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L120TUB500-3.8V

Ultra Blue

3mm, Flanged Dome, 4.5mm Height
45° Viewing Angle

DWG BY:
BL / GP
09-25-06

R&D:
UF
06-18-21

MFG:
LD
06-18-21

QA:
SB
06-18-21

REVISION LTR: B
ECR#: 061821-GP01
06-18-21

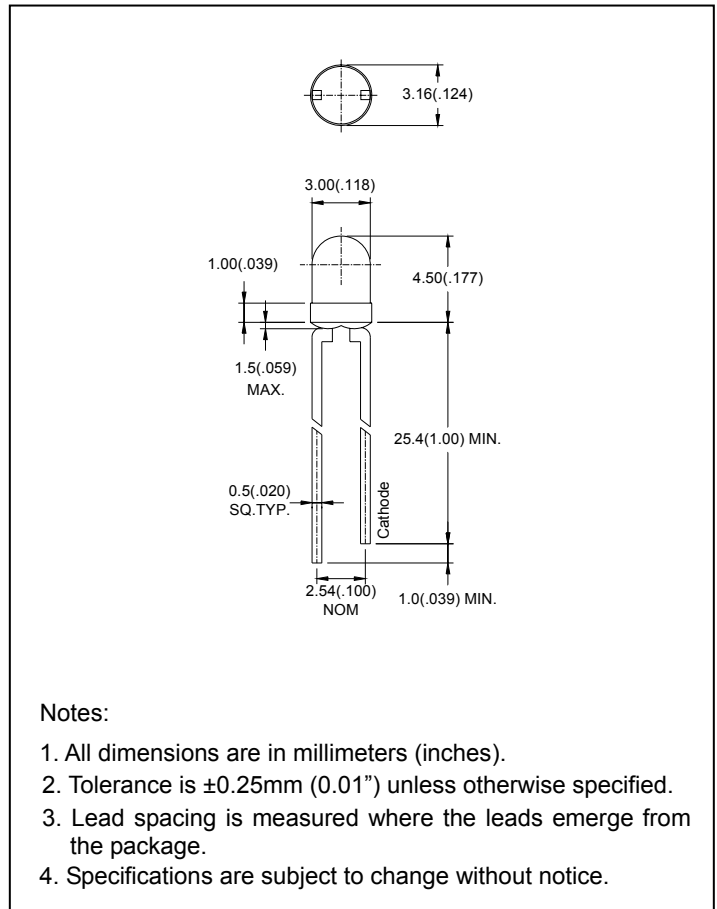
● **Features:**

1. Chip material: GaN /SiC.
2. Emitted color: Ultra Blue
3. Lens Appearance: White Diffused
4. Low power consumption.
5. High efficiency.
6. Versatile mounting on P.C. Board or panel.
7. Low current requirement.
8. 3.0mm diameter package.
9. This product is RoHS compliant.

● **Applications:**

1. TV set
2. Monitor
3. Telephone
4. Computer
5. Circuit board

● **Package dimensions**



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (0.01") unless otherwise specified.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.

● **Absolute Maximum Ratings(Ta=25°C)**

Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	120	mW
Forward Current	I _F	30	mA
Peak Forward Current* ¹	I _{FP}	150	mA
Reverse Voltage	V _R	5	V
Operating Temperature	Topr	-40°C~+80°C	
Storage Temperature	Tstg	-40°C~+85°C	

*¹Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width.

● **Electrical and Optical Characteristics(Ta=25°C)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F=20mA$	-	4.4	4.5	V
Luminous Intensity	I_v	$I_F=20mA$	-	48	-	mcd
Reverse Current	I_R	$V_R=5V$	-	-	100	μA
Peak Wave Length	λ_p	$I_F=20mA$	-	426	-	nm
Dominant Wave Length	λ_d	$I_F=20mA$	-	464	-	nm
Spectral Line Half-width	$\Delta\lambda$	$I_F=20mA$	-	63	-	nm
Viewing Angle	$2\theta_{1/2}$	$I_F=20mA$	-	45	-	deg
Radiant Intensity		$I_F=20mA$	-	852	-	$\mu W/sr$
Chromaticity Coordinates	X	$I_F=20mA$	-	0.16	-	
	Y		-	0.07	-	

● **Typical electro-optical characteristics curves**

Fig.1 Relative intensity vs. Wavelength

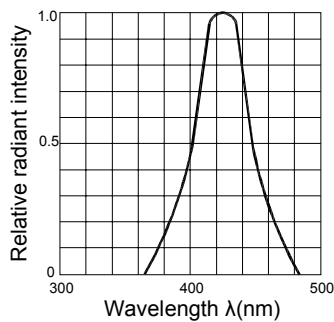


Fig.2 Forward current derating curve vs. Ambient temperature

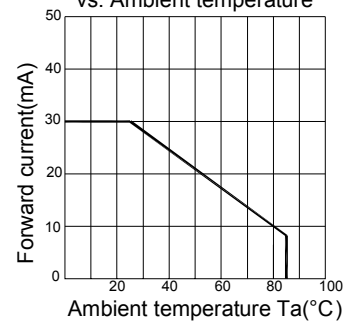


Fig.3 Forward current vs. Forward voltage

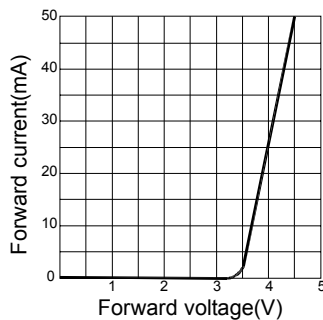


Fig.4 Relative luminous intensity vs. Ambient temperature

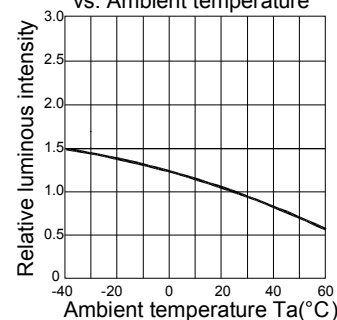


Fig.5 Relative luminous intensity vs. Forward current

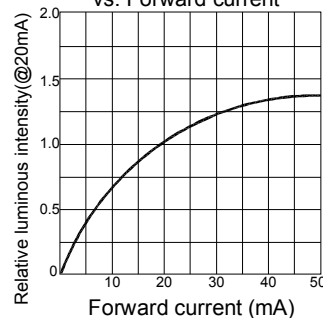
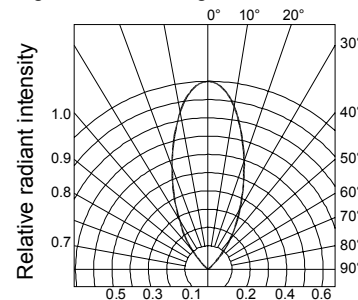


Fig.6 Radiation diagram



● **Bin Limits**

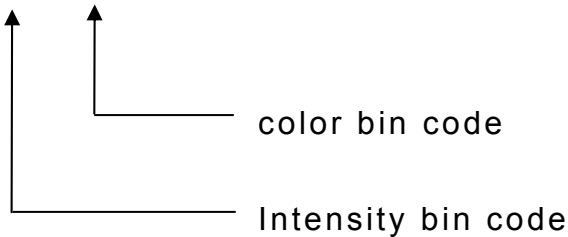
1. Intensity bin limits (At $I_F=20\text{mA}$)

Bin Code	Min. (mcd)	Max. (mcd)
H	5.5	8.2
J	8.2	12.3
K	12.3	18.5
L	18.5	28
M	28	42

2. Color Bin Limits (At $I_F=20\text{mA}$) : Dominant Wave Length $\lambda_d(\text{nm})$

Bin Code	Min. (nm)	Max. (nm)
3	460	465
4	465	470
5	470	475

● Bin : x x



NOTES: 1. Tolerance of measurement of luminous intensity. : $\pm 15\%$

2. Tolerance of measurement of dominant wavelength : $\pm 1.0\text{nm}$

● Reliability Test

Classification	Test Item	Reference Standard	Test Conditions	Result
Endurance Test	Operation Life	MIL-STD-750:1026 MIL-STD-883:1005 JIS-C-7021 :B-1	I _F =20mA Ta=+25°C±5°C Test time=1,000hrs	0/32
	High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	Ta=+85°C±5°C RH=90%-95% Test time=240hrs	0/32
	High Temperature Storage	MIL-STD-883:1008 JIS-C-7021 :B-10	High Ta=+85°C±5°C Test time=1,000hrs	0/32
	Low Temperature Storage	JIS-C-7021 :B-12	Low Ta=-45°C±5°C Test time=1,000hrs	0/32
Environmental Test	Temperature Cycling	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS-C-7021 :A-4	Ta : +85°C(30min) ~ +25°C(5min) ~ -45°C(30min) ~ +25°C(5min) Test Time : 70min/cycle 10cycle	0/32
	Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	-45°C±5°C ~+85°C±5°C 20min 20min Test Time=10cycle	0/32
	Solder Resistance	MIL-STD-202:201A MIL-STD-750:2031 JIS-C-7021 :A-1	Preheating : 120°C,within 120-180 sec. Operation heating : 255°C±5°C within 5 sec.260°C (Max)	0/32
	Solderability	MIL-STD-202F:208D MIL-STD-750D:2026 MIL-STD-883D:2003 JIS C 7021:A-2	T.sol=230±5°C Dwell Time=5±1secs	0/32

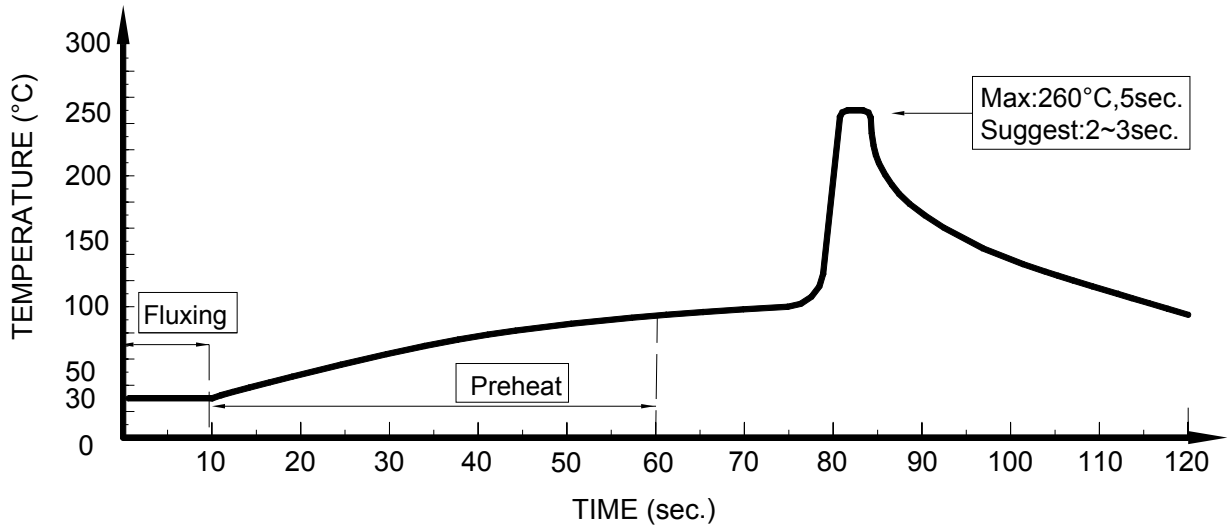
● Judgment criteria of failure for the reliability

Measuring items	Symbol	Measuring conditions	Judgment criteria for failure
Forward voltage	V _F (V)	I _F =20mA	Over U ¹ x1.2
Reverse current	I _R (uA)	V _R =5V	Over U ¹ x2
Luminous intensity	I _v (mcd)	I _F =20mA	Below S ¹ X0.5

Note: 1. U means the upper limit of specified characteristics. S means initial value.

2. Measurement shall be taken between 2 hours and after the test pieces have been returned to normal ambient conditions after completion of each test.

● **Dip Soldering**



1. Please avoid any external stress applied to the lead-frames and epoxy while the LEDs are at high temperature, especially during soldering
2. DIP soldering and hand soldering should not be done more than one time.
3. After soldering, avoid the epoxy lens from mechanical shock or vibration until the LEDs are back to room temperature.
4. Avoid rapid cooling during temperature ramp-down process
5. Although the soldering condition is recommended above, soldering at the lowest possible temperature is feasible for the LEDs

● **IRON Soldering**

A : Max : 350°C Within 3 sec. One time only.

B : For 3mm LED without flange, if the LED epoxy lays flat on the PCB, the welding condition is 350°C within 2 seconds, one time only.

