

## LM-79-08 Test Report

For

# Beyond LED Technology (Brand Name: Beyond LED)

1939 Parker Court Suite C Stone Mountain, GA 30087

## Direct Linear Ambient Luminaires

Model name(s): ZS-T8Y2460T-CC

Remark: The CC represents CCT as below: 30=3000K, 35=3500K,  
40=4000K, 45=4500K, 50=5000K

Representative (Tested) Model: ZS-T8Y2460T-30

ZS-T8Y2460T-50

ZS-T8Y1230T-30(1.2m)

The construction of Model ZS-T8Y1230T-30 (1.2m) is similar with ZS-T8Y2460T-30, except for length and wattage. The IES was tested to ZS-T8Y1230T-30 (1.2m) to be the representative model for ZS-T8Y2460T-30.

Model Different: All construction and rating are the same, except CCT

Test &amp; Report By:

*Clint Chen*

Engineer: Clint Chen

Date: May.21,2018

Review By:

*Univ Xie*

Manager: Univ Xie

Note: 1. The results contained in this report pertain only to the tested samples.

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

**Laboratory: Standard-Tech Co., Ltd. Testing Center****NVLAP CODE: 201011-0**

Report Format Number STD/QR4909-A/2

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Tel: 8620-3229 0320

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<http://www.standard-tech.com>

**1.1 Product Information:**

Organization Name	SHENZHEN ZENITH TECHNOLOGY CO.,LTD.	
Brand Name	N/A	
Model Number	ZS-T8Y2460T-CC	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	Direct Linear Ambient Luminaires	
Rated Voltage / Frequency	100 -250Vac, 50/60 Hz	
Nominal Power	60W	
Rated Initial Lamp Lumen	--	
Declared CCT	3000K,3500K,4000K,4500K,5000K	
LED Manufacturer	DONGGUAN SINOWIN OPTO-ELECTRONIC CO.,LTD	
LED Model	ZT2835WOM1-3080	
Sample Number	JBE180403-E1 (3000K), E2 (5000K), E3 (1.2M, 3000K).	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	2400	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s
<b>Photo</b>		
T8Y24		
		
		
T8Y12		
		
		

**1.2 Test Specifications:**

Date of Receipt	May.21,2018
Date of Test	May.21,2018
Test item	<ol style="list-style-type: none"> <li>1. Total Luminous Flux</li> <li>2. Luminous Distribution Intensity</li> <li>3. Luminous Efficacy</li> <li>4. Correlated Color Temperature</li> <li>5. Color Rendering Index</li> <li>6. Chromaticity Coordinate</li> <li>7. Electrical Parameters</li> </ol>
Reference Standard	<ol style="list-style-type: none"> <li>1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products</li> <li>2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products</li> <li>3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources</li> <li>4. CIE 15-2004 Technical Report Colorimetry</li> <li>5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source</li> <li>6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems</li> </ol>
Reference Work Instruction	QD25

**1.3 Test Methods**

**1) Photometric and Light Distribution Measurement – Goniophotometer 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 or rated 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) Chromaticity Measurement – Sphere-Spectroradiometer Method:**

Chromaticity parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25 °C ± 1 °C. 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 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral power distribution taken at 5 nm intervals over the range of 380 to 780 nm.

**3) Electrical Measurements:**

Electrical parameters were measured using power meters incorporated in goniophotometer or sphere-spectroradiometer system. The ambient temperature surrounding the sample was maintained at 25 °C ± 1 °C. The sample was operated at 120 or rated Volts AC, 60Hz. It was stabilized before measurement was made. Voltage, frequency, current, power, power factor and total harmonic distortion were measured by and read from the power meter.

**2.1 Electrical, Photometric and Chromaticity Measurements**  
*(Refer to Work Instruction QD25)*

<b>Test date</b>	2018-05-21	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	ZS-T8Y2460T-30		

**Electrical Measurement:**

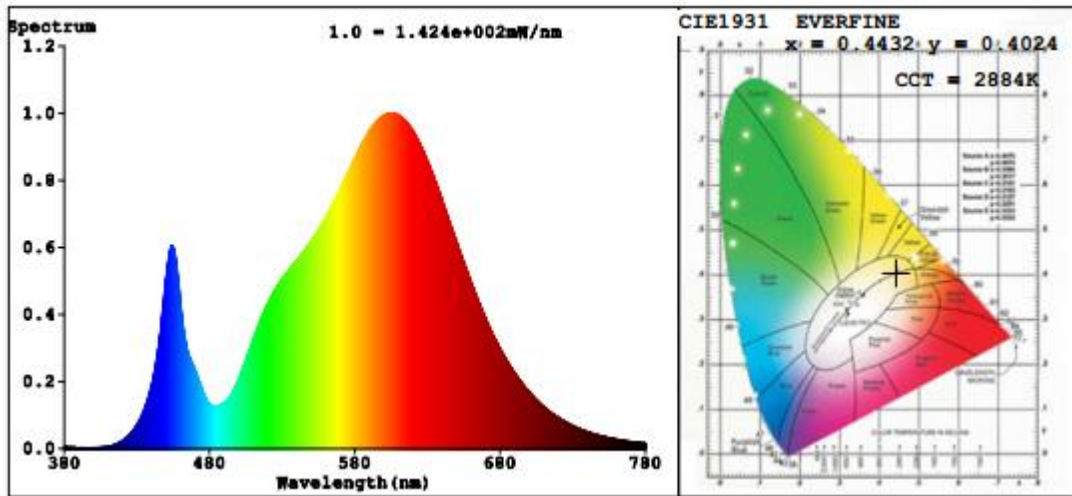
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180403-	120.0	60	0.4927	57.42	0.9712	23.61
E1	250.0	60	0.2406	57.08	0.9489	19.63
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	79	R9	7
Frequency (Hz)	60	R2	89	R10	73
CCT (K)	2884	R3	95	R11	75
Duv	-0.0015	R4	78	R12	62
Chromaticity (x, y)	x=0.4432 y=0.4024	R5	78	R13	81
Chromaticity (u', v')	u'=0.2554 v'=0.5216	R6	85	R14	97
Color Rendering Index (CRI)	80.7	R7	83	R15	73
R9	7	R8	59	--	--

**Photometric Measurement –Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.3 Pass Criteria	
Test Voltage (V)	120.0	250.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	7812	7785	>=375(lm/ft)(-10%)	
Luminous Efficacy (lm/W)	136.05	136.39	Standard: >=	Premium: >=
Most worst Luminous/Highest Watts	135.58		105(-3%)	130(-3%)



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**2.2 Electrical, Photometric and Chromaticity Measurements**  
*(Refer to Work Instruction QD25)*

<b>Test date</b>	2018-05-21	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	ZS-T8Y2460T-50		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180403-	120.0	60	0.5012	57.75	0.9601	21.27
E2	250.0	60	0.2425	57.43	0.9472	20.52
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

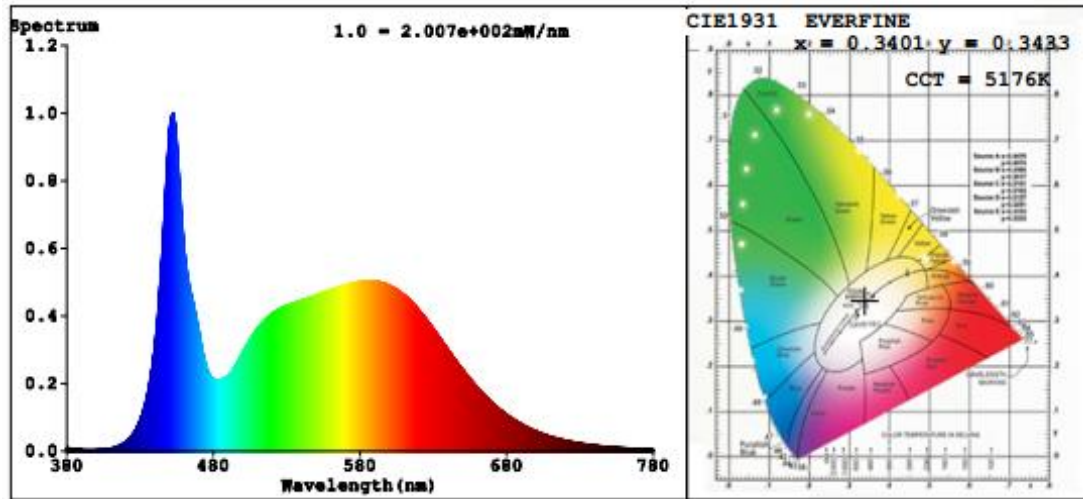
**Chromaticity Measurement - Sphere-Spectroradiometer Method:**

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	85	R9	21
Frequency (Hz)	60	R2	91	R10	77
CCT (K)	5176	R3	93	R11	85
Duv	-0.0021	R4	85	R12	63
Chromaticity (x, y)	x=0.3401 y=0.3433	R5	85	R13	87
Chromaticity (u', v')	u'=0.2112 v'=0.4798	R6	86	R14	96
Color Rendering Index (CRI)	85.5	R7	87	R15	82
R9	21	R8	71	--	--

**Photometric Measurement – Sphere-Spectroradiometer Method:**

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	250.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	7933	7901	>=375(lm/ft)(-10%)	
Luminous Efficacy (lm/W)	137.37	137.58	Standard: >=	Premium: >=
Most worst Luminous/Highest Watts	136.81		105(-3%)	130(-3%)

**Spectral Power Distribution & Chromaticity Diagram**



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**2.3 Electrical, Photometric and Chromaticity Measurements**

*(Refer to Work Instruction QD25)*

Remark: ZS-T8Y1230T-30 (1.2m) and ZS-T8Y2460T-30 have the same cross section structure.

<b>Test date</b>	2018-05-09	<b>Test Ambient:</b>	25.2 °C
<b>Test Orientation</b>	As intended	<b>Stabilization Time (min)</b>	90
<b>Model Number</b>	ZS-T8Y1230T-30		

**Electrical Measurement:**

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
JBE180403	120.0	60	0.2702	29.62	0.9134	22.81
-E3	250.0	60	0.1175	29.57	0.9089	23.62
<b>DLC Pass Criteria</b>					>= 0.9(-3%)	<= 20(+5)

**Photometric Measurement – Goniophotometer Method:**

Parameter	Result		DLC V4.2 Pass Criteria	
Test Voltage (V)	120.0	250.0	--	
Frequency (Hz)	60	60		
Total Luminous (lm)	4003	4011	>=375(lm/ft)(-10%)	
Luminous Efficacy (lm/W)	135.15	135.64	Standard: >=	Premium: >=
Most worst Luminous/Highest Watts	135.15		105(-3%)	130(-3%)
Zonal lumens in the 0-60 ° zone (%)	81.4	--	>=40(-3)	
Beam Angle ( ° )	108.3	--	--	
Center Beam Candle Power (cd)	1376	--	--	

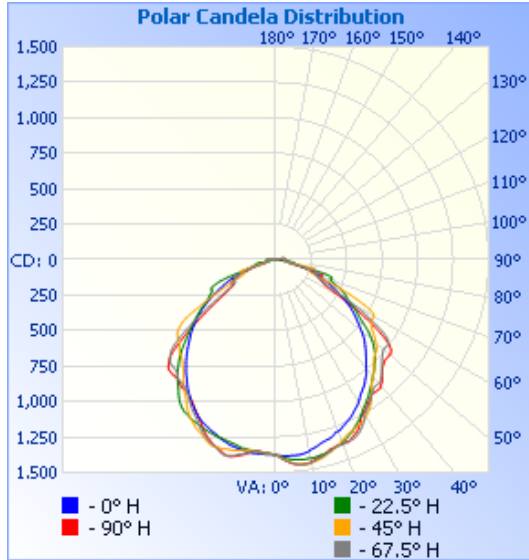


**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	1,121.5	28%
0-40	1,837.6	45.9%
0-60	3,258.2	81.4%
60-90	659.0	16.5%
70-100	296.2	7.4%
90-120	69.5	1.7%
0-90	3,917.2	97.9%
90-180	85.4	2.1%
0-180	4,002.6	100%

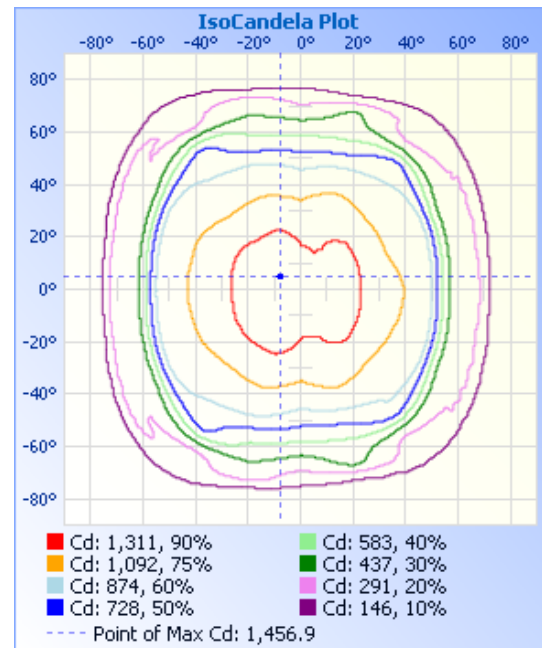
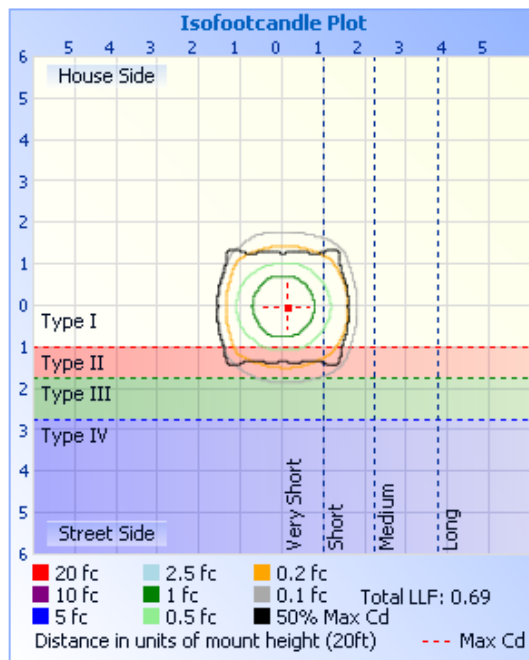
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	%Total
0-10	133.1	3.3%	90-100	44.6	1.1%
10-20	390.9	9.8%	100-110	17.0	0.4%
20-30	597.6	14.9%	110-120	8.0	0.2%
30-40	716.1	17.9%	120-130	5.3	0.1%
40-50	761.6	19.0%	130-140	3.9	0.1%
50-60	659.0	16.5%	140-150	2.9	0.1%
60-70	407.3	10.2%	150-160	2.0	0.1%
70-80	188.0	4.7%	160-170	1.3	0%
80-90	63.7	1.6%	170-180	0.5	0%

**Photometric Data**



	Center Beam fc	Beam Width	
17.0ft	4.76 fc	45.6 ft	47.9 ft
34.0ft	1.19 fc	91.2 ft	95.8 ft
51.0ft	0.53 fc	136.8 ft	143.7 ft
68.0ft	0.30 fc	182.4 ft	191.6 ft
85.0ft	0.19 fc	228.0 ft	239.5 ft
102.0ft	0.13 fc	273.6 ft	287.4 ft

■ Vert. Spread: 106.6°  
■ Horiz. Spread: 109.3°



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Table--1

UNIT: cd

C (DEG) \ T (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	1376	1376	1376	1376	1376	1376	1376	1376	1376	1376	1376	1376	1376	1376	1376	1376
5	1353	1354	1357	1368	1383	1414	1437	1441	1444	1440	1425	1399	1372	1361	1358	1358
10	1396	1384	1353	1342	1367	1420	1453	1451	1445	1451	1449	1417	1362	1349	1363	1390
15	1414	1416	1380	1310	1324	1403	1416	1411	1402	1405	1410	1414	1334	1321	1380	1423
20	1354	1366	1379	1287	1285	1369	1357	1383	1380	1367	1367	1383	1291	1306	1378	1365
25	1254	1276	1305	1256	1234	1309	1313	1362	1342	1347	1321	1327	1247	1282	1315	1280
30	1169	1169	1227	1234	1164	1225	1274	1256	1240	1244	1293	1249	1176	1255	1235	1191
35	1119	1089	1111	1184	1083	1147	1177	1174	1171	1159	1194	1172	1085	1188	1122	1107
40	1085	1057	1002	1070	989	1066	1067	1134	1152	1114	1075	1085	982	1078	1014	1075
45	1072	1020	931	969	896	990	979	1058	1066	1036	972	992	879	952	949	1042
50	853	939	875	841	791	887	922	988	1044	981	920	881	770	798	890	936
55	500	595	838	699	677	731	822	955	900	934	818	719	651	671	828	573
60	342	345	610	560	558	607	800	650	537	611	794	583	514	549	514	340
65	312	326	298	484	435	516	567	351	367	338	517	488	382	499	263	321
70	196	238	250	433	311	409	265	289	338	288	245	390	256	359	253	194
75	76.0	75.2	158	151	195	284	225	241	164	195	240	197	140	111	127	75.7
80	64.5	66.8	67.4	137	97.6	110	77.9	82.0	79.2	78.9	76.2	101	54.6	58.1	68.5	66.5
85	50.2	50.1	49.4	48.6	28.6	43.4	68.7	73.5	75.0	73.9	69.9	48.0	11.4	41.8	49.6	51.9
90	58.2	59.1	59.4	65.6	2.43	58.6	68.8	69.7	72.7	69.8	65.6	65.9	1.33	51.2	62.0	61.7
95	54.4	54.3	42.5	12.9	1.36	28.4	68.4	64.9	67.1	68.5	66.8	18.2	1.60	13.8	38.4	53.6
100	33.2	28.7	14.8	8.48	1.45	13.4	36.1	55.5	61.2	55.6	32.3	11.0	2.20	9.11	14.9	26.9
105	14.2	13.6	12.1	6.84	1.64	9.63	17.7	32.2	38.4	31.3	16.7	8.05	2.92	7.10	12.6	13.8
110	12.0	11.4	9.01	6.30	2.19	7.44	12.6	15.7	20.2	15.3	12.4	6.15	3.33	6.20	9.10	11.7
115	9.84	8.87	7.17	5.80	2.56	6.20	9.48	11.9	13.0	12.2	9.46	5.16	3.57	5.70	7.31	8.91
120	7.39	7.15	6.39	5.52	2.92	5.79	8.02	8.85	10.3	9.14	7.62	5.03	3.84	4.97	6.21	6.99
125	6.38	6.36	5.74	5.21	3.24	6.02	6.81	7.92	8.22	7.88	6.33	4.71	3.79	2.48	5.57	6.06
130	5.77	5.62	5.79	4.94	3.34	5.45	5.94	6.76	6.62	6.45	5.28	4.57	3.88	4.29	5.59	5.23
135	5.01	5.01	5.79	4.39	3.41	5.15	5.52	5.92	5.90	5.61	4.91	4.01	4.11	4.04	5.38	5.08
140	4.82	5.24	5.37	4.28	3.65	4.56	5.35	5.27	4.91	4.87	4.68	3.92	4.30	4.01	4.79	5.18
145	5.15	5.37	4.87	4.17	3.75	4.42	5.15	4.99	4.63	4.77	4.62	3.90	4.48	4.06	4.37	5.18
150	5.10	5.06	4.23	4.21	3.97	4.29	5.11	4.91	4.63	4.85	4.46	3.94	4.65	4.24	4.06	4.63
155	4.59	4.46	4.17	4.17	4.34	4.24	4.54	4.90	4.65	4.78	4.29	3.97	4.70	4.42	4.14	3.84
160	3.87	3.81	4.03	4.21	4.56	4.33	4.37	4.21	4.16	4.22	4.22	4.03	4.89	5.02	4.42	3.98
165	3.80	3.81	4.04	4.48	5.16	5.06	4.51	4.36	4.24	4.26	4.32	4.48	5.12	5.70	5.02	4.44
170	3.83	3.81	4.27	4.84	5.85	5.20	4.74	4.35	4.30	4.22	4.36	4.55	5.18	6.16	5.40	4.67
175	3.78	4.04	4.45	5.07	6.35	5.38	4.88	4.35	3.97	4.08	4.18	4.39	5.16	6.43	5.46	4.81
180	3.83	4.08	4.41	5.03	6.26	5.38	4.83	4.26	3.88	3.76	4.09	4.39	5.07	6.29	5.43	4.72

**2.3 Performance Assessment:**

Model name	CCT(K)	Total Luminous (lm)	Power (W)	Luminous Efficacy (lm/W)
ZS-T8Y2460T-30	3000K	7812	57.42	136.05
ZS-T8Y2460T-35	3500K	7842*1	57.59*2	136.17*3
ZS-T8Y2460T-40	4000K	7873*1	57.59*2	136.71*3
ZS-T8Y2460T-45	4500K	7903*1	57.59*2	137.23*3
ZS-T8Y2460T-50	5000K	7933	57.75	137.37

\*1: This value is calculated and the calculation formula is as below:

$$7842 = (7933 - 7812) / 4 * 1 + 7812$$

$$7873 = (7933 - 7812) / 4 * 2 + 7812$$

$$7903 = (7933 - 7812) / 4 * 3 + 7812$$

\*2: This value is calculated and the calculation formula is as below:

$$57.59 = (57.42 + 57.75) / 2$$

\*3: This value is calculated and the calculation formula is as below:

$$136.17 = 7842 / 57.59$$

$$136.71 = 7873 / 57.59$$

$$137.37 = 7903 / 57.59$$

### 3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2017-07-01	2018-06-30
ST-R-327	Spectral analysis system HAAS-2000	2017-07-01	2018-06-30
D204	Standard Lamp	2017-07-12	2018-07-11
PF2010	Power Meter for Integrating Sphere	2017-07-01	2018-06-30
GO-R5000	Goniophotometer system	2017-07-01	2018-06-30
D908S	Standard Lamp	2017-07-12	2018-07-11
PF210	Power Meter for Goniophotometer	2017-07-07	2018-07-06
Expand Uncertainty: Photometric Measurement (Sphere):2.04%, k=2 Chromaticity Measurement(Sphere):28.8K, k=2 Photometric Measurement(Goniophotometer):2.36%, k=2			

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

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