Report No.:	TW2409182E
Applicant:	Dan's Electronics Etc., Inc.
Product:	Remote Control
Model No.:	FA0238C-S, FA0238-S
Trademark:	N/A
Test Standards:	FCC Part 15 Subpart C, Paragraph 15.231
Test result:	It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.231 for the evaluation of electromagnetic compatibility
Approved By Terry Tang Manager	
Dated:	September 26, 2024
	herein relate only to the sample tested orts is issued errors and omissions exempt and is subject to
SHENZHE	N TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com



Special Statement:

FCC-Registration No.: 744189

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 744189.

Industry Canada (IC) — Registration No.: 5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

A2LA (Certification Number:5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

CAB identifier: CN0033

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1.0 General Details

1.1 Test Lab Details

Name:	SHENZHEN TIMEWAY TESTING LABORATORIES.
Address:	Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le
	Village, Nanshan District, Shenzhen, China
Telephone:	+86 755 83448688
Fax:	+86 755 83442996
Site on File w	vith the Federal Communications Commission – United Sates
Registration Number: 744189	
For 3m Anech	noic Chamber

1.2 Applicant Details

Applicant:	Dan's Electronics Etc., Inc.
Address:	4945 Reynolda Road, Winston Salem, NC 27106 U.S.A.

1.3 Description of EUT

1	
Product:	Remote Control
Manufacturer:	DawnSun Electronic Technology Co., Ltd. Zhongshan
Address:	8# Nanyi Street, Xinggong Road, Longxing Industrial District, Shaxi Town,
	Zhongshan, Guangdong, China 528471
Trademark:	N/A
Model Number:	FA0238C-S
Additional Model Name	FA0238-S
Additional Trade Name	N/A
Hardware Version:	FA0238-V1
Software Version:	FA0238-0x049D
Serial No.:	FA0238
Rating:	DC3.0V, 2pcs AAA batteries
Operation Frequency:	304MHz
Modulation Type:	OOK
Emission Designation:	387KA1D
Antenna Designation	PCB Antenna with Gain 0dBi

- 1.4 Submitted Sample: 2 Samples
- 1.5 Test Duration

2024-09-18 to 2024-09-26

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- 1.6 Test Uncertainty Conducted Emissions Uncertainty =3.6dB Radiated Emissions below 1GHz Uncertainty =4.7dB Radiated Emissions above 1GHz Uncertainty =6.0dB Conducted Power Uncertainty =6.0dB Occupied Channel Bandwidth Uncertainty =5% Note: The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.
- 1.7 Test Engineer

The sample tested by

Andy -Xing

Print Name: Andy Xing

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2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2024-07-12	2025-07-11
LISN	R&S	EZH3-Z5	100294	2024-07-12	2025-07-11
LISN	R&S	EZH3-Z5	100253	2024-07-12	2025-07-11
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2024-07-12	2025-07-11
Loop Antenna	EMCO	6507	00078608	2022-07-18	2025-07-17
Spectrum	R&S	FSIQ26	100292	2024-07-12	2025-07-11
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2022-07-18	2025-07-17
Horn Antenna	R&S	BBHA 9120D	9120D-631	2022-07-18	2025-07-17
Power meter	Anritsu	ML2487A	6K00003613	2024-07-12	2025-07-11
Power sensor	Anritsu	MA2491A	32263	2024-07-12	2025-07-11
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2022-07-18	2025-07-17
9*6*6 Anechoic			N/A	2022-07-26	2025-07-25
EMI Test Receiver	RS	ESVB	826156/011	2024-07-12	2025-07-11
EMI Test Receiver	RS	ESCS 30	834115/006	2024-07-12	2025-07-11
Spectrum	HP/Agilent	E4407B	MY50441392	2024-07-12	2025-07-11
Spectrum	RS	FSP	1164.4391.38	2024-07-12	2025-07-11
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA		2024-07-12	2025-07-11
RF Cable	Zhengdi	7m		2024-07-12	2025-07-11
Pre-Amplifier	Schwarebeck	BBV9743	#218	2024-07-12	2025-07-11
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2024-07-12	2025-07-11
LISN	SCHAFFNER	NNB42	00012	2024-07-12	2025-07-11
ESPI Test Receiver	R&S	ESPI 3	100379	2024-07-12	2025-07-11
LISN	R&S	EZH3-Z5	100294	2024-07-12	2025-07-11

2.2 Automation Test Software

For Conducted Emission Test

Name	Version	
EZ-EMC	Ver.EMC-CON 3A1.1	

For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

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3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:				
Standard	Test Type	Result	Notes	
FCC Part 15, Paragraph 15.203	Antenna requirements	Pass	Compliant	
FCC Part 15, Paragraph 15.207	Conducted Emission Test	N/A	N/A	
FCC Part 15, Paragraph 15.209	General Requirement	Pass	Compliant	
FCC Part 15, Paragraph 15.231 (b)	Radiated Emission Test	Pass	Compliant	
FCC Part 15, Paragraph 15.231 (c)	20dB Bandwidth Testing	Pass	Compliant	
FCC Part 15, Paragraph 15.231 (a1)	Deactivate Testing	Pass	Compliant	

3.2 Test Standards

FCC Part 15 Subpart C, Paragraph 15.231 , ANSI C63.4 :2014 and ANSI C63.10 :2013

4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

The report refers only to the sample tested and does not apply to the bulk.

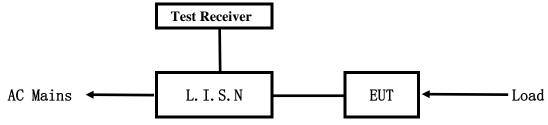
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5. Power Line Conducted Emission Test

5.1 Schematics of the test

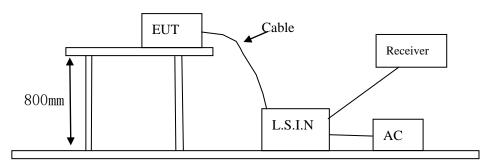


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2014. The Frequency spectrum from 0.15MHz to 30MHz was investigated. The LISN used was 500hm/50uH as specified by section 5.1 of ANSI C63.4 –2014.

Block diagram of Test setup



5.3 Configuration of The EUT

Internal Device

N/A

The EUT was configured according to ANSI C63.4-2014. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A.	EUT

R

Device	Manufacturer	Model	FCC ID
Remote Control	DawnSun Electronic Technology	FA0238C-S, FA0238-S	2BLBD-FA0238
	Co., Ltd.Zhongshan		

D.	Internal Device	<i>.</i>				
	Device	Ma		Model	FCC ID/DOC	
	N/A					
C.	Peripherals					
	Device	Manufacturer	Model	FCC ID/DOC		Cable

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5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2014.

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency	Limits (dB µ V)				
(MHz)	Quasi-peak Level	Average Level			
$0.15~\sim~0.50$	66.0~56.0*	56.0~46.0*			
$0.50~\sim~5.00$	56.0	46.0			
$5.00 \sim 30.00$	60.0	50.0			

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz. (The average detector is necessary when the Quasi-peak emission level beyond the average Limit.)

Note: Due to AAA Battery operation, this test item not applicable.

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N/A

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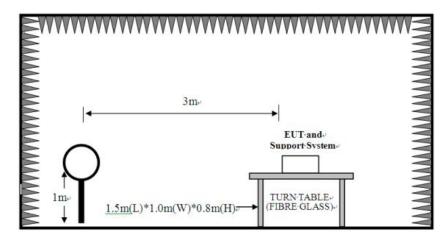


6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at TIMEWAY EMC Laboratory. This site is on file with the FCC laboratory division, Registration No.744189
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.
- (3) The frequency spectrum from 30 MHz to 4GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**QP**" in the data table.
- (6) The antenna polarization: Vertical polarization and Horizontal polarization.

Block diagram of Test setup

For radiated emissions from 9kHz to 30MHz

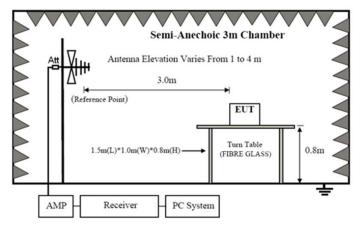


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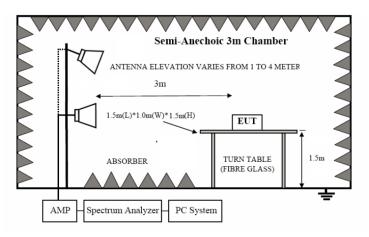
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For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



- 6.2 Configuration of The EUT Same as section 5.3 of this report
- 6.3 EUT Operating Condition Same as section 5.4 of this report.
- 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

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A FCC Fart 15 Subpart C Faragraph 15.251(a) Limit							
Fundamental Frequency (MHz)	Field St	rength of	Field Strength of Spurious				
	Funda	mental	Em	ission			
	uV/m	dBuV/m	uV/m	dBuV/m			
40.66-40.70	2250	67.04	225	47.04			
70-130	1250	61.94	125	41.94			
130-174	1250-3750	61.94-71.48	125-375	41.94-51.48			
174-260	3750	71.48	375	51.48			
260-470	3750-12500	71.48-81.94	375-1250	51.48-61.94			
Above 470	12500	81.94	1250	61.94			

A FCC Part 15 Subpart C Paragraph 15.231(a) Limit

Note: 1. RF Field Strength $(dBuV) = 20 \log RF$ Voltage (uV)

2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

4. Linear interpolations for frequency ranges 130-174MHz and 260-470MHz

5.the above field strength limits are specified at a distance of 3-meters and the tighter limits apply at the band edges

6. New batteries were installed in the equipment under test for radiated emission testing.

7. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

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B. Frequencies in restricted band are compiled to limit on Paragraph 15.209.

1	1	81
Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1. RF Voltage $(dBuV) = 20 \log RF$ Voltage (uV)

2. In the Above Table, the tighter limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-5G, the final emission level got using PK detector. And Average = peak(dBuV/m) - |duty cycle|(dB)

6.5 Test result

A Fundamental and Harmonics Radiated emission data

Product:	Remote Control		Test Mode:	Keep Transmitting
Test Item:	Fundamental Radiated Emission Spurious Emission Data	Fundamental Radiated Emission and Spurious Emission Data		25℃
Test Voltage:	DC3.0V		Humidity:	56%
Test Result:	Pass			
Frequency	Emission PK/AV	H	orizontal / Vertical	Limits PK/AV
(MHz)	(dBuV/m)			(dBuV/m)
304	75.14 (PK) / 65.12 (AV)		Н	94.90/74.90
304	69.38 (PK)		V	94.90/74.90
608	43.14 (PK)		Н	74.90/54.90
608	43.30 (PK)		V	74.90/54.90
912	56.66 (PK) / 46.64 (AV)		Н	74.90/54.90
912	49.09 (PK)		V	74.90/54.90
1216			H/V	74.00/54.00
1520			H/V	74.00/54.00
1824			H/V	74.90/54.90
2128			H/V	74.90/54.90
2432			H/V	74.90/54.90
2736			H/V	74.00/54.00
3040			H/V	74.90/54.90

Note: H=Horizontal, V=Vertical, AV=PK- | duty cycle factor | =PK-10.02

The PK measurement level less than the AV limit, no necessary to record the AV value

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B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

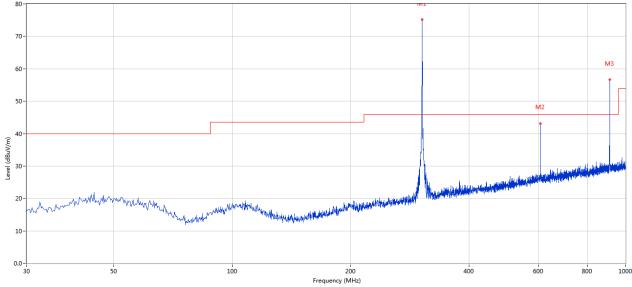
EUT set Condition: Keep Transmitting

Results:

Pass

Please refer to following diagram for individual

FCC_FCC Part 15C Class B 30MHz-1GHz



No.	Frequency	Results	Factor	Limit	Margin	Detector	Table	Height	Antenna	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(Degree)	(cm)		
1	303.957	75.14	-10.99	46.0	-29.14	Peak	60.00	100	Horizontal	N/A
2	607.976	43.14	-5.05	46.0	2.86	Peak	73.00	100	Horizontal	Pass
3	911.995	56.66	-1.80	46.0	-10.66	Peak	277.00	100	Horizontal	N/A

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B. General Radiated Emission Data

Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Transmitting

Results: Pass

2

3

607.976

911.995

43.30

49.09

-5.05

-1.80

46.0

46.0

Please refer to following diagram for individual

FCC_FCC Part 15C Class B 30MHz-1GHz 8 M1 70 60 M3 50 4(Level (dBuV/m) 30 العقا ومعاركون 20 10 0.0-100 600 30 50 200 400 800 1000 Frequency (MHz) Results Factor Limit Detector Table Height Verdict No. Frequency Margin Antenna (MHz) (dBuV/m) (dB) (dBuV/m) (dB) (Degree) (cm) 1 303.957 69.38 -10.99 46.0 -23.38 Peak 170.00 100 Vertical N/A

2.70

-3.09

Peak

Peak

91.00

5.00

100

100

Vertical

Vertical

Pass

N/A

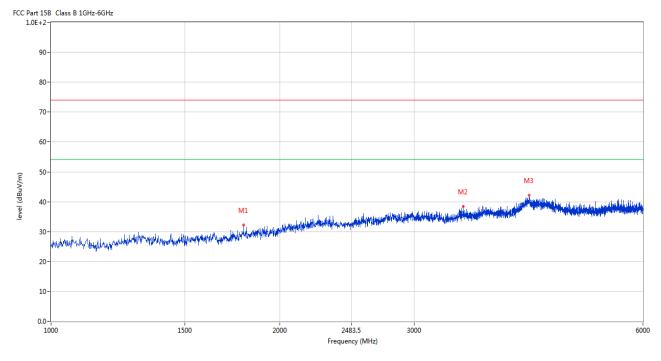
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Test Plot above 1G

Horizontal



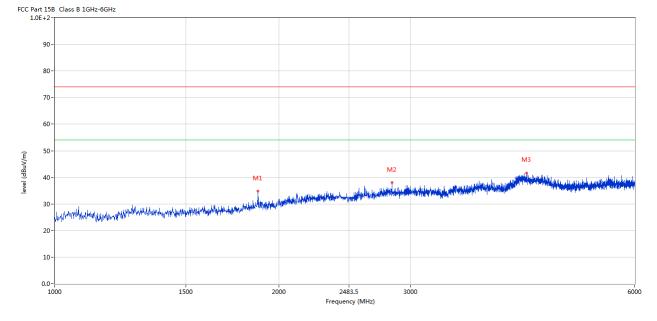
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	1791.052	32.11	-6.89	74.0	-41.89	Peak	339.00	100	Horizontal	Pass
2	3479.380	38.45	-1.23	74.0	-35.55	Peak	349.00	100	Horizontal	Pass
3	4252.937	42.14	1.73	74.0	-31.86	Peak	360.00	100	Horizontal	Pass

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Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	1873.532	34.81	-6.16	74.0	-39.19	Peak	0.00	100	Vertical	Pass
2	2833.292	37.95	-2.69	74.0	-36.05	Peak	0.00	100	Vertical	Pass
3	4297.926	41.62	1.84	74.0	-32.38	Peak	15.00	100	Vertical	Pass

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7.0 20dB and 99% Bandwidth Testing

7.1 Requirement

Per 15.231(c) and RSS-210 A1, The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

7.2 Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

7.3 Test Data

Frequency (MHz)	20dB Bandwidth Emission (kHz)	Limit (kHz)	Result
304	172	760	Pass

Frequency (MHz)	Frequency (MHz)99% Bandwidth Emission (kHz)		Result
304	387	760	Pass

Limit=Frequency x 0.25%=304x 0.25%=760kHz

Refer to attached plots:

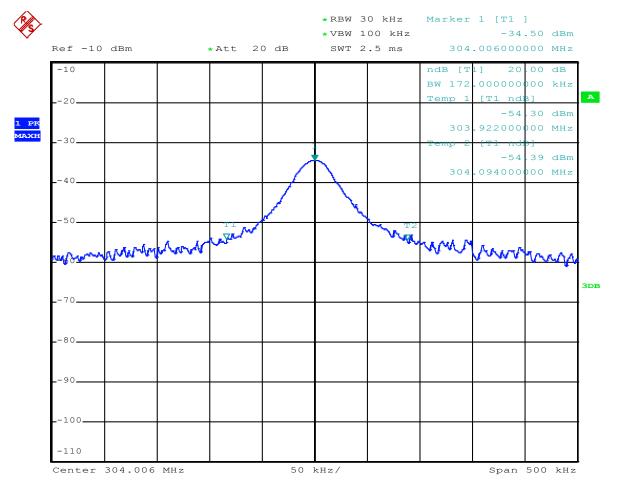
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20dB Bandwidth



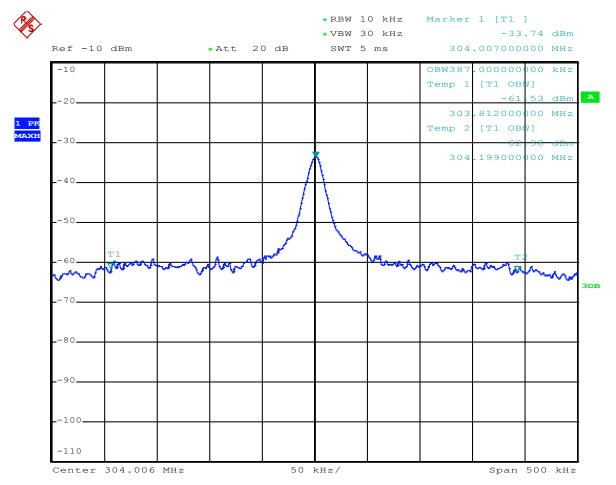
Date: 25.SEP.2024 14:16:17

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99% Bandwidth:



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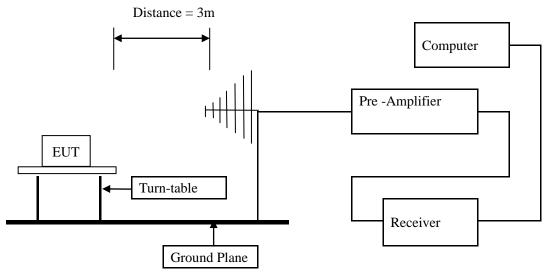
8.0 Deactivate Test

8.1 Requirement

Per 15.231(a) (1)

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

8.2 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing The deactivation test was performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.10-2013.

8.3 Test Procedure

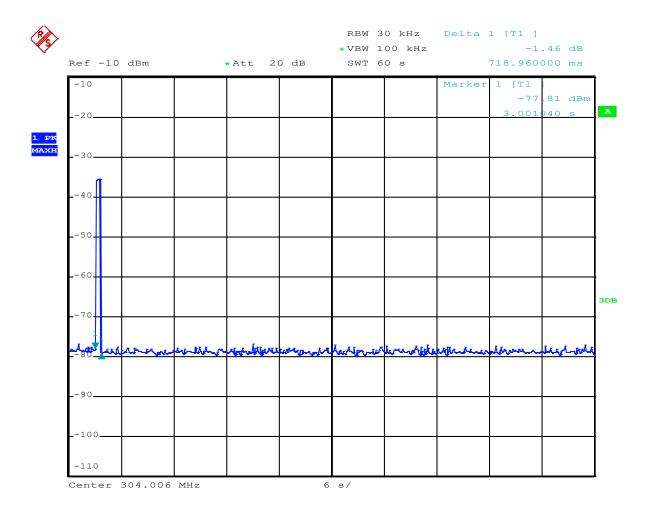
Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

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8.4 Test Data Refer to attached plots:



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8.5 Test result

Pass

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9.0 Duty Cycle

9.1 Limit

No dedicated limit specified in the Rules

9.2 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 center frequency of spectrum analyzer=operating frequency.
- 4. Set the spectrum analyzer as RBW=VBW=100kHz, Span=0Hz, Adjust Sweep=100ms.
- 5. Repeat above procedures until all frequency measured were complete.

9.3 Test Data

Base on the worst case

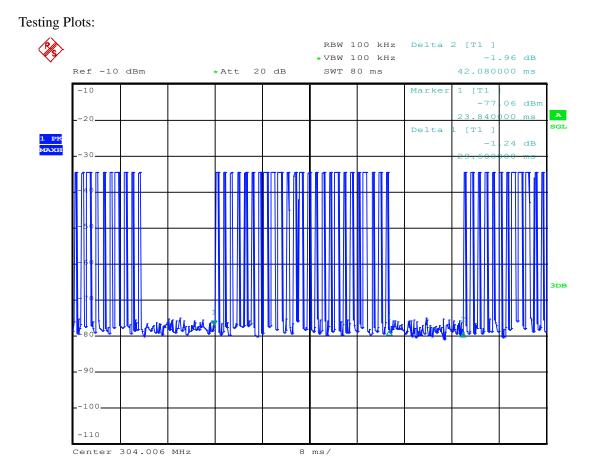
Tp = 42.08ms Ton1 = 0.44*19 = 8.36 (ms) Ton2 = 0.82*6 = 4.92 (ms)Duty cycle=Ton/Tp=13.28/42.08=0.3156=31.56% Duty cycle factor = 20 * log (duty cycle) = 20 * log (0.3156) = -10.02dB

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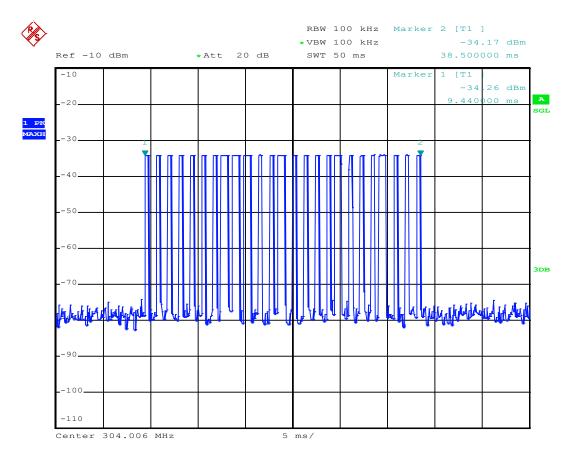


Date: 25.SEP.2024 14:19:28

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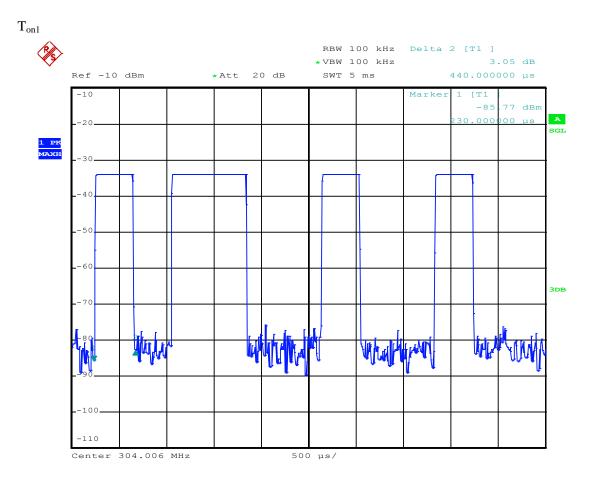


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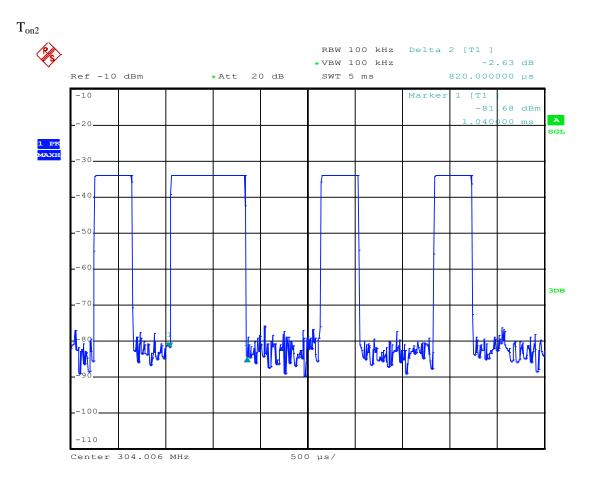


Date: 25.SEP.2024 14:21:18

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10.0 Antenna Requirement

10.1 Standard Applicable

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 shall be considered sufficient to comply with the provisions of this Section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

10.2 Antenna Connected constructions

The antenna is PCB Printed antenna which is built-in. The antenna gain is 0dBi. So, it meets the requirement of 15.203

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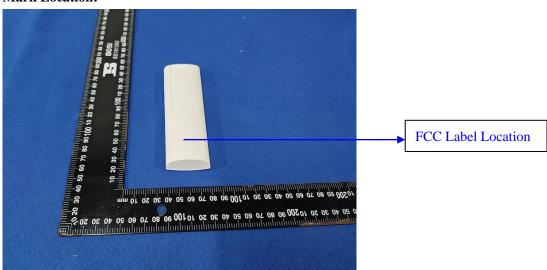
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11.0 FCC ID Label

FCC ID: 2BLBD-FA0238

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.



Mark Location:

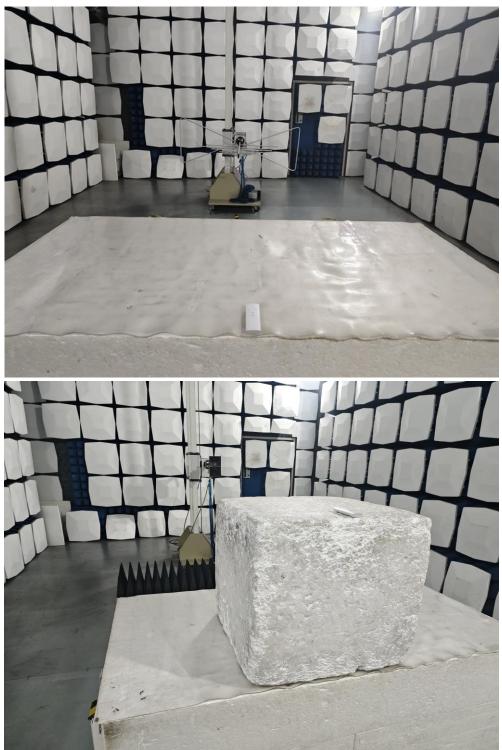
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12.0 Photo of testing

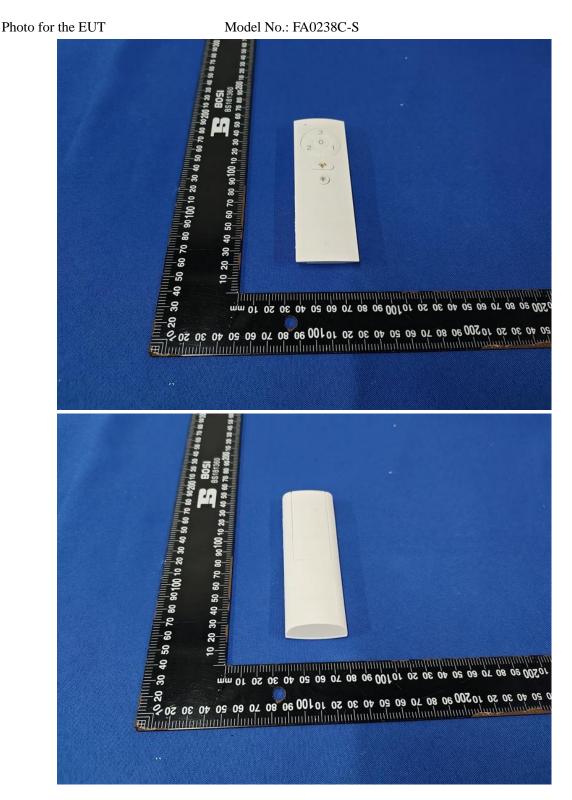
- 12.1 Conducted test View—N/A
- 12.2 Radiated emission test view



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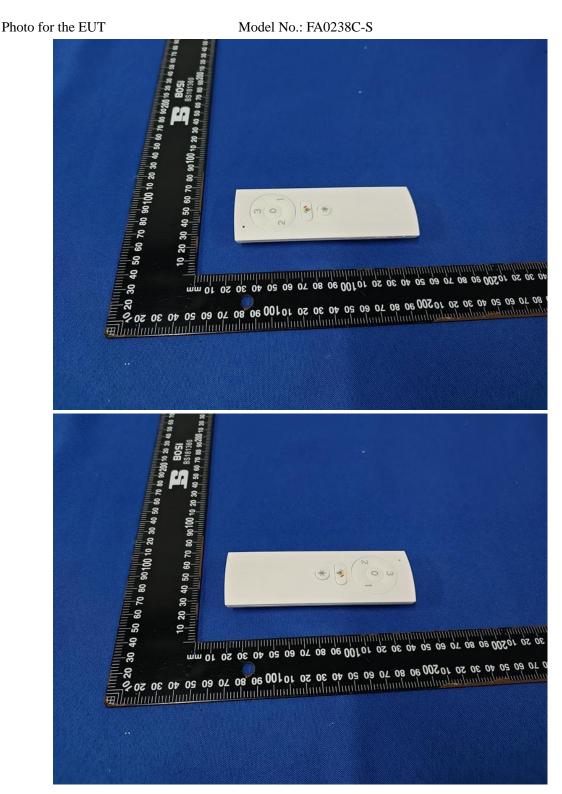




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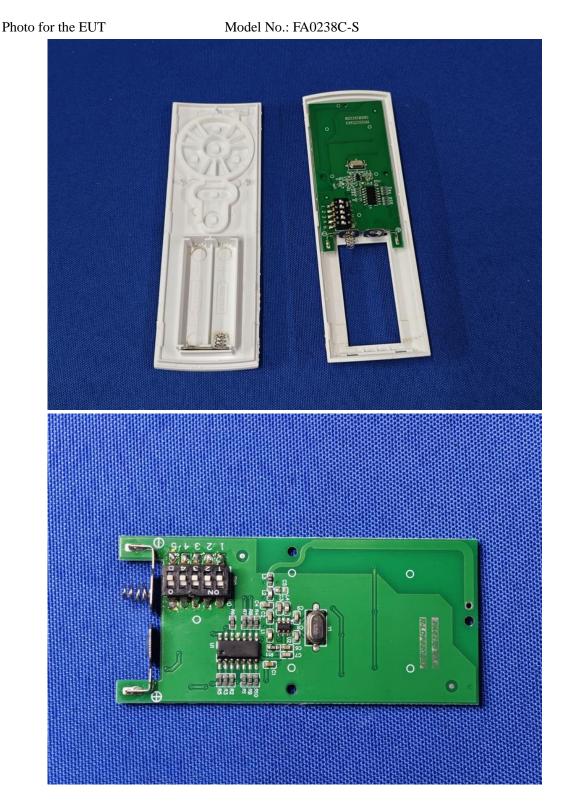




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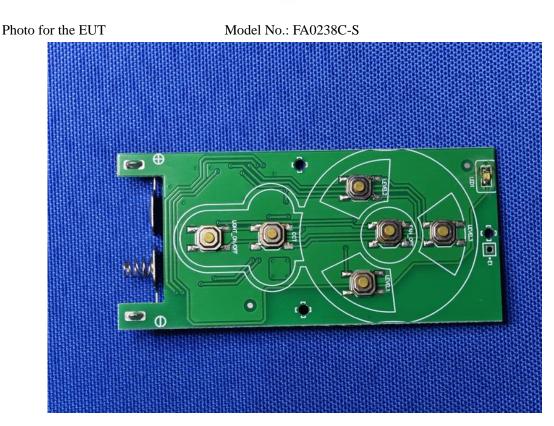


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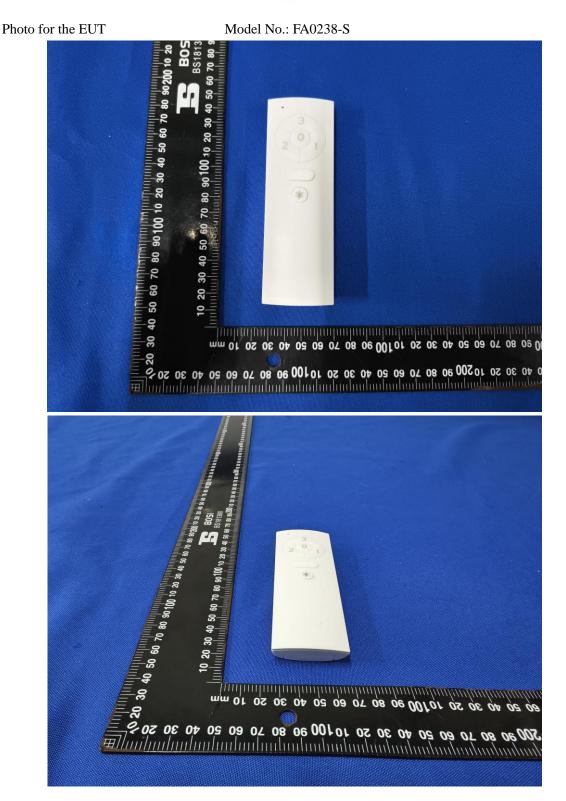


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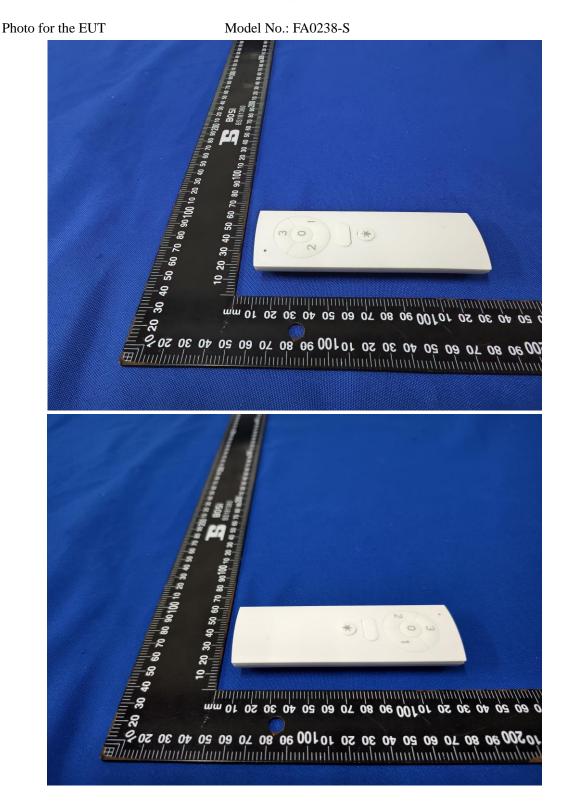




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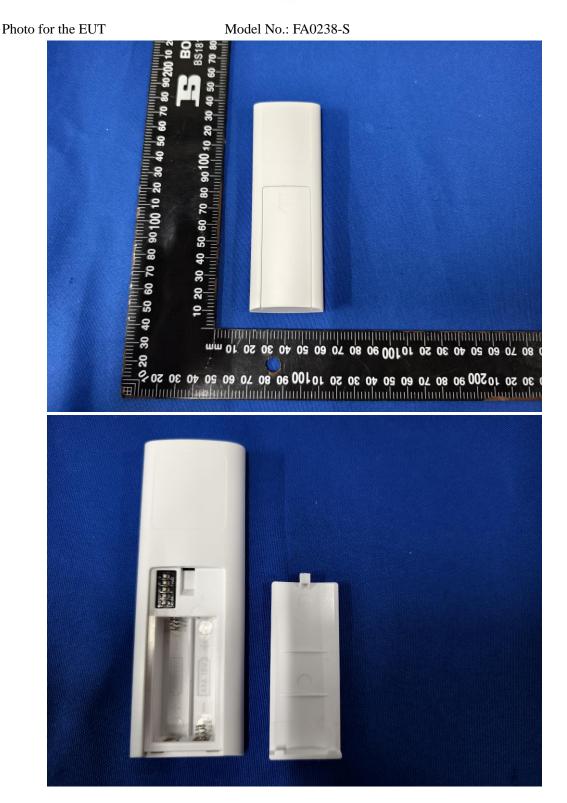




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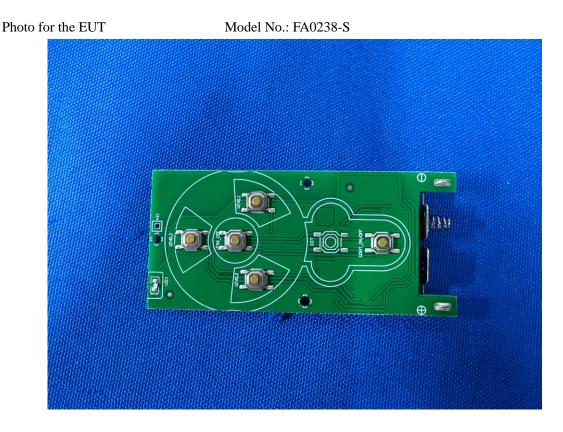


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