



STC Test Report

Date : 2011-06-07

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No. : HM166648

Applicant (MAT024):

MAGIC TIME INTERNATIONAL LIMITED.
ROOM 618, INTERNATIONAL PLAZA, 20 SHEUNG
YUET ROAD, KOWLOON BAY, HONG KONG

Manufacturer:

A.S. PLASTIC TOYS CO., LTD. OF CHENGHAI
SHANTOU
3RD FLOOR, BLOCK 8, GUANGHUA INDUSTRIAL
ZONE, LONGTIAN, CHENGHAI DISTRICT,
SHANTOU, GUANGDONG PROVINCE, CHINA

Description of Sample(s):

Submitted samples(s) said to be
Product: R/C CAR
Brand Name: MAGIC TIME
Model Number: 90130
FCC ID: ZJR90152-49MT

Date Sample(s) Received: 2011-05-04

Date Tested: 2011-05-19 to 2011-06-07

Investigation Requested:

Perform ElectroMagnetic Interference measurement in
accordance with FCC 47CFR [Codes of Federal
Regulations] Part 15: 2010 and ANSI C63.4:2009 for FCC
Certification.

Conclusion(s):

The submitted product 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.

Remark(s):

Dr. LEE Kam Chuen,
Authorized Signatory
ElectroMagnetic Compatibility Department
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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Appendix A

List of Measurement Equipment

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Appendix B

Duty Cycle Correction During 100 msec

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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 Equipment Under Test [EUT]

Description of Sample(s)

Submitted sample(s) said to be

Product: R/C CAR
Manufacturer: A.S. PLASTIC TOYS CO., LTD. OF CHENGHAI SHANTOU
3RD FLOOR, BLOCK 8, GUANGHUA INDUSTRIAL ZONE,
LONGTIAN, CHENGHAI DISTRICT, SHANTOU,
GUANGDONG PROVINCE, CHINA
Brand Name: MAGIC TIME
Model Number: 90130
Input Voltage: 3Vd.c. ("AA" size battery x 2)

1.3 Description of EUT Operation

The Equipment Under Test (EUT) is MAGIC TIME INTERNATIONAL LIMITED., R/C CAR. The EUT is a transmitter of radio control toy. The transmitter was operating with 2 buttons, the EUT continues to transmit while button is being on, It is pulse transmitter, Modulation by IC, and type is pulse modulation.

1.4 Date of Order

2011-05-04

1.5 Submitted Sample(s):

1 sample

1.6 Test Duration

2011-05-19 to 2011-06-07

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: 2010 and ANSI C63.4:2009 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary				
Test Condition	Test Requirement	Test Method	Class / Severity	
			Pass	Failed
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.235	ANSI C63.4:2009	N/A	<input checked="" type="checkbox"/> <input type="checkbox"/>
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.209	ANSI C63.4:2009	N/A	<input checked="" type="checkbox"/> <input 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 15.235
Test Method:	ANSI C63.4:2009
Test Date:	2011-06-07
Mode of Operation:	Tx mode

Test Method:

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. 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. In the frequency range of 9kHz to 30MHz, The center of the loop antenna shall be 1 meter above the ground and rotated loop axis for maximum reading. The emissions worst-case are shown in Test Results of the following pages.

Remark: 3 orthogonal axis apply to hand-held device only.

*: Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

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Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av)

RBW: 10kHz
VBW: 30kHz
Sweep: Auto
Span: Fully capture the emissions being measured
Trace: Max. hold

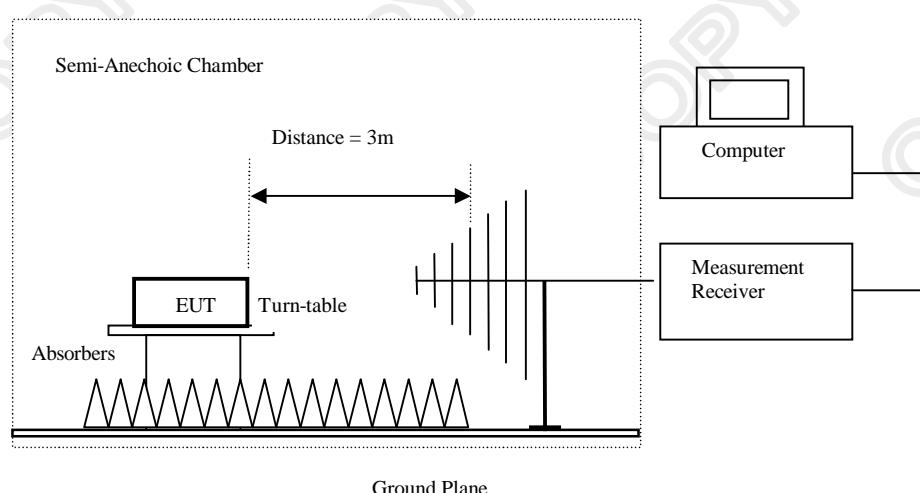
30MHz – 1GHz (QP)

RBW: 120kHz
VBW: 120kHz
Sweep: Auto
Span: Fully capture the emissions being measured
Trace: Max. hold

Above 1GHz (Pk & Av)

RBW: 3MHz
VBW: 3MHz
Sweep: Auto
Span: Fully capture the emissions being measured
Trace: Max. hold

Test Setup:



Absorbers placed on top of the ground plane are for measurements above 1000MHz only.

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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] [μ V/m]	Field Strength of Fundamental Emission [Average] [μ V/m]
49.82-49.90	100,000	10,000

Results of Tx mode: PASS

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
49.86	59.4	10.3	69.7	3,054.9	100,000	Vertical

Field Strength of Fundamental Emissions Average Value							
Frequency MHz	Measured Level @3m dB μ V	Adjusted by Duty Cycle dB	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
49.86	49.9	-4.45	10.3	60.2	1,023.3	10,000	Vertical

According to FCC 47CFR15.35, the limit on the radio frequency emissions as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.1dB

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Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Field strength [microvolts/meter]	Measurement distance [meters]
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

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 of Tx on mode (9k – 30MHz): PASS

Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Results of Tx on mode (30MHz – 1000MHz): PASS

Radiated Emissions						
Quasi-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
99.7	30.6	10.3	40.9	110.9	150	Vertical
149.6	< 1.0	14.4	< 15.4	< 5.9	150	Vertical
199.4	< 1.0	11.9	< 12.9	< 4.4	150	Vertical
212.2	< 1.0	13.8	< 14.8	< 5.5	150	Vertical
249.3	19.5	15.4	34.9	55.6	200	Vertical
299.2	< 1.0	16.3	< 17.3	< 7.3	200	Vertical
349.0	16.1	18.5	34.6	53.7	200	Vertical
398.9	15.0	19.1	34.1	50.7	200	Vertical
448.7	11.5	21.1	32.6	42.7	200	Vertical
498.6	< 1.0	20.6	< 21.6	< 12.0	200	Vertical

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Results of Tx on mode (Above 1000MHz): PASS

Field Strength of Spurious Emissions						
Peak Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Results of Tx on mode (Above 1000MHz): PASS

Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Measured Level dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit μ V/m	E-Field Polarity
Emissions detected are more than 20 dB below the FCC Limits						

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.1dB

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3.2 20dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.235
Test Method:	ANSI C63.4:2009
Test Date:	2011-05-17
Mode of Operation:	Tx 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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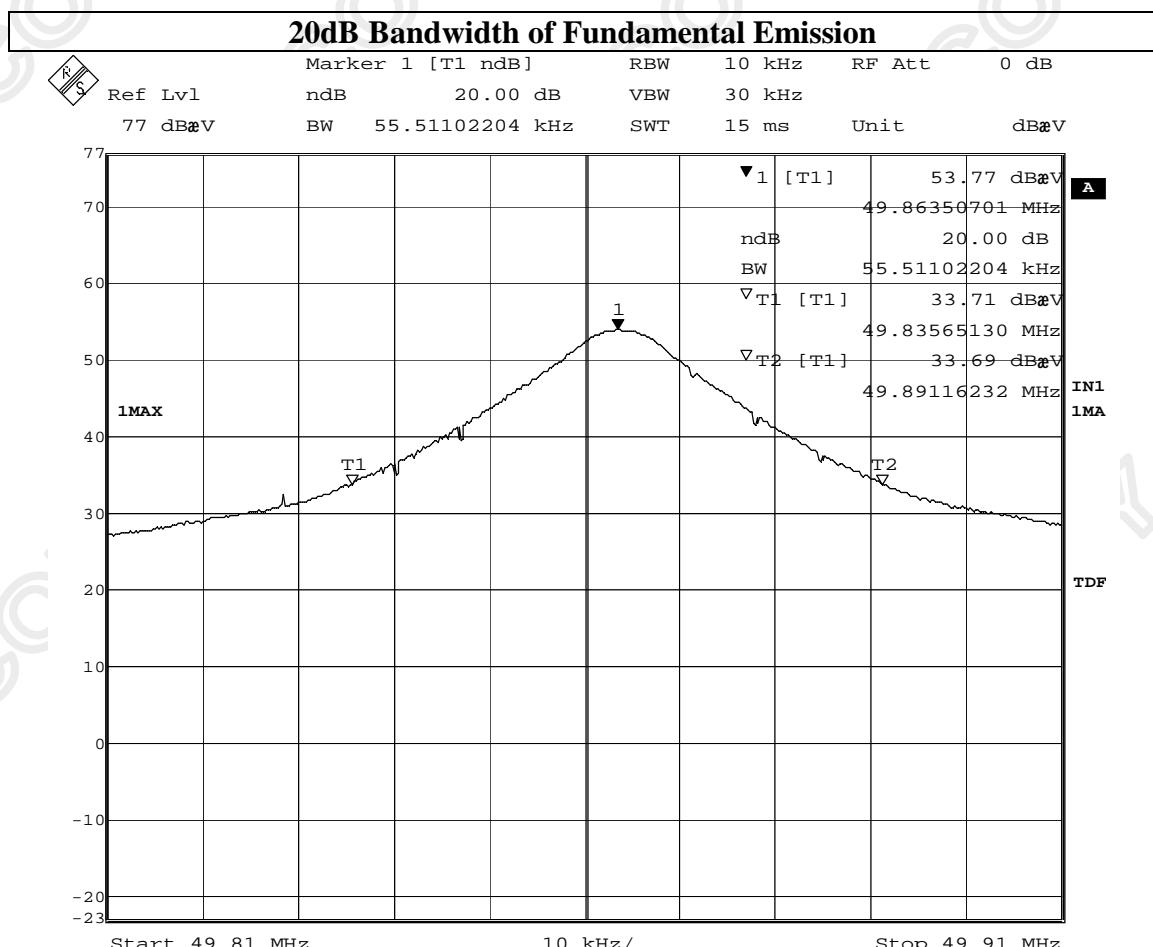
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Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [MHz]
49.86	55.5110	within 49.82-49.90



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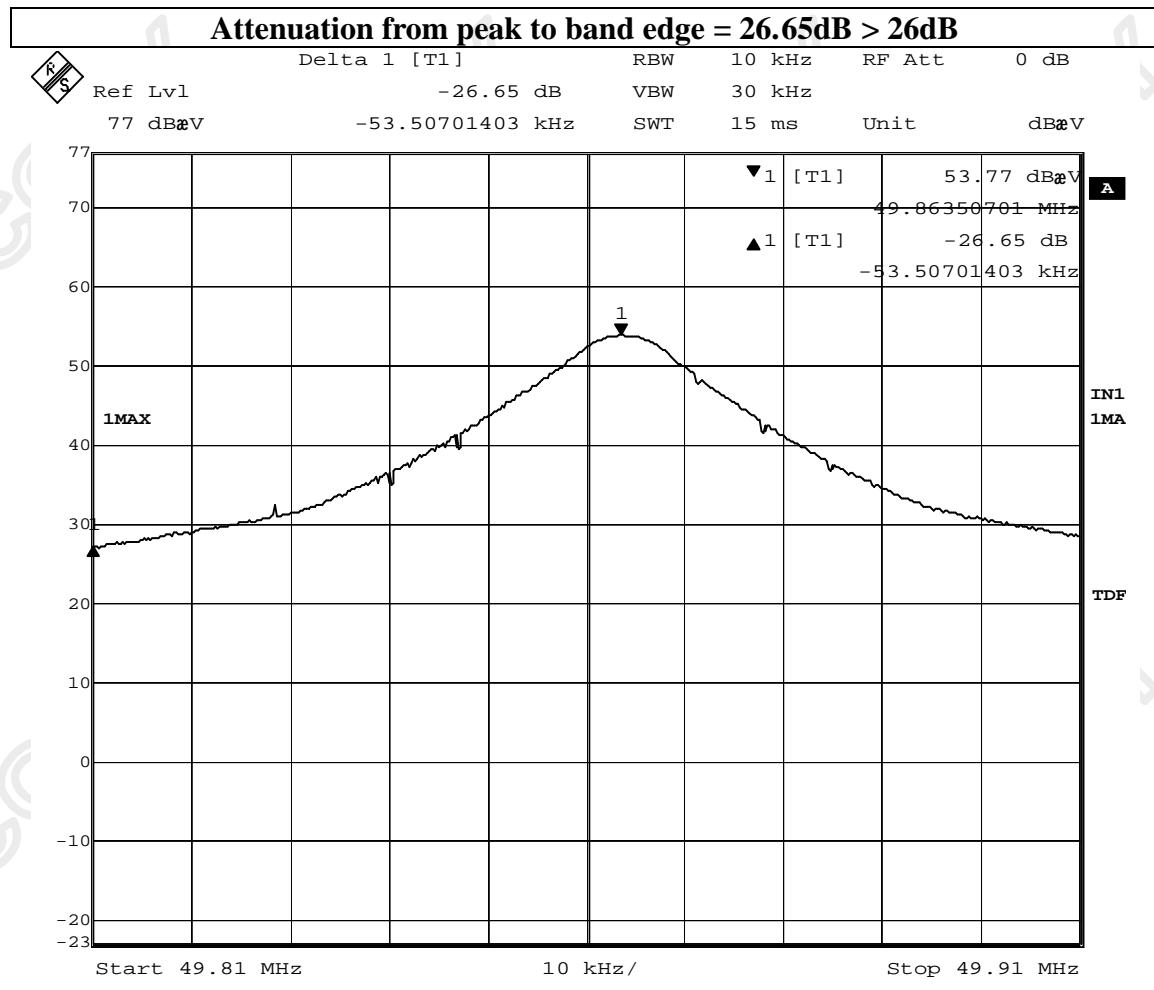


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3.3 Duty Cycle Correction During 100msec

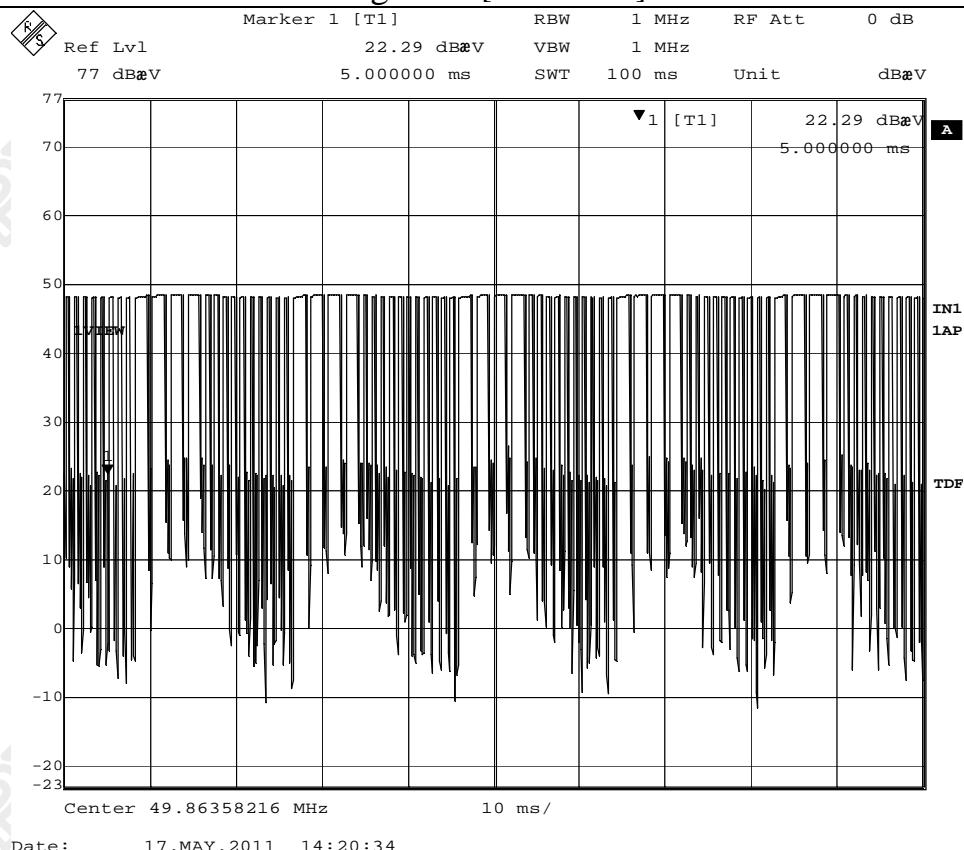
Each function key sends a different series of characters, but each packet period 100msec never exceeds a series of 20 long (1.513msec) and 58 short (0.511022msec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $(20 \times 1.513) + (58 \times 0.511022)$ msec per 100msec 59.899% duty cycle. Figure A through D show the characteristics of the pulse train for one of these functions.

Remarks:

$$\text{Duty Cycle Correction} = 20 \log(0.59899) = -4.45 \text{ dB}$$

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

Figure A [Pulse Train]



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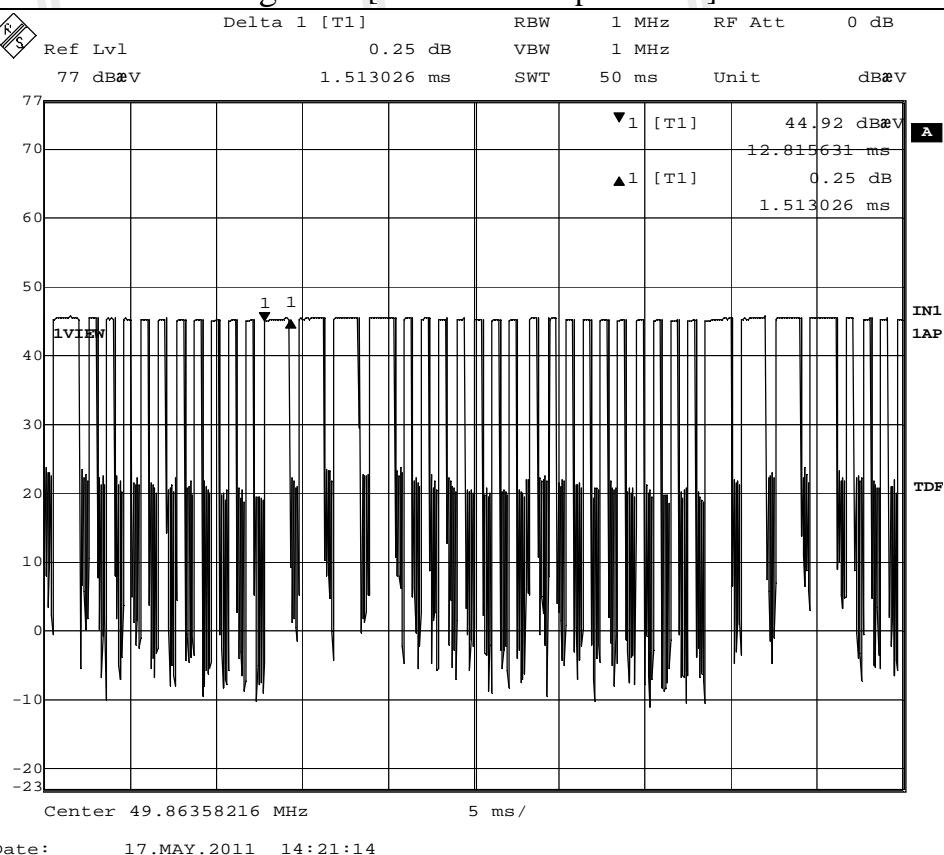
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Figure B [Closer look on pulse train]



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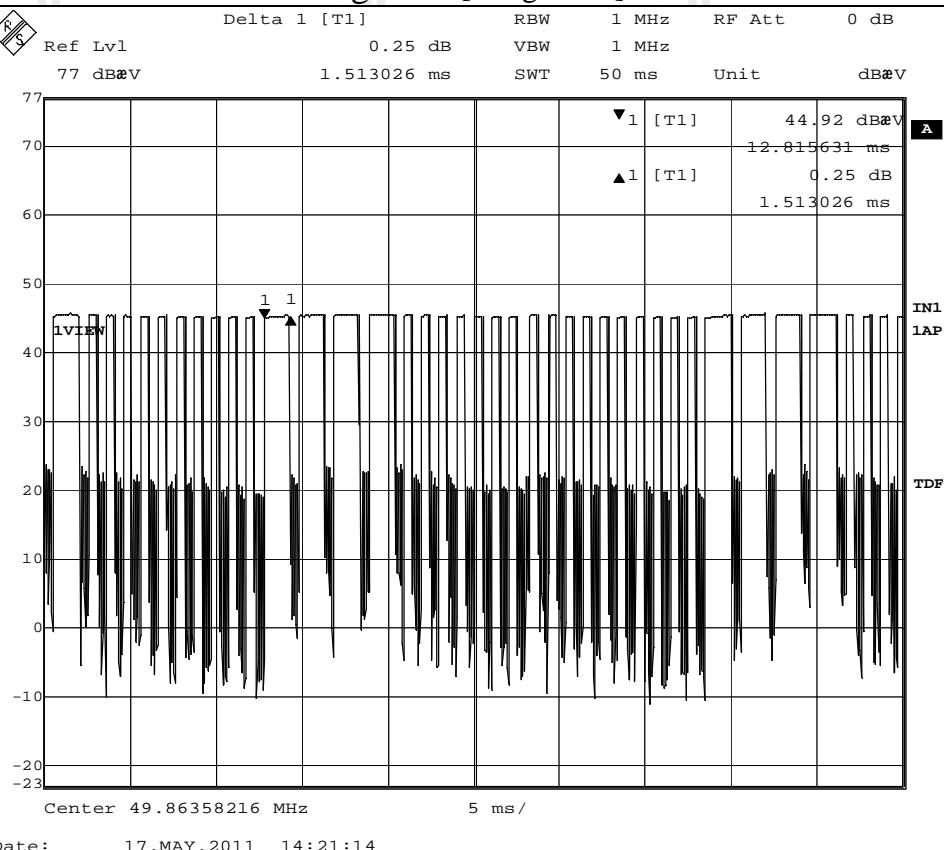
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Figure C [Long Pulse]



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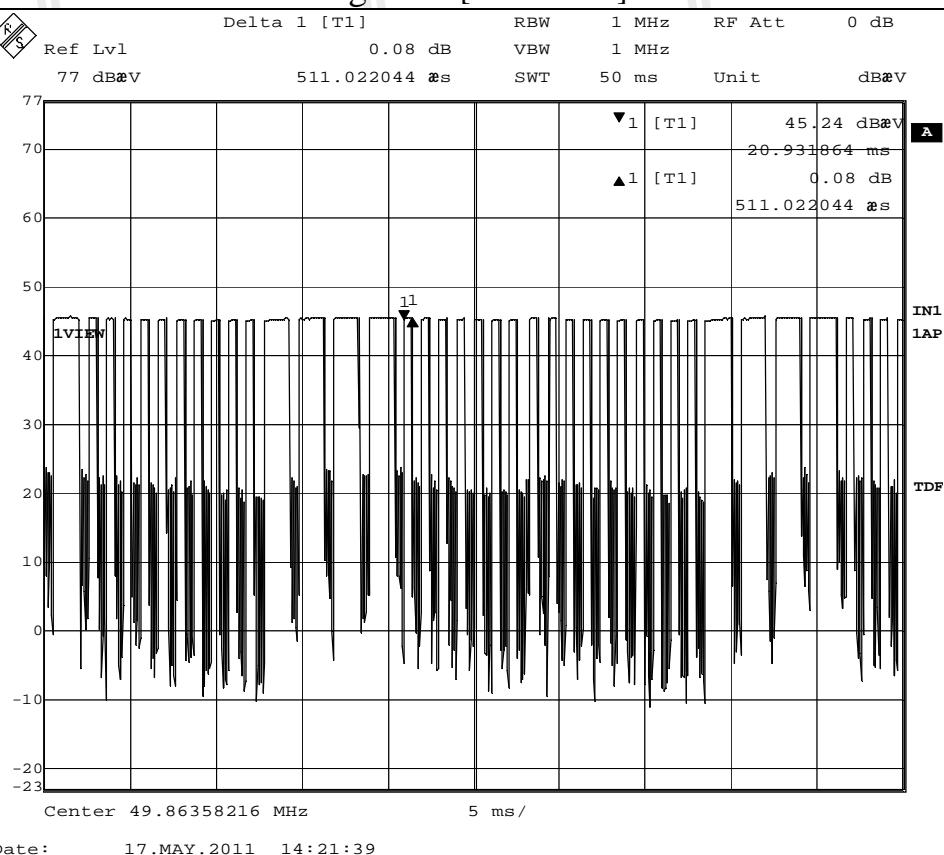
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Figure D [Short Pulse]



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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM020	HORN ANTENNA	EMCO	3115	4032	2009/09/02	2011/09/02
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-Linggren	FACT-3	--	2010/10/25	2011/10/25
EM174	BICONILOG ANTENNA	EMCO	3142B	1671	2010/02/09	2012/02/09
EM229	EMI Test Receiver	R&S	ESIB40	100248	2010/11/02	2011/11/02
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2009/09/07	2011/09/07

Remarks:-

CM Corrective Maintenance

N/A Not Applicable

TBD To Be Determined

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Appendix B

Photographs of EUT

Front View of the product



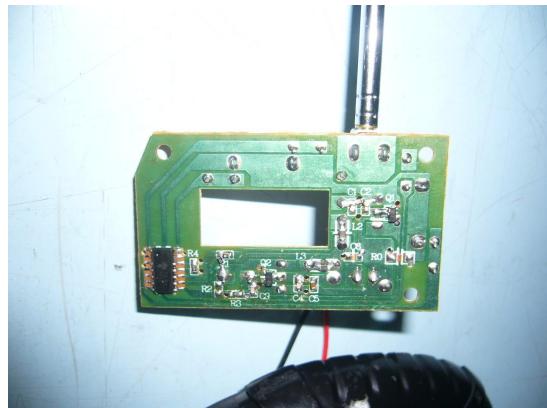
Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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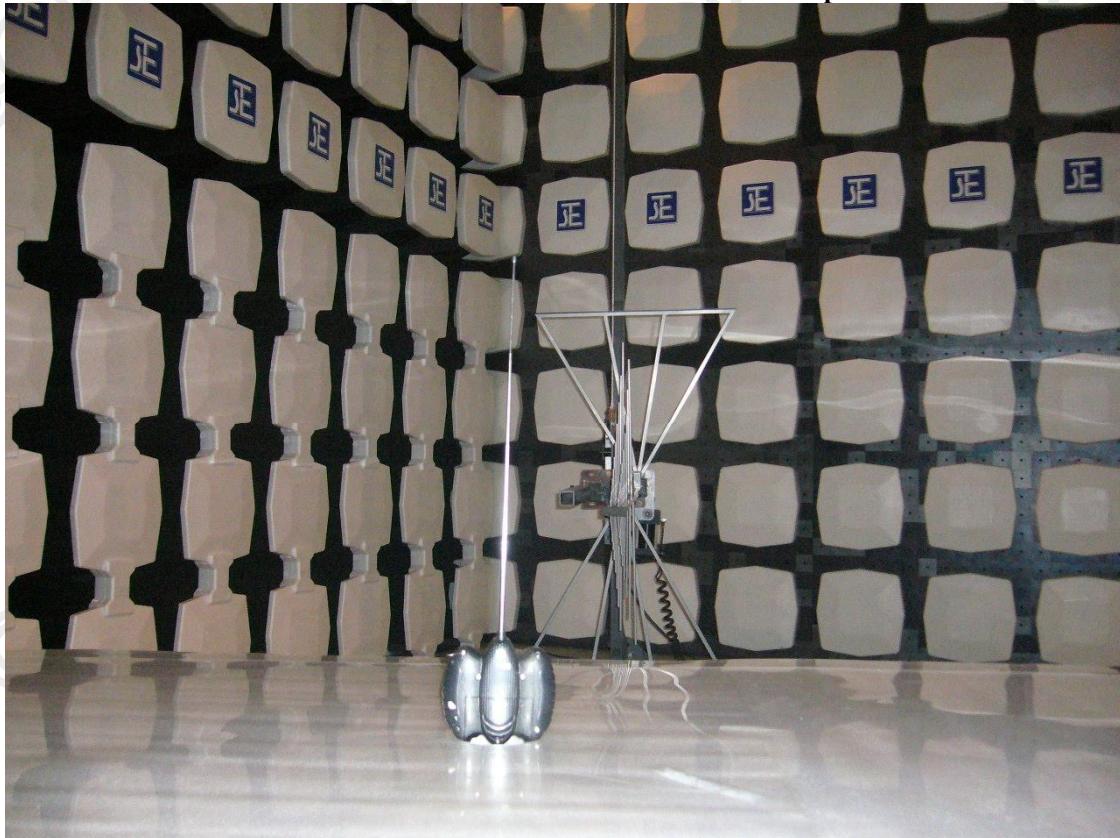
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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