FCC RF Test Report

APPLICANT : JET Optoelectronics Co., LTD

EQUIPMENT: **EVO ASSEMBLY - 5**

BRAND NAME : FORD U553

MODEL NAME : 620065

MARKETING NAME : EVO ASSEMBLY - 5 FCC ID : Z3K-620065U553

STANDARD : FCC Part 15 Subpart C §15.247

CLASSIFICATION : (DTS) Digital Transmission System

The product was received on May 20, 2017 and testing was completed on Aug. 30, 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.

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1190

Report No.: FR752007C

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR752007C	Rev. 01	Initial issue of report	Sep. 05, 2017

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark		
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-		
3.1	-	99% Bandwidth	-	Pass	-		
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-		
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-		
3.4	4F 247(d)	Conducted Band Edges		Pass	-		
3.4	15.247(d)	Conducted Spurious Emission	≤ 20dBc	Pass	-		
3.5	Radiated Band Edges and 15.209(a) & Radiated Spurious Emission 15.247(d)		Pass	Under limit 0.22 dB at 2483.500 MHz			
-	- 15.207 AC Conducted Emission 15.207(a)		15.207(a)	Not Required	-		
3.6	15.203 & 15.247(b)	Antenna Requirement	N/A	Pass	-		
Note: Not re	Note: Not required means after assessing, test items are not necessary to carry out						

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1 General Description

1.1 Applicant

JET Optoelectronics Co., LTD

3F., No. 300, Yangguang St., Neihu Dist., Taipei City 11491, Taiwan, R.O.C

1.2 Manufacturer

JET Optoelectronics Co., LTD

3F., No. 300, Yangguang St., Neihu Dist., Taipei City 11491, Taiwan, R.O.C

1.3 Product Feature of Equipment Under Test

Bluetooth and Wi-Fi 2.4GHz 802.11b/g/n

Product Specification subjective to this standard			
Antenna Type	WLAN: Printed Antenna		
Antenna Type	Bluetooth: Printed Antenna		

1.4 Modification of EUT

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

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1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

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

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

Test Site	SPORTON INTERNATIONAL INC.
	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist,
Test Site Location	Taoyuan City, Taiwan (R.O.C.)
rest Site Location	TEL: +886-3-327-0868
	FAX: +886-3-327-0855
Took Site No	Sporton Site No.
Test Site No.	03CH13-HY

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

1.6 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- 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.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
	1	2412	7	2442
	2	2417	8	2447
2400 2492 E MU-	3	2422	9	2452
2400-2483.5 MHz	4	2427	10	2457
	5	2432	11	2462
	6	2437	-	-

2.2 Test Mode

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

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

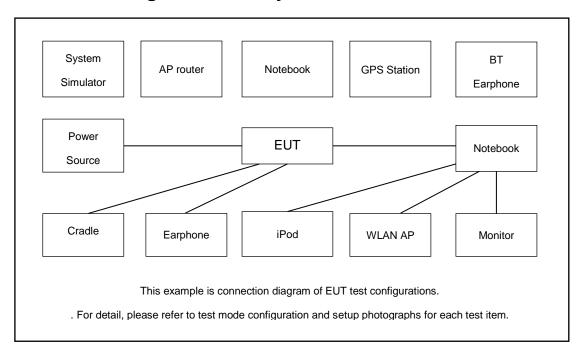
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2.3 Connection Diagram of Test System



2.4 EUT Operation Test Setup

The RF test items, programmed RF utility, "CMD" installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

2.5 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 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

- 1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
- 5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1MHz and set the Video bandwidth (VBW) = 3MHz.
- 6. Measure and record the results in the test report.

3.1.4 Test Setup



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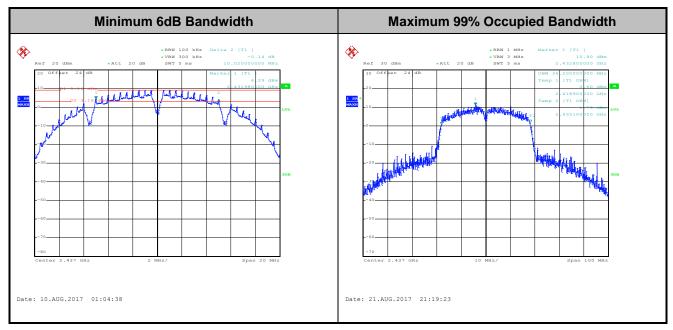
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3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.



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

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3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

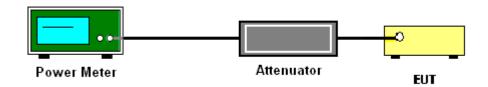
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

- The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04 section 9.1.2 PKPM1 Peak power meter method.
- 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average output Power (Reporting Only)

Please refer to Appendix A.

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3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

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 Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz.
 Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
- 5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
- 6. Measure and record the results in the test report.

3.3.4 Test Setup

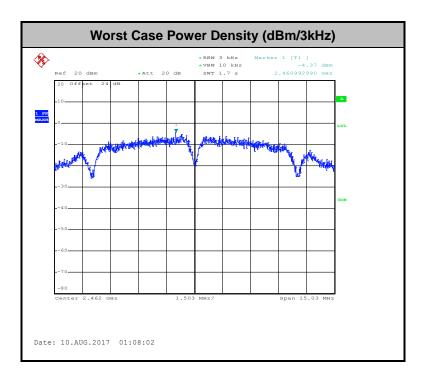


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3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



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3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

- 1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
- 5. Measure and record the results in the test report.
- The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

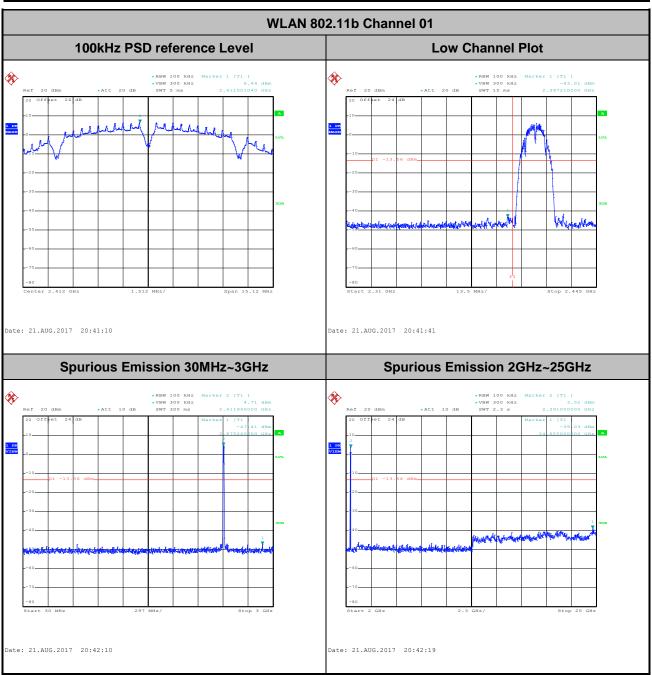


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3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Test Mode :	802.11b	Temperature :	21~25 ℃
Test Band :	2.4GHz Low	Relative Humidity :	51~54%
Test Channel :	01	Test Engineer :	Shiming Liu

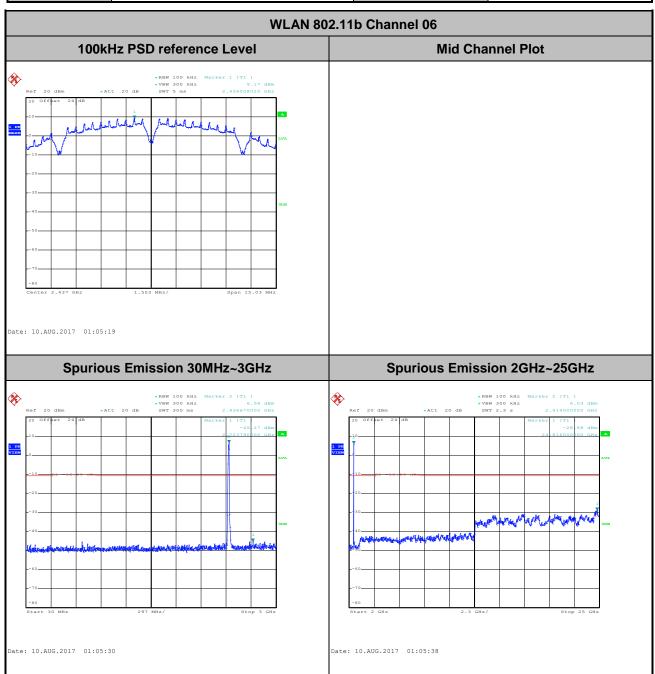


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Test Mode :	802.11b	Temperature :	21~25℃
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel:	06	Test Engineer :	Shiming Liu



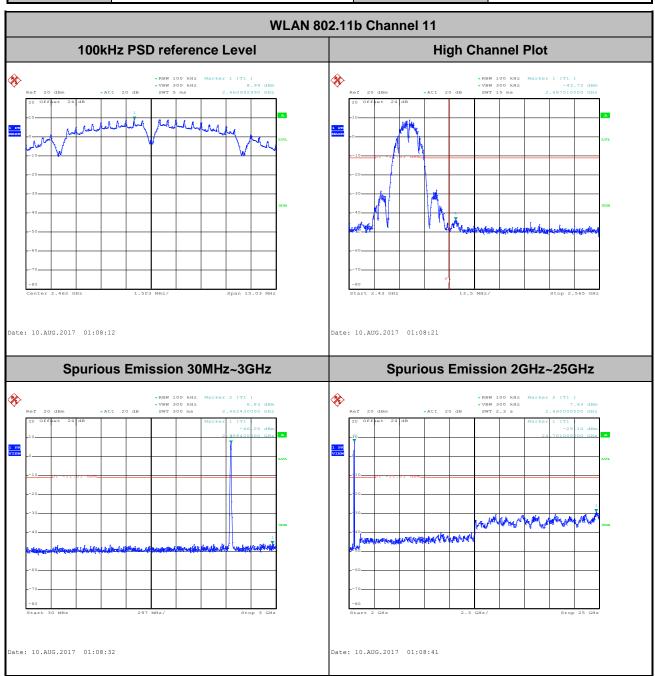
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 Test Mode :
 802.11b
 Temperature :
 21~25°C

 Test Band :
 2.4GHz High
 Relative Humidity :
 51~54%

 Test Channel :
 11
 Test Engineer :
 Shiming Liu



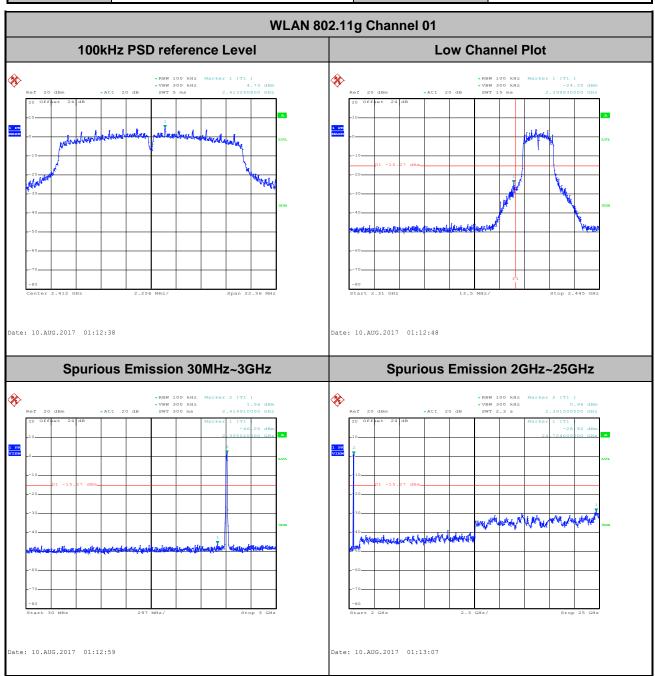
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 Test Mode :
 802.11g
 Temperature :
 21~25°C

 Test Band :
 2.4GHz Low
 Relative Humidity :
 51~54%

 Test Channel :
 01
 Test Engineer :
 Shiming Liu

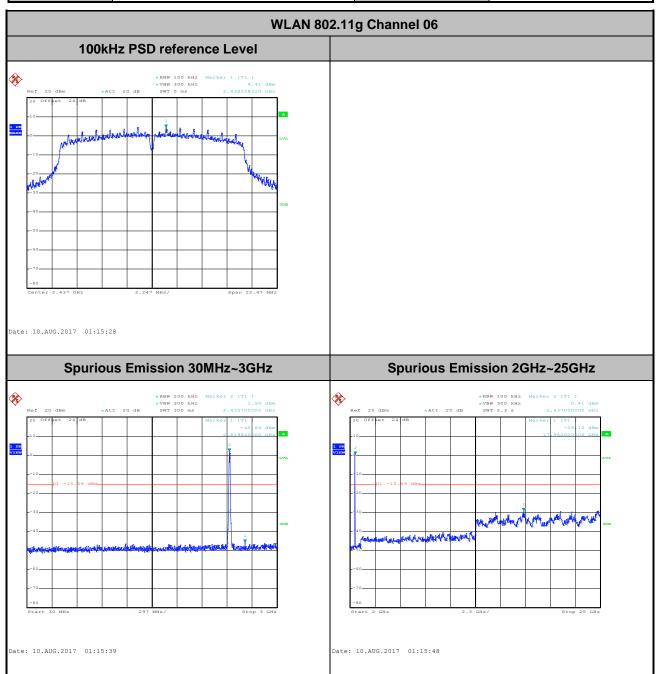


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Test Mode :	802.11g	Temperature :	21~25℃
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel:	06	Test Engineer :	Shiming Liu



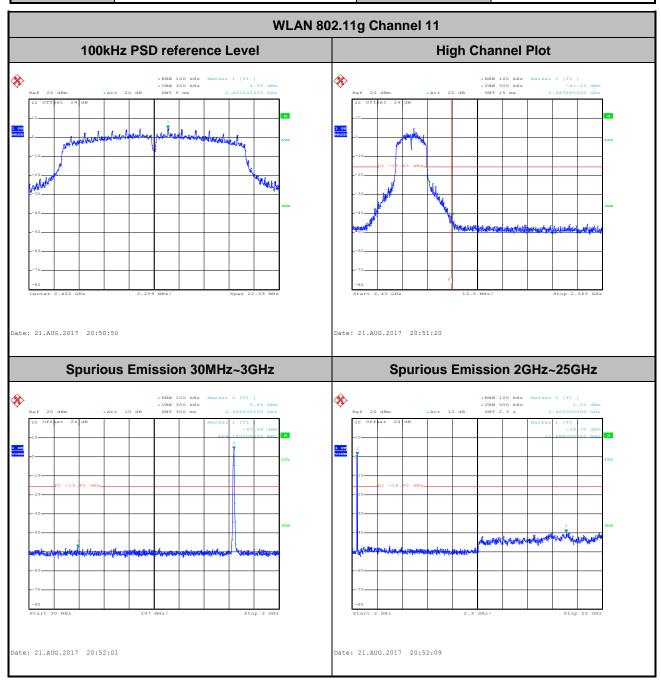
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 Test Mode :
 802.11g
 Temperature :
 21~25°C

 Test Band :
 2.4GHz High
 Relative Humidity :
 51~54%

 Test Channel :
 11
 Test Engineer :
 Shiming Liu



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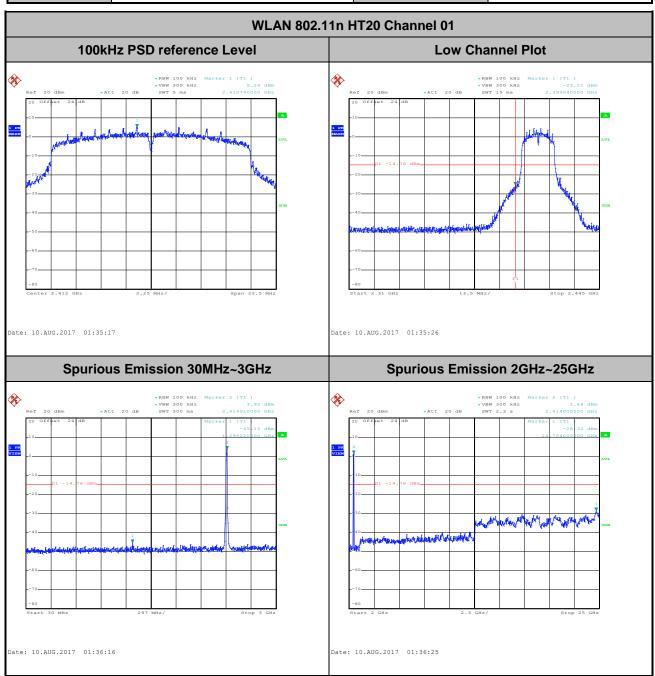
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 Test Mode :
 802.11n HT20
 Temperature :
 21~25°C

 Test Band :
 2.4GHz Low
 Relative Humidity :
 51~54%

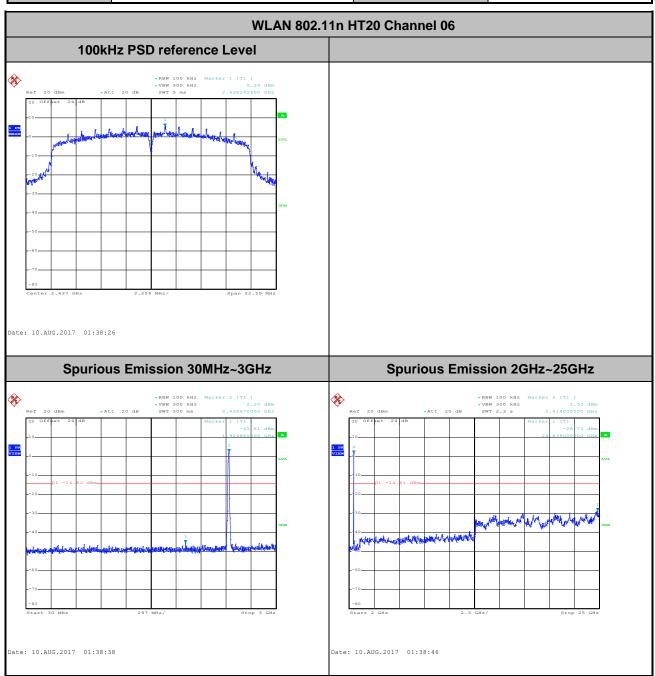
 Test Channel :
 01
 Test Engineer :
 Shiming Liu



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Test Mode :	802.11n HT20	Temperature :	21~25℃
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel:	06	Test Engineer :	Shiming Liu



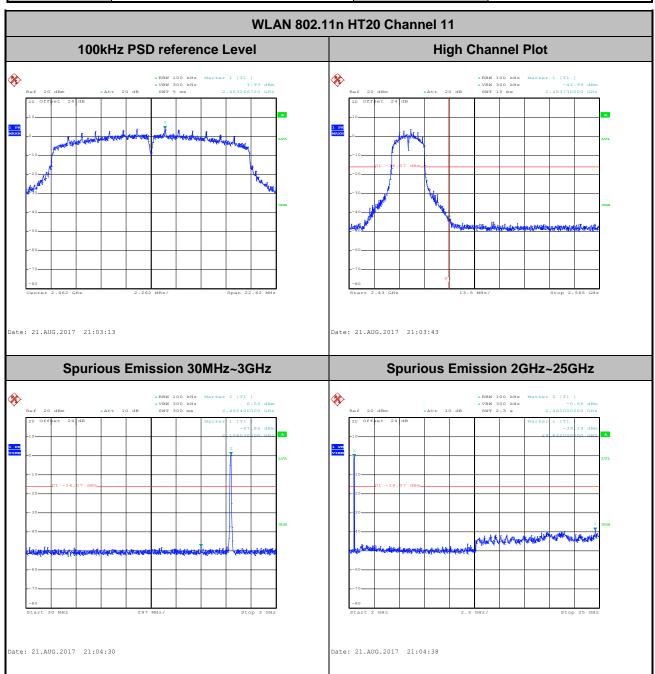
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 Test Mode :
 802.11n HT20
 Temperature :
 21~25℃

 Test Band :
 2.4GHz High
 Relative Humidity :
 51~54%

 Test Channel :
 11
 Test Engineer :
 Shiming Liu



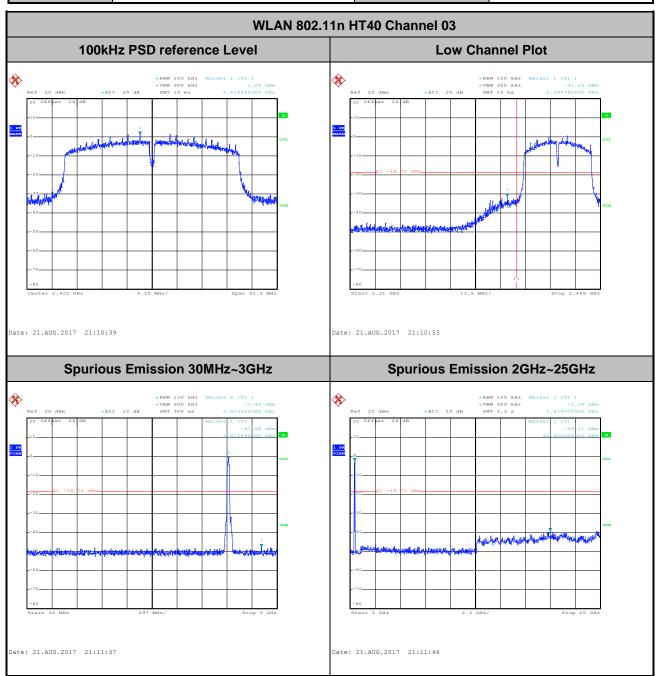
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 Test Mode :
 802.11n HT40
 Temperature :
 21~25℃

 Test Band :
 2.4GHz Low
 Relative Humidity :
 51~54%

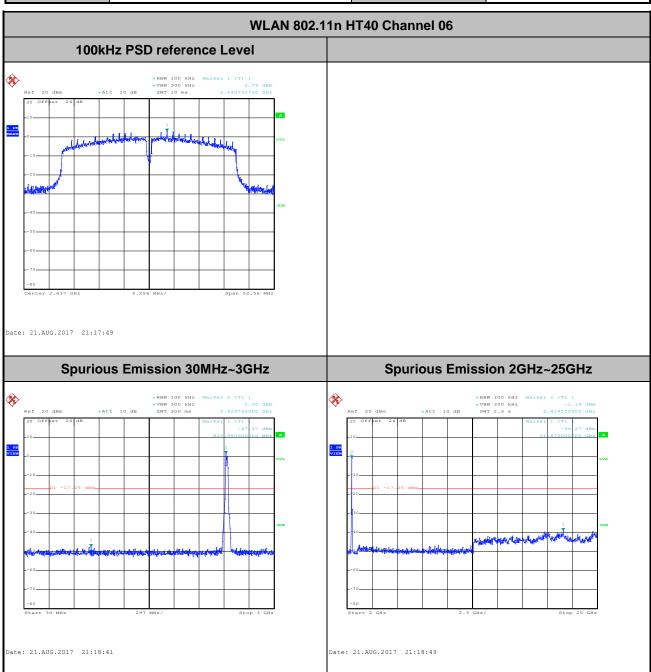
 Test Channel :
 03
 Test Engineer :
 Shiming Liu



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Test Mode :	802.11n HT40	Temperature :	21~25℃
Test Band :	2.4GHz Mid	Relative Humidity :	51~54%
Test Channel:	06	Test Engineer :	Shiming Liu



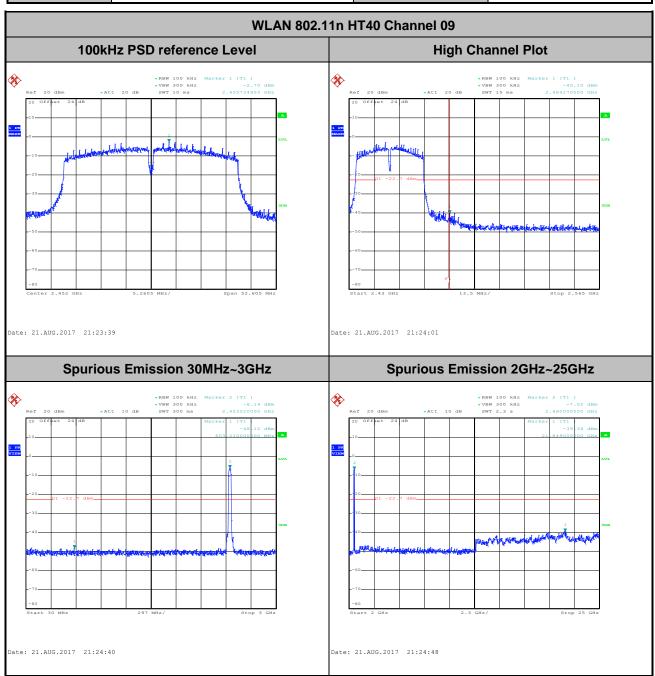
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 Test Mode :
 802.11n HT40
 Temperature :
 21~25℃

 Test Band :
 2.4GHz High
 Relative Humidity :
 51~54%

 Test Channel :
 09
 Test Engineer :
 Shiming Liu



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3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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		

3.5.2 Measuring Instruments

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

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3.5.3 Test Procedures

- 1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
- 2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
- 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.
- 4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 5. Corrected Reading: Antenna Factor + Cable Loss + Read Level Preamp Factor = Level
- 6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
- 7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \ge 1$ GHz for peak measurement. For average measurement:
 - 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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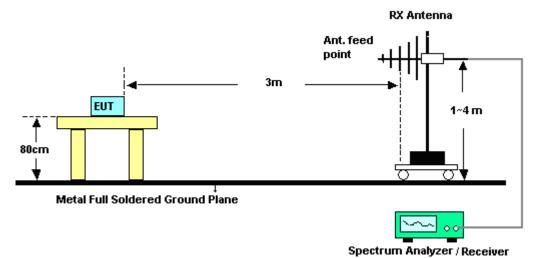
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3.5.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



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For radiated emissions above 1GHz



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

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

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B and C.

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3.6 Antenna Requirements

3.6.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

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4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	0932001	N/A	Sep. 29, 2016	Aug. 07, 2017 ~ Aug. 21, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GH z	Sep. 29, 2016	Aug. 07, 2017 ~ Aug. 21, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz ~ 30GHz	Nov. 17, 2016	Aug. 07, 2017 ~ Aug. 21, 2017	Nov. 16, 2017	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	GEO82176 3	N/A	Nov. 14, 2016	Aug. 07, 2017 ~ Aug. 21, 2017	Nov. 13, 2017	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz ~ 30 MHz	May 15, 2017	Aug. 14, 2017 ~ Aug. 30, 2017	May 14, 2019	Radiation (03CH13-HY)
Amplifier	Sonoma-Instru ment	310 N	187282	9 kHz ~ 1GHz	Dec. 21, 2016	Aug. 14, 2017 ~ Aug. 30, 2017	Dec. 20, 2017	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	40103&04	30MHz to 1GHz	Jan. 07, 2017	Aug. 14, 2017 ~ Aug. 30, 2017	Jan. 06, 2018	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-124 1	1GHz ~ 18GHz	May 02, 2017	Aug. 14, 2017 ~ Aug. 30, 2017	May 01, 2018	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz ~ 18GHz	May 22, 2017	Aug. 14, 2017 ~ Aug. 30, 2017	May 21, 2018	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY532701 47	1GHz ~ 26.5GHz	Jan. 09, 2017	Aug. 14, 2017 ~ Aug. 30, 2017	Jan. 08, 2018	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY553705 26	N/A	Mar. 15, 2017	Aug. 14, 2017 ~ Aug. 30, 2017	Mar. 14, 2018	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	N/A	Aug. 14, 2017 ~ Aug. 30, 2017	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Aug. 14, 2017 ~ Aug. 30, 2017	N/A	Radiation (03CH13-HY)
EMI Test Receiver	Agilent	N9038A (MXE)	MY532900 53	20Hz to 26.5GHz	Jan. 12, 2017	Aug. 14, 2017 ~ Aug. 30, 2017	Jan. 11, 2018	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz ~ 40GHz	Nov. 08, 2016	Aug. 14, 2017 ~ Aug. 30, 2017	Nov. 07, 2017	Radiation (03CH13-HY)
Preamplifier	MITEQ	TTA 1840-35-HG	1887435	18GHz ~ 40GHz	Oct. 13, 2016	Aug. 14, 2017 ~ Aug. 30, 2017	Oct. 12, 2017	Radiation (03CH13-HY)

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5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence	2.70
of 95% (U = 2Uc(y))	2.70

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

Measuring Uncertainty for a Level of Confidence	4.90
of 95% (U = 2Uc(y))	4.50

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

Measuring Uncertainty for a Level of Confidence	5.40
of 95% (U = 2Uc(y))	3.40

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

		-
Me	asuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.30

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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Shiming Liu	Temperature:	21~25	ç
Test Date:	2017/8/7~2017/8/21	Relative Humidity:	51~54	%

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TEST RESULTS DATA 6dB and 99% Occupied Bandwidth

	2.4GHz Band										
Mod.	Data Rate NTX CH		CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail			
11b	1Mbps	1	1	2412	14.75	10.08	0.50	Pass			
11b	1Mbps	1	6	2437	14.95	10.02	0.50	Pass			
11b	1Mbps	1	11	2462	14.95	10.02	0.50	Pass			
11g	6Mbps	1	1	2412	17.25	15.04	0.50	Pass			
11g	6Mbps	1	6	2437	17.15	14.98	0.50	Pass			
11g	6Mbps	1	11	2462	17.05	15.06	0.50	Pass			
HT20	MCS0	1	1	2412	18.30	15.00	0.50	Pass			
HT20	MCS0	1	6	2437	18.25	15.06	0.50	Pass			
HT20	MCS0	1	11	2462	18.20	15.08	0.50	Pass			
HT40	MCS0	1	3	2422	36.10	35.00	0.50	Pass			
HT40	MCS0	1	6	2437	36.20	35.04	0.50	Pass			
HT40	MCS0	1	9	2452	35.90	35.07	0.50	Pass			

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TEST RESULTS DATA Peak Power Table

	2.4GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	
11b	1Mbps	1	1	2412	17.20	30.00	3.16	20.36	36.00	Pass	
11b	1Mbps	1	6	2437	21.04	30.00	3.16	24.20	36.00	Pass	
11b	1Mbps	1	11	2462	21.06	30.00	3.16	24.22	36.00	Pass	
11g	6Mbps	1	1	2412	22.66	30.00	3.16	25.82	36.00	Pass	
11g	6Mbps	1	6	2437	22.65	30.00	3.16	25.81	36.00	Pass	
11g	6Mbps	1	11	2462	21.92	30.00	3.16	25.08	36.00	Pass	
HT20	MCS0	1	1	2412	22.77	30.00	3.16	25.93	36.00	Pass	
HT20	MCS0	1	6	2437	22.64	30.00	3.16	25.80	36.00	Pass	
HT20	MCS0	1	11	2462	21.75	30.00	3.16	24.91	36.00	Pass	
HT40	MCS0	1	3	2422	21.66	30.00	3.16	24.82	36.00	Pass	
HT40	MCS0	1	6	2437	21.85	30.00	3.16	25.01	36.00	Pass	
HT40	MCS0	1	9	2452	18.40	30.00	3.16	21.56	36.00	Pass	

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TEST RESULTS DATA Average Power Table (Reporting Only)

			2	2.4GHz l	Band	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)
11b	1Mbps	1	1	2412	0.00	15.17
11b	1Mbps	1	6	2437	0.00	18.90
11b	1Mbps	1	11	2462	0.00	18.92
11g	6Mbps	1	1	2412	0.65	16.25
11g	6Mbps	1	6	2437	0.65	16.04
11g	6Mbps	1	11	2462	0.65	14.72
HT20	MCS0	1	1	2412	0.66	16.18
HT20	MCS0	1	6	2437	0.66	16.13
HT20	MCS0	1	11	2462	0.66	13.94
HT40	MCS0	1	3	2422	0.38	13.98
HT40	MCS0	1	6	2437	0.38	15.33
HT40	MCS0	1	9	2452	0.38	10.28

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TEST RESULTS DATA Peak Power Density

				2	2.4GHz Band	d		
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm /3kHz)	DG (dBi)	Peak PSD Limit (dBm /3kHz)	Pass/Fail
11b	1Mbps	1	1	2412	-7.73	3.16	8.00	Pass
11b	1Mbps	1	6	2437	-5.28	3.16	8.00	Pass
11b	1Mbps	1	11	2462	-4.37	3.16	8.00	Pass
11g	6Mbps	1	1	2412	-10.43	3.16	8.00	Pass
11g	6Mbps	1	6	2437	-10.94	3.16	8.00	Pass
11g	6Mbps	1	11	2462	-9.67	3.16	8.00	Pass
HT20	MCS0	1	1	2412	-9.64	3.16	8.00	Pass
HT20	MCS0	1	6	2437	-10.12	3.16	8.00	Pass
HT20	MCS0	1	11	2462	-10.87	3.16	8.00	Pass
HT40	MCS0	1	3	2422	-15.20	3.16	8.00	Pass
HT40	MCS0	1	6	2437	-12.01	3.16	8.00	Pass
HT40	MCS0	1	9	2452	-18.00	3.16	8.00	Pass

Appendix B. Radiated Spurious Emission

Test Engineer :	Alex Jheng, Bill Chang, and Wilson Wu	Temperature :	25.1~25.3°C
rest Engineer .		Relative Humidity :	52~56%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		2326.905	51.61	-22.39	74	41.25	26.68	4.76	31.01	257	238	Р	Н
		2385.915	41.53	-12.47	54	30.87	26.89	4.83	30.99	257	238	Α	Н
	*	2412	100.54	-	-	89.79	26.94	4.87	30.99	257	238	Р	Н
	*	2412	97.44	-	-	86.69	26.94	4.87	30.99	257	238	Α	Н
802.11b													Н
CH 01													Н
2412MHz		2374.785	51.4	-22.6	74	40.82	26.84	4.8	30.99	385	279	Р	V
2412111112		2385.915	41.16	-12.84	54	30.5	26.89	4.83	30.99	385	279	Α	V
	*	2412	96.62	-	-	85.87	26.94	4.87	30.99	385	279	Р	V
	*	2412	93.49	-	-	82.74	26.94	4.87	30.99	385	279	Α	V
													V
													V
		2386.16	51.55	-22.45	74	40.89	26.89	4.83	30.99	182	238	Р	Н
		2388.82	41.25	-12.75	54	30.59	26.89	4.83	30.99	182	238	Α	Н
	*	2437	107.88	-	-	97.01	27.04	4.88	30.98	182	238	Р	Н
	*	2437	104.73	-	-	93.86	27.04	4.88	30.98	182	238	Α	Н
000 445		2487.4	53.03	-20.97	74	41.99	27.15	4.93	30.97	182	238	Р	Н
802.11b CH 06		2487.89	42.98	-11.02	54	31.88	27.2	4.93	30.96	182	238	Α	Н
2437MHz		2347.94	51.81	-22.19	74	41.37	26.73	4.78	31	140	180	Р	V
2437111112		2386.86	40.56	-13.44	54	29.9	26.89	4.83	30.99	140	180	Α	V
	*	2437	101.74	-	-	90.87	27.04	4.88	30.98	140	180	Р	V
	*	2437	98.55	-	-	87.68	27.04	4.88	30.98	140	180	Α	V
		2484.18	51.79	-22.21	74	40.75	27.15	4.93	30.97	140	180	Р	V
		2489.01	41.04	-12.96	54	29.94	27.2	4.93	30.96	140	180	Α	V

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	*	2462	109.89	-	-	98.93	27.1	4.9	30.97	206	236	Р	
802.11b CH 11 2462MHz	*	2462	106.56	-	-	95.6	27.1	4.9	30.97	206	236	Α	
		2488.36	57.13	-16.87	74	46.03	27.2	4.93	30.96	206	236	Р	
•		2488.8	50.7	-3.3	54	39.6	27.2	4.93	30.96	206	236	Α	
	*	2462	101.29	-	-	90.33	27.1	4.9	30.97	118	178	Р	
	*	2462	97.94	-	-	86.98	27.1	4.9	30.97	118	178	Α	
		2488.04	52.41	-21.59	74	41.31	27.2	4.93	30.96	118	178	Р	
		2488.72	43.92	-10.08	54	32.82	27.2	4.93	30.96	118	178	Α	
													-

Remark

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^{1.} No other spurious found.

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

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.	ļ			Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	,	(dBµV/m)			(dB)	(dB)	(cm)	(deg)		
		4824	54.79	-19.21	74	72.63	31.56	7.33	57.24	161	165	Р	Н
		4824	53.65	-0.35	54	71.49	31.56	7.33	57.24	161	165	Α	Н
222.441													Н
802.11b													Н
CH 01 2412MHz		4824	52.52	-21.48	74	70.36	31.56	7.33	57.24	265	165	Р	V
24 I ZIVI T Z		4824	50.56	-3.44	54	68.4	31.56	7.33	57.24	265	165	Α	V
													V
													V
		4874	51.76	-22.24	74	69.36	31.63	7.44	57.17	250	169	Р	Н
		4874	50.58	-3.42	54	68.18	31.63	7.44	57.17	250	169	Α	Н
000 445		7311	43.14	-30.86	74	54.66	36.16	9.13	57.27	100	0	Р	Н
802.11b													Н
CH 06 2437MHz		4874	48.77	-25.23	74	66.37	31.63	7.44	57.17	100	0	Р	V
2437 WITZ		7311	44.6	-29.4	74	56.12	36.16	9.13	57.27	100	0	Р	V
													V
													V
		4924	46.45	-27.55	74	63.83	31.7	7.52	57.1	100	0	Р	Н
		7386	44.41	-29.59	74	55.86	36.31	9.18	57.38	100	0	Р	Н
802.11b													Н
CH 11													Н
2462MHz		4924	45.58	-28.42	74	62.96	31.7	7.52	57.1	100	0	Р	V
		7386	44.41	-29.59	74	55.86	36.31	9.18	57.38	100	0	Р	V
													V
													V

Remark

- 1. No other spurious found.
- 2. All results are PASS against Peak and Average limit line.

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2.4GHz 2400~2483.5MHz WIFI 802.11g (Band Edge @ 3m)

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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		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dB _µ V)	(dB/m)	(dB)	(dB)	(cm)		(P/A)	
		2389.905	61.77	-12.23	74	51.11	26.89	4.83	30.99	269	243	Р	Н
		2389.905	47.26	-6.74	54	36.6	26.89	4.83	30.99	269	243	Α	Н
	*	2412	105.85	-	-	95.1	26.94	4.87	30.99	269	243	Р	Н
	*	2412	98.1	-	-	87.35	26.94	4.87	30.99	269	243	Α	Н
802.11g													Н
CH 01													Н
2412MHz		2390	58.36	-15.64	74	47.7	26.89	4.83	30.99	142	173	Р	V
		2389.905	44.39	-9.61	54	33.73	26.89	4.83	30.99	142	173	Α	V
	*	2412	100.18	-	-	89.43	26.94	4.87	30.99	142	173	Р	V
	*	2412	92.43	-	-	81.68	26.94	4.87	30.99	142	173	Α	V
													V
													V
		2356.2	50.9	-23.1	74	40.4	26.79	4.78	31	236	236	Р	Н
		2387.56	41.44	-12.56	54	30.78	26.89	4.83	30.99	236	236	Α	Н
	*	2437	108.53	-	-	97.66	27.04	4.88	30.98	236	236	Р	Н
	*	2437	100.6	ı	-	89.73	27.04	4.88	30.98	236	236	Α	Η
000 44 ~		2483.62	54.15	-19.85	74	43.11	27.15	4.93	30.97	236	236	Р	Н
802.11g CH 06		2484.67	43.5	-10.5	54	32.46	27.15	4.93	30.97	236	236	Α	Н
2437MHz		2366.14	51.15	-22.85	74	40.62	26.79	4.8	30.99	173	179	Р	V
2437111112		2380.84	41.26	-12.74	54	30.65	26.84	4.83	30.99	173	179	Α	V
	*	2437	101.55	-	-	90.68	27.04	4.88	30.98	173	179	Р	V
	*	2437	93.71	-	-	82.84	27.04	4.88	30.98	173	179	Α	V
		2490.83	51.86	-22.14	74	40.76	27.2	4.93	30.96	173	179	Р	V
		2485.02	41.75	-12.25	54	30.71	27.15	4.93	30.97	173	179	Α	V

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	*	2462	109.38	-	-	98.42	27.1	4.9	30.97	208	239	Р	Н
802.11g CH 11 — 2462MHz	*	2462	101.71	-	-	90.75	27.1	4.9	30.97	208	239	Α	Н
		2483.76	71.01	-2.99	74	59.97	27.15	4.93	30.97	208	239	Р	Н
		2483.52	52.78	-1.22	54	41.74	27.15	4.93	30.97	208	239	Α	Н
													Н
_													Н
	*	2462	102.06	-	-	91.1	27.1	4.9	30.97	166	179	Р	V
2402WITZ	*	2462	93.72	-	-	82.76	27.1	4.9	30.97	166	179	Α	V
		2483.8	58.76	-15.24	74	47.72	27.15	4.93	30.97	166	179	Р	V
		2483.52	45.36	-8.64	54	34.32	27.15	4.93	30.97	166	179	Α	V
													V
													V

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

^{1.} No other spurious found.

Remark

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

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant. 1		(MHz)	(dBµV/m)	Limit (dB)	Line (dBµV/m)	Level (dBµV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	
		4824	51.86	-22.14	74	69.7	31.56	7.33	57.24	100	169	Р	Н
		4824	47.29	-6.71	54	65.13	31.56	7.33	57.24	100	169	Α	Н
000 44													Н
802.11g													Н
CH 01 2412MHz		4824	48.09	-25.91	74	65.93	31.56	7.33	57.24	100	0	Р	V
2412111112													V
													V
													V
		4874	48.74	-25.26	74	66.34	31.63	7.44	57.17	100	0	Р	Н
		7311	44.41	-29.59	74	55.93	36.16	9.13	57.27	100	0	Р	Н
802.11g													Н
CH 06													Н
2437MHz		4874	47.38	-26.62	74	64.98	31.63	7.44	57.17	100	0	Р	V
		7311	43.49	-30.51	74	55.01	36.16	9.13	57.27	100	0	Р	V
													V
													V
		4924	49.1	-24.9	74	66.48	31.7	7.52	57.1	100	0	Р	Н
		7386	45.13	-28.87	74	56.58	36.31	9.18	57.38	100	0	Р	Н
802.11g													Н
CH 11													Н
2462MHz		4924	46.33	-27.67	74	63.71	31.7	7.52	57.1	100	0	Р	V
		7386	44.04	-29.96	74	55.49	36.31	9.18	57.38	100	0	Р	V
													V
													V

Remark

- 1. No other spurious found.
- 2. All results are PASS against Peak and Average limit line.

SPORTON INTERNATIONAL INC.

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

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2.4GHz 2400~2483.5MHz WIFI 802.11n HT20 (Band Edge @ 3m)

Report No. : FR752007C

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dB _µ V)	(dB/m)	(dB)	(dB)	(cm)		(P/A)	
		2389.485	65.54	-8.46	74	54.88	26.89	4.83	30.99	245	234	Р	Н
		2390	50.95	-3.05	54	40.29	26.89	4.83	30.99	245	234	Α	Н
	*	2412	106.25	-	-	95.5	26.94	4.87	30.99	245	234	Р	Н
	*	2412	98.68	-	-	87.93	26.94	4.87	30.99	245	234	Α	Н
802.11n													Н
HT20													Н
CH 01		2389.065	58.06	-15.94	74	47.4	26.89	4.83	30.99	146	172	Р	V
2412MHz		2390	45.9	-8.1	54	35.24	26.89	4.83	30.99	146	172	Α	V
	*	2412	98.31	-	-	87.56	26.94	4.87	30.99	146	172	Р	V
	*	2412	90.75	-	-	80	26.94	4.87	30.99	146	172	Α	V
													V
													V
		2386.44	51.4	-22.6	74	40.74	26.89	4.83	30.99	222	235	Р	Н
		2389.8	41.66	-12.34	54	31	26.89	4.83	30.99	222	235	Α	Н
	*	2437	107.61	-	-	96.74	27.04	4.88	30.98	222	235	Р	Н
	*	2437	99.88	-	-	89.01	27.04	4.88	30.98	222	235	Α	Н
802.11n		2483.69	53.61	-20.39	74	42.57	27.15	4.93	30.97	222	235	Р	Н
HT20		2485.58	43.78	-10.22	54	32.74	27.15	4.93	30.97	222	235	Α	Н
CH 06		2344.44	51.77	-22.23	74	41.33	26.73	4.78	31	136	182	Р	V
2437MHz		2383.22	41.31	-12.69	54	30.7	26.84	4.83	30.99	136	182	Α	V
	*	2437	100.74	-	-	89.87	27.04	4.88	30.98	136	182	Р	V
	*	2437	93.15	-	-	82.28	27.04	4.88	30.98	136	182	Α	V
		2491.18	51.68	-22.32	74	40.58	27.2	4.93	30.96	136	182	Р	V
		2490.41	41.83	-12.17	54	30.73	27.2	4.93	30.96	136	182	Α	V

SPORTON INTERNATIONAL INC. Page Number : B7 of B15



FCC RF Test Report

	*	2462	107.76	_	_	96.8	27.1	4.9	30.97	207	239	Р	Н
	*	2462	100.27	-	-	89.31	27.1	4.9	30.97	207	239	Α	Н
		2483.64	66.06	-7.94	74	55.02	27.15	4.93	30.97	207	239	Р	Н
		2483.56	53.23	-0.77	54	42.19	27.15	4.93	30.97	207	239	Α	Н
802.11n													Н
HT20													Н
CH 11	*	2462	99.93	-	-	88.97	27.1	4.9	30.97	121	166	Р	٧
2462MHz	*	2462	92.19	-	-	81.23	27.1	4.9	30.97	121	166	Α	V
		2484.6	58.38	-15.62	74	47.34	27.15	4.93	30.97	121	166	Р	\
		2483.6	45.84	-8.16	54	34.8	27.15	4.93	30.97	121	166	Α	\
													٧
													V

Remark

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

^{1.} No other spurious found.

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

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dB _µ V)	(dB/m)	(dB)	(dB)	(cm)	(deg)		
		4824	52.81	-21.19	74	70.65	31.56	7.33	57.24	109	168	Р	Н
		4824	48.03	-5.97	54	65.87	31.56	7.33	57.24	109	168	Α	Н
802.11n													Н
HT20													Н
CH 01		4824	48.3	-25.7	74	66.14	31.56	7.33	57.24	100	0	Р	V
2412MHz													V
													V
													V
		4874	51.68	-22.32	74	69.28	31.63	7.44	57.17	275	169	Р	Н
		4874	46.4	-7.6	54	64	31.63	7.44	57.17	275	169	Α	Н
802.11n		7311	45.46	-28.54	74	56.98	36.16	9.13	57.27	100	0	Р	Н
HT20													Н
CH 06		4874	49.89	-24.11	74	67.49	31.63	7.44	57.17	100	0	Р	V
2437MHz		7311	44.18	-29.82	74	55.7	36.16	9.13	57.27	100	0	Р	V
													V
													V
		4924	51.85	-22.15	74	69.23	31.7	7.52	57.1	212	174	Р	Н
		4924	48.84	-5.16	54	66.22	31.7	7.52	57.1	212	174	Α	Н
802.11n		7386	44.81	-29.19	74	56.26	36.31	9.18	57.38	100	0	Р	Н
HT20													Н
CH 11		4924	46.92	-27.08	74	64.3	31.7	7.52	57.1	100	0	Р	V
2462MHz		7386	44.55	-29.45	74	56	36.31	9.18	57.38	100	0	Р	V
													V
													V

Remark

1. No other spurious found.

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

SPORTON INTERNATIONAL INC.

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

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2.4GHz 2400~2483.5MHz WIFI 802.11n HT40 (Band Edge @ 3m)

Report No. : FR752007C

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.		, .		Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dB _µ V)	(dB/m)	(dB)	(dB)	(cm)		(P/A)	
		2389.24	65.94	-8.06	74	55.28	26.89	4.83	30.99	182	238	Р	Н
		2389.94	52.7	-1.3	54	42.04	26.89	4.83	30.99	182	238	Α	Н
	*	2422	103.22	-	-	92.41	26.99	4.87	30.98	182	238	Р	Н
	*	2422	94.6	-	-	83.79	26.99	4.87	30.98	182	238	Α	Н
802.11n		2484.39	54.39	-19.61	74	43.35	27.15	4.93	30.97	182	238	Р	Н
HT40		2483.76	43.07	-10.93	54	32.03	27.15	4.93	30.97	182	238	Α	Н
CH 03		2389.52	61.89	-12.11	74	51.23	26.89	4.83	30.99	172	182	Р	V
2422MHz		2389.66	48.11	-5.89	54	37.45	26.89	4.83	30.99	172	182	Α	V
	*	2422	95.2	-	-	84.39	26.99	4.87	30.98	172	182	Р	V
	*	2422	87.32	-	-	76.51	26.99	4.87	30.98	172	182	Α	\
		2484.95	51.62	-22.38	74	40.58	27.15	4.93	30.97	172	182	Р	٧
		2494.82	41.92	-12.08	54	30.82	27.2	4.93	30.96	172	182	Α	٧
		2389.24	57.73	-16.27	74	47.07	26.89	4.83	30.99	164	238	Р	I
		2389.94	45.73	-8.27	54	35.07	26.89	4.83	30.99	164	238	Α	I
	*	2437	106.77	-	-	95.9	27.04	4.88	30.98	164	238	Р	I
	*	2437	97.92	-	-	87.05	27.04	4.88	30.98	164	238	Α	Н
802.11n		2483.5	66.66	-7.34	74	55.62	27.15	4.93	30.97	164	238	Р	Н
HT40		2483.5	53.78	-0.22	54	42.74	27.15	4.93	30.97	164	238	Α	Н
CH 06		2388.68	54.75	-19.25	74	44.09	26.89	4.83	30.99	171	175	Р	٧
2437MHz		2389.94	42.92	-11.08	54	32.26	26.89	4.83	30.99	171	175	Α	V
	*	2437	98.92	-	-	88.05	27.04	4.88	30.98	171	175	Р	V
	*	2437	90.29	-	-	79.42	27.04	4.88	30.98	171	175	Α	V
		2483.62	55.62	-18.38	74	44.58	27.15	4.93	30.97	171	175	Р	V
		2483.5	45.1	-8.9	54	34.06	27.15	4.93	30.97	171	175	Α	V

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			,	,				ı.	(
		2383.78	52.01	-21.99	74	41.4	26.84	4.83	30.99	170	238	Р	Н
		2388.54	41.51	-12.49	54	30.85	26.89	4.83	30.99	170	238	Α	Н
	*	2452	100.89	-	-	89.99	27.04	4.9	30.97	170	238	Р	Н
	*	2452	92.16	-	-	81.26	27.04	4.9	30.97	170	238	Α	Н
802.11n		2484.67	67.94	-6.06	74	56.9	27.15	4.93	30.97	170	238	Р	Н
HT40		2483.62	51.59	-2.41	54	40.55	27.15	4.93	30.97	170	238	Α	Н
CH 09		2381.4	51.84	-22.16	74	41.23	26.84	4.83	30.99	165	168	Р	V
2452MHz		2384.2	41.18	-12.82	54	30.57	26.84	4.83	30.99	165	168	Α	V
	*	2452	93.67	-	-	82.77	27.04	4.9	30.97	165	168	Р	V
	*	2452	85.17	-	-	74.27	27.04	4.9	30.97	165	168	Α	V
		2485.58	60.84	-13.16	74	49.8	27.15	4.93	30.97	165	168	Р	V
		2483.5	45.32	-8.68	54	34.28	27.15	4.93	30.97	165	168	Α	V

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

^{1.} No other spurious found.

Remark

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

2.4GHz 2400~2483.5MHz WIFI 802.11n HT40 (Harmonic @ 3m)

						,		,					T
WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	, ,	(dBµV/m)	(dB _µ V)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	1
		4844	49.18	-24.82	74	66.94	31.58	7.37	57.22	100	0	Р	Н
		7266	43.95	-30.05	74	55.5	36.1	9.11	57.23	100	0	Р	Н
802.11n													Н
HT40													Н
CH 03		4844	46.41	-27.59	74	64.17	31.58	7.37	57.22	100	0	Р	V
2422MHz		7266	44.34	-29.66	74	55.89	36.1	9.11	57.23	100	0	Р	V
													V
													V
		4874	49.54	-24.46	74	67.14	31.63	7.44	57.17	100	0	Р	Н
		7311	44.25	-29.75	74	55.77	36.16	9.13	57.27	100	0	Р	Н
802.11n													Н
HT40													Н
CH 06		4874	47.23	-26.77	74	64.83	31.63	7.44	57.17	100	0	Р	V
2437MHz		7311	43.84	-30.16	74	55.36	36.16	9.13	57.27	100	0	Р	V
													V
													V
		4904	48.67	-25.33	74	66.13	31.68	7.48	57.12	100	0	Р	Н
		7356	44.79	-29.21	74	56.25	36.25	9.17	57.33	100	0	Р	Н
802.11n													Н
HT40													Н
CH 09		4904	46.82	-27.18	74	64.28	31.68	7.48	57.12	100	0	Р	V
2452MHz		7356	43.7	-30.3	74	55.16	36.25	9.17	57.33	100	0	Р	V
													V
													V

Remark

- No other spurious found.
- 2. All results are PASS against Peak and Average limit line.

SPORTON INTERNATIONAL INC.

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

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2.4GHz 2400~2483.5MHz

Emission below 1GHz

2.4GHz WIFI 802.11b (LF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	
		62.4	22.61	-17.39	40	45.72	8.38	0.84	32.31	-	-	Р	Н
		121.8	27.24	-16.26	43.5	45.21	13.17	1.09	32.29	-	-	Р	Н
		193.89	27.27	-16.23	43.5	46.64	11.41	1.42	32.27	-	-	Р	Н
		484.8	30.35	-15.65	46	39.88	20.41	2.17	32.19	-	-	Р	Н
		675.2	40.62	-5.38	46	46.75	23.37	2.57	32.18	100	0	Р	Н
		836.9	31.12	-14.88	46	33.8	26.16	2.84	31.81	-	-	Р	Н
													Н
													Н
													Н
													Н
													Н
2.4GHz													Н
802.11b		72.12	27.77	-12.23	40	49.9	9.23	0.84	32.31	-	-	Р	V
LF		142.32	21.39	-22.11	43.5	37.72	14.72	1.19	32.28	-	-	Р	V
		193.89	20.35	-23.15	43.5	39.72	11.41	1.42	32.27	-	-	Р	V
		582.1	37.94	-8.06	46	45.38	22.28	2.39	32.21	100	0	Р	V
		675.2	36.21	-9.79	46	42.34	23.37	2.57	32.18	-	-	Р	V
		955.9	31.36	-14.64	46	30.82	28.33	3.07	31	-	-	Р	V
													V
													V
													V
													V
													V
													V

Remark 2.

- All results are PASS against limit line.

SPORTON INTERNATIONAL INC.

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

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Note symbol

Report No. : FR752007C

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

SPORTON INTERNATIONAL INC. Page Number : B14 of B15

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

Report No.: FR752007C

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dB _µ V)	(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 μ V/m) – Limit Line(dB μ 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(dBµV) 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 : B15 of B15



Appendix C. Radiated Spurious Emission Plots

Test Engineer :	Alex Jheng, Bill Chang, and Wilson Wu	Temperature :	25.1~25.3°C
rest Engineer.		Relative Humidity :	52~56%

Report No.: FR752007C

Note symbol

-L	Low channel location
-R	High channel location

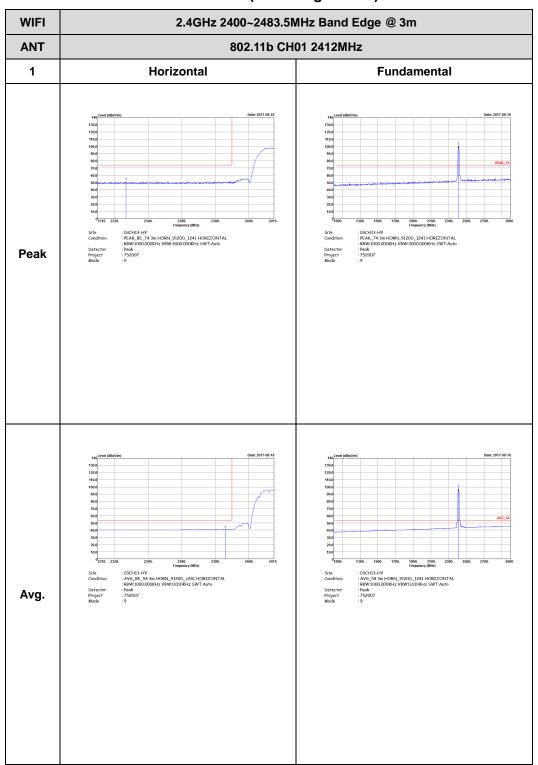
SPORTON INTERNATIONAL INC. Page Number : C1 of C50



Report No. : FR752007C

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)



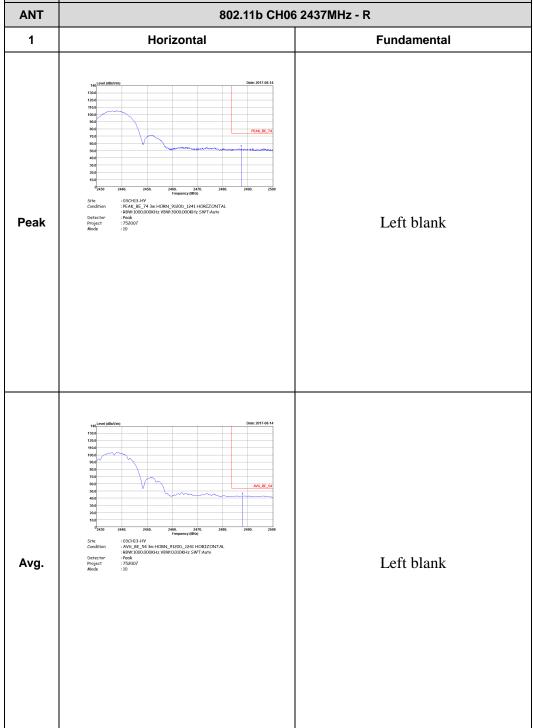
WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11b CH01 2412MHz 1 Vertical **Fundamental** Peak Avg.

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

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11b CH06 2437MHz - L 1 Horizontal **Fundamental** Peak Avg.

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

Report No.: FR752007C WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11b CH06 2437MHz - R



WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11b CH06 2437MHz - L 1 Vertical **Fundamental** Peak Avg.

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

Report No. : FR752007C

WIFI	2.4GHz 2400~2483.5M	Hz Band Edge @ 3m
ANT	802.11b CH06	2437MHz - R
1	Vertical	Fundamental
Peak	100 Delta: 2017 08-14 100 Delta: 2017 08-14	Left blank
Avg.	100 Date: 2017 08.14	Left blank

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11b CH11 2462MHz 1 Horizontal **Fundamental** Peak Avg.

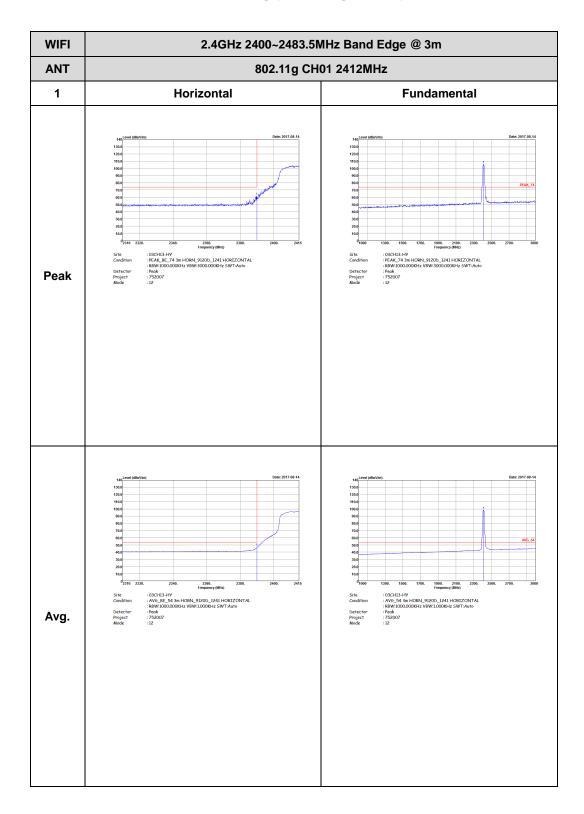
TEL: 886-3-327-3456 FAX: 886-3-328-4978

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11b CH11 2462MHz 1 Vertical **Fundamental** Peak Avg.

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

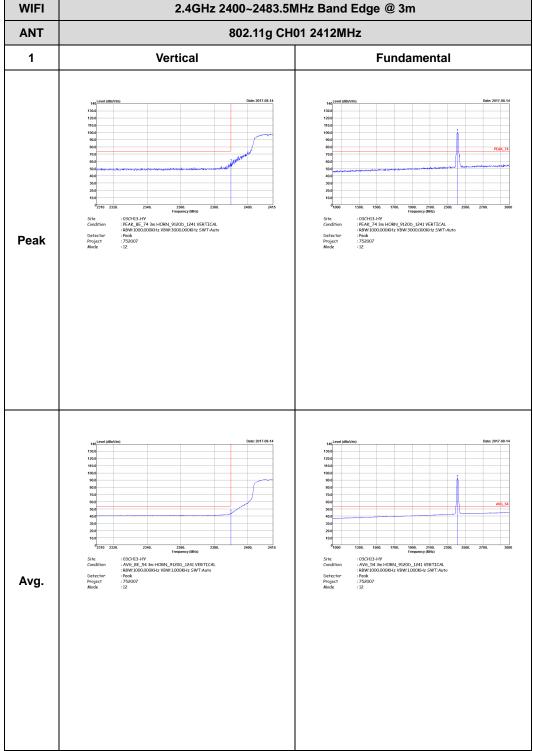


2.4GHz 2400~2483.5MHz WIFI 802.11g (Band Edge @ 3m)

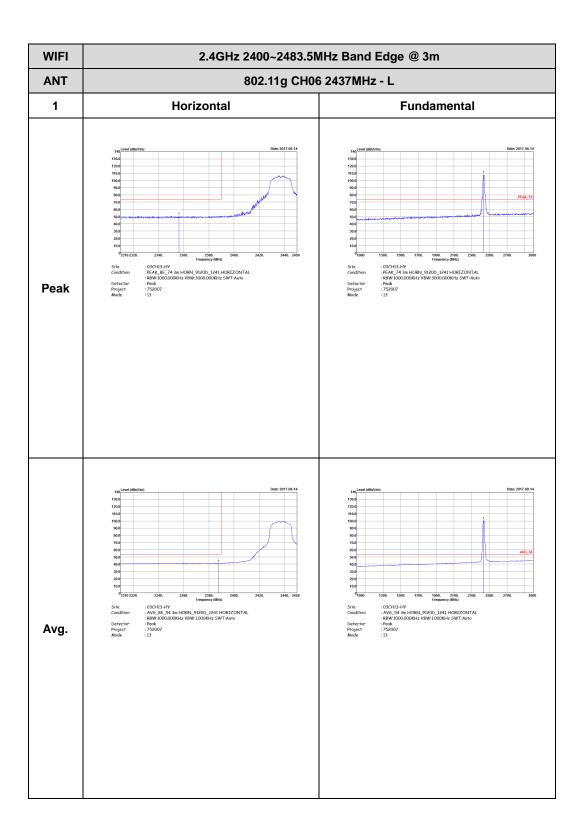


TEL: 886-3-327-3456 FAX: 886-3-328-4978

Report No.: FR752007C



Report No.: FR752007C



Report No. : FR752007C

WIFI	2.4GHz 2400~2483.5N	IHz Band Edge @ 3m
ANT	802.11g CH06	2437MHz - R
1	Horizontal	Fundamental
Peak	140, Everd (ells/rim) 1328 1439 1538 1538 1538 1538 1538 1538 1538 1538	Left blank
Avg.	1 12.0 12.	Left blank

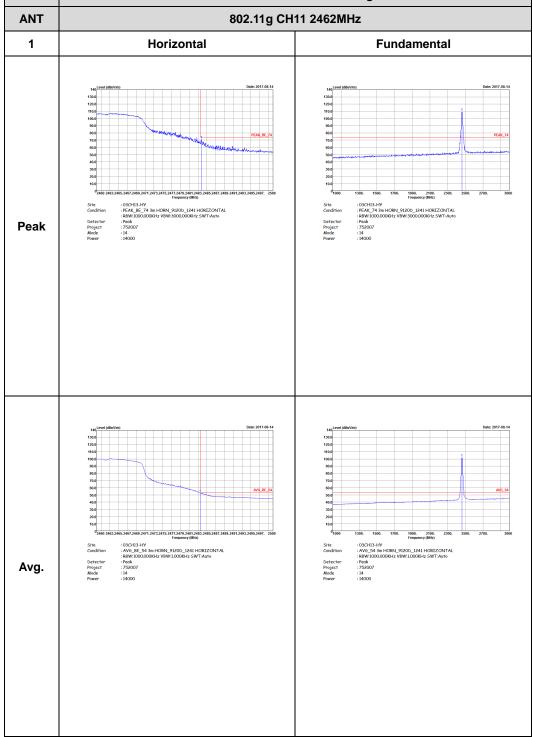
WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11g CH06 2437MHz - L 1 Vertical **Fundamental** Peak Avg.

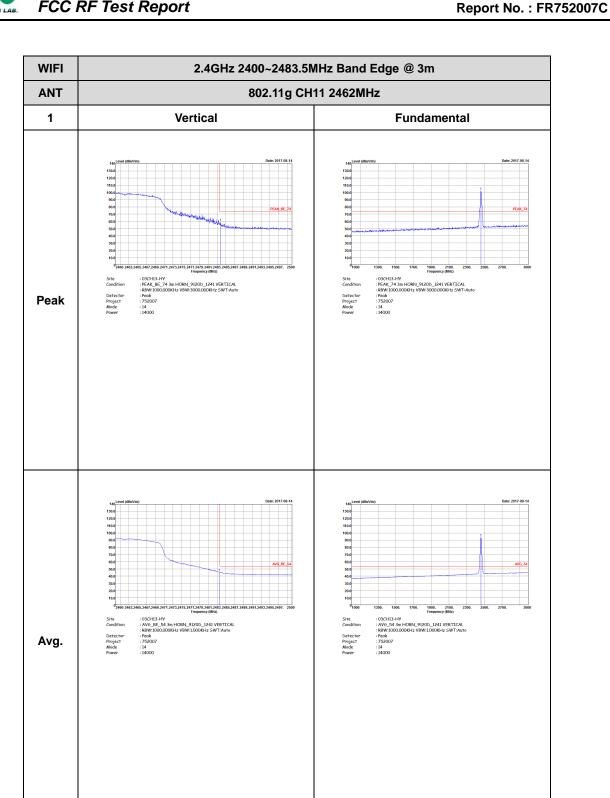
TEL: 886-3-327-3456 FAX: 886-3-328-4978

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11g CH06 2437MHz - R 1 Vertical **Fundamental** Left Blank Peak Left Blank Avg.

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

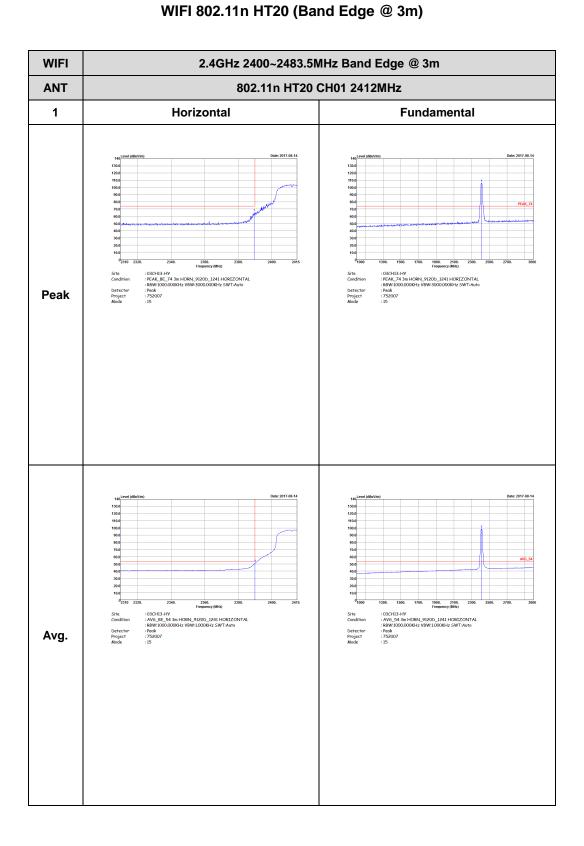
Report No.: FR752007C WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11g CH11 2462MHz







2.4GHz 2400~2483.5MHz



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

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT20 CH01 2412MHz 1 Vertical **Fundamental** Peak Avg.

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

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT20 CH06 2437MHz - L 1 Horizontal **Fundamental** Peak Avg.

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

st Report No. : FR752007C

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m				
ANT	802.11n HT20 CH06 2437MHz - R				
1	Horizontal	Fundamental			
Peak	146 Level (diffortino) Date: 2917.48-14 120.0 15	Left blank			
Avg.	146_Level (differ/fine) Date: 2017.48-14. 128.0 118.0	Left blank			

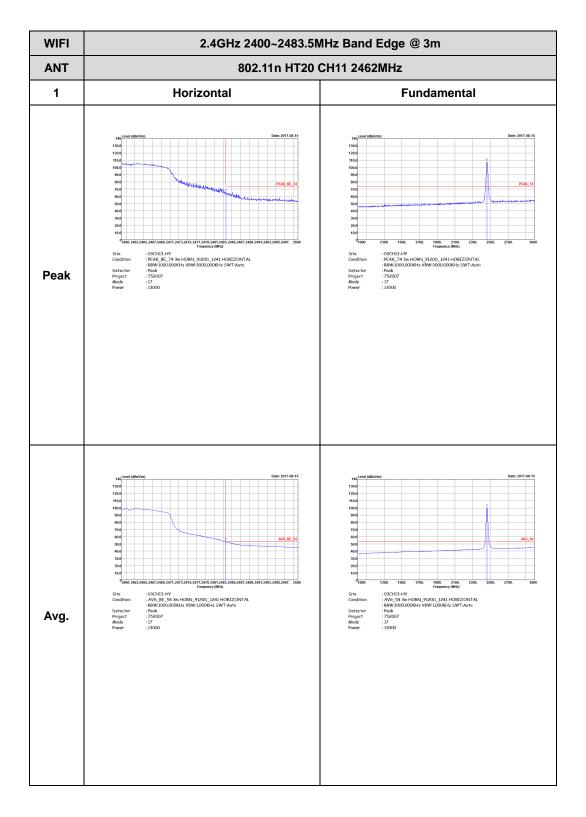
WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT20 CH06 2437MHz - L 1 Vertical **Fundamental** Peak Avg.

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

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT20 CH06 2437MHz - R 1 Vertical **Fundamental** Left Blank Peak Left Blank Avg.

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

Report No. : FR752007C



WIFI 2.4GHz 2400~2483.5MHz Fundamental @ 3m ANT 802.11n HT20 CH11 2462MHz 1 Vertical **Fundamental** Peak Avg.

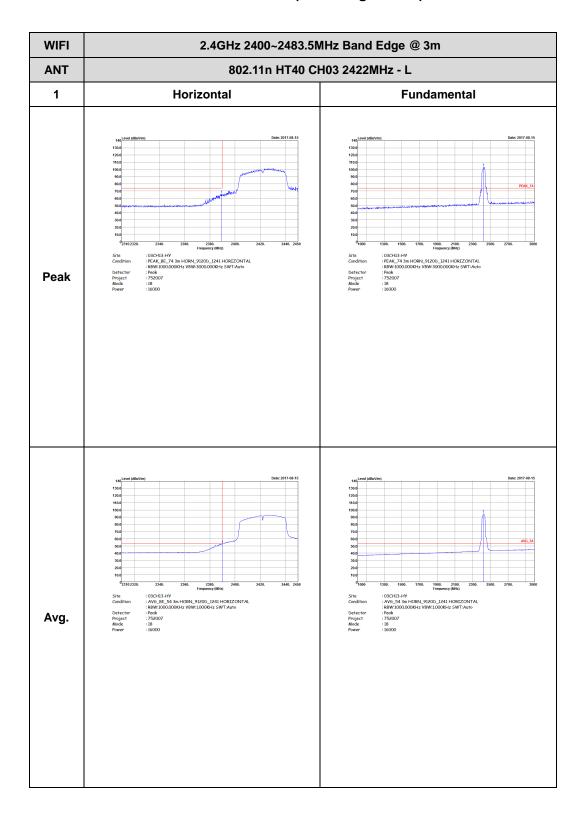
TEL: 886-3-327-3456 FAX: 886-3-328-4978



Report No. : FR752007C

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Band Edge @ 3m)



Report No. : FR752007C

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m					
ANT	802.11n HT40 CH03 2422MHz - R					
1	Horizontal	Fundamental				
Peak	100 Date 2997 68-15 120 Da	Left Blank				
Avg.	144 Event (dills/min) 1520 1	Left Blank				

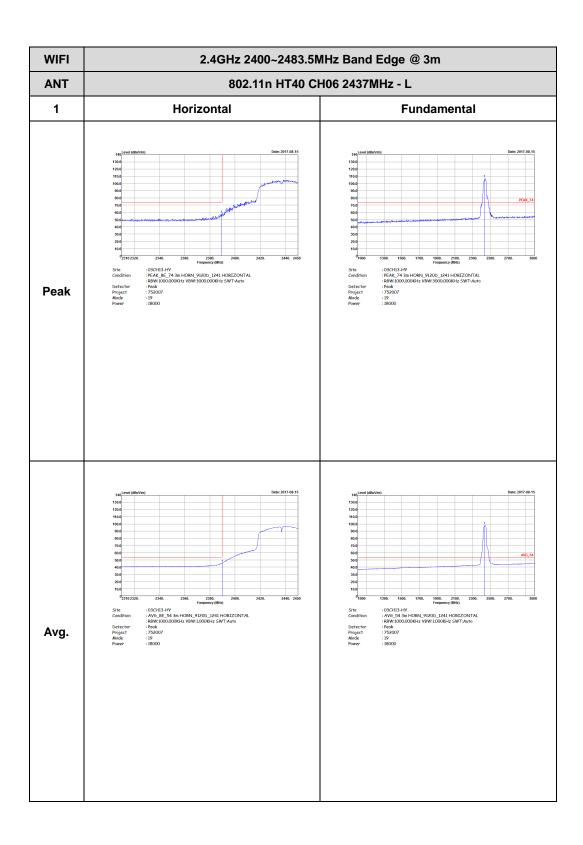
WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT40 CH03 2422MHz - L 1 Vertical **Fundamental** Peak Avg.

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

rt Report No. : FR752007C

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m				
ANT	802.11n HT40 CH03 2422MHz - R				
1	Vertical	Fundamental			
Peak	100 100	Left blank			
Avg.	Total Tota	Left blank			

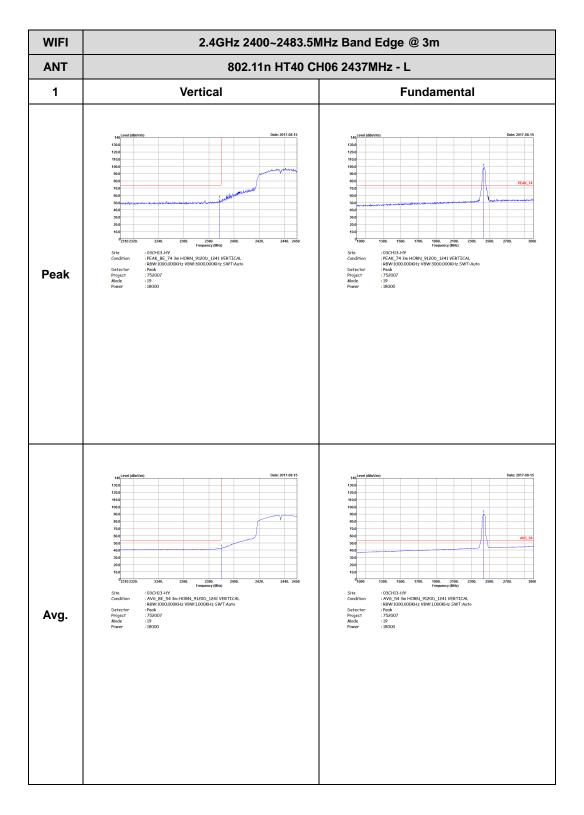
Report No. : FR752007C



WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT40 CH06 2437MHz - R 1 Horizontal **Fundamental** Left blank Peak Left blank Avg.

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

Report No. : FR752007C



Report No. : FR752007C

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m				
ANT	802.11n HT40 CH06 2437MHz - R				
1	Horizontal	Fundamental			
Peak	100 100	Left blank			
Avg.	146_Level (diffurities) Date: 2017-08-15 128.0	Left blank			

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT40 CH09 2452MHz - L 1 Horizontal **Fundamental** Peak Avg.

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

Report No. : FR752007C WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m

WIFI	2.4GHZ 2400~2483.5MHZ Band Edge @ 3m				
ANT	802.11n HT40 CH09 2452MHz - R				
1	Horizontal	Fundamental			
Peak	100.0 15 15 100.0 15	Left blank			
Avg.	100 100	Left blank			

WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT40 CH09 2452MHz - L 1 Vertical **Fundamental** Peak Avg.

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

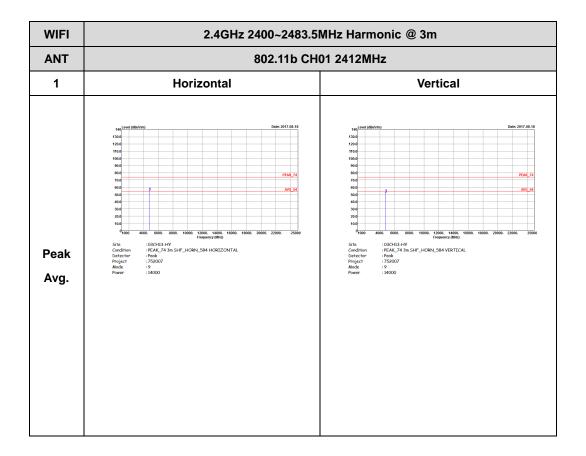
WIFI 2.4GHz 2400~2483.5MHz Band Edge @ 3m ANT 802.11n HT40 CH09 2452MHz - R 1 Vertical **Fundamental** Left blank Peak Left blank Avg.

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



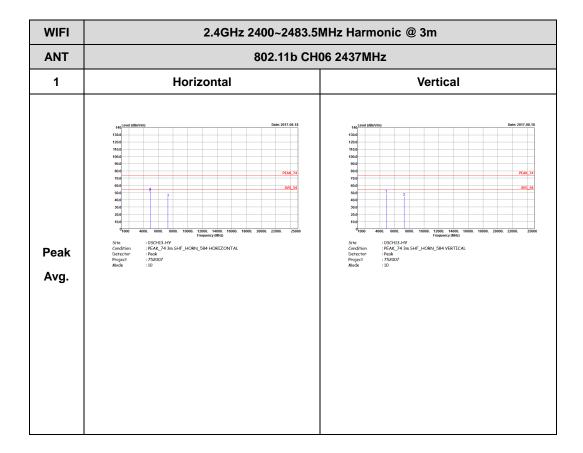
2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

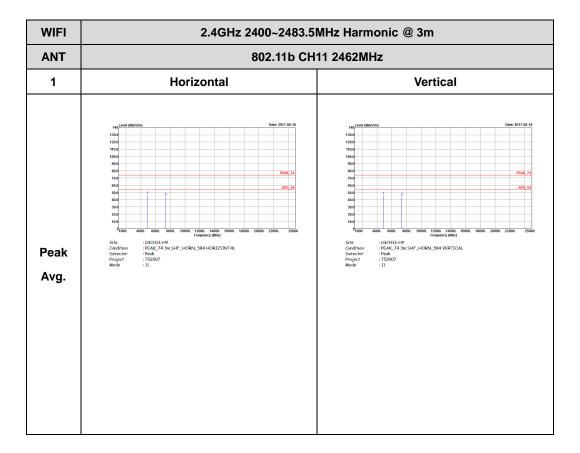


TEL: 886-3-327-3456 FAX: 886-3-328-4978



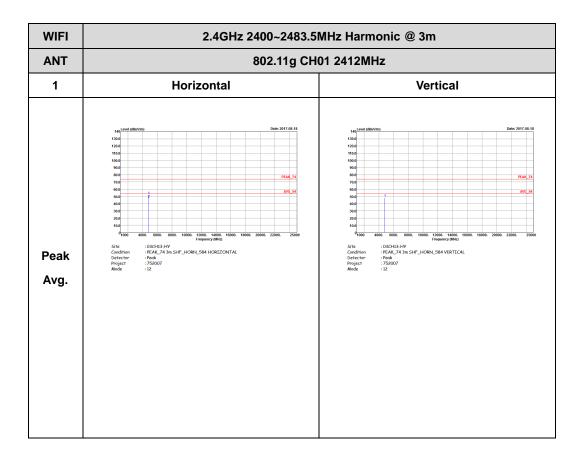




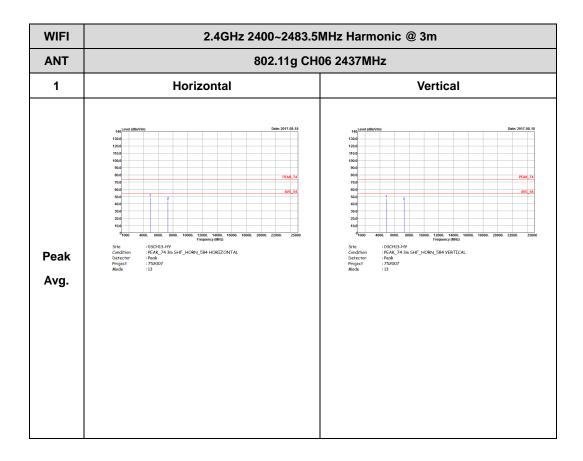




2.4GHz 2400~2483.5MHz WIFI 802.11g (Harmonic @ 3m)



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



WIFI

ANT

802.11g CH11 2462MHz

1 Horizontal

Vertical

Vertical

Wertical

Peak

Peak

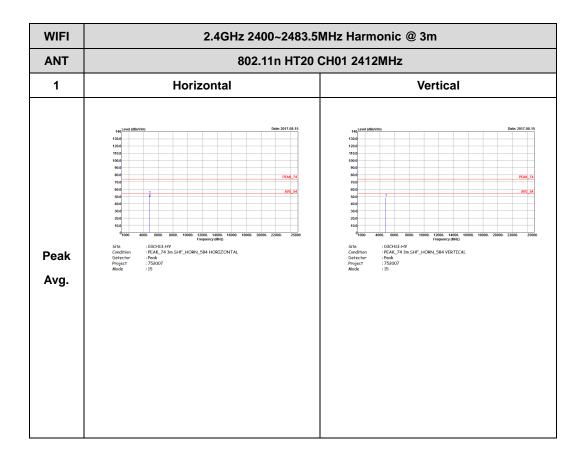
Avg.

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

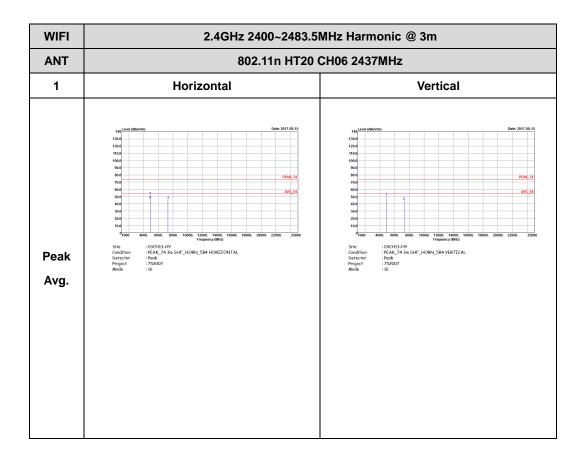


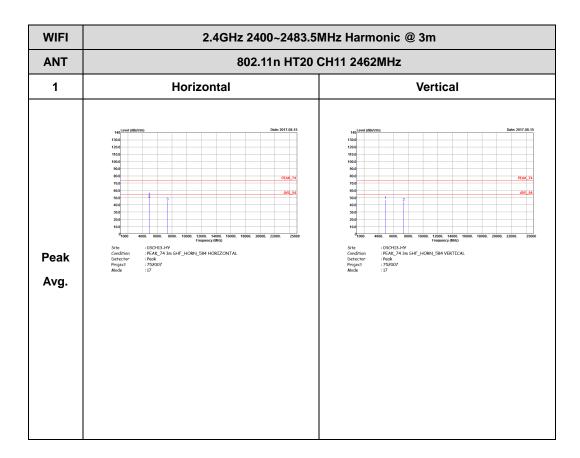
2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)



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

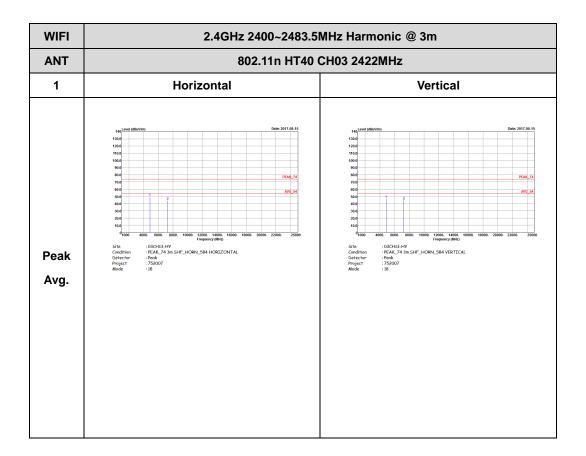






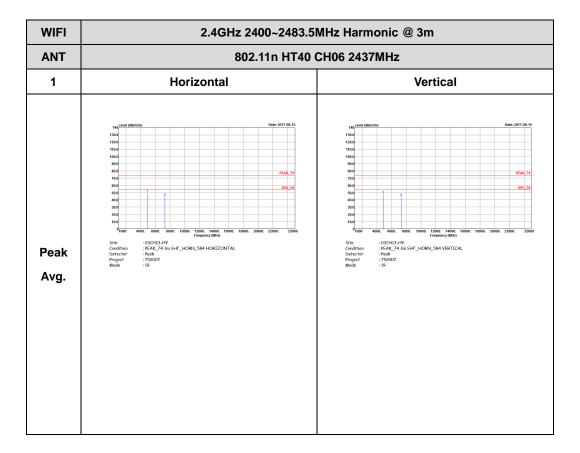
2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

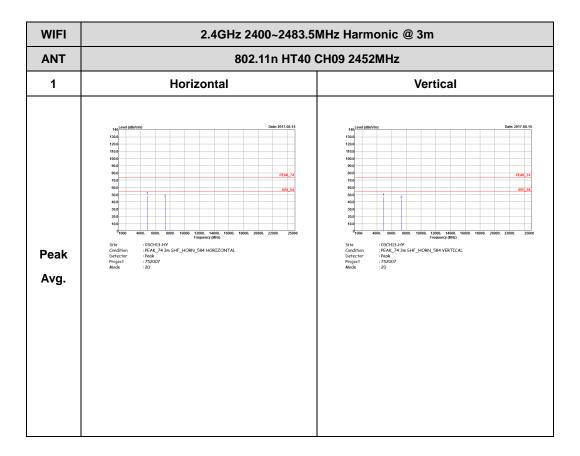


TEL: 886-3-327-3456 FAX: 886-3-328-4978



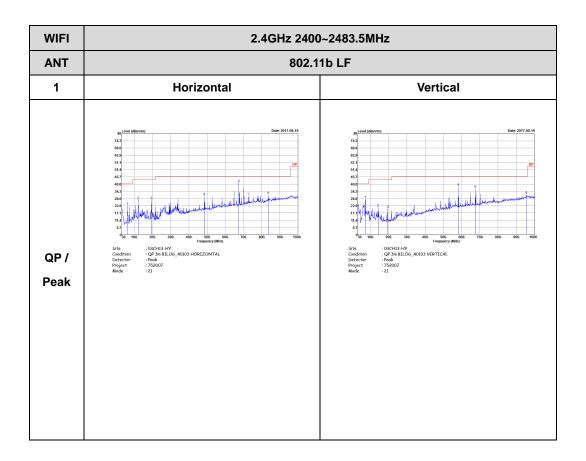








Emission below 1GHz 2.4GHz WIFI 802.11b (LF)



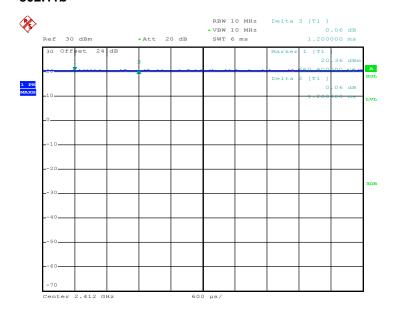
TEL: 886-3-327-3456 FAX: 886-3-328-4978



Appendix D. Duty Cycle Plots

Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	86.03	1404.00	0.71	1kHz
2.4GHz 802.11n HT20	85.83	1308.00	0.76	1kHz
2.4GHz 802.11n HT40	91.67	2464.00	0.41	1kHz

802.11b



Date: 8.AUG.2017 00:16:49

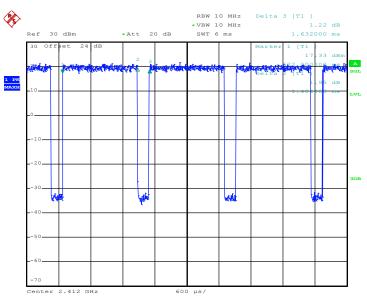
Page Number

: D1 of D3



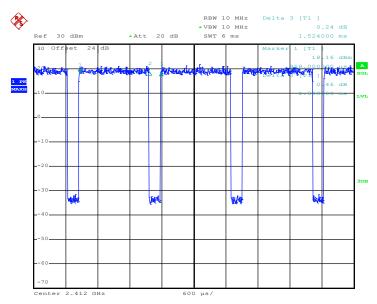
Report No.: FR752007C





Date: 8.AUG.2017 00:19:38

802.11n HT20



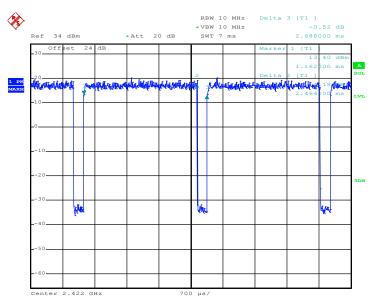
Date: 8.AUG.2017 00:22:08



FCC RF Test Report

Report No. : FR752007C

802.11n HT40



Date: 9.AUG.2017 18:23:15