





Photometric Test Report

Relevant Standards UL1598-2008 ANSI C82.77-10-2014 IES LM-79-2008

Prepared For

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Catalog Number 55076

Project Number 4789044943 Report Number 4789044943_7

Test Date 06/19/2019 - 06/26/2019 Issue Date 06/28/2019 Revision Date N/A

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Approved By

Yang

Yang, Duff

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Test Summary DLC Technical Requirements v4.4- issued 2018-10-18

Requirement Category	Test Method	Requirements	Tolerance	Test Result
Minimum Light Output (Im)-Luminaires	IES LM-79-2008	≥2000	-10%	3849.2
Spacing Criteria (0-180°)	IES LM-79-2008	1.0-2.0	±0.1	1.22
Spacing Criteria (90-270°)	IES LM-79-2008	1.0-2.0	±0.1	1.30
Zonal Lumen Requirement 1(0°-60°)	IES LM-79-2008	≥75%	-3%	74.50%
Minimum Luminaire Efficacy (Im/W)-Luminaires	IES LM-79-2008	≥125	-3%	127.73
Allowable CCT (3500K)	IES LM-79-2008/ANSI C78.377-2015	3465±245	N/A	3431.0
Allowable CCT (5000K)	IES LM-79-2008/ANSI C78.377-2015	5029±283	N/A	5139.0
Minimum CRI	IES LM-79-2008/CIE 13.3-1995	≥80	-2	81.98
L70 Lumen maintenance (Hours)	N/A	≥50000	N/A	≥50000
L90 Lumen maintenance (Hours)	N/A	≥36000	N/A	≥36000
Power Factor	ANSI C82.77-10-2014	≥0.9	-0.03	0.9521
Total Harmonic Distortion (A%)	ANSI C82.77-10-2014	≤20%	5%	5.98%
In-Situ Temperature Measurement Test for LED 1 (°C)	UL1598-2008	≤105	N/A	56.1
In-Situ Temperature Measurement Test for Driver 1 (°C)	UL1598-2008	≤90	N/A	52.2
Minimum Luminaire Warranty (Years)	N/A	≥5	N/A	≥5







Test List

Sample Received Date: 06/18/2019

Test Item	Test Date	Model Number	Tests Conducted By
Integrating Sphere Test	06/25/2019	5507X-30-35K	Xiong, Blaire
Integrating Sphere Test 06/25/2019 5507		55076	Xiong, Blaire
Goniophotometer Test	06/19/2019	5507X-30-35K	Xiong, Blaire
THD and PF Test 06/26/2019		5507X-30-35K	Xiong, Blaire
In-Situ Temperature Measurement Test	06/26/2019	5507X-30-35K	Xiong, Blaire

Remark (if any)

1. UL test equipment information is recorded on Meter Use in UL's Aurora database.



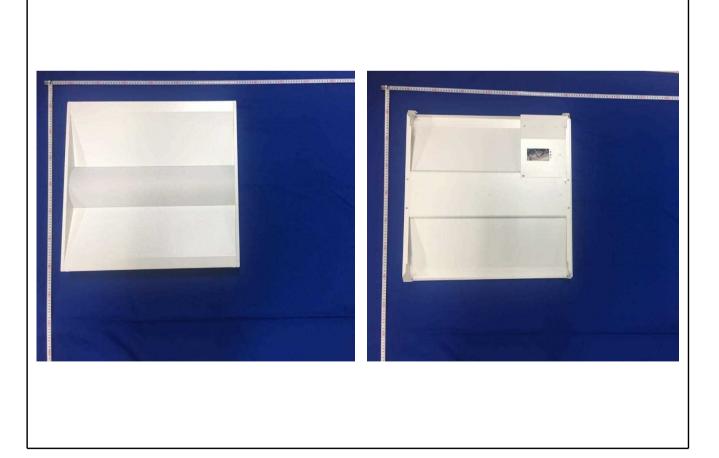




Product Description Lamp/Luminaire Description: 2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces Model Number: 5507X-30-35K Electrical Parameter: 120-277V, 50/60Hz LED Package: STW8A2PD-XX Family Model and Variation: 55076

Products Scaled Value									
Model Number	ССТ	Luminous Flux	Power	Luminous Efficacy					
5507X-30-35K	3500	3780	30	126					
55075	4000	3810	30	127					
55076	5000	3840	30	128					

Photos of Products Characteristics









Integrating Sphere Test

Model No.		5507X-30-35K			2359061
Operate time	e (Min.)	90	Stabilizatio	on time (Min.)	45

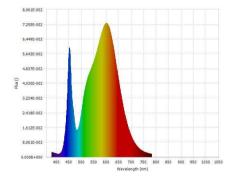
Test Method

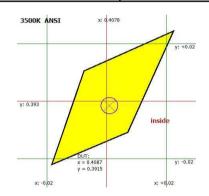
1. The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning. 2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C \pm 1° C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by Labsphere, Inc., Optical Calibration Laboratory. 3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation	
25.0	120.03	60	0.2533	30.134	0.9914	N/A	Horizontal	
Test Results								

ССТ (К)	CRI (Ra)	Duv	Flux (lm)	Luminous Efficacy (Im/W)	Luminous Efficacy (lm/ft)			
3431.0	81.98	-0.0004	3881.46	128.81	N/A			





Luminous Flux (lm)	3881.46	Chrom x	0.4087
Chrom y	0.3915	Chrom u	0.2376
Chrom v	0.3414	Duv	-0.0004
Chrom u'	0.2376	Chrom v'	0.5121
CCT (K)	3431.0	Luminous Efficacy (Im/W)	128.81
Ra	81.98	R1	80.4
R2	88.6	R3	94.7
R4	80.7	R5	80.0
R6	84.5	R7	84.8
R8	62.1	R9	7.5
R10	72.8	R11	79.1
R12	62.5	R13	82.2
R14	97.0	R15	74.2
Rf	81.3	Rg	96.6







Integrating Sphere Test

Model No.	55076			Sample ID.	2359063
Operate time	e (Min.)	90	Stabilizatio	on time (Min.)	45

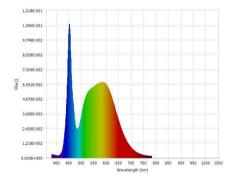
Test Method

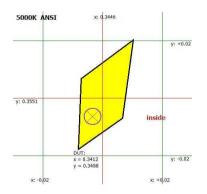
1. The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning. 2. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25° C \pm 1° C. The reference standard lamp is rated current 2.679A omni-directional Incandescent lamp and was calibrated by Labsphere, Inc., Optical Calibration Laboratory. 3. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Integrating Sphere Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation	
25.0	120.06	60	0.2536	30.184	0.9915	N/A	Horizontal	
Test Results								

ССТ (К)	CRI (Ra)	Duv	Flux (lm)	Luminous Efficacy (lm/W)	Luminous Efficacy (lm/ft)			
5139.0	83.42	0.0002	3965.7	131.38	N/A			





Luminous Flux (lm)	3965.7	Chrom x	0.3412
Chrom y	0.3488	Chrom u	0.2099
Chrom v	0.3218	Duv	0.0002
Chrom u'	0.2099	Chrom v'	0.4827
CCT (K)	5139.0	Luminous Efficacy (Im/W)	131.38
Ra	83.42	R1	82.5
R2	87.9	R3	90.7
R4	83.9	R5	82.9
R6	82.5	R7	87.2
R8	69.8	R9	13.7
R10	70.3	R11	83.1
R12	61.1	R13	83.9
R14	94.9	R15	78.3
Rf	81.3	Rg	96.5







Goniophotometer Test

Model No.	5507X-30-35K		Sample ID.	2359061	
Operate tin	ne (Min.)	90	Stabilizatio	n time (Min.)	45

Test Method

1. The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning. 2. Photometric parameters were measured using a type C goniophotometer and software.

3. The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is rated current 3.8466A, 3.8601A, 3.8618A omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.

4. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonallumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.

Goniophotometer Test Conditions

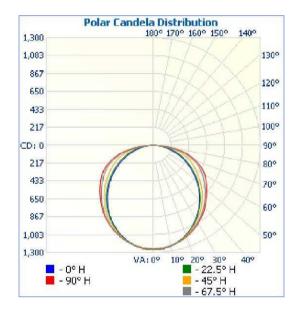
Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation	
25.4	120.02	60	0.2523	30.135	0.9952	5.56%	Horizontal	
	Test Results							
	Zonal Lumen	Zonal Lumen Zonal Lumen		Beam Angle (50%)		Spacing	Spacing	
Luminous Flux (Im)	Luminous Flux Requirement :	Requirement 2	Horizontal	Vertical	Luminous Efficacy (Im/W)	Criteria	Criteria	
()	0°-60°	N/A	Spread	Spread		(0-180°)	(90°-270°)	
3849.2	74.50%	N/A	131.0	106.3	127.73	1.22	1.30	



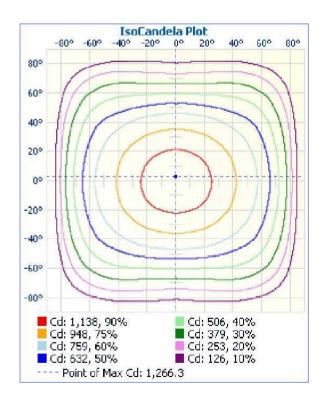




Goniophotometer Test (Cont'd) Polar Candela Distribution



IsoCandela Plot









Goniophotometer Test (Cont'd) Zonal Lumen Summary

Zonal Lumen Summary							
Zone	Lumens	% Luminaire					
0-30	974.7	25.30%					
0-40	1596.8	41.50%					
0-60	2863.1	74.40%					
60-90	977.0	25.40%					
70-100	461.7	12.00%					
90-120	3.7	0.10%					
0-90	3840.1	99.80%					
90-180	9.1	0.20%					
0-180	3849.2	100.00%					

Lumens Per Zone

Lumens Per Zone							
Lumens	%Total	Zone	Lumens	%Total			
30.1	0.80%	90-95	1.2	0.00%			
89.1	2.30%	95-100	0.8	0.00%			
144.9	3.80%	100-105	0.6	0.00%			
195.6	5.10%	105-110	0.5	0.00%			
239.5	6.20%	110-115	0.4	0.00%			
275.4	7.20%	115-120	0.4	0.00%			
302.4	7.90%	120-125	0.4	0.00%			
319.7	8.30%	125-130	0.5	0.00%			
327.3	8.50%	130-135	0.5	0.00%			
325.5	8.50%	135-140	0.6	0.00%			
315.2	8.20%	140-145	0.6	0.00%			
298.2	7.70%	145-150	0.6	0.00%			
274.6	7.10%	150-155	0.5	0.00%			
242.6	6.30%	155-160	0.5	0.00%			
201.5	5.20%	160-165	0.4	0.00%			
152.1	4.00%	165-170	0.3	0.00%			
87.6	2.30%	170-175	0.2	0.00%			
18.5	0.50%	175-180	0.1	0.00%			
	30.1 89.1 144.9 195.6 239.5 275.4 302.4 319.7 327.3 325.5 315.2 298.2 274.6 242.6 201.5 152.1 87.6	Lumens%Total30.10.80%89.12.30%144.93.80%195.65.10%239.56.20%275.47.20%302.47.90%319.78.30%327.38.50%315.28.20%298.27.70%274.67.10%242.66.30%201.55.20%152.14.00%87.62.30%	30.10.80%90-9589.12.30%95-100144.93.80%100-105195.65.10%105-110239.56.20%110-115275.47.20%115-120302.47.90%120-125319.78.30%125-130327.38.50%130-135325.58.50%135-140315.28.20%140-145298.27.70%145-150274.67.10%150-155242.66.30%155-160201.55.20%160-165152.14.00%165-17087.62.30%170-175	Lumens%TotalZoneLumens30.10.80%90-951.289.12.30%95-1000.8144.93.80%100-1050.6195.65.10%105-1100.5239.56.20%110-1150.4275.47.20%115-1200.4302.47.90%120-1250.4319.78.30%125-1300.5327.38.50%130-1350.5325.58.50%135-1400.6298.27.70%145-1500.6274.67.10%150-1550.5242.66.30%155-1600.5201.55.20%160-1650.4152.14.00%165-1700.387.62.30%170-1750.2			







Goniophotometer Test (Cont'd) Intensity Data(cd)

1260 1261 1262 1263 1262 1263 1262 1263 1262 1263 1260 1261 1261 1260 1260 1261 1260 1260 1261 1260 1260 1261 1260 1260 1260 1261 1260 <th< th=""><th>92.5 315 1260 1260 1255 1263 1256 1262 1257 1255 1252 1255 1248 1252 1247 1249 1242 1247 1238 1220 1229 1223 1220 1220 1221 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1204 1196 1196 1191</th><th>1264 1263 1260 1259 1258 1255 1251 1244 1242 1237 1231 1224 1217 1212 1212 1212</th><th>360 1260 1265 1263 1264 1258 1255 1250 1248 1244 1238 1231 1227 1220 1210 1204</th></th<>	92.5 315 1260 1260 1255 1263 1256 1262 1257 1255 1252 1255 1248 1252 1247 1249 1242 1247 1238 1220 1229 1223 1220 1220 1221 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1220 1204 1196 1196 1191	1264 1263 1260 1259 1258 1255 1251 1244 1242 1237 1231 1224 1217 1212 1212 1212	360 1260 1265 1263 1264 1258 1255 1250 1248 1244 1238 1231 1227 1220 1210 1204
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165 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3	3 3	3
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175 4 3 4 3 3 3 3 3 3 3 3 3 3 3	3 4	3	4
180 4 4 4 4 4 4 4 4 4 4 4 4	4 4	4	4







THD and PF Test

Model No.		5507X-30-35K		Sample ID.	2359061
Operate time (Min.)		90	Stabilizatio	on time (Min.)	45

Test Method

The samples were tested according to the ANSI C82.77-10-2014.
 The ambient temperature condition was maintained at 25° C ± 1° C. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.4	120.02	60	0.2523	30.135	0.9952	5.56%	Horizontal
25.4	276.96	60	0.1124	29.639	0.9521	5.98%	Horizontal







In-Situ Temperature Measurement Test

Model No.	5507X-30-35K	Sample ID.	2359061
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Test Method In-Situ Temperature Measurement Test is conducted according to the UL 1598-2008, Section 14.
 The testing was conducted in a room with ambient temperature of 25°C ± 5°C. The apparatus construction followed those described in UL1598-2008 for normal temperature testing. Thermocouples were placed on the LED package in the locations indicated by LM-80 report. Thermocouples were placed on the LED driver case in the locations specified by the manufacture if necessary. The temperature was recorded after the lamp was operated by 7.5 hours.

In-Situ Temperature Measurement Test Conditions

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Current THD	Orientation
25.5	120.02	60	0.2523	30.135	0.9952	5.56%	Horizontal

Test Results (LEDs)

Thermocouple	Declared Light Source	Temperature (for Light Source (°C)		LM-80	LM-80
Location	Current (mA)	Test Result	Test Result (Correct to 25 °C)	LED Model Number	Limit Current (mA)	Limit Temp (°C)
Ambient TEMP	N/A	25.5	25.0			
TMP of Location 1	105	56.6	56.1	STW8A2PD-XX	200	105

Test Results (Drivers)

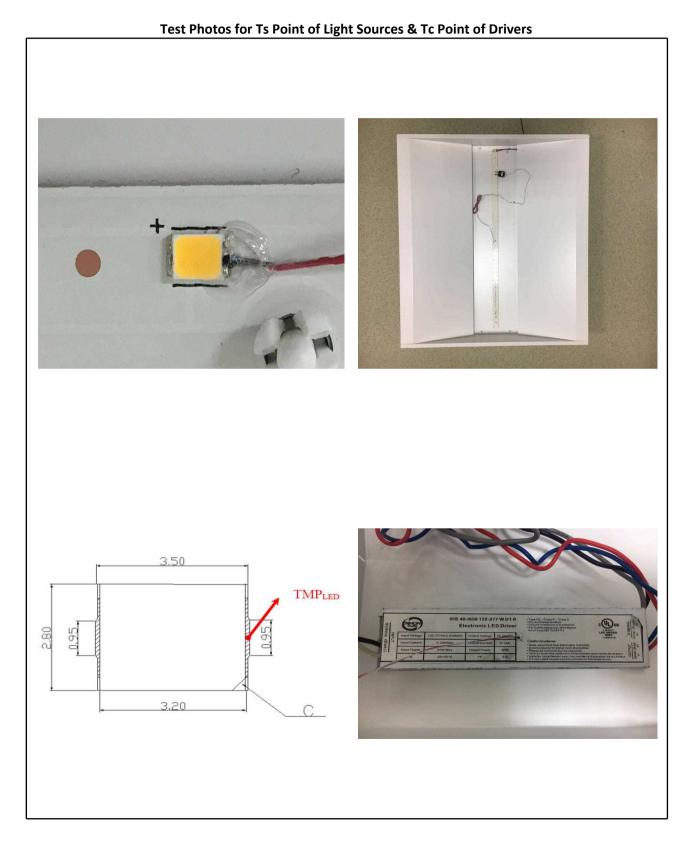
	Temperature for Driver (°C)				
Thermocouple Location	Test Result	Test Result (Correct to 25 °C)	Driver Model Number	Driver Limit Temp (°C)	
Ambient TEMP	25.5	25.0			
TMP of Location 1	52.7	52.2	SIE40-I650 120-277 W D1 R	90	







In-Situ Temperature Measurement Test (Cont'd)









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