



BUREAU  
VERITAS

TEST REPORT N°: (5209)226-0736

## TEST REPORT

To:	NKOK, INC.	To:	-
Attn:	Kohsche Koh	Attn:	-
Address:	13368 E Valley Blvd G2 City of Industry CA 91746	Address:	-
Fax:	626-330-1199	Fax:	-
E-mail:	<a href="mailto:kohsche@nkok.com">kohsche@nkok.com</a>	E-mail:	-
Offer No.:	BVCK 09AU157MTHS-B		

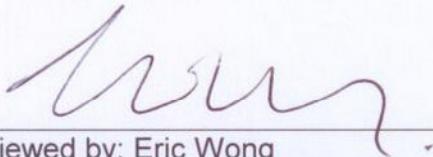
Factory name:	--
Location:	--
Product:	R/C Halo Vehicles MODEL: 712

	Sample No:	(5209)226-0736
	Test date:	August 25, 2009 to September 15, 2009
	Test Requested:	FCC Part 15 - 2008
	Test Method:	ANSI C63.4 - 2003
	FCC ID:	XQPXH090949TX

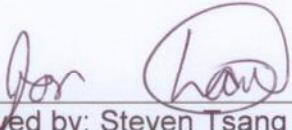
The results given in this report are related to the tested specimen of the described electrical apparatus.

CONCLUSION: The submitted sample was found to COMPLY with requirement of FCC Part 15 Subpart C.

Authorized Signature:



Reviewed by: Eric Wong  
Date: September 17, 2009



Approved by: Steven Tsang  
Date: September 17, 2009

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### Location of the test site

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	ESCS30	830986/030	18-SEP-2009
BILOG ANTENNA	SCHAFFNER	CBL6112D	25229	30-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	02-DEC-2009

#### Conducted Emission

EQUIPMENT	MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATION DUE
EMI TEST RECEIVER	R&S	ESCS30	830986/030	18-SEP-2009
LISN	R&S	ENV216	100024	25-MAR-2010

#### 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 N°: (5209)226-0736

### Equipment Under Test [EUT]

#### Description of Sample:

Model Name: R/C Halo Vehicles  
Model Number: 712  
Rating: 3Vd.c ("AA" size battery x 2)

#### Description of EUT Operation:

The Equipment Under Test (EUT) is a NKOK, INC. of Radio Control toy. The transmitter is 4 buttons transmitter and operating at 49.86MHz. The EUT continues to transmit buttons is being pressed, Modulation by IC, and type is pulse modulation.

X, Y, Z orthogonal plane are pre-tested, Y-plane is the worst one and final test are carried on this plane.

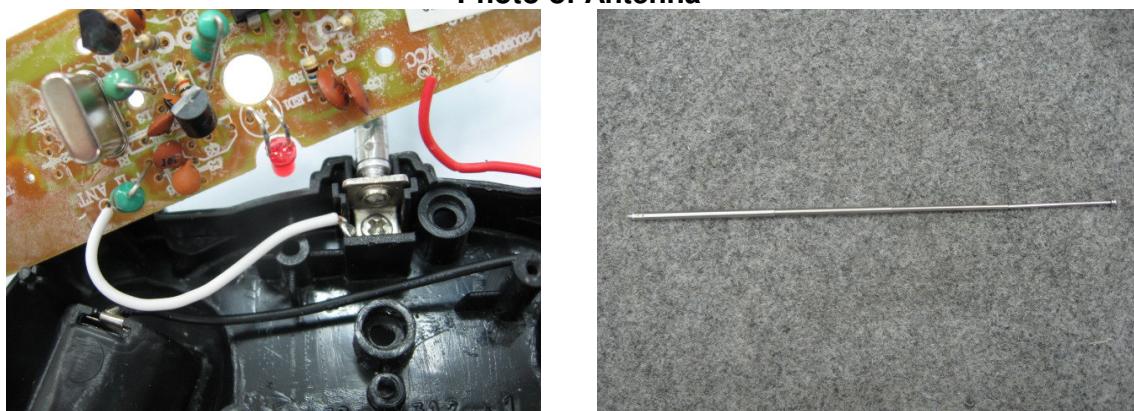
The transmitter has different control:

1. Left button – left wheel control
2. Right button – right wheel control
3. Forward button – Forward control
4. Backward button – Backward control

#### Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. The antenna consists of 26.0cm long metal antenna. The antenna is not replaceable or user serviceable and the antenna connector is custom-made and not be able to found in the market. It also cannot be replaced with other antenna other then the one bundled inside the package. The requirement of S15.203 are met. There are no deviations or exceptions to the specifications.

Photo of Antenna





## TEST REPORT N°: (5209)226-0736

### Radiated Emissions (Fundamental)

Test Requirement: FCC Part 15 Section 15.235

Test Method: ANSI C63.4

Test Date(s): 2009-08-27

Mode of Operation: Transmission mode

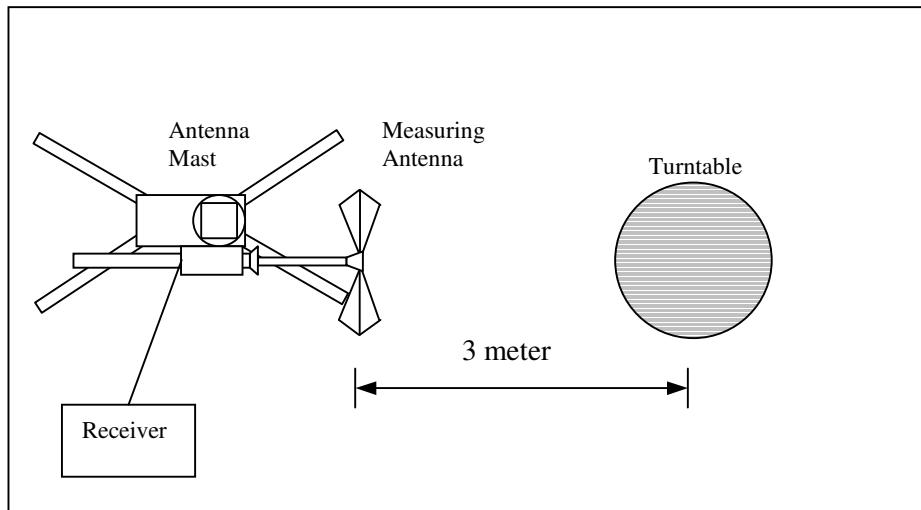
### Test Procedure:

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 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.

### Test Setup: Open Area Test Site





## TEST REPORT N°: (5209)226-0736

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

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [ $\mu$ V/m]	Field Strength of Fundamental Emission [Average] [ $\mu$ V/m]
49.82 – 49.90	100,000 (100 dB $\mu$ V/m)	10,000 (80 dB $\mu$ V/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 (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
49.86	H	9.6	58.4	100	-41.6

#### Detection mode: # Average

Frequency (MHz)	Polarity (H/V) and degree	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dB $\mu$ V/m)	Limit at 3m (dB $\mu$ V/m)	Margin (dB)
49.86	H	9.6	**54.2	80	-25.8

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

\*\*Duty Cycle Correction =  $20\log(0.617) = -4.2\text{dB}$

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 100KHz  
VBW = 300KHz



## TEST REPORT N°: (5209)226-0736

### Radiated Emissions (9kHz – 1GHz)

Test Requirement: FCC Part 15 Section 15.209

Test Method: ANSI C63.4

Test Date(s): 2009-08-27

Mode of Operation: **Transmission mode**

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

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu$ V/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 ( $\text{dB}\mu\text{V/m}$ )	Limit at 3m ( $\text{dB}\mu\text{V/m}$ )	Margin (dB)
99.72	H	10.7	29.4	43.5	-14.1
149.58	H	10.9	24.0	43.5	-19.5
199.44	H	11.6	26.8	43.5	-16.7
249.30	H	13.7	26.7	46.0	-19.3
299.16	H	15.0	31.4	46.0	-14.6
349.02	H	16.8	31.2	46.0	-14.8
398.88	V	18.1	33.6	46.0	-12.4
448.74	V	19.0	32.6	46.0	-13.4
498.60	V	19.9	32.5	46.0	-13.5
548.46	H	21.0	32.0	46.0	-14.0

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz  
VBW = 120KHz

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## TEST REPORT N°: (5209)226-0736

### 26dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.235  
Test Method: ANSI C63.4:2003 (Section 13.1.7)  
Test Date: 2009-09-15  
Mode of Operation: Transmission mode

#### 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]
49.8601	73.9	within 49.82-49.90

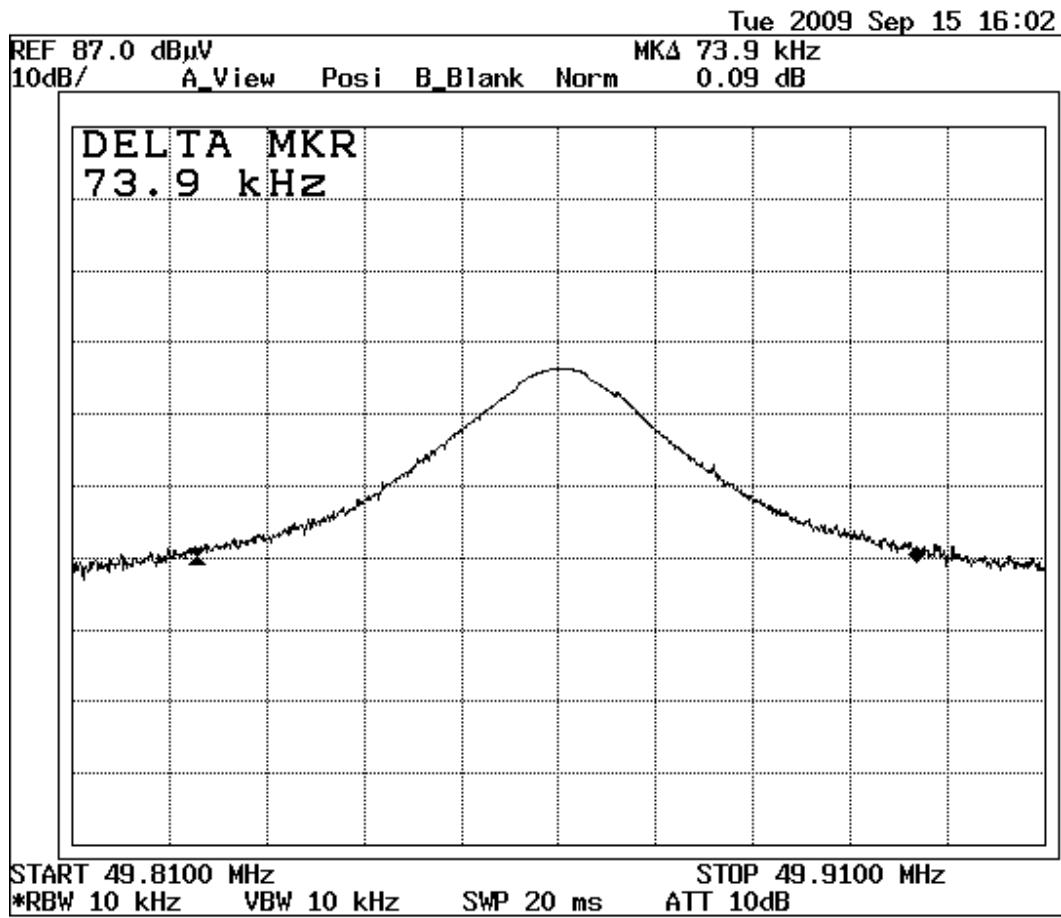


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### Measurement Data :

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



XdB Down		
1	XdB Down	
2	XdB Left	
3	XdB Right	
4	MKR Read	
DLT	LFT	RHT
5	Cont Down	
ON	OFF	



## TEST REPORT N°: (5209)226-0736

### Duty Cycle Correction During 100msec:

Each function key sends a different series of characters, but each packet period (17.5msec) never exceeds a series of 4 long (1.45msec) and 10 short (0.5msec) pulses. Assuming any combination of short and long pulses maybe obtained due to encoding the worst case transmit duty cycle would be considered  $(4 \times 1.45\text{msec}) + (10 \times 0.5\text{msec}) \text{ per } 17.5\text{msec} = 61.7\% \text{ duty cycle}$ . Figure A through C shows the characteristics of the pulse train for one of these functions.

Remarks:

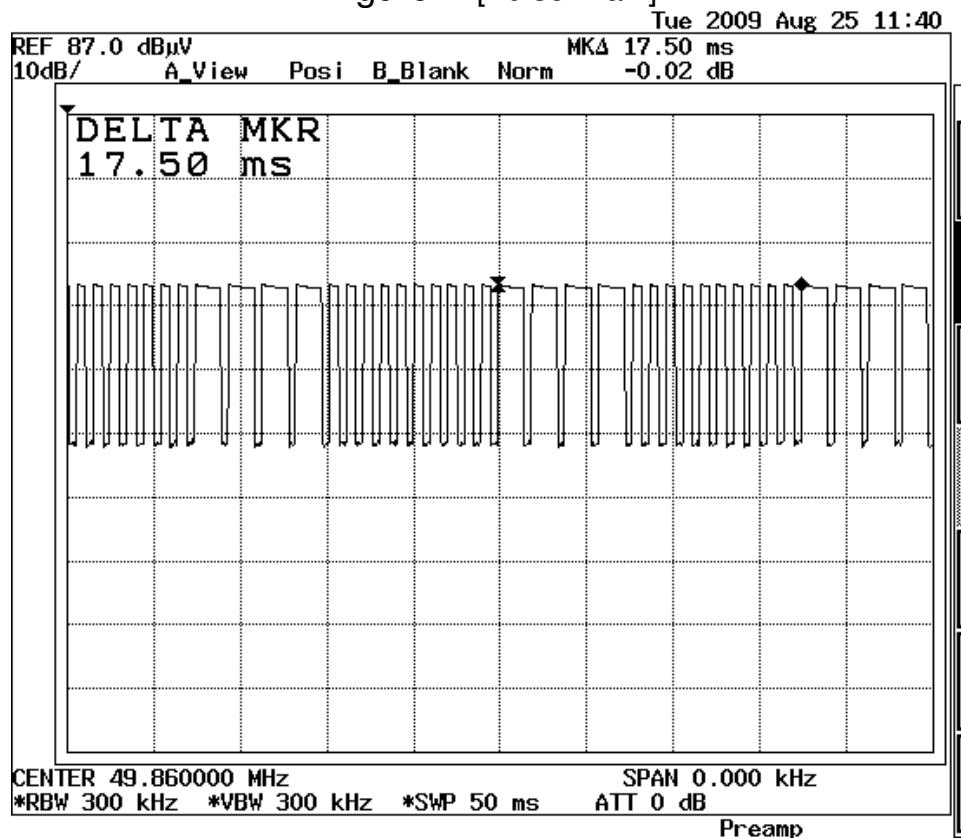
Duty Cycle Correction =  $20\text{Log}(0.617) = -4.2\text{dB}$

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]



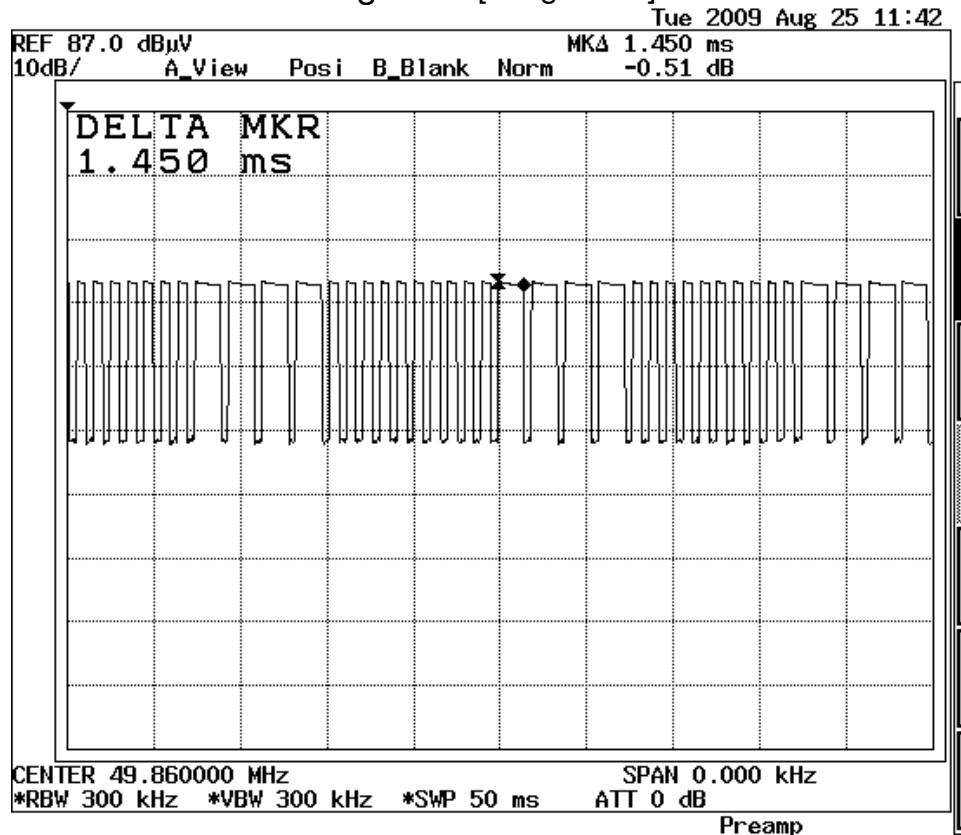
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Figure B [Long Pulse]



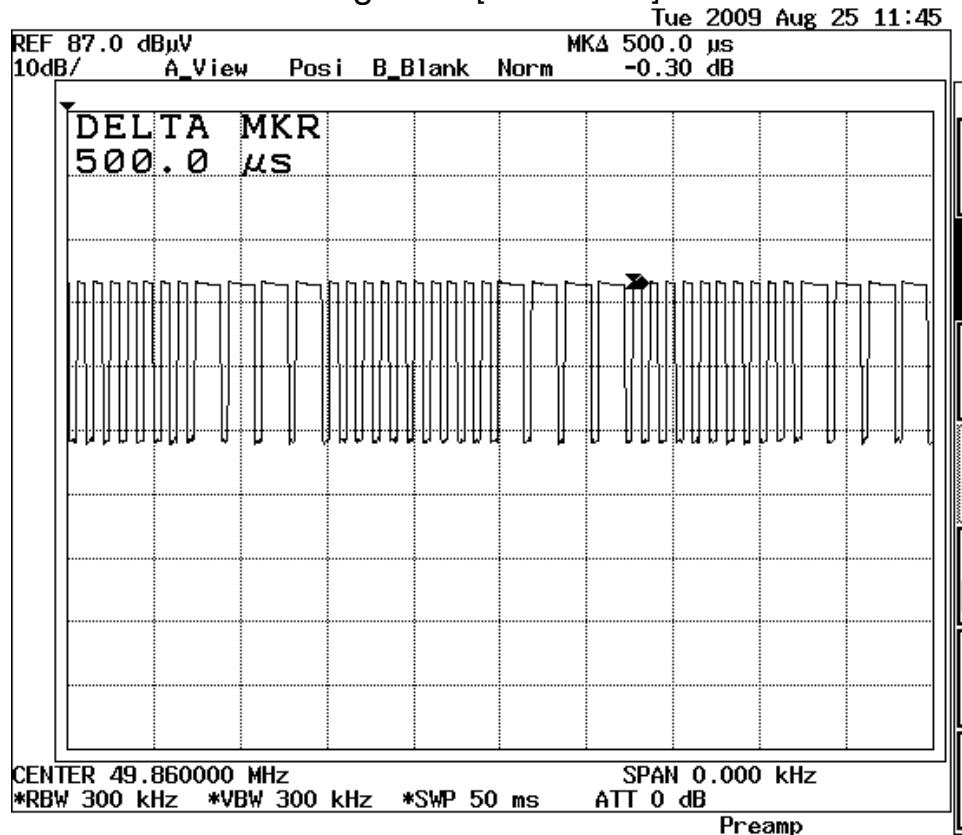
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Figure C [Short Pulse]



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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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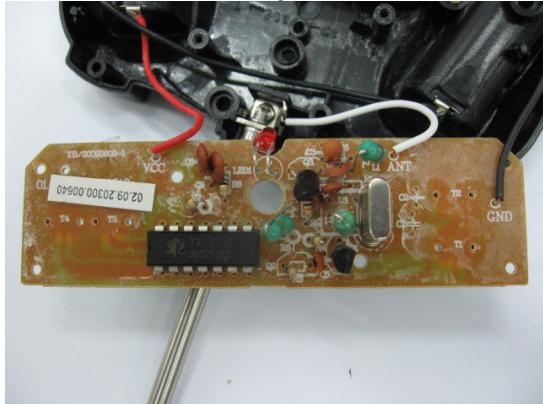
**Battery compartment**



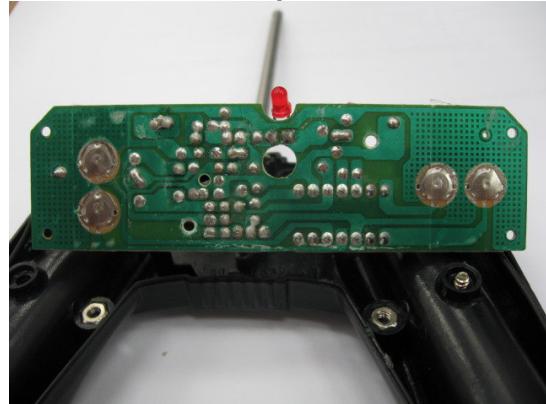
**Battery Cover**



**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 \*\*\*\*\*

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