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TEST REPORT

FCC/ISED UNII Test for ETWCERBS01
Certification

APPLICANT
LG Innotek Co., Ltd.

REPORT NO.
HCT-RF-2106-FI005

DATE OF ISSUE
June 4, 2021

Tested by
Jin Gwan Lee

Technical Manager
Jong Seok Lee

Accredited by KOLAS, Republic of KOREA

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June 04, 2021

Additional Model
-

Applicant	**LG Innotek Co., Ltd.** E1/E3, 30, Magokjungang 10-ro, Gangseo-gu, Seoul, 07796, Korea
Eut Type Model Name	RF Module ETWCERBS01
FCC ID IC	YZP-ETWCERBS01 7414C-ETWCERBS01
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 04, 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.

This laboratory is not accredited for the test results marked *.

The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 AND KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA.(HCT Accreditation No.: KT197)

CONTENTS

1. GENERAL INFORMATION

EUT DESCRIPTION

Model	ETWCERBS01	
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	01 Antenna type: Planar Inverted F antenna A7 Antenna type: Diplole antenna	
Antenna Peak Gain	01 Antenna Peak Gain : 5.37 dBi(UNII 1)/ 5.57 dBi(UNII 2A)/ 5.63 dBi(UNII 2C)/ 5.39 dBi(UNII 3) A7 Antenna Peak Gain : -0.38 dBi(UNII 1)/ -0.07 dBi(UNII 2A)/ 0.78 dBi(UNII 2C)/ 2.14 dBi(UNII 3)	
Straddle channel	Supported	
TDWR Band	Not Supported	
Dynamic Frequency Selection	Slave without radar detection	
Date(s) of Tests	April 26, 2021 ~ June 01, 2021	
PMN (Product Marketing Number)	RF Module	
HVIN (Hardware Version Identification Number)	ETWCERBS01	
FVIN (Firmware Version Identification Number)	1.0	
HMN (Host Marketing Name)	N/A	
EUT serial numbers	Radiated : 944444105C3E Conducted : 44444105C3A	
Manufacurer	PT. LG INNOTEK INDONESIA Bekasi International Industrial Estate, Blok C8 NO. 12 & 12 A, Desa Cibatu, Cikarang Selatan, Bekasi 17750 Indonesia	

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*log(N_{ANT}/N_{SS}) dBi

- 01 Antenna

Band	Ant Gain (dBi)		N_{ANT}/N_{SS}	Directional Gain = G_{ANT}+10*log(N_{ANT}/N_{SS})dBi
UNII 1	Ant1	5.37	2/1	8.38
	Ant2	5.37	2/1	
UNII 2A	Ant1	5.57	2/1	8.58
	Ant2	5.57	2/1	
UNII 2C	Ant1	5.63	2/1	8.64
	Ant2	5.63	2/1	
UNII 3	Ant1	5.39	2/1	8.41
	Ant2	5.39	2/1	

- A7 Atnenna

Band	Ant Gain (dBi)		N_{ANT}/N_{SS}	Directional Gain = $G_{ANT}+10*\log(N_{ANT}/N_{SS})$dBi
UNII 1	Ant1	-0.38	2/1	2.63
	Ant2	-0.38	2/1	
UNII 2A	Ant1	-0.07	2/1	2.94
	Ant2	-0.07	2/1	
UNII 2C	Ant1	0.78	2/1	3.79
	Ant2	0.78	2/1	
UNII 3	Ant1	2.14	2/1	5.15
	Ant2	2.14	2/1	

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	9.40	0.009	9.34	0.009	12.36	0.017
	802.11n (HT20)	9.37	0.009	9.20	0.008	12.26	0.017
	802.11n (HT40)	10.46	0.011	10.37	0.011	13.43	0.022
	802.11ac (VHT20)	9.55	0.009	9.38	0.009	12.46	0.018
	802.11ac (VHT40)	10.53	0.011	10.17	0.010	13.36	0.022
	802.11ac (VHT80)	10.21	0.010	10.39	0.011	13.31	0.021
UNII2A	802.11a	15.48	0.035	15.06	0.032	18.15	0.065
	802.11n (HT20)	15.50	0.035	15.20	0.033	18.34	0.068
	802.11n (HT40)	15.10	0.032	15.14	0.033	18.09	0.064
	802.11ac (VHT20)	15.52	0.036	15.22	0.033	18.38	0.069
	802.11ac (VHT40)	15.46	0.035	15.16	0.033	18.32	0.068
	802.11ac (VHT80)	13.13	0.021	13.01	0.020	16.08	0.041
UNII2C	802.11a	15.30	0.034	15.29	0.034	18.10	0.065
	802.11n (HT20)	15.10	0.032	15.29	0.034	18.10	0.064
	802.11n (HT40)	15.41	0.035	15.30	0.034	18.36	0.068
	802.11ac (VHT20)	14.79	0.030	15.27	0.034	18.03	0.063
	802.11ac (VHT40)	15.16	0.033	15.26	0.034	18.13	0.065
	802.11ac (VHT80)	13.10	0.020	13.13	0.021	16.13	0.041
UNII3	802.11a	15.31	0.034	15.14	0.033	18.24	0.067
	802.11n (HT20)	15.53	0.036	15.29	0.034	18.39	0.069
	802.11n (HT40)	15.10	0.032	15.07	0.032	18.05	0.064
	802.11ac (VHT20)	15.58	0.036	15.40	0.035	18.29	0.067
	802.11ac (VHT40)	15.23	0.033	15.14	0.033	18.20	0.066
	802.11ac (VHT80)	13.26	0.021	13.04	0.020	16.16	0.041

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 February 14, 2019 (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.

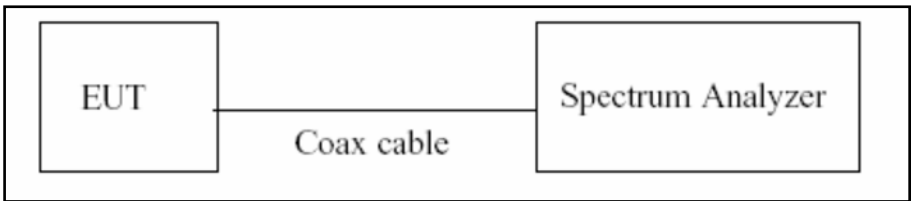
The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
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.

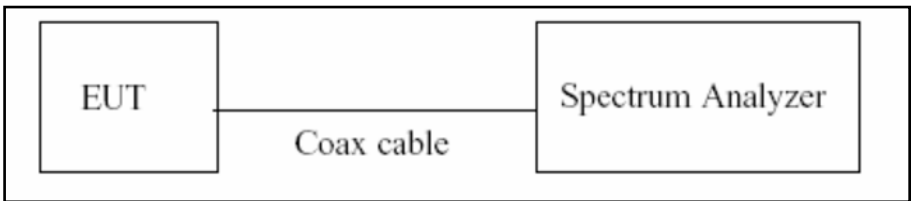
1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz (≥ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on}/ T_{total} and Duty Cycle Factor = 10log(1/Duty Cycle)

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 ≥ 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 lever 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 ≒ 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.

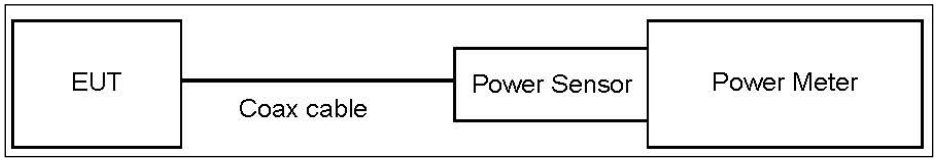
8.3. Output Power Measurement

Limit

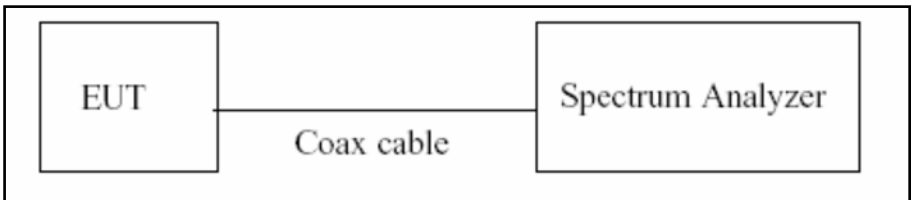
Band	Limit
UNII 1	- Master : Not exceed 1 W(=30dBm) - Slave : Not exceed 250 mW(=23.98 dBm)
UNII 2A, 2C	Not exceed the lesser of 250 mW or 11 dBm + 10 log B, (where B is the 26 dB emission bandwidth in megahertz.)
UNII 3	Not exceed 1 W(=30dBm)

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 ≥ 3 MHz.
5. Number of points in sweep ≥ 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 10log(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		23.69
			23.66
	UNII 2C		23.68
			23.65
	UNII 3		30.00
			30.00
MIMO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	23.98
	UNII 2A		23.66
	UNII 2C		23.65
	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)

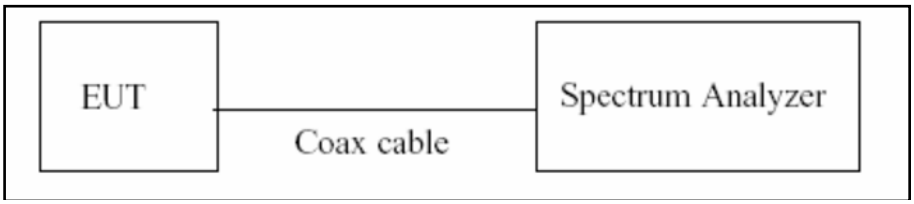
Operating Mode	Band	Mode	E.I.R.P Limit (dBm)	Conducted Limit (dBm)
SISO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	22.14	N/A
			22.14	N/A
	UNII 2A		29.14	23.14
			29.14	23.14
	UNII 2C		29.14	23.14
			29.14	23.14
	UNII 3		N/A	30.00
			N/A	30.00
MIMO	UNII 1	802.11a/ 802.11n20/ 802.11ac20	22.14	N/A
	UNII 2A		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	30.00
			N/A	30.00
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	30.00

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 ≥ 3 MHz
4. Number of points in sweep ≥ 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

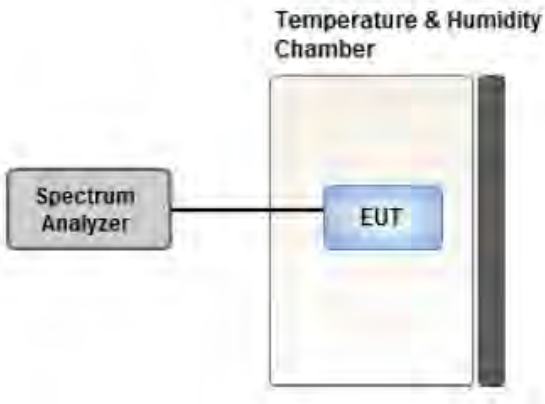
(Actual value of loss for the attenuator and cable combination)

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 battety 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 μH/50 ohms line impedance stabilization network (LISN).

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

[a]Decreases with the logarithm of the frequency.

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

Test Configuration

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

Test Procedure

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

Sample Calculation

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

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(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30

ISED

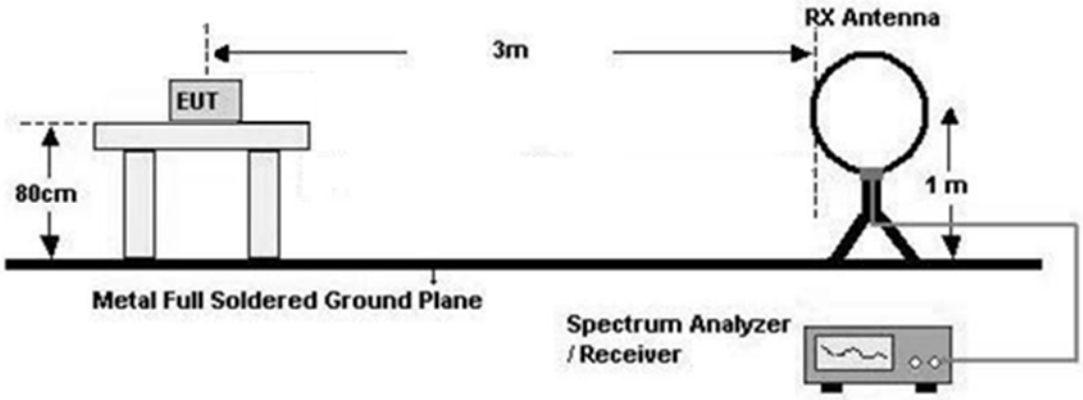
Frequency (MHz)	Field Strength (uA/m)	Measurement Distance (m)
0.009 – 0.490	6.37/F(kHz)	300
0.490 – 1.705	63.7/F(kHz)	30
1.705 – 30	0.08	30

FCC&ISED

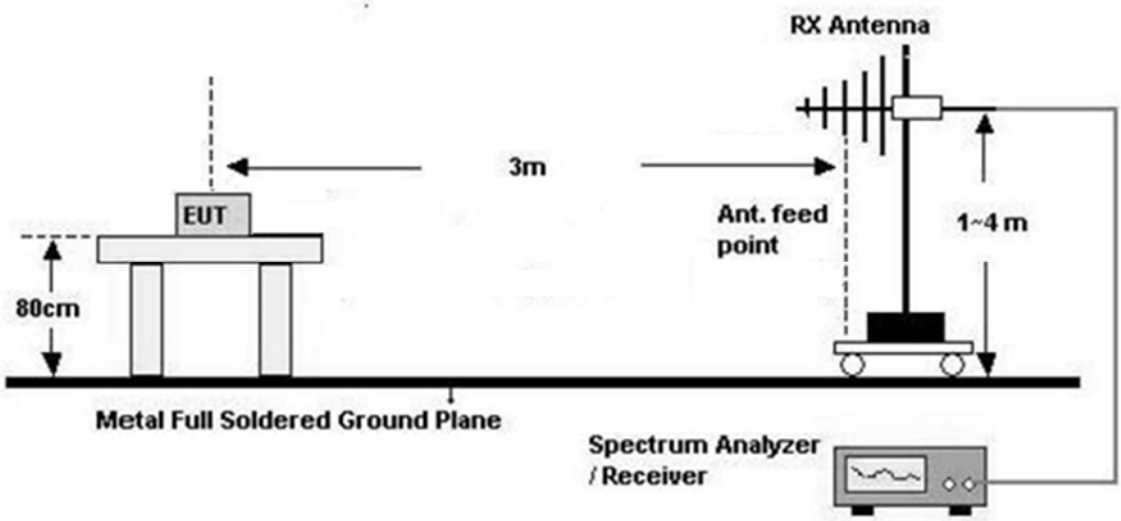
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

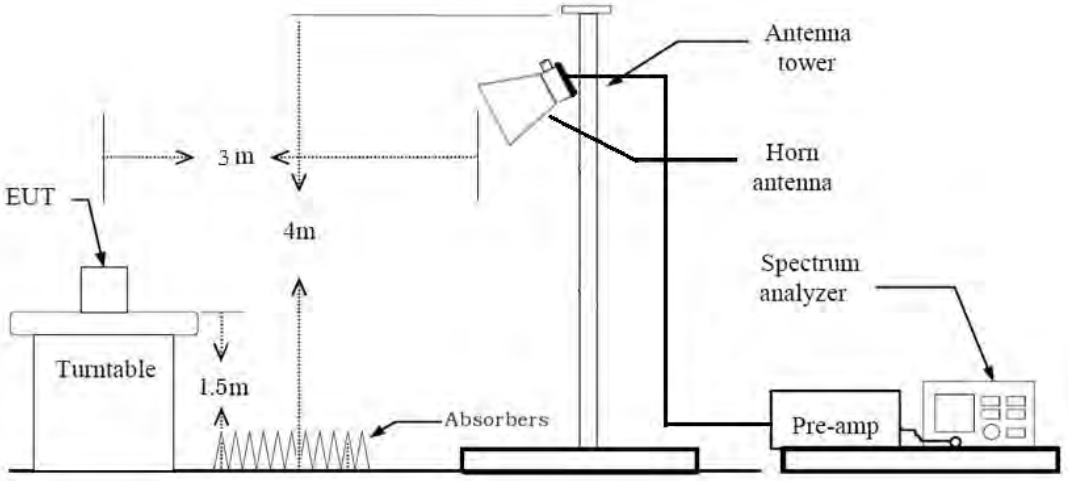
Below 30 MHz



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) = 40log(3 m/300 m) = - 80 dB
   Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m
8. Spectrum Setting
   - Frequency Range = 9 kHz ~ 30 MHz
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 9 kHz
   - VBW ≥ 3 x RBW
9. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

KDB 414788 OFS and Chamber Correlation Justification

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

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

Test Procedure of Radiated spurious emissions(Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 100 kHz
      - VBW ≥ 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 ≥ 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 ≥ 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 = 20log (test distance / 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 ≥ 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 ≥ 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 = 20log (test distance / 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

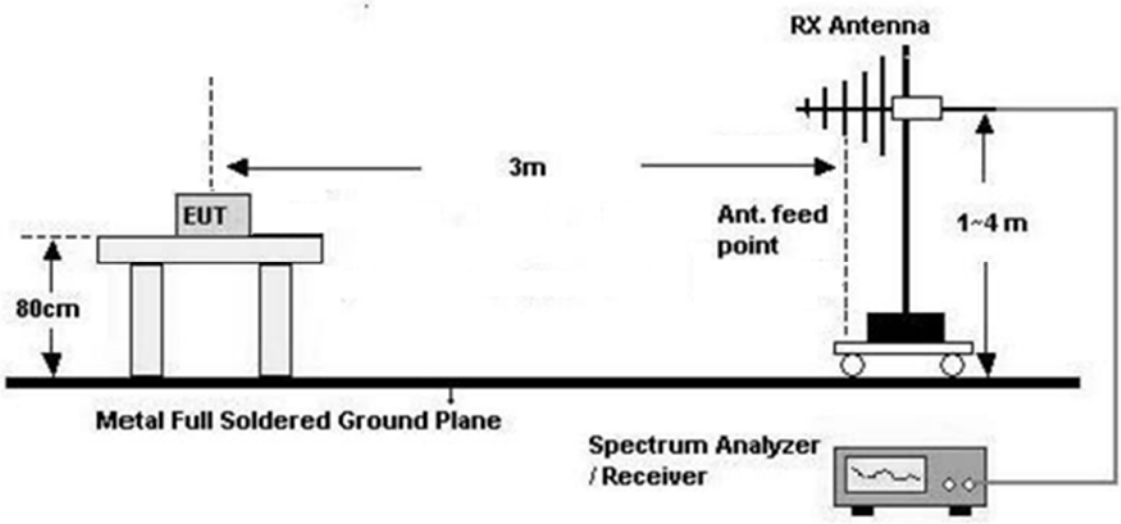
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

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

Test Configuration

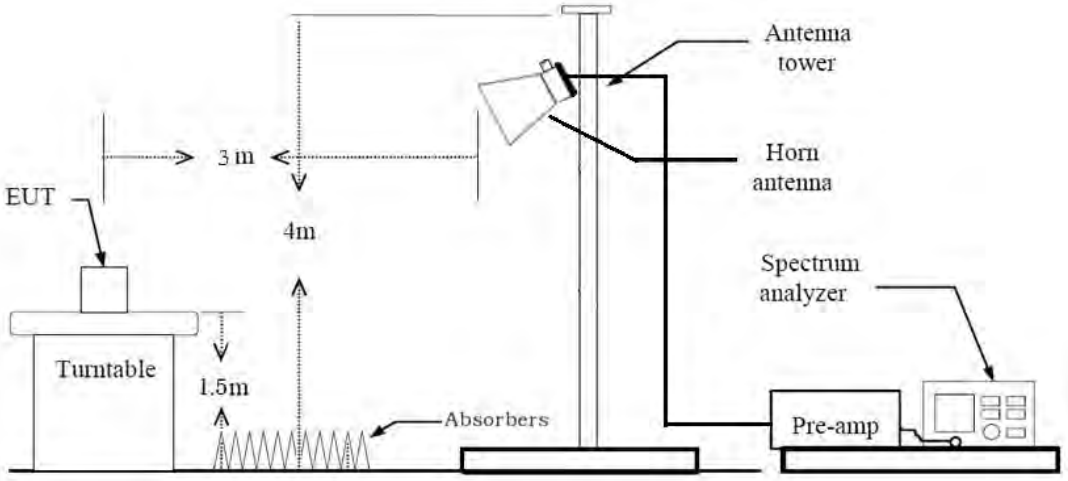
30 MHz - 1 GHz



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 ≥ 3 x RBW
   (2) Measurement Type(Quasi-peak):
      - Measured Frequency Range : 30 MHz – 1 GHz
      - Detector = Quasi-Peak
      - RBW = 120 kHz
7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)

Above 1 GHz



Test Procedure of Radiated spurious emissions (Above 1 GHz)

1. The EUT is placed on a turntable, which is 1.5 m above ground plane.
2. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
3. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
4. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. The unit was tested with its standard battery.
8. Spectrum Setting
   (1) Measurement Type(Peak):
      - Measured Frequency Range : 1 GHz – 25 GHz
      - Detector = Peak
      - Trace = Maxhold
      - RBW = 1 MHz
      - VBW ≥ 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 ≥ 1/τ Hz, where τ = 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 = 20log (test distance / 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_01(SISO), Ant2_01(SISO), Ant1_01+Ant2_01(CDD,SDM),
     Ant1_A7(SISO), Ant2_A7(SISO), Ant1_A7+Ant2_A7(CDD,SDM)
   - Worst case : Ant1_01+Ant2_01(CDD),
3. EUT Axis
   - Radiated Spurious Emissions : Y
   - Radiated Restricted Band Edge : Z
4. All data rate of operation were investigated and the worst case data rate results are reported
   - 802.11a : 6Mbps
   - 802.11n : MCS0
   - 802.11ac : MCS0
5. All position of loop antenna were investigated and the test result is a no critical peak found at all positions.
   - Position : Horizontal, Vertical, Parallel to the ground plane

AC Power line Conducted Emissions

1. We don't perform powerline conducted emission test. Because this EUT is used DC.

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)	< 250 mW(5150-5250 MHz) < 250 mW or 11+10 log $\log_{10}$ (BW) dBm (5250-5350 MHz) < 250 mW or 11+10 log $\log_{10}$ (BW) dBm (5470-5725 MHz) <1 W(5725-5850 MHz)		PASS
Peak Power Spectral Density	§ 15.407(a)(1),(5)	<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	<FCC 15.207 limits		N/A(#Note1)
Undesirable Emissions	§ 15.407(b)	<-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)(5), (6)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS

#Note1 : Not Tested

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		N/A(#Note1)
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)		
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		PASS
Receiver Spurious Emissions	RSS-GEN, 5 RSS-GEN, 7.3	RSS-GEN section 7.3 table 3		PASS

#Note1 : Not Tested

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	18.60	16.376
5200	40	18.60	16.369
5240	48	18.52	16.384
5260	52	18.62	16.397
5300	60	18.57	16.380
5320	64	18.63	16.379
5500	100	18.61	16.377
5580	116	18.63	16.389
5720	144	18.52	16.405
5745	149	18.62	16.392
5785	157	18.55	16.386
5825	165	18.60	16.401

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.59	17.545
5200	40	19.52	17.542
5240	48	19.49	17.541
5260	52	19.54	17.546
5300	60	19.52	17.544
5320	64	19.56	17.542
5500	100	19.49	17.533
5580	116	19.55	17.551
5720	144	19.57	17.538
5745	149	19.58	17.545
5785	157	19.54	17.553
5825	165	19.53	17.560

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	41.32	36.080
5230	46	41.04	36.027
5270	54	41.12	36.052
5310	62	40.86	36.044
5510	102	40.93	36.040
5550	110	41.04	36.078
5710	142	40.89	36.044
5755	151	41.14	36.092
5795	159	40.92	36.067

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.54	17.549
5200	40	19.54	17.551
5240	48	19.58	17.544
5260	52	19.57	17.552
5300	60	19.54	17.547
5320	64	19.62	17.544
5500	100	19.52	17.548
5580	116	19.53	17.552
5720	144	19.50	17.555
5745	149	19.51	17.552
5785	157	19.61	17.563
5825	165	19.60	17.555

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	41.07	36.051
5230	46	40.78	36.046
5270	54	41.02	36.057
5310	62	41.05	36.062
5510	102	41.04	36.042
5550	110	40.81	36.061
5710	142	40.85	36.050
5755	151	41.21	36.106
5795	159	41.11	36.039

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	80.97	74.577
5290	58	81.14	74.639
5530	106	80.69	74.516
5690	138	81.02	74.644
5775	155	81.04	74.657

[ANT2]

802.11a Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	18.50	16.369
5200	40	18.50	16.376
5240	48	18.49	16.377
5260	52	18.45	16.387
5300	60	18.53	16.388
5320	64	18.46	16.382
5500	100	18.52	16.397
5580	116	18.43	16.388
5720	144	18.44	16.378
5745	149	18.50	16.387
5785	157	18.50	16.386
5825	165	18.46	16.387

802.11n(HT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.62	17.558
5200	40	19.51	17.558
5240	48	19.61	17.556
5260	52	19.63	17.546
5300	60	19.60	17.553
5320	64	19.61	17.544
5500	100	19.55	17.553
5580	116	19.54	17.559
5720	144	19.61	17.545
5745	149	19.53	17.554
5785	157	19.63	17.553
5825	165	19.57	17.556

802.11n(HT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	40.85	36.067
5230	46	41.06	36.099
5270	54	41.23	36.100
5310	62	41.16	36.103
5510	102	41.55	36.072
5550	110	40.97	36.062
5710	142	41.16	36.051
5755	151	41.23	36.079
5795	159	41.02	36.042

802.11ac(VHT20) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5180	36	19.61	17.567
5200	40	19.53	17.564
5240	48	19.62	17.564
5260	52	19.60	17.564
5300	60	19.64	17.567
5320	64	19.58	17.557
5500	100	19.58	17.548
5580	116	19.53	17.563
5720	144	19.59	17.563
5745	149	19.79	17.571
5785	157	19.50	17.559
5825	165	19.58	17.562

802.11ac(VHT40) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5190	38	41.16	36.054
5230	46	41.17	36.088
5270	54	41.02	36.067
5310	62	40.87	36.049
5510	102	41.29	36.075
5550	110	41.06	36.086
5710	142	41.21	36.041
5755	151	41.51	36.085
5795	159	41.13	36.055

802.11ac(VHT80) Mode		26dB Bandwidth [MHz]	99% bandwidth [MHz]
Frequency [MHz]	Channel No.		
5210	42	81.17	74.557
5290	58	81.13	74.545
5530	106	81.19	74.671
5690	138	80.82	74.404
5775	155	81.06	74.372

[ANT1]

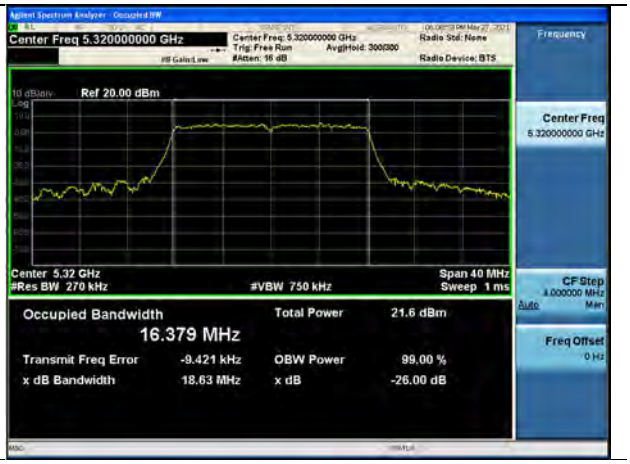
▣ Test Plots(802.11a)

Note:

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

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

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



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

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

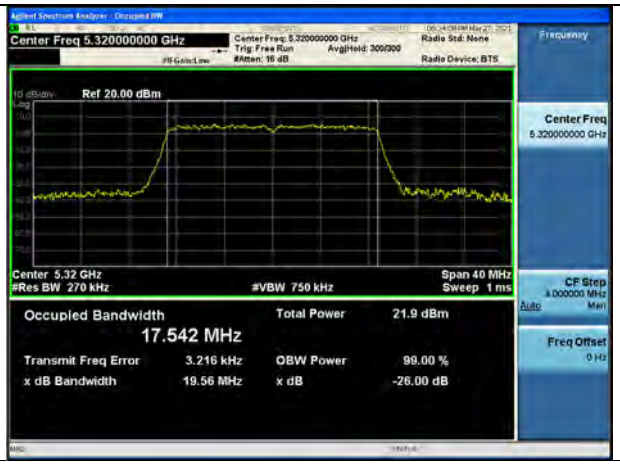
▣ Test Plots(802.11n(HT20))

Note:

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

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 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 149)

▣ 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 38)	802.11n_HT40 UNII 2A BAND 26dB Bandwidth (CH 54)
	
802.11n_HT40 UNII 2C BAND 26dB Bandwidth(CH 110)	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 116)	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 62)

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)
	

[ANT2]

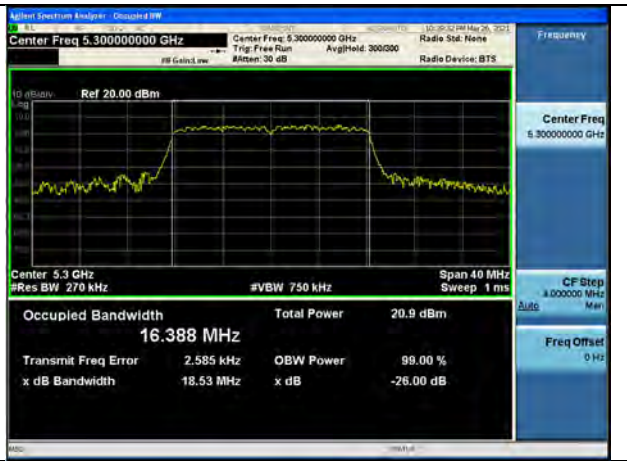
▣ Test Plots(802.11a)

Note:

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

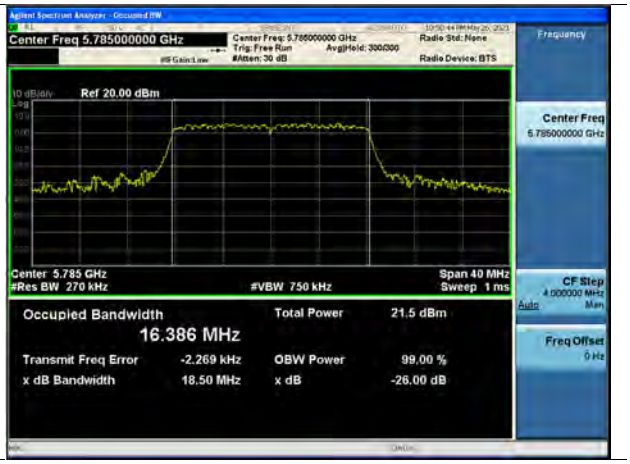
802.11a UNII 1 BAND 26dB Bandwidth (CH 40)

802.11a UNII 2A BAND 26dB Bandwidth (CH 60)



802.11a UNII 2C BAND 26dB Bandwidth (CH 100)

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



▣ Test Plots(802.11n(HT20))

Note:

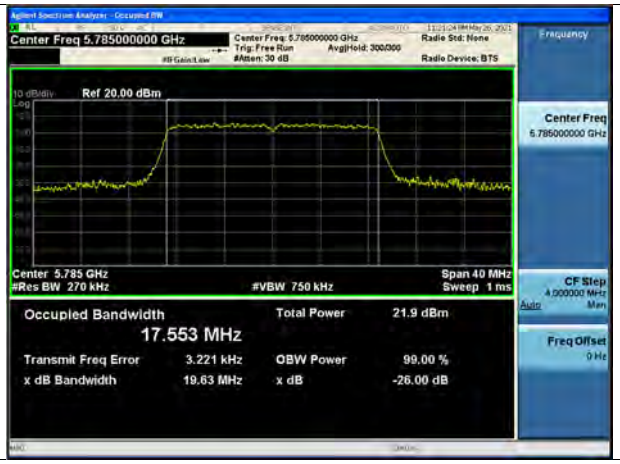
In order to simplify the report, attached plots were only the most wide channel.

802.11n_HT20 UNII 1 BAND 26dB Bandwidth(CH 36)

802.11n_HT20 UNII 2A BAND 26dB Bandwidth(CH 52)

802.11n_HT20 UNII 2C BAND 26dB Bandwidth(CH 144)

802.11n_HT20 UNII 3 BAND 26dB Bandwidth(CH 157)



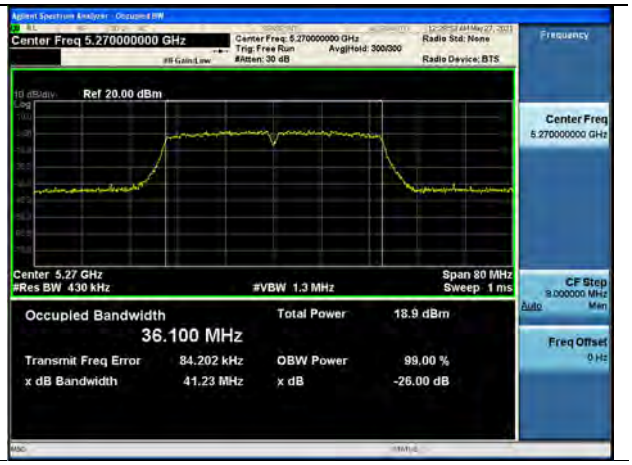
▣ Test Plots(802.11n(HT40))

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 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 60)
	
802.11ac_VHT20 UNII 2C BAND 26dB Bandwidth(CH 144)	802.11ac_VHT20 UNII 3 BAND 26dB Bandwidth(CH 149)
	

▣ 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)

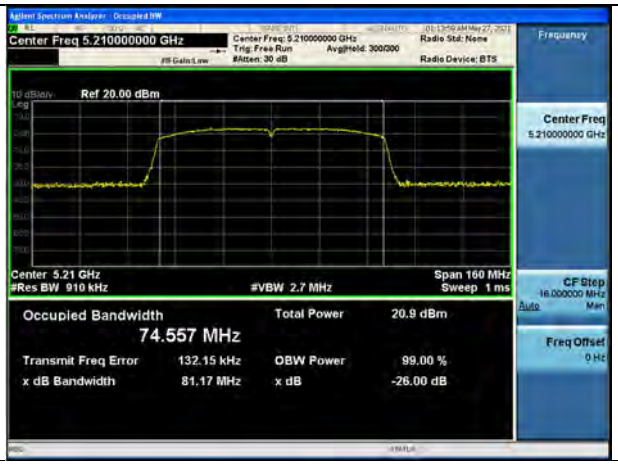
802.11ac_VHT40 UNII 2C BAND 26dB Bandwidth(CH 102)

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 106)	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	16.54	> 0.5	Pass
5785	157	16.52	> 0.5	Pass
5825	165	16.51	> 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	17.70	> 0.5	Pass
5825	165	17.68	> 0.5	Pass

802.11n(HT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.46	> 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	17.69	> 0.5	Pass
5785	157	17.68	> 0.5	Pass
5825	165	17.68	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.45	> 0.5	Pass
5795	159	36.43	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.88	> 0.5	Pass

[ANT2]

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

802.11n(HT20) 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	17.69	> 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	36.43	> 0.5	Pass

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.68	> 0.5	Pass
5785	157	17.69	> 0.5	Pass
5825	165	17.71	> 0.5	Pass

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	36.46	> 0.5	Pass
5795	159	36.43	> 0.5	Pass

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]	Limit [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	73.43	> 0.5	Pass

[ANT1]

▣ Test Plots

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

802.11a (CH.165)

802.11n(HT20) (CH.157)

802.11n(HT40) (CH.159)

802.11ac(VHT20) (CH.165)

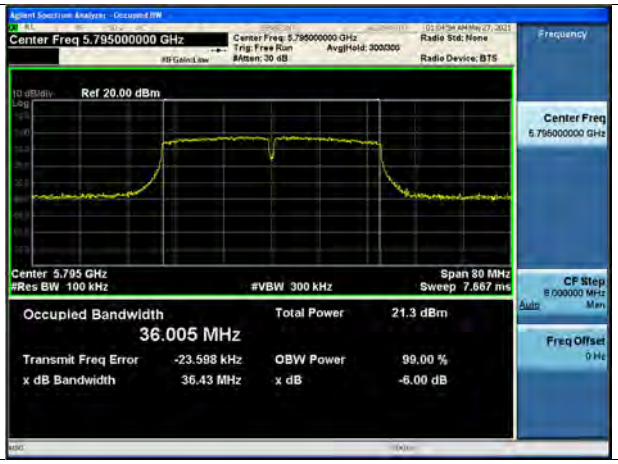
802.11ac(VHT40) (CH.159)

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.149)	802.11n(HT20) (CH.157)
	
802.11n(HT40) (CH.159)	**802.11ac(VHT20) (CH.149)**
	
802.11ac(VHT40) (CH.159)	**802.11ac(VHT80) (CH.155)**
	

99 % Bandwidth measurement(ISED)

[ANT1]

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	16.485
5785	157	16.474
5825	165	16.478

802.11n(HT20) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.599
5785	157	17.603
5825	165	17.604

802.11n(HT40) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.316
5795	159	36.302

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.607
5785	157	17.609
5825	165	17.602

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.317
5795	159	36.273

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	74.643

[ANT2]

802.11a Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	16.458
5785	157	16.444
5825	165	16.442

802.11n(HT20) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.595
5785	157	17.598
5825	165	17.599

802.11n(HT40) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.374
5795	159	36.272

802.11ac(VHT20) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5745	149	17.619
5785	157	17.615
5825	165	17.617

802.11ac(VHT40) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5755	151	36.277
5795	159	36.215

802.11ac(VHT80) Mode		Measured Bandwidth [MHz]
Frequency [MHz]	Channel No.	
5775	155	74.426

[ANT1]

▣ Test Plots

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

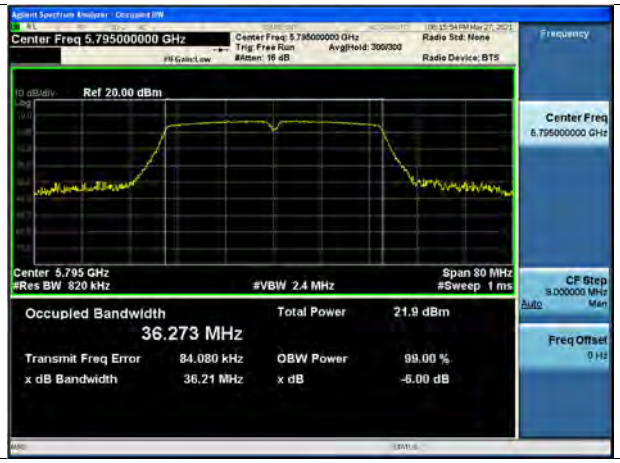
802.11a (CH.157)

802.11n(HT20) (CH.149)

802.11n(HT40) (CH.159)

802.11ac(VHT20) (CH.165)

802.11ac(VHT40) (CH.159)



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.165)

802.11n(HT20) (CH.149)

802.11n(HT40) (CH.159)

802.11ac(VHT20) (CH.157)

802.11ac(VHT40) (CH.159)

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 Limts (802.11a, 802.11n_HT20, 802.11ac_VHT20)

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

FCC Limts (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 Limts (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 Limts (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

Mod	CH	Worst Data rate (Mbps)	PLS	SISO Measured Power(dBm)		
				Ant1 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)
802.11a	36	6Mbps	48	9.37	5.38	14.75
	40		48	9.40		14.78
	48		47	9.35		14.73
	52		71	15.48	5.58	21.06
	60		70	15.12		20.70
	64		70	15.13		20.71
	100		64	14.82	5.64	20.46
	116		63	14.73		14.73
	144		66	15.30		20.94
	149		64	15.31	-	-
	157		62	15.16		-
	165		64	15.31		-
802.11n_20MHz	36	MCS0_6.5 Mbps	48	9.05	5.38	14.43
	40		48	9.37		14.75
	48		48	9.30		14.68
	52		72	15.03	5.58	20.61
	60		72	15.34		20.92
	64		73	15.50		21.08
	100		65	14.74	5.64	20.38
	116		65	14.68		20.32
	144		66	15.10		20.74
	149		64	15.21	-	-
	157		65	15.47		-
	165		67	15.53		-
802.11n_40MHz	38	MCS0_13.5 Mbps	53	10.20	5.38	15.58
	46		53	10.46		15.58
	54		73	14.74	5.58	20.32
	62		73	15.10		20.68
	102		66	14.69	5.64	20.33
	110		66	14.60		20.24
	142		66	15.41		21.05
	151		64	15.00	-	-
	159		64	15.10		-

802.11ac_20MHz	36	MCS0_6.5 Mbps	49	9.55	5.38	14.93
	40		48	9.43		14.81
	48		48	9.54		14.92
	52		73	15.37	5.58	20.95
	60		72	15.21		20.79
	64		73	15.52		21.10
	100		64	14.66	5.64	20.30
	116		64	14.79		20.19
	144		62	14.57		20.21
	149		63	14.93	-	-
	157		63	15.19		-
	165		66	15.58		-
802.11ac_40MHz	38	MCS0_13.5 Mbps	52	10.31	5.38	15.69
	46		51	10.53		15.91
	54		73	15.10	5.58	20.68
	62		73	15.46		21.04
	102		65	14.71	5.64	20.35
	110		65	14.70		20.34
	142		68	15.16		20.80
	151		64	15.23	-	-
	159		64	15.20		-
802.11ac_80MHz	42	MCS0_29.3 Mbps	54	10.21	8.38	18.59
	58		65	13.13	8.58	21.71
	106		58	13.10	8.64	21.74
	138		58	12.86		21.50
	155		56	13.26	-	-

[Ant2]

FCC Limts (802.11a, 802.11n_HT20, 802.11ac_VHT20)

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

FCC Limts (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 Limts (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 Limts (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

Mod	CH	Worst Data rate (Mbps)	PLS	SISO Measured Power(dBm)		
				Ant2 Power (dBm)	Peak Ant Gain (dBi)	E.I.R.P (dBm)
802.11a	36	6Mbps	48	9.11	5.38	14.49
	40		48	9.23		14.61
	48		47	9.34		14.72
	52		71	14.76	5.58	20.34
	60		70	15.06		20.64
	64		70	14.98		20.56
	100		64	15.22	5.64	20.86
	116		63	15.29		15.29
	144		66	14.86		20.50
	149		64	15.14	-	-
	157		62	14.90		-
	165		64	14.87		-
802.11n_20MHz	36	MCS0_6.5 Mbps	48	9.20	5.38	14.58
	40		48	9.13		14.51
	48		48	9.11		14.49
	52		72	15.10	5.58	20.68
	60		72	15.20		20.78
	64		73	15.15		20.73
	100		65	15.29	5.64	20.93
	116		65	15.14		20.78
	144		66	15.07		20.71
	149		64	15.09	-	-
	157		65	15.29		-
	165		67	15.12		-
802.11n_40MHz	38	MCS0_13.5 Mbps	53	10.34	5.38	15.72
	46		53	10.37		15.72
	54		73	15.14	5.58	20.72
	62		73	15.06		20.64
	102		66	15.30	5.64	20.94
	110		66	15.27		20.91
	142		66	15.28		20.92
	151		64	15.07	-	-
	159		64	14.96		-

802.11ac_20MHz	36	MCS0_6.5 Mbps	49	9.13	5.38	14.51
	40		48	9.38		14.76
	48		48	9.36		14.74
	52		73	15.05	5.58	20.63
	60		72	15.07		20.65
	64		73	15.22		20.80
	100		64	15.06	5.64	20.70
	116		64	15.23		20.63
	144		62	15.27		20.91
	149		63	15.40	-	-
	157		63	15.32		-
	165		66	14.96		-
802.11ac_40MHz	38	MCS0_13.5 Mbps	52	10.11	5.38	15.49
	46		51	10.17		15.55
	54		73	15.08	5.58	20.66
	62		73	15.16		20.74
	102		65	15.26	5.64	20.90
	110		65	15.24		20.88
	142		68	15.07		20.71
	151		64	15.14	-	-
	159		64	14.91		-
802.11ac_80MHz	42	MCS0_29.3 Mbps	54	10.39	8.38	18.77
	58		65	13.01	8.58	21.59
	106		58	13.13	8.64	21.77
	138		58	12.87		21.51
	155		56	13.04	-	-

[MIMO]

FCC Limts (802.11a, 802.11n_HT20, 802.11ac_VHT20)

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

FCC Limts (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 Limts (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 Limts (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

- FCC

Mod	CH	Worst Data rate (Mbps)	PLS	MIMO Total Power (dBm) (CDD)			
				mW	SUM Power (dBm)	Exceed Gain (dBi)	E.I.R.P (dBm)
802.11a	36	6Mbps	48	16.80	12.25	2.38	14.63
	40		48	17.08	12.33		14.71
	48		47	17.20	12.36		14.74
	52		71	65.24	18.15	2.58	20.72
	60		70	64.57	18.10		20.68
	64		70	64.06	18.07		20.64
	100		64	63.60	18.03	2.64	20.67
	116		63	63.52	18.03		20.66
	144		66	64.50	18.10		20.73
	149		64	66.62	18.24	2.41	20.64
	157		62	63.71	18.04		20.45
	165		64	64.65	18.11		20.51
802.11n_20MHz	36	MCS0_6.5 Mbps	48	16.35	12.14	2.38	14.52
	40		48	16.83	12.26		14.64
	48		48	16.66	12.22		14.60
	52		72	64.20	18.08	2.58	20.65
	60		72	67.31	18.28		20.86
	64		73	68.22	18.34		20.92
	100		65	63.59	18.03	2.64	20.67
	116		65	62.04	17.93		20.56
	144		66	64.50	18.10		20.73
	149		64	65.47	18.16	2.41	20.57
	157		65	69.04	18.39		20.80
	165		67	68.24	18.34		20.75
802.11n_40MHz	38	MCS0_13.5 Mbps	53	21.29	13.28	2.38	15.66
	46		53	22.01	13.43		15.81
	54		73	62.44	17.95	2.58	20.53
	62		73	64.42	18.09		20.67
	102		66	63.33	18.02	2.64	20.65
	110		66	62.49	17.96		20.59
	142		66	68.48	18.36		20.99
	151		64	63.76	18.05	2.41	20.45
	159		64	63.69	18.04		20.45

802.11ac_20MHz	36	MCS0_6.5 Mbps	49	17.20	12.36	2.38	14.74
	40		48	17.44	12.42		14.80
	48		48	17.62	12.46		14.84
	52		73	66.42	18.22	2.58	20.80
	60		72	65.33	18.15		20.73
	64		73	68.91	18.38		20.96
	100		64	61.30	17.87	2.64	20.51
	116		64	63.47	18.03		20.66
	144		62	62.29	17.94		20.58
	149		63	65.79	18.18	2.41	20.59
	157		63	67.08	18.27		20.67
	165		66	67.47	18.29		20.70
802.11ac_40MHz	38	MCS0_13.5 Mbps	52	21.00	13.22	2.38	15.60
	46		51	21.70	13.36		15.74
	54		73	64.57	18.10	2.58	20.68
	62		73	67.97	18.32		20.90
	102		65	63.15	18.00	2.64	20.64
	110		65	62.93	17.99		20.62
	142		68	64.95	18.13		20.76
	151		64	66.00	18.20	2.41	20.60
	159		64	64.09	18.07		20.47
802.11ac_80MHz	42	MCS0_29.3 Mbps	54	21.43	13.31	2.38	15.69
	58		65	40.56	16.08	2.58	18.66
	106		58	40.98	16.13	2.64	18.76
	138		58	38.68	15.88		18.51
	155		56	41.32	16.16	2.41	18.57

Note:

Exceed Gain = Directional Gain – 6 (dBi)

UNII-1 Exceed Gain = 8.38 - 6 = 2.38 (dBi)

UNII-2A Exceed Gain = 8.58 – 6 = 2.58 (dBi)

UNII-2C Exceed Gain = 8.64 – 6 = 2.64 (dBi)

UNII-3 Exceed Gain = 8.41 – 6 = 2.41 (dBi)

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Mod	CH	Worst Data rate (Mbps)	PLS	MIMO Total Power (dBm) (CDD)			
				mW	SUM Power (dBm)	Directional Gain (dBi)	E.I.R.P (dBm)
802.11a	36	6Mbps	48	16.80	12.25	8.38	20.63
	40		48	17.08	12.33		20.71
	48		47	17.20	12.36		20.74
	52		71	65.24	18.15	8.58	26.73
	60		70	64.57	18.10		26.68
	64		70	64.06	18.07		26.65
	100		64	63.60	18.03	8.64	26.67
	116		63	63.52	18.03		18.03
	144		66	64.50	18.10		26.74
802.11n_20MHz	36	MCS0_6.5 Mbps	48	16.35	12.14	8.38	20.52
	40		48	16.83	12.26		20.64
	48		48	16.66	12.22		20.60
	52		72	64.20	18.08	8.58	26.66
	60		72	67.31	18.28		26.86
	64		73	68.22	18.34		26.92
	100		65	63.59	18.03	8.64	26.67
	116		65	62.04	17.93		26.57
	144		66	64.50	18.10		26.74
802.11n_40MHz	38	MCS0_13.5 Mbps	53	21.29	13.28	8.38	21.66
	46		53	22.01	13.43		21.66
	54		73	62.44	17.95	8.58	26.53
	62		73	64.42	18.09		26.67
	102		66	63.33	18.02	8.64	26.66
	110		66	62.49	17.96		26.60
	142		66	68.48	18.36		27.00
802.11ac_20MHz	36	MCS0_6.5 Mbps	49	17.20	12.36	8.38	20.74
	40		48	17.44	12.42		20.80
	48		48	17.62	12.46		20.84
	52		73	66.42	18.22	8.58	26.80
	60		72	65.33	18.15		26.73
	64		73	68.91	18.38		26.96
	100		64	61.30	17.87	8.64	26.51
	116		64	63.47	18.03		26.43

	144		62	62.29	17.94		26.58
802.11ac_40MHz	38	MCS0_13.5 Mbps	52	21.00	13.22	8.38	21.60
	46		51	21.70	13.36		21.74
	54		73	64.57	18.10	8.58	26.68
	62		73	67.97	18.32		26.90
	102		65	63.15	18.00	8.64	26.64
	110		65	62.93	17.99		26.63
	142		68	64.95	18.13		26.77
802.11ac_80MHz	42	MCS0_29.3 Mbps	54	21.43	13.31	8.38	21.69
	58		65	40.56	16.08	8.58	24.66
	106		58	40.98	16.13	8.64	24.77
	138		58	38.68	15.88		24.52

Mod	CH	Worst Data rate (Mbps)	PLS	MIMO Total Power (dBm) (CDD)			
				mW	SUM Power (dBm)	Exceed Gain (dBi)	E.I.R.P (dBm)
802.11a	149	6Mbps	64	66.62	18.24	2.41	20.64
	157		62	63.71	18.04		20.45
	165		64	64.65	18.11		20.51
802.11n_20MHz	149	MCS0_6.5 Mbps	64	65.47	18.16	2.41	20.57
	157		65	69.04	18.39		20.80
	165		67	68.24	18.34		20.75
802.11n_40MHz	151	MCS0_13.5 Mbps	64	63.76	18.05	2.41	20.45
	159		64	63.69	18.04		20.45
802.11ac_20MHz	149	MCS0_6.5 Mbps	63	65.79	18.18	2.41	20.59
	157		63	67.08	18.27		20.67
	165		66	67.47	18.29		20.70
802.11ac_40MHz	151	MCS0_13.5 Mbps	64	66.00	18.20	2.41	20.60
	159		64	64.09	18.07		20.47
802.11ac_80MHz	155	MCS0_29.3 Mbps	56	41.32	16.16	2.41	18.57

Note:

Exceed Gain = Directional Gain – 6 (dBi)

UNII-3 Exceed Gain = 8.41 – 6 = 2.41

10.4 POWER SPECTRAL DENSITY

[Ant1]

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11a	-2.024	3.346	11 dBm/MHz
5200	40		-2.177	3.193	
5240	48		-2.211	3.159	
5260	52		4.027	-	
5300	60		3.768	-	
5320	64		3.827	-	
5500	100		3.561	-	
5580	116		3.549	-	
5720	144		4.093	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11a	1.361	30 dBm/500kHz
5785	157		0.985	
5825	165		1.266	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11n (20 MHz)	-2.288	3.082	11 dBm/MHz
5200	40		-2.090	3.280	
5240	48		-2.143	3.227	
5260	52		3.641	-	
5300	60		3.734	-	
5320	64		3.878	-	
5500	100		3.470	-	
5580	116		3.172	-	
5720	144		3.840	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11n (20 MHz)	1.075	30 dBm/500kHz
5785	157		1.293	
5825	165		1.631	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11n (40 MHz)	-3.086	2.284	11 dBm/MHz
5230	46		-3.176	2.194	
5270	54		0.415	-	
5310	62		0.937	-	
5510	102		0.512	-	
5500	110		0.559	-	
5710	142		1.234	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11n (40 MHz)	-1.966	30 dBm/500kHz
5795	159		-2.166	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11ac (20 MHz)	-2.075	3.295	11 dBm/MHz
5200	40		-2.073	3.297	
5240	48		-2.069	3.301	
5260	52		3.954	-	
5300	60		3.718	-	
5320	64		3.876	-	
5500	100		3.227	-	
5580	116		3.424	-	
5720	144		3.473	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11ac (20 MHz)	0.803	30 Bm/500kHz
5785	157		1.036	
5825	165		1.556	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11ac (40 MHz)	-2.906	2.464	11 dBm/MHz
5230	46		-2.906	2.464	
5270	54		1.085	-	
5310	62		1.192	-	
5510	102		0.638	-	
5500	110		0.537	-	
5710	142		0.842	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11ac (40 MHz)	-1.968	30 dBm/500kHz
5795	159		-1.822	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5210	42	802.11ac (80 MHz)	-6.391	-1.021	11 dBm/MHz
5290	58		-3.727	-	
5530	106		-4.028	-	
5690	138		-4.310	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5775	155	802.11ac (80 MHz)	-6.975	30 dBm/500kHz

Note:

1. UNII-1 E.I.R.P Limit is 10 dBm/MHz.

[Ant2]

Frequency (MHz)	Channel No.	Mode	Test Result		Limit
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	
5180	36	802.11a	-2.113	3.257	11 dBm/MHz
5200	40		-2.240	3.130	
5240	48		-1.952	3.418	
5260	52		3.634	-	
5300	60		3.334	-	
5320	64		3.775	-	
5500	100		4.267	-	
5580	116		3.845	-	
5720	144		3.887	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11a	1.681	30 dBm/500kHz
5785	157		1.249	
5825	165		1.105	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11n (20 MHz)	-2.066	3.304	11 dBm/MHz
5200	40		-2.148	3.222	
5240	48		-2.134	3.236	
5260	52		3.788	-	
5300	60		3.891	-	
5320	64		3.835	-	
5500	100		3.809	-	
5580	116		3.616	-	
5720	144		3.431	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11n (20 MHz)	1.316	30 dBm/500kHz
5785	157		1.330	
5825	165		1.320	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11n (40 MHz)	-3.088	2.282	11 dBm/MHz
5230	46		-2.972	2.398	
5270	54		1.076	-	
5310	62		1.145	-	
5510	102		1.319	-	
5500	110		1.314	-	
5710	142		1.307	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11n (40 MHz)	-1.717	30 dBm/500kHz
5795	159		-1.889	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11ac (20 MHz)	-2.002	3.368	11 dBm/MHz
5200	40		-1.921	3.449	
5240	48		-2.115	3.255	
5260	52		3.552	-	
5300	60		3.629	-	
5320	64		3.869	-	
5500	100		3.662	-	
5580	116		3.834	-	
5720	144		3.485	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5745	149	802.11ac (20 MHz)	1.480	30 dBm/500kHz
5785	157		1.418	
5825	165		1.359	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11ac (40 MHz)	-3.032	2.338	11 dBm/MHz
5230	46		-3.085	2.285	
5270	54		1.363	-	
5310	62		1.279	-	
5510	102		1.136	-	
5500	110		1.311	-	
5710	142		1.322	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5755	151	802.11ac (40 MHz)	-1.702	30 dBm/500kHz
5795	159		-2.096	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5210	42	802.11ac (80 MHz)	-6.284	-0.914	11 dBm/MHz
5290	58		-4.071	-	
5530	106		-3.892	-	
5690	138		-4.218	-	

Frequency (MHz)	Channel No.	Mode	Test Result	
			Conducted (dBm/500kHz)	Limit
5775	155	802.11ac (80 MHz)	-6.856	30 dBm/500kHz

Note:

1. UNII-1 E.I.R.P Limit is 10 dBm/MHz.

[MIMO (CDD)]

- FCC

Frequency (MHz)	Channel No.	Mode	Test Result			Limit
			Conducted (dBm/MHz)	Exceed Gain (dBi)	E.I.R.P (dBm/MHz)	
5180	36	802.11a	0.942	2.38	3.322	11 dBm/MHz
5200	40		0.802	2.38	3.182	
5240	48		0.930	2.38	3.310	
5260	52		6.843	2.58	9.422	
5300	60		6.564	2.58	9.143	
5320	64		6.811	2.58	9.390	
5500	100		6.931	2.64	9.567	
5580	116		6.709	2.64	9.344	
5720	144		7.001	2.64	9.636	

Frequency (MHz)	Channel No.	Mode	Test Result			Limit
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	
5745	149	802.11a	4.533	2.41	6.938	30 dBm/500kHz
5785	157		4.128	2.41	6.534	
5825	165		4.196	2.41	6.601	

Frequency (MHz)	Channel No.	Mode	Test Result			Limit
			Conducted (dBm/MHz)	Exceed Gain (dBi)	E.I.R.P (dBm/MHz)	
5180	36	802.11n (20 MHz)	0.834	2.38	3.214	11 dBm/MHz
5200	40		0.891	2.38	3.272	
5240	48		0.872	2.38	3.252	
5260	52		6.725	2.58	9.304	
5300	60		6.823	2.58	9.402	
5320	64		6.867	2.58	9.445	
5500	100		6.651	2.64	9.287	
5580	116		6.407	2.64	9.043	
5720	144		6.648	2.64	9.284	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5745	149	802.11n (20 MHz)	4.207	2.41	6.612	30 dBm/500kHz
5785	157		4.322	2.41	6.727	
5825	165		4.487	2.41	6.892	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/MHz)	Exceed Gain (dBi)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11n (40 MHz)	-0.077	2.38	2.304	11 dBm/MHz
5230	46		-0.063	2.38	2.317	
5270	54		3.762	2.58	6.341	
5310	62		4.052	2.58	6.630	
5510	102		3.935	2.64	6.571	
5500	110		3.955	2.64	6.591	
5710	142		4.281	2.64	6.916	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5755	151	802.11n (40 MHz)	1.170	2.41	3.575	30 dBm/500kHz
5795	159		0.984	2.41	3.389	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/MHz)	Exceed Gain (dBi)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11ac (20 MHz)	0.972	2.38	3.352	11 dBm/MHz
5200	40		1.014	2.38	3.394	
5240	48		0.918	2.38	3.299	
5260	52		6.766	2.58	9.344	
5300	60		6.684	2.58	9.262	
5320	64		6.883	2.58	9.461	
5500	100		6.458	2.64	9.093	
5580	116		6.642	2.64	9.277	
5720	144		6.489	2.64	9.125	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5745	149	802.11ac (20 MHz)	4.158	2.41	6.564	30 dBm/500kHz
5785	157		4.239	2.41	6.645	
5825	165		4.468	2.41	6.874	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/MHz)	Exceed Gain (dBi)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11ac (40 MHz)	0.042	2.38	2.422	11 dBm/MHz
5230	46		0.015	2.38	2.396	
5270	54		4.235	2.58	6.814	
5310	62		4.246	2.58	6.824	
5510	102		3.901	2.64	6.536	
5500	110		3.943	2.64	6.578	
5710	142		4.096	2.64	6.731	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5755	151	802.11ac (40 MHz)	1.176	2.41	3.582	30 dBm/500 kHz
5795	159		1.052	2.41	3.458	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/MHz)	Exceed Gain (dBi)	E.I.R.P (dBm/MHz)	Limit
5210	42	802.11ac (80 MHz)	-3.327	2.38	-0.947	11 dBm/MHz
5290	58		-0.887	2.58	1.692	
5530	106		-0.949	2.64	1.686	
5690	138		-1.254	2.64	1.382	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5775	155	802.11ac (80 MHz)	-3.905	2.41	-1.500	30 dBm/500k Hz

Note:

Exceed Gain = Directional Gain – 6 (dBi)

UNII-1 Exceed Gain = 8.38 - 6 = 2.38 (dBi)

UNII-2A Exceed Gain = 8.58 – 6 = 2.58 (dBi)

UNII-2C Exceed Gain = 8.64 – 6 = 2.64 (dBi)

UNII-3 Exceed Gain = 8.41 – 6 = 2.41 (dBi)

- ISED

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11a	0.942	9.322	11 dBm/MHz
5200	40		0.802	9.182	
5240	48		0.930	9.310	
5260	52		6.843	-	
5300	60		6.564	-	
5320	64		6.811	-	
5500	100		6.931	-	
5580	116		6.709	-	
5720	144		7.001	-	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5745	149	802.11a	4.533	2.41	6.938	30 dBm/500kHz
5785	157		4.128	2.41	6.534	
5825	165		4.196	2.41	6.601	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11n (20 MHz)	0.834	9.214	11 dBm/MHz
5200	40		0.891	9.272	
5240	48		0.872	9.252	
5260	52		6.725	-	
5300	60		6.823	-	
5320	64		6.867	-	
5500	100		6.651	-	
5580	116		6.407	-	
5720	144		6.648	-	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5745	149	802.11n (20 MHz)	4.207	2.41	6.612	30 dBm/500kHz
5785	157		4.322	2.41	6.727	
5825	165		4.487	2.41	6.892	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11n (40 MHz)	-0.077	8.304	11 dBm/MHz
5230	46		-0.063	8.317	
5270	54		3.762	-	
5310	62		4.052	-	
5510	102		3.935	-	
5500	110		3.955	-	
5710	142		4.281	-	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5755	151	802.11n (40 MHz)	1.170	2.41	3.575	30 dBm/500kHz
5795	159		0.984	2.41	3.389	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5180	36	802.11ac (20 MHz)	0.972	9.352	11 dBm/MHz
5200	40		1.014	9.394	
5240	48		0.918	9.299	
5260	52		6.766	-	
5300	60		6.684	-	
5320	64		6.883	-	
5500	100		6.458	-	
5580	116		6.642	-	
5720	144		6.489	-	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5745	149	802.11ac (20 MHz)	4.158	2.41	6.564	30 dBm/500kHz
5785	157		4.239	2.41	6.645	
5825	165		4.468	2.41	6.874	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5190	38	802.11ac (40 MHz)	0.042	8.422	11 dBm/MHz
5230	46		0.015	8.396	
5270	54		4.235	-	
5310	62		4.246	-	
5510	102		3.901	-	
5500	110		3.943	-	
5710	142		4.096	-	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5755	151	802.11ac (40 MHz)	1.176	2.41	3.582	30 dBm/500kHz
5795	159		1.052	2.41	3.458	

Frequency (MHz)	Channel No.	Mode	Test Result		
			Conducted (dBm/MHz)	E.I.R.P (dBm/MHz)	Limit
5210	42	802.11ac (80 MHz)	-3.327	5.053	11 dBm/MHz
5290	58		-0.887	-	
5530	106		-0.949	-	
5690	138		-1.254	-	

Frequency (MHz)	Channel No.	Mode	Test Result			
			Conducted (dBm/500kHz)	Exceed Gain (dBi)	E.I.R.P (dBm/500kHz)	Limit
5775	155	802.11ac (80 MHz)	-3.905	2.41	-1.500	30 dBm/500kHz

Note:

1. UNII-1 E.I.R.P Limit is 10 dBm/MHz.
2. Exceed Gain = Directional Gain – 6 (dBi)
   UNII-3 Exceed Gain = 8.41 – 6 = 2.41 (dBi)

[Ant1]

▣ Test Plots(802.11a)

Note:

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

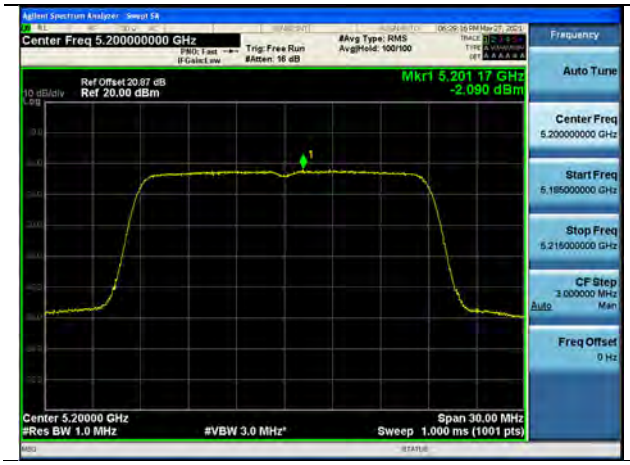
UNII 1 (Ch. 36)	UNII 2A (Ch. 52)
	

UNII 2C (Ch. 144)	UNII 3 (Ch. 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. 64)
	

UNII 2C (Ch. 100)	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. 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. 48)	UNII 2A (Ch. 52)
	
UNII 2C (Ch. 144)	**UNII 3 (Ch. 165)**
	

▣ Test Plots(802.11ac(VHT40))

Note:

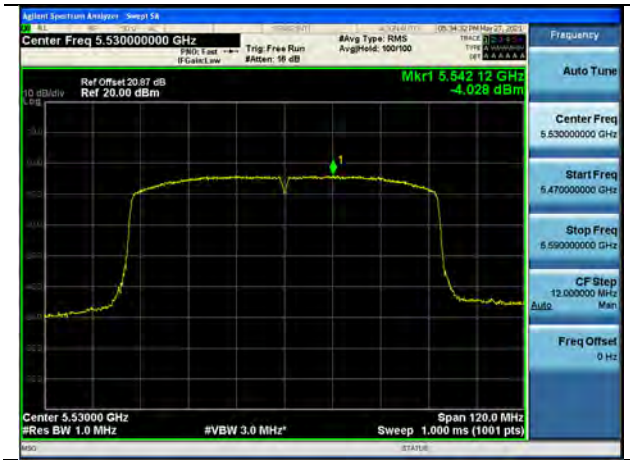
In order to simplify the report, attached plots were only channel of highest power.

UNII 1 (Ch. 46)	UNII 2A (Ch. 62)
	
UNII 2C (Ch. 142)	**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)**
	

[Ant2]

▣ Test Plots(802.11a)

Note:

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

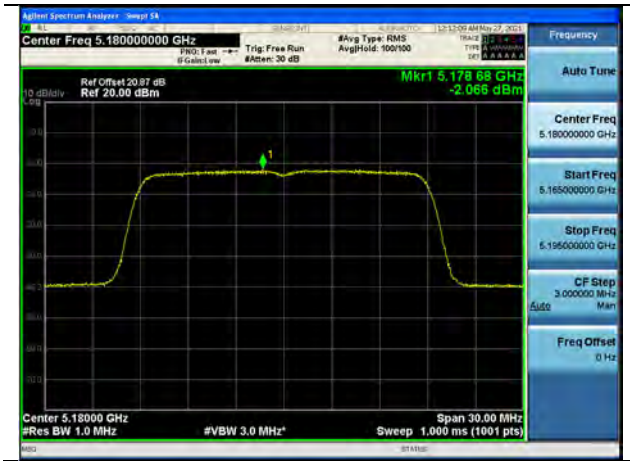
UNII 1 (Ch. 48)	UNII 2A (Ch. 64)
	

UNII 2C (Ch. 100)	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. 36)	UNII 2A (Ch. 60)
	

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. 46)	UNII 2A (Ch. 54)
	

UNII 2C (Ch. 102)	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. 64)
	
UNII 2C (Ch. 116)	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. 54)
	
UNII 2C (Ch. 142)	**UNII 3 (Ch. 151)**
	

▣ 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 (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.3	+20(Ref)	5210079.54	79.54
100%		-30	5210072.30	72.30
100%		-20	5210079.51	79.51
100%		-10	5210053.38	53.38
100%		0	5210066.86	66.86
100%		+10	5210038.87	38.87
100%		+30	5210030.29	30.29
100%		+40	5210081.73	81.73
100%		+50	5210051.77	51.77
Max	3.135	+20	5210041.14	41.14
Min	3.60	+20	5210088.92	88.92

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)	5290080.89	80.89
100%		-30	5290030.76	30.76
100%		-20	5290020.18	20.18
100%		-10	5290089.87	89.87
100%		0	5290010.26	10.26
100%		+10	5290042.81	42.81
100%		+30	5290035.87	35.87
100%		+40	5290078.46	78.46
100%		+50	5290058.07	58.07
Max	3.135	+20	5290009.08	9.08
Min	3.60	+20	5290088.94	88.94

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)	5530063.54	63.54
100%		-30	5530086.18	86.18
100%		-20	5530039.36	39.36
100%		-10	5530062.54	62.54
100%		0	5530086.30	86.3
100%		+10	5530017.02	17.02
100%		+30	5530039.33	39.33
100%		+40	5530073.36	73.36
100%		+50	5530063.51	63.51
Max	3.135	+20	5530012.52	12.52
Min	3.60	+20	5530098.93	98.93

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)	5775044.45	44.45
100%		-30	5775053.26	53.26
100%		-20	5775030.22	30.22
100%		-10	5775006.34	6.34
100%		0	5775075.44	75.44
100%		+10	5775044.35	44.35
100%		+30	5775068.45	68.45
100%		+40	5775077.84	77.84
100%		+50	5775093.46	93.46
Max	3.135	+20	5775014.22	14.22
Min	3.60	+20	5775034.28	34.28

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)	5210085.38	85.38
100%		-30	5210099.35	99.35
100%		-20	5210090.48	90.48
100%		-10	5210036.85	36.85
100%		0	5210089.57	89.57
100%		+10	5210065.27	65.27
100%		+30	5210097.21	97.21
100%		+40	5210065.60	65.60
100%		+50	5210062.98	62.98
Max	3.6	+20	5210070.18	70.18
Min	3.14	+20	5210056.41	56.41

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)	5290076.70	76.70
100%		-30	5290031.17	31.17
100%		-20	5290079.75	79.75
100%		-10	5290028.67	28.67
100%		0	5290032.55	32.55
100%		+10	5290013.61	13.61
100%		+30	5290056.53	56.53
100%		+40	5290054.13	54.13
100%		+50	5290082.36	82.36
Max	3.6	+20	5290027.19	27.19
Min	3.14	+20	5290099.29	99.29

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)	5530027.62	27.62
100%		-30	5530046.83	46.83
100%		-20	5530002.30	2.3
100%		-10	5530084.34	84.34
100%		0	5530018.03	18.03
100%		+10	5530007.09	7.09
100%		+30	5530008.96	8.96
100%		+40	5530009.50	9.5
100%		+50	5530031.93	31.93
Max	3.6	+20	5530067.10	67.10
Min	3.14	+20	5530012.79	12.79

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)	5775038.09	38.09
100%		-30	5775073.31	73.31
100%		-20	5775087.99	87.99
100%		-10	5775061.67	61.67
100%		0	5775020.27	20.27
100%		+10	5775082.14	82.14
100%		+30	5775022.16	22.16
100%		+40	5775070.64	70.64
100%		+50	5775041.40	41.40
Max	3.6	+20	5775049.82	49.82
Min	3.14	+20	5775014.61	14.61

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.

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)	5210060.05	60.05
100%		-30	5210010.90	10.90
100%		-20	5210071.63	71.63
100%		-10	5210042.58	42.58
100%		0	5210029.28	29.28
100%		+10	5210068.96	68.96
100%		+30	5210023.92	23.92
100%		+40	5210072.22	72.22
100%		+50	5210005.20	5.20
Max	3.6	+20	5210016.46	16.46
Min	3.14	+20	5210047.07	47.07

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.

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)	5290006.87	6.87
100%		-30	5290045.99	45.99
100%		-20	5290099.73	99.73
100%		-10	5290059.52	59.52
100%		0	5290005.22	5.22
100%		+10	5290035.27	35.27
100%		+30	5290003.35	3.35
100%		+40	5290093.32	93.32
100%		+50	5290006.08	6.08
Max	3.6	+20	5290048.35	48.35
Min	3.14	+20	5290030.94	30.94

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 (VDC)	Temp. (°C)	Frequency (kHz)	Frequency Error (kHz)
100%	3.3	+20(Ref)	5530005.89	5.89
100%		-30	5530032.80	32.80
100%		-20	5530089.31	89.31
100%		-10	5530024.15	24.15
100%		0	5530053.15	53.15
100%		+10	5530073.32	73.32
100%		+30	5530011.08	11.08
100%		+40	5530069.53	69.53
100%		+50	5530021.87	21.87
Max	3.6	+20	5530074.49	74.49
Min	3.14	+20	5530085.15	85.15

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)	5775006.67	6.67
100%		-30	5775072.81	72.81
100%		-20	5775092.33	92.33
100%		-10	5775018.39	18.39
100%		0	5775070.27	70.27
100%		+10	5775008.88	8.88
100%		+30	5775090.04	90.04
100%		+40	5775039.19	39.19
100%		+50	5775023.81	23.81
Max	3.6	+20	5775094.46	94.46
Min	3.14	+20	5775083.70	83.7

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.

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)	5210094.39	94.39
100%		-30	5210069.32	69.32
100%		-20	5210086.57	86.57
100%		-10	5210040.71	40.71
100%		0	5210020.58	20.58
100%		+10	5210074.91	74.91
100%		+30	5210029.60	29.60
100%		+40	5210081.05	81.05
100%		+50	5210029.57	29.57
Max	3.6	+20	5210020.36	20.36
Min	3.14	+20	5210054.25	54.25

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)	5290016.90	16.90
100%		-30	5290038.62	38.62
100%		-20	5290012.35	12.35
100%		-10	5290074.33	74.33
100%		0	5290037.28	37.28
100%		+10	5290094.84	94.84
100%		+30	5290043.24	43.24
100%		+40	5290078.27	78.27
100%		+50	5290037.84	37.84
Max	3.6	+20	5290030.38	30.38
Min	3.14	+20	5290020.05	20.05

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)	5530011.69	11.69
100%		-30	5530054.80	54.80
100%		-20	5530093.94	93.94
100%		-10	5530069.56	69.56
100%		0	5530053.65	53.65
100%		+10	5530092.56	92.56
100%		+30	5530020.11	20.11
100%		+40	5530056.62	56.62
100%		+50	5530054.29	54.29
Max	3.6	+20	5530060.37	60.37
Min	3.14	+20	5530095.75	95.75

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)	5775009.95	9.95
100%		-30	5775074.14	74.14
100%		-20	5775043.64	43.64
100%		-10	5775018.31	18.31
100%		0	5775004.30	4.3
100%		+10	5775074.55	74.55
100%		+30	5775061.64	61.64
100%		+40	5775029.58	29.58
100%		+50	5775009.30	9.30
Max	3.6	+20	5775027.19	27.19
Min	3.14	+20	5775046.67	46.67

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)	5210043.51	43.51
100%		-30	5210043.87	43.87
100%		-20	5210099.45	99.45
100%		-10	5210073.55	73.55
100%		0	5210066.82	66.82
100%		+10	5210095.51	95.51
100%		+30	5210088.52	88.52
100%		+40	5210040.22	40.22
100%		+50	5210007.73	7.73
Max	3.135	+20	5210031.71	31.71
Min	3.60	+20	5210034.04	34.04

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)	5290059.24	59.24
100%		-30	5290003.54	3.54
100%		-20	5290037.31	37.31
100%		-10	5290096.25	96.25
100%		0	5290068.56	68.56
100%		+10	5290029.71	29.71
100%		+30	5290031.80	31.8
100%		+40	5290045.96	45.96
100%		+50	5290094.93	94.93
Max	3.135	+20	5290095.12	95.12
Min	3.60	+20	5290019.39	19.39

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)	5530066.16	66.16
100%		-30	5530015.29	15.29
100%		-20	5530096.57	96.57
100%		-10	5530096.32	96.32
100%		0	5530054.87	54.87
100%		+10	5530084.97	84.97
100%		+30	5530084.61	84.61
100%		+40	5530039.09	39.09
100%		+50	5530012.64	12.64
Max	3.135	+20	5530024.43	24.43
Min	3.60	+20	5530007.26	7.26

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)	5775095.27	95.27
100%		-30	5775057.90	57.90
100%		-20	5775039.40	39.4
100%		-10	5775058.69	58.69
100%		0	5775093.86	93.86
100%		+10	5775042.79	42.79
100%		+30	5775083.33	83.33
100%		+40	5775020.51	20.51
100%		+50	5775055.83	55.83
Max	3.135	+20	5775028.92	28.92
Min	3.60	+20	5775087.77	87.77

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)	5210079.31	79.31
100%		-30	5210024.10	24.10
100%		-20	5210062.62	62.62
100%		-10	5210058.58	58.58
100%		0	5210021.82	21.82
100%		+10	5210075.17	75.17
100%		+30	5210009.86	9.86
100%		+40	5210014.38	14.38
100%		+50	5210064.24	64.24
Max	3.6	+20	5210051.11	51.11
Min	3.14	+20	5210092.56	92.56

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)	5290070.83	70.83
100%		-30	5290063.88	63.88
100%		-20	5290075.96	75.96
100%		-10	5290080.52	80.52
100%		0	5290083.52	83.52
100%		+10	5290050.11	50.11
100%		+30	5290013.53	13.53
100%		+40	5290028.90	28.9
100%		+50	5290092.76	92.76
Max	3.6	+20	5290009.72	9.72
Min	3.14	+20	5290015.42	15.42

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 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)	5530044.94	44.94
100%		-30	5530023.58	23.58
100%		-20	5530062.67	62.67
100%		-10	5530050.51	50.51
100%		0	5530068.86	68.86
100%		+10	5530014.96	14.96
100%		+30	5530022.32	22.32
100%		+40	5530048.51	48.51
100%		+50	5530008.16	8.16
Max	3.6	+20	5530033.72	33.72
Min	3.14	+20	5530050.02	50.02

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 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)	5775078.34	78.34
100%		-30	5775013.39	13.39
100%		-20	5775038.27	38.27
100%		-10	5775053.62	53.62
100%		0	5775019.44	19.44
100%		+10	5775016.77	16.77
100%		+30	5775026.48	26.48
100%		+40	5775022.66	22.66
100%		+50	5775045.92	45.92
Max	3.6	+20	5775019.55	19.55
Min	3.14	+20	5775040.45	40.45

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)	5210038.24	38.24
100%		-30	5210082.66	82.66
100%		-20	5210058.48	58.48
100%		-10	5210059.28	59.28
100%		0	5210028.86	28.86
100%		+10	5210015.65	15.65
100%		+30	5210062.17	62.17
100%		+40	5210051.18	51.18
100%		+50	5210033.54	33.54
Max	3.6	+20	5210071.48	71.48
Min	3.14	+20	5210071.62	71.62

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)	5290091.18	91.18
100%		-30	5290017.81	17.81
100%		-20	5290035.45	35.45
100%		-10	5290063.85	63.85
100%		0	5290078.76	78.76
100%		+10	5290075.09	75.09
100%		+30	5290016.91	16.91
100%		+40	5290072.87	72.87
100%		+50	5290016.05	16.05
Max	3.6	+20	5290099.10	99.10
Min	3.14	+20	5290008.06	8.06

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)	5530086.47	86.47
100%		-30	5530082.69	82.69
100%		-20	5530066.67	66.67
100%		-10	5530050.85	50.85
100%		0	5530040.53	40.53
100%		+10	5530019.66	19.66
100%		+30	5530041.61	41.61
100%		+40	5530027.80	27.8
100%		+50	5530095.19	95.19
Max	3.6	+20	5530043.23	43.23
Min	3.14	+20	5530085.14	85.14

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)	5775077.55	77.55
100%		-30	5775024.79	24.79
100%		-20	5775083.08	83.08
100%		-10	5775001.61	1.61
100%		0	5775007.48	7.48
100%		+10	5775015.56	15.56
100%		+30	5775096.98	96.98
100%		+40	5775026.85	26.85
100%		+50	5775035.06	35.06
Max	3.6	+20	5775075.43	75.43
Min	3.14	+20	5775061.21	61.21

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)	5210074.11	74.11
100%		-30	5210092.56	92.56
100%		-20	5210061.77	61.77
100%		-10	5210049.97	49.97
100%		0	5210052.16	52.16
100%		+10	5210081.74	81.74
100%		+30	5210062.27	62.27
100%		+40	5210071.93	71.93
100%		+50	5210023.76	23.76
Max	3.6	+20	5210031.39	31.39
Min	3.14	+20	5210074.37	74.37

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)	5290041.78	41.78
100%		-30	5290091.03	91.03
100%		-20	5290036.21	36.21
100%		-10	5290025.16	25.16
100%		0	5290092.97	92.97
100%		+10	5290011.24	11.24
100%		+30	5290089.68	89.68
100%		+40	5290087.13	87.13
100%		+50	5290049.27	49.27
Max	3.6	+20	5290051.94	51.94
Min	3.14	+20	5290059.82	59.82

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 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)	5530077.13	77.13
100%		-30	5530048.49	48.49
100%		-20	5530044.82	44.82
100%		-10	5530067.15	67.15
100%		0	5530098.47	98.47
100%		+10	5530074.05	74.05
100%		+30	5530059.63	59.63
100%		+40	5530094.95	94.95
100%		+50	5530051.97	51.97
Max	3.6	+20	5530059.98	59.98
Min	3.14	+20	5530092.44	92.44

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)	5775091.99	91.99
100%		-30	5775051.41	51.41
100%		-20	5775032.38	32.38
100%		-10	5775096.93	96.93
100%		0	5775089.41	89.41
100%		+10	5775046.09	46.09
100%		+30	5775075.17	75.17
100%		+40	5775066.56	66.56
100%		+50	5775072.02	72.02
Max	3.6	+20	5775013.78	13.78
Min	3.14	+20	5775042.34	42.34

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	5710.84	14.16
802.11n(HT20)				5710.32	14.68
802.11ac(VHT20)				5710.28	14.72
802.11a	UNII 3	5720	144	5729.20	4.20
802.11n(HT20)				5729.68	4.68
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	5689.76	35.24
802.11ac(VHT40)				5689.68	35.32
802.11n(HT40)	UNII 3	5710	142	5730.40	5.40
802.11ac(VHT40)				5730.72	5.72

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	5730.48	5.48

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	5710.68	14.32
802.11n(HT20)				5710.28	14.72
802.11ac(VHT20)				5710.24	14.76
802.11a	UNII 3	5720	144	5729.12	4.12
802.11n(HT20)				5729.72	4.72
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	5689.76	35.24
802.11ac(VHT40)				5689.60	35.40
802.11n(HT40)	UNII 3	5710	142	5730.64	5.64
802.11ac(VHT40)				5730.56	5.56

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	5730.16	5.16

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	5728.28	3.28	> 0.5
802.11n(HT20)				5728.84	3.84	> 0.5
802.11ac(VHT20)				5728.84	3.84	> 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	5727.92	2.92	> 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)				5728.84	3.84	> 0.5
802.11ac(VHT20)				5728.84	3.84	> 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	5725.84	0.84	> 0.5

Note:

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

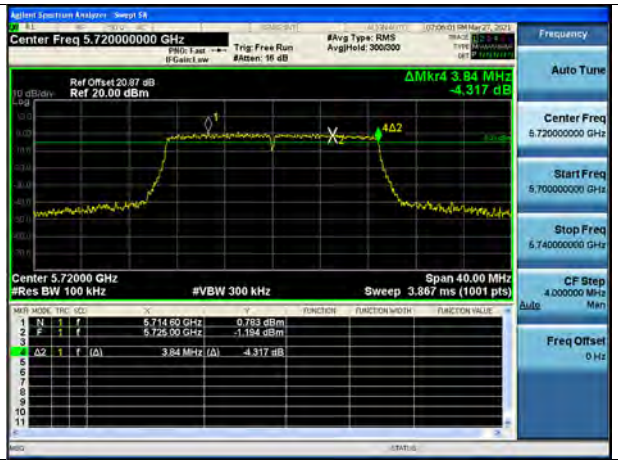
[ANT1]

▣ 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

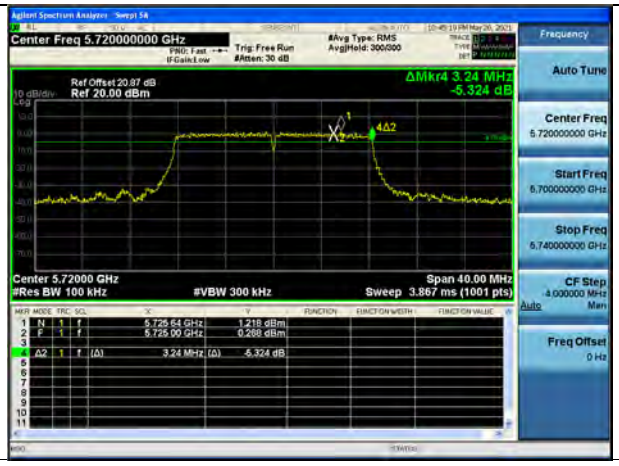
802.11ac_VHT40 CH.142

802.11ac_VHT80 CH.138

[ANT2]

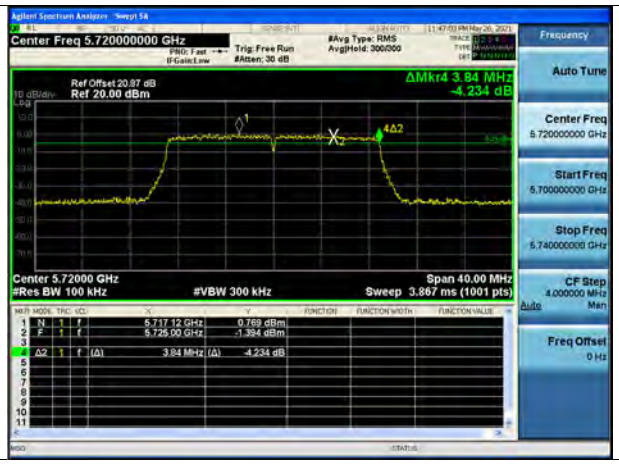
▣ Test Plots(UNII 3 Band 6dB Bandwidth)

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	14.31	22.51
802.11n(HT20)			14.07	22.67
802.11ac(VHT20)			13.84	22.68
802.11a	5720 (UNII 3 Band)	144	7.83	30.00
802.11n(HT20)			8.11	30.00
802.11ac(VHT20)			7.54	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	14.98	23.98
802.11ac(VHT40)			14.53	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	3.36	30.00
802.11ac(VHT40)			2.87	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	12.71	23.98
	5690 (UNII 3 Band)	138	-4.30	30.00

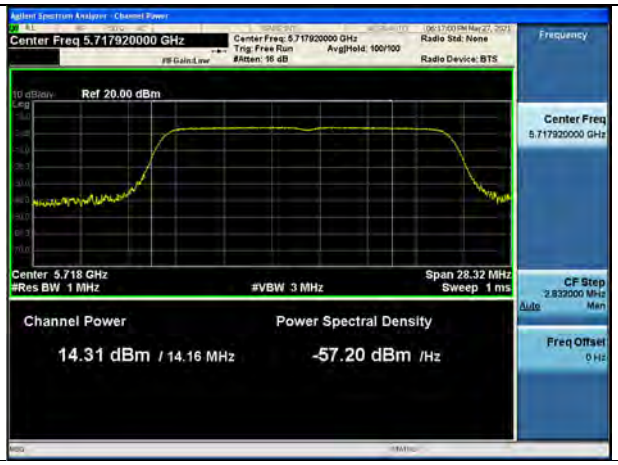
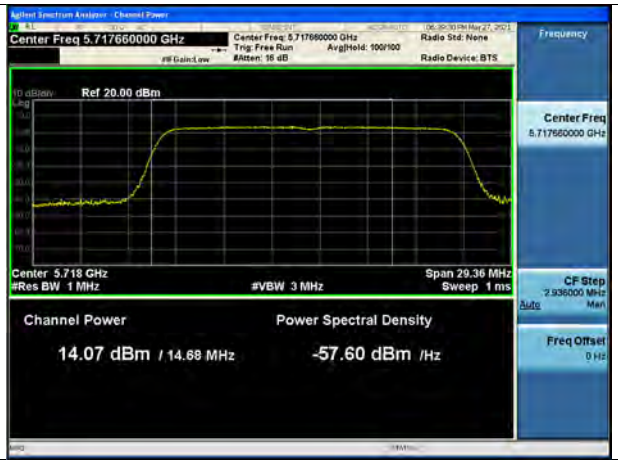
[ANT2]

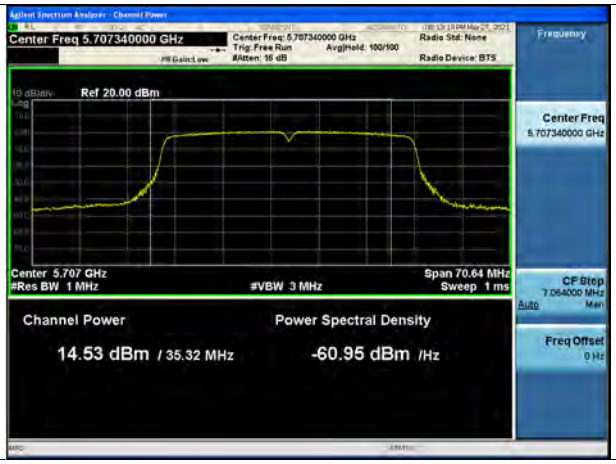
Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11a	5720 (UNII 2C Band)	144	13.89	22.56
802.11n(HT20)			13.74	22.68
802.11ac(VHT20)			13.77	22.69
802.11a	5720 (UNII 3 Band)	144	7.33	30.00
802.11n(HT20)			7.71	30.00
802.11ac(VHT20)			7.71	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11n(HT40)	5710 (UNII 2C Band)	142	14.99	23.98
802.11ac(VHT40)			15.02	23.98
802.11n(HT40)	5710 (UNII 3 Band)	142	3.05	30.00
802.11ac(VHT40)			3.09	30.00

Mode	Frequency [MHz]	Channel	Total Power (dBm)	Limit (dBm)
802.11ac(VHT80)	5690 (UNII 2C Band)	138	12.66	23.98
	5690 (UNII 3 Band)	138	-5.12	30.00

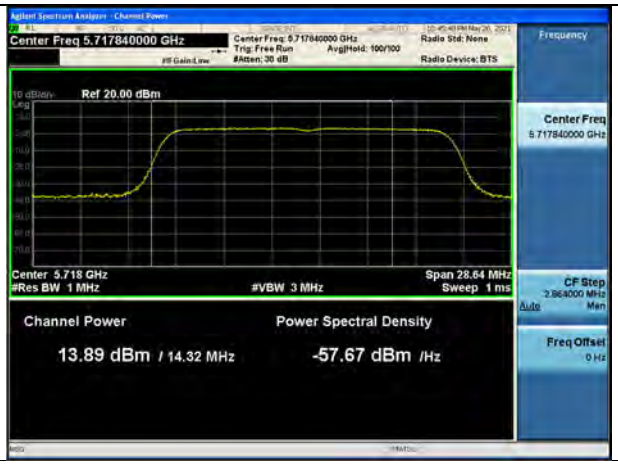
▣ Test Plots_**[ANT1]**

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
	

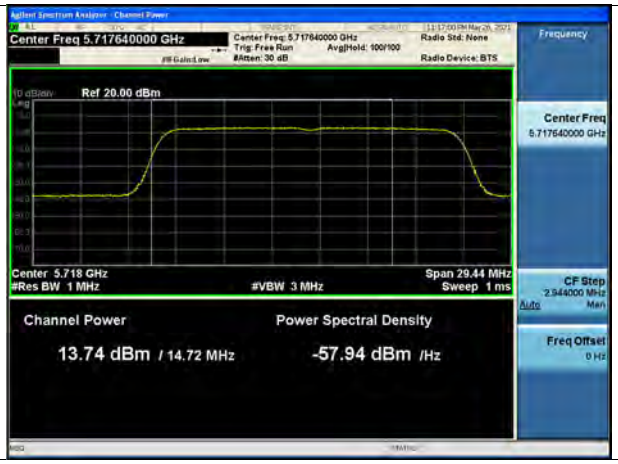
▣ Test Plots_[ANT2]

802.11a UNII 2C Band



802.11a UNII 3 Band

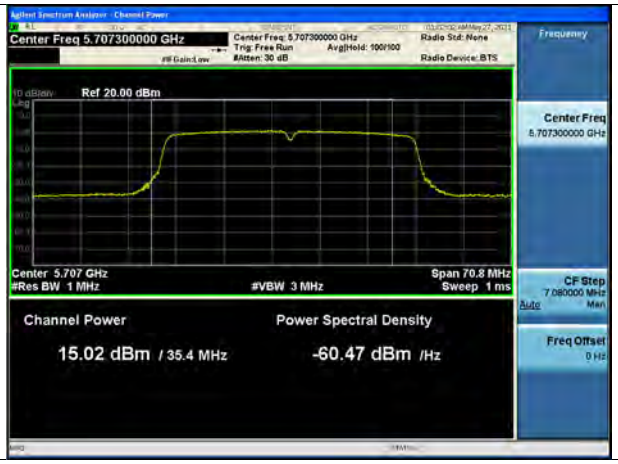
802.11n(HT20) UNII 2C Band



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	4.259	11 dBm/MHz
802.11n(HT20)			3.871	
802.11ac(VHT20)			3.219	
802.11a	5720 (UNII 3 Band)	144	0.772	30 dBm/500kHz
802.11n(HT20)			0.507	
802.11ac(VHT20)			-0.152	

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11n(HT40)	5710 (UNII 2C Band)	142	1.407	11 dBm/MHz
802.11ac(VHT40)			1.035	
802.11n(HT40)	5710 (UNII 3 Band)	142	-3.800	30 dBm/500kHz
802.11ac(VHT40)			-4.140	

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-4.371	11 dBm/MHz
802.11ac(VHT80)	5690 (UNII 3 Band)	138	-11.459	30 dBm/500kHz

[ANT2]

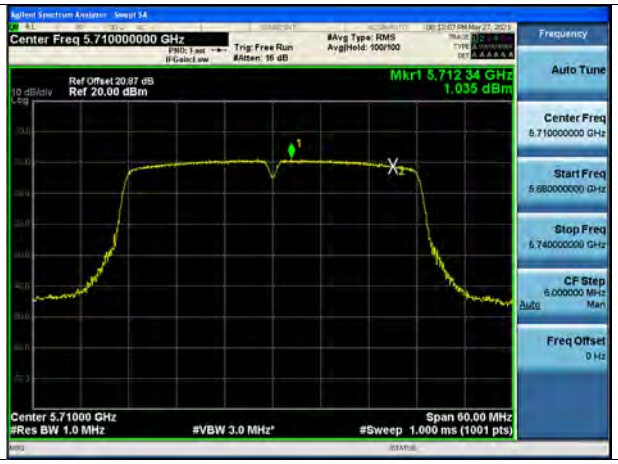
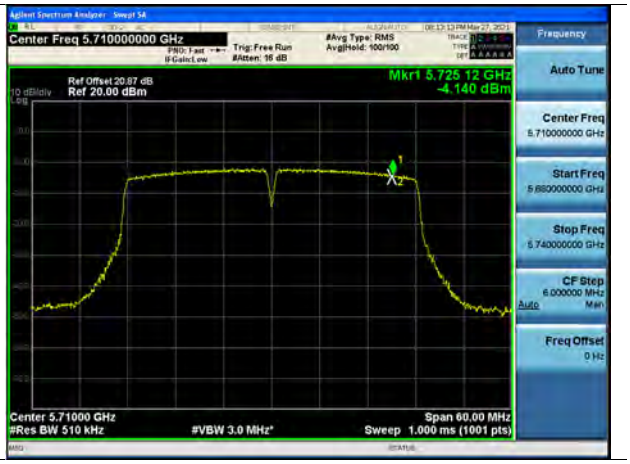
Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11a	5720 (UNII 2C Band)	144	3.825	11 dBm/MHz
802.11n(HT20)			3.643	
802.11ac(VHT20)			3.613	
802.11a	5720 (UNII 3 Band)	144	0.292	30 dBm/500kHz
802.11n(HT20)			0.268	
802.11ac(VHT20)			0.177	

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11n(HT40)	5710 (UNII 2C Band)	142	1.397	11 dBm/MHz
802.11ac(VHT40)			1.281	
802.11n(HT40)	5710 (UNII 3 Band)	142	-3.839	30 dBm/500kHz
802.11ac(VHT40)			-3.700	

Mode	Frequency [MHz]	Channel	Total PSD (dBm/MHz)	Limit
802.11ac(VHT80)	5690 (UNII 2C Band)	138	-4.015	11 dBm/MHz
802.11ac(VHT80)	5690 (UNII 3 Band)	138	-12.013	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 = 40log (specific distance / 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

[Olny MIMO_01 Antenna]

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	56.28	5.63	V	61.91	68.20	6.29	PK
15540	51.02	6.11	V	57.13	73.98	16.85	PK
15540	36.00	6.11	V	42.11	53.98	11.87	AV
10360	54.72	5.63	H	60.35	68.20	7.85	PK
15540	55.07	6.11	H	61.18	73.98	12.80	PK
15540	38.68	6.11	H	44.79	53.98	9.19	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	58.12	5.06	V	63.18	68.20	5.02	PK
15600	51.61	4.93	V	56.54	73.98	17.44	PK
15600	36.27	4.93	V	41.20	53.98	12.78	AV
10400	60.03	5.06	H	65.09	68.20	3.11	PK
15600	51.74	4.93	H	56.67	73.98	17.31	PK
15600	36.48	4.93	H	41.41	53.98	12.57	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	58.67	5.81	V	64.48	68.20	3.72	PK
15720	51.07	4.48	V	55.55	73.98	18.43	PK
15720	35.99	4.48	V	40.47	53.98	13.51	AV
10480	59.36	5.81	H	65.17	68.20	3.03	PK
15720	51.17	4.48	H	55.65	73.98	18.33	PK
15720	36.23	4.48	H	40.71	53.98	13.27	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	57.18	5.64	V	62.82	68.20	5.38	PK
15780	47.90	5.17	V	53.07	73.98	20.91	PK
15780	33.85	5.17	V	39.02	53.98	14.96	AV
10520	58.73	5.64	H	64.37	68.20	3.83	PK
15780	48.53	5.17	H	53.70	73.98	20.28	PK
15780	34.94	5.17	H	40.11	53.98	13.87	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	56.88	5.90	V	62.78	73.98	11.20	PK
10600	43.21	5.90	V	49.11	53.98	4.87	AV
15900	50.89	5.96	V	56.85	73.98	17.13	PK
15900	35.17	5.96	V	41.13	53.98	12.85	AV
10600	57.13	5.90	H	63.03	73.98	10.95	PK
10600	44.97	5.90	H	50.87	53.98	3.11	AV
15900	51.98	5.96	H	57.94	73.98	16.04	PK
15900	36.08	5.96	H	42.04	53.98	11.94	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	57.23	6.01	V	63.24	73.98	10.74	PK
10640	42.96	6.01	V	48.97	53.98	5.01	AV
15960	55.81	5.20	V	61.01	73.98	12.97	PK
15960	40.60	5.20	V	45.80	53.98	8.18	AV
10640	57.55	6.01	H	63.56	73.98	10.42	PK
10640	44.85	6.01	H	50.86	53.98	3.12	AV
15960	53.21	5.20	H	58.41	73.98	15.57	PK
15960	37.95	5.20	H	43.15	53.98	10.83	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	55.71	6.10	V	61.81	73.98	12.17	PK
11000	43.28	6.10	V	49.38	53.98	4.60	AV
16500	54.78	7.83	V	62.61	68.20	5.59	PK
11000	56.74	6.10	H	62.84	73.98	11.14	PK
11000	44.41	6.10	H	50.51	53.98	3.47	AV
16500	55.80	7.83	H	63.63	68.20	4.57	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	55.39	5.39	V	60.78	73.98	13.20	PK
11160	42.87	5.39	V	48.26	53.98	5.72	AV
16740	51.29	9.32	V	60.61	68.20	7.59	PK
11160	56.95	5.39	H	62.34	73.98	11.64	PK
11160	44.42	5.39	H	49.81	53.98	4.17	AV
16740	52.14	9.32	H	61.46	68.20	6.74	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	51.27	6.02	V	57.29	73.98	16.69	PK
11440	38.45	6.02	V	44.47	53.98	9.51	AV
17160	49.96	9.78	V	59.74	68.20	8.46	PK
11440	52.21	6.02	H	58.23	73.98	15.75	PK
11440	39.02	6.02	H	45.04	53.98	8.94	AV
17160	50.89	9.78	H	60.67	68.20	7.53	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	49.88	6.06	V	55.94	73.98	18.04	PK
11490	37.09	6.06	V	43.15	53.98	10.83	AV
17235	51.56	10.88	V	62.44	68.20	5.76	PK
11490	50.79	6.06	H	56.85	73.98	17.13	PK
11490	37.99	6.06	H	44.05	53.98	9.93	AV
17235	52.34	10.88	H	63.22	68.20	4.98	PK

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

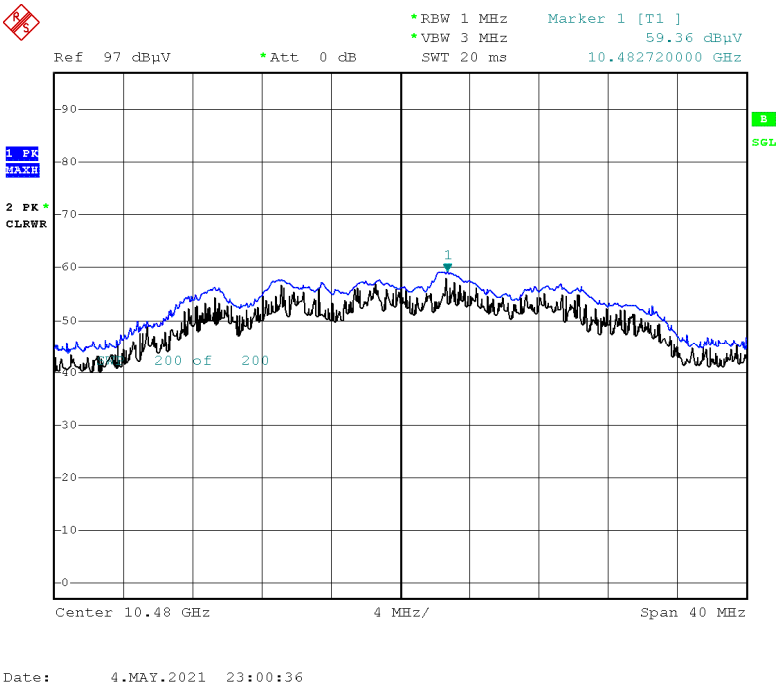
Frequency	Reading	ANT+CL-AMP G	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
11570	49.94	6.77	V	56.71	73.98	17.27	PK
11570	36.87	6.77	V	43.64	53.98	10.34	AV
17355	50.99	11.73	V	62.72	68.20	5.48	PK
11570	50.83	6.77	H	57.60	73.98	16.38	PK
11570	37.54	6.77	H	44.31	53.98	9.67	AV
17355	51.43	10.98	H	62.41	68.20	5.79	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	51.36	6.38	V	57.74	73.98	16.24	PK
11650	38.69	6.38	V	45.07	53.98	8.91	AV
17475	51.08	11.29	V	62.37	68.20	5.83	PK
11650	52.53	6.38	H	58.91	73.98	15.07	PK
11650	39.53	6.38	H	45.91	53.98	8.07	AV
17475	52.00	11.29	H	63.29	68.20	4.91	PK

▣ Test Plots

Peak Reading (802.11a, Ch.48 2nd Harmonic, H)



Note:

Only the worst case plots for Radiated Spurious Emissions.

10.8 RADIATED RESTRICTED BAND EDGE

[Olny MIMO_01 Antenna]

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	44.91	12.69	H	57.60	73.98	16.38	PK
5150	31.40	12.69	H	44.09	53.98	9.89	AV
5150	44.24	12.69	V	56.93	73.98	17.05	PK
5150	31.18	12.69	V	43.87	53.98	10.11	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	56.43	12.36	H	68.79	73.98	5.19	PK
5350	38.25	12.36	H	50.61	53.98	3.37	AV
5350	55.68	12.36	V	68.04	73.98	5.94	PK
5350	37.64	12.36	V	50.00	53.98	3.98	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	45.77	12.83	H	58.60	73.98	15.38	PK
5460	31.47	12.83	H	44.30	53.98	9.68	AV
5470	52.00	13.04	H	65.04	68.20	3.16	PK
5460	44.87	12.83	V	57.70	73.98	16.28	PK
5460	31.27	12.83	V	44.10	53.98	9.88	AV
5470	51.14	13.04	V	64.18	68.20	4.02	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	44.90	12.69	H	57.59	73.98	16.39	PK
5150	31.40	12.69	H	44.09	53.98	9.89	AV
5150	43.99	12.69	V	56.68	73.98	17.30	PK
5150	31.10	12.69	V	43.79	53.98	10.19	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	56.90	12.36	H	69.26	73.98	4.72	PK
5350	38.45	12.36	H	50.81	53.98	3.17	AV
5350	56.72	12.36	V	69.08	73.98	4.90	PK
5350	37.89	12.36	V	50.25	53.98	3.73	AV

Band :	UNII 2C
Operation Mode:	802.11 n_HT20
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	44.15	12.83	H	56.98	73.98	17.00	PK
5460	31.29	12.83	H	44.12	53.98	9.86	AV
5470	51.59	13.04	H	64.63	68.20	3.57	PK
5460	43.45	12.83	V	56.28	73.98	17.70	PK
5460	30.89	12.83	V	43.72	53.98	10.26	AV
5470	50.98	13.04	V	64.02	68.20	4.18	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	44.38	12.69	H	57.07	73.98	16.91	PK
5150	31.36	12.69	H	44.05	53.98	9.93	AV
5150	43.77	12.69	V	56.46	73.98	17.52	PK
5150	30.87	12.69	V	43.56	53.98	10.42	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	55.83	12.36	H	68.19	73.98	5.79	PK
5350	38.29	12.36	H	50.65	53.98	3.33	AV
5350	54.76	12.36	V	67.12	73.98	6.86	PK
5350	37.48	12.36	V	49.84	53.98	4.14	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	44.73	12.83	H	57.56	73.98	16.42	PK
5460	31.35	12.83	H	44.18	53.98	9.80	AV
5470	51.75	13.04	H	64.79	68.20	3.41	PK
5460	43.87	12.83	V	56.70	73.98	17.28	PK
5460	30.68	12.83	V	43.51	53.98	10.47	AV
5470	50.36	13.04	V	63.40	68.20	4.80	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	51.00	12.69	H	63.69	73.98	10.29	PK
5150	37.52	12.69	H	50.21	53.98	3.77	AV
5150	50.48	12.69	V	63.17	73.98	10.81	PK
5150	37.14	12.69	V	49.83	53.98	4.15	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	58.46	12.36	H	70.82	73.98	3.16	PK
5350	38.27	12.36	H	50.63	53.98	3.35	AV
5350	57.68	12.36	V	70.04	73.98	3.94	PK
5350	37.94	12.36	V	50.30	53.98	3.68	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	46.39	12.83	H	59.22	73.98	14.76	PK
5460	32.32	12.83	H	45.15	53.98	8.83	AV
5470	51.50	13.04	H	64.54	68.20	3.66	PK
5460	46.20	12.83	V	59.03	73.98	14.95	PK
5460	31.87	12.83	V	44.70	53.98	9.28	AV
5470	50.17	13.04	V	63.21	68.20	4.99	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	49.81	12.69	H	62.50	73.98	11.48	PK
5150	37.93	12.69	H	50.62	53.98	3.36	AV
5150	48.39	12.69	V	61.08	73.98	12.90	PK
5150	37.09	12.69	V	49.78	53.98	4.20	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	56.68	12.36	H	69.04	73.98	4.94	PK
5350	37.58	12.36	H	49.94	53.98	4.04	AV
5350	55.19	12.36	V	67.55	73.98	6.43	PK
5350	37.28	12.36	V	49.64	53.98	4.34	AV

Band :	UNII 2C
Operation Mode:	802.11 ac_VHT40
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	47.52	12.83	H	60.35	73.98	13.63	PK
5460	32.22	12.83	H	45.05	53.98	8.93	AV
5470	50.97	13.04	H	64.01	68.20	4.19	PK
5460	46.81	12.83	V	59.64	73.98	14.34	PK
5460	31.95	12.83	V	44.78	53.98	9.20	AV
5470	50.07	13.04	V	63.11	68.20	5.09	PK

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	51.49	12.69	H	64.18	73.98	9.80	PK
5150	38.01	12.69	H	50.70	53.98	3.28	AV
5150	50.17	12.69	V	62.86	73.98	11.12	PK
5150	37.86	12.69	V	50.55	53.98	3.43	AV

Band :	UNII 2A
Operation Mode:	802.11 ac_VHT80
Transfer MCS Index:	0
Operating Frequency	5290 MHz
Channel No.	58 Ch

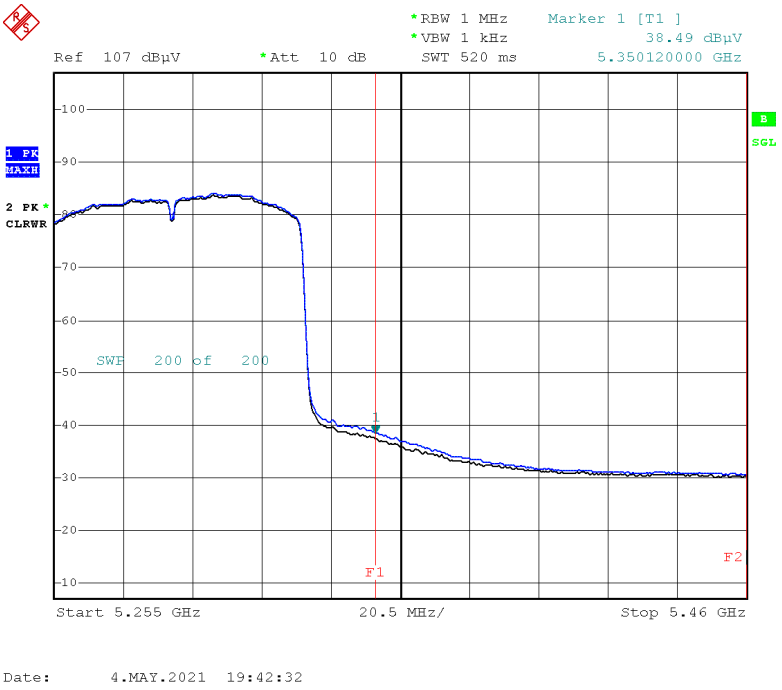
Frequency	Reading	CL+AF+DF-AG	ANT. POL	Total	Limit	Margin	Detect
[MHz]	dBuV	[dB]	[H/V]	[dBuV/m]	[dBuV/m]	[dB]	
5350	55.69	12.36	H	68.05	73.98	5.93	PK
5350	38.49	12.36	H	50.85	53.98	3.13	AV
5350	54.42	12.36	V	66.78	73.98	7.20	PK
5350	37.94	12.36	V	50.30	53.98	3.68	AV

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	49.34	12.83	H	62.17	73.98	11.81	PK
5460	33.32	12.83	H	46.15	53.98	7.83	AV
5470	51.91	13.04	H	64.95	68.20	3.25	PK
5460	48.65	12.83	V	61.48	73.98	12.50	PK
5460	33.09	12.83	V	45.92	53.98	8.06	AV
5470	50.87	13.04	V	63.91	68.20	4.29	PK

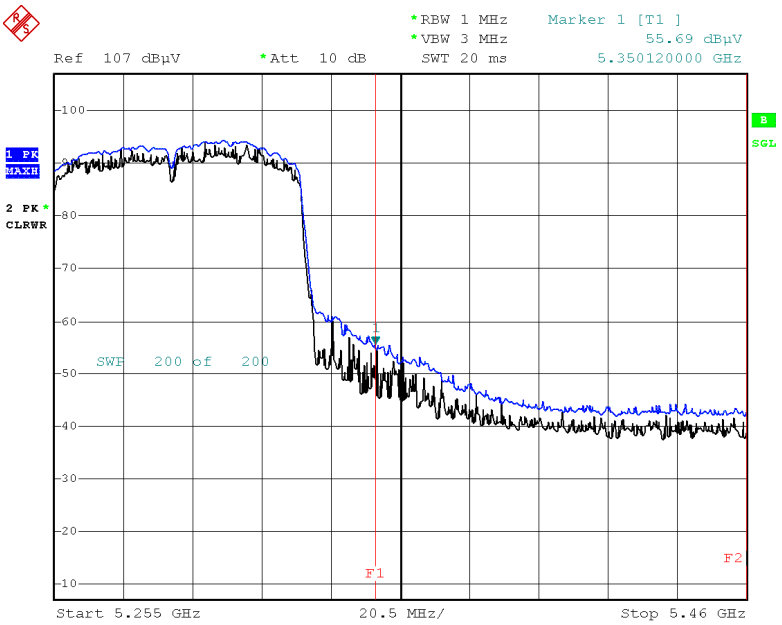
▣ Test Plots(UNII 1, 2A, 2C)

Average Reading (802.11ac(80M), Ch.58, **Z-H**)



Date: 4.MAY.2021 19:42:32

Peak Reading (802.11ac(80M), Ch.58, **Z-H**)



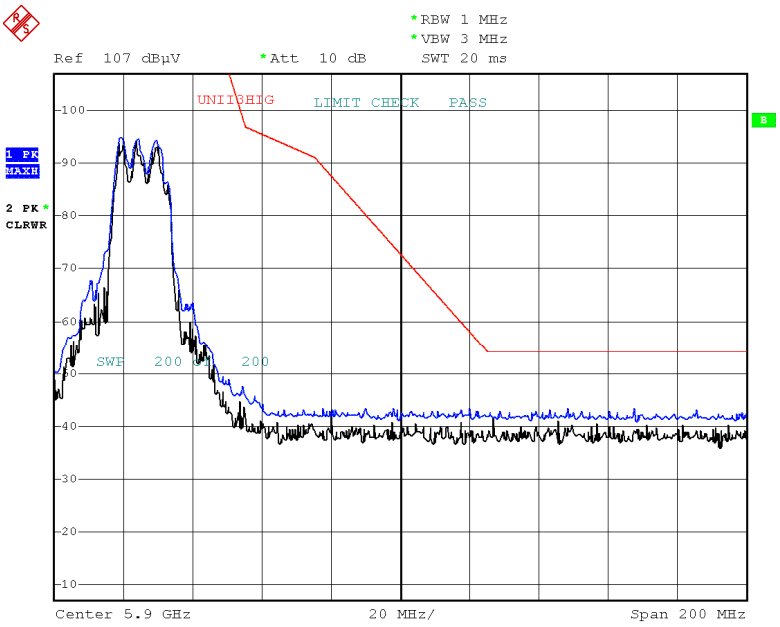
Date: 4.MAY.2021 19:42:56

Note:

Only the worst case plots for Radiated Restricted Band Edge.

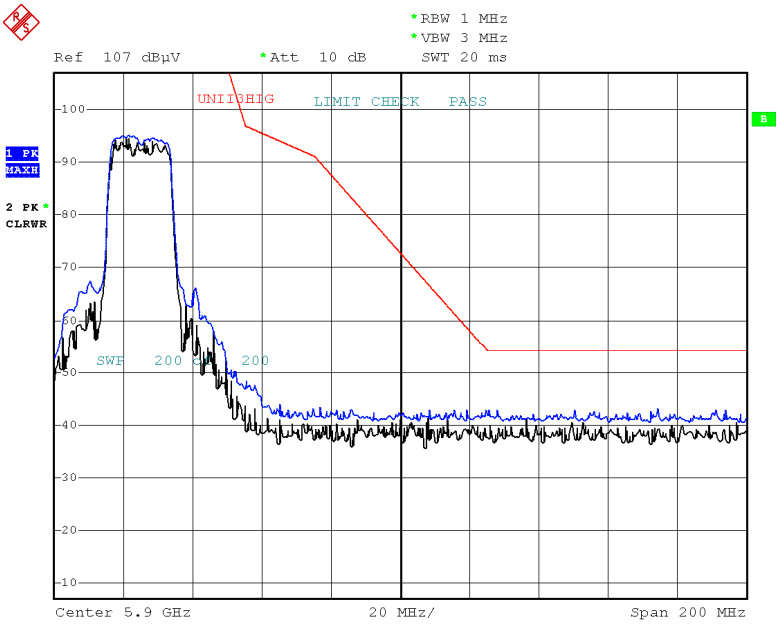
▣ Test Plots(UNII 3)

Peak Reading (802.11a, Ch.165)



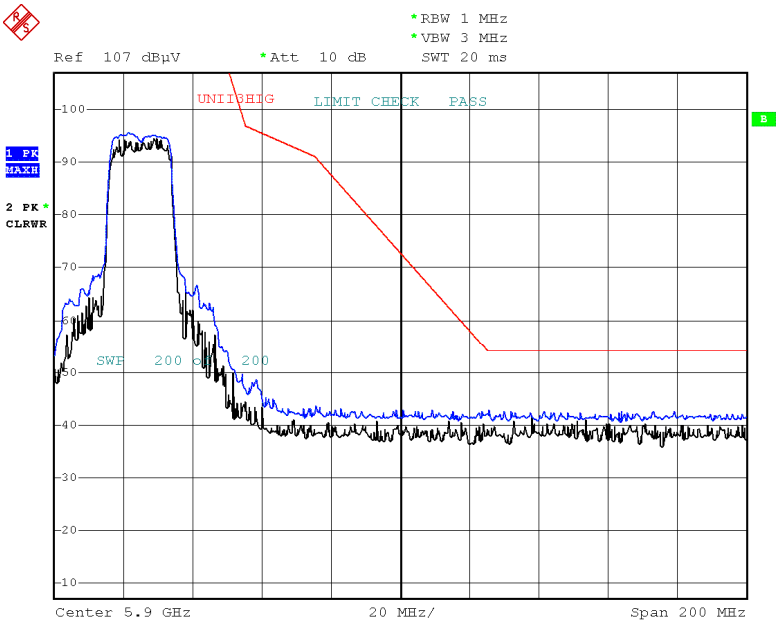
Date: 4.MAY.2021 20:30:46

Peak Reading (802.11n_HT20, Ch.165)



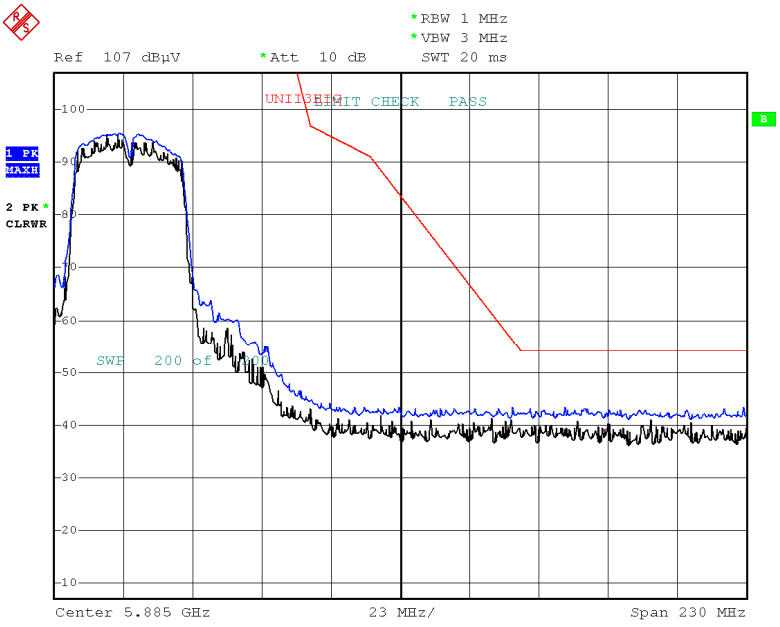
Date: 4.MAY.2021 20:31:48

Peak Reading (802.11ac_VHT20, Ch.165)



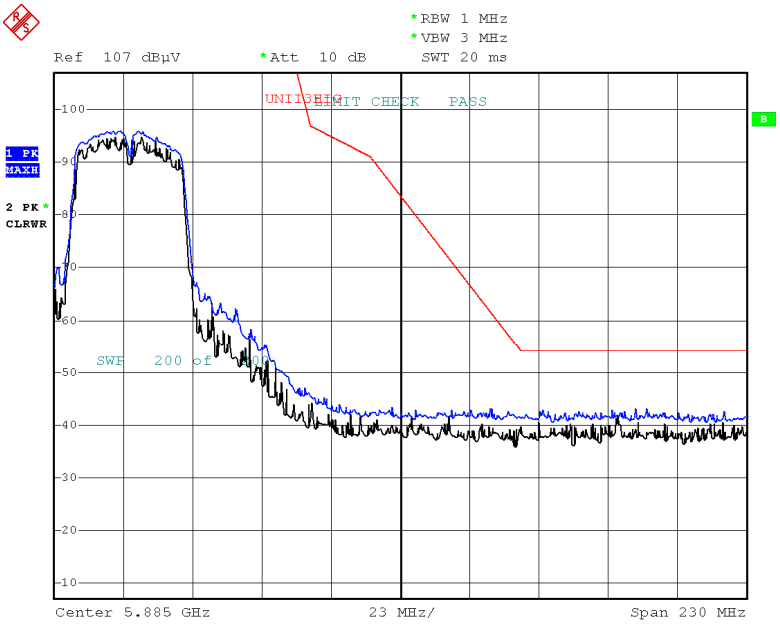
Date: 4.MAY.2021 20:32:53

Peak Reading (802.11n_HT40, Ch.159)



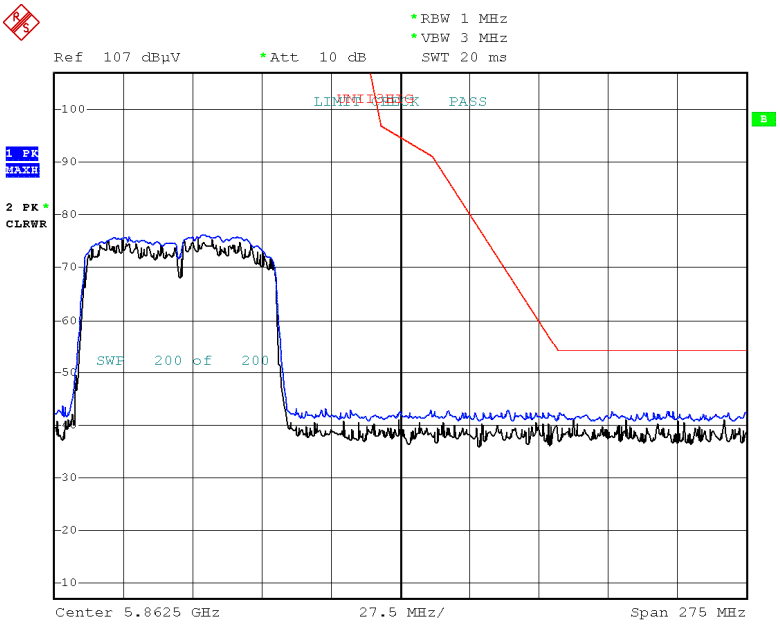
Date: 4.MAY.2021 20:20:42

Peak Reading (802.11ac_VHT40, Ch.159)



Date: 4.MAY.2021 20:22:05

Peak Reading (802.11ac_VHT80, Ch.155)



Date: 4.MAY.2021 20:03:42

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							

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	06/08/2020	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	06/12/2020	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 WEINSCHEL	CBLU1183540B-01/Broadband Bench Top LNA 56-10 / Attenuator(10 dB)	12/23/2020	Annual	N/A
CERNEX Api tech.	CBL06185030 / Broadband Low Noise Amplifier 18B-03 / Attenuator (3 dB)	12/23/2020	Annual	N/A
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-FI005-P