

FCC DTS REPORT

Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Date of Issue:

August 21, 2018

Address:

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

Test Site/Location:

HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA

Report No.: HCT-RF-1808-FC022-R2

FCC ID: A3LSMJ701FB

APPLICANT: SAMSUNG Electronics Co., Ltd.

Model: SM-J701FB/DS

EUT Type: Mobile Phone

Average Output Power:
802.11b : 18.60 dBm
802.11g : 16.45 dBm
802.11n(HT20) : 15.84 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

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.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S. C.853(a)



Report prepared by : Kwon Jeong
Engineer of Telecommunication testing center



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Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1808-FC022	August 17, 2018	- First Approval Report
HCT-RF-1808-FC022-R1	August 21, 2018	- Revised the worst case of radiated test on page 19
HCT-RF-1808-FC022-R2	August 21, 2018	- Revised the description of test modes on page 5

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1. EUT DESCRIPTION

Model	SM-J701FB/DS
EUT Type	Mobile Phone
Power Supply	DC 3.85 V
Battery Information	Model: EB-BJ700CBN Type: Li-ion Battery
Travel Adapter Information	Model: EP-TA50IWE Manufacture: elentec
Frequency Range	2412 MHz - 2472 MHz
Max. RF Output Power	<u>Peak Power</u> 802.11b : 21.43 dBm 802.11g : 25.87 dBm 802.11n(HT20) : 25.72 dBm <u>Average Power</u> 802.11b : 18.60 dBm 802.11g : 16.45 dBm 802.11n(HT20) : 15.84 dBm
Modulation Type	DSSS/CCK : 802.11b OFDM : 802.11g, 802.11n
Number of Channels	13 Channels
Antenna Specification	Antenna type: Intenna(FPCB ANT) Peak Gain : -1.71 dBi
Date(s) of Tests	July 25, 2018 ~ August 17, 2018

2. TEST METHODOLOGY

FCC KDB 558074 D01 DTS Meas Guidance v04 dated April 5, 2017 entitled "Guidance for Performing Compliance Measurements on Digital Transmission Systems(DTS) 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 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 8 of ANSI C63.10. (Version: 2013)

Conducted Antenna Terminal

See Section from 9.1 to 9.2.(KDB 558074 v04)

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.

Channel low, mid and high with lowest data rate (worst case) is chosen for full testing.

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, 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 July 07, 2015 (Registration Number: 90661)

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.

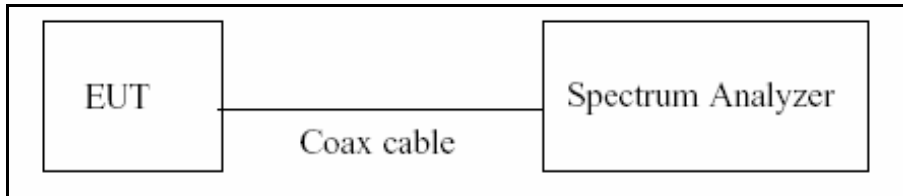
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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, 6.0)b) in KDB 558074 v04.

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 $> 50/T$.

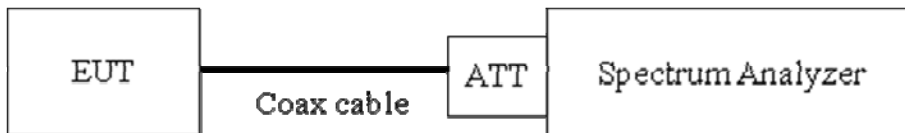
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = $T_{\text{on}} / T_{\text{total}}$ and Duty Cycle Factor = $10 \cdot \log(1/\text{Duty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

7.2. 6dB Bandwidth

Limit

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to (Procedure 8.1 in KDB 558074 v04)

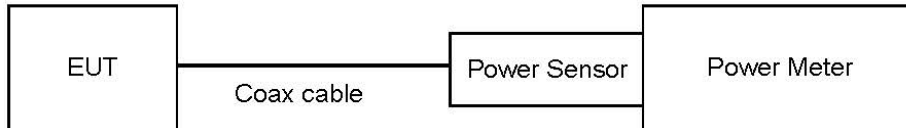
- 1) RBW = 100 kHz
- 2) VBW $\geq 3 \times$ RBW
- 3) Detector = Peak
- 4) Trace mode = max hold
- 5) Sweep = auto couple
- 6) Allow the trace to stabilize
- 7) We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

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 9.1.3 in KDB 558074 v04)
: Measure the peak power of the transmitter.
- Average Power (Procedure 9.2.3.1 in KDB 558074 v04)
 - 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

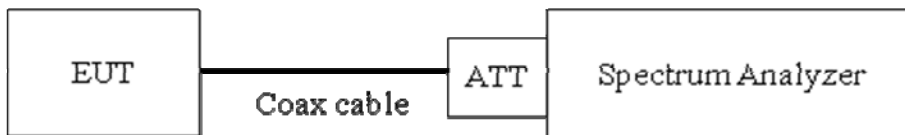
- Conducted Output Power(Peak) = Reading Value + ATT loss + Cable loss
- Conducted Output Power(Average) = Reading Value + ATT loss + Cable loss + Duty Cycle Factor

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 10.2 in KDB 558074, issued 04/05/2017

The spectrum analyzer is set to :

- 1) Set analyzer center frequency to DTS channel center frequency.
- 2) Span = 1.5 times the DTS channel bandwidth.
- 3) $RBW = 3 \text{ kHz} \leq RBW \leq 100 \text{ kHz}$.
- 4) $VBW \geq 3 \times RBW$.
- 5) Sweep = auto couple
- 6) Detector = peak
- 7) Trace Mode = max hold
- 8) Allow trace to fully stabilize.
- 9) 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

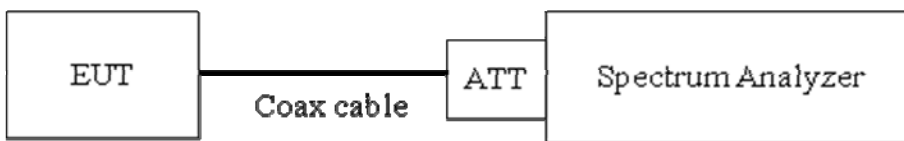
7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

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 11.0 in KDB 558074 v04)

- 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	11.30
100	9.83
200	10.19
300	10.13
400	10.23
500	10.25
600	10.32
700	10.35
800	10.35
900	10.34
1000	10.39
2000	10.64
2400*	10.65
2500*	10.67
3000	10.68
4000	10.89
5000	11.07
6000	11.06
7000	11.35
8000	11.32
9000	11.48
10000	11.56
11000	11.56
12000	11.68
13000	11.83
14000	11.90
15000	11.98
16000	12.04
17000	12.02
18000	12.08
19000	12.07
20000	12.14
21000	12.17
22000	12.31
23000	12.60
24000	12.34
25000	12.53
26000	12.02

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

2. Factor = Attenuator loss + Cable loss

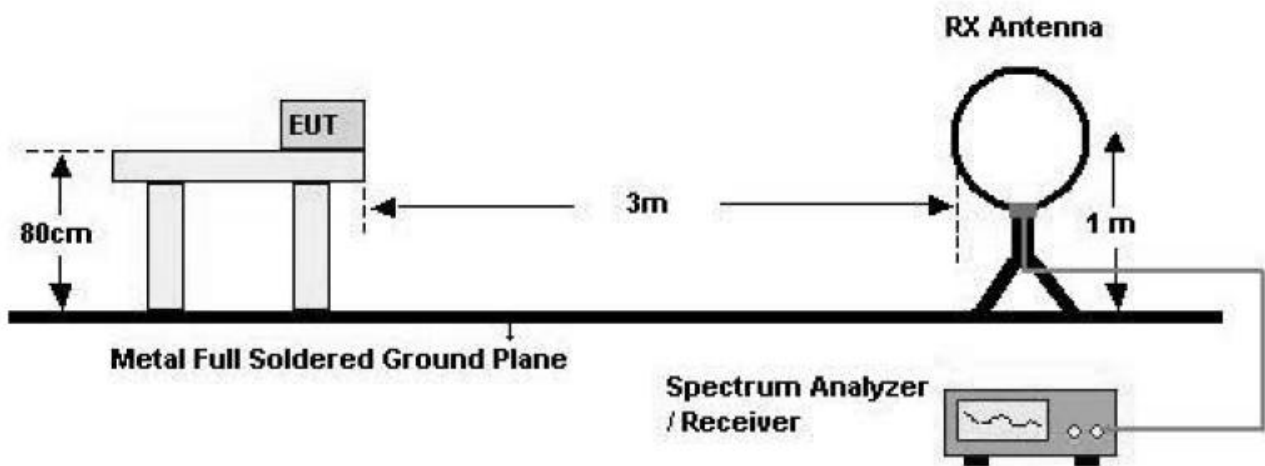
7.6. Radiated Test

Limit

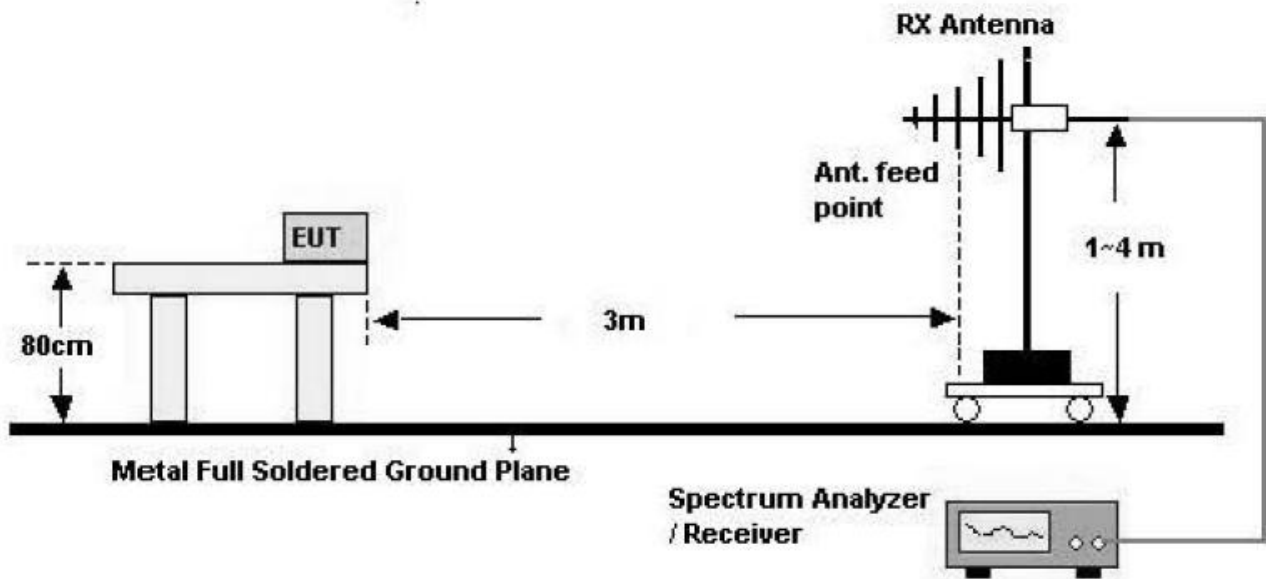
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	$2400/F(\text{kHz})$	300
0.490 – 1.705	$24000/F(\text{kHz})$	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

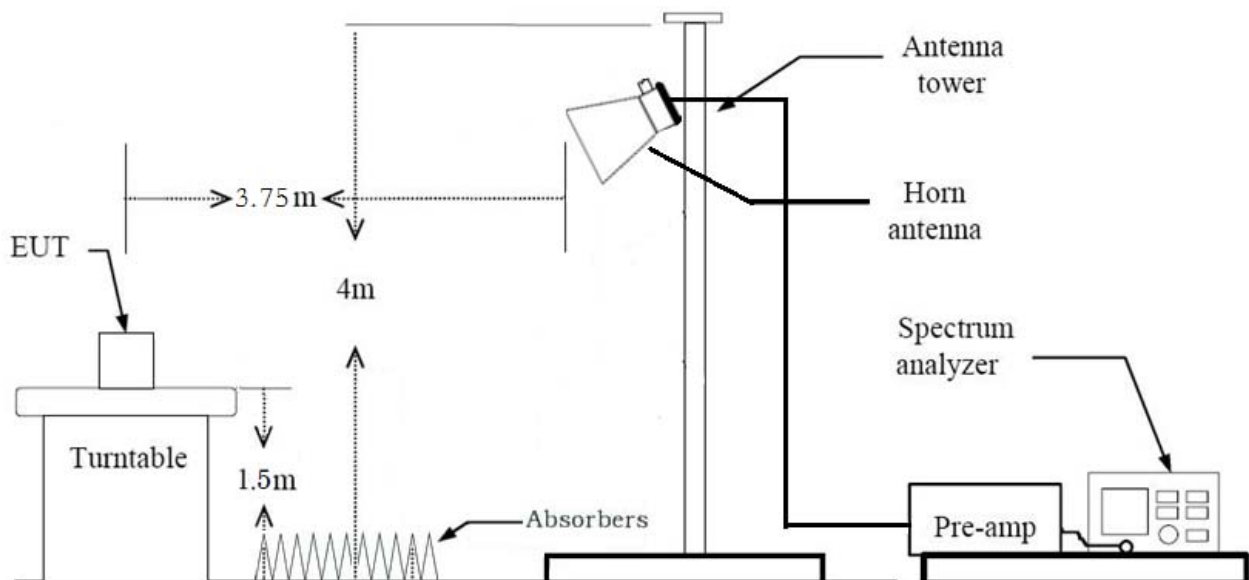
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



Test Procedure of Radiated spurious emissions (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 (Method 12.1 in KDB 558074 v04)
 - (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): Duty cycle $\geq 98\%$
 - Measured Frequency Range : 1 GHz – 25 GHz
 - Detector = RMS
 - Averaging type = power (i.e., RMS)
 - RBW = 1 MHz
 - VBW $\geq 3 \cdot \text{RBW}$
 - 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 : 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)

= 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

Worst case

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 + earphone

2. EUT Axis

- Radiated Spurious Emissions : Y
- Radiated Restricted Band Edge : X

3. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.

4. Duty cycle factor applies only 802.11g/n(Duty cycle < 98%).

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.
5. The EUT is the device operating below 30 MHz.
 - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
 - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

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

Worst case

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

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 Peak Output Power	§15.247(b)(3)	< 1 Watt		N/A
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	8.620	8.720	0.98853211	0.050
	2	4.320	4.400	0.98181818	0.080
	5.5	1.627	1.725	0.94318841	0.254
	11	0.860	0.958	0.89770355	0.469
802.11g	6	1.430	1.530	0.93464052	0.294
	9	0.960	1.060	0.90566038	0.430
	12	0.723	0.825	0.87636364	0.573
	18	0.492	0.591	0.83248731	0.796
	24	0.372	0.474	0.78481013	1.052
	36	0.256	0.357	0.71708683	1.444
	48	0.194	0.295	0.65762712	1.820
	54	0.180	0.280	0.64285714	1.919
802.11n (HT20)	6.5 (MCS0)	1.335	1.437	0.92901879	0.320
	13 (MCS1)	0.687	0.789	0.87072243	0.601
	19.5 (MCS2)	0.471	0.573	0.82198953	0.851
	26 (MCS3)	0.366	0.465	0.78709677	1.040
	39 (MCS4)	0.255	0.357	0.71428571	1.461
	52 (MCS5)	0.198	0.300	0.66000000	1.805
	58.5 (MCS6)	0.184	0.284	0.64788732	1.885
	65 (MCS7)	0.168	0.268	0.62686567	2.028

9.2 6dB BANDWIDTH

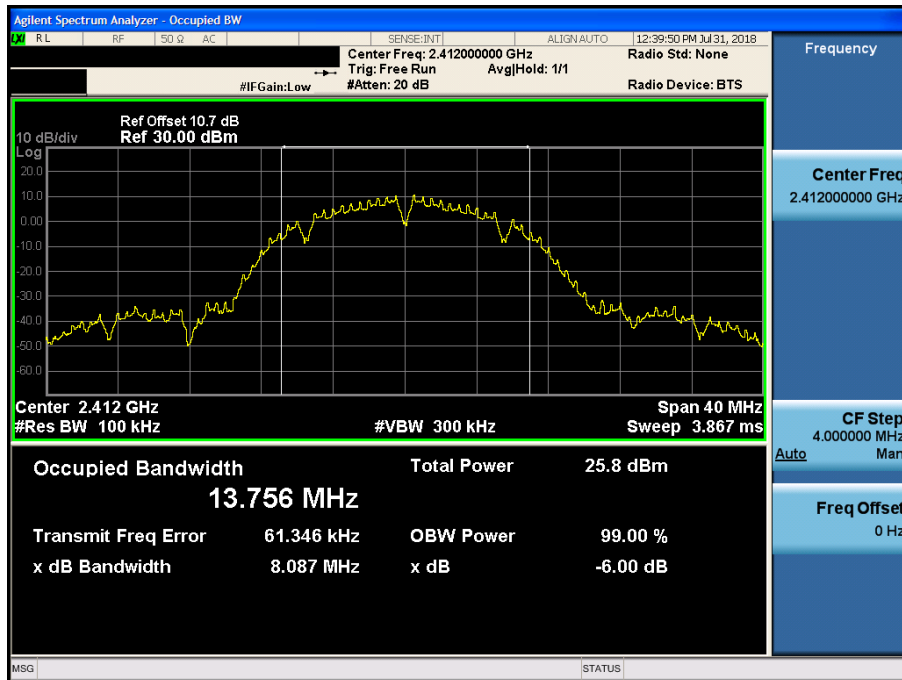
802.11b Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	8.087	0.5
2437	6	8.597	0.5
2462	11	8.581	0.5
2467	12	8.586	0.5
2472	13	9.067	0.5

802.11g Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	15.17	0.5
2437	6	16.34	0.5
2462	11	15.44	0.5
2467	12	15.72	0.5
2472	13	15.99	0.5

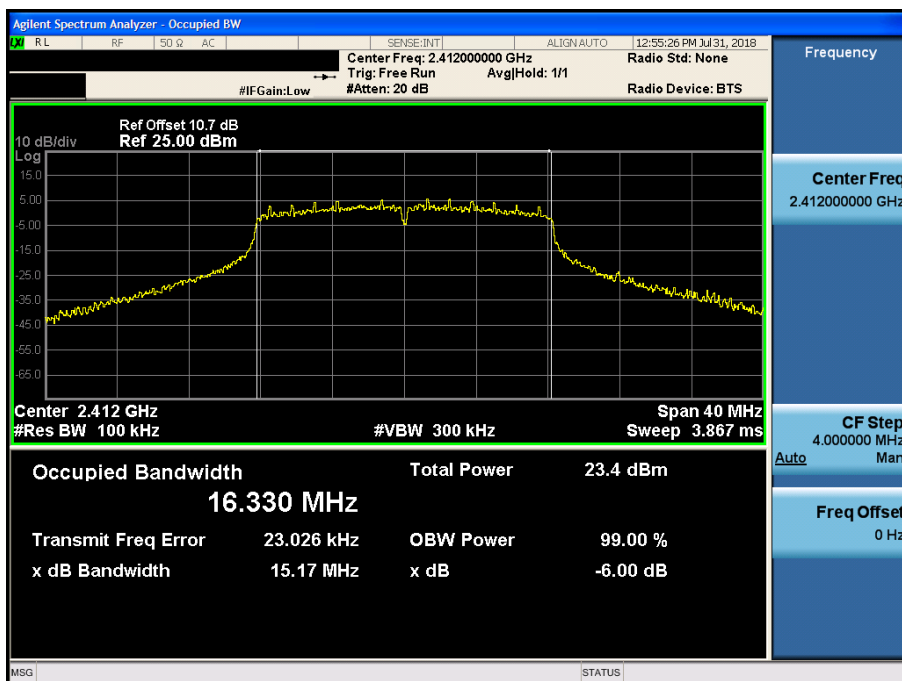
802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
Frequency [MHz]	Channel No.		
2412	1	15.09	0.5
2437	6	15.76	0.5
2462	11	15.18	0.5
2467	12	16.21	0.5
2472	13	16.70	0.5

Test Plots

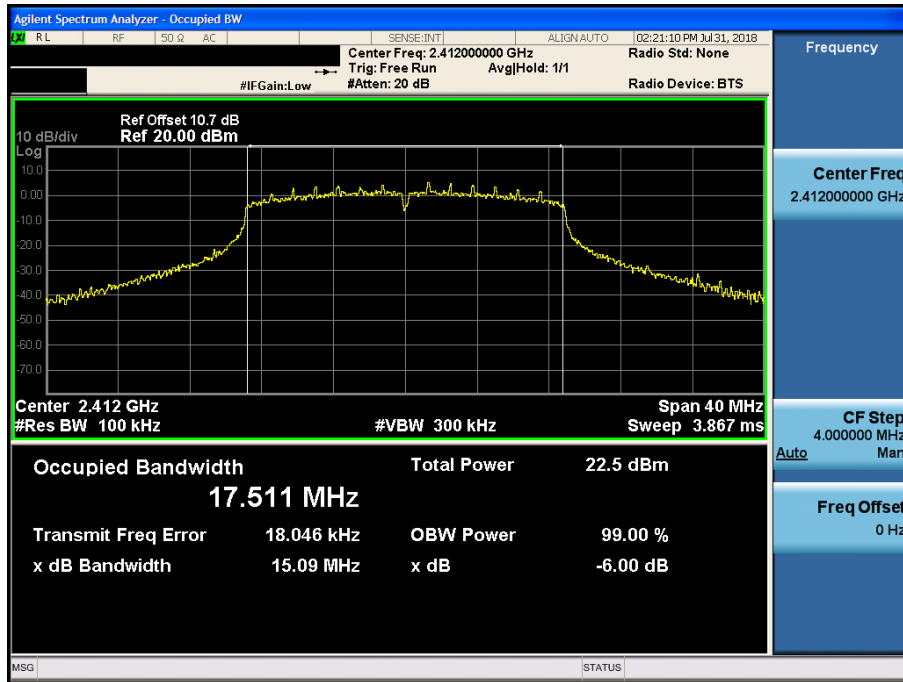
6dB Bandwidth plot (802.11b-CH 1)



6dB Bandwidth plot (802.11g-CH 1)



6dB Bandwidth plot (802.11n_HT20-CH 1)


Note:

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

9.3 OUTPUT POWER

Peak Power

1. Power Meter offset = Attenuator loss + Cable loss
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		Power Level Setting	Data Rate [Mbps]	Measured Power[dBm]	Limit [dBm]
Frequency [MHz]	Channel No.				
2412	1	18	1	21.12	30
			2	21.02	30
			5.5	21.05	30
			11	21.38	30
2437	6	18	1	20.57	30
			2	20.92	30
			5.5	20.97	30
			11	21.10	30
2462	11	18	1	21.10	30
			2	21.12	30
			5.5	21.18	30
			11	21.43	30
2467	12	8	1	9.69	30
			2	9.85	30
			5.5	9.87	30
			11	10.12	30
2472	13	6	1	7.61	30
			2	7.89	30
			5.5	7.97	30
			11	7.91	30

802.11g Mode		Power Level Setting	Data Rate [Mbps]	Measured Power[dBm]	Limit [dBm]
Frequency[M Hz]	Channel No.				
2412	1	16	6	25.66	30
			9	25.56	30
			12	25.40	30
			18	25.42	30
			24	25.57	30
			36	25.66	30
			48	25.41	30
			54	25.60	30
2437	6	16	6	25.24	30
			9	25.27	30
			12	25.04	30
			18	25.06	30
			24	25.21	30
			36	25.33	30
			48	25.18	30
			54	25.39	30
2462	11	16	6	25.87	30
			9	25.83	30
			12	25.44	30
			18	25.64	30
			24	25.56	30
			36	25.48	30
			48	25.50	30
			54	25.57	30
2467	12	8	6	20.30	30
			9	19.93	30
			12	18.35	30
			18	18.03	30
			24	18.91	30
			36	19.46	30
			48	18.01	30
			54	17.81	30
2472	13	5	6	16.54	30
			9	16.19	30
			12	15.32	30
			18	15.69	30
			24	15.59	30
			36	15.57	30
			48	15.21	30
			54	15.38	30

802.11n Mode		Power Level Setting	MCS Index	Measured Power[dBm]	Limit [dBm]
Frequency[M Hz]	Channel No.				
2412	1	15	0	25.49	30
			1	25.24	30
			2	25.61	30
			3	25.16	30
			4	25.21	30
			5	25.40	30
			6	25.05	30
			7	25.28	30
2437	6	15	0	25.10	30
			1	24.93	30
			2	25.04	30
			3	24.72	30
			4	24.69	30
			5	25.27	30
			6	24.89	30
			7	24.60	30
2462	11	15	0	25.43	30
			1	25.51	30
			2	25.40	30
			3	25.26	30
			4	25.30	30
			5	25.72	30
			6	25.43	30
			7	25.24	30
2467	12	8	0	19.35	30
			1	19.58	30
			2	19.63	30
			3	18.46	30
			4	18.01	30
			5	19.38	30
			6	18.15	30
			7	17.87	30
2472	13	5	0	16.20	30
			1	16.08	30
			2	16.98	30
			3	15.96	30
			4	15.48	30
			5	16.78	30
			6	15.86	30
			7	15.16	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		Power Level Setting	Data Rate [Mbps]	Measured Power[dBm]	Duty Cycle Factor [dB]	Measured Power(dBm) + Duty Cycle Factor[dB]	Limit [dBm]
Frequency [MHz]	Channel No.						
2412	1	18	1	18.23	0.050	18.28	30
			2	18.24	0.080	18.32	30
			5.5	18.10	0.254	18.35	30
			11	17.94	0.469	18.41	30
2437	6	18	1	18.00	0.050	18.05	30
			2	18.08	0.080	18.16	30
			5.5	18.00	0.254	18.25	30
			11	17.66	0.469	18.13	30
2462	11	18	1	18.27	0.050	18.32	30
			2	18.34	0.080	18.42	30
			5.5	18.21	0.254	18.46	30
			11	18.13	0.469	18.60	30
2467	12	8	1	6.88	0.050	6.93	30
			2	6.96	0.080	7.04	30
			5.5	6.74	0.254	6.99	30
			11	6.48	0.469	6.95	30
2472	13	6	1	5.11	0.050	5.16	30
			2	5.13	0.080	5.21	30
			5.5	4.91	0.254	5.16	30
			11	4.86	0.469	5.33	30

802.11g Mode		Power Level Setting	Data Rate [Mbps]	Measured Power[dBm]	Duty Cycle Factor [dB]	Measured Power(dBm) + Duty Cycle Factor[dB]	Limit [dBm]
Frequency [MHz]	Channel No.						
2412	1	16	6	15.96	0.294	16.25	30
			9	15.85	0.430	16.28	30
			12	15.72	0.573	16.29	30
			18	15.53	0.796	16.33	30
			24	15.25	1.052	16.30	30
			36	14.85	1.444	16.29	30
			48	14.40	1.820	16.22	30
			54	14.30	1.919	16.22	30
2437	6	16	6	15.77	0.294	16.06	30
			9	15.55	0.430	15.98	30
			12	15.42	0.573	15.99	30
			18	15.17	0.796	15.97	30
			24	14.96	1.052	16.01	30
			36	14.53	1.444	15.97	30
			48	14.16	1.820	15.98	30
			54	14.10	1.919	16.02	30
2462	11	16	6	16.15	0.294	16.44	30
			9	16.02	0.430	16.45	30
			12	15.80	0.573	16.37	30
			18	15.56	0.796	16.36	30
			24	15.31	1.052	16.36	30
			36	14.90	1.444	16.34	30
			48	14.55	1.820	16.37	30
			54	14.42	1.919	16.34	30
2467	12	8	6	6.93	0.294	7.22	30
			9	6.65	0.430	7.08	30
			12	6.47	0.573	7.04	30
			18	6.30	0.796	7.10	30
			24	6.02	1.052	7.07	30
			36	5.66	1.444	7.10	30
			48	5.22	1.820	7.04	30
			54	5.06	1.919	6.98	30
2472	13	5	6	4.06	0.294	4.35	30
			9	3.80	0.430	4.23	30
			12	3.72	0.573	4.29	30
			18	3.61	0.796	4.41	30
			24	3.15	1.052	4.20	30
			36	2.85	1.444	4.29	30
			48	2.55	1.820	4.37	30
			54	2.42	1.919	4.34	30

802.11n Mode		Power Level Setting	MCS Index	Measured Power[dBm]	Duty Cycle Factor [dB]	Measured Power(dBm) + Duty Cycle Factor[dB]	Limit [dBm]
Frequency [MHz]	Channel No.						
2412	1	16	0	14.96	0.320	15.28	30
			1	14.62	0.601	15.22	30
			2	14.44	0.851	15.29	30
			3	14.19	1.040	15.23	30
			4	13.85	1.461	15.31	30
			5	13.50	1.805	15.30	30
			6	13.40	1.885	15.29	30
			7	13.26	2.028	15.29	30
2437	6	16	0	14.86	0.320	15.18	30
			1	14.58	0.601	15.18	30
			2	14.25	0.851	15.10	30
			3	14.00	1.040	15.04	30
			4	13.66	1.461	15.12	30
			5	13.36	1.805	15.16	30
			6	13.18	1.885	15.07	30
			7	13.08	2.028	15.11	30
2462	11	16	0	15.17	0.320	15.49	30
			1	14.90	0.601	15.50	30
			2	14.54	0.851	15.39	30
			3	14.56	1.040	15.60	30
			4	14.38	1.461	15.84	30
			5	13.97	1.805	15.77	30
			6	13.60	1.885	15.49	30
			7	13.34	2.028	15.37	30
2467	12	8	0	6.65	0.320	6.97	30
			1	6.28	0.601	6.88	30
			2	6.10	0.851	6.95	30
			3	5.86	1.040	6.90	30
			4	5.63	1.461	7.09	30
			5	5.15	1.805	6.95	30
			6	5.08	1.885	6.97	30
			7	4.95	2.028	6.98	30
2472	13	5	0	3.90	0.320	4.22	30
			1	3.78	0.601	4.38	30
			2	3.43	0.851	4.28	30
			3	3.25	1.040	4.29	30
			4	2.86	1.461	4.32	30
			5	2.53	1.805	4.33	30
			6	2.38	1.885	4.27	30
			7	2.27	2.028	4.30	30

9.4 POWER SPECTRAL DENSITY

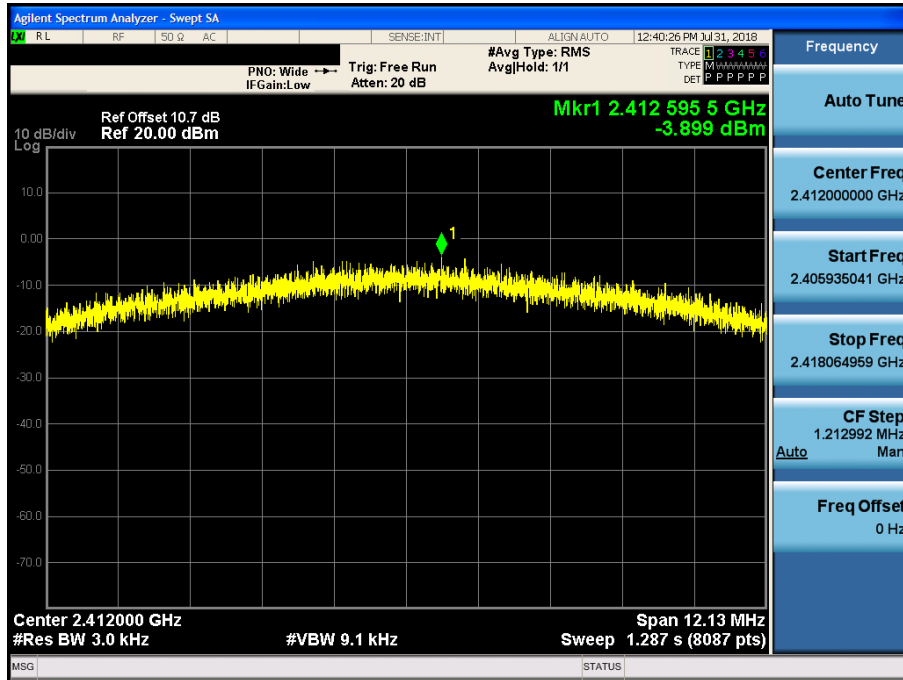
Mode	Frequency (MHz)	Channel No.	Test Result	
			PSD (dBm)	Limit (dBm)
802.11b	2412	1	-3.899	8
	2437	6	-5.078	8
	2462	11	-4.914	8
	2467	12	-15.452	8
	2472	13	-14.762	8
802.11g	2412	1	-8.563	8
	2437	6	-9.132	8
	2462	11	-9.268	8
	2467	12	-17.958	8
	2472	13	-21.087	8
802.11n (HT20)	2412	1	-9.260	8
	2437	6	-9.941	8
	2462	11	-10.091	8
	2467	12	-19.275	8
	2472	13	-19.841	8

Note :

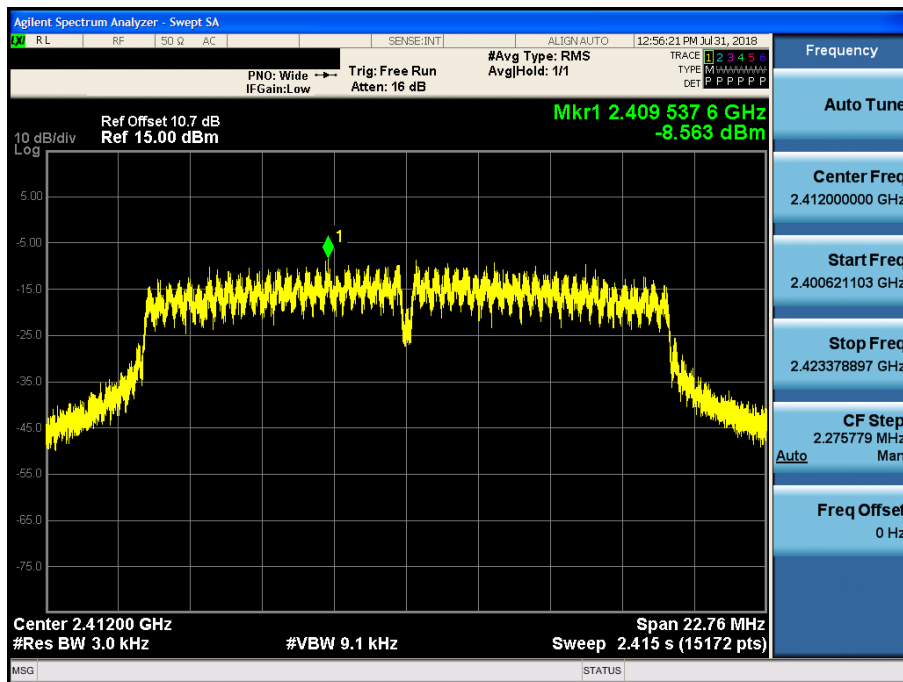
1. Spectrum reading values are not plot data.
The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.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

Test Plots

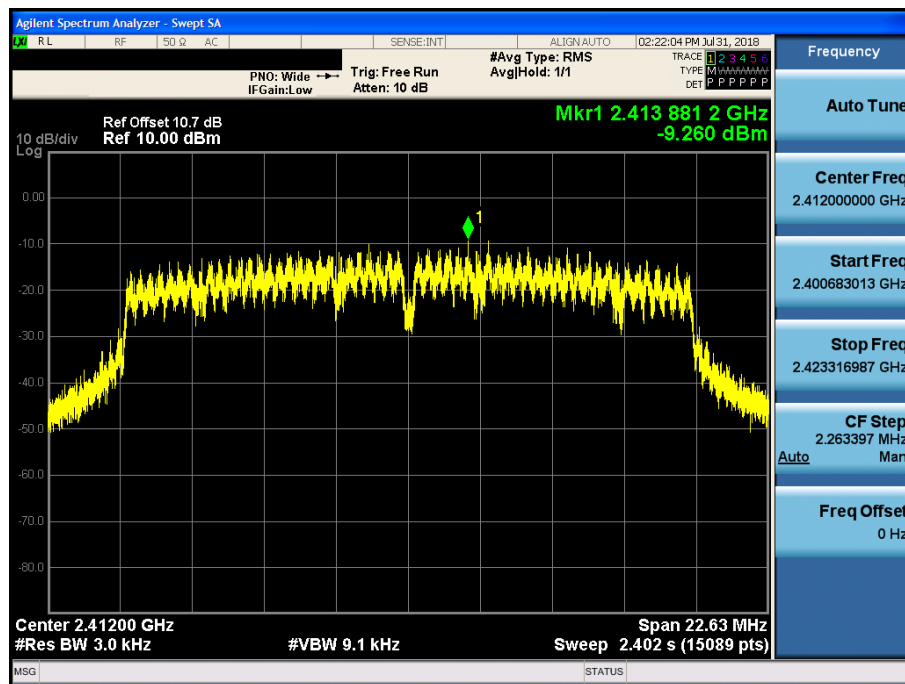
Power Spectral Density (802.11b-CH 1)



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 worstcase PSD channel.

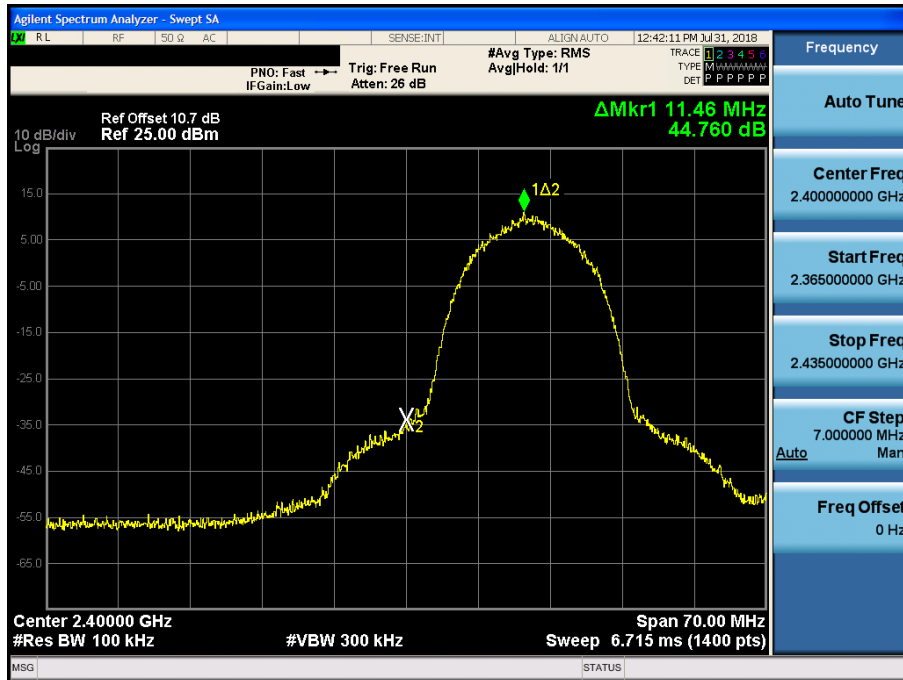
9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below.

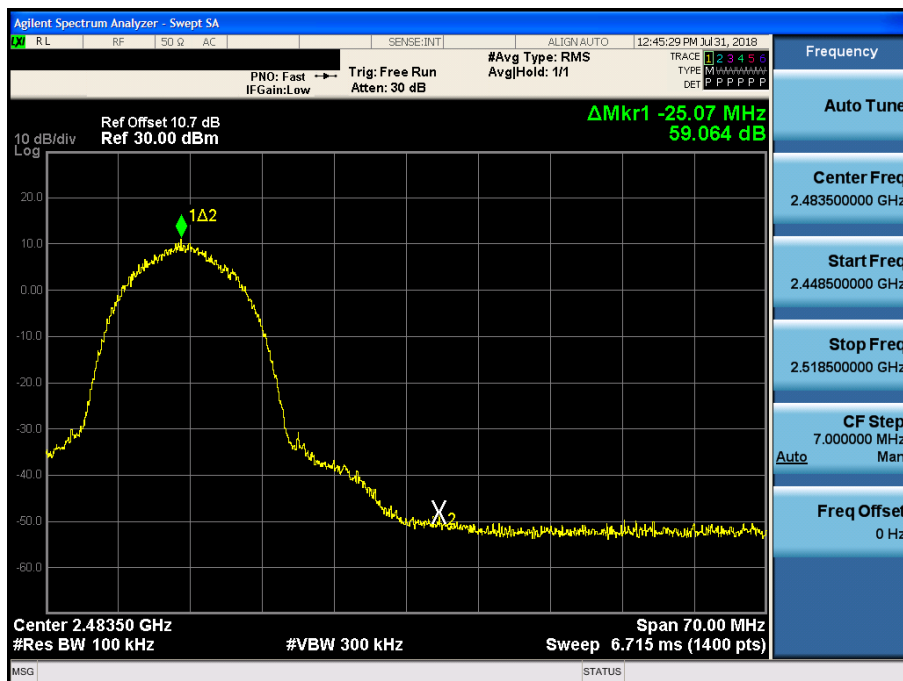
In order to simplify the report, attached plots were only the worst case channel and data rate.

Test Plots(BandEdge)

Band Edge (802.11b-CH1)



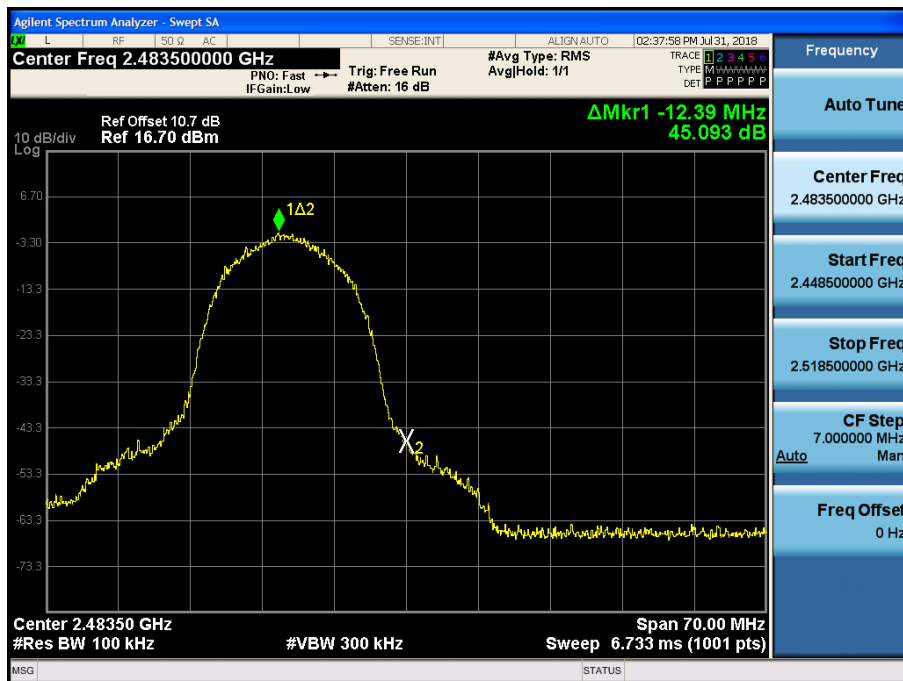
Band Edge (802.11b-CH11)



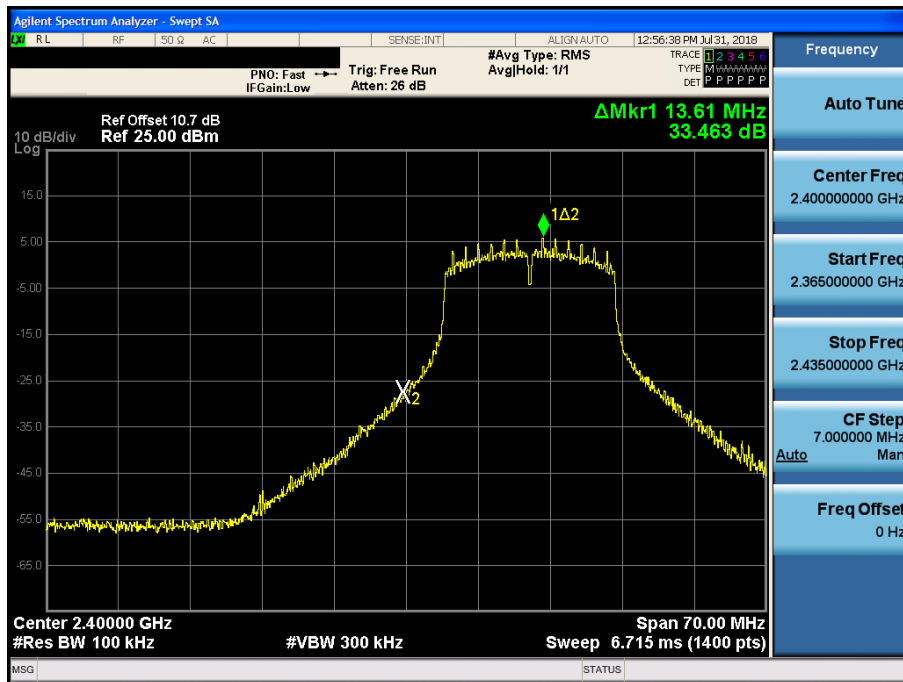
Band Edge (802.11b-CH12)



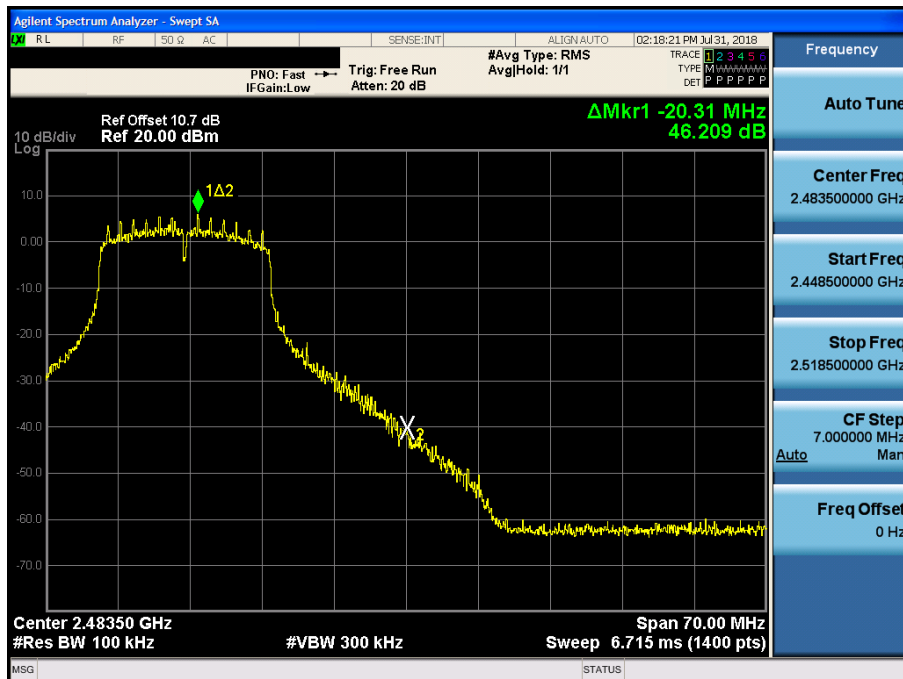
Band Edge (802.11b-CH13)



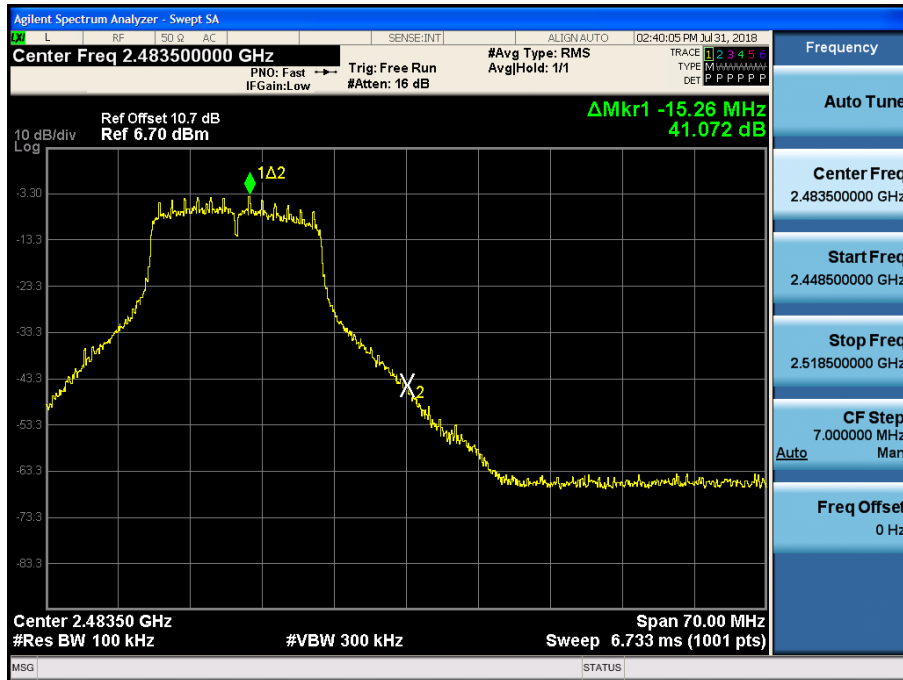
Band Edge (802.11g-CH1)



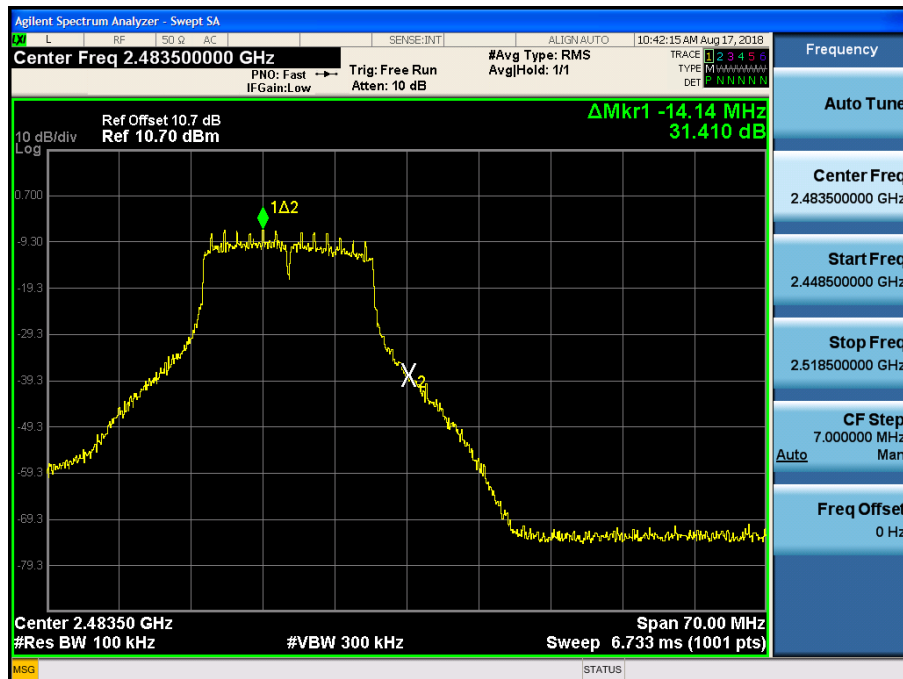
Band Edge (802.11g-CH11)



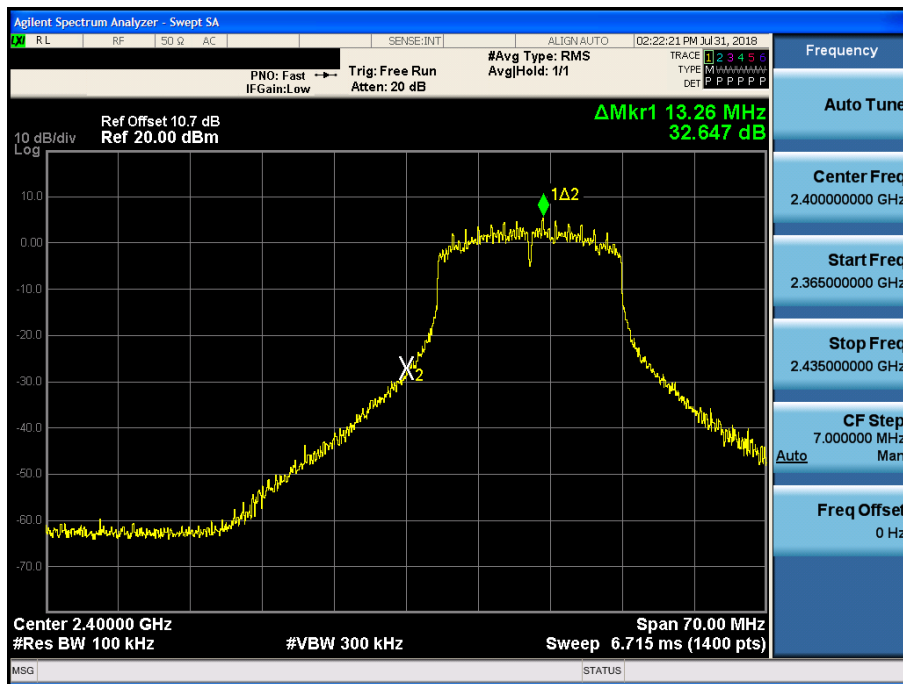
Band Edge (802.11g-CH12)



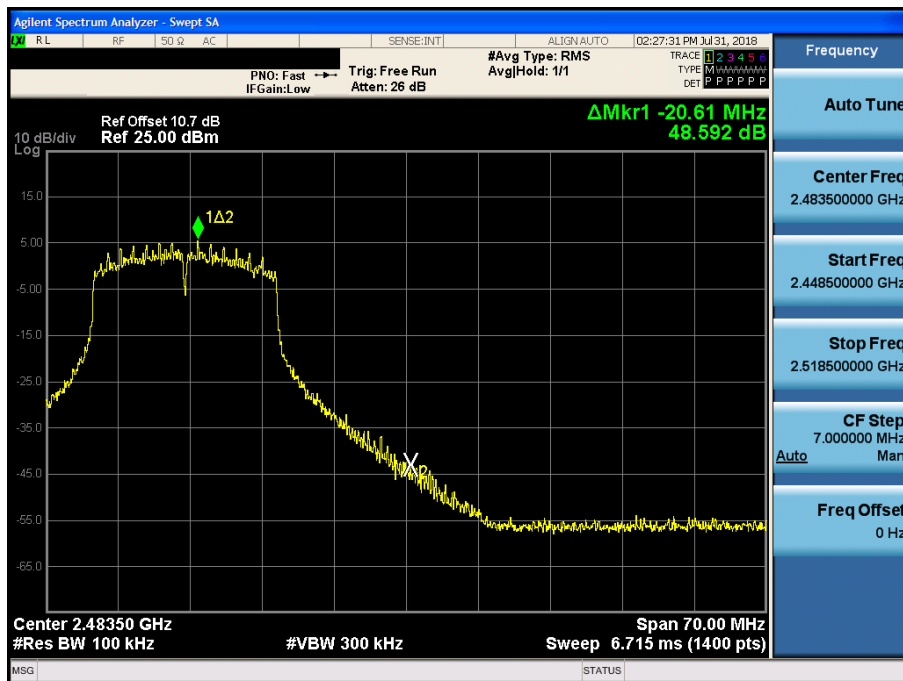
Band Edge (802.11g-CH13)



Band Edge (802.11n_HT20-CH1)



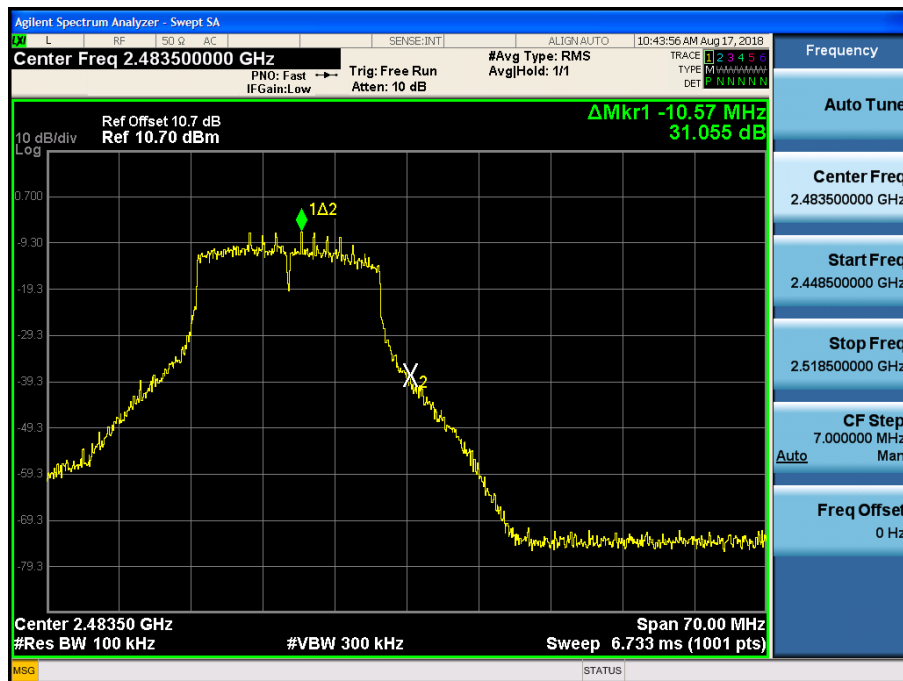
Band Edge (802.11n_HT20-CH11)



Band Edge (802.11n_HT20-CH12)



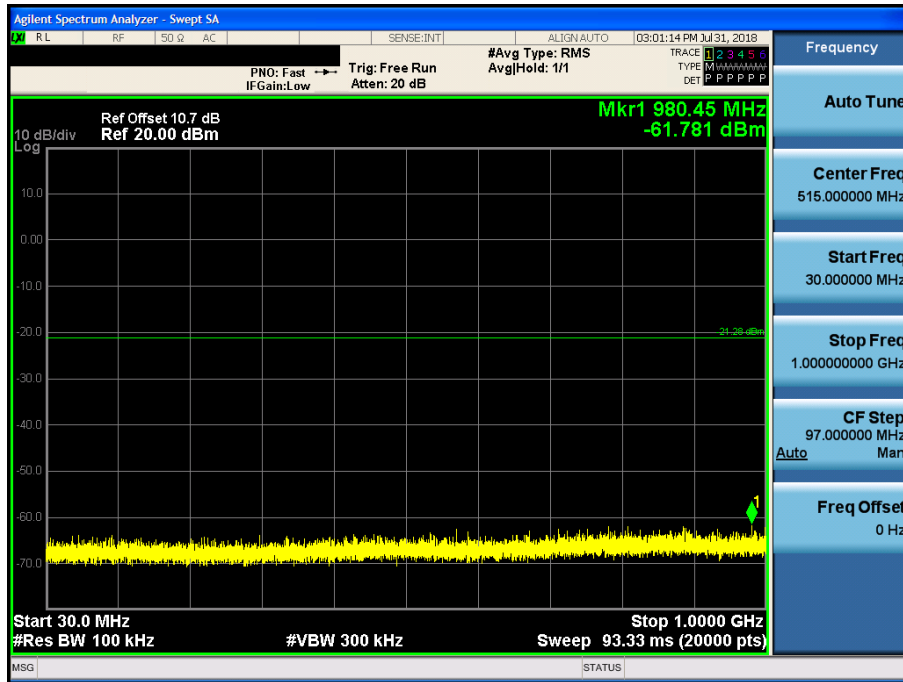
Band Edge (802.11n_HT20-CH13)



Test Plots(Conducted Spurious Emission)

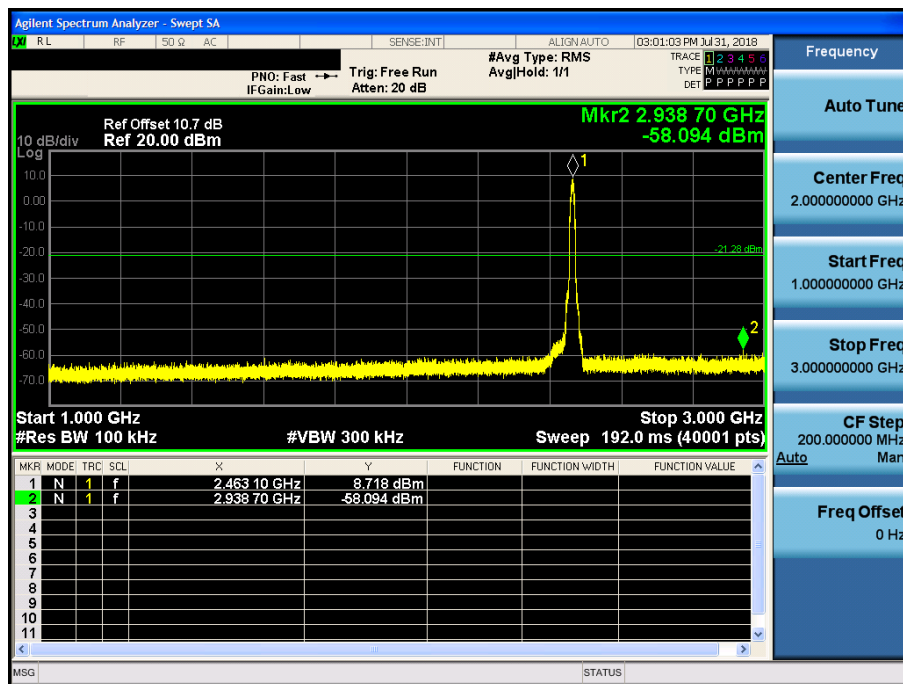
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



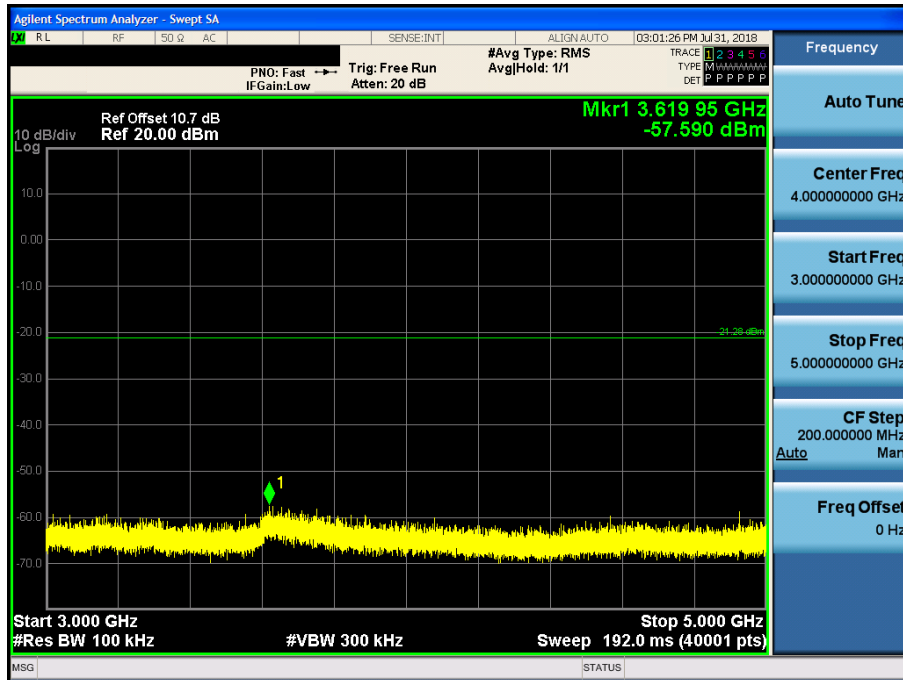
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



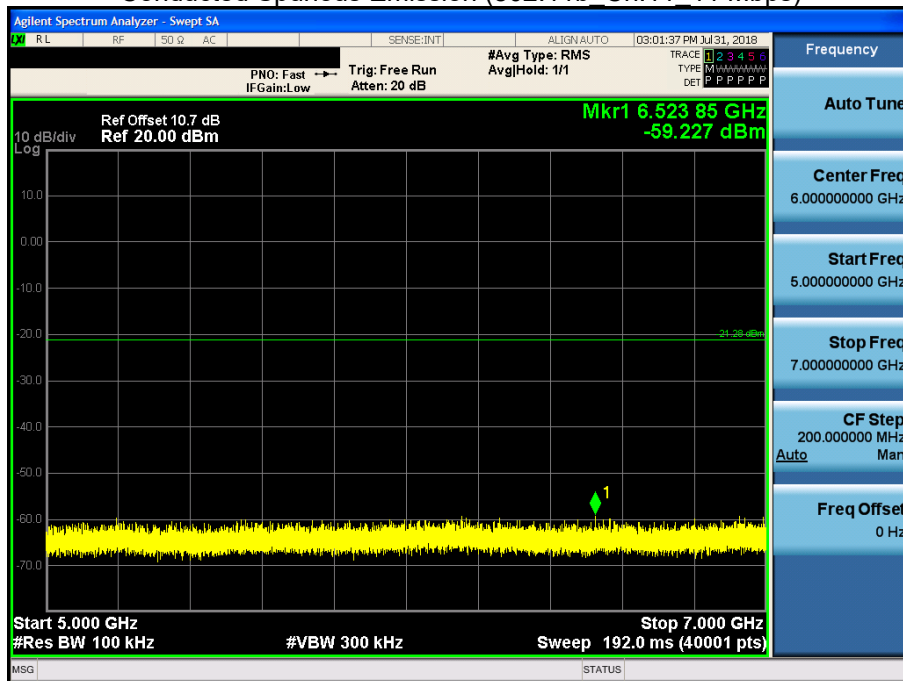
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



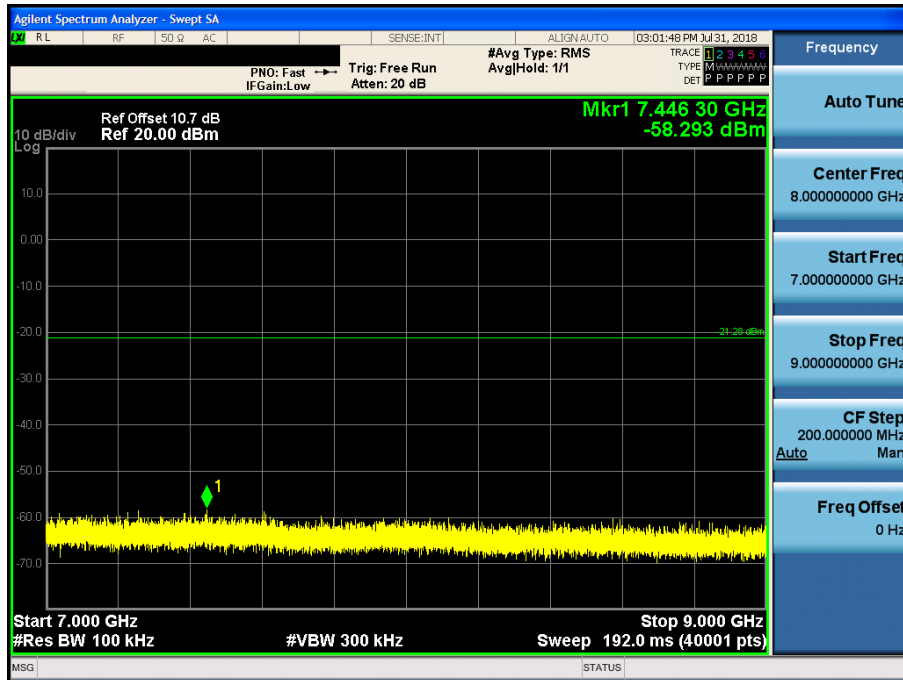
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



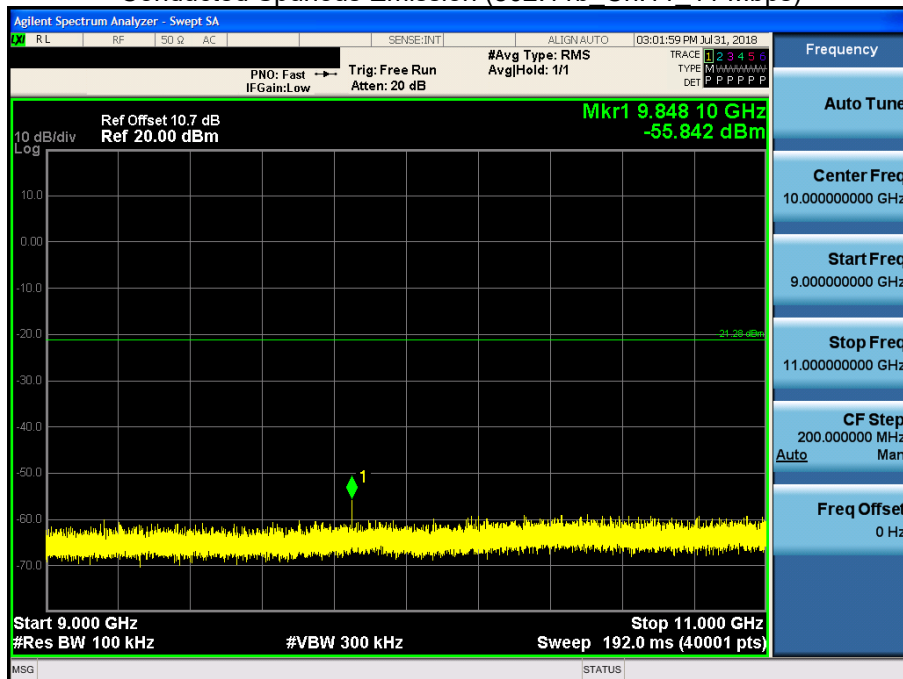
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



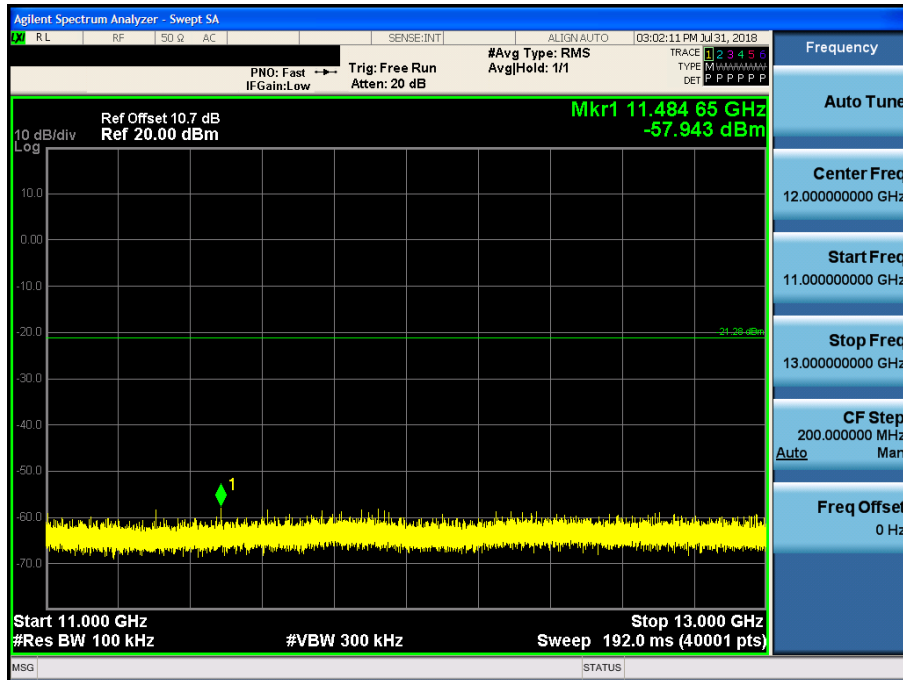
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



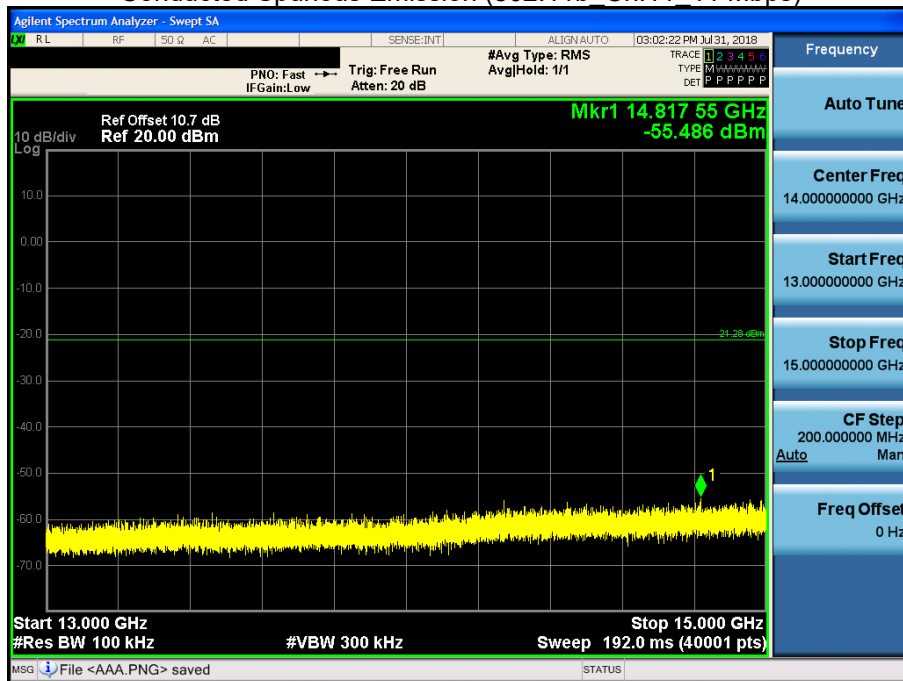
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



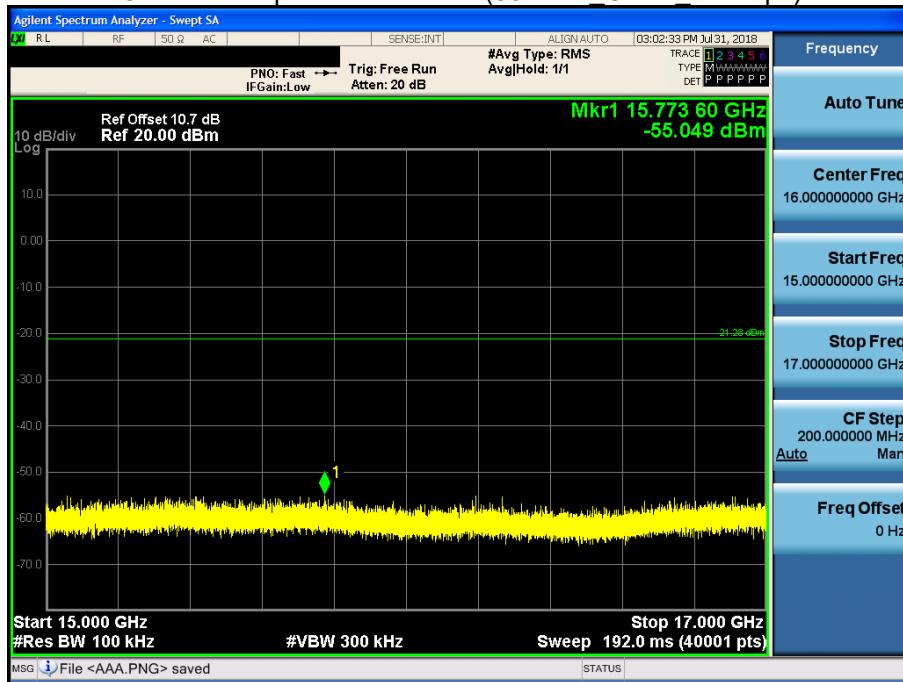
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



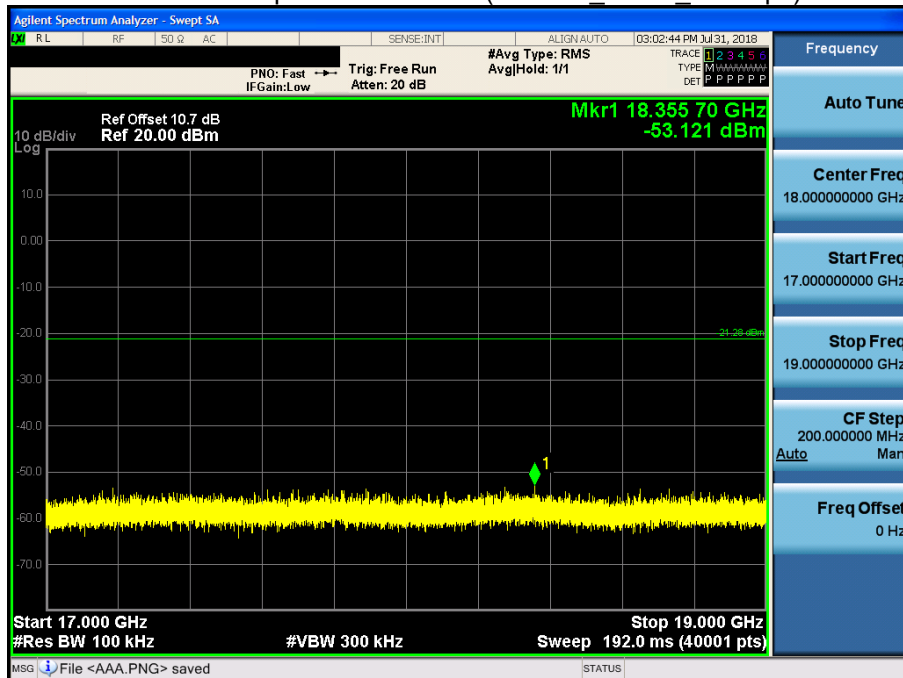
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11b Ch.11 11 Mbps)



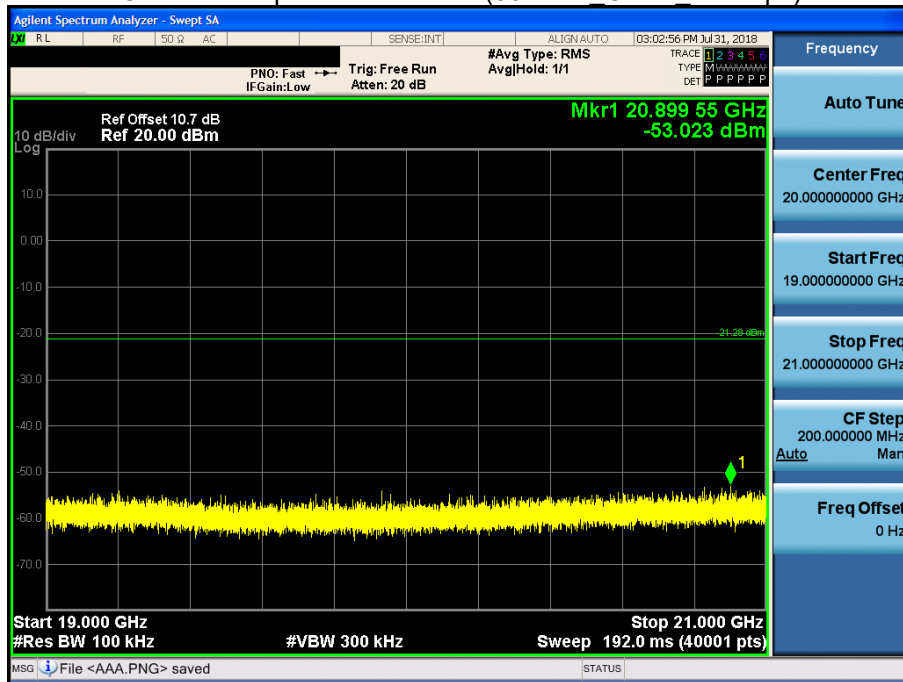
17 GHz ~ 19 GHz

Conducted Spurious Emission (802.11b Ch.11 11 Mbps)



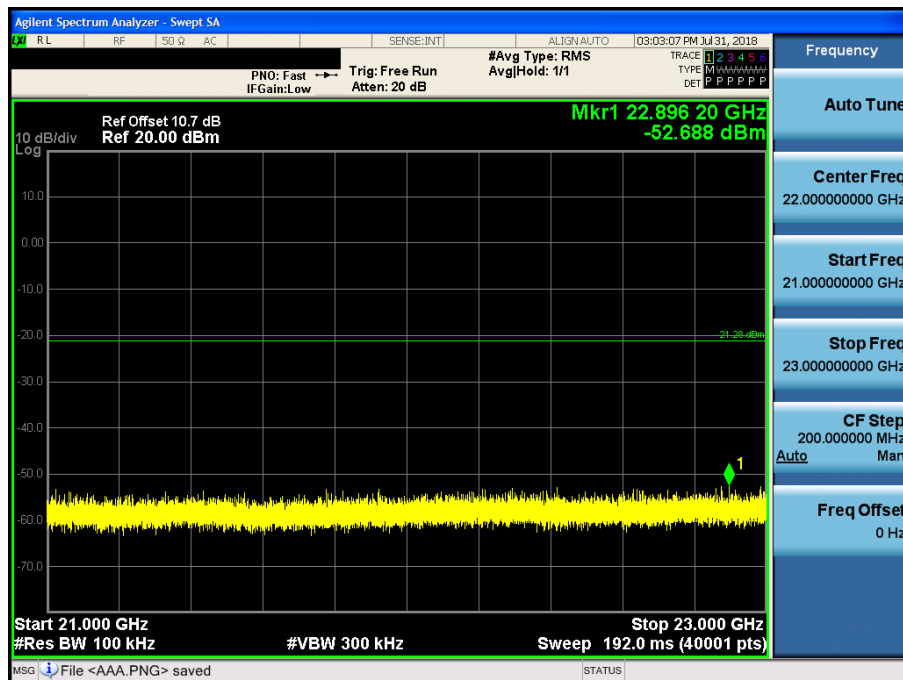
19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11b Ch.11 11 Mbps)



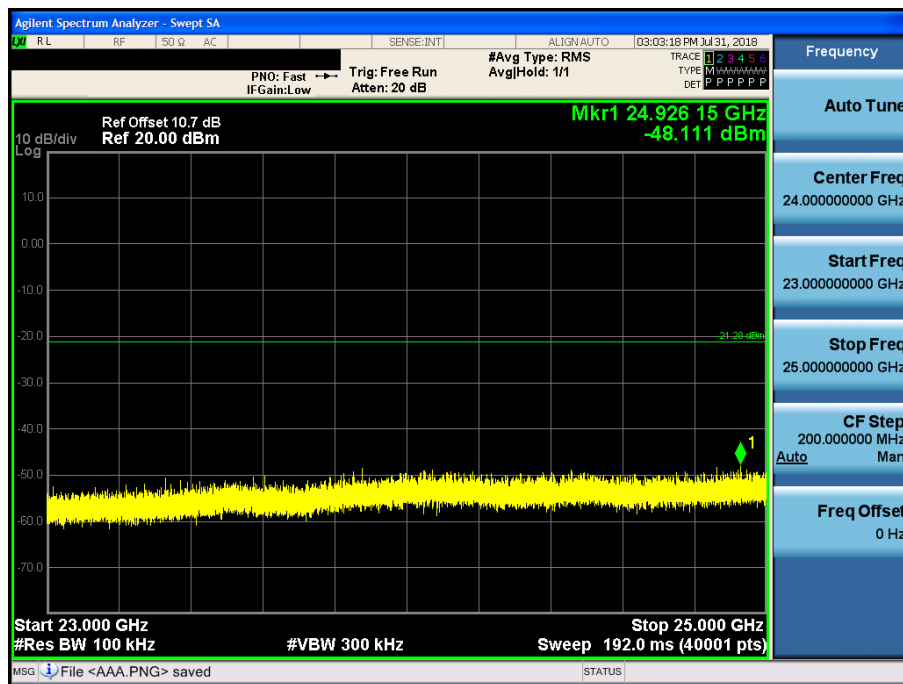
21 GHz ~ 23 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



23 GHz ~ 25 GHz

Conducted Spurious Emission (802.11b_Ch.11_11 Mbps)



9.6 RADIATED SPURIOUS EMISSIONS

Frequency Range : 9 kHz – 30MHz

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

Note:

1. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
2. Distance extrapolation factor = $40 \cdot \log(\text{specific distance} / \text{test distance})$ (dB)
3. Limit line = specific Limits (dBuV) + Distance extrapolation factor
4. Radiated test is performed with hopping off.
5. The test results for below 30 MHz is correlated to an open site.
The result on OATS 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	51.65	-0.67	V	50.99	73.98	23.00	PK
4824	40.81	-0.67	V	40.15	53.98	13.84	AV
7236	51.31	5.28	V	56.59	73.98	17.40	PK
7236	39.65	5.28	V	44.93	53.98	9.06	AV
4824	50.78	-0.67	H	50.12	73.98	23.87	PK
4824	39.84	-0.67	H	39.18	53.98	14.81	AV
7236	50.79	5.28	H	56.07	73.98	17.92	PK
7236	39.26	5.28	H	44.54	53.98	9.45	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	51.91	0.00	-0.67	V	51.25	73.98	22.74	PK
4824	40.16	0.29	-0.67	V	39.79	53.98	14.19	AV
7236	51.60	0.00	5.28	V	56.88	73.98	17.11	PK
7236	39.69	0.29	5.28	V	45.26	53.98	8.72	AV
4824	51.26	0.00	-0.67	H	50.60	73.98	23.39	PK
4824	39.87	0.29	-0.67	H	39.50	53.98	14.48	AV
7236	51.44	0.00	5.28	H	56.72	73.98	17.27	PK
7236	39.20	0.29	5.28	H	44.77	53.98	9.21	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	51.36	0.00	-0.67	V	50.70	73.98	23.29	PK
4824	40.21	0.32	-0.67	V	39.87	53.98	14.12	AV
7236	51.68	0.00	5.28	V	56.96	73.98	17.03	PK
7236	39.66	0.32	5.28	V	45.26	53.98	8.73	AV
4824	51.08	0.00	-0.67	H	50.42	73.98	23.57	PK
4824	39.17	0.32	-0.67	H	38.83	53.98	15.16	AV
7236	51.16	0.00	5.28	H	56.44	73.98	17.55	PK
7236	39.23	0.32	5.28	H	44.83	53.98	9.16	AV

Operation Mode:	802.11b
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	52.32	-0.37	V	51.95	73.98	22.03	PK
4874	40.24	-0.37	V	39.87	53.98	14.11	AV
7311	51.67	5.60	V	57.27	73.98	16.71	PK
7311	39.26	5.60	V	44.86	53.98	9.12	AV
4874	51.67	-0.37	H	51.30	73.98	22.68	PK
4874	39.28	-0.37	H	38.91	53.98	15.07	AV
7311	51.13	5.60	H	56.73	73.98	17.25	PK
7311	39.04	5.60	H	44.64	53.98	9.34	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	52.02	0.00	-0.37	V	51.65	73.98	22.33	PK
4874	40.19	0.29	-0.37	V	40.11	53.98	13.87	AV
7311	51.30	0.00	5.60	V	56.90	73.98	17.08	PK
7311	39.31	0.29	5.60	V	45.20	53.98	8.78	AV
4874	51.76	0.00	-0.37	H	51.39	73.98	22.59	PK
4874	39.26	0.29	-0.37	H	39.18	53.98	14.80	AV
7311	51.00	0.00	5.60	H	56.60	73.98	17.38	PK
7311	39.08	0.29	5.60	H	44.97	53.98	9.01	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	52.05	0.00	-0.37	V	51.68	73.98	22.30	PK
4874	40.16	0.32	-0.37	V	40.11	53.98	13.87	AV
7311	51.87	0.00	5.60	V	57.47	73.98	16.51	PK
7311	39.18	0.32	5.60	V	45.10	53.98	8.88	AV
4874	51.69	0.00	-0.37	H	51.32	73.98	22.66	PK
4874	39.84	0.32	-0.37	H	39.79	53.98	14.19	AV
7311	51.48	0.00	5.60	H	57.08	73.98	16.90	PK
7311	38.28	0.32	5.60	H	44.20	53.98	9.78	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	51.84	-0.60	V	51.25	73.98	22.74	PK
4924	40.08	-0.60	V	39.49	53.98	14.50	AV
7386	50.91	5.67	V	56.58	73.98	17.41	PK
7386	39.25	5.67	V	44.92	53.98	9.07	AV
4924	51.27	-0.60	H	50.68	73.98	23.31	PK
4924	39.84	-0.60	H	39.25	53.98	14.74	AV
7386	50.26	5.67	H	55.93	73.98	18.06	PK
7386	38.56	5.67	H	44.23	53.98	9.76	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	51.78	0.00	-0.60	V	51.19	73.98	22.80	PK
4924	40.06	0.29	-0.60	V	39.76	53.98	14.22	AV
7386	51.01	0.00	5.67	V	56.68	73.98	17.31	PK
7386	39.28	0.29	5.67	V	45.24	53.98	8.74	AV
4924	51.48	0.00	-0.60	H	50.89	73.98	23.10	PK
4924	39.21	0.29	-0.60	H	38.91	53.98	15.07	AV
7386	50.46	0.00	5.67	H	56.13	73.98	17.86	PK
7386	39.01	0.29	5.67	H	44.97	53.98	9.01	AV

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

Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4924	51.54	0.00	-0.60	V	50.95	73.98	23.04	PK
4924	40.13	0.32	-0.60	V	39.86	53.98	14.13	AV
7386	50.74	0.00	5.67	V	56.41	73.98	17.58	PK
7386	39.12	0.32	5.67	V	45.11	53.98	8.88	AV
4924	51.17	0.00	-0.60	H	50.58	73.98	23.41	PK
4924	39.44	0.32	-0.60	H	39.17	53.98	14.82	AV
7386	50.37	0.00	5.67	H	56.04	73.98	17.95	PK
7386	38.56	0.32	5.67	H	44.55	53.98	9.44	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	51.65	-0.54	V	51.11	73.98	22.87	PK
4934	40.06	-0.54	V	39.52	53.98	14.46	AV
7401	51.31	5.70	V	57.01	73.98	16.97	PK
7401	39.33	5.70	V	45.03	53.98	8.95	AV
4934	50.92	-0.54	H	50.38	73.98	23.60	PK
4934	39.84	-0.54	H	39.30	53.98	14.68	AV
7401	50.60	5.70	H	56.30	73.98	17.68	PK
7401	38.92	5.70	H	44.62	53.98	9.36	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	51.85	0.00	-0.54	V	51.31	73.98	22.67	PK
4934	40.12	0.29	-0.54	V	39.87	53.98	14.11	AV
7401	50.85	0.00	5.70	V	56.55	73.98	17.43	PK
7401	39.33	0.29	5.70	V	45.32	53.98	8.66	AV
4934	50.66	0.00	-0.54	H	50.12	73.98	23.86	PK
4934	39.54	0.29	-0.54	H	39.29	53.98	14.69	AV
7401	50.54	0.00	5.70	H	56.24	73.98	17.74	PK
7401	39.08	0.29	5.70	H	45.07	53.98	8.91	AV

Operation Mode:	802.11n (HT20)
Transfer MCS Index:	0
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	51.82	0.00	-0.54	V	51.28	73.98	22.70	PK
4934	40.19	0.32	-0.54	V	39.97	53.98	14.01	AV
7401	51.13	0.00	5.70	V	56.83	73.98	17.15	PK
7401	39.29	0.32	5.70	V	45.31	53.98	8.67	AV
4934	51.34	0.00	-0.54	H	50.80	73.98	23.18	PK
4934	39.88	0.32	-0.54	H	39.66	53.98	14.32	AV
7401	50.59	0.00	5.70	H	56.29	73.98	17.69	PK
7401	38.95	0.32	5.70	H	44.97	53.98	9.01	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	51.95	-0.55	V	51.40	73.98	22.58	PK
4944	40.08	-0.55	V	39.53	53.98	14.45	AV
7416	50.93	6.00	V	56.93	73.98	17.05	PK
7416	38.82	6.00	V	44.82	53.98	9.16	AV
4944	51.69	-0.55	H	51.14	73.98	22.84	PK
4944	39.84	-0.55	H	39.29	53.98	14.69	AV
7416	50.49	6.00	H	56.49	73.98	17.49	PK
7416	38.27	6.00	H	44.27	53.98	9.71	AV

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

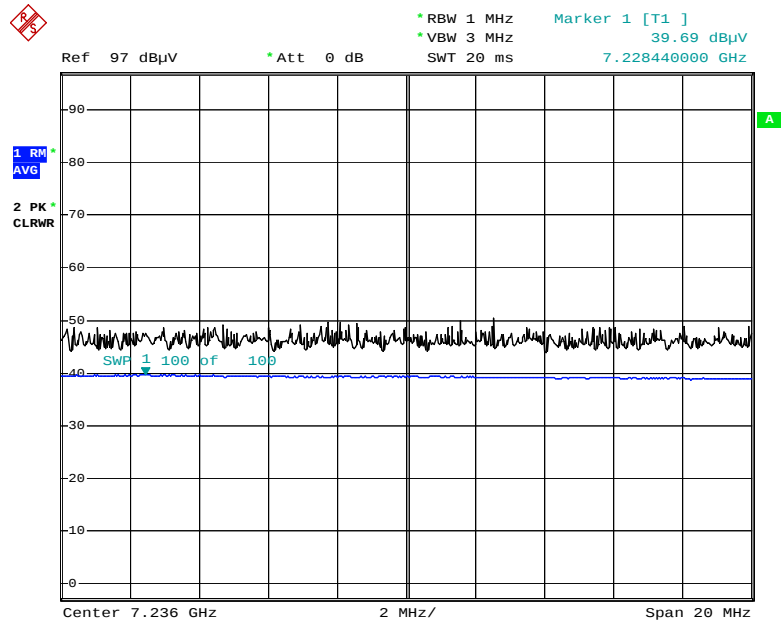
Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.-A.G+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
4944	53.12	0.00	-0.55	V	52.57	73.98	21.41	PK
4944	42.31	0.29	-0.55	V	42.05	53.98	11.93	AV
7416	51.09	0.00	6.00	V	57.09	73.98	16.89	PK
7416	38.83	0.29	6.00	V	45.12	53.98	8.86	AV
4944	52.98	0.00	-0.55	H	52.43	73.98	21.55	PK
4944	41.22	0.29	-0.55	H	40.96	53.98	13.02	AV
7416	50.49	0.00	6.00	H	56.49	73.98	17.49	PK
7416	38.12	0.29	6.00	H	44.41	53.98	9.57	AV

Operation Mode:	802.11n (HT20)
Transfer MCS Index:	0
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	53.46	0.00	-0.55	V	52.91	73.98	21.07	PK
4944	42.13	0.32	-0.55	V	41.90	53.98	12.08	AV
7416	50.26	0.00	6.00	V	56.26	73.98	17.72	PK
7416	38.86	0.32	6.00	V	45.18	53.98	8.80	AV
4944	52.98	0.00	-0.55	H	52.43	73.98	21.55	PK
4944	41.56	0.32	-0.55	H	41.33	53.98	12.65	AV
7416	49.76	0.00	6.00	H	55.76	73.98	18.22	PK
7416	38.11	0.32	6.00	H	44.43	53.98	9.55	AV

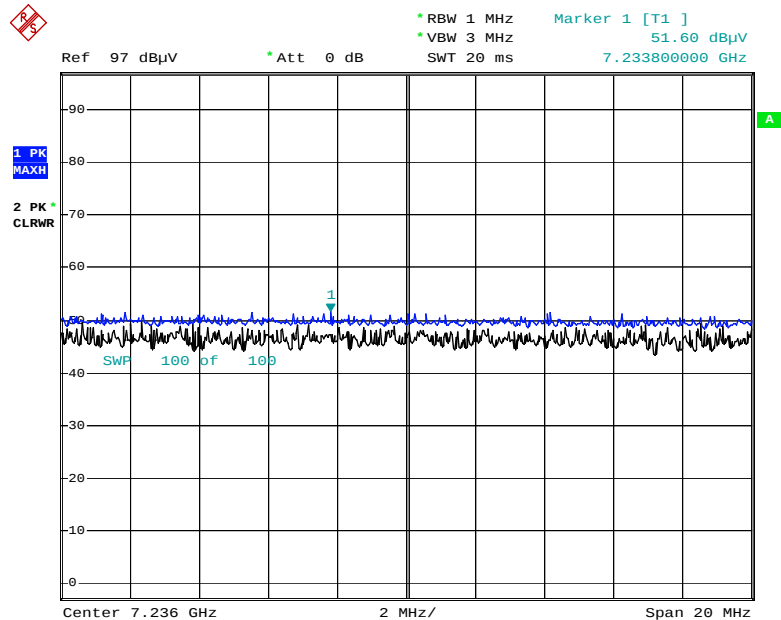
Test Plots (Worst case : Y-V)

Radiated Spurious Emissions plot – Average Reading (802.11g, Ch.1 3rd Harmonic)



Date: 27.JUL.2018 07:18:25

Radiated Spurious Emissions plot – Peak Reading (802.11g, Ch.1 3rd Harmonic)



Date: 27.JUL.2018 07:20:09

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	52.54	0.26	H	52.80	73.98	21.18	PK
2390.0	42.22	0.26	H	42.48	53.98	11.50	AV
2390.0	51.67	0.26	V	51.93	73.98	22.05	PK
2390.0	41.85	0.26	V	42.11	53.98	11.87	AV
2483.5	54.70	0.32	H	55.02	73.98	18.96	PK
2483.5	43.91	0.32	H	44.23	53.98	9.75	AV
2483.5	54.13	0.32	V	54.45	73.98	19.53	PK
2483.5	43.24	0.32	V	43.56	53.98	10.42	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	57.34	0.00	0.26	H	57.60	73.98	16.38	PK
2390.0	43.46	0.29	0.26	H	44.01	53.98	9.97	AV
2390.0	56.94	0.00	0.26	V	57.20	73.98	16.78	PK
2390.0	42.11	0.29	0.26	V	42.66	53.98	11.32	AV
2483.5	63.33	0.00	0.32	H	63.65	73.98	10.33	PK
2483.5	46.33	0.29	0.32	H	46.94	53.98	7.04	AV
2483.5	62.48	0.00	0.32	V	62.80	73.98	11.18	PK
2483.5	45.56	0.29	0.32	V	46.17	53.98	7.81	AV

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	57.62	0.00	0.26	H	57.88	73.98	16.10	PK
2390.0	43.66	0.32	0.26	H	44.24	53.98	9.74	AV
2390.0	56.94	0.00	0.26	V	57.20	73.98	16.78	PK
2390.0	42.89	0.32	0.26	V	43.47	53.98	10.51	AV
2483.5	62.47	0.00	0.32	H	62.79	73.98	11.19	PK
2483.5	46.12	0.32	0.32	H	46.76	53.98	7.22	AV
2483.5	61.82	0.00	0.32	V	62.14	73.98	11.84	PK
2483.5	45.67	0.32	0.32	V	46.31	53.98	7.67	AV

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2467 MHz
Channel No.	12 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
2483.5	52.42	0.32	H	52.74	73.98	21.24	PK
2483.5	42.06	0.32	H	42.38	53.98	11.60	AV
2483.5	51.98	0.32	V	52.30	73.98	21.68	PK
2483.5	41.24	0.32	V	41.56	53.98	12.42	AV

Operation Mode:	802.11b
Transfer Rate:	1 Mbps
Operating Frequency	2472 MHz
Channel No.	13 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
2483.5	55.34	0.32	H	55.66	73.98	18.32	PK
2483.5	45.85	0.32	H	46.17	53.98	7.81	AV
2483.5	55.05	0.32	V	55.37	73.98	18.61	PK
2483.5	45.24	0.32	V	45.56	53.98	8.42	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	53.21	0.00	0.32	H	53.53	73.98	20.45	PK
2483.5	42.51	0.29	0.32	H	43.12	53.98	10.86	AV
2483.5	52.67	0.00	0.32	V	52.99	73.98	20.99	PK
2483.5	41.29	0.29	0.32	V	41.90	53.98	12.08	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
2483.5	60.21	0.00	0.32	H	60.53	73.98	13.45	PK
2483.5	50.76	0.29	0.32	H	51.37	53.98	2.61	AV
2483.5	59.42	0.00	0.32	V	59.74	73.98	14.24	PK
2483.5	49.86	0.29	0.32	V	50.47	53.98	3.51	AV

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

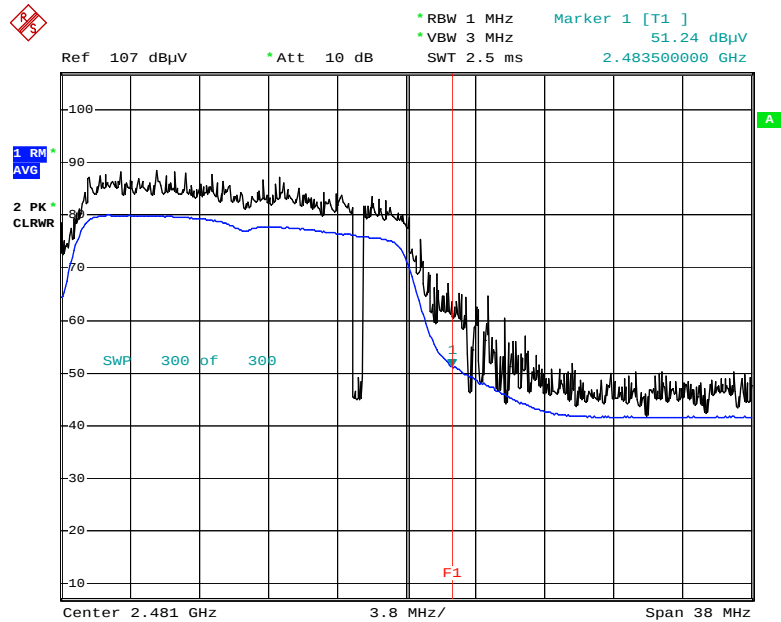
Frequency [MHz]	Reading [dBuV]	Duty Cycle Factor [dB]	A.F.+C.L.+D.F. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
2483.5	52.97	0.00	0.32	H	53.29	73.98	20.69	PK
2483.5	42.05	0.32	0.32	H	42.69	53.98	11.29	AV
2483.5	51.49	0.00	0.32	V	51.81	73.98	22.17	PK
2483.5	41.55	0.32	0.32	V	42.19	53.98	11.79	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
2483.5	69.65	0.00	0.32	H	69.97	73.98	4.01	PK
2483.5	51.24	0.32	0.32	H	51.88	53.98	2.10	AV
2483.5	60.27	0.00	0.32	V	60.59	73.98	13.39	PK
2483.5	50.66	0.32	0.32	V	51.30	53.98	2.68	AV

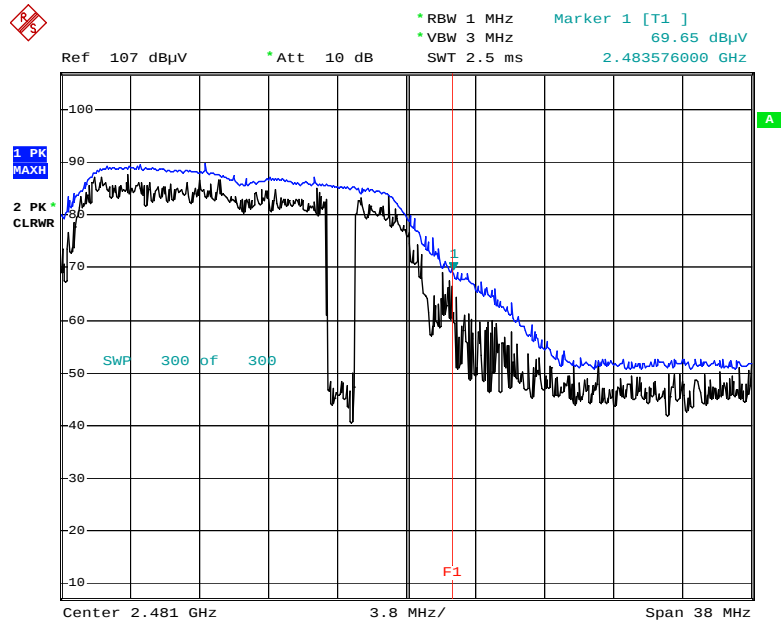
Test Plots (Worst case : X-H)

Radiated Restricted Band Edges plot – Average Reading (802.11n Ch.13)



Date: 31.JUL.2018 02:08:32

Radiated Restricted Band Edges plot – Peak Reading (802.11n Ch.13)



Date: 31.JUL.2018 02:10:42

Note:

Plot of worst case are only reported.

9.8 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

EMI Auto Test(4)

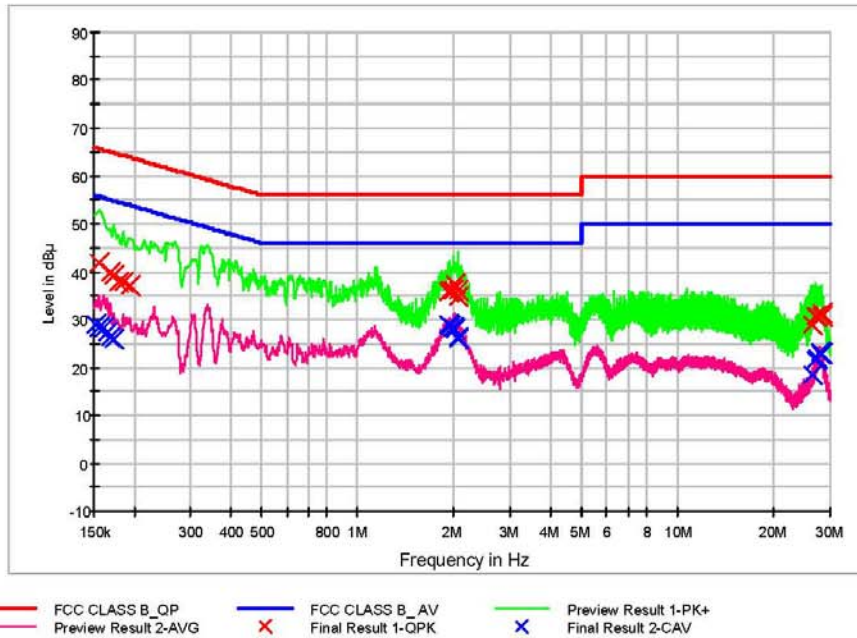
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HCT TEST Report

Common Information

EUT: SM-J701FB
Manufacturer: SAMSUNG
Test Site: SHIELD ROOM
Operating Conditions: 2.4G WLAN_MODE_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.156000	41.9	9.000	Off	N	9.7	23.8	65.7
0.168000	40.0	9.000	Off	N	9.7	25.1	65.1
0.172000	39.3	9.000	Off	N	9.7	25.6	64.9
0.178000	38.0	9.000	Off	N	9.7	26.6	64.6
0.186000	37.7	9.000	Off	N	9.7	26.5	64.2
0.194000	37.2	9.000	Off	N	9.7	26.7	63.9
1.926000	35.6	9.000	Off	N	9.8	20.4	56.0
1.950000	36.1	9.000	Off	N	9.8	19.9	56.0
1.982000	36.0	9.000	Off	N	9.8	20.0	56.0
2.014000	37.5	9.000	Off	N	9.8	18.5	56.0
2.064000	36.2	9.000	Off	N	9.8	19.8	56.0
2.072000	34.7	9.000	Off	N	9.8	21.3	56.0
26.302000	29.1	9.000	Off	N	10.9	30.9	60.0
26.444000	29.1	9.000	Off	N	10.9	30.9	60.0
27.146000	30.5	9.000	Off	N	10.9	29.5	60.0
27.314000	30.7	9.000	Off	N	10.9	29.3	60.0
28.134000	31.2	9.000	Off	N	10.9	28.8	60.0
28.256000	30.8	9.000	Off	N	10.9	29.2	60.0

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EMI Auto Test(4)

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	28.9	9.000	Off	N	9.7	27.0	55.9
0.156000	28.3	9.000	Off	N	9.7	27.4	55.7
0.160000	28.2	9.000	Off	N	9.7	27.3	55.5
0.164000	27.4	9.000	Off	N	9.7	27.8	55.3
0.168000	26.4	9.000	Off	N	9.7	28.6	55.1
0.172000	25.9	9.000	Off	N	9.7	28.9	54.9
1.926000	29.1	9.000	Off	N	9.8	16.9	46.0
1.952000	28.7	9.000	Off	N	9.8	17.3	46.0
1.984000	28.4	9.000	Off	N	9.8	17.6	46.0
2.020000	28.1	9.000	Off	N	9.8	17.9	46.0
2.068000	26.2	9.000	Off	N	9.8	19.8	46.0
2.072000	26.1	9.000	Off	N	9.8	19.9	46.0
26.302000	18.5	9.000	Off	N	10.9	31.5	50.0
27.146000	21.4	9.000	Off	N	10.9	28.6	50.0
27.314000	22.0	9.000	Off	N	10.9	28.0	50.0
27.932000	23.3	9.000	Off	N	10.9	26.7	50.0
28.084000	23.0	9.000	Off	N	10.9	27.0	50.0
28.134000	22.8	9.000	Off	N	10.9	27.2	50.0

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Conducted Emissions (Line 2)

EMI Auto Test(4)

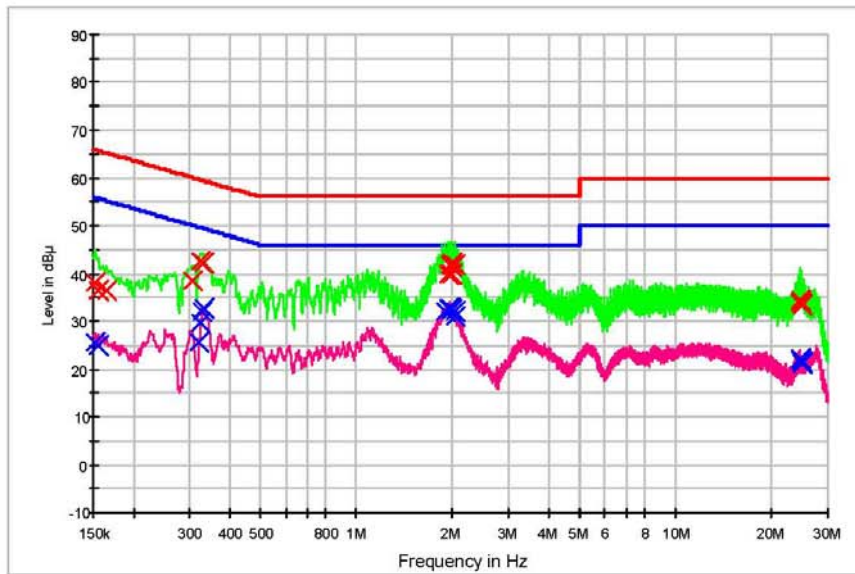
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HCT TEST Report

Common Information

EUT: SM-J701FB
Manufacturer: SAMSUNG
Test Site: SHIELD ROOM
Operating Conditions: 2.4G WLAN_MODE_L1

FCC CLASS B_Exten Cable



— FCC CLASS B_OP — FCC CLASS B_AV — Preview Result 1-PK+
— Preview Result 2-AVG — Final Result 1-OPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.152000	38.0	9.000	Off	L1	9.7	27.9	65.9
0.156000	36.3	9.000	Off	L1	9.7	29.4	65.7
0.164000	36.3	9.000	Off	L1	9.7	29.0	65.3
0.306000	38.5	9.000	Off	L1	9.7	21.6	60.1
0.326000	42.7	9.000	Off	L1	9.7	16.9	59.6
0.334000	42.4	9.000	Off	L1	9.7	17.0	59.4
1.940000	40.0	9.000	Off	L1	9.8	16.0	56.0
1.960000	41.8	9.000	Off	L1	9.8	14.2	56.0
1.980000	39.7	9.000	Off	L1	9.8	16.3	56.0
1.994000	42.4	9.000	Off	L1	9.8	13.6	56.0
1.998000	41.4	9.000	Off	L1	9.8	14.6	56.0
2.042000	41.7	9.000	Off	L1	9.8	14.3	56.0
24.504000	34.4	9.000	Off	L1	10.5	25.6	60.0
24.520000	34.2	9.000	Off	L1	10.5	25.8	60.0
24.526000	33.9	9.000	Off	L1	10.5	26.1	60.0
24.544000	34.3	9.000	Off	L1	10.5	25.7	60.0
24.582000	33.8	9.000	Off	L1	10.5	26.2	60.0
24.766000	33.3	9.000	Off	L1	10.5	26.7	60.0

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EMI Auto Test(4)

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Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	25.5	9.000	Off	L1	9.7	30.4	55.9
0.156000	24.9	9.000	Off	L1	9.7	30.8	55.7
0.322000	25.6	9.000	Off	L1	9.7	24.1	49.7
0.326000	29.5	9.000	Off	L1	9.7	20.0	49.6
0.330000	31.9	9.000	Off	L1	9.7	17.6	49.5
0.334000	32.6	9.000	Off	L1	9.7	16.7	49.4
1.890000	32.2	9.000	Off	L1	9.8	13.8	46.0
1.940000	32.8	9.000	Off	L1	9.8	13.2	46.0
1.960000	32.6	9.000	Off	L1	9.8	13.4	46.0
1.996000	32.3	9.000	Off	L1	9.8	13.7	46.0
2.032000	31.1	9.000	Off	L1	9.8	14.9	46.0
2.042000	32.1	9.000	Off	L1	9.8	13.9	46.0
24.504000	22.3	9.000	Off	L1	10.5	27.7	50.0
24.558000	22.1	9.000	Off	L1	10.5	27.9	50.0
24.664000	21.9	9.000	Off	L1	10.5	28.1	50.0
24.766000	21.6	9.000	Off	L1	10.5	28.4	50.0
24.782000	21.6	9.000	Off	L1	10.5	28.4	50.0
24.926000	21.3	9.000	Off	L1	10.5	28.7	50.0

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10. LIST OF TEST EQUIPMENT

Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/20/2017	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/27/2018	Annual	100033
ESPAC	SU-642 /Temperature Chamber	03/30/2018	Annual	0093008124
Agilent	N9020A / Signal Analyzer	06/08/2018	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/22/2017	Annual	MY49431210
Agilent	N1911A / Power Meter	04/16/2018	Annual	MY45100523
Agilent	N1921A / Power Sensor	04/16/2018	Annual	MY52260025
Agilent	87300B / Directional Coupler	11/20/2017	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

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
Emco	2090 / Controller	N/A	N/A	060520
Ets	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	11/21/2017	Biennial	9120D-1191
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/21/2017	Annual	836650/016
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/27/2017	Annual	101068-SZ
Wainwright Instruments	WHKX10-2700-3000-18000-40SS / High Pass Filter	07/16/2018	Annual	4
Wainwright Instruments	WHKX8-6090-7000-18000-40SS / High Pass Filter	07/10/2018	Annual	5
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/03/2018	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2018	Annual	2
Api tech.	18B-03 / Attenuator (3 dB)	06/07/2018	Annual	2
WEINSCHL	56-10 / Attenuator(10 dB)	10/13/2017	Annual	72316
CERNEX	CBLU1183540 / Broadband Low Noise Amplifier	01/03/2018	Annual	24613
CERNEX	CBL06185030 / Broadband Low Noise Amplifier	01/03/2018	Annual	24615
CERNEX	CBL18265035 / Power Amplifier	01/10/2018	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/29/2018	Annual	25956

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-1808-FC022-P