

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No: CCISE200805001

FCC REPORT

Applicant: Remote Tech LLC

Address of Applicant: 310 ALDER RD, DOVER DE 19904 USA

Equipment Under Test (EUT)

Product Name: smart key

Model No.: RT-2CY3B, RT-2CY4BT, RT-2CY4BR, RT-2CY5BC

FCC ID: 2AOKM-CYV11

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.231

Date of sample receipt: 18 Aug., 2020

Date of Test: 19 Aug., to 25 Aug., 2020

Date of report issue: 02 Sep., 2020

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	02 Sep., 2020	Original

Prepared By: Over Men Date: 02 Sep., 2020

Test Engineer

Check By: Date: 02 Sep., 2020

Project Engineer



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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.231 (b)	Pass
Spurious emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Duration Time	15.231 (a)(1)	Pass
Conducted Emission	15.207	N/A

Remarks:

- 1. Pass: The EUT complies with the essential requirements in the standard.
- 2. N/A: The EUT not applicable of the test item.
- The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).

Took Mathadi	ANSI C63.4-2014
Test Method:	ANSI C63 10-2013



5 General Information

5.1 Client Information

Applicant:	Remote Tech LLC
Address:	310 ALDER RD, DOVER DE 19904 USA
Manufacturer:	Remote Tech LLC
Address:	310 ALDER RD, DOVER DE 19904 USA

5.2 General Description of E.U.T.

Product Name:	smart key
Model No.:	RT-2CY3B, RT-2CY4BT, RT-2CY4BR, RT-2CY5BC
Operation Frequency:	433.9MHz
Channel numbers:	1
Modulation type:	FSK
Antenna Type:	PCB antenna
Antenna gain:	0 dBi
Power supply:	DC 3V (CR2032 battery)
Test Sample Condition:	The test samples were provided in good working order with no visible defects.
Remark:	Model No.: All models are identical inside, including the electrical circuit design, layout, components used and internal wiring. Models RT-2CY3B, RT-2CY4BT, RT-2CY4BR, RT-2CY5BC represent appearance of the key with 2, 3 and 4 buttons on the shell. The PCB function is the same for all these models.

5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with modulation (new battery used)							
Pre-Test Mode:								
CCIS has verified the construpolar directions; i.e. X axis, Y								
Axis X Y Z								
Field Strength(dBuV/m)	82.43	82.36	82.21					
Final Test Mode:								
According to ANSI C63.4 sta	ndards, the test results are	ooth the "worst case" and "v	vorst setup": X axis (see					

the test setup photo)

5.4 Description of Support Units

N/A

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.20 dB (k=2)

Shenzhen Zhongjian Nanfang Testing Co., Ltd. No.110~116, Building B, Jinyuan Business Building, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366

Report No: CCISE200805001

5.6 Additions to, deviations, or exclusions from the method

No

5.7 Laboratory Facility

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

• FCC - Designation No.: CN1211

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

• ISED - CAB identifier.: CN0021

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

A2LA - Registration No.: 4346.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No.110~116, Building B, Jinyuan Business Building, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

5.9 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.		Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2020	07-21-2023
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-07-2020	03-06-2021
Broadband Antenna	SCHWARZBECK	VUBA9117	359 06-22-2020		06-21-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	916 03-07-2020		03-06-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2020	06-21-2021
Horn Antenna	SCHWARZBECK	BBHA9170	582	11-18-2019	11-17-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	03-07-2020	03-06-2021
EMI Test Software	AUDIX	E3	١	Version: 6.110919b	
Pre-amplifier	HP	8447D	2944A09358	03-07-2020	03-06-2021
Pre-amplifier	CD	PAP-1G18	11804	03-07-2020	03-06-2021
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2020	03-06-2021
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-18-2019	11-17-2020
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2020	03-06-2021
Simulated Station	Anritsu	MT8820C	6201026545	03-07-2020	03-06-2021
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2020	03-06-2021
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2020	03-06-2021
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2020	03-06-2021



6 Test results and Measurement Data

6.1 Antenna requirement

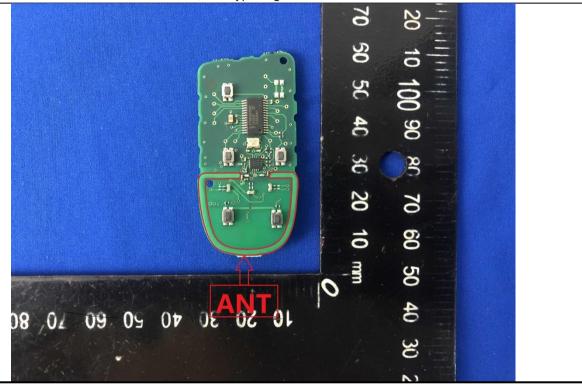
Standard requirement: FCC Part15 C Section 15.203

15.203 requirement:

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 an 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.

E.U.T Antenna:

The EUT make use of a PCB antenna, The typical gain of the antenna is 0dBi.

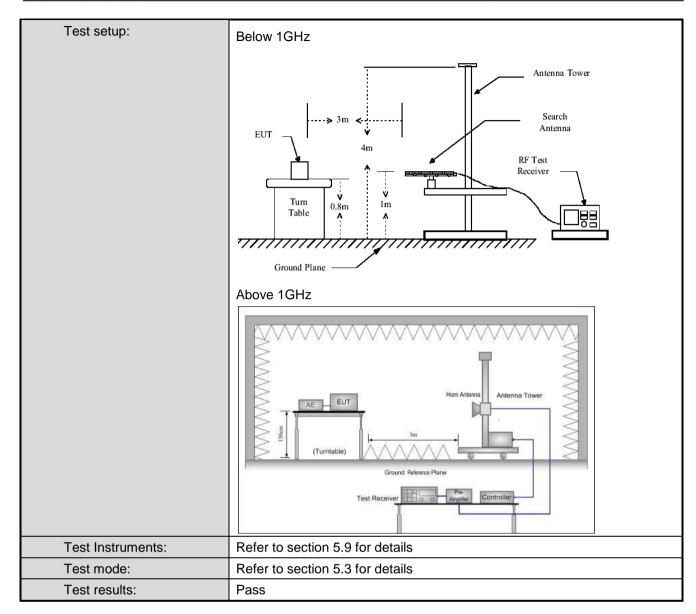




6.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.231(a) and 15.209					
Test Frequency Range:	30MHz to 350	0MHz				
Test site:	Measurement	Distance: 3m (Semi-Anecho	oic Cham	iber)	
Receiver setup:	Frequency	Detector	RBW	VBW	/ Remark	
	30MHz-1GHz Quasi-pe		120kHz	300kH	Iz Quasi-peak Value	
	Above 1GHz	Peak	1MHz		z Peak Value	
Limit:	Frequency Limit (dBu		imit (dBuV/m @	@3m)	Remark	
(Field strength of the	433.90M	⊔	80.82		Average Value	
fundamental signal)	433.9010	112	100.82		Peak Value	
Limit:	Frequen	cy L	imit (dBuV/m (@3m)	Remark	
(Spurious Emissions)	30MHz-88	MHz	40.0		Quasi-peak Value	
(-1	88MHz-216	6MHz	43.5		Quasi-peak Value	
	216MHz-96	0MHz	46.0		Quasi-peak Value	
	960MHz-1	GHz	54.0		Quasi-peak Value	
	Above 10	\U-	54.0		Average Value	
	Above 10	סחב	74.0		Peak Value	
Test Procedure:	Or The maximum permitted unwanted emission level is 20 maximum permitted fundamental level whichever limit perm strength. a. The EUT was placed on the top of a rotating table 0.8mg /1.5m(above 1GHz) above the ground at a 3 meter chan table was rotated 360 degrees to determine the position radiation. b. The EUT was set 3 meters away from the interference-rantenna, which was mounted on the top of a variable-he tower. c. The antenna height is varied from one meter to four met ground to determine the maximum value of the field stre horizontal and vertical polarizations of the antenna are stream the measurement. d. For each suspected emission, the EUT was arranged to and then the antenna was tuned to heights from 1 meter and the rotatable table was turned from 0 degrees to 36 find the maximum reading. e. The test-receiver system was set to Peak Detect Function Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB the limit specified, then testing could be stopped and the of the EUT would be reported. Otherwise the emissions have 10dB margin would be re-tested one by one using			able 0.8m(below 1GHz) beter chamber. The exposition of the highest ference-receiving ariable-height antenna of four meters above the exposition of the highest ference-receiving ariable-height antenna of four meters above the exposition mater to 4make ranged to its worst case multiple 1 meters must 10 degrees to exposition and ex		





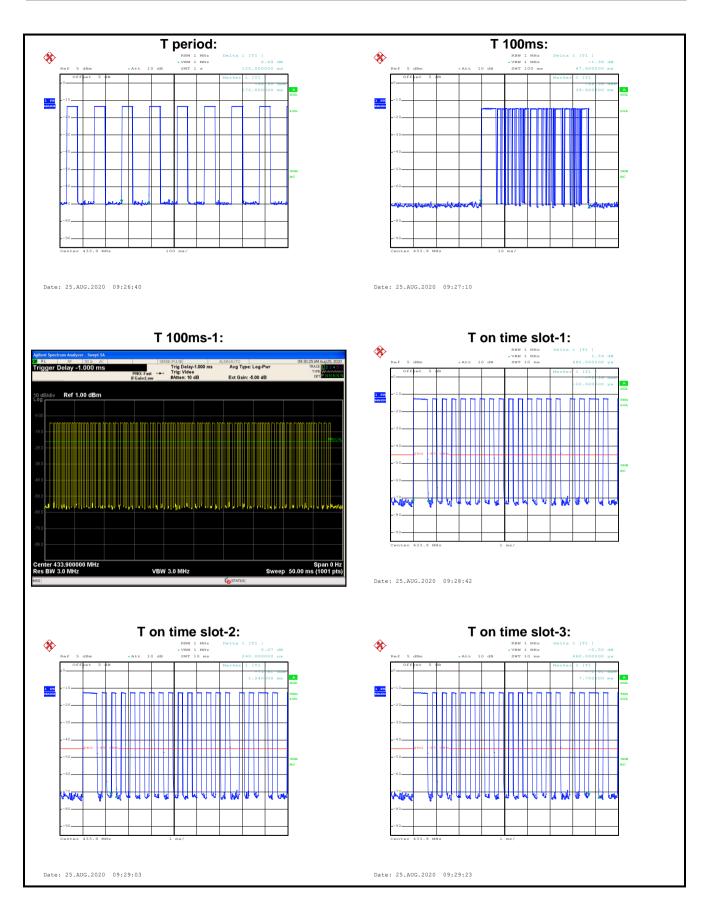




6.2.1 Field Strength Of The Fundamental Signal

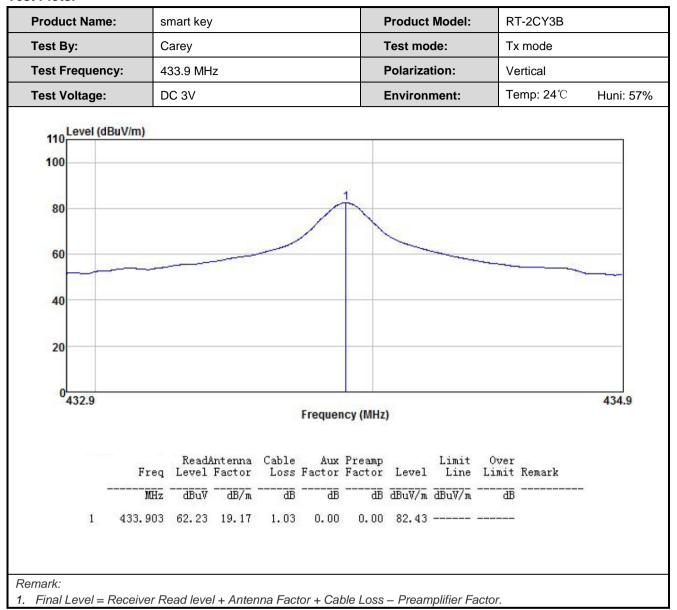
					Peak value					
Frequency (MHz)	Read Level (dBuV)	Facto	Antenna Cable Factor Loss (dB/m) (dB)		Preamp Factor(dB)		_evel BuV/m)	Limit Line		Polarization
433.9	62.23	19.17	19.17 1.03		0.00	8	32.43	100.82	-18.39	Vertical
433.9	51.79	19.17	19.17 1.03		0.00	7	1.99	100.82	-28.83	Horizontoal
					Average value)				
Frequency (MHz)	Level (dBuV/r		Duty Cycle factor		Average val (dBuV/m)			t Line uV/m)	Over Limit (dB)	Polarization
433.9	82.43		-11.42		71.01		80).82	-9.81	Vertical
433.9	71.99			-11.42	60.57		80.82		-20.25	Horizontoal
			rage	value=Peak v	value + Duty C	ycle	Factor			
Calcula	Duty	Duty cycle factor = 20log(Duty cycle)								
		Duty	Duty cycle = on time/100 milliseconds or period, whichever is less							
			T on time =(0.24*61)(ms) +(0.46*25)+ 0.68(ms) =26.82(ms)							
т		T pe	riod	=120(ms)>10	00(ms)					
les	st data:	Duty	/ cyc	le =26.82%	•					
		Duty	Duty cycle factor = 20log(Duty cycle) = -11.42							







Test Plots:



Tel: +86-755-23118282, Fax: +86-755-23116366



Product Name:	sma	art key				ı	Product	Model:	R	T-2CY3B	
Test By:	Carey			-	Test mode:			Tx mode			
Test Frequency:	ency: 433.9 MHz Polarization: Horizontal										
Test Voltage:	DC	3V				ı	Environr	nent:	Te	emp: 24℃	Huni: 57
70 700,000											
110 Level (dBuV/r	n)										
100						-					
80						1					
60							_				
							- 100 miles				
40										A/SS	
20											
20											
432.9					Frequen	icy (MHz)					434.9
						, , , ,					
1	Freq	ReadA Level	ntenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark	
		dBu₹	dB/m			<u>d</u> B	dBuV/m	$\overline{dBuV/m}$	dB		-
	MHz										
1 433.			19.17	1.03	0.00	0.00	71.99				
1 433.			19.17	1.03	0.00	0.00	71.99				





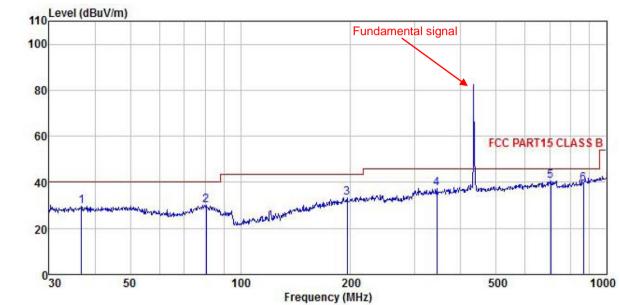
6.2.2 Spurious Emissions

	Below 1GHz (30MHz-1000MHz)							
				Peak value				
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
867.80	16.32	21.77	1.45	0.00	39.54	80.82	-41.28	Vertical
867.80	867.80 16.25 21.7		1.45	0.00	39.47	80.82	-41.35	Horizontal
				Average valu	е			
Frequency Level Duty cycle Average value Limit Line Over Limit (MHz) (dBuV/m) factor (dBuV/m) (dBuV/m) (dB)						Polarization		
867.80 39.54		54	-11.42	2	8.12	60.82	-32.70	Vertical
867.80 39.47 -11.42 28.05		8.05	60.82	-32.77	Horizontal			
Remark: Aver	rage value=Pe	ak value + L	Dutv Cvcle Fa	ctor.				



Test Plots:

Product Name:	smart key	Product Model:	RT-2CY3B
Test By:	Carey	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	DC 3V	Environment:	Temp: 24°C Huni: 57%
L. Jun Maria			



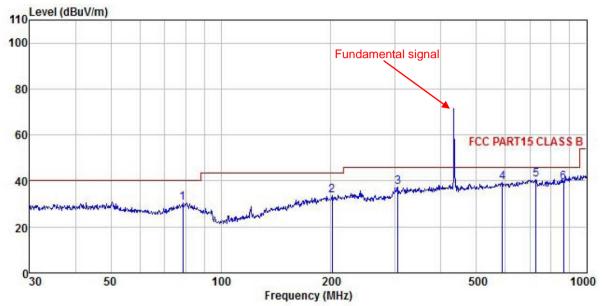
	Freq		ntenna Factor			Preamp Factor	Level	Limit Line	Over Limit	Remark
-	MHz	dBu₹			<u>ab</u>	<u>dB</u>	$\overline{dBuV/m}$	dBuV/m	<u>dB</u>	
1	36.766	16.49	12.67	0.34	0.00	0.00	29.50	40.00	-10.50	QP
2 3 4 5 6	80.644	16.86	12.66	0.47	0.00	0.00	29.99	40.00	-10.01	QP
3	195.822	14.87	17.87	0.71	0.00	0.00	33.45	43.50	-10.05	QP
4	344.386	17.59	18.79	0.92	0.00	0.00	37.30	46.00	-8.70	QP
5	704.226	18.92	20.51	1.33	0.00	0.00	40.76	46.00	-5.24	QP
6	866.088	16.32	21.77	1.45			39.54		-6.46	

Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3. The Aux Factor is a notch filter switch box loss, this item is not used.



Product Name:	smart key	Product Model:	RT-2CY3B
Test By:	Carey	Test mode:	Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	DC 3V	Environment:	Temp: 24℃ Huni: 57%
1 1 (4P-3/1-3			



		Read	Antenna	Cable	Aux	Preamp		Limit	Over	
	Freq	Level	Factor	Loss	Factor	Factor	Level	Line	Limit	Remark
2	MHz	dBu∜	dB/π	<u>ab</u>	<u>ab</u>	<u>ab</u>	$\overline{\mathtt{dBuV/m}}$	$\overline{dBuV/m}$	<u>dB</u>	
1	78.689	17.55	12.46	0.47	0.00	0.00	30.48	40.00	-9.52	QP
2	201.393	14.64	18.31	0.72	0.00	0.00	33.67	43.50	-9.83	QP
2	304.610	17.57	18.71	0.87	0.00	0.00	37.15	46.00	-8.85	QP
4	588.905	18.48	19.84	1.20	0.00	0.00	39.52	46.00	-6.48	QP
5	726.805	18.55	20.56	1.34	0.00	0.00	40.45	46.00	-5.55	QP
6	866.088	16.25	21.77	1.45	0.00	0.00	39.47	46.00	-6.53	Peak

Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3. The Aux Factor is a notch filter switch box loss, this item is not used.



Product Name:	: sm	art key				F	Product Model: RT-2CY3B Test mode: Tx mode				
Test By:	Ca	rey				Т			Tx	mode	
Test Frequency	y: 1 G	GHz ~ 5 GHz Polarization: Vertice			Polarization:		Vertical				
Test Voltage:	DC	3V				Е	Environment:		Те	mp: 24℃	Huni: 57
Level (dBu	11/m)										
80 Level (dbt	IV/III)									FCC PAR	T 15 (PK)
70											
60											
					-					FCC PAR	T 15 (AV)
50								5	6	7	Bakandadharana
40			2	and the second	3	h-present-pa	4 month	methodological and	undiplaced by	marapan	
30 marchan	mentanin	(Natal Alberta	Machinesta								
20											
10											
01000	1200	1500		20	000						5000
1000	.200	1000				cy (MHz)					-
	Freq		Antenna Factor			Preamp Factor	Level	Limit Line	Over Limit	Remark	
	MHz	dBu₹	<u>dB</u> /m	₫B	<u>dB</u>	dB	$\overline{dBuV/m}$	dBuV/m	dB		
1 2 3	1302.967 1734.454 2169.447	46.61 47.57 46.34		3.08 3.62 4.06	1.47 1.64	41.04 41.15 41.68		74.00 74.00	-39.25 -37.38 -37.17	Peak Peak	

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor.

27.56

28.42

28.69

29.19

29.86

47.44

49.15

47.93 47.38

47.54

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

4.50

4.92

5.28

5.68

6.02

1.92

2.18

2.31

41.87

41.49

41.43

41.80

41.92

39.38

42.92

42.65

42.65

43.81

74.00 -31.17 Peak 74.00 -34.62 Peak 74.00 -31.08 Peak 74.00 -31.35 Peak 74.00 -31.35 Peak 74.00 -30.19 Peak

2609.957

3037.743

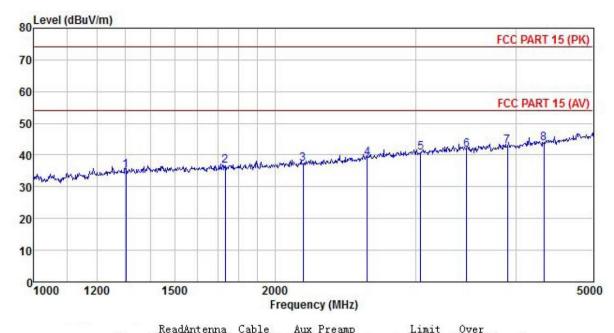
3474.263

3904.529

4337.145



Product Name:	smart key	Product Model:	RT-2CY3B
Test By:	Carey	Test mode:	Tx mode
Test Frequency:	1 GHz ~ 5 GHz	Polarization:	Horizontal
Test Voltage:	DC 3V	Environment:	Temp: 24℃ Huni: 57%



	Freq		Antenna Factor			Preamp Factor		Limit Line	Over Limit	Remark
	MHz	dBu√				<u>dB</u>	$\overline{dBuV/m}$	dBu√/m	<u>d</u> B	
1	1302.967	46.99	24.85	3.08	1.25	41.04	35.13	74.00	-38.87	Peak
2	1734.454	47.42	25.11	3.62	1.47	41.15	36.47	74.00	-37.53	Peak
3	2169.447	46.67	26.47	4.06	1.64	41.68	37.16	74.00	-36.84	Peak
4	2609.957	46.97	27.56	4.50	1.75	41.87	38.91	74.00	-35.09	Peak
5	3043.660	47.09	28.43	4.93	1.92	41.49	40.88	74.00	-33.12	Peak
6	3474.263	46.77	28.69	5.28	2.18	41.43	41.49	74.00	-32.51	Peak
7	3904.529	47.42	29.19	5.68	2.20	41.80	42.69	74.00	-31.31	Peak
8	4337.145	47.50	29.86	6.02	2.31	41.92	43.77	74.00	-30.23	Peak

Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor.
- 2. The emission levels of other frequencies are very lower than the limit and not show in test report.



6.3 Bandwidth

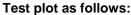
Test Requirement:	FCC Part15 C Section 15.231 (c)				
Receiver setup:	RBW=1kHz, VBW=3kHz, detector: Peak				
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center 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 the EUT to proper test channel. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. Read 20dB bandwidth. 				
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane				
Test Instruments:	Refer to section 5.9 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Passed				

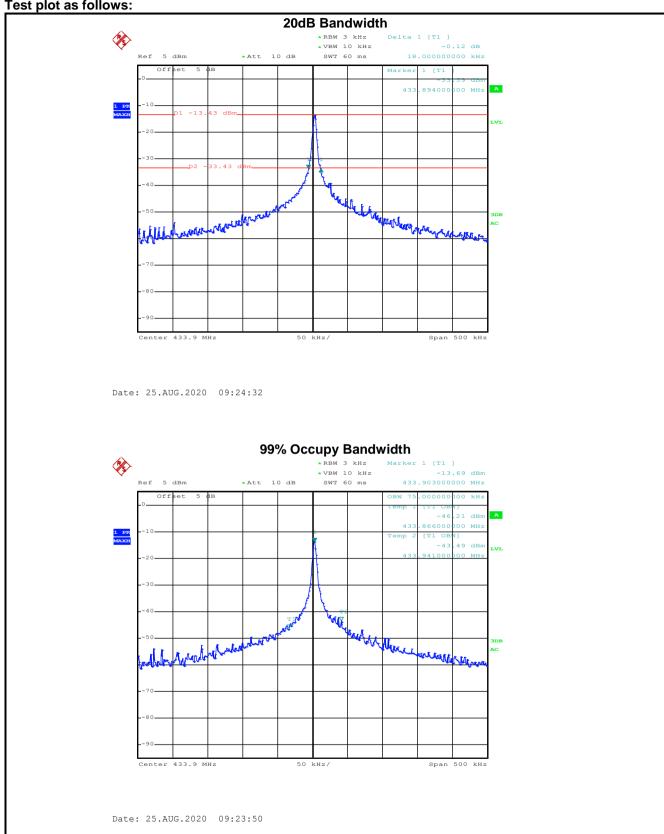
Measurement Data

20dB bandwidth (MHz)	99% Occupy Bandwidth (MHz)	Limit (MHz)	Results
0.018	0.075	0.7805	Passed

Note: Limit= Fundamental frequencyx0.25%=433.9x0.25%=1.08475MHz









6.4 Duration Time

Test Requirement:	FCC Part15 C Section 15.231 (a)			
Receiver setup:	RBW=100kHz, VBW=300kHz, span=0Hz, detector: Peak			
Limit:	Not more than 5 seconds			
Test mode:	Transmitting mode			
Test Procedure:	 According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set the EUT to proper test channel. Single scan the transmission, and read the transmission time. 			
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane			
Test Instruments:	Refer to section 5.9 for details			
Test mode:	Refer to section 5.3 for details			
Test results:	Passed			

Measurement Data

Duration time (second)	Limit (second)	Result
1.30	<5.0	Pass



