

# Global United Technology Services Co., Ltd.

Report No.: GTSE15060100101

# **FCC REPORT**

Applicant: MegaGain International Ltd.

**Address of Applicant:** Rm 1908, Greenfield Tower, Concordia Plaza, 1 Science

Museum Road, T.S.T. East. Kowloon Hong Kong China

**Equipment Under Test (EUT)** 

**Product Name:** CARS 6" MCQUEEN RC-ALT

Model No.: 1501-COL00907

FCC ID: SIP-3239-W

FCC CFR Title 47 Part 15 Subpart C Section 15.227:2014 Applicable standards:

Date of sample receipt: June 10, 2015

**Date of Test:** June 10-16, 2015

Date of report issued: June 16, 2015

PASS \* Test Result:

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

Authorized Signature:



# **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 GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in

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# 2 Version

Version No.	Date	Description
00	June 16, 2015	Original

Prepared By:	Sam. Gao	Date:	June 16, 2015	
	Project Engineer			_
Check By:	hank. yan	Date:	June 16, 2015	
	Reviewer			



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# 4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	N/A
Radiated emission	15.227 & 15.209	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not applicable

# 4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement unce	rtainty is for coverage factor of k	=2 and a level of confidence of 9	95%.



# **5** General Information

## 5.1 Client Information

Applicant:	MegaGain International Ltd.
Address of Applicant:	Rm 1908, Greenfield Tower, Concordia Plaza, 1 Science Museum Road, T.S.T. East. Kowloon Hong Kong China
Manufacturer/Factory:	Yiu Yi Plastic & Mould (Shenzhen) Co., Ltd.
Address of Manufacturer/Factory:	No.22, Xitou Road, Second Industrial Zone, Xitou, Songgang Town, Bao'an District, Shenzhen

# 5.2 General Description of EUT

Product Name:	CARS 6" MCQUEEN RC-ALT
Model No.:	1501-COL00907
Operation Frequency:	27.145MHz
Modulation type:	AM
Antenna Type:	Integral antenna
Antenna gain:	0dBi (declare by Applicant)
Power supply:	DC 9V



#### 5.3 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the new	battery was used.

#### Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Υ	Z
Field Strength(dBuV/m)	52.13	58.62	54.67

#### **Final Test Mode:**

According to ANSI C63.4 standards, the test results is at "worst setup":

Y axis (see the test setup photo)

#### 5.4 Description of Support Units

None

## 5.5 Test Facility

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

#### • CNAS —Registration No.: CNAS L5775

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

#### • FCC —Registration No.: 600491

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

#### • Industry Canada (IC) —Registration No.: 9079A-2

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

#### 5.6 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Room 301-309, 3th Floor, Block A, Huafeng Jinyuan Business Building, No. 300 Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China

Tel: 0755-27798480 Fax: 0755-27798960

#### 5.7 Other Information Requested by the Customer

None.

Global United Technology Services Co., Ltd.

Room 301-309, 3th Floor, Block A, Huafeng Jinyuan Business Building, No. 300 Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China Telephone: +86 (0) 755 2779 8480 Fax: +86 (0) 755 2779 8960



# 6 Test Instruments list

Rad	iated Emission:					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 28 2015	Mar. 27 2016
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	Jul. 01 2014	Jun 30 2015
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 01 2014	Jun 30 2015
5	Loop Antenna	ZHINAN	ZN30900A	GTS534	Feb. 22 2015	Feb. 21 2016
6	BiConiLog Antenna	SCHWARZBECK MESS- ELEKTRONIK	VULB9163	GTS214	Jul. 01 2014	Jun 30 2015
7	Double -ridged waveguide horn	SCHWARZBECK MESS- ELEKTRONIK	9120D-829	GTS208	June 27 2014	June 26 2015
8	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 27 2015	Mar. 26 2016
9	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
10	Coaxial Cable	GTS	N/A	GTS213	Mar. 28 2015	Mar. 27 2016
11	Coaxial Cable	GTS	N/A	GTS211	Mar. 28 2015	Mar. 27 2016
12	Coaxial cable	GTS	N/A	GTS210	Mar. 28 2015	Mar. 27 2016
13	Coaxial Cable	GTS	N/A	GTS212	Mar. 28 2015	Mar. 27 2016
14	Amplifier(100kHz- 3GHz)	HP	8347A	GTS204	Jul. 01 2014	Jun. 30, 2015
15	Amplifier(2GHz- 20GHz)	HP	8349B	GTS206	Jul. 01 2014	Jun. 30, 2015
16	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 27 2014	June 26 2015
17	Band filter	Amindeon	82346	GTS219	Mar. 28 2015	Mar. 27 2016

Gen	eral used equipment:					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	ChangChun	DYM3	GTS257	July 08 2014	July 07 2015

Telephone: +86 (0) 755 2779 8480 Fax: +86 (0) 755 2779 8960



## 7 Test results and Measurement Data

## 7.1 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.

#### **EUT Antenna:**

The antenna is integral antenna, the best case gain of the antenna is 0dBi.



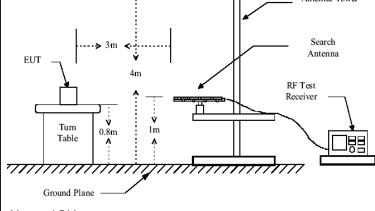


# 7.2 Radiated Emission

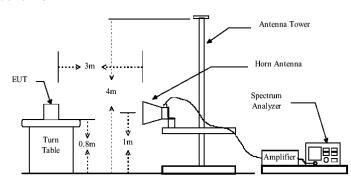
FCC Part15 C Section	on 15.2	09					
ANSI C63.4:2009							
9kHz to 1GHz							
Measurement Distar	nce: 3m	l					
Frequency	Def	etector RBW		Ν	VBW	Va	lue
9KHz-150KHz	Quas	si-peak	200H	Ηz	600Hz	z Quas	i-peak
150KHz-30MHz	Quas	si-peak	9KF	łz	30KH	z Quas	i-peak
30MHz-1GHz	Quas	si-peak	100K	Hz	300KH	lz Quas	i-peak
Above 1CHz	Р	eak	1MF	Ιz	3MHz	z Pe	ak
Above IGHZ	Р	eak	1MF	Ηz	10Hz	Ave	rage
Frequency		Limit	(dBuV/	m @3	m)	Rema	rk
00.00MH 07.00	2841.1-		80.08	0		Average \	/alue
26.96MHZ ~ 27.28	SIVIHZ		100.0	00		Peak Va	alue
Frequency		Limit (u\	//m)	Va	lue		
0.009MHz-1.705M	Hz	2400/F(k	(Hz)	Q	!P	3001	n
0.490MHz-1.705M	Hz 2	24000/F(	KHz)	Q	!P	3001	m
1.705MHz-30MH	Z	30		QP		30m	
30MHz-88MHz		100		QP			
88MHz-216MHz	<u>.</u>	150		Q	!P	- 2m	
216MHz-960MH	z	200		Q	!P		
960MHz-1GHz		500		Q	!P	3111	
Above 1GHz		500		Average			
Above 1GHz		5000		Peak			
harmonics, shall be a fundamental or to the whichever is the less	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.						
Below 30MHz  Turntable  FUT  0.8 m  Test Receiver  Coaxial Cable					rer		
	ANSI C63.4:2009 9kHz to 1GHz Measurement Distar Frequency 9KHz-150KHz 150KHz-30MHz 30MHz-1GHz Above 1GHz Frequency 26.96MHz ~ 27.28 Frequency 0.009MHz-1.705M 0.490MHz-1.705M 1.705MHz-30MH 30MHz-88MHz 88MHz-216MHz 216MHz-960MH 960MHz-1GHz Above 1GHz Emissions radiated of harmonics, shall be a fundamental or to the whichever is the less Below 30MHz	ANSI C63.4:2009  9kHz to 1GHz  Measurement Distance: 3m  Frequency  9KHz-150KHz Quasi 150KHz-30MHz Quasi 30MHz-1GHz  Prequency  26.96MHz ~ 27.28MHz  Frequency  0.009MHz-1.705MHz 0.490MHz-1.705MHz 30MHz-88MHz 88MHz-216MHz 216MHz-960MHz 960MHz-1GHz Above 1GHz  Emissions radiated outside harmonics, shall be attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental or to the gener whichever is the lesser atternal possible attenual fundamental po	Measurement Distance: 3m  Frequency Detector  9KHz-150KHz Quasi-peak  150KHz-30MHz Quasi-peak  30MHz-1GHz Quasi-peak  Above 1GHz Peak  Frequency Limit  26.96MHz ~ 27.28MHz  Frequency Limit (u)  0.009MHz-1.705MHz 2400/F(k)  0.490MHz-1.705MHz 24000/F(k)  1.705MHz-30MHz 30  30MHz-88MHz 100  88MHz-216MHz 150  216MHz-960MHz 200  960MHz-1GHz 500  Above 1GHz 500  5000  Emissions radiated outside of the spharmonics, shall be attenuated by atfundamental or to the general radiat whichever is the lesser attenuation.  Below 30MHz  Turntable 100  Turntable 100  Turntable 3m  0.8 m	ANSI C63.4:2009  9kHz to 1GHz  Measurement Distance: 3m  Frequency Detector RBN 9KHz-150KHz Quasi-peak 2001 150KHz-30MHz Quasi-peak 9KH 30MHz-1GHz Quasi-peak 100K Above 1GHz Peak 1MH Peak 1MH Frequency Limit (dBuV/) 26.96MHz ~ 27.28MHz 80.00 100.00  Frequency Limit (uV/m) 0.009MHz-1.705MHz 24000/F(KHz) 1.705MHz-30MHz 30 30MHz-88MHz 100 88MHz-216MHz 150 216MHz-960MHz 200 960MHz-1GHz 500 Above 1GHz 5000 Emissions radiated outside of the specified harmonics, shall be attenuated by at least of fundamental or to the general radiated emiswhichever is the lesser attenuation.  Below 30MHz	ANSI C63.4:2009  9kHz to 1GHz  Measurement Distance: 3m  Frequency Detector RBW  9KHz-150KHz Quasi-peak 200Hz  150KHz-30MHz Quasi-peak 9KHz  30MHz-1GHz Peak 1MHz  Above 1GHz Peak 1MHz  Frequency Limit (dBuV/m @3 80.00 100.00  Frequency Limit (uV/m) Va  0.009MHz-1.705MHz 2400/F(KHz) Q  0.490MHz-1.705MHz 2400/F(KHz) Q  1.705MHz-30MHz 30 Q  30MHz-88MHz 100 Q  88MHz-216MHz 150 Q  216MHz-960MHz 200 Q  960MHz-1GHz 500 Q  Above 1GHz 500 Ave 5000 Pe  Emissions radiated outside of the specified frequency harmonics, shall be attenuated by at least 50 dB fundamental or to the general radiated emission whichever is the lesser attenuation.  Below 30MHz  Turntable EUT  Turntable 100 Q 8 m	ANSI C63.4:2009  9kHz to 1GHz  Measurement Distance: 3m  Frequency Detector RBW VBW  9KHz-150KHz Quasi-peak 200Hz 600Hz 150KHz-30MHz Quasi-peak 100KHz 300KHz 30MHz-1GHz Quasi-peak 1MHz 3MHz Above 1GHz Peak 1MHz 10Hz  Frequency Limit (dBuV/m @3m)  26.96MHz ~ 27.28MHz  Frequency Limit (uV/m) Value  0.009MHz-1.705MHz 2400/F(KHz) QP  0.490MHz-1.705MHz 24000/F(KHz) QP  1.705MHz-30MHz 30 QP  30MHz-88MHz 100 QP  88MHz-216MHz 150 QP  216MHz-960MHz 200 QP  960MHz-1GHz 500 QP  Above 1GHz 500 Average 5000 Peak  Emissions radiated outside of the specified frequency be harmonics, shall be attenuated by at least 50 dB below of fundamental or to the general radiated emission limits in whichever is the lesser attenuation.	ANSI C63.4:2009



Report No.: GTSE15060100101 Antenna Tower Search Antenna



#### Above 1GHz



#### Test Procedure:

- 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. 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 rota 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.
- 7. For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with



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polarization oriented for maximum response. The measurement
antenna may have to be higher or lower than the EUT, depending on
the radiation pattern of the emission and staying aimed at the emission
source for receiving the maximum signal. The final measurement
antenna elevation shall be that which maximizes the emissions. The
measurement antenna elevation for maximum emissions shall be

For the test above 1GHz, when radiated measurements are made at the measurement distance and the measurement antenna does not completely encompass a large EUT at that distance, additional measurements at a greater distance may be necessary to demonstrate that emissions were at maximum at the limit distance.

restricted to a range of heights of from 1 m to 4 m above the ground or

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

reference ground plane.

#### Measurement data:

Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80

Limit dBuV/m @3m = Limit dBuV/m @30m + 40

#### **Below 30MHz**

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit @3m (dBuV/m)	Over Limit (dB)	ANT. Polarizati on	Detector
26.96	6.94	27.12	0.55	0.00	34.61	69.50	-34.89	Vertical	QP
27.145	30.88	27.12	0.55	0.00	58.55	80.00	-21.45	Vertical	Ave.
27.145	30.95	27.12	0.55	0.00	58.62	100.00	-41.38	Vertical	Peak
27.28	5.42	27.12	0.55	0.00	33.09	69.50	-36.41	Vertical	QP
26.96	-1.16	27.12	0.55	0.00	26.51	69.50	-42.99	Horizontal	QP
27.145	28.30	27.12	0.55	0.00	55.97	80.00	-24.03	Horizontal	Ave.
27.145	28.44	27.12	0.55	0.00	56.11	100.00	-43.89	Horizontal	Peak
27.28	-5.23	27.12	0.55	0.00	22.44	69.50	-47.06	Horizontal	QP

#### 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.



## 30MHz ~ 1000MHz (Quasi-peak value):

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
51.52	30.52	15.19	0.79	29.99	16.51	40.00	-23.49	Vertical
54.25	39.58	15.05	0.81	29.97	25.47	40.00	-14.53	Vertical
96.45	32.05	14.94	1.16	29.72	18.43	43.50	-25.07	Vertical
104.22	29.48	14.78	1.23	29.67	15.82	43.50	-27.68	Vertical
127.19	31.87	11.32	1.41	29.53	15.07	43.50	-28.43	Vertical
143.65	38.66	10.22	1.53	29.44	20.97	43.50	-22.53	Vertical
41.59	25.78	15.57	0.68	30.04	11.99	40.00	-28.01	Horizontal
54.25	33.33	15.05	0.81	29.97	19.22	40.00	-20.78	Horizontal
98.61	25.47	15.06	1.18	29.71	12.00	43.50	-31.50	Horizontal
190.14	26.88	12.56	1.79	29.24	11.99	43.50	-31.51	Horizontal
465.99	25.16	17.71	3.16	29.36	16.67	46.00	-29.33	Horizontal
928.88	25.44	23.28	4.96	29.10	24.58	46.00	-21.42	Horizontal



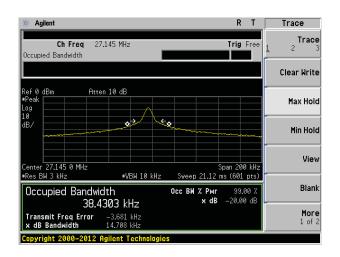
# 7.3 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.227/15.215		
Test Method:	ANSI C63.4:2009		
Limit:	Operation Frequency range 26.96MHz ~ 27.28MHz		
Test setup:	Spectrum Analyzer  E.U.T  Non-Conducted Table  Ground Reference Plane		
Test Instruments:	Refer to section 6.0 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

#### **Measurement Data**

20dB bandwidth(MHz)	Result
0.015	Pass

## Test plot as follows:

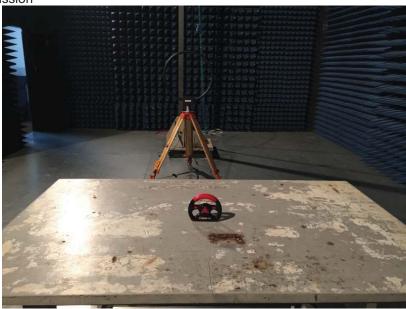


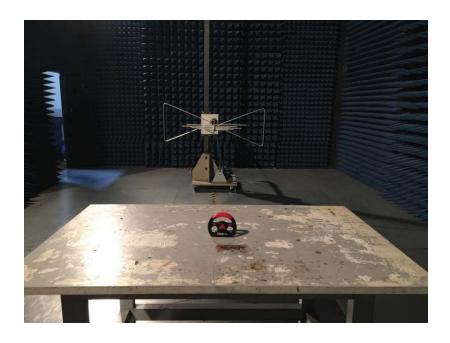
Telephone: +86 (0) 755 2779 8480 Fax: +86 (0) 755 2779 8960



# 8 Test Setup Photo

Radiated Emission







# 9 EUT Constructional Details











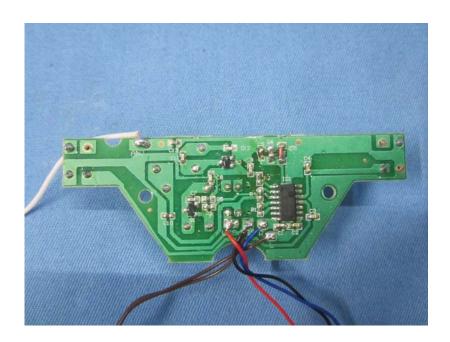






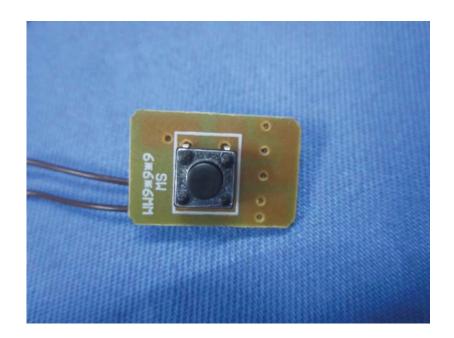




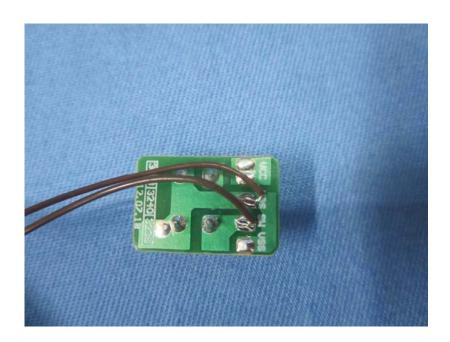


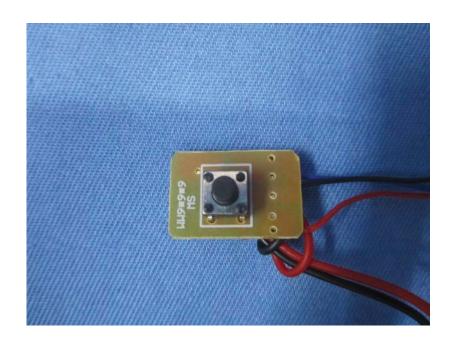




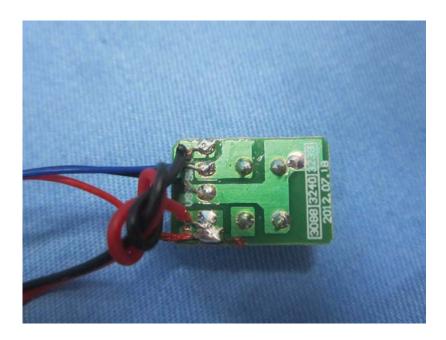












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