




TEST REPORT No.: (5210)109-0986 (C)

TEST REPORT

To:	MAC DUE INTERNATIONAL LTD.	To:	-
Attn:	Linda Lei	Attn:	-
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E-mail:	<a href="mailto:linda@innovation-hk.com">linda@innovation-hk.com</a>	E-mail:	-
Folder No.:	BVCK10MY077MTHS-B		
Factory name:	--		
Location:	--		
Product:	1:20 Cyclone (49MHz) Model: KD0733		
		Sample No:	(5210)110-0574
		Test date:	May 1, 2010
		Test Requested:	FCC Part 15 - 2008
		Test Method:	ANSI C63.4 - 2003
		FCC ID:	YB91-20R49MHZ
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: May 26, 2010		Date: May 26, 2010	

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.



## TEST REPORT No.: (5210)109-0986 (C)

### Location of the test laboratory

Radiated and Conducted emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. 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

### List of measuring equipment

#### **Radiated Emission**

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DUE
EMI TEST RECEIVER	R&S	ESCI	100379	24-AUG-2010
LOOP ANTENNA	ETS-LINDGREN	6502	00102266	12-MAY-2010
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	31-MAY-2010
OPEN AREA TEST SITE	BVCPS	N/A	N/A	03-JULY-2010
ANECHOIC CHAMBER	ALBATROSS	M-CDC	80374004499B	07-JULY-2010
COAXIAL CABLE	SUHNER	N/A	N/A	11-MAY-2010
SPECTRUM ANALYZER	ADVANTEST	R3127	111000909	17-DEC-2010

#### **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:**

Model Name: 1:20 Cyclone  
Model Number: KD0733  
Trade Name: Fast lane RC / Motorma RC  
Additional 1:20 BUGGY / 1:18 Formula / 1:16 Short Course / 1:20 Super Off  
Model Name: Road  
Additional KD0733A, KD0733B, KD0733C, MDI1042 / MDI1058, MDI1059,  
Model Number: MDI1060 / MDI1061, MDI1062, MDI1063 / MDI1064, MDI1065,  
MDI1066 / 496776  
Additional Declare the Circuit, PCB layout and Electrical parts of the products are  
Model identical to the basic model. Except the shape and decoration of shell  
information: is different.  
Rating: 3Vd.c ("AA" size battery x 2)

**Description of EUT Operation:**

The Equipment Under Test (EUT) is a Mac Due International Ltd. of Radio Control toy. It is a 2 sticks transmitter and operating at 49.8598MHz. The EUT continues to transmit when sticks is pressed, Modulation by IC, and type is pulse modulation.

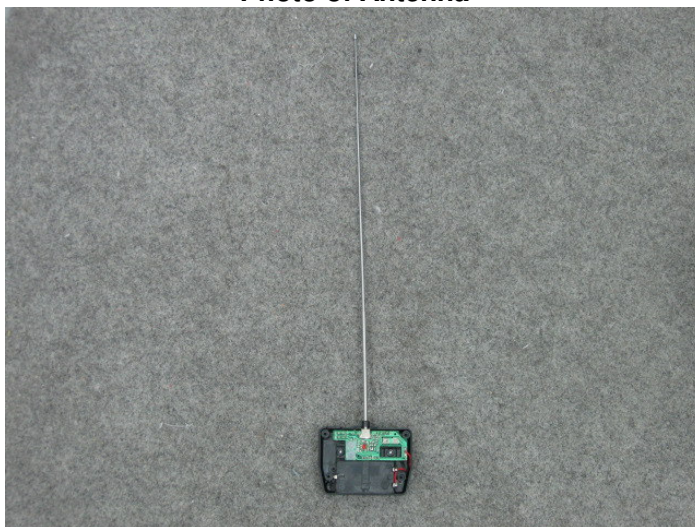
The transmitter has different control:

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

**Antenna Requirement (Section 15.203)**

The EUT is use of a permanently antenna. The antenna consists of 43.0cm long metal antenna. 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**



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### Test Results

#### Radiated Emissions (Fundamental)

Test Requirement: FCC Part 15 Section 15.235  
Test Method: ANSI C63.4  
Test Date(s): 2010-05-01  
Temperature: 25.0 °C  
Humidity: 63.0 %  
Atmospheric Pressure: 101.8 kPa  
Mode of Operation: Transmission mode  
Tested Voltage: 3Vd.c. ("AA" size battery x 2)

#### Test Method:

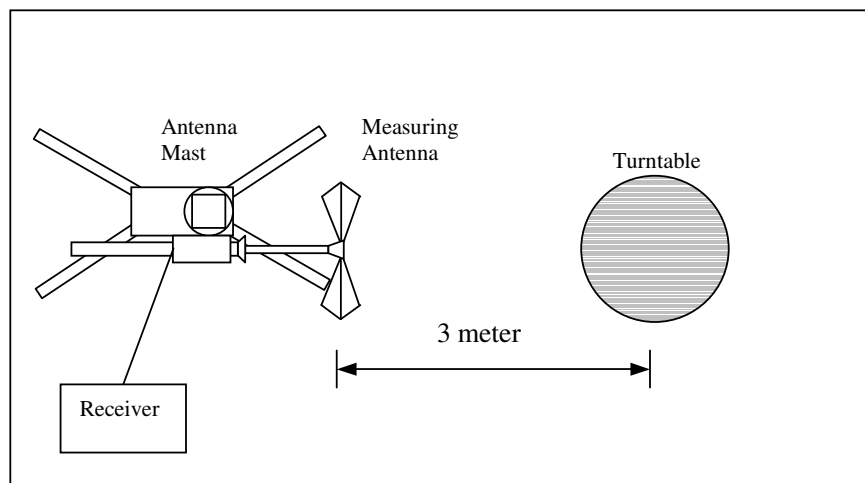
Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003.

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







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### Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.235]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [μV/m]	Field Strength of Fundamental Emission [Average] [μV/m]
49.82 – 49.90	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)
49.86	V	9.7	77.1	100	-22.9

#### 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)
49.86	V	9.7	**72.9	80	-7.1

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

\*\*Duty Cycle Correction =  $20\log(0.615) = -4.2\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz  
VBW = 300KHz



## TEST REPORT No.: (5210)109-0986 (C)

### Radiated Emissions (9kHz – 1GHz)

Test Requirement: FCC Part 15 Section 15.209  
 Test Method: ANSI C63.4  
 Test Date(s): 2010-05-01  
 Temperature: 25.0 °C  
 Humidity: 63.0 %  
 Atmospheric Pressure: 101.8 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 [μV/m]
1.705-30	300
30-88	100
88-216	150
216-960	200
Above 960	500

### 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)
99.72	H	10.7	28.0	43.5	-15.5
149.58	V	10.9	28.4	43.5	-15.1
199.44	V	11.6	31.7	43.5	-11.8
249.30	H	13.8	26.1	46.0	-19.9
299.16	H	15.0	31.1	46.0	-14.9
349.02	V	16.8	30.0	46.0	-16.0
398.88	V	18.1	36.1	46.0	-9.9
448.74	V	19.0	28.5	46.0	-17.5
498.60	H	19.9	30.3	46.0	-15.7
548.46	H	20.9	31.8	46.0	-14.2

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz  
 VBW = 120KHz



## TEST REPORT No.: (5210)109-0986 (C)

### 26dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.235  
Test Method: ANSI C63.4:2003 (Section 13.1.7)  
Test Date(s): 2010-05-01  
Temperature: 25.0 °C  
Humidity: 63.0 %  
Atmospheric Pressure: 101.8 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:

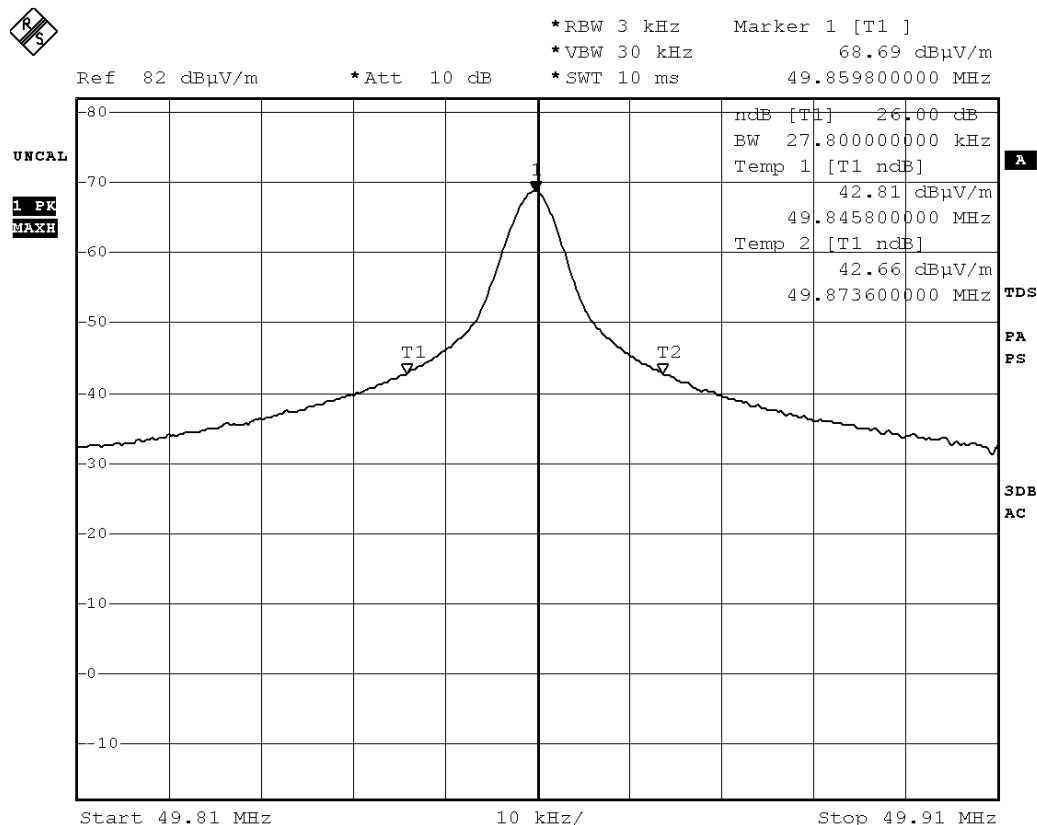
Frequency [MHz]	26dB Bandwidth [KHz]	Limits [MHz]
49.8598	27.8	within 49.82-49.90



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## Measurement Data :

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



Date: 1.MAY.2010 12:12:08





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### Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (17.9msec) never exceeds a series of 4 long (1.5msec) and 10 short (0.5msec) pulses. Assuming any combination of short or long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered  $(4 \times 1.5\text{msec}) + (10 \times 0.5\text{msec})$  per 17.9msec = 61.5% duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

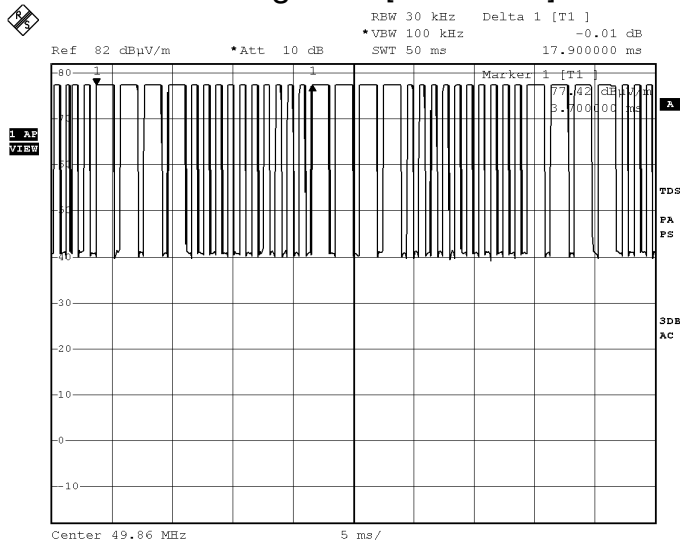
Remarks:

Duty Cycle Correction =  $20\text{Log}(0.615) = -4.2\text{dB}$

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

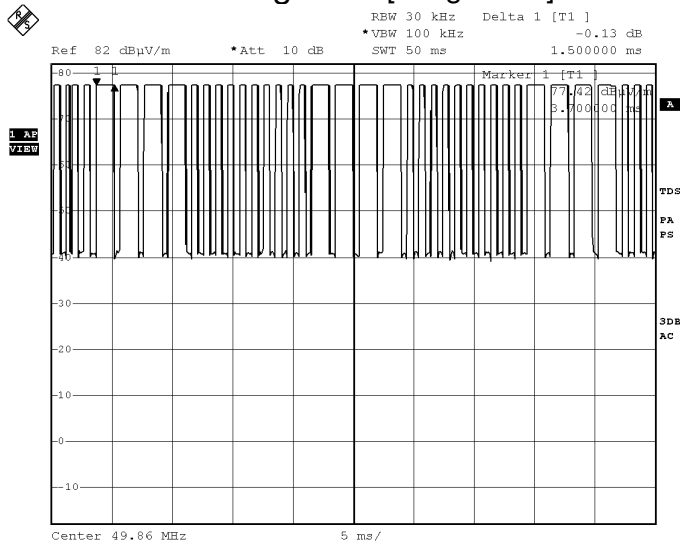
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**Figure A [Pulse Train]**



Date: 1.MAY.2010 12:14:28

**Figure B [Long Pulse]**

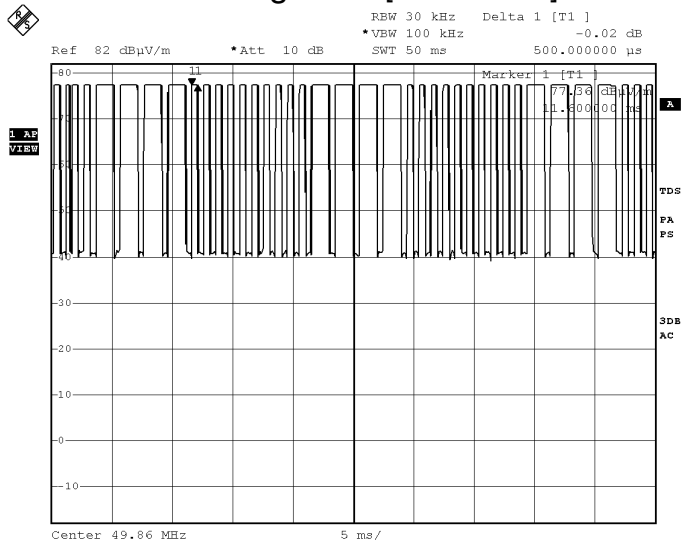


Date: 1.MAY.2010 12:14:46



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### Figure C [Short Pulse]



Date: 1.MAY.2010 12:15:11

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**Photographs of EUT**

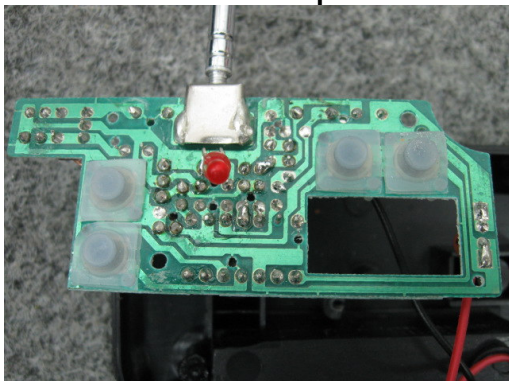
**Front View of the product**



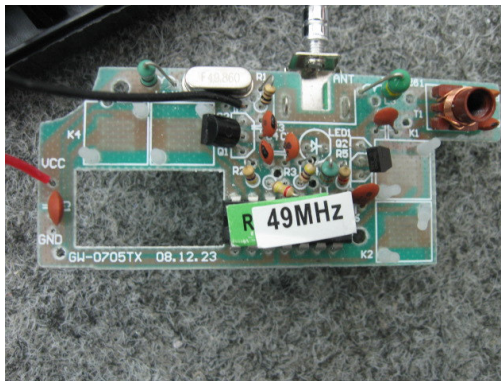
**Rear View of the product**



**Inner Circuit Top View**



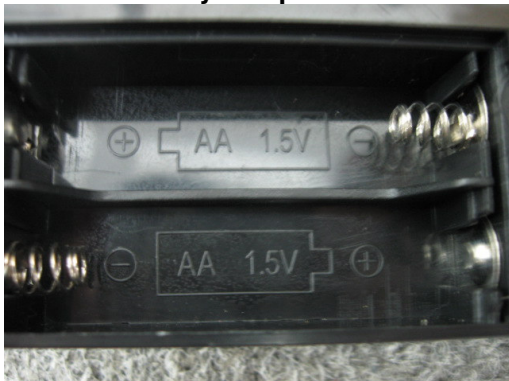
**Inner Circuit Bottom View**





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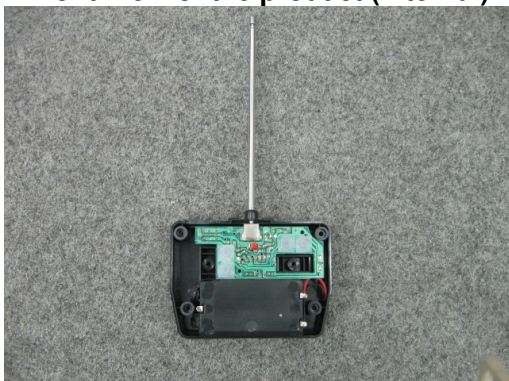
**Battery compartment**



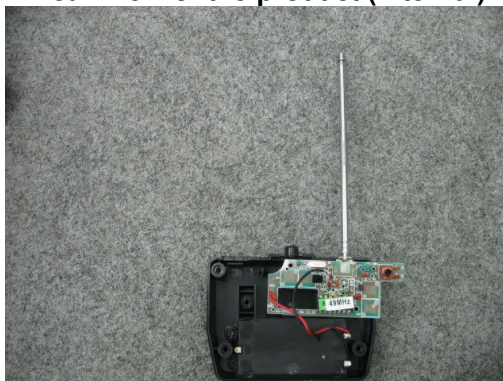
**Battery Cover**



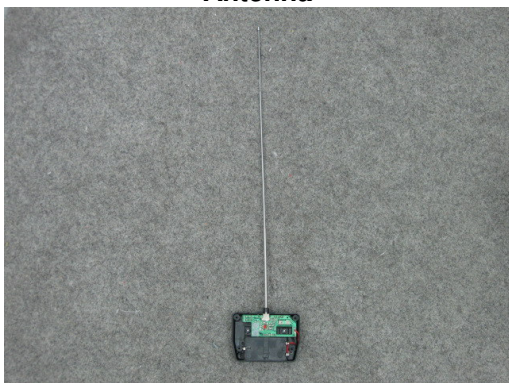
**Front View of the product (Internal)**



**Rear View of the product (Internal)**



**Antenna**



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**Measurement of Radiated Emission Test Set Up**



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