DOMINANT™
Opto Technologies
Innovating Illumination

DATA SHEET:

DomiLED

AlInGaP : DRx-NRS

DomiLED

Synonymous with function and performance, the DomiLED series is perfectly suited for a variety of cross-industrial applications due to its small package outline, durability and superior brightness.

Features:

> High brightness surface mount LED using thin film technology.
> 120° viewing angle.
> Small package outline (LxWxH) of 3.2 x 2.8 x 1.8mm.
> Qualified according to JEDEC moisture sensitivity Level 2.
> Compatible to IR reflow soldering.
> Environmental friendly; RoHS compliance.
> Compliance to automotive standard; AEC-Q102.
> Passed Corrosion Resistant Test. *Appx. 7.1*

Applications:

> Automotive: interior applications, eg: switches, telematics, climate control system, dashboard, etc.
> Display: full color display video notice board.
> Industrial: white goods (eg: Oven, microwave, etc.).

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Optical Characteristics at Tj=25˚C

Part Number	Color	Viewing Angle˚	Luminous Intensity @ IF = 20mA IV (mcd) *Appx. 1.1*		
			Min.	Typ.	Max.
DRS-NRS-TU1-1	Super Red, 632nm	120	285.0	355.0	560.0
DRR-NRS-T2U-1	Red, 625nm	120	355.0	450.0	715.0
DRA-NRS-UV1-1	Amber, 615nm	120	450.0	560.0	900.0
DRO-NRS-UV1-1	Orange, 605nm	120	450.0	560.0	900.0
DRY-NRS-UV1-1	Yellow, 587nm	120	450.0	560.0	900.0

Electrical Characteristics at Tj=25˚C

Part Number	Vf @ If = 20mA *Appx. 3.1*			V_r @ I_r = 10uA *Appx. 6.1*
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
DRx-NRS	1.8	2.1	2.6	12

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	50	mA
Peak pulse current; (T_s=55°C, tp ≤ 100µs, Duty cycle = 0.03)	100	mA
Reverse voltage *Appx. 6.1*	12	V
ESD threshold (HBM)	2	kV
LED junction temperature	120	˚C
Operating temperature	-40 … +105	˚C
Storage temperature	-40 … +110	˚C
Power dissipation (at room temperature)	80	mW
Thermal resistance (Rated current = 20mA, Ts=25 ˚C) - Real Thermal Resistance Junction / solder point, Rth JS real	115	K/W

Wavelength Grouping at Tj=25˚C

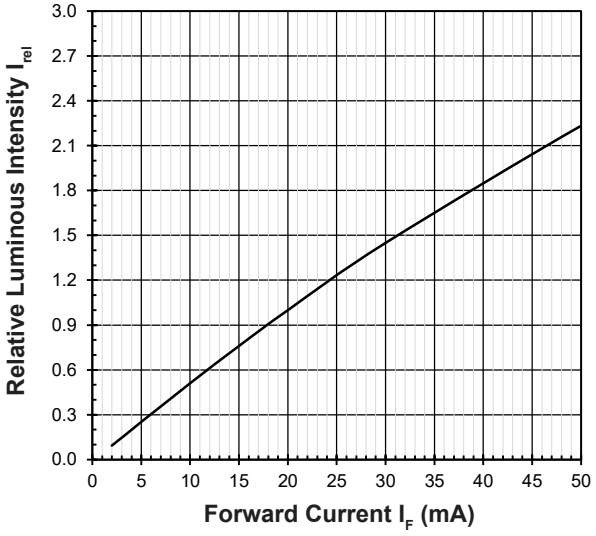
Color	Group	Wavelength distribution (nm) *Appx. 2.2*
DRS; Super Red	Full	625 - 640
DRR; Red	Full	620 - 630
DRA; Amber	Full	610 - 621
	W	610 - 615
	X	615 - 621
DRO; Orange	Full	600 - 612
	W	600 - 603
	X	603 - 606
	Y	606 - 609
	Z	609 - 612
DRY; Yellow	Full	582 - 594
	W	582 - 585
	X	585 - 588
	Y	588 - 591
	Z	591 - 594

Luminous Intensity Group at Tj=25˚C

Brightness Group	Luminous Intensity *Appx. 1.1* IV (mcd)
T1	285.0...355.0
T2	355.0...450.0
U1	450.0...560.0
U2	560.0...715.0
V1	715.0...900.0

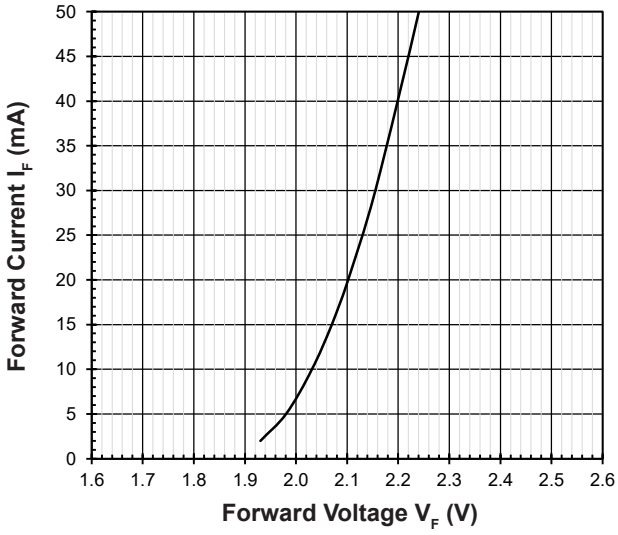
Relative Luminous Intensity Vs Forward Current

$I_V/I_V(20mA) = f(I_F)$; $T_j = 25°C$



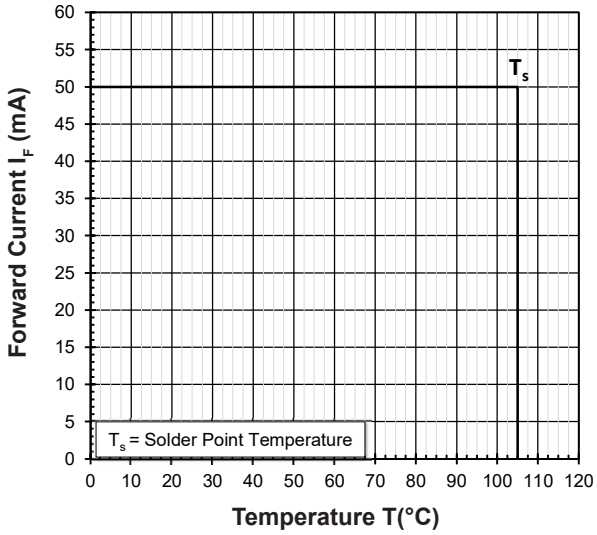
Forward Current Vs Forward Voltage

$I_F = f(V_F)$; $T_j = 25°C$



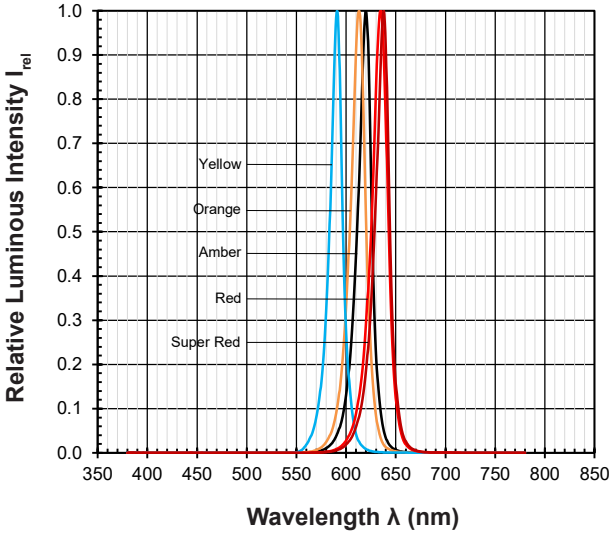
Maximum Current Vs Temperature

$I_F=f(T)$



Relative Spectral Emission

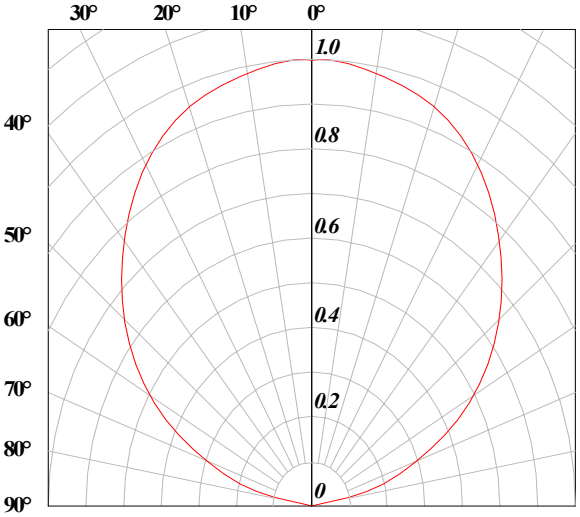
$I_{rel} = f(\lambda)$; $T_j = 25°C$; $I_F = 20mA$



Allowable Forward Current Vs Duty Ratio

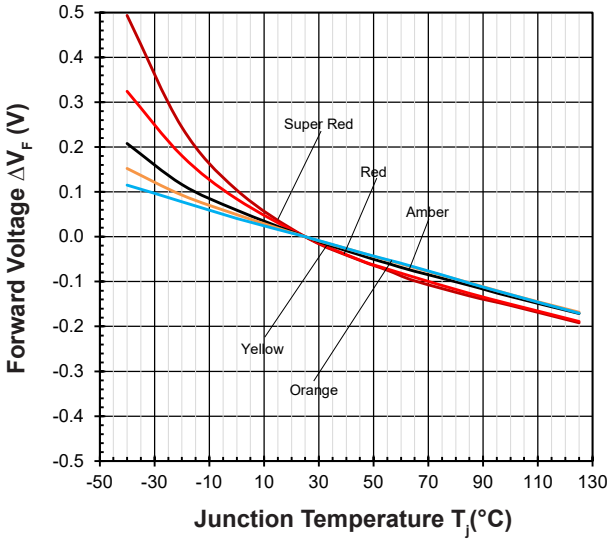
($T_s = 55°C$; $t_p \leq 100\mu s$)

Radiation Pattern



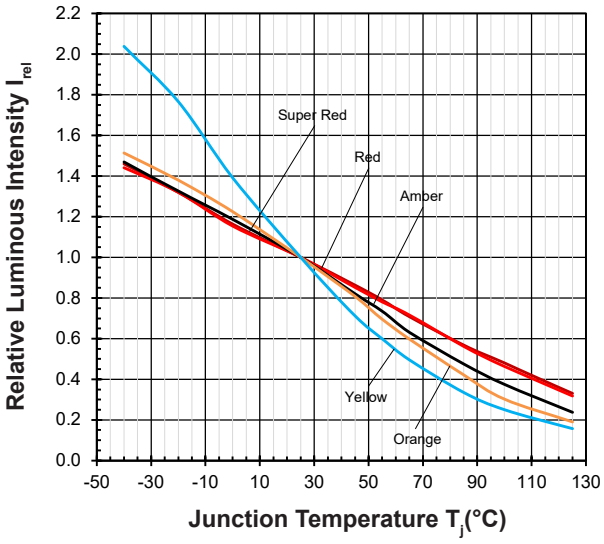
Forward Voltage Vs Junction Temperature

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =20mA



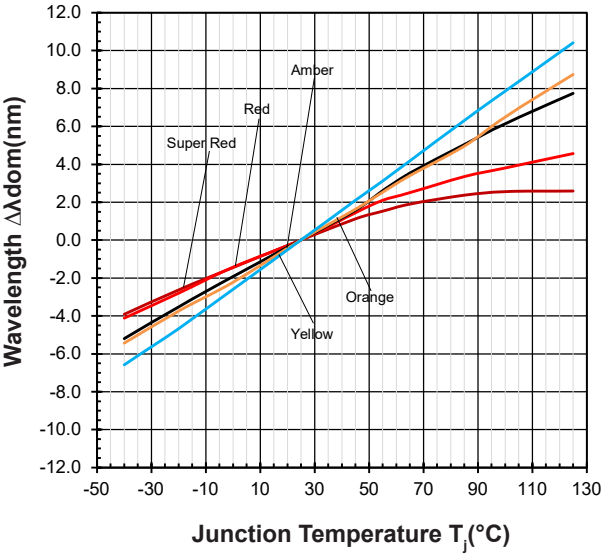
Relative Luminous Intensity Vs Junction Temperature

$I_V/I_V(25°C) = f(T_j)$; I_F = 20mA

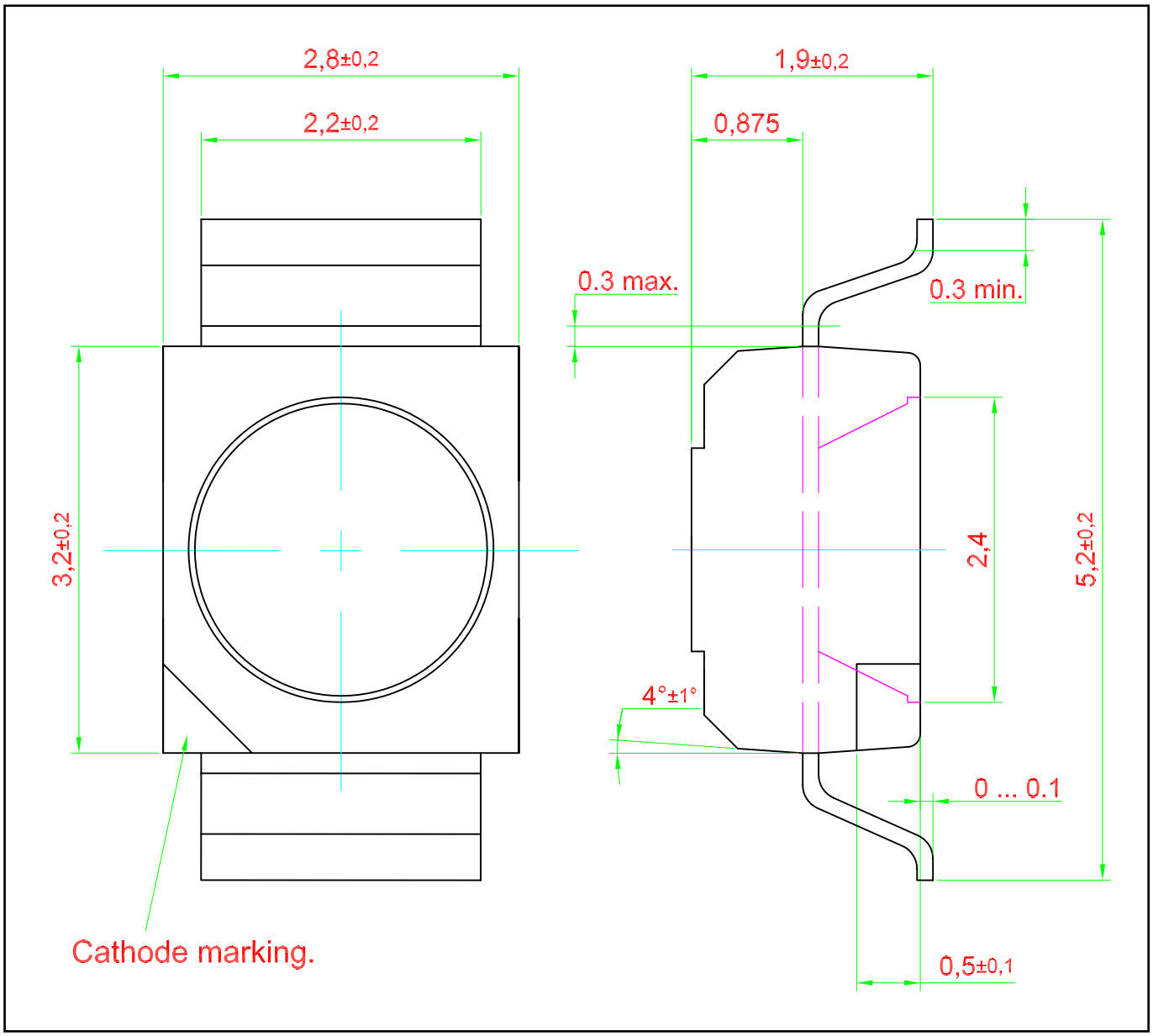


Wavelength Vs Junction Temperature

$\Delta\lambda dom = \lambda dom - \lambda dom\ (25°C) = f(T_j)$; I_F =20mA



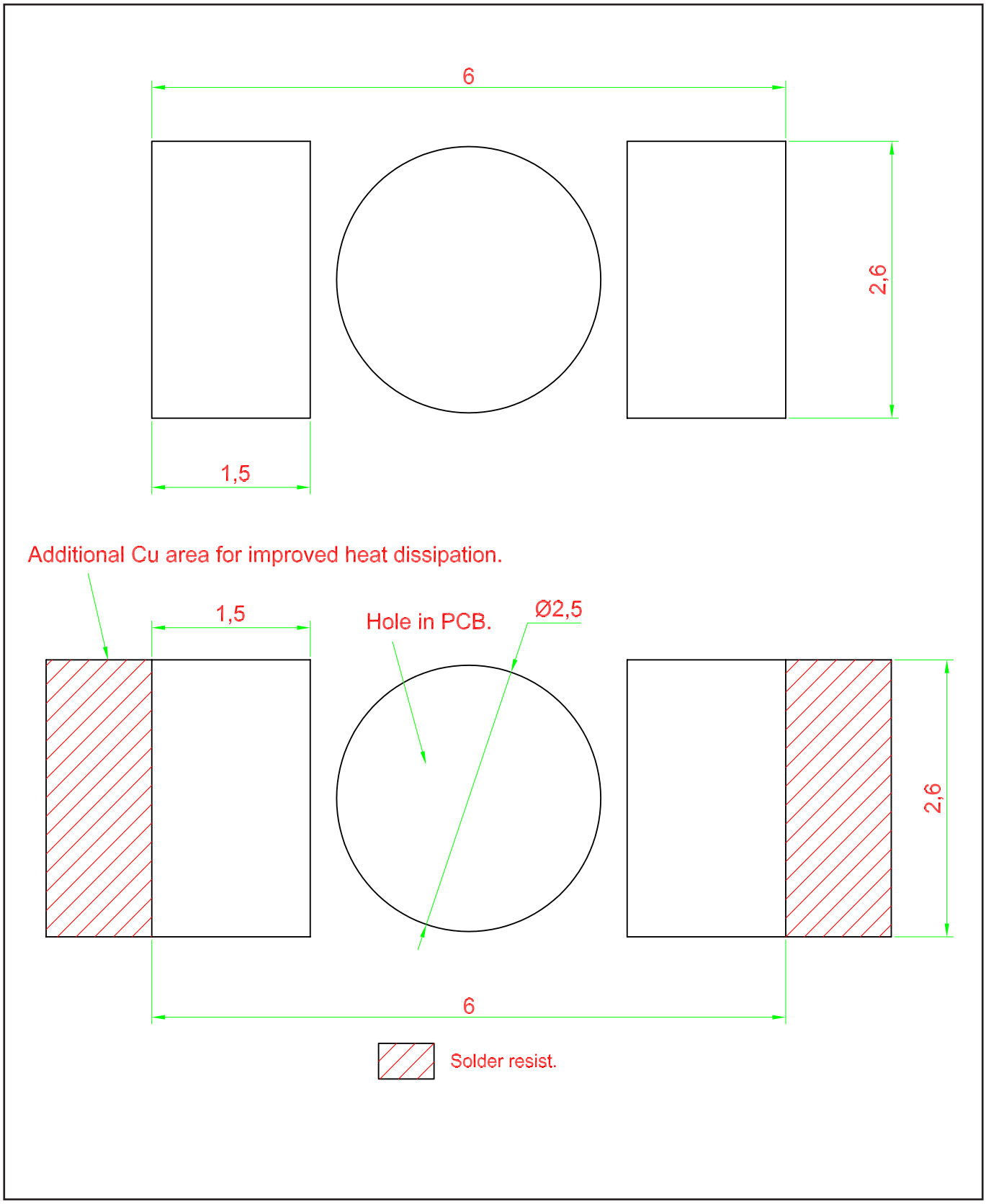
DomiLED • AlInGaP : DRx-NRS Package Outlines



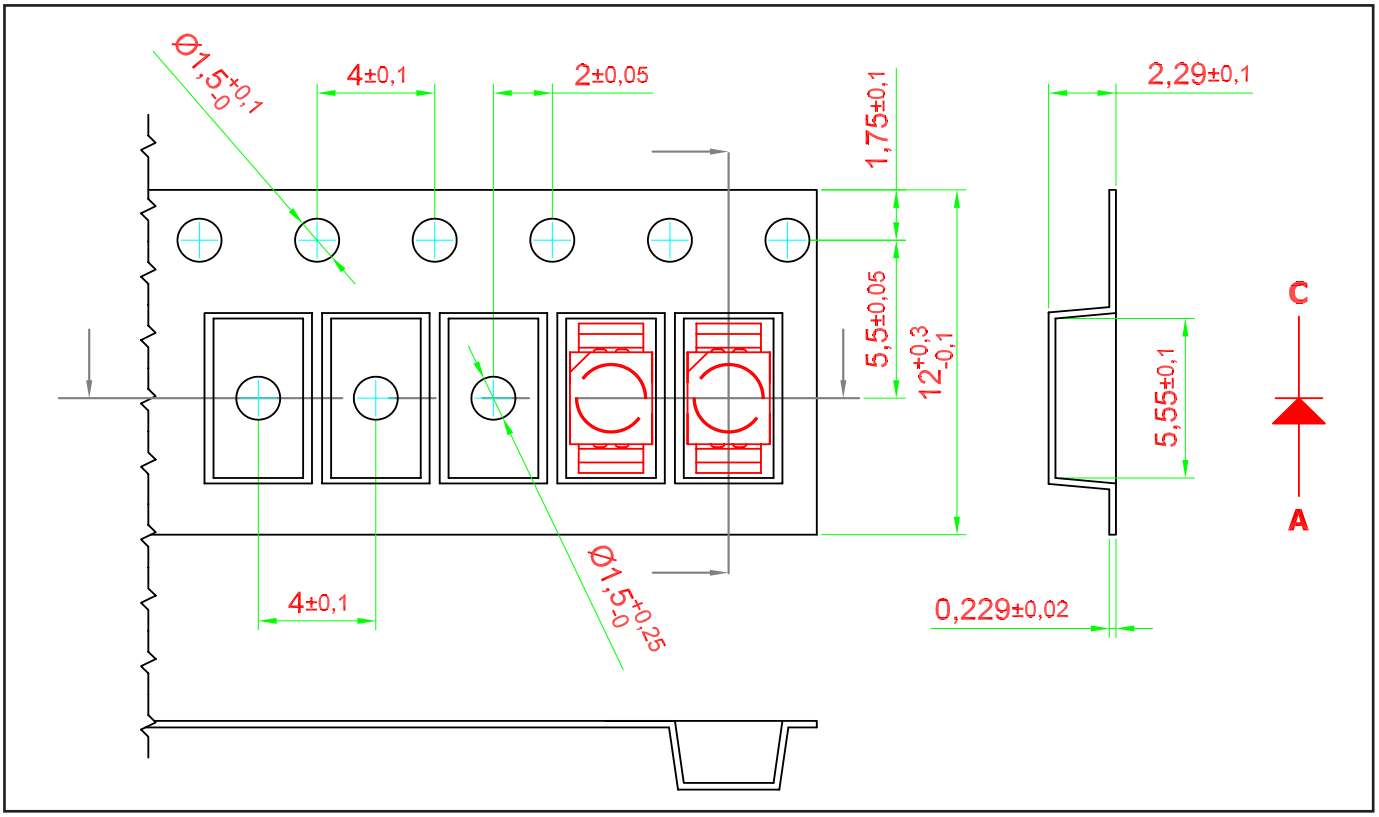
Material

	Material
Lead-frame	Cu Alloy With Ag Plating
Package	High Temperature Resistant Plastic
Encapsulant	Epoxy Resin
Soldering Leads	Sn Plating

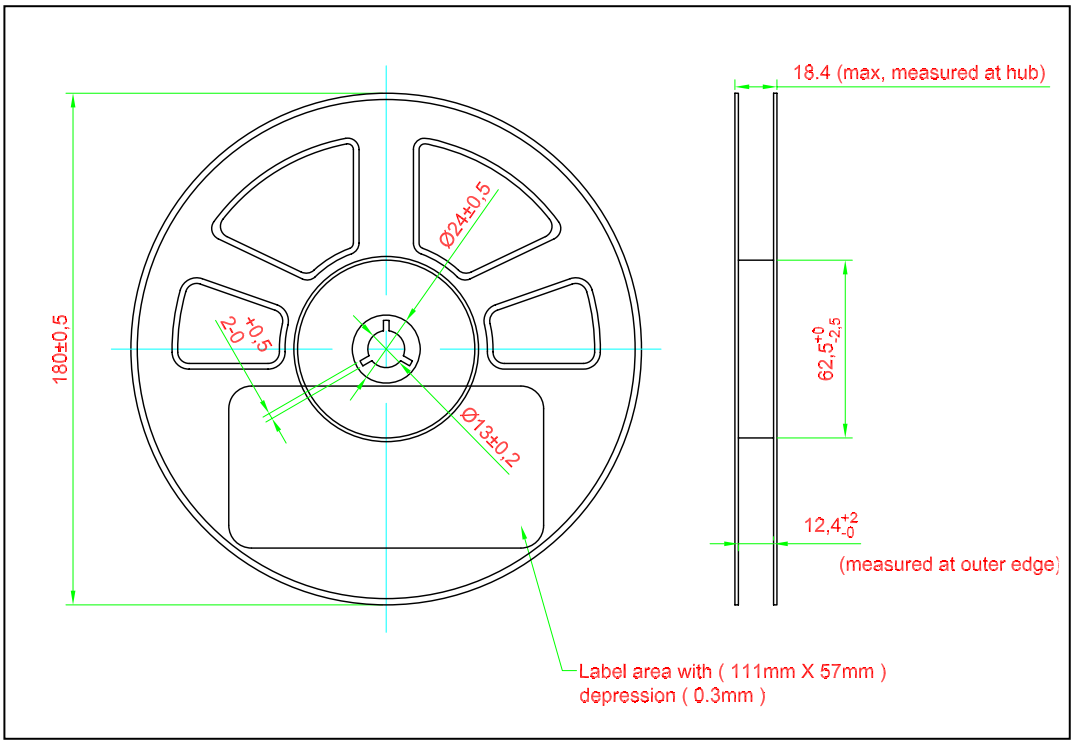
Recommended Solder Pad



Taping and orientation



Packaging Specification

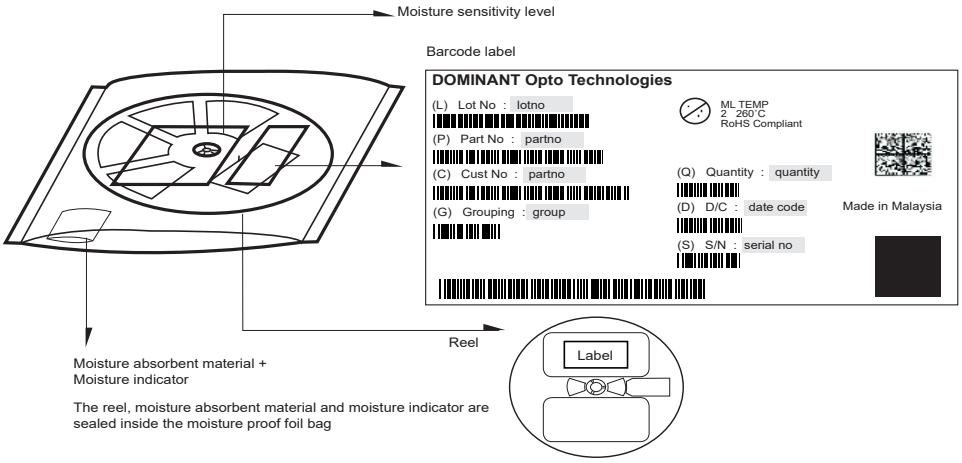


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	2000	DRx-NRS-xxx-x

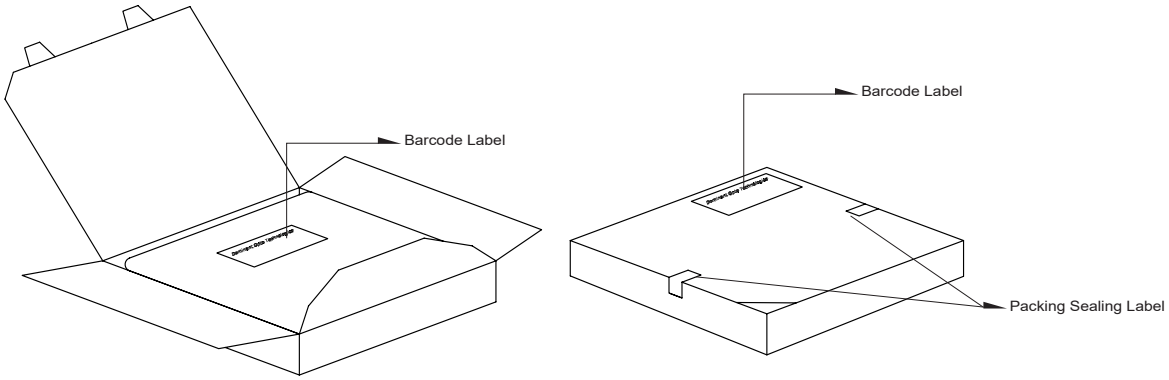
Notes:

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

Packaging Specification



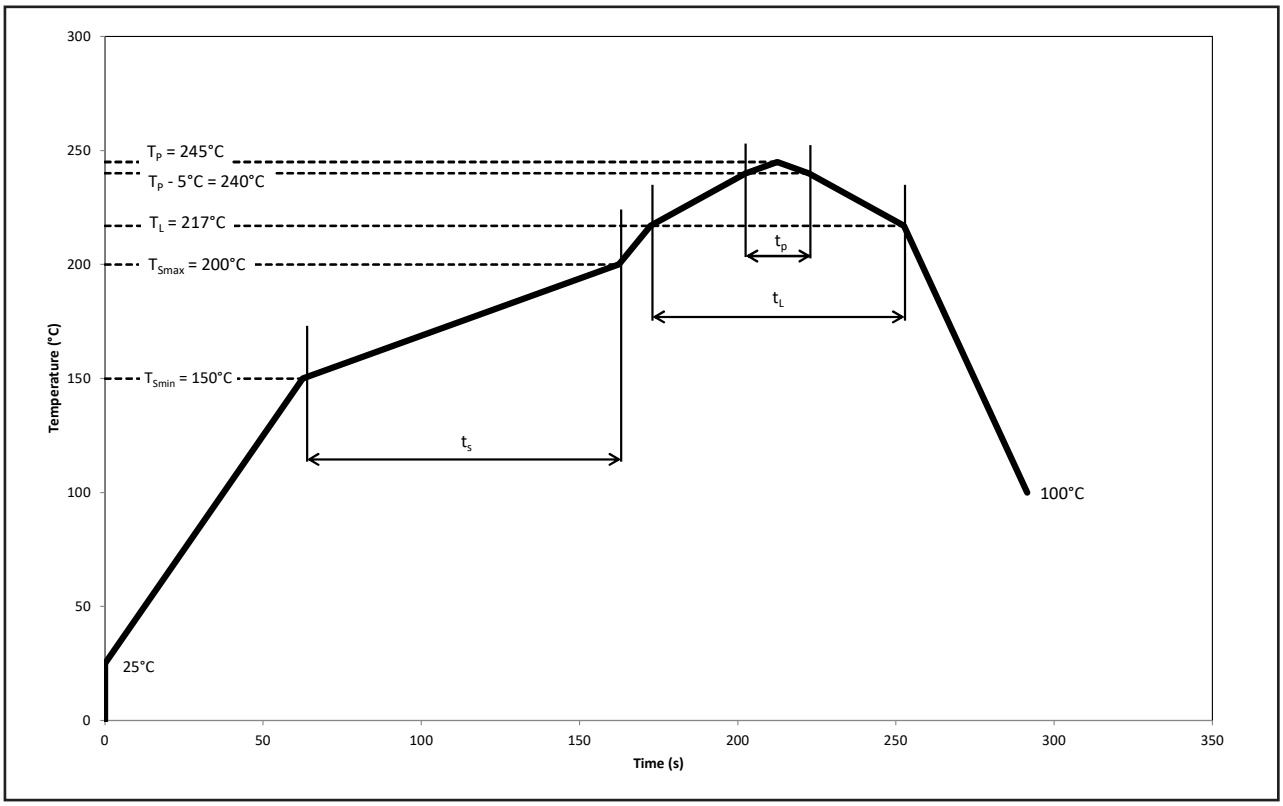
Quantity per bag (pcs)	Average 1pc DomiLED (gram)	1 completed bag (gram)
2000	0.034	240 ± 10



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°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 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 specifiec 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].

8) Thermal Resistance

8.1 Rth max is based on statistic values (6σ).

Revision History

Page	Subjects	Date of Modification
-	Initial Release	12 Aug 2009
-	Update company name	31 May 2010
3	Add characteristics	12 Jul 2010
9	Error in carrier tape	22 Jun 2012
1, 10	Add Features Update Package Specification	16 Oct 2015
1, 10, 12	Update Product Photo Error on Packaging Specification Add Appendix	03 Jul 2017
1, 2, 4, 5, 9, 10, 11	Update AEC-Q101 to AEC-Q102 Update Operating & Storage Temperature Add Thermal Resistance Update Graph Update Packaging Specification Update Recommended Pb-free Soldering Profile	07 Jun 2022

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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