FCC RADIO TEST REPORT

FCC ID	:	**HLZRXMG1**
Equipment	:	**Notebook Computer**
Brand Name	:	**ACER**
Model Name	:	**N20C7**
Applicant	:	**Acer Incorporated** **8F,. No. 88, Sec. 1, Xintai 5th Rd., Xizhi, New Taipei City 22181, Taiwan (R.O.C)**
Manufacturer	:	**Acer Incorporated** **8F,. No. 88, Sec. 1, Xintai 5th Rd., Xizhi, New Taipei City 22181, Taiwan (R.O.C)**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Jul. 01, 2020 and testing was started from Jul. 25, 2020 and completed on Aug. 23, 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 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.

Louis Wu

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
FR070206E	01	Initial issue of report	Sep. 30, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403 (i)	6dB & 26dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407 (a)	Maximum Conducted Output Power	Pass	-
3.3	15.407 (a)	Power Spectral Density	Pass	-
3.4	15.407(b)	Unwanted Emissions	Pass	Under limit 7.57 dB at 115.360 MHz
3.5	15.207	AC Conducted Emission	Pass	Under limit 12.61 dB at 4.964 MHz
3.6	15.407 (c)	Automatically Discontinue Transmission	Pass	-
3.7	15.203 & 15.407 (a)	Antenna Requirement	Pass	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
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: Vivian Hsu

1 General Description

1.1 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Antenna Type	WWAN <Ant. 0>: PIFA Antenna <Ant. 2>: PIFA Antenna WLAN <Main>: PIFA Antenna <Aux.>: PIFA Antenna Bluetooth: PIFA Antenna GPS / Glonass / BDS / Galileo : Copule Antenna

Antenna Information			
Antenna 1 (NB Mode)	**Antenna Type**	PIFA Antenna	PIFA Antenna
	Part number	DC33002GL00 (81ELAU15.G14)	DC33002GL10 (81ELAU15.G15)
	Peak gain (dbi)	Main Antenna：	Aux Antenna：
		WLAN 5GHz (Band 4): -2.42 dBi	WLAN 5GHz (Band 4): -2.45 dBi
Antenna 2 (TB Mode)	**Antenna Type**	PIFA Antenna	PIFA Antenna
	Part number	DC33002GL00 (81ELAU15.G14)	DC33002GL10 (81ELAU15.G15)
	Peak gain (dbi)	Main Antenna：	Aux Antenna：
		WLAN 5GHz (Band 4): -8 dBi	WLAN 5GHz (Band 4): -0.98 dBi

Remark: All the tests were performed with Antenna 2.

1.2 Modification of EUT

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

1.3 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	TH05-HY	CO05-HY

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

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

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

FCC designation No.: TW1190 and TW0007

1.4 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.

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 Tablet type (three orthogonal panels, X, Y, Z) and Notebook type. The worst cases (Y plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
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.

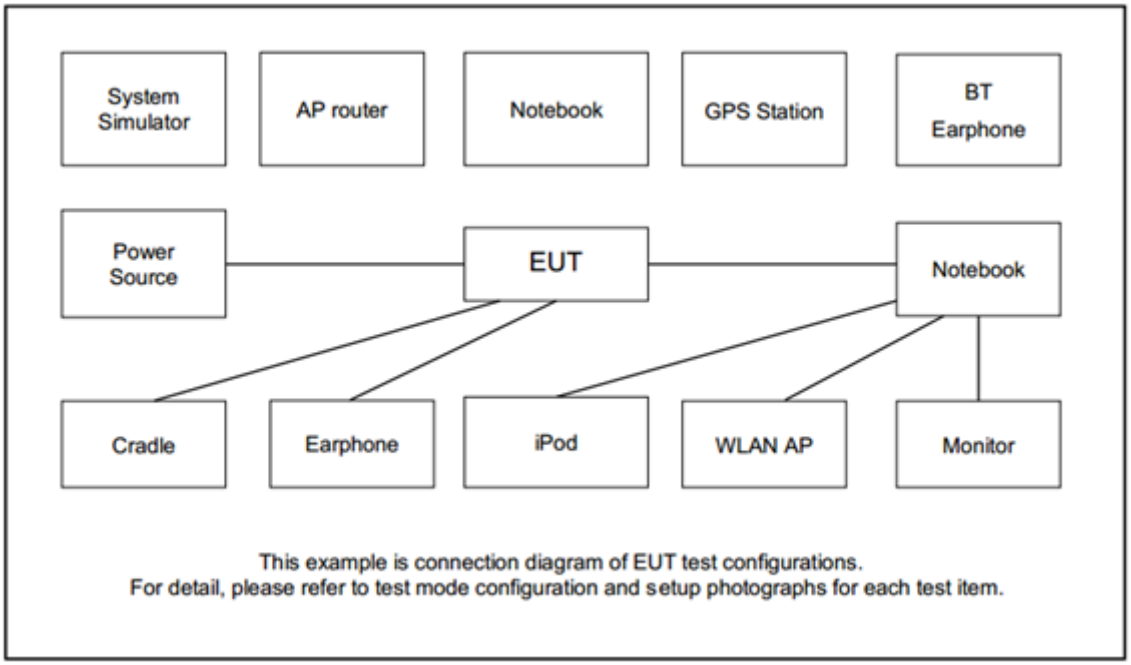
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (5GHz) Link + Hard Disk (Load) + Earphone + Adapter

Ch. #		Band IV：5725-5850 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	Earphone	Sony	MH750	N/A	N/A	N/A
3.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
4.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
5.	Hard Disk	Lenovo	F310S	FCC DoC	Shielded, 1.0m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility "QRCT_V4.0.00156.0" was installed in EUT 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.

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

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

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

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

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

26dB and 99% Occupied bandwidth are reporting only.

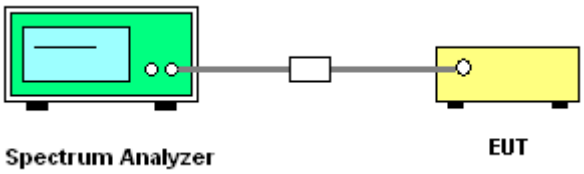
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

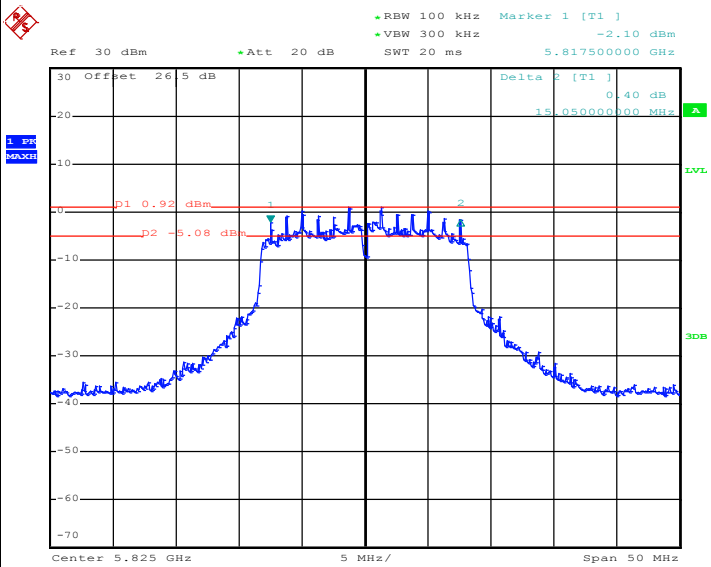
3.1.4 Test Setup



3.1.5 Test Result of 6dB and 26dB and 99% Occupied Bandwidth

Please refer to Appendix A.

Minimum 6dB Bandwidth



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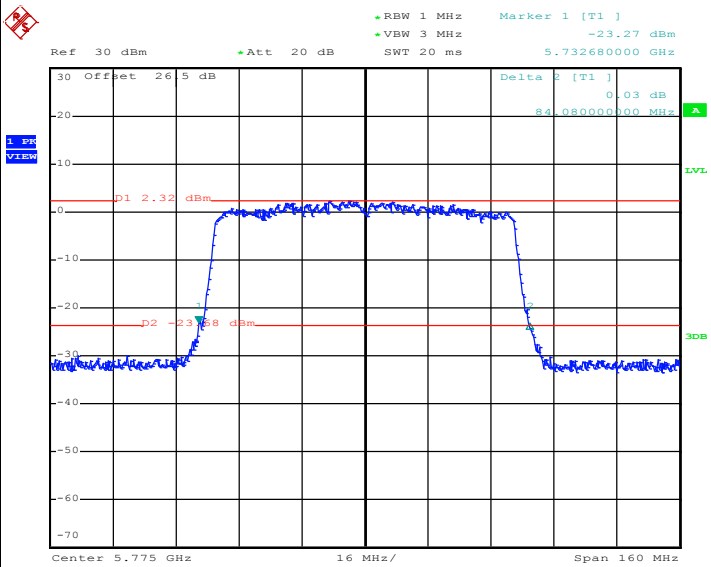
Maximum 26dB Bandwidth



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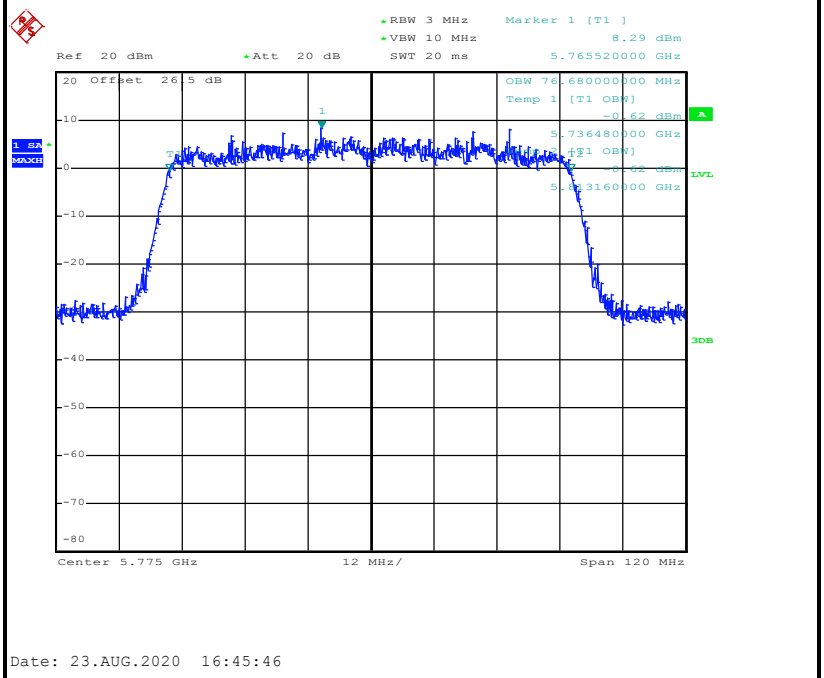
Maximum 99% Occupied Bandwidth



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

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

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

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

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

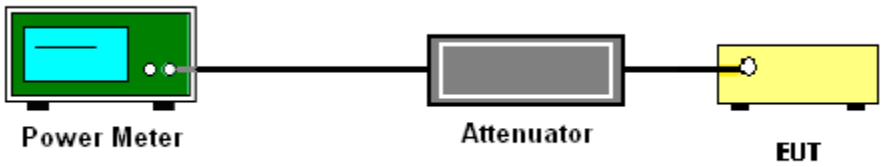
3.2.3 Test Procedures

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

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

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

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

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

3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section F) Maximum power spectral density.

 # Method SA-3 #

(power averaging (rms) detection with max hold):

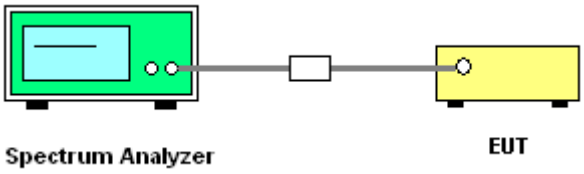
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time ≤ (number of points in sweep) × T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
- Detector = power averaging (rms).
- Trace mode = max hold.
- Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

   Method (c): Measure and add 10 log(N_{ANT}) dB.

   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit. The addition of 10 log(N_{ANT}) dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}$ th of the PSD limit.

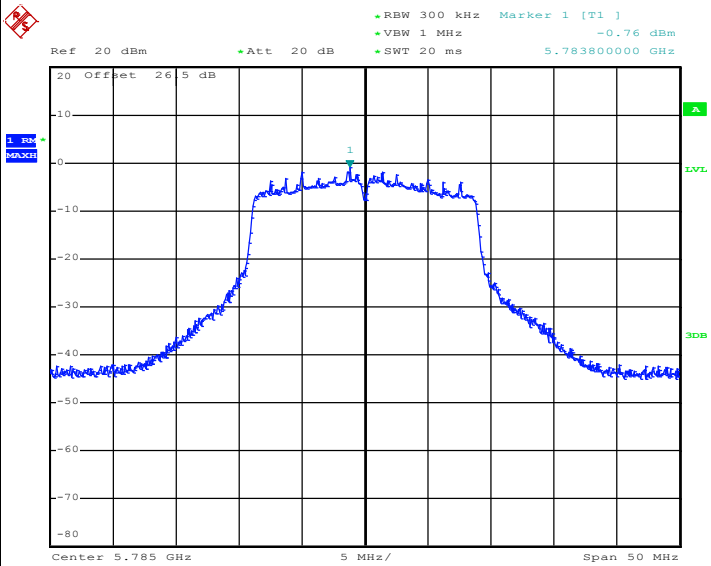
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/MHz) for MIMO Ant. 1



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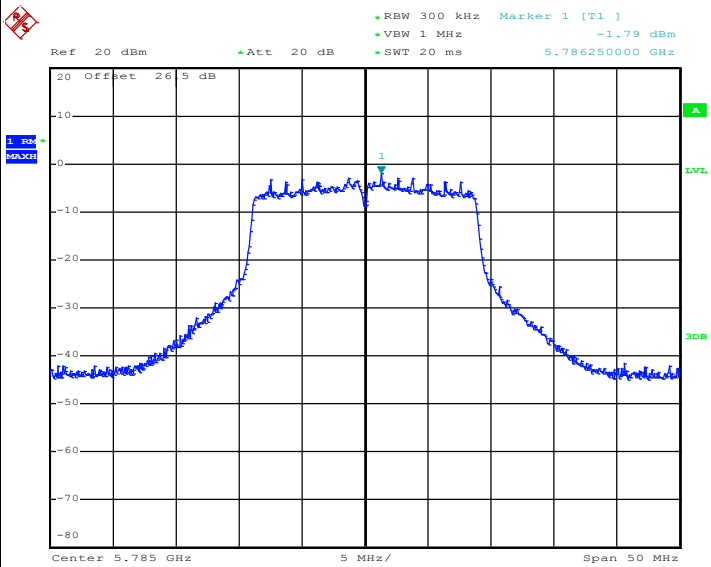
Worst Case Power Density (dBm/MHz) for MIMO Ant. 2



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3.4 Unwanted Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

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

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

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

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

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

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

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

3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 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

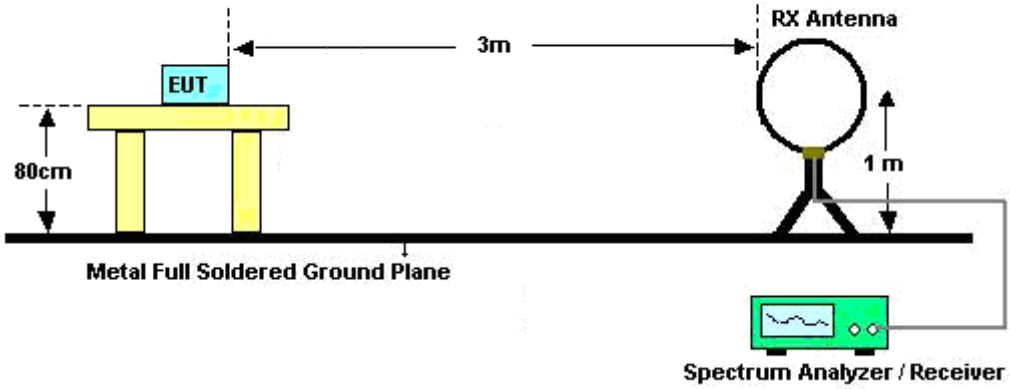
(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

- 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.

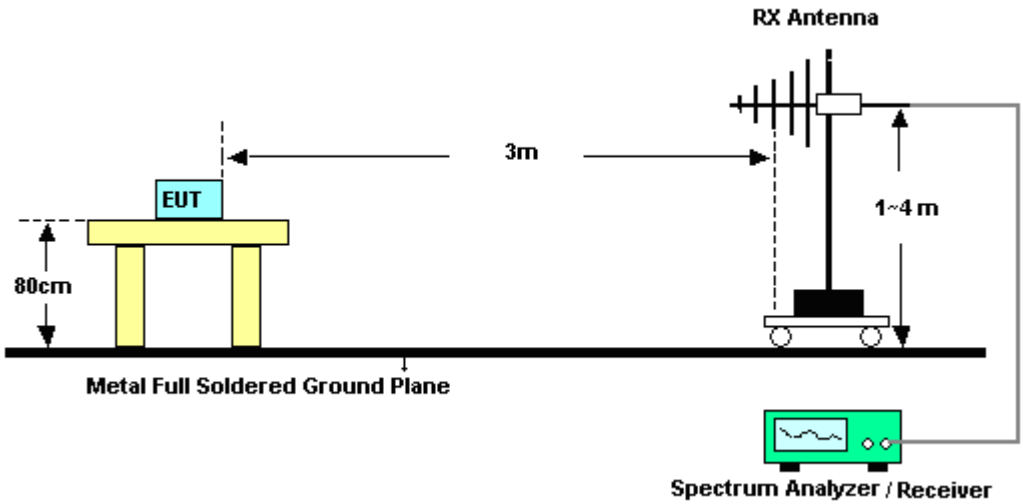
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

3.4.4 Test Setup

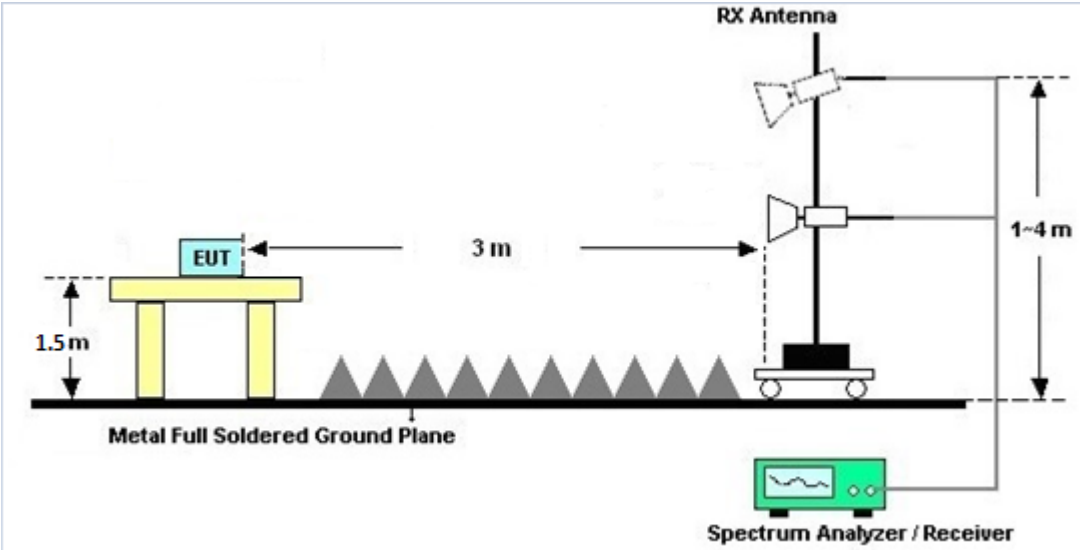
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

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.

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix C and D.

3.4.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

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

*Decreases with the logarithm of the frequency.

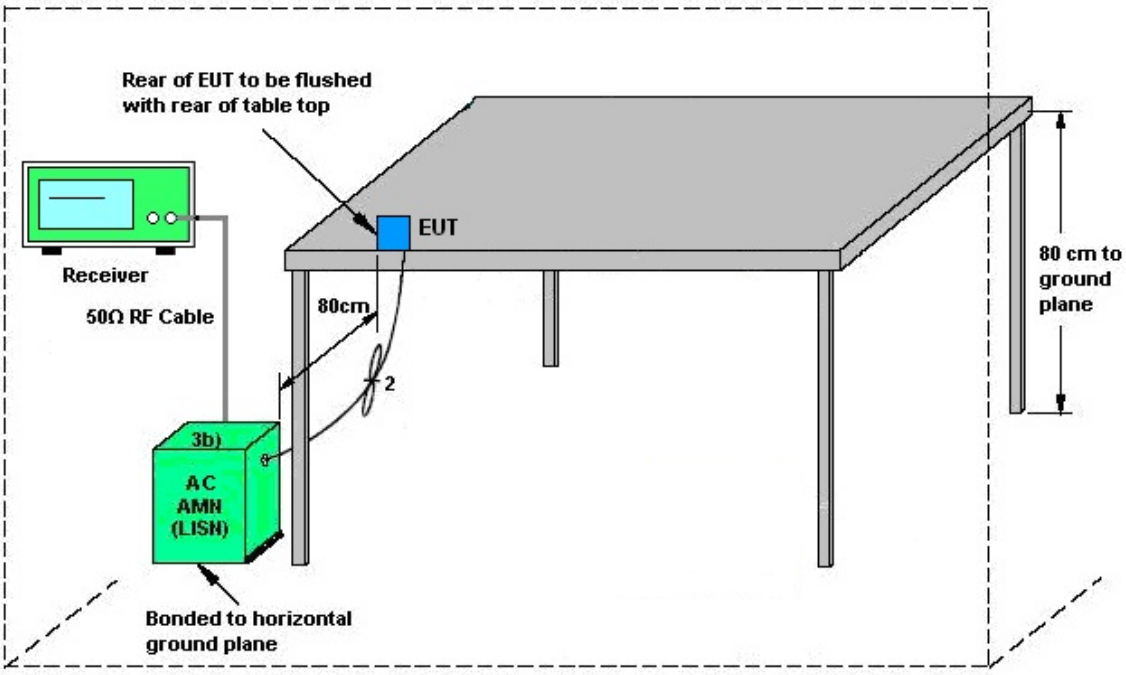
3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

3.7 Antenna Requirements

3.7.1 Standard Applicable

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

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + 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 GANT 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.

<CDD Modes>

	Ant. 1 (dBi)	Ant. 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band IV	-0.80	-0.98	-0.80	2.12	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	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 09, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Jan. 08, 2021	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1212	1GHz ~ 18GHz	May 20, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	May 19, 2021	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800N1D01N-06	40103&07	30MHz to 1GHz	Apr. 29, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Apr. 28, 2021	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Dec. 10, 2019	Jul. 31, 2020 ~ Aug. 18, 2020	Dec. 09, 2020	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Oct. 28, 2019	Jul. 31, 2020 ~ Aug. 18, 2020	Oct. 27, 2020	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590074	1GHz~18GHz	May 19, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	May 18, 2021	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Dec. 17, 2019	Jul. 31, 2020 ~ Aug. 18, 2020	Dec. 16, 2020	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	Jul. 31, 2020 ~ Aug. 18, 2020	Dec. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz-30MHz	Mar. 12, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Mar. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30M-18G	Feb. 12, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Feb. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30M-18G	Feb. 12, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Feb. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/4	30M-18G	Feb. 12, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Feb. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30M~40GHz	Mar. 12, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Mar. 11, 2021	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30M~40GHz	Mar. 12, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Mar. 11, 2021	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz~44GHz	Feb. 10, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Feb. 09, 2021	Radiation (03CH13-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jul. 31, 2020 ~ Aug. 18, 2020	N/A	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jul. 31, 2020 ~ Aug. 18, 2020	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jul. 31, 2020 ~ Aug. 18, 2020	N/A	Radiation (03CH13-HY)
Software	AUDIX	E3 6.2009-8-24c	RK-001124	N/A	N/A	Jul. 31, 2020 ~ Aug. 18, 2020	N/A	Radiation (03CH13-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY54130085	20Hz ~ 8.4GHz	Nov. 01, 2019	Jul. 31, 2020 ~ Aug. 18, 2020	Oct. 31, 2020	Radiation (03CH13-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN6	6.75GHz High Pass Filter	Mar. 12, 2020	Jul. 31, 2020 ~ Aug. 18, 2020	Mar. 11, 2021	Radiation (03CH13-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN12	1.53GHz Low Pass Filter	Sep. 16, 2019	Jul. 31, 2020 ~ Aug. 18, 2020	Sep. 15, 2020	Radiation (03CH13-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 27, 2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	Jul. 27, 2020	Nov. 14, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	Jul. 27, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jul. 27, 2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	Jul. 27, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	Jul. 27, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 02, 2020	Jul. 25, 2020~ Aug. 23, 2020	Mar. 01, 2021	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054S NO10	10MHz~6GHz	Dec. 23, 2019	Jul. 25, 2020~ Aug. 23, 2020	Dec. 22, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Dec. 30, 2019	Jul. 25, 2020~ Aug. 23, 2020	Dec. 29, 2020	Conducted (TH05-HY)
Switch Control Manframe	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2020	Jul. 25, 2020~ Aug. 23, 2020	Mar. 16, 2021	Conducted (TH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.3

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

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

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

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

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

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

Appendix A. Test Result of Conducted Test Items

Test Engineer:	MINA LIU/JunYu	Temperature:	24.1~24.3	°C
Test Date:	2020/7/25~2020/8/23	Relative Humidity:	53.4~53.7	%

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

Band IV MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	149	5745	16.65	16.65	23.75	24.95	15.15	15.35	0.5	Pass
11a	6Mbps	2	157	5785	16.70	16.70	23.75	24.05	15.15	15.40	0.5	Pass
11a	6Mbps	2	165	5825	16.70	16.65	23.85	24.25	15.05	15.05	0.5	Pass
HT20	MCS0	2	149	5745	18.00	17.80	26.75	25.35	15.70	15.95	0.5	Pass
HT20	MCS0	2	157	5785	17.75	17.85	25.00	25.35	15.15	16.60	0.5	Pass
HT20	MCS0	2	165	5825	17.80	17.80	24.85	24.85	15.05	15.95	0.5	Pass
HT40	MCS0	2	151	5755	36.40	36.60	41.58	42.12	35.46	35.19	0.5	Pass
HT40	MCS0	2	159	5795	36.40	36.60	41.76	42.12	35.46	35.28	0.5	Pass
VHT80	MCS0	2	155	5775	76.56	76.68	82.88	84.08	75.04	75.04	0.5	Pass

Report Number : FR070206E

TEST RESULTS DATA
Average Power Table

Band IV MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	10.40	10.10	13.26	30.00		-0.80		Pass
11a	6Mbps	2	157	5785	10.40	10.20	13.31	30.00		-0.80		Pass
11a	6Mbps	2	165	5825	10.40	10.20	13.31	30.00		-0.80		Pass
HT20	MCS0	2	149	5745	10.40	10.30	13.36	30.00		-0.80		Pass
HT20	MCS0	2	157	5785	10.20	10.00	13.11	30.00		-0.80		Pass
HT20	MCS0	2	165	5825	10.50	10.20	13.36	30.00		-0.80		Pass
HT40	MCS0	2	151	5755	10.50	10.00	13.27	30.00		-0.80		Pass
HT40	MCS0	2	159	5795	10.40	10.20	13.31	30.00		-0.80		Pass
VHT20	MCS0	2	149	5745	10.50	10.00	13.27	30.00		-0.80		Pass
VHT20	MCS0	2	157	5785	10.50	10.00	13.27	30.00		-0.80		Pass
VHT20	MCS0	2	165	5825	10.50	10.10	13.31	30.00		-0.80		Pass
VHT40	MCS0	2	151	5755	10.40	10.00	13.21	30.00		-0.80		Pass
VHT40	MCS0	2	159	5795	10.40	10.20	13.31	30.00		-0.80		Pass
VHT80	MCS0	2	155	5775	10.30	10.10	13.21	30.00		-0.80		Pass

Report Number : FR070206E

TEST RESULTS DATA
Power Spectral Density

Band IV MIMO															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	2.22		0.92	0.64	3.93	30.00		2.12		Pass
11a	6Mbps	2	157	5785	2.22		0.72	1.25	4.26	30.00		2.12		Pass
11a	6Mbps	2	165	5825	2.22		0.37	1.10	4.11	30.00		2.12		Pass
HT20	MCS0	2	149	5745	2.22		1.13	0.05	4.14	30.00		2.12		Pass
HT20	MCS0	2	157	5785	2.22		1.46	0.43	4.47	30.00		2.12		Pass
HT20	MCS0	2	165	5825	2.22		1.14	0.88	4.15	30.00		2.12		Pass
HT40	MCS0	2	151	5755	2.22		-2.52	-2.35	0.66	30.00		2.12		Pass
HT40	MCS0	2	159	5795	2.22		-1.98	-2.82	1.03	30.00		2.12		Pass
VHT80	MCS0	2	155	5775	2.22		-3.64	-5.01	-0.63	30.00		2.12		Pass

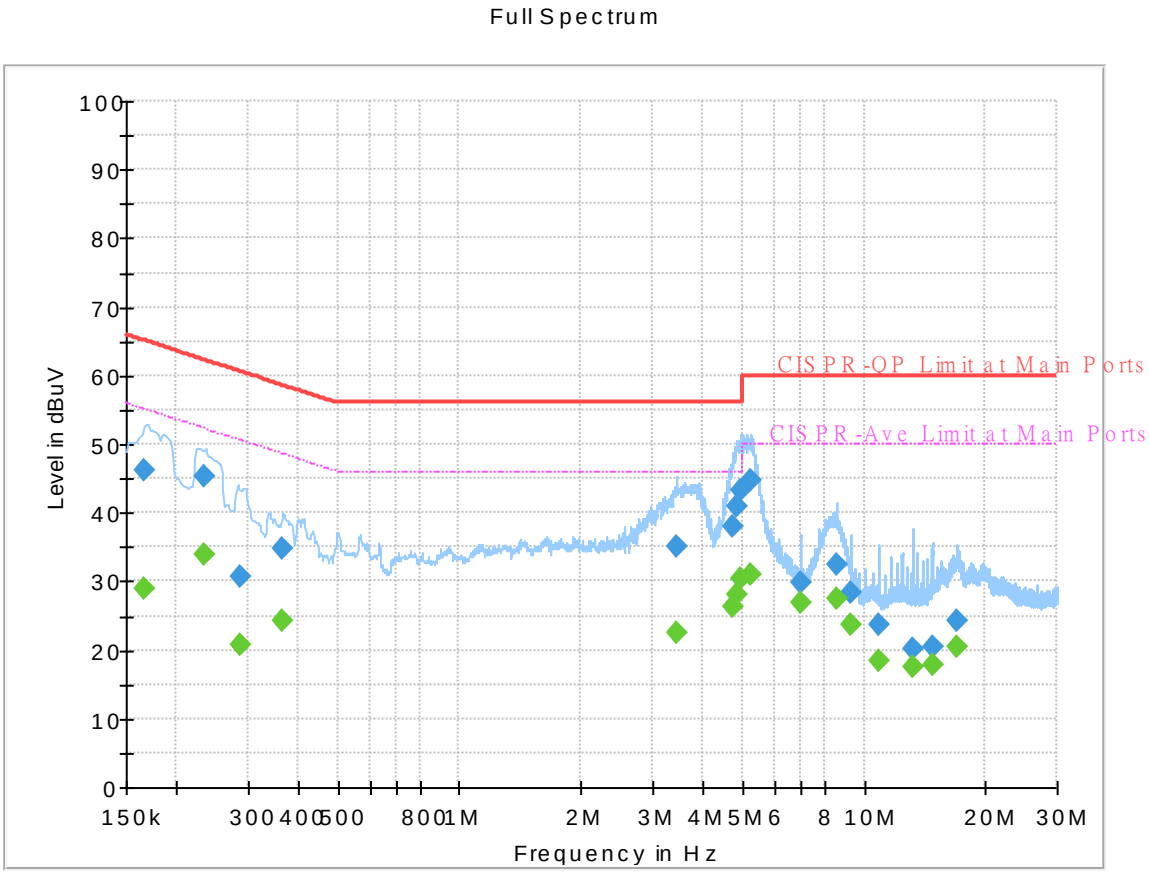
Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)

Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	**Temperature :**	23~25℃
		Relative Humidity :	42~50%

EUT Information

Report NO :	070206
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line



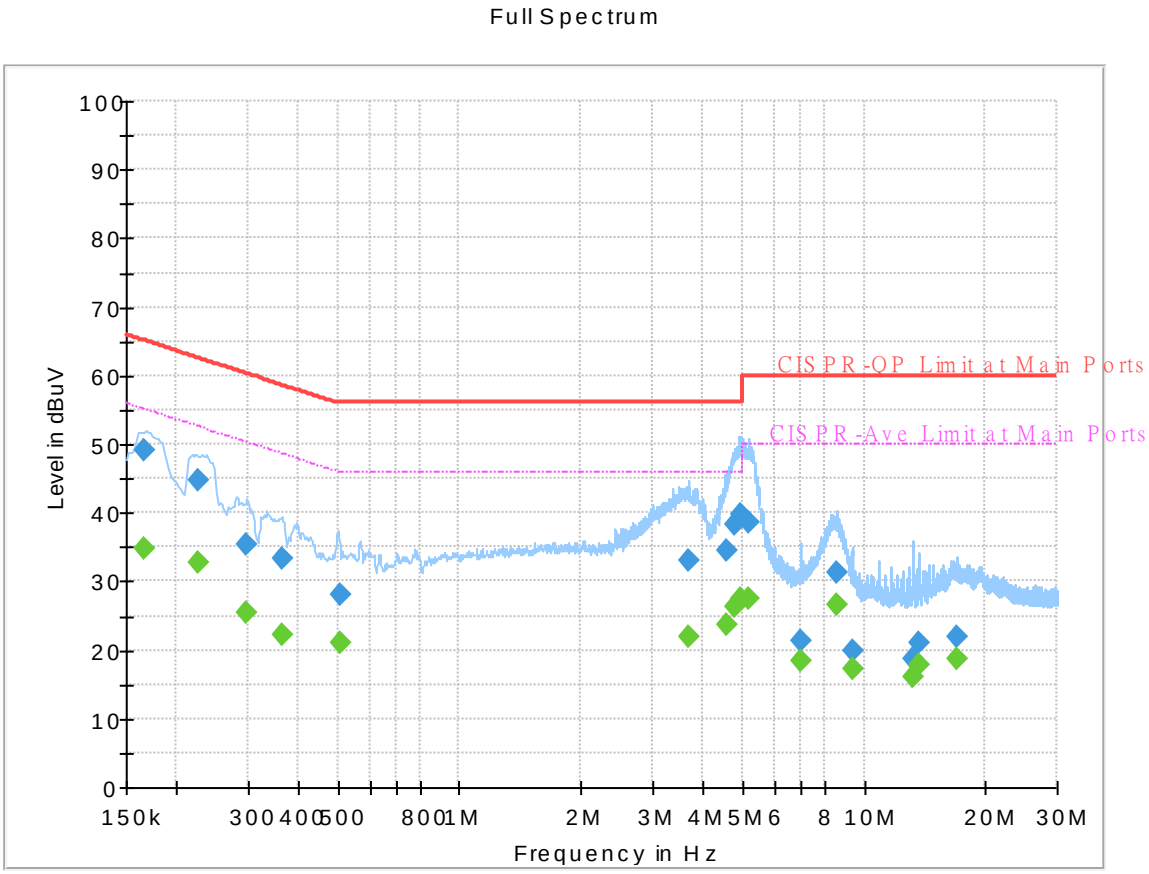
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.165750	46.07	---	65.17	19.10	L1	OFF	19.5
0.165750	---	28.93	55.17	26.24	L1	OFF	19.5
0.234780	45.41	---	62.28	16.87	L1	OFF	19.5
0.234780	---	33.78	52.28	18.50	L1	OFF	19.5
0.286440	30.83	---	60.63	29.80	L1	OFF	19.5
0.286440	---	20.63	50.63	30.00	L1	OFF	19.5
0.366450	34.72	---	58.58	23.86	L1	OFF	19.5
0.366450	---	24.21	48.58	24.37	L1	OFF	19.5
3.437250	35.11	---	56.00	20.89	L1	OFF	19.6
3.437250	---	22.37	46.00	23.63	L1	OFF	19.6
4.711560	37.89	---	56.00	18.11	L1	OFF	19.6
4.711560	---	26.44	46.00	19.56	L1	OFF	19.6
4.823250	40.98	---	56.00	15.02	L1	OFF	19.6
4.823250	---	28.17	46.00	17.83	L1	OFF	19.6
4.963650	43.39	---	56.00	12.61	L1	OFF	19.6
4.963650	---	30.34	46.00	15.66	L1	OFF	19.6
5.270100	44.67	---	60.00	15.33	L1	OFF	19.6
5.270100	---	31.13	50.00	18.87	L1	OFF	19.6
6.978750	29.93	---	60.00	30.07	L1	OFF	19.7
6.978750	---	26.78	50.00	23.22	L1	OFF	19.7
8.523780	32.53	---	60.00	27.47	L1	OFF	19.8

8.523780	---	27.49	50.00	22.51	L1	OFF	19.8
9.305250	28.50	---	60.00	31.50	L1	OFF	19.8
9.305250	---	23.56	50.00	26.44	L1	OFF	19.8
10.857750	23.73	---	60.00	36.27	L1	OFF	19.8
10.857750	---	18.44	50.00	31.56	L1	OFF	19.8
13.170750	20.07	---	60.00	39.93	L1	OFF	19.8
13.170750	---	17.48	50.00	32.52	L1	OFF	19.8
14.718750	20.61	---	60.00	39.39	L1	OFF	19.8
14.718750	---	17.74	50.00	32.26	L1	OFF	19.8
17.049750	24.29	---	60.00	35.71	L1	OFF	19.8
17.049750	---	20.38	50.00	29.62	L1	OFF	19.8

EUT Information

Report NO :	070206
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.165750	---	34.81	55.17	20.36	N	OFF	19.5
0.165750	49.25	---	65.17	15.92	N	OFF	19.5
0.226500	---	32.84	52.58	19.74	N	OFF	19.5
0.226500	44.74	---	62.58	17.84	N	OFF	19.5
0.297330	---	25.51	50.32	24.81	N	OFF	19.5
0.297330	35.46	---	60.32	24.86	N	OFF	19.5
0.363750	---	22.25	48.64	26.39	N	OFF	19.5
0.363750	33.48	---	58.64	25.16	N	OFF	19.5
0.505500	---	21.14	46.00	24.86	N	OFF	19.5
0.505500	28.15	---	56.00	27.85	N	OFF	19.5
3.669720	---	22.05	46.00	23.95	N	OFF	19.6
3.669720	33.18	---	56.00	22.82	N	OFF	19.6
4.587000	---	23.56	46.00	22.44	N	OFF	19.6
4.587000	34.43	---	56.00	21.57	N	OFF	19.6
4.774380	---	26.28	46.00	19.72	N	OFF	19.7
4.774380	38.44	---	56.00	17.56	N	OFF	19.7
4.973910	---	27.54	46.00	18.46	N	OFF	19.7
4.973910	39.67	---	56.00	16.33	N	OFF	19.7
5.207820	---	27.38	50.00	22.62	N	OFF	19.7
5.207820	38.55	---	60.00	21.45	N	OFF	19.7
6.999000	---	18.40	50.00	31.60	N	OFF	19.7

6.999000	21.38	---	60.00	38.62	N	OFF	19.7
8.556000	---	26.68	50.00	23.32	N	OFF	19.8
8.556000	31.43	---	60.00	28.57	N	OFF	19.8
9.332160	---	17.18	50.00	32.82	N	OFF	19.8
9.332160	19.85	---	60.00	40.15	N	OFF	19.8
13.229250	---	16.13	50.00	33.87	N	OFF	19.9
13.229250	18.57	---	60.00	41.43	N	OFF	19.9
13.618050	---	17.74	50.00	32.26	N	OFF	19.9
13.618050	21.00	---	60.00	39.00	N	OFF	19.9
16.955610	---	18.77	50.00	31.23	N	OFF	19.9
16.955610	22.01	---	60.00	37.99	N	OFF	19.9

Appendix C. Radiated Spurious Emission

Test Engineer :	Deniel Lee, Jacky Hong and Wilson Wu	Temperature :	21.5 ~ 23.5°C
		Relative Humidity :	49.5 ~ 55.5%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5607.8	51.23	-16.97	68.2	40	31.7	6.31	26.78	263	256	P	H
		5696	52.28	-49.97	102.25	40.93	31.79	6.42	26.86	263	256	P	H
		5714.2	53.28	-55.9	109.18	41.83	31.89	6.44	26.88	263	256	P	H
		5723.8	53.78	-65.68	119.46	42.28	31.94	6.45	26.89	263	256	P	H
	*	5745	106.89	-	-	95.26	32.07	6.47	26.91	263	256	P	H
	*	5745	99.98	-	-	88.35	32.07	6.47	26.91	263	256	A	H
													H
													H
		5643.4	53.35	-14.85	68.2	42.12	31.7	6.35	26.82	347	330	P	V
		5678.8	51.56	-37.99	89.55	40.26	31.76	6.39	26.85	347	330	P	V
		5706.4	51.68	-55.31	106.99	40.28	31.84	6.43	26.87	347	330	P	V
		5721.6	52.38	-62.07	114.45	40.89	31.93	6.45	26.89	347	330	P	V
	*	5745	102.87	-	-	91.24	32.07	6.47	26.91	347	330	P	V
	*	5745	95.6	-	-	83.97	32.07	6.47	26.91	347	330	A	V
													V
													V

WIFI Ant. 1+2	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)
802.11a CH 157 5785MHz		5620.2	50.91	-17.29	68.2	39.69	31.7	6.32	26.8	262	257	P	H
		5689.8	51.93	-45.75	97.68	40.6	31.78	6.41	26.86	262	257	P	H
		5719.8	52.07	-58.67	110.74	40.59	31.92	6.44	26.88	262	257	P	H
		5723.8	51	-68.46	119.46	39.5	31.94	6.45	26.89	262	257	P	H
	*	5785	107.6	-	-	95.92	32.1	6.52	26.94	262	257	P	H
	*	5785	100.22	-	-	88.54	32.1	6.52	26.94	262	257	A	H
		5854.8	52.27	-58.99	111.26	40.42	32.31	6.54	27	262	257	P	H
		5858.6	52.51	-57.28	109.79	40.66	32.32	6.54	27.01	262	257	P	H
		5904.2	52.24	-31.31	83.55	40.33	32.42	6.54	27.05	262	257	P	H
		5938.4	51.98	-16.22	68.2	39.97	32.55	6.54	27.08	262	257	P	H
													H
													H
		5644.2	51.71	-16.49	68.2	40.48	31.7	6.35	26.82	360	331	P	V
		5672.8	51.9	-33.21	85.11	40.6	31.75	6.39	26.84	360	331	P	V
		5701	50.85	-54.63	105.48	39.49	31.81	6.42	26.87	360	331	P	V
		5720.4	49.88	-61.83	111.71	38.4	31.92	6.44	26.88	360	331	P	V
	*	5785	102.59	-	-	90.91	32.1	6.52	26.94	360	331	P	V
	*	5785	95.15	-	-	83.47	32.1	6.52	26.94	360	331	A	V
		5851.6	51.84	-66.71	118.55	40	32.3	6.54	27	360	331	P	V
		5858.6	51.63	-58.16	109.79	39.78	32.32	6.54	27.01	360	331	P	V
		5879	51.42	-50.81	102.23	39.54	32.36	6.54	27.02	360	331	P	V
		5943.4	51.62	-16.58	68.2	39.59	32.57	6.54	27.08	360	331	P	V
													V
													V

WIFI Ant. 1+2	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)
	*	5825	107.09	-	-	95.33	32.2	6.54	26.98	246	255	P	H
	*	5825	99.51	-	-	87.75	32.2	6.54	26.98	246	255	A	H
		5852.6	52.44	-63.83	116.27	40.59	32.31	6.54	27	246	255	P	H
		5866.4	53.27	-54.34	107.61	41.41	32.33	6.54	27.01	246	255	P	H
		5882	53.8	-46.2	100	41.93	32.36	6.54	27.03	246	255	P	H
		5926.6	51.92	-16.28	68.2	39.94	32.51	6.54	27.07	246	255	P	H
													H
802.11a													H
CH 165	*	5825	101.98	-	-	90.22	32.2	6.54	26.98	100	280	P	V
5825MHz	*	5825	94.25	-	-	82.49	32.2	6.54	26.98	100	280	A	V
		5852	50.21	-67.43	117.64	38.37	32.3	6.54	27	100	280	P	V
		5857.2	51.32	-58.86	110.18	39.47	32.31	6.54	27	100	280	P	V
		5903.8	52.55	-31.3	83.85	40.64	32.42	6.54	27.05	100	280	P	V
		5929.2	51.71	-16.49	68.2	39.72	32.52	6.54	27.07	100	280	P	V
													V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11a (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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	46.86	-27.14	74	52.23	40	10.43	55.8	100	0	P	H
		17235	47.46	-20.74	68.2	50.87	39.81	13.09	56.31	100	0	P	H
													H
													H
		11490	46.99	-27.01	74	52.36	40	10.43	55.8	100	0	P	V
		17235	48.03	-20.17	68.2	51.44	39.81	13.09	56.31	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	45.72	-28.28	74	51.14	39.93	10.48	55.83	100	0	P	H
		17355	48.08	-20.12	68.2	51.08	40.39	13.16	56.55	100	0	P	H
													H
													H
		11570	45.99	-28.01	74	51.41	39.93	10.48	55.83	100	0	P	V
		17355	48.41	-19.79	68.2	51.41	40.39	13.16	56.55	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11650	46.91	-27.09	74	52.61	39.65	10.53	55.88	100	0	P	H
		17475	48.88	-19.32	68.2	51.37	41.08	13.23	56.8	100	0	P	H
													H
													H
		11650	46.82	-27.18	74	52.52	39.65	10.53	55.88	100	0	P	V
		17475	49.31	-18.89	68.2	51.8	41.08	13.23	56.8	100	0	P	V
													V
													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 Ant. 1+2	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)
		5632.8	52.42	-15.78	68.2	41.06	31.83	6.34	26.81	213	252	P	H
		5695.6	52.13	-49.83	101.96	40.6	31.98	6.41	26.86	213	252	P	H
		5716.6	52.49	-57.36	109.85	40.9	32.03	6.44	26.88	213	252	P	H
		5725	57.53	-64.67	122.2	45.92	32.05	6.45	26.89	213	252	P	H
	*	5745	107.64	-	-	95.99	32.09	6.47	26.91	213	252	P	H
	*	5745	99.64	-	-	87.99	32.09	6.47	26.91	213	252	A	H
802.11n													H
HT20													H
CH 149		5642.4	52.35	-15.85	68.2	41	31.82	6.35	26.82	100	278	P	V
5745MHz		5671.4	53.86	-30.22	84.08	42.42	31.89	6.39	26.84	100	278	P	V
		5719	51.8	-58.72	110.52	40.2	32.04	6.44	26.88	100	278	P	V
		5721.2	51.08	-62.46	113.54	39.47	32.04	6.45	26.88	100	278	P	V
	*	5745	103.64	-	-	91.99	32.09	6.47	26.91	100	278	P	V
	*	5745	95.34	-	-	83.69	32.09	6.47	26.91	100	278	A	V
													V
													V

WIFI Ant. 1+2	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)
		5615.2	51.92	-16.28	68.2	40.52	31.87	6.32	26.79	222	250	P	H
		5668.8	51.04	-31.11	82.15	39.62	31.88	6.38	26.84	222	250	P	H
		5710.4	51.72	-56.39	108.11	40.15	32.02	6.43	26.88	222	250	P	H
		5723.8	52.59	-66.87	119.46	40.98	32.05	6.45	26.89	222	250	P	H
	*	5785	106.28	-	-	94.6	32.1	6.52	26.94	222	250	P	H
	*	5785	98.18	-	-	86.5	32.1	6.52	26.94	222	250	A	H
		5852.2	52.28	-64.9	117.18	40.43	32.31	6.54	27	222	250	P	H
		5870.6	51.98	-54.45	106.43	40.08	32.38	6.54	27.02	222	250	P	H
		5912.8	53.11	-24.09	77.2	41.07	32.55	6.54	27.05	222	250	P	H
		5937.8	51.19	-17.01	68.2	39.08	32.65	6.54	27.08	222	250	P	H
802.11n													H
HT20													H
CH 157		5633.8	51.3	-16.9	68.2	39.94	31.83	6.34	26.81	100	278	P	V
5785MHz		5660	52.16	-23.47	75.63	40.78	31.84	6.37	26.83	100	278	P	V
		5710	52.27	-55.73	108	40.69	32.02	6.43	26.87	100	278	P	V
		5723.4	50.69	-67.86	118.55	39.08	32.05	6.45	26.89	100	278	P	V
	*	5785	102.48	-	-	90.8	32.1	6.52	26.94	100	278	P	V
	*	5785	94.78	-	-	83.1	32.1	6.52	26.94	100	278	A	V
		5851.4	51.3	-67.71	119.01	39.45	32.31	6.54	27	100	278	P	V
		5855.8	51.67	-58.91	110.58	39.81	32.32	6.54	27	100	278	P	V
		5915.6	52.32	-22.81	75.13	40.28	32.56	6.54	27.06	100	278	P	V
		5932.4	52.18	-16.02	68.2	40.08	32.63	6.54	27.07	100	278	P	V
													V
													V

WIFI Ant. 1+2	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)
	*	5825	106.46	-	-	94.7	32.2	6.54	26.98	234	254	P	H
	*	5825	98.46	-	-	86.7	32.2	6.54	26.98	234	254	A	H
		5855	52.49	-58.31	110.8	40.63	32.32	6.54	27	234	254	P	H
		5872	53.4	-52.64	106.04	41.49	32.39	6.54	27.02	234	254	P	H
		5882.8	53.2	-46.21	99.41	41.26	32.43	6.54	27.03	234	254	P	H
		5928.6	52.28	-15.92	68.2	40.2	32.61	6.54	27.07	234	254	P	H
802.11n													H
HT20													H
CH 165	*	5825	102.36	-	-	90.6	32.2	6.54	26.98	112	275	P	V
5825MHz	*	5825	94.36	-	-	82.6	32.2	6.54	26.98	112	275	A	V
		5851.8	52.64	-65.46	118.1	40.79	32.31	6.54	27	112	275	P	V
		5873.6	52.8	-52.79	105.59	40.89	32.39	6.54	27.02	112	275	P	V
		5882.2	52.46	-47.39	99.85	40.52	32.43	6.54	27.03	112	275	P	V
		5942.4	52.23	-15.97	68.2	40.1	32.67	6.54	27.08	112	275	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1+2	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 HT20 CH 149 5745MHz		11490	47.02	-26.98	74	52.32	40.07	10.43	55.8	100	0	P	H
		17235	47.74	-20.46	68.2	50.95	40.01	13.09	56.31	100	0	P	H
													H
													H
		11490	46.79	-27.21	74	52.09	40.07	10.43	55.8	100	0	P	V
		17235	47.63	-20.57	68.2	50.84	40.01	13.09	56.31	100	0	P	V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	46.11	-27.89	74	51.57	39.89	10.48	55.83	100	0	P	H
		17355	47.99	-20.21	68.2	50.9	40.48	13.16	56.55	100	0	P	H
													H
													H
		11570	46.38	-27.62	74	51.84	39.89	10.48	55.83	100	0	P	V
		17355	49.48	-18.72	68.2	52.39	40.48	13.16	56.55	100	0	P	V
													V
													V
802.11n HT20 CH 165 5825MHz		11650	47.09	-26.91	74	52.89	39.55	10.53	55.88	100	0	P	H
		17475	49.81	-18.39	68.2	52.46	40.92	13.23	56.8	100	0	P	H
													H
													H
		11650	46.17	-27.83	74	51.97	39.55	10.53	55.88	100	0	P	V
		17475	48.93	-19.27	68.2	51.58	40.92	13.23	56.8	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2	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)
		5613.4	51.71	-16.49	68.2	40.31	31.87	6.32	26.79	214	252	P	H
		5688.4	52.82	-43.82	96.64	41.32	31.95	6.41	26.86	214	252	P	H
		5717.4	54.97	-55.1	110.07	43.38	32.03	6.44	26.88	214	252	P	H
		5722.2	55.94	-59.88	115.82	44.34	32.04	6.45	26.89	214	252	P	H
	*	5755	105.07	-	-	93.39	32.1	6.49	26.91	214	252	P	H
	*	5755	97.67	-	-	85.99	32.1	6.49	26.91	214	252	A	H
		5851	51.95	-67.97	119.92	40.11	32.3	6.54	27	214	252	P	H
		5859.4	54.33	-55.24	109.57	42.46	32.34	6.54	27.01	214	252	P	H
		5875.4	51.72	-53.18	104.9	39.8	32.4	6.54	27.02	214	252	P	H
		5936.6	52.6	-15.6	68.2	40.48	32.65	6.54	27.07	214	252	P	H
802.11n													H
HT40													H
CH 151		5637.2	52.48	-15.72	68.2	41.12	31.83	6.34	26.81	106	276	P	V
5755MHz		5665.8	52.35	-27.58	79.93	40.95	31.86	6.38	26.84	106	276	P	V
		5718.8	52.33	-58.13	110.46	40.73	32.04	6.44	26.88	106	276	P	V
		5720.8	54.87	-57.75	112.62	43.27	32.04	6.44	26.88	106	276	P	V
	*	5755	100.97	-	-	89.29	32.1	6.49	26.91	106	276	P	V
	*	5755	93.57	-	-	81.89	32.1	6.49	26.91	106	276	A	V
		5851.2	51.5	-67.96	119.46	39.66	32.3	6.54	27	106	276	P	V
		5860	52.14	-57.26	109.4	40.27	32.34	6.54	27.01	106	276	P	V
		5883	51.89	-47.37	99.26	39.95	32.43	6.54	27.03	106	276	P	V
		5931.2	51.44	-16.76	68.2	39.35	32.62	6.54	27.07	106	276	P	V
													V
													V

WIFI Ant. 1+2	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)
		5617	51.28	-16.92	68.2	39.88	31.87	6.32	26.79	214	251	P	H
		5698	52.3	-51.43	103.73	40.75	31.99	6.42	26.86	214	251	P	H
		5700.2	51.64	-53.62	105.26	40.09	32	6.42	26.87	214	251	P	H
		5721.2	52.95	-60.59	113.54	41.34	32.04	6.45	26.88	214	251	P	H
	*	5795	104.68	-	-	93	32.1	6.53	26.95	214	251	P	H
	*	5795	97.38	-	-	85.7	32.1	6.53	26.95	214	251	A	H
		5851	52.38	-67.54	119.92	40.54	32.3	6.54	27	214	251	P	H
		5873.4	53.36	-52.29	105.65	41.45	32.39	6.54	27.02	214	251	P	H
		5894	52.57	-38.53	91.1	40.59	32.48	6.54	27.04	214	251	P	H
		5945	52.83	-15.37	68.2	40.69	32.68	6.54	27.08	214	251	P	H
802.11n													H
HT40													H
CH 159		5603.6	51.88	-16.32	68.2	40.47	31.89	6.3	26.78	100	276	P	V
5795MHz		5675.2	51	-35.89	86.89	39.55	31.9	6.39	26.84	100	276	P	V
		5703.2	51.01	-55.09	106.1	39.45	32.01	6.42	26.87	100	276	P	V
		5720.2	52.01	-59.25	111.26	40.41	32.04	6.44	26.88	100	276	P	V
	*	5795	100.68	-	-	89	32.1	6.53	26.95	100	276	P	V
	*	5795	93.68	-	-	82	32.1	6.53	26.95	100	276	A	V
		5851.8	52.52	-65.58	118.1	40.67	32.31	6.54	27	100	276	P	V
		5861.2	52.42	-56.64	109.06	40.55	32.34	6.54	27.01	100	276	P	V
		5875	52.04	-53.16	105.2	40.12	32.4	6.54	27.02	100	276	P	V
		5929.6	51.32	-16.88	68.2	39.23	32.62	6.54	27.07	100	276	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1+2	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 CH 151 5755MHz		11510	47.27	-26.73	74	52.55	40.07	10.45	55.8	100	0	P	H
		17265	47.81	-20.39	68.2	50.97	40.1	13.11	56.37	100	0	P	H
													H
													H
		11510	46.76	-27.24	74	52.04	40.07	10.45	55.8	100	0	P	V
		17265	47.98	-20.22	68.2	51.14	40.1	13.11	56.37	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	46.91	-27.09	74	52.44	39.83	10.49	55.85	100	0	P	H
		17385	48.38	-19.82	68.2	51.2	40.62	13.18	56.62	100	0	P	H
													H
													H
		11590	45.87	-28.13	74	51.4	39.83	10.49	55.85	100	0	P	V
		17385	48.63	-19.57	68.2	51.45	40.62	13.18	56.62	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	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)
		5628.6	51.95	-16.25	68.2	40.58	31.84	6.33	26.8	212	251	P	H
		5699.8	54.18	-50.87	105.05	42.63	32	6.42	26.87	212	251	P	H
		5716.8	56.77	-53.14	109.91	45.18	32.03	6.44	26.88	212	251	P	H
		5725	55.63	-66.57	122.2	44.02	32.05	6.45	26.89	212	251	P	H
	*	5775	102.28	-	-	90.6	32.1	6.51	26.93	212	251	P	H
	*	5775	94.98	-	-	83.3	32.1	6.51	26.93	212	251	A	H
		5851.4	53.71	-65.3	119.01	41.86	32.31	6.54	27	212	251	P	H
		5859.4	54.78	-54.79	109.57	42.91	32.34	6.54	27.01	212	251	P	H
		5909.4	52.73	-26.98	79.71	40.7	32.54	6.54	27.05	212	251	P	H
		5946.4	51.73	-16.47	68.2	39.58	32.69	6.54	27.08	212	251	P	H
802.11ac													H
VHT80													H
CH 155		5621.4	51.91	-16.29	68.2	40.52	31.86	6.33	26.8	100	280	P	V
5775MHz		5699.8	54.3	-50.75	105.05	42.75	32	6.42	26.87	100	280	P	V
		5719.6	54.03	-56.66	110.69	42.43	32.04	6.44	26.88	100	280	P	V
		5723	55.72	-61.92	117.64	44.11	32.05	6.45	26.89	100	280	P	V
	*	5775	98.58	-	-	86.9	32.1	6.51	26.93	100	280	P	V
	*	5775	90.98	-	-	79.3	32.1	6.51	26.93	100	280	A	V
		5852.4	52.56	-64.17	116.73	40.71	32.31	6.54	27	100	280	P	V
		5868.4	52.78	-54.27	107.05	40.88	32.37	6.54	27.01	100	280	P	V
		5891.4	52.85	-40.18	93.03	40.87	32.47	6.54	27.03	100	280	P	V
		5926.2	51.22	-16.98	68.2	39.15	32.6	6.54	27.07	100	280	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1+2	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 155 5775MHz		11550	46.91	-27.09	74	52.31	39.95	10.47	55.82	100	0	P	H
		17325	48.48	-19.72	68.2	51.5	40.33	13.14	56.49	100	0	P	H
													H
													H
		11550	46.59	-27.41	74	51.99	39.95	10.47	55.82	100	0	P	V
		17325	49.72	-18.48	68.2	52.74	40.33	13.14	56.49	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 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)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
5GHz 802.11a LF		72.68	26.61	-13.39	40	45.31	12.78	0.74	32.22	-	-	P	H
		115.36	35.93	-7.57	43.5	49.74	17.39	0.94	32.14	100	0	P	H
		193.93	26.45	-17.05	43.5	42.57	14.93	1.25	32.3	-	-	P	H
		264.74	28.17	-17.83	46	39.07	19.79	1.41	32.1	-	-	P	H
		307.42	29.98	-16.02	46	41.09	19.35	1.5	31.96	-	-	P	H
		956.35	32.75	-13.25	46	30.3	30.66	2.71	30.92	-	-	P	H
													H
													H
													H
													H
													H
													H
		33.88	26.07	-13.93	40	34.93	22.87	0.51	32.24	-	-	P	V
		62.98	27.38	-12.62	40	47.07	11.91	0.67	32.27	-	-	P	V
		72.68	28.33	-11.67	40	47.03	12.78	0.74	32.22	100	0	P	V
		91.11	27.07	-16.43	43.5	43.39	15.04	0.79	32.15	-	-	P	V
		721.61	33.12	-12.88	46	35.35	27.14	2.33	31.7	-	-	P	V
		957.32	32.72	-13.28	46	30.28	30.63	2.72	30.91	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

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

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. 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 D. Radiated Spurious Emission Plots

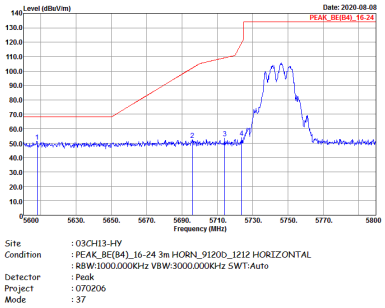
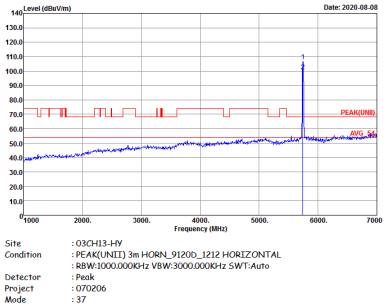
Test Engineer :	Deniel Lee, Jacky Hong and Wilson Wu	**Temperature :**	21.5 ~ 23.5°C
		Relative Humidity :	49.5 ~ 55.5%

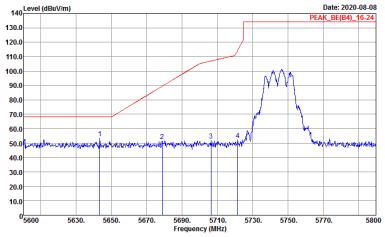
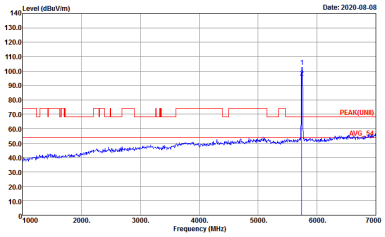
Note symbol

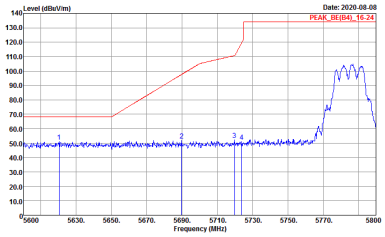
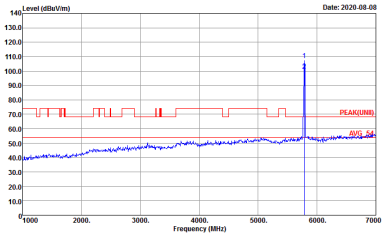
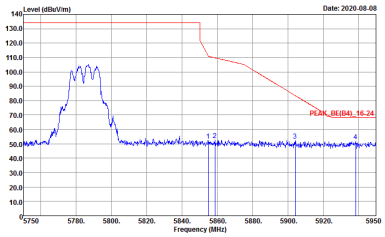
-L	**Low channel location**
-R	**High channel location**

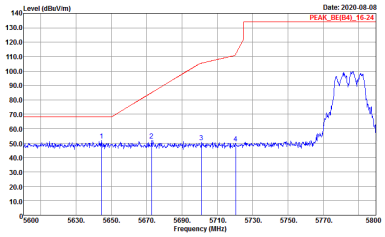
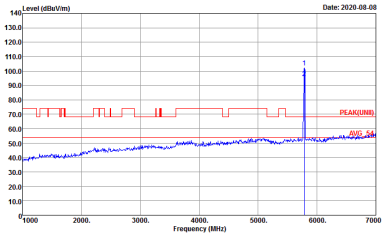
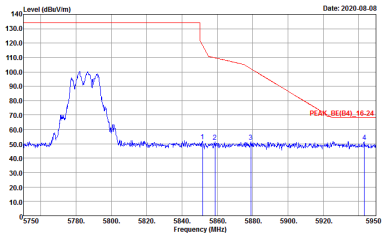
Band 4 - 5725~5850MHz

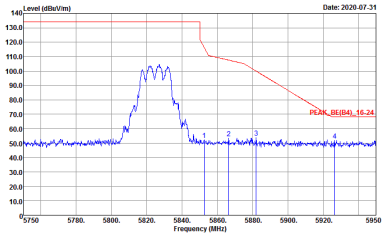
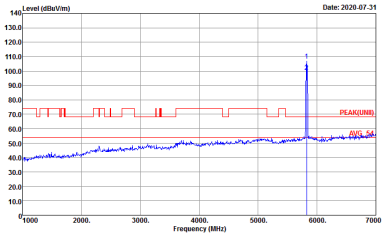
WIFI 802.11a (Band Edge @ 3m)

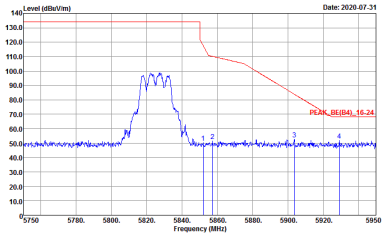
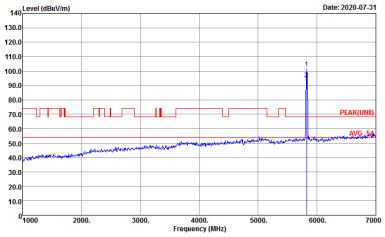
WIFI	**Band 4 5725~5850MHz Band Edge @ 3m**	
ANT	**802.11a CH149 5745MHz**	
1+2	**Horizontal**	**Fundamental**
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 37	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 37

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 38	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 38
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 38	Left blank

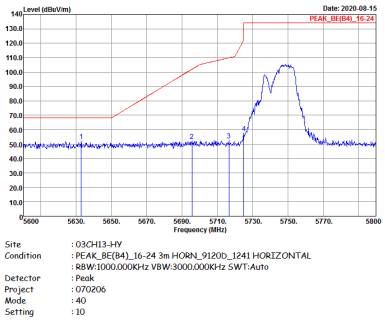
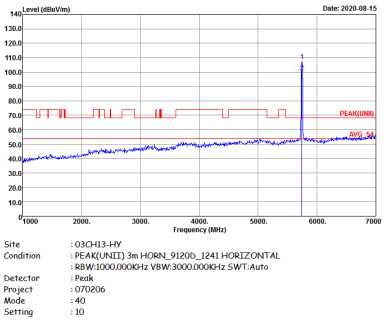
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 38	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 38
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 38	Left blank

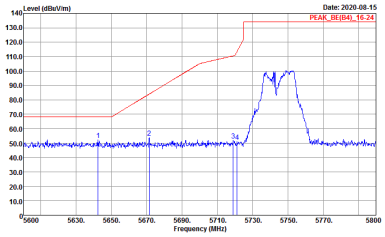
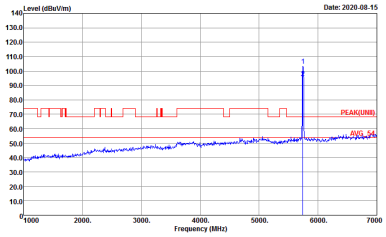
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 39 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 39 Setting : 10

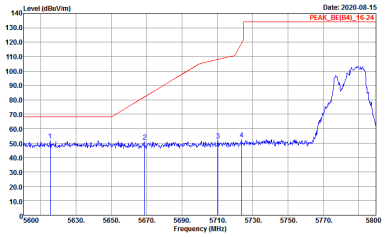
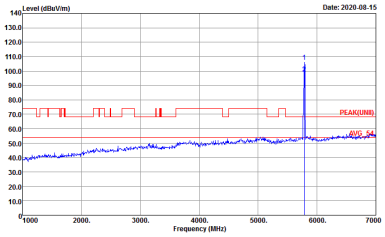
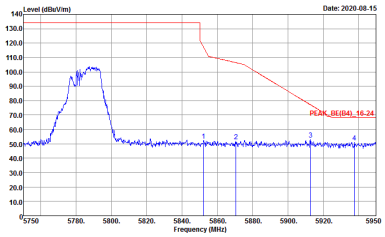
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 39 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 39 Setting : 10

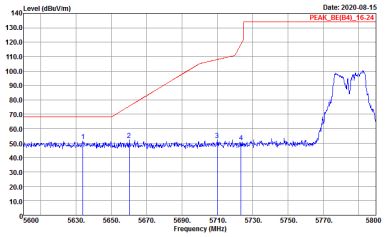
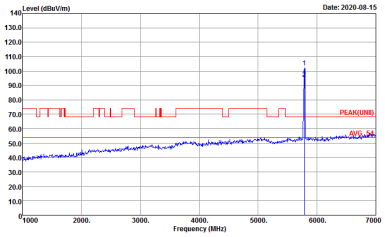
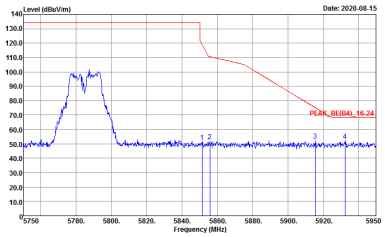
Band 4 5725~5850MHz

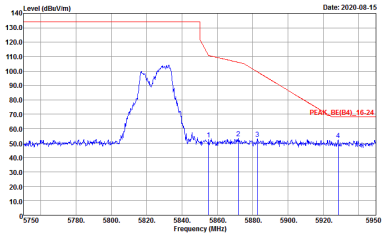
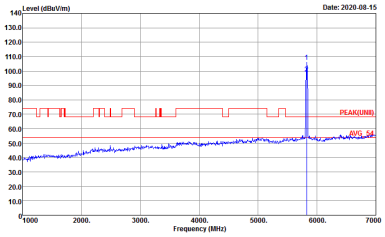
WIFI 802.11n HT20 (Band Edge @ 3m)

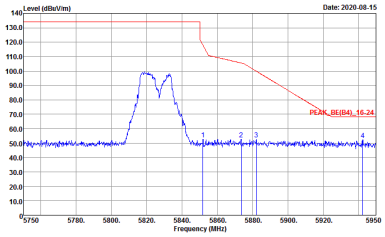
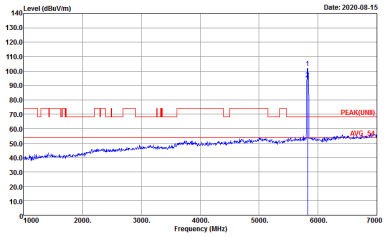
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Vertical	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 41 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 41 Setting : 10
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 41 Setting : 10	Left blank

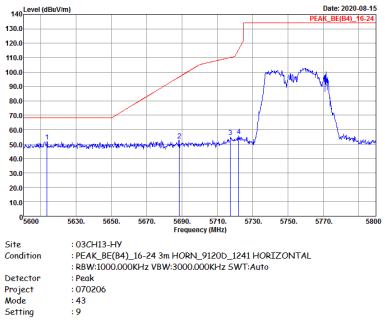
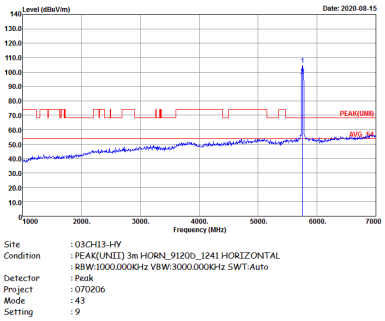
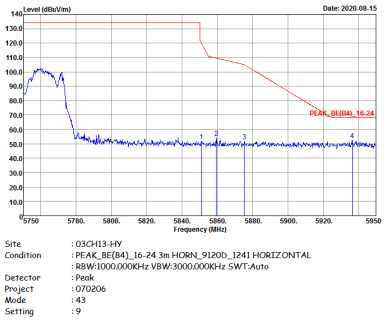
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 41 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 41 Setting : 10
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 41 Setting : 10	Left blank

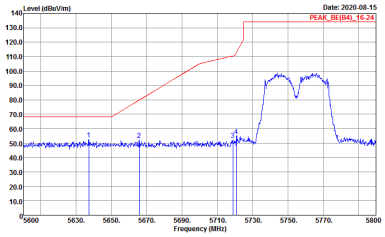
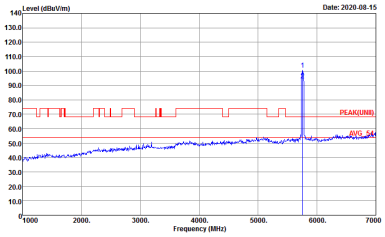
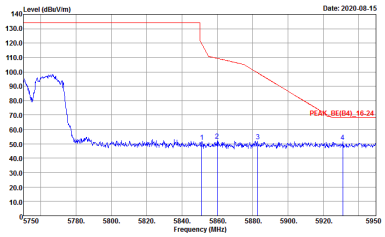
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 42 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 42 Setting : 10

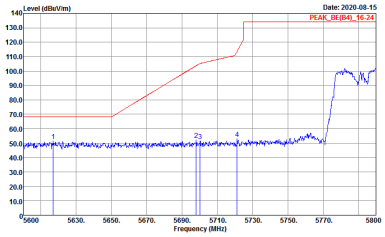
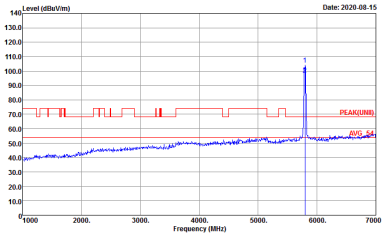
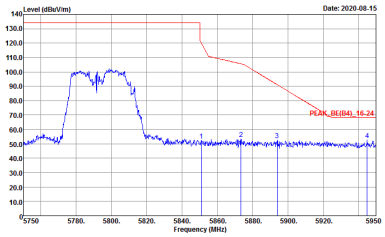
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 42 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 42 Setting : 10

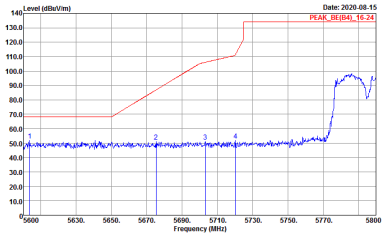
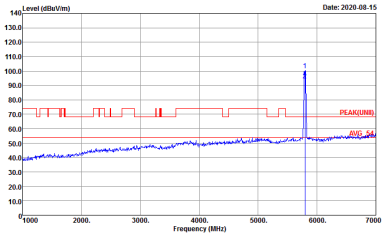
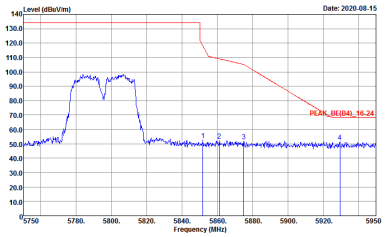
Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Fundamental
Peak		
Peak		Left blank

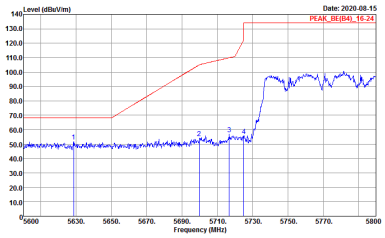
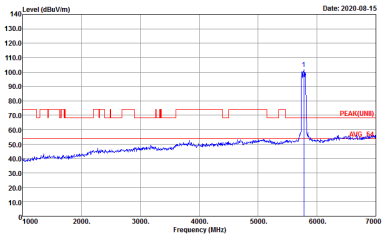
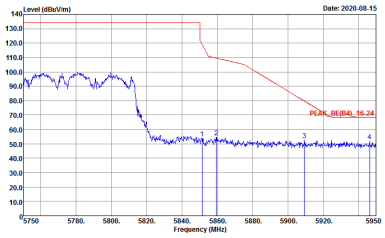
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 43 Setting : 9	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 43 Setting : 9
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 43 Setting : 9	Left blank

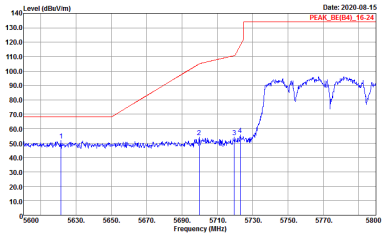
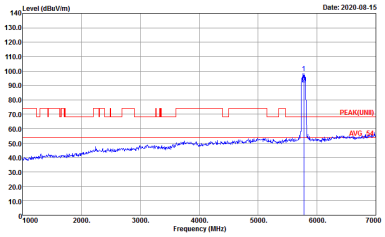
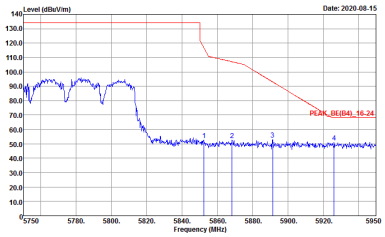
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 44 Setting : 9.5	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 44 Setting : 9.5
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 44 Setting : 9.5	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 44 Setting : 9.5	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 44 Setting : 9.5
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 44 Setting : 9.5	Left blank

Band 4 5725~5850MHz

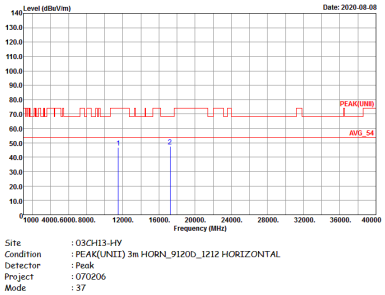
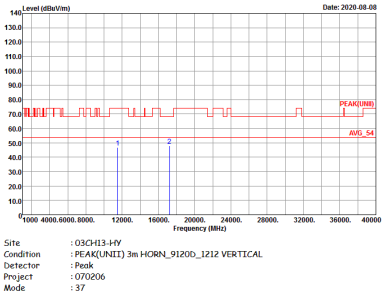
WIFI 802.11ac VHT80 (Band Edge @ 3m)

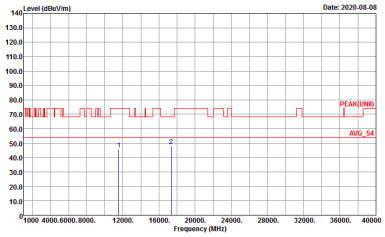
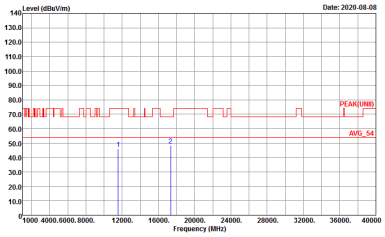
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 45 Setting : 9.5	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 45 Setting : 9.5
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 45 Setting : 9.5	Left blank

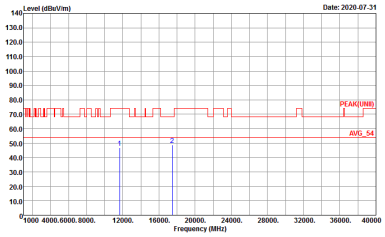
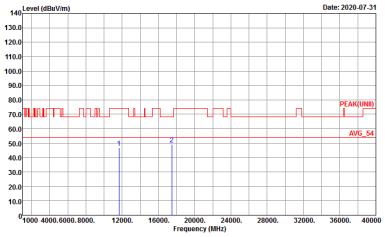
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 45 Setting : 9.5	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 45 Setting : 9.5
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 070206 Mode : 45 Setting : 9.5	Left blank

Band 4 - 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

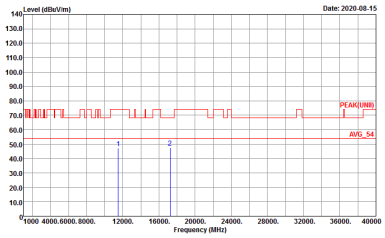
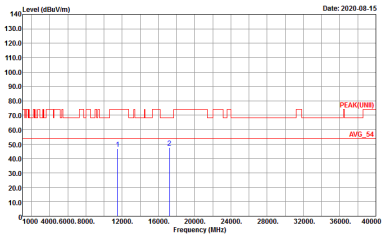
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 HORIZONTAL Detector : Peak Project : 070206 Mode : 37	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 VERTICAL Detector : Peak Project : 070206 Mode : 37

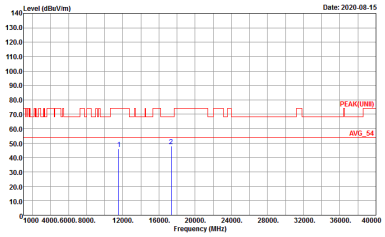
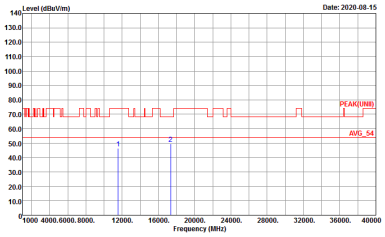
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 HORIZONTAL Detector : Peak Project : 070206 Mode : 38	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 VERTICAL Detector : Peak Project : 070206 Mode : 38

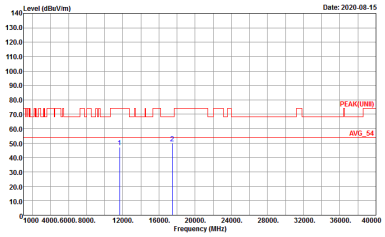
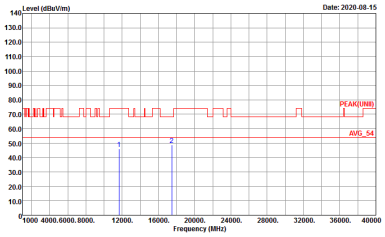
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 HORIZONTAL Detector : Peak Project : 070206 Mode : 39 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1212 VERTICAL Detector : Peak Project : 070206 Mode : 39 Setting : 10

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

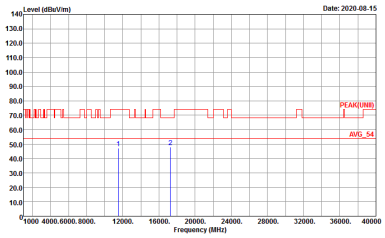
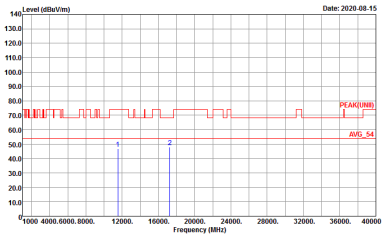
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL Detector : Peak Project : 070206 Mode : 40 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL Detector : Peak Project : 070206 Mode : 40 Setting : 10

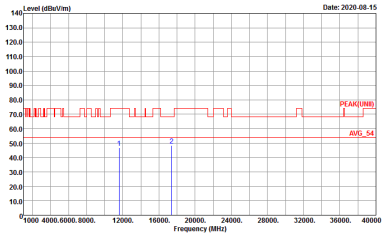
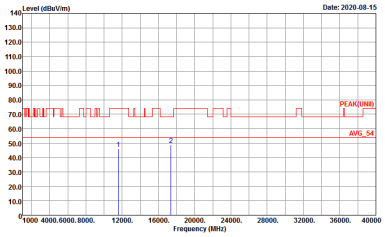
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL Detector : Peak Project : 070206 Mode : 41 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL Detector : Peak Project : 070206 Mode : 41 Setting : 10

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL Detector : Peak Project : 070206 Mode : 42 Setting : 10	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL Detector : Peak Project : 070206 Mode : 42 Setting : 10

Band 4 5725~5850MHz

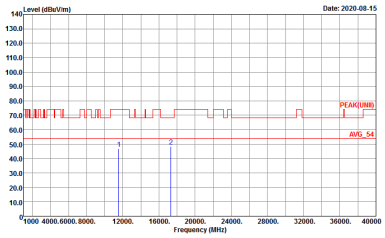
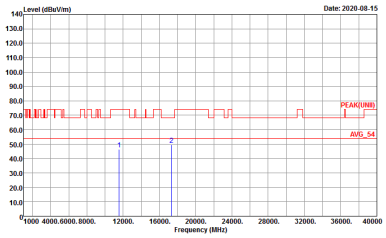
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL Detector : Peak Project : 070206 Mode : 43 Setting : 9	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL Detector : Peak Project : 070206 Mode : 43 Setting : 9

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL Detector : Peak Project : 070206 Mode : 44 Setting : 9.5	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL Detector : Peak Project : 070206 Mode : 44 Setting : 9.5

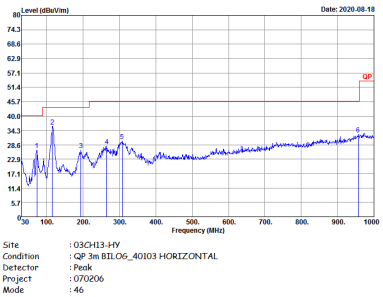
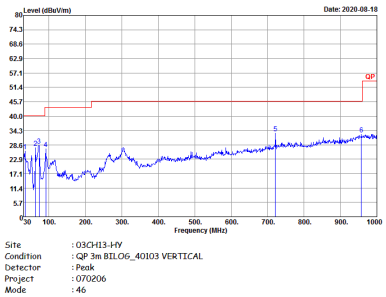
Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 HORIZONTAL Detector : Peak Project : 070206 Mode : 45 Setting : 9.5	 Site : 03CH13-HY Condition : PEAK(UNII) 3m HORN_9120D_1241 VERTICAL Detector : Peak Project : 070206 Mode : 45 Setting : 9.5

Emission below 1GHz

5GHz WIFI 802.11a (LF)

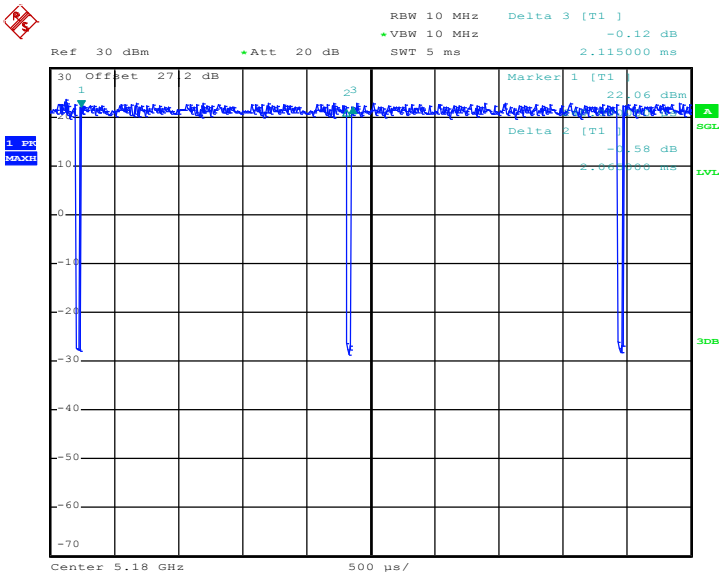
WIFI	5GHz 5725~5850MHz	
ANT	802.11a LF	
1+2	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
1+2	802.11a for Ant 1	97.64	2065	0.48	1kHz	0.10
1+2	802.11a for Ant 2	98.11	-	-	10Hz	0.08
1+2	5GHz 802.11n HT20 for Ant 1	97.47	1925	0.52	1kHz	0.11
1+2	5GHz 802.11n HT20 for Ant 2	98.23	-	-	10Hz	0.08
1+2	5GHz 802.11n HT40 for Ant 1	98.98	-	-	10Hz	0.04
1+2	5GHz 802.11n HT40 for Ant 2	96.41	975	1.03	3kHz	0.16
1+2	5GHz 802.11ac VHT80 for Ant 1	98.08	-	-	10Hz	0.08
1+2	5GHz 802.11ac VHT80 for Ant 2	91.72	495	2.02	3kHz	0.38

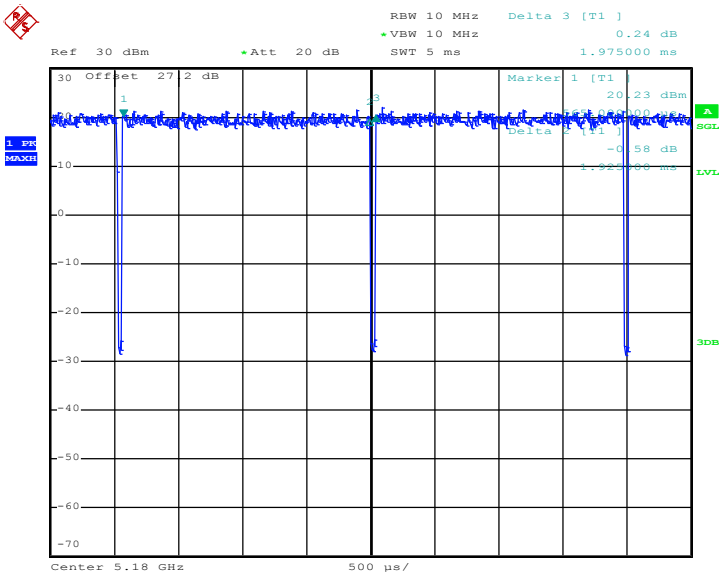
MIMO <Ant. 1>

802.11a



Date: 16.JUL.2020 17:15:37

802.11n HT20



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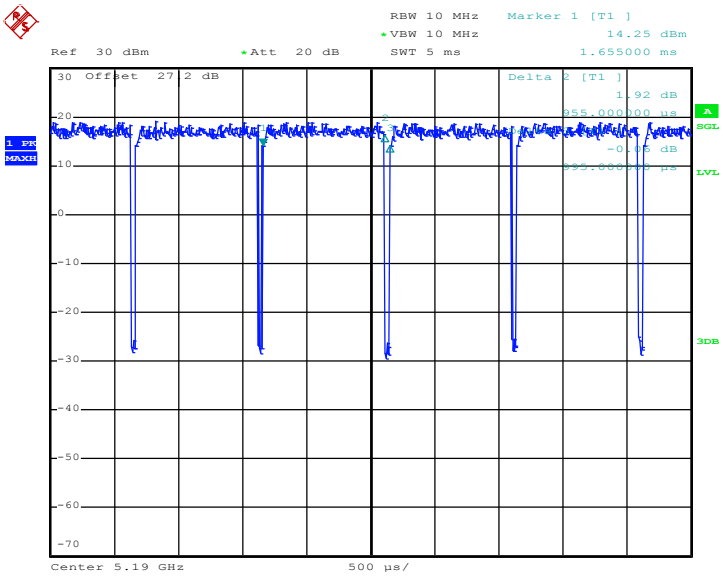
802.11n HT40



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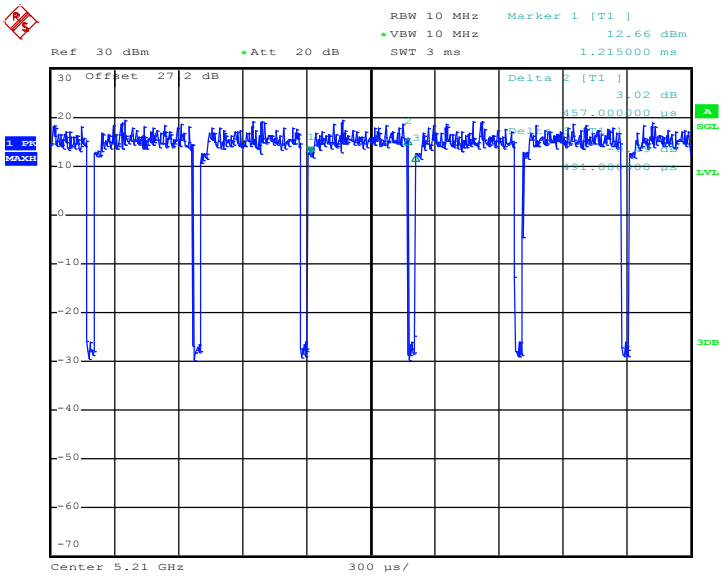
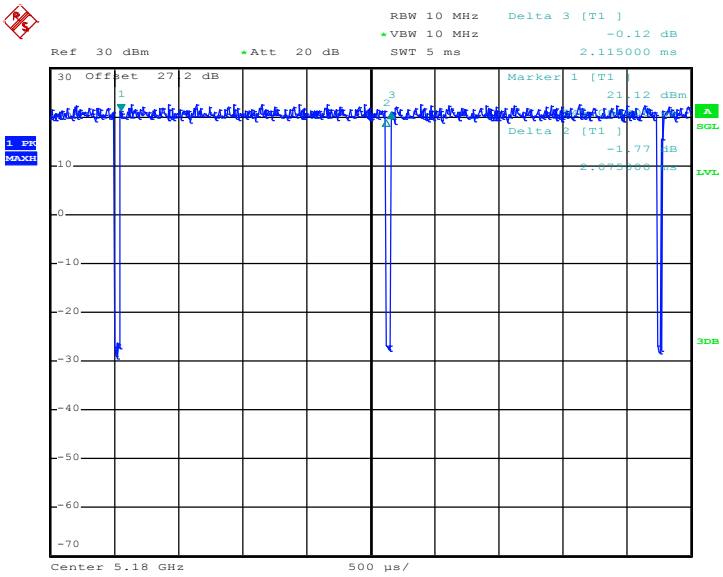
802.11ac VHT80



Date: 16.JUL.2020 17:54:15

MIMO <Ant. 2>

802.11a



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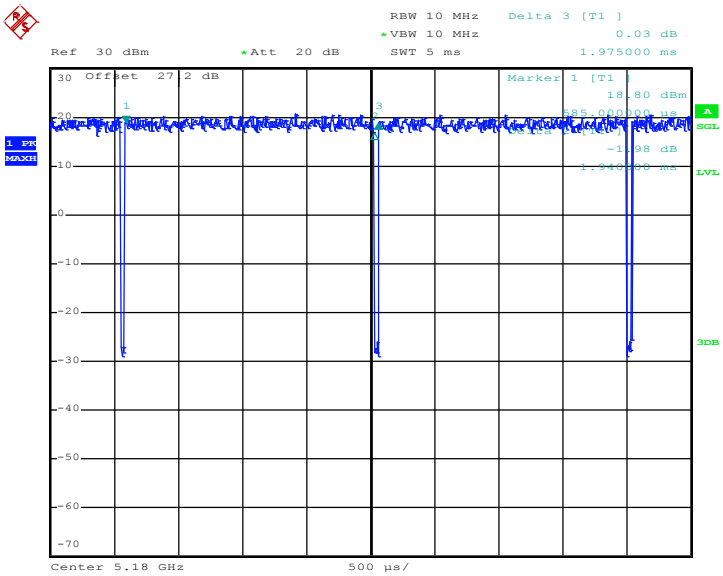
802.11n HT20



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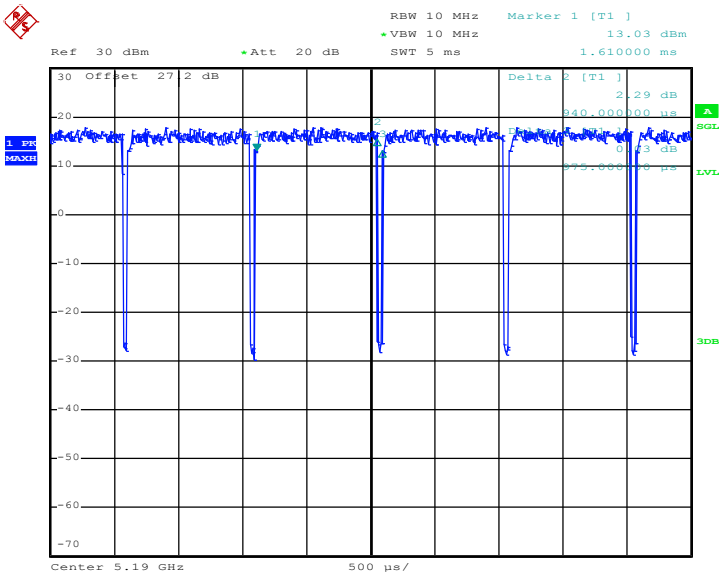
802.11n HT40



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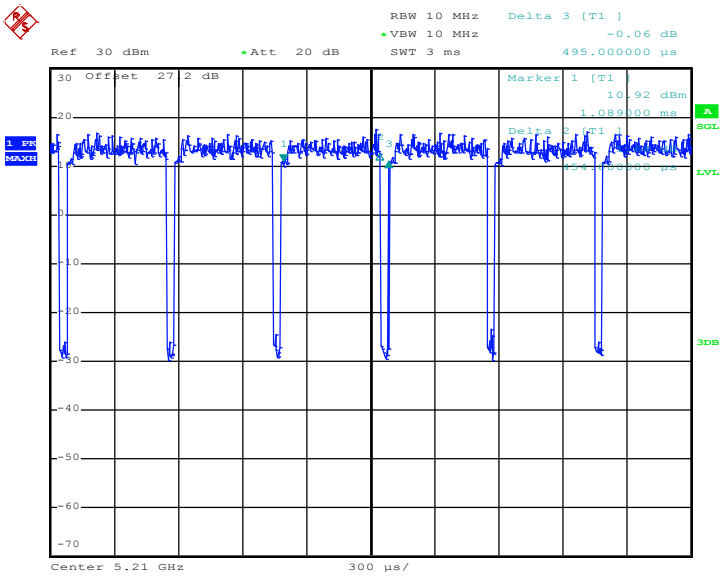
802.11ac VHT80



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