TCT 通测检					
	TEST REPOR	Т			
FCC ID :	2AAPK-DC-0375				
Test Report No:	TCT230418E005				
Date of issue:	Apr. 24, 2023				
Testing laboratory: :	SHENZHEN TONGCE TESTING	S LAB			
Testing location/ address:	2101 & 2201, Zhenchang Factor Subdistrict, Bao'an District, Sher People's Republic of China	y Renshan Industrial Zone, Fuhai Izhen, Guangdong, 518103,			
Applicant's name: :	Shenzhen Kingsun Enterprises (Co., Ltd.			
Address:	25/F, CEC Information Building, Guangdong, 518034 China	Xinwen Rd., Shenzhen,			
Manufacturer's name :	Shenzhen Kingsun Enterprises Co., Ltd.				
Address:	25/F, CEC Information Building, Xinwen Rd., Shenzhen, Guangdong, 518034 China				
Standard(s):	FCC CFR Title 47 Part 15 Subpa	art C Section 15.249			
Test item description :	Wireless mouse				
Trade Mark :	N/A				
Model/Type reference :	DC-0375, 2MNMS2000, 2MNMS 2MNMS2000O0L2, 2MNMS2000 2MNMS2000M0L2				
Rating(s):	DC 1.5V(1*AA Battery)				
Date of receipt of test item	Apr. 18, 2023				
Date (s) of performance of test:	Apr. 18, 2023 - Apr. 24, 2023				
Tested by (+signature) :	Ronaldo LUO	R-snalor 600000			
Check by (+signature) :	Beryl ZHAO	BoyCongerer			
Approved by (+signature):	Tomsin	Tomster			
TONGCE TESTING LAB. TH	nis document may be altered or r	e written approval of SHENZHEN evised by SHENZHEN TONGCE ion section of the document. The			

test results in the report only apply to the tested sample.

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TCT通测检测 TESTING CENTRE TECHNOLOGY

1. General Product Information

1.1. EUT description

Test item description:	Wireless mouse		
Model/Type reference:	DC-0375		
Sample Number:	TCT230418E005-0101		
Operation Frequency:	2402MHz - 2480MHz		
Number of Channel:	16		
Modulation Technology:	GFSK		
Antenna Type:	PCB Antenna		
Antenna Gain:	-4.62dBi		
Rating(s):	DC 1.5V(1*AA Battery)		

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

	0, 2MNMS2 1NMS20000 /INMS2000 models are d	DOL2, 2MN EOL2, 2MN erivative mod	IMS2000N0 IMS2000M dels. The mod	0L2, 0L2 dels are identi	ical in circuit	
2N 2N s tested model, other	INMS20000 INMS2000 models are de	DOL2, 2MN EOL2, 2MN erivative mod	IMS2000N0 IMS2000M dels. The mod	0L2, 0L2 dels are identi		
					Page	e 3 of 31
	00-6611-140 Tel: 8	Image: Contract of the second seco	Image: Contract of the second seco	Image: Contract of the second seco	Outomode Tel: 86-755-27673339 Fax: 86-755-27673332 http:	

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1.3. Operation Frequency

	Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
	1	2402MHz	5	2418MHz	9	2448MHz	13	2468MHz
2	<u>)</u> 2	2404MHz	6	2428MHz	10	2450MHz	14	2470MHz
	3	2410MHz	7	2432MHz	11	2454MHz	15	2476MHz
	4	2412MHz	8	2440MHz	12	2464MHz	16	2480MHz
	latar							

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:

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2440MHz
The Highest channel	2480MHz



2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	N/A
Field Strength of Fundamental	§15.249 (a)	PASS
Spurious Emissions	§15.249 (a) (d)/ §15.209	PASS
Band Edge	§15.249 (d)/ §15.205	PASS
20dB Occupied Bandwidth	§15.215 (c)	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.

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3. General Information

3.1. Test Environment and Mode

Operating Environment:	
Condition	Radiated Emission
Temperature:	25.3 °C
Humidity:	51 % RH
Atmospheric Pressure:	1010 mbar

Test Mode:

Engineering mode: Keep the EUT in continuous transmitting by select channel and modulations

The sample was placed 0.8m & 1.5m for the measurement below & 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(Z axis) are shown in Test Results of the following pages.

3.2.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
, 8				

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



4. Facilities and Accreditations

4.1.Facilities

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

• FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab 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

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2.Location

SHENZHEN TONGCE TESTING LAB

Address: 2101 & 2201, Zhenchang Factory Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China TEL: +86-755-27673339

4.3. Measurement Uncertainty

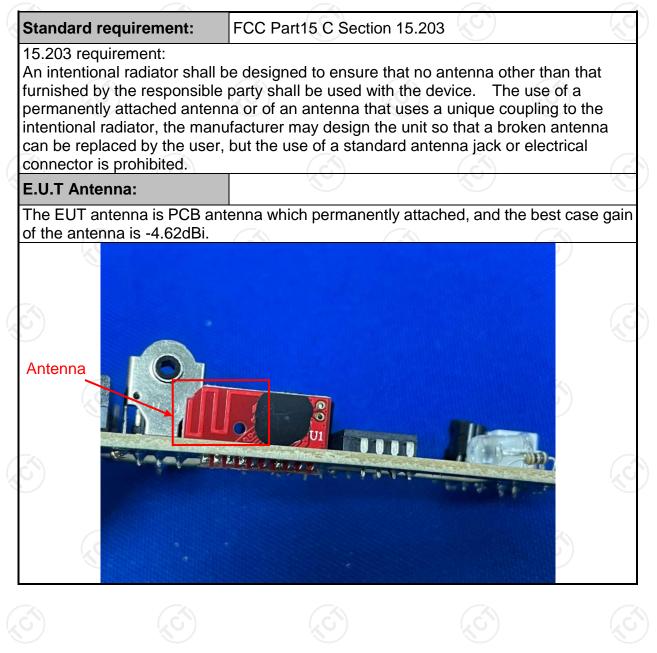
The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB



5. Test Results and Measurement Data

5.1. Antenna Requirement



5.2. Conducted Emission

5.2.1. Test Specification

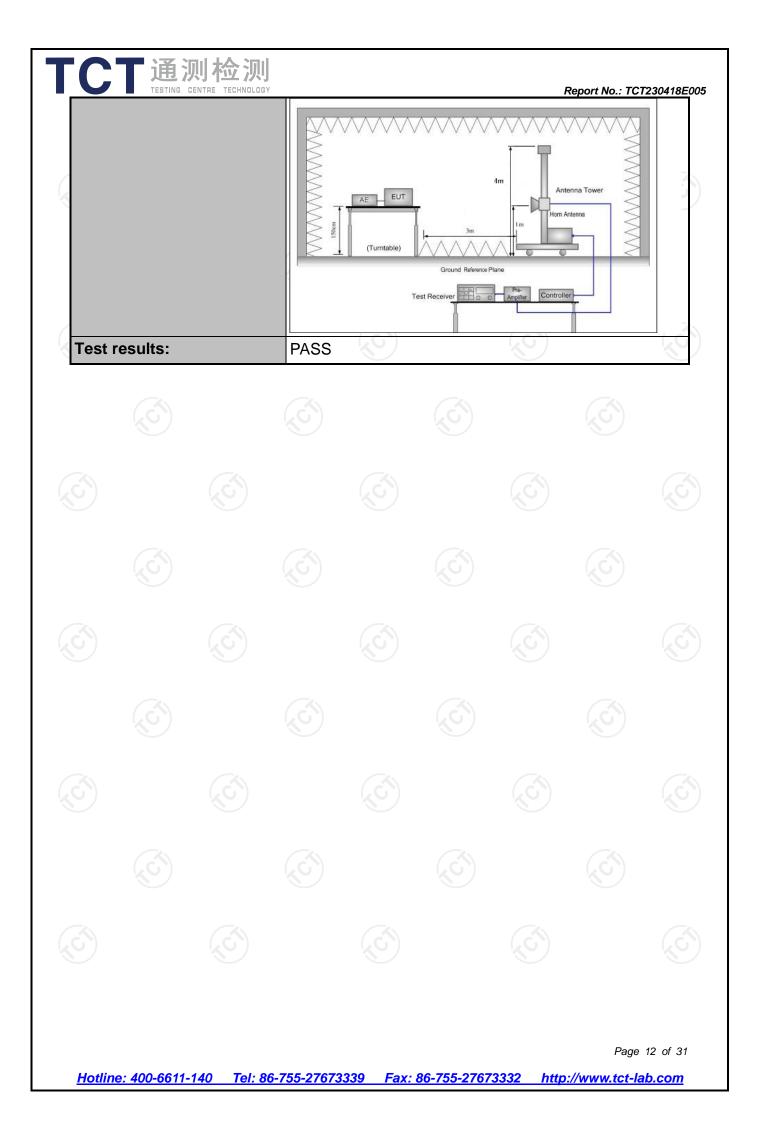
Test Requirement:	FCC Part15 C Section 15.207						
Test Method:	ANSI C63.10:2013						
Frequency Range:	150 kHz to 30 MHz						
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto						
	Frequency range	Frequency range Limit (dBuV)					
	(MHz)	Quasi-peak					
Limits:	0.15-0.5	66 to 56*	56 to 46*				
	0.5-5	56	46				
	5-30	60	50				
	Refere	ence Plane					
Test Setup: Test Mode:	AUX Equipment E.U Test table/Insulation pla Remarkc E.U.T: Equipment Under Test LISN: Line Impedence Stabilizatio Test table height=0.8m Transmitting mode with	U.T me Mon Network	ter — AC power				
Test Procedure:	 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. 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). 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 						
Test Result:	ANSI C63.10:2013 of N/A; Because the EUT item is not applicable.						

5.3. Radiated Emission Measurement

5.3.1. Test Specification

Test Requirement:	FCC Part15	5 C Section	n 15.209		No.	
Test Method:	ANSI C63.1	0:2013				
Frequency Range:	9 kHz to 25	GHz	3			
Measurement Distance:	3 m					
Antenna Polarization:	Horizontal &	& Vertical				
	Frequency	Detector	RBW	VBW	Remark	
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value	
Receiver Setup:	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value	
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value	
	Above 1CHz	Peak	1MHz	3MHz	Peak Value	
	Above 1GHz	Peak	1MHz	10Hz	Average Value	
Limit(Field strength of the	Freque	ency	Limit (dBu	V/m @3m)	Remark	
fundamental signal):	2400MHz-24		94.		Average Value	
runuamentai signai).	240010172-24	463.510172	114	.00	Peak Value	
	Frequency Limit (Limit (dBu	V/m @3m)	Remark	
	0.009-0.490		2400/F(KHz)		Quasi-peak Value	
	0.490-1.705		24000/F(KHz)		Quasi-peak Value	
	1.705-30		30		Quasi-peak Value	
Limit(Spurious Emissions):	30MHz-88MHz		40.0		Quasi-peak Value	
	88MHz-216MHz		43	.5	Quasi-peak Value	
	216MHz-960MHz		46.0		Quasi-peak Value	
	960MHz-1GHz		54.0		Quasi-peak Value	
	Above 1GHz		54.0		Average Value	
		_	74	-	Peak Value	
Limit (band edge) :	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by a least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 whichever is the lesser attenuation.					
Test Procedure:	 whichever is the lesser attenuation. 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber in below 1GHz, 1.5m above the ground in above 1GHz. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 					

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	 4. For each suspected emission, the EUT was arrang to its worst case and then the antenna was tuned heights from 1 meter to 4 meters and the rotata table was turned from 0 degrees to 360 degrees find the maximum reading. 5. The test-receiver system was set to Peak Det Function and Specified Bandwidth with Maxim Hold Mode. 6. If the emission level of the EUT in peak mode w 10dB lower than the limit specified, then testing co be stopped and the peak values of the EUT would reported. Otherwise the emissions that did not hat 10dB margin would be re-tested one by one us peak, quasi-peak or average method as specified at then reported in a data sheet. 	d to ble s to tect um vas ould be ave sing
	For radiated emissions below 30MHz	
	Distance = 3m Computer Pre - Amplifier UT UT Turn table Ground Plane 30MHz to 1GHz	
Test setup:	EUT Turn Table Ground Plane	
	Above 1GHz	
	(The diagram below shows the test setup that is utiliz to make the measurements for emission from 1GHz to the tenth harmonic of the highest fundamental frequency or to 40GHz emissions, whichever is lower	to
		L.C



5.3.2. Test Instruments

	Radiated En	nission Test Site	e (966)	
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESIB7	100197	Jul. 03, 2023
Spectrum Analyzer	R&S	FSQ40	200061	Jul. 03, 2023
Pre-amplifier	SKET	LNPA_0118G- 45	SK2021012 102	Feb. 20, 2024
Pre-amplifier	SKET	LNPA_1840G- 50	SK2021092 03500	Feb. 20, 2024
Pre-amplifier	HP	8447D	2727A05017	Jul. 03, 2023
Loop antenna	Schwarzbeck	FMZB1519B	00191	Jun. 11, 2023
Broadband Antenna	Schwarzbeck	VULB9163	340	Jul. 05, 2023
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Jul. 05, 2023
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Feb. 24, 2024
Antenna Mast	Keleto	RE-AM	9 /	
Coaxial cable	SKET	RC-18G-N-M	1	Feb. 24, 2024
Coaxial cable	SKET	RC_40G-K-M	1	Feb. 24, 2024
EMI Test Software	Shurple Technology	EZ-EMC		1

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5.3.3. Test Data

Field Strength of Fundamental

Frequency (MHz)	Emission PK (dBuV/m)	Horizontal /Vertical	Limits PK (dBuV/m)	Margin (dB)
2402	83.26	Н	114	-30.74
2402	78.04	V	114	-35.96
2440	83.61	н	114	-30.39
2440	78.22	V	114	-35.78
2480	83.24	(C H	114	-30.76
2480	76.84	\sim v	114	-37.16

Frequency (MHz)	Emission AV (dBuV/m)	Horizontal /Vertical	Limits AV (dBuV/m)	Margin (dB)
2402	63.50	Н	94	-30.50
2402	58.37	V	94	-35.63
2440	63.87	Н	94	-30.13
2440	58.58	V	94	-35.42
2480	63.34	H G	94	-30.66
2480	57.01	V	94	-36.99

Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@	Ձ3m (dBµ	ıV/m)	Limit@3m (dBµV/m)
· · · ·				

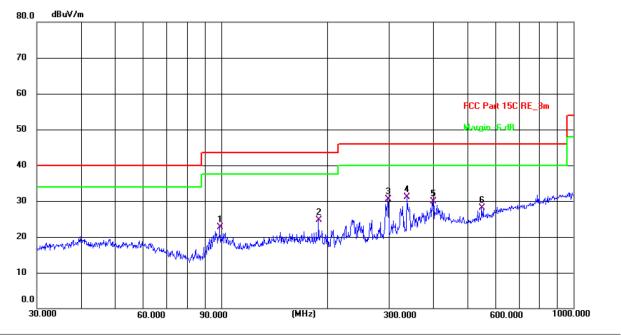
Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor.

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.

3. For fundamental frequency, RBW >20dB BW , VBW>=RBW, PK detector is for PK value, RMS detector is for AV value.



Horizontal:



Site #2 3m Anechoic Chamber Polarization: Horizontal Temperature: 25.3(C) Humidity: 51 %

Limit: FCC Part 15C RE_3m

Power: DC 1.5 V

		-							1
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	99.1797	12.11	10.63	22.74	43.50	-20.76	QP	Р	
2	189.0743	13.17	11.51	24.68	43.50	-18.82	QP	Р	
3	297.2241	15.94	14.58	30.52	46.00	-15.48	QP	Р	
4 *	337.2155	15.57	15.59	31.16	46.00	-14.84	QP	Ρ	
5	399.0302	13.03	16.92	29.95	46.00	-16.05	QP	Ρ	
6	549.0195	7.87	20.25	28.12	46.00	-17.88	QP	Р	







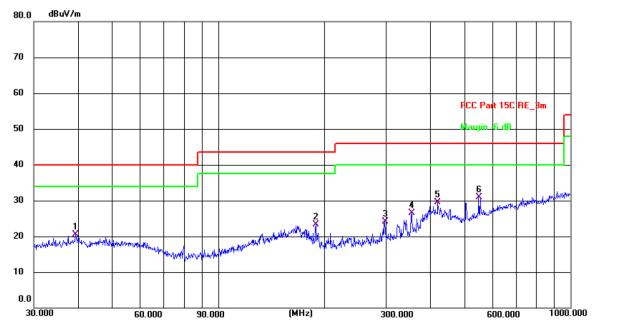


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Vertical:



Site #2 3m Anechoic ChamberPolarization:VerticalTemperature: 25.3(C)Humidity: 51 %

Limit: FCC Part 15C RE_3m

Power: DC 1.5 V

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	39.4371	6.05	14.36	20.41	40.00	-19.59	QP	Р	
2	189.7385	11.73	11.52	23.25	43.50	-20.25	QP	Р	
3	297.2241	9.62	14.58	24.20	46.00	-21.80	QP	Р	
4	354.1831	10.66	15.91	26.57	46.00	-19.43	QP	Р	
5	420.5803	11.91	17.60	29.51	46.00	-16.49	QP	Р	
6 *	549.0195	10.71	20.25	30.96	46.00	-15.04	QP	Ρ	



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				Above	e 1GHz				
				channel:	2402MHz				
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak		Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
4804	Н	51.48		-3.94	47.54		74	54	-6.46
7206	Н	46.93		0.52	47.45		74	54	-6.55
)I							
4804	V	49.75		-3.94	45.81		74	54	-8.19
7206	V	42.31		0.52	42.83	<u> </u>	74	54	-11.17
				/	1	<u> </u>			

			Ν	liddle chann	el: 2440M	Hz			
Frequency	Ant Pol	Peak	AV	Correction		on Level	Peak limit	AV/ limit	Margin
(MHz)	H/V	reading	reading	Factor	Peak	AV	(dBu\//m)	(dBµV/m)	(dB)
(1011 12)	11/ V	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(abp v/m)	(abp v/m)	(UD)
4880	Н	51.07		-3.98	47.09		74	54	-6.91
7320	Н	45.64		0.57	46.21		74	54	-7.79
4880	V	51.80		-3.98	47.82	\sim	74	54	-6.18
7320	V	44.26		0.57	44.83		74	54	-9.17

	High channel: 2480MHz											
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Peak	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)			
4960	Н	52.19		-3.98	48.21		74	54	-5.79			
7440	H	47.52		0.57	48.09		74	54	-5.91			
4960	V	51.36		-3.98	47.38		74	54	-6.62			
7440	V	45.84		0.57	46.41		74	54	-7.59			
					J							

Note:

1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss - Pre-amplifier

2. Margin (dB) = Emission Level (Peak) (dB μ V/m)-Average limit (dB μ V/m)

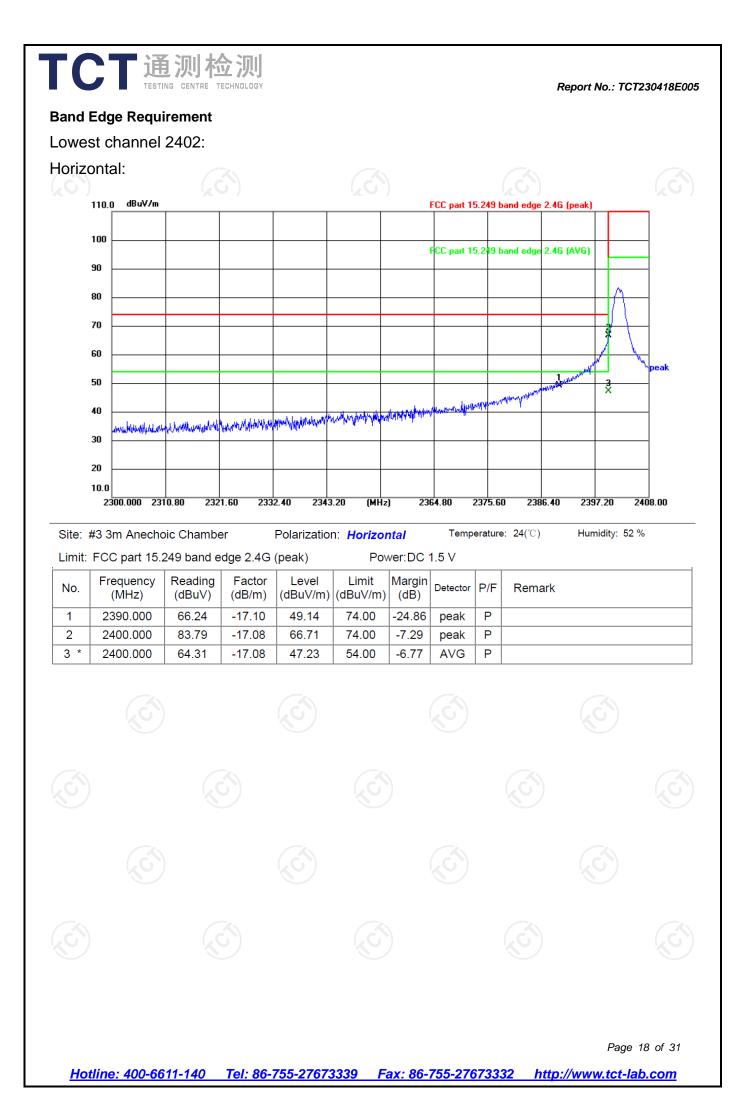
3. The emission levels of other frequencies are very lower than the limit and not show in test report.

4. Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

5. Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

6. All the restriction bands are compliance with the limit of 15.209.

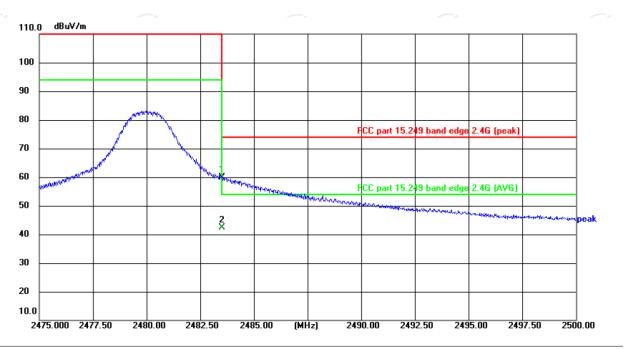
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Report No.: TCT230418E005 Vertical: 110.0 dBuV/m FCC part 15.249 band edge 2.4G (peak) 100 FCC part 15.249 band edge 2.4G (AVG) 90 80 70 60 oeak 50 Ĵ 3 X 40 and a second our and the ball of the war and the to all the second hundred 30 20 10.0 2300.000 2310.80 2321.60 2332.40 2343.20 (MHz) 2364.80 2375.60 2386.40 2408.00 2397.20 Temperature: 24(℃) Humidity: 52 % Site: #3 3m Anechoic Chamber Polarization: Vertical Limit: FCC part 15.249 band edge 2.4G (peak) Power: DC 1.5 V Reading Frequency Factor Level Limit Margin Detector P/F No. Remark (MHz) (dBuV) (dB/m) (dBuV/m) (dBuV/m) (dB) 1 2390.000 61.02 -17.10 43.92 74.00 -30.08 Ρ peak 2 2400.000 78.12 -17.08 61.04 74.00 -12.96 peak Ρ 3 * 2400.000 59.73 -17.08 42.65 54.00 -11.35 AVG Ρ

Highest channel 2480:

Horizontal:



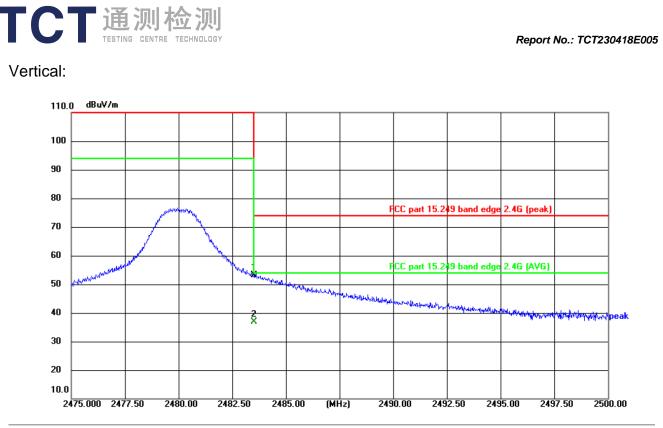
Site: #3 3m Anechoic Chamber Polarization: Horizontal Temperature: 24(°C) Humidity: 52 %

Limit: FCC part 15.249 band edge 2.4G (peak)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2483.500	76.74	-16.88	59.86	74.00	-14.14	peak	Ρ	
2 *	2483.500	59.20	-16.88	42.32	54.00	-11.68	AVG	Ρ	

Power: DC 1.5 V

Report No.: TCT230418E005



Site: #3 3m Anechoic Chamber Polarization: Vertical Temperature: 24(°C) Humidity: 52 %

Limit: FCC part 15.249 band edge 2.4G (peak)

N	0.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1		2483.500	69.96	-16.88	53.08	74.00	-20.92	peak	Ρ	
2	*	2483.500	53.75	-16.88	36.87	54.00	-17.13	AVG	Ρ	

Power: DC 1.5 V





5.4. 20dB Occupied Bandwidth

5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	N/A
	 According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set to the maximum power setting and enable the EUT transmit continuously. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW≥1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. Measure and record the results in the test report.
Test setup:	Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test results:	PASS

5.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due Jul. 04, 2023	
Spectrum Analyzer	R&S	FSU	200054		
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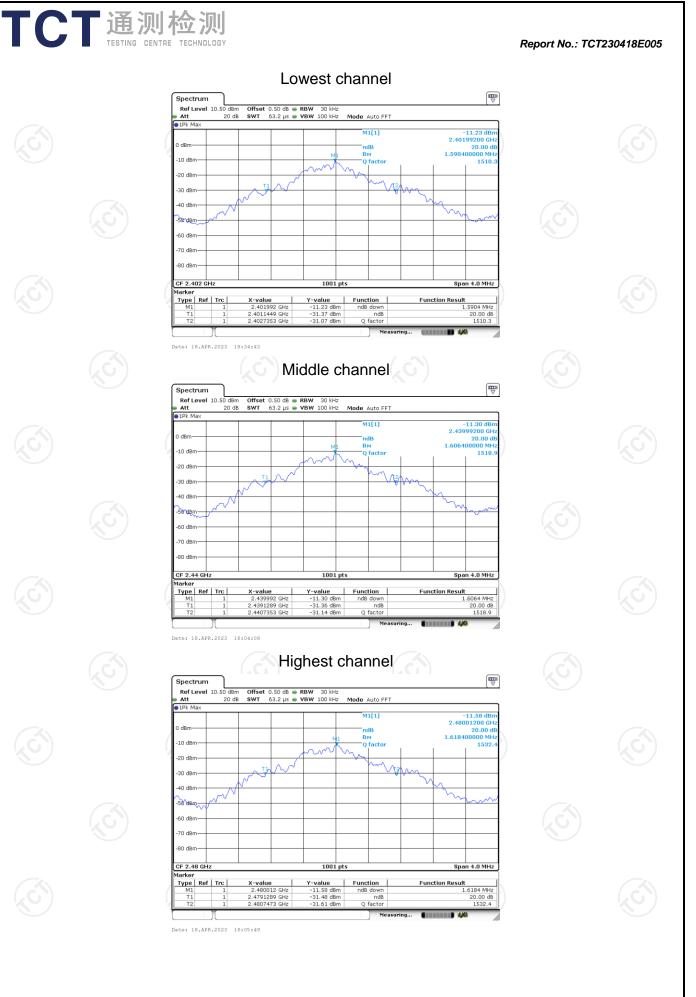
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5.4.3. Test data

Report No.: TCT230418E005

	Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion
6	2402MHz	1590.40	(5)	PASS
	2440MHz	1606.40		PASS
	2480MHz	1618.40		PASS

		1010.40	5	<u> </u>	PA33	
Test plots as f	ollows:					



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