radiated Spurious Emission (Simultaneous TX)

Please refer to test report (FR731501B).

3.3 AC Conducted Emission Measurement

3.3.1 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.

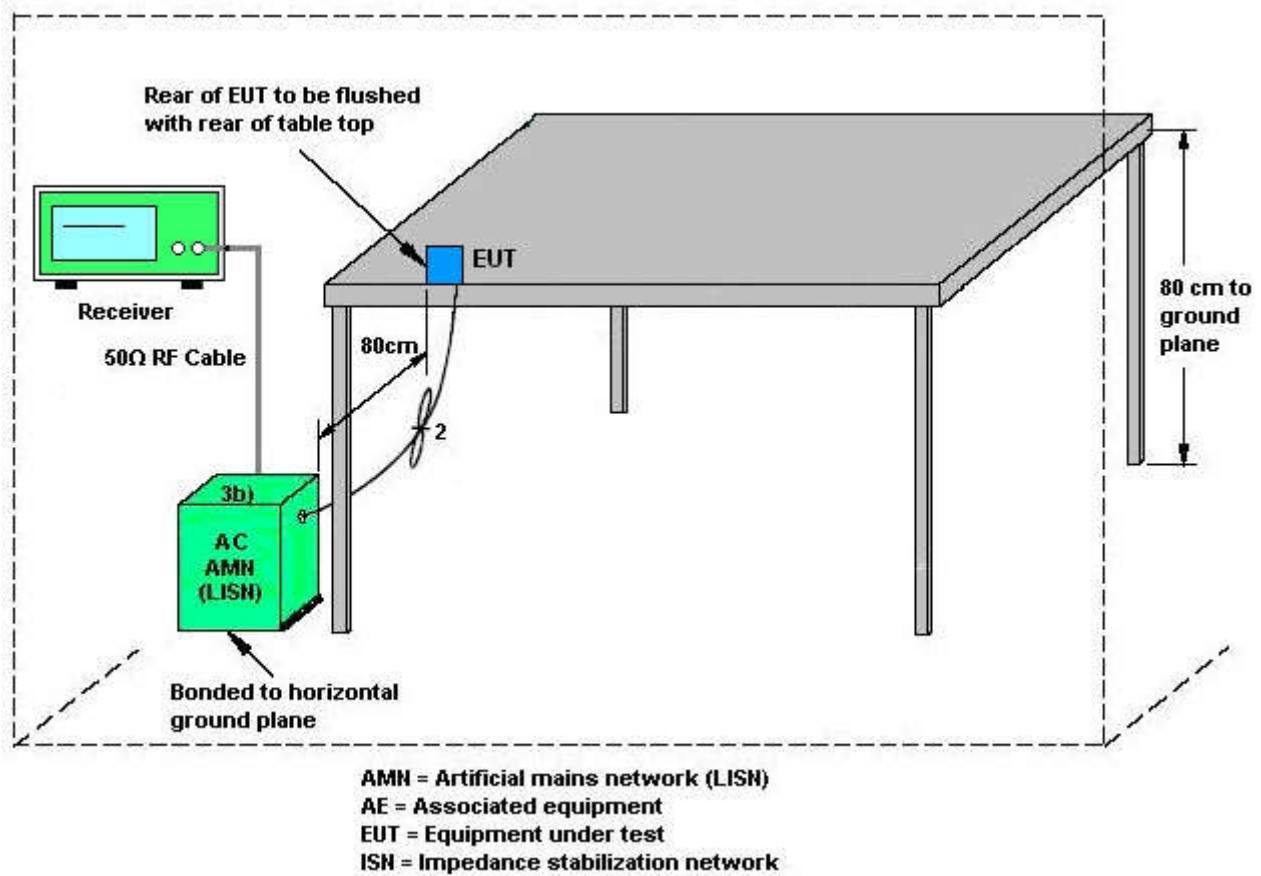
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

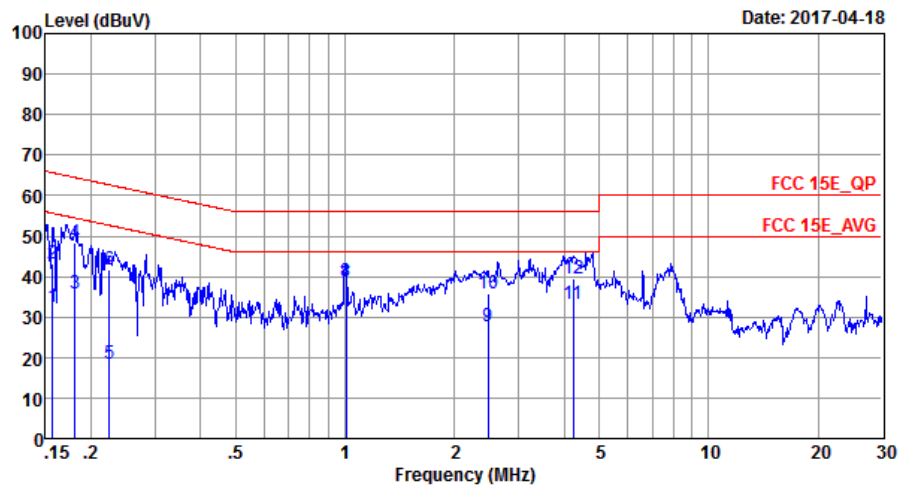
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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.

3.3.4 Test Setup



3.3.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Tao Cheng	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link (5G) + Bluetooth Link + Adapter 1 + Earphone		



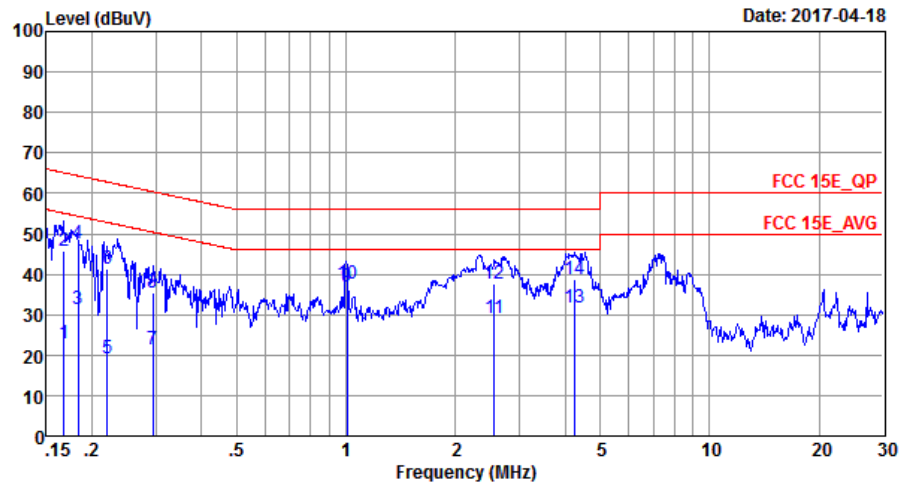
Site : CO01-SZ
Condition: FCC 15E_QP LISN_20170301_L LINE

Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	32.41	-23.24	55.65	22.00	0.03	10.38	Average
2	0.16	43.08	-22.57	65.65	32.67	0.03	10.38	QP
3	0.18	35.65	-18.81	54.46	25.33	0.03	10.29	Average
4	0.18	48.30	-16.16	64.46	37.98	0.03	10.29	QP
5	0.22	18.45	-34.21	52.66	8.20	0.03	10.22	Average
6	0.22	41.85	-20.81	62.66	31.60	0.03	10.22	QP
7 *	1.00	38.02	-7.98	46.00	27.80	0.07	10.15	Average
8	1.00	38.62	-17.38	56.00	28.40	0.07	10.15	QP
9	2.47	27.62	-18.38	46.00	17.29	0.14	10.19	Average
10	2.47	35.92	-20.08	56.00	25.59	0.14	10.19	QP
11	4.25	33.24	-12.76	46.00	22.80	0.18	10.26	Average
12	4.25	39.54	-16.46	56.00	29.10	0.18	10.26	QP



Test Mode :	Mode 1	Temperature :	21~23℃
Test Engineer :	Tao Cheng	Relative Humidity :	41~42%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN Link (5G) + Bluetooth Link + Adapter 1 + Earphone		



Site : CO01-SZ
Condition: FCC 15E_QP LISN_20170301_N NEUTRAL

Mode : Mode 1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.17	22.77	-32.31	55.08	12.40	0.03	10.34	Average
2	0.17	45.77	-19.31	65.08	35.40	0.03	10.34	QP
3	0.18	31.51	-22.82	54.33	21.20	0.03	10.28	Average
4	0.18	47.71	-16.62	64.33	37.40	0.03	10.28	QP
5	0.22	19.35	-33.44	52.79	9.10	0.03	10.22	Average
6	0.22	41.25	-21.54	62.79	31.00	0.03	10.22	QP
7	0.29	21.55	-28.86	50.41	11.30	0.03	10.22	Average
8	0.29	35.35	-25.06	60.41	25.10	0.03	10.22	QP
9 *	1.00	37.00	-9.00	46.00	26.80	0.05	10.15	Average
10	1.00	37.60	-18.40	56.00	27.40	0.05	10.15	QP
11	2.55	29.33	-16.67	46.00	19.10	0.04	10.19	Average
12	2.55	37.73	-18.27	56.00	27.50	0.04	10.19	QP
13	4.27	31.82	-14.18	46.00	21.50	0.06	10.26	Average
14	4.27	38.62	-17.38	56.00	28.30	0.06	10.26	QP



3.4 Automatically Discontinue Transmission

3.4.1 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.

3.4.2 Measuring Instruments

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

3.4.3 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.

3.5 Antenna Requirements

3.5.1 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.

3.5.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.5.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

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

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

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

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

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

The EUT supports CDD mode.

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 (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant 1 (dBi)	Ant 2 (dBi)				
Band IV	3.17	4.89	4.89	7.08	0.00	1.08

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

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



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	9kHz~40GHz	May 07, 2016	Apr. 13, 2017	May 06, 2017	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1207253	30MHz~40GHz	Jan. 06, 2017	Apr. 13, 2017	Jan. 05, 2018	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Jan. 06, 2017	Apr. 13, 2017	Jan. 05, 2018	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	May 07, 2016	Mar. 16, 2017~ Apr. 16, 2017	May 06, 2017	Radiation (03CH03-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz	May 07, 2016	Mar. 16, 2017~ Apr. 16, 2017	May 06, 2017	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 07, 2016	Mar. 16, 2017~ Apr. 16, 2017	May 06, 2017	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	May 21, 2016	Mar. 16, 2017~ Apr. 16, 2017	May 20, 2017	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	May 07, 2016	Mar. 16, 2017~ Apr. 16, 2017	May 06, 2017	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Aug. 10, 2016	Mar. 16, 2017~ Apr. 16, 2017	Aug. 09, 2017	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102210	0.01Hz~3000MHz	Oct. 11, 2016	Mar. 16, 2017~ Apr. 16, 2017	Oct. 10, 2017	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1943528	1GHz~18GHz	Oct. 11, 2016	Mar. 16, 2017~ Apr. 16, 2017	Oct. 10, 2017	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 06, 2017	Mar. 16, 2017~ Apr. 16, 2017	Jan. 05, 2018	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 16, 2016	Mar. 16, 2017~ Apr. 16, 2017	Jul. 15, 2017	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Mar. 16, 2017~ Apr. 16, 2017	NCR	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Mar. 16, 2017~ Apr. 16, 2017	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Mar. 16, 2017~ Apr. 16, 2017	NCR	Radiation (03CH03-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jan. 06, 2017	Apr. 18, 2017	Jan. 05, 2018	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103892	9kHz~30MHz	Jan. 05, 2017	Apr. 18, 2017	Jan. 04, 2018	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	MessTec	3816/2SH	00103912	9kHz~30MHz	Jan. 05, 2017	Apr. 18, 2017	Jan. 04, 2018	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 16, 2016	Apr. 18, 2017	Jul. 15, 2017	Conduction (CO01-SZ)
Pulse Limiter	COM-POWER	LIT-153 Transient Limiter	53139	150kHz~30MHz	Oct. 11, 2016	Apr. 18, 2017	Oct. 10, 2017	Conduction (CO01-SZ)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.5 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0 dB
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Appendix A. Conducted Test Results

Report Number : FR731501E

Test Engineer:	Sam Zheng	Temperature:	21~25	°C
Test Date:	2017/4/13	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Power Table

Band IV														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	0.08	0.05	12.80	13.35		30.00	30.00	3.17	4.89	Pass
11a	6Mbps	1	157	5785	0.08	0.05	12.53	13.16		30.00	30.00	3.17	4.89	Pass
11a	6Mbps	1	165	5825	0.08	0.05	12.68	12.90		30.00	30.00	3.17	4.89	Pass
HT20	MCS0	1	149	5745	0.07	0.06	12.28	12.98		30.00	30.00	3.17	4.89	Pass
HT20	MCS0	1	157	5785	0.07	0.06	12.05	12.65		30.00	30.00	3.17	4.89	Pass
HT20	MCS0	1	165	5825	0.07	0.06	12.04	12.51		30.00	30.00	3.17	4.89	Pass
HT40	MCS0	1	151	5755	0.15	0.12	12.18	12.85		30.00	30.00	3.17	4.89	Pass
HT40	MCS0	1	159	5795	0.15	0.12	11.86	12.58		30.00	30.00	3.17	4.89	Pass
VHT20	MCS0	1	149	5745	0.09	0.06	12.26	12.96		30.00	30.00	3.17	4.89	Pass
VHT20	MCS0	1	157	5785	0.09	0.06	11.99	12.64		30.00	30.00	3.17	4.89	Pass
VHT20	MCS0	1	165	5825	0.09	0.06	12.03	12.50		30.00	30.00	3.17	4.89	Pass
VHT40	MCS0	1	151	5755	0.13	0.12	12.15	12.83		30.00	30.00	3.17	4.89	Pass
VHT40	MCS0	1	159	5795	0.13	0.12	11.84	12.57		30.00	30.00	3.17	4.89	Pass
VHT80	MCS0	1	155	5775	0.25	0.25	12.07	11.27		30.00	30.00	3.17	4.89	Pass
HT20	MCS0	2	149	5745	0.07	0.06	11.73	11.79	14.77	30.00		4.89		Pass
HT20	MCS0	2	157	5785	0.07	0.06	11.32	11.85	14.60	30.00		4.89		Pass
HT20	MCS0	2	165	5825	0.07	0.06	11.61	11.30	14.47	30.00		4.89		Pass
HT40	MCS0	2	151	5755	0.15	0.12	11.63	11.63	14.64	30.00		4.89		Pass
HT40	MCS0	2	159	5795	0.15	0.12	11.77	11.66	14.73	30.00		4.89		Pass
VHT20	MCS0	2	149	5745	0.09	0.06	11.72	11.63	14.68	30.00		4.89		Pass
VHT20	MCS0	2	157	5785	0.09	0.06	11.44	11.36	14.41	30.00		4.89		Pass
VHT20	MCS0	2	165	5825	0.09	0.06	11.09	11.18	14.14	30.00		4.89		Pass
VHT40	MCS0	2	151	5755	0.13	0.12	11.56	11.41	14.50	30.00		4.89		Pass
VHT40	MCS0	2	159	5795	0.13	0.12	11.26	11.15	14.22	30.00		4.89		Pass
VHT80	MCS0	2	155	5775	0.25	0.25	11.03	10.85	13.95	30.00		4.89		Pass



Appendix B. 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.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5622.4	51.77	-16.43	68.2	41.5	33.14	9.25	32.12	174	164	P	H
		5687.6	55.61	-40.44	96.05	45.04	33.23	9.35	32.01	174	164	P	H
		5717.8	61.63	-48.55	110.18	50.9	33.27	9.44	31.98	174	164	P	H
		5724.2	64.9	-55.48	120.38	54.17	33.27	9.44	31.98	174	164	P	H
	*	5745	110.89	-	-	100	33.29	9.54	31.94	174	164	P	H
	*	5745	101.01	-	-	90.12	33.29	9.54	31.94	174	164	A	H
		5623	49.64	-18.56	68.2	39.37	33.14	9.25	32.12	168	167	P	V
		5691	50.4	-48.16	98.56	39.83	33.23	9.35	32.01	168	167	P	V
		5718.6	53.39	-57.02	110.41	42.66	33.27	9.44	31.98	168	167	P	V
		5724.8	58	-63.74	121.74	47.27	33.27	9.44	31.98	168	167	P	V
	*	5745	103.18	-	-	92.29	33.29	9.54	31.94	168	167	P	V
	*	5745	92.74	-	-	81.85	33.29	9.54	31.94	168	167	A	V



WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5627.6	51.43	-16.77	68.2	41.16	33.14	9.25	32.12	150	171	P	H
		5669.6	52.76	-29.98	82.74	42.25	33.21	9.35	32.05	150	171	P	H
		5703.6	53.99	-52.22	106.21	43.31	33.25	9.44	32.01	150	171	P	H
		5724	55.75	-64.17	119.92	45.02	33.27	9.44	31.98	150	171	P	H
	*	5785	110.66	-	-	99.56	33.33	9.64	31.87	150	171	P	H
	*	5785	101.5	-	-	90.4	33.33	9.64	31.87	150	171	A	H
		5851.2	56.42	-63.04	119.46	45.14	33.41	9.67	31.8	150	171	P	H
		5860.8	55.34	-53.83	109.17	43.96	33.43	9.71	31.76	150	171	P	H
		5901.6	55.74	-29.74	85.48	44.24	33.48	9.74	31.72	150	171	P	H
		5942.6	53.06	-15.14	68.2	41.39	33.54	9.78	31.65	150	171	P	H
		5622.8	48.85	-19.35	68.2	38.58	33.14	9.25	32.12	150	235	P	V
		5697.4	49.29	-53.99	103.28	38.72	33.23	9.35	32.01	150	235	P	V
		5713.4	49.52	-59.43	108.95	38.81	33.25	9.44	31.98	150	235	P	V
		5722.8	50.51	-66.67	117.18	39.78	33.27	9.44	31.98	150	235	P	V
	*	5785	101.85	-	-	90.75	33.33	9.64	31.87	150	235	P	V
	*	5785	93.09	-	-	81.99	33.33	9.64	31.87	150	235	A	V
		5852.6	52.52	-63.75	116.27	41.24	33.41	9.67	31.8	150	235	P	V
		5862.4	52.05	-56.68	108.73	40.67	33.43	9.71	31.76	150	235	P	V
		5892.6	52.14	-40	92.14	40.67	33.48	9.71	31.72	150	235	P	V
		5946	52.04	-16.16	68.2	40.37	33.54	9.78	31.65	150	235	P	V



WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz	*	5825	112.06	-	-	100.83	33.39	9.67	31.83	163	171	P	H
	*	5825	101.52	-	-	90.29	33.39	9.67	31.83	163	171	A	H
		5855	58.11	-52.69	110.8	46.81	33.43	9.67	31.8	163	171	P	H
		5855.2	58.28	-52.46	110.74	46.98	33.43	9.67	31.8	163	171	P	H
		5887.4	56.01	-39.98	95.99	44.56	33.46	9.71	31.72	163	171	P	H
		5929	53.41	-14.79	68.2	41.84	33.52	9.74	31.69	163	171	P	H
	*	5825	104.29	-	-	93.06	33.39	9.67	31.83	150	169	P	V
	*	5825	93.81	-	-	82.58	33.39	9.67	31.83	150	169	A	V
		5850.6	52.57	-68.26	120.83	41.29	33.41	9.67	31.8	150	169	P	V
		5855.8	53.5	-57.08	110.58	42.16	33.43	9.71	31.8	150	169	P	V
		5901.6	51.03	-34.45	85.48	39.53	33.48	9.74	31.72	150	169	P	V
		5945.2	50.85	-17.35	68.2	39.18	33.54	9.78	31.65	150	169	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		11490	50.42	-23.58	74	56.94	39.7	13.41	59.63	250	0	P	H
		17235	54.74	-13.46	68.2	58.48	40.06	16.29	60.09	150	0	P	H
		11490	49.85	-24.15	74	56.37	39.7	13.41	59.63	250	0	P	V
		17235	51.62	-16.58	68.2	55.36	40.06	16.29	60.09	150	0	P	V
802.11a CH 157 5785MHz		11570	49.66	-24.34	74	56.19	39.66	13.46	59.65	250	0	P	H
		17355	56.64	-11.56	68.2	60.04	40.34	16.36	60.1	150	0	P	H
		11570	50.29	-23.71	74	56.82	39.66	13.46	59.65	250	0	P	V
		17355	53.49	-14.71	68.2	56.89	40.34	16.36	60.1	150	0	P	V
802.11a CH 165 5825MHz		11650	50.7	-23.3	74	57.25	39.62	13.5	59.67	156	347	P	H
		17475	58.35	-9.85	68.2	61.42	40.62	16.43	60.12	150	360	P	H
		11650	51.47	-22.53	74	58.02	39.62	13.5	59.67	156	347	P	V
		11650	44.71	-9.29	54	51.26	39.62	13.5	59.67	156	347	A	V
		17475	53.51	-14.69	68.2	56.58	40.62	16.43	60.12	150	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 802.11a (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 165 5825MHz	*	5825	111.34	-	-	100.11	33.39	9.67	31.83	192	162	P	H
	*	5825	102.59	-	-	91.36	33.39	9.67	31.83	192	162	A	H
		5850.8	57.42	-62.96	120.38	46.14	33.41	9.67	31.8	192	162	P	H
		5859	56.97	-52.71	109.68	45.59	33.43	9.71	31.76	192	162	P	H
		5879.4	55.12	-46.81	101.93	43.71	33.46	9.71	31.76	192	162	P	H
		5927	53.01	-15.19	68.2	41.44	33.52	9.74	31.69	192	162	P	H
	*	5825	101.46	-	-	90.23	33.39	9.67	31.83	150	250	P	V
	*	5825	94.11	-	-	82.88	33.39	9.67	31.83	150	250	A	V
		5850	51.39	-70.81	122.2	40.11	33.41	9.67	31.8	150	250	P	V
		5858	52.48	-57.48	109.96	41.1	33.43	9.71	31.76	150	250	P	V
		5893.6	51.93	-39.47	91.4	40.46	33.48	9.71	31.72	150	250	P	V
		5940.2	50.59	-17.61	68.2	38.92	33.54	9.78	31.65	150	250	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 165 5825MHz		11650	50.57	-23.43	74	57.12	39.62	13.5	59.67	156	347	P	H
		17475	56.86	-11.34	68.2	59.93	40.62	16.43	60.12	150	360	P	H
		11650	50.47	-23.53	74	57.02	39.62	13.5	59.67	156	347	P	V
		17475	52.72	-15.48	68.2	55.79	40.62	16.43	60.12	150	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	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)
802.11ac VHT80 CH 155 5775MHz		5649.2	54.13	-14.07	68.2	43.79	33.17	9.25	32.08	150	170	P	H
		5697.6	65.68	-37.75	103.43	55.11	33.23	9.35	32.01	150	170	P	H
		5719.8	68.56	-42.18	110.74	57.83	33.27	9.44	31.98	150	170	P	H
		5722.4	67.48	-48.79	116.27	56.75	33.27	9.44	31.98	150	170	P	H
	*	5775	104.9	-	-	93.93	33.33	9.54	31.9	150	170	P	H
	*	5775	95.88	-	-	84.91	33.33	9.54	31.9	150	170	A	H
		5852	65.67	-51.97	117.64	54.39	33.41	9.67	31.8	150	170	P	H
		5861.6	65.92	-43.03	108.95	54.54	33.43	9.71	31.76	150	170	P	H
		5875.8	58.55	-46.06	104.61	47.14	33.46	9.71	31.76	150	170	P	H
		5938.8	52.17	-16.03	68.2	40.5	33.54	9.78	31.65	150	170	P	H
		5645.6	50.76	-17.44	68.2	40.42	33.17	9.25	32.08	150	170	P	V
		5696.2	60.39	-42.01	102.4	49.82	33.23	9.35	32.01	150	170	P	V
		5709.4	62.32	-45.51	107.83	51.61	33.25	9.44	31.98	150	170	P	V
		5724.4	62.29	-58.54	120.83	51.56	33.27	9.44	31.98	150	170	P	V
	*	5775	97.23	-	-	86.26	33.33	9.54	31.9	150	170	P	V
	*	5775	87.88	-	-	76.91	33.33	9.54	31.9	150	170	A	V
		5852.8	61.36	-54.46	115.82	50.08	33.41	9.67	31.8	150	170	P	V
		5855.8	56.62	-53.96	110.58	45.28	33.43	9.71	31.8	150	170	P	V
		5900.8	53.31	-32.76	86.07	41.81	33.48	9.74	31.72	150	170	P	V
		5946	49.73	-18.47	68.2	38.06	33.54	9.78	31.65	150	170	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 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac		11550	50.09	-23.91	74	56.61	39.67	13.46	59.65	160	360	P	H
VHT80		17325	50.44	-17.76	68.2	53.92	40.26	16.36	60.1	170	360	P	H
CH 155		11550	50.48	-23.52	74	57	39.67	13.46	59.65	160	360	P	V
5775MHz		17325	50.11	-18.09	68.2	53.59	40.26	16.36	60.1	170	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	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 149 5745MHz		5641	54.1	-14.1	68.2	43.76	33.17	9.25	32.08	172	171	P	H
		5698.6	57.77	-46.4	104.17	47.2	33.23	9.35	32.01	172	171	P	H
		5718.8	60.42	-50.04	110.46	49.69	33.27	9.44	31.98	172	171	P	H
		5723.6	64.83	-54.18	119.01	54.1	33.27	9.44	31.98	172	171	P	H
	*	5745	109.74	-	-	98.85	33.29	9.54	31.94	172	171	P	H
	*	5745	99.09	-	-	88.2	33.29	9.54	31.94	172	171	A	H
		5643.6	51.89	-16.31	68.2	41.55	33.17	9.25	32.08	150	247	P	V
		5689.8	55.76	-41.92	97.68	45.19	33.23	9.35	32.01	150	247	P	V
		5718.8	54.98	-55.48	110.46	44.25	33.27	9.44	31.98	150	247	P	V
		5724.8	58.56	-63.18	121.74	47.83	33.27	9.44	31.98	150	247	P	V
	*	5745	104.56	-	-	93.67	33.29	9.54	31.94	150	247	P	V
	*	5745	93.92	-	-	83.03	33.29	9.54	31.94	150	247	A	V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		5619.8	55.02	-13.18	68.2	44.85	33.14	9.15	32.12	169	171	P	H
		5695.2	56.06	-45.6	101.66	45.49	33.23	9.35	32.01	169	171	P	H
		5700.6	56.1	-49.27	105.37	45.42	33.25	9.44	32.01	169	171	P	H
		5721.6	56.45	-58	114.45	45.72	33.27	9.44	31.98	169	171	P	H
	*	5785	111.08	-	-	99.98	33.33	9.64	31.87	169	171	P	H
	*	5785	101.13	-	-	90.03	33.33	9.64	31.87	169	171	A	H
		5854.4	58.41	-53.76	112.17	47.11	33.43	9.67	31.8	169	171	P	H
		5866.4	59.1	-48.51	107.61	47.72	33.43	9.71	31.76	169	171	P	H
		5894	58.17	-32.93	91.1	46.7	33.48	9.71	31.72	169	171	P	H
		5940.8	55.71	-12.49	68.2	44.04	33.54	9.78	31.65	169	171	P	H
		5629.4	51.13	-17.07	68.2	40.82	33.14	9.25	32.08	150	237	P	V
		5696.8	52.68	-50.16	102.84	42.11	33.23	9.35	32.01	150	237	P	V
		5716.8	52.45	-57.46	109.91	41.74	33.25	9.44	31.98	150	237	P	V
		5723.6	52.17	-66.84	119.01	41.44	33.27	9.44	31.98	150	237	P	V
	*	5785	104.9	-	-	93.8	33.33	9.64	31.87	150	237	P	V
	*	5785	94.32	-	-	83.22	33.33	9.64	31.87	150	237	A	V
		5852.2	53.49	-63.69	117.18	42.21	33.41	9.67	31.8	150	237	P	V
		5859.8	54.21	-55.24	109.45	42.83	33.43	9.71	31.76	150	237	P	V
		5876	54.45	-50.01	104.46	43.04	33.46	9.71	31.76	150	237	P	V
		5932.8	52.99	-15.21	68.2	41.42	33.52	9.74	31.69	150	237	P	V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 165 5825MHz	*	5825	112.96	-	-	101.73	33.39	9.67	31.83	154	171	P	H
	*	5825	102.45	-	-	91.22	33.39	9.67	31.83	154	171	A	H
		5850.6	61.69	-59.14	120.83	50.41	33.41	9.67	31.8	154	171	P	H
		5855.6	60.64	-49.99	110.63	49.3	33.43	9.71	31.8	154	171	P	H
		5883.8	58.84	-39.83	98.67	47.39	33.46	9.71	31.72	154	171	P	H
		5942.4	57.05	-11.15	68.2	45.38	33.54	9.78	31.65	154	171	P	H
	*	5825	105.61	-	-	94.38	33.39	9.67	31.83	160	239	P	V
	*	5825	94.54	-	-	83.31	33.39	9.67	31.83	160	239	A	V
		5852.2	54.55	-62.63	117.18	43.27	33.41	9.67	31.8	160	239	P	V
		5855.6	55.05	-55.58	110.63	43.71	33.43	9.71	31.8	160	239	P	V
		5894.8	54.4	-36.11	90.51	42.9	33.48	9.74	31.72	160	239	P	V
		5948.6	53.9	-14.3	68.2	42.23	33.54	9.78	31.65	160	239	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 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 149 5745MHz		11490	50.56	-23.44	74	57.08	39.7	13.41	59.63	160	360	P	H
		17235	51.21	-16.99	68.2	54.95	40.06	16.29	60.09	170	360	P	H
		11490	51.42	-22.58	74	57.94	39.7	13.41	59.63	160	360	P	V
		11490	43.74	-10.26	54	50.26	39.7	13.41	59.63	160	360	A	V
		17235	50.05	-18.15	68.2	53.79	40.06	16.29	60.09	170	360	P	V
802.11n HT20 CH 157 5785MHz		11570	51.17	-22.83	74	57.7	39.66	13.46	59.65	175	198	P	H
		11570	43.78	-10.22	54	50.31	39.66	13.46	59.65	175	198	A	H
		17355	53.79	-14.41	68.2	57.19	40.34	16.36	60.1	189	185	P	H
		11570	50.7	-23.3	74	57.23	39.66	13.46	59.65	175	198	P	V
		17355	51.09	-17.11	68.2	54.49	40.34	16.36	60.1	189	185	P	V
802.11n HT20 CH 165 5825MHz		11650	50.93	-23.07	74	57.48	39.62	13.5	59.67	156	347	P	H
		17475	56.39	-11.81	68.2	59.46	40.62	16.43	60.12	150	360	P	H
		11650	50.52	-23.48	74	57.07	39.62	13.5	59.67	156	347	P	V
		17475	53.58	-14.62	68.2	56.65	40.62	16.43	60.12	150	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	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 CH 151 5755MHz		5633.4	56.1	-12.1	68.2	45.76	33.17	9.25	32.08	173	170	P	H
		5693.4	59.84	-40.49	100.33	49.27	33.23	9.35	32.01	173	170	P	H
		5719	67.1	-43.42	110.52	56.37	33.27	9.44	31.98	173	170	P	H
		5724.6	70.22	-51.07	121.29	59.49	33.27	9.44	31.98	173	170	P	H
	*	5755	108.59	-	-	97.68	33.31	9.54	31.94	173	170	P	H
	*	5755	99.14	-	-	88.23	33.31	9.54	31.94	173	170	A	H
		5853.8	58.42	-55.12	113.54	47.12	33.43	9.67	31.8	173	170	P	H
		5867.4	59.25	-48.08	107.33	47.87	33.43	9.71	31.76	173	170	P	H
		5888.4	58.15	-37.1	95.25	46.68	33.48	9.71	31.72	173	170	P	H
		5927.6	54.66	-13.54	68.2	43.09	33.52	9.74	31.69	173	170	P	H
		5622.2	52.83	-15.37	68.2	42.56	33.14	9.25	32.12	150	246	P	V
		5699.6	54.61	-50.3	104.91	43.95	33.23	9.44	32.01	150	246	P	V
		5716.8	60.07	-49.84	109.91	49.36	33.25	9.44	31.98	150	246	P	V
		5725	61.35	-60.85	122.2	50.62	33.27	9.44	31.98	150	246	P	V
	*	5755	101.25	-	-	90.34	33.31	9.54	31.94	150	246	P	V
	*	5755	92.7	-	-	81.79	33.31	9.54	31.94	150	246	A	V
		5851.4	52.82	-66.19	119.01	41.54	33.41	9.67	31.8	150	246	P	V
		5860.2	54.07	-55.27	109.34	42.69	33.43	9.71	31.76	150	246	P	V
		5888	53.18	-42.37	95.55	41.71	33.48	9.71	31.72	150	246	P	V
		5925.6	52.32	-15.88	68.2	40.75	33.52	9.74	31.69	150	246	P	V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 159 5795MHz		5636.2	53.92	-14.28	68.2	43.58	33.17	9.25	32.08	170	170	P	H
		5686.8	55.6	-39.86	95.46	45.03	33.23	9.35	32.01	170	170	P	H
		5717.4	56.77	-53.3	110.07	46.06	33.25	9.44	31.98	170	170	P	H
		5721.8	57.59	-57.31	114.9	46.86	33.27	9.44	31.98	170	170	P	H
	*	5795	108.47	-	-	97.35	33.35	9.64	31.87	170	170	P	H
	*	5795	100.18	-	-	89.06	33.35	9.64	31.87	170	170	A	H
		5850.2	59.74	-62	121.74	48.46	33.41	9.67	31.8	170	170	P	H
		5855.8	59.7	-50.88	110.58	48.36	33.43	9.71	31.8	170	170	P	H
		5879.2	58.03	-44.05	102.08	46.62	33.46	9.71	31.76	170	170	P	H
		5931.2	56.91	-11.29	68.2	45.34	33.52	9.74	31.69	170	170	P	H
		5620.8	51.71	-16.49	68.2	41.54	33.14	9.15	32.12	150	234	P	V
		5695	52.24	-49.27	101.51	41.67	33.23	9.35	32.01	150	234	P	V
		5714.8	52.78	-56.57	109.35	42.07	33.25	9.44	31.98	150	234	P	V
		5721	52.91	-60.17	113.08	42.18	33.27	9.44	31.98	150	234	P	V
	*	5795	102.44	-	-	91.32	33.35	9.64	31.87	150	234	P	V
	*	5795	93.96	-	-	82.84	33.35	9.64	31.87	150	234	A	V
		5853.8	55.14	-58.4	113.54	43.84	33.43	9.67	31.8	150	234	P	V
		5857.2	55.44	-54.74	110.18	44.1	33.43	9.71	31.8	150	234	P	V
		5879.8	55.18	-46.45	101.63	43.77	33.46	9.71	31.76	150	234	P	V
		5934.4	53.79	-14.41	68.2	42.14	33.52	9.78	31.65	150	234	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 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n		11510	50.36	-23.64	74	56.88	39.7	13.41	59.63	160	360	P	H
HT40		17265	51.11	-17.09	68.2	54.75	40.14	16.32	60.1	170	360	P	H
CH 151		11510	50.43	-23.57	74	56.95	39.7	13.41	59.63	160	360	P	V
5755MHz		17265	49.78	-18.42	68.2	53.42	40.14	16.32	60.1	170	360	P	V
802.11n HT40 CH 159 5795MHz		11590	52.28	-21.72	74	58.81	39.65	13.48	59.66	170	300	P	H
		11590	44.73	-9.27	54	51.26	39.65	13.48	59.66	170	300	A	H
		17385	53.77	-14.43	68.2	57.07	40.42	16.39	60.11	150	200	P	H
		11590	51.73	-22.27	74	58.26	39.65	13.48	59.66	170	300	P	V
		11590	43.7	-10.3	54	50.23	39.65	13.48	59.66	170	300	A	V
		17385	52.37	-15.83	68.2	55.67	40.42	16.39	60.11	150	200	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	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac VHT80 CH 155 5775MHz		5650	59.96	-8.24	68.2	49.6	33.19	9.25	32.08	150	172	P	H
		5678	72.79	-16.17	88.96	62.28	33.21	9.35	32.05	150	172	P	H
		5719	74.11	-36.41	110.52	63.38	33.27	9.44	31.98	150	172	P	H
		5720.6	72.07	-40.1	112.17	61.34	33.27	9.44	31.98	150	172	P	H
	*	5775	105.49	-	-	94.52	33.33	9.54	31.9	150	172	P	H
	*	5775	96.25	-	-	85.28	33.33	9.54	31.9	150	172	A	H
		5852.8	68.66	-47.16	115.82	57.38	33.41	9.67	31.8	150	172	P	H
		5858.6	76.08	-33.71	109.79	64.7	33.43	9.71	31.76	150	172	P	H
		5878.2	61.73	-41.09	102.82	50.32	33.46	9.71	31.76	150	172	P	H
		5929	56.96	-11.24	68.2	45.39	33.52	9.74	31.69	150	172	P	H
		5649.6	56.24	-11.96	68.2	45.88	33.19	9.25	32.08	169	237	P	V
		5694.8	66.79	-34.58	101.37	56.22	33.23	9.35	32.01	169	237	P	V
		5705.8	67.57	-39.26	106.83	56.86	33.25	9.44	31.98	169	237	P	V
		5724.6	66.69	-54.6	121.29	55.96	33.27	9.44	31.98	169	237	P	V
	*	5775	100.85	-	-	89.88	33.33	9.54	31.9	169	237	P	V
	*	5775	90.44	-	-	79.47	33.33	9.54	31.9	169	237	A	V
		5851	67.78	-52.14	119.92	56.5	33.41	9.67	31.8	169	237	P	V
		5865.6	64.52	-43.31	107.83	53.14	33.43	9.71	31.76	169	237	P	V
		5892.4	54.99	-37.3	92.29	43.52	33.48	9.71	31.72	169	237	P	V
		5926	54.81	-13.39	68.2	43.24	33.52	9.74	31.69	169	237	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 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac VHT80 CH 155 5775MHz		11550	51.66	-22.34	74	58.18	39.67	13.46	59.65	160	360	P	H
		11550	44.84	-9.16	54	51.36	39.67	13.46	59.65	160	360	A	H
		17325	52.49	-15.71	68.2	55.97	40.26	16.36	60.1	170	360	P	H
		11550	51.55	-22.45	74	58.07	39.67	13.46	59.65	160	360	P	V
		11550	44.51	-9.49	54	51.03	39.67	13.46	59.65	160	360	A	V
		17325	52.79	-15.41	68.2	56.27	40.26	16.36	60.1	170	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n VHT80 LF		30	26.5	-13.5	40	31.47	26.7	0.33	32	-	-	P	H
		86.26	27.24	-12.76	40	41.53	16.84	0.69	31.82	-	-	P	H
		153.19	24.58	-18.92	43.5	37.35	17.67	1.07	31.51	-	-	P	H
		228.85	28.05	-17.95	46	41.07	16.98	1.37	31.37	-	-	P	H
		382.11	35.11	-10.89	46	40.46	24.02	1.89	31.26	135	100	P	H
		703.18	31.82	-14.18	46	32.76	27.68	2.63	31.25	-	-	P	H
		39.7	30.58	-9.42	40	39.66	22.5	0.41	31.99	120	160	P	V
		84.32	26.66	-13.34	40	41.38	16.44	0.67	31.83	-	-	P	V
		458.74	30.38	-15.62	46	34.96	24.52	2.04	31.14	-	-	P	V
		535.37	32.46	-13.54	46	37.11	24.32	2.21	31.18	-	-	P	V
		611.03	35.28	-10.72	46	38.92	25.14	2.43	31.21	-	-	P	V
		686.69	34.26	-11.74	46	35.86	27.05	2.59	31.24	-	-	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)

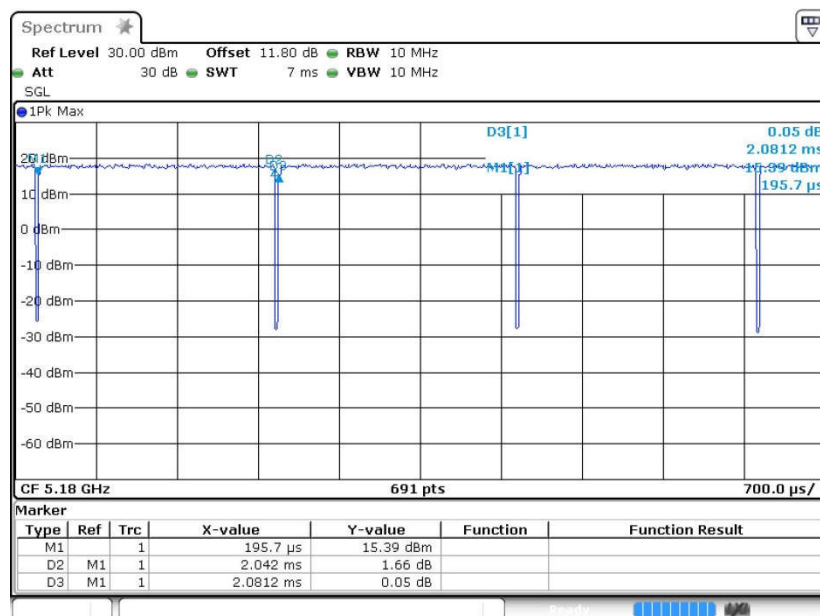
= -10.46(dB)

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

Appendix C. Duty Cycle Plots

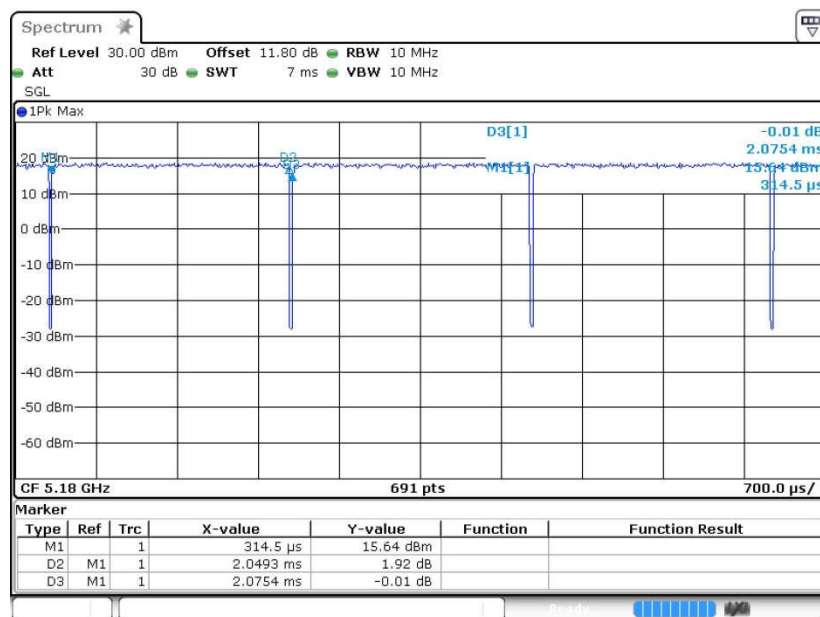
Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1	802.11a	98.12	-	-	10Hz
2	802.11a	98.74	-	-	10Hz
2	802.11ac VHT80	94.37	0.438	2.285	3KHz
1+2	802.11n HT20	98.66	-	-	10Hz
1+2	802.11n HT40	97.28	0.93	1.070	3KHz
1+2	802.11ac VHT80	94.37	0.438	2.285	3KHz

802.11a for Ant.1



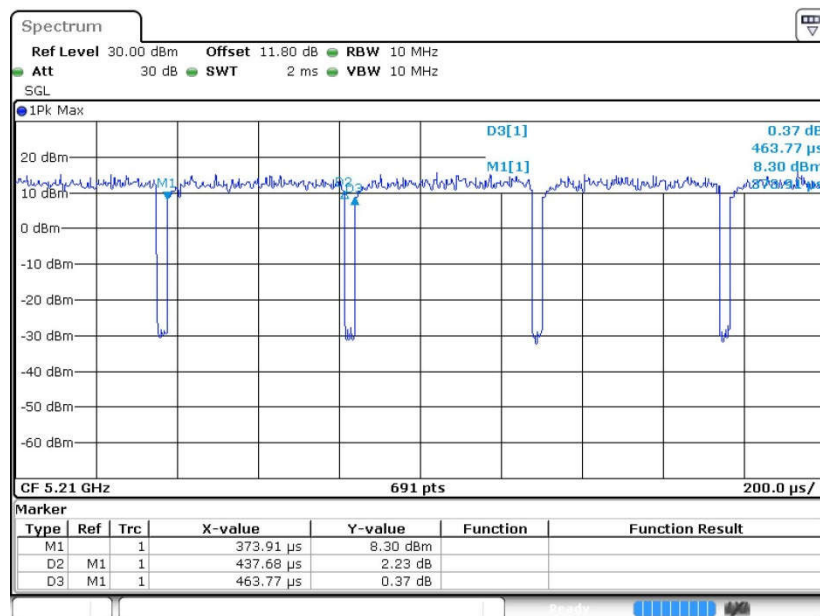
Date: 16.MAR.2017 11:26:27

802.11a for Ant.2



Date: 16.MAR.2017 11:30:57

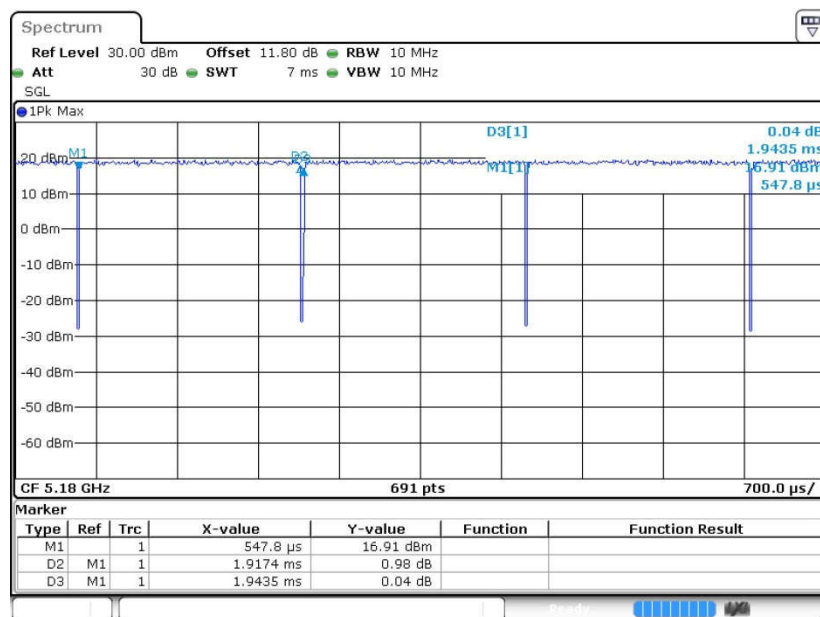
802.11ac VTH80 for Ant.2



Date: 16.MAR.2017 11:30:07

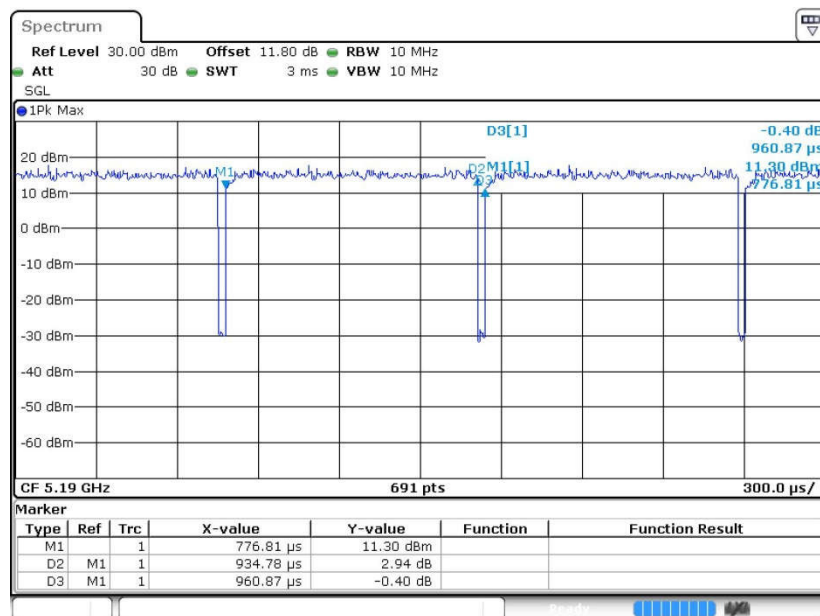


802.11n HT20 for Ant.1+2



Date: 16.MAR.2017 11:33:31

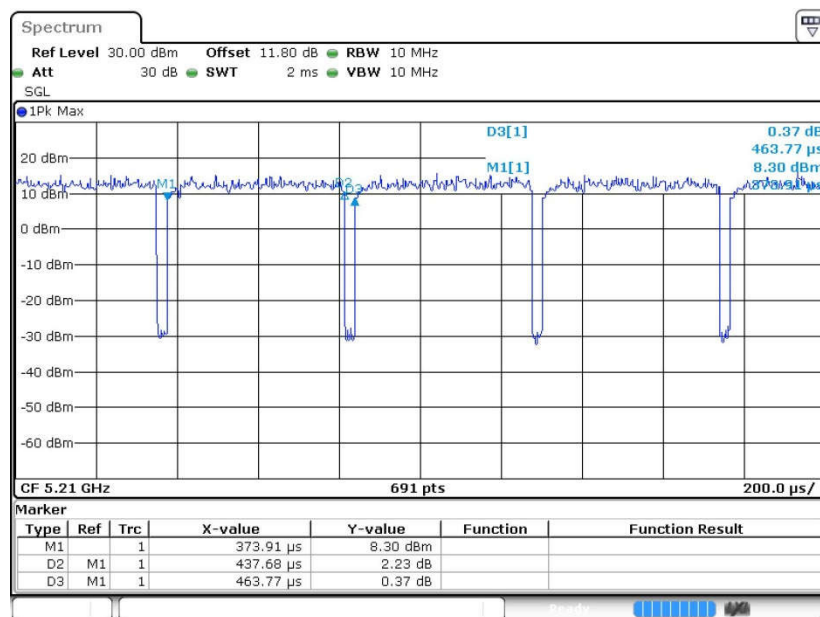
802.11n HT40 for Ant.1+2



Date: 16.MAR.2017 11:35:55



802.11ac VHT80 for Ant.1+2



Date: 16.MAR.2017 11:30:07