



## STC Test Report

Date: 2015-03-09

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No. : DM118648

**Applicant:** GTO Access Systems, LLC  
3121 Hartsfield Road, Tallahassee, Florida 32303, USA

**Description of Sample(s):** Submitted sample(s) said to be  
Product: Utilitech Pro SecureCode 3 Button  
Transmitter  
Brand Name: GTO MIGHTY MULE  
Model Number: CS3BT  
FCC ID: I6HGD03BTXL

**Date Sample(s) Received:** 2015-02-10

**Date Tested:** 2015-02-12 to 2015-03-05

**Investigation Requested:** Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2014 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):** For additional model(s) details, please page 4.



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LONG Yun Jian, Along  
Authorized Signatory  
ElectroMagnetic Compatibility Department  
For and on behalf of  
STC (Dongguan) Company Limited

### STC (Dongguan) Company Limited

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### **1.0 General Details**

#### **1.1 Equipment Under Test [EUT] Description of Sample(s)**

Submitted sample(s) said to be

Product:	Utilitech Pro SecureCode 3 Button Transmitter
Manufacturer:	Smart Electronic Industrial(Dong Guan) Co., Ltd. Qing Long Road, Long Jian Tian-Cun, Huang Jiang-Zhen, Dong Guan, Guang Dong, China
Brand Name:	GTO MIGHTY MULE
Additional Brand Name:	GTO / ACCESS - GTO / PRO
Model Number:	CS3BT
Additional Model Number:	LUP-100
Rating:	3Vd.c. (CR2032*1)

#### **1.1.1 Description of EUT Operation**

The Equipment Under Test (EUT) is an Utilitech Pro SecureCode 3 Button Transmitter of GTO Access Systems, LLC. The EUT is a garage door remote operating at 318MHz.

#### **1.2 Date of Order**

2015-02-10

#### **1.3 Submitted Sample(s):**

1 Sample

#### **1.4 Test Duration**

2015-02-11 to 2015-03-05

#### **1.5 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: 2014 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	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.231a	ANSI C63.4:2009	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2009	N/A	<input checked="" type="checkbox"/>	<input 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**

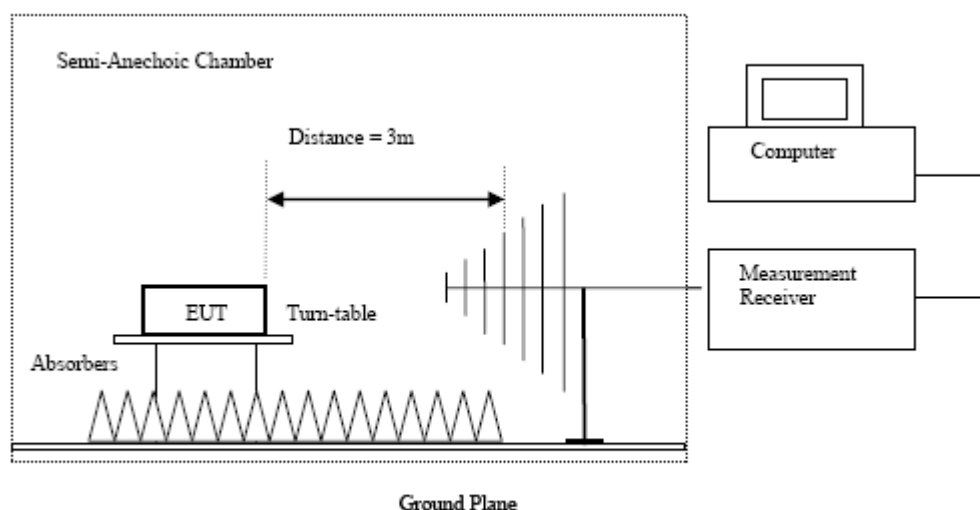
Test Requirement:	FCC 47CFR 15.231a
Test Method:	ANSI C63.4:2009
Test Date:	2015-03-05
Mode of Operation:	Tx mode

#### **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 STC (Dongguan) Company Ltd. 68 Fumin Nan Road, Dalang, Dongguan, Guangdong, PRC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 629686.

#### **Test Setup:**



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used.

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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] [ $\mu\text{V}/\text{m}$ ]	Field Strength of Spurious Emission [Average] [ $\mu\text{V}/\text{m}$ ]
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

<sup>1</sup>Linear interpolations.

The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

### Results of Tx mode (CH1, Worst case): PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu\text{V}$	Correction Factor dB/m	Field Strength dB $\mu\text{V}/\text{m}$	Field Strength $\mu\text{V}/\text{m}$	Limit @3m $\mu\text{V}/\text{m}$	E-Field Polarity
318.12	67.5	16.2	83.7	15328.5	61,716.8	Horizontal

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dB $\mu\text{V}$	Correction Factor dB/m	Field Strength dB $\mu\text{V}/\text{m}$	Field Strength $\mu\text{V}/\text{m}$	Limit @3m $\mu\text{V}/\text{m}$	E-Field Polarity
954.38	27.3	26.9	54.2	514.6	6,171.7	Horizontal
1590.63	19.0	31.8	50.8	347.1	6,171.7	Horizontal
2226.88	18.9	35.9	54.8	548.3	6,171.7	Horizontal
2545.00	10.3	36.8	47.1	227.2	6,171.7	Horizontal

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Results of Tx mode (CH1, Worst case): PASS

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
318.12	59.0	16.2	75.2	5734.6	6,171.7	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dB $\mu$ V	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Field Strength $\mu$ V/m	Limit @3m $\mu$ V/m	E-Field Polarity
954.38	18.8	26.9	45.7	192.5	617.1	Horizontal
1590.63	10.5	31.8	42.3	129.9	617.1	Horizontal
2226.88	10.3	35.9	46.2	205.1	617.1	Horizontal
2545.00	1.8	36.8	38.6	85.0	617.1	Horizontal

Remarks:

\*: Adjusted by Duty Cycle = -8.5dB

+: 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.

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

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu\text{V}/\text{m}$ ]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
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.

### Result of Tx mode (9kHz - 30MHz): PASS

Emissions detected are more than 20 dB below the limit line(s).

### Results of Tx mode (CH1, Worst case) (30MHz – 1GHz): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dB $\mu\text{V}/\text{m}$	Limit @3m dB $\mu\text{V}/\text{m}$	Level @3m $\mu\text{V}/\text{m}$	Limit @3m $\mu\text{V}/\text{m}$
30.1	Vertical	30.3	40.0	32.7	100
535.2	Vertical	36.7	46.0	68.4	200
575.5	Horizontal	37.5	46.0	75.0	200

### Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty (30MHz – 1GHz): 4.6dB

(1GHz – 18GHz): 4.4dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

CH1, 2, 3 have been investigated and the worst-case test results are recorded in this report.

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### **3.2 20dB Bandwidth of Fundamental Emission**

Test Requirement:	FCC 47 CFR 15.231a
Test Method:	ANSI C63.4:2009 (Section 13.1.7)
Test Date:	2015-02-12 to 2015-03-05
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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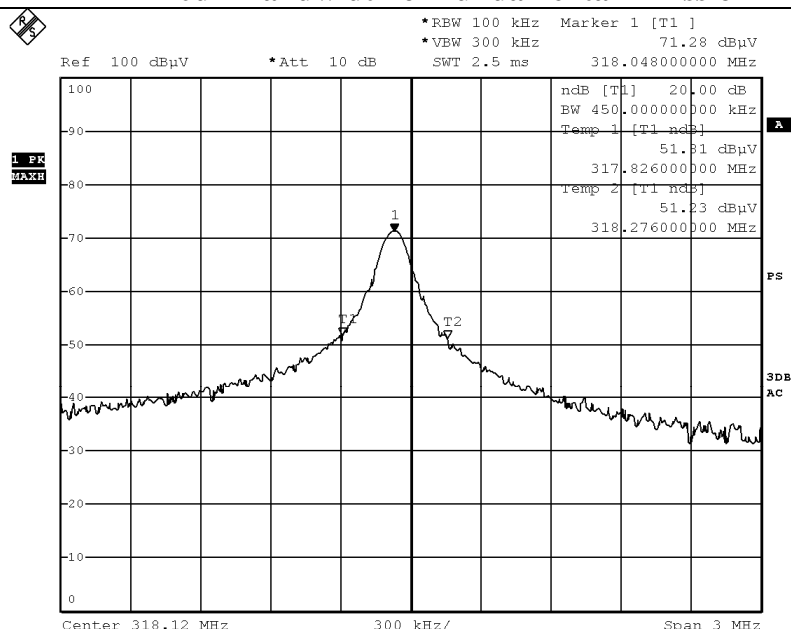
No. : DM118648

**Limits for 20 dB Bandwidth of Fundamental Emission:**

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits * [kHz]
318	450.0	795

\*: FCC Limit for Bandwidth measurement = (0.25%)(Center Frequency)  
 = (0.0025)(318)  
 = 795kHz

### 20dB Bandwidth of Fundamental Emission



Date: 12.FEB.2015 19:55:37

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### Appendix A

#### List of Measurement Equipment

##### Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM276	BROADBAND HORN ANTENNA	A-INFOMW	JXTXLB-10180-SF	J2031090903007	2013/03/23	2016/03/23
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-LINDGREN	FACT-3	--	2014/09/29	2015/09/29
EM219	BICONILOG ANTENNA	EMCO	3142C	00029071	2013/04/25	2015/04/25
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2014/01/15	2016/01/15

#### Remarks:-

N/A Not Applicable

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### Appendix B

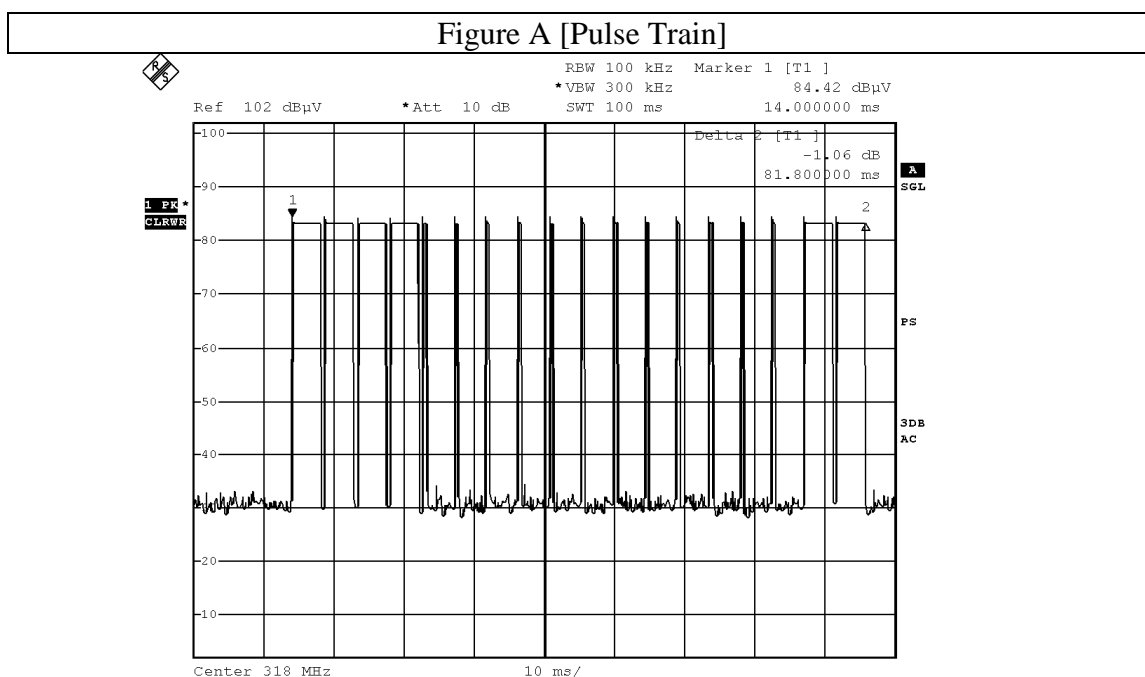
#### Duty Cycle Correction During 100msec

Each packet period (81.8msec) never exceeds a series of 6 (4.1msec) long and 12 (0.5msec) short pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered  $(4.1 \times 6 + 0.5 \times 12)$  msec per 81.8msec = 37.4% duty cycle. Figure A through D shows the characteristics of the pulses train for one of these functions.

Remarks:

Duty cycle factor =  $20\text{Log} [(4.1*6+0.5*12)/81.8] = -8.5\text{dB}$

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



Date: 5.MAR.2015 13:47:04

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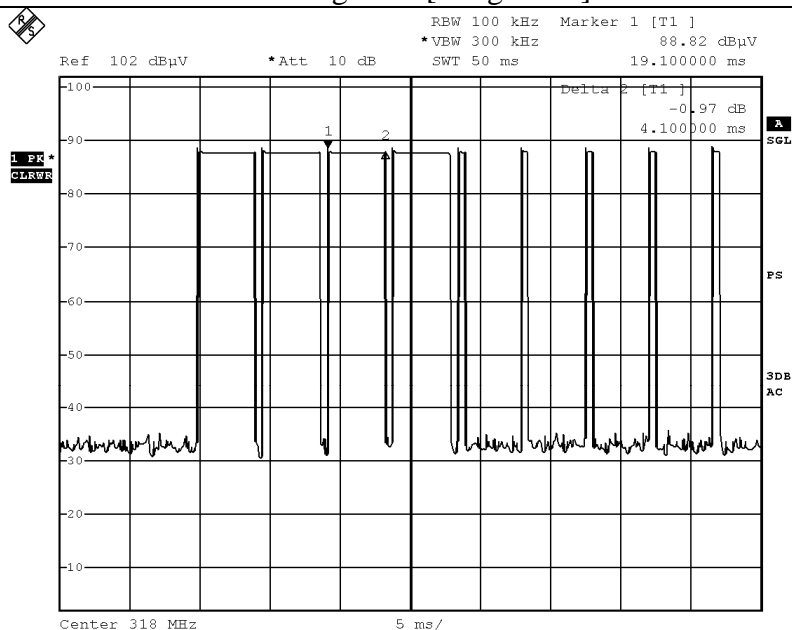
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Figure B [Long Pulse]



Date: 5.MAR.2015 13:46:09

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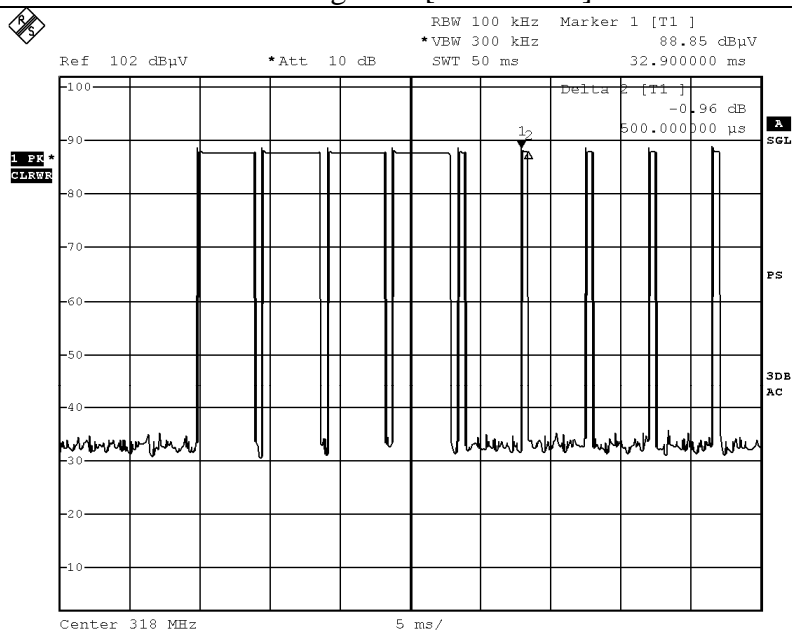
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Figure C [Short Pulse]



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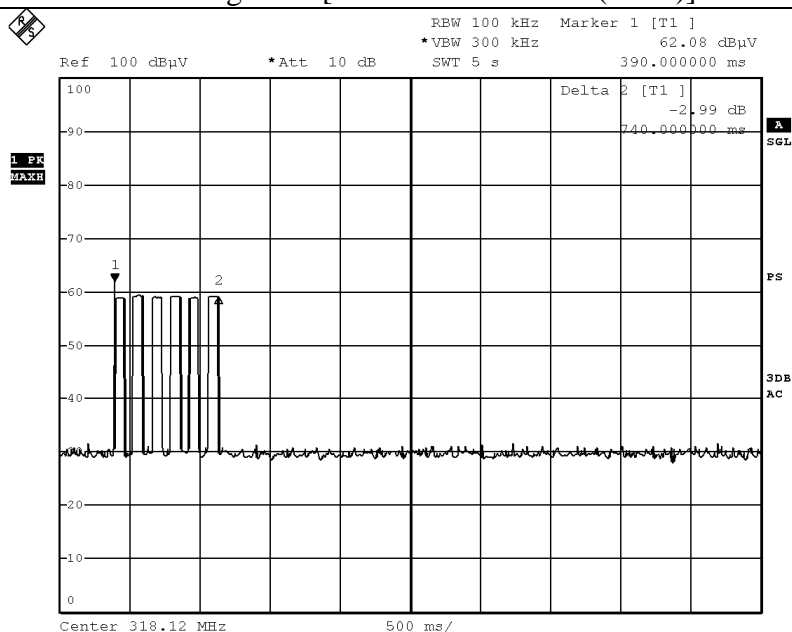
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### Appendix C

#### Manual Operation [FCC 47CFR 15.231(a)]

According to FCC 47CFR15.231 (a). A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. 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.

Figure D [Transmission Period(0.74s)]



Date: 13.FEB.2015 13:00:49

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### Appendix D

#### Photographs of EUT

**Front View of the product**



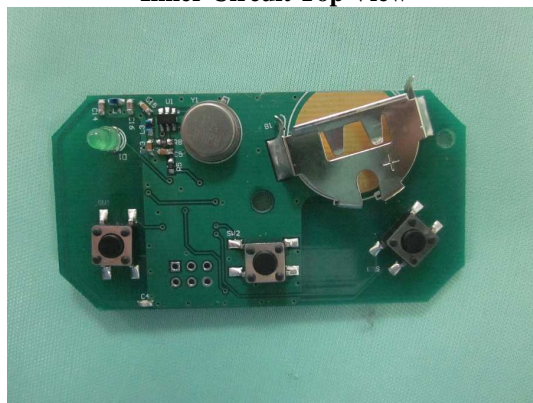
**Rear View of the product**



**Inside View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



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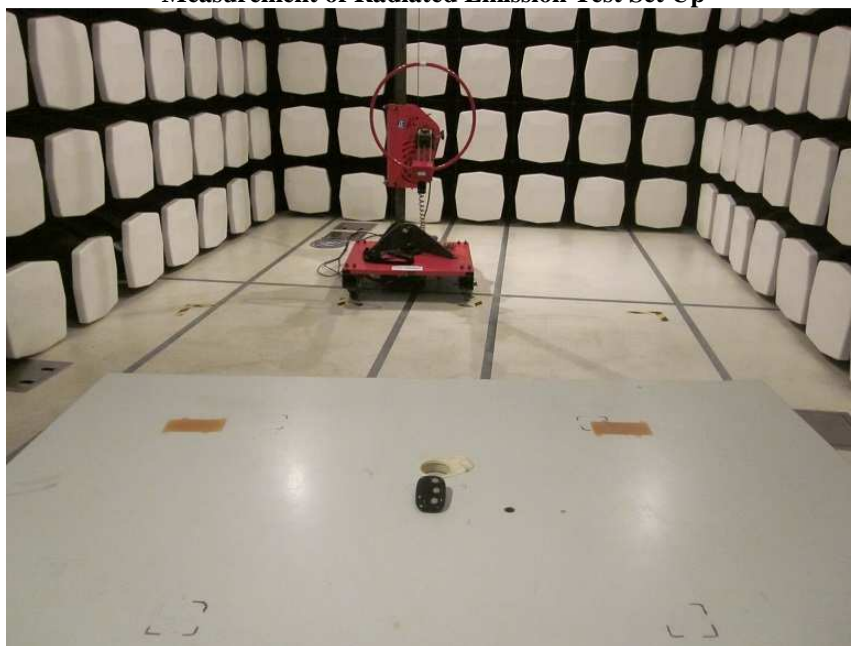
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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up**



**Measurement of Radiated Emission Test Set Up**



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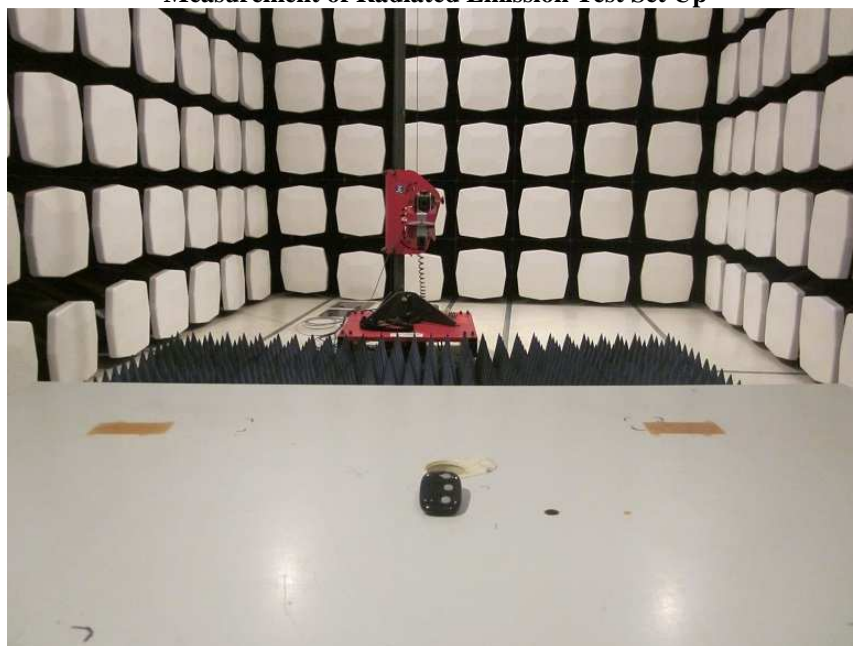
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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up**



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

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