



STC Test Report

Date : 2006-07-18

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No. : HM156864

Applicant:

Play-It Incorporated
162 Rhode Island Avenue,
Newport, RI 02840,
USA

Description of Samples:

Model name: PLAY-IT online controller
Model no.: 888
Brand name: PLAY-IT
FCC ID: UEF92443417171275

Date Samples Received: 2006-06-17

Date Tested: 2006-26 to 2006-07-15

Investigation Requested: FCC Part 15 Subpart C

Conclusions:

The submitted product was deemed to have COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks:

TSANG Chi Ho, Steven, EMD

For and on behalf of

The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Ltd.

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List of Measurement Equipment

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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Applicant Details

Applicant

Play-It Incorporated
162 Rhode Island Avenue,
Newport, RI 02840,
USA

HKSTC Code Number for Applicant

Manufacturer

Herald Metal & Plastic Works Ltd.
1/F Pat Tat Ind. Bldg.,
1, Pat Tat St., Sanpokong, Kln., H.K.

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1.3 Equipment Under Test [EUT]

Description of Sample

Product: PLAY-IT online controller
Manufacturer: Herald Metal & Plastic Works Ltd.
Brand Name: PLAY-IT
Model Number: 888
Rating: 4.5Vd.c. ("AA" size battery x 3)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Play-It Incorporated, PLAY-IT online controller. The transmitter is a 4 button transmitter. The EUT continues to transmit while button is being pressed, Modulation by Data Code type is pulse modulation.

1.4 Date of Order

2006-06-17

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2006-26 to 2006-07-15

1.7 Country of Origin

China

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2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 2005 and ANSI C63.4:2003 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.231a	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.209	ANSI C63.4:2003	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

Test Requirement: FCC 47CFR 15.231a

Test Method: ANSI C63.4:2003

Test Date: 2006-07-14

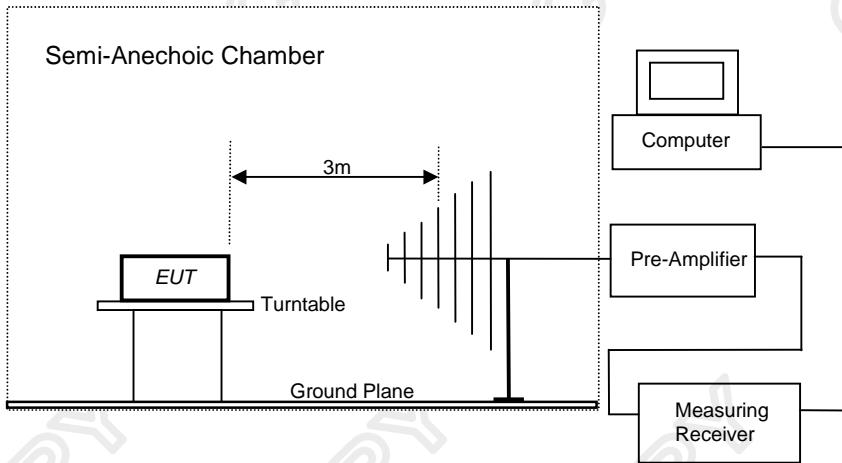
Mode of Operation: Tx mode

Test Method:

The sample was placed 0.8m above the ground plane of **semi-anechoic chamber***. Measurements in both horizontal and vertical polarities were performed. 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, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*: Semi-anechoic chamber located on the G/F of HKSTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.231a]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [μ V/m]	Field Strength of Spurious Emission [Average] [μ V/m]
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750 *	125 to 375 *
174-260	3,750	375
260-470	3,750 to 12,500 *	375 to 1,250 *
Above 470	12,500	1,250

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, μ V/m at 3 meters = $56.81818(F) - 6136.3636$; for the band 260-470 MHz, μ V/m at 3 meters = $41.6667(F) - 7083.3333$. The maximum permissible unwanted emission level is 20dB below the maximum permitted fundamental level.

Results:

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
315.00	58.0	15.6	73.6	4786.3	60,416.8	Horizontal
630.00	36.1	22.8	58.9	881.049	6,041.7	Horizontal
945.00	28.4	25.7	54.1	506.991	6,041.7	Horizontal

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
1260.00	< 1.0	32.2	< 33.2	< 45.7	6,041.7	Vertical
+ 1575.00	< 1.0	38.8	< 39.8	< 97.7	5,000.0	Vertical
1890.00	< 1.0	17.4	< 18.4	< 8.3	6,041.7	Vertical
+ 2205.00	< 1.0	17.2	< 18.2	< 8.1	5,000.0	Vertical
2520.00	< 1.0	18.8	< 19.8	< 9.8	6,041.7	Vertical
+ 2835.00	< 1.0	19.7	< 20.7	< 10.8	5,000.0	Vertical
3150.00	< 1.0	20.6	< 21.6	< 12.0	6,041.7	Vertical

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Results:

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
315.00	49.2	15.6	64.8	1737.8	60,416.8	Horizontal
630.00	27.3	22.8	50.1	319.89	6,041.7	Horizontal
945.00	19.6	25.7	45.3	184.077	6,041.7	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
1260.00	< 1.0	32.2	< 33.2	< 45.7	6,041.7	Vertical
+ 1575.00	< 1.0	38.8	< 39.8	< 97.7	5,000.0	Vertical
1890.00	< 1.0	17.4	< 18.4	< 8.3	6,041.7	Vertical
+ 2205.00	< 1.0	17.2	< 18.2	< 8.1	5,000.0	Vertical
2520.00	< 1.0	18.8	< 19.8	< 9.8	6,041.7	Vertical
+ 2835.00	< 1.0	19.7	< 20.7	< 10.8	5,000.0	Vertical
3150.00	< 1.0	20.6	< 21.6	< 12.0	6,041.7	Vertical

Remarks:

*: Adjusted by Duty Cycle = -8dB

FCC Limit for Average Measurement = $41.6667(315\text{MHz})-7083.3333=6,041.6772\mu\text{V/m}$

+: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 were not adjusted for averaging and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz $\pm 4.1\text{dB}$

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Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results:

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level . @3m dB V/m	Limit . @3m dB V/m	Level . @3m V/m	Limit . @3m V/m
EMISSIONS DETECTED ARE MORE THAN 20dB BELOW THE FCC LIMITS					

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty: 30MHz to 1GHz ± 4.1 dB

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3.1.1 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement:	FCC 47CFR 15.207
Test Method:	ANSI C63.4:2003
Test Date:	N/A
Mode of Operation:	N/A

Results: N/A

The EUT is operated by a single source of internal battery power [located in the battery compartment], therefore power line conducted emission was deemed unnecessary.

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3.2 20dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.231a
Test Method: ANSI C63.4:2003 (Section 13.1.7)
Test Date: 2006-07-15
Mode of Operation: On 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.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.



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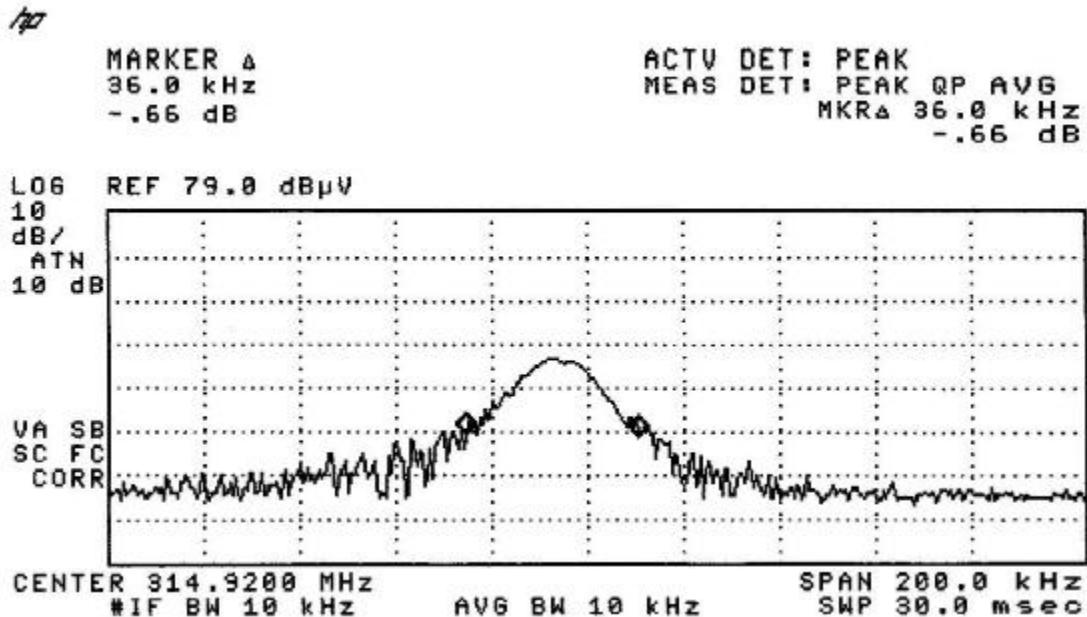
No. : HM156864

Limits for 20 dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits * [KHz]
315	36	787.5

*: FCC Limit for Bandwidth measurement
=(0.25%)(Center Frequency)
=(0.0025)(315)
=787.5KHz

20dB Bandwidth of Fundamental Emission



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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM007	SPECTRUM ANALYZER	HEWLETT PACKARD	HP85660B	3144A21192	2005/06/27
EM008	SPECTRUM ANALYZER DISPLAY	HEWLETT PACKARD	HP85662A	3144A20514	2005/06/27
EM009	QUASI PEAK ADAPTOR	HEWLETT PACKARD	HP85650A	3303A01702	2005/06/27
EM010	RF PRESELECTOR	HEWLETT PACKARD	HP85685A	3221A01410	2005/06/27
EM011	ATTENUATOR/SWITCH	HEWLETT PACKARD	HP11713A	2508A10595	2005/06/27
EM012	PRE-AMPLIFIER	HEWLETT PACKARD	HP8449B	3008A00262	2005/06/27
EM020	HORN ANTENNA	ETS-Linggren	3115	4032	2003/07/30
EM022	LOOP ANTENNA	ETS-Linggren	6502	1189-2424	2003/09/19
EM072	SIGNAL GENERATOR	HEWLETT PACKARD	8640B	1948A11892	N/A
EM083	OPEN AREA TEST SITE	HKSTC	N/A	N/A	2005/12/08
EM131	EMC ANALYZER	HEWLETT PACKARD	8595EM	3710A00155	2006/03/29
EM145	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCS 30	830245/021	2004/10/04
EM195	ANTENNA POSITIONING MAST	ETS-Linggren	2075	2368	N/A
EM196	MULTI-DEVICE CONTROLLER	ETS-Linggren	2090	1662	N/A
EM215	MULTIDEVICE CONTROLLER	ETS-Linggren	2090	00024676	N/A
EM216	MINI MAST SYSTEM	ETS-Linggren	2075	00026842	N/A
EM217	ELECTRIC POWERED TURNTABLE	ETS-Linggren	2088	00029144	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	2006/05/02
EM219	BICONILOG ANTENNA	ETS-Linggren	3142C	00029071	2006/02/01
EM229	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB40	100248	2005/02/04

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL
EM078	VARIAC	SHANGHAI VOLTAGE	TDGC-3/0.5	N/A	CM
EM081	SMALL SCREENED ROOM	MIKO INST HK	N/A	N/A	2006/01/12
EM119	LISN	ROHDE & SCHWARZ	ESH3-Z5	0831.5518.52	2004/10/14
EM127	ISOLATION TRANSFORMER 220 TO 300V	WING SUN	N/A	N/A	CM
EM233	PULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	100314	2006/01/09
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2006/03/17
EM154	SHIELDING ROOM	SIEMENA MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2006/01/12
EM197	LISN	ETS-Linggren	4825/2	1193	2005/06/27
EM213	DIGITAL POWER METER	VICNOBL	VIP120	00277	2004/09/14

Remarks:-

CM Corrective Maintenance

N/A Not Applicable or Not Available

TBD To Be Determined

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Appendix B

Duty Cycle Correction During 100msec

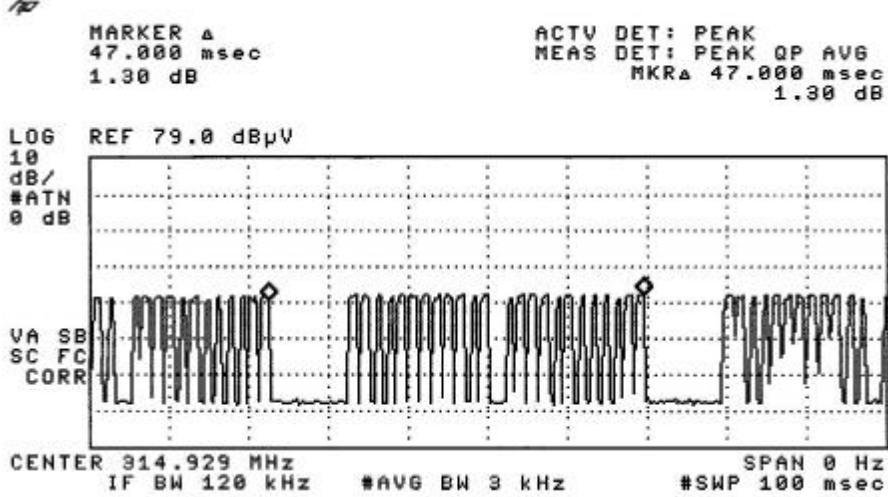
Each function key sends a different series of characters, but each packet period (47msec) never exceeds a series of 15 long (900 μ sec) and 9 short (375 μ sec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $15 \times 900\mu\text{sec} + 9 \times 375\mu\text{sec}$ per 47msec=35.9% duty cycle. Figure A through C show the characteristics of the pulses train for one of these functions.

Remarks:

Duty Cycle Correction = $20\log(0.359) = -8.8\text{dB}$

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

Figure A [Pulse Train]



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Figure B [Long Pulse]

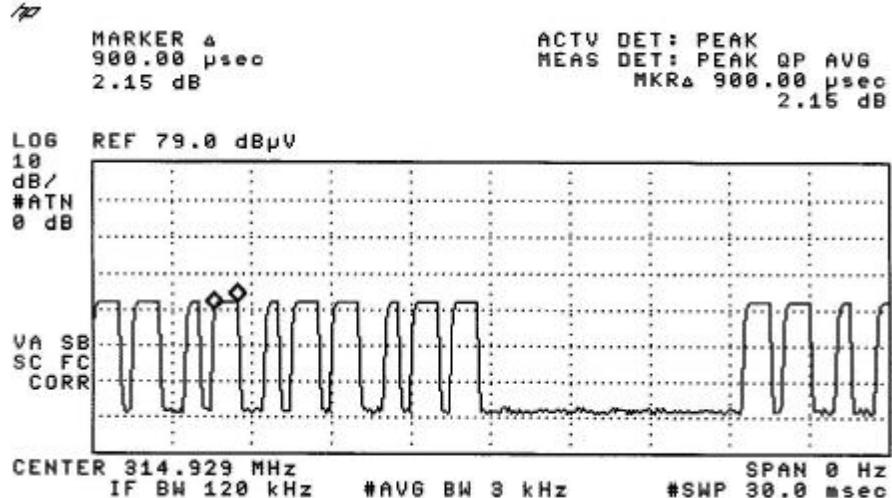
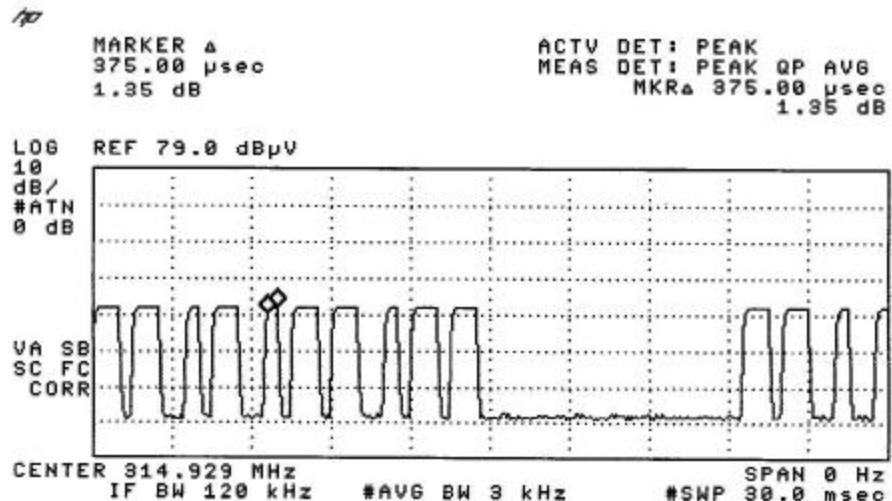


Figure C [Short Pulse]



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Appendix C

Periodic Operation [FCC 47CFR 15.231(a2)]

According to FCC 47CFR15.231 (a2). A transmitter automatically activated must automatically deactivate within not more than 5 seconds of being released. The EUT to transmit while detecting something moved. The EUT ceases transmission almost immediately upon being released and appears to finish the current packet being transmitted. Therefore the longest period of time the transmitter should take to deactivate is a packet length.

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Appendix D

Photographs of EUT

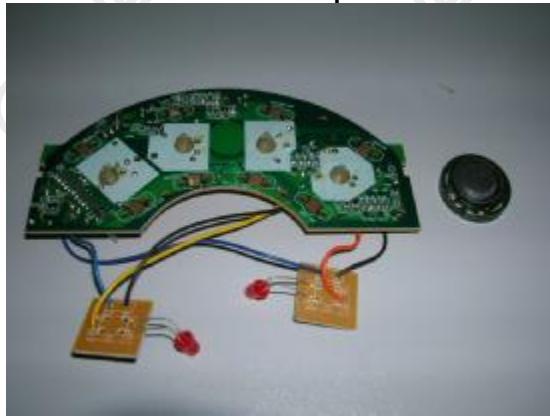
Front View of the product



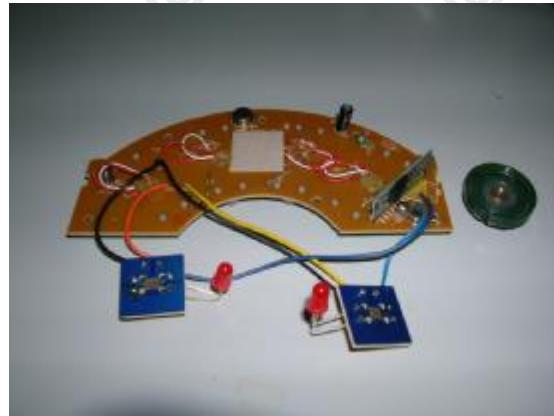
Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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