

CTC Laboratories, Inc.

2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

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Т	EST REPORT			
Report No:	CTC20231517E06			
FCC ID:	2AKXB-W3011020			
Applicant:	Woan Technology (Shenzhen) C	o., Ltd.		
Address:	Room 1101, Qiancheng Commerci Road, Mabu Community, Xixiang S Shenzhen, Guangdong, P.R.China	Sub-district, Bao'an District,		
Manufacturer	Woan Technology (Shenzhen) Co.,	, Ltd.		
Address	Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100 SwitchBot Mini Robot Vacuum K10+			
	SwitchBot Mini Robot Vacuum K	10		
Trade Mark:	SwitchBot			
Model/Type reference:	W3011020			
Listed Model(s):	W3011021, W3011022, W3011023	, W3011024, W3011025		
Standard:	FCC CFR Title 47 Part 15 Subpar	t C Section 15.247		
Date of receipt of test sample:	Jul. 10, 2023			
Date of testing	Jul. 10, 2023 to Aug. 1, 2023			
Date of issue	Aug. 13, 2023			
Result	PASS			
Compiled by:		Jim Jiang		
(Printed name+signature)	Jim Jiang			
Supervised by:		n: shang		
(Printed name+signature)	Eric Zhang Totti Zhao			
Approved by:		1 Janes		
(Printed name+signature)	Totti Zhao			
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## 1. TEST SUMMARY

### 1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Operation within the bands 902–928MHz, 2400–2483.5MHz, and 5725–5850MHz.

<u>RSS-247 Issue 2</u>: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.

RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus.

ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

### 1.2. Report Version

Revised No.	Date of issue	Description
01	Aug. 13, 2023	Original

### **1.3. Test Description**

FCC Part 15 Subpart C (15.247) / RSS-247 Issue 2					
Test Item	Standard	Section	Result	Test	
rest nem	FCC	IC	Result	Engineer	
Antenna Requirement	15.203	RSS-Gen 6.8	Pass	Jim Jiang	
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Jim Jiang	
Conducted Band Edge and Spurious Emissions	15.247(d)	RSS-247 5.5	Pass	Jim Jiang	
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	RSS-247 5.5	Pass	Jim Jiang	
6dB Bandwidth	15.247(a)(2)	RSS-247 5.2 (a)	Pass	Jim Jiang	
Conducted Max Output Power	15.247(b)(3)	RSS-247 5.4 (d)	Pass	Jim Jiang	
Power Spectral Density	15.247(e)	RSS-247 5.2 (b)	Pass	Jim Jiang	
Transmitter Radiated Spurious	15.209&15.247(d)	RSS-247 5.5& RSS-Gen 8.9	Pass	Jim Jiang	

Note:

1. The measurement uncertainty is not included in the test result.

2. N/A: means this test item is not applicable for this device according to the technology characteristic of device.

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### 1.4. Test Facility

### Address of the report laboratory

### CTC Laboratories, Inc.

Add: 2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

### Laboratory accreditation

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

### A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

### Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

### FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 951311, Aug 26, 2017.



### **1.5. Measurement Uncertainty**

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties radio equipment characteristics; Part 2" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Test Items	Measurement Uncertainty	Notes
DTS Bandwidth	±0.0196%	(1)
Maximum Conducted Output Power	±0.686 dB	(1)
Maximum Power Spectral Density Level	±0.743 dB	(1)
Band-edge Compliance	±1.328 dB	(1)
Unwanted Emissions In Non-restricted Freq Bands	9kHz-1GHz: ±0.746dB 1GHz-26GHz: ±1.328dB	(1)
Conducted Emissions 9kHz~30MHz	±3.08 dB	(1)
Radiated Emissions 30~1000MHz	±4.51 dB	(1)
Radiated Emissions 1~18GHz	±5.84 dB	(1)
Radiated Emissions 18~40GHz	±6.12 dB	(1)

Below is the best measurement capability for CTC Laboratories, Inc.

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### **1.6. Environmental Conditions**

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15 °C to 35 °C
Relative Humidity:	20 % to 75 %
Air Pressure:	101 kPa

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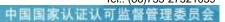
# 2. GENERAL INFORMATION

### 2.1. Client Information

Applicant:	Woan Technology (Shenzhen) Co., Ltd.
Address:	Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100
Manufacturer:	Woan Technology (Shenzhen) Co., Ltd.
Address:	Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100

### 2.2. General Description of EUT

Product Name:	SwitchBot Mini Robot Vacuum K10+				
	SwitchBot Mini Robot Vacuum K10				
	All these products are identical in the same PCB, layout, electrical circuit and enclosure. The difference is in product accessories.				
Product Differences:	K10+ is equipped with a mop holder, and there is a wet mop in the accessory bag. The product has a floor mop function.				
	K10 is not equipped with a mop holder, and there is no wet mop in the accessory bag. The product does not have a floor mop function.				
Trade Mark:	SwitchBot				
Model/Type reference:	W3011020				
Listed Model(s):	W3011021, W3011022, W3011023, W3011024, W3011025				
Model Difference:	All these models are identical in the same PCB, layout, electrical circuit and enclosure. The difference is model name.				
Power Supply:	Rated Voltage: DC14.4V, Rated Power: 30W, Rated Input: DC24V 1A				
Hardware Version:	V1.2				
Software Version:	V1.9.0.3080-0.3				
Bluetooth 4.2 / BLE					
Modulation:	GFSK				
Operation Frequency:	2402MHz~2480MHz				
Channel Number:	40				
Channel Separation:	2MHz				
Data Rate:	1Mbps				
Antenna Type:	PCB Antenna				
Antenna Gain:	3.08dBi				



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## 2.3. Accessory Equipment Information

Equipment Information					
Name	Model	S/N	Manufacturer		
Notebook	ThinkPad T460s	/	Lenovo		
Cable Information					
Name	Shielded Type	Ferrite Core	Length		
USB Cable	Unshielded	NO	150cm		
Test Software Information					
Name	Version	/	1		
RTL8762x_RFTestTool	v1.0.1.7	/	/		

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### 2.4. Operation State

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. BT BLE, 40 channels are provided to the EUT. Channels 00/19/39 were selected for testing.

**Operation Frequency List:** 

Channel	Frequency (MHz)
00	2402
01	2404
:	:
18	2438
19	2440
20	2442
:	:
38	2478
39	2480

Note: The display in grey were the channel selected for testing.

### Test Mode:

For RF test items:

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The engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions:

The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.

For Radiated spurious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

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### 2.5. Measurement Instruments List

Tonsce	Tonscend RF Test System					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until	
1	MXA Signal Analyzer	Keysight	N9020A	MY46471737	Dec. 16, 2023	
2	Spectrum Analyzer	R&S	FSU26	100105	Dec. 16, 2023	
3	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 14, 2024	
4	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 16, 2023	
5	PSG Analog Signal Generator	Agilent	E8257D	MY46521908	Dec. 16, 2023	
6	Power Sensor	Keysight	U2021XA	MY55130004	Mar. 14, 2024	
7	Power Sensor	Keysight	U2021XA	MY55130006	Mar. 14, 2024	
8	Wideband Radio Communication Tester	R&S	CMW500	102414	Dec. 16, 2023	
9	High and low temperature box	ESPEC	MT3035	/	Mar. 24, 2024	
10	JS1120 RF Test System	TONSCEND	v2.6	/	/	

Radiate	Radiated Emission (3m chamber 2)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until	
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-1013	Dec. 07, 2024	
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-648	Dec. 07, 2024	
3	Spectrum Analyzer	R&S	FSU26	100105	Dec. 16, 2023	
4	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 14, 2024	
5	Pre-Amplifier	SONOMA	310	186194	Dec. 16, 2023	
6	Low Noise Pre-Amplifier	EMCI	EMC051835	980075	Dec. 16, 2023	
7	Test Receiver	R&S	ESCI7	100967	Dec. 16, 2023	
8	3m chamber 2	Frankonia	EE025	/	Oct. 23, 2024	

Conduc	ted Emission				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until
1	LISN	R&S	ENV216	101112	Dec. 16, 2023
2	LISN	R&S	ENV216	101113	Dec. 16, 2023
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 16, 2023
4	ISN CAT6	Schwarzbeck	NTFM 8158	CAT6-8158-0046	Dec. 16, 2023
5	ISN CAT5	Schwarzbeck	NTFM 8158	CAT5-8158-0046	Dec. 16, 2023

Note: 1. The Cal. Interval was one year.

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2. The Cal. Interval was three years of the antenna.

3. The cable loss has been calculated in test result which connection between each test instruments.

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# 3. TEST ITEM AND RESULTS

### 3.1. Conducted Emission

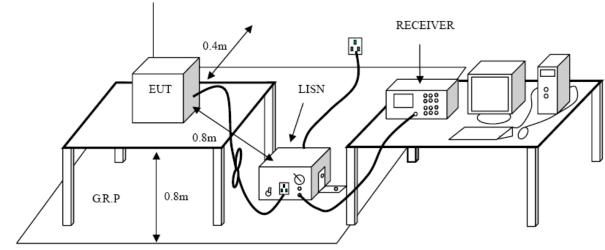
### <u>Limit</u>

### FCC CFR Title 47 Part 15 Subpart C Section 15.207 / RSS-Gen 8.8

	Conducte	d Limit (dBμV)
Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

\* Decreases with the logarithm of the frequency.

### **Test Configuration**



### Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.

2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.

3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm / 50  $\mu$ H coupling impedance for the measuring equipment. 4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

8. During the above scans, the emissions were maximized by cable manipulation.

### Test Mode

Please refer to the clause 2.4.

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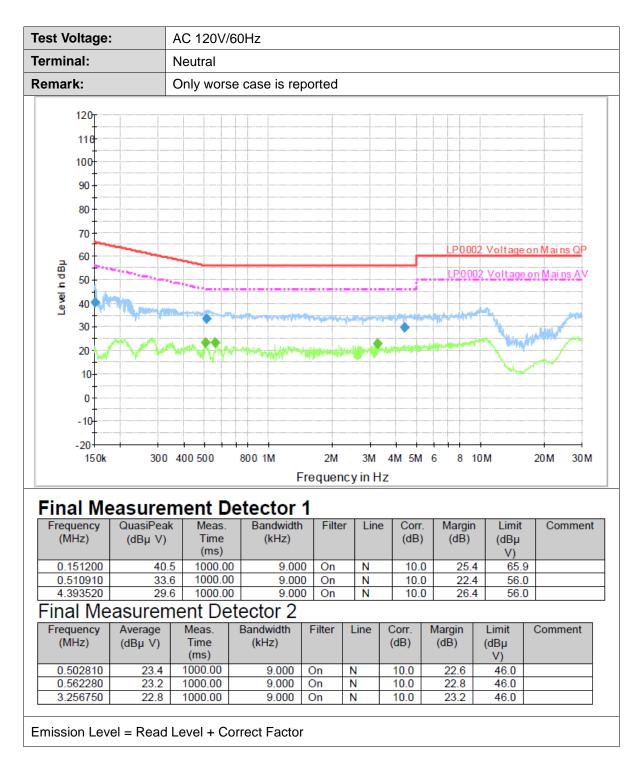
est Voltage:		AC 120V/6	60Hz						
erminal:	L	ine							
emark:	(	Only worse	e case is rep	orted					
120 <del></del>									
110									
100									
90									
80									
+									
70							FCC CI	ace D Voltag	e on Mains QP
≥ <sup>60</sup>									
E 50	()						FCC C	lass B Voltag	e on Mains AV
50 to the second									
30	F FY				and the second second	-	-	A Andrew	
									Manne
20		V VV	a second and the seco	where we		1. Andrew of the second se			
10									
0									
-10-									
+									
-20 + 150k	300	400 500	800 1M	2M	3M	4M 5M	6 8 1	0M	20M 30M
			Fr	equency	in Hz				
Final Me		<u>nent D</u>							
Frequency (MHz)	QuasiPeak (dBµ V)	Meas. Time	Bandwidth (kHz)	Filte	r Line	e Corr (dB)		Limit	Comment
(11112)	(ubµ v)	(ms)	(((12)			(00)		(ubµ V)	
0.151200	46.0			_	L1	9.		9 65.9	_
0.169760 0.369750	<u>41.0</u> 37.5				L1	9.			
Final Me									1
Frequency	Average	Meas.	Bandwidth	Filter	Line	Corr.	Margin	Limit	Comment
(MHz)	(dBµ V)	Time (ms)	(kHz)			(dB)	(dB)	(dBµ	
0.344120	26.7	1000.00	9.000	On	L1	9.7	22.4	V) 49.1	
0.500810	24.7	1000.00	9.000	On	L1	9.7	21.3	46.0	
0.569050	23.8	1000.00	9.000	On	L1	9.7	22.2	46.0	

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### 3.2. Radiated Emission

<u>Limit</u>

### FCC CFR Title 47 Part 15 Subpart C Section 15.209 / RSS-Gen 8.9

Frequency	Field Strength	Measurement Distance
(MHz)	(microvolts/meter)	(meters)
0.009~0.490	2400/F (kHz)	300
0.490~1.705	24000/F (kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

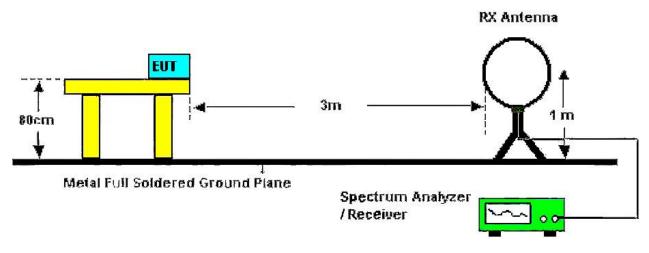
	dBµV/m	(at 3 meters)
Frequency Range (MHz)	Peak	Average
Above 1000	74	54

#### Note:

(1) The tighter limit applies at the band edges.

(2) Emission Level (dB $\mu$ V/m)=20log Emission Level ( $\mu$ V/m).

### **Test Configuration**



Below 30MHz Test Setup

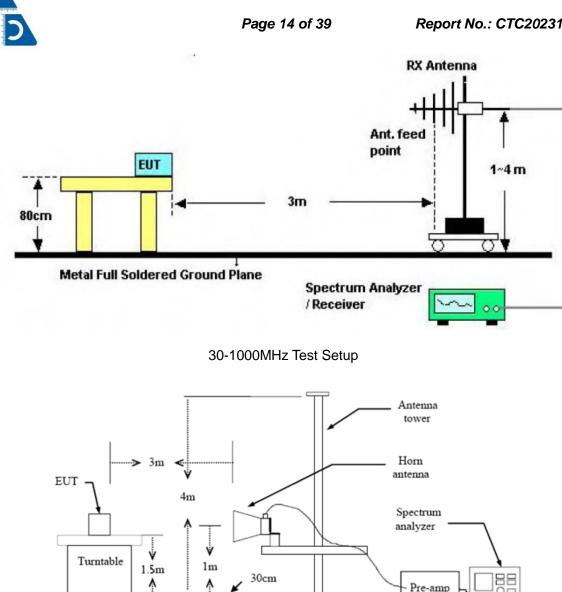
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Above 1GHz Test Setup

### **Test Procedure**

1. The EUT was setup and tested according to ANSI C63.10:2013.

The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for 2. above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable 3. height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.

- Set to the maximum power setting and enable the EUT transmit continuously. 5.
- 6. Use the following spectrum analyzer settings
- Span shall wide enough to fully capture the emission being measured; (1)
- (2) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;

If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the guasi-peak detector and reported.

(3) From 1 GHz to 10<sup>th</sup> harmonic:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

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RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

### Test Mode

Please refer to the clause 2.4.

### Test Result

#### 9 kHz~30 MHz

From 9 kHz to 30 MHz: The conclusion is PASS.

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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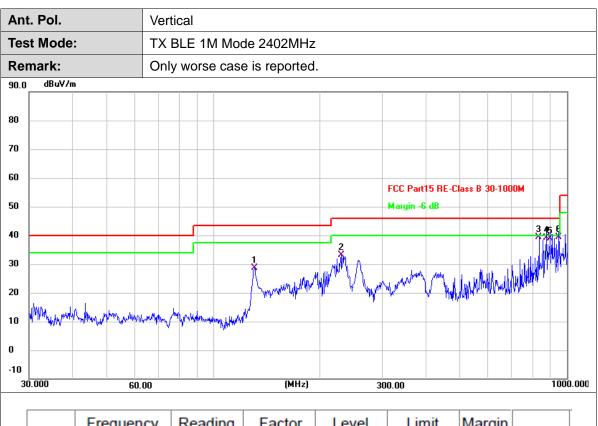
2	263.0799	55.61	-18.23	37.38	46.00	-8.62	QP
3	382.0516	52.74	-15.25	37.49	46.00	-8.51	QP
4	675.2078	46.39	-9.40	36.99	46.00	-9.01	QP
5 *	854.6236	46.33	-6.53	39.80	46.00	-6.20	QP
6	942.7912	44.98	-5.36	39.62	46.00	-6.38	QP
						· · · · · · · · · · · · · · · · · · ·	

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	130.4704	47.20	-18.46	28.74	43.50	-14.76	QP
2	229.9370	52.47	-19.33	33.14	46.00	-12.86	QP
3	835.6579	46.14	-6.80	39.34	46.00	-6.66	QP
4	876.4754	45.34	-6.22	39.12	46.00	-6.88	QP
5	898.8857	44.83	-5.89	38.94	46.00	-7.06	QP
6 *	950.7590	44.73	-5.26	39.47	46.00	-6.53	QP

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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Ant. Pol.	Horizontal
Test Mode:	TX BLE 1M Mode 2402MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

N	lo.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	*	4803.899	30.88	2.16	33.04	54.00	-20.96	AVG
	2	4803.915	42.52	2.16	44.68	74.00	-29.32	peak

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

Ant. Pol.	Vertical
Test Mode:	TX BLE 1M Mode 2402MHz
Remark:	No report for the emission which more than 20 dB below the prescribed limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	4804.000	41.73	2.16	43.89	74.00	-30.11	peak
2 *	4804.000	29.87	2.16	32.03	54.00	-21.97	AVG

Remarks:

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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TX BLE 1M Mode 2440MHz      Remark:    No report for the emission which more than 20 dB below the prescr limit.      No.    Frequency (MHz)    Reading (dBuV)    Factor (dB/m)    Level (dBuV/m)    Limit (dBuV/m)    Margin (dB)    Detector	Ant	. Pol.	Horizontal						
No. Frequency Reading Factor Level Limit Margin	Tes	t Mode:	TX BLE 1M Mode 2440MHz						
	Rer	nark:	•	he emission	which more	than 20 dB	below the	e prescribe	
					1				

2.31

2.31

32.86

44.14

54.00

74.00

-21.14

-29.86

AVG

peak

Remarks:

\*

1 2

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

30.55

41.83

2.Margin value = Level -Limit value

4879.963

4880.077

Ant.	. Pol.		Vertical								
Test	t Mode:		TX BLE 1M Mode 2440MHz								
Ren	nark:		No report for the emission which more than 20 dB below the prescribed limit.								
	No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector			
	No.							Detector peak			

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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Ant	. Pol.		Horizontal							
Tes	t Mode:		TX BLE 1M Mode 2480MHz							
Rer	nark:		No report for t limit.	he emission	which more	than 20 dB	below the	e prescribe	ed	
	No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector		
					1					

2.48

43.77

74.00

-30.23

peak

Remarks:

2

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

41.29

2.Margin value = Level -Limit value

4960.024

Ant.	. Pol.		Vertical TX BLE 1M Mode 2480MHz							
Test	t Mode:									
Rem	nark:		No report for t limit.	the emissior	which more	than 20 dB	below the	e prescribe		
	No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector		
	No.						· ·	Detector peak		

Remarks:

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor

2.Margin value = Level -Limit value

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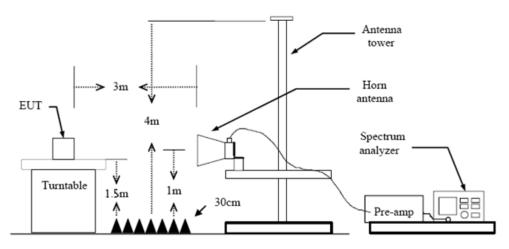
### 3.3. Band Edge Emissions (Radiated)

Limit

### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d) / RSS-247 5.5

Restricted Frequency Band	(dBµV/m	ı) (at 3m)
(MHz)	Peak	Average
2310 ~ 2390	74	54
2483.5 ~ 2500	74	54

### **Test Configuration**



### **Test Procedure**

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 2. degrees to determine the position of the maximum emission level.

3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is 4. repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement. The receiver set as follow: 5.

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

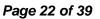
Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

### **Test Mode**

Please refer to the clause 2.4.

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		Hor	rizontal											
Fest Mode:		ТХ	BLE 1M	Mod	e 2402l	ИНz								
20.0 dBuV/m														
10														
00														
0													^	
30							F	CC Pa	art15 C	lass B 3M	Above-	1G Pe	ak	
70												1		
50											<u> </u>		<u> </u>	
50							F	UU Pa	art15 L	lass B 3M	Above-			
10											ł			
80											2		$  \langle   \rangle$	
											×		<u> </u>	
20														
0														
0.0 2285.400 22	298.40 2311.	40 2	324.40	2337.4	0 (MH	zl	2363.4	10	2376	40 23	89.40	24	02.40	241
No.	Frequen (MHz)		Reading (dBuV)		Factor (dB/m)		Leve BuV/			imit uV/m)	Mar (d		Dete	ctor
	0000.00	0	50.24		-7.72	4	12.52	2	7	4.00	-31	.48	pea	ak
1	2390.00				-7.72		29.99	0	5	4.00	-24	04	AV	<u> </u>

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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EN

. Pol.	۱.	Vertical					
t Mode	:	TX BLE 1M M	ode 2402MI	Ηz			
) dBuV/m	1						
				FCC P	art15 Class B 3M	Above-1G Pe	ak
							$\Lambda$
				FCC P	art15 Class B 3M .	Above-1G AV	$\mathbb{N}$
						1	$\square$
						X	<u> </u>
						3	La.
283.000 2	296.00 2309.00	2322.00 233	35.00 (MHz)	2361.00	2374.00 23	87.00 24	00.00 241
	-	D					
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.000	49.62	-7.72	41.90	74.00	-32.10	peak
2 *	2390.000	37.65	-7.72	29.93	54.00	-24.07	AVG

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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t. Pol.		Hor	izontal					
st Mode	:	ΤХ	BLE 1M N	lode 2480M	Hz			
.0 dBuV/	m							
	0							
	A				FCC P	art15 Class B 3M .	Above-16 Pe	ak
							ADOVE-TO TE	
$\vdash$	X				FCC P	art15 Class B 3M .	Above-1G AV	
	X							
467.800 2	2480.80 2493	00 21	506.80 25	i19.80 (MHz)	2545.80	2558.80 25	71.80 25	84.80 25
Na	Frequer	icy f	Reading	Factor	Level	Limit	Margin	Detector
No.	(MHz)	·	(dBuV)	(dB/m)	-	(dBuV/m)		
1	2483.50	00	63.37	-7.32	56.05	74.00	-17.95	peak
2 *	2483.50	00	53.88	-7.32	46.56	54.00	-7.44	AVG

EN

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

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Ant.	Pol.			Ve	Vertical										
Test	t Mode:			TX	BLE '	1M M	ode 2	480MI	Ηz						
120.0	dBu∀/m	1												1	_
110															
100															
90															
80										FUU B	art15 Cl	aee R 3M	Above-1G	Peak	_
70													ADOTE-TO	IGAN	
60		$\downarrow$								FCC P	art15 Cl	ass B 3M	Above-1G	AV	_
50		1 ×													
40	-+	2													
30		<u> </u>											+		-
20															
10															
0.0 24	<b>69.000</b> 24	482.00	2495.0	0 2	2508.00	252	21.00	(MHz)	254	7.00	2560.0	0 25	73.00	2586.00	2599.
	No.		quenc //Hz)	y	Read (dBu	V)	(dB	ctor 3/m)	-	V/m)	(dBı	mit ıV/m)		Delecti	or
	1	248	33.500	)	55.5	53	-7	.32	48.	21	74	.00	-25.7	9 peak	۲
	2 *	248	3.500	)	46.1	1	-7.	.32	38.	79	54	.00	-15.2	1 AVG	
Rem	narks:														

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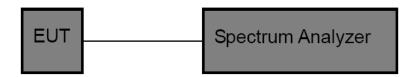
### 3.4. Band Edge and Spurious Emissions (Conducted)

### <u>Limit</u>

### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d) / RSS-247 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

### **Test Configuration**



### Test Procedure

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously.
- Use the following spectrum analyzer settings: RBW = 100 kHz, VBW ≥ RBW, scan up through 10<sup>th</sup> harmonic. Sweep = auto, Detector function = peak, Trace = max hold.
- 4. Measure and record the results in the test report.

### Test Mode

Please refer to the clause 2.4.

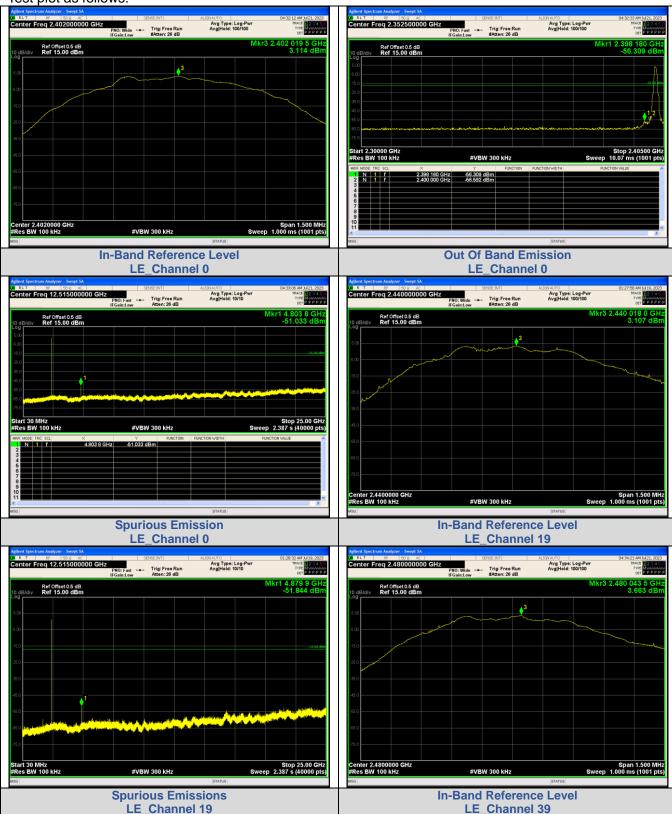
### Test Result

Mode	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
		2400.00	-56.592	-16.89	-39.702	PASS
	0	2398.18	-56.309	-16.89	-39.419	PASS
BLE 1M		4803.80	-51.033	-16.89	-34.143	PASS
DLC_1W	19	4879.92	-51.844	-16.89	-34.954	PASS
	39	2483.50	-58.228	-16.34	-42	PASS
		4959.83	-51.212	-16.34	-34.872	PASS

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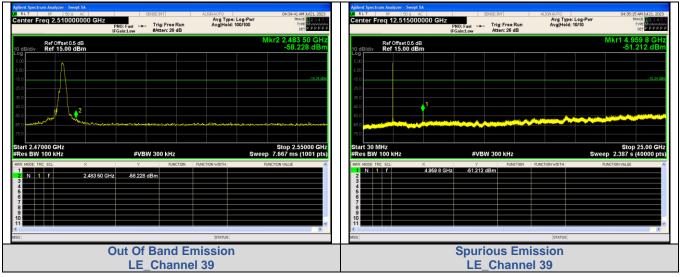
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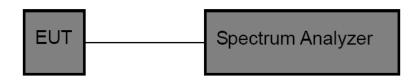
### 3.5. DTS Bandwidth

<u>Limit</u>

### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2) / RSS-247 5.2 a

Test Item	Limit	Frequency Range (MHz)
DTS Bandwidth	≥500 kHz (6dB bandwidth)	2400~2483.5

### **Test Configuration**



### Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. DTS Spectrum Setting:
  - (1) Set RBW = 100 kHz.
  - (2) Set the video bandwidth (VBW)  $\geq$  3 RBW.
  - (3) Detector = Peak.
  - (4) Trace mode = Max hold.
  - (5) Sweep = Auto couple.
  - OCB Spectrum Setting:
  - (1) Set RBW =  $1\% \sim 5\%$  occupied bandwidth.
  - (2) Set the video bandwidth (VBW)  $\geq$  3 RBW.
  - (3) Detector = Peak.
  - (4) Trace mode = Max hold.
  - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

### Test Mode

Please refer to the clause 2.4.

### Test Result

Test Mode	Frequency (MHz)	99% Bandwidth (MHz)	DTS Bandwidth (MHz)	Limit (MHz)	Verdict
	2402	1.0243	0.6529	≥0.5	Pass
BLE_1M	2440	1.0507	0.6477	≥0.5	Pass
	2480	1.0477	0.6911	≥0.5	Pass

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99% Bandwidth:

Agilent Spectrum Analyzer - Occupied BW		01:21:37 AM Jul 19, 2023	Agilent Spectrum Analyzer - Occupied BW		nen aner-th en		01:27:08 AM Jul 19, 2023
Center Freq 2.402000000 GHz	Center Freq: 2.402000000 GHz Trig: Free Run Avg Hold: 100/100	Radio Std: None	Center Freq 2.440000000 G	Hz	Center Freq: 2.4400000 Trig: Free Run	00 GHz Avg Hold: 100/100	Radio Std: None
#IFGain:Low	#Atten: 26 dB	Radio Device: BTS Mkr2 2.4025384 GHz		#IFGain:Low	#Atten: 26 dB		Radio Device: BTS
Ref Offset 0.5 dB 10 dB/div Ref 20.50 dBm		-17.093 dBm	Ref Offset 0.5 dB 10 dB/div Ref 20.50 dBm				-16.924 dBm
Log 10.5			Log 10.5				
9.500	non and		9.500				
19.50 Jun 447	A to a company where		-9.50	1 mm		m	<u> </u>
-29.5		- m	-29.5				Month and a service
-39.5		have been a second and the second an	-39.5				17-2-V
-59.5			-59.5				
-69.5			-69.6				
Center 2.402 GHz #Res BW 20 kHz	#VBW 62 kHz	Span 2 MHz Sweep   5.333 ms	Center 2.44 GHz #Res BW 20 kHz		#VBW 62 kH:	z	Span 2 MHz Sweep 5.333 ms
Occupied Bandwidth	Total Power 8.79 dBm		Occupied Bandwidth		Total Power	8.77 dBm	
1.0243 MHz			1.0	507 MHz			
Transmit Freq Error 26.489 kHz	OBW Power 99.00 %		Transmit Freq Error	23.002 kHz	OBW Power	99.00 %	
x dB Bandwidth 1.249 MHz	x dB -26.00 dB		x dB Bandwidth	1.261 MHz	x dB	-26.00 dB	
MSG	STATUS		MSG		<u></u>	STATUS	
	E_Channel 0			LE_	Channel	19	
Agilent Spectrum Analyzer - Occupied BW	SENSE:INT ALIGN AUTO	02:07:39 AM Jul 19, 2023					
Center Freq 2.480000000 GHz #IFGain:Low	Center Freq: 2.480000000 GHz Trig: Free Run Avg Hold: 100/100 #Atten: 26 dB	Radio Std: None Radio Device: BTS					
	#Atten: 20 db	Mkr2 2.4805486 GHz					
Ref Offset 0.5 dB 10 dB/div Ref 20.50 dBm		-16.846 dBm					
10.5							
1.500							
	man	2					
9 50	······································	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
		22 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
0.55 016 016 016 016 016 016 016 016							
	#VBW 62 kHz	Span 2 MHz Sweep 5.333 ms					
Center 2.48 CHz RRes BW 20 kHz		Span 2 MHz					
2.5 3.6 3.6 3.6 4.5 5 5 5 5 5 5 5 5 5 5 5 5 5	#VBW 62 kHz	Span 2 MHz					
Center 2.48 CHz RRes BW 20 kHz	#VBW 62 kHz	Span 2 MHz					
Center 2.48 GHZ #Res BW 20 kHz Occupied Bandwidth 1.0477 MHz	#VBW 62 kHz Total Power 9.63 dBm	Span 2 MHz					
Center 2.48 GHz RRes BW 20 kHz Cocupied Bandwidth 1.0477 MHz Transmit Freq Error 24.884 kHz	#VBW 62 kHz Total Power 9.63 dBm OBW Power 99.00 %	Span 2 MHz					
Center 2.48 GHz RRes BW 20 kHz Cocupied Bandwidth 1.0477 MHz Transmit Freq Error 24.884 kHz	#VBW 62 kHz        Total Power      9.63 dBm        OBW Power      99.00 %        x dB      -26.00 dB	Span 2 MHz					
Center 2.48 GHz #Res BW 20 KHz Occupied Bandwidth 1.0477 MHz Transmit Freq Error 24.884 kHz x dB Bandwidth 1.285 MHz	#VBW 62 kHz Total Power 9.63 dBm OBW Power 99.00 %	Span 2 MHz					

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#### DTS Bandwidth:

Centre Freq 2.40200000 GHz Fred Status Fred Status Fre	Agilent Spectrum Analyzer - Occupied BW			Agilent Spectrum Analyzer - Occupied BW		
Exclusion and the set of the s	Center Freq 2.402000000 GHz	Trig: Free Run Avg Hold>100/100	Radio Std: None	Center Freq 2.440000000 GHz	Trig: Free Run Avg Hold: 100/100	
The second seco						
<pre>ind of of</pre>						
All of the second secon	450			5.50		
All of the second secon	14.5			-14.5		
Bit Bandwidth  Total Power  9.81 dBm    Occupied Bandwidth  Total Power  9.81 dBm    1.0500 MHZ  Total Power  9.81 dBm    Transmit Freq Error  13.400 kHz  OBW Power  98.00 %    x dB Bandwidth  652.9 kHz  x dB  -6.00 dB    moi	-24.5			34.5		1 Landana
Refe BW 100 kHz POWER 100 kHz BWeep 1.333 m Occupied Bandwidth Total Power 9.8.61 dBm 1.0.500 MHz Transmit Freq Error 13.400 kHz OBW Power 98.00 % x dB Bandwidth 652.9 kHz x dB - 6.00 dB Center Freq 248000000 GHz Bandwidth Court Freq 2000000 GHz Bandwidth Strees Files 2000 BARZ Strees Files 2000000 GHz Bandwidth 647.7 kHz x dB - 6.00 dB Center Freq 248000000 GHz Bandwidth Total Power 10.1 dBm 1.0.817 MHz Bandwidth Total Power 10.1 dBm 1.0.817 MHz Court 10.1 dBm 1.0.817 MHz Court 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Total Power 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB	-44.5			-44.5		
Refe BW 100 kHz POWER 100 kHz BWeep 1.333 m Occupied Bandwidth Total Power 9.8.61 dBm 1.0.500 MHz Transmit Freq Error 13.400 kHz OBW Power 98.00 % x dB Bandwidth 652.9 kHz x dB - 6.00 dB Center Freq 248000000 GHz Bandwidth Court Freq 2000000 GHz Bandwidth Strees Files 2000 BARZ Strees Files 2000000 GHz Bandwidth 647.7 kHz x dB - 6.00 dB Center Freq 248000000 GHz Bandwidth Total Power 10.1 dBm 1.0.817 MHz Bandwidth Total Power 10.1 dBm 1.0.817 MHz Court 10.1 dBm 1.0.817 MHz Court 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Total Power 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB	-54.5			-54.5		
Refe BW 100 kHz POWER 100 kHz BWeep 1.333 m Occupied Bandwidth Total Power 9.8.61 dBm 1.0.500 MHz Transmit Freq Error 13.400 kHz OBW Power 98.00 % x dB Bandwidth 652.9 kHz x dB - 6.00 dB Center Freq 248000000 GHz Bandwidth Court Freq 2000000 GHz Bandwidth Strees Files 2000 BARZ Strees Files 2000000 GHz Bandwidth 647.7 kHz x dB - 6.00 dB Center Freq 248000000 GHz Bandwidth Total Power 10.1 dBm 1.0.817 MHz Bandwidth Total Power 10.1 dBm 1.0.817 MHz Court 10.1 dBm 1.0.817 MHz Court 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Total Power 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB Center 5.23 6Hz Bandwidth Strees Error 10.1 dBm 1.0.817 MHz X dB - 6.00 dB	-74.5			-74.5		
Instantik Freq Error    1.0500 MHz      Transmit Freq Error    13.400 kHz    OBW Power    99.00 %      x dB Bandwidth    652.9 kHz    x dB    -6.00 dB      moment    LE_Channel 0    Image: Channel 10      Mathematic Reserved Colspan="2">Reserved State Name      Colspan="2">Colspan="2">Reserved State Name      Colspan="2">Reserved State Name      Colspan="2">Reserved State Name      Mathematic Reserved State Name    Span 2 Mite      Openet Freq 2.48 Other    Freq Diverse 10.1 dBm    Span 2 Mite      Colspan="2">Colspan="2">Reserved State Name      Mathematic Reserved State Name    Span 2 Mite    Span 2 Mite      Openet Freq 2.48 Other    Freq Brown    10.1 dBm    Span 2 Mite      Colspan="2">Colspan="2">State Name    Span 2 Mite      Mathematic Reserved State Name    Span 2 Mite    Span 2 Mite      Mathematic Rese	Center 2.402 GHz #Res BW 100 kHz	#VBW 300 kHz	Span 2 MHz Sweep   1.333 ms	Center 2.44 GHz #Res BW 100 kHz	#VBW 300 kHz	Span 2 MH Sweep 1.333 m
Transmit Freq Error    13.400 kHz    OBW Power    99.00 %      x dB Bandwidth    65.2 9 kHz    x dB    -6.00 dB      mol    mol    mol    mol      mol    mol    mol    mol    mol      mol    mol    mol    mol    mol      mol    mol    mol    mol    mol      mol    mol    mol    mol    mol      mol    mol    mol    mol    m		Total Power 9.61 dBm				
tes source for a set of the format of the f		OBW Power 99.00 %				
LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19	x dB Bandwidth 652.9 kHz	x dB -6.00 dB		x dB Bandwidth 647.7 kHz	x dB -6.00 dB	
LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19 LE_Channel 19						
Ref  Channel 19    Conter Freq 2.480000000 GHz  Conter Freq 2.48000000 GHz  Conter Freq 2.48000000 GHz    Order  Freq 2.48000000 GHz  Span 2 MHz    Span 2 MHz  Sweep 1.333 ms    Occupied Bandwidth  Total Power    1.0.817 MHz  Transmit Freq Error    Transmit Freq Error  33.707 KHz    OBW Power  99.00 %    x dB Bandwidth  691.1 KHz    x dB Bandwidth  691.1 KHz	100	PTATI IP		Nec	etatue	
Wed Synchron Registry & December 19 and 20 a				MOU		
Transmit Freq Error 33.707 KHz OBW Power 99.00 % x dB Bandwidth 691.1 KHz x dB = -6.00 dB				L		
Bit Control 0  Bit Read Device: BTS    0  Bit Sound Bit    0	Center Freq 2.480000000 GHz	Trig: Free Run Avg Hold: 100/100	Radio Std: None			
Log de la construction de la con		#Atten: 26 dB	Radio Device: BTS			
All  All  All  All    All  All  All  All    All  All  All  All    All  All  All  All    Center 2.48 GHz  #VBW 300 kHz  Span 2 MHz    SRes BW 100 kHz  #VBW 300 kHz  Sweep 1.333 ms    Occupied Bandwidth  Total Power  10.1 dBm    1.0817 MHz  MHz    Transmit Freq Error  33.707 kHz  OBW Power    99.00 %  x dB Bandwidth  691.1 kHz  x dB    M0  Intrul  Intrul						
All  All  All  All    All  All  All  All    All  All  All  All    All  All  All  All    Center 2.48 GHz  #VBW 300 kHz  Span 2 MHz    SRes BW 100 kHz  #VBW 300 kHz  Sweep 1.333 ms    Occupied Bandwidth  Total Power  10.1 dBm    1.0817 MHz  MHz    Transmit Freq Error  33.707 kHz  OBW Power    99.00 %  x dB Bandwidth  691.1 kHz  x dB    M0  Intrul  Intrul	450					
All  All  All  All    All  All  All  All    All  All  All  All    All  All  All  All    Center 2.48 GHz  #VBW 300 kHz  Span 2 MHz    SRes BW 100 kHz  #VBW 300 kHz  Sweep 1.333 ms    Occupied Bandwidth  Total Power  10.1 dBm    1.0817 MHz  MHz    Transmit Freq Error  33.707 kHz  OBW Power    99.00 %  x dB Bandwidth  691.1 kHz  x dB    M0  Intrul  Intrul	14.5		Mar and a sector			
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#Res BW 100 kHz #VEW 300 kHz Sweep 1.333 ms Occupied Bandwidth Total Power 10.1 dBm 1.0817 MHz Transmit Freq Error 33.707 kHz OBW Power 99.00 % x dB Bandwidth 691.1 kHz x dB 66.00 dB	-54.5 -64.6					
#Res BW 100 kHz #VEW 300 kHz Sweep 1.333 ms Occupied Bandwidth Total Power 10.1 dBm 1.0817 MHz Transmit Freq Error 33.707 kHz OBW Power 99.00 % x dB Bandwidth 691.1 kHz x dB 66.00 dB	-74.5					
1.0817 MHz      Transmit Freq Error    33.707 kHz    OBW Power    99.00 %      x dB Bandwidth    691.1 kHz    x dB    -6.00 dB	Center 2.48 GHz #Res BW 100 kHz	#VBW 300 kHz	Span 2 MHz Sweep 1.333 ms			
Transmit Freq Error      33.707 kHz      OBW Power      99.00 %        x dB Bandwidth      691.1 kHz      x dB      -6.00 dB		Total Power 10.1 dBm				
x dB Bandwidth 691.1 kHz x dB -6.00 dB						
	x dB Bandwidth 691.1 kHz	x dB -5.00 dB				
LE Channel 20						
	150	STATUS				

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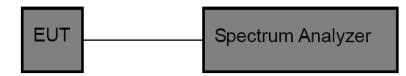
### 3.6. Peak Output Power

Limit

### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3) / RSS-247 5.4 d

Section	Test Item	Limit	Frequency Range (MHz)
FCC CFR 47 Part15.247 (b)(3)	Maximum Conducted Output Power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	2400~2483.5

### **Test Configuration**



### **Test Procedure**

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

- 2. Spectrum Setting:
  - (1) Set RBW ≥ DTS Bandwidth.
  - (2) Set VBW  $\geq$  3\*RBW.
  - (3) Set Span  $\geq$  3\*RBW.
  - (4) Sweep time = Auto couple.
  - (5) Detector = Peak.
  - (6) Trace mode = Max hold.

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

### **Test Mode**

Please refer to the clause 2.4.

### **Test Result**

Mode	Channel	Peak Output Power (dBm)	Limit (dBm)	Result
	0	3.354	30	PASS
BLE_1M	19	4.436	30	PASS
	39	4.671	30	PASS

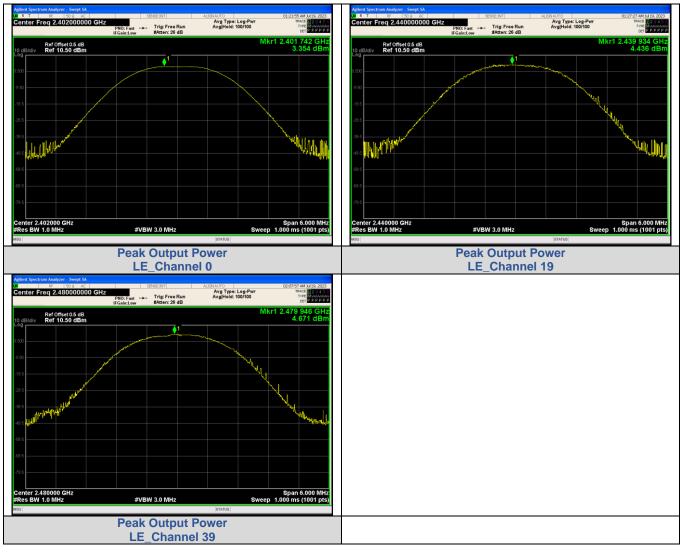
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Test plot as follows:





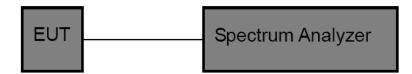
#### **Power Spectral Density** 3.7.

Limit

### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e) / RSS-247 5.2 b

Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	8 dBm (in any 3 kHz)	2400~2483.5

### **Test Configuration**



### **Test Procedure**

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.

3. Spectrum Setting:

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz.

Set the VBW to: 10 kHz.

Detector: peak.

Sweep time: auto.

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

### **Test Mode**

Please refer to the clause 2.4.

### **Test Result**

Mode	Channel	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Result
	0	-10.893	8	PASS
BLE_1M	19	-11.362	8	PASS
	39	-10.011	8	PASS

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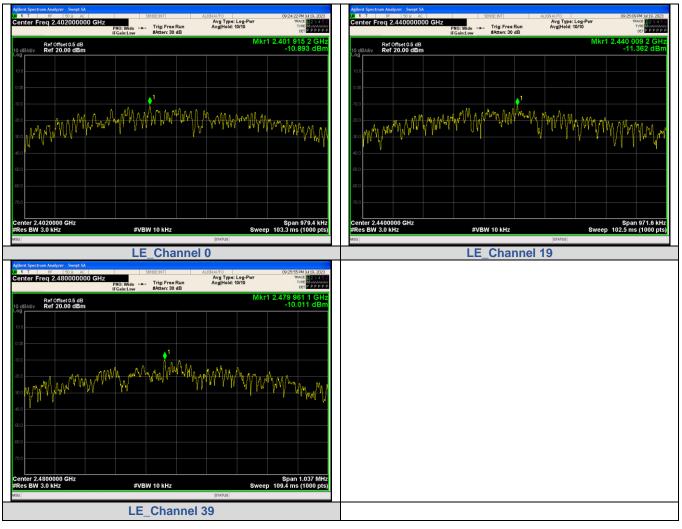
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Test plot as follows:

EN



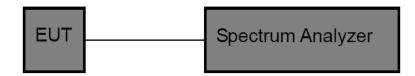


#### 3.8. **Duty Cycle**

### Limit

None, for report purposes only.

### **Test Configuration**



### **Test Procedure**

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.

3. Spectrum Setting: Set analyzer center frequency to test channel center frequency. Set the span to 0Hz. Set the RBW to 10MHz. Set the VBW to 10MHz. Detector: Peak. Sweep time: Auto.

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

### **Test Mode**

Please refer to the clause 2.4.

### **Test Result**

Mode	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	1/T Minimum VBW (kHz)	Final Setting for VBW (kHz)
	0	0.274	0.625	43.85	3.65	5
BLE_1M	19	0.274	0.625	43.78	3.65	5
	39	0.275	0.625	43.94	3.64	5

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<mark>ΙΧΙ</mark> R T   RF   50 Ω AC	SENSE:INT		01:21:29 AM Jul 19, 2023
Center Freq 2.402000000 GHz	PNO: Fast ↔→ Trig: Free Run IFGain:Low #Atten: 26 dB	Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWW DET A A A A A A
Ref Offset 0.5 dB 10 dB/div Ref 16.50 dBm			∆Mkr3 624.9 µs -0.29 dB
Log 6.50		Δ1 Δ2Δ1	3Δ1
-3.50		Q <sup>1</sup> 2∆1	
-23.5			
-43.5			
-53.5 1 - 51			
-73.5	Alterebush the	understaat in the second s	and the first first of a state of
Center 2.402000000 GHz Res BW 8 MHz	#VBW 8.0 MHz*	Sweep	Span 0 Hz 3.333 ms (40000 pts)
	MIN -6.47 dBm	FUNCTION WIDTH FU	INCTION VALUE
<b>3</b> Δ1 <b>1</b> t (Δ) 624.9	μs (Δ) -0.15 dB μs (Δ) -0.29 dB		
5 6 7			
8 9 10			
MSG		STATUS	×
	LE 2402		
Agilent Spectrum Analyzer - Swept SA (XI) R T RF 50 Ω AC	SENSE:INT	ALIGNAUTO	01:27:00 AM Jul 19, 2023
Center Freq 2.440000000 GHz	PNO: Fast ↔ Trig: Free Run IFGain:Low #Atten: 26 dB	Avg Type: RMS	TRACE 123456 TYPE WWWWWW DET A A A A A A
Ref Offset 0.5 dB			ΔMkr3 624.9 μs
Ref Offset 0.5 dB 10 dB/div Ref 16.50 dBm Log		.201 241	ΔMkr3 624.9 μs -0.46 dB
10 dB/div Ref 16.50 dBm 6.50 	¢1		ΔMkr3 624.9 µs -0.46 dB
10 dB/div Ref 16.50 dBm 6.50 -3.50 -13.5 -23.5			ΔMkr3 624.9 μs -0.46 dB
10 dB/div Ref 16.50 dBm 6.50 -3.50 -13.5 -23.5 -33.5 -43.5			-0.46 dB
10 dB/div Ref 16.50 dBm 6.50 -3.50 -13.5 -23.5 -33.5 -43.5 -43.5 -43.5 -44.5 -45.5	1		-0.46 dB
10 dB/div Ref 16.50 dBm 6.50 -3.50 -3.50 -3.50 -3.50 -43.5 Hb, H, de team b -43.5	,,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, , ,, ,, , , , , , , , , , , , , , , , , , , ,		
10 aB/div Ref 16.50 dBm 6.50 -3.50 -3.50 -3.55 -3.55 -3.55 -3.55 -4.35 -4.35 -3.55 -4.35 -4.35 -4.35 -5.55	1		
10 dB/div      Ref      16.50 dBm        Log	#VBW 8.0 MHz*		-0.46 dB
10 dB/div Ref 16.50 dBm 6.50 13.50 13.5 14.5 15.5	Y      Y		-0.46 dB
10 dB/div  Ref  16.50 dBm    L og  6.50  6.50    3.50  73.5  73.5    -43.5  73.5  73.5    -43.5  73.5  73.6    Center 2.440000000 GHz  Center 2.440000000 GHz    Res BW 8 MHz  1.575    2 Δ1  1    1  1    4  6    6  6	#VBW 8.0 MHz*		-0.46 dB
10 dB/div      Ref      16.50 dBm        6 50      -      -      -        3 50      -      -      -      -        -13 5      -      -      -      -      -        -13 5      -      -      -      -      -      -        -13 5      -	#VBW 8.0 MHz*		-0.46 dB
10 dB/div Ref 16.50 dBm Log 6.50 13.50 13.5 13.5 13.5 13.5 13.5 13.5 13.5 13.5 13.5 14.5 15.5 10.0	#VBW 8.0 MHz*		-0.46 dB

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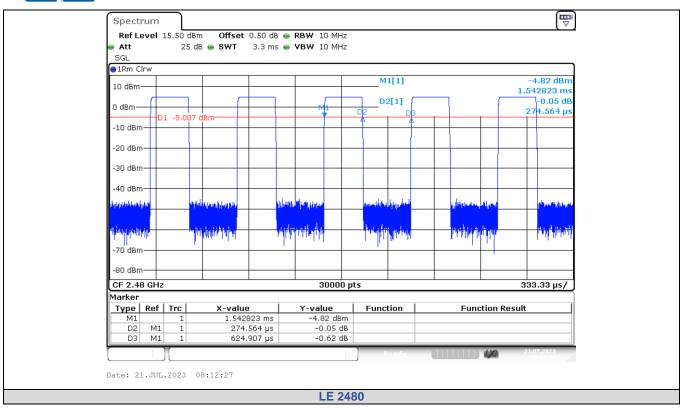
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EB 中国国家认证认可监督管理委员会

Accreditation Administration of the People's Republic of China : http://yz.cnca.cn





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### 3.9. Antenna Requirement

### **Requirement**

### FCC CFR Title 47 Part 15 Subpart C Section 15.203

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 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.

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i)

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

### Test Result

The directional gain of the antenna is less than 6dBi, please refer to the EUT internal photographs antenna photo.

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