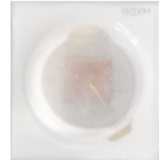


L-Spice

L-Spice packs a powerful performance with its directional light output and efficient distribution. This specialized lens optimizes brightness and minimizes glare, enhancing both visual comfort and energy efficiency. It empowers designers with newfound flexibility, enabling the creation of sleek and visually appealing lighting solutions. Whether spotlighting, accentuating specific areas, or delivering precise illumination, L-Spice illuminates the way to a brighter and more focused future.



Features:

- > Super high brightness surface mount LED automotive exterior applications.
- > 60° viewing angle.
- > Compact package outline (LxW) of 2.8 x 3.0mm.
- > Low height profile - 1.96mm max.
- > Low thermal resistance.
- > Superior corrosion robustness.
- > Compatible to IR reflow soldering.
- > Compliance to automotive standard; AEC-Q102.
- > Environmental friendly; RoHS compliance.



Applications:

- > Automotive: Exterior application: eg: Rear Combination Light (RCL), Center High Mounted Stop Light (CHMSL).

Optical Characteristics at Tj=25°C

Part Number	Color	Viewing Angle°	Luminous Flux <i>Appx. 1.2</i> 60mA (lm)			Luminous Intensity <i>Appx. 1.1</i> 60mA (mcd)
			Min.	Typ.	Max.	Typ.
C6A-MHG-KL3-4	Amber, 625 nm	60	8.20	11.00	13.90	7800
C6A-MHG-LM3-2	Amber, 617 nm	60	10.70	14.00	18.10	10000

Electrical Characteristics at Tj=25°C

Part Number	Vf @ If = 60mA <i>Appx. 3.1</i>			Vr @ Ir = 10uA <i>Appx. 7.1</i>
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
C6A-MHG	2.10	2.35	2.70	12

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	80	mA
Peak pulse current; (Ts = 55°C, tp ≤ 100µs, Duty cycle = 0.03)	300	mA
Reverse voltage <i>Appx. 7.1</i>	12	V
ESD threshold (HBM)	2	KV
LED junction temperature	125	°C
Operating temperature	-40 ... +115	°C
Storage temperature	-40 ... +125	°C
Thermal resistance (Rated current = 60mA, Ts = 25 °C)		
- Real Thermal Resistance Junction / solder point, R _{th JS real} Amber (typ = 35)	46	K/W
- Electrical Thermal Resistance Junction / solder point, R _{th JS el} Amber (typ = 22)	30	K/W

Wavelength Grouping at Tj= 25°C

Color	Group	Wavelength distribution (nm) <i>Appx. 2.2</i>
C6x; Amber	Full	612 - 627
	W	612 - 616
	X	616 - 620
	Y	620 - 624
	Z	624 - 627

Luminous Flux Group at Tj=25°C

Brightness Group	Luminous Flux <i>Appx. 1.2</i> (lm)
K2	8.20 ... 9.35
K3	9.35 ... 10.70
L2	10.70 ... 12.20
L3	12.20 ... 13.90
M2	13.90 ... 15.80
M3	15.80 ... 18.10

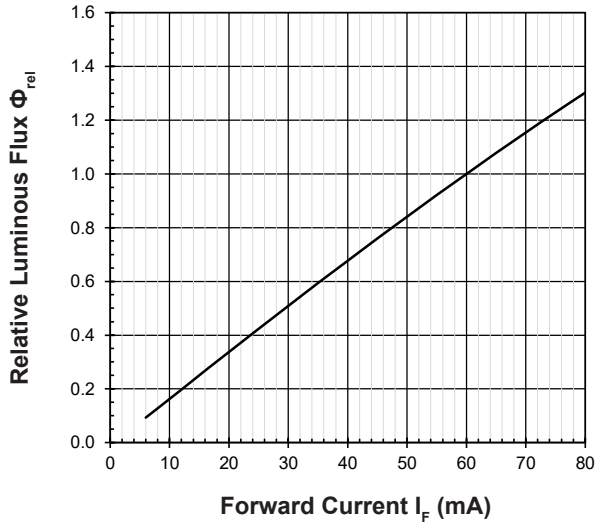
Vf Bining (Optional)

Vf Bin @ 60 mA	Forward Voltage (V) <i>Appx. 4.1</i>
V05	2.10 ... 2.25
V06	2.25 ... 2.40
V07	2.40 ... 2.55
V08	2.55 ... 2.70

Please consult sales and marketing for special part number to incorporate Vf binning.

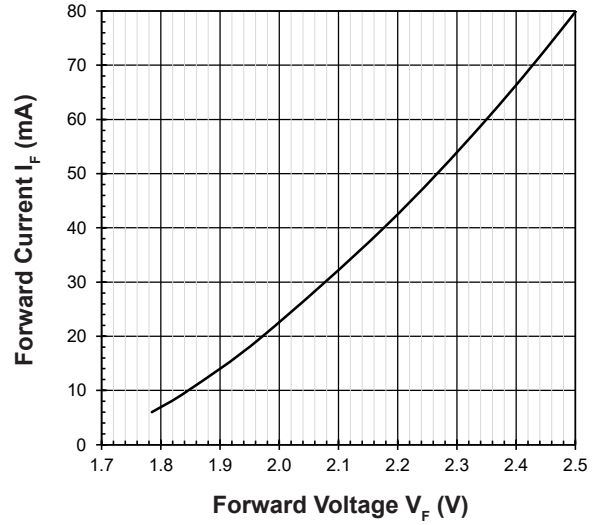
Relative Luminous Flux Vs Forward Current

$\Phi_v/\Phi_v(60\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$



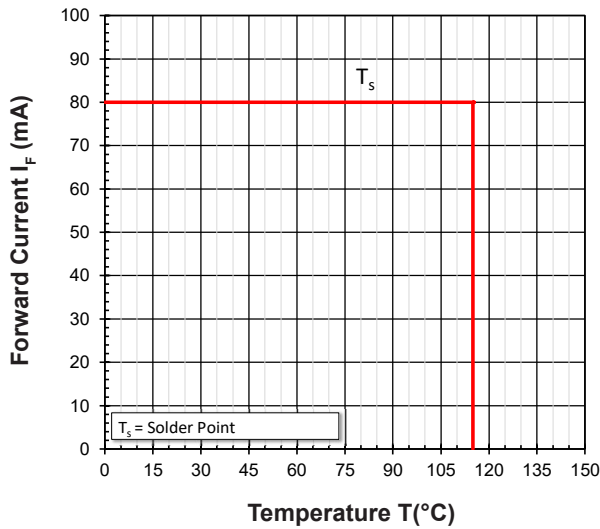
Forward Current Vs Forward Voltage

$I_F = f(V_F); T_j = 25^\circ\text{C}$



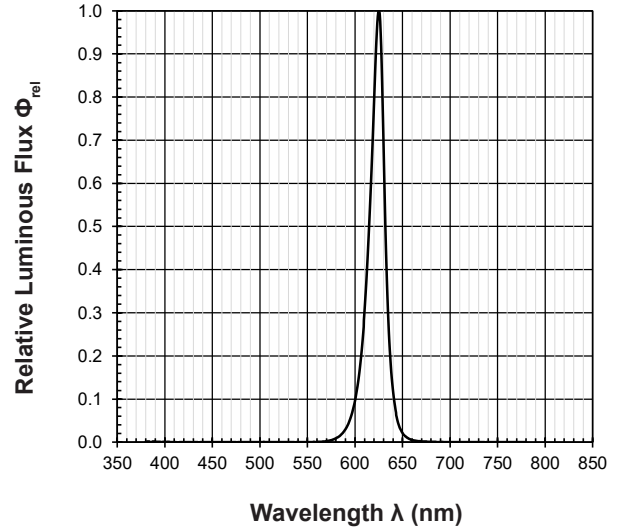
Maximum Current Vs Temperature

$I_F = f(T)$



Relative Spectral Emission

$\Phi_{rel} = f(\lambda); T_j = 25^\circ\text{C}; I_F = 60\text{mA}$

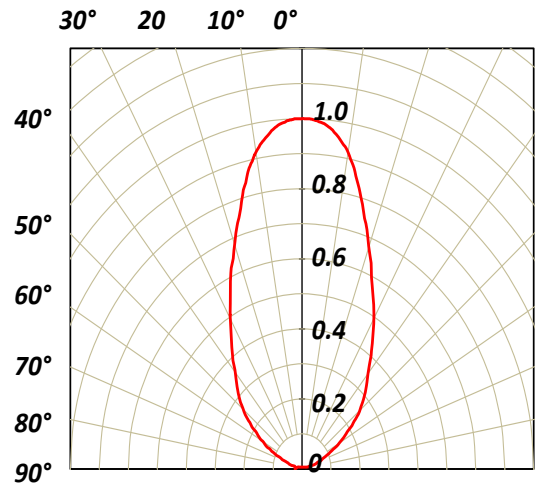


Allowable Forward Current Vs Duty Ratio

$(T_s = 55^\circ\text{C}; t_p \leq 100\mu\text{s})$

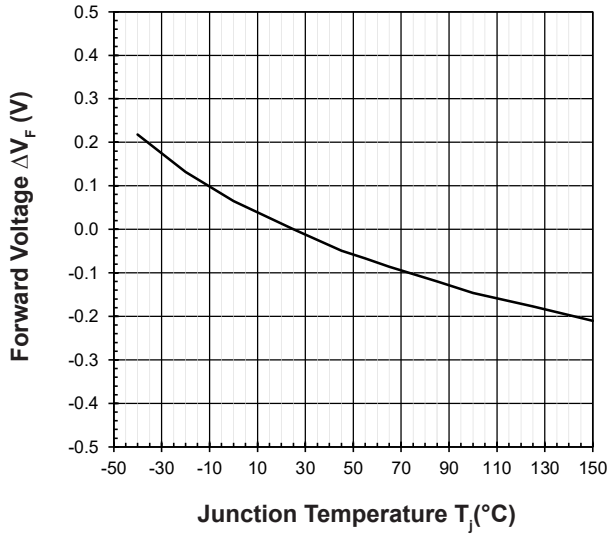


Radiation Pattern



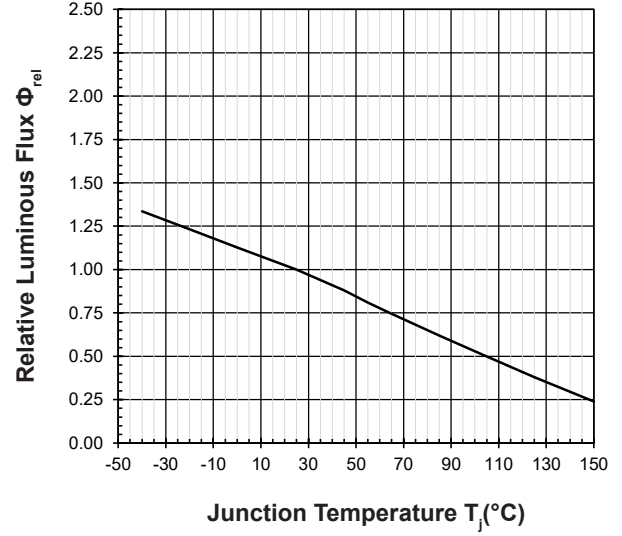
Forward Voltage Vs Junction Temperature

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 60\text{mA}$$



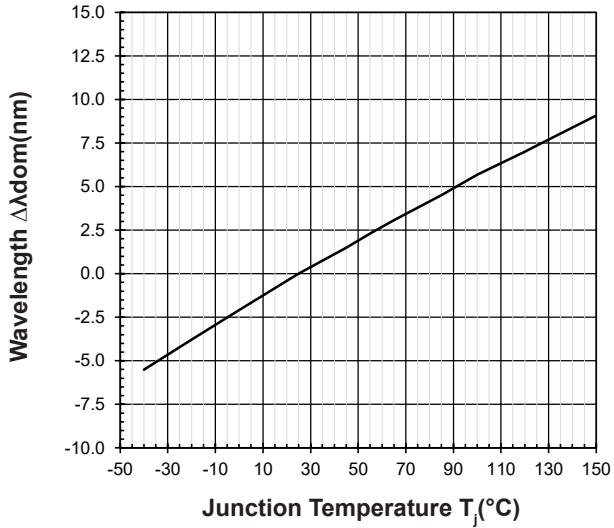
Relative Luminous Flux Vs Junction Temperature

$$\Phi_V/\Phi_V(25^\circ\text{C}) = f(T_j); I_F = 60\text{mA}$$

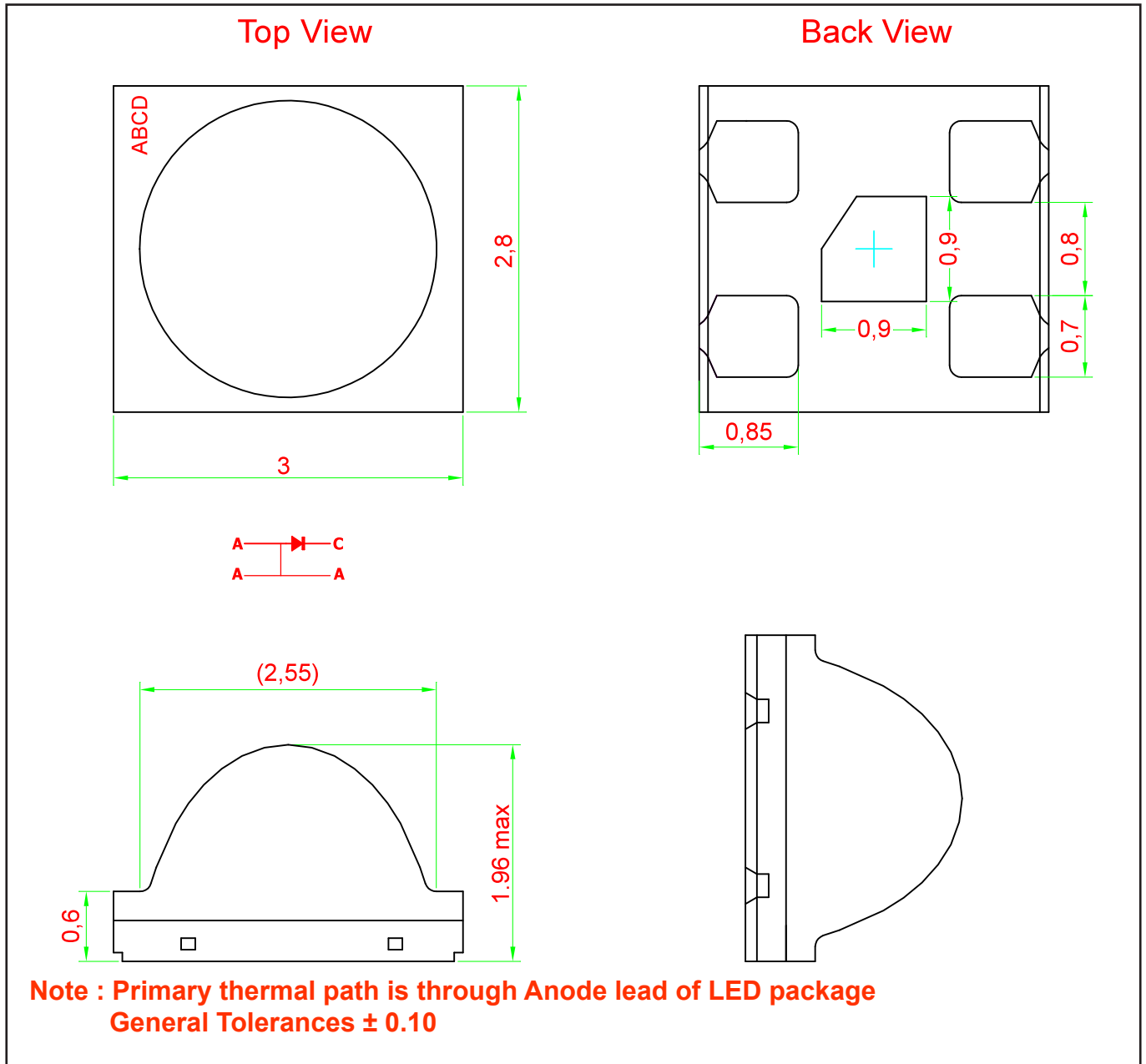


Wavelength Vs Junction Temperature

$$\Delta \lambda_{\text{dom}} = \lambda_{\text{dom}} - \lambda_{\text{dom}}(25^\circ\text{C}) = f(T_j); I_F = 60\text{mA}$$



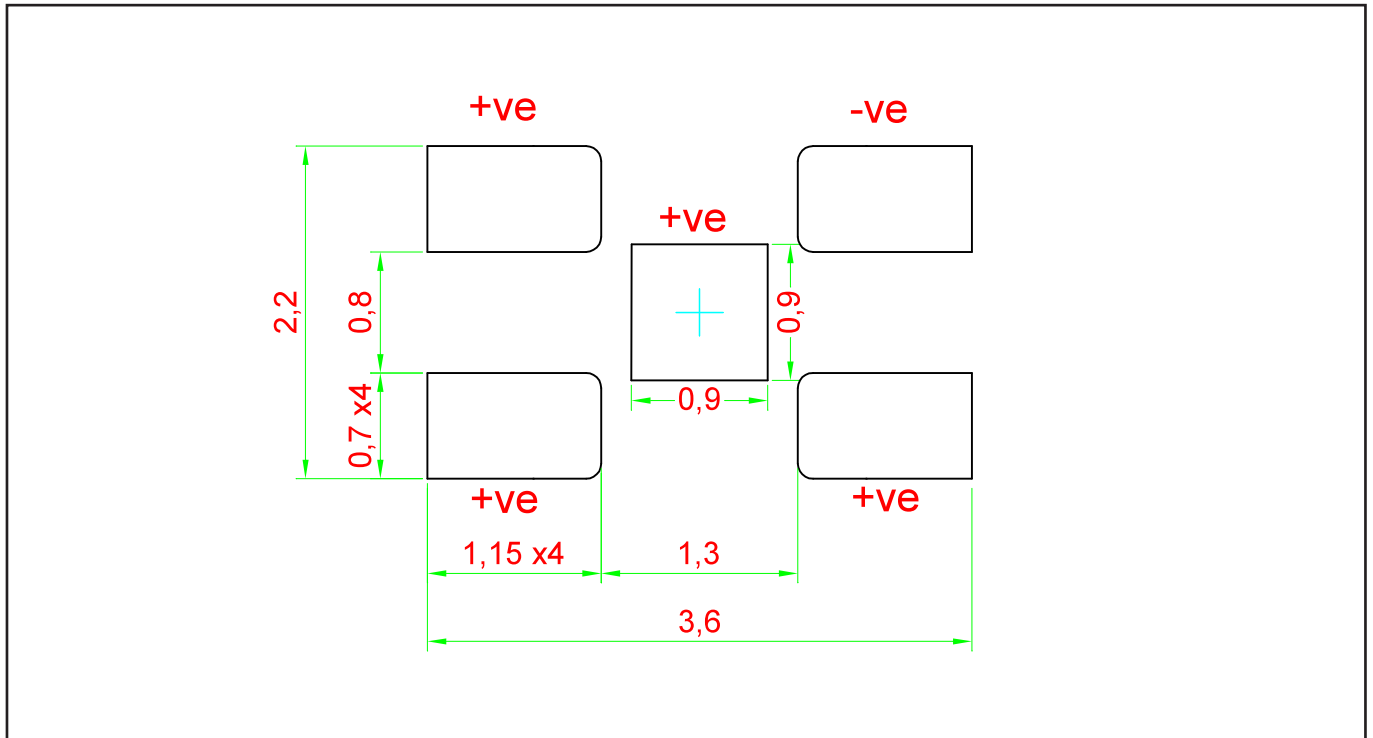
L-Spice AllnGaP : C6A-MHG Package Outlines



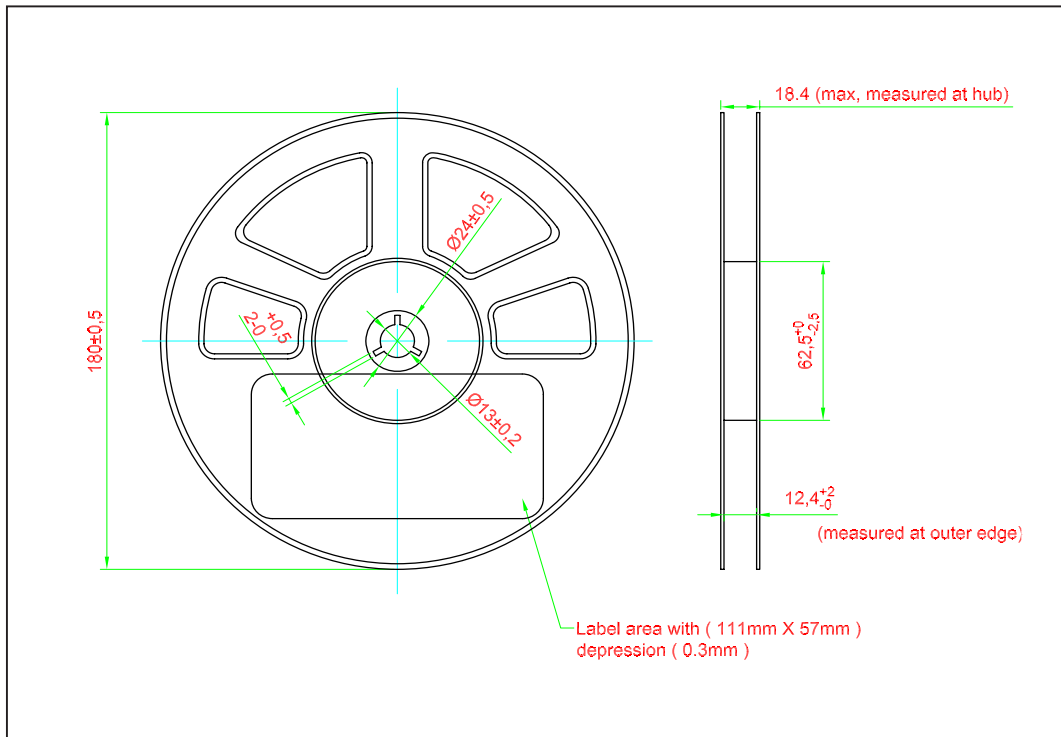
Material

Material	
Lead-frame	Cu Alloy With Au Plating
Package	Heat Resistant Polymer
Encapsulant	Silicone Resin
Soldering Leads	Sn Plating

Recommended Solder Pad



Packaging Specification

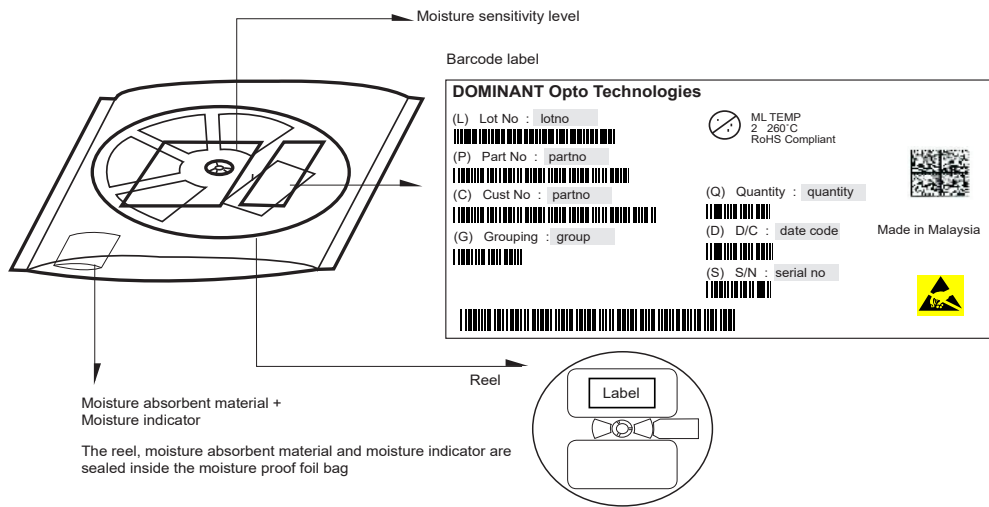


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	1000	C6A-MHG-xxx-1

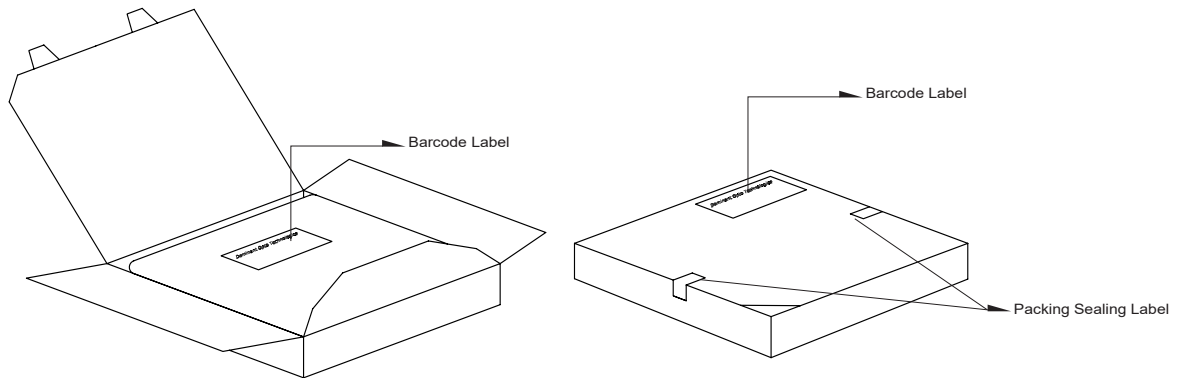
Notes:

* For ordering purpose only. Please consult sales and marketing for details.

Packaging Specification



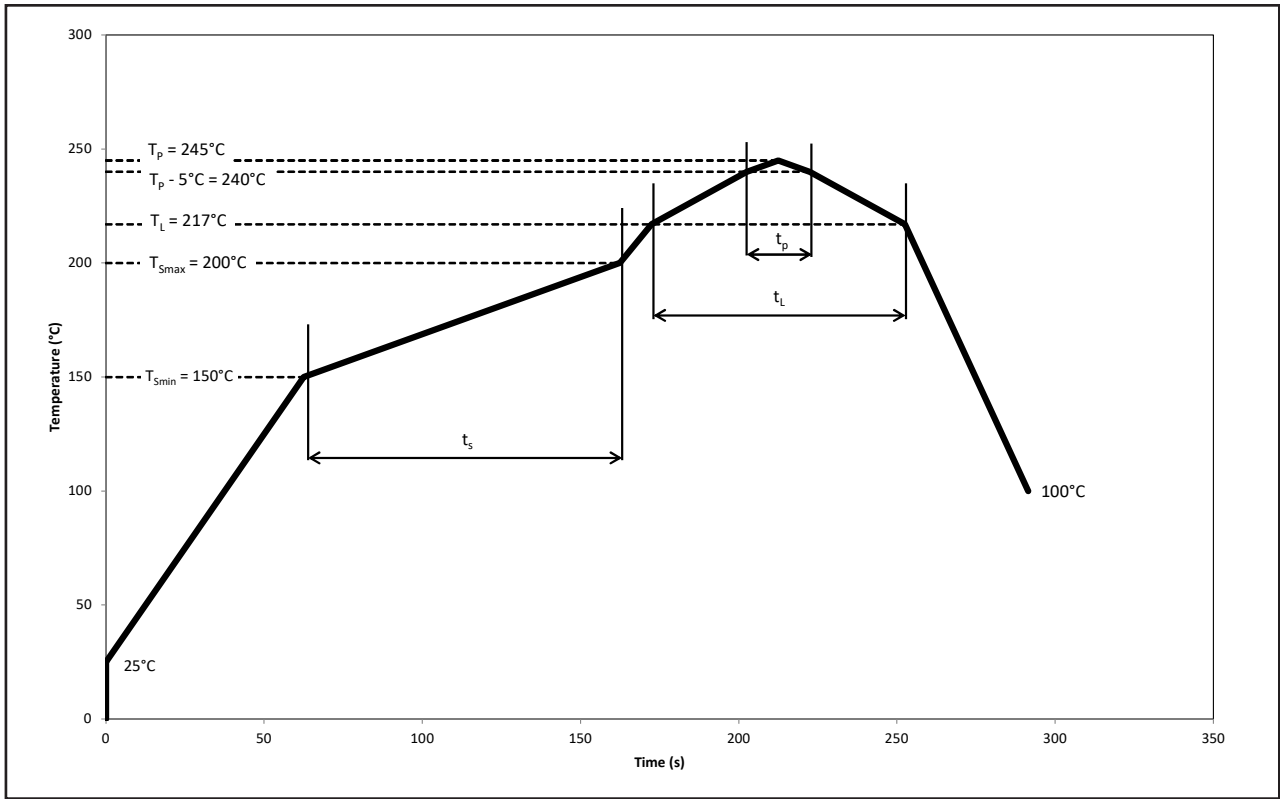
Quantity per bag (pcs)	Average 1pc L-Spice (g)	1 completed bag (g)
1000	0.0170	80 ± 10



Reel Diameter (mm)	Packing Box Dimensions (mm)
180	210 x 210 x 20

Recommended Pb-free Soldering Profile

Product complies to MSL Level 2 acc. to JEDEC J-STD-020E



Profile Feature	Symbol	Pb-Free Assembly			Unit
		Min.	Recommended	Max.	
Ramp-up rate to preheat 25°C to T_{smin}	-	-	2	3	°C/s
Time t_s T_{smin} to T_{smax}	t_s	60	100	120	s
Ramp-up rate to peak T_L to T_p	-	-	2	3	°C/s
Liquidous temperature	T_L	-	217	-	°C
Time above liquidous temperature	t_L	60	80	150	s
Peak temperature	T_p	-	245	260	°C
Time within 5°C of the specified peak temperature $T_p - 5^\circ\text{C}$	t_p	10	20	30	s
Ramp-down rate T_p to 100°C	-	-	3	6	°C/s
Time 25°C to T_p	-	-	-	480	s

Appendix

1) **Brightness:**

- 1.1 Luminous intensity is measured at current pulse 25 ms(typ) with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (according to GUM with a coverage factor of $k=3$).
- 1.2 Luminous flux is measured at current pulse 25 ms(typ) with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (according to GUM with a coverage factor of $k=3$).
- 1.3 Radiant intensity is measured at current pulse 25 ms(typ) with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (according to GUM with a coverage factor of $k=3$).
- 1.4 Radiant flux is measured at current pulse 25 ms(typ) with an internal reproducibility of $\pm 8\%$ and an expanded uncertainty of $\pm 11\%$ (according to GUM with a coverage factor of $k=3$).

2) **Color:**

- 2.1 Chromaticity coordinate groups are measured at current pulse 25 ms(typ) with an internal reproducibility of ± 0.005 and an expanded uncertainty of ± 0.01 (accordingly to GUM with a coverage factor of $k=3$).
- 2.2 Dominant wavelength is measured at current pulse 25 ms(typ) with an internal reproducibility of $\pm 0.5\text{nm}$ and an expanded uncertainty of $\pm 1\text{nm}$ (accordingly to GUM with a coverage factor of $k=3$).

3) **Voltage:**

- 3.1 Forward Voltage, V_f is measured when a current pulse of 8 ms(typ) with an internal reproducibility of $\pm 0.05\text{V}$ and an expanded uncertainty of $\pm 0.1\text{V}$ (accordingly to GUM with a coverage factor of $k=3$).

4) **Typical Values:**

- 4.1 At special conditions of LED manufacturing processes, typical data or calculated correlations of technical parameters only reflect the statistical figures. But not necessarily correspond to the actual parameters of each single product, which could differ from the typical data or calculated correlations or the typical characteristic line. These typical data may change whenever technical improvements happen.

5) **Tolerance of Measure**

- 5.1 Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimension are specified in mm.

6) **Corrosion Robustness:**

- 6.1 Test conditions: $40\text{ }^\circ\text{C} / 90\% \text{ rh} / 15 \text{ ppm H}_2\text{S} / 336 \text{ h}$.
= Stricter than IEC 60068-2-43 (H_2S) [$25\text{ }^\circ\text{C} / 75\% \text{ rh} / 10 \text{ ppm H}_2\text{S} / 21 \text{ days}$].

7) **Reverse Voltage:**

- 7.1 Not designed for reverse operation. Continuous reverse voltage can cause migration and LED damage.

About Us

DOMINANT Opto Technologies is a dynamic company that is amongst the world's leading automotive LED manufacturers. With an extensive industry experience and relentless pursuit of innovation, DOMINANT's state-of-art manufacturing and development capabilities have become a trusted and reliable brand across the globe. More information about DOMINANT Opto Technologies, an IATF 16949 and ISO 14001 certified company, can be found under <http://www.dominant-semi.com>.

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