



Report No.: GZE160820-B

NVLAP LAB CODE 201011-0

LM-79-08 Test Report

For

LIGHT EFFICIENT DESIGN

(Brand Name:N/A)

188 S. Northwest Highway Cary, IL60013

LED Lamp

Model name(s): LED-7311-35A

Representative (Tested) Model: LED-7311-35A (3500K)

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Aug 19,2016

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.

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2


Address: Standard-Tech Building, No.6 Guanhong Road,Guangzhou Science City, Guangzhou 510663, China

Tel: 8620-3229 0320

Fax: 8620-32290422

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-7311-35A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Lamp	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	7W	
Rated Initial Lamp Lumen	--	
Declared CCT	3500K	
LED Manufacturer	Samsung Electronics LED Business	
LED Model	SPMWHT327F*****	
Sample Number	GZE160820-B1(3500K)	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s
Photo		
		

1.2 Test Specifications:

Date of Receipt	Aug 13,2016
Date of Test	Aug.14,2016
Test item	<ol style="list-style-type: none"> 1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. Electrical Parameters
Reference Standard	<ol style="list-style-type: none"> 1. IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products 2. ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products 3. CIE 13.3-1995 Method of Measuring and Specifying Colour Rendering Properties of Light Sources 4. CIE 15-2004 Technical Report Colorimetry 5. IESNA LM-16-93 Practical Guide to Colorimetry of Light Source 6. IESNA TM-16-05 Technical Memorandum on Light Emitting Diode (LED) Sources and Systems
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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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)

Test date	2016-08-14	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-7311-35A(3000K)		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160820-B1	120.0	60	0.0632	6.85	0.9030	18.57

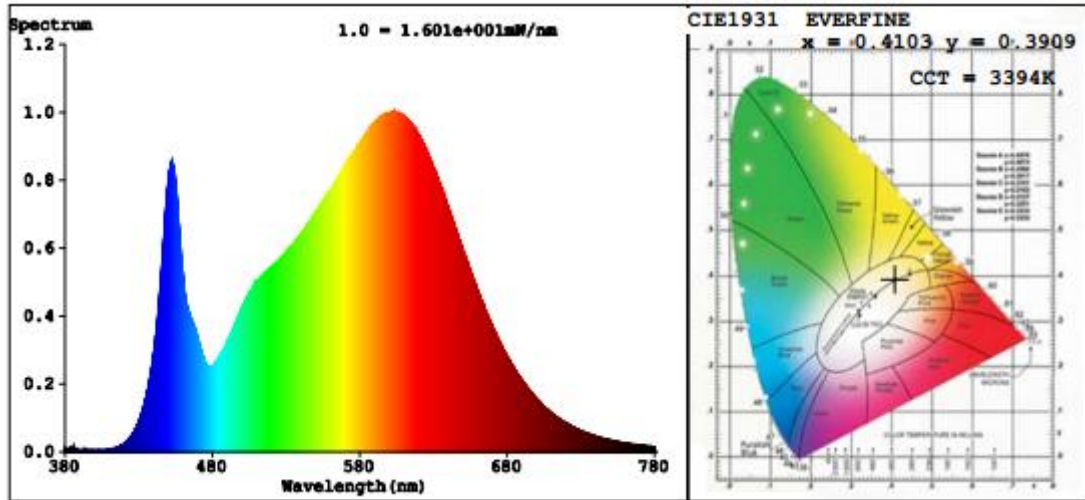
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	19
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	3394	R3	97	R11	83
Duv	-0.0010	R4	83	R12	70
Chromaticity (x, y)	x=0.4103 y=0.3909	R5	84	R13	86
Chromaticity (u', v')	u'=0.2389 v'=0.5121	R6	90	R14	99
Color Rendering Index (CRI)	85.1	R7	85	R15	78
R9	19	R8	65	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	883.67
Luminous Efficacy (lm/W)	129.00
Beam Angle (°)	110.4
Center Beam Candle Power (cd)	287

Spectral Power Distribution & Chromaticity Diagram

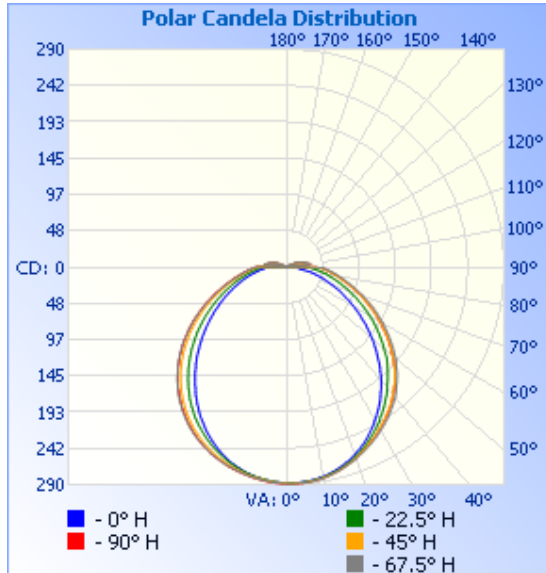


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	222.8	25.2%
0-40	363.7	41.2%
0-60	639.3	72.3%
60-90	216.5	24.5%
70-100	124.8	14.1%
90-120	26.2	3%
0-90	855.8	96.8%
90-180	27.9	3.2%
0-180	883.6	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	27.2	3.1%	90-100	11.0	1.2%
10-20	77.9	8.8%	100-110	10.8	1.2%
20-30	117.6	13.3%	110-120	4.5	0.5%
30-40	141.0	16.0%	120-130	0.7	0.1%
40-50	145.1	16.4%	130-140	0.3	0%
50-60	130.4	14.8%	140-150	0.3	0%
60-70	102.7	11.6%	150-160	0.2	0%
70-80	70.8	8.0%	160-170	0.1	0%
80-90	43.0	4.9%	170-180	0.0	0%

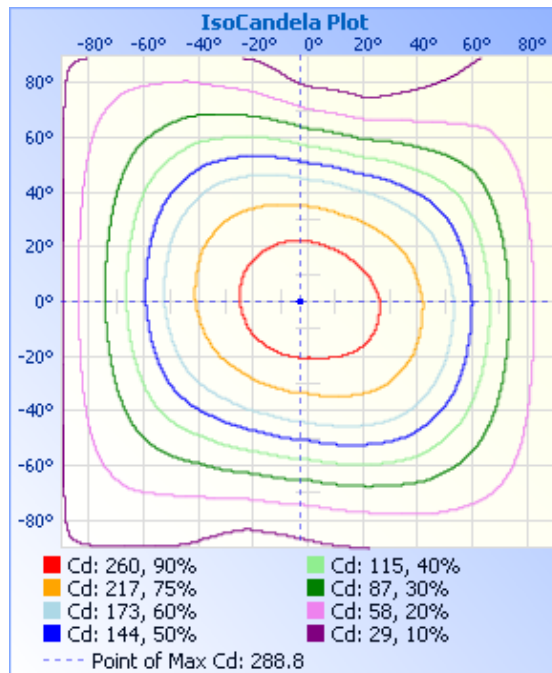
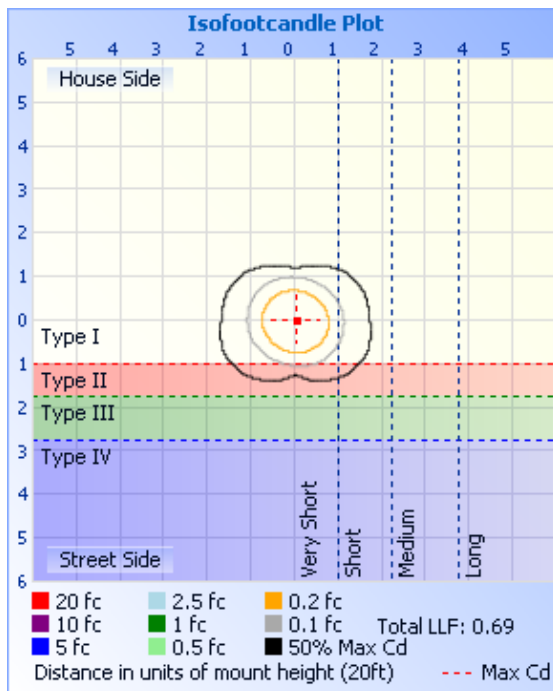
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	0.99 fc	42.0 ft	57.9 ft
34.0ft	0.25 fc	84.0 ft	115.9 ft
51.0ft	0.11 fc	126.1 ft	173.8 ft
68.0ft	0.06 fc	168.1 ft	231.7 ft
85.0ft	0.04 fc	210.1 ft	289.7 ft
102.0ft	0.03 fc	252.1 ft	347.6 ft

■ Vert. Spread: 102.0°
■ Horiz. Spread: 119.2°



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Candela Table - Type C

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	287	287	288	288	289	288	288	288	287	287	288	288	289	288	288	288	287
1	288	287	288	288	289	289	288	288	287	287	288	288	288	288	288	288	288
2	288	288	288	289	289	289	288	287	287	287	287	288	288	288	288	287	288
3	287	288	288	288	289	288	288	287	287	286	287	287	288	288	287	287	287
4	287	287	288	288	288	288	287	287	286	286	286	287	287	287	287	287	287
5	287	287	288	288	288	288	287	286	285	285	286	286	287	287	286	286	287
6	286	287	287	288	288	287	286	286	285	284	285	286	286	286	286	286	286
7	286	286	287	287	287	287	286	285	284	283	284	285	285	285	285	285	286
8	285	286	286	287	287	286	285	284	282	282	283	284	285	284	284	284	285
9	284	285	286	286	286	285	284	283	282	281	283	283	284	284	283	283	284
10	283	284	285	285	285	285	283	282	280	280	282	283	283	282	282	282	283
11	282	283	284	284	284	283	282	280	279	279	281	282	282	281	281	280	282
12	281	282	283	283	283	282	280	279	277	278	280	281	281	280	279	279	281
13	279	281	282	282	282	281	279	277	275	276	278	280	280	279	278	278	279
14	278	279	280	281	280	280	277	276	274	274	277	279	279	278	276	276	278
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23	258	262	264	266	264	262	257	253	252	256	263	266	266	261	257	255	258
24	256	260	262	264	262	260	254	250	249	254	261	264	264	260	254	252	256
25	253	257	260	262	260	257	251	247	246	251	259	262	262	257	251	249	253
26	249	254	258	260	258	255	248	244	243	248	257	260	260	255	249	246	249
27	246	252	256	258	256	252	245	241	239	246	254	258	258	253	246	243	246
28	243	248	253	256	253	249	241	237	235	243	252	256	255	250	243	239	243

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29	239	246	251	254	252	246	238	233	232	241	250	254	253	248	240	236	239
30	236	243	248	251	248	243	235	229	229	237	247	251	251	245	237	232	236
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60	103	127	143	148	143	130	111	102	105	120	135	142	142	131	110	94	103

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61	98	123	139	144	139	127	108	98	101	116	131	137	138	127	105	89	98
62	94	119	135	139	135	122	104	95	97	112	127	133	133	123	100	85	94
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64	85	110	127	131	126	114	96	87	90	105	118	124	124	113	91	77	85
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76	40	66	81	84	81	72	58	49	53	63	72	76	77	68	47	28	40
77	37	62	77	81	77	70	55	47	50	60	69	73	73	65	43	26	37
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84	17	42	57	61	58	51	38	27	34	43	50	53	53	46	26	7	17
85	17	40	55	58	56	49	37	25	32	41	48	51	51	43	23	5	17
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89	12	30	44	48	44	39	28	18	25	34	40	42	42	34	17	1	12
90	9	25	29	31	24	25	21	14	19	29	38	40	40	32	15	1	9
91	4	5	6	8	4	2	5	7	8	9	22	26	28	17	9	0	4
92	0	1	1	1	1	1	1	1	1	1	3	10	6	2	1	0	0

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93	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	0
94	0	1	2	1	2	9	1	1	1	2	1	1	1	2	1	0	0
95	2	5	12	3	11	19	5	0	2	9	4	1	2	8	1	0	2
96	4	7	30	22	30	18	14	1	5	16	21	11	15	10	5	0	4
97	5	7	31	32	32	18	17	4	9	15	28	25	28	10	7	0	5
98	5	6	29	32	31	17	15	7	9	14	27	29	28	9	7	0	5
99	4	5	28	31	29	16	13	6	6	13	26	27	27	9	6	0	4
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101	2	3	25	28	27	14	7	4	2	5	24	25	25	8	3	0	2
102	1	5	24	26	25	13	5	3	1	9	23	24	24	8	2	0	1
103	0	5	23	25	24	12	4	1	1	10	22	23	23	7	2	0	0
104	0	4	21	24	23	12	4	1	1	9	20	22	21	7	2	0	0
105	0	4	21	23	22	11	3	0	1	8	19	21	20	7	1	0	0
106	0	4	19	22	21	10	2	1	1	7	18	20	19	6	1	0	0
107	0	3	18	21	19	9	1	1	1	6	17	19	18	6	1	0	0
108	0	3	17	19	18	8	0	1	1	5	16	18	17	5	1	0	0
109	0	3	16	18	17	8	0	1	1	5	15	17	17	5	1	0	0
110	0	2	15	17	16	7	0	1	1	4	14	16	16	4	1	0	0
111	0	2	14	16	15	6	0	2	1	3	13	16	14	4	1	0	0
112	0	1	13	16	14	5	0	2	1	2	12	15	13	3	1	0	0
113	0	1	11	14	13	4	0	2	1	2	11	14	12	3	1	0	0
114	0	1	10	13	11	3	0	2	1	1	10	13	11	2	0	0	0
115	0	0	9	12	10	2	0	2	1	1	8	12	10	2	0	0	0
116	0	0	7	11	9	2	0	3	1	1	7	10	9	1	0	0	0
117	0	0	6	9	7	1	1	3	1	1	6	9	7	1	0	0	0
118	0	0	5	8	6	0	1	3	1	1	5	8	6	0	0	0	0
119	0	0	4	7	5	0	0	3	1	0	3	7	5	0	0	0	0
120	0	0	2	5	4	0	0	3	1	0	2	6	4	0	0	0	0
121	0	0	1	4	3	0	0	3	1	0	2	4	3	0	0	0	0
122	0	0	1	3	2	0	0	3	0	0	1	3	2	0	0	0	0
123	0	0	0	2	1	0	0	3	0	0	0	2	1	0	0	0	0
124	0	0	0	1	0	0	0	3	0	0	0	1	0	0	0	0	0

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125	0	0	0	1	0	0	0	3	0	0	0	1	0	0	0	0	0
126	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	0
128	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
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134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
136	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
138	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
143	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
144	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
146	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
148	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
149	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
151	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
152	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
154	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
156	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0

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

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157	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0
158	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
159	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
160	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
161	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
162	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
163	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
164	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
165	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
166	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0
167	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0
168	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0
169	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
170	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-336	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-331	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-01	2017-06-30
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
EE-09	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-01	2017-06-30
PF210	Power Meter for Goniophotometer	2016-07-01	2017-06-30
ST-R-181A	Temperature Tester	2016-07-01	2017-06-30
Uncertainty: Photometric Measurement (Sphere):1.74% Chromaticity Measurement(Sphere):14.3K Photometric Measurement(Goniophotometer):1.62%			

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