NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

L-TECH CORPORTION

(Brand Name: L-TECH CORP)

SHAOGANGTOU DISTRICT.QIAOTOU TOWN.DONGGUAN
CITY.GUANGDONG PROVINCE,CHINA

LED Recessed Downlight

Model name(s): LRKT3574/3575

Test & Report By:

Sean Zhuo

Engineer: Sean Zhuo

Date: 2015-07-03

Review By:

Tommy Liang

Manager: Tommy Liang

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

NVLAP LAB CODE 201011-0

U.S. Department of Energy

Lighting Facts™ Uniform LM-79 Reporting Template

Laboratory Information:

Name of Test Laboratory	Standard-Tech Co. Ltd
Date of Test Report	2015-07-03
Test Report No.	GZE150302-B
Laboratory Contact Name	Tommy Liang

Product Information:

Organization Name	L-TECH CORPORTION	
Brand Name	L-TECH CORP	
Model Number	LRKT3574/3575	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Recessed Downlight	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s

Electrical Measurements:	**Integrating Sphere Output**	**Goniophotometer Output**	
Input Wattage	--	7.902	W
Input Current	--	0.0663	A
Input Voltage (ac)	--	120.0	V
Power Factor	--	0.9922	
Off-State Power	--	0	W

Photometric Characteristics

Total Initial Lumen Output	--	499.34	lm
Initial Lumen Efficacy	--	63.19	lm/w
Correlated color temperature / CCT	3015	--	K
Color rendering index / CRI	82.2	--	
R9 Value	7	--	
Duv	-0.0007	--	
Luminous Intensity Distribution			
Center beam candlepower (if applicable)	-----	249	cd
Beam angle (if applicable)		87	°
Zonal lumens in the 0 °-60 °zone		90.5	%
Zonal lumens in the 60 °-90 °zone		9.5	%
Zonal lumens in the 90 °-120 °zone		0	%
Zonal lumens in the 120 °-180 °zone		0	%

Test Specifications:	
Date of Receipt	: 2015-07-01
Date of Test	: 2015-07-03
Test item	: Total Luminous Flux, Luminous Distribution Intensity, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry IESNA LM-16-93 Practical Guide to Colorimetry of Light Source IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
Reference Work Instruction	QD25

Test Methods

1. Photometric and Electrical measurements – Light Distribution Method:

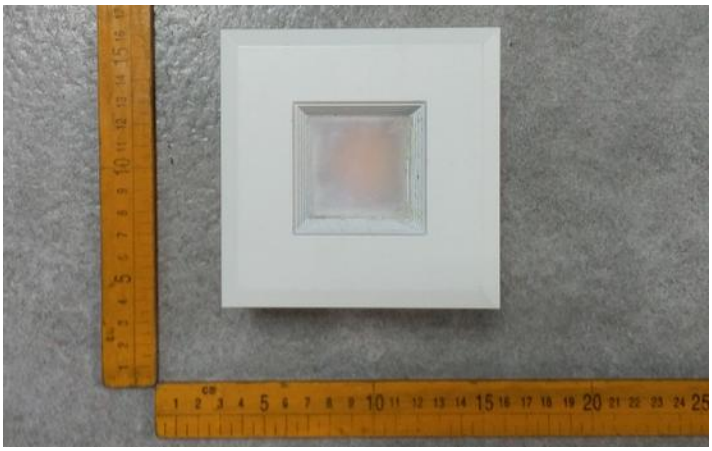
Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at 25 °C ±1 °C, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1 °vertical intervals and 22.5 °horizontal intervals.

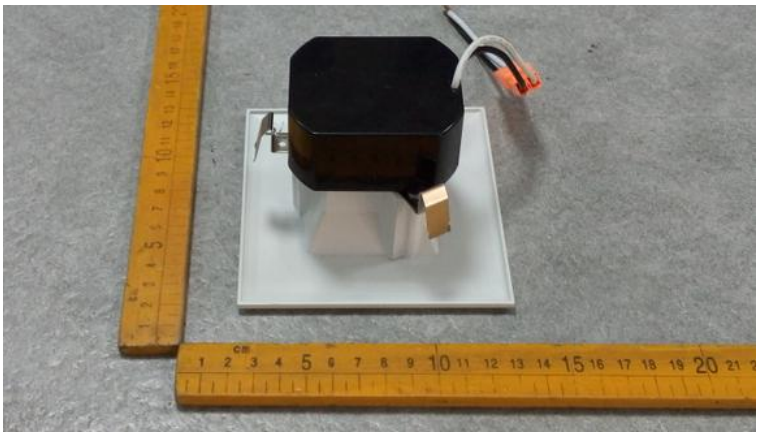
2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 ºC ±1 ºC. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.

1. Product Information:

Brand Name	L-TECH CORP
Model Number	LRKT3574/3575
Luminaire Type	LED Recessed Downlight
Rated Voltage / Frequency	120~277Vac, 50/60 Hz
Nominal Power	10W
Rated Initial Lamp Lumen	--
Declared CCT	3000K,3500K,4000K,5000K
LED Manufacturer	EVERLIGHT ELECTRONICS CO,.LTD
LED Model	SMD MID Power LED 62-217D series
Sample Receipt Date	2015-07-01
Sample Number	GZE150302-B1,B2,B3(2700K),B4(3000K)
Recessed Can Model	H400/H400R
Recessed Can UL File/Cert. No.	E252582
Recessed Can Diameter, mm	4’
Recessed Can Height, mm	5’
Photo	





2.1 Electrical, Photometric and Chromaticity Measurements *(Refer to Work Instruction QD25)*	**IES LM-79 2008**

Test date	2015-07-03	**Test Ambient:**	25.2 ºC
Test Orientation	As intended	**Stabilization Time (min)**	90
Model Number	LRKT3574/3575		

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE150302-B1	120.0	60	0.0663	7.902	0.9922
GZE150302-B2	120.0	60	0.0665	7.896	0.9890
GZE150302-B3	120.0	60	0.0665	7.912	0.9910
Average			0.0665	7.900	0.9907

Electrical Measurement:

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE150302-B1	277.0	60	0.0321	8.227	0.9264

Sphere-Spectroradiometer Method:

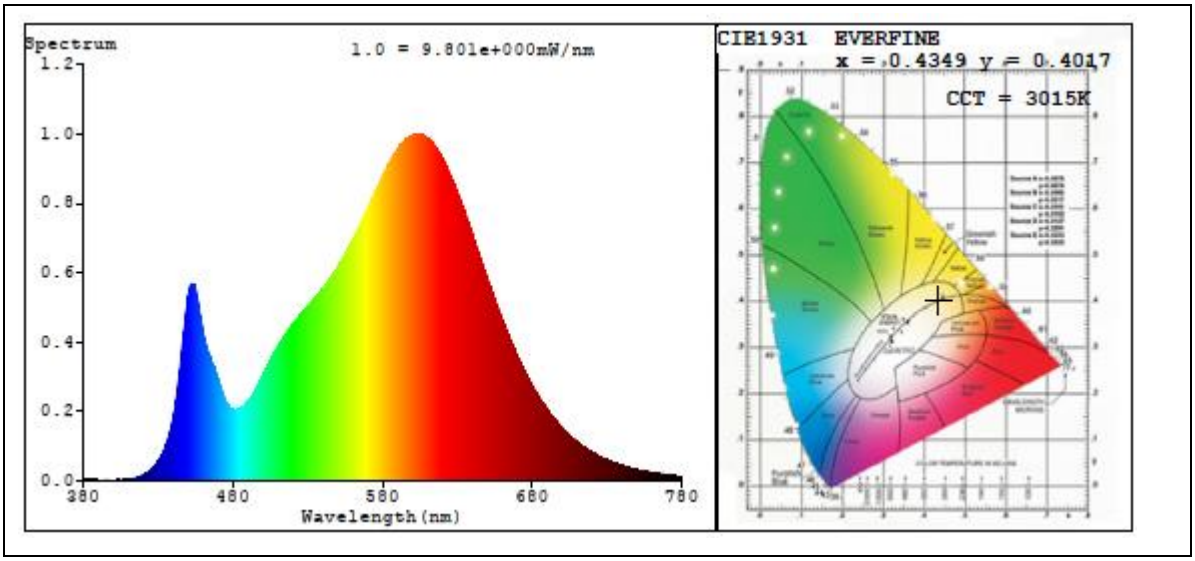
Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Color Rendering Index (CRI)	82.2
R9	7
CCT (K)	3015
Chromaticity (x, y)	x=0.4349 y=0.4017
Chromaticity (u', v')	u'=0.2503 v'=0.5202
Duv	-0.0007

Special Color Rendering Indices			
R1	81	R9	7
R2	91	R10	80
R3	96	R11	78
R4	79	R12	69
R5	81	R13	83
R6	89	R14	99
R7	82	R15	74
R8	59	--	--

Goniophotometer Method:

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	499.34
Luminous Efficacy (lm/W)	63.19
Beam Angle °	87.0
Center Beam Candle Power (cd)	249

Spectral Power Distribution and Chromaticity Diagram



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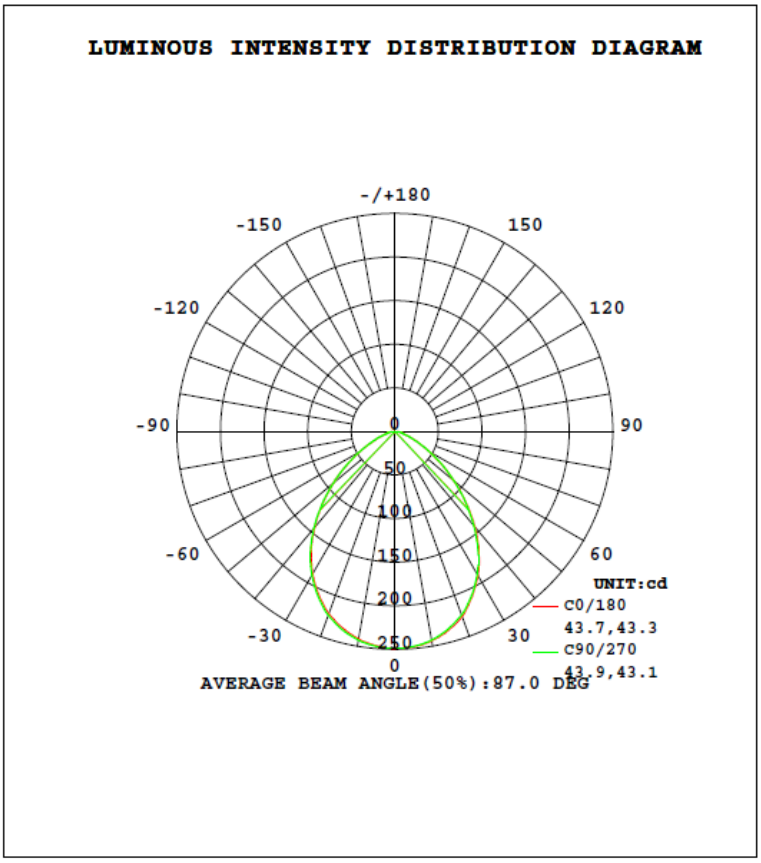
Zonal Lumen Tabulation



ZONAL FLUX DIAGRAM:

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum,lamp
10	243.8	243.5	242.7	242.0	241.4	242.3	242.9	243.5	0- 10	23.46	23.46	4.7,4.7
20	225.4	225.2	223.8	223.2	222.3	223.1	224.1	226.0	10- 20	66.16	89.63	17.9,17.9
30	190.4	194.3	188.8	193.2	188.8	193.6	190.5	196.2	20- 30	96.31	185.9	37.2,37.2
40	142.3	151.6	140.8	151.4	143.4	153.1	144.7	154.3	30- 40	106.6	292.6	58.6,58.6
50	88.72	101.5	88.97	102.1	92.47	104.6	92.73	104.2	40- 50	94.43	387.0	77.5,77.5
60	44.05	52.79	44.56	54.15	46.41	56.03	47.06	54.14	50- 60	64.97	452.0	90.5,90.5
70	17.30	18.70	16.43	19.16	17.81	20.27	18.63	19.76	60- 70	32.18	484.2	97,97
80	6.224	6.034	6.201	6.304	6.403	6.412	6.449	6.269	70- 80	12.01	496.2	99.4,99.4
90	0.0378	0.0149	0.0119	0.0145	0.0105	0.0308	0.0460	0.0314	80- 90	3.112	499.3	100,100
100	0	0	0	0	0	0	0	0	90-100	0.0014	499.3	100,100
110	0.0003	0.0011	0.0005	0.0008	0.0024	0.0027	0.0022	0.0024	100-110	0.0005	499.3	100,100
120	0.0056	0.0064	0.0056	0.0067	0.0062	0.0070	0.0065	0.0070	110-120	0.0039	499.3	100,100
130	0.0118	0.0124	0.0118	0.0121	0.0113	0.0124	0.0118	0.0124	120-130	0.0082	499.3	100,100
140	0.0164	0.0167	0.0164	0.0167	0.0172	0.0178	0.0178	0.0180	130-140	0.0112	499.3	100,100
150	0.0196	0.0199	0.0207	0.0210	0.0215	0.0212	0.0234	0.0231	140-150	0.0120	499.3	100,100
160	0.0212	0.0218	0.0207	0.0234	0.0218	0.0212	0.0250	0.0229	150-160	0.0101	499.3	100,100
170	0.0212	0.0218	0.0210	0.0232	0.0210	0.0212	0.0221	0.0212	160-170	0.0063	499.3	100,100
180	0.0116	0.0118	0.0097	0.0118	0.0113	0.0116	0.0108	0.0116	170-180	0.0018	499.3	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

γ (DEG) \ C (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	249	249	249	249	249	249	249	249	249	249	249	249	249	249	249	249			
5	248	248	248	248	247	247	247	247	247	247	247	247	248	248	248	248			
10	244	243	243	243	243	242	242	242	241	242	242	242	243	243	243	244			
15	236	236	236	236	235	234	234	234	233	233	234	235	235	236	236	236			
20	225	225	225	225	224	223	223	223	222	223	223	224	224	225	226	226			
25	209	210	212	210	208	209	210	208	207	208	210	209	209	211	213	211			
30	190	192	194	191	189	191	193	191	189	191	194	191	191	194	196	192			
35	168	171	173	170	166	170	173	171	168	171	174	172	169	174	176	172			
40	142	147	152	146	141	146	151	148	143	149	153	149	145	151	154	148			
45	115	122	127	121	114	121	127	123	118	125	130	124	119	126	130	122			
50	88.7	95.5	102	95.3	89.0	95.5	102	97.7	92.5	99.6	105	98.5	92.7	99.7	104	96.1			
55	64.8	70.9	76.3	71.4	65.6	71.7	77.4	73.4	68.3	75.3	79.7	74.0	68.4	74.8	78.1	71.0			
60	44.0	48.6	52.8	49.3	44.6	49.7	54.1	50.8	46.4	52.3	56.0	51.5	47.1	51.9	54.1	48.8			
65	28.4	30.7	32.9	30.7	28.0	31.3	33.9	31.9	29.4	32.9	35.4	33.1	30.4	33.0	34.1	31.1			
70	17.3	18.3	18.7	17.9	16.4	18.2	19.2	18.9	17.8	19.5	20.3	19.8	18.6	19.7	19.8	18.8			
75	10.1	10.4	10.4	10.4	10.1	10.7	10.7	11.0	10.6	11.1	11.3	11.0	10.5	10.9	11.1	10.6			
80	6.22	6.40	6.03	6.38	6.20	6.52	6.30	6.68	6.40	6.73	6.41	6.74	6.45	6.66	6.27	6.50			
85	2.65	2.58	2.52	2.55	2.63	2.59	2.61	2.67	2.66	2.69	2.67	2.70	2.66	2.69	2.64	2.61			
90	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.03	0.04	0.05	0.05	0.03	0.03			
95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
105	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
110	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
115	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
120	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
125	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
130	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
135	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.02			
140	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
145	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
150	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
155	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02			
160	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02			
165	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
170	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
175	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
180	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			

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2.2 Color Spatial Uniformity	IES LM-79 2008 ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.0

Test Data for LRKT3574/3575:

Test date	2015-07-03	Test Ambient	25.1°C
Sample No.		Maximum Δu'v'	
GZE150302-B1		0.0008	

	C0 /180							C90 /270						
Gamma\C	CIE x	CIE y	CIE u'	CIE v'	CCT(K)	Ra	du'v'	CIE x	CIE y	CIE u'	CIE v'	CCT(K)	Ra	du'v'
-68	0.4407	0.4081	0.2513	0.5235	2970	81.6	0.0008	0.4402	0.4075	0.2512	0.5232	2974	81.7	0.0008
-67	0.4404	0.4079	0.2512	0.5234	2973	81.7	0.0008	0.4402	0.4074	0.2512	0.5232	2973	81.7	0.0008
-66	0.4404	0.4078	0.2512	0.5234	2972	81.6	0.0008	0.4401	0.4073	0.2512	0.5231	2975	81.7	0.0008
-65	0.4402	0.4077	0.2511	0.5233	2975	81.7	0.0009	0.4402	0.4073	0.2513	0.5231	2972	81.7	0.0007
-64	0.4405	0.4077	0.2514	0.5233	2969	81.6	0.0007	0.4401	0.4072	0.2512	0.5231	2974	81.7	0.0008
-63	0.4404	0.4075	0.2513	0.5233	2970	81.7	0.0007	0.44	0.4072	0.2512	0.523	2975	81.7	0.0008
-62	0.4403	0.4075	0.2513	0.5232	2972	81.7	0.0007	0.4401	0.4072	0.2513	0.5231	2972	81.6	0.0007
-61	0.4402	0.4075	0.2512	0.5232	2973	81.7	0.0008	0.4401	0.4071	0.2513	0.523	2972	81.7	0.0007
-60	0.4406	0.4074	0.2515	0.5232	2967	81.6	0.0005	0.44	0.4071	0.2513	0.523	2973	81.7	0.0007
-59	0.4405	0.4074	0.2514	0.5232	2968	81.6	0.0005	0.4402	0.4071	0.2514	0.5231	2970	81.6	0.0006
-58	0.4404	0.4074	0.2514	0.5232	2968	81.6	0.0006	0.4402	0.407	0.2514	0.523	2970	81.7	0.0006
-57	0.4404	0.4073	0.2514	0.5232	2969	81.6	0.0006	0.4401	0.407	0.2514	0.523	2970	81.7	0.0006
-56	0.4403	0.4073	0.2514	0.5231	2969	81.7	0.0006	0.4401	0.407	0.2514	0.523	2971	81.7	0.0006
-55	0.4403	0.4073	0.2514	0.5231	2970	81.7	0.0006	0.4404	0.407	0.2515	0.523	2967	81.6	0.0005
-54	0.4407	0.4073	0.2516	0.5232	2964	81.6	0.0004	0.4404	0.407	0.2515	0.523	2967	81.7	0.0005
-53	0.4407	0.4072	0.2516	0.5232	2964	81.6	0.0004	0.4403	0.407	0.2515	0.523	2967	81.7	0.0005
-52	0.4407	0.4072	0.2516	0.5232	2964	81.6	0.0004	0.4403	0.407	0.2515	0.523	2967	81.7	0.0005
-51	0.4406	0.4072	0.2516	0.5231	2964	81.7	0.0004	0.4406	0.4069	0.2517	0.523	2963	81.6	0.0003
-50	0.4406	0.4072	0.2516	0.5231	2964	81.7	0.0004	0.4406	0.4069	0.2517	0.5231	2963	81.6	0.0003
-49	0.4406	0.4072	0.2516	0.5231	2964	81.7	0.0004	0.4406	0.407	0.2517	0.5231	2962	81.6	0.0003
-48	0.4408	0.4071	0.2517	0.5232	2961	81.7	0.0003	0.4406	0.4069	0.2517	0.523	2962	81.7	0.0003
-47	0.4408	0.4071	0.2517	0.5232	2961	81.7	0.0003	0.4408	0.4069	0.2518	0.5231	2959	81.6	0.0002
-46	0.4407	0.4071	0.2517	0.5231	2961	81.7	0.0003	0.4408	0.4069	0.2519	0.5231	2958	81.6	0.0001
-45	0.441	0.4071	0.2518	0.5232	2958	81.6	0.0001	0.4409	0.4069	0.2519	0.5231	2958	81.6	0.0001
-44	0.4409	0.4071	0.2518	0.5231	2958	81.7	0.0001	0.4408	0.4069	0.2519	0.5231	2958	81.7	0.0001
-43	0.4409	0.4071	0.2518	0.5231	2958	81.7	0.0001	0.4408	0.4069	0.2519	0.5231	2958	81.7	0.0001
-42	0.4409	0.407	0.2518	0.5231	2959	81.7	0.0001	0.4408	0.4069	0.2519	0.5231	2958	81.7	0.0001
-41	0.4411	0.407	0.252	0.5232	2956	81.6	0	0.4411	0.4068	0.2521	0.5231	2953	81.6	0.0001

-40	0.441	0.407	0.2519	0.5231	2956	81.7	0	0.4412	0.4069	0.2521	0.5231	2953	81.6	0.0001
-39	0.441	0.407	0.252	0.5231	2956	81.7	0	0.4411	0.4068	0.2521	0.5231	2953	81.6	0.0001
-38	0.4412	0.407	0.252	0.5232	2953	81.7	0.0001	0.4411	0.4068	0.2521	0.5231	2953	81.6	0.0001
-37	0.4412	0.407	0.2521	0.5232	2953	81.7	0.0001	0.4411	0.4068	0.2521	0.5231	2953	81.6	0.0001
-36	0.4412	0.4069	0.2521	0.5231	2953	81.7	0.0001	0.4411	0.4068	0.2521	0.5231	2953	81.7	0.0001
-35	0.4412	0.4069	0.2521	0.5231	2953	81.7	0.0001	0.4411	0.4068	0.2521	0.5231	2953	81.7	0.0001
-34	0.4412	0.4069	0.2521	0.5231	2953	81.7	0.0001	0.4413	0.4068	0.2523	0.5231	2949	81.6	0.0003
-33	0.4413	0.4069	0.2522	0.5231	2951	81.6	0.0002	0.4413	0.4067	0.2523	0.5231	2949	81.6	0.0003
-32	0.4413	0.4069	0.2522	0.5231	2950	81.7	0.0002	0.4414	0.4068	0.2523	0.5231	2949	81.6	0.0003
-31	0.4413	0.4068	0.2522	0.5231	2950	81.7	0.0002	0.4413	0.4067	0.2523	0.5231	2949	81.6	0.0003
-30	0.4413	0.4068	0.2522	0.5231	2951	81.7	0.0002	0.4413	0.4067	0.2523	0.5231	2949	81.6	0.0003
-29	0.4412	0.4068	0.2522	0.5231	2951	81.7	0.0002	0.4413	0.4067	0.2523	0.5231	2948	81.7	0.0003
-28	0.4414	0.4068	0.2523	0.5231	2949	81.6	0.0003	0.4413	0.4067	0.2523	0.523	2949	81.7	0.0003
-27	0.4413	0.4067	0.2523	0.5231	2949	81.7	0.0003	0.4413	0.4066	0.2523	0.523	2949	81.7	0.0003
-26	0.4413	0.4067	0.2523	0.5231	2949	81.7	0.0003	0.4412	0.4066	0.2522	0.523	2950	81.7	0.0003
-25	0.4413	0.4066	0.2523	0.523	2949	81.7	0.0003	0.4415	0.4066	0.2524	0.5231	2946	81.6	0.0004
-24	0.4412	0.4066	0.2522	0.523	2949	81.7	0.0003	0.4414	0.4066	0.2524	0.523	2946	81.7	0.0004
-23	0.4412	0.4066	0.2522	0.523	2950	81.7	0.0003	0.4414	0.4065	0.2524	0.523	2947	81.6	0.0004
-22	0.4412	0.4066	0.2522	0.523	2950	81.7	0.0003	0.4414	0.4065	0.2524	0.523	2946	81.6	0.0004
-21	0.4413	0.4066	0.2523	0.523	2948	81.7	0.0004	0.4414	0.4065	0.2524	0.523	2947	81.6	0.0004
-20	0.4413	0.4065	0.2523	0.523	2948	81.7	0.0003	0.4413	0.4064	0.2524	0.523	2947	81.6	0.0004
-19	0.4412	0.4065	0.2523	0.523	2949	81.6	0.0004	0.4413	0.4064	0.2523	0.5229	2947	81.6	0.0004
-18	0.4412	0.4065	0.2523	0.523	2948	81.7	0.0004	0.4412	0.4064	0.2523	0.5229	2948	81.7	0.0004
-17	0.4412	0.4064	0.2523	0.5229	2949	81.7	0.0004	0.4412	0.4064	0.2523	0.5229	2948	81.7	0.0004
-16	0.4411	0.4064	0.2523	0.5229	2949	81.7	0.0004	0.4412	0.4064	0.2523	0.5229	2948	81.7	0.0004
-15	0.4411	0.4064	0.2522	0.5229	2950	81.7	0.0003	0.4412	0.4064	0.2523	0.5229	2949	81.7	0.0004
-14	0.4411	0.4064	0.2522	0.5229	2951	81.7	0.0003	0.4411	0.4063	0.2523	0.5229	2949	81.7	0.0004
-13	0.441	0.4064	0.2522	0.5229	2951	81.7	0.0003	0.4411	0.4064	0.2523	0.5229	2949	81.7	0.0004
-12	0.441	0.4063	0.2522	0.5229	2952	81.7	0.0003	0.4411	0.4063	0.2523	0.5229	2950	81.7	0.0004
-11	0.441	0.4063	0.2522	0.5229	2951	81.7	0.0003	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004
-10	0.4411	0.4063	0.2523	0.5229	2949	81.7	0.0004	0.441	0.4063	0.2523	0.5229	2950	81.7	0.0004
-9	0.4411	0.4063	0.2523	0.5229	2949	81.7	0.0004	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004
-8	0.4411	0.4063	0.2523	0.5229	2950	81.7	0.0004	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004
-7	0.4411	0.4063	0.2523	0.5229	2949	81.7	0.0004	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004
-6	0.4411	0.4062	0.2523	0.5228	2949	81.7	0.0004	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004
-5	0.4411	0.4063	0.2523	0.5229	2949	81.7	0.0004	0.4409	0.4062	0.2522	0.5228	2951	81.7	0.0004
-4	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004	0.441	0.4062	0.2523	0.5228	2951	81.7	0.0004
-3	0.4411	0.4062	0.2523	0.5228	2949	81.7	0.0004	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004
-2	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004	0.441	0.4062	0.2522	0.5228	2951	81.7	0.0004
-1	0.441	0.4062	0.2523	0.5228	2950	81.7	0.0004	0.4409	0.4062	0.2522	0.5228	2951	81.7	0.0004

0	0. 4413	0. 4063	0. 2524	0. 5229	2946	81. 6	0. 0005	0. 4413	0. 4063	0. 2524	0. 5229	2946	81. 6	0. 0005
1	0. 441	0. 4062	0. 2523	0. 5228	2950	81. 7	0. 0004	0. 441	0. 4062	0. 2523	0. 5228	2950	81. 7	0. 0004
2	0. 441	0. 4062	0. 2523	0. 5228	2950	81. 7	0. 0004	0. 441	0. 4062	0. 2522	0. 5228	2951	81. 7	0. 0004
3	0. 441	0. 4062	0. 2523	0. 5228	2949	81. 7	0. 0004	0. 4409	0. 4062	0. 2522	0. 5228	2951	81. 7	0. 0004
4	0. 4411	0. 4062	0. 2523	0. 5229	2949	81. 7	0. 0004	0. 441	0. 4062	0. 2523	0. 5228	2950	81. 7	0. 0004
5	0. 4411	0. 4063	0. 2523	0. 5229	2950	81. 7	0. 0004	0. 441	0. 4062	0. 2523	0. 5228	2950	81. 7	0. 0004
6	0. 4411	0. 4063	0. 2523	0. 5229	2949	81. 7	0. 0004	0. 441	0. 4063	0. 2522	0. 5229	2950	81. 7	0. 0004
7	0. 4411	0. 4063	0. 2523	0. 5229	2949	81. 7	0. 0004	0. 4411	0. 4063	0. 2523	0. 5229	2949	81. 7	0. 0004
8	0. 4411	0. 4063	0. 2523	0. 5229	2949	81. 7	0. 0004	0. 441	0. 4063	0. 2523	0. 5229	2950	81. 7	0. 0004
9	0. 4412	0. 4063	0. 2523	0. 5229	2948	81. 7	0. 0004	0. 4411	0. 4063	0. 2523	0. 5229	2949	81. 7	0. 0004
10	0. 4411	0. 4063	0. 2523	0. 5229	2949	81. 7	0. 0004	0. 4411	0. 4063	0. 2523	0. 5229	2949	81. 7	0. 0004
11	0. 4412	0. 4063	0. 2524	0. 5229	2947	81. 6	0. 0005	0. 4412	0. 4064	0. 2523	0. 5229	2949	81. 7	0. 0004
12	0. 4412	0. 4064	0. 2523	0. 5229	2948	81. 7	0. 0004	0. 4411	0. 4063	0. 2523	0. 5229	2949	81. 7	0. 0004
13	0. 4413	0. 4064	0. 2524	0. 5229	2947	81. 7	0. 0004	0. 441	0. 4064	0. 2522	0. 5229	2951	81. 7	0. 0003
14	0. 4413	0. 4064	0. 2524	0. 523	2947	81. 6	0. 0004	0. 4411	0. 4064	0. 2522	0. 5229	2951	81. 7	0. 0003
15	0. 4413	0. 4064	0. 2524	0. 5229	2946	81. 7	0. 0005	0. 4411	0. 4064	0. 2522	0. 5229	2950	81. 7	0. 0003
16	0. 4414	0. 4065	0. 2524	0. 523	2946	81. 6	0. 0004	0. 4411	0. 4065	0. 2522	0. 5229	2950	81. 7	0. 0003
17	0. 4414	0. 4065	0. 2524	0. 523	2945	81. 6	0. 0005	0. 4412	0. 4065	0. 2523	0. 523	2949	81. 7	0. 0003
18	0. 4414	0. 4065	0. 2524	0. 523	2946	81. 7	0. 0004	0. 4412	0. 4066	0. 2523	0. 523	2949	81. 7	0. 0003
19	0. 4415	0. 4065	0. 2524	0. 523	2945	81. 7	0. 0005	0. 4412	0. 4066	0. 2523	0. 523	2949	81. 7	0. 0003
20	0. 4415	0. 4066	0. 2524	0. 523	2945	81. 6	0. 0005	0. 4413	0. 4066	0. 2523	0. 523	2948	81. 7	0. 0003
21	0. 4415	0. 4066	0. 2524	0. 5231	2945	81. 6	0. 0005	0. 4413	0. 4066	0. 2523	0. 523	2948	81. 6	0. 0003
22	0. 4415	0. 4066	0. 2524	0. 5231	2944	81. 6	0. 0005	0. 4414	0. 4066	0. 2523	0. 523	2947	81. 6	0. 0004
23	0. 4416	0. 4067	0. 2525	0. 5231	2944	81. 6	0. 0005	0. 4412	0. 4067	0. 2522	0. 5231	2950	81. 7	0. 0002
24	0. 4417	0. 4067	0. 2525	0. 5231	2943	81. 6	0. 0005	0. 4413	0. 4067	0. 2522	0. 5231	2949	81. 7	0. 0003
25	0. 4414	0. 4068	0. 2523	0. 5231	2947	81. 7	0. 0003	0. 4413	0. 4067	0. 2522	0. 5231	2949	81. 7	0. 0003
26	0. 4415	0. 4068	0. 2523	0. 5231	2947	81. 7	0. 0004	0. 4414	0. 4068	0. 2523	0. 5231	2949	81. 7	0. 0003
27	0. 4415	0. 4068	0. 2524	0. 5231	2946	81. 7	0. 0004	0. 4414	0. 4068	0. 2523	0. 5231	2948	81. 7	0. 0003
28	0. 4415	0. 4068	0. 2523	0. 5231	2947	81. 7	0. 0004	0. 4415	0. 4069	0. 2523	0. 5232	2948	81. 6	0. 0003
29	0. 4416	0. 4068	0. 2524	0. 5232	2946	81. 7	0. 0004	0. 4415	0. 4069	0. 2523	0. 5232	2948	81. 6	0. 0003
30	0. 4416	0. 4069	0. 2524	0. 5232	2946	81. 6	0. 0004	0. 4413	0. 4069	0. 2522	0. 5231	2951	81. 7	0. 0002
31	0. 4416	0. 4069	0. 2523	0. 5232	2946	81. 6	0. 0004	0. 4414	0. 4069	0. 2522	0. 5232	2950	81. 7	0. 0002
32	0. 4416	0. 4069	0. 2523	0. 5232	2946	81. 6	0. 0004	0. 4414	0. 407	0. 2522	0. 5232	2950	81. 7	0. 0002
33	0. 4416	0. 407	0. 2524	0. 5232	2946	81. 6	0. 0004	0. 4414	0. 407	0. 2522	0. 5232	2949	81. 6	0. 0002
34	0. 4417	0. 407	0. 2524	0. 5232	2945	81. 6	0. 0004	0. 4414	0. 407	0. 2522	0. 5232	2950	81. 6	0. 0002
35	0. 4414	0. 4069	0. 2522	0. 5232	2949	81. 7	0. 0003	0. 4413	0. 407	0. 2521	0. 5232	2952	81. 7	0. 0001
36	0. 4414	0. 4069	0. 2522	0. 5232	2949	81. 7	0. 0002	0. 4413	0. 4071	0. 2521	0. 5232	2952	81. 6	0. 0001
37	0. 4414	0. 407	0. 2522	0. 5232	2949	81. 7	0. 0002	0. 4413	0. 4071	0. 2521	0. 5232	2952	81. 6	0. 0002
38	0. 4415	0. 407	0. 2522	0. 5232	2949	81. 7	0. 0003	0. 4413	0. 4071	0. 2521	0. 5232	2952	81. 6	0. 0002
39	0. 4414	0. 407	0. 2522	0. 5232	2950	81. 6	0. 0002	0. 4412	0. 4071	0. 252	0. 5232	2955	81. 7	0. 0001

40	0.4414	0.407	0.2522	0.5232	2950	81.7	0.0002	0.4413	0.4072	0.252	0.5233	2954	81.7	0.0001
41	0.4414	0.4071	0.2522	0.5232	2950	81.6	0.0002	0.4412	0.4072	0.252	0.5232	2954	81.6	0.0001
42	0.4412	0.4071	0.252	0.5232	2954	81.7	0.0001	0.4412	0.4072	0.252	0.5232	2955	81.6	0.0001
43	0.4412	0.4071	0.252	0.5232	2954	81.6	0.0001	0.4411	0.4072	0.2519	0.5232	2957	81.6	0.0002
44	0.4412	0.4071	0.252	0.5232	2954	81.7	0.0001	0.4411	0.4073	0.2519	0.5233	2957	81.6	0.0002
45	0.4412	0.4071	0.252	0.5232	2954	81.6	0.0001	0.4411	0.4072	0.2519	0.5232	2957	81.6	0.0002
46	0.4412	0.4071	0.252	0.5232	2954	81.6	0.0001	0.4409	0.4073	0.2518	0.5232	2960	81.7	0.0002
47	0.4409	0.4071	0.2518	0.5232	2959	81.7	0.0002	0.441	0.4073	0.2518	0.5233	2959	81.6	0.0002
48	0.4409	0.4071	0.2518	0.5232	2958	81.7	0.0002	0.441	0.4073	0.2518	0.5233	2960	81.6	0.0003
49	0.441	0.4072	0.2518	0.5232	2958	81.7	0.0002	0.441	0.4074	0.2518	0.5233	2959	81.6	0.0003
50	0.441	0.4072	0.2518	0.5232	2959	81.6	0.0002	0.441	0.4073	0.2518	0.5233	2959	81.6	0.0002
51	0.4409	0.4072	0.2518	0.5232	2959	81.6	0.0002	0.441	0.4074	0.2518	0.5233	2959	81.6	0.0002
52	0.4407	0.4072	0.2517	0.5232	2963	81.6	0.0003	0.4411	0.4074	0.2518	0.5233	2959	81.5	0.0003
53	0.4408	0.4073	0.2517	0.5232	2962	81.6	0.0003	0.4406	0.4074	0.2515	0.5232	2966	81.7	0.0005
54	0.4408	0.4072	0.2517	0.5232	2962	81.6	0.0003	0.4407	0.4075	0.2515	0.5233	2965	81.6	0.0005
55	0.4408	0.4073	0.2517	0.5232	2962	81.6	0.0003	0.4407	0.4074	0.2516	0.5233	2964	81.6	0.0004
56	0.4406	0.4073	0.2515	0.5232	2965	81.7	0.0004	0.4406	0.4075	0.2514	0.5233	2967	81.6	0.0006
57	0.4406	0.4073	0.2515	0.5232	2965	81.6	0.0004	0.4407	0.4076	0.2515	0.5233	2966	81.6	0.0005
58	0.4406	0.4074	0.2515	0.5232	2965	81.6	0.0004	0.4406	0.4076	0.2514	0.5233	2968	81.6	0.0006
59	0.4407	0.4074	0.2516	0.5233	2965	81.6	0.0004	0.4406	0.4076	0.2514	0.5233	2968	81.6	0.0006
60	0.4404	0.4073	0.2514	0.5232	2968	81.6	0.0006	0.4406	0.4077	0.2514	0.5233	2969	81.6	0.0007
61	0.4406	0.4075	0.2515	0.5233	2967	81.7	0.0005	0.4407	0.4077	0.2514	0.5234	2968	81.6	0.0006
62	0.4407	0.4075	0.2515	0.5233	2966	81.6	0.0005	0.4407	0.4078	0.2514	0.5234	2967	81.6	0.0006
63	0.4406	0.4076	0.2514	0.5233	2968	81.6	0.0006	0.4409	0.4079	0.2515	0.5234	2965	81.6	0.0006
64	0.4406	0.4076	0.2514	0.5233	2968	81.6	0.0006	0.4405	0.4079	0.2513	0.5234	2971	81.7	0.0008
65	0.4405	0.4077	0.2513	0.5233	2970	81.7	0.0007	0.4407	0.408	0.2513	0.5235	2969	81.6	0.0008
66	0.4407	0.4078	0.2514	0.5234	2968	81.6	0.0007	0.4407	0.408	0.2513	0.5235	2969	81.7	0.0008
67	0.4408	0.4079	0.2514	0.5235	2967	81.6	0.0007	0.4409	0.4082	0.2514	0.5236	2967	81.6	0.0008
68	0.4408	0.408	0.2514	0.5235	2968	81.6	0.0007	0.4411	0.4083	0.2515	0.5237	2965	81.6	0.0007

3. Electrical and Photometric Measurements, with dimming	[√] ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.0

Test date	2015-07-03	Test Ambient:	25.2 °C		
Dimmer Model		LEVITON MFG CO INC (E31373), Cat. No. 6681			
Sample No.	**Input**	**Luminous flux (lm)**	**CCT (K)**	**CRI**	**P.F.**
GZE150302-B1	120.0 V / 60 Hz	92.7	2965	85.5	0.5055
GZE150302-B2	120.0 V / 60 Hz	97.6	2966	85.4	0.4948
GZE150302-B3	120.0 V / 60 Hz	96.6	2968	85.5	0.4929
Average		95.6	2966	85.5	0.4977

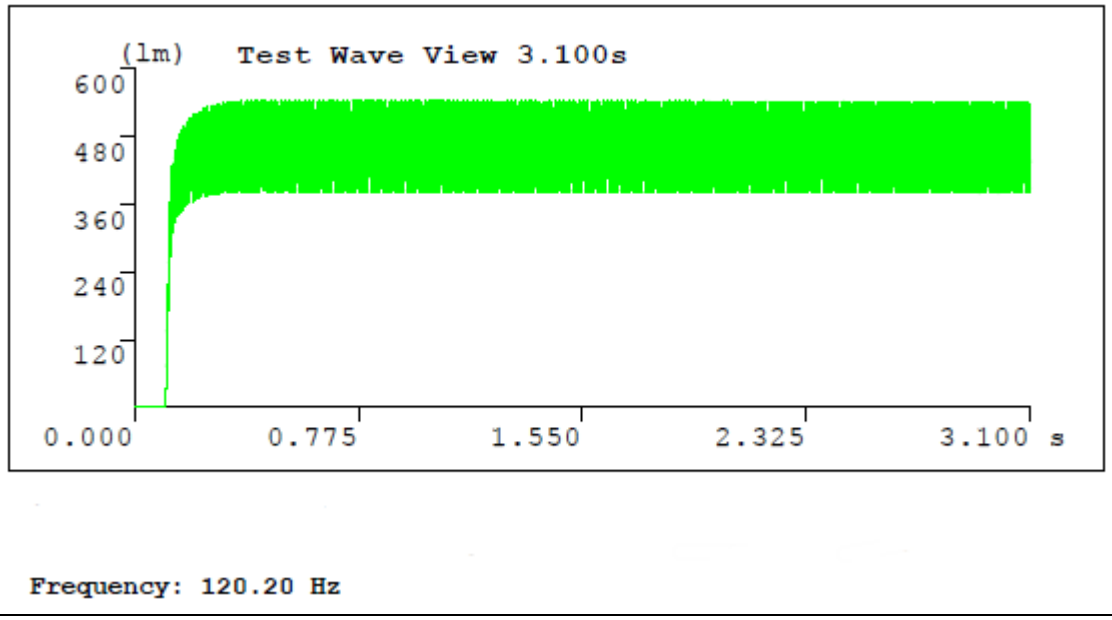
The luminaires [can] ~~[can not]~~ provide less than 20% of total light output with continuous dimmer.

Test date	2015-07-02	Test Ambient:	25.2 °C
Dimmer Model		LEVITON MFG CO INC (E31373), Cat. No. 6681	
Sample No.	**Test Condition**	**Peak Noise Reading (dBA)**	**Distance between the microphone and the UUT**
GZE150302-B1	Min Light Output	21.2	**< 1 m**
GZE150302-B2	Min Light Output	21.2	**< 1 m**
GZE150302-B3	Min Light Output	21.6	**< 1 m**
Average		21.3	**< 1 m**

4 Operating Frequency	[√] ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.0

Test date	2015-07-03	Test Ambient:	25.1°C
Sample No.		Operating Frequency (Hz)	
GZE150302-B1		120.20	
GZE150302-B2		120.09	
GZE150302-B3		120.13	
Average		120.14	

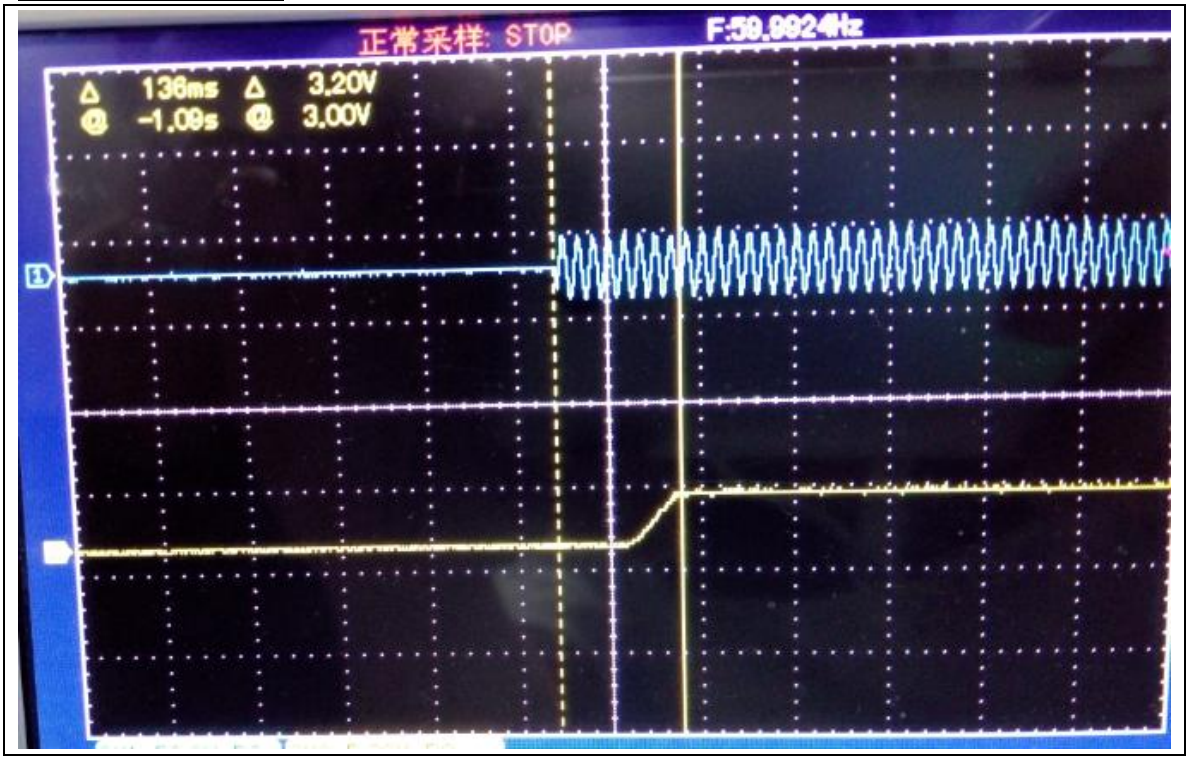
Graph:



5 Starting Time (Refer to Work Instruction QD28)	**[√] ENERGY STAR® Program Requirements Product Specification for Luminaires (Light Fixtures) - Version 2.0**

Test date	2015-07-03	Test Ambient:	25.1°C
Sample No.	**Start Time (ms)**		
GZE150302-B1	136		
GZE150302-B2	150		
GZE150302-B3	140		
Average	142		

Graph (Start Time):



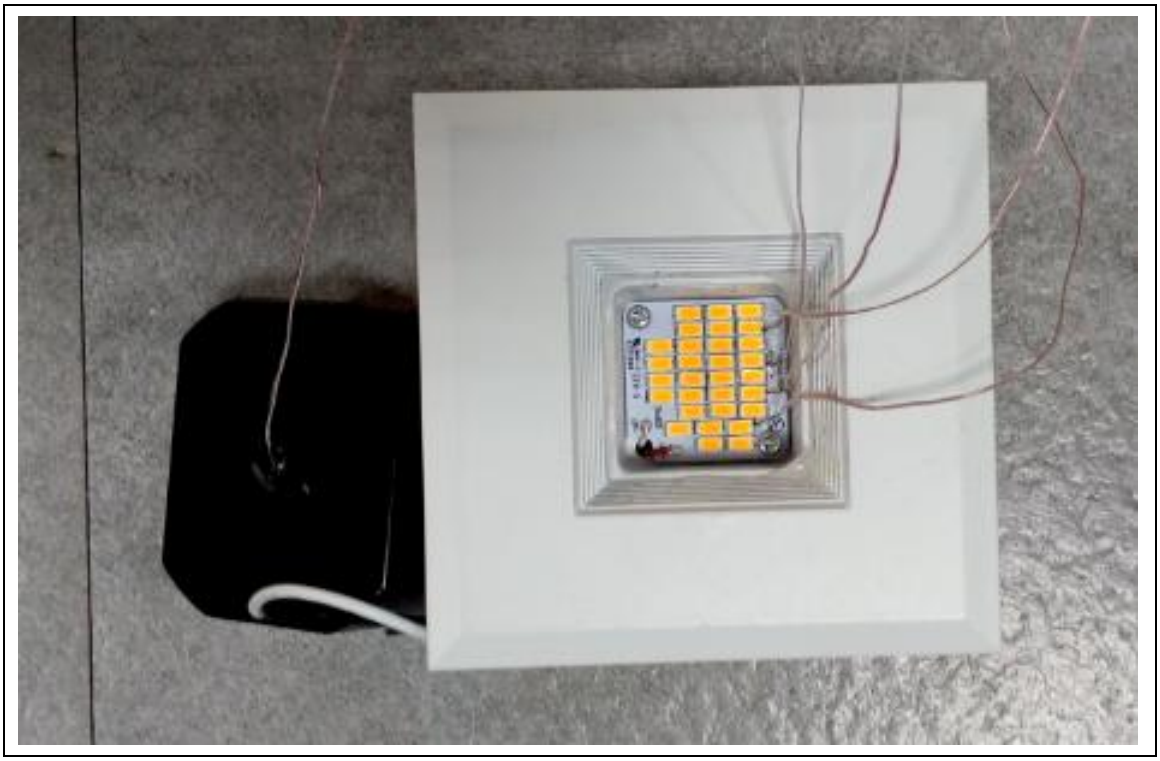
6. Transient Protection Test	ANSI/IEEE C62.41 ENERGY STAR® Program Requirements for Luminaires – Version 2.0

Test date	2015-07-03	Test Ambient	25.1°C
Sample No.		Transient Protection Test - Seven Strikes	
GZE150302-B1		Pass	
GZE150302-B2		Pass	
GZE150302-B3		Pass	

7.1 In-Situ Temperature Measurement Test (ISTMT)	[√]UL1993-2012, 4th Edition

Test date	2015-07-03	Test Ambient	25.1°C
Input Vol./Frequency	120 V / 60 Hz	Output Current of Driver(mA)	120.6
Sample No.	LED Package Model	Maximum Measured Driver Case Temperature (°C)	Maximum Driver Case Temperature (°C)
GZE150302-B1	SMD MID Power LED 62-217D series	53.6	95

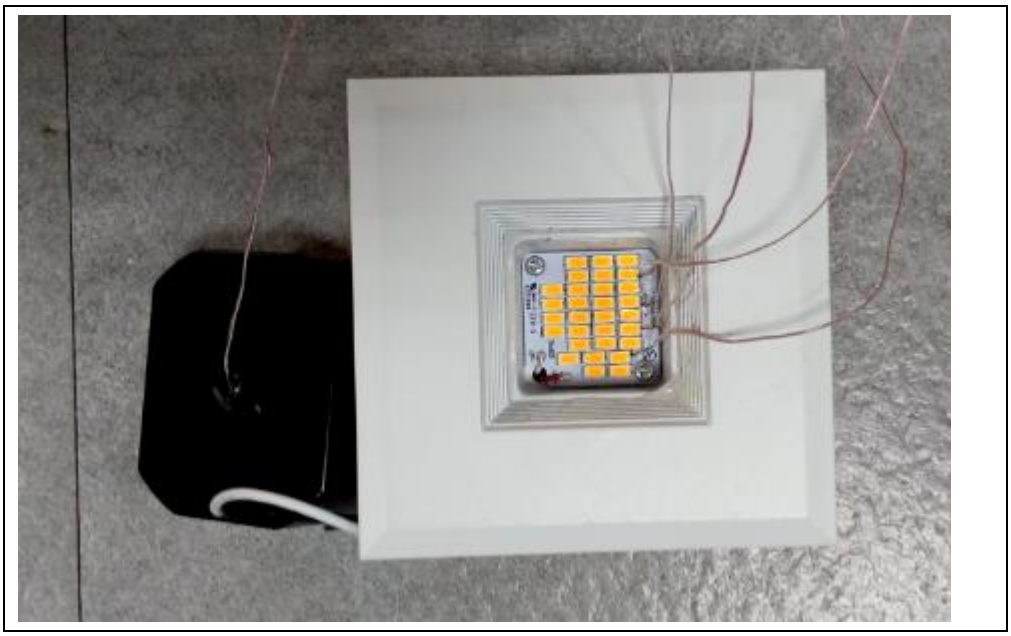
In-Situ Picture - Ts:



7.2 Maximum Measured Ballast or Driver Case Temperature	[√] UL1598-2008, 3rd Edition

Test date	2015-07-03	Test Ambient	25.1°C
Sample No.	Maximum Measured Driver Case Temperature (°C)	Maximum Driver Case Temperature (°C)	
GZE150302-B1	56.2	90	

In-Situ Picture - Ts:



8. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2014-07-01	2015-06-30
ST-R-331	Spectral analysis system HAAS-2000	2014-07-01	2015-06-30
EE-09	Goniophotometer system	2014-07-01	2015-06-30
D908S	Standard Lamp	2014-07-01	2015-06-30
D204	Standard Lamp	2014-07-01	2015-06-30
PF2010	Power Meter for Integrating Sphere	2014-07-01	2015-06-30
PF210	Power Meter for Goniophotometer	2014-07-01	2015-06-30
EE-015	Flux Meter	2014-07-01	2015-06-30
ST-R-277	Oscillograph	2014-07-01	2015-06-30
ST-R-EM01	Surge Generator	2014-07-01	2015-06-30
ST-R-EM02	EMC Coupler/Decoupler Module	2014-07-01	2015-06-30

******** END OF DATASHEET PACKAGE ********