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TEST REPORT

FCC/IC DTS Test for LGSBWAX12 Certification

APPLICANT LG Electronics Inc.

REPORT NO. HCT-RF-2009-FI005

DATE OF ISSUE 10 September 2020

> Tested by Jin Gwan Lee

Mr B

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Accredited by KOLAS, Republic of KOREA

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ALBORATORY ACCREDITATION

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TEST REPORT FCC/IC DTS Test for LGSBWAX12	REPORT NO. HCT-RF-2009-FI005 DATE OF ISSUE September 10, 2020 Additional Model -
Applicant	LG Electronics Inc. 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, Korea
Eut Type Model Name	RF Module LGSBWAX12
FCC ID IC	BEJLGSBWAX12 2703H-LGSBWAX12
Modulation type	CCK/DSSS/OFDM
FCC Classification	Digital Transmission System(DTS)
FCC Rule Part(s)	Part 15.247
IC Rule Part(s)	RSS-247 Issue 2 (February 2017) RSS-Gen Issue 5_Amendment 1 (March 2019)
	The result shown in this test report refer only to the sample(s) tested unless otherwise stated. This test results were applied only to the test methods required by the

standard.



REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	September 10, 2020	Initial Release

Engineering Statement:

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

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.

* The report shall not be reproduced except in full(only partly) without approval of the laboratory.



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11. ANNEX A_ TEST SETUP PHOTO



1. EUT DESCRIPTION

Model	LGSBWAX12		
Additional Model	-		
EUT Type	RF Module		
Power Supply	DC 3.30 V		
Frequency Range	2412 MHz - 2472 MHz		
	Peak Power	Ant. 1 (SISO)	802.11b: 20.97 dBm 802.11g: 22.69 dBm 802.11n(HT20): 22.56 dBm 802.11n(HT40): 22.08 dBm 802.11b: 20.75 dBm
		Ant. 2 (SISO)	802.11g: 22.98 dBm 802.11n(HT20): 22.70 dBm 802.11n(HT40): 21.53 dBm
Max. RF Output Power		Ant. 1 + Ant. 2 (MIMO)	802.11b: 23.84 dBm 802.11g: 25.74 dBm 802.11n(HT20): 25.64 dBm 802.11n(HT40): 24.83 dBm
	Average Power	Ant. 1 (SISO)	802.11b: 14.72 dBm 802.11g: 14.42 dBm 802.11n(HT20): 14.12 dBm 802.11n(HT40): 13.52 dBm
		Ant. 2 (SISO)	802.11b: 14.88 dBm 802.11g: 14.51 dBm 802.11n(HT20): 14.15 dBm 802.11n(HT40): 13.06 dBm
		Ant. 1 + Ant. 2 (MIMO)	802.11b: 17.81 dBm 802.11g: 17.46 dBm 802.11n(HT20): 17.11 dBm 802.11n(HT40): 16.26 dBm
Modulation Type	DSSS/CCK : 802. OFDM : 802.11g,		
Number of Channels	13 Channels		
Antenna type	Metal press Ant		
Antenna Peak Gain	Ant1: -0.94 dBi /		
Date(s) of Tests	July 02, 2020 ~ A	ugust 31, 2020	
PMN (Product Marketing Number)	LGSBWAX12		
HVIN (Hardware Version Identification Number)	ETWCHMBC01		
FVIN (Firmware Version Identification Number)	MT7921_V1.0		
HMN (Host Marketing Name)	N/A		
EUT serial numbers	ETWCHMBC01-01, ETWCHMBC01-02, ETWCHMBC01-03, ETWCHMBC01-04		
EUT Cable Type.	Basic Cable Type, FFC Cable Type		



ANTENNA CONFIGURATIONS

Configurations	SIS	50	SDM	CDD
Configurations	Ant1	Ant2	Ant1 + Ant2	Ant1 + Ant2
802.11b	0	0	Х	0
802.11g	0	0	Х	0
802.11n(HT20)	0	0	0	0
802.11n(HT40)	0	0	0	0

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

Note:

1. O = Support, X = Not Support

2. SISO = Single Input Single Output

3. SDM = Spatial Diversity Multiplexing

4. CDD = Cyclic Delay Diversity

2. Directional Gain Calculation

• If any transmit signals are correlated with each other(802.11b/g/n_HT20),

Directional gain = $10^{\log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N] dBi$

Antenna Gain

2.4 GHz Band

Antonno Coin	902.11 h/a/n	Ant 0	-0.94 dBi
Antenna Gain	802.11b/g/n	Ant 1	1.50 dBi
Directional Antenna Gain	802.11b/g/n	Ant 0 & 1	3.38 dBi



2. TEST METHODOLOGY

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

EUT CONFIGURATION

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

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpse of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C. / RSS-Gen issue 5, RSS-247 issue 2.

GENERAL TEST PROCEDURES

Conducted Emissions

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

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 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 radi ated 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 A NSI C63.4. (Version :2014) and CISPR Publication 22.

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

For ISED, test facility was accepted dated February 14, 2019 (CAB identifier: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

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





5. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203:

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

(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.

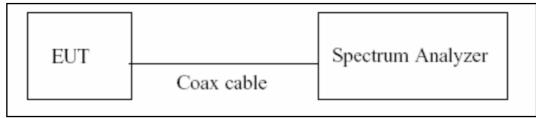
Parameter	Expanded Uncertainty (\pm dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05



7. DESCRIPTION OF TESTS

7.1. Duty Cycle

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to the zero-span measurement method.

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

The zero-span method of measuring duty cycle shall not be used if T \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 availble 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 = 10log(1/Duty Cycle)



7.2. 6dB Bandwidth & 99 % Bandwidth

Limit

The minimum permissible 6 dB bandwidth is 500 kHz.

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

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

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

Test Procedure (99 % Bandwidth for IC)

The transmitter output is connected to the spectrum analyzer.

RBW = $1\% \sim 5\%$ of the occupied bandwidth VBW $\Rightarrow 3 \times$ RBW Detector = Peak Trace mode = max hold Sweep = auto couple Allow the trace to stabilize

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

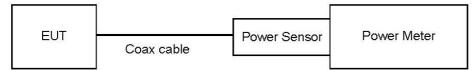


7.3. Output Power

Limit

The maximum permissible conducted output power is 1 Watt.

Test Configuration



Test Procedure

The transmitter output is connected to the Power Meter.

- Peak Power (Procedure 11.9.1.3 in ANSI 63.10-2013)
- : Measure the peak power of the transmitter.
- Average Power (Procedure 11.9.2.3 in ANSI 63.10-2013)
 - 1) Measure the duty cycle.
 - 2) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
 - 3) Add 10 $\log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Sample Calculation

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

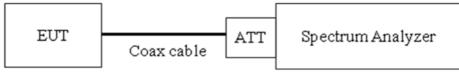


7.4. Power Spectral Density

Limit

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

Test Configuration



Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure 8.4 in KDB 558074 v05r02, Procedure 11.10.2 in ANSI 63.10-2013.

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 kHz \leq RBW \leq 100 kHz.
- 4) VBW \geq 3 x RBW.
- 5) Sweep = auto couple
- 6) Detector = peak
- 7) Trace Mode = max hold
- 8) Allow trace to fully stabilize.
- 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



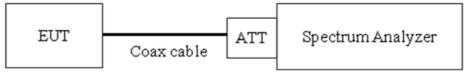


7.5. Conducted Band Edge(Out of Band Emissions) & Conducted Spurious Emissions

Limit

The maximum conducted (Peak) 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 20 dB relative to the maximum in-band peak PSD level in 100 kHz. [Conducted > 20 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 x RBW
- 3) Set span to encompass the spectrum to be examined
- 4) Detector = Peak
- 5) Trace Mode = max hold
- 6) Sweep time = auto couple
- 7) Ensure that the number of measurement points $\geq 2 \times \text{Span/RBW}$
- 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.

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Factors for frequency

Freq(MHz)	Factor(dB)
30	19.94
100	19.98
200	20.02
300	20.09
400	20.12
500	20.10
600	20.13
700	20.15
800	20.17
900	20.19
1000	20.21
2000	20.36
2400	20.41
2412	20.48
2437	20.48
2462	20.48
2500	20.80
3000	21.32
4000	21.56
5000	21.88
6000	21.99
7000	22.09
8000	22.15
9000	22.22
10000	22.27
11000	22.30
12000	22.35
13000	22.41
14000	22.42
15000	22.45
16000	22.51
17000	22.52
18000	22.57
19000	22.59
20000	22.63
21000	22.76
22000	22.75
23000	22.19
24000	22.24
25000	22.35

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

2. Factor = Attenuator loss + Cable loss





7.6. Radiated Test

Limit

FCC

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30

IC

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

FCC&IC

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

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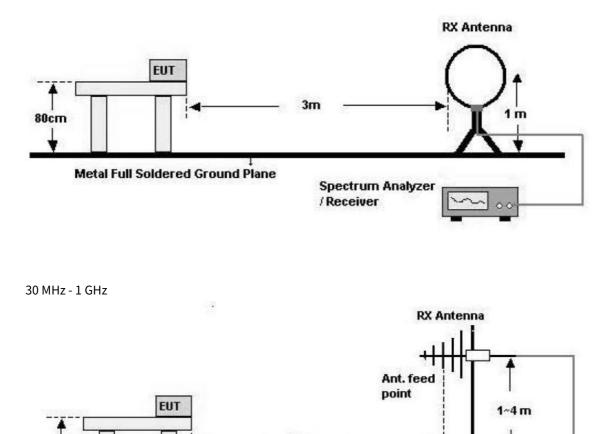


Test Configuration

Below 30 MHz

80cm

Metal Full Soldered Ground Plane



3m

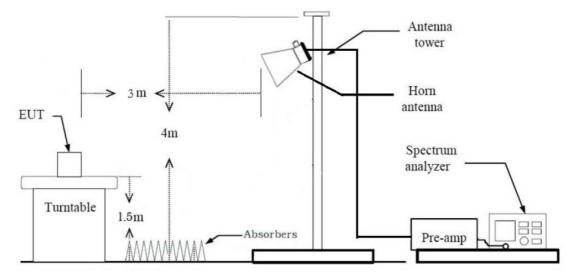
Spectrum Analyzer

00

/Receiver



Above 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

- 1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
- 2. The loop antenna was placed at a location 3m from the EUT
- 3. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.

5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

6. Distance Correction Factor(0.009 MHz - 0.490 MHz) = 40log(3 m/300 m) = - 80 dB

Measurement Distance : 3 m

7. Distance Correction Factor(0.490 MHz - 30 MHz) = 40log(3 m/30 m) = - 40 dB

Measurement Distance : 3 m

- 8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW \geq 3 x RBW
- 9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered



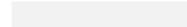


that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

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

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



Test Procedure of Radiated spurious emissions(Below 1GHz)

- 1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
- 2. The EUT is placed on a turntable, which is 0.8m above ground plane.
- 3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
- 4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

6. Spectrum Setting

- (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \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 = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
- 8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.

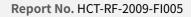
- 2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out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



- 8. Spectrum Setting (Method 8.6 in KDB 558074 v05r02, Procedure 11.12 in ANSI 63.10-2013)
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \geq 3 x 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 x RBW
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).

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

- Measured Frequency Range : 1 GHz 25 GHz
- Detector = RMS
- Averaging type = power (*i.e.*, RMS)
- RBW = 1 MHz
- VBW \geq 3 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.
- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.
- 9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
- 11. Total(Measurement Type : Peak)
 - = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(G) + Distance Factor(D.F)





- Total(Measurement Type : Average, Duty cycle \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 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. The unit was tested with its standard battery.
- 8. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 2310 MHz \sim 2390 MHz/ 2483.5 MHz \sim 2500 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - (2) Measurement Type(Average): Duty cycle \geq 98%,
 - Measured Frequency Range : 2310 MHz \sim 2390 MHz/ 2483.5 MHz \sim 2500 MHz
 - Detector = RMS
 - Averaging type = power (*i.e.*, RMS)
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - Sweep time = auto.
 - Trace mode = average (at least 100 traces).
 - (3) Measurement Type(Average): Duty cycle < 98%, duty cycle variations are less than $\pm 2\%$



- 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 x RBW
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle.
- Duty Cycle Factor (dB) : Please refer to the please refer to section 9.1.
- 9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 10. Distance extrapolation factor = 20log (test distance / specific distance) (dB)
- 11. Total(Measurement Type : Peak)
 - = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) Amp Gain(G) + Distance Factor(D.F)

Total(Measurement Type : Average, Duty cycle \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





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 $50 \,\mu$ H/50 ohms line impedance stabilization network (LISN).

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

^(a)Decreases with the logarithm of the frequency.

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

Test Configuration

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

Test Procedure

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

Sample Calculation

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



7.8. Receiver Spurious Emissions

Limit

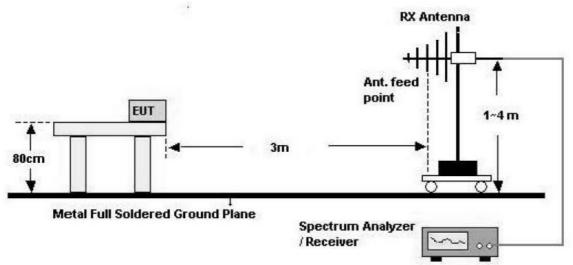
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

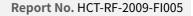
Measurements for compliance with the limits in table may be performed at distances other than 3 metres.

Test Configuration











Test Procedure of Receiver Spurious Emissions (Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.

2. The EUT is placed on a turntable, which is 0.8m above ground plane.

3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.

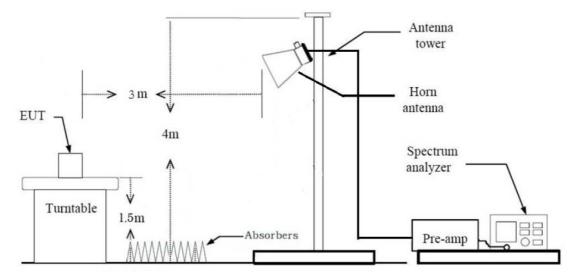
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

- 6. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \geq 3 x RBW
 - (2) Measurement Type(Quasi-peak):
 - Measured Frequency Range : 30 MHz 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
- 7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)



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 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. The unit was tested with its standard battery.
- 8. Spectrum Setting
 - (1) Measurement Type(Peak):
 - Measured Frequency Range : 1 GHz 25 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 1 MHz
 - VBW \geq 3 x RBW
 - (2) Measurement Type(Average):

- We performed using a reduced video BW method was done with the analyzer in linear mode

Report No. HCT-RF-2009-FI005



- Measured Frequency Range : 1 GHz 25 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW \geq 3 x RBW
- 10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

11. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G)



7.9. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.

2. All configurations of antenna were investigated and the worst case configuration results are reported.

- Mode : Ant1(SISO), Ant2(SISO), Ant1+Ant2(CDD,SDM)
- Worstcase : Ant1+Ant2(CDD)
- 3. EUT Axis
 - Radiated Spurious Emissions : Z
 - Radiated Restricted Band Edge : X
- 4. Duty cycle factor applies only 802.11g/n (Duty cycle < 98%).
- 5. All datarate of operation were investigated and the worst case datarate results are reported
 - 802.11b : 1Mbps
 - -802.11g:6Mbps
 - 802.11n : MCS0
- 6. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
- Position : Horizontal, Vertical, Parallel to the ground plane

Radiated test(DBS)

1. Please refer to the LGSBWAX12 [DTS]802.11ax Test Report.

AC Power line Conducted Emissions

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

Conducted test

- 1. The EUT was configured with data rate of highest power.
- 2. SISO & MIMO were tested and the all case results are reported.
 - Mode : Ant1(SISO), Ant2(SISO), Ant1+Ant2(MIMO)

8. SUMMARY TEST OF RESULTS

FCC Part

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	§ 15.247(a)(2)	> 500 kHz		PASS
Conducted Maximum Output Power	§ 15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§ 15.247(e)	< 8 dBm / 3 kHz Band	Conducted	PASS
Band Edge (Out of Band Emissions)	§ 15.247(d)	Conducted > 20 dBc		PASS
AC Power line Conducted Emissions	§ 15.207	cf. Section 7.7		PASS
Radiated Spurious Emissions 15.205, 15.209		cf. Section 7.6	Dedictor	PASS
Radiated Restricted Band Edge	§ 15.247(d), 15.205, 15.209	cf. Section 7.6	Radiated	PASS

Report No. HCT-RF-2009-FI005

HCT

IC Part

Test Description	IC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	RSS-247, 5.2	> 500 kHz		PASS
99% Bandwidth	RSS-GEN, 6.7	N/A		PASS
Conducted Maximum Peak Output Power And e.i.r.p.	RSS-247, 5.4.	< 1 Watt <4 Watt(e.i.r.p.)	Conducted	PASS
Power Spectral Density	RSS-247, 5.2	< 8 dBm / 3 kHz Band		PASS
Band Edge(Out of Band Emissions)	RSS-247, 5.5	Conducted > 20 dBc		PASS
AC Power line Conducted Emissions	RSS-GEN, 8.8	cf. Section 7.7		PASS
Radiated Spurious Emissions	RSS-GEN, 8.9	cf. Section 7.6		PASS
Receiver Spurious Emissions	RSS-GEN, 7	cf. Section 7.8	Radiated	PASS
Radiated Restricted Band Edge	RSS-GEN, 8.10	cf. Section 7.6		PASS

9. TEST RESULT

9.1 DUTY CYCLE

Mode	Ton (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
802.11b	-	-	-	-
802.11g	-	-	-	-
802.11n (HT20)	-	-	-	-
802.11n (HT40)	-	-	-	-

Note:

1. Duty Cycle Factor = 10Xlog(1/Duty Cycle). where, Duty Cycle = T_{on} / T_{total}

2. Test was performed with continuous Tx.



9.2 6dB BANDWIDTH & 99 % BANDWIDTH

FCC

[ANT1]

802.11	b Mode	Massurad Pandwidth [MHz] Minimum Pandwidth [MH	
Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	7.371	> 0.5
2437	6	7.552	> 0.5
2462	11	7.539	> 0.5
2467	12	8.096	> 0.5
2472	13	8.075	> 0.5

802.11	g Mode	Management David the [MU]	
Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	16.43	> 0.5
2437	6	16.48	> 0.5
2462	11	16.48	> 0.5
2467	12	16.37	> 0.5
2472	13	16.37	> 0.5

802.11n(HT20) Mode			
Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	17.62	> 0.5
2437	6	17.70	> 0.5
2462	11	17.72	> 0.5
2467	12	17.56	> 0.5
2472	13	16.29	> 0.5

802.11n(HT40) Mode		Manager d David de [MU]	
Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2422	3	36.05	> 0.5
2437	6	36.35	> 0.5
2452	9	35.49	> 0.5

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[ANT2]

802.11	b Mode	Manager and Damphuridth [MU]	Minimum Randwidth [MUz]	
Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	
2412	1	8.099	> 0.5	
2437	6	7.630	> 0.5	
2462	11	8.033	> 0.5	
2467	12	8.074	> 0.5	
2472	13	8.023	> 0.5	

802.11	g Mode		
Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]
2412	1	16.37	> 0.5
2437	6	16.43	> 0.5
2462	11	16.41	> 0.5
2467	12	16.37	> 0.5
2472	13	16.35	> 0.5

802.11n(HT20) Mode		Manager and Damphuridth [MU]	Minimum Dan duridah [MU]	
Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	
2412	1	17.61	> 0.5	
2437	6	17.65	> 0.5	
2462	11	17.66	> 0.5	
2467	12	17.60	> 0.5	
2472	13	17.56	> 0.5	

802.11n(HT40) Mode		Management David the [MU]		
Frequency [MHz]	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	
2422	3	36.30	> 0.5	
2437	6	36.10	> 0.5	
2452	9	35.06	> 0.5	



[ANT1]

Test Plots



6dB Bandwidth plot (802.11b-CH 1)

6dB Bandwidth plot (802.11g-CH 12)

Agilent Spectrum Ar									
Center Freq		CORREC 00 GHz #IFGain:Low	Center Fr			ALIGN AUTO	Radio Std		Frequency
	Ref Offset 20.4 Ref 30.00 dE					h			
20.0			wanner	-					Center Freq 2.467000000 GHz
-10.0 -20.0 -30.0						The second se			
-40.0	wentron Marth					ww.	hunnah	Ar hange an	
Center 2.467 #Res BW 100			#VB	W 300 k	Hz			n 40 MHz 3.867 ms	CF Step 4.000000 MHz
Occupied	Occupied Bandwidth Total Power 22.6 dBm 16.342 MHz				<u>Auto</u> Man				
	Freq Error	4.340	Hz	OBW P	ower		9.00 %		Freq Offset 0 Hz
x dB Band	łwidth	16.37 N	IHz	x dB		-6.	00 dB		
MSG									



Agilent Spectrum Analyzer - Occupied B X RL RF 50 Q AC Center Freq 2.472000000 NFE	CORREC SI	Freq: 2.472000000 GHz e Run Avg Hold	Radio Std:		Frequency
Ref Offset 20.48 of 10 dB/div Ref 20.00 dBn					
Log 10.0 0.00	manterman	mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm	· · · · · · · · · · · · · · · · · · ·		Center Fre 2.472000000 GH
30.0 100 A. L. M. L. M.			monula	lluuraa	
40.0 Why Why Crust Hills 50.0					
Center 2.472 GHz #Res BW 100 kHz	#V	BW 300 kHz	Spar Sweep		CF Ste 4.000000 Mi
Occupied Bandwidt	h 7. 552 MH z	Total Power	23.1 dBm		Auto Ma Freg Offs
Transmit Freq Error	-3.914 kHz	OBW Power	99.00 %		. 01
x dB Bandwidth	16.29 MHz	x dB	-6.00 dB		
SG			STATUS		

6dB Bandwidth plot (802.11n_HT20-CH 13)

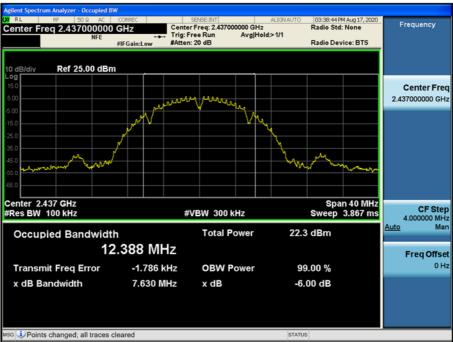
6dB Bandwidth plot (802.11n_HT40-CH 9)





[ANT2]

Test Plots



6dB Bandwidth plot (802.11b-CH 6)

6dB Bandwidth plot (802.11g-CH 13)

Agilent Spectrum Analyzer - O	ccupied BW					
	R AC CORREC	SENSE:INT Center Freg: 2.4720	ALIGNAUT	05:31:24 PM AL Radio Std: No		;y
		Trig: Free Run #Atten: 20 dB	Avg Hold: 1/1	Radio Device	BTS	
10 dB/div Ref 5.00	0 dBm					
-5.00					Center	Freq
-15.0	mannahr	A CARDON AND CONTRACTOR	mensensen		2.47200000	0 GHz
-25.0						
-45.0			²			
-55.0 mm som warmen			<u> </u>	were the word	homen	
-65.0						
-75.0						
Center 2.472 GHz					10 MHz	
#Res BW 100 kHz		#VBW 300	kHz	Sweep 3.	867 ms 4.00000	Step MHz
Occupied Band	dwidth	Total P	ower 8.	59 dBm	Auto	Man
	16.333 M	Hz			Eren	feet
Transmit Freg Er			ower	99.00 %	FreqC	0 Hz
x dB Bandwidth	16.35			6.00 dB		
x db bandwidth	10.00			0.00 08		
мsg iPoints changed; al	I traces cleared		STA	TUS		



RL RF 50 Ω AC Center Freq 2.472000000 NFE NFE	GHz Cente Trig: F	sense:int r Freq: 2.472000000 GHz ree Run Avg Hold : 20 dB	ALIGNAUTO	05:39:15 P Radio Std Radio Dev		Frequency
10 dB/div Ref 5.00 dBm						
-5.00	www.www.	ny problem manage				Center Fre 2.472000000 GH
-25.0						
-55.0				n the second days	+-sl#49464	
85.0 Center 2.472 GHz				Spa	n 40 MHz	
#Res BW 100 kHz	#	VBW 300 kHz			3.867 ms	CF Ste 4.000000 MH
Occupied Bandwidt	'n	Total Power	8.75	5 dBm		<u>Auto</u> Ma
17	.531 MHz					Freq Offse
Transmit Freq Error	12.283 kHz	OBW Power	99	9.00 %		01
x dB Bandwidth	17.56 MHz	x dB	-6.	00 dB		
sg i Points changed; all traces of	leared		STATU	5		

6dB Bandwidth plot (802.11n_HT20-CH 13)

6dB Bandwidth plot (802.11n_HT40-CH 9)



Note:

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



99% Bandwidth Measurements(IC)

[ANT1]

802.11b Mode	802.11b Mode		
Frequency [MHz]	Channel No.	Bandwidth [MHz]	Limit [MHz]
2412	1	12.408	N/A
2437	6	12.403	N/A
2462	11	12.414	N/A
2467	12	12.351	N/A
2472	13	12.403	N/A

802.11g Mode	-	OBW	Limit
Frequency [MHz]	Channel No.	Bandwidth [MHz]	[MHz]
2412	1	16.587	N/A
2437	6	17.252	N/A
2462	11	17.249	N/A
2467	12	16.600	N/A
2472	13	16.603	N/A

802.11n(HT20) Mode	802.11n(HT20) Mode		
Frequency [MHz]	Channel No.	Bandwidth [MHz]	Limit [MHz]
2412	1	17.725	N/A
2437	6	18.338	N/A
2462	11	18.271	N/A
2467	12	17.720	N/A
2472	13	17.695	N/A

802.11n(HT40) Mode	802.11n(HT40) Mode		Limit
Frequency [MHz]	Channel No.	Bandwidth [MHz]	[MHz]
2422	3	36.220	N/A
2437	6	36.127	N/A
2452	9	36.159	N/A



ΓΔ	М	т	· ว 1	1
[A	IN.	I	Z	

802.11b Mode	802.11b Mode		
Frequency [MHz]	Channel No.	Bandwidth [MHz]	Limit [MHz]
2412	1	12.357	N/A
2437	6	12.370	N/A
2462	11	12.348	N/A
2467	12	12.326	N/A
2472	13	12.811	N/A

802.11g Mode	OBW	Limit	
Frequency [MHz]	Channel No.	Bandwidth [MHz]	[MHz]
2412	1	16.530	N/A
2437	6	17.234	N/A
2462	11	17.361	N/A
2467	12	16.571	N/A
2472	13	16.575	N/A

802.11n(HT20) Mode	802.11n(HT20) Mode		
Frequency [MHz]	Channel No.	Bandwidth [MHz]	Limit [MHz]
2412	1	17.593	N/A
2437	6	18.264	N/A
2462	11	18.225	N/A
2467	12	17.639	N/A
2472	13	17.601	N/A

802.11n(HT40) Mode	OBW	Limit	
Frequency [MHz]	Channel No.	Bandwidth [MHz]	[MHz]
2422	3	36.131	N/A
2437	6	36.129	N/A
2452	9	36.090	N/A

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Test Plots_[ANT1]



99% Bandwidth plot (802.11b-CH 11)

99% Bandwidth plot (802.11g-CH 6)

Agilent Spectrum Analyzer - Occupied	SW CORREC	SENSE:INT	ALIGNAUTO	09-22-22.04	Aug 12, 2020	
Center Freq 2.43700000) GHz Cent	er Freq: 2.437000000 GHz Free Run Avg Hol n: 20 dB		Radio Std: Radio Devi	None	Frequency
Ref Offset 20.48 10 dB/div Ref 30.00 dB/						
20.0		manne	<u> </u>			Center Freq 2.437000000 GHz
0.00 -10.0 -20.0			and the second second	West and the second		
-30.0 www.www.www.www.www.www.www.www.www.					and the second	
60.0 Center 2.437 GHz				Snar	140 MHz	
#Res BW 390 kHz	:	#VBW 1.2 MHz			ep 1 ms	CF Step 4.000000 MHz
Occupied Bandwid		Total Power	22.1	dBm		<u>Auto</u> Man
1	7.252 MHz					Freq Offset
Transmit Freq Error	-39.191 kHz	OBW Power	99	0.00 %		0 Hz
x dB Bandwidth	16.34 MHz	x dB	-6.	00 dB		
MSG			STATUS	5		

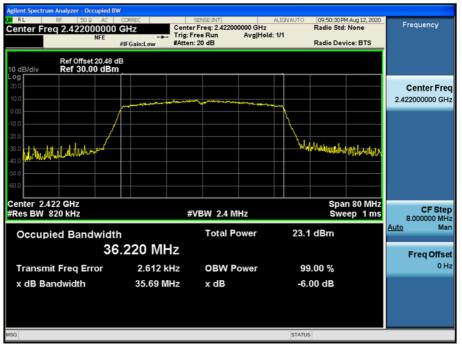




Center Freq 2.43700000	0 GHz Cente Trig: F	SENSE:INT r Freq: 2.437000000 GHz Free Run Avg Hold I: 20 dB	Radio St d>1/1	PM Aug 12, 2020 d: None evice: BTS	Frequency
Ref Offset 20.48					
20.0 10.0		-			Center Fr 2.437000000 G
0.0					
0.0 month blok and and a short of the			and the second s	million	
0.0					
enter 2.437 GHz					
Res BW 390 kHz	#	VBW 1.2 MHz		an 40 MHz /eep 1 ms	CF St 4.000000 M
Occupied Bandwid		Total Power	22.3 dBm		<u>Auto</u> M
1	8.338 MHz				Freq Offs
Transmit Freq Error	-19.577 kHz	OBW Power	99.00 %		0
x dB Bandwidth	17.33 MHz	x dB	-6.00 dB		
G			STATUS		

99% Bandwidth plot (802.11n_HT20-CH 6)

99% Bandwidth plot (802.11n_HT40-CH 3)



Note:

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

Test Plots_[ANT2]

HCT



99% Bandwidth plot (802.11b-CH 13)

99% Bandwidth plot (802.11g-CH 11)

Agilent Spectrum Analyzer - Occupied I	BW				
Image: Weight of the second	Trig:	sense:INT er Freq: 2.462000000 GHz Free Run Avg Hol n: 20 dB	Radio Std:		Frequency
10 dB/div Ref 20.00 dB	m				
0.00	manna	~~~~	~		Center Freq 2.462000000 GHz
-10.0 -20.0			John Marken Barry	Milwey Kar	
-40.0					
-00.0					
Center 2.462 GHz #Res BW 390 kHz	#	ŧVBW 1.2 MHz		ep 1 ms	CF Step 4.000000 MHz
Occupied Bandwid	th	Total Power	22.2 dBm		<u>Auto</u> Man
1	7.361 MHz				Freq Offset
Transmit Freq Error	48.240 kHz	OBW Power	99.00 %		0 Hz
x dB Bandwidth	16.39 MHz	x dB	-6.00 dB		
MSG			STATUS		



gilent Spectrum Analyzer - Occupied B RL RF 50 Q AC	CORREC	SENSE:INT		:19:50 PM Aug 17, 2020	5
Center Freq 2.437000000	Trig: f	er Freq: 2.437000000 GHz Free Run Avg Hol n: 20 dB	d: 1/1	dio Std: None dio Device: BTS	Frequency
0 dB/div Ref 20.00 dBm					
og 0.0		vorman			Center F
.00					2.437000000
0.0			and the second	- hardened	
0.0				and a first and a first and a first a	
0.0					
0.0					
0.0					
enter 2.437 GHz Res BW 390 kHz		VBW 1.2 MHz		Span 40 MHz Sweep 1 ms	CF S
Occupied Bandwidt		Total Power	22.0 dE	<u> </u>	4.000000 M Auto
	.264 MHz				Freg Off
Transmit Freq Error	46.883 kHz	OBW Power	99.00	%	(
x dB Bandwidth	17.50 MHz	x dB	-6.00	dB	
G			STATUS		

99% Bandwidth plot (802.11n_HT20-CH 6)

99% Bandwidth plot (802.11n_HT40-CH 3)



Note:

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



9.3 OUTPUT POWER

Peak Power

1. Power Meter offset = Attenuator loss+ Cable loss

2. We apply to the offset in the 2.4 GHz range that was rounded off to the closest tenth dB.

So, 20.48 dB is offset for 2.4 GHz Band

802.11b	Mode	Rate	SIS	O Measured	d Power (c	lBm)	MIMO (CDD) (dBm)	Limit
Frequency [MHz]	Channel No.	(Mbps)	Ant 1	Power Level Setting	Ant 2	Power Level Setting	Ant 1 + Ant 2	(dBm)
		1	17.94		17.41		20.69	30.00
2412	1	2	18.14	13.5	17.80	13.5	20.98	30.00
2412		5.5	19.27	15.5	18.95	15.5	22.12	30.00
		11	20.94	2	20.69		23.82	30.00
		1	17.62		17.21		20.43	30.00
2437	6	2	17.91	13.5	17.64	13.5	20.79	30.00
2457	6	5.5	19.46		18.86		22.18	30.00
		11	20.97		20.68		23.84	30.00
		1	17.60		17.39	13.5	20.50	30.00
2462	11	2	17.89	13.5	17.71		20.81	30.00
2402	11	5.5	19.17	15.5	19.03		22.11	30.00
		11	20.89		20.75		23.83	30.00
		1	16.94		16.67		19.82	30.00
2467	12	2	17.10	13.0	17.19	13.0	20.15	30.00
2407	12	5.5	18.60	15.0	18.45	15.0	21.54	30.00
		11	20.26		20.28		23.28	30.00
		1	7.34]	7.40		10.38	30.00
2472	12	2	7.58	3.5	7.76	3.5	10.68	30.00
2472	13	5.5	8.97	3.5	9.11	3.3	12.05	30.00
		11	10.71		10.91		13.82	30.00



802.11g	Mode	Rate	SIS	O Measured	d Power (d	lBm)	MIMO (CDD) (dBm)	Limit
Frequency [MHz]	Channel No.	(Mbps)	Ant 1	Power Level Setting	Ant 2	Power Level Setting	Ant 1 + Ant 2	(dBm)
		6	20.76		21.70		24.26	30.00
		9	21.47		21.83		24.66	30.00
		12	21.21]	21.11		24.17	30.00
2412	1	18	21.30	11.5	21.12	11.5	24.22	30.00
2412	1	24	21.73	11.5	21.55	11.5	24.65	30.00
		36	21.70		21.67		24.70	30.00
		48	19.95		19.88		22.92	30.00
		54	20.05		19.38		22.74	30.00
		6	21.85		22.54		25.22	30.00
		9	21.82		22.76		25.33	30.00
		12	21.97		22.00		25.00	30.00
2427	C	18	22.08	12.0	22.03	12.0	25.07	30.00
2437	6	24	22.43	13.0	22.52	13.0	25.49	30.00
		36	22.56		22.63		25.61	30.00
		48	20.66		20.92		23.80	30.00
		54	20.74		20.75		23.75	30.00
		6	22.03		22.71		25.39	30.00
		9	21.99		22.98	13.0	25.52	30.00
		12	22.13	12.0	22.31		25.23	30.00
2462	11	18	22.08		22.21		25.16	30.00
2462	11	24	22.66	13.0	22.62	13.0	25.65	30.00
		36	22.69		22.76		25.74	30.00
		48	20.86		21.00		23.94	30.00
		54	21.01		20.88		23.96	30.00
		6	14.89		15.42		18.17	30.00
		9	15.00		15.48		18.26	30.00
		12	14.92		14.86		17.90	30.00
2467	10	18	14.84		14.84	F 0	17.85	30.00
2467	12	24	15.45	5.0	15.43	5.0	18.45	30.00
		36	15.27		15.41		18.35	30.00
		48	13.46		13.46		16.47	30.00
		54	13.56		13.38		16.48	30.00
		6	9.36		10.00		12.70	30.00
		9	9.51	1	10.05		12.80	30.00
		12	9.32	1	9.51	1	12.43	30.00
2472	2472	18	9.34		9.53	0.5	12.45	30.00
2472	13	24	9.84	-0.5	10.07	-0.5	12.97	30.00
		36	9.79	1	10.07		12.94	30.00
		48	8.02	1	8.16		11.10	30.00
		54	8.29	1	8.06	1	11.19	30.00



802.11n(HT	20) Mode	MCS	SIS	O Measured	d Power (d	lBm)	MIMO (CDD) (dBm)	Limit
Frequency [MHz]	Channel No.	Index	Ant 1	Power Level Setting	Ant 2	Power Level Setting	Ant 1 + Ant 2	(dBm)
		0	18.41		18.85		21.65	30.00
		1	18.23		17.78		21.02	30.00
		2	18.25		17.82		21.05	30.00
2412		3	18.71		18.53	0.5	21.63	30.00
2412	1	4	18.72	8.5	18.51	8.5	21.63	30.00
		5	18.96		18.67		21.83	30.00
		6	16.75		16.40		19.59	30.00
		7	16.65		16.37		19.52	30.00
		0	21.65		22.48		25.09	30.00
		1	21.59		21.95		24.78	30.00
		2	21.65		21.91		24.79	30.00
		3	21.98		22.42		25.22	30.00
2437	6	4	22.44	13.0	22.54	13.0	25.50	30.00
		5	22.56		22.70		25.64	30.00
		6	20.61		20.76		23.70	30.00
		7	20.65		20.77		23.72	30.00
		0	21.29		21.88		24.61	30.00
		1	21.45		21.22		24.35	30.00
		2	21.30		21.15		24.24	30.00
		3	21.76		21.74		24.76	30.00
2462	11	4	21.66	12.0	21.65	12.0	24.67	30.00
		5	22.06		21.84		24.96	30.00
		6	20.12		19.96		23.05	30.00
		7	20.11		19.85		22.99	30.00
		0	14.77		15.26		18.03	30.00
		1	14.79		14.67		17.74	30.00
		2	14.65		14.68		17.67	30.00
2467	10	3	15.21		15.25	F 0	18.24	30.00
2467	12	4	15.16	5.0	15.22	5.0	18.20	30.00
		5	15.20		15.25		18.23	30.00
		6	13.43		13.27		16.36	30.00
		7	13.42	1	13.30		16.37	30.00
		0	9.35		9.91		12.65	30.00
		1	9.32	1	9.43		12.38	30.00
2472 12	2	9.32	1	9.37		12.35	30.00	
	3	9.84		9.84		12.85	30.00	
2472	13	4	9.86	0.0	9.85	0.0	12.86	30.00
	5	9.95	1	9.95		12.96	30.00	
		6	8.01	1	8.04		11.03	30.00
		7	8.02	1	8.02		11.03	30.00



802.11n(HT	40) Mode	MCS	SIS	O Measured	d Power (d	lBm)	MIMO (CDD) (dBm)	Limit
Frequency [MHz]	Channel No.	Index	Ant 1	Power Level Setting	Ant 2	Power Level Setting	Ant 1 + (d Ant 2	(dBm)
		0	15.46		15.94		18.72	30.00
	3	1	15.38		15.05		18.23	30.00
		2	15.45		15.04		18.26	30.00
2422		3	15.98	6.0	15.47	6.0	18.74	30.00
2422		4	16.00	6.0	15.52	6.0	18.78	30.00
		5	16.09		15.46		18.79	30.00
		6	14.01		13.55		16.79	30.00
		7	13.98		13.46		16.74	30.00
		0	21.26	-	21.41	12.0	24.35	30.00
		1	21.36		21.05		24.22	30.00
		2	21.47		20.84		24.18	30.00
2437	6	3	21.86	12.0	21.39		24.64	30.00
2437	0	4	21.90	12.0	21.48		24.70	30.00
		5	22.08		21.53		24.83	30.00
		6	20.18		19.74		22.98	30.00
		7	20.18		19.64		22.93	30.00
		0	20.70		20.97		23.85	30.00
		1	20.59		20.40		23.51	30.00
		2	20.59		20.34		23.48	30.00
2452	2452	3	20.99	11.0	20.78	11.0	23.89	30.00
2452 9	4	20.97	11.0	20.94	11.0	23.97	30.00	
		5	21.07		20.99		24.04	30.00
		6	19.34		19.01		22.19	30.00
		7	19.29		18.99		22.15	30.00



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, 20.48 dB is offset for 2.4 GHz Band.

802.11b	Mode	Rate	SIS	O Measured	lBm)	MIMO (CDD) (dBm)	Limit	
Frequency [MHz]	Channel No.	(Mbps)	Ant 1	Power Level Setting	Ant 2	Power Level Setting	Ant 1 + Ant 2	(dBm)
		1	14.66		14.82		17.75	30.00
2412	12 1	2	14.72	12 5	14.88	12 5	17.81	30.00
2412		5.5	14.38	13.5	14.65	13.5	17.53	30.00
		11	14.39	1	14.60		17.51	30.00
		1	14.67		14.76		17.72	30.00
2427	C	2	14.57	12 5	14.86	13.5	17.73	30.00
2437	6	5.5	14.36	13.5	14.66		17.52	30.00
		11	14.40		14.70		17.56	30.00
		1	14.45		14.83		17.65	30.00
2462	11	2	14.42	13.5	14.81	13.5	17.63	30.00
2462	11	5.5	14.35	13.5	14.75		17.56	30.00
		11	14.27		14.66		17.48	30.00
		1	14.31		14.09		17.21	30.00
2467	10	2	14.19	12.0	14.33	12.0	17.27	30.00
2467	12	5.5	14.25	13.0	14.19	13.0	17.23	30.00
		11	14.15		14.20		17.18	30.00
		1	4.78		4.91		7.86	30.00
2472	13	2	4.74	3.5	5.04	3.5	7.90	30.00
2412	12	5.5	4.74	3.5	4.92	3.5	7.84	30.00
		11	4.73		4.93		7.84	30.00



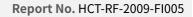
802.11g	Mode	Rate	SIS	O Measured	d Power (c	lBm)	MIMO (CDD) (dBm)	Limit
Frequency	Channel	(Mbps)		Power		Power	Ant 1 +	(dBm)
[MHz]	No.		Ant 1	Level Setting	Ant 2	Level Setting	Ant 2	
		6	12.86		13.36		16.13	30.00
		9	13.51		13.35		16.44	30.00
		12	13.40		13.25		16.33	30.00
2412	1	18	13.40	11.5	13.24	11.5	16.33	30.00
2412	1	24	13.29	11.5	13.12	11.5	16.22	30.00
		36	13.26		13.27		16.28	30.00
		48	11.48		11.37		14.44	30.00
		54	11.51		10.92		14.23	30.00
		6	14.37		14.19		17.29	30.00
		9	14.31		14.35		17.34	30.00
		12	14.25		14.22		17.24	30.00
2427	6	18	14.36	12.0	14.23	12.0	17.31	30.00
2437	6	24	14.22	13.0	14.13	13.0	17.19	30.00
		36	14.10		14.16		17.14	30.00
		48	12.33		12.40		15.38	30.00
		54	12.39	1	12.29		15.35	30.00
		6	14.42		14.41		17.43	30.00
		9	14.39		14.51		17.46	30.00
		12	14.33		14.42		17.38	30.00
2462		18	14.37	12.0	14.29	12.0	17.34	30.00
2462	11	24	14.25	13.0	14.17	13.0	17.22	30.00
		36	14.26	1	14.32		17.30	30.00
		48	12.42		12.48		15.46	30.00
		54	12.33		12.34		15.35	30.00
		6	7.08		7.01		10.06	30.00
		9	7.10		7.05		10.08	30.00
		12	7.12		7.06		10.10	30.00
2467	10	18	7.07		7.07	-	10.08	30.00
2467	12	24	7.02	5.0	6.96	5.0	10.00	30.00
		36	6.91		6.97		9.95	30.00
		48	4.97		4.90		7.94	30.00
		54	4.99	1	4.92	1	7.96	30.00
		6	1.48		1.70		4.60	30.00
		9	1.55	1	1.71	1	4.64	30.00
		12	1.54	1	1.72	1	4.64	30.00
2472	18	1.55	1	1.71	0.5	4.64	30.00	
2472	13	24	1.51	-0.5	1.71	-0.5	4.62	30.00
		36	1.39	1	1.74	1	4.58	30.00
		48	-0.51	1	-0.25	1	2.63	30.00
		54	-0.21	1	-0.36		2.73	30.00



802.11n(HT	20) Mode	MCS	SIS	O Measured	d Power (c	lBm)	MIMO (CDD) (dBm)	Limit
Frequency [MHz]	Channel No.	Index	Ant 1	Power Level Setting	Ant 2	Power Level Setting	Ant 1 + Ant 2	(dBm)
		0	10.48		10.39		13.44	30.00
		1	10.45		9.94		13.22	30.00
		2	10.49		9.94		13.23	30.00
2412	1	3	10.36	8.5	10.21	8.5	13.30	30.00
2412	1 I	4	10.28	0.5	10.12	0.5	13.21	30.00
		5	10.42		10.11		13.28	30.00
		6	8.24		7.96		11.11	30.00
		7	8.25		7.95		11.11	30.00
		0	14.12		14.01		17.08	30.00
		1	14.06		14.12		17.10	30.00
		2	14.05		14.01		17.04	30.00
2427	c	3	14.10	12.0	14.09	12.0	17.11	30.00
2437	6	4	14.00	13.0	14.13	13.0	17.08	30.00
		5	13.95		14.15		17.06	30.00
		6	12.12		12.20		15.17	30.00
		7	12.02		12.18		15.11	30.00
		0	13.35		13.44		16.41	30.00
		1	13.51		13.33		16.43	30.00
		2	13.43		13.28		16.37	30.00
2462		3	13.41	10.0	13.31	10.0	16.37	30.00
2462	11	4	13.32	12.0	13.25	12.0	16.30	30.00
		5	13.47		13.25		16.37	30.00
		6	11.64		11.43		14.54	30.00
		7	11.57		11.35		14.47	30.00
		0	6.83		6.83		9.84	30.00
		1	6.90		6.84		9.88	30.00
		2	6.81		6.84		9.83	30.00
0.467	10	3	6.88		6.82	-	9.86	30.00
2467	12	4	6.79	5.0	6.84	5.0	9.82	30.00
		5	6.70		6.71		9.72	30.00
		6	4.93		4.79		7.87	30.00
		7	4.93	1	4.78	1	7.87	30.00
		0	1.59		1.47		4.54	30.00
		1	1.60	1	1.60	1	4.61	30.00
		2	1.63	1	1.62	1	4.64	30.00
	3	1.60	1	1.48		4.55	30.00	
2472	13	4	1.61	0.0	1.49	0.0	4.56	30.00
	5	1.61	1	1.49		4.56	30.00	
		6	-0.36	1	-0.48		2.59	30.00
		7	-0.35	1	-0.47	1	2.60	30.00



802.11n(HT	40) Mode	MCS	SIS	O Measured	d Power (d	lBm)	MIMO (CDD) (dBm)	Limit
Frequency [MHz]	Channel No.	Index	Ant 1	Power Level Setting	Ant 2	Power Level Setting	Ant 1 + (dE Ant 2	(dBm)
		0	7.53		7.38		10.47	30.00
	3	1	7.42	_	7.08		10.27	30.00
		2	7.47		7.10		10.30	30.00
2422		3	7.48	6.0	6.99	6.0	10.25	30.00
2422		4	7.53	0.0	7.00	0.0	10.29	30.00
		5	7.51		6.89		10.23	30.00
		6	5.47		4.99		8.24	30.00
		7	5.39		4.89		8.16	30.00
		0	13.32	-	12.81	12.0	16.08	30.00
		1	13.44		13.06		16.26	30.00
		2	13.52		12.82		16.19	30.00
2437	6	3	13.42	12.0	12.93		16.19	30.00
2437	0	4	13.45	12.0	12.96	12.0	16.22	30.00
		5	13.48		12.88		16.20	30.00
		6	11.66		11.15		14.42	30.00
		7	11.59		11.05		14.34	30.00
		0	12.78		12.45		15.63	30.00
		1	12.69		12.51		15.61	30.00
		2	12.68		12.41		15.56	30.00
2452	2452 9	3	12.58	11.0	12.31	11.0	15.46	30.00
2452		4	12.57	11.0	12.48	11.0	15.53	30.00
		5	12.51		12.45		15.49	30.00
		6	10.80		10.50		13.66	30.00
		7	10.71		10.41		13.58	30.00





9.4 POWER SPECTRAL DENSITY

				Test Res	sult		
Mode	Frequency (MHz)	Channel No.	Ant 1 Measured	Ant 2 Measured	MIMO (Ant 1 + Ant	Limit (dBm)	
			Power	Power	2)	(42)	
	2412	1	-5.312	-8.056	-3.468		
	2437	6	-5.412	-7.535	-3.279		
802.11b	2462	11	-6.588	-8.080	-4.202		
	2467	12	-8.311	-8.300	-5.229		
	2472	13	-17.446	-17.226	-13.979		
	2412	1	-1.312	-5.489	0.086		
	2437	6	-5.060	-6.407	-2.676		
802.11g	2462	11	-7.055	-7.920	-4.437		
	2467	12	-17.528	-15.792	-13.010	8	
	2472	13	-22.726	-22.751	-16.990	0	
	2412	1	-7.967	-11.414	-6.383		
	2437	6	-5.435	-8.095	-3.468		
802.11n(HT20)	2462	11	-6.360	-9.121	-4.559		
	2467	12	-17.417	-17.558	-13.979		
	2472	13	-23.304	-22.088	-20.000		
	2422	3	-15.303	-14.175	-11.549		
802.11n(HT40)	2437	6	-5.882	-9.329	-4.202		
	2452	9	-6.615	-9.820	-4.949		

Note :

1. Spectrum reading values are not plot data.

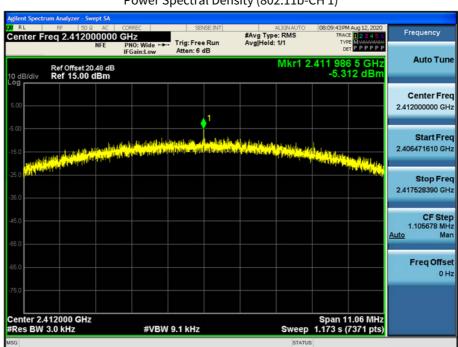
The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.

2. Spectrum offset = Attenuator loss(20 dB) + Cable loss(1ea)

3. 20.48 dB is offset for 2.4 GHz Band.

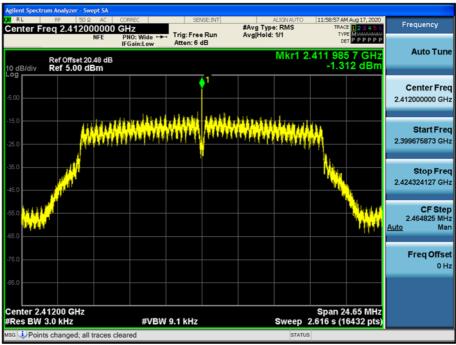


[Ant1] Test Plots



Power Spectral Density (802.11b-CH 1)

Power Spectral Density (802.11g-CH 1)





Agilent Spect	RF 50.0 AC		SENSE:INT	ALIGN AUTO	09:39:53 PM Aug 12, 2020	
	reg 2.43700000	00 GHz		#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE MULTINE	Frequency
10 dB/div	Ref Offset 20.48 d Ref 20.00 dBm	PNO: Wide +++ IFGain:Low	Trig: Free Run Atten: 10 dB	AvgjHold: 1/1 Mkr1 2	2.436 993 2 GHz -5.435 dBm	Auto Tur
10.0						Center Fre 2.437000000 GF
•10.00		1. 10111. A. A. John	1 			Start Fr 2.423723131 G
20.0 30.0						Stop Fr 2.450276869 G
40.0 50.0	t på dela dela dela dela dela dela dela dela				- New Andrews	CF St 2.655374 M <u>Auto</u> M
60.0						Freq Off 0
70.0						
¢Res BW	43700 GHz 3.0 kHz	#VBW	9.1 kHz	Sweep	Span 26.55 MHz 2.818 s (17702 pts)	
SG				STATU	s	

Power Spectral Density (802.11n_HT20 -CH 6)

Power Spectral Density (802.11n_HT40 -CH 6)

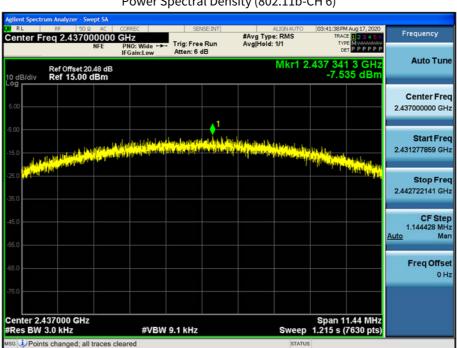


Note :

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



[Ant2] Test Plots



Power Spectral Density (802.11b-CH 6)

Power Spectral Density (802.11g-CH 1)

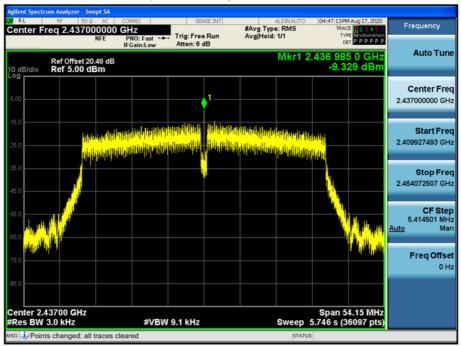




RL	rum Analyzer - Swep RF 50 Ω req 2.437000	AC CORREC			#Avg Type Avg Hold:		TRAC	E 123456	Frequency
0 dB/div	Ref Offset 20.4 Ref 10.00 dE	IFGain:Lo 8 dB					.436 982	2 7 GHz 95 dBm	Auto Tun
.og 0.00				↓ 1					Center Fre 2.437000000 GF
20.0	M		MANN	A AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		Ŵŀ			Start Fr 2.423763760 Gi
30.0 40.0								le Partician	Stop Fr 2.450236240 G
50.0 1920 (194	edit"							Hereiner Car	CF St 2.647248 M <u>Auto</u> M
0.0									Freq Offs 0
	43700 GHz						Span 2	6.47 MHz	
	3.0 kHz ts changed; all tra		VBW 9.1 kHz			Sweep	2.809 s (1	7648 pts)	

Power Spectral Density (802.11n_HT20 -CH 6)

Power Spectral Density (802.11n_HT40 -CH 6)



Note :

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





9.5 BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Result : please refer to the plot below.

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

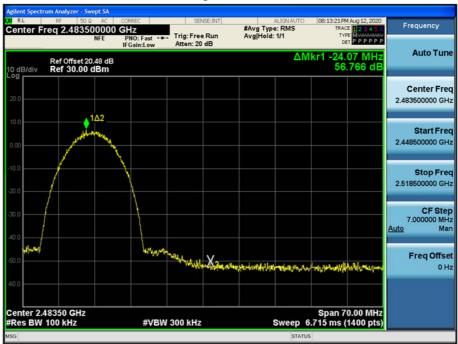


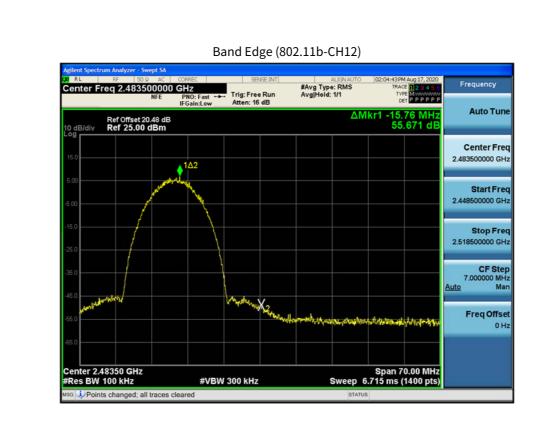
[ANT1] Test Plots(BandEdge)



Band Edge (802.11b-CH1)

Band Edge (802.11b-CH11)





Band Edge (802.11b-CH13)



HCT







Band Edge (802.11g-CH11)

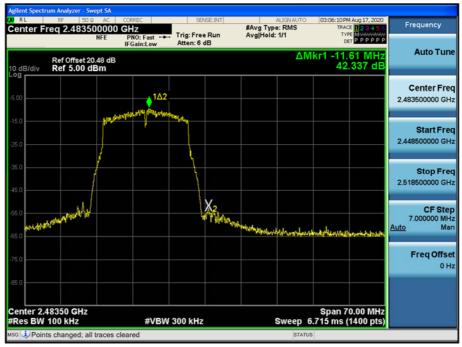




RL RF 50.0 AC Center Freq 2.483500000 NFE	GHz	ree Run Av	ALIGN AUTO vg Type: RMS vg Hold: 1/1	02:14:44 PM Aug 17, 2020 TRACE 1 2 3 4 5 6 TYPE M	Frequency
Ref Offset 20.48 dB			ΔM	kr1 -19.11 MHz 48.542 dB	Auto Tur
0.00	Δ2				Center Fre 2.483500000 Gi
20.0					Start Fr 2.448500000 G
40.0					Stop Fr 2.518500000 G
50.0 mlmthyn ffu	with a			terry operation of a statistic states	CF St 7.000000 M Auto M
70,0			anan a sherika da ana sa	herefer of the order of the second second	Freq Offs 0
800 Center 2.48350 GHz #Res BW 100 kHz	#VBW 300 k		Swaap 6	Span 70.00 MHz 715 ms (1400 pts)	

Band Edge (802.11g-CH12)

Band Edge (802.11g-CH13)



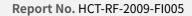


	RF 50 Ω AC q 2.400000000 NFE	PNO: Fast ++	. Trig: Free R Atten: 6 dB		#Avg Type Avg Hold:		TRAC	Aug 17, 2020	Frequency
0 dB/div R	tef Offset 20.48 dB Ref 15.00 dBm	IFGain:Low	Atten: 6 dB			ΔM	kr1 12.	71 MHz 460 dB	Auto Tui
5.00					•	Δ2			Center Fr 2.400000000 G
15.0				- Haltonia	heimen may an	WHIT HIS IN THE WAY			Start Fr 2.365000000 G
25.0									Stop Fr 2.435000000 G
45.0	Juggaloulager-shipmander	manthornalit	an All All All All All				Walley	uninger and the first of the second	CF St 7.000000 M <u>Auto</u> N
65.0									Freq Off 0
Center 2.400		#VBW	300 kHz			Sweep 6.	Span 7 715 m <u>s (</u>	0.00 MHz 1400 pts)	

Band Edge (802.11n_HT20 -CH1)

Band Edge (802.11n_HT20 -CH11)



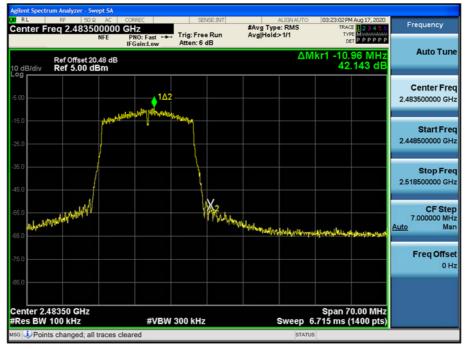




RL RF 50 Q AC		SENSE:INT		LIGN AUTO		Aug 17, 2020	Frequency
Center Freq 2.483500000	PNO: East Trig:	Free Run n: 6 dB	#Avg Type Avg Hold:		TYP	E 123456 E M 444444444 T P P P P P P	requeries
Ref Offset 20.48 dB 0 dB/div Ref 10.00 dBm	I GAINLOW			ΔM		76 MHz 035 dB	Auto Tur
0.00 10.0 10.0	1Δ2 number 1						Center Fr 2.483500000 G
20.0							Start Fr 2.448500000 G
40.0							Stop Fr 2.518500000 G
50.0 MANA		in the King of the second s	halfallangeite	ul-laturatura	Juana	ted an annu an a	CF St 7.000000 M Auto N
80.0							Freq Offs 0
Center 2.48350 GHz Res BW 100 kHz	#VBW 300 F	KHz	s	weep <u>6</u> .	Span 7 715 ms (0.00 MHz 1400 pts)	

Band Edge (802.11n_HT20 -CH12)

Band Edge (802.11n_HT20 -CH13)





RL RF 50 Q AC		SENSE:INT	ALIGN AUTO	12:53:06 PM Aug 17, 2020	Frequency
enter Freq 2.4000000	PNO: Fast T	rig: Free Run Atten: 6 dB	#Avg Type: RMS Avg Hold: 1/1	TRACE	Frequency
Ref Offset 20.48 d 0 dB/div Ref 10.00 dBm	II OUIILOW	Atom v vib	Δ	Mkr1 21.96 MHz 36.059 dB	Auto Tu
og 0.00			162		Center Fr 2.400000000 G
20.0		distant Will	hadal and the stand stand		Start Fr 2.345000000 G
		X5			Stop Fr 2.455000000 G
50.0	معدة بن معلق بعض معنوم عمد المدين المعالم	WWW ANY Z		Tor el derret	CF St 11.000000 M Auto N
70.0					Freq Off 0
800 Center 2.40000 GHz Res BW 100 kHz	#VBW 30	10 kHz	Sweep	Span 110.0 MHz 10.56 ms (2200 pts)	

Band Edge (802.11n_HT40 -CH3)

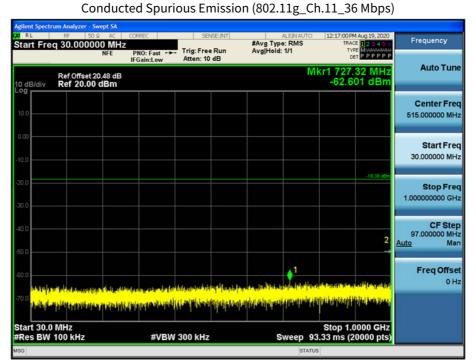
Band Edge (802.11n_HT40 -CH9)





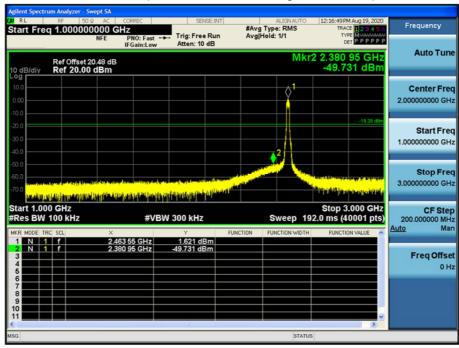
Test Plots(Conducted Spurious Emission)

$30 \text{ MHz} \sim 1 \text{ GHz}$



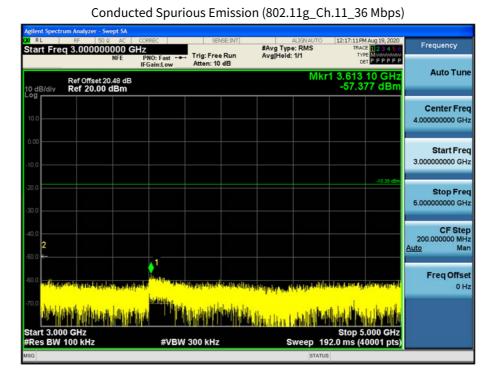
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11g_Ch.11_36 Mbps)





3 GHz ~ 5 GHz



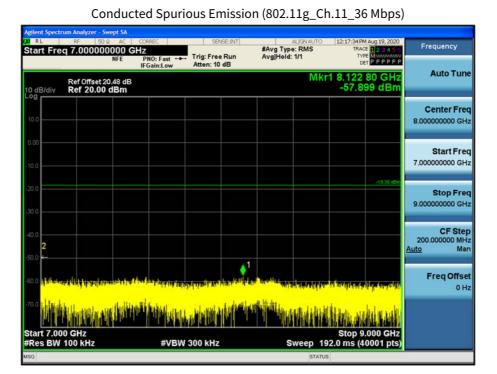
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11g_Ch.11_36 Mbps)

Start Free	RF 50 Ω AC q 5.000000000 G NFE	PNO: Fast ++	SENSE:I	#A In Av	ALIGN AU vg Type: RMS g Hold: 1/1	TRA	M Aug 19, 2020 CE 123456 PE MUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU	Frequency
10 dB/div	Ref Offset 20.48 dB Ref 20.00 dBm	IFGain:Low	Atten: 10 dB		N	1kr1 6.105		Auto Tun
10.0								Center Fre 6.000000000 GH
10.00								Start Fre 5.000000000 GF
20.0 30.0							-18.38 dBn	Stop Fro 7.000000000 Gi
40.0 2 50.0 (-								CF Sto 200.000000 M Auto M
	ter beiten bei gener bilder für ein bilder	a aratara an	(milition (military multi	1 International Advice		a an	a and a state to a state of the	Freq Offs 0
70.0			ullul addi	<mark>ayahalla</mark>	hoye had N	Stop 7	.000 GHz	
Res BW		#VBW	V 300 kHz		Sweep	192.0 ms (4	0001 pts)	



7 GHz ~ 9 GHz



9 GHz ~ 11 GHz



