

ENERGY STAR PROGRAM REQUIREMENTS FOR DOWNLIGHTS (VERSION 1.0)

MEASUREMENT AND TEST REPORT

For

GREEN CREATIVE LTD

Room 3603, Level 36, Tower 1, Enterprise Square Five, 38 Wang Chiu Road, Kowloon Bay, KL,
Hong Kong

Model: SLMFT5/9CCTS/DIM010UNV

Report Type: Original Report		Product Type: Downlight	
Reviewed By:	Hill Liu		
Report Number:	2402Z67580E-EE		
Test Date:	2024-11-23 to 2024-12-03		
Report Date:	2024-12-27		
Approved by:	Blake Zhang / EE Engineer		
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5F (B-West), 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Road, Futian Free Trade Zone Shenzhen, 518038, China. Tel: +86-755-33320018 Fax: +86-755-33320008		
Test Location 1:	Test facility was located at No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China.		
Test Location 2:	Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.		

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.(Shenzhen). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S. Government. *This report contains data that are not covered by the NVLAP accreditation.

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1. GENERAL INFORMATION

1.1. Product Description for Equipment under Test (EUT)[#]

The client submitted 1 sample of model SLMFT5/9CCTS/DIM010UNV , Sample was numbered 2402Z67580E-S01. The test sample was in good condition and received on 2024-11-22. All tests and evaluations were performed at the most consumptive white light setting.

Model Tested:	SLMFT5/9CCTS/DIM010UNV
Manufacturer:	GREEN CREATIVE LTD
Product Designation:	LED Surface Mount Downlight
Rated Voltage/Frequency:	120-277V AC 50/60Hz
Rated Power:	10W
Nominal CCT:	2700K/3000K/3500K/4000K/5000K
Rated Life:	50000 hrs
Dimming:	Yes
Dimming Range:	10%-100%
Indoor and Outdoor:	Indoor use only
Connected Product:	No
Color Tunable:	White-Tunable
CCT Range:	2700K/3000K/3500K/4000K/5000K
Most Consumptive Setting:	5000K
Number of LED Components	60
Type of LED Components:	LED Package
Model of LED Components:	BXNN-(A)G-13H-9C
Light Source Manufacturer:	Bridgelux Inc.
LM-80 Report:	Yes
The Number of LED Driver:	1
The Model of LED Driver:	LB010AMS-104C
Driver Manufacturer:	Zhejiang YanKon Group Co Ltd
Rated Maximum TMPc:	125°C
Replaceability of Driver:	Inseparable
Model of Dimmer Used During Test:	Cat.No.IP710-DLZ
Brand of Dimmer:	Leviton
Type of Dimmer:	0-10V Continuous dimmer

1.2. Statement of Traceability:

Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

2. SUMMARY OF TEST RESULT

Item	Measured	Verdict	Requirement
Efficacy(lm/W) ^{ΔΔ}	99.98	PASS	≥82 lm/W
Aperture(inch) ^{ΔΔ}	3.49	PASS	≤10 inch
Light Output(lm) ^{ΔΔ}	970.81	PASS	For Aperture ≤4.5": ≥345 lm For Aperture >4.5": ≥575 lm
Zonal Lumen Density ^Δ	79.11%	PASS	Luminaire shall deliver a minimum of 75% of total initial lumens within the 0°- 60° zone (axially symmetric about the nadir).
CCT (K) ^{ΔΔ}	4888	PASS	The luminaire shall fall within the corresponding 7-step chromaticity quadrangles as defined in ANSI C78.377-2017 (R2022).
R _a ^{ΔΔ}	92.9	PASS	R _a ≥80
R _g ^{ΔΔ}	63	PASS	R _g >0
Color Angular Uniformity ^Δ	Complied	PASS	Throughout the beam angle, the variation of chromaticity shall be within a total linear distance of 0.006 from the weighted average point on the CIE 1976(u',v') diagram.
Lumen Maintenance Life ^{iiΔΔ}	>102000 hours See Attachment A	PASS	≥25,000 hours
Color Maintenance ^{iiiΔΔ}	See Attachment A	PASS	≤0.007 (In LM-80 test report)
Start Time(ms) ^{ΔΔ}	242.0	PASS	Light source shall remain continuously illuminated within 750 milliseconds of application of electrical power.
Power Factor ^{ΔΔ}	0.9713	PASS	≥ 0.7
Transient Protection ^{ΔΔ}	See tables	PASS	Sample shall survive after seven strikes
Standby Power (W) ^{ΔΔ}	N/A	PASS ^{iv}	luminaires shall not draw power in the off state.
Operating Frequency (Hz) ^{iΔΔ}	120.090	PASS	≥ 120 Hz
P _{st} ^{ΔΔ}	0.111	N/A	Optional: ≤1.0
SVM ^{ΔΔ}	0.078	N/A	Optional: For indoor use: ≤1.6
Dimming ^{iΔΔ}	See tables	PASS	Provide continuous dimming from 100% to 20%
Noise(dBA) ^{iΔΔ}	18.3	PASS	≤ 24 dBA at 1 meter or less at the minimum output
Driver Case Temperature(°C) ^{ΔΔ}	58.1	PASS	The measured driver case temperature at thermal equilibrium shall not exceed the driver manufacturer's maximum recommended temperature 125°C during in situ operation.

Note:

- i. Operating frequency, dimming, and noise test are not accredited by the NVLAP.
 - ii. TM-21 calculator is used to calculate the L₇₀ life. Test data from LM-80 test report of LED light source was used.
 - iii. Color Maintenance referenced to LM-80 test report of LED light source.
 - iv. According to IEC 62301-2011, This *Type A* product has no secondary function load and no power switch.
- ^Δ Test facility was located at No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.
^{ΔΔ} Test facility was located at Room 301, No.113, Pingkang Road, Dalang, Dongguan, Guangdong, China.

3. TEST RESULT

3.1. Driver Case Temperature and in Situ TMP_{LED} Temperature Test

Test Method and ENERGY STAR Requirements:

ANSI/UL 1598-2008: Standard for Safety of Luminaires

ENERGY STAR Requirements:

In the sample luminaire, the in situ TMP_{LED} temperature is less than or equal to the temperature specified in the LM-80 test report for the corresponding or higher drive current, within the manufacturer's specified operating current range.

The drive current measured in the luminaire is less than or equal to the drive current specified in the LM-80 test report at the corresponding temperature or higher.

At the temperature measurement point for the hottest location on the driver case (TMP_c as detailed by the driver manufacturer), the measured driver case temperature at thermal equilibrium shall not exceed the driver manufacturer's maximum recommended temperature during in situ (installed in the luminaire) operation.

Test Procedure:

One sample was mounted according to ANSI/UL 1598-2008 and operated until constant temperatures were obtained. A temperature was considered constant if the sample was operating for at least three hours and upon three successive readings - taken at 15 minute intervals - were within one degree and were not rising. The sample was connected to a 120V, 60 Hz source of supply.

Thermocouples were attached at locations described in the results by means of a cement made of water glass and Fuller's earth, solder, or epoxy. The drive current of LED package/module/ array was calculated as the total output current of the driver measured by multimeter, divided by the number of branches in parallel of LEDs.

Test Equipment:

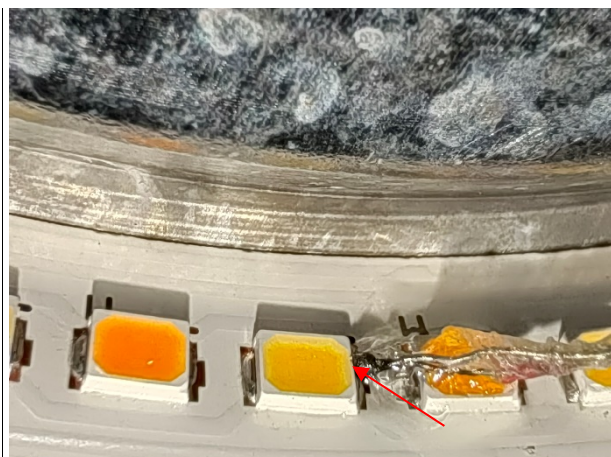
Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Multimeter	FLUKE	115C	N/A	2024-07-25	2025-07-24
Hybrid Recorder	YOKOGAWA	DR240	10#	2024-07-25	2025-07-24
AC POWER SUPPLY	HengPu	HPA 1103	0003394	2024-07-25	2025-07-24

Uncertainty:

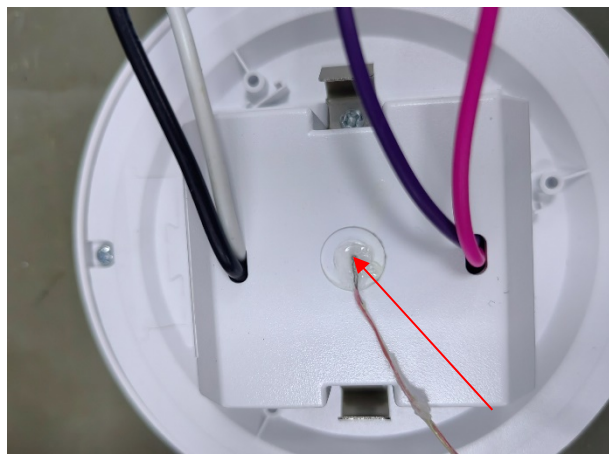
The uncertainty of the temperature is $U=0.8^{\circ}\text{C}$ ($K=2$), at the 95% confidence level.

Test Data:

Temperature measurement point of LED light source (TMP_{LED})



Temperature measurement point of driver (TMP_d)



Sample No.	2402Z67580E-S01
Type of Thermocouples:	K
Test Duration	≥ 3.5 hours
Maximum Recommended Driver Case Temperature	125°C
Test Location	Test Result
TMP _{LED}	65.2°C
TMP _c	58.1°C
Driver Current of LED	Test Result
IF (mA)	33.7mA

See attachment A: LM-80 test report and TM-21 calculator.

3.2. Photometric and Electrical Measurements at 25°C

Test Method and ENERGY STAR Requirements:

IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products

ANSI C82.77-10:2021: Lighting Equipment - Harmonic Emission Limits - Related Power Quality Requirements

CIE Pub. No. 13.3-1995: Method of Measuring and Specifying Color Rendering of Light Sources

CIE Pub. No. 15:2004: Colorimetry

ENERGY STAR Requirement:

Luminaire Efficacy: $\geq 82 \text{ lm/W}$;

Luminaire Minimum Light Output: $\leq 4.5''$ aperture: 345 lumens ; $> 4.5''$ aperture: 575 lumens

CCT Requirements: fall within a 7-step chromaticity quadrangles for CCT: 2200K, 2500K, 2700K, 3000K, 3500K, 4000K, 5000K

CRI Requirements: $R_a \geq 80$, $R_9 > 0$

Power Factor Requirements: ≥ 0.7

Test Procedure:

The photometric tests were performed after the lamps were seasoned. Spectral radiant flux measurements are made using Spectroradiometer attached to the detector port of the integrating sphere. Each lamp is operated at rated voltage in its designated orientation. Each lamp is allowed to stabilize from 30 min to 2 or more hours before measurements are made. Luminous flux, chromaticity coordinates, correlated color temperature, u' , v' and color rendering index for each lamp are calculated from the spectral radiant flux measurements taken at no more 5 nm intervals over the range 380 to 780 nm. The calibration of the sphere photometer-spectroradiometer system is traceable to The National Metrology Institute of China, NIM. Lamp efficacy (lumens per watts) for each lamp model is computed based on this luminous flux result. Electrical measurements including voltage, current, power, power factor and harmonic analysis are measured using the Digital Power Analyzer.

Test Equipment:

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	2024-07-25	2025-07-24
spectroradiometer	EVERFINE	HAAS-2000	G112048TS81331121	2024-07-25	2025-07-24
Digital Power Meter	EVERFINE	PF2010A	1011004	2024-07-25	2025-07-24
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	2024-07-25	2025-07-24
Standard Light Source	EVERFINE	D204	N/A	2023-05-12	2025-05-11
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	2024-07-25	2025-07-24

Uncertainty:

The uncertainty of the light output (luminous flux) measurements is $U_{rel}=2.1\%$ ($k=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=22K$ ($k=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.1(k=2)$, at the 95% confidence level.

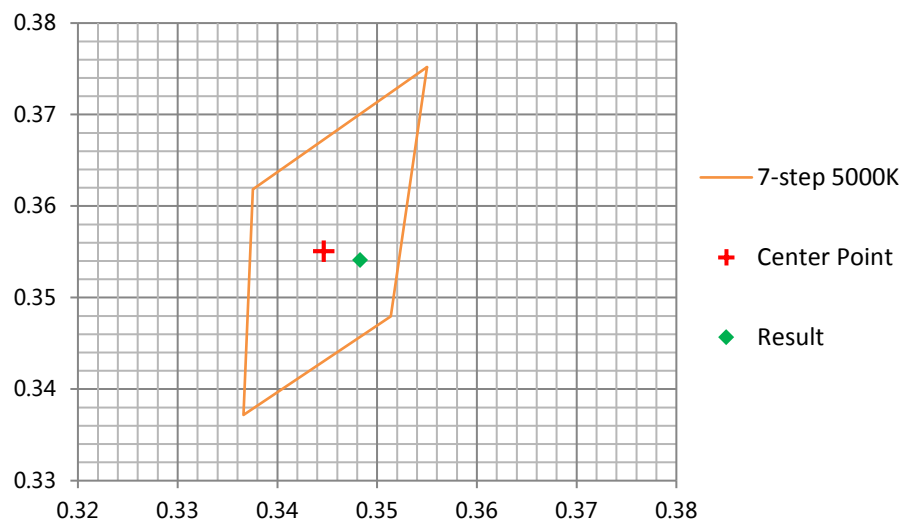
The uncertainty of power meter AC current $U_{rel}=0.19\%$ of rdg, AC Voltage $U_{rel}=0.18\%$ of rdg, Power $U_{rel}=0.46\%$ ($k=2$), at the 95% confidence level.

Test Data at Control setting: 5000K

Photometric and Electrical Measurements at 25 °C

Sample No.	Voltage(V)	Current(A)	Power(W)	Power Factor	Luminous Flux (lm)	Efficacy (lm/W)	CCT(K)
2402Z67580E-S01	120	0.0833	9.71	0.9713	970.81	99.98	4888

Sample No.	R _a	R ₉	x	y	u'	v'	Duv
2402Z67580E-S01	92.9	63	0.3483	0.3541	0.2126	0.4864	-0.0000424



3.3. Luminous Intensity Distribution and Color Spatial Uniformity

Test Method and ENERGY STAR Requirements:

IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products

ANSI/IES LM-58:2020: Method for Spectroradiometric Measurement Methods for Light Sources

CIE Pub. No. 15:2004: Colorimetry

ENERGY STAR Requirements:

Luminaire Zonal Lumen Density: Luminaire shall deliver a minimum of 75% of total initial lumens within the 0-60° zone (axially symmetric about the nadir)

Test Procedure:

Luminous Intensity & Color Distribution was measured by goniophotometer system at 25°C±1°C. One sample was measured and operated at downward orientation. Sample was operated at rated voltage and was tested after stabilized. System was calibrated by standard light source before measurement.

Test Equipment:

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
AC POWER SUPPLY	EVERFINE	VPS1030 PWM	1012017	2024-07-25	2025-07-24
Digital CC&CV DC Power Supply	EVERFINE	WY12010	1009009	2024-07-25	2025-07-24
Digital power meter	YOKOGAWA	WT-210	91j926132	2024-07-25	2025-07-24
full-field speed goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	2024-07-25	2025-07-24
wireless remote thermohygrometer	N/A	AOK-5017B	N/A	2024-07-25	2025-07-24
Standard Light Source	EVERFINE	D908	N/A	2023-05-12	2025-05-11

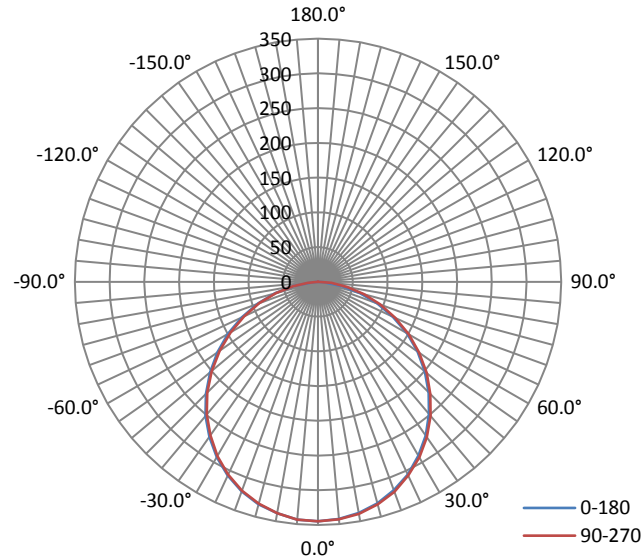
Uncertainty:

The uncertainty of the luminous intensity is U=2.00% (K=2), at the 95% confidence level.

Test Data:

Sample Number: 2402Z67580E-S01

Luminous Intensity Distribution Diagram



Orientation	Beam Angle(°)	I _{max} (cd)
Downward	111.1	345.1

Zonal Lumen Density

Deg	Flux (lm)	%
0-5	8.2	0.85
0-10	32.6	3.36
0-15	72.3	7.44
0-20	126.0	12.96
0-25	191.7	19.73
0-30	267.3	27.51
0-35	350.1	36.02
0-40	437.1	44.98
0-45	525.4	54.06
0-50	611.9	62.97
0-55	694.0	71.41
0-60	768.8	79.11
0-65	833.9	85.81
0-70	887.5	91.33
0-75	928.4	95.53
0-80	955.6	98.33
0-85	969.3	99.74
0-90	971.8	100.00

Deg	Flux (lm)	%
0-95	971.8	100.00
0-100	971.8	100.00
0-105	971.8	100.00
0-110	971.8	100.00
0-115	971.8	100.00
0-120	971.8	100.00
0-125	971.8	100.00
0-130	971.8	100.00
0-135	971.8	100.00
0-140	971.8	100.00
0-145	971.8	100.00
0-150	971.8	100.00
0-155	971.8	100.00
0-160	971.8	100.00
0-165	971.8	100.00
0-170	971.8	100.00
0-175	971.8	100.00
0-180	971.8	100.00

Color Spatial Uniformity

Average Weighted
u': 0.2124, v': 0.4873

$y \setminus C0-180$	u'	v'	$Du'v'$	$y \setminus C90-270$	u'	v'	$Du'v'$
-60	0.2123	0.4872	0.0001	-60	0.2122	0.4868	0.0005
-59	0.2122	0.4872	0.0002	-59	0.2122	0.4869	0.0004
-58	0.2123	0.4873	0.0001	-58	0.2123	0.4869	0.0004
-57	0.2124	0.4873	0.0000	-57	0.2122	0.4869	0.0004
-56	0.2123	0.4872	0.0001	-56	0.2122	0.4869	0.0004
-55	0.2124	0.4873	0.0000	-55	0.2123	0.4870	0.0003
-54	0.2124	0.4874	0.0001	-54	0.2124	0.4870	0.0003
-53	0.2123	0.4874	0.0001	-53	0.2124	0.4870	0.0003
-52	0.2123	0.4873	0.0001	-52	0.2124	0.4870	0.0003
-51	0.2123	0.4873	0.0001	-51	0.2124	0.4870	0.0003
-50	0.2124	0.4874	0.0001	-50	0.2124	0.4870	0.0003
-49	0.2124	0.4875	0.0002	-49	0.2124	0.4870	0.0003
-48	0.2124	0.4874	0.0001	-48	0.2124	0.4871	0.0002
-47	0.2125	0.4874	0.0001	-47	0.2123	0.4870	0.0003
-46	0.2124	0.4874	0.0001	-46	0.2124	0.4870	0.0003
-45	0.2125	0.4874	0.0001	-45	0.2124	0.4871	0.0002
-44	0.2124	0.4875	0.0002	-44	0.2124	0.4871	0.0002
-43	0.2124	0.4875	0.0002	-43	0.2124	0.4871	0.0002
-42	0.2125	0.4875	0.0002	-42	0.2124	0.4871	0.0002
-41	0.2125	0.4875	0.0002	-41	0.2125	0.4871	0.0002
-40	0.2125	0.4875	0.0002	-40	0.2125	0.4872	0.0001
-39	0.2125	0.4875	0.0002	-39	0.2124	0.4872	0.0001
-38	0.2125	0.4875	0.0002	-38	0.2124	0.4872	0.0001
-37	0.2125	0.4875	0.0002	-37	0.2124	0.4872	0.0001
-36	0.2125	0.4875	0.0002	-36	0.2124	0.4872	0.0001
-35	0.2125	0.4875	0.0002	-35	0.2125	0.4872	0.0001
-34	0.2125	0.4875	0.0002	-34	0.2124	0.4872	0.0001
-33	0.2125	0.4875	0.0002	-33	0.2124	0.4872	0.0001
-32	0.2125	0.4875	0.0002	-32	0.2124	0.4872	0.0001
-31	0.2125	0.4875	0.0002	-31	0.2124	0.4872	0.0001
-30	0.2125	0.4875	0.0002	-30	0.2125	0.4872	0.0001
-29	0.2125	0.4875	0.0002	-29	0.2124	0.4872	0.0001
-28	0.2124	0.4875	0.0002	-28	0.2124	0.4872	0.0001
-27	0.2124	0.4875	0.0002	-27	0.2124	0.4872	0.0001
-26	0.2125	0.4875	0.0002	-26	0.2124	0.4872	0.0001
-25	0.2124	0.4875	0.0002	-25	0.2124	0.4872	0.0001
-24	0.2123	0.4875	0.0002	-24	0.2123	0.4872	0.0001
-23	0.2123	0.4875	0.0002	-23	0.2123	0.4872	0.0001
-22	0.2123	0.4875	0.0002	-22	0.2124	0.4872	0.0001
-21	0.2123	0.4875	0.0002	-21	0.2123	0.4872	0.0001
-20	0.2124	0.4874	0.0001	-20	0.2124	0.4872	0.0001
-19	0.2123	0.4874	0.0001	-19	0.2123	0.4872	0.0001
-18	0.2123	0.4874	0.0001	-18	0.2123	0.4872	0.0001
-17	0.2123	0.4874	0.0001	-17	0.2123	0.4872	0.0001
-16	0.2124	0.4874	0.0001	-16	0.2123	0.4872	0.0001
-15	0.2123	0.4874	0.0001	-15	0.2123	0.4872	0.0001
-14	0.2123	0.4873	0.0001	-14	0.2122	0.4872	0.0002
-13	0.2123	0.4874	0.0001	-13	0.2123	0.4872	0.0001
-12	0.2122	0.4873	0.0002	-12	0.2122	0.4872	0.0002
-11	0.2123	0.4873	0.0001	-11	0.2122	0.4872	0.0002
-10	0.2122	0.4873	0.0002	-10	0.2122	0.4872	0.0002
-9	0.2122	0.4873	0.0002	-9	0.2121	0.4872	0.0003
-8	0.2122	0.4873	0.0002	-8	0.2121	0.4872	0.0003
-7	0.2123	0.4873	0.0001	-7	0.2122	0.4872	0.0002
-6	0.2122	0.4873	0.0002	-6	0.2122	0.4872	0.0002
-5	0.2122	0.4873	0.0002	-5	0.2122	0.4871	0.0003
-4	0.2123	0.4873	0.0001	-4	0.2121	0.4872	0.0003
-3	0.2122	0.4873	0.0002	-3	0.2121	0.4872	0.0003

Color Spatial Uniformity

Average Weighted
u': 0.2124, v': 0.4873

y \ C0-180	u'	v'	Du'v'	y \ C90-270	u'	v'	Du'v'
-2	0.2122	0.4874	0.0002	-2	0.2120	0.4873	0.0004
-1	0.2122	0.4874	0.0002	-1	0.2121	0.4873	0.0003
0	0.2122	0.4874	0.0002	0	0.2122	0.4874	0.0002
1	0.2122	0.4874	0.0002	1	0.2123	0.4872	0.0001
2	0.2122	0.4873	0.0002	2	0.2120	0.4874	0.0004
3	0.2121	0.4873	0.0003	3	0.2121	0.4874	0.0003
4	0.2122	0.4873	0.0002	4	0.2123	0.4872	0.0001
5	0.2122	0.4873	0.0002	5	0.2122	0.4872	0.0002
6	0.2122	0.4873	0.0002	6	0.2122	0.4872	0.0002
7	0.2123	0.4873	0.0001	7	0.2122	0.4872	0.0002
8	0.2123	0.4873	0.0001	8	0.2122	0.4872	0.0002
9	0.2123	0.4873	0.0001	9	0.2122	0.4872	0.0002
10	0.2123	0.4873	0.0001	10	0.2123	0.4872	0.0001
11	0.2123	0.4873	0.0001	11	0.2123	0.4872	0.0001
12	0.2123	0.4873	0.0001	12	0.2122	0.4872	0.0002
13	0.2122	0.4873	0.0002	13	0.2123	0.4872	0.0001
14	0.2123	0.4874	0.0001	14	0.2123	0.4872	0.0001
15	0.2123	0.4873	0.0001	15	0.2124	0.4873	0.0000
16	0.2123	0.4874	0.0001	16	0.2125	0.4873	0.0001
17	0.2123	0.4874	0.0001	17	0.2124	0.4873	0.0000
18	0.2123	0.4874	0.0001	18	0.2125	0.4873	0.0001
19	0.2123	0.4874	0.0001	19	0.2124	0.4873	0.0000
20	0.2124	0.4874	0.0001	20	0.2125	0.4874	0.0001
21	0.2124	0.4873	0.0000	21	0.2125	0.4873	0.0001
22	0.2124	0.4873	0.0000	22	0.2126	0.4874	0.0002
23	0.2124	0.4874	0.0001	23	0.2126	0.4874	0.0002
24	0.2124	0.4874	0.0001	24	0.2124	0.4874	0.0001
25	0.2124	0.4874	0.0001	25	0.2125	0.4874	0.0001
26	0.2125	0.4873	0.0001	26	0.2126	0.4874	0.0002
27	0.2125	0.4873	0.0001	27	0.2126	0.4874	0.0002
28	0.2125	0.4874	0.0001	28	0.2126	0.4874	0.0002
29	0.2125	0.4874	0.0001	29	0.2126	0.4874	0.0002
30	0.2125	0.4874	0.0001	30	0.2126	0.4875	0.0003
31	0.2125	0.4874	0.0001	31	0.2126	0.4875	0.0003
32	0.2125	0.4874	0.0001	32	0.2126	0.4874	0.0002
33	0.2125	0.4874	0.0001	33	0.2126	0.4874	0.0002
34	0.2125	0.4874	0.0001	34	0.2126	0.4875	0.0003
35	0.2125	0.4873	0.0001	35	0.2127	0.4875	0.0004
36	0.2125	0.4873	0.0001	36	0.2126	0.4875	0.0003
37	0.2125	0.4874	0.0001	37	0.2126	0.4875	0.0003
38	0.2125	0.4873	0.0001	38	0.2126	0.4875	0.0003
39	0.2125	0.4873	0.0001	39	0.2127	0.4874	0.0003
40	0.2125	0.4873	0.0001	40	0.2127	0.4874	0.0003
41	0.2125	0.4873	0.0001	41	0.2127	0.4874	0.0003
42	0.2124	0.4873	0.0000	42	0.2126	0.4874	0.0002
43	0.2124	0.4873	0.0000	43	0.2127	0.4874	0.0003
44	0.2125	0.4873	0.0001	44	0.2127	0.4874	0.0003
45	0.2125	0.4873	0.0001	45	0.2127	0.4874	0.0003
46	0.2124	0.4872	0.0001	46	0.2127	0.4873	0.0003
47	0.2123	0.4872	0.0001	47	0.2127	0.4874	0.0003
48	0.2124	0.4872	0.0001	48	0.2125	0.4874	0.0001
49	0.2123	0.4872	0.0001	49	0.2125	0.4874	0.0001
50	0.2124	0.4871	0.0002	50	0.2126	0.4873	0.0002
51	0.2123	0.4871	0.0002	51	0.2126	0.4873	0.0002
52	0.2124	0.4871	0.0002	52	0.2125	0.4872	0.0001
53	0.2123	0.4871	0.0002	53	0.2124	0.4873	0.0000
54	0.2124	0.4871	0.0002	54	0.2126	0.4873	0.0002
55	0.2123	0.4871	0.0002	55	0.2125	0.4872	0.0001

Color Spatial Uniformity

Average Weighted
u': 0.2124, v':0.4873

$\gamma \setminus C0-180$	u'	v'	$Du'v'$	$\gamma \setminus C90-270$	u'	v'	$Du'v'$
56	0.2123	0.4871	0.0002	56	0.2124	0.4871	0.0002
57	0.2123	0.4870	0.0003	57	0.2124	0.4872	0.0001
58	0.2123	0.4871	0.0002	58	0.2124	0.4871	0.0002
59	0.2123	0.4871	0.0002	59	0.2124	0.4871	0.0002
60	0.2123	0.4869	0.0004	60	0.2124	0.4871	0.0002

3.4. Start Time

Test Method and ENERGY STAR Requirements:

Test Method

ENERGY STAR Test Method: Start Time Test

ENERGY STAR Requirement:

Light source shall remain continuously illuminated within 750 ms (1 second for connected product) of application of electrical power.

Test Procedure:

Integrating sphere, oscilloscope, photocell were used during start time test.

Luminaires were stored at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for a minimum of 16 hours prior to the test, after which the temperature range was $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for at least two hours immediately prior to the test. Luminaires were tested at rated voltage/frequency in an ambient temperature of $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The start time is defined as, the time between the application of power to the DUT and the point where the light source is continuously illuminated, and the light output is either constant or increasing.

Test Equipment:

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	2024-07-25	2025-07-24
Digital Power Meter	EVERFINE	PF2010A	1011004	2024-07-25	2025-07-24
Digital Oscilloscope	Tektronix	TDS 220	C033131	2024-07-25	2025-07-24
Photometric detector	EVERFINE	V-10141A	1006285	2024-07-25	2025-07-24
thermometer	Anymetre	JR900A	N/A	2024-07-25	2025-07-24
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	2024-07-25	2025-07-24

Uncertainty:

The uncertainty of Start time $U=0.6\%$ ($K=2$), at the 95% confidence level.

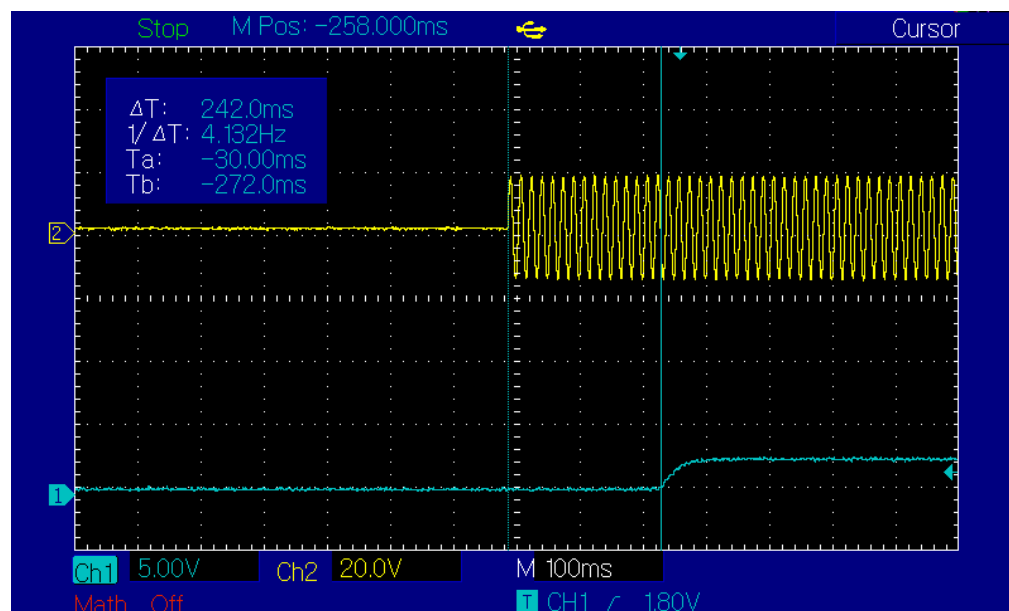
Test Data:

Test date: 2024-12-03; Test voltage AC 120 V 60 Hz.

Sample No.	Time base (ms/div)	Start Time(ms)
2402Z67580E-S01	100.0	242.0

Figure of Input voltage and light output waveforms

2402Z67580E-S01



3.5. Transient Protection

Test Method and ENERGY STAR Requirements:

*ANSI/IEEE C62.41.1-2002: IEEE Guide on the Surge Environment in Low-Voltage (1000 V and Less) AC Power Circuits (This method is not in NVLAP accreditation scope)

ANSI/IEEE C62.41.2-2002: IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000V and Less) AC Power Circuits

ENERGY STAR Requirement:

Ballast or driver shall comply with ANSI/IEEE C62.41.1-2002 and ANSI/IEEE C62.41.2-2002, Category A operation. The line transient shall consist of seven strikes of a 100 kHz ring wave, 2.5 kV level, for both common mode and differential mode.

Test Procedure:

Seven strikes were performed on lamp base in accordance with ANSI/IEEE C62.41 (Category A). The line transient shall consist of seven strikes of a 100 kHz ring wave, 2.5 kV level, for both common mode and differential mode. Samples should be fully operational after seven strikes.

Test Equipment:

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
AC Power source	HengPu	HPA 1103	0003394	2024-07-25	2025-07-24
MODULAR IMPULSE GENERATOR	EMC-PARTNER	MIG0603IN1 IEC-ANSI	593	2024-07-25	2025-07-24

Uncertainty:

The uncertainty of voltage $U=3.00\%$ ($K=2$), at the 95% confidence level.

The uncertainty of time $U=3.00\%$ ($K=2$), at the 95% confidence level.

Test Data:

Sample No.	Transient Protection Test
2402Z67580E-S01	PASS

3.6. Operating Frequency

Test Method and ENERGY STAR Requirements:

*ANSI C82.18-2022: Light Emitting Diode Drivers—Performance Characteristics (This method is not in NVLAP accreditation scope)

ENERGY STAR Requirements:

$\geq 120\text{Hz}$

Test Procedure:

The sample was operated at rated voltage in its designated orientation during the test. Lamp was measured by a photodetector, integrating sphere and rapid recording photometer. For dimmable lamps, test was performed with dimmer at three levels: full light output level, medium light output level and minimum light output level. The final result would be the minimum of the three test results.

Test Equipment:

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
1.5m integrating sphere	SENSING	1.5m	N/A	2024-07-25	2025-07-24
Digital power meter	EVERFINE	PF9811	G135717CN1361159	2024-07-25	2025-07-24
Precision frequency power supply	ALL Power	APW-105N	970663	2024-07-25	2025-07-24
Standard Light Source	EVERFINE	D204	N/A	2024-07-25	2025-07-24
thermometer	SENSING	N/A	N/A	2024-07-25	2025-07-24
Programmable Precision DC Power Supply	EVERFINE	WY5015	11060010	2024-07-25	2025-07-24
light flickering analyzer	EVERFINE	LFA-3000	P185972CJ6371119	2024-07-25	2025-07-24

Uncertainty:

The uncertainty of Operating Frequency $U=0.6\%$ ($K=2$), at the 95% confidence level.

Test Data:

Sample No.	Operating Frequency (Hz)
2402Z67580E-S01	120.090

3.7. Flicker Test

Test Method:

NEMA 77-2017: Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria

Performance Requirements:

Optional: $P_{st} \leq 1.0$; SVM for indoor luminaires: ≤ 1.6 .

Test Procedure:

All test luminaires required stabilized after operating for this period of time per IES-LM-79-08 before measurements and the stabilization time recorded. The light output was measured by integrating sphere and light flicker analyzer (sampling speed is set no less than 20 kHz). The Sampling time was set 3 minutes. Flicker was calculated by flicker analyzer according to NEMA 77-2017. Wave data was reported as CSV file separately.

Test Equipment:

Device	Manufacturer	Model No	Serial No	Calibration date	Calibration due date
1.5m integrating sphere	SENSING	1.5m	N/A	2024-07-25	2025-07-24
Digital power meter	EVERFINE	PF9811	G135717CN1361159	2024-07-25	2025-07-24
Precision frequency power supply	ALL Power	APW-105N	970663	2024-07-25	2025-07-24
Standard Light Source	EVERFINE	D204	N/A	2024-07-25	2025-07-24
thermometer	SENSING	N/A	N/A	2024-07-25	2025-07-24
Programmable Precision DC Power Supply	EVERFINE	WY5015	11060010	2024-07-25	2025-07-24
light flickering analyzer	EVERFINE	LFA-3000	P185972CJ6371119	2024-07-25	2025-07-24

Uncertainty:

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.17\%$ of rdg, Power $U=0.48\%$ ($K=2$), at the 95% confidence level.

Test Data:

Sample No.	P_{st}	SVM
2402Z67580E-S01	0.111	0.078

Note: Detail light source flicker test data please refer to attachment B.

3.8. Dimming and noise Test

Test Method and ENERGY STAR Requirements:

IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products

*NEMA SSL 7A-2015 (R2021): Phase Cut Dimming for Solid State Lighting: Basic Compatibility(This method is not in NVLAP accreditation scope)

ENERGY STAR Requirements:

The luminaire and its components shall provide continuous dimming from 100% to 20% of light output. Luminaire shall not emit noise above 24dBA at 1 meter or less at the minimum output.

Test Procedure:

The photometric measurement test was performed with dimmer specified by manufacturer and detailed as below. For continuous dimmer, the dimmer was set maximum level and minimum level output for photometric measurement.

Sample was transferred to sound insulation chamber to measure the noise level at the lowest dimmable level.

Test Equipment:

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
1.5m integrating sphere	SENSING	1.5m	N/A	2024-07-25	2025-07-24
Digital power meter	EVERFINE	PF9811	G135717CN1361159	2024-07-25	2025-07-24
Precision frequency power supply	ALL Power	APW-105N	970663	2024-07-25	2025-07-24
Standard Light Source	EVERFINE	D204	N/A	2024-07-25	2025-07-24
thermometer	SENSING	N/A	N/A	2024-07-25	2025-07-24
Programmable Precision DC Power Supply	EVERFINE	WY5015	11060010	2024-07-25	2025-07-24
light flickering analyzer	EVERFINE	LFA-3000	P185972CJ6371119	2024-07-25	2025-07-24
Precision frequency power supply	ALL Power	APW-105N	970663	2024-07-25	2025-07-24
Sound Insulation Box	N/A	N/A	01#	2024-07-25	2025-07-24
Sound Level Meter	Hangzhou Aihua	AWA5661	88071	2024-07-25	2025-07-24

Uncertainty:

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.17\%$ of rdg, Power $U=0.48\%$ ($K=2$), at the 95% confidence level.

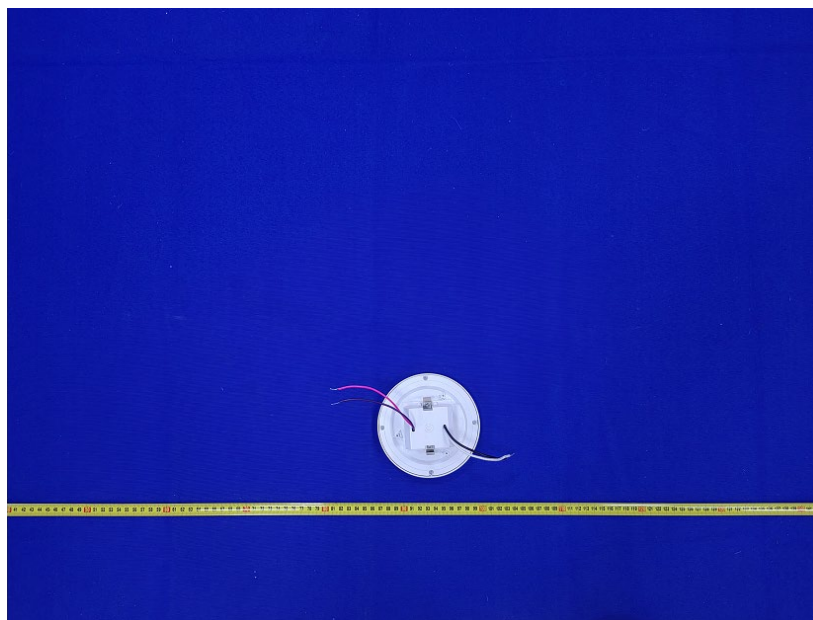
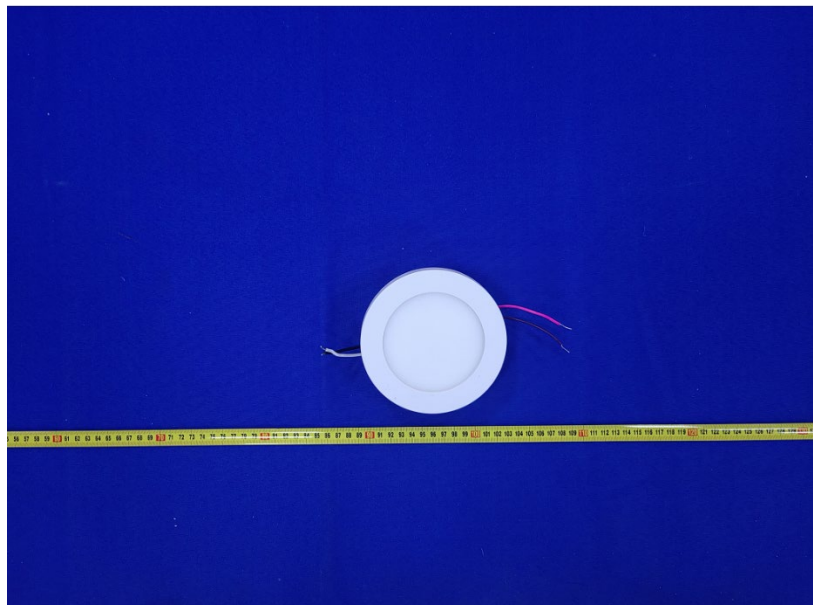
The uncertainty of noise $U=0.5\text{ dB}$ ($K=2$), at the 95% confidence level.

Test Data:

Sample No.		Maximum Level	Minimum Level
2402Z67580E-S01	Light output (Lumen)	953.5	91.739
	Percentage	100%	9.62%
	Noise(dBA)	/	18.3

4. EUT Photo

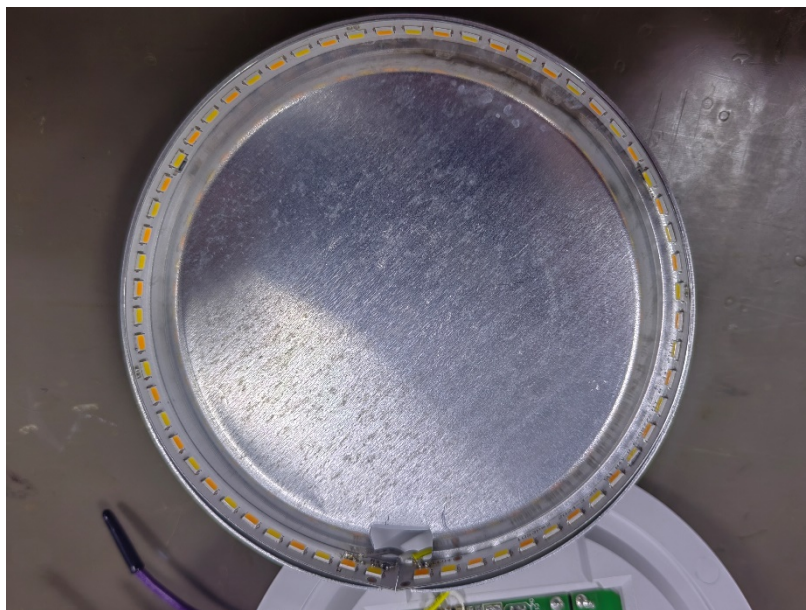
4.1. EUT Photo



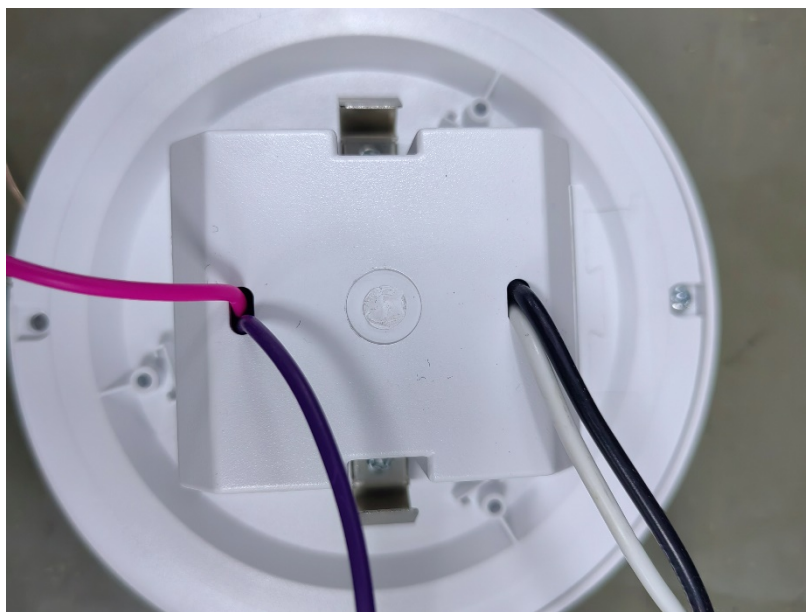
4.2. Labeling

GREEN CREATIVE LTD.,
SLMFT5/9CCTS/DIM010UNV.,
120-277V 50/60Hz .,
10W .,
2700K, 3000K, 3500K, 4000K, 5000K.,
820lm(2700K),820lm(3000K),900lm(3500K),900lm (4000K),900lm (5000K).,

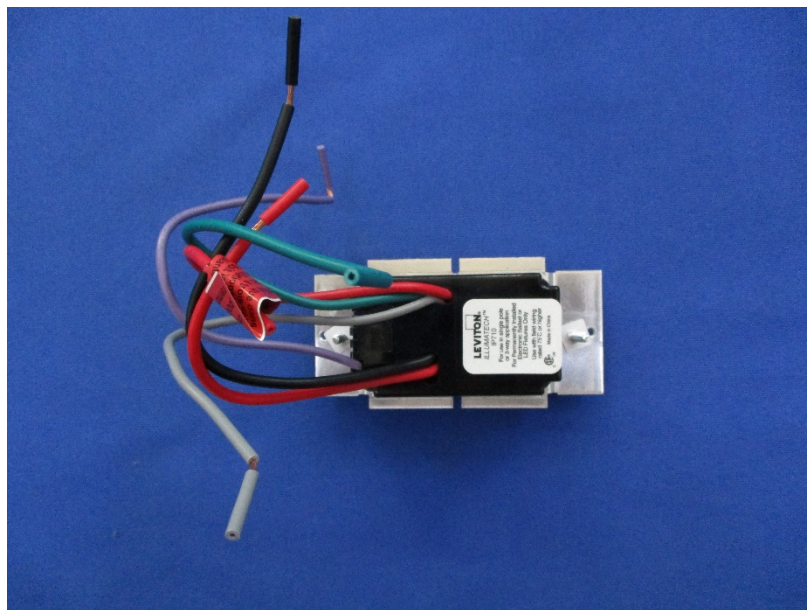
4.3. LED Source Photo



4.4. LED Driver Photo



4.5. Dimmer Photo



Attachment A –LM-80 test report and TM-21 Calculator

Attachment B –Light Source Flicker Test Data

Attachment C - Instructions for Color Tunable

Directions

1. The information marked “superscript #” is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. This report includes some test methods are not in NVLAP accreditation scope marked *.
3. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
5. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor $K=2$ with the 95% confidence interval.
6. This report cannot be reproduced except in full, without prior written approval of the Company.
7. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

*****END OF REPORT*****