




TEST REPORT N°: EGI-08-MA-H0350-HTHFB

TEST REPORT

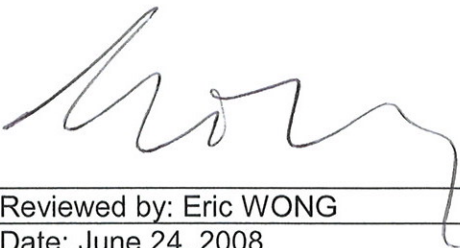

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Factory name:	Unidentified	Offer:	EGI08MA25-02HTHHFP
Location:	Unidentified	Sample No:	80320001
		Start date:	March 28, 2008
		Finish date:	April 10, 2008
		Test Requested:	FCC Part 15 Certification Procedure
		Test Method:	ANSI C63.4 – 2003
		Re-testing:	NONE
BUMPER CARS – SETS OF TWO, MODEL: 4289		FCC ID: V9GELEGANT	

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	Approved by: Patrick WONG
Date: June 24, 2008	Date: June 24, 2008

BUREAU VERITAS HONG KONG LIMITED –
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Location of the test site

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. A Semi-Anechoic Chamber Testing Site (FCC Listed Site, registration no.: 552221) is set up for investigation and located at:

CMA INDUSTRIAL DEVELOPMENT FOUNDATION LIMITED

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
New Territories,
Hong Kong.

List of measuring equipment

Radiated Emission

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date
EMI TEST RECEIVER	R&S	ESCI	100152	2008 OCT 14
BROADBAND ANTENNA	SCHAFFNER	CBL6112B	2718	2008 MAY 23
LOOP ANTENNA	EMCO	6502	00056620	2009 JULY 19

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: Bumper cars
Model Number: 4289
Rating: 3Vd.c ("AAA" size battery x 2)
Antenna Spec.: -5dBi (Integral Spring Antenna)

Description of EUT Operation:

The equipment under test (EUT) is a transmitter for Bumper car. It operates at 27.145MHz and the oscillation of radio control is generated by crystal. The EUT is powered by 2 x 1.5V AAA size batteries. There are four button keys on the EUT. When it switched on and passed the key once, it will transmit a radio control signal to receiver.

Antenna Requirement (Section 15.203)

The EUT is use of a permanently antenna. It is soldered on the PCB. The antenna is not replaceable or user serviceable. The requirement of S15.203 are met. There are no deviations or exceptions to the specifications.

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Radiated Emissions (Fundamental)

Test Requirement: FCC Part 15 Section 15.227
Test Method: ANSI C63.4:2003

Test Date(s): 2008-03-28

Mode of Operation: Transmission mode

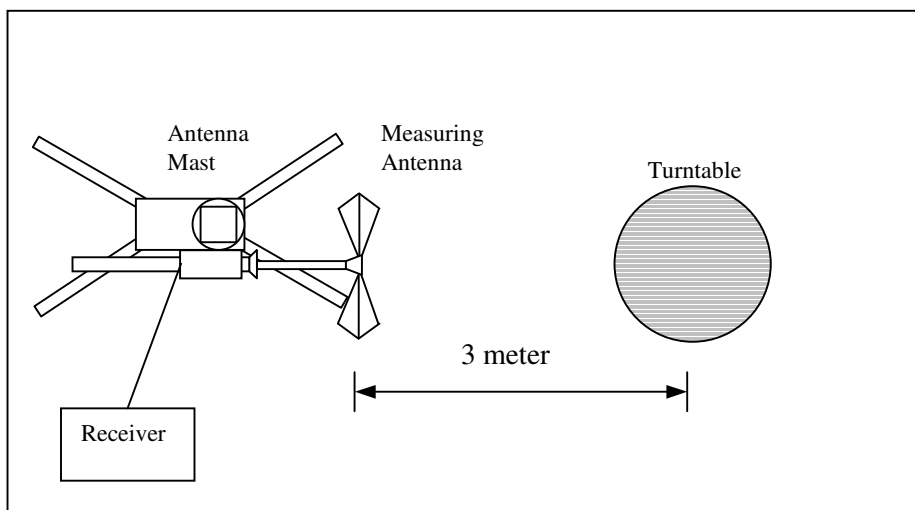
Test Procedure:

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: Semi-Anechoic Chamber



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.227]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [μV/m]	Field Strength of Fundamental Emission [Average] [μV/m]
26.96-27.28	100,000	10,000

Measurement Data

Test Result of (Transmission mode): PASS

Detection mode: 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)
27.145	V	9.1	69.6	100	-30.4

Detection mode: # Average

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)
27.145	V	9.1	**64.2	80	-15.8

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

**Duty Cycle Correction = $20\log(0.54) = -5.4\text{dB}$

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 C63.4:2003

Test Date(s): 2008-03-28

Mode of Operation: **Transmission mode**

Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [μ 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 (dBuV/m)	Limit at 3m (dBuV/m)	Margin (dB)
54.302	V	8.4	32.0	40.0	-8.0
81.427	H	7.3	18.5	40.0	-21.5
108.560	H	11.1	20.8	43.5	-22.7
135.721	H	12.6	20.1	43.5	-23.4
162.870	H	10.7	19.6	43.5	-23.9
190.016	H	9.5	18.2	43.5	-25.3
217.162	H	9.8	20.9	46.0	-25.1
244.307	H	9.8	21.6	46.0	-24.4
271.452	H	13.9	21.3	46.0	-24.7

Note: Field Strength includes Antenna Factor and Cable Loss.

Receiver setting: RBW = 120KHz
VBW = 120KHz



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Measurement Data

26dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.227
Test Method: ANSI C63.4:2003 (Section 13.1.7)
Test Date: 2008-04-10
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]	FCC Limits [MHz]
27.165	within 26.96-27.28

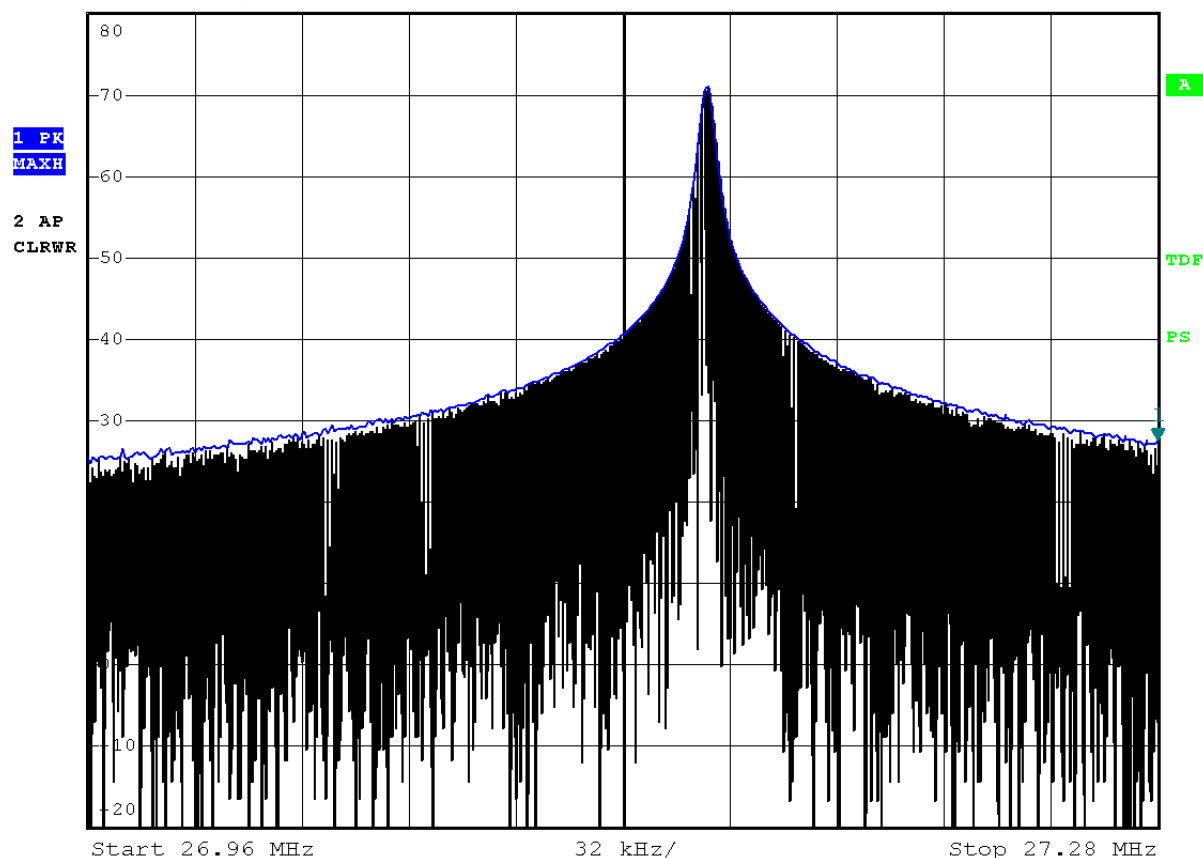
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Measurement Data :

Test Result of 26dB Bandwidth of Fundamental Emission: PASS



Ref 80 dB μ V/m *Att 0 dB *RBW 3 kHz Marker 1 [T1] 27.54 dB μ V/m
 *VBW 10 MHz 27.28000000 MHz
 *SWT 500 ms



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Duty Cycle Correction During 100msec:

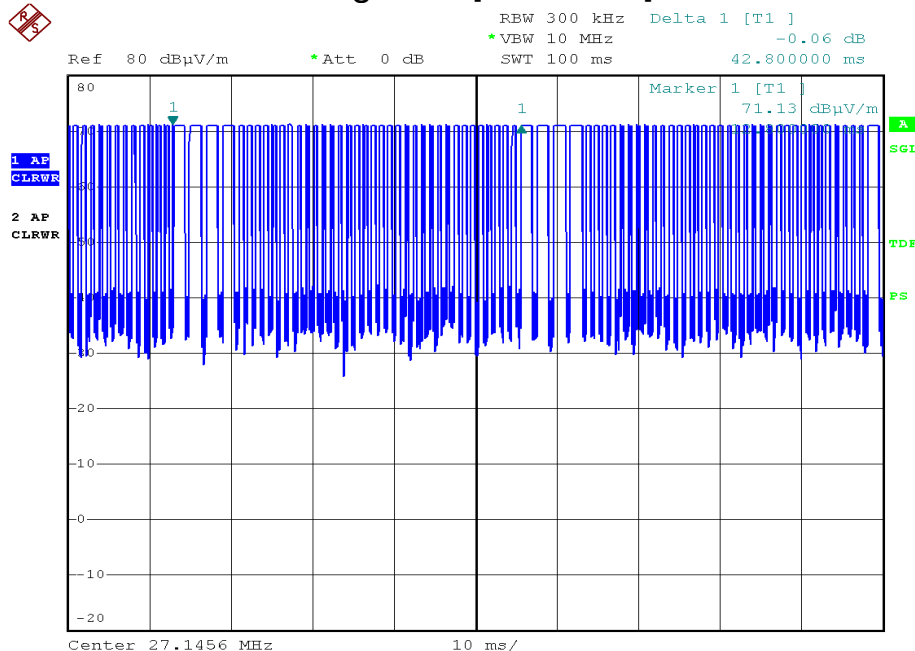
Each function key sends a different series of characters, but each packet period (42.8msec) never exceeds a series of 4 long (1.53msec) and 34 short (0.5msec) pulses. Assuming any combination of short or long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $23.12\text{msec}(1.53\text{msec} \times 4 + 0.5\text{msec} \times 34)$ per $42.8\text{msec}=54.0\%$ duty cycle. Figure A to C show the characteristics of the pulse train for one of these functions.

Remarks:

Duty Cycle Correction = $20\text{Log}(0.54) = -5.4\text{dB}$

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

Figure A [Pulse Train]



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Figure B [Long pulses]

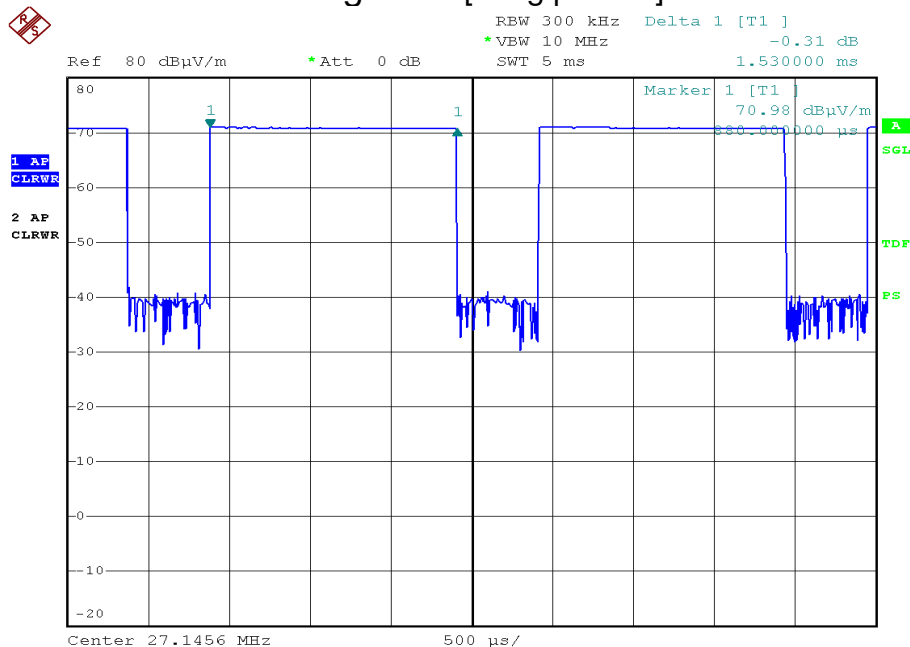
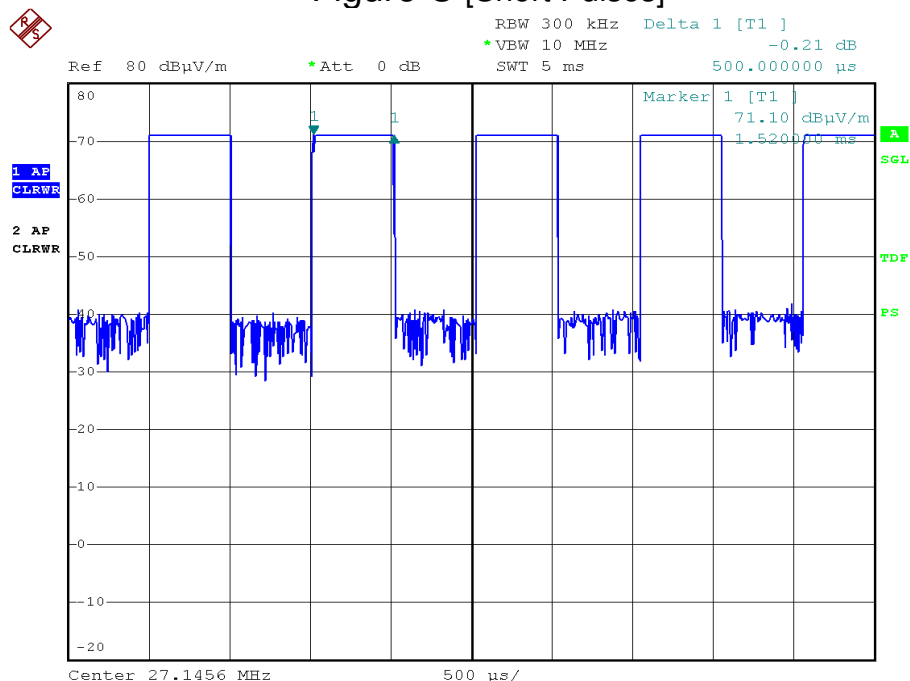


Figure C [Short Pulses]



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Photographs of EUT

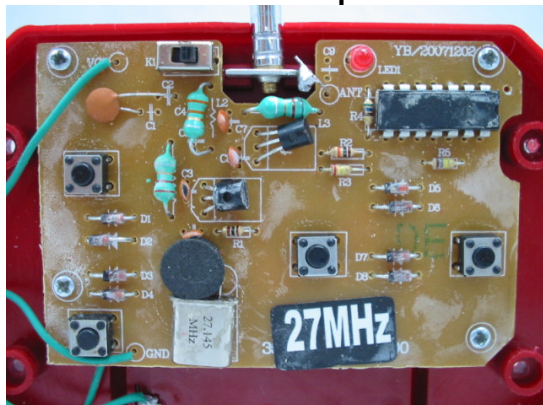
Front View of the product



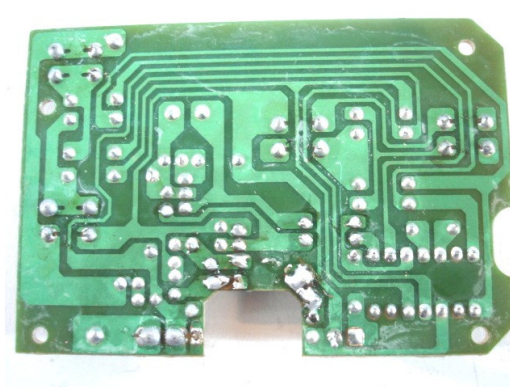
Rear View of the product



Inner Circuit Top View

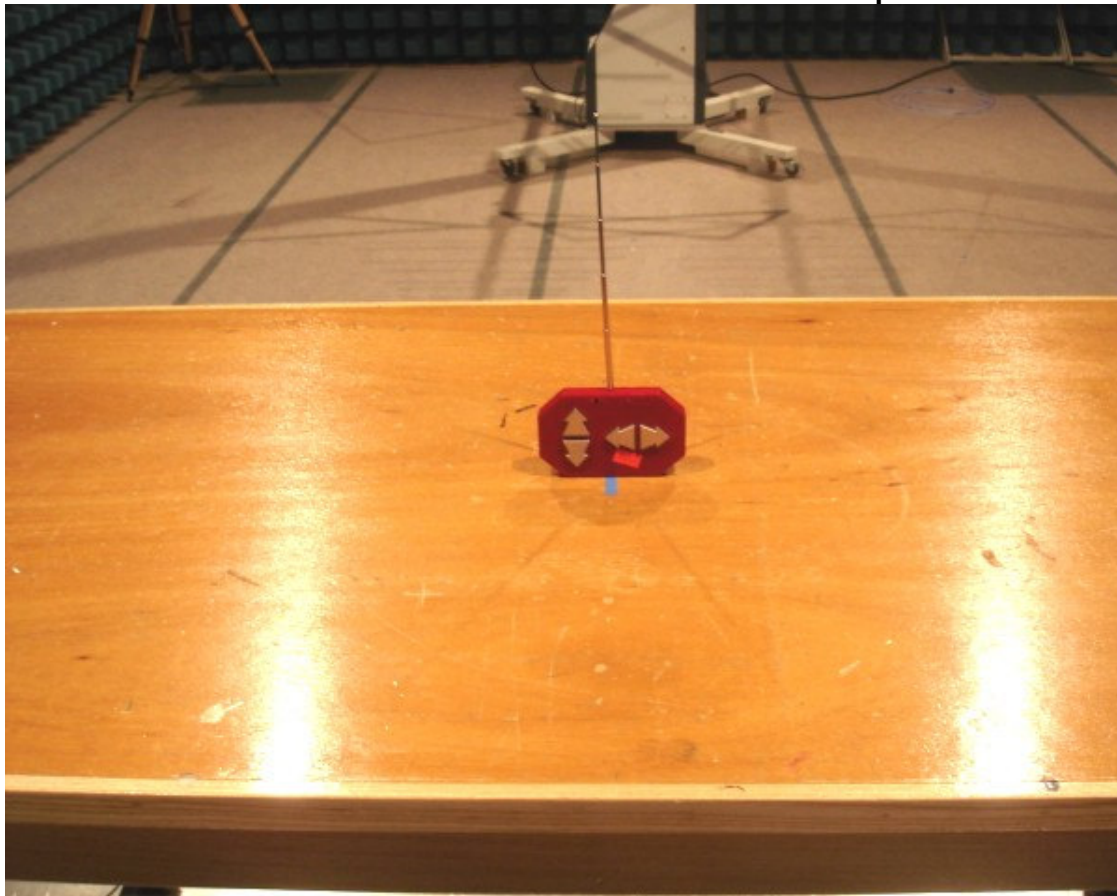


Inner Circuit Bottom View



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Measurement of Radiated Emission Test Set Up



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