

TEST REPORT No.: (5214)020-1645

TEST REPORT

|                                                                                                            |                                                                                       |                                                                                      |                    |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------|
| To:                                                                                                        | NEW BRIGHT INDUSTRIAL CO., LTD                                                        | To:                                                                                  | -                  |
| Attn:                                                                                                      | Eric Kwok                                                                             | Attn:                                                                                | -                  |
| Address:                                                                                                   | 9/F., NEW BRIGHT BUILDING,<br>11 SHEUNG YUET ROAD, KOWLOON<br>BAY, KOWLOON, HONG KONG | Address:                                                                             | -                  |
| Fax:                                                                                                       | 852 27953665                                                                          | Fax:                                                                                 | -                  |
| E-mail:                                                                                                    | chkwok01@newbright.com                                                                | E-mail:                                                                              | -                  |
| Folder No.:                                                                                                | NBT-14JA129MTHS-B-A                                                                   |                                                                                      |                    |
| Factory Name:                                                                                              | NEW BRIGHT INDUSTRIAL CO., LTD                                                        |                                                                                      |                    |
| Location:                                                                                                  | 9/F., NEW BRIGHT BUILDING, 11 SHEUNG YUET ROAD,<br>KOWLOON BAY, KOWLOON, HONG KONG    |                                                                                      |                    |
| Product:                                                                                                   | Radio Control Toy Transmitter<br>MODEL: G6DG21H2-2                                    |                                                                                      |                    |
|                          |                                                                                       | Sample No:                                                                           | HK140114/020       |
|                                                                                                            |                                                                                       | Test date:                                                                           | January 22, 2014   |
|                                                                                                            |                                                                                       | Test Requested:                                                                      | FCC Part 15 – 2012 |
|                                                                                                            |                                                                                       | Test Method:                                                                         | ANSI C63.4 – 2009  |
|                                                                                                            |                                                                                       | FCC ID:                                                                              | G6DG21H2-2         |
| The results given in this report are related to the tested specimen of the described electrical apparatus. |                                                                                       |                                                                                      |                    |
| CONCLUSION: The submitted sample was found to <u>COMPLY</u> with requirement of FCC Part 15 Subpart C.     |                                                                                       |                                                                                      |                    |
| Authorized Signature:                                                                                      |                                                                                       |                                                                                      |                    |
|                         |                                                                                       |  |                    |
| Reviewed by: Keith Yeung                                                                                   |                                                                                       | Approved by: Steven Tsang                                                            |                    |
| Date: January 24, 2014                                                                                     |                                                                                       | Date: January 24, 2014                                                               |                    |

**BUREAU VERITAS HONG KONG LIMITED –**  
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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.



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## Test Result Summary

| EMISSION TEST                           |             |                                     |                          |
|-----------------------------------------|-------------|-------------------------------------|--------------------------|
| Test requirement: FCC Part 15 - 2012    |             |                                     |                          |
| Test Condition                          | Test Method | Test Result                         |                          |
|                                         |             | Pass                                | Failed                   |
| Radiated Emission Test,<br>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 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**

| <b>EQUIPMENT</b>        | <b>MANUFACTURER</b> | <b>MODEL NO.</b> | <b>SERIAL NO.</b> | <b>CALIBRATION DUE</b> |
|-------------------------|---------------------|------------------|-------------------|------------------------|
| EMI TEST RECEIVER       | R&S                 | ESCI             | 100379            | 28-JAN-2014            |
| SIGNAL ANALYER<br>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<br>SITE  | BVCPS               | N/A              | N/A               | 11-SEP-2014            |
| ANECHOIC CHAMBER        | ALBATROSS           | M-CDC            | 80374004499B      | 08-JUL-2014            |
| COAXIAL CABLE           | SUHNER              | RG214            | N/A               | 05-FEB-2014            |

#### **Remarks: -**

N/A: Not Applicable or Not Available

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

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## **Equipment Under Test [EUT]**

### **Description of Sample:**

Product: Radio Control Toy Transmitter  
Model No.: G6DG21H2-2  
Additional Model Name: --  
Additional Model Number: --  
Additional Model Information: --  
Power Supply: 3Vd.c. ("AA" size battery x 2)

### **Description of EUT Operation:**

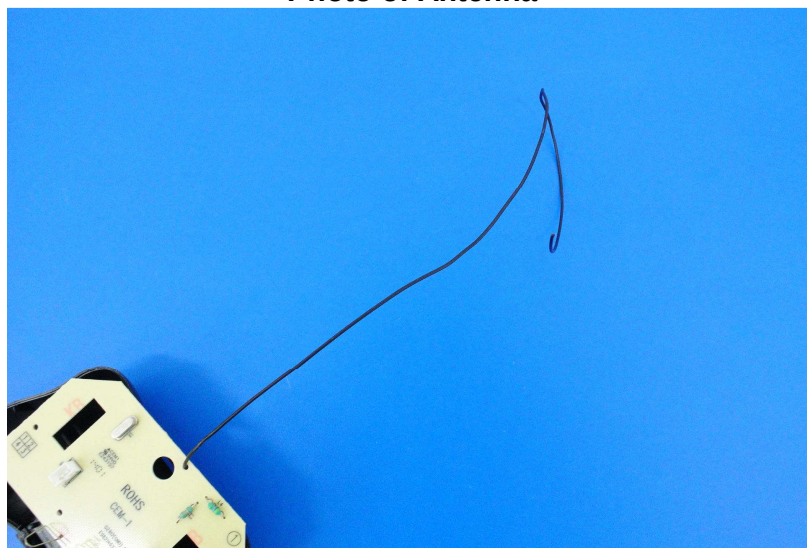
The Equipment Under Test (EUT) is a NEW BRIGHT INDUSTRIAL CO., LTD of Radio Control toy. It is 2 sticks, 2 buttons and operating at 27.147MHz transmitter. The EUT continues to transmit while sticks are being pushed or pulled, Modulation by IC, and type is pulse modulation. The transmitter has different control:

1. Left stick – control forward and backward
2. Right stick – control leftward and rightward
3. Left button – turn on or off the sounds
4. Right button – press to active the horn sound

### **Antenna Requirement (Section 15.203)**

The EUT is use of a permanently antenna. The antenna consists of 32cm 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)020-1645

### Test Results

#### Radiated Emissions (Fundamental)

Test Requirement: FCC Part 15 Section 15.227  
Test Method: ANSI C63.4  
Test Date(s): 2014-01-21  
Temperature: 14.0 °C  
Humidity: 35.0 %  
Atmospheric Pressure: 101.3 kPa  
Mode of Operation: Transmission mode  
Tested Voltage: 3Vd.c. ("AA" size battery x 2)

#### Test Method:

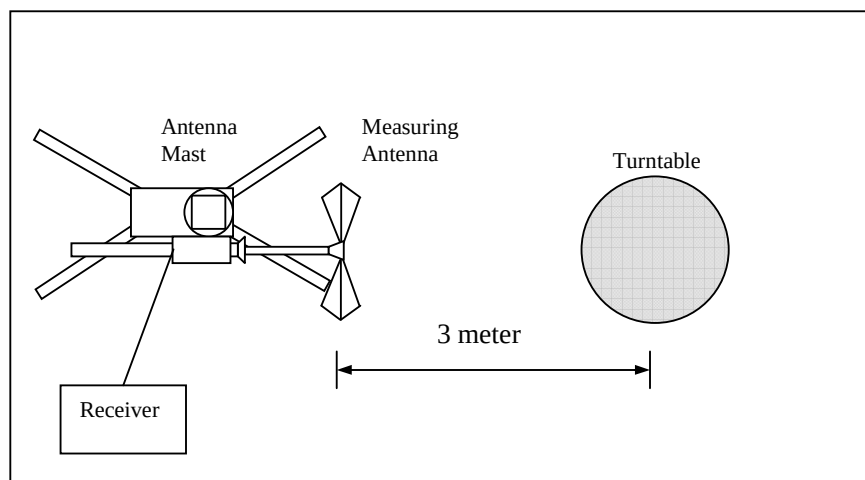
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

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 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 Fundamental<br>[MHz] | Field Strength of Fundamental Emission<br>[Peak]<br>[μV/m] | Field Strength of Fundamental Emission<br>[Average]<br>[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) |
|-----------------|---------------------------|--------------------------------------|-------------------------------|----------------------|-------------|
| 27.147          | V/0°                      | 11.0                                 | 55.5                          | 100.0                | -44.5       |

#### 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) |
|-----------------|---------------------------|--------------------------------------|-------------------------------|----------------------|-------------|
| 27.147          | V/0°                      | 11.0                                 | **35.5                        | 80.0                 | -44.5       |

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

\*\*Duty Cycle Correction =  $20\log(0.0464) = -26.7\text{dB}$

Therefore, -20dB is taken

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz  
VBW = 300KHz



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### Radiated Emissions (9kHz – 1GHz)

Test Requirement: FCC Part 15 Section 15.209  
Test Method: ANSI C63.4

Test Date(s): 2014-01-21  
Temperature: 14.0 °C  
Humidity: 35.0 %  
Atmospheric Pressure: 101.3 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<br>[MHz] | Quasi-Peak Limits<br>[μV/m] | Measurement Distance<br>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                         |



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### 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) |
|-----------------|----------------|--------------------------------------|-------------------------------|----------------------|-------------|
| 54.294          | H              | 12.2                                 | 32.1                          | 40.0                 | -7.9        |
| 81.441          | H              | 7.9                                  | 19.9                          | 40.0                 | -20.1       |
| 108.588         | H              | 12.3                                 | 24.5                          | 43.5                 | -19.0       |
| 135.735         | H              | 13.3                                 | 25.0                          | 43.5                 | -18.5       |
| 162.882         | H              | 11.5                                 | 24.1                          | 43.5                 | -19.4       |
| 190.029         | H              | 11.5                                 | 23.8                          | 43.5                 | -19.7       |
| 217.176         | H              | 13.0                                 | 25.3                          | 46.0                 | -20.7       |
| 244.323         | H              | 13.6                                 | 27.6                          | 46.0                 | -18.4       |
| 271.470         | H              | 14.1                                 | 26.0                          | 46.0                 | -20.0       |
| 298.617         | H              | 14.5                                 | 32.7                          | 46.0                 | -13.3       |

| 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) |
|-----------------|----------------|--------------------------------------|-------------------------------|----------------------|-------------|
| 54.294          | V              | 12.2                                 | 30.5                          | 40.0                 | -9.5        |
| 81.441          | V              | 7.9                                  | 19.3                          | 40.0                 | -20.7       |
| 108.588         | V              | 12.3                                 | 21.6                          | 43.5                 | -21.9       |
| 135.735         | V              | 13.3                                 | 25.6                          | 43.5                 | -17.9       |
| 162.882         | V              | 11.5                                 | 23.8                          | 43.5                 | -19.7       |
| 190.029         | V              | 11.5                                 | 22.5                          | 43.5                 | -21.0       |
| 217.176         | V              | 13.0                                 | 27.4                          | 46.0                 | -18.6       |
| 244.323         | V              | 13.6                                 | 28.5                          | 46.0                 | -17.5       |
| 271.470         | V              | 14.1                                 | 27.6                          | 46.0                 | -18.4       |
| 298.617         | V              | 14.5                                 | 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)020-1645

### 26dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.227  
Test Method: ANSI C63.4  
Test Date(s): 2014-01-21  
  
Temperature: 14.0 °C  
Humidity: 35.0 %  
Atmospheric Pressure: 101.3 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:

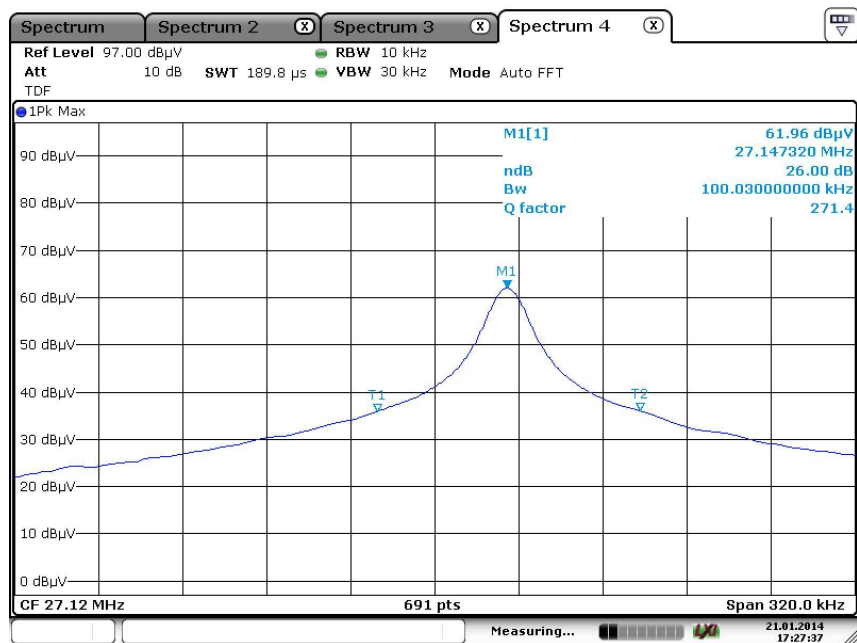
| Frequency<br>[MHz] | 26dB Bandwidth<br>[KHz] | Limits<br>[MHz]      |
|--------------------|-------------------------|----------------------|
| 27.14732           | 100.03                  | within 26.96 – 27.28 |



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### Measurement Data

Test Result of 26dB Bandwidth of Fundamental Emission: PASS



Date: 21.JAN.2014 17:27:37



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### Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (55.072msec) never exceeds a series of 1 long (623.2μsec), 2 middle (318.8μsec) and 9 short (144.9μsec) pulses. Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered  $(2 \times 318.8\mu\text{sec}) + (9 \times 144.9\mu\text{sec}) + 623.2\mu\text{sec}$  per 55.072msec = 4.64% duty cycle. Figure A to Figure D show the characteristics of the pulse train for one of these functions.

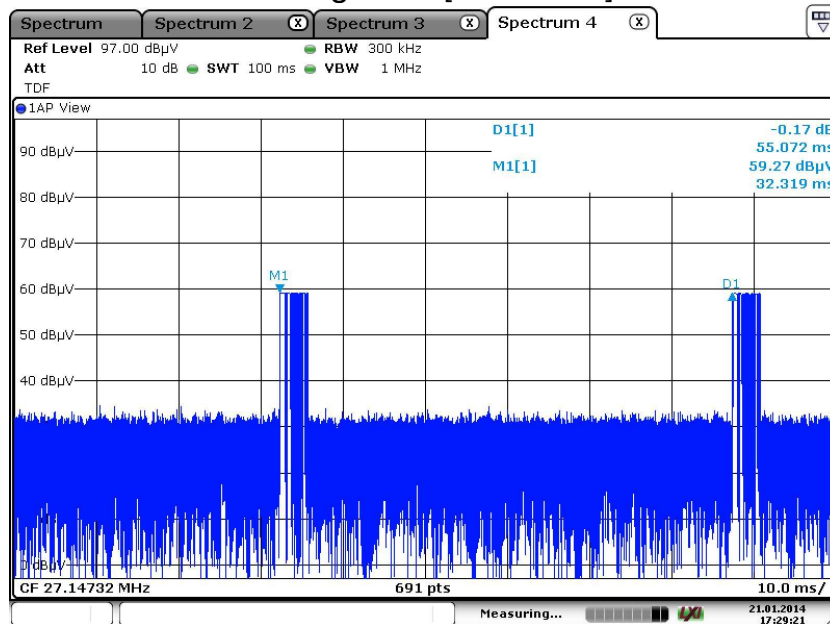
Remarks: -

Duty Cycle Correction =  $20\text{Log}(0.464) = -26.7\text{dB}$   
Therefore, -20dB is taken

The following figures (Figure A to Figure D) show the characteristics of the pulse train for one of these functions.

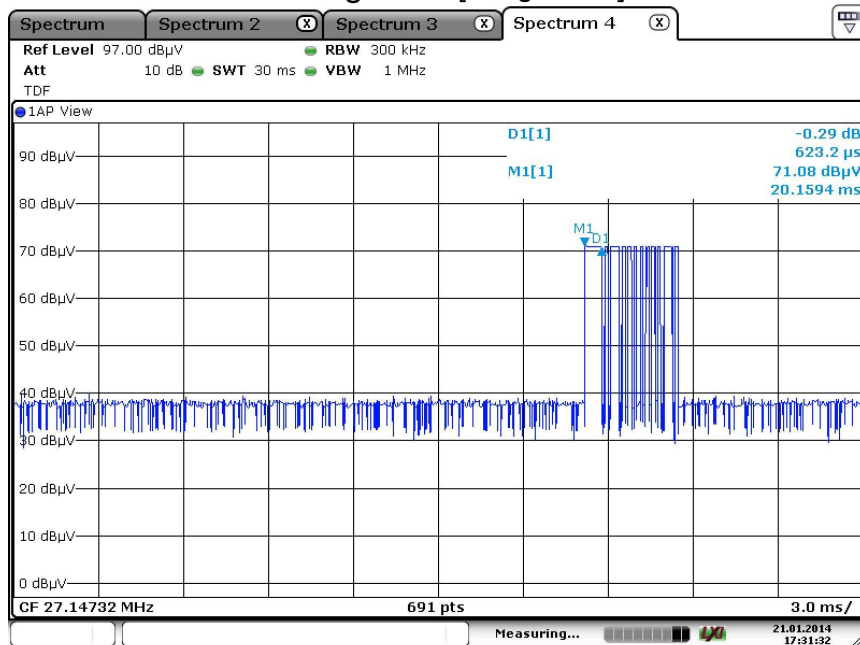
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**Figure A [Pulse Train]**



Date: 21.JAN.2014 17:29:21

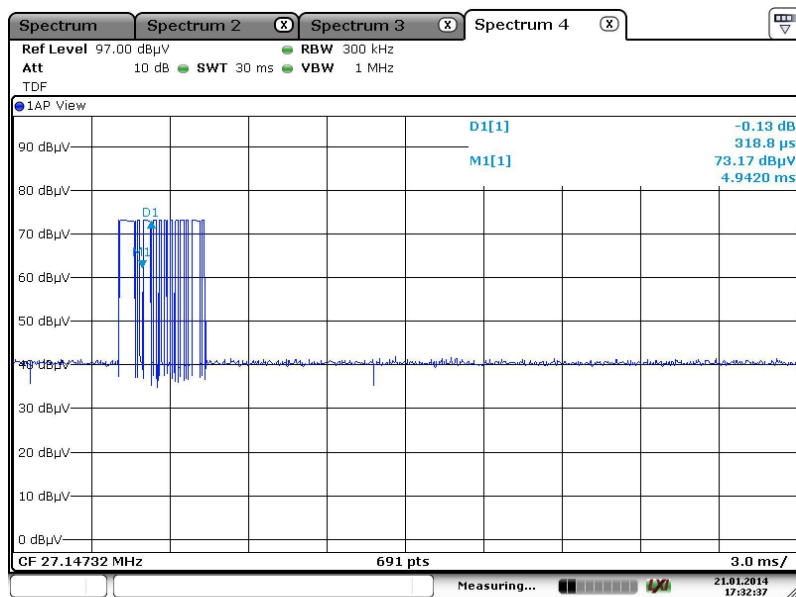
**Figure B [Long Pulse]**



Date: 21.JAN.2014 17:31:32

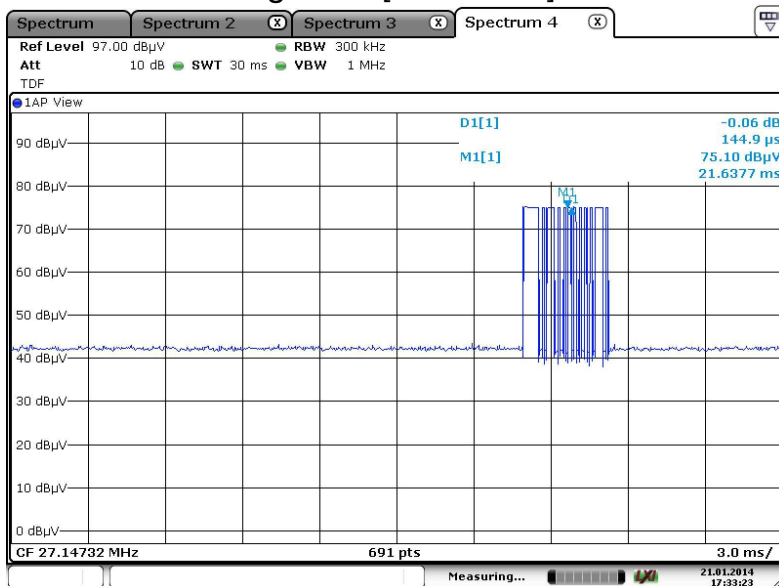
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**Figure C [Short Pulse]**



Date: 21.JAN.2014 17:32:37

**Figure D [Short Pulse]**



Date: 21.JAN.2014 17:33:23

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**Photographs of EUT**

**Front View of the product**



**Rear View of the product**



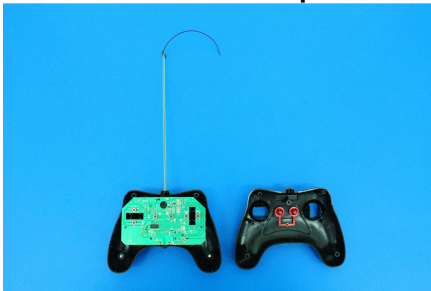
**Battery compartment**



**Battery Cover**



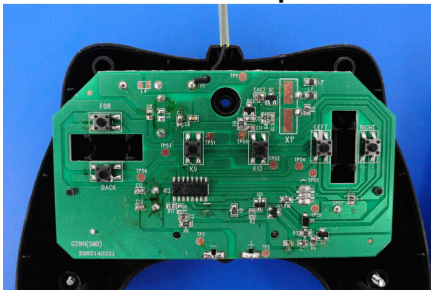
**Internal View of the product**



**Internal View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



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**Measurement of Radiated Emission Test Set Up**



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