DOMINANT™
Opto Technologies
Innovating Illumination

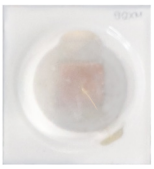
DATASHEET:

L-Spice

AlInGaP : C6Y-MHG

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.
> The matt surface of the lens diffuses light and improve homogeneity.

Applications:

> Automotive: Exterior application: eg: Turn Signal

Optical Characteristics at Tj=25˚C

Part Number	Color	Viewing Angle˚	Luminous Flux Appx. 1.2 60mA (lm)			Luminous Intensity Appx. 1.1 60mA (mcd)
			Min.	Typ.	Max.	Typ.
C6Y-MHG-LM3-4	Yellow, 592 nm	60	10.70	14.00	18.10	10000
C6Y-MHG-K3M2-3	Yellow, 589 nm	60	9.35	12.50	15.80	8900
C6Y-MHG-KL3-2	Yellow, 586 nm	60	8.20	11.00	13.90	7800

Electrical Characteristics at Tj=25˚C

Part Number	Vf @ If = 60mA Appx. 3.1			V_r @ I_r = 10uA Appx. 6.1
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
C6Y-MHG	2.10	2.40	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 Appx. 6.1	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, $R_{th\ JS\ real}$		
Yellow (typ = 35)	46	K/W
- Electrical Thermal Resistance Junction / solder point, $R_{th\ JS\ el}$		
Yellow (typ = 30)	39	K/W

Wavelength Grouping at Tj= 25˚C

Color	Group	Wavelength distribution (nm) *Appx. 2.2*
C6x; Yellow	Full	583 - 595
	W	583 - 586
	X	586 - 589
	Y	589 - 592
	Z	592 - 595

Luminous Flux Group at Tj=25˚C

Brightness Group	Luminous Flux *Appx. 1.2* (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

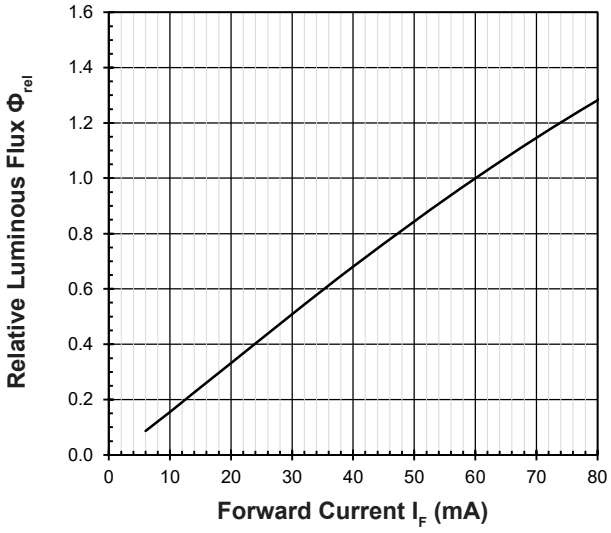
Vf Bining (Optional)

Vf Bin @ 60 mA	Forward Voltage (V) *Appx. 3.1*
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 bining.

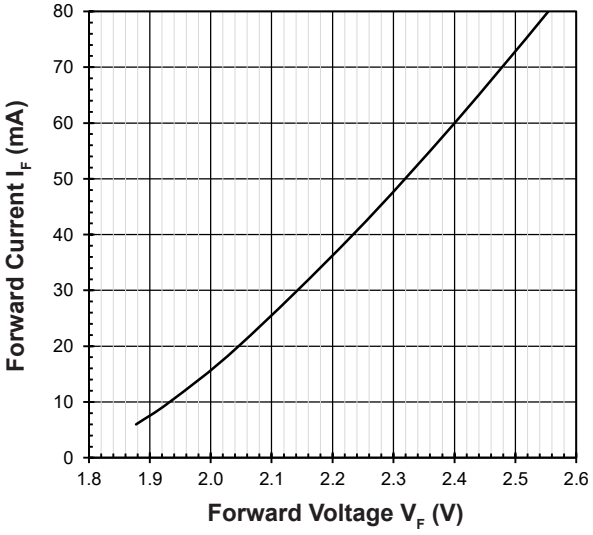
Relative Luminous Flux Vs Forward Current *Appx. 4.1*

$\Phi_V/\Phi_V(60mA) = f(I_F)$; $T_j = 25°C$



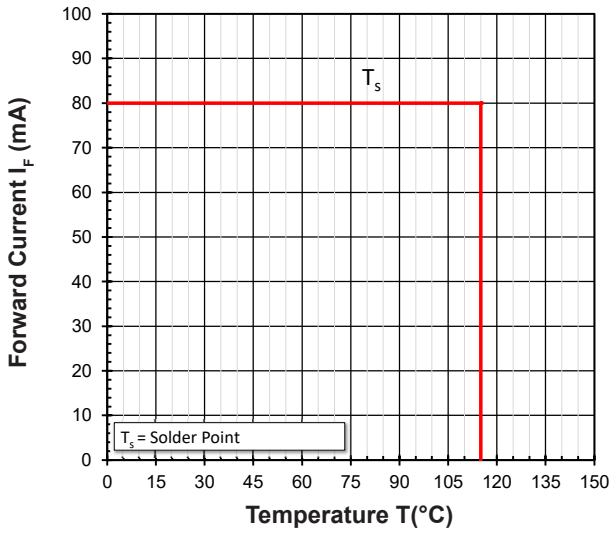
Forward Current Vs Forward Voltage *Appx. 4.1*

$I_F = f(V_F)$; $T_j = 25°C$



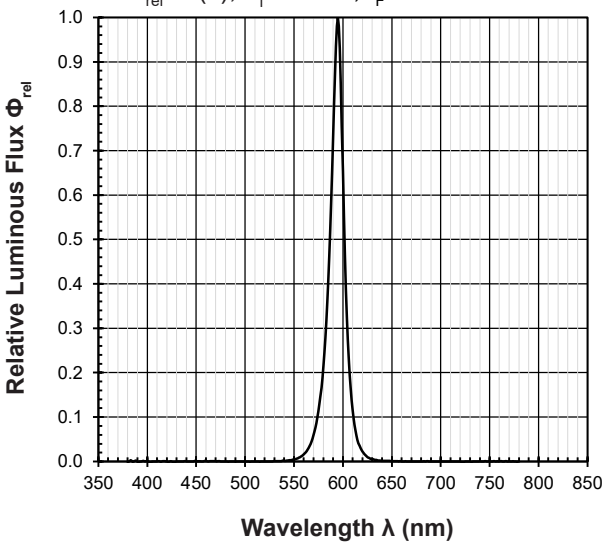
Maximum Current Vs Temperature

$I_F = f(T)$



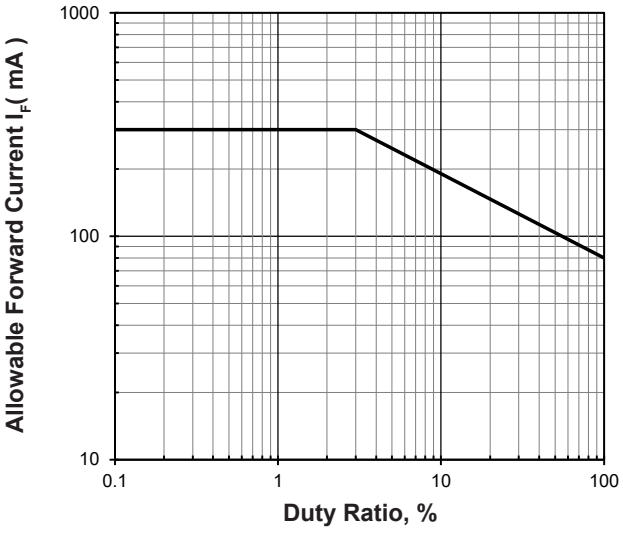
Relative Spectral Emission *Appx. 4.1*

$\Phi_{rel} = f(\lambda)$; $T_i = 25°C$; $I_F = 60mA$

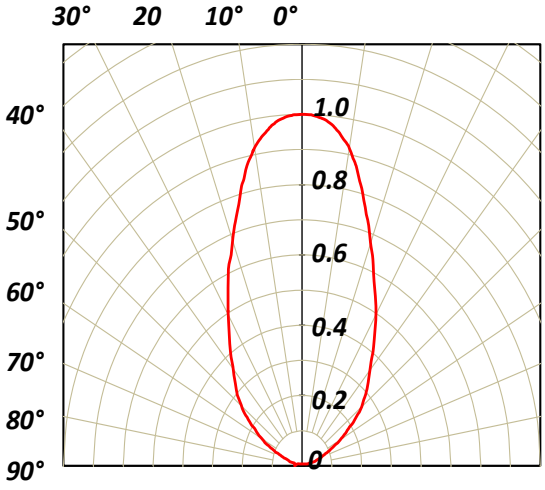


Allowable Forward Current Vs Duty Ratio

($T_s = 55°C$; $t_p \leq 100\mu s$)

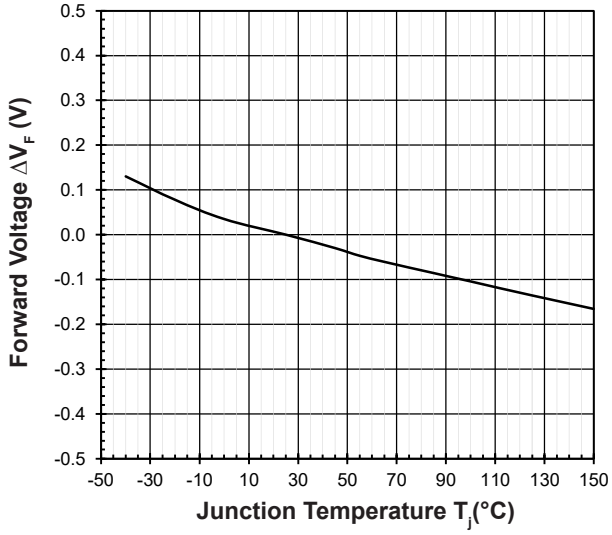


Radiation Pattern *Appx. 4.1*



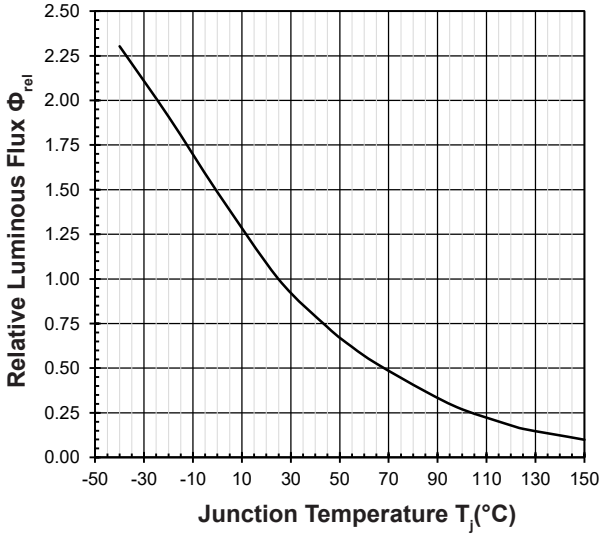
Forward Voltage Vs Junction Temperature *Appx. 4.1*

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =60mA



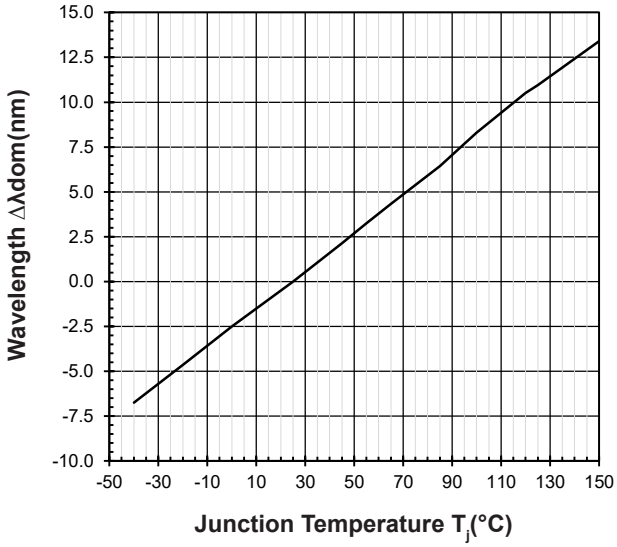
Relative Luminous Flux Vs Junction Temperature *Appx. 4.1*

$\Phi V/\Phi V(25°C) = f(T_j)$; I_F = 60mA

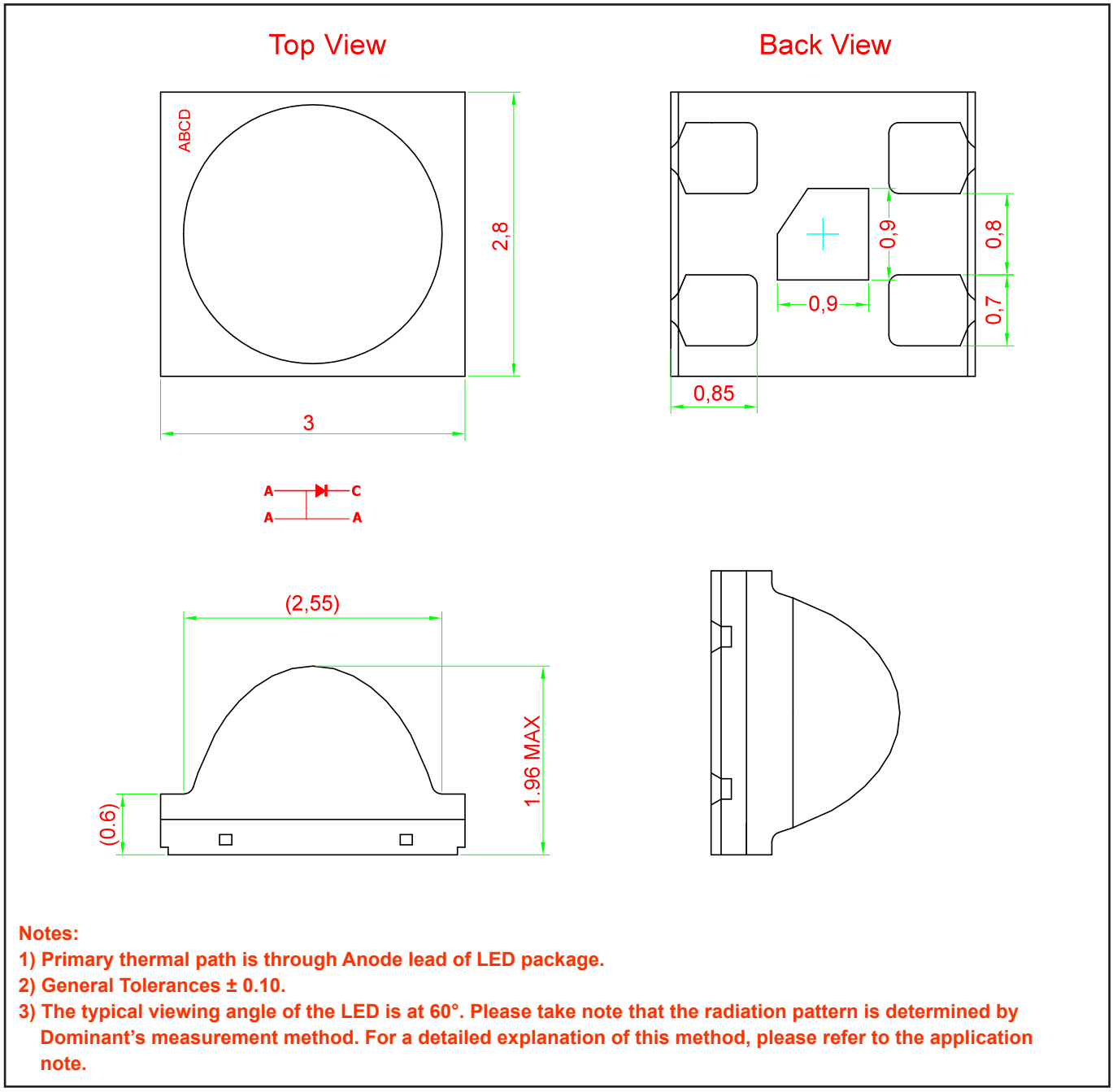


Wavelength Vs Junction Temperature *Appx. 4.1*

$\Delta\lambda dom = \lambda dom - \lambda dom\ (25°C) = f(T_j)$; I_F = 60mA



L-Spice AlInGaP: C6Y-MHG Package Outlines *Appx. 5.1*



Notes:

1) Primary thermal path is through Anode lead of LED package.

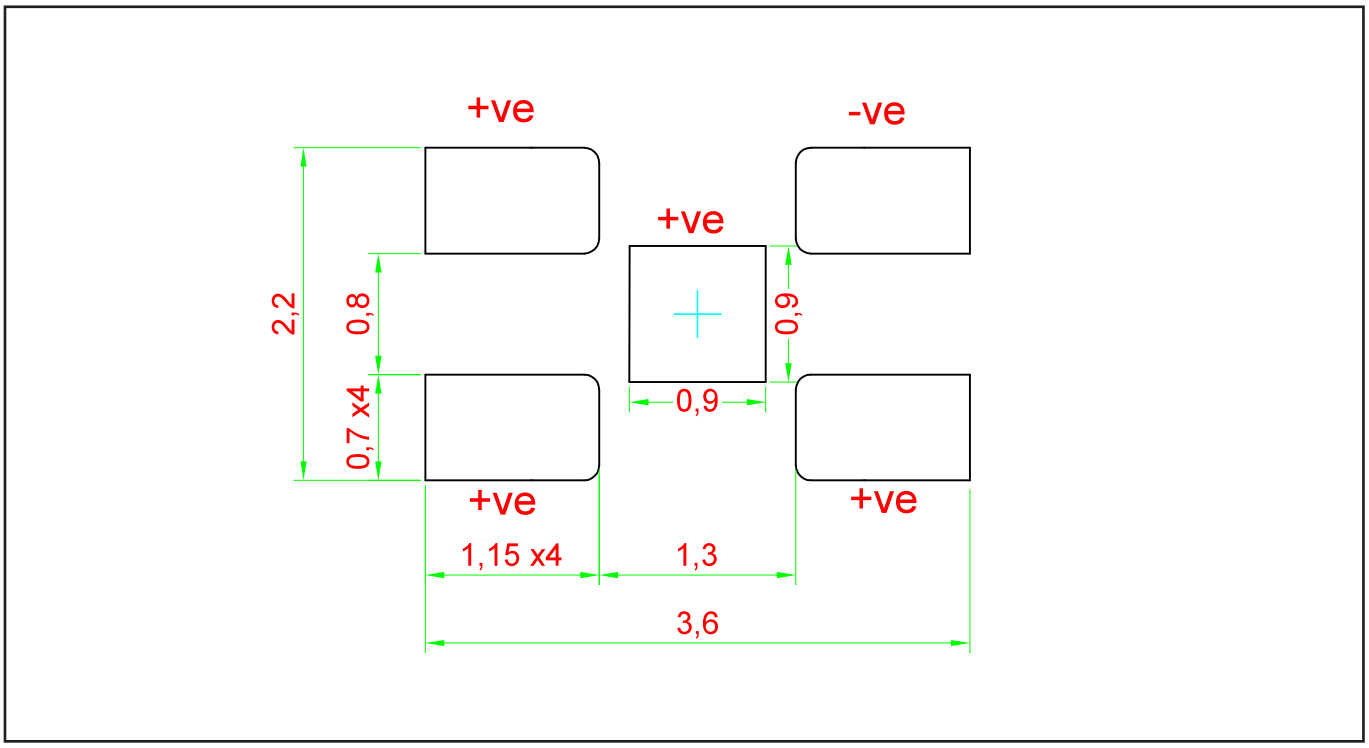
2) General Tolerances ± 0.10.

3) The typical viewing angle of the LED is at 60°. Please take note that the radiation pattern is determined by Dominant's measurement method. For a detailed explanation of this method, please refer to the application note.

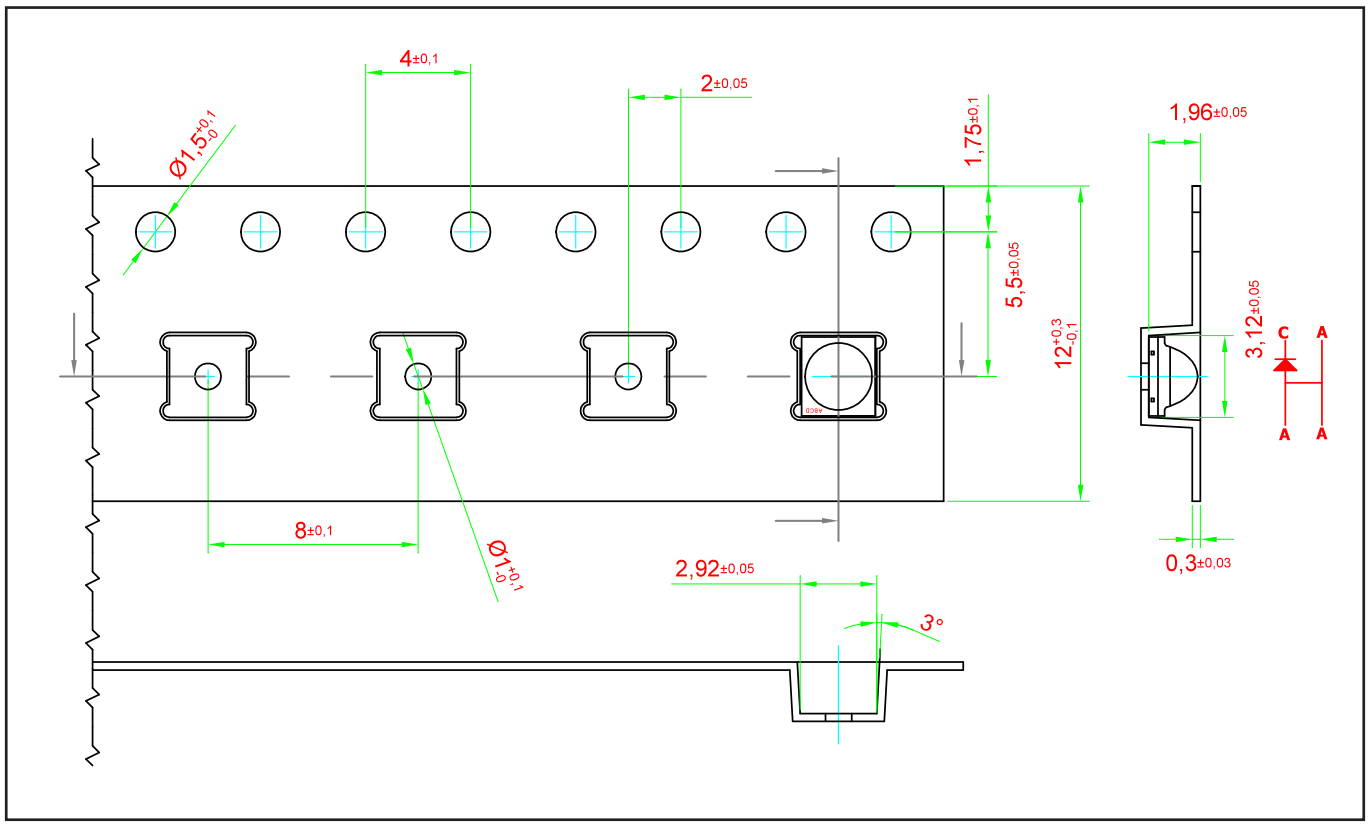
Material

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

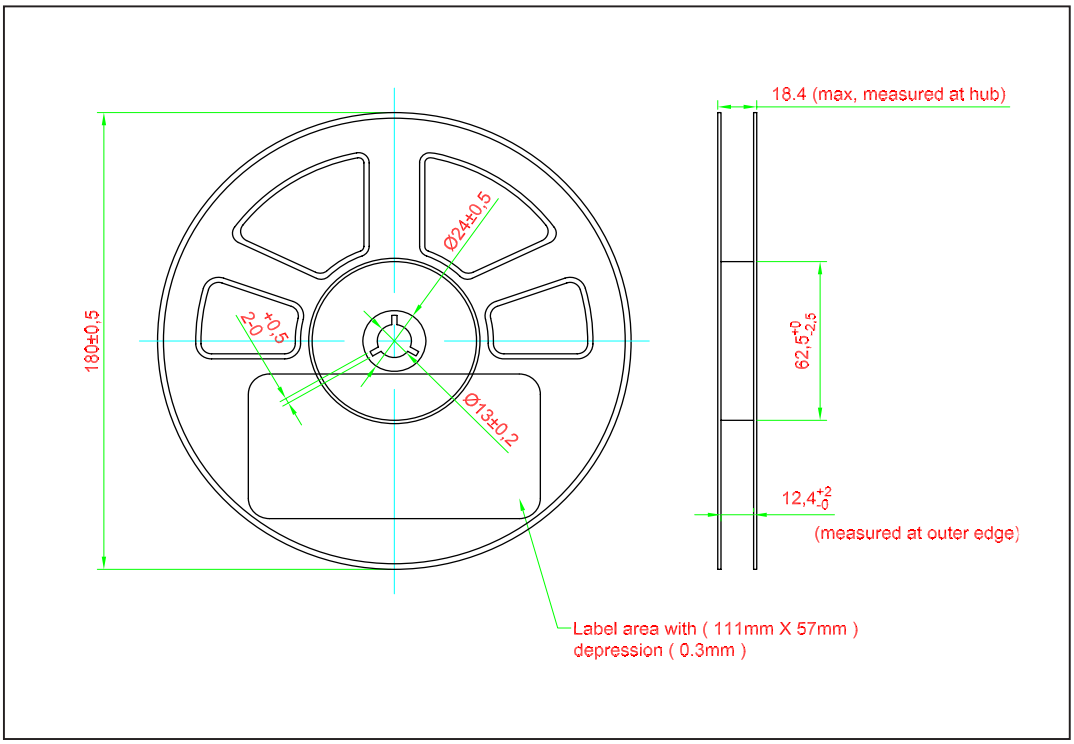
Recommended Solder Pad *Appx. 5.1*



Taping and orientation *Appx. 5.1*



Packaging Specification

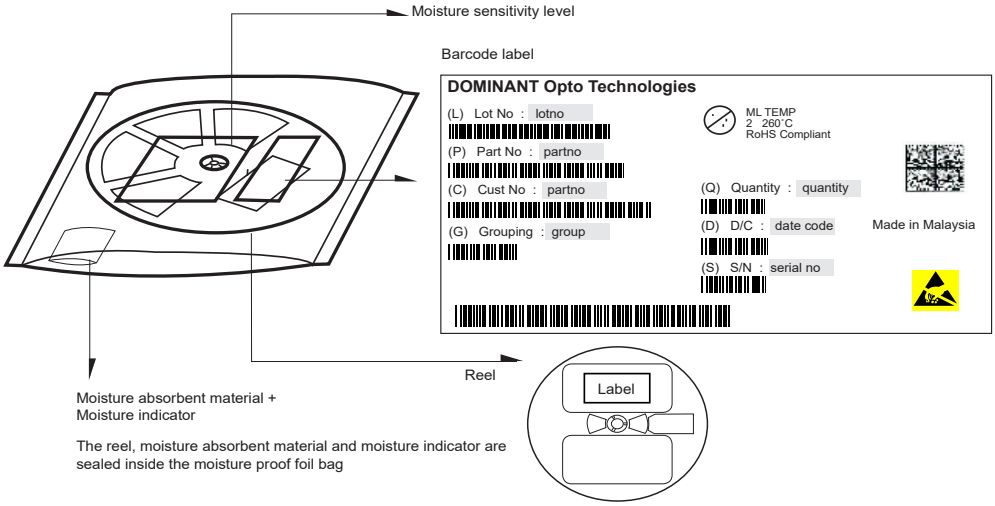


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	1000	C6Y-MHG-xxx-1

Notes:

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

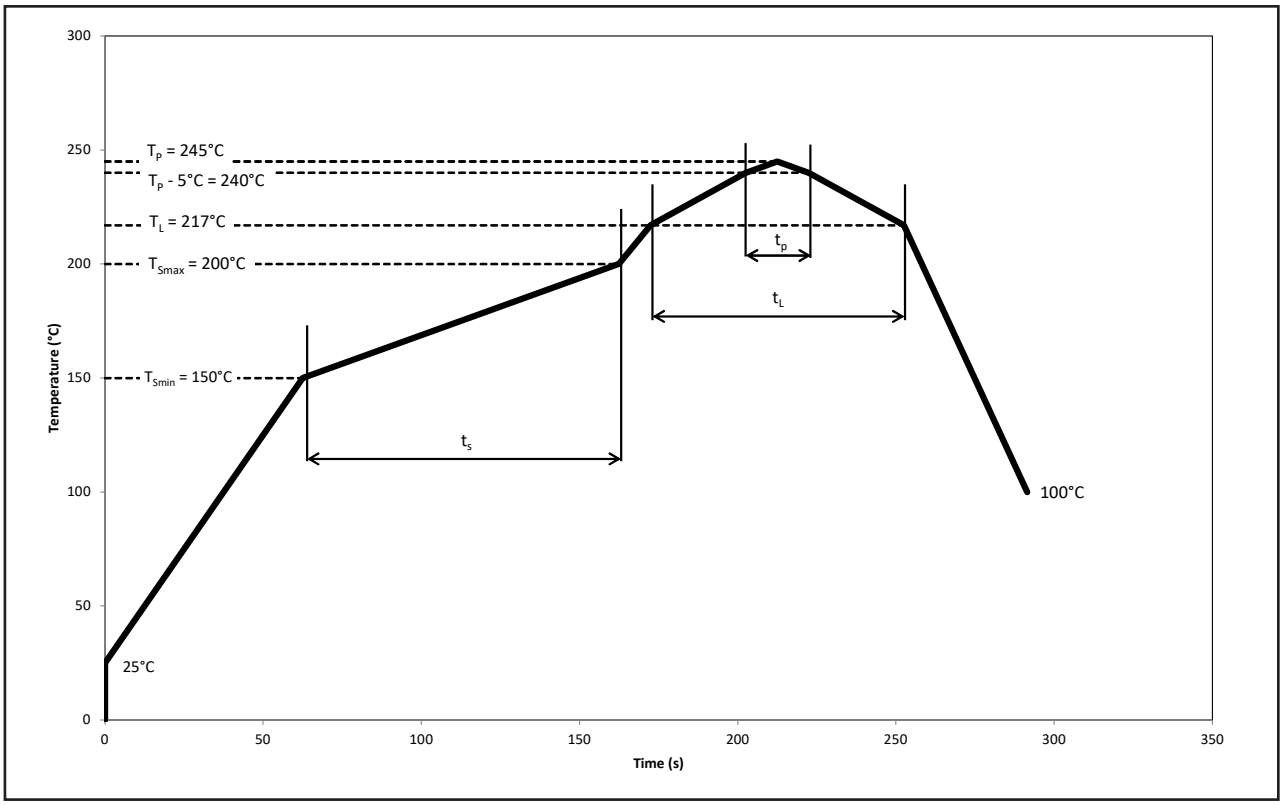
Packaging Specification



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

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°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 ± 8 % and an expanded uncertainty of ± 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 ± 8 % and an expanded uncertainty of ± 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 ± 8 % and an expanded uncertainty of ± 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 ± 8 % and an expanded uncertainty of ± 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 ± 0.5nm and an expanded uncertainty of ± 1nm (accordingly to GUM with a coverage factor of k=3).

3) Voltage:

3.1 Forward Voltage, Vf is measured when a current pulse of 8 ms(typ) with an internal reproducibility of ± 0.05V and an expanded uncertainty of ± 0.1V (accordingly to GUM with a coverage factor of k=3).

4) Typical Values:

4.1 Due to the specific conditions of semiconductor devices' manufacturing processes, the provided typical data and calculated correlations of technical parameters should only be considered as statistical values. It is important to note that the actual parameters of individual devices may deviate from these typical data, calculated correlations or the typical characteristic line. Dominant reserves the right to update this typical data without prior notice, particularly in response to technical enhancements.

5) Tolerance of Measure

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

6) Reverse Voltage:

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

7) Corrosion Robustness:

7.1 Test conditions: 40 °C / 90 % rh / 15 ppm H_2S / 336 h.

= Stricter than IEC 60068-2-43 (H_2S) [25 °C / 75% rh / 10 ppm H_2S / 21 days].

Revision History

Page	Subjects	Date of Modification
-	Initial Release	06 Jun 2023
1	Update Features	11 Sep 2023
6	Update Package Outline	24 May 2024

NOTE

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Dispose of product is in accordance with local, regional, national and international regulations.

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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