



TEST REPORT

IC: 21262-CDJP4A

On Behalf of

Kaba Ilco Corp

Remote Key

**Model No.: PRX-JEEP-3B1, CY24P21, PRX-JEEP-4B1,
CY24P23, PRX-JEEP-5B1, CY24P24, PRX-JEEP-4B2,
CY24P22**

Prepared for : Kaba Ilco Corp
Address : 400 Jeffreys Road Rocky Mount, NC 27804 United States

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.
Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,
Shenzhen, Guangdong, China

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TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION -----	5
1.1 Description of Device (EUT)-----	5
1.2 Description of Test Facility -----	6
2. EQUIPMENT LIST-----	7
3. SUMMARY OF MEASUREMENT -----	8
3.1 Summary of test result-----	8
3.2 Test connection -----	8
3.3 Assistant equipment used for test -----	8
3.4 Test mode-----	8
3.5 Test Conditions -----	9
3.6 Measurement Uncertainty (95% confidence levels, k=2) -----	9
4. RADIATED EMISSION MEASUREMENT -----	10
4.1 Radiated Emission Limits-----	10
4.2 Test Procedure -----	11
4.3 Deviation From Test Standard-----	12
4.4 Test Setup -----	12
4.5 Eut Operating Conditions -----	13
4.6 Test Results -----	14
5. FREQUENCY STABILITY -----	18
5.1. Test limit-----	18
5.2. Test Procedure -----	18
5.3. Test Setup -----	18
5.4. Test Results -----	18
6. BANDWIDTH TEST -----	20
6.1. Applied procedures / limit -----	20
6.2. Test Requirements-----	20
6.3. Test Procedure -----	20
6.4. Test Setup -----	21
6.5. EUT Operation Conditions -----	21
6.6. Test Results -----	21
7. MANUALLY ACTIVATED TRANSMITTER -----	22
7.1. Limit -----	22
7.2. Test Procedure -----	22
7.3. Test Setup -----	22
7.4. Test Results -----	22
8. ANTENNA REQUIREMENT -----	23
8.1. Standard Requirement -----	23
8.2. EUT Antenna -----	23
9. TEST SETUP PHOTO -----	24
10. PHOTOS OF EUT -----	25

TEST REPORT DECLARATION

Applicant : Kaba Ilco Corp
 Address : 400 Jeffreys Road Rocky Mount, NC 27804 United States
 Manufacturer : Qinuo Electronics Co., Ltd
 Address : 3/F, Bldg.A, Yucheng Base, Keji Rd., High-tech Industrial Park, Fengze, Quanzhou, Fujian 362000, P.R. China
 EUT Description : Remote Key
 (A) Model No. : PRX-JEEP-3B1, CY24P21, PRX-JEEP-4B1, CY24P23, PRX-JEEP-5B1, CY24P24, PRX-JEEP-4B2, CY24P22
 (B) Trademark : N/A


Measurement Standard Used:


FCC Rules and Regulations Part 15 Subpart C Section 15.231, ANSI C63.10:2013, RSS-210 Issue 9, RSS-GEN Issue 5

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Ella Liang
 Project Engineer 

Approved by (name + signature).....: Simple Guan
 Project Manager 

Date of issue.....: July 16, 2019

Revision History

Revision	Issue Date	Revisions	Revised By
V0	July 16, 2019	Initial released Issue	Simple Guan

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	: Remote Key
Model No.	PRX-JEEP-3B1, CY24P21, PRX-JEEP-4B1, CY24P23, PRX-JEEP-5B1, CY24P24, PRX-JEEP-4B2, CY24P22 There is no difference between all the models, except the appearance of
DIFF.	: the button and model numbers, this report performs the model PRX-JEEP-5B1.
Trade Name	: N/A
Antenna Type	: Internal Antenna, Maximum Gain is 0dBi
Operation Frequency	: 433.92MHz
Modulation type	: ASK
Power Supply	: DC 3V by button cell

1.2 Description of Test Facility

Shenzhen Alpha Product Testing Co., Ltd

Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road,
Bao'an, Shenzhen, China

July 15, 2019 Certificated by IC

Registration Number: CN0085

2. EQUIPMENT LIST

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	N/A	2018.09.21	1 Year
Spectrum analyzer	ROHDE&SCHWARZ	FSU	1166.1660.26	2018.09.21	1 Year
Spectrum analyzer	Agilent	N9020A	MY499100060	2018.09.11	1 Year
Receiver	ROHDE&SCHWARZ	ESR	1316.3003K03-10208 2-Wa	2018.09.21	1 Year
Receiver	R&S	ESCI	101165	2018.09.21	1 Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2018.04.13	2 Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2018.04.13	2 Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00059	2018.09.26	2 Year
Cable	Resenberger	N/A	No.1	2018.09.21	1 Year
Cable	Resenberger	N/A	No.2	2018.09.21	1 Year
Cable	Resenberger	N/A	No.3	2018.09.21	1 Year
Pre-amplifier	HP	HP8347A	2834A00455	2018.09.21	1 Year
Pre-amplifier	Agilent	8449B	3008A02664	2018.09.21	1 Year
20db Attenuator	ICPROBING	IATS1	82347	2018.09.21	1 Year
Horn Antenna	A-INFOMW	LB-180100-KF	J211020657	2018.09.21	2 Year
Preamplifier	SKET	LNPA_1840-50	SK2018101801	2018.09.21	1 Year
Power Meter	Agilent	E9300A	MY41496625	2018.09.21	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-1000-40-8 80	100631	2018.9.11	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	20140927-6	2018.09.11	1 Year

3. SUMMARY OF MEASUREMENT

3.1 Summary of test result

Test Item	Test Requirement	Standards Paragraph	Result
Spurious Emission	FCC Part 15:2016 & IC RSS Gen	Section 15.205(a)/15.209/ 15.231 &RSS-210 Annex A	Compliance
Conduction Emission	FCC Part 15:2016 & IC RSS Gen	Section 15.207 &RSS-210 Annex A	Compliance
99%dB Bandwidth	FCC Part 15:2016 & IC RSS Gen	Section 15.231(C) &RSS-210 Annex A	Compliance
Transmission requirement	FCC Part 15:2016 & IC RSS Gen	Section 15.231 &RSS-210 Annex A	Compliance
Antenna Requirement	FCC Part 15:2016 & IC RSS Gen	Section 15.203 &RSS-210 Annex A	Compliance

Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power (The adapter be used during Test)

3.2 Test connection

EUT

3.3 Assistant equipment used for test

Description	:	N/A
Manufacturer	:	N/A
Model No.	:	N/A

3.4 Test mode

Mode	Channel	Frequency (MHz)
TX	1	433.92

Note: According exploratory test, EUT will have maximum output power in those data rate. so those data rate were used for all test.

3.5 Test Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa

3.6 Measurement Uncertainty (95% confidence levels, k=2)

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	2.74dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB(Polarize: V)
	2.57dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.16dB(Polarize: H)
	4.13dB(Polarize: V)
Uncertainty for radio frequency	5.4×10^{-8}
Uncertainty for conducted RF Power	0.37dB
Uncertainty for temperature	0.2°C
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

4. RADIATED EMISSION MEASUREMENT

4.1 Radiated Emission Limits

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15.205(a), then the Part 15.209(a) and Part 15.231(e) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

Frequencies (MHz)	Field Strength (micovolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~40.66	100	3

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.231)

Fundamental Frequency (MHz)	Field Strength of fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

NOTE:** 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, $\mu\text{V/m}$ at 3 meters = $56.81818(F) - 6136.3636$;

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

So for fundamental frequency the Avg Power limit is 80.83dBuV/m, Peak Power limit is 100.83dBuV/m, for spurious emissions frequencies, the Avg Power limit is 60.83dBuV/m, Peak Power limit is 80.83dBuV/m.

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 3 MHz

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2 Test Procedure

- a. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Below 1GHz)
- b. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation (Above 1GHz)
- c. The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarization of the antenna are set to make the measurement.
- d. The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform (Below 1GHz)
- f. All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak & AVG limits and then only Peak mode was measured, but AVG mode didn't perform. (Above 1GHz)
- g. For the actual test configuration, please refer to the related Item –EUT Test Photos.

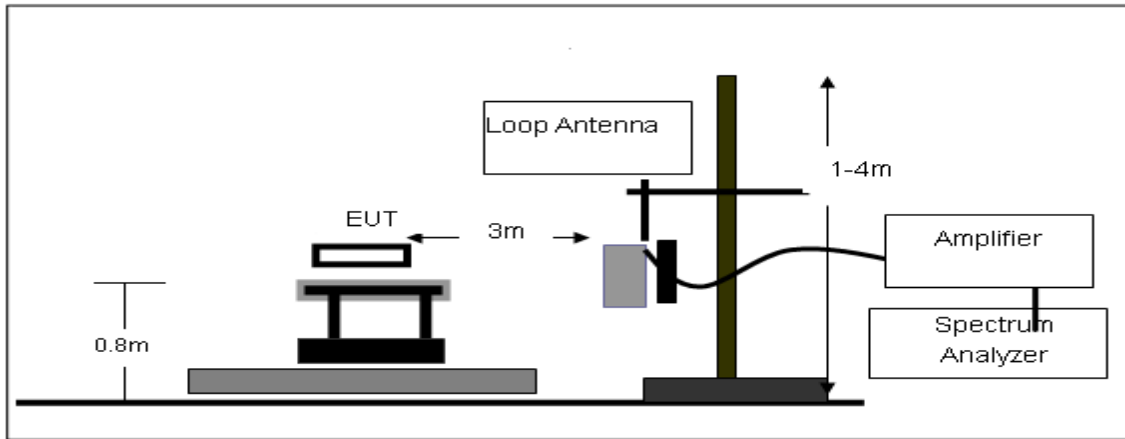
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

4.3 Deviation From Test Standard

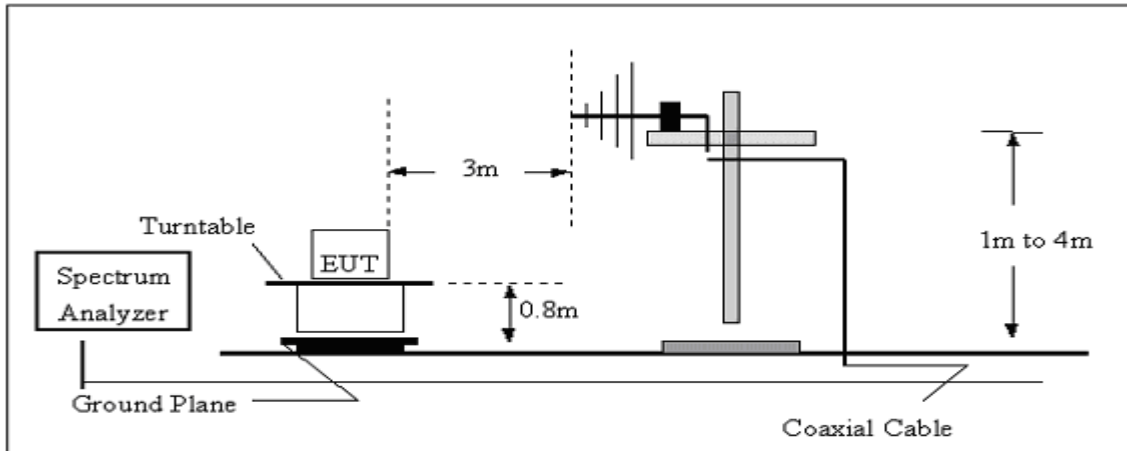
No deviation

4.4 Test Setup

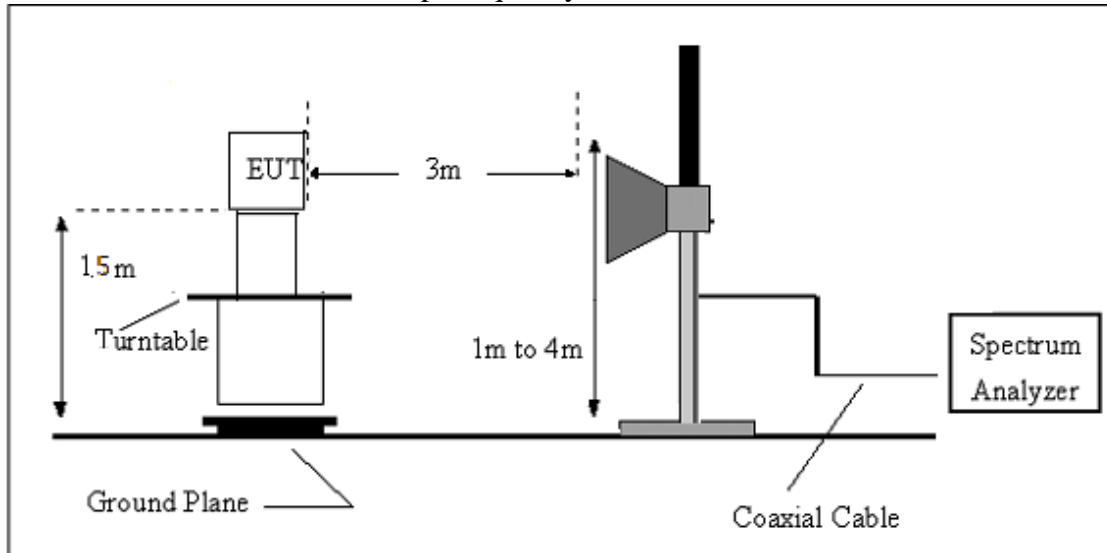
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



4.5 Eut Operating Conditions

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

For the actual test, please refer to the ANSI C63.10, refer to section 7 for more detail

4.6 Test Results

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

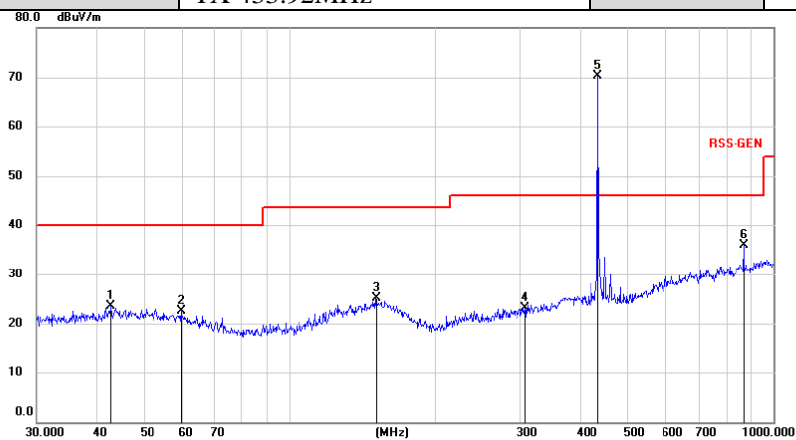
Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

Below 1GHz

EUT Description	Remote Key	Model No.	PRX-JEEP-5B1
Temperature	24°C	Humidity	56%
Pol	Vertical	Distance	3M
Test Voltage	DC 3V by button cell	Test date	March 13, 2019
Test mode	TX 433.92MHz		



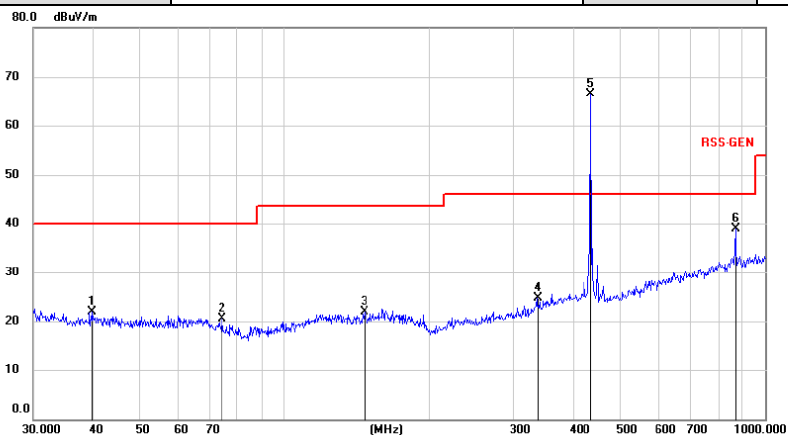
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		42.8997	9.65	13.95	23.60	40.00	-16.40	peak			
2		59.6493	9.57	13.02	22.59	40.00	-17.41	peak			
3		151.0665	10.63	14.56	25.19	43.50	-18.31	peak			
4		306.7537	9.60	13.59	23.19	46.00	-22.81	peak			
5	*	434.0650	53.87	16.37	70.24	46.00	24.24	peak			
6		869.1302	13.20	22.69	35.89	46.00	-10.11	peak			

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	434.0650	53.87	16.37	70.24	100.83	-30.59	PK
2	434.0650	/	/	/	80.83	/	AV

Note:

- When the PK measure result value is less than the AVG limit value, the AV measure result values test not applicable.
- Margin = Result (Result = Reading + Factor) - Limit

Pol	Horizontal	Test date	March 13, 2019
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No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table
		MHz	Level	Factor	ment	dBuV/m	dB	Height	Degree
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		39.8542	7.59	14.23	21.82	40.00	-18.18	peak	
2		74.1351	10.02	10.41	20.43	40.00	-19.57	peak	
3		146.8876	7.51	14.33	21.84	43.50	-21.66	peak	
4		336.0351	10.28	14.37	24.65	46.00	-21.35	peak	
5	*	434.0650	50.16	16.37	66.53	46.00	20.53	peak	
6		869.1302	16.28	22.69	38.97	46.00	-7.03	peak	

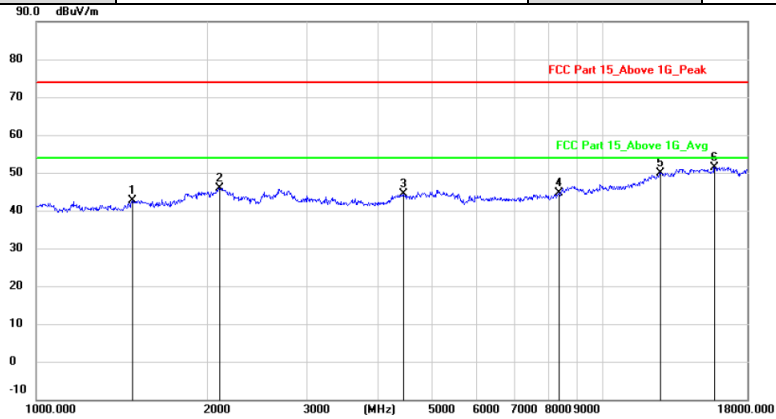
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	434.0650	50.16	16.37	66.53	100.83	-34.30	PK
2	434.0650	/	/	/	80.83	/	AV

Note:

1. When the PK measure result value is less than the AVG limit value, the AV measure result values test not applicable.
2. Margin = Result (Result =Reading + Factor)-Limit

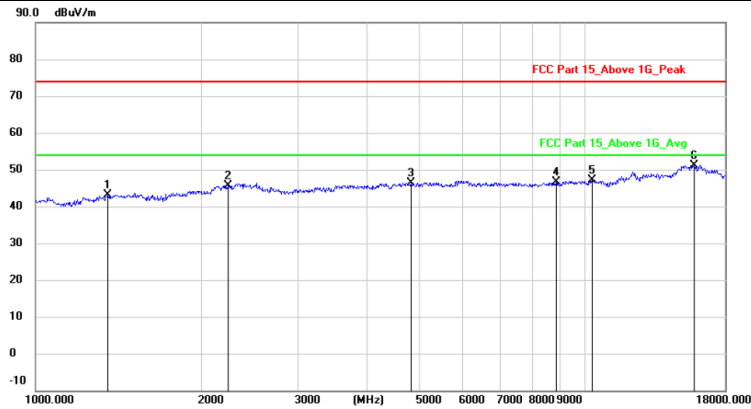
Above 1GHz

EUT Description	Remote Key	Model No.	PRX-JEEP-5B1
Temperature	24°C	Humidity	56%
Pol	Vertical	Distance	3M
Test Voltage	DC 3V by button cell	Test date	March 13, 2019
Test mode	TX 433.92MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1477.276	49.69	-7.01	42.68	74.00	-31.32	peak		
2		2107.950	50.01	-4.06	45.95	74.00	-28.05	peak		
3		4443.453	48.46	-3.99	44.47	74.00	-29.53	peak		
4		8368.070	41.30	3.37	44.67	74.00	-29.33	peak		
5		12651.12	44.59	5.35	49.94	74.00	-24.06	peak		
6	*	15759.04	47.44	4.04	51.48	74.00	-22.52	peak		

Pol	Horizontal	Test date	March 13, 2019
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No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		1354.577	50.25	-7.15	43.10	74.00	-30.90	peak		
2		2239.861	49.02	-3.32	45.70	74.00	-28.30	peak		
3		4831.962	49.34	-2.86	46.48	74.00	-27.52	peak		
4		8866.061	42.95	3.71	46.66	74.00	-27.34	peak		
5		10303.97	42.17	4.94	47.11	74.00	-26.89	peak		
6	*	15804.66	47.44	3.80	51.24	74.00	-22.76	peak		

5. FREQUENCY STABILITY

5.1. Test limit

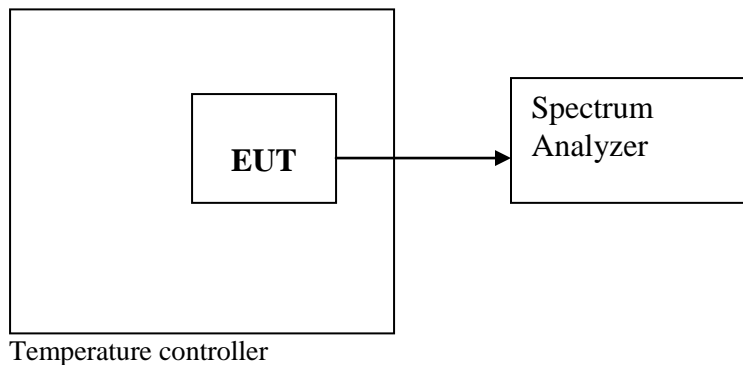
Please refer section RSS-Gen.

Regulation RSS-Gen If the frequency stability of the licence-exempt radio apparatus is not specified in the applicable RSS, the fundamental emissions of the radio apparatus should be kept within at least the central 80% of its permitted operating frequency band in order to minimize the possibility of out-of-band operation. In addition, its occupied bandwidth shall be entirely outside the restricted bands and the prohibited TV bands of 54- 72 MHz, 76-88 MHz, 174-216 MHz, and 470-602 MHz, unless otherwise indicated.

5.2. Test Procedure

The following equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3. Test Setup



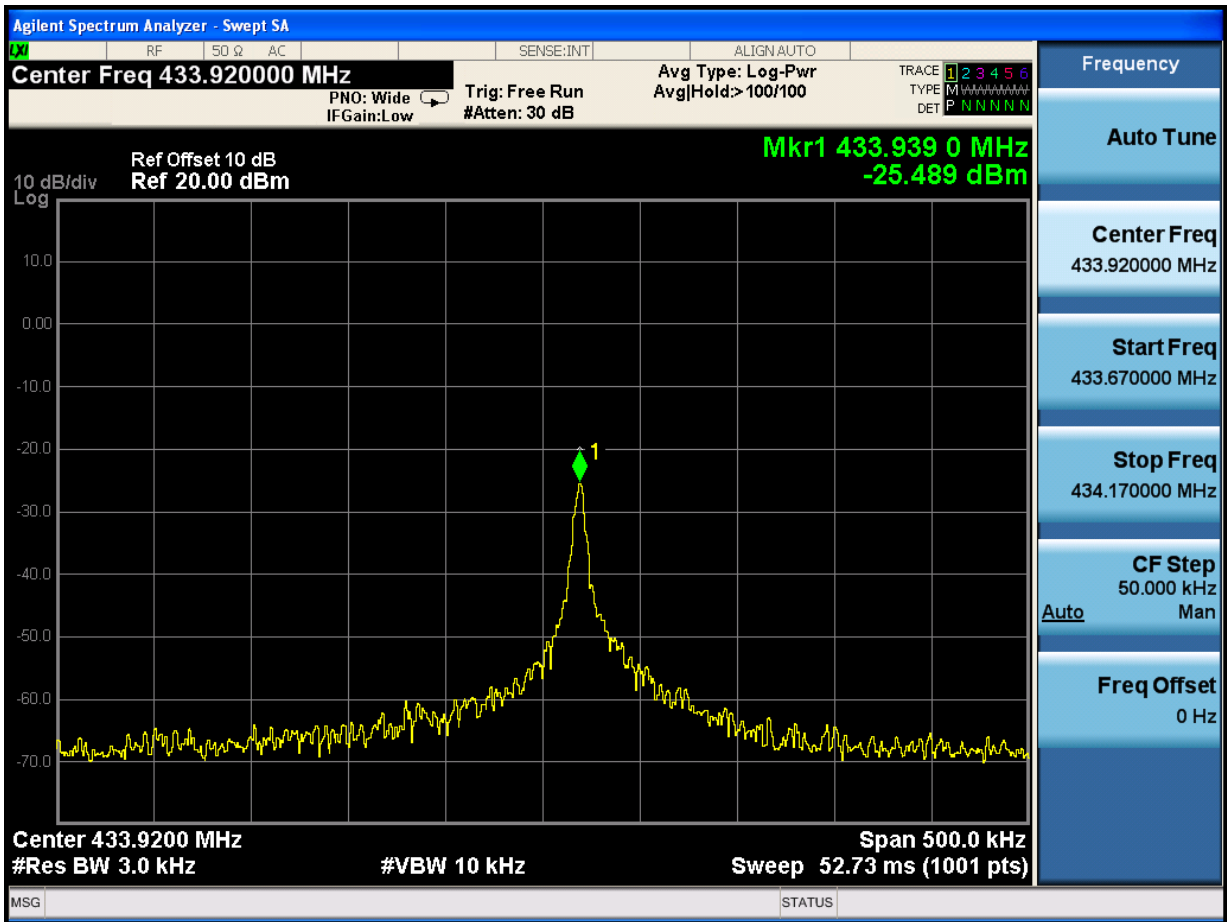
5.4. Test Results

PASS.

Detailed information please see the following page.

Assigned Frequency(MHz): 433.92MHz				
Voltage	Temperature	Measured Frequency (MHz)	Frequency stability(MHz)	Limit(MHz)
Low DC 1.8V	+20°C	433.9388	0.0188	±0.07500
Normal DC 3V	-20°C	433.9389	0.0189	±0.07500
	+20°C	433.9390	0.0190	±0.07500
	+50°C	433.9387	0.0187	±0.07500

Note: The frequency range of the EUT transmission is 433.92MHz ±75KHz.



6. BANDWIDTH TEST

6.1. Applied procedures / limit

RSS 210 I9 A1				
Section	Test Item	Limit	Frequency Range	Result
A.1.3	99% Bandwidth	The 99% bandwidth of the emissions shall not exceed 0.25% of the center frequency	433.92(MHz)	PASS

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth
RB	10 kHz (20dB Bandwidth)
VB	30 kHz (20dB Bandwidth)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

6.2. Test Requirements

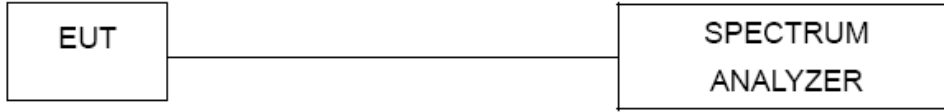
The 99% bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

6.3. Test Procedure

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.

Spectrum Setting : RBW= 10KHz, VBW=30KHz, Sweep time = Auto.

6.4. Test Setup

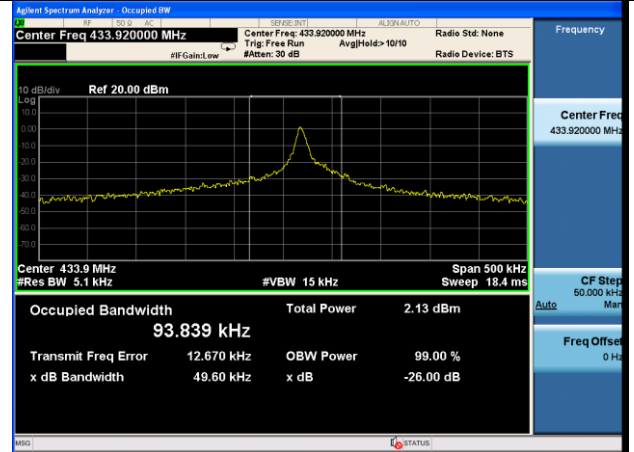
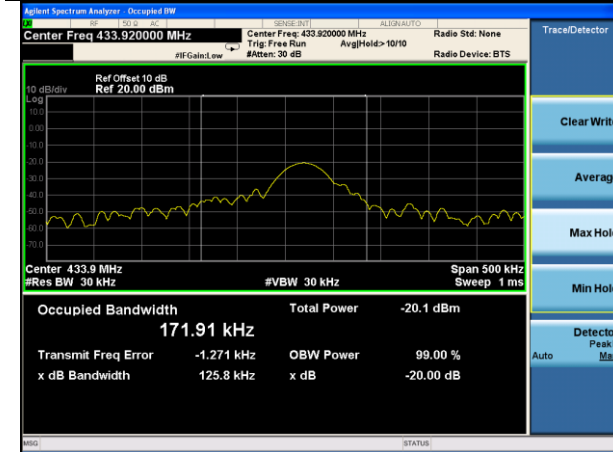


6.5. EUT Operation Conditions

TX mode.

6.6. Test Results

Centre Frequency	Measurement			
	20dB Bandwidth (kHz)	99% Bandwidth (kHz)	Limit (kHz)	Conclusion
433.92 MHz	125.8	93.839	1084.8	PASS



7. MANUALLY ACTIVATED TRANSMITTER

7.1. Limit

According to 15.231(a), A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

7.2. Test Procedure

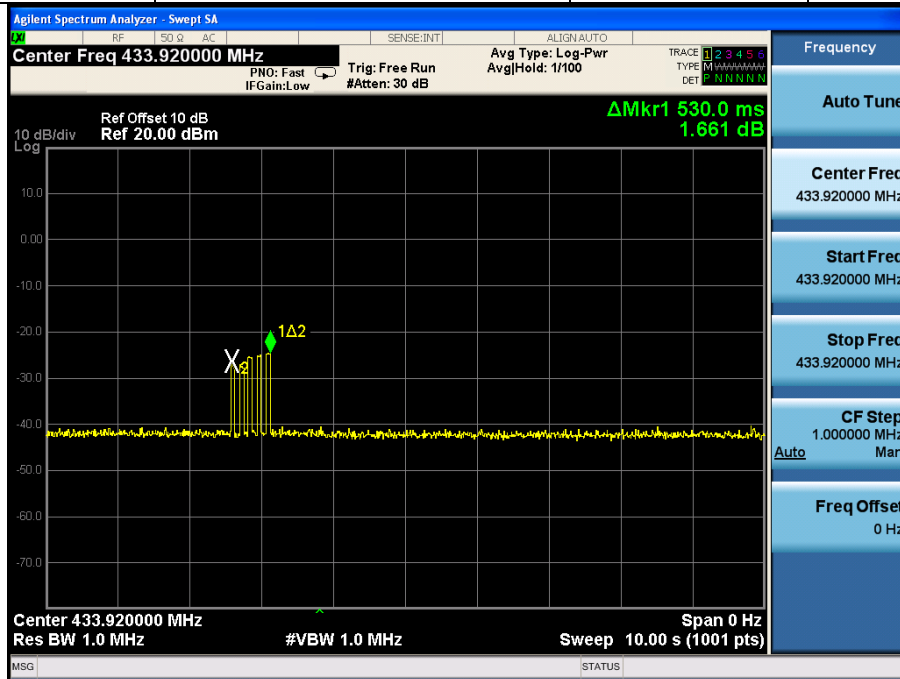
- (1) Put the EUT on the support in its standard position with associated equipment and switched on.
- (2) Set center frequency of spectrum analyzer = operating frequency.
- (3) Set the spectrum analyzer as RBW=100kHz, VBW=100kHz, Span=0Hz, Adjust Sweep=120s.
- (4) record the duration time

7.3. Test Setup



7.4. Test Results

Test Channel (MHz)	Manually Activated Transmitter (s)	Limit (s)	Conclusion
433.92	0.530	5S	PASS



8. ANTENNA REQUIREMENT

8.1. Standard Requirement

According to the FCC Part 15 Paragraph 15.203, 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 to the intentional radiator shall be considered sufficient to comply with the provisions of this section. This product use a permanent ceramic printed antenna, fulfill the requirement of this section

8.2. EUT Antenna

The EUT antenna is internal antenna. It conforms to the standard requirements.

9. TEST SETUP PHOTO

Photos of Radiated emission



10. PHOTOS OF EUT

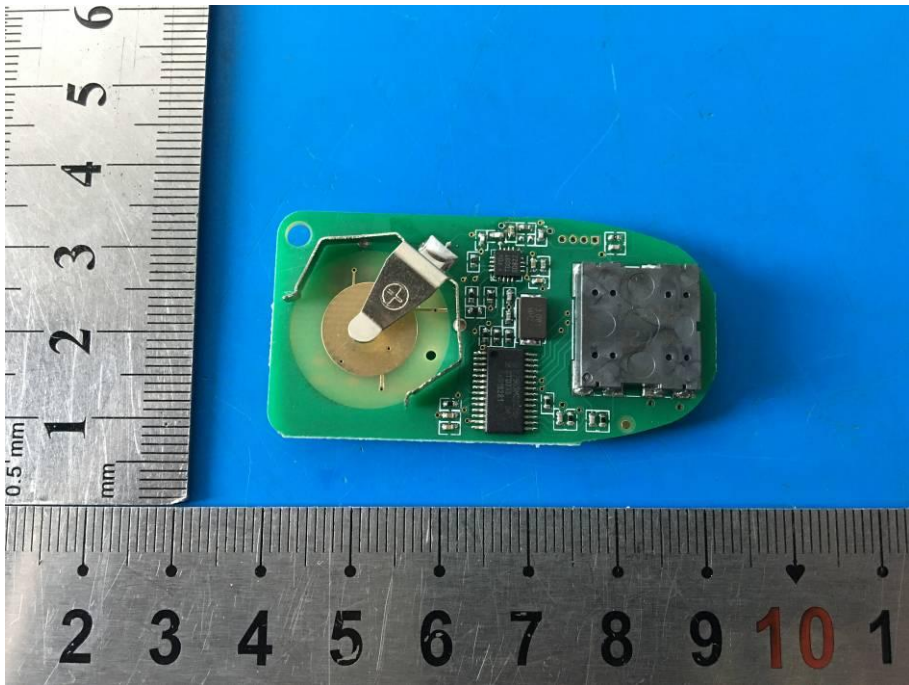
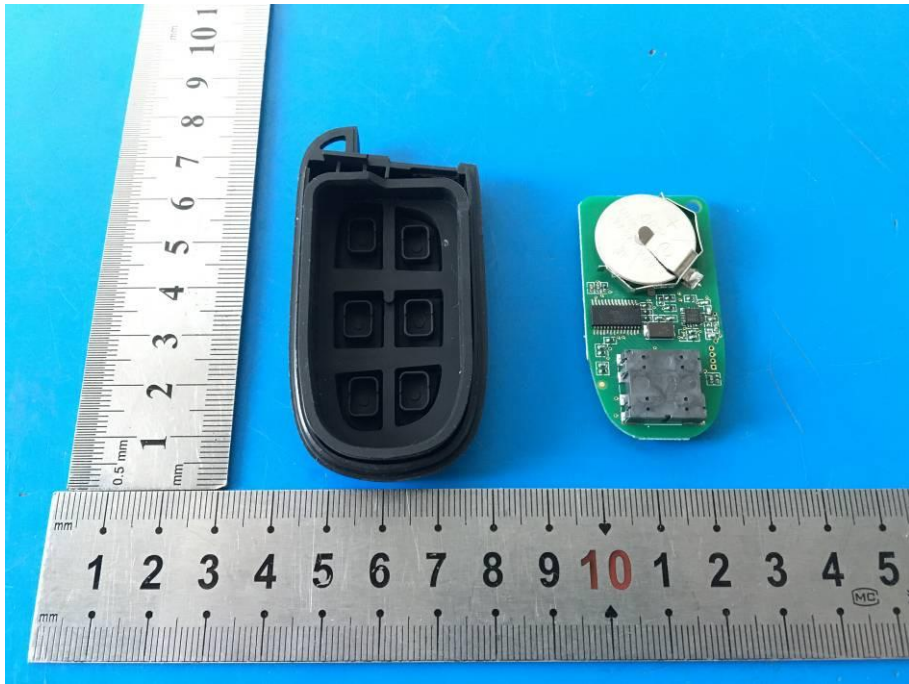


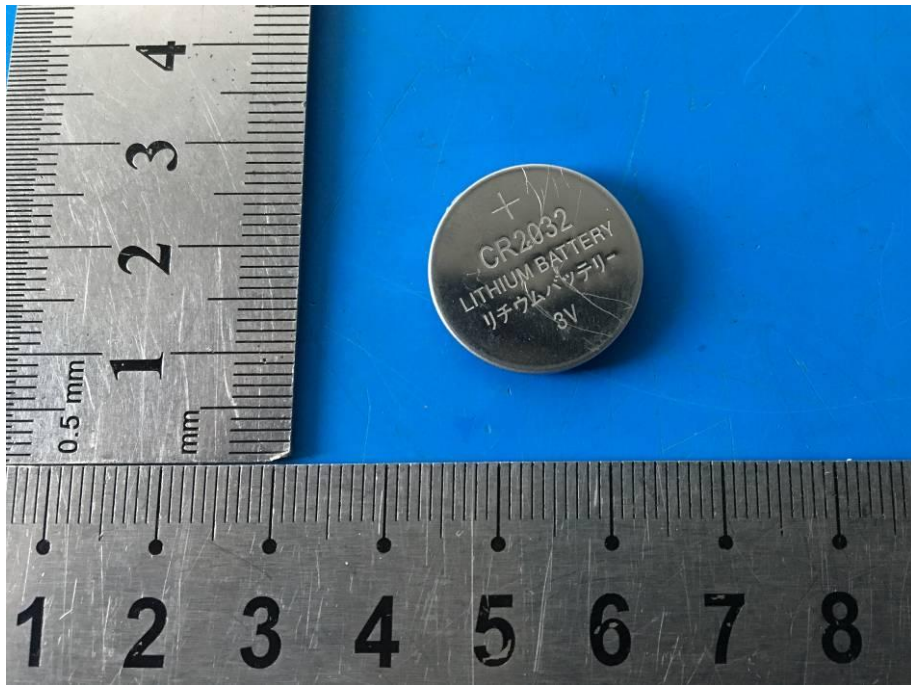
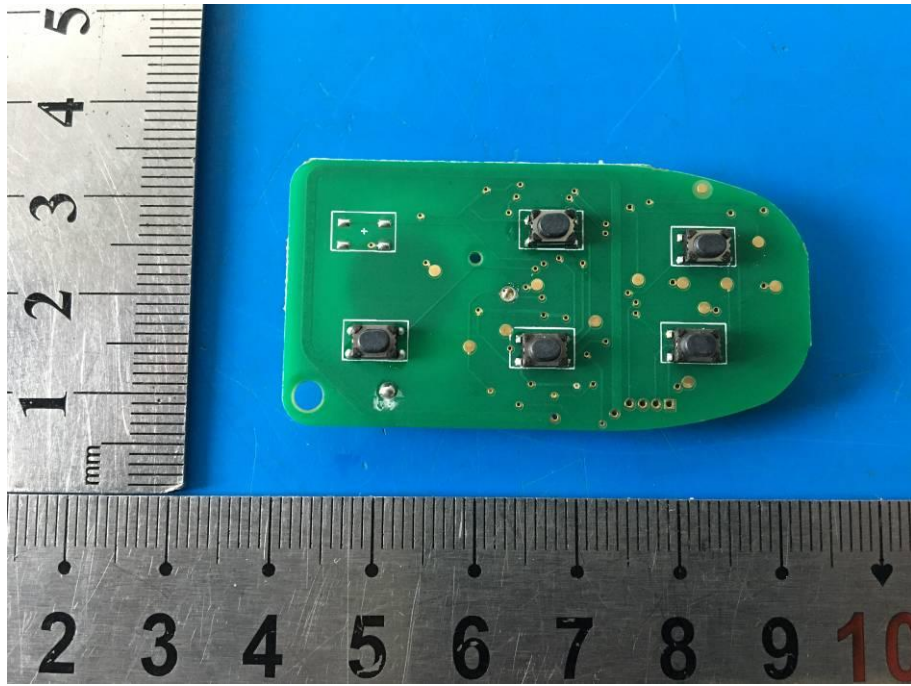












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