



# FCC RADIO TEST REPORT

FCC ID : A4RG025I  
Equipment : Phone  
Model Name : G025I, G025H  
Applicant : Google LLC  
1600 Amphitheatre Parkway,  
Mountain View, California, 94043 USA  
Standard : FCC Part 15 Subpart E §15.407

The product was received on May 08, 2020 and testing was started from Jun. 11, 2020 and completed on Jul. 02, 2020. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, 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 variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Louis Wu

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**

*No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)*



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### History of this test report

Report No.	Version	Description	Issued Date
FR022521-04E	01	Initial issue of report	Jul. 10, 2020
FR022521-04E	02	Revising the remark description in summary.	Jul. 23, 2020



### Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.403(i)	26dB Bandwidth	Not Required	-
-	2.1049	99% Occupied Bandwidth	Not Required	-
3.1	15.407(a)	Maximum Conducted Output Power	Pass	-
-	15.407(a)	Power Spectral Density	Not Required	-
3.2	15.407(b)	Unwanted Emissions	Pass	Under limit 1.54 dB at 5149.760 MHz
-	15.207	AC Conducted Emission	Not Required	-
-	15.407(c)	Automatically Discontinue Transmission	Not Required	-
3.3	15.203 15.407(a)	Antenna Requirement	Pass	-

**Note:**

1. Not required means after assessing, test items are not necessary to carry out.
2. This is a variant report which can be referred Product Equality Declaration. After spot-checking the tests, the parent test results were worse than variant test results, thus this test report was reuse parent test data, all the test cases were performed on original report which can be referred to Sporton Report Number FR022521-02E.

<b>Declaration of Conformity:</b>
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
<b>Comments and Explanations:</b>
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

**Reviewed by: Wii Chang**  
**Report Producer: Cindy Liu**



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Phone
Model Name	G025I, G025H
FCC ID	A4RG025I
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/NFC/GNSS/5G NR WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE

**Remark:** The above EUT's information was declared by manufacturer.

EUT Information List	
S/N	Performed Test Item
04271FQCB00001	RF Conducted Measurement
04241FQCB00343	Radiated Spurious Emission



### 1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
<b>Tx/Rx Frequency Range</b>	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5720 MHz
<b>Maximum Output Power</b>	<p><b>&lt;5180 MHz ~ 5240 MHz&gt;</b></p> <p><b>&lt;Ant. 4&gt;</b>  802.11a : 17.00 dBm / 0.0501 W  802.11n HT20 : 17.20 dBm / 0.0525 W  802.11n HT40 : 17.30 dBm / 0.0537 W  802.11ac VHT20: 17.10 dBm / 0.0501 W  802.11ac VHT40: 17.20 dBm / 0.0525 W  802.11ac VHT80: 12.80 dBm / 0.0191 W</p> <p><b>&lt;Ant. 3&gt;</b>  802.11a : 16.80 dBm / 0.0479 W  802.11n HT20 : 17.20 dBm / 0.0525 W  802.11n HT40 : 17.00 dBm / 0.0501 W  802.11ac VHT20: 17.10 dBm / 0.0501 W  802.11ac VHT40: 16.90 dBm / 0.0490 W  802.11ac VHT80: 12.90 dBm / 0.0195 W</p> <p><b>MIMO &lt;Ant. 4 + 3&gt;</b>  802.11a : 19.86 dBm / 0.0968 W  802.11n HT20 : 20.21 dBm / 0.1050 W  802.11n HT40 : 20.16 dBm / 0.1038 W  802.11ac VHT20: 20.11 dBm / 0.1026 W  802.11ac VHT40: 20.06 dBm / 0.1014 W  802.11ac VHT80: 15.86 dBm / 0.0385 W</p> <p><b>&lt;5260 MHz ~ 5320 MHz&gt;</b></p> <p><b>&lt;Ant. 4&gt;</b>  802.11a : 17.30 dBm / 0.0537 W  802.11n HT20 : 17.20 dBm / 0.0525 W  802.11n HT40 : 17.20 dBm / 0.0525 W  802.11ac VHT20: 17.10 dBm / 0.0501 W  802.11ac VHT40: 17.10 dBm / 0.0501 W  802.11ac VHT80: 12.00 dBm / 0.0158 W</p> <p><b>&lt;Ant. 3&gt;</b>  802.11a : 16.90 dBm / 0.0490 W  802.11n HT20 : 16.90 dBm / 0.0490 W  802.11n HT40 : 16.90 dBm / 0.0490 W  802.11ac VHT20: 16.80 dBm / 0.0479 W  802.11ac VHT40: 16.80 dBm / 0.0479 W  802.11ac VHT80: 11.80 dBm / 0.0151 W</p> <p><b>MIMO &lt;Ant. 4 + 3&gt;</b>  802.11a : 20.06 dBm / 0.1014 W  802.11n HT20 : 20.06 dBm / 0.1014 W  802.11n HT40 : 20.06 dBm / 0.1014 W  802.11ac VHT20: 19.96 dBm / 0.0991 W  802.11ac VHT40: 19.96 dBm / 0.0991 W  802.11ac VHT80: 14.91 dBm / 0.0310 W</p>



Standards-related Product Specification							
<b>Maximum Output Power</b>	<p><b>&lt;5500 MHz ~ 5720 MHz&gt;</b>  <b>&lt;Ant. 4&gt;</b>            802.11a : 17.10 dBm / 0.0513 W            802.11n HT20 : 17.10 dBm / 0.0513 W            802.11n HT40 : 16.90 dBm / 0.0490 W            802.11ac VHT20: 17.00 dBm / 0.0501 W            802.11ac VHT40: 16.80 dBm / 0.0479 W            802.11ac VHT80: 16.90 dBm / 0.0490 W  <b>&lt;Ant. 3&gt;</b>            802.11a : 17.40 dBm / 0.0550 W            802.11n HT20 : 17.60 dBm / 0.0575 W            802.11n HT40 : 17.30 dBm / 0.0537 W            802.11ac VHT20: 17.50 dBm / 0.0562 W            802.11ac VHT40: 17.20 dBm / 0.0525 W            802.11ac VHT80: 16.70 dBm / 0.0468 W  <b>MIMO &lt;Ant. 4 + 3&gt;</b>            802.11a : 20.26 dBm / 0.1062 W            802.11n HT20 : 20.32 dBm / 0.1076 W            802.11n HT40 : 20.11 dBm / 0.1026 W            802.11ac VHT20: 20.22 dBm / 0.1052 W            802.11ac VHT40: 20.01 dBm / 0.1002 W            802.11ac VHT80: 19.81 dBm / 0.0957 W</p>						
<b>Type of Modulation</b>	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)						
<b>Antenna Type / Gain</b>	<p><b>&lt;5180 MHz ~ 5240 MHz&gt;</b>  <b>Ant. 4</b> : Monopole Antenna with gain -0.60 dBi  <b>Ant. 3</b> : PIFA Antenna with gain -0.20 dBi  <b>&lt;5260 MHz ~ 5320 MHz&gt;</b>  <b>Ant. 4</b> : Monopole Antenna with gain -0.80 dBi  <b>Ant. 3</b> : PIFA Antenna with gain -0.40 dBi  <b>&lt;5500 MHz ~ 5720 MHz &gt;</b>  <b>Ant. 4</b> : Monopole Antenna with gain -1.50 dBi  <b>Ant. 3</b> : PIFA Antenna with gain -0.70 dBi</p>						
<b>Antenna Function Description</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%;">Ant. 4</th> <th style="width: 25%;">Ant. 3</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">802.11 n/ac MIMO</td> <td style="text-align: center;">V</td> <td style="text-align: center;">V</td> </tr> </tbody> </table>		Ant. 4	Ant. 3	802.11 n/ac MIMO	V	V
	Ant. 4	Ant. 3					
802.11 n/ac MIMO	V	V					

**Note:** MIMO Ant. 4+3 is a calculated result from sum of the power MIMO Ant. 4 and MIMO Ant. 3.



### 1.3 Modification of EUT

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

### 1.4 Testing Location

<b>Test Site</b>	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
<b>Test Site Location</b>	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
<b>Test Site No.</b>	<b>Sporton Site No.</b>	
	TH05-HY	03CH07-HY

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

FCC designation No.: TW1190

### 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 414788 D01 Radiated Test Site v01r01.
- ♦ 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. The TAF code is not including all the FCC KDB listed without accreditation.
3. 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) were recorded in this report.

### 2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42 <sup>#</sup>	5210		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	54*	5270	62*	5310
	56	5280	64	5320
	58 <sup>#</sup>	5290		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5470-5725 MHz Band 3 (U-NII-2C)	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	106 <sup>#</sup>	5530	134*	5670
	108	5540	136	5680
	110*	5550	140	5700



Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
TDWR Channel	118*	5590	124	5620
	120	5600	126*	5630
	122 <sup>#</sup>	5610	128	5640

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	138 <sup>#</sup>	5690	144	5720
	142*	5710		

**Note:**

1. The above Frequency and Channel in "\*" were 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel in "<sup>#</sup>" were 802.11ac VHT80.

## 2.2 Test Mode

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

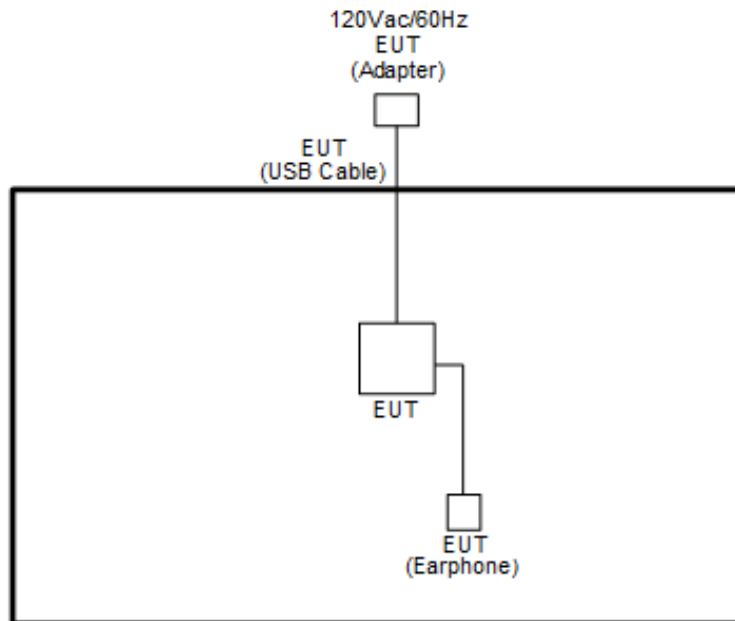
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

Ch. #		Band I : 5150-5250 MHz	Band II : 5250-5350 MHz	Band III : 5470-5725MHz
		802.11ac VHT80	802.11n HT40	802.11n HT40
L	Low	-	-	102
M	Middle	42	-	-
H	High	-	62	-

1. For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.
2. For Radiated Test Cases, the tests were performed with Adapter 1 and USB Cable 1

## 2.3 Connection Diagram of Test System

<WLAN Tx Mode>



## 2.4 EUT Operation Test Setup

The RF test items, utility "QRCT4 v4.0.00158.0" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to 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

<FCC 14-30 CFR 15.407>

**For the 5.15–5.25 GHz bands:**

- For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

**For the 5.25–5.725 GHz bands:**

- The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

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.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

##### 3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

### 3.1.3 Test Procedures

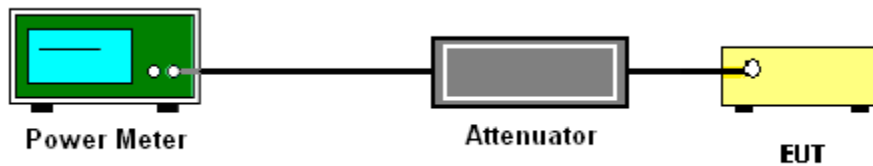
The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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

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

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

### 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 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

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

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

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

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



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

(3) KDB789033 D02 v02r01 G)2)c)

- (i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.
- (ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

### 3.2.2 Measuring Instruments

See list of measuring equipment 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 ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

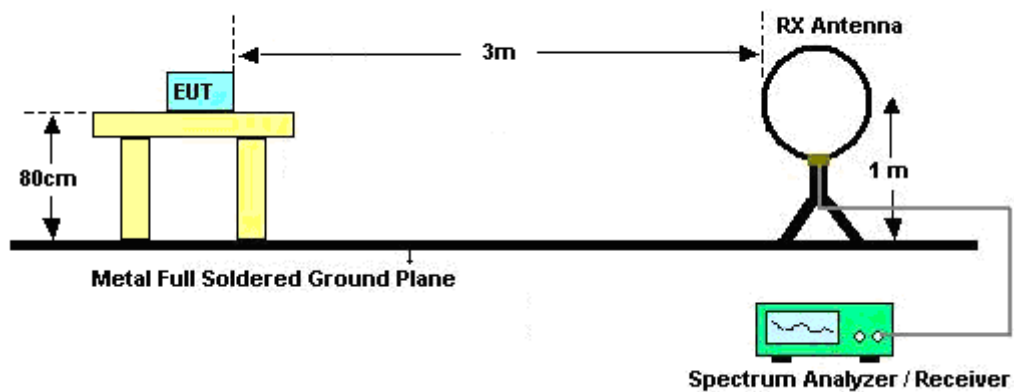
(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

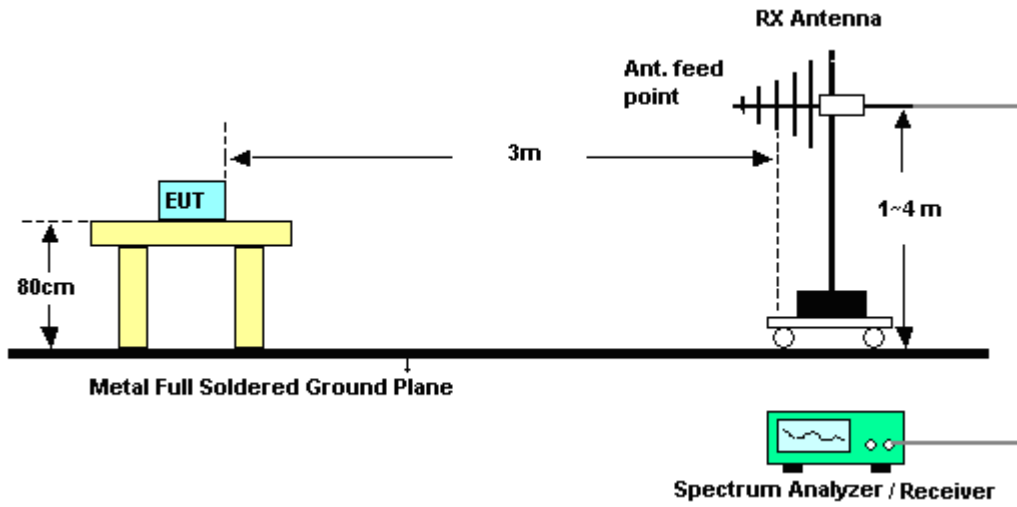
### 3.2.4 Test Setup

**For radiated emissions below 30MHz**

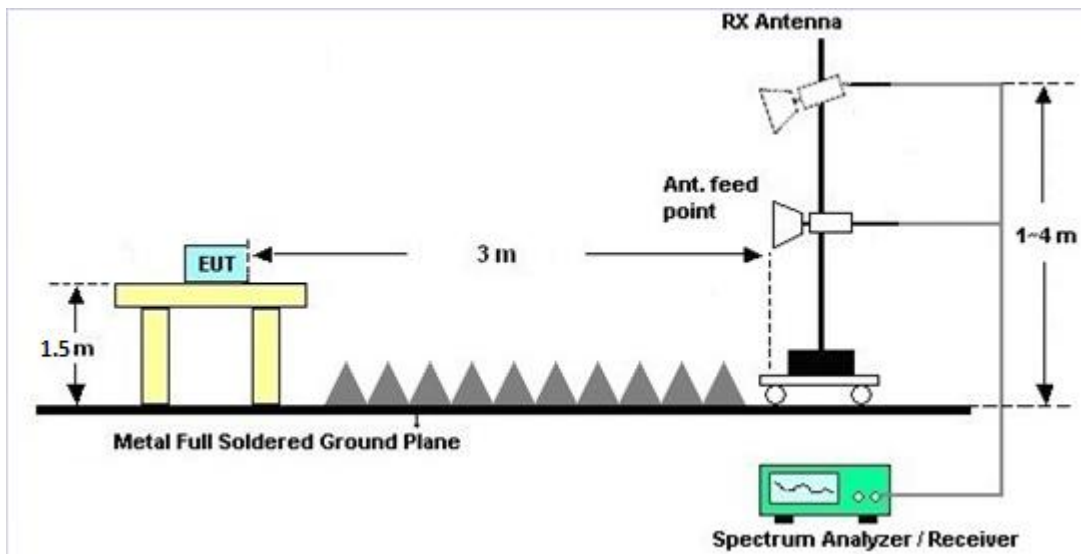




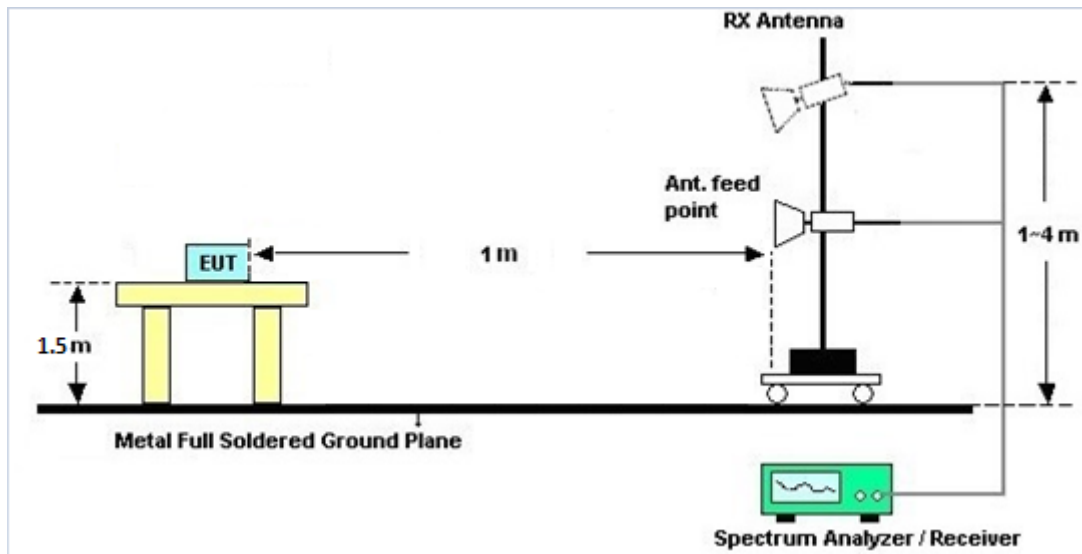
For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



For radiated emissions above 18GHz



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

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

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

### 3.2.6 Test Result of Radiated Spurious at 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 Radiated Spurious Emissions (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**

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



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DYM-303B	P161250	N/A	May 08, 2020	Jun. 18, 2020	May 07, 2021	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO 10	10MHz~6GHz	Dec. 23, 2019	Jun. 18, 2020	Dec. 22, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Aug. 14, 2019	Jun. 18, 2020	Aug. 13, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Aug. 22, 2019	Jun. 18, 2020	Aug. 21, 2020	Conducted (TH05-HY)
Power Supply	GW Instek	SPS-606	GES842931	NA	Aug. 19, 2019	Jun. 18, 2020	Aug. 18, 2020	Conducted (TH05-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	35419 & 03	30MHz~1GHz	Apr. 29, 2020	Jun. 11, 2020~ Jul. 02, 2020	Apr. 28, 2021	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 06, 2019	Jun. 11, 2020~ Jul. 02, 2020	Dec. 05, 2020	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz~26.5GHz	Jan. 18, 2020	Jun. 11, 2020~ Jul. 02, 2020	Jan. 17, 2021	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Jun. 11, 2020~ Jul. 02, 2020	Dec. 25, 2020	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 23, 2020	Jun. 11, 2020~ Jul. 02, 2020	Apr. 22, 2021	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	May 19, 2020	Jun. 11, 2020~ Jul. 02, 2020	May 18, 2021	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Nov. 01, 2019	Jun. 11, 2020~ Jul. 02, 2020	Oct. 31, 2020	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2,80 1606/2	18GHz~40GHz	Feb. 25, 2020	Jun. 11, 2020~ Jul. 02, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4, MY28655/4	9kHz~30MHz	Feb. 25, 2020	Jun. 11, 2020~ Jul. 02, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	30MHz~1GHz	Feb. 25, 2020	Jun. 11, 2020~ Jul. 02, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4, MY24971/4, MY15682/4	1GHz~18GHz	Feb. 25, 2020	Jun. 11, 2020~ Jul. 02, 2020	Feb. 24, 2021	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Jun. 11, 2020~ Jul. 02, 2020	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF780208368	Control Ant Mast	N/A	Jun. 11, 2020~ Jul. 02, 2020	N/A	Radiation (03CH07-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Jun. 11, 2020~ Jul. 02, 2020	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Jun. 11, 2020~ Jul. 02, 2020	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	N/A	Jun. 11, 2020~ Jul. 02, 2020	N/A	Radiation (03CH07-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 28, 2019	Jun. 11, 2020~ Jul. 02, 2020	Oct. 27, 2020	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917058 4	18GHz~40GHz	Dec. 10, 2019	Jun. 11, 2020~ Jul. 02, 2020	Dec. 09, 2020	Radiation (03CH07-HY)
Software	Audix	E3 6.2009-8-24	N/A	N/A	N/A	Jun. 11, 2020~ Jul. 02, 2020	N/A	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 13, 2019	Jun. 11, 2020~ Jul. 02, 2020	Dec. 12, 2020	Radiation (03CH07-HY)



## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.6
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.2
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.3
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**Appendix A. Test Result of Conducted Test Items**

Test Engineer:	Kathy Chen	Temperature:	20.1~22.1	°C
Test Date:	2020/6/18	Relative Humidity:	45.7~58.8	%

**TEST RESULTS DATA**  
**Average Power Table**

FCC Band I MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
11a	6Mbps	2	36	5180	16.80	16.80	19.81	24.00		-0.20	Pass	
11a	6Mbps	2	44	5220	16.90	16.80	19.86	24.00		-0.20	Pass	
11a	6Mbps	2	48	5240	17.00	16.70	19.86	24.00		-0.20	Pass	
HT20	MCS0	2	36	5180	17.00	17.20	20.11	24.00		-0.20	Pass	
HT20	MCS0	2	44	5220	17.20	17.20	20.21	24.00		-0.20	Pass	
HT20	MCS0	2	48	5240	17.20	16.90	20.06	24.00		-0.20	Pass	
HT40	MCS0	2	38	5190	13.10	13.40	16.26	24.00		-0.20	Pass	
HT40	MCS0	2	46	5230	17.30	17.00	20.16	24.00		-0.20	Pass	
VHT20	MCS0	2	36	5180	16.90	17.10	20.01	24.00		-0.20	Pass	
VHT20	MCS0	2	44	5220	17.10	17.10	20.11	24.00		-0.20	Pass	
VHT20	MCS0	2	48	5240	17.10	16.80	19.96	24.00		-0.20	Pass	
VHT40	MCS0	2	38	5190	13.00	13.30	16.16	24.00		-0.20	Pass	
VHT40	MCS0	2	46	5230	17.20	16.90	20.06	24.00		-0.20	Pass	
VHT80	MCS1	2	42	5210	12.80	12.90	15.86	24.00		-0.20	Pass	



**TEST RESULTS DATA**  
**Average Power Table**

FCC Band II MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3		
11a	6Mbps	2	52	5260	16.90	16.60	19.76	23.98		-0.40		30	Pass
11a	6Mbps	2	60	5300	17.30	16.70	20.02	23.98		-0.40		30	Pass
11a	6Mbps	2	64	5320	17.20	16.90	20.06	23.98		-0.40		30	Pass
HT20	MCS0	2	52	5260	17.20	16.90	20.06	23.98		-0.40		30	Pass
HT20	MCS0	2	60	5300	17.10	16.60	19.87	23.98		-0.40		30	Pass
HT20	MCS0	2	64	5320	17.10	16.70	19.91	23.98		-0.40		30	Pass
HT40	MCS0	2	54	5270	17.20	16.90	20.06	23.98		-0.40		30	Pass
HT40	MCS0	2	62	5310	13.70	13.20	16.47	23.98		-0.40		30	Pass
VHT20	MCS0	2	52	5260	17.10	16.80	19.96	23.98		-0.40		30	Pass
VHT20	MCS0	2	60	5300	17.00	16.50	19.77	23.98		-0.40		30	Pass
VHT20	MCS0	2	64	5320	17.00	16.60	19.81	23.98		-0.40		30	Pass
VHT40	MCS0	2	54	5270	17.10	16.80	19.96	23.98		-0.40		30	Pass
VHT40	MCS0	2	62	5310	13.60	13.10	16.37	23.98		-0.40		30	Pass
VHT80	MCS1	2	58	5290	12.00	11.80	14.91	23.98		-0.40		30	Pass

**TEST RESULTS DATA**  
**Average Power Table**

FCC Band III MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3		
11a	6Mbps	2	100	5500	17.10	16.80	19.96	23.98		-0.70		30	Pass
11a	6Mbps	2	116	5580	17.10	17.40	20.26	23.98		-0.70		30	Pass
11a	6Mbps	2	140	5700	16.60	17.30	19.97	23.98		-0.70		30	Pass
HT20	MCS0	2	100	5500	17.00	16.80	19.91	23.98		-0.70		30	Pass
HT20	MCS0	2	116	5580	17.10	17.40	20.26	23.98		-0.70		30	Pass
HT20	MCS0	2	140	5700	17.00	17.60	20.32	23.98		-0.70		30	Pass
HT40	MCS0	2	102	5510	15.30	15.40	18.36	23.98		-0.70		30	Pass
HT40	MCS0	2	110	5550	16.90	17.30	20.11	23.98		-0.70		30	Pass
HT40	MCS0	2	134	5670	16.40	17.30	19.88	23.98		-0.70		30	Pass
VHT20	MCS0	2	100	5500	16.90	16.70	19.81	23.98		-0.70		30	Pass
VHT20	MCS0	2	116	5580	17.00	17.30	20.16	23.98		-0.70		30	Pass
VHT20	MCS0	2	140	5700	16.90	17.50	20.22	23.98		-0.70		30	Pass
VHT40	MCS0	2	102	5510	15.20	15.30	18.26	23.98		-0.70		30	Pass
VHT40	MCS0	2	110	5550	16.80	17.20	20.01	23.98		-0.70		30	Pass
VHT40	MCS0	2	134	5670	16.30	17.20	19.78	23.98		-0.70		30	Pass
VHT80	MCS1	2	106	5530	12.00	12.20	15.11	23.98		-0.70		30	Pass
VHT80	MCS1	2	122	5610	16.90	16.70	19.81	23.98		-0.70		30	Pass

FCC Band III straddle channel MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3		
11a	6Mbps	2	144	5720	16.50	17.40	19.98	23.36		-0.70		30	Pass
HT20	MCS0	2	144	5720	16.40	17.40	19.94	23.59		-0.70		30	Pass
HT40	MCS0	2	142	5710	16.40	17.20	19.83	23.98		-0.70		30	Pass
VHT20	MCS0	2	144	5720	16.30	17.30	19.84	23.59		-0.70		30	Pass
VHT40	MCS0	2	142	5710	16.30	17.10	19.73	23.98		-0.70		30	Pass
VHT80	MCS1	2	138	5690	16.90	16.10	19.53	23.98		-0.70		30	Pass



## Appendix B. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	23~26°C
		Relative Humidity :	45~52%

### Band 1 - 5150~5250MHz

#### WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant.	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level ( dBμV )	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. ( P/A )	Pol. ( H/V )
802.11ac VHT80 CH 42 5210MHz		5149.76	60.3	-13.7	74	49.76	34.4	11.56	35.42	100	281	P	H
		5149.76	52.46	-1.54	54	41.92	34.4	11.56	35.42	100	281	A	H
	*	5210	100.13	-	-	89.42	34.5	11.61	35.4	100	281	P	H
	*	5210	93.84	-	-	83.13	34.5	11.61	35.4	100	281	A	H
		5351.64	49.74	-24.26	74	38.83	34.5	11.76	35.35	100	281	P	H
		5354.16	41.4	-12.6	54	30.49	34.5	11.76	35.35	100	281	A	H
		5126.36	51.17	-22.83	74	40.69	34.37	11.54	35.43	395	225	P	V
		5143.52	42.98	-11.02	54	32.45	34.4	11.55	35.42	395	225	A	V
	*	5210	99.33	-	-	88.62	34.5	11.61	35.4	395	225	P	V
	*	5210	91.55	-	-	80.84	34.5	11.61	35.4	395	225	A	V
	5452.44	49.44	-24.56	74	38.19	34.7	11.87	35.32	395	225	P	V	
	5368.44	41.24	-12.76	54	30.23	34.57	11.78	35.34	395	225	A	V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**Band 1 5150~5250MHz  
WIFI 802.11ac VHT80 (Harmonic @ 3m)**

WIFI Ant. 4+3	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level (dBμV)	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. (P/A)	Pol. (H/V)	
802.11ac VHT80 CH 42 5210MHz		10420	43.92	-24.28	68.2	47.76	37.52	17.63	58.99	100	0	P	H	
		15630	46.99	-27.01	74	41.64	40.4	21.71	56.76	100	0	P	H	
													H	
													H	
			10420	44.31	-23.89	68.2	48.15	37.52	17.63	58.99	100	0	P	V
			15630	46.8	-27.2	74	41.45	40.4	21.71	56.76	100	0	P	V
														V
													V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



**Band 2 - 5250~5350MHz**

**WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4+3		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11n HT40 CH 62 5310MHz		5083.65	48.57	-25.43	74	38.28	34.23	11.5	35.44	100	299	P	H
		5136.15	40.86	-13.14	54	30.36	34.37	11.55	35.42	100	299	A	H
	*	5310	104.1	-	-	93.11	34.63	11.72	35.36	100	299	P	H
	*	5310	96.22	-	-	85.23	34.63	11.72	35.36	100	299	A	H
		5350.8	56.59	-17.41	74	45.68	34.5	11.76	35.35	100	299	P	H
		5351.28	50.73	-3.27	54	39.82	34.5	11.76	35.35	100	299	A	H
		5030.45	48.54	-25.46	74	38.44	34.1	11.46	35.46	278	59	P	V
		5122.85	40.71	-13.29	54	30.24	34.37	11.53	35.43	278	59	A	V
	*	5310	101.32	-	-	90.33	34.63	11.72	35.36	278	59	P	V
	*	5310	94.21	-	-	83.22	34.63	11.72	35.36	278	59	A	V
		5352.72	49.94	-24.06	74	39.03	34.5	11.76	35.35	278	59	P	V
		5352.72	44.44	-9.56	54	33.53	34.5	11.76	35.35	278	59	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**Band 2 5250~5350MHz  
WIFI 802.11n HT40 (Harmonic @ 3m)**

WIFI Ant. 4+3	Note	Frequency ( MHz )	Level ( dBμV/m )	Over Limit ( dB )	Limit Line ( dBμV/m )	Read Level (dBμV)	Antenna Factor ( dB/m )	Path Loss ( dB )	Preamp Factor ( dB )	Ant Pos ( cm )	Table Pos ( deg )	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40		10620	44.11	-29.89	74	47.58	37.62	17.78	58.87	100	0	P	H
		15930	46.8	-27.2	74	40.8	40.8	21.91	56.71	100	0	P	H
													H
													H
CH 62 5310MHz		10620	44.79	-29.21	74	48.26	37.62	17.78	58.87	100	0	P	V
		15930	47.21	-26.79	74	41.21	40.8	21.91	56.71	100	0	P	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**Band 3 - 5470~5725MHz**

**WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4+3		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
802.11n HT40 CH 102 5510MHz		5458.96	60.18	-13.82	74	48.91	34.7	11.88	35.31	100	302	P	H
		5462.32	59.24	-8.96	68.2	47.97	34.7	11.88	35.31	100	302	P	H
		5459.44	52.39	-1.61	54	41.12	34.7	11.88	35.31	100	302	A	H
	*	5510	102.3	-	-	90.66	35	11.94	35.3	100	302	P	H
	*	5510	95.92	-	-	84.28	35	11.94	35.3	100	302	A	H
		5746.73	49.77	-18.43	68.2	37.81	35	12.28	35.32	100	302	P	H
		5458.72	51.33	-22.67	74	40.06	34.7	11.88	35.31	314	67	P	V
		5470	59.21	-8.99	68.2	47.83	34.8	11.89	35.31	314	67	P	V
		5458.48	43.42	-10.58	54	32.15	34.7	11.88	35.31	314	67	A	V
	*	5510	100.87	-	-	89.23	35	11.94	35.3	314	67	P	V
	*	5510	93.66	-	-	82.02	35	11.94	35.3	314	67	A	V
		5759.96	48.07	-20.13	68.2	36.1	35	12.3	35.33	314	67	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 3 - 5470~5725MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

Table with 14 columns: WIFI Ant. 4+3, Note, Frequency (MHz), Level (dBµV/m), Over Limit (dB), Limit Line (dBµV/m), Read Level (dBµV), Antenna Factor (dB/m), Path Loss (dB), Preamp Factor (dB), Ant Pos (cm), Table Pos (deg), Peak Avg. (P/A), Pol. (H/V). Rows include data for 802.11n HT40 CH 102 at 11020 and 16530 MHz, and a Remark section.





**Emission above 18GHz**

**5GHz WIFI 802.11ac VHT80 (SHF)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
4+3		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )	
5GHz 802.11ac VHT80 SHF		39956	44.39	-29.61	74	42.57	44.1	12.09	54.37	150	0	P	H	
													H	
													H	
													H	
													H	
													H	
			39604	44.73	-29.27	74	43.07	44.63	11.96	54.93	150	0	P	V
														V
														V
														V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against limit line.													



**Emission below 1GHz**

**5GHz WIFI 802.11ac VHT80 (LF)**

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.	
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.		
4+3		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )	
5GHz 802.11ac VHT80 LF		32.97	22.68	-17.32	40	28.55	23.16	0.98	30.01	-	-	P	H	
		107.49	24.18	-19.32	43.5	35.48	16.82	1.85	29.97	-	-	P	H	
		177.69	29.83	-13.67	43.5	42.27	15.1	2.4	29.94	-	-	P	H	
		881	32.75	-13.25	46	27.61	28.89	5.33	29.08	-	-	P	H	
		932.1	33.16	-12.84	46	27.09	29.36	5.52	28.81	-	-	P	H	
		953.1	34.2	-11.8	46	26.87	30.42	5.59	28.68	100	0	P	H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
			30	32.54	-7.46	40	37.29	24.32	0.94	30.01	100	0	P	V
			40.53	25	-15	40	34.91	19	1.09	30	-	-	P	V
			178.23	23.19	-20.31	43.5	35.73	15	2.4	29.94	-	-	P	V
			860.7	32.36	-13.64	46	27.4	28.9	5.23	29.17	-	-	P	V
			936.3	33.75	-12.25	46	27.56	29.44	5.53	28.78	-	-	P	V
			955.2	34.26	-11.74	46	26.81	30.53	5.59	28.67	-	-	P	V
													V	
													V	
													V	
													V	
													V	
													V	
													V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against limit line.													



**Note symbol**

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



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4+3		( 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. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)  
= Antenna Factor(dB/m) + Path 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) + Path 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

Test Engineer :	Jesse Wang, Stan Hsieh and Ken Wu	Temperature :	23~26°C
		Relative Humidity :	45~52%

### Note symbol

-L	Low channel location
-R	High channel location



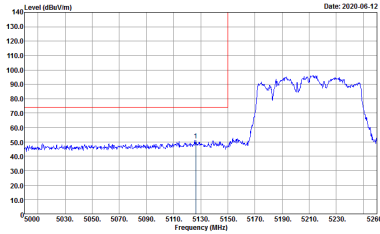
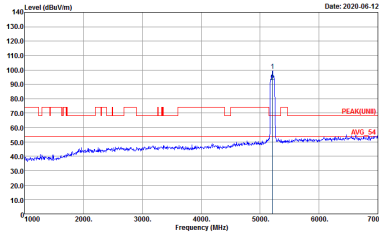
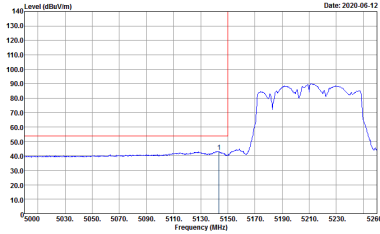
**Band 1 - 5150~5250MHz**  
**WIFI 802.11ac VHT80 (Band Edge @ 3m)**

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
4+3	Horizontal	Fundamental
<p align="center"><b>Peak</b></p>	<p>Site : 03CH07-HY            Condition : PEAK_BE_74 3m HE_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>	<p>Site : 03CH07-HY            Condition : PEAK(LINE) 3m HE_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>
<p align="center"><b>Avg.</b></p>	<p>Site : 03CH07-HY            Condition : AVG_BE_54 3m HE_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3.000kHz SWT:Auto            Detector : Peak</p>	<p align="center"><b>Left blank</b></p>



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
4+3	Horizontal	Fundamental
<p><b>Peak</b></p>		<p>Left blank</p>
<p><b>Avg.</b></p>		<p>Left blank</p>



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
4+3	Vertical	Fundamental
Peak	 <p>Site : 03CH07-HY            Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL            Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            : Peak</p>	 <p>Site : 03CH07-HY            Condition : PEAK(LIN) 3m HF_ANT_00075962 VERTICAL            Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            : Peak</p>
Avg.	 <p>Site : 03CH07-HY            Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL            Detector : RBW:1000.000kHz VBW:3.000kHz SWT:Auto            : Peak</p>	Left blank





WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
4+3	Vertical	Fundamental
<p><b>Peak</b></p>	<p>Site : 03CH07-HY            Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL            : RBW:1000.000kHz VBW:3000.000kHz SWF:Auto            Detector : Peak</p>	<p>Left blank</p>
<p><b>Avg.</b></p>	<p>Site : 03CH07-HY            Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL            : RBW:1000.000kHz VBW:3.000kHz SWF:Auto            Detector : Peak</p>	<p>Left blank</p>

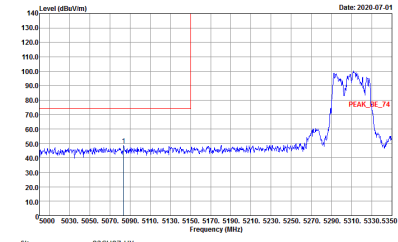
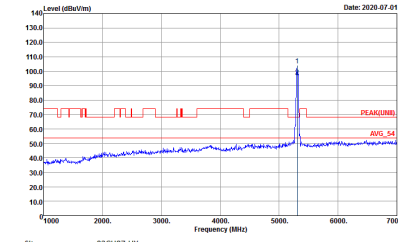
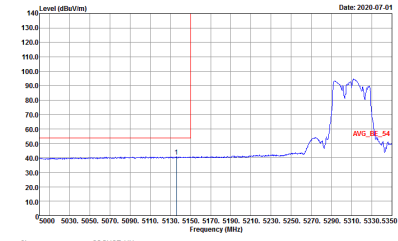


**Band 1 - 5150~5250MHz**  
**WIFI 802.11ac VHT80 (Harmonic @ 3m)**

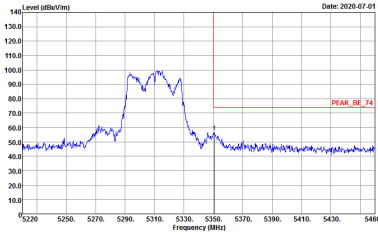
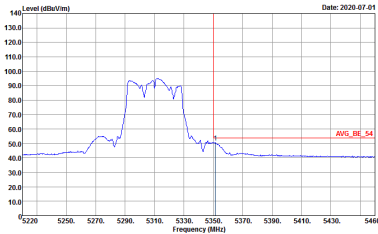
<b>WIFI</b>	<b>Band 1 5150~5250MHz Harmonic @ 3m</b>	
<b>ANT</b>	<b>802.11ac VHT80 CH42 5210MHz</b>	
<b>4+3</b>	<b>Horizontal</b>	<b>Vertical</b>
<b>Peak</b> <b>Avg.</b>	<p>Site : 03CH07-HY          Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL          Detector : Peak</p>	<p>Site : 03CH07-HY          Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL          Detector : Peak</p>



**Band 2 - 5250~5350MHz**  
**WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11n HT40 CH62 5310 - L	
4+3	Horizontal	Fundamental
<p align="center"><b>Peak</b></p>	 <p>Site : 03CH07-HY            Condition : PEAK_BE_74 3m HE_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>	 <p>Site : 03CH07-HY            Condition : PEAK_LNB 3m HE_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>
<p align="center"><b>Avg.</b></p>	 <p>Site : 03CH07-HY            Condition : AVG_BE_54 3m HE_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3.000kHz SWT:Auto            Detector : Peak</p>	<p align="center"><b>Left blank</b></p>

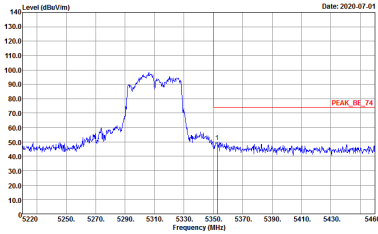
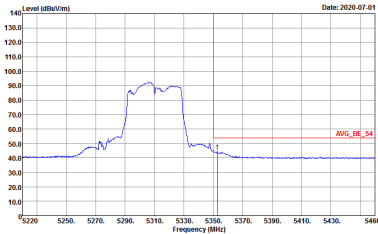


WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11n HT40 CH62 5310 - R	
4+3	Horizontal	Fundamental
<p><b>Peak</b></p>	 <p>Site : 03CH07-HY            Condition : PEAK_BE_74 3m HF_ANT_00075962 HORIZONTAL            RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>	<p>Left blank</p>
<p><b>Avg.</b></p>	 <p>Site : 03CH07-HY            Condition : AVG_BE_54 3m HF_ANT_00075962 HORIZONTAL            RBW:1000.000kHz VBW:3.000kHz SWT:Auto            Detector : Peak</p>	<p>Left blank</p>



WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11n HT40 CH62 5310 - L	
4+3	Vertical	Fundamental
Peak	<p>Date: 2020-07-01</p> <p>Site : 03CH07-HY            Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL            RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>	<p>Date: 2020-07-02</p> <p>Site : 03CH07-HY            Condition : PEAK(LIN) 3m HF_ANT_00075962 VERTICAL            RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>
Avg.	<p>Date: 2020-07-01</p> <p>Site : 03CH07-HY            Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL            RBW:1000.000kHz VBW:3.000kHz SWT:Auto            Detector : Peak</p>	Left blank



WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11n HT40 CH62 5310 - R	
4+3	Vertical	Fundamental
Peak	 <p>Site : 03CH07-HY            Condition : PEAK_BE_74 3m HF_ANT_00075962 VERTICAL            RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>	Left blank
Avg.	 <p>Site : 03CH07-HY            Condition : AVG_BE_54 3m HF_ANT_00075962 VERTICAL            RBW:1000.000kHz VBW:3.000kHz SWT:Auto            Detector : Peak</p>	Left blank

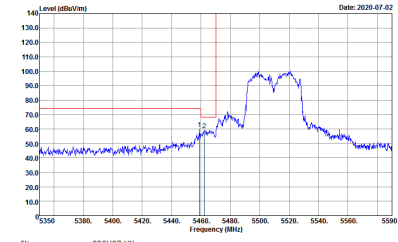
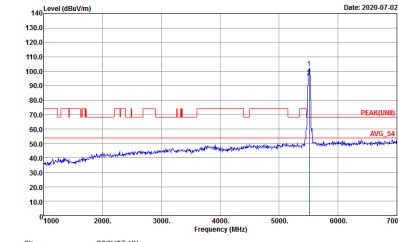
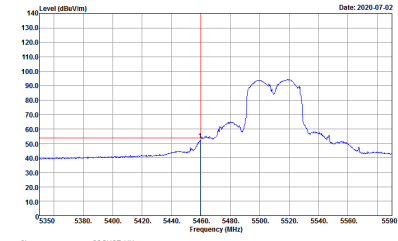


**Band 2 - 5250~5350MHz**  
**WIFI 802.11n HT40 (Harmonic @ 3m)**

<b>WIFI</b>	<b>Band 2 5250~5350MHz Harmonic @ 3m</b>	
<b>ANT</b>	<b>802.11n HT40 CH62 5310</b>	
<b>4+3</b>	<b>Horizontal</b>	<b>Vertical</b>
<b>Peak</b> <b>Avg.</b>	<p>Site : 03CH07-HY          Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL          Detector : Peak</p>	<p>Site : 03CH07-HY          Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL          Detector : Peak</p>



**Band 3 - 5470~5725MHz**  
**WIFI 802.11n HT40 (Band Edge @ 3m)**

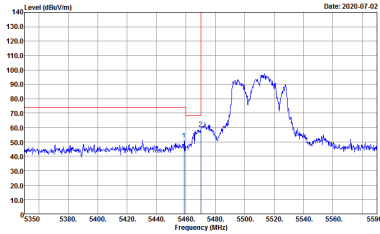
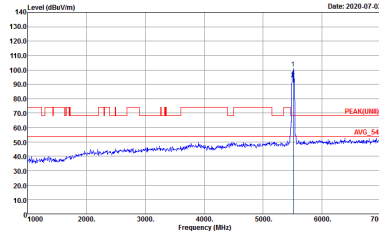
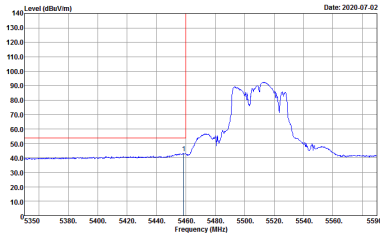
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11n HT40 CH102 5510MHz - L	
4+3	Horizontal	Fundamental
<p align="center"><b>Peak</b></p>	 <p>Site : 03CH07-HY            Condition : PEAK_BE(LIN)_B3 3m HF_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>	 <p>Site : 03CH07-HY            Condition : PEAK(LIN)_3m HF_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>
<p align="center"><b>Avg.</b></p>	 <p>Site : 03CH07-HY            Condition : AVG_BE(LIN)_B3 3m HF_ANT_00075962 HORIZONTAL            : RBW:1000.000kHz VBW:3.000kHz SWT:Auto            Detector : Peak</p>	<p align="center"><b>Left blank</b></p>





<b>WIFI</b>	<b>Band 3 5470~5725MHz Band Edge @ 3m</b>	
<b>ANT</b>	<b>802.11n HT40 CH102 5510MHz - R</b>	
<b>4+3</b>	<b>Horizontal</b>	<b>Fundamental</b>
<b>Peak</b>	<p>Site : EDCM07-41Y Condition : PEAK_BE(LINII)_B3 3m HF_ANT_00075962 HORIZONTAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWF:Auto : Peak</p>	<b>Left blank</b>



WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11n HT40 CH102 5510MHz - L	
4+3	Vertical	Fundamental
Peak	 <p>Site : 03CH07-HY            Condition : PEAK_BE(LIN10)_B3 3m HF ANT_00075962 VERTICAL            Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>	 <p>Site : 03CH07-HY            Condition : PEAK(LIN10) 3m HF ANT_00075962 VERTICAL            Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto            Detector : Peak</p>
Avg.	 <p>Site : 03CH07-HY            Condition : AVG_BE(LIN10)_B3 3m HF ANT_00075962 VERTICAL            Detector : RBW:1000.000kHz VBW:3.000kHz SWT:Auto            Detector : Peak</p>	Left blank



WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11n HT40 CH102 5510MHz - R	
4+3	Vertical	Fundamental
Peak	<p>Site : EDCM07-41Y Condition : PEAK_BE(LINII), B3 3m HF ANT_00075962 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto : Peak</p>	Left blank



**Band 3 - 5470~5725MHz**  
**WIFI 802.11n HT40 (Harmonic @ 3m)**

<b>WIFI</b>	<b>Band 3 5470~5725MHz Harmonic @ 3m</b>	
<b>ANT</b>	<b>802.11n HT40 CH102 5510MHz</b>	
<b>4+3</b>	<b>Horizontal</b>	<b>Vertical</b>
<b>Peak</b> <b>Avg.</b>	<p>Site : 03CH07-HY          Condition : PEAK(UNII) 3m HF_ANT_00075962 HORIZONTAL          Detector : Peak</p>	<p>Site : 03CH07-HY          Condition : PEAK(UNII) 3m HF_ANT_00075962 VERTICAL          Detector : Peak</p>



Emission above 18GHz  
5GHz WIFI 802.11ac VHT80 (SHF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 SHF	
4+3	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH07-HY Condition : PEAK(UNII) 1m SHF-EHF_9170584 HORIZONTAL Detector : Peak</p>	<p>Site : 03CH07-HY Condition : PEAK(UNII) 1m SHF-EHF_9170576 VERTICAL Detector : Peak</p>



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

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
4+3	Horizontal	Vertical
QP / Peak	<p>Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) HORIZONTAL Detector : Peak</p>	<p>Site : 03CH07-HY Condition : QP 3m LF-ANT-35419(6) VERTICAL Detector : Peak</p>



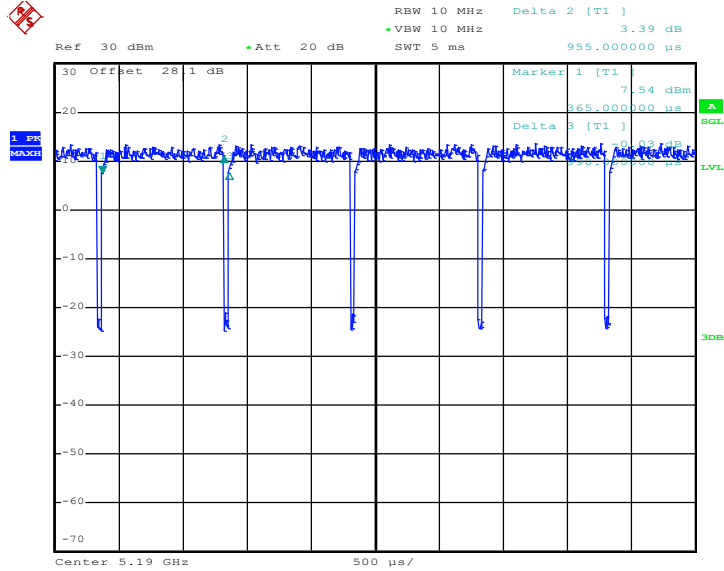
### Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
4+3	5GHz 802.11n HT40 for Ant. 4	96.46	955	1.05	3kHz	0.16
4+3	5GHz 802.11n HT40 for Ant. 3	95.96	950	1.05	3kHz	0.18
4+3	5GHz 802.11ac VHT80 for Ant. 4	92.00	460	2.17	3kHz	0.36
4+3	5GHz 802.11ac VHT80 for Ant. 3	92.80	464	2.16	3kHz	0.32



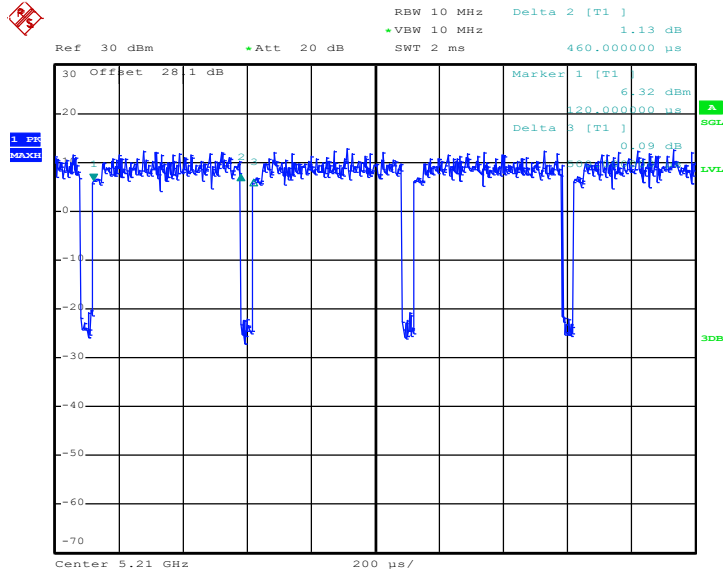
MIMO <Ant. 4>

802.11n HT40



Date: 18.JUN.2020 17:00:40

802.11ac VHT80



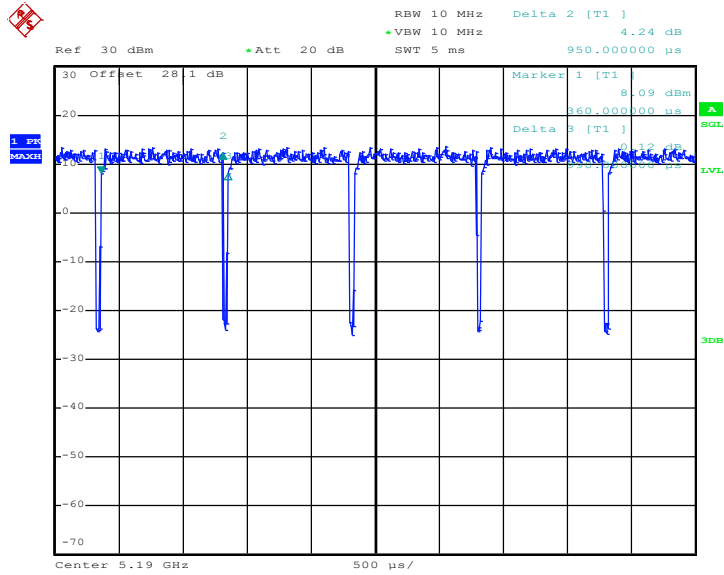
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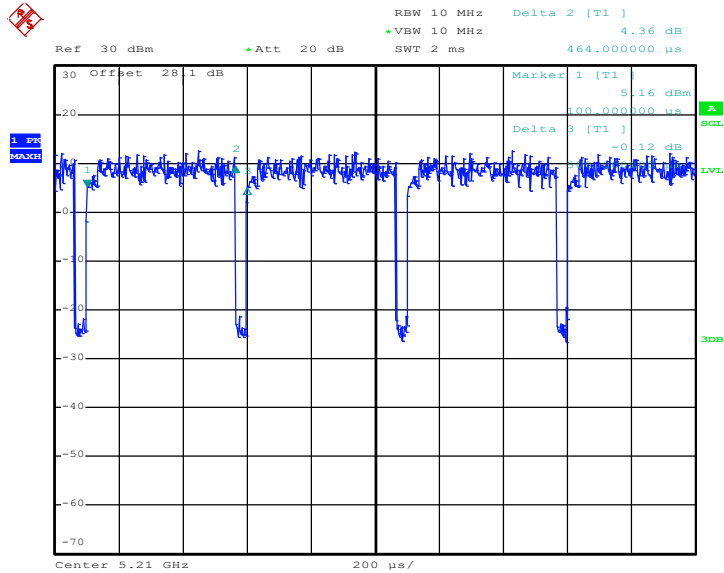
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802.11n HT40



Date: 18.JUN.2020 17:01:13

802.11ac VHT80



Date: 18.JUN.2020 17:04:41

—THE END—