



Report No.: GZE160820-K

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-7322-35-A

Representative (Tested) Model: LED-7322-35-A

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

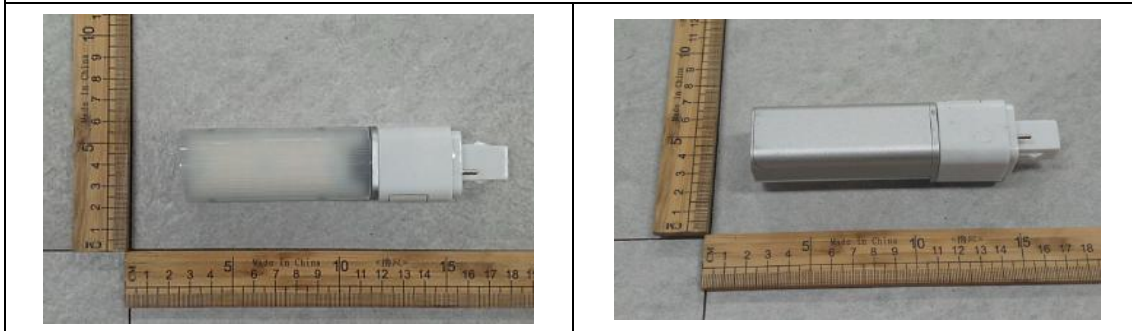
Report Format Number STD/QR4909-A/2

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-7322-35-A	
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-K1(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

<p>1) Photometric and Light Distribution Measurement – Goniophotometer Method:</p> <p>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.</p>
<p>2) Chromaticity Measurement – Sphere-Spectroradiometer Method:</p> <p>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.</p>
<p>3) Electrical Measurements:</p> <p>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.</p>

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-7322-35-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE160820-K1	120.0	60	0.0618	6.69	0.9022	18.93

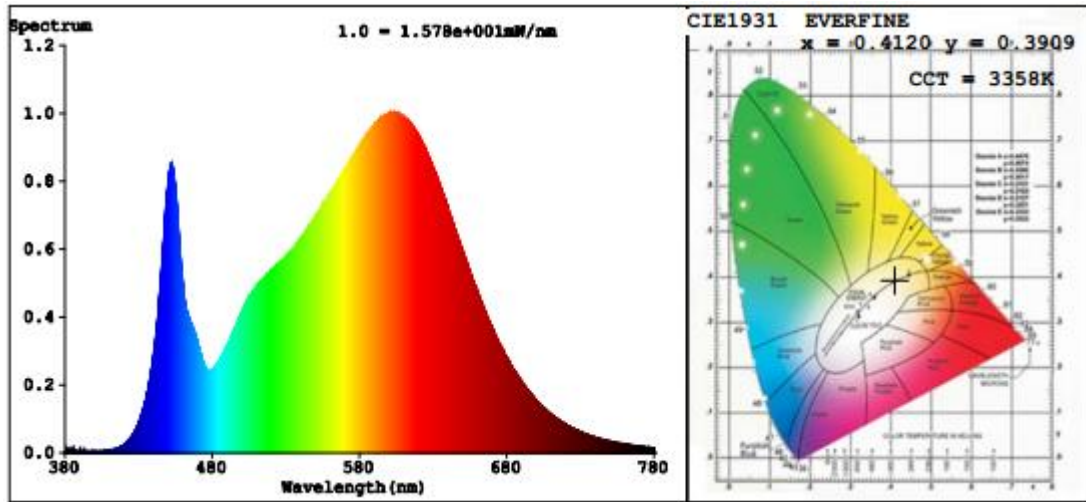
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	84	R9	18
Frequency (Hz)	60	R2	92	R10	82
CCT (K)	3358	R3	97	R11	83
Duv	-0.0013	R4	83	R12	70
Chromaticity (x, y)	x=0.4120 y=0.3909	R5	84	R13	86
Chromaticity (u', v')	u'=0.2400 v'=0.5124	R6	90	R14	99
Color Rendering Index (CRI)	85.0	R7	85	R15	78
R9	18	R8	65	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result
Test Voltage (V)	120.0
Frequency (Hz)	60
Total Luminous (lm)	869.29
Luminous Efficacy (lm/W)	129.94
Beam Angle (°)	109.5
Center Beam Candle Power (cd)	184

Spectral Power Distribution & Chromaticity Diagram

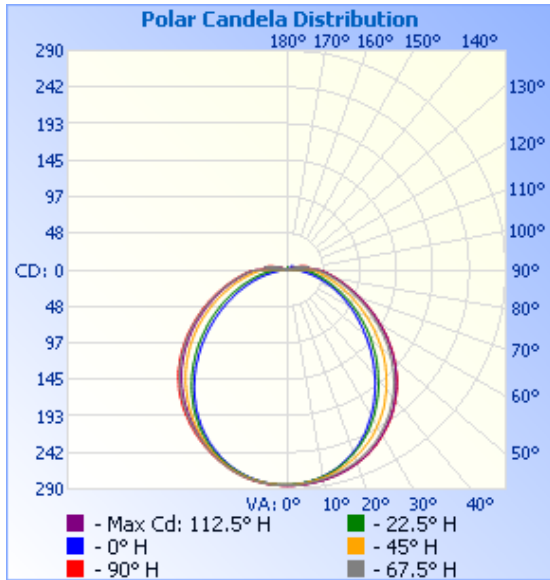


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	220.6	25.4%
0-40	360.1	41.4%
0-60	632.3	72.7%
60-90	215.2	24.8%
70-100	123.5	14.2%
90-120	19.7	2.3%
0-90	847.5	97.5%
90-180	21.8	2.5%
0-180	869.3	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	26.9	3.1%	90-100	9.7	1.1%
10-20	77.1	8.9%	100-110	8.1	0.9%
20-30	116.5	13.4%	110-120	1.9	0.2%
30-40	139.5	16.0%	120-130	0.7	0.1%
40-50	143.4	16.5%	130-140	0.4	0%
50-60	128.8	14.8%	140-150	0.4	0.1%
60-70	101.3	11.7%	150-160	0.3	0%
70-80	70.3	8.1%	160-170	0.2	0%
80-90	43.6	5.0%	170-180	0.0	0%

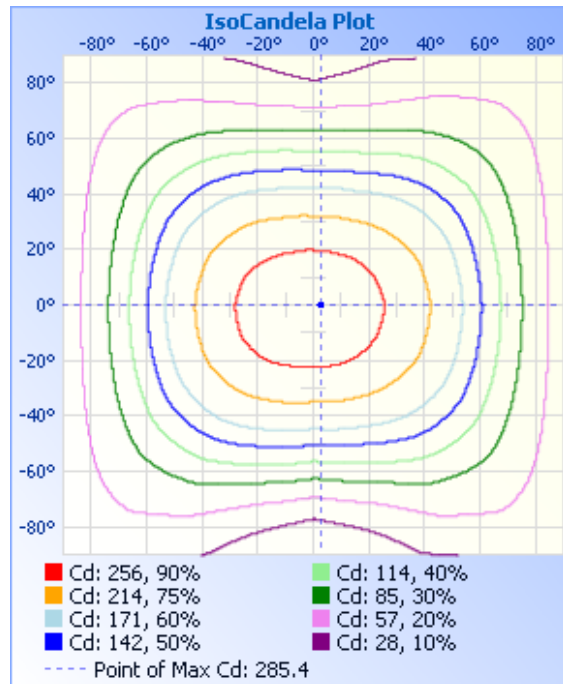
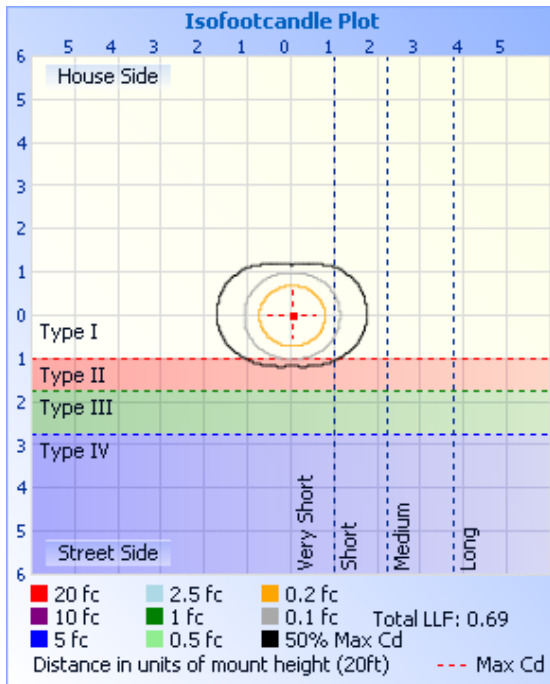
Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width	
17.0ft	0.98 fc	39.9 ft	59.1 ft
34.0ft	0.25 fc	79.9 ft	118.3 ft
51.0ft	0.11 fc	119.8 ft	177.4 ft
68.0ft	0.06 fc	159.8 ft	236.5 ft
85.0ft	0.04 fc	199.7 ft	295.7 ft
102.0ft	0.03 fc	239.6 ft	354.8 ft

■ Vert. Spread: 99.2°
■ Horiz. Spread: 120.2°



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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	284	284	284	285	285	285	285	284	284	284	284	285	285	285	285	284	284
1	284	284	284	285	285	285	285	284	284	284	284	285	285	285	285	283	284
2	284	284	284	285	285	285	285	284	284	284	284	285	285	285	284	283	284
3	284	283	284	284	285	285	285	284	284	284	284	285	285	285	284	283	284
4	283	283	283	284	285	285	284	283	284	284	284	284	285	284	284	282	283
5	282	282	283	284	284	285	284	283	283	283	283	284	284	284	283	282	282
6	282	282	282	283	284	284	284	282	282	283	283	284	284	283	282	281	282
7	281	281	281	283	283	284	283	282	282	282	282	283	283	283	282	280	281
8	280	280	281	282	283	283	283	281	281	281	282	282	283	282	281	279	280
9	279	279	280	281	282	283	282	280	280	280	281	282	282	281	280	278	279
10	277	277	279	281	282	282	281	279	279	279	280	281	281	280	279	277	277
11	276	276	278	280	281	281	280	279	278	278	279	280	280	279	278	275	276
12	274	275	277	279	280	281	279	277	276	277	278	279	279	278	276	273	274
13	273	273	275	278	280	280	278	276	275	276	277	278	278	277	275	272	273
14	271	271	274	277	279	279	277	275	273	274	275	277	277	276	273	271	271
15	269	269	272	276	278	278	276	273	272	272	274	275	275	274	272	269	269
16	266	267	271	275	277	277	275	271	270	271	272	273	274	272	270	267	266
17	264	265	269	274	276	276	273	270	268	269	270	272	272	271	268	264	264
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21	254	256	262	268	271	270	267	261	258	260	263	264	265	263	260	255	254
22	251	253	260	266	269	269	265	259	256	258	261	263	263	261	257	252	251
23	248	250	258	264	268	267	263	257	253	255	258	260	261	259	255	249	248
24	244	247	255	263	266	266	261	254	250	253	256	259	259	257	252	246	244
25	242	245	253	261	264	264	259	252	247	250	253	256	257	255	249	244	242
26	238	241	250	258	262	261	256	249	244	247	251	254	255	252	246	240	238
27	234	238	248	257	260	259	254	246	241	244	248	252	253	250	244	237	234
28	230	235	245	254	258	257	252	243	237	241	245	249	250	247	241	234	230

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29	227	231	242	252	256	254	249	240	235	238	242	247	248	245	238	230	227
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56	112	121	139	154	161	160	149	128	114	124	145	159	160	154	139	119	112
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58	104	112	129	146	152	151	139	119	105	115	137	150	152	146	131	111	104
59	101	109	126	141	147	147	135	114	100	110	132	146	147	142	126	107	101

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60	97	104	121	136	142	142	131	110	95	106	129	142	144	138	122	104	97
61	93	101	118	132	138	138	127	105	91	102	124	137	139	133	119	100	93
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88	17	28	37	45	48	47	37	18	2	17	37	47	48	47	39	28	17
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90	14	22	32	40	43	41	32	14	1	13	27	32	35	32	26	19	14

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91	7	11	11	22	26	23	13	9	0	5	8	8	11	9	7	8	7
92	1	1	1	6	9	3	1	1	1	1	1	1	1	1	1	1	1
93	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0
94	0	1	1	1	1	1	2	0	1	1	2	1	1	1	2	1	0
95	0	1	4	2	1	2	6	1	0	1	6	8	2	7	6	2	0
96	1	4	8	18	9	19	6	3	0	4	6	26	18	26	9	5	1
97	8	7	7	28	24	29	6	5	0	5	6	29	30	29	8	8	8
98	14	7	7	28	30	28	6	3	0	3	6	27	29	28	8	8	14
99	14	5	6	26	28	26	5	2	0	2	5	26	27	26	7	5	14
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103	11	1	4	20	22	20	4	0	0	0	3	19	21	19	4	1	11
104	6	1	3	18	20	18	3	0	0	0	3	17	19	17	4	1	6
105	4	1	2	16	18	16	2	0	0	0	2	15	17	16	3	1	4
106	8	1	2	14	16	14	2	0	0	0	2	13	15	14	3	1	8
107	12	1	1	12	14	12	2	0	0	0	2	11	14	12	2	1	12
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110	11	1	1	7	9	7	0	0	0	0	1	7	9	7	1	1	11
111	11	1	0	6	8	6	0	0	0	0	0	6	8	6	1	1	11
112	11	1	0	4	6	4	0	0	0	0	0	5	7	5	1	1	11
113	11	1	0	3	5	3	0	0	0	0	0	4	5	4	1	1	11
114	10	1	0	2	4	2	0	0	0	0	0	2	4	2	1	1	10
115	10	1	0	1	3	1	0	0	0	0	0	1	3	1	1	1	10
116	10	1	0	1	2	0	0	0	0	0	0	1	2	1	1	1	10
117	10	1	0	0	1	0	0	0	0	0	0	0	1	0	1	1	10
118	10	1	0	0	1	0	0	0	0	0	0	0	1	1	1	1	10
119	9	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	9
120	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9
121	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9

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122	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9
123	9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	9
124	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8
125	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8
126	8	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	8
127	8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	8
128	7	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	7
129	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
134	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
135	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
136	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
137	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1
138	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
139	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
140	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
141	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
142	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
143	1	3	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1
144	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1
145	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
146	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
147	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
148	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
149	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
150	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
151	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
152	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1

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153	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
154	1	3	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
155	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
156	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	3	1
157	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	2	1
158	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	2	1
159	0	2	1	0	0	0	0	0	0	0	0	0	0	0	1	2	0
160	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	2	1
161	0	2	1	0	0	0	0	1	0	0	0	0	0	0	1	2	0
162	0	2	1	0	0	0	0	1	0	0	0	0	0	0	1	2	0
163	1	2	1	0	0	0	0	1	0	0	0	0	0	0	1	2	1
164	0	2	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0
165	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
166	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
167	0	1	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0
168	0	1	1	0	0	0	0	1	0	0	0	0	0	0	1	1	0
169	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0
170	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0
171	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0
172	0	1	1	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	0
174	0	1	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	0
176	0	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	0
178	0	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	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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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 *******

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