

# TEST REPORT

FCC/ISED UNII Test for LGSBWAC22  
Certification

**APPLICANT**  
LG Electronics Inc.

**REPORT NO.**  
HCT-RF-2106-FI018

**DATE OF ISSUE**  
June 25, 2021

**Tested by**  
Jin Gwan Lee



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Accredited by KOLAS, Republic of KOREA

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CUSTOMER SECRET



# TEST REPORT

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for LGSBWAC22

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## Additional Model

-

## Applicant

**LG Electronics Inc.**

222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, Korea

## Eut Type Model Name

RF Module  
LGSBWAC22

## FCC ID IC

BEJLGSBWAC22  
2703H-LGSBWAC22

## Modulation type

OFDM

## FCC Classification

Unlicensed National Information Infrastructure(NII)

## FCC Rule Part(s)

Part 15.407

## ISED Rule Part(s)

RSS-247 Issue 2 (February 2017)  
RSS-Gen Issue 5\_Amendment 2 (February 2021)

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	June 25, 2021	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 / ISED Rules under normal use and maintenance.

### KOLAS Statement:

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. (KOLAS Accreditation No. KT197)

If this report is required to confirmation of authenticity, please contact to [www.hct.co.kr](http://www.hct.co.kr)

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## 1. GENERAL INFORMATION

### EUT DESCRIPTION

Model	LGSBWAC22	
Additional Model	-	
EUT Type	RF Module	
Power Supply	DC 3.30 V	
Modulation Type	OFDM : 802.11a, 802.11n, 802.11ac	
Frequency Range (MHz)	U-NII-1	20MHz BW : 5180 - 5240 40MHz BW : 5190 - 5230 80MHz BW : 5210
	U-NII-2A	20MHz BW : 5260 - 5320 40MHz BW : 5270 - 5310 80MHz BW : 5290
	U-NII-2C	20MHz BW : 5500 - 5720 40MHz BW : 5510 - 5710 80MHz BW : 5530 - 5690
	U-NII-3	20MHz BW : 5745 - 5825 40MHz BW : 5755 - 5795 80MHz BW : 5775
Antenna type	Metal press Antenna	
Antenna Peak Gain	Ant1 Peak Gain : 0.05 dBi(UNII 1)/ 0.98 dBi(UNII 2A)/ 1.41 dBi(UNII 2C)/ 1.44 dBi(UNII 3) Ant2 Peak Gain : 1.42 dBi(UNII 1)/ 1.45 dBi(UNII 2A)/ 1.37 dBi(UNII 2C)/ 1.42 dBi(UNII 3)	
Straddle channel	Supported	
TDWR Band	Not Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	April 15, 2021 ~ June 22, 2021	
PMN (Product Marketing Number)	RF Module	
HVIN (Hardware Version Identification Number)	LGSBWAC22	
FVIN (Firmware Version Identification Number)	1.0	
HMN (Host Marketing Name)	N/A	
EUT serial numbers	Radiated : ETWCERBC01-01 Conducted : ETWCERBC01-02	
Manufacturer	1. PT. LG INNOTEK INDONESIA Bekasi International Industrial Estate, Blok C8 NO. 12 & 12 A, Desa Cibatu, Cikarang Selatan, Bekasi 17750 – Indonesia 2. COMPAL NETWORKING(KUNSHAN)CO.,LTD No. 520, Nanbang Rd, Economic & Technical Development Zone, Kunshan, Jiangsu Province, China	

## ANTENNA CONFIGURATIONS

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

Configurations	SISO		SDM	CDD
	Ant1	Ant2	Ant1 + Ant2	Ant1 + Ant2
802.11a	O	O	X	O
802.11n(HT20)	O	O	O	O
802.11n(HT40)	O	O	O	O
802.11ac(VHT20)	O	O	O	O
802.11ac(VHT40)	O	O	O	O
802.11ac(VHT80)	O	O	O	O

**Note:**

1. O = Support, X = Not Support
2. SISO = Single Input Single Output
3. SDM = Spatial Diversity Multiplexing
4. CDD = Cyclic Delay Diversity

## 2. Directional Gain Calculation

According to KDB 662911 D01 Multiple Transmitter Output v02r01

Directional gain =  $G_{ANT} + 10 \cdot \log(N_{ANT}/N_{SS})$  dBi

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

Band	Ant Gain (dBi)		$N_{ANT}/N_{SS}$	Directional Gain
				= $G_{ANT} + 10 \cdot \log(N_{ANT}/N_{SS})$ dBi
UNII 1	Ant1	0.05	2/2	CDD : 4.43
	Ant2	1.42	2/2	SDM : 1.42
UNII 2A	Ant1	0.98	2/2	CDD : 4.46
	Ant2	1.45	2/2	SDM : 1.45
UNII 2C	Ant1	1.41	2/2	CDD : 4.42
	Ant2	1.37	2/2	SDM : 1.41
UNII 3	Ant1	1.44	2/2	CDD : 4.45
	Ant2	1.42	2/2	SDM : 1.44

## 2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

Band	Mode	SISO				MIMO	
		Ant1 Power		Ant2 Power		Ant 1 + Ant 2 Power	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
UNII1	802.11a	13.23	0.021	13.12	0.021	16.16	0.041
	802.11n (HT20)	13.26	0.021	13.59	0.023	16.34	0.043
	802.11n (HT40)	13.12	0.021	13.31	0.021	16.21	0.042
	802.11ac (VHT20)	12.31	0.017	12.19	0.017	15.13	0.033
	802.11ac (VHT40)	12.12	0.016	12.42	0.017	15.28	0.034
	802.11ac (VHT80)	12.17	0.016	12.21	0.017	15.20	0.033
UNII2A	802.11a	13.35	0.022	13.33	0.022	16.22	0.042
	802.11n (HT20)	13.22	0.021	13.10	0.020	16.16	0.041
	802.11n (HT40)	13.16	0.021	13.79	0.024	16.46	0.044
	802.11ac (VHT20)	12.25	0.017	12.12	0.016	15.19	0.033
	802.11ac (VHT40)	12.36	0.017	13.03	0.020	15.72	0.037
	802.11ac (VHT80)	12.21	0.017	12.74	0.019	15.49	0.035
UNII2C	802.11a	13.29	0.021	13.78	0.024	16.48	0.044
	802.11n (HT20)	13.21	0.021	13.43	0.022	16.33	0.043
	802.11n (HT40)	13.19	0.021	13.05	0.020	16.10	0.041
	802.11ac (VHT20)	12.26	0.017	12.55	0.018	15.42	0.035
	802.11ac (VHT40)	12.18	0.017	12.59	0.018	15.40	0.035
	802.11ac (VHT80)	12.29	0.017	12.30	0.017	15.26	0.034
UNII3	802.11a	13.28	0.021	13.64	0.023	16.47	0.044
	802.11n (HT20)	13.31	0.021	13.60	0.023	16.47	0.044
	802.11n (HT40)	13.24	0.021	13.06	0.020	16.14	0.041
	802.11ac (VHT20)	12.19	0.017	12.61	0.018	15.42	0.035
	802.11ac (VHT40)	12.26	0.017	12.57	0.018	15.42	0.035
	802.11ac (VHT80)	12.32	0.017	12.39	0.017	15.36	0.034



### 3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated December 14, 2017 entitled “Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and ANSI C63.10(Version : 2013) ‘the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices’ were used in the measurement.

#### 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 15.407 under the FCC Rules Part 15 Subpart E. / 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.

## 4. 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, which is traceable to recognized national standards.

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

## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.

The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

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

For ISED, test facility was accepted dated January 26, 2021 (CAB identifier: KR0032).

### 5.2 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."

## 6. ANTENNA REQUIREMENTS

According to FCC 47 CFR § 15.203, § 15.407 / RSS-Gen (Issue 5) Section 8:

“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, § 15.407

## 7. 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.

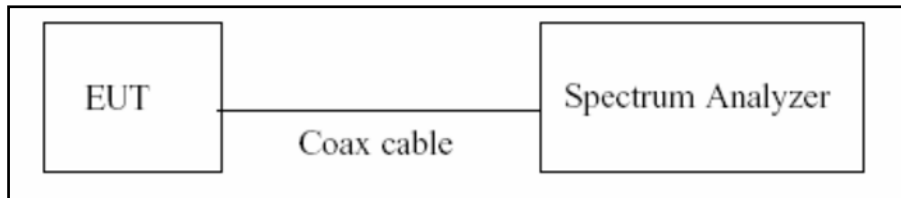
The measurement data shown herein meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance

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

## 8. DESCRIPTION OF TESTS

### 8.1. Duty Cycle

#### Test Configuration



#### Test Procedure

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure B.2 in KDB 789033 D02 v02r01.

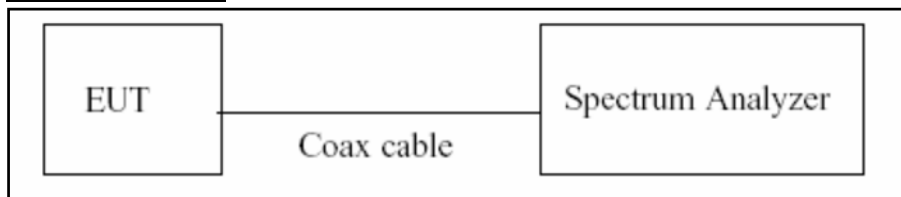
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ( $\geq$  RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure  $T_{total}$  and  $T_{on}$
8. Calculate Duty Cycle =  $T_{on} / T_{total}$  and Duty Cycle Factor =  $10\log(1/\text{Duty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

## 8.2. 6dB Bandwidth & 26dB Bandwidth & 99 % Bandwidth

### Limit

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

### Test Configuration



### Test Procedure(26dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure C.1 in KDB 789033 D02 v02r01.

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Detector = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

### Test Procedure (6dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

We tested according to Procedure C.2 in KDB 789033 D02 v02r01.

1. RBW = 100 kHz
2. VBW  $\geq$  3 x RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### Note:

1. We tested X dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.



2. DFS test channels should be defined. So, We performed the OBW test to prove that no part of the fundamental emissions of any channels belong to UNII1 and UNII3 band for DFS.
3. The 26 dB bandwidth is used to determine the conducted power limits.

#### **Test Procedure (99 % Bandwidth for ISED)**

The transmitter output is connected to the spectrum analyzer.

RBW = 1% ~ 5% of the occupied bandwidth

VBW  $\cong$  3 x 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.

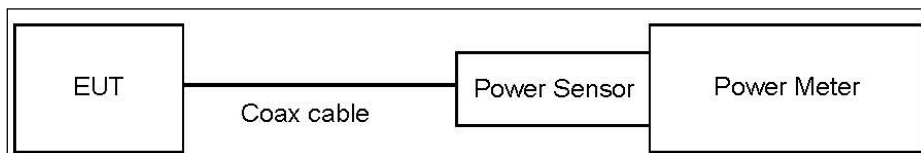
### 8.3. Output Power Measurement

#### Limit

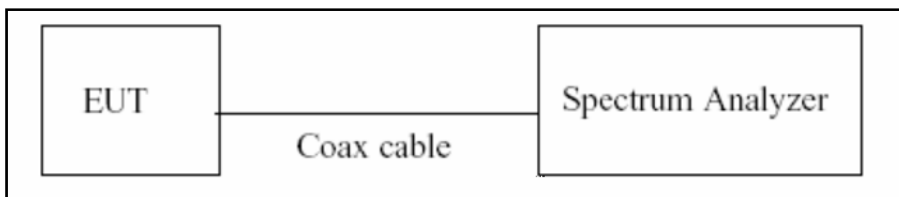
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

#### Test Configuration

##### Power Meter



##### Spectrum Analyzer(Only Straddle Channel)



#### Test Procedure(Power Meter)

We tested according to Procedure E.3.a in KDB 789033 D02 v02r01.

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.

#### Test Procedure(Spectrum Analyzer)

The transmitter output is connected to the Spectrum Analyzer.

We use the spectrum analyzer's integrated band power measurement function.

We tested according to Procedure E.2.d) in KDB 789033 D02 v02r01.

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW  $\geq$  3 MHz.
5. Number of points in sweep  $\geq$  2 x span/RBW.
6. Sweep time = auto.
7. Detector = RMS.
8. Do not use sweep triggering. Allow the sweep to “free run”.
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. 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**

Total Power(dBm) = Reading Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

#### **Note**

1. Spectrum reading values are not plot data.

The power 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

3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	20.87
UNII 2A	20.87
UNII 2C	20.87
UNII 3	20.87

(Actual value of loss for the attenuator and cable combination)



Limit & Ant Gain Calculation (FCC)

Operating Mode	Band	Mode	Conducted Limit (dBm)
SISO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	23.98
			23.98
	UNII 2A		23.68
			23.65
	UNII 2C		23.69
			23.66
	UNII 3		30.00
			30.00
MIMO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	23.98
	UNII 2A		23.65
	UNII 2C		23.66
	UNII 3		30.00
SISO	UNII 1	802.11n40/ 802.11ac40/ 802.11ac80	23.98
			23.98
	UNII 2A		23.98
			23.98
	UNII 2C		23.98
			23.98
	UNII 3		30.00
			30.00
MIMO	UNII 1	802.11n40/ 802.11ac40/ 802.11ac80	23.98
	UNII 2A		23.98
	UNII 2C		23.98
	UNII 3		30.00

**Limit & Ant Gain Calculation (ISED)**

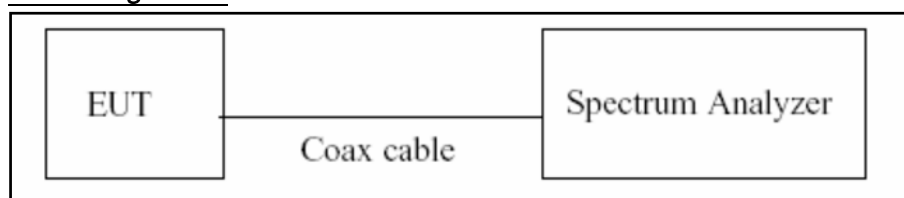
Operating Mode	Band	Mode	E.I.R.P Limit (dBm)	Conducted Limit (dBm)
SISO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	22.15	N/A
			22.14	N/A
	UNII 2A		29.15	23.15
			29.14	23.14
	UNII 2C		29.15	23.15
			29.14	23.14
	UNII 3		N/A	30.00
			N/A	30.00
MIMO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	22.14	N/A
	UNII 2A		29.14	23.14
	UNII 2C		29.14	23.14
	UNII 3		N/A	30.00
SISO	UNII 1	802.11n40/ 802.11ac40/ 802.11ac80	23.01	N/A
			23.01	N/A
	UNII 2A		30.00	23.98
			30.00	23.98
	UNII 2C		30.00	23.98
			30.00	23.98
	UNII 3		N/A	23.98
			N/A	23.98
MIMO	UNII 1	802.11n40/ 802.11ac40/ 802.11ac80	23.01	N/A
	UNII 2A		30.00	23.98
	UNII 2C		30.00	23.98
	UNII 3		N/A	23.98

#### 8.4. Power Spectral Density

##### Limit

Band	Limit
UNII 1	11 dBm/MHz
UNII 2A, 2C	11 dBm/MHz
UNII 3	30 dBm/500 kHz

##### Test Configuration



##### Test Procedure

We tested according to Procedure F in KDB 789033 D02 v02r01.

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz(510 kHz for UNII 3)
3. VBW  $\geq$  3 MHz
4. Number of points in sweep  $\geq$  2 x span/RBW.
5. Sweep time = auto.
6. Detector = RMS(i.e., power averaging), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add  $10 \log(1/x)$ , where x is the duty cycle, to the peak of the spectrum.

### Sample Calculation

Total PSD(dBm) = Reading Value(dBm) + ATT loss(dB) + Cable loss(dB) + Duty Cycle Factor(dB)

### 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

3. Actual value of loss for the attenuator and cable combination is below table.

Band	Loss(dB)
UNII 1	20.87
UNII 2A	20.87
UNII 2C	20.87
UNII 3	20.87

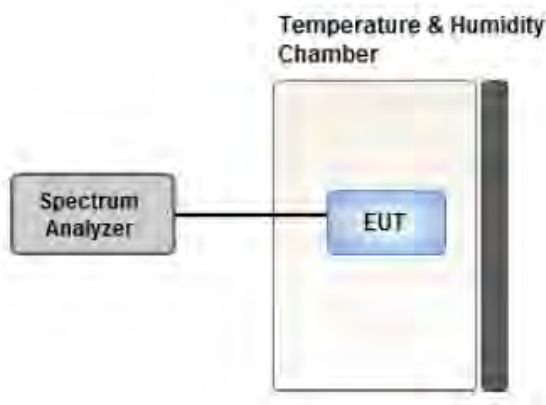
(Actual value of loss for the attenuator and cable combination)

## 8.5. Frequency Stability

### Limit

Maintained within the band

### Test Configuration



### Test Procedure

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 °C and 50 °C.
2. The temperature was incremented by 10 °C intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.
3. The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.
4. While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

## 8.6. 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).

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56 <sup>a</sup>	56 to 46 <sup>a</sup>
0.50 to 5	56	46
5 to 30	60	50
5 to 30	60	50

<sup>a)</sup>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

## 8.7. Radiated Test

### Limit

1. UNII 1: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of  $-27$  dBm/MHz.
2. UNII 2A, 2C: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of  $-27$  dBm/MHz.
3. UNII 3: All emissions shall be limited to a level of  $-27$  dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
4. All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Section 15.209.

### FCC

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

### ISED

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



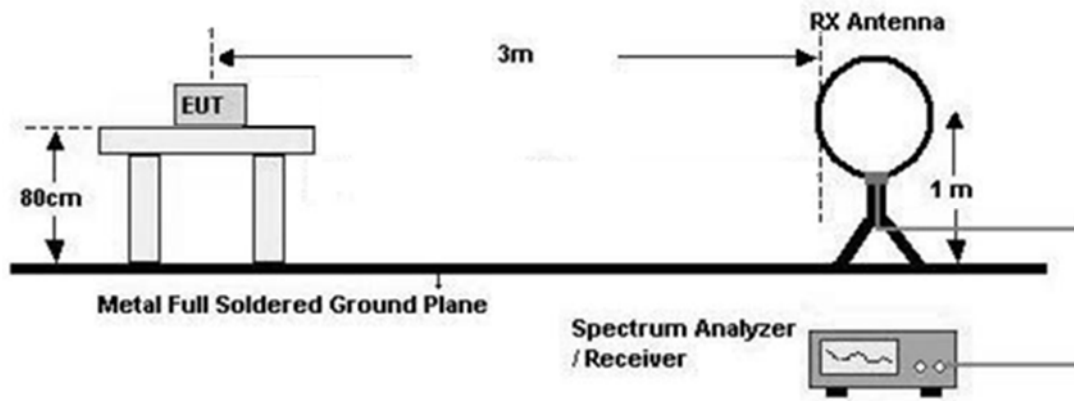
**FCC&ISED**

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

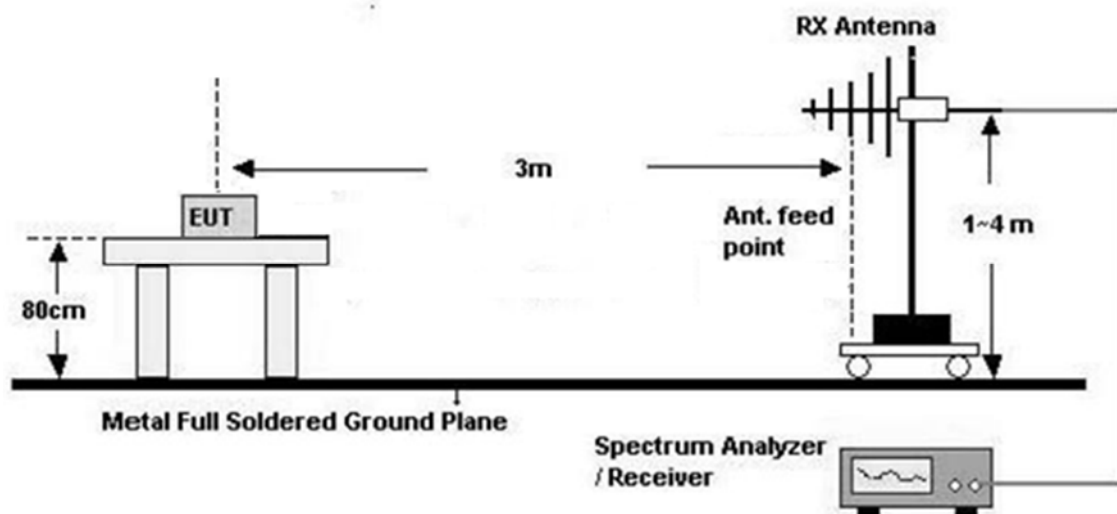


## Test Configuration

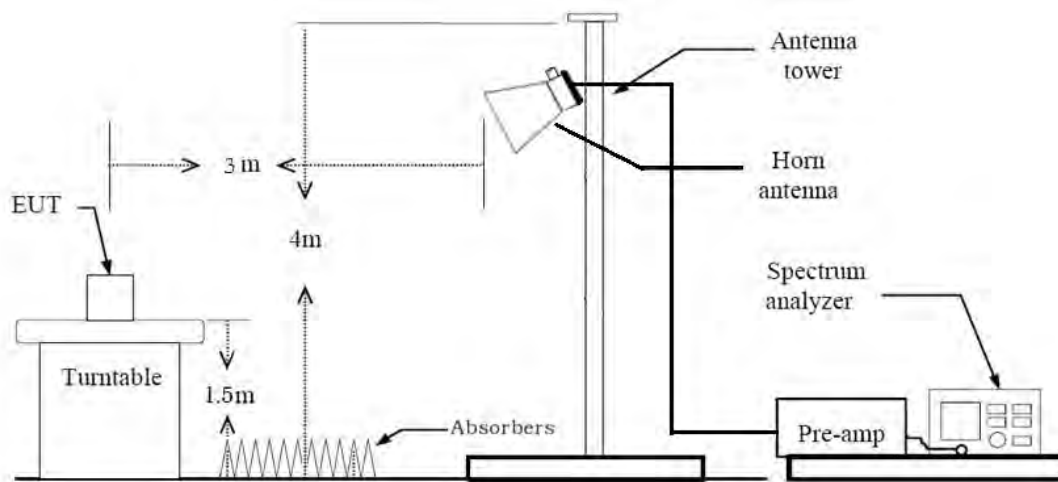
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



#### Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3m from the EUT
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) =  $40\log(3\text{ m}/300\text{ m}) = -80\text{ dB}$   
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) =  $40\log(3\text{ m}/30\text{ m}) = -40\text{ dB}$   
Measurement Distance : 3 m
8. Spectrum Setting
  - Frequency Range = 9 kHz ~ 30 MHz
  - Detector = Peak
  - Trace = Maxhold
  - RBW = 9 kHz
  - VBW  $\geq 3 \times$  RBW
9. Total = 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

#### (1) Measurement Type (Peak, G.5 in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW  $\geq$  3 MHz
- Detector = Peak
- Sweep Time = auto
- Trace mode = max hold
- Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately 1/x, where x is the duty cycle.

#### (2) Measurement Type (Average, G.6.c in KDB 789033 v02r01):

- RBW = 1 MHz
- VBW  $\geq$  3 MHz
- The analyzer is set to linear detector mode.
- Averaging type = power (*i.e.*, RMS)
- Sweep time = auto.
- Trace mode = average (at least 100 traces).
- If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.

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. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency
11. Distance extrapolation factor =  $20\log(\text{test distance} / \text{specific distance})$  (dB)
12. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) - Amp Gain(G) + Distance Factor(D.F)

### **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, G.5 in KDB 789033 v02r01):
    - RBW = 1 MHz
    - VBW  $\geq$  3 MHz
    - Detector = Peak
    - Sweep Time = auto
    - Trace mode = max hold
    - Allow sweeps to continue until the trace stabilizes.

Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately  $1/x$ , where x is the duty cycle.
  - (2) Measurement Type (Average, G.6.c in KDB 789033 v02r01):
    - RBW = 1 MHz
    - VBW  $\geq$  3 MHz
    - The analyzer is set to linear detector mode.
    - Averaging type = power (*i.e.*, RMS)
    - Sweep time = auto.
    - Trace mode = average (at least 100 traces).
    - If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning on and off with the transmit cycle, no duty cycle correction is required for that emission.



9. Measured Frequency Range :

- 4500MHz ~ 5150MHz
- 5350MHz ~ 5460MHz
- 5460MHz ~ 5470MHz
- (75 MHz or more below the 5725MHz) ~ 5725MHz
- 5850MHz ~ (75 MHz or more above the 5850MHz)

10. Distance extrapolation factor =  $20\log(\text{test distance} / \text{specific distance})$  (dB)

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



## 8.8. Receiver Spurious Emissions

### Limit

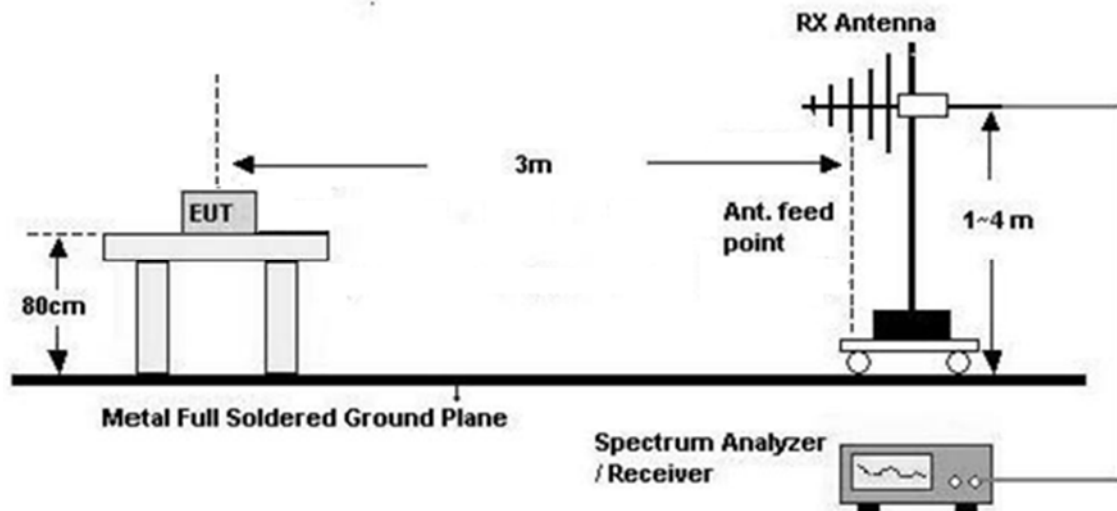
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

### Note:

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

## Test Configuration

30 MHz - 1 GHz



## 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  $\geq 3 \times$  RBW

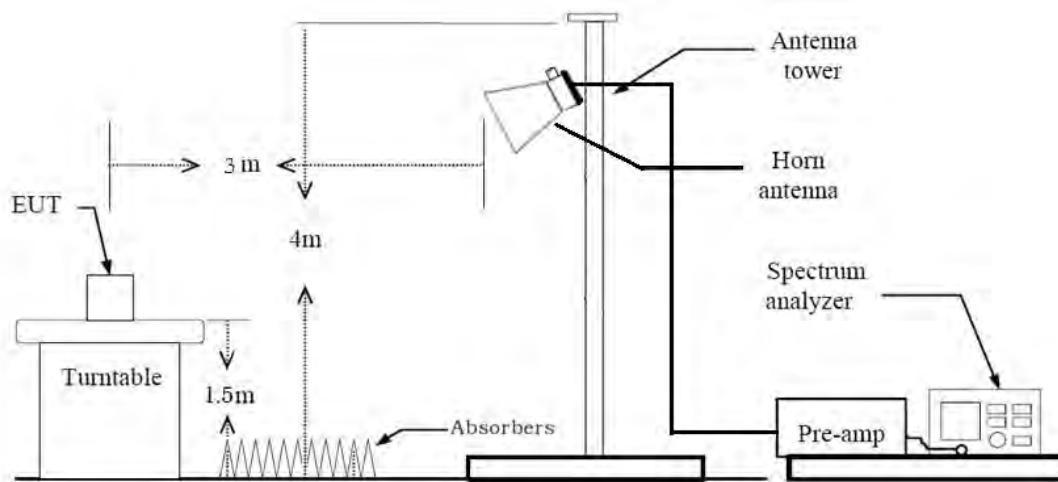
#### (2) Measurement Type(Quasi-peak):

- 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
- Measured Frequency Range : 1 GHz – 25 GHz



- Detector = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds

The actual setting value of VBW = 1 kHz

9. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

10. Distance extrapolation factor =  $20\log(\text{test distance} / \text{specific distance})$  (dB)

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

## 8.9. 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 : Z
4. All data rate of operation were investigated and the worst case data rate results are reported
  - 802.11a : 9Mbps
  - 802.11n : MCS0
  - 802.11ac : MCS0
5. Radiated Spurious Emission
  - All modulation of operation were investigated and the worst case modulation results are reported.
  - (Worstcase : 802.11a\_6 Mbps)
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

### AC Power line Conducted Emissions

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

### Conducted test

1. All data rate of operation were investigated and the worst case data rate results are reported.
2. SISO & MIMO were tested and the all case results are reported.
  - Mode : Ant1(SISO), Ant2(SISO), Ant1+Ant2(CDD)

## 9. SUMMARY OF TEST RESULTS

### FCC

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
26dB Bandwidth	§ 15.407 (for Power Measurement)	N/A	Conducted	PASS
6 dB Bandwidth	§ 15.407(e)	>500 kHz (5725-5850 MHz)		PASS
Maximum Conducted Output Power	§ 15.407(a)(1),(2),(3)	< 250 mW(5150-5250 MHz)  < 250 mW or 11+10 log log <sub>10</sub> (BW) dBm (5250-5350 MHz)  < 250 mW or 11+10 log log <sub>10</sub> (BW) dBm (5470-5725 MHz)  <1 W(5725-5850 MHz)		PASS
Peak Power Spectral Density	§ 15.407(a)(1),(2),(3)	<11 dBm/ MHz (5150-5250 MHz) <11 dBm/ MHz (5250-5350 MHz) <11 dBm/ MHz (5470-5725 MHz) <30 dBm/500 kHz(5725-5850 MHz)		PASS
Frequency Stability	§ 15.407(g) § 2.1055	Maintained within the band		PASS
AC Conducted Emissions 150 kHz-30 MHz	15.207 15.407(b)(8)	<FCC 15.207 limits		PASS
Undesirable Emissions	§ 15.407(b) (1),(2),(3),(4)	<-27 dBm/MHz EIRP (UNII1, 2A, 2C) cf. Section 8.7 (UNII 3)	Radiated	PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	15.205, 15.407(b)(9),(10)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS

**ISED**

Test Description	ISED Part Section(s)	Test Limit	Test Condition	Test Result
99% Bandwidth	RSS-GEN, 6.7	N/A	CONDUCTED	PASS
6 dB Bandwidth	RSS-247, 6.2.4.1	> 500 kHz (5725~5850 MHz)		PASS
Maximum Conducted Output Power,	RSS-247, 6.2	< 250 mW or $11+10 \log_{10}$ (BW) dBm (5470-5600, 5650-5725 MHz) Whichever power is less		PASS
	RSS-247, 6.2.4.1	<1 W (5725-5850 MHz)		
Maximum e.i.r.p	RSS-247, 6.2	< 200 mW or $10+10 \log_{10}$ (BW) dBm (5150-5250 MHz) < 1 W or $17+10 \log_{10}$ (BW) dBm (5250-5350 MHz) < 1 W or $17+10 \log_{10}$ (BW) dBm (5470-5725 MHz) Whichever power is less		PASS
Power Spectral Density	RSS-247 6.2	<10 dBm/ MHz(e.i.r.p.) (5150-5250 MHz) <11 dBm/MHz(Conducted) (5250-5350 MHz, 5470-5600 MHz, 5650-5725 MHz)		PASS
	RSS-247, 6.2.4.1	<30 dBm/500 kHz(Conducted) (5725-5850 MHz)		
Frequency Stability	RSS-GEN 8.11	should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation.		PASS
AC Conducted Emissions 150 kHz-30 MHz	RSS-GEN, 8.8	RSS-GEN section 8.8 table 4		PASS
Undesirable Emissions	RSS-247, 6.2.1.2	26 dBc at 5250~5350 MHz (5150~5350 MHz)		PASS
	RSS-247, 6.2	<-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)	RADIATED	PASS
	RSS-247, 6.2.4.2	cf. Section 9.8.1 (UNII 3)		PASS
General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	RSS-Gen, 8.9 RSS-Gen, 8.10	RSS-Gen section 8.9 table 5, 6 section 8.10 table 7		
Receiver Spurious Emissions	RSS-GEN, 5 RSS-GEN, 7.3	RSS-GEN section 7.3 table 3		PASS

## 10. TEST RESULT

### 10.1 26DB BANDWIDTH & 99 % BANDWIDTH

[ANT1]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	18.68	16.411
5200	40	18.65	16.414
5240	48	18.71	16.409
5260	52	18.75	16.402
5300	60	18.53	16.415
5320	64	18.67	16.431
5500	100	18.70	16.418
5580	116	18.71	16.415
5720	144	18.59	16.418
5745	149	18.71	16.420
5785	157	18.67	16.412
5825	165	18.69	16.397

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.50	17.586
5200	40	19.54	17.555
5240	48	19.57	17.557
5260	52	19.63	17.558
5300	60	19.60	17.552
5320	64	19.57	17.552
5500	100	19.69	17.563
5580	116	19.61	17.569
5720	144	19.59	17.560
5745	149	19.57	17.567
5785	157	19.63	17.559
5825	165	19.62	17.574

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.93	36.051
5230	46	41.48	36.070
5270	54	40.97	36.099
5310	62	40.98	36.032
5510	102	41.42	36.037
5550	110	41.04	36.078
5710	142	40.92	36.057
5755	151	41.81	36.094
5795	159	41.72	36.095

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.49	17.568
5200	40	19.50	17.556
5240	48	19.49	17.571
5260	52	19.51	17.561
5300	60	19.52	17.547
5320	64	19.50	17.555
5500	100	19.49	17.563
5580	116	19.52	17.570
5720	144	19.56	17.558
5745	149	19.41	17.560
5785	157	19.55	17.570
5825	165	19.50	17.558

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	41.03	36.031
5230	46	40.98	36.037
5270	54	41.29	36.081
5310	62	40.76	36.030
5510	102	41.71	36.066
5550	110	41.29	36.045
5710	142	40.93	36.045
5755	151	40.92	36.066
5795	159	41.26	36.062

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.25	74.456
5290	58	81.15	74.636
5530	106	81.32	74.526
5690	138	81.43	74.724
5775	155	81.37	74.720



[ANT2]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	18.46	16.378
5200	40	18.47	16.368
5240	48	18.38	16.369
5260	52	18.43	16.377
5300	60	18.40	16.367
5320	64	18.43	16.369
5500	100	18.44	16.370
5580	116	18.44	16.371
5720	144	18.44	16.366
5745	149	18.38	16.365
5785	157	18.46	16.374
5825	165	18.40	16.365

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.50	17.554
5200	40	19.46	17.548
5240	48	19.44	17.551
5260	52	19.47	17.558
5300	60	19.56	17.556
5320	64	19.57	17.557
5500	100	19.52	17.550
5580	116	19.51	17.559
5720	144	19.57	17.553
5745	149	19.50	17.563
5785	157	19.57	17.552
5825	165	19.60	17.553

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.93	36.030
5230	46	41.18	36.071
5270	54	41.19	36.083
5310	62	40.78	36.033
5510	102	41.18	36.051
5550	110	41.09	36.053
5710	142	41.16	36.045
5755	151	41.47	36.076
5795	159	40.63	36.043

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.49	17.559
5200	40	19.45	17.557
5240	48	19.55	17.552
5260	52	19.49	17.561
5300	60	19.46	17.559
5320	64	19.55	17.554
5500	100	19.49	17.559
5580	116	19.48	17.561
5720	144	19.50	17.559
5745	149	19.50	17.553
5785	157	19.59	17.563
5825	165	19.51	17.558

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.94	36.032
5230	46	41.10	36.052
5270	54	41.41	36.054
5310	62	40.75	36.058
5510	102	41.82	36.065
5550	110	41.14	36.044
5710	142	40.84	36.017
5755	151	41.46	36.073
5795	159	41.31	36.034

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.34	74.549
5290	58	81.01	74.584
5530	106	80.50	74.760
5690	138	80.88	74.611
5775	155	81.37	74.656

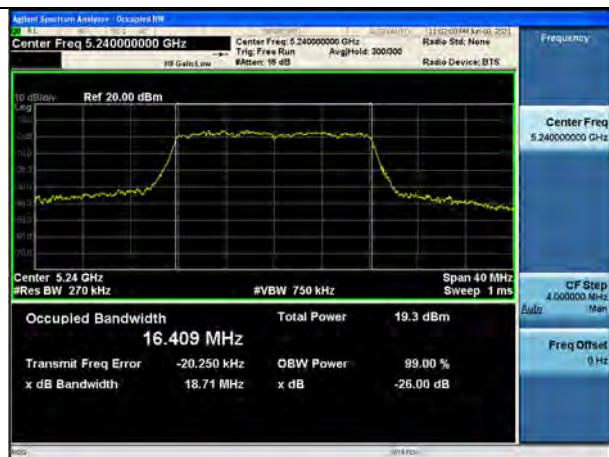
[ANT1]

▣ Test Plots(802.11a)

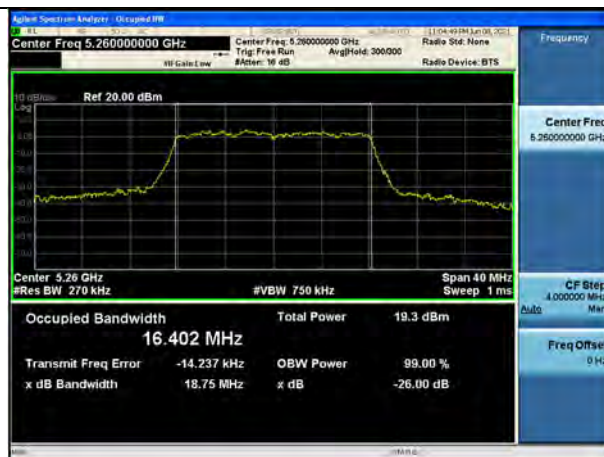
Note:

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

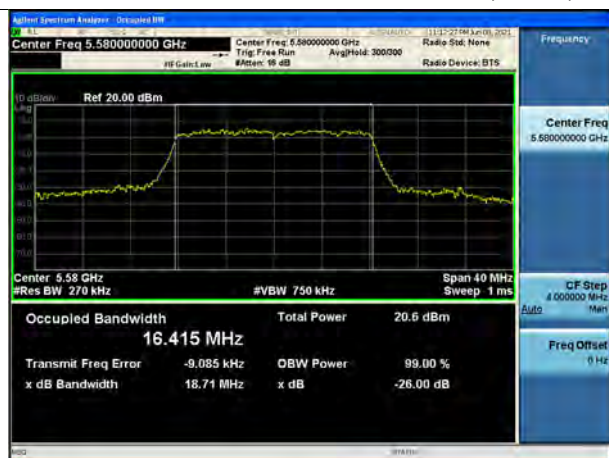
802.11a UNII 1 BAND 26dB Bandwidth (CH 48)



802.11a UNII 2A BAND 26dB Bandwidth (CH 52)



802.11a UNII 2C BAND 26dB Bandwidth (CH116)



802.11a UNII 3 BAND 26dB Bandwidth (CH 149)



□ Test Plots(802.11n(HT20))

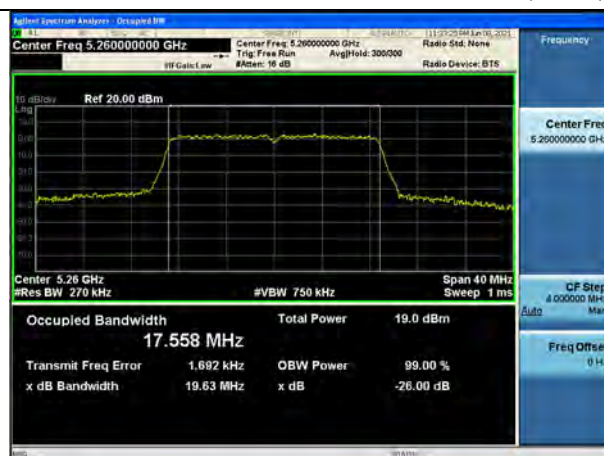
Note:

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

802.11n\_HT20 UNII 1 BAND 26dB Bandwidth(CH 48)



802.11n\_HT20 UNII 2A BAND 26dB Bandwidth(CH 52)



802.11n\_HT20 UNII 2C BAND 26dB Bandwidth(CH 100)



802.11n\_HT20 UNII 3 BAND 26dB Bandwidth(CH 157)



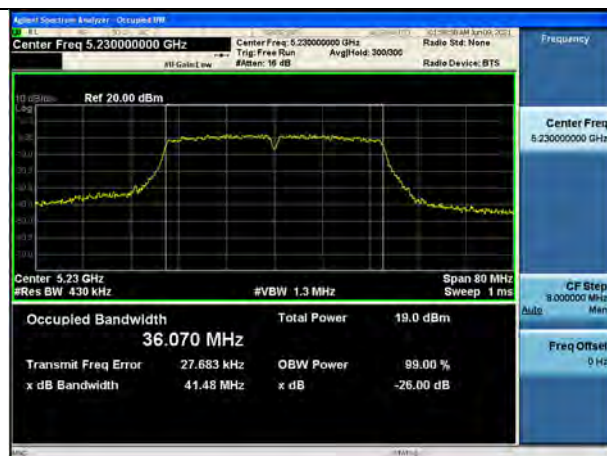


□ Test Plots(802.11n(HT40))

Note:

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

802.11n\_HT40 UNII 1 BAND 26dB Bandwidth(CH 46)



802.11n\_HT40 UNII 2A BAND 26dB Bandwidth (CH 62)



802.11n\_HT40 UNII 2C BAND 26dB Bandwidth(CH 102)



802.11n\_HT40 UNII 3 BAND 26dB Bandwidth (CH 151)



■ Test Plots(802.11ac(VHT20))

Note:

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

802.11ac\_VHT20 UNII 1 BAND 26dB Bandwidth(CH 40)



802.11ac\_VHT20 UNII 2A BAND 26dB Bandwidth(CH 60)



802.11ac\_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)



802.11ac\_VHT20 UNII 3 BAND 26dB Bandwidth(CH 157)



□ Test Plots(802.11ac(VHT40))

Note:

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

802.11ac\_VHT40 UNII 1 BAND 26dB Bandwidth(CH 38)



802.11ac\_VHT40 UNII 2A BAND 26dB Bandwidth (CH 54)



802.11ac\_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)



802.11ac\_VHT40 UNII 3 BAND 26dB Bandwidth (CH 159)





■ Test Plots(802.11ac(VHT80))

Note:

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

802.11ac\_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)



802.11ac\_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)



802.11ac\_VHT80 UNII 2C BAND 26dB Bandwidth(CH 138)



802.11ac\_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)



[ANT2]

■ Test Plots(802.11a)

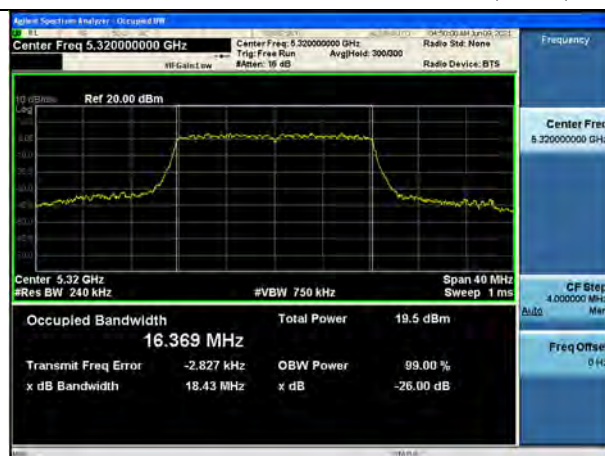
Note:

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

802.11a UNII 1 BAND 26dB Bandwidth (CH 40)



802.11a UNII 2A BAND 26dB Bandwidth (CH 64)



802.11a UNII 2C BAND 26dB Bandwidth (CH 144)



802.11a UNII 3 BAND 26dB Bandwidth (CH 157)



□ Test Plots(802.11n(HT20))

Note:

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

802.11n\_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)



802.11n\_HT20 UNII 2A BAND 26dB Bandwidth(CH 64)



802.11n\_HT20 UNII 2C BAND 26dB Bandwidth(CH 144)



802.11n\_HT20 UNII 3 BAND 26dB Bandwidth(CH 165)





□ Test Plots(802.11n(HT40))

Note:

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

802.11n\_HT40 UNII 1 BAND 26dB Bandwidth(CH 46)



802.11n\_HT40 UNII 2A BAND 26dB Bandwidth (CH 54)



802.11n\_HT40 UNII 2C BAND 26dB Bandwidth(CH 102)



802.11n\_HT40 UNII 3 BAND 26dB Bandwidth (CH 151)



■ Test Plots(802.11ac(VHT20))

Note:

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

802.11ac\_VHT20 UNII 1 BAND 26dB Bandwidth(CH 48)



802.11ac\_VHT20 UNII 2A BAND 26dB Bandwidth(CH 64)



802.11ac\_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)



802.11ac\_VHT20 UNII 3 BAND 26dB Bandwidth(CH 157)



■ Test Plots(802.11ac(VHT40))

Note:

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

802.11ac\_VHT40 UNII 1 BAND 26dB Bandwidth(CH 46)



802.11ac\_VHT40 UNII 2A BAND 26dB Bandwidth (CH 54)



802.11ac\_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)



802.11ac\_VHT40 UNII 3 BAND 26dB Bandwidth (CH 151)





■ Test Plots(802.11ac(VHT80))

Note:

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

802.11ac\_VHT80 UNII 1 BAND 26dB Bandwidth(CH 42)



802.11ac\_VHT80 UNII 2A BAND 26dB Bandwidth (CH 58)



802.11ac\_VHT80 UNII 2C BAND 26dB Bandwidth(CH 138)



802.11ac\_VHT80 UNII 3 BAND 26dB Bandwidth (CH 155)



## 10.2 6DB BANDWIDTH

### [ANT1]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.53	> 0.5	Pass
5785	157	16.52	> 0.5	Pass
5825	165	16.53	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.71	> 0.5	Pass
5785	157	17.73	> 0.5	Pass
5825	165	17.70	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.44	> 0.5	Pass
5795	159	36.45	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.70	> 0.5	Pass
5785	157	17.74	> 0.5	Pass
5825	165	17.70	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.42	> 0.5	Pass
5795	159	36.44	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	76.01	> 0.5	Pass



[ANT2]

802.11a Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.48	> 0.5	Pass
5785	157	16.47	> 0.5	Pass
5825	165	16.48	> 0.5	Pass

802.11n(HT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.69	> 0.5	Pass
5785	157	17.71	> 0.5	Pass
5825	165	17.70	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.45	> 0.5	Pass
5795	159	36.45	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.70	> 0.5	Pass
5785	157	17.69	> 0.5	Pass
5825	165	17.72	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.43	> 0.5	Pass
5795	159	36.44	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.99	> 0.5	Pass

[ANT1]

Test Plots

**Note:** In order to simplify the report, attached plots were only the most narrow channel.

802.11a (CH.157)



802.11n(HT20) (CH.165)



802.11n(HT40) (CH.151)



802.11ac(VHT20) (CH.149)



802.11ac(VHT40) (CH.151)



802.11ac(VHT80) (CH.155)



[ANT2]

☐ Test Plots

Note: In order to simplify the report, attached plots were only the most narrow channel.

802.11a (CH.157)



802.11n(HT20) (CH.149)



802.11n(HT40) (CH.151)



802.11ac(VHT20) (CH.157)



802.11ac(VHT40) (CH.151)



802.11ac(VHT80) (CH.155)



**99 % Bandwidth measurement(ISED)**

**[ANT1]**

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	16.500
5785	157	16.511
5825	165	16.480
802.11n(HT20) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.608
5785	157	17.602
5825	165	17.610
802.11n(HT40) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.313
5795	159	36.275
802.11ac(VHT20) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.616
5785	157	17.618
5825	165	17.606
802.11ac(VHT40) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.299
5795	159	36.292
802.11ac(VHT80) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	74.630



[ANT2]

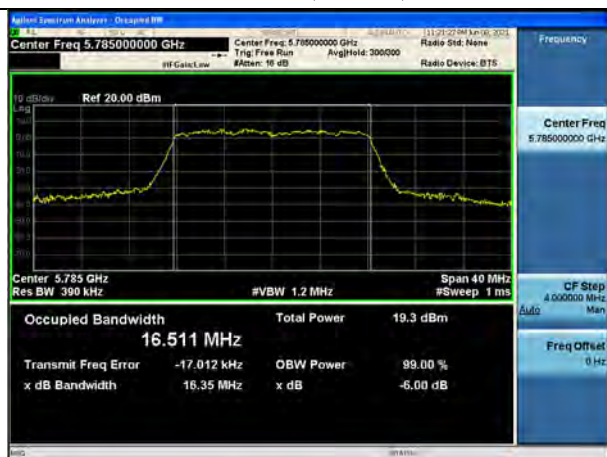
802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	16.430
5785	157	16.448
5825	165	16.439
802.11n(HT20) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.604
5785	157	17.610
5825	165	17.589
802.11n(HT40) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.269
5795	159	36.316
802.11ac(VHT20) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.615
5785	157	17.606
5825	165	17.602
802.11ac(VHT40) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.312
5795	159	36.273
802.11ac(VHT80) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	74.612

[ANT1]

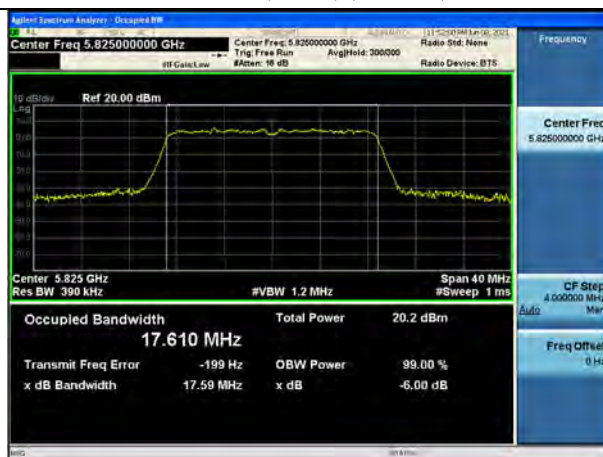
▣ Test Plots

**Note:** In order to simplify the report, attached plots were only the most wide channel.

802.11a (CH.157)



802.11n(HT20) (CH.165)



802.11n(HT40) (CH.151)



802.11ac(VHT20) (CH.157)



802.11ac(VHT40) (CH.151)



802.11ac(VHT80) (CH.155)

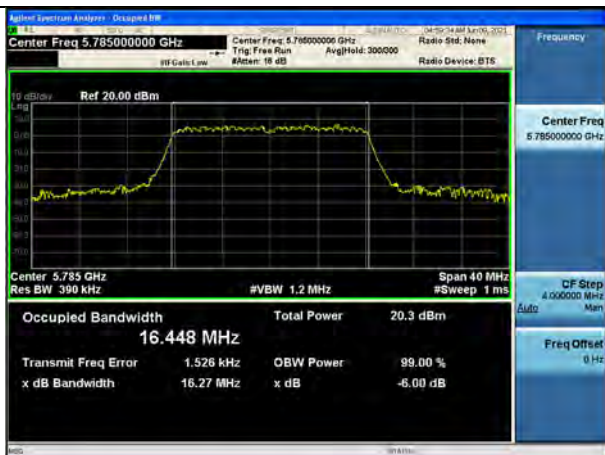


[ANT2]

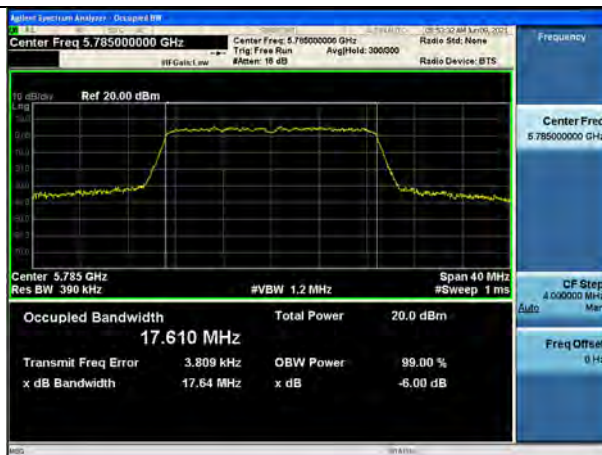
☐ Test Plots

Note: In order to simplify the report, attached plots were only the most wide channel.

802.11a (CH.157)



802.11n(HT20) (CH.157)



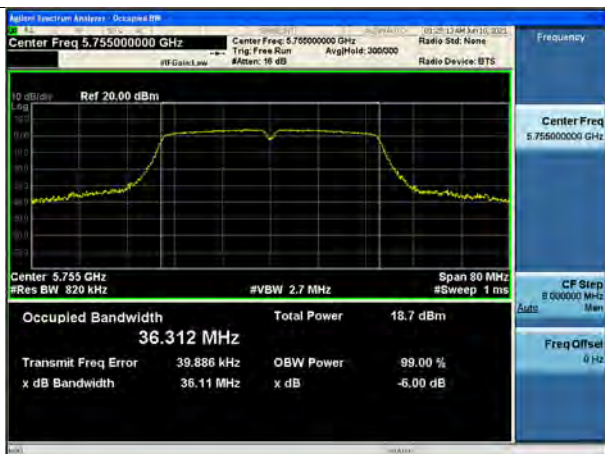
802.11n(HT40) (CH.159)



802.11ac(VHT20) (CH.149)



802.11ac(VHT40) (CH.151)



802.11ac(VHT80) (CH.155)



### 10.3 OUTPUT POWER MEASUREMENT

Straddle channel data in the table below are for reporting purposes only.  
Straddle channel data were added in section 10.7.3.

[Ant1]

FCC Limtis (802.11a, 802.11n\_HT20, 802.11ac\_VHT20)

UNII-1	: Total Power < 23.98 dBm
UNII-2A	: Total Power < 23.68 dBm
UNII-2C	: Total Power < 23.69 dBm
UNII-3	: Total Power < 30.00 dBm

FCC Limits (802.11n\_HT40, 802.11ac\_VHT40, 802.11ac\_VHT80)

UNII-1	: Total Power < 23.98 dBm
UNII-2A	: Total Power < 23.98 dBm
UNII-2C	: Total Power < 23.98 dBm
UNII-3	: Total Power < 30.00 dBm

ISED Limits (802.11a, 802.11n\_HT20, 802.11ac\_VHT20)

UNII-1	: E.I.R.P < 22.15 dBm
UNII-2A	: Total Power < 23.15 dBm
UNII-2A	: E.I.R.P < 29.15 dBm
UNII-2C	: Total Power < 23.15 dBm
UNII-2C	: E.I.R.P < 29.15 dBm
UNII-3	: Total Power < 30.00 dBm

ISED Limits (802.11n\_HT40, 802.11ac\_VHT40, 802.11ac\_VHT80)

UNII-1	: E.I.R.P < 23.01 dBm
UNII-2A	: Total Power < 23.98 dBm
UNII-2A	: E.I.R.P < 30.00 dBm
UNII-2C	: Total Power < 23.98 dBm
UNII-2C	: E.I.R.P < 30.00 dBm
UNII-3	: Total Power < 23.98 dBm



802.11a Mode			Worstcase Datarate (Mbps)	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5180	36	9	13.23	0.05	13.28	78
	5200	40	9	13.06	0.05	13.11	78
	5240	48	9	13.18	0.05	13.23	80

802.11a Mode			Worstcase Datarate (Mbps)	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5260	52	9	13.08	0.98	14.06	82
	5300	60	9	13.03	0.98	14.01	80
	5320	64	9	13.35	0.98	14.33	81

802.11a Mode			Worstcase Datarate (Mbps)	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5500	100	9	13.13	1.41	14.54	78
	5580	116	9	13.16	1.41	13.16	76
	5720	144	9	13.29	1.41	14.70	73

802.11a Mode			Worstcase Datarate (Mbps)	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	PLS
UNII 3	5745	149	9	13.12	68
	5785	157	9	13.15	70
	5825	165	9	13.28	68

802.11n Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5180	36	MCS0	13.06	0.05	13.11	80
	5200	40	MCS0	13.25	0.05	13.30	80
	5240	48	MCS0	13.26	0.05	13.31	81

802.11n Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5260	52	MCS0	13.21	0.98	14.19	83
	5300	60	MCS0	13.13	0.98	14.11	82
	5320	64	MCS0	13.22	0.98	14.20	81

802.11n Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5500	100	MCS0	13.18	1.41	14.59	79
	5580	116	MCS0	13.13	1.41	14.54	77
	5720	144	MCS0	13.21	1.41	14.62	74

802.11n Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	PLS
UNII 3	5745	149	MCS0	13.10	69
	5785	157	MCS0	13.19	69
	5825	165	MCS0	13.31	68

802.11ac Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5180	36	MCS0	12.05	0.05	12.10	74
	5200	40	MCS0	12.31	0.05	12.36	74
	5240	48	MCS0	12.08	0.05	12.13	73

802.11ac Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5260	52	MCS0	12.25	0.98	13.23	78
	5300	60	MCS0	12.16	0.98	13.14	76
	5320	64	MCS0	12.21	0.98	13.19	78

802.11ac Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5500	100	MCS0	12.07	1.41	13.48	76
	5580	116	MCS0	12.14	1.41	13.55	74
	5720	144	MCS0	12.26	1.41	13.67	72

802.11ac Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	PLS
UNII 3	5745	149	MCS0	12.19	67
	5785	157	MCS0	12.10	65
	5825	165	MCS0	12.18	65

802.11n(40 MHz) Mode			Worstcase	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5190	38	MCS0	13.12	0.05	13.17	78
	5230	46	MCS0	13.10	0.05	13.15	80

802.11n(40 MHz) Mode			Worstcase	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5270	54	MCS0	13.07	0.98	14.05	83
	5310	62	MCS0	13.16	0.98	14.14	81

802.11n(40 MHz) Mode			Worstcase	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5510	102	MCS0	13.09	1.41	14.50	78
	5550	110	MCS0	13.07	1.41	14.48	79
	5710	142	MCS0	13.19	1.41	14.60	77

802.11n(40 MHz) Mode			Worstcase	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	PLS
UNII 3	5755	151	MCS0	13.24	70
	5795	159	MCS0	13.20	72

802.11ac(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5190	38	MCS0	12.12	0.05	12.17	76
	5230	46	MCS0	12.08	0.05	12.13	74

802.11ac(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5270	54	MCS0	12.21	0.98	13.19	79
	5310	62	MCS0	12.36	0.98	13.34	78

802.11ac(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5510	102	MCS0	12.18	1.41	13.59	77
	5550	110	MCS0	12.17	1.41	13.58	78
	5710	142	MCS0	12.12	1.41	13.53	74

802.11ac(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	PLS
UNII 3	5755	151	MCS0	12.08	67
	5795	159	MCS0	12.26	68

802.11ac(80MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5210	42	MCS0	12.17	0.05	12.22	77

802.11ac(80MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5290	58	MCS0	12.21	0.98	13.19	80

802.11ac(80MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5530	106	MCS0	12.19	1.41	13.60	78
	5690	138	MCS0	12.29	1.41	13.70	77

802.11ac(80MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant1 Power (dBm)	PLS
UNII 3	5775	155	MCS0	12.32	70

[Ant2]

FCC Limits (802.11a, 802.11n\_HT20, 802.11ac\_VHT20)

UNII-1	: Total Power < 23.98 dBm
UNII-2A	: Total Power < 23.65 dBm
UNII-2C	: Total Power < 23.66 dBm
UNII-3	: Total Power < 30.00 dBm

FCC Limits (802.11n\_HT40, 802.11ac\_VHT40, 802.11ac\_VHT80)

UNII-1	: Total Power < 23.98 dBm
UNII-2A	: Total Power < 23.98 dBm
UNII-2C	: Total Power < 23.98 dBm
UNII-3	: Total Power < 30.00 dBm

ISED Limits (802.11a, 802.11n\_HT20, 802.11ac\_VHT20)

UNII-1	: E.I.R.P < 22.14 dBm
UNII-2A	: Total Power < 23.14 dBm
UNII-2A	: E.I.R.P < 29.14 dBm
UNII-2C	: Total Power < 23.14 dBm
UNII-2C	: E.I.R.P < 29.14 dBm
UNII-3	: Total Power < 30.00 dBm

ISED Limits (802.11n\_HT40, 802.11ac\_VHT40, 802.11ac\_VHT80)

UNII-1	: E.I.R.P < 23.01 dBm
UNII-2A	: Total Power < 23.98 dBm
UNII-2A	: E.I.R.P < 30.00 dBm
UNII-2C	: Total Power < 23.98 dBm
UNII-2C	: E.I.R.P < 30.00 dBm
UNII-3	: Total Power < 23.98 dBm

802.11a Mode			Worstcase Datarate (Mbps)	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5180	36	9	13.06	1.42	14.48	78
	5200	40	9	13.12	1.42	14.54	78
	5240	48	9	13.10	1.42	14.52	80

802.11a Mode			Worstcase Datarate (Mbps)	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5260	52	9	13.33	1.45	14.78	82
	5300	60	9	12.92	1.45	14.37	80
	5320	64	9	13.06	1.45	14.51	81

802.11a Mode			Worstcase Datarate (Mbps)	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5500	100	9	13.78	1.37	15.15	78
	5580	116	9	13.69	1.37	15.06	76
	5720	144	9	13.49	1.37	14.86	73

802.11a Mode			Worstcase Datarate (Mbps)	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	PLS
UNII 3	5745	149	9	13.37	68
	5785	157	9	13.30	70
	5825	165	9	13.64	68



802.11n Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5180	36	MCS0	13.59	1.42	15.01	80
	5200	40	MCS0	13.23	1.42	14.65	80
	5240	48	MCS0	12.79	1.42	14.21	81

802.11n Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5260	52	MCS0	13.10	1.45	14.55	83
	5300	60	MCS0	13.04	1.45	14.49	82
	5320	64	MCS0	12.80	1.45	14.25	81

802.11n Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5500	100	MCS0	13.22	1.37	14.59	79
	5580	116	MCS0	13.34	1.37	14.71	77
	5720	144	MCS0	13.43	1.37	14.80	74

802.11n Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	PLS
UNII 3	5745	149	MCS0	13.44	69
	5785	157	MCS0	13.44	69
	5825	165	MCS0	13.60	68

802.11ac Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5180	36	MCS0	12.19	1.42	13.61	74
	5200	40	MCS0	11.84	1.42	13.26	74
	5240	48	MCS0	11.60	1.42	13.02	73

802.11ac Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5260	52	MCS0	12.12	1.45	13.57	78
	5300	60	MCS0	11.76	1.45	13.21	76
	5320	64	MCS0	12.04	1.45	13.49	78

802.11ac Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5500	100	MCS0	12.09	1.37	13.46	76
	5580	116	MCS0	12.32	1.37	13.69	74
	5720	144	MCS0	12.55	1.37	13.92	72

802.11ac Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	PLS
UNII 3	5745	149	MCS0	12.61	67
	5785	157	MCS0	12.37	65
	5825	165	MCS0	12.51	65

802.11n(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5190	38	MCS0	12.94	1.42	14.36	78
	5230	46	MCS0	13.31	1.42	14.73	80

802.11n(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5270	54	MCS0	13.79	1.45	15.24	83
	5310	62	MCS0	13.69	1.45	15.14	81

802.11n(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5510	102	MCS0	13.01	1.37	14.38	72
	5550	110	MCS0	13.05	1.37	14.42	74
	5710	142	MCS0	12.99	1.37	14.36	73

802.11n(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	PLS
UNII 3	5755	151	MCS0	12.92	66
	5795	159	MCS0	13.06	68

802.11ac(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5190	38	MCS0	12.42	1.42	13.84	76
	5230	46	MCS0	11.75	1.42	13.17	74

802.11ac(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5270	54	MCS0	12.35	1.45	13.80	79
	5310	62	MCS0	13.03	1.45	14.48	78

802.11ac(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5510	102	MCS0	12.59	1.37	13.96	70
	5550	110	MCS0	12.49	1.37	13.86	70
	5710	142	MCS0	12.45	1.37	13.82	69

802.11ac(40 MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	PLS
UNII 3	5755	151	MCS0	12.57	62
	5795	159	MCS0	12.56	64

802.11ac(80MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 1	5210	42	MCS0	12.21	1.42	13.63	77

802.11ac(80MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2A	5290	58	MCS0	12.74	1.45	14.19	80

802.11ac(80MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)			
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)	PLS
UNII 2C	5530	106	MCS0	12.30	1.37	13.67	70
	5690	138	MCS0	12.17	1.37	13.54	70

802.11ac(80MHz) Mode			Worstcase MCS Index	SISO Measured Power(dBm)	
Band	Frequency [MHz]	Channel No.		Ant2 Power (dBm)	PLS
UNII 3	5775	155	MCS0	12.39	64

[MIMO]

FCC Limits (802.11a, 802.11n\_HT20, 802.11ac\_VHT20)

UNII-1	: Total Power < 23.98 dBm
UNII-2A	: Total Power < 23.65 dBm
UNII-2C	: Total Power < 23.66 dBm
UNII-3	: Total Power < 30.00 dBm

FCC Limits (802.11n\_HT40, 802.11ac\_VHT40, 802.11ac\_VHT80)

UNII-1	: Total Power < 23.98 dBm
UNII-2A	: Total Power < 23.98 dBm
UNII-2C	: Total Power < 23.98 dBm
UNII-3	: Total Power < 30.00 dBm

ISED Limits (802.11a, 802.11n\_HT20, 802.11ac\_VHT20)

UNII-1	: E.I.R.P < 22.14 dBm
UNII-2A	: Total Power < 23.14 dBm
UNII-2A	: E.I.R.P < 29.14 dBm
UNII-2C	: Total Power < 23.14 dBm
UNII-2C	: E.I.R.P < 29.14 dBm
UNII-3	: Total Power < 30.00 dBm

ISED Limits (802.11n\_HT40, 802.11ac\_VHT40, 802.11ac\_VHT80)

UNII-1	: E.I.R.P < 23.01 dBm
UNII-2A	: Total Power < 23.98 dBm
UNII-2A	: E.I.R.P < 30.00 dBm
UNII-2C	: Total Power < 23.98 dBm
UNII-2C	: E.I.R.P < 30.00 dBm
UNII-3	: Total Power < 23.98 dBm

802.11a Mode			Worstcase Datarate (Mbps)	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 1	5180	36	9	41.29	16.16	4.43	20.59	78
	5200	40	9	40.75	16.10	4.43	20.53	78
	5240	48	9	41.24	16.15	4.43	20.58	80

802.11a Mode			Worstcase Datarate (Mbps)	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2A	5260	52	9	41.88	16.22	4.46	20.68	82
	5300	60	9	39.69	15.99	4.46	20.45	80
	5320	64	9	41.88	16.22	4.46	20.68	81

802.11a Mode			Worstcase Datarate (Mbps)	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2C	5500	100	9	44.45	16.48	4.42	20.90	78
	5580	116	9	44.13	16.45	4.42	16.45	76
	5720	144	9	43.67	16.40	4.42	20.82	73

802.11a Mode			Worstcase Datarate (Mbps)	MIMO Total Power (dBm) (CDD)		PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	
UNII 3	5745	149	9	42.24	16.26	68
	5785	157	9	42.06	16.24	70
	5825	165	9	44.40	16.47	68

802.11n Mode			Worstcase	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 1	5180	36	MCS0	43.08	16.34	4.43	20.77	80
	5200	40	MCS0	42.16	16.25	4.43	20.68	80
	5240	48	MCS0	40.23	16.05	4.43	20.48	81

802.11n Mode			Worstcase	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2A	5260	52	MCS0	41.35	16.16	4.46	20.62	83
	5300	60	MCS0	40.67	16.09	4.46	20.55	82
	5320	64	MCS0	40.04	16.02	4.46	20.49	81

802.11n Mode			Worstcase	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2C	5500	100	MCS0	41.79	16.21	4.42	20.63	79
	5580	116	MCS0	42.11	16.24	4.42	20.66	77
	5720	144	MCS0	42.94	16.33	4.42	20.75	74

802.11n Mode			Worstcase	MIMO Total Power (dBm) (CDD)		PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	
UNII 3	5745	149	MCS0	42.50	16.28	69
	5785	157	MCS0	42.93	16.33	69
	5825	165	MCS0	44.34	16.47	68



802.11ac Mode			Worstcase	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 1	5180	36	MCS0	32.60	15.13	4.43	19.56	74
	5200	40	MCS0	32.30	15.09	4.43	19.52	74
	5240	48	MCS0	30.61	14.86	4.43	19.29	73

802.11ac Mode			Worstcase	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2A	5260	52	MCS0	33.06	15.19	4.46	19.65	78
	5300	60	MCS0	31.44	14.97	4.46	19.44	76
	5320	64	MCS0	32.63	15.14	4.46	19.60	78

802.11ac Mode			Worstcase	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2C	5500	100	MCS0	32.31	15.09	4.42	19.51	76
	5580	116	MCS0	33.43	15.24	4.42	19.69	74
	5720	144	MCS0	34.79	15.42	4.42	19.84	72

802.11ac Mode			Worstcase	MIMO Total Power (dBm) (CDD)		PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	
UNII 3	5745	149	MCS0	34.81	15.42	67
	5785	157	MCS0	33.49	15.25	65
	5825	165	MCS0	34.35	15.36	65

802.11n(40MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 1	5190	38	MCS0	40.19	16.04	4.43	20.47	78
	5230	46	MCS0	41.80	16.21	4.43	20.47	80

802.11n(40MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2A	5270	54	MCS0	44.22	16.46	4.46	20.92	83
	5310	62	MCS0	44.10	16.44	4.46	20.90	81

802.11n(40MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2C	5510	102	MCS0	40.35	16.06	4.42	20.48	78/72
	5550	110	MCS0	40.44	16.07	4.42	20.49	79/74
	5710	142	MCS0	40.74	16.10	4.42	20.52	77/73

802.11n(40MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)		PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	
UNII 3	5755	151	MCS0	40.65	16.09	70/66
	5795	159	MCS0	41.12	16.14	72/68

802.11ac(40MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 1	5190	38	MCS0	33.74	15.28	4.43	19.71	76
	5230	46	MCS0	31.11	14.93	4.43	19.36	74

802.11ac(40MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2A	5270	54	MCS0	33.81	15.29	4.46	19.75	79
	5310	62	MCS0	37.30	15.72	4.46	20.18	78

802.11ac(40MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2C	5510	102	MCS0	34.68	15.40	4.42	19.82	77/70
	5550	110	MCS0	34.23	15.34	4.42	19.76	78/70
	5710	142	MCS0	33.88	15.30	4.42	19.72	74/69

802.11ac(40MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)		PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	
UNII 3	5755	151	MCS0	34.20	15.34	67/62
	5795	159	MCS0	34.86	15.42	68/64

802.11ac(80MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 1	5210	42	MCS0	33.14	15.20	4.43	19.63	77

802.11ac(80MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2A	5290	58	MCS0	35.42	15.49	4.46	19.95	80

802.11ac(80MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)				PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	Directional Ant Gain (dBi)	E.I.R.P (dBm)	
UNII 2C	5530	106	MCS0	33.54	15.26	4.42	19.68	78/70
	5690	138	MCS0	33.43	15.24	4.42	19.66	77/70

802.11ac(80MHz) Mode			Worstcase MCS Index	MIMO Total Power (dBm) (CDD)		PLS
Band	Frequency [MHz]	Channel No.		mW	SUM Power (dBm)	
UNII 3	5775	155	MCS0	34.39	15.36	70/64

## 10.4 POWER SPECTRAL DENSITY

### FCC&ISED

[Ant1]

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11a	2.171	2.221	11 dBm/MHz
5200	40		2.199	2.249	
5240	48		2.185	2.235	
5260	52		2.058	-	
5300	60		2.067	-	
5320	64		2.278	-	
5500	100		2.186	-	
5580	116		2.067	-	
5720	144		2.319	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11a	-0.667	30 dBm/500kHz
5785	157		-0.711	
5825	165		-0.671	

### Note :

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11n (20 MHz)	1.904	1.954	11 dBm/MHz
5200	40		2.096	2.146	
5240	48		2.075	2.125	
5260	52		2.002	-	
5300	60		1.956	-	
5320	64		1.957	-	
5500	100		2.070	-	
5580	116		1.943	-	
5720	144		2.008	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11n (20 MHz)	-0.890	30 dBm/500kHz
5785	157		-0.734	
5825	165		-0.780	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11n (40 MHz)	-1.039	-0.989	11 dBm/MHz
5230	46		-1.119	-1.069	
5270	54		-1.136	-	
5310	62		-1.057	-	
5510	102		-1.091	-	
5500	110		-1.187	-	
5710	142		-1.029	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11n (40 MHz)	-3.383	30 dBm/500kHz
5795	159		-3.629	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11ac (20 MHz)	0.706	0.756	11 dBm/MHz
5200	40		0.945	0.995	
5240	48		0.771	0.821	
5260	52		0.807	-	
5300	60		1.000	-	
5320	64		0.840	-	
5500	100		0.806	-	
5580	116		0.801	-	
5720	144		0.892	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11ac (20 MHz)	-1.887	30 Bm/500kHz
5785	157		-1.912	
5825	165		-1.720	

**Note :**

UNII-1 Limit : 10 dBm/MHz



Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11ac (40 MHz)	-2.012	-1.962	11 dBm/MHz
5230	46		-1.875	-1.825	
5270	54		-1.733	-	
5310	62		-1.799	-	
5510	102		-1.722	-	
5500	110		-1.925	-	
5710	142		-1.845	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11ac (40 MHz)	-4.805	30 dBm/500kHz
5795	159		-4.569	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5210	42	802.11ac (80 MHz)	-4.970	-3.550	11 dBm/MHz
5290	58		-4.789	-	
5530	106		-4.925	-	
5690	138		-4.803	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5775	155	802.11ac (80 MHz)	-7.516	30 dBm/500kHz

**Note :**

UNII-1 Limit : 10 dBm/MHz

[Ant2]

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11a	2.062	3.482	11 dBm/MHz
5200	40		2.076	3.496	
5240	48		2.111	3.531	
5260	52		2.417	-	
5300	60		2.018	-	
5320	64		2.137	-	
5500	100		2.680	-	
5580	116		2.462	-	
5720	144		2.440	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11a	-0.327	30 dBm/500kHz
5785	157		-0.530	
5825	165		-0.323	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11n (20 MHz)	2.155	3.575	11 dBm/MHz
5200	40		1.923	3.343	
5240	48		1.752	3.172	
5260	52		1.808	-	
5300	60		1.697	-	
5320	64		1.582	-	
5500	100		1.965	-	
5580	116		1.963	-	
5720	144		2.154	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11n (20 MHz)	-0.526	30 dBm/500kHz
5785	157		-0.556	
5825	165		-0.322	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11n (40 MHz)	-1.186	-1.136	11 dBm/MHz
5230	46		-1.077	-1.027	
5270	54		-0.638	-	
5310	62		-0.654	-	
5510	102		-0.007	-	
5500	110		-0.038	-	
5710	142		0.267	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11n (40 MHz)	-3.142	30 dBm/500kHz
5795	159		-3.157	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11ac (20 MHz)	0.730	0.780	11 dBm/MHz
5200	40		0.399	0.449	
5240	48		0.131	0.181	
5260	52		0.939	-	
5300	60		0.515	-	
5320	64		0.952	-	
5500	100		0.815	-	
5580	116		1.131	-	
5720	144		1.259	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11ac (20 MHz)	-1.477	30 dBm/500kHz
5785	157		-1.596	
5825	165		-1.674	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11ac (40 MHz)	-1.556	-0.136	11 dBm/MHz
5230	46		-2.376	-0.956	
5270	54		-1.985	-	
5310	62		-1.088	-	
5510	102		-1.006	-	
5500	110		-1.033	-	
5710	142		-1.641	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11ac (40 MHz)	-4.207	30 dBm/500kHz
5795	159		-4.203	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5210	42	802.11ac (80 MHz)	-4.635	-3.215	11 dBm/MHz
5290	58		-4.279	-	
5530	106		-4.728	-	
5690	138		-4.923	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5775	155	802.11ac (80 MHz)	-7.638	30 dBm/500kHz

**Note :**

UNII-1 Limit : 10 dBm/MHz

[MIMO (CDD)]

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11a	5.127	9.557	11 dBm/MHz
5200	40		5.148	9.578	
5240	48		5.158	9.589	
5260	52		5.250	-	
5300	60		5.053	-	
5320	64		5.218	-	
5500	100		5.447	-	
5580	116		5.277	-	
5720	144		5.390	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11a	2.515	30 dBm/500kHz
5785	157		2.390	
5825	165		2.515	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11n (20 MHz)	5.041	9.471	11 dBm/MHz
5200	40		5.020	9.451	
5240	48		4.925	9.356	
5260	52		4.916	-	
5300	60		4.838	-	
5320	64		4.782	-	
5500	100		5.028	-	
5580	116		4.963	-	
5720	144		5.092	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11n (20 MHz)	2.304	30 dBm/500kHz
5785	157		2.366	
5825	165		2.462	

**Note :**

UNII-1 Limit : 10 dBm/MHz



Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11n (40 MHz)	1.898	6.328	11 dBm/MHz
5230	46		1.912	6.343	
5270	54		2.127	-	
5310	62		2.157	-	
5510	102		2.478	-	
5500	110		2.417	-	
5710	142		2.653	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11n (40 MHz)	-0.251	30 dBm/500kHz
5795	159		-0.379	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11ac (20 MHz)	3.728	8.159	11 dBm/MHz
5200	40		3.687	8.117	
5240	48		3.467	7.897	
5260	52		3.884	-	
5300	60		3.771	-	
5320	64		3.906	-	
5500	100		3.821	-	
5580	116		3.978	-	
5720	144		4.088	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11ac (20 MHz)	1.331	30 dBm/500kHz
5785	157		1.258	
5825	165		1.313	

**Note :**

UNII-1 Limit : 10 dBm/MHz

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11ac (40 MHz)	1.229	5.660	11 dBm/MHz
5230	46		0.888	5.319	
5270	54		1.152	-	
5310	62		1.574	-	
5510	102		1.654	-	
5500	110		1.543	-	
5710	142		1.268	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11ac (40 MHz)	-1.491	30 dBm/500kHz
5795	159		-1.374	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5210	42	802.11ac (80 MHz)	-1.791	2.640	11 dBm/MHz
5290	58		-1.520	-	
5530	106		-1.816	-	
5690	138		-1.852	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5775	155	802.11ac (80 MHz)	-4.566	30 dBm/500kHz

**Note :**

UNII-1 Limit : 10 dBm/MHz

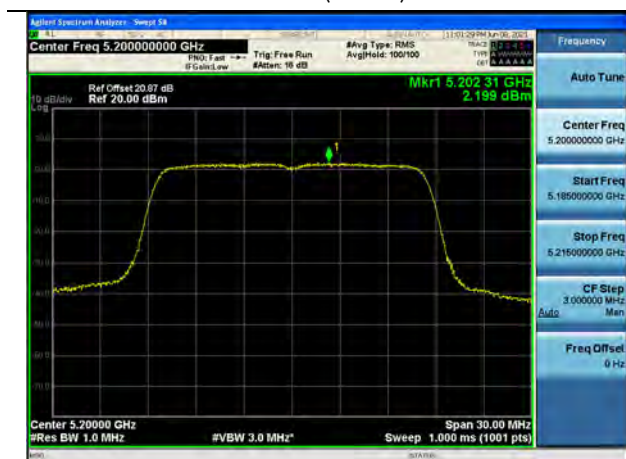
[Ant1]

■ Test Plots(802.11a)

Note:

In order to simplify the report, attached plots were only channel of highest power.

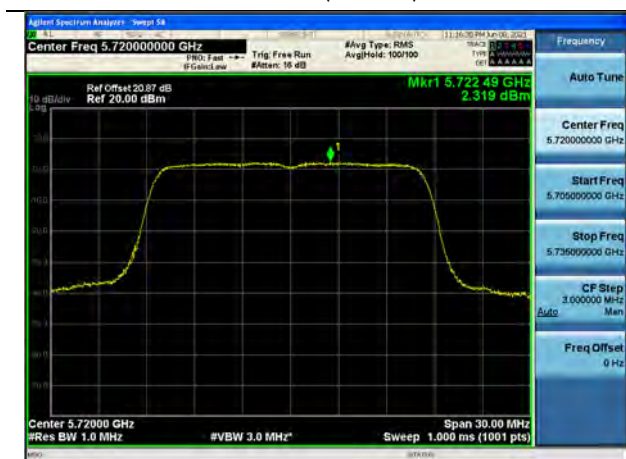
UNII 1 (Ch. 40)



UNII 2A (Ch. 64)



UNII 2C (Ch. 144)



UNII 3 (Ch. 149)



□ Test Plots(802.11n(HT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 40)



UNII 2A (Ch. 52)



UNII 2C (Ch. 100)



UNII 3 (Ch. 157)



□ Test Plots(802.11n(HT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 38)



UNII 2A (Ch. 62)



UNII 2C (Ch. 142)



UNII 3 (Ch. 151)





□ Test Plots(802.11ac(VHT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 40)



UNII 2A (Ch. 60)



UNII 2C (Ch. 144)



UNII 3 (Ch. 165)



□ Test Plots(802.11ac(VHT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 46)



UNII 2A (Ch. 54)



UNII 2C (Ch. 102)



UNII 3 (Ch. 159)

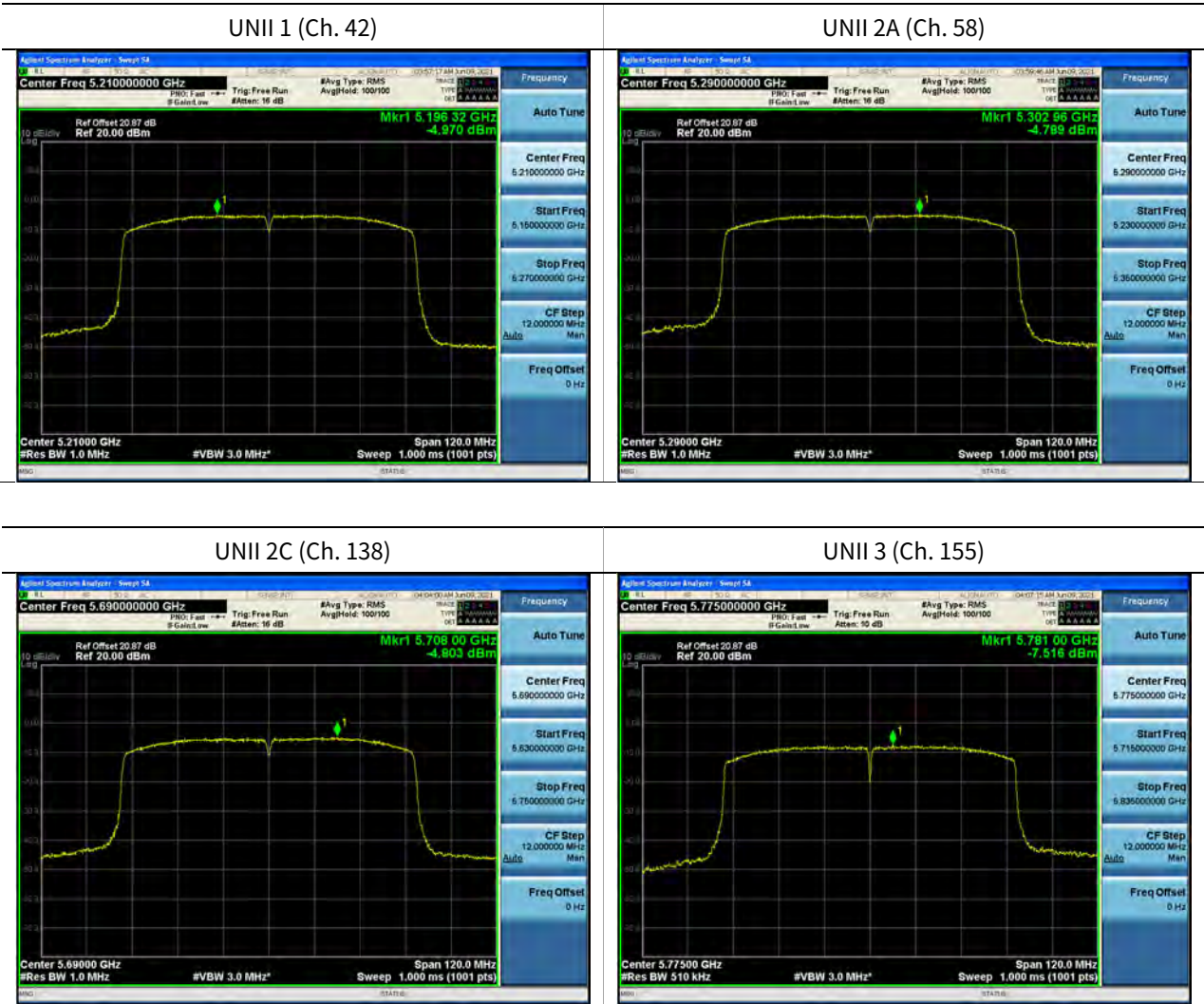




Test Plots(802.11ac(VHT80))

Note:

In order to simplify the report, attached plots were only channel of highest power.



[Ant2]

■ Test Plots(802.11a)

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 48)



UNII 2A (Ch. 52)



UNII 2C (Ch. 100)



UNII 3 (Ch. 165)



□ Test Plots(802.11n(HT20))

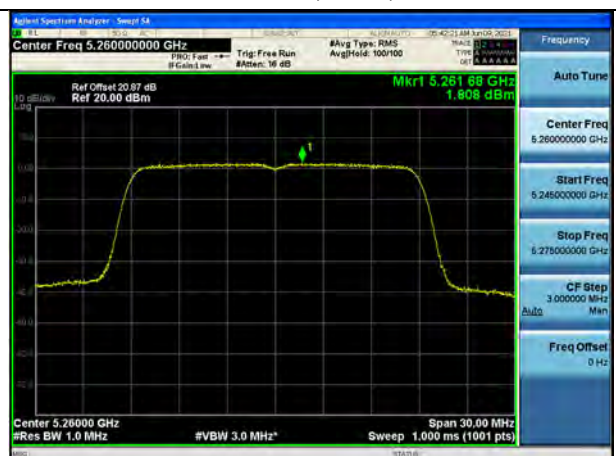
Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 36)



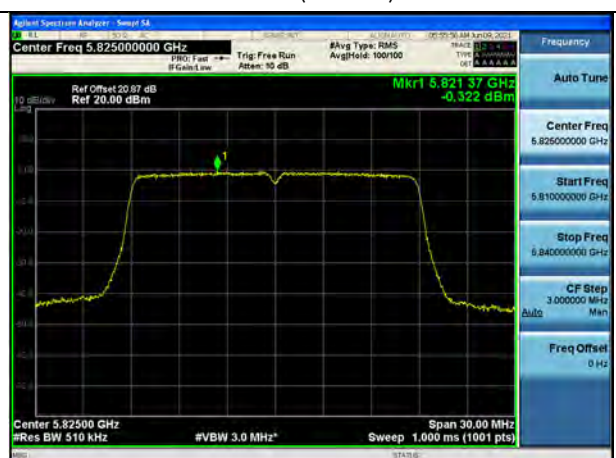
UNII 2A (Ch. 52)



UNII 2C (Ch. 144)



UNII 3 (Ch. 165)





□ Test Plots(802.11n(HT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 46)



UNII 2A (Ch. 54)



UNII 2C (Ch. 142)



UNII 3 (Ch. 151)

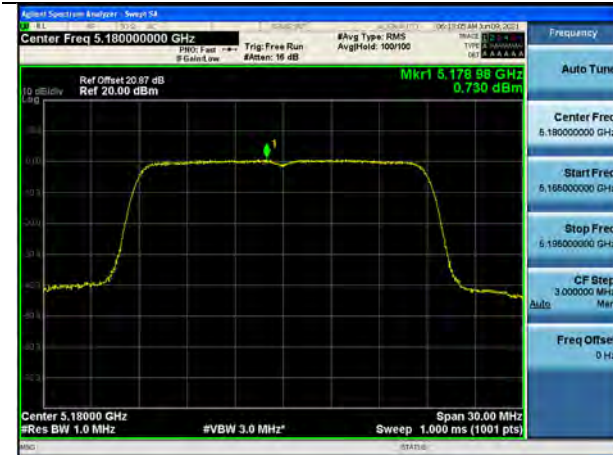


□ Test Plots(802.11ac(VHT20))

Note:

In order to simplify the report, attached plots were only channel of highest power.

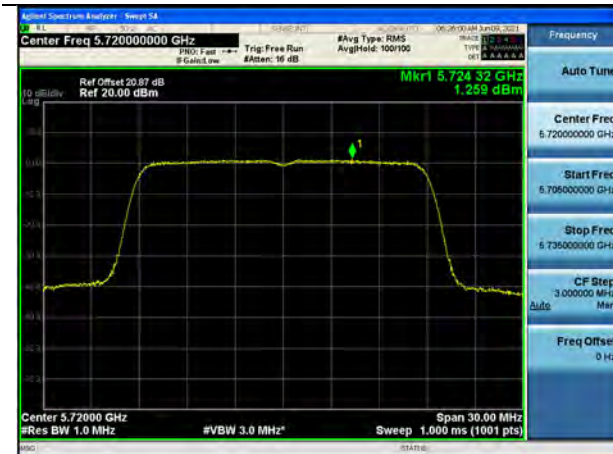
UNII 1 (Ch. 36)



UNII 2A (Ch. 64)



UNII 2C (Ch. 144)



UNII 3 (Ch. 149)



□ Test Plots(802.11ac(VHT40))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 38)



UNII 2A (Ch. 62)



UNII 2C (Ch. 102)



UNII 3 (Ch. 159)



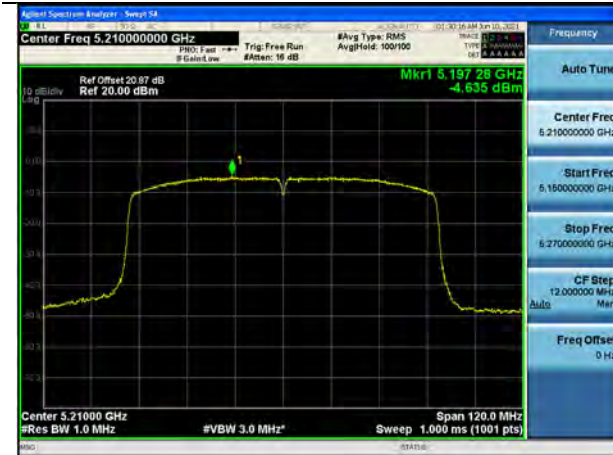


□ Test Plots(802.11ac(VHT80))

Note:

In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 42)



UNII 2A (Ch. 58)



UNII 2C (Ch. 106)



UNII 3 (Ch. 155)



## 10.5 FREQUENCY STABILITY.

### 10.5.1 80MHz BW

[ANT1]

Startup after the EUT is energized

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,210,000,000 Hz  
CHANNEL: 42  
REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210085.36	85.36
100%		-30	5210054.11	54.11
100%		-20	5210034.30	34.30
100%		-10	5210059.77	59.77
100%		0	5210067.36	67.36
100%		+10	5210099.54	99.54
100%		+30	5210072.22	72.22
100%		+40	5210025.18	25.18
100%		+50	5210092.83	92.83
Max	3.135	+20	5210085.87	85.87
Min	3.60	+20	5210086.03	86.03

#### Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2A  
 OPERATING FREQUENCY: 5,290,000,000 Hz  
 CHANNEL: 58  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290017.80	17.80
100%		-30	5290020.54	20.54
100%		-20	5290058.50	58.5
100%		-10	5290065.31	65.31
100%		0	5290039.13	39.13
100%		+10	5290039.13	39.13
100%		+30	5290014.57	14.57
100%		+40	5290054.73	54.73
100%		+50	5290006.76	6.76
Max	3.135	+20	5290086.52	86.52
Min	3.60	+20	5290020.51	20.51

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530094.24	94.24
100%		-30	5530054.53	54.53
100%		-20	5530010.35	10.35
100%		-10	5530084.30	84.3
100%		0	5530057.90	57.9
100%		+10	5530053.72	53.72
100%		+30	5530078.05	78.05
100%		+40	5530043.29	43.29
100%		+50	5530017.39	17.39
Max	3.135	+20	5530059.59	59.59
Min	3.60	+20	5530045.54	45.54

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775045.69	45.69
100%		-30	5775016.41	16.41
100%		-20	5775080.11	80.11
100%		-10	5775085.64	85.64
100%		0	5775004.06	4.06
100%		+10	5775001.75	1.75
100%		+30	5775038.22	38.22
100%		+40	5775035.87	35.87
100%		+50	5775084.57	84.57
Max	3.135	+20	5775039.84	39.84
Min	3.60	+20	5775064.70	64.7

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

2 minutes after the EUT is energized

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,210,000,000 Hz  
CHANNEL: 42  
REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210044.92	44.92
100%		-30	5210049.04	49.04
100%		-20	5210052.48	52.48
100%		-10	5210034.54	34.54
100%		0	5210082.66	82.66
100%		+10	5210048.96	48.96
100%		+30	5210066.55	66.55
100%		+40	5210043.02	43.02
100%		+50	5210066.27	66.27
Max	3.6	+20	5210013.07	13.07
Min	3.14	+20	5210045.71	45.71

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2A  
 OPERATING FREQUENCY: 5,290,000,000 Hz  
 CHANNEL: 58  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290024.98	24.98
100%		-30	5290030.52	30.52
100%		-20	5290063.79	63.79
100%		-10	5290030.62	30.62
100%		0	5290043.05	43.05
100%		+10	5290094.27	94.27
100%		+30	5290081.40	81.4
100%		+40	5290042.52	42.52
100%		+50	5290037.05	37.05
Max	3.6	+20	5290050.70	50.70
Min	3.14	+20	5290066.94	66.94

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530076.05	76.05
100%		-30	5530079.89	79.89
100%		-20	5530014.30	14.3
100%		-10	5530036.69	36.69
100%		0	5530045.86	45.86
100%		+10	5530050.48	50.48
100%		+30	5530096.29	96.29
100%		+40	5530023.41	23.41
100%		+50	5530096.95	96.95
Max	3.6	+20	5530017.50	17.50
Min	3.14	+20	5530019.61	19.61

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775059.47	59.47
100%		-30	5775012.40	12.40
100%		-20	5775048.85	48.85
100%		-10	5775084.90	84.9
100%		0	5775096.47	96.47
100%		+10	5775003.05	3.05
100%		+30	5775036.30	36.3
100%		+40	5775020.51	20.51
100%		+50	5775069.93	69.93
Max	3.6	+20	5775090.99	90.99
Min	3.14	+20	5775051.39	51.39

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

**5 minutes after the EUT is energized**

OPERATING BAND: UNII Band 1  
 OPERATING FREQUENCY: 5,210,000,000 Hz  
 CHANNEL: 42  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210035.15	35.15
100%		-30	5210076.68	76.68
100%		-20	5210021.61	21.61
100%		-10	5210034.33	34.33
100%		0	5210036.24	36.24
100%		+10	5210022.48	22.48
100%		+30	5210064.17	64.17
100%		+40	5210004.98	4.98
100%		+50	5210023.49	23.49
Max	3.6	+20	5210023.23	23.23
Min	3.14	+20	5210057.87	57.87

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.





OPERATING BAND: UNII Band 2A  
 OPERATING FREQUENCY: 5,290,000,000 Hz  
 CHANNEL: 58  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290072.11	72.11
100%		-30	5290007.87	7.87
100%		-20	5290016.36	16.36
100%		-10	5290069.60	69.6
100%		0	5290006.60	6.6
100%		+10	5290082.15	82.15
100%		+30	5290017.31	17.31
100%		+40	5290079.73	79.73
100%		+50	5290078.49	78.49
Max	3.6	+20	5290057.63	57.63
Min	3.14	+20	5290057.52	57.52

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530055.64	55.64
100%		-30	5530079.69	79.69
100%		-20	5530021.65	21.65
100%		-10	5530011.97	11.97
100%		0	5530060.70	60.7
100%		+10	5530093.91	93.91
100%		+30	5530087.37	87.37
100%		+40	5530050.76	50.76
100%		+50	5530035.99	35.99
Max	3.6	+20	5530071.21	71.21
Min	3.14	+20	5530066.16	66.16

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775004.62	4.62
100%		-30	5775028.19	28.19
100%		-20	5775058.38	58.38
100%		-10	5775028.82	28.82
100%		0	5775063.56	63.56
100%		+10	5775013.78	13.78
100%		+30	5775062.61	62.61
100%		+40	5775008.71	8.71
100%		+50	5775082.45	82.45
Max	3.6	+20	5775017.91	17.91
Min	3.14	+20	5775021.07	21.07

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

10 minutes after the EUT is energized

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,210,000,000 Hz  
CHANNEL: 42  
REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210072.82	72.82
100%		-30	5210097.69	97.69
100%		-20	5210047.66	47.66
100%		-10	5210077.68	77.68
100%		0	5210040.82	40.82
100%		+10	5210097.72	97.72
100%		+30	5210006.95	6.95
100%		+40	5210067.12	67.12
100%		+50	5210041.90	41.90
Max	3.6	+20	5210059.24	59.24
Min	3.14	+20	5210053.42	53.42

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2A  
 OPERATING FREQUENCY: 5,290,000,000 Hz  
 CHANNEL: 58  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290008.36	8.36
100%		-30	5290037.37	37.37
100%		-20	5290089.49	89.49
100%		-10	5290031.85	31.85
100%		0	5290085.90	85.9
100%		+10	5290049.31	49.31
100%		+30	5290036.74	36.74
100%		+40	5290004.06	4.06
100%		+50	5290079.32	79.32
Max	3.6	+20	5290036.35	36.35
Min	3.14	+20	5290016.02	16.02

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530045.84	45.84
100%		-30	5530039.36	39.36
100%		-20	5530022.18	22.18
100%		-10	5530059.02	59.02
100%		0	5530078.32	78.32
100%		+10	5530033.57	33.57
100%		+30	5530010.22	10.22
100%		+40	5530098.97	98.97
100%		+50	5530094.29	94.29
Max	3.6	+20	5530097.14	97.14
Min	3.14	+20	5530030.40	30.4

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775023.88	23.88
100%		-30	5775032.24	32.24
100%		-20	5775040.44	40.44
100%		-10	5775023.80	23.8
100%		0	5775019.17	19.17
100%		+10	5775082.55	82.55
100%		+30	5775089.37	89.37
100%		+40	5775057.72	57.72
100%		+50	5775099.26	99.26
Max	3.6	+20	5775048.60	48.60
Min	3.14	+20	5775007.70	7.7

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

[ANT2]

Startup after the EUT is energized

OPERATING BAND: UNII Band 1  
 OPERATING FREQUENCY: 5,210,000,000 Hz  
 CHANNEL: 42  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210058.97	58.97
100%		-30	5210054.91	54.91
100%		-20	5210062.35	62.35
100%		-10	5210021.45	21.45
100%		0	5210018.12	18.12
100%		+10	5210059.22	59.22
100%		+30	5210055.48	55.48
100%		+40	5210096.61	96.61
100%		+50	5210024.61	24.61
Max	3.135	+20	5210037.31	37.31
Min	3.60	+20	5210007.96	7.96

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2A  
 OPERATING FREQUENCY: 5,290,000,000 Hz  
 CHANNEL: 58  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290096.87	96.87
100%		-30	5290071.48	71.48
100%		-20	5290037.90	37.9
100%		-10	5290073.85	73.85
100%		0	5290042.49	42.49
100%		+10	5290062.45	62.45
100%		+30	5290078.94	78.94
100%		+40	5290033.31	33.31
100%		+50	5290076.88	76.88
Max	3.135	+20	5290052.21	52.21
Min	3.60	+20	5290070.39	70.39

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530097.53	97.53
100%		-30	5530018.53	18.53
100%		-20	5530014.92	14.92
100%		-10	5530012.24	12.24
100%		0	5530016.78	16.78
100%		+10	5530002.93	2.93
100%		+30	5530015.35	15.35
100%		+40	5530009.12	9.12
100%		+50	5530084.86	84.86
Max	3.135	+20	5530077.03	77.03
Min	3.60	+20	5530024.75	24.75

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775034.03	34.03
100%		-30	5775071.63	71.63
100%		-20	5775008.88	8.88
100%		-10	5775087.71	87.71
100%		0	5775021.91	21.91
100%		+10	5775085.61	85.61
100%		+30	5775056.96	56.96
100%		+40	5775087.38	87.38
100%		+50	5775024.36	24.36
Max	3.135	+20	5775028.76	28.76
Min	3.60	+20	5775059.31	59.31

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

2 minutes after the EUT is energized

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,210,000,000 Hz  
CHANNEL: 42  
REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210018.68	18.68
100%		-30	5210080.75	80.75
100%		-20	5210036.11	36.11
100%		-10	5210089.22	89.22
100%		0	5210080.64	80.64
100%		+10	5210087.60	87.60
100%		+30	5210019.77	19.77
100%		+40	5210043.49	43.49
100%		+50	5210067.93	67.93
Max	3.6	+20	5210044.44	44.44
Min	3.14	+20	5210003.87	3.87

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2A  
 OPERATING FREQUENCY: 5,290,000,000 Hz  
 CHANNEL: 58  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290064.08	64.08
100%		-30	5290007.21	7.21
100%		-20	5290088.25	88.25
100%		-10	5290088.77	88.77
100%		0	5290070.73	70.73
100%		+10	5290030.49	30.49
100%		+30	5290053.95	53.95
100%		+40	5290067.87	67.87
100%		+50	5290029.86	29.86
Max	3.6	+20	5290078.52	78.52
Min	3.14	+20	5290003.17	3.17

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530019.09	19.09
100%		-30	5530093.31	93.31
100%		-20	5530038.92	38.92
100%		-10	5530039.38	39.38
100%		0	5530068.27	68.27
100%		+10	5530034.17	34.17
100%		+30	5530035.72	35.72
100%		+40	5530040.74	40.74
100%		+50	5530070.49	70.49
Max	3.6	+20	5530086.25	86.25
Min	3.14	+20	5530085.82	85.82

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775060.55	60.55
100%		-30	5775095.26	95.26
100%		-20	5775023.10	23.1
100%		-10	5775042.99	42.99
100%		0	5775046.15	46.15
100%		+10	5775073.75	73.75
100%		+30	5775056.06	56.06
100%		+40	5775039.28	39.28
100%		+50	5775056.82	56.82
Max	3.6	+20	5775023.48	23.48
Min	3.14	+20	5775005.58	5.58

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

**5 minutes after the EUT is energized**

OPERATING BAND: UNII Band 1  
 OPERATING FREQUENCY: 5,210,000,000 Hz  
 CHANNEL: 42  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210011.14	11.14
100%		-30	5210026.84	26.84
100%		-20	5210047.47	47.47
100%		-10	5210065.56	65.56
100%		0	5210084.06	84.06
100%		+10	5210074.16	74.16
100%		+30	5210098.99	98.99
100%		+40	5210049.09	49.09
100%		+50	5210089.57	89.57
Max	3.6	+20	5210090.87	90.87
Min	3.14	+20	5210072.80	72.80

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.





OPERATING BAND: UNII Band 2A  
 OPERATING FREQUENCY: 5,290,000,000 Hz  
 CHANNEL: 58  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290059.50	59.50
100%		-30	5290062.47	62.47
100%		-20	5290050.52	50.52
100%		-10	5290085.17	85.17
100%		0	5290001.46	1.46
100%		+10	5290025.42	25.42
100%		+30	5290027.70	27.7
100%		+40	5290099.10	99.1
100%		+50	5290047.24	47.24
Max	3.6	+20	5290074.72	74.72
Min	3.14	+20	5290047.84	47.84

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530069.14	69.14
100%		-30	5530079.81	79.81
100%		-20	5530034.11	34.11
100%		-10	5530020.25	20.25
100%		0	5530027.51	27.51
100%		+10	5530001.84	1.84
100%		+30	5530063.29	63.29
100%		+40	5530059.81	59.81
100%		+50	5530085.99	85.99
Max	3.6	+20	5530076.40	76.40
Min	3.14	+20	5530078.90	78.9

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775091.44	91.44
100%		-30	5775018.58	18.58
100%		-20	5775099.78	99.78
100%		-10	5775088.91	88.91
100%		0	5775083.65	83.65
100%		+10	5775027.75	27.75
100%		+30	5775008.93	8.93
100%		+40	5775077.28	77.28
100%		+50	5775042.26	42.26
Max	3.6	+20	5775016.07	16.07
Min	3.14	+20	5775085.57	85.57

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

10 minutes after the EUT is energized

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,210,000,000 Hz  
CHANNEL: 42  
REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5210051.89	51.89
100%		-30	5210015.55	15.55
100%		-20	5210060.44	60.44
100%		-10	5210038.33	38.33
100%		0	5210034.60	34.60
100%		+10	5210044.50	44.50
100%		+30	5210013.31	13.31
100%		+40	5210055.18	55.18
100%		+50	5210045.94	45.94
Max	3.6	+20	5210081.85	81.85
Min	3.14	+20	5210084.39	84.39

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2A  
 OPERATING FREQUENCY: 5,290,000,000 Hz  
 CHANNEL: 58  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5290088.68	88.68
100%		-30	5290069.37	69.37
100%		-20	5290084.45	84.45
100%		-10	5290017.43	17.43
100%		0	5290027.63	27.63
100%		+10	5290098.71	98.71
100%		+30	5290090.51	90.51
100%		+40	5290025.62	25.62
100%		+50	5290061.11	61.11
Max	3.6	+20	5290070.28	70.28
Min	3.14	+20	5290053.39	53.39

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 2C  
 OPERATING FREQUENCY: 5,530,000,000 Hz  
 CHANNEL: 106  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5530030.35	30.35
100%		-30	5530054.59	54.59
100%		-20	5530007.27	7.27
100%		-10	5530051.61	51.61
100%		0	5530055.64	55.64
100%		+10	5530019.63	19.63
100%		+30	5530075.85	75.85
100%		+40	5530068.41	68.41
100%		+50	5530044.38	44.38
Max	3.6	+20	5530058.30	58.30
Min	3.14	+20	5530033.64	33.64

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.



OPERATING BAND: UNII Band 3  
 OPERATING FREQUENCY: 5,775,000,000 Hz  
 CHANNEL: 155  
 REFERENCE VOLTAGE: 3.3 VDC

Voltage	Power	Temp.	Frequency	Frequency
(%)	(VDC)	(°C)	(kHz)	Error (kHz)
100%	3.3	+20(Ref)	5775054.26	54.26
100%		-30	5775042.96	42.96
100%		-20	5775089.15	89.15
100%		-10	5775083.10	83.1
100%		0	5775083.76	83.76
100%		+10	5775023.32	23.32
100%		+30	5775092.33	92.33
100%		+40	5775008.21	8.21
100%		+50	5775049.10	49.10
Max	3.6	+20	5775039.11	39.11
Min	3.14	+20	5775025.82	25.82

**Note:**

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

## 10.6 STRADDLE CHANNEL

### 10.6.1 26dB Bandwidth

[ANT1]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5710.72	14.28
802.11n(HT20)				5710.24	14.76
802.11ac(VHT20)				5710.24	14.76
802.11a	UNII 3	5720	144	5729.24	4.24
802.11n(HT20)				5729.76	4.76
802.11ac(VHT20)				5729.76	4.76

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5689.60	35.40
802.11ac(VHT40)				5689.68	35.32
802.11n(HT40)	UNII 3	5710	142	5730.64	5.64
802.11ac(VHT40)				5730.48	5.48

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.52	75.48
	UNII 3	5690	138	5730.64	5.64

**Note:**

[UNII 2C] 26dB Bandwidth = 5725MHz - Measured Frequency[MHz]

[UNII 3C] 26dB Bandwidth = Measured Frequency[MHz] -5725MHz



[ANT2]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11a	UNII 2C	5720	144	5710.76	14.24
802.11n(HT20)				5710.24	14.76
802.11ac(VHT20)				5710.28	14.72
802.11a	UNII 3	5720	144	5729.20	4.20
802.11n(HT20)				5729.76	4.76
802.11ac(VHT20)				5729.72	4.72

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11n(HT40)	UNII 2C	5710	142	5689.68	35.32
802.11ac(VHT40)				5689.68	35.32
802.11n(HT40)	UNII 3	5710	142	5730.56	5.56
802.11ac(VHT40)				5730.40	5.40

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	26dB Bandwidth [MHz]
802.11ac(VHT80)	UNII 2C	5690	138	5649.68	75.32
	UNII 3	5690	138	5730.48	5.48

**Note:**

[UNII 2C] 26dB Bandwidth = 5725MHz - Measured Frequency[MHz]

[UNII 3C] 26dB Bandwidth = Measured Frequency[MHz] -5725MHz

[ANT1]

▣ Test Plots (26dB Bandwidth)

802.11a UNII Band



802.11n(HT20) UNII Band



802.11ac(VHT20) UNII Band



□ Test Plots (26dB Bandwidth)

802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band



[ANT2]

▣ Test Plots (26dB Bandwidth)

802.11a UNII Band



802.11n(HT20) UNII Band



802.11ac(VHT20) UNII Band





■ Test Plots (26dB Bandwidth)

802.11n(HT40) UNII Band



802.11ac(VHT40) UNII Band



802.11ac(VHT80) UNII Band



## 10.6.2 6dB Bandwidth

### [ANT1]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII 3	5720	144	5728.24	3.24	> 0.5
802.11n(HT20)				5728.88	3.88	> 0.5
802.11ac(VHT20)				5728.88	3.88	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	UNII 3	5710	142	5728.24	3.24	> 0.5
802.11ac(VHT40)				5728.24	3.24	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	UNII 3	5690	138	5728.08	3.08	> 0.5

### **Note:**

6dB Bandwidth = Measured Frequency[MHz] – 5725MHz

[ANT2]

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11a	UNII 3	5720	144	5728.24	3.24	> 0.5
802.11n(HT20)				5728.88	3.88	> 0.5
802.11ac(VHT20)				5728.88	3.88	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11n(HT40)	UNII 3	5710	142	5728.24	3.24	> 0.5
802.11ac(VHT40)				5728.24	3.24	> 0.5

Mode	Band	Frequency [MHz]	Channel	Measured Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11ac(VHT80)	UNII 3	5690	138	5727.44	2.44	> 0.5

**Note:**

6dB Bandwidth = Measured Frequency[MHz] – 5725MHz

[ANT1]

■ Test Plots(UNII 3 Band 6dB Bandwidth)

802.11a CH.144



802.11n\_HT20 CH.144



802.11ac\_VHT20 CH.144

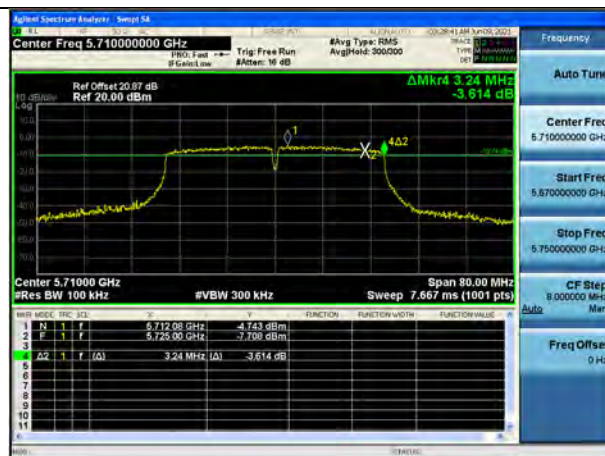




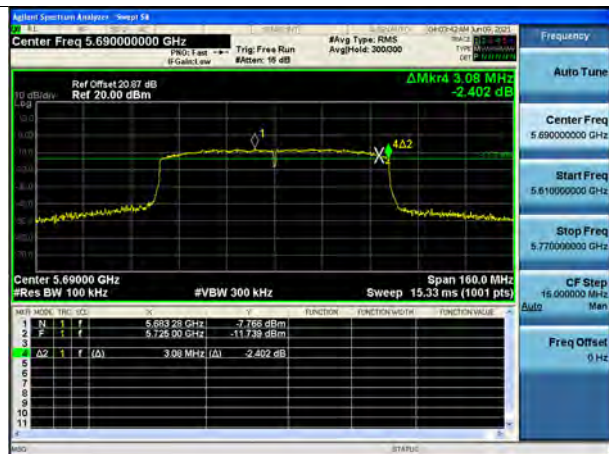
802.11n\_HT40 CH.142



802.11ac\_VHT40 CH.142



802.11ac\_VHT80 CH.138



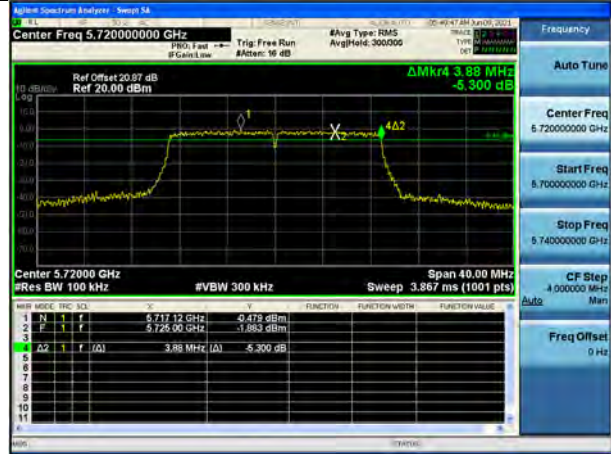
[ANT2]

■ Test Plots(UNII 3 Band 6dB Bandwidth)

802.11a CH.144



802.11n\_HT20 CH.144



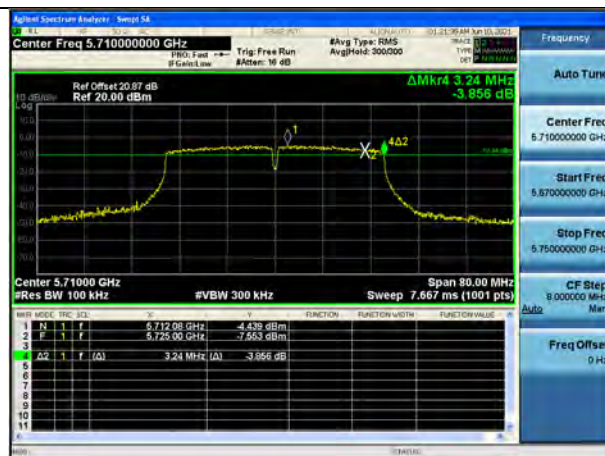
802.11ac\_VHT20 CH.144



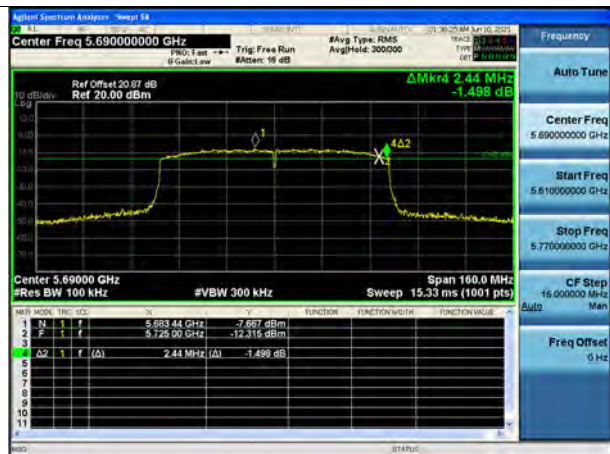
802.11n\_HT40 CH.142



802.11ac\_VHT40 CH.142



802.11ac\_VHT80 CH.138



### 10.6.3 Output Power

#### [ANT1]

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	12.43	22.55
802.11n(HT20)			12.09	22.69
802.11ac(VHT20)			11.22	22.69
802.11a	5720 (UNII 3 Band)	144	6.10	30.00
802.11n(HT20)			6.33	30.00
802.11ac(VHT20)			5.47	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	12.77	23.98
802.11ac(VHT40)			11.68	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	1.33	30.00
802.11ac(VHT40)			0.36	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	12.13	23.98
	5690 (UNII 3 Band)	138	-4.44	30.00

[ANT2]

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	12.57	22.54
802.11n(HT20)			12.42	22.69
802.11ac(VHT20)			11.53	22.68
802.11a	5720 (UNII 3 Band)	144	6.17	30.00
802.11n(HT20)			6.60	30.00
802.11ac(VHT20)			5.70	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	13.72	23.98
802.11ac(VHT40)			11.98	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	2.15	30.00
802.11ac(VHT40)			0.47	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	12.07	23.98
	5690 (UNII 3 Band)	138	-4.79	30.00

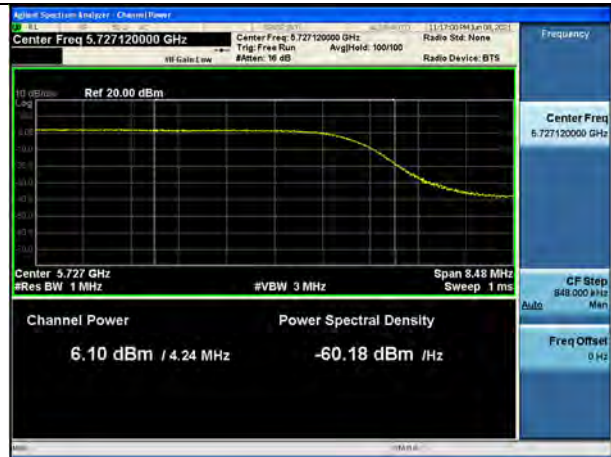


Test Plots\_[ANT1]

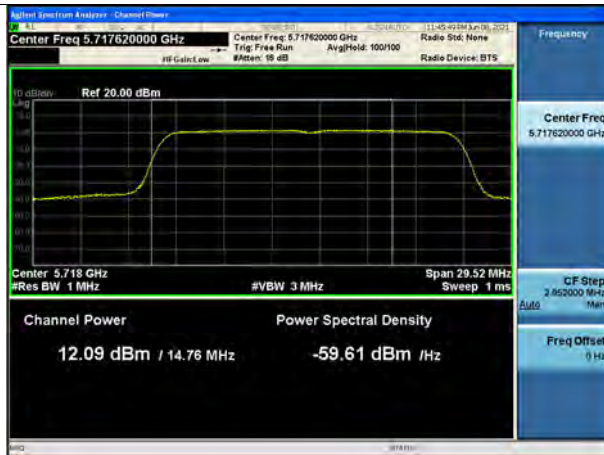
802.11a UNII 2C Band



802.11a UNII 3 Band



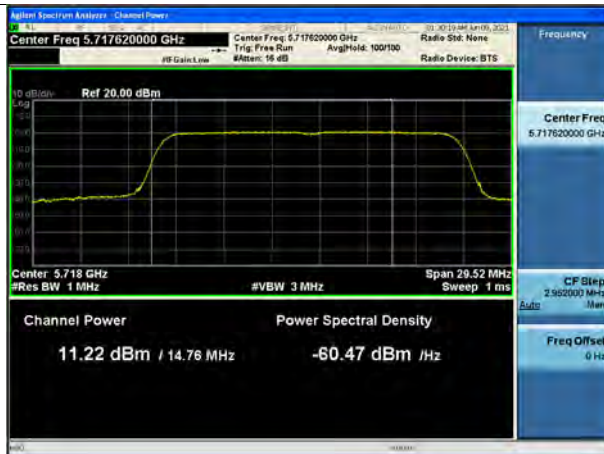
802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



802.11ac(VHT20) UNII 2C Band



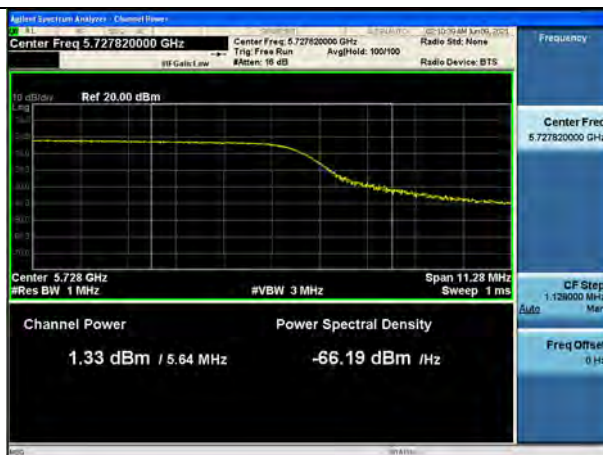
802.11ac(VHT20) UNII 3 Band



802.11n(HT40) UNII 2C Band



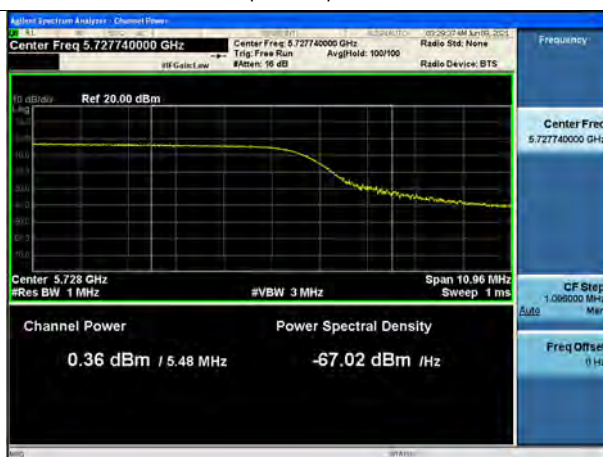
802.11n(HT40) UNII 3 Band



802.11ac(VHT40) UNII 2C Band



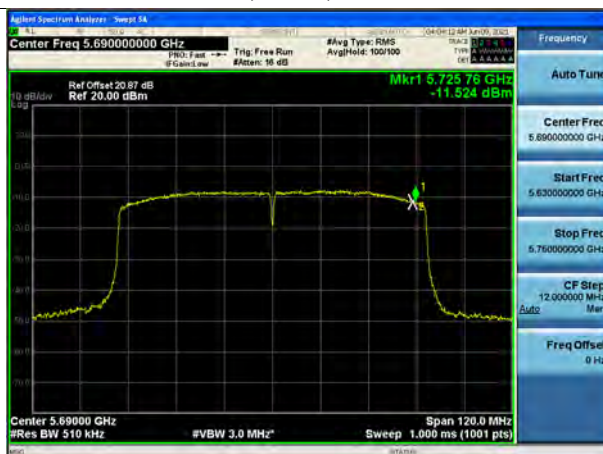
802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band



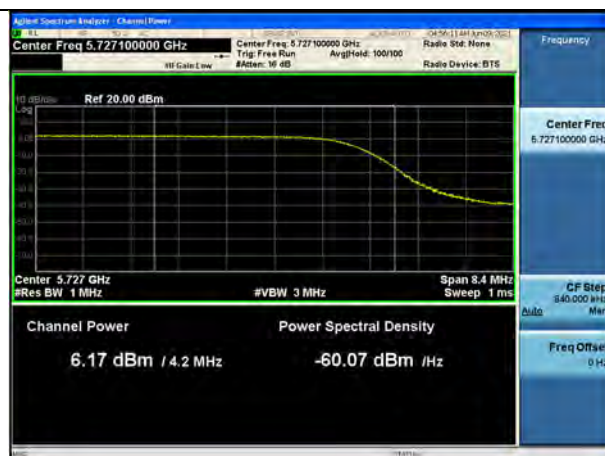


Test Plots\_[ANT2]

802.11a UNII 2C Band



802.11a UNII 3 Band



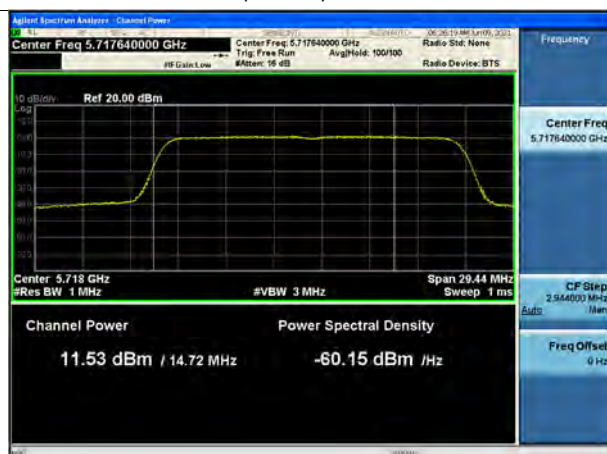
802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band

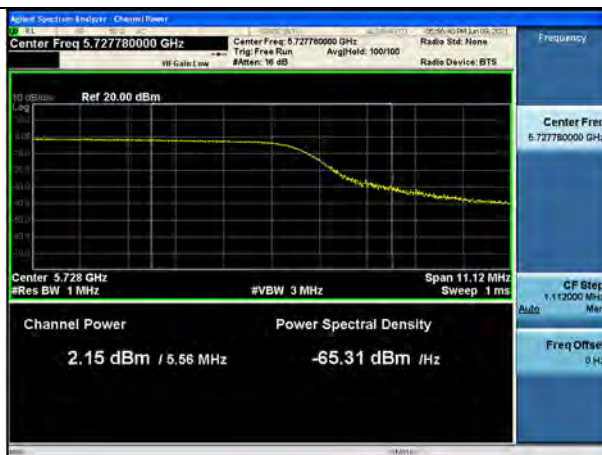




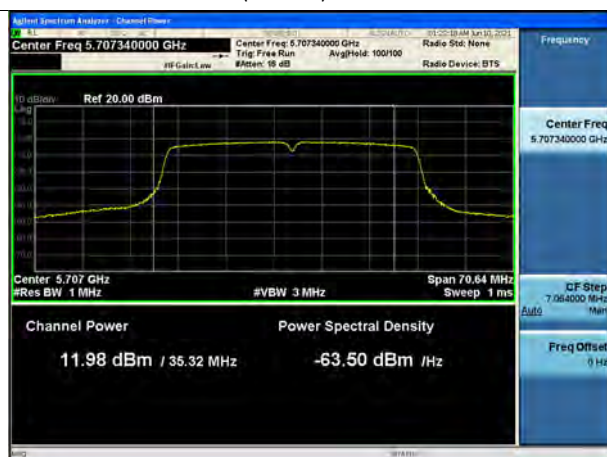
802.11n(HT40) UNII 2C Band



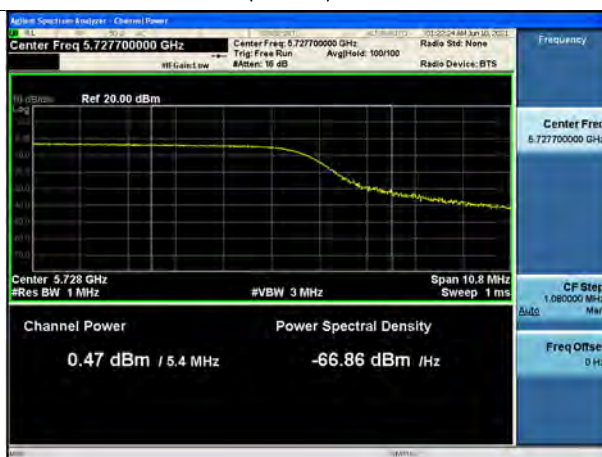
802.11n(HT40) UNII 3 Band



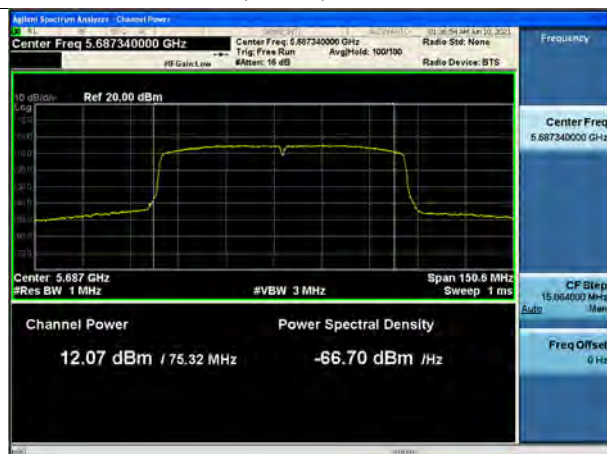
802.11ac(VHT40) UNII 2C Band



802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band



#### 10.6.4 Power Spectral Density

[ANT1]

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11a	5720 (UNII 2C Band)	144	2.345	11 dBm/MHz
802.11n(HT20)			2.010	
802.11ac(VHT20)			1.075	
802.11a	5720 (UNII 3 Band)	144	-0.818	30 dBm/500kHz
802.11n(HT20)			-1.341	
802.11ac(VHT20)			-2.278	

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11n(HT40)	5710 (UNII 2C Band)	142	-1.198	11 dBm/MHz
802.11ac(VHT40)			-2.008	
802.11n(HT40)	5710 (UNII 3 Band)	142	-5.771	30 dBm/500kHz
802.11ac(VHT40)			-6.794	

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-4.851	11 dBm/MHz
802.11ac(VHT80)	5690 (UNII 3 Band)	138	-11.524	30 dBm/500kHz

[ANT2]

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11a	5720 (UNII 2C Band)	144	2.427	11 dBm/MHz
802.11n(HT20)			2.140	
802.11ac(VHT20)			1.370	
802.11a	5720 (UNII 3 Band)	144	-0.830	30 dBm/500kHz
802.11n(HT20)			-1.044	
802.11ac(VHT20)			-1.838	

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11n(HT40)	5710 (UNII 2C Band)	142	0.125	11 dBm/MHz
802.11ac(VHT40)			-1.608	
802.11n(HT40)	5710 (UNII 3 Band)	142	-4.956	30 dBm/500kHz
802.11ac(VHT40)			-6.555	

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-4.794	11 dBm/MHz
802.11ac(VHT80)	5690 (UNII 3 Band)	138	-11.460	30 dBm/500kHz

Test Plots [ANT1]

802.11a UNII 2C Band



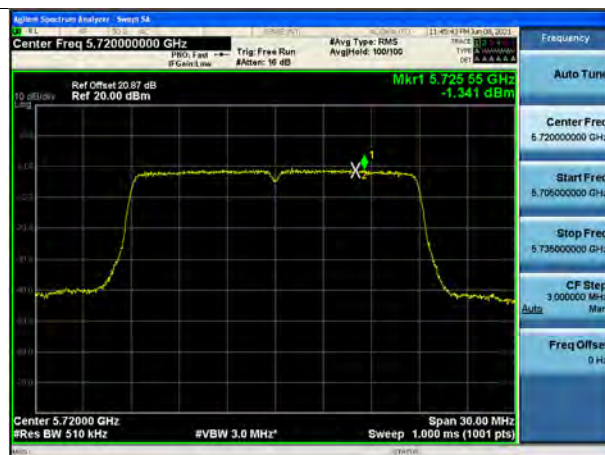
802.11a UNII 3 Band



802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band





802.11n(HT40) UNII 2C Band



802.11n(HT40) UNII 3 Band



802.11ac(VHT40) UNII 2C Band



802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band

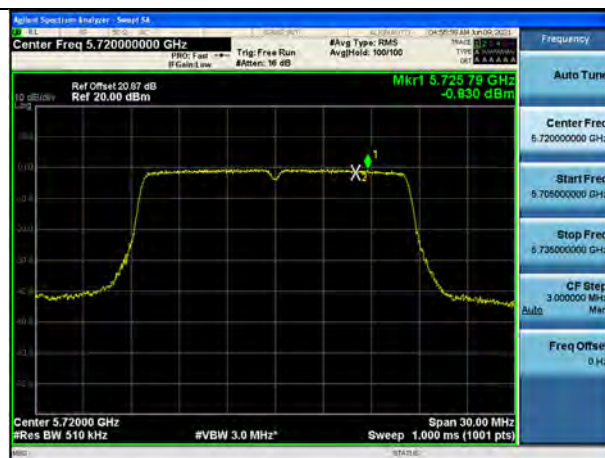


Test Plots\_[ANT2]

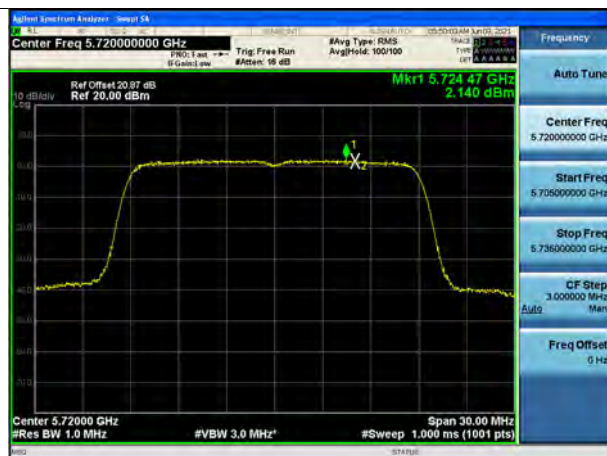
802.11a UNII 2C Band



802.11a UNII 3 Band



802.11n(HT20) UNII 2C Band



802.11n(HT20) UNII 3 Band



802.11ac(VHT20) UNII 2C Band



802.11ac(VHT20) UNII 3 Band





802.11n(HT40) UNII 2C Band



802.11n(HT40) UNII 3 Band



802.11ac(VHT40) UNII 2C Band



802.11ac(VHT40) UNII 3 Band



802.11ac(VHT80) UNII 2C Band



802.11ac(VHT80) UNII 3 Band



## 10.7 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 =  $40\log(\text{specific distance} / \text{test distance})$  (dB)
3. Limit line = specific Limits (dBuV) + Distance extrapolation factor

### Frequency Range : Below 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB

No Critical peaks found

#### Note:

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



[Only MIMO]

Frequency Range : Above 1 GHz

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
10360	50.41	5.63	V	56.04	68.20	12.16	PK
15540	51.31	6.11	V	57.42	73.98	16.56	PK
15540	36.40	6.11	V	42.51	53.98	11.47	AV
10360	54.09	5.63	H	59.72	68.20	8.48	PK
15540	52.11	6.11	H	58.22	73.98	15.76	PK
15540	36.86	6.11	H	42.97	53.98	11.01	AV

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5200 MHz
Channel No.	40 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
10400	52.52	5.06	V	57.58	68.20	10.62	PK
15600	50.70	4.93	V	55.63	73.98	18.35	PK
15600	36.42	4.93	V	41.35	53.98	12.63	AV
10400	53.07	5.06	H	58.13	68.20	10.07	PK
15600	51.54	4.93	H	56.47	73.98	17.51	PK
15600	36.98	4.93	H	41.91	53.98	12.07	AV



Band : UNII 1  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5240 MHz  
 Channel No. 48 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
10480	50.67	5.81	V	56.48	68.20	11.72	PK
15720	50.74	4.48	V	55.22	73.98	18.76	PK
15720	36.09	4.48	V	40.57	53.98	13.41	AV
10480	51.46	5.81	H	57.27	68.20	10.93	PK
15720	51.31	4.48	H	55.79	73.98	18.19	PK
15720	36.62	4.48	H	41.10	53.98	12.88	AV

Band : UNII 2A  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5260 MHz  
 Channel No. 52 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
10520	51.47	5.64	V	57.11	68.20	11.09	PK
15780	50.67	5.17	V	55.84	73.98	18.14	PK
15780	35.94	5.17	V	41.11	53.98	12.87	AV
10520	50.36	5.64	H	56.00	68.20	12.20	PK
15780	50.12	5.17	H	55.29	73.98	18.69	PK
15780	35.94	5.17	H	41.11	53.98	12.87	AV



Band : UNII 2A  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5300 MHz  
 Channel No. 60 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
10600	49.52	5.90	V	55.42	73.98	18.56	PK
10600	37.56	5.90	V	43.46	53.98	10.52	AV
15900	47.07	5.96	V	53.03	73.98	20.95	PK
15900	32.94	5.96	V	38.90	53.98	15.08	AV
10600	50.79	5.90	H	56.69	73.98	17.29	PK
10600	37.15	5.90	H	43.05	53.98	10.93	AV
15900	47.32	5.96	H	53.28	73.98	20.70	PK
15900	33.56	5.96	H	39.52	53.98	14.46	AV

Band : UNII 2A  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5320 MHz  
 Channel No. 64 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
10640	50.81	6.01	V	56.82	73.98	17.16	PK
10640	37.90	6.01	V	43.91	53.98	10.07	AV
15960	49.47	5.20	V	54.67	73.98	19.31	PK
15960	34.12	5.20	V	39.32	53.98	14.66	AV
10640	49.52	6.01	H	55.53	73.98	18.45	PK
10640	37.63	6.01	H	43.64	53.98	10.34	AV
15960	49.65	5.20	H	54.85	73.98	19.13	PK
15960	34.82	5.20	H	40.02	53.98	13.96	AV

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5500 MHz
Channel No.	100 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11000	54.68	6.10	V	60.78	73.98	13.20	PK
11000	41.35	6.10	V	47.45	53.98	6.53	AV
16500	50.53	7.83	V	58.36	68.20	9.84	PK
11000	55.37	6.10	H	61.47	73.98	12.51	PK
11000	42.01	6.10	H	48.11	53.98	5.87	AV
16500	51.28	7.83	H	59.11	68.20	9.09	PK

Band :	UNII 2C
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5580 MHz
Channel No.	116 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11160	52.91	5.39	V	58.30	73.98	15.68	PK
11160	38.69	5.39	V	44.08	53.98	9.90	AV
16740	50.61	9.32	V	59.93	68.20	8.27	PK
11160	53.66	5.39	H	59.05	73.98	14.93	PK
11160	39.73	5.39	H	45.12	53.98	8.86	AV
16740	51.67	9.32	H	60.99	68.20	7.21	PK



Band : UNII 2C  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5720 MHz  
 Channel No. 144 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11440	50.33	6.02	V	56.35	73.98	17.63	PK
11440	37.33	6.02	V	43.35	53.98	10.63	AV
17160	48.99	9.78	V	58.77	68.20	9.43	PK
11440	51.25	6.02	H	57.27	73.98	16.71	PK
11440	37.61	6.02	H	43.63	53.98	10.35	AV
17160	49.80	9.78	H	59.58	68.20	8.62	PK

Band : UNII 3  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5745MHz  
 Channel No. 149 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11490	51.28	6.06	V	57.34	73.98	16.64	PK
11490	38.09	6.06	V	44.15	53.98	9.83	AV
17235	48.06	10.88	V	58.94	68.20	9.26	PK
11490	52.80	6.06	H	58.86	73.98	15.12	PK
11490	38.65	6.06	H	44.71	53.98	9.27	AV
17235	48.81	10.88	H	59.69	68.20	8.51	PK



Band : UNII 3  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5785 MHz  
 Channel No. 157 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11570	53.03	6.77	V	59.80	73.98	14.18	PK
11570	39.11	6.77	V	45.88	53.98	8.10	AV
17355	48.38	11.73	V	60.11	68.20	8.09	PK
11570	53.65	6.77	H	60.42	73.98	13.56	PK
11570	39.84	6.77	H	46.61	53.98	7.37	AV
17355	48.98	10.98	H	59.96	68.20	8.24	PK

Band : UNII 3  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5825 MHz  
 Channel No. 165 Ch

Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11650	54.17	6.38	V	60.55	73.98	13.43	PK
11650	40.39	6.38	V	46.77	53.98	7.21	AV
17475	49.87	11.29	V	61.16	68.20	7.04	PK
11650	55.05	6.38	H	61.43	73.98	12.55	PK
11650	41.11	6.38	H	47.49	53.98	6.49	AV
17475	50.22	11.29	H	61.51	68.20	6.69	PK

**Note:**

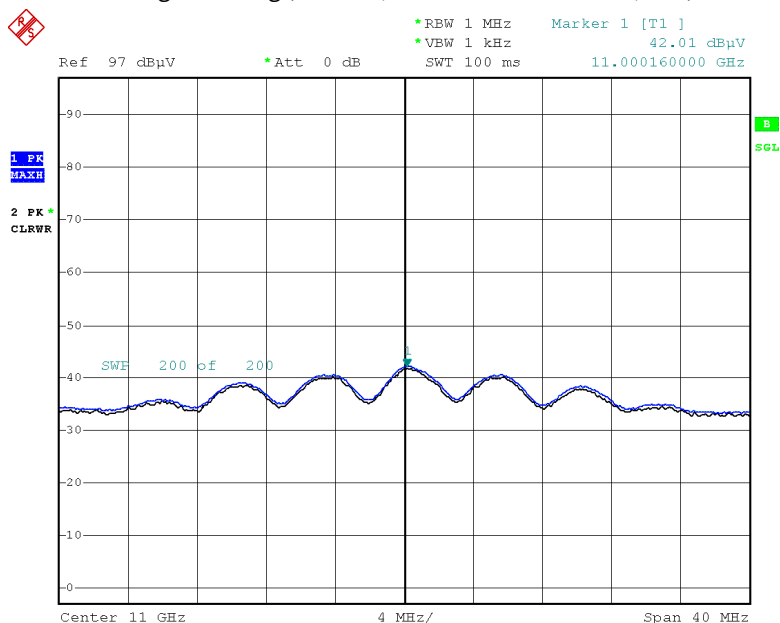
All Modes of operation were investigated and the worst case configuration results are reported.

[Worst case]

UNII 1, 2A, 2C, 3 : 802.11a

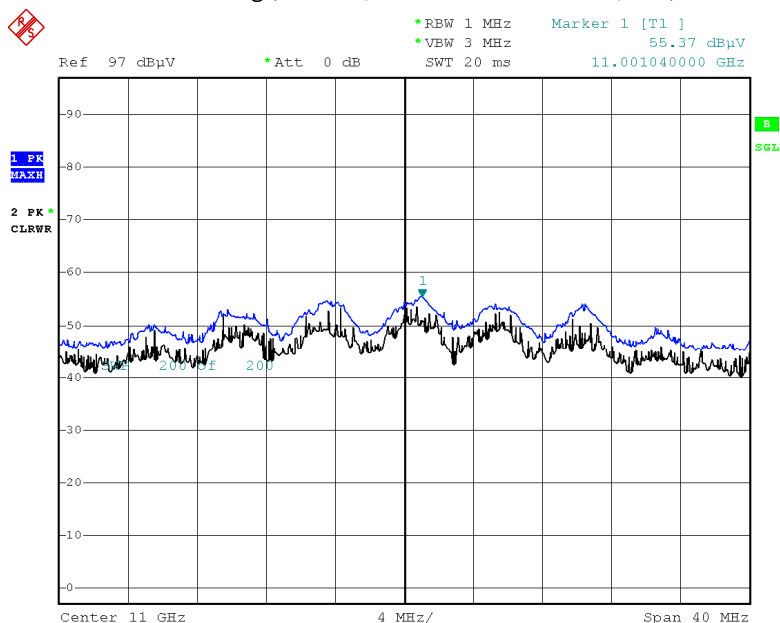
Test Plots

Average Reading (802.11a, Ch.100 2nd Harmonic, Z-H)



Date: 17.JUN.2021 14:33:30

Peak Reading (802.11a, Ch.100 2nd Harmonic, Z-H)



Date: 17.JUN.2021 14:33:51

Note:

Only the worst case plots for Radiated Spurious Emissions.

## 10.8 RADIATED RESTRICTED BAND EDGE

Band :	UNII 1
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5180 MHz
Channel No.	36 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5150	44.73	12.69	H	57.42	73.98	16.56	PK
5150	31.81	12.69	H	44.50	53.98	9.48	AV
5150	44.67	12.69	V	57.36	73.98	16.62	PK
5150	31.75	12.69	V	44.44	53.98	9.54	AV

Band :	UNII 2A
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5320 MHz
Channel No.	64 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5350	43.93	12.36	H	56.29	73.98	17.69	PK
5350	30.67	12.36	H	43.03	53.98	10.95	AV
5350	43.64	12.36	V	56.00	73.98	17.98	PK
5350	30.55	12.36	V	42.91	53.98	11.07	AV





Band : UNII 2C  
 Operation Mode: 802.11 a  
 Transfer Rate: 6 Mbps  
 Operating Frequency 5500 MHz  
 Channel No. 100 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5460	44.10	12.83	H	56.93	73.98	17.05	PK
5460	30.66	12.83	H	43.49	53.98	10.49	AV
5470	44.72	13.04	H	57.76	68.20	10.44	PK
5460	43.67	12.83	V	56.50	73.98	17.48	PK
5460	30.36	12.83	V	43.19	53.98	10.79	AV
5470	43.56	13.04	V	56.60	68.20	11.60	PK



Band : UNII 1  
 Operation Mode: 802.11 n\_HT20  
 Transfer MCS Index: 0  
 Operating Frequency 5180 MHz  
 Channel No. 36 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5150	44.87	12.69	H	57.56	73.98	16.42	PK
5150	31.18	12.69	H	43.87	53.98	10.11	AV
5150	45.37	12.69	V	58.06	73.98	15.92	PK
5150	31.41	12.69	V	44.10	53.98	9.88	AV

Band : UNII 2A  
 Operation Mode: 802.11 n\_HT20  
 Transfer MCS Index: 0  
 Operating Frequency 5320 MHz  
 Channel No. 64 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5350	43.63	12.36	H	55.99	73.98	17.99	PK
5350	30.61	12.36	H	42.97	53.98	11.01	AV
5350	43.96	12.36	V	56.32	73.98	17.66	PK
5350	30.94	12.36	V	43.30	53.98	10.68	AV



Band : UNII 2C

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Operation Mode: 802.11 n\_HT20

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Transfer MCS Index: 0

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Operating Frequency 5500 MHz

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Channel No. 100 Ch

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Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5460	43.97	12.83	H	56.80	73.98	17.18	PK
5460	30.54	12.83	H	43.37	53.98	10.61	AV
5470	43.59	13.04	H	56.63	68.20	11.57	PK
5460	44.02	12.83	V	56.85	73.98	17.13	PK
5460	30.69	12.83	V	43.52	53.98	10.46	AV
5470	45.96	13.04	V	59.00	68.20	9.20	PK



Band : UNII 1

Operation Mode: 802.11 ac\_VHT20

Transfer MCS Index: 0

Operating Frequency 5180 MHz

Channel No. 36 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5150	45.55	12.69	H	58.24	73.98	15.74	PK
5150	31.27	12.69	H	43.96	53.98	10.02	AV
5150	45.00	12.69	V	57.69	73.98	16.29	PK
5150	31.23	12.69	V	43.92	53.98	10.06	AV

Band : UNII 2A

Operation Mode: 802.11 ac\_VHT20

Transfer MCS Index: 0

Operating Frequency 5320 MHz

Channel No. 64 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5350	43.95	12.36	H	56.31	73.98	17.67	PK
5350	30.74	12.36	H	43.10	53.98	10.88	AV
5350	43.93	12.36	V	56.29	73.98	17.69	PK
5350	30.92	12.36	V	43.28	53.98	10.70	AV



Band : UNII 2C

Operation Mode: 802.11 ac\_VHT20

Transfer MCS Index: 0

Operating Frequency 5500 MHz

Channel No. 100 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5460	43.76	12.83	H	56.59	73.98	17.39	PK
5460	30.60	12.83	H	43.43	53.98	10.55	AV
5470	43.42	13.04	H	56.46	68.20	11.74	PK
5460	43.64	12.83	V	56.47	73.98	17.51	PK
5460	30.61	12.83	V	43.44	53.98	10.54	AV
5470	44.41	13.04	V	57.45	68.20	10.75	PK



Band : UNII 1  
 Operation Mode: 802.11 n\_HT40  
 Transfer MCS Index: 0  
 Operating Frequency 5190 MHz  
 Channel No. 38 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5150	49.65	12.69	H	62.34	73.98	11.64	PK
5150	36.81	12.69	H	49.50	53.98	4.48	AV
5150	50.76	12.69	V	63.45	73.98	10.53	PK
5150	37.55	12.69	V	50.24	53.98	3.74	AV

Band : UNII 1  
 Operation Mode: 802.11 n\_HT40  
 Transfer MCS Index: 0  
 Operating Frequency 5310 MHz  
 Channel No. 62 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5350	47.85	12.36	H	60.21	73.98	13.77	PK
5350	34.40	12.36	H	46.76	53.98	7.22	AV
5350	46.93	12.36	V	59.29	73.98	14.69	PK
5350	33.82	12.36	V	46.18	53.98	7.80	AV



Band : UNII 2C  
 Operation Mode: 802.11 n\_HT40  
 Transfer MCS Index: 0  
 Operating Frequency 5510 MHz  
 Channel No. 102 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5460	44.19	12.83	H	57.02	73.98	16.96	PK
5460	31.07	12.83	H	43.90	53.98	10.08	AV
5470	50.10	13.04	H	63.14	68.20	5.06	PK
5460	44.73	12.83	V	57.56	73.98	16.42	PK
5460	31.57	12.83	V	44.40	53.98	9.58	AV
5470	51.42	13.04	V	64.46	68.20	3.74	PK

Band : UNII 1

Operation Mode: 802.11 ac\_VHT40

Transfer MCS Index: 0

Operating Frequency 5190 MHz

Channel No. 38 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5150	49.27	12.69	H	61.96	73.98	12.02	PK
5150	36.15	12.69	H	48.84	53.98	5.14	AV
5150	50.40	12.69	V	63.09	73.98	10.89	PK
5150	36.47	12.69	V	49.16	53.98	4.82	AV

Band : UNII 1

Operation Mode: 802.11 ac\_VHT40

Transfer MCS Index: 0

Operating Frequency 5310 MHz

Channel No. 62 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5350	46.99	12.36	H	59.35	73.98	14.63	PK
5350	33.85	12.36	H	46.21	53.98	7.77	AV
5350	46.27	12.36	V	58.63	73.98	15.35	PK
5350	32.97	12.36	V	45.33	53.98	8.65	AV







Band : UNII 1  
 Operation Mode: 802.11 ac\_VHT80  
 Transfer MCS Index: 0  
 Operating Frequency 5210 MHz  
 Channel No. 42 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5150	51.33	12.69	H	64.02	73.98	9.96	PK
5150	36.85	12.69	H	49.54	53.98	4.44	AV
5150	52.90	12.69	V	65.59	73.98	8.39	PK
5150	37.31	12.69	V	50.00	53.98	3.98	AV

Band : UNII 2A  
 Operation Mode: 802.11 ac\_VHT80  
 Transfer MCS Index: 0  
 Operating Frequency 5290 MHz  
 Channel No. 58 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5350	50.04	12.36	H	62.40	73.98	11.58	PK
5350	36.06	12.36	H	48.42	53.98	5.56	AV
5350	48.91	12.36	V	61.27	73.98	12.71	PK
5350	35.84	12.36	V	48.20	53.98	5.78	AV

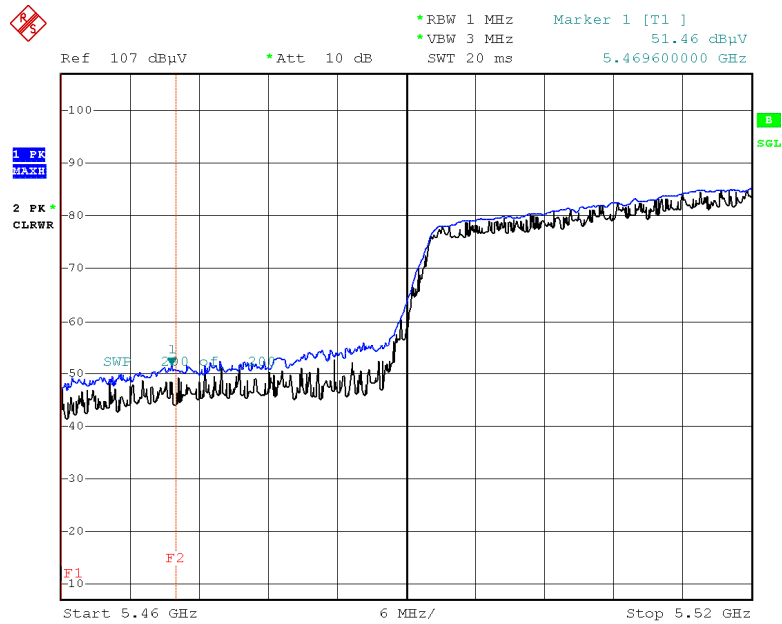


Band : UNII 2C  
 Operation Mode: 802.11 ac\_VHT80  
 Transfer MCS Index: 0  
 Operating Frequency 5530 MHz  
 Channel No. 106 Ch

Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5460	47.31	12.83	H	60.14	73.98	13.84	PK
5460	33.58	12.83	H	46.41	53.98	7.57	AV
5470	50.67	13.04	H	63.71	68.20	4.49	PK
5460	47.83	12.83	V	60.66	73.98	13.32	PK
5460	34.49	12.83	V	47.32	53.98	6.66	AV
5470	51.46	13.04	V	64.50	68.20	3.70	PK

▣ Test Plots(UNII 1, 2A, 2C)

Peak Reading (802.11ac(80M), Ch.106, Z-V)



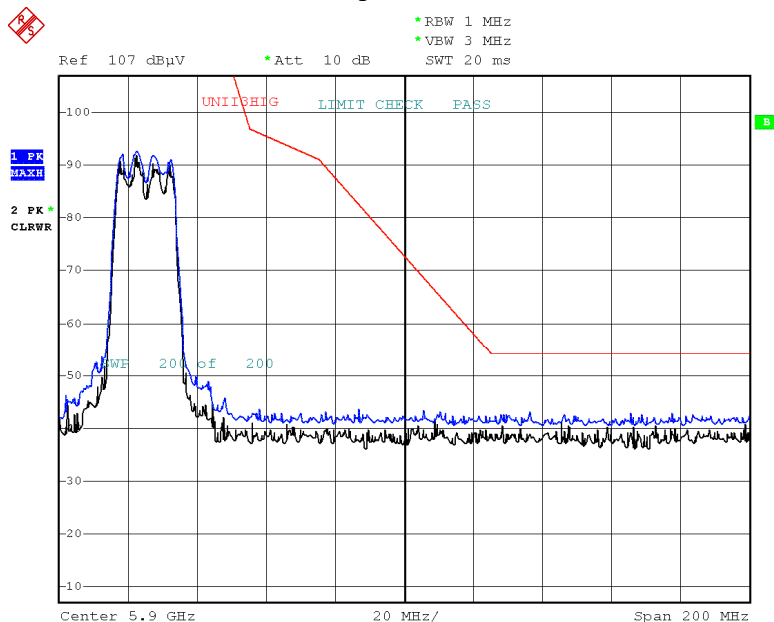
Date: 17.JUN.2021 17:38:16

**Note:**

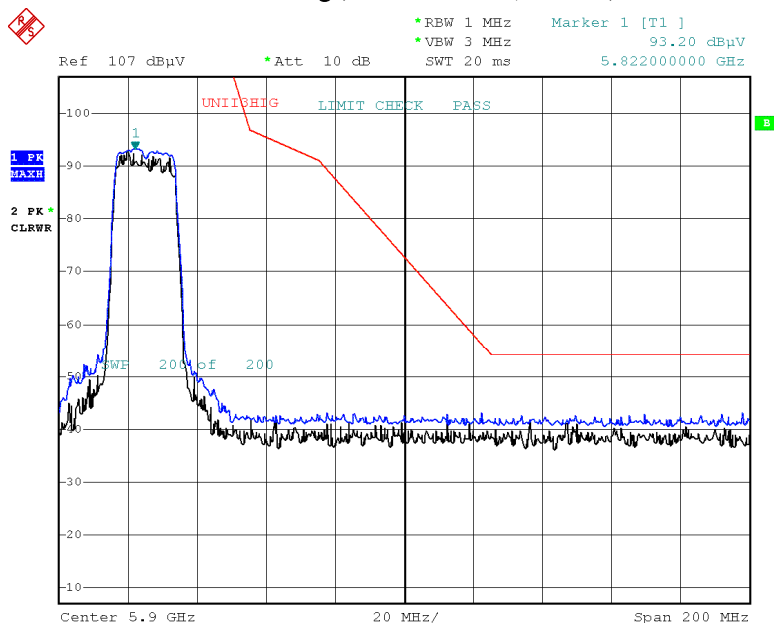
Only the worst case plots for Radiated Restricted Band Edge.

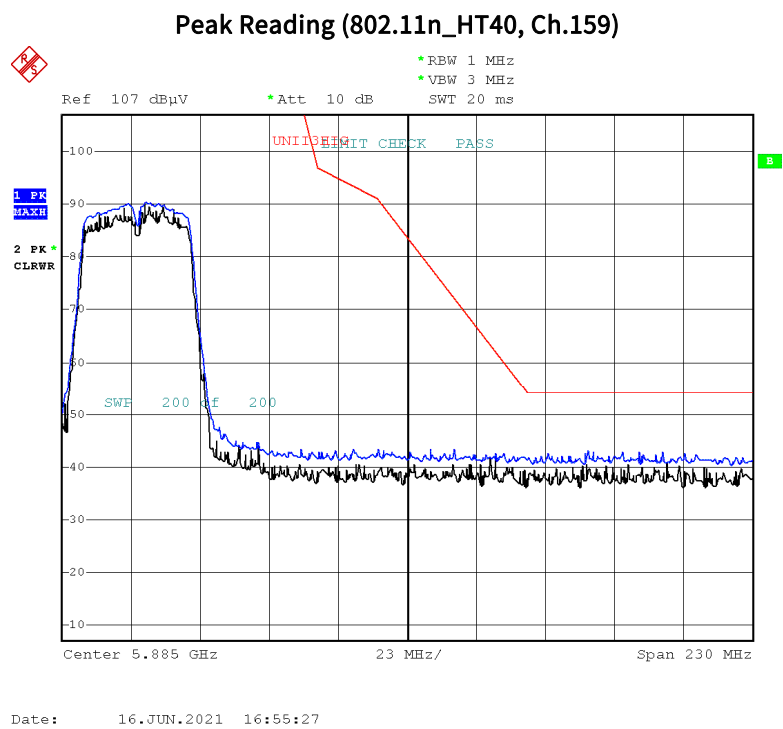
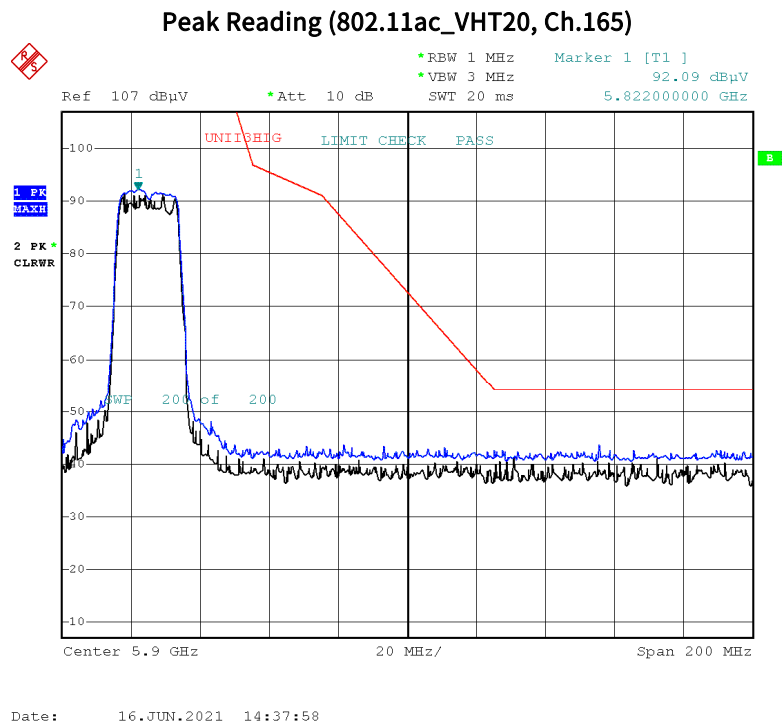
Test Plots(UNII 3)

Peak Reading (802.11a, Ch.165)

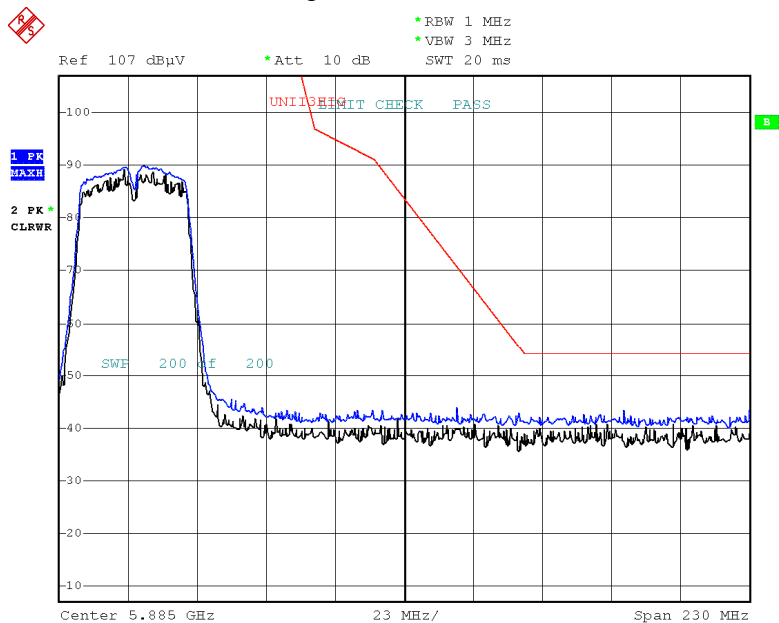


Peak Reading (802.11n\_HT20, Ch.165)



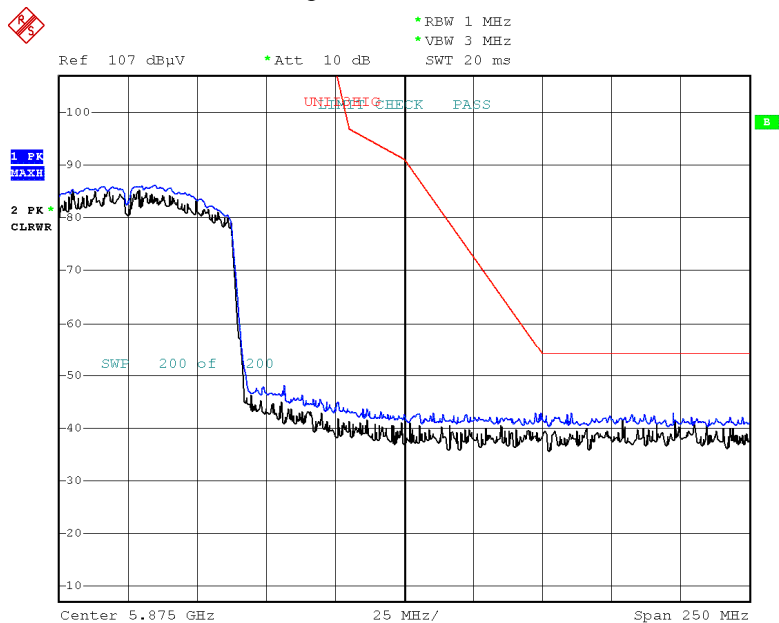


### Peak Reading (802.11ac\_VHT40, Ch.159)



Date: 16.JUN.2021 16:56:29

### Peak Reading (802.11ac\_VHT80, Ch.155)



Date: 16.JUN.2021 18:20:41

## 10.9 RECEIVER SPURIOUS EMISSIONS

### Frequency Range : Below 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB

No Critical peaks found

### Note:

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

### Frequency Range : Above 1 GHz

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV/m	dBm/m	dBm	(H/V)	dBuV/m	dBuV/m	dB

No Critical peaks found





10.10 POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

Test

1 / 2

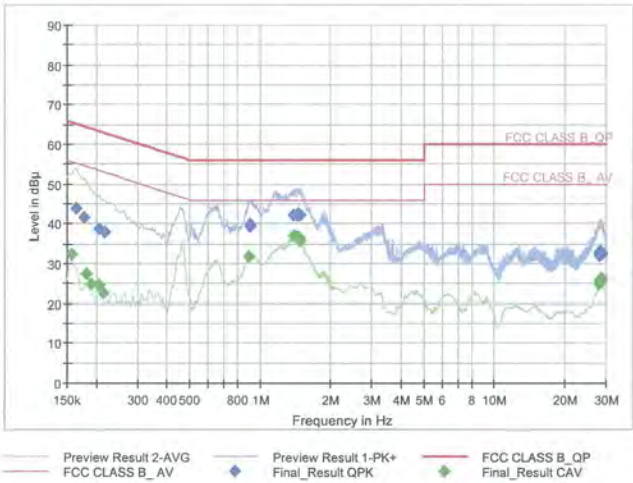
Test Report

Common Information

EUT :  
Manufacturer :  
Test Site:  
Operating Conditions :  
Operator Name:  
Comment:

LGSBWAC22  
LG  
SHIELD ROOM  
5G\_L1

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak	Limit (dBuV)	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.1635	43.95	65.28	21.33	9.000	L1	OFF	9.6
0.1770	41.50	64.63	23.12	9.000	L1	OFF	9.6
0.2063	38.63	63.36	24.72	9.000	L1	OFF	9.6
0.2175	37.65	62.91	25.26	9.000	L1	OFF	9.6
0.9028	39.28	56.00	16.72	9.000	L1	OFF	9.6
0.9095	39.85	56.00	16.15	9.000	L1	OFF	9.6
1.3843	42.17	56.00	13.83	9.000	L1	OFF	9.6
1.4315	42.22	56.00	13.78	9.000	L1	OFF	9.6
1.4473	42.19	56.00	13.81	9.000	L1	OFF	9.6
1.4585	42.54	56.00	13.46	9.000	L1	OFF	9.6
1.4675	42.24	56.00	13.76	9.000	L1	OFF	9.6
1.4810	42.21	56.00	13.79	9.000	L1	OFF	9.6
27.9770	32.12	60.00	27.88	9.000	L1	OFF	10.0
28.0558	32.67	60.00	27.33	9.000	L1	OFF	10.0
28.1885	32.95	60.00	27.05	9.000	L1	OFF	10.0
28.4743	33.32	60.00	26.68	9.000	L1	OFF	10.0
28.6678	32.73	60.00	27.27	9.000	L1	OFF	10.0
28.7195	32.45	60.00	27.55	9.000	L1	OFF	10.0

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Test

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### Final Result CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1568	32.32	55.63	23.31	9.000	L1	OFF	9.6
0.1815	27.43	54.42	26.99	9.000	L1	OFF	9.6
0.1905	24.69	54.02	29.33	9.000	L1	OFF	9.6
0.2063	24.61	53.36	28.75	9.000	L1	OFF	9.6
0.2153	22.55	53.00	30.45	9.000	L1	OFF	9.6
0.9005	31.60	46.00	14.40	9.000	L1	OFF	9.6
1.3978	36.89	46.00	9.11	9.000	L1	OFF	9.6
1.4338	36.76	46.00	9.24	9.000	L1	OFF	9.6
1.4450	36.71	46.00	9.29	9.000	L1	OFF	9.6
1.4585	36.47	46.00	9.53	9.000	L1	OFF	9.6
1.4698	36.36	46.00	9.64	9.000	L1	OFF	9.6
1.4810	35.91	46.00	10.09	9.000	L1	OFF	9.6
27.9973	24.81	50.00	25.19	9.000	L1	OFF	10.0
28.1840	25.61	50.00	24.39	9.000	L1	OFF	10.0
28.2898	25.97	50.00	24.03	9.000	L1	OFF	10.0
28.5463	26.12	50.00	23.88	9.000	L1	OFF	10.0
28.7173	25.74	50.00	24.26	9.000	L1	OFF	10.0
28.7443	25.71	50.00	24.29	9.000	L1	OFF	10.0

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## Conducted Emissions (Line 2)

Test

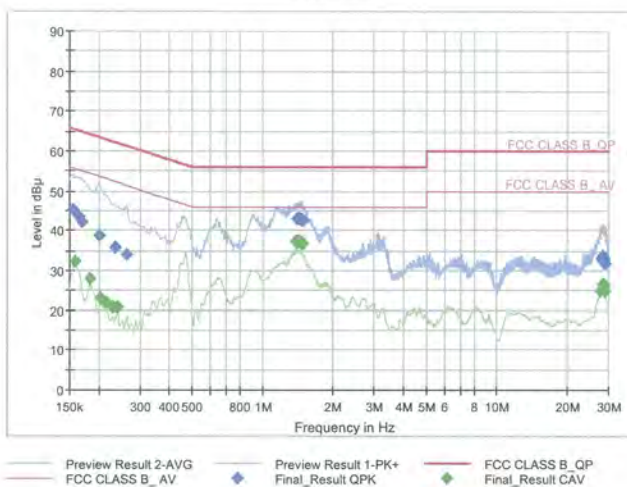
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### Test Report

#### Common Information

EUT : LGSBWAC22  
 Manufacturer : LG  
 Test Site: SHIELD ROOM  
 Operating Conditions : 5G\_N  
 Operator Name:  
 Comment:

Full Spectrum



#### Final Result QPK

Frequency (MHz)	QuasiPeak	Limit (dBμV)	Margin	Bandwidth	Line	Filter	Corr. (dB)
0.1545	45.31	65.75	20.44	9.000	N	OFF	9.6
0.1635	43.47	65.28	21.81	9.000	N	OFF	9.6
0.1703	42.21	64.95	22.74	9.000	N	OFF	9.6
0.2018	38.70	63.54	24.84	9.000	N	OFF	9.6
0.2355	35.91	62.25	26.35	9.000	N	OFF	9.6
0.2625	34.16	61.35	27.19	9.000	N	OFF	9.6
1.4113	42.84	56.00	13.16	9.000	N	OFF	9.6
1.4225	43.02	56.00	12.98	9.000	N	OFF	9.6
1.4338	42.99	56.00	13.01	9.000	N	OFF	9.6
1.4473	42.84	56.00	13.16	9.000	N	OFF	9.6
1.4810	42.56	56.00	13.44	9.000	N	OFF	9.6
1.4945	42.34	56.00	13.66	9.000	N	OFF	9.6
27.9928	33.23	60.00	26.77	9.000	N	OFF	10.0
28.0265	32.74	60.00	27.26	9.000	N	OFF	10.0
28.2628	33.65	60.00	26.35	9.000	N	OFF	10.1
28.5328	33.27	60.00	26.73	9.000	N	OFF	10.1
28.7398	32.62	60.00	27.38	9.000	N	OFF	10.1
28.8433	31.71	60.00	28.29	9.000	N	OFF	10.1

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Test

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### Final Result CAV

Frequency (MHz)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1590	32.26	55.52	23.26	9.000	N	OFF	9.6
0.1838	27.84	54.31	26.48	9.000	N	OFF	9.6
0.2040	23.14	53.45	30.31	9.000	N	OFF	9.6
0.2153	21.81	53.00	31.19	9.000	N	OFF	9.6
0.2288	20.80	52.50	31.70	9.000	N	OFF	9.6
0.2400	20.86	52.10	31.24	9.000	N	OFF	9.6
1.3978	37.26	46.00	8.74	9.000	N	OFF	9.6
1.4113	37.09	46.00	8.91	9.000	N	OFF	9.6
1.4225	37.33	46.00	8.67	9.000	N	OFF	9.6
1.4338	37.28	46.00	8.72	9.000	N	OFF	9.6
1.4585	37.18	46.00	8.82	9.000	N	OFF	9.6
1.4810	36.67	46.00	9.33	9.000	N	OFF	9.6
27.6463	24.89	50.00	25.11	9.000	N	OFF	10.0
28.2425	26.66	50.00	23.34	9.000	N	OFF	10.1
28.5350	26.52	50.00	23.48	9.000	N	OFF	10.1
28.7398	25.84	50.00	24.16	9.000	N	OFF	10.1
28.9063	24.89	50.00	25.11	9.000	N	OFF	10.1
28.9513	24.86	50.00	25.14	9.000	N	OFF	10.1

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## 11. LIST OF TEST EQUIPMENT

### Conducted Test

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	09/04/2020	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	09/16/2020	Annual	101910
ESPAC	SU-642 / Temperature Chamber	03/15/2021	Annual	0093008124
Agilent	N9020A / Signal Analyzer	04/16/2021	Annual	MY50210191
Agilent	N9030A / Signal Analyzer	01/11/2021	Annual	MY49431210
Agilent	N1911A / Power Meter	04/08/2021	Annual	MY45100523
Agilent	N1921A / Power Sensor	04/08/2021	Annual	MY57820067
Agilent	87300B / Directional Coupler	11/10/2020	Annual	3116A03621
Hewlett Packard	11667B / Power Splitter	02/09/2021	Annual	10545
Hewlett Packard	E3632A / DC Power Supply	06/10/2021	Annual	KR75303960
Weinschel	2-20 / Attenuator(20 dB)	10/07/2020	Annual	BR0592
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A
HCT CO., LTD.	FCC WLAN&BT&BLE Conducted Test Software v3.0	N/A	N/A	N/A
Rohde & Schwarz	CBT / Bluetooth Tester	05/04/2021	Annual	100422

### Note:

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

**Radiated Test**

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Emco	2090 / Controller	N/A	N/A	060520
Ets	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	03/19/2020	Biennial	1513-333
Schwarzbeck	VULB 9168 / Hybrid Antenna	09/04/2020	Biennial	9168-0895
Schwarzbeck	BBHA 9120D / Horn Antenna	11/18/2019	Biennial	9120D-1191
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	11/29/2019	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/14/2020	Annual	836650/016
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/22/2020	Annual	101068-SZ
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	01/06/2021	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	02/08/2021	Annual	1
CERNEX	CBLU1183540B-01/Broadband Bench Top LNA	12/23/2020	Annual	N/A
WEINSCHTEL	56-10 / Attenuator(10 dB)			
CERNEX	CBL06185030 / Broadband Low Noise Amplifier	12/23/2020	Annual	N/A
Api tech.	18B-03 / Attenuator (3 dB)			
Wainwright Instruments	WHKX10-2700-3000-18000-40SS / High Pass Filter	12/23/2020	Annual	N/A
Wainwright Instruments	WHKX8-6090-7000-18000-40SS / High Pass Filter	12/23/2020	Annual	N/A
T&M SYSTEM	COAXIAL ATTENUATOR / Thru	12/23/2020	Annual	N/A
CERNEX	CBL18265035 / Power Amplifier	12/04/2020	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	03/23/2021	Annual	25956
TESCOM	TC-3000C / Bluetooth Tester	03/09/2021	Annual	3000C000276

**Note:**

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



## 12. ANNEX A\_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2106-FI018-P