

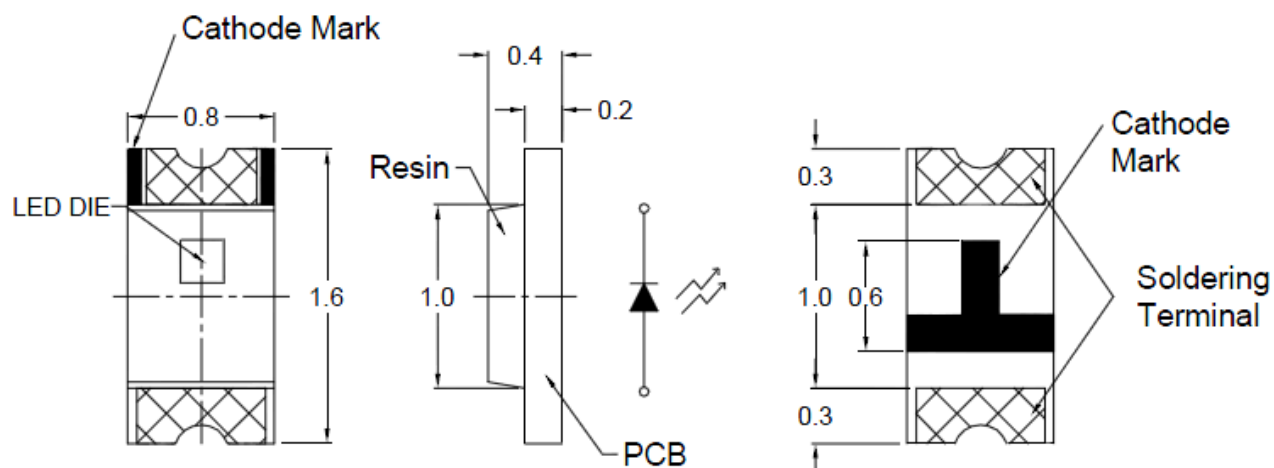


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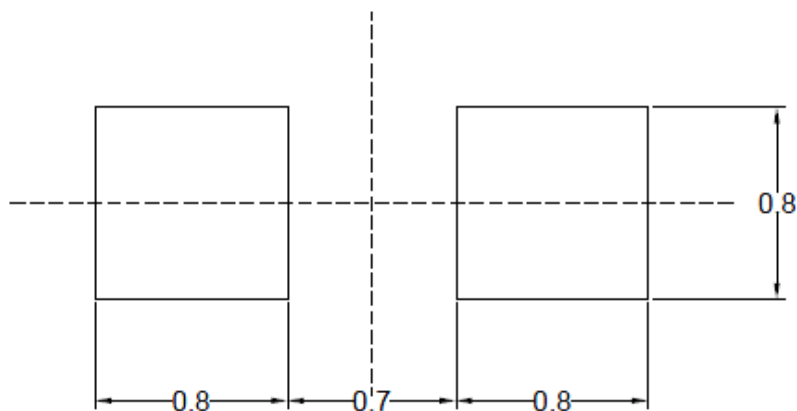
L196L-MPGC-TR

1.6 x 0.8 x 0.4 mm Green SMD LED

PACKAGE OUTLINES



RECOMMENDED PAD LAYOUT



NOTES:

1. All dimensions are in millimeters;
2. Tolerances are $\pm 0.2\text{mm}$ unless otherwise noted.

Part Number	Material	Color	
		Emitted	Lens
L196L-MPGC-TR	InGaN/GaN	Green	Water Clear



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ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

Parameter	Symbol	Value	Unit
Forward current	If	20	mA
Reverse current @5V	Ir	50	μA
Power dissipation	Pd	80	mW
Peak forward current (1/10 @ 10kHz)	Ifp	100	mA
Electrostatic Discharge	ESD	150	V
Operating temperature range	Topr	-40~+85	°C
Storage temperature range	Tstg	-40~+90	°C
Soldering Temperature	Tsol	Max 260°C for 5 sec Max	

OPTICAL-ELECTRICAL CHARACTERISTICS

(Ta=25°C)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Spectral half bandwidth	$\Delta\lambda$	$I_F = 20\text{mA}$	--	36	--	nm
Peak Wavelength	λ_P	$I_F = 20\text{mA}$	--	518	--	nm
Dominant wavelength	λ_D	$I_F = 20\text{mA}$	--	525	--	nm
Forward Voltage	Vf	$I_F = 20\text{mA}$	--	3.5	4.0	V
Luminous intensity	Iv	$I_F = 20\text{mA}$	200	500	800	mcd
Viewing angle at 50% Iv	$2\theta_{1/2}$	$I_F = 20\text{mA}$	--	140	--	Deg

*Note: 1. The forward voltage data did not include $\pm 0.1\text{V}$ testing tolerance.
2. The luminous intensity data did not include $\pm 15\%$ testing balance.



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OPTICAL CHARACTERISTIC CURVES

Fig.1 Forward current vs. Forward Voltage

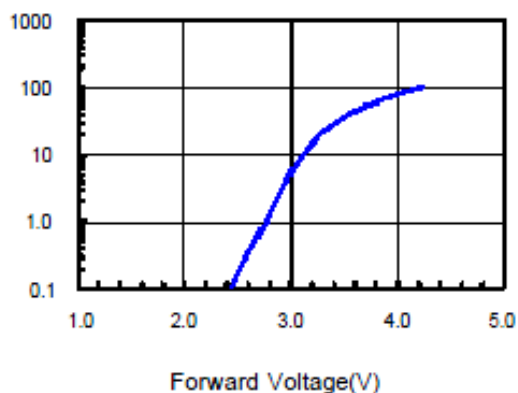


Fig.2 Relative Intensity vs. Forward Current

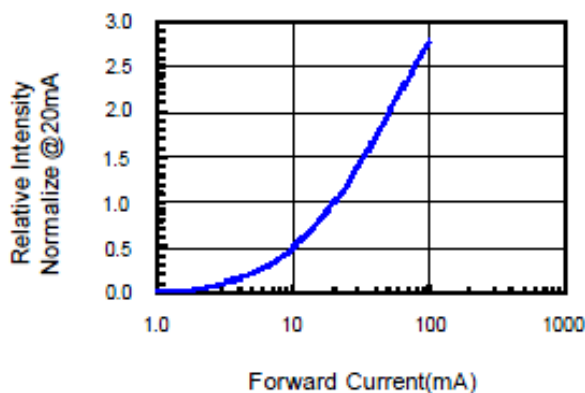


Fig.3 Forward Voltage vs. Temperature

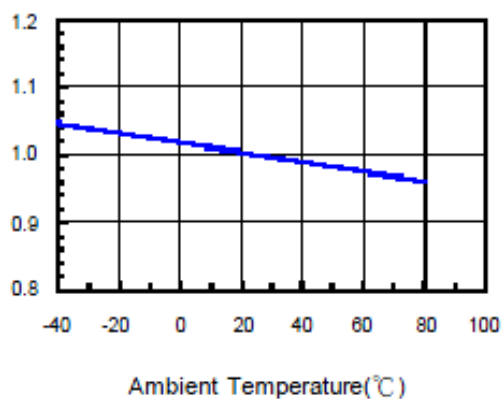


Fig.4 Relative Intensity vs. Temperature

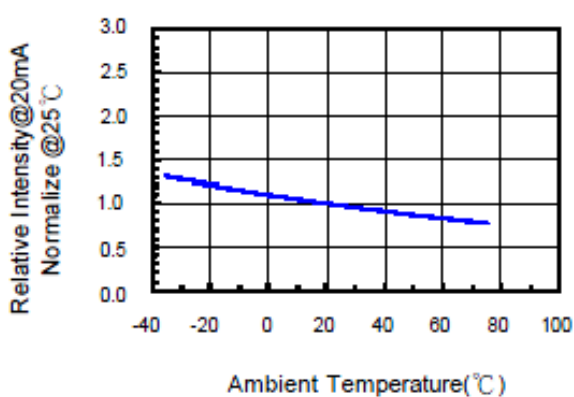


Fig.5 Relative Intensity vs. Wavelength

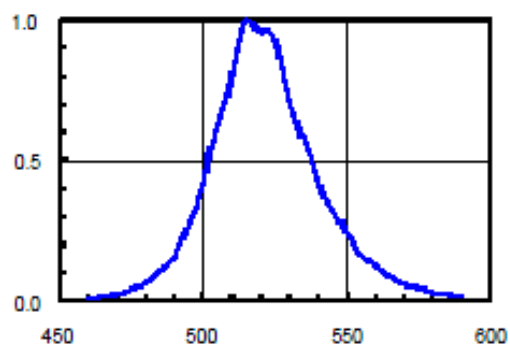
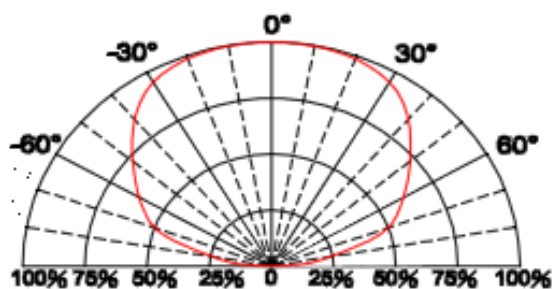


Fig.6 Directive Radiation



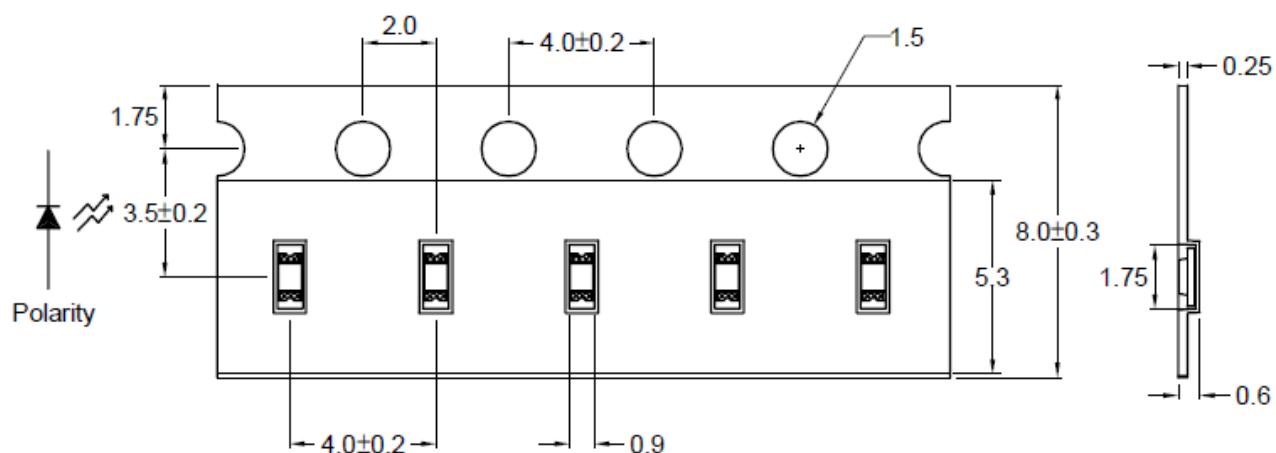


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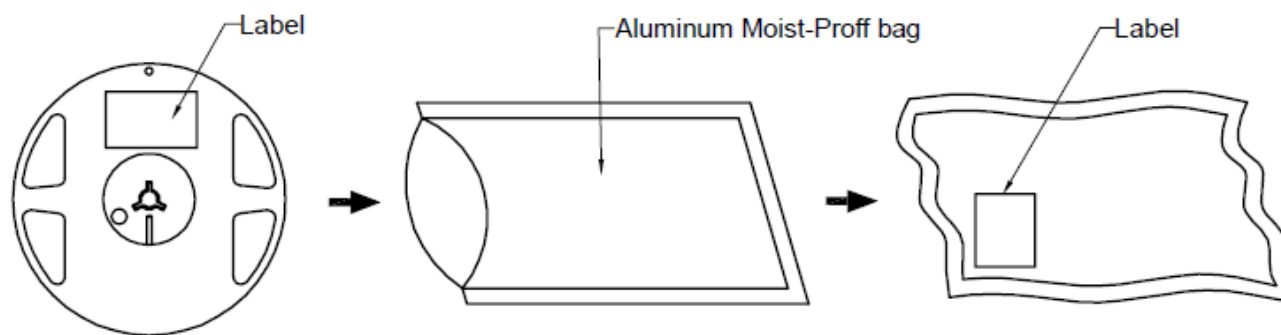
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CARRIER TYPE DIMENSIONS



Note: The tolerances unless mentioned is ± 0.1 mm, Angle ± 0.5 . Unit=mm.

PACKAGING SPECIFICATION



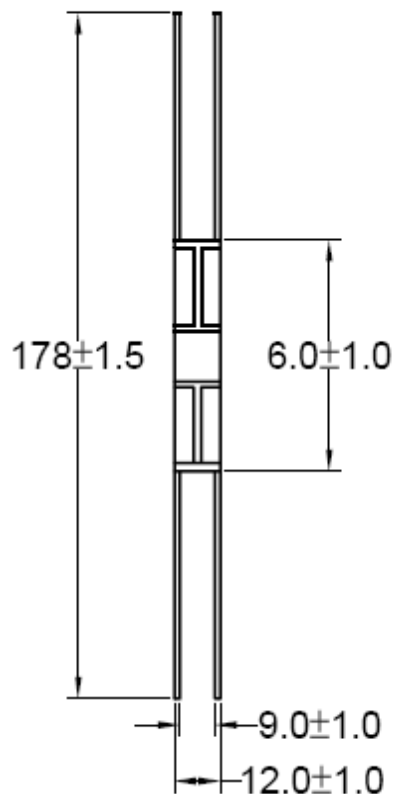
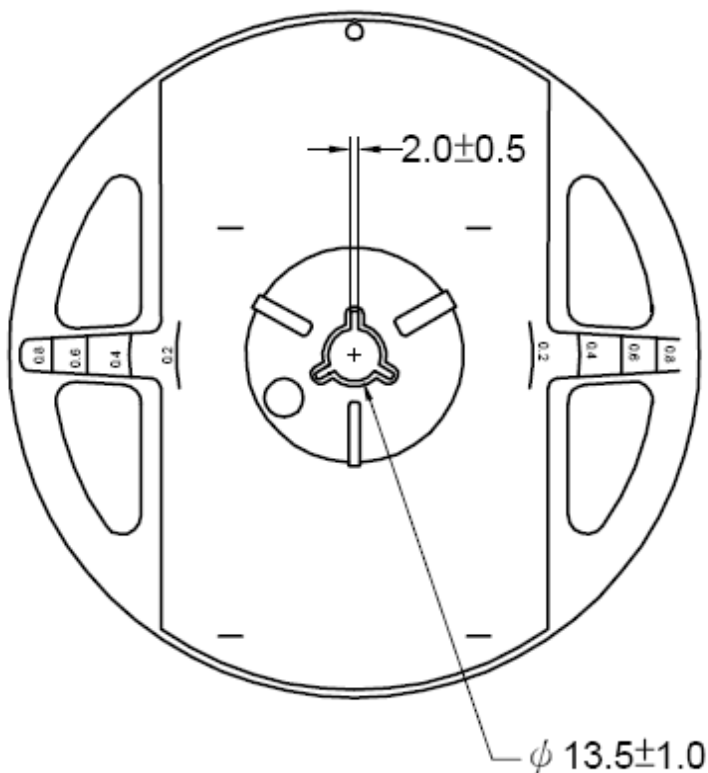


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REEL DIMENSIONS



Notes:

1. Empty component pockets are sealed with top cover tape;
2. The maximum number of missing lamps is two;
3. The cathode is oriented towards the tape sprocket hole.
4. 4,000pcs/Reel



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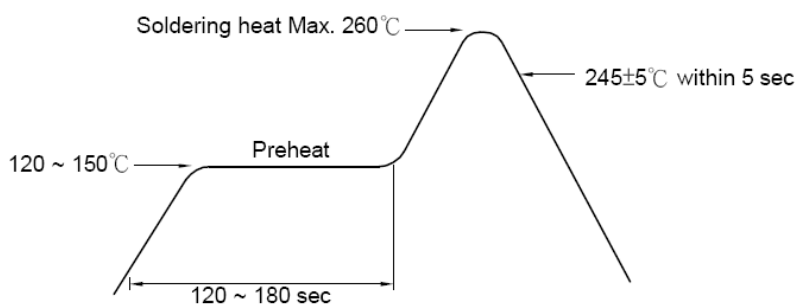
1.6 x 0.8 x 0.4 mm Green SMD LED

RECOMMENDED SOLDERING CONDITIONS

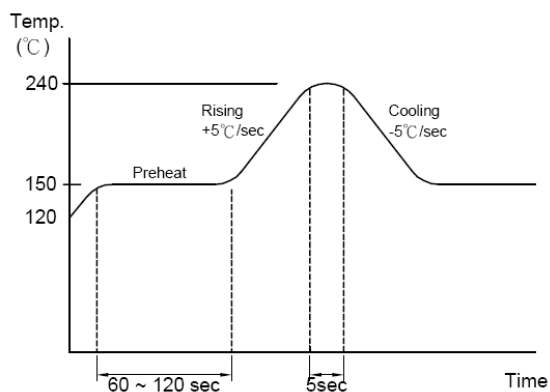
1. Hand Solder

Basic spec is $\leq 280^{\circ}\text{C}$ 3 sec one time only.

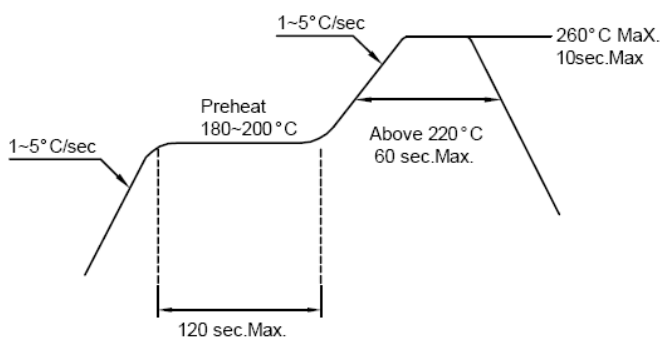
2. Wave Solder



3-1. LEAD Reflow Solder



3-2. PB-Free Reflow Solder



Notes:

1. Reflow soldering should not be done more than two times.
2. When soldering, do not put stress on the LEDs during heating.
3. After soldering, do not warp the circuit board.



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Precautions for use:

Storage time:

1. The operation of temperature and RH are: 5°C~35°C, RH60%.
2. Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp proof box with desiccating agent. Considering the tape life, we suggest our customers to use our products within a year (from production date).
3. If opened more than one week in an atmosphere 5°C ~ 35°C, RH60%, they should be treated at 60°C ± 5°C for 15hrs.

Drive Method:

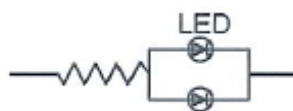
LED is a current operated device, and therefore, require some kind of current limiting incorporated into the driver circuit. This current limiting typically takes the form of a current limiting resistor placed in a series with the LED.

Consider worst case voltage variations that could occur across the current limiting resistor. The forward current should not be allowed to change by more than 40% of its desired value.

Circuit Model A



Circuit Model B



(A) Recommended circuit.

(B) The difference of brightness between LED could be found due to the VF-IF characteristics of LED.

Cleaning:

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED.

ESD (Electrostatic Discharge):

Static electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling these LED. All devices, equipment and machinery must be properly grounded.



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Classification	Test Item	Test Conditions	Number of Damaged
Endurance Test	Operating Life Test	1. Ta=under room temperature as per data sheet 2. If=20mA 3. t=1000 hrs (-24hrs, +72hrs)	MIL-STD-750D:1026 MIL-STD-883D: 1005 JIS C 7021: B-1
	High Temperature Storage Test	1. Ta=105°C±5°C 2. t=1000 hrs (-24hrs, +72hrs)	MIL-STD-883D:1008 JIS C 7021: B-10
	Low Temperature Storage Test	1. Ta=40°C±5°C 2. t=1000 hrs (-24hrs, +72hrs)	JIS C 7021: B-12
	High Temperature High Humidity Storage Test	1. Ta=65°C±5°C 2. RH=90%~95% 3. t=1000hrs	MIL-STD-202F:103B JIS C 7021: B-11
Environmental Test	Thermal Shock Test	1. Ta= 105°C±5°C & -40°C±5°C (10min) (10min) 2. Total 10 cycles	MIL-STD-202F: 107D MIL-STD-750D: 1051 MIL-STD-883D: 1011
	Solderability Test	1. Tsol=235°C±5°C 2. Immersion time 2±0.5sec 3. Coverage ≥95% of the dipped surface	MIL-STD-202F: 208D MIL-STD-750D: 2026 MIL-STD-883D: 2003 IEC 68 Part 2-20 JIS C 7021: A-4
	Temperature Cycling	1. 105°C ~ 25°C ~ -55°C ~ 25°C 30 mins 5 mins 30 mins 5 mins 2. 10 cycles	MIL-STD-202F: 107D MIL-STD-750D: 1051 MIL-STD-883D: 1010 JIS C 7021: A-4
	IR Reflow	1. T=260°C Max. 10sec.Max. 2. 6 Min	MIL-STD-750D:2031.2 J-STD-020