FCC REPORT

Applicant:	DawnSun Electronic Technology.Co.,Ltd.ZhongShan
Address of Applicant:	NO.8 NANYI STREET ,XINGGONG RD SHAXI TOWN, ZHONGSHAN,GUANGDONG, China
Manufacturer/ Factory:	DawnSun Electronic Technology Co., Ltd. Zhongshan
Address of Manufacturer// Factory:	8# Nanyi Street, Xinggong Road, Longxing Industrial District, Shaxi Town, Zhongshan, Guangdong, China 528471

Equipment Under Test (EUT)

Product Name:	Remote Control-Transmitter
Model No.:	TX043N, TX043L, TX043R, TX043C, TX043LR, TX043LC, TX043RC, TX043LRC
FCC ID:	A25-43
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.231
Date of sample receipt:	April 17, 2018
Date of Test:	April 18-23, 2018
Date of report issued:	April 23, 2018
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
01	*April 23, 2018*	*Original*

Prepared By: Bill. Yuan ***Date:*** *April 23, 2018*

Project Engineer

Check By: Andy. Wu ***Date:*** *April 23, 2018*

Reviewer

3 Contents

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203	Pass
Conduction Emission	15.207	N/A
Field strength of the Fundamental Signal	15.231 (b)	Pass
Spurious Emissions	15.231 (b)/15.209	Pass
20dB Bandwidth	15.231 (c)	Pass
Dwell Time	15.231 (a)(1)	Pass

Pass: The EUT complies with the essential requirements in the standard.

N/A: Not applicable

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

Product Name:	Remote Control-Transmitter
Model No.:	TX043N, TX043L, TX043R, TX043C, TX043LR, TX043LC, TX043RC, TX043LRC
Test Model No:	TX043-LR

Remark: All above models are identical in the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction. The difference lies only below:

Model no.	Function		
	S6	K1	K2
TX043-N			
TX043-L	○		
TX043-R		○	
TX043-C			○
TX043-LR	○	○	
TX043-LC	○		○
TX043-RC		○	○
TX043-LRC	○	○	

The keys S6, K1 and K2 are function keys, these are optional for all models, and no influence to RF.

Serial No.:	2018-426
Test sample(s) ID:	GTS201804000156-1
Sample(s) Status:	Engineer sample
Hardware:	TX043
Software:	A7B7
Operation Frequency:	304MHz
Modulation technology:	ASK
Antenna Type:	PCB Antenna
Antenna gain:	0dBi (declare by applicant)
Power supply:	DC 3.0V (CR2032H)

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting mode.	New battery is used during all test

Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which only the worst case was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	76.15	76.29	75.96

5.3 Description of Support Units

None.

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383, January 08, 2018.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone,
Xixiang Road, Baoan District, Shenzhen, Guangdong, China
Tel: 0755-27798480
Fax: 0755-27798960

5.6 Other Information Requested by the Customer

None.

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June 28 2017	June 27 2018
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 28 2017	June 27 2018
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 28 2017	June 27 2018
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 28 2017	June 27 2018
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 28 2017	June 27 2018
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 28 2017	June 27 2018
10	Coaxial Cable	GTS	N/A	GTS211	June 28 2017	June 27 2018
11	Coaxial cable	GTS	N/A	GTS210	June 28 2017	June 27 2018
12	Coaxial Cable	GTS	N/A	GTS212	June 28 2017	June 27 2018
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 28 2017	June 27 2018
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 28 2017	June 27 2018
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 28 2017	June 27 2018
16	Band filter	Amindeon	82346	GTS219	June 28 2017	June 27 2018

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	June 29 2016	June 28 2017

7 Test results and Measurement Data

7.1 Antenna Requirement

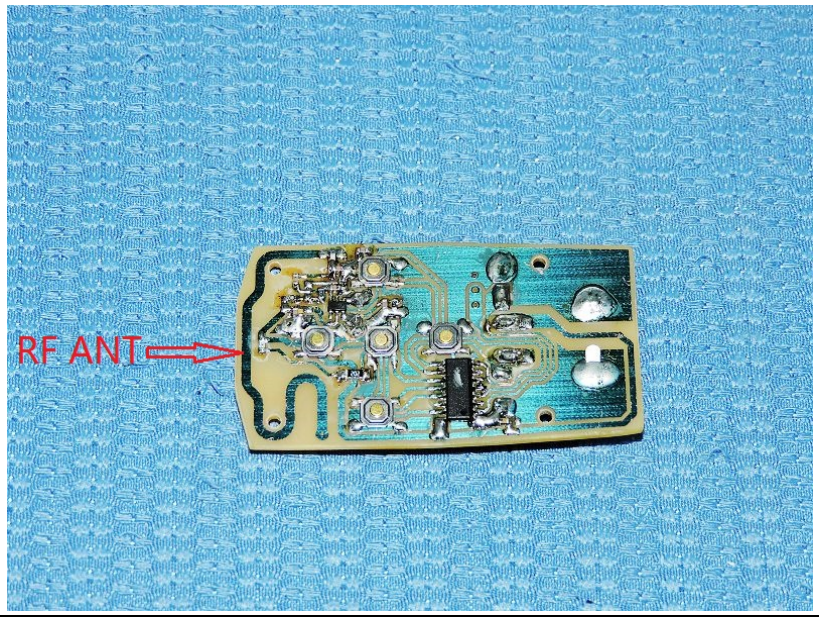
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

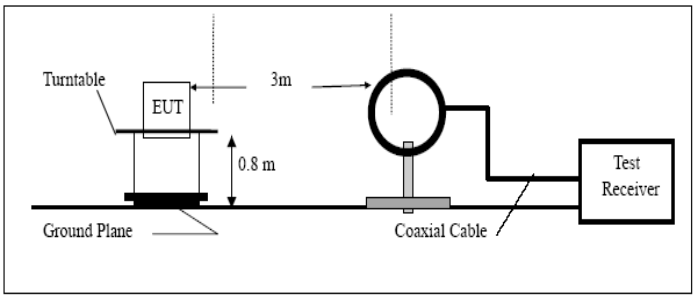
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

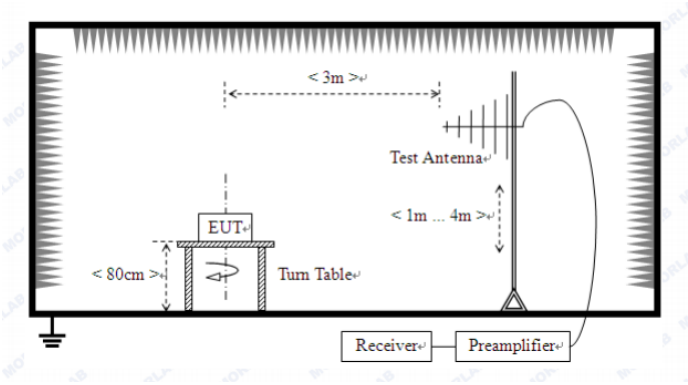
The antenna is PCB antenna, the best case gain of the antenna is 0dBi.

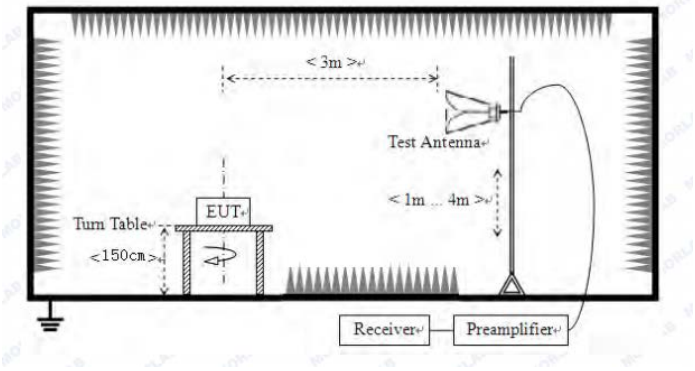


7.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.231 (b)& Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 4000MHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Value</td></tr>
<tr><td>9KHz-150KHz</td><td>Quasi-peak</td><td>200Hz</td><td>600Hz</td><td>Quasi-peak</td></tr>
<tr><td>150KHz-30MHz</td><td>Quasi-peak</td><td>9KHz</td><td>30KHz</td><td>Quasi-peak</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(Field strength of the fundamental signal)</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2">304MHz</td><td>74.94</td><td>Average Value</td></tr>
<tr><td>94.94</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(Spurious Emissions)</td><td>
<table>
<tr><td>Frequency</td><td>Limit (uV/m)</td><td>Value</td><td>Measurement Distance</td></tr>
<tr><td>0.009MHz-0.490MHz</td><td>2400/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>0.490MHz-1.705MHz</td><td>24000/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>1.705MHz-30MHz</td><td>30</td><td>QP</td><td>30m</td></tr>
<tr><td>30MHz-88MHz</td><td>100</td><td>QP</td><td rowspan="6">3m</td></tr>
<tr><td>88MHz-216MHz</td><td>150</td><td>QP</td></tr>
<tr><td>216MHz-960MHz</td><td>200</td><td>QP</td></tr>
<tr><td>960MHz-1GHz</td><td>500</td><td>QP</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>500</td><td>Average</td></tr>
<tr><td>5000</td><td>Peak</td></tr>
</table>
Or The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level whichever limit permits a higher field strength.
</td></tr>
<tr><td>Test setup:</td><td>Below 30MHz
 

Below 1GHz</td></tr>
</table>

<table>
<tr><td></td><td> 

Above 1GHz

</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table (0.8 meters for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 6.0 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.2 for details</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

Measurement data:

7.2.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
304.00	94.81	13.68	2.38	37.42	73.45	94.94	-21.49	Horizontal
304.00	97.65	13.68	2.38	37.42	76.29	94.94	-18.65	Vertical

Remark: Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

Average value:

Frequency (MHz)	Peak Value (dBuV/m)	Average factor	Average value (dBuV/m)	Limit Line (dBuV/m)	Polarization
304.00	73.45	-14	59.45	74.94	Horizontal
304.00	76.29	-14	62.29	74.94	Vertical

Remark: Average value=Peak value + Duty cycle factor

7.2.2 Spurious Emissions

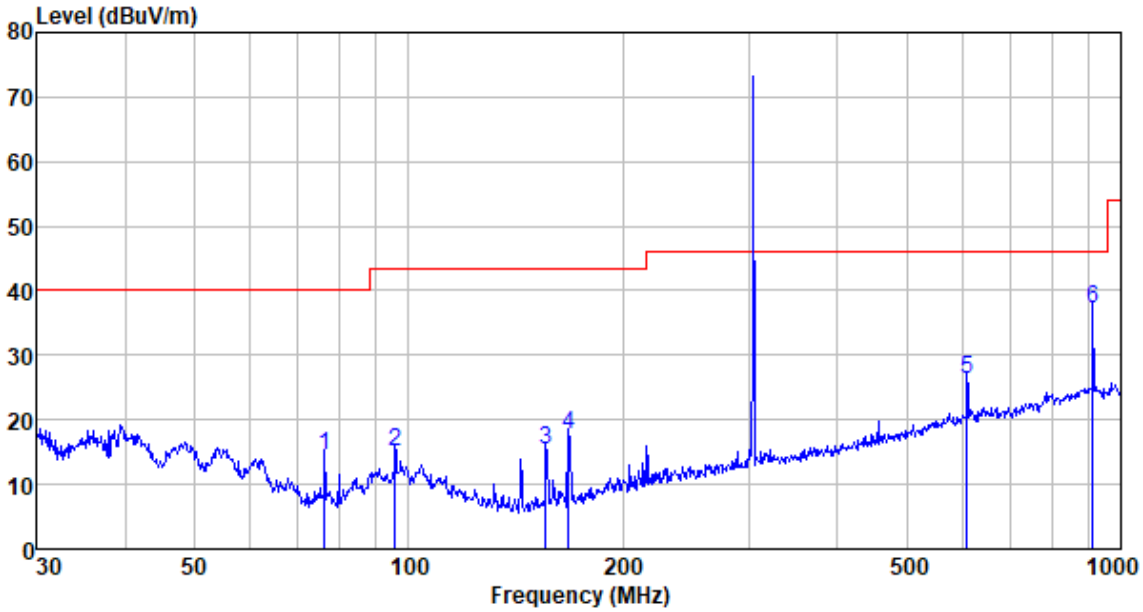
Measurement data:

9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

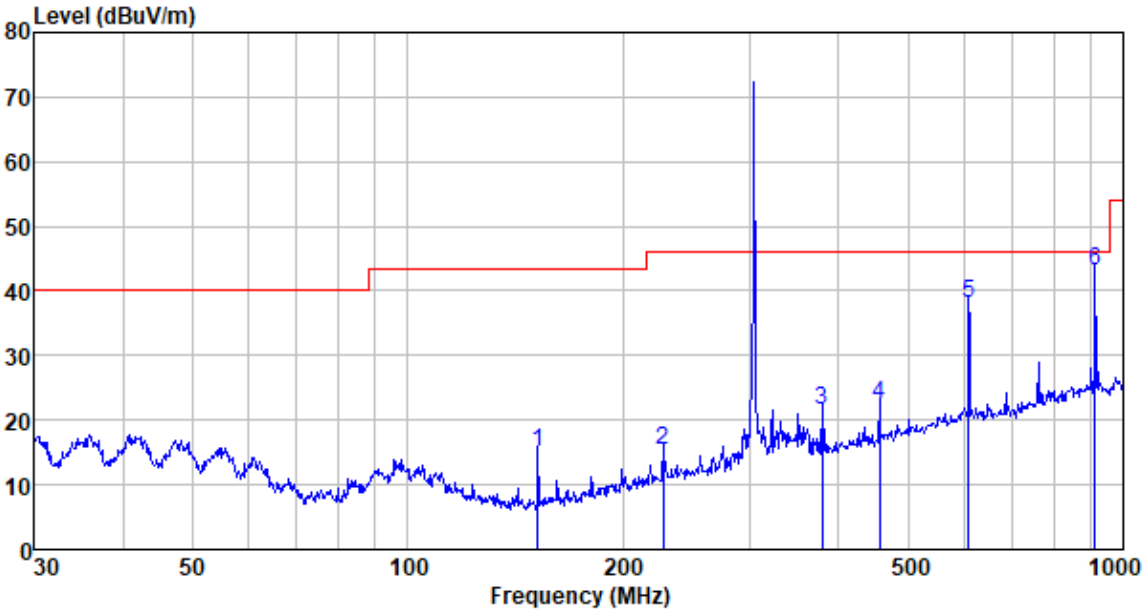
Below 1GHz:

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
76.244	42.44	7.43	1.00	36.51	14.36	40.00	-25.64	QP
95.762	38.92	11.59	1.16	36.69	14.98	43.50	-28.52	QP
155.910	42.94	8.05	1.60	37.11	15.48	43.50	-28.02	QP
167.824	44.63	8.46	1.67	37.18	17.58	43.50	-25.92	QP
607.787	40.69	19.51	3.75	37.55	26.40	46.00	-19.60	QP
912.862	47.52	22.35	4.90	37.59	37.18	46.00	-8.82	QP

Horizontal:



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV	dBuV/m	dB	
152.130	42.62	7.80	1.58	37.09	14.91	43.50	-28.59	QP
227.691	39.17	11.42	2.01	37.36	15.24	46.00	-30.76	QP
379.914	41.21	15.00	2.76	37.50	21.47	46.00	-24.53	QP
455.906	40.31	16.48	3.11	37.51	22.39	46.00	-23.61	QP
607.787	52.32	19.51	3.75	37.55	38.03	46.00	-7.97	QP
912.862	53.30	22.35	4.90	37.59	42.96	46.00	-3.04	QP

Above 1G:

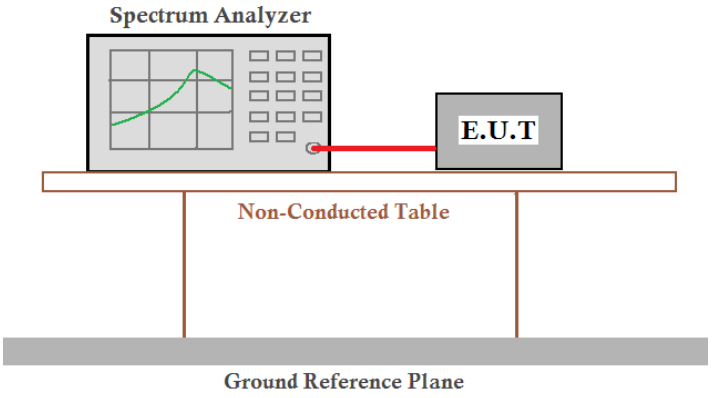
Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1175.00	37.53	25.20	4.45	35.89	31.29	74.00	-42.71	Vertical
1895.00	42.93	25.72	4.91	36.44	37.12	74.00	-36.88	Vertical
2710.00	33.87	28.18	5.68	37.10	30.63	74.00	-43.37	Vertical
3380.00	35.60	28.54	6.72	37.34	33.52	74.00	-40.48	Vertical
4325.00	29.30	30.83	8.18	37.54	30.77	74.00	-43.23	Vertical
4765.00	29.62	31.73	8.56	37.71	32.20	74.00	-41.80	Vertical
1215.00	44.87	25.42	4.48	35.92	38.85	74.00	-35.15	Horizontal
1365.00	40.35	25.67	4.59	36.06	34.55	74.00	-39.45	Horizontal
1520.00	40.63	25.18	4.69	36.18	34.32	74.00	-39.68	Horizontal
2430.00	37.91	27.52	5.42	36.88	33.97	74.00	-40.03	Horizontal
3330.00	35.14	28.41	6.62	37.34	32.83	74.00	-41.17	Horizontal
4310.00	29.29	30.77	8.16	37.53	30.69	74.00	-43.31	Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *Average value=Peak value + Duty cycle factor*

7.3 20dB Occupy Bandwidth

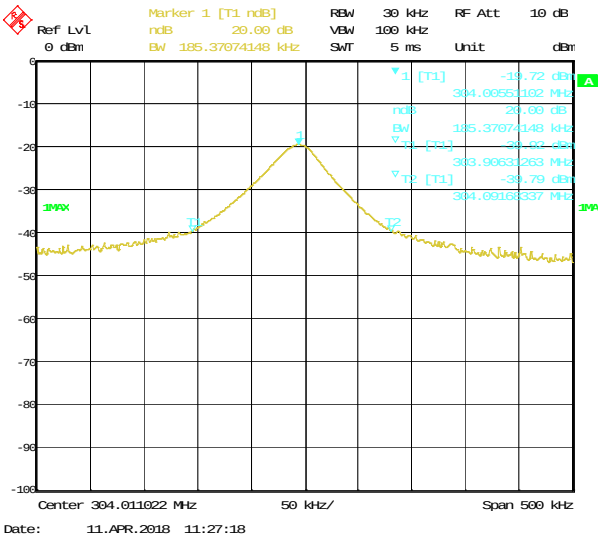
Test Requirement:	FCC Part15 C Section 15.231 (c)
Test Method:	ANSI C63.10:2013
Limit:	The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

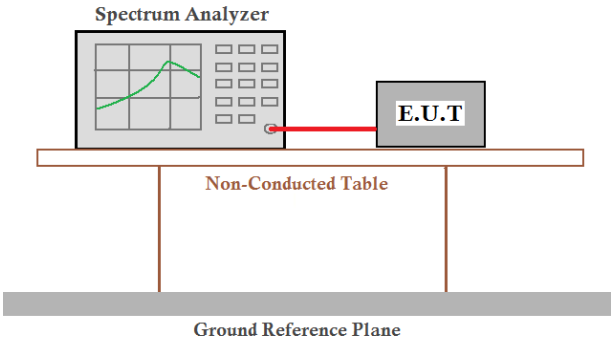
Test Frequency (MHz)	20dB bandwidth (MHz)	Limit (MHz)	Result
304.00	0.185	0.76	Pass

Note: Limit= Fundamental frequency×0.25%=304×0.25%=0.76MHz

Test plot as follows:

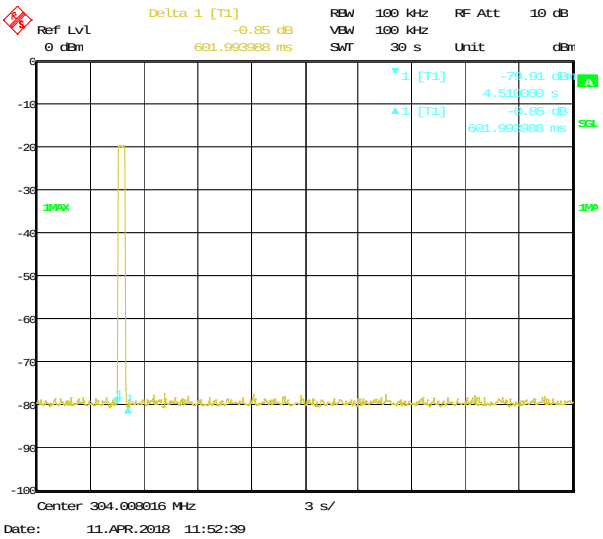


7.4 Dwell Time

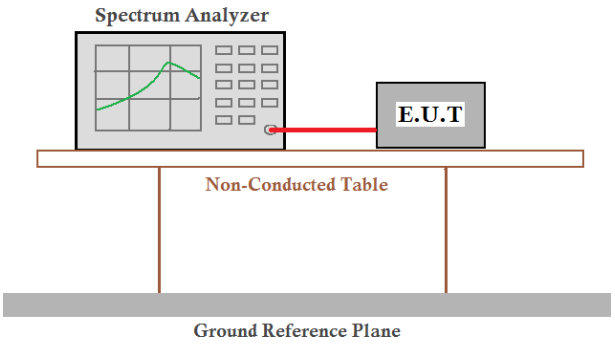
Test Requirement:	FCC Part15 C Section 15.231 (a) (1)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	Not more than 5 seconds
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

Test Frequency (MHz)	Duration of each TX(second):	Limit (second)	Result
304.00	0.602	<5.0	Pass



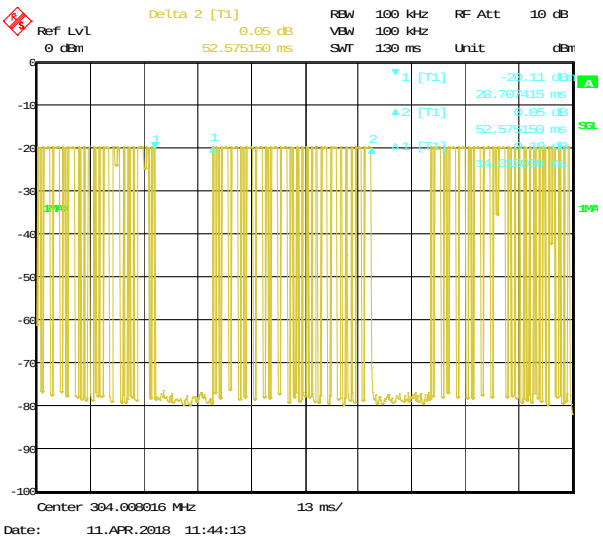
7.5 Duty Cycle

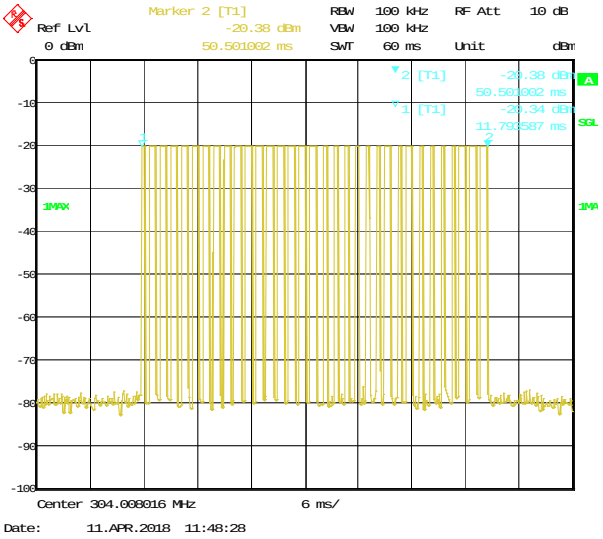
Test Requirement:	FCC Part15 C Section 15.231
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100KHz, VBW=300KHz, span=0Hz, detector: Peak
Limit:	No dedicated limit specified in the Rules.
Test Procedure:	1. Place the EUT on the table and set it in transmitting mode. 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer. 3. Set centre frequency of spectrum analyzer=operating frequency. 4. Set the spectrum analyzer as RBW=100kHz, VBW=100KHz, Span=0Hz, Adjust Sweep=100ms to obtain the “worst-case” pulse on time 5. Repeat above procedures until all frequency measured was complete.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

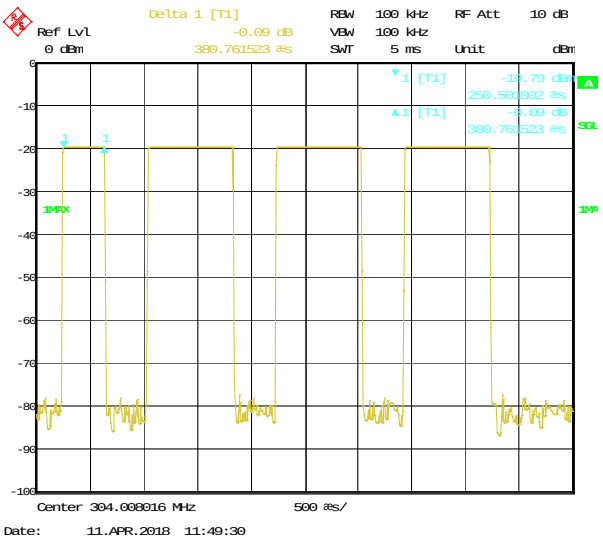
Measurement data:

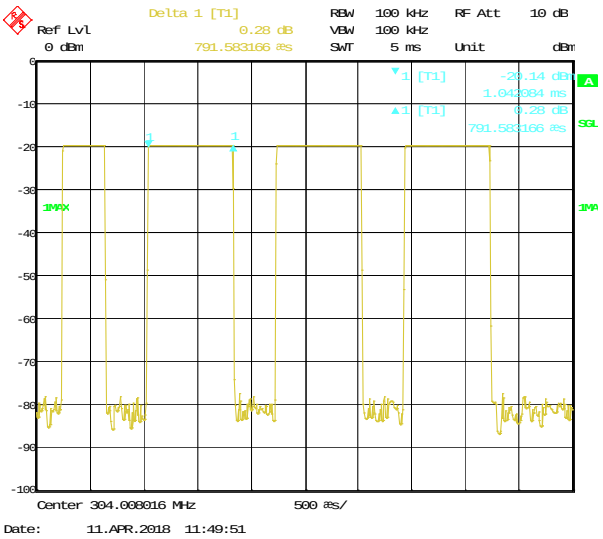
Tp =52.575+14.018=66.593ms
Ton= 0.7916x11+0.38076x12=8.708+4.572=13.28ms
(0.7916x11+0.38076x12=8.708+4.572=13.28)/(52.575+14.018=66.593)
Duty cycle=Ton/Tp=13.28/66.593=19.94%
Duty cycle factor = 20 * log (duty cycle) = 20 * log (0.1994) = -14dB

Test plots is below:



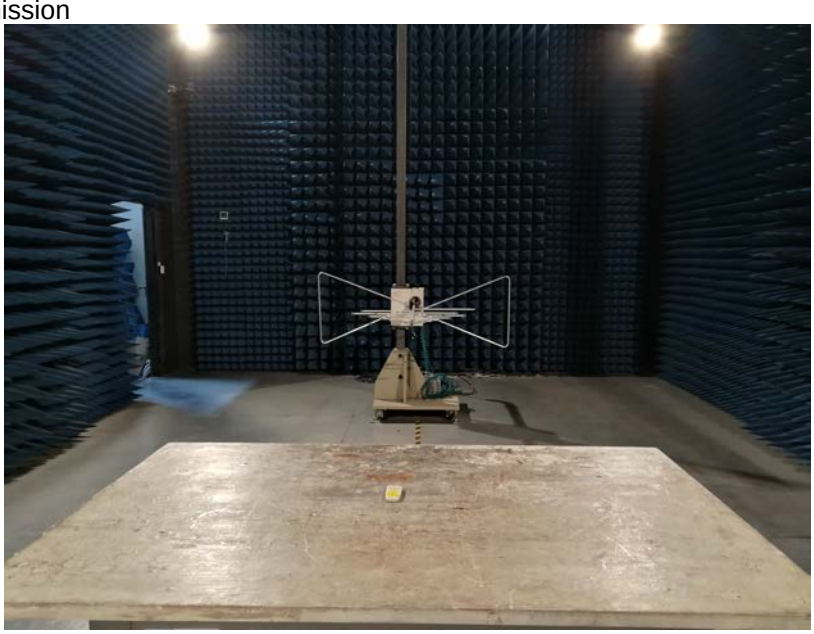




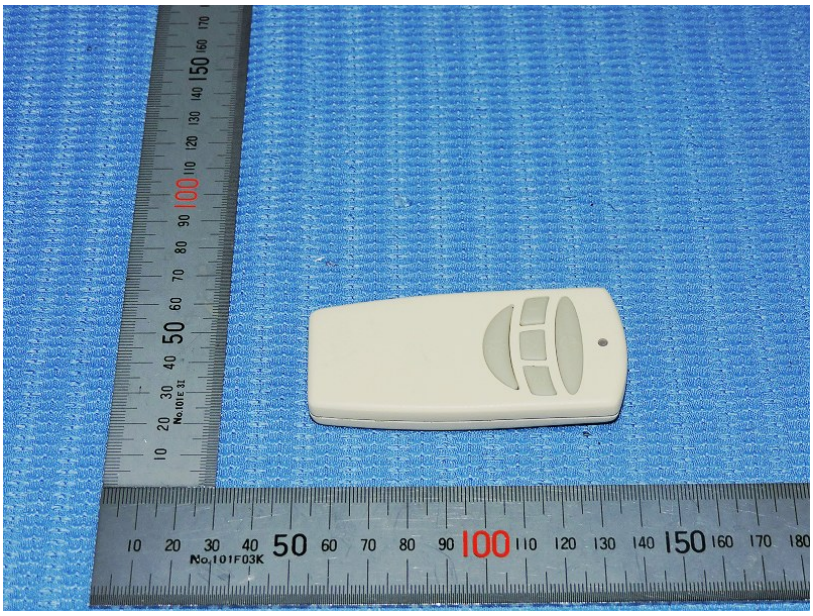

Delta 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
0.28 dB
VBW 100 kHz
0 dBm
791.583166 µs
SWT 5 ms
Unit dBm
1 [T1] -20.14 dBm
1.042084 ms
1 [T1] 0.28 dB
791.583166 µs
1MAX
Center 304.008016 MHz
500 µs/
Date: 11.APR.2018 11:49:51

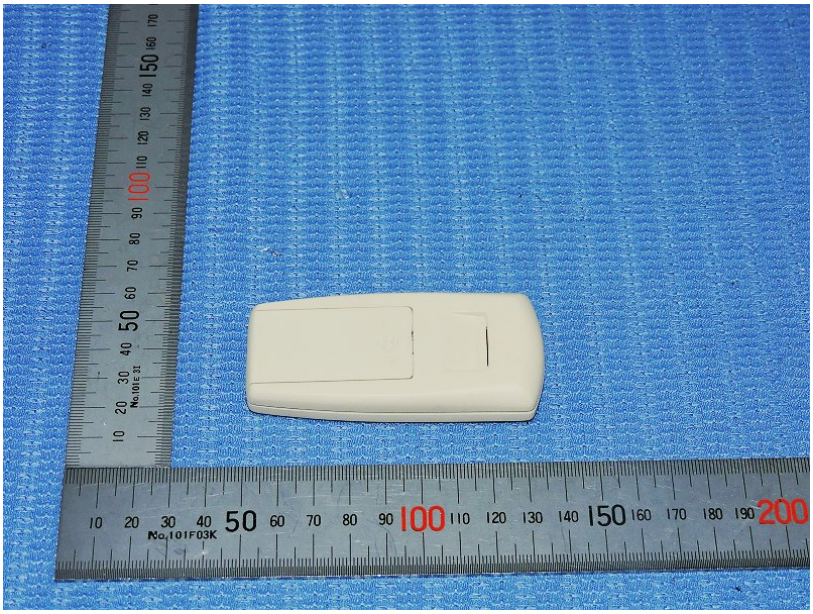
8 Test Setup Photo

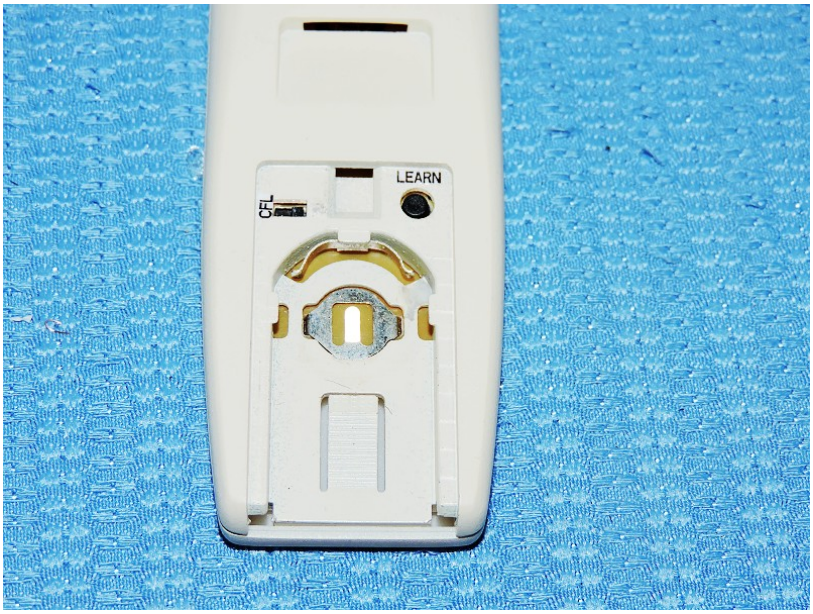
Radiated Emission



9 EUT Constructional Details






LEARN
CFL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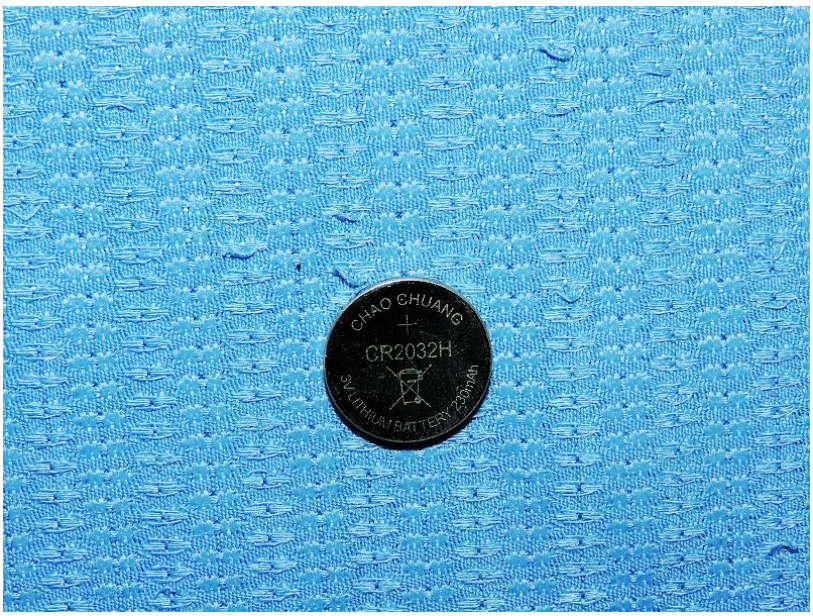
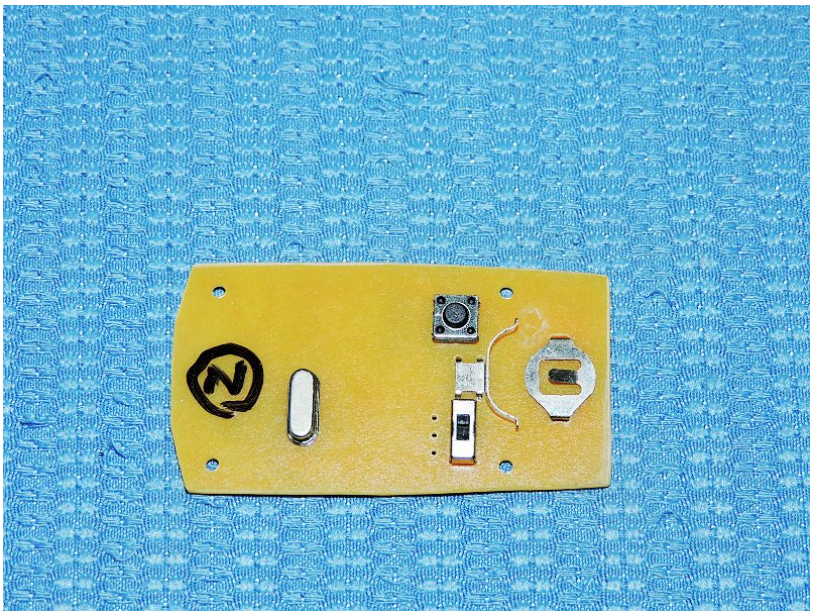
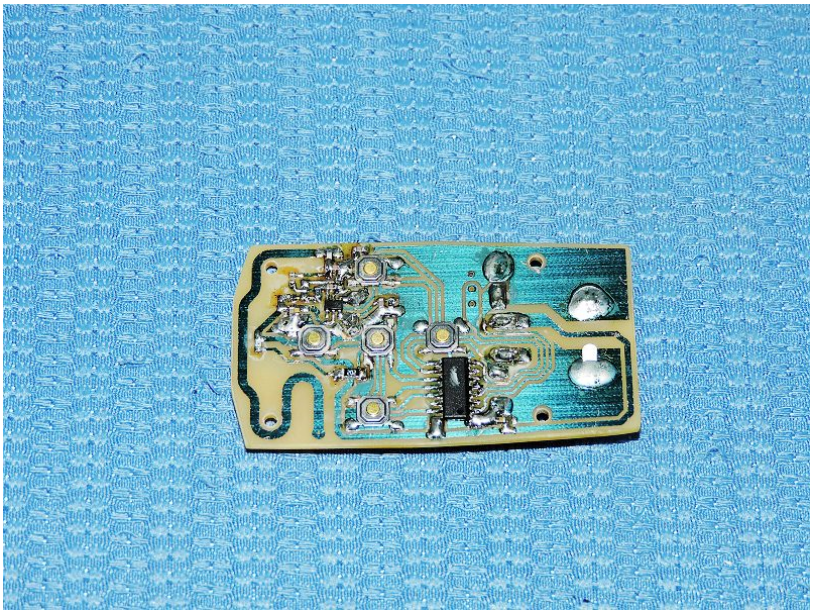
CFL
CR2032H


CHAO CHUANG
CR2032H
3V LITHIUM BATTERY 230mAh


No.101F03K





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