

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-8144M30C-A

Representative (Tested) Model: LED-8144M30C-A

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

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN, LLC	
Brand Name	N/A	
Model Number	LED-8144M30C-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	3000K	
LED Manufacturer	SAMSUNG ELECTRONICS CO., LTD	
LED Model	SPMWH1228FD5WAV0SE	
Sample Number	GZE1801030-H-W1	
Luminaire Aperture (for downlights)	--	in.
Luminaire Length	--	mm
Luminaires Width	--	mm
Number of Units (modular products)	N/A	s
Photo		
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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"> 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 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° 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 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-8144M30C-A		

Electrical Measurement:

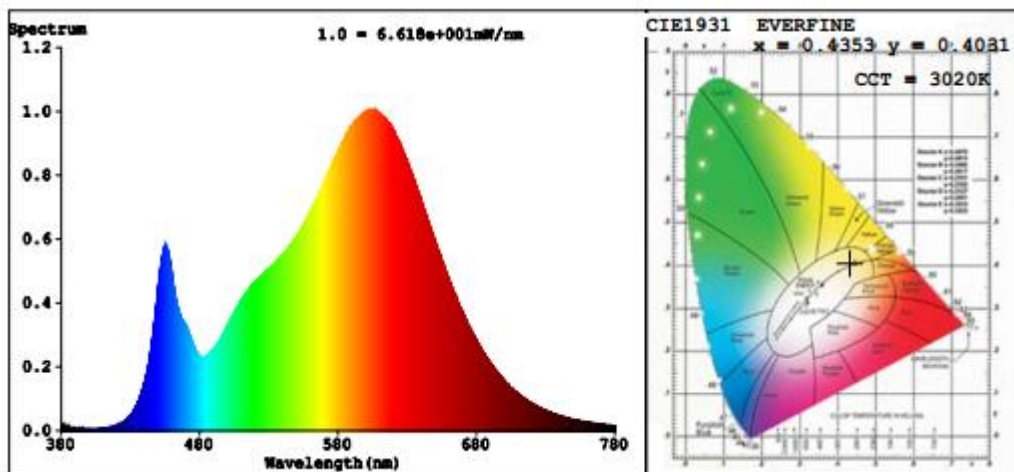
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD %
GZE180103	277.0	60	0.1185	31.35	0.9548	11.48
0-H-W1	347.0	60	0.0997	31.45	0.9089	14.75

Chromaticity Measurement - Sphere-Spectroradiometer Method:

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	82	R9	11
Frequency (Hz)	60	R2	93	R10	84
CCT (K)	3020	R3	95	R11	80
Duv	-0.0002	R4	81	R12	72
Chromaticity (x, y)	x=0.4353 y=0.4031	R5	83	R13	85
Chromaticity (u', v')	u'=0.2499 v'=0.5208	R6	92	R14	98
Color Rendering Index (CRI)	83.4	R7	82	R15	75
R9	11	R8	60	--	--

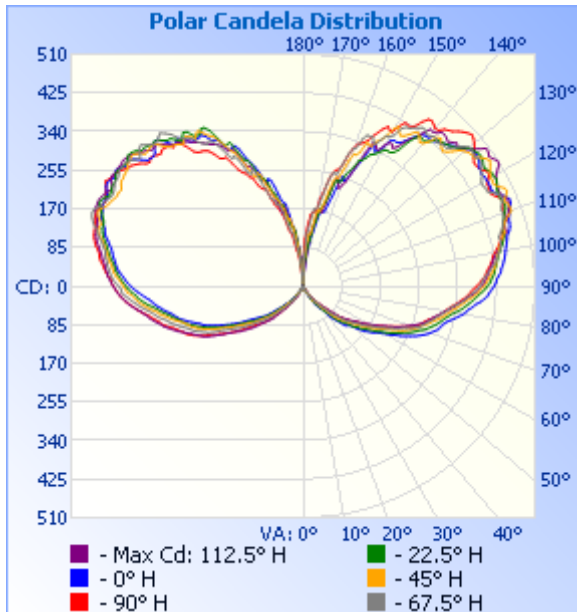
Photometric Measurement – Goniophotometer Method:

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	3836.5	3831.1
Luminous Efficacy (lm/W)	122.38	121.82
Most worst Luminous/Highest Watts	121.82	
Beam Angle (°)	322.4	--
Center Beam Candle Power (cd)	2	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	6.1	0.2%
0-40	28.4	0.7%
0-60	231.9	6%
60-90	949.4	24.7%
70-100	1,180.7	30.8%
90-120	1,420.0	37%
0-90	1,181.3	30.8%
90-180	2,655.4	69.2%
0-180	3,836.7	100%

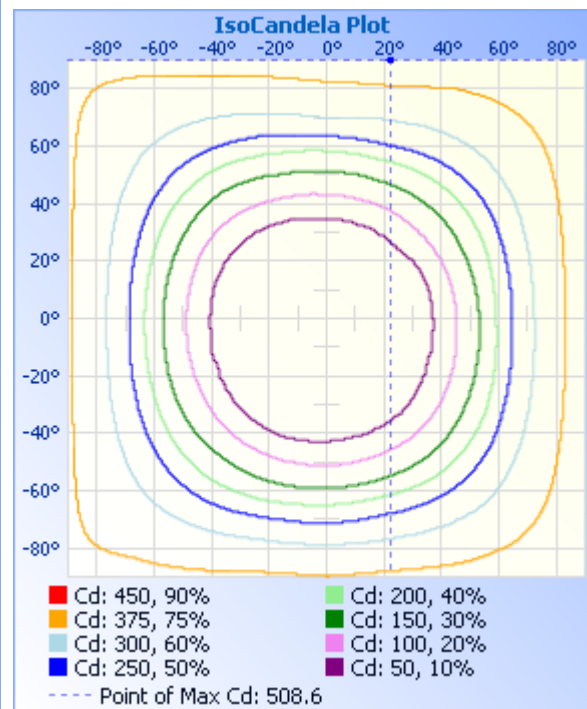
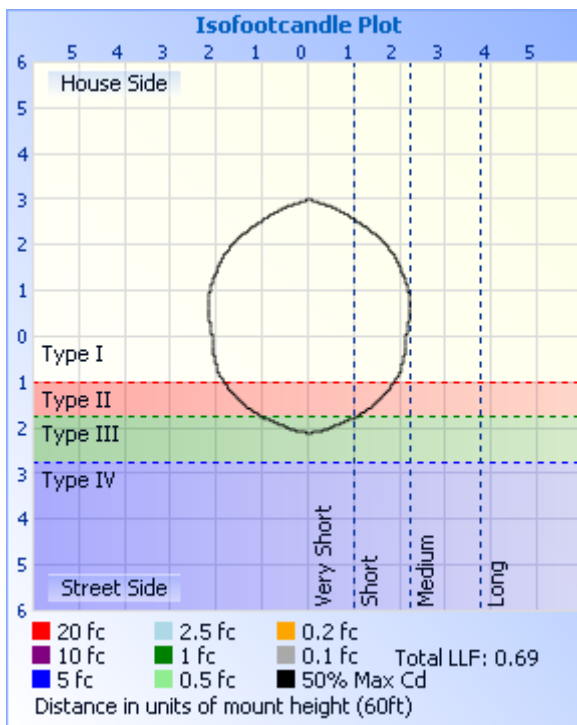
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	0.2	0.0%	90-100	460.6	12%
10-20	1.2	0.0%	100-110	487.3	12.7%
20-30	4.7	0.1%	110-120	472.1	12.3%
30-40	22.3	0.6%	120-130	425.0	11.1%
40-50	67.3	1.8%	130-140	346.6	9%
50-60	136.2	3.6%	140-150	251.4	6.6%
60-70	229.3	6.0%	150-160	146.4	3.8%
70-80	318.4	8.3%	160-170	57.6	1.5%
80-90	401.6	10.5%	170-180	8.5	0.2%

Photometric Data


Illuminance at a Distance

	Center Beam fc	Beam Width
10.0ft	0.02 fc	19.0 ft
20.0ft	0.00 fc	37.9 ft
30.0ft	0.00 fc	56.9 ft
40.0ft	0.00 fc	75.9 ft
50.0ft	0.00 fc	94.8 ft
60.0ft	0.00 fc	113.8 ft

■ Beam Spread: 87.0°



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

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29	22	18	13	12	11	10	9	9	10	11	12	13	16	22	25	23	22
30	26	22	15	13	12	11	10	10	10	11	12	14	19	26	30	32	26
31	31	27	19	14	13	12	11	11	12	12	13	17	24	29	32	34	31
32	36	31	25	18	14	12	12	12	12	13	14	21	28	33	38	43	36
33	40	39	28	21	16	14	13	13	13	15	16	30	32	35	43	42	40
34	47	39	37	28	20	16	14	15	14	17	24	30	35	45	51	50	47
35	51	46	35	30	27	23	19	19	17	21	34	39	40	46	56	49	51
36	53	48	39	33	32	29	22	21	21	26	35	39	44	49	53	54	53
37	59	50	44	38	37	31	26	23	26	35	41	49	51	52	61	60	59
38	64	56	46	41	37	39	31	29	31	38	43	52	58	61	65	67	64
39	65	64	49	42	40	39	34	31	36	42	50	51	61	63	72	69	65
40	71	70	57	48	47	49	38	38	40	46	48	58	66	68	75	75	71
41	84	73	62	54	47	48	46	42	44	49	51	66	76	76	82	82	84
42	91	78	65	56	51	50	47	43	49	50	58	69	82	84	92	89	91
43	98	86	73	63	58	56	52	50	53	58	64	74	84	97	105	99	98
44	104	96	84	71	63	65	61	56	56	65	70	81	93	102	111	111	104
45	110	103	89	78	67	67	65	61	60	69	75	89	102	107	115	118	110
46	118	110	97	83	75	72	70	67	70	72	84	97	110	112	120	124	118
47	127	114	102	90	83	79	77	74	72	81	90	102	118	117	127	128	127
48	129	118	106	95	90	87	85	82	77	90	98	108	122	122	131	130	129
49	131	124	114	102	98	98	92	88	86	95	103	113	126	132	137	134	131
50	135	130	119	111	105	107	101	95	94	102	108	118	131	140	145	143	135
51	142	140	125	119	112	111	107	101	100	107	115	124	137	147	152	150	142
52	152	146	131	125	118	116	112	107	108	113	121	130	144	154	158	160	152
53	161	150	137	129	124	122	119	114	111	120	130	138	152	160	163	168	161
54	168	158	144	136	130	128	125	120	116	127	137	147	161	169	170	176	168
55	175	163	150	143	134	132	133	125	122	133	140	154	169	175	178	183	175
56	181	170	158	148	140	139	140	130	128	138	148	162	178	179	184	188	181
57	187	176	165	158	147	146	147	137	134	145	154	168	186	188	192	194	187
58	193	186	171	164	155	154	153	144	142	154	161	174	194	195	198	201	193
59	201	194	179	170	164	161	158	152	151	162	170	182	202	206	208	210	201
60	209	201	186	176	173	167	164	160	161	171	179	190	211	214	215	219	209

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61	222	211	195	186	181	176	170	166	169	178	186	199	219	225	225	229	222
62	230	220	201	194	185	185	179	176	178	187	194	212	227	236	235	241	230
63	241	228	210	202	193	193	187	185	186	197	203	223	238	244	243	251	241
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65	261	242	229	219	209	210	202	199	204	215	222	239	258	255	264	269	261
66	270	251	240	229	219	220	212	211	212	223	231	246	265	261	273	278	270
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68	286	267	255	246	238	237	233	227	231	240	248	261	279	276	283	288	286
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75	320	310	296	292	285	288	282	281	280	284	290	305	322	324	323	324	320
76	325	314	304	297	293	292	288	286	285	292	300	310	326	331	330	331	325
77	333	319	311	301	299	298	296	293	291	297	305	319	332	337	335	337	333
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91	424	411	403	393	389	398	395	398	386	395	400	413	422	423	422	428	424
92	426	414	407	396	393	402	399	403	392	400	406	419	424	426	426	432	426

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93	431	419	411	401	400	406	404	408	397	406	412	422	430	431	428	436	431
94	436	422	416	407	403	409	408	414	403	411	417	427	435	433	431	439	436
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103	461	452	447	446	445	450	446	441	440	449	454	458	472	467	456	471	461
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105	470	457	459	449	453	463	457	448	452	457	467	469	475	471	471	475	470
106	473	456	458	455	457	463	465	457	454	460	468	477	476	471	475	476	473
107	475	460	462	460	461	464	469	463	459	460	465	484	479	473	472	476	475
108	476	464	468	462	467	469	471	466	466	461	470	488	482	477	473	478	476
109	480	467	478	467	472	477	481	470	470	467	477	492	483	480	478	478	480
110	484	472	487	468	472	480	486	472	471	471	480	491	484	485	475	482	484
111	487	477	487	468	470	484	485	481	472	477	475	484	481	488	470	484	487
112	493	479	486	470	475	487	486	498	476	484	468	478	478	488	468	486	493
113	493	477	480	475	477	488	479	498	476	483	465	475	473	488	469	483	493
114	487	475	488	479	476	482	469	486	474	479	461	470	475	485	470	481	487
115	476	475	495	477	468	480	462	466	476	471	458	466	478	482	468	476	476
116	470	476	493	468	461	479	465	465	481	471	455	465	482	476	468	475	470
117	465	478	483	456	461	480	468	462	486	473	455	467	487	473	470	472	465
118	466	483	476	455	462	482	467	464	487	475	453	470	492	476	471	469	466
119	467	486	476	454	463	486	462	463	484	474	458	473	487	484	474	470	467
120	467	484	477	453	469	490	461	464	479	477	462	472	484	486	474	474	467
121	466	484	479	458	477	499	460	466	483	481	462	474	482	482	478	475	466
122	464	480	485	464	477	508	464	459	484	481	464	478	477	483	487	471	464
123	465	476	491	467	470	509	471	456	480	477	464	478	472	483	487	472	465
124	467	478	496	474	466	502	482	455	472	475	466	477	465	482	482	472	467

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125	473	482	490	478	464	499	481	459	471	474	470	476	462	483	476	470	473
126	476	484	482	477	464	503	480	467	474	478	471	470	455	480	473	470	476
127	479	484	470	472	470	504	485	477	464	481	474	462	449	478	469	468	479
128	479	481	470	475	479	491	481	480	452	479	472	456	438	472	469	469	479
129	478	478	468	477	485	478	471	468	440	473	464	461	434	465	467	471	478
130	470	472	463	477	491	471	463	453	438	464	453	472	439	461	460	466	470
131	464	466	456	469	496	461	464	444	436	463	453	473	437	455	450	459	464
132	458	454	444	457	499	458	467	448	438	461	455	464	431	448	443	453	458
133	453	450	434	445	494	462	471	456	449	455	454	457	428	447	448	442	453
134	446	447	427	438	489	456	476	457	457	457	449	453	432	449	454	438	446
135	442	443	430	438	482	450	483	457	455	455	437	451	431	443	453	440	442
136	439	440	437	436	473	454	488	457	446	446	426	458	428	432	452	441	439
137	435	437	445	432	469	456	483	450	429	439	423	461	418	425	446	436	435
138	430	432	440	437	464	455	474	445	420	437	419	452	421	421	437	430	430
139	427	422	422	437	454	447	453	448	425	428	414	443	417	420	428	425	427
140	428	415	411	431	452	444	441	458	426	416	410	425	403	413	433	427	428
141	427	417	407	432	457	445	443	463	416	422	416	417	380	410	432	428	427
142	423	418	416	437	461	428	437	457	401	429	419	414	374	404	425	413	423
143	413	410	422	437	460	407	424	441	401	425	411	407	371	396	415	398	413
144	402	391	418	431	447	402	411	428	400	409	403	392	368	391	398	394	402
145	390	366	408	426	431	385	400	418	399	405	410	383	363	385	382	387	390
146	380	355	399	419	422	369	390	411	401	405	412	377	351	378	373	377	380
147	378	350	395	417	423	362	389	412	393	413	401	381	335	372	379	363	378
148	378	351	398	409	424	369	386	414	376	412	390	376	331	367	383	344	378
149	373	350	409	387	411	369	387	409	377	399	385	358	331	363	361	338	373
150	354	342	401	379	393	358	391	406	368	376	368	335	312	355	340	337	354
151	342	334	379	378	392	342	382	408	348	353	353	320	293	340	327	345	342
152	335	329	364	364	398	343	367	393	338	354	337	324	283	339	336	351	335
153	350	324	357	350	388	352	359	368	343	355	328	312	279	338	342	333	350
154	338	314	343	353	377	351	350	353	344	328	309	279	267	313	309	314	338
155	305	306	343	363	366	325	330	355	332	307	286	272	263	291	288	292	305
156	287	303	346	359	351	294	309	320	309	303	265	277	243	290	276	279	287

Laboratory: Standard-Tech Co., Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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157	270	284	320	362	344	268	304	299	296	291	260	278	235	276	254	267	270
158	252	274	311	349	339	246	303	306	284	267	268	251	230	264	245	259	252
159	249	263	312	326	335	238	293	298	266	251	263	226	229	251	239	257	249
160	257	247	294	322	322	228	285	271	247	253	236	205	206	247	239	263	257
161	242	242	268	309	307	238	278	278	242	240	225	202	189	234	226	245	242
162	209	245	249	283	281	252	254	282	248	219	207	190	183	210	215	219	209
163	189	240	251	261	268	246	254	254	243	213	202	187	175	193	201	220	189
164	171	211	242	257	266	217	242	229	228	196	197	185	165	169	175	186	171
165	171	193	215	260	260	188	207	209	208	181	180	163	148	162	174	172	171
166	168	184	186	248	250	167	190	202	193	184	177	139	126	185	171	167	168
167	167	177	173	229	229	174	176	185	189	163	158	126	123	177	152	148	167
168	154	164	167	202	209	168	163	178	185	145	148	121	115	156	139	134	154
169	131	144	171	184	196	160	162	160	159	135	151	119	96	135	124	112	131
170	118	136	159	175	170	140	139	141	138	131	134	103	80	133	121	101	118
171	113	116	130	170	165	132	132	125	116	130	113	84	75	130	120	88	113
172	98	102	117	172	167	118	129	118	105	120	97	82	67	121	104	84	98
173	85	96	115	156	163	86	104	93	85	87	80	65	44	94	75	69	85
174	69	85	116	140	158	60	66	68	70	71	59	51	28	83	66	53	69
175	55	69	99	125	142	50	48	51	56	61	42	29	13	74	56	35	55
176	42	59	86	117	129	33	31	36	40	34	28	16	7	65	38	31	42
177	25	53	67	92	116	15	16	22	17	10	10	7	7	46	22	18	25
178	14	43	60	68	103	4	4	6	5	4	5	10	18	33	17	12	14
179	9	35	47	58	82	4	4	3	3	10	22	31	36	16	9	8	9
180	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23

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 *******