

## TEST REPORT

The following tested product(s) were submitted and identified by the vendor as:

Applicant : Lextar Electronics Corp.  
Address of Applicant : No. 3 Gongye E. 3rd Rd., Hsinchu Science Park, Hsinchu 30075, Taiwan, R.O.C.  
Testing Laboratory : SGS Taiwan Ltd., Optics Laboratory  
Testing Address : 33, Wu Chyuan Rd., New Taipei Industrial Park, New Taipei City, Taiwan 24886  
Product Name : PC56H Series LED Component  
Model / Serial Number : PC56H01  
Manufacturer : Lextar Electronics Corp.  
Rating : DC 150 mA, 0.5W  
Test Standard/Method : IES LM-80-08 Approved Method: Measuring Lumen Maintenance of LED Light Sources  
Date of Issue : Aug. 14, 2012  
Modified Date : Mar. 08, 2013

The submitted products have been tested as requested and the following results were obtained, and the report, not applicable for lawsuit, refers only to the unit(s) submitted for test.

※Note: The report (OA-2011-80014-01) replaces the previous one (OA-2011-80014), and the previous report (OA-2011-80014) is invalid from the modified date.

Test Results : -PLEASE SEE ATTACHED SHEETS-

Signed for and on behalf of  
SGS TAIWAN Ltd.



Calvin Tzou  
Technical Manager

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## 1 SAMPLING DESCRIPTION

No sampling action and method employed

## 2 DATE OF RECEIPT OF SAMPLES

Aug. 31, 2011

## 3 DATE(S) OF PERFORMANCE OF THE TEST

Oct. 26, 2011 ~ Aug. 03, 2012

## 4 IDENTITY OF SAMPLES

Quantity	Model	Serial Number
25	PC56H01	# A01 - # A25 (25 °C)
25	PC56H01	# B01 - # B25 (55 °C)
25	PC56H01	# C01 - # C25 (85 °C)

## 5 TEST ITEMS

### 5.1 Data Summary of Lumen and Color Maintenance

Test results were concluded by different Case Temperatures (Ts).

### 5.2 Lumen Maintenance and Color Maintenance Test

Testing specifications by different case temperatures according to IES LM-80-08 Approved Method: Measuring Lumen Maintenance of LED Light Sources and client's requirements were implemented per the following items.

#### 5.2.1 Total Luminous Flux ( $\Phi_V$ )

The test results of total luminous flux were implemented referring to Clause 2 PROPERTIES OF LEDS & Clause 6 MEASUREMENT OF LUMINOUS FLUX of CIE 127: 2007 2nd edition MEASUREMENT OF LEDS and IES LM-80-08 Approved Method: Measuring Lumen Maintenance of LED Light Sources, when the UUTs were powered with constant current of  $I_F$ .

#### 5.2.2 Correlated Color Temperature (CCT), CIE Color Coordinate (CIE<sub>x</sub>, CIE<sub>y</sub>) & Chromaticity Shift ( $\Delta u'v'$ )

The test results of correlated color temperature were implemented referring to CIE 127:2007 2nd edition MEASUREMENT OF LEDS, CIE 15: 2004 COLORIMETRY.

The test results of color coordinate were implemented referring to CIE 127: 2007 2nd edition MEASUREMENT OF LEDS, CIE 15:2004 COLORIMETRY.

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**6 TEST CONDITIONS**

Main Test Equipment:

Name	Brand	Model	Traceability
Spectroradiometer	Labsphere	CDS 2100	NIST
Standard Light Source	Labsphere	SCL-600	NIST
Source Meter	Keithley	2400	NMI
Digital Multimeter	Agilent	U1242A	NMI

Environmental Conditions:

Temperature: (25 ± 1) °C  
 Relative Humidity: < 65 % RH

UUT Conditions:

Drive Current: DC 150 mA  
 Forward Voltage: DC 3.0 ~ 3.6V  
 Power Consumption: 0.5 W  
 CCT: 3000 K  
 Package Dimension: L 5.6 x W 3.0 x H 1.0 mm  
 Prior operation: 0 hour  
 Total Operation Duration: 6000 hours  
 Target CCT: 3000 K  
 Sample Size: 75 pcs (25 pcs for each temperature)  
 Failed Quantity: 0 pcs

Measurement Conditions:

Interval Time: 0, 500, 1000, 1500, 2000, 3000, 4000, 5000, 6000 hours  
 Warm up Time: < 1 minute (initial)  
 Relative measurement uncertainty: 2.8 % (95 % Confidence Level)

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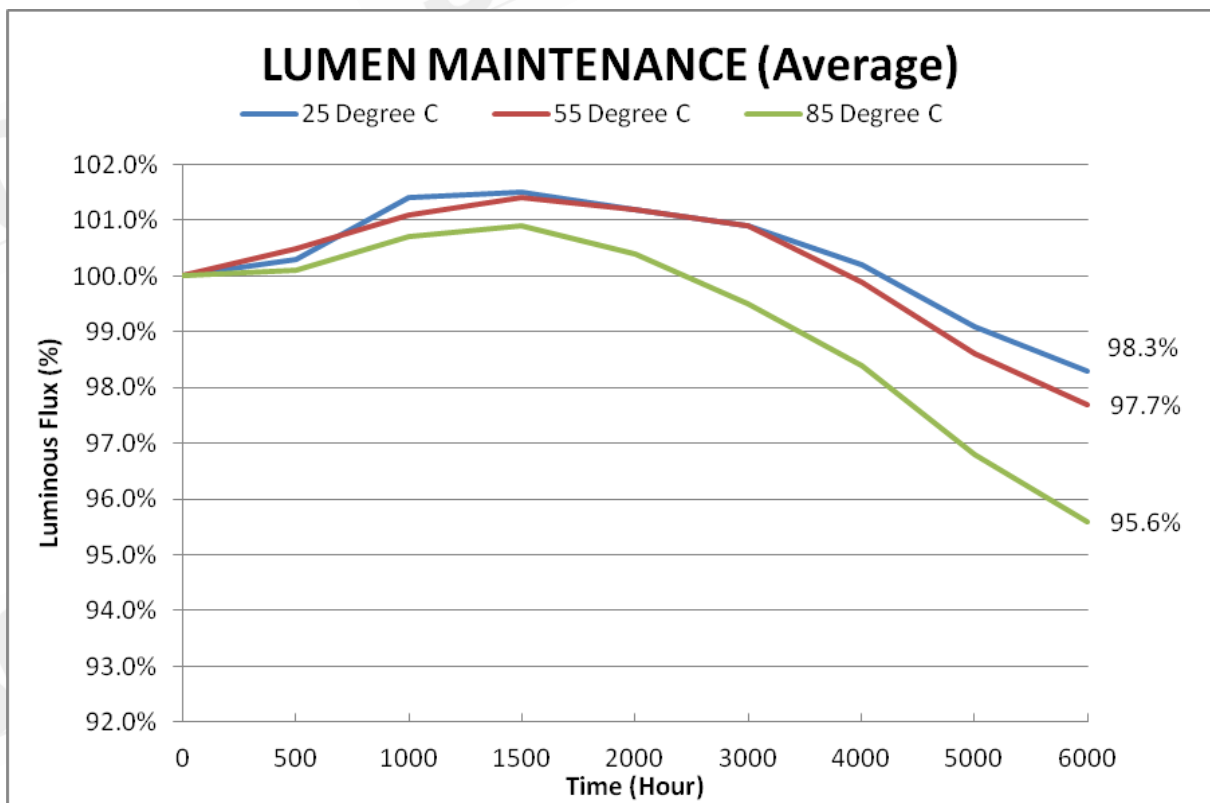
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## 7 TEST RESULTS

### 7.1 Data Summary of Lumen and Color Maintenance

Temp.	Initial(0hrs)		Luminous Maintenance (%)							
	TLF(lm)	V <sub>F</sub> (V)	500 hrs	1000 hrs	1500 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
25°C Avg.	41.95	3.28	100.3%	101.4%	101.5%	101.2%	100.9%	100.2%	99.1%	98.3%
55°C Avg.	41.87	3.28	100.5%	101.1%	101.4%	101.2%	100.9%	99.9%	98.6%	97.7%
85°C Avg.	42.06.	3.28	100.1%	100.7%	100.9%	100.4%	99.5%	98.4%	96.8%	95.6%

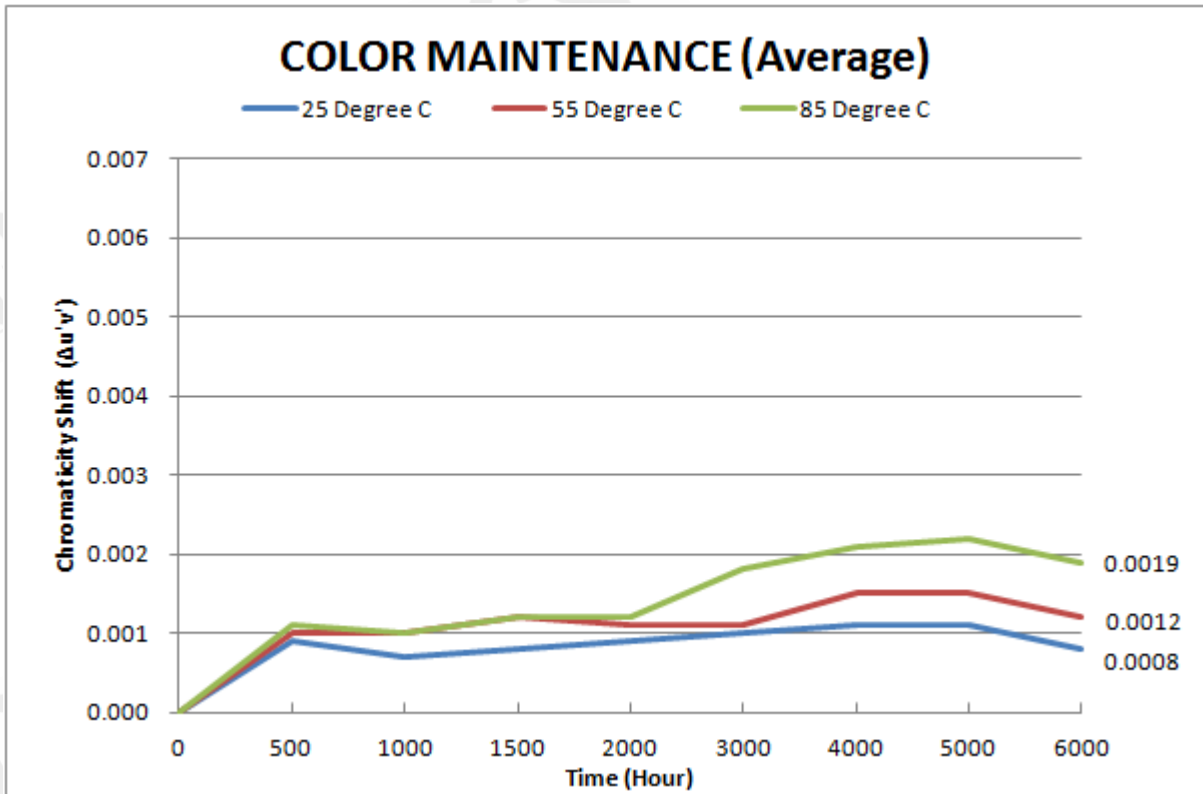
Temp.	Initial(0hrs)			Chromaticity Shift ( $\Delta u'v'$ )							
	CIE <sub>x</sub>	CIE <sub>y</sub>	CCT	500 hrs	1000 hrs	1500 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
25°C Avg.	0.4256	0.3998	3163.9	0.0009	0.0007	0.0008	0.0009	0.0010	0.0011	0.0011	0.0008
55°C Avg.	0.4259	0.4005	3162.5	0.0010	0.0010	0.0012	0.0011	0.0011	0.0015	0.0015	0.0012
85°C Avg.	0.4254	0.4002	3169.8	0.0011	0.0010	0.0012	0.0012	0.0018	0.0021	0.0022	0.0019



Average Lumen Maintenance diagram

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Average Color Maintenance diagram

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7.2 Lumen Maintenance and Color Maintenance Test

**Test Condition:  $T_s = 25\text{ }^\circ\text{C}$**

Requirement	
Case Temperature [ $T_s$ ]: $\geq 23\text{ }^\circ\text{C}$	Average [ $T_s$ ]: 25.6
Ambient Temperature [ $T_a$ ]: $\geq 20\text{ }^\circ\text{C}$	Average [ $T_a$ ]: 24.5
Driver Current: 150mA	Air Flow: Minimized
Measurement Current: 150mA	Relative humidity: < 65 % RH

7.2.1 Total Luminous Flux ( $\Phi_V$ )

S/N	Initial(Ohrs)		Luminous Maintenance (%)							
	TLF(lm)	$V_F(V)$	500 hrs	1000 hrs	1500 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
A01	42.79	3.27	100.3%	102.0%	102.3%	101.8%	101.3%	100.7%	99.2%	97.5%
A02	41.94	3.27	100.9%	102.4%	102.8%	102.6%	102.5%	101.9%	100.6%	99.0%
A03	40.92	3.25	100.7%	101.7%	102.3%	102.0%	101.3%	100.5%	98.9%	97.4%
A04	42.10	3.28	100.2%	101.9%	101.5%	101.0%	100.2%	100.3%	98.6%	97.8%
A05	42.74	3.30	99.0%	99.4%	99.7%	99.0%	99.0%	98.8%	98.3%	96.9%
A06	42.44	3.30	99.1%	100.5%	100.9%	100.5%	99.6%	98.7%	98.7%	97.3%
A07	41.47	3.26	100.8%	102.1%	102.2%	102.0%	102.1%	101.6%	101.2%	100.4%
A08	41.87	3.29	100.0%	100.8%	101.1%	100.6%	100.8%	99.3%	97.5%	97.4%
A09	41.36	3.30	99.7%	100.3%	100.6%	100.2%	99.7%	99.6%	98.4%	97.1%
A10	43.24	3.30	99.3%	100.3%	100.4%	99.8%	100.3%	99.8%	99.1%	97.9%
A11	41.27	3.27	101.2%	102.3%	101.9%	101.6%	101.6%	101.0%	99.9%	99.6%
A12	41.68	3.28	102.1%	102.9%	103.2%	102.7%	102.3%	101.7%	100.3%	99.1%
A13	41.33	3.28	101.1%	102.1%	102.2%	102.0%	101.3%	100.6%	99.9%	99.1%
A14	42.04	3.30	100.6%	101.5%	101.8%	101.5%	101.4%	100.3%	99.0%	98.5%
A15	42.49	3.30	100.6%	101.2%	101.7%	101.2%	101.2%	100.5%	98.6%	98.1%
A16	40.83	3.22	99.7%	101.3%	101.9%	101.2%	100.9%	99.9%	98.9%	97.8%
A17	42.03	3.30	100.5%	101.6%	102.0%	102.0%	101.8%	101.3%	99.5%	99.3%
A18	41.65	3.27	101.3%	102.3%	102.1%	101.5%	101.3%	100.8%	100.1%	99.4%
A19	43.05	3.31	101.6%	101.9%	101.3%	101.1%	101.1%	100.2%	98.8%	97.1%
A20	42.21	3.29	100.0%	101.1%	101.4%	101.3%	101.2%	100.6%	100.3%	99.6%
A21	41.54	3.27	100.3%	101.7%	101.8%	101.2%	101.4%	100.7%	99.0%	98.8%
A22	40.95	3.26	100.5%	101.8%	102.0%	101.4%	100.8%	100.3%	99.5%	98.8%
A23	41.60	3.27	99.0%	100.3%	100.1%	99.9%	99.9%	99.1%	97.8%	97.7%
A24	43.12	3.30	99.3%	100.2%	99.9%	99.8%	99.6%	98.7%	97.9%	97.1%
A25	42.03	3.29	99.2%	100.3%	101.4%	100.9%	100.7%	99.4%	98.6%	98.4%
Max.	43.24	3.31	102.1%	102.9%	103.2%	102.7%	102.5%	101.9%	101.2%	100.4%
Min.	40.83	3.22	99.0%	99.4%	99.7%	99.0%	99.0%	98.7%	97.5%	96.9%
Avg.	41.95	3.28	100.3%	101.4%	101.5%	101.2%	100.9%	100.2%	99.1%	98.3%
std. deviation	0.69	0.02	0.86%	0.88%	0.88%	0.90%	0.90%	0.92%	0.91%	0.99%

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7.2.2 Correlated Color Temperature (CCT), CIE Color Coordinate (CIEx, CIEy) & Chromaticity Shift ( $\Delta u'v'$ )

		Correlated Color Temperature (CCT)							
S/N	0hr	500hrs	1000hrs	1500hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
A01	3177	3192	3188	3194	3190	3192	3184	3196	3183
A02	3184	3196	3193	3192	3194	3199	3191	3202	3195
A03	3119	3137	3134	3135	3135	3138	3129	3142	3131
A04	3168	3183	3182	3184	3189	3189	3181	3200	3189
A05	3189	3204	3202	3202	3210	3210	3201	3214	3203
A06	3224	3238	3232	3234	3235	3240	3228	3243	3233
A07	3184	3207	3198	3198	3201	3208	3213	3208	3202
A08	3184	3209	3211	3209	3210	3215	3218	3217	3211
A09	3142	3164	3160	3161	3161	3165	3170	3155	3161
A10	3180	3201	3198	3201	3198	3201	3205	3205	3199
A11	3140	3178	3170	3175	3182	3180	3187	3185	3174
A12	3169	3199	3193	3197	3202	3205	3211	3210	3200
A13	3158	3179	3177	3184	3190	3188	3189	3183	3183
A14	3111	3146	3145	3145	3144	3150	3153	3152	3150
A15	3139	3170	3170	3177	3174	3180	3181	3180	3171
A16	3151	3172	3167	3174	3167	3164	3172	3168	3161
A17	3192	3220	3220	3229	3230	3225	3227	3223	3222
A18	3168	3188	3188	3193	3194	3189	3198	3193	3188
A19	3188	3225	3201	3210	3206	3202	3211	3209	3200
A20	3196	3221	3212	3219	3217	3219	3229	3229	3222
A21	3140	3171	3165	3170	3171	3172	3179	3175	3170
A22	3127	3152	3149	3154	3154	3152	3204	3164	3157
A23	3164	3196	3187	3190	3189	3190	3202	3203	3194
A24	3177	3205	3191	3200	3196	3193	3201	3199	3196
A25	3127	3151	3146	3149	3153	3147	3157	3156	3154
Max.	3224	3238	3232	3234	3235	3240	3229	3243	3233
Min.	3111	3137	3134	3135	3135	3138	3129	3142	3131
Avg.	3163.9	3188.2	3183.2	3187.0	3187.7	3188.5	3192.8	3192.4	3186.0
std. deviation	27.76	26.18	24.76	25.28	25.44	25.72	24.52	25.91	24.89

Unit: K

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S/N	Initial(0hrs)		Chromaticity Shift ( $\Delta u'v'$ )							
	CIE <sub>x</sub>	CIE <sub>y</sub>	500hrs	1000hrs	1500hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
A01	0.4242	0.3985	0.0005	0.0004	0.0005	0.0004	0.0005	0.0002	0.0006	0.0002
A02	0.4244	0.3998	0.0003	0.0003	0.0002	0.0003	0.0006	0.0003	0.0006	0.0004
A03	0.4314	0.4071	0.0007	0.0006	0.0007	0.0007	0.0008	0.0005	0.0011	0.0007
A04	0.4244	0.3978	0.0005	0.0004	0.0005	0.0007	0.0008	0.0005	0.0012	0.0009
A05	0.4234	0.3979	0.0005	0.0005	0.0005	0.0008	0.0008	0.0004	0.0009	0.0005
A06	0.4216	0.3981	0.0004	0.0003	0.0004	0.0005	0.0007	0.0003	0.0007	0.0003
A07	0.4241	0.3988	0.0009	0.0006	0.0005	0.0007	0.0010	0.0011	0.0010	0.0007
A08	0.4241	0.3989	0.0009	0.0010	0.0009	0.0009	0.0012	0.0012	0.0012	0.0010
A09	0.4273	0.4012	0.0008	0.0006	0.0006	0.0006	0.0008	0.0010	0.0006	0.0008
A10	0.4251	0.4008	0.0008	0.0007	0.0007	0.0006	0.0007	0.0009	0.0009	0.0007
A11	0.4271	0.4003	0.0014	0.0012	0.0013	0.0015	0.0015	0.0017	0.0016	0.0012
A12	0.4257	0.4008	0.0011	0.0008	0.0010	0.0012	0.0013	0.0015	0.0014	0.0011
A13	0.4259	0.3999	0.0008	0.0007	0.0009	0.0011	0.0010	0.0011	0.0009	0.0009
A14	0.4291	0.4012	0.0013	0.0013	0.0013	0.0012	0.0015	0.0016	0.0015	0.0014
A15	0.4267	0.3994	0.0011	0.0011	0.0013	0.0012	0.0015	0.0015	0.0015	0.0011
A16	0.4264	0.4001	0.0008	0.0006	0.0009	0.0007	0.0008	0.0009	0.0007	0.0004
A17	0.4235	0.3986	0.0010	0.0010	0.0013	0.0013	0.0012	0.0012	0.0011	0.0010
A18	0.4249	0.3989	0.0007	0.0007	0.0009	0.0009	0.0008	0.0011	0.0009	0.0008
A19	0.4239	0.3990	0.0013	0.0005	0.0008	0.0007	0.0008	0.0010	0.0009	0.0007
A20	0.4232	0.3983	0.0009	0.0006	0.0009	0.0008	0.0009	0.0012	0.0012	0.0010
A21	0.4273	0.4007	0.0012	0.0010	0.0011	0.0011	0.0012	0.0014	0.0013	0.0011
A22	0.4275	0.3996	0.0009	0.0008	0.0010	0.0010	0.0010	0.0028	0.0014	0.0012
A23	0.4256	0.3999	0.0012	0.0008	0.0009	0.0009	0.0009	0.0014	0.0014	0.0011
A24	0.4248	0.3997	0.0010	0.0005	0.0008	0.0007	0.0007	0.0009	0.0008	0.0007
A25	0.4277	0.4002	0.0009	0.0007	0.0008	0.0009	0.0008	0.0012	0.0012	0.0011
Max.	0.4314	0.4071	0.0014	0.0013	0.0013	0.0015	0.0015	0.0028	0.0016	0.0014
Min.	0.4216	0.3978	0.0003	0.0003	0.0002	0.0003	0.0005	0.0002	0.0006	0.0002
Avg.	0.4256	0.3998	0.0009	0.0007	0.0008	0.0009	0.0010	0.0011	0.0011	0.0008
std. deviation	0.0021	0.0018	0.0003	0.0003	0.0003	0.0003	0.0003	0.0006	0.0003	0.0003

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7.3 Lumen Maintenance and Color Maintenance Test

**Test Condition:  $T_s = 55\text{ }^\circ\text{C}$**

Requirement	
Case Temperature [ $T_s$ ]: $\geq 53\text{ }^\circ\text{C}$	Average [ $T_s$ ]: 55.7
Ambient Temperature [ $T_a$ ]: $\geq 50\text{ }^\circ\text{C}$	Average [ $T_a$ ]: 54.5
Driver Current: 150mA	Air Flow: Minimized
Measurement Current: 150mA	Relative humidity: < 65 % RH

7.3.1 Total Luminous Flux ( $\Phi_V$ )

S/N	Initial(Ohrs)		Luminous Maintenance (%)							
	TLF(lm)	$V_F(V)$	500 hrs	1000 hrs	1500 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
B01	41.85	3.29	101.6%	102.5%	102.7%	102.1%	102.1%	100.5%	98.9%	97.1%
B02	42.32	3.28	101.2%	101.9%	102.2%	101.9%	101.9%	101.3%	99.7%	98.3%
B03	41.96	3.29	99.9%	100.7%	100.4%	100.2%	100.3%	99.7%	98.4%	97.3%
B04	41.42	3.30	99.3%	99.9%	100.2%	100.2%	100.0%	99.4%	98.2%	97.6%
B05	42.31	3.30	99.3%	100.0%	100.8%	100.3%	99.6%	98.9%	98.1%	97.2%
B06	42.11	3.28	100.7%	101.1%	101.3%	101.1%	100.4%	99.8%	98.0%	97.6%
B07	41.57	3.28	101.1%	101.8%	102.1%	102.0%	102.1%	101.5%	100.2%	99.6%
B08	41.51	3.28	101.5%	102.1%	102.4%	101.9%	101.8%	101.0%	99.7%	98.6%
B09	42.54	3.30	99.6%	100.1%	100.9%	100.4%	100.3%	99.2%	98.3%	97.5%
B10	42.45	3.29	99.2%	99.8%	100.5%	100.4%	100.3%	99.7%	98.5%	97.4%
B11	41.72	3.28	99.3%	99.7%	100.1%	99.7%	100.0%	98.7%	97.4%	96.5%
B12	41.24	3.26	100.2%	100.9%	101.3%	100.9%	100.1%	99.2%	98.3%	98.3%
B13	42.57	3.28	102.2%	102.9%	103.1%	103.0%	102.9%	101.5%	100.6%	99.4%
B14	40.95	3.28	102.4%	103.5%	103.3%	103.2%	102.4%	101.6%	100.6%	99.8%
B15	40.68	3.25	99.4%	99.7%	101.1%	101.2%	100.7%	99.6%	98.8%	98.0%
B16	41.95	3.28	99.3%	100.0%	100.2%	100.0%	100.1%	98.8%	97.7%	96.5%
B17	41.92	3.28	101.6%	102.5%	102.8%	102.7%	102.1%	101.2%	98.9%	98.4%
B18	41.87	3.28	101.1%	101.8%	101.8%	101.8%	101.0%	99.3%	97.2%	96.9%
B19	41.55	3.28	101.5%	102.4%	102.5%	102.4%	102.1%	100.4%	98.7%	98.3%
B20	42.68	3.30	99.9%	100.3%	100.2%	99.7%	99.3%	99.0%	97.2%	96.9%
B21	41.23	3.26	100.3%	100.8%	101.7%	101.2%	100.8%	100.0%	99.1%	98.0%
B22	42.82	3.30	100.5%	101.0%	100.6%	100.3%	99.7%	99.0%	97.5%	96.5%
B23	40.44	3.25	101.7%	102.2%	102.1%	101.9%	101.6%	100.8%	99.1%	97.8%
B24	42.47	3.29	99.2%	99.9%	100.2%	100.2%	100.1%	99.6%	98.0%	96.9%
B25	42.61	3.30	99.6%	100.4%	100.0%	100.0%	100.3%	99.0%	97.7%	96.6%
Max.	42.82	3.30	102.4%	103.5%	103.3%	103.2%	102.9%	101.6%	100.6%	99.8%
Min.	40.44	3.25	99.2%	99.7%	100.0%	99.7%	99.3%	98.7%	97.2%	96.5%
Avg.	41.87	3.28	100.5%	101.1%	101.4%	101.2%	100.9%	99.9%	98.6%	97.7%
std. deviation	0.64	0.02	1.04%	1.16%	1.05%	1.07%	1.02%	0.97%	0.98%	0.95%

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7.3.2 Correlated Color Temperature (CCT), CIE Color Coordinate (CIEx, CIEy) & Chromaticity Shift ( $\Delta u'v'$ )

		Correlated Color Temperature (CCT)							
S/N	0hr	500hrs	1000hrs	1500hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
B01	3204	3230	3235	3233	3236	3235	3252	3251	3241
B02	3174	3199	3205	3202	3200	3198	3213	3213	3202
B03	3130	3157	3166	3158	3158	3164	3172	3169	3161
B04	3180	3214	3211	3212	3211	3211	3227	3225	3214
B05	3243	3267	3268	3274	3275	3272	3292	3289	3277
B06	3223	3252	3247	3252	3255	3251	3270	3269	3259
B07	3183	3213	3218	3217	3216	3215	3230	3230	3220
B08	3168	3181	3174	3195	3186	3180	3196	3196	3187
B09	3140	3171	3176	3170	3174	3170	3187	3186	3176
B10	3181	3208	3215	3228	3209	3206	3222	3221	3209
B11	3129	3154	3159	3149	3152	3149	3165	3164	3154
B12	3163	3189	3183	3199	3205	3195	3207	3208	3198
B13	3181	3215	3217	3221	3225	3220	3232	3231	3224
B14	3123	3155	3166	3162	3162	3161	3166	3175	3164
B15	3132	3154	3174	3174	3154	3157	3165	3167	3157
B16	3122	3151	3149	3148	3149	3148	3160	3162	3153
B17	3156	3182	3178	3184	3185	3185	3192	3193	3186
B18	3165	3192	3191	3199	3195	3196	3208	3211	3200
B19	3210	3226	3230	3249	3230	3228	3236	3239	3226
B20	3118	3149	3144	3157	3152	3159	3164	3166	3156
B21	3152	3176	3166	3181	3177	3181	3193	3191	3185
B22	3142	3176	3167	3180	3176	3181	3191	3190	3183
B23	3115	3141	3134	3152	3144	3150	3161	3162	3149
B24	3137	3160	3153	3167	3160	3166	3169	3165	3169
B25	3192	3216	3209	3228	3223	3226	3236	3239	3230
Max.	3243	3267	3268	3274	3275	3272	3292	3289	3277
Min.	3115	3141	3134	3148	3144	3148	3160	3162	3149
Avg.	3162.5	3189.1	3189.4	3195.6	3192.4	3192.2	3204.2	3204.5	3195.2
std. deviation	34.67	34.02	34.48	35.36	35.66	33.74	36.39	35.82	34.94

Unit: K

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S/N	Initial(Ohrs)		Chromaticity Shift ( $\Delta u'v'$ )							
	CIE <sub>x</sub>	CIE <sub>y</sub>	500hrs	1000hrs	1500hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
B01	0.4226	0.3980	0.0009	0.0011	0.0010	0.0011	0.0011	0.0016	0.0016	0.0013
B02	0.4243	0.3983	0.0009	0.0011	0.0009	0.0009	0.0009	0.0014	0.0014	0.0011
B03	0.4282	0.4015	0.0010	0.0013	0.0010	0.0011	0.0013	0.0016	0.0015	0.0013
B04	0.4251	0.4008	0.0012	0.0011	0.0011	0.0011	0.0011	0.0016	0.0016	0.0012
B05	0.4202	0.3969	0.0009	0.0009	0.0011	0.0012	0.0011	0.0017	0.0017	0.0014
B06	0.4219	0.3986	0.0010	0.0008	0.0010	0.0012	0.0010	0.0016	0.0016	0.0013
B07	0.4241	0.3987	0.0011	0.0013	0.0013	0.0012	0.0012	0.0017	0.0017	0.0013
B08	0.4252	0.3997	0.0004	0.0003	0.0009	0.0007	0.0008	0.0011	0.0011	0.0009
B09	0.4296	0.4058	0.0012	0.0013	0.0012	0.0012	0.0011	0.0018	0.0017	0.0013
B10	0.4243	0.3991	0.0009	0.0012	0.0016	0.0010	0.0010	0.0014	0.0014	0.0011
B11	0.4284	0.4019	0.0009	0.0011	0.0007	0.0008	0.0008	0.0013	0.0013	0.0010
B12	0.4249	0.3983	0.0009	0.0007	0.0013	0.0015	0.0012	0.0015	0.0016	0.0013
B13	0.4245	0.3996	0.0012	0.0013	0.0014	0.0016	0.0013	0.0018	0.0017	0.0015
B14	0.4291	0.4026	0.0012	0.0016	0.0014	0.0015	0.0014	0.0016	0.0020	0.0015
B15	0.4275	0.4003	0.0008	0.0015	0.0016	0.0009	0.0010	0.0013	0.0013	0.0010
B16	0.4304	0.4054	0.0011	0.0010	0.0010	0.0010	0.0010	0.0014	0.0015	0.0012
B17	0.4259	0.3997	0.0009	0.0008	0.0010	0.0010	0.0011	0.0013	0.0014	0.0011
B18	0.4258	0.4006	0.0010	0.0009	0.0012	0.0011	0.0011	0.0015	0.0016	0.0012
B19	0.4221	0.3976	0.0005	0.0007	0.0013	0.0007	0.0008	0.0010	0.0011	0.0008
B20	0.4290	0.4020	0.0011	0.0009	0.0013	0.0012	0.0015	0.0017	0.0017	0.0013
B21	0.4274	0.4024	0.0009	0.0005	0.0011	0.0009	0.0011	0.0015	0.0015	0.0012
B22	0.4274	0.4014	0.0012	0.0009	0.0013	0.0013	0.0014	0.0018	0.0018	0.0014
B23	0.4296	0.4028	0.0010	0.0007	0.0014	0.0011	0.0013	0.0017	0.0017	0.0013
B24	0.4278	0.4015	0.0008	0.0006	0.0011	0.0009	0.0011	0.0012	0.0011	0.0012
B25	0.4234	0.3983	0.0008	0.0006	0.0013	0.0011	0.0012	0.0015	0.0016	0.0014
Max.	0.4304	0.4058	0.0012	0.0016	0.0016	0.0016	0.0015	0.0018	0.0020	0.0015
Min.	0.4202	0.3969	0.0004	0.0003	0.0007	0.0007	0.0008	0.0010	0.0011	0.0008
Avg.	0.4259	0.4005	0.0010	0.0010	0.0012	0.0011	0.0011	0.0015	0.0015	0.0012
std. deviation	0.0028	0.0023	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002

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### 7.4 Lumen Maintenance and Color Maintenance Test

#### Test Condition: $T_s = 85\text{ }^\circ\text{C}$

Requirement	
Case Temperature [ $T_s$ ]: $\geq 83\text{ }^\circ\text{C}$	Average [ $T_s$ ]: 85.2
Ambient Temperature [ $T_a$ ]: $\geq 80\text{ }^\circ\text{C}$	Average [ $T_a$ ]: 84.4
Driver Current: 150mA	Air Flow: Minimized
Measurement Current: 150mA	Relative humidity: < 65 % RH

#### 7.4.1 Total Luminous Flux ( $\Phi_V$ )

S/N	Initial(Ohrs)		Luminous Maintenance (%)							
	TLF(lm)	$V_F(V)$	500 hrs	1000 hrs	1500 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
C01	41.75	3.27	100.2%	101.1%	101.4%	101.0%	100.3%	98.5%	96.8%	95.7%
C02	41.19	3.30	100.3%	100.6%	101.1%	100.7%	99.3%	97.4%	95.8%	94.1%
C03	42.28	3.29	100.7%	101.2%	101.3%	100.7%	100.0%	98.3%	96.4%	95.4%
C04	41.13	3.26	99.5%	100.0%	100.3%	100.1%	98.9%	97.7%	96.2%	96.1%
C05	42.93	3.33	102.0%	101.4%	101.2%	100.5%	98.6%	97.1%	95.4%	93.9%
C06	43.15	3.31	99.0%	99.8%	99.9%	99.5%	97.9%	96.9%	95.8%	94.3%
C07	41.67	3.25	100.1%	101.1%	101.1%	100.6%	100.4%	98.9%	97.1%	96.6%
C08	42.10	3.28	101.1%	101.7%	101.7%	101.3%	100.8%	99.7%	97.8%	95.8%
C09	42.32	3.28	99.1%	99.6%	100.2%	99.8%	98.9%	97.2%	95.0%	94.3%
C10	40.75	3.26	100.5%	101.4%	101.7%	101.3%	100.0%	98.8%	96.8%	94.6%
C11	41.17	3.27	101.5%	102.4%	103.1%	102.3%	102.0%	100.5%	98.3%	97.3%
C12	41.72	3.28	101.2%	101.9%	102.0%	101.9%	101.3%	100.1%	98.7%	96.8%
C13	41.60	3.28	101.3%	101.9%	102.2%	101.4%	100.8%	100.1%	98.8%	98.1%
C14	40.67	3.26	99.4%	99.9%	99.4%	98.7%	97.6%	96.4%	95.3%	93.8%
C15	42.27	3.29	99.4%	99.9%	100.4%	100.0%	99.2%	98.2%	96.9%	95.7%
C16	42.92	3.29	99.3%	99.9%	99.4%	98.3%	97.1%	97.0%	95.4%	93.9%
C17	42.36	3.27	99.6%	100.1%	100.6%	100.2%	100.2%	99.0%	97.7%	96.8%
C18	41.30	3.29	100.5%	101.5%	102.0%	101.1%	100.3%	100.1%	98.5%	97.0%
C19	42.72	3.28	99.9%	100.6%	101.0%	100.2%	98.9%	97.5%	95.5%	94.5%
C20	43.31	3.32	99.4%	100.1%	99.9%	99.6%	98.8%	98.8%	97.1%	95.2%
C21	42.22	3.29	99.0%	99.7%	100.1%	99.5%	98.4%	97.5%	96.2%	95.3%
C22	42.45	3.30	99.7%	100.2%	100.6%	100.0%	99.9%	98.3%	96.5%	95.5%
C23	41.40	3.26	100.3%	100.8%	101.1%	100.3%	100.0%	99.3%	97.9%	97.2%
C24	42.45	3.28	100.2%	100.8%	101.0%	100.8%	99.6%	99.4%	98.5%	97.3%
C25	43.66	3.31	99.1%	99.4%	100.0%	99.9%	99.0%	97.6%	96.4%	95.4%
Max.	43.66	3.33	102.0%	102.4%	103.1%	102.3%	102.0%	100.5%	98.8%	98.1%
Min.	40.67	3.25	99.0%	99.4%	99.4%	98.3%	97.1%	96.4%	95.0%	93.8%
Avg.	42.06	3.28	100.1%	100.7%	100.9%	100.4%	99.5%	98.4%	96.8%	95.6%
std. deviation	0.80	0.02	0.87%	0.84%	0.91%	0.92%	1.16%	1.18%	1.18%	1.24%

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7.4.2 Correlated Color Temperature (CCT), CIE Color Coordinate (CIEx, CIEy) & Chromaticity Shift ( $\Delta u'v'$ )

		Correlated Color Temperature (CCT)							
S/N	0hr	500hrs	1000hrs	1500hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
C01	3183	3218	3216	3225	3227	3254	3253	3255	3240
C02	3176	3207	3203	3217	3213	3240	3241	3240	3227
C03	3146	3181	3178	3193	3190	3211	3211	3211	3197
C04	3117	3156	3149	3158	3153	3176	3175	3175	3165
C05	3221	3229	3209	3219	3216	3244	3243	3245	3235
C06	3132	3173	3161	3170	3171	3190	3188	3188	3177
C07	3185	3209	3205	3213	3214	3221	3231	3234	3223
C08	3135	3164	3162	3170	3170	3182	3189	3191	3178
C09	3165	3191	3188	3199	3193	3220	3224	3226	3218
C10	3164	3170	3165	3173	3170	3182	3189	3191	3180
C11	3172	3215	3208	3218	3217	3227	3241	3243	3234
C12	3178	3214	3207	3213	3214	3223	3236	3237	3224
C13	3150	3179	3176	3188	3181	3192	3201	3200	3193
C14	3135	3168	3163	3174	3172	3182	3197	3196	3186
C15	3225	3252	3252	3255	3256	3266	3279	3280	3267
C16	3176	3217	3207	3215	3217	3241	3246	3244	3239
C17	3187	3217	3221	3225	3222	3237	3245	3241	3233
C18	3149	3178	3179	3182	3179	3194	3203	3203	3194
C19	3174	3201	3207	3209	3208	3225	3242	3244	3233
C20	3200	3193	3190	3198	3198	3214	3226	3222	3215
C21	3165	3191	3186	3194	3190	3205	3212	3210	3199
C22	3191	3232	3233	3231	3229	3243	3258	3255	3248
C23	3180	3213	3208	3217	3215	3227	3234	3234	3227
C24	3195	3223	3219	3230	3226	3239	3246	3260	3237
C25	3145	3170	3168	3178	3176	3187	3195	3199	3184
Max.	3225	3252	3252	3255	3256	3266	3279	3280	3267
Min.	3117	3156	3149	3158	3153	3176	3175	3175	3165
Avg.	3169.8	3198.4	3194.4	3202.6	3200.7	3216.9	3224.2	3225.0	3214.1
std. deviation	26.90	24.95	25.48	24.06	24.84	25.67	26.61	27.02	26.74

Unit: K

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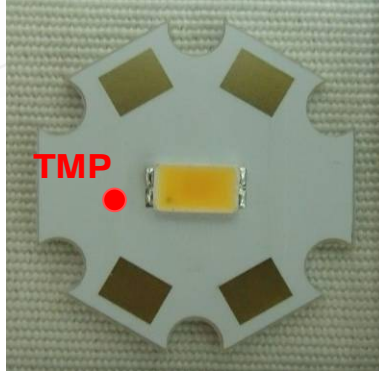
S/N	Initial(0hrs)		Chromaticity Shift ( $\Delta u'v'$ )							
	CIE <sub>x</sub>	CIE <sub>y</sub>	500hrs	1000hrs	1500hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
C01	0.4241	0.3987	0.0013	0.0012	0.0015	0.0016	0.0027	0.0028	0.0030	0.0025
C02	0.4243	0.3984	0.0012	0.0011	0.0015	0.0014	0.0026	0.0027	0.0027	0.0023
C03	0.4267	0.4002	0.0012	0.0012	0.0017	0.0015	0.0026	0.0027	0.0027	0.0023
C04	0.4306	0.4053	0.0014	0.0012	0.0015	0.0013	0.0022	0.0022	0.0022	0.0019
C05	0.4227	0.4002	0.0004	0.0004	0.0001	0.0002	0.0014	0.0016	0.0017	0.0016
C06	0.4275	0.4002	0.0015	0.0011	0.0014	0.0015	0.0021	0.0021	0.0022	0.0018
C07	0.4233	0.3974	0.0008	0.0006	0.0010	0.0010	0.0012	0.0018	0.0023	0.0018
C08	0.4285	0.4029	0.0011	0.0009	0.0013	0.0013	0.0017	0.0019	0.0020	0.0016
C09	0.4256	0.4000	0.0010	0.0008	0.0012	0.0010	0.0021	0.0024	0.0026	0.0024
C10	0.4253	0.3993	0.0003	0.0003	0.0004	0.0006	0.0009	0.0010	0.0010	0.0006
C11	0.4246	0.3986	0.0015	0.0013	0.0017	0.0016	0.0020	0.0026	0.0028	0.0026
C12	0.4244	0.3989	0.0013	0.0010	0.0013	0.0013	0.0016	0.0022	0.0023	0.0019
C13	0.4271	0.4017	0.0010	0.0009	0.0014	0.0012	0.0015	0.0018	0.0019	0.0017
C14	0.4292	0.4044	0.0012	0.0011	0.0015	0.0013	0.0017	0.0024	0.0025	0.0021
C15	0.4213	0.3974	0.0010	0.0009	0.0011	0.0011	0.0014	0.0021	0.0023	0.0019
C16	0.4241	0.3981	0.0014	0.0011	0.0014	0.0014	0.0025	0.0029	0.0031	0.0030
C17	0.4240	0.3992	0.0010	0.0012	0.0013	0.0012	0.0017	0.0020	0.0019	0.0016
C18	0.4264	0.3998	0.0011	0.0011	0.0012	0.0011	0.0016	0.0020	0.0022	0.0019
C19	0.4256	0.4012	0.0009	0.0012	0.0012	0.0012	0.0018	0.0026	0.0029	0.0025
C20	0.4240	0.4007	0.0003	0.0003	0.0001	0.0004	0.0005	0.0009	0.0013	0.0012
C21	0.4256	0.4001	0.0009	0.0007	0.0010	0.0010	0.0014	0.0016	0.0016	0.0012
C22	0.4237	0.3989	0.0015	0.0015	0.0014	0.0014	0.0018	0.0025	0.0026	0.0025
C23	0.4260	0.4027	0.0012	0.0010	0.0013	0.0012	0.0017	0.0019	0.0022	0.0021
C24	0.4229	0.3976	0.0010	0.0008	0.0012	0.0012	0.0016	0.0017	0.0023	0.0015
C25	0.4285	0.4040	0.0009	0.0009	0.0012	0.0012	0.0016	0.0018	0.0020	0.0014
Max.	0.4306	0.4053	0.0015	0.0015	0.0017	0.0016	0.0027	0.0029	0.0031	0.0030
Min.	0.4213	0.3974	0.0003	0.0003	0.0001	0.0002	0.0005	0.0009	0.0010	0.0006
Avg.	0.4254	0.4002	0.0011	0.0010	0.0012	0.0012	0.0018	0.0021	0.0022	0.0019
std. deviation	0.0022	0.0022	0.0003	0.0003	0.0004	0.0003	0.0005	0.0005	0.0005	0.0005

Note: The LED light source monitoring interval was per 24 hours.

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## 8 TEMPERATURE MEASUREMENT POINT (TMP) DEFINITION

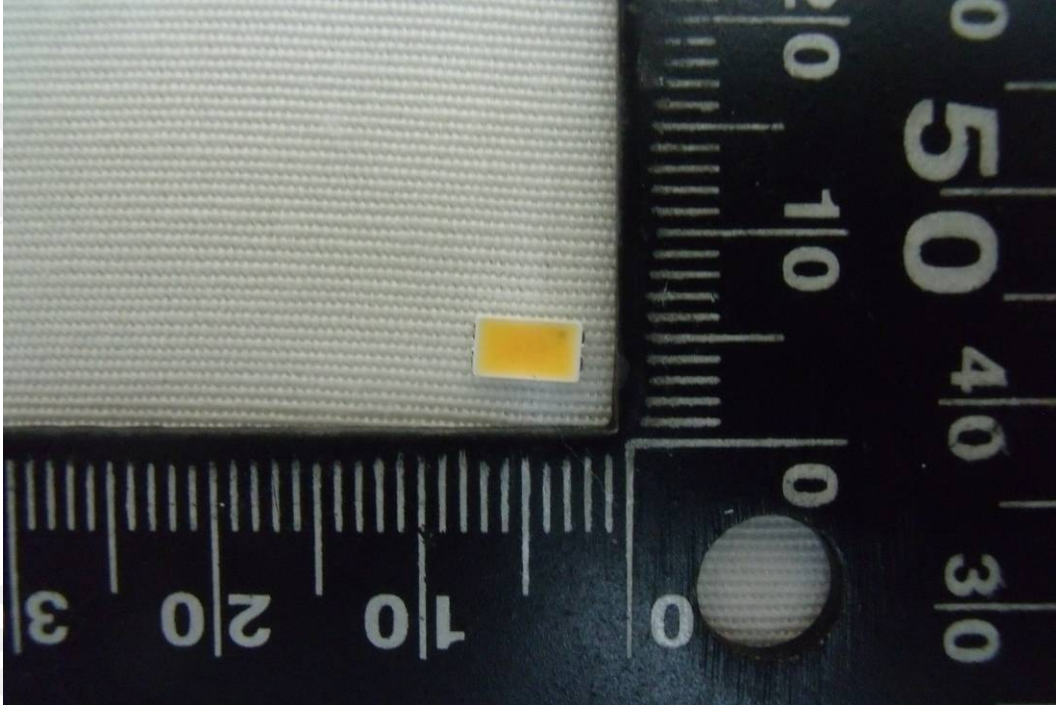


Temperature Measurement Point (TMP)

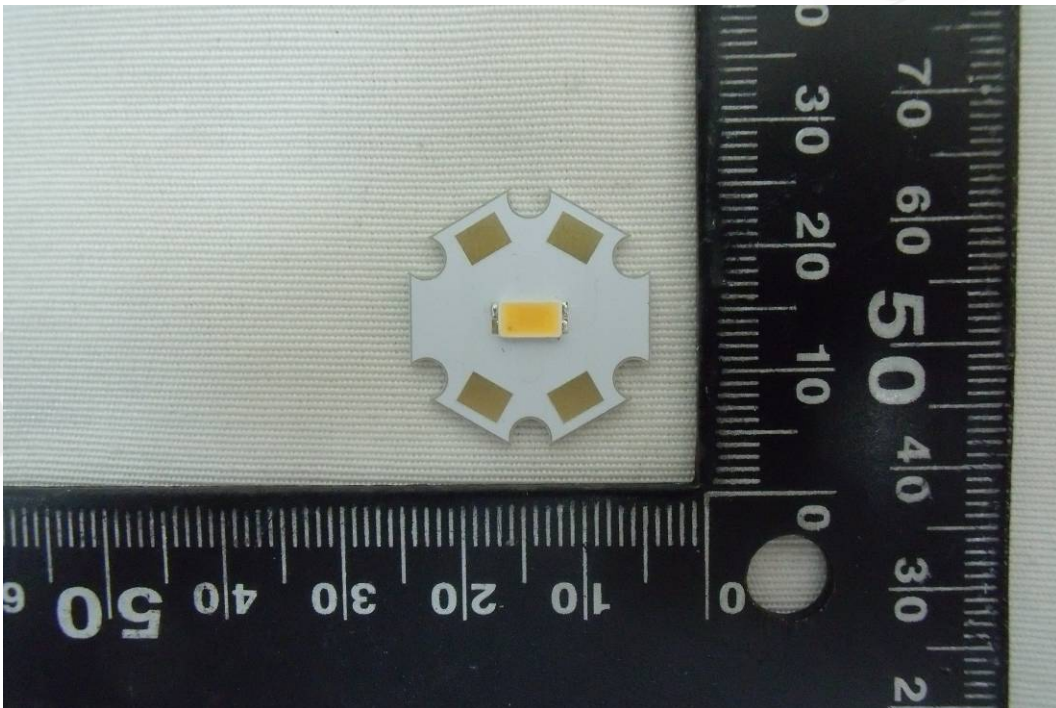
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## 9 PHOTO



LED Component

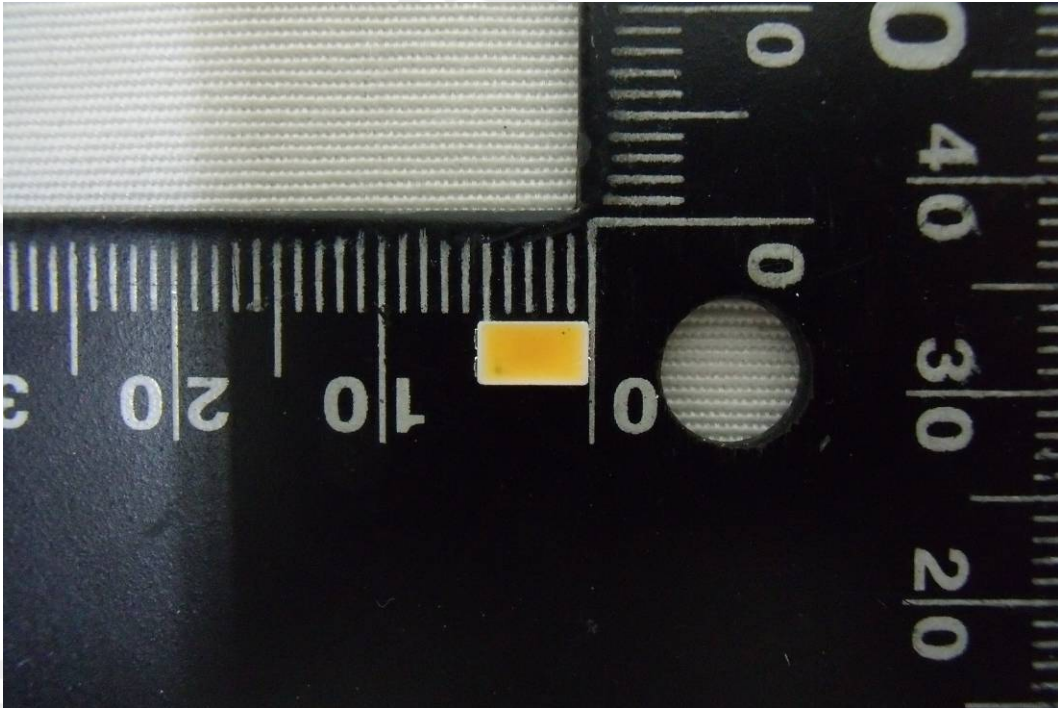


Test Sample

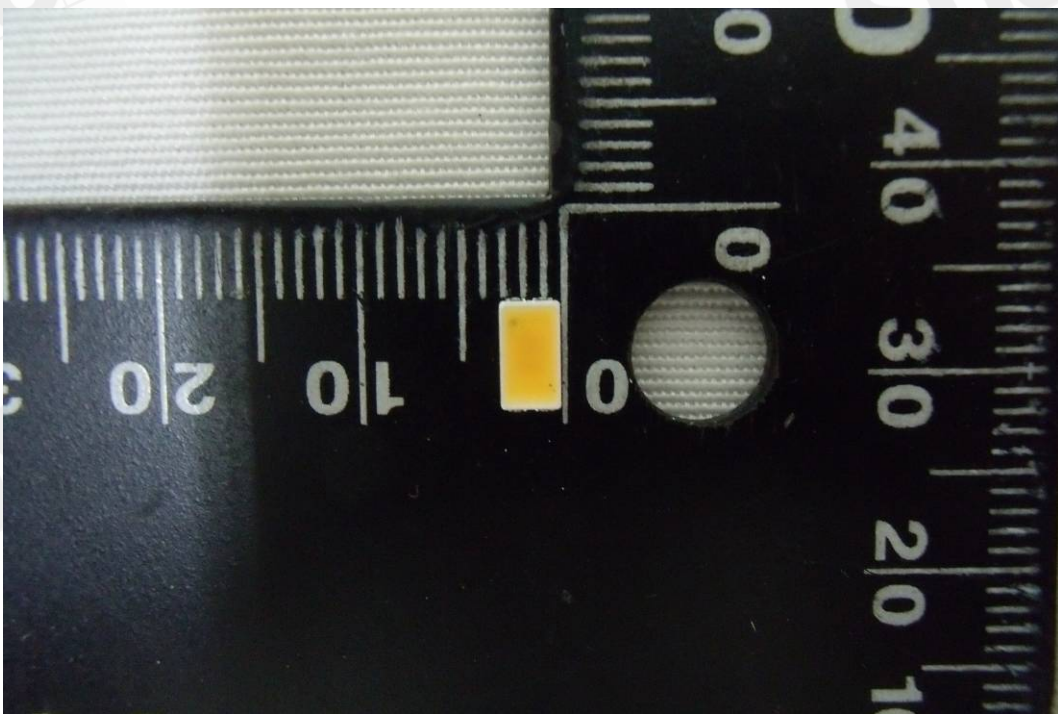
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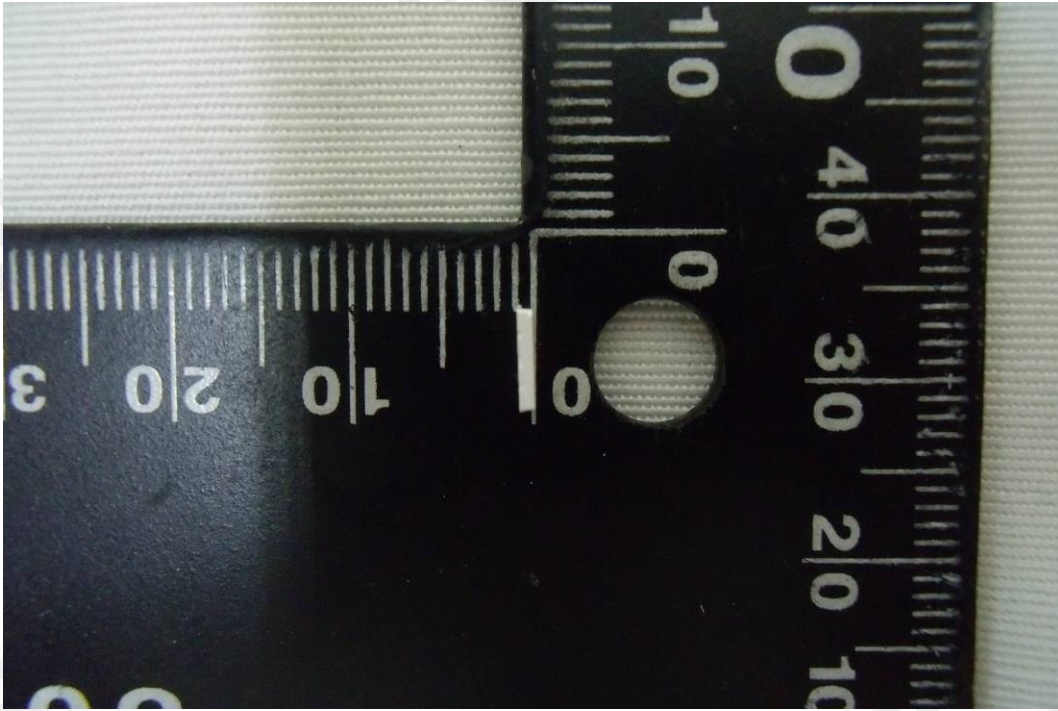
LED Component Front View



LED Component Front View

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LED Component Side View

**-End of Report-**

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