RADIO COMMUNICATIONS AND EMC TESTING

DONGGUAN CHI LOK BO TOYS COMPANY LIMITED

Model: 656AR

Mini Cabrio F57 Battery Operated Car

Test Report : SZHH01177508-001

Test Engineer :	Abel Zhou Senior Engineer	Sign On File
Report Approved By :	Jimmy Wen Assistant Supervisor	Digitally signed by jimmy.wen Location: Intertek Testing Services
Date :	20 September 2017	

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TRF No.: EN300440_2a

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RADIO PERFORMANCE MEASUREMENTS
RESULT SUMMARY

Requirements	ETSI EN 300 440		Compliance
	Technical requirements	Test Specification	
	Clause Number		
Equivalent Isotropically Radiated Power (EIRP)	4.2.2	4.2.2.3	Complied
Permitted Range of Operating Frequencies	4.2.3	4.2.3.3	Complied
Unwanted emissions in the spurious domain	4.2.4	4.2.4.3	Complied
Blocking or desensitization	4.3.4	4.3.4.3	Complied
Spurious radiation	4.3.5	4.3.5.3	Complied
When determining the test conclusion, the Measurement Uncertainty of test has been considered.			

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EMC COMPLIANCE MEASUREMENTS
RESULT SUMMARY

	ETSI EN 301 489-3	ETSI EN 301 489-1	Compliance
	Clause Number		
EMC Emission	7.2	8.2	Complied
Electrostatic Discharge	7.3	9.3	Complied
Radio Frequency Electromagnetic Field (80MHz-6GHz)	7.3	9.2	Complied
When determining the test conclusion, the Measurement Uncertainty of test has been considered.			

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EQUIPMENT UNDER TEST (EUT) INFORMATION

Applicant :	DONGGUAN CHI LOK BO TOYS COMPANY LIMITED DAJI INDUSTRIAL PARK SHIPAI TOWN DONGGUAN CITY GUANGDONG PROVINCE, CHINA
Description of EUT :	Mini Cabrio F57 Battery Operated Car
Brand Name(s)/ Type Number(s) :	N/A/ 656AR
Serial Number(s) :	Not Labelled
Equipment Received :	10 August 2017
Test Date(s) :	10 August 2017 to 20 September 2017
Categories of Receiver :	Category 2
Extreme Temp.:	-20°C to 55°C
Modulation Type:	GFSK
Test Specification(s) :	ETSI EN 300 440 V2.1.1 (2017-03)
	Draft ETSI EN 301 489-1 V2.2.0 (2017-03)
	Final Draft ETSI EN 301 489-3 V2.1.1 (2017-03)

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CONTENTS

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EXHIBIT 1

GENERAL DESCRIPTION

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1 INTRODUCTION

Intertek Testing Services Shenzhen Ltd. Longhua Branch (address: 1F/2F, Building B, QiaoAn Scientific Technology Park, ShangKeng Community, GuanHu Subdistrict, LongHua District, ShenZhen. P.R. China, 518110) has tested the DONGGUAN CHI LOK BO TOYS COMPANY LIMITED 656AR, Mini Cabrio F57 Battery Operated Car. The sample was tested to the relevant performance specification published by the European Telecommunications Standards Institute. This report contains the results of these tests and is submitted to DONGGUAN CHI LOK BO TOYS COMPANY LIMITED as the final test results.

The production units are required to conform to the initial sample as received when the units are placed on the market.

2 TEST SPECIFICATION

2.1 RELEVANT PERFORMANCE SPECIFICATION

The relevant performance specification for DONGGUAN CHI LOK BO TOYS COMPANY LIMITED 656AR, Mini Cabrio F57 Battery Operated Car and the technical standards are FINAL DRAFT ETSI EN301 489-3 V2.1.1 (2017-03) and DRAFT ETSI EN301 489-1 V2.2.0 (2017-03).

The tests performed are those required to demonstrate compliance with the essential requirements of Article 3.2 of the Radio Equipment Directive - RED for regulatory purposes.

2.2 TEST ENVIRONMENT

The tests were performed in the Radio communications Test Facility at **Error! Reference source not found.** (CNAS No.: L0327), the tests were performed in the Radio communications and Electromagnetic Compatibility Test Facility at **Error! Reference source not found.**. The sample was subjected to the ambient conditions in the laboratory and indoor test site except during tests at extremes of temperatures and the Radiated Emissions Tests. The temperature and relative humidity recorded during the period of each test are given in the results.

2.3 CONFIGURATION OF TEST SAMPLE

The test samples consisted of one transmitter (Control Unit) and one receiver (Car Unit).

2.4 TEST POWER SOURCES

The Control Unit is intended to operate from 4.5VDC (3 x 1.5V AA batteries). The Car Unit is powered by 6.0V DC (1 x 6.0V rechargeable battery). The test power source voltages declared by the manufacturer were:

Control Unit:

Nominal test voltage	4.5V DC
Lower extreme test voltage	3.825V DC
Upper extreme test voltage	4.5V DC

Car Unit:

Nominal test voltage	6.0V DC

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2.5 TEST FREQUENCIES

The sample supplied operated nominally at 2.416 - 2.480 GHz for transceiver. The tests were carried out on channel Low, Medium and High of the alignment range.

2.6 MEASUREMENT UNCERTAINTY

All measurement uncertainties stated in this report are estimated to a 95% confidence level.

2.7 SUPPORT EQUIPMENT - RADIO PERFORMANCE MEASUREMENTS

N/A

2.8 SUPPORT EQUIPMENT - EMC COMPLIANCE MEASUREMENTS

N/A

2.9 PERFORMANCE CRITERIA

2.9.1 PERFORMANCE CRITERIA FOR CONTINUOUS PHENOMENA (CT & CR)

During test, there may be loss of function but there should be no unintentional responses.

After test, EUT should operate as intended. Lost functions should be self-recoverable.

2.9.2 PERFORMANCE CRITERIA FOR TRANSIENT PHENOMENA (TT & TR)

At the conclusion of each exposure the EUT shall operated with no user noticeable loss of communication link.

Where the EUT is transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

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EXHIBIT 2

TEST RESULT
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3 EQUIVALENT ISOTROPICALLY RADIATED POWER (EIRP) AND SPURIOUS EMISSIONS

3.1 TEST METHOD AND SUMMARY

	Equivalent Isotropically Radiated Power (EIRP)	Spurious Emissions	Spurious Emissions
Basic Standard :	ETSI EN 300 440 V2.1.1 (2017-03)		
Clause :	4.2.2	4.2.4	4.3.5
Application :	Transmitter with an Integral or Dedicated Antenna	All Transmitters	All Receivers

3.2 EQUIPMENT LIST

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ061-12	BiConiLog Antenna	ETS	3142E	9-Nov-16	9-Nov-17
SZ016-02	Programmable Temperature & Humidity Chamber	DongZhiXun	WGD/SJ-415-A	27-Oct-16	27-Oct-17
SZ185-01	EMI Receiver	R&S	ESCI	20-Jan-17	20-Jan-18
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	15-Jan-17	15-Jan-19
SZ056-03	Spectrum Analyzer	R&S	FSP30	14-Jun-17	14-Jun-18
SZ006-11	DC Power Source	APC	AFC-11005GS	21-Mar-17	21-Nov-17
SZ062-04	RF Cable	RADIALL	RG 213U	26-Mar-17	26-Oct-17
SZ062-13	RF Cable	Habia	0.026-26.5GHz	26-Mar-17	26-Oct-17

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3.3 TEST RESULT - EQUIVALENT ISOTROPICALLY RADIATED POWER (EIRP)

Ambient Test Conditions: Temperature 25°C; Humidity 50%

(Control Unit)

Test Conditions			Power (dBm)	Limit (dBm)	Margin (dB)
Temperature(°C) Humidity(%)	Voltage	CH			
Ambient	❒ VDC nom 4.5VDC	L 2416MHz	-0.8	10.0	-10.8
Tmin -20 ℃ Hmin 0%	❒ VDC max 4.5VDC		-1.0	10.0	-11.0
	❒ VDC min 3.825VDC		-1.1	10.0	-11.1
Tmax 55℃ Hmax 50%	❒ VDC max 4.5VDC		-0.9	10.0	-10.9
	❒ VDC min 3.825VDC		-1.2	10.0	-11.2
Ambient	❒ VDC nom 4.5VDC	M 2442MHz	-0.7	10.0	-10.7
Tmin -20℃ Hmin 0%	❒ VDC max 4.5VDC		-0.9	10.0	-10.9
	❒ VDC min 3.825VDC		-1.0	10.0	-11.0
Tmax 55℃ Hmax 50%	❒ VDC max 4.5VDC		-0.8	10.0	-10.8
	❒ VDC min 3.825VDC		-1.0	10.0	-11.0
Ambient	❒ VDC nom 4.5VDC	H 2480MHz	-4.4	10.0	-14.4
Tmin-20℃ Hmin 0%	❒ VDC max 4.5VDC		-4.5	10.0	-14.5
	❒ VDC min 3.825VDC		-4.7	10.0	-14.7
Tmax 55℃ Hmax 50%	❒ VDC max 4.5VDC		-4.5	10.0	-14.5
	❒ VDC min 3.825VDC		-4.8	10.0	-14.8

Notes:

1. Negative sign (-) in the margin column signify levels below the limit.
2. 10 dBm corresponds to 10 mW.
3. Measurement Uncertainty: ±4.8dB.

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3.4 RESULTS OF TRANSMITTER TESTS - SPURIOUS EMISSIONS

3.4.1 CONDUCTED

Not applicable. Equipment has integral antenna.

3.4.2 RADIATED

3.4.2.1 SPURIOUS EMISSIONS - OPERATING

Test Conditions: Temperature 25°C; Humidity 50%

(Control Unit)

Channel: Low			
Frequency (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
4832.000	-32.9	-30.0	-2.9
7248.000	-35.1	-30.0	-5.1

Channel: Medium			
Frequency (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
4884.000	-34.2	-30.0	-4.2
7326.000	-33.4	-30.0	-3.4

Channel: High			
Frequency (MHz)	Measured Power (dBm)	Limit (dBm)	Margin (dB)
4960.000	-36.1	-30.0	-6.1
7440.000	-31.7	-30.0	-1.7

Notes:

1. Negative sign (-) in the margin column signify levels below the limit.
2. Other emissions found were at least 10 dB below the limit.
3. -30 dBm corresponds to 1 μW.
4. Measurement Uncertainty: ±4.8dB.

3.4.2.2 SPURIOUS EMISSIONS - STANDBY

There were no emissions found above system measuring level (at least 10 dB below the limit).

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3.5 RESULTS OF RECEIVER TESTS - SPURIOUS EMISSIONS

3.5.1 CONDUCTED

Not applicable. Equipment has integral antenna.

3.5.2 RADIATED

3.5.2.1 SPURIOUS EMISSIONS - OPERATING

There were no emissions found above system measuring level (at least 10 dB below the limit).

3.5.2.2 SPURIOUS EMISSIONS - STANDBY

There were no emissions found above system measuring level (at least 10 dB below the limit).

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4 PERMITTED RANGE OF OPERATING FREQUENCIES

4.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 440 V2.1.1 (2017-03)
Clause :	4.2.3
Application :	All Transmitters

4.2 EQUIPMENT LIST

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ056-03	Spectrum Analyzer	R&S	FSP30	14-Jun-17	14-Jun-18
SZ016-02	Temperature & Humidity Chamber	terchy	WGD/SJ-415-A	27-Oct-16	27-Oct-17
SZ006-11	DC Power Source	APC	AFC-11005GS	21-Mar-17	21-Nov-17
SZ062-14	RF cable	Tek	Torc080	16-Apr-17	16-Apr-18

4.3 TEST RESULT - DC TEST VOLTAGE

Control Unit

Test Conditions			Frequency Range (GHz)	
Temperature (°C) Humidity (%)	Voltage	CH	F_L	F_H
T_{nom} 25°C H_{nom} 50%	VDC $_{nom}$ 4.5VDC	Low, High	2.415960	2.480477
T_{min} -20°C H_{min} 0%	VDC $_{max}$ 4.5VDC		2.415975	2.480485
	VDC $_{min}$ 3.825VDC		2.415974	2.480485
T_{max} 55°C H_{max} 50%	VDC $_{max}$ 4.5VDC		2.415975	2.480484
	VDC $_{min}$ 3.825VDC		2.415973	2.480482
Measurement Uncertainty			± 240Hz	

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4.4 BAND EDGE WORSE RESULT

Control Unit

		Frequency (GHz)	Within Assigned Frequency Band
Lowest F_L	F_{LB}	2.415960	Complied
Highest F_H	F_{HB}	2.480485	Complied

where

F_{LB} Lowest frequency at appropriate spurious emission level
F_{HB} Highest frequency at appropriate spurious emission level

The permitted range of modulation bandwidth must be within the limits of the assigned frequency band 2.4-2.4835 GHz.

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5 BLOCING OR DESENSITIZATION

5.1 TEST METHOD AND SUMMARY

Basic Standard :	ETSI EN 300 440 V2.1.1 (2017-03)
Clause :	4.3.4
Test method	Conducted measurements

5.2 EQUIPMENT LIST

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ056-07	Signal Analyzer	R&S	FSV40	13-Nov-16	13-Nov-17
SZ180-13	MXG Vector Signal Generator	Keysight	N5182B	27-Oct-16	27-Oct-17
SZ180-15	Signal Generator	R&S	SMB100A	27-Oct-16	27-Oct-17
SZ070-21	Combiner	Mini-Circuits	ZN2PD-63-S+	13-Nov-16	13-Nov-17
SZ070-05	Directional Coupler	Agilent	87300C	09-Feb-17	09-Feb-18
SZ070-18	Attenuator	Agilent	8494B	09-Feb-17	09-Feb-18
SZ070-19	Attenuator	Agilent	8495B	09-Feb-17	09-Feb-18
SZ068-03	RF Shielding Cover	Changruixing	50×50×60cm	17-Mar-17	17-Oct-17

5.3 TEST RESULT - DC TEST VOLTAGE

The minimum level of Wanted signal from companion device (dBm) (P_{min}+3dB)	Blocking signal frequency (MHz)		Blocking signal power (dBm)	Limit (-45 dBm + k)	Result
-47+3	±10*BW	Lower: 2397.1	-34.4	-52.2	Pass
-47+3		Upper: 2434.9	-34.2	-52.2	Pass
-47+3	±20*BW	Lower: 2379.1	-28.7	-52.2	Pass
-47+3		Upper: 2452.9	-28.4	-52.2	Pass
-47+3	±50*BW	Lower: 2325.1	-22.8	-52.2	Pass
-47+3		Upper: 2506.9	-21.7	-52.2	Pass

Notes:
1. When adjusts the level for the wanted signal at the input of the UUT to -47.0dBm, the UUT still gives sufficient response. And when below the level -47.0dBm, the UUT couldn't give sufficient response.
2. The receive channel bandwidth (BW) is 1.8 MHz, which is declared by manufacturer.
3. The nominal frequency of the receiver f during test is 2416MHz.
4. The correction factor k = −20log f −10log BW. Where f is the frequency in GHz and BW is the channel bandwidth in MHz. As the f is 2416MHz and BW is 1.8MHz, the correction factor k is -7.2dB.

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EXHIBIT 3

TEST RESULT
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EMC COMPLIANCE MEASUREMENTS

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6 EMC EMISSION TEST

6.1 TEST METHOD AND SUMMARY

Basic Standard :	EN55032: 2015	
Test :	Radiated Emission	
Classification :	Class B	
Port :	Enclosure Port of Ancillary Equipment	AC Mains Power Port

6.2 RADIATED EMISSION TEST

6.2.1 TEST EQUIPMENT

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ185-01	EMI Receiver	R & S	ESCI	20-Jan-17	20-Jan-18
SZ061-12	Biconilog Antenna	ETS	3142E	9-Nov-16	9-Nov-17
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	15-Jan-17	15-Jan-19
SZ062-04	RF Cable	RADIALL	RG 213U	26-Mar-17	26-Oct-17
SZ062-13	RF Cable	Habia	0.026-26.5GHz	26-Mar-17	26-Oct-17

6.2.2 TEST RESULT

Forward running (Motor)

Polarization	Frequency (MHz)	Net at 3m (dBμV/m)	Calculated Net at 10m (dBμV/m)	Limit at 10m (dBμV/m)	Margin (dB)
H	127.485	30.2	20.2	30.0	-9.8
H	168.225	26.1	16.1	30.0	-13.9
H	462.135	34.6	24.6	37.0	-12.4
V	123.120	37.6	27.6	30.0	-2.4
V	143.005	34.3	24.3	30.0	-5.7
V	353.980	36.0	26.0	37.0	-11.0

Notes: 1. Quasi-Peak Detector Data
2. Negative sign (-) in the margin column signify levels below the limit
3. Frequency range scanned: 30 MHz to 1000 MHz
4. Only emissions significantly above equipment noise floor are reported
5. Measurement Uncertainty: ±4.8dB.

6.2.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainties: ± 4.8dB. The measured result is above the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance is more probable than non-compliance with the specification limit.

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7 ELECTROSTATIC DISCHARGE

7.1 TEST METHOD AND SUMMARY

Basic Standard :		EN 61000-4-2: 2009
Port :		Enclosure
Required Performance Criterion :		TT & TR
Level :		± 2.0, ± 4.0, ±8.0 kV (Air Discharge) ± 2.0, ±4.0 kV (Contact Discharge) ± 2.0, ±4.0 kV (Indirect Contact Discharge)
No. of Discharge(s) :		Minimum of 10 Discharges per Each Polarity
Time Between Each Discharge :		1 second
Test Mode :		TX : Stand-by and Transmission, Power off RX : Stand-by and Operating (Motor), Power off
Test Setup :		Floor stand
Temperature :		25.1^{0}C
Relative Humidity :		48.6%
Test of Post-installation :		N/A
Test Point	Air Discharge:	All insulated enclosure and seams
		All the points where contact discharge cannot be applied
	Contact:	All conductive surfaces of the EUT
	HCP:	All sides of the EUT
	VCP:	Four faces of the EUT

7.2 TEST EQUIPMENT

Equip No.	Description	Manufacturer	Model No.	Cal. Date	Due Date
SZ189-03	ESD Simulator	TESEQ	NSG 435	17-Nov-2016	17-Nov-2017

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7.3 TEST RESULT

7.3.1 TEST RESULT

Discharge Type	Applied Voltage	Result (Pursuant to ETSI EN 301 489-3 Criterion TT & TR)
Contact Discharge	± 2.0, ± 4kV	Complied
Air Discharge	± 2, ± 4, ± 8kV	Complied
Indirect HCP Discharge	± 2.0, ± 4kV	Complied
Indirect VCP Discharge	± 2.0, ± 4kV	Complied

7.3.2 ADDITIONAL RESULT INFORMATION

The EUT worked normally as intended during and after the test. No any observable change occurred.

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8 RADIO FREQUENCY ELECTROMAGNETIC FIELD

8.1 TEST METHOD AND SUMMARY

Basic Standard :	EN 61000-4-3: 2006 + A1: 2008 + A2: 2010
Port :	Enclosure
Required Performance Criterion :	CT & CR
Level :	3.0 V/m (rms)
Test Modulation :	1kHz, 80% AM
Frequency :	80 MHz to 6000 MHz
Dwell Time :	1s
Frequency Step :	10%
Temperature :	26.3^0C
Relative Humidity :	52.7%
Test Facility :	Full Anechoic Chamber
Antenna Polarization :	Horizontal and Vertical
Type of Antenna :	Broadband Antenna
Test Distance :	3m
Test Mode :	TX : Stand-by and Transmission, Power off RX : Stand-by and Operating (Motor), Power off
Test Setup :	Floor stand

8.2 TEST EQUIPMENT

Equipment No.	Equipment	Manufacturer	Model No.	Cal. Date	Due Date
SZ061-04	BiConiLog Antenna	ETS	3142C	27-Jun-16	27-Dec-17
EM061-06	Stacked double log-Per. Antenna	SCHWARZBECK	STLP 9149	16-Oct-15	16-Oct-17
SZ180-01	Signal Generator	R&S	SML03	23-May-17	23-May-18
SZ180-15	Signal Generator	R&S	SMB 100A	27-Oct-16	27-Oct-17
SZ181-01	Amplifier	PRANA	AP32 MT215	9-Feb-17	9-Feb-18
SZ181-02	Power Amplifier	MILMEGA	AS0825-35	23-May-17	23-May-18
SZ190-07	RF Amplifier	AMETEK	AS0860-75/45	24-Mar-17	24-Mar-18
SZ182-01	RF Power Meter	BOONTON	4232A	9-Feb-17	9-Feb-18
SZ188-02	Anechoic Chamber	ETS	RFD-F/A-100	8-Nov-16	8-Nov-17
SZ062-02	RF Cable	RADIALL	RG 213U(6M)	8-Jan-17	8-Jan-18
SZ186-01	Field Probe	ETS	HI-6105	31-Mar-17	31-Mar-18
SZ070-05	Directional Coupler	Agilent	87300C	9-Feb-17	9-Feb-18

* The Equipment would be verified together with the test system before testing.

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8.3 TEST RESULT

8.3.1 TEST RESULT

Frequency (MHz)	Exposed Side	Result (Pursuant to ETSI EN 301 489-3 Criterion CT & CR)
80 to 6000	Front	Complied
80 to 6000	Left	Complied
80 to 6000	Rear	Complied
80 to 6000	Right	Complied

8.3.2 ADDITIONAL RESULT INFORMATION

The EUT worked normally as intended during and after the test. No any observable change occurred.

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EXHIBIT 4

PHOTOS OF EUT

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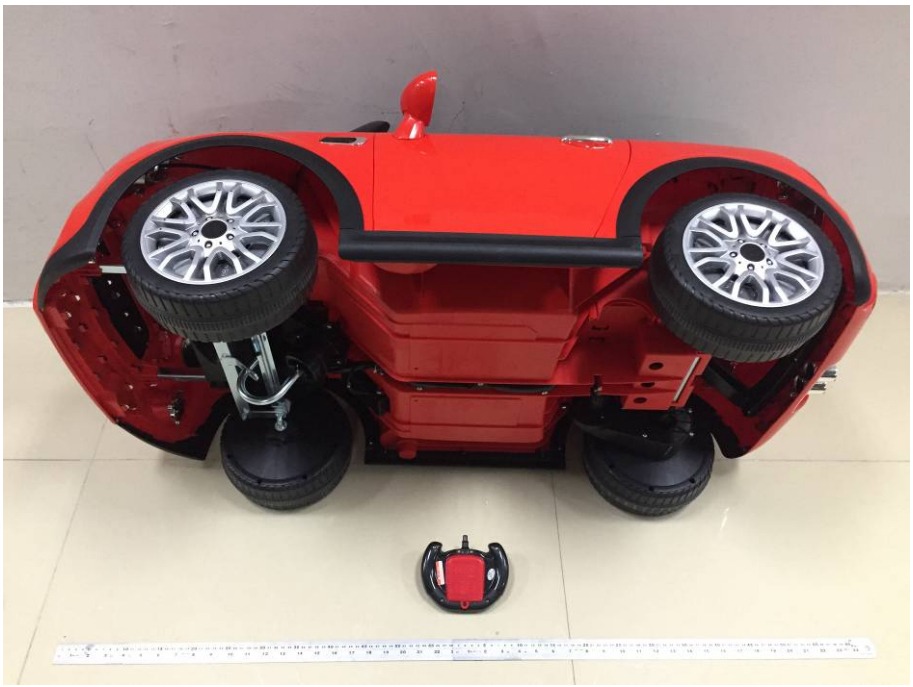
9 EUT PHOTOS

9.1 EXTERNAL PHOTOS



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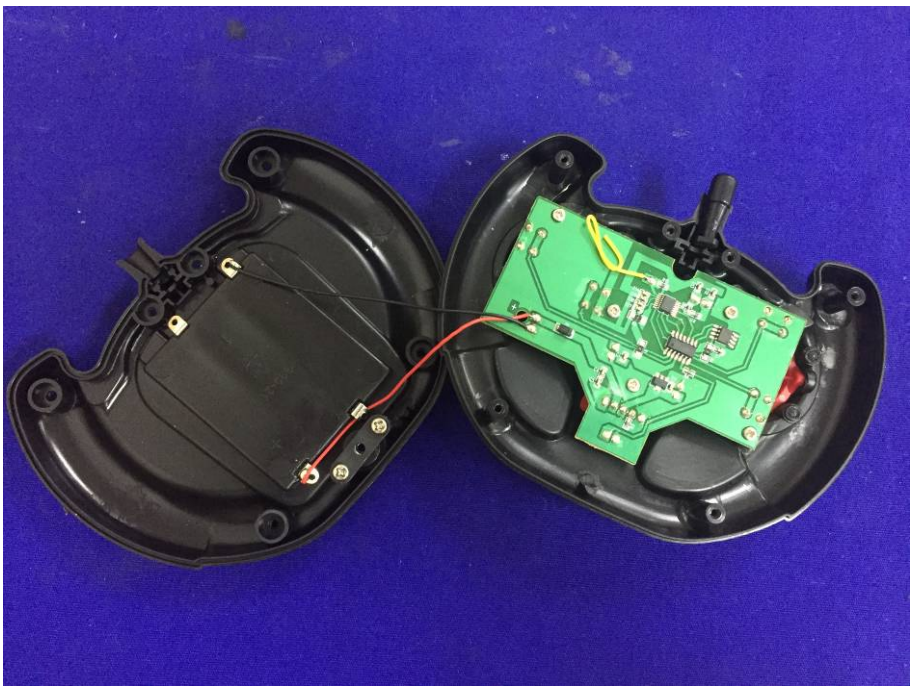
9.2 INTERNAL PHOTOS (Control Unit)



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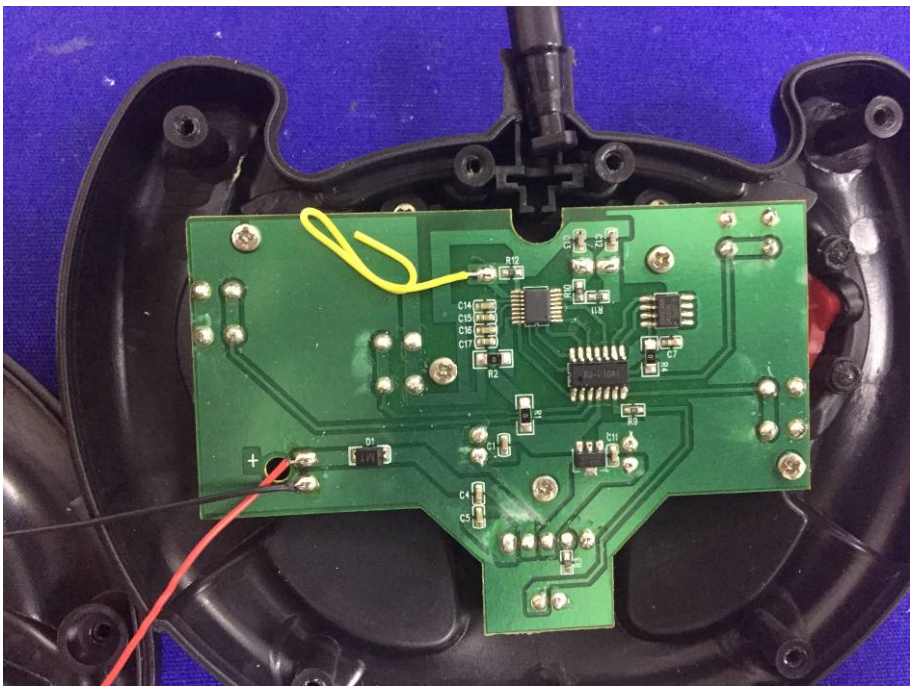

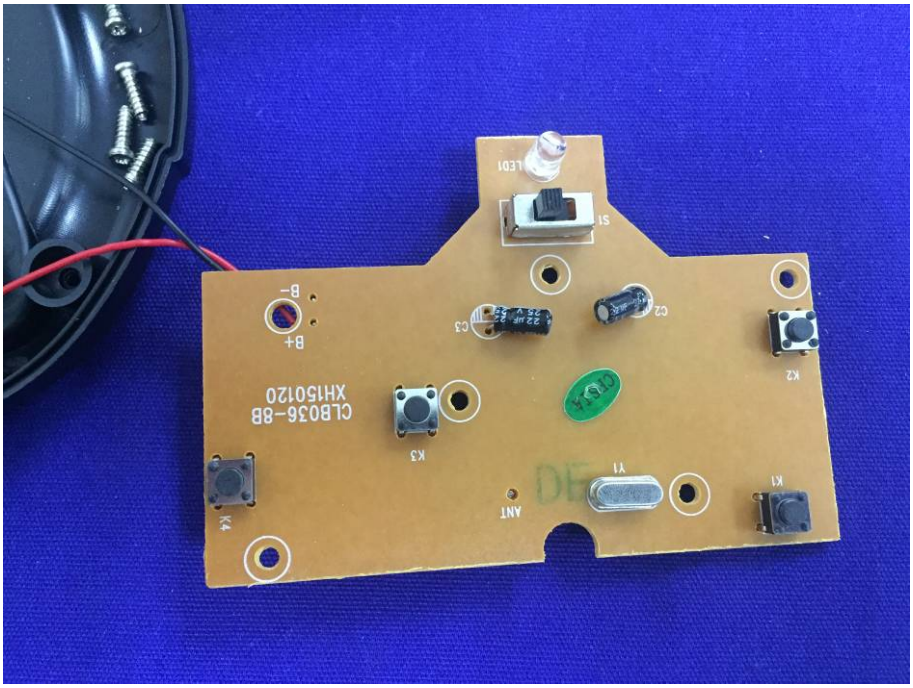

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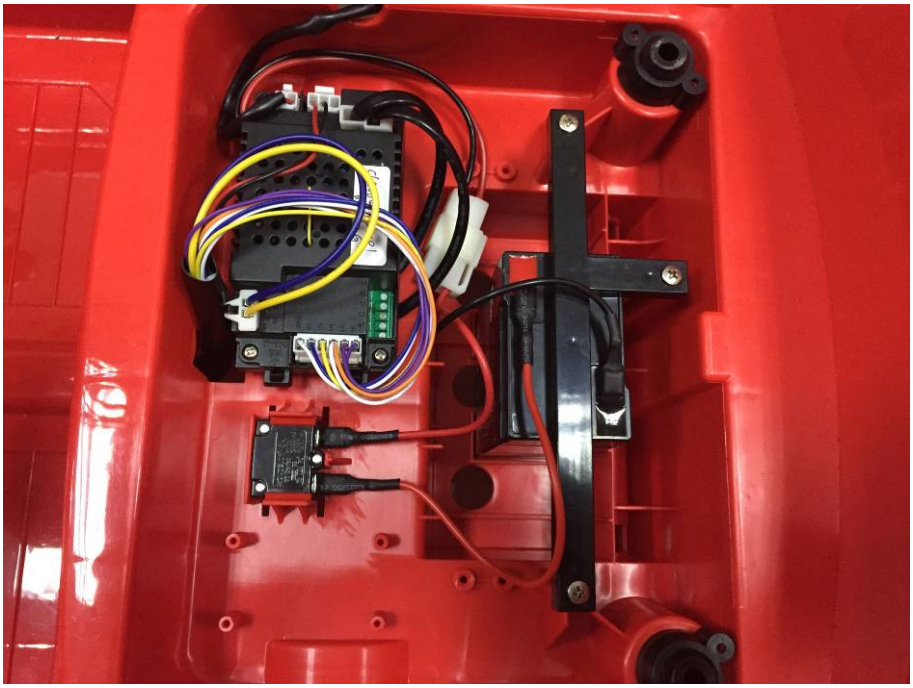
9.3 INTERNAL PHOTOS (Car Unit)



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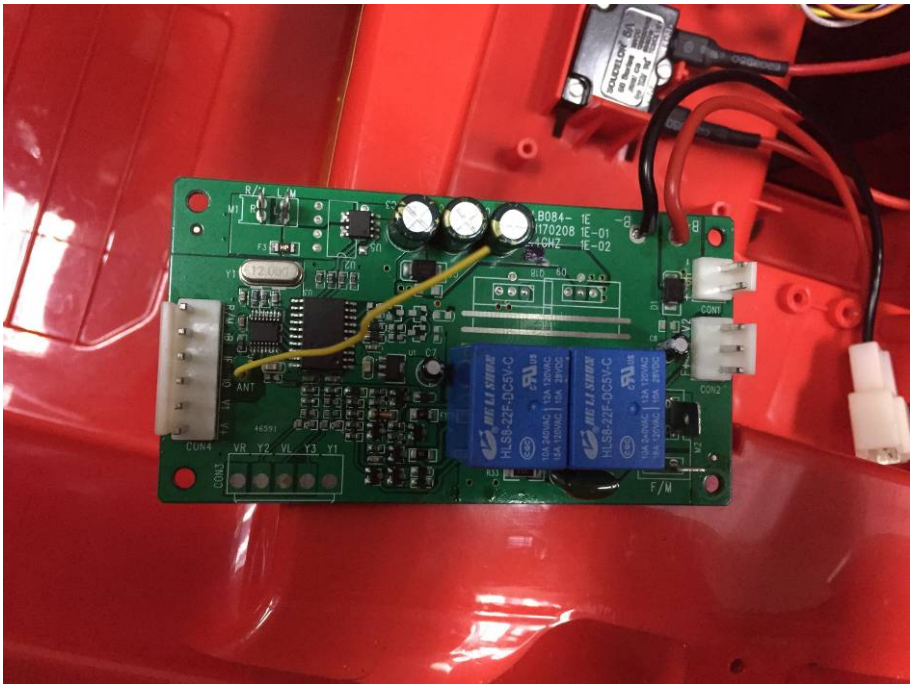

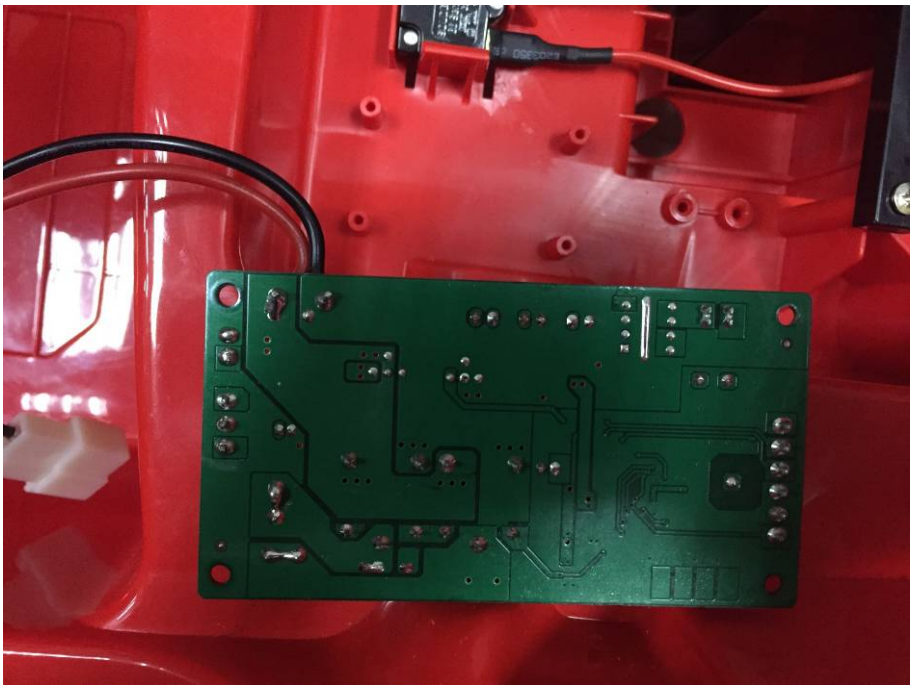

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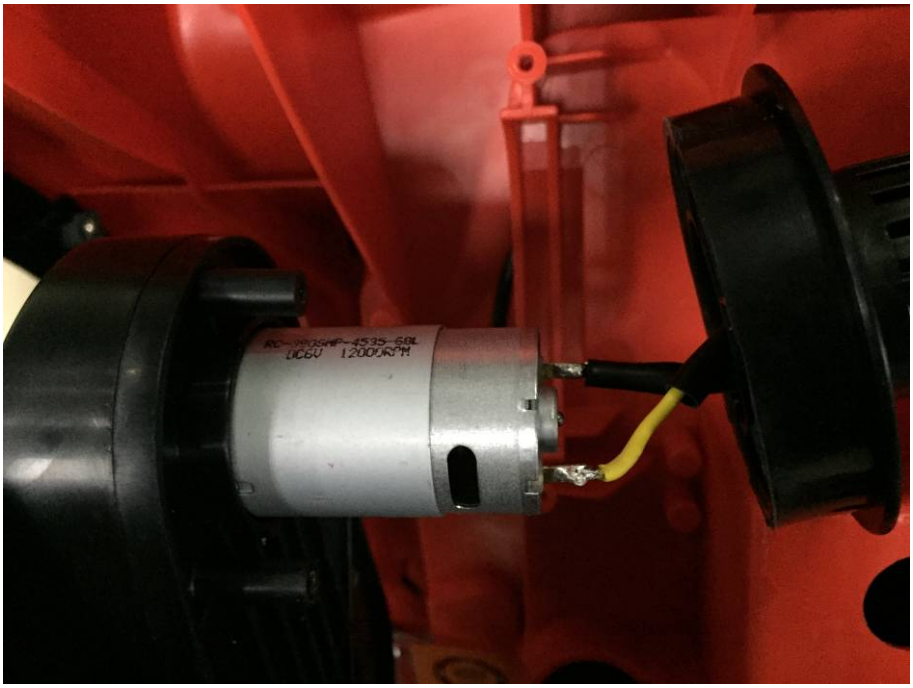

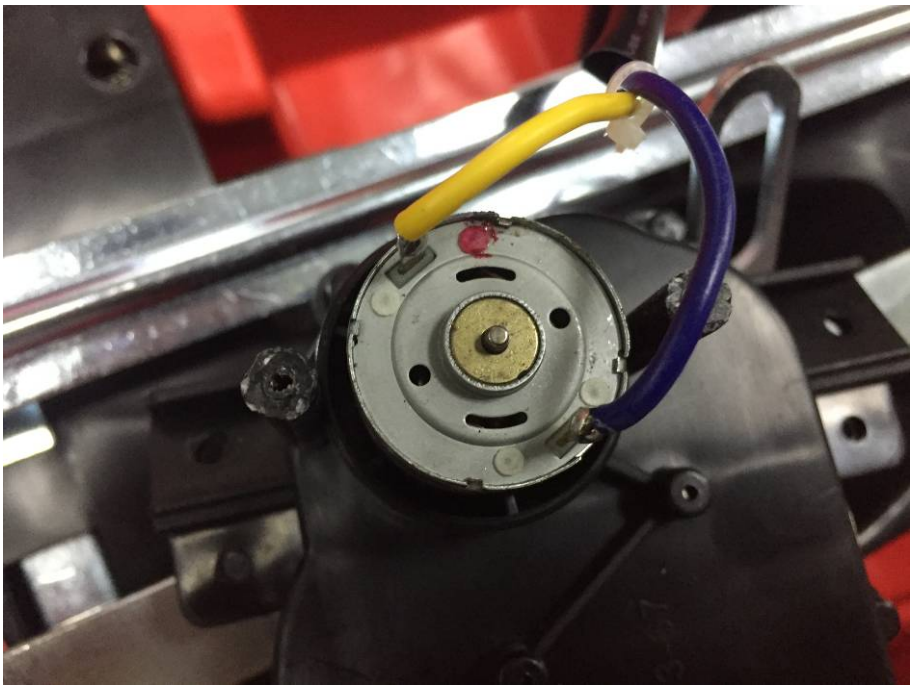

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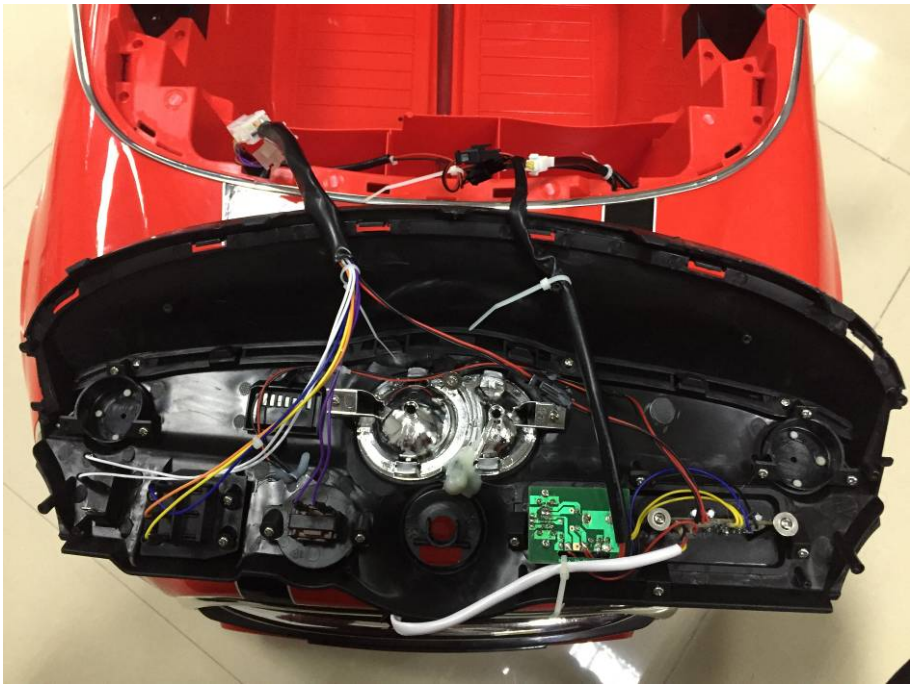

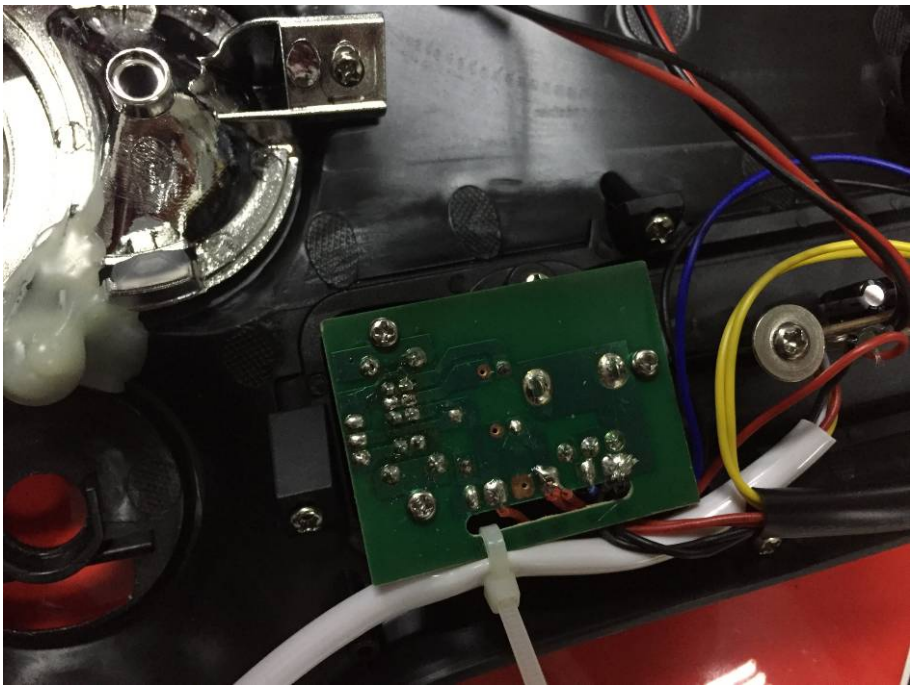

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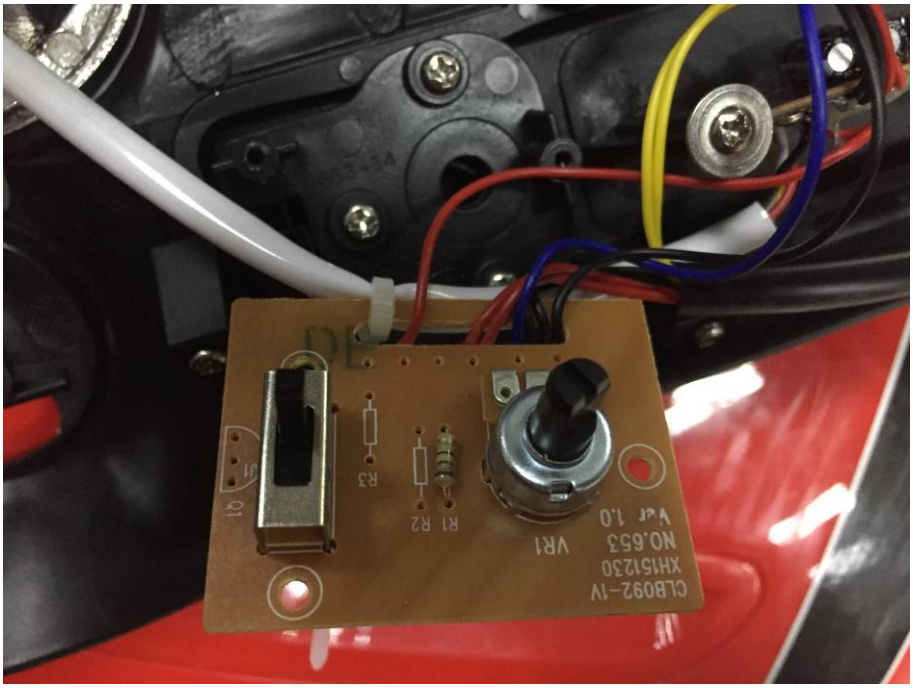

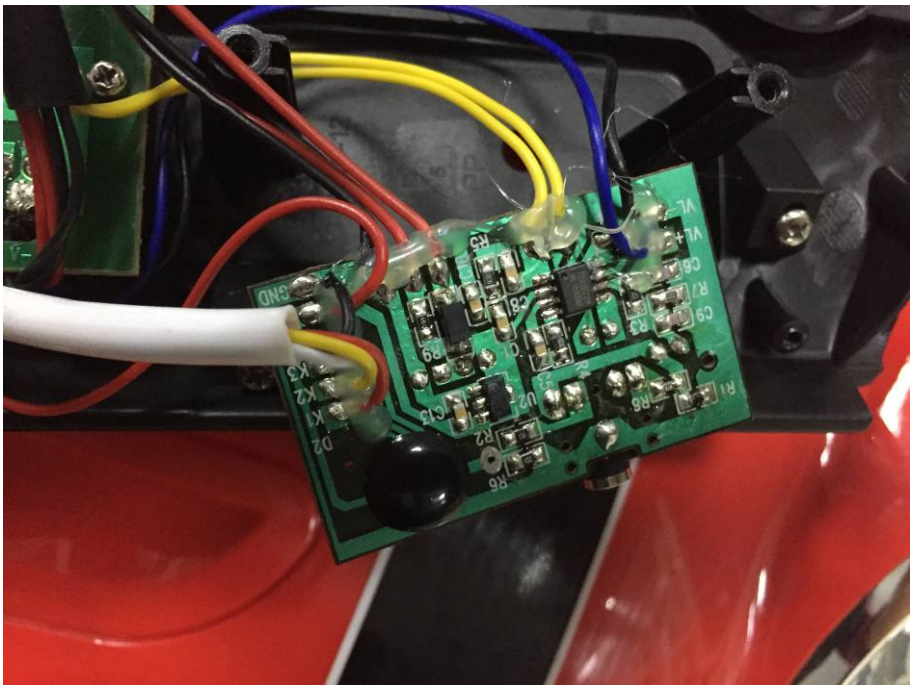

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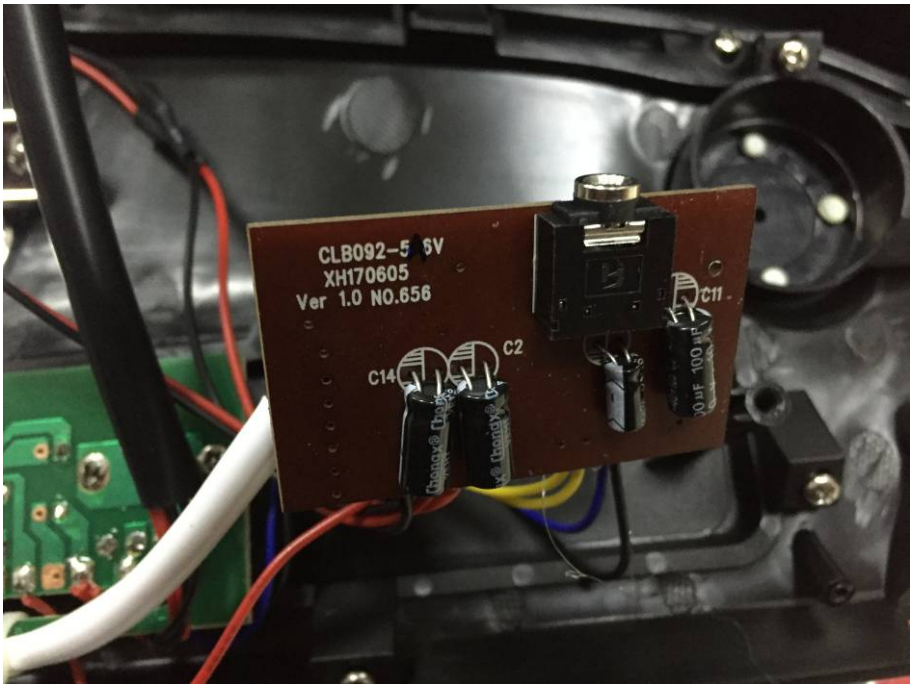

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