

Power Right Angle DomiLED

AlInGaP : D3x-SKG

Power Right Angle

Power Right Angle DomiLED features a package with excellent luminous efficiency in high optimization in its optical design and provides stable SMT process to avoid topping issue.



Features:

- > Super high brightness surface mount LED.
- > 120° viewing angle.
- > Compact package outline (LxWxH) of 4.0 x 4.3 x 2.75 mm.
- > Qualified according to JEDEC moisture sensitivity Level 2.
- > Low thermal resistance.
- > Superior corrosion robustness.
- > Compatible to IR reflow soldering.
- > Compliance to automotive standard; AEC-Q102.
- > Environmental friendly; RoHS compliance.
- > Desired for sideway illumination.



Applications:

- > Automotive:

Interior applications, eg: switches, telematics, climate control system, dashboard, etc.

Exterior applications, eg: Turn Signal, Rear Combination Lamp (RCL), Center High Mounted Stop Lamp (CHMSL).

Electrical Characteristics at Tj=25°C

Part Number	Color	Viewing Angle°	Luminous Flux @ 140mA (lm) <i>Appx. 1.2</i>		
			Min.	Typ.	Max.
D3S-SKG-K3M2-3	Super Red, 635 nm	120	9.35	12.20	15.80
D3S-SKG-LM3-2	Super Red, 630 nm	120	10.70	13.90	18.10
D3A-SKG-M3P-4	Amber, 624 nm	120	15.80	20.60	30.60
D3A-SKG-N3Q2-2	Amber, 615 nm	120	20.60	26.80	34.80
D3Y-SKG-N3Q2-4	Yellow, 592 nm	120	20.60	26.80	34.80
D3Y-SKG-NP3-3	Yellow, 589 nm	120	18.10	23.50	30.60
D3Y-SKG-MN3-2	Yellow, 586 nm	120	13.90	18.10	23.50
● D3Y-SKG-NP3-1	Yellow, 587 nm	120	18.10	23.50	30.60

● Not for New Design.

Electrical Characteristics at Tj=25°C

Part Number	Vf @ If = 140mA <i>Appx. 3.1</i>			Vr @ Ir = 10uA <i>Appx. 6.1</i>
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
D3x-SKG	1.90	2.30	2.50	12

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	200	mA
Peak pulse current; (Ts=55 °C, tp ≤ 100µs, Duty cycle = 0.03)	400	mA
Reverse voltage <i>Appx. 6.1</i>	12	V
ESD threshold (HBM)	2	KV
LED junction temperature	150	°C
Operating temperature	-40 ... +115	°C
Storage temperature	-40 ... +125	°C
Thermal resistance (Rated current = 140mA, Ts=25°C)		
- Real Thermal Resistance		
Junction / solder point, R _{th JS real} (typ = 60)	70	K/W
- Electrical Thermal Resistance		
Junction / solder point, R _{th JS el} (typ = 50)	60	K/W

Wavelength Grouping at Tj= 25°C

Color	Group	Wavelength distribution (nm) <i>Appx. 2.2</i>
D3S, Super Red	Full	627 - 637
	W	627 - 630
	X	630 - 634
	Y	634 - 637
D3A, Amber	Full	612 - 627
	W	612 - 616
	X	616 - 620
	Y	620 - 624
	Z	624 - 627
D3Y, Yellow	Full	583 - 595
	W	583 - 586
	X	586 - 589
	Y	589 - 592
	Z	592 - 595

Luminous Intensity Group at Tj=25°C

Brightness Group	Luminous Flux Appx. 1.2 (lm)
K3	9.35 ... 10.7
L2	10.7 ... 12.2
L3	12.2 ... 13.9
M2	13.9 ... 15.8
M3	15.8 ... 18.1
N2	18.1 ... 20.6
N3	20.6 ... 23.5
P2	23.5 ... 26.8
P3	26.8 ... 30.6
Q2	30.6 ... 34.8

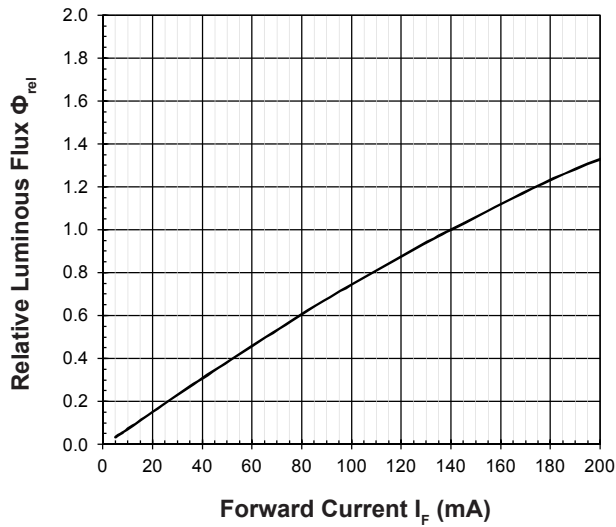
Vf Bining (Optional)

Vf Bin @ 140 mA	Forward Voltage (V) Appx. 4.1
V43	1.90 ... 2.05
V44	2.05 ... 2.20
V45	2.20 ... 2.35
V46	2.35 ... 2.50

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

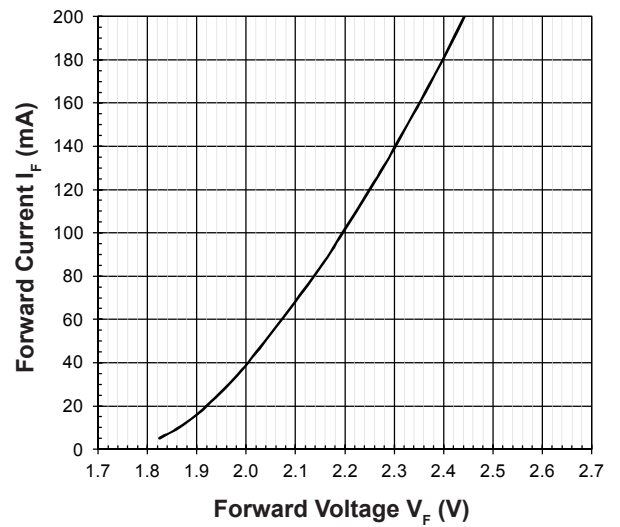
Relative Luminous Flux Vs Forward Current Appx. 4.1

$$\Phi_V/\Phi_V(140\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$$



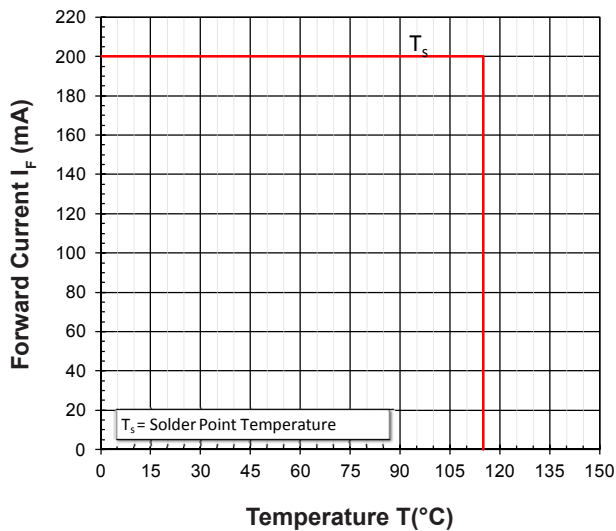
Forward Current Vs Forward Voltage Appx. 4.1

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



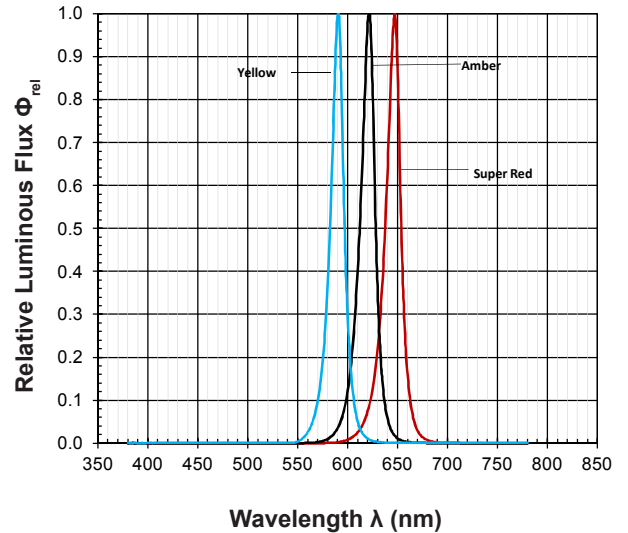
Maximum Current Vs Temperature

$$I_F = f(T)$$



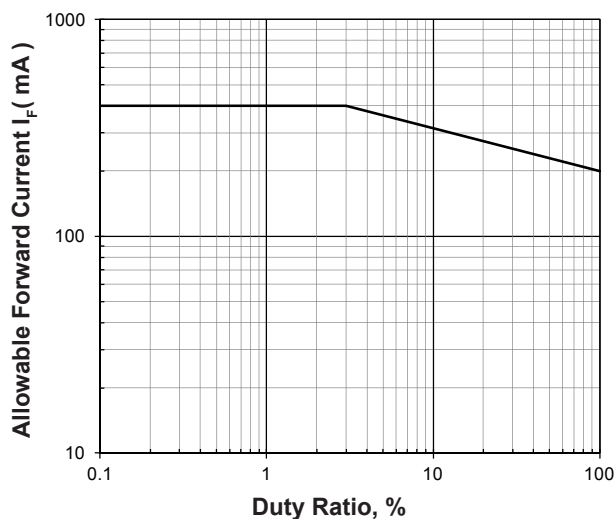
Relative Spectral Emission Appx. 4.1

$$\Phi_{rel} = f(\lambda); T_j = 25^\circ\text{C}; I_F = 140\text{mA}$$

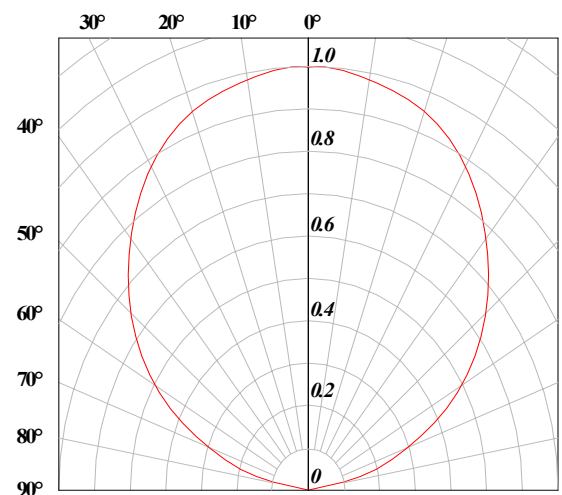


Allowable Forward Current Vs Duty Ratio

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

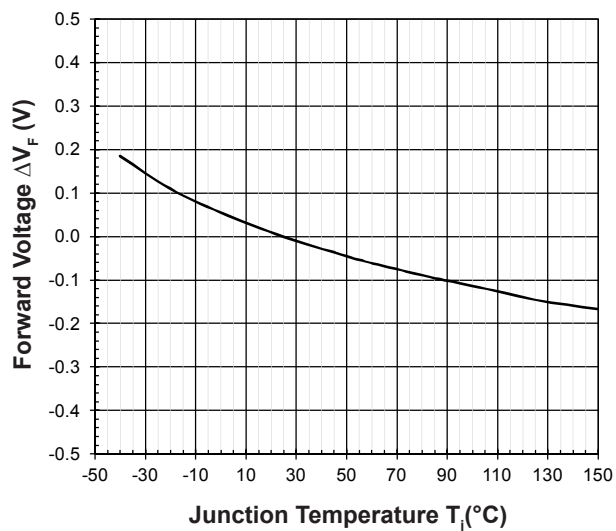


Radiation Pattern Appx. 4.1



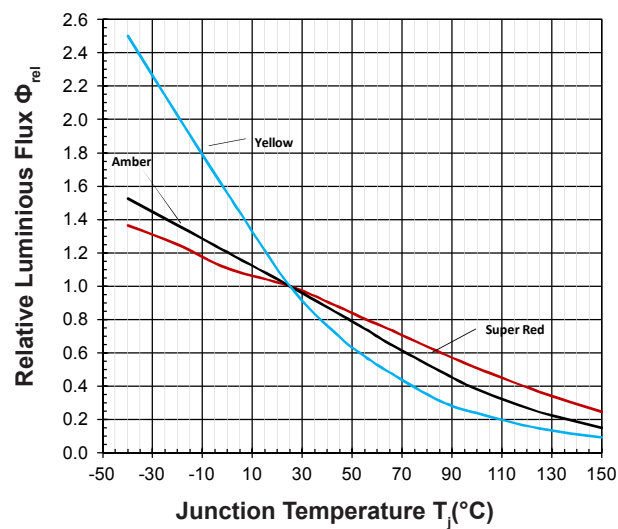
Forward Voltage Vs Junction Temperature *Appx. 4.1*

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 140\text{mA}$$



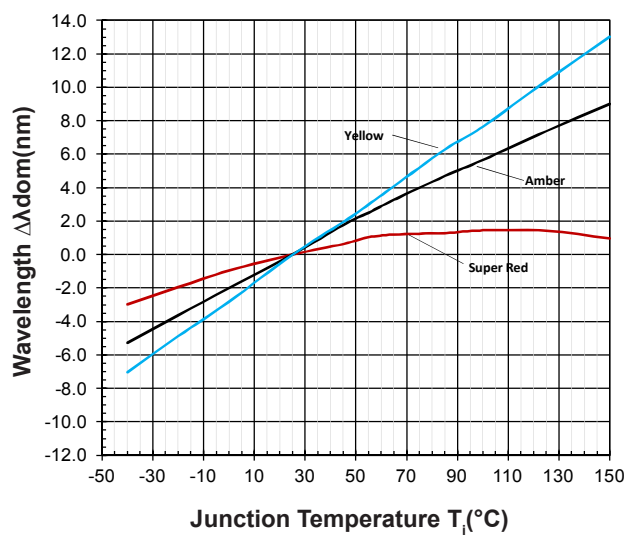
Relative Luminous Flux Vs Junction Temperature *Appx. 4.1*

$$\Phi_V/\Phi_V(25^\circ\text{C}) = f(T_j); I_F = 140\text{mA}$$

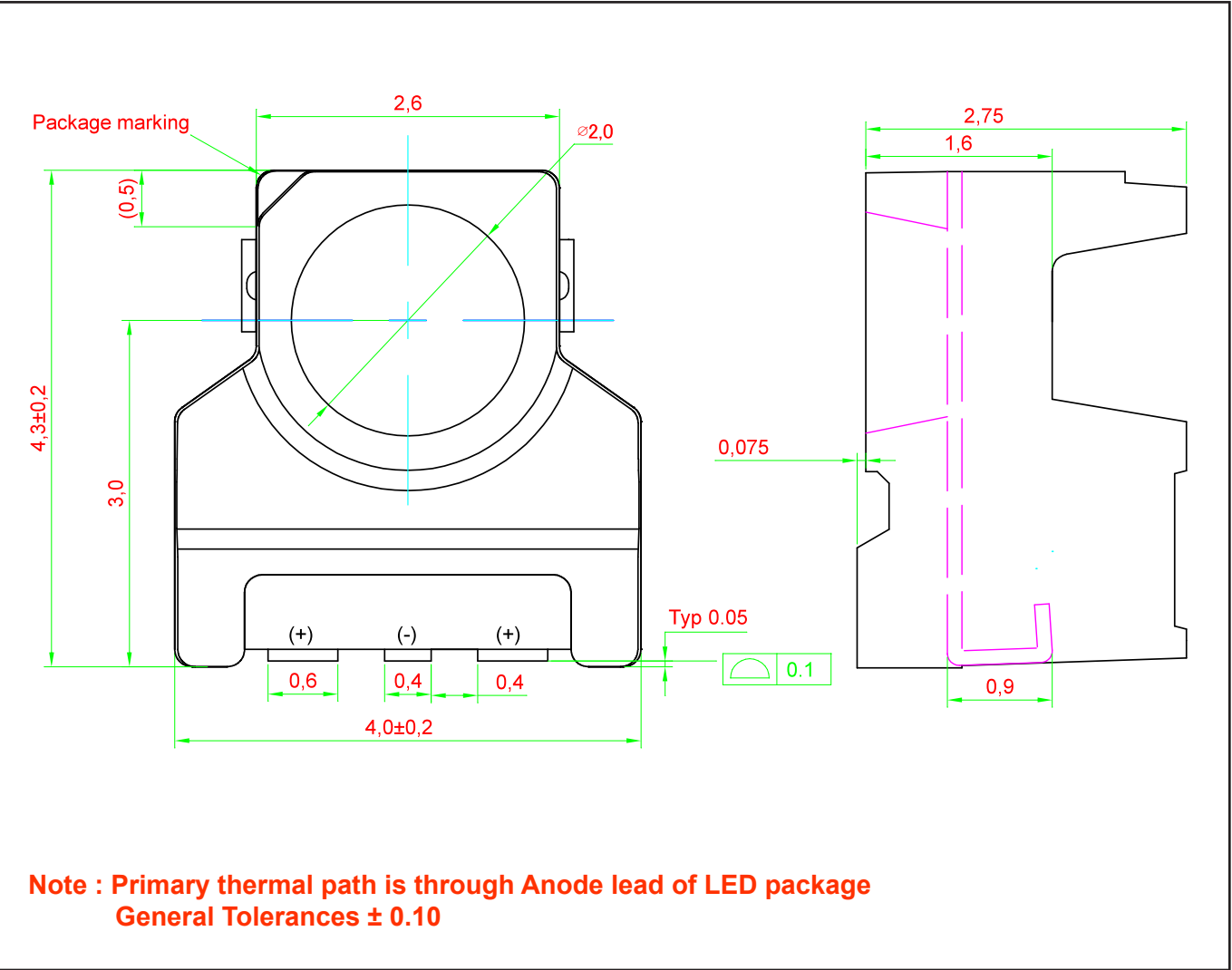


Wavelength Vs Junction Temperature *Appx. 4.1*

$$\Delta \lambda_{dom} = \lambda_{dom} - \lambda_{dom}(25^\circ\text{C}) = f(T_j); I_F = 140\text{mA}$$



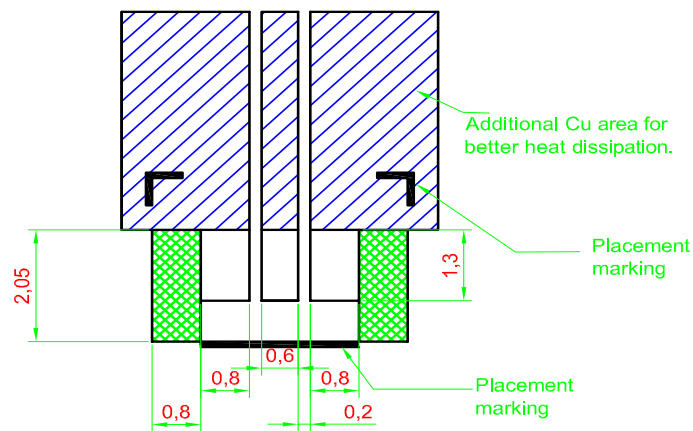
Power Right Angle DomiLED AllnGaP : D3x-SKG Package Outlines *Appx. 5.1*



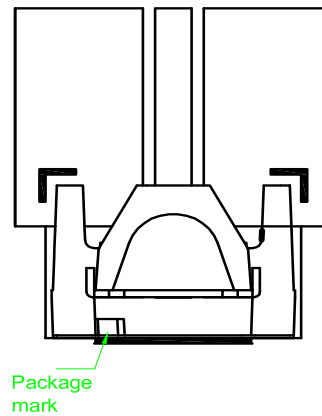
Material

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

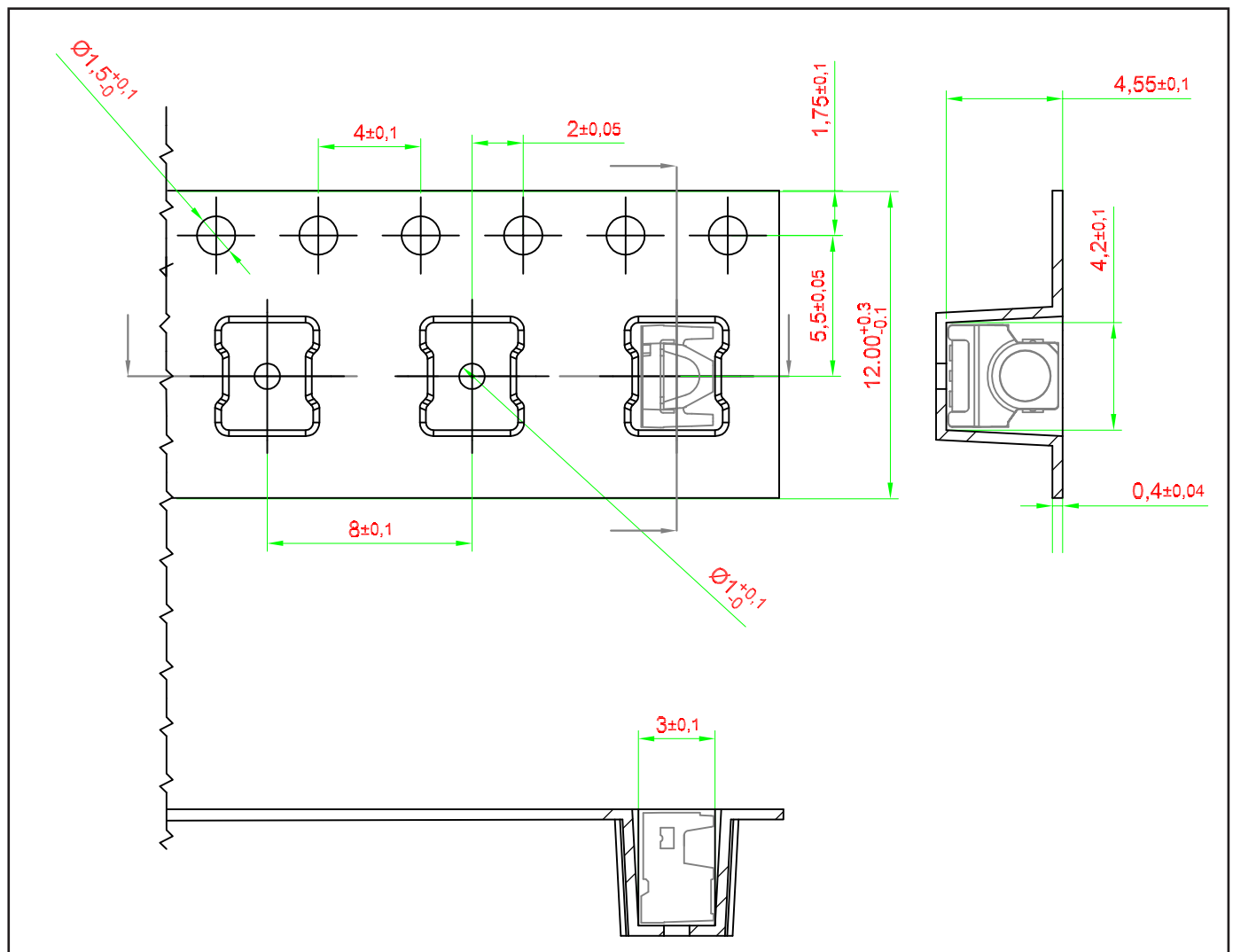
Recommended Solder Pad *Appx. 5.1*



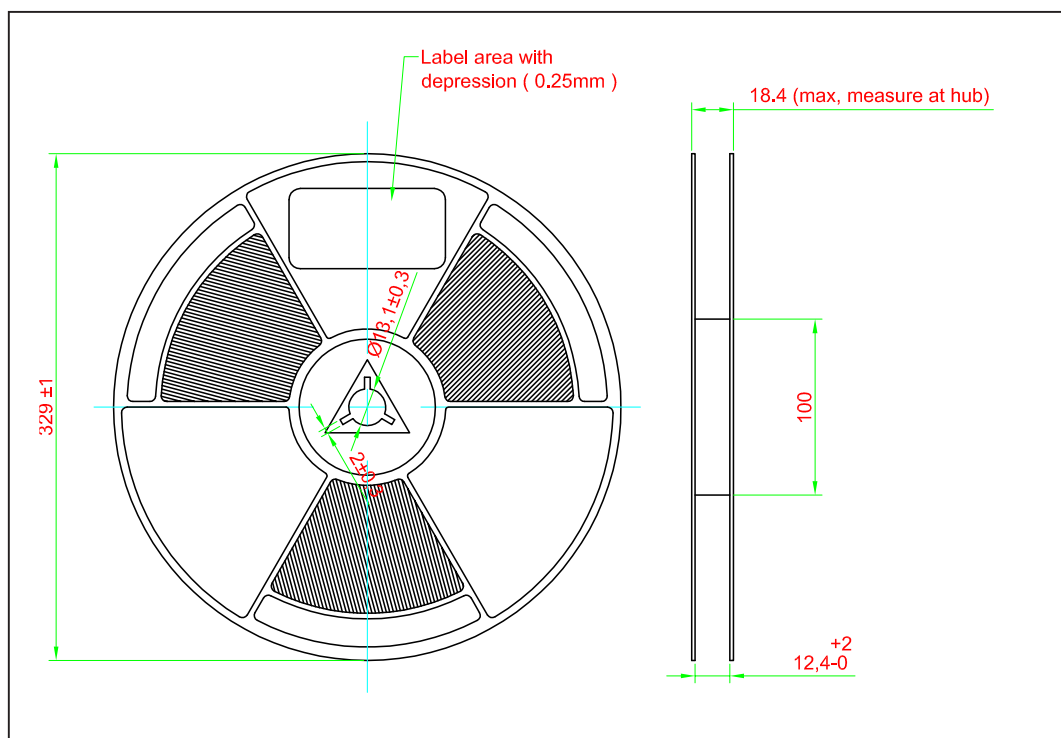
-  Cu trace with solder mask
-  Exposed FR4 base.
(No Solder Mask, No Copper Trace)



Taping and orientation *Appx. 5.1*



Packaging Specification

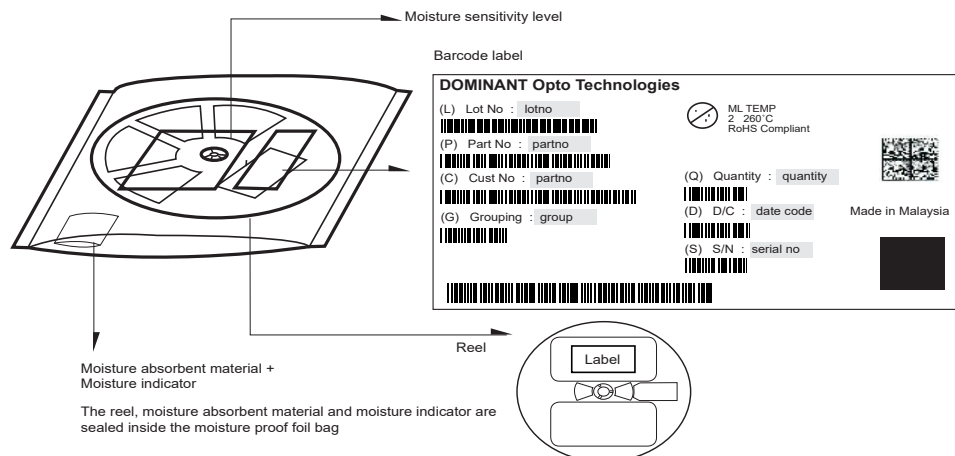


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	329	1500	D3x-SKG-xxx-x

Notes:

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

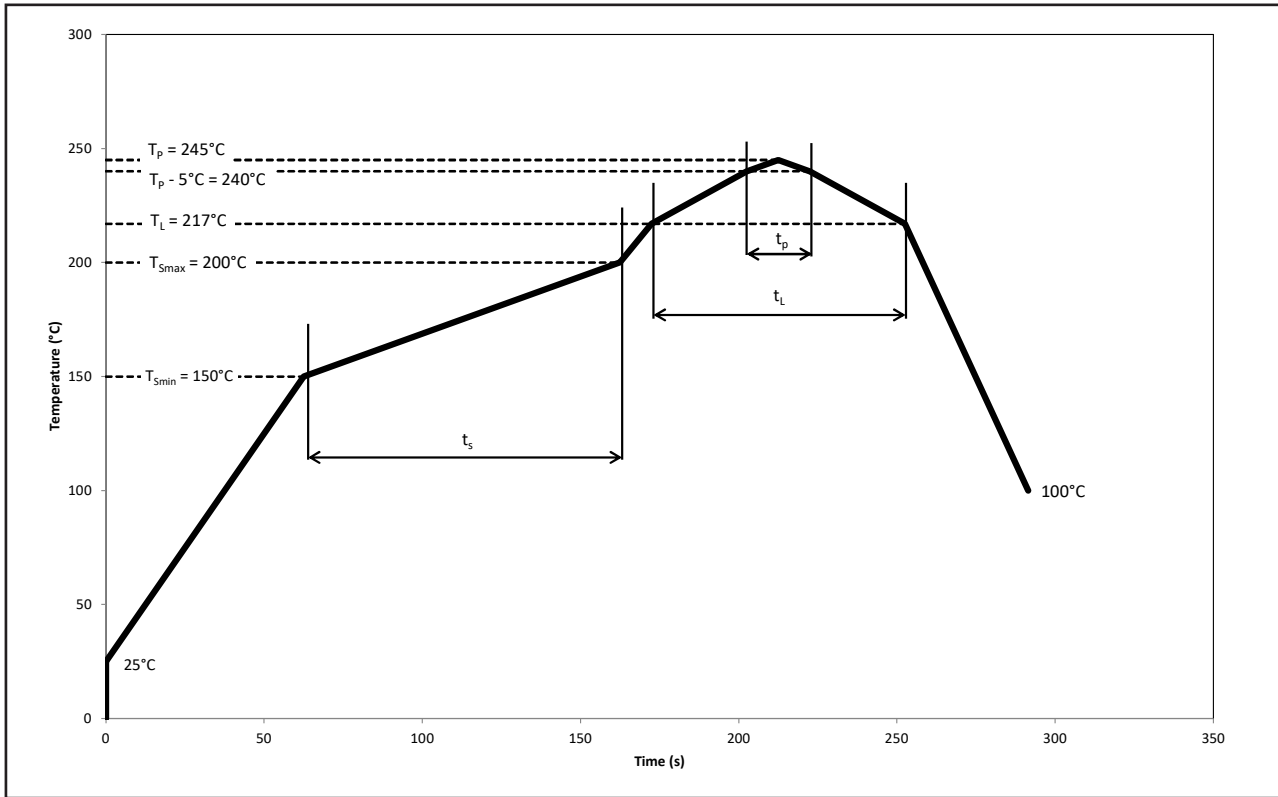
Packaging Specification



Quantity per bag (pcs)	Average 1pc Power Right Angle DomiLED (g)	1 completed bag (g)
1500	0.041	700 ± 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 $T_p - 5^{\circ}\text{C}$	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 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 / $15 \text{ ppm H}_2\text{S}$ / 336 h .
= Stricter than IEC 60068-2-43 (H_2S) [25°C / 75% rh / $10 \text{ ppm H}_2\text{S}$ / 21 days].

Revision History

Page	Subjects	Date of Modification
1, 2, 5, 7, 8, 9, 10, 11	Update Product Photo Update Features Update Peak Pulse Current Update Thermal Resistance Update Graph: Allowable Forward Current Vs Duty Ratio Update Package Outline Update Solder Pad Update Carrier Tape Update Packaging Specification	02 Oct 2019
7	Update Package Outline	26 Nov 2019
1, 7, 9, 11, 12	Update Product Photo Update Package Outline Update Taping & Orientation Update Qty per reel from 1000 to 1500 Update Recommended Pb-free Soldering Profile	30 Sep 2020
2, 3	Add New Partno: D3Y-SKG-N3Q2-4, D3Y-SKG-NP3-3, D3Y-SKG-MN3-2 Not for New Design: D3Y-SKG-NP3-1 Update Yellow Wavelength	12 Oct 2022
11	Update Packaging Specification	19 Feb 2025
7, 8	Update Package Outline Update Recommendation Solder Pad	19 Mar 2026

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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