

# TEST REPORT

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

Applicant : EVERLIGHT ELECTRONICS CO., LTD.  
 Address of Applicant : No.6-8, Zhonghua Rd., Shulin Dist, New Taipei City  
 23860, Taiwan, R.O.C.  
 Testing Laboratory : SGS Taiwan Ltd., Optics Laboratory  
 Laboratory Address : 33, Wu Chyuan Rd., New Taipei Industrial Park, New  
 Taipei City, Taiwan 24886  
 Product Name : SMD MID Power LED 62-217D series  
 Model / Serial Number : 62-217D (3000 K)  
 Manufacturer : EVERLIGHT ELECTRONICS CO., LTD.  
 Rating : DC 150 mA, 0.5 W  
 Tested Condition : DC 150 mA (Constant Current)  
 Test Standard/Method : IES LM-80-08 Approved Method: Measuring Lumen  
 Maintenance of LED Light Sources  
 Date of Issue : Aug. 30, 2013  
 Modified Date : Jan. 15, 2014

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-2012-B0007-01) replaced the previous one (OA-2012-B0007), and the previous report (OA-2012-B0007) is invalid from 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**

Nov. 12, 2012

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

Nov. 12, 2012 ~ Aug. 21, 2013

**4 IDENTITY OF SAMPLES**

Quantity	Model	Serial Number
25	62-217D (3000 K)	# A01 - # A25 (55 °C)
25	62-217D (3000 K)	# B01 - # B25 (85 °C)
25	62-217D (3000 K)	# C01 - # C25 (95 °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 (CIEx, CIEy) & 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	S/N	Traceability
Standard Light Source / Spectroradiometer	Labsphere	SCL-600 / CDS 2100	D112 / 0811118355	NIST
Source Meter	Keithley	2400	1321218	NMI
Handheld Digital Multimeter	Agilent	U1242A	MY48490144	NMI

### Environmental Conditions:

Temperature: (25 ± 1) °C

Relative Humidity: < 65 % RH

### UUT Conditions:

LED Light source: LED Package

Drive Current: DC 150 mA (Typical)

Forward Voltage: DC 2.8 V to 3.5 V

Power Consumption: 0.5 W

CCT: 3000 K

Package Dimension: L 5.6 mm x W 3.0 mm x H 0.65 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, 1000, 2000, 3000, 4000, 5000, 6000 hours

Warm up Time: < 1 minute (initial)

Relative measurement uncertainty: 2.8 % (95 % Confidence Level)

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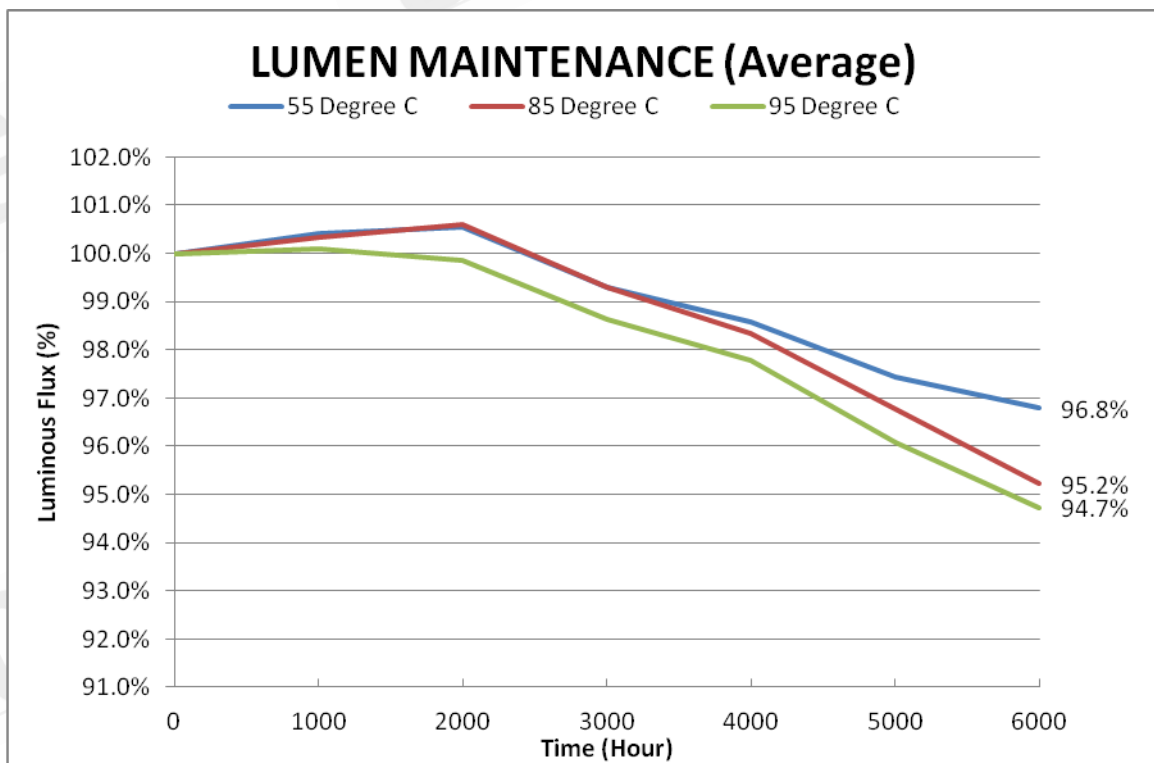
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## 7 TEST RESULTS

### 7.1 Data Summary of Lumen and Color Maintenance

Temp.	Initial (0 hr)		Luminous Maintenance (%)					
	TLF(lm)	V <sub>F</sub> (V)	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
55°C Avg.	46.95	3.16	100.4%	100.6%	99.3%	98.6%	97.4%	96.8%
85°C Avg.	46.92	3.15	100.3%	100.6%	99.3%	98.3%	96.8%	95.2%
95°C Avg.	46.86	3.16	100.1%	99.9%	98.6%	97.8%	96.1%	94.7%

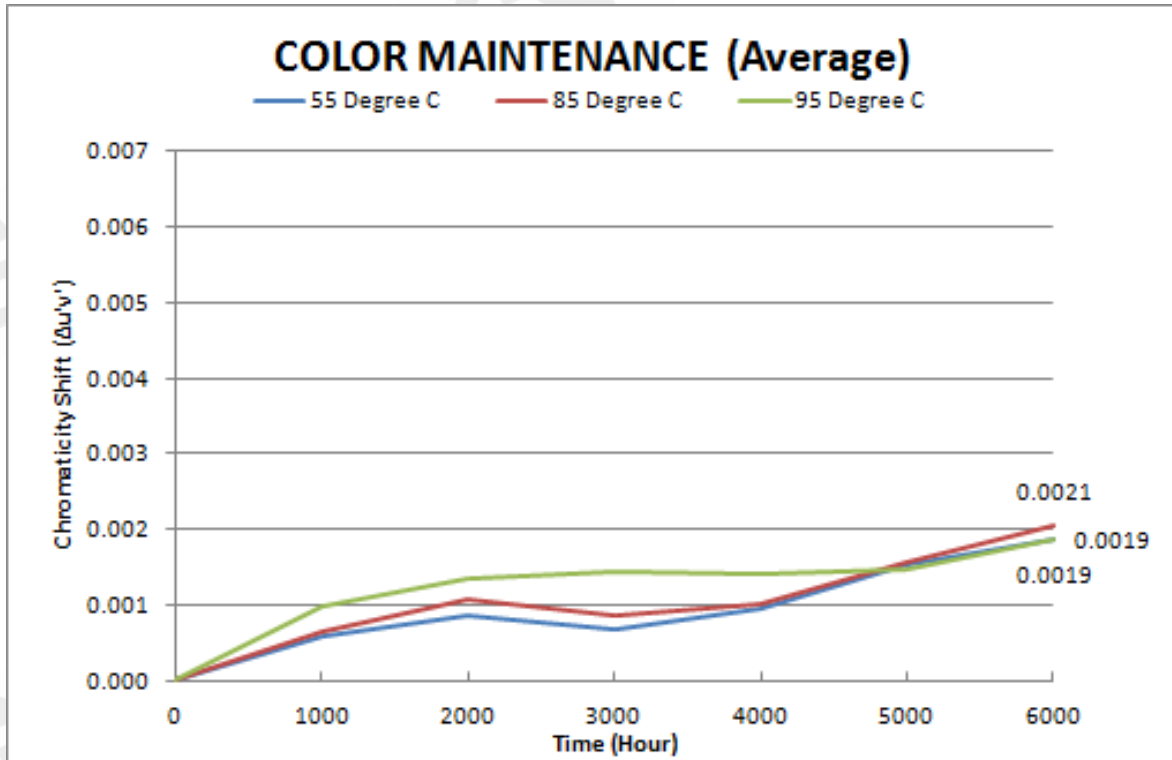
Temp.	Initial (0 hr)			Chromaticity Shift ( $\Delta u'v'$ )					
	CIE <sub>x</sub>	CIE <sub>y</sub>	CCT	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
55°C Avg.	0.4383	0.4096	3019.5	0.0006	0.0009	0.0007	0.0009	0.0015	0.0019
85°C Avg.	0.4385	0.4099	3018.5	0.0007	0.0011	0.0009	0.0010	0.0016	0.0021
95°C Avg.	0.4385	0.4102	3020.9	0.0010	0.0014	0.0015	0.0014	0.0015	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:  $T_s = 55\text{ }^\circ\text{C}$** 

		Requirement
Case Temperature [ $T_s$ ]: $\geq 53\text{ }^\circ\text{C}$		Average [ $T_s$ ]: $55.1\text{ }^\circ\text{C}$
Ambient Temperature [ $T_a$ ]: $\geq 50\text{ }^\circ\text{C}$		Average [ $T_a$ ]: $54.2\text{ }^\circ\text{C}$
Driver Current: 150 mA		Air Flow: Minimized
Measurement Current: 150 mA		Relative humidity: $< 65\text{ } \% \text{ RH}$

 7.2.1 Total Luminous Flux ( $\Phi_V$ )

S/N	Initial (0 hr)		Luminous Maintenance (%)					
	TLF(lm)	$V_F(V)$	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
A01	47.5	3.1	100.6 %	101.2 %	99.9 %	99.3 %	98.4 %	98.4 %
A02	46.4	3.2	100.6 %	101.0 %	99.7 %	98.9 %	97.5 %	95.5 %
A03	48.6	3.2	100.2 %	101.1 %	99.8 %	98.8 %	97.0 %	95.7 %
A04	47.6	3.2	100.9 %	102.3 %	101.2 %	100.3 %	99.0 %	97.0 %
A05	47.4	3.1	101.0 %	101.2 %	99.9 %	98.8 %	97.2 %	96.2 %
A06	47.3	3.2	100.7 %	99.6 %	98.2 %	97.0 %	98.3 %	98.8 %
A07	47.2	3.2	100.9 %	100.1 %	99.1 %	97.8 %	97.9 %	96.2 %
A08	45.7	3.2	100.6 %	100.3 %	99.1 %	98.8 %	97.0 %	96.6 %
A09	46.5	3.1	99.3 %	100.8 %	99.3 %	98.1 %	96.3 %	98.8 %
A10	47.4	3.2	101.0 %	100.2 %	98.8 %	98.1 %	96.8 %	97.8 %
A11	47.2	3.1	99.9 %	100.4 %	99.1 %	99.4 %	98.5 %	96.5 %
A12	47.6	3.2	99.2 %	99.7 %	98.3 %	99.6 %	98.2 %	95.7 %
A13	45.6	3.2	99.9 %	99.6 %	98.2 %	96.9 %	95.5 %	95.4 %
A14	46.8	3.1	100.5 %	101.4 %	100.2 %	99.3 %	97.6 %	97.9 %
A15	47.5	3.2	100.8 %	100.9 %	99.5 %	98.6 %	96.7 %	96.9 %
A16	45.8	3.2	100.5 %	101.3 %	100.0 %	99.7 %	97.7 %	96.2 %
A17	46.3	3.1	100.3 %	100.3 %	99.5 %	98.9 %	97.1 %	96.3 %
A18	46.4	3.2	99.5 %	99.7 %	98.4 %	97.6 %	96.2 %	96.4 %
A19	45.9	3.2	100.7 %	100.6 %	99.6 %	98.2 %	96.3 %	96.6 %
A20	46.4	3.2	100.8 %	100.8 %	99.5 %	98.9 %	97.1 %	95.5 %
A21	47.8	3.2	100.6 %	100.1 %	98.7 %	97.9 %	96.0 %	96.0 %
A22	47.4	3.2	100.6 %	101.2 %	99.8 %	99.3 %	98.3 %	97.1 %
A23	47.4	3.2	100.3 %	98.8 %	97.6 %	97.4 %	98.2 %	97.4 %
A24	46.9	3.2	100.5 %	100.6 %	99.5 %	99.2 %	99.2 %	98.5 %
A25	47.1	3.2	100.4 %	100.5 %	99.2 %	98.1 %	97.9 %	96.3 %
Max.	48.6	3.2	101.0 %	102.3 %	101.2 %	100.3 %	99.2 %	98.8 %
Min.	45.6	3.1	99.2 %	98.8 %	97.6 %	96.9 %	95.5 %	95.4 %
Avg.	46.95	3.16	100.4 %	100.6 %	99.3 %	98.6 %	97.4 %	96.8 %
std. deviation	0.74	0.02	0.49 %	0.76 %	0.77 %	0.85 %	0.95 %	1.05 %

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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	0 hr	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
A01	3051	3058	3063	3058	3068	3085	3097
A02	3018	3015	3029	3021	3027	3049	3057
A03	3045	3051	3062	3062	3072	3106	3114
A04	3007	3017	3027	3025	3029	3059	3059
A05	3026	3028	3041	3043	3054	3081	3071
A06	2989	2993	3021	3015	3023	3020	3024
A07	3011	3018	3040	3028	3034	3038	3051
A08	3005	3017	3029	3028	3034	3039	3063
A09	3017	3030	3040	3043	3043	3056	3058
A10	3038	3040	3063	3059	3072	3071	3075
A11	3020	3039	3040	3033	3031	3052	3061
A12	3006	3019	3028	3015	3014	3036	3052
A13	3008	3014	3024	3020	3020	3040	3065
A14	3001	3011	3009	3012	3026	3041	3043
A15	3008	3018	3019	3027	3034	3062	3059
A16	3040	3043	3047	3051	3057	3087	3093
A17	3039	3046	3053	3052	3062	3086	3097
A18	3002	3012	3021	3016	3026	3061	3049
A19	3036	3037	3021	3050	3062	3083	3084
A20	3026	3038	3047	3042	3037	3063	3078
A21	3013	3025	3037	3035	3029	3048	3067
A22	3020	3027	3041	3036	3032	3048	3064
A23	3045	3057	3069	3060	3056	3071	3091
A24	3013	3021	3039	3028	3027	3040	3047
A25	3004	3015	3030	3021	3019	3041	3049
Max.	3051	3058	3069	3062	3072	3106	3114
Min.	2989	2993	3009	3012	3014	3020	3024
Avg.	3019.5	3027.6	3037.6	3035.2	3039.5	3058.5	3066.7
std. deviation	16.6	16.0	15.7	15.8	17.8	20.8	20.5

Unit: K

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S/N	Initial (0 hr)		Chromaticity Shift ( $\Delta u'v'$ )					
	CIE <sub>x</sub>	CIE <sub>y</sub>	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
A01	0.4365	0.4098	0.0006	0.0006	0.0004	0.0009	0.0013	0.0018
A02	0.4384	0.4096	0.0006	0.0006	0.0004	0.0007	0.0012	0.0015
A03	0.4358	0.4076	0.0004	0.0007	0.0006	0.0010	0.0024	0.0027
A04	0.4383	0.4081	0.0005	0.0008	0.0007	0.0009	0.0020	0.0020
A05	0.4391	0.4121	0.0004	0.0006	0.0006	0.0012	0.0022	0.0018
A06	0.4407	0.4106	0.0005	0.0013	0.0011	0.0014	0.0013	0.0015
A07	0.4382	0.4083	0.0005	0.0012	0.0007	0.0010	0.0011	0.0016
A08	0.4399	0.4111	0.0006	0.0010	0.0009	0.0012	0.0013	0.0023
A09	0.4387	0.4102	0.0006	0.0010	0.0010	0.0010	0.0015	0.0016
A10	0.4371	0.4094	0.0005	0.0010	0.0008	0.0013	0.0013	0.0014
A11	0.4387	0.4105	0.0008	0.0008	0.0005	0.0008	0.0012	0.0016
A12	0.4402	0.4119	0.0005	0.0009	0.0004	0.0006	0.0012	0.0018
A13	0.4390	0.4097	0.0005	0.0007	0.0006	0.0008	0.0012	0.0022
A14	0.4400	0.4108	0.0007	0.0007	0.0006	0.0011	0.0016	0.0017
A15	0.4389	0.4094	0.0006	0.0007	0.0008	0.0012	0.0022	0.0020
A16	0.4346	0.4043	0.0007	0.0007	0.0006	0.0009	0.0019	0.0021
A17	0.4384	0.4122	0.0006	0.0008	0.0006	0.0010	0.0018	0.0023
A18	0.4385	0.4078	0.0004	0.0007	0.0006	0.0010	0.0024	0.0019
A19	0.4376	0.4101	0.0007	0.0011	0.0007	0.0011	0.0019	0.0019
A20	0.4385	0.4107	0.0007	0.0009	0.0007	0.0007	0.0015	0.0021
A21	0.4387	0.4095	0.0006	0.0010	0.0009	0.0008	0.0014	0.0022
A22	0.4374	0.4077	0.0006	0.0009	0.0007	0.0007	0.0011	0.0017
A23	0.4374	0.4109	0.0006	0.0010	0.0006	0.0007	0.0010	0.0018
A24	0.4382	0.4085	0.0006	0.0010	0.0007	0.0008	0.0011	0.0014
A25	0.4386	0.4082	0.0005	0.0011	0.0007	0.0008	0.0015	0.0018
Max.	0.4407	0.4122	0.0008	0.0013	0.0011	0.0014	0.0024	0.0027
Min.	0.4346	0.4043	0.0004	0.0006	0.0004	0.0006	0.0010	0.0014
Avg.	0.4383	0.4096	0.0006	0.0009	0.0007	0.0009	0.0015	0.0019
std. deviation	0.0013	0.0017	0.0001	0.0002	0.0002	0.0002	0.0004	0.0003

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### 7.3 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 [ $T_s$ ]: $85.3\text{ }^\circ\text{C}$
Ambient Temperature [ $T_a$ ]: $\geq 80\text{ }^\circ\text{C}$	Average [ $T_a$ ]: $84.6\text{ }^\circ\text{C}$
Driver Current: 150 mA	Air Flow: Minimized
Measurement Current: 150 mA	Relative humidity: $< 65\text{ } \% \text{ RH}$

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

S/N	Initial (0 hr)		Luminous Maintenance (%)					
	TLF(lm)	$V_F(V)$	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
B01	45.8	3.1	99.4 %	100.4 %	99.0 %	98.3 %	97.0 %	95.1 %
B02	46.9	3.1	100.6 %	101.3 %	99.9 %	98.9 %	97.0 %	95.0 %
B03	47.4	3.2	99.9 %	100.7 %	99.2 %	98.2 %	96.8 %	94.8 %
B04	48.2	3.2	100.8 %	100.7 %	99.5 %	98.9 %	97.2 %	95.8 %
B05	46.7	3.2	100.5 %	100.6 %	99.1 %	98.3 %	96.9 %	94.9 %
B06	46.6	3.1	100.5 %	100.6 %	99.2 %	98.3 %	97.0 %	94.7 %
B07	46.2	3.1	100.4 %	101.8 %	100.3 %	99.3 %	97.3 %	95.5 %
B08	46.7	3.2	99.4 %	100.1 %	98.7 %	97.5 %	95.9 %	94.1 %
B09	46.3	3.2	100.8 %	100.2 %	98.8 %	97.6 %	96.3 %	94.9 %
B10	47.4	3.2	100.4 %	101.3 %	100.0 %	98.6 %	96.8 %	94.5 %
B11	45.8	3.2	100.2 %	98.7 %	97.6 %	96.5 %	95.0 %	94.1 %
B12	47.9	3.1	101.0 %	99.6 %	98.3 %	97.1 %	95.8 %	96.4 %
B13	46.5	3.1	100.7 %	101.4 %	100.2 %	98.9 %	96.9 %	94.7 %
B14	47.7	3.2	100.7 %	101.4 %	100.1 %	99.0 %	97.6 %	96.1 %
B15	46.3	3.1	100.1 %	100.6 %	99.1 %	98.4 %	96.8 %	95.2 %
B16	46.4	3.1	100.4 %	99.8 %	98.4 %	97.8 %	95.9 %	96.3 %
B17	47.6	3.2	100.6 %	101.2 %	99.8 %	98.4 %	96.8 %	94.9 %
B18	47.1	3.2	100.4 %	101.0 %	99.7 %	98.4 %	96.9 %	95.3 %
B19	45.8	3.1	100.5 %	100.9 %	100.0 %	99.4 %	97.7 %	95.7 %
B20	47.8	3.2	100.8 %	100.7 %	99.5 %	98.7 %	96.9 %	94.9 %
B21	47.2	3.1	100.4 %	100.9 %	99.9 %	99.2 %	97.4 %	95.5 %
B22	47.6	3.1	100.6 %	101.7 %	100.4 %	99.0 %	97.6 %	97.1 %
B23	47.0	3.1	99.6 %	99.9 %	98.9 %	97.6 %	96.1 %	94.6 %
B24	47.7	3.1	100.5 %	100.2 %	98.8 %	97.7 %	96.3 %	95.6 %
B25	46.6	3.2	99.5 %	99.7 %	98.2 %	98.3 %	96.9 %	94.9 %
Max.	48.2	3.2	101.0 %	101.8 %	100.4 %	99.4 %	97.7 %	97.1 %
Min.	45.8	3.1	99.4 %	98.7 %	97.6 %	96.5 %	95.0 %	94.1 %
Avg.	46.92	3.15	100.3 %	100.6 %	99.3 %	98.3 %	96.8 %	95.2 %
std. deviation	0.70	0.03	0.45 %	0.73 %	0.73 %	0.72 %	0.64 %	0.72 %

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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	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
B01	3027	3034	3050	3050	3046	3065	3072
B02	3016	3023	3037	3044	3032	3051	3072
B03	2975	2984	3005	2996	2990	3015	3023
B04	3018	3029	3047	3045	3037	3062	3069
B05	3018	3023	3010	3042	3037	3077	3066
B06	3023	3027	3037	3031	3041	3061	3070
B07	3023	3028	3044	3040	3047	3059	3092
B08	3013	3022	3042	3033	3039	3059	3073
B09	3045	3042	3070	3066	3072	3085	3099
B10	3008	3009	3025	3024	3030	3047	3076
B11	3004	3012	3037	3037	3046	3046	3058
B12	3040	3048	3075	3050	3053	3070	3079
B13	3022	3033	3047	3038	3022	3059	3074
B14	2996	3005	3024	3006	2990	3026	3046
B15	3031	3046	3041	3044	3028	3061	3075
B16	3024	3031	3028	3028	3015	3052	3069
B17	3032	3039	3052	3036	3051	3075	3078
B18	3042	3053	3072	3035	3048	3075	3088
B19	3000	3008	3028	3012	3021	3035	3056
B20	3004	3017	3035	3018	3030	3051	3064
B21	3008	3010	3040	3023	3034	3053	3069
B22	3019	3026	3037	3037	3021	3055	3067
B23	3009	3020	3028	3031	3017	3053	3069
B24	3034	3046	3051	3049	3038	3070	3085
B25	3031	3043	3051	3061	3044	3088	3102
Max.	3045	3053	3075	3066	3072	3088	3102
Min.	2975	2984	3005	2996	2990	3015	3023
Avg.	3018.5	3026.3	3040.5	3035.0	3033.2	3058.0	3071.6
std. deviation	16.0	16.2	16.9	16.0	18.3	16.8	16.2

Unit: K

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S/N	Initial (0 hr)		Chromaticity Shift ( $\Delta u'v'$ )					
	CIE <sub>x</sub>	CIE <sub>y</sub>	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
B01	0.4367	0.4071	0.0007	0.0010	0.0010	0.0010	0.0015	0.0017
B02	0.4387	0.4100	0.0006	0.0010	0.0012	0.0009	0.0014	0.0022
B03	0.4423	0.4122	0.0006	0.0012	0.0010	0.0009	0.0016	0.0019
B04	0.4377	0.4082	0.0006	0.0012	0.0011	0.0009	0.0017	0.0020
B05	0.4385	0.4098	0.0006	0.0013	0.0010	0.0010	0.0023	0.0018
B06	0.4392	0.4119	0.0005	0.0007	0.0008	0.0010	0.0015	0.0018
B07	0.4374	0.4082	0.0006	0.0009	0.0009	0.0011	0.0014	0.0027
B08	0.4369	0.4059	0.0006	0.0012	0.0009	0.0011	0.0018	0.0023
B09	0.4360	0.4080	0.0007	0.0010	0.0010	0.0011	0.0015	0.0020
B10	0.4392	0.4100	0.0006	0.0009	0.0009	0.0011	0.0015	0.0026
B11	0.4394	0.4099	0.0006	0.0014	0.0014	0.0016	0.0017	0.0021
B12	0.4373	0.4100	0.0007	0.0014	0.0007	0.0010	0.0012	0.0015
B13	0.4402	0.4139	0.0007	0.0011	0.0008	0.0008	0.0015	0.0020
B14	0.4409	0.4120	0.0007	0.0012	0.0006	0.0009	0.0012	0.0020
B15	0.4394	0.4132	0.0009	0.0009	0.0008	0.0009	0.0013	0.0018
B16	0.4398	0.4132	0.0007	0.0009	0.0006	0.0010	0.0012	0.0018
B17	0.4376	0.4097	0.0007	0.0010	0.0005	0.0010	0.0016	0.0018
B18	0.4379	0.4116	0.0007	0.0012	0.0007	0.0009	0.0012	0.0017
B19	0.4407	0.4121	0.0007	0.0012	0.0007	0.0011	0.0014	0.0022
B20	0.4395	0.4102	0.0008	0.0012	0.0008	0.0012	0.0018	0.0023
B21	0.4394	0.4104	0.0007	0.0013	0.0007	0.0012	0.0018	0.0024
B22	0.4378	0.4085	0.0007	0.0009	0.0008	0.0008	0.0014	0.0018
B23	0.4388	0.4093	0.0007	0.0009	0.0009	0.0007	0.0017	0.0024
B24	0.4366	0.4078	0.0007	0.0009	0.0007	0.0008	0.0014	0.0020
B25	0.4355	0.4051	0.0008	0.0010	0.0012	0.0010	0.0022	0.0027
Max.	0.4423	0.4139	0.0009	0.0014	0.0014	0.0016	0.0023	0.0027
Min.	0.4355	0.4051	0.0005	0.0007	0.0005	0.0007	0.0012	0.0015
Avg.	0.4385	0.4099	0.0007	0.0011	0.0009	0.0010	0.0016	0.0021
std. deviation	0.0016	0.0023	0.0001	0.0002	0.0002	0.0002	0.0003	0.0003

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## 7.4 Lumen Maintenance and Color Maintenance Test

**Test Condition:  $T_s = 95\text{ }^\circ\text{C}$** 

Requirement	
Case Temperature [ $T_s$ ]: $\geq 93\text{ }^\circ\text{C}$	Average [ $T_s$ ]: $95.4\text{ }^\circ\text{C}$
Ambient Temperature [ $T_a$ ]: $\geq 90\text{ }^\circ\text{C}$	Average [ $T_a$ ]: $94.8\text{ }^\circ\text{C}$
Driver Current: 150 mA	Air Flow: Minimized
Measurement Current: 150 mA	Relative humidity: $< 65\text{ } \% \text{ RH}$

 7.4.1 Total Luminous Flux ( $\Phi_V$ )

S/N	Initial (0 hr)		Luminous Maintenance (%)					
	TLF(lm)	$V_F(V)$	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
C01	46.3	3.1	100.2 %	99.7 %	98.3 %	97.1 %	95.4 %	93.2 %
C02	46.9	3.2	100.4 %	99.6 %	98.2 %	96.8 %	95.0 %	94.7 %
C03	46.0	3.2	100.7 %	99.8 %	98.5 %	97.5 %	95.6 %	94.6 %
C04	46.0	3.1	100.3 %	99.3 %	98.2 %	97.5 %	95.7 %	94.5 %
C05	45.4	3.2	100.5 %	100.0 %	98.7 %	97.5 %	96.0 %	95.0 %
C06	46.8	3.1	99.4 %	100.3 %	98.9 %	97.9 %	96.2 %	96.2 %
C07	46.5	3.1	100.4 %	99.9 %	98.5 %	97.7 %	96.0 %	93.7 %
C08	46.8	3.1	99.9 %	100.6 %	99.5 %	99.6 %	97.8 %	94.8 %
C09	46.4	3.2	99.8 %	100.9 %	99.6 %	98.3 %	96.7 %	93.8 %
C10	46.5	3.2	100.4 %	98.7 %	97.5 %	97.7 %	96.1 %	93.2 %
C11	48.2	3.2	99.8 %	100.8 %	99.3 %	98.3 %	96.7 %	95.9 %
C12	46.1	3.1	99.5 %	98.4 %	97.6 %	96.9 %	95.2 %	94.8 %
C13	47.9	3.2	99.7 %	99.4 %	98.3 %	97.2 %	95.4 %	94.8 %
C14	47.8	3.2	100.5 %	99.1 %	97.8 %	96.8 %	95.0 %	93.5 %
C15	47.4	3.2	99.7 %	101.1 %	99.6 %	98.3 %	96.7 %	93.8 %
C16	46.1	3.2	100.0 %	100.4 %	99.2 %	98.7 %	97.1 %	96.7 %
C17	47.7	3.2	100.5 %	100.7 %	99.4 %	99.9 %	98.2 %	96.8 %
C18	47.4	3.2	99.5 %	99.4 %	98.4 %	99.4 %	97.7 %	94.7 %
C19	46.8	3.2	99.4 %	99.3 %	97.9 %	96.6 %	94.7 %	94.4 %
C20	47.0	3.1	100.2 %	101.3 %	100.0 %	98.7 %	96.9 %	95.6 %
C21	46.8	3.2	99.9 %	99.7 %	98.5 %	97.2 %	95.4 %	95.6 %
C22	46.8	3.2	99.9 %	100.0 %	99.0 %	97.6 %	96.3 %	95.3 %
C23	47.3	3.2	100.2 %	99.0 %	97.9 %	96.8 %	95.2 %	94.2 %
C24	48.4	3.2	100.8 %	99.7 %	98.5 %	97.4 %	95.5 %	94.4 %
C25	46.2	3.1	100.8 %	99.3 %	98.0 %	96.9 %	95.3 %	94.0 %
Max.	48.4	3.2	100.8 %	101.3 %	100.0 %	99.9 %	98.2 %	96.8 %
Min.	45.4	3.1	99.4 %	98.4 %	97.5 %	96.6 %	94.7 %	93.2 %
Avg.	46.86	3.16	100.1 %	99.9 %	98.6 %	97.8 %	96.1 %	94.7 %
std. deviation	0.75	0.02	0.43 %	0.76 %	0.68 %	0.92 %	0.96 %	0.99 %

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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	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
C01	3003	3022	3045	3063	3054	3045	3066
C02	2987	3006	3026	3047	3043	3039	3043
C03	3033	3051	3071	3071	3072	3074	3089
C04	3022	3043	3060	3068	3070	3064	3075
C05	3035	3059	3071	3110	3105	3082	3089
C06	3026	3050	3051	3056	3039	3058	3067
C07	3038	3047	3067	3070	3052	3070	3080
C08	3032	3040	3056	3057	3050	3076	3082
C09	3040	3051	3066	3065	3056	3078	3083
C10	3021	3032	3055	3061	3043	3056	3071
C11	3023	3039	3045	3054	3048	3060	3065
C12	3012	3027	3045	3032	3034	3047	3050
C13	2995	3016	3030	3024	3023	3027	3037
C14	3042	3065	3077	3068	3083	3083	3097
C15	3033	3051	3057	3053	3061	3068	3089
C16	3006	3023	3035	3037	3041	3043	3046
C17	3041	3060	3059	3065	3061	3077	3082
C18	3004	3034	3029	3039	3031	3044	3062
C19	3002	3024	3037	3042	3038	3048	3059
C20	3003	3013	3024	3027	3020	3030	3041
C21	3010	3027	3040	3049	3046	3053	3066
C22	3040	3053	3063	3067	3070	3078	3081
C23	3025	3039	3056	3056	3065	3056	3061
C24	3010	3019	3040	3040	3036	3041	3049
C25	3039	3053	3071	3077	3079	3072	3079
Max.	3042	3065	3077	3110	3105	3083	3097
Min.	2987	3006	3024	3024	3020	3027	3037
Avg.	3020.9	3037.8	3051.0	3055.9	3052.8	3058.8	3068.4
std. deviation	16.5	16.2	15.6	18.4	19.9	16.6	17.0

Unit: K

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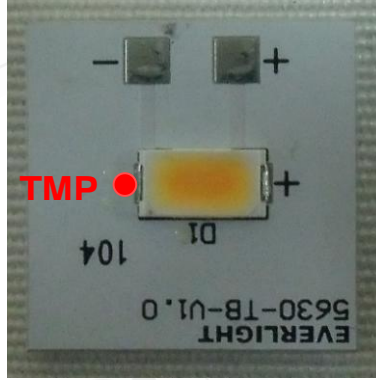
S/N	Initial (0 hr)		Chromaticity Shift ( $\Delta u'v'$ )					
	CIE <sub>x</sub>	CIE <sub>y</sub>	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
C01	0.4400	0.4110	0.0011	0.0017	0.0024	0.0021	0.0016	0.0025
C02	0.4415	0.4120	0.0011	0.0016	0.0024	0.0023	0.0021	0.0023
C03	0.4377	0.4100	0.0010	0.0015	0.0015	0.0016	0.0016	0.0022
C04	0.4399	0.4132	0.0011	0.0016	0.0018	0.0019	0.0017	0.0021
C05	0.4371	0.4090	0.0012	0.0026	0.0029	0.0027	0.0018	0.0021
C06	0.4366	0.4070	0.0011	0.0011	0.0012	0.0009	0.0012	0.0016
C07	0.4360	0.4069	0.0009	0.0013	0.0013	0.0010	0.0013	0.0017
C08	0.4378	0.4100	0.0009	0.0012	0.0011	0.0010	0.0017	0.0020
C09	0.4390	0.4137	0.0008	0.0012	0.0011	0.0010	0.0015	0.0017
C10	0.4376	0.4083	0.0009	0.0014	0.0016	0.0011	0.0014	0.0019
C11	0.4366	0.4065	0.0009	0.0011	0.0013	0.0011	0.0014	0.0016
C12	0.4411	0.4144	0.0009	0.0014	0.0010	0.0011	0.0014	0.0015
C13	0.4392	0.4083	0.0011	0.0014	0.0012	0.0013	0.0013	0.0017
C14	0.4366	0.4090	0.0011	0.0014	0.0011	0.0016	0.0016	0.0021
C15	0.4369	0.4084	0.0010	0.0011	0.0010	0.0012	0.0013	0.0022
C16	0.4432	0.4181	0.0010	0.0013	0.0013	0.0014	0.0014	0.0016
C17	0.4352	0.4057	0.0010	0.0010	0.0011	0.0010	0.0014	0.0016
C18	0.4401	0.4115	0.0013	0.0012	0.0014	0.0012	0.0015	0.0022
C19	0.4392	0.4093	0.0011	0.0015	0.0016	0.0015	0.0017	0.0022
C20	0.4413	0.4137	0.0010	0.0011	0.0011	0.0010	0.0012	0.0015
C21	0.4374	0.4065	0.0010	0.0013	0.0016	0.0015	0.0017	0.0022
C22	0.4372	0.4098	0.0010	0.0012	0.0012	0.0014	0.0015	0.0016
C23	0.4385	0.4106	0.0008	0.0014	0.0013	0.0016	0.0013	0.0014
C24	0.4407	0.4134	0.0008	0.0013	0.0013	0.0012	0.0012	0.0016
C25	0.4364	0.4082	0.0009	0.0014	0.0015	0.0016	0.0012	0.0015
Max.	0.4432	0.4181	0.0013	0.0026	0.0029	0.0027	0.0021	0.0025
Min.	0.4352	0.4057	0.0008	0.0010	0.0010	0.0009	0.0012	0.0014
Avg.	0.4385	0.4102	0.0010	0.0014	0.0015	0.0014	0.0015	0.0019
std. deviation	0.0020	0.0030	0.0001	0.0003	0.0005	0.0004	0.0002	0.0003

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)

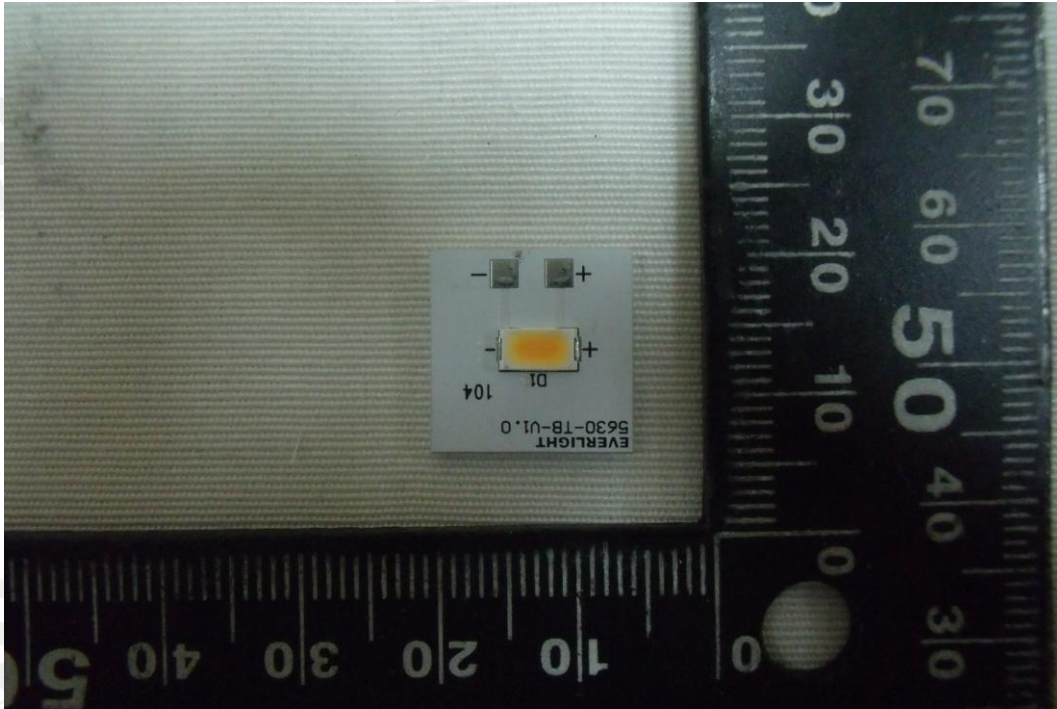
### Revised description

Report No.	Description	Issue Date	Status
OA-2012-B0007	Original issue version.	Aug. 30, 2013	Invalid
OA-2012-B0007-01	Correct some keyin error.	Jan. 15, 2013	Release

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## 9 PHOTO



Test Sample

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## APPENDIX A: Product Specification



### SMD ■ MID POWER LED

#### 62-217D Series



#### Features

- LM-80 Certified
- PLCC-2 Package
- Top view white LED
- High luminous flux output
- High current capability
- Wide viewing angle
- Pb-free
- RoHS compliant
- ANSI Binning

#### Description

The Everlight 0.5W 62-217D package has high efficacy, high CRI, low power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting application.

#### Applications

- Decorative and Entertainment Lighting
- Light pipe application
- Indicator and backlight in office and family equipment
- General use

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DATASHEET  
SMD • MID POWER LED  
62-217D Series

**EVERLIGHT**

**Device Selection Guide**

Chip Materials	Emitted Color	Resin Color
InGaN	Cool White	Water Clear
	Natural White	
	Warm White	

**Absolute Maximum Ratings (T<sub>Soldering</sub>=25°C)**

Parameter	Symbol	Rating	Unit
Forward Current	I <sub>F</sub>	180	mA
Peak Forward Current (Duty 1/10 @10ms)	I <sub>FP</sub>	300	mA
Power Dissipation	P <sub>d</sub>	630	mW
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
Thermal Resistance (Junction / Soldering point)	R <sub>th J-S</sub>	21	°C/W
Junction Temperature	T <sub>j</sub>	115	°C
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

Notes:

The products are sensitive to static electricity and must be carefully taken when handling products.

**Electro-Optical Characteristics (T<sub>Soldering</sub>=25°C)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux <sub>(1)</sub>	Φ	36	----	76	lm	I <sub>F</sub> =150mA
Forward Voltage <sub>(2)</sub>	V <sub>F</sub>	2.8	----	3.5	V	I <sub>F</sub> =150mA
Color Rendering Index <sub>(3)</sub>	R <sub>a</sub>	75	----	----	----	I <sub>F</sub> =150mA
Viewing Angle	2θ <sub>1/2</sub>	----	120	----	deg	I <sub>F</sub> =150mA
Reverse Current	I <sub>R</sub>	----	----	50	μA	V <sub>R</sub> =5V

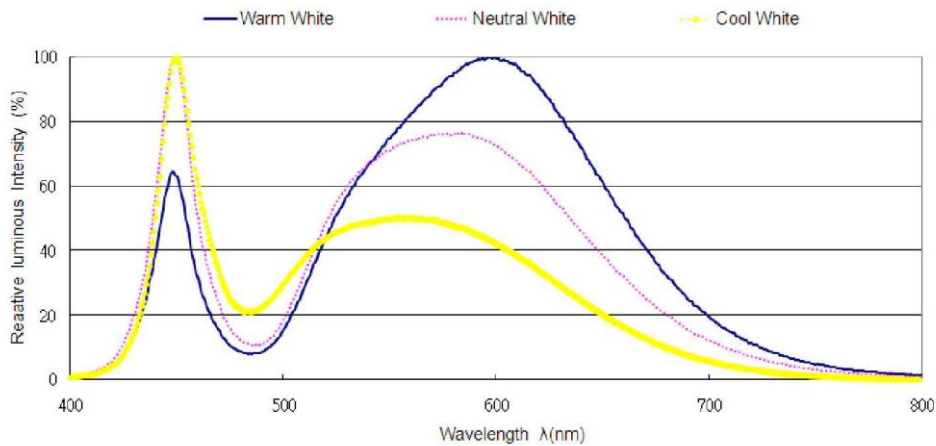
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SMD • MID POWER LED  
62-217D Series

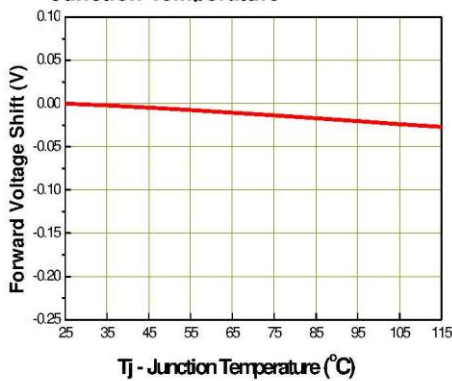
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### Spectrum Distribution

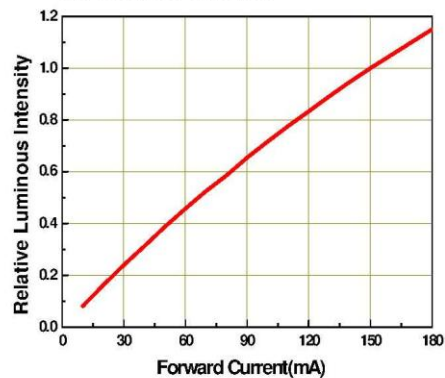


### Typical Electro-Optical Characteristics Curves

**Fig.1 – Forward Voltage Shift vs. Junction Temperature**



**Fig.2 - Relative Luminous Intensity vs. Forward Current**



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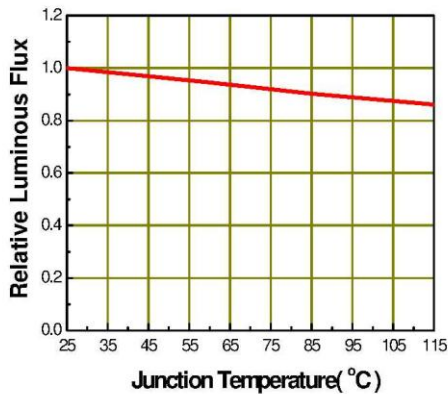
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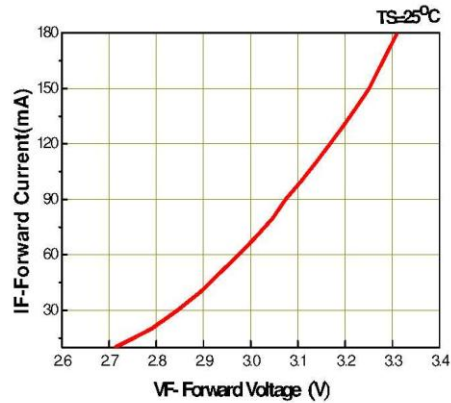
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**Typical Electro-Optical Characteristics Curves**

**Fig.3 - Relative Luminous Intensity vs. Junction Temperature**

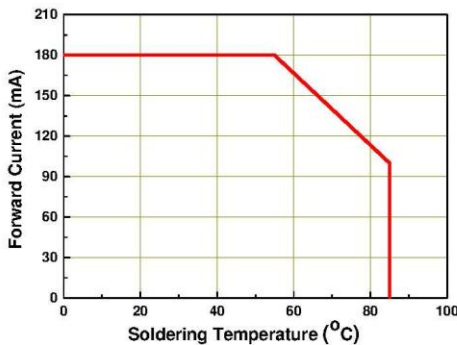


**Fig.4 - Forward Current vs. Forward Voltage**

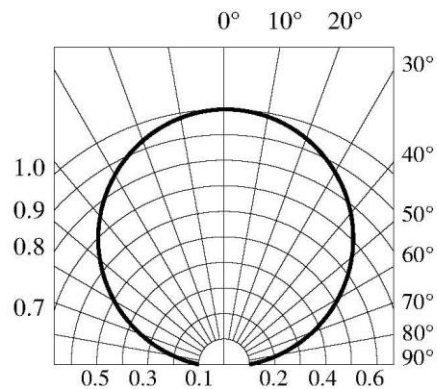


**Fig.5 – Max. Driving Forward Current vs. Soldering Temperature**

$R_{th\ j-s}=21\ ^\circ\text{C/W}$



**Fig.6 – Radiation Diagram**



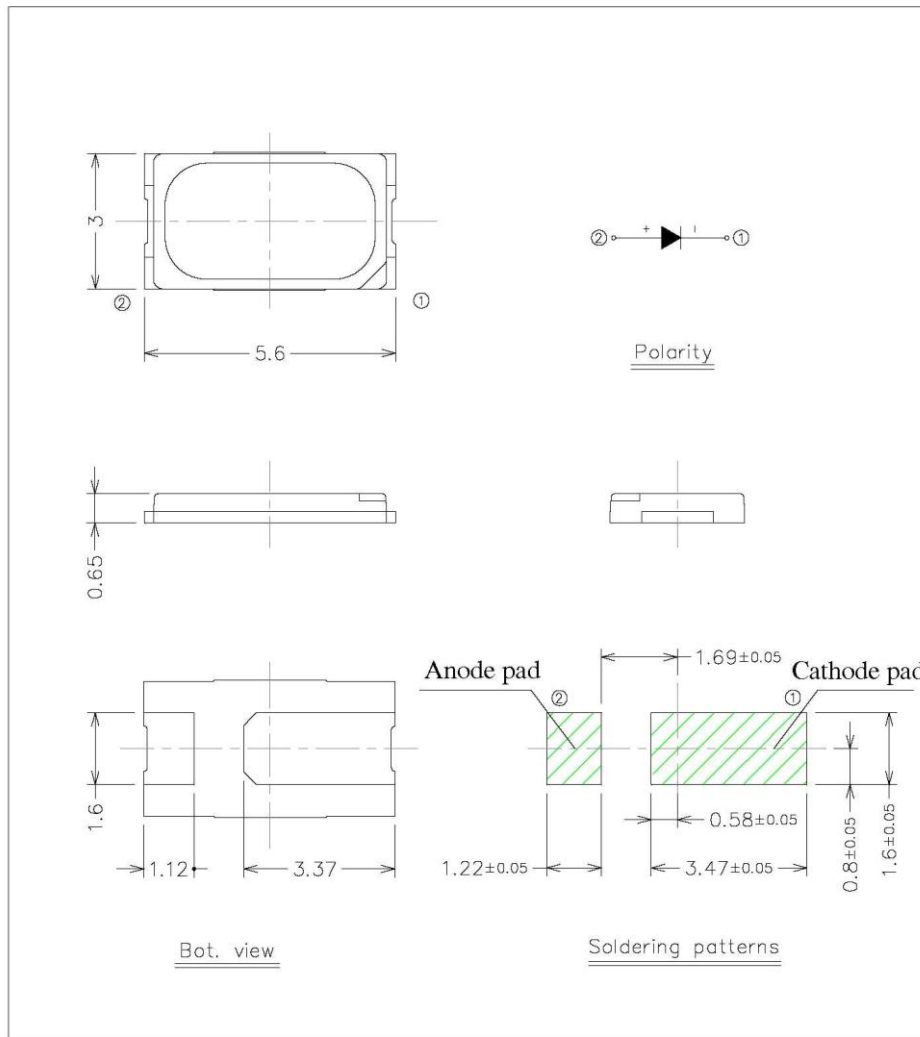
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**Package Dimension**



Note:  
Tolerance unless mentioned is ±0.1mm; Unit = mm

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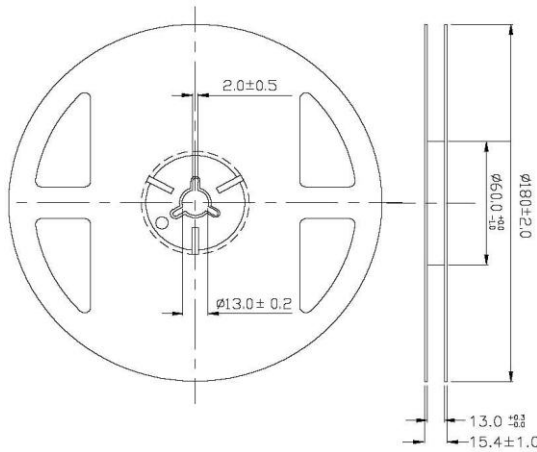
**Moisture Resistant Packing Materials**

**Label Explanation**



- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

**Reel Dimensions**



Note:  
Tolerances unless mentioned  $\pm 0.1$ mm. Unit = mm

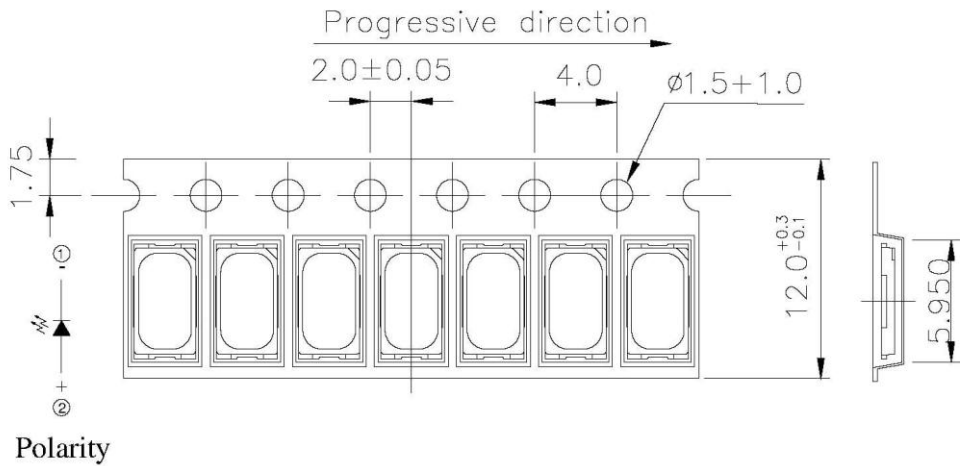
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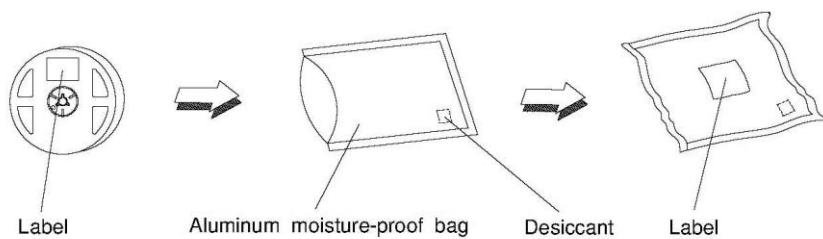
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**Carrier Tape Dimensions: Loaded Quantity 250/500/1000/2000 pcs. Per Reel**



Note:  
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**Moisture Resistant Packing Process**



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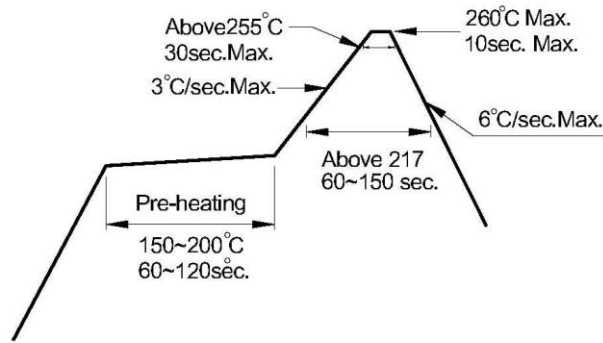
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**EVERLIGHT**

**Precautions for Use**

1. Over-current-proof  
Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).
2. Storage
  - 2.1 Do not open moisture proof bag before the products are ready to use.
  - 2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.
  - 2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.
  - 2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.  
Baking treatment: 60±5°C for 24 hours.
3. Soldering Condition
  - 3.1 Pb-free solder temperature profile



- 3.2 Reflow soldering should not be done more than two times.
- 3.3 When soldering, do not put stress on the LEDs during heating.
- 3.4 After soldering, do not warp the circuit board.

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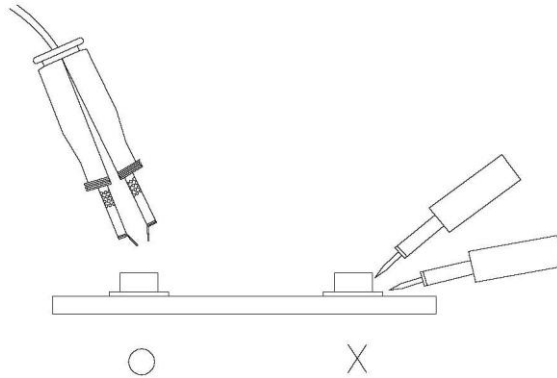
**EVERLIGHT**

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



**-End of Report-**

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