

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-8033E40C-A

Representative (Tested) Model: LED-8033E40C-A

Model Different: N/A

Test & Report By:

Garman Mo

Engineer: Garman Mo

Date: Feb.08,2017

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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1.1 Product Information:

Organization Name	LIGHT EFFICIENT DESIGN		
Brand Name	N/A		
Model Number	LED-8033E40C-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-D1		
Luminaire Aperture (for downlights)	--	in. mm mm	
Luminaire Length	--		
Luminaires Width	--		
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-8033E40C-A		

Electrical Measurement :

Sample No.	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
GZE161214-D1	277.0	60	0.1423	37.28	0.9456
	347.0	60	0.1158	37.28	0.9278

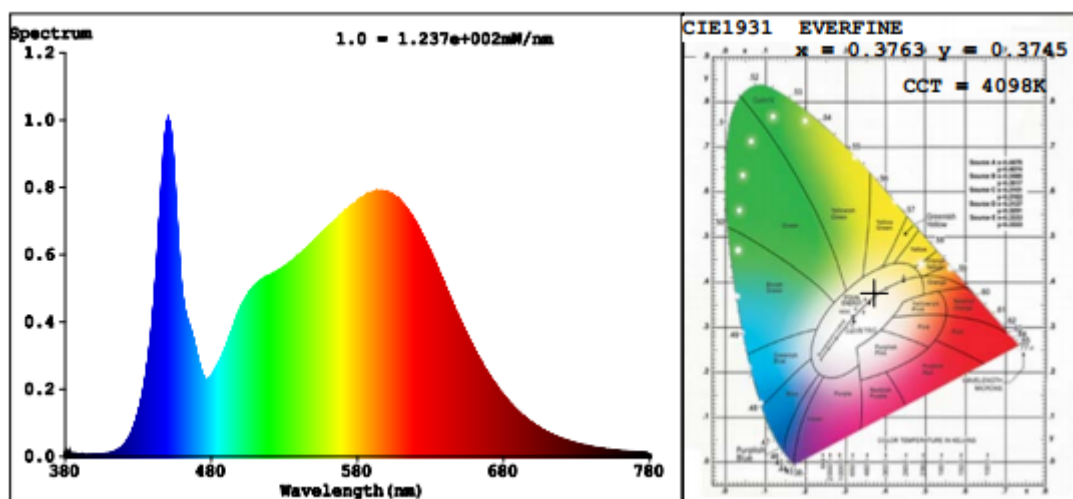
Chromaticity Measurement - Sphere-Spectroradiometer Method :

Parameter	Result	Special Color Rendering Indices			
Test Voltage (V)	277.0	R1	83	R9	14
Frequency (Hz)	60	R2	90	R10	77
CCT (K)	4098	R3	96	R11	84
Duv	0.0002	R4	84	R12	65
Chromaticity (x, y)	x=0.3763 y=0.3745	R5	83	R13	85
Chromaticity (u', v')	u'=0.2233 v'=0.4999	R6	87	R14	98
Color Rendering Index (CRI)	84.6	R7	87	R15	77
R9	14	R8	67	--	--

Photometric Measurement – Goniophotometer Method :

Parameter	Result	
Test Voltage (V)	277.0	347.0
Frequency (Hz)	60	60
Total Luminous (lm)	5670.9	5546.0
Luminous Efficacy (lm/W)	152.12	148.77
Beam Angle (°)	279.9	--
Center Beam Candle Power (cd)	235	--

Spectral Power Distribution & Chromaticity Diagram

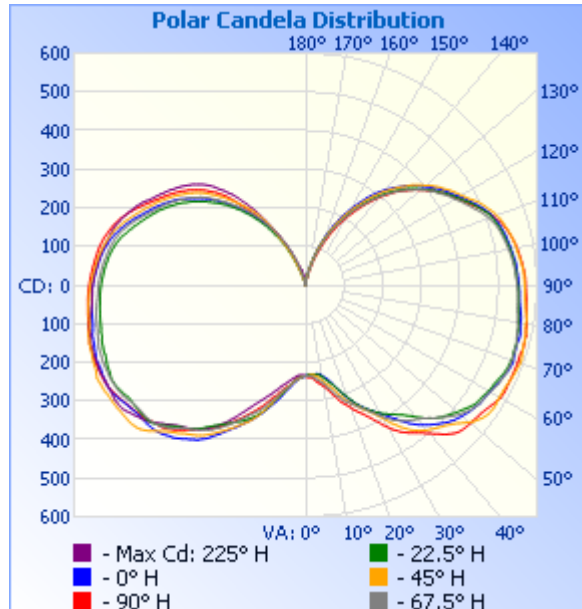


Zonal Lumen Tabulation

Zonal Lumen Summary		
Zone	Lumens	% Luminaire
0-30	281.0	5%
0-40	563.4	9.9%
0-60	1,454.7	25.7%
60-90	1,771.5	31.2%
70-100	1,798.8	31.7%
90-120	1,606.7	28.3%
0-90	3,226.2	56.9%
90-180	2,445.1	43.1%
0-180	5,671.3	100%

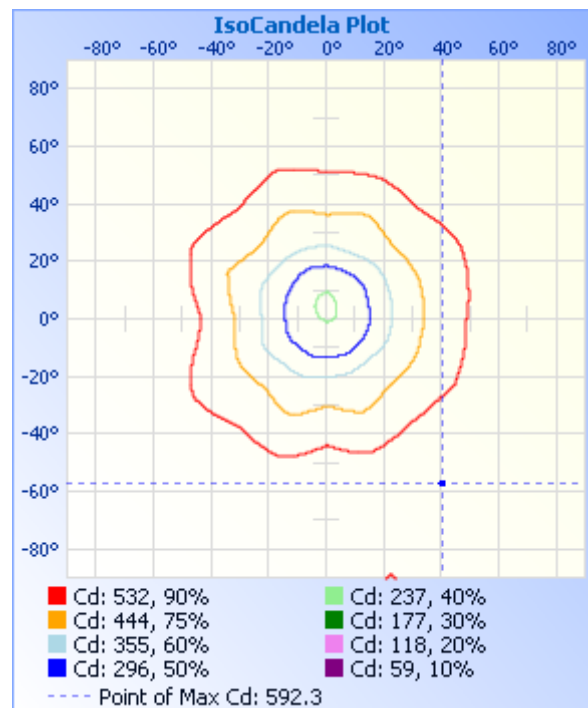
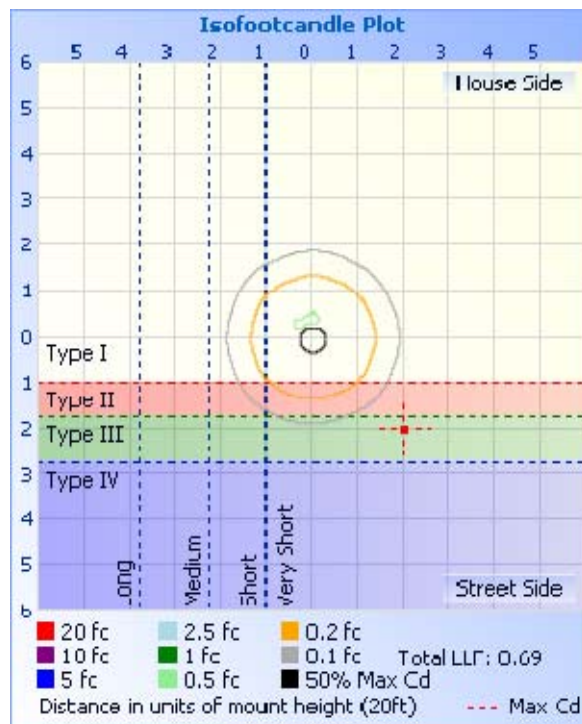
Lumens Per Zone					
Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	23.6	0.4%	90-100	592.2	10.4%
10-20	84.6	1.5%	100-110	548.8	9.7%
20-30	172.8	3.0%	110-120	465.6	8.2%
30-40	282.4	5.0%	120-130	365.5	6.4%
40-50	396.4	7.0%	130-140	256.8	4.5%
50-60	494.9	8.7%	140-150	145.8	2.6%
60-70	564.9	10.0%	150-160	57.7	1%
70-80	600.7	10.6%	160-170	11.9	0.2%
80-90	605.9	10.7%	170-180	0.6	0%

Photometric Data



Illuminance at a Distance

	Center Beam fc	Beam Width
17.0ft	0.81 fc	
34.0ft	0.20 fc	
51.0ft	0.09 fc	
68.0ft	0.05 fc	
85.0ft	0.03 fc	
102.0ft	0.02 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	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235
1	234	234	235	236	238	235	235	238	237	236	236	236	236	233	233	234	234
2	233	232	234	236	238	236	236	239	239	237	237	237	237	234	233	233	233
3	232	232	233	236	239	236	239	240	240	239	239	239	239	235	234	233	232
4	231	231	233	238	241	238	241	243	243	241	242	243	241	237	234	233	231
5	232	232	234	240	244	241	244	246	246	244	246	245	243	241	235	233	232
6	232	233	235	243	249	245	248	251	251	248	248	248	246	245	238	234	232
7	231	234	238	246	254	250	253	255	256	252	253	253	252	251	242	236	231
8	232	234	241	249	256	255	256	260	263	258	258	259	256	256	245	238	232
9	233	236	246	254	260	261	266	264	270	264	264	263	262	261	249	240	233
10	237	239	250	258	265	266	272	271	275	271	269	269	266	265	253	244	237
11	242	244	256	263	270	271	276	276	284	279	275	274	270	269	258	248	242
12	245	249	261	270	277	278	285	284	292	287	283	278	276	274	263	251	245
13	249	255	266	276	283	286	293	292	300	293	290	287	283	280	267	257	249
14	256	260	272	283	293	290	300	300	309	301	299	295	289	286	272	263	256
15	263	265	278	290	299	298	309	308	316	309	307	302	297	293	279	270	263
16	272	272	287	299	308	306	314	314	324	320	319	309	302	301	285	279	272
17	280	280	296	303	316	313	321	324	334	328	328	317	310	308	293	287	280
18	290	288	304	312	322	319	330	331	342	339	340	328	319	313	299	298	290
19	298	297	312	319	328	325	337	339	351	349	348	335	328	321	305	306	298
20	307	304	320	322	336	331	346	346	359	356	360	344	336	330	312	316	307
21	317	314	328	328	345	337	353	353	369	364	368	350	343	336	319	323	317
22	324	323	333	334	351	344	361	360	376	369	377	357	352	344	327	332	324
23	333	334	340	341	358	349	368	366	384	376	385	363	359	351	335	340	333
24	340	342	347	346	365	355	377	373	391	382	391	372	367	359	345	351	340
25	349	349	355	353	373	362	385	378	400	388	399	380	375	366	354	359	349
26	355	356	361	359	382	371	394	384	409	392	406	387	384	376	365	368	355
27	363	363	369	367	392	379	402	389	416	398	415	397	391	383	375	374	363
28	368	369	376	374	402	390	412	395	426	404	422	404	401	392	387	382	368

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29	376	376	387	384	414	400	423	401	433	408	430	414	410	399	397	388	376
30	383	382	396	391	424	408	431	406	444	415	437	422	417	409	409	395	383
31	391	388	409	401	435	419	440	412	453	420	445	431	427	416	418	400	391
32	399	393	422	408	444	428	448	418	464	427	453	438	433	425	429	407	399
33	409	398	432	416	453	438	456	426	474	433	460	446	441	432	437	412	409
34	417	404	444	422	460	445	462	432	481	442	469	453	446	441	446	418	417
35	428	409	453	429	467	453	468	442	489	449	475	457	453	446	453	423	428
36	437	415	463	433	472	461	472	449	494	458	481	463	459	453	461	427	437
37	448	421	470	439	478	466	477	458	500	464	485	467	466	458	467	433	448
38	456	429	478	443	485	472	482	465	504	471	490	473	474	464	472	437	456
39	465	436	484	448	493	476	487	473	512	478	494	478	481	470	478	444	465
40	471	446	490	452	500	482	493	481	517	483	501	484	490	477	482	449	471
41	479	454	494	457	511	487	499	485	523	489	507	491	496	482	486	458	479
42	486	464	500	464	518	493	507	490	526	493	513	497	504	489	490	465	486
43	492	472	504	470	528	496	513	495	531	499	519	506	510	495	496	473	492
44	499	480	509	478	535	500	520	502	536	506	525	513	517	499	502	481	499
45	505	485	513	485	543	504	525	508	539	514	534	520	522	504	509	489	505
46	511	491	520	493	548	507	530	515	542	522	543	523	526	508	516	495	511
47	516	496	526	499	552	511	535	522	543	528	554	528	528	511	523	502	516
48	521	501	534	508	554	514	539	526	545	533	561	531	530	513	530	506	521
49	524	506	544	514	555	519	545	530	546	537	568	534	535	518	538	513	524
50	528	512	552	521	557	522	548	533	546	539	573	535	538	523	543	520	528
51	531	516	561	526	558	526	552	536	547	540	576	536	543	529	549	526	531
52	535	521	566	531	560	533	555	538	548	540	578	537	545	534	553	533	535
53	538	527	572	536	562	536	557	541	550	540	578	537	547	540	558	538	538
54	540	532	577	539	563	539	558	545	551	541	579	539	550	544	562	542	540
55	543	536	580	543	566	540	559	548	554	542	580	541	552	547	568	545	543
56	546	538	581	545	569	541	559	550	556	542	581	543	556	549	573	547	546
57	547	541	582	546	572	543	560	552	560	542	583	547	558	550	574	549	547
58	548	542	582	548	577	545	560	553	564	544	584	550	562	550	576	552	548
59	550	545	581	550	580	548	559	554	566	548	585	554	564	551	577	555	550
60	552	548	580	553	583	550	559	555	570	551	585	556	567	553	575	558	552

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61	554	550	580	555	585	554	560	556	573	554	586	557	570	555	575	561	554
62	556	552	580	558	585	557	561	557	575	556	588	558	573	558	575	564	556
63	559	553	581	561	585	559	563	557	576	558	589	559	576	561	575	568	559
64	562	556	583	563	584	560	565	557	576	559	590	560	577	563	575	572	562
65	564	559	585	565	584	561	567	559	576	558	591	561	578	565	575	574	564
66	567	562	586	567	585	562	568	562	576	556	592	561	579	566	577	576	567
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68	571	566	589	569	585	565	569	559	573	555	587	562	579	567	578	577	571
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70	573	568	592	570	585	562	566	555	576	551	585	561	581	567	577	577	573
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72	570	567	590	568	585	563	564	555	573	551	582	560	580	564	578	578	570
73	569	566	589	568	586	564	565	556	572	549	582	561	580	564	578	577	569
74	569	567	586	568	588	564	564	554	570	549	581	559	581	561	578	573	569
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76	571	564	586	564	586	562	563	551	568	544	578	555	577	561	574	568	571
77	571	563	584	562	587	561	562	550	567	545	578	554	575	559	572	569	571
78	569	564	585	562	584	559	560	546	564	542	574	551	575	558	572	568	569
79	567	563	581	561	583	558	556	544	562	541	571	551	575	557	572	566	567
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81	566	560	580	557	581	554	553	542	560	539	568	549	571	553	567	562	566
82	564	559	579	556	578	553	552	541	559	538	568	548	570	551	564	562	564
83	562	556	576	554	577	553	551	540	558	537	567	547	569	549	561	559	562
84	560	556	574	553	576	552	550	539	557	536	566	545	567	549	559	556	560
85	557	554	572	552	575	552	549	538	556	535	565	544	567	547	556	555	557
86	556	554	571	552	574	551	548	537	556	535	563	542	566	546	555	554	556
87	556	553	570	551	573	550	547	537	555	534	562	540	566	545	554	553	556
88	555	553	569	551	572	549	546	535	555	533	562	539	564	544	553	553	555
89	554	552	569	550	571	548	545	535	554	532	560	538	562	543	553	552	554
90	553	550	568	548	570	547	545	533	552	530	559	538	561	541	552	551	553
91	552	549	567	547	570	546	543	532	551	529	556	536	560	540	551	550	552
92	551	547	567	546	570	545	542	531	548	527	554	535	558	538	549	549	551

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93	550	546	567	546	569	544	540	530	547	526	552	533	557	538	548	548	550
94	549	546	565	545	567	543	538	528	544	524	550	531	555	536	546	546	549
95	549	545	564	543	565	542	536	527	542	522	548	530	553	534	544	545	549
96	548	544	562	542	564	540	534	525	541	520	546	528	551	534	542	544	548
97	546	543	560	540	562	538	532	523	538	518	544	526	550	532	540	542	546
98	544	541	558	539	560	537	530	520	536	516	541	523	548	531	539	541	544
99	542	540	556	537	558	535	528	518	533	513	539	521	547	528	537	540	542
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101	539	536	554	532	554	530	523	513	527	508	533	516	543	524	531	537	539
102	537	534	552	531	552	527	520	510	524	505	530	513	540	522	528	534	537
103	535	532	549	529	549	524	518	507	521	501	527	510	537	519	526	532	535
104	534	530	547	527	546	521	514	503	516	497	523	507	534	517	524	530	534
105	532	528	544	524	543	517	511	499	512	492	519	503	530	515	522	529	532
106	529	526	541	522	539	513	506	495	506	485	515	499	527	511	520	526	529
107	527	523	538	519	536	508	501	489	501	481	510	494	523	508	517	524	527
108	525	520	535	515	530	504	497	484	495	474	504	488	519	504	514	521	525
109	521	517	532	511	524	499	490	477	490	469	499	483	514	500	510	517	521
110	517	514	528	506	519	494	485	472	483	463	493	476	509	495	507	513	517
111	513	510	523	501	513	487	477	466	478	458	487	471	503	489	502	507	513
112	509	505	518	496	507	481	471	460	471	452	481	463	497	484	498	501	509
113	504	498	512	490	499	474	463	454	464	448	475	457	491	476	493	496	504
114	497	493	507	483	493	468	457	449	459	441	469	451	485	471	488	488	497
115	492	486	501	476	485	462	450	443	452	437	464	445	477	464	484	482	492
116	485	480	495	470	477	456	445	439	447	431	458	439	471	457	478	475	485
117	478	473	486	464	471	450	438	432	440	427	452	434	463	453	473	469	478
118	473	466	478	459	464	444	432	426	435	420	446	429	457	446	466	461	473
119	466	460	472	453	458	439	427	418	428	414	441	425	451	442	459	453	466
120	460	453	465	446	452	433	420	412	424	408	436	418	444	435	454	448	460
121	452	447	460	442	445	427	415	406	416	401	428	413	439	428	449	442	452
122	446	441	455	436	439	421	409	398	411	396	424	406	433	422	444	438	446
123	442	436	449	430	434	415	403	391	404	389	417	401	427	416	438	429	442
124	437	428	443	423	427	407	395	385	397	382	412	395	421	412	434	422	437

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125	432	421	436	417	420	401	389	378	388	374	405	388	416	405	429	416	432
126	424	416	431	413	415	394	381	371	380	368	399	382	410	397	423	409	424
127	417	408	424	405	408	388	375	365	373	360	392	375	404	389	419	403	417
128	412	402	418	399	399	381	368	358	364	352	387	369	397	381	413	397	412
129	405	395	410	391	392	374	361	352	357	343	379	361	391	375	408	390	405
130	398	387	402	385	383	366	353	343	348	336	373	354	383	367	402	384	398
131	391	381	396	376	377	360	345	336	341	328	365	345	376	360	396	375	391
132	385	373	388	368	369	351	338	327	331	319	357	337	368	351	391	369	385
133	378	367	381	361	360	342	330	318	324	312	348	327	360	340	383	360	378
134	370	358	371	353	353	335	322	308	313	303	338	318	351	331	376	351	370
135	363	350	361	346	344	326	312	299	305	295	329	307	342	319	367	344	363
136	354	342	354	337	336	318	305	288	294	285	319	299	334	308	359	334	354
137	347	332	343	327	325	309	295	280	285	277	310	289	321	297	348	327	347
138	338	324	335	319	315	301	287	269	274	266	299	278	311	282	334	317	338
139	330	315	325	309	306	291	276	259	265	258	290	270	297	267	325	309	330
140	323	305	317	300	295	283	268	250	254	246	279	261	284	250	312	299	323
141	313	296	307	289	286	272	257	240	244	238	271	252	267	233	302	288	313
142	304	288	296	280	274	264	248	231	235	227	260	242	255	218	288	280	304
143	294	278	287	269	266	253	237	220	225	216	251	234	238	202	272	270	294
144	286	267	275	259	254	242	227	211	217	208	241	224	227	196	260	262	286
145	275	259	266	251	243	233	219	201	206	197	232	213	213	181	244	251	275
146	263	248	255	240	234	222	208	192	198	187	220	204	202	174	231	241	263
147	254	239	243	232	223	213	200	183	187	175	206	192	194	158	214	233	254
148	242	228	235	221	213	203	188	175	179	163	195	184	183	144	199	222	242
149	231	217	224	209	202	194	179	165	167	152	179	174	176	131	186	214	231
150	222	208	215	201	191	183	167	155	156	143	161	165	165	114	170	203	222
151	210	197	205	190	183	175	158	147	146	132	142	153	151	94	156	191	210
152	201	187	194	179	172	164	147	135	134	123	129	143	138	79	144	182	201
153	189	178	184	171	160	156	138	125	124	110	113	131	124	67	131	170	189
154	177	167	172	161	150	144	127	113	113	97	102	120	115	59	122	159	177
155	168	159	159	152	137	135	116	105	104	85	90	112	103	49	109	151	168
156	156	149	149	139	128	124	107	96	94	70	76	99	93	40	96	140	156

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

Tel: 8620-3229 0320

Fax: 8620-32290422

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

157	144	138	137	126	117	113	97	87	85	58	59	90	83	35	86	132	144
158	135	130	128	117	106	104	88	79	72	46	46	81	77	37	74	121	135
159	123	119	117	107	97	94	77	70	61	38	35	71	67	35	64	110	123
160	114	110	106	98	88	85	69	63	53	30	26	57	57	33	58	101	114
161	104	99	98	90	80	74	62	52	45	23	21	44	49	31	51	91	104
162	93	89	87	81	71	67	57	46	41	18	19	36	39	28	47	84	93
163	84	81	77	72	61	59	47	40	35	18	16	26	32	22	44	75	84
164	74	72	70	62	53	50	40	35	29	16	13	20	22	19	42	66	74
165	65	63	61	53	46	44	35	28	24	14	9	14	15	19	40	59	65
166	55	56	53	47	38	37	27	22	20	13	7	9	12	18	38	50	55
167	49	48	45	40	34	31	24	18	16	11	5	6	8	15	35	43	49
168	43	42	39	33	27	24	19	14	12	8	3	3	5	11	27	38	43
169	36	35	33	27	21	20	14	10	9	6	2	2	4	8	20	32	36
170	27	29	26	22	17	17	12	8	6	4	2	2	3	7	16	25	27
171	23	23	20	18	14	12	8	5	4	3	1	2	3	6	13	21	23
172	19	18	17	13	9	8	5	4	3	2	1	1	2	4	10	16	19
173	13	14	12	10	6	4	4	3	2	2	1	1	2	3	8	11	13
174	11	10	9	7	4	3	3	2	2	1	1	1	1	2	5	9	11
175	7	7	6	4	3	3	2	1	1	1	1	1	1	1	4	6	7
176	5	4	4	2	2	2	1	1	1	1	1	1	1	1	3	3	5
177	3	3	2	1	1	1	1	1	1	1	1	1	1	1	2	2	3
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-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 *******