

LM-79-08 Test Report

For

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

188 S. Northwest Highway Cary, IL60013

LED LuminairesModel name(s): LED-8024M40-A
LED-8024-CW-E40-A

Representative (Tested) Model: LED-8024M40-A

Model Different: The models are identical except the model No..

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Jul.07,2017

Updated: Oct.12, 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

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Revision Details

Report No.Revision	Revised Item: model name	Revised Reason	Issue date
GZE1706117-H-C	N/A	As manufacturer request	Jul.07,2017
GZE1706117-H-C-R	Add alternate model No. LED-8024-CW-E40-A		Oct.12, 2017

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8024M40-A, LED-8024-CW-E40-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	120-277Vac, 50/60 Hz	
Nominal Power	45W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	SAMSUNG	
LED Model	SPMWHT541MXXXXXXXXX	
Sample Number	GZE1706117-H-C1	
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	Jun 27,2017
Date of Test	Jun 28,2017
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 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	2017-06-28	Test Ambient:	25.2 ° C
Test Orientation	As intended	Stabilization Time (min)	90
Model Number	LED-8024M40-A		

Electrical Measurement :

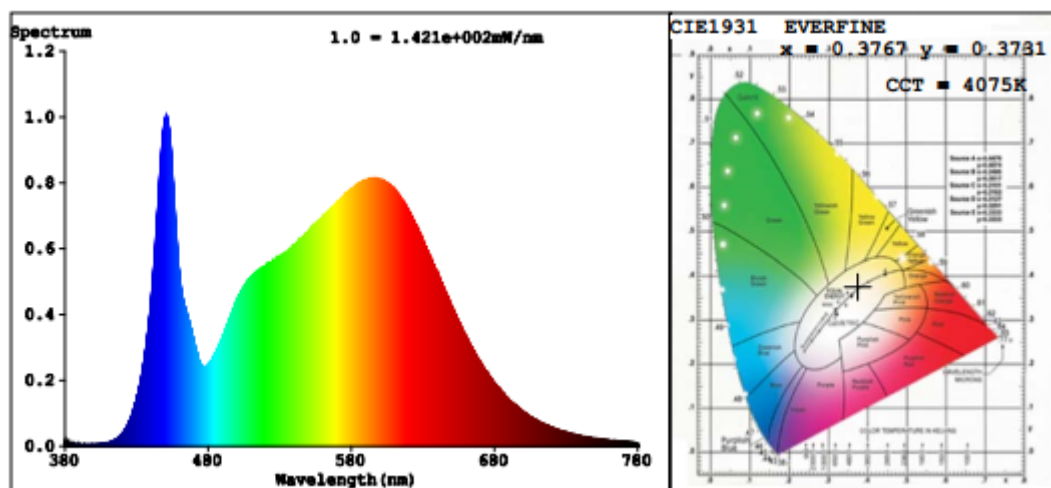
Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD%
GZE170611	120.0	60	0.4013	47.64	0.9893	9.22
7-H-C1	277.0	60	0.1785	46.20	0.9342	18.97

Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	120.0	R1	83	R9	15
Frequency (Hz)	60	R2	91	R10	78
CCT (K)	4075	R3	96	R11	84
Duv	-0.0006	R4	84	R12	66
Chromaticity (x, y)	x=0.3767 y=0.3731	R5	84	R13	85
Chromaticity (u', v')	u'=0.2241 v'=0.4994	R6	87	R14	98
Color Rendering Index (CRI)	84.7	R7	87	R15	78
R9	15	R8	67	--	--

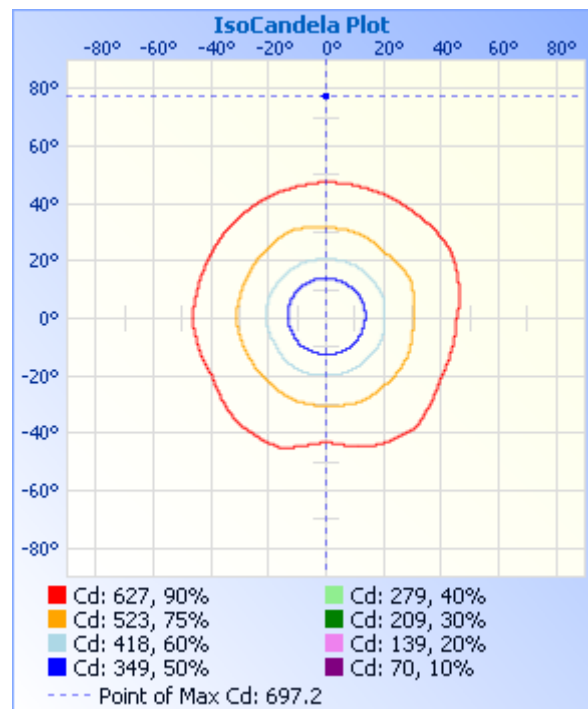
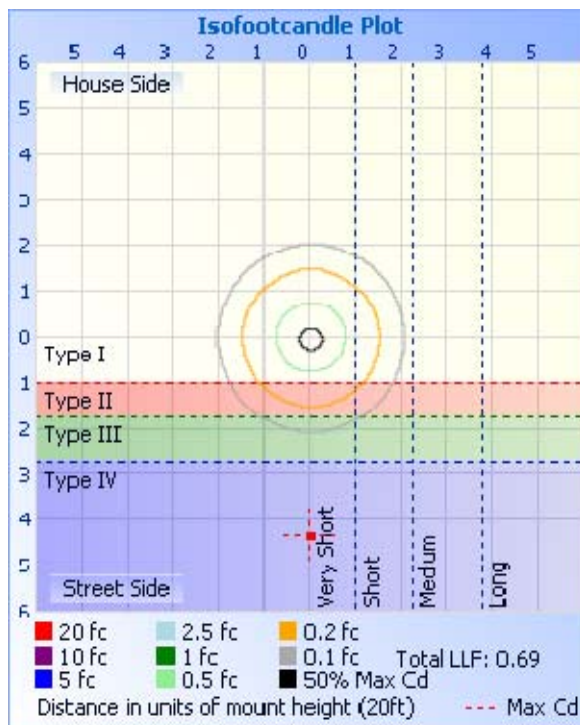
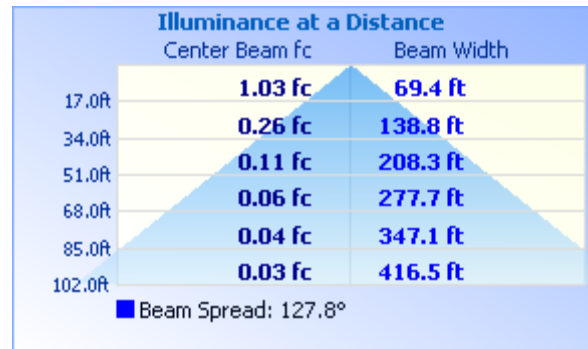
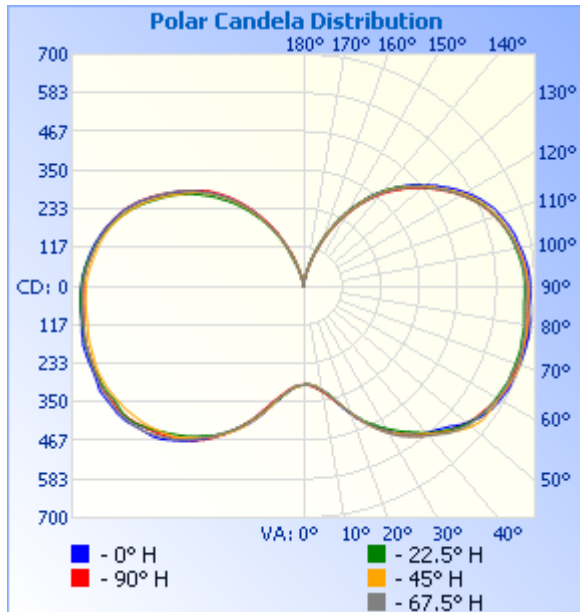
Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	120.0	277.0
Frequency (Hz)	60	60
Total Luminous (lm)	6930.3	6831.8
Luminous Efficacy (lm/W)	145.47	147.87
Beam Angle (°)	281.9	--
Center Beam Candle Power (cd)	299	--

Spectral Power Distribution & Chromaticity Diagram

Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	351.7	5.1%
0-40	701.3	10.1%
0-60	1,780.0	25.7%
60-90	2,137.4	30.8%
70-100	2,183.2	31.5%
90-120	1,967.7	28.4%
0-90	3,917.4	56.5%
90-180	3,013.4	43.5%
0-180	6,930.8	100%

Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	29.7	0.4%	90-100	723.6	10.4%
10-20	104.7	1.5%	100-110	669.3	9.7%
20-30	217.2	3.1%	110-120	574.8	8.3%
30-40	349.6	5.0%	120-130	447.5	6.5%
40-50	481.2	6.9%	130-140	315.0	4.5%
50-60	597.5	8.6%	140-150	185.7	2.7%
60-70	677.8	9.8%	150-160	79.4	1.1%
70-80	723.2	10.4%	160-170	17.3	0.3%
80-90	736.4	10.6%	170-180	0.8	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	299	299	299	299	299	299	299	299	299	299	299	299	299	299	299	299	299
1	297	296	297	297	299	300	302	300	300	300	300	300	298	298	299	298	297
2	297	297	297	297	300	301	302	301	300	301	301	300	299	299	299	298	297
3	297	298	298	298	300	303	303	302	302	301	302	300	300	300	299	298	297
4	299	299	299	299	302	303	305	304	304	304	304	302	302	300	300	300	299
5	300	300	300	302	304	306	307	307	307	308	307	303	306	303	303	303	300
6	302	302	302	304	307	309	310	311	311	310	310	307	308	307	305	305	302
7	306	305	305	307	310	313	314	316	317	315	314	313	311	309	308	306	306
8	311	310	309	311	314	317	319	322	320	321	320	318	316	314	310	308	311
9	315	314	314	315	319	322	323	325	327	328	326	324	320	316	315	313	315
10	318	320	319	321	324	327	330	333	333	333	332	330	327	323	321	318	318
11	324	325	325	325	329	333	335	342	339	339	338	335	333	330	327	325	324
12	329	330	332	331	336	342	344	348	348	347	345	344	339	333	334	332	329
13	336	334	337	338	342	348	349	354	355	353	354	349	347	342	340	340	336
14	344	343	345	346	349	358	355	361	364	362	363	357	354	350	348	349	344
15	353	352	353	354	358	367	364	373	375	371	375	366	363	357	358	355	353
16	363	361	362	361	366	376	372	384	383	380	385	377	372	365	366	364	363
17	376	372	372	372	375	388	384	392	397	392	393	388	383	375	377	374	376
18	387	381	381	384	383	396	395	402	407	401	405	397	393	388	385	383	387
19	396	393	393	393	394	407	406	410	419	413	414	409	404	398	396	396	396
20	408	404	404	403	404	417	418	420	428	424	426	418	418	409	407	406	408
21	418	414	417	412	417	429	427	428	439	433	436	431	429	419	421	418	418
22	430	425	427	424	429	439	440	440	449	444	448	443	441	431	434	427	430
23	439	434	439	434	437	448	449	452	458	453	461	453	450	442	445	440	439
24	451	446	451	447	449	461	461	461	468	465	469	464	463	452	458	453	451
25	460	453	460	460	458	470	474	472	476	474	480	473	472	462	468	462	460
26	468	462	472	470	470	482	485	481	486	484	487	483	484	470	479	472	468
27	478	469	481	482	479	492	498	493	494	492	498	491	493	481	488	481	478
28	485	479	490	492	490	504	507	502	505	501	505	500	505	489	499	492	485

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29	495	487	498	503	499	513	519	512	513	510	514	508	515	499	508	500	495
30	505	495	509	511	509	524	529	520	523	517	523	518	524	506	519	509	505
31	513	504	516	522	519	534	538	530	532	525	530	528	535	515	530	516	513
32	523	512	525	531	526	542	547	540	540	531	539	536	544	524	539	526	523
33	531	521	532	540	535	551	555	548	551	539	546	546	554	530	548	532	531
34	540	529	540	547	542	558	563	557	558	545	553	554	560	537	555	540	540
35	546	537	546	555	551	567	568	564	568	553	560	562	569	542	563	546	546
36	554	543	554	561	558	575	575	572	575	561	567	571	577	548	569	553	554
37	560	553	562	569	566	585	579	578	584	568	574	580	581	553	575	559	560
38	567	560	568	576	573	594	585	584	593	575	581	590	589	558	579	566	567
39	572	571	576	582	581	599	589	591	600	581	588	597	594	562	584	573	572
40	578	578	582	589	586	605	596	598	608	587	595	605	601	568	587	579	578
41	583	587	590	595	592	610	602	605	615	594	602	610	607	573	592	588	583
42	588	593	596	603	598	618	608	608	624	600	604	617	611	579	597	594	588
43	593	601	606	610	606	624	612	610	632	606	610	623	618	585	603	602	593
44	599	607	614	619	612	629	616	615	637	612	615	629	622	594	609	608	599
45	605	615	623	625	619	633	621	618	643	619	618	636	627	601	617	615	605
46	611	623	630	632	624	637	628	623	647	626	623	641	632	611	623	620	611
47	619	628	640	637	627	642	634	628	650	632	627	648	635	620	631	627	619
48	627	635	646	643	633	649	640	633	653	639	632	653	641	627	639	632	627
49	636	641	654	647	637	651	644	640	656	645	635	658	645	636	646	638	636
50	643	646	660	651	643	655	647	646	661	651	639	662	650	642	654	641	643
51	649	650	666	655	648	659	650	652	666	657	641	665	655	648	660	647	649
52	654	655	671	658	652	663	654	656	670	661	643	668	659	651	665	652	654
53	662	658	674	659	655	669	657	659	675	665	646	671	663	654	668	657	662
54	667	663	676	661	658	673	659	662	678	667	649	672	666	656	671	662	667
55	672	666	677	665	661	678	662	663	680	668	653	675	671	657	672	665	672
56	676	669	677	667	665	682	666	663	682	668	656	677	673	657	673	665	676
57	680	671	678	671	668	685	669	665	684	668	657	679	675	655	672	666	680
58	682	672	679	673	672	686	674	667	685	667	659	680	674	655	672	667	682
59	685	673	680	676	675	687	678	669	686	668	661	681	674	657	673	667	685
60	687	674	681	678	678	688	680	671	687	670	664	681	676	659	676	668	687

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61	688	675	683	680	683	689	683	674	689	673	666	682	679	663	679	669	688
62	691	676	685	681	686	690	685	676	692	675	667	684	682	667	680	671	691
63	693	678	687	682	689	691	686	679	693	677	669	685	684	670	682	674	693
64	694	680	689	684	691	691	686	682	691	678	670	684	683	673	685	675	694
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66	693	682	690	683	689	693	687	685	688	680	672	682	679	674	688	675	693
67	693	681	693	683	689	693	688	686	687	680	673	683	680	673	690	676	693
68	694	681	694	684	689	693	688	687	687	682	673	684	681	673	692	676	694
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79	695	679	689	682	690	684	684	684	683	679	666	677	677	670	685	668	695
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81	693	675	687	678	688	682	682	681	680	678	664	675	674	668	682	666	693
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83	688	672	684	677	683	680	678	680	678	678	663	673	672	666	678	664	688
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88	686	669	680	674	680	678	674	679	675	675	660	670	667	662	674	661	686
89	686	669	680	674	679	677	673	679	674	674	659	669	667	662	673	661	686
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91	685	668	678	672	677	676	672	676	671	671	657	667	667	661	672	659	685
92	684	668	677	671	676	675	670	675	669	670	656	665	665	660	672	658	684

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93	684	667	675	670	675	674	668	672	668	667	654	663	663	659	670	657	684
94	682	666	674	668	674	672	667	671	665	666	652	661	661	656	669	656	682
95	680	664	672	667	671	671	665	668	663	663	649	659	659	655	668	655	680
96	678	662	670	665	669	669	662	665	661	660	646	656	656	653	666	653	678
97	675	660	667	663	667	666	658	662	658	656	644	653	653	651	664	651	675
98	673	658	665	660	664	663	655	658	655	653	640	650	651	648	661	649	673
99	669	655	663	657	661	658	652	655	652	649	638	647	648	645	659	646	669
100	666	652	660	655	657	656	649	651	649	646	635	644	645	643	655	643	666
101	663	650	657	653	654	652	647	648	645	642	633	641	642	639	653	641	663
102	661	647	653	651	650	650	643	645	642	638	630	638	638	636	651	638	661
103	659	645	650	647	647	645	640	641	638	634	626	634	636	632	648	636	659
104	656	641	646	644	642	641	636	636	634	629	623	631	632	629	644	632	656
105	652	638	643	639	639	637	632	631	630	625	619	626	629	625	641	629	652
106	649	635	640	635	634	632	627	627	625	619	615	623	624	621	636	625	649
107	645	631	636	632	630	628	623	622	621	615	610	617	620	616	633	622	645
108	640	627	632	627	626	623	617	617	615	608	606	613	615	612	628	618	640
109	636	621	628	623	620	619	613	611	611	603	600	608	611	607	622	614	636
110	631	617	622	617	616	612	607	605	605	596	596	603	606	603	618	609	631
111	628	612	617	613	609	606	600	598	600	591	589	599	601	598	612	604	628
112	623	608	612	607	605	599	595	590	594	584	582	593	595	593	608	600	623
113	617	602	606	601	599	592	587	583	589	577	576	587	589	588	603	594	617
114	610	597	602	594	594	584	581	574	581	571	569	581	583	582	597	589	610
115	603	590	595	587	587	578	573	567	575	562	563	575	575	576	590	582	603
116	598	583	589	582	581	571	567	558	567	555	555	566	568	568	585	576	598
117	590	577	581	574	573	564	558	552	561	546	548	560	560	560	576	567	590
118	582	568	575	567	565	555	552	542	551	538	540	551	554	552	567	560	582
119	574	561	565	558	558	545	543	534	542	528	533	542	544	543	559	551	574
120	567	552	558	552	549	538	535	525	534	521	524	535	537	536	552	542	567
121	557	545	548	543	542	528	525	518	524	512	516	525	528	527	545	535	557
122	549	536	539	535	533	521	515	508	516	504	507	518	520	520	535	526	549
123	540	528	531	526	525	512	507	501	506	496	499	509	511	511	526	519	540
124	531	518	521	518	515	503	497	493	499	488	490	502	501	504	519	510	531

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125	521	512	513	508	507	492	489	484	490	479	480	493	492	496	509	504	521
126	512	502	503	499	498	484	479	476	482	469	473	485	482	489	501	495	512
127	504	493	496	492	488	474	471	466	472	461	463	475	475	480	493	488	504
128	494	486	488	482	480	466	460	458	464	450	456	467	465	470	486	480	494
129	485	477	480	474	469	456	452	447	454	442	446	457	458	463	476	473	485
130	474	469	469	464	461	447	442	439	443	431	439	448	449	453	468	464	474
131	465	460	458	456	451	438	434	430	435	423	430	437	441	445	458	454	465
132	456	452	449	446	443	427	424	421	424	411	422	427	431	436	447	446	456
133	448	443	439	438	432	419	415	409	416	401	412	418	423	429	440	436	448
134	437	433	431	428	424	408	405	400	406	390	404	407	414	418	429	428	437
135	428	425	421	419	413	400	394	387	397	381	393	398	406	410	420	417	428
136	417	415	412	408	402	389	386	378	386	369	384	386	395	399	409	409	417
137	407	406	401	397	393	379	374	367	376	357	373	376	383	389	399	398	407
138	397	395	392	388	381	367	365	354	365	347	361	364	373	378	388	389	397
139	384	386	381	377	373	358	354	344	355	335	352	355	361	365	378	378	384
140	375	374	371	367	361	345	344	331	342	326	339	343	351	356	366	368	375
141	364	364	359	354	351	332	331	321	329	313	329	333	339	344	355	356	364
142	354	351	347	343	339	320	321	309	318	302	316	319	328	334	342	344	354
143	341	341	336	329	327	307	307	298	304	289	304	306	315	321	329	334	341
144	330	327	323	318	315	296	295	284	292	280	290	296	304	311	318	321	330
145	318	313	313	305	305	283	280	272	279	267	279	283	290	297	305	311	318
146	304	303	300	291	291	272	266	258	267	254	265	272	279	286	294	297	304
147	294	290	288	280	277	258	255	245	253	244	251	257	265	273	281	286	294
148	280	279	274	266	265	243	241	234	239	232	240	244	251	259	270	272	280
149	269	266	263	255	250	232	230	221	227	221	226	229	240	248	255	261	269
150	253	255	249	241	239	219	217	209	214	208	215	216	227	235	241	248	253
151	241	241	235	227	226	207	203	196	204	197	202	206	216	225	230	235	241
152	227	229	224	216	215	193	193	183	190	183	189	191	203	211	216	224	227
153	214	215	211	202	201	183	179	172	179	169	179	180	190	198	205	211	214
154	203	201	201	191	188	170	168	158	165	159	165	167	179	188	190	198	203
155	189	188	187	178	177	157	154	147	151	145	153	156	163	175	176	187	189
156	178	177	174	166	163	146	140	135	138	131	139	146	147	164	165	174	178

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

Report Format Number STD/QR4909-A/2

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157	164	164	163	156	151	133	130	123	120	117	124	131	136	149	151	164	164
158	150	153	149	144	138	119	117	112	104	100	114	118	124	134	141	151	150
159	138	139	134	132	124	108	104	99	92	88	102	109	114	124	128	138	138
160	124	123	123	116	113	96	93	86	81	77	91	95	105	112	114	127	124
161	115	113	111	103	102	88	81	78	72	67	81	86	92	103	105	114	115
162	104	103	101	94	91	78	73	68	65	63	71	76	81	90	92	103	104
163	93	93	89	83	81	66	63	58	52	51	60	65	68	76	82	89	93
164	84	83	78	74	69	59	55	47	42	40	48	55	61	65	67	78	84
165	72	72	69	63	61	50	45	40	35	35	39	45	51	54	53	68	72
166	62	62	58	56	53	43	38	32	29	28	28	39	43	44	43	58	62
167	51	52	51	48	43	35	31	24	22	22	19	30	35	36	32	49	51
168	43	45	42	39	37	30	25	20	19	16	14	25	28	28	24	39	43
169	38	38	34	32	29	24	20	16	15	14	7	20	22	22	16	29	38
170	29	29	28	26	23	18	15	14	12	9	5	15	16	14	10	23	29
171	22	24	22	20	18	15	11	11	10	6	3	9	12	10	6	16	22
172	18	18	18	16	14	11	8	7	6	4	3	4	6	7	4	12	18
173	13	13	13	12	10	7	5	5	4	3	3	2	3	3	2	7	13
174	8	10	9	9	7	4	4	3	3	2	2	2	2	2	2	5	8
175	6	7	7	6	5	3	3	2	2	2	2	2	2	2	2	4	6
176	4	4	4	4	3	2	2	2	2	2	2	2	2	2	2	3	4
177	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	3
178	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
179	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
180	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

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 *******