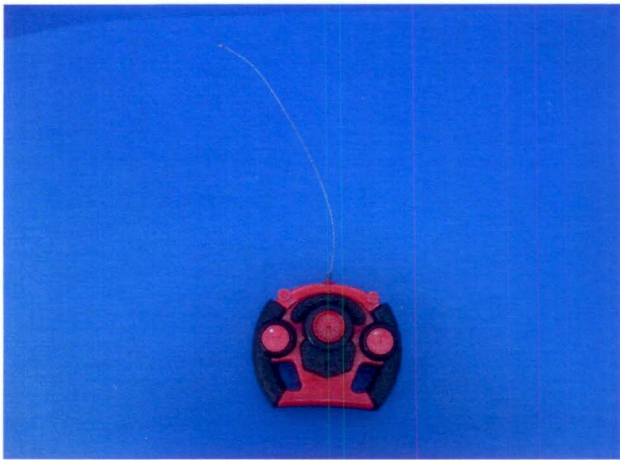

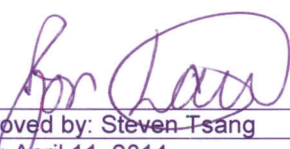


TEST REPORT No.: (5214)084-1693

TEST REPORT

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------|----|
| To: | GAINMAX LIMITED | To: | - |
| 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.: | | | -- |
| 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 Requested: | FCC Part 15 – 2012 | |
| | Test Method: | ANSI C63.4 – 2009 | |
| | FCC ID: | 2AB7F35114 | |
| <p>The results given in this report are related to the tested specimen of the described electrical apparatus.</p> <p>CONCLUSION: The submitted sample was found to <u>COMPLY</u> with requirement of FCC Part 15 Subpart C.</p> <p>Authorized Signature:</p> | | | |
|  | |  | |
| Reviewed by: Keith Yeung Date: April 11, 2014 | | Approved by: Steven Tsang Date: April 11, 2014 | |



TEST REPORT No.: (5214)084-1693

Test Result Summary

| EMISSION TEST | | | |
|---------------------------------------------|-------------|-------------------------------------|--------------------------|
| Test requirement: FCC Part 15 - 2012 | | | |
| Test Condition | Test Method | Test Result | |
| | | Pass | Failed |
| Radiated Emission Test, 9kHz to 1GHz | ANSI C63.4 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Frequency range of Fundamental Emission | ANSI C63.4 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 26dB Bandwidth of Fundamental Emission | ANSI C63.4 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Duty Cycle Correction During 100mesc | ANSI C63.4 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Report Revision & Sample Re-submit History:

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TEST REPORT No.: (5214)084-1693

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

Radiated Emission

| 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 |

Remarks: -

N/A: Not Applicable or Not Available

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

TEST REPORT No.: (5214)084-1693

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.

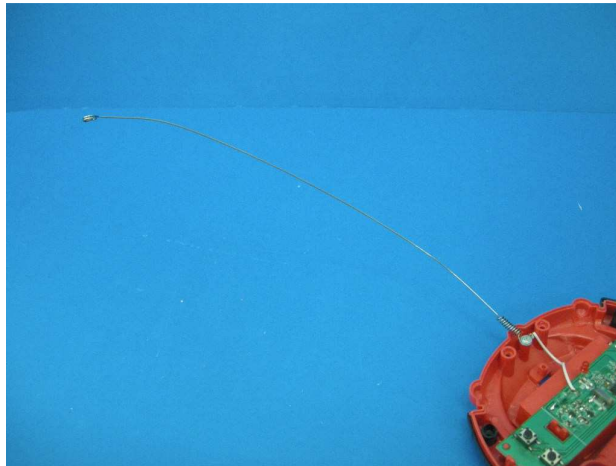
The transmitter has different control:

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.

Photo of Antenna



TEST REPORT No.: (5214)084-1693

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:

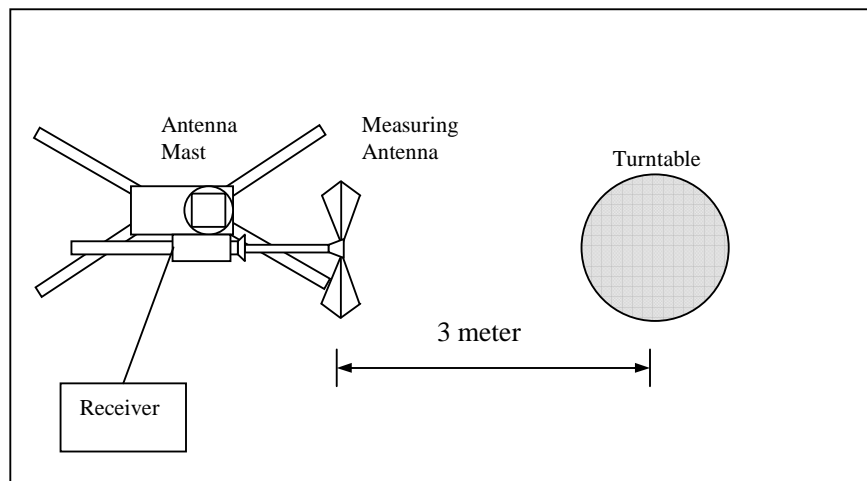
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

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 performed 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 placed 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





TEST REPORT No.: (5214)084-1693

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

| Frequency Range of Fundamental [MHz] | Field Strength of Fundamental Emission [Peak] [μV/m] | Field Strength of Fundamental Emission [Average] [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 = $20\log(0.646) = -3.8\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz
VBW = 300KHz



TEST REPORT No.: (5214)084-1693

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 [MHz] | Quasi-Peak Limits [μ V/m] | Measurement Distance 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 |



TEST REPORT No.: (5214)084-1693

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 | H | 8.2 | 26.0 | 40.0 | -14.0 |
| 81.435 | H | 8.1 | 25.4 | 40.0 | -14.6 |
| 108.580 | H | 13.2 | 28.4 | 43.5 | -15.1 |
| 135.725 | H | 13.3 | 27.2 | 43.5 | -16.3 |
| 162.870 | H | 11.0 | 26.5 | 43.5 | -17.0 |
| 190.015 | H | 10.6 | 26.7 | 43.5 | -16.8 |
| 217.160 | H | 10.5 | 27.3 | 46.0 | -18.7 |
| 244.305 | H | 13.3 | 27.2 | 46.0 | -18.8 |
| 271.450 | H | 14.2 | 29.4 | 46.0 | -16.6 |
| 298.595 | H | 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



TEST REPORT No.: (5214)084-1693

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.

Limits for 26dB Bandwidth of Fundamental Emission:

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



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TEST REPORT No.: (5214)084-1693

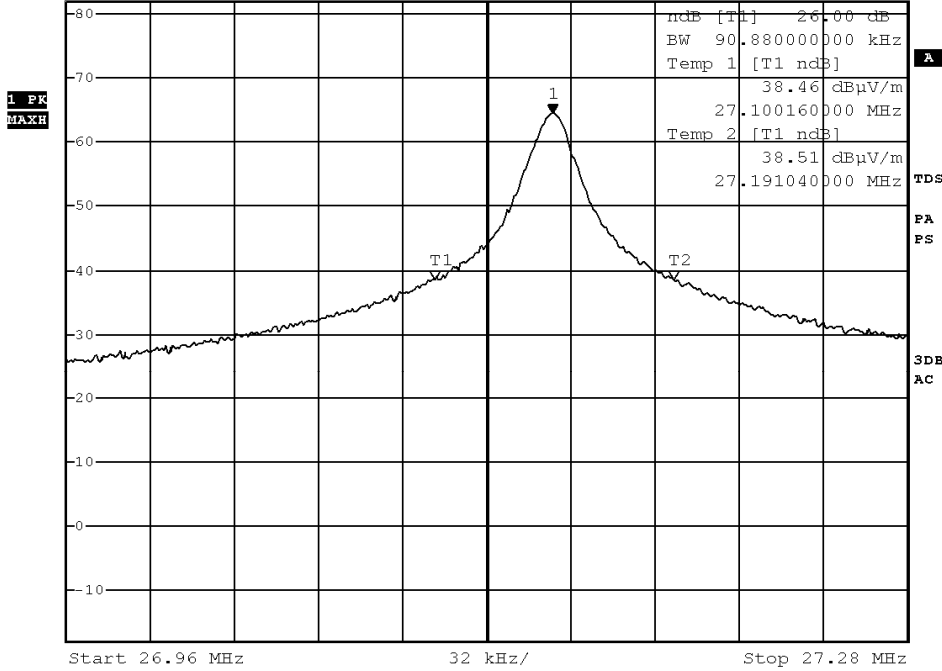
Measurement Data

Test Result of 26dB Bandwidth of Fundamental Emission: PASS



*RBW 10 kHz Marker 1 [T1]
VBW 30 kHz 64.50 dBµV/m
SWT 5 ms 27.144960000 MHz

Ref 82 dBµV/m *Att 10 dB



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



TEST REPORT No.: (5214)084-1693

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 $(4 \times 1.6\text{msec}) + (10 \times 0.6\text{msec})$ 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 = $20\text{Log}(0.646) = -3.8\text{dB}$
Therefore, -20dB is taken

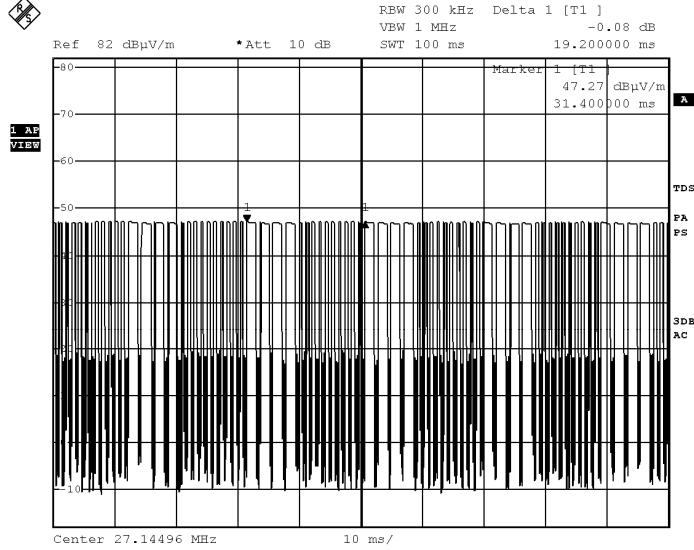
The following figures [Figure A to Figure C] show the characteristics of the pulse train for one of these functions.



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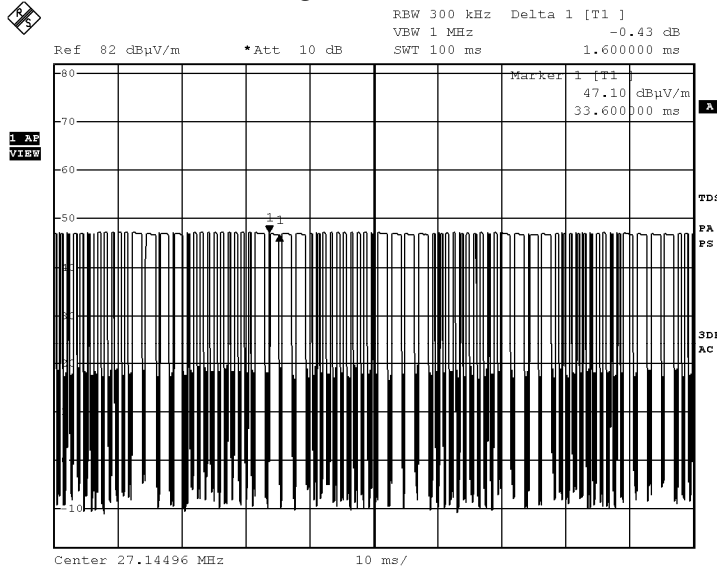
TEST REPORT No.: (5214)084-1693

Figure A [Pulse Train]



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

Figure B [Long Pulse]



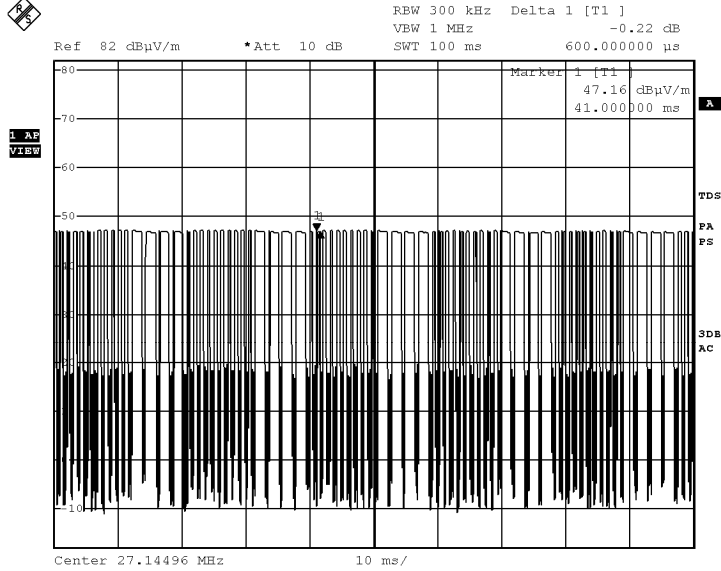
Date: 28.MAR.2014 14:37:54



BUREAU VERITAS

TEST REPORT No.: (5214)084-1693

Figure C [Short Pulse]



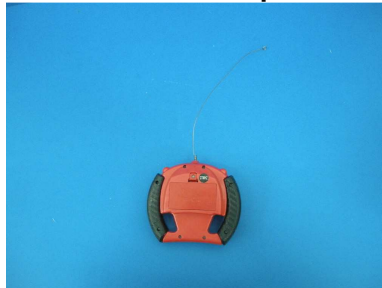
Date: 28.MAR.2014 14:38:10

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

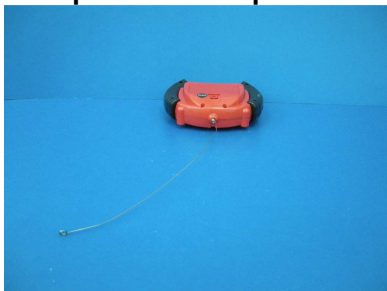
Front View of the product



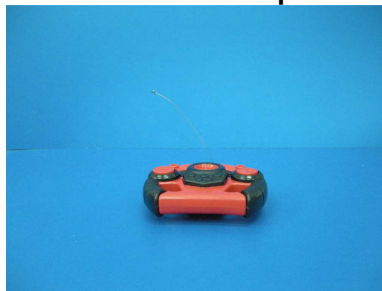
Rear View of the product



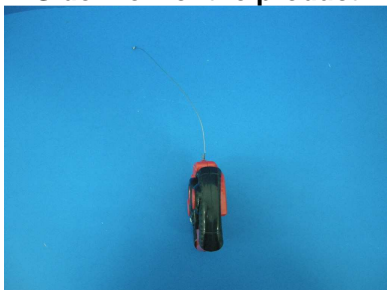
Top View of the product



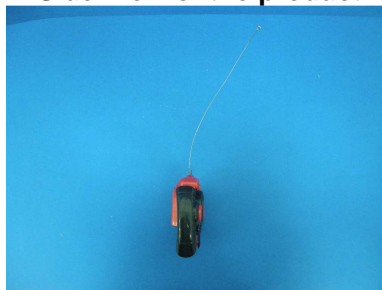
Bottom View of the product



Side View of the product



Side View of the product



Battery compartment



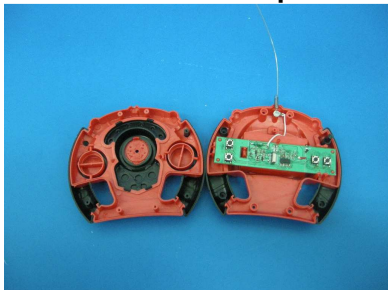
Battery Cover



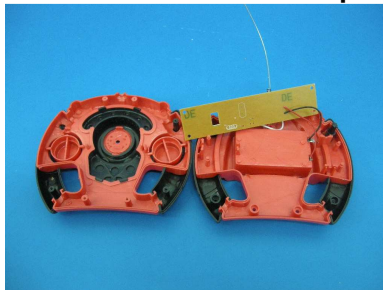
TEST REPORT No.: (5213)331-1368

Photographs of EUT

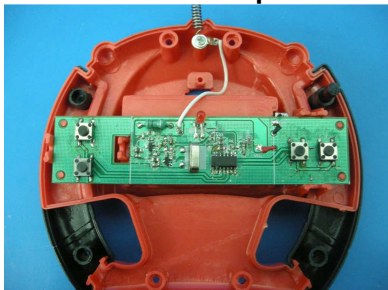
Internal View of the product



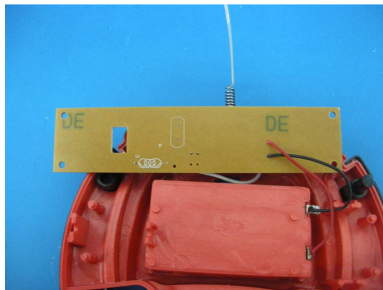
Internal View of the product



Inner Circuit Top View



Inner Circuit Bottom View



TEST REPORT No.: (5213)331-1368

Measurement of Radiated Emission Test Set Up



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