



STC Test Report

Date : 2009-08-14

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No. : MH183266

Applicant (HKS001):

FUZHOU RISE ELECTRONIC CO., LTD
No.67 HongJiang Road, Pushang Industrial Park, Jinshan
new area, Fuzhou, Fujian, China

Manufacturer:

FUZHOU RISE ELECTRONIC CO., LTD
No.67 HongJiang Road, Pushang Industrial Park, Jinshan
new area, Fuzhou, Fujian, China

Description of Samples:

Product: Digital Clock Transmitter
Brand Name: N/A
Model Number: TX3
FCC ID: XNBRISCTX3

Date Samples Received:

2009-07-29

Date Tested:

2009-08-09, 2009-08-11

Investigation Requested:

Perform ElectroMagnetic Interference measurement in
accordance with FCC 47CFR [Codes of Federal Regulations]
Part 15: 2008 and ANSI C63.4:2003 for FCC Certification.

Conclusions:

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.

Remarks:

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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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**

FUZHOU RISE ELECTRONIC CO., LTD
No.67 HongJiang Road, Pushang Industrial Park, Jinshan new area, Fuzhou, Fujian, China

Manufacturer

FUZHOU RISE ELECTRONIC CO., LTD
No.67 HongJiang Road, Pushang Industrial Park, Jinshan new area, Fuzhou, Fujian, China

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1.3 Equipment Under Test [EUT] Description of Sample

Product: Digital Clock Transmitter
Manufacturer: FUZHOU RISE ELECTRONIC CO., LTD
Brand Name: N/A
Model Number: TX3
Rating: 3Vd.c. ("AAA" size battery ×2)

1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is a FUZHOU RISE ELECTRONIC CO., LTD, Digital Clock Transmitter. The EUT is a periodic transmitter, which consist a mechanical switch, that allow the user to select 3 different set of pulse codes by setting the switch at different position. All 3 sets of pulse code have been examined and only the worse case is reported. The transmission signal modulated by IC; and the type is ASK modulation.

1.4 Date of Order

2009-07-29

1.5 Submitted Sample(s):

1 Sample

1.6 Test Duration

2009-08-09, 2009-08-11

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 2008 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 15.231e	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"/>

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions (30 – 1000MHz)

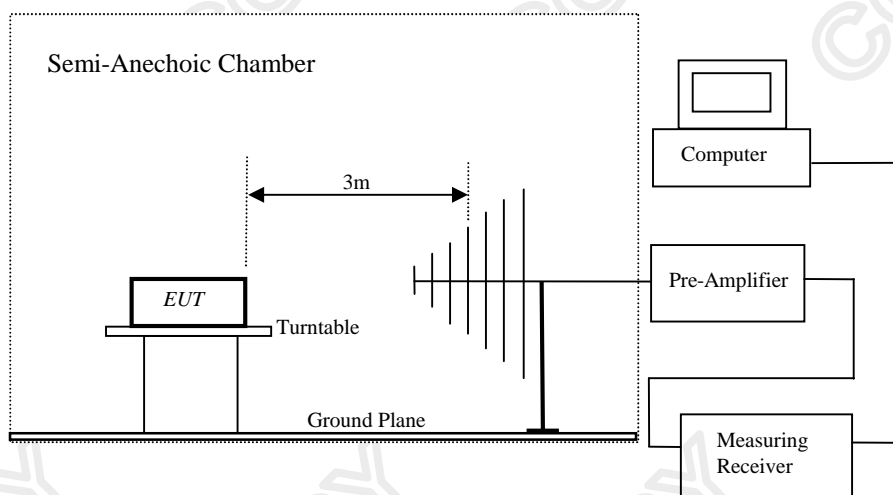
Test Requirement: FCC 47CFR 15.231e
Test Method: ANSI C63.4:2003
Test Date: 2009-08-09
Mode of Operation: Tx on mode

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 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.

Test Setup:



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

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [μV/m]	Field Strength of Spurious Emission [Average] [μV/m]
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500 **	50 to 150 **
174-260	1,500	150
260-470	1,500 to 5,000 **	150 to 500 **
Above 470	5,000	500

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, $\mu\text{V/m}$ at 3 meters = $22.72727(F) - 2454.545$; for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $16.6667(F) - 2833.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

Results of Tx on mode: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
433.93	58.2	18.6	76.8	6,918.3	43,988.5	Vertical

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
* 433.93	41.7	18.6	60.3	1,035.1	4,398.8	Vertical

*: Adjusted by Duty Cycle = -16.8dB

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Results of Tx on mode: PASS

Field Strength of Spurious Emissions Quasi-Peak						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
867.86	13.2	25.8	39.0	89.1	441.6	Vertical
+ 1301.79	1.1	31.1	32.2	40.7	500.0	Vertical
1735.72	1.3	32.9	34.2	51.3	434.9	Vertical
+ 2169.65	1.3	35.6	36.9	70.0	434.9	Vertical
2603.58	1.6	37.5	39.1	90.2	434.9	Vertical
+ 3037.51	1.5	38.4	39.9	98.9	434.9	Vertical

Remarks:

FCC Limit for Fundamental Average Measurement = $16.6667(433.93) - 2833.3333 = 4398.8 \mu\text{V/m}$

+: 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 5.2dB

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Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Frequency Range [MHz]	Quasi-Peak Limits [$\mu\text{V/m}$]
30-88	100
88-216	150
216-960	200
Above 960	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 of Tx on mode: PASS

Field Strength of Fundamental Emissions						
Peak Value						
Frequency	Measured Level @3m	Correction Factor	Field Strength	Field Strength	Limit @3m	E-Field Polarity
MHz	dB μV	dB/m	dB $\mu\text{V/m}$	$\mu\text{V/m}$	$\mu\text{V/m}$	
Emissions detected are more than 20 dB below the FCC Limits						

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30MHz

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

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3.2 20dB Bandwidth of Fundamental Emission

Test Requirement: FCC 47 CFR 15.231e
Test Method: ANSI C63.4:2003 (Section 13.1.7)
Test Date: 2009-08-11
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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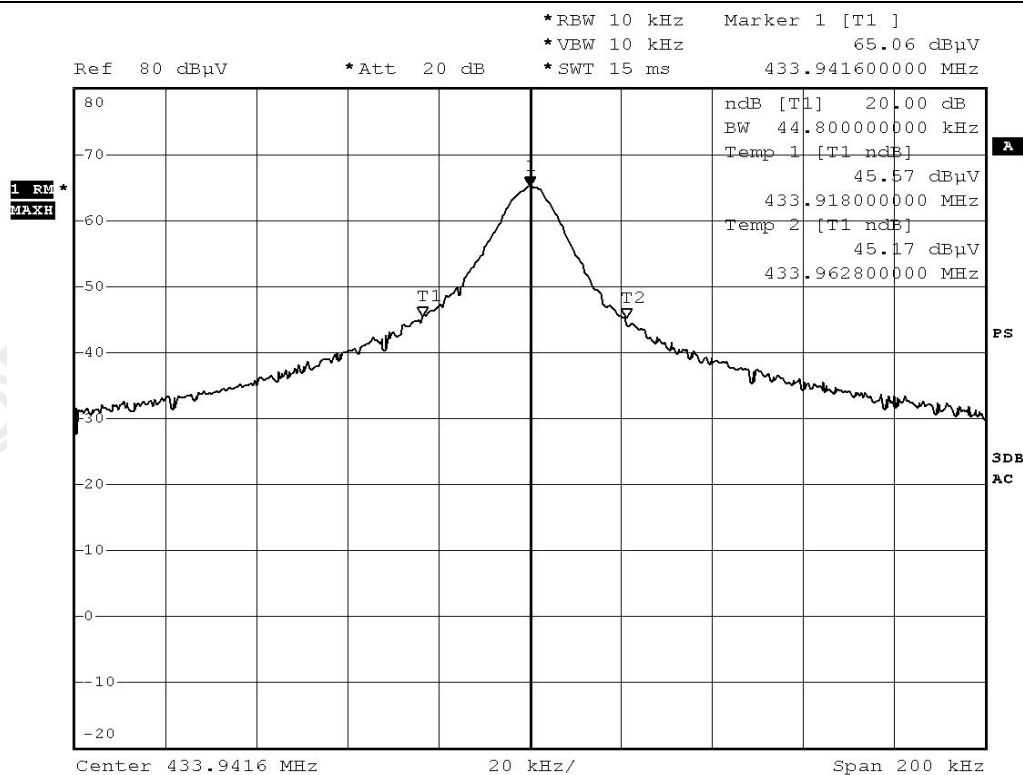
No. : MH183266

Limits for 20 dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [KHz]	FCC Limits * [KHz]
433.9	44.8	1084.7

∗: FCC Limit for Bandwidth measurement = (0.25%)(Center Frequency)
= (0.0025)(433.9)
= 1084.7KHz

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	DUE CAL
EMD062	HORN ANTENNA	EMCO	3117	0075933	2008/11/06	2010/11/06
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	--	2008/12/01	2011/12/01
EM174	BICONILOG ANTENNA	EMCO	3142B	1671	2008/01/24	2010/01/24
EM181	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB7	100072	2009/06/29	2010/06/29
EM022	LOOP ANTENNA	EMCO	6502	1189-2424	2009/07/26	2011/07/26

Remarks:-

CM Corrective Maintenance

N/A Not Applicable or Not Available

TBD To Be Determined

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Appendix B

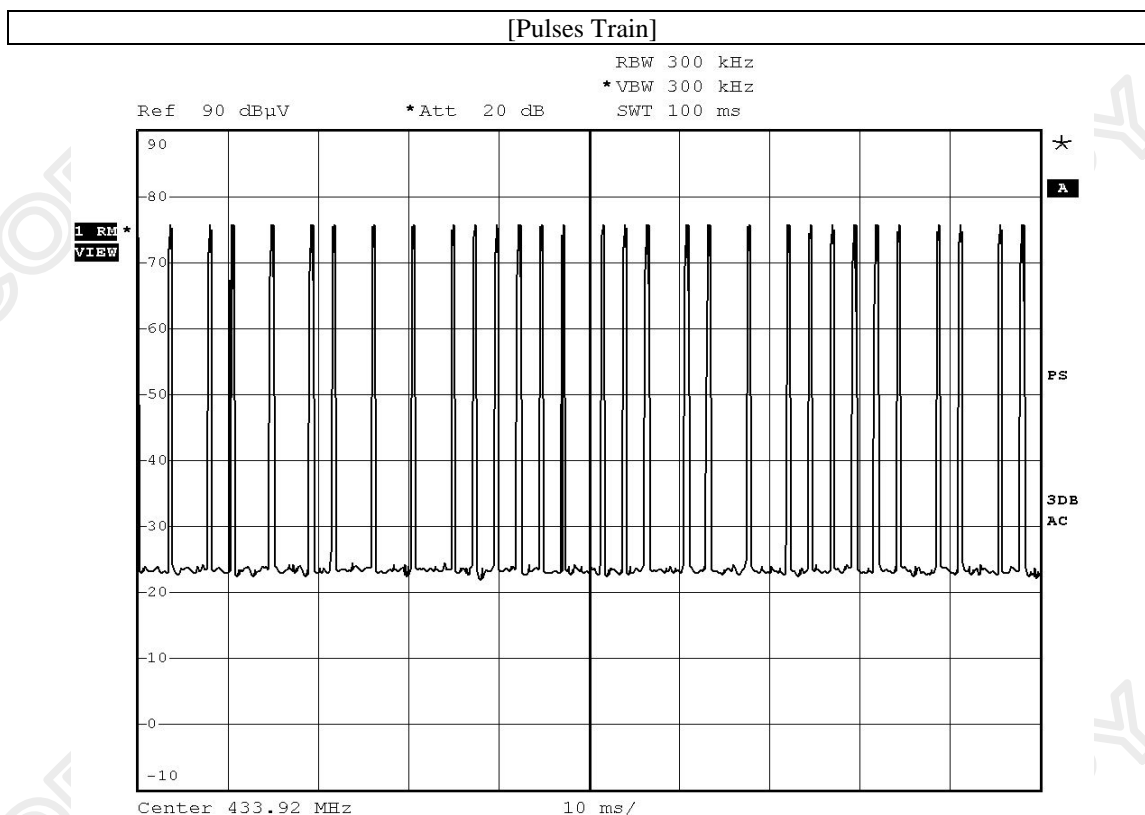
Duty Cycle Correction During 100msec

The transmitter periodically sends a different series of characters, but each packet period (100msec) never exceeds a series of 30 sole (0.48msec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered (31 x 0.48)msec per 100msec=14.88msec duty cycle with 100msec. Figure A through C show the characteristics of the pulses train for one of these functions.

Remarks:

Duty Cycle Correction = -16.5dB

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



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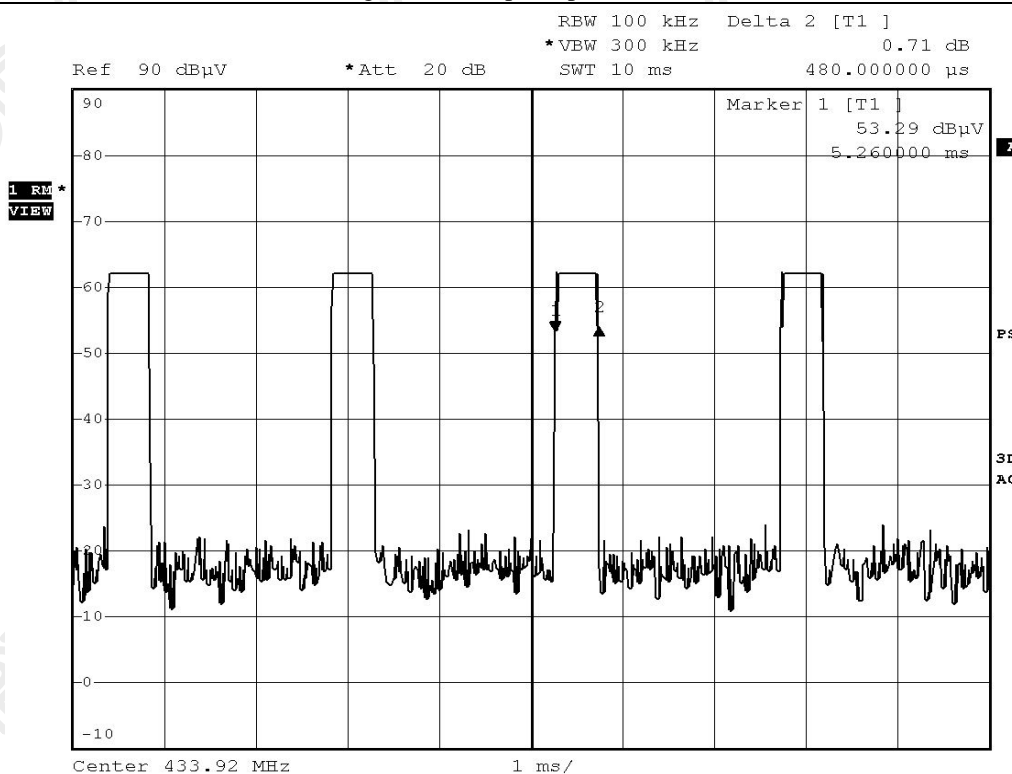
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Figure A [Sole pulse period]



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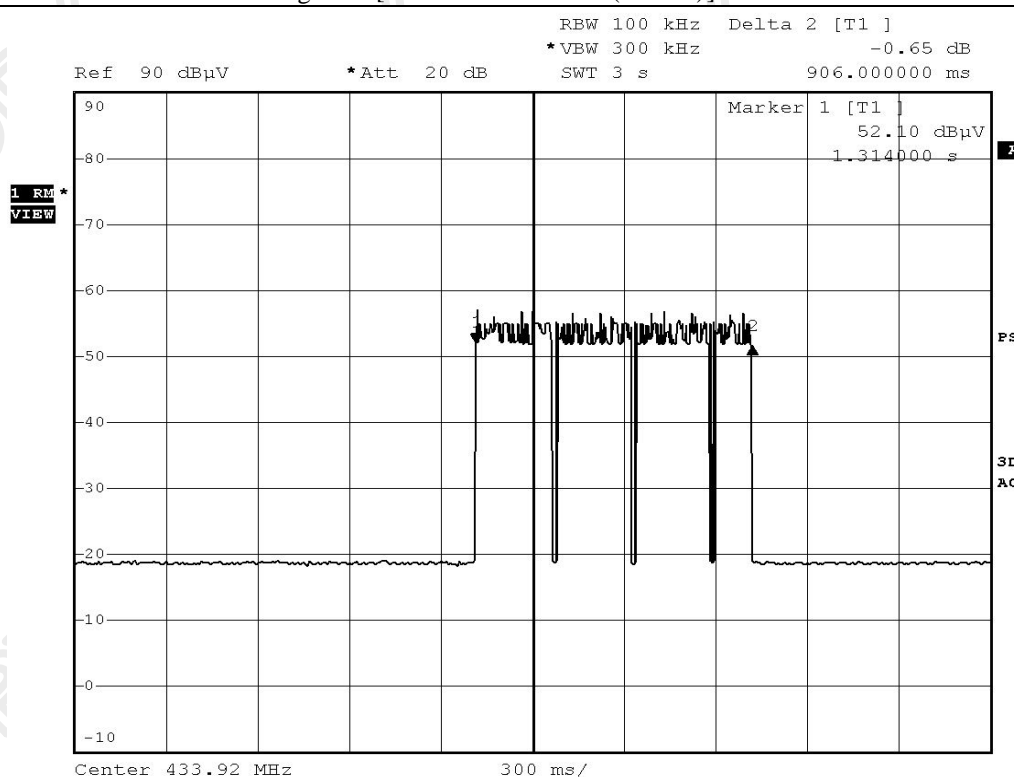
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Figure B [Transmission Period (0.906 s)]



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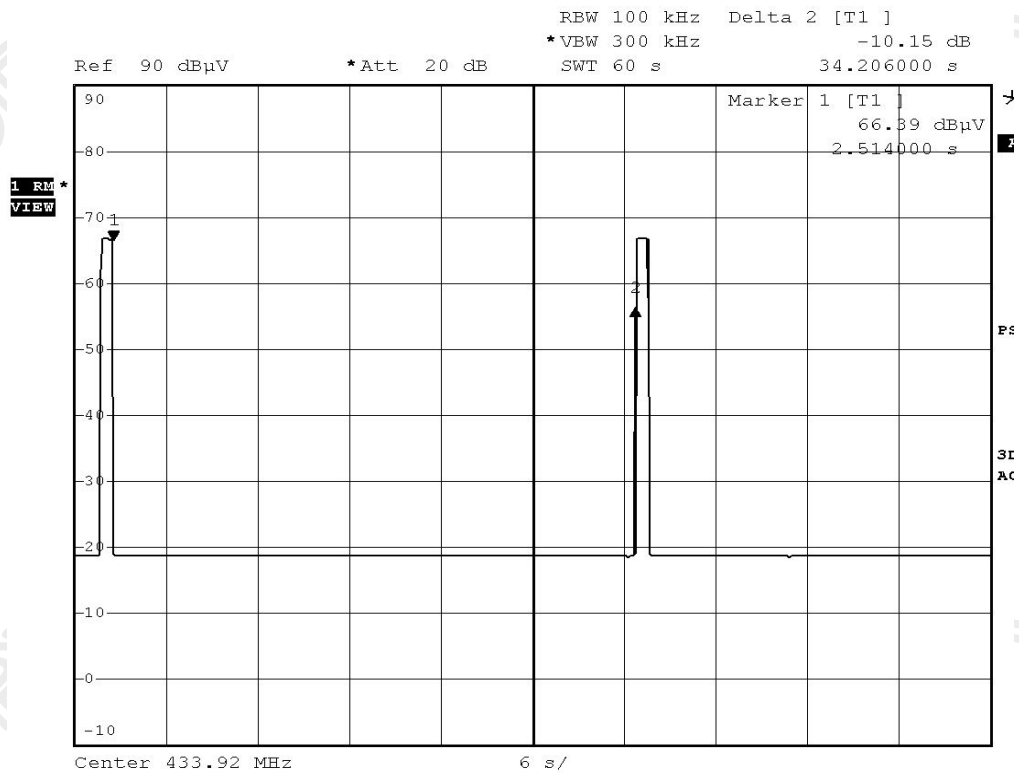
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Figure C [Silent period=34.206s [$>10s$, and $>30 \times 0.906(27.18s)$]]



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Appendix C

Periodic Operation [FCC 47CFR 15.231(e)]

According to FCC 47CFR15.231 (e). A periodic transmitter shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

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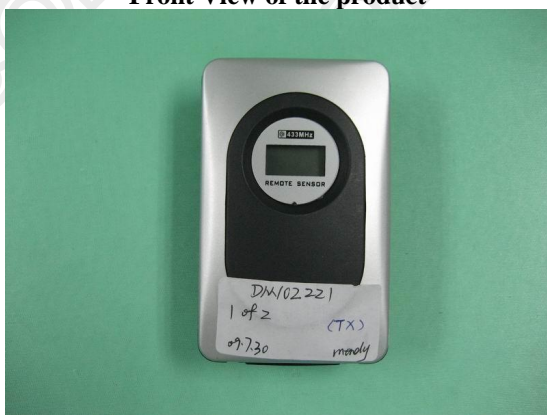
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Appendix D

Photographs of EUT

Front View of the product



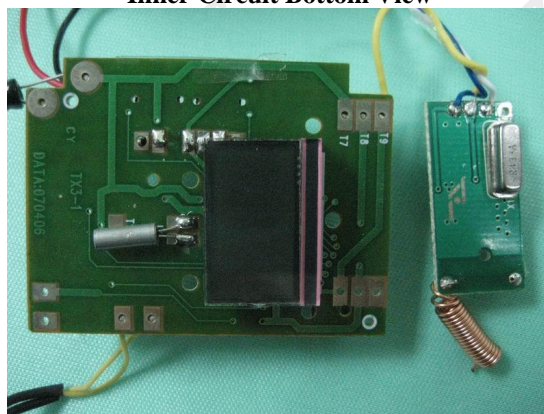
Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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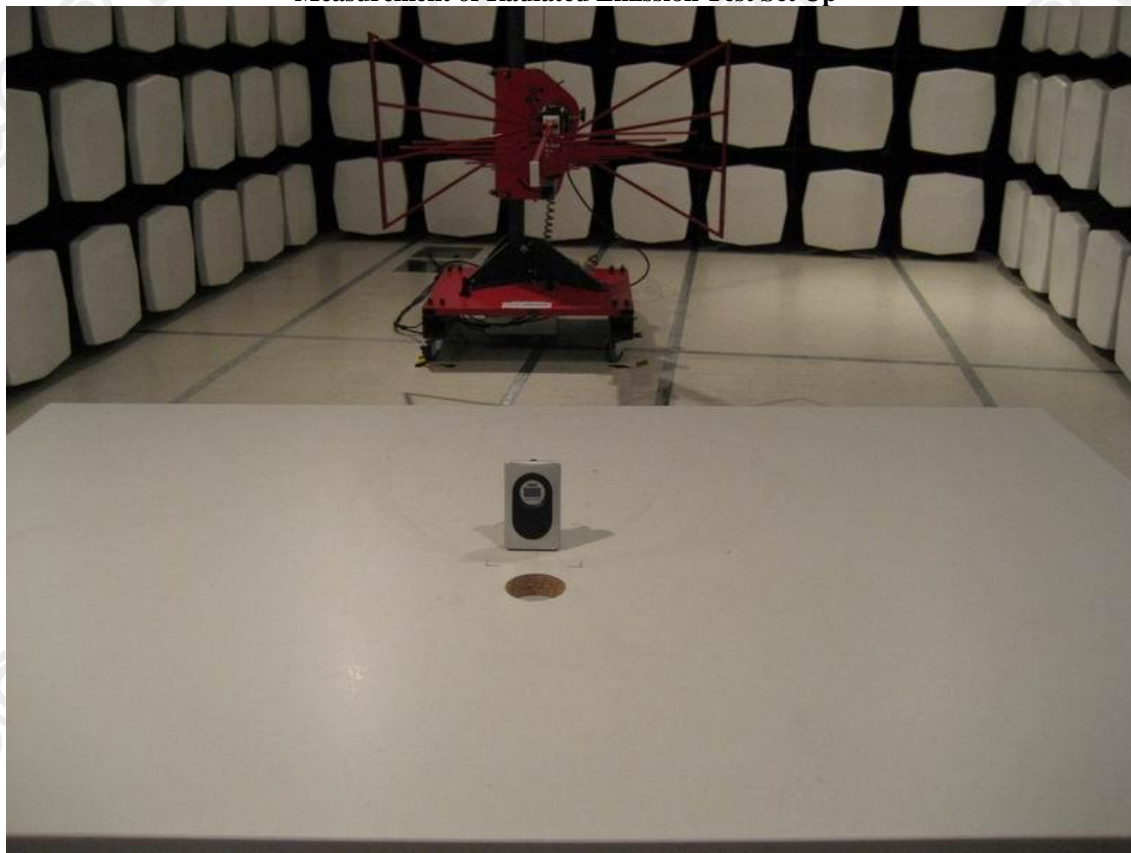
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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