



FCC RF Test Report

APPLICANT : Getac Technology Corporation.
EQUIPMENT : WLAN module
BRAND NAME : Getac
MODEL NAME : 8265NGW
FCC ID : QYL8265NG
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

This is a partial report. The product testing was completed on Jul. 07, 2018. We, Sporton International (Shenzhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

This report contains data that were produced under subcontract by Laboratory SPORTON INTERNATIONAL INC.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Shenzhen) Inc., the test report shall not be reproduced except in full.

Approved by: Eric Shih / Manager



Sporton International (Shenzhen) Inc.

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Guangdong Province 518055 China**



TABLE OF CONTENTS

REVISION HISTORY.....	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant.....	5
1.2 Product Feature of Equipment Under Test.....	5
1.3 Modification of EUT	5
1.4 Testing Location	6
1.5 Applicable Standards.....	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Carrier Frequency and Channel	8
2.2 Test Mode.....	9
2.3 Connection Diagram of Test System.....	10
2.4 Support Unit used in test configuration and system	10
2.5 EUT Operation Test Setup	10
3 TEST RESULT	11
3.1 Maximum Conducted Output Power Measurement	11
3.2 Unwanted Emissions Measurement.....	12
3.3 Antenna Requirements.....	17
4 LIST OF MEASURING EQUIPMENT	18
5 UNCERTAINTY OF EVALUATION	19
APPENDIX A. CONDUCTED TEST RESULTS	
APPENDIX B. RADIATED SPURIOUS EMISSION	
APPENDIX C. RADIATED SPURIOUS EMISSION PLOTS	
APPENDIX D. DUTY CYCLE PLOTS	
APPENDIX E. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR570164-39E	Rev. 01	Initial issue of report	Jul. 31, 2018



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.2	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) & 15.209(a)	Pass	Under limit 12.16 dB at 570.290 MHz
3.3	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-
Remark: Except Conducted output power and Unwanted Emissions is carrying out, For other test data please refer to Intel Report No.: 160321-01.TR01 for WLAN module (Model: 8265NGW).					

1 General Description

1.1 Applicant

Getac Technology Corporation.

5F., Building A, No. 209, Sec.1, Nangang Rd., Nangang Dist., Taipei City 11568, Taiwan, R.O.C.

1.2 Product Feature of Equipment Under Test

WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac, NFC, GNSS and Digitizer.

Product Specification subjective to this standard	
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna GPS: PATCH Antenna NFC: Loop Antenna Digitizer: Loop Antenna

The product was installed into Tablet (Brand Name: Getac, Model Name: RX10) during test, and all tests were performed with SKU A

SKU Table		
RX10 SKU		
	SKU A	SKU B
CPU	i5	M3
DDR	8G	4G
SSD	256GB	128GB
Panel	FHD	FHD
Digitizer	Support	Not Support
WLAN/BT	Support	Not Support
WWAN	Support	Not Support
GPS	Support	Not Support
RFID	Support	Not Support
Battery	5800mAh & 2160mAh	2160mAh

1.3 Modification of EUT

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

1.4 Testing Location

SPORTON INTERNATIONAL INC. is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and under the FCC-recognized accredited testing laboratories by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist. Taoyuan City Taiwan Tel: 886-3-327-3456 FAX: +886-3-327-0978		
Test Site No.	Sporton Site No.	FCC designation No.	FCC Test Firm Registration No.
	TH05-HY	TW1190	553509

Note: Test data subcontracted Conducted power in section 3.1 of this report.

Sporton International (Shenzhen) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600156-0) and the FCC designation No is CN5019.

Test Site	Sporton International (Shenzhen) Inc.	
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan District Shenzhen City Guangdong Province 518055 China TEL: +86-755-3320-2398	
Test Site No.	Sporton Site No.	FCC Test Firm Registration No.
	03CH01-SZ	577730

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



1.5 Applicable Standards

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

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

Remark:

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

2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: 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 (X plane for Ant. 1, Y Plane for Ant. 2 and MIMO Ant. 1+2) were recorded in this report.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155 [#]	5775	165	5825

Note:

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



2.2 Test Mode

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

Single Mode

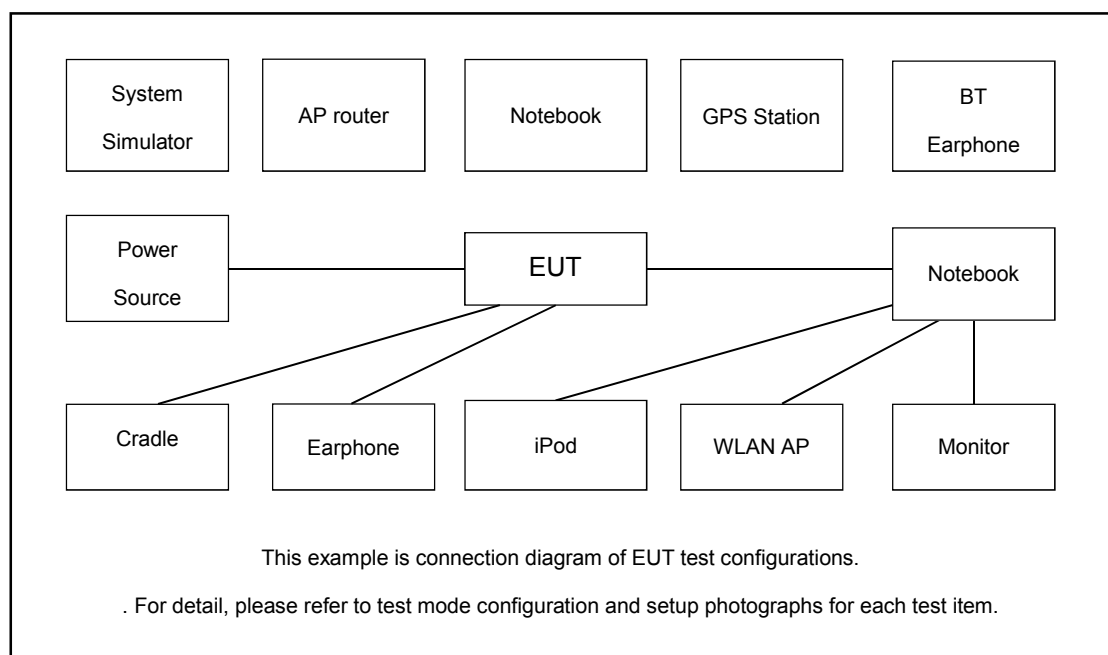
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0

MIMO Mode

Modulation	Data Rate
802.11n HT20	MCS0

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

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Earphone	Apple	MC690ZP/A	N/A	Shielded, 1.0m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “DRTU” was installed in Notebook which was programmed in order to make the EUT provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

3 Test Result

3.1 Maximum Conducted Output Power Measurement

3.1.1 Limit of Maximum Conducted Output Power

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

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.1.2 Measuring Instruments

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

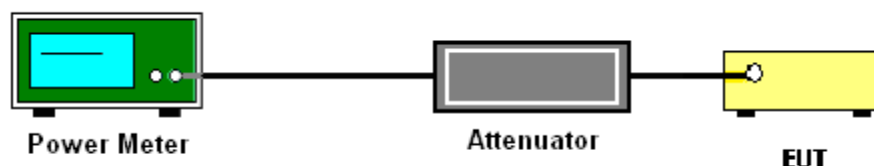
3.1.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, $10 \log(1/x)$, where x is the duty cycle.

3.1.4 Test Setup



3.1.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.2 Unwanted Emissions Measurement

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

3.2.1 Limit of Unwanted Emissions

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

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

- (2) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table,

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3



EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.2

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

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

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m

3.2.2 Measuring Instruments

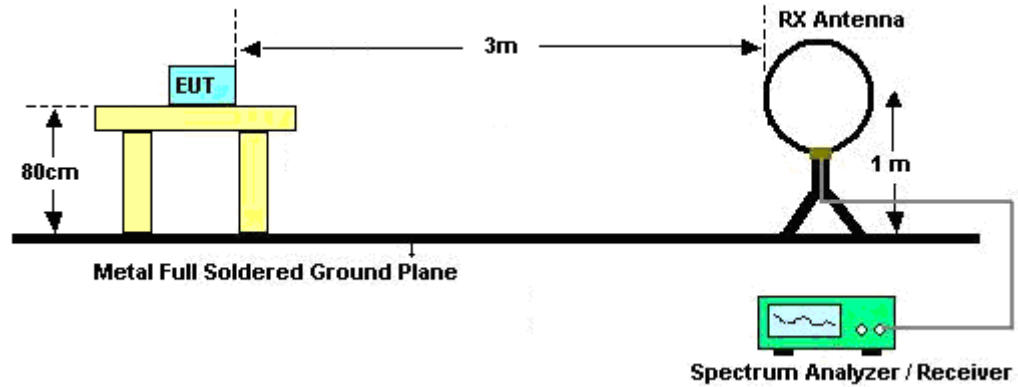
The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

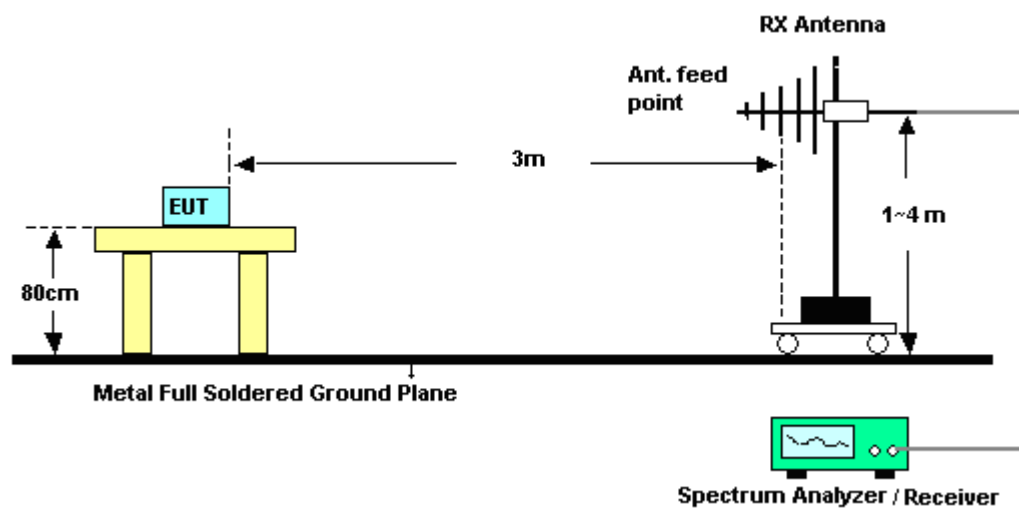
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
 - (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
 - RBW = 1 MHz
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.2.4 Test Setup

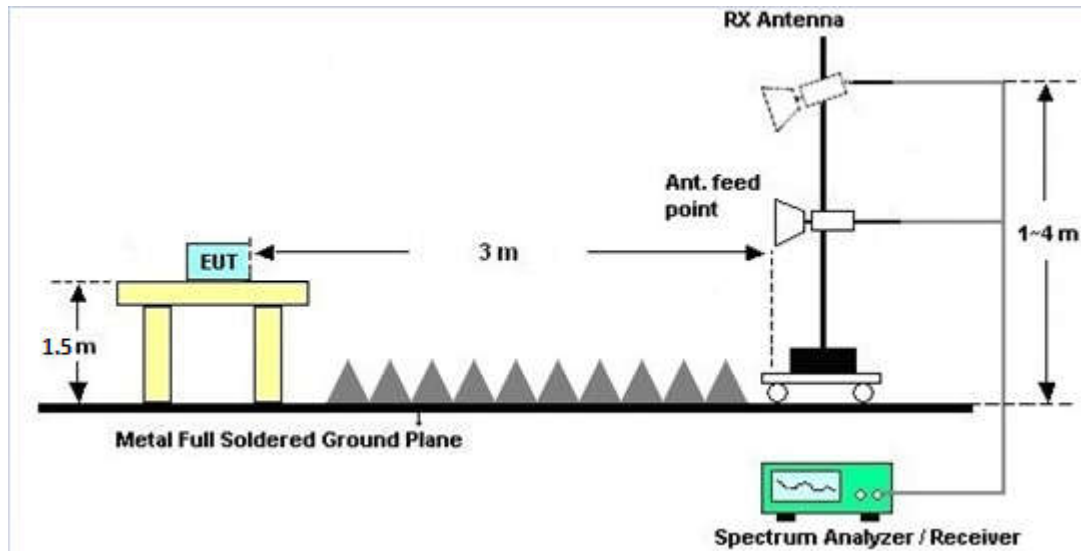
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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

3.2.6 Test Result of Radiated Band Edges

Please refer to Appendix B and C.

3.2.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix B and C.

3.3 Antenna Requirements

3.3.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.3.3 Antenna Gain

<CDD Modes >

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(NANT/NSS=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

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

The EUT supports CDD mode.

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

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

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

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

			DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant. 1 (dBi)	Ant. 2 (dBi)				
Band IV	0.28	-0.36	0.28	0.28	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	DTM-303A	TP157075	N/A	Mar. 06, 2018	Jun. 20, 2018	Mar. 05, 2019	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	1240001	N/A	Sep. 07, 2017	Jun. 20, 2018	Sep. 06, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1207349	300MHz~40GHz	Sep. 07, 2017	Jun. 20, 2018	Sep. 06, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 21, 2017	Jun. 20, 2018	Nov. 20, 2018	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Mar. 01, 2018	Jun. 20, 2018	Feb. 28, 2019	Conducted (TH05-HY)
EMI Test Receiver&SA	Agilent	N9038A	MY52260185	20Hz~26.5GHz	Apr. 19, 2018	Jul. 06, 2018~ Jul. 07, 2018	Apr. 18, 2019	Radiation (03CH01-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	May 14, 2018	Jul. 06, 2018~ Jul. 07, 2018	May 13, 2019	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz-2GHz	Apr. 19, 2018	Jul. 06, 2018~ Jul. 07, 2018	Apr. 18, 2019	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	119436	1GHz~18GHz	Jul. 28, 2017	Jul. 06, 2018~ Jul. 07, 2018	Jul. 27, 2018	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz-40GHz	Mar. 30, 2018	Jul. 06, 2018~ Jul. 07, 2018	Mar. 29, 2019	Radiation (03CH01-SZ)
LF Amplifier	Burgeon	BPA-530	102209	0.01~3000Mhz	Apr. 19, 2018	Jul. 06, 2018~ Jul. 07, 2018	Apr. 18, 2019	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	AMF-7D-001018 00-30-10P-R	1707137	1GHz~18GHz	Oct. 19, 2017	Jul. 06, 2018~ Jul. 07, 2018	Oct. 18, 2018	Radiation (03CH01-SZ)
HF Amplifier	KEYSIGHT	83017A	MY53270104	0.5GHz~26.5GHz	Oct. 19, 2017	Jul. 06, 2018~ Jul. 07, 2018	Oct. 18, 2018	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 18, 2017	Jul. 06, 2018~ Jul. 07, 2018	Jul. 17, 2018	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	6160100019 85	N/A	NCR	Jul. 06, 2018~ Jul. 07, 2018	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Jul. 06, 2018~ Jul. 07, 2018	NCR	Radiation (03CH01-SZ)

NCR: No Calibration Required



5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.8 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.3 dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Lena Lo	Temperature:	21~25	°C
Test Date:	2018/6/20	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Power Table

Band IV														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	0.04	0.06	13.32	13.42		30.00	30.00	0.28	-0.36	Pass
11a	6Mbps	1	157	5785	0.04	0.06	13.47	13.48		30.00	30.00	0.28	-0.36	Pass
11a	6Mbps	1	165	5825	0.04	0.06	13.49	13.17		30.00	30.00	0.28	-0.36	Pass
HT20	MCS0	1	149	5745	0.09	0.07	13.37	13.38		30.00	30.00	0.28	-0.36	Pass
HT20	MCS0	1	157	5785	0.09	0.07	13.43	13.46		30.00	30.00	0.28	-0.36	Pass
HT20	MCS0	1	165	5825	0.09	0.07	13.49	13.49		30.00	30.00	0.28	-0.36	Pass
HT40	MCS0	1	151	5755	0.11	0.14	13.40	13.48		30.00	30.00	0.28	-0.36	Pass
HT40	MCS0	1	159	5795	0.11	0.14	13.44	13.32		30.00	30.00	0.28	-0.36	Pass
VHT20	MCS0	1	149	5745	0.07	0.07	13.33	13.36		30.00	30.00	0.28	-0.36	Pass
VHT20	MCS0	1	157	5785	0.07	0.07	13.42	13.44		30.00	30.00	0.28	-0.36	Pass
VHT20	MCS0	1	165	5825	0.07	0.07	13.47	13.48		30.00	30.00	0.28	-0.36	Pass
VHT40	MCS0	1	151	5755	0.14	0.14	13.38	13.48		30.00	30.00	0.28	-0.36	Pass
VHT40	MCS0	1	159	5795	0.14	0.14	13.43	13.26		30.00	30.00	0.28	-0.36	Pass
VHT80	MCS0	1	155	5775	0.24	0.26	13.45	13.49		30.00	30.00	0.28	-0.36	Pass
HT20	MCS0	2	149	5745	0.11	0.11	10.47	10.24	13.37	30.00		0.28		Pass
HT20	MCS0	2	157	5785	0.11	0.11	10.31	10.45	13.39	30.00		0.28		Pass
HT20	MCS0	2	165	5825	0.11	0.11	10.39	10.48	13.45	30.00		0.28		Pass
HT40	MCS0	2	151	5755	0.16	0.16	10.37	10.52	13.46	30.00		0.28		Pass
HT40	MCS0	2	159	5795	0.16	0.16	10.39	10.23	13.32	30.00		0.28		Pass
VHT20	MCS0	2	149	5745	0.15	0.15	10.19	10.23	13.22	30.00		0.28		Pass
VHT20	MCS0	2	157	5785	0.15	0.15	10.30	10.44	13.38	30.00		0.28		Pass
VHT20	MCS0	2	165	5825	0.15	0.15	10.37	10.47	13.43	30.00		0.28		Pass
VHT40	MCS0	2	151	5755	0.30	0.29	10.06	10.50	13.30	30.00		0.28		Pass
VHT40	MCS0	2	159	5795	0.30	0.29	10.11	10.22	13.18	30.00		0.28		Pass
VHT80	MCS0	2	155	5775	0.54	0.57	10.06	10.64	13.37	30.00		0.28		Pass



Appendix B. Radiated Spurious Emission

Test Engineer :	Vikki He	Temperature :	24~25°C
		Relative Humidity :	48~49%



Band 4 - 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 157 5785MHz		5621.8	49.92	-18.28	68.2	38.49	32.3	12.23	33.1	100	22	P	H
		5682.4	50.47	-41.74	92.21	38.9	32.3	12.37	33.1	100	22	P	H
		5714.6	51.86	-57.43	109.29	40.15	32.3	12.51	33.1	100	22	P	H
		5724.6	50.53	-70.76	121.29	38.82	32.3	12.51	33.1	100	22	P	H
	*	5785	99.05	-	-	87.06	32.3	12.79	33.1	100	22	P	H
	*	5785	92.53	-	-	80.54	32.3	12.79	33.1	100	22	A	H
		5854.2	48.96	-63.66	112.62	36.88	32.3	12.88	33.1	100	22	P	H
		5870.4	49.59	-56.9	106.49	37.42	32.3	12.97	33.1	100	22	P	H
		5907.8	49.66	-31.23	80.89	37.41	32.3	13.05	33.1	100	22	P	H
		5943.2	50.23	-17.97	68.2	37.89	32.3	13.14	33.1	100	22	P	H
		5647.4	49.86	-18.34	68.2	38.43	32.3	12.23	33.1	229	186	P	V
		5692.4	50.22	-49.38	99.6	38.65	32.3	12.37	33.1	229	186	P	V
		5713.4	50.44	-58.51	108.95	38.73	32.3	12.51	33.1	229	186	P	V
		5724.2	49.64	-70.74	120.38	37.93	32.3	12.51	33.1	229	186	P	V
	*	5785	98.4	-	-	86.41	32.3	12.79	33.1	229	186	P	V
	*	5785	91.75	-	-	79.76	32.3	12.79	33.1	229	186	A	V
		5851	48.99	-70.93	119.92	36.91	32.3	12.88	33.1	229	186	P	V
		5859.2	49.98	-59.64	109.62	37.81	32.3	12.97	33.1	229	186	P	V
		5893.6	49.45	-41.95	91.4	37.28	32.3	12.97	33.1	229	186	P	V
		5935.2	50.6	-17.6	68.2	38.26	32.3	13.14	33.1	229	186	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		11570	50.85	-23.15	74	51.06	40.13	14.9	55.24	175	198	P	H
		17355	54.53	-13.67	68.2	51.44	41.49	18.18	56.58	175	198	P	H
		11570	50.66	-23.34	74	50.87	40.13	14.9	55.24	175	198	P	V
		17355	54.65	-13.55	68.2	51.56	41.49	18.18	56.58	175	198	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 - 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 157 5785MHz		5616.2	49.27	-18.93	68.2	37.98	32.3	12.09	33.1	262	323	P	H
		5689.6	50.32	-47.21	97.53	38.75	32.3	12.37	33.1	262	323	P	H
		5710.8	50.14	-58.09	108.23	38.43	32.3	12.51	33.1	262	323	P	H
		5721	50.37	-62.71	113.08	38.66	32.3	12.51	33.1	262	323	P	H
	*	5785	95.74	-	-	83.75	32.3	12.79	33.1	262	323	P	H
	*	5785	89.14	-	-	77.15	32.3	12.79	33.1	262	323	A	H
		5852.4	49.76	-66.97	116.73	37.68	32.3	12.88	33.1	262	323	P	H
		5860.4	49.3	-59.99	109.29	37.13	32.3	12.97	33.1	262	323	P	H
		5895.4	49.56	-40.51	90.07	37.31	32.3	13.05	33.1	262	323	P	H
		5943.2	49.33	-18.87	68.2	36.99	32.3	13.14	33.1	262	323	P	H
		5639.6	51.26	-16.94	68.2	39.83	32.3	12.23	33.1	288	199	P	V
		5689.8	52.91	-44.77	97.68	41.34	32.3	12.37	33.1	288	199	P	V
		5703.8	51.7	-54.57	106.27	39.99	32.3	12.51	33.1	288	199	P	V
		5722.8	52.56	-64.62	117.18	40.85	32.3	12.51	33.1	288	199	P	V
	*	5785	102.73	-	-	90.74	32.3	12.79	33.1	288	199	P	V
	*	5785	96.11	-	-	84.12	32.3	12.79	33.1	288	199	A	V
		5851.6	50.87	-67.68	118.55	38.79	32.3	12.88	33.1	288	199	P	V
		5870.6	50.15	-56.28	106.43	37.98	32.3	12.97	33.1	288	199	P	V
		5887.2	51.37	-44.77	96.14	39.2	32.3	12.97	33.1	288	199	P	V
		5947	50.34	-17.86	68.2	38	32.3	13.14	33.1	288	199	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



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

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		11570	50.44	-23.56	74	50.65	40.13	14.9	55.24	175	198	P	H
		17355	55.79	-12.41	68.2	52.7	41.49	18.18	56.58	175	198	P	H
		11570	50.16	-23.84	74	50.37	40.13	14.9	55.24	175	198	P	V
		17355	55.07	-13.13	68.2	51.98	41.49	18.18	56.58	175	198	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 - 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 157 5785MHz		5611.4	49.51	-18.69	68.2	38.22	32.3	12.09	33.1	200	147	P	H
		5696	49.54	-52.71	102.25	37.97	32.3	12.37	33.1	200	147	P	H
		5709.6	49.55	-58.34	107.89	37.84	32.3	12.51	33.1	200	147	P	H
		5721.6	49.65	-64.8	114.45	37.94	32.3	12.51	33.1	200	147	P	H
	*	5785	98.08	-	-	86.09	32.3	12.79	33.1	200	147	P	H
	*	5785	91.55	-	-	79.56	32.3	12.79	33.1	200	147	A	H
		5853.2	48.94	-65.96	114.9	36.86	32.3	12.88	33.1	200	147	P	H
		5870.2	50	-56.54	106.54	37.83	32.3	12.97	33.1	200	147	P	H
		5923	49.88	-19.79	69.67	37.63	32.3	13.05	33.1	200	147	P	H
		5945.4	50.03	-18.17	68.2	37.69	32.3	13.14	33.1	200	147	P	H
		5618.2	49.5	-18.7	68.2	38.21	32.3	12.09	33.1	197	196	P	V
		5685.4	50.44	-43.99	94.43	38.87	32.3	12.37	33.1	197	196	P	V
		5709.8	50.01	-57.94	107.95	38.3	32.3	12.51	33.1	197	196	P	V
		5721.2	49.85	-63.69	113.54	38.14	32.3	12.51	33.1	197	196	P	V
	*	5785	103.07	-	-	91.08	32.3	12.79	33.1	197	196	P	V
	*	5785	96.75	-	-	84.76	32.3	12.79	33.1	197	196	A	V
		5850.6	49.52	-71.31	120.83	37.44	32.3	12.88	33.1	197	196	P	V
		5870.8	50.98	-55.39	106.37	38.81	32.3	12.97	33.1	197	196	P	V
		5913.2	49.47	-27.43	76.9	37.22	32.3	13.05	33.1	197	196	P	V
		5942.4	49.87	-18.33	68.2	37.53	32.3	13.14	33.1	197	196	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



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

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		11570	50.5	-23.5	74	50.71	40.13	14.9	55.24	175	198	P	H
		17355	55.02	-13.18	68.2	51.93	41.49	18.18	56.58	175	198	P	H
		11570	50.77	-23.23	74	50.98	40.13	14.9	55.24	175	198	P	V
		17355	55.49	-12.71	68.2	52.4	41.49	18.18	56.58	175	198	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

Emission below 1GHz

5GHz WIFI 802.11n HT20 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT20 LF		30	22.69	-17.31	40	29.76	24.3	0.23	31.6			P	H
		263.77	32.15	-13.85	46	41.48	19.79	1.91	31.03			P	H
		288.99	32.38	-13.62	46	42.43	19.03	2	31.08	100	47	P	H
		386.96	31.77	-14.23	46	39.14	21.38	2.35	31.1			P	H
		418.97	28.19	-17.81	46	34.78	22.05	2.46	31.1			P	H
		700.27	30.55	-15.45	46	33.38	25.1	3.27	31.2			P	H
		70.74	23.24	-16.76	40	41.56	12.69	0.59	31.6			P	V
		263.77	30.48	-15.52	46	39.81	19.79	1.91	31.03			P	V
		386.96	29.94	-16.06	46	37.31	21.38	2.35	31.1			P	V
		570.29	33.84	-12.16	46	37.79	24.34	2.91	31.2	100	28	P	V
		638.19	29.65	-16.35	46	32.88	24.85	3.12	31.2			P	V
		835.1	29.51	-16.49	46	30.77	26.37	3.67	31.3			P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Band 4 5725~5850MHz

Note symbol

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



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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



Appendix C. Radiated Spurious Emission Plots

Note symbol

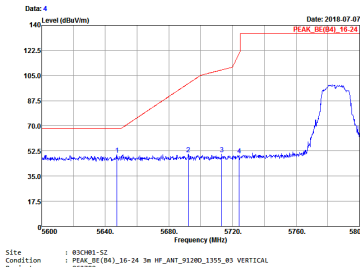
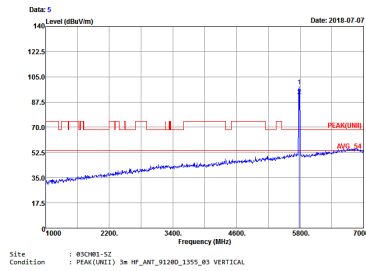
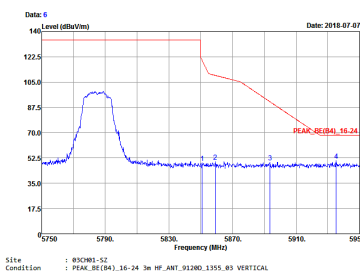
-L	Low channel location
-R	High channel location



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

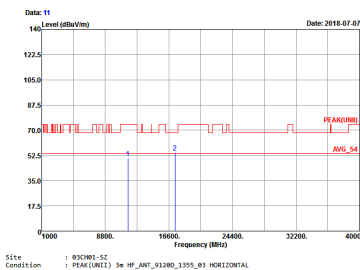
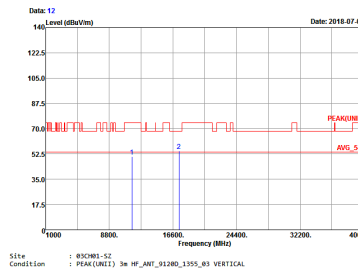
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak	Site Date: 2018-07-07 Condition: 802.11n HT20 CH157 5785MHz PEAK (dBm) 16.24	Site Date: 2018-07-07 Condition: 802.11n HT20 CH157 5785MHz PEAK (dBm) 16.24
Peak	Site Date: 2018-07-07 Condition: 802.11n HT20 CH157 5785MHz PEAK (dBm) 16.24	



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak	Peak  Site Condition : 802.11n-S2 PEAK_RE(B4)_16-24 3m HP_ANT_912ND_1355_03 VERTICAL	 Site Condition : 802.11n-S2 PEAK (UNIT) 3m HP_ANT_912ND_1355_03 VERTICAL
Peak	 Site Condition : 802.11n-S2 PEAK_RE(B4)_16-24 3m HP_ANT_912ND_1355_03 VERTICAL	

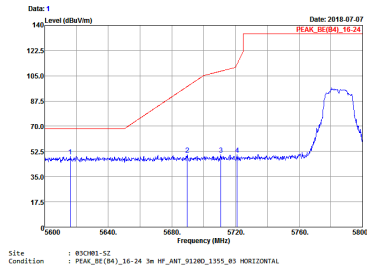
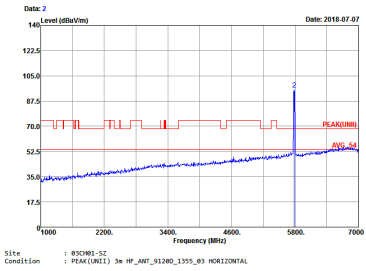
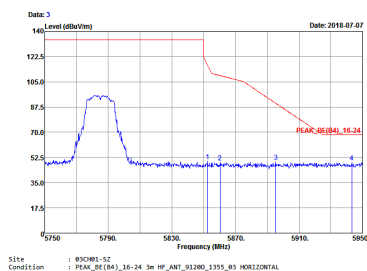


Band 4 - 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 83CH01-SZ Condition : PEAK(UNIT) 3m HP_ANT_91280_1355_03 HORIZONTAL	 Site : 83CH01-SZ Condition : PEAK(UNIT) 3m HP_ANT_91280_1355_03 VERTICAL



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

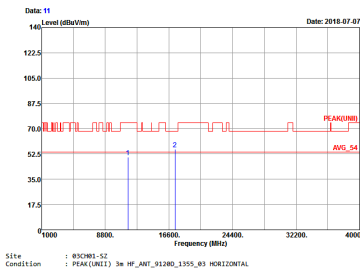
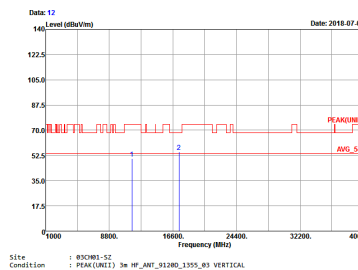
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
2	Horizontal	Fundamental
Peak	 Site Condition : 802.11a-52 : PEAK_RE(BA)_16-24 3m HP_ANT_91280_1355_83 HORIZONTAL	 Site Condition : 802.11a-52 : PEAK (LINE) 3m HP_ANT_91280_1355_83 HORIZONTAL
Peak	 Site Condition : 802.11a-52 : PEAK_RE(BA)_16-24 3m HP_ANT_91280_1355_83 HORIZONTAL	



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
2	Vertical	Fundamental
Peak	Peak Site : 03CM1-SZ Condition : PEAK_RE(B4)_16-24 3m HP_ANT_912ND_1355_03 VERTICAL	Site : 03CM1-SZ Condition : PEAK_RE(B4)_16-24 3m HP_ANT_912ND_1355_03 VERTICAL
Peak	Site : 03CM1-SZ Condition : PEAK_RE(B4)_16-24 3m HP_ANT_912ND_1355_03 VERTICAL	

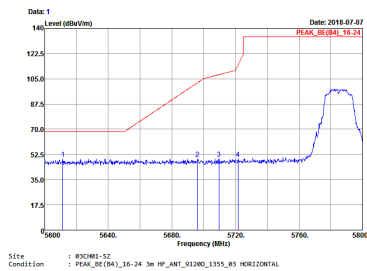
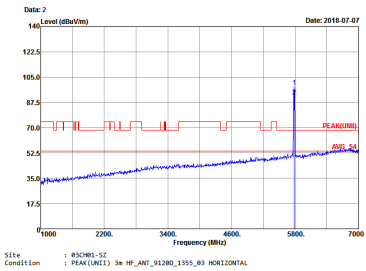
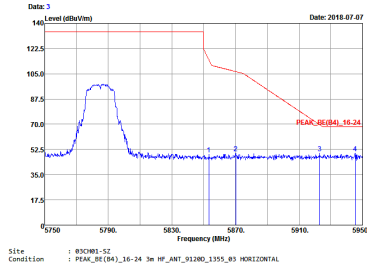


Band 4 - 5725~5850MHz
WIFI 802.11a (Harmonic @ 3m)

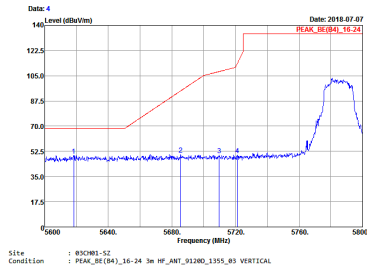
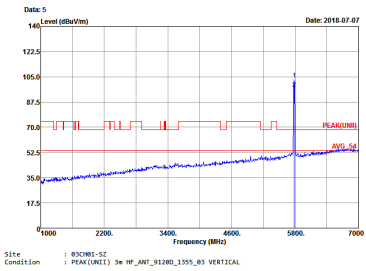
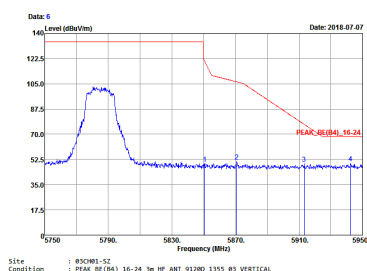
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 83CM1-SZ Condition : PEAK (UNIT) 3m HP_ANT_91280_1355_03 HORIZONTAL	 Site : 83CM1-SZ Condition : PEAK (UNIT) 3m HP_ANT_91280_1355_03 VERTICAL



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

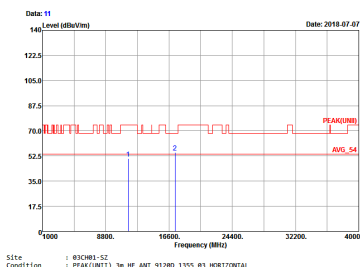
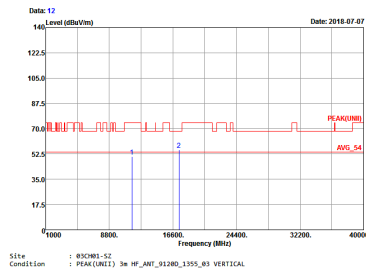
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site Condition : 03CH01-S2 : PEAK_RE(BA)_16-24 3m HP_ANT_91280_1355_83 HORIZONTAL	 Site Condition : 03CH01-S2 : PEAK (LINE) 3m HP_ANT_91280_1355_83 HORIZONTAL
Peak	 Site Condition : 03CH01-S2 : PEAK_RE(BA)_16-24 3m HP_ANT_91280_1355_83 HORIZONTAL	



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	Peak 	
Peak		



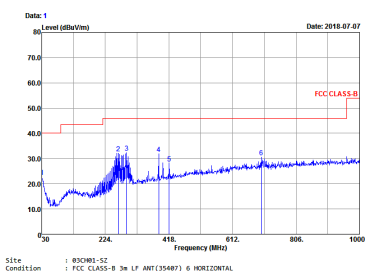
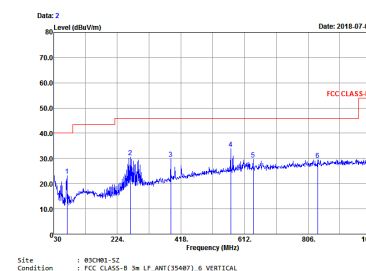
Band 4 - 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

Emission below 1GHz

5GHz WIFI 802.11a (LF)

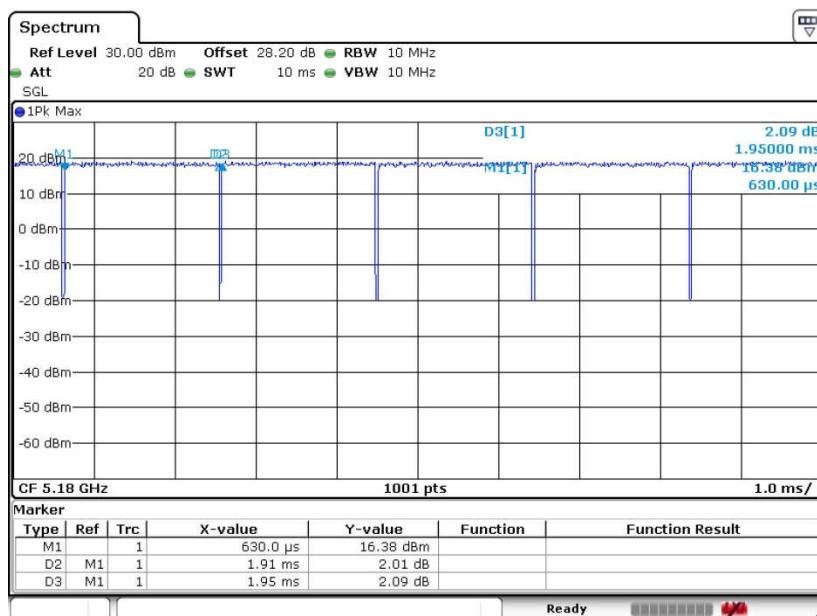
WIFI	5GHz 5725~5850MHz	
ANT	802.11a LF	
2	Horizontal	Vertical
QP / Peak	 Site Condition : B3C081-SZ : FCC CLASS-B 3m LF ANT(35487) 6 HORIZONTAL	 Site Condition : B3C081-SZ : FCC CLASS-B 3m LF ANT(35487) 6 VERTICAL

Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	5GHz 802.11n HT20	97.95	1.910	0.524	1KHz
2	802.11a	98.56	-	-	10Hz
1+2	5GHz 802.11n HT20 for Ant.1	97.45	1.910	0.524	1KHz
1+2	5GHz 802.11n HT20 for Ant.2	97.45	1.910	0.524	1KHz

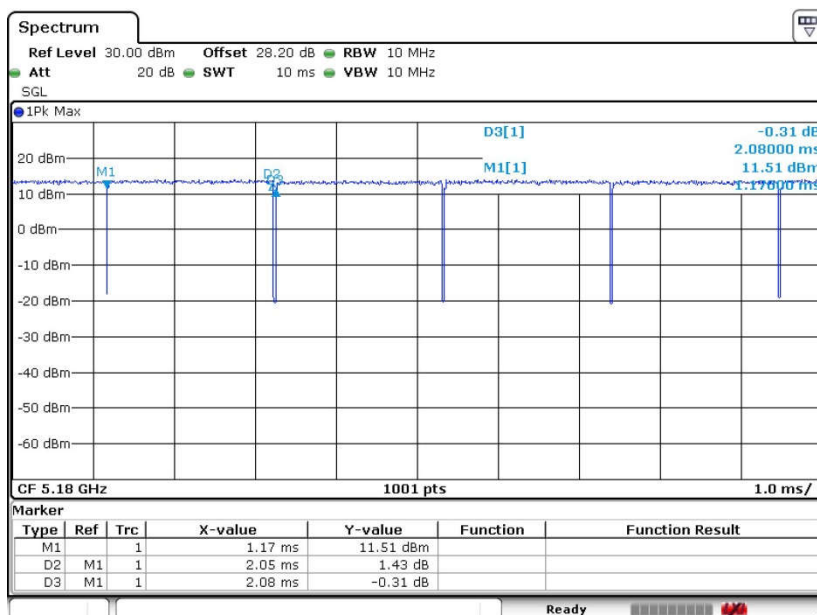
<Ant. 1>

802.11n HT20



<Ant. 2>

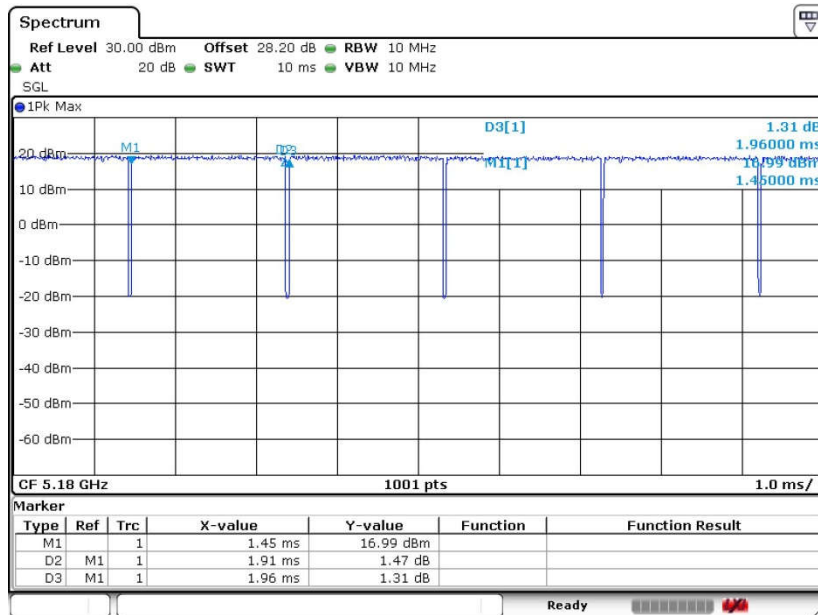
802.11a



Date: 19.JUN.2018 11:52:27

<MIMO Ant. 1>

802.11n HT20



<MIMO Ant. 2>

802.11n HT20

