

LM-79-08 Test Report

For

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

188 S. Northwest Highway Cary, IL60013

LED Luminaires

Model name(s): LED-8024M30C-A

Representative (Tested) Model: LED-8024M30C-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Apr.17,2017

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

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

1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN		
Brand Name	N/A		
Model Number	LED-8024M30C-A		
SKU (if available)	N/A		
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires		
Rated Voltage / Frequency	220-347Vac, 50/60 Hz		
Nominal Power	45W		
Rated Initial Lamp Lumen	--		
Declared CCT	3000K		
LED Manufacturer	SAMSUNG		
LED Model	SPMWHT541MXXXXXXX		
Sample Number	GZE161214-BD1		
Luminaire Aperture (for downlights)	--	in. mm mm s	
Luminaire Length	--		
Luminaires Width	--		
Number of Units (modular products)	N/A		
Photo			
			

1.2 Test Specifications:

Date of Receipt	Jan 16,2017
Date of Test	Jan 17,2017
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	2017-01-17	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8024M30C-A		

Electrical Measurement :

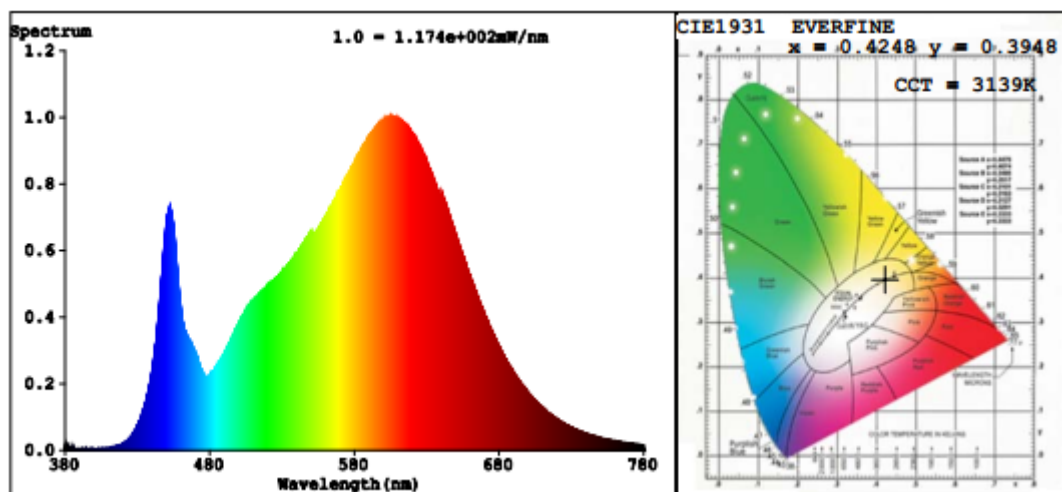
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	277.0	60	0.1669	43.80	0.9474
BD1	347.0	60	0.1351	43.84	0.9353

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	86	R9	25
Frequency (Hz)	60	R2	94	R10	85
CCT (K)	3139	R3	97	R11	85
Duv	-0.0020	R4	85	R12	75
Chromaticity (x, y)	x=0.4248 y=0.3948	R5	86	R13	88
Chromaticity (u', v')	u'=0.2467 v'=0.5158	R6	92	R14	99
Color Rendering Index (CRI)	86.4	R7	85	R15	80
R9	25	R8	67	--	--

Photometric Measurement – Goniophotometer Method :

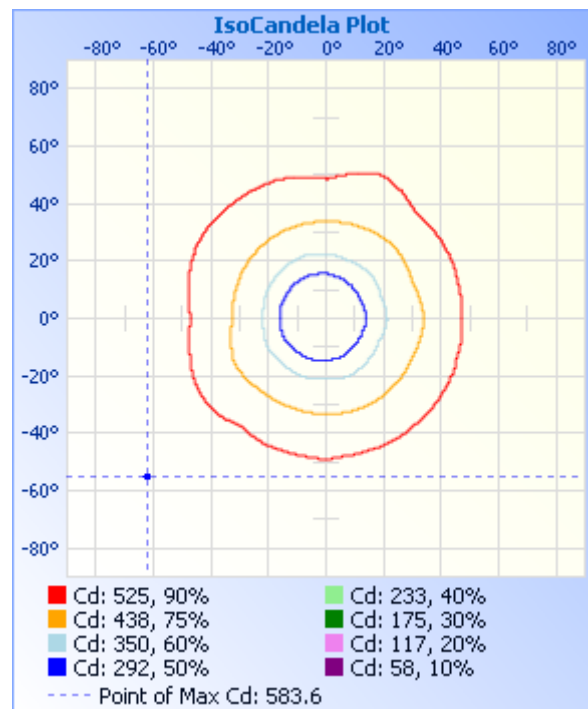
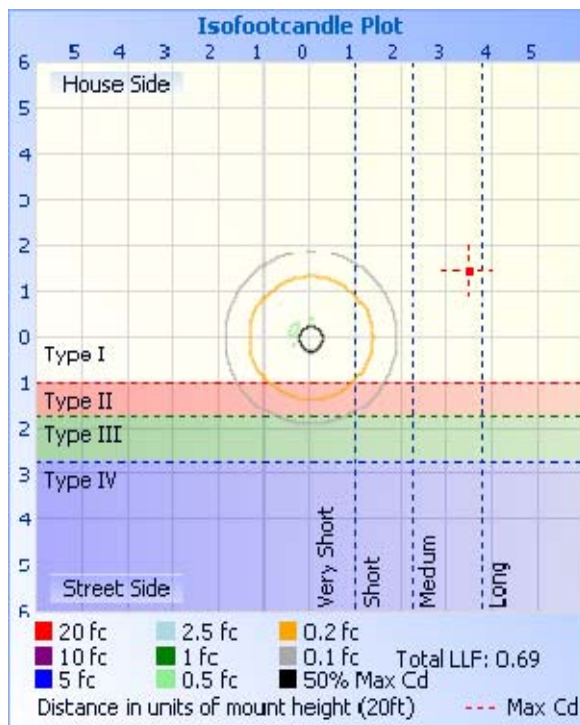
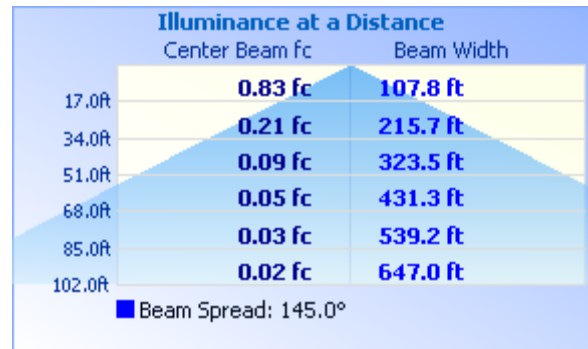
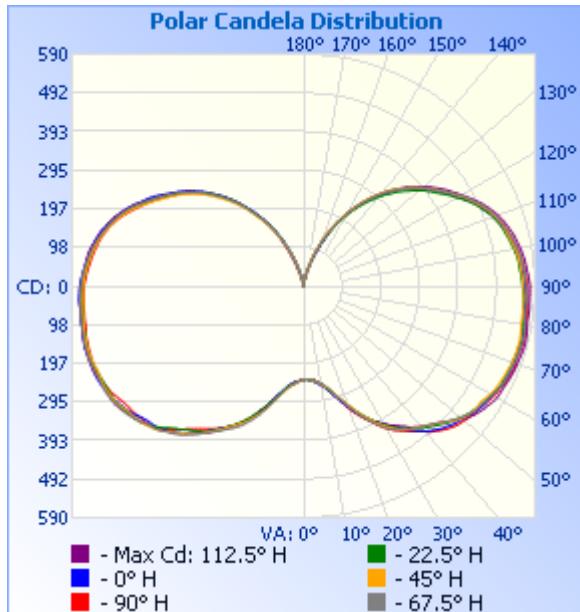
Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	5856.0	5765.3
Luminous Efficacy (lm/W)	133.70	131.51
Beam Angle (°)	282.7	--
Center Beam Candle Power (cd)	238	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	283.7	4.9%
0-40	565.7	9.8%
0-60	1,449.4	25.1%
60-90	1,790.4	31.1%
70-100	1,835.8	31.8%
90-120	1,653.6	28.7%
0-90	3,239.8	56.2%
90-180	2,525.9	43.8%
0-180	5,765.7	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	23.7	0.4%	90-100	609.0	10.6%
10-20	84.5	1.5%	100-110	564.0	9.8%
20-30	175.5	3.0%	110-120	480.6	8.3%
30-40	282.0	4.9%	120-130	373.1	6.5%
40-50	393.1	6.8%	130-140	263.2	4.6%
50-60	490.6	8.5%	140-150	155.2	2.7%
60-70	563.5	9.8%	150-160	66.3	1.2%
70-80	606.8	10.5%	160-170	13.9	0.2%
80-90	620.0	10.8%	170-180	0.6	0%

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	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238
1	238	238	238	237	238	237	238	239	239	241	239	240	239	239	238	238	238
2	237	238	237	237	237	237	238	239	240	242	241	241	240	239	239	238	237
3	239	238	237	238	236	237	239	240	243	243	243	242	242	241	241	240	239
4	241	241	239	237	237	237	239	242	243	245	246	245	244	244	243	241	241
5	242	241	241	238	238	238	240	244	244	247	251	249	247	248	245	243	242
6	244	241	241	241	239	240	242	246	247	249	253	251	249	250	248	246	244
7	246	244	243	243	242	243	246	249	250	252	255	254	253	252	250	248	246
8	249	246	246	246	246	247	248	252	254	255	259	258	256	257	253	249	249
9	253	249	250	248	249	250	252	255	257	260	265	262	261	262	258	253	253
10	256	252	253	251	252	253	256	260	265	264	270	268	267	266	263	257	256
11	259	256	258	255	256	258	260	263	270	271	277	276	273	272	269	263	259
12	265	262	261	259	260	262	267	271	276	278	284	282	281	279	275	270	265
13	271	269	264	265	268	268	274	277	282	285	290	291	287	287	282	276	271
14	278	274	270	269	274	273	279	284	289	293	300	300	293	297	292	284	278
15	285	279	278	277	278	281	288	292	299	302	308	307	300	304	300	293	285
16	292	288	287	286	287	290	298	300	307	308	317	317	308	313	305	300	292
17	302	294	293	294	295	297	306	307	318	317	327	327	317	321	313	310	302
18	310	302	301	303	307	305	316	318	327	324	334	336	326	329	320	317	310
19	316	309	309	311	316	314	324	326	334	333	343	346	335	338	329	326	316
20	326	318	318	321	328	325	335	336	344	343	350	354	342	346	337	336	326
21	333	328	327	332	339	335	345	346	352	351	358	364	353	357	345	345	333
22	344	337	335	341	347	343	352	357	363	360	367	371	362	365	351	353	344
23	352	347	347	352	357	354	361	368	372	367	374	380	370	371	356	360	352
24	360	355	356	361	364	360	369	376	379	375	381	388	378	379	365	369	360
25	369	365	367	371	374	369	378	386	386	383	386	394	385	385	370	377	369
26	377	373	374	381	382	378	386	393	392	390	393	401	393	394	377	383	377
27	385	382	384	388	390	384	393	400	399	398	400	406	398	401	384	390	385
28	390	390	394	398	401	391	401	407	405	405	406	412	405	408	391	395	390

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29	397	399	402	407	408	397	407	413	411	413	413	418	412	415	399	402	397
30	404	407	410	416	417	405	415	420	416	419	419	425	417	423	406	409	404
31	412	414	418	423	424	410	421	426	423	426	428	432	423	431	414	417	412
32	419	423	426	430	432	417	429	433	431	432	434	437	428	437	421	424	419
33	428	430	433	435	438	423	435	439	438	439	442	444	434	444	429	431	428
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35	444	442	444	446	450	435	449	449	452	450	457	457	443	458	445	443	444
36	451	449	451	451	457	442	458	455	460	457	464	464	448	464	451	448	451
37	460	453	454	455	463	450	466	461	466	461	470	472	454	471	460	455	460
38	467	460	459	459	470	455	473	466	474	466	477	480	461	476	466	461	467
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40	482	472	466	466	483	466	489	480	488	477	489	493	475	488	479	474	482
41	488	477	471	471	491	472	496	487	494	482	495	498	482	495	487	479	488
42	494	481	476	475	497	477	501	493	498	487	500	504	491	499	495	484	494
43	498	486	481	480	504	481	509	499	505	494	506	508	498	506	500	488	498
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45	508	497	492	491	515	492	520	511	513	509	520	519	516	516	514	496	508
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48	522	512	512	509	528	512	531	527	523	530	533	529	528	530	531	506	522
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56	548	541	539	544	546	556	549	558	552	556	554	562	543	561	546	537	548
57	550	544	539	547	550	559	553	560	556	561	559	564	545	564	548	542	550
58	552	547	542	550	554	563	558	562	559	563	562	567	549	567	550	545	552
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60	555	554	550	554	559	569	564	564	565	563	565	570	555	569	555	550	555

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61	556	556	553	556	562	570	565	565	567	563	566	572	560	568	557	555	556
62	559	560	555	560	563	571	567	568	570	564	567	573	562	567	559	557	559
63	563	563	556	563	565	571	570	569	571	564	568	573	564	567	560	559	563
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67	569	564	562	568	572	577	578	572	577	568	568	574	572	576	566	563	569
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76	574	572	568	575	577	583	581	576	579	572	572	578	570	577	567	569	574
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91	563	557	559	566	568	576	573	570	569	562	561	567	558	567	556	556	563
92	562	556	559	565	567	575	572	569	567	560	560	565	556	565	555	555	562

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93	560	555	558	565	566	573	570	567	565	558	558	564	555	563	553	554	560
94	559	553	557	564	565	571	569	566	563	557	556	562	552	562	552	553	559
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97	553	551	553	561	560	567	563	560	556	551	550	555	546	557	546	549	553
98	551	549	552	559	558	565	561	558	555	549	548	553	544	556	544	546	551
99	549	547	550	556	556	563	560	556	553	547	545	550	542	554	542	545	549
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101	545	541	545	551	551	558	555	551	548	542	540	545	537	548	537	540	545
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103	540	537	540	547	546	553	549	543	543	536	534	538	532	541	532	534	540
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106	531	529	532	537	536	543	540	534	532	525	522	526	521	530	523	526	531
107	528	526	530	532	534	539	535	530	527	522	518	522	517	525	520	522	528
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109	520	519	522	525	524	532	525	521	516	513	509	513	507	518	511	513	520
110	514	514	519	522	520	527	522	517	512	507	503	508	502	514	506	507	514
111	510	510	514	517	514	523	517	511	507	502	498	504	497	508	501	503	510
112	505	505	510	513	509	517	512	507	502	497	491	498	490	501	494	497	505
113	499	498	504	507	503	512	505	501	495	491	486	493	484	495	488	490	499
114	495	493	499	502	498	505	498	495	490	485	479	486	477	489	481	485	495
115	489	487	492	496	493	500	492	487	483	478	472	480	470	484	474	479	489
116	484	480	485	488	486	492	485	480	478	472	465	472	464	475	468	473	484
117	477	474	480	482	480	486	478	473	469	464	457	464	457	467	460	465	477
118	470	466	474	476	473	478	471	466	463	457	450	458	451	459	455	458	470
119	463	459	467	470	467	472	465	460	457	450	442	450	444	452	447	450	463
120	455	450	459	462	460	464	456	453	451	444	436	444	438	445	442	444	455
121	448	444	451	454	453	458	450	446	444	437	428	436	431	438	434	437	448
122	441	437	445	447	447	451	443	439	435	429	421	430	426	432	427	429	441
123	434	429	438	439	439	444	437	432	428	423	414	422	418	424	421	424	434
124	427	422	432	433	433	438	429	425	420	415	409	415	412	416	414	416	427

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125	421	414	424	426	425	431	423	419	413	409	401	408	405	410	408	410	421
126	414	408	418	419	419	424	416	411	405	401	395	402	398	403	400	403	414
127	407	400	410	410	411	416	408	404	400	394	387	394	390	397	395	395	407
128	400	395	402	402	402	409	402	396	392	386	381	388	384	389	388	388	400
129	392	387	396	396	395	401	394	390	385	380	373	379	377	382	380	380	392
130	386	379	388	388	387	393	386	382	376	372	364	371	370	374	375	375	386
131	378	372	382	381	381	385	376	374	369	365	358	364	362	364	367	367	378
132	373	363	374	373	372	378	370	368	359	357	349	356	353	358	361	360	373
133	366	356	368	366	364	370	362	359	353	350	341	348	346	349	353	350	366
134	358	347	359	357	357	363	355	352	344	340	332	339	337	342	346	341	358
135	351	340	351	349	349	353	346	343	334	333	323	330	330	333	336	335	351
136	341	331	345	342	343	344	338	335	325	323	314	320	320	325	327	325	341
137	333	321	337	333	333	336	330	326	315	314	306	312	312	315	319	317	333
138	323	314	329	325	325	326	322	318	308	306	296	302	302	306	309	306	323
139	313	304	319	316	315	318	311	308	298	296	288	294	293	297	301	298	313
140	305	296	311	306	307	308	302	300	289	288	277	283	283	287	291	289	305
141	295	285	300	297	297	300	292	290	278	276	268	274	274	277	280	279	295
142	287	277	290	287	287	290	284	281	270	267	258	263	263	266	272	271	287
143	276	267	281	278	278	281	273	270	258	256	249	254	254	255	261	260	276
144	267	257	271	267	266	270	262	261	248	246	238	243	242	246	252	252	267
145	256	249	262	258	256	261	253	250	238	234	227	231	233	235	241	241	256
146	245	239	250	247	245	250	241	239	229	226	217	221	222	226	233	229	245
147	236	230	238	236	233	241	232	230	218	214	206	210	211	216	222	221	236
148	225	219	229	227	223	229	221	218	207	206	197	202	203	205	210	210	225
149	216	208	218	216	212	220	211	209	198	195	186	192	192	196	201	202	216
150	205	199	209	205	203	208	199	198	186	184	178	183	183	184	190	190	205
151	194	188	198	195	191	196	189	188	176	176	167	172	170	174	179	178	194
152	186	179	187	184	180	188	178	177	165	166	158	162	160	162	170	167	186
153	174	168	179	174	171	176	167	168	156	158	148	150	148	148	159	155	174
154	158	156	168	163	159	167	158	156	144	145	137	138	138	136	149	145	158
155	145	147	159	151	149	153	146	144	135	135	128	128	123	119	136	134	145
156	130	137	148	142	139	144	137	134	126	122	116	117	109	109	123	120	130

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

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157	122	128	135	131	128	131	125	124	113	113	107	108	99	98	113	110	122
158	110	116	126	123	120	122	117	115	104	103	96	97	86	85	99	99	110
159	99	105	114	112	109	111	106	105	95	92	89	88	77	75	89	89	99
160	90	98	102	100	99	100	97	96	86	83	79	78	66	62	78	81	90
161	82	86	94	91	88	92	87	84	76	73	70	69	57	48	67	71	82
162	75	74	84	81	78	83	77	75	68	63	59	59	47	39	57	64	75
163	66	68	76	73	70	74	70	65	58	53	47	49	38	30	47	53	66
164	56	62	67	63	63	63	60	57	51	41	37	41	33	23	37	44	56
165	46	55	57	55	55	57	53	49	44	31	26	32	28	16	33	38	46
166	37	46	50	49	47	50	44	41	35	21	19	25	21	9	28	33	37
167	32	39	42	40	39	44	38	34	28	15	11	18	14	5	23	27	32
168	27	34	35	33	33	35	31	27	18	10	8	13	10	4	20	24	27
169	23	27	29	28	26	30	25	22	13	7	5	10	6	3	17	18	23
170	19	22	23	22	20	24	19	17	9	4	4	8	4	3	14	14	19
171	16	17	18	18	16	18	15	13	6	2	2	6	3	3	10	11	16
172	12	13	14	13	12	15	12	9	3	2	2	4	2	2	8	8	12
173	8	10	10	9	9	11	9	6	2	1	2	2	1	2	6	4	8
174	6	7	7	7	6	7	6	5	2	2	1	1	1	1	4	3	6
175	4	5	5	5	4	3	3	3	2	1	1	1	1	1	2	2	4
176	2	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1	2
177	1	2	2	2	1	2	2	1	1	1	1	1	1	1	1	1	1
178	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
179	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

3. Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Next Calibration Date
ST-R-331	2 meter Integrating Sphere	2016-07-01	2017-06-30
ST-R-327	Spectral analysis system HAAS-2000	2016-07-01	2017-06-30
D204	Standard Lamp	2016-07-12	2017-07-11
PF2010	Power Meter for Integrating Sphere	2016-07-01	2017-06-30
GO-R5000	Goniophotometer system	2016-07-01	2017-06-30
D908S	Standard Lamp	2016-07-12	2017-07-11
PF210	Power Meter for Goniophotometer	2016-07-07	2017-07-06
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 *******