TEST REPORT

ACCORDING TO IES LM-80-2015
For

Hongli Zhihui Group Co.,Ltd. Guangzhou Branch

Room 316, Building 2, No.1, Xianke Yi Road, Huadong Town, Huadu District, Guangzhou, China

Model: HL-ES-PU3032DW-2C-S1-HR3

Report Type: 9000 Hours Test Report	**Product Type:** LED Package
Test Engineer:	Pote Wang
Report Number:	RSZ160313501-10-9000-M1
Test Date:	2016-03-13 to 2017-03-23
Report Date:	2019-01-12
Revised Note:	The previous report RSZ160313501-10-9000 is replaced by this report on 2019-01-12
Reviewed By:	Daniel Duan / EE Manager
Test Facility:	Test facility was located at No.69, Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China

Prepared By: Bay Area Compliance Laboratories Corp. (Dongguan).

1 - General Information

1.1 Description of LED Light Sources

Sample Size:

50 PCS samples were received on 2016-03-13. The samples were numbered from 1 to 25 and 26 to 50.

Manufacturer:	Hongli Zhihui Group Co.,Ltd. Guangzhou Branch
Part Number:	HL-ES-PU3032DW-2C-S1-HR3
Part Type:	LED Package
Drive Level:	DC 150mA
Nominal CCT:	3000K
Power:	1.224W
Average Current Density per LED die:	301.84mA/mm^2
Average Power DensW* nBT/F4 9.96	

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	Reported TM-21 L_{70} Lifetime	Reported TM-21 L_{90} Lifetime

3 - Test Data

3.1 Data Set 1, 85°C, 150mA (Lumen Maintenance) 98.15

No.		Lumen Maintenance (%)								
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	123.7	100.32	100.16	99.84	99.60	99.27	99.11	98.79	98.54	98.30
2	121.2	100.17	100.08	99.75	99.50	99.17	98.84	98.51	98.35	98.27
3	124.4	100.16	99.92	99.76	99.44	99.28	98.87	98.63	98.31	98.07
4	119.8	100.17	100.08	99.83	99.42	99.08	98.83	98.66	98.41	98.08
5	118.0	100.25	100.17	99.92	99.49	99.15	98.90	98.56	98.22	98.05
6	120.5	100.33	99.92	99.75	99.59	99.34	98.92	98.59	98.34	98.01
7	117.3	100.26	100.09	99.66	99.40	99.15	98.81	98.47	98.21	98.04
8	122.6	100.33	100.08	99.84	99.43	99.18	98.86	98.69	98.45	98.21
9	121.6	100.16	99.92	99.67	99.42	99.01	98.68	98.36	98.11	97.94
10	119.2	100.34	100.17	99.92	99.66	99.33	99.16	98.83	98.66	98.57
11	124.2	100.24	99.92	99.60	99.28	98.95	98.63	98.47	98.39	98.23
12	122.2	100.16	99.84	99.43	99.10	98.77	98.53	98.20	97.87	97.71
13	123.1	100.24	99.92	99.68	99.27	98.94	98.54	98.13	98.05	97.73
14	120.8	100.33	100.08	99.67	99.34	99.09	98.76	98.43	98.01	97.68
15	117.2	100.09	99.91	99.66	99.32	98.89	98.63	98.46	98.21	97.95
16	118.7	[redacted]	99.92	99.58	99.33	99.07	98.74	98.48	98.32	98.15
17	127.8	100.31	99.84	99.61						

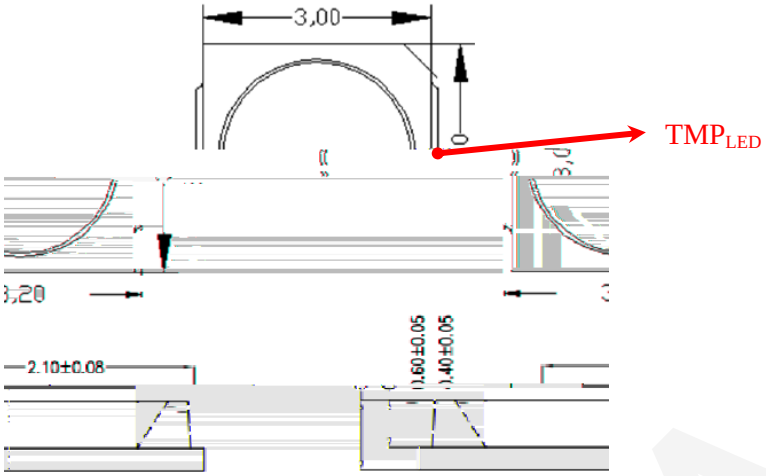
3.2 Data Set 1, 85°C, 150mA (Forward Voltage)

No.	Forward Voltage (V)									
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	8000hrs	9000hrs
1	6.276	6.279	6.277	6.285	6.284	6.284	6.283	6.284	6.307	6.306
2	6.179	6.174	6.176	6.177	6.175	6.176	6.177	6.175	6.196	6.195
3	6.212	6.211	6.210	6.213	6.214	6.216	6.212	6.216	6.237	6.235
4	6.139	6.137	6.143	6.140	6.141	6.138	6.138	6.146	6.164	6.158
5	6.201	6.207	6.212	6.206	6.204	6.209	6.210	6.214	6.229	6.230
6	6.130	6.127	6.129	6.133	6.130	6.131	6.137	6.137	6.153	6.150
7	6.204	6.211	6.210	6.206	6.210	6.208	6.213	6.217	6.228	6.230
8	6.195	6.193	6.198	6.198	6.192	6.200	6.193	6.204	6.220	6.215
9	6.136	6.132	6.136	6.135	6.132	6.143	6.143	6.143	6.155	6.154
10	6.139	6.139	6.146	6.144	6.140	6.148	6.148	6.149	6.163	6.162
11	6.242	6.242	6.247	6.242	6.241	6.246	6.244	6.253	6.269	6.264
12	6.210	6.209	6.214	6.211	6.212	6.215	6.211	6.221	6.229	6.229
13	6.180	6.177	6.187	6.182	6.185	6.186	6.186	6.189	6.199	6.200
14	6.198	6.197	6.202	6.196	6.199	6.201	6.198	6.210	6.231	6.218
15	6.193	6.189	6.198	6.191	6.192	6.195	6.191	6.203	6.217	6.214
16	6.206	6.205	6.207	6.206	6.210	6.213	6.206	6.219	6.233	6.224
17	6.127	6.131	6.137	6.129	6.128	6.136	6.134	6.146	6.154	6.149
18	6.156	6.162	6.164	6.159	6.162	6.162	6.162	6.169	6.178	6.177
19	6.103	6.102	6.108	6.105	6.102	6.117	6.108	6.116	6.128	6.121
20	6.136	6.134	6.142	6.139	6.134	6.143	6.144	6.148	6.153	6.154
21	6.126	6.130	6.130	6.131	6.134	6.134	6.139	6.143	6.149	6.148
22	6.131	6.130	6.136	6.130	6.135	6.134	6.130	6.138	6.151	6.148
23	6.202	6.198	6.207	6.203	6.206	6.208	6.207	6.210	6.227	6.223
24	6.145	6.146	6.149	6.149	6.144	6.151	6.147	6.155	6.165	6.172
25	6.220	6.216	6.222	6.220	6.224	6.222	6.218	6.233	6.278	6.243
Ave.	6.175	6.175	6.179	6.177	6.177	6.181	6.179	6.186	6.201	6.197
Med.	6.180	6.177	6.187	6.182	6.185	6.186	6.186	6.189	6.199	6.200
st dev	0.0431	0.0433	0.0426	0.0433	0.0442	0.0425	0.0420	0.0427	0.0469	0.0448
Min.	6.103	6.102	6.108	6.105	6.102	6.117	6.108	6.116	6.128	6.121
Max.	6.276	6.279	6.277	6.285	6.284	6.284	6.283	6.284	6.307	6.306

FIN

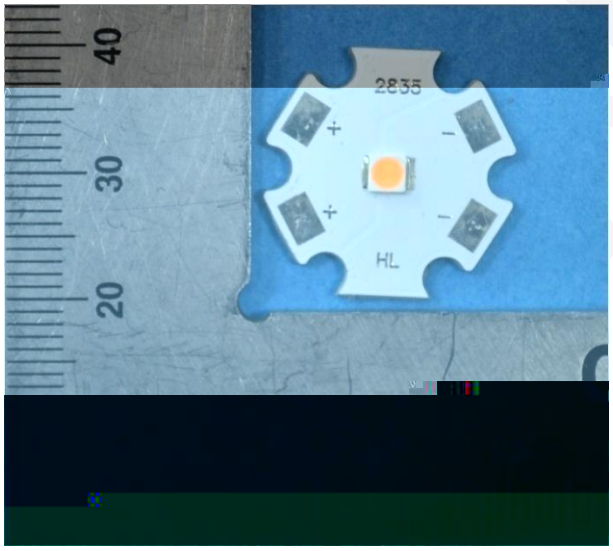
4 - EUT Photo

4.1 Mechanical Dimensions



All dimensions are in millimeter

4.2 EUT Photo



4.3 Report Revision

Report Number	Report Date	Contents
RSZ160313501-10-9000	2017-03-28	Original report.
RSZ160313501-10-9000-M1	2019-01-12	Update the Logo of lab on the Page 1 Update Company name and address on page 1. Add DUT Characteristics on page 3 according to ENERGY STAR requirements

**********END OF REPORT**********