

FCC DTS REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: January 06, 2022
Address: 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea	Test Site/Location: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
	Report No.: HCT-RF-2201-FC038

FCC ID:	A3LSMA336M
APPLICANT:	SAMSUNG Electronics Co., Ltd.
Model:	SM-A336M/DSN
Additional Model:	SM-A336M
EUT Type:	Mobile Phone
Average Output Power:	802.11b : 19.05 dBm, 802.11g : 16.56 dBm, 802.11n(HT20) : 17.30 dBm
Frequency Range:	2 412 MHz ~ 2 472 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.

Report No.: HCT-RF-2201-FC038

REVIEWED BY



Report prepared by : Sang Hoon Lee
Engineer of Telecommunication Testing Center

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

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 (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2201-FC038	January 06, 2022	- First Approval Report

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1. EUT DESCRIPTION

Model	SM-A336M/DSN	
Additional Model	SM-A336M	
EUT Type	Mobile Phone	
Power Supply	DC 3.86 V	
Frequency Range	2 412 MHz ~ 2 472 MHz	
Max. RF Output Power	Peak Power (For information only)	802.11b : 24.98 dBm 802.11g : 25.27 dBm 802.11n(HT20) : 25.61 dBm
	Average Power	802.11b : 19.05 dBm 802.11g : 16.56 dBm 802.11n(HT20) : 17.30 dBm
Modulation Type	DSSS/CCK : 802.11b OFDM : 802.11g, 802.11n	
Number of Channels	13 Channels	
Date(s) of Tests	December 08, 2021 ~ January 06, 2022	
Serial number	Radiated : R3CRA0TYEFE Conducted: 5b225620bb337ece	

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 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.

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 30 MHz 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 1 GHz. Above 1 GHz with 1.5 m 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.

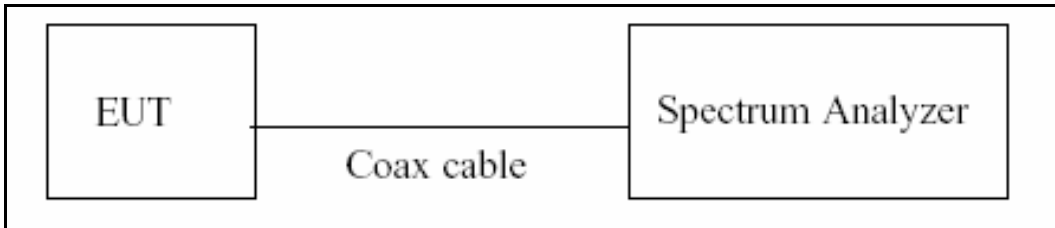
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (Confidence level about 95 %, $k=2$)

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 $> 50/T$.

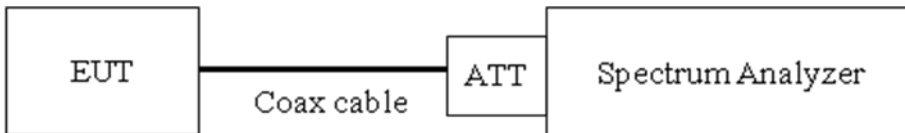
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (\geq RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = $10\log(1/\text{Duty Cycle})$

7.2. 6 dB 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 $\geq 3 \times$ 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.

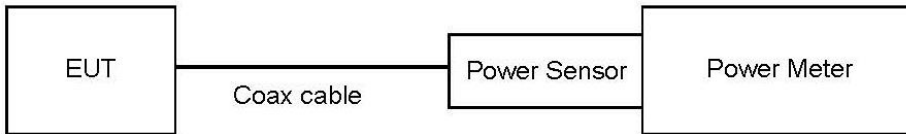
Note : We tested OBW using the automatic bandwidth measurement capability of a spectrum analyzer.

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

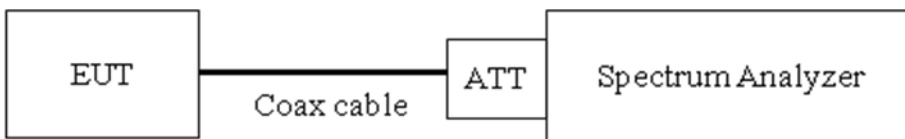
- Conducted Output Power(Peak) = Measured Level + ATT loss + Cable loss
- Conducted Output Power(Average) = Measured Level + ATT loss + Cable loss + Duty Cycle Factor

7.4. Power Spectral Density

Limit

The transmitter power density average over 1-second interval shall not be greater than 8 dBm in any 3 kHz 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) $RBW = 3 \text{ kHz} \leq RBW \leq 100 \text{ kHz}$.
- 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.
- 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 = Measured Level + ATT loss + Cable loss + Duty Cycle Factor

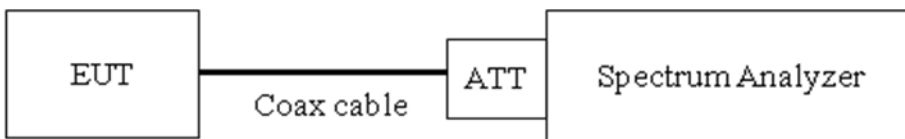
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

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 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 $\geq 2 \times$ 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	20.04
100	20.09
200	20.13
300	20.19
400	20.22
500	20.23
600	20.23
700	20.25
800	20.27
900	20.29
1000	20.31
2000	20.46
2400	20.52
2480	20.52
2500	20.52
3000	20.57
4000	20.67
5000	20.75
5150	20.77
5850	20.82
6000	20.82
7000	20.91
8000	20.98
9000	21.05
10 000	21.12
11 000	21.16
12 000	21.24
13 000	21.32
14 000	21.30
15 000	21.32
16 000	21.37
17 000	21.41
18 000	21.47
19 000	21.50
20 000	21.56
21 000	21.77
22 000	21.74
23 000	21.94
24 000	21.77

Note : 1. 2 400 ~ 2 500 MHz is fundamental frequency range.

2. Factor = Attenuator loss(20 dB) + Cable loss(1ea) + EUT Cable loss

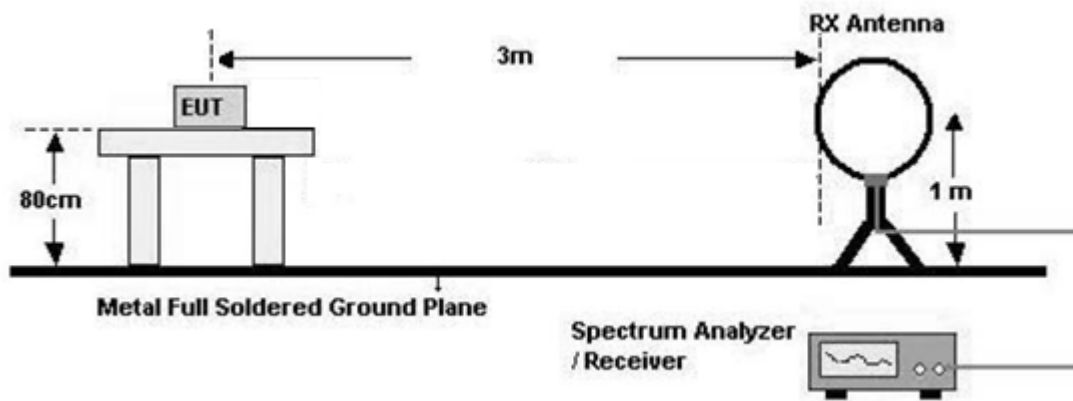
7.6. Radiated Test

Limit

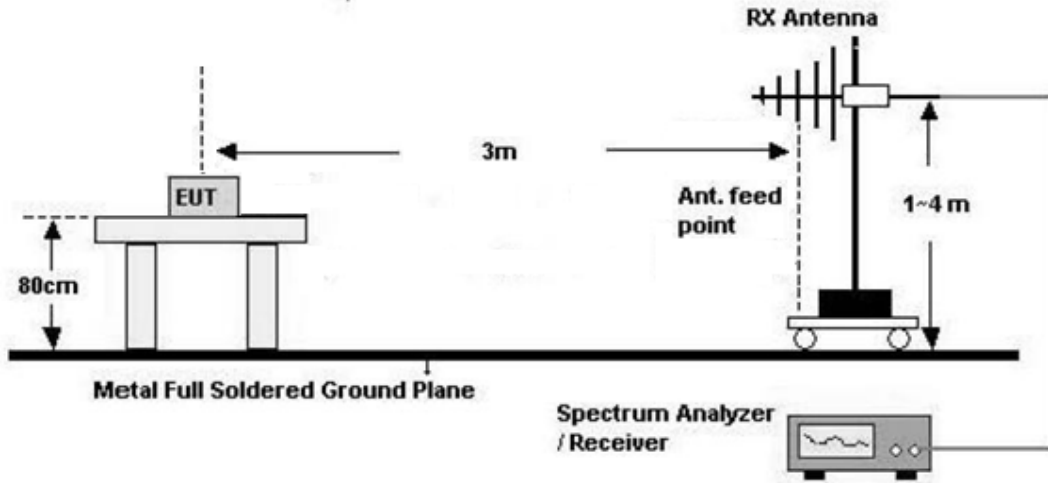
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

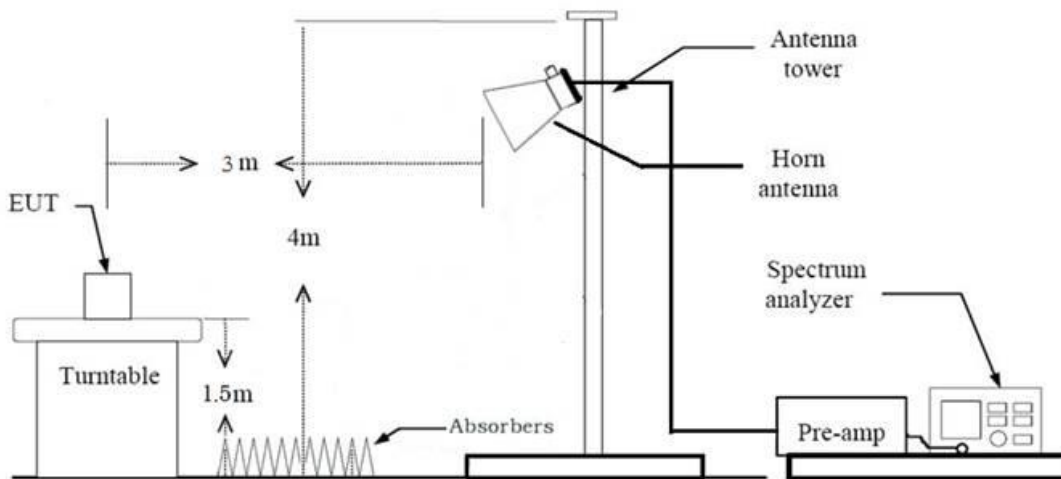
Below 30 MHz



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 3 m from the EUT
3. The EUT is placed on a turntable, which is 0.8 m 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) = $40\log(3\text{ m}/300\text{ m}) = - 80\text{ dB}$
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3\text{ m}/30\text{ m}) = - 40\text{ dB}$
Measurement Distance : 3 m
8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW $\geq 3 \times$ RBW
9. Total = Measured Level + 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 1 GHz)

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 0.8 m above ground plane.
3. The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m 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 \geq 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 = Measured Level + 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 1 m to 4 m 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 $\geq 3 \times$ 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 % 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 = $20\log$ (test distance / specific distance) (dB)

11. Total(Measurement Type : Peak)

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

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

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

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

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

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 1 m to 4 m 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 $\geq 3 \times$ 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 $\geq 3 \times$ 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 : 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 % 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 = $20\log(\text{test distance} / \text{specific distance})$ (dB)

11. Total(Measurement Type : Peak)

= Measured Level + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

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

= Measured Level + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

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

= Measured Level + Antenna Factor(A.F) + Cable Loss(C.L) + 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 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 ^(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) = Measured Level + 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 : Z
 - Radiated Restricted Band Edge : X
3. Duty cycle factor applies only 802.11g/n/ac (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 : 1 Mbps
 - 802.11g : 6 Mbps
 - 802.11n(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
6. SM-A336M/DSN, SM-A336Mwere tested and the worst case results are reported.
(Worst case : SM-A336M/DSN)

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
2. SM-A336M/DSN, SM-A336Mwere tested and the worst case results are reported.
(Worst case : SM-A336M/DSN)

Conducted test

1. The EUT was configured with data rate of highest power.
2. SM-A336M/DSN, SM-A336Mwere tested and the worst case results are reported.
(Worst case : SM-A336M/DSN)

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

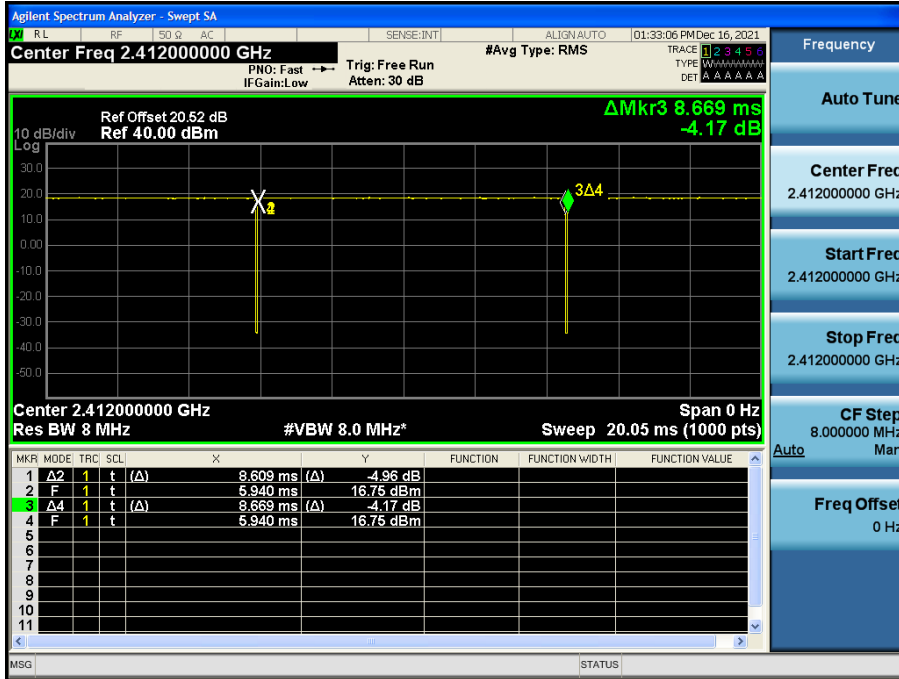
9. TEST RESULT

9.1 DUTY CYCLE

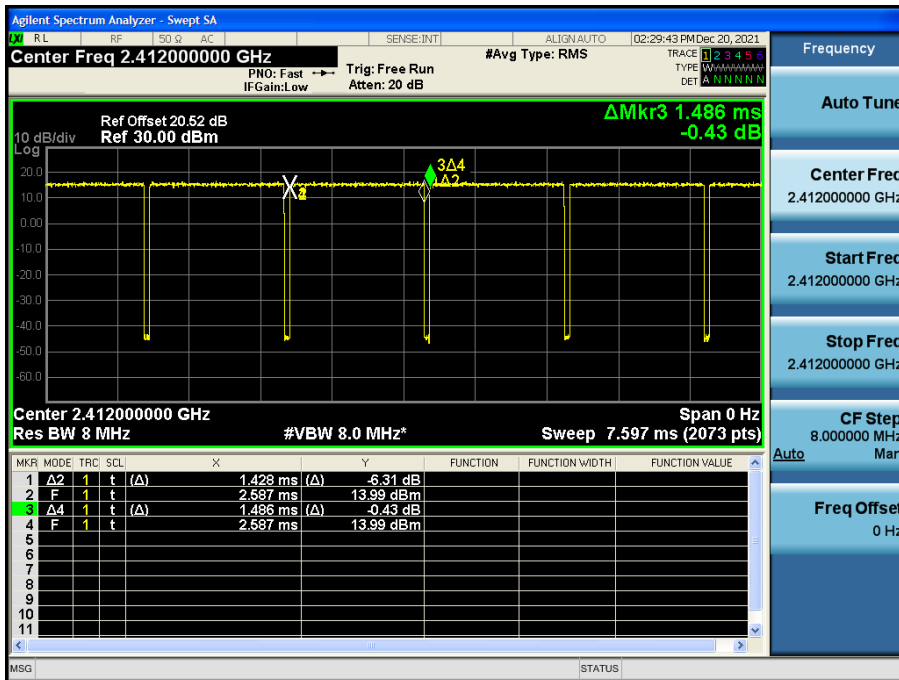
Mode	Data Rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11b	1	8.609	8.669	0.993	0.030
	2	4.308	4.356	0.989	0.049
	5.5	1.624	1.676	0.969	0.138
	11	0.855	0.911	0.939	0.275
802.11g	6	1.428	1.486	0.961	0.173
	9	0.959	1.015	0.945	0.246
	12	0.721	0.777	0.928	0.324
	18	0.487	0.546	0.892	0.495
	24	0.370	0.486	0.761	1.187
	36	0.254	0.371	0.685	1.641
	48	0.194	0.311	0.622	2.059
	54	0.178	0.295	0.604	2.188
802.11n (HT20)	6.5 (MCS0)	1.334	1.394	0.957	0.191
	13 (MCS1)	0.685	0.742	0.923	0.350
	19.5 (MCS2)	0.469	0.526	0.891	0.501
	26 (MCS3)	0.362	0.418	0.865	0.629
	39 (MCS4)	0.254	0.310	0.820	0.864
	52 (MCS5)	0.199	0.255	0.780	1.081
	58.5 (MCS6)	0.183	0.241	0.756	1.212
	65 (MCS7)	0.166	0.283	0.588	2.304

Test Plots

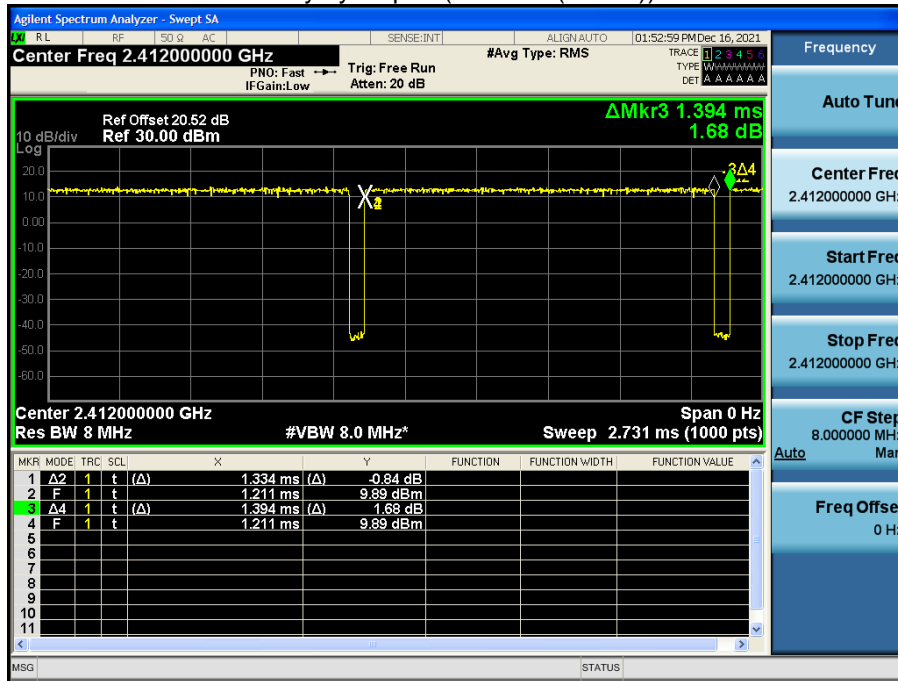
Duty cycle plot (802.11b(1 Mbps))



Duty cycle plot (802.11g(6 Mbps))



Duty cycle plot (802. 11n(MCS0))



Note:

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

9.2 6 dB BANDWIDTH

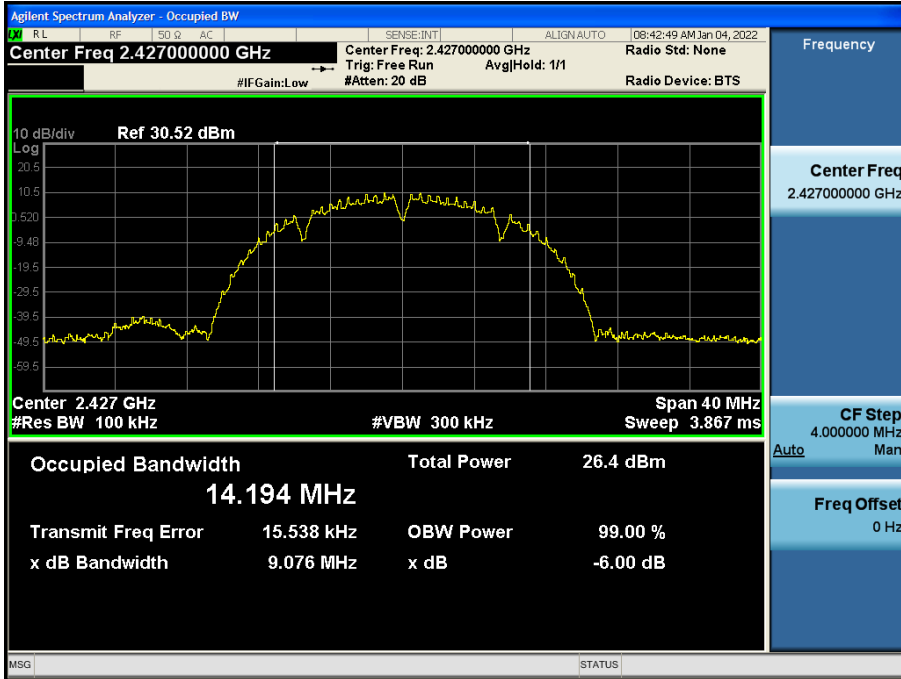
802.11b Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	9.580	0.5
2417	2	10.05	0.5
2422	3	9.573	0.5
2427	4	9.076	0.5
2432	5	9.576	0.5
2437	6	9.103	0.5
2462	11	9.592	0.5
2467	12	10.06	0.5
2472	13	9.555	0.5

802.11g Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	16.40	0.5
2437	6	16.38	0.5
2462	11	16.39	0.5
2467	12	16.38	0.5
2472	13	16.37	0.5

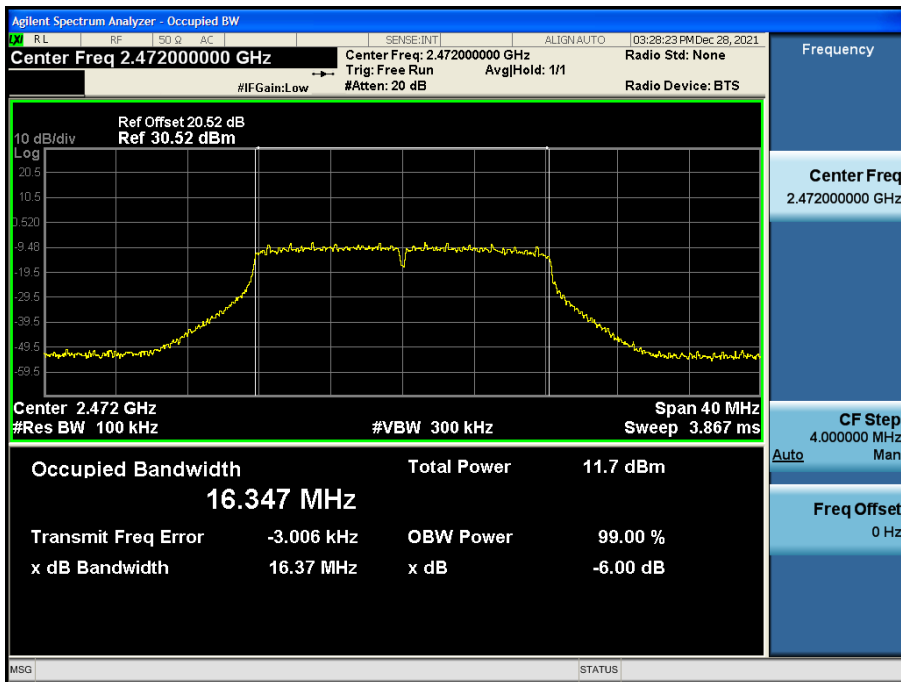
802.11n(HT20) Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	17.35	0.5
2437	6	17.56	0.5
2462	11	17.57	0.5
2467	12	17.56	0.5
2472	13	17.20	0.5

Test Plots

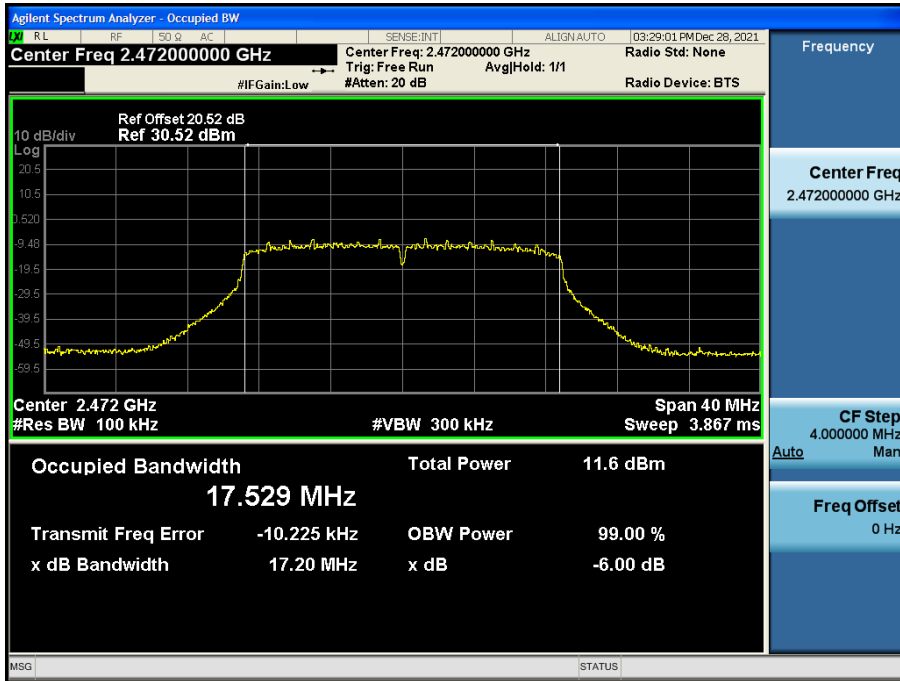
6 dB Bandwidth plot (802.11b-CH 4)



6 dB Bandwidth plot (802.11g-CH 13)



6 dB Bandwidth plot (802.11n_HT20-CH 13)



Note:

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

9.3 OUTPUT POWER

Peak Power

Power Meter offset

Attenuator loss(20 dB) + Cable loss + EUT Cable loss

802.11b Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	1	20.92	30
		2	21.11	30
		5.5	22.50	30
		11	24.15	30
2417	2	1	21.72	30
		2	21.93	30
		5.5	23.34	30
		11	24.98	30
2422	3	1	21.72	30
		2	21.89	30
		5.5	23.29	30
		11	24.90	30
2427	4	1	21.46	30
		2	21.71	30
		5.5	23.12	30
		11	24.77	30
2432	5	1	20.31	30
		2	20.55	30
		5.5	21.97	30
		11	23.59	30
2437	6	1	21.74	30
		2	21.93	30
		5.5	23.31	30
		11	24.91	30
2462	11	1	21.08	30
		2	21.30	30
		5.5	22.72	30
		11	24.33	30
2467	12	1	18.57	30
		2	18.75	30
		5.5	20.09	30
		11	21.67	30
2472	13	1	9.35	30
		2	9.64	30
		5.5	11.06	30
		11	12.63	30

802.11g Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	6	25.21	30
		9	25.27	30
		12	24.95	30
		18	25.18	30
		24	24.89	30
		36	24.76	30
		48	24.79	30
		54	25.02	30
2437	6	6	24.92	30
		9	24.88	30
		12	24.48	30
		18	24.74	30
		24	24.46	30
		36	24.29	30
		48	24.33	30
		54	24.59	30
2462	11	6	24.16	30
		9	24.27	30
		12	23.86	30
		18	24.05	30
		24	23.75	30
		36	23.58	30
		48	24.22	30
		54	24.54	30
2467	12	6	23.43	30
		9	23.41	30
		12	23.04	30
		18	23.26	30
		24	22.90	30
		36	22.74	30
		48	23.55	30
		54	23.83	30
2472	13	6	12.71	30
		9	12.68	30
		12	12.33	30
		18	12.53	30
		24	12.10	30
		36	11.94	30
		48	12.92	30
		54	13.20	30

802.11n(HT20) Mode		MCS Index	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	0	25.61	30
		1	25.32	30
		2	25.21	30
		3	24.64	30
		4	24.76	30
		5	24.71	30
		6	24.98	30
		7	24.93	30
2437	6	0	24.83	30
		1	24.66	30
		2	24.77	30
		3	24.21	30
		4	24.28	30
		5	24.28	30
		6	24.54	30
		7	24.43	30
2462	11	0	24.21	30
		1	24.02	30
		2	24.21	30
		3	23.59	30
		4	23.72	30
		5	24.19	30
		6	24.47	30
		7	24.37	30
2467	12	0	23.42	30
		1	23.26	30
		2	23.44	30
		3	22.78	30
		4	22.88	30
		5	23.46	30
		6	23.88	30
		7	23.71	30
2472	13	0	12.60	30
		1	12.47	30
		2	12.61	30
		3	11.95	30
		4	12.01	30
		5	12.90	30
		6	13.19	30
		7	13.05	30

Average Power

Power Meter offset Loss = Attenuator loss(20 dB) + Cable loss + EUT Cable loss

802.11b Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
2412	1	1	17.97	0.030	18.00	30
		2	17.87	0.049	17.92	30
		5.5	17.60	0.138	17.74	30
		11	17.41	0.275	17.68	30
2417	2	1	18.78	0.030	18.81	30
		2	18.75	0.049	18.79	30
		5.5	18.61	0.138	18.74	30
		11	18.48	0.275	18.76	30
2422	3	1	19.02	0.030	19.05	30
		2	18.79	0.049	18.84	30
		5.5	18.62	0.138	18.75	30
		11	18.53	0.275	18.80	30
2427	4	1	18.78	0.030	18.81	30
		2	18.75	0.049	18.80	30
		5.5	18.61	0.138	18.74	30
		11	18.50	0.275	18.77	30
2432	5	1	17.52	0.030	17.55	30
		2	17.48	0.049	17.53	30
		5.5	17.34	0.138	17.48	30
		11	17.19	0.275	17.47	30
2437	6	1	18.99	0.030	19.02	30
		2	18.91	0.049	18.96	30
		5.5	18.72	0.138	18.86	30
		11	18.64	0.275	18.92	30
2462	11	1	18.26	0.030	18.29	30
		2	18.21	0.049	18.26	30
		5.5	18.07	0.138	18.21	30
		11	17.94	0.275	18.21	30
2467	12	1	15.67	0.030	15.70	30
		2	15.57	0.049	15.62	30
		5.5	15.39	0.138	15.53	30
		11	15.23	0.275	15.51	30
2472	13	1	6.60	0.030	6.63	30
		2	6.52	0.049	6.57	30
		5.5	6.37	0.138	6.51	30
		11	6.21	0.275	6.49	30

802.11g Mode		Rate (Mbps)	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
2412	1	6	16.09	0.173	16.27	30
		9	16.03	0.246	16.28	30
		12	15.57	0.324	15.89	30
		18	15.13	0.495	15.62	30
		24	13.90	1.187	15.09	30
		36	13.38	1.641	15.02	30
		48	12.77	2.059	14.83	30
		54	12.53	2.188	14.72	30
2437	6	6	16.39	0.173	16.56	30
		9	16.25	0.246	16.50	30
		12	16.12	0.324	16.45	30
		18	15.94	0.495	16.44	30
		24	14.66	1.187	15.84	30
		36	14.26	1.641	15.90	30
		48	13.96	2.059	16.02	30
		54	13.87	2.188	16.06	30
2462	11	6	15.76	0.173	15.93	30
		9	15.59	0.246	15.84	30
		12	15.46	0.324	15.78	30
		18	15.28	0.495	15.77	30
		24	13.95	1.187	15.14	30
		36	13.56	1.641	15.20	30
		48	13.86	2.059	15.92	30
		54	13.77	2.188	15.96	30
2467	12	6	14.88	0.173	15.06	30
		9	14.76	0.246	15.01	30
		12	14.66	0.324	14.99	30
		18	14.49	0.495	14.98	30
		24	13.15	1.187	14.34	30
		36	12.76	1.641	14.40	30
		48	13.19	2.059	15.25	30
		54	13.09	2.188	15.27	30
2472	13	6	4.21	0.173	4.38	30
		9	4.08	0.246	4.33	30
		12	3.97	0.324	4.29	30
		18	3.80	0.495	4.30	30
		24	2.36	1.187	3.55	30
		36	1.99	1.641	3.64	30
		48	2.60	2.059	4.66	30
		54	2.53	2.188	4.71	30

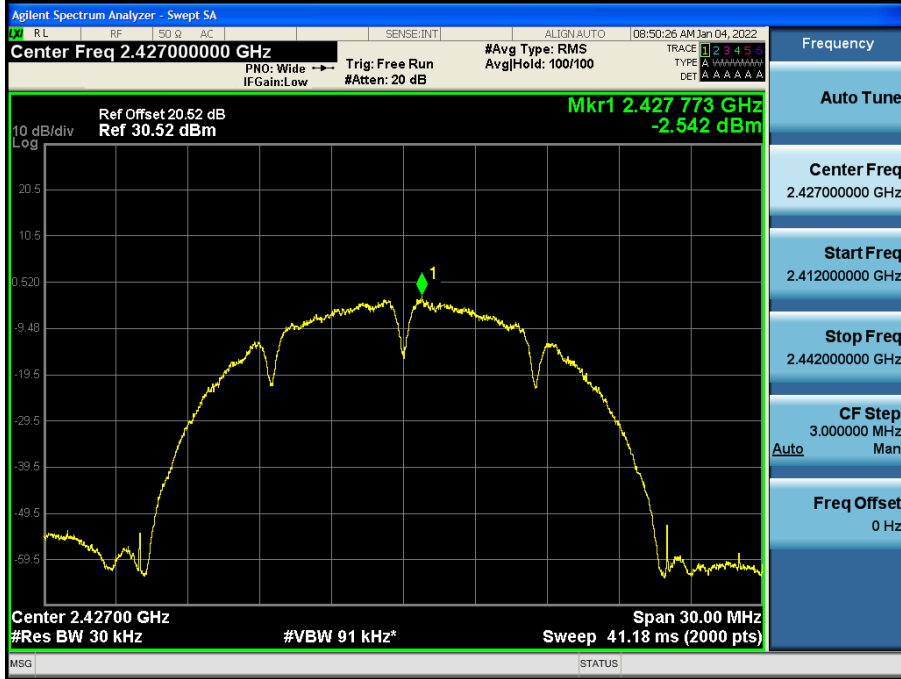
802.11n(HT20) Mode		MCS Index	Measured Power (dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
2412	1	0	17.11	0.191	17.30	30
		1	15.88	0.350	16.23	30
		2	15.42	0.501	15.92	30
		3	15.27	0.629	15.90	30
		4	13.92	0.864	14.78	30
		5	13.73	1.081	14.81	30
		6	13.31	1.212	14.52	30
		7	12.65	2.304	14.95	30
2437	6	0	16.22	0.191	16.41	30
		1	15.94	0.350	16.29	30
		2	15.77	0.501	16.27	30
		3	14.91	0.629	15.54	30
		4	14.19	0.864	15.06	30
		5	13.87	1.081	14.95	30
		6	13.80	1.212	15.01	30
		7	13.62	2.304	15.92	30
2462	11	0	15.64	0.191	15.83	30
		1	15.33	0.350	15.68	30
		2	15.15	0.501	15.66	30
		3	14.88	0.629	15.51	30
		4	13.75	0.864	14.62	30
		5	13.78	1.081	14.86	30
		6	13.73	1.212	14.94	30
		7	13.55	2.304	15.85	30
2467	12	0	14.87	0.191	15.07	30
		1	14.61	0.350	14.96	30
		2	14.41	0.501	14.92	30
		3	13.15	0.629	13.77	30
		4	12.81	0.864	13.67	30
		5	13.13	1.081	14.22	30
		6	13.11	1.212	14.32	30
		7	12.91	2.304	15.22	30
2472	13	0	4.15	0.191	4.34	30
		1	3.79	0.350	4.14	30
		2	3.65	0.501	4.15	30
		3	2.35	0.629	2.98	30
		4	1.96	0.864	2.82	30
		5	2.56	1.081	3.65	30
		6	2.51	1.212	3.72	30
		7	2.33	2.304	4.63	30

9.4 POWER SPECTRAL DENSITY

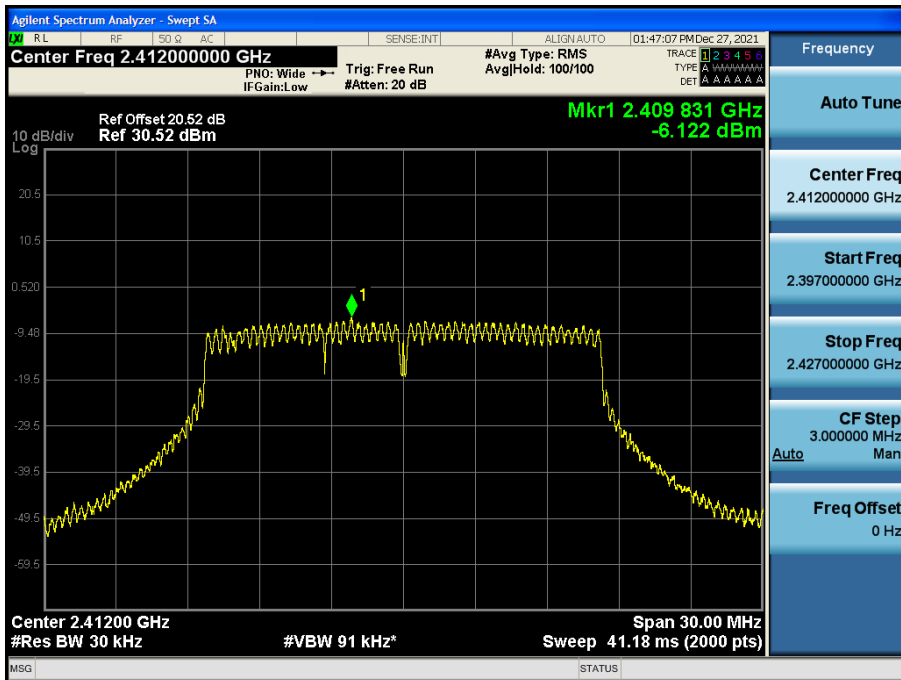
Mode	Frequency (MHz)	Channel No.	Test Result			Limit (dBm)
			Measured PSD (dBm)	Duty Cycle Factor	Measured PSD(dBm) + Duty Cycle Factor	
802.11b	2412	1	-2.517	0.030	-2.487	8 dBm / 3 kHz
	2417	2	-3.257	0.030	-2.264	
	2422	3	-3.275	0.030	-2.282	
	2427	4	-2.542	0.030	-1.549	
	2432	5	-4.402	0.030	-3.409	
	2437	6	-3.239	0.030	-3.209	
	2462	11	-3.633	0.030	-3.603	
	2467	12	-6.389	0.030	-6.359	
2472	13	-15.117	0.030	-15.087		
802.11g	2412	1	-6.122	0.173	-5.949	
	2437	6	-7.871	0.246	-7.625	
	2462	11	-9.453	2.188	-7.265	
	2467	12	-9.460	2.188	-7.272	
	2472	13	-20.617	2.188	-18.429	
802.11n(HT20)	2412	1	-6.767	0.191	-6.576	
	2437	6	-8.232	0.191	-8.041	
	2462	11	-9.186	2.304	-6.882	
	2467	12	-9.919	2.304	-7.615	
	2472	13	-20.150	2.304	-17.846	

Test Plots

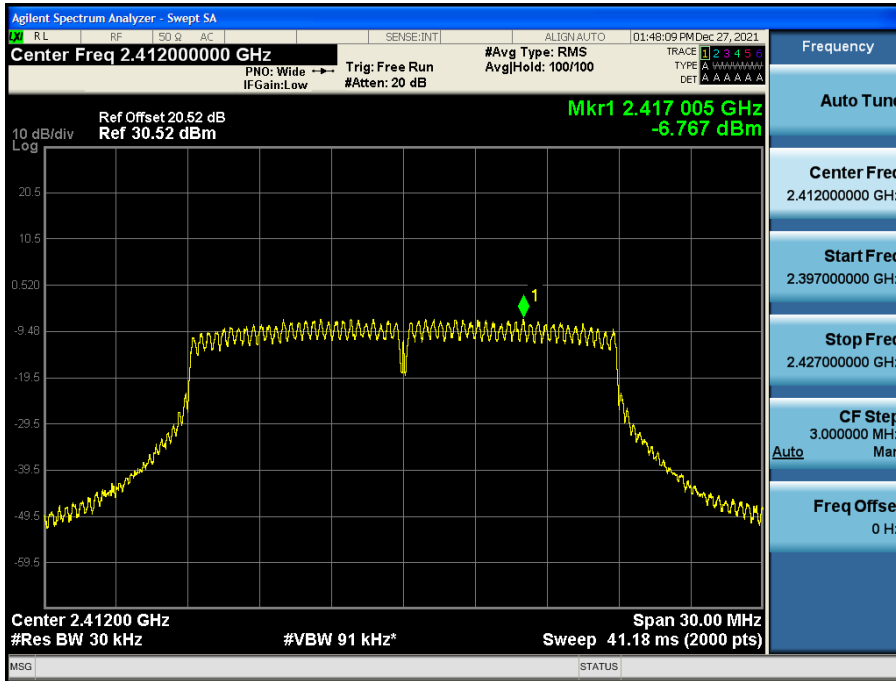
Power Spectral Density (802.11b-CH 4)



Power Spectral Density (802.11g-CH 1)



Power Spectral Density (802.11n_HT20-CH 1)



Note :

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

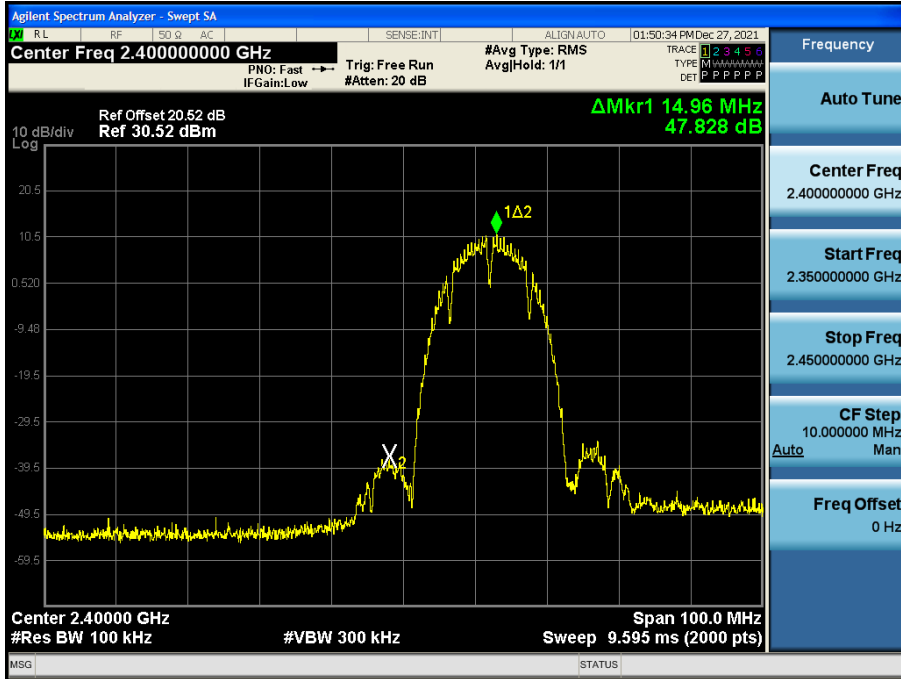
9.5 BAND EDGE / CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below.

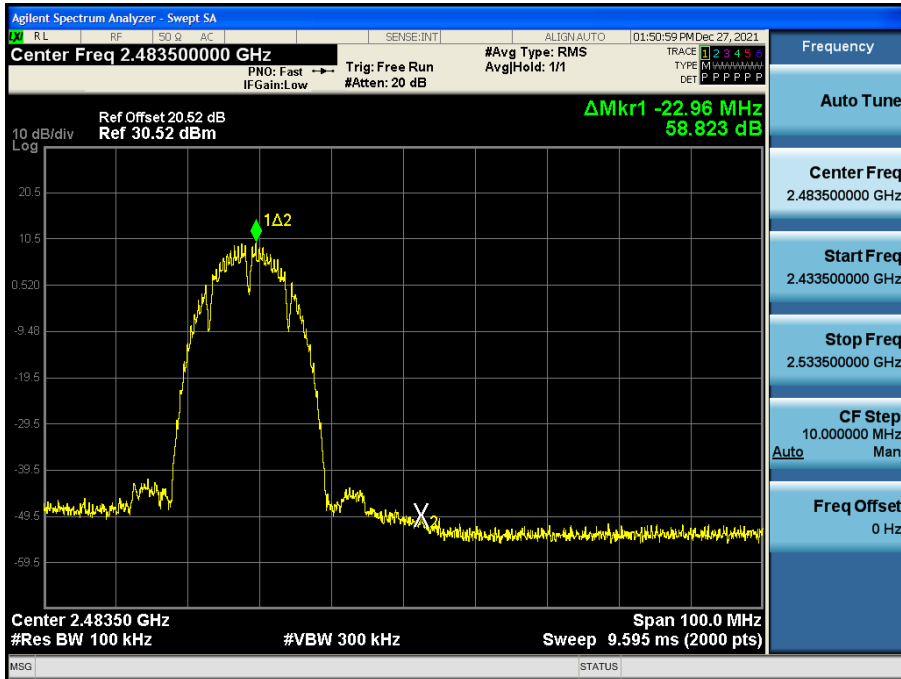
In order to simplify the report, attached plots were only the worst case channel and data rate.

▣ Test Plots(Band Edge)

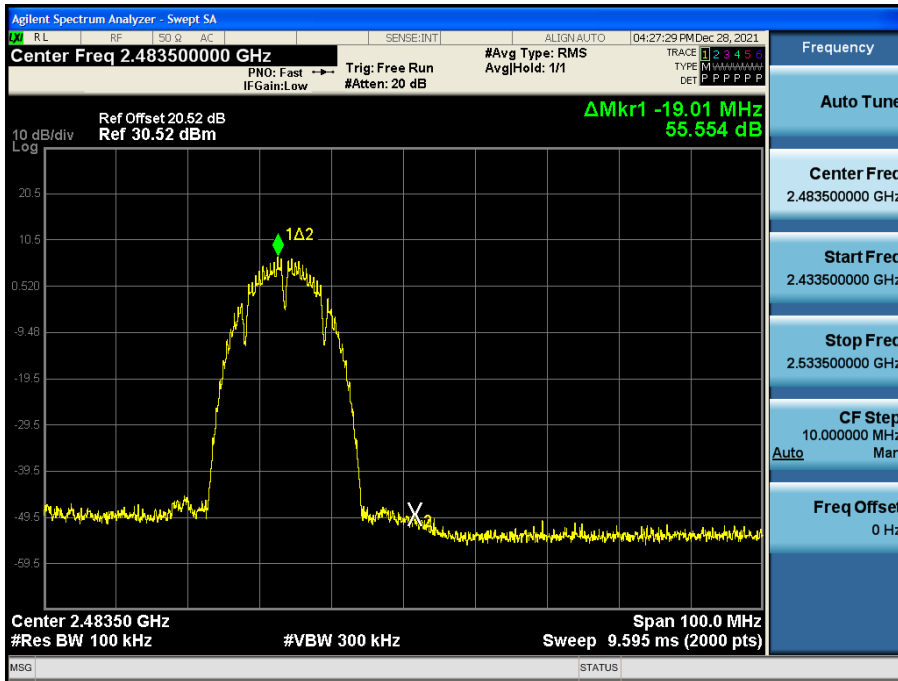
Band Edge (802.11b-CH1)



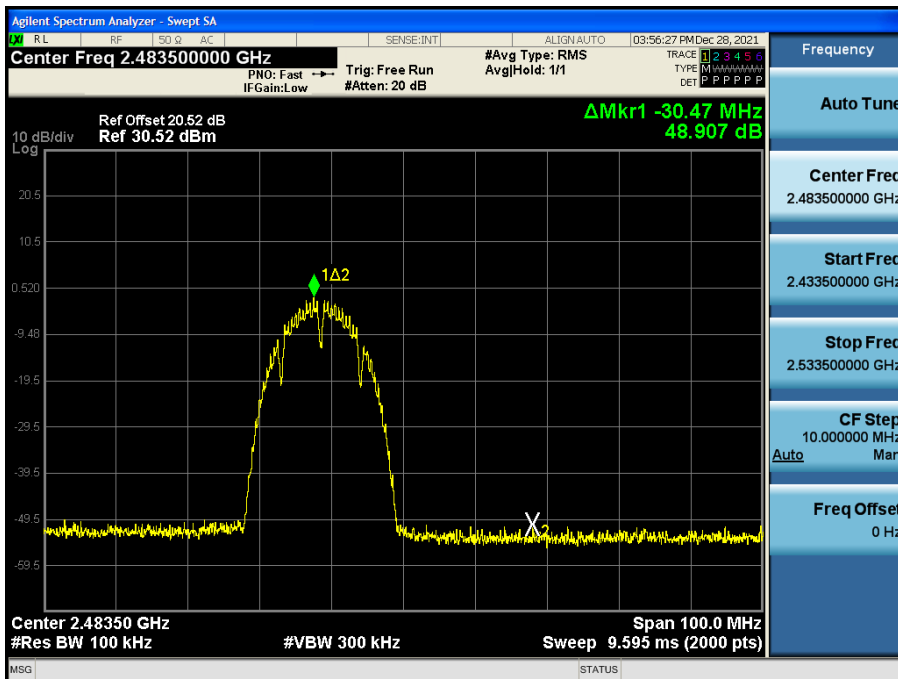
Band Edge (802.11b-CH11)



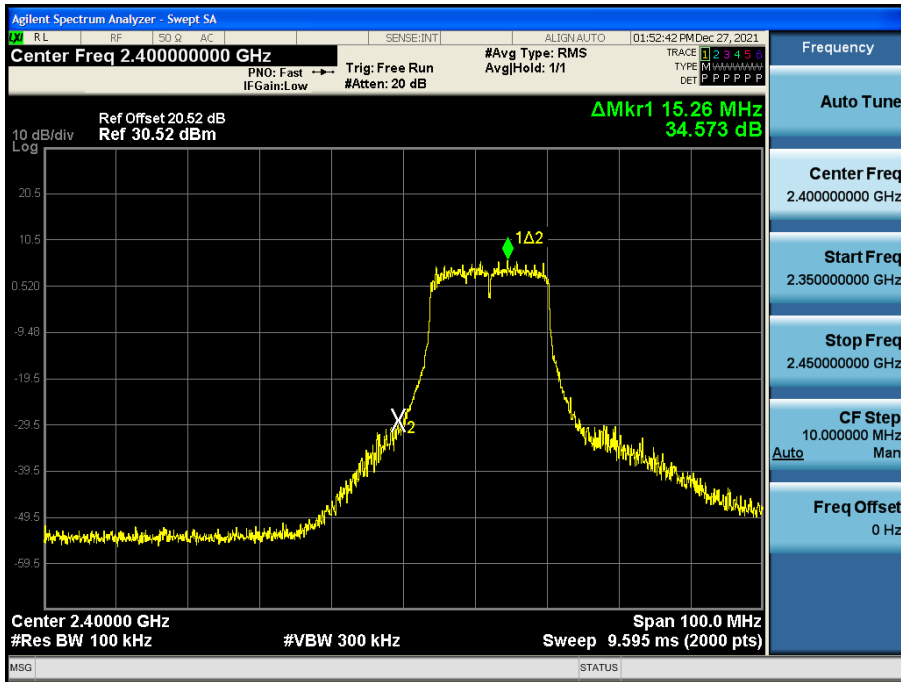
Band Edge (802.11b-CH12)



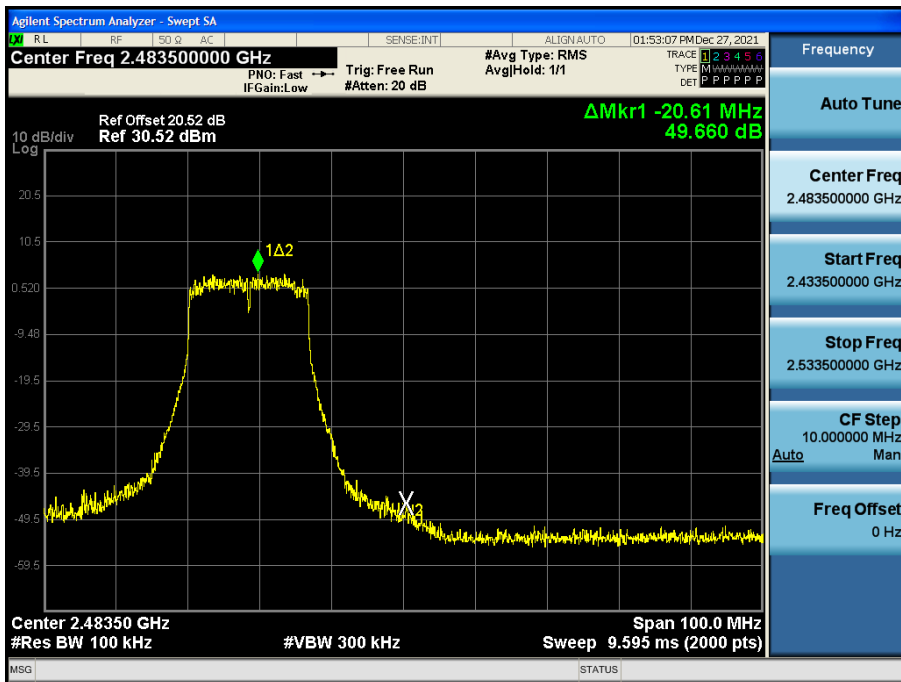
Band Edge (802.11b-CH13)



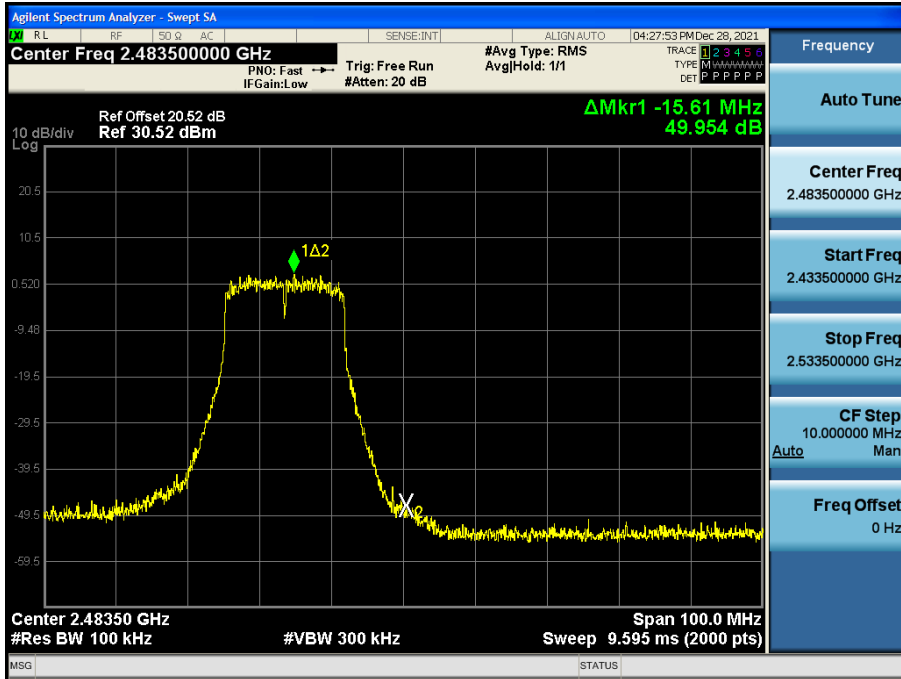
Band Edge (802.11g-CH1)



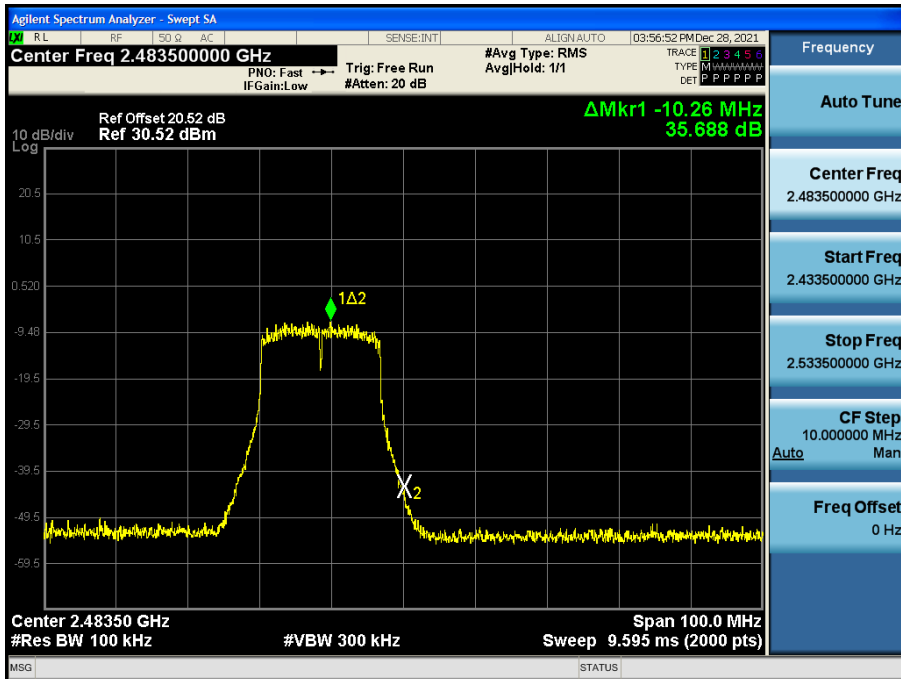
Band Edge (802.11g-CH11)



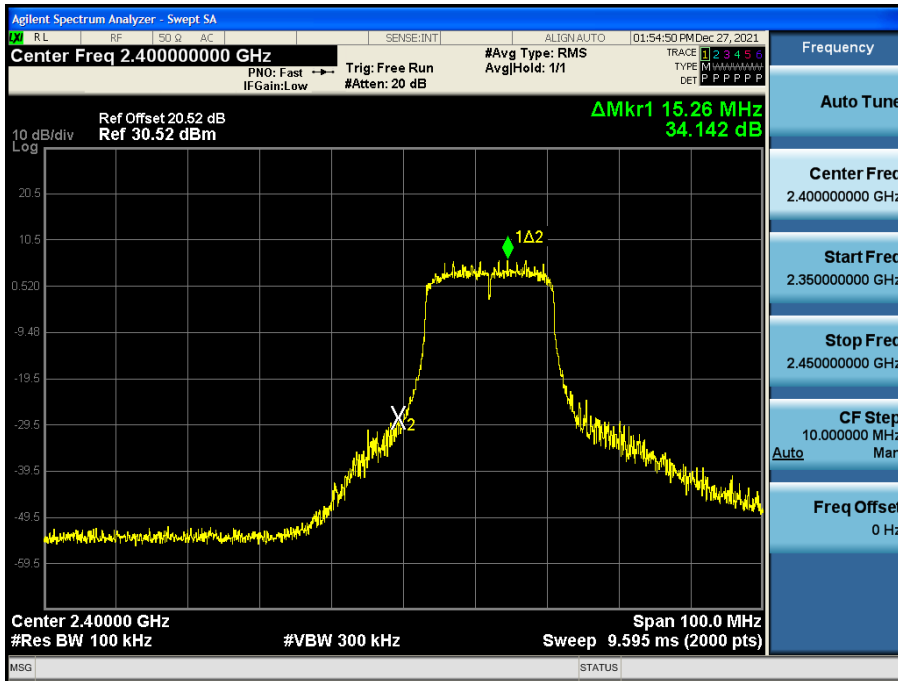
Band Edge (802.11g-CH12)



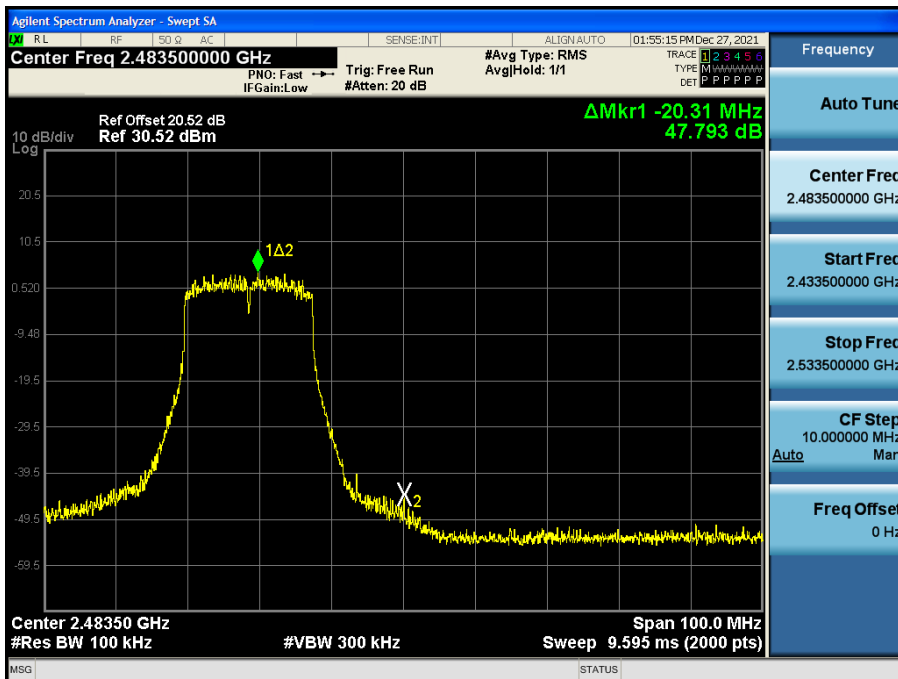
Band Edge (802.11g-CH13)



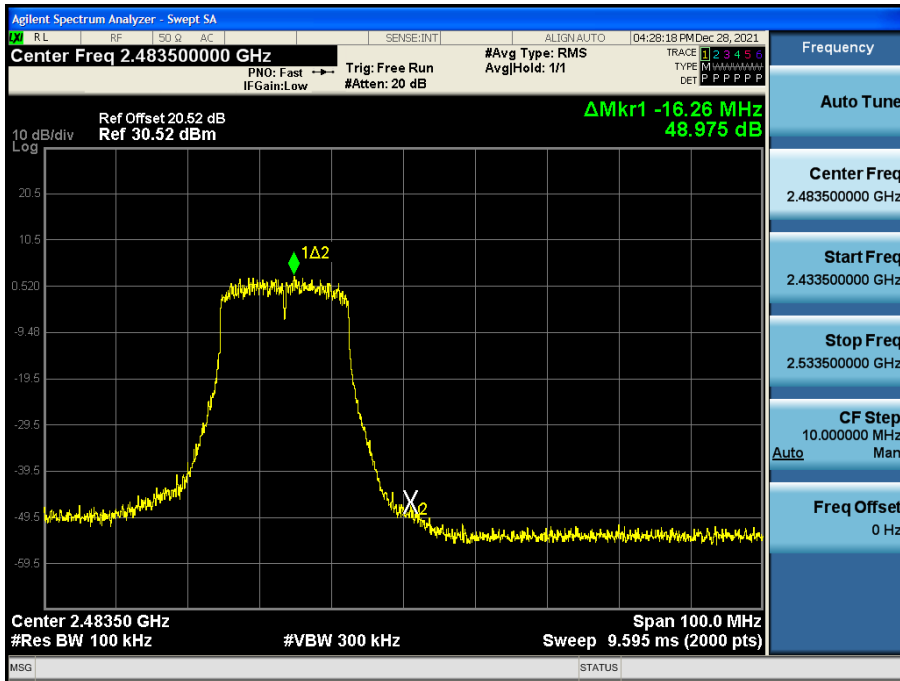
Band Edge (802.11n_HT20-CH1)



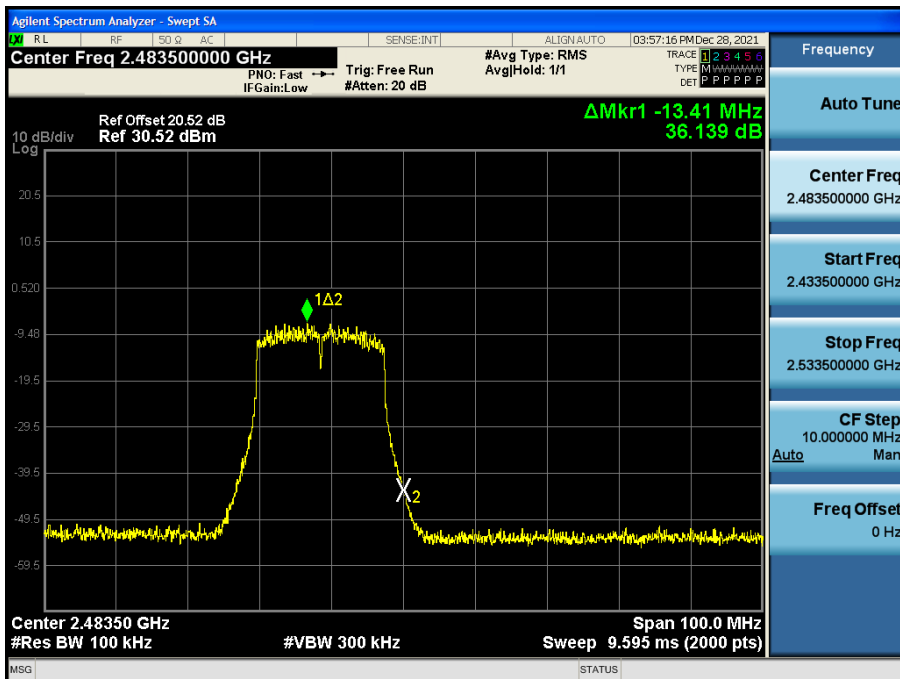
Band Edge (802.11n_HT20-CH11)



Band Edge (802.11n_HT20-CH12)



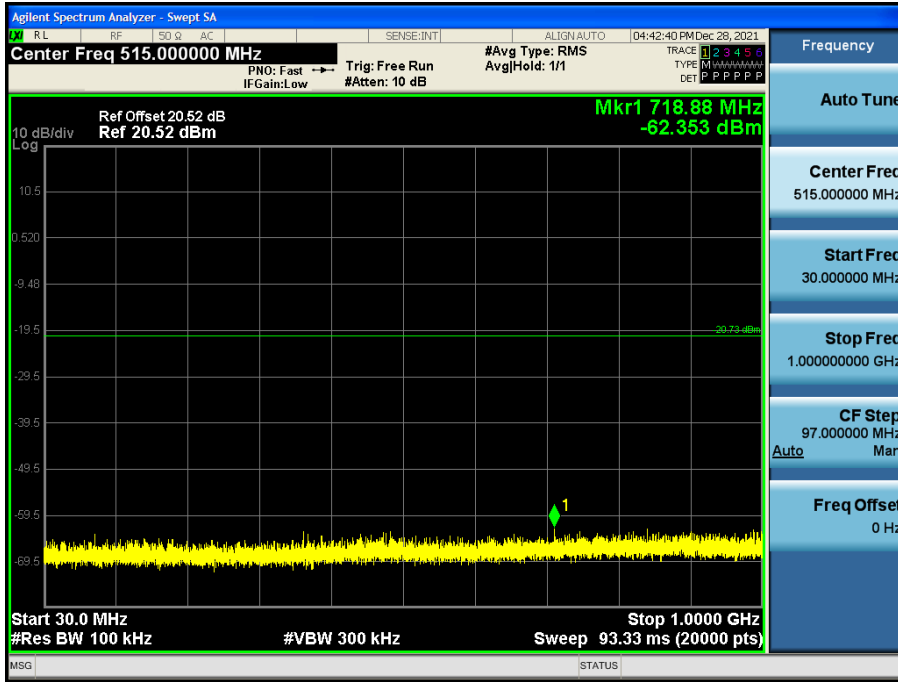
Band Edge (802.11n_HT20-CH13)



Test Plots(Conducted Spurious Emission)

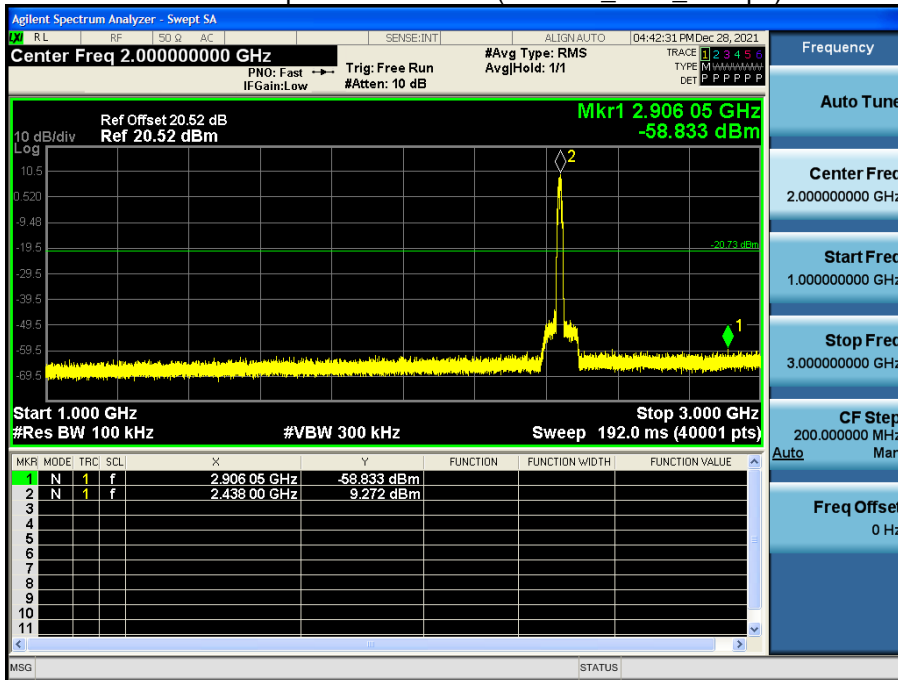
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



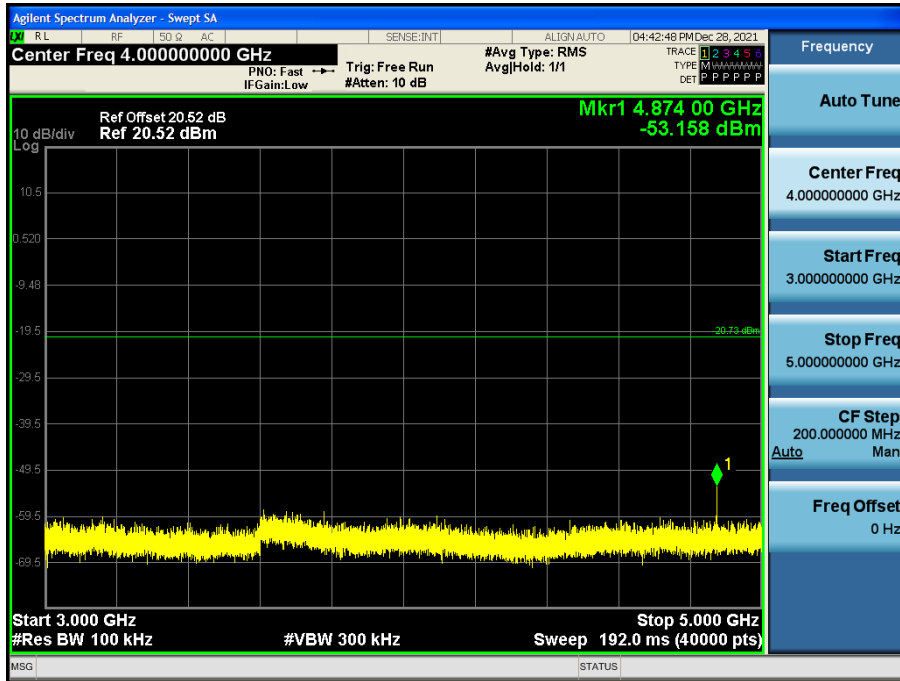
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



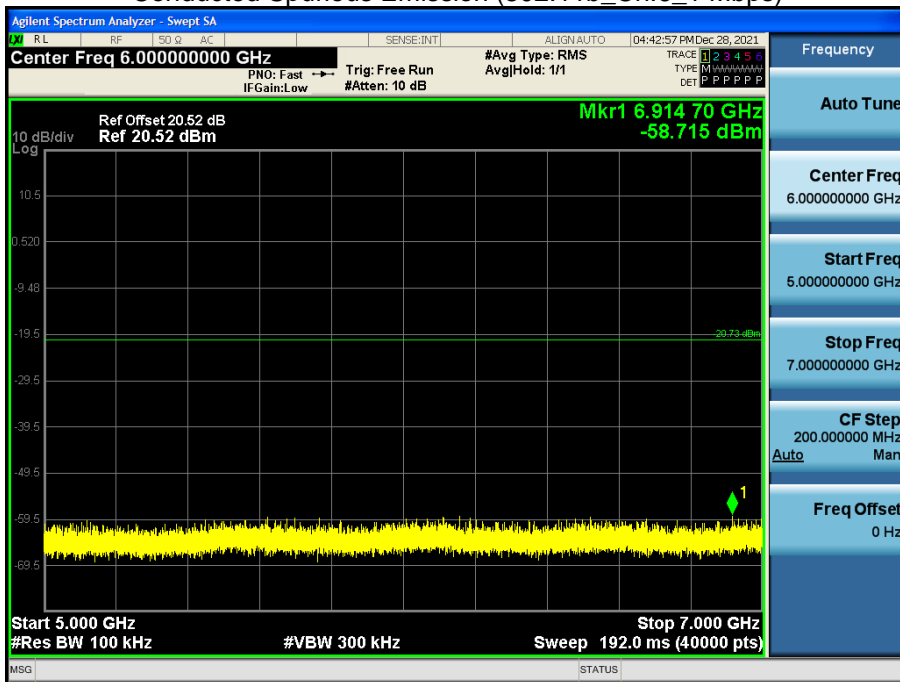
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



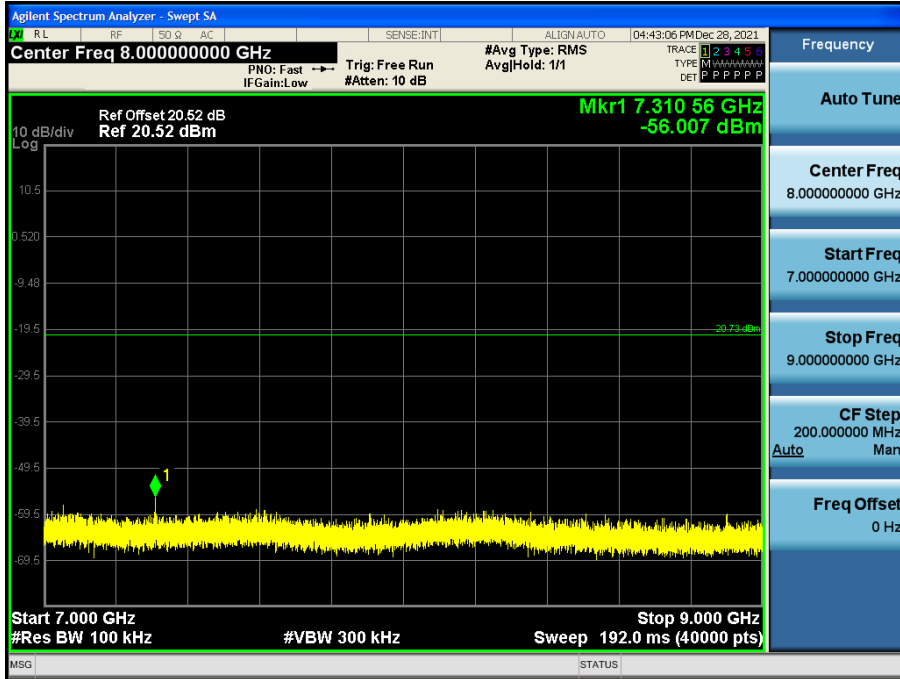
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



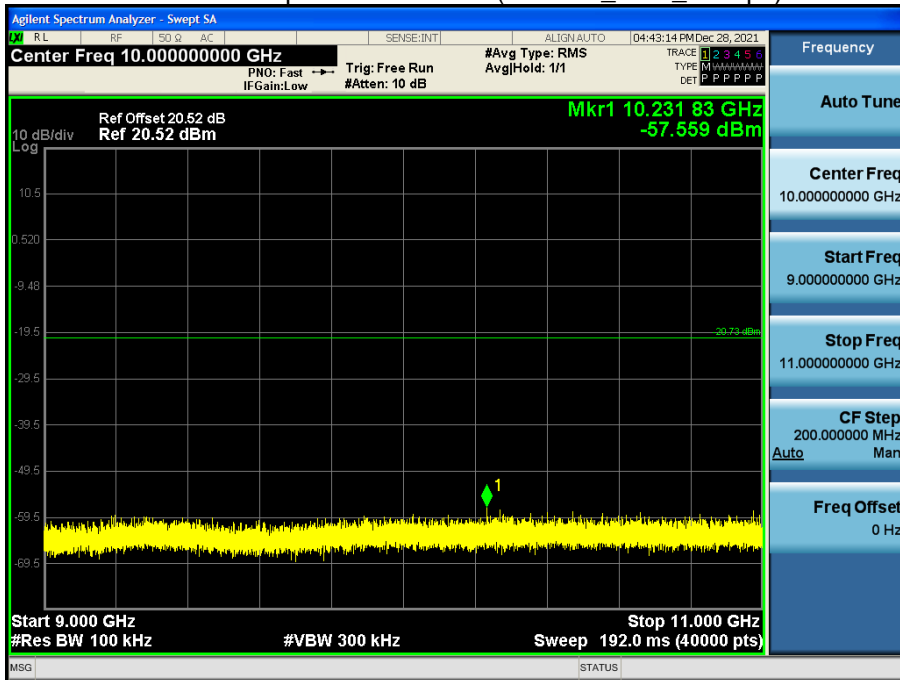
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



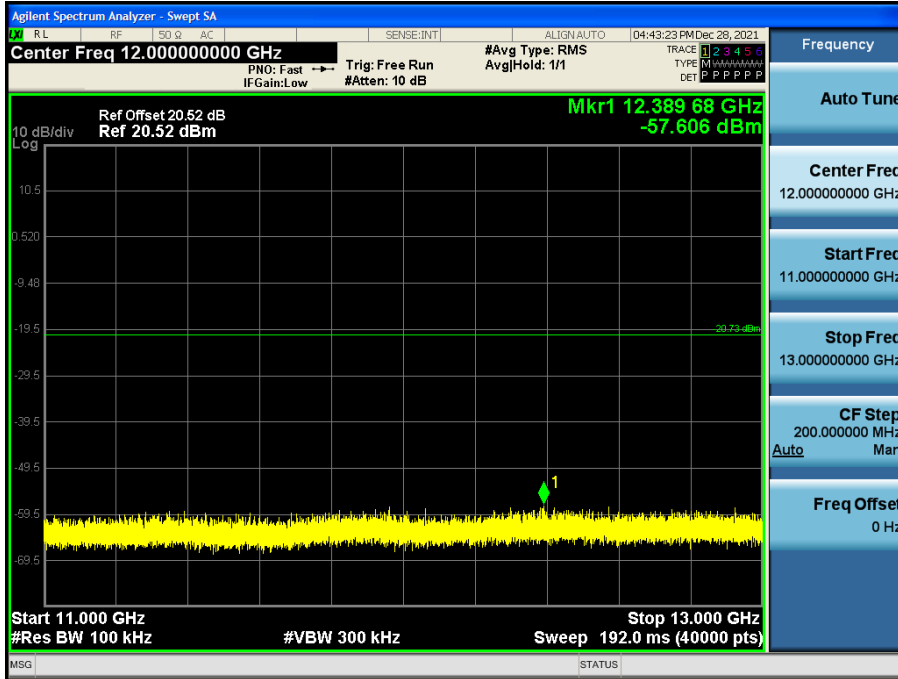
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



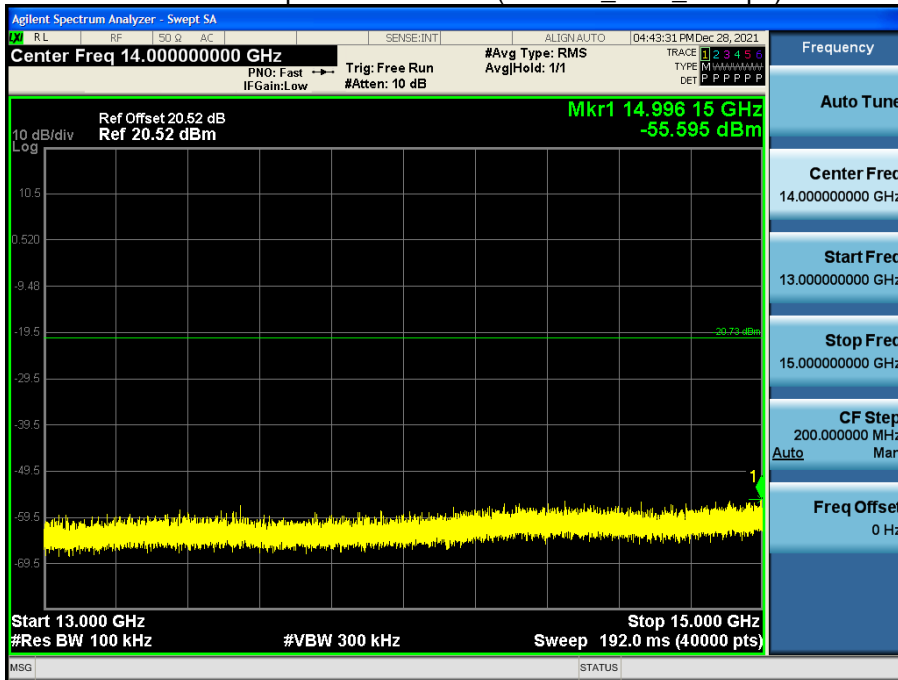
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



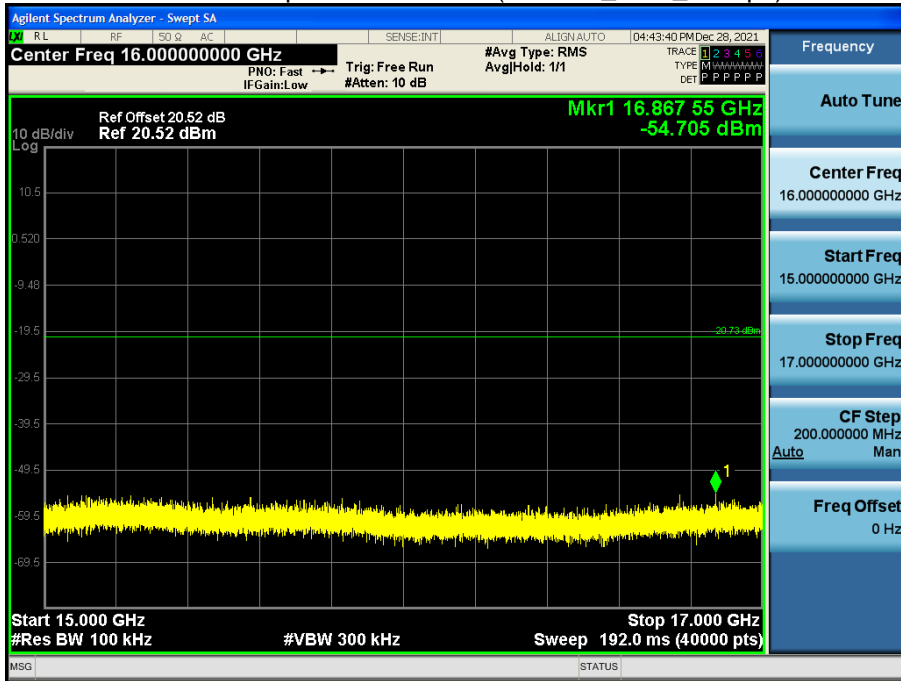
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



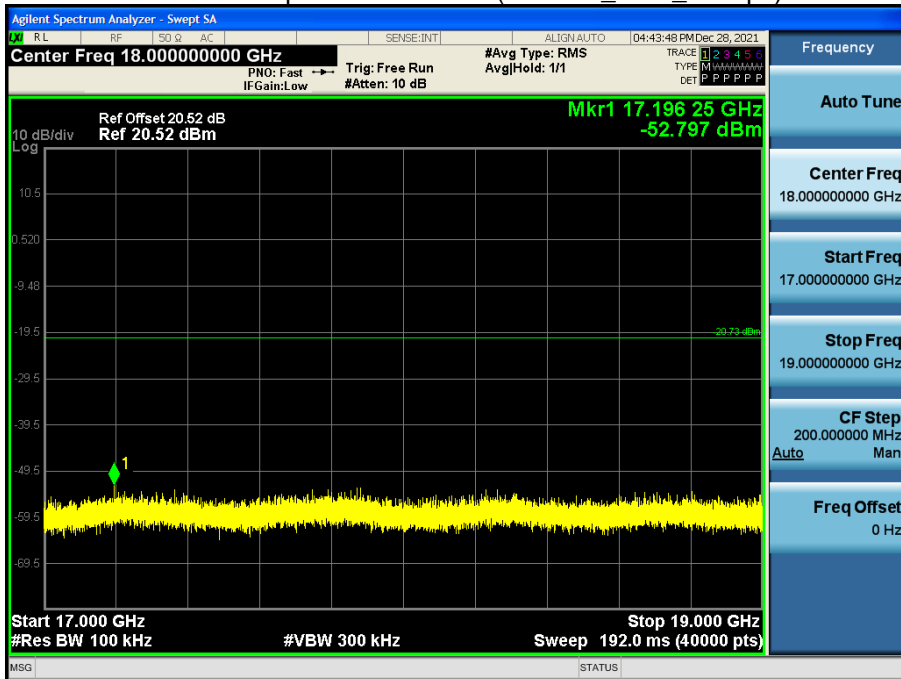
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



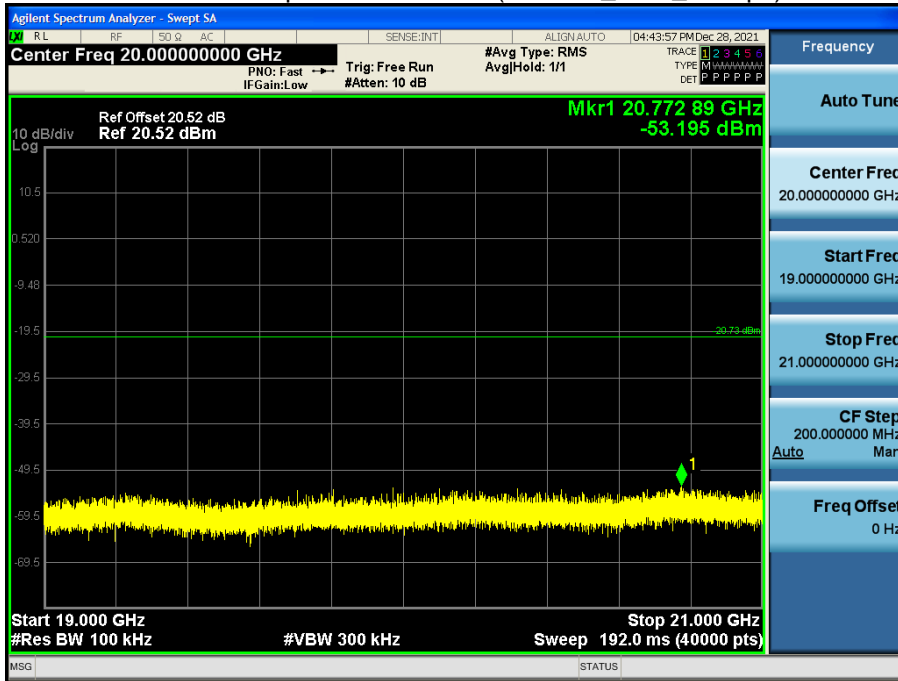
17 GHz ~ 19 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



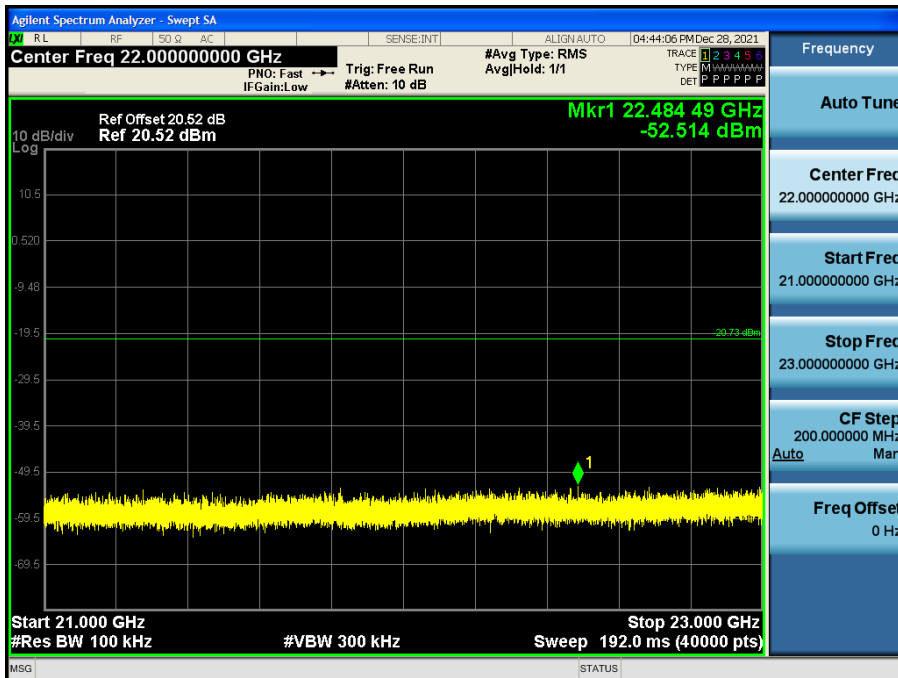
19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



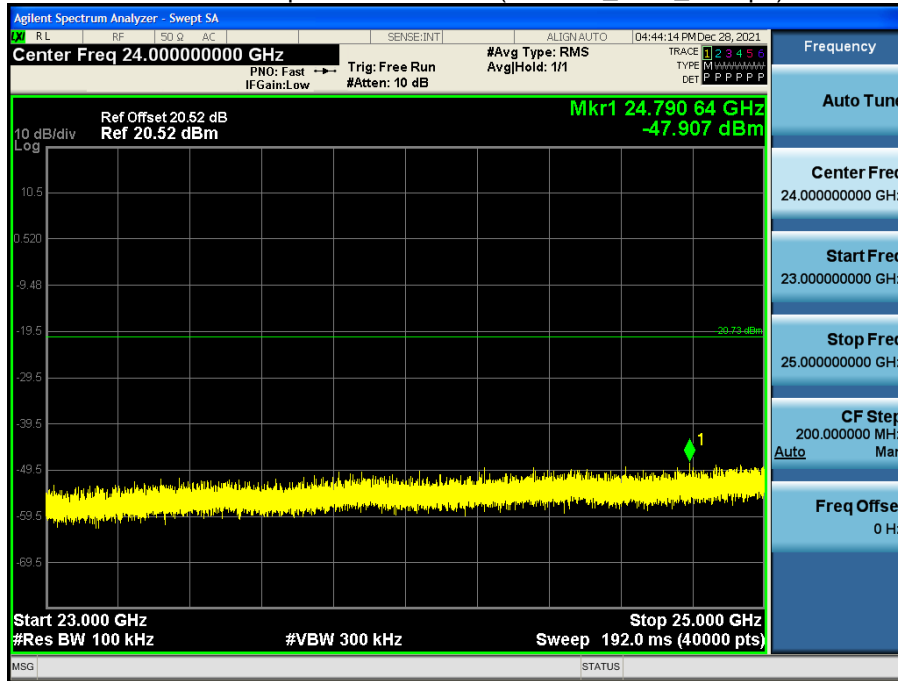
21 GHz ~ 23 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



23 GHz ~ 25 GHz

Conducted Spurious Emission (802.11b_Ch.6_1 Mbps)



9.6 RADIATED SPURIOUS EMISSIONS**Frequency Range : 9 kHz – 30 MHz**

Frequency	Measured Value	A.F+C.L+D.F	POL	Total	Limit	Margin
[MHz]	[dB μ V/m]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/m]	[dB]
No Critical peaks found						

Note:

1. The Measured 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 = $40\log(\text{specific distance} / \text{test distance})$ (dB)
3. Limit line = specific Limits (dB μ V) + Distance extrapolation factor
4. Radiated test is performed with hopping off.

Frequency Range : Below 1 GHz

Frequency	Measured Value	A.F+C.L	POL	Total	Limit	Margin
[MHz]	[dB μ V/m]	[dB/m]	[H/V]	[dB μ V/m]	[dB μ V/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.
2. Radiated test is performed with hopping off.

Frequency Range : Above 1 GHz

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

Frequency [MHz]	Measured Level [dB μ V]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
4824	41.35	5.27	V	46.62	73.98	27.36	PK
4824	28.72	5.27	V	33.99	53.98	19.99	AV
7236	39.92	12.86	V	52.78	73.98	21.20	PK
7236	30.46	12.86	V	43.32	53.98	10.66	AV
4824	40.22	5.27	H	45.49	73.98	28.49	PK
4824	28.55	5.27	H	33.82	53.98	20.16	AV
7236	40.41	12.86	H	53.27	73.98	20.71	PK
7236	31.52	12.86	H	44.38	53.98	9.60	AV

Operation Mode: 802.11b
Transfer Rate: 1 Mbps
Operating Frequency: 2417 MHz
Channel No. 02 Ch

Frequency [MHz]	Measured Level [dB μ V]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
4834	43.10	5.30	V	48.40	73.98	25.58	PK
4834	31.91	5.30	V	37.21	53.98	16.77	AV
7251	41.56	12.94	V	54.50	73.98	19.48	PK
7251	33.72	12.94	V	46.66	53.98	7.32	AV
4834	42.05	5.30	H	47.35	73.98	26.63	PK
4834	30.87	5.30	H	36.17	53.98	17.81	AV
7251	42.88	12.94	H	55.82	73.98	18.16	PK
7251	34.87	12.94	H	47.81	53.98	6.17	AV

Operation Mode: 802.11b
Transfer Rate: 1 Mbps
Operating Frequency: 2422 MHz
Channel No.: 03 Ch

Frequency [MHz]	Measured Level [dB μ V]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
4844	43.65	5.27	V	48.92	73.98	25.06	PK
4844	35.32	5.27	V	40.59	53.98	13.39	AV
7266	43.71	12.93	V	56.64	73.98	17.34	PK
7266	36.24	12.93	V	49.17	53.98	4.81	AV
4844	42.90	5.27	H	48.17	73.98	25.81	PK
4844	34.29	5.27	H	39.56	53.98	14.42	AV
7266	44.27	12.93	H	57.20	73.98	16.78	PK
7266	37.30	12.93	H	50.23	53.98	3.75	AV

Operation Mode: 802.11b
Transfer Rate: 1 Mbps
Operating Frequency: 2427 MHz
Channel No.: 04 Ch

Frequency [MHz]	Measured Level [dB μ V]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
4854	42.28	5.36	V	47.64	73.98	26.34	PK
4854	33.62	5.36	V	38.98	53.98	15.00	AV
7281	42.55	13.00	V	55.55	73.98	18.43	PK
7281	35.11	13.00	V	48.11	53.98	5.87	AV
4854	41.55	5.36	H	46.91	73.98	27.07	PK
4854	32.59	5.36	H	37.95	53.98	16.03	AV
7281	43.79	13.00	H	56.79	73.98	17.19	PK
7281	36.99	13.00	H	49.99	53.98	3.99	AV

Operation Mode: 802.11b
Transfer Rate: 1 Mbps
Operating Frequency: 2432 MHz
Channel No.: 05 Ch

Frequency [MHz]	Measured Level [dB μ V]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
4864	40.91	5.44	V	46.35	73.98	27.63	PK
4864	30.25	5.44	V	35.69	53.98	18.29	AV
7296	42.99	12.95	V	55.94	73.98	18.04	PK
7296	33.52	12.95	V	46.47	53.98	7.51	AV
4864	40.26	5.44	H	45.70	73.98	28.28	PK
4864	29.26	5.44	H	34.70	53.98	19.28	AV
7296	43.18	12.95	H	56.13	73.98	17.85	PK
7296	34.94	12.95	H	47.89	53.98	6.09	AV

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

Frequency [MHz]	Measured Level [dB μ V]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
4874	40.49	5.43	V	45.92	73.98	28.06	PK
4874	28.71	5.43	V	34.14	53.98	19.84	AV
7311	39.99	12.90	V	52.89	73.98	21.09	PK
7311	27.66	12.90	V	40.56	53.98	13.42	AV
4874	41.11	5.43	H	46.54	73.98	27.44	PK
4874	28.77	5.43	H	34.20	53.98	19.78	AV
7311	40.16	12.90	H	53.06	73.98	20.92	PK
7311	28.92	12.90	H	41.82	53.98	12.16	AV

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

Frequency [MHz]	Measured Level [dB μ V]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
4924	41.07	5.94	V	47.01	73.98	26.97	PK
4924	31.56	5.94	V	37.50	53.98	16.48	AV
7386	40.97	12.66	V	53.63	73.98	20.35	PK
7386	31.39	12.66	V	44.05	53.98	9.93	AV
4924	42.19	5.94	H	48.13	73.98	25.85	PK
4924	33.63	5.94	H	39.57	53.98	14.41	AV
7386	40.99	12.66	H	53.65	73.98	20.33	PK
7386	31.53	12.66	H	44.19	53.98	9.79	AV

Note: Channel 12 and 13 are less powerful than channel 11 so the test for high channel was performed at channel 11.

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

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4824	39.75	0.00	5.27	V	45.02	73.98	28.96	PK
4824	27.73	0.17	5.27	V	33.17	53.98	20.81	AV
7236	42.14	0.00	12.86	V	55.00	73.98	18.98	PK
7236	28.55	0.17	12.86	V	41.58	53.98	12.40	AV
4824	40.95	0.00	5.27	H	46.22	73.98	27.76	PK
4824	28.75	0.17	5.27	H	34.19	53.98	19.79	AV
7236	43.53	0.00	12.86	H	56.39	73.98	17.59	PK
7236	29.04	0.17	12.86	H	42.07	53.98	11.91	AV

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

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
4874	40.11	0.00	5.43	V	45.54	73.98	28.44	PK
4874	28.42	0.17	5.43	V	34.02	53.98	19.96	AV
7311	38.18	0.00	12.90	V	51.08	73.98	22.90	PK
7311	26.61	0.17	12.90	V	39.68	53.98	14.30	AV
4874	40.93	0.00	5.43	H	46.36	73.98	27.62	PK
4874	28.44	0.17	5.43	H	34.04	53.98	19.94	AV
7311	40.10	0.00	12.90	H	53.00	73.98	20.98	PK
7311	26.63	0.17	12.90	H	39.70	53.98	14.28	AV

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

Frequency [MHz]	Measured Level [dB μ V]	Duty Cycle Factor [dB]	A.F+C.L-AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
4924	40.13	0.00	5.94	V	46.07	73.98	27.91	PK
4924	28.58	0.17	5.94	V	34.69	53.98	19.29	AV
7386	40.59	0.00	12.66	V	53.25	73.98	20.73	PK
7386	27.33	0.17	12.66	V	40.16	53.98	13.82	AV
4924	40.85	0.00	5.94	H	46.79	73.98	27.19	PK
4924	28.61	0.17	5.94	H	34.72	53.98	19.26	AV
7386	41.57	0.00	12.66	H	54.23	73.98	19.75	PK
7386	28.12	0.17	12.66	H	40.95	53.98	13.03	AV

Note: Channel 12 and 13 are less powerful than channel 11 so the test for high channel was performed at channel 11.

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

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F+C.L- AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measure ment Type
4824	40.99	0.00	5.27	V	46.26	73.98	27.72	PK
4824	27.98	0.19	5.27	V	33.44	53.98	20.54	AV
7236	42.58	0.00	12.86	V	55.44	73.98	18.54	PK
7236	27.44	0.19	12.86	V	40.49	53.98	13.49	AV
4824	41.34	0.00	5.27	H	46.61	73.98	27.37	PK
4824	28.72	0.19	5.27	H	34.18	53.98	19.80	AV
7236	43.82	0.00	12.86	H	56.68	73.98	17.30	PK
7236	28.46	0.19	12.86	H	41.51	53.98	12.47	AV

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

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F+C.L- AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measure ment Type
4874	40.26	0.00	5.43	V	45.69	73.98	28.29	PK
4874	28.44	0.19	5.43	V	34.06	53.98	19.92	AV
7311	38.77	0.00	12.90	V	51.67	73.98	22.31	PK
7311	26.43	0.19	12.90	V	39.52	53.98	14.46	AV
4874	40.73	0.00	5.43	H	46.16	73.98	27.82	PK
4874	28.46	0.19	5.43	H	34.08	53.98	19.90	AV
7311	39.08	0.00	12.90	H	51.98	73.98	22.00	PK
7311	26.51	0.19	12.90	H	39.60	53.98	14.38	AV

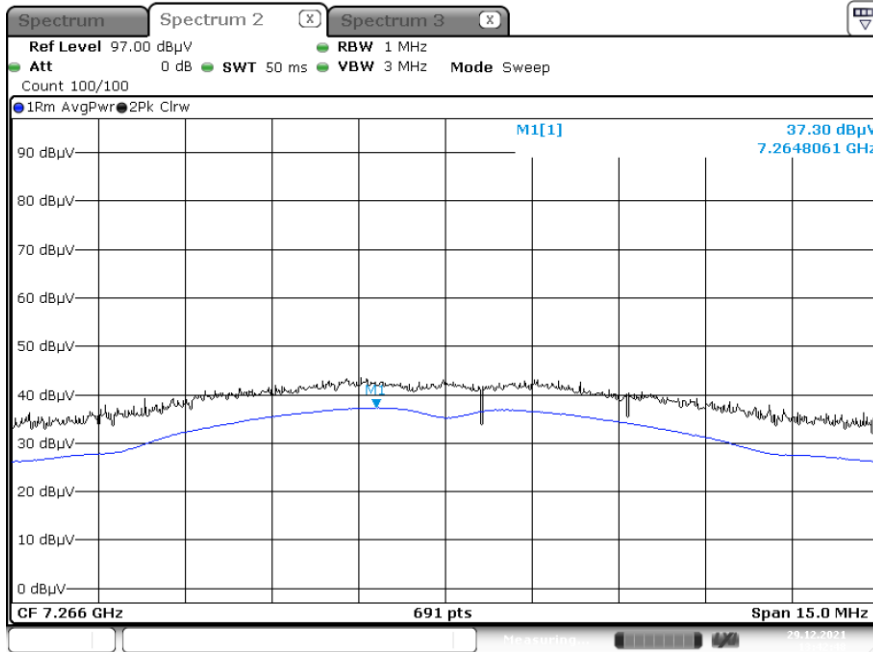
Operation Mode: 802.11n (HT20)
Transfer MCS Index: 0
Operating Frequency: 2462 MHz
Channel No. 11 Ch

Frequency [MHz]	Measured Level [dB μ V]	Duty Cycle Factor [dB]	A.F+C.L- AMP+D.F [dB/m]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measure ment Type
4924	40.45	0.00	5.94	V	46.39	73.98	27.59	PK
4924	28.55	0.19	5.94	V	34.68	53.98	19.30	AV
7386	40.72	0.00	12.66	V	53.38	73.98	20.60	PK
7386	27.45	0.19	12.66	V	40.30	53.98	13.68	AV
4924	41.38	0.00	5.94	H	47.32	73.98	26.66	PK
4924	28.62	0.19	5.94	H	34.75	53.98	19.23	AV
7386	41.63	0.00	12.66	H	54.29	73.98	19.69	PK
7386	28.11	0.19	12.66	H	40.96	53.98	13.02	AV

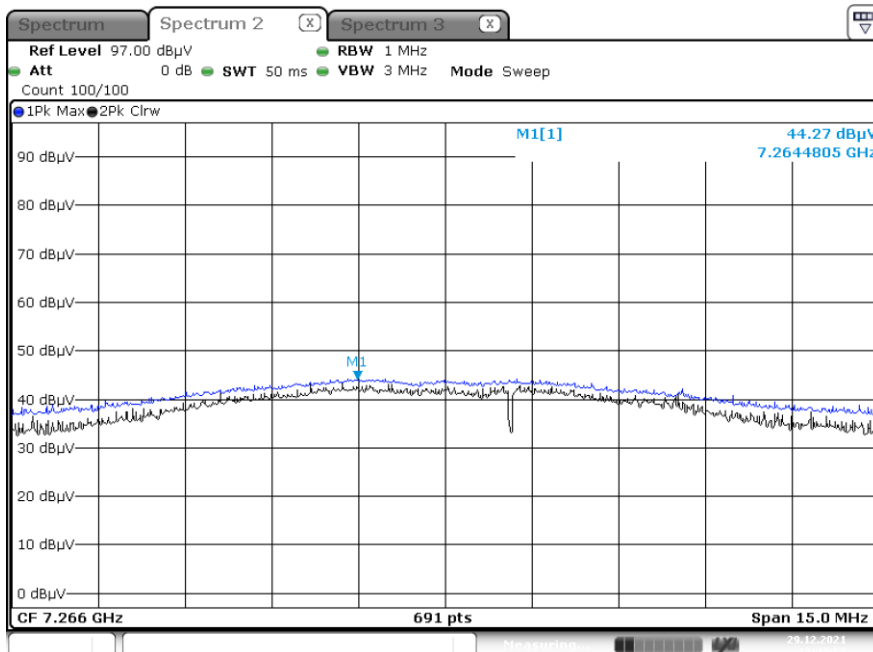
Note: Channel 12 and 13 are less powerful than channel 11 so the test for high channel was performed at channel 11.

Test Plots (Worst case : Z-H)

Radiated Spurious Emissions plot – Average Result (802.11b_1 Mbps, Ch.3 3rd Harmonic)



Radiated Spurious Emissions plot – Peak Result (802.11b_1 Mbps, Ch.3 3rd Harmonic)



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]	Measured Level [dB μ V]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
2390.0	21.69	35.23	H	56.92	73.98	17.06	PK
2390.0	9.86	35.23	H	45.09	53.98	8.89	AV
2390.0	19.55	35.23	V	54.78	73.98	19.20	PK
2390.0	9.54	35.23	V	44.77	53.98	9.21	AV
2483.5	21.66	35.96	H	57.62	73.98	16.36	PK
2483.5	10.76	35.96	H	46.72	53.98	7.26	AV
2483.5	21.15	35.96	V	57.11	73.98	16.87	PK
2483.5	10.26	35.96	V	46.22	53.98	7.76	AV

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

Frequency [MHz]	Measured Level [dB μ V]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
2483.5	23.17	35.96	H	59.13	73.98	14.85	PK
2483.5	11.44	35.96	H	47.40	53.98	6.58	AV
2483.5	21.98	35.96	V	57.94	73.98	16.04	PK
2483.5	10.38	35.96	V	46.34	53.98	7.64	AV

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

Frequency [MHz]	Measured Level [dB μ V]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
2483.5	21.39	35.96	H	57.35	73.98	16.63	PK
2483.5	10.24	35.96	H	46.20	53.98	7.78	AV
2483.5	20.34	35.96	V	56.30	73.98	17.68	PK
2483.5	9.22	35.96	V	45.18	53.98	8.80	AV

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

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2390.0	19.33	0.00	35.23	H	54.56	73.98	19.42	PK
2390.0	9.58	0.17	35.23	H	44.98	53.98	9.00	AV
2390.0	18.29	0.00	35.23	V	53.52	73.98	20.46	PK
2390.0	9.32	0.17	35.23	V	44.72	53.98	9.26	AV
2483.5	33.81	0.00	35.96	H	69.77	73.98	4.21	PK
2483.5	12.35	0.17	35.96	H	48.48	53.98	5.50	AV
2483.5	31.64	0.00	35.96	V	67.60	73.98	6.38	PK
2483.5	11.89	0.17	35.96	V	48.02	53.98	5.96	AV

Operation Mode: 802.11g
 Transfer Rate: 6 Mbps
 Operating Frequency: 2452 MHz, 2457 MHz
 Channel No.: 09 Ch, 10 Ch

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	25.61	0.00	35.96	H	61.57	73.98	12.41	PK
2483.5	10.93	0.17	35.96	H	47.06	53.98	6.92	AV
2483.5	24.58	0.00	35.96	V	60.54	73.98	13.44	PK
2483.5	10.55	0.17	35.96	V	46.68	53.98	7.30	AV
2483.5	29.59	0.00	35.96	H	65.55	73.98	8.43	PK
2483.5	11.34	0.17	35.96	H	47.47	53.98	6.51	AV
2483.5	28.96	0.00	35.96	V	64.92	73.98	9.06	PK
2483.5	11.02	0.17	35.96	V	47.15	53.98	6.83	AV

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

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	23.18	0.00	35.96	H	59.14	73.98	14.84	PK
2483.5	11.22	0.17	35.96	H	47.35	53.98	6.63	AV
2483.5	22.77	0.00	35.96	V	58.73	73.98	15.25	PK
2483.5	10.89	0.17	35.96	V	47.02	53.98	6.96	AV

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

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	33.56	0.00	35.96	H	69.52	73.98	4.46	PK
# 2484.0	12.96	0.17	35.96	H	49.09	53.98	4.89	AV
# 2485.0	9.85	0.17	35.96	V	45.98	53.98	8.00	AV
2485~2500	9.56	0.17	35.96	V	45.69	53.98	8.29	AV

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

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

Frequency [MHz]	Measured Level [dB μ V]	Duty Cycle Factor [dB]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
2390.0	20.33	0.00	35.23	H	55.56	73.98	18.42	PK
2390.0	9.65	0.19	35.23	H	45.07	53.98	8.91	AV
2390.0	19.91	0.00	35.23	V	55.14	73.98	18.84	PK
2390.0	9.42	0.19	35.23	V	44.84	53.98	9.14	AV
2483.5	34.91	0.00	35.96	H	70.87	73.98	3.11	PK
2483.5	12.50	0.19	35.96	H	48.65	53.98	5.33	AV
2483.5	33.48	0.00	35.96	V	69.44	73.98	4.54	PK
2483.5	12.03	0.19	35.96	V	48.18	53.98	5.80	AV

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

Frequency [MHz]	Measured Level [dB μ V]	Duty Cycle Factor [dB]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Measurement Type
2483.5	34.46	0.00	35.96	H	70.42	73.98	3.56	PK
2483.5	13.57	0.19	35.96	H	49.72	53.98	4.26	AV
2483.5	33.25	0.00	35.96	V	69.21	73.98	4.77	PK
2483.5	12.46	0.19	35.96	V	48.61	53.98	5.37	AV

Operation Mode: 802.11n (HT20)
 Transfer Rate: 0
 Operating Frequency: 2467 MHz
 Channel No.: 12 Ch

Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	24.63	0.00	35.96	H	60.59	73.98	13.39	PK
2483.5	11.36	0.19	35.96	H	47.51	53.98	6.47	AV
2483.5	23.59	0.00	35.96	V	59.55	73.98	14.43	PK
2483.5	10.21	0.19	35.96	V	46.36	53.98	7.62	AV

Operation Mode: 802.11n (HT20)
 Transfer Rate: 0
 Operating Frequency: 2472 MHz
 Channel No.: 13 Ch

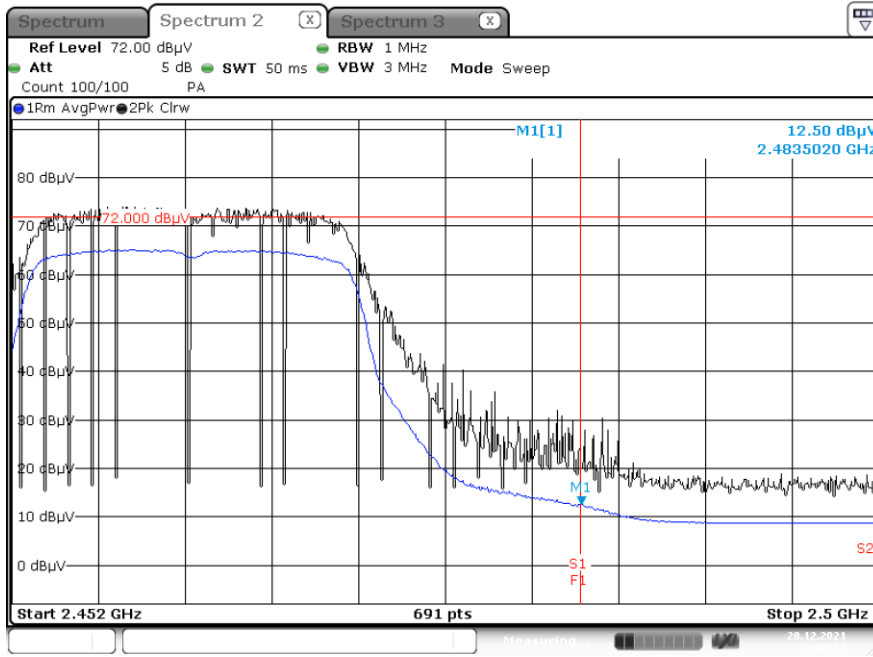
Frequency [MHz]	Measured Level [dBμV]	Duty Cycle Factor [dB]	A.F.+ C.L+ D.F [dB]	ANT. POL [H/V]	Total [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Measurement Type
2483.5	34.08	0.00	35.96	H	70.04	73.98	3.94	PK
# 2484.0	14.30	0.19	35.96	H	50.45	53.98	3.53	AV
# 2485.0	9.83	0.19	35.96	V	45.98	53.98	8.00	AV
2485~2500	9.44	0.19	35.96	V	45.59	53.98	8.39	AV

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

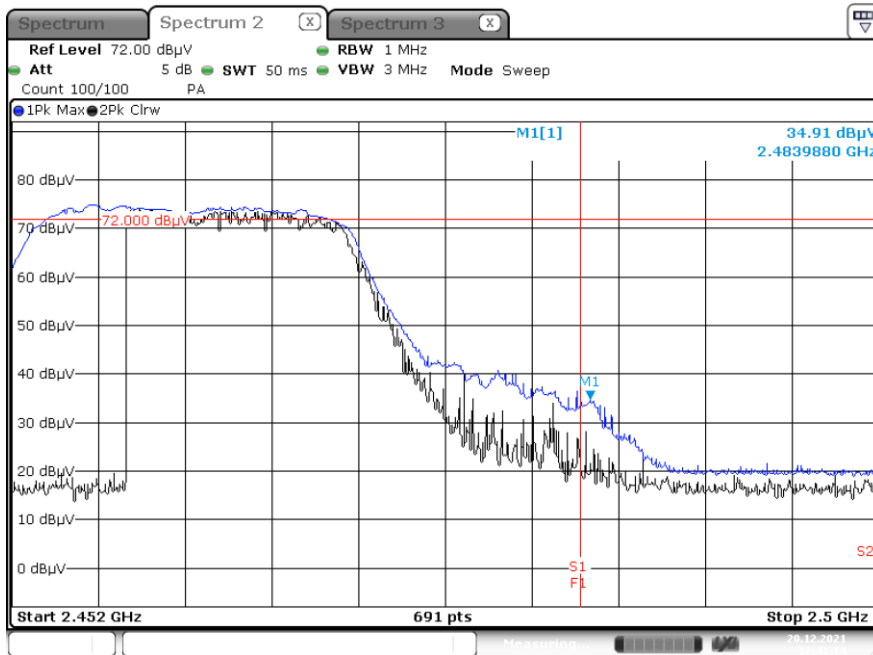
Test Plots

(Worst case : X-H)

Radiated Restricted Band Edges plot – Average Result (802.11n (HT20)_MCS0 Ch.11)



Radiated Restricted Band Edges plot – Peak Result (802.11n (HT20)_ MCS0 Ch.11)



Note:

Plot of worst case are only reported.

9.8 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

WLAN 2.4G MODE_L1

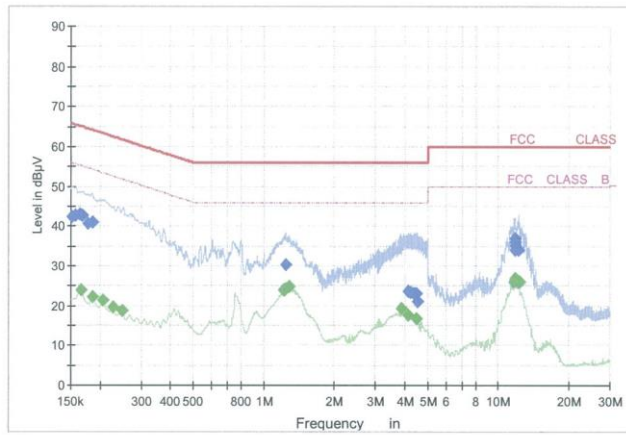
1 / 2

Test Report

Common Information

EUT : SM-A336M/DSN
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : WLAN 2.4G MODE_L1

Full Spectrum



— Preview Result ◆ Preview Final_Result QPK — FCC CLASS
- - - FCC CLASS B_ ◆ Final_Result CAV

Final Result QPK

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	42.54	65.88	23.33	9.000	L1	OFF	9.6
0.1568	42.59	65.63	23.04	9.000	L1	OFF	9.6
0.1635	43.03	65.28	22.25	9.000	L1	OFF	9.6
0.1680	42.89	65.06	22.37	9.000	L1	OFF	9.6
0.1770	40.76	64.63	23.86	9.000	L1	OFF	9.6
0.1860	41.08	64.21	23.13	9.000	L1	OFF	9.6
1.2380	30.36	56.00	25.64	9.000	L1	OFF	9.7
4.1405	23.76	56.00	32.24	9.000	L1	OFF	9.8
4.2530	23.44	56.00	32.56	9.000	L1	OFF	9.8
4.3993	23.00	56.00	33.01	9.000	L1	OFF	9.8
4.4713	23.20	56.00	32.80	9.000	L1	OFF	9.8
4.5455	21.18	56.00	34.82	9.000	L1	OFF	9.9
11.7275	37.00	60.00	23.00	9.000	L1	OFF	10.1
11.7343	36.12	60.00	23.88	9.000	L1	OFF	10.1
11.7770	35.27	60.00	24.73	9.000	L1	OFF	10.1
11.8243	34.02	60.00	25.98	9.000	L1	OFF	10.1
12.1663	33.91	60.00	26.09	9.000	L1	OFF	10.1
12.1910	34.04	60.00	25.96	9.000	L1	OFF	10.1

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오전 4:24:02

WLAN 2.4G MODE_L1

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Final Result CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1658	23.95	55.17	31.22	9.000	L1	OFF	9.6
0.1860	22.10	54.21	32.11	9.000	L1	OFF	9.6
0.2063	21.22	53.36	32.13	9.000	L1	OFF	9.6
0.2265	19.64	52.58	32.94	9.000	L1	OFF	9.6
0.2490	18.75	51.79	33.04	9.000	L1	OFF	9.6
1.2178	23.90	46.00	22.10	9.000	L1	OFF	9.7
1.2313	24.03	46.00	21.97	9.000	L1	OFF	9.7
1.2403	24.33	46.00	21.67	9.000	L1	OFF	9.7
1.2898	24.70	46.00	21.30	9.000	L1	OFF	9.7
3.8863	19.44	46.00	26.56	9.000	L1	OFF	9.8
4.1405	17.46	46.00	28.54	9.000	L1	OFF	9.8
4.4735	16.63	46.00	29.37	9.000	L1	OFF	9.8
11.6915	25.93	50.00	24.07	9.000	L1	OFF	10.1
11.7298	26.61	50.00	23.39	9.000	L1	OFF	10.1
11.7680	26.73	50.00	23.27	9.000	L1	OFF	10.1
11.8063	26.43	50.00	23.57	9.000	L1	OFF	10.1
12.2473	25.83	50.00	24.17	9.000	L1	OFF	10.1
12.2810	25.88	50.00	24.12	9.000	L1	OFF	10.1

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오전 4:24:02

WLAN 2.4G 45W MODE_L1

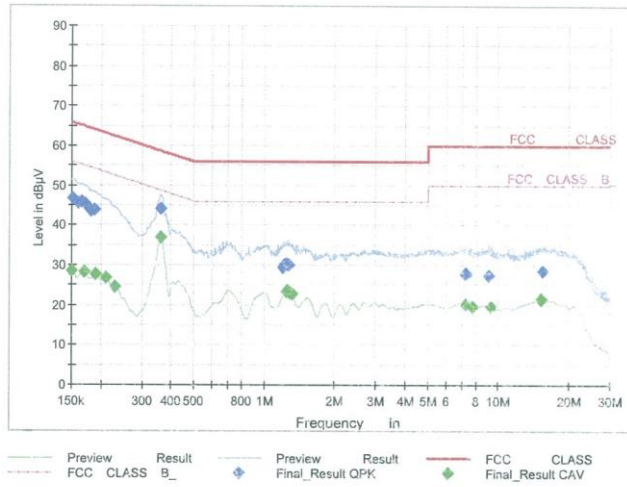
1 / 2

Test Report

Common Information

EUT : SM-A336M/DSN
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : WLAN 2.4G 45W MODE_L1

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	46.86	65.88	19.02	9.000	L1	OFF	9.6
0.1613	45.66	65.40	19.74	9.000	L1	OFF	9.6
0.1658	45.81	65.17	19.36	9.000	L1	OFF	9.6
0.1725	45.26	64.84	19.58	9.000	L1	OFF	9.6
0.1815	43.54	64.42	20.88	9.000	L1	OFF	9.6
0.1883	43.93	64.11	20.18	9.000	L1	OFF	9.6
0.3615	44.26	58.69	14.44	9.000	L1	OFF	9.6
1.2043	29.48	56.00	26.52	9.000	L1	OFF	9.7
1.2223	29.93	56.00	26.07	9.000	L1	OFF	9.7
1.2358	30.03	56.00	25.97	9.000	L1	OFF	9.7
1.2403	30.29	56.00	25.71	9.000	L1	OFF	9.7
1.2560	29.98	56.00	26.02	9.000	L1	OFF	9.7
1.2650	29.89	56.00	26.11	9.000	L1	OFF	9.7
7.2343	27.85	60.00	32.15	9.000	L1	OFF	9.9
7.2590	27.63	60.00	32.37	9.000	L1	OFF	9.9
9.0793	27.39	60.00	32.61	9.000	L1	OFF	10.0
9.1018	27.48	60.00	32.52	9.000	L1	OFF	10.0
15.5300	28.46	60.00	31.54	9.000	L1	OFF	10.2

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오전 5:24:56

WLAN 2.4G 45W MODE_L1

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Final Result CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	28.56	56.00	27.44	9.000	L1	OFF	9.6
0.1703	28.30	54.95	26.65	9.000	L1	OFF	9.6
0.1905	27.71	54.02	26.30	9.000	L1	OFF	9.6
0.2108	26.78	53.18	26.39	9.000	L1	OFF	9.6
0.2310	24.66	52.41	27.75	9.000	L1	OFF	9.6
0.3615	36.84	48.69	11.85	9.000	L1	OFF	9.6
1.2425	23.50	46.00	22.50	9.000	L1	OFF	9.7
1.2538	23.55	46.00	22.45	9.000	L1	OFF	9.7
1.2650	23.45	46.00	22.55	9.000	L1	OFF	9.7
1.2763	23.28	46.00	22.72	9.000	L1	OFF	9.7
1.2898	23.17	46.00	22.83	9.000	L1	OFF	9.7
1.3123	22.70	46.00	23.30	9.000	L1	OFF	9.7
7.2365	20.24	50.00	29.76	9.000	L1	OFF	9.9
7.2590	20.30	50.00	29.70	9.000	L1	OFF	9.9
7.7788	19.51	50.00	30.49	9.000	L1	OFF	10.0
9.3358	19.63	50.00	30.37	9.000	L1	OFF	10.0
15.3343	21.44	50.00	28.56	9.000	L1	OFF	10.2
15.3388	21.50	50.00	28.50	9.000	L1	OFF	10.2

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오전 5:24:56

Conducted Emissions (Line 2)

WLAN 2.4G MODE_N

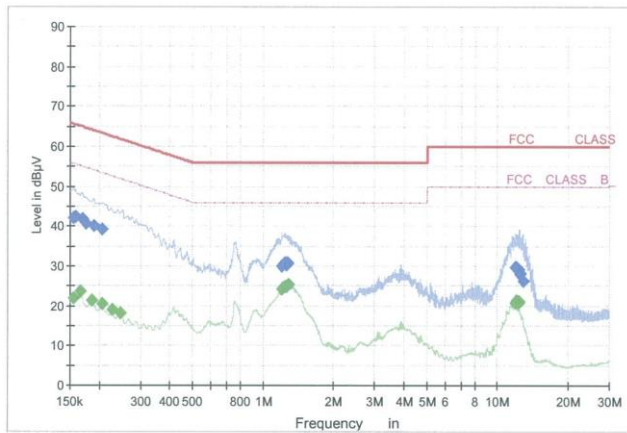
1 / 2

Test Report

Common Information

EUT : SM-A336M/DSN
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : WLAN 2.4G MODE_N

Full Spectrum



— Preview Result
— FCC CLASS
— FCC CLASS B_
◆ Preview Final_Result QPK
◆ Preview Final_Result CAV

Final Result QPK

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	42.09	65.75	23.67	9.000	N	OFF	9.6
0.1590	42.28	65.52	23.23	9.000	N	OFF	9.6
0.1703	41.85	64.95	23.10	9.000	N	OFF	9.6
0.1748	40.81	64.73	23.92	9.000	N	OFF	9.6
0.1905	40.08	64.02	23.93	9.000	N	OFF	9.6
0.2063	39.36	63.36	23.99	9.000	N	OFF	9.6
1.2043	29.91	56.00	26.09	9.000	N	OFF	9.7
1.2290	30.61	56.00	25.39	9.000	N	OFF	9.7
1.2425	30.74	56.00	25.26	9.000	N	OFF	9.7
1.2583	30.22	56.00	25.78	9.000	N	OFF	9.7
1.2673	30.86	56.00	25.14	9.000	N	OFF	9.7
1.2740	30.55	56.00	25.45	9.000	N	OFF	9.7
11.9885	29.66	60.00	30.34	9.000	N	OFF	10.2
12.0065	29.82	60.00	30.18	9.000	N	OFF	10.2
12.2788	29.19	60.00	30.81	9.000	N	OFF	10.2
12.4295	28.37	60.00	31.63	9.000	N	OFF	10.2
12.4768	27.92	60.00	32.08	9.000	N	OFF	10.2
12.8503	26.14	60.00	33.86	9.000	N	OFF	10.2

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오전 4:18:37

WLAN 2.4G MODE_N

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Final Result CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	21.91	55.75	33.84	9.000	N	OFF	9.6
0.1658	23.54	55.17	31.63	9.000	N	OFF	9.6
0.1860	21.34	54.21	32.87	9.000	N	OFF	9.6
0.2063	20.59	53.36	32.76	9.000	N	OFF	9.6
0.2265	18.96	52.58	33.62	9.000	N	OFF	9.6
0.2468	18.30	51.87	33.56	9.000	N	OFF	9.6
1.2065	24.13	46.00	21.87	9.000	N	OFF	9.7
1.2178	24.56	46.00	21.44	9.000	N	OFF	9.7
1.2403	24.92	46.00	21.08	9.000	N	OFF	9.7
1.2538	24.92	46.00	21.08	9.000	N	OFF	9.7
1.2650	25.23	46.00	20.77	9.000	N	OFF	9.7
1.2898	25.33	46.00	20.67	9.000	N	OFF	9.7
11.9255	20.82	50.00	29.18	9.000	N	OFF	10.2
11.9525	20.88	50.00	29.12	9.000	N	OFF	10.2
12.0088	21.13	50.00	28.87	9.000	N	OFF	10.2
12.0268	21.29	50.00	28.71	9.000	N	OFF	10.2
12.2968	21.02	50.00	28.98	9.000	N	OFF	10.2
12.3260	20.73	50.00	29.27	9.000	N	OFF	10.2

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오전 4:18:37

WLAN 2.4G 45W MODE_N

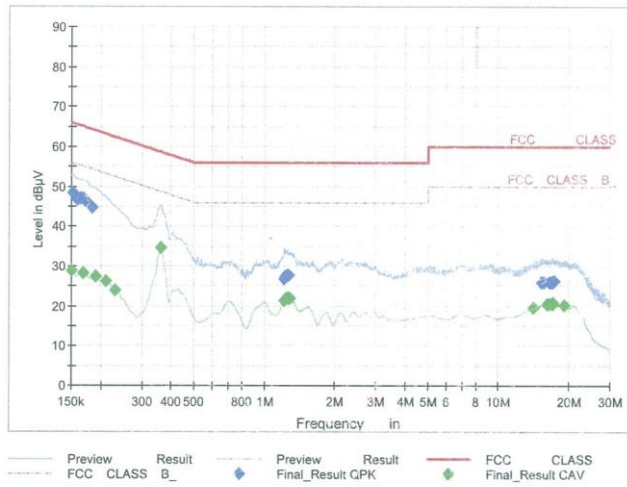
1 / 2

Test Report

Common Information

EUT : SM-A336M/DSN
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : WLAN 2.4G 45W MODE_N

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	48.45	65.88	17.43	9.000	N	OFF	9.6
0.1590	46.71	65.52	18.81	9.000	N	OFF	9.6
0.1635	46.94	65.28	18.34	9.000	N	OFF	9.6
0.1680	47.01	65.06	18.05	9.000	N	OFF	9.6
0.1725	46.35	64.84	18.49	9.000	N	OFF	9.6
0.1838	44.66	64.31	19.66	9.000	N	OFF	9.6
1.2223	26.85	56.00	29.15	9.000	N	OFF	9.7
1.2313	27.09	56.00	28.91	9.000	N	OFF	9.7
1.2358	27.49	56.00	28.51	9.000	N	OFF	9.7
1.2448	27.43	56.00	28.57	9.000	N	OFF	9.7
1.2538	27.61	56.00	28.39	9.000	N	OFF	9.7
1.2650	27.64	56.00	28.36	9.000	N	OFF	9.7
15.2713	25.85	60.00	34.15	9.000	N	OFF	10.3
15.5728	25.93	60.00	34.07	9.000	N	OFF	10.3
16.6100	25.97	60.00	34.03	9.000	N	OFF	10.3
16.9858	26.06	60.00	33.94	9.000	N	OFF	10.4
17.1005	26.06	60.00	33.94	9.000	N	OFF	10.4
17.3030	26.28	60.00	33.72	9.000	N	OFF	10.4

2021-12-26

오전 5:16:20

WLAN 2.4G 45W MODE_N

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Final Result CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	28.83	56.00	27.17	9.000	N	OFF	9.6
0.1680	28.39	55.06	26.67	9.000	N	OFF	9.6
0.1905	27.36	54.02	26.65	9.000	N	OFF	9.6
0.2108	26.15	53.18	27.02	9.000	N	OFF	9.6
0.2310	24.08	52.41	28.33	9.000	N	OFF	9.6
0.3615	34.52	48.69	14.18	9.000	N	OFF	9.6
1.2178	21.42	46.00	24.58	9.000	N	OFF	9.7
1.2313	21.76	46.00	24.24	9.000	N	OFF	9.7
1.2403	21.85	46.00	24.15	9.000	N	OFF	9.7
1.2538	21.91	46.00	24.09	9.000	N	OFF	9.7
1.2673	21.94	46.00	24.06	9.000	N	OFF	9.7
1.2898	21.97	46.00	24.03	9.000	N	OFF	9.7
14.1080	19.73	50.00	30.27	9.000	N	OFF	10.2
16.1465	20.36	50.00	29.64	9.000	N	OFF	10.3
16.6100	20.39	50.00	29.61	9.000	N	OFF	10.3
17.0150	20.62	50.00	29.38	9.000	N	OFF	10.4
17.1253	20.63	50.00	29.37	9.000	N	OFF	10.4
19.1930	20.27	50.00	29.73	9.000	N	OFF	10.4

2021-12-26

오전 5:16:20

10. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/23/2022	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	06/17/2022	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	03/15/2022	Annual
Signal Analyzer	N9030A	Agilent	MY49432108	03/09/2022	Annual
Power Meter	N1911A	Agilent	MY45100523	04/08/2022	Annual
Power Sensor	N1921A	Agilent	MY57820067	04/08/2022	Annual
Power Splitter	11667B	Hewlett Packard	10545	02/09/2022	Annual
DC Power Supply	E3632A	HP	MY50360067	02/26/2022	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C	HP	07560	06/18/2022	Annual
Attenuator(10 dB)(DC-26.5 GHz)	8493C	HP	08285	06/28/2022	Annual
Attenuator(20 dB)	18N-20dB	Rohde & Schwarz	8	03/08/2022	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A
FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	HCT CO., LTD.	N/A	N/A	N/A

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

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
Controller(Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	N/A	N/A	N/A
Controller	EM1000	Audix	060520	N/A	N/A
Turn Table	N/A	Audix	N/A	N/A	N/A
Amp & Filter Bank Switch Controller	FBSM-01B	TNM system	TM19050002	N/A	N/A
Loop Antenna	1513	Schwarzbeck	1513-333	03/19/2022	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	09/04/2022	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	02296	05/19/2022	Biennial
Horn Antenna(15 GHz ~ 40 GHz)	BBHA9170	Schwarzbeck	BBHA9170124	04/12/2023	Biennial
Spectrum Analyzer	FSV(10 Hz ~ 40 GHz)	Rohde & Schwarz	101055	05/14/2022	Annual
Band Reject Filter	WRCJV2400/2483.5-2370/2520-60/12SS	Wainwright Instruments	2	01/06/2022	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	5	06/24/2022	Annual
Band Reject Filter	WRCJV12-4900-5100-5900-6100-50SS	Wainwright Instruments	6	06/24/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/02/2022	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/23/2022	Annual
HPF(3~18GHz) LNA1(1~18GHz)	FMSR-05B	TNM system	F6	01/20/2022	Annual
ATT(10dB) + LNA1(1~18GHz)	FMSR -05B	TNM system	None	01/20/2022	Annual
ATT(3dB) + LNA1(1~18GHz)	FMSR -05B	TNM system	None	01/20/2022	Annual
LNA1(1~18GHz)	FMSR -05B	TNM system	25540	01/20/2022	Annual
HPF(7~18GHz) LNA2(6~18GHz)	FMSR -05B	TNM system	28550	01/20/2022	Annual
Thru(30MHz ~ 18GHz)	FMSR -05B	TNM system	None	01/20/2022	Annual

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-2201-FC038-P