



Report No.: TW2111040E File reference No.: 2021-11-30

Applicant: Guangdong A-OK TECHNOLOGY GRAND

DEVELOPMENT CO., LTD.

Product: Plantation Shutter Motor

Model No.: AM20-D50N-82MM

Trademark: A-OK

Test Standards: FCC Part 15.249

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.10 &FCC Part 15 Subpart C,

Paragraph 15.249 regulations for the evaluation of

electromagnetic compatibility

Approved By

Jack Chung

Manager

Dated: November 30, 2021

Results appearing herein relate only to the sample tested The technical reports is issued errors and omissions exempt and is subject to withdrawal at

## SHENZHEN 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

Date: 2021-11-30



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# **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

#### **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of testing Laboratories.

## 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

Date: 2021-11-30



# **Test Report Conclusion**

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

11.0

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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: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 744189 For 3m Anechoic Chamber

#### 1.2 Applicant Details

Applicant: Guangdong A-OK TECHNOLOGY GRAND DEVELOPMENT CO.,LTD.

Address: Hexing Road South side, Sanhe Economic Development Zone, Huiyang, Huizhou, Guangdong,

CN

Telephone: 86-752-5718330 Fax: 86-752-5718329

#### 1.3 Description of EUT

Product: Plantation Shutter Motor

Manufacturer: Guangdong A-OK TECHNOLOGY GRAND DEVELOPMENT CO.,LTD.

Address: Hexing Road South side, Sanhe Economic Development Zone, Huiyang,

Huizhou, Guangdong, CN

Trademark: A-OK

Model Number: AM20-D50N-82MM

Additional Model Name N/A
Hardware Version: V2.0
Software Version: 210903

Serial No.: B111731L010001 Input Voltage: DC5.0V, 0.5A

Battery: DC7.4V, 900mAh, 6.66Wh

Power Supply: Model: NA010050020; Input: 100-240V~, 50-60Hz, 0.5A Max;

Output: DC5V, 2.0A

Modulation Type: GFSK (Bluetooth Low Energy)

Operation Frequency: 2402-2480MHz

Channel Separate: 2MHz
Channel Number: 40

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Antenna Designation

Motor:

PCB antenna used. The gain of the antennas is 2.5dBi (Declared by the applicant) EUT have alternative motors L20A and L20B, manufactured by the applicant. And the Motors do not affect the RF performance. During the test report. The conducted emissions and radiated emissions (below 1GHz) are measured and recorded.

- 1.4 Submitted Sample: 2 pcs
- 1.5 Test Duration

2021-11-04 to 2021-11-30

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%

Conducted Emissions Uncertainty = 3.6dB

Note: The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

1.7 Test Engineer

Terry Tang

The sample tested by

Print Name: Terry Tang

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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	2021-06-18	2022-06-17
LISN	R&S	EZH3-Z5	100294	2021-06-18	2022-06-17
LISN	R&S	EZH3-Z5	100253	2021-06-18	2022-06-17
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2021-06-18	2022-06-17
Loop Antenna	EMCO	6507	00078608	2021-06-18	2024-06-17
Spectrum	R&S	FSIQ26	100292	2021-06-18	2022-06-17
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2021-07-02	2024-07-01
Horn Antenna	R&S	BBHA 9120D	9120D-631	2021-07-02	2024-07-01
Power meter	Anritsu	ML2487A	6K00003613	2021-06-18	2022-06-17
Power sensor	Anritsu	MA2491A	32263	2021-06-18	2022-06-17
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2021-07-02	2024-07-01
9*6*6 Anechoic			N/A	2021-07-02	2022-07-01
EMI Test Receiver	RS	ESVB	826156/011	2021-06-18	2022-06-17
EMI Test Receiver	RS	ESH3	860904/006	2021-06-18	2022-06-17
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2021-06-18	2022-06-17
Spectrum	HP/Agilent	E4407B	MY50441392	2021-06-18	2022-06-17
Spectrum	RS	FSP	1164.4391.38	2021-01-16	2022-01-15
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA	1	2021-06-18	2022-06-17
RF Cable	Zhengdi	7m	1	2021-06-18	2022-06-17
RF Switch	EM	EMSW18	060391	2021-06-18	2022-06-17
Pre-Amplifier	Schwarebeck	BBV9743	#218	2021-06-18	2022-06-17
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2021-06-18	2022-06-17
LISN	SCHAFFNER	NNB42	00012	2021-01-06	2022-01-05

## 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 acc	ording to	the follo	wing sn	ecifications:
1116 12 0 1	nas Deen	icsicu acc	տաութ ա	the iono	พาเมช รมเ	cuncanons.

Standard	Test Type	Result	Notes	
FCC Part 15, Paragraph 15.207	Conducted Emission Test	Pass	Complies	
FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit	Field Strength of Fundamental	Pass	Complies	
FCC Part 15, Paragraph 15.209	Radiated Emission Test	Pass	Complies	
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	Pass	Complies	

#### 3.2 **Test Standards**

FCC Part 15 Subpart C, Paragraph 15.249, ANSI C63.4:2014 and ANSI C63.10:2013

#### 4.0 **EUT Modification**

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

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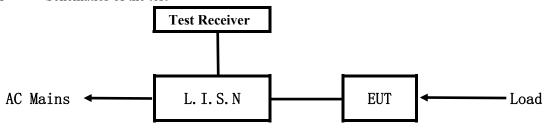
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#### 5. Power Line Conducted Emission Test

#### 5.1 Schematics of the test

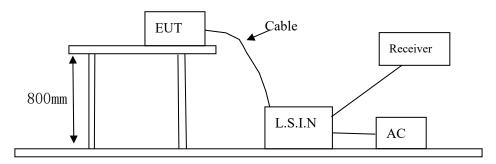


**EUT: Equipment Under Test** 

#### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013. The Frequency spectrum from 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10 –2013.

Test Voltage: 120V∼, 60Hz Block diagram of Test setup



#### 5.3 Configuration of the EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

79 channels are provided to the EUT

#### A. EUT

Device	Manufacturer	Model	FCC ID
	Guangdong A-OK TECHNOLOGY		
Plantation Shutter Motor	GRAND DEVELOPMENT	AM20-D50N-82MM	2AVVDAM20D50N
	CO.,LTD.		

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#### B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

#### C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	TIANYIN	TPA-46050200UU	Input: 100-240V~, 50/60Hz, 0.3A;
			Output: DC5V, 2A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10-2013

- 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 ~ 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:

Pass

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# A: Conducted Emission on Live Terminal (150kHz to 30MHz)

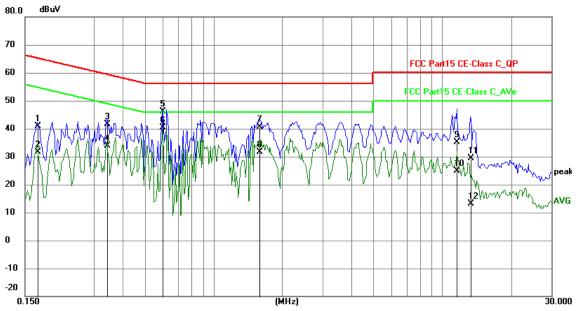
**EUT Operating Environment** 

Temperature: 25°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

**EUT set Condition: Communication by BT** 

Note: Motor L20A Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1695	31.02	9.77	40.79	64.98	-24.19	QP	Р
2	0.1695	21.74	9.77	31.51	54.98	-23.47	AVG	Р
3	0.3410	31.90	9.76	41.66	59.18	-17.52	QP	Р
4	0.3410	24.12	9.76	33.88	49.18	-15.30	AVG	Р
5	0.5985	36.43	9.77	46.20	56.00	-9.80	QP	Р
6	0.5985	30.52	9.77	40.29	46.00	-5.71	AVG	Р
7	1.5930	30.77	9.80	40.57	56.00	-15.43	QP	Р
8	1.5930	21.90	9.80	31.70	46.00	-14.30	AVG	Р
9	11.5956	25.02	10.23	35.25	60.00	-24.75	QP	Р
10	11.5956	14.65	10.23	24.88	50.00	-25.12	AVG	Р
11	13.3194	19.01	10.31	29.32	60.00	-30.68	QP Q	Р
12	13.3194	2.93	10.31	13.24	50.00	-36.76	AVG	Р

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# B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

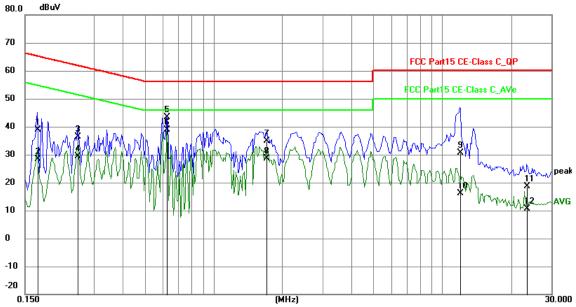
**EUT Operating Environment** 

Temperature: 25°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

**EUT set Condition: Communication by BT** 

Note: Motor L20A Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1695	28.99	9.77	38.76	64.98	-26.22	QP	Р
2	0.1695	18.62	9.77	28.39	54.98	-26.59	AVG	Р
3	0.2553	26.57	9.75	36.32	61.58	-25.26	QP	Р
4	0.2553	19.62	9.75	29.37	51.58	-22.21	AVG	Р
5	0.6258	33.50	9.78	43.28	56.00	-12.72	QP	Р
6	0.6258	29.15	9.78	38.93	46.00	-7.07	AVG	Р
7	1.7061	25.16	9.80	34.96	56.00	-21.04	QP	Р
8	1.7061	18.87	9.80	28.67	46.00	-17.33	AVG	Р
9	11.9934	20.31	10.25	30.56	60.00	-29.44	QP	Р
10	11.9934	5.87	10.25	16.12	50.00	-33.88	AVG	Р
11	23.4204	7.71	10.89	18.60	60.00	-41.40	QP	Р
12	23.4204	-0.27	10.89	10.62	50.00	-39.38	AVG	Р

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# C: Conducted Emission on Live Terminal (150kHz to 30MHz)

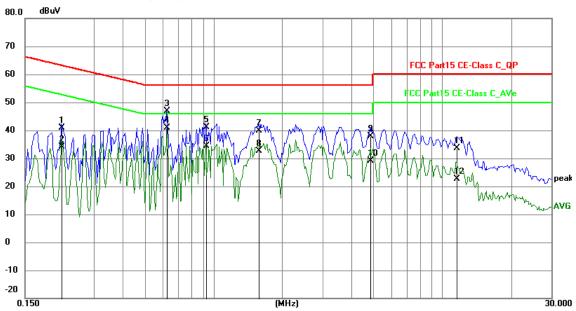
**EUT Operating Environment** 

Temperature: 25°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

**EUT set Condition: Communication by BT** 

Note: Motor L20B Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2163	31.19	9.75	40.94	62.96	-22.02	QP	Р
2	0.2163	24.43	9.75	34.18	52.96	-18.78	AVG	Р
3	0.6258	37.01	9.78	46.79	56.00	-9.21	QP	Р
4	0.6258	31.10	9.78	40.88	46.00	-5.12	AVG	Р
5	0.9261	31.22	9.79	41.01	56.00	-14.99	QP	Р
6	0.9261	24.56	9.79	34.35	46.00	-11.65	AVG	Р
7	1.5774	30.13	9.80	39.93	56.00	-16.07	QP	Р
8	1.5774	22.92	9.80	32.72	46.00	-13.28	AVG	Р
9	4.8720	27.91	9.92	37.83	56.00	-18.17	QP	Р
10	4.8720	19.32	9.92	29.24	46.00	-16.76	AVG	Р
11	11.5605	23.42	10.23	33.65	60.00	-26.35	QP	Р
12	11.5605	12.45	10.23	22.68	50.00	-27.32	AVG	Р

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# D: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

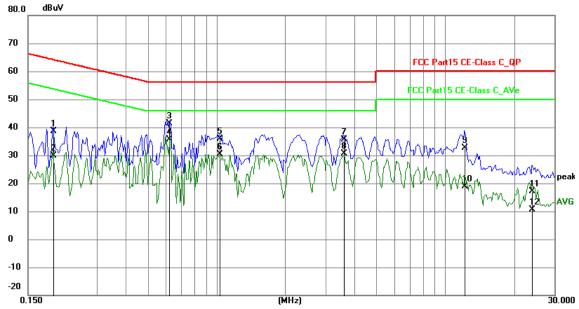
**EUT Operating Environment** 

Temperature: 25°C Humidity: 65%RH Atmospheric Pressure: 101 kPa

**EUT set Condition: Communication by BT** 

Note: Motor L20B Results: Pass

Please refer to following diagram for individual



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1929	28.97	9.75	38.72	63.91	-25.19	QP	Р
2	0.1929	20.15	9.75	29.90	53.91	-24.01	AVG	Р
3	0.6219	31.65	9.78	41.43	56.00	-14.57	QP	Р
4	0.6219	25.81	9.78	35.59	46.00	-10.41	AVG	Р
5	1.0314	25.99	9.79	35.78	56.00	-20.22	QP	Р
6	1.0314	20.58	9.79	30.37	46.00	-15.63	AVG	Р
7	3.5928	25.76	9.87	35.63	56.00	-20.37	QP	Р
8	3.5928	20.71	9.87	30.58	46.00	-15.42	AVG	Р
9	12.1650	22.45	10.26	32.71	60.00	-27.29	QP	Р
10	12.1650	8.55	10.26	18.81	50.00	-31.19	AVG	Р
11	23.9859	6.19	10.93	17.12	60.00	-42.88	QP	Р
12	23.9859	-0.30	10.93	10.63	50.00	-39.37	AVG	Р

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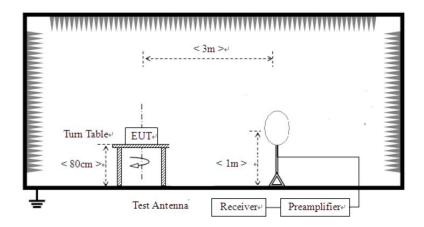


#### **6** Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) 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 25 GHz 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 (Note: for Fundamental frequency radiated emission measurement, RBW=3MHz, VBW=10MHz). 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) The antenna polarization: Vertical polarization and Horizontal polarization.

#### **Block diagram of Test setup**

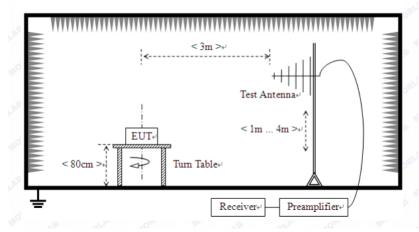
For radiated emissions from 9kHz to 30MHz



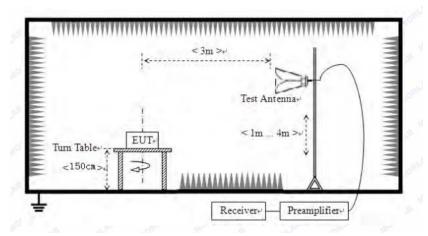
Date: 2021-11-30



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.

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#### 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:

#### A FCC Part 15 Subpart C Paragraph 15.249(a) Limit

Fundamental Frequency	Field Stre	ength of Fundame	ental (3m)	Field S	trength of Harmo	onics (3m)
(MHz)	mV/m	dBu	V/m	uV/m	dBu	V/m
2400-2483.5	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)

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.

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

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
0.009-0.049	3	20log(2400/F(kHz)) +40log (300/3)
0.490-1.705	3	20log(24000/F(kHz)) +40log (30/3)
1.705-30	3	69.5
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 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-25G, the final emission level got using PK. For fundamental measurement, PK detector used.

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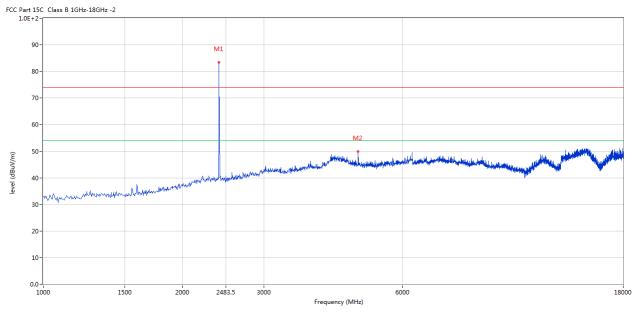


#### 6.5 Test result

## A Fundamental & Harmonics Radiated Emission Data

Please refer to the following test plots for details: Low Channel-2402MHz

#### Horizontal



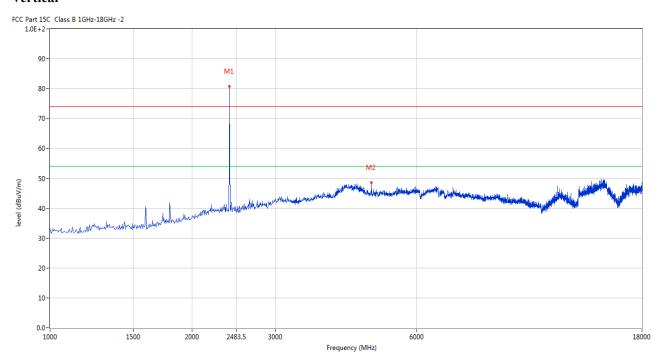
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(0)	(cm)		
1	2402.149	83.47	-3.57	114.0	-30.53	Peak	127.00	100	Horizontal	Pass
2	4802.799	50.92	3.12	74.0	-23.08	Peak	136.00	100	Horizontal	Pass

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#### Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2402.149	80.82	-3.57	74.0	6.82	Peak	39.00	100	Vertical	Pass
2	4802.799	49.55	3.12	74.0	-24.45	Peak	193.00	100	Vertical	Pass

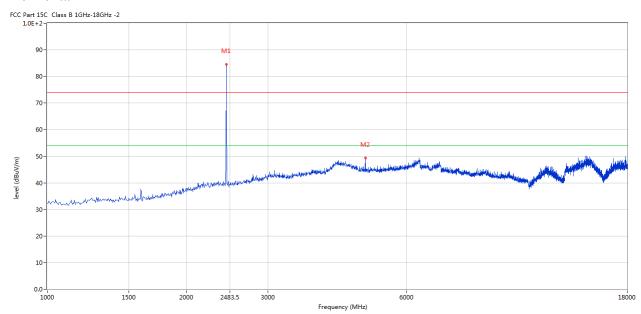
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Please refer to the following test plots for details: Middle Channel-2440MHz

#### Horizontal



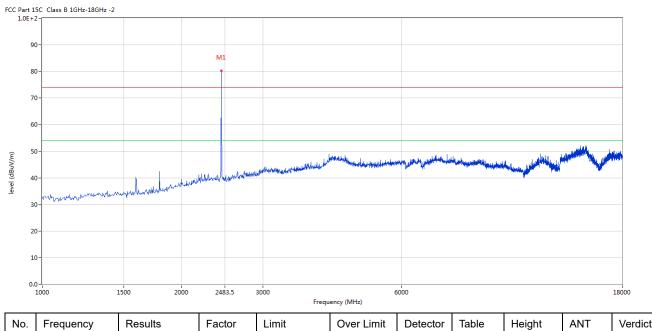
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2440.390	84.56	-3.57	114.0	-29.44	Peak	134.00	100	Horizontal	Pass
2	4883.529	49.37	3.20	74.0	-24.63	Peak	130.00	100	Horizontal	Pass

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#### Vertical



Ī	No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
Ī	1	2440.390	80.30	-3.57	114.0	-33.70	Peak	156.00	100	Vertical	Pass

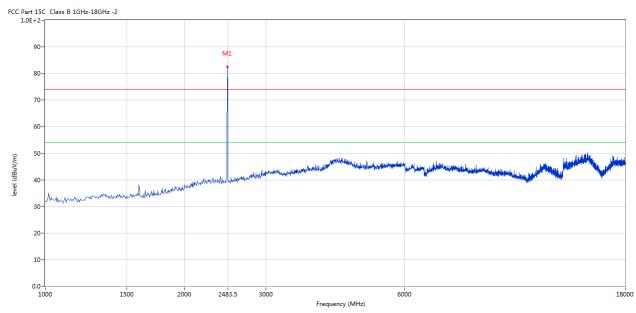
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Please refer to the following test plots for details: High Channel-2480MHz

#### Horizontal



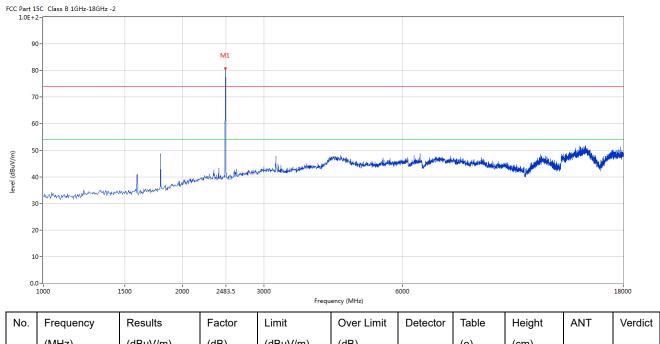
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2479.630	82.53	-3.57	114.0	-31.47	Peak	204.00	100	Horizontal	Pass

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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	2479.630	80.75	-3.57	114.0	-33.25	Peak	164.00	100	Vertical	Pass

Note: (2) Emission Level = Reading Level + Antenna Factor + Cable Loss-Amplifier

- (3) Margin=Emission-Limits
- (4) According to section 15.35(b), the peak limit is 20dB higher than the average limit
- (5) For test purpose, keep EUT continuous transmitting
- (5) For emission above 18GHz and Below 30MHz, It is only the floor noise. No necessary to take down.
- (6) the measured PK value less than the AV limit.

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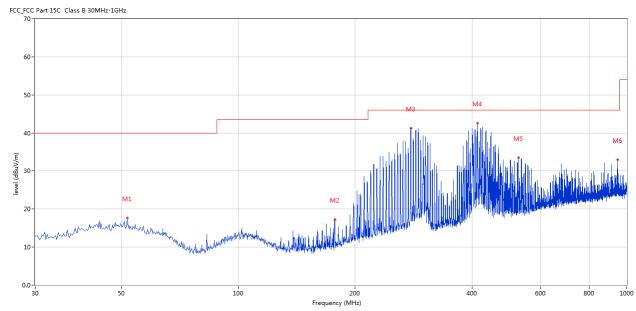


# B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Remark: Motor L20A

**Results:** Pass



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	51.820	17.61	-11.42	40.0	-22.39	Peak	332.00	100	Horizontal	Pass
2	177.161	17.23	-15.71	43.5	-26.27	Peak	265.00	200	Horizontal	Pass
3	278.015	41.21	-11.55	46.0	-4.79	Peak	74.00	100	Horizontal	Pass
4	412.812	42.60	-8.35	46.0	-3.40	Peak	78.00	100	Horizontal	Pass
5	527.243	33.46	-6.58	46.0	-12.54	Peak	272.00	200	Horizontal	Pass
6	946.663	32.99	-1.57	46.0	-13.01	Peak	228.00	100	Horizontal	Pass

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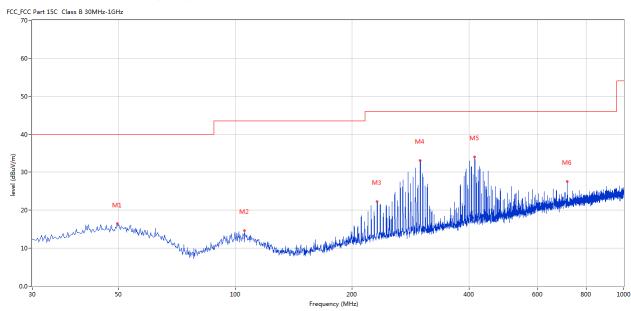


#### Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Remark: Motor L20A

**Results:** Pass



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	49.638	16.42	-11.32	40.0	-23.58	Peak	115.00	100	Vertical	Pass
2	105.641	14.61	-13.27	43.5	-28.89	Peak	34.00	100	Vertical	Pass
3	231.952	22.28	-12.56	46.0	-23.72	Peak	105.00	100	Vertical	Pass
4	299.350	33.13	-11.06	46.0	-12.87	Peak	0.00	100	Vertical	Pass
5	413.539	33.99	-8.28	46.0	-12.01	Peak	158.00	100	Vertical	Pass
6	715.619	27.55	-3.99	46.0	-18.45	Peak	329.00	100	Vertical	Pass

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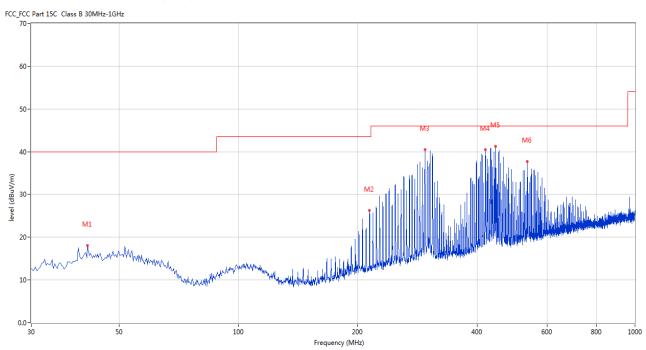


#### Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Remark: Motor L20B

**Results:** Pass



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	41.637	18.12	-11.82	40.0	-21.88	Peak	96.00	100	Horizontal	Pass
2	214.011	26.28	-13.60	43.5	-17.22	Peak	267.00	200	Horizontal	Pass
3	295.229	40.48	-11.14	46.0	-5.52	Peak	247.00	100	Horizontal	Pass
4	419.843	40.51	-8.23	46.0	-5.49	Peak	105.00	100	Horizontal	Pass
5	445.541	41.24	-8.02	46.0	-4.76	Peak	64.00	200	Horizontal	Pass
6	535.486	37.75	-6.45	46.0	-8.25	Peak	88.00	200	Horizontal	Pass

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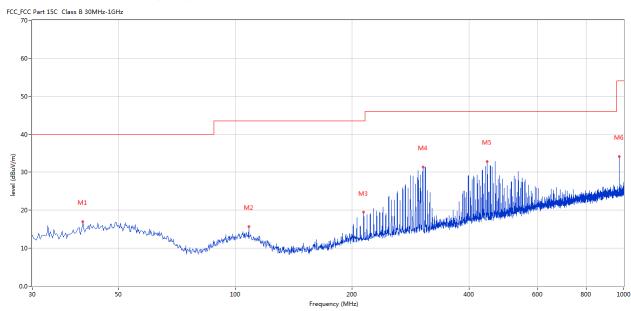


#### Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Remark: Motor L20B

**Results:** Pass



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	40.425	16.96	-12.27	40.0	-23.04	Peak	269.00	100	Vertical	Pass
2	108.308	15.63	-13.43	43.5	-27.87	Peak	286.00	200	Vertical	Pass
3	214.011	19.45	-13.60	43.5	-24.05	Peak	360.00	200	Vertical	Pass
4	303.957	31.43	-10.99	46.0	-14.57	Peak	360.00	200	Vertical	Pass
5	445.299	32.78	-8.00	46.0	-13.22	Peak	344.00	200	Vertical	Pass
6	973.332	34.11	-1.55	54.0	-19.89	Peak	181.00	100	Vertical	Pass

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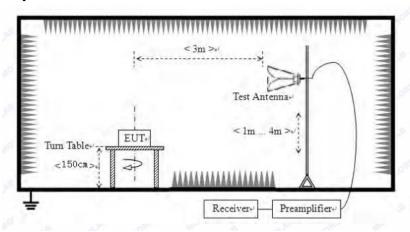
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#### 7. Band Edge

#### 7.1 Test Method and test Procedure:

- (1) 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) Set Spectrum as RBW=1MHz, VBW=3MHz and Peak detector used for PK value. RBW=1MHz, VBW=10Hz and Peak detector used for AV value.
- (3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (4) The antenna polarization: Vertical polarization and Horizontal polarization.

#### 7. 2 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing

## 7.3 Configuration of The EUT

Same as section 5.3 of this report

#### 7.4 EUT Operating Condition

Same as section 5.4 of this report.

#### 7.5 Band Edge Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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

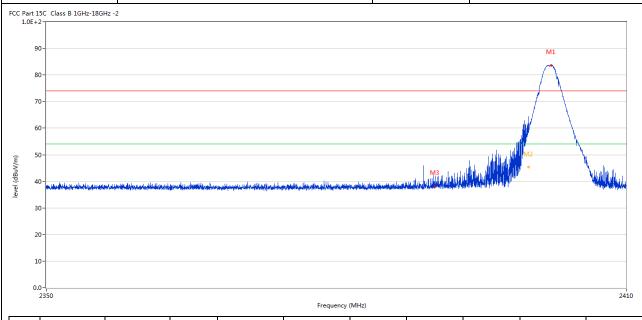
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#### 7.6 Test Result

Product:	Plantation Shutter Motor	Polarity	Horizontal
Mode	Keeping Transmitting	Test Voltage	DC7.4V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass		



	No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict	
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)			
	2	2399.788	64.38	-3.57	74.0	-9.62	Peak	133.00	100	Horizontal	Pass	
	2**	2399.788	45.42	-3.57	54.0	-8.58	AV	133.00	100	Horizontal	Pass	
	3	2390.055	38.27	-3.53	74.0	-35.73	Peak	133.00	100	Horizontal	Pass	
Г	•	•		•		•				•		_

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]	Product:	Pla	intation Sh	utter Motor	]	Detector		Ve	rtical	
	Mode	K	Leeping Tra	nsmitting	Te	est Voltage	:	DC7.4V		
Te	mperature		24 deg	g. C,	H	Humidity		56% RH		
Te	est Result:		Pas	ss						
2 Part 1	L5C Class B 1GHz-18GHz 2-	-2								
9	0-							M	1	
8	0-									
7	0-									
6	0-							/		
	0-							4hd		
									$\overline{}$	
	0-		1 .			, M3,		M2		
5	0-	المراجع والمساولة والمالية	i i i i i i i i i i i i i i i i i i i	غريد المراسات بالمراما الم		, N3		M2 •	- Lune	
5	o-	أوار ويستعدون المتراجع والماليان		فراد ما همید او مارد	kan da maylan da	13		M2	Mu	
5 4 3	o-	المرابا ويومين والفرارية ووالمالية	el demot belonger	بدرا أمراديان واستهديته بالعداية	ksa, eksa es silvenikka (t. kk	13		M2	Marie	uddled as an
3	0-	أرار المروس من مواد المروس المواد الم	ek dilami ki kilo esekilib eradi.	ioles Lateral de Asside Le	kon di dang silaun dikin di di			M2	1	
5 4 3	0-	الوارا أو ويودين والله بالمتلا ويود الوالية والمتلا المتلا	d death by sections of	بدرا أمرادية والماسية والمارة والمارة	ksa, et kan gilamikka (t. bl			M2	Market	Altico
5 4 3 2 1	0-	المرابة ويومينه والفراد والمرابة والمرابة والمرابة والمرابة	et diamet i librio environ condi					M2		2410
5 4 3 2 1	0-			Fr	equency (MHz)			M2		2410
5 4 3 2 1	0	Results	Factor	Fr	equency (MHz)  Over Limit	Detector	Table	M2	ANT	2410
5 4 3 2 1 0.	o- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0-	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit	Detector	(0)	(cm)	ANT	2410 Verdi
5 4 3 2 1 0.	o- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0-	Results	Factor	Fr	equency (MHz)  Over Limit					2410
5 4 3 2 1	o- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0-	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit	Detector	(0)	(cm)	ANT	2410 Verdid

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]	Product:		Plantati	on Shutter	Motor	Po	olarity		Horizon	tal
	Mode		Keepi	ng Transm	itting	Test	t Voltage		DC7.4V	
Te	mperature			24 deg. C,		Нυ	Humidity		56% RH	
Te	est Result:		Pass							
C Part 1	L5C Class B 1GHz-18GF	Hz -2								
90	0-									
				No many						
80	0-									
70	0-		- Andrew Company							
_	60-				7					
60	0-		. ALL W							
					M2					
	0-				M2		hullible is a second			
50	0-				M2			h kalalista daga valenad		history and the same of the last
	0-				M2		att Mark Justines Liver	Literature de la constitución de		history and the second second
. 50	o-				M2			walling the way were	રાવે <del>તાલા કરો છે. તે કરો કરો કરો કરો કરો કરો કરો કરો કરો કરો</del>	فالدارية معاملة عداجه لمأخذون
44	o-				M2	d William de de se establishe	atiple to be a service of	i, kulikin daga waka can	કરો <u>. જ્</u> યાર માટે જે	history, develop
36 20 10	0-					Whitesterical	Mild Markey Louis	Like the second		
56 44 36 20 10	0-				M2 2483.5 Frequency (M		Alfa de esta acomo de esta	h, h, lide de parent de l'estate de l'esta	· · · · · · · · · · · · · · · · · · ·	dest, i metalicate subsequences
5(44) 34 21 10 0.0	0-	Results	Factor	Limit	2483.5 Frequency (M		Table (o)	Height	ANT	
5(44) 34 21 10 0.0	0-	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	2483.5 Frequency (M	lHz)			Taget in the property of the second s	250
36 20 10	o- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0- 0-				2483.5 Frequency (M  Over Limit (dB)	lHz)		Height	Taget in the property of the second s	250

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]	Product:	Plan	ntation Sh	utter Motor	Ι	Detector		Vertical		
	Mode	K	eeping Tra	nsmitting	Tes	st Voltage		DC	7.4V	
Te	mperature		24 deg	g. C,	Н	Humidity 56% RH			6 RH	
Te	est Result:		Pas	S						
1.0E+.	15C Class B 1GHz-18GHz 2- 10-	2								
5 5 4 3 3 2 2 1 1 0 0 0	0-				Manual Maria de Salva de Caracida de C	1, 16, 16, 16, 16, 16, 16, 16, 16, 16, 1			h dhala a dhila sa	
3 2 2 1 0 0 0				2483.5	equency (MHz)					2500
5 5 4 4 3 3 2 1 1 O.	0-	Results	Factor	2483.5		Detector	Table	Height	ANT	2500
5 4 4 3 2 2 1 1 0 0 0	0-2470	Results (dBuV/m)	Factor (dB)	2483.5 Fre	equency (MHz)					

Note: 1. The PK emission level less than the AV limit. No necessary to record the AV emission level.

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# 8.0 Antenna Requirement

#### **Applicable Standard**

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.

This product has a PCB antenna with gain 2.5dBi Max. It fulfills the requirement of this section.

Test Result: Pass

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Product:  Mode	Plantation Sh Keeping Tra		Test N Test V			transmitting DC7.4V		
Temperature	24 de		Hum		56% RH			
Test Result:	Pas		Dete		PK			
0dB Bandwidth	889.78	3kHz	-	-				
Ref Lvl 10 dBm	Marker 1 [5 ndB BW 889.779	r1 ndB] 20.00 dB 955912 kHz		30 kHz .00 kHz			3 3m	
10				<b>V</b> 1 [	r1]	-2.54 dE	3m Iz	
-10			λ,	ndB BW ∇ <sub>T1</sub>	889.77	20.00 dB 7955912 kH -22.62 de	Z	
-20			\\\\\\	<b>∨</b> <sub>T2</sub>		0155 <mark>210 GH -22.57 dE 0244188 GH</mark>	3m	
1MAX -30	لرس			M	2.10	, , , , , , , , , , , , , , , , , , ,	1	
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-70								
-80								
-90								

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Product:		Plantatio	n Shutter	Motor		Т	est Mode:		Keep tra	ansmitting	
Mode		Keepin	g Transmi	tting		Т	est Voltage		DC	7.4V	
Temperatur	·e	2	4 deg. C,			]	Humidity		569	% RH	
Test Result	:		Pass				Detector		PK		
20dB Bandwi	dth	889.78kHz									
Ŕ		Marker	1 [T1 n	ndB]	R	BW	30 k	Hz R	F Att	20 dB	
Ref I		ndB		00 dB		BW	100 k				
10 0	dBm	BW 889	779559	912 kHz	S	WT	8.5 m	s U	nit	dBm	
10							<b>v</b> <sub>1</sub>	[T1]	- 3	.22 dBm	A
0									2.44000	902 GHz	
				0	1		ndE	C	20 89.77955	.00 dB 912 kHz	
1.0				/W	$\setminus \wedge$		BW ▼ <sub>T</sub> j	。 L [T1]	-23	912 kHz	
-10						7			2.43955	210 GHz	
0.0			لہ			V	$\bigwedge_{1}$	2 [T1]	-23	.48 dBm	
-20 1MAX			<b>T</b>				V <sub>T2</sub>		2.44044	188 GHz	1MA
							1				
-30			5				1	~			
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \						η,			
-40		/							0.		
5.0	~~~~~	\ \d						\ /			
-50								V			
									7	why	
-60										<u></u>	
-70											
-80											
-90 Cente	<u> </u>	.44 GHz 300 kH			kHz/				ı sq2	ın 3 MHz	l
Date:		021 13:	03:46		•					_	
Date.	9.INOV.2	UZI I3•	03.40								

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Product:	Plantation Shutter	Motor	Test Mode:	Keep tra	nsmitting	
Mode	Keeping Transmi	tting	Test Voltage		7.4V	
Temperature	24 deg. C,		Humidity	56%	6 RH	
Test Result:	Pass		Detector	PK		
20dB Bandwidth	865.73kHz					
	Marker 1 [T1 n		RBW 30 kH		20 dB	
Ref Lvl 10 dBm	ndB 20 BW 865.731462		7BW 100 kH GWT 8.5 ms		dBm	
10			<u> </u>			
			<b>V</b> 1	[T1] -4 2.48000	.45 dBm 301 GHz	
0		1	ndB	20	.00 dB	
		$\Lambda_0$	BW	865.73146		
-10			\textstyle	[T1] -23	.96 dBm	
		$\mathcal{N}$	$\nabla_{\mathbf{T}_{2}}$	2.47955 [T1] -24	210 GHz .46 dBm	
-20	T1		<u></u>	2.48041	784 GHz	
-30					IMA	
				\		
-40						
-50				W	. Al	
-60					Maran Mark	
-70						
-80						
-90 Conton 2	49 011-	200 1-11-		G	2 MII-	
Center 2.  Date: 9.1	.48 GHz NOV.2021 13:05:50	300 kHz/		Spa	n 3 MHz	

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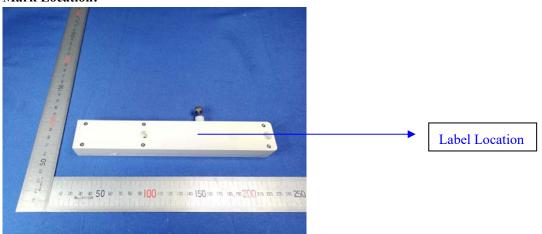
#### 10.0 FCC ID Label

#### FCC ID: 2AVVDAM20D50N

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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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### 11.0 Photo of testing

#### 11.1 Conducted test View--



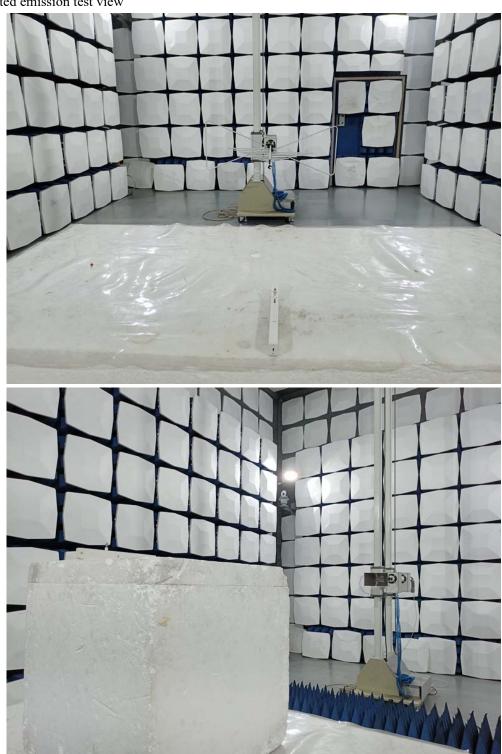
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# Radiated emission test view



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### 11.2 Photographs – EUT

## Outside View



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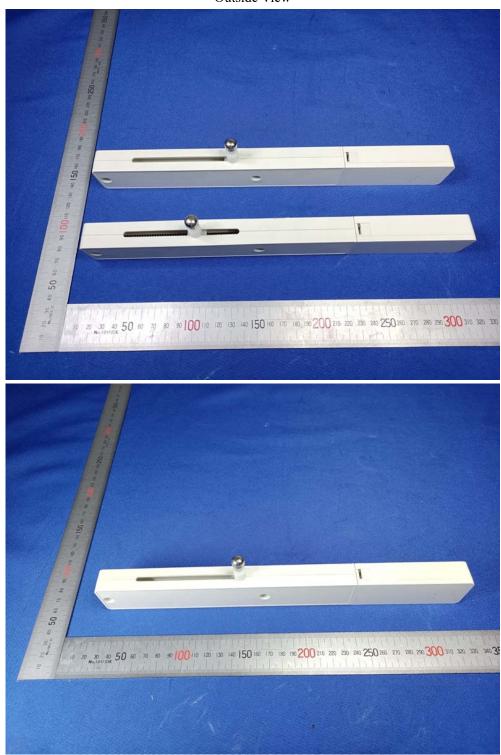
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Outside View



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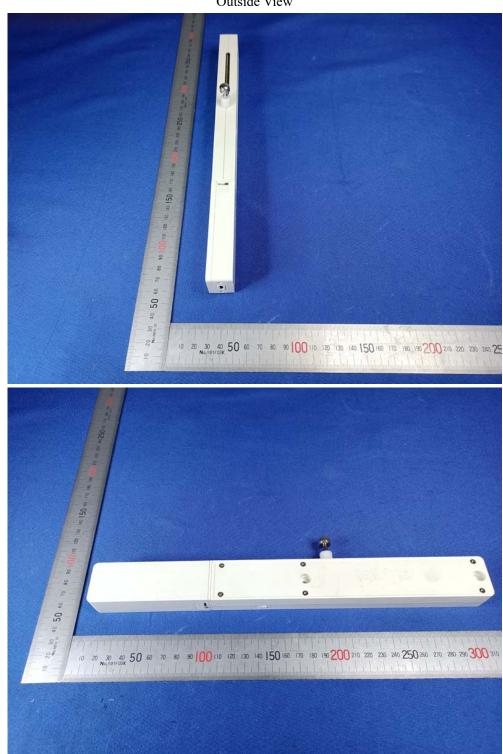
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Outside View



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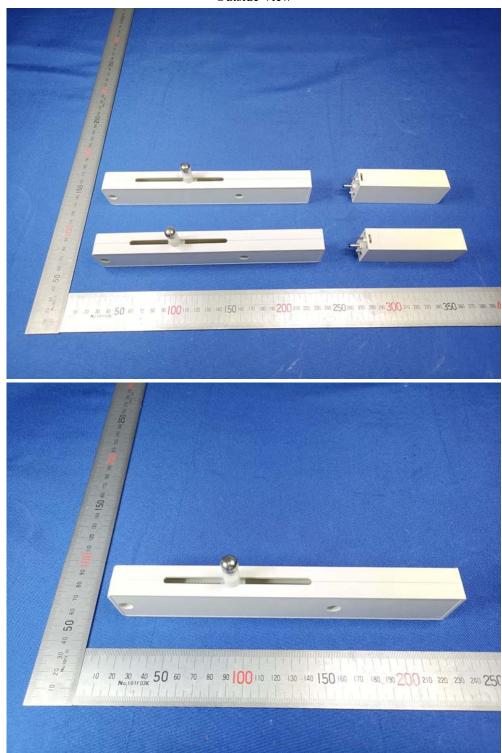
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Outside View



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

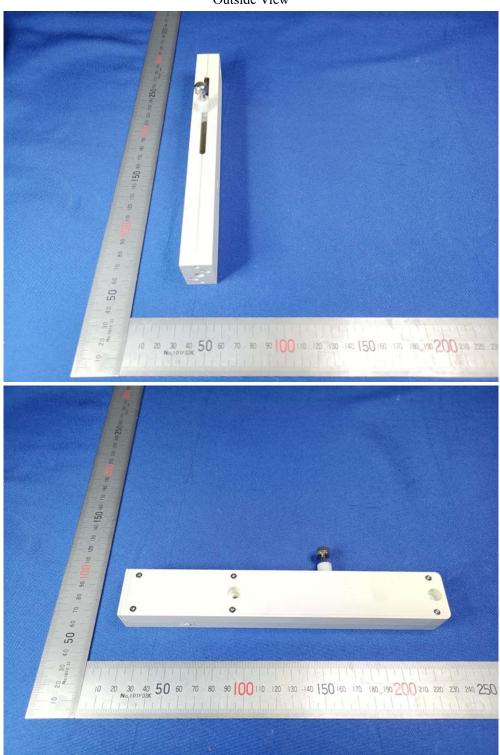
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Outside View



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Outside View



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Outside View



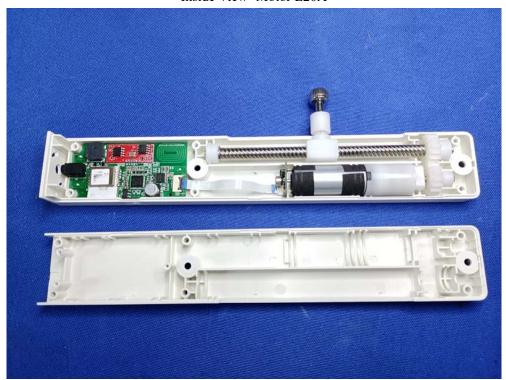
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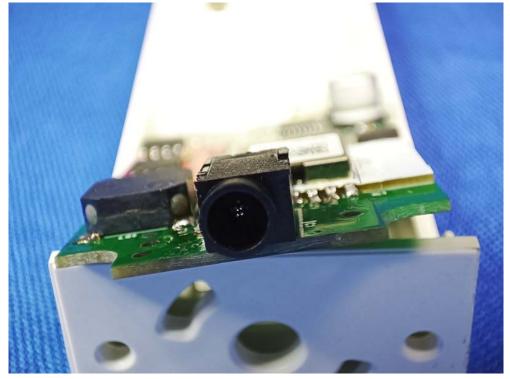
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Inside View- Motor L20A





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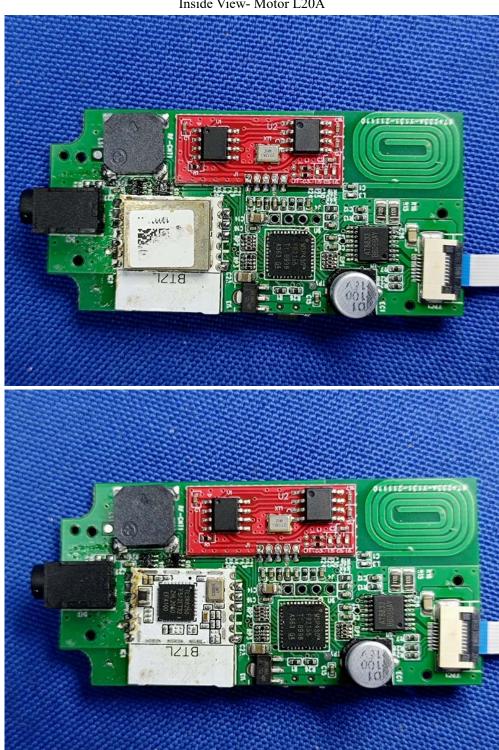
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Inside View- Motor L20A



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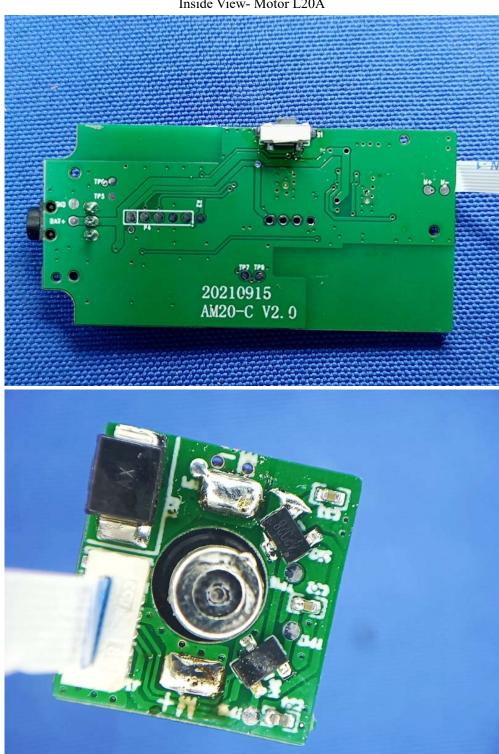
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Inside View- Motor L20A



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Inside View- Motor L20A



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Inside View- Motor L20A



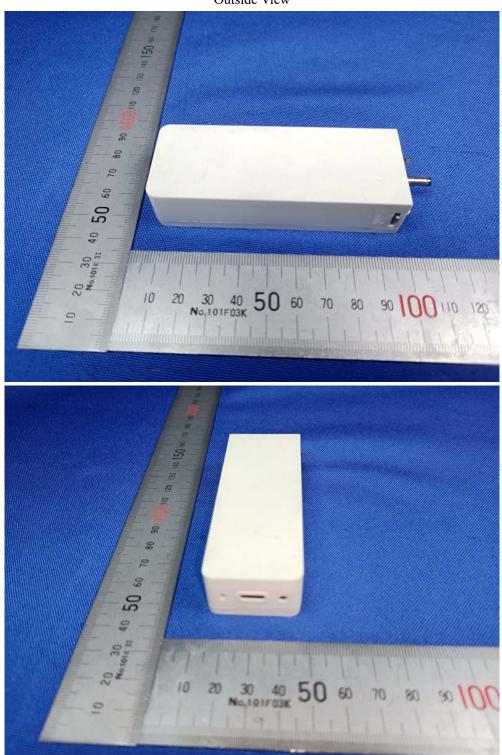
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Outside View



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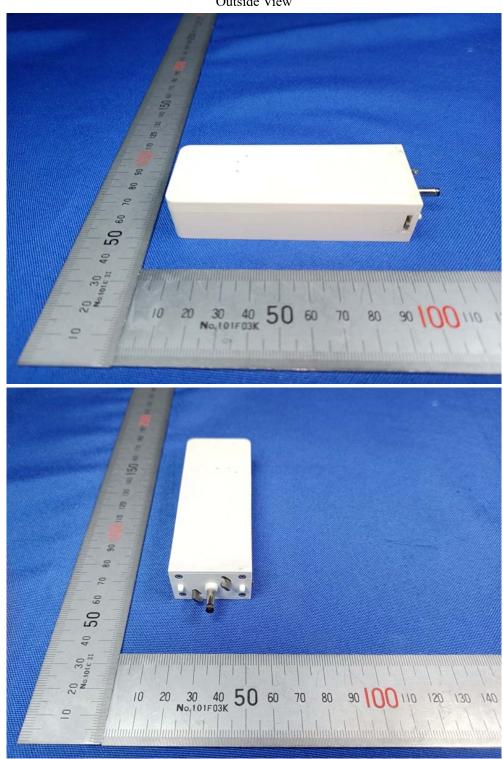
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Outside View



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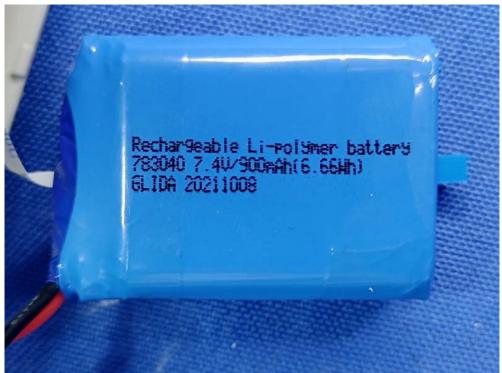
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Inside View

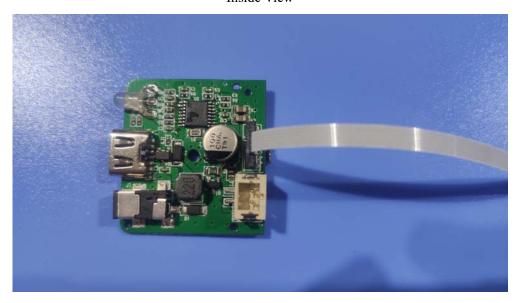


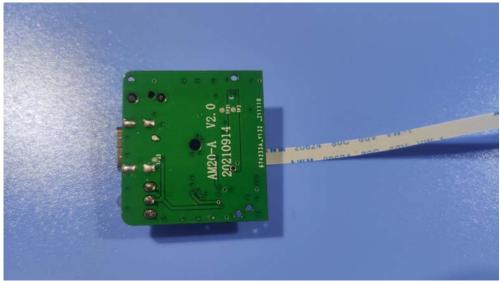


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Inside View



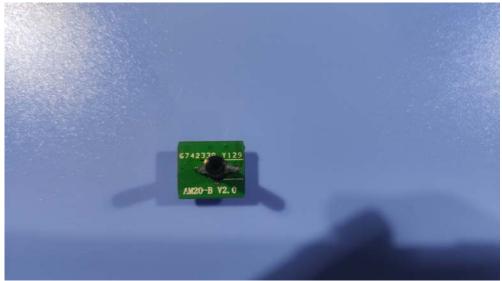


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Inside View

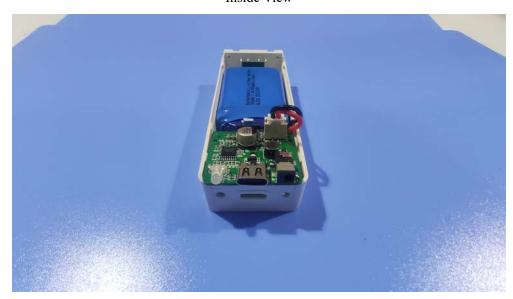




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Inside View



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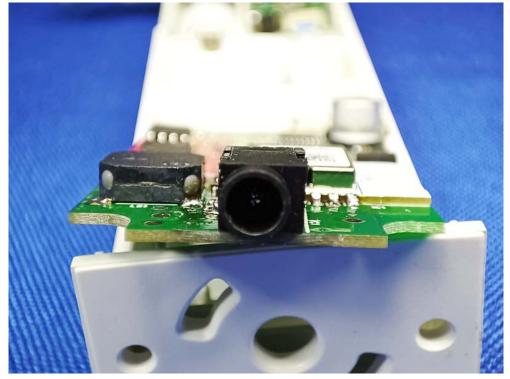
Report No.: TW2111040E

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Inside View-Motor L20B





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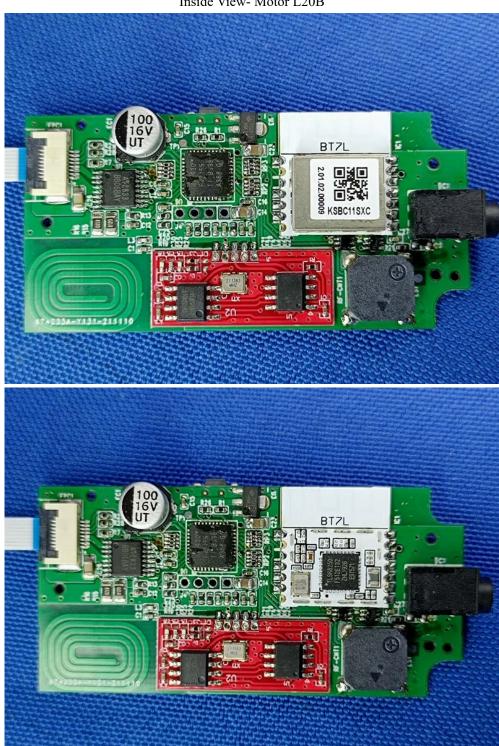
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Inside View- Motor L20B



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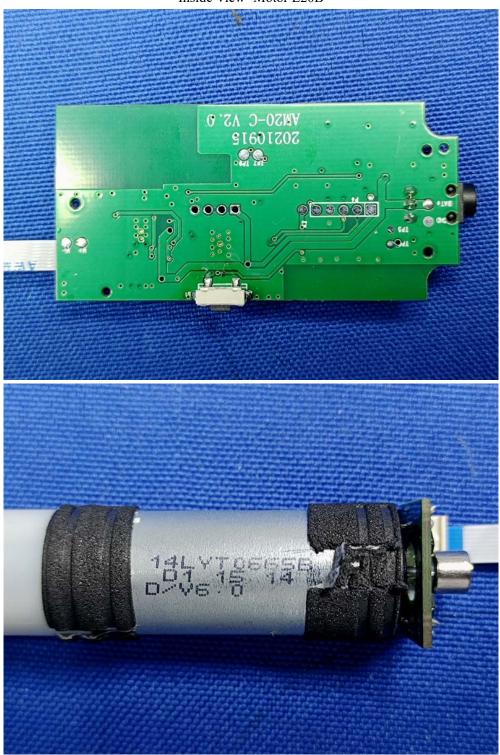
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Inside View- Motor L20B



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