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FCC DTS REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
July 15, 2020

Test Site/Location:
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2007-FC016

FCC ID:	**A3LSMT878U**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**
Model:	SM-T878U
EUT Type:	Tablet
Average Output Power:	Ant.1: 802.11b : 19.91 dBm / 802.11g : 18.50 dBm / 802.11n(HT20) : 17.13 dBm 802.11ac(HT20) : 17.23 dBm Ant.2: 802.11b : 19.91 dBm / 802.11g : 18.43 dBm / 802.11n(HT20) : 17.07 dBm 802.11ac(HT20) : 17.14 dBm Ant.1&2 : 802.11b : 22.88 dBm / 802.11g : 21.48 dBm 802.11n(HT20) : 20.11 dBm / 802.11ac(HT20) : 20.20 dBm
Frequency Range:	2 412 MHz ~ 2 462 MHz (US Only: 2 412 MHz ~ 2 462 MHz)
Modulation type:	CCK/DSSS/OFDM
FCC Classification:	Digital Transmission System(DTS)
FCC Rule Part(s):	Part 15.247

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

REVIEWED BY

Report prepared by : Jeong Ho Kim
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2007-FC016	July 15, 2020	- First Approval Report

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1. EUT DESCRIPTION

Model	SM-T878U		
Additional Model	-		
EUT Type	Tablet		
Power Supply	DC 3.85 V		
Battery Information	Model: EB-BT875ABY Type: Li-ion Battery		
Travel Adapter Information	Model : EP-TA200 Manufacture: RFTech		
Data Cable Information	Model : EP-DT725BBE Manufacture: KSDCO		
Ear-jack Information	Model : GHSS028-K8 Manufacture: BUJEON		
S-PEN Information	Model : EJ-PT870 Manufacture: WACOM		
Keyboard Information	Model : EF-DT870 Manufacture: SAMSUNG		
Frequency Range	2 412 MHz ~ 2 462 MHz (US Only: 2 412 MHz ~ 2 462 MHz)		
Max. RF Output Power	Peak Power (For information only)	Ant. 1 (SISO)	802.11b : 25.49 dBm 802.11g : 26.28 dBm 802.11n(HT20) : 25.26 dBm 802.11ac(HT20) : 25.44 dBm
		Ant.2 (SISO)	802.11b : 25.45 dBm 802.11g : 26.11 dBm 802.11n(HT20) : 25.20 dBm 802.11ac(HT20) : 25.32 dBm
		Ant.1&2 (MIMO)	802.11b : 28.44 dBm 802.11g : 29.20 dBm 802.11n(HT20) : 28.24 dBm 802.11ac(HT20) : 28.39 dBm
	Average Power	Ant. 1 (SISO)	802.11b : 19.91 dBm 802.11g : 18.50 dBm 802.11n(HT20) : 17.13 dBm 802.11ac(HT20) : 17.23 dBm
		Ant.2 (SISO)	802.11b : 19.91 dBm 802.11g : 18.43 dBm 802.11n(HT20) : 17.07 dBm 802.11ac(HT20) : 17.14 dBm
		Ant.1&2 (MIMO)	802.11b : 22.88 dBm 802.11g : 21.48 dBm 802.11n(HT20) : 20.11 dBm 802.11ac(HT20) : 20.20 dBm
Modulation Type	DSSS/CCK : 802.11b OFDM : 802.11g, 802.11n, 802.11ac		
Number of Channels	11 Channels		
Antenna Specification	Antenna type: Metal Peak Gain: Ant.1: 0.90 dBi / Ant.2: -0.50 dBi		
Date(s) of Tests	May 28, 2020 ~ July 01, 2020		

ANTENNA CONFIGURATIONS

1. The device employs MIMO technology. Below are the possible configurations

Configurations	SISO		SDM	CDD
	Ant1	Ant2	Ant1 + Ant2	Ant1 + Ant2
802.11b	O	O	X	O
802.11g	O	O	X	O
802.11n(HT20)	O	O	O	O
802.11ac(VHT20)	O	O	O	O

Note:

(1) O = Support, X = Not Support

(2) SISO = Single Input Single Output

(3) SDM = Spatial Diversity Multiplexing

(4) CDD = Cyclic Delay Diversity

2.This device supports simultaneous transmission operation, which allows for two channels to operate independent of one another in the 2.4GHz and 5GHz bands simultaneously on each antenna.

	2.4GHz WIFI		5GHz WIFI		Test case
	Ant1	Ant2	Ant1	Ant2	
2.4 GHz + 5 GHz RSDB Only	B			C	O
		B	C		O
	B		C		-
		B		C	O
2.4 GHz + 5 GHz RSDB & MIMO	B	B	C		-
	B	B		C	-
	B		C	C	-
		B	C	C	O
2.4 GHz + 5 GHz RSDB MIMO	B	B	C	C	O

3. Directional Gain Calculation

According to KDB 662911 D01 Multiple Transmitter Output v02r01 F) 2) f) (ii)

Directional gain =

- $$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

Ant Gain (dBi)		N_{ANT}/ N_{SS}	Directional Gain (dBi)
Ant.1	0.90	2 / 2	3.24
Ant.2	-0.50		

2. TEST METHODOLOGY

FCC KDB 558074 D01 15.247 Meas Guidance v05r02 dated April 02, 2019 entitled “guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices and the measurement procedure described in ANSI C63.10(Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpse of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013)

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment's, which is traceable to recognized national standards.

Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of §15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

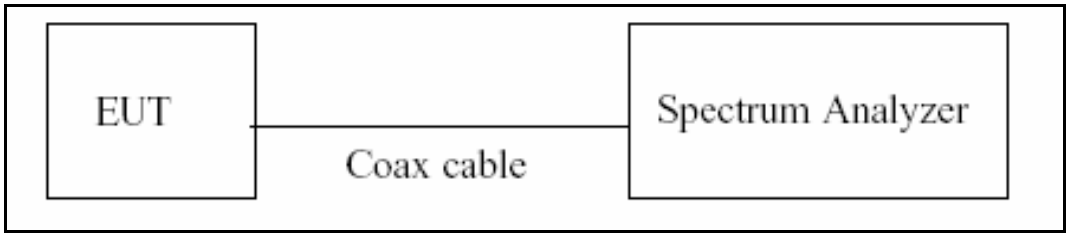
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

7. DESCRIPTION OF TESTS

7.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to the zero-span measurement method.

The largest availble value of RBW is 8 MHz and VBW is 50 MHz.

The zero-span method of measuring duty cycle shall not be used if T ≤ 6.25 microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/*T*.

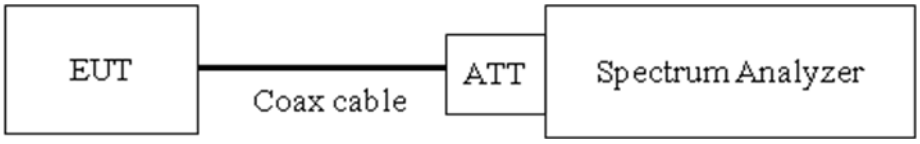
1. RBW = 8 MHz (the largest availble value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

7.2. 6dB Bandwidth

Limit

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to (Procedure 11.8.1 in ANSI 63.10-2013)

1) RBW = 100 kHz
2) VBW ≥ 3 x RBW
3) Detector = Peak
4) Trace mode = max hold
5) Sweep = auto couple
6) Allow the trace to stabilize
7) We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

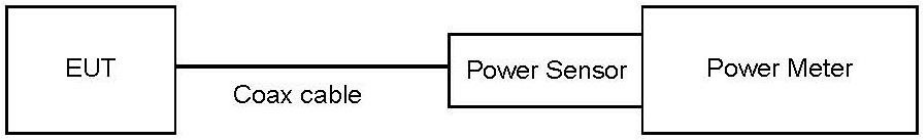
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

7.3. Output Power

Limit

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

The transmitter output is connected to the Power Meter.

▪ Peak Power (Procedure 11.9.1.3 in ANSI 63.10-2013)

: Measure the peak power of the transmitter.

▪ Average Power (Procedure 11.9.2.3 in ANSI 63.10-2013)

1) Measure the duty cycle.
2) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
3) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

▪ Conducted Output Power(Peak) = Reading Value + ATT loss + Cable loss

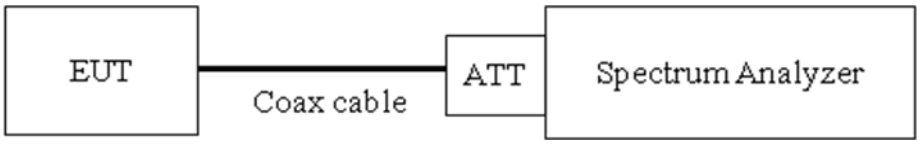
▪ Conducted Output Power(Average) = Reading Value + ATT loss + Cable loss + Duty Cycle Factor

7.4. Power Spectral Density

Limit

The transmitter power density average over 1-second interval shall not be greater than 8 dBm in any 3kHz BW.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure 8.4 in KDB 558074 v05r02, Procedure 11.10 in ANSI 63.10-2013.

The spectrum analyzer is set to :

1) Set analyzer center frequency to DTS channel center frequency.
2) Set span to at least 1.5 times the OBW.
3) RBW = 3 kHz ≤ RBW ≤ 100 kHz.
4) VBW ≥ 3 x RBW.
5) Sweep = auto couple
6) Detector = power averaging (rms) or sample detector (when rms not available).
7) Ensure that the number of measurement points in the sweep ≥[2 ×span / RBW].
8) Employ trace averaging (rms) modeover a minimum of 100 traces
9) Use the peak marker function to determine the maximum amplitude level.
10) Use the peak marker function to determine the maximum amplitude level within the RBW.
    If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11) if then duty factor shall be added to adjust the result if the duty cycle is less than 98%

Sample Calculation

▪ Power Spectral Density = Reading Value + ATT loss + Cable loss

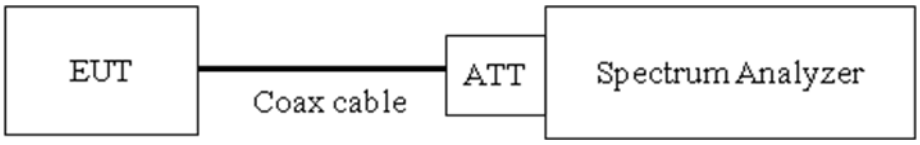
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

Limit

The maximum conducted (Average) output power was used to demonstrate compliance, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least relative to the maximum in-band peak PSD level in 100 kHz.

[Conducted > 30 dBc]

Test Configuration



Test Procedure

The transmitter output is connected to the spectrum analyzer.

(Procedure 11.11 in ANSI 63.10-2013)

1) RBW = 100 kHz
2) VBW ≥ 3 x RBW
3) Set span to encompass the spectrum to be examined
4) Detector = Peak
5) Trace Mode = max hold
6) Sweep time = auto couple
7) Ensure that the number of measurement points ≥ 2 x Span/RBW
8) Allow trace to fully stabilize.
9) Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 25 GHz range with the transmitter set to the lowest, middle, and highest channels.

Factors for frequency

Freq(MHz)	Factor(dB)
30	10.26
100	10.29
200	10.34
300	10.39
400	10.42
500	10.43
600	10.43
700	10.45
800	10.46
900	10.50
1000	10.51
2000	10.75
2400	10.85
2480	10.87
2500	10.87
3000	11.03
4000	11.08
5000	11.26
5150	11.26
5850	11.36
6000	11.36
7000	11.43
8000	11.48
9000	11.54
10000	11.60
11000	11.65
12000	11.73
13000	11.82
14000	11.79
15000	11.84
16000	11.85
17000	11.88
18000	11.93
19000	11.95
20000	11.99
21000	12.11
22000	12.18
23000	12.18
24000	12.22
25000	12.31
26000	12.32

Note : 1. 2400 ~ 2500 MHz is fundamental frequency range.

2. Factor = Attenuator loss + Cable loss + EUT Cable loss

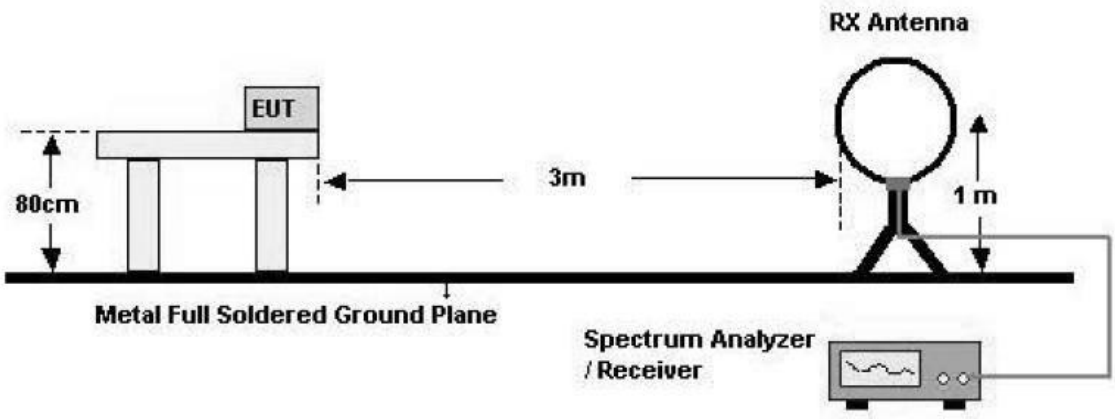
7.6. Radiated Test

Limit

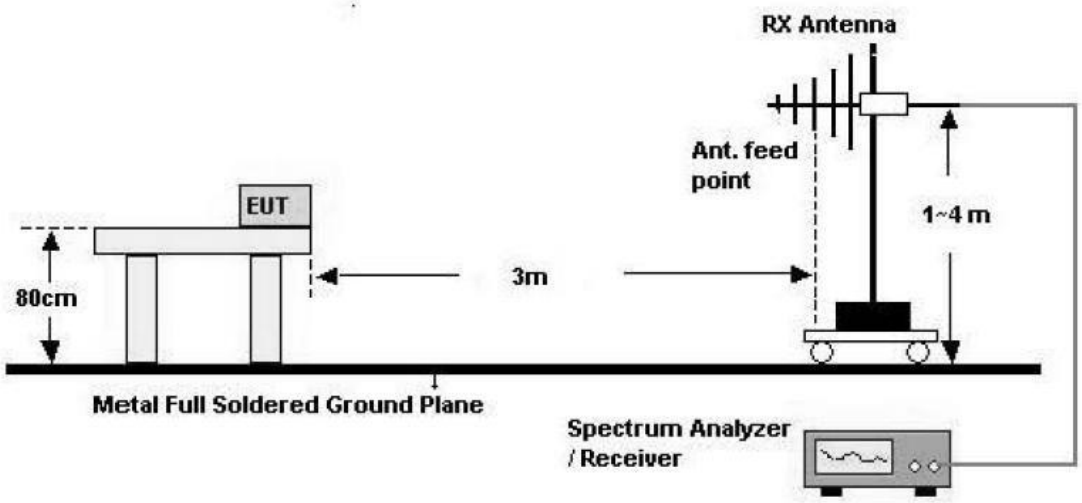
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

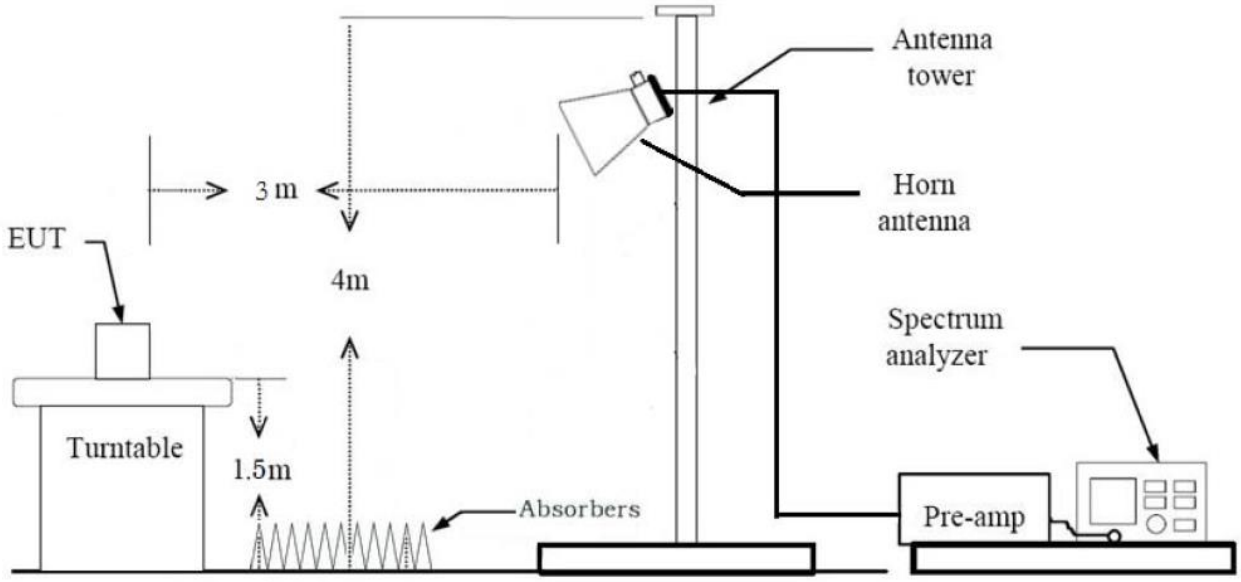
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = 40log(3 m/300 m) = - 80 dB
   Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 9 kHz
   - VBW ≥ 3 x RBW
9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions(Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 100 kHz
      - VBW ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz

   ※In general, (1) is used mainly
7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting (Method 8.6 in KDB 558074 v05r02, Procedure 11.12 in ANSI 63.10-2013)
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 1 GHz – 25 GHz
      - Detector = Peak

- Trace = Maxhold
- RBW = 1 MHz
- VBW ≥ 3 x RBW

(2) Measurement Type(Average): Duty cycle ≥ 98%

- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).

(3) Measurement Type(Average): Duty cycle < 98%, duty cycle variations are less than ±2%

- Measured Frequency Range : 1 GHz – 25 GHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.
- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total(Measurement Type : Peak)
    = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

    Total(Measurement Type : Average, Duty cycle ≥ 98%)
    = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

    Total(Measurement Type : Average, Duty cycle < 98%)
    = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)
    + Duty Cycle Factor

Test Procedure of Radiated Restricted Band Edge

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting

(1) Measurement Type(Peak):

- Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
- Detector = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW ≥ 3 x RBW

(2) Measurement Type(Average): Duty cycle ≥ 98%,

- Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).

(3) Measurement Type(Average): Duty cycle < 98%, duty cycle variations are less than ±2%

- Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW ≥ 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.

- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
11. Total(Measurement Type : Peak)
    = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

    Total(Measurement Type : Average, Duty cycle ≥ 98%)
    = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

    Total(Measurement Type : Average, Duty cycle < 98%)
    = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)
    + Duty Cycle Factor

7.7. AC Power line Conducted Emissions

Limit

For an intentional radiator 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, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56[(a)]	56 to 46[(a)]
0.50 to 5	56	46
5 to 30	60	50

[(a)]Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

7.8. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone, Stand alone + External accessories(Earphone, etc)
   - Worstcase : Stand alone
2. EUT Axis
   - Radiated Spurious Emissions : Y
   - Radiated Restricted Band Edge : X
3. Duty cycle factor not applies 802.11b/g/n(HT20)/ac(HT20)(Duty cycle > 98%, Continuous Signal).
4. All data rate of operation were investigated and the test results are worst case in lowest datarate of each mode.
   - 802.11b : 1Mbps
   - 802.11g : 6Mbps
   - 802.11n_HT20 : MCS0
   - 802.11ac_HT20 : MCS0
5. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
   - Position : Horizontal, Vertical, Parallel to the ground plane

Radiated test(DBS)

1. Please refer to the SM-T878U [DTS]802.11ax Test Report.

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : Stand alone + External accessories(Earphone, etc)+Travel Adapter,
     Stand alone + Travel Adapter
   - Worstcase : Stand alone + Travel Adapter

Conducted test

1. The EUT was configured with data rate of highest power.

8. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	§15.247(a)(2)	> 500 kHz	Conducted	PASS
Conducted Maximum Output Power	§15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§15.247(e)	< 8 dBm / 3 kHz Band		PASS
Band Edge (Out of Band Emissions)	§15.247(d)	Conducted > 30 dBc		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 7.7		PASS
Radiated Spurious Emissions	§15.247(d), 15.205, 15.209	cf. Section 7.6	Radiated	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 7.6		PASS

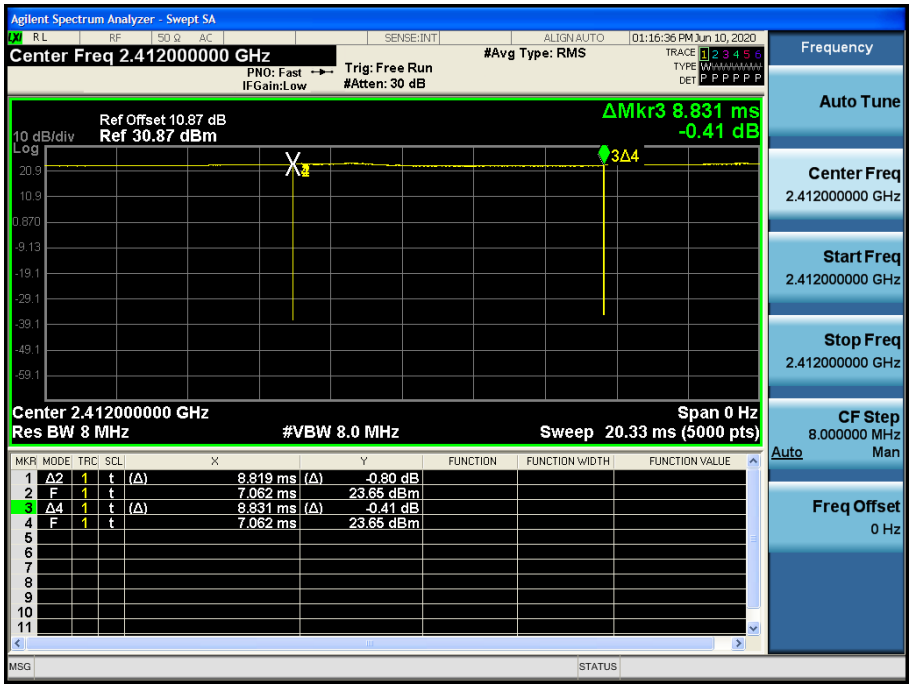
9. TEST RESULT

9.1 DUTY CYCLE

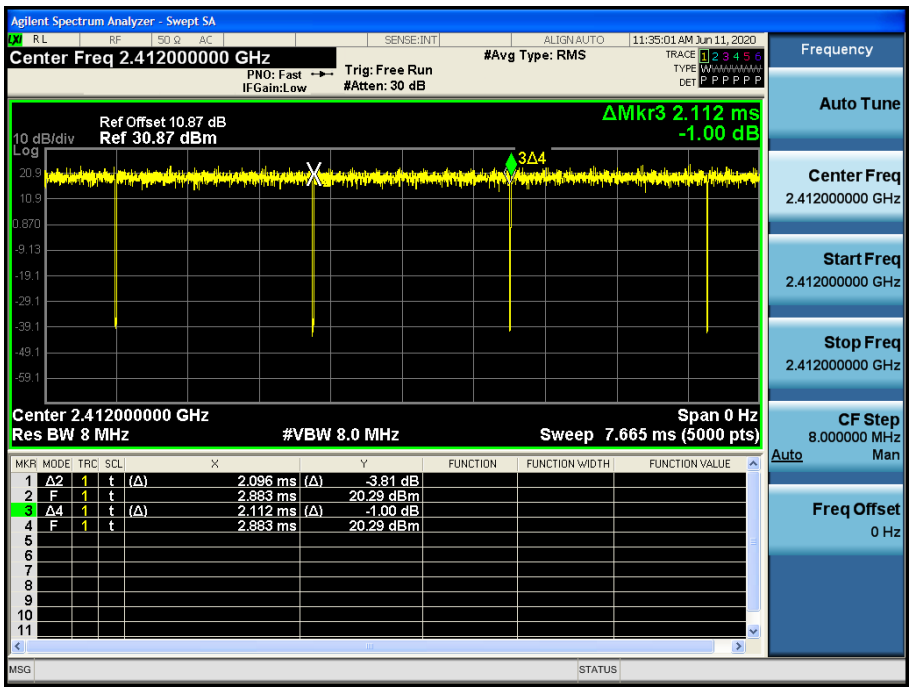
Mode	Data Rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11b	1	8.819	8.831	0.999	0.006
	2	4.407	4.422	0.997	0.015
	5.5	1.665	1.678	0.992	0.034
	11	0.880	0.893	0.985	0.065
802.11g	6	2.096	2.112	0.992	0.033
	9	1.406	1.423	0.988	0.052
	12	1.060	1.076	0.985	0.065
	18	0.712	0.729	0.977	0.101
	24	0.540	0.557	0.971	0.130
	36	0.368	0.385	0.957	0.192
	48	0.280	0.297	0.945	0.247
	54	0.252	0.269	0.938	0.277
802.11n (HT20)	6.5 (MCS0)	5.430	5.447	0.997	0.014
	13 (MCS1)	5.428	5.445	0.997	0.014
	19.5 (MCS2)	5.427	5.442	0.997	0.012
	26 (MCS3)	5.427	5.442	0.997	0.012
	39 (MCS4)	5.427	5.445	0.997	0.014
	52 (MCS5)	5.430	5.449	0.997	0.015
	58.5 (MCS6)	5.427	5.445	0.997	0.014
	65 (MCS7)	5.430	5.445	0.997	0.012
802.11ac (HT20)	6.5 (MCS0)	5.427	5.448	0.996	0.017
	13 (MCS1)	5.427	5.445	0.997	0.014
	19.5 (MCS2)	5.430	5.445	0.997	0.012
	26 (MCS3)	5.430	5.445	0.997	0.012
	39 (MCS4)	5.430	5.448	0.997	0.014
	52 (MCS5)	5.430	5.448	0.997	0.014
	58.5 (MCS6)	5.427	5.445	0.997	0.014
	65 (MCS7)	5.430	5.448	0.997	0.014
	78 (MCS8)	5.430	5.445	0.997	0.012

▣ Test Plots

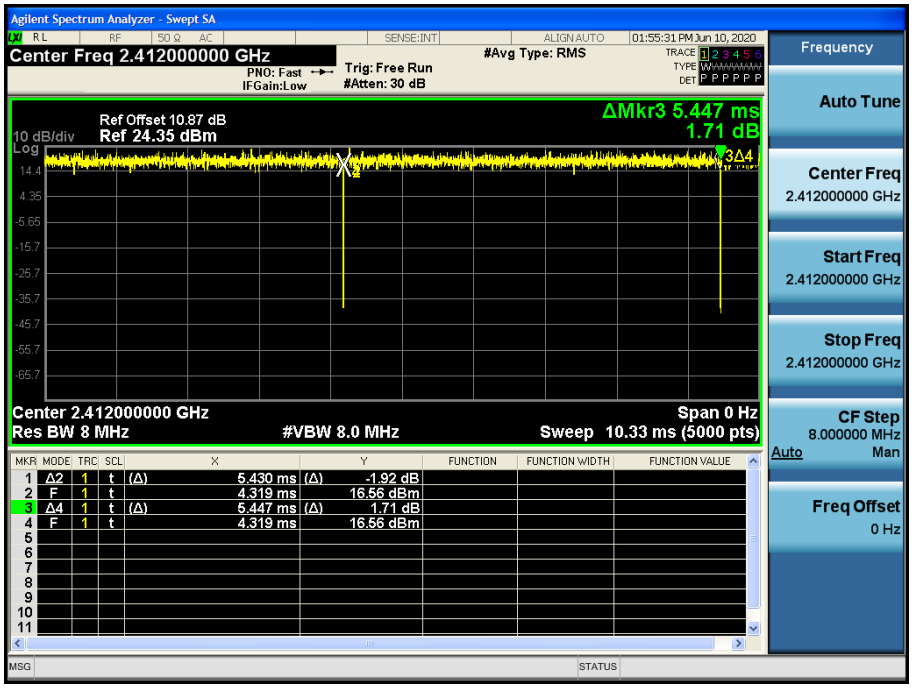
Duty cycle plot (802.11b(1Mbps))



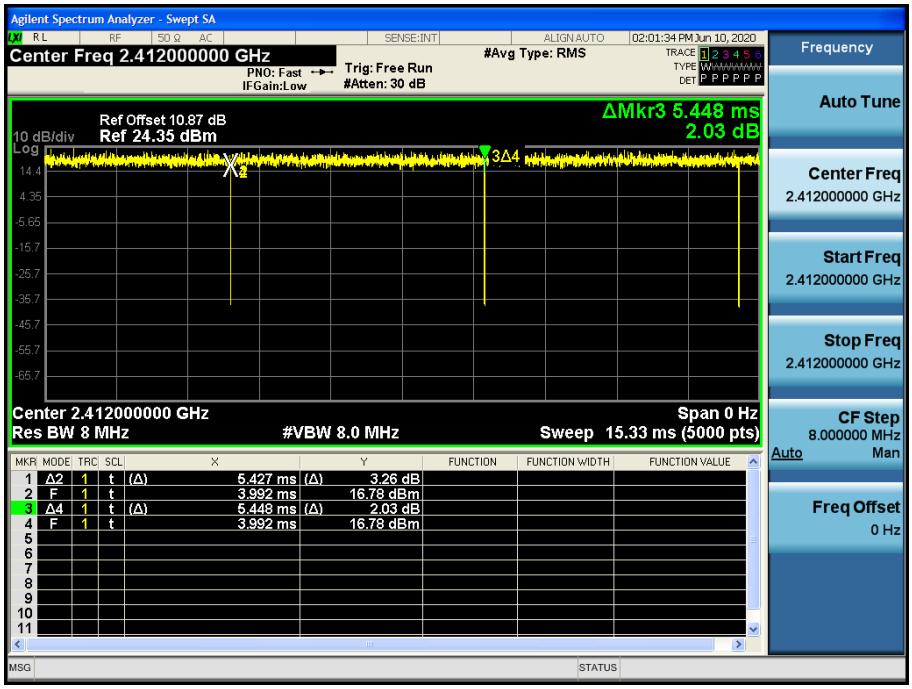
Duty cycle plot (802.11g(6Mbps))



Duty cycle plot (802.11n(MCS0))



Duty cycle plot (802.11ac(MCS0))



Note:

In order to simplify the report, attached plots were only the most lowest data rate.

9.2 6dB BANDWIDTH

[Ant.1]

802.11b Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	7.653	0.5
2437	6	8.087	0.5
2462	11	7.615	0.5

802.11g Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	15.46	0.5
2437	6	16.09	0.5
2462	11	16.08	0.5

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	16.93	0.5
2437	6	16.29	0.5
2462	11	16.84	0.5

802.11ac(HT20) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	15.48	0.5
2437	6	16.93	0.5
2462	11	16.77	0.5

[Ant.2]

802.11b Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	7.132	0.5
2437	6	8.082	0.5
2462	11	8.077	0.5

802.11g Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	15.67	0.5
2437	6	15.39	0.5
2462	11	16.06	0.5

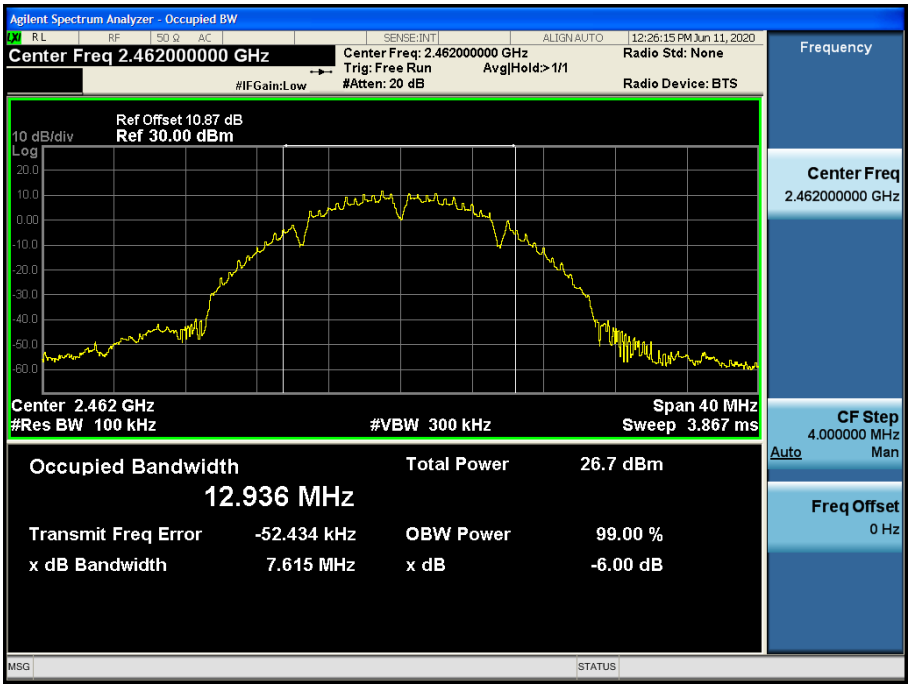
802.11n(HT20) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	16.61	0.5
2437	6	16.13	0.5
2462	11	15.44	0.5

802.11ac(HT20) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	16.59	0.5
2437	6	16.92	0.5
2462	11	15.39	0.5

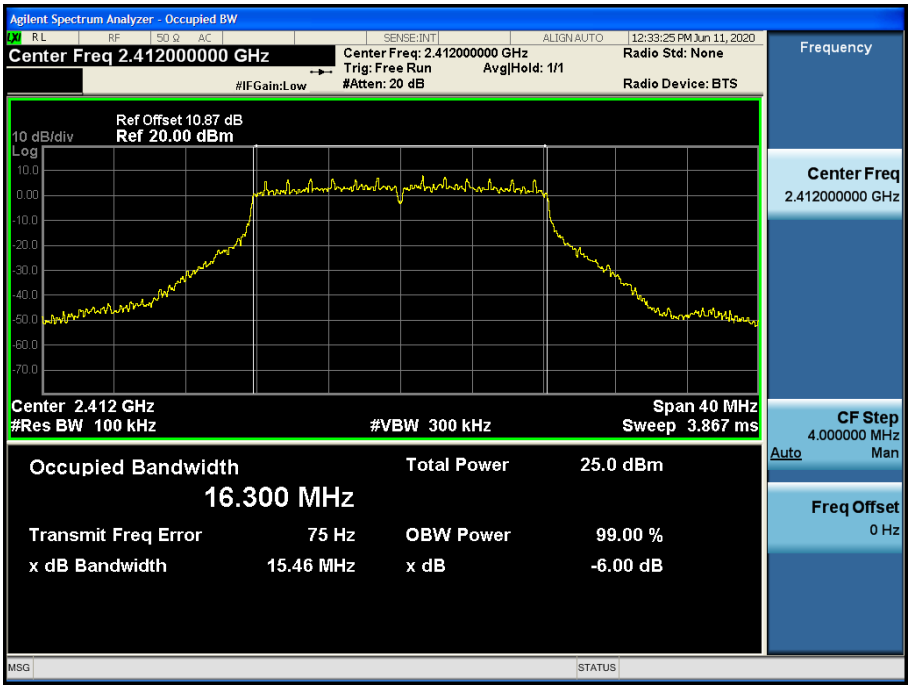
[Ant.1]

▣ Test Plots

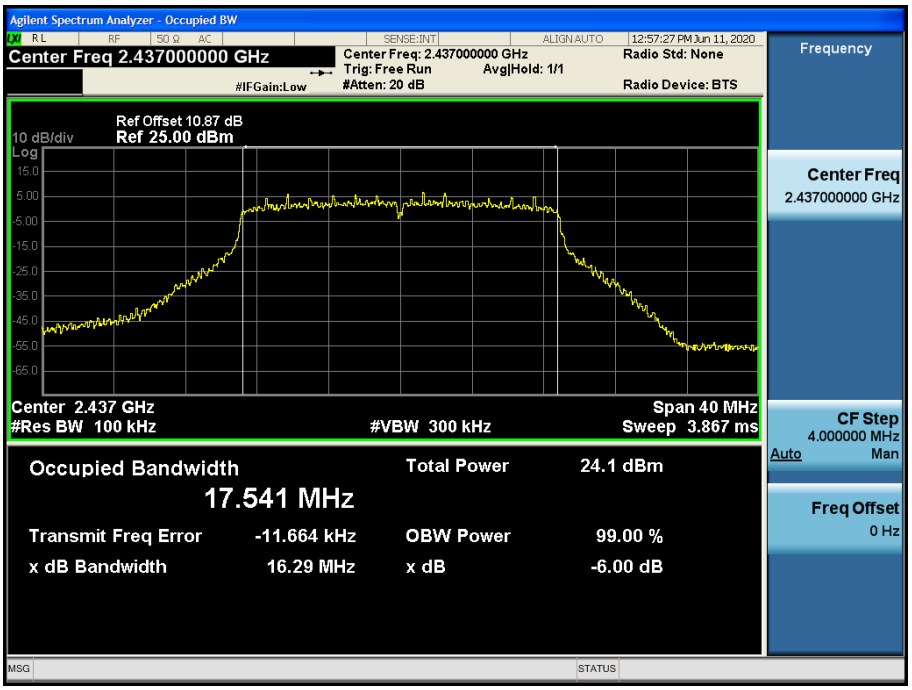
6dB Bandwidth plot (802.11b-CH 11)



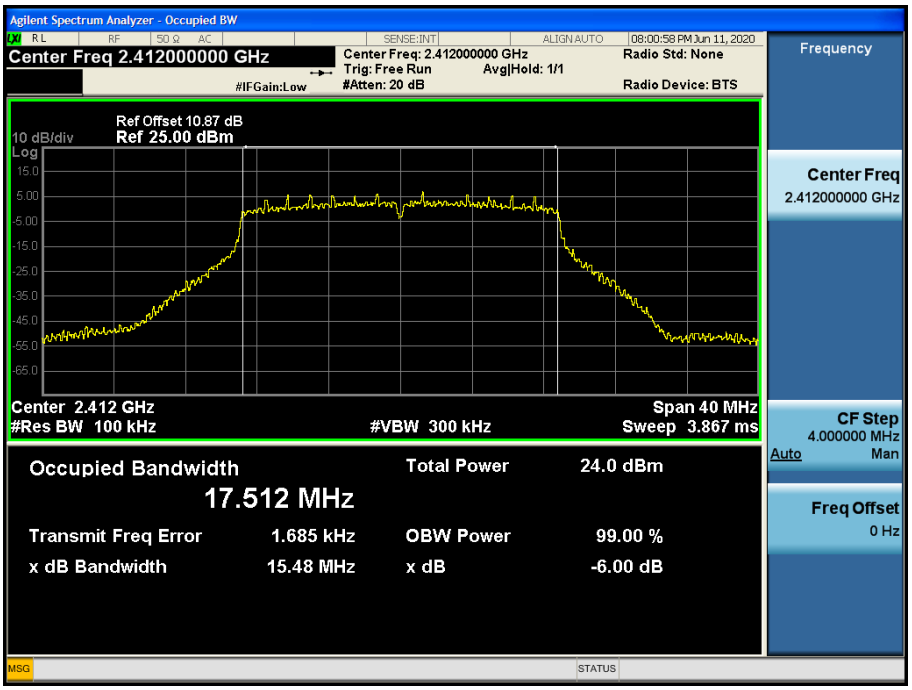
6dB Bandwidth plot (802.11g-CH 1)



6dB Bandwidth plot (802.11n_HT20-CH 6)



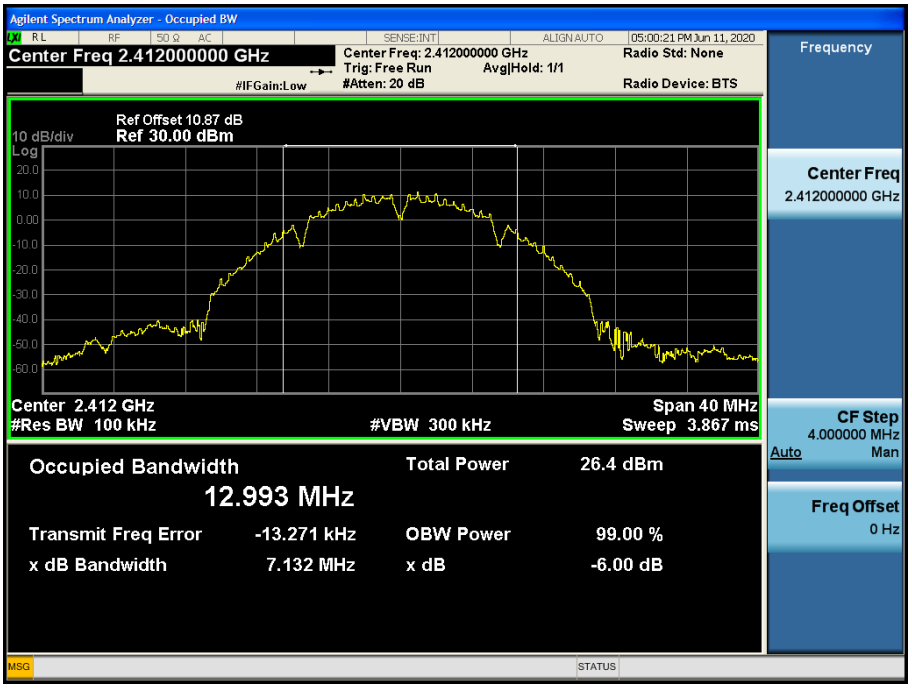
6dB Bandwidth plot (802.11ac_HT20-CH 1)



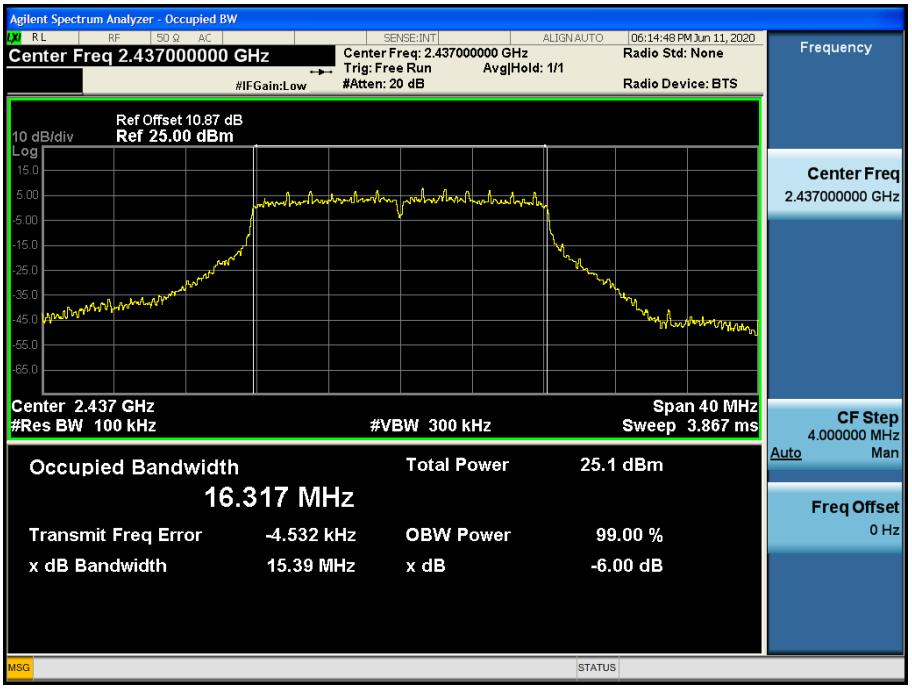
[Ant.2]

▣ Test Plots

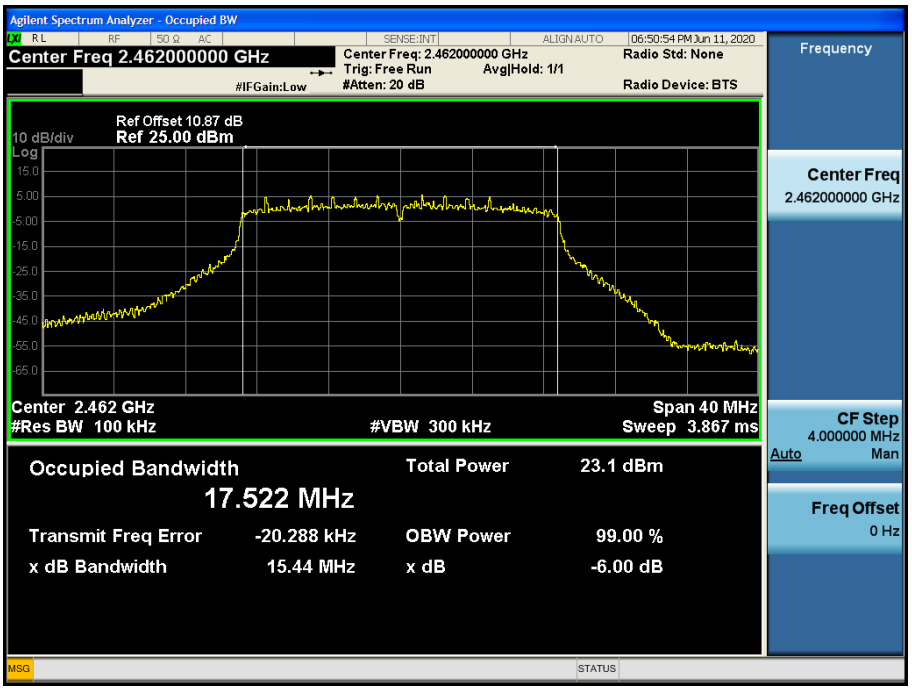
6dB Bandwidth plot (802.11b-CH 1)



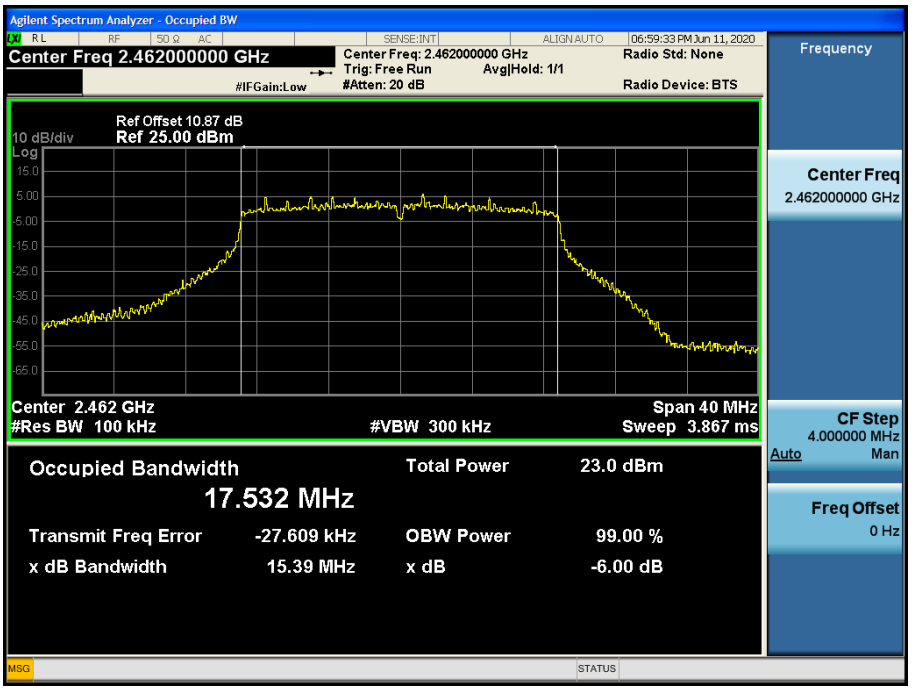
6dB Bandwidth plot (802.11g-CH 6)



6dB Bandwidth plot (802.11n_HT20-CH 11)



6dB Bandwidth plot (802.11ac_HT20-CH 11)



Note:

In order to simplify the report, attached plots were only the most narrow 6 dB BW channel.

9.3 OUTPUT POWER

Peak Power

1. Power Meter offset = Attenuator loss + Cable loss + EUT Cable loss
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
So, 10.87 dB is offset for 2.4 GHz Band

[Ant.1]

802.11b Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	1	21.97	30	19
		2	22.33	30	
		5.5	23.75	30	
		11	25.16	30	
2437	6	1	22.08	30	19
		2	22.65	30	
		5.5	24.04	30	
		11	25.49	30	
2462	11	1	22.10	30	19
		2	22.43	30	
		5.5	23.87	30	
		11	25.25	30	

802.11g Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	6	25.44	30	18
		9	25.63	30	
		12	25.37	30	
		18	25.95	30	
		24	26.07	30	
		36	25.73	30	
		48	25.81	30	
		54	25.94	30	
2437	6	6	25.74	30	18
		9	25.88	30	
		12	25.62	30	
		18	26.16	30	
		24	26.28	30	
		36	25.97	30	
		48	26.06	30	
		54	26.17	30	
2462	11	6	24.55	30	17
		9	24.68	30	
		12	24.41	30	
		18	24.94	30	
		24	25.27	30	
		36	24.85	30	
		48	24.85	30	
		54	25.04	30	

802.11n(HT20) Mode		MCS Index	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	0	24.52	30	17
		1	24.24	30	
		2	24.87	30	
		3	25.22	30	
		4	24.93	30	
		5	24.98	30	
		6	25.09	30	
		7	25.09	30	
2437	6	0	24.63	30	17
		1	24.29	30	
		2	24.94	30	
		3	25.26	30	
		4	24.99	30	
		5	25.08	30	
		6	25.22	30	
		7	25.20	30	
2462	11	0	23.25	30	16
		1	22.88	30	
		2	23.53	30	
		3	23.82	30	
		4	23.64	30	
		5	23.62	30	
		6	23.73	30	
		7	23.73	30	

802.11ac(HT20) Mode		MCS Index	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	0	23.95	30	17
		1	23.68	30	
		2	24.28	30	
		3	24.61	30	
		4	24.12	30	
		5	24.06	30	
		6	24.19	30	
		7	24.21	30	
		8	24.15	30	
2437	6	0	24.74	30	17
		1	24.38	30	
		2	25.10	30	
		3	25.44	30	
		4	25.24	30	
		5	25.26	30	
		6	25.33	30	
		7	25.33	30	
		8	25.29	30	
2462	11	0	23.22	30	16
		1	22.92	30	
		2	23.54	30	
		3	23.98	30	
		4	23.73	30	
		5	23.72	30	
		6	23.79	30	
		7	23.79	30	
		8	23.80	30	

[Ant.2]

802.11b Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	1	21.53	30	19
		2	22.03	30	
		5.5	23.66	30	
		11	24.96	30	
2437	6	1	22.08	30	19
		2	22.54	30	
		5.5	23.89	30	
		11	25.36	30	
2462	11	1	22.20	30	19
		2	22.59	30	
		5.5	24.03	30	
		11	25.45	30	

802.11g Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	6	25.30	30	18
		9	25.52	30	
		12	25.23	30	
		18	25.72	30	
		24	25.83	30	
		36	25.59	30	
		48	25.65	30	
		54	25.78	30	
2437	6	6	25.50	30	18
		9	25.74	30	
		12	25.38	30	
		18	25.97	30	
		24	26.11	30	
		36	25.77	30	
		48	25.84	30	
		54	26.00	30	
2462	11	6	24.59	30	17
		9	24.81	30	
		12	24.48	30	
		18	25.12	30	
		24	25.38	30	
		36	25.00	30	
		48	25.09	30	
		54	25.20	30	

802.11n(HT20) Mode		MCS Index	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	0	24.05	30	17
		1	23.74	30	
		2	24.40	30	
		3	24.71	30	
		4	24.48	30	
		5	24.54	30	
		6	24.58	30	
		7	24.53	30	
2437	6	0	24.57	30	17
		1	24.17	30	
		2	24.87	30	
		3	25.20	30	
		4	24.94	30	
		5	24.96	30	
		6	25.09	30	
		7	25.04	30	
2462	11	0	23.43	30	16
		1	23.16	30	
		2	23.80	30	
		3	24.19	30	
		4	23.78	30	
		5	23.80	30	
		6	23.92	30	
		7	23.85	30	

802.11ac(HT20) Mode		MCS Index	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	0	24.04	30	17
		1	23.74	30	
		2	24.37	30	
		3	24.81	30	
		4	24.49	30	
		5	24.43	30	
		6	24.57	30	
		7	24.52	30	
		8	24.52	30	
2437	6	0	24.63	30	17
		1	24.29	30	
		2	24.96	30	
		3	25.32	30	
		4	25.19	30	
		5	25.10	30	
		6	25.24	30	
		7	25.17	30	
		8	25.22	30	
2462	11	0	23.46	30	16
		1	23.17	30	
		2	23.82	30	
		3	24.20	30	
		4	23.85	30	
		5	23.77	30	
		6	23.88	30	
		7	23.82	30	
		8	23.92	30	

[MIMO]

802.11b Mode		Rate (Mbps)	Ant.1 Measured Power(dBm)	Ant.2 Measured Power(dBm)	MIMO Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	1	21.97	21.53	24.77	30	19
		2	22.33	22.03	25.19	30	
		5.5	23.75	23.66	26.72	30	
		11	25.16	24.96	28.07	30	
2437	6	1	22.08	22.08	25.09	30	
		2	22.65	22.54	25.60	30	
		5.5	24.04	23.89	26.98	30	
		11	25.49	25.36	28.44	30	
2462	11	1	22.10	22.20	25.16	30	
		2	22.43	22.59	25.52	30	
		5.5	23.87	24.03	26.96	30	
		11	25.25	25.45	28.37	30	

802.11g Mode		Rate (Mbps)	Ant.1 Measured Power(dBm)	Ant.2 Measured Power(dBm)	MIMO Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	6	25.44	25.30	28.38	30	18
		9	25.63	25.52	28.59	30	
		12	25.37	25.23	28.31	30	
		18	25.95	25.72	28.84	30	
		24	26.07	25.83	28.96	30	
		36	25.73	25.59	28.67	30	
		48	25.81	25.65	28.74	30	
		54	25.94	25.78	28.87	30	
2437	6	6	25.74	25.50	28.63	30	18
		9	25.88	25.74	28.82	30	
		12	25.62	25.38	28.52	30	
		18	26.16	25.97	29.08	30	
		24	26.28	26.11	29.20	30	
		36	25.97	25.77	28.88	30	
		48	26.06	25.84	28.96	30	
		54	26.17	26.00	29.10	30	
2462	11	6	24.55	24.59	27.58	30	17
		9	24.68	24.81	27.75	30	
		12	24.41	24.48	27.45	30	
		18	24.94	25.12	28.04	30	
		24	25.27	25.38	28.34	30	
		36	24.85	25.00	27.94	30	
		48	24.85	25.09	27.98	30	
		54	25.04	25.20	28.13	30	

802.11n(HT20) Mode		MCS Index	Ant.1 Measured Power(dBm)	Ant.2 Measured Power(dBm)	MIMO Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	0	24.52	24.05	27.30	30	17
		1	24.24	23.74	27.01	30	
		2	24.87	24.40	27.65	30	
		3	25.22	24.71	27.98	30	
		4	24.93	24.48	27.72	30	
		5	24.98	24.54	27.78	30	
		6	25.09	24.58	27.86	30	
		7	25.09	24.53	27.83	30	
2437	6	0	24.63	24.57	27.61	30	17
		1	24.29	24.17	27.24	30	
		2	24.94	24.87	27.92	30	
		3	25.26	25.20	28.24	30	
		4	24.99	24.94	27.98	30	
		5	25.08	24.96	28.03	30	
		6	25.22	25.09	28.16	30	
		7	25.20	25.04	28.13	30	
2462	11	0	23.25	23.43	26.35	30	16
		1	22.88	23.16	26.03	30	
		2	23.53	23.80	26.68	30	
		3	23.82	24.19	27.02	30	
		4	23.64	23.78	26.72	30	
		5	23.62	23.80	26.72	30	
		6	23.73	23.92	26.83	30	
		7	23.73	23.85	26.80	30	

802.11ac(HT20) Mode		MCS Index	Ant.1 Measured Power(dBm)	Ant.2 Measured Power(dBm)	MIMO Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	0	23.95	24.04	27.01	30	17
		1	23.68	23.74	26.72	30	
		2	24.28	24.37	27.33	30	
		3	24.61	24.81	27.72	30	
		4	24.12	24.49	27.32	30	
		5	24.06	24.43	27.26	30	
		6	24.19	24.57	27.39	30	
		7	24.21	24.52	27.38	30	
		8	24.15	24.52	27.35	30	
2437	6	0	24.74	24.63	27.70	30	17
		1	24.38	24.29	27.35	30	
		2	25.10	24.96	28.04	30	
		3	25.44	25.32	28.39	30	
		4	25.24	25.19	28.22	30	
		5	25.26	25.10	28.19	30	
		6	25.33	25.24	28.30	30	
		7	25.33	25.17	28.26	30	
		8	25.29	25.22	28.26	30	
2462	11	0	23.22	23.46	26.35	30	16
		1	22.92	23.17	26.05	30	
		2	23.54	23.82	26.69	30	
		3	23.98	24.20	27.10	30	
		4	23.73	23.85	26.80	30	
		5	23.72	23.77	26.76	30	
		6	23.79	23.88	26.85	30	
		7	23.79	23.82	26.82	30	
		8	23.80	23.92	26.87	30	

Average Power

1. Power Meter offset = Attenuator loss + Cable loss + EUT Cable loss
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
   So, 10.87 dB is offset for 2.4 GHz Band.

[Ant.1]

802.11b Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)	Power Level Setting
Frequency [MHz]	Channel No.						
2412	1	1	19.54	0.006	19.546	30	19
		2	19.69	0.015	19.705	30	
		5.5	19.66	0.034	19.694	30	
		11	19.67	0.065	19.735	30	
2437	6	1	19.64	0.006	19.646	30	19
		2	19.87	0.015	19.885	30	
		5.5	19.87	0.034	19.904	30	
		11	19.85	0.065	19.915	30	
2462	11	1	19.73	0.006	19.736	30	19
		2	19.76	0.015	19.775	30	
		5.5	19.75	0.034	19.784	30	
		11	19.74	0.065	19.805	30	

802.11g Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)	Power Level Setting
Frequency [MHz]	Channel No.						
2412	1	6	17.60	0.033	17.633	30	18
		9	17.59	0.052	17.642	30	
		12	17.56	0.065	17.625	30	
		18	18.17	0.101	18.271	30	
		24	17.59	0.130	17.720	30	
		36	17.50	0.192	17.692	30	
		48	17.17	0.247	17.417	30	
		54	17.21	0.277	17.487	30	
2437	6	6	17.86	0.033	17.893	30	18
		9	17.80	0.052	17.852	30	
		12	17.74	0.065	17.805	30	
		18	18.40	0.101	18.501	30	
		24	17.80	0.130	17.930	30	
		36	17.71	0.192	17.902	30	
		48	17.34	0.247	17.587	30	
		54	17.35	0.277	17.627	30	
2462	11	6	16.57	0.033	16.603	30	17
		9	16.59	0.052	16.642	30	
		12	16.54	0.065	16.605	30	
		18	17.20	0.101	17.301	30	
		24	16.57	0.130	16.700	30	
		36	16.48	0.192	16.672	30	
		48	16.23	0.247	16.477	30	
		54	16.17	0.277	16.447	30	

802.11n(HT20) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)	Power Level Setting
Frequency [MHz]	Channel No.						
2412	1	0	16.37	0.014	16.384	30	17
		1	16.24	0.014	16.254	30	
		2	17.03	0.012	17.042	30	
		3	17.00	0.012	17.012	30	
		4	16.80	0.014	16.814	30	
		5	16.68	0.015	16.695	30	
		6	16.73	0.014	16.744	30	
		7	16.74	0.012	16.752	30	
2437	6	0	16.46	0.014	16.474	30	17
		1	16.48	0.014	16.494	30	
		2	17.12	0.012	17.132	30	
		3	17.11	0.012	17.122	30	
		4	17.04	0.014	17.054	30	
		5	17.02	0.015	17.035	30	
		6	17.03	0.014	17.044	30	
		7	17.02	0.012	17.032	30	
2462	11	0	14.97	0.014	14.984	30	16
		1	14.98	0.014	14.994	30	
		2	15.68	0.012	15.692	30	
		3	15.67	0.012	15.682	30	
		4	15.51	0.014	15.524	30	
		5	15.51	0.015	15.525	30	
		6	15.51	0.014	15.524	30	
		7	15.41	0.012	15.422	30	

802.11ac(HT20) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	0	16.24	0.017	16.257	30	17
		1	16.23	0.014	16.244	30	
		2	16.95	0.012	16.962	30	
		3	16.94	0.012	16.952	30	
		4	16.72	0.014	16.734	30	
		5	16.72	0.014	16.734	30	
		6	16.70	0.014	16.714	30	
		7	16.69	0.014	16.704	30	
		8	16.73	0.012	16.742	30	
2437	6	0	16.51	0.017	16.527	30	17
		1	16.46	0.014	16.474	30	
		2	17.22	0.012	17.232	30	
		3	17.20	0.012	17.212	30	
		4	17.07	0.014	17.084	30	
		5	17.08	0.014	17.094	30	
		6	17.08	0.014	17.094	30	
		7	17.06	0.014	17.074	30	
		8	17.10	0.012	17.112	30	
2462	11	0	14.97	0.017	14.987	30	16
		1	14.99	0.014	15.004	30	
		2	15.79	0.012	15.802	30	
		3	15.77	0.012	15.782	30	
		4	15.58	0.014	15.594	30	
		5	15.57	0.014	15.584	30	
		6	15.58	0.014	15.594	30	
		7	15.56	0.014	15.574	30	
		8	15.57	0.012	15.582	30	

[Ant.2]

802.11b Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)	Power Level Setting
Frequency [MHz]	Channel No.						
2412	1	1	19.42	0.006	19.426	30	19
		2	19.59	0.015	19.605	30	
		5.5	19.57	0.034	19.604	30	
		11	19.55	0.065	19.615	30	
2437	6	1	19.65	0.006	19.656	30	19
		2	19.79	0.015	19.805	30	
		5.5	19.70	0.034	19.734	30	
		11	19.75	0.065	19.815	30	
2462	11	1	19.73	0.006	19.736	30	19
		2	19.83	0.015	19.845	30	
		5.5	19.82	0.034	19.854	30	
		11	19.85	0.065	19.915	30	

802.11g Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)	Power Level Setting
Frequency [MHz]	Channel No.						
2412	1	6	17.51	0.033	17.543	30	18
		9	17.49	0.052	17.542	30	
		12	17.45	0.065	17.515	30	
		18	18.06	0.101	18.161	30	
		24	17.51	0.130	17.640	30	
		36	17.42	0.192	17.612	30	
		48	17.02	0.247	17.267	30	
		54	16.96	0.277	17.237	30	
2437	6	6	17.74	0.033	17.773	30	18
		9	17.74	0.052	17.792	30	
		12	17.69	0.065	17.755	30	
		18	18.33	0.101	18.431	30	
		24	17.71	0.130	17.840	30	
		36	17.60	0.192	17.792	30	
		48	17.25	0.247	17.497	30	
		54	17.16	0.277	17.437	30	
2462	11	6	16.73	0.033	16.763	30	17
		9	16.64	0.052	16.692	30	
		12	16.63	0.065	16.695	30	
		18	17.42	0.101	17.521	30	
		24	16.78	0.130	16.910	30	
		36	16.68	0.192	16.872	30	
		48	16.32	0.247	16.567	30	
		54	16.30	0.277	16.577	30	

802.11n(HT20) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)	Power Level Setting
Frequency [MHz]	Channel No.						
2412	1	0	15.95	0.014	15.964	30	17
		1	15.82	0.014	15.834	30	
		2	16.62	0.012	16.632	30	
		3	16.59	0.012	16.602	30	
		4	16.37	0.014	16.384	30	
		5	16.37	0.015	16.385	30	
		6	16.38	0.014	16.394	30	
		7	16.36	0.012	16.372	30	
2437	6	0	16.38	0.014	16.394	30	17
		1	16.38	0.014	16.394	30	
		2	17.06	0.012	17.072	30	
		3	17.05	0.012	17.062	30	
		4	16.92	0.014	16.934	30	
		5	16.94	0.015	16.955	30	
		6	16.93	0.014	16.944	30	
		7	16.89	0.012	16.902	30	
2462	11	0	15.46	0.014	15.474	30	16
		1	15.45	0.014	15.464	30	
		2	16.22	0.012	16.232	30	
		3	16.14	0.012	16.152	30	
		4	15.99	0.014	16.004	30	
		5	15.99	0.015	16.005	30	
		6	16.00	0.014	16.014	30	
		7	15.98	0.012	15.992	30	

802.11ac(HT20) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	0	15.90	0.017	15.917	30	17
		1	15.88	0.014	15.894	30	
		2	16.59	0.012	16.602	30	
		3	16.58	0.012	16.592	30	
		4	16.34	0.014	16.354	30	
		5	16.35	0.014	16.364	30	
		6	16.32	0.014	16.334	30	
		7	16.35	0.014	16.364	30	
		8	16.36	0.012	16.372	30	
2437	6	0	16.39	0.017	16.407	30	17
		1	16.34	0.014	16.354	30	
		2	17.13	0.012	17.142	30	
		3	17.04	0.012	17.052	30	
		4	16.95	0.014	16.964	30	
		5	16.88	0.014	16.894	30	
		6	16.85	0.014	16.864	30	
		7	16.97	0.014	16.984	30	
		8	16.96	0.012	16.972	30	
2462	11	0	15.48	0.017	15.497	30	16
		1	15.43	0.014	15.444	30	
		2	16.20	0.012	16.212	30	
		3	16.14	0.012	16.152	30	
		4	16.01	0.014	16.024	30	
		5	15.96	0.014	15.974	30	
		6	15.94	0.014	15.954	30	
		7	15.93	0.014	15.944	30	
		8	15.95	0.012	15.962	30	

[MIMO]

802.11g Mode		Rate (Mbps)	Ant.1 Measured Power(dBm)	Ant.2 Measured Power(dBm)	MIMO Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	1	19.546	19.426	22.497	30	19
		2	19.705	19.605	22.665	30	
		5.5	19.694	19.604	22.659	30	
		11	19.735	19.615	22.685	30	
2437	6	1	19.646	19.656	22.661	30	19
		2	19.885	19.805	22.855	30	
		5.5	19.904	19.734	22.830	30	
		11	19.915	19.815	22.875	30	
2462	11	1	19.736	19.736	22.746	30	19
		2	19.775	19.845	22.820	30	
		5.5	19.784	19.854	22.829	30	
		11	19.805	19.915	22.870	30	

802.11g Mode		Rate (Mbps)	Ant.1 Measured Power(dBm)	Ant.2 Measured Power(dBm)	MIMO Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	6	17.633	17.543	20.599	30	18
		9	17.642	17.542	20.603	30	
		12	17.625	17.515	20.581	30	
		18	18.271	18.161	21.227	30	
		24	17.720	17.640	20.690	30	
		36	17.692	17.612	20.662	30	
		48	17.417	17.267	20.353	30	
		54	17.487	17.237	20.374	30	
2437	6	6	17.893	17.773	20.844	30	18
		9	17.852	17.792	20.833	30	
		12	17.805	17.755	20.790	30	
		18	18.501	18.431	21.477	30	
		24	17.930	17.840	20.895	30	
		36	17.902	17.792	20.857	30	
		48	17.587	17.497	20.553	30	
		54	17.627	17.437	20.543	30	
2462	11	6	16.603	16.763	19.694	30	17
		9	16.642	16.692	19.678	30	
		12	16.605	16.695	19.661	30	
		18	17.301	17.521	20.423	30	
		24	16.700	16.910	19.816	30	
		36	16.672	16.872	19.783	30	
		48	16.477	16.567	19.533	30	
		54	16.447	16.577	19.523	30	

802.11n(HT20) Mode		MCS Index	Ant.1 Measured Power(dBm)	Ant.2 Measured Power(dBm)	MIMO Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	0	16.384	15.964	19.189	30	17
		1	16.254	15.834	19.059	30	
		2	17.042	16.632	19.852	30	
		3	17.012	16.602	19.822	30	
		4	16.814	16.384	19.615	30	
		5	16.695	16.385	19.553	30	
		6	16.744	16.394	19.583	30	
		7	16.752	16.372	19.576	30	
2437	6	0	16.474	16.394	19.444	30	17
		1	16.494	16.394	19.454	30	
		2	17.132	17.072	20.112	30	
		3	17.122	17.062	20.102	30	
		4	17.054	16.934	20.005	30	
		5	17.035	16.955	20.006	30	
		6	17.044	16.944	20.005	30	
		7	17.032	16.902	19.978	30	
2462	11	0	14.984	15.474	18.246	30	16
		1	14.994	15.464	18.245	30	
		2	15.692	16.232	18.981	30	
		3	15.682	16.152	18.934	30	
		4	15.524	16.004	18.781	30	
		5	15.525	16.005	18.782	30	
		6	15.524	16.014	18.787	30	
		7	15.422	15.992	18.727	30	

802.11ac(HT20) Mode		MCS Index	Ant.1 Measured Power(dBm)	Ant.2 Measured Power(dBm)	MIMO Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.						
2412	1	0	16.257	15.917	19.100	30	17
		1	16.244	15.894	19.083	30	
		2	16.962	16.602	19.796	30	
		3	16.952	16.592	19.786	30	
		4	16.734	16.354	19.559	30	
		5	16.734	16.364	19.564	30	
		6	16.714	16.334	19.539	30	
		7	16.704	16.364	19.548	30	
		8	16.742	16.372	19.571	30	
2437	6	0	16.527	16.407	19.477	30	17
		1	16.474	16.354	19.425	30	
		2	17.232	17.142	20.198	30	
		3	17.212	17.052	20.143	30	
		4	17.084	16.964	20.035	30	
		5	17.094	16.894	20.006	30	
		6	17.094	16.864	19.991	30	
		7	17.074	16.984	20.040	30	
		8	17.112	16.972	20.053	30	
2462	11	0	14.987	15.497	18.260	30	16
		1	15.004	15.444	18.240	30	
		2	15.802	16.212	19.022	30	
		3	15.782	16.152	18.981	30	
		4	15.594	16.024	18.825	30	
		5	15.584	15.974	18.794	30	
		6	15.594	15.954	18.788	30	
		7	15.574	15.944	18.774	30	
		8	15.582	15.962	18.786	30	

9.4 POWER SPECTRAL DENSITY

[Ant.1]

Mode	Frequency (MHz)	Channel No.	Test Result			
			Measured PSD (dBm)	Duty Cycle Factor	Measured PSD(dBm) + Duty Cycle Factor	Limit (dBm)
802.11b	2412	1	3.577	0.065	3.642	8
	2437	6	3.227	0.065	3.292	8
	2462	11	3.709	0.065	3.774	8
802.11g	2412	1	-1.554	0.101	-1.453	8
	2437	6	-1.270	0.101	-1.169	8
	2462	11	-2.237	0.101	-2.136	8
802.11n	2412	1	-3.250	0.012	-3.238	8
	2437	6	-2.767	0.012	-2.755	8
	2462	11	-4.661	0.012	-4.649	8
802.11ac	2412	1	-3.012	0.012	-3.000	8
	2437	6	-3.156	0.012	-3.144	8
	2462	11	-4.632	0.012	-4.620	8

[Ant.2]

Mode	Frequency (MHz)	Channel No.	Test Result			
			Measured PSD (dBm)	Duty Cycle Factor	Measured PSD(dBm) + Duty Cycle Factor	Limit (dBm)
802.11b	2412	1	3.447	0.065	3.512	8
	2437	6	3.567	0.065	3.632	8
	2462	11	3.313	0.065	3.378	8
802.11g	2412	1	-1.763	0.101	-1.662	8
	2437	6	-1.220	0.101	-1.119	8
	2462	11	-2.090	0.101	-1.989	8
802.11n	2412	1	-3.580	0.012	-3.568	8
	2437	6	-3.083	0.012	-3.071	8
	2462	11	-3.879	0.012	-3.867	8
802.11ac	2412	1	-3.192	0.012	-3.180	8
	2437	6	-2.980	0.012	-2.968	8
	2462	11	-3.895	0.012	-3.883	8

[MIMO]

Mode	Frequency (MHz)	Channel No.	Test Result			
			ANT 1 Measured PSD(dBm) + Duty Cycle Factor	ANT 2 Measured PSD(dBm) + Duty Cycle Factor	MIMO Result (dBm)	Limit (dBm)
802.11b	2412	1	3.642	3.512	6.587	8
	2437	6	3.292	3.632	6.475	
	2462	11	3.774	3.378	6.590	
802.11g	2412	1	-1.453	-1.662	1.454	
	2437	6	-1.169	-1.119	1.867	
	2462	11	-2.136	-1.989	0.949	
802.11n	2412	1	-3.238	-3.568	-0.390	
	2437	6	-2.755	-3.071	0.100	
	2462	11	-4.649	-3.867	-1.230	
802.11ac	2412	1	-3.000	-3.180	-0.079	
	2437	6	-3.144	-2.968	-0.045	
	2462	11	-4.620	-3.883	-1.226	

Note :

1. Spectrum reading values are not plot data.
   The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss(10 dB) + Cable loss(1ea) + EUT Cable loss(1ea)
3. 10.87 dB is offset for 2.4 GHz Band.

[Ant.1]

▣ Test Plots

Power Spectral Density (802.11b-CH 11)

Power Spectral Density (802.11g-CH 6)

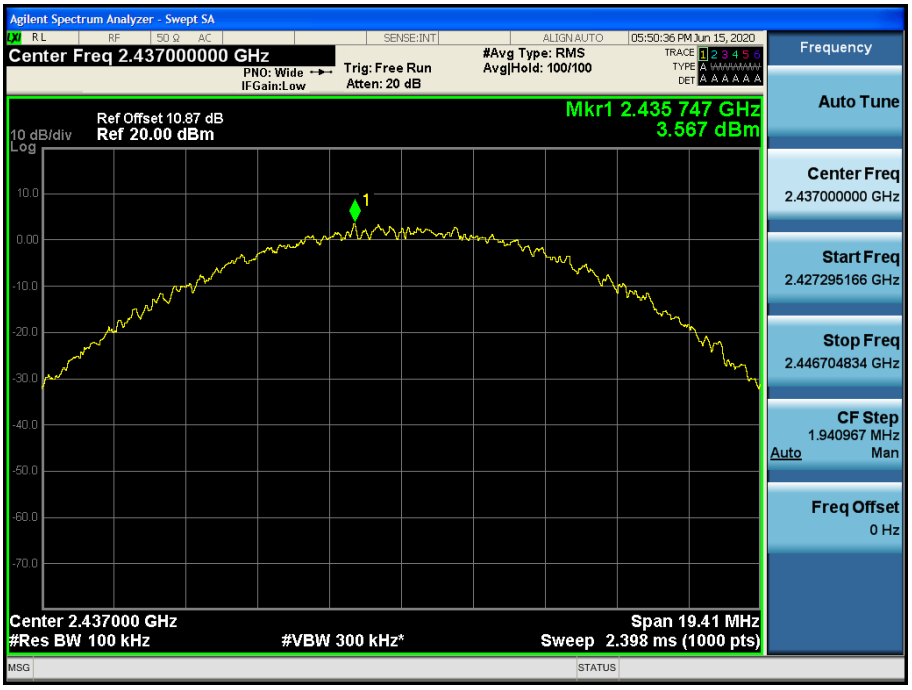
Power Spectral Density (802.11n_HT20 -CH 6)

Power Spectral Density (802.11ac_HT20 -CH 1)

[Ant.2]

▣ Test Plots

Power Spectral Density (802.11b-CH 6)



Power Spectral Density (802.11g-CH 6)

Power Spectral Density (802.11n_HT20 -CH 6)

Power Spectral Density (802.11ac_HT20 -CH 6)

Note :

In order to simplify the report, attached plots were only the worstcase PSD channel.

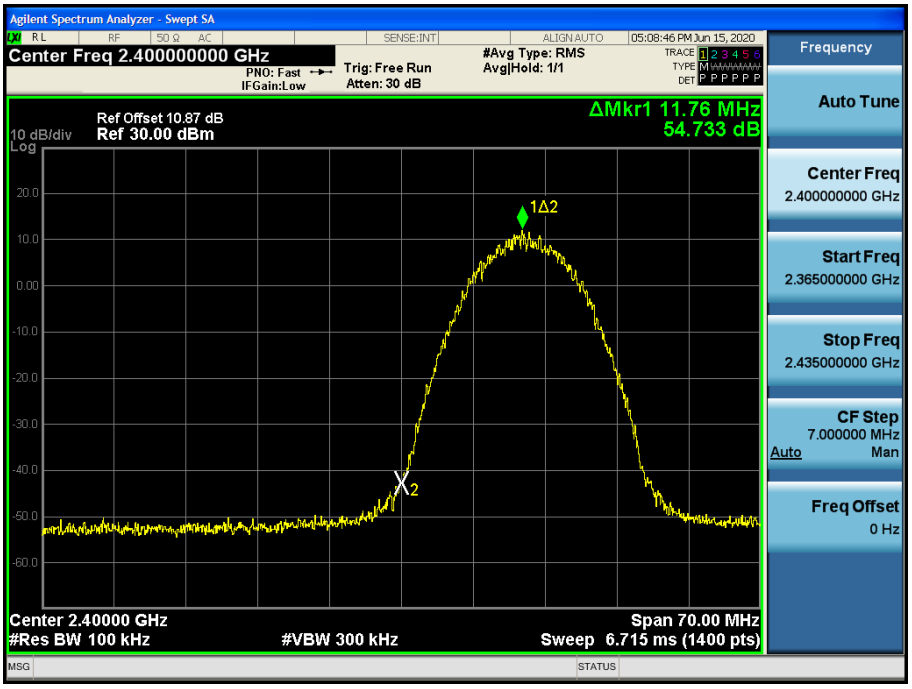
9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below.
In order to simplify the report, attached plots were only the worst case channel and data rate.

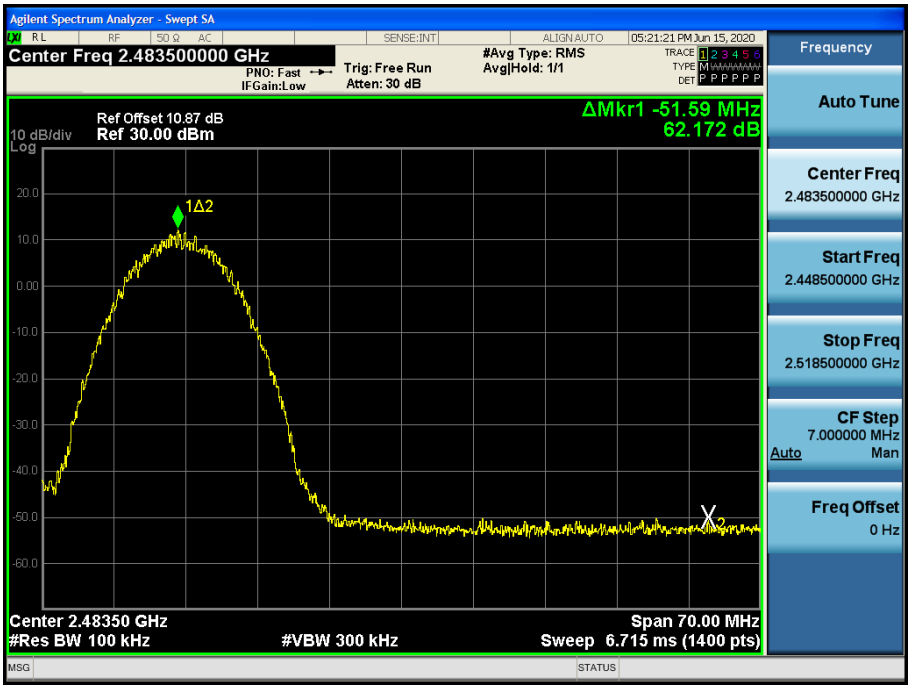
[Ant.1]

▣ Test Plots(BandEdge)

Band Edge (802.11b-CH1)

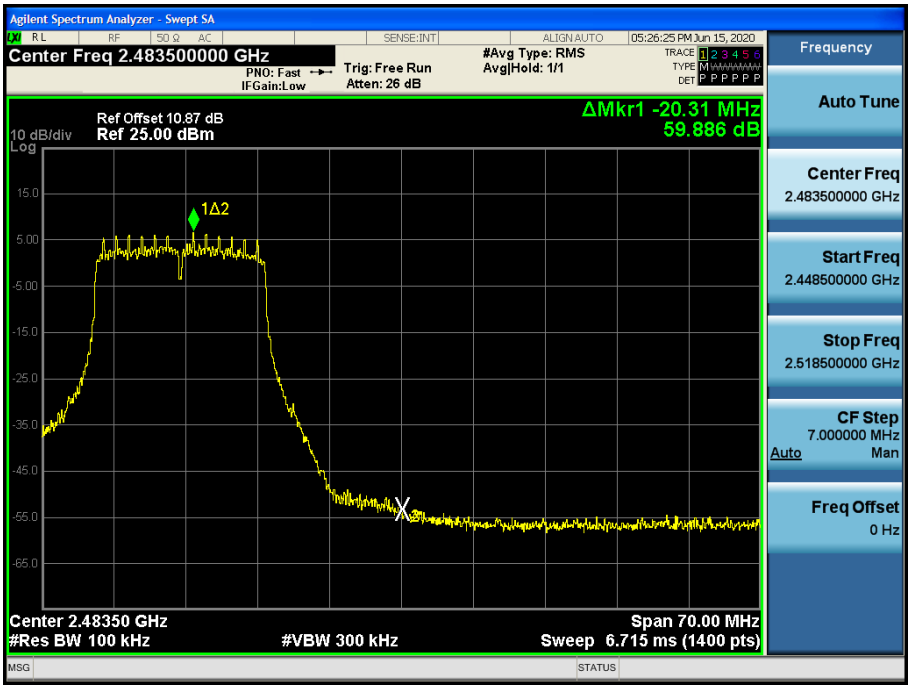


Band Edge (802.11b-CH11)

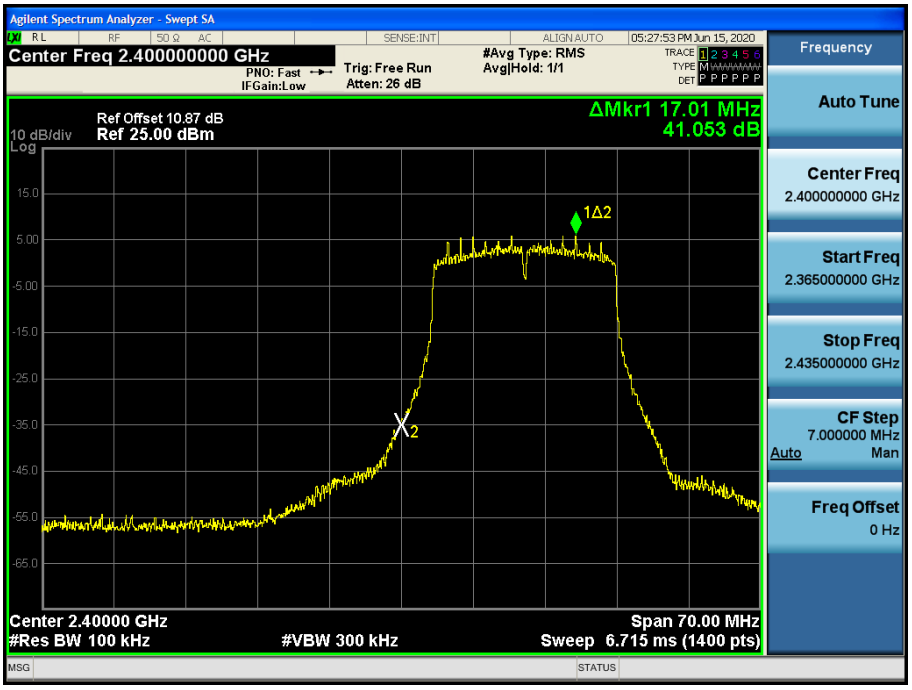


Band Edge (802.11g-CH1)

Band Edge (802.11g-CH11)

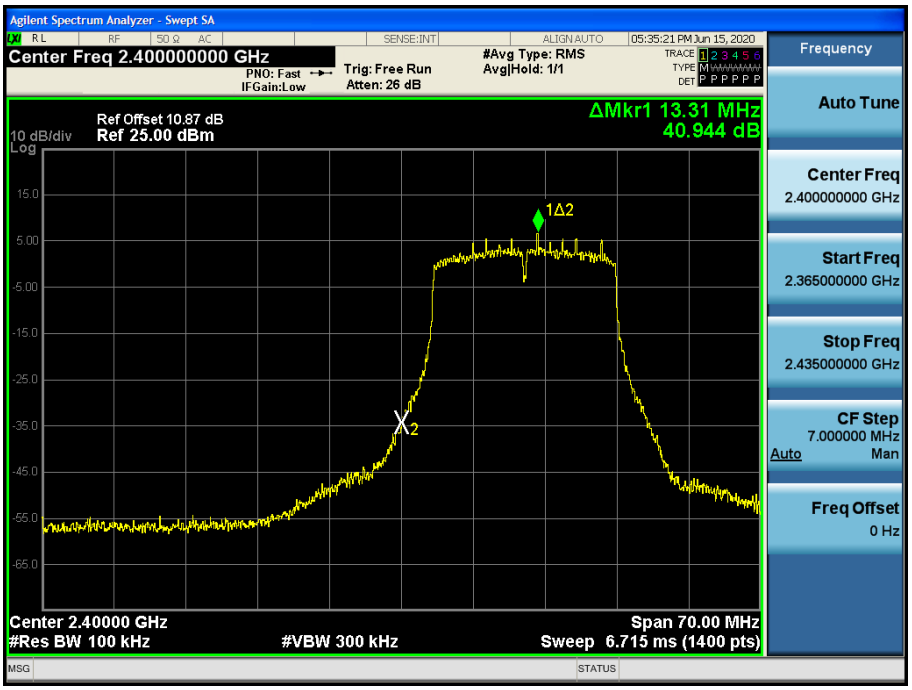


Band Edge (802.11n_HT20 -CH1)

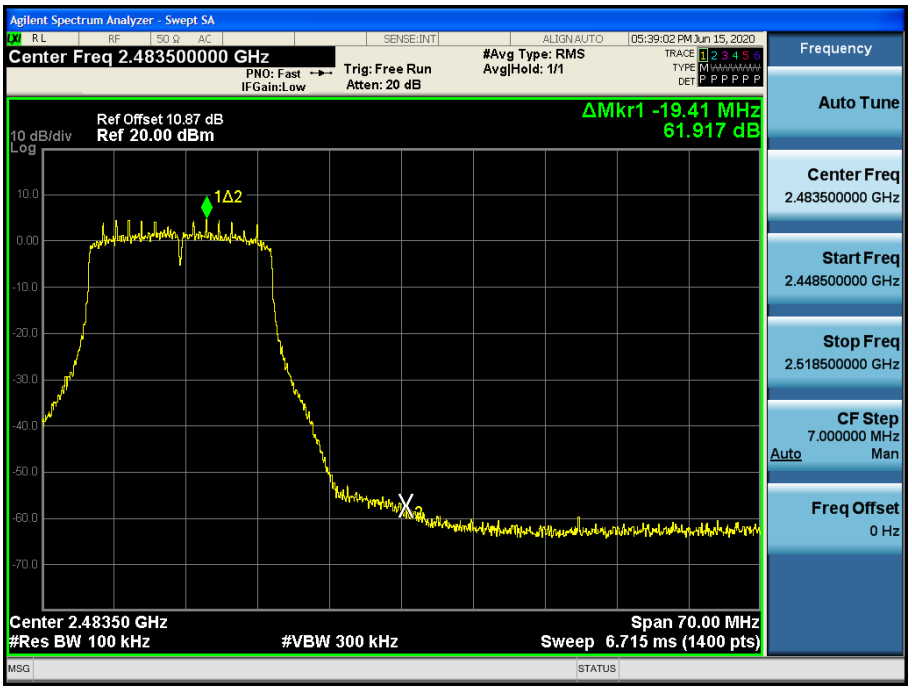


Band Edge (802.11n_HT20 –CH11)

Band Edge (802.11ac_HT20 -CH1)



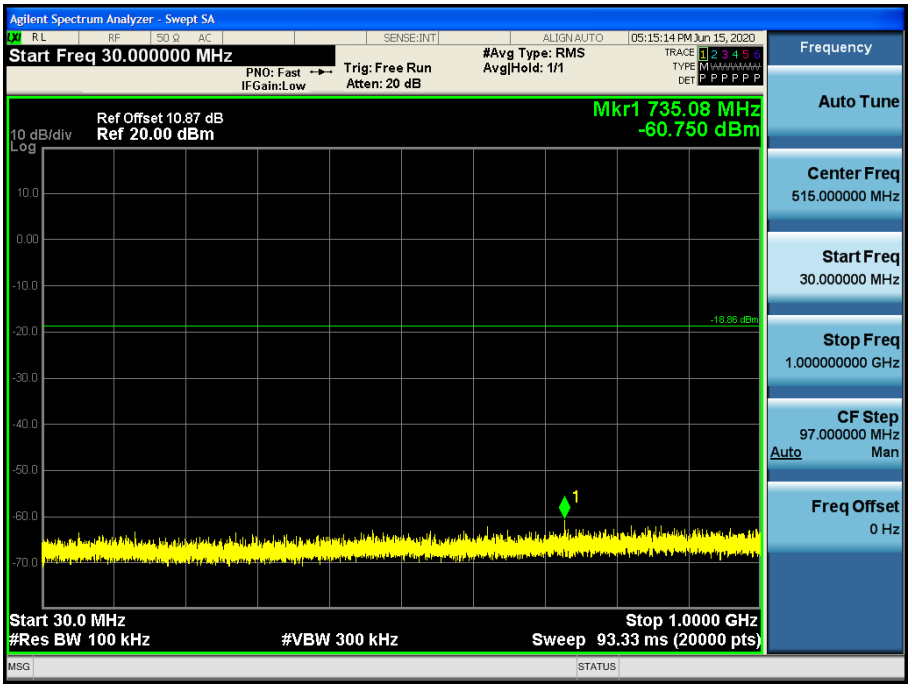
Band Edge (802.11ac_HT20 –CH11)



▣ Test Plots(Conducted Spurious Emission)

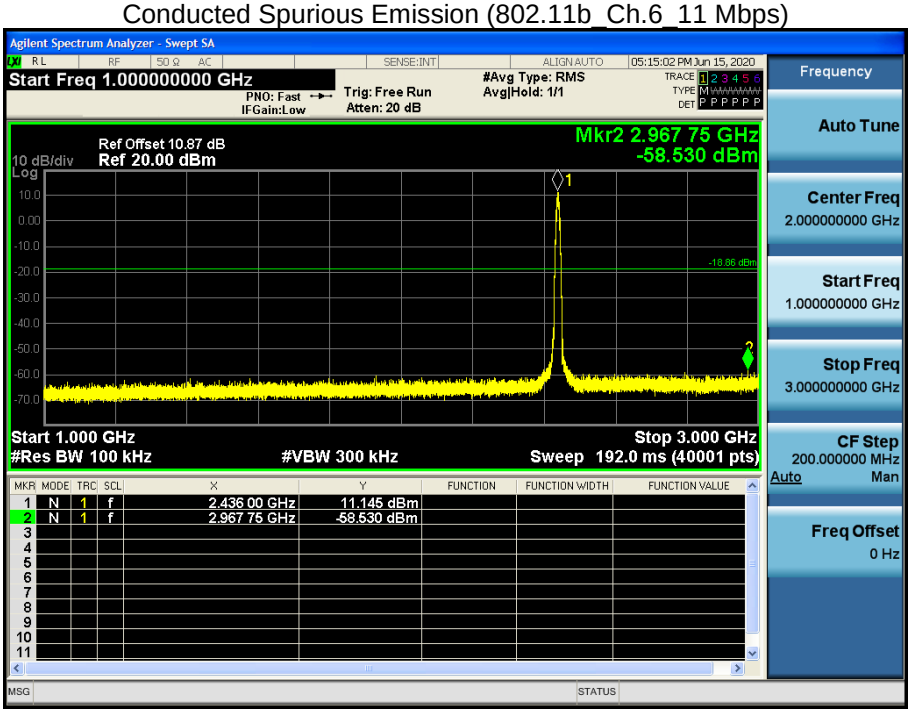
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



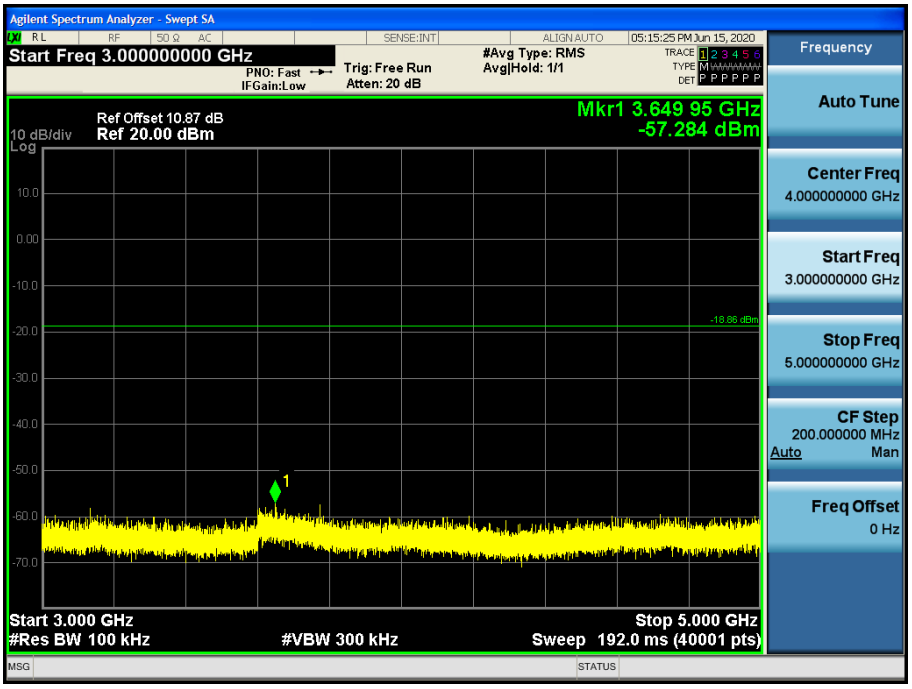
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



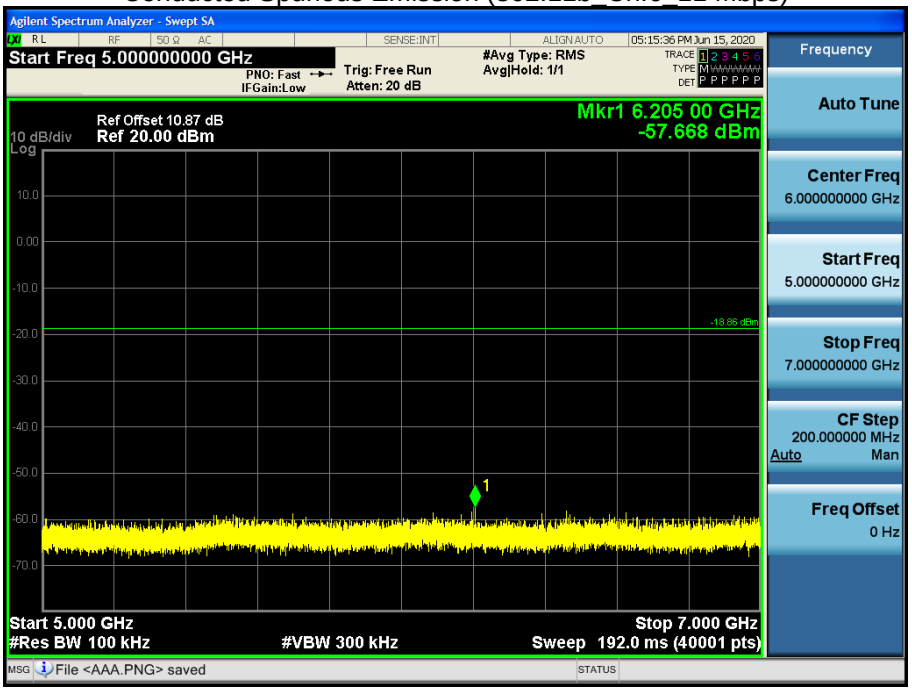
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



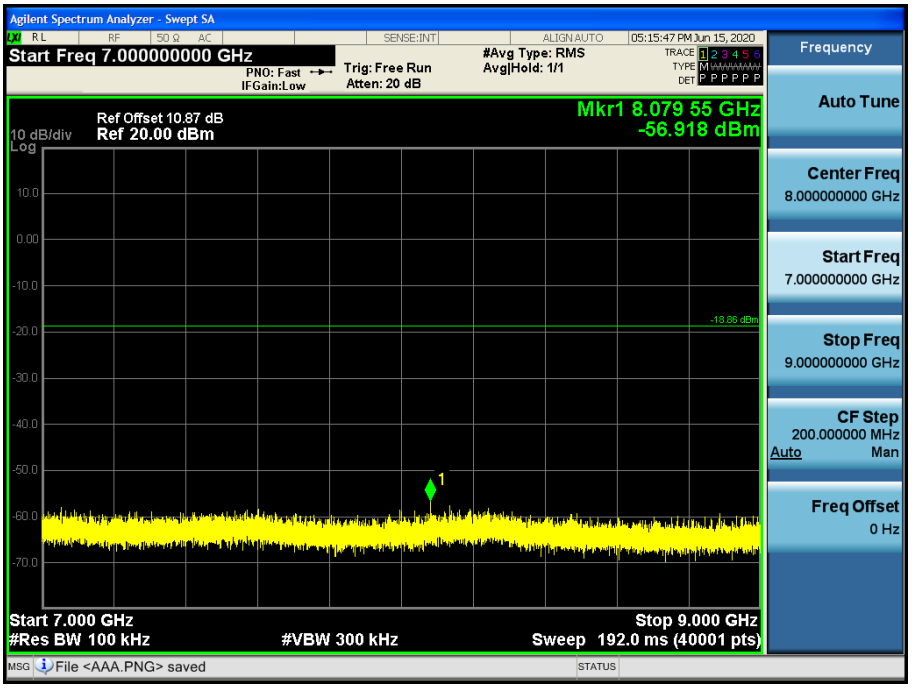
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



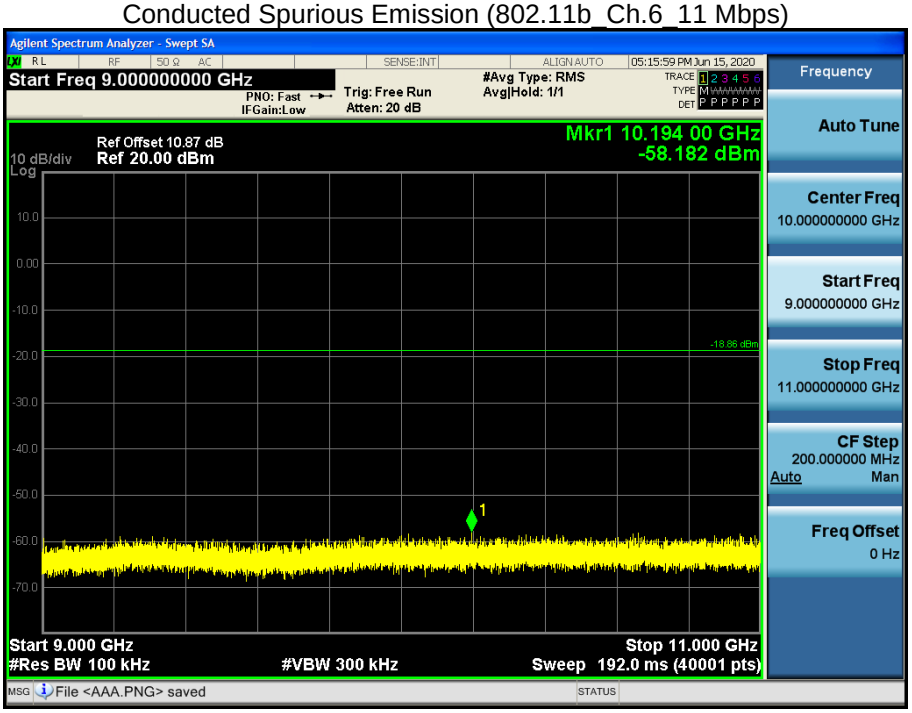
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



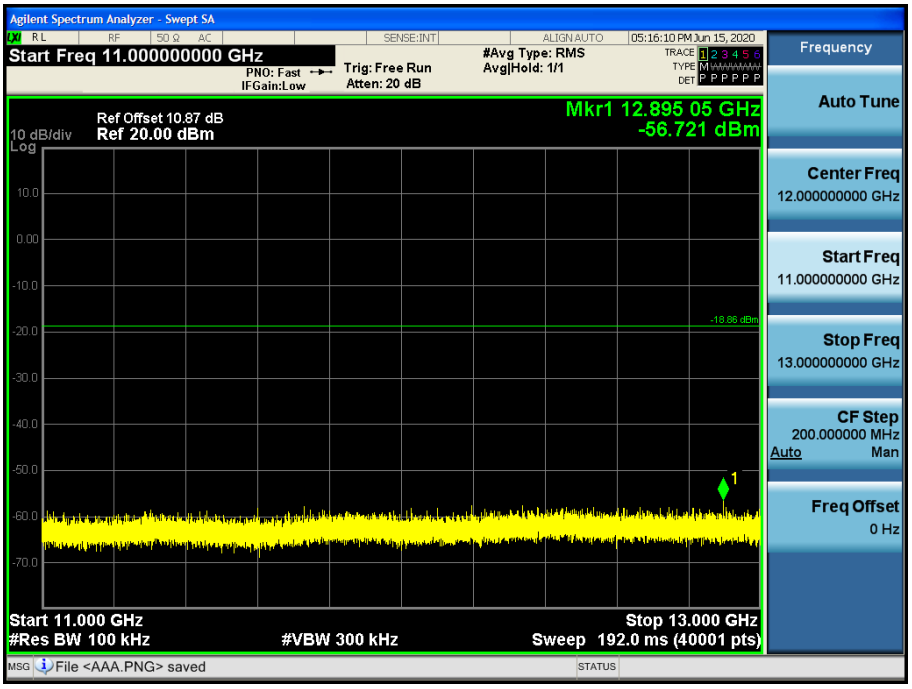
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



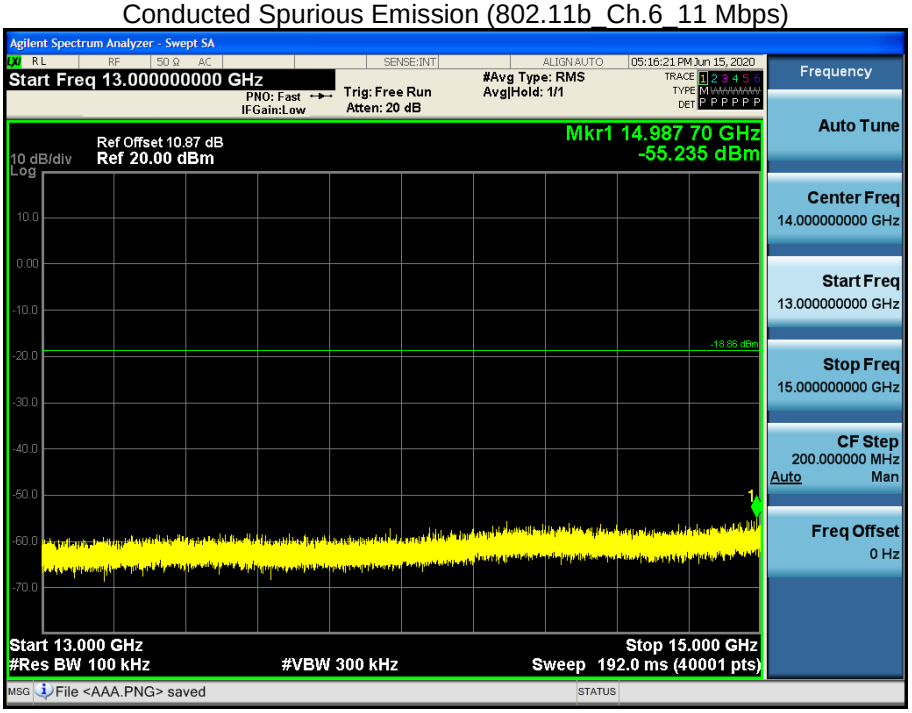
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



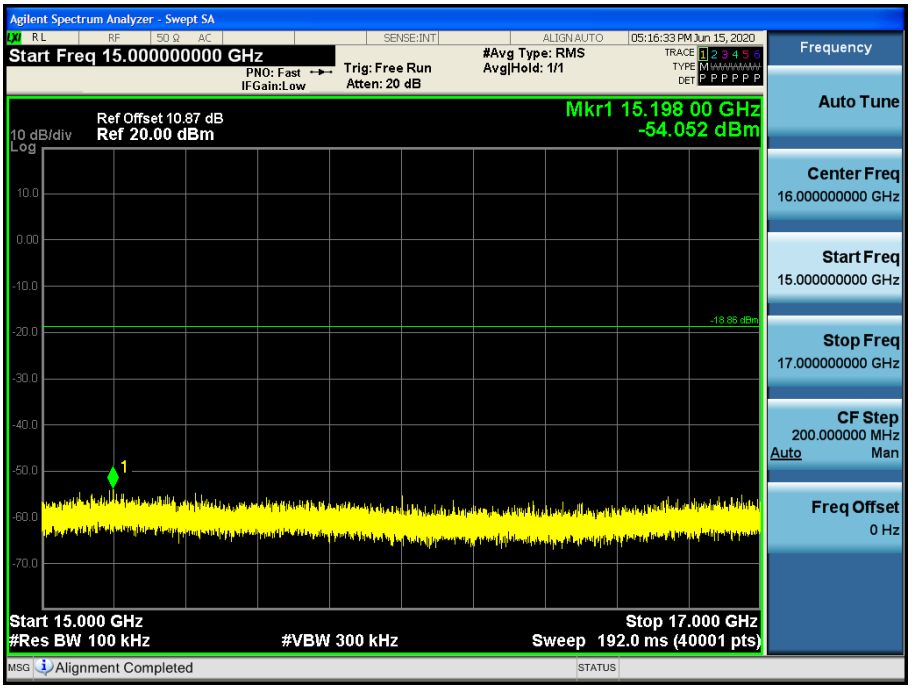
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



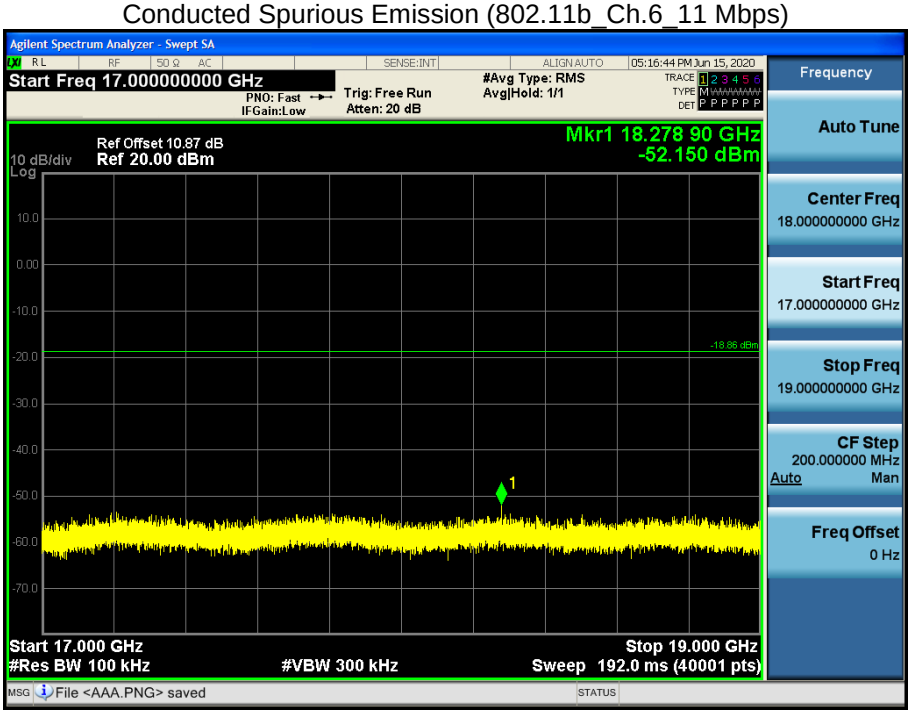
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



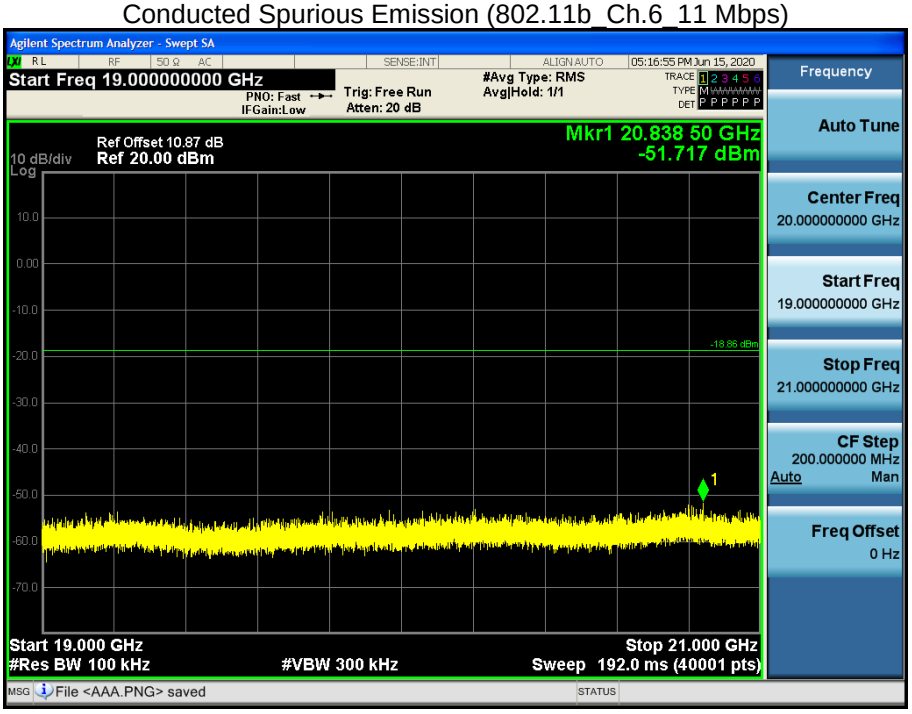
17 GHz ~ 19 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



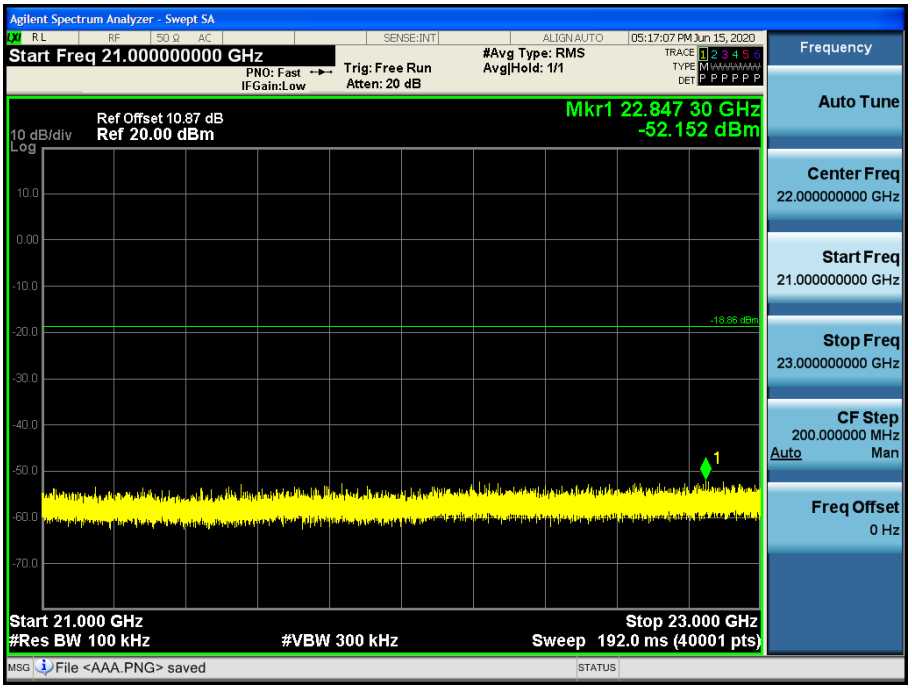
19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



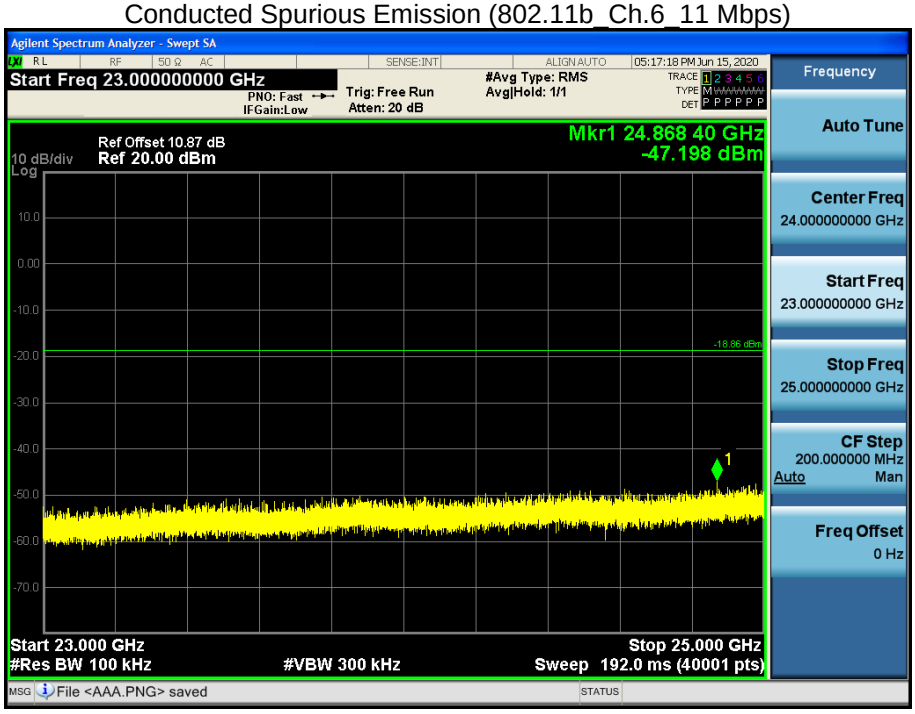
21 GHz ~ 23 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



23 GHz ~ 25 GHz

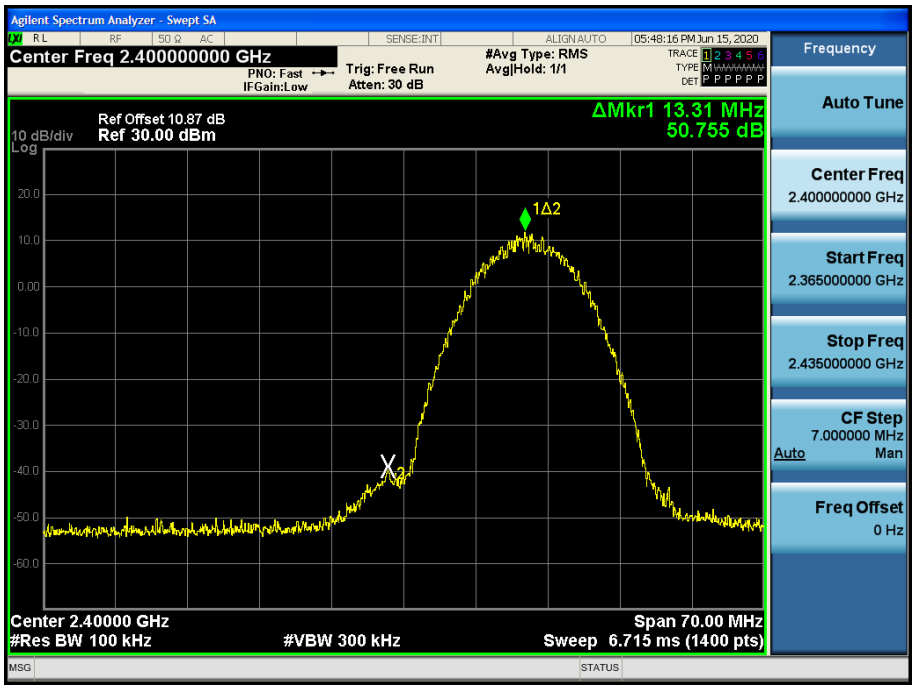
Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



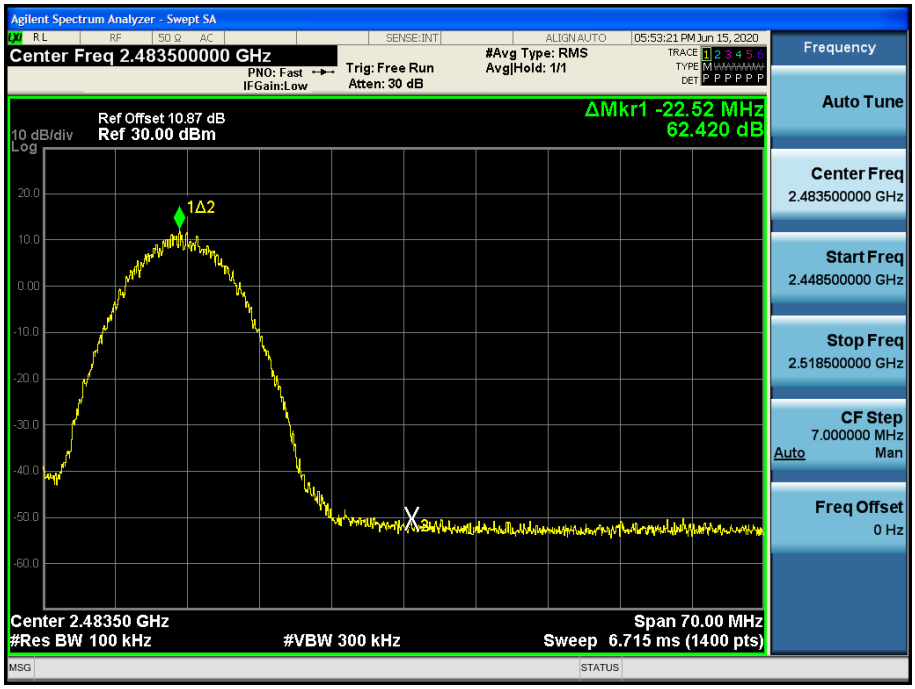
[Ant.2]

▣ Test Plots(BandEdge)

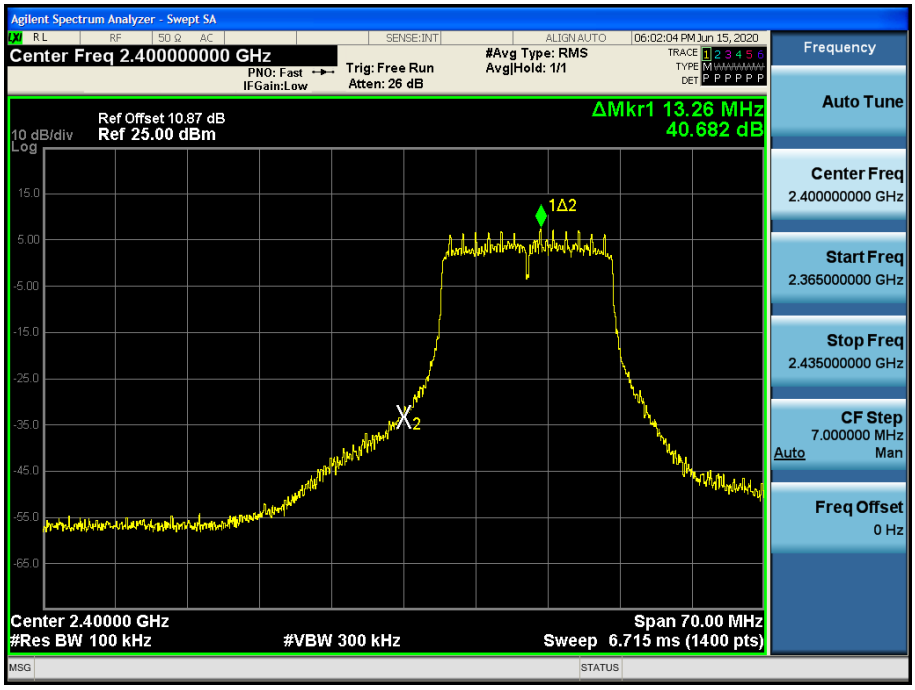
Band Edge (802.11b-CH1)



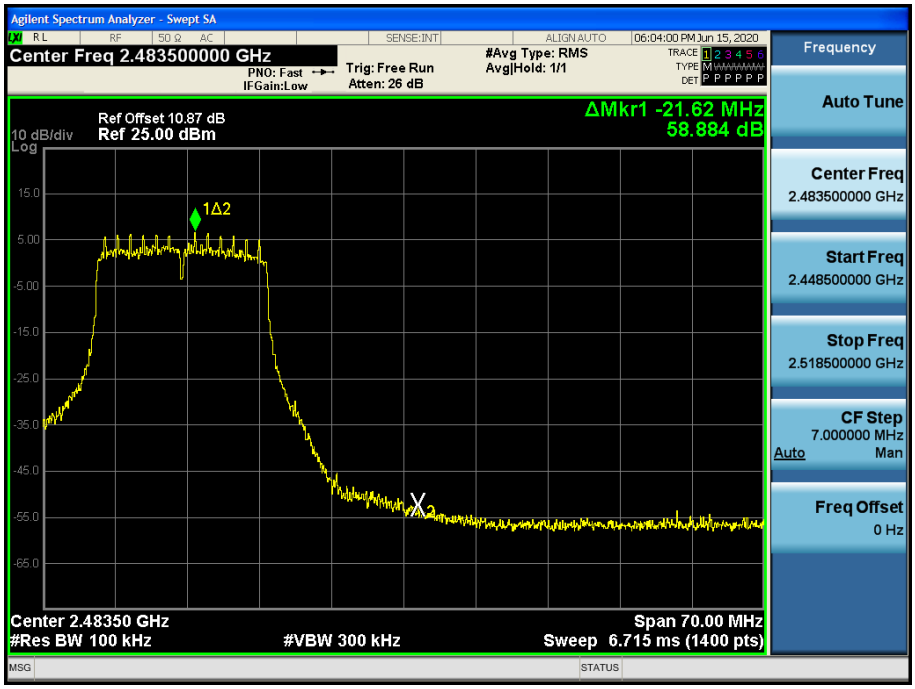
Band Edge (802.11b-CH11)



Band Edge (802.11g-CH1)

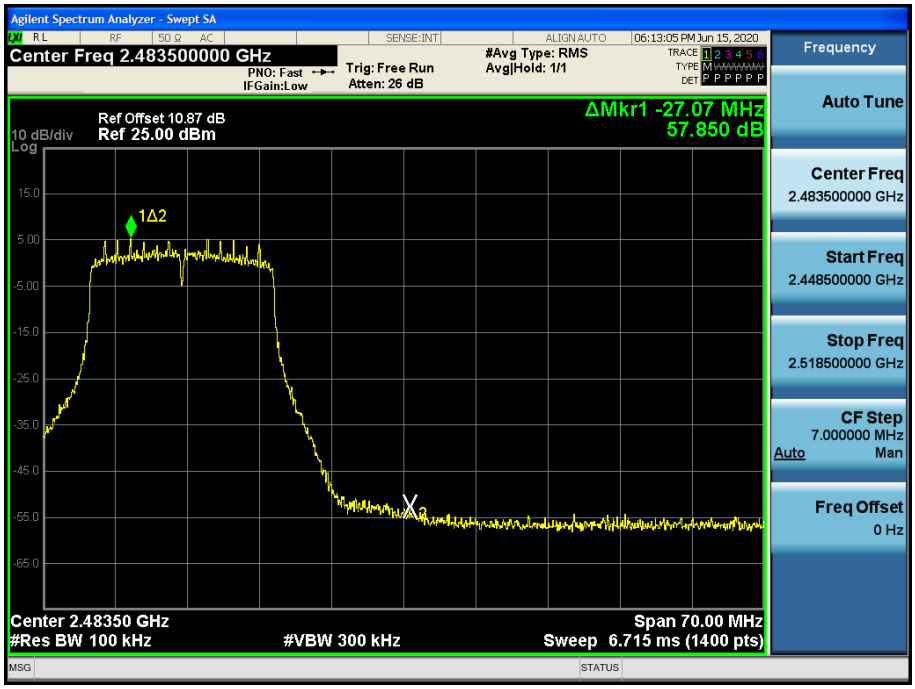


Band Edge (802.11g-CH11)

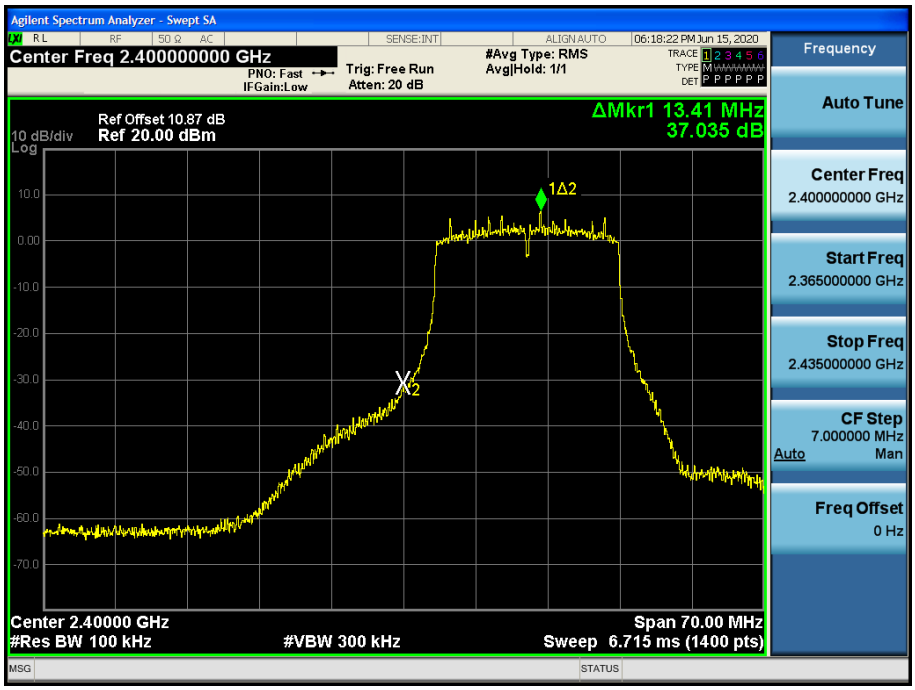


Band Edge (802.11n_HT20 -CH1)

Band Edge (802.11n_HT20 –CH11)



Band Edge (802.11ac_HT20 -CH1)

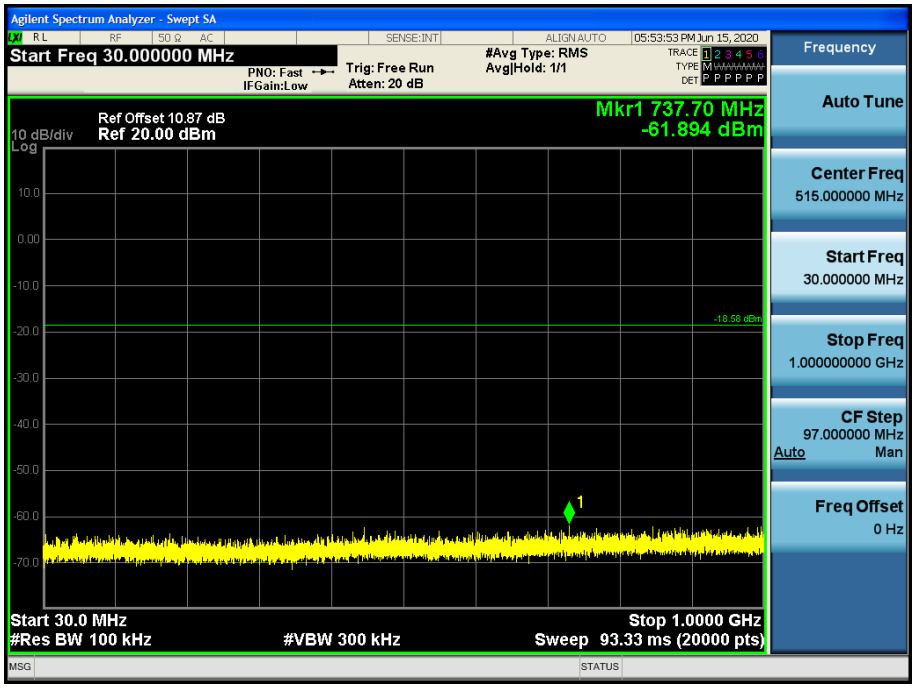


Band Edge (802.11ac_HT20 –CH11)

▣ Test Plots(Conducted Spurious Emission)

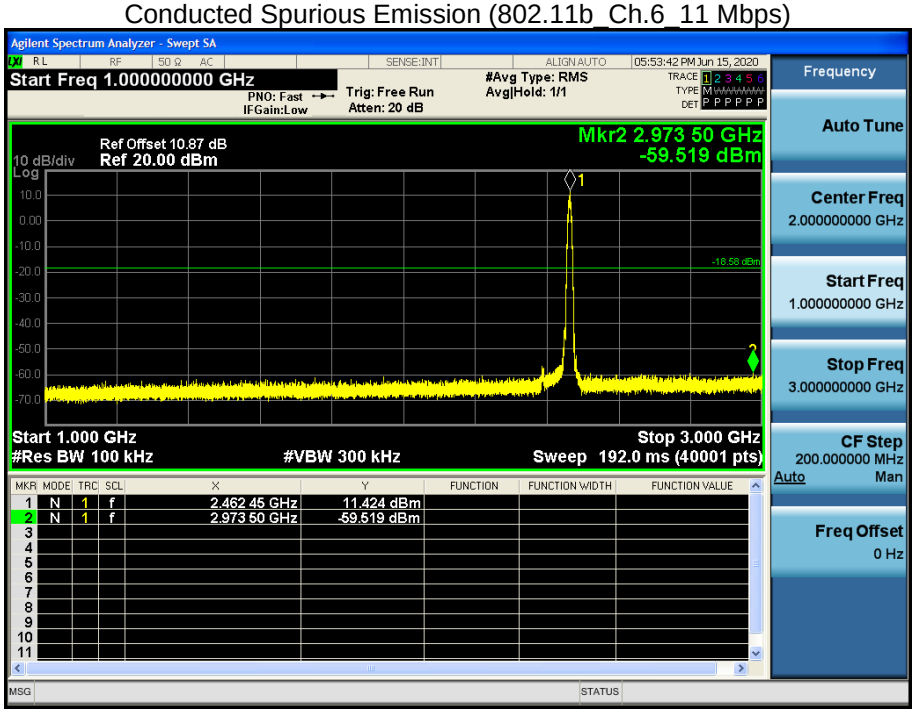
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



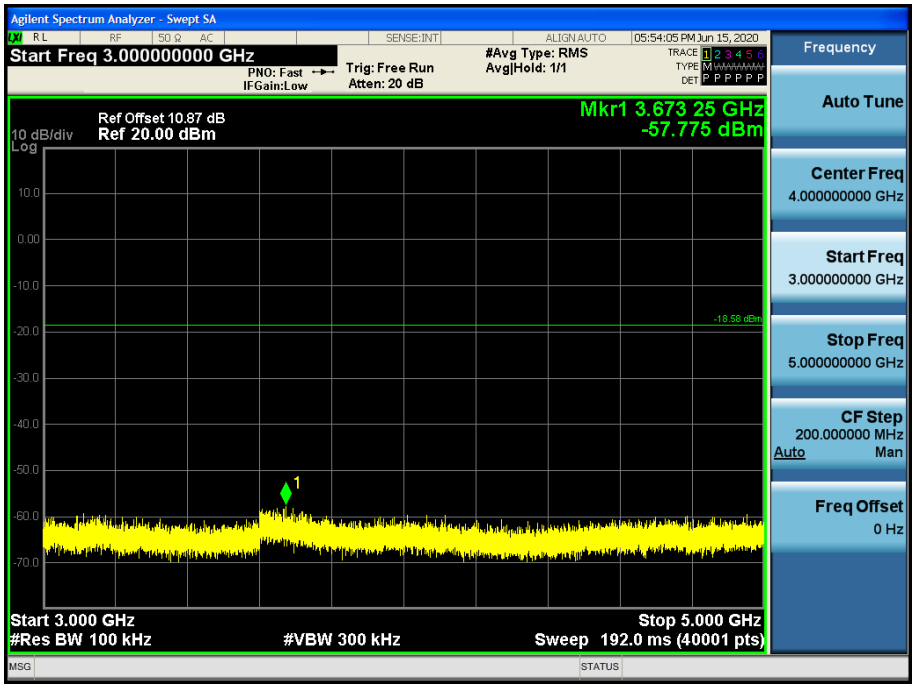
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



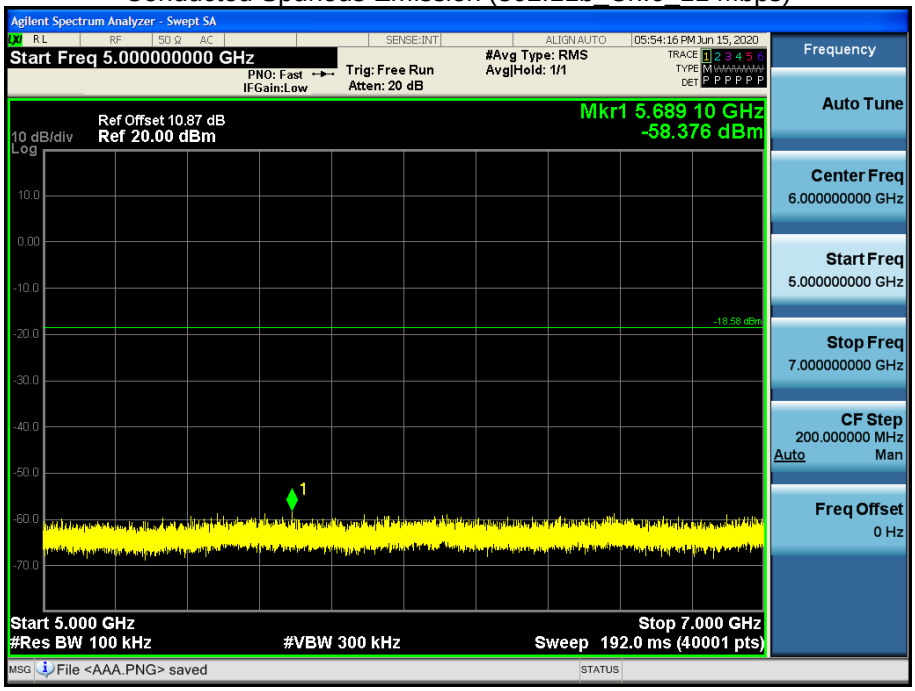
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



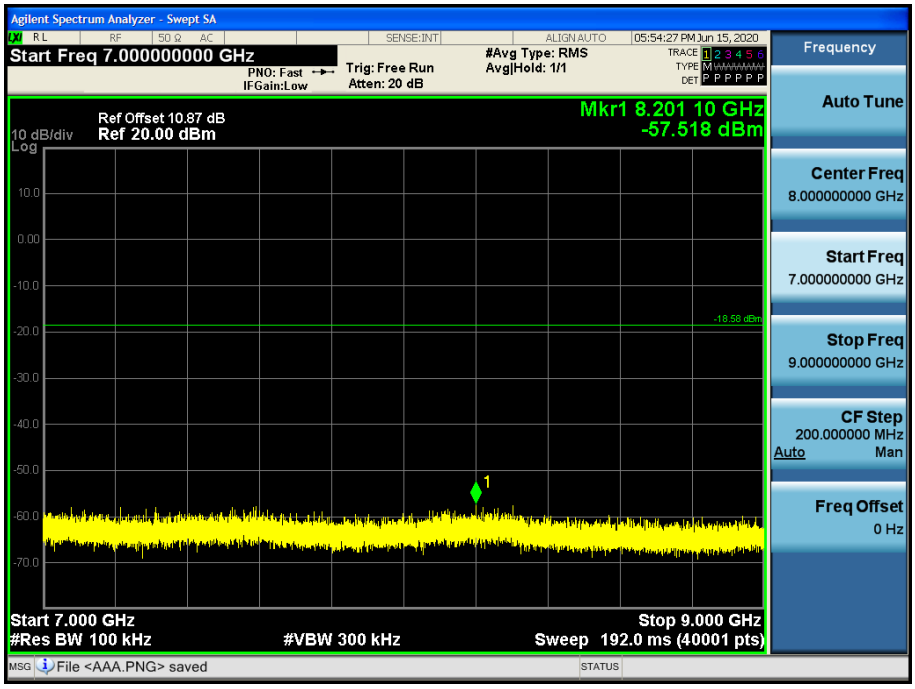
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



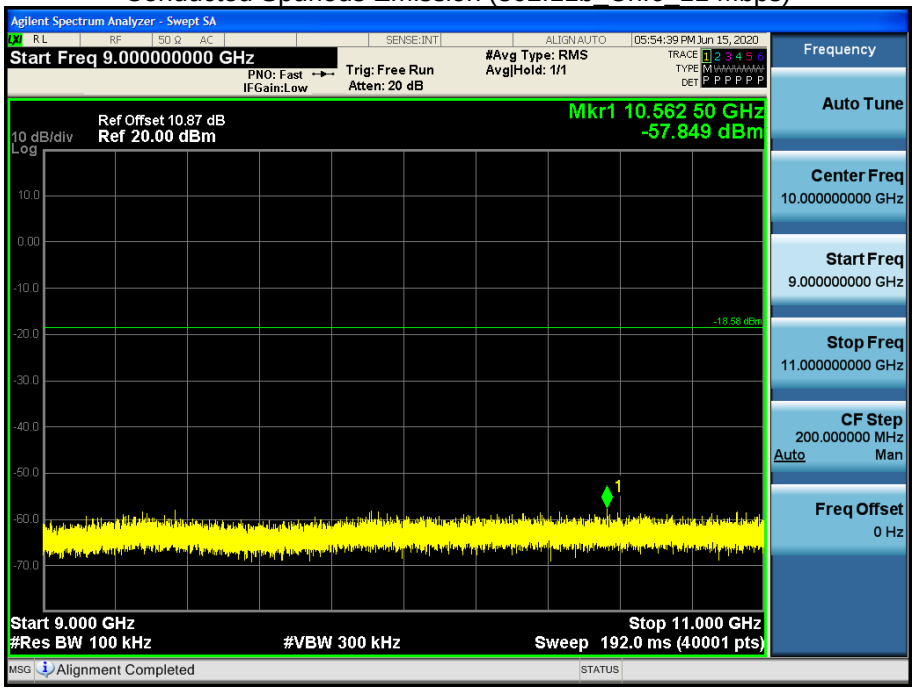
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



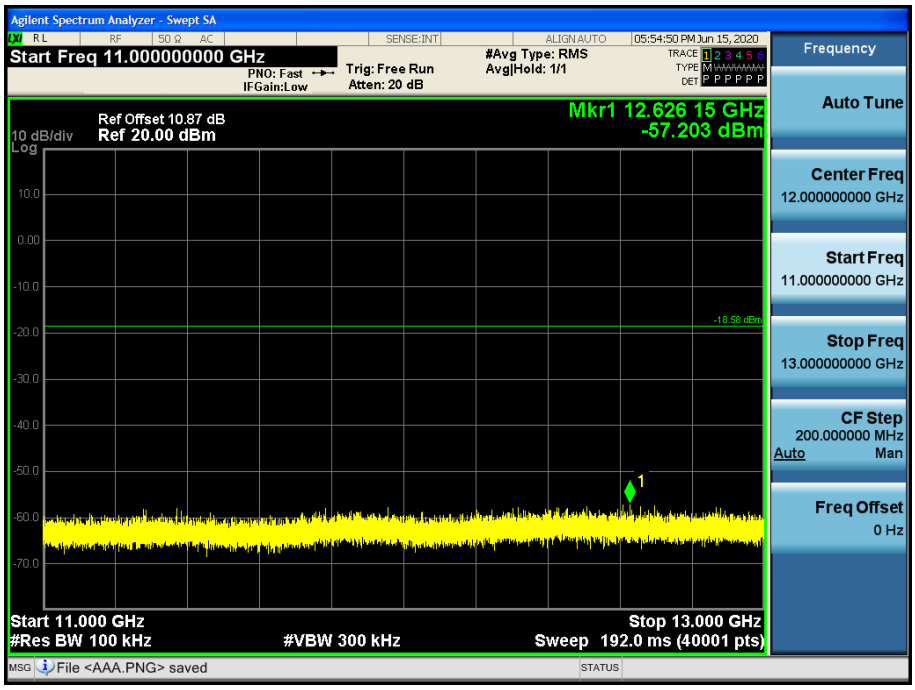
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



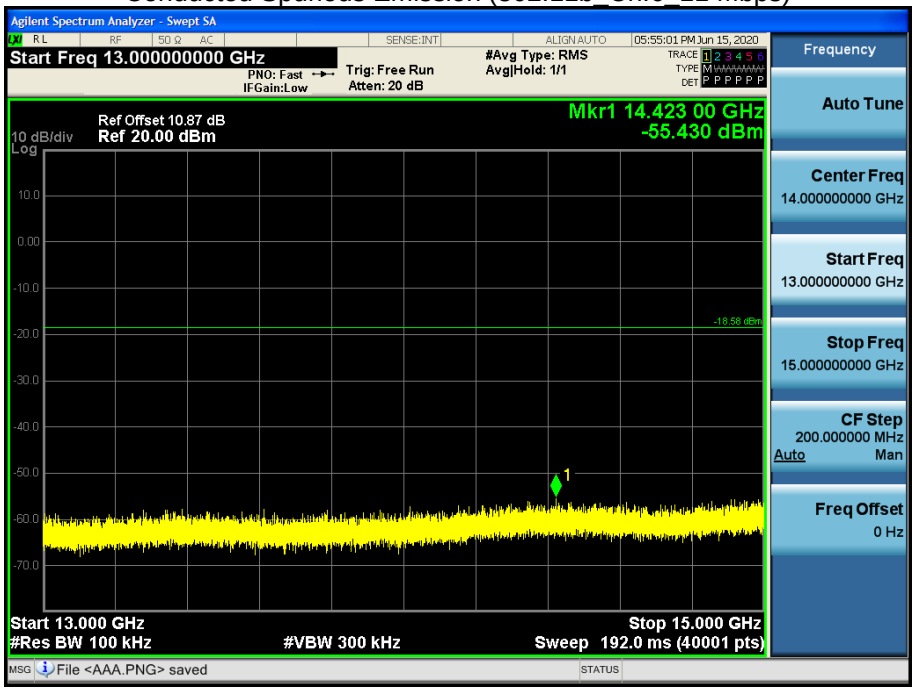
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



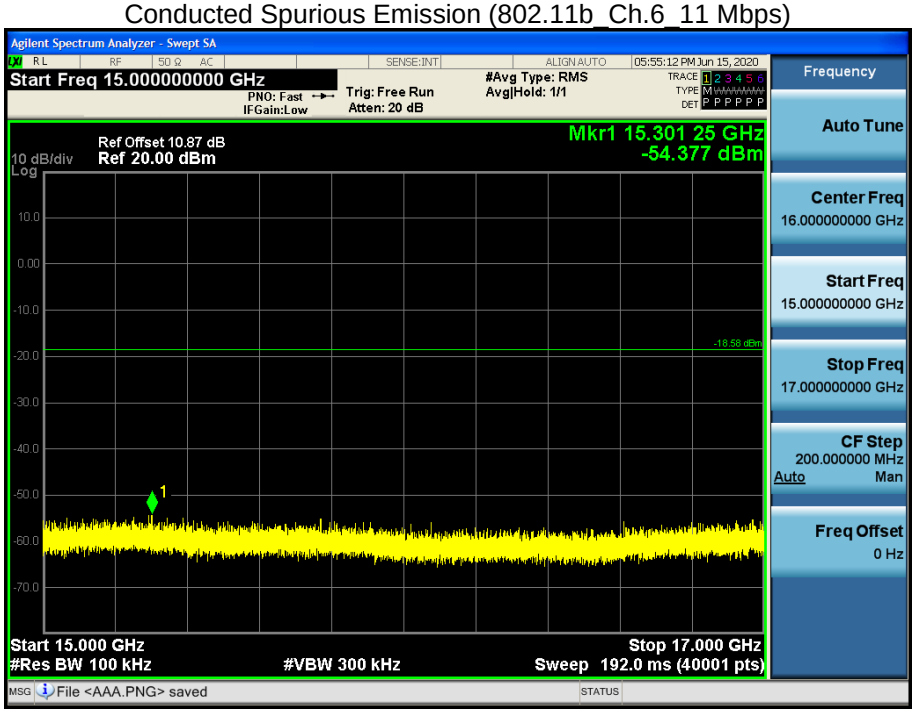
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



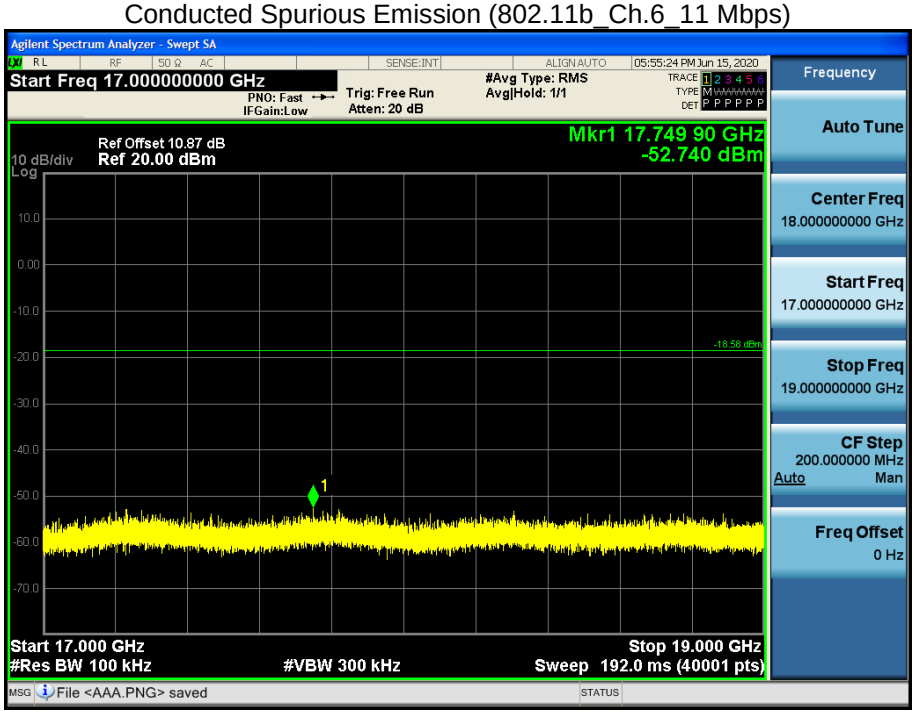
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



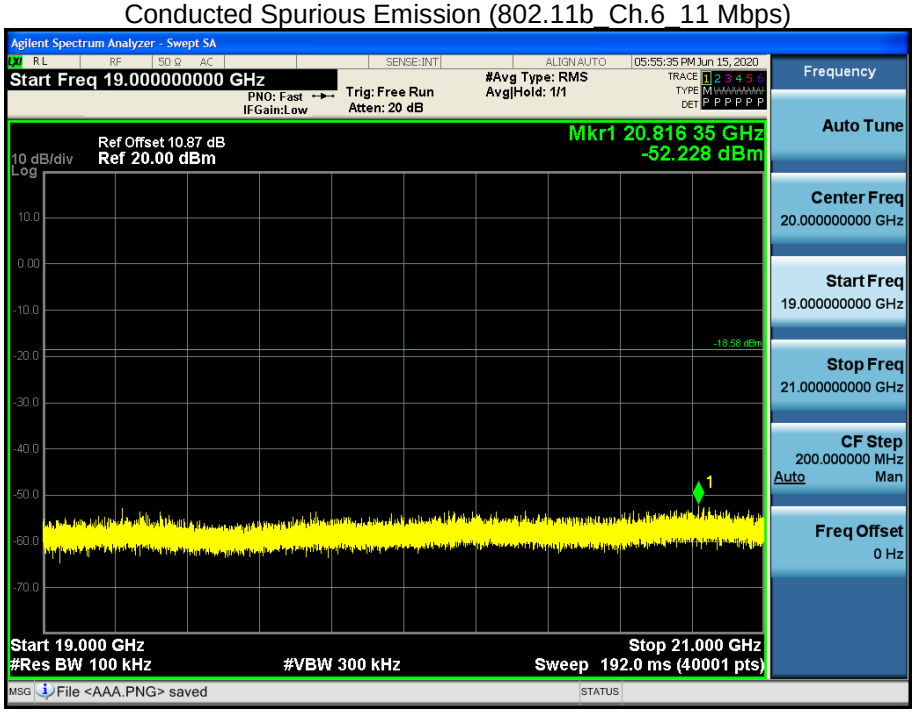
17 GHz ~ 19 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



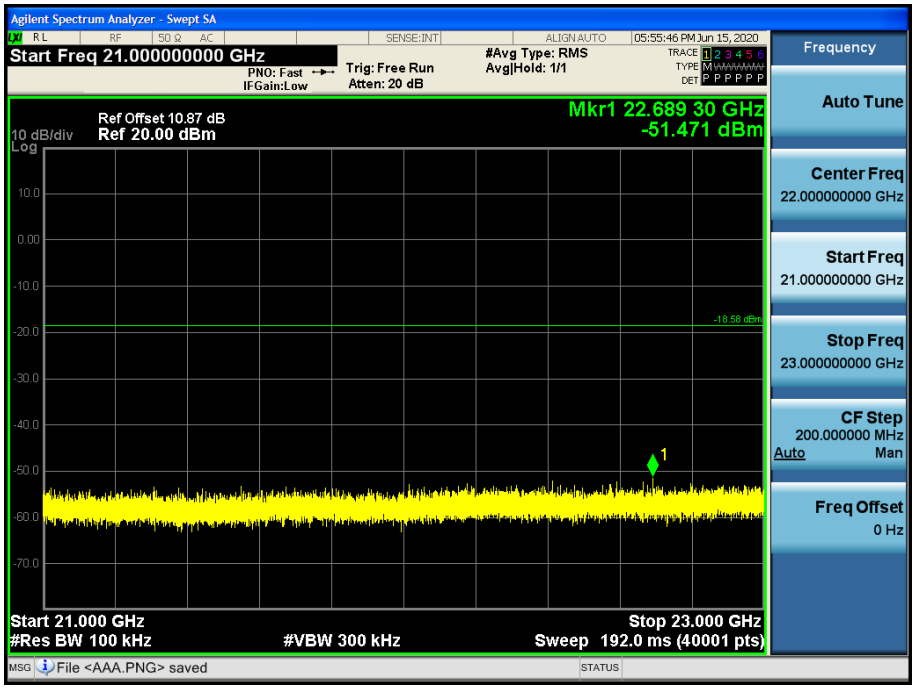
19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



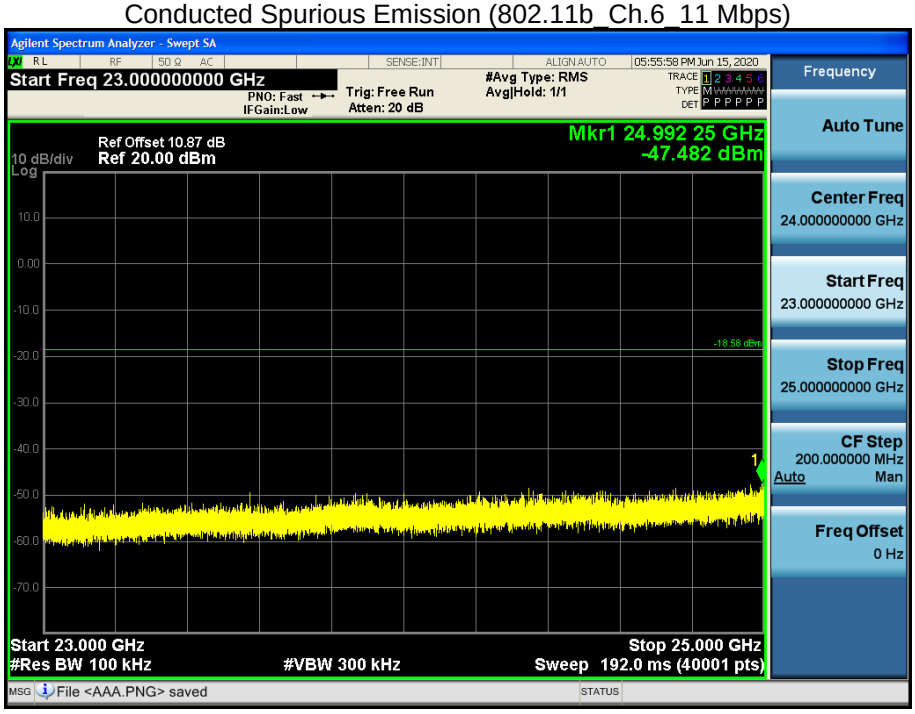
21 GHz ~ 23 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



23 GHz ~ 25 GHz

Conducted Spurious Emission (802.11b_Ch.6_11 Mbps)



9.6 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30MHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

Note:

1. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = 40log (specific distance / test distance) (dB)
3. Limit line = specific Limits (dBuV) + Distance extrapolation factor

Frequency Range : Below 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB
No Critical peaks found							

Note:

1. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.

[Ant.1&Ant.2_MIMO(CDD)]

Frequency Range : Above 1 GHz

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	45.78	4.31	V	50.09	73.98	23.89	PK
4824	39.50	4.31	V	43.81	53.98	10.17	AV
7236	37.69	12.35	V	50.04	73.98	23.94	PK
7236	25.57	12.35	V	37.92	53.98	16.06	AV
4824	46.20	4.31	H	50.51	73.98	23.47	PK
4824	40.51	4.31	H	44.82	53.98	9.16	AV
7236	38.23	12.35	H	50.58	73.98	23.40	PK
7236	26.02	12.35	H	38.37	53.98	15.61	AV

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	43.94	4.40	V	48.34	73.98	25.64	PK
4874	37.28	4.40	V	41.68	53.98	12.30	AV
7311	39.05	12.37	V	51.42	73.98	22.56	PK
7311	26.63	12.37	V	39.00	53.98	14.98	AV
4874	44.57	4.40	H	48.97	73.98	25.01	PK
4874	37.94	4.40	H	42.34	53.98	11.64	AV
7311	38.52	12.37	H	50.89	73.98	23.09	PK
7311	26.11	12.37	H	38.48	53.98	15.50	AV

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	42.37	4.51	V	46.88	73.98	27.10	PK
4924	33.24	4.51	V	37.75	53.98	16.23	AV
7386	39.16	12.31	V	51.47	73.98	22.51	PK
7386	27.08	12.31	V	39.39	53.98	14.59	AV
4924	42.80	4.51	H	47.31	73.98	26.67	PK
4924	33.73	4.51	H	38.24	53.98	15.74	AV
7386	39.71	12.31	H	52.02	73.98	21.96	PK
7386	27.71	12.31	H	40.02	53.98	13.96	AV

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	40.62	0.00	4.31	V	44.93	73.98	29.05	PK
4824	29.85	0.00	4.31	V	34.16	53.98	19.82	AV
7236	37.55	0.00	12.35	V	49.90	73.98	24.08	PK
7236	25.75	0.00	12.35	V	38.10	53.98	15.88	AV
4824	42.80	0.00	4.31	H	47.11	73.98	26.87	PK
4824	30.89	0.00	4.31	H	35.20	53.98	18.78	AV
7236	38.44	0.00	12.35	H	50.79	73.98	23.19	PK
7236	25.83	0.00	12.35	H	38.18	53.98	15.80	AV

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	41.15	0.00	4.40	V	45.55	73.98	28.43	PK
4874	29.65	0.00	4.40	V	34.05	53.98	19.93	AV
7311	37.43	0.00	12.37	V	49.80	73.98	24.18	PK
7311	26.03	0.00	12.37	V	38.40	53.98	15.58	AV
4874	41.64	0.00	4.40	H	46.04	73.98	27.94	PK
4874	29.81	0.00	4.40	H	34.21	53.98	19.77	AV
7311	38.33	0.00	12.37	H	50.70	73.98	23.28	PK
7311	26.15	0.00	12.37	H	38.52	53.98	15.46	AV

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	41.02	0.00	4.51	V	45.53	73.98	28.45	PK
4924	29.06	0.00	4.51	V	33.57	53.98	20.41	AV
7386	38.81	0.00	12.31	V	51.12	73.98	22.86	PK
7386	26.26	0.00	12.31	V	38.57	53.98	15.41	AV
4924	41.51	0.00	4.51	H	46.02	73.98	27.96	PK
4924	29.55	0.00	4.51	H	34.06	53.98	19.92	AV
7386	38.88	0.00	12.31	H	51.19	73.98	22.79	PK
7386	26.41	0.00	12.31	H	38.72	53.98	15.26	AV

Operation Mode:	802.11n (HT20)
Transfer MCS Index:	0
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	41.26	0.00	4.31	V	45.57	73.98	28.41	PK
4824	30.01	0.00	4.31	V	34.32	53.98	19.66	AV
7236	37.71	0.00	12.35	V	50.06	73.98	23.92	PK
7236	25.81	0.00	12.35	V	38.16	53.98	15.82	AV
4824	42.22	0.00	4.31	H	46.53	73.98	27.45	PK
4824	30.06	0.00	4.31	H	34.37	53.98	19.61	AV
7236	38.37	0.00	12.35	H	50.72	73.98	23.26	PK
7236	25.88	0.00	12.35	H	38.23	53.98	15.75	AV

Operation Mode:	802.11n (HT20)
Transfer MCS Index:	0
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	40.80	0.00	4.40	V	45.20	73.98	28.78	PK
4874	29.05	0.00	4.40	V	33.45	53.98	20.53	AV
7311	38.04	0.00	12.37	V	50.41	73.98	23.57	PK
7311	26.27	0.00	12.37	V	38.64	53.98	15.34	AV
4874	41.40	0.00	4.40	H	45.80	73.98	28.18	PK
4874	29.29	0.00	4.40	H	33.69	53.98	20.29	AV
7311	38.34	0.00	12.37	H	50.71	73.98	23.27	PK
7311	26.35	0.00	12.37	H	38.72	53.98	15.26	AV

Operation Mode:	802.11n (HT20)
Transfer MCS Index:	0
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	40.65	0.00	4.51	V	45.16	73.98	28.82	PK
4924	28.36	0.00	4.51	V	32.87	53.98	21.11	AV
7386	37.75	0.00	12.31	V	50.06	73.98	23.92	PK
7386	25.81	0.00	12.31	V	38.12	53.98	15.86	AV
4924	41.15	0.00	4.51	H	45.66	73.98	28.32	PK
4924	29.32	0.00	4.51	H	33.83	53.98	20.15	AV
7386	38.41	0.00	12.31	H	50.72	73.98	23.26	PK
7386	26.42	0.00	12.31	H	38.73	53.98	15.25	AV

Operation Mode:	802.11ac (HT20)
Transfer MCS Index:	0
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4824	41.82	0.00	4.31	V	46.13	73.98	27.85	PK
4824	28.05	0.00	4.31	V	32.36	53.98	21.62	AV
7236	38.05	0.00	12.35	V	50.40	73.98	23.58	PK
7236	26.03	0.00	12.35	V	38.38	53.98	15.60	AV
4824	42.53	0.00	4.31	H	46.84	73.98	27.14	PK
4824	29.81	0.00	4.31	H	34.12	53.98	19.86	AV
7236	38.69	0.00	12.35	H	51.04	73.98	22.94	PK
7236	26.07	0.00	12.35	H	38.42	53.98	15.56	AV

Operation Mode:	802.11ac (HT20)
Transfer MCS Index:	0
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4874	40.33	0.00	4.40	V	44.73	73.98	29.25	PK
4874	28.42	0.00	4.40	V	32.82	53.98	21.16	AV
7311	38.22	0.00	12.37	V	50.59	73.98	23.39	PK
7311	26.05	0.00	12.37	V	38.42	53.98	15.56	AV
4874	41.61	0.00	4.40	H	46.01	73.98	27.97	PK
4874	29.33	0.00	4.40	H	33.73	53.98	20.25	AV
7311	38.88	0.00	12.37	H	51.25	73.98	22.73	PK
7311	26.38	0.00	12.37	H	38.75	53.98	15.23	AV

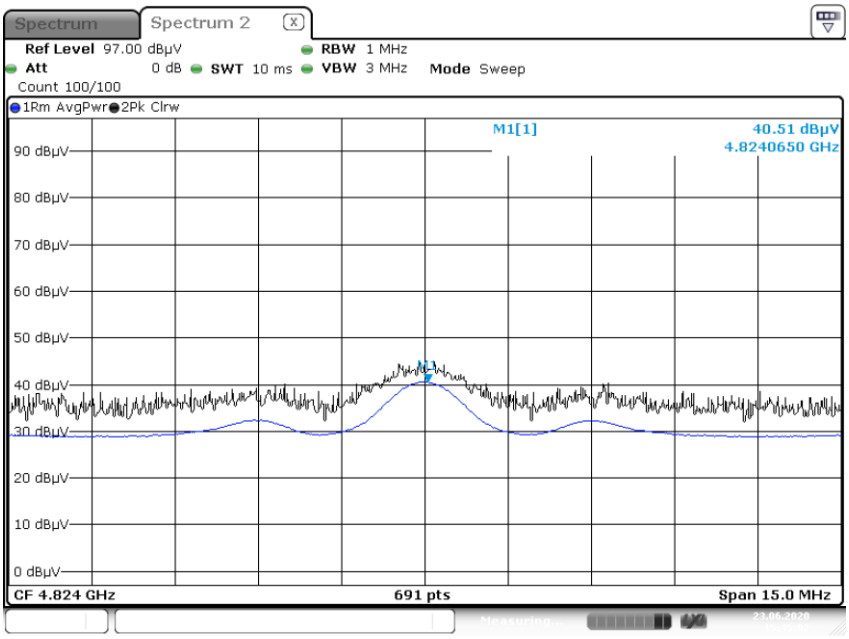
Operation Mode:	802.11ac (HT20)
Transfer MCS Index:	0
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	40.44	0.00	4.51	V	44.95	73.98	29.03	PK
4924	28.53	0.00	4.51	V	33.04	53.98	20.94	AV
7386	38.83	0.00	12.31	V	51.14	73.98	22.84	PK
7386	26.31	0.00	12.31	V	38.62	53.98	15.36	AV
4924	41.46	0.00	4.51	H	45.97	73.98	28.01	PK
4924	29.36	0.00	4.51	H	33.87	53.98	20.11	AV
7386	39.26	0.00	12.31	H	51.57	73.98	22.41	PK
7386	26.53	0.00	12.31	H	38.84	53.98	15.14	AV

[Ant.1&Ant.2_MIMO(CDD)]

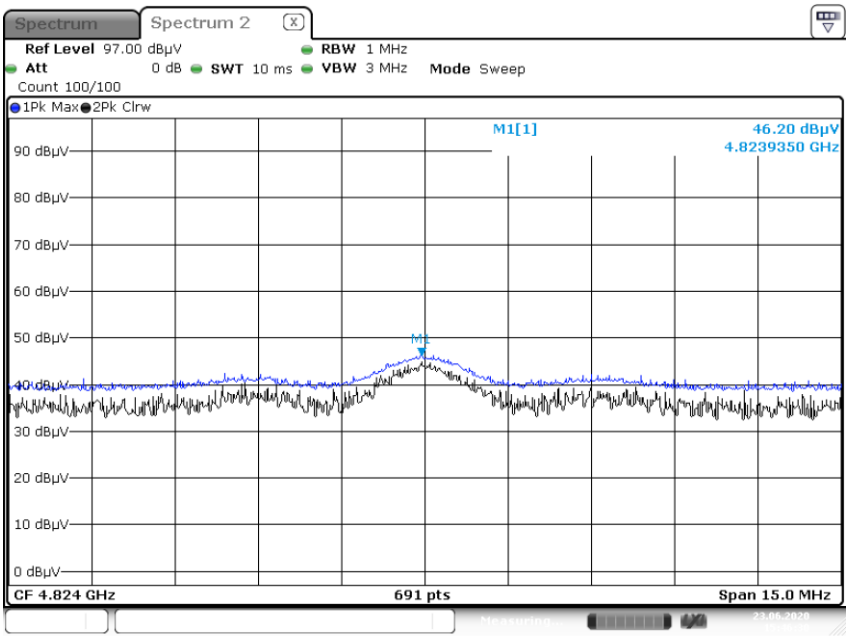
▣ Test Plots (Worst case : Y-H)

Radiated Spurious Emissions plot – Average Reading (802.11b_1Mbps, Ch.1 2nd Harmonic)



Date: 23.JUN.2020 15:45:02

Radiated Spurious Emissions plot – Peak Reading (802.11b_1Mbps, Ch.1 2nd Harmonic)



Date: 23.JUN.2020 15:46:30

Note:

Plot of worst case are only reported.

9.7 RADIATED RESTRICTED BAND EDGES

[Ant.1&Ant.2_MIMO(CDD)]

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. -A.G+ATT [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	51.48	5.61	H	57.09	73.98	16.89	PK
2390.0	38.95	5.61	H	44.56	53.98	9.42	AV
2390.0	51.02	5.61	V	56.63	73.98	17.35	PK
2390.0	38.62	5.61	V	44.23	53.98	9.75	AV
2483.5	51.47	6.13	H	57.60	73.98	16.38	PK
2483.5	40.27	6.13	H	46.40	53.98	7.58	AV
2483.5	50.82	6.13	V	56.95	73.98	17.03	PK
2483.5	39.46	6.13	V	45.59	53.98	8.39	AV

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F -A.G+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	58.82	0.00	5.61	H	64.43	73.98	9.55	PK
2390.0	45.32	0.00	5.61	H	50.93	53.98	3.05	AV
2390.0	57.41	0.00	5.61	V	63.02	73.98	10.96	PK
2390.0	44.81	0.00	5.61	V	50.42	53.98	3.56	AV
2483.5#(2484)	55.49	0.00	6.13	H	61.62	73.98	12.36	PK
2483.5#(2484)	44.79	0.00	6.13	H	50.92	53.98	3.06	AV
2483.5#(2485)	52.63	0.00	6.13	H	58.76	73.98	15.22	PK
2483.5#(2485)	41.87	0.00	6.13	H	48.00	53.98	5.98	AV
2485.5~2500	54.94	0.00	6.13	H	61.07	73.98	12.91	PK
2485.5~2500	42.01	0.00	6.13	H	48.14	53.98	5.84	AV

Note : # integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2457 MHz
Channel No.	10 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F -A.G+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	52.11	0.00	6.13	H	58.24	73.98	15.74	PK
2483.5	39.77	0.00	6.13	H	45.90	53.98	8.08	AV
2483.5	51.96	0.00	6.13	V	58.09	73.98	15.89	PK
2483.5	39.26	0.00	6.13	V	45.39	53.98	8.59	AV

Operation Mode:	802.11n (HT20)
Transfer Rate:	0
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F -A.G+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	57.12	0.00	5.61	H	62.73	73.98	11.25	PK
2390.0	43.19	0.00	5.61	H	48.80	53.98	5.18	AV
2390.0	54.65	0.00	5.61	V	60.26	73.98	13.72	PK
2390.0	42.17	0.00	5.61	V	47.78	53.98	6.20	AV
2483.5#(2484)	54.62	0.00	6.13	H	60.75	73.98	13.23	PK
2483.5#(2484)	44.06	0.00	6.13	H	50.19	53.98	3.79	AV
2483.5#(2485)	52.86	0.00	6.13	H	58.99	73.98	14.99	PK
2483.5#(2485)	42.20	0.00	6.13	H	48.33	53.98	5.65	AV
2485.5~2500	53.88	0.00	6.13	H	60.01	73.98	13.97	PK
2485.5~2500	41.96	0.00	6.13	H	48.09	53.98	5.89	AV

Note : “#” integration method Used (ANSI C63.10 Section11.13.3)

Operation Mode:	802.11n (HT20)
Transfer Rate:	0
Operating Frequency	2457 MHz
Channel No.	10 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F -A.G+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	52.96	0.00	6.13	H	59.09	73.98	14.89	PK
2483.5	39.81	0.00	6.13	H	45.94	53.98	8.04	AV
2483.5	51.88	0.00	6.13	V	58.01	73.98	15.97	PK
2483.5	39.42	0.00	6.13	V	45.55	53.98	8.43	AV

Operation Mode:	802.11ac (HT20)
Transfer Rate:	0
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F -A.G+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	56.04	0.00	5.61	H	61.65	73.98	12.33	PK
2390.0	43.51	0.00	5.61	H	49.12	53.98	4.86	AV
2390.0	55.16	0.00	5.61	V	60.77	73.98	13.21	PK
2390.0	42.11	0.00	5.61	V	47.72	53.98	6.26	AV
2483.5#(2484)	55.88	0.00	6.13	H	62.01	73.98	11.97	PK
2483.5#(2484)	44.53	0.00	6.13	H	50.66	53.98	3.32	AV
2483.5#(2485)	54.43	0.00	6.13	H	60.56	73.98	13.42	PK
2483.5#(2485)	43.07	0.00	6.13	H	49.20	53.98	4.78	AV
2485.5~2500	56.45	0.00	6.13	H	62.58	73.98	11.40	PK
2485.5~2500	42.53	0.00	6.13	H	48.66	53.98	5.32	AV

Note : "#" integration method Used (ANSI C63.10 Section11.13.3)

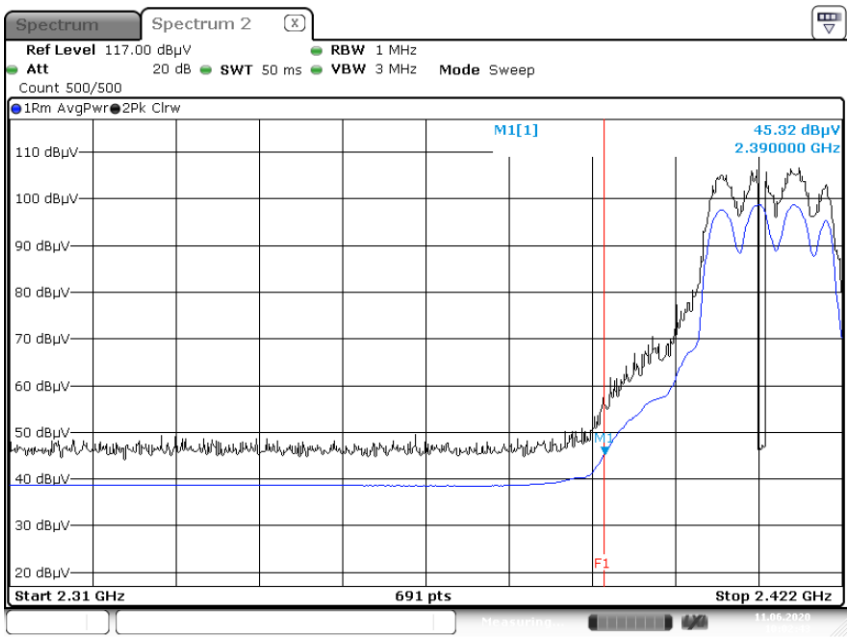
Operation Mode:	802.11ac (HT20)
Transfer Rate:	0
Operating Frequency	2457 MHz
Channel No.	10 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F -A.G+ATT. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	52.23	0.00	6.13	H	58.36	73.98	15.62	PK
2483.5	41.08	0.00	6.13	H	47.21	53.98	6.77	AV
2483.5	50.75	0.00	6.13	V	56.88	73.98	17.10	PK
2483.5	39.19	0.00	6.13	V	45.32	53.98	8.66	AV

[Ant.1&Ant.2_MIMO(CDD)]

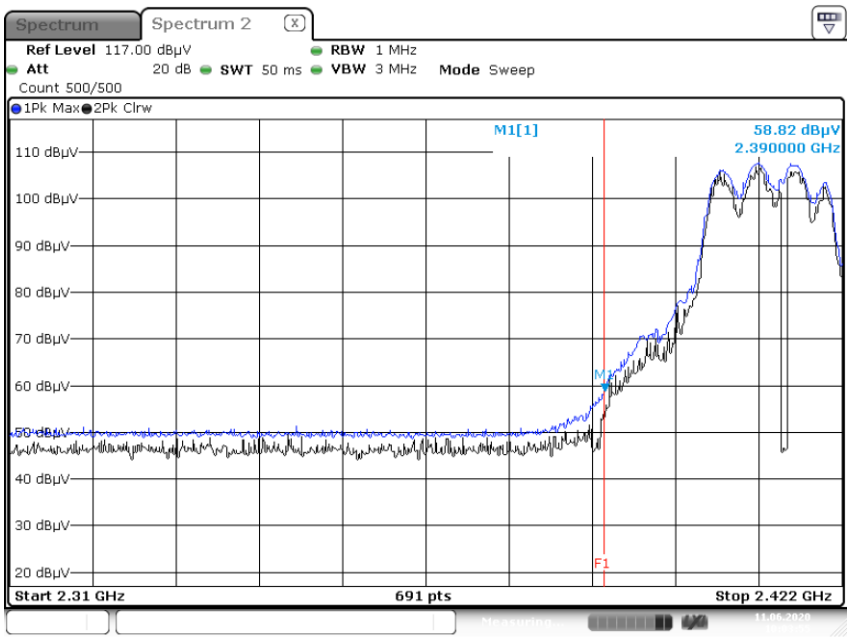
▣ Test Plots (Worst case : Z-H)

Radiated Restricted Band Edges plot – Average Reading (802.11g_6 Mbps Ch.1)



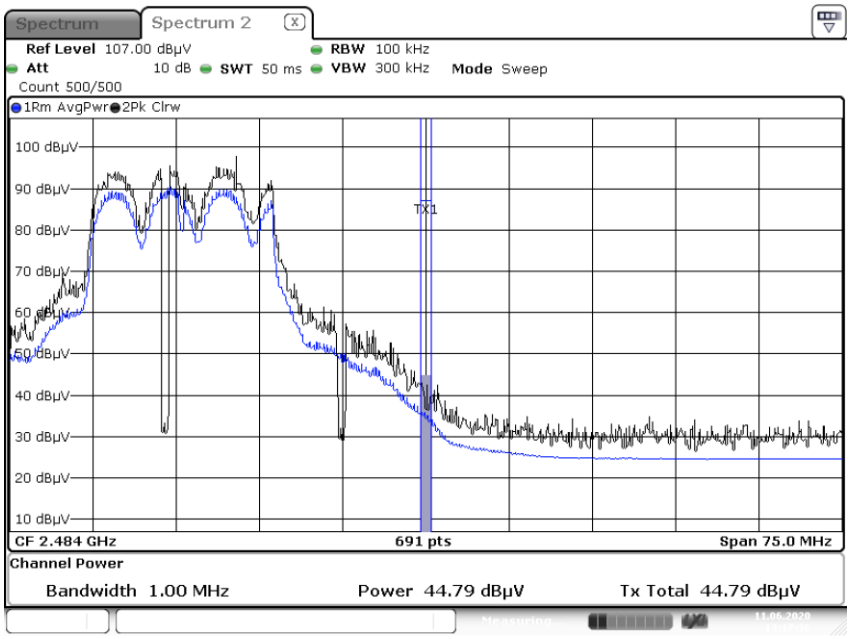
Date: 11.JUN.2020 10:02:43

Radiated Restricted Band Edges plot – Peak Reading (802.11g_6 Mbps Ch.1)



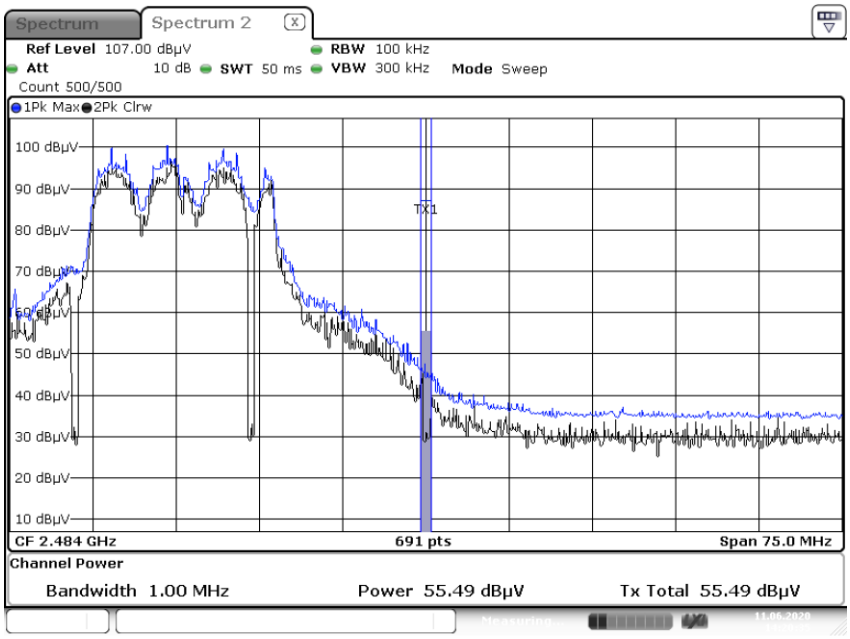
Date: 11.JUN.2020 10:03:55

Radiated Restricted Band Edges plot – Average Reading (802.11g_6 Mbps Ch.11) 2484 MHz



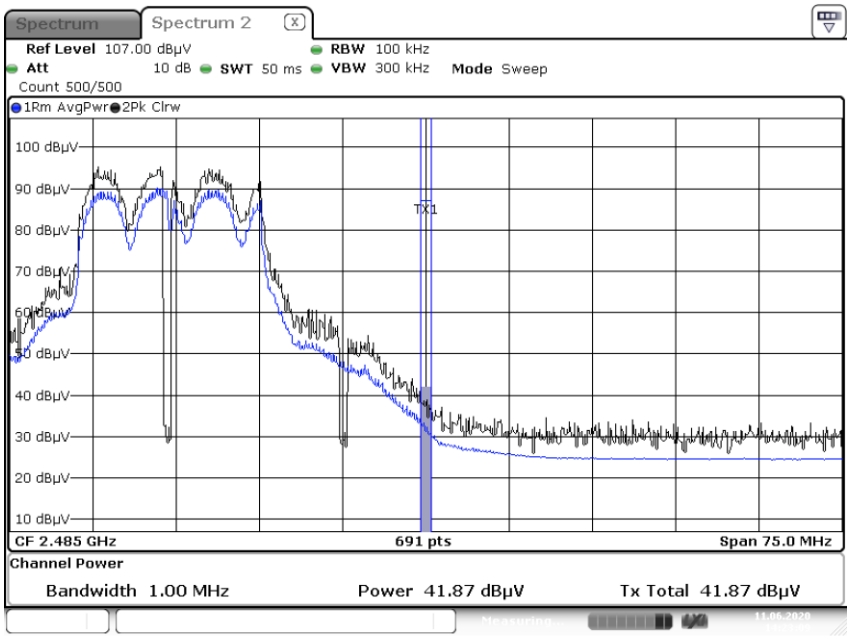
Date: 11.JUN.2020 14:17:37

Radiated Restricted Band Edges plot – Peak Reading (802.11g_6 Mbps Ch.11) 2484 MHz



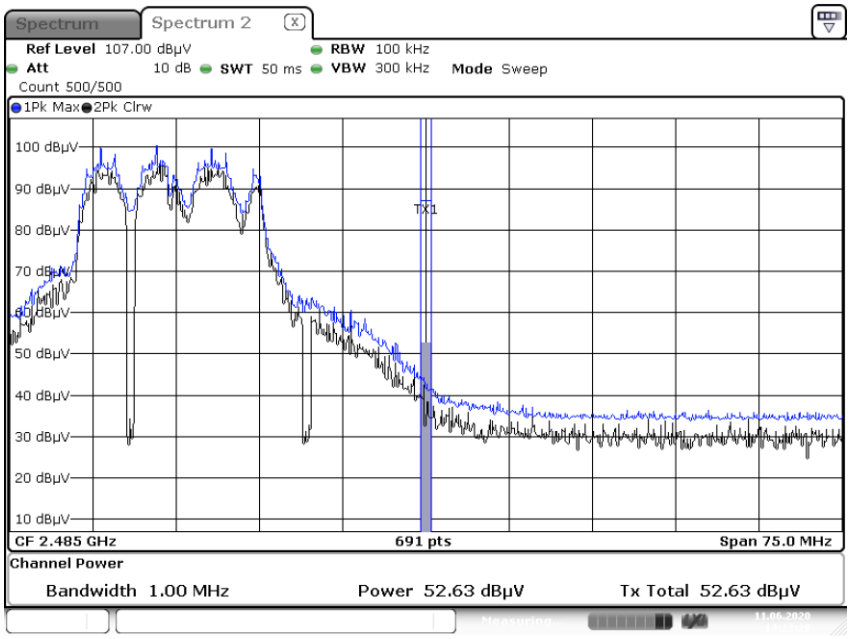
Date: 11.JUN.2020 14:20:35

Radiated Restricted Band Edges plot – Average Reading (802.11g_6 Mbps Ch.11) 2485 MHz



Date: 11.JUN.2020 14:23:10

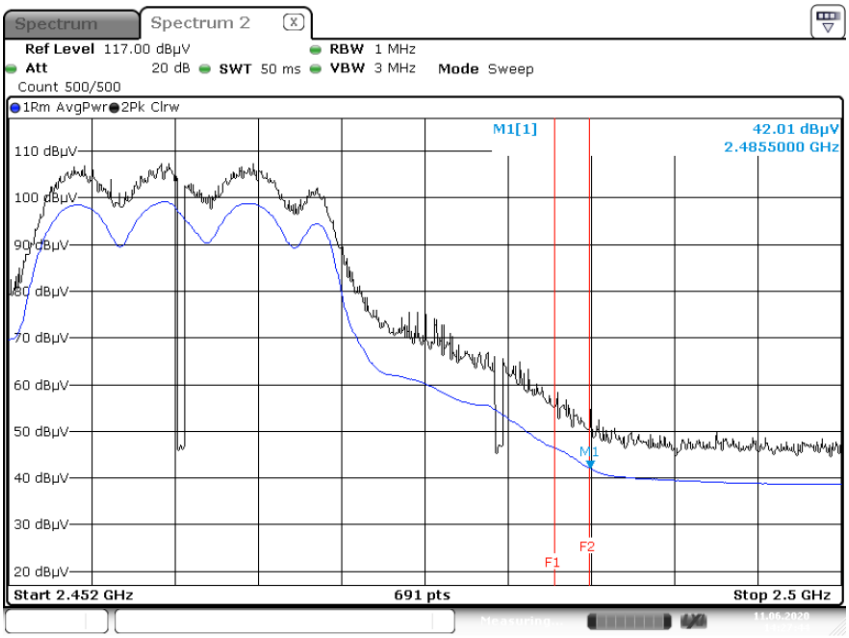
Radiated Restricted Band Edges plot – Peak Reading (802.11g_6 Mbps Ch.11) 2485 MHz



Date: 11.JUN.2020 14:22:27

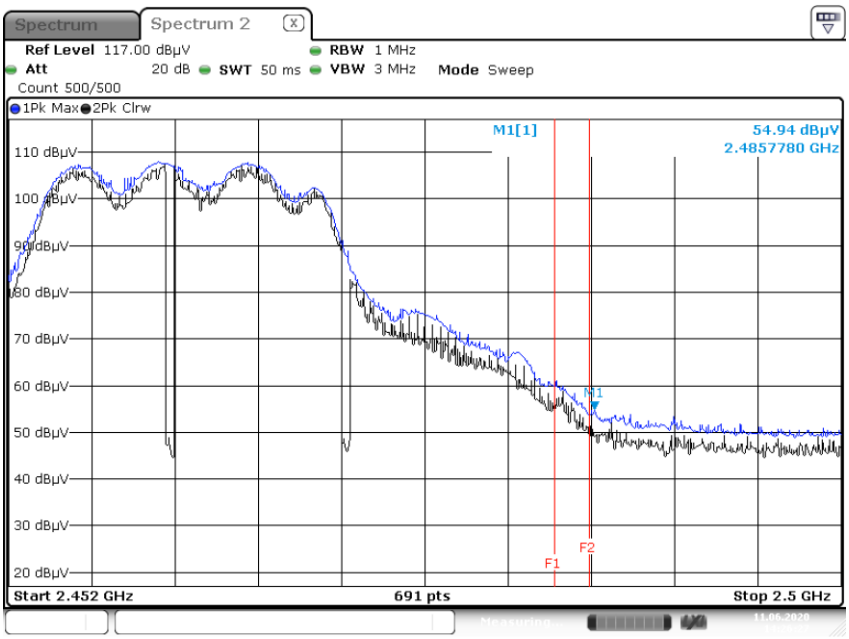
Radiated Restricted Band Edges plot – Average Reading (802.11g_6 Mbps Ch.11)

2 485.5 MHz ~ 2 500 MHz



Radiated Restricted Band Edges plot – Peak Reading (802.11g_6 Mbps Ch.11)

2 485.5 MHz ~ 2 500 MHz



Note:

Plot of worst case are only reported.

9.8 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

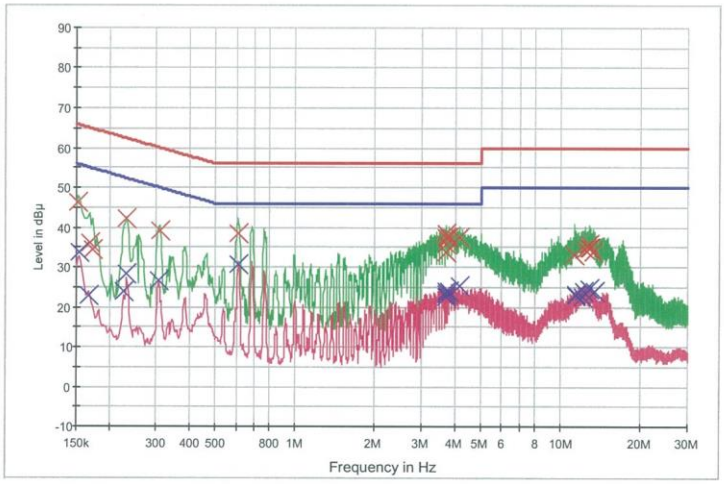
WLAN 2.4G MODE_L1 1 / 2

HCT TEST Report

Common Information

EUT:	SM-T878U
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN 2.4G MODE_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.152000	46.3	9.000	Off	L1	9.8	19.6	65.9
0.168000	36.0	9.000	Off	L1	9.8	29.1	65.1
0.172000	34.5	9.000	Off	L1	9.8	30.3	64.9
0.232000	42.3	9.000	Off	L1	9.8	20.1	62.4
0.308000	39.2	9.000	Off	L1	9.8	20.8	60.0
0.610000	38.6	9.000	Off	L1	9.8	17.4	56.0
3.684000	33.6	9.000	Off	L1	10.0	22.4	56.0
3.702000	35.9	9.000	Off	L1	10.0	20.1	56.0
3.706000	37.4	9.000	Off	L1	10.0	18.6	56.0
3.710000	38.3	9.000	Off	L1	10.0	17.7	56.0
3.784000	37.4	9.000	Off	L1	10.0	18.6	56.0
4.176000	37.4	9.000	Off	L1	10.0	18.6	56.0
11.172000	32.9	9.000	Off	L1	10.3	27.1	60.0
12.310000	34.4	9.000	Off	L1	10.3	25.6	60.0
12.758000	35.7	9.000	Off	L1	10.3	24.3	60.0
12.848000	34.7	9.000	Off	L1	10.3	25.3	60.0
12.984000	34.6	9.000	Off	L1	10.3	25.4	60.0
13.154000	33.7	9.000	Off	L1	10.3	26.3	60.0

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	33.6	9.000	Off	L1	9.8	22.2	55.8
0.166000	22.9	9.000	Off	L1	9.8	32.3	55.2
0.226000	23.8	9.000	Off	L1	9.8	28.8	52.6
0.232000	28.2	9.000	Off	L1	9.8	24.2	52.4
0.306000	26.5	9.000	Off	L1	9.8	23.6	50.1
0.612000	30.8	9.000	Off	L1	9.8	15.2	46.0
3.684000	22.5	9.000	Off	L1	10.0	23.5	46.0
3.700000	23.1	9.000	Off	L1	10.0	22.9	46.0
3.706000	23.8	9.000	Off	L1	10.0	22.2	46.0
3.710000	23.3	9.000	Off	L1	10.0	22.7	46.0
3.784000	23.8	9.000	Off	L1	10.0	22.2	46.0
4.176000	25.2	9.000	Off	L1	10.0	20.8	46.0
11.396000	23.2	9.000	Off	L1	10.3	26.8	50.0
11.418000	23.0	9.000	Off	L1	10.3	27.0	50.0
12.016000	22.5	9.000	Off	L1	10.3	27.5	50.0
12.152000	24.0	9.000	Off	L1	10.3	26.0	50.0
12.846000	24.7	9.000	Off	L1	10.3	25.3	50.0
13.372000	23.8	9.000	Off	L1	10.3	26.2	50.0

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Conducted Emissions (Line 2)

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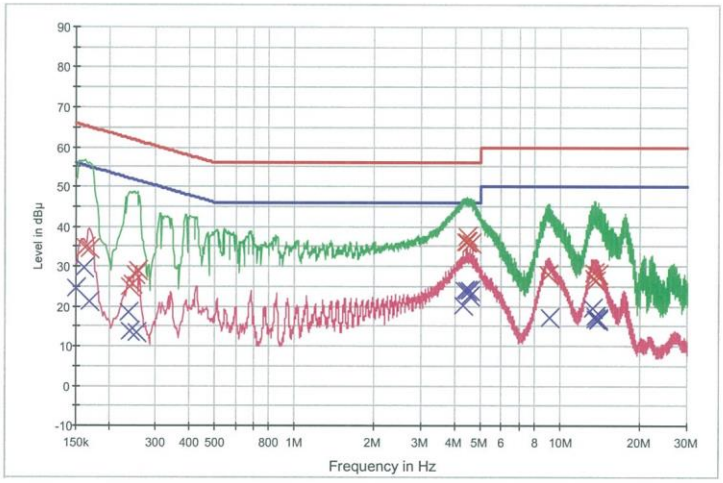
HCT TEST Report

Common Information

EUT:	SM-T878U
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN 2.4G MODE_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.162000	34.7	9.000	Off	N	9.8	30.7	65.4
0.168000	34.3	9.000	Off	N	9.8	30.7	65.1
0.240000	25.0	9.000	Off	N	9.8	37.0	62.1
0.244000	25.7	9.000	Off	N	9.8	36.3	62.0
0.250000	28.0	9.000	Off	N	9.8	33.7	61.8
0.256000	29.0	9.000	Off	N	9.8	32.6	61.6
4.382000	36.0	9.000	Off	N	10.0	20.0	56.0
4.446000	36.1	9.000	Off	N	10.0	19.9	56.0
4.450000	36.1	9.000	Off	N	10.0	19.9	56.0
4.454000	36.2	9.000	Off	N	10.0	19.8	56.0
4.474000	37.3	9.000	Off	N	10.0	18.7	56.0
4.628000	35.9	9.000	Off	N	10.0	20.1	56.0
8.970000	28.1	9.000	Off	N	10.2	31.9	60.0
13.376000	28.1	9.000	Off	N	10.4	31.9	60.0
13.390000	28.4	9.000	Off	N	10.4	31.6	60.0
13.458000	27.0	9.000	Off	N	10.4	33.0	60.0
13.536000	26.4	9.000	Off	N	10.4	33.6	60.0
13.858000	28.1	9.000	Off	N	10.4	31.9	60.0

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WLAN 2.4G MODE_N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	24.5	9.000	Off	N	9.8	31.5	56.0
0.160000	29.7	9.000	Off	N	9.8	25.7	55.5
0.168000	21.1	9.000	Off	N	9.8	33.9	55.1
0.236000	18.5	9.000	Off	N	9.8	33.7	52.2
0.240000	13.8	9.000	Off	N	9.8	38.3	52.1
0.254000	13.3	9.000	Off	N	9.8	38.4	51.6
4.326000	20.1	9.000	Off	N	10.0	25.9	46.0
4.380000	23.9	9.000	Off	N	10.0	22.1	46.0
4.452000	23.8	9.000	Off	N	10.0	22.2	46.0
4.476000	23.8	9.000	Off	N	10.0	22.2	46.0
4.552000	23.8	9.000	Off	N	10.0	22.2	46.0
4.578000	22.4	9.000	Off	N	10.0	23.6	46.0
9.062000	17.0	9.000	Off	N	10.2	33.0	50.0
13.172000	19.6	9.000	Off	N	10.4	30.4	50.0
13.520000	17.5	9.000	Off	N	10.4	32.5	50.0
13.534000	16.9	9.000	Off	N	10.4	33.1	50.0
13.844000	16.5	9.000	Off	N	10.4	33.5	50.0
13.858000	16.8	9.000	Off	N	10.4	33.2	50.0

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9.9 CONFIRMATION OF GEO-LOCATION MECHANISM

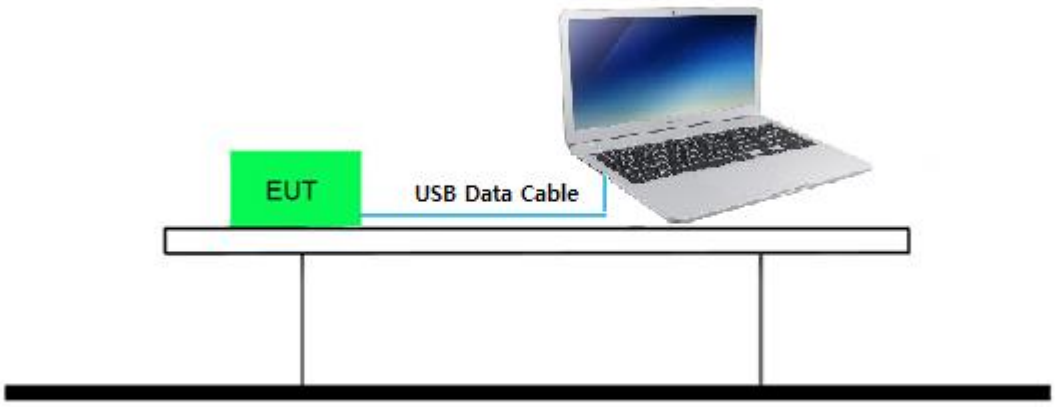
The device uses MCC information obtained from the public cellular carrier to determine that it is operating outside the U.S. and then enable channels 12 and 13 only if a non-US MCC that supports channel 12 and 13 is confirmed.

The device uses a geo-location mechanism based on the Country in order to only enable certain WLAN DTS bands when the device is not in the USA.

WLAN	Country code = US	Country code = KR(Korea)
CH 12	Did not connect	Connected
CH 13	Did not connect	Connected

The verification tests confirmed the operational of the geo-location mechanism.

Test Setup



Test Procedure

In case of Country code

1. Open Command Prompt.
2. At the Command Prompt, enter the command.

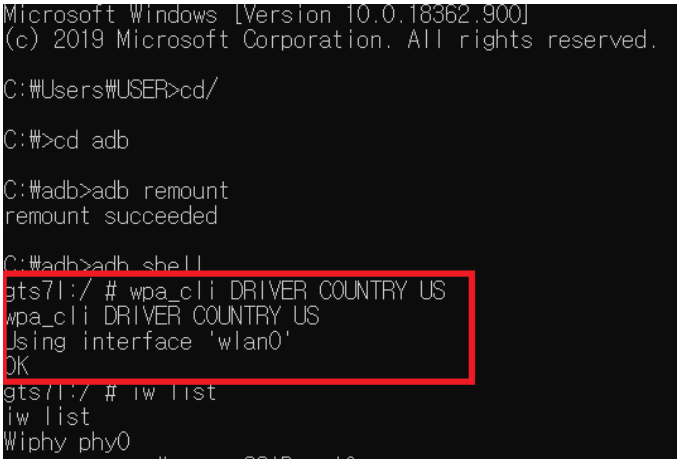
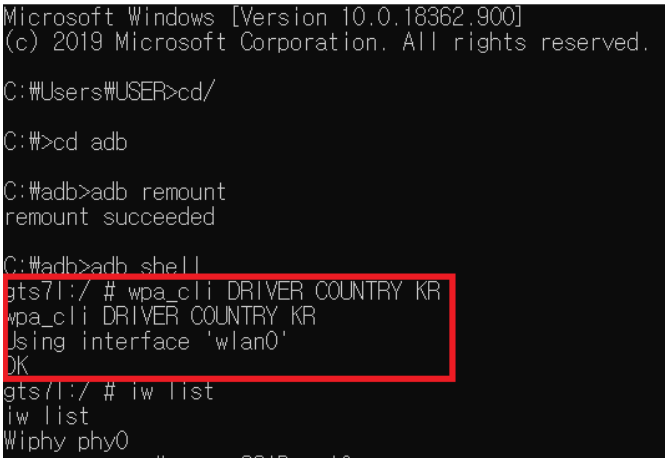
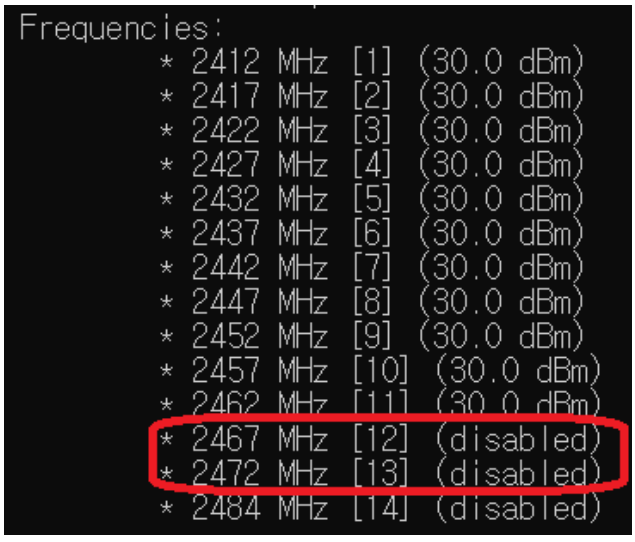
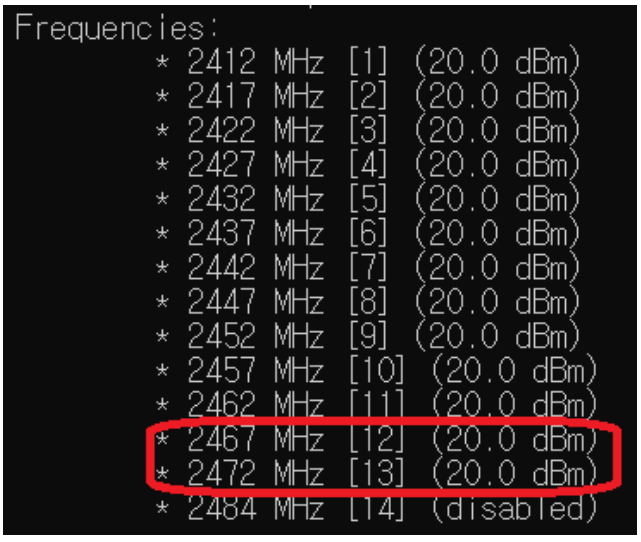
- C:\adb>adb remount
- C:\adb>adb shell
- gts4lv:/ # wpa_cli driver country US // Setting the country.
- gts4lv:/ # iw list // Channel list is obtain.

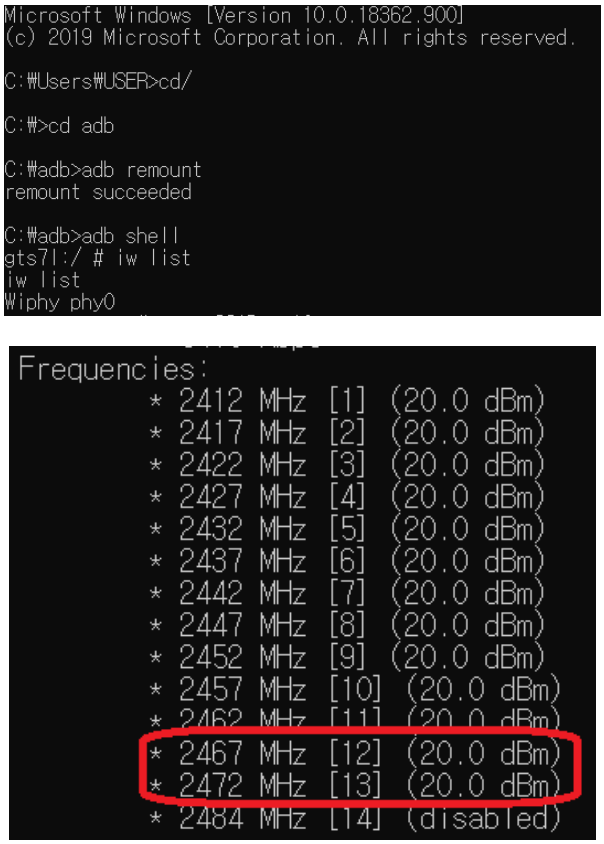
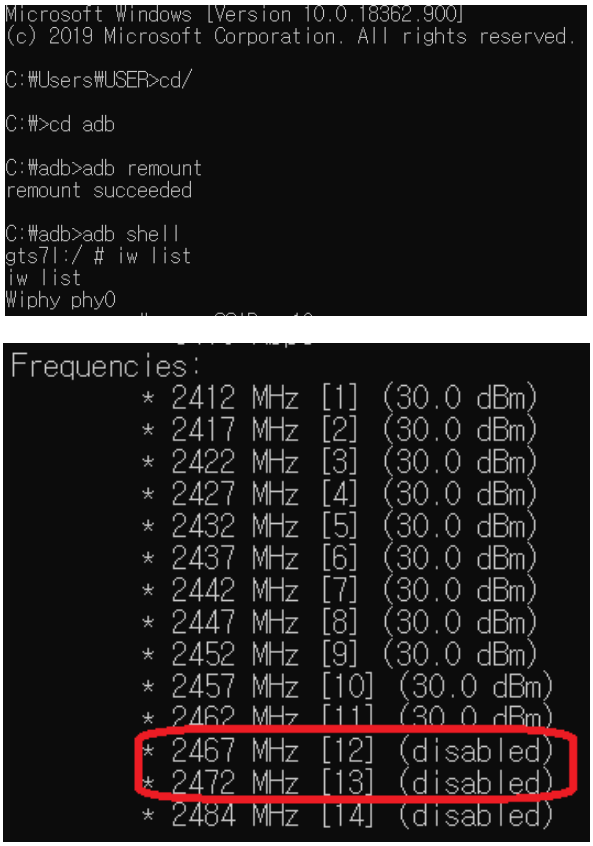
In case of airplane mode

1. airplane mode on
2. Wifi on
3. Open Command Prompt.
4. At the Command Prompt, enter the command.

- C:\adb>adb remount
- C:\adb>adb shell
- gts4lv:/ # iw list // support band in case of airplane mode

Setting the country for product

Country code = US	Country code = KR(Korea)
	
	

Did not connect Airplane mode	
Airplane off	**Airplane on**
	

Note : The frequency range is occupied band, not center frequency.

10. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	09/11/2019	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/10/2020	Annual	100584
ESPAC	SU-642 /Temperature Chamber	08/14/2019	Annual	0093000718
Agilent	N9020A / Signal Analyzer	05/11/2020	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	03/23/2020	Annual	MY49432108
Agilent	N1911A / Power Meter	04/07/2020	Annual	MY45100523
Agilent	N1921A / Power Sensor	03/23/2020	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/11/2019	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	02/24/2020	Annual	10545
Hewlett Packard	E3632A / DC Power Supply	09/27/2019	Annual	MY40004427
Agilent	8493C / Attenuator(10 dB)	07/02/2019	Annual	07560
Rohde & Schwarz	18N-20dB / Attenuator(20 dB)	03/23/2020	Annual	8
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	N/A	N/A
Rohde & Schwarz	CBT / Bluetooth Tester	03/02/2020	Annual	100808

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Radiated Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
TNM system	FBSM-01B / Amp & Filter Bank Switch Controller	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	05/18/2020	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	08/02/2019	Biennial	01039
Schwarzbeck	BBHA 9120D / Horn Antenna	06/28/2019	Biennial	1300
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	04/29/2019	Biennial	BBHA9170342
Weinschel	2-3 / Attenuator (3 dB)	10/08/2019	Annual	BR0617
Rohde & Schwarz	FSV(10 Hz ~ 40 GHz) / Spectrum Analyzer	05/13/2020	Annual	101055
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/21/2020	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/10/2020	Annual	1
CERNEX	CBL18265035 / Power Amplifier	12/26/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2020	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	03/18/2020	Annual	3000C000276
TNM system	FBSM-05B / HPF(3~18GHz) + LNA1(1~18GHz)	01/21/2020	Annual	F6
TNM system	FBSM-05B / ATT(10dB) + LNA1(1~18GHz)	01/21/2020	Annual	None
TNM system	FBSM-05B / ATT(3dB) + LNA1(1~18GHz)	01/21/2020	Annual	None
TNM system	FBSM-05B / LNA1(1~18GHz)	01/21/2020	Annual	25540
TNM system	FBSM-05B / HPF(7~18GHz) + LNA2(6~18GHz)	01/21/2020	Annual	28550
TNM system	FBSM-05B / Thru(30MHz ~ 18GHz)	01/21/2020	Annual	None

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

11. ANNEX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2007-FC016-P