

# TEST REPORT

**FCC ID: 2AKSAMOBULAA-S**

**Product: Mobile phone**

**Model No.: S1**

**Additional Model No.: Please refer to page 5**

**Trade Mark: MOBULAA**

**Report No.: TCT190614E038**

**Issued Date: Oct. 15, 2019**

**Issued for:**

**Shenzhen YLWD Technology Co., Ltd**

**RM1002.A.Haisong BLD.RD, Tairan. FuTian District, Shenzhen, China**

**Issued By:**

**Shenzhen Tongce Testing Lab.**

**1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District,  
Shenzhen, Guangdong, China**

**TEL: +86-755-27673339**

**FAX: +86-755-27673332**

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This document may be altered or revised by Shenzhen Tongce Testing Lab. personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

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## 1. Test Certification

<b>Product:</b>	Mobile phone
<b>Model No.:</b>	S1
<b>Additional Model No.:</b>	Please refer to page 5
<b>Trade Mark:</b>	<b>MOBULAA</b>
<b>Applicant:</b>	Shenzhen YLWD Technology Co., Ltd
<b>Address:</b>	RM1002.A.Haisong BLD.RD, Tairan. FuTian District, Shenzhen, China
<b>Manufacturer:</b>	Shenzhen YLWD Technology Co., Ltd
<b>Address:</b>	RM1002.A.Haisong BLD.RD, Tairan. FuTian District, Shenzhen, China
<b>Date of Test:</b>	Jun. 17, 2019 – Oct. 14, 2019
<b>Applicable Standards:</b>	FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2016 KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General U-NII Test Procedures New Rules v02r01r01

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:

*Brews Xu*

Date: Oct. 14, 2019

*Brews Xu*

Reviewed By:

*Berry Zhao*

Date: Oct. 15, 2019

Approved By:



*Tomsin*

Date: Oct. 15, 2019

## 2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Maximum Conducted Output Power	§15.407(a)	PASS
6dB Emission Bandwidth	§15.407(a)	PASS
26dB Emission Bandwidth& 99% Occupied Bandwidth	§15.407(a)	PASS
Power Spectral Density	§15.407(a)	PASS
Restricted Bands around fundamental frequency	§15.407(a)	PASS
Radiated Emission	§15.407(a)	PASS
Frequency Stability	§15.407(g)	PASS

**Note:**

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

### 3. EUT Description

<b>Product:</b>	Mobile phone
<b>Model No.:</b>	S1
<b>Additional Model No.:</b>	S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17, S18, S19, S20, T4001, T4002, T4003, T4004, T4005, T4501, T4502, T4503, T4504, T4505, T5001, T5002, T5003, T5004, T5005, T5501, T5502, T5503, T5504, T5505, T6001, T6002, T6003, T6004, T6005, F4001, F4002, F4003, F4004, F4005, F4501, F4502, F4503, F4504, F4505, F5001, F5002, F5003, F5004, F5005, F5501, F5502, F5503, F5504, F5505, F6001, F6002, F6003, F6004, F6005, K4001, K4002, K4003, K4004, K4005, K4501, K4502, K4503, K4504, K4505, K5001, K5002, K5003, K5004, K5005, K5501, K5502, K5503, K5504, K5505, K6001, K6002, K6003, K6004, K6005, A4001, A4002, A4003, A4004, A4005, A4501, A4502, A4503, A4504, A4505, A5001, A5002, A5003, A5004, A5005, A5501, A5502, A5503, A5504, A5505, A6001, A6002, A6003, A6004, A6005, E4001, E4002, E4003, E4004, E4005, E4501, E4502, E4503, E4504, E4505, E5001, E5002, E5003, E5004, E5005, E5501, E5502, E5503, E5504, E5505, E6001, E6002, E6003, E6004, E6005, K1, K2, K3, K4, K5, K6, K7, K8, K9, K10
<b>Trade Mark:</b>	<b>MOBULAA</b>
<b>Operation Frequency:</b>	Band 1: 5180 MHz -5240 MHz Band 3: 5745 MHz -5825 MHz
<b>Channel Bandwidth:</b>	802.11a: 20MHz 802.11n: 20MHz, 40MHz 802.11ac: 20MHz, 40MHz, 80MHz
<b>Modulation Technology:</b>	Orthogonal Frequency Division Multiplexing(OFDM)
<b>Modulation Type</b>	256QAM, 64QAM, 16QAM, BPSK, QPSK
<b>Antenna Type:</b>	Internal Antenna
<b>Antenna Gain:</b>	1.5dBi
<b>Power Supply:</b>	Rechargeable Li-ion Battery DC 3.7V
<b>AC adapter:</b>	Adapter Information: INPUT: AC 100-240V, 50/60Hz, 0.2A OUTPUT: DC 5.0V, 1000mA

**Remark:**

All models above are identical in interior structure, Electrical circuits and components, and just model names are different for the marketing requirement.

## Test Frequency each of channel

## Band 1

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180	38	5190	42	5210
40	5200	46	5230		
48	5240				

## Band 3

20MHz		40MHz		80MHz	
Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745	151	5755	155	5775
157	5785	159	5795		
165	5825				

**Note:**

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below.

## 4. General Information

### 4.1. Test environment and mode

<b>Operating Environment:</b>	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
<b>Test Mode:</b>	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 100%)
The sample was placed 0.8m/1.5m for blow/above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

**Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.**

Mode	Data rate
802.11a	6 Mbps
802.11n(HT20)	6.5 Mbps
802.11n(HT40)	13.5 Mbps
802.11ac(VHT20)	6.5 Mbps
802.11ac(VHT40)	13.5 Mbps
802.11ac(VHT80)	29.3 Mbps

**Final Test Mode:**

Operation mode:	Keep the EUT in continuous transmitting with modulation
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## 4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

**Note:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

## 5. Facilities and Accreditations

### 5.1. Facilities

The test facility is recognized, certified, or accredited by the following organizations:

- FCC - Registration No.: 645098

Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

### 5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

### 5.3. Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 2.56\text{dB}$
2	RF power, conducted	$\pm 0.12\text{dB}$
3	Spurious emissions, conducted	$\pm 0.11\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.92\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$

## 6. Test Results and Measurement Data

### 6.1. Antenna requirement

<b>Standard requirement:</b>	FCC Part15 C Section 15.203 /247(c)
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**15.203 requirement:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**E.U.T Antenna:**

The WIFI antenna is internal antenna which permanently attached, and the best case gain of the antenna is 1.5dBi.



## 6.2. Conducted Emission

### 6.2.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.207																	
<b>Test Method:</b>	ANSI C63.10:2013																	
<b>Frequency Range:</b>	150 kHz to 30 MHz																	
<b>Receiver setup:</b>	RBW=9 kHz, VBW=30 kHz, Sweep time=auto																	
<b>Limits:</b>	<table border="1"> <thead> <tr> <th>Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr> <tr> <th></th><th>Quasi-peak</th><th>Average</th></tr> </thead> <tbody> <tr> <td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr> <tr> <td>0.5-5</td><td>56</td><td>46</td></tr> <tr> <td>5-30</td><td>60</td><td>50</td></tr> </tbody> </table>			Frequency range (MHz)	Limit (dBuV)			Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)																	
	Quasi-peak	Average																
0.15-0.5	66 to 56*	56 to 46*																
0.5-5	56	46																
5-30	60	50																
<b>Test Setup:</b>	<p>Reference Plane</p> <p>Test table/Insulation plane</p> <p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>																	
<b>Test Mode:</b>	Tx Mode																	
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</li> </ol>																	
<b>Test Result:</b>	PASS																	

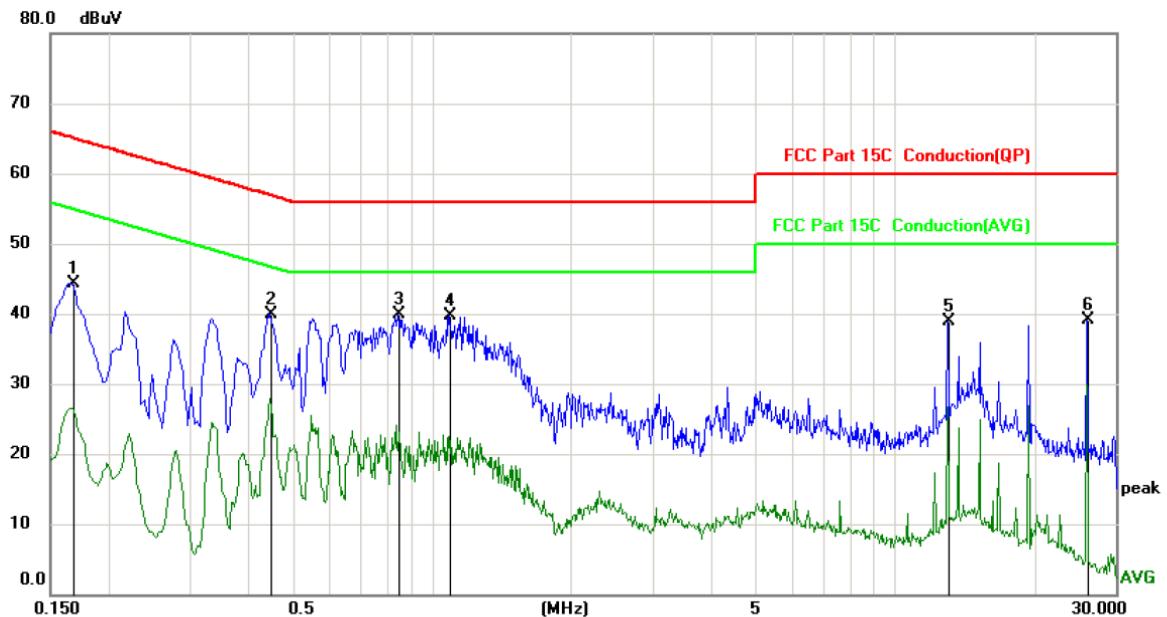
**6.2.2. Test Instruments**

Conducted Emission Shielding Room Test Site (843)				
Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	R&S	ESPI	101402	Jul. 29, 2020
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 11, 2020
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Sep. 08, 2020
EMI Test Software	Shurples Technology	EZ-EMC	N/A	N/A

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

### 6.2.3. Test data

Please refer to following diagram for individual  
Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site: Phase: **L1** Temperature: 25  
Limit: FCC Part 15C Conduction(QP) Power: AC 120V/60Hz Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dB $\mu$ V	Correct Factor dB	Measure- ment dB $\mu$ V	Limit dB $\mu$ V	Over dB	Detector	Comment
1		0.1680	34.18	10.12	44.30	65.06	-20.76	peak	
2		0.4470	29.79	10.13	39.92	56.93	-17.01	peak	
3	*	0.8475	29.74	10.12	39.86	56.00	-16.14	peak	
4		1.0905	29.51	10.12	39.63	56.00	-16.37	peak	
5		12.9975	28.70	10.16	38.86	60.00	-21.14	peak	
6		26.0025	28.81	10.23	39.04	60.00	-20.96	peak	

**Note:**

Freq. = Emission frequency in MHz

Reading level (dB $\mu$ V) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dB $\mu$ V) = Reading level (dB $\mu$ V) + Corr. Factor (dB)

Limit (dB $\mu$ V) = Limit stated in standard

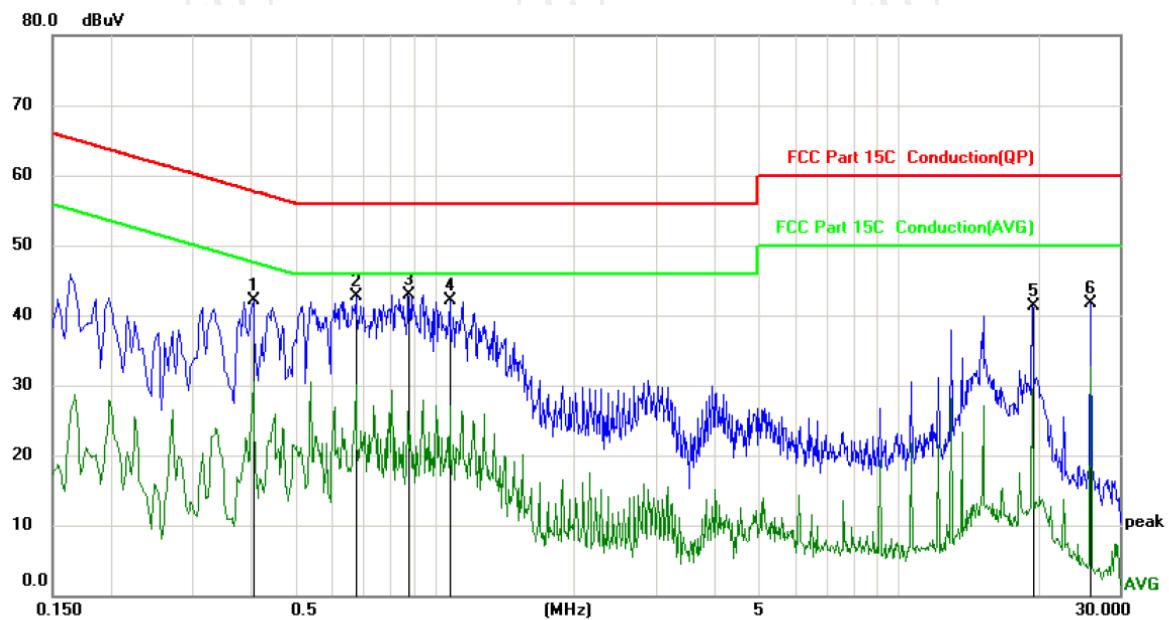
Margin (dB) = Measurement (dB $\mu$ V) - Limits (dB $\mu$ V)

Q.P. = Quasi-Peak

AVG = average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

**Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)**



Site: Phase: **N** Temperature: 25  
Limit: FCC Part 15C Conduction(QP) Power: AC 120V/60Hz Humidity: 55 %

No.	Mk.	Freq. MHz	Reading Level dB $\mu$ V	Correct Factor dB	Measure- ment dB $\mu$ V	Limit dB $\mu$ V	Over dB	Detector	Comment
1		0.4065	31.88	10.13	42.01	57.72	-15.71	peak	
2		0.6764	32.49	10.12	42.61	56.00	-13.39	peak	
3	*	0.8790	32.87	10.12	42.99	56.00	-13.01	peak	
4		1.0814	31.89	10.12	42.01	56.00	-13.99	peak	
5		19.5000	31.02	10.20	41.22	60.00	-18.78	peak	
6		25.9980	31.41	10.23	41.64	60.00	-18.36	peak	

**Note:**

Freq. = Emission frequency in MHz

Reading level (dB $\mu$ V) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dB $\mu$ V) = Reading level (dB $\mu$ V) + Corr. Factor (dB)

Limit (dB $\mu$ V) = Limit stated in standard

Margin (dB) = Measurement (dB $\mu$ V) - Limits (dB $\mu$ V)

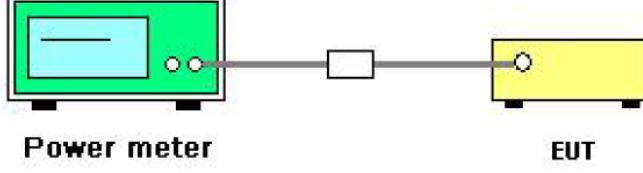
Q.P. = Quasi-Peak

AVG = average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

### 6.3. Maximum Conducted Output Power

### 6.3.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 E Section 15.407(a)& Part 2 J Section 2.1046										
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E										
<b>Limit:</b>	<table border="1"> <thead> <tr> <th>Frequency Band (MHz)</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td>5180 - 5240</td> <td>24dBm(250mW) for client device</td> </tr> <tr> <td>5260 - 5320</td> <td>24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz</td> </tr> <tr> <td>5470 - 5725</td> <td>24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz</td> </tr> <tr> <td>5745 - 5825</td> <td>30dBm(1W)</td> </tr> </tbody> </table>	Frequency Band (MHz)	Limit	5180 - 5240	24dBm(250mW) for client device	5260 - 5320	24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz	5470 - 5725	24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz	5745 - 5825	30dBm(1W)
Frequency Band (MHz)	Limit										
5180 - 5240	24dBm(250mW) for client device										
5260 - 5320	24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz										
5470 - 5725	24dBm(250mW) or 11 dBm + 10 log B, B is the 26 dB emission bandwidth in megahertz										
5745 - 5825	30dBm(1W)										
<b>Test Setup:</b>	 <p>The diagram illustrates the test setup. A green 'Power meter' is connected to a yellow 'EUT' (Equipment Under Test) via a grey 'RF cable' and a white 'attenuator' box.</p>										
<b>Test Mode:</b>	Transmitting mode with modulation										
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E, 3, a</li> <li>2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>3. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>5. Measure the conducted output power and record the results in the test report.</li> </ol>										
<b>Test Result:</b>	PASS										
<b>Remark:</b>	Conducted output power= measurement power + $10\log(1/x)$ X is duty cycle=1, so $10\log(1/1)=0$ Conducted output power= measurement power										

**6.3.2. Test Instruments**

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
Power Meter	Agilent	E4418B	GB43312526	Sep. 08, 2020
Power Sensor	Agilent	E9301A	MY41497725	Sep. 08, 2020
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Antenna Connector	TCT	RFC-03	N/A	Sep. 08, 2020

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**6.3.3. Test Data****Configuration Band 1 (5180 - 5240 MHz)**

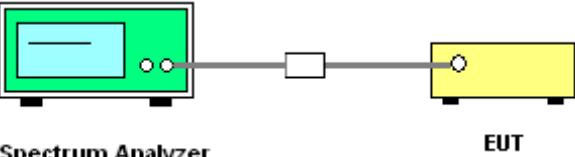
Mode	Test channel	Maximum Conducted Output Power (dBm)	Limit (dBm)	Result
11a	CH36	7.66	24	PASS
11a	CH40	7.64	24	PASS
11a	CH48	7.54	24	PASS
11n(HT20)	CH36	7.39	24	PASS
11n(HT20)	CH40	7.61	24	PASS
11n(HT20)	CH48	7.42	24	PASS
11n(HT40)	CH38	6.82	24	PASS
11n(HT40)	CH46	6.73	24	PASS
11ac(HT20)	CH36	7.42	24	PASS
11ac(HT20)	CH40	7.60	24	PASS
11ac(HT20)	CH48	7.41	24	PASS
11ac(HT40)	CH38	6.72	24	PASS
11ac(HT40)	CH46	6.76	24	PASS
11ac(VHT80)	CH42	6.22	24	PASS

**Configuration Band 3 (5745 - 5825 MHz )**

Mode	Test channel	Maximum Conducted Output Power (dBm)	Limit (dBm)	Result
11a	CH149	7.79	30	PASS
11a	CH157	7.77	30	PASS
11a	CH165	7.62	30	PASS
11n(HT20)	CH149	7.66	30	PASS
11n(HT20)	CH157	7.73	30	PASS
11n(HT20)	CH165	7.61	30	PASS
11n(HT40)	CH151	7.15	30	PASS
11n(HT40)	CH159	6.56	30	PASS
11ac(VHT20)	CH149	7.76	30	PASS
11ac(VHT20)	CH157	7.61	30	PASS
11ac(VHT20)	CH165	7.59	30	PASS
11ac(VHT40)	CH151	7.40	30	PASS
11ac(VHT40)	CH159	6.72	30	PASS
11ac(VHT80)	CH155	6.61	30	PASS

## 6.4. 6dB Emission Bandwidth

### 6.4.1. Test Specification

<b>Test Requirement:</b>	FCC CFR47 Part 15 Section 15.407(e)& Part 2 J Section 2.1049
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
<b>Limit:</b>	>500kHz
<b>Test Setup:</b>	 <p style="text-align: center;"><b>Spectrum Analyzer</b>   <b>EUT</b></p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C</li> <li>2. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.</li> <li>4. Measure and record the results in the test report.</li> </ol>
<b>Test Result:</b>	PASS

### 6.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Antenna Connector	TCT	RFC-03	N/A	Sep. 08, 2020

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**6.4.3. Test data**

<b>Band 3 (5745 - 5825 MHz )</b>					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11a	CH149	5745	16.37	0.5	PASS
11a	CH157	5785	16.38	0.5	PASS
11a	CH165	5825	16.36	0.5	PASS
11n(HT20)	CH149	5745	17.62	0.5	PASS
11n(HT20)	CH157	5785	17.62	0.5	PASS
11n(HT20)	CH165	5825	17.62	0.5	PASS
11n(HT40)	CH151	5755	35.99	0.5	PASS
11n(HT40)	CH159	5795	36.12	0.5	PASS
11ac(VHT20)	CH149	5745	17.62	0.5	PASS
11ac(VHT20)	CH157	5785	17.62	0.5	PASS
11ac(VHT20)	CH165	5825	17.58	0.5	PASS
11ac(VHT40)	CH151	5755	36.13	0.5	PASS
11ac(VHT40)	CH159	5795	36.15	0.5	PASS
11ac(VHT80)	CH155	5775	76.17	0.5	PASS

**Test plots as follows:**

## Band 3 (5725 – 5850 MHz)

11a

CH149



CH157

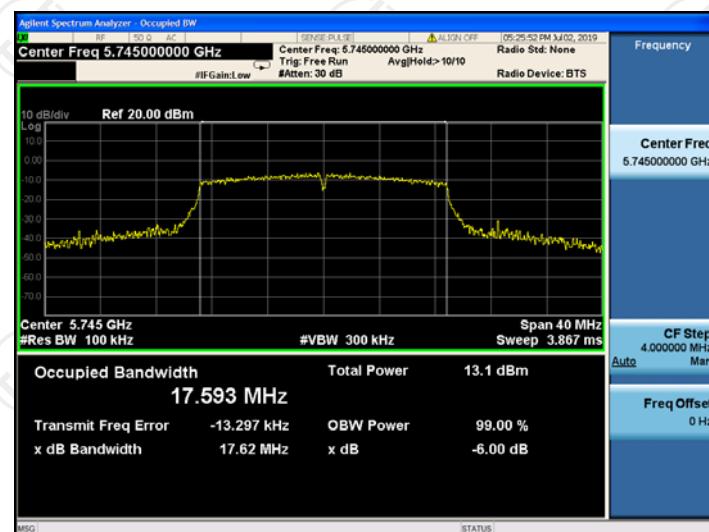


CH165



11n(HT20)

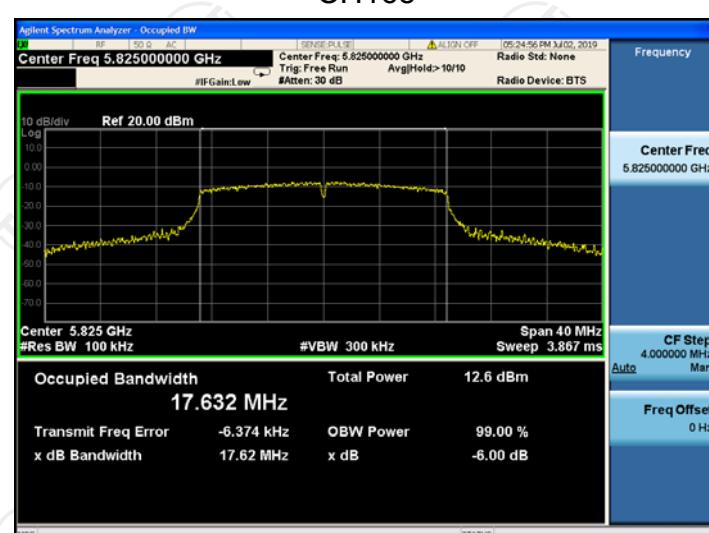
CH149



CH157

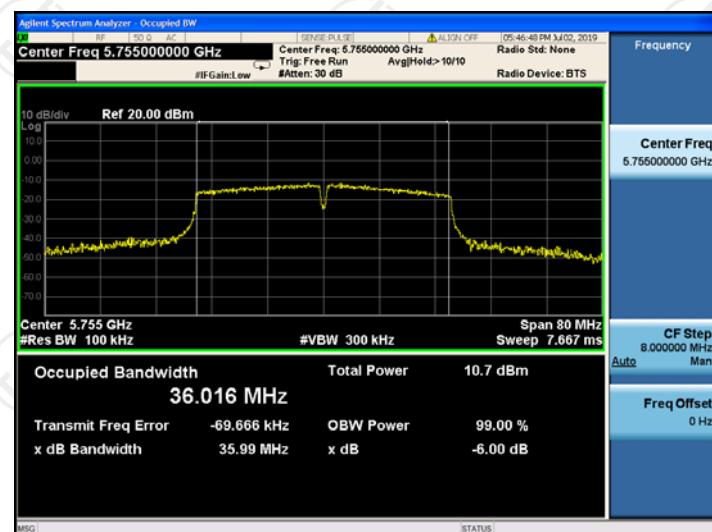


CH165

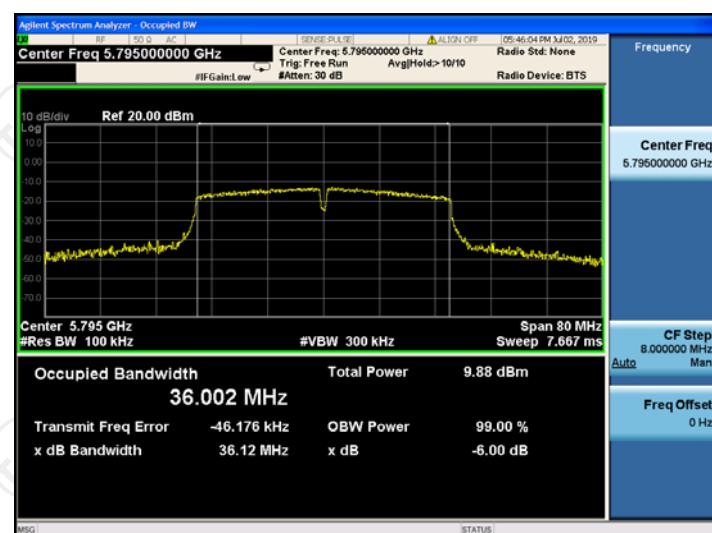


11n(HT40)

CH151



CH159



11ac(VHT20)

CH149



CH157



CH165



11ac(VHT40)

CH151



CH159



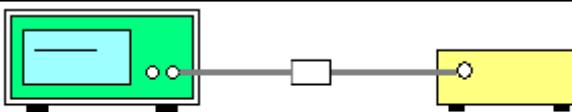
11ac(VHT80)

CH155



## 6.5. 26dB Bandwidth and 99% Occupied Bandwidth

### 6.5.1. Test Specification

<b>Test Requirement:</b>	47 CFR Part 15C Section 15.407 (a)& Part 2 J Section 2.1049
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D
<b>Limit:</b>	No restriction limits
<b>Test Setup:</b>	 <p style="text-align: center;"><b>Spectrum Analyzer</b>      <b>EUT</b></p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section D</li> <li>2. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement.</li> <li>4. Measure and record the results in the test report.</li> </ol>
<b>Test Result:</b>	PASS

### 6.5.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Antenna Connector	TCT	RFC-03	N/A	Sep. 08, 2020

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**6.5.3. Test data****Band 1**

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11a	CH36	5180	22.45	16.80
11a	CH40	5200	22.46	16.70
11a	CH48	5240	21.93	16.74
11n(HT20)	CH36	5180	24.56	17.75
11n(HT20)	CH40	5200	23.05	17.80
11n(HT20)	CH48	5240	22.94	17.83
11n(HT40)	CH38	5190	41.29	36.17
11n(HT40)	CH46	5230	41.33	36.28
11ac(VHT20)	CH36	5180	23.05	17.79
11ac(VHT20)	CH40	5200	22.24	17.80
11ac(VHT20)	CH48	5240	23.38	17.75
11ac(VHT40)	CH38	5190	41.29	36.31
11ac(VHT40)	CH46	5230	43.26	36.17
11ac(VHT80)	CH42	5210	84.77	75.36

**Band 3**

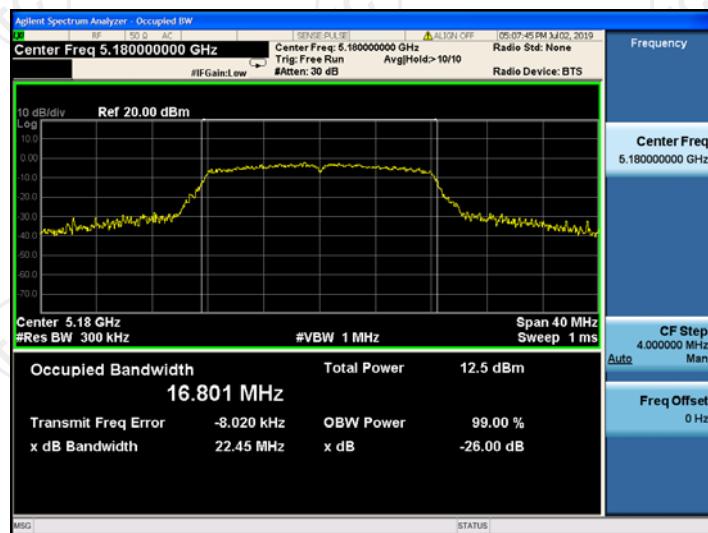
Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
11a	CH149	5745	16.75
11a	CH157	5785	16.81
11a	CH165	5825	16.75
11n(HT20)	CH149	5745	17.80
11n(HT20)	CH157	5785	17.80
11n(HT20)	CH165	5825	17.75
11n(HT40)	CH151	5755	36.13
11n(HT40)	CH159	5795	36.13
11ac(VHT20)	CH149	5745	17.80
11ac(VHT20)	CH157	5785	17.80
11ac(VHT20)	CH165	5825	17.77
11ac(VHT40)	CH151	5755	36.23
11ac(VHT40)	CH159	5795	36.15
11ac(VHT80)	CH155	5775	75.26

**Test plots as follows:**

## Band 1 (5180-5240 MHz)

11a

CH36



CH40

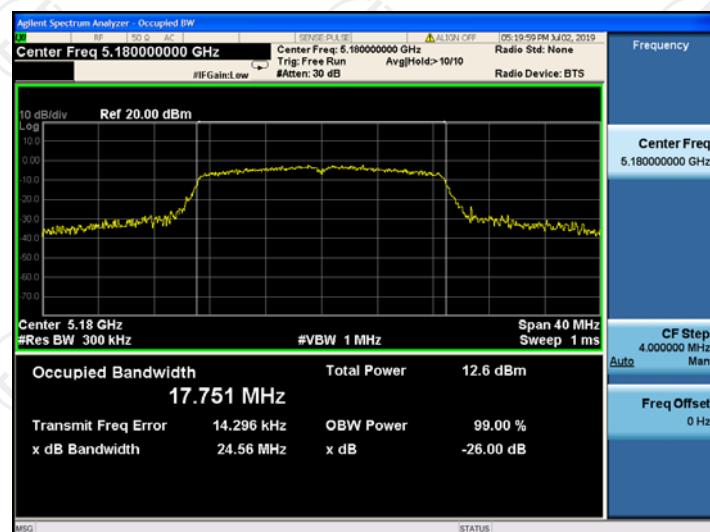


CH48



11n(HT20)

CH36



CH40



CH48

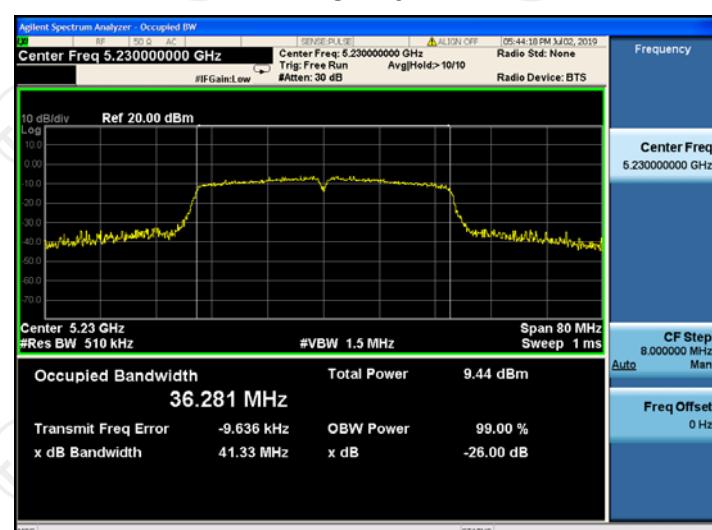


11n(HT40)

CH38



CH46



11ac(VHT20)

CH36



## CH40



## CH48



## 11ac(VHT40)

## CH38



## CH46



## 11ac(VHT80)

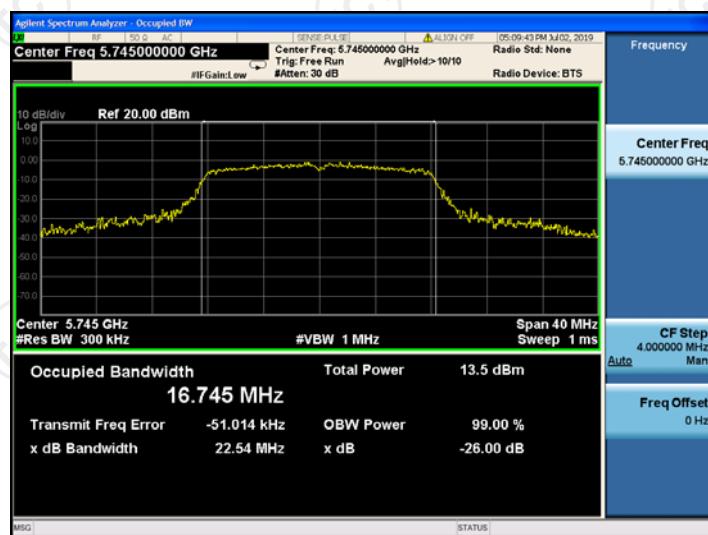
## CH42



## Band 3(5745-5825MHz)

11a

CH149



CH157



CH165



11n(HT20)

CH149



CH157



CH165



11n(HT40)

CH151

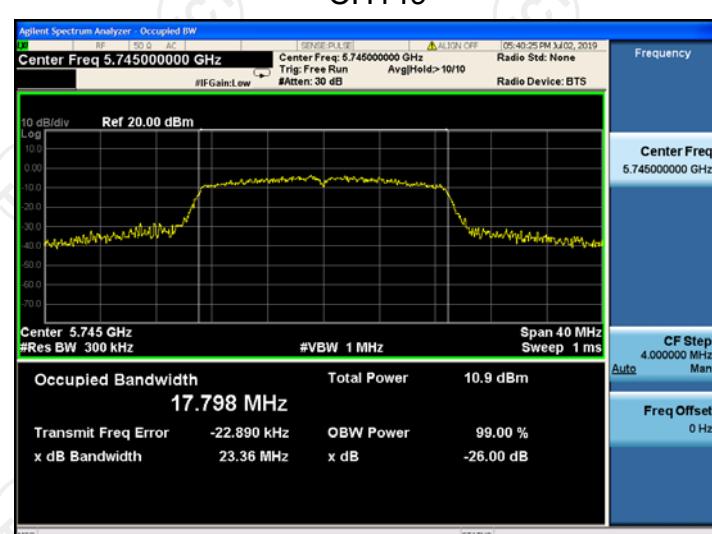


CH159

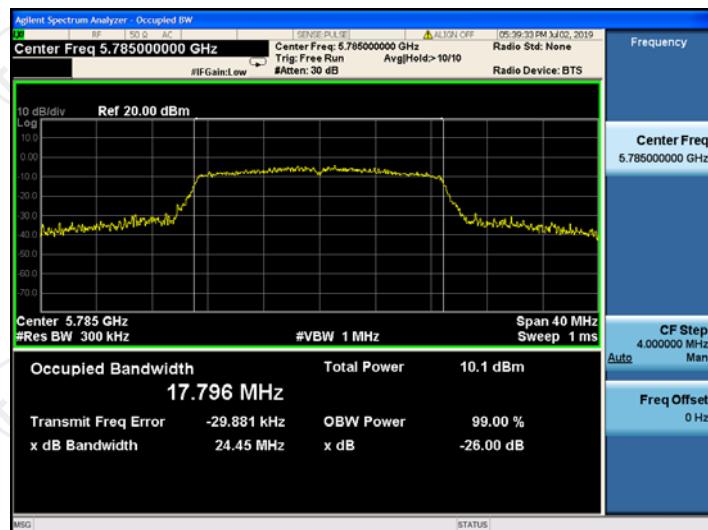


11ac(VHT20)

CH149



CH157



CH165



11ac(VHT40)

CH151



CH159



## 11ac(VHT80)

CH155



## 6.6. Power Spectral Density

### 6.6.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 E Section 15.407 (a)	
<b>Test Method:</b>	KDB662911 D01 Multiple Transmitter Output v02r01r01 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section F	
<b>Limit:</b>	≤11.00dBm/MHz for Band 1 5150MHz-5250MHz(client device) ≤11.00dBm/MHz for Band 2A&2C 5250-5350&5470-5725 ≤30.00dBm/500KHz for Band 3 5725MHz-5850MHz The e.i,r,p spectral density for Band 1 5150MHz – 5250 MHz should not exceed 10dBm/MHz	
<b>Test Setup:</b>	 <b>Spectrum Analyzer</b> <b>EUT</b>	
<b>Test Mode:</b>	Transmitting mode with modulation	
<b>Test Procedure:</b>	1. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 1. Set RBW = 510 kHz/1 MHz, VBW $\geq$ 3*RBW, Sweep time = Auto, Detector = RMS. 2. Allow the sweeps to continue until the trace stabilizes. 3. Use the peak marker function to determine the maximum amplitude level. 4. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.	
<b>Test Result:</b>	PASS	

### 6.6.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	N9020A	MY49100619	Sep. 11, 2020
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Sep. 08, 2020
Antenna Connector	TCT	RFC-03	N/A	Sep. 08, 2020

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).