

ENERGY STAR PROGRAM REQUIREMENTS FOR LUMINAIRES (LIGHT FIXTURES) (VERSION 2.0)

MEASUREMENT AND TEST REPORT

For

AFX, Inc.

2345 N. Ernie Krueger Circle, Waukegan, IL , 60087, USA

Model: DSW300L30BKWGPC

Report Type: Copy Report		Product Type: Non-Directional Wall-Mounted Luminaire
Test Engineer:	Daniel Duan <i>Daniel Duan</i>	
Report Number:	R2DG160530050-10	
Test Date:	2016-04-15 to 2016-04-19	
Report Date:	2016-06-02	
Reviewed By:	Jeanne Han / Safety Manager <i>Jeanne . Han</i>	
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008	
Test Facility:	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Shenzhen, Guangdong, P.R.China.	

Note: The test data was only valid for the test sample(s). 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, NIST, or any agency of the U.S. Federal Government. Some of the tests or test methods in this report may not in NVLAP accreditation scope and was noted.
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Issue
1	R2DG160401050-10-M1	Original Report	2016-04-20
2	R2DG160530050-10	Copy Report	2016-06-02

Note:

This is an amended report application based on the first amended report R2DG160401050-10-M1, the details as below

- 1) The applicant was changed to AFX,Inc.
- 2) The address was changed to 2345 N. Ernie Krueger Circle, Waukegan, IL , 60087,USA
- 3) The model name was changed to DWSW300L30BKWGPC.

The changes between the original device and the current one are stated and guaranteed by the applicant, the differences between them will not affect the test results, we will keep the test results, test photos and the EUT photos.

BELOW IS THE ORIGINAL REPORT

ENERGY STAR PROGRAM REQUIREMENTS FOR LUMINAIRES (LIGHT FIXTURES) (VERSION 2.0)

MEASUREMENT AND TEST REPORT

For

Foshan Innovative Lighting Co.,Ltd.

Dajin Industrial Zone,Danzao,Nanhai,Foshan,China

Model: WL-090102-A

Report Type: Original Report		Product Type: Non-Directional Wall-Mounted Luminaire	
Test Engineer:	Daniel Duan <i>Daniel Duan</i>		
Report Number:	R2DG160401050-10-M1		
Test Date:	2016-04-15 to 2016-04-19		
Report Date:	2016-06-02		
Reviewed By:	Jeanne Han / Safety Manager		<i>Jeanne Han</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008		
Test Facility:	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Shenzhen, Guangdong, P.R.China.		

Note: The test data was only valid for the test sample(s). 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, NIST, or any agency of the U.S. Federal Government. Some of the tests or test methods in this report may not in NVLAP accreditation scope and was noted.

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1. GENERAL INFORMATION

1.1. Product Description for Equipment under Test (EUT)

The client submitted 1 sample of model WL-090102-A, Sample was numbered R2DG160401050-S01,. The sample was received on 2016-04-01, in undamaged condition.

Model Tested:	WL-090102-A
Manufacturer:	Foshan Innovative Lighting Co.,Ltd.
Product Designation:	Wall-Mounted Luminaire
Classification:	Non-Directional
Rated Voltage/Frequency:	AC120V 60Hz
Rated Power:	6W
Nominal CCT:	3000K
Rated Life:	50000 hrs
Dimming:	Non-Dimmable
Indoor and Outdoor:	Both indoor and outdoor use
Connected Product:	No
Color Tunable:	No
Number of LED Components	15
Type of LED Components:	LED Package
Model of LED Components:	EMC3030
Light Source Manufacturer:	Shenzhen Smalite Optoelectronics Co., Ltd.
LM-80 Report:	Yes
The Number of LED Driver:	1
Driver Manufacturer:	Quantum Lighting Technologies LLC
Rated Maximum TMP _C :	70 °C

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

Test Result of Light Engine

Item	Measured(Avg.)	Verdict	Requirement
Luminous Efficacy (lm/W)	77.815	PASS	≥ 65 lm/W
Light Output(lm)	487.070	PASS	Installed in the luminaire,each LED light engine <i>in situ</i> shall provide a minimum of 450 lumens
CCT (K)	2983	PASS	The luminaire shall fall within the corresponding 7-step chromaticity quadrangles as defined in ANSI/NEMA/ANSI C78.377-2011.
R _a	81.2	PASS	R _a ≥ 80
R ₉	3	PASS	R ₉ ≥ 0
Start Time(ms)	74.00	PASS	≤ 750 ms
Transient Protection	See tables	PASS	Sample shall survive after seven strikes
Operating Frequency (Hz) ⁱ	120.05	PASS	≥ 120 Hz

Test Result of LED Luminaires

Item	Measured	Verdict	Requirement
Lumen Maintenance Life ⁱⁱ	>36000 (See Attachment A)	PASS	$\geq 35,000$ hours (For Outdoor Luminaires)
Color Maintenance ⁱⁱ	See Attachment A	PASS	≤ 0.007
Power Factor	0.840	PASS	For power ≤ 5 W; PF ≥ 0.5 For Power > 5 W, PF ≥ 0.7
Off –State Power (W)	N/A ^{iv}	PASS	Luminaires shall not draw power in the off state.
Light Source Replaceability	See Section 4	PASS	LED light engines shall make use of electrical interconnects which allow for consumer replacement of the engine without the cutting of wires or the use of solder.
Driver Replaceability	See Section 4	PASS	LED light engines shall make use of electrical interconnects which allow for consumer replacement of the engine without the cutting of wires or the use of solder.
Driver Case Temperature(°C)	53.2	PASS	The measured driver case temperature at thermal equilibrium shall not exceed the driver manufacturer's maximum recommended temperature 70 °C during in situ operation.
Light Source Shipment	N/A	PASS	Complete light source components shall be provided with the luminaire.

Note:

- i. Operating frequency test is 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.

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.

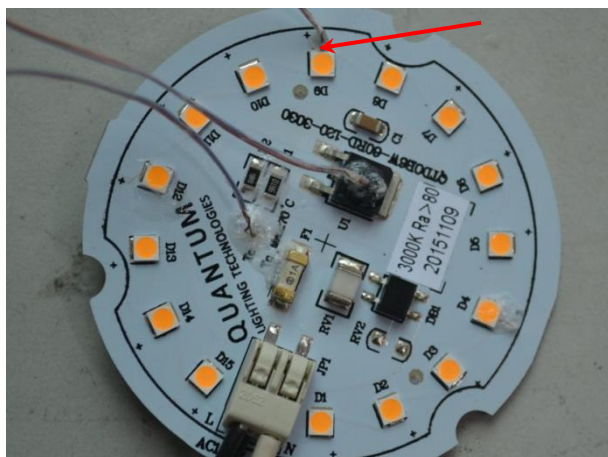
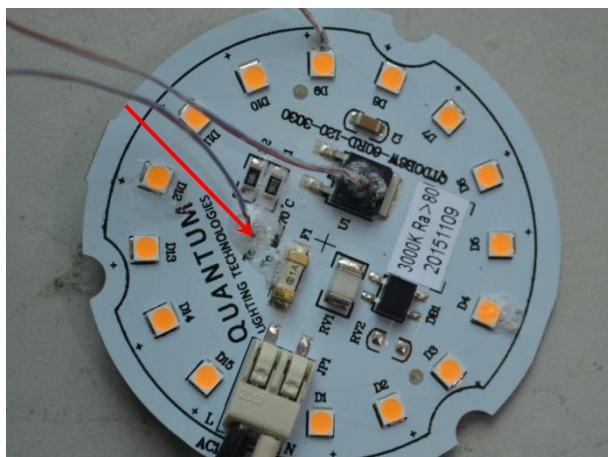
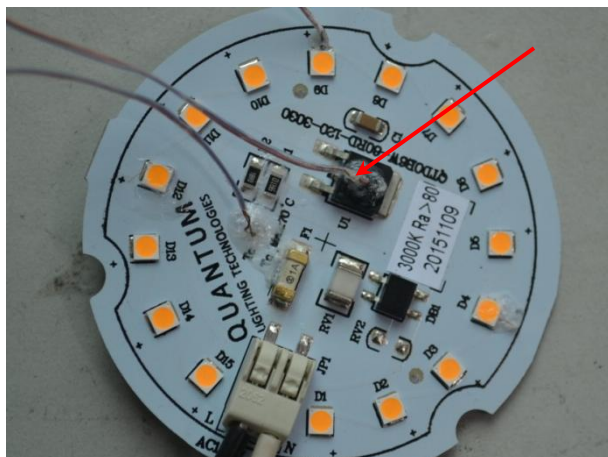
Thermocouples were attached at locations described in the results by means of a cement made of water glass and Fuller's earth, solder, or epoxy. The drive current of LED package/module/ array was calculated as the total output current of the driver measured by multimeter, divided by the number of branches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

Test Equipment:

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Multimeter	FLUKE	17B	1573 1328	400nV~4000nV,4V~1000V	2016-03-04	2017-03-03
Hybrid Recorder	YOKOGAWA	DR240	10#	N/A	2016-03-04	2017-03-03
Power Supply	HengPu	HPA 1103	0003394	3KVA	2016-03-04	2017-03-03

Uncertainty:

The uncertainty of the temperature is U=0.9 °C (K=2) , at the 95% confidence level.

Test Data:**Temperature measurement point of LED light source (TMP_{LED})****Temperature measurement point of LED light source (TMP_b)****Temperature measurement point of driver (TMP_d)**

Sample No.	R2DG160401050-S01
Type of Thermocouples:	T
Test Duration	≥ 3.5 hours
Maximum Recommended Driver Case Temperature	70 °C
Test Location	Test Result
TMP _{LED}	56.7 °C
TMP _b	45.9 °C
TMP _c	53.2 °C
Driver Current of LED	Test Result
IF (mA)	99.8mA

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

3.2. Photometric and Electrical Measurements of LED Light Engine

Test Method and ENERGY STAR Requirements:

IES LM-82-12: Approved method for the Characterization of LED Light Engines and Intergrated LED Lamps for electrical and photometric Properties as a function of Temperature

ANSI/UL 8750-2009: Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products

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:

Efficacy of light engine: ≥ 65 lm/W;

Light Output of light engine: Installed in the luminaire, each LED light engine in situ shall provide a minimum of 450 lumens

CCT Requirements of light engine: fall within a 7-step chromaticity quadrangles for CCT: 2700K, 3000K, 3500K, 4000K, 5000K

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

Test Procedure:

The sample was tested with no season. Before all photometric measurements are taken at any given temperature, the UUT shall be operated long enough to reach stabilization and temperature equilibrium. It should be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %, and the readings shall not be increasing or decreasing monotonically. Room Temperature Initial Measurement and Room Temperature Calibration Measurement were conducted to determine the correction factor of electric power, luminous flux, and chromaticity. Elevated temperature photometric measurement was conducted at the condition that T_b temperature according to IES LM-82 was set $T_{bi}+25^{\circ}\text{C}$ and additional temperature manufacturer specified. The elevated temperature measurement test result is reported after corrected by correction factor. Luminous efficacy was calculated by corrected power and luminous flux.

Radiant flux measurements are taken at 5 nm intervals over the range 350 to 800 nm. The spectral photometer was calibrated by luminous flux standard Lamp. Electrical measurements including voltage, current, power, power factor and harmonic analysis are measured using the Digital Power Analyzer.

Light engine was tested without fixture. For the photo of light engine, see section4.

Test Equipment:

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Integrating Sphere	SENSING	SPR-600	S09008	25~50 ℃	2016-03-10	2017-03-09
Spectral photometer	SENSING	SPR3000	90902027	350nm~800nm	2016-03-10	2017-03-09
Power Meter	YOKOGAWA	WT-210	91j926132	15/30/60/150/300/600 V	2016-03-04	2017-03-03
AC Power Supply	ALL Power	APW-105N	970663	220V \pm 10% 50HZ	2016-03-04	2017-03-03
Standard Light Source	EVERFINE	D204	01331191	24V/100W	2015-08-27	2016-08-26
Thermal Meter	SENSING	N/A	N/A	25、50 ℃	2016-03-10	2017-03-09
DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~32V	2016-03-04	2017-03-03
Hybrid Recorder	YOKOGAWA	DR240	10#	N/A	2016-03-04	2017-03-03

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Power Supply	HengPu	HPA 1103	0003394	3KVA	2016-03-04	2017-03-03

Uncertainty:

The uncertainty of the light output (luminous flux) measurements is $U=2.1\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=32K$ ($K=2$), 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 $U=0.19\%$ of rdg, AC Voltage $U=0.15\%$ of rdg, Power $U=0.20\%$ ($K=2$), at the 95% confidence level.

The uncertainty of the temperature is $U=0.9\text{ }^{\circ}\text{C}$ ($K=2$), at the 95% confidence level.

Test Data:

Room Temperature Initial Measurement (Ambient temperature= $25\text{ }^{\circ}\text{C}$)

SampleNo.	Voltage(V)	Current (A)	Power (W)	PF	Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)	R _a	R ₉	x	y	T _{b,i} (°C)	T _{d,i} (°C)
Light Engine 1#	120.04	0.0594	6.300	0.8840	493.216	78.288	2977	81.2	3	0.4348	0.3969	44.4	51.9

Room Temperature Calibration Measurement (at $T_{b,0}=T_{b,i}$)

SampleNo.	Voltage(V)	Current (A)	Power (W)	Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)	R _a	R ₉	x	y	T _{b,0} (°C)	T _{d,0} (°C)
Light Engine 1#	120.03	0.0594	6.300	493.234	78.291	2975	81.3	3	0.4347	0.3965	44.2	51.5

Measurement at Temperature $T_{b,1}=T_{b,i}+25\text{ }^{\circ}\text{C}$

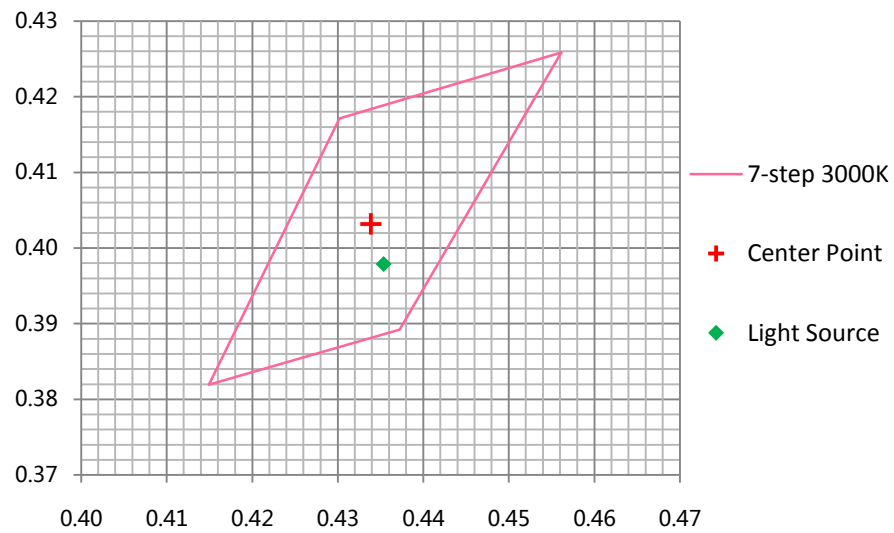
SampleNo.	Voltage(V)	Current (A)	Power (W)	Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)	R _a	R ₉	x	y	T _{b,1} (°C)	T _{d,1} (°C)
Light Engine 1#	120.03	0.0577	6.200	458.649	73.976	2986	81.2	3	0.4341	0.3965	69.7	75.1

Measurement at Temperature $T_{b,2}=50\text{ }^{\circ}\text{C}$

SampleNo.	Voltage(V)	Current (A)	Power (W)	Luminous Flux (lm)	Efficacy (lm/W)	CCT (K)	R _a	R ₉	x	y	T _{b,2} (°C)	T _{d,2} (°C)
Light Engine 1#	120.04	0.0578	6.200	476.445	76.846	2992	81.1	3	0.4340	0.3971	50.2	56.1

Linear interpolation at Temperature $T_b=45.9\text{ }^{\circ}\text{C}$

SampleNo.	Interpolated Power (W)	Interpolated Flux (lm)	Efficacy (lm/W)	Interpolated CCT(K)	Interpolated R _a	Interpolated R ₉	Interpolated x	Interpolated y
Light Engine 1#	6.259	487.070	77.815	2983	81.2	3	0.4345	0.3970



3.3. Photometric and Electrical Measurements of Luminaire

Test Method and ENERGY STAR Requirements:

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

ANSI C82.77:2014: Harmonic Emission Limits - Related Power Quality Requirements for Lighting Equipment
ANSI/UL 8750-2009: Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products

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:

Power Factor Requirements: $\leq 5W, PF \geq 0.5$; $> 5W, PF \geq 0.7$

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 5 nm intervals over the range 380 to 800 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	Test Range	Calibration date	Calibration due date
Integrating Sphere	SENSING	SPR-600	S09008	25~50 °C	2016-03-10	2017-03-09
Spectral photometer	SENSING	SPR3000	90902027	350nm~800nm	2016-03-10	2017-03-09
Power Meter	YOKOGAWA	WT-210	91j926132	15/30/60/150/300/600 V	2016-03-04	2017-03-03
AC Power Supply	ALL Power	APW-105N	970663	220V $\pm 10\%$ 50HZ	2016-03-04	2017-03-03
Standard Light Source	EVERFINE	D204	01331191	24V/100W	2015-08-27	2016-08-26
Thermal Meter	SENSING	N/A	N/A	25、50 °C	2016-03-10	2017-03-09
DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~32V	2016-03-04	2017-03-03

Uncertainty:

The uncertainty of the light output (luminous flux) measurements is $U=2.1\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=32K$ ($K=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.1$ ($K=2$), at the 95% confidence level.

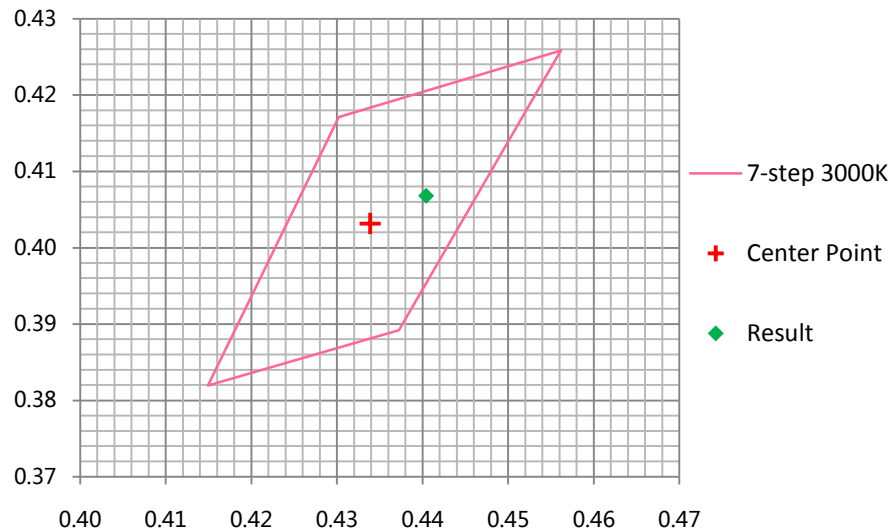
The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.15\%$ of rdg, Power $U=0.20\%$ ($K=2$), at the 95% confidence level.

Test Data:

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)
R2DG160401050-S01	120.02	0.0657	6.62	0.84	211.619	31.967	2965

Sample No.	CRI	R ₉	x	y	u'	v'	Duv
R2DG160401050-S01	80.4	-2	0.4404	0.4068	0.2516	0.5229	0.0006



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.

Sample shall be stored at $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for a minimum of 16 hours prior to the test, after which the temperature range shall be $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ for at least two hours immediately prior to the test. Sample was tested at rated voltage. The start time is defined that the time between the application of power to the device and the point where light output reaches 98% of the lamp's initial plateau.

Test Equipment:

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	R98	2015-11-09	2016-11-08
Digital Power Meter	EVERFINE	PF2010A	1011004	600V/20A	2015-07-24	2016-07-23
Digital real-time oscilloscope	Tektronix	TDS 220	C033131	N/A	2015-07-09	2016-07-08
Sensor	EVERFINE	V-10111	A8331337	N/A	N/A	N/A
Thermal Meter	Anymetre	JR900A	N/A	N/A	2016-01-12	2017-01-11
AC Power Supply	EVERFINE	DPS1010-YF	1011001T	30V/5A	2016-03-04	2017-03-03

Uncertainty:

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

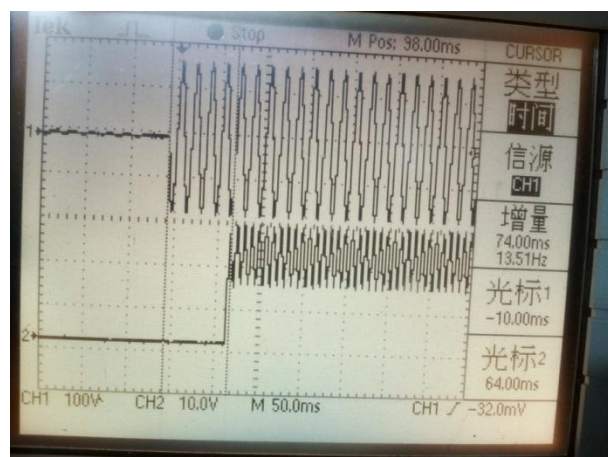
Test Data:

Test date: 2016-04-16 Test voltage AC 120 V 60 Hz.

Sample No.	Time base (ms/div)	Start Time(ms)
R2DG160401050-S01	50.0	74.00

Figure of Input voltage and light output waveforms

R2DG160401050-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

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	Test Range	Calibration date	Calibration due date
AC Power source	HengPu	HPA 1103	0003394	3KVA	2016-03-04	2017-03-03
MODULAR IMPULSE GENERATOR	EMC-PARTNER	MIG0603I N1 IEC-ANSI	593	N/A	2016-03-04	2017-03-03

Uncertainty:

The uncertainty of voltage $U=1.07\%$ ($K=2$), at the 95% confidence level.

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

Test Data:

Sample No.	Transient Protection Test
R2DG160401050-S01	PASS

3.6. Operating Frequency

These test method was not accredited by the NVLAP

Test Method and ENERGY STAR Requirements:

ENERGY STAR Requirements:

≥ 120 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	Test Range	Calibration date	Calibration due date
Rapid recording photometer	EVERFINE	PHOTO-2000F	1007010	0.1lm—200klm	2015-12-31	2016-12-30
2.0m integrating sphere	EVERFINE	R98	11010018	R98	2015-11-09	2016-11-08
Digital Power Meter	EVERFINE	PF2010A	1011004	600V/20A	2015-07-24	2016-07-23
Thermal Meter	Anymetre	JR900A	N/A	N/A	2016-01-12	2017-01-11
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	30V/5A	2016-03-04	2017-03-03

Uncertainty:

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

Test Data:

Sample No.	Operating Frequency (Hz)
R2DG160401050-S01	120.05

4. EUT Photo

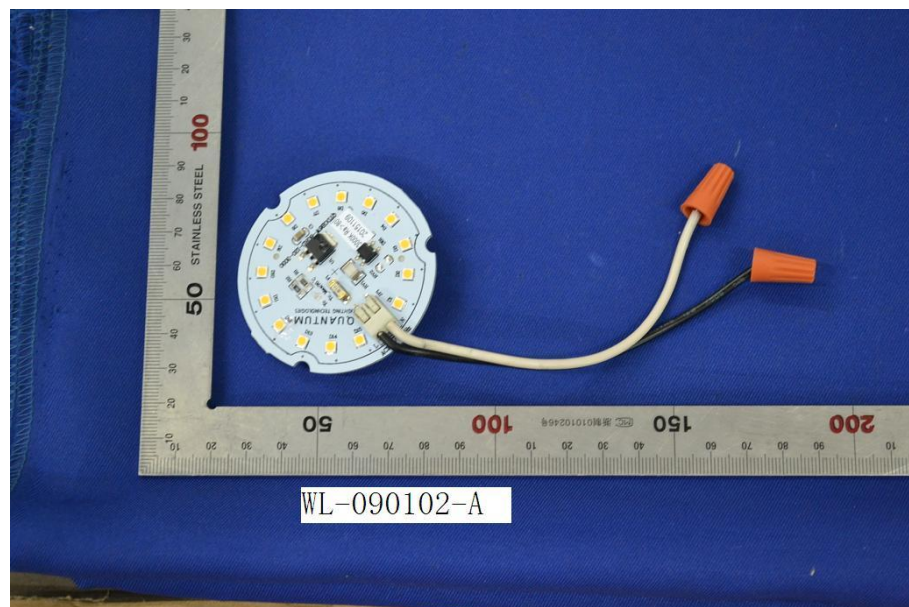
4.1. Luminaire Photo



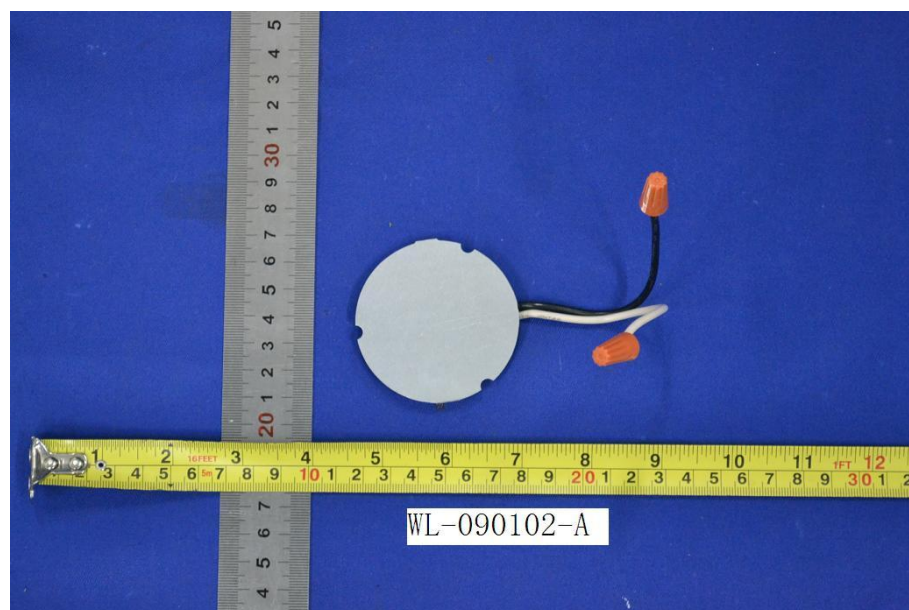
4.2. Luminaire Photo



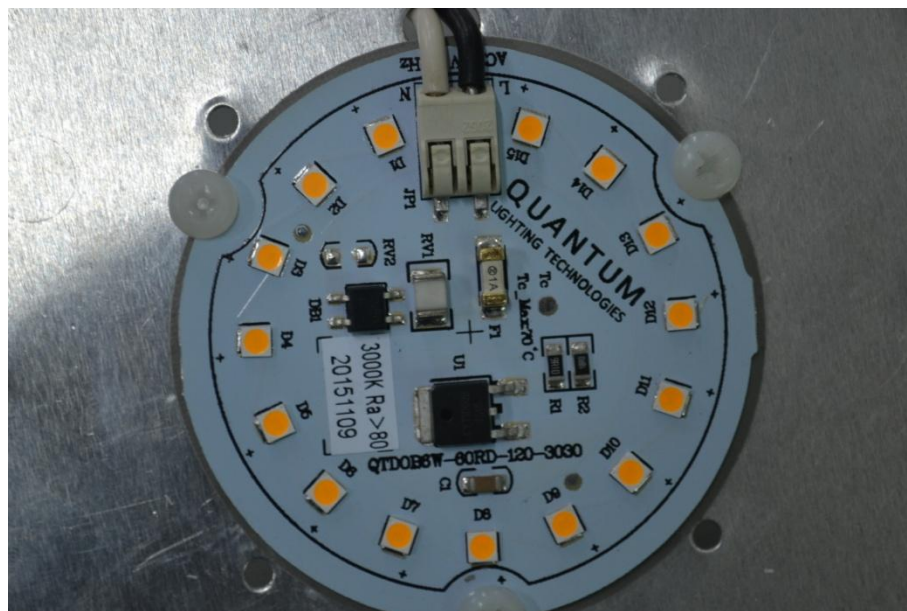
4.3. Light Engine Photo



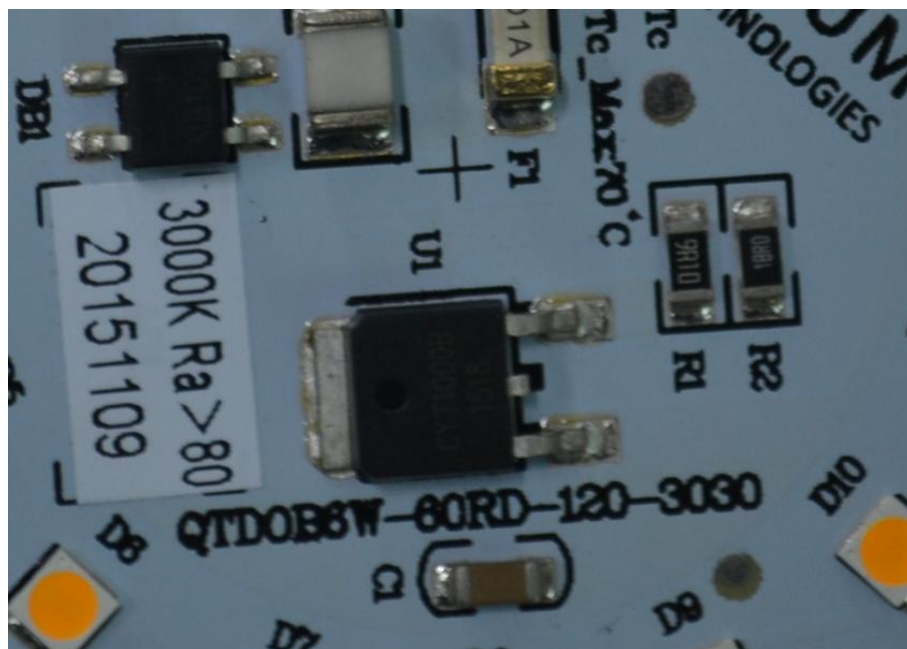
4.4. Light Engine Photo



4.5. LED Source Photo



4.6. LED Driver Photo



5. Report Revision

Report Number	Report Date	Contents
R2DG160401050-10	2016-04-20	Original report.
R2DG160401050-10-M1	2016-06-02	Adjust the picture position at page 17 to 18.

Attachment A –LM-80-08 test report and TM-21 Calculator

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