DOMINANT™
Opto Technologies
Innovating Illumination

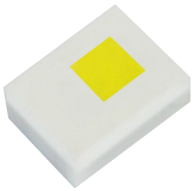
DATA SHEET:

NagaJo 1216

InGaN : JEW-EZHY-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 1.2 X 1.6 X 0.79mm.
> Small LES 0.55 x 0.55mm.
> Low thermal resistance, $R_{thJS;}$ 21K/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; DRL - Daytime Running Light.

Electrical Characteristics at Tj=25˚C

Part Ordering Number	Color	Viewing Angle˚	Luminous Flux @ 150mA (lm) Appx. 1.2		
			Min.	Typ.	Max.
JEW-EZHY-RS3-VNBN	White	120	39.8	51.7	67.2
JEW-EZHY-RS9-VNBN	White	120	42.5	55.4	72.0

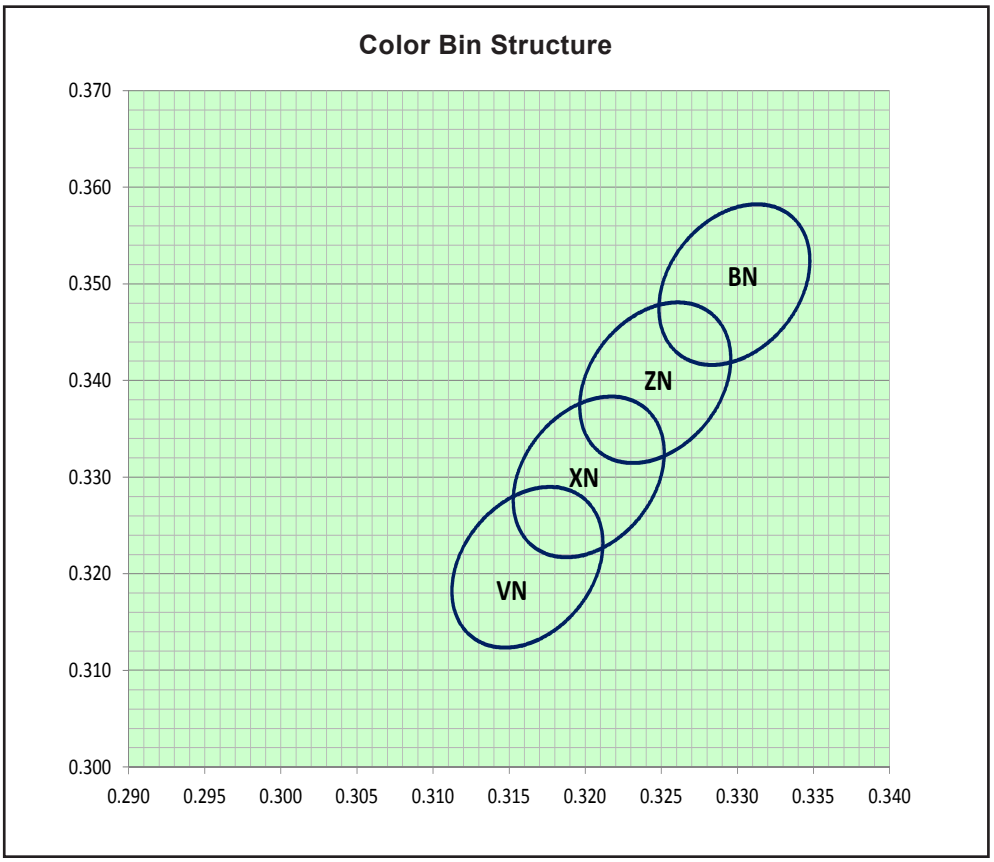
Electrical Characteristics at Tj=25˚C

Part Number	Vf @ If = 150mA Appx. 3.1		
	Min. (V)	Typ. (V)	Max. (V)
JEW-EZHY	2.80	3.25	3.60

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	300	mA
Peak pulse current; (T_s=55°C, tp ≤ 100µs, Duty cycle = 0.03)	500	mA
Reverse voltage	Not for Reverse Bias	V
ESD threshold (HBM)	8	kV
LED junction temperature	150	˚C
Operating temperature	-40 … +125	˚C
Storage temperature	-40 … +125	˚C
Thermal resistance (Rated current = 150mA, Ts=25˚C) - Real Thermal Resistance Junction / solder point, $R_{th\ JS\ real}$ (typ = 19) - Electrical Thermal Resistance Junction / solder point, $R_{th\ JS\ el}$ (typ = 13) (Mounting on DOMINANT standard PCB)	 25 20	 K/W 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)
R2	39.8 ... 45.2
R3	45.2 ... 51.7
S2	51.7 ... 59.0
S3	59.0 ... 67.2
Brightness Group	**Luminous Flux *Appx. 1.2* (lm)**
R8	42.5 ... 48.5
R9	48.5 ... 55.4
S8	55.4 ... 63.0
S9	63.0 ... 72.0

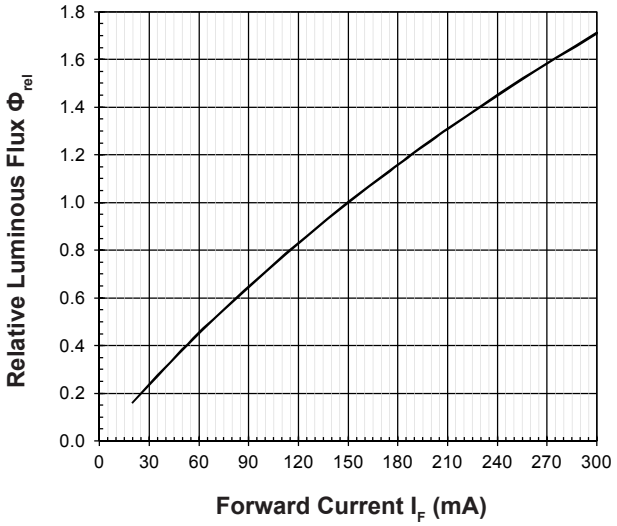
Vf Bining (Optional)

Vf Bin @ 150mA	Forward Voltage (V) *Appx. 3.1*
VH8	2.80 ... 3.00
VH9	3.00 ... 3.20
VJ1	3.20 ... 3.40
VJ2	3.40 ... 3.60

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

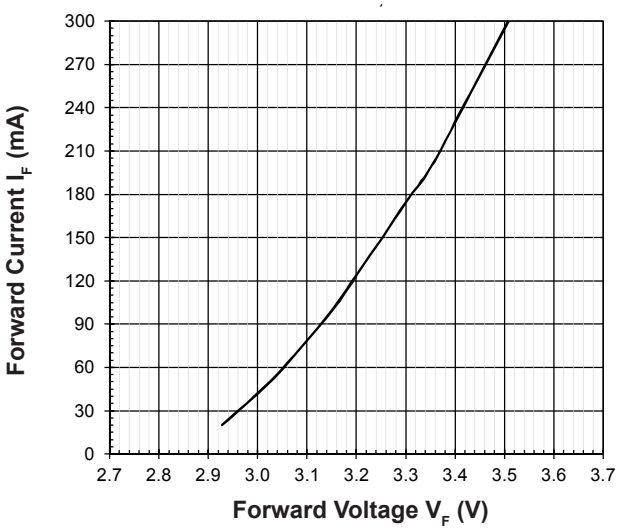
Relative Luminous Flux Vs Forward Current

$\Phi_V/\Phi_V(150mA) = f(I_F); T_j = 25°C$



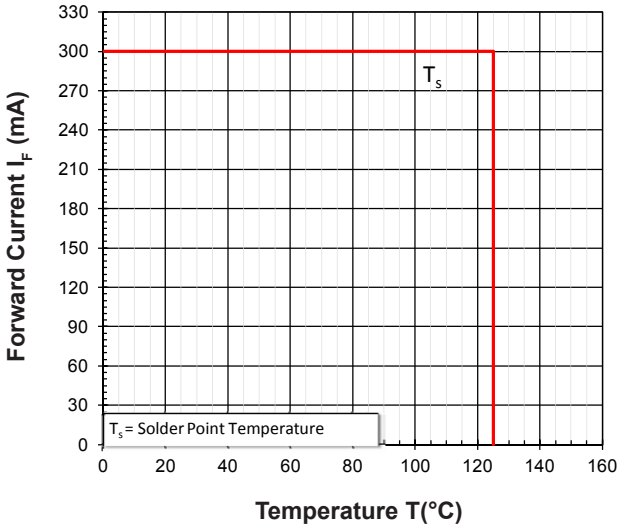
Forward Current Vs Forward Voltage

$I_F = f(V_F); T_j = 25°C$



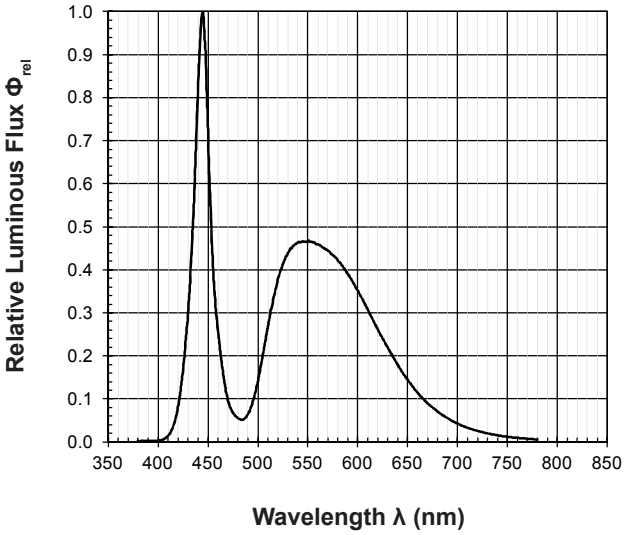
Maximum Current Vs Temperature

$I_F=f(T)$



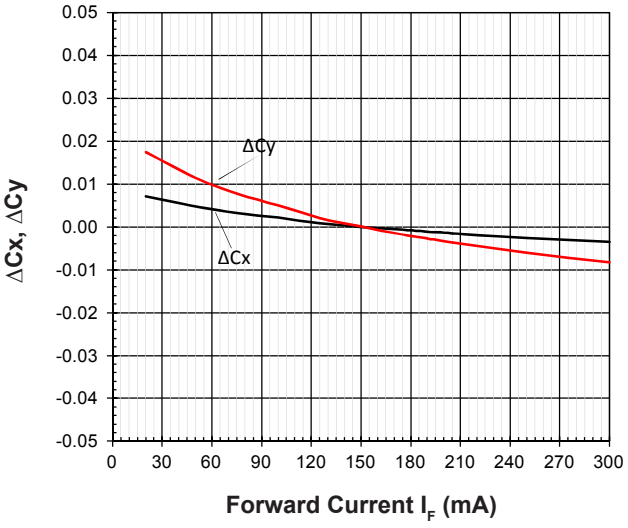
Relative Spectral Emission

$\Phi_{rel} = f(\lambda); T_j = 25°C; I_F = 150mA$



Chromaticity Coordinate Shift Vs Forward Current

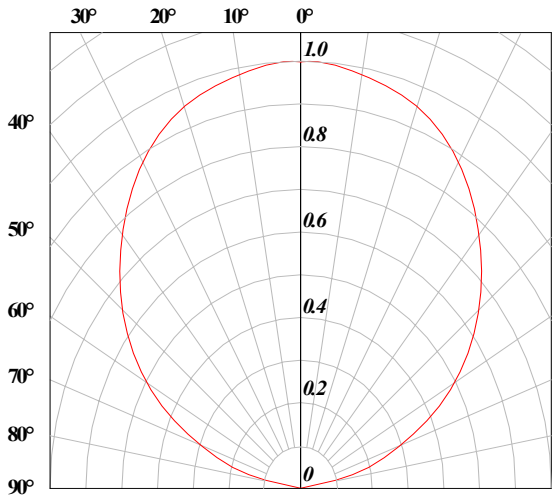
$\Delta Cx, \Delta Cy = f(I_F); T_j = 25°C$



Allowable Forward Current Vs Duty Ratio

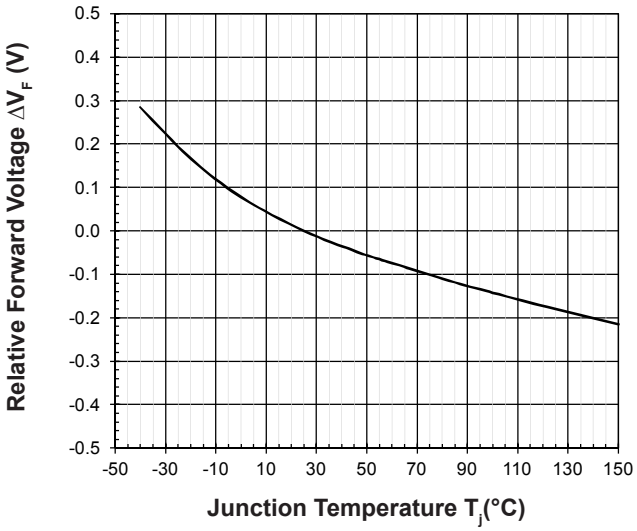
($T_s = 55°C; t_p \leq 100\mu s$)

Radiation Pattern



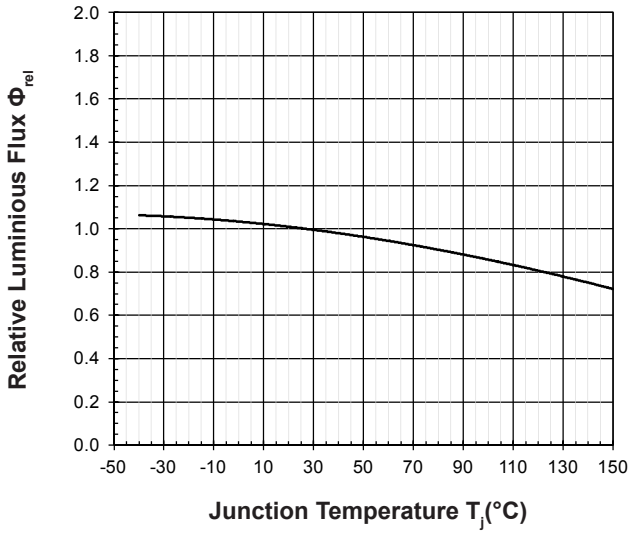
Relative Forward Voltage Vs Junction Temperature

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =150mA



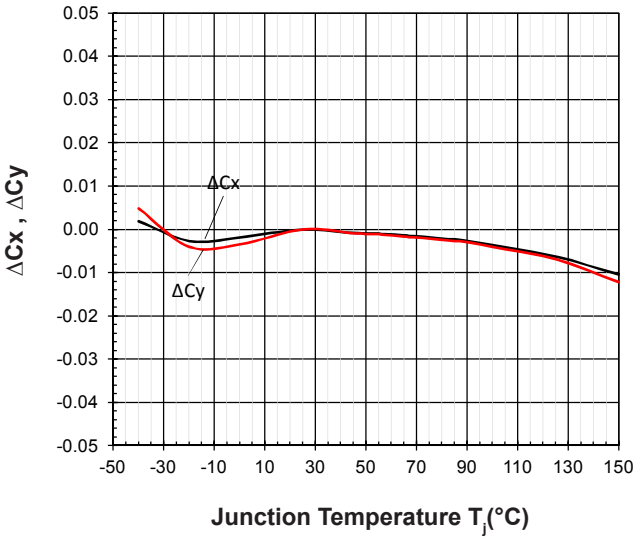
Relative Luminious Flux Vs Junction Temperature

$\Phi V/\Phi V(25°C) = f(T_j)$; I_F = 150mA

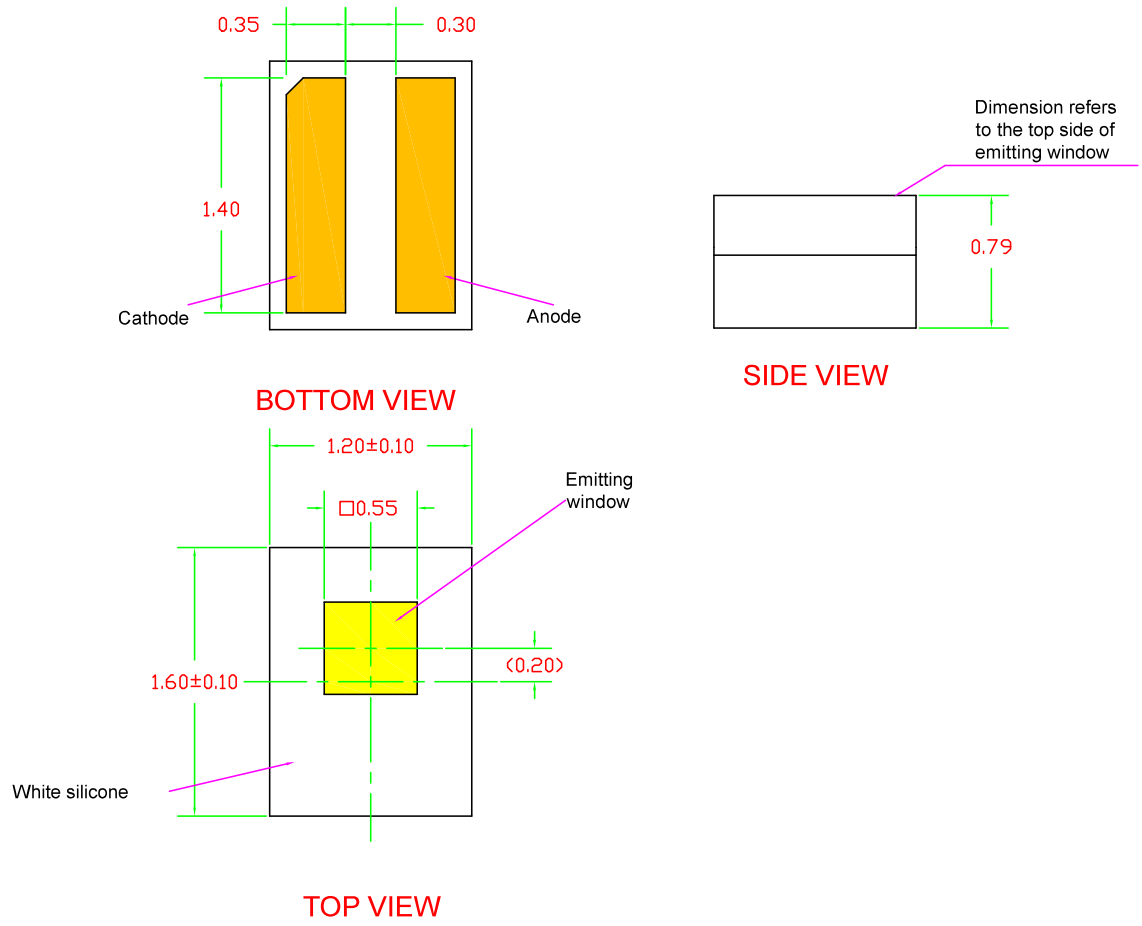


Chromaticity Coordinate Shift Vs Junction Temperature

$\Delta Cx, \Delta Cy = f(T_j)$; I_F = 150mA



NagaJo 1216 InGaN : JEW-EZHY-VNBN Package Outlines



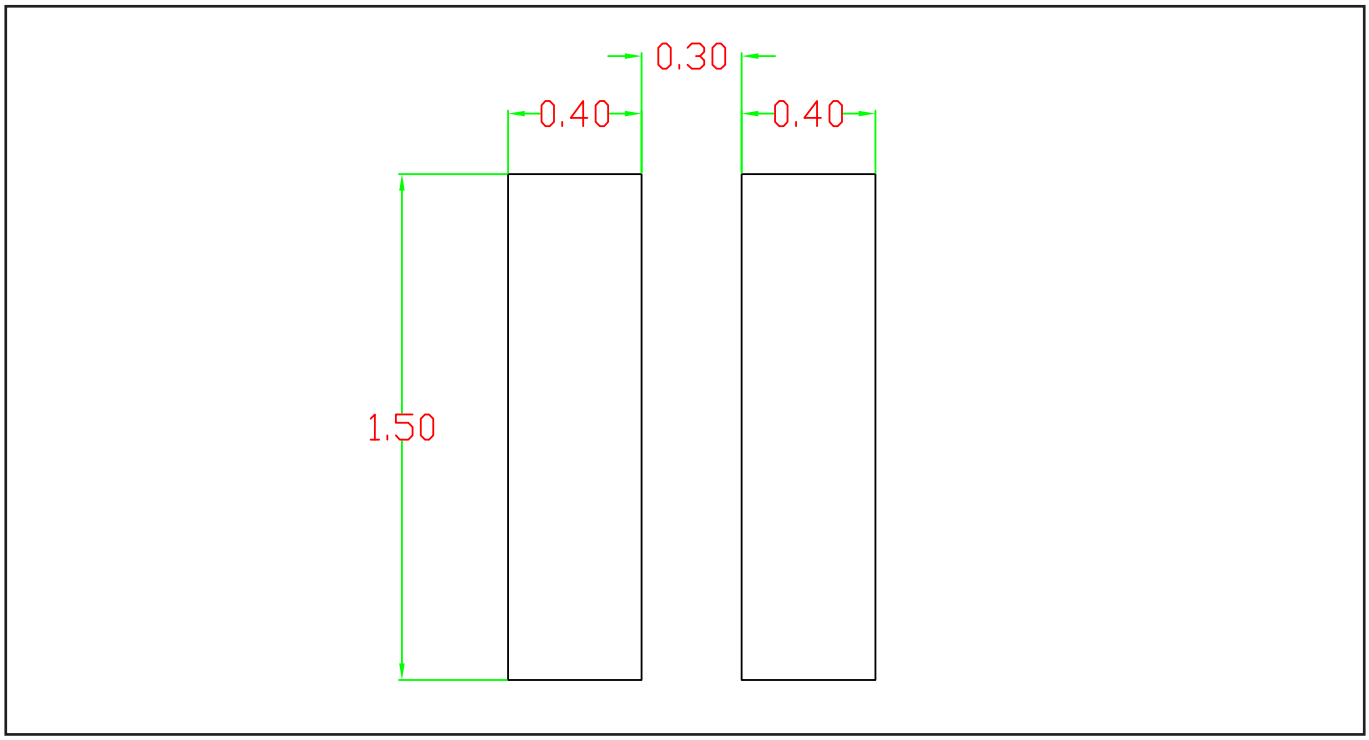
Notes:
General Tolerances +/- 0.05mm

Material

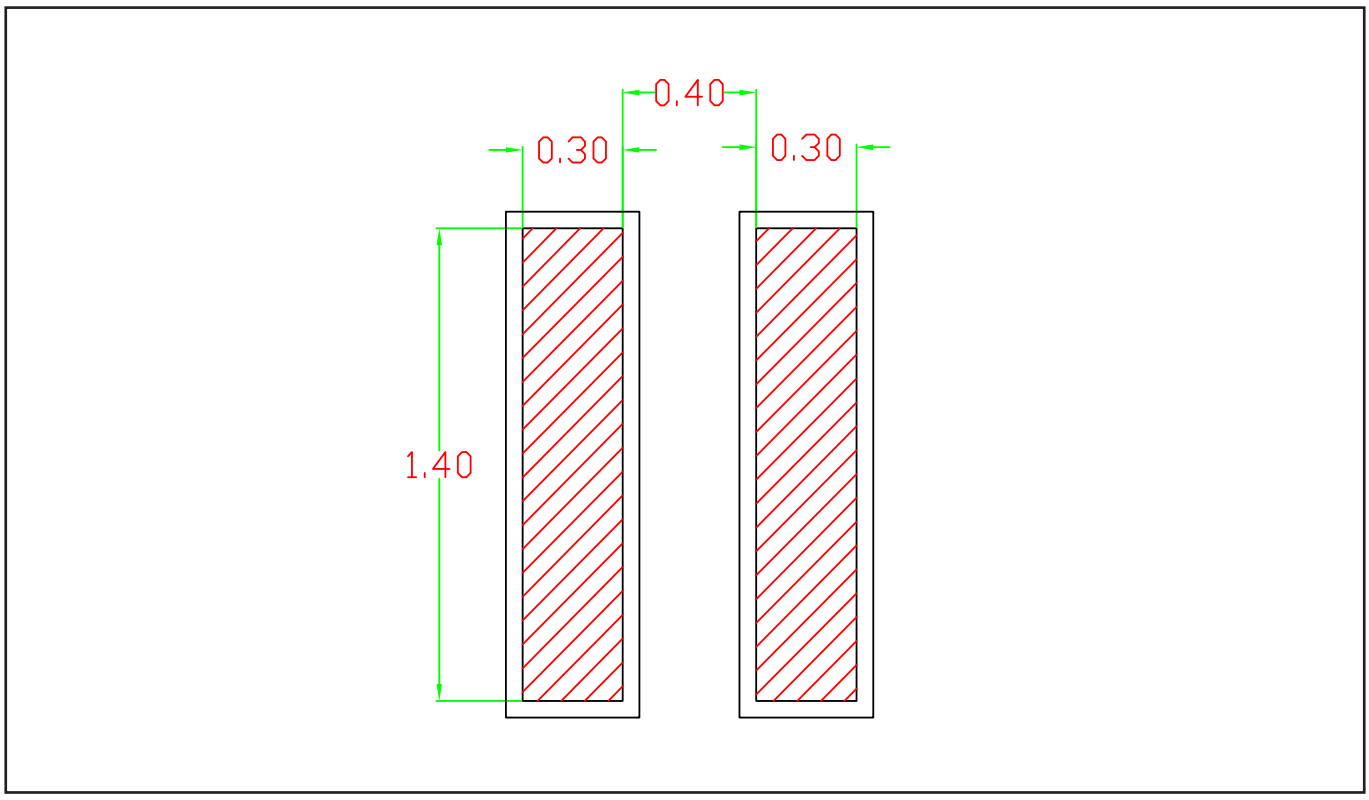
	Material
Substrate	Ceramic
Encapsulant	Silicone
Soldering Surface	Au Plating

Note: product is Pb free

Recommended Solder Pad

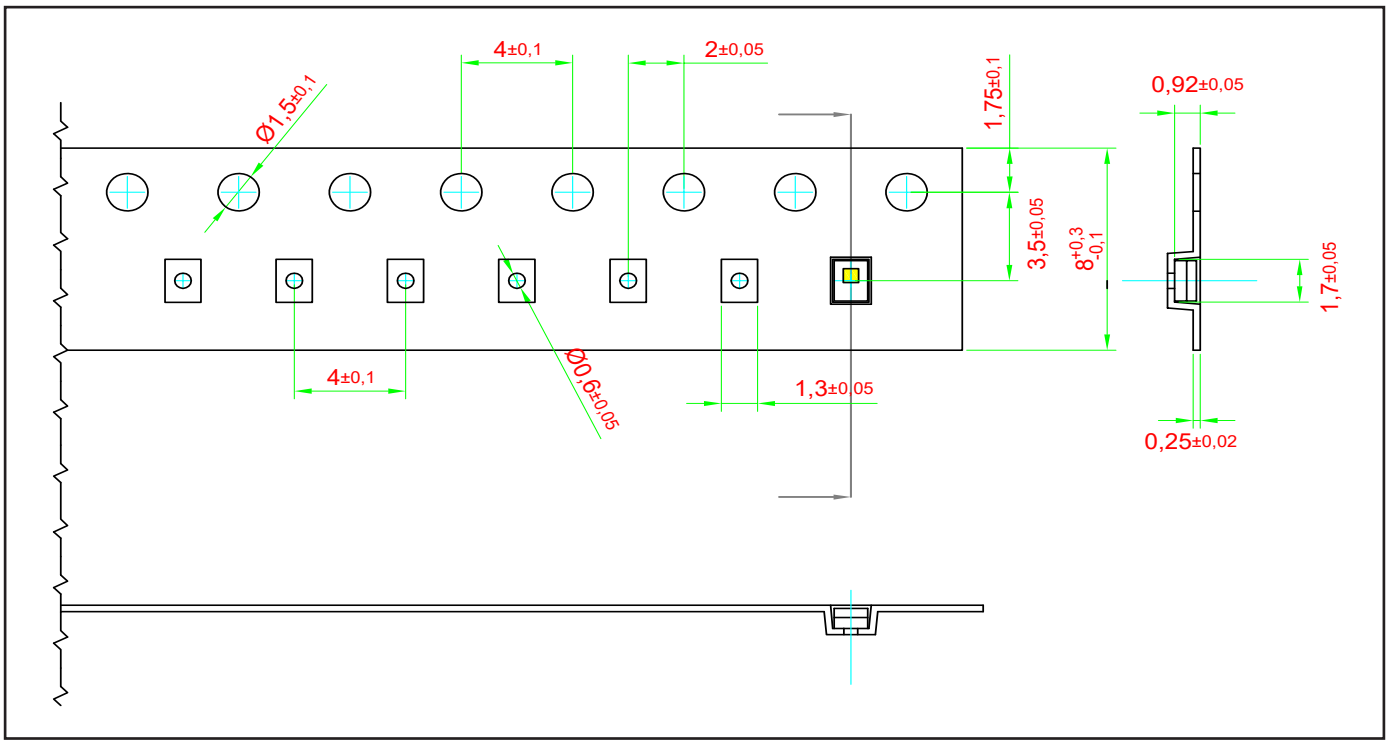


Recommended Solder Stencil Design



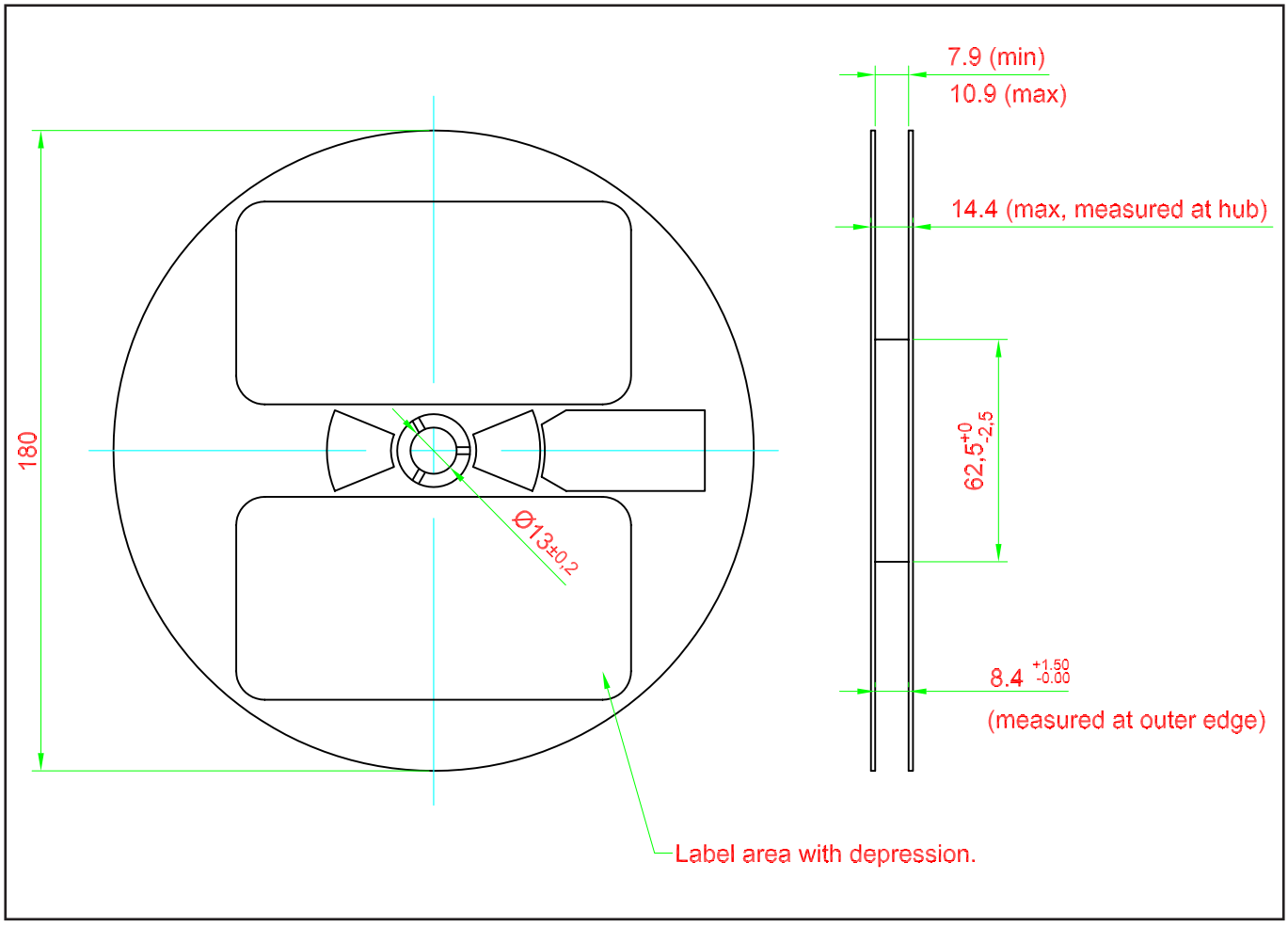
Taping and orientation

- Reels come in quantity of 2000 units.
- Reel diameter is 180 mm.

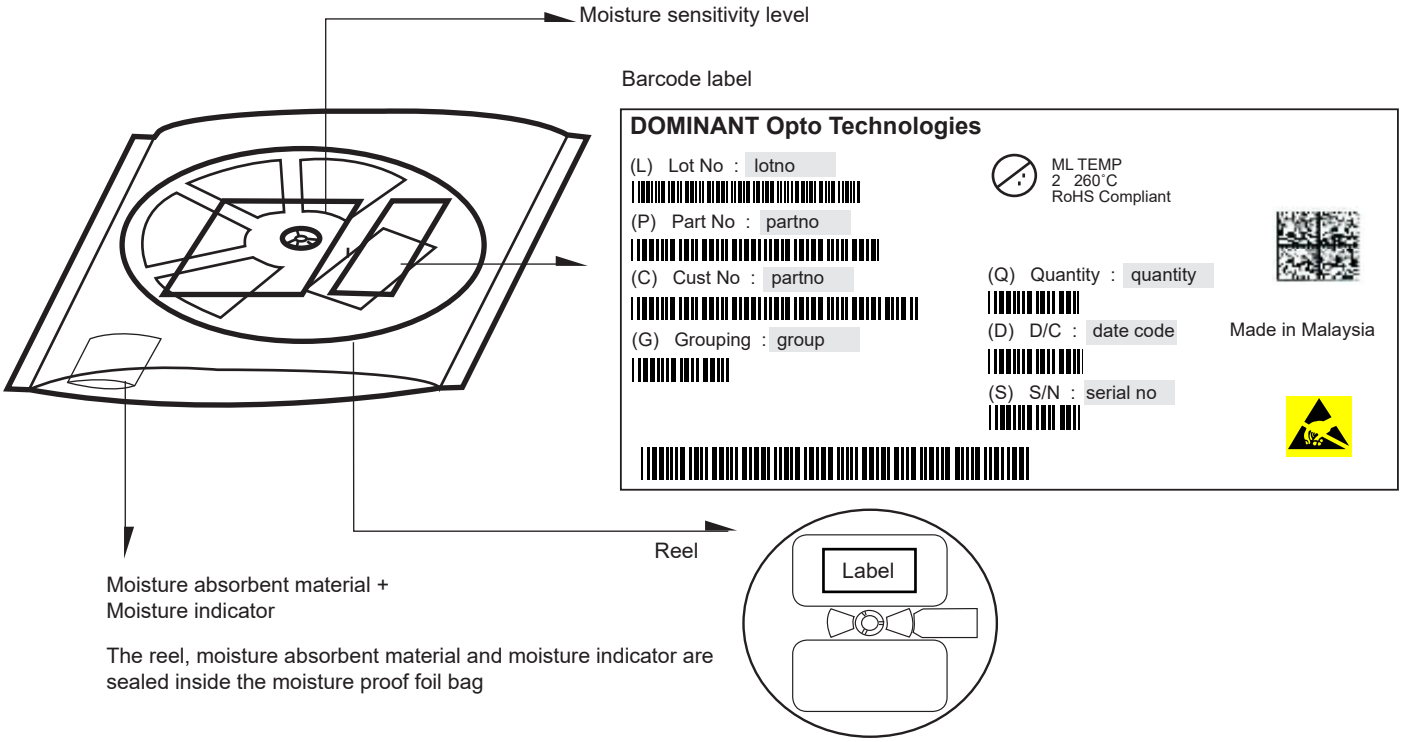


Notes:
Please refer to DOMINANT LED Handling Procedure's application note for additional information.

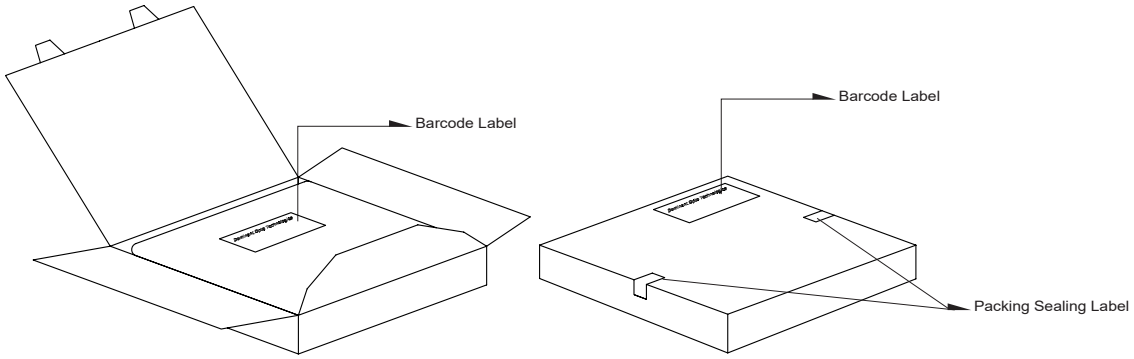
Packaging Specification



Packaging Specification



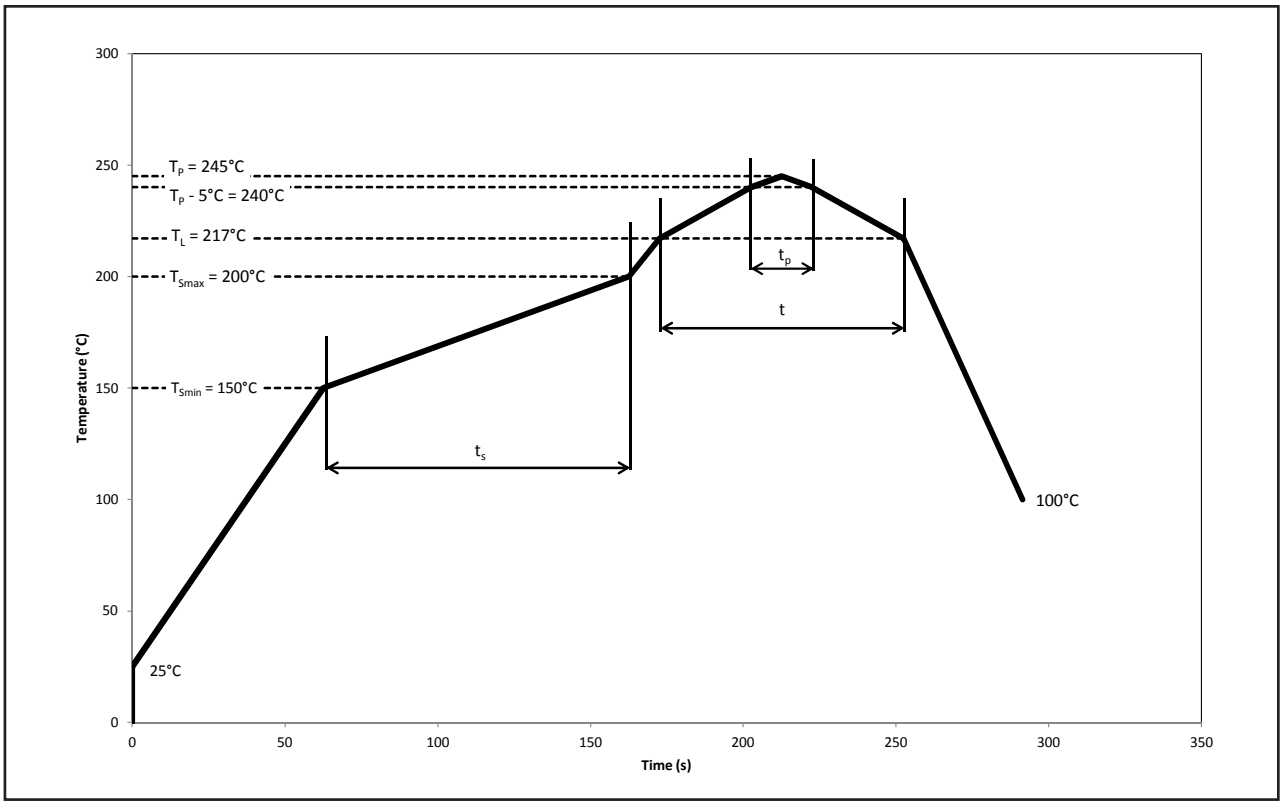
	Average 1pc NagaJo 1216	1 completed bag (2000 pcs)
Weight (gram)	**0.0048**	**175 ± 10**



Dimensions (mm)	
Packing Box	**210 x 210 x 16**

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	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.

Revision History

Page	Subjects	Date of Modification
-	Initial Release	12 Jul 2019
11, 12	Update Package Specification Update Recommended Pb-free Soldering Profile	23 Feb 2022

NOTE

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