Variant FCC RF Test Report

APPLICANT	:	**TP-LINK TECHNOLOGIES CO., LTD.**
EQUIPMENT	:	**AC1900 Wireless Dual Band Gigabit Access Point**
BRAND NAME	:	**TP-LINK**
MODEL NAME	:	**EAP330**
FCC ID	:	**TE7EAP330**
STANDARD	:	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	:	**(NII) Unlicensed National Information Infrastructure**

The product testing was completed on Jul. 19, 2016. 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: Ken Chen / Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
2353

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR640501-01C	Rev. 01	This is a variant report for EAP330. All the test cases were performed on the original test report which can be referred to Sporton Report Number FG640501C. Based on the original test report, only adding the Beamforming power and RSE test data.	Sep. 06, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.407(a)	RSS-247 Section 6	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.2	15.407(b)	RSS-247 Section 6	Unwanted Emissions	15.407(b)(4)(i) &15.209(a)	Pass	Under limit 1.33 dB at 39.700 MHz
3.3	15.407(c)	RSS-247 6.4(2)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.4	15.203 & 15.407(a)	N/A	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

TP-LINK TECHNOLOGIES CO., LTD.
Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

1.2 Manufacturer

TP-LINK TECHNOLOGIES CO., LTD.
Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	AC1900 Wireless Dual Band Gigabit Access Point
Brand Name	TP-LINK
Model Name	EAP330
FCC ID	TE7EAP330
EUT supports Radios application	WLAN2.4GHz 802.11b/g/n HT20/HT40/ WLAN2.4GHz 802.11ac VHT20/VHT40 WLAN5GHz 802.11a/n HT20/HT40/ WLAN5GHz 802.11ac VHT20/VHT40/VHT80
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

<table>
<tr><th colspan="2">Product Specification subjective to this standard</th></tr>
<tr><td>Tx/Rx Channel Frequency Range</td><td>5745 MHz ~ 5825 MHz</td></tr>
<tr><td>Maximum Output Power
<TXBF Modes></td><td>802.11n HT20 : 24.41 dBm / 0.2761 W
802.11n HT40 : 24.53 dBm / 0.2838 W
802.11ac VHT20: 24.35 dBm / 0.2723 W
802.11ac VHT40: 24.50 dBm / 0.2818 W
802.11ac VHT80: 24.34 dBm / 0.2716 W</td></tr>
<tr><td>Antenna Type / Gain</td><td>Chain Port 1 : PIFA Antenna
Chain Port 2 : PIFA Antenna
Chain Port 3 : PIFA Antenna</td></tr>
<tr><td>Antenna Gain</td><td>Chain Port 1 : 5.66 dBi
Chain Port 2 : 7.20 dBi
Chain Port 3 : 6.90 dBi</td></tr>
<tr><td>TX Beamforming Gain (Y)</td><td>MIMO Ant. 1+2+3 : 4.18 dBi</td></tr>
<tr><td>Type of Modulation</td><td>802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)
802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)</td></tr>
<tr><td>Antenna Function Description</td><td>
<table>
<tr><th></th><th>Chain Port 1</th><th>Chain Port 2</th><th>Chain Port 3</th></tr>
<tr><td>802.11a/n/ac MIMO</td><td>V</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

Remark: Only 802.11n and 11ac support TX Beamforming

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	1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595
Test Site No.	**Sporton Site No.**
	TH01-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/IC Registration No.**
	03CH03-SZ	565805/4086F

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.
- 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

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: radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 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 boldface were 802.11n HT40.

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

<TXBF Modes>

WLAN 5GHz 802.11n-HT20 Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 149	5745	1+2+3	**24.41**	CH 149	24.31	24.31	24.29	24.33	24.32	24.34	24.34
CH 157	5785	1+2+3	24.32								
CH 165	5825	1+2+3	24.28								

WLAN 5GHz 802.11n-HT40 Average Power (dBm)											
Power vs. Channel				Power vs. Data Rate							
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 151	5755	1+2+3	**24.53**	CH 151	24.46	24.46	24.40	24.48	24.48	24.48	24.48
CH 159	5795	1+2+3	24.37								

WLAN 5GHz 802.11ac VHT20 Average Power (dBm)												
Power vs. Channel				Power vs. Data Rate								
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8
CH 149	5745	1+2+3	**24.35**	CH 149	24.20	24.22	24.24	24.23	24.22	24.22	24.19	24.20
CH 157	5785	1+2+3	24.26									
CH 165	5825	1+2+3	24.24									

WLAN 5GHz 802.11ac VHT40 Average Power (dBm)													
Power vs. Channel				Power vs. Data Rate									
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 151	5755	1+2+3	**24.50**	CH 151	24.45	24.41	24.39	24.41	24.44	24.38	24.40	24.42	24.43
CH 159	5795	1+2+3	24.31										

WLAN 5GHz 802.11n-HT80 Average Power (dBm)													
Power vs. Channel				Power vs. Data Rate									
Channel	Frequency (MHz)	Chain Port	MCS Index MCS0	Channel	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
CH 155	5775	1+2+3	**24.34**	CH 155	24.29	24.28	24.29	24.30	24.28	24.27	24.30	24.32	24.31

Note: Chain Port 1+2+3 is a calculated result from sum of the power Chain Port 1+2+3(1), Chain Port 1+2+3(2) and Chain Port 1+2+3(3).

2.3 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

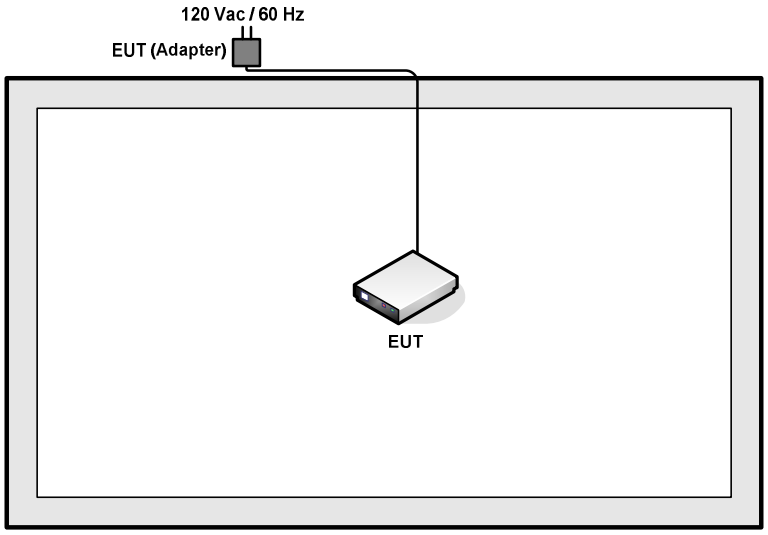
Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

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

Ch. #		Band IV：5725-5850 MHz		
		802.11ac VHT20	802.11ac VHT40	802.11ac VHT80
L	Low	149	151	-
M	Middle	157	-	155
H	High	165	159	-

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



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.

3 Test Result

3.1 Maximum Conducted Output Power Measurement

3.1.1 Limit of Maximum Conducted Output Power

For an indoor access point operating in the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W.

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.

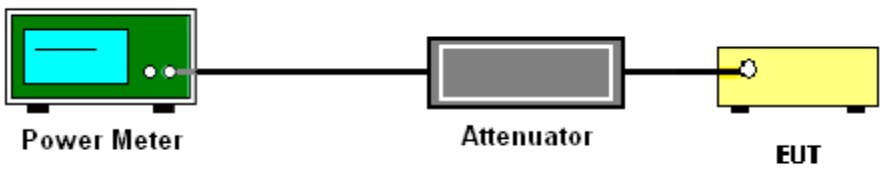
3.1.3 Test Procedures

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03 for TXBF modes.

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.1.4 Test Setup



3.1.5 Test Result of Maximum Conducted Output Power

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	SUM	Ant 1	Ant 2	Ant 3	Ant 1	Ant 2	Ant 3	
HT20	MCS0	3	149	5745	19.83	18.91	20.08	24.41	24.62			11.38			Pass
HT20	MCS0	3	157	5785	19.74	18.82	20.00	24.32	24.62			11.38			Pass
HT20	MCS0	3	165	5825	19.70	18.76	19.97	24.28	24.62			11.38			Pass
HT40	MCS0	3	151	5755	20.03	19.29	19.93	24.53	24.62			11.38			Pass
HT40	MCS0	3	159	5795	19.84	19.03	19.88	24.37	24.62			11.38			Pass
VHT20	MCS0	3	149	5745	19.87	18.83	19.93	24.35	24.62			11.38			Pass
VHT20	MCS0	3	157	5785	19.82	18.70	19.85	24.26	24.62			11.38			Pass
VHT20	MCS0	3	165	5825	19.80	18.66	19.82	24.24	24.62			11.38			Pass
VHT40	MCS0	3	151	5755	19.97	19.20	19.96	24.50	24.62			11.38			Pass
VHT40	MCS0	3	159	5795	19.75	18.90	19.89	24.31	24.62			11.38			Pass
VHT80	MCS0	3	155	5775	19.96	18.83	19.83	24.34	24.62			11.38			Pass

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 Part15.205.

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 per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 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.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/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 v01r02 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 v01r02. 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 ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

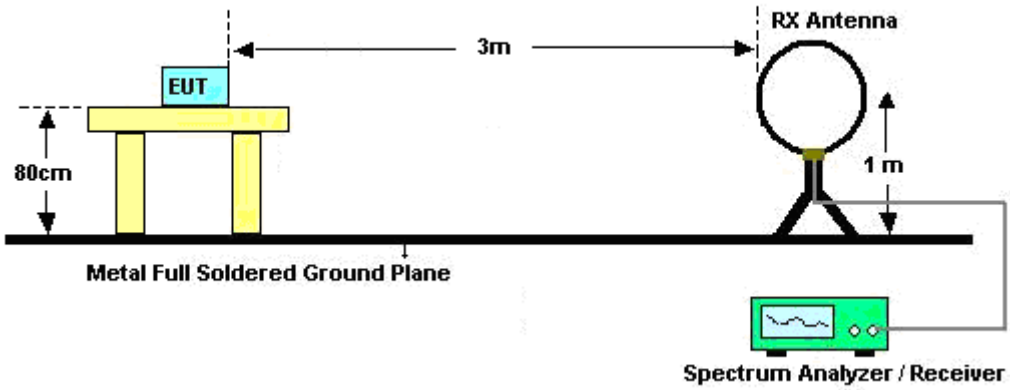
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 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.

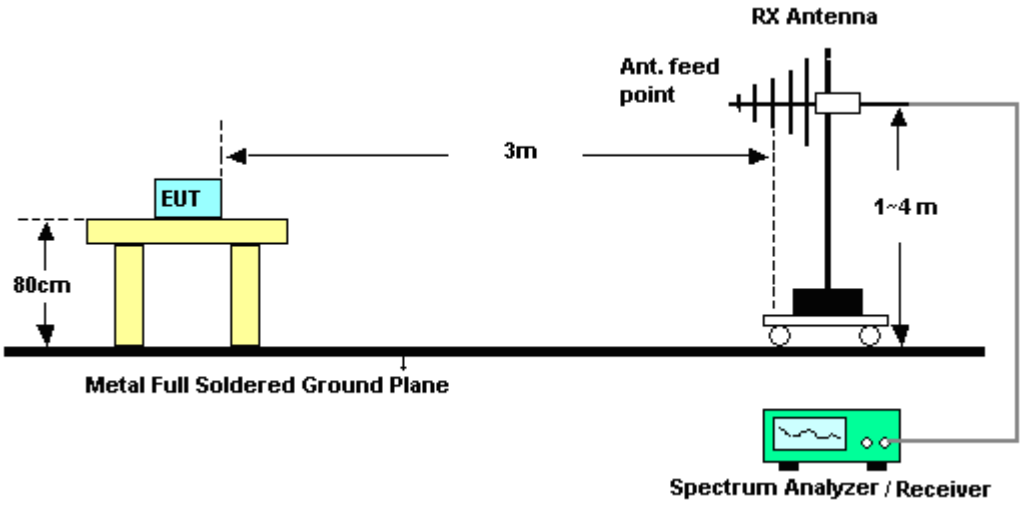
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

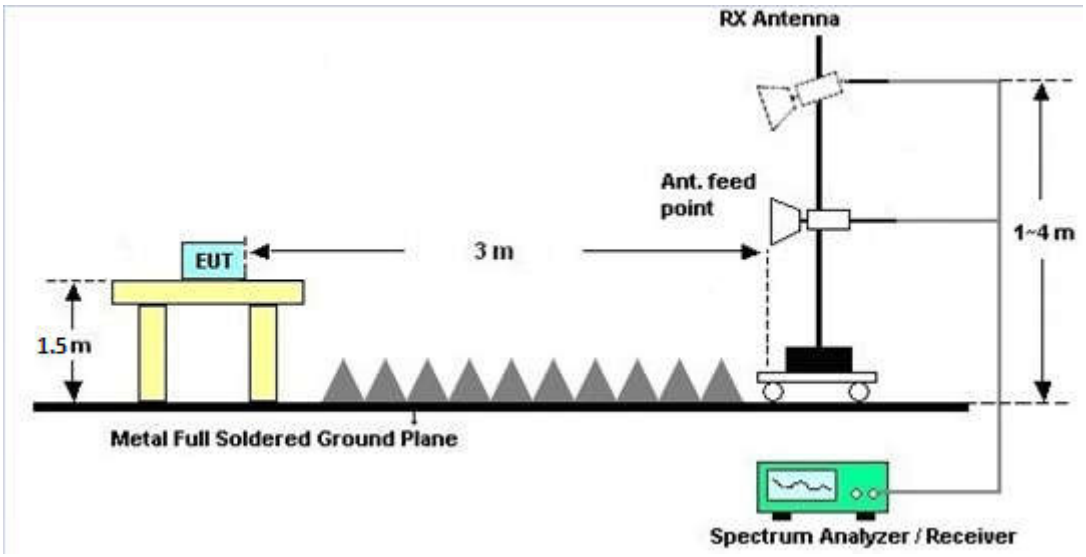
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.2.5 Test Results of Radiated 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 per 15.31(o) was not reported.

3.2.6 Test Result of Radiated Band Edges

Please refer to Appendix A.

3.2.7 Duty Cycle

Please refer to Appendix B.

3.2.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix A.

3.3 Automatically Discontinue Transmission

3.3.1 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.

3.3.2 Measuring Instruments

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

3.3.3 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.

3.4 Antenna Requirements

3.4.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,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.

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.4.3 Antenna Gain

TX Beamforming modes

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

$$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k / 20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

The EUT supports beamforming for 802.11ac modes.

The directional gain calculation is following F)2)e)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.

5.8G Band Antenna	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
1	5.66	5.66	0.00	0.00
2	7.20	7.20	1.20	1.20
3	6.90	6.90	0.90	0.90
1+2	9.47	9.47	3.47	3.47
1+3	9.31	9.31	3.31	3.31
2+3	10.06	10.06	4.06	4.06
1+2+3	11.38	11.38	5.38	5.38

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
Pulse Power Senor	Anritsu	MA2411B	1207253	30MHz~40GHz	Jan. 12, 2016	Jun. 06, 2016	Jan. 11, 2017	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Jan. 12, 2016	Jun. 06, 2016	Jan. 11, 2017	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	May 07, 2016	Jul. 19, 2016	May 06, 2017	Radiation (03CH03-SZ)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz;	May 07, 2016	Jul. 19, 2016	May 06, 2017	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 07, 2016	Jul. 19, 2016	May 06, 2017	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	May 21, 2016	Jul. 19, 2016	May 20, 2017	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	May 07, 2016	Jul. 19, 2016	May 06, 2017	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Aug. 19, 2015	Jul. 19, 2016	Aug. 18, 2016	Radiation (03CH03-SZ)
Amplifier	PREAMP LIFIER	BPA-530	102210	0.01Hz ~3000MHz	Oct. 20, 2015	Jul. 19, 2016	Oct. 19, 2016	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 12, 2016	Jul. 19, 2016	Jan. 11, 2017	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 20, 2015	Jul. 19, 2016	Oct. 19, 2016	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 18, 2016	Jul. 19, 2016	Jul. 17, 2017	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Jul. 19, 2016	NCR	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jul. 19, 2016	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Jul. 19, 2016	NCR	Radiation (03CH03-SZ)

NCR: No Calibration Required

5 Uncertainty of Evaluation

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

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

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.8dB**

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

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

Appendix A. Radiated Spurious Emission

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1+2+3	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)
		5617	57.9	-10.4	68.3	50.6	33.14	7.65	33.49	158	229	P	H
		5657.6	65.96	-7.99	73.95	58.6	33.19	7.67	33.5	158	229	P	H
		5719.4	69.2	-41.53	110.73	61.77	33.27	7.68	33.52	158	229	P	H
		5723.6	84.72	-34.39	119.11	77.29	33.27	7.68	33.52	158	229	P	H
802.11n		5745	119.13	-	-	111.63	33.29	7.74	33.53	158	229	P	H
HT20		5745	111	-	-	103.5	33.29	7.74	33.53	158	229	A	H
CH 149		5632.8	57.13	-11.17	68.3	49.8	33.17	7.65	33.49	150	165	P	V
5745MHz		5662	61.32	-15.89	77.21	53.96	33.19	7.67	33.5	150	165	P	V
		5719.2	63.85	-46.83	110.68	56.42	33.27	7.68	33.52	150	165	P	V
		5720.8	72.82	-39.9	112.72	65.39	33.27	7.68	33.52	150	165	P	V
		5745	115.88	-	-	108.38	33.29	7.74	33.53	150	165	P	V
		5745	106.49	-	-	98.99	33.29	7.74	33.53	150	165	A	V

WIFI Ant. 1+2+3	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		5632.4	58.94	-9.36	68.3	51.64	33.14	7.65	33.49	150	133	P	H
		5698.8	57.05	-47.37	104.42	49.65	33.23	7.68	33.51	150	133	P	H
		5713.2	62.37	-46.63	109	54.96	33.25	7.68	33.52	150	133	P	H
		5722.2	53.11	-62.81	115.92	45.68	33.27	7.68	33.52	150	133	P	H
		5785	119.26	-	-	111.67	33.33	7.8	33.54	150	133	P	H
		5785	111.99	-	-	104.4	33.33	7.8	33.54	150	133	A	H
		5850.4	51.05	-70.34	121.39	43.33	33.41	7.87	33.56	150	133	P	H
		5872.8	62.93	-42.99	105.92	55.16	33.46	7.87	33.56	150	133	P	H
		5913.6	56.63	-20.08	76.71	48.8	33.5	7.91	33.58	150	133	P	H
		5948.4	55.81	-12.49	68.3	47.9	33.54	7.95	33.58	150	133	P	H
		5623.4	59.13	-9.17	68.3	51.83	33.14	7.65	33.49	150	170	P	V
		5696.8	59.44	-43.5	102.94	52.04	33.23	7.68	33.51	150	170	P	V
		5707.4	62.01	-45.36	107.37	54.6	33.25	7.68	33.52	150	170	P	V
		5723.6	52.53	-66.58	119.11	45.1	33.27	7.68	33.52	150	170	P	V
		5785	115.73	-	-	108.14	33.33	7.8	33.54	150	170	P	V
		5785	105.56	-	-	97.97	33.33	7.8	33.54	150	170	A	V
		5850.4	49.78	-71.61	121.39	42.06	33.41	7.87	33.56	150	170	P	V
		5865	59.56	-48.54	108.1	51.82	33.43	7.87	33.56	150	170	P	V
		5913.4	55.62	-21.24	76.86	47.79	33.5	7.91	33.58	150	170	P	V
		5939.6	55.26	-13.04	68.3	47.35	33.54	7.95	33.58	150	170	P	V

WIFI Ant. 1+2+3	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	118.2	-	-	110.52	33.39	7.84	33.55	211	223	P	H
		5825	111.19	-	-	103.51	33.39	7.84	33.55	211	223	A	H
		5851	68.25	-51.77	120.02	60.53	33.41	7.87	33.56	211	223	P	H
		5855	66.19	-44.71	110.9	58.45	33.43	7.87	33.56	211	223	P	H
		5904.4	64.65	-18.86	83.51	56.83	33.48	7.91	33.57	211	223	P	H
		5939.4	57.19	-11.11	68.3	49.28	33.54	7.95	33.58	211	223	P	H
		5825	115.04	-	-	107.36	33.39	7.84	33.55	150	183	P	V
		5825	105.23	-	-	97.55	33.39	7.84	33.55	150	183	A	V
		5850	62.69	-59.61	122.3	54.97	33.41	7.87	33.56	150	183	P	V
		5858.4	57	-52.95	109.95	49.26	33.43	7.87	33.56	150	183	P	V
		5899.8	56.29	-30.62	86.91	48.47	33.48	7.91	33.57	150	183	P	V
		5944.2	53.09	-15.21	68.3	45.18	33.54	7.95	33.58	150	183	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 Ant. 1+2+3	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)
		7475	66.89	-7.11	74	78.43	37.7	9.15	58.39	150	201	P	H
		7475	40.01	-13.99	54	51.55	37.7	9.15	58.39	150	201	A	H
		11490	58.27	-15.73	74	67.22	39.7	11.1	59.75	240	204	P	H
802.11n		11490	48.6	-5.4	54	57.55	39.7	11.1	59.75	240	204	A	H
HT20		17235	53.72	-14.58	68.3	57.02	40.06	14.89	58.25	150	0	P	H
CH 149		7535	65.51	-8.49	74	77.06	37.74	9.14	58.43	250	206	P	V
5745MHz		7535	41.11	-12.89	54	52.66	37.74	9.14	58.43	250	206	A	V
		11490	62.92	-11.08	74	71.87	39.7	11.1	59.75	150	174	P	V
		11490	50.88	-3.12	54	59.83	39.7	11.1	59.75	150	174	A	V
		17235	53.27	-15.03	68.3	56.57	40.06	14.89	58.25	150	0	P	V
		7510	70.03	-3.97	74	81.56	37.72	9.15	58.4	150	196	P	H
		7510	41.03	-12.97	54	52.56	37.72	9.15	58.4	150	196	A	H
		11570	59.9	-14.1	74	68.9	39.66	11.17	59.83	195	190	P	H
802.11n		11570	50.02	-3.98	54	59.02	39.66	11.17	59.83	195	190	A	H
HT20		17355	54.19	-14.11	68.3	56.87	40.34	14.78	57.8	250	0	P	H
CH 157		7525	70.35	-3.65	74	81.9	37.74	9.14	58.43	150	200	P	V
5785MHz		7525	44.45	-9.55	54	56	37.74	9.14	58.43	150	200	A	V
		11570	60.96	-13.04	74	69.96	39.66	11.17	59.83	150	173	P	V
		11570	51.21	-2.79	54	60.21	39.66	11.17	59.83	150	173	A	V
		17355	55.49	-12.81	68.3	58.17	40.34	14.78	57.8	250	0	P	V
		7490	69.48	-4.52	74	80.99	37.7	9.15	58.36	250	165	P	H
		7490	38.04	-15.96	54	49.55	37.7	9.15	58.36	250	165	A	H
		11650	59.94	-14.06	74	68.99	39.62	11.23	59.9	150	186	P	H
802.11n		11650	46.75	-7.25	54	55.8	39.62	11.23	59.9	150	186	A	H
HT20		17475	55.01	-13.29	68.3	57.07	40.62	14.67	57.35	150	0	P	H
CH 165		7535	70.02	-3.98	74	81.57	37.74	9.14	58.43	250	0	P	V
5825MHz		7535	45	-9	54	56.55	37.74	9.14	58.43	250	0	A	V
		11650	58.65	-15.35	74	67.7	39.62	11.23	59.9	250	0	P	V
		11650	49.02	-4.98	54	58.07	39.62	11.23	59.9	250	0	A	V
		17475	55.67	-12.63	68.3	57.73	40.62	14.67	57.35	150	0	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	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)
		5608	58.24	-10.06	68.3	50.96	33.12	7.65	33.49	170	222	P	H
		5676.6	60.77	-27.25	88.02	53.39	33.21	7.67	33.5	170	222	P	H
		5716.8	69.79	-40.22	110.01	62.38	33.25	7.68	33.52	170	222	P	H
		5721.4	75.78	-38.31	114.09	68.35	33.27	7.68	33.52	170	222	P	H
		5755	117.33	-	-	109.81	33.31	7.74	33.53	170	222	P	H
		5755	106.99	-	-	99.47	33.31	7.74	33.53	170	222	A	H
		5851.8	59.7	-58.49	118.19	51.98	33.41	7.87	33.56	170	222	P	H
		5867.8	53.2	-54.11	107.31	45.46	33.43	7.87	33.56	170	222	P	H
802.11n		5924.4	56.92	-11.82	68.74	49.07	33.52	7.91	33.58	170	222	P	H
HT40		5927.4	56.56	-11.74	68.3	48.67	33.52	7.95	33.58	170	222	P	H
CH 151		5605.6	48.71	-19.59	68.3	41.44	33.12	7.64	33.49	158	198	P	V
5755MHz		5690.6	56.17	-42.2	98.37	48.77	33.23	7.68	33.51	158	198	P	V
		5717.6	72.52	-37.71	110.23	65.09	33.27	7.68	33.52	158	198	P	V
		5725	74.37	-47.93	122.3	66.94	33.27	7.68	33.52	158	198	P	V
		5755	116.44	-	-	108.92	33.31	7.74	33.53	158	198	P	V
		5755	108.13	-	-	100.61	33.31	7.74	33.53	158	198	A	V
		5851.6	53.71	-64.94	118.65	45.99	33.41	7.87	33.56	158	198	P	V
		5866.4	49.11	-58.6	107.71	41.37	33.43	7.87	33.56	158	198	P	V
		5909.6	51.79	-27.87	79.66	43.96	33.5	7.91	33.58	158	198	P	V
		5932.6	49.77	-18.53	68.3	41.88	33.52	7.95	33.58	158	198	P	V

WIFI Ant. 1+2+3	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		5639.8	57.46	-10.84	68.3	50.13	33.17	7.65	33.49	190	217	P	H
		5650.2	56.4	-12.05	68.45	49.03	33.19	7.67	33.49	190	217	P	H
		5712.2	59.17	-49.55	108.72	51.76	33.25	7.68	33.52	190	217	P	H
		5722.2	59.84	-56.08	115.92	52.41	33.27	7.68	33.52	190	217	P	H
		5795	116.3	-	-	108.69	33.35	7.8	33.54	190	217	P	H
		5795	108.11	-	-	100.5	33.35	7.8	33.54	190	217	A	H
		5850.8	61.86	-58.62	120.48	54.14	33.41	7.87	33.56	190	217	P	H
		5855.2	61.13	-49.71	110.84	53.39	33.43	7.87	33.56	190	217	P	H
		5880	60.28	-41.31	101.59	52.51	33.46	7.87	33.56	190	217	P	H
		5948	54.23	-14.07	68.3	46.32	33.54	7.95	33.58	190	217	P	H
		5631.6	54.52	-13.78	68.3	47.22	33.14	7.65	33.49	190	193	P	V
		5698.4	57.62	-46.5	104.12	50.22	33.23	7.68	33.51	190	193	P	V
		5720	60.23	-50.67	110.9	52.8	33.27	7.68	33.52	190	193	P	V
		5722.6	57.38	-59.45	116.83	49.95	33.27	7.68	33.52	190	193	P	V
		5795	114.51	-	-	106.9	33.35	7.8	33.54	190	193	P	V
		5795	106.77	-	-	99.16	33.35	7.8	33.54	190	193	A	V
		5851	60.94	-59.08	120.02	53.22	33.41	7.87	33.56	190	193	P	V
		5859.8	59.93	-49.62	109.55	52.19	33.43	7.87	33.56	190	193	P	V
		5880.8	58.36	-42.63	100.99	50.59	33.46	7.87	33.56	190	193	P	V
		5943.4	53	-15.3	68.3	45.09	33.54	7.95	33.58	190	193	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 Ant. 1+2+3	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		7465	67.53	-6.47	74	79.11	37.69	9.15	58.42	150	202	P	H
		7465	38.62	-15.38	54	50.2	37.69	9.15	58.42	150	202	A	H
		11510	54.59	-19.41	74	63.55	39.7	11.1	59.76	240	243	P	H
		11510	46.03	-7.97	54	54.99	39.7	11.1	59.76	240	243	A	H
		17265	53.49	-14.81	68.3	56.63	40.14	14.85	58.13	250	0	P	H
		11510	54.6	-19.4	74	63.56	39.7	11.1	59.76	243	237	P	V
		11510	44.34	-9.66	54	53.3	39.7	11.1	59.76	243	237	A	V
		17265	53.29	-15.01	68.3	56.43	40.14	14.85	58.13	250	0	P	V
802.11n HT40 CH 159 5795MHz		11590	54.49	-19.51	74	63.52	39.65	11.17	59.85	150	178	P	H
		11590	46.25	-7.75	54	55.28	39.65	11.17	59.85	150	178	A	H
		17385	52.59	-15.71	68.3	55.1	40.42	14.74	57.67	150	0	P	H
		11590	55.51	-18.49	74	64.54	39.65	11.17	59.85	214	164	P	V
		11590	48.03	-5.97	54	57.06	39.65	11.17	59.85	214	164	A	V
		17385	55.36	-12.94	68.3	57.87	40.42	14.74	57.67	150	0	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	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		5628.4	64.01	-4.29	68.3	56.71	33.14	7.65	33.49	244	229	P	H
		5697.4	66.33	-37.05	103.38	58.93	33.23	7.68	33.51	244	229	P	H
		5703.8	69.45	-36.92	106.37	62.03	33.25	7.68	33.51	244	229	P	H
		5724.4	70.03	-50.9	120.93	62.6	33.27	7.68	33.52	244	229	P	H
		5775	112.26	-	-	104.66	33.33	7.8	33.53	244	229	P	H
		5775	106.1	-	-	98.5	33.33	7.8	33.53	244	229	A	H
		5851.6	65.18	-53.47	118.65	57.46	33.41	7.87	33.56	244	229	P	H
		5858.4	66.11	-43.84	109.95	58.37	33.43	7.87	33.56	244	229	P	H
		5877.8	57.17	-46.05	103.22	49.4	33.46	7.87	33.56	244	229	P	H
		5938.8	52.75	-15.55	68.3	44.84	33.54	7.95	33.58	244	229	P	H
		5630.2	53.67	-14.63	68.3	46.37	33.14	7.65	33.49	150	197	P	V
		5689.8	71.76	-26.02	97.78	64.36	33.23	7.68	33.51	150	197	P	V
		5719.4	71.62	-39.11	110.73	64.19	33.27	7.68	33.52	150	197	P	V
		5721.8	71.84	-43.16	115	64.41	33.27	7.68	33.52	150	197	P	V
		5775	109.95	-	-	102.35	33.33	7.8	33.53	150	197	P	V
		5775	105.45	-	-	97.85	33.33	7.8	33.53	150	197	A	V
		5855	66.01	-44.89	110.9	58.27	33.43	7.87	33.56	150	197	P	V
		5856	66.7	-43.92	110.62	58.96	33.43	7.87	33.56	150	197	P	V
		5884.4	58.25	-40.07	98.32	50.49	33.46	7.87	33.57	150	197	P	V
		5945.4	50.72	-17.58	68.3	42.81	33.54	7.95	33.58	150	197	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 Ant. 1+2+3	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		7450	69.38	-4.62	74	80.99	37.69	9.15	58.45	150	251	P	H
		7450	42.61	-11.39	54	54.22	37.69	9.15	58.45	150	251	A	H
		11550	50.69	-23.31	74	59.7	39.67	11.13	59.81	150	0	P	H
		17325	53.97	-14.33	68.3	56.86	40.26	14.78	57.93	250	0	P	H
		11550	49.21	-24.79	74	58.22	39.67	11.13	59.81	150	0	P	V
		17325	53.75	-14.55	68.3	56.64	40.26	14.78	57.93	250	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11n HT20 (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		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT20 LF		31.94	31.43	-8.57	40	36.73	25.86	0.62	31.78	100	200	P	H
		139.61	32.5	-11	43.5	44.79	18.01	1.15	31.45	-	-	P	H
		169.68	33.36	-10.14	43.5	46.62	16.94	1.15	31.35	-	-	P	H
		483.96	34.14	-11.86	46	39.89	23.42	1.99	31.16	-	-	P	H
		722.58	32.57	-13.43	46	33.83	27.52	2.44	31.22	-	-	P	H
		919.49	34	-12	46	33.66	28.85	2.77	31.28	-	-	P	H
		31.94	38.49	-1.51	40	43.79	25.86	0.62	31.78	100	152	QP	V
		39.7	38.67	-1.33	40	47.31	22.5	0.62	31.76	100	165	QP	V
		49.4	37.15	-2.85	40	51.55	16.7	0.62	31.72	100	140	QP	V
		82.38	36.41	-3.59	40	51.12	16.12	0.83	31.66	100	0	QP	V
		160.95	37.18	-6.32	43.5	50.08	17.33	1.15	31.38	-	-	P	V
		714.82	32.38	-13.62	46	33.58	27.58	2.44	31.22	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

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

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

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

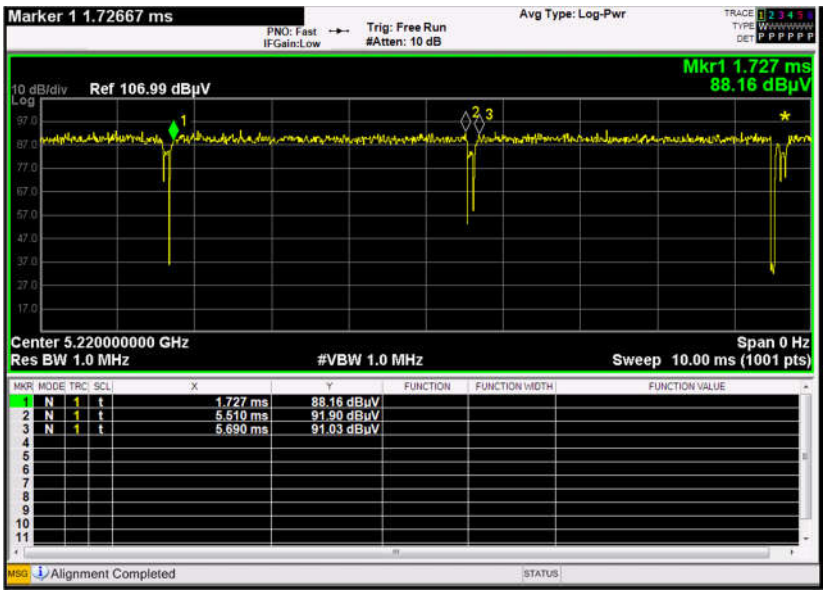
= -10.46(dB)

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

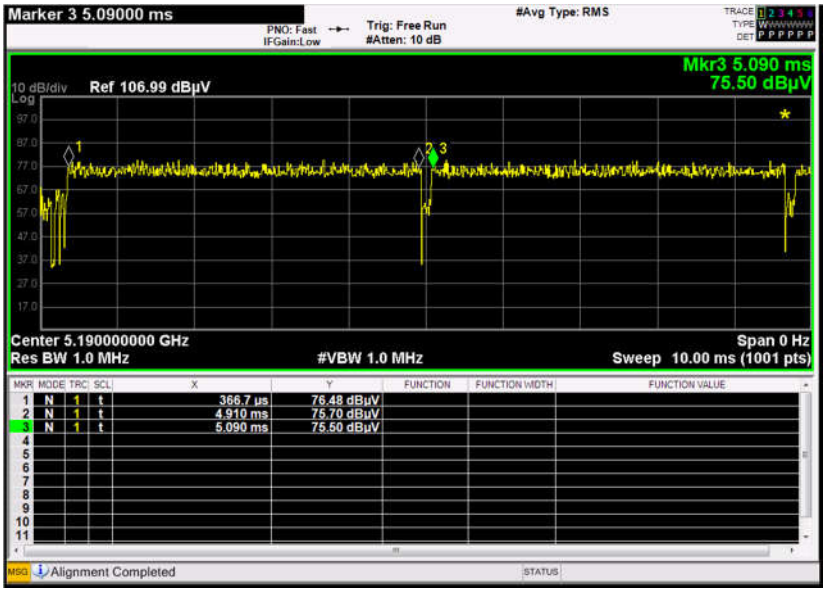
Appendix B. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
1+2+3	802.11n HT20	95.46	3.783	0.264	300Hz
1+2+3	802.11n HT40	89.83	4.243	0.236	300Hz
1+2+3	802.11ac VHT80	94.63	5.282	0.190	300Hz

802.11n HT20



802.11n HT40



802.11ac VHT80