

Attn: JORDEN Attn: -   Address: 5/f., Yat Chau Building, 262 Des Voeux Road central, HK. Address: -   Fax: 0754 85822067 Fax: -   E-mail: - - E-mail: -   Folder No.: - - E-mail: -   Factory Name: - - - -   Location: FULL FUCTION DISNEY CARS RC (MC QUEEN & MATER) MODEL: 049022790230 MATER)   Product: FULL FUCTION DISNEY CARS RC (MC QUEEN & MATER) MODEL: 049022790230   Image: Sample No: (5214)084-1693 Test date: March 28, 2014   Image: Test Care FCC Part 15 – 2013 Test date: MARCh 28, 2014   Image: Test Method: ANSI C63.4 – 2005 FCC ID: 2AB7F35114		TEST			1
Address: 5/f., Yat Chau Building, 262 Des Voeux Address: -   Fax: 0754 85822067 Fax: -   E-mail:  E-mail: -   Folder No.:  - -   Factory Name:  - -   Location:  - -   Product: FULL FUCTION DISNEY CARS RC (MC QUEEN & MATER) MODEL: 049022790230 Sample No: (5214)084-1693   Test date: March 28, 2014 Test date: March 28, 2014   Test Method: ANSI C63.4 - 2009 FCC ID: 2AB7F35114	To:	GAINMAX LIMITED	To:		-
Road central, HK.   Fax:   0754 85822067   Fax:   -     E-mail:    E-mail:   -   -     Folder No.:     -   -     Factory Name:     -   -     Location:     -   -     Product:   FULL FUCTION DISNEY CARS RC (MC QUEEN & MATER) MODEL: 049022790230   -   -     Vertication:     -   -     Product:   FULL FUCTION DISNEY CARS RC (MC QUEN & MATER) MODEL: 049022790230   -   -     Vertication:     -   -     Product:   FULL FUCTION DISNEY CARS RC (MC QUEEN & MATER) MODEL: 049022790230   -   -     Vertication:     -   -     Vertication:     -   -     Product:   FULL FUCTION DISNEY CARS RC (MC QUEEN & MATER)   -   -     Vertication:     -   -     Vertication:     - <td< td=""><td>Attn:</td><td>JORDEN</td><td>Attn:</td><td></td><td>-</td></td<>	Attn:	JORDEN	Attn:		-
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Image: Second system <td< td=""><td></td><td></td><td>Sam</td><td>ple No:</td><td>(5214)084-1693</td></td<>			Sam	ple No:	(5214)084-1693
Test Method: ANSI C63.4 - 2009   FCC ID: 2AB7F35114			Tes	t date:	March 28, 2014
FCC ID: 2AB7F35114   The results given in this report are related to the tested specimen of the described electrical apparate			Test Re	equested:	FCC Part 15 – 2012
The results given in this report are related to the tested specimen of the described electrical appara			Test	Vethod:	ANSI C63.4 – 2009
			FC	C ID:	2AB7F35114
	The results o	given in this report are related to the tes	sted specimen	of the des	cribed electrical apparatus.
CONCLUSION: The submitted sample was found to COMPLY with requirement of FCC Part 15 Subpart	CONCLUSION:	The submitted sample was found to <u>CC</u>	MPLY with re	quirement	of FCC Part 15 Subpart C.
Authorized Signature:		Authorized	Signature:		
Oeith for Law	Orif	L	hore	Lar	
Reviewed by: Keith Yeung Approved by: Steven Tsang			Approved by: S	Steven Tsan	Ig
Date: April 11, 2014 Date: April 11, 2014	Date: April 11, 20	014	Date: April 11,	2014	

TEST REPORT

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## **Test Result Summary**

EMISSION TEST								
Test requirement: FCC Part 15 - 2012								
Test Condition Test Method Test Result								
Test Condition	Test Method	Pass	Failed					
Radiated Emission Test,	ANSI C63.4	$\square$						
9kHz to 1GHz								
Frequency range of Fundamental Emission	ANSI C63.4	$\boxtimes$						
26dB Bandwidth of Fundamental Emission	ANSI C63.4	$\boxtimes$						
Duty Cycle Correction During 100mesc	ANSI C63.4	$\boxtimes$						

### Report Revision & Sample Re-submit History:



## **Test Laboratory & Test Instruments List**

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 - 2009. An Open Area Test Site and Full Anechoic Chamber (FCC Listed Site, Registration No. 642151) are set up for investigation and located at:

### **BUREAU VERITAS HONG KONG LIMITED, EMC CENTRE**

No. 2106-2107, 21/F., Westin Centre, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

#### **Test Instrument List**

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DUE			
EMI TEST RECEIVER	R&S	ESCI	100379	20-JAN-2015			
SIGNAL ANALYZER 40GHZ	R&S	FSV 40	100977	22-Dec-2014			
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	20-OCT-2014			
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	20-OCT-2014			
OPEN AREA TEST SITE	BVCPS	N/A	N/A	11-SEP-2014			
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	08-JUL-2014			
COAXIAL CABLE	SUHNER	RG214	N/A	04-FEB-2015			

### **Dedicted** Emission

#### Remarks: -

N/A: Not Applicable or Not Available

The measurement instrumentation uncertainty would be taking into consideration on each of the test result



# **Equipment Under Test [EUT]**

Description of Sample:

Product:	FULL FUCTION DISNEY CARS RC (MC QUEEN & MATER)
Model No.:	049022790230
Additional Model name:	FULL FUCTION DISNEY CARS RC (MC QUEEN & MATER)
Additional Model number:	049022790483
Additional Model Information:	Declare the Circuit, PCB layout, Electrical parts and Outlook of the products are identical to the basic model, difference model number is for difference market perpose
Power Supply:	3Vd.c. ("AA" size battery x 2)

**Description of EUT Operation:** 

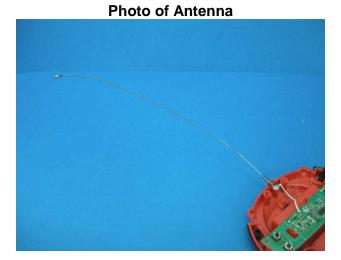
The Equipment Under Test (EUT) is a **GAINMAX LIMITED** of Radio Control toy. The transmitter is 2 buttons and operating at 27.145MHz. The EUT continues to transmit buttons is being pressed, Modulation by IC, and type is frequency modulation.

The transmitter has different control:

- 1. Left button control forward and backward
- 2. Right button control left and right

#### Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. The antenna consists of 24cm long. It is soldered on the PCB. The antenna is not replaceable or user serviceable. The requirements of S15.203 are met. There are no deviations or exceptions to the specifications.



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## **Test Results**

### **Radiated Emissions (Fundamental)**

Test Requirement:	FCC Part 15 Section 15.227
Test Method:	ANSI C63.4
Test Date(s):	2014-03-28
Temperature:	24.0 °C
Humidity:	82.0 %
Atmospheric Pressure:	100.8 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. ("AA" size battery x 2)

### **Test Method:**

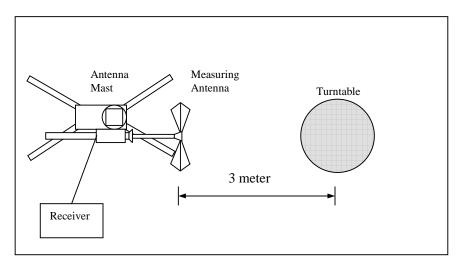
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 - 2009.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using new battery. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

Location: The Roof, Westin Centre, 26 Hung To Road, Kwun Tong, Kowloon, Hong Kong

### Test Setup: Open Area Test Site



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#### Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.227]:

Frequency Range of	Field Strength of	Field Strength of
Fundamental	Fundamental Emission	Fundamental Emission
	[Peak]	[Average]
[MHz]	[µV/m]	[µV/m]
26.96 - 27.28	100,000 (100 dBμV/m)	10,000 (80 dBμV/m)

#### **Measurement Data**

### Test Result of (Transmission mode): PASS

#### **Detection mode: Peak**

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
27.145	V/0°	11.1	56.4	100.0	-43.6

#### **Detection mode: # Average**

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
27.145	V/0°	11.1	**52.6	80.0	-27.4

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation. \*\*Duty Cycle Correction = 20Log(0.646) = -3.8dB

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHzVBW = 300KHz



#### Radiated Emissions (9kHz - 1GHz)

Test Requirement:	FCC Part 15 Section 15.209
Test Method:	ANSI C63.4
Test Date(s):	2014-03-28
Temperature:	24.0 °C
Humidity:	82.0 %
Atmospheric Pressure:	100.8 kPa
Mode of Operation:	Transmission mode
Tested Voltage:	3Vd.c. ("AA" size battery x 2)

#### Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range	Quasi-Peak Limits	Measurement Distance
[MHz]	[µV/m]	m
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above960	500	3



#### **Measurement Data**

### Test Result of (Transmission mode): PASS

#### **Detection mode: Quasi-Peak**

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
54.290	Н	8.2	26.0	40.0	-14.0
81.435	Н	8.1	25.4	40.0	-14.6
108.580	Н	13.2	28.4	43.5	-15.1
135.725	Н	13.3	27.2	43.5	-16.3
162.870	Н	11.0	26.5	43.5	-17.0
190.015	Н	10.6	26.7	43.5	-16.8
217.160	Н	10.5	27.3	46.0	-18.7
244.305	Н	13.3	27.2	46.0	-18.8
271.450	Н	14.2	29.4	46.0	-16.6
298.595	Н	14.8	32.5	46.0	-13.5

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
54.290	V	8.2	26.3	40.0	-13.7
81.435	V	8.1	26.1	40.0	-13.9
108.580	V	13.2	29.3	43.5	-14.2
135.725	V	13.3	27.4	43.5	-16.1
162.870	V	11.0	26.8	43.5	-16.7
190.015	V	10.6	26.9	43.5	-16.6
217.160	V	10.5	27.2	46.0	-18.8
244.305	V	13.3	27.1	46.0	-18.9
271.450	V	14.2	29.2	46.0	-16.8
298.595	V	14.8	30.8	46.0	-15.2

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz VBW = 120KHz

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### 26dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.227	
Test Method:	ANSI C63.4	
Test Date(s):	2014-03-28	
Temperature:	24.0 °C	
Humidity:	82.0 %	
Atmospheric Pressure:	100.8 kPa	
Mode of Operation:	Transmission mode	
Tested Voltage:	3Vd.c. ("AA" size battery x 2)	

#### Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Frequency	26dB Bandwidth	Limits
[MHz]	[KHz]	[MHz]
27.14496	90.88	within 26.96 – 27.28

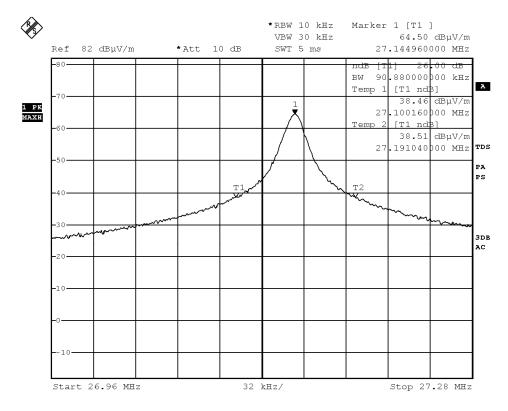
#### Limits for 26dB Bandwidth of Fundamental Emission:

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#### **Measurement Data**

### Test Result of 26dB Bandwidth of Fundamental Emission: PASS



Date: 28.MAR.2014 14:36:08

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### **Duty Cycle Correction During 100msec:**

Each function key sends a different series of characters, but each packet period (19.2msec) never exceeds a series of 4 long (1.6msec) and 10 short (0.6msec) pulses. Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered (4x1.6msec)+(10x0.6msec) per 19.2msec = 64.6% duty cycle. Figure A through C shows the characteristics of the pulse train for one of these functions.

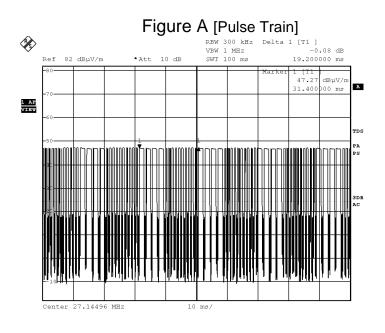
Remarks: -

Duty Cycle Correction = 20Log(0.646) = -3.8dBTherefore, -20dB is taken

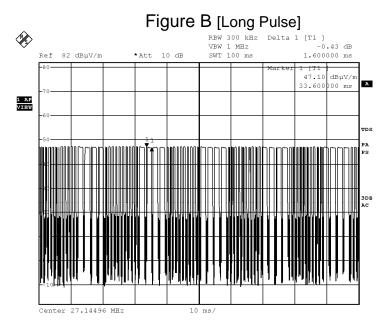
The following figures [Figure A to Figure C] show the characteristics of the pulse train for one of these functions.

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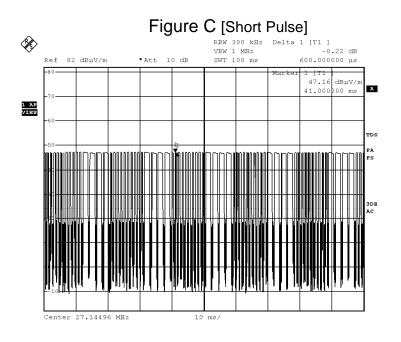
Date: 28.MAR.2014 14:37:33



Date: 28.MAR.2014 14:37:54

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Date: 28.MAR.2014 14:38:10

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#### TEST REPORT No.: (5213)331-1368 Photographs of EUT

Front View of the product



Top View of the product



Side View of the product



#### Battery compartment



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#### **Rear View of the product**



Bottom View of the product



#### Side View of the product



#### **Battery Cover**





### TEST REPORT No.: (5213)331-1368

#### Photographs of EUT

#### Internal View of the product



#### **Inner Circuit Top View**



#### Internal View of the product



#### Inner Circuit Bottom View



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### TEST REPORT No.: (5213)331-1368





\*\*\*\*\* End of Report \*\*\*\*\*

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