DOMINANT™
Opto Technologies
Innovating Illumination

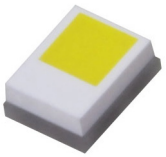
DATA SHEET:

NagaJo 1519

InGaN : JKW-TZHY-VNBN

NagaJo

With continuous driven state of art mindset NagaJo is released to support today's market demand for new performance setting and economical standards. Its compact and robust in design, high efficiency, NagaJo also contributes to weight reduction. The small package outline with enhanced durability, enhanced heat dissipation and superior light performance.



Features:

> Super high brightness surface mount LED automotive exterior applications.
> 120° viewing angle.
> Compact package outline (LxWxH) of 1.5 x 1.9 x 0.79mm.
> Small LES 1.05 x 1.05mm.
> Low thermal resistance, $R_{thJS;}$ 5.3K/W.
> Superior corrosion robustness.
> Compatible to IR reflow soldering.
> Compliance to automotive standard; AEC-Q102.
> Qualified according to JEDEC moisture sensitivity Level 2.
> Environmental friendly; RoHS compliance.

Applications:

> Automotive: Exterior application: eg: Head Lamp - High Beam, Low Beam; Fog Lamp; DRL - Daytime Running Light.

Electrical Characteristics at Tj=25˚C

Part	Color	Viewing Angle˚	Luminous Flux @ 1A (lm) Appx. 1.2		
			Min.	Typ.	Max.
JKW-TZHY-9ZEB-VNBN	White	120	395.0	450.0	500.0
● JKW-TZHY-7ZEA-VNBN	White	120	347.0	410.0	450.0

● Not for new design

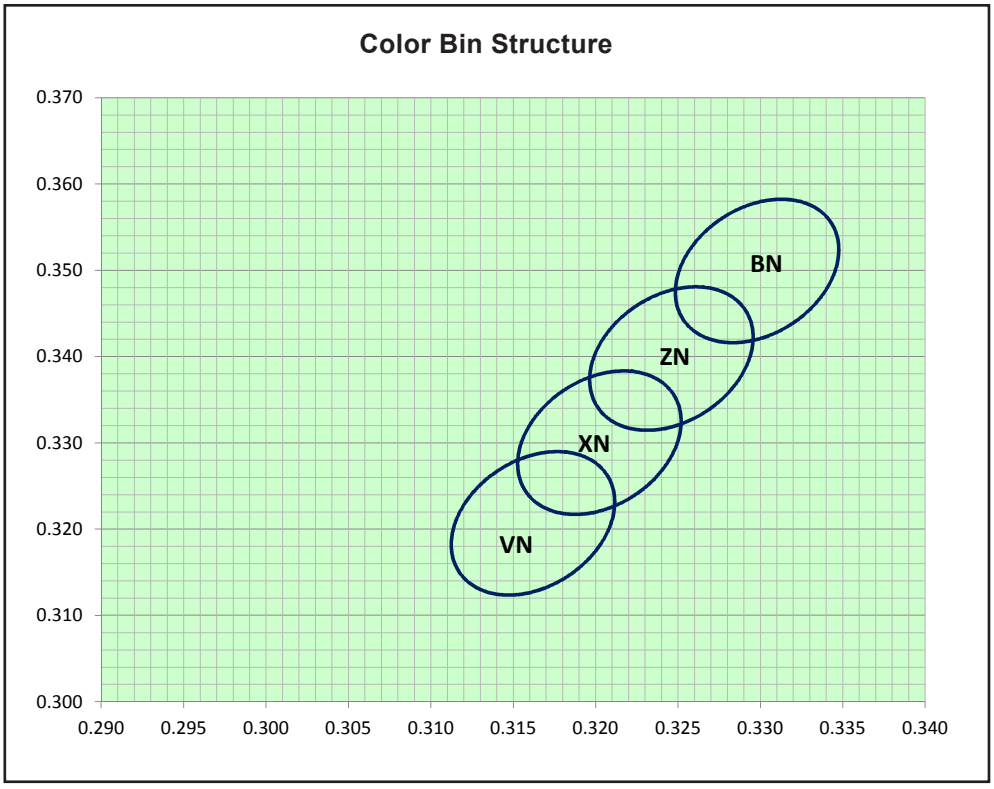
Electrical Characteristics at Tj=25˚C

Part Number	Vf @ If = 1A Appx. 3.1		
	Min. (V)	Typ. (V)	Max. (V)
JKW-TZHY	2.90	3.15	3.50

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	1.5	A
Peak pulse current; (Ts=55 ˚C, tp ≤ 100µs, Duty cycle = 0.03)	3	A
Reverse voltage; Ir_{max} = 10µA	Not for Reverse Bias	V
ESD threshold (HBM)	8	kV
LED junction temperature	150	˚C
Operating temperature	-40 … +135	˚C
Storage temperature	-40 … +135	˚C
Thermal resistance (Rated current = 1A, Ts=25˚C) - Real Thermal Resistance Junction / solder point, $R_{th\ JS\ real}$ (typ = 5.3)	6.8	K/W
- Electrical Thermal Resistance Junction / solder point, $R_{th\ JS\ el}$ (typ = 3.5)	4.5	K/W

Color Grouping *Appx. 2.1*



Bin	Ellipse	x	y	a	b	Θ °
BN	5 Step	0.3298	0.3499	0.0085	0.00463	75.57
ZN	5 Step	0.3246	0.3398	0.0085	0.00463	75.57
XN	5 Step	0.3202	0.3300	0.0085	0.00463	75.57
VN	5 Step	0.3162	0.3207	0.0085	0.00463	75.57

InGaN wavelength is very sensitive to drive current. Operating at lower current is not recommended and may yield unpredictable performance current pulsing should be used for dimming purposed.

Luminous Flux Group at Tj=25˚C

Brightness Group	Luminous Flux *Appx. 1.2* (lm)
7Z	347.0 ... 370.0
8Z	370.0 ... 395.0
9Z	395.0 ... 422.0
EA	422.0 ... 450.0
FA	450.0 ... 474.0
EB	474.0 ... 500.0

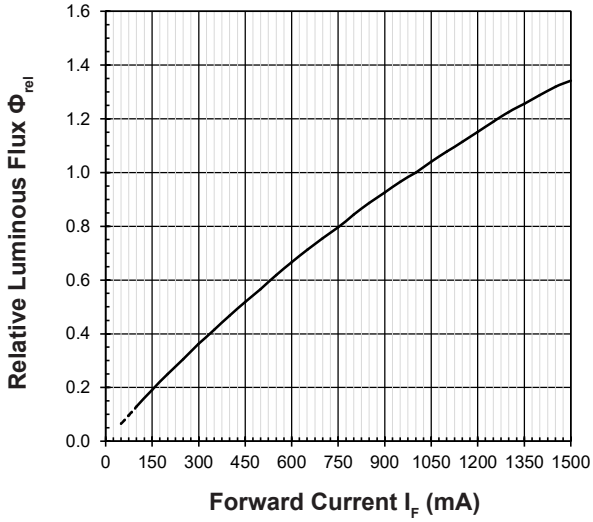
Vf Bining (Optional)

Vf Bin @ 1A	Forward Voltage (V) *Appx. 3.1*
VD8	2.90 ... 3.10
VD9	3.10 ... 3.30
VE1	3.30 ... 3.50

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

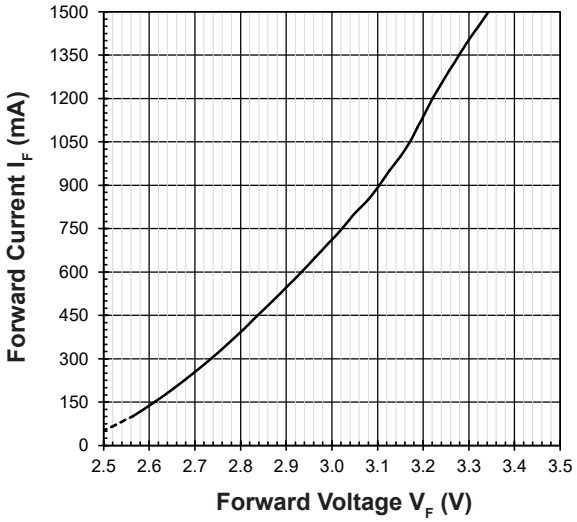
Relative Luminous Flux Vs Forward Current *Appx. 4.1*

$\Phi_V/\Phi_V(1A) = f(I_F)$; $T_j = 25°C$



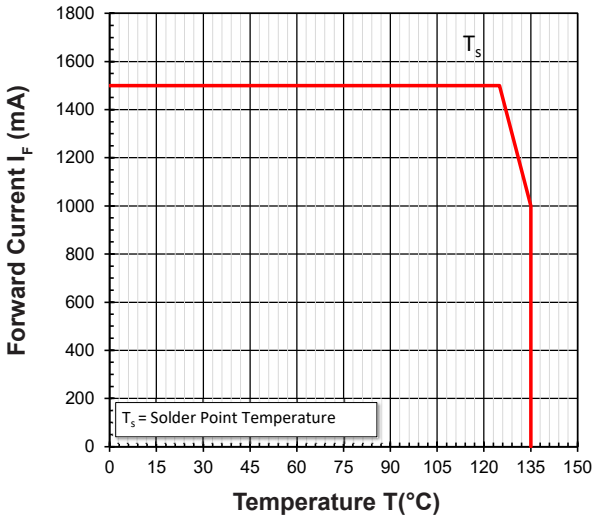
Forward Current Vs Forward Voltage *Appx. 4.1*

$I_F = f(V_F)$; $T_j = 25°C$



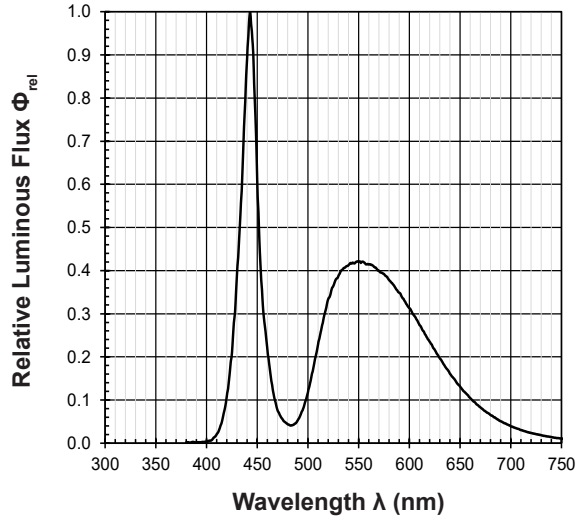
Maximum Current Vs Temperature

$I_F=f(T)$



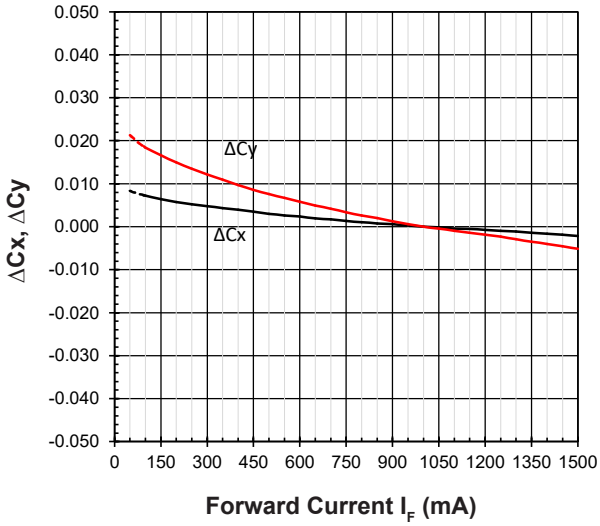
Relative Spectral Emission *Appx. 4.1*

$\Phi_{rel} = f(\lambda)$; $T_j = 25°C$; $I_F = 1A$



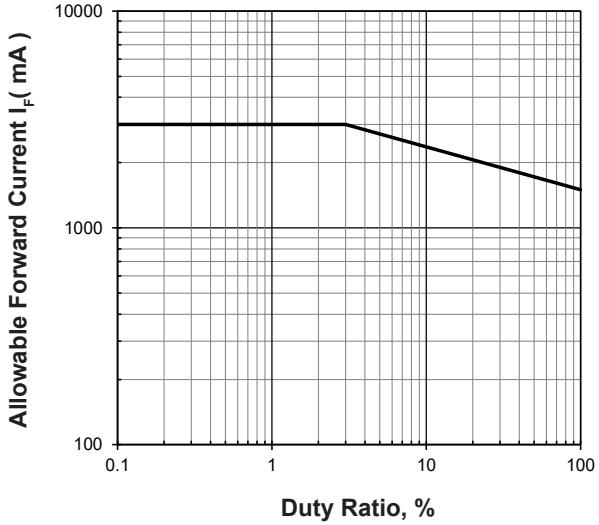
Chromaticity Coordinate Shift Vs Forward Current *Appx. 4.1*

$\Delta Cx, \Delta Cy = f(I_F)$; $T_j = 25°C$

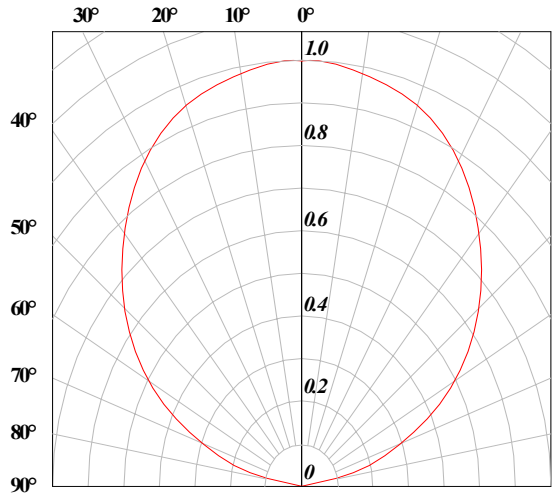


Allowable Forward Current Vs Duty Ratio

(T_s= 55°C; $t_p \leq 100\mu s$)

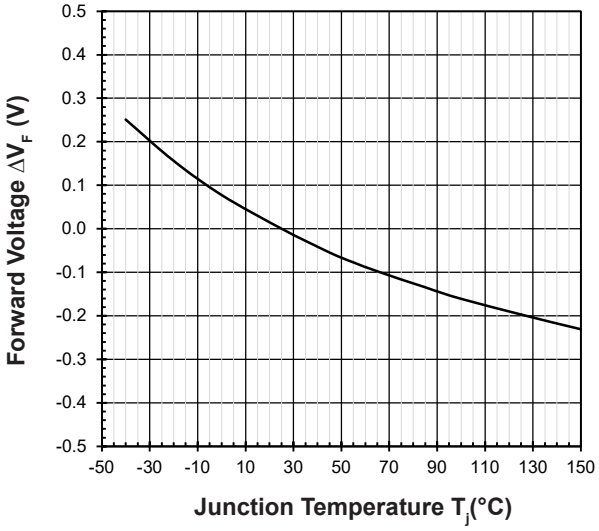


Radiation Pattern *Appx. 4.1*



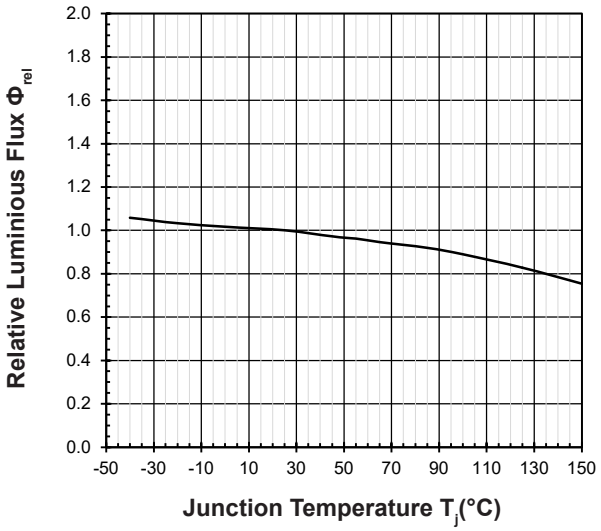
Forward Voltage Vs Junction Temperature *Appx. 4.1*

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =1A



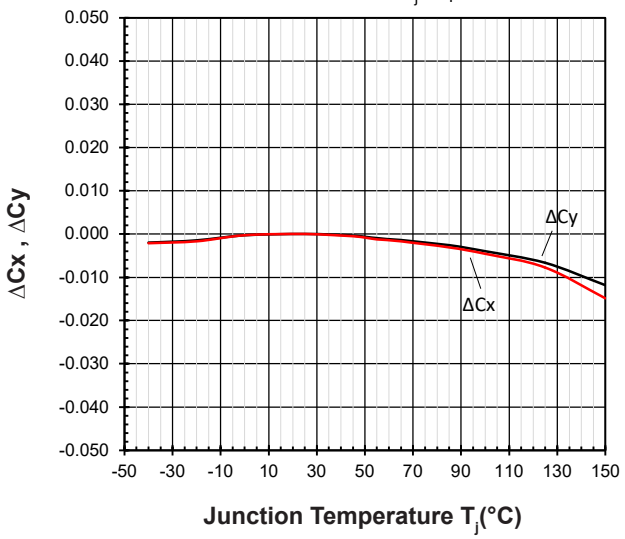
Relative Luminous Flux Vs Junction Temperature *Appx. 4.1*

$\Phi V/\Phi V(25°C) = f(T_j)$; I_F = 1A

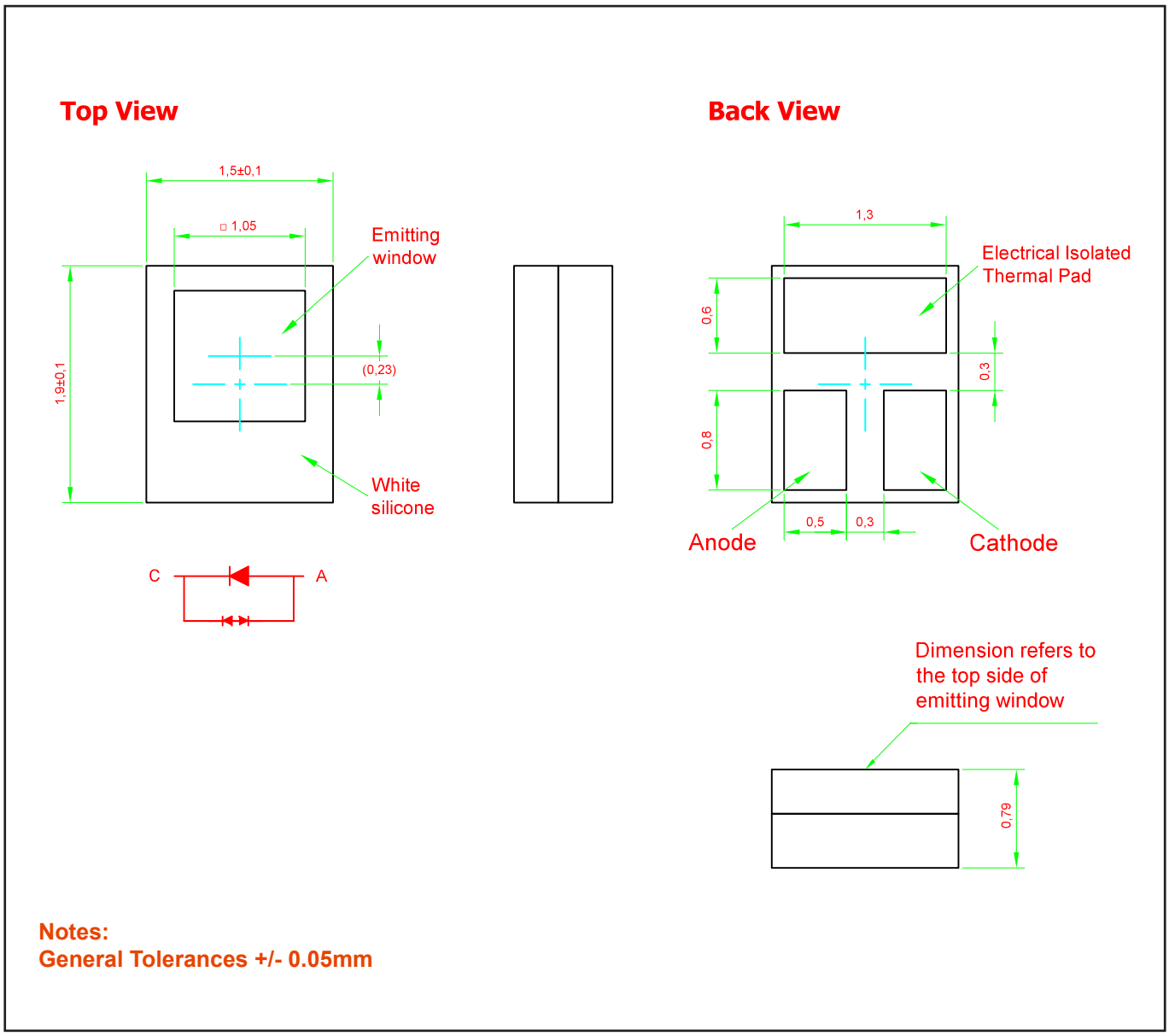


Chromaticity Coordinate Shift Vs Junction Temperature *Appx. 4.1*

$\Delta Cx, \Delta Cy = f(T_j)$; I_F = 1A



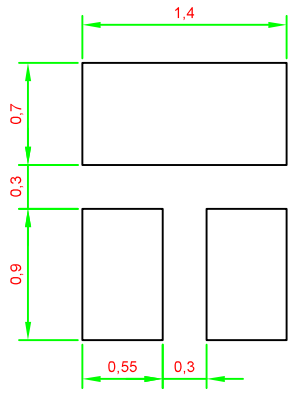
NagaJo 1519 InGaN : JKW-TZHY-VNBN Package Outlines *Appx. 5.1*



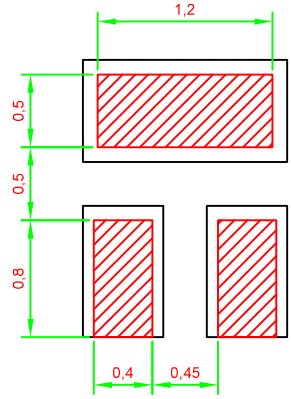
Material

	Material
Substrate	Ceramic
Encapsulant	Silicone Resin
Soldering Surface	Au Plating

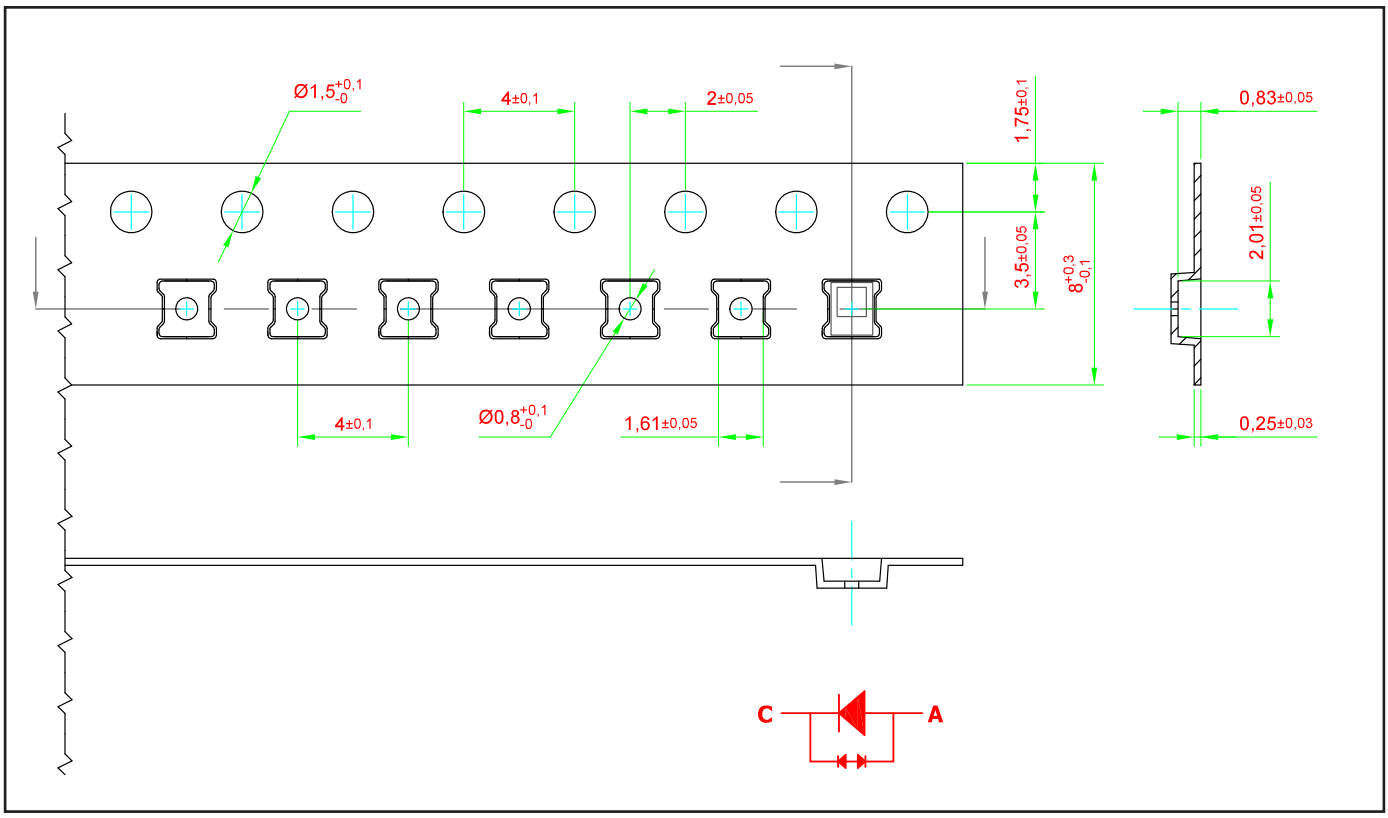
Recommended Solder Pad *Appx. 5.1*



Recommended Solder Stencil Design *Appx. 5.1*

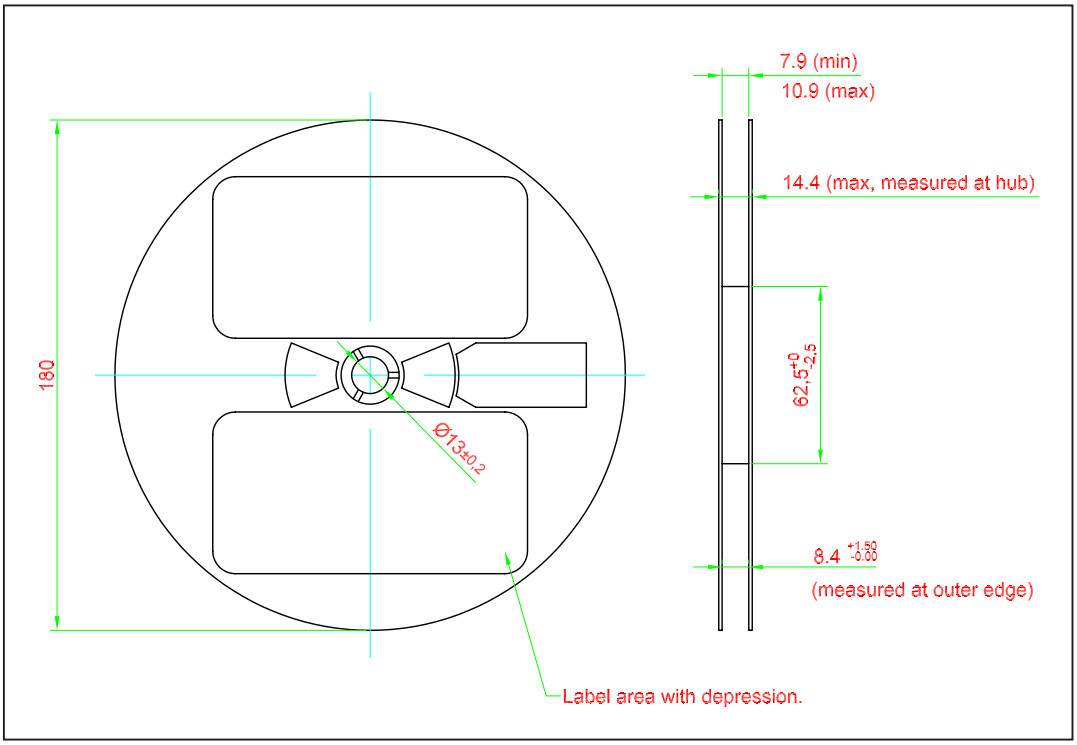


Taping and orientation *Appx. 5.1*



Notes:
Please refer to DOMINANT LED Handling Procedure‘s application note for additional information.

Packaging Specification

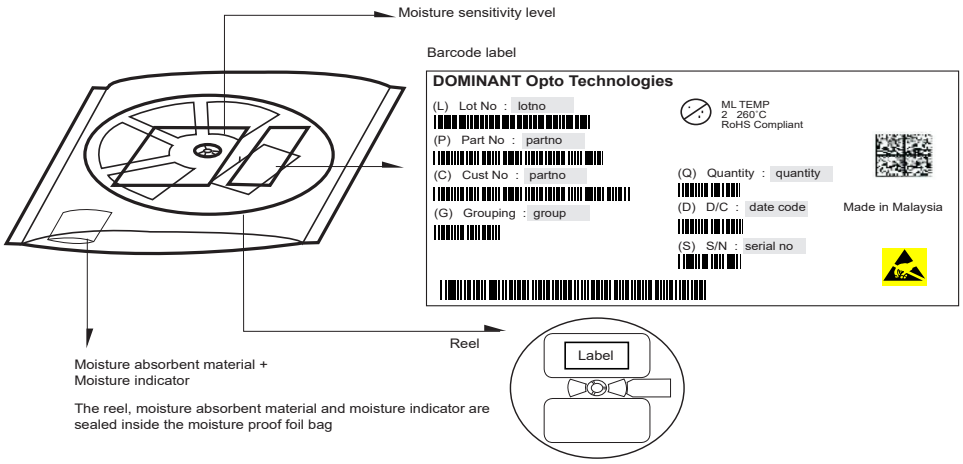


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	4500	JKW-TZHY-xxx-xxxx

Notes:

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

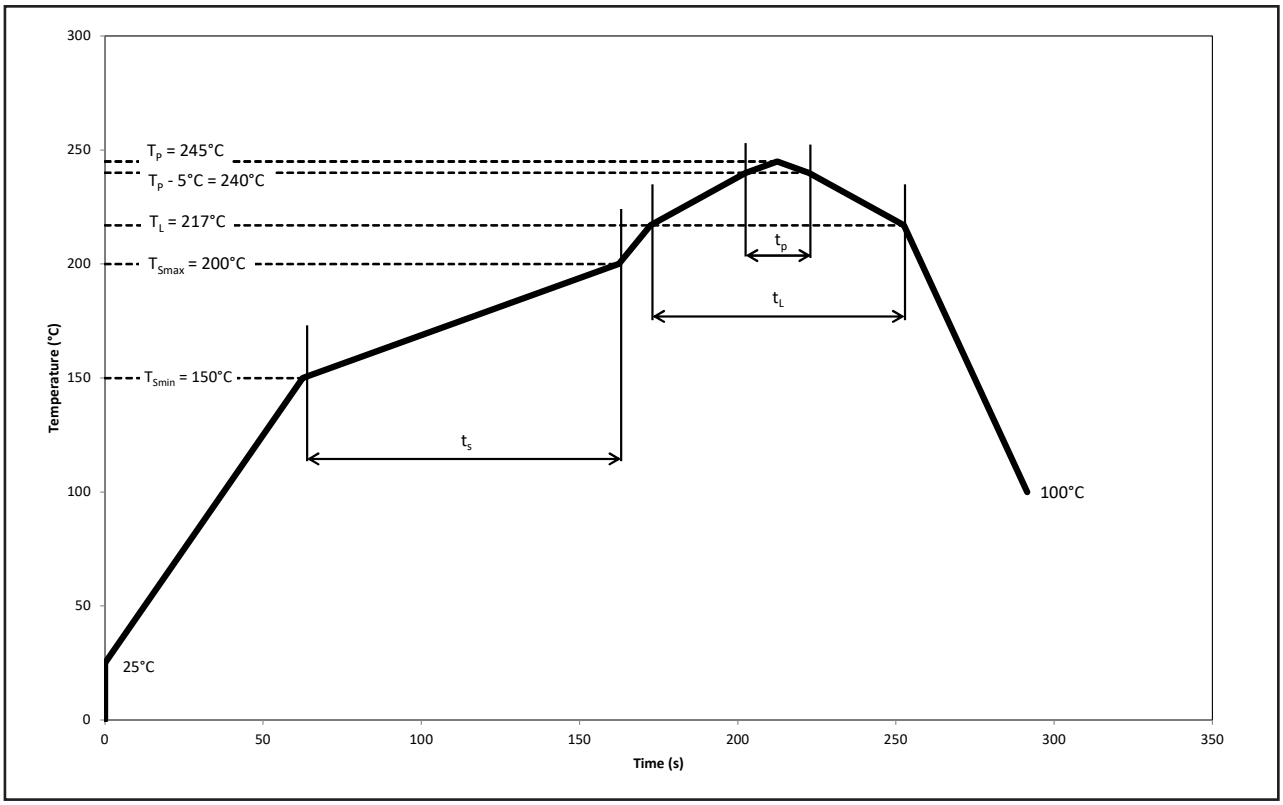
Packaging Specification



Quantity per bag (pcs)	Average 1pc NagaJo 1519 (g)	1 completed bag (g)
4500	0.0072	120 ± 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 1 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 1 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 1 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 1 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 1 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 1 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 In the drawing, normally the tolerances used are at ± 0.1 with the dimension measurement unit in mm.

Revision History

Page	Subjects	Date of Modification
-	Initial Release	04 Apr 2023
2, 6	Update Typ Flux Update Graph	08 Jun 2023
7	Add Info in Package Outline	12 Sep 2023
2, 11	Add New Part No: JKW-TZHY-9ZEB-VNBN Not for New Design: JKW-TZHY-7ZEA-VNBN Update Packaging Specification	14 Mar 2024
2, 5	Update Operating and Storage Temperature Update Graph: Maximum Current Vs Temperature	13 Sep 2024
5	Update Graph: Relative Lumionous Flux Vs Forward Current Forward Current Vs Forward Voltage Chromaticity Coordinate Shift Vs Forward Current	03 Jan 2025
2, 5	Update Typical Brightness for JKW-TZHY-9ZEB-VNBN Update Typical Voltage: 3.25V to 3.15V Update Graph: Forward Current Vs Forward Voltage	14 Jul 2025

NOTE

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

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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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