



Ledman Optoelectronic Co., Ltd.

DATA SHEET

MODEL No : LL2501HGWW1-A02

DOC. No: LMS-25-076

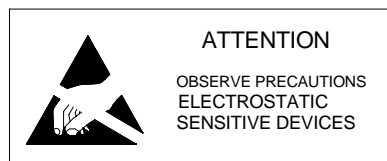
Revision: 01

Description:

- 5mm Oval lamp
- Lens Color: Water Clear
- Emitting Color: White
- Viewing Angle :100°
- Stopper

Dice Material: InGaN

PREPARED BY	CHECKED BY	APPROVED BY	CUSTOMER APPROVED SIGNATURES
Xiaowei Deng	Zhensheng Xie	Jiandong Huang	



Add: Building 8,Block 2,Baimang Baiwangxin Industrial Park,
Xili Area,Nanshan District,Shenzhen, P.R.China

Tel: 86-755-86139688

Fax: 86-755-86139001



Model No.	LL2501HGWW1-A02
ENG: No.	LMS-25-076
Revision	01

Applications:

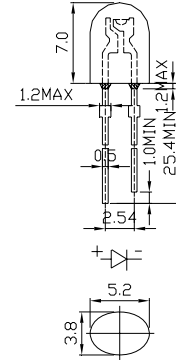
Indicators
Illuminations
Automobile's Applications

Absolute Maximum Ratings at Ta = 25°C

Items	Symbol	Absolute maximum Rating	Unit
Forward Current	I_F	30	mA
Peak Forward Current*	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	108	mW
Operation Temperature	T_{opr}	-20 ~ +75	°C
Storage Temperature	T_{stg}	-30 ~ +80	°C
Lead Soldering Temperature	T_{sol}	Max.260°C for 5 sec Max. (3mm from the base of the epoxy bulb)	

*pulse width $\leq 0.1\text{msec}$ duty $\leq 1/10$

Dimension Drawing



NOTES:

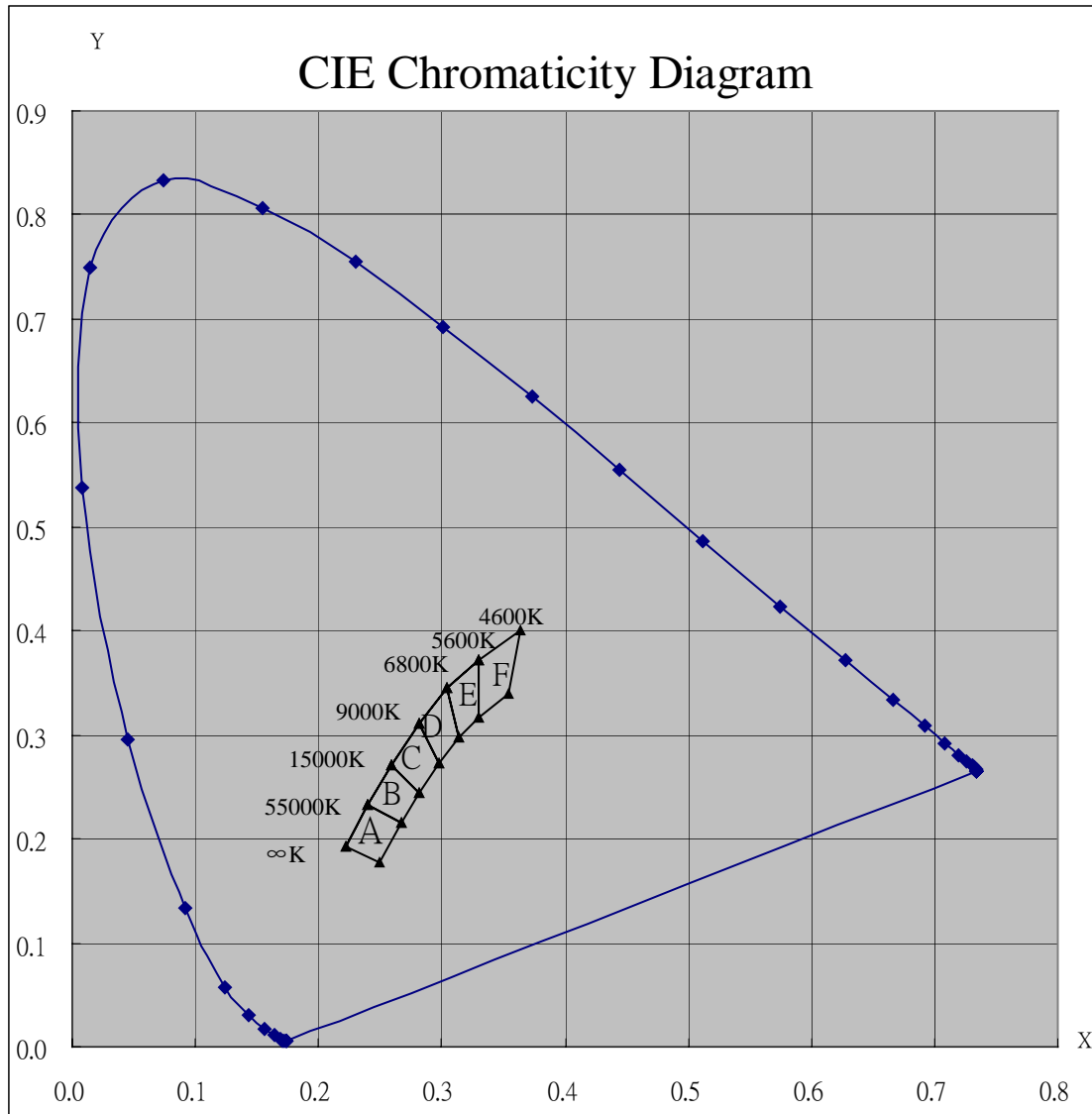
1. ALL DIMENSIONS ARE IN mm TOLERANCE IS $\pm 0.25\text{mm}$ UNLESS OTHERWISE NOTED.
2. AN EPOXY MENISCUS MAY EXTEND ABOUT 1.5mm DOWN THE LEADS.
3. BURR AROUND BOTTOM OF EPOXY MAY BE 0.5 mm MAX.

Typical Electrical & Optical Characteristics (Ta = 25°C)

Items	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F = 20\text{mA}$	---	3.2	3.6	V
Reverse Current	I_R	$V_R = 5\text{V}$	---	---	10	μA
Color Temperature	CCT	$I_F = 20\text{mA}$	---	7800	---	K
Chromaticity Coordinates	X	$I_F = 20\text{mA}$	---	0.299	---	---
	Y	$I_F = 20\text{mA}$	---	0.304	---	---
Luminous Intensity	I_V	$I_F = 20\text{mA}$	---	2750	---	mcd
50% Power Angle	$2\theta_{H-H}$	$I_F = 20\text{mA}$	---	100	---	deg
	$2\theta_{V-V}$	$I_F = 20\text{mA}$	---	50	---	deg

Important Notes:

- 1) All ranks will be included per delivery, rank ratio will be determined by LEDMAN.
- 2) Tolerance of measurement of luminous intensity is $\pm 15\%$.
- 3) Tolerance of measurement of dominant wavelength is $\pm 1\text{nm}$.
- 4) Tolerance of measurement of V_f is $\pm 0.05\text{V}$.
- 5) Packaging methods are available for selection, please refer to PACKAGING STANDARD.
- 6) Please refer to LED LAMP RELIABILITY TEST STANDARD for reliability test conditions.



Color Ranks(IF=20mA,Ta=25℃)

Color Ranks		CIE				CCT
A	X	0.2218	0.24	0.267	0.25	55000K-∞K
	Y	0.1928	0.233	0.215	0.178	
B	X	0.24	0.2591	0.2817	0.267	15000K-55000K
	Y	0.233	0.2709	0.2433	0.215	
C	X	0.2591	0.2813	0.2973	0.2817	9000K-15000K
	Y	0.2709	0.31	0.2721	0.2433	
D	X	0.2813	0.305	0.3135	0.2973	6800K-9000K
	Y	0.31	0.345	0.2969	0.2721	
E	X	0.305	0.33	0.33	0.3135	5600K-6800K
	Y	0.345	0.3716	0.317	0.2969	
F	X	0.33	0.3638	0.354	0.33	4600K-5600K
	Y	0.3716	0.4001	0.34	0.317	

Measurement uncertainty of the color coordinates: ± 0.015



Model No.	LL2501HGWW1-A02
ENG: No.	LMS-25-076
Revision	01

RELIABILITY

(1)TEST ITEMS AND RESULTS

Test Item	REF Standard	Test Conditions	Note	Number of Damaged
Temperature Cycles	JISC 7021 {1977}A-4	-40°C~25°C~100°C~25°C 30min 5min 30min 5min	100cycles	0/100
Life Testing	JISC 7021 (1985)	Ta=25°C,IF=30mA(R,G,Y)/20mA(W,B)	1000hrs.	0/100
High Humidity High Temperature Lifetime Test		Ta=60°C RH=90% If=30mA(R,G,Y)/15mA(W,B)	500hrs.	0/100
Low Temperature Life Test		Ta=-30°C If=20mA	1000hrs.	0/100
Thermal Shock		-40°C ~ 100°C 15min 15min	100cycles	0/100
High Temperature Storage	JISC 7021 {1977}B-10	Ta=100°C	1000hrs.	0/100
Low Temperature Storage	JISC 7021 {1977}B-12	Ta=-40°C	1000hrs.	0/100
Resistance to Soldering Heat	JISC 7021 (1977)A-2	Tsld=260±5°C,5sec. 3mm from the base of the epoxy bulb	1 time	0/100
Solderability	JISC 7021 (1977)A-11	Tsol=235±5°C,5sec using flux	1 time over 95%	0/100

(2) CRITERIA FOR JUDGING DAMAGE

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	VF	IF=20mA	-	U.S.L.*1.1
Reverse Current	IR	VR=5V	-	U.S.L.*2.0
Luminous Intensity	IV	IF=20mA	L.S.L.*0.7	-

U.S.L.: Upper Standard Level L.S.L.: Low Standard Level



Model No.	LL2501HGWW1-A02
ENG: No.	LMS-25-076
Revision	01

Instructions on LED lamp using

- 1.Storage condition : 10°C-26°C , 40%-65% RH. Store the product in sealed package.
2. It is recommended to use a wrist band or an antistatic glove when handling the LEDs. Operation tables must be earthed, and in order to avoid the oxidizing of the Lamp leads make sure you will seal the package soon after it is opened.
3. Please pay attention to antistatic steps during Insertation Procedure:
 - A : The equipments should be properly earthed.
 - B : The wrist bands are OK ,make sure the metal on the wrist band contacts closely with the skin.
 - C : It is recommended that workers wear antistatic gloves when inserting LEDs.
 - D : The operation table needs to be covered by antistatic rubberized fabric which is earthed.
 - E : LEDs should be used within 24 hours after opening the package. Otherwise the lamp leads might be oxidized.
4. Four methods to solder LED lamp: manual soldering, automatic soldering, soldering through tin oven, soldering through wave oven.
 - A : Manual soldering: in general, the temperature of soldering iron can be set at around 315°C . Ideally the soldering time is within 3 seconds ,and it must be no longer than 5 seconds .Soldering should be less than 3 times for a LED. The temperature of the soldering iron which might vary, is generally set according to the ingredients of the tin soldering wire.
 - B : Automatic spot soldering: the temperature is set according to the ingredients of the tin soldering wire. Set the soldering time to be 3 seconds or less.
 - C : Soldering through tin oven: this method is widely used in China now. Before operation you need to check whether the temperature of the tin oven is in line with the set temperature. The maximum temperature should be no more than $235^{\circ}\text{C} \pm 5^{\circ}\text{C}$, and the lead should be immersed for no more than 5 seconds. Check the temperature of liquid tin, choose the right flux,and clean the surface of the liquild tin frequently.
 - D : Soldering through wave oven: it is a more advanced soldering technology. The choice of flux is very important as different types of flux have different requirement as to cleanness of the soldering point. The pre-heating time can also have effect on the soldering quality. Normally, the liquid tin needs to be regularly checked and replaced. The temperature of the oven needs to be adjusted according to the ingredients of tin, but it can not be higher than $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$, and the soldering time should be less than 5 seconds.

All the equipments/operation tables need to be earthed while soldering.

The static electricity of equipments/operation tables should not exceed 30 V, and of the human body no more than 50 V. Recommend to choose constant temperature soldering iron for manual soldering.

In the cold and dry seasons, you need minimize personnel moving in workshops in order to avoid generating static electricity.
- 5.With increase on forward current and temperature, LED's life time will decrease .The electricity leakage will increase significantly as a reslut of temperature increase, and result in a quick degradation of the LED's life time. Please refer to Ledman's specification sheets.
6. A grounding circuit is necessary in the design of PCB.Pay special attention to the environment: -20 °C to 70



Model No.	LL2501HGWW1-A02
ENG: No.	LMS-25-076
Revision	01

°C, 50%RH to 80%RH, otherwise electro-static discharge might break down the LEDs and large current might cause the invalidation of the LEDs.

when $T_a = 25^{\circ}\text{C}$, blue and green LEDs with 12 mil chip:

the maximum value of the constant current should not exceed 30 mA, with 9mil chip should not exceed 15 mA.

Red and yellow LEDs with 12 mil chip:

the maximum value of the constant current should not exceed 50 mA, with 9mil chip should not exceed 30 mA.

7. Pay particular attention to the use of white-light LEDs:

A: Do not mix white-light LEDs of different Bins, specially of the Color Ranks.

B: LEDs with different forward voltages can not be used in parallel.

C: Recommend to drive with constant current .

8. When the LEDs are shaping up, the distance between the bending points of the LED leads and the bottom of the lens should be at least 3 mm. Do not bend the LED leads while soldering or after soldering. If you must bend it, please do it before soldering.

Please read carefully about the working environment and parameters of LEDs before use.

Typical Optical-Electronic Characteristic Curves

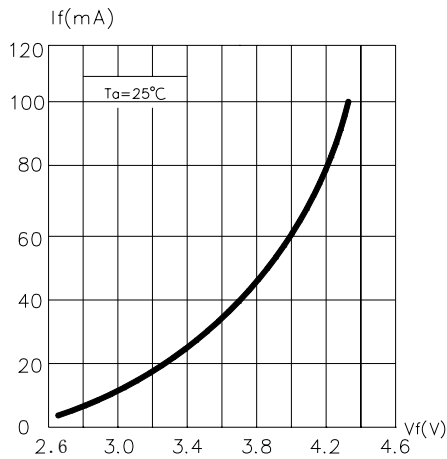


Fig.1 Forward Current vs. Forward Voltage

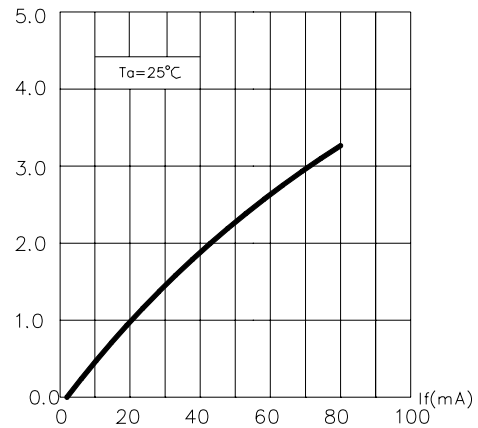


Fig.2 Relative Luminous Intensity vs. Forward Current

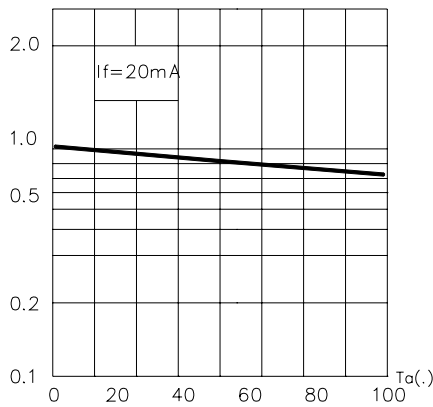


Fig.3 Relative Luminous Intensity vs. Ambient Temperature

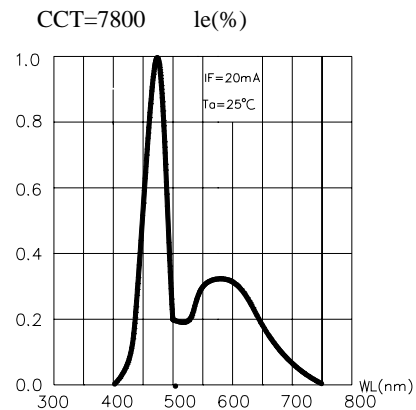


Fig.4 Intensity vs. Wavelength.

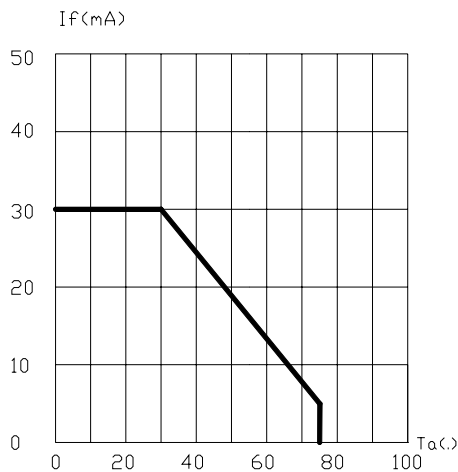


Fig.5 Maximum Forward Current vs. Ambient Temperature

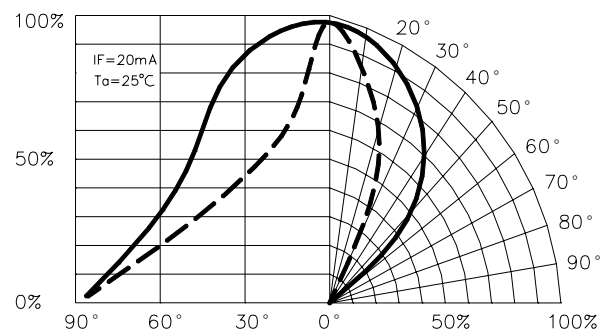


Fig.6 Relative Luminous Intensity vs. Radiation Angle

Items	Signatures	Date	<div style="border: 1px solid black; border-radius: 50%; padding: 10px; text-align: center; width: 100px; margin: 0 auto;">R&D ISSUE</div>
Prepared by	Xiaowei Deng	2008-12-8	
Checked by	Zhensheng Xie	2008-12-8	
Approved by	Jiandong Huang	2008-12-8	