

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 (5700 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

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.

Test Results : -PLEASE SEE ATTACHED SHEETS-

Signed for and on behalf of
SGS TAIWAN Ltd.



Calvin Tzou
Technical Manager

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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. 26, 2013

4 IDENTITY OF SAMPLES

Quantity	Model	Serial Number
25	62-217D (5700 K)	# A01 - # A25 (55 °C)
25	62-217D (5700 K)	# B01 - # B25 (85 °C)
25	62-217D (5700 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 (Φ_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_x, CIE_y) & 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.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

6 TEST CONDITIONSMain 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) °CRelative Humidity: < 65 % RHUUT Conditions:LED Light source: LED PackageDrive Current: DC 150 mA (Typical)Forward Voltage: DC 2.8 V to 3.5 VPower Consumption: 0.5 WCCT: 5700 KPackage Dimension: L 5.6 mm x W 3.0 mm x H 0.65 mmPrior operation: 0 hourTotal Operation Duration: 6000 hoursTarget CCT: 5700 KSample Size: 75 pcs (25 pcs for each temperature)Failed Quantity: 0 pcsMeasurement Conditions:Interval Time: 0, 1000, 2000, 3000, 4000, 5000, 6000 hoursWarm up Time: < 1 minute (initial)Relative measurement uncertainty: 2.8 % (95 % Confidence Level)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

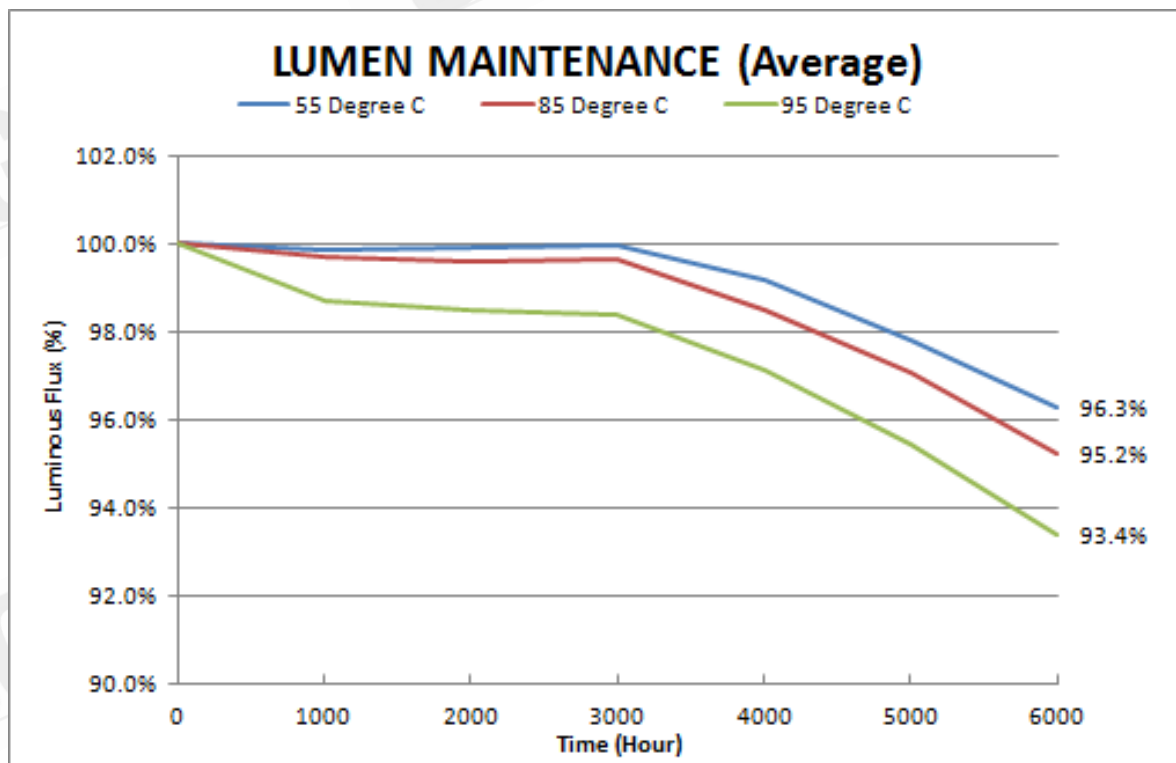
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

7 TEST RESULTS

7.1 Data Summary of Lumen and Color Maintenance

Temp.	Initial (0 hr)		Luminous Maintenance (%)					
	TLF(lm)	V _F (V)	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
55°C Avg.	54.62	3.20	99.8%	99.9%	100.0%	99.2%	97.8%	96.3%
85°C Avg.	54.12	3.19	99.7%	99.6%	99.6%	98.5%	97.0%	95.2%
95°C Avg.	54.09	3.19	98.7%	98.5%	98.4%	97.1%	95.4%	93.4%

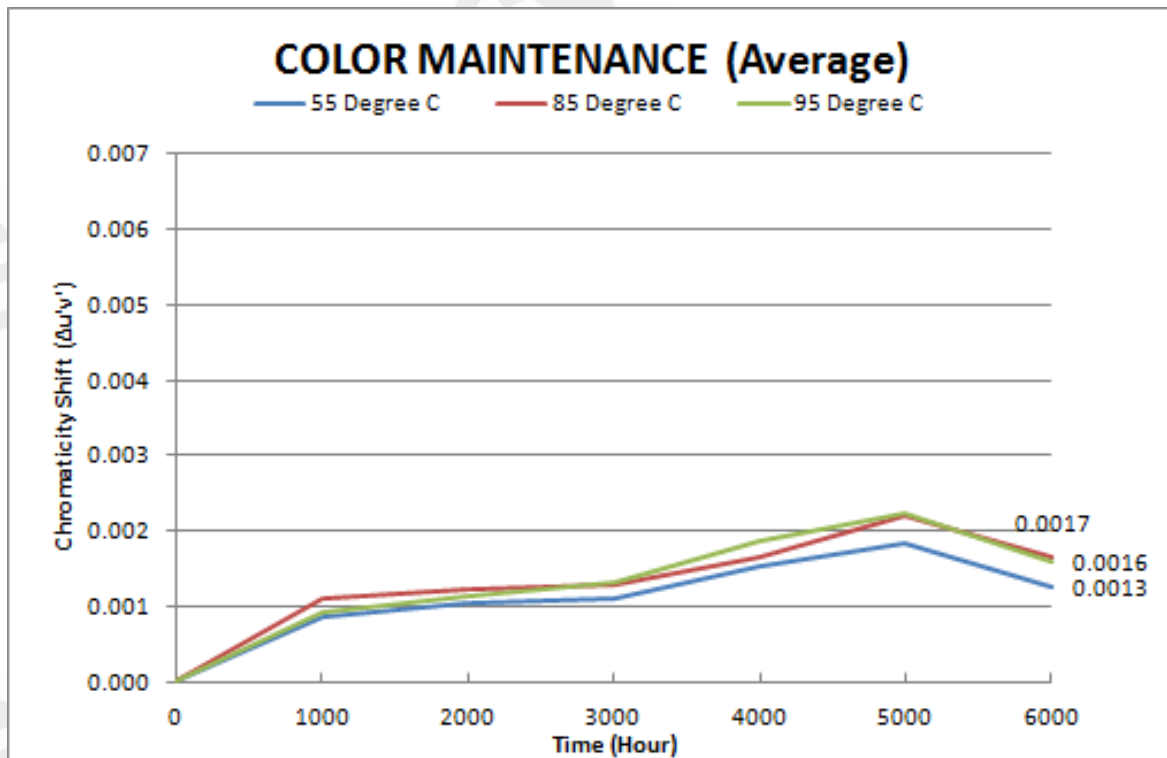
Temp.	Initial (0 hr)			Chromaticity Shift ($\Delta u'v'$)					
	CIE _x	CIE _y	CCT	1000 hrs	2000 hrs	3000 hrs	4000 hrs	5000 hrs	6000 hrs
55°C Avg.	0.3295	0.3363	5632.1	0.0009	0.0011	0.0011	0.0015	0.0018	0.0013
85°C Avg.	0.3292	0.3372	5642.6	0.0011	0.0012	0.0013	0.0017	0.0022	0.0017
95°C Avg.	0.3289	0.3381	5657.4	0.0009	0.0012	0.0013	0.0019	0.0022	0.0016



Average Lumen Maintenance diagram

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.



Average Color Maintenance diagram

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

7.2 Lumen Maintenance and Color Maintenance Test

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

Requirement	
Case Temperature [T_s]: $\geq 53^\circ\text{C}$	Average [T_s]: 55.2°C
Ambient Temperature [T_a]: $\geq 50^\circ\text{C}$	Average [T_a]: 54.4°C
Driver Current: 150 mA	Air Flow: Minimized
Measurement Current: 150 mA	Relative humidity: $< 65\% \text{ RH}$

7.2.1 Total Luminous Flux (Φ_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	55.9	3.2	99.4 %	98.3 %	98.8 %	98.5 %	97.1 %	95.4 %
A02	54.0	3.2	99.5 %	99.7 %	99.3 %	98.7 %	97.2 %	95.5 %
A03	54.7	3.2	99.9 %	99.3 %	100.1 %	98.7 %	97.2 %	96.0 %
A04	55.2	3.2	99.1 %	98.9 %	98.0 %	99.2 %	97.5 %	96.1 %
A05	54.9	3.2	99.3 %	98.9 %	99.2 %	98.7 %	97.5 %	96.3 %
A06	55.3	3.2	99.1 %	98.7 %	98.8 %	99.2 %	97.5 %	95.9 %
A07	54.8	3.2	100.8 %	99.3 %	99.0 %	98.8 %	97.0 %	95.8 %
A08	54.6	3.2	100.1 %	99.1 %	99.2 %	99.1 %	97.5 %	96.3 %
A09	54.6	3.2	99.9 %	99.7 %	100.1 %	99.3 %	97.3 %	96.2 %
A10	55.1	3.2	99.5 %	99.1 %	99.9 %	98.5 %	97.2 %	95.9 %
A11	54.4	3.2	100.2 %	98.8 %	98.8 %	97.4 %	96.4 %	95.2 %
A12	53.5	3.2	100.6 %	101.8 %	102.1 %	100.7 %	99.1 %	97.6 %
A13	55.2	3.2	99.6 %	98.9 %	99.1 %	97.9 %	96.2 %	94.9 %
A14	54.6	3.3	99.5 %	100.2 %	100.4 %	99.3 %	97.4 %	95.6 %
A15	53.8	3.2	99.1 %	100.4 %	100.5 %	99.3 %	98.0 %	96.8 %
A16	54.7	3.2	99.6 %	101.1 %	101.5 %	100.5 %	98.9 %	96.5 %
A17	53.0	3.2	99.6 %	100.1 %	100.0 %	99.4 %	97.8 %	95.3 %
A18	55.3	3.2	99.7 %	99.6 %	100.1 %	99.4 %	98.5 %	97.2 %
A19	54.9	3.2	100.4 %	100.9 %	101.2 %	100.0 %	99.6 %	97.6 %
A20	54.7	3.2	100.4 %	100.7 %	100.8 %	99.5 %	99.2 %	97.1 %
A21	53.8	3.2	100.2 %	100.3 %	99.2 %	98.7 %	98.4 %	97.8 %
A22	55.2	3.2	99.8 %	99.6 %	100.9 %	99.5 %	97.9 %	96.4 %
A23	54.3	3.2	100.6 %	101.7 %	100.4 %	99.2 %	97.7 %	96.2 %
A24	55.3	3.2	99.7 %	100.8 %	100.7 %	99.2 %	98.0 %	96.3 %
A25	53.8	3.2	100.5 %	101.3 %	101.3 %	99.9 %	98.8 %	96.7 %
Max.	55.9	3.3	100.8 %	101.8 %	102.1 %	100.7 %	99.6 %	97.8 %
Min.	53.0	3.2	99.1 %	98.3 %	98.0 %	97.4 %	96.2 %	94.9 %
Avg.	54.62	3.20	99.8 %	99.9 %	100.0 %	99.2 %	97.8 %	96.3 %
std. deviation	0.68	0.03	0.52 %	1.00 %	1.02 %	0.72 %	0.86 %	0.77 %

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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	5590	5640	5628	5667	5728	5772	5726
A02	5497	5544	5533	5598	5616	5647	5626
A03	5652	5656	5644	5683	5761	5694	5745
A04	5628	5678	5664	5733	5775	5815	5764
A05	5687	5664	5693	5726	5800	5782	5752
A06	5666	5673	5699	5745	5817	5820	5767
A07	5611	5624	5636	5668	5709	5739	5709
A08	5655	5671	5672	5704	5781	5767	5739
A09	5614	5635	5620	5657	5695	5730	5697
A10	5617	5643	5631	5661	5703	5744	5702
A11	5618	5643	5638	5692	5734	5739	5694
A12	5668	5668	5662	5690	5755	5766	5730
A13	5610	5629	5616	5646	5712	5724	5698
A14	5619	5660	5635	5666	5747	5746	5709
A15	5670	5661	5665	5684	5735	5749	5724
A16	5634	5648	5617	5655	5721	5758	5700
A17	5673	5700	5673	5715	5757	5802	5751
A18	5446	5472	5445	5484	5528	5549	5506
A19	5700	5711	5683	5721	5783	5794	5754
A20	5561	5566	5545	5582	5626	5649	5618
A21	5763	5783	5763	5826	5866	5914	5848
A22	5679	5680	5661	5690	5740	5796	5737
A23	5697	5693	5657	5716	5761	5768	5741
A24	5543	5574	5542	5586	5627	5653	5624
A25	5704	5713	5695	5727	5789	5797	5764
Max.	5763	5783	5763	5826	5866	5914	5848
Min.	5446	5472	5445	5484	5528	5549	5506
Avg.	5632.1	5649.2	5636.7	5676.9	5730.6	5748.6	5713.0
std. deviation	68.4	61.4	64.7	65.9	71.8	71.4	65.6

Unit: K

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

S/N	Initial (0 hr)		Chromaticity Shift ($\Delta u'v'$)					
	CIE _x	CIE _y	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
A01	0.3304	0.3340	0.0009	0.0011	0.0013	0.0019	0.0037	0.0019
A02	0.3324	0.3342	0.0009	0.0011	0.0015	0.0017	0.0034	0.0018
A03	0.3289	0.3412	0.0006	0.0010	0.0009	0.0019	0.0038	0.0036
A04	0.3296	0.3325	0.0009	0.0011	0.0015	0.0020	0.0026	0.0018
A05	0.3284	0.3320	0.0010	0.0009	0.0009	0.0015	0.0013	0.0010
A06	0.3288	0.3330	0.0010	0.0011	0.0013	0.0020	0.0020	0.0014
A07	0.3299	0.3406	0.0010	0.0011	0.0013	0.0025	0.0018	0.0014
A08	0.3289	0.3397	0.0010	0.0012	0.0013	0.0017	0.0016	0.0012
A09	0.3299	0.3317	0.0009	0.0009	0.0009	0.0018	0.0016	0.0011
A10	0.3298	0.3363	0.0009	0.0009	0.0010	0.0019	0.0018	0.0012
A11	0.3297	0.3411	0.0008	0.0007	0.0010	0.0016	0.0017	0.0011
A12	0.3286	0.3389	0.0010	0.0010	0.0010	0.0012	0.0013	0.0009
A13	0.3299	0.3349	0.0009	0.0009	0.0009	0.0020	0.0015	0.0012
A14	0.3298	0.3336	0.0007	0.0008	0.0009	0.0018	0.0017	0.0012
A15	0.3286	0.3385	0.0011	0.0011	0.0012	0.0010	0.0011	0.0009
A16	0.3295	0.3325	0.0012	0.0016	0.0014	0.0013	0.0017	0.0011
A17	0.3286	0.3358	0.0007	0.0009	0.0010	0.0012	0.0018	0.0011
A18	0.3336	0.3416	0.0007	0.0009	0.0009	0.0012	0.0015	0.0010
A19	0.3281	0.3337	0.0009	0.0012	0.0010	0.0012	0.0013	0.0009
A20	0.3310	0.3361	0.0007	0.0012	0.0011	0.0010	0.0012	0.0009
A21	0.3266	0.3369	0.0005	0.0008	0.0009	0.0014	0.0021	0.0011
A22	0.3285	0.3332	0.0008	0.0012	0.0012	0.0010	0.0016	0.0009
A23	0.3279	0.3412	0.0008	0.0015	0.0010	0.0009	0.0010	0.0008
A24	0.3314	0.3366	0.0006	0.0010	0.0010	0.0012	0.0015	0.0012
A25	0.3279	0.3381	0.0008	0.0011	0.0011	0.0012	0.0013	0.0009
Max.	0.3336	0.3416	0.0012	0.0016	0.0015	0.0025	0.0038	0.0036
Min.	0.3266	0.3317	0.0005	0.0007	0.0009	0.0009	0.0010	0.0008
Avg.	0.3295	0.3363	0.0009	0.0011	0.0011	0.0015	0.0018	0.0013
std. deviation	0.0015	0.0033	0.0002	0.0002	0.0002	0.0004	0.0008	0.0006

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

7.3 Lumen Maintenance and Color Maintenance Test

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

Requirement	
Case Temperature [T_s]: $\geq 83^\circ\text{C}$	Average [T_s]: 85.4°C
Ambient Temperature [T_a]: $\geq 80^\circ\text{C}$	Average [T_a]: 84.7°C
Driver Current: 150 mA	Air Flow: Minimized
Measurement Current: 150 mA	Relative humidity: $< 65\% \text{ RH}$

7.3.1 Total Luminous Flux (Φ_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	54.2	3.2	99.6 %	99.3 %	100.6 %	99.2 %	97.9 %	95.8 %
B02	55.3	3.2	99.1 %	99.2 %	99.2 %	97.9 %	96.1 %	94.4 %
B03	55.4	3.2	99.8 %	99.5 %	99.4 %	98.2 %	97.3 %	95.4 %
B04	54.9	3.2	99.3 %	99.3 %	99.5 %	98.2 %	97.0 %	95.0 %
B05	54.2	3.2	100.3 %	100.4 %	99.2 %	98.5 %	96.9 %	95.4 %
B06	54.2	3.2	99.5 %	99.1 %	98.9 %	97.5 %	96.2 %	94.7 %
B07	54.3	3.2	99.8 %	99.9 %	99.9 %	98.7 %	96.7 %	94.6 %
B08	54.1	3.2	99.5 %	98.7 %	99.4 %	98.8 %	96.6 %	95.0 %
B09	55.0	3.2	99.1 %	98.2 %	98.0 %	97.1 %	96.1 %	94.5 %
B10	52.7	3.2	100.0 %	100.1 %	100.0 %	98.8 %	98.3 %	97.0 %
B11	54.1	3.2	99.2 %	99.6 %	100.2 %	98.7 %	97.7 %	95.2 %
B12	53.0	3.2	100.2 %	100.4 %	100.6 %	99.2 %	97.7 %	95.4 %
B13	53.8	3.2	100.1 %	100.2 %	101.7 %	100.2 %	98.8 %	96.8 %
B14	54.0	3.2	99.8 %	98.5 %	99.9 %	99.0 %	97.5 %	95.2 %
B15	53.2	3.2	99.3 %	99.9 %	100.0 %	98.9 %	97.5 %	95.6 %
B16	54.3	3.2	99.5 %	99.0 %	99.0 %	97.9 %	97.3 %	95.3 %
B17	52.9	3.2	99.9 %	100.5 %	99.6 %	98.8 %	97.6 %	95.4 %
B18	53.7	3.2	99.9 %	100.6 %	99.2 %	98.1 %	96.6 %	94.9 %
B19	54.5	3.2	100.3 %	99.8 %	100.0 %	98.6 %	96.8 %	95.5 %
B20	54.2	3.2	99.8 %	99.4 %	98.7 %	97.7 %	95.6 %	94.2 %
B21	54.0	3.2	99.6 %	99.4 %	99.2 %	97.9 %	96.4 %	94.6 %
B22	54.6	3.2	100.2 %	99.9 %	100.6 %	99.2 %	97.3 %	96.3 %
B23	55.1	3.2	100.0 %	99.8 %	98.9 %	97.5 %	96.4 %	94.6 %
B24	54.3	3.2	99.5 %	99.7 %	99.4 %	98.5 %	97.4 %	94.9 %
B25	53.4	3.2	99.0 %	99.5 %	99.7 %	98.4 %	96.5 %	94.7 %
Max.	55.4	3.2	100.3 %	100.6 %	101.7 %	100.2 %	98.8 %	97.0 %
Min.	52.7	3.2	99.0 %	98.2 %	98.0 %	97.1 %	95.6 %	94.2 %
Avg.	54.12	3.19	99.7 %	99.6 %	99.6 %	98.5 %	97.0 %	95.2 %
std. deviation	0.71	0.02	0.39 %	0.61 %	0.77 %	0.69 %	0.75 %	0.70 %

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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	5671	5694	5688	5691	5755	5785	5796
B02	5592	5634	5630	5669	5715	5755	5744
B03	5685	5710	5717	5760	5812	5835	5807
B04	5630	5674	5657	5704	5762	5771	5775
B05	5680	5683	5669	5747	5789	5780	5771
B06	5759	5697	5658	5757	5804	5813	5788
B07	5628	5671	5649	5692	5760	5794	5759
B08	5673	5702	5681	5736	5771	5785	5759
B09	5692	5706	5720	5794	5821	5834	5822
B10	5703	5620	5612	5657	5705	5744	5711
B11	5683	5702	5763	5683	5759	5812	5780
B12	5687	5706	5687	5719	5773	5804	5806
B13	5500	5512	5486	5503	5578	5574	5579
B14	5687	5694	5673	5696	5771	5790	5786
B15	5713	5718	5685	5719	5771	5823	5807
B16	5475	5471	5481	5533	5589	5584	5586
B17	5656	5692	5676	5729	5766	5818	5771
B18	5665	5696	5676	5759	5804	5788	5758
B19	5628	5647	5632	5669	5749	5753	5724
B20	5634	5655	5638	5693	5761	5811	5743
B21	5653	5666	5660	5703	5768	5784	5775
B22	5642	5661	5660	5705	5745	5765	5720
B23	5645	5639	5648	5685	5768	5816	5810
B24	5658	5656	5664	5711	5744	5804	5767
B25	5426	5415	5424	5438	5487	5499	5523
Max.	5759	5718	5763	5794	5821	5835	5822
Min.	5426	5415	5424	5438	5487	5499	5523
Avg.	5642.6	5652.8	5645.4	5686.1	5741.1	5764.8	5746.7
std. deviation	74.9	76.3	75.9	81.5	77.9	84.7	75.7

Unit: K

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

S/N	Initial (0 hr)		Chromaticity Shift ($\Delta u'v'$)					
	CIE _x	CIE _y	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
B01	0.3286	0.3374	0.0006	0.0006	0.0009	0.0012	0.0015	0.0017
B02	0.3303	0.3369	0.0008	0.0009	0.0012	0.0017	0.0022	0.0021
B03	0.3284	0.3315	0.0009	0.0009	0.0011	0.0017	0.0020	0.0016
B04	0.3294	0.3394	0.0008	0.0010	0.0012	0.0018	0.0019	0.0020
B05	0.3284	0.3376	0.0008	0.0010	0.0009	0.0015	0.0014	0.0012
B06	0.3267	0.3367	0.0015	0.0022	0.0006	0.0006	0.0007	0.0005
B07	0.3295	0.3419	0.0050	0.0048	0.0051	0.0062	0.0066	0.0062
B08	0.3285	0.3389	0.0007	0.0009	0.0011	0.0013	0.0015	0.0012
B09	0.3282	0.3325	0.0010	0.0008	0.0014	0.0017	0.0018	0.0017
B10	0.3279	0.3370	0.0035	0.0037	0.0034	0.0025	0.0021	0.0024
B11	0.3283	0.3374	0.0007	0.0013	0.0013	0.0011	0.0018	0.0013
B12	0.3282	0.3400	0.0006	0.0007	0.0006	0.0012	0.0031	0.0017
B13	0.3323	0.3367	0.0009	0.0012	0.0012	0.0011	0.0026	0.0012
B14	0.3283	0.3370	0.0009	0.0012	0.0012	0.0012	0.0028	0.0014
B15	0.3279	0.3302	0.0010	0.0015	0.0013	0.0013	0.0029	0.0012
B16	0.3328	0.3357	0.0009	0.0007	0.0009	0.0016	0.0015	0.0015
B17	0.3290	0.3322	0.0007	0.0008	0.0010	0.0014	0.0022	0.0015
B18	0.3288	0.3311	0.0006	0.0008	0.0012	0.0018	0.0016	0.0012
B19	0.3295	0.3414	0.0007	0.0009	0.0010	0.0018	0.0018	0.0013
B20	0.3294	0.3390	0.0007	0.0009	0.0009	0.0018	0.0026	0.0015
B21	0.3290	0.3391	0.0008	0.0009	0.0010	0.0016	0.0018	0.0017
B22	0.3290	0.3521	0.0006	0.0008	0.0010	0.0015	0.0018	0.0011
B23	0.3292	0.3343	0.0010	0.0009	0.0009	0.0017	0.0024	0.0012
B24	0.3288	0.3388	0.0008	0.0008	0.0008	0.0012	0.0020	0.0015
B25	0.3339	0.3359	0.0010	0.0008	0.0011	0.0009	0.0026	0.0014
Max.	0.3339	0.3521	0.0050	0.0048	0.0051	0.0062	0.0066	0.0062
Min.	0.3267	0.3302	0.0006	0.0006	0.0006	0.0006	0.0007	0.0005
Avg.	0.3292	0.3372	0.0011	0.0012	0.0013	0.0017	0.0022	0.0017
std. deviation	0.0016	0.0044	0.0010	0.0010	0.0009	0.0010	0.0011	0.0010

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

7.4 Lumen Maintenance and Color Maintenance Test

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

Requirement	
Case Temperature [T_s]: $\geq 93^\circ\text{C}$	Average [T_s]: 95.5°C
Ambient Temperature [T_a]: $\geq 90^\circ\text{C}$	Average [T_a]: 94.7°C
Driver Current: 150 mA	Air Flow: Minimized
Measurement Current: 150 mA	Relative humidity: $< 65\% \text{ RH}$

7.4.1 Total Luminous Flux (Φ_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	54.3	3.2	96.6 %	97.2 %	97.0 %	95.6 %	93.8 %	92.3 %
C02	53.6	3.2	98.6 %	99.6 %	99.4 %	97.9 %	96.1 %	94.7 %
C03	54.8	3.2	98.3 %	98.4 %	98.4 %	96.9 %	94.8 %	92.7 %
C04	54.9	3.2	98.4 %	97.5 %	98.3 %	96.8 %	94.7 %	92.3 %
C05	55.2	3.2	97.0 %	97.8 %	98.3 %	96.8 %	95.1 %	93.0 %
C06	53.8	3.2	97.9 %	97.5 %	98.1 %	96.7 %	95.0 %	92.9 %
C07	54.5	3.2	100.1 %	99.4 %	100.2 %	99.0 %	97.7 %	95.6 %
C08	52.7	3.2	99.7 %	98.3 %	97.1 %	95.7 %	95.0 %	93.0 %
C09	53.0	3.2	100.3 %	99.4 %	100.3 %	98.8 %	97.2 %	95.2 %
C10	54.4	3.2	96.0 %	95.6 %	95.1 %	93.8 %	92.6 %	90.6 %
C11	53.2	3.2	100.5 %	99.5 %	99.9 %	98.5 %	96.5 %	94.4 %
C12	54.4	3.2	98.3 %	97.7 %	97.1 %	96.0 %	94.2 %	92.2 %
C13	55.0	3.2	97.5 %	96.7 %	96.1 %	94.9 %	92.7 %	90.6 %
C14	54.2	3.2	97.8 %	96.8 %	98.0 %	96.5 %	94.8 %	92.6 %
C15	54.1	3.2	99.5 %	99.3 %	100.0 %	99.4 %	97.4 %	95.1 %
C16	53.6	3.1	100.8 %	100.8 %	100.1 %	98.7 %	97.0 %	94.8 %
C17	52.9	3.2	100.3 %	101.2 %	100.3 %	98.9 %	97.3 %	97.4 %
C18	54.4	3.2	99.4 %	100.1 %	100.5 %	99.3 %	97.2 %	95.3 %
C19	54.4	3.2	99.5 %	99.2 %	99.9 %	98.9 %	96.6 %	94.2 %
C20	54.1	3.2	100.7 %	100.1 %	99.8 %	98.5 %	97.1 %	94.7 %
C21	53.0	3.2	97.8 %	98.3 %	96.9 %	95.6 %	93.9 %	91.5 %
C22	54.4	3.2	97.3 %	96.9 %	97.5 %	96.1 %	93.8 %	91.5 %
C23	55.4	3.2	95.5 %	96.0 %	96.0 %	94.7 %	94.4 %	92.1 %
C24	54.8	3.2	99.7 %	99.1 %	97.6 %	96.5 %	95.9 %	93.8 %
C25	53.1	3.2	99.9 %	99.1 %	97.7 %	96.6 %	94.5 %	92.3 %
Max.	55.4	3.2	100.8 %	101.2 %	100.5 %	99.4 %	97.7 %	97.4 %
Min.	52.7	3.1	95.5 %	95.6 %	95.1 %	93.8 %	92.6 %	90.6 %
Avg.	54.09	3.19	98.7 %	98.5 %	98.4 %	97.1 %	95.4 %	93.4 %
std. deviation	0.77	0.03	1.52 %	1.46 %	1.57 %	1.60 %	1.52 %	1.70 %

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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	5627	5691	5720	5695	5756	5782	5752
C02	5632	5701	5706	5696	5738	5790	5731
C03	5601	5650	5668	5693	5746	5813	5790
C04	5680	5737	5769	5785	5845	5921	5903
C05	5633	5690	5708	5733	5776	5854	5844
C06	5660	5738	5758	5765	5822	5819	5781
C07	5620	5637	5692	5688	5728	5751	5710
C08	5739	5756	5822	5870	5851	5893	5868
C09	5615	5657	5718	5728	5760	5784	5748
C10	5623	5713	5757	5734	5777	5825	5755
C11	5772	5815	5866	5807	5814	5877	5807
C12	5687	5777	5843	5798	5834	5828	5836
C13	5613	5696	5744	5676	5754	5739	5714
C14	5643	5716	5751	5756	5760	5798	5749
C15	5644	5650	5679	5655	5701	5750	5719
C16	5812	5774	5818	5793	5861	5895	5881
C17	5599	5574	5608	5612	5689	5697	5658
C18	5635	5627	5657	5647	5713	5749	5707
C19	5587	5599	5637	5632	5694	5705	5665
C20	5706	5703	5749	5748	5804	5826	5795
C21	5739	5824	5800	5847	5856	5885	5849
C22	5669	5752	5746	5805	5783	5858	5803
C23	5617	5717	5682	5720	5755	5789	5772
C24	5662	5757	5737	5797	5831	5817	5788
C25	5621	5743	5693	5750	5769	5791	5769
Max.	5812	5824	5866	5870	5861	5921	5903
Min.	5587	5574	5608	5612	5689	5697	5658
Avg.	5657.4	5707.8	5733.1	5737.2	5776.7	5809.4	5775.8
std. deviation	57.1	63.0	64.0	66.7	52.1	59.2	64.1

Unit: K

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

S/N	Initial (0 hr)		Chromaticity Shift ($\Delta u'v'$)					
	CIE _x	CIE _y	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
C01	0.3295	0.3385	0.0009	0.0013	0.0011	0.0018	0.0022	0.0017
C02	0.3292	0.3521	0.0010	0.0011	0.0010	0.0016	0.0024	0.0015
C03	0.3301	0.3376	0.0008	0.0009	0.0013	0.0021	0.0031	0.0012
C04	0.3285	0.3324	0.0008	0.0012	0.0014	0.0023	0.0034	0.0017
C05	0.3293	0.3433	0.0008	0.0011	0.0015	0.0022	0.0034	0.0016
C06	0.3288	0.3391	0.0011	0.0014	0.0014	0.0024	0.0039	0.0040
C07	0.3297	0.3343	0.0006	0.0010	0.0009	0.0014	0.0018	0.0012
C08	0.3272	0.3351	0.0004	0.0012	0.0019	0.0016	0.0022	0.0019
C09	0.3298	0.3386	0.0006	0.0015	0.0016	0.0021	0.0024	0.0019
C10	0.3296	0.3361	0.0013	0.0020	0.0015	0.0022	0.0029	0.0019
C11	0.3265	0.3361	0.0006	0.0014	0.0007	0.0006	0.0014	0.0006
C12	0.3282	0.3394	0.0013	0.0022	0.0015	0.0031	0.0021	0.0023
C13	0.3299	0.3366	0.0012	0.0020	0.0010	0.0020	0.0017	0.0014
C14	0.3291	0.3409	0.0010	0.0016	0.0016	0.0034	0.0022	0.0015
C15	0.3292	0.3378	0.0006	0.0007	0.0013	0.0013	0.0015	0.0011
C16	0.3256	0.3361	0.0010	0.0005	0.0012	0.0007	0.0011	0.0009
C17	0.3301	0.3413	0.0009	0.0006	0.0009	0.0013	0.0013	0.0008
C18	0.3293	0.3417	0.0007	0.0007	0.0012	0.0015	0.0016	0.0011
C19	0.3304	0.3416	0.0005	0.0008	0.0010	0.0020	0.0017	0.0012
C20	0.3280	0.3325	0.0006	0.0008	0.0009	0.0017	0.0016	0.0012
C21	0.3271	0.3364	0.0012	0.0008	0.0014	0.0016	0.0020	0.0015
C22	0.3286	0.3389	0.0012	0.0010	0.0020	0.0016	0.0028	0.0020
C23	0.3298	0.3346	0.0014	0.0009	0.0014	0.0019	0.0024	0.0022
C24	0.3288	0.3386	0.0013	0.0010	0.0019	0.0025	0.0022	0.0018
C25	0.3297	0.3323	0.0017	0.0010	0.0017	0.0020	0.0022	0.0020
Max.	0.3304	0.3521	0.0017	0.0022	0.0020	0.0034	0.0039	0.0040
Min.	0.3256	0.3323	0.0004	0.0005	0.0007	0.0006	0.0011	0.0006
Avg.	0.3289	0.3381	0.0009	0.0012	0.0013	0.0019	0.0022	0.0016
std. deviation	0.0012	0.0042	0.0003	0.0004	0.0004	0.0006	0.0007	0.0007

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

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

8 TEMPERATURE MEASUREMENT POINT (TMP) DEFINITION

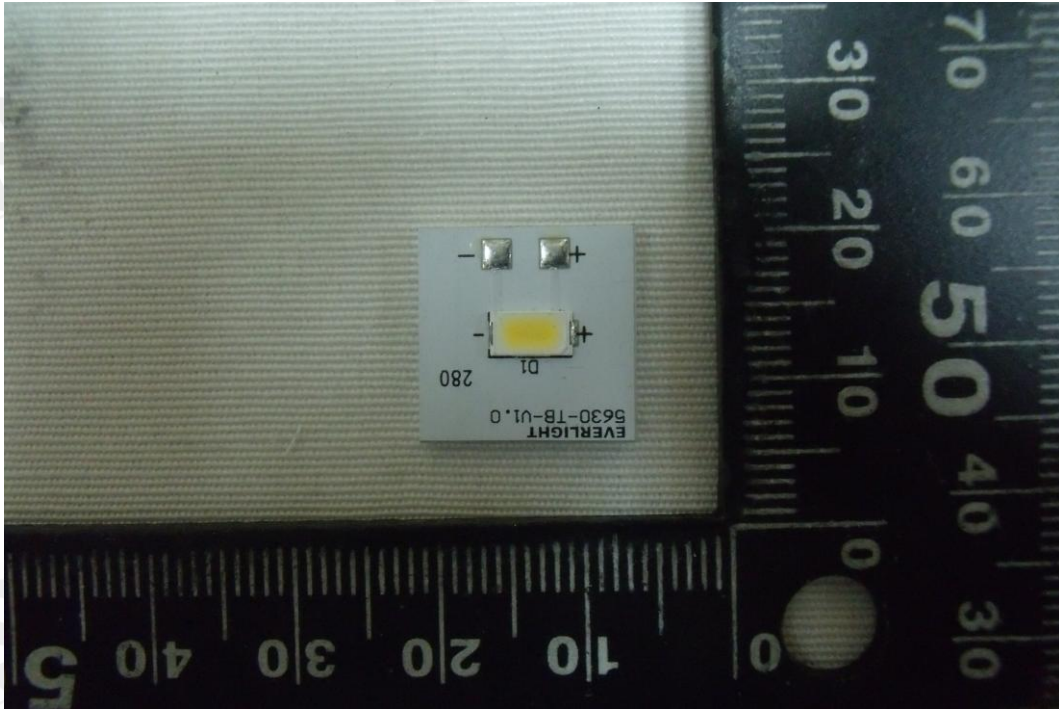


Temperature Measurement Point (TMP)

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

9 PHOTO



Test Sample

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

DATASHEET
SMD • MID POWER LED
62-217D Series

EVERLIGHT

Device Selection Guide

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

Absolute Maximum Ratings ($T_{\text{Soldering}}=25^{\circ}\text{C}$)

Parameter	Symbol	Rating	Unit
Forward Current	I_F	180	mA
Peak Forward Current (Duty 1/10 @10ms)	I_{FP}	300	mA
Power Dissipation	P_d	630	mW
Operating Temperature	T_{opr}	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ +100	$^{\circ}\text{C}$
Thermal Resistance (Junction / Soldering point)	$R_{th J-S}$	21	$^{\circ}\text{C/W}$
Junction Temperature	T_j	115	$^{\circ}\text{C}$
Soldering Temperature	T_{sol}	Reflow Soldering : 260 $^{\circ}\text{C}$ for 10 sec. Hand Soldering : 350 $^{\circ}\text{C}$ for 3 sec.	

Notes:

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

Electro-Optical Characteristics ($T_{\text{Soldering}}=25^{\circ}\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux ₍₁₎	Φ	36	-----	76	lm	$I_F=150\text{mA}$
Forward Voltage ₍₂₎	V_F	2.8	-----	3.5	V	$I_F=150\text{mA}$
Color Rendering Index ₍₃₎	R_a	75	-----	-----	-----	$I_F=150\text{mA}$
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	$I_F=150\text{mA}$
Reverse Current	I_R	-----	-----	50	μA	$V_R=5\text{V}$

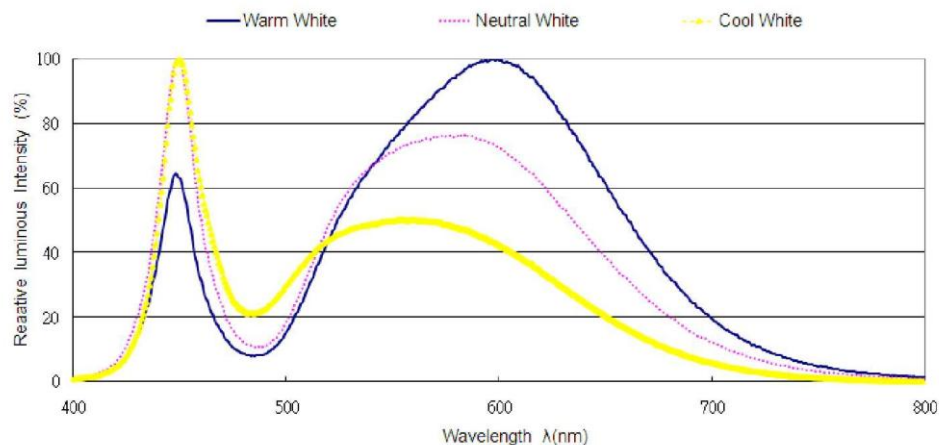
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

DATASHEET
SMD • MID POWER LED
62-217D Series

EVERLIGHT

Spectrum Distribution



Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature

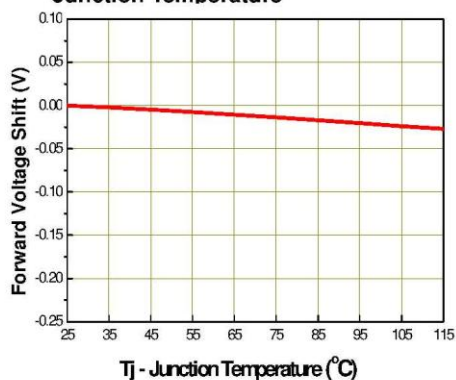
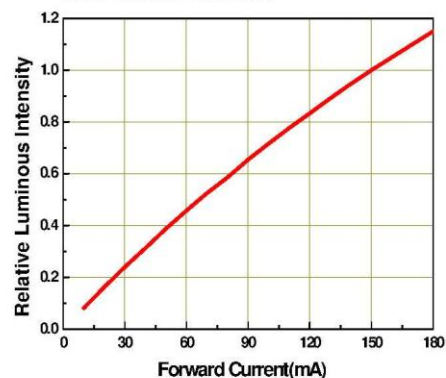


Fig.2 - Relative Luminous Intensity vs. Forward Current



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

DATASHEET
SMD • MID POWER LED
62-217D Series

EVERLIGHT

Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

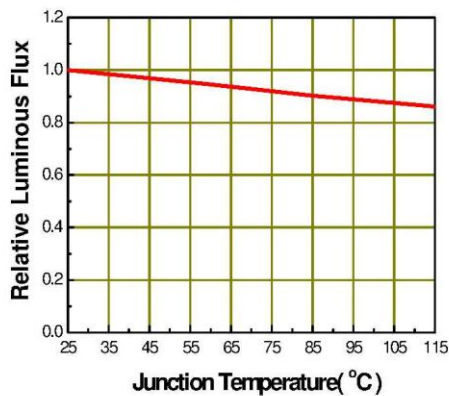


Fig.4 - Forward Current vs. Forward Voltage

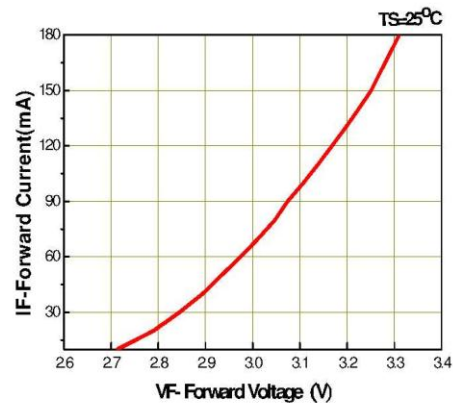


Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

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

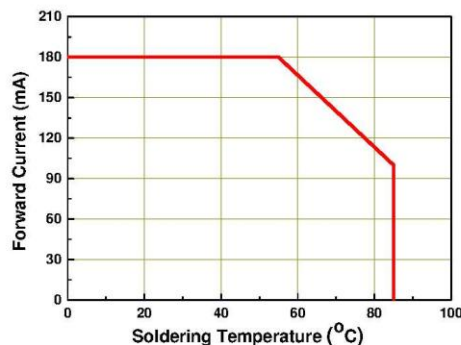
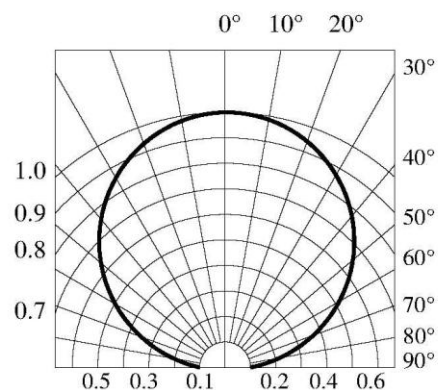


Fig.6 – Radiation Diagram



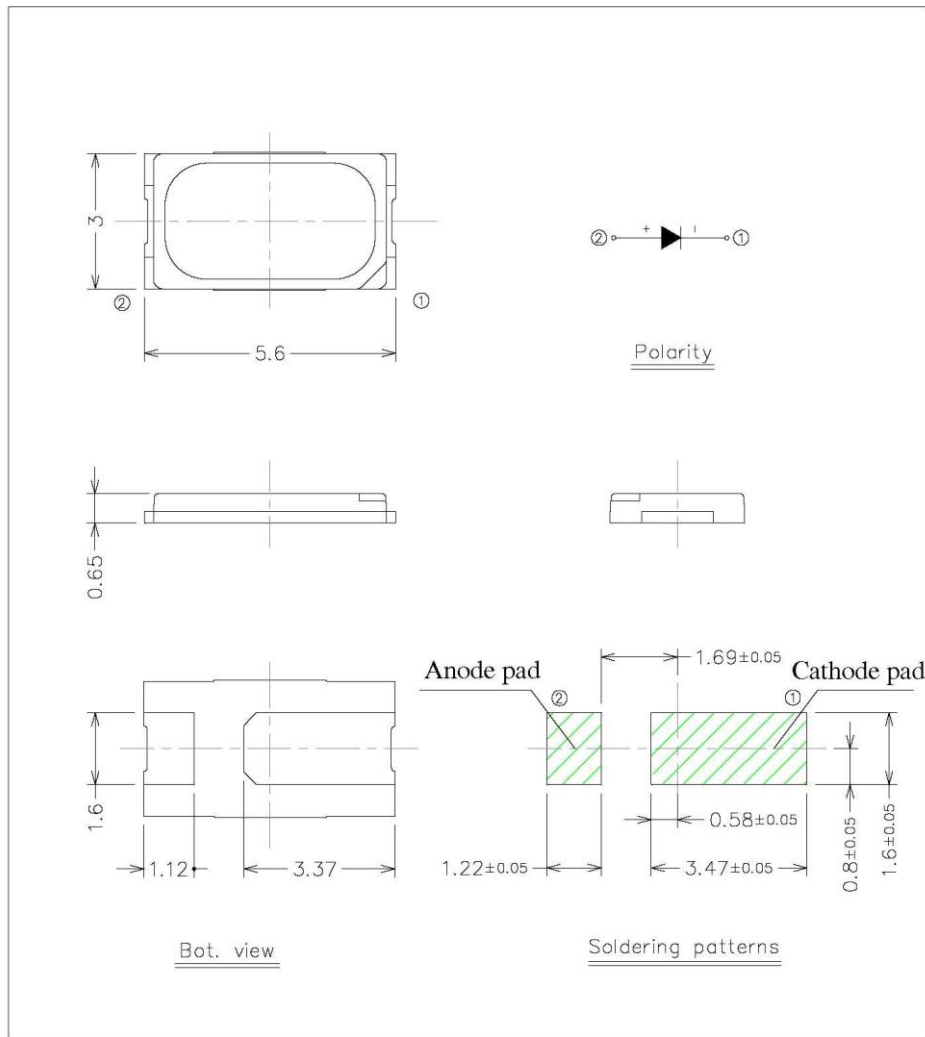
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

DATASHEET
SMD • MID POWER LED
62-217D Series

EVERLIGHT

Package Dimension



Note:
Tolerance unless mentioned is $\pm 0.1\text{mm}$; Unit = mm

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

DATASHEET
SMD • MID POWER LED
62-217D Series

EVERLIGHT

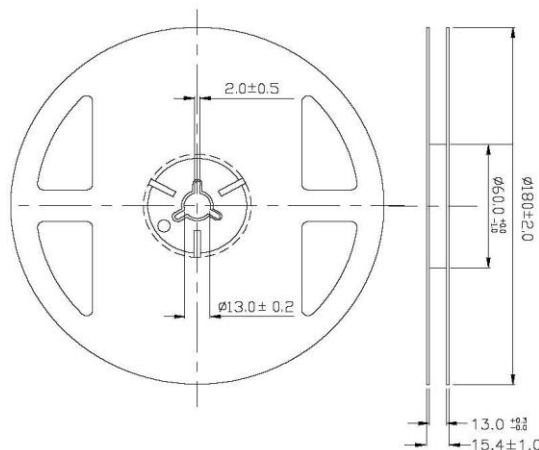
Moisture Resistant Packing Materials

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 ± 0.1 mm. Unit = mm

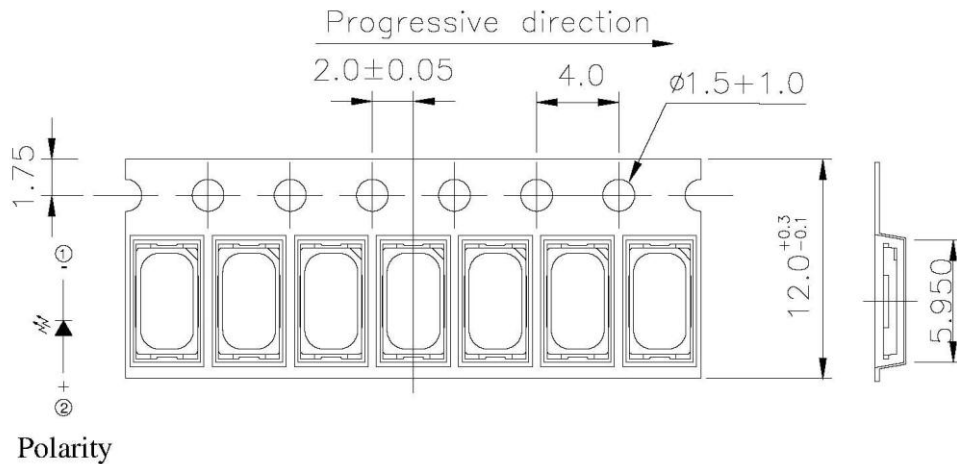
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

DATASHEET
SMD • MID POWER LED
62-217D Series

EVERLIGHT

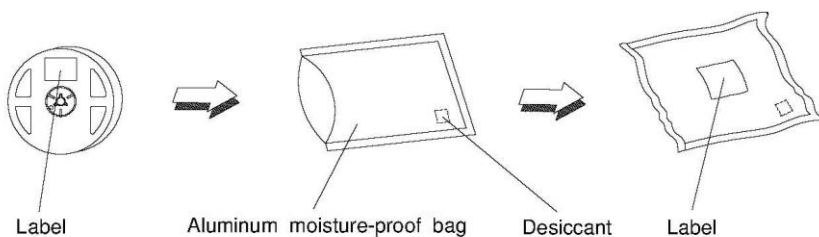
Carrier Tape Dimensions: Loaded Quantity 250/500/1000/2000 pcs. Per Reel



Note:

Tolerance unless mentioned is ±0.1mm; Unit = mm

Moisture Resistant Packing Process



7

Copyright © 2013, Everlight All Rights Reserved

www.everlight.com

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

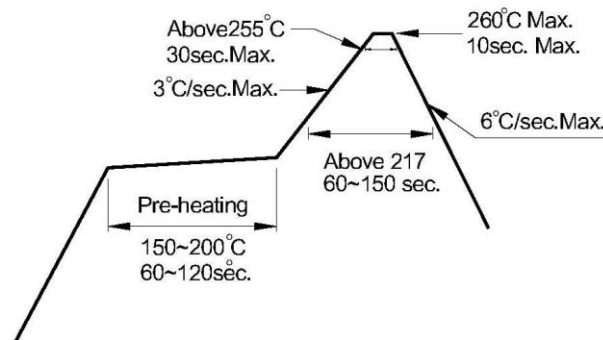
This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

DATASHEET
SMD • MID POWER LED
62-217D Series

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.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

DATASHEET
SMD • MID POWER LED
62-217D Series

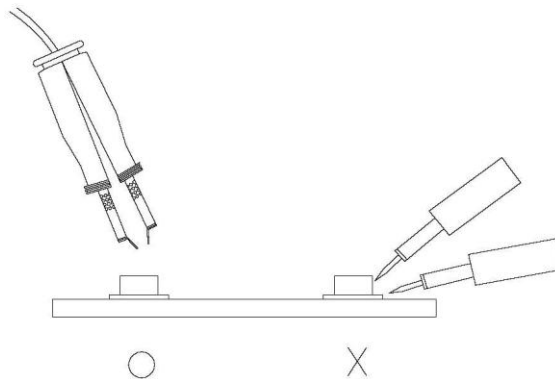
EVERLIGHT

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-

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This test report cannot be reproduced, except in full, without prior written permission of the Company. 除非另有說明，此報告結果僅對測試之樣品負責。本報告未經本公司書面許可，不可部份複製。

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/en/Terms-and-Conditions/Terms-e-Document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.