

**LM-79-08 Test Report**

For

**LIGHT EFFICIENT DESIGN, LLC****(Brand Name: N/A)**

188 S.Northwest Highway, Cary, IL60013, USA

**LED Lamps**

Model name(s): LED-8144M40C-A

Representative (Tested) Model: LED-8144M40C-A

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

Test &amp; Report By:

*Garman Mo*

Engineer: Garman Mo

Date: May.23,2018

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

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

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**1.1 Product Information:**

Organization Name	LIGHT EFFICIENT DESIGN, LLC		
Brand Name	N/A		
Model Number	LED-8144M40C-A		
SKU (if available)	N/A		
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Lamps		
Rated Voltage / Frequency	220 -347Vac, 50/60 Hz		
Nominal Power	30W		
Rated Initial Lamp Lumen	--		
Declared CCT	4000K		
LED Manufacturer	SAMSUNG ELECTRONICS CO., LTD		
LED Model	SPMWH1228FD5WAT0SE		
Sample Number	GZE1801030-H-X1		
Luminaire Aperture (for downlights)	--	in.	
Luminaire Length	--	mm	
Luminaires Width	--	mm	
Number of Units (modular products)	N/A	s	
Photo			
			

Laboratory: Standard-Tech Co., Ltd Testing Center

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**1.2 Test Specifications:**

Date of Receipt	May.15,2018
Date of Test	May.16,2018
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  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , 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 277 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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  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 277 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 277 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	2018-05-16	Test Ambient:	25.2 °C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8144M40C-A		

**Electrical Measurement:**

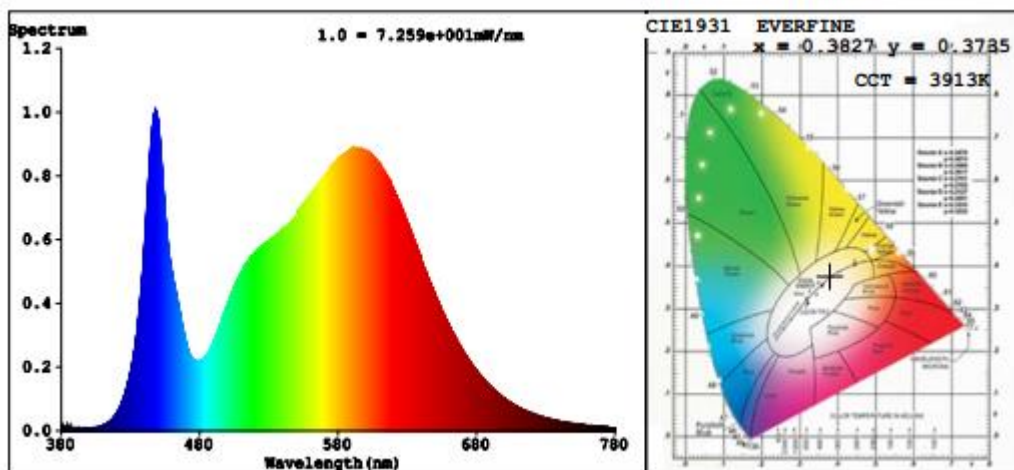
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180103	277.0	60	0.1189	31.56	0.9581	11.35
0-H-X1	347.0	60	0.1005	31.63	0.9073	15.26

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

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	80	R9	3
Frequency (Hz)	60	R2	88	R10	72
CCT (K)	3913	R3	94	R11	80
Duv	-0.0022	R4	8/1	R12	64
Chromaticity (x, y)	x=0.3827 y=0.3735	R5	81	R13	82
Chromaticity (u', v')	u'=0.2279 v'=0.5005	R6	84	R14	97
Color Rendering Index (CRI)	81.8	R7	84	R15	74
R9	3	R8	62	--	--

**Photometric Measurement – Goniophotometer Method:**

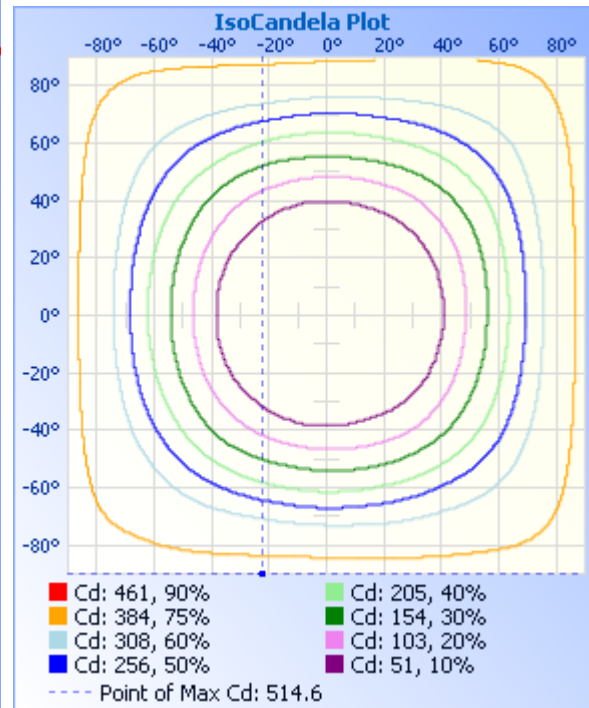
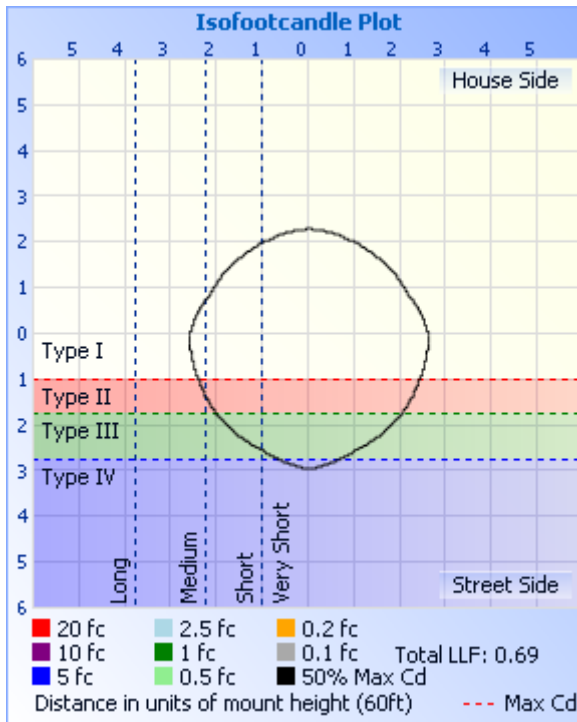
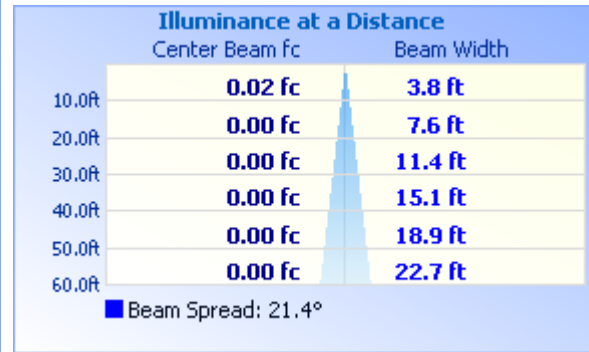
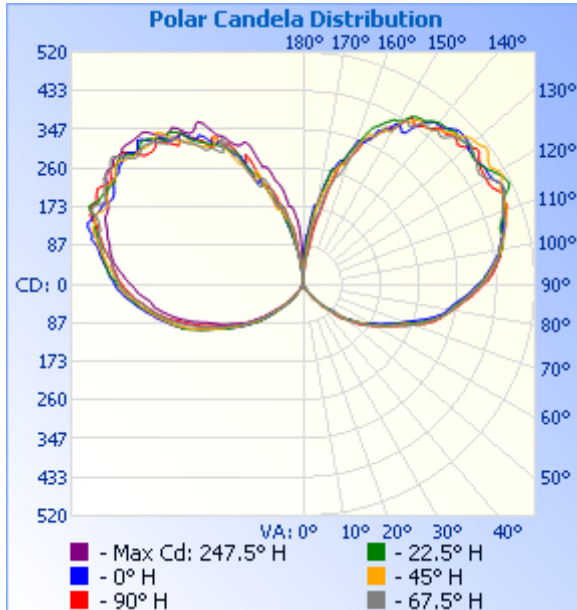
Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	3922.6	3912.6
Luminous Efficacy (lm/W)	124.29	123.70
Most worst Luminous/Highest Watts	123.70	
Beam Angle (°)	322.8	--
Center Beam Candle Power (cd)	2	--

**Spectral Power Distribution & Chromaticity Diagram**

**Zonal Lumen Tabulation**

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	5.4	0.1%
0-40	26.5	0.7%
0-60	231.3	5.9%
60-90	961.6	24.5%
70-100	1,205.6	30.7%
90-120	1,454.1	37.1%
0-90	1,192.9	30.4%
90-180	2,729.8	69.6%
0-180	3,922.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	0.2	0.0%	90-100	470.1	12%
10-20	1.1	0.0%	100-110	498.2	12.7%
20-30	4.1	0.1%	110-120	485.8	12.4%
30-40	21.1	0.5%	120-130	436.7	11.1%
40-50	66.3	1.7%	130-140	361.1	9.2%
50-60	138.6	3.5%	140-150	260.3	6.6%
60-70	226.1	5.8%	150-160	151.8	3.9%
70-80	326.4	8.3%	160-170	57.9	1.5%
80-90	409.1	10.4%	170-180	7.8	0.2%

**Photometric Data**



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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	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	2	2	2	2	2	2	3	3	3	2	2	2	2	2	2	2	2
10	2	2	2	2	2	3	3	3	3	3	2	2	2	2	2	2	2
11	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	2
12	2	2	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2
13	2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2
14	3	3	3	3	3	3	4	4	4	4	3	3	3	3	3	3	3
15	3	3	3	3	4	4	4	4	4	4	4	3	3	3	3	3	3
16	3	3	3	4	4	4	5	5	5	4	4	4	3	3	3	3	3
17	3	3	4	4	4	5	5	5	5	5	4	4	4	4	3	3	3
18	4	4	4	4	5	5	5	6	5	5	5	5	4	4	4	4	4
19	4	4	4	5	5	6	6	6	6	6	5	5	5	4	4	4	4
20	5	5	5	5	6	6	7	6	6	6	6	5	5	5	5	4	5
21	5	5	5	6	6	7	7	7	7	7	6	6	5	5	5	5	5
22	5	6	6	7	7	7	8	8	8	7	7	6	6	6	6	5	5
23	6	6	7	7	7	8	8	9	9	8	8	7	6	6	6	6	6
24	6	7	7	8	8	8	9	9	9	8	8	7	7	7	7	6	6
25	7	7	8	8	9	9	9	10	10	9	9	8	8	8	7	7	7
26	8	8	9	9	9	10	10	11	11	10	9	9	8	8	8	8	8
27	9	9	10	10	10	11	11	12	12	11	10	9	9	9	9	8	9
28	10	10	10	11	11	12	12	13	13	13	11	10	9	10	9	9	10

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29	10	11	11	12	12	13	14	14	14	14	13	11	10	10	10	10	10
30	12	12	12	13	14	14	15	16	16	15	13	12	12	12	11	12	12
31	13	14	14	16	19	17	19	21	22	18	16	14	13	13	12	12	13
32	14	16	18	22	22	23	25	26	28	23	20	15	14	15	14	14	14
33	17	20	24	27	26	26	28	31	29	30	26	21	19	19	17	16	17
34	24	28	28	29	30	34	34	33	37	33	29	27	23	22	21	20	24
35	29	29	32	32	36	33	35	39	39	40	35	30	28	27	27	25	29
36	31	35	37	35	38	42	44	41	46	44	37	35	31	31	31	33	31
37	39	39	43	41	46	44	44	47	48	47	42	40	35	34	35	36	39
38	42	41	47	46	47	47	52	49	50	52	47	45	41	39	40	41	42
39	46	49	49	48	51	54	57	54	56	56	49	48	47	43	44	47	46
40	52	51	54	56	56	61	58	62	63	61	56	50	49	46	49	51	52
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42	58	61	64	65	68	67	74	71	71	71	65	65	61	57	56	59	58
43	67	69	69	72	73	75	79	79	75	78	73	69	67	62	61	65	67
44	75	72	76	78	78	82	84	85	84	84	78	74	73	67	68	71	75
45	78	76	82	85	84	90	90	95	93	91	85	80	78	72	74	76	78
46	81	83	89	91	96	98	98	103	100	98	89	88	85	79	78	79	81
47	85	91	94	99	107	106	110	112	108	104	96	96	93	86	84	85	85
48	94	100	101	109	112	114	121	118	113	112	103	103	102	92	90	93	94
49	105	107	108	114	117	121	127	124	121	124	114	110	109	99	99	101	105
50	114	116	117	121	119	127	130	131	127	132	124	117	115	107	106	111	114
51	122	123	127	130	126	133	135	136	135	136	131	125	122	114	112	118	122
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53	132	136	139	141	141	146	147	152	149	146	143	138	136	128	129	132	132
54	140	142	144	146	151	153	154	160	156	153	150	145	144	135	133	140	140
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56	156	155	155	160	163	168	171	173	170	168	165	159	156	147	149	155	156
57	162	160	162	165	169	176	180	180	177	176	174	168	163	155	155	162	162
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59	172	174	178	179	182	190	193	194	190	193	186	181	176	168	169	173	172
60	177	182	185	187	186	198	201	201	197	199	194	189	184	176	175	179	177

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61	182	188	191	195	194	206	209	208	205	205	203	194	189	182	182	185	182
62	189	194	203	200	199	213	216	216	212	215	211	203	197	191	191	192	189
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66	218	222	225	228	230	248	256	257	252	252	252	237	231	215	213	217	218
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93	411	415	416	420	425	442	434	439	436	436	427	421	420	407	401	405	411
94	417	421	422	426	429	446	438	441	440	439	430	426	423	414	408	412	417
95	422	427	426	430	434	447	442	443	445	443	437	429	429	420	415	418	422
96	429	433	432	435	437	447	444	447	450	446	443	431	431	424	420	425	429
97	432	438	436	439	442	450	448	450	454	450	448	435	434	431	427	431	432
98	439	445	443	443	446	453	451	453	460	454	452	440	441	433	430	433	439
99	444	448	447	444	448	454	454	456	463	457	458	445	447	436	435	438	444
100	446	453	452	446	451	456	458	460	467	460	463	455	453	439	439	440	446
101	450	456	453	450	453	460	462	465	475	466	469	461	458	444	445	442	450
102	453	458	457	455	456	465	467	471	486	470	474	463	462	449	449	445	453
103	458	460	462	459	458	468	471	475	485	473	479	470	467	452	452	450	458
104	461	461	465	464	463	471	476	477	494	478	486	472	473	454	454	452	461
105	463	459	468	467	468	475	478	481	500	482	489	471	477	455	456	455	463
106	465	460	471	471	471	479	477	486	502	486	485	475	482	454	460	459	465
107	468	464	474	473	475	485	479	494	496	488	487	480	495	458	462	462	468
108	473	469	479	475	476	486	482	501	494	491	491	487	502	466	466	467	473
109	476	473	481	474	482	488	484	501	489	505	489	502	502	471	470	469	476
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111	483	483	486	479	490	497	490	494	484	505	474	497	501	464	483	469	483
112	486	487	489	483	489	499	491	489	481	495	473	484	500	467	489	472	486
113	489	490	490	489	489	496	489	483	472	495	476	482	504	472	491	479	489
114	490	496	491	494	493	491	487	479	469	492	481	487	506	476	494	482	490
115	496	508	491	499	489	491	486	478	469	485	489	493	508	483	497	485	496
116	498	514	492	500	483	491	483	479	472	487	495	495	502	489	502	490	498
117	497	513	497	499	477	492	481	484	476	486	490	500	493	490	505	493	497
118	491	510	506	493	474	499	478	486	482	481	487	506	489	487	501	501	491
119	486	506	510	485	473	507	482	488	486	482	484	506	493	484	492	507	486
120	485	500	507	476	474	510	487	491	485	487	485	503	499	485	488	507	485
121	483	494	501	469	474	510	491	496	483	492	490	504	504	476	487	504	483
122	484	487	495	466	475	503	492	499	488	495	498	510	501	469	487	501	484
123	484	483	497	467	475	497	489	495	490	497	499	515	497	463	488	508	484
124	481	478	499	471	479	497	487	491	490	500	497	514	498	459	487	509	481

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125	476	476	506	475	482	498	482	487	493	498	487	499	504	461	482	503	476
126	477	476	511	477	487	492	473	475	495	493	481	483	502	469	483	503	477
127	478	475	512	481	494	490	462	468	490	483	476	470	490	475	481	507	478
128	478	480	505	484	493	490	457	468	480	475	475	469	473	478	480	506	478
129	478	485	503	486	487	487	455	473	478	473	474	470	458	481	483	503	478
130	482	489	501	489	477	483	455	478	485	478	472	473	455	482	490	500	482
131	489	483	499	487	471	482	454	484	492	484	468	474	451	489	499	499	489
132	490	480	493	480	467	481	450	484	485	482	465	470	451	489	502	497	490
133	490	481	485	478	472	477	447	481	471	477	465	464	452	484	500	496	490
134	490	481	480	475	474	475	437	467	463	468	467	456	458	466	492	492	490
135	489	483	478	468	474	467	434	459	464	462	468	447	452	452	487	477	489
136	483	480	472	457	466	462	434	455	454	447	474	438	442	446	488	463	483
137	478	475	466	452	464	460	434	452	443	449	463	435	431	446	495	458	478
138	472	475	463	455	467	455	436	455	436	455	440	442	418	442	505	454	472
139	470	475	459	458	465	444	429	450	434	452	423	439	422	447	497	455	470
140	469	473	449	453	456	439	417	431	434	446	419	416	436	448	482	458	469
141	468	469	449	449	449	442	407	416	434	434	412	405	436	439	461	450	468
142	459	464	447	451	447	436	408	409	422	413	399	401	416	429	453	433	459
143	455	457	450	452	444	421	404	411	406	403	387	388	412	428	451	423	455
144	445	456	450	443	438	413	397	414	404	395	381	372	403	437	447	422	445
145	427	455	450	431	433	398	388	408	408	388	379	369	392	434	441	425	427
146	410	452	441	426	443	387	380	390	400	380	368	369	371	416	427	432	410
147	406	448	432	432	446	383	374	381	382	374	366	359	369	401	415	434	406
148	414	436	432	435	431	387	368	368	367	372	376	349	387	394	406	426	414
149	418	426	421	416	413	383	359	352	373	362	387	347	387	382	401	405	418
150	414	422	397	396	403	376	348	339	371	353	366	364	366	382	388	385	414
151	400	422	392	396	403	365	326	316	347	344	330	375	354	394	377	381	400
152	389	414	392	398	394	331	299	307	326	337	307	344	359	399	382	372	389
153	385	406	381	388	383	297	290	306	328	334	301	314	341	393	381	357	385
154	383	397	372	371	373	276	286	284	318	298	280	281	306	390	372	348	383
155	365	390	367	356	361	269	286	260	281	284	261	257	300	390	357	343	365
156	352	384	368	357	358	271	281	243	246	272	257	241	319	376	339	342	352

Laboratory: Standard-Tech Co., Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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157	345	368	355	353	345	275	270	238	252	268	275	237	304	356	340	344	345
158	346	352	343	337	323	261	251	209	248	260	270	248	255	345	331	343	346
159	344	332	324	312	315	228	223	199	233	232	238	256	242	330	313	333	344
160	325	323	296	293	300	203	216	184	214	214	212	249	234	314	305	301	325
161	305	309	287	270	285	184	194	169	191	207	177	235	227	307	299	278	305
162	292	291	283	256	289	191	189	169	179	197	176	204	221	303	281	277	292
163	291	279	275	255	278	188	159	157	178	191	186	180	207	286	252	273	291
164	282	268	269	236	246	168	135	155	180	168	178	177	185	278	247	259	282
165	269	266	245	227	223	134	112	137	152	145	158	184	180	280	263	240	269
166	265	263	227	212	191	95	88	125	134	140	150	178	178	250	254	234	265
167	240	239	217	185	163	74	80	122	121	131	150	157	162	225	245	227	240
168	227	216	210	156	150	56	71	107	108	108	144	144	142	214	223	216	227
169	200	188	191	157	131	53	56	82	92	91	123	135	133	196	197	194	200
170	185	179	180	152	112	36	43	62	82	84	93	123	129	174	178	176	185
171	180	170	159	125	82	32	33	58	68	78	85	98	112	171	193	177	180
172	178	153	131	92	69	25	31	40	52	66	76	70	76	178	175	173	178
173	152	125	108	69	63	13	20	29	38	51	58	68	58	173	149	165	152
174	130	113	87	59	62	6	18	21	24	39	43	55	41	140	129	151	130
175	111	95	63	54	34	4	11	7	15	26	29	28	26	121	126	144	111
176	111	86	53	40	30	4	6	4	7	10	13	18	18	111	113	128	111
177	98	66	44	25	20	4	4	4	4	5	5	10	12	96	96	109	98
178	77	55	35	22	22	14	11	13	13	10	6	4	4	70	64	78	77
179	66	52	30	17	9	29	27	28	31	26	15	5	3	49	51	61	66
180	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31

**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 \*\*\*\*\***