






**BUREAU  
VERITAS**

**TEST REPORT No.: (5214)227-1215**

## TEST REPORT

To:	<b>BIG TREE INTERNATIONAL CO., LTD</b>	To:	-
Attn:	--	Attn:	-
Address:	SOUTH PART 1-101, NANSHE AREA, PENGAN INDUSTRIAL PARK, NORTH YINGBIN ROAD, WAISHA CITY, GUANGDONG, CHINA.	Address:	-
Fax:	--	Fax:	-
E-mail:	<a href="mailto:bigtree35@bigtreetoys.com">bigtree35@bigtreetoys.com</a>	E-mail:	-
Folder No.:			--
Factory Name:			--
Location:			--
Product:	1:20 4w R/C CAR W/O BATTERY MODEL: BT681449		
	Sample No:	(5214)227-1215	
	Test date:	August 19, 2014 to August 26, 2014	
	Test Requested:	FCC Part 15 – 2012	
	Test Method:	ANSI C63.4 – 2009	
	FCC ID:	2ACXT668899	
<b>The results given in this report are related to the tested specimen of the described electrical apparatus.</b>			
<b>CONCLUSION: The submitted sample was found to <u>COMPLY</u> with requirement of FCC Part 15 Subpart C.</b>			
Authorized Signature:			
			
Reviewed by: Keith Yeung		Approved by: Steven Tsang	
Date: August 29, 2014		Date: August 29, 2014	

**BUREAU VERITAS HONG KONG LIMITED –  
Kowloon Bay Office  
1/F Pacific Trade Centre,  
2 Kai Hing Road, Kowloon Bay,  
Kowloon, HONG KONG**  
Tel: +852 2331 0888  
Fax: +852 2331 0889  
[www.cps.bureauveritas.com](http://www.cps.bureauveritas.com)

This report is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. Our report is limited to the test samples identified herein. The results set forth in this report are not necessarily indicative or representative of the statistical quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof. You shall have thirty days from receipt of this report to request additional testing of the samples or to notify us of any errors or omissions relating to our report, provided, however, such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



**TEST REPORT No.: (5214)227-1215**

## Test Result Summary

<b>EMISSION TEST</b>			
<b>Test requirement: FCC Part 15 - 2012</b>			
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:

Sample first submission date: August 18, 2014

Sample second submission date: August 26, 2014



**TEST REPORT No.: (5214)227-1215**

## 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	20-OCT-2014
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	20-OCT-2014
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	14-SEP-2014
OPEN AREA TEST SITE	BVCPS	N/A	N/A	11-SEP-2014
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	07-JUL-2015
COAXIAL CABLE	SUHNER	RG214	N/A	23-SEP-2014

**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)227-1215

### Equipment Under Test [EUT]

#### Description of Sample:

Product: 1:20 4w R/C CAR W/O BATTERY  
Model No.: BT681449  
Additional Model name: --  
Additional Model number: --  
Additional Model Information: --  
Power Supply: 3Vd.c. ("AA" size battery x 2)

#### Description of EUT Operation:

The Equipment Under Test (EUT) is a **BIG TREE INTERNATIONAL CO., LTD** of Radio Control toy. The transmitter is 2 buttons and operating at 27.15MHz. The EUT continues to transmit while buttons are being pressed, Modulation by IC, and type is pulse modulation.

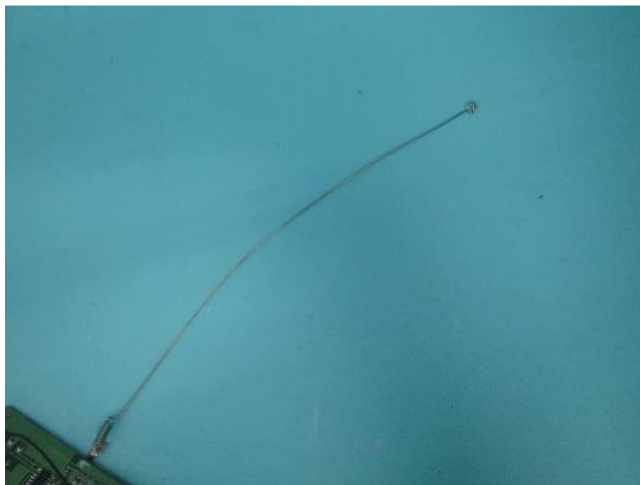
The transmitter has different control:

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

#### Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. The antenna consists of 22cm long wire. 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)227-1215**

**Test Results**

**Radiated Emissions (Fundamental)**

Test Requirement: FCC Part 15 Section 15.227  
 Test Method: ANSI C63.4  
 Test Date(s): 2014-08-26  
 Temperature: 34.0 °C  
 Humidity: 60.0 %  
 Atmospheric Pressure: 100.3 kPa  
 Mode of Operation: Transmission mode  
 Tested Voltage: 3Vd.c. ("AA" size battery x 2)

**Test Method:**

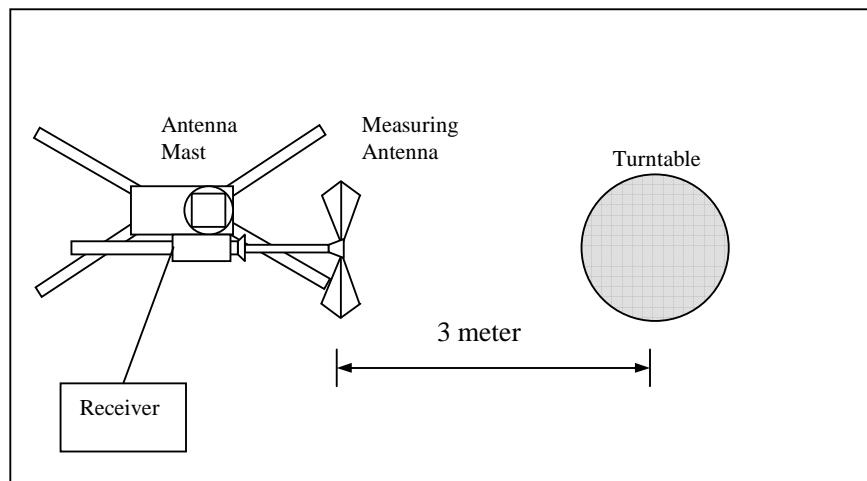
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

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)227-1215**

**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)
27.15	V/0°	11.1	59.8	100.0	40.2

**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)
27.15	V/0°	11.1	**56.3	80.0	23.7

# For pulse modulated devices and using measuring equipment employing a peak detection mode, properly adjusted for such factor as pulse desensitisation.

\*\*Duty Cycle Correction =  $20\log(0.667) = -3.5\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz  
VBW = 300KHz



## TEST REPORT No.: (5214)227-1215

### Radiated Emissions (9kHz – 1GHz)

Test Requirement: FCC Part 15 Section 15.209  
 Test Method: ANSI C63.4  
 Test Date(s): 2014-08-26  
 Temperature: 34.0 °C  
 Humidity: 60.0 %  
 Atmospheric Pressure: 100.3 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 [ $\mu$ 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)227-1215

### 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 (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
54.30	H	8.2	31.8	40.0	-8.2
81.45	H	8.1	28.3	40.0	-11.7
108.60	H	13.2	25.3	43.5	-18.2
135.75	H	13.3	25.2	43.5	-18.3
162.90	H	11.0	22.7	43.5	-20.8
190.05	H	10.6	22.4	43.5	-21.1
217.20	H	10.5	23.4	46.0	-22.6
244.35	H	13.3	26.3	46.0	-19.7
271.50	H	14.2	35.2	46.0	-10.8
298.65	H	14.8	31.9	46.0	-14.1
325.80	H	15.5	33.6	46.0	-12.4
352.95	H	17.2	33.9	46.0	-12.1

Frequency (MHz)	Polarity (H/V)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
54.30	V	8.2	32.1	40.0	-7.9
81.45	V	8.1	21.9	40.0	-18.1
108.60	V	13.2	25.0	43.5	-18.5
135.75	V	13.3	25.1	43.5	-18.4
162.90	V	11.0	22.9	43.5	-20.6
190.05	V	10.6	22.8	43.5	-20.7
217.20	V	10.5	23.6	46.0	-22.4
244.35	V	13.3	25.9	46.0	-20.1
271.50	V	14.2	33.4	46.0	-12.6
298.65	V	14.8	29.2	46.0	-16.8
325.80	V	15.5	29.8	46.0	-16.2
352.95	V	17.2	30.7	46.0	-15.3

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz  
VBW = 120KHz





## TEST REPORT No.: (5214)227-1215

### 26dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.227  
Test Method: ANSI C63.4  
Test Date(s): 2014-08-19  
Temperature: 30.0 °C  
Humidity: 82.0 %  
Atmospheric Pressure: 99.8 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]
27.15008	85.76	within 26.96 – 27.28



BUREAU VERITAS

# TEST REPORT No.: (5214)227-1215

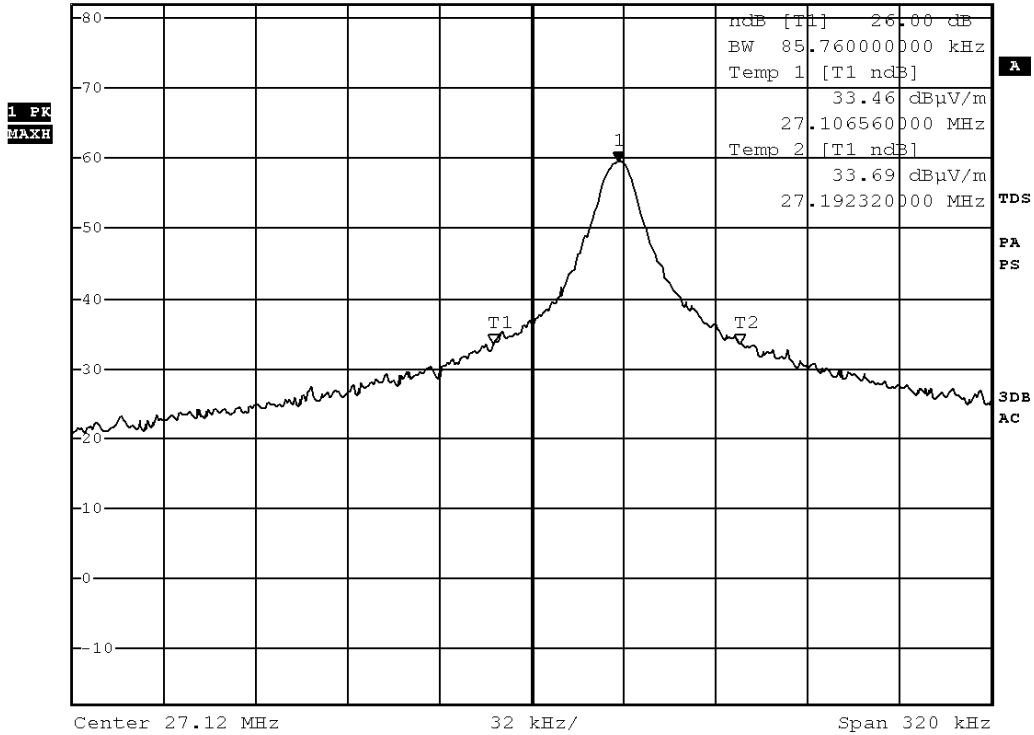
## Measurement Data

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



\*RBW 10 kHz    Marker 1 [T1 ]  
 VBW 30 kHz    59.68 dB $\mu$ V/m  
 \*SWT 5 ms    27.150080000 MHz

Ref 82 dB $\mu$ V/m    \*Att 10 dB



Date: 19.AUG.2014 14:16:52



## TEST REPORT No.: (5214)227-1215

### Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (18.6msec) 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 18.6msec = 66.7% duty cycle. Figure A through C shows the characteristics of the pulse train for one of these functions.

Remarks: -

Duty Cycle Correction =  $20\text{Log}(0.667) = -3.5\text{dB}$

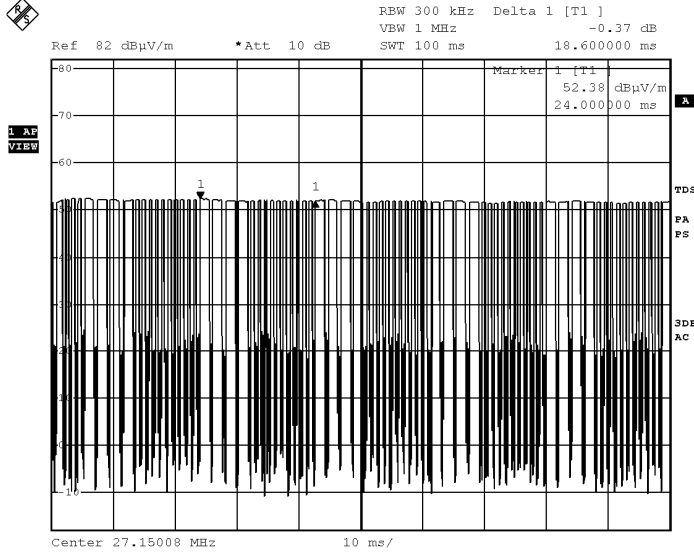
The following figures [Figure A to Figure C] show the characteristics of the pulse train for one of these functions.



BUREAU VERITAS

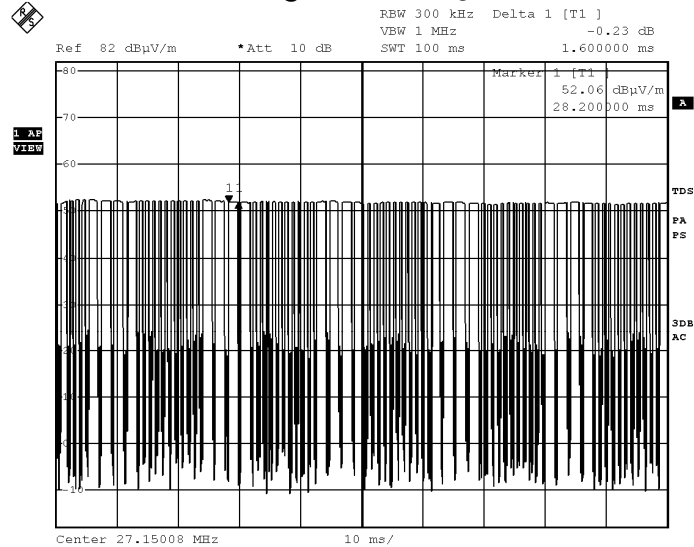
TEST REPORT No.: (5214)227-1215

Figure A [Pulse Train]



Date: 19.AUG.2014 14:17:59

Figure B [Long Pulse]



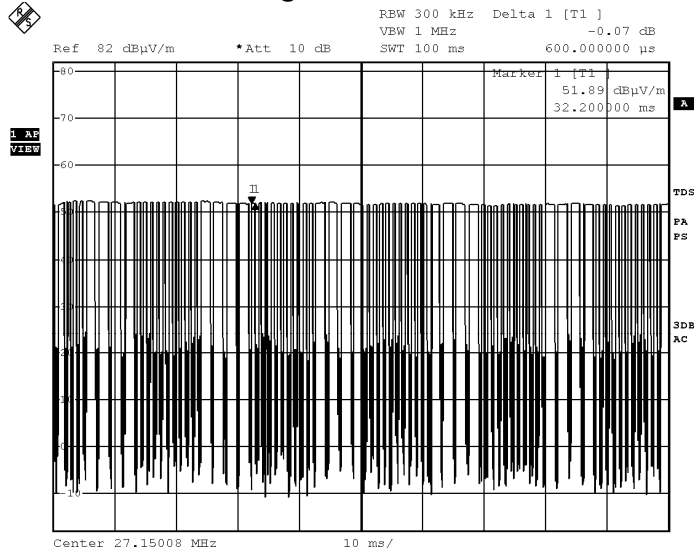
Date: 19.AUG.2014 14:18:24



BUREAU VERITAS

TEST REPORT No.: (5214)227-1215

Figure C [Short Pulse]



Date: 19.AUG.2014 14:18:39

**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**



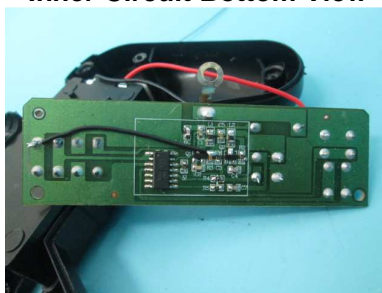
**Internal View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



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

**Measurement of Radiated Emission Test Set Up**



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