FCC ID : Test Report No : Date of issue :	TEST REPC 2ATK8-SH9160-1 TCT250115E018			
Test Report No:	-			
•	TCT250115E018			
Date of issue:		(
	Jan. 22, 2025	×	$\boldsymbol{\mathcal{D}}$	S.
Testing laboratory::	SHENZHEN TONGCE TES	STING LAB		
Testing location/ address:	2101 & 2201, Zhenchang F Fuhai Subdistrict, Bao'an D 518103, People's Republic	District, Shei		
Applicant's name: :	Ningbo Shuanghe Hongsh	eng Electro	nic Technology	Co., Ltd
Address:	No.2 Binxi south Rd Dayin China	Industrial P	ark, Yuyao, Zhe	ejiang,
Manufacturer's name :	Ningbo Shuanghe Hongsh	eng Electro	nic Technology	Co., Ltd
Address:	No.2 Binxi south Rd Dayin China	Industrial P	ark, Yuyao, Zhe	iang,
Standard(s):	FCC CFR Title 47 Part 15	· /		
Product Name:	WIRELESS THERMOMET	ER & REM	OTE CONTROL	POOL
Frade Mark:	N/A			
Model/Type reference :	SH9160	$\langle \mathcal{O} \rangle$	$\langle \mathcal{C} \rangle$	
Rating(s):	DC 3V(1.5V*AAA*2 Battery	y)		
Date of receipt of test item	Jan. 15, 2025		C)	
Date (s) of performance of est:	Jan. 15, 2025 ~ Jan. 22, 20	025		
Fested by (+signature) :	Yannie ZHONG	V Yan	nie Zhonger	
Check by (+signature) :	Beryl ZHAO	Ba	TCT	STING
Approved by (+signature):	Tomsin	01	NS 175 84	

This report shall not be reproduced except in full, without the written approval of SHENZHEN TONGCE TESTING LAB. This document may be altered or revised by SHENZHEN TONGCE TESTING LAB personnel only, and shall be noted in the revision section of the document. The test results in the report only apply to the tested sample.

Table of Contents

TCT 通测检测 TESTING CENTRE TECHNOLOGY

1. General Product Information		
1.1. EUT description	<u> </u>	3
1.2. Model(s) list		3
2. Test Result Summary		
3. General Information		
3.1. Test Environment and Mode		5
3.2. Description of Support Units		6
4. Facilities and Accreditations		
4.1. Facilities		7
4.2. Location	<u>(6)</u>	7
4.3. Measurement Uncertainty		7
5. Test Results and Measurement Data		8
5.1. Antenna Requirement		8
5.2. Conducted Emission		9
5.3. Radiated Emission Measurement		
5.4. Manually Activated Transmitter	\sim	20
5.5. Occupied Bandwidth		22
Appendix A: Photographs of Test Setup		
Appendix B: Photographs of EUT		



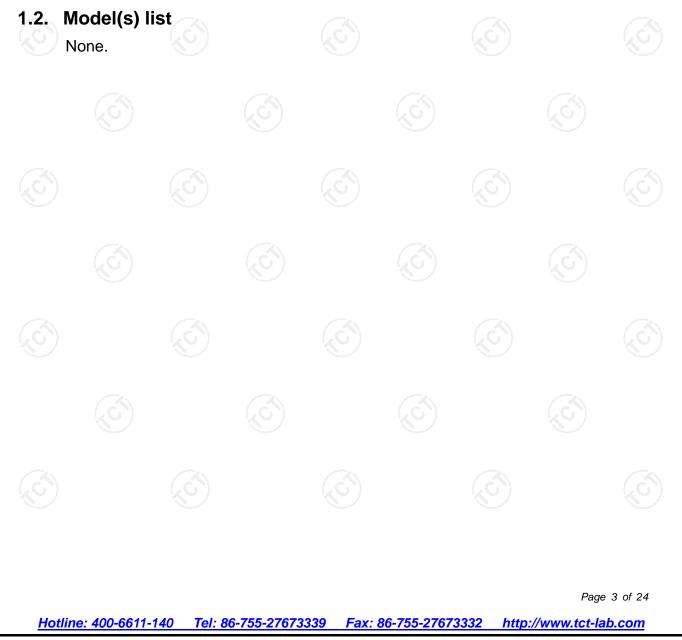
1. General Product Information

Report No.: TCT250115E018

1.1. EUT description

Product Name:	WIRELESS THERMOMETER & REMO LIGHT	TE CONTROL POOL
Model/Type reference:	SH9160	
Sample Number	TCT250115E018-0101	
Operation Frequency:	433.92MHz	
Modulation Technology:	ASK	
Antenna Type:	Helical Antenna	
Antenna Gain:	0dBi	
Rating(s):	DC 3V(1.5V*AAA*2 Battery)	

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





2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna Requirement	§15.203/§15.247 (c)	PASS
Conduction Emission, 0.15MHz to 30MHz	§15.207	N/A
Manually Activated Transmitter	§15.231(a)	PASS
Radiation Emission	§15.231(b), §15.205, §15.209, §15.35	PASS
Occupied Bandwidth	§15.231(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.



3. General Information

3.1. Test Environment and Mode

Operating Env	ironment:				
Condition		Radiated Emission	6		C
Temperatur	re:	23.1 °C			
Humidity:		46 % RH	S)	S	
Test Mode:					
Operation r	node:	Keep the EUT in co	ntinuous transn	nitting with modul	lation
interconnecting both horizontal shown in Test -test mode. have verified the	g cables, rota I and vertical Results of th construction ar	configuration to obtain ating the turntable, var polarizations. The em e following pages.	ying antenna h lissions worst-c	eight from 1m to case (Y axis) are	
Axis		which was shown in this to	est report and defi	Z	
Field Strength		52.47	55.31	52.59	
5)	(sc)			5)	6
cording to ANSI Ce axis (see the test s		s, the test results are both	the "worst case" a	nd "worst setup":	
J J				3) (3)	

3.2. Description of Support Units

TCT通测检测 TESTING CENTRE TECHNOLOGY

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	1	
	N. N			

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

. Grounding wa use.	s established l	n accordance	with the manuf	racturer s requ	conditions for t	

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
 - SHENZHEN TONGCE TESTING LAB
 - CAB identifier: CN0031

The testing lab has been registered by Innovation, Science and Economic Development Canada for radio equipment testing.

4.2. Location

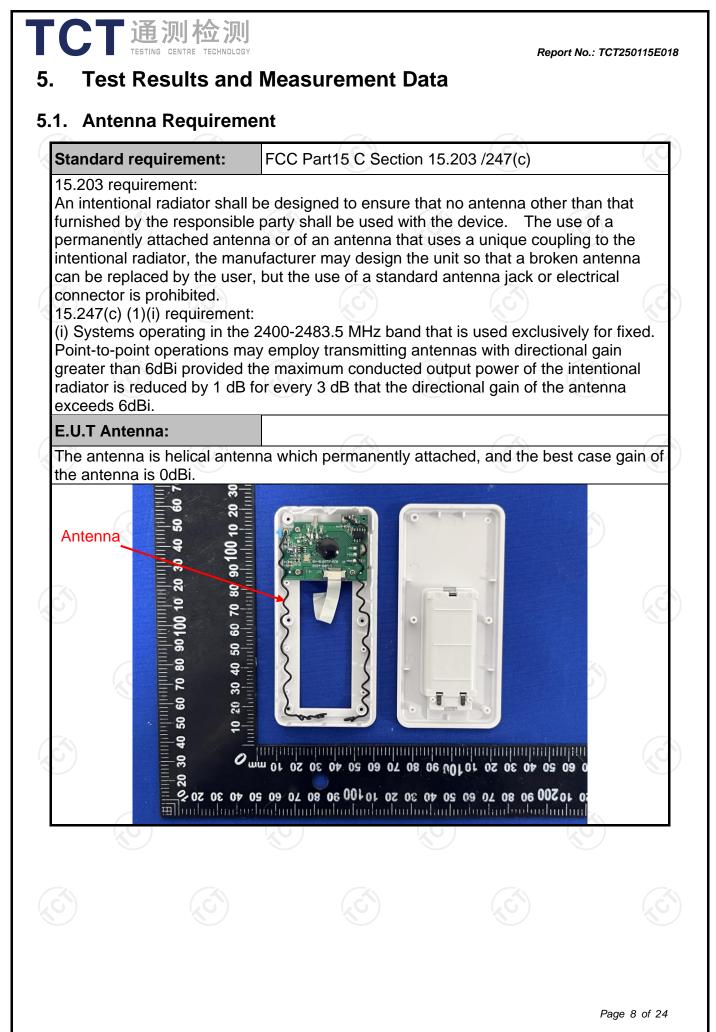
SHENZHEN TONGCE TESTING LAB

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
7	Temperature	± 0.1°C
8	Humidity	± 1.0%



5.2. Conducted Emission

5.2.1. Test Specification

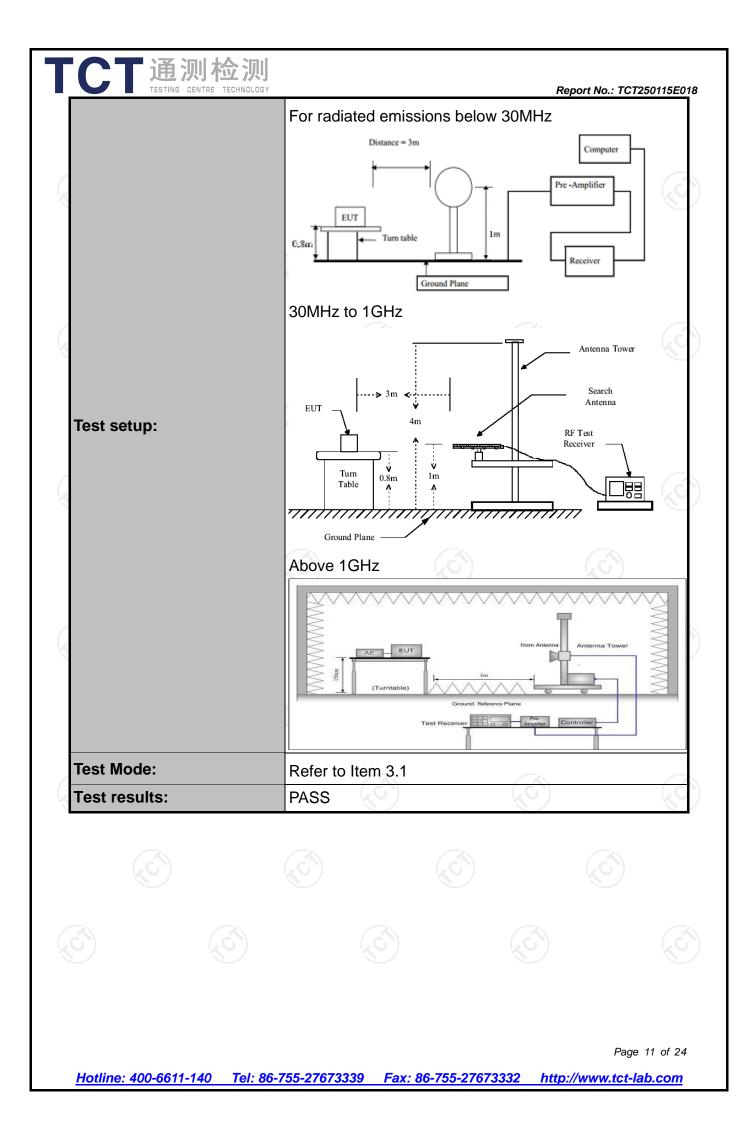
Test Requirement:	FCC Part15 C Section 15.207			
Test Method:	ANSI C63.10:2020			
Frequency Range:	150 kHz to 30 MHz			
Receiver setup:	RBW=9 kHz, VBW=30	kHz, Sweep time	e=auto	
	Frequency range	Limit (dBuV)	
	(MHz)	Quasi-peak	Áverage	
Limits:	0.15-0.5	66 to 56*	56 to 46*	
	0.5-5	56	46	
	5-30	60	50	
	Reference	e Plane		
Test Setup:	E.U.T AC powe Test table/Insulation plane Remarkc E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Ne Test table height=0.8m	EMI Receiver	r _ AC power	
Test Mode:	Transmitting Mode			
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 the interface to the provide to the setup. 			
	ANSI C63.10:2020 on conducted measurement. N/A; The EUT powered by battery, the battery can only be charged by solar energy, so this test item is not applicable			



5.3. Radiated Emission Measurement

5.3.1. Test Specification

Test Requirement:	FCC Part15	C Section	15.231(a) and 15	.209
Test Method:	ANSI C63.4: 2014 and ANSI C63.10:2013 9 kHz to 5 GHz				
Frequency Range:					
Measurement Distance:	3 m	R.	Ĵ)		S.
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 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak 🔪	1MHz	10Hz	Average Value otating table 0.
Test Procedure:	below 10 1GHz. T determine 2. The EU interferen on the top 3. The anter meters at value of vertical p the meas 4. For each s to its wor heights fr table was find the m 5. The test- Function Hold Mod 6. If the emi 10dB lowe be stopped reported. 0 10dB man peak, quas	GHz, 1.5m he table the position T was succe-receiving of a variation of a variation of a variation of a variation the field olarizations urement. Suspected of the field olarizations urement. Suspected of the field olarizations of a variation of a	a above was ro on of the et 3 m ig anteni ble-heigh is varied ound to strength s of the a emission d then th er to 4 m om 0 deg eading. ystem w ified Ba of the E imit spec eak valu the emis be re-te average r	the gro tated 36 highest eters a na, which tantenr from on determin antenna a , the EU e antenna , the EU e antenr neters ar grees to as set t ndwidth EUT in p cified, the esions the sted one method a	way from th h was mounte



5.3.2. Limit

Fundamental Frequency (MHz)	Filed Strength of Fundamental (microvolts/meter)	Filed Strength of Spurious Emission (microvolts/meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750*	125 to 375*
174-260	3750	375
260-470	3750 to 12500*	375 to 1250*
Above 470	12500	1250
Horn Antenna	Schwarzbeck	BBHA 9120D

*Linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows:

For the band 130-174 MHz, μ V/m at 3 meters = 56.81818(F) - 6136.3636;

for the band 260-470 MHz, μ V/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

For EUT

Fundamental Frequency (MHz)	Filed Strength of Fundamental (dBµV/m)	Filed Strength of Spurious Emission(dBµV/m)
433.92	80.83	60.83

Note:

1. Intentional radiators operating under the provisions of this Section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions.

2.According to 15.35, on any frequency or frequencies below or equal to 1000 MHz, the limits Shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test.

3. According to 15.231(b), The limits on the field strength of the spurious emissions in the above table is based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in Section 15.209, whichever limit permits one higher field strength.

Frequencies in restricted band are complied to limit on Paragraph 15.209

Frequency Range (MHz)	Distance (m)	Field strength (dBµV/m)
0.009-0.490	3	20log 2400/F (kHz) + 80
0.490-1.705	3	20log 24000/F (kHz) + 40
1.705-30	3	20log 30 + 40
30-88	3 (6)	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

RF Voltage (dBuV) = 20 log RF Voltage (uV)
 In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was

found that the worse radiated emission was get at the lying position.

5. If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula Ld1 = Ld2 * (d2/d1)



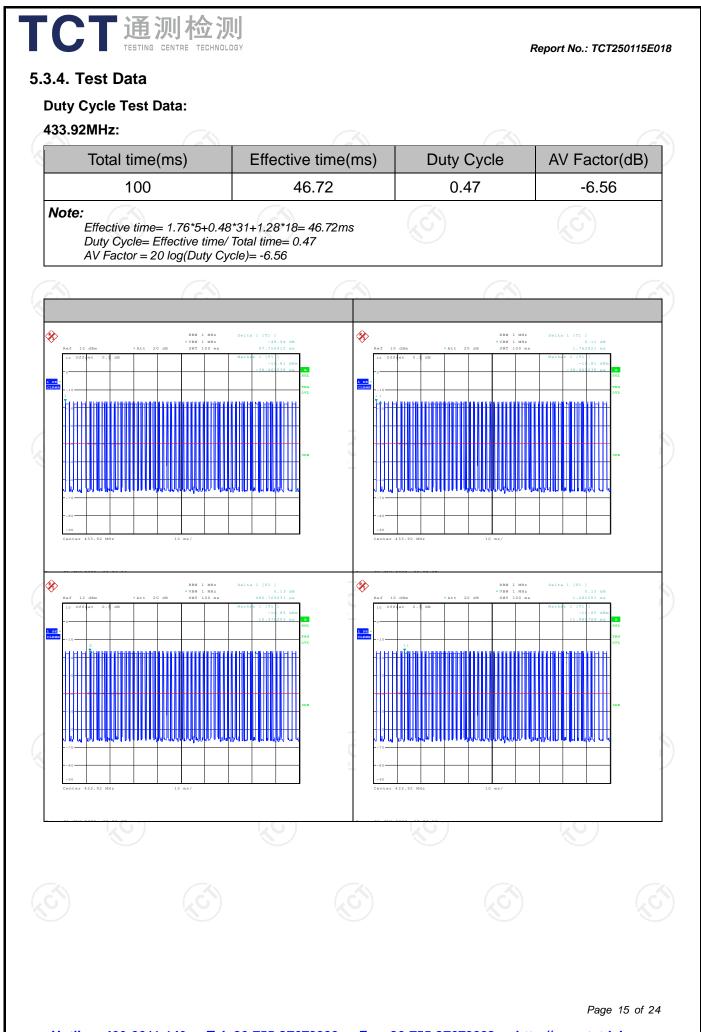
5.3.3. Test Instruments

TCT通测检测 TESTING CENTRE TECHNOLOGY

	Radiated Emission Test Site (966)								
Name of Equipment	Manutacturer		Model Serial Number						
EMI Test Receiver	R&S	ESCI7	100529	Jan. 31, 2025					
Spectrum Analyzer	R&S	FSQ40	200061	Jun. 26, 2025					
Pre-amplifier	SKET	LNPA_0118G- 45	SK2021012 102	Jan. 31, 2025					
Pre-amplifier	SKET	LNPA_1840G- 50	SK2021092 03500	Jan. 31, 2025					
Pre-amplifier	HP	8447D	2727A05017	Jun. 26, 2025					
Loop antenna	Schwarzbeck	FMZB1519B	00191	Jun. 26, 2025					
Broadband Antenna	Schwarzbeck	VULB9163	340	Jun. 28, 2025					
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Jun. 28, 2025					
Horn Antenna	Schwarzbeck	BBHA 9170	00956	Feb. 02, 2025					
Coaxial cable	SKET	RE-03-D	/	Jun. 26, 2025					
Coaxial cable	SKET	RE-03-M		Jun. 26, 2025					
Coaxial cable	SKET	RE-03-L	/	Jun. 26, 2025					
Coaxial cable	SKET	RE-04-D	1	Jun. 26, 2025					
Coaxial cable	SKET	RE-04-M	K)	Jun. 26, 2025					
Coaxial cable	SKET	RE-04-L	/	Jun. 26, 2025					
Antenna Mast	Keleto	RE-AM		(SY					
EMI Test Software	EZ_EMC	FA-03A2 RE+	1.1.4.2						

Page 14 of 24

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com





Frequency Range (9 kHz-30MHz)

	Frequency (MHz)	Level@3m (dBµV/m)	Limit@3m (dBµV/m)
	$G^{}$ $(_{k}G^{})$	Ú.	(xo`) (xo`
1	<u> </u>		· · ·
	<u></u>		

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

Page 16 of 24

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

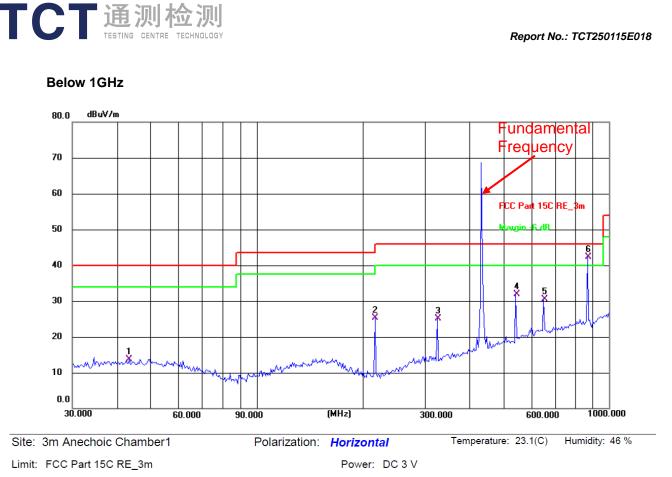
Field Strength of Fundamental

	Frequ (Mł			nission PK dBuV/m)	Horizontal /Vertical	Limits PK (dBuV/m)	Marg (dB)	
×.	433	.92	\mathcal{D}	68.66	Н	100.83	-32.1	7
433.92		65.24		V	100.83	-35.5	9	
	(Ć			
Fre	equency	Emission	PK	AV	Horizontal	Emission	Limits AV	Margin

Frequency (MHz)	Emission PK (dBuV/m)	AV Factor(dB)	Horizontal /Vertical	Emission AVG (dBuV/m)	Limits AV (dBuV/m)	Margin (dB)
433.92	68.66	-6.56	G H	62.10	80.83	-18.73
433.92	65.24	-6.56	V	58.68	80.83	-22.15

Report No.: TCT250115E018





No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	43.5056	25.90	-12.12	13.78	40.00	-26.22	QP	Ρ	
2	216.7828	40.38	-15.00	25.38	46.00	-20.62	QP	Р	
3	325.5958	35.36	-10.28	25.08	46.00	-20.92	QP	Ρ	
4	543.2742	38.58	-6.61	31.97	46.00	-14.03	QP	Ρ	
5	651.9417	34.50	-4.01	30.49	46.00	-15.51	QP	Ρ	
6 *	869.1301	44.23	-1.84	42.39	46.00	-3.61	QP	Ρ	

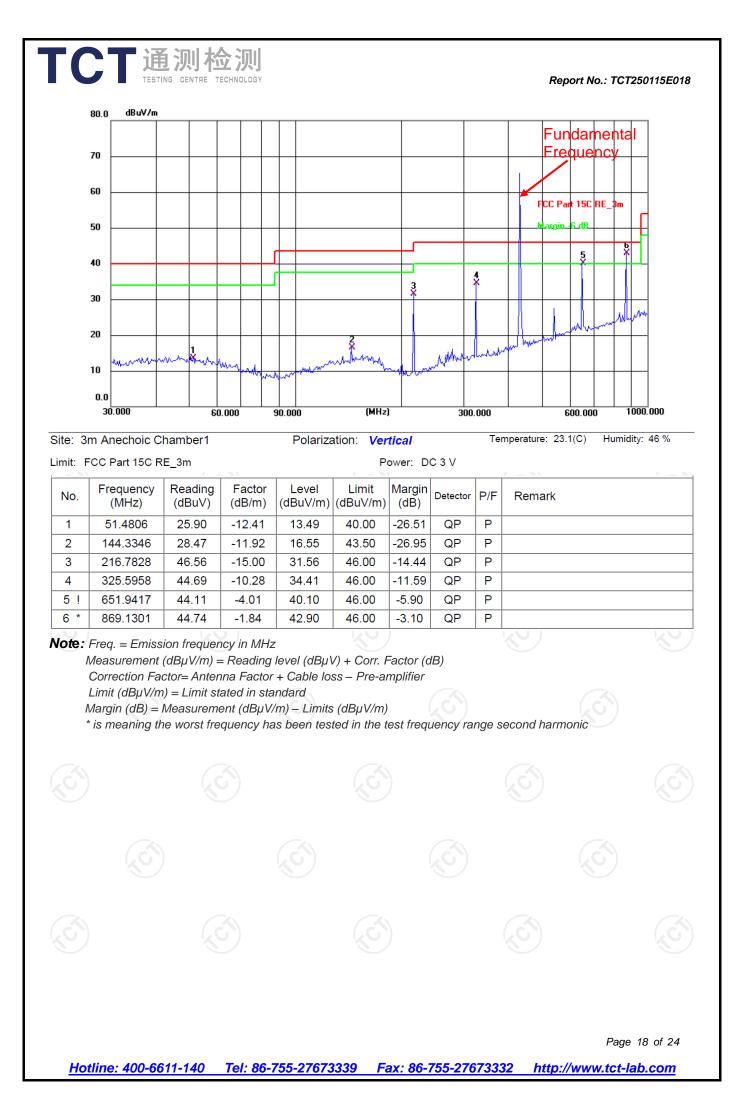
5)

5)

Q

Page 17 of 24

Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com



Above 1GHz (PK value)

Frequency PK Value (MHz)	Read Level PK (dBuV)	Correction Factor (dB/m)	Level PK (dBuV/m)	Limit Line PK (dBuV/m)	Over Limit (dB)	Polarization
1301.76	62.52	-18.59	43.93	80.83	-36.90	Vertical
1735.68	52.36	-18.14	34.22	80.83	-46.61	Vertical
2169.60	52.09	-17.61	34.48	80.83	-46.35	Vertical
2603.52	47.81	-16.45	31.36	80.83	-49.47	Vertical
3037.44	47.42	-14.84	32.58	80.83	-48.25	Vertical
3471.36	46.06	-14.17	31.89	80.83	-48.94	Vertical
1301.76	58.78	-18.59	40.19	80.83	-40.64	Horizontal
1735.68	55.65	-18.14	37.51	80.83	-43.32	Horizontal
2169.60	53.86	-17.61	36.25	80.83	-44.58	Horizontal
2603.52	53.04	-16.45	36.59	80.83	-44.24	Horizontal
3037.44	53.97	-14.84	39.13	80.83	-41.70	Horizontal
3471.36	51.73	-14.17	37.56	80.83	-43.27	Horizontal
					(.0	

Note:

- 1. Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss Pre-amplifier
- 2. Margin (dB) = Emission Level (dB μ V/m)- 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.
- dB below the limits or the field strength is too small to be measured.

5. Data of measurement shown "*" in the above table mean that the reading of emissions is attenuated more than 20

Page 19 of 24

Report No.: TCT250115E018

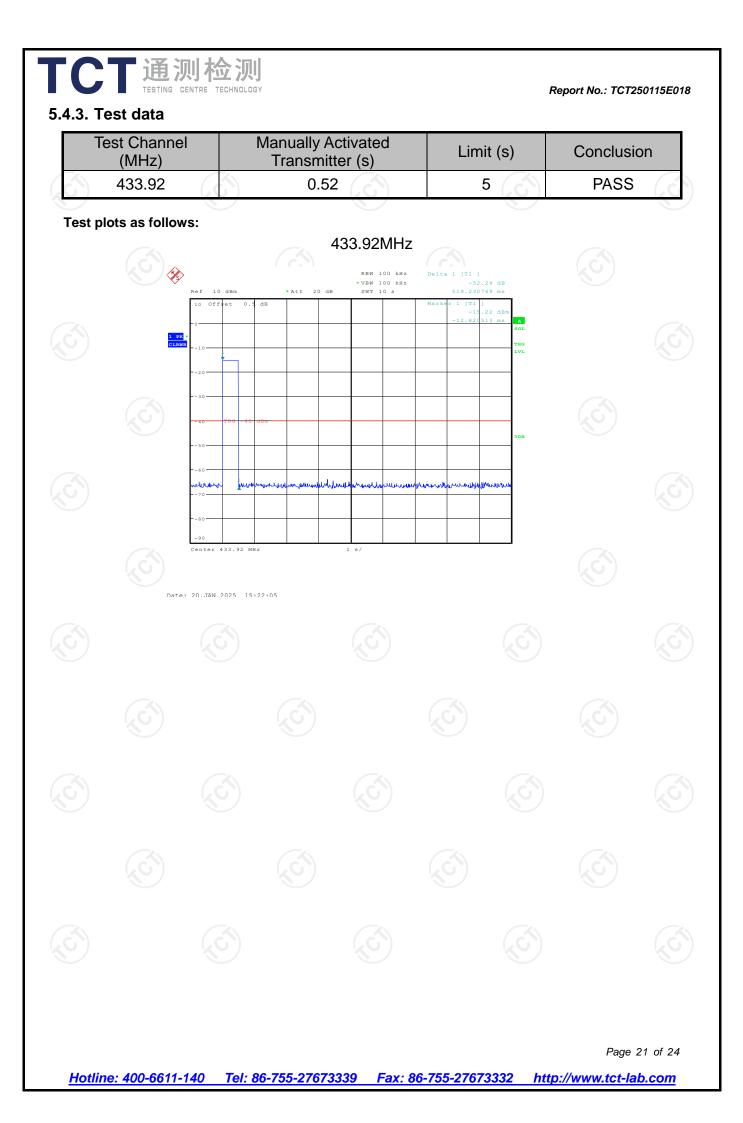
5.4. Manually Activated Transmitter

5.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 2	FCC Part15 C Section 15.231(a)(1)					
Test Method:	ANSI C63.10: 2013	ANSI C63.10: 2013					
Limit:	shall employ a switch t	A manually operated transmitte hat will automatically deactivat of more than 5 seconds of bein					
Test Procedure:	position between the 2. Set to the maximum EUT transmit continu 3. Use the following spe VBW = 1MHz, VBW Span = 0; Sweep Tin	 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. VBW = 1MHz, VBW≥RBW; Span = 0; Sweep Time > T(on)+5S; Detector function = peak; 					
Test setup:	Spectrum Analyzer	EUT					
Test Mode:	Refer to Item 3.1						
Test results:	PASS						

5.4.2. Test Instruments

	RF Test Room							
	Equipment Manufacturer		Equipment Manufacturer Model Serial Numb		Calibration Due			
6	Spectrum Analyzer	R&S	FSU	200054	Jun. 26, 2025			



5.5. Occupied Bandwidth

5.5.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.231C
Test Method:	ANSI C63.10: 2013
Limit:	According to 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the centre frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the centre frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test Procedure:	 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
Test Mode:	Refer to Item 3.1
Test results:	PASS

5.5.2. Test Instruments

RF Test Room							
Equipment	Manufacturer	Model	Serial Number	Calibration Due			
Spectrum Analyzer	R&S	FSU	200054	Jun. 26, 2025			

