

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-8024M40C-A

Representative (Tested) Model: LED-8024M40C-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Mar.22,2017

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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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN	
Brand Name	N/A	
Model Number	LED-8024M40C-A	
SKU (if available)	N/A	
Type of Luminaire (for integral lamps, list base type and lamp type)	LED Luminaires	
Rated Voltage / Frequency	277-347Vac, 50/60 Hz	
Nominal Power	35W	
Rated Initial Lamp Lumen	--	
Declared CCT	4000K	
LED Manufacturer	Samsung	
LED Model	LM561B	
Sample Number	GZE161214-W1	
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	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.

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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-8024M40C-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-	277.0	60	0.1722	45.37	0.9512
W1	347.0	60	0.1361	44.44	0.9409

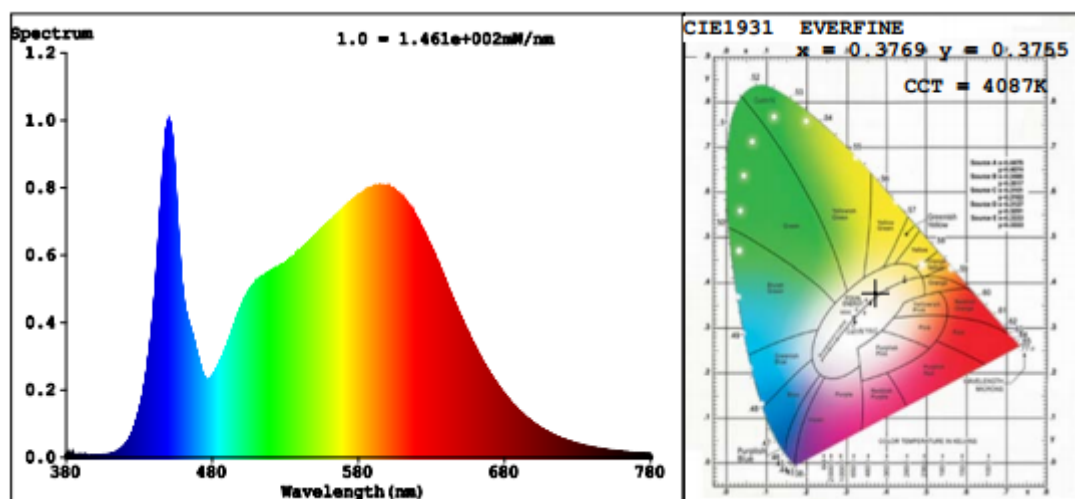
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	83	R9	13
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	4087	R3	95	R11	84
Duv	0.0004	R4	84	R12	66
Chromaticity (x, y)	x=0.3769 y=0.3755	R5	83	R13	85
Chromaticity (u', v')	u'=0.2233 v'=0.5005	R6	86	R14	98
Color Rendering Index (CRI)	84.4	R7	87	R15	77
R9	13	R8	67	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	6739.8	6601.4
Luminous Efficacy (lm/W)	148.55	148.55
Beam Angle (°)	277.9	--
Center Beam Candle Power (cd)	299	--

Spectral Power Distribution & Chromaticity Diagram

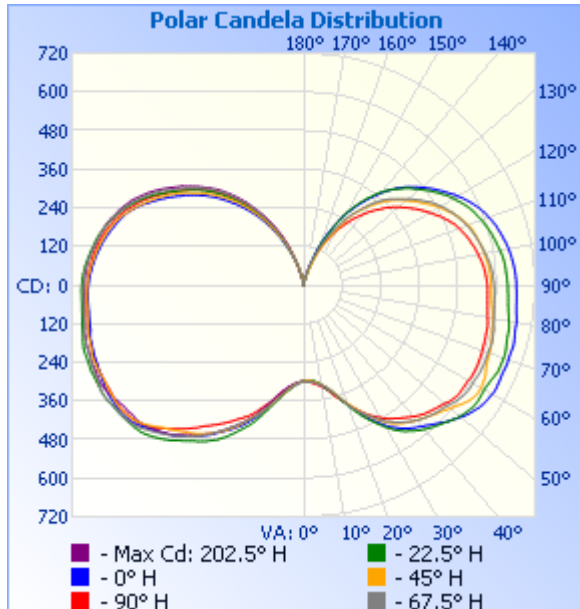


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	350.0	5.2%
0-40	695.4	10.3%
0-60	1,758.2	26.1%
60-90	2,067.6	30.7%
70-100	2,102.8	31.2%
90-120	1,898.0	28.2%
0-90	3,825.9	56.8%
90-180	2,914.4	43.2%
0-180	6,740.3	100%

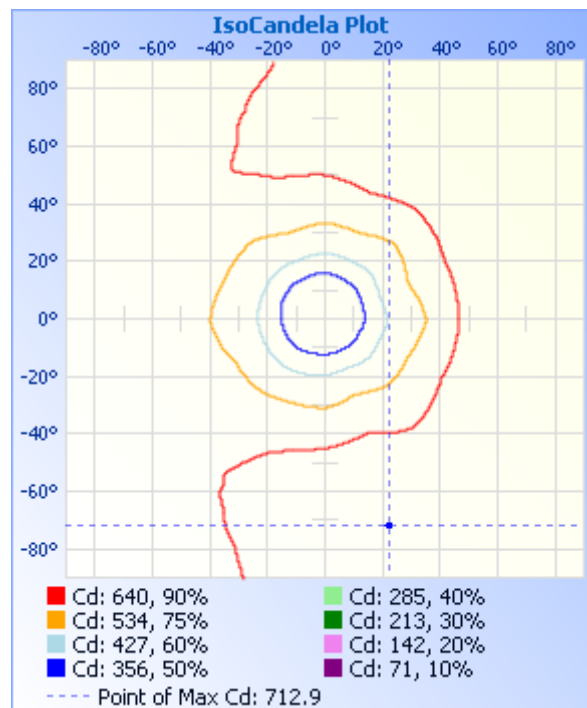
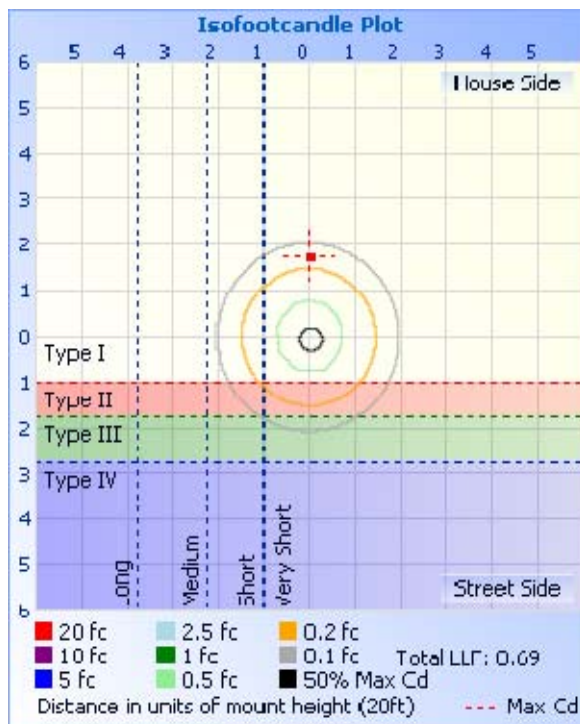
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	29.8	0.4%	90-100	695.6	10.3%
10-20	104.8	1.6%	100-110	645.5	9.6%
20-30	215.3	3.2%	110-120	556.9	8.3%
30-40	345.4	5.1%	120-130	435.6	6.5%
40-50	475.4	7.1%	130-140	307.6	4.6%
50-60	587.5	8.7%	140-150	181.5	2.7%
60-70	660.5	9.8%	150-160	76.2	1.1%
70-80	699.2	10.4%	160-170	14.9	0.2%
80-90	707.9	10.5%	170-180	0.5	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	1.03 fc	
34.0ft	0.26 fc	
51.0ft	0.11 fc	
68.0ft	0.06 fc	
85.0ft	0.04 fc	
102.0ft	0.03 fc	



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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	299	297	298	299	300	298	300	299	300	299	299	300	301	298	299	298	299
2	298	296	297	299	300	300	301	302	303	302	301	302	302	300	299	297	298
3	299	297	297	300	301	302	302	304	305	304	304	304	304	302	299	298	299
4	299	297	298	300	302	303	305	306	309	308	306	307	306	304	301	298	299
5	300	298	300	301	305	304	306	310	313	313	311	310	309	307	303	300	300
6	301	300	302	304	307	308	309	313	317	317	316	315	313	311	307	302	301
7	304	302	304	306	309	311	313	317	323	323	320	319	316	314	309	306	304
8	308	306	307	310	313	315	317	323	327	330	325	324	321	317	313	309	308
9	310	309	310	313	315	319	325	328	332	334	331	330	327	322	317	313	310
10	314	312	314	314	320	324	332	336	340	342	340	337	332	329	321	318	314
11	319	319	318	320	323	329	337	344	346	351	348	345	337	335	327	322	319
12	325	325	322	321	328	335	344	351	355	358	354	353	344	343	333	329	325
13	332	332	327	327	335	341	350	361	365	369	363	361	351	350	341	337	332
14	339	338	335	333	343	349	356	369	372	378	373	371	360	359	349	344	339
15	345	345	343	340	351	357	366	376	385	389	381	380	369	371	356	353	345
16	352	352	349	350	360	364	374	384	394	402	392	392	378	380	365	363	352
17	360	362	358	358	367	374	383	393	405	414	401	403	387	392	373	373	360
18	371	374	367	369	376	380	392	405	417	428	411	411	394	401	384	383	371
19	382	384	379	378	382	391	401	417	426	439	422	422	404	414	392	393	382
20	391	395	387	390	392	402	410	426	438	452	430	430	414	425	404	405	391
21	404	406	398	402	400	411	419	437	447	464	440	442	425	438	415	415	404
22	413	420	409	412	410	422	430	445	458	474	449	451	433	446	424	427	413
23	424	431	418	422	418	431	442	456	467	485	461	460	442	457	434	436	424
24	436	444	429	430	428	443	452	465	478	494	470	468	449	468	442	449	436
25	446	454	439	439	436	453	464	476	486	506	482	477	456	476	451	459	446
26	460	466	450	447	445	464	473	487	495	516	491	487	463	487	459	471	460
27	470	475	458	458	454	475	484	496	504	528	500	495	471	496	468	480	470
28	481	487	469	466	460	483	493	507	511	537	510	506	479	508	475	491	481

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29	491	497	477	476	468	494	503	516	520	548	518	514	487	516	483	500	491
30	502	509	487	484	474	502	513	527	528	555	527	525	495	526	490	512	502
31	511	518	495	493	482	511	519	535	538	563	534	534	502	534	498	522	511
32	521	529	505	499	488	519	527	545	548	572	543	545	511	544	505	533	521
33	527	538	512	507	495	527	533	552	555	578	550	555	518	551	515	542	527
34	536	546	519	513	500	532	539	560	564	585	558	563	527	559	523	551	536
35	543	554	523	521	506	537	544	569	572	591	564	572	534	567	532	559	543
36	550	560	529	526	511	541	550	575	581	599	570	580	544	575	541	569	550
37	556	567	534	532	515	545	555	583	588	605	576	588	555	583	551	578	556
38	562	573	539	537	521	549	562	590	597	613	582	595	563	592	559	584	562
39	567	579	543	543	527	553	568	598	604	620	587	603	574	599	569	592	567
40	573	584	548	548	532	559	574	603	611	629	593	610	582	608	576	599	573
41	578	590	551	552	538	564	580	610	619	638	599	619	592	615	586	607	578
42	585	594	557	556	542	569	585	615	624	644	605	626	601	622	595	614	585
43	590	600	560	560	548	575	591	620	631	652	611	632	611	628	602	622	590
44	598	604	565	564	551	579	596	625	637	658	617	640	618	634	611	627	598
45	604	609	569	567	555	584	602	630	643	666	625	646	628	639	617	634	604
46	612	613	574	571	557	588	606	634	648	671	634	654	639	645	627	639	612
47	619	619	579	574	562	594	609	636	655	677	641	660	646	650	634	646	619
48	624	625	583	576	565	598	612	640	661	681	650	668	656	654	642	651	624
49	632	630	589	579	569	602	614	644	668	684	657	675	662	659	645	658	632
50	637	634	595	583	572	605	615	648	674	687	665	680	668	664	648	664	637
51	644	638	601	588	578	608	616	652	680	689	670	685	672	667	650	671	644
52	650	641	607	591	582	610	618	654	684	691	676	688	676	667	655	674	650
53	655	645	615	596	585	610	621	656	687	693	680	692	678	668	659	675	655
54	659	648	620	599	587	610	623	658	690	696	683	695	680	671	664	676	659
55	665	650	627	603	589	609	626	659	691	698	686	697	684	673	669	678	665
56	668	651	631	605	590	608	628	660	692	699	687	699	685	674	674	680	668
57	671	651	635	607	590	608	629	663	693	700	688	701	687	678	676	681	671
58	673	650	637	608	590	609	630	667	694	702	689	703	687	681	679	682	673
59	675	649	637	608	591	610	631	670	695	705	688	705	687	685	681	683	675
60	678	649	637	608	592	611	632	674	695	708	687	708	686	690	683	684	678

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61	679	650	636	608	594	613	635	674	695	710	688	710	686	693	683	684	679
62	679	651	635	610	595	614	635	673	695	710	689	711	686	696	683	685	679
63	679	653	633	611	595	614	634	671	694	710	688	710	687	699	683	688	679
64	678	656	630	612	595	614	633	670	692	710	687	707	687	701	682	691	678
65	677	659	626	612	595	615	633	671	692	710	687	705	688	702	684	694	677
66	677	661	621	612	595	616	634	672	690	711	689	704	689	701	684	696	677
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68	678	662	618	612	593	616	631	673	689	713	691	705	688	700	686	695	678
69	679	662	617	611	593	616	630	671	688	712	692	705	689	701	686	693	679
70	678	662	615	611	591	615	629	670	687	711	693	703	689	701	686	693	678
71	677	662	614	611	591	613	628	669	688	711	694	702	689	701	686	693	677
72	678	661	612	612	590	611	626	670	687	712	692	702	688	699	687	692	678
73	678	659	611	612	589	612	625	670	685	713	689	701	688	699	687	692	678
74	679	657	609	611	589	612	624	670	685	713	688	701	687	700	686	692	679
75	678	655	607	610	588	612	623	668	684	710	688	701	686	700	685	689	678
76	677	654	604	609	587	610	622	668	684	708	687	700	685	699	684	689	677
77	675	654	602	608	587	607	621	666	681	705	687	701	685	697	682	690	675
78	673	653	601	605	586	607	619	663	678	703	686	699	684	696	682	689	673
79	673	651	599	602	584	605	617	661	677	701	684	696	683	692	681	689	673
80	673	648	597	601	581	603	615	660	675	700	682	694	682	692	681	686	673
81	671	646	595	599	579	602	614	660	675	698	680	692	680	690	678	684	671
82	668	644	594	599	578	601	613	659	674	696	679	691	680	688	676	682	668
83	667	642	591	597	576	600	612	658	673	695	678	689	678	687	674	681	667
84	666	640	589	596	575	600	611	658	673	693	677	688	677	686	673	678	666
85	665	639	587	596	574	600	611	657	672	693	677	688	677	686	673	677	665
86	664	638	586	595	574	599	610	656	672	692	676	687	676	685	673	676	664
87	663	637	585	595	573	599	610	655	672	692	675	687	675	684	672	675	663
88	663	636	584	594	573	598	609	655	672	692	675	686	674	683	672	674	663
89	662	635	584	594	573	597	608	654	671	691	674	686	674	683	672	674	662
90	662	635	583	593	572	596	607	654	670	691	673	685	673	682	671	674	662
91	662	634	583	592	571	595	605	652	668	689	672	685	672	681	671	673	662
92	661	633	582	591	569	594	604	651	667	688	671	684	671	681	670	672	661

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93	660	632	581	589	568	592	602	649	664	687	669	683	670	680	669	671	660
94	659	631	580	588	566	590	600	646	662	684	666	681	669	678	669	671	659
95	657	630	579	587	564	588	598	643	660	682	664	679	667	677	668	669	657
96	656	629	578	584	563	585	596	641	657	679	661	676	665	676	667	667	656
97	654	628	576	582	560	583	594	638	655	677	658	673	663	674	666	666	654
98	652	626	575	579	558	580	591	636	652	674	656	670	661	671	664	664	652
99	650	623	572	576	554	578	588	633	649	671	653	667	659	668	663	661	650
100	648	620	571	574	552	575	586	630	646	667	651	664	657	665	660	658	648
101	645	618	569	570	548	573	583	627	643	664	647	661	653	662	658	655	645
102	643	615	567	568	546	570	580	625	639	662	644	658	651	659	655	651	643
103	639	613	565	564	542	567	577	621	635	658	641	655	647	656	652	648	639
104	636	609	562	562	538	564	574	616	631	655	637	652	644	652	649	644	636
105	633	607	560	559	535	561	570	612	627	650	634	649	640	649	645	641	633
106	630	603	557	556	531	558	566	606	623	646	629	645	635	646	642	638	630
107	627	600	555	552	528	554	562	602	618	640	625	641	631	644	637	634	627
108	623	597	553	549	524	550	557	597	614	636	620	636	626	639	634	630	623
109	619	593	550	545	520	546	554	593	609	630	615	632	622	634	628	626	619
110	614	590	546	541	515	542	548	587	605	624	609	626	616	629	623	622	614
111	610	586	540	538	510	538	543	583	599	619	603	620	612	624	619	616	610
112	605	581	536	533	506	534	536	577	595	613	595	616	605	620	612	612	605
113	599	578	530	528	499	529	530	571	588	608	589	609	599	614	607	607	599
114	595	573	525	524	493	524	523	566	580	600	582	604	592	609	599	602	595
115	588	568	518	519	486	519	517	558	573	594	575	596	584	603	593	598	588
116	582	562	512	515	481	513	509	551	564	585	567	590	578	598	585	593	582
117	575	557	505	509	473	507	503	542	556	578	558	582	570	590	577	588	575
118	568	550	497	504	465	501	495	536	546	569	551	575	564	582	570	581	568
119	562	544	492	498	459	495	488	527	537	562	543	567	555	575	561	574	562
120	553	539	485	491	451	487	480	520	528	552	536	560	548	567	552	566	553
121	547	532	478	486	445	480	473	510	519	544	527	552	538	560	545	557	547
122	538	526	470	479	437	472	465	500	509	534	520	544	530	551	535	550	538
123	529	518	462	473	430	465	456	492	501	523	510	535	521	542	527	541	529
124	522	511	455	464	423	456	450	483	491	515	503	526	514	534	518	533	522

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125	513	503	447	456	415	449	441	475	482	504	493	515	505	523	508	523	513
126	507	495	440	449	408	440	434	466	471	496	485	505	497	515	500	513	507
127	498	488	432	440	400	433	424	458	464	486	475	496	488	505	490	505	498
128	489	480	424	433	392	425	417	449	454	478	467	487	480	496	482	495	489
129	482	472	418	424	385	419	408	441	446	468	456	479	471	489	473	487	482
130	473	464	410	416	377	411	400	432	435	460	445	469	463	477	465	477	473
131	465	456	403	409	370	403	390	425	425	450	436	461	454	468	455	466	465
132	455	450	395	400	361	397	382	415	416	442	426	451	446	458	444	458	455
133	448	441	386	393	353	388	372	406	405	431	418	443	436	449	436	447	448
134	438	433	379	385	343	381	364	395	396	422	407	432	427	439	426	439	438
135	428	424	370	378	333	371	354	387	384	410	397	425	416	428	418	430	428
136	419	415	361	370	326	362	346	375	375	401	386	414	407	420	407	419	419
137	407	408	351	360	316	351	335	366	362	389	377	404	396	409	396	410	407
138	397	397	342	351	307	342	326	355	352	379	365	392	384	400	387	399	397
139	384	389	332	340	297	330	315	345	340	365	356	382	374	388	375	392	384
140	374	377	321	331	287	320	306	332	330	355	343	370	362	375	366	380	374
141	361	367	312	319	278	307	294	321	317	341	333	359	352	365	354	371	361
142	348	355	302	305	267	296	285	308	308	330	320	346	339	352	344	359	348
143	337	341	292	294	259	283	273	298	295	316	309	333	329	341	332	346	337
144	323	331	280	282	248	273	263	285	284	305	295	322	315	327	319	335	323
145	312	318	271	271	237	260	252	274	271	290	285	311	304	316	309	322	312
146	298	306	256	259	227	250	242	262	261	278	271	296	290	301	296	311	298
147	284	292	237	249	216	238	231	251	248	264	261	282	279	288	285	298	284
148	273	277	221	236	208	228	221	238	237	252	246	270	266	277	271	287	273
149	259	266	203	222	197	216	208	227	223	238	235	255	256	262	258	272	259
150	248	251	185	210	186	206	196	213	212	224	220	243	243	250	247	258	248
151	233	232	174	194	176	194	186	200	198	213	207	228	233	235	233	246	233
152	217	216	160	178	164	184	174	190	187	200	196	216	219	221	221	232	217
153	203	196	151	169	155	172	164	176	174	188	182	201	205	209	207	220	203
154	188	180	138	158	143	162	152	164	163	173	172	189	194	195	194	206	188
155	175	167	127	148	132	149	143	149	149	160	159	173	180	183	184	192	175
156	160	153	118	134	124	134	131	138	136	146	150	160	168	169	171	181	160

Laboratory: Standard-Tech Co. Ltd Testing Center

NVLAP CODE: 201011-0

Report Format Number STD/QR4909-A/2

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157	145	143	103	121	113	124	120	126	125	134	137	144	155	154	159	167	145
158	133	124	89	109	101	112	107	116	112	120	126	132	143	141	148	152	133
159	118	104	77	97	93	102	98	104	103	110	112	118	126	125	134	140	118
160	102	88	65	87	83	92	87	97	91	99	102	102	111	109	122	126	102
161	88	72	59	80	76	85	80	84	83	85	89	93	93	98	108	115	88
162	72	59	49	73	66	75	70	73	73	76	78	82	76	85	96	102	72
163	61	44	39	65	56	67	60	64	62	66	68	70	61	74	87	86	61
164	51	34	33	50	46	57	52	54	51	57	59	56	43	63	77	72	51
165	41	31	29	35	35	48	43	46	46	46	50	46	31	53	69	58	41
166	34	28	20	25	28	35	37	36	37	39	40	34	19	44	55	46	34
167	25	21	13	16	20	25	29	31	29	31	33	23	13	36	46	38	25
168	20	16	6	10	14	19	22	25	25	26	24	17	11	28	39	28	20
169	14	13	4	8	10	14	16	19	18	19	20	12	10	22	30	21	14
170	9	11	4	6	8	13	12	14	14	14	15	9	7	16	22	15	9
171	8	9	5	5	7	10	10	9	10	11	11	6	5	12	19	11	8
172	5	7	6	5	6	8	8	7	6	7	8	5	3	9	13	9	5
173	3	5	5	4	4	5	6	5	5	5	5	4	3	6	9	6	3
174	2	4	4	3	3	4	4	3	3	3	3	3	2	4	6	4	2
175	2	2	3	2	2	3	3	2	2	2	2	2	2	3	3	3	2
176	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
177	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
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-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 *******