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TCT通测检测 TESTING CENTRE TECHNOLOGY

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1. Test Certification

Product:	R/C Car					
Model No.:	757-4WD12B					
Additional Model:	BP0221, 6610A, 757-916, 757-904					
Trade Mark:	N/A (C) (C)					
Applicant:	Shenzhen Thousandshores Technology Co., Ltd.					
Address:	5th Floor, Chuangxin Building, Seven-star Creative Square, No.2 North Alley, Chuangye 2nd Road, 28th Bao'an District , Shenzhen, China					
Manufacturer:	SHANTOU NEWQIDA TOYS FACTORY CO. LTD.					
Address:	YUTING ROAD, CHENGHUA, CHENGHAI ZONE, SHANTOU CITY,GUANGDONG, CHINA					
Date of Test:	Sep. 20, 2017 – Oct. 11, 2017					
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249					

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:	Garon	Date:	Oct. 11, 2017	Ś
Reviewed By:	Garen Zon zhm	Date:	Oct. 12, 2017	
Approved By:	Joe Zhou TomSin Tomsin	Date:	Oct. 12, 2017	Ś
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2. Test Result Summary

Antenna	Requirement		CFR 47 Se	ection		Result	
Antenna Requirement			§15.20)3		PASS	0
AC Power Line Conducted Emission			§15.20	07	N/A		
	Strength of Iamental		§15.249	(a)		PASS	
Spuriou	s Emissions	§15	§2.105 .249 (a) (d)		S	PASS	Ċ
Bar	id Edge	§1	§2.105 5.249 (d)			PASS	
20dB Occu	pied Bandwidth	§2.1049 §15.215 (c)			PASS		
	item meets the require						R.C.
3. N/A: Test c	em does not meet the ase does not apply to sult judgment is decid	the test objec	ct.	d.			

Product: R/C Car Model No.: 757-4WD12B **Additional Model:** BP0221, 6610A, 757-916, 757-904 N/A **Trade Mark: Operation Frequency:** 2405MHz - 2475MHz Number of Channel: 72 **Modulation** GFSK Technology: Internal Antenna Antenna Type: Antenna Gain: 2.1dBi DC 4.5V (AAA 1.5V*3 Battery) **Power Supply:** All models above are identical in interior structure, electrical **Remark:** circuits and components, and just model names are different for the marketing requirement.

Operation Frequency Each of Channel

Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
2405MHz	20	2424MHz	40	2444MHz	60	2464MHz
2406MHz	21	2425MHz	41	2445MHz	61	2465MHz
(.	(X			
2414MHz	30	2434MHz	50	2454MHz	70	2474MHz
2415MHz	31	2435MHz	51	2455MHz	71	2475MHz
<i>(</i> 1				····		
2422MHz	38	2442MHz	58	2462MHz		
2423MHz	39	2443MHz	59	2463MHz		-
	2405MHz 2406MHz 2414MHz 2415MHz 2422MHz	2405MHz 20 2406MHz 21 2414MHz 30 2415MHz 31 2422MHz 38	2405MHz 20 2424MHz 2406MHz 21 2425MHz 2414MHz 30 2434MHz 2415MHz 31 2435MHz 2412MHz 31 2434MHz 2415MHz 31 2435MHz 2422MHz 38 2442MHz	2405MHz 20 2424MHz 40 2406MHz 21 2425MHz 41 2414MHz 30 2434MHz 50 2415MHz 31 2435MHz 51 2422MHz 38 2442MHz 58	2405MHz 20 2424MHz 40 2444MHz 2406MHz 21 2425MHz 41 2445MHz 2414MHz 30 2434MHz 50 2454MHz 2415MHz 31 2435MHz 51 2455MHz 2412MHz 31 2435MHz 51 2455MHz 2415MHz 31 2435MHz 51 2455MHz 2422MHz 38 2442MHz 58 2462MHz	2405MHz 20 2424MHz 40 2444MHz 60 2406MHz 21 2425MHz 41 2445MHz 61 2414MHz 30 2434MHz 50 2454MHz 70 2415MHz 31 2435MHz 51 2455MHz 71 2412MHz 38 2442MHz 58 2462MHz

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:

DCIOW.	
Channel	Frequency
The lowest channel	2405MHz
The middle channel	2430MHz
The Highest channel	2470MHz

4.1. Test Environment and Mode

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4.

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				

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.

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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

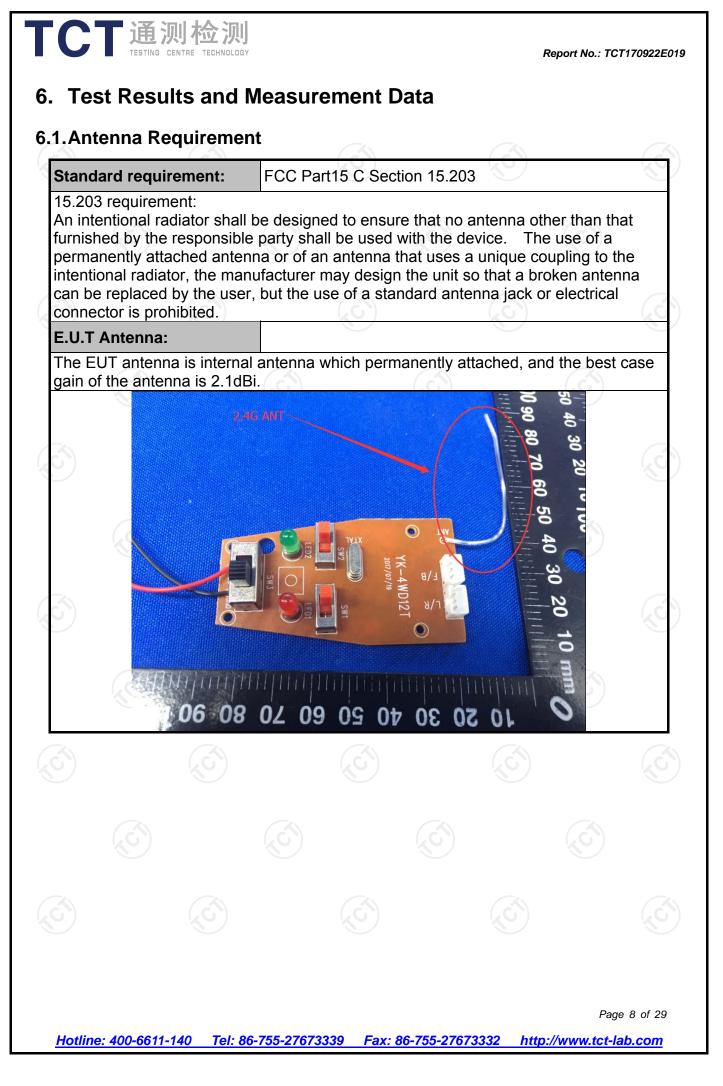
Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

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	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1GHz)	±3.92dB
5	All emissions, radiated(>1GHz)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%
		(\mathcal{G})



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6.2.Conducted Emission

6.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Frequency Range:	150 kHz to 30 MHz		(\mathcal{C})			
Receiver setup:	RBW=9 kHz, VBW=30 kH	Iz, Sweep time	e=auto			
Limits:	Frequency range	Limit (Quasi-peak 66 to 56* 56 60	(dBuV) Average 56 to 46* 46 50			
Test Setup:	Reference	80cm Fi EMI Receiver	liter — AC power			
Test Mode:	Transmitting mode with m	odulation				
Test Procedure:	 The E.U.T and simulate power through a line in (L.I.S.N.). This provide impedance for the means 2. The peripheral devices power through a LISN coupling impedance wite refer to the block dial photographs). Both sides of A.C. line conducted interference emission, the relative per the interface cables means ANSI C63.10:2013 on comparison 	npedance stal des a 50ohn suring equipm are also conn that provides th 50ohm terr agram of the ne are checke . In order to fi ositions of equipust be chang	bilization network n/50uH coupling nent. ected to the main s a 50ohm/50uH mination. (Please test setup and ed for maximum ind the maximum upment and all of ged according to			
Test Result:	N/A; The EUT powered by not applicable	y battery, so th	nis test item is			

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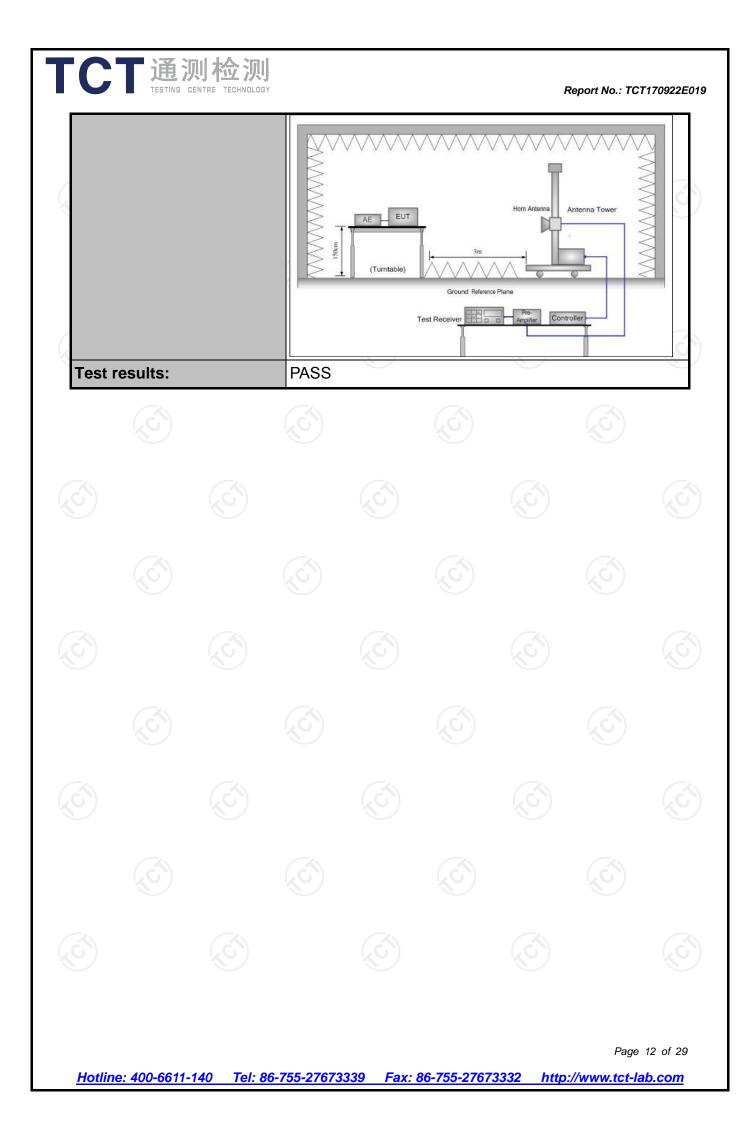
6.3. Radiated Emission Measurement

6.3.1. Test Specification

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Test Requirement:	FCC Part15	C Section	n 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 &	& Vertical				
	Frequency	Detector	RBW	VBW	Remark	
	9kHz- 150kHz		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 5MHz	94.		Average Value	
rundamentar signarj.	240010112-2-	100.01011 IZ	114.00		Peak Value	
	Frequency		Limit (dBuV/m @3m)		Remark	
	0.009-0.490		2400/F(KHz)		Quasi-peak Value	
	0.490-1.705		24000/F(KHz)		Quasi-peak Value	
			30		Quasi-peak Value	
Limit(Spurious Emissions):	30MHz-88MHz		40.0		Quasi-peak Value	
· · · · · · · · · · · · · · · · · · ·	88MHZ-216MHZ		43.5 46.0		Quasi-peak Value	
	216MHz-960MHz 960MHz-1GHz		54.0		Quasi-peak Value Quasi-peak Value	
			54		Average Value	
	Above 7	1GHz	74.0		Peak Value	
Limit (band edge) :	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at 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. 4. 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. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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.
	For radiated emissions below 30MHz
Test setup:	30MHz to 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

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	Radiated Em	ission Test Si	te (966)	
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Test Receiver	ROHDE&SCHW ARZ	ESVD	100008	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHW ARZ	FSQ	200061	Sep. 27, 2018
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 27, 2018
Pre-amplifier	HP	8447D	2727A05017	Sep. 27, 2018
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
Coax cable (9KHz-1GHz)	тст	RE-low-01	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	о тст	RE-high-02	N/A	Sep. 27, 2018
Coax cable (9KHz-1GHz)	тст	RE-low-03	N/A	Sep. 27, 2018
Coax cable (9KHz-40GHz)	тст	RE-high-04	N/A	Sep. 27, 2018
EMI Test Software	Shurple Technology	EZ-EMC	N/A G	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)	Emission PK/AV (dBuV/m)	Horizontal /Vertical	Limits PK/AV (dBuV/m)	Margin (dB)
2405	88.63(PK)	Н	114/94	-25.37
2405	75.61(AV)	H G	114/94	-18.39
2433	87.17(PK)	Н	114/94	-26.83
2433	74.60(AV)	Н	114/94	-19.4
2475	85.86(PK)	(C)H	114/94	-28.14
2475	71.95(AV)	Н	114/94	-22.05
2405	88.19(PK)	V	114/94	-25.81
2405	76.77(AV)	V	114/94	-17.23
2433	86.61(PK)	V	114/94	-27.39
2433	76.53(AV)	V	114/94	-17.47
2475	87.78(PK)	V	114/94	-26.22
2475	75.05(AV)	V	114/94	-18.95

Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBµV/m)	Limit@3m (dBµV/m)		
	-			R.	
	-	_			
(G)-	(G) -	- (,G`)	- (, G)		

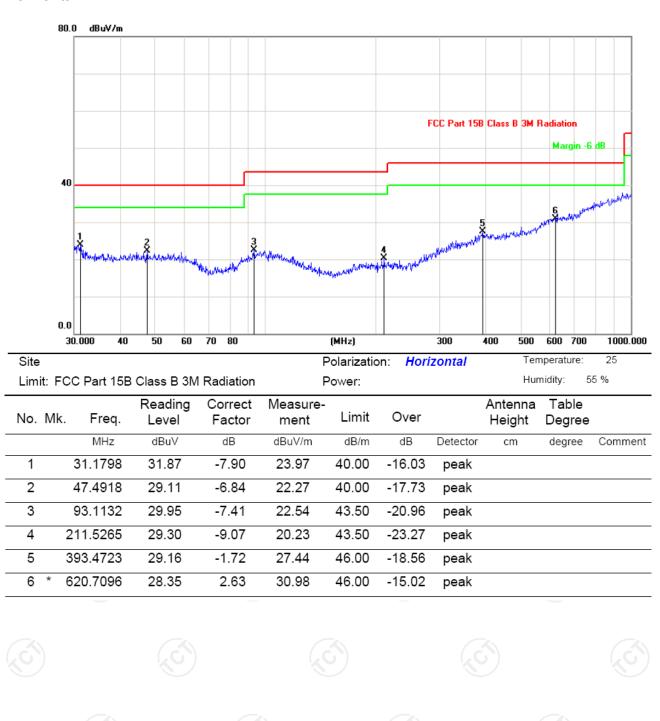
Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor

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



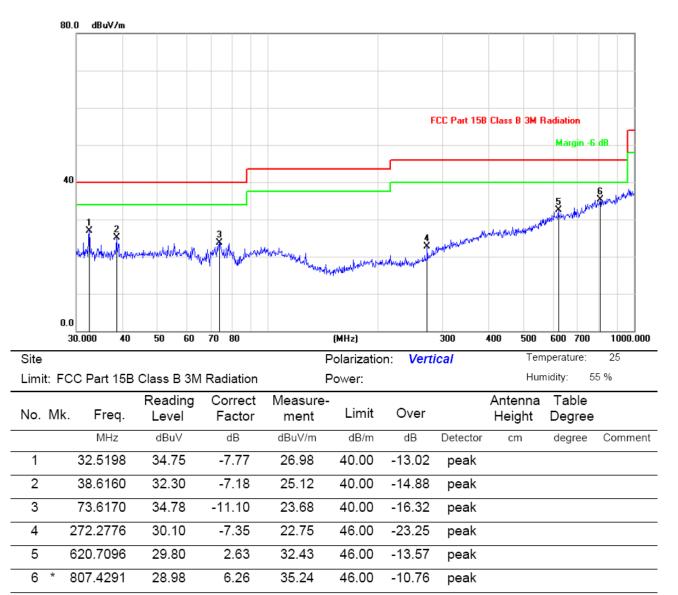
Frequency Range (30MHz-1GHz)

Horizontal:



Vertical:

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

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	Above 1GHz									
	Low channel: 2405 MHz									
	Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)	Peak	n Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
	2387.50	Н	54.25		-4.20	50.05		74	54	-3.95
	2387.50	Н		48.14	-4.20	У	43.94	74	54	-10.06
	4810.00	Н	52.46		-3.94	48.52		74	54	-5.48
	7215.00	Н	47.60		0.52	48.12		74	54	-5.88
		(4 -7								
		XG)		2			(C)			
	2387.50	V	51.16		-4.20	46.96		74	54	-7.04
	2387.50	V		49.47	-4.20		45.27	74	54	-8.73
	4810.00	V	48.73		-3.94	44.79		74	54	-9.21
	7215.00	V	45.22		0.52	45.74		74	54	-8.26
3	2)				X	//				

	Middle channel: 2433 MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Peak		Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)	
4866.00	Н	53.31		-3.98	49.33		74	54	-4.67	
7299.00	Н	48.86		0.57	49.43		74	54	-4.57	
~				(X					
G`}		()		(20	5)					
<u> </u>					/					
4866.00	V	51.26		-3.98	47.28		74	54	-6.72	
7299.00	V	50.37		0.57	50.94		74	54	-3.06	
			10)				ko /		

	High channel: 2475 MHz								
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBµV)	Correction Factor (dB/m)	Emissio Peak (dBµV/m)	on Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
2483.50	Н	52.11		-2.38	49.73		74	54	-4.27
2483.50	Н		42.37	-2.38		39.99	74	54	-14.01
4950.00	Н	50.66		-3.98	46.68	<u> </u>	74	54	-7.32
7425.00	Н	49.53		0.57	50.1		74	54	-3.9
~					2				
2483.50	V	50.65		-2.38	48.27		74	54	-5.73
2483.50	V		43.73	-2.38	J	41.35	74	54	-12.65
4950.00	V	51.81		-3.98	47.83		74	54	-6.17
7425.00	V	48.27		0.57	48.84		74	54	-5.16
				·					
Note:			N.			<u>(</u>)		(U)	

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.

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Band Edge Requirement

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Low chann	el: 2405 N	1Hz							
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBµV)	AV reading (dBuV)	Correction Factor (dB/m)		n Level AV (dBµV/m)	Peak limit (dBµV/m)	AV limit (dBµV/m)	Margin (dB)
2400	Н	49.62	/	-4.2	45.42		74		-28.58
2400	Н		42.58	-4.2		38.38		54	-15.62
2400	V	48.37	(-4.2	44.17		74		-29.83
2400	V		39.32	-4.2		35.12		54	-18.88

High channel 2475 MU-

High chanr	nel: 2475 N	ЛНz							
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)
2483.5	H	50.81		-4.2	46.61		74		-27.39
2483.5			41.66	-4.2		37.46		54	-16.54
			7						
2483.5	V	49.27		-4.2	45.07		74		-28.93
2483.5	V		40.87	-4.2		36.67		54	-17.33
			/		07-				

Note:

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

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



6.4.20dB Occupied Bandwidth

6.4.1. Test Specification

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Test Requirement:	FCC Part15 C Sectio 2.1049	n 15.215(c)/ Pa	rt 2 J Section
Test Method:	ANSI C63.10: 2013		
Limit:	N/A		$\langle \langle \mathcal{O} \rangle \rangle$
	 Set to the maxim EUT transmit com Use the following 20dB Bandwidth r Span = approximing bandwidth, centered on a hop dB bandwidth; 	the artificial ante um power setti tinuously. g spectrum an measurement. mately 2 to 3 oping channel; eep = auto; D x hold.	enna and the EUT. ng and enable the alyzer settings for times the 20 dB RBW≥1% of the 20 etector function =
Test setup:	Spectrum Analyzer	EU	T T
Test Mode:	Transmitting mode w	ith modulation	
Test results:	PASS		

6.4.2. Test Instruments

	RF Test Room							
Equipment Manufacturer Model Serial Number Calibra								
	Spectrum Analyzer	R&S	FSU	200054	Sep. 27, 2018			

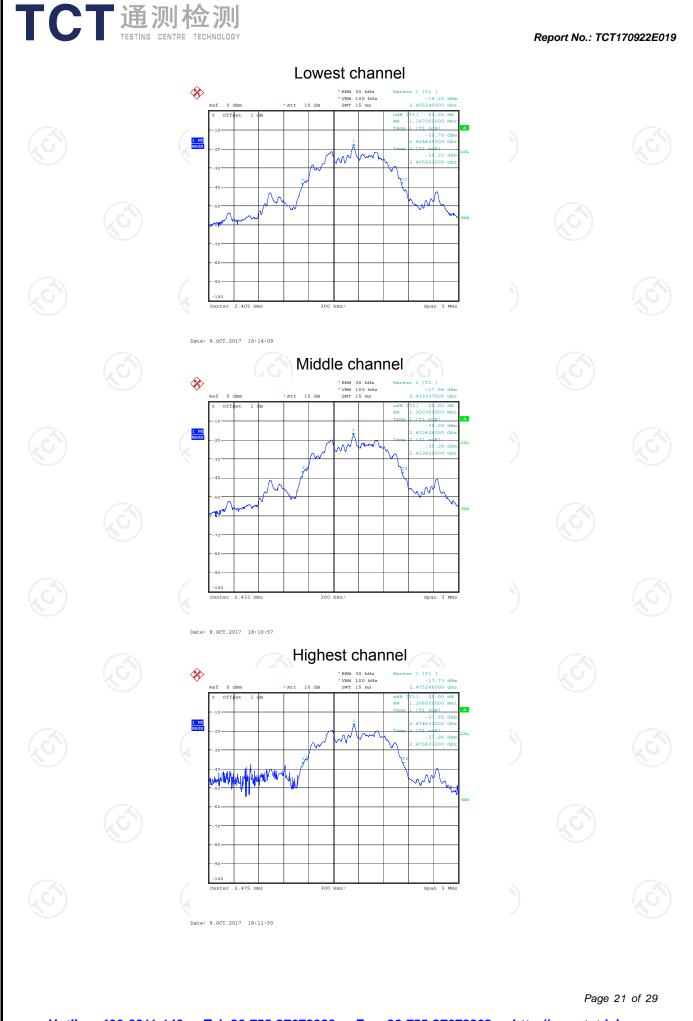
Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

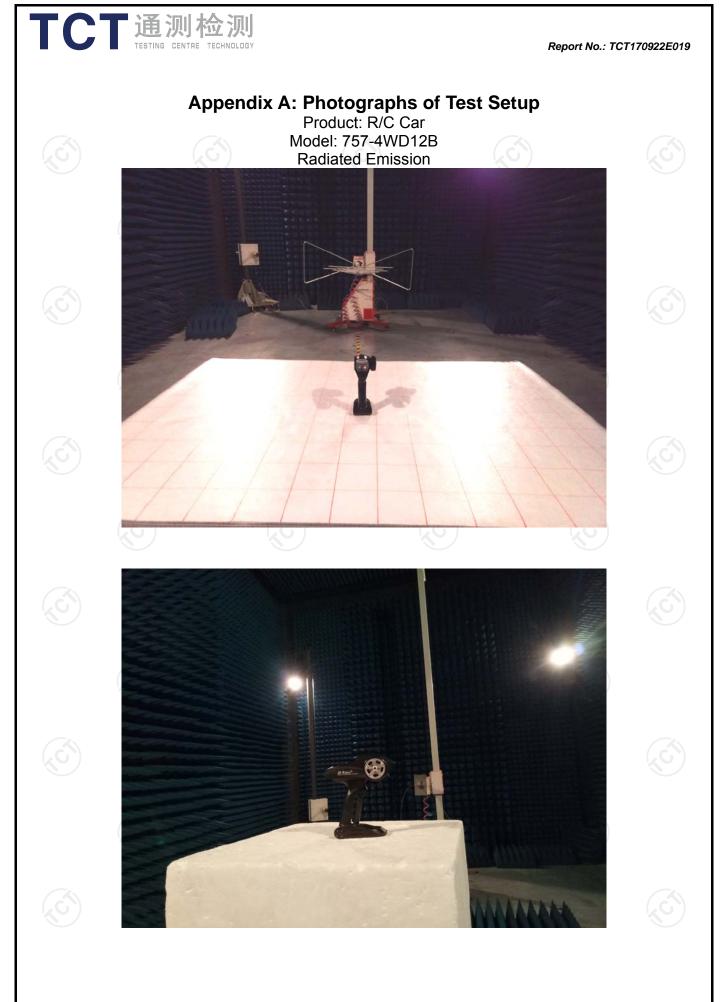


6.4.3. Test data

	Test Channel	20dB Occupy Bandwidth (kHz)	Limit	Conclusion
1	Lowest	1197		PASS
	Middle	1200		PASS
	Highest	1206		PASS

Test plots as follows:			
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<u>notanie, 400-0011-140 - 161, 00-100-21010000 - 1 ax. 00-100-21010002 - nttp://www.tet-lab.com</u>			





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