# TEST REPORT

FCC ID: 2AAMA-SKRF607 Product: Wireless Mouse Model No.: SK-RF607 Additional Model: N/A Trade Mark: N/A Report No.: TCT190311E006 Issued Date: Mar. 19, 2019

Shenzhen Newidea Technology Co., Limited Blg 31, Cuigang Industrial Zone 5, Huaide Road, Fuyong Town, Bao'an District, Shenzhen, China

Issued for:

Issued By:

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FAX: +86-755-27673332

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#### 「CT 通测检测 TESTING CENTRE TECHNOLOGY 1. Test Certification

Product:	Wireless Mouse	
Model No.:	SK-RF607	C
Additional Model:	N/A	C
Trade Mark:	N/A	
Applicant:	Shenzhen Newidea Technology Co., Limited	
Address:	Blg 31, Cuigang Industrial Zone 5, Huaide Road, Fuyong Town, Bao'an District, Shenzhen, China	
Manufacturer:	Shenzhen Newidea Technology Co., Limited	C
Address:	Blg 31, Cuigang Industrial Zone 5, Huaide Road, Fuyong Town, Bao'an District, Shenzhen, China	
Date of Test:	Mar. 12, 2019 – Mar. 18, 2019	
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249	(č

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: Date: Mar. 18, 2019 Jerry Xie **Reviewed By:** Date: Mar. 19, 2019 Beryl Zhao min Approved By: Mar. 19, 2019 Date: Tomsin

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# 2. Test Result Summary

	quirement		CFR 47 Se	ection		Result	
Antenna	a Requirement		§15.20	03	K)	PASS	K.
	Line Conducted	§15.207			N/A		
	Strength of ndamental		§15.249	) (a)		PASS	
Spurio	us Emissions	§15	§2.105 .249 (a) (d			PASS	
Ba	and Edge	§1	§2.105 5.249 (d)/			PASS	
20dB Occ	upied Bandwidth	S)	§2.1049 §15.215 (c)		PASS		
	st item meets the require t item does not meet the		J.				<b>C</b>
	t case does not apply to result judgment is decide			rd.			
3)							
3							
3							



# 3. EUT Description

Product:	Wireless Mouse
Model No.:	SK-RF607
Additional Model:	N/A
Trade Mark:	N/A
Hardware Version:	V1.0
Software Version:	V1.0
<b>Operation Frequency:</b>	2408MHz - 2474MHz
Number of Channel:	33
Modulation Technology:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi
Power Supply:	DC 3V

### **Operation Frequency Each of Channel**

Operatio	Operation Frequency each of channel						
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2408MHz	11	2428MHz	21	2448MHz	31	2468MHz
2	2410MHz	12	2430MHz	22	2450MHz	32	2470MHz
3	2412MHz	13	2432MHz	23	2452MHz	33	2472MHz
4	2414MHz	14	2434MHz	24	2454MHz	34	2474MHz
5	2416MHz	15	2436MHz	25	2456MHz		
6	2418MHz	16	2438MHz	26	2458MHz		
7	2420MHz	17	2440MHz	27	2460MHz		G
8	2422MHz	18	2442MHz	28	2462MHz		
9	2424MHz	19	2444MHz	29	2464MHz		
10	2426MHz	20	2446MHz	30	2466MHz		
Remark: (	Channel 1, 1	4 and 34	are selected	to perfor	m the tests.		

#### 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	2408MHz
The middle channel	2440MHz
The Highest channel	2474MHz

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# 4. General Information

### 4.1. Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel

The sample was placed (0.8m below 1GHz, 1.5m 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.

# 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
1	1	1	<u>(</u> ) 1	

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.

# 「CT通测检测 TESTING CENTRE TECHNOLOGY 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

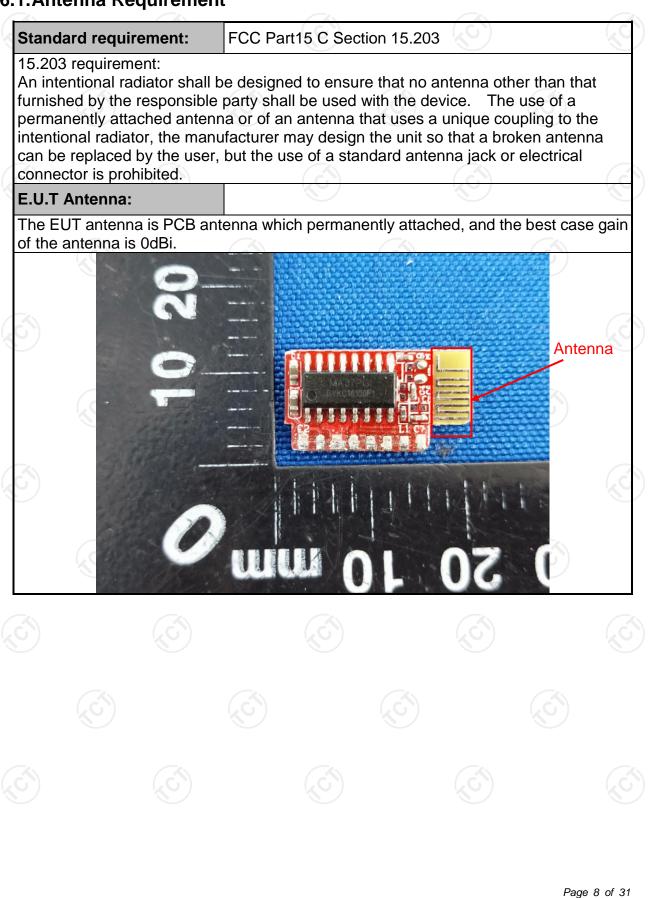
The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Item	MU
Conducted Emission	±2.56dB
RF power, conducted	±0.12dB
Spurious emissions, conducted	±0.11dB
All emissions, radiated(<1GHz)	±3.92dB
All emissions, radiated(>1GHz)	±4.28dB
Temperature	±0.1°C
Humidity	±1.0%
	Conducted Emission         RF power, conducted         Spurious emissions, conducted         All emissions, radiated(<1GHz)



# 6. Test Results and Measurement Data

# 6.1. Antenna Requirement



# **6.2.Conducted Emission**

### 6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013						
Frequency Range:	150 kHz to 30 MHz	150 kHz to 30 MHz					
Receiver setup:	RBW=9 kHz, VBW=30	RBW=9 kHz, VBW=30 kHz, Sweep time=auto					
Limits:	Frequency range (MHz) 0.15-0.5 0.5-5	Limit ( Quasi-peak 66 to 56* 56	dBuV) Average 56 to 46* 46				
	5-30	60	46				
Test Setup:	LISN 40cm	U.T Inne	] ter ]— AC power				
Test Mode:	Transmitting mode with	Transmitting mode with modulation					
	1. The E.U.T and simu	ilators are conne	otod to the main				
Test Procedure:	<ul> <li>power through a line (L.I.S.N.). This pro- impedance for the m</li> <li>2. The peripheral device power through a LI coupling impedance refer to the block photographs).</li> <li>3. Both sides of A.C. conducted interferent emission, the relative the interface cables ANSI C63.10:2013 c</li> </ul>	e impedance stab ovides a 500hm neasuring equipme ces are also conne SN that provides with 500hm term diagram of the line are checkence. In order to fir e positions of equ s must be chang	a 500hm/50uH coupling ent. ected to the main a 500hm/50uH hination. (Please test setup and d for maximum ipment and all o ed according to				

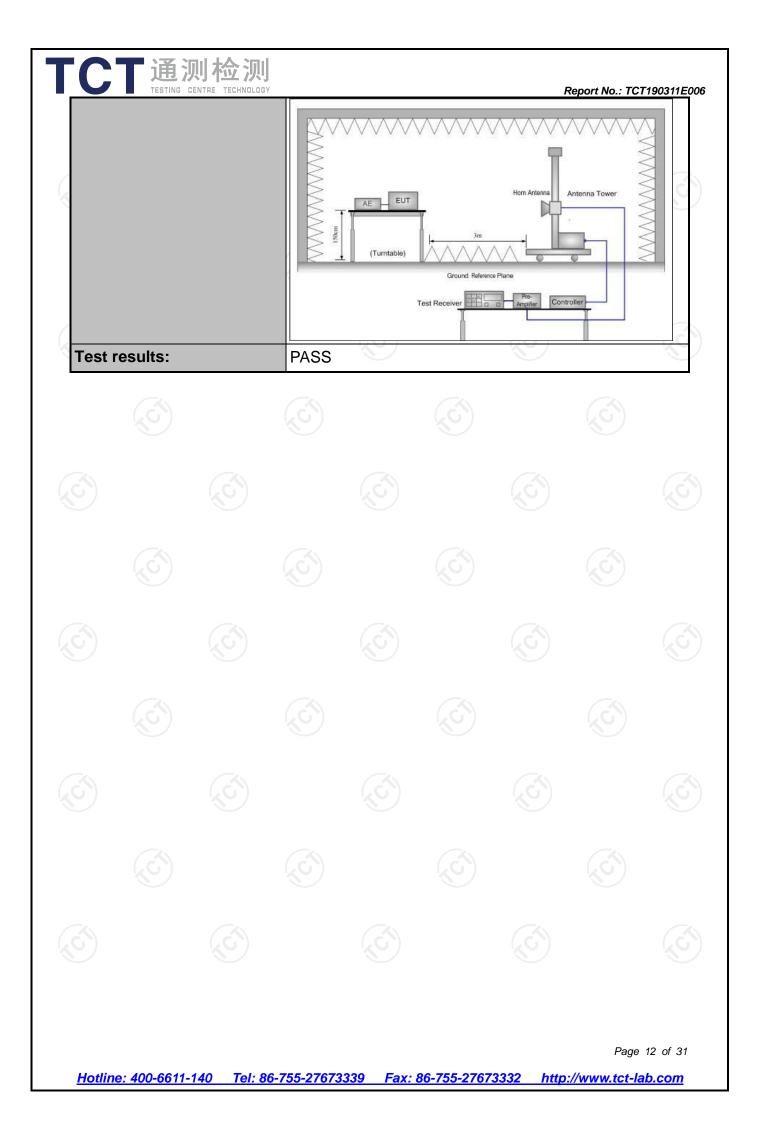
# **6.3.Radiated Emission Measurement**

#### 6.3.1. Test Specification

TCT 通测检测 TESTING CENTRE TECHNOLOGY

Test Requirement:	FCC Part15 C Section 15.209/ Part 2 J Section 2.1053				
Test Method:	ANSI C63.1	0:2013			
Frequency Range:	9 kHz to 25	GHz	3		
Measurement Distance:	3 m				
Antenna Polarization:	Horizontal &				
	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 1GHz	Peak	1MHz	3MHz	Peak Value
	Above TGHZ	Peak	1MHz	10Hz	Average Value
Limit(Field strength of the	Freque	ency	Limit (dBu	√/m @3m)	Remark
fundamental signal):	2400MHz-24	183 514-7	94.	00	Average Value
Tunuamentai Signai).	2400101112-24	403.310112	114	.00	Peak Value
	Freque	ency	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
	Above 1GHz		74.0		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:	<ol> <li>The EUT was placed on the top of a rotating table 0. meters above the ground at a 3 meter chamber i below 1GHz, 1.5m above the ground in abov 1GHz. The table was rotated 360 degrees t determine the position of the highest radiation.</li> <li>The EUT was set 3 meters away from th interference-receiving antenna, which was mounte on the top of a variable-height antenna tower.</li> <li>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 an vertical polarizations of the antenna are set to make the measurement.</li> </ol>				

CT通测检测 TESTING CENTRE TECHNOLOGY	Report No.: TCT190311
	<ol> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li> </ol>
	For radiated emissions below 30MHz
	Distance = 3m
	· Antenna Tower
Test setup:	EUT 4m Search Antenna FEUT 4m RF Test Receiver Ground Plane Above 1GHz
	(The diagram below shows the test setup that is utilized to make the measurements for emission from 1GHz to the tenth harmonic of the highest fundamental frequency or to 40GHz emissions, whichever is lower.)



# 6.3.2. Test Instruments

Radiated Emission Test Site (966)									
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due					
Test Receiver	ROHDE&SCHW ARZ	ESIB7	100197	Jul. 17, 2019					
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ40	200061	Sep. 20, 2019					
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 16, 2019					
Pre-amplifier	HP	8447D	2727A05017	Sep. 16, 2019					
Loop antenna	ZHINAN	ZN30900A	12024	Oct. 20, 2019					
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 02, 2019					
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Oct. 20, 2019					
Horn Antenna	A-INFO	LB-180400-KF	J211020657	Sep. 16, 2019					
Antenna Mast	Keleto	RE-AM	N/A	N/A					
Coax cable (9KHz-1GHz)	тст	RE-low-01	N/A	Sep. 16, 2019					
Coax cable (9KHz-40GHz)	отст	RE-high-02	N/A	Sep. 16, 2019					
Coax cable (9KHz-1GHz)	тст	RE-low-03	N/A	Sep. 16, 2019					
Coax cable (9KHz-40GHz)	тст	RE-high-04	N/A	Sep. 16, 2019					
EMI Test Software	Shurple 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).

#### 6.3.3. Test Data

#### **Field Strength of Fundamental**

Frequency (MHz)			Limits PK/AV (dBuV/m)	Margin (dB)
2408	73.67(PK)	Н	114/94	-40.33
2408	62.39(AV)	Н	114/94	-31.61
2440	73.13(PK)	н	114/94	-40.87
2440	61.47(AV)	Н	114/94	-32.53
2474	73.58(PK)	H	114/94	-40.42
2474	61.92(AV)	Н	114/94	-32.08
2408	72.86(PK)	V	114/94	-41.14
2408	60.75(AV)	V K	114/94	-33.25
2440	73.37(PK)	V	114/94	-40.63
2440	62.54(AV)	V	114/94	-31.46
2474	75.90(PK)	V	114/94	-38.10
2474	63.09(AV)	V	114/94	-30.91

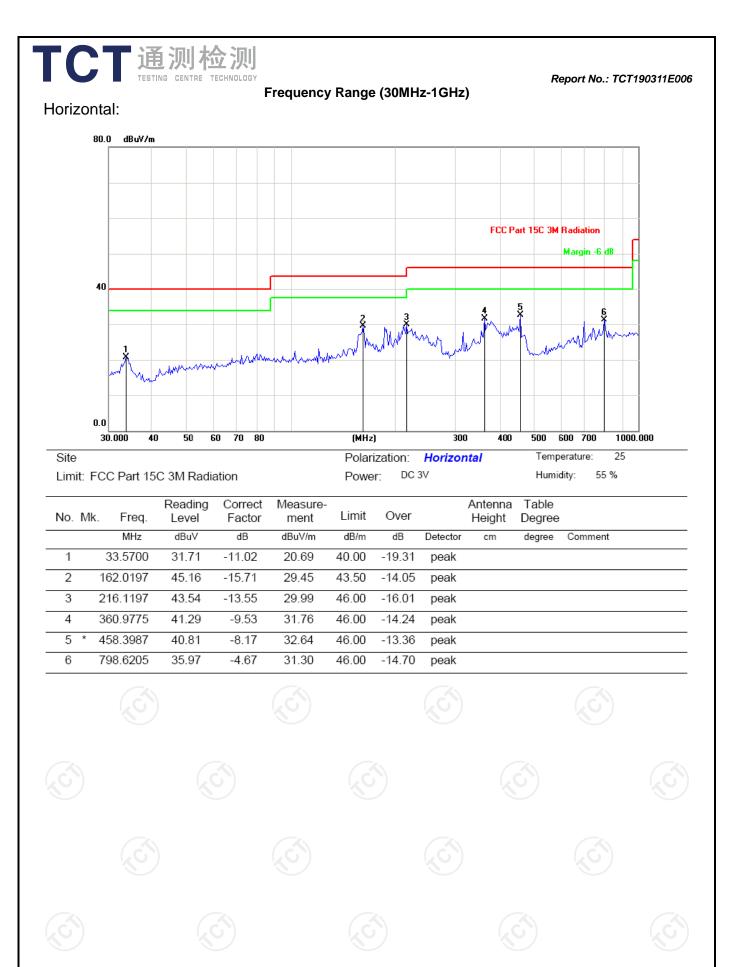
#### **Spurious Emissions**

#### Frequency Range (9 kHz-30MHz)

Level@3m (dBµV/m)	Limit@3m (dBµV/m)
-	

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

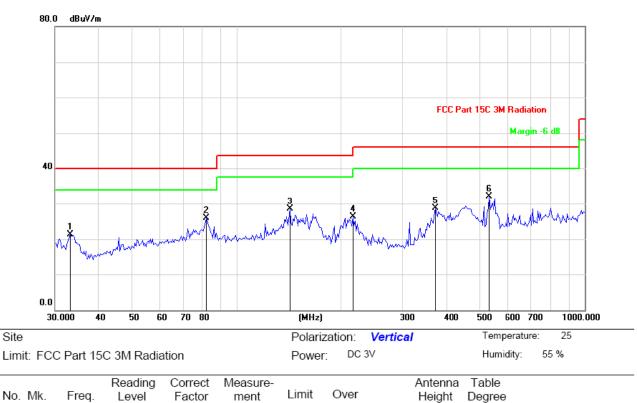
2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement



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#### Vertical:

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	MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1	33.1015	32.42	-11.02	21.40	40.00	-18.60	peak			
2	81.9477	41.31	-15.47	25.84	40.00	-14.16	peak			
3	141.7694	44.55	-16.12	28.43	43.50	-15.07	peak			
4	216.1197	39.89	-13.55	26.34	46.00	-19.66	peak			
5	371.2679	38.05	-9.37	28.68	46.00	-17.32	peak			
6 *	531.2910	39.20	-7.15	32.05	46.00	-13.95	peak			

**Note:** Measurements were conducted in all channels (high, middle, low), and the worst case (low channel) was submitted only.

Report No.: TCT190311E006

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Т	<b>C</b> T	通测	则检测	IJ						
		TESTING CE	ENTRE TECHNOL	OGY	Above	e 1GHz			Report No.:	TCT190311E0
	Low channel: 2408 MHz									
	Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Emissic Peak (dBµV/m)	AV	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
1	4810.00	Н	52.37		-3.94	48.43		74.00	54.00	-5.57
k	7215.00	Н	47.82		0.52	48.34		74.00	54.00	-5.66
			$\sim$					$\sim$		
	2387.50	V	51.25		-4.20	47.05		74.00	54.00	-6.95
	2387.50	V		49.56	-4.20	(	45.36	74.00	54.00	-8.64
	4810.00	V	48.73		-3.94	44.79	<u> </u>	74.00	54.00	-9.21
	7215.00	V	45.18		0.52	45.70		74.00	54.00	-8.30

			Μ	liddle chann	el: 2440 N	lHz			
Frequency	Ant Dol	Peak	AV	Correction	Emissio	on Level	Peak limit	AV limit	Margin
(MHz)	H/V	reading	reading	Factor	Peak			(dBµV/m)	•
(11112)	F1/ V	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(ubµ v/m)	(ubµ v/m)	(dB)
4860.00	Н	53.39		-3.98	49.41		74.00	54.00	-4.59
7290.00	CH)	48.64	- KO	0.57	49.21	01	74.00	54.00	-4.79
				( (					( ć
4860.00	V	51.26		-3.98	47.28		74.00	54.00	-6.72
7290.00	V	50.41		0.57	50.98		74.00	54.00	-3.02
						<u> </u>			
	. C		- <del></del> .C		(	. C		C	

				ł	High channe	el: 2474 Mł	Ηz			
F	requency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Emissic Peak (dBµV/m)	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
	4940.00	Н	50.73		-3.98 🔍	46.75		74.00	54.00	-7.25
	7410.00	Н	49.48		0.57	50.05		74.00	54.00	-3.95
	4940.00	<b>V</b>	51.92	-40	-3.98	47.94		74.00	54.00	-6.06
	7410.00	V	48.35		0.57	48.92		74.00	54.00	-5.08

#### Note:

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

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



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Band Edge Requirement

Low chann	el: 2408 IV	IHZ							
Frequency	Ant. Pol.	Peak	AV	Correction	-	on Level	Peak limit	AV limit	Margin
(MHz)	H/V	reading (dBµV)	reading (dBuV)	Factor (dB/m)	Peak (dBµV/m)	AV (dBµV/m)	(dBu)/(m)	(dBµV/m)	(dĔ)
2400	Н	49.24		-4.2	45.04		74.00		-28.96
2400	Н	-140	42.56	-4.2	0+	38.36		54.00	-15.64
					<u> </u>		<u> </u>		
2400	V	48.72		-4.2	44.52		74.00		-29.48
2400	V		39.78	-4.2		35.58		54.00	-18.42
			(	,					/

#### High channel: 2474 MHz

		Peak	AV	Correction	Emissic	n Level			
requency (MHz)	Ant. Pol. H/V	reading (dBµV)	reading (dBuV)				Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
2483.5	Н	50.95		-4.2	46.75		74.00		-27.25
2483.5	H		41.63	-4.2		37.43		54.00	-16.57
	Ē,			G`)				/20	<b>`</b> )
			1					le l	
2483.5	V	49.28		-4.2	45.08		74.00		-28.92
2483.5	V		40.82	-4.2		36.62		54.00	-17.38

#### Note:

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

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



# 6.4.20dB Occupied Bandwidth

#### 6.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)/ Part 2 J Section 2.1049
Test Method:	ANSI C63.10: 2013
Limit:	N/A (G) (G)
	<ol> <li>According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>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.</li> <li>Measure and record the results in the test report.</li> </ol>
Test setup:	Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation

#### 6.4.2. Test Instruments

	RF Test Room							
N	Equipment	Manufacturer	Model	Serial Number	Calibration Due			
	Spectrum Analyzer	R&S	FSU	200054	Sep. 20, 2019			

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

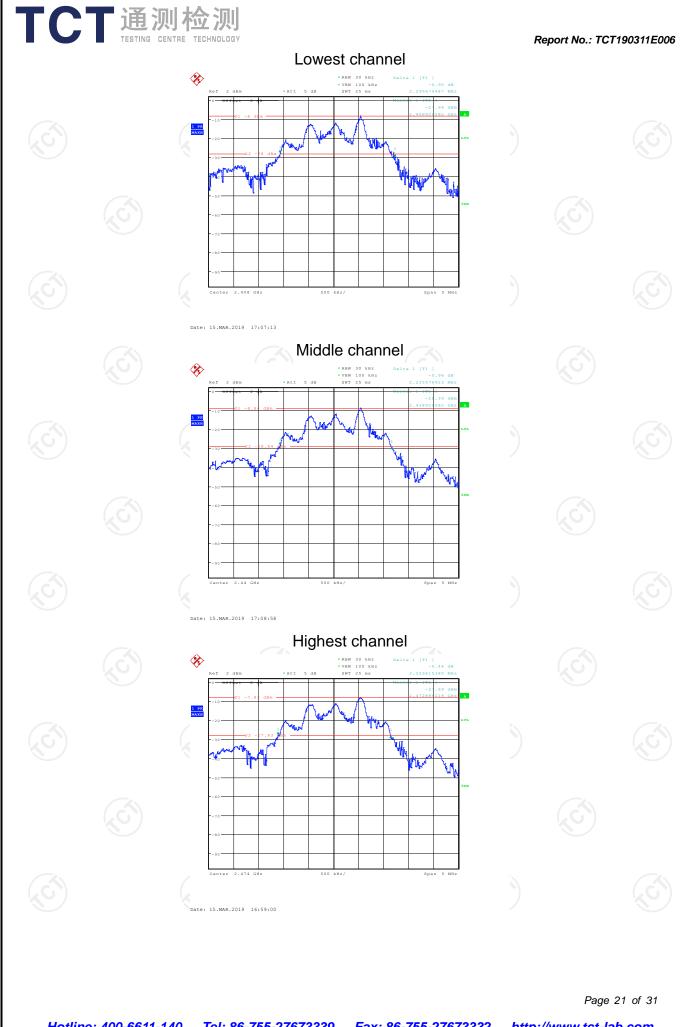
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# 6.4.3. Test data

Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion
Lowest	2299.68	((3)	PASS
Middle	2235.58		PASS
Highest	2259.62		PASS
Test plots as follows:	<b>N</b>		

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