

FCC / IC DTS REPORT

Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

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Date of Issue:

March 18, 2019

Location:

HCT CO., LTD.,

74, Seoicheon-ro 578beon-gil, Majang-myeon,

Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

Report No.: HCT-RF-1903-FI012-R1**FCC ID:****A3LSMT720****IC:****649E-SMT720****APPLICANT:****SAMSUNG Electronics Co., Ltd.**

According to the Evaluation report, all of the data contained herein is reused from the reference
FCC ID : A3LSMT725 report.

Model:

SM-T720

Additional Model:

SM-T720X

EUT Type:

Tablet

Average Output Power:

802.11b : 18.56 dBm

802.11g : 19.02 dBm

802.11n(HT20) : 18.12 dBm

Frequency Range:

2412 MHz - 2472 MHz

Modulation type:

CCK/DSSS/OFDM

FCC Classification:

Digital Transmission System(DTS)

FCC Rule Part(s):

Part 15.247

ISED Rule Part(s):

RSS-247 Issue 2 (February 2017), RSS-Gen Issue 5(April 2018)

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 / IC Rules under normal use and maintenance



Report prepared by : Jeong Ho Kim
Engineer of Telecommunication testing center



Approved by : Kwon Jeong
Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1903-FI012	March 15, 2019	- First Approval Report
HCT-RF-1903-FI012-R1	March 18, 2019	- Revised the worst case configuration on page 25. - Deleted the OBW test results on page 31.

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1. EUT DESCRIPTION

Model	SM-T720
Additional Model	SM-T720X
EUT Type	Tablet
Power Supply	DC 3.85 V
Battery Information	Model: EB-BT725ABU Type: Li-ion battery
Travel Adapter Information	Model : EP-TA200 Manufacture: SOLUM
Keyboard Information	Model : EJ-FT720 Manufacture: SAMSUNG
Charging Doc Information	Model : EE-D3200 Manufacture: SAMSUNG
Frequency Range	2412 MHz - 2472 MHz
Max. RF Output Power	<u>Peak Power (For information only)</u> 802.11b : 21.09 dBm 802.11g : 25.67 dBm 802.11n(HT20) : 25.06 dBm <u>Average Power</u> 802.11b : 18.56 dBm 802.11g : 19.02 dBm 802.11n(HT20) : 18.12 dBm
Modulation Type	DSSS/CCK : 802.11b OFDM : 802.11g, 802.11n
Number of Channels	13 Channels
Antenna Specification	Antenna type: Metal Peak Gain : -5.50 dBi
Date(s) of Tests	January 17, 2019 ~ March 14, 2019
PMN (Product Marketing Number)	SM-T720
HVIN (Hardware Version Identification Number)	SM-T720, SM-T720X
FVIN (Firmware Version Identification Number)	T720.001
HMN (Host Marketing Name)	N/A

2. TEST METHODOLOGY

FCC KDB 558074 D01 15.247 Meas Guidance v05r01 dated February 11, 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 purpose 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 / RSS-Gen issue 5, RSS-247 issue 2.

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 3.75 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)

Conducted Antenna Terminal

See Section from 8.3.(KDB 558074 v05r01)

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).

For ISED, test facility was accepted dated February 14, 2019 (CAB identifier: 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."

* The antennas of this E.U.T are permanently attached.

* 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.

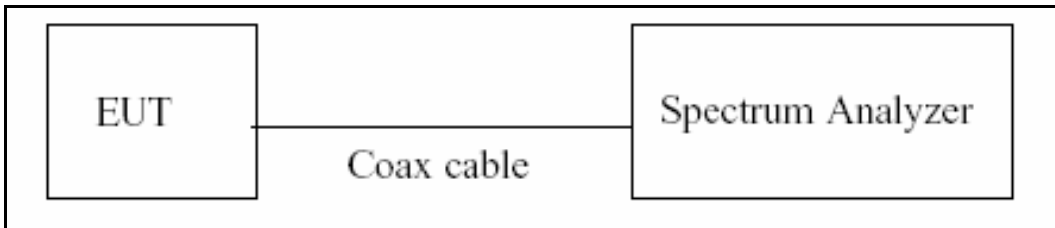
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty ($\pm$ 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)	5.71

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 available value of RBW is 8 MHz and VBW is 50 MHz.

The zero-span method of measuring duty cycle shall not be used if $T \leq 6.25$ 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 $> 50/T$.

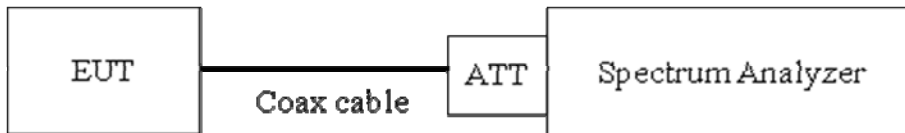
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = $10 \cdot \log(1/\text{Duty Cycle})$

7.2. 6dB Bandwidth & 99 % 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 8.2 in KDB 558074 v05r01,
Procedure 11.8.1 in ANSI 63.10-2013)

- 1) RBW = 100 kHz
- 2) VBW $\geq 3 \times$ 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.

Test Procedure (99 % Bandwidth for IC)

The transmitter output is connected to the spectrum analyzer.

RBW = 1% ~ 5% of the occupied bandwidth

VBW $\approx 3 \times$ RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Allow the trace to stabilize

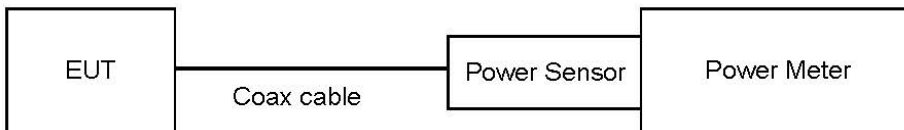
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

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

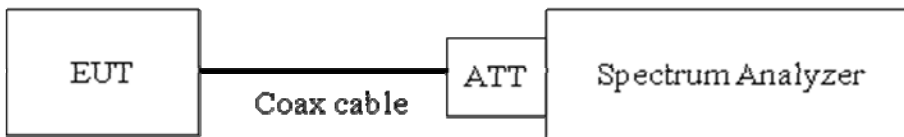
- Conducted Output Power(Peak) = Reading Value + ATT loss + Cable loss
- Conducted Output Power(Average) = Reading Value + ATT loss + Cable loss + Duty Cycle Factor

7.4. Power Spectral Density

Limit

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

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to 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) $RBW = 3 \text{ kHz} \leq RBW \leq 100 \text{ kHz}$.
- 4) $VBW \geq 3 \times RBW$.
- 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 $\geq [2 \times \text{span} / RBW]$.
- 8) Employ trace averaging (rms) mode over 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.

Sample Calculation

- Power Spectral Density = Reading Value + ATT loss + Cable loss + Duty Cycle Factor

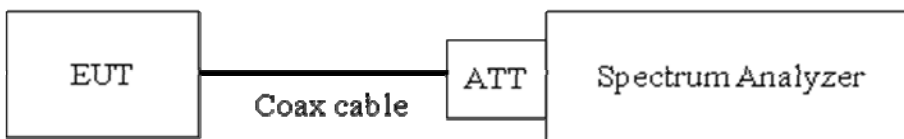
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

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 30 dB 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 $\geq 3 \times$ 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 $\geq 2 \times \text{Span} / \text{RBW}$
- 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	11.35
100	9.88
200	10.24
300	10.18
400	10.28
500	10.30
600	10.37
700	10.40
800	10.40
900	10.39
1000	10.44
2000	10.69
2400*	10.68
2500*	10.70
3000	10.73
4000	10.94
5000	10.88
6000	10.91
7000	11.40
8000	11.37
9000	11.53
10000	11.61
11000	11.61
12000	11.73
13000	11.88
14000	11.95
15000	12.03
16000	12.09
17000	12.07
18000	12.13
19000	12.12
20000	12.19
21000	12.22
22000	12.36
23000	12.65
24000	12.39
25000	12.58
26000	12.07

Note : 1. '*' is fundamental frequency range.

2. Factor = Attenuator loss + Cable loss

7.6. Radiated Test

Limit

FCC

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

IC

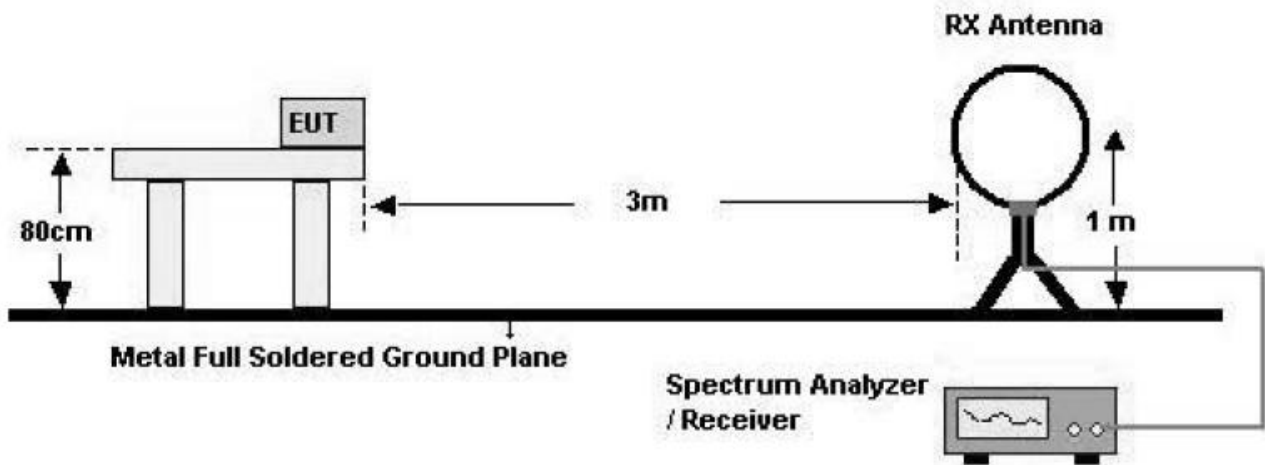
Frequency (MHz)	Field Strength (uA/m)	Measurement Distance (m)
0.009 – 0.490	6.37/F(kHz)	300
0.490 – 1.705	63.7/F(kHz)	30
1.705 – 30	0.08	30

FCC&IC

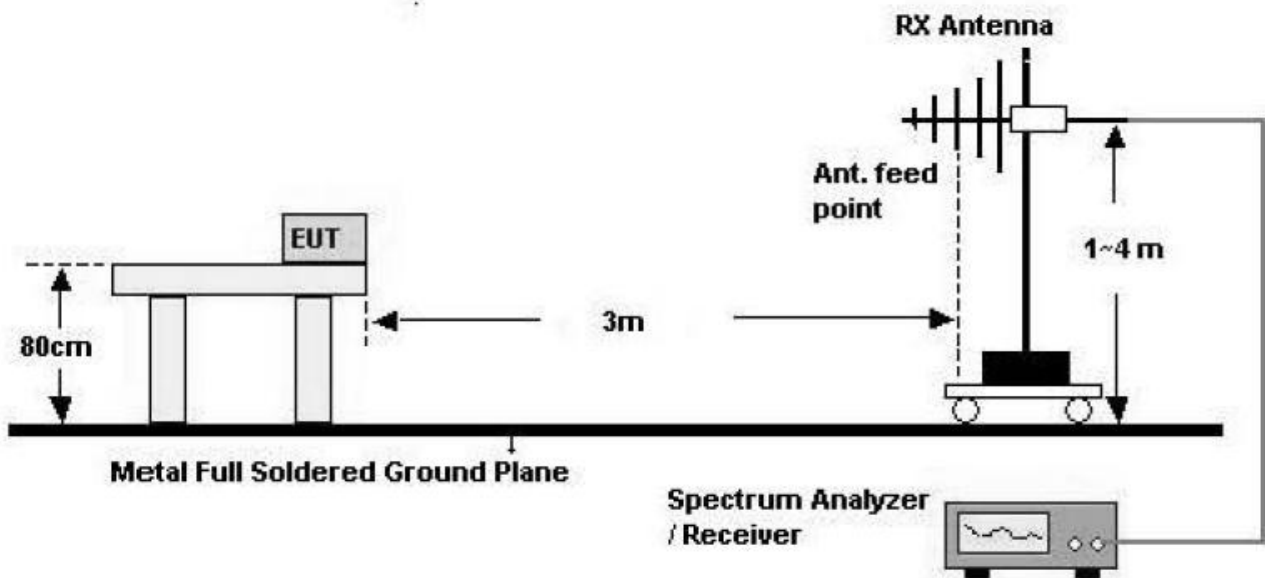
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

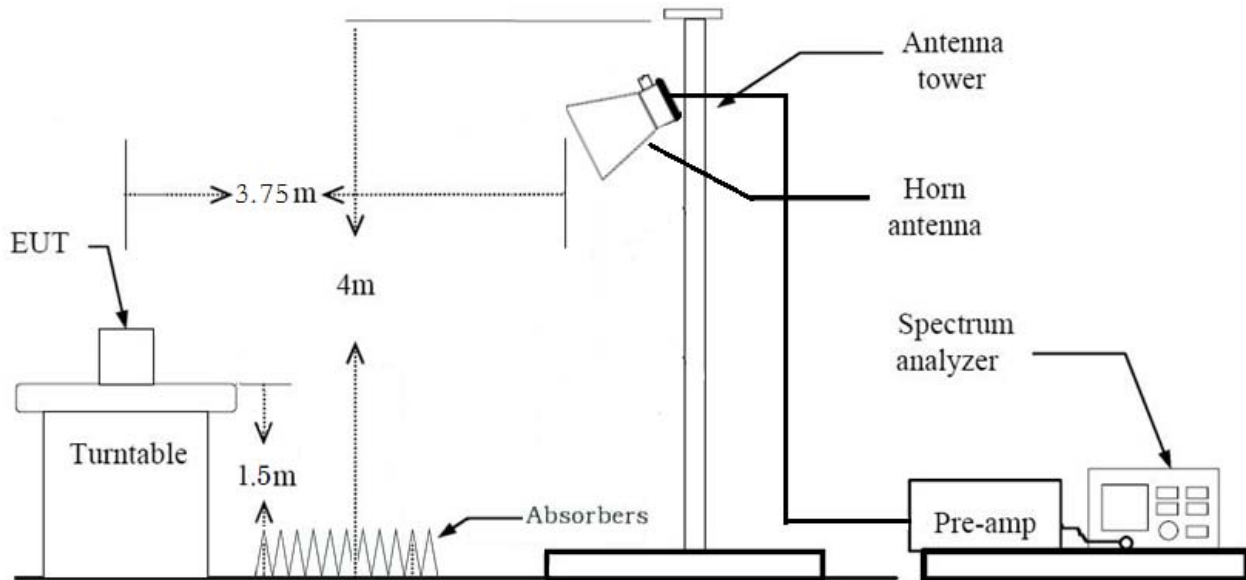
Below 30 MHz



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 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) = $40 \cdot \log(3 \text{ m}/300 \text{ m}) = -80 \text{ dB}$

Measurement Distance : 3 m

7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40 \cdot \log(3 \text{ m}/30 \text{ m}) = -40 \text{ dB}$

Measurement Distance : 3 m

8. Spectrum Setting

- Frequency Range = 9 kHz ~ 30 MHz
- Detector = Peak
- Trace = Maxhold
- RBW = 9 kHz
- VBW $\geq 3 \cdot \text{RBW}$

9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

10. The test results for below 30 MHz is correlated to an open site.

The result on OFS is about 2 dB higher than semi-anechoic chamber(10 m chamber)

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. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Spectrum Setting

(1) Measurement Type(Peak):

- Measured Frequency Range : 30 MHz – 1 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 100 kHz
- VBW $\geq 3 \times$ 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

6. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)

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 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
*Distance extrapolation factor = $20 \times \log(\text{test distance} / \text{specific distance})$ (dB)
6. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
7. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
8. The unit was tested with its standard battery.
9. Spectrum Setting (Method 8.6 in KDB 558074 v05r01, 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 $\geq 3 \times$ RBW

(2) Measurement Type(Average): Duty cycle $\geq 98\%$

- Measured Frequency Range : 1 GHz – 25 GHz

- Detector = RMS

- Averaging type = power (i.e., RMS)

- RBW = 1 MHz

- VBW $\geq 3 \times$ RBW

- Sweep time = auto.

- Trace mode = average (at least 100 traces).

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

- Measured Frequency Range : 1 GHz – 25 GHz

- Detector = RMS

- Averaging type = power (i.e., RMS)

- RBW = 1 MHz

- VBW $\geq 3 \times$ 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.

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.

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 $\geq 98\%$)

= 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 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
*Distance extrapolation factor = $20 \cdot \log (\text{test distance} / \text{specific distance})$ (dB)
6. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
7. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
8. The unit was tested with its standard battery.
9. 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 $\geq 3 \cdot \text{RBW}$
 - (2) Measurement Type(Average): Duty cycle $\geq 98\%$,
 - Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
 - Detector = RMS
 - Averaging type = power (i.e., RMS)
 - RBW = 1 MHz
 - VBW $\geq 3 \cdot \text{RBW}$
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).

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

- Measured Frequency Range : 2310 MHz ~ 2390 MHz/ 2483.5 MHz ~ 2500 MHz
- Detector = RMS
- Averaging type = power (i.e., RMS)
- RBW = 1 MHz
- VBW $\geq 3 \times$ 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.

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.

11. Total(Measurement Type : Peak)

$$= \text{Reading Value} + \text{Antenna Factor(A.F)} + \text{Cable Loss(C.L)} - \text{Amp Gain(G)} + \text{Distance Factor(D.F)}$$

Total(Measurement Type : Average, Duty cycle $\geq 98\%$)

$$= \text{Reading Value} + \text{Antenna Factor(A.F)} + \text{Cable Loss(C.L)} - \text{Amp Gain(G)} + \text{Distance Factor(D.F)}$$

Total(Measurement Type : Average, Duty cycle < 98%)

$$= \text{Reading Value} + \text{Antenna Factor(A.F)} + \text{Cable Loss(C.L)} - \text{Amp Gain(G)} + \text{Distance Factor(D.F)} \\ + \text{Duty Cycle Factor}$$

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 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

*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. Receiver Spurious Emissions**Limit**

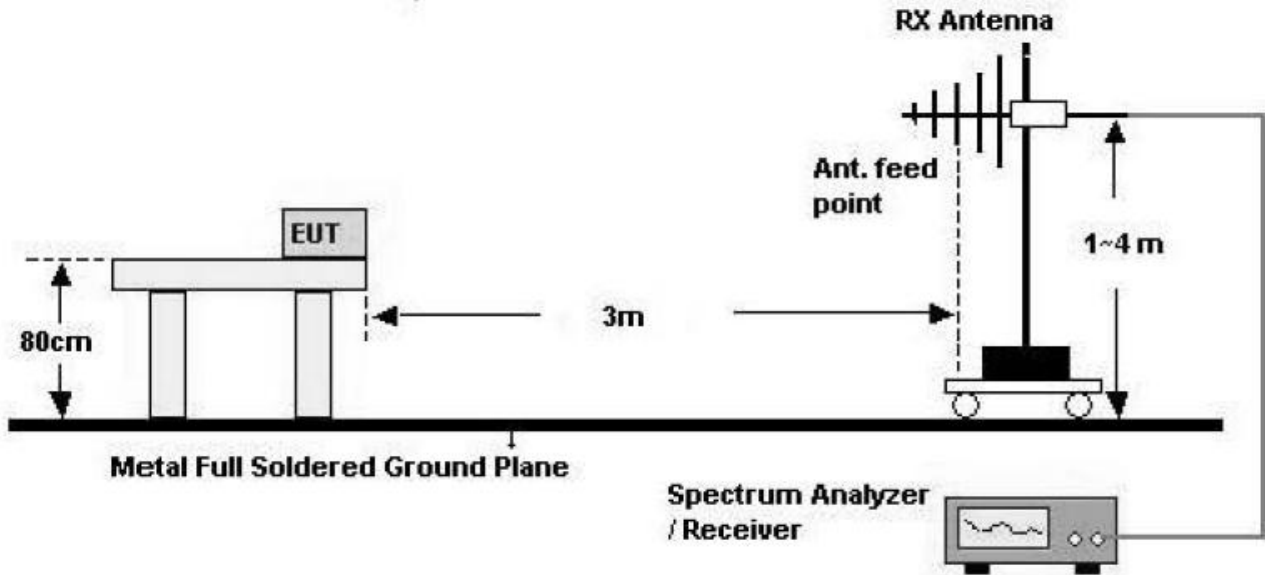
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

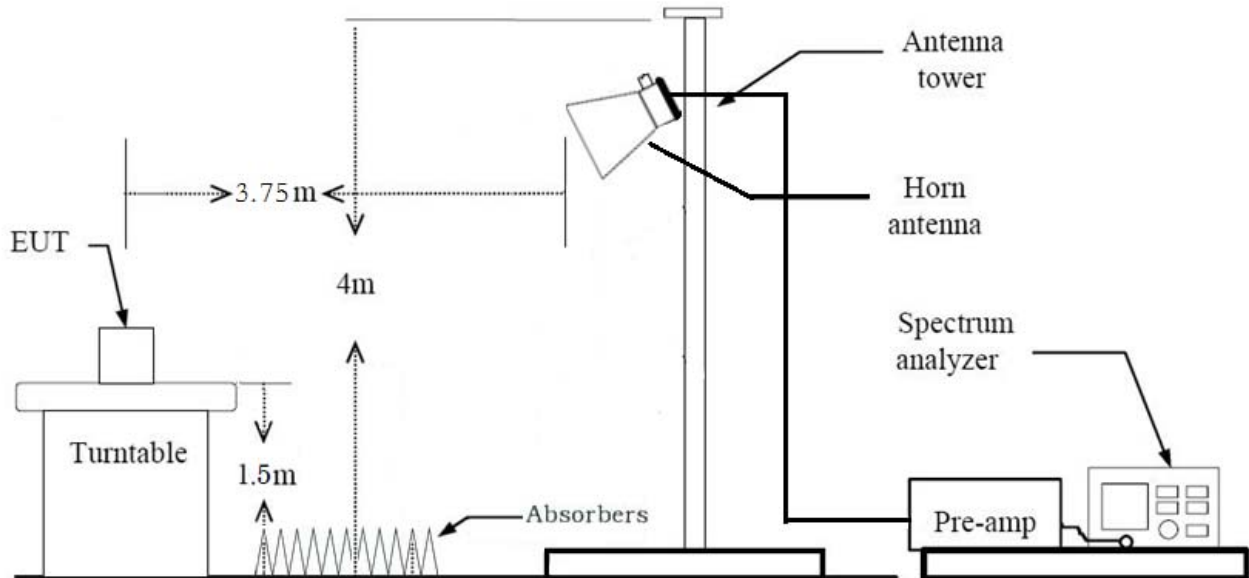
Measurements for compliance with the limits in table may be performed at distances other than 3 metres.

Test Configuration

30 MHz - 1 GHz



Above 1 GHz



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 3.75 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. According to SVSWR requirement in ANSI 63.4-2014, We performed the radiated test at 3.75 m distance from center of turn table. So, we applied the distance factor(reference distance : 3 m).
*Distance extrapolation factor = $20 \cdot \log (\text{test distance} / \text{specific distance})$ (dB)
6. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
7. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
8. The unit was tested with its standard battery.
9. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 1 GHz – 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW $\geq 3 \cdot \text{RBW}$
 - (2) Measurement Type(Average):
 - We performed using a reduced video BW method was done with the analyzer in linear mode
 - Measured Frequency Range : 1 GHz – 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW $\geq 1/\tau$ Hz, where τ = pulse width in secondsThe actual setting value of VBW = 1 kHz
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.
11. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

7.9. 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(Keyboard, Charging Doc, Earphone, etc)
 - Worstcase : Stand alone
2. EUT Axis
 - Radiated Spurious Emissions : X
 - Radiated Restricted Band Edge : X
3. Duty cycle factor applies only 802.11g/n(Duty cycle < 98%).
4. All data rate of operation were investigated and the test results are worst case in lowest data rate of each mode.
 - 802.11b : 1Mbps
 - 802.11g : 6Mbps
 - 802.11n : MCS0
5. SM-T720 & SM-T720X were tested and the worst case results are reported.
(Worst case : SM-T720)

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(Keyboard, Charging Doc, Earphone, etc)+Travel Adapter,
Stand alone + Travel Adapter
 - Worstcase : Stand alone + Travel Adapter
2. SM-T720 & SM-T720X were tested and the worst case results are reported.
(Worst case : SM-T720)

Conducted test

1. The EUT was configured with data rate of highest power.
2. SM-T720 & SM-T720X were tested and the worst case results are reported.
(Worst case : SM-T720)

8. SUMMARY TEST OF RESULTS

FCC Part

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 Peak 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

IC Part

Test Description	IC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	RSS-247, 5.2	> 500 kHz	Conducted	PASS
99% Bandwidth	RSS-GEN, 6.7	N/A		PASS
Conducted Maximum Peak Output Power And e.i.r.p.	RSS-247, 5.4.	< 1 Watt <4 Watt(e.i.r.p.)		PASS
Power Spectral Density	RSS-247, 5.2	< 8 dBm / 3 kHz Band		PASS
Band Edge(Out of Band Emissions)	RSS-247, 5.5	Conducted > 30 dBc		PASS
AC Power line Conducted Emissions	RSS-GEN, 8.8	cf. Section 7.7		N/A (Note1)
Radiated Spurious Emissions	RSS-GEN, 8.9	cf. Section 7.6	Radiated	PASS
Receiver Spurious Emissions	RSS-GEN, 7	cf. Section 7.8		PASS
Radiated Restricted Band Edge	RSS-GEN, 8.10	cf. Section 7.6		PASS

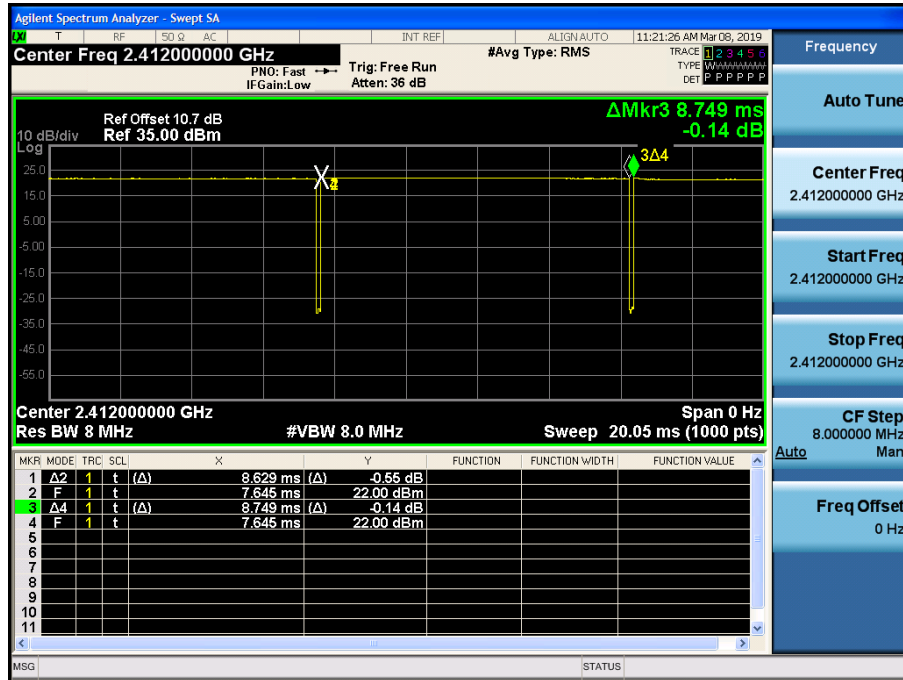
9. TEST RESULT

9.1 DUTY CYCLE

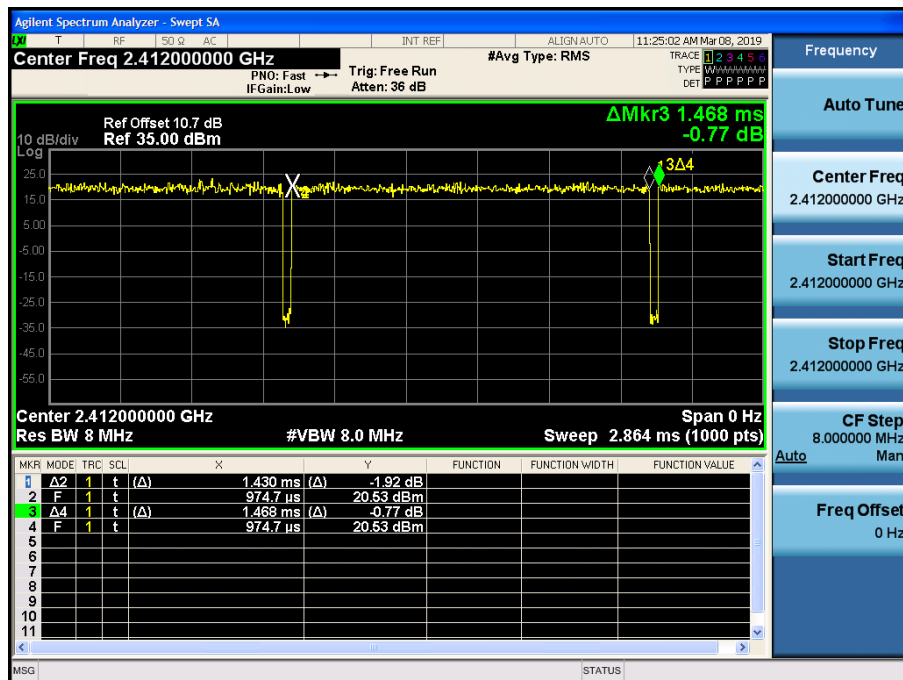
Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11b	1	8.629	8.749	0.986	0.060
	2	4.315	4.342	0.994	0.027
	5.5	1.631	1.663	0.981	0.085
	11	0.862	0.893	0.966	0.151
802.11g	6	1.430	1.468	0.975	0.112
	9	0.961	0.998	0.963	0.163
	12	0.728	0.764	0.953	0.210
	18	0.492	0.530	0.930	0.317
	24	0.376	0.413	0.912	0.401
	36	0.256	0.292	0.878	0.564
	48	0.200	0.236	0.847	0.722
	54	0.180	0.216	0.833	0.795
802.11n (HT20)	6.5 (MCS0)	1.342	1.378	0.974	0.115
	13 (MCS1)	0.689	0.725	0.950	0.221
	19.5 (MCS2)	0.473	0.510	0.927	0.329
	26 (MCS3)	0.364	0.401	0.908	0.418
	39 (MCS4)	0.256	0.292	0.877	0.569
	52 (MCS5)	0.200	0.236	0.848	0.715
	58.5 (MCS6)	0.184	0.220	0.835	0.784
	65 (MCS7)	0.168	0.204	0.823	0.847

Test Plots

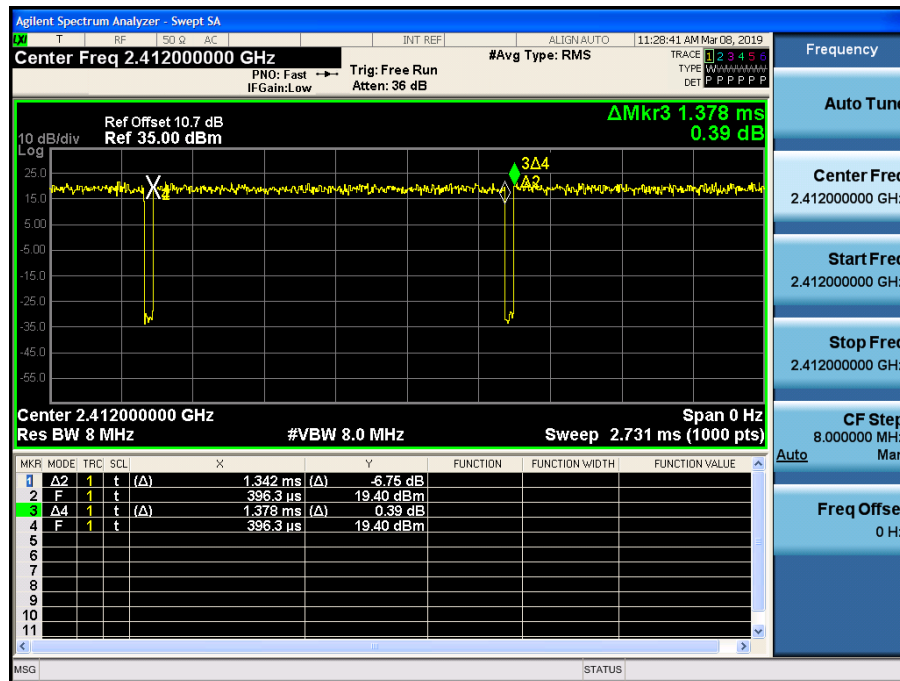
Duty cycle plot (802.11b(1Mbps))



Duty cycle plot (802.11g(6Mbps))



Duty cycle plot (802.11n(MCS0))



Note:

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

9.2 6dB BANDWIDTH & 99 % BANDWIDTH

FCC

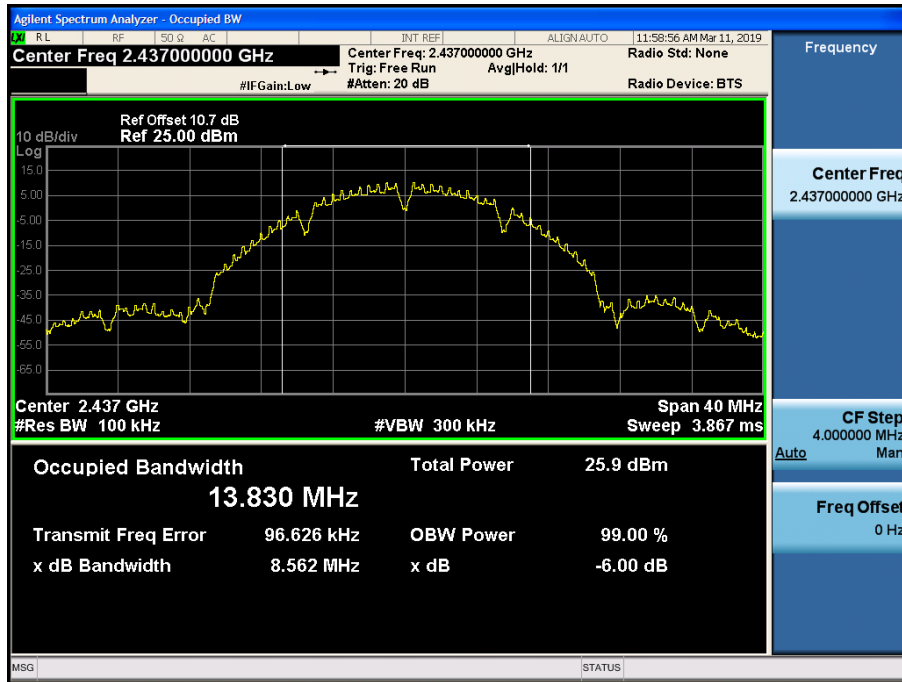
802.11b Mode		6dB Bandwidth [MHz]	Limit [MHz]
Frequency [MHz]	Channel No.		
2412	1	8.587	> 0.5
2417	2	8.608	> 0.5
2437	6	8.562	> 0.5
2462	11	8.579	> 0.5
2467	12	8.626	> 0.5
2472	13	8.600	> 0.5

802.11g Mode		6dB Bandwidth [MHz]	Limit [MHz]
Frequency [MHz]	Channel No.		
2412	1	15.763	> 0.5
2417	2	15.170	> 0.5
2437	6	15.182	> 0.5
2462	11	15.504	> 0.5
2467	12	15.120	> 0.5
2472	13	15.720	> 0.5

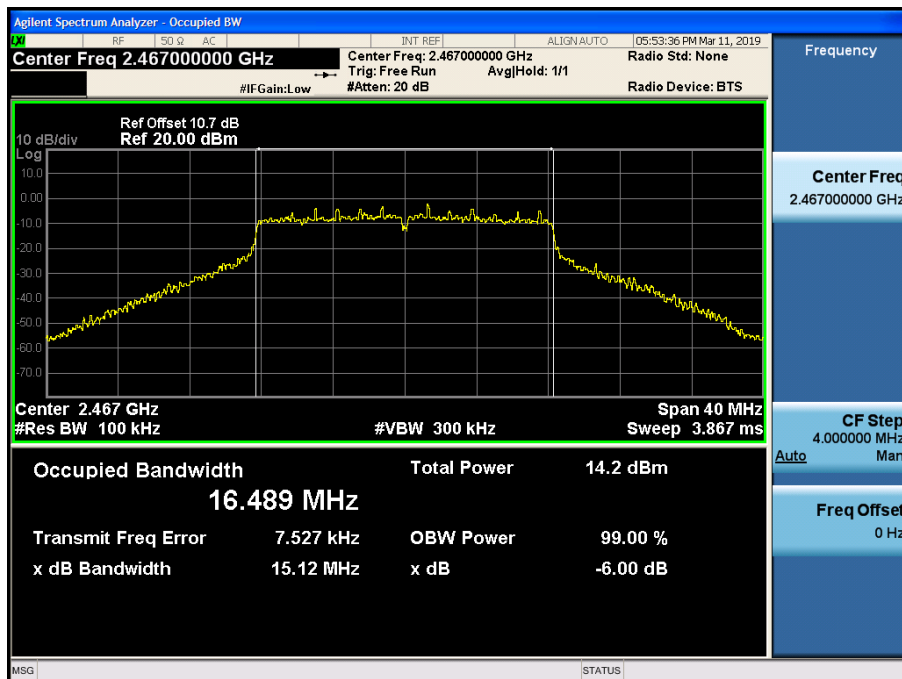
802.11n Mode		6dB Bandwidth [MHz]	Limit [MHz]
Frequency [MHz]	Channel No.		
2412	1	16.004	> 0.5
2417	2	15.670	> 0.5
2437	6	16.333	> 0.5
2462	11	15.483	> 0.5
2467	12	16.310	> 0.5
2472	13	17.200	> 0.5

Test Plots

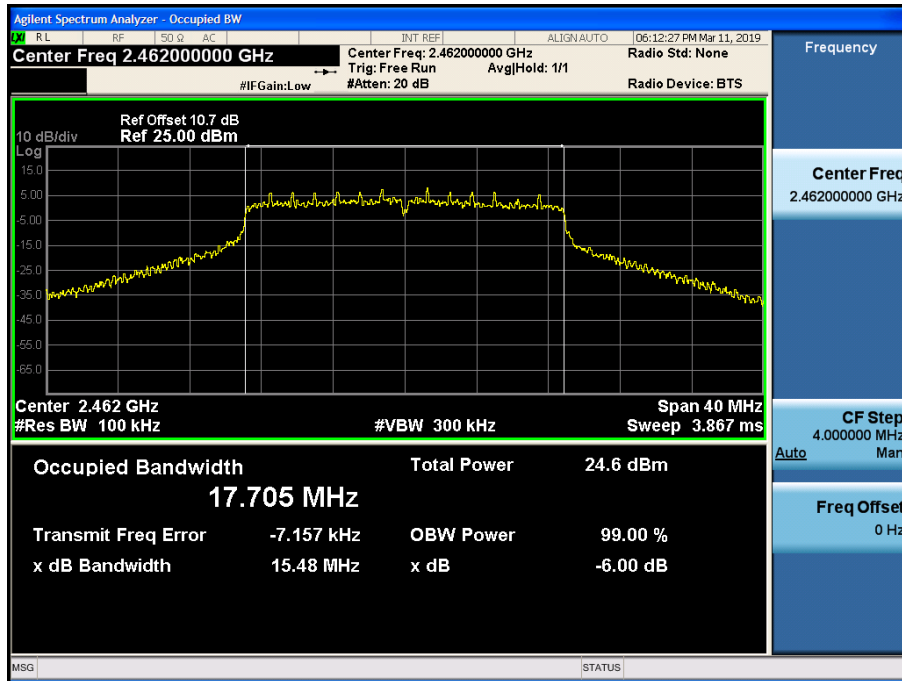
6dB Bandwidth plot (802.11b-CH 6)



6dB Bandwidth plot (802.11g-CH 12)



6dB Bandwidth plot (802.11n_HT20-CH 11)


Note:

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

IC

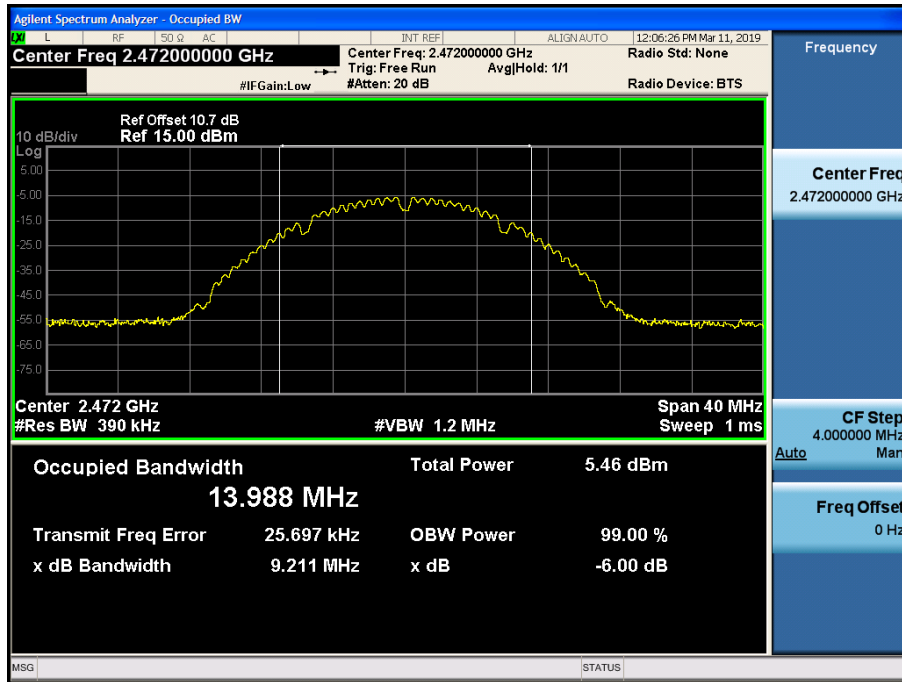
802.11b Mode		OBW Bandwidth [MHz]	Limit [MHz]
Frequency [MHz]	Channel No.		
2412	1	13.817	N/A
2417	2	13.844	N/A
2437	6	13.814	N/A
2462	11	13.882	N/A
2467	12	13.855	N/A
2472	13	13.988	N/A

802.11g Mode		OBW Bandwidth [MHz]	Limit [MHz]
Frequency [MHz]	Channel No.		
2412	1	16.967	N/A
2417	2	16.979	N/A
2437	6	17.037	N/A
2462	11	17.025	N/A
2467	12	16.957	N/A
2472	13	17.042	N/A
2412	1	16.967	N/A

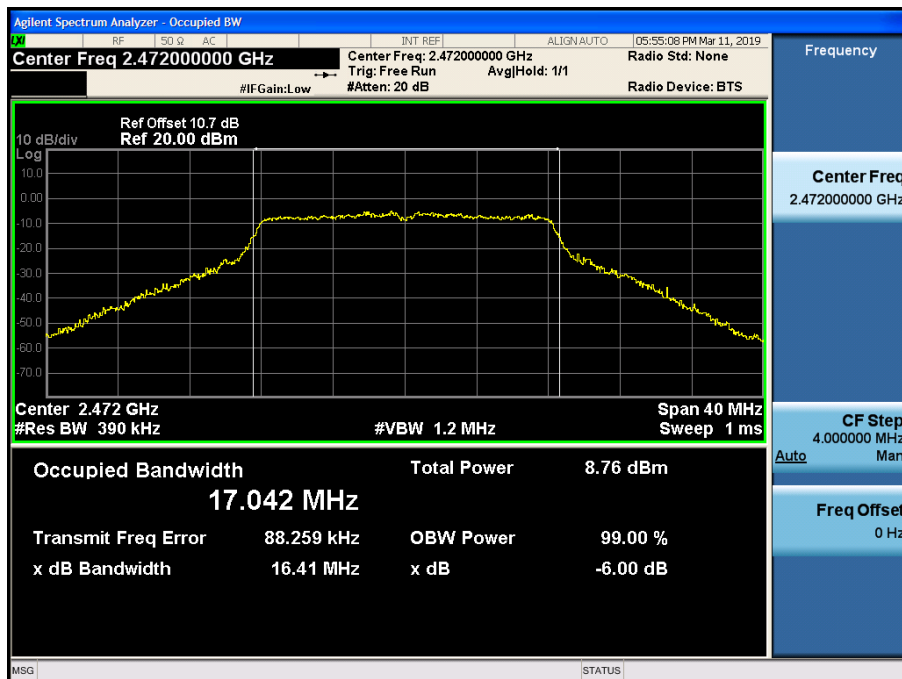
802.11n(HT20) Mode		OBW Bandwidth [MHz]	Limit [MHz]
Frequency [MHz]	Channel No.		
2412	1	18.094	N/A
2417	2	18.067	N/A
2437	6	18.109	N/A
2462	11	18.167	N/A
2467	12	18.091	N/A
2472	13	18.180	N/A

Test Plots

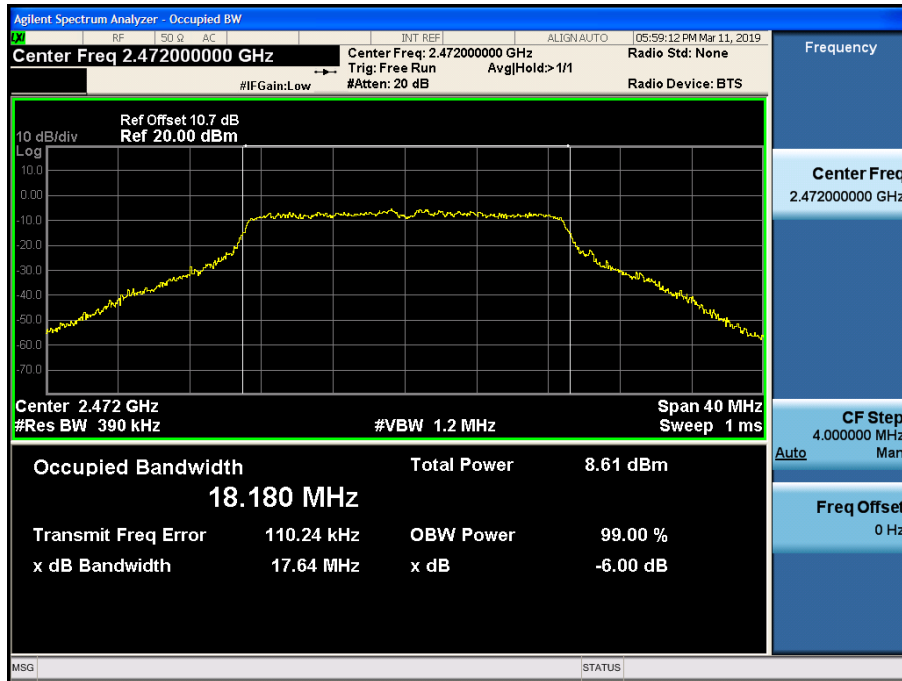
99% Bandwidth plot (802.11b-CH 6)



99% Bandwidth plot (802.11g-CH 12)



99% Bandwidth plot (802.11n_HT20-CH 2)



Note:

In order to simplify the report, attached plots were only the most wide 99% Bandwidth channel.

9.3 OUTPUT POWER

Peak Power

1. Power Meter offset = Attenuator loss + Cable loss
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
So, 10.7 dB is offset for 2.4 GHz Band.

802.11b Mode		Data Rate [Mbps]	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	1	20.44	30	18
		2	20.65	30	
		5.5	20.60	30	
		11	20.66	30	
2417	2	1	20.32	30	
		2	20.58	30	
		5.5	20.56	30	
		11	20.60	30	
2437	6	1	20.88	30	
		2	21.08	30	
		5.5	20.99	30	
		11	21.09	30	
2462	11	1	20.60	30	
		2	20.82	30	
		5.5	20.75	30	
		11	20.86	30	
2467	12	1	9.98	30	7
		2	10.08	30	
		5.5	10.04	30	
		11	10.09	30	
2472	13	1	4.80	30	1.5
		2	4.94	30	
		5.5	4.92	30	
		11	4.95	30	

802.11g Mode		Data Rate [Mbps]	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	6	22.08	30	18.5
		9	22.09	30	
		12	22.07	30	
		18	23.94	30	
		24	23.92	30	
		36	24.79	30	
		48	24.70	30	
		54	24.73	30	
2417	2	6	22.39	30	19
		9	22.38	30	
		12	22.42	30	
		18	24.21	30	
		24	24.15	30	
		36	24.88	30	
		48	24.90	30	
		54	24.88	30	
2437	6	6	23.14	30	
		9	23.07	30	
		12	22.98	30	
		18	24.98	30	
		24	24.91	30	
		36	25.45	30	
		48	25.59	30	
		54	25.51	30	
2462	11	6	22.37	30	18.5
		9	22.33	30	
		12	22.31	30	
		18	24.05	30	
		24	24.11	30	
		36	25.03	30	
		48	25.67	30	
		54	25.03	30	
2467	12	6	11.75	30	7.5
		9	11.79	30	
		12	11.82	30	
		18	14.09	30	
		24	14.00	30	
		36	18.62	30	
		48	18.97	30	
		54	18.55	30	
2472	13	6	6.55	30	2
		9	6.61	30	
		12	6.57	30	
		18	8.78	30	
		24	8.72	30	
		36	12.82	30	
		48	13.50	30	
		54	13.11	30	

802.11n Mode		MCS Index	Measured Power(dBm)	Limit (dBm)	Power Level Setting
Frequency[MHz]	Channel No.				
2412	1	0	21.14	30	17.5
		1	21.16	30	
		2	23.13	30	
		3	23.11	30	
		4	24.62	30	
		5	24.59	30	
		6	24.61	30	
		7	24.66	30	
2417	2	0	21.55	30	
		1	21.57	30	
		2	23.52	30	
		3	23.57	30	
		4	24.82	30	
		5	24.81	30	
		6	24.80	30	
		7	24.87	30	
2437	6	0	22.11	30	18
		1	22.04	30	
		2	23.93	30	
		3	23.85	30	
		4	24.80	30	
		5	24.78	30	
		6	24.77	30	
		7	24.85	30	
2462	11	0	21.94	30	
		1	21.88	30	
		2	23.89	30	
		3	23.79	30	
		4	24.91	30	
		5	25.04	30	
		6	24.97	30	
		7	25.06	30	
2467	12	0	11.80	30	7.5
		1	11.75	30	
		2	13.92	30	
		3	14.02	30	
		4	18.58	30	
		5	18.22	30	
		6	18.96	30	
		7	18.28	30	
2472	13	0	6.53	30	2
		1	6.62	30	
		2	8.70	30	
		3	8.78	30	
		4	13.36	30	
		5	12.95	30	
		6	13.75	30	
		7	12.94	30	

Average Power

1. Power Meter offset = Attenuator loss + Cable loss
2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
So, 10.7 dB is offset for 2.4 GHz Band.

802.11b Mode		Data Rate [Mbps]	Measured Power (dBm)	Duty Cycle Factor [dB]	Measured Power(dBm) + Duty Cycle Factor[dB]	Limit (dBm)	Power Level Setting
Frequency [MHz]	Channel No.						
2412	1	1	17.96	0.060	18.02	30	18
		2	17.97	0.027	18.00	30	
		5.5	17.96	0.085	18.05	30	
		11	17.88	0.151	18.03	30	
2417	2	1	17.95	0.060	18.01	30	
		2	18.00	0.027	18.03	30	
		5.5	17.99	0.085	18.08	30	
		11	17.89	0.151	18.04	30	
2437	6	1	18.23	0.060	18.29	30	
		2	18.46	0.027	18.49	30	
		5.5	18.47	0.085	18.56	30	
		11	18.37	0.151	18.52	30	
2462	11	1	18.01	0.060	18.07	30	
		2	18.19	0.027	18.22	30	
		5.5	18.20	0.085	18.29	30	
		11	18.12	0.151	18.27	30	
2467	12	1	7.18	0.060	7.24	30	7
		2	7.45	0.027	7.48	30	
		5.5	7.40	0.085	7.49	30	
		11	7.29	0.151	7.44	30	
2472	13	1	1.89	0.060	1.95	30	1.5
		2	2.09	0.027	2.12	30	
		5.5	2.06	0.085	2.15	30	
		11	1.98	0.151	2.13	30	

802.11g Mode		Data 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	17.22	0.112	17.33	30	18.5
		9	17.12	0.163	17.28	30	
		12	17.07	0.210	17.28	30	
		18	17.68	0.317	18.00	30	
		24	17.52	0.401	17.92	30	
		36	17.37	0.564	17.93	30	
		48	17.29	0.722	18.01	30	
		54	17.18	0.795	17.97	30	
2417	2	6	17.61	0.112	17.72	30	19
		9	17.54	0.163	17.70	30	
		12	17.50	0.210	17.71	30	
		18	18.15	0.317	18.47	30	
		24	17.92	0.401	18.32	30	
		36	17.87	0.564	18.43	30	
		48	17.80	0.722	18.52	30	
		54	17.64	0.795	18.43	30	
2437	6	6	18.01	0.112	18.12	30	
		9	17.96	0.163	18.12	30	
		12	17.89	0.210	18.10	30	
		18	18.68	0.317	19.00	30	
		24	18.45	0.401	18.85	30	
		36	18.40	0.564	18.96	30	
		48	18.30	0.722	19.02	30	
		54	18.20	0.795	18.99	30	
2462	11	6	17.49	0.112	17.60	30	18.5
		9	17.40	0.163	17.56	30	
		12	17.38	0.210	17.59	30	
		18	18.03	0.317	18.35	30	
		24	17.79	0.401	18.19	30	
		36	17.70	0.564	18.26	30	
		48	17.66	0.722	18.38	30	
		54	17.58	0.795	18.37	30	
2467	12	6	6.70	0.112	6.81	30	7.5
		9	6.61	0.163	6.77	30	
		12	6.55	0.210	6.76	30	
		18	7.24	0.317	7.56	30	
		24	7.02	0.401	7.42	30	
		36	7.06	0.564	7.62	30	
		48	6.95	0.722	7.67	30	
		54	6.86	0.795	7.65	30	
2472	13	6	1.34	0.112	1.45	30	2
		9	1.24	0.163	1.40	30	
		12	1.19	0.210	1.40	30	
		18	1.77	0.317	2.09	30	
		24	1.57	0.401	1.97	30	
		36	1.61	0.564	2.17	30	
		48	1.50	0.722	2.22	30	
		54	1.40	0.795	2.19	30	

802.11n 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	15.99	0.115	16.10	30	17.5
		1	15.81	0.221	16.03	30	
		2	16.53	0.329	16.86	30	
		3	16.42	0.418	16.84	30	
		4	16.49	0.569	17.06	30	
		5	16.34	0.715	17.05	30	
		6	16.32	0.784	17.10	30	
		7	16.22	0.847	17.07	30	
2417	2	0	16.48	0.115	16.59	30	
		1	16.30	0.221	16.52	30	
		2	17.04	0.329	17.37	30	
		3	16.93	0.418	17.35	30	
		4	16.99	0.569	17.56	30	
		5	16.86	0.715	17.57	30	
		6	16.83	0.784	17.61	30	
		7	16.74	0.847	17.59	30	
2437	6	0	17.03	0.115	17.14	30	18
		1	16.84	0.221	17.06	30	
		2	17.57	0.329	17.90	30	
		3	17.47	0.418	17.89	30	
		4	17.49	0.569	18.06	30	
		5	17.38	0.715	18.09	30	
		6	17.34	0.784	18.12	30	
		7	17.24	0.847	18.09	30	
2462	11	0	16.83	0.115	16.94	30	
		1	16.70	0.221	16.92	30	
		2	17.42	0.329	17.75	30	
		3	17.32	0.418	17.74	30	
		4	17.34	0.569	17.91	30	
		5	17.22	0.715	17.93	30	
		6	17.19	0.784	17.97	30	
		7	17.11	0.847	17.96	30	
2467	12	0	6.56	0.115	6.67	30	7.5
		1	6.37	0.221	6.59	30	
		2	7.12	0.329	7.45	30	
		3	7.01	0.418	7.43	30	
		4	7.11	0.569	7.68	30	
		5	6.97	0.715	7.68	30	
		6	6.93	0.784	7.71	30	
		7	6.81	0.847	7.66	30	
2472	13	0	1.21	0.115	1.32	30	2
		1	1.02	0.221	1.24	30	
		2	1.67	0.329	2.00	30	
		3	1.56	0.418	1.98	30	
		4	1.68	0.569	2.25	30	
		5	1.52	0.715	2.23	30	
		6	1.48	0.784	2.26	30	
		7	1.37	0.847	2.22	30	

9.4 POWER SPECTRAL DENSITY

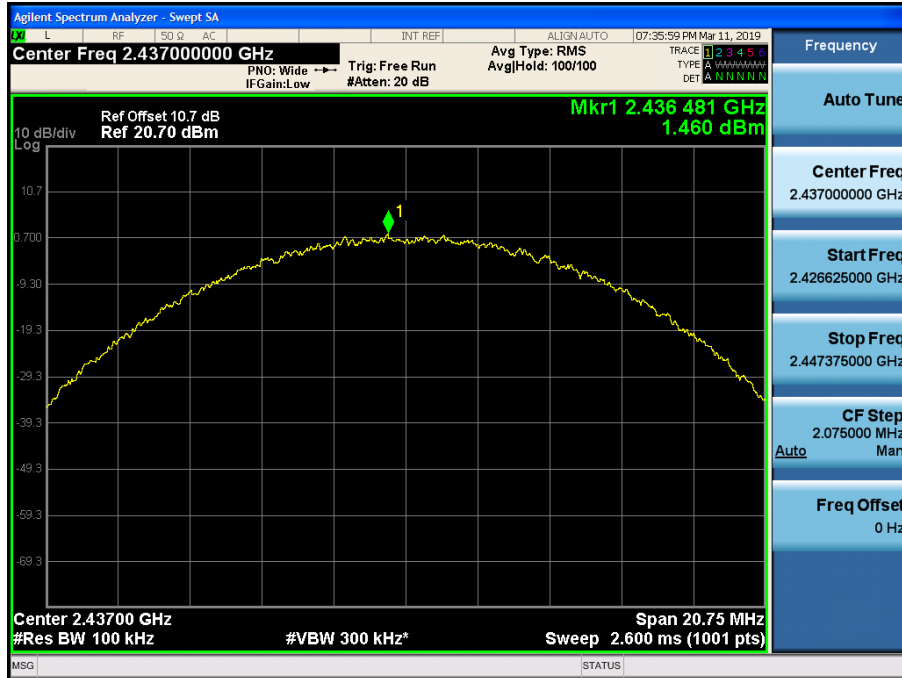
Mode	Frequency (MHz)	Channel No.	Test Result			
			Measured PSD (dBm)	Duty Cycle Factor	Measured PSD(dBm) + Duty Cycle Factor	Limit (dBm)
802.11b	2412	1	0.891	0.085	0.976	8
	2417	2	1.016	0.085	1.101	8
	2437	6	1.460	0.085	1.545	8
	2462	11	1.260	0.085	1.345	8
	2467	12	-9.594	0.085	-9.509	8
	2472	13	-14.999	0.085	-14.914	8
802.11g	2412	1	-1.630	0.722	-0.908	8
	2417	2	-1.457	0.722	-0.735	9
	2437	6	-0.286	0.722	0.436	8
	2462	11	-0.870	0.722	-0.148	8
	2467	12	-11.793	0.722	-11.071	8
	2472	13	-17.579	0.722	-16.857	8
802.11n	2412	1	-1.419	0.784	-0.635	8
	2417	2	-1.958	0.784	-1.174	8
	2437	6	-1.011	0.784	-0.227	8
	2462	11	-1.455	0.784	-0.671	8
	2467	12	-12.009	0.784	-11.225	8
	2472	13	-16.920	0.784	-16.136	8

Note :

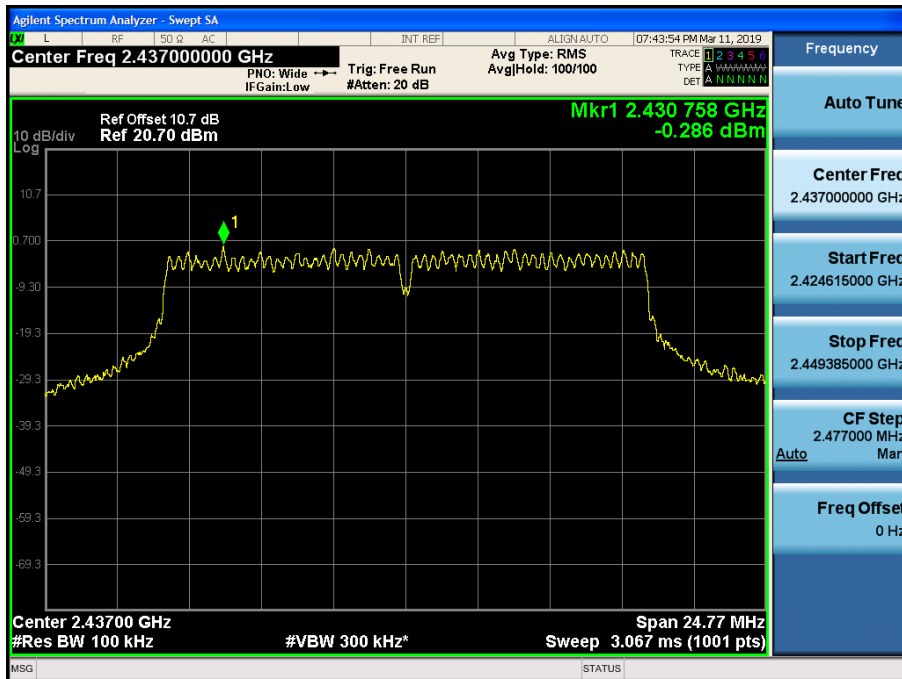
- Spectrum reading values are not plot data.
The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
- Spectrum offset = Attenuator loss + Cable loss
- We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.
So, 10.7 dB is offset for 2.4 GHz Band.

Test Plots

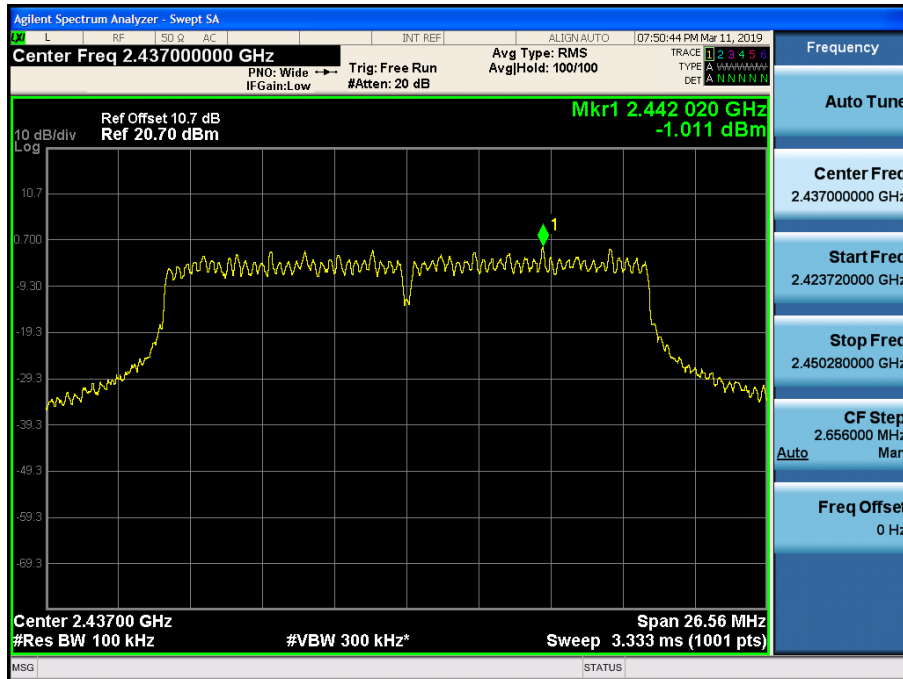
Power Spectral Density (802.11b-CH 6)



Power Spectral Density (802.11g-CH 6)



Power Spectral Density (802.11n_HT20 -CH 6)



Note :

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

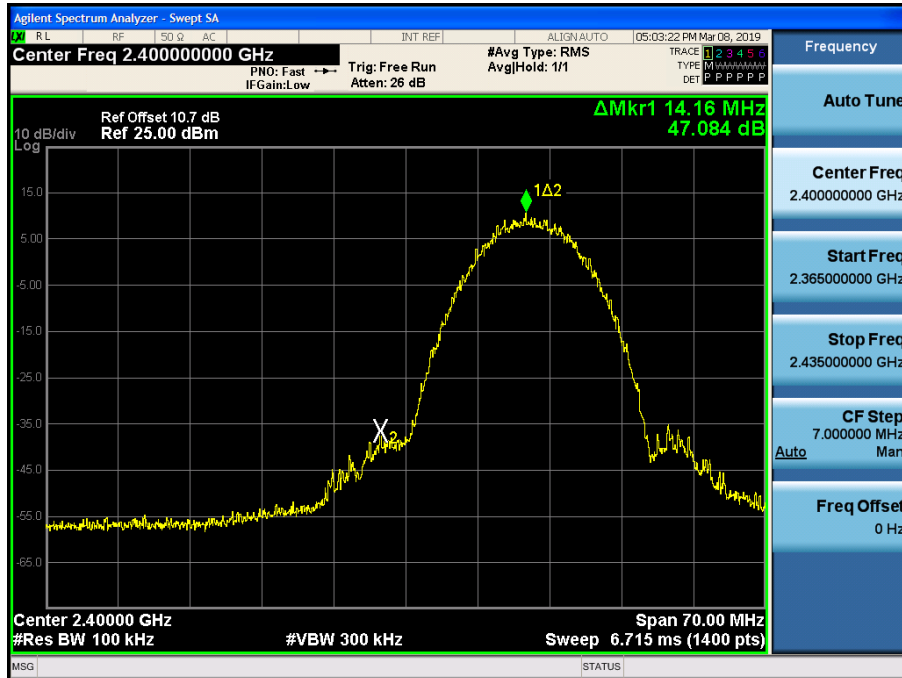
9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below.

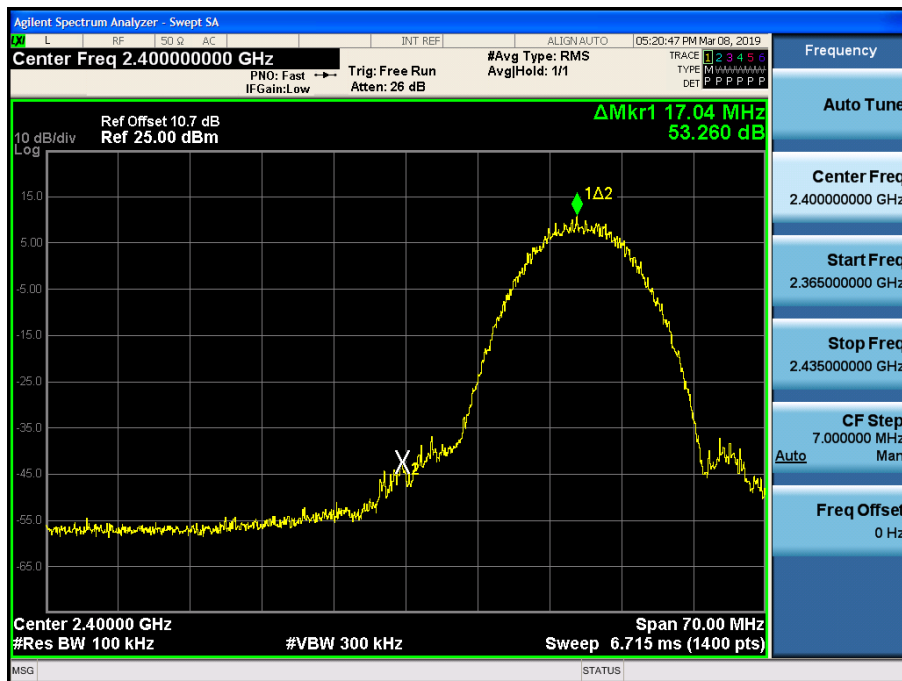
In order to simplify the report, attached plots were only the worst case channel and data rate.

■ Test Plots(BandEdge)

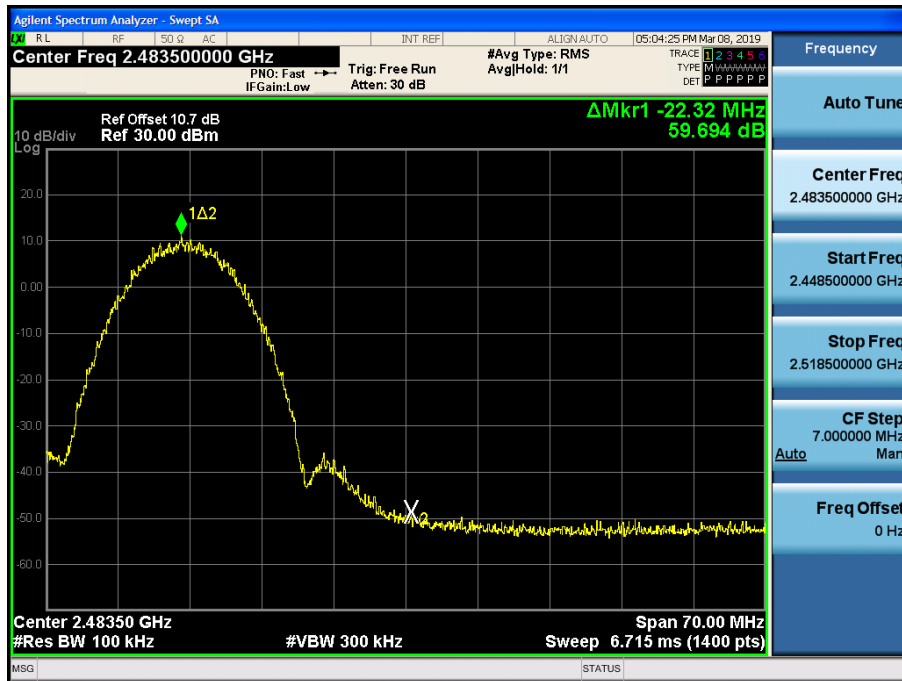
Band Edge (802.11b-CH1)



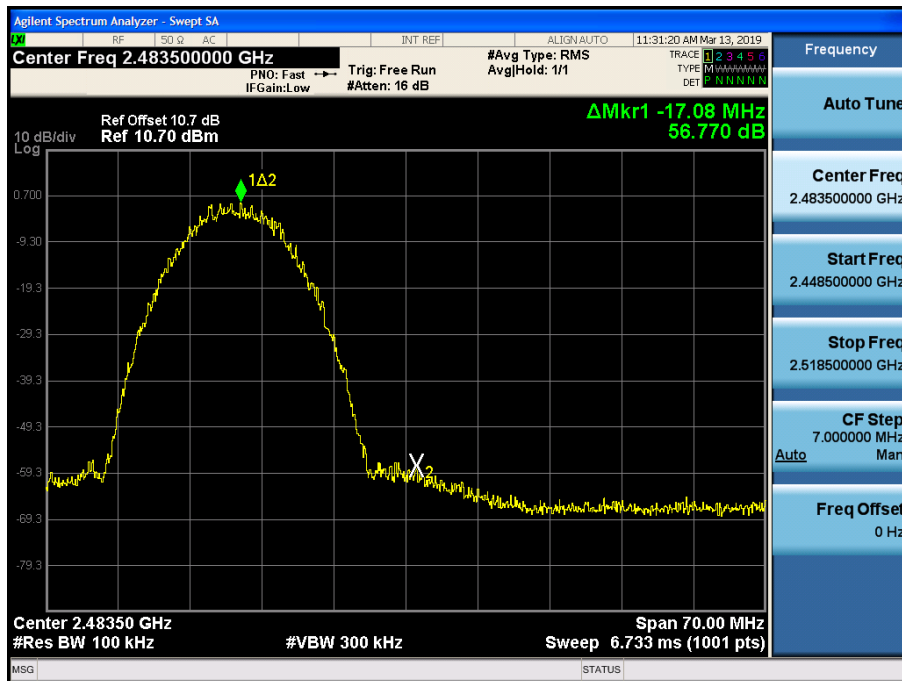
Band Edge (802.11b-CH2)



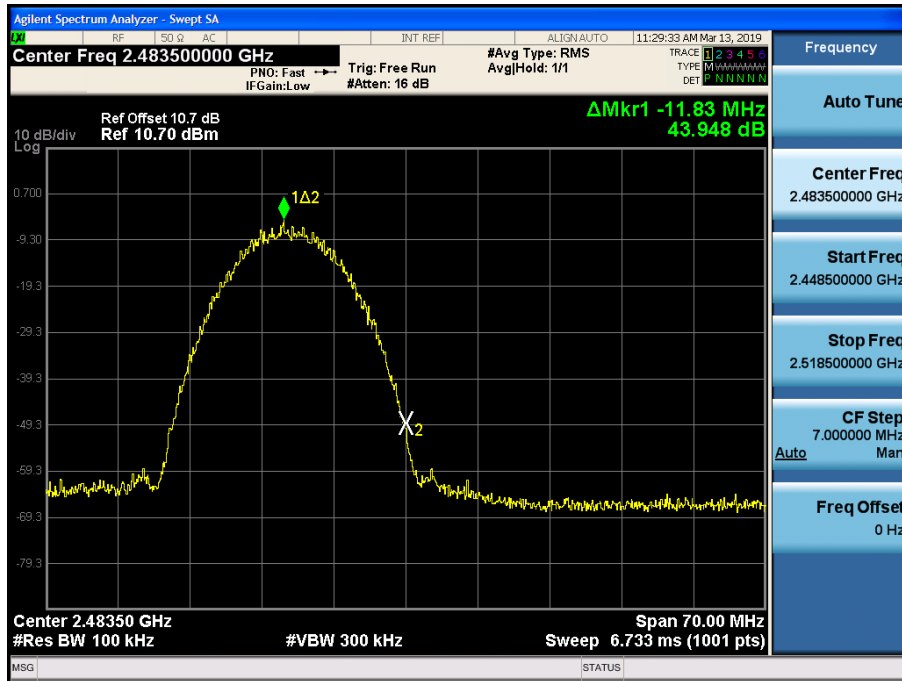
Band Edge (802.11b-CH11)



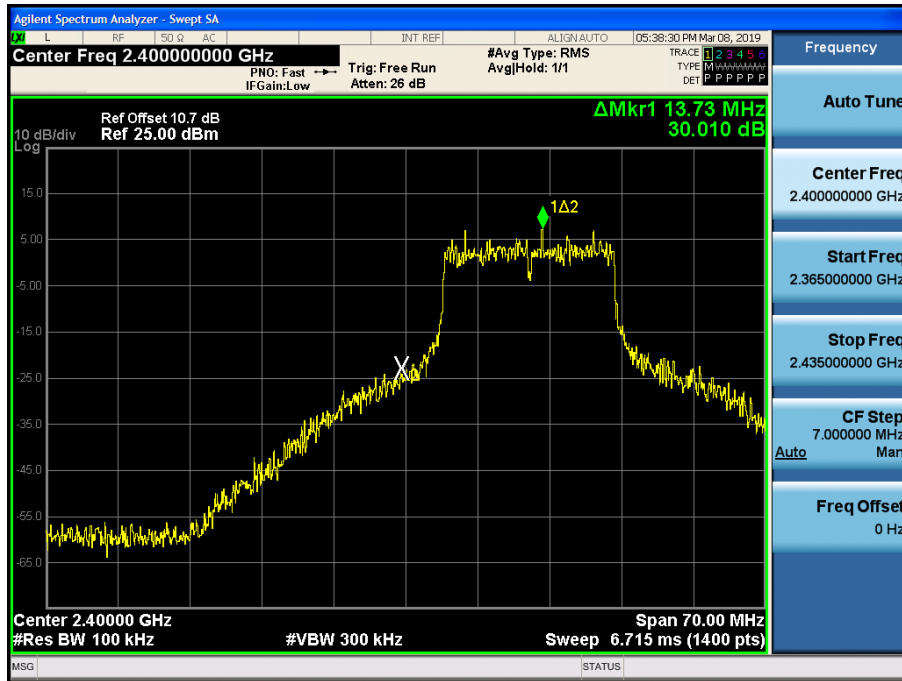
Band Edge (802.11b-CH12)



Band Edge (802.11b-CH13)



Band Edge (802.11g-CH1)



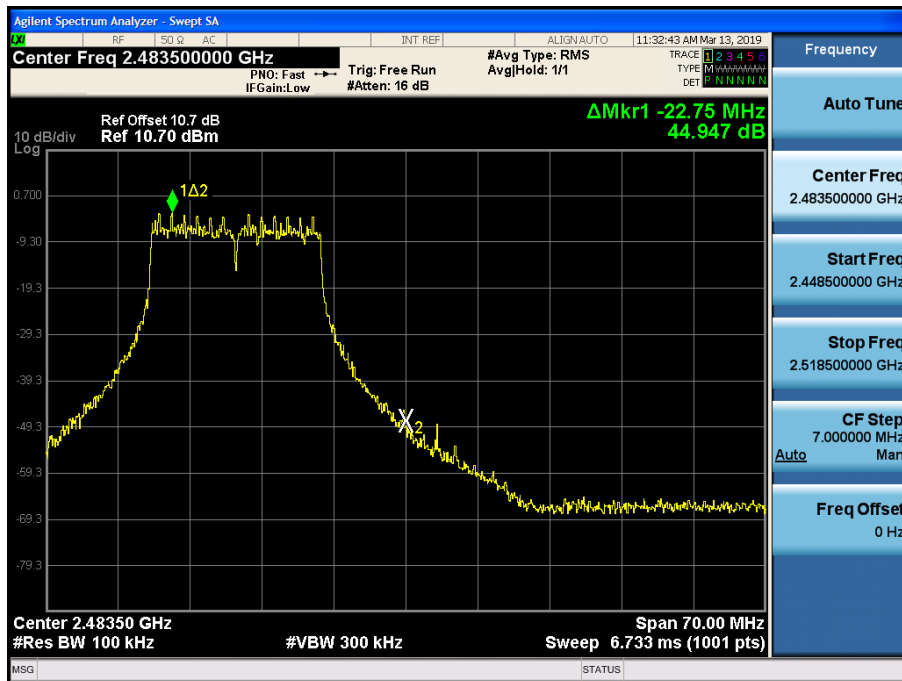
Band Edge (802.11g-CH2)



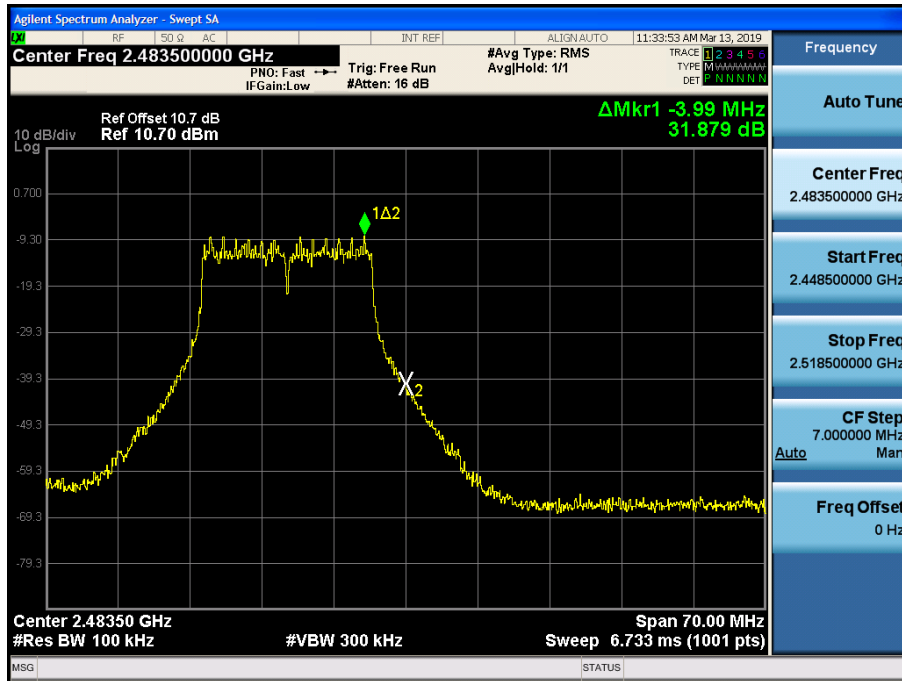
Band Edge (802.11g-CH11)



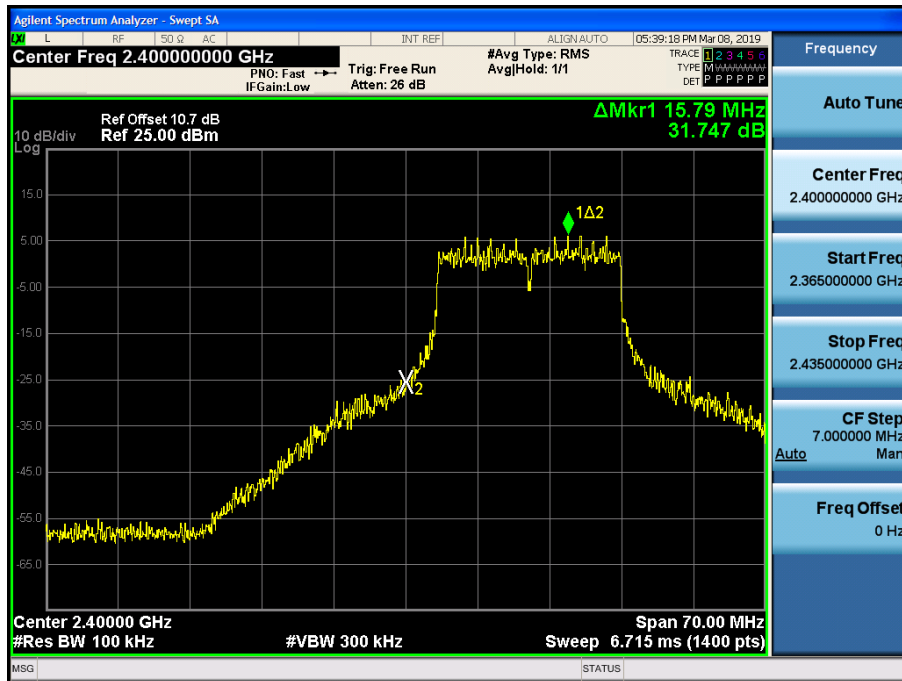
Band Edge (802.11g-CH12)



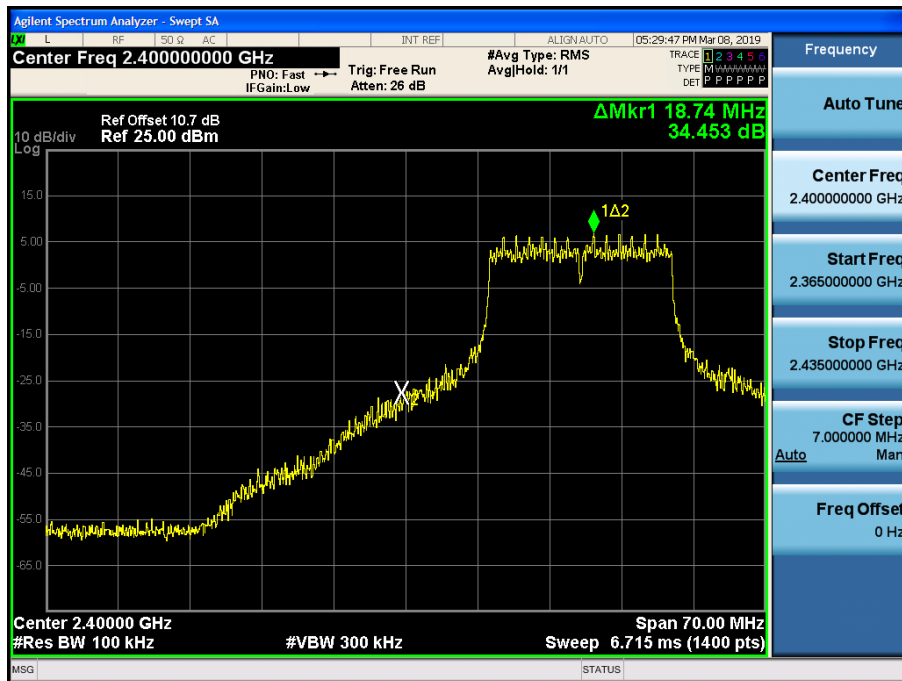
Band Edge (802.11g-CH13)



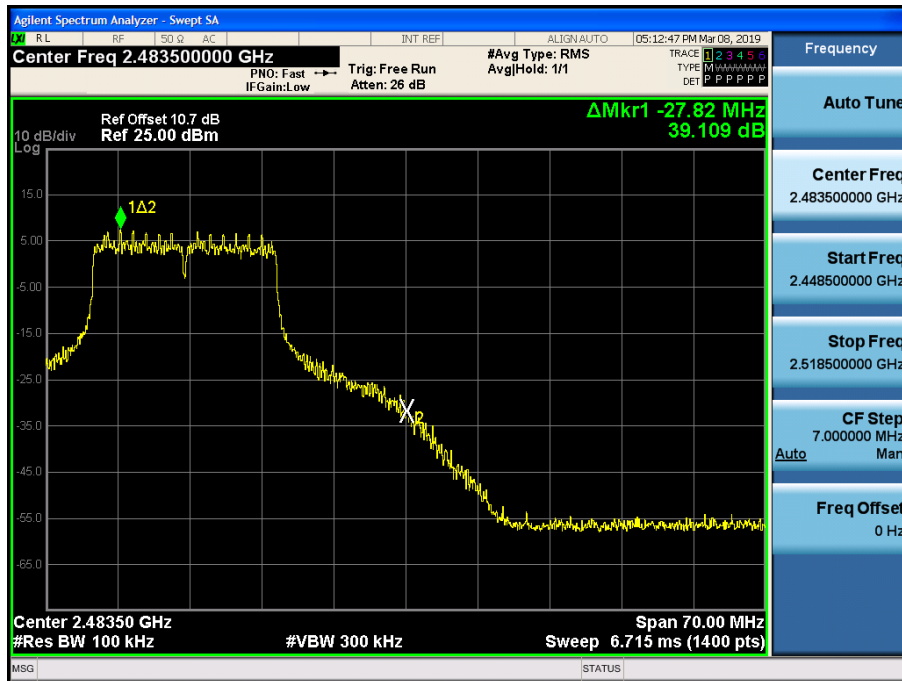
Band Edge (802.11n_HT20-CH1)



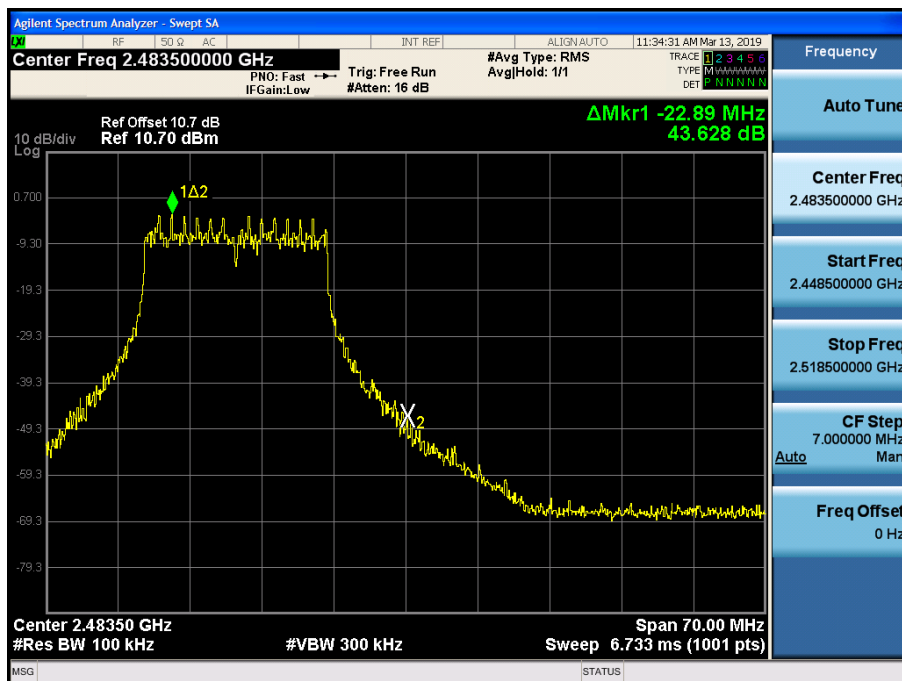
Band Edge (802.11n_HT20-CH2)



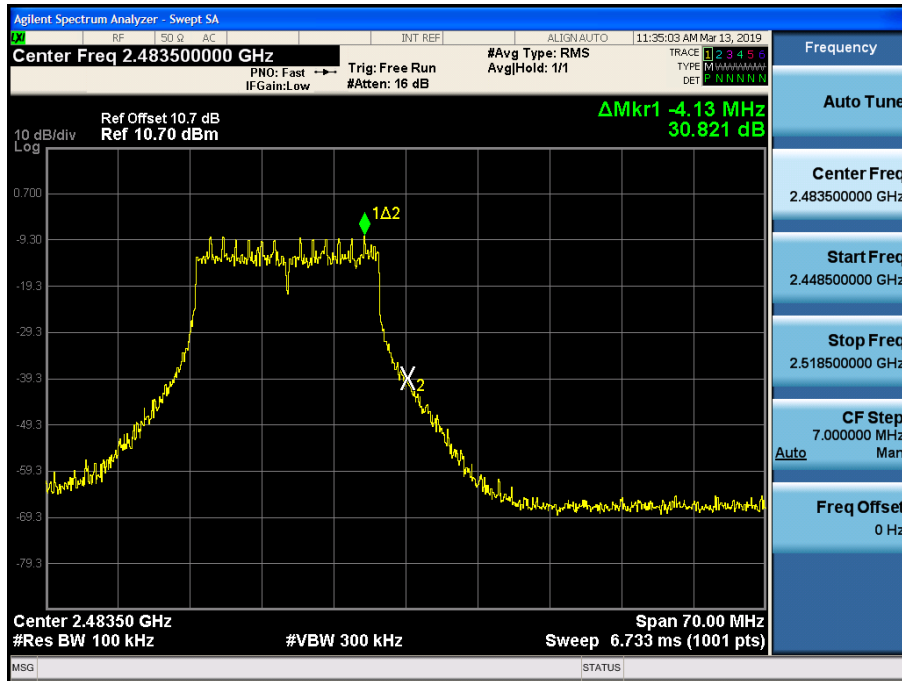
Band Edge (802.11n_HT20-CH11)



Band Edge (802.11n_HT20-CH12)



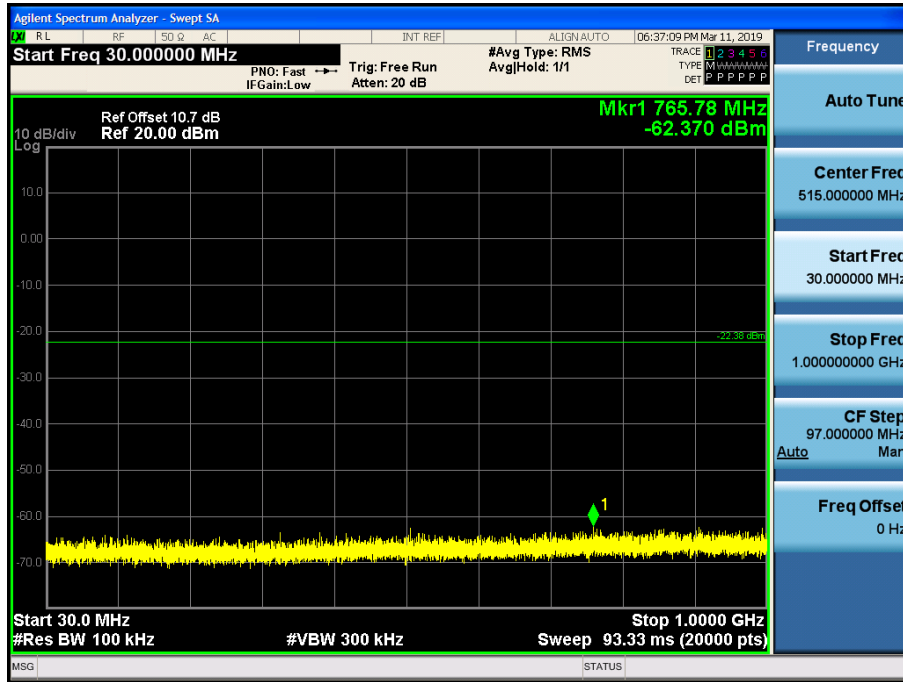
Band Edge (802.11n_HT20-CH13)



Test Plots(Conducted Spurious Emission)

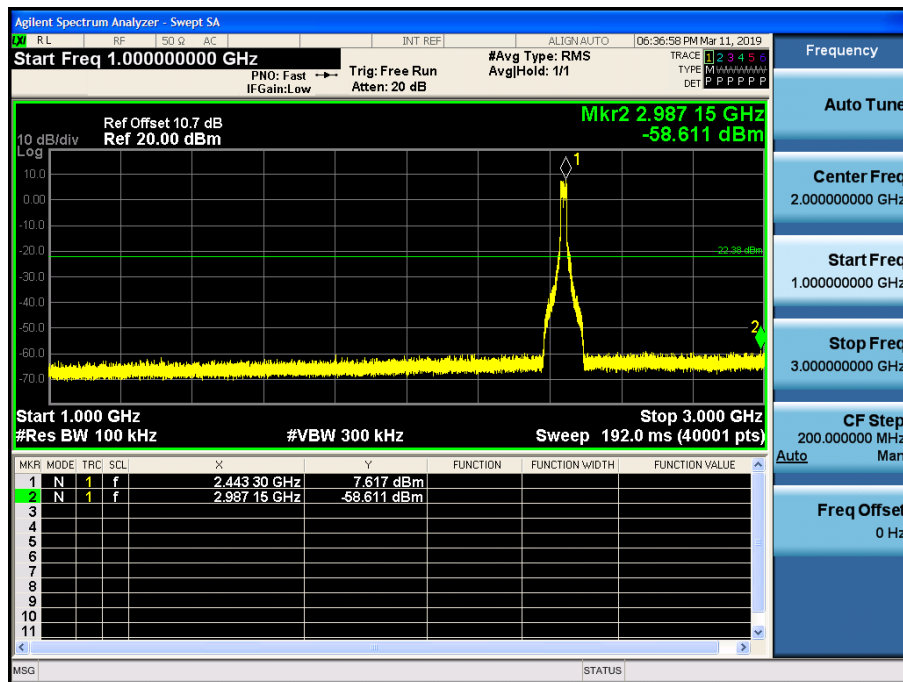
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



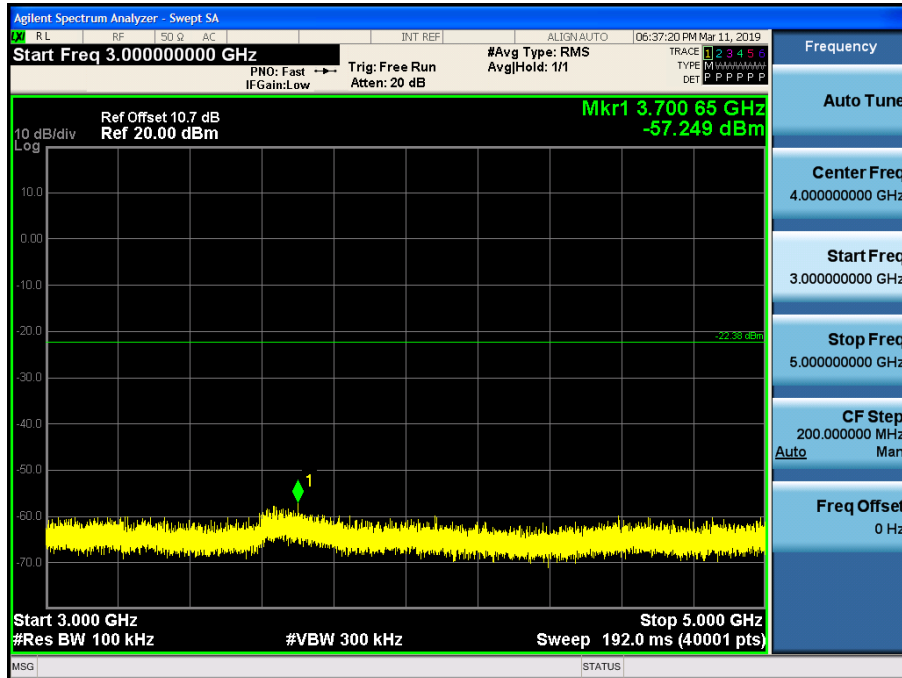
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



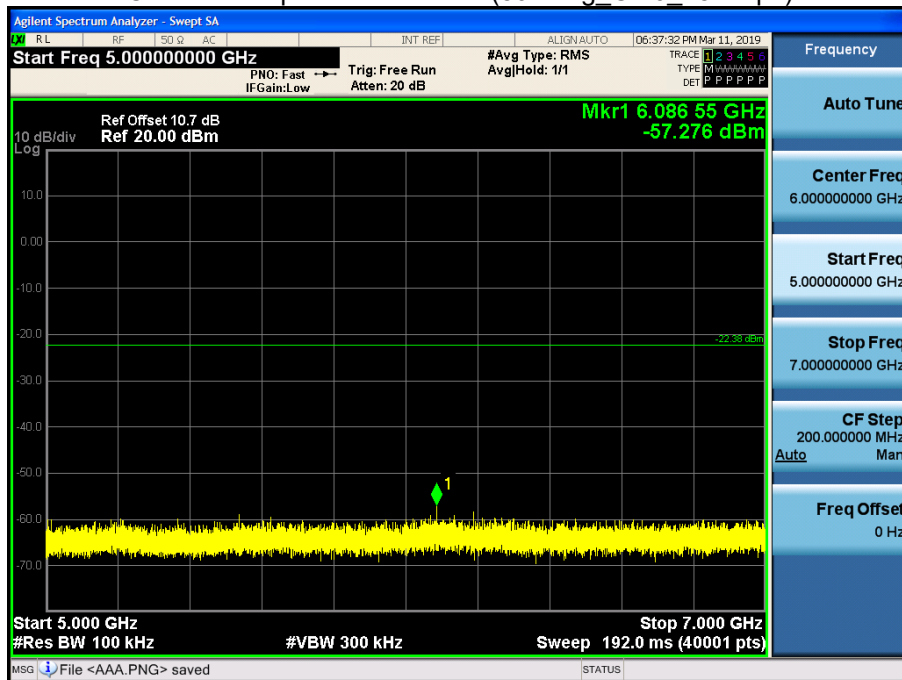
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



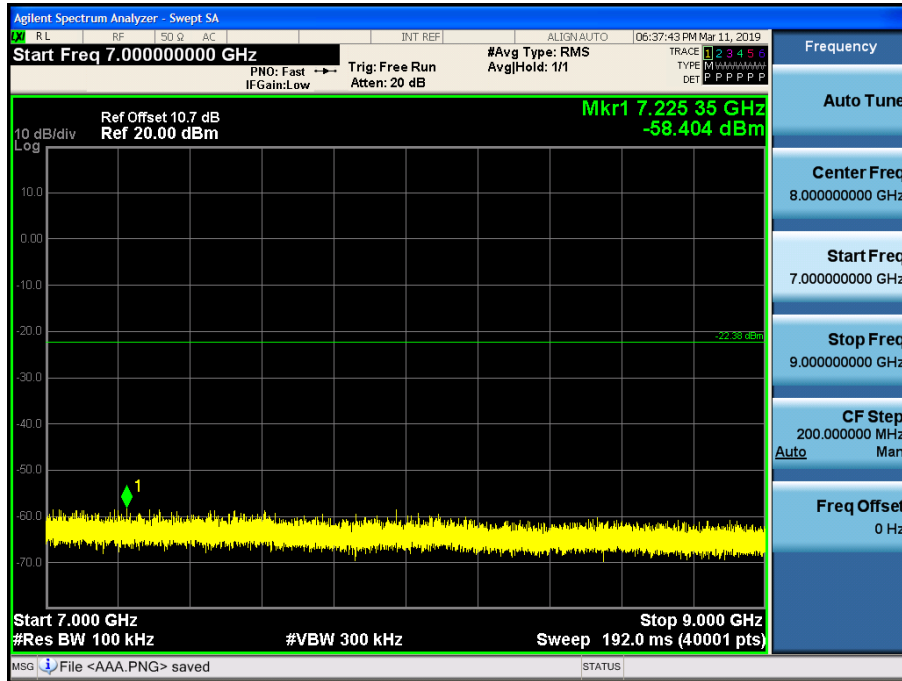
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



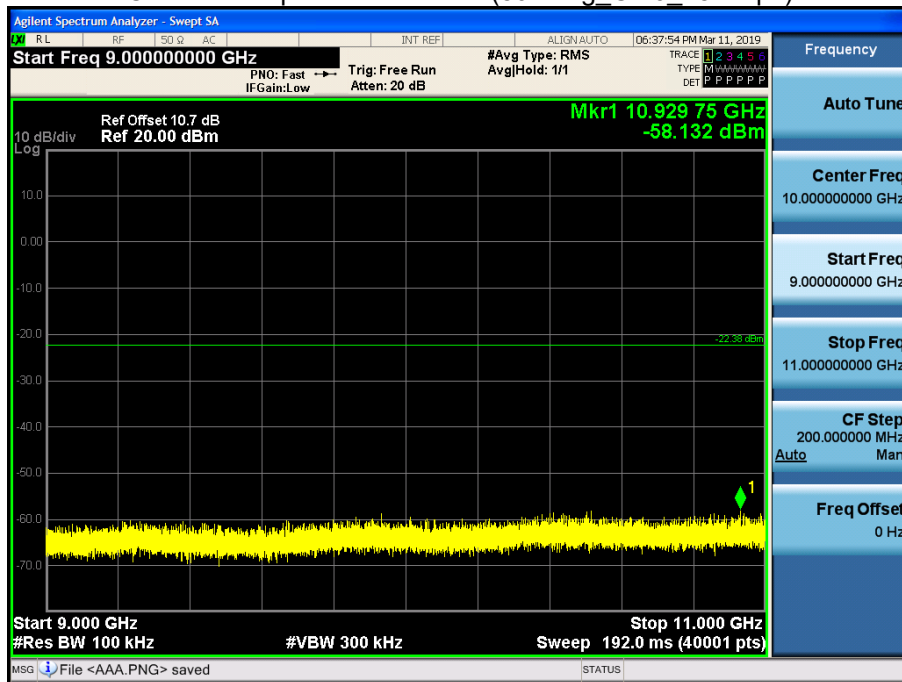
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



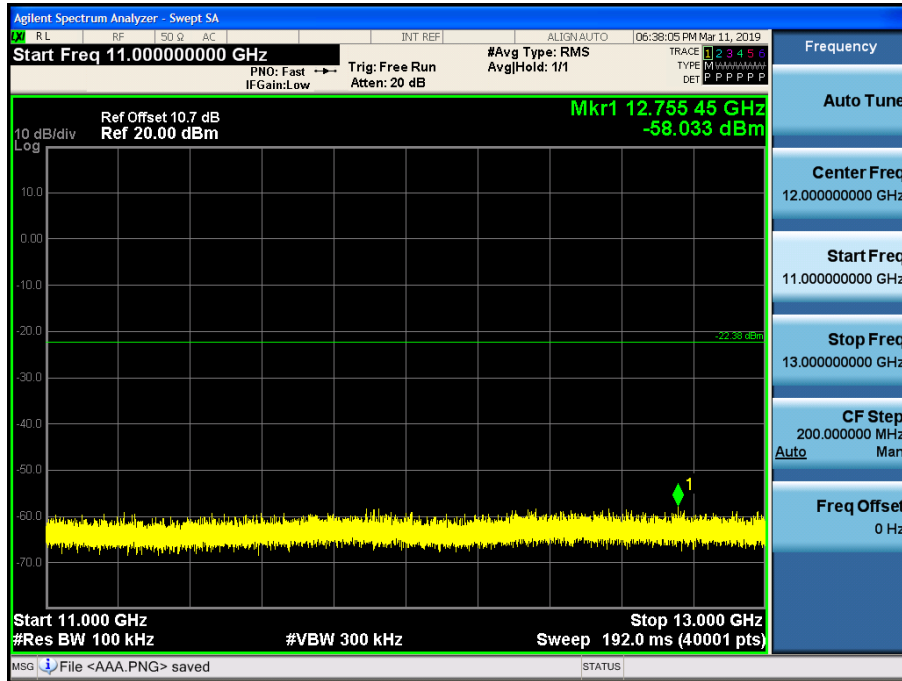
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



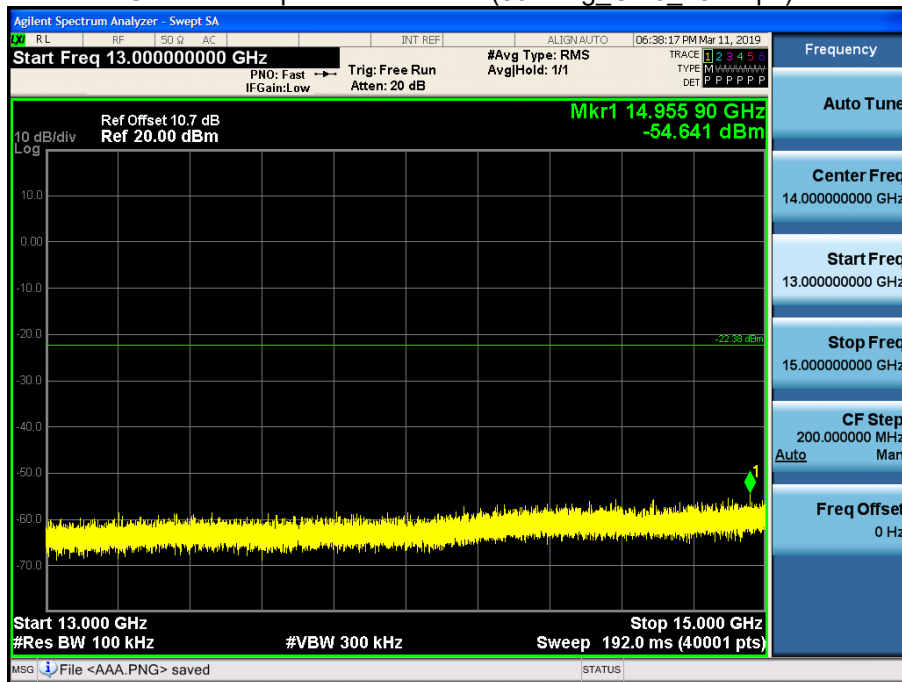
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



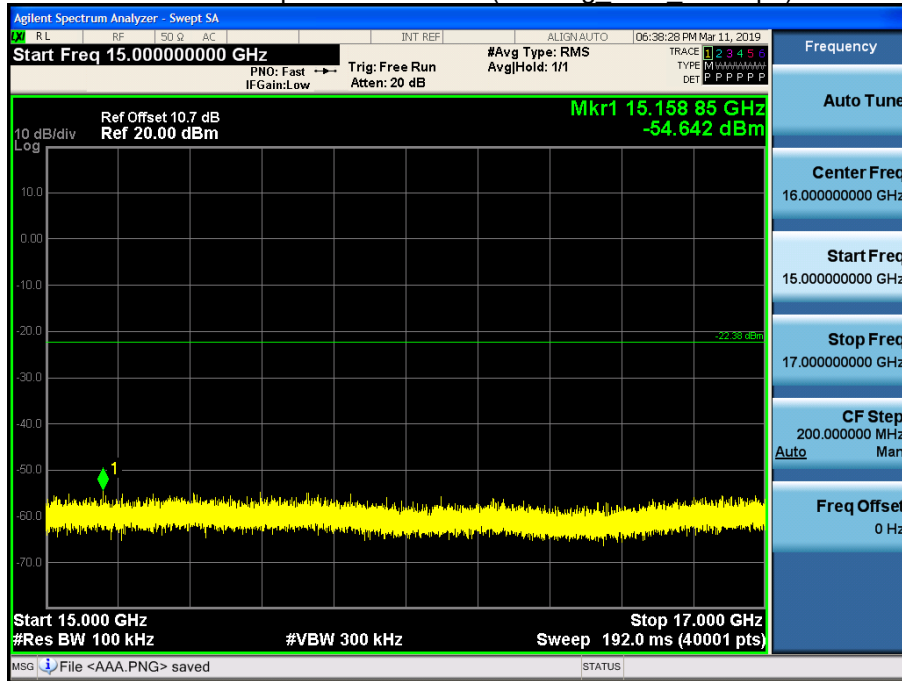
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



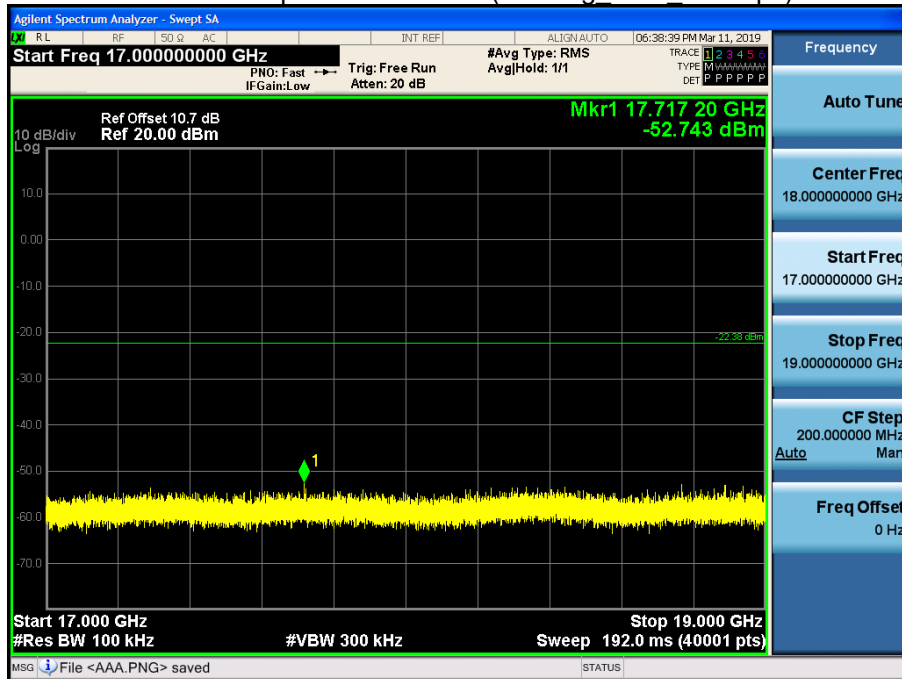
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11g Ch.6 48 Mbps)



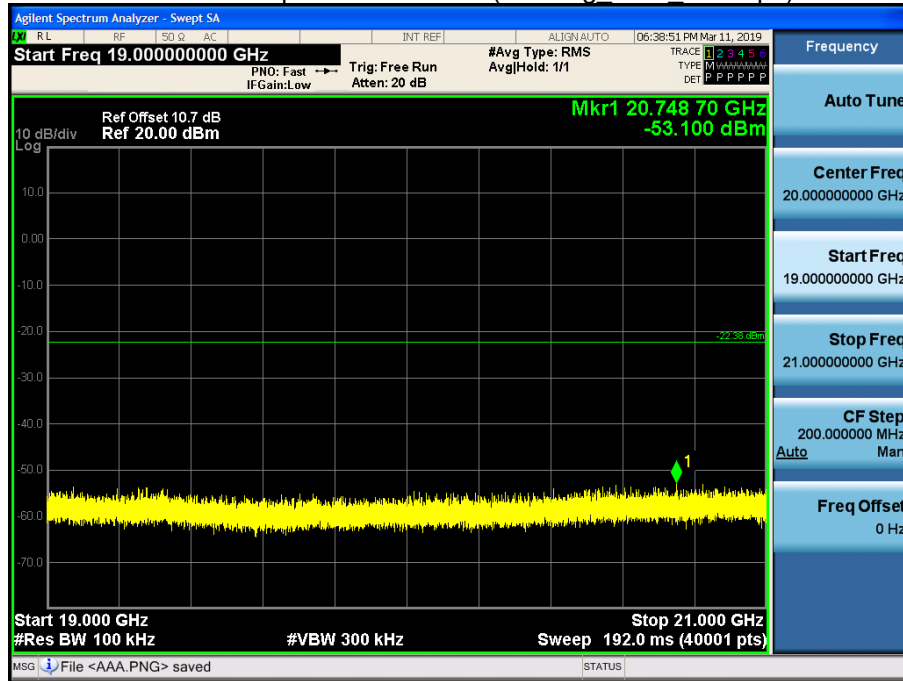
17 GHz ~ 19 GHz

Conducted Spurious Emission (802.11g Ch.6 48 Mbps)



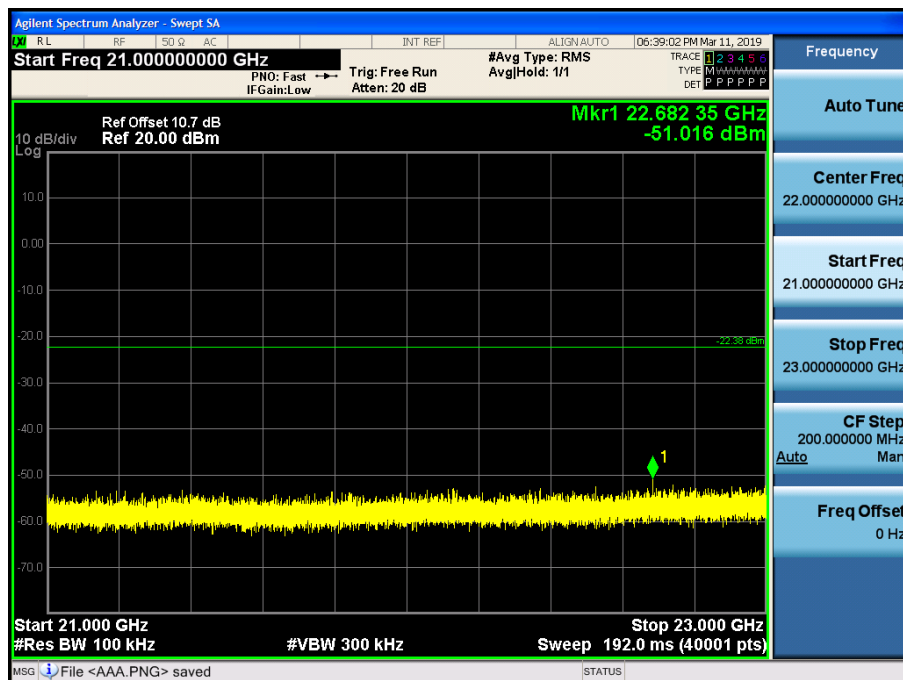
19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



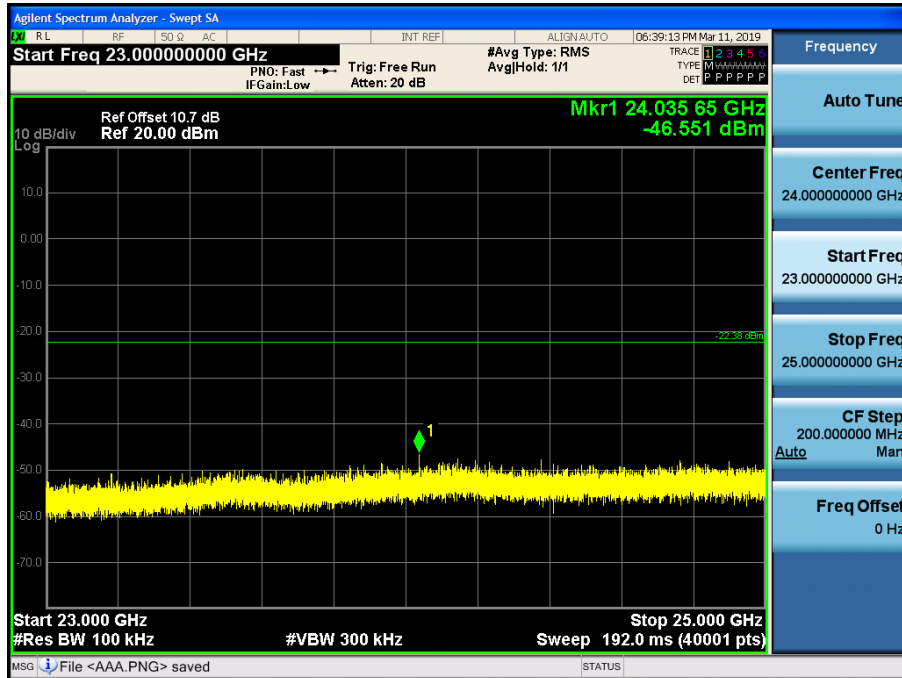
21 GHz ~ 23 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 Mbps)



23 GHz ~ 25 GHz

Conducted Spurious Emission (802.11g_Ch.6_48 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 = $40 \cdot \log(\text{specific distance} / \text{test distance})$ (dB)
3. Limit line = specific Limits (dBuV) + Distance extrapolation factor
4. The test results for below 30 MHz is correlated to an open site.
The result on OFS is about 2 dB higher than semi-anechoic chamber(10 m chamber)

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.

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	49.87	1.95	V	51.82	73.98	22.16	PK
4824	38.11	1.95	V	40.06	53.98	13.92	AV
7236	48.91	9.86	V	58.77	73.98	15.21	PK
7236	36.84	9.86	V	46.70	53.98	7.28	AV
4824	50.92	1.95	H	52.87	73.98	21.11	PK
4824	39.13	1.95	H	41.08	53.98	12.90	AV
7236	49.92	9.86	H	59.78	73.98	14.20	PK
7236	37.97	9.86	H	47.83	53.98	6.15	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	50.27	0.00	1.95	V	52.22	73.98	21.76	PK
4824	37.66	0.11	1.95	V	39.72	53.98	14.26	AV
7236	49.42	0.00	9.86	V	59.28	73.98	14.70	PK
7236	37.45	0.11	9.86	V	47.42	53.98	6.56	AV
4824	50.99	0.00	1.95	H	52.94	73.98	21.04	PK
4824	38.73	0.11	1.95	H	40.79	53.98	13.19	AV
7236	51.39	0.00	9.86	H	61.25	73.98	12.73	PK
7236	38.06	0.11	9.86	H	48.03	53.98	5.95	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	50.83	0.00	1.95	V	52.78	73.98	21.20	PK
4824	37.41	0.12	1.95	V	39.48	53.98	14.51	AV
7236	49.61	0.00	9.86	V	59.47	73.98	14.51	PK
7236	36.84	0.12	9.86	V	46.82	53.98	7.16	AV
4824	51.39	0.00	1.95	H	53.34	73.98	20.64	PK
4824	38.66	0.12	1.95	H	40.73	53.98	13.26	AV
7236	49.72	0.00	9.86	H	59.58	73.98	14.40	PK
7236	37.99	0.12	9.86	H	47.97	53.98	6.01	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	50.14	2.33	V	52.47	73.98	21.51	PK
4874	38.16	2.33	V	40.49	53.98	13.49	AV
7311	49.67	10.14	V	59.81	73.98	14.17	PK
7311	36.82	10.14	V	46.96	53.98	7.02	AV
4874	50.46	2.33	H	52.79	73.98	21.19	PK
4874	38.82	2.33	H	41.15	53.98	12.83	AV
7311	50.21	10.14	H	60.35	73.98	13.63	PK
7311	37.91	10.14	H	48.05	53.98	5.93	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	50.26	0.00	2.33	V	52.59	73.98	21.39	PK
4874	37.24	0.11	2.33	V	39.68	53.98	14.30	AV
7311	49.28	0.00	10.14	V	59.42	73.98	14.56	PK
7311	36.44	0.11	10.14	V	46.69	53.98	7.29	AV
4874	50.74	0.00	2.33	H	53.07	73.98	20.91	PK
4874	38.65	0.11	2.33	H	41.09	53.98	12.89	AV
7311	50.63	0.00	10.14	H	60.77	73.98	13.21	PK
7311	37.91	0.11	10.14	H	48.16	53.98	5.82	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	49.02	0.00	2.33	V	51.35	73.98	22.63	PK
4874	37.58	0.12	2.33	V	40.03	53.98	13.96	AV
7311	49.76	0.00	10.14	V	59.90	73.98	14.08	PK
7311	37.05	0.12	10.14	V	47.31	53.98	6.68	AV
4874	50.99	0.00	2.33	H	53.32	73.98	20.66	PK
4874	38.79	0.12	2.33	H	41.24	53.98	12.75	AV
7311	50.16	0.00	10.14	H	60.30	73.98	13.68	PK
7311	37.87	0.12	10.14	H	48.13	53.98	5.86	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	49.68	2.28	V	51.96	73.98	22.02	PK
4924	37.23	2.28	V	39.51	53.98	14.47	AV
7386	48.37	9.81	V	58.18	73.98	15.80	PK
7386	35.98	9.81	V	45.79	53.98	8.19	AV
4924	50.42	2.28	H	52.70	73.98	21.28	PK
4924	38.25	2.28	H	40.53	53.98	13.45	AV
7386	49.69	9.81	H	59.50	73.98	14.48	PK
7386	36.99	9.81	H	46.80	53.98	7.18	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	49.71	0.00	2.28	V	51.99	73.98	21.99	PK
4924	37.28	0.11	2.28	V	39.67	53.98	14.31	AV
7386	48.99	0.00	9.81	V	58.80	73.98	15.18	PK
7386	36.41	0.11	9.81	V	46.33	53.98	7.65	AV
4924	50.07	0.00	2.28	H	52.35	73.98	21.63	PK
4924	38.06	0.11	2.28	H	40.45	53.98	13.53	AV
7386	49.21	0.00	9.81	H	59.02	73.98	14.96	PK
7386	37.02	0.11	9.81	H	46.94	53.98	7.04	AV

Operation Mode: 802.11n (HT20)

Transfer Rate: 6.5 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	49.05	0.00	2.28	V	51.33	73.98	22.65	PK
4924	37.82	0.12	2.28	V	40.22	53.98	13.77	AV
7386	49.06	0.00	9.81	V	58.87	73.98	15.11	PK
7386	36.52	0.12	9.81	V	46.45	53.98	7.53	AV
4924	49.62	0.00	2.28	H	51.90	73.98	22.08	PK
4924	38.06	0.12	2.28	H	40.46	53.98	13.53	AV
7386	48.91	0.00	9.81	H	58.72	73.98	15.26	PK
7386	36.97	0.12	9.81	H	46.90	53.98	7.08	AV

Operation Mode: 802.11b

Transfer Rate: 1 Mbps

Operating Frequency: 2467

Channel No.: 12 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
4934	49.17	2.21	V	51.38	73.98	22.60	PK
4934	37.69	2.21	V	39.90	53.98	14.08	AV
7401	49.05	9.78	V	58.83	73.98	15.15	PK
7401	36.51	9.78	V	46.29	53.98	7.69	AV
4934	49.83	2.21	H	52.04	73.98	21.94	PK
4934	38.05	2.21	H	40.26	53.98	13.72	AV
7401	49.67	9.78	H	59.45	73.98	14.53	PK
7401	37.22	9.78	H	47.00	53.98	6.98	AV

Operation Mode: 802.11g

Transfer Rate: 6 Mbps

Operating Frequency: 2467

Channel No.: 12 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
4934	49.30	0.00	2.21	V	51.51	73.98	22.47	PK
4934	37.47	0.11	2.21	V	39.79	53.98	14.19	AV
7401	48.67	0.00	9.78	V	58.45	73.98	15.53	PK
7401	36.24	0.11	9.78	V	46.13	53.98	7.85	AV
4934	50.31	0.00	2.21	H	52.52	73.98	21.46	PK
4934	38.09	0.11	2.21	H	40.41	53.98	13.57	AV
7401	49.88	0.00	9.78	H	59.66	73.98	14.32	PK
7401	37.25	0.11	9.78	H	47.14	53.98	6.84	AV

Operation Mode:	802.11n (HT20)
Transfer Rate:	6.5 Mbps
Operating Frequency	2467
Channel No.	12 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
4934	48.72	0.00	2.21	V	50.93	73.98	23.05	PK
4934	37.72	0.12	2.21	V	40.05	53.98	13.94	AV
7401	48.37	0.00	9.78	V	58.15	73.98	15.83	PK
7401	36.55	0.12	9.78	V	46.45	53.98	7.54	AV
4934	49.84	0.00	2.21	H	52.05	73.98	21.93	PK
4934	38.11	0.12	2.21	H	40.44	53.98	13.55	AV
7401	49.66	0.00	9.78	H	59.44	73.98	14.54	PK
7401	37.26	0.12	9.78	H	47.16	53.98	6.83	AV

Operation Mode: 802.11b

Transfer Rate: 1 Mbps

Operating Frequency: 2472

Channel No. 13 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
4944	50.51	2.35	V	52.86	73.98	21.12	PK
4944	37.95	2.35	V	40.30	53.98	13.68	AV
7416	49.09	9.80	V	58.89	73.98	15.09	PK
7416	37.02	9.80	V	46.82	53.98	7.16	AV
4944	50.65	2.35	H	53.00	73.98	20.98	PK
4944	38.39	2.35	H	40.74	53.98	13.24	AV
7416	49.11	9.80	H	58.91	73.98	15.07	PK
7416	37.36	9.80	H	47.16	53.98	6.82	AV

Operation Mode: 802.11g

Transfer Rate: 6 Mbps

Operating Frequency: 2472

Channel No. 13 Ch

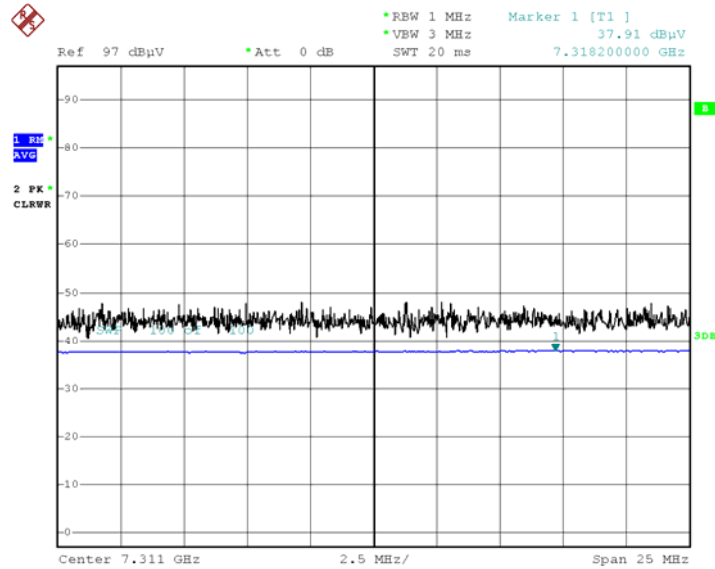
Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4944	49.69	0.00	2.35	V	52.04	73.98	21.94	PK
4944	37.26	0.11	2.35	V	39.72	53.98	14.26	AV
7416	48.88	0.00	9.80	V	58.68	73.98	15.30	PK
7416	36.72	0.11	9.80	V	46.63	53.98	7.35	AV
4944	50.45	0.00	2.35	H	52.80	73.98	21.18	PK
4944	38.31	0.11	2.35	H	40.77	53.98	13.21	AV
7416	49.14	0.00	9.80	H	58.94	73.98	15.04	PK
7416	37.42	0.11	9.80	H	47.33	53.98	6.65	AV

Operation Mode:	802.11n (HT20)
Transfer Rate:	6.5 Mbps
Operating Frequency	2472
Channel No.	13 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
4944	49.44	0.00	2.35	V	51.79	73.98	22.19	PK
4944	38.62	0.12	2.35	V	41.09	53.98	12.90	AV
7416	48.67	0.00	9.80	V	58.47	73.98	15.51	PK
7416	37.06	0.12	9.80	V	46.98	53.98	7.00	AV
4944	49.88	0.00	2.35	H	52.23	73.98	21.75	PK
4944	39.27	0.12	2.35	H	41.74	53.98	12.25	AV
7416	49.43	0.00	9.80	H	59.23	73.98	14.75	PK
7416	37.42	0.12	9.80	H	47.34	53.98	6.64	AV

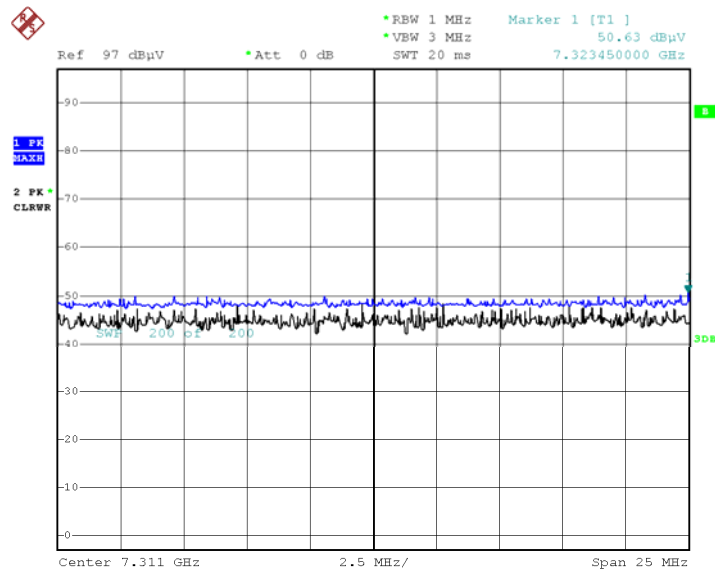
Test Plots

Radiated Spurious Emissions plot – Average Reading (802.11g, Ch.6 3rd Harmonic, H)



Date: 8.MAR.2019 19:20:14

Radiated Spurious Emissions plot – Peak Reading (802.11g, Ch.6 3rd Harmonic, H)



Date: 11.MAR.2019 18:39:48

Note:

Plot of worst case are only reported.

9.7 RADIATED RESTRICTED BAND EDGES

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. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	55.08	0.85	H	55.93	73.98	18.05	PK
2390.0	43.06	0.85	H	43.91	53.98	10.07	AV
2390.0	54.02	0.85	V	54.87	73.98	19.11	PK
2390.0	42.66	0.85	V	43.51	53.98	10.47	AV
2483.5	59.92	1.13	H	61.05	73.98	12.93	PK
2483.5	43.07	1.13	H	44.20	53.98	9.78	AV
2483.5	58.33	1.13	V	59.46	73.98	14.52	PK
2483.5	42.63	1.13	V	43.76	53.98	10.22	AV

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2467 MHz, 2472 MHz
Channel No.	12 Ch, 13 Ch

Channel	Frequency [MHz]	Reading [dBuV]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
12	2483.5	55.18	1.13	H	56.31	73.98	17.67	PK
	2483.5	42.06	1.13	H	43.19	53.98	10.79	AV
	2483.5	54.97	1.13	V	56.10	73.98	17.88	PK
	2483.5	41.84	1.13	V	42.97	53.98	11.01	AV
	2483.5	57.03	1.13	H	58.16	73.98	15.82	PK
13	2483.5	47.26	1.13	H	48.39	53.98	5.59	AV
	2483.5	56.81	1.13	V	57.94	73.98	16.04	PK
	2483.5	46.98	1.13	V	48.11	53.98	5.87	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. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	63.97	0.00	0.85	H	64.82	73.98	9.16	PK
2390.0	50.26	0.11	0.85	H	51.22	53.98	2.76	AV
2390.0	62.76	0.00	0.85	V	63.61	73.98	10.37	PK
2390.0	46.28	0.11	0.85	V	47.24	53.98	6.74	AV
2483.5	62.94	0.00	1.13	H	64.07	73.98	9.91	PK
2483.5	48.34	0.11	1.13	H	49.58	53.98	4.40	AV
2483.5	61.74	0.00	1.13	V	62.87	73.98	11.11	PK
2483.5	46.27	0.11	1.13	V	47.51	53.98	6.47	AV

Operation Mode: 802.11g
Transfer Rate: 6 Mbps
Operating Frequency: 2417 MHz, 2457 MHz
Channel No. 02 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	58.58	0.00	0.85	H	59.43	73.98	14.55	PK
2390.0	46.01	0.11	0.85	H	46.97	53.98	7.01	AV
2390.0	57.96	0.00	0.85	V	58.81	73.98	15.17	PK
2390.0	45.82	0.11	0.85	V	46.78	53.98	7.20	AV

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2467 MHz
Channel No.	12 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	64.78	0.00	1.13	H	65.91	73.98	8.07	PK
2483.5	49.22	0.11	1.13	H	50.46	53.98	3.52	AV
2483.5	62.78	0.00	1.13	V	63.91	73.98	10.07	PK
2483.5	47.91	0.11	1.13	V	49.15	53.98	4.83	AV

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2472 MHz
Channel No.	13 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2484 *	59.12	0.00	1.13	H	60.25	73.98	13.73	PK
2484 *	49.21	0.11	1.13	H	50.45	53.98	3.53	AV
2485 *	57.17	0.00	1.13	H	58.30	73.98	15.68	PK
2485 *	48.05	0.11	1.13	H	49.29	53.98	4.69	AV
2485.5~2500	43.81	0.00	1.13	H	44.94	73.98	29.04	PK
2485.5~2500	42.47	0.11	1.13	H	43.71	53.98	10.27	AV

Note:

* : Procedure 11.13.3 (Integration method) in ANSI 63.10-2013

Operation Mode: 802.11n (HT20)

Transfer MCS Index: 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. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	65.58	0.00	0.85	H	66.43	73.98	7.55	PK
2390.0	50.64	0.12	0.85	H	51.61	53.98	2.37	AV
2390.0	61.94	0.00	0.85	V	62.79	73.98	11.19	PK
2390.0	49.88	0.12	0.85	V	50.85	53.98	3.13	AV
2483.5	61.16	0.00	1.13	H	62.29	73.98	11.69	PK
2483.5	49.11	0.12	1.13	H	50.36	53.98	3.62	AV
2483.5	58.94	0.00	1.13	V	60.07	73.98	13.91	PK
2483.5	47.86	0.12	1.13	V	49.11	53.98	4.87	AV

Operation Mode: 802.11n (HT20)

Transfer MCS Index: 0

Operating Frequency: 2417 MHz

Channel No. 02 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2390.0	58.19	0.00	0.85	H	59.04	73.98	14.94	PK
2390.0	45.60	0.12	0.85	H	46.57	53.98	7.41	AV
2390.0	57.70	0.00	0.85	V	58.55	73.98	15.43	PK
2390.0	44.87	0.12	0.85	V	45.84	53.98	8.15	AV

Operation Mode: 802.11n(HT20)

Transfer MCS Index: 0

Operating Frequency 2467 MHz

Channel No. 12 Ch

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	64.60	0.00	1.13	H	65.73	73.98	8.25	PK
2483.5	50.02	0.12	1.13	H	51.27	53.98	2.71	AV
2483.5	63.42	0.00	1.13	V	64.55	73.98	9.43	PK
2483.5	48.91	0.12	1.13	V	50.16	53.98	3.83	AV

Operation Mode: 802.11n(HT20)

Transfer MCS Index: 0

Operating Frequency 2472 MHz

Channel No. 13 Ch

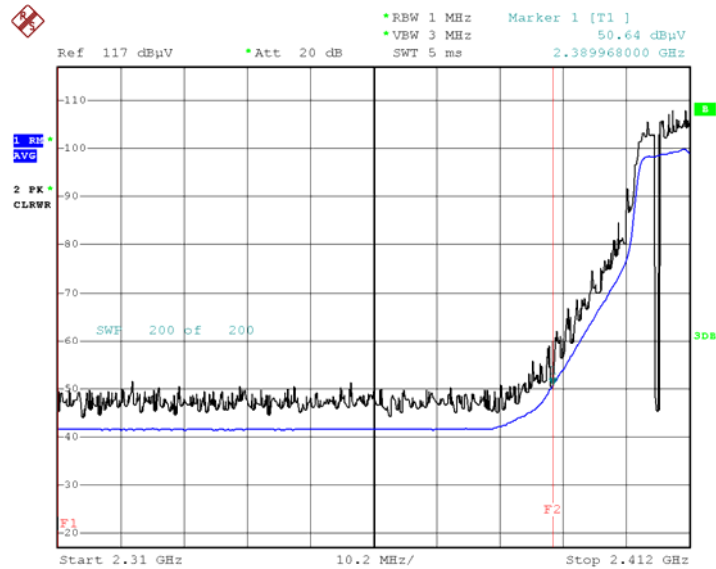
Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2484 *	59.20	0.00	1.13	H	60.33	73.98	13.65	PK
2484 *	49.31	0.12	1.13	H	50.56	53.98	3.42	AV
2485 *	57.27	0.00	1.13	H	58.40	73.98	15.58	PK
2485 *	48.08	0.12	1.13	H	49.33	53.98	4.65	AV
2485.5~2500	53.87	0.00	1.13	H	55.00	73.98	18.98	PK
2485.5~2500	42.83	0.12	1.13	H	44.08	53.98	9.90	AV

Note:

* : Procedure 11.13.3 (Integration method) in ANSI 63.10-2013

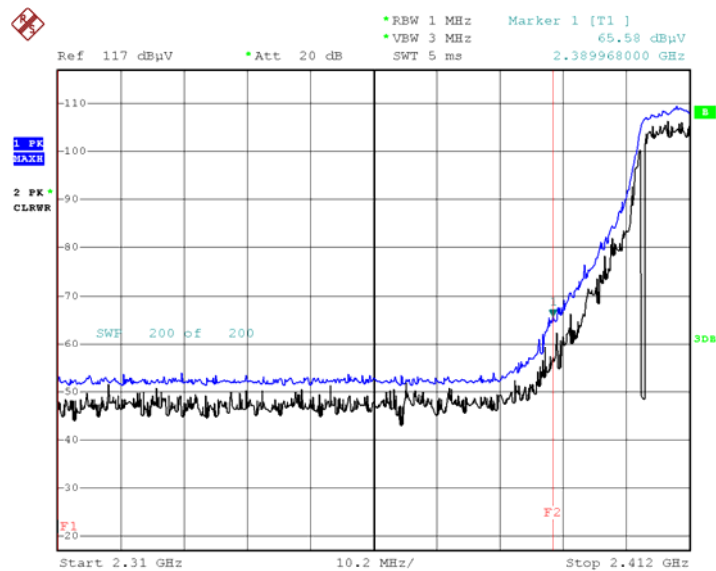
■ Test Plots

Radiated Restricted Band Edges plot – Average Reading (802.11n_HT20, Ch.1)



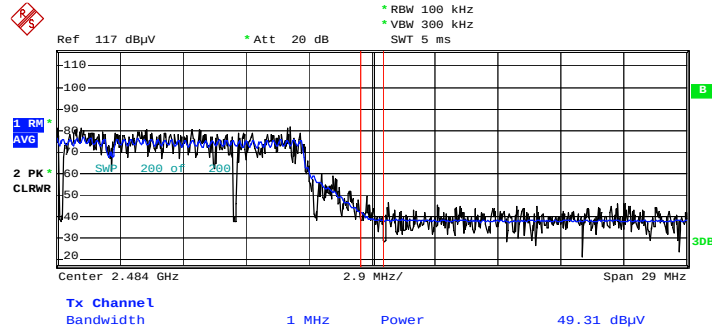
Date: 4.MAR.2019 13:42:55

Radiated Restricted Band Edges plot – Peak Reading (802.11n_HT20, Ch.1)



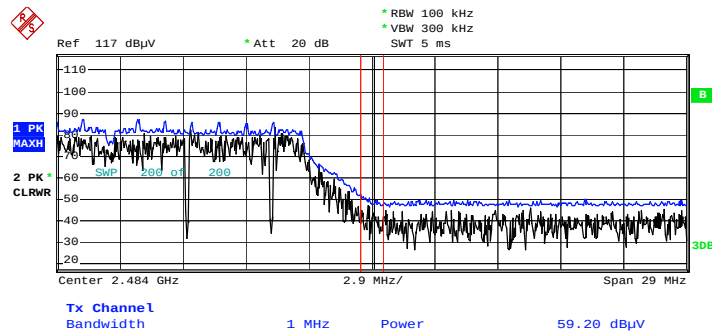
Date: 4.MAR.2019 13:43:39

Radiated Restricted Band Edges plot – Average Reading (802.11n_HT20, Ch.13) – 2 484 MHz



Date: 7.MAR.2019 17:21:47

Radiated Restricted Band Edges plot – Peak Reading (802.11n_HT20, Ch.13) – 2 484 MHz



Date: 7.MAR.2019 17:24:22

Note:

Plot of worst case are only reported.

9.8 RECEIVER SPURIOUS EMISSIONS

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.

Frequency Range : Above 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							

9.9 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

Test

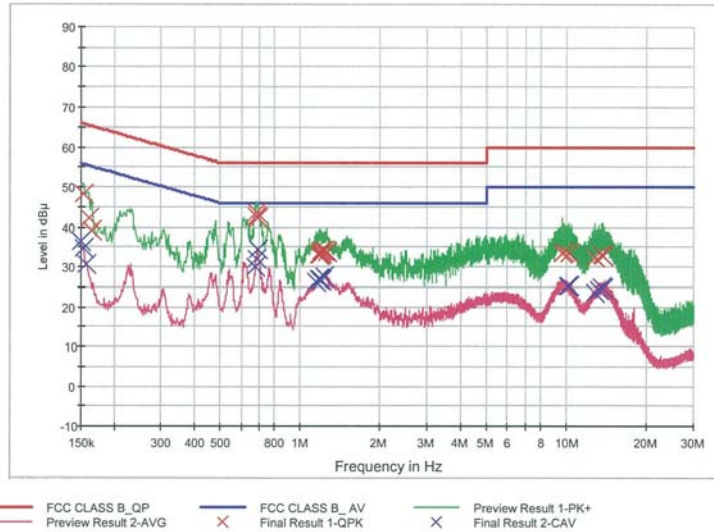
1 / 2

HCT TEST Report

Common Information

EUT: SM-T725
Manufacturer: SAMSUNG
Test Site: SHIELD ROOM
Operating Conditions: 2.4G WLAN_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154000	48.3	9.000	Off	L1	9.7	17.5	65.8
0.160000	42.2	9.000	Off	L1	9.7	23.3	65.5
0.164000	39.1	9.000	Off	L1	9.7	26.1	65.3
0.684000	42.5	9.000	Off	L1	9.8	13.5	56.0
0.690000	43.4	9.000	Off	L1	9.8	12.6	56.0
0.696000	42.1	9.000	Off	L1	9.8	13.9	56.0
1.176000	32.9	9.000	Off	L1	9.8	23.1	56.0
1.194000	33.0	9.000	Off	L1	9.8	23.0	56.0
1.200000	33.3	9.000	Off	L1	9.8	22.7	56.0
1.206000	34.2	9.000	Off	L1	9.8	21.8	56.0
1.232000	34.0	9.000	Off	L1	9.8	22.0	56.0
1.258000	33.6	9.000	Off	L1	9.9	22.4	56.0
9.614000	33.5	9.000	Off	L1	10.2	26.5	60.0
9.740000	33.6	9.000	Off	L1	10.2	26.4	60.0
10.172000	33.3	9.000	Off	L1	10.2	26.7	60.0
12.774000	32.2	9.000	Off	L1	10.3	27.8	60.0
13.552000	32.9	9.000	Off	L1	10.4	27.1	60.0
13.772000	32.9	9.000	Off	L1	10.4	27.1	60.0

Test

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	36.3	9.000	Off	L1	9.7	19.7	56.0
0.154000	34.6	9.000	Off	L1	9.7	21.2	55.8
0.158000	30.6	9.000	Off	L1	9.7	25.0	55.6
0.680000	30.1	9.000	Off	L1	9.8	15.9	46.0
0.684000	32.1	9.000	Off	L1	9.8	13.9	46.0
0.692000	34.5	9.000	Off	L1	9.8	11.5	46.0
1.152000	26.3	9.000	Off	L1	9.8	19.7	46.0
1.176000	26.8	9.000	Off	L1	9.8	19.2	46.0
1.194000	26.9	9.000	Off	L1	9.8	19.1	46.0
1.200000	26.5	9.000	Off	L1	9.8	19.5	46.0
1.234000	27.7	9.000	Off	L1	9.8	18.3	46.0
1.238000	27.7	9.000	Off	L1	9.9	18.3	46.0
10.148000	25.2	9.000	Off	L1	10.2	24.8	50.0
10.172000	25.1	9.000	Off	L1	10.2	24.9	50.0
12.774000	23.5	9.000	Off	L1	10.3	26.5	50.0
13.260000	24.1	9.000	Off	L1	10.3	25.9	50.0
13.552000	24.9	9.000	Off	L1	10.4	25.1	50.0
13.772000	24.6	9.000	Off	L1	10.4	25.4	50.0

Conducted Emissions (Line 2)

2.4G WLAN N

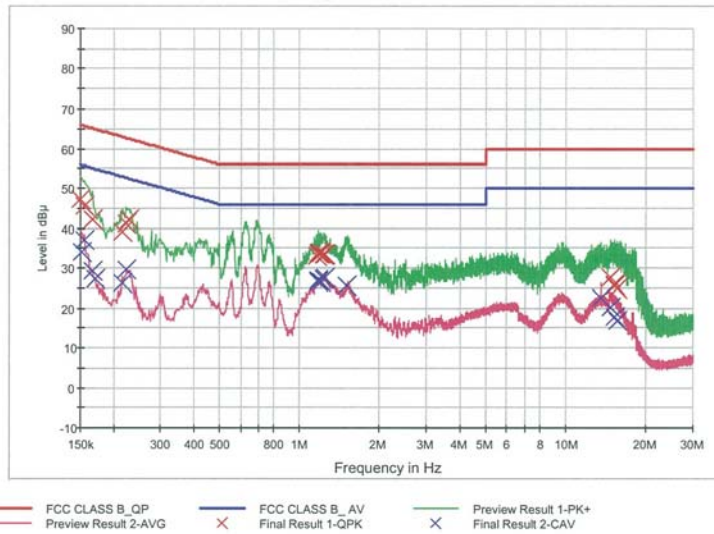
1 / 2

HCT TEST Report

Common Information

EUT: SM-T725
Manufacturer: SAMSUNG
Test Site: SHIELD ROOM
Operating Conditions: 2.4G WLAN_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	47.4	9.000	Off	N	9.8	18.6	66.0
0.156000	45.5	9.000	Off	N	9.8	20.2	65.7
0.166000	42.2	9.000	Off	N	9.8	22.9	65.2
0.216000	39.2	9.000	Off	N	9.9	23.8	63.0
0.222000	41.3	9.000	Off	N	9.9	21.4	62.7
0.228000	42.1	9.000	Off	N	9.9	20.4	62.5
1.168000	32.9	9.000	Off	N	10.0	23.1	56.0
1.182000	33.6	9.000	Off	N	10.0	22.4	56.0
1.188000	33.9	9.000	Off	N	10.0	22.1	56.0
1.210000	33.6	9.000	Off	N	10.0	22.4	56.0
1.238000	33.5	9.000	Off	N	10.0	22.5	56.0
1.246000	33.5	9.000	Off	N	10.0	22.5	56.0
14.624000	27.6	9.000	Off	N	10.7	32.4	60.0
15.148000	26.0	9.000	Off	N	10.7	34.0	60.0
15.220000	25.6	9.000	Off	N	10.7	34.4	60.0
15.224000	25.5	9.000	Off	N	10.7	34.5	60.0
15.258000	25.7	9.000	Off	N	10.7	34.3	60.0
15.544000	25.0	9.000	Off	N	10.7	35.0	60.0

2.4G WLAN N

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	33.9	9.000	Off	N	9.8	22.0	55.9
0.156000	37.0	9.000	Off	N	9.8	18.7	55.7
0.166000	29.3	9.000	Off	N	9.8	25.9	55.2
0.170000	27.2	9.000	Off	N	9.8	27.8	55.0
0.216000	26.2	9.000	Off	N	9.9	26.8	53.0
0.224000	29.6	9.000	Off	N	9.9	23.0	52.7
1.174000	26.8	9.000	Off	N	10.0	19.2	46.0
1.182000	26.6	9.000	Off	N	10.0	19.4	46.0
1.210000	26.7	9.000	Off	N	10.0	19.3	46.0
1.236000	27.4	9.000	Off	N	10.0	18.6	46.0
1.246000	27.5	9.000	Off	N	10.0	18.5	46.0
1.504000	25.6	9.000	Off	N	10.1	20.4	46.0
13.522000	22.5	9.000	Off	N	10.6	27.5	50.0
14.624000	20.1	9.000	Off	N	10.7	29.9	50.0
15.220000	17.9	9.000	Off	N	10.7	32.1	50.0
15.224000	17.9	9.000	Off	N	10.7	32.1	50.0
15.258000	17.8	9.000	Off	N	10.7	32.2	50.0
15.544000	16.7	9.000	Off	N	10.7	33.3	50.0

10. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/12/2018	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/27/2018	Annual	100033
ESPACE	SU-642 / Temperature Chamber	03/30/2018	Annual	0093008124
Agilent	N9020A / Signal Analyzer	06/08/2018	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/20/2018	Annual	MY49431210
Agilent	N1911A / Power Meter	04/16/2018	Annual	MY45100523
Agilent	N1921A / Power Sensor	04/16/2018	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/20/2018	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	06/07/2018	Annual	05001
Hewlett Packard	E3632A / DC Power Supply	06/26/2018	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	07/10/2018	Annual	07560
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	05/17/2018	Annual	100422

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
Rohde & Schwarz	Loop Antenna	08/23/2018	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	VULB 9168 / Hybrid Antenna	08/09/2018	Annual	3368
Schwarzbeck	BBHA 9120D / Horn Antenna	06/30/2017	Biennial	1300
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 40 GHz) / Spectrum Analyzer	07/24/2018	Annual	100843
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	01/03/2019	Annual	F6
Wainwright Instruments	WHFX7.0/18G-8SS / High Pass Filter	05/09/2018	Annual	29
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/29/2018	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2019	Annual	2
Weinschel	2-3 / Attenuator (3 dB)	10/10/2018	Annual	BR0617
H+S	5910-N-50-010 / Attenuator(10 dB)	11/08/2018	Annual	NONE
CERNEX	CBLU1183540B-01 / Power Amplifier	12/21/2018	Annual	25540
CERNEX	CBL06185030 / Power Amplifier	03/28/2018	Annual	28550
CERNEX	CBL18265035 / Power Amplifier	01/03/2019	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/29/2018	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	03/27/2018	Annual	3000C000276

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.

11. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-1903-FI012-P