# **FCC RF Test Report**

APPLICANT : Nest Labs Inc. EQUIPMENT : Nest Cam IQ

MODEL NAME : A0053

FCC ID : ZQANC31

STANDARD : FCC Part 15 Subpart E §15.407

CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was completed on Mar. 08, 2017. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

SPORTON INTERNATIONAL INC.

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Report No.: FR630207-02E

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### **REVISION HISTORY**

Report No. : FR630207-02E

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR630207-02E	Rev. 01	Initial issue of report	Apr. 19, 2017
FR630207-02E	Rev. 02	Add remark description of test mode in section 2.2, and antenna information in section 1.2, and add loop antenna information in section 4, and add description of radiated spurious emissions below 30MHz in section 3.4.5.	May 05, 2017
FR630207-02E	Rev. 03	Add Zigbee information in section 1.2 and revising connection diagram of test system in section 2.3.	May 09, 2017
FR630207-02E	Rev. 04	Revising PSD test data in appendix a and remover frequency stability description and test data in report and appendix a.	May 15, 2017

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### **SUMMARY OF TEST RESULT**

Report Section	FCC Rule Description Limit		Result	
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
3.5	15.207	AC Conducted Emission	15.207(a)	Pass
-	15.407(g)	Frequency Stability	Within Operation Band	Not Required
3.6	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass
3.7	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass

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### **General Description**

### 1.1 Applicant

**Nest Labs Inc.** 

3400 Hillview Ave.Palo Alto, CA 94304 USA

### 1.2 Product Feature of Equipment Under Test

Bluetooth- LE, Wi-Fi 2.4GHz 802.11b/g/n/ac, Wi-Fi 5GHz 802.11a/n/ac, Zigbee

Product Specification subjective to this standard			
Antenna Type	ANT FPC 1 2.4G/5G: Fixed Internal Antenna ANT FPC 2 2.4G/5G: Fixed Internal Antenna ANT FPC 15.4 2.4G: Fixed Internal Antenna		

#### 1.3 Modification of EUT

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

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### 1.4 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. 2353 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
	No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,		
Test Site Location	Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.		
Test Site Location	TEL: +886-3-327-3456		
	FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		
Test Site NO.	TH05-HY	CO05-HY	

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

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 101, Complex Building C, Guanlong Village, Xili Town, Nanshan District, Shenzhen, Guangdong, P.R.C. TEL: +86-755-8637-9589 (TAF Code: 2353)	
Test Site No.	Sporton Site No.	
1001 0110 1101	03CH02-SZ	

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

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### 1.5 Applicable Standards

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

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- 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:

All test items were verified and recorded according to the standards and without any deviation during the test.

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### 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)
	149	5745	157	5785
5725-5850 MHz	151*	5755	159*	5795
Band 4 (U-NII-3)	153	5765	161	5805
(3.411.6)	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.

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#### 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.

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#### Single Antenna

Modulation	Data Rate	
802.11a	6 Mbps	
802.11n HT20	MCS0	
802.11n HT40	MCS0	
802.11ac VHT20	MCS0	
802.11ac VHT40	MCS0	
802.11ac VHT80	MCS0	

#### **MIMO Antenna**

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

**Remark:** WLAN (STBC) only support MIMO mode operation.

Test Cases			
AC Conducted  Mode 1: WLAN Tx + Bluetooth Idle + Zigbee Idle + Y Cable + Ada			
Emission	Weak 1. Weak 1x + Bidetooth idle + Zigbee idle + 1 Cable + Adapter 1		
<b>Remark:</b> For radiated spurious emissions, the tests were performed with Y Cable and Adapter 1.			

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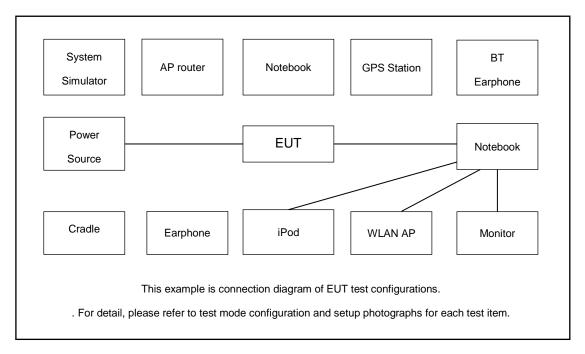
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	01. "		Band IV: 5725-5850 MHz	
	Ch. #	802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
н	High	165	165	159

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

### 2.3 Connection Diagram of Test System



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### 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	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude E3340	FCC DoC/ Contains FCC ID: PD97260NGU	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
4.	Y Cable	N/A	N/A	N/A	Unshielded, 1.93 m	Unshielded, 1.93 m

### 2.5 EUT Operation Test Setup

For WLAN function, programmed RF utility, "ADB" installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

### 2.6 Measurement Results Explanation Example

#### For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

#### Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB). = 4.2 + 10 = 14.2 (dB)

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#### 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.

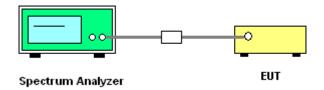
#### 3.1.2 Measuring Instruments

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

#### 3.1.3 Test Procedures

- The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.
   Section C) Emission bandwidth for the band 5.725-5.85GHz
- 2. Set RBW = 100kHz.
- 3. Set the VBW  $\geq$  3 x 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.

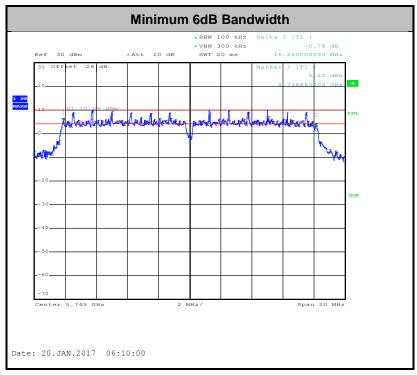
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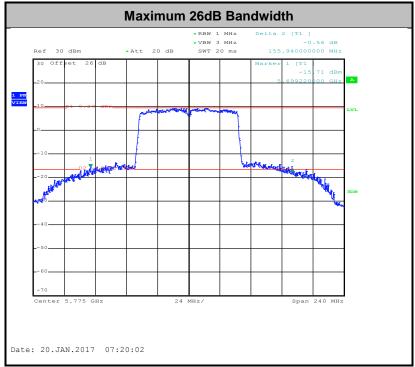
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#### <CDD Modes>



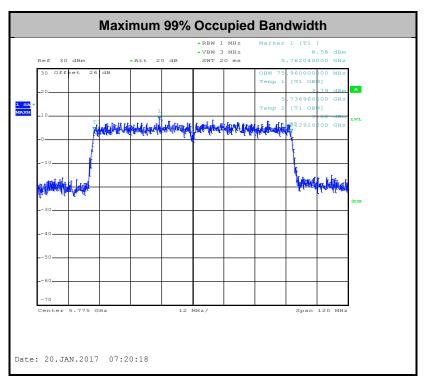


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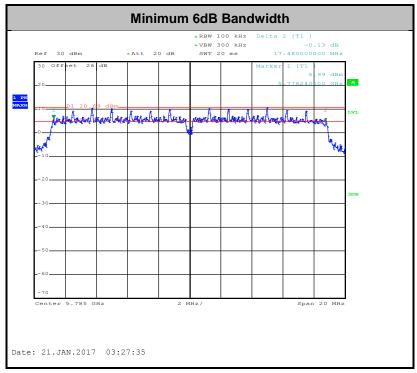


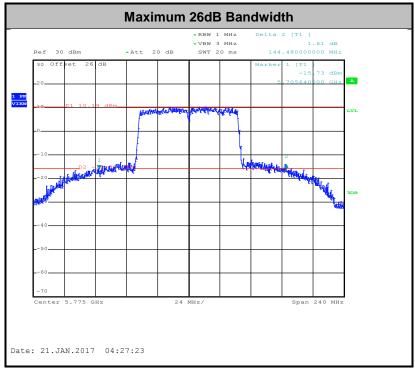


**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

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#### <STBC Modes>



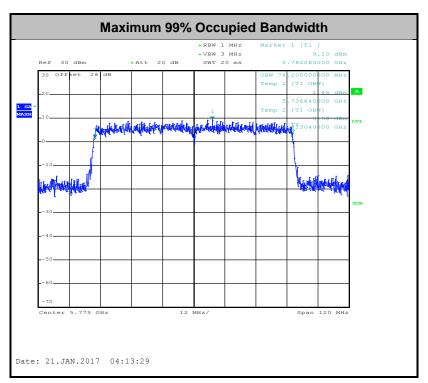


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**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

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#### 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.

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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 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.

#### 3.2.4 Test Setup



#### 3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

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### 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.

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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 v01r03. 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 ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(500kHz/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.

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3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (c): Measure and add 10 log(N<sub>ANT</sub>) 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  $10 \log(N_{ANT})$  dB is added to each spectrum value before comparing to the emission limit. The addition of  $10 \log(N_{ANT})$  dB serves to apportion the emission limit among the  $N_{ANT}$  outputs so that each output is permitted to contribute no more than  $1/N_{ANT}$  th of the PSD limit.

#### 3.3.4 Test Setup



#### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

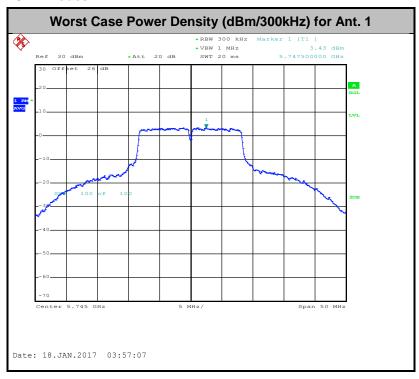
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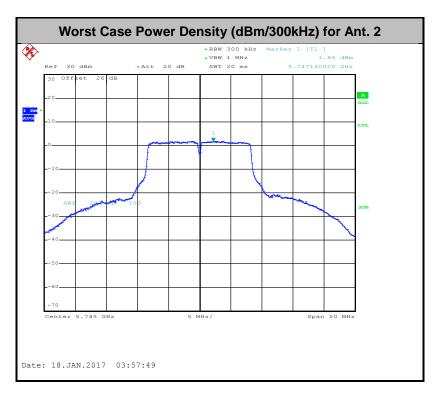
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#### <CDD Modes>



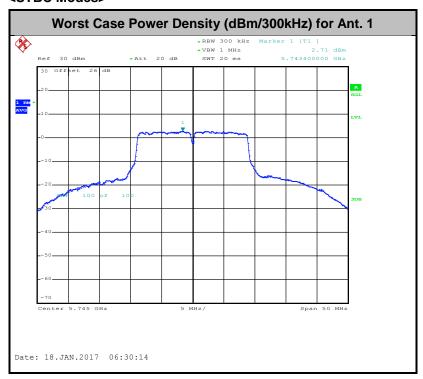


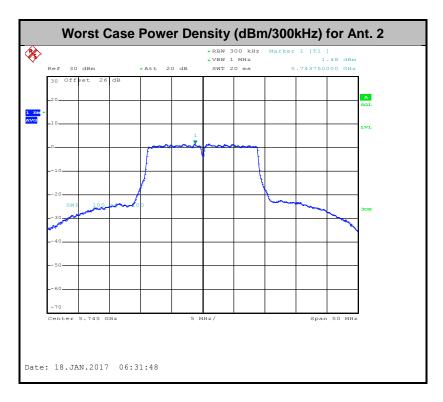
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#### <STBC Modes>





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#### 3.4 Unwanted Emissions Measurement

This section 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	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(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)

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

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#### (3) KDB789033 D02 v01r03 G)2)c)

- (i) Section 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and 2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz. However, an out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz dBm/MHz peak emission limit.
- (ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). An alternative to the band emissions mask is specified in Section 15.407(b)(4)(ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the alternative limit

#### 3.4.2 Measuring Instruments

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

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#### 3.4.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.
 Section G) Unwanted emissions measurement.

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- (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.

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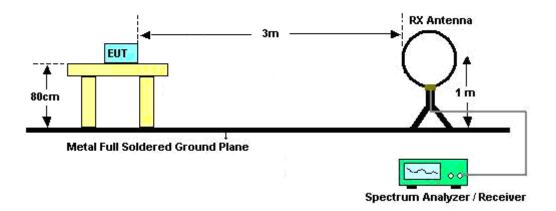
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- The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
- 3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable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



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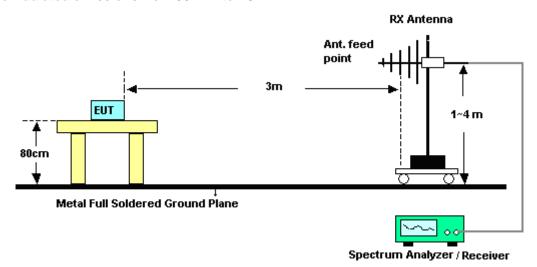
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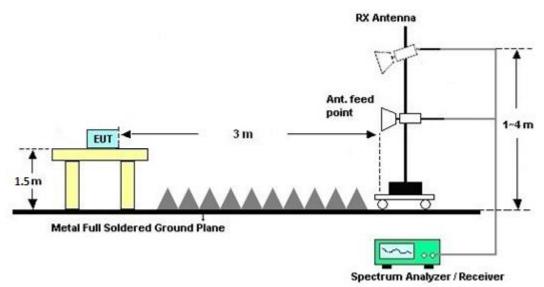
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#### For radiated emissions from 30MHz to 1GHz



#### For radiated emissions above 1GHz



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#### 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.

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

#### 3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

#### 3.4.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

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#### 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.

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Fraguency of amission (MUz)	Conducted limit (dBμV)			
Frequency of emission (MHz)	Quasi-peak	Average		
0.15-0.5	66 to 56*	56 to 46*		
0.5-5	56	46		
5-30	60	50		

<sup>\*</sup>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.

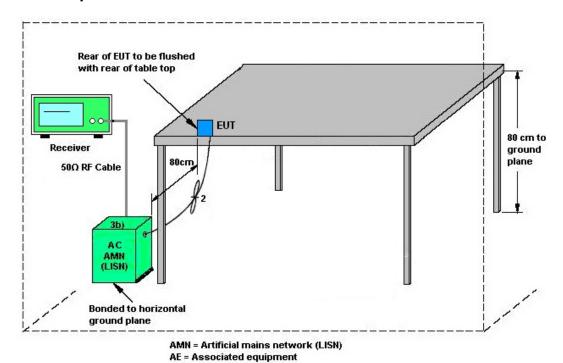
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#### 3.5.4 Test Setup



EUT = Equipment under test

ISN = Impedance stabilization network

3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

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### 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

EUT is verified this characteristic during the function check of normal sample associated with an access point:

- A. Information start: make EUT supply information to the access point.
- B. Information stop: stop supplying information to the access point.

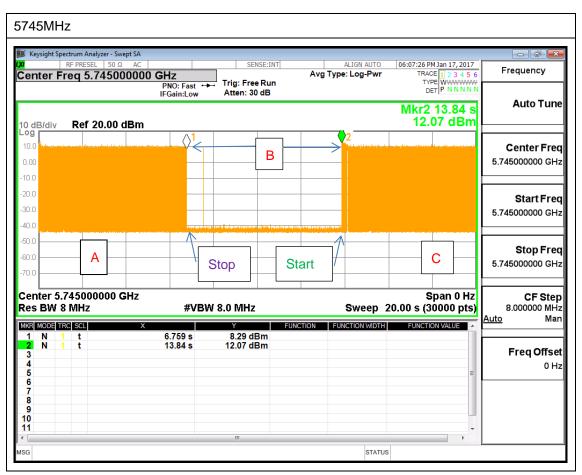
While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving.

C. Information start: make EUT supply information to the access point again.

The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

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Note: The control / signalling information during the period B is precluded.

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### 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.

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#### 3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

#### 3.7.3 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  $N_{ANT} \le 4$ .

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

The EUT supports CDD mode.

For power, the directional gain G<sub>ANT</sub> 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.

#### <CDD Modes>

			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant 1	Ant 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	2.71	2.15	2.71	5.44	0.00	0.00

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#### <STBC Modes>

			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant 1	Ant 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	2.71	2.15	2.71	2.71	0.00	0.00

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

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

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## 4 List of Measuring Equipment

					0-111			
Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	0932001	300MHz~40GH z	Sep. 29, 2016	Dec. 30, 2016 ~ Mar. 08, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GH z	Sep. 29, 2016	Dec. 30, 2016 ~ Mar. 08, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Jul. 17, 2016	Dec. 30, 2016 ~ Mar. 08, 2017	Jul. 16, 2017	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40°C ~90°C	Sep. 01, 2016	Dec. 30, 2016 ~ Mar. 08, 2017	Aug. 31, 2017	Conducted (TH05-HY)
AC Power Source	AC POWER	AFC-500W	F10407001	50Hz~60Hz	Dec. 01, 2016	Dec. 30, 2016 ~ Mar. 08, 2017	Nov. 30, 2017	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jan. 24, 2017	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 30, 2016	Jan. 24, 2017	Aug. 29, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Jan. 24, 2017	Nov. 28, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 06, 2016	Jan. 24, 2017	Dec. 05, 2017	Conduction (CO05-HY)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY551502 46	10Hz~44GHz;	May 07, 2016	Jan. 12, 2017 ~ Jan. 21, 2017	May 06, 2017	Radiation (03CH02-SZ
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY544500 83	20Hz~8.4GHz	May 07, 2016	Jan. 12, 2017 ~ Jan. 21, 2017	May 06, 2017	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz-2GHz	May 21, 2016	Jan. 12, 2017 ~ Jan. 21, 2017	May 20, 2017	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	SCHWARZBE CK	BBHA 9120D	9120D-128 5	1GHz~18GHz	Jan. 12, 2017	Jan. 12, 2017 ~ Jan. 21, 2017	Jan. 11, 2018	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	TTA1840-35- HG	1871923	18GHz~40GHz	Jul. 16, 2016	Jan. 12, 2017 ~ Jan. 21, 2017	Jul. 15, 2017	Radiation (03CH02-SZ
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Aug. 10, 2016	Jan. 12, 2017 ~ Jan. 21, 2017	Aug. 09, 2017	Radiation (03CH02-SZ)
Amplifier	Agilent Technologies	83017A	MY395013 02	500MHz~26.5G Hz	Jan. 06, 2017	Jan. 12, 2017 ~ Jan. 21, 2017	Jan. 05, 2018	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P- R	1707137	1GHz~18GHz	Oct. 11, 2016	Jan. 12, 2017 ~ Jan. 21, 2017	Oct. 10, 2017	Radiation (03CH02-SZ)
Amplifier	Burgeon	BPA-530	102210	0.01Hz ~3000MHz	Oct. 11, 2016	Jan. 12, 2017 ~ Jan. 21, 2017	Oct. 10, 2017	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010002 470	N/A	N/A	Jan. 12, 2017 ~ Jan. 21, 2017	N/A	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	N/A	Jan. 12, 2017 ~ Jan. 21, 2017	N/A	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	N/A	Jan. 12, 2017 ~ Jan. 21, 2017	N/A	Radiation (03CH02-SZ)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100321	9kHz~30MHz	Oct. 23, 2016	Jan. 06, 2017~ Jan. 21, 2017	Oct. 22, 2017	Radiation (03CH02-SZ)

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### 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence	2.7
of 95% (U = 2Uc(y))	2.1

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

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

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

Measuring Uncertainty for a Level of Confidence	5.1
of 95% (U = 2Uc(y))	5.1

#### <u>Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)</u>

Measuring Uncertainty for a Level of Confidence	E 4
of 95% (U = 2Uc(y))	5.1

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# Appendix A. Test Result of Conducted Test Items <CDD>

Test Engineer:	Derek Hsu	Temperature:	21~25	°C
Test Date:	2016/12/30~2017/03/08	Relative Humidity:	51~54	%

## <u>TEST RESULTS DATA</u> 6dB and 26dB EBW and 99% OBW

	Band IV												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)		9% width Hz)	Band	dB lwidth Hz)	Band	dB width Hz)	6 d Band Min. (Ml	width Limit	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	CDD	149	5745	23.20	18.75	44.49	37.56	16.26	16.26	0.	5	Pass
11a	6Mbps	CDD	157	5785	23.40	18.35	44.88	36.24	16.32	16.32	0.	5	Pass
11a	6Mbps	CDD	165	5825	25.10	18.60	45.24	37.50	16.28	16.30	0.	5	Pass
HT20	MCS0	CDD	149	5745	24.15	19.50	48.42	46.19	17.56	17.54	0.	5	Pass
HT20	MCS0	CDD	157	5785	25.15	19.45	49.07	45.06	17.52	17.52	0.	5	Pass
HT20	MCS0	CDD	165	5825	25.60	19.50	49.68	44.76	17.54	17.52	0.	5	Pass
HT40	MCS0	CDD	151	5755	51.90	37.80	97.92	92.76	35.96	36.28	0.	5	Pass
HT40	MCS0	CDD	159	5795	54.30	37.70	97.56	94.89	36.32	36.32	0.	5	Pass
VHT80	MCS0	CDD	155	5775	75.96	75.96	155.94	139.44	75.36	75.36	0.	5	Pass

# TEST RESULTS DATA Average Power Table

	Band IV													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Du Fac (d	ctor		Average Conducte Power (dBm)		Cond Powe	CC lucted r Limit Bm)		G Bi)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	SISO	149	5745	0.57	0.57	20.41	20.10		30.00	30.00	2.71	2.15	Pass
11a	6Mbps	SISO	157	5785	0.57	0.57	20.37	20.03		30.00	30.00	2.71	2.15	Pass
11a	6Mbps	SISO	165	5825	0.57	0.57	20.26	19.98		30.00	30.00	2.71	2.15	Pass
HT20	MCS0	SISO	149	5745	0.63	0.64	20.33	20.10		30.00	30.00	2.71	2.15	Pass
HT20	MCS0	SISO	157	5785	0.63	0.64	20.27	20.09		30.00	30.00	2.71	2.15	Pass
HT20	MCS0	SISO	165	5825	0.63	0.64	20.07	20.04		30.00	30.00	2.71	2.15	Pass
HT40	MCS0	SISO	151	5755	1.20	1.20	19.76	20.03		30.00	30.00	2.71	2.15	Pass
HT40	MCS0	SISO	159	5795	1.20	1.20	19.71	20.00		30.00	30.00	2.71	2.15	Pass
VHT20	MCS0	SISO	149	5745	0.63	0.63	19.64	20.08		30.00	30.00	2.71	2.15	Pass
VHT20	MCS0	SISO	157	5785	0.63	0.63	19.59	20.07		30.00	30.00	2.71	2.15	Pass
VHT20	MCS0	SISO	165	5825	0.63	0.63	19.57	20.03		30.00	30.00	2.71	2.15	Pass
VHT40	MCS0	SISO	151	5755	1.13	1.16	19.71	20.00		30.00	30.00	2.71	2.15	Pass
VHT40	MCS0	SISO	159	5795	1.13	1.16	19.66	19.96		30.00	30.00	2.71	2.15	Pass
VHT80	MCS0	SISO	155	5775	2.05	2.05	18.38	18.34		30.00	30.00	2.71	2.15	Pass
11a	6Mbps	CDD	149	5745	0.60	0.58	21.10	19.65	23.44	30.	.00	2.	71	Pass
11a	6Mbps	CDD	157	5785	0.60	0.58	21.05	19.54	23.37	30.	.00	2.	71	Pass
11a	6Mbps	CDD	165	5825	0.60	0.58	21.04	19.29	23.26	30.	.00	2.	71	Pass
HT20	MCS0	CDD	149	5745	0.63	0.64	21.03	19.48	23.33	30.	.00	2.	71	Pass
HT20	MCS0	CDD	157	5785	0.63	0.64	20.92	19.47	23.27	30.	.00	2.	71	Pass
HT20	MCS0	CDD	165	5825	0.63	0.64	20.80	19.20	23.08	30.	.00	2.	71	Pass
HT40	MCS0	CDD	151	5755	1.13	1.13	20.81	19.31	23.14	30.	.00	2.	71	Pass
HT40	MCS0	CDD	159	5795	1.13	1.13	20.66	19.24	23.02	30	.00	2.	71	Pass
VHT20	MCS0	CDD	149	5745	0.63	0.63	20.86	19.24	23.14	30	.00	2.	71	Pass
VHT20	MCS0	CDD	157	5785	0.63	0.63	20.79	19.21	23.08	30.	.00	2.	71	Pass
VHT20	MCS0	CDD	165	5825	0.63	0.63	20.79	19.18	23.07	30.	.00	2.	71	Pass
VHT40	MCS0	CDD	151	5755	1.18	1.18	20.84	19.19	23.11	30.	.00	2.	71	Pass
VHT40	MCS0	CDD	159	5795	1.18	1.18	20.73	19.09	23.00	30	.00	2.	71	Pass
VHT80	MCS0	CDD	155	5775	2.05	2.05	18.40	18.35	21.38	30.	.00	2.	71	Pass

# TEST RESULTS DATA Power Spectral Density

	Band IV															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Fac	Duty Factor (dB)		log IkHz BW) r (dB)		Average Power Density Bm/500k		PS Lir	rage SD nit 00kHz)		G Bi)	Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	CDD	149	5745	0.60	0.58	2.	22	6.24	4.65	9.25	30.	00	5.	44	Pass
11a	6Mbps	CDD	157	5785	0.60	0.58	2.	22	5.79	4.34	8.80	30.	00	5.	44	Pass
11a	6Mbps	CDD	165	5825	0.60	0.58	2.	22	5.90	4.46	8.91	30.	00	5.	44	Pass
HT20	MCS0	CDD	149	5745	0.63	0.64	2.	22	5.74	4.06	8.75	30.	00	5.	44	Pass
HT20	MCS0	CDD	157	5785	0.63	0.64	2.	22	5.55	4.15	8.56	30.	00	5.	44	Pass
HT20	MCS0	CDD	165	5825	0.63	0.64	2.	22	5.66	4.14	8.67	30.	00	5.	44	Pass
HT40	MCS0	CDD	151	5755	1.13	1.13	2.	22	2.90	1.06	5.91	30.	00	5.	44	Pass
HT40	MCS0	CDD	159	5795	1.13	1.13	2.	22	2.47	0.98	5.48	30.	00	5.	44	Pass
VHT80	MCS0	CDD	155	5775	2.05	2.05	2.	22	-1.71	-2.13	1.30	30.	00	5.	44	Pass

Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)

## <STBC>

Test Engineer:	Derek Hsu	Temperature:	21~25	°C
Test Date:	2016/12/30~2017/03/08	Relative Humidity:	51~54	%

#### TEST RESULTS DATA 6dB and 26dB EBW and 99% OBW

	Band IV												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Band	9% width Hz)	Band	dB lwidth Hz)	Band	dB width Hz)	6 dB Bandwidth Min. Limit (MHz)		
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1 Ant	2	
HT20	MCS0	STBC	149	5745	28.20	19.35	49.38	47.28	17.50	17.54	0.5	Pass	
HT20	MCS0	STBC	157	5785	26.70	19.55	48.65	46.17	17.48	17.52	0.5	Pass	
HT20	MCS0	STBC	165	5825	26.45	19.70	49.74	45.14	17.52	17.54	0.5	Pass	
HT40	MCS0	STBC	151	5755	53.10	37.70	101.88	93.66	36.08	36.32	0.5	Pass	
HT40	MCS0	STBC	159	5795	55.00	38.30	102.72	92.88	36.32	36.32	0.5	Pass	
VHT80	MCS0	STBC	155	5775	76.20	76.20	144.48	139.20	75.28	75.04	0.5	Pass	

# TEST RESULTS DATA Average Power Table

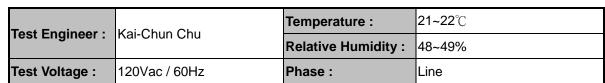
	Band IV													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)		uty etor B)		Average conducte Power (dBm)		FC Cond Power (dB	ucted Limit	D (di	G Bi)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	STBC	149	5745	0.63	0.63	21.08	19.56	23.39	30.	00	2.7	71	Pass
HT20	MCS0	STBC	157	5785	0.63	0.63	20.92	19.44	23.25	30.	00	2.	71	Pass
HT20	MCS0	STBC	165	5825	0.63	0.63	20.99	19.36	23.26	30.	00	2.7	71	Pass
HT40	MCS0	STBC	151	5755	1.13	1.12	20.84	19.37	23.18	30.	00	2.7	71	Pass
HT40	MCS0	STBC	159	5795	1.13	1.12	20.76	19.23	23.07	30.	00	2.	71	Pass
VHT20	MCS0	STBC	149	5745	0.63	0.63	20.99	19.43	23.29	30.	00	2.	71	Pass
VHT20	MCS0	STBC	157	5785	0.63	0.63	20.94	19.36	23.23	30.	00	2.	71	Pass
VHT20	MCS0	STBC	165	5825	0.63	0.63	20.93	19.31	23.20	30.	00	2.	71	Pass
VHT40	MCS0	STBC	151	5755	1.18	1.18	20.78	19.28	23.11	30.	00	2.	71	Pass
VHT40	MCS0	STBC	159	5795	1.18	1.18	20.74	19.20	23.05	30.	00	2.	71	Pass
VHT80	MCS0	STBC	155	5775	2.06	2.06	18.66	18.44	21.56	30.	00	2.	71	Pass

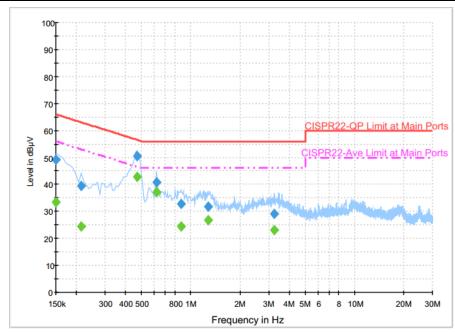
#### <u>TEST RESULTS DATA</u> <u>Power Spectral Density</u>

	Band IV												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Du Fac (d	ctor	10log (500kHz /RBW) Factor (dB)		Average Power Density Sm/500k		Average PSD Limit (dBm/500kHz)	DG (dBi)	Pass /Fail
					Ant 1	Ant 2	Ant 1 Ant 2	Ant 1	Ant 2	SUM	Ant 1 Ant 2	Ant 1 Ant 2	
HT20	MCS0	STBC	149	5745	0.63	0.63	2.22	5.56	4.33	8.57	30.00	2.71	Pass
HT20	MCS0	STBC	157	5785	0.63	0.63	2.22	5.44	3.91	8.45	30.00	2.71	Pass
HT20	MCS0	STBC	165	5825	0.63	0.63	2.22	5.41	3.85	8.42	30.00	2.71	Pass
HT40	MCS0	STBC	151	5755	1.13	1.12	2.22	2.68	1.02	5.69	30.00	2.71	Pass
HT40	MCS0	STBC	159	5795	1.13	1.12	2.22	2.21	1.16	5.22	30.00	2.71	Pass
VHT80	MCS0	STBC	155	5775	2.06	2.06	2.22	-1.96	-2.50	1.05	30.00	2.71	Pass

Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)

## **Appendix B. AC Conducted Emission Test Results**





#### Final Result : QuasiPeak

Frequency	QuasiPeak	Ciltor.	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	Filter	Line	(dB)	(dB)	(dBµV)
0.150000	49.2	Off	L1	19.6	16.8	66.0
0.214000	39.3	Off	L1	19.6	23.7	63.0
0.470000	50.6	Off	L1	19.6	5.9	56.5
0.622000	40.9	Off	L1	19.6	15.1	56.0
0.870000	32.6	Off	L1	19.6	23.4	56.0
1.278000	31.7	Off	L1	19.6	24.3	56.0
3.246000	29.1	Off	L1	19.6	26.9	56.0

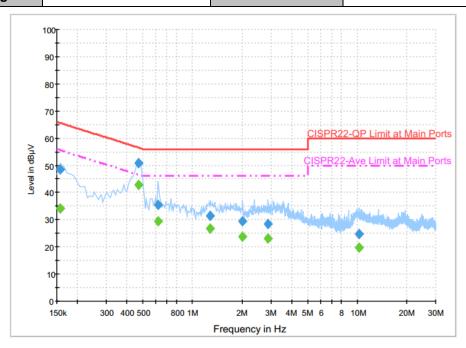
Final Result : Average

Frequency	Average	Filter	Line	Corr.	Margin	Limit
(MHz)	(dBµV)	Filler	Lille	(dB)	(dB)	(dBµV)
0.150000	33.3	Off	L1	19.6	22.7	56.0
0.214000	24.6	Off	L1	19.6	28.4	53.0
0.470000	42.7	Off	L1	19.6	3.8	46.5
0.622000	37.2	Off	L1	19.6	8.8	46.0
0.870000	24.5	Off	L1	19.6	21.5	46.0
1.278000	26.8	Off	L1	19.6	19.2	46.0
3.246000	23.2	Off	L1	19.6	22.8	46.0

TEL: 886-3-327-3456 FAX: 886-3-328-4978

Test Engineer : Kai-Chun Chu

| Temperature : 21~22°C |
| Relative Humidity : 48~49% |
| Test Voltage : 120Vac / 60Hz | Phase : Neutral



#### Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	48.5	Off	N	19.6	17.1	65.6
0.470000	50.8	Off	N	19.6	5.7	56.5
0.622000	35.5	Off	N	19.6	20.5	56.0
1.286000	31.5	Off	N	19.6	24.5	56.0
2.022000	29.3	Off	N	19.6	26.7	56.0
2.886000	28.5	Off	N	19.5	27.5	56.0
10.270000	24.7	Off	N	20.1	35.3	60.0

Final Result : Average

•	mai Nesuit	. Average					
	Frequency	Average	Filter	Line	Corr.	Margin	Limit
	(MHz)	(dBµV)	riitei	Line	(dB)	(dB)	(dBµV)
	0.158000	34.1	Off	N	19.6	21.5	55.6
	0.470000	42.7	Off	N	19.6	3.8	46.5
	0.622000	29.3	Off	N	19.6	16.7	46.0
	1.286000	26.8	Off	N	19.6	19.2	46.0
	2.022000	23.8	Off	N	19.6	22.2	46.0
	2.886000	23.0	Off	N	19.5	23.0	46.0
	10.270000	19.6	Off	N	20.1	30.4	50.0

TEL: 886-3-327-3456 FAX: 886-3-328-4978



## Appendix C. Radiated Spurious Emission

Test Engineer :	Jeff Yao	Temperature :	20~24°C
rest Engineer .		Relative Humidity :	48~50%

Report No. : FR630207-02E

#### Band 4 - 5725~5850MHz

#### WIFI 802.11a CDD (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)
		5633.2	54.48	-13.72	68.2	48.09	33.16	6.23	33	225	144	Р	Н
		5696.8	68.08	-34.76	102.84	61.59	33.23	6.26	33	225	144	Р	Н
		5718.2	77.43	-32.87	110.3	70.9	33.27	6.26	33	225	144	Р	Н
		5723	87.14	-30.5	117.64	80.61	33.27	6.26	33	225	144	Р	Н
000.44	*	5745	115.75	-	-	109.18	33.29	6.28	33	225	144	Р	Н
802.11a	*	5745	106.94	-	-	100.37	33.29	6.28	33	225	144	Α	Н
CH 149 5745MHz		5648.6	48.85	-19.35	68.2	42.44	33.16	6.25	33	190	40	Р	٧
3743WITIZ		5699	64.03	-40.43	104.46	57.54	33.23	6.26	33	190	40	Р	٧
		5719.8	72.51	-38.23	110.74	65.98	33.27	6.26	33	190	40	Р	V
		5725	86.28	-35.92	122.2	79.75	33.27	6.26	33	190	40	Р	V
	*	5745	110.64	-	-	104.07	33.29	6.28	33	190	40	Р	٧
	*	5745	101.58	-	-	95.01	33.29	6.28	33	190	40	Α	V

SPORTON INTERNATIONAL INC. Page Number : C1-1 of 14



WIFI Preamp Note Level Over Limit Read Antenna Cable Ant **Table** Peak Pol. Frequency Limit Line **Factor** Ant. Level Loss Factor Pos Pos Avg. ( dB ) ( dB \( V/m \) 1+2 (MHz) (dBµV/m) (dB<sub>µ</sub>V) ( dB/m ) (dB) (dB) (cm) (deg) (P/A) (H/V) 5646.4 49.23 -18.9768.2 42.82 33.16 6.25 33 224 139 Н 100.04 Ρ 5693 55.81 -44.23 49.32 33.23 6.26 33 224 139 Н 5719.8 58.63 -52.11 110.74 52.1 33.27 6.26 33 224 139 Ρ Н 5725 61.36 -60.84 122.2 54.83 33.27 6.26 33 224 139 Ρ Н \* 5785 116.43 -109.8 33.33 6.3 33 224 139 Ρ Н 5785 107.3 100.67 33.33 224 6.3 33 139 Α Η 5852 Р 54.94 33.42 6.33 224 Н 61.69 -55.95 117.64 33 139 5858 60.22 -49.74 109.96 53.45 33.44 6.33 33 224 139 Ρ Н Ρ 5889.6 51.98 -42.38 94.36 45.15 33.48 6.35 33 224 139 Н 802.11a 5938.4 50.81 -17.3968.2 43.93 33.52 6.36 33 224 139 Ρ Н CH 157 45.97 6.25 Ρ ٧ 5649.2 -22.23 68.2 39.56 33.16 33 154 29 5785MHz Р -54.58 ٧ 5698.6 49.59 104.17 43.1 33.23 6.26 33 154 29 5718.4 53.65 -56.7 110.35 47.12 33.27 6.26 33 154 29 Ρ ٧ 5725 57.06 -65.14 122.2 50.53 33.27 6.26 33 154 29 Ρ ٧ \* 5785 109.63 103 33.33 6.3 33 154 29 Ρ ٧ ٧ 5785 100.95 94.32 33.33 6.3 33 154 29 Α Ρ ٧ 5850 55.44 -66.76 122.2 48.69 33.42 6.33 33 154 29 6.33 29 Ρ ٧ 5855.6 54.26 -56.37 110.63 47.49 33.44 33 154 Р ٧ 5884.6 48.23 -49.84 98.07 41.44 33.46 6.33 33 154 29 5930 47.21 -20.99 68.2 40.33 33.52 6.36 33 154 29 Ρ ٧

Report No.: FR630207-02E

SPORTON INTERNATIONAL INC. Page Number : C1-2 of 14



WIFI Preamp Note Frequency Over Limit Read Antenna Cable Ant Table Peak Pol. Level Limit Line Level **Factor** Factor Pos Pos Ant. Loss Avg. (dB) (dBµV/m) (dBµV/m) (dB<sub>µ</sub>V) ( dB/m ) ( deg ) (P/A) (H/V) 1+2 (MHz) (dB) (dB) ( cm ) \* 115.52 108.82 33.39 244 146 5825 6.31 33 Η \* 5825 107.3 100.6 33.39 6.31 33 244 146 Н --Α 5850.6 80.94 -39.89 120.83 74.19 33.42 6.33 33 244 146 Ρ Н 5856.8 76.57 33.44 6.33 244 Н -33.73 110.3 69.8 33 146 5876.6 67.43 -36.58 104.01 60.64 33.46 6.33 33 244 146 Ρ Н 802.11a 5925.4 51.28 -16.92 68.2 44.41 33.52 6.35 33 244 146 Ρ Н **CH 165** 5825 111.31 104.61 33.39 6.31 33 190 40 Р V 5825MHz 5825 102.16 95.46 33.39 6.31 33 190 40 Α ٧ 5852.2 76.43 -40.75 117.18 69.68 33.42 6.33 33 190 40 ٧ Ρ ٧ 5855.6 69.69 -40.94 110.63 62.92 33.44 6.33 33 190 40 5878.2 40 Р ٧ 62.96 -39.86 102.82 56.17 33.46 6.33 33 190 40 ٧ 5928 46.55 -21.65 68.2 39.67 33.52 6.36 33 190 No other spurious found.

Remark

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978

All results are PASS against Peak and Average limit line.

#### WIFI 802.11a CDD (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1+2		( MHz )	( dBµV/m )	Limit (dB)	Line ( dBµV/m )	Level ( dBµV )	Factor ( dB/m )	Loss (dB)	Factor ( dB )	Pos ( cm )		Avg. (P/A)	
		11490	49.94	-24.06	74	57.43	39.6	8.93	56.02	160	360	Р	Н
802.11a CH 149		17235	51.18	-17.02	68.2	55.58	39.1	11.95	55.45	170	360	Р	Н
		11490	49.61	-24.39	74	57.1	39.6	8.93	56.02	160	360	Р	V
5745MHz		17235	50.23	-17.97	68.2	54.63	39.1	11.95	55.45	170	360	Р	V
		11570	49.13	-24.87	74	56.74	39.57	8.93	56.11	175	198	Р	Н
802.11a		17355	50.97	-17.23	68.2	56.12	38.89	11.97	56.01	189	185	Р	Н
CH 157		11570	50.01	-23.99	74	57.62	39.57	8.93	56.11	175	198	Р	V
5785MHz		17355	49.85	-18.35	68.2	55	38.89	11.97	56.01	189	185	Р	V
		11650	50.01	-23.99	74	57.73	39.54	8.93	56.19	156	347	Р	Н
802.11a		17475	50.2	-18	68.2	56.08	38.69	12	56.57	150	360	Р	Н
CH 165		11650	50.26	-23.74	74	57.98	39.54	8.93	56.19	156	347	Р	V
5825MHz		17475	49.56	-18.64	68.2	55.44	38.69	12	56.57	150	360	Р	V

## Remark

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978

<sup>1.</sup> No other spurious found.

<sup>2.</sup> All results are PASS against Peak and Average limit line.

Report No. : FR630207-02E

## WIFI 802.11n HT20 CDD (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)	(dB <sub>µ</sub> V)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
		5633.6	54.76	-13.44	68.2	48.37	33.16	6.23	33	204	144	Р	Н
		5697.2	72.13	-31.01	103.14	65.64	33.23	6.26	33	204	144	Р	Н
		5718.8	80.27	-30.19	110.46	73.74	33.27	6.26	33	204	144	Р	Н
		5724.2	90.11	-30.27	120.38	83.58	33.27	6.26	33	204	144	Р	Н
802.11n	*	5745	114.71	-	-	108.14	33.29	6.28	33	204	144	Р	Н
HT20	*	5745	106.58	-	-	100.01	33.29	6.28	33	204	144	Α	Н
CH 149		5632.8	50.6	-17.6	68.2	44.21	33.16	6.23	33	192	46	Р	V
5745MHz		5697.2	67.89	-35.25	103.14	61.4	33.23	6.26	33	192	46	Р	V
		5719.8	77.09	-33.65	110.74	70.56	33.27	6.26	33	192	46	Р	V
		5724.4	90.38	-30.45	120.83	83.85	33.27	6.26	33	192	46	Р	V
	*	5745	109.6	-	-	103.03	33.29	6.28	33	192	46	Р	V
	*	5745	101.58	-	-	95.01	33.29	6.28	33	192	46	Α	٧

SPORTON INTERNATIONAL INC. Page Number : C1-5 of 14



WIFI Preamp Note Level Over Limit Read Antenna Cable Ant **Table** Peak Pol. Frequency Limit Line **Factor** Ant. Level Loss Factor Pos Pos Avg. (dBµV/m) 1+2 (MHz) (dBµV/m) (dB) (dB<sub>µ</sub>V) ( dB/m ) (dB) (dB) (cm) (deg) (P/A) (H/V) 5643.2 49.82 -18.38 68.2 43.43 33.16 6.23 33 232 142 Н 104.32 Ρ 5698.8 54.84 -49.48 48.35 33.23 6.26 33 232 142 Н 5711.2 60.12 -48.22 108.34 53.61 33.25 6.26 33 232 142 Ρ Н 5723.8 65.24 -54.22 119.46 58.71 33.27 6.26 33 232 142 Ρ Н \* 5785 115.41 108.78 33.33 6.3 33 232 142 Ρ Н 5785 232 106.29 99.66 33.33 6.3 33 142 Α Η Р 5851.8 51.43 44.68 33.42 6.33 160 Н -66.67 118.1 33 36 5863 50.73 -57.83 108.56 43.96 33.44 6.33 33 160 36 Ρ Н 33.48 Ρ 5896.8 46.69 -42.34 89.03 39.86 6.35 33 160 36 Н 802.11n Ρ **HT20** 5939.8 42.36 -25.84 68.2 35.46 33.54 6.36 33 160 36 Н CH 157 6.25 Ρ ٧ 5648.8 47.04 -21.16 68.2 40.63 33.16 33 160 36 5785MHz Р 5699.4 49.9 -54.86 ٧ 104.76 43.41 33.23 6.26 33 160 36 5719.4 55.01 -55.62 110.63 48.48 33.27 6.26 33 160 36 Ρ ٧ 5725 57.41 -64.79122.2 50.88 33.27 6.26 33 160 36 Ρ ٧ \* 5785 110.1 103.47 33.33 6.3 33 160 36 Ρ ٧ ٧ 5785 101.61 94.98 33.33 6.3 33 160 36 Α Ρ ٧ 5852 54.6 -63.04 117.64 47.85 33.42 6.33 33 160 36 6.33 Ρ ٧ 5856.8 55.24 -55.06 110.3 48.47 33.44 33 160 36 Р ٧ 5876 49.29 -55.17 104.46 42.5 33.46 6.33 33 160 36 5945 45.72 -22.48 68.2 38.82 33.54 6.36 33 160 36 Ρ ٧

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WIFI Ant. 1+2	Note	Frequency ( MHz )	Level	Over Limit ( dB )	Limit Line ( dBµV/m )	Read Level ( dBµV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )		Peak Avg. (P/A)	
	*	5825	115.14	-	-	108.44	33.39	6.31	33	206	142	Р	Н
	*	5825	106.74	-	-	100.04	33.39	6.31	33	206	142	Α	Н
		5850.6	83.49	-37.34	120.83	76.74	33.42	6.33	33	206	142	Р	Н
		5856.2	78.72	-31.74	110.46	71.95	33.44	6.33	33	206	142	Р	Н
802.11n		5876	68.82	-35.64	104.46	62.03	33.46	6.33	33	206	142	Р	Н
HT20		5935.4	52.5	-15.7	68.2	45.62	33.52	6.36	33	206	142	Р	Н
CH 165	*	5825	109.42	-	-	102.72	33.39	6.31	33	192	46	Р	V
5825MHz	*	5825	100.6	-	-	93.9	33.39	6.31	33	192	46	Α	V
		5851.6	74.49	-44.06	118.55	67.74	33.42	6.33	33	192	46	Р	V
		5859.6	71.19	-38.32	109.51	64.42	33.44	6.33	33	192	46	Р	V
		5876.6	62.29	-41.72	104.01	55.5	33.46	6.33	33	192	46	Р	V
		5930.2	47.37	-20.83	68.2	40.49	33.52	6.36	33	192	46	Р	V

Remark 1. No other spurious found.

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978

<sup>2.</sup> All results are PASS against Peak and Average limit line.

### WIFI 802.11n HT20 CDD (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1+2		(MHz)	( dBµV/m )	Limit (dB)	Line ( dBµV/m )	Level ( dBµV )	Factor ( dB/m )	Loss (dB)	Factor (dB)	Pos ( cm )	Pos ( deg )	Avg. (P/A)	
802.11n		11490	49.54	-24.46	74	57.03	39.6	8.93	56.02	160	360	Р	Н
HT20		17235	50.53	-17.67	68.2	54.93	39.1	11.95	55.45	170	360	Р	Н
CH 149		11490	50.4	-23.6	74	57.89	39.6	8.93	56.02	160	360	Р	V
5745MHz		17235	49.36	-18.84	68.2	53.76	39.1	11.95	55.45	170	360	Р	V
802.11n		11570	49.5	-24.5	74	57.11	39.57	8.93	56.11	175	198	Р	Н
HT20		17355	51.05	-17.15	68.2	56.2	38.89	11.97	56.01	189	185	Р	Н
CH 157		11570	50.36	-23.64	74	57.97	39.57	8.93	56.11	175	198	Р	V
5785MHz		17355	49.12	-19.08	68.2	54.27	38.89	11.97	56.01	189	185	Р	V
802.11n		11650	49.77	-24.23	74	57.49	39.54	8.93	56.19	156	347	Р	Н
HT20		17475	49.75	-18.45	68.2	55.63	38.69	12	56.57	150	360	Р	Н
CH 165		11650	50.45	-23.55	74	58.17	39.54	8.93	56.19	156	347	Р	V
5825MHz		17475	49.35	-18.85	68.2	55.23	38.69	12	56.57	150	360	Р	V

#### Remark

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978

<sup>1.</sup> No other spurious found.

<sup>2.</sup> All results are PASS against Peak and Average limit line.

## WIFI 802.11n HT40 CDD (Band Edge @ 3m)

Report No. : FR630207-02E

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 )	( $dB\mu V$ )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
		5648.2	62.6	-5.6	68.2	56.19	33.16	6.25	33	202	140	Р	Н
		5696.2	79.07	-23.33	102.4	72.58	33.23	6.26	33	202	140	Р	Н
		5717.6	92.67	-17.46	110.13	86.14	33.27	6.26	33	202	140	Р	Н
		5721	92.81	-20.27	113.08	86.28	33.27	6.26	33	202	140	Р	Н
	*	5755	112.59	-	-	106	33.31	6.28	33	202	140	Р	Н
	*	5755	105	-	-	98.41	33.31	6.28	33	202	140	Α	Н
		5850.2	64.09	-57.65	121.74	57.34	33.42	6.33	33	202	140	Р	Н
		5858.4	63.56	-46.29	109.85	56.79	33.44	6.33	33	202	140	Р	Н
802.11n		5875.2	57.29	-47.76	105.05	50.5	33.46	6.33	33	202	140	Р	Н
HT40		5931.6	52.38	-15.82	68.2	45.5	33.52	6.36	33	202	140	Р	Н
CH 151		5648.8	55.12	-13.08	68.2	48.71	33.16	6.25	33	192	46	Р	V
5755MHz		5698.8	74.41	-29.91	104.32	67.92	33.23	6.26	33	192	46	Р	V
		5717.4	86.82	-23.25	110.07	80.31	33.25	6.26	33	192	46	Р	٧
		5722.2	91.29	-24.53	115.82	84.76	33.27	6.26	33	192	46	Р	٧
	*	5755	107.34	-	-	100.75	33.31	6.28	33	192	46	Р	٧
	*	5755	99.06	-	-	92.47	33.31	6.28	33	192	46	Α	٧
		5852.2	55.48	-61.7	117.18	48.73	33.42	6.33	33	192	46	Р	٧
		5867.4	58.41	-48.92	107.33	51.64	33.44	6.33	33	192	46	Р	V
		5896.8	50.78	-38.25	89.03	43.95	33.48	6.35	33	192	46	Р	V
		5930.2	46.8	-21.4	68.2	39.92	33.52	6.36	33	192	46	Р	V

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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)
		5645.6	55.52	-12.68	68.2	49.13	33.16	6.23	33	239	143	Р	Н
		5697.4	65.59	-37.69	103.28	59.1	33.23	6.26	33	239	143	Р	Н
		5719.6	70.47	-40.22	110.69	63.94	33.27	6.26	33	239	143	Р	Н
		5723.8	68.94	-50.52	119.46	62.41	33.27	6.26	33	239	143	Р	Н
	*	5795	112.53	-	-	105.88	33.35	6.3	33	239	143	Р	Н
	*	5795	104.65	-	-	98	33.35	6.3	33	239	143	Α	Н
		5852.6	79.71	-36.56	116.27	72.96	33.42	6.33	33	239	143	Р	Н
		5855.8	79.43	-31.15	110.58	72.66	33.44	6.33	33	239	143	Р	Н
802.11n		5875.8	69.84	-34.77	104.61	63.05	33.46	6.33	33	239	143	Р	Н
HT40		5936.8	57.2	-11	68.2	50.32	33.52	6.36	33	239	143	Р	Н
CH 159		5647.4	47.87	-20.33	68.2	41.46	33.16	6.25	33	192	46	Р	V
5795MHz		5699	54.03	-50.43	104.46	47.54	33.23	6.26	33	192	46	Р	V
		5718.4	62.18	-48.17	110.35	55.65	33.27	6.26	33	192	46	Р	V
		5723.2	63.91	-54.19	118.1	57.38	33.27	6.26	33	192	46	Р	V
	*	5795	104.6	-	-	97.95	33.35	6.3	33	192	46	Р	V
	*	5795	96.39	-	-	89.74	33.35	6.3	33	192	46	Α	V
		5852.2	72.78	-44.4	117.18	66.03	33.42	6.33	33	192	46	Р	V
		5856.2	72.45	-38.01	110.46	65.68	33.44	6.33	33	192	46	Р	V
		5875.8	62.23	-42.38	104.61	55.44	33.46	6.33	33	192	46	Р	V
		5927.4	52.09	-16.11	68.2	45.21	33.52	6.36	33	192	46	Р	V

Remark

SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978

<sup>1.</sup> No other spurious found.

<sup>2.</sup> All results are PASS against Peak and Average limit line.

### WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency ( MHz )	Level	Over Limit ( dB )	Limit Line ( dBµV/m )	Read Level ( dBµV )	Antenna Factor ( dB/m )	Cable Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )		Peak Avg. (P/A)	
802.11n		11510	49.75	-24.25	74	57.25	39.6	8.93	56.03	160	360	Р	Н
HT40		17265	49.66	-18.54	68.2	54.28	39.04	11.95	55.61	170	360	Р	Н
CH 151		11510	48.96	-25.04	74	56.46	39.6	8.93	56.03	160	360	Р	V
5755MHz		17265	49.38	-18.82	68.2	54	39.04	11.95	55.61	170	360	Р	V
802.11n		11590	49.39	-24.61	74	57.03	39.56	8.93	56.13	170	300	Р	Н
HT40		17385	48.34	-19.86	68.2	53.69	38.84	11.98	56.17	150	200	Р	Н
CH 159		11590	49.04	-24.96	74	56.68	39.56	8.93	56.13	170	300	Р	V
5795MHz		17385	48.76	-19.44	68.2	54.11	38.84	11.98	56.17	150	200	Р	V
Remark		o other spurious		Peak and	Average lim	it line.							

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#### WIFI 802.11ac VHT80 CDD (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 )	( $dB\mu V$ )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
		5638.4	64.09	-4.11	68.2	57.7	33.16	6.23	33	217	141	Р	Н
		5699	78.59	-25.87	104.46	72.1	33.23	6.26	33	217	141	Р	Н
		5718.4	82.32	-28.03	110.35	75.79	33.27	6.26	33	217	141	Р	Н
		5721.4	80.55	-33.44	113.99	74.02	33.27	6.26	33	217	141	Р	Н
	*	5775	107.09	-	-	100.46	33.33	6.3	33	217	141	Р	Н
	*	5775	97.87	-	-	91.24	33.33	6.3	33	217	141	Α	Н
		5851.6	79.1	-39.45	118.55	72.35	33.42	6.33	33	217	141	Р	Н
		5857.2	78.29	-31.89	110.18	71.52	33.44	6.33	33	217	141	Р	Н
802.11ac		5875.4	73.29	-31.61	104.9	66.5	33.46	6.33	33	217	141	Р	Н
VHT80		5931.2	57.7	-10.5	68.2	50.82	33.52	6.36	33	217	141	Р	Η
CH 155		5647.2	60.33	-7.87	68.2	53.92	33.16	6.25	33	190	40	Р	<
5775MHz		5699.2	73.25	-31.36	104.61	66.76	33.23	6.26	33	190	40	Р	٧
		5711.6	75.2	-33.25	108.45	68.69	33.25	6.26	33	190	40	Р	٧
		5723.4	73.43	-45.12	118.55	66.9	33.27	6.26	33	190	40	Р	٧
	*	5775	101.23	-	-	94.6	33.33	6.3	33	190	40	Р	٧
	*	5775	93.22	-	-	86.59	33.33	6.3	33	190	40	Α	٧
		5854.8	73.27	-37.99	111.26	66.5	33.44	6.33	33	190	40	Р	٧
		5859.8	71.68	-37.77	109.45	64.91	33.44	6.33	33	190	40	Р	٧
		5875	66.68	-38.52	105.2	59.89	33.46	6.33	33	190	40	Р	٧
		5926.6	52.37	-15.83	68.2	45.49	33.52	6.36	33	190	40	Р	V

#### Remark

1. No other spurious found.

2. All results are PASS against Peak and Average limit line.

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#### WIFI 802.11ac VHT80 CDD (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 )	(dB <sub>µ</sub> V)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11ac		11550	50.46	-23.54	74	58.04	39.58	8.93	56.09	160	360	Р	Н
VHT80		17325	48.97	-19.23	68.2	53.9	38.95	11.97	55.85	170	360	Р	Н
CH 155		11550	50.2	-23.8	74	57.78	39.58	8.93	56.09	160	360	Р	V
5775MHz		17325	48.26	-19.94	68.2	53.19	38.95	11.97	55.85	170	360	Р	V

#### Remark

1. No other spurious found.

2. All results are PASS against Peak and Average limit line.

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#### **Emission below 1GHz**

## 5GHz WIFI 802.11ac VHT80 CDD (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)
		30	26.03	-13.97	40	31.47	25.1	0.65	31.19	100	0	Р	Н
		53.76	22.38	-17.62	40	38.69	14.1	0.83	31.24	-	-	Р	Н
		268.68	24.52	-21.48	46	35.5	18.43	1.37	30.78	-	-	Р	Н
		316.1	27.79	-18.21	46	37.45	19.7	1.44	30.8	-	-	Р	Н
5GHz		542.9	27.02	-18.98	46	32.02	24.14	1.86	31	-	-	Р	Н
802.11ac		953.1	31.46	-14.54	46	31.53	28.93	2.41	31.41	-	-	Р	Н
VHT80		49.44	27.67	-12.33	40	42.55	15.72	0.65	31.25	400	0	Р	V
LF		149.34	22.8	-20.7	43.5	34.84	17.97	1.08	31.09	-	-	Р	V
		255.99	24.89	-21.11	46	36.3	18	1.37	30.78	-	-	Р	V
		560.4	26.2	-19.8	46	30.92	24.45	1.86	31.03	-	-	Р	٧
		685.7	27.75	-18.25	46	31.44	25.6	2.05	31.34	-	-	Р	٧
		917.4	31.13	-14.87	46	31.66	28.58	2.35	31.46	-	-	Р	٧
Remark		o other spurious		mit line.									

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#### WIFI 802.11n HT20 STBC (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1+2		(MHz)	( dBµV/m )	Limit (dB)	Line ( dBµV/m )	Level ( dBµV )	Factor ( dB/m )	Loss (dB)	Factor (dB)	Pos ( cm )	Pos ( deg )	Avg. (P/A)	(H/V)
		5638	52.47	-15.73	68.2	46.08	33.16	6.23	33	212	140	Р	Н
		5697.8	71.51	-32.07	103.58	65.02	33.23	6.26	33	212	140	Р	Н
		5719.8	79.8	-30.94	110.74	73.27	33.27	6.26	33	212	140	Р	Н
		5725	89.93	-32.27	122.2	83.4	33.27	6.26	33	212	140	Р	Н
802.11n	*	5745	114.85	-	-	108.28	33.29	6.28	33	212	140	Р	Н
HT20	*	5745	106.6	-	-	100.03	33.29	6.28	33	212	140	Α	Н
CH 149		5648.4	49.13	-19.07	68.2	42.72	33.16	6.25	33	203	45	Р	٧
5745MHz		5698.8	65.65	-38.67	104.32	59.16	33.23	6.26	33	203	45	Р	٧
		5719.6	74.31	-36.38	110.69	67.78	33.27	6.26	33	203	45	Р	٧
		5724.8	85.9	-35.84	121.74	79.37	33.27	6.26	33	203	45	Р	٧
	*	5745	110.77	-	-	104.2	33.29	6.28	33	203	45	Р	V
	*	5745	103.17	-	-	96.6	33.29	6.28	33	203	45	Α	V

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WIFI Preamp Note Level Over Limit Read Antenna Cable Ant **Table** Peak Pol. Frequency Limit Line **Factor** Ant. Level Loss Factor Pos Pos Avg. (dBµV/m) 1+2 (MHz) (dBµV/m) (dB) (dB<sub>µ</sub>V) ( dB/m ) (dB) (dB) (cm) (deg) (P/A) (H/V) 5642 49.84 -18.36 68.2 43.45 33.16 6.23 33 218 142 Н Ρ 5696.8 53.1 -49.74 102.84 46.61 33.23 6.26 33 218 142 Н 5718.6 59.37 -51.04 110.41 52.84 33.27 6.26 33 218 142 Ρ Н 5724.2 62.11 -58.27 120.38 55.58 33.27 6.26 33 218 142 Ρ Н \* 5785 113.69 107.06 33.33 6.3 33 218 142 Ρ Н 5785 33.33 218 104.78 98.15 6.3 33 142 Α Η Р 5851.4 62.09 55.34 33.42 6.33 Н -56.92 119.01 33 218 142 5858 59.5 -50.46 109.96 52.73 33.44 6.33 33 218 142 Ρ Н 101.78 Ρ 5879.6 52.66 -49.12 45.87 33.46 6.33 33 218 142 Н 802.11n **HT20** 5932.2 51.18 -17.02 68.2 44.3 33.52 6.36 33 218 142 Ρ Н CH 157 6.25 Ρ ٧ 5649.2 46.97 -21.23 68.2 40.56 33.16 33 143 37 5785MHz Р 5698.6 ٧ 50.59 -53.58 104.17 44.1 33.23 6.26 33 143 37 5718.4 54.65 -55.7 110.35 48.12 33.27 6.26 33 143 37 Ρ ٧ 5725 58.06 -64.14 122.2 51.53 33.27 6.26 33 143 37 Ρ ٧ \* 5785 109.63 103 33.33 6.3 33 143 37 Ρ ٧ ٧ 5785 99.95 93.32 33.33 6.3 33 143 37 Α Ρ ٧ 5850 55.44 -66.76 122.2 48.69 33.42 6.33 33 143 37 33.44 6.33 Ρ ٧ 5855.6 55.26 -55.37 110.63 48.49 33 143 37 ٧ 5884.6 49.23 -48.84 98.07 42.44 33.46 6.33 33 143 37 Ρ 5930 48.21 -19.99 68.2 41.33 33.52 6.36 33 143 37 Ρ ٧

SPORTON INTERNATIONAL INC.

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WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1+2		( MHz )	( dBµV/m )	Limit (dB)	Line ( dBµV/m )	Level ( dBµV )	Factor ( dB/m )	Loss (dB)	Factor (dB)	Pos ( cm )	Pos ( deg )	Avg. (P/A)	
	*	5825	115.69	-	-	108.99	33.39	6.31	33	234	141	Р	Н
	*	5825	106.74	-	-	100.04	33.39	6.31	33	234	141	Α	Н
		5850.2	83.88	-37.86	121.74	77.13	33.42	6.33	33	234	141	Р	Н
		5855	79.57	-31.23	110.8	72.8	33.44	6.33	33	234	141	Р	Н
802.11n		5876.8	71.07	-32.79	103.86	64.28	33.46	6.33	33	234	141	Р	Н
HT20		5934.4	52.83	-15.37	68.2	45.95	33.52	6.36	33	234	141	Р	Н
CH 165	*	5825	108.39	-	-	101.69	33.39	6.31	33	151	38	Р	V
5825MHz	*	5825	99.57	-	-	92.87	33.39	6.31	33	151	38	Α	V
		5850	78.26	-43.94	122.2	71.51	33.42	6.33	33	151	38	Р	V
		5855.4	75.66	-35.03	110.69	68.89	33.44	6.33	33	151	38	Р	V
		5876.4	63.8	-40.36	104.16	57.01	33.46	6.33	33	151	38	Р	V
		5927	47.84	-20.36	68.2	40.96	33.52	6.36	33	151	38	Р	V

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Remark

SPORTON INTERNATIONAL INC. Page Number

No other spurious found.

<sup>2.</sup> All results are PASS against Peak and Average limit line.

#### WIFI 802.11n HT20 STBC (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1+2		( MHz )	( dBµV/m )	Limit (dB)	Line ( dBµV/m )	Level ( dBµV )	Factor ( dB/m )	Loss (dB)	Factor ( dB )	Pos ( cm )	Pos ( deg )	Avg. (P/A)	
802.11n		11490	50.31	-23.69	74	57.8	39.6	8.93	56.02	160	360	Р	Н
HT20		17235	50.92	-17.28	68.2	55.32	39.1	11.95	55.45	170	360	Р	Н
CH 149		11490	50.36	-23.64	74	57.85	39.6	8.93	56.02	160	360	Р	V
5745MHz		17235	50.9	-17.3	68.2	55.3	39.1	11.95	55.45	170	360	Р	V
802.11n		11570	49.6	-24.4	74	57.21	39.57	8.93	56.11	175	198	Р	Н
HT20		17355	50.39	-17.81	68.2	55.54	38.89	11.97	56.01	189	185	Р	Н
CH 157		11570	49.77	-24.23	74	57.38	39.57	8.93	56.11	175	198	Р	V
5785MHz		17355	48.77	-19.43	68.2	53.92	38.89	11.97	56.01	189	185	Р	V
802.11n		11650	49.5	-24.5	74	57.22	39.54	8.93	56.19	156	347	Р	Н
HT20		17475	49.62	-18.58	68.2	55.5	38.69	12	56.57	150	360	Р	Н
CH 165		11650	50.64	-23.36	74	58.36	39.54	8.93	56.19	156	347	Р	V
5825MHz		17475	49.68	-18.52	68.2	55.56	38.69	12	56.57	150	360	Р	V

#### Remark

SPORTON INTERNATIONAL INC.

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<sup>1.</sup> No other spurious found.

<sup>2.</sup> All results are PASS against Peak and Average limit line.

## WIFI 802.11n HT40 STBC (Band Edge @ 3m)

Report No. : FR630207-02E

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 )	(dB <sub>µ</sub> V)	( dB/m )	( dB )	( dB )	( cm )	(deg)	(P/A)	(H/V)
		5650	61.21	-6.99	68.2	54.77	33.19	6.25	33	221	143	Р	Н
		5697.6	76.06	-27.37	103.43	69.57	33.23	6.26	33	221	143	Р	Н
		5717.2	91.82	-18.2	110.02	85.31	33.25	6.26	33	221	143	Р	Н
		5722.4	91.79	-24.48	116.27	85.26	33.27	6.26	33	221	143	Р	Н
	*	5755	111.73	-	-	105.14	33.31	6.28	33	221	143	Р	Н
	*	5755	103.57	-	-	96.98	33.31	6.28	33	221	143	Α	Н
		5852.2	64.3	-52.88	117.18	57.55	33.42	6.33	33	221	143	Р	Н
		5864.6	62.74	-45.37	108.11	55.97	33.44	6.33	33	221	143	Р	Н
802.11n		5876.4	59.23	-44.93	104.16	52.44	33.46	6.33	33	221	143	Р	Н
HT40		5935	51.76	-16.44	68.2	44.88	33.52	6.36	33	221	143	Р	Н
CH 151		5645.2	55.79	-12.41	68.2	49.4	33.16	6.23	33	186	44	Р	٧
5755MHz		5698.2	73.83	-30.04	103.87	67.34	33.23	6.26	33	186	44	Р	V
		5717.6	84.09	-26.04	110.13	77.56	33.27	6.26	33	186	44	Р	V
		5723.8	87.09	-32.37	119.46	80.56	33.27	6.26	33	186	44	Р	V
	*	5755	106.22	-	-	99.63	33.31	6.28	33	186	44	Р	V
	*	5755	98.01	-	-	91.42	33.31	6.28	33	186	44	Α	V
		5850	59.02	-63.18	122.2	52.27	33.42	6.33	33	186	44	Р	V
		5856.4	55.96	-54.45	110.41	49.19	33.44	6.33	33	186	44	Р	V
		5876	51.35	-53.11	104.46	44.56	33.46	6.33	33	186	44	Р	٧
		5945.2	48.1	-20.1	68.2	41.2	33.54	6.36	33	186	44	Р	V

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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)
		5624.8	57.59	-10.61	68.2	51.22	33.14	6.23	33	224	143	Р	Н
		5699.8	66.03	-39.02	105.05	59.54	33.23	6.26	33	224	143	Р	Н
		5718.4	71.63	-38.72	110.35	65.1	33.27	6.26	33	224	143	Р	Н
		5724.8	74.22	-47.52	121.74	67.69	33.27	6.26	33	224	143	Р	Н
	*	5795	112.91	-	-	106.26	33.35	6.3	33	224	143	Р	Н
	*	5795	104.23	-	-	97.58	33.35	6.3	33	224	143	Α	Н
		5852.8	80.23	-35.59	115.82	73.48	33.42	6.33	33	224	143	Р	Н
		5855.4	78.06	-32.63	110.69	71.29	33.44	6.33	33	224	143	Р	Н
802.11n		5875.2	69.19	-35.86	105.05	62.4	33.46	6.33	33	224	143	Р	Н
HT40		5927.4	57.11	-11.09	68.2	50.23	33.52	6.36	33	224	143	Р	Н
CH 159		5645	51.26	-16.94	68.2	44.87	33.16	6.23	33	176	40	Р	V
5795MHz		5694.8	60.51	-40.86	101.37	54.02	33.23	6.26	33	176	40	Р	V
		5718.2	65.67	-44.63	110.3	59.14	33.27	6.26	33	176	40	Р	V
		5723.6	67.42	-51.59	119.01	60.89	33.27	6.26	33	176	40	Р	V
	*	5795	106.86	-	-	100.21	33.35	6.3	33	176	40	Р	V
	*	5795	98.91	-	-	92.26	33.35	6.3	33	176	40	Α	V
		5852.8	74.04	-41.78	115.82	67.29	33.42	6.33	33	176	40	Р	V
		5856.2	71.86	-38.6	110.46	65.09	33.44	6.33	33	176	40	Р	V
		5875.4	63.1	-41.8	104.9	56.31	33.46	6.33	33	176	40	Р	V
		5947.4	51.79	-16.41	68.2	44.89	33.54	6.36	33	176	40	Р	٧

Remark

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<sup>1.</sup> No other spurious found.

<sup>2.</sup> All results are PASS against Peak and Average limit line.

### WIFI 802.11n HT40 STBC (Harmonic @ 3m)

Ant. 1+2		,					Antenna	Cable	Preamp	Ant	Table	reak	FOI.
			I	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
902 44 m		(MHz)	( dBµV/m )	(dB)	( dBµV/m )	(dBµV)	( dB/m )	(dB)	( dB )	( cm )	(deg)	(P/A)	(H/V)
802.11n		11510	49.48	-24.52	74	56.98	39.6	8.93	56.03	160	360	Р	Н
HT40		17265	49.59	-18.61	68.2	54.21	39.04	11.95	55.61	170	360	Р	Н
CH 151		11510	48.82	-25.18	74	56.32	39.6	8.93	56.03	160	360	Р	V
5755MHz		17265	48.74	-19.46	68.2	53.36	39.04	11.95	55.61	170	360	Р	V
802.11n		11590	49.5	-24.5	74	57.14	39.56	8.93	56.13	170	300	Р	Н
HT40		17385	48.39	-19.81	68.2	53.74	38.84	11.98	56.17	150	200	Р	Н
CH 159		11590	50.07	-23.93	74	57.71	39.56	8.93	56.13	170	300	Р	V
5795MHz		17385	48.6	-19.6	68.2	53.95	38.84	11.98	56.17	150	200	Р	V
1	No	other spurious	e found									•	
Remark 2		results are PA											

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#### WIFI 802.11ac VHT80 STBC (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 )	(dB <sub>µ</sub> V)	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
		5628.8	64.68	-3.52	68.2	58.31	33.14	6.23	33	231	144	Р	Н
		5692.2	78.02	-21.43	99.45	71.53	33.23	6.26	33	231	144	Р	Н
		5716.2	77.98	-31.76	109.74	71.47	33.25	6.26	33	231	144	Р	Н
		5720.8	78.01	-34.61	112.62	71.48	33.27	6.26	33	231	144	Р	Н
	*	5775	107.98	-	-	101.35	33.33	6.3	33	231	144	Р	Н
	*	5775	99.28	-	-	92.65	33.33	6.3	33	231	144	Α	Н
		5854.8	80	-31.26	111.26	73.23	33.44	6.33	33	231	144	Р	Н
		5859.4	77.03	-32.54	109.57	70.26	33.44	6.33	33	231	144	Р	Н
802.11ac		5877.4	69.3	-34.12	103.42	62.51	33.46	6.33	33	231	144	Р	Н
VHT80		5935.4	59.25	-8.95	68.2	52.37	33.52	6.36	33	231	144	Р	Н
CH 155		5640	58.09	-10.11	68.2	51.7	33.16	6.23	33	192	43	Р	V
5775MHz		5699.4	71.89	-32.87	104.76	65.4	33.23	6.26	33	192	43	Р	V
		5707.8	73.49	-33.9	107.39	66.98	33.25	6.26	33	192	43	Р	V
		5722.2	73.23	-42.59	115.82	66.7	33.27	6.26	33	192	43	Р	V
	*	5775	101.12	-	-	94.49	33.33	6.3	33	192	43	Р	V
	*	5775	92.53	-	-	85.9	33.33	6.3	33	192	43	Α	V
		5850.4	71.43	-49.86	121.29	64.68	33.42	6.33	33	192	43	Р	V
		5858.8	73.12	-36.61	109.73	66.35	33.44	6.33	33	192	43	Р	V
		5879.6	62.5	-39.28	101.78	55.71	33.46	6.33	33	192	43	Р	V
		5933.2	53.94	-14.26	68.2	47.06	33.52	6.36	33	192	43	Р	V

#### Remark

1. No other spurious found.

2. All results are PASS against Peak and Average limit line.

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#### WIFI 802.11ac VHT80 STBC (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.		<b>,</b> .		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	( dBµV/m )	(dB)	( dBµV/m )	(dB <sub>µ</sub> V)	( dB/m )	( dB )	( dB )	(cm)	(deg)	(P/A)	(H/V)
802.11ac		11550	49.23	-24.77	74	56.81	39.58	8.93	56.09	160	360	Р	Н
VHT80		17325	50.48	-17.72	68.2	55.41	38.95	11.97	55.85	170	360	Р	Н
CH 155		11550	50.09	-23.91	74	57.67	39.58	8.93	56.09	160	360	Р	V
5775MHz		17325	48.6	-19.6	68.2	53.53	38.95	11.97	55.85	170	360	Р	V

#### Remark

1. No other spurious found.

2. All results are PASS against Peak and Average limit line.

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#### **Emission below 1GHz**

## 5GHz WIFI 802.11ac VHT80 STBC (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)
		30.54	24.72	-15.28	40	30.74	24.52	0.65	31.19	-	-	Р	Н
		150.42	29.94	-13.56	43.5	41.95	18	1.08	31.09	-	-	Р	Н
		207.66	30.39	-13.11	43.5	44.54	15.52	1.17	30.84	400	0	Р	Н
		329.4	28.3	-17.7	46	37.82	19.86	1.44	30.82	-	-	Р	Н
5GHz		568.1	27.17	-18.83	46	31.79	24.56	1.86	31.04	-	-	Р	Н
802.11ac		916	30.4	-15.6	46	30.96	28.56	2.35	31.47	-	-	Р	Н
VHT80		49.17	26.37	-13.63	40	41.25	15.72	0.65	31.25	400	0	Р	<b>V</b>
LF		150.15	23.02	-20.48	43.5	35.03	18	1.08	31.09	-	-	Р	٧
		208.47	22.32	-21.18	43.5	36.41	15.57	1.17	30.83	-	-	Р	٧
		579.3	26.98	-19.02	46	31.39	24.7	1.94	31.05	-	-	Р	٧
		706	28.18	-17.82	46	31.64	25.82	2.1	31.38	-	-	Р	٧
		986	30.83	-23.17	54	30.54	29.19	2.47	31.37	-	-	Р	٧
Remark		o other spurious		mit line.								•	

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### Note symbol

Report No. : FR630207-02E

*	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 <b>over limit</b> line.
P/A	Peak or Average
H/V	Horizontal or Vertical

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

Report No.: FR630207-02E

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)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	Р	Н
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	Α	Н

1. Level( $dB\mu V/m$ ) =

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

2. Over Limit(dB) = Level(dB $\mu$ V/m) – Limit Line(dB $\mu$ V/m)

#### For Peak Limit @ 2390MHz:

- 1. Level(dBµV/m)
- = Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) Preamp Factor(dB)
- $= 32.22(dB/m) + 4.58(dB) + 54.51(dB\mu V) 35.86 (dB)$
- $= 55.45 (dB\mu V/m)$
- 2. Over Limit(dB)
- = Level(dBµV/m) Limit Line(dBµV/m)
- $= 55.45(dB\mu V/m) 74(dB\mu V/m)$
- = -18.55(dB)

#### For Average Limit @ 2390MHz:

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

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

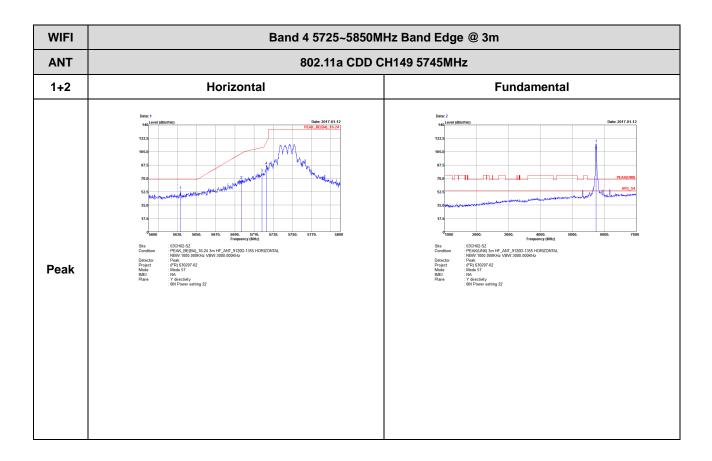
SPORTON INTERNATIONAL INC. Page Number : C2-12 of 12

## Appendix D. Radiated Spurious Emission Plots

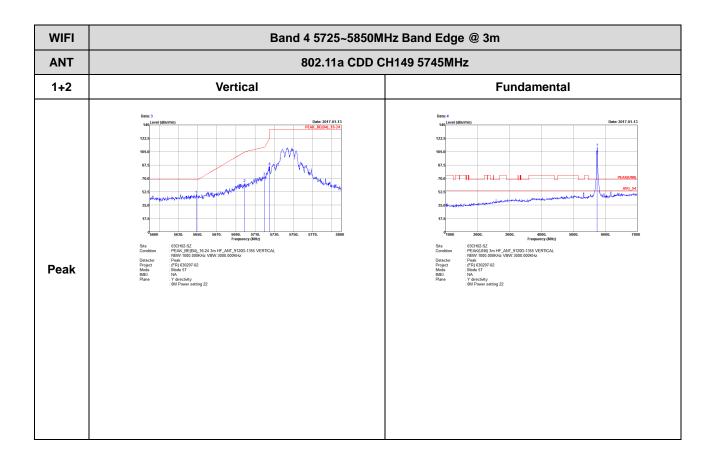
Test Engineer :	Jeff Yao	Temperature :	20~24°C
rest Engineer.		Relative Humidity :	48~50%

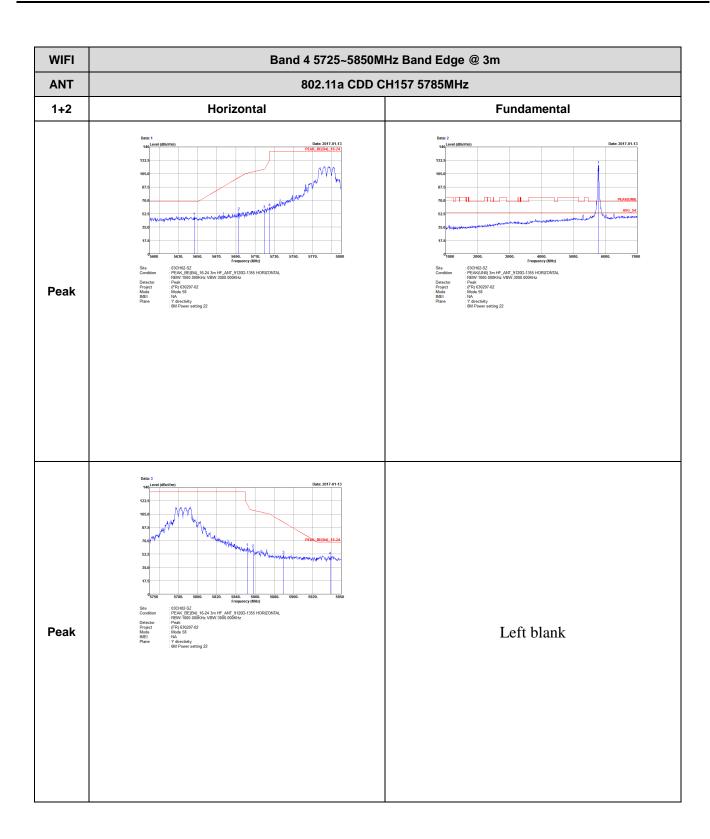
Report No. : FR630207-02E

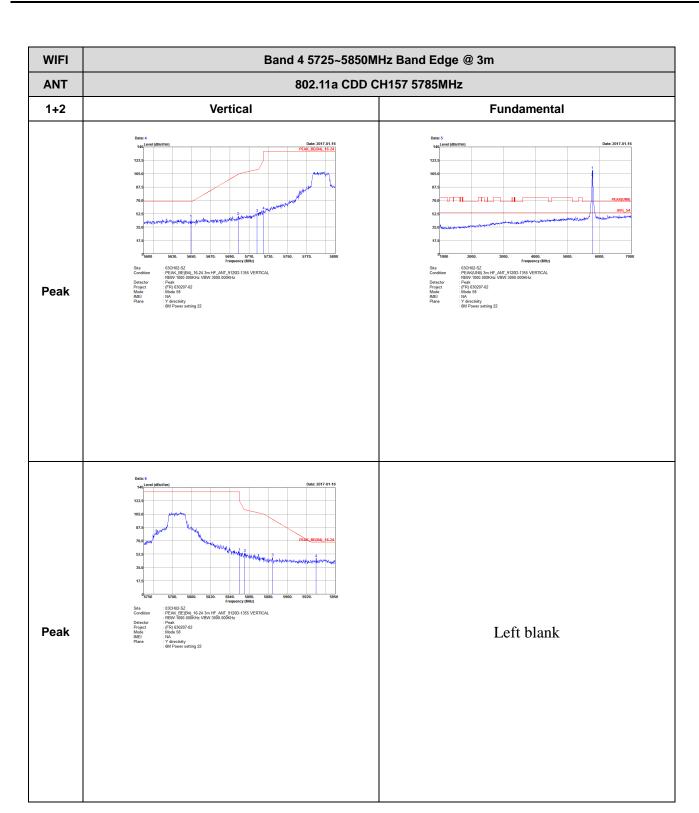
Band 4 - 5725~5850MHz
WIFI 802.11a CDD (Band Edge @ 3m)



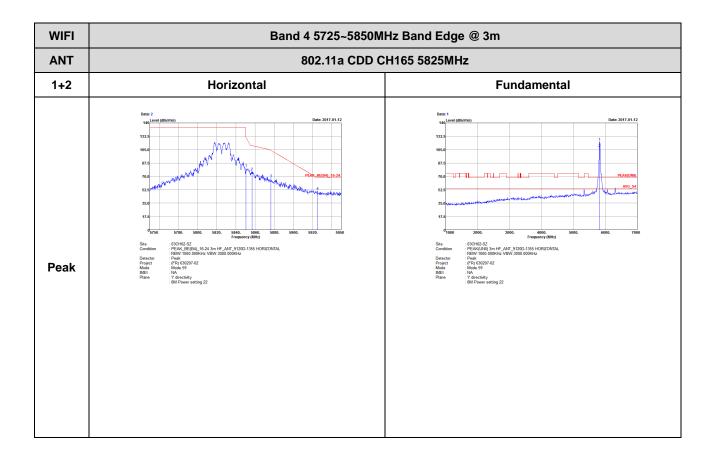
SPORTON INTERNATIONAL INC. Page Number : D1-1 of 29



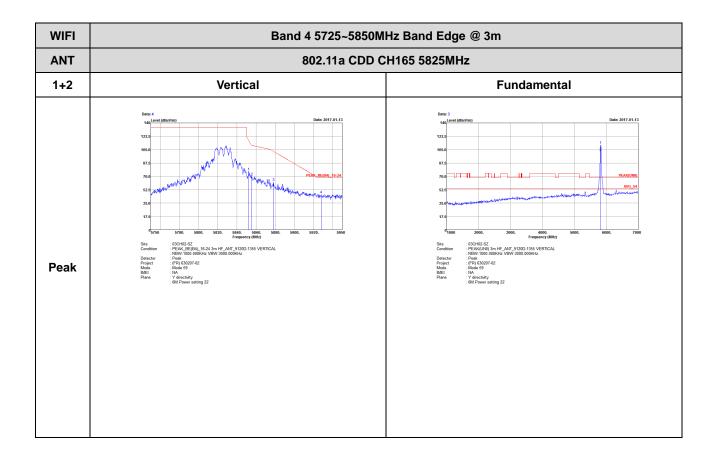






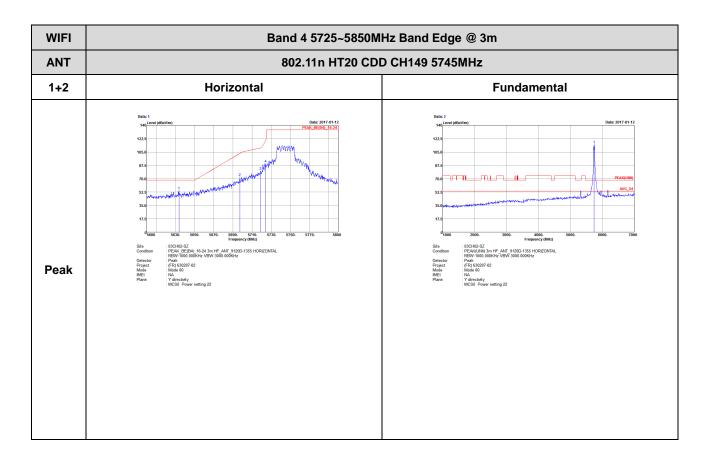


Report No. : FR630207-02E



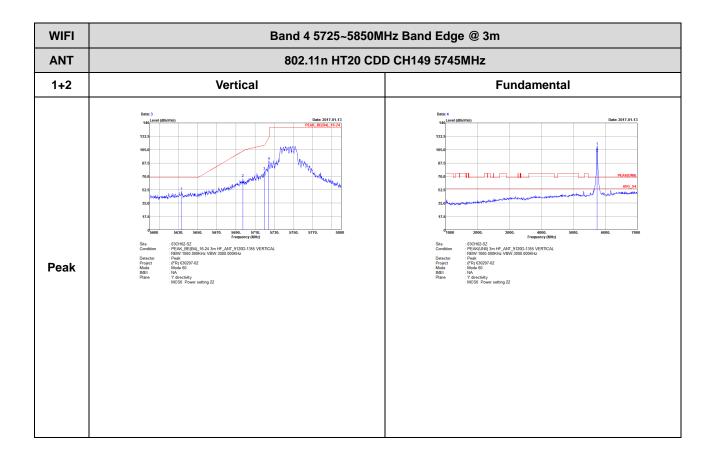
TEL: 886-3-327-3456 FAX: 886-3-328-4978

### Band 4 5725~5850MHz WIFI 802.11n HT20 CDD (Band Edge @ 3m)



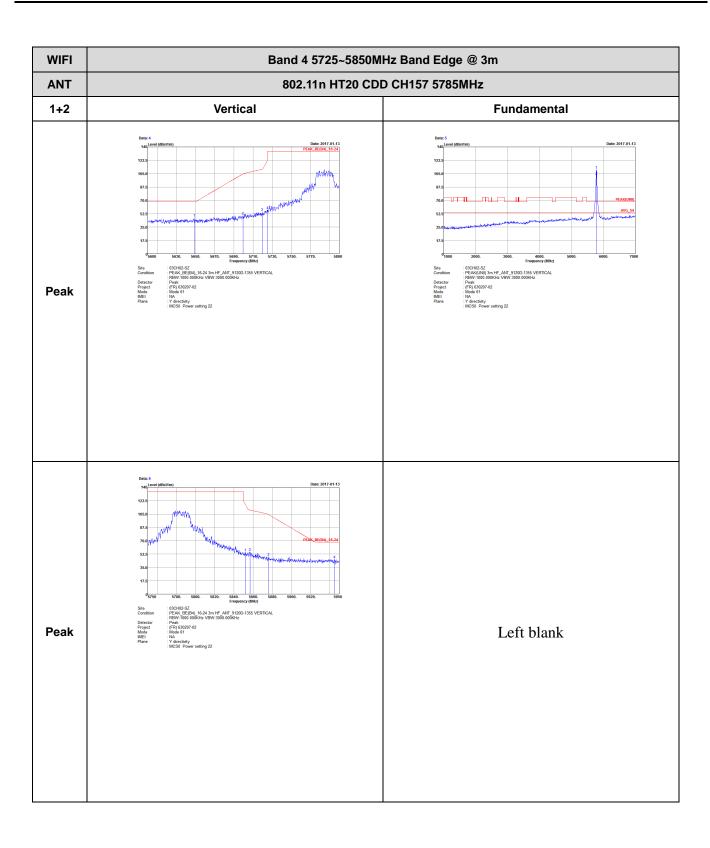
TEL: 886-3-327-3456 FAX: 886-3-328-4978

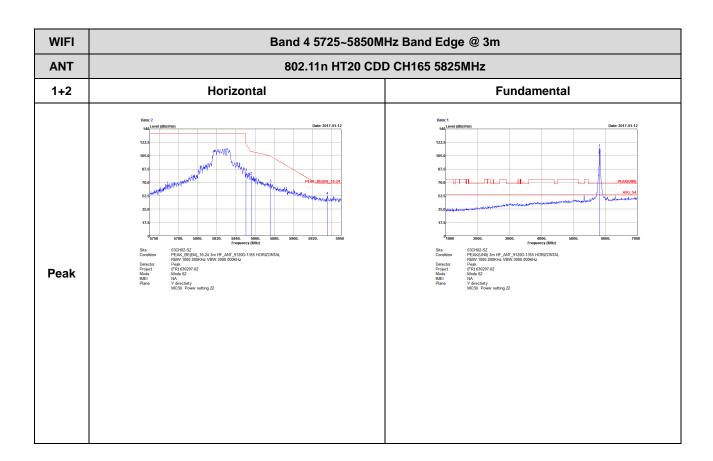




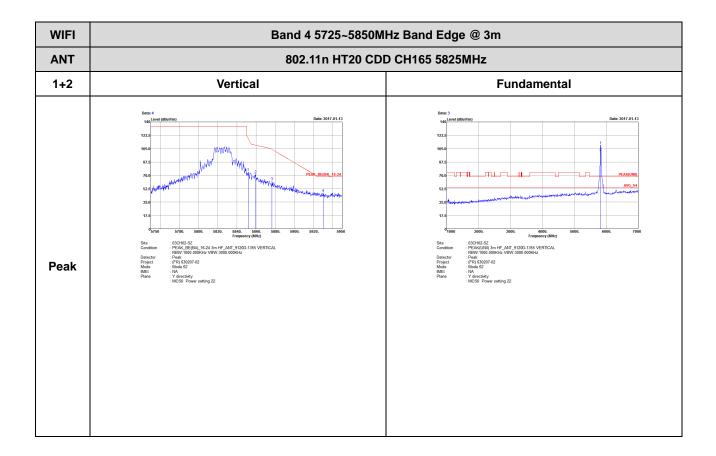
WIFI Band 4 5725~5850MHz Band Edge @ 3m **ANT** 802.11n HT20 CDD CH157 5785MHz 1+2 Horizontal **Fundamental** : 03CH02 SZ PEAK BERGH, 1624 3M HF\_ANT\_9120D-1355 HORIZONTAL PBW 1000 0000KHz VBW 3000 0000Hz PBW (PRI S3202F-92 1044 VA 1 Vineschiny 1 MG 2500 Power setting 22 103CH02-SZ
PEAK(JMI) 3m HF\_ANT\_91200-1355 HORIZONTAL, PBW-1000 0000Hz VBW-3000 0000Hz
Peak
(PR) 530207-02
Mode 61
Vdfectibly
MCS0 Power setting 22 Peak Left blank Peak

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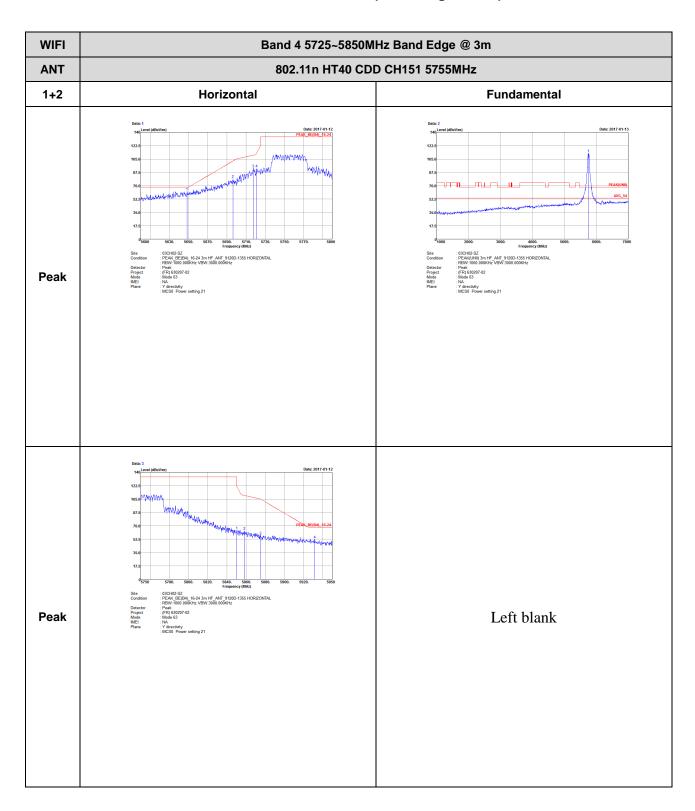






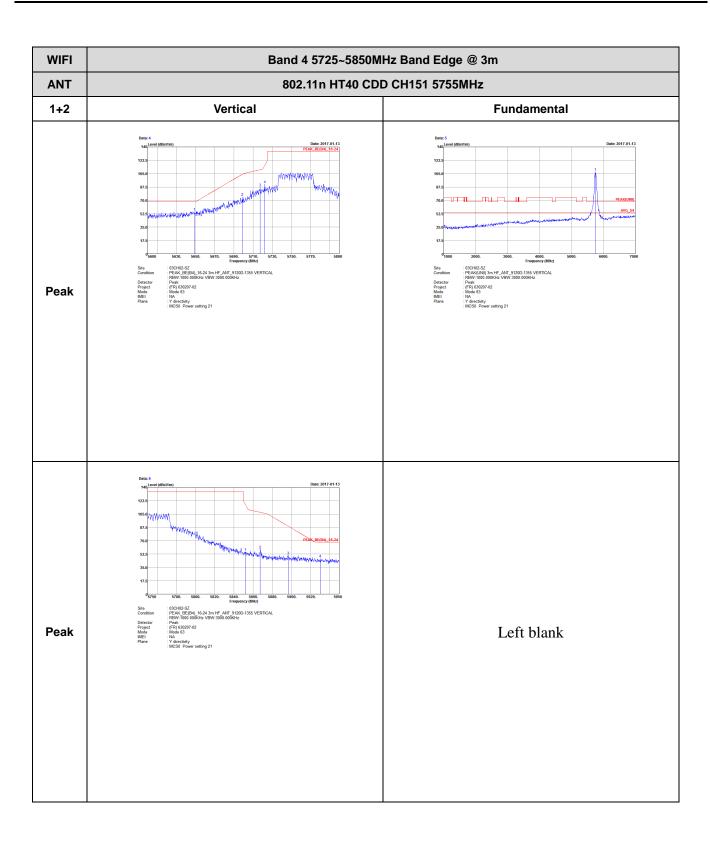


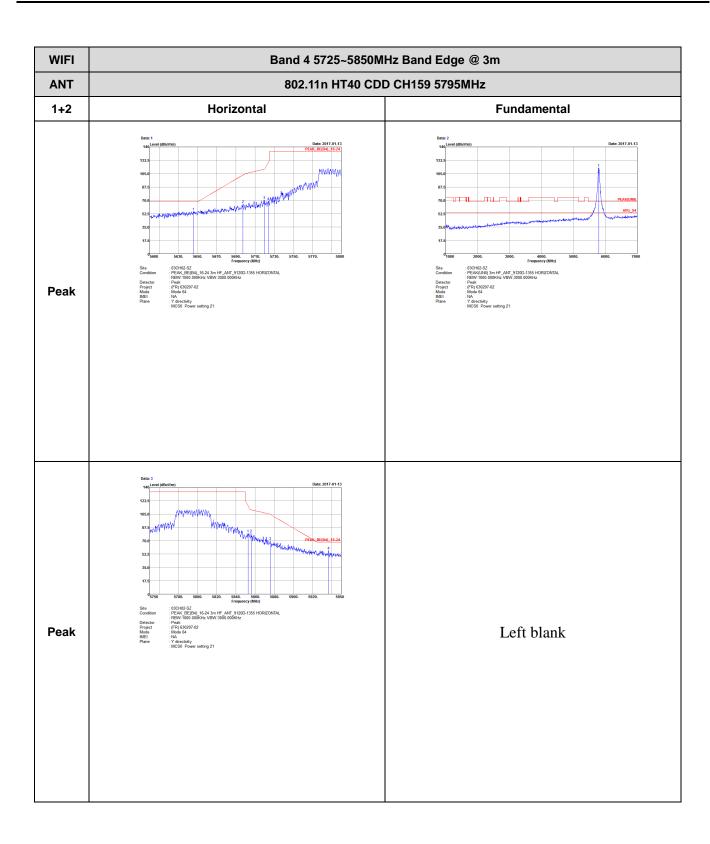
#### Band 4 5725~5850MHz WIFI 802.11n HT40 CDD (Band Edge @ 3m)

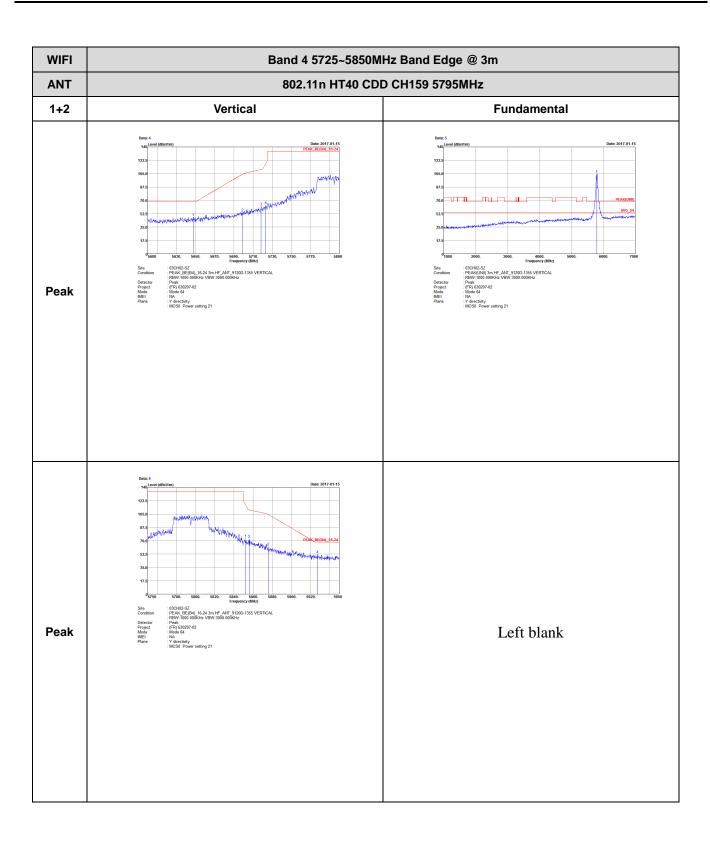


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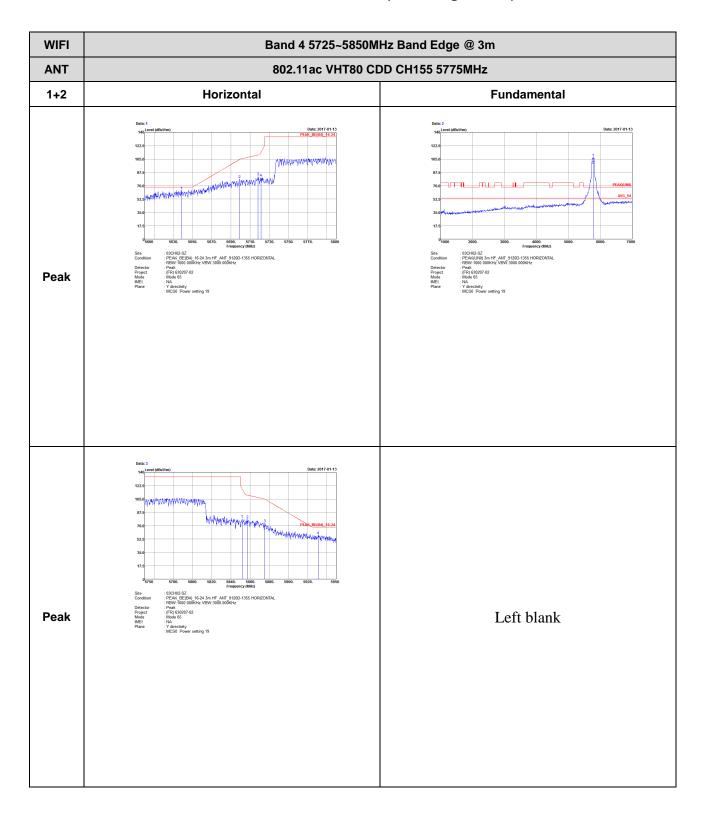
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### Band 4 5725~5850MHz WIFI 802.11ac VHT80 CDD (Band Edge @ 3m)



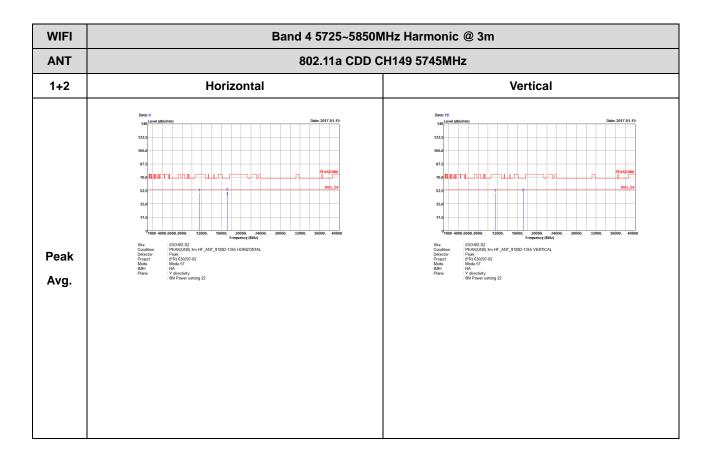
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WIFI Band 4 5725~5850MHz Band Edge @ 3m **ANT** 802.11ac VHT80 CDD CH155 5775MHz 1+2 Vertical **Fundamental** - 03CH02-SZ - PEAK\_BEIGH\_16-24 3m HF\_ANT\_91200-1355 VERTICAL - PEAK\_BEIGH\_16-24 3m HF\_ANT\_91200-1355 VERTICAL - Peak - Peak - (PRI) 53207-02 - Mode 65 - Videochiely - Mic250 Power setting 19 105CH02-SZ
PEAK(JNI) 3m HF\_ANT\_9120C-1355 VERTICAL,
PEAK(JNI) 3000KHz VBW:3000.000KHz
Peak
(PR) 53020T-02
Mode 66
Mode 66
Mode 67
Mode Peak - 03CH02-S2
PEAK BE(B4) 16-24 3m HF\_ANT 9120D-1355 VERTICAL
RSW-1000 000KHz VSW-3000 000KHz
FR 500071/02
Hode 65
NA
V Greechtly
MCS0 Power setting 19 Left blank Peak

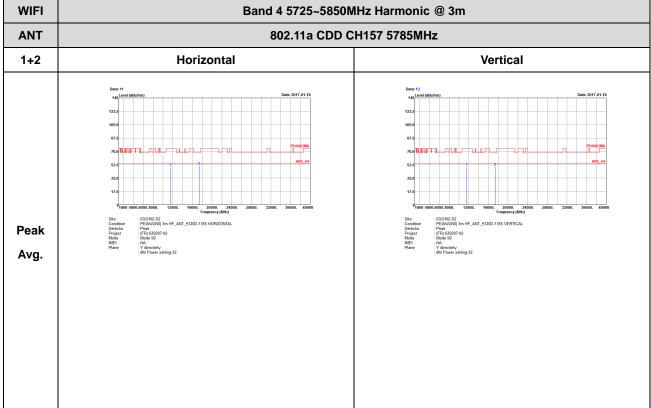
TEL: 886-3-327-3456 FAX: 886-3-328-4978

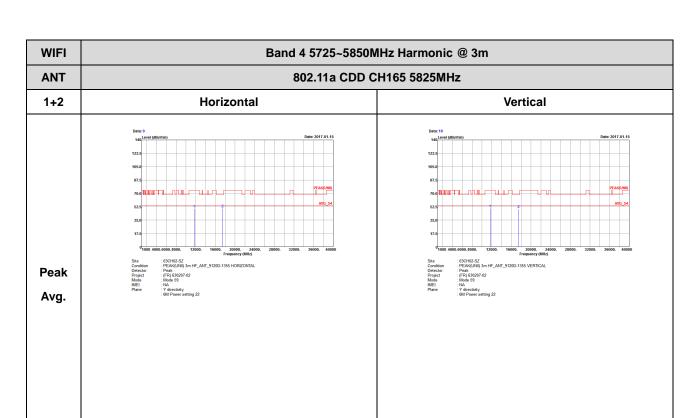
# Band 4 - 5725~5850MHz WIFI 802.11a CDD (Harmonic @ 3m)



TEL: 886-3-327-3456 FAX: 886-3-328-4978

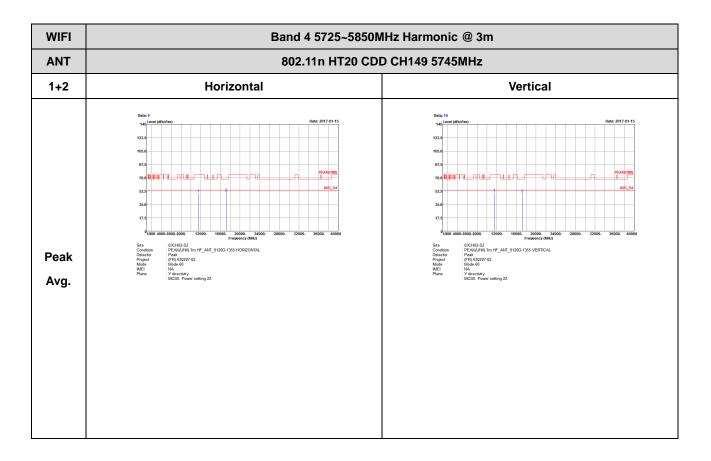






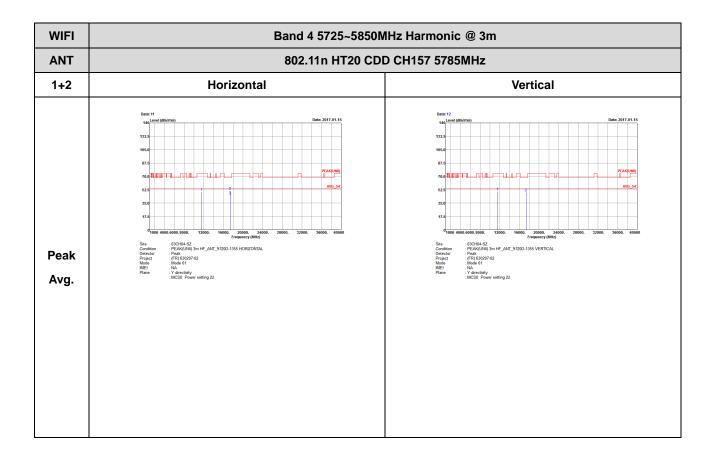
: D1-21 of 29

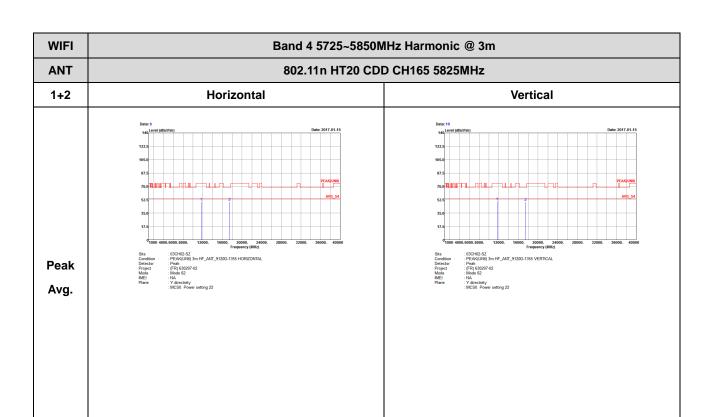
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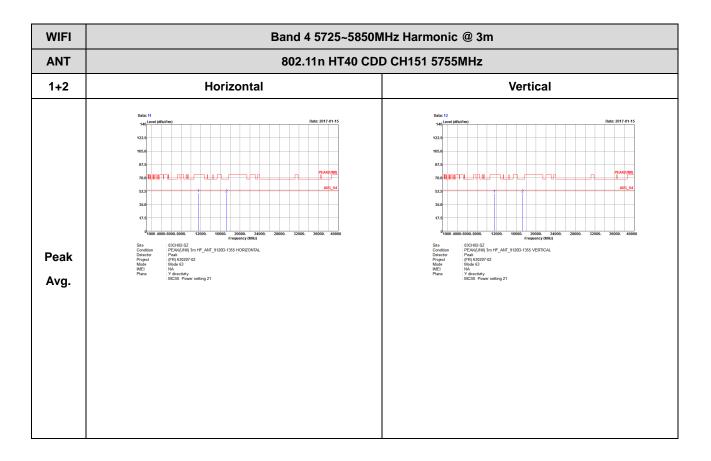
TEL: 886-3-327-3456 FAX: 886-3-328-4978





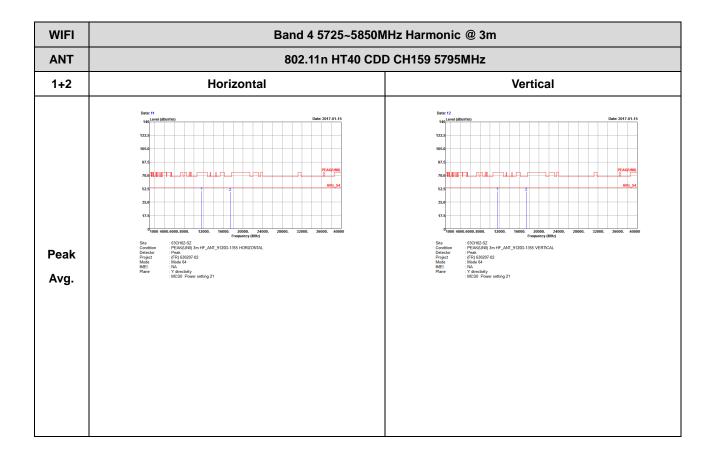


### Band 4 5725~5850MHz WIFI 802.11n HT40 CDD (Harmonic @ 3m)

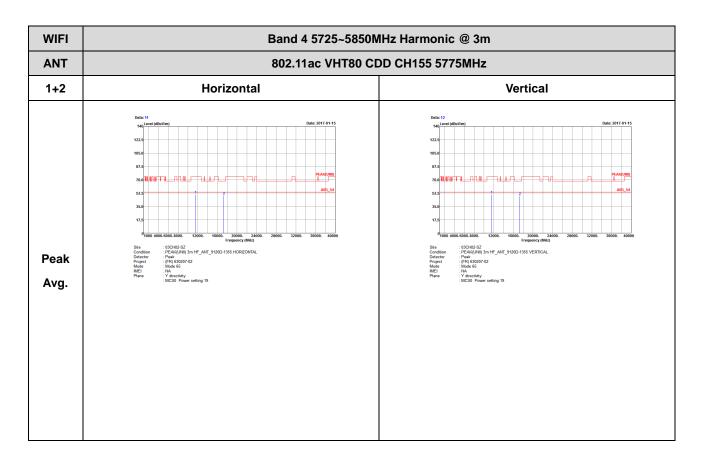


TEL: 886-3-327-3456 FAX: 886-3-328-4978



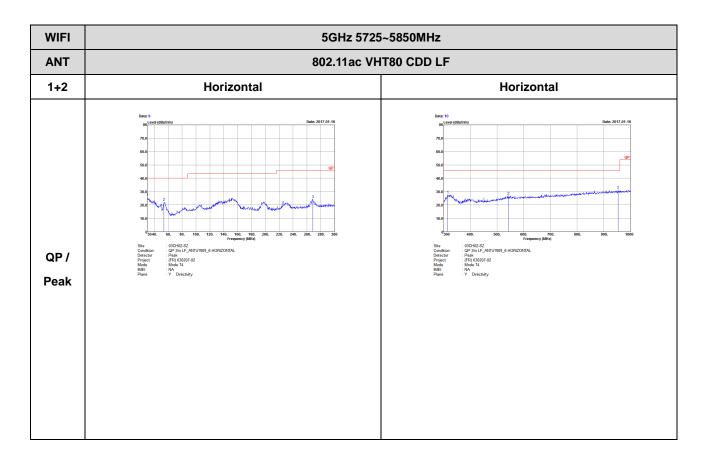


## Band 4 5725~5850MHz WIFI 802.11ac VHT80 CDD (Harmonic @ 3m)

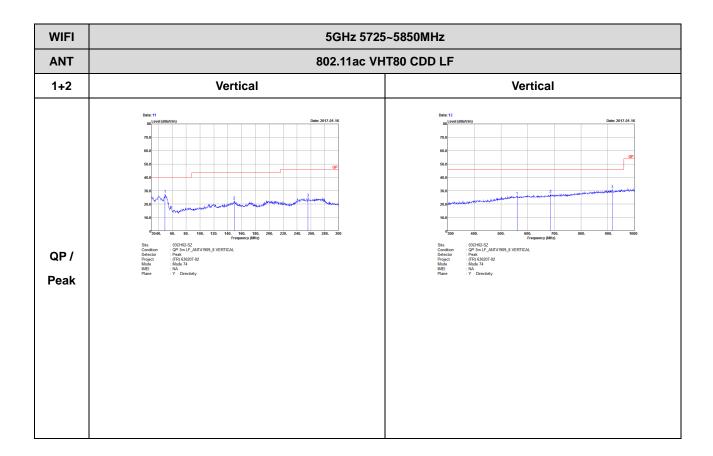


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### Emission below 1GHz 5GHz WIFI 802.11ac VHT80 CDD (LF)

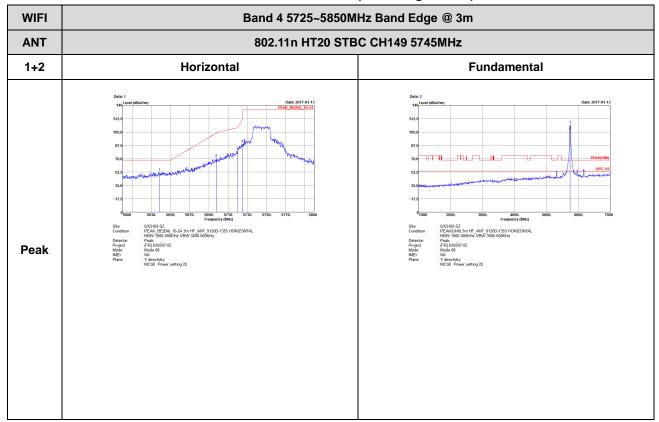


TEL: 886-3-327-3456 FAX: 886-3-328-4978



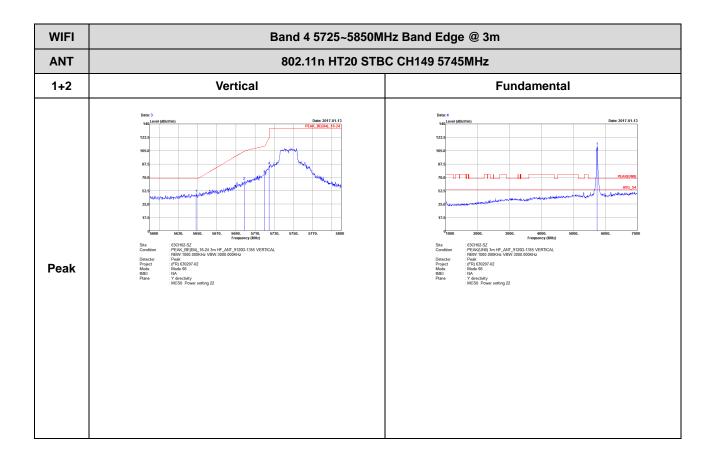
### Band 4 5725~5850MHz

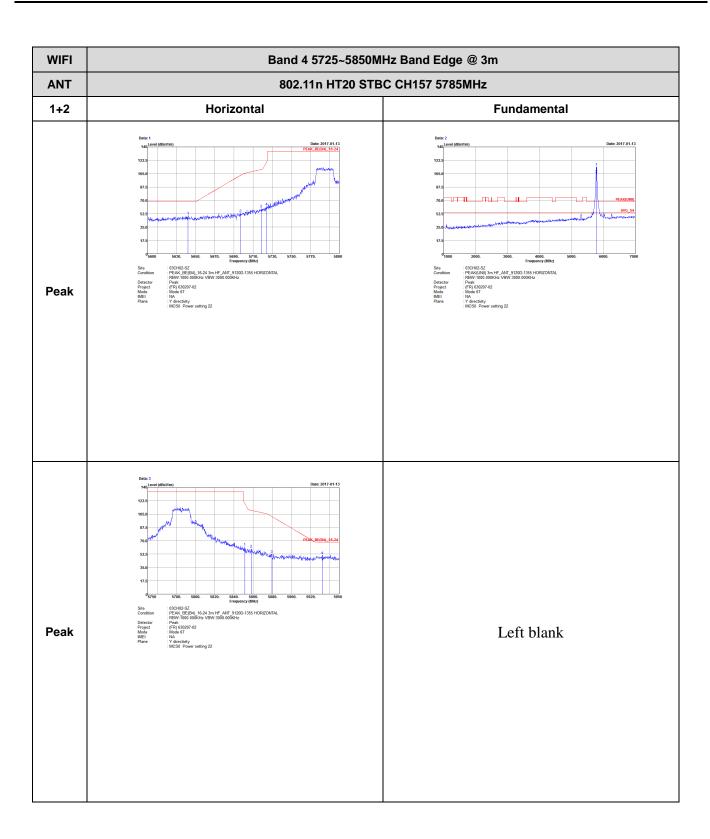
#### WIFI 802.11n HT20 STBC (Band Edge @ 3m)

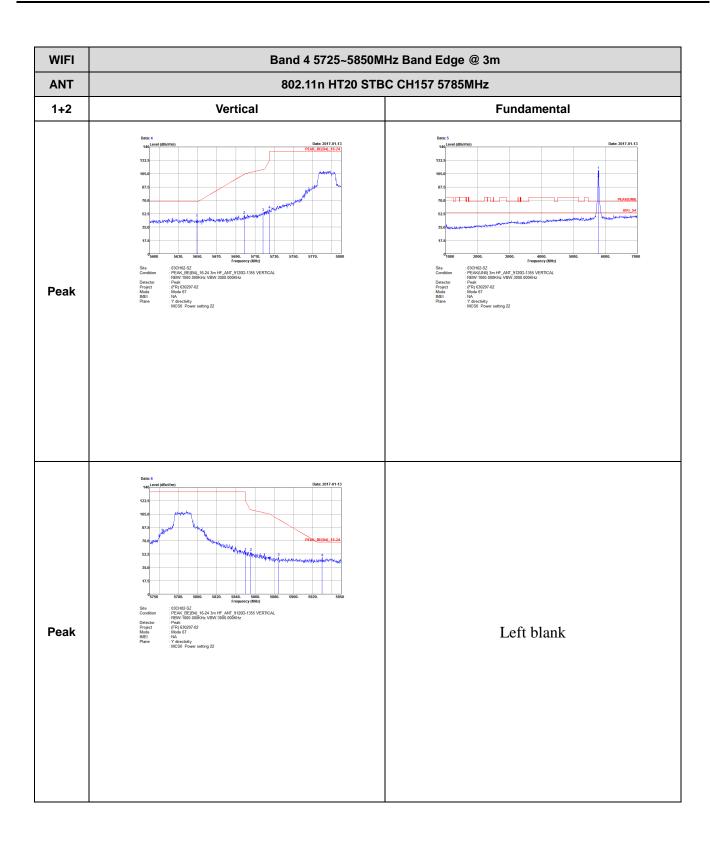


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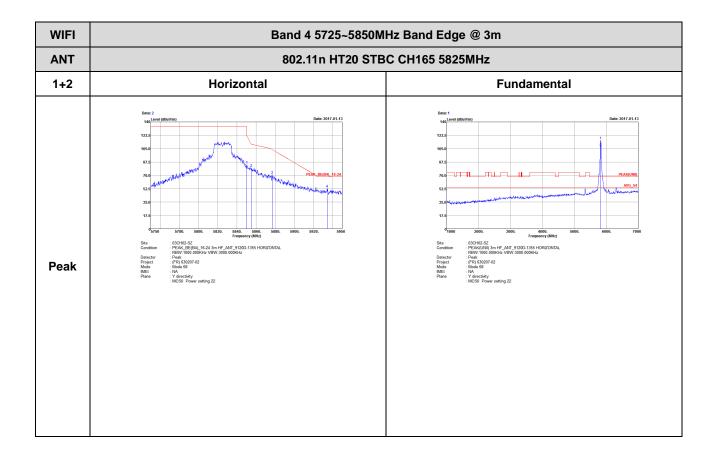




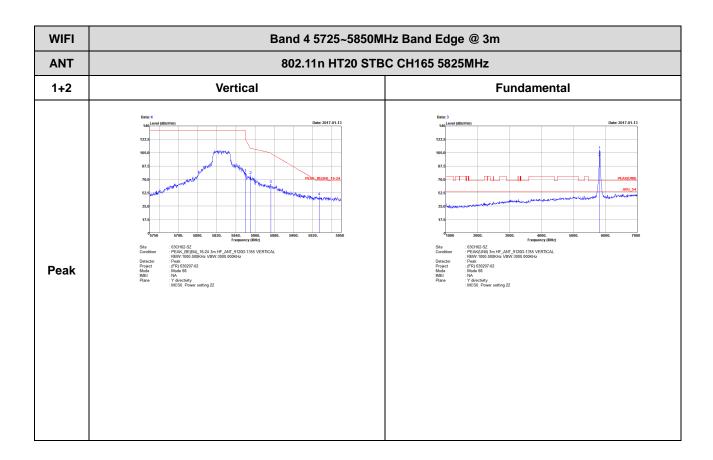




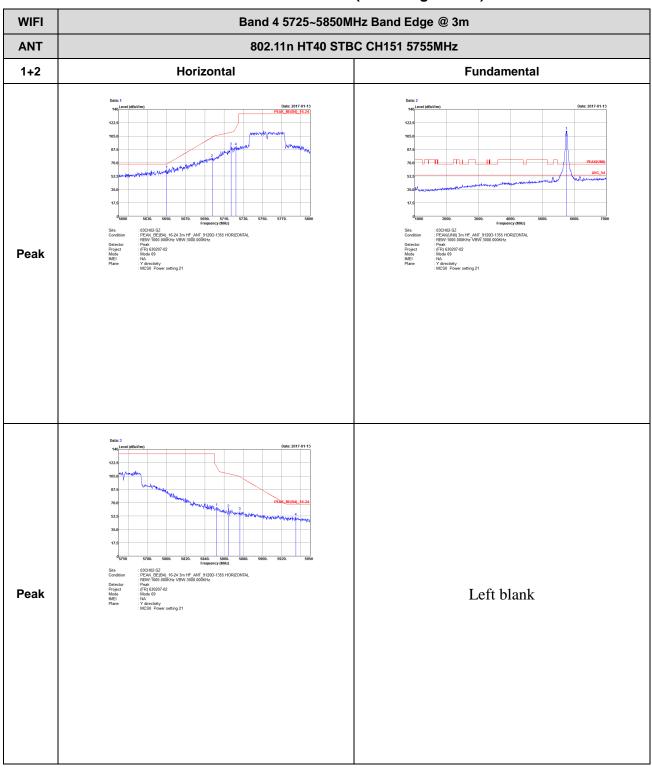








### Band 4 5725~5850MHz WIFI 802.11n HT40 STBC (Band Edge @ 3m)

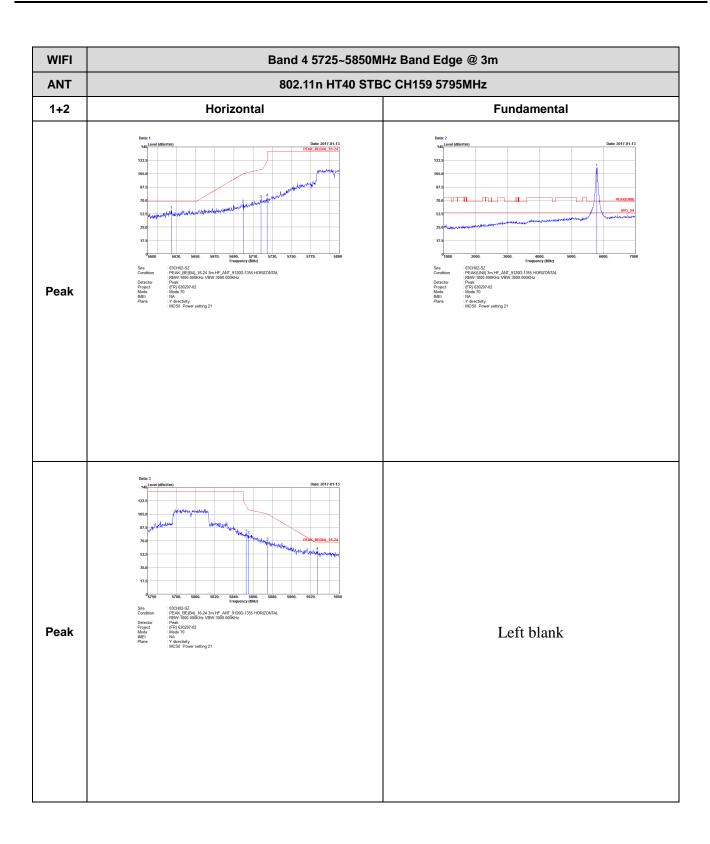


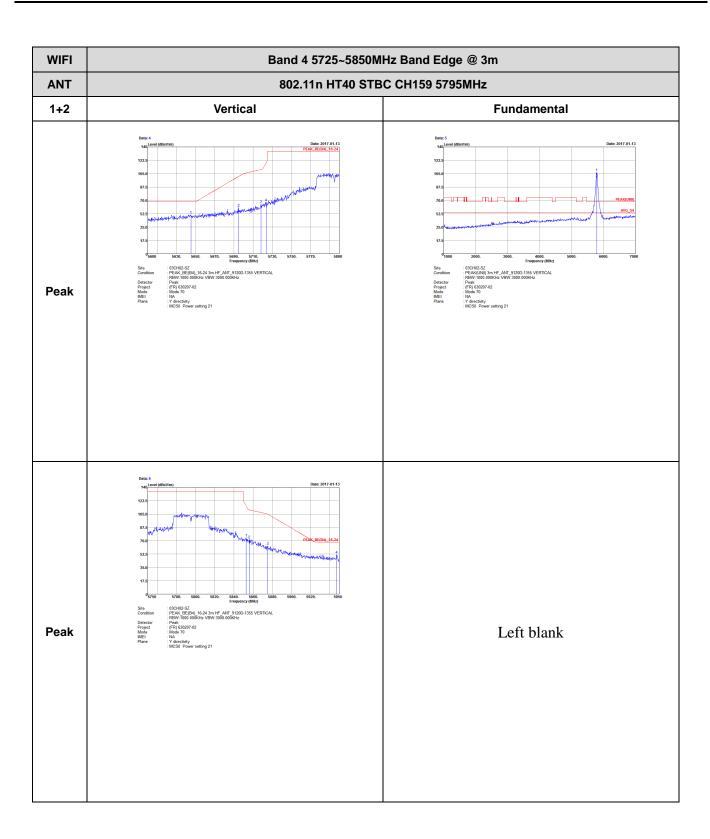
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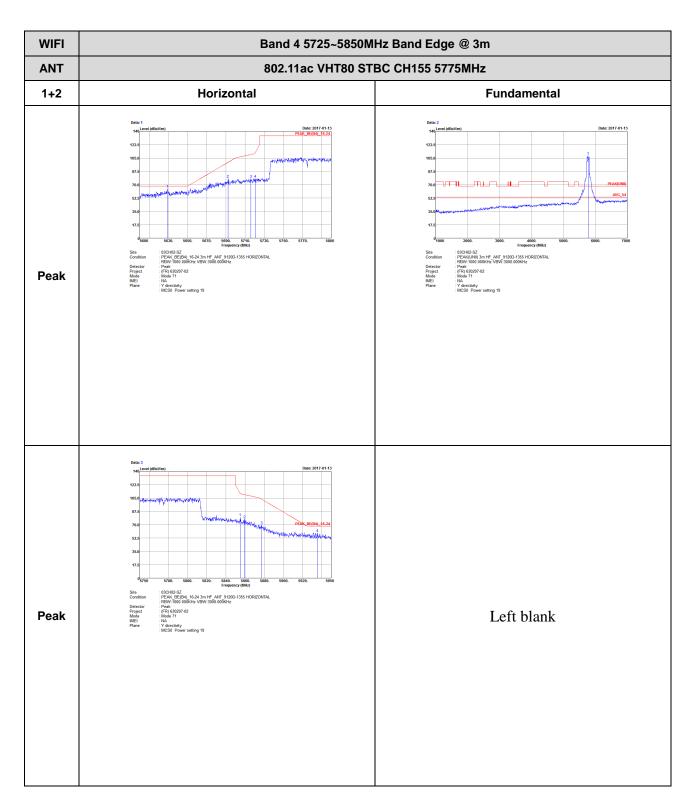
WIFI Band 4 5725~5850MHz Band Edge @ 3m **ANT** 802.11n HT40 STBC CH151 5755MHz 1+2 Vertical **Fundamental** . 03CH02-SZ .PEAK\_BEIGH\_16-24 3m HF\_ANT\_91200-1355 VERTICAL. PEAK\_BEIGH\_16-24 3m HF\_ANT\_91200-1355 VERTICAL. Peak (PR) 53207-02 .Mode 69 .Videochie) .Videochiely .Mc500 Power setting 21 . 03CH02-SZ PEAK(JNI) 3m HF\_ANT\_9120C-1355 VERTICAL RBW:1000 0000kt-bz VBW:3000 000kt-bz Peak (PR) 530207-02 Mode 69 Videochipt Vide Peak - 03CH02-S2
PEAK BE(B4) 16-24 3m HF\_ANT 9120D-1355 VERTICAL
RSW-1000 000KHz VSW-3000 000KHz
FR 500071/02
H045 50
H045 50
H05 10
H05 50
H05 10
H05 10 Left blank Peak

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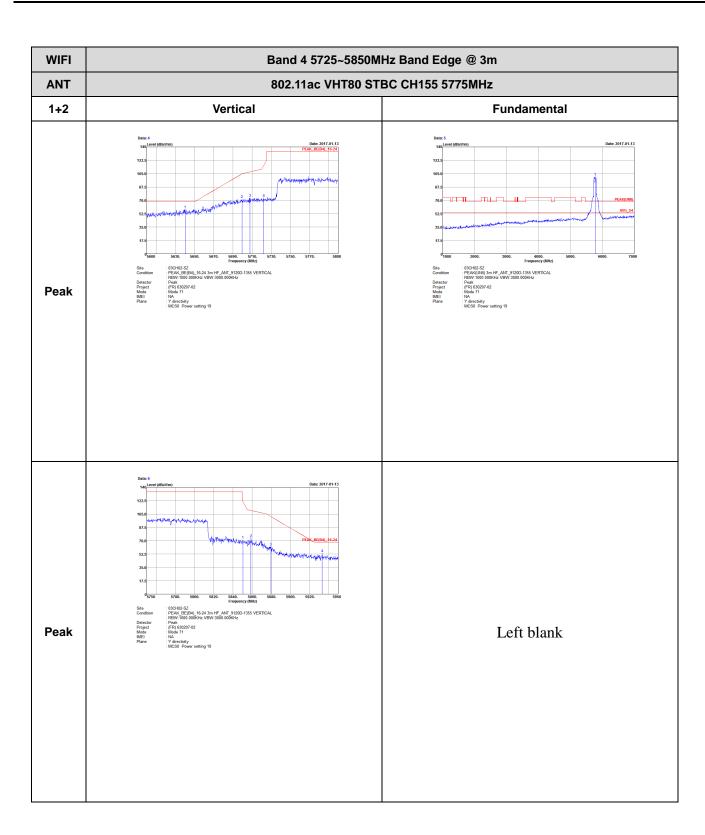


#### Band 4 5725~5850MHz WIFI 802.11ac VHT80 STBC (Band Edge @ 3m)

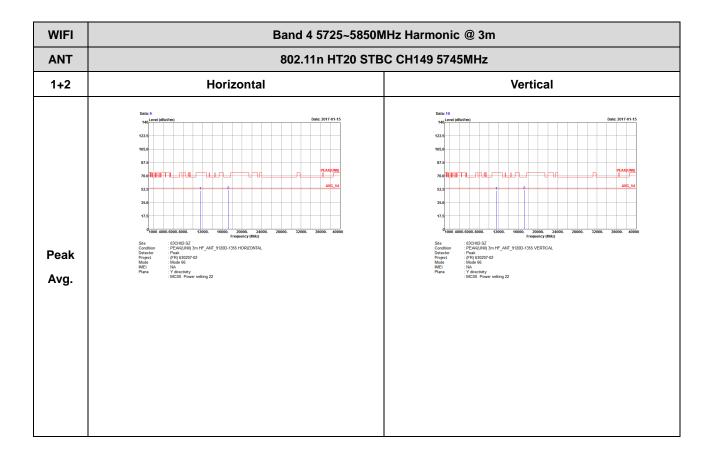


SPORTON INTERNATIONAL INC.

TEL: 886-3-327-3456 FAX: 886-3-328-4978

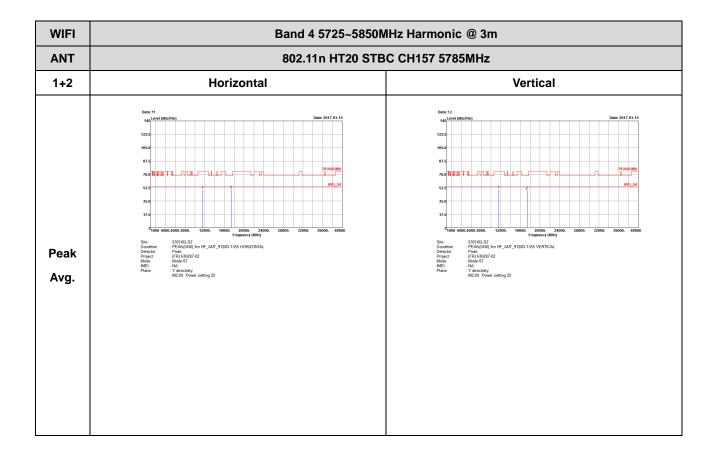


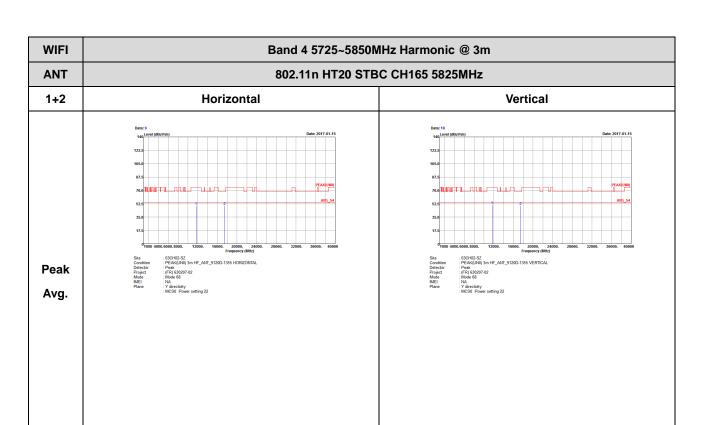
# Band 4 5725~5850MHz WIFI 802.11n HT20 STBC (Harmonic @ 3m)



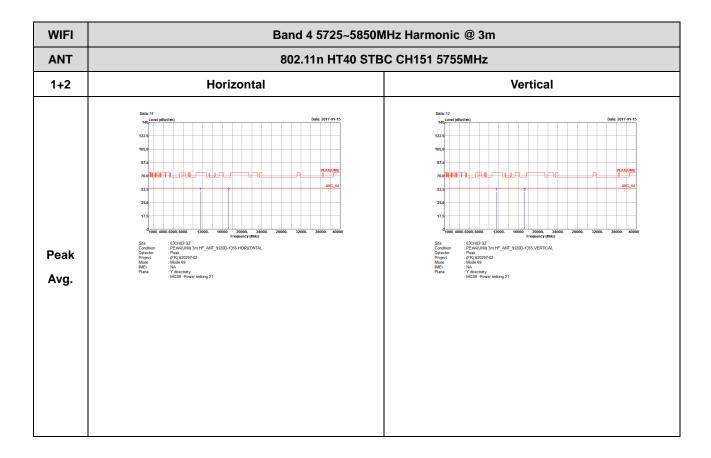
TEL: 886-3-327-3456 FAX: 886-3-328-4978





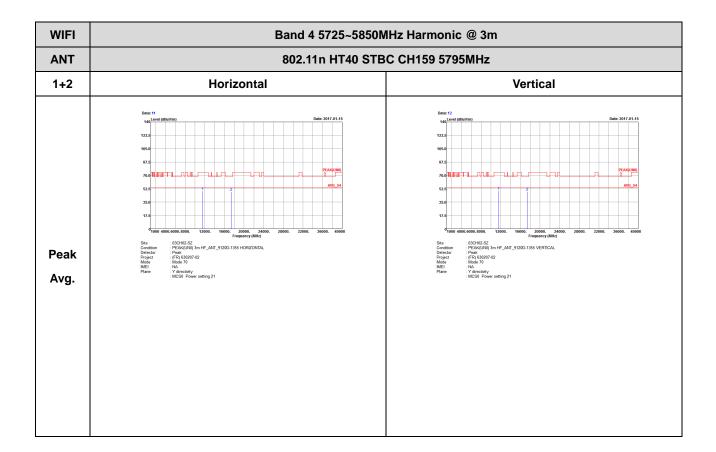


# Band 4 5725~5850MHz WIFI 802.11n HT40 STBC (Harmonic @ 3m)

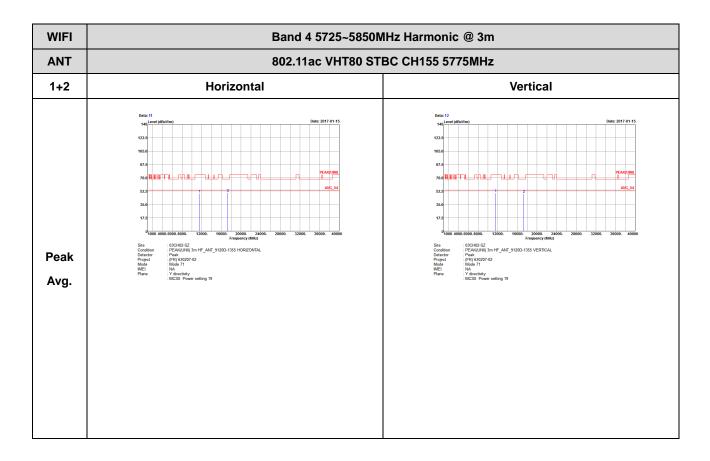


TEL: 886-3-327-3456 FAX: 886-3-328-4978



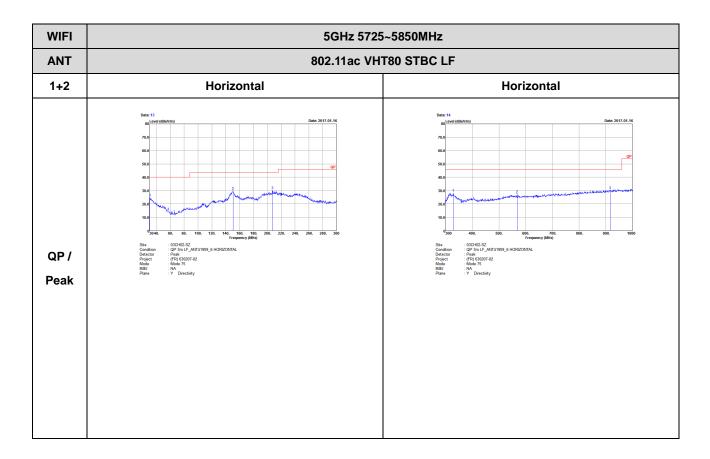


# Band 4 5725~5850MHz WIFI 802.11ac VHT80 STBC (Harmonic @ 3m)

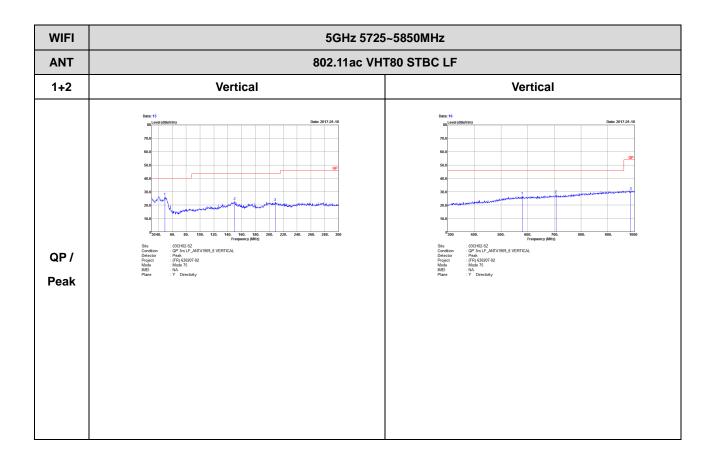


TEL: 886-3-327-3456 FAX: 886-3-328-4978

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



TEL: 886-3-327-3456 FAX: 886-3-328-4978





**Appendix E. Duty Cycle Plots** 

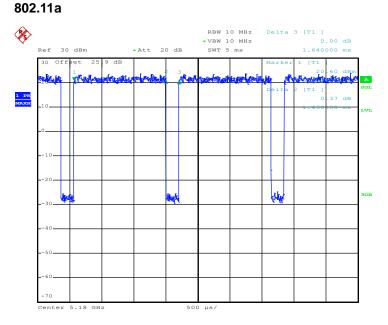
#### <CDD Modes>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	5GHz 802.11a for Ant 1	87.20	1430.00	0.70	1kHz
1+2	5GHz 802.11a for Ant 2	87.50	1435.00	0.70	1kHz
1+2	5GHz 802.11n HT20 for Ant 1	86.45	1340.00	0.75	1kHz
1+2	5GHz 802.11n HT20 for Ant 2	86.36	1330.00	0.75	1kHz
1+2	5GHz 802.11n HT40 for Ant 1	77.01	670.00	1.49	3kHz
1+2	5GHz 802.11n HT40 for Ant 2	77.01	670.00	1.49	3kHz
1+2	5GHz 802.11ac VHT80 for Ant 1	62.41	332.00	3.01	3kHz
1+2	5GHz 802.11ac VHT80 for Ant 2	62.41	332.00	3.01	3kHz

TEL: 886-3-327-3456 FAX: 886-3-328-4978

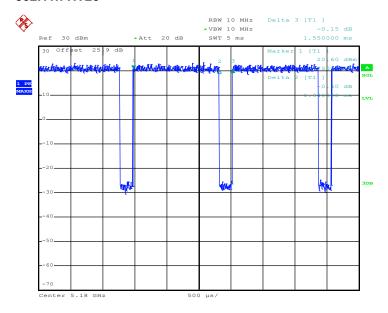


## <CDD-MIMO Ant. 1>



Date: 30.DEC.2016 05:05:00

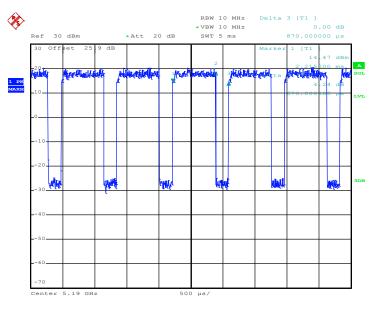
#### 802.11n HT20



Date: 30.DEC.2016 05:30:57

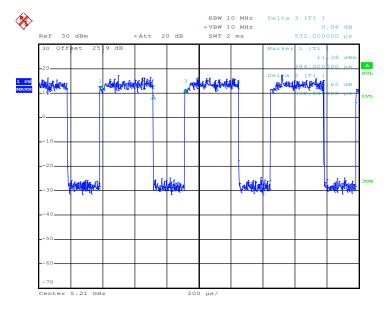


#### 802.11n HT40



Date: 30.DEC.2016 05:44:27

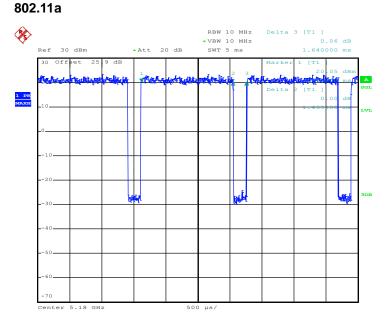
#### 802.11ac VHT80



Date: 30.DEC.2016 06:26:12

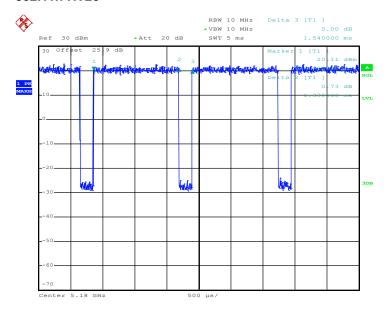


## <CDD-MIMO Ant. 2>



Date: 30.DEC.2016 05:07:08

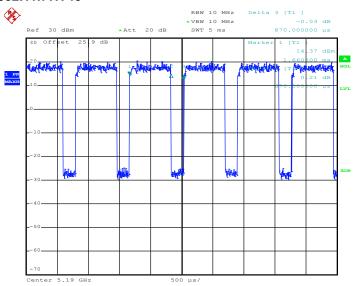
#### 802.11n HT20



Date: 30.DEC.2016 05:31:41

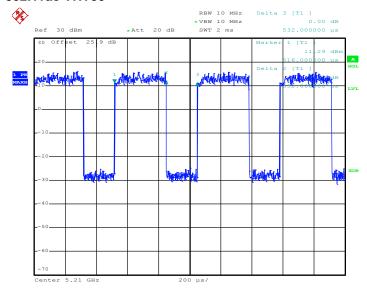






Date: 30.DEC.2016 05:45:41

#### 802.11ac VHT80



Date: 30.DEC.2016 06:27:06



### FCC RF Test Report

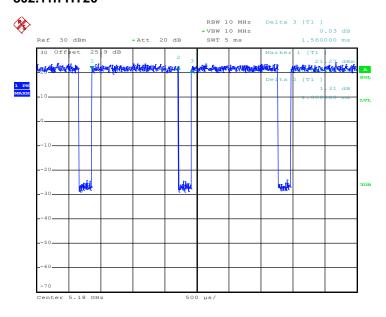
#### <STBC Modes>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	5GHz 802.11n HT20 for Ant 1	86.54	1350.00	0.74	1kHz
1+2	5GHz 802.11n HT20 for Ant 2	86.54	1350.00	0.74	1kHz
1+2	5GHz 802.11n HT40 for Ant 1	77.01	670.00	1.49	3kHz
1+2	5GHz 802.11n HT40 for Ant 2	77.27	680.00	1.47	3kHz
1+2	5GHz 802.11ac VHT80 for Ant 1	62.22	336.00	2.98	3kHz
1+2	5GHz 802.11ac VHT80 for Ant 2	62.22	336.00	2.98	3kHz

TEL: 886-3-327-3456 FAX: 886-3-328-4978

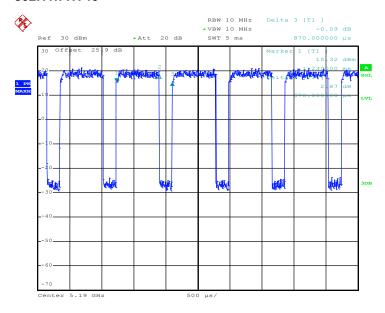


#### <STBC-MIMO Ant. 1> 802.11n HT20



Date: 31.DEC.2016 04:24:08

#### 802.11n HT40



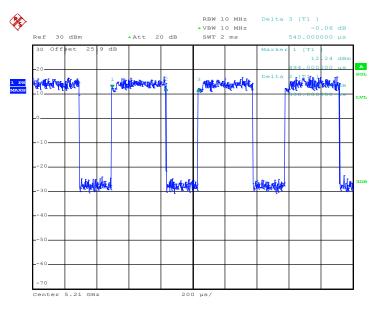
Date: 31.DEC.2016 04:37:00



### FCC RF Test Report

Report No.: FR630207-02E

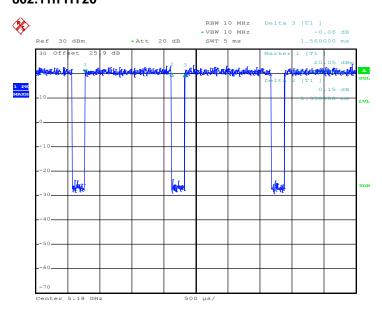




Date: 31.DEC.2016 05:13:37

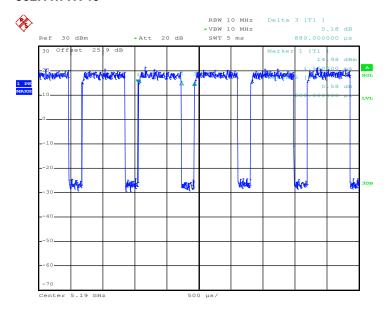


# <STBC-MIMO Ant. 2> 802.11n HT20



Date: 31.DEC.2016 04:17:32

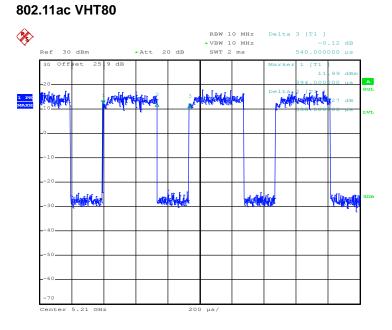
#### 802.11n HT40



Date: 31.DEC.2016 04:42:26



### FCC RF Test Report



Date: 31.DEC.2016 05:14:27

TEL: 886-3-327-3456 FAX: 886-3-328-4978