

## Primax

Synonymous with function and performance, enter the Primax, the new era of high intensity illumination in LED. With its high flux output and high luminous intensity, Primax transcends today LED lightings technology and how we perceive it. The small package outline (3.7 x 3.5 x 0.8 mm) and high intensity make it an ideal choice for backlighting, signage, exterior automotive lighting and decorative lighting.



## Features:

- > Super high brightness surface mount LED
- > 120° viewing angle.
- > Compact package outline (LxW) of 3.7 x 3.5 mm.
- > Ultra low height profile - 0.8mm.
- > Low thermal resistance.
- > Compatible to IR reflow soldering.
- > Environmental friendly; RoHS compliance.
- > Superior corrosion resistance.
- > Compliance to automotive standard; AEC-Q102.



## Applications:

- > Automotive: Exterior application: eg: Turn Indicator, Signal Lighting.

### Optical Characteristics at Tj=25°C

Part Number	Color	Viewing Angle°	Luminous Flux @ 150mA (lm) <small>Appx. 1.2</small>		
			Min.	Typ.	Max.
MAZY-SZHG-P3R-1	InGaN Yellow	120	26.8	34.8	51.7
● MAZY-SZHG-N3Q-1	InGaN Yellow	120	20.6	30.6	39.8

● Not for new design.

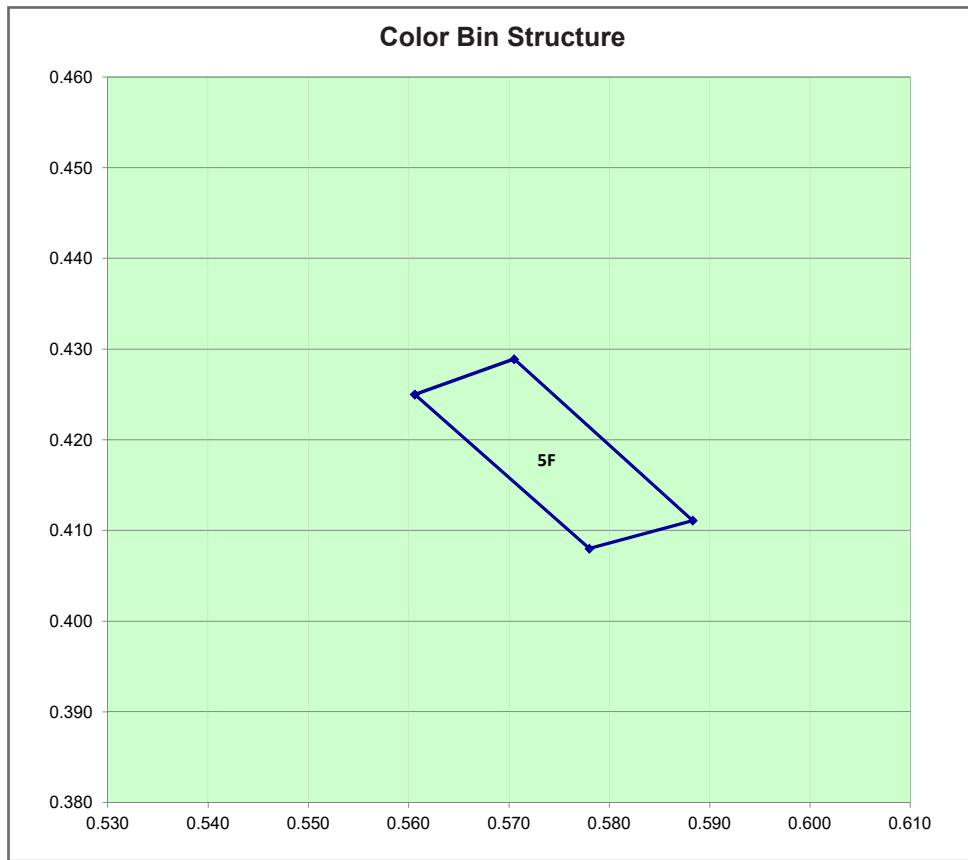
### Electrical Characteristics at Tj=25°C

Part Number	Vf @ If = 150mA <small>Appx. 3.1</small>		
	Min. (V)	Typ. (V)	Max. (V)
MAZY-SZHG	2.90	3.25	3.45

### Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	200	mA
Peak pulse current (Ts = 55°C, tp ≤ 100µs, Duty cycle = 0.03)	300	mA
Reverse voltage	Not designed 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 <sub>th JS real</sub> (typ = 35)	45	K/W
- Electrical Thermal Resistance		
Junction / solder point, R <sub>th JS el</sub> (typ = 25)	30	K/W

**MAZY-SZHG, Color Grouping** *Appx. 2.1*



Bin		1	2	3	4
5F	Cx	0.5606	0.5705	0.5883	0.5780
	Cy	0.4250	0.4289	0.4111	0.4080

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 purposes.

**Luminous Intensity Group at Tj=25°C**

Brightness Group	Luminous Flux (lm) <i>Appx. 1.2</i>
N3	20.6 ... 23.5
P2	23.5 ... 26.8
P3	26.8 ... 30.6
Q2	30.6 ... 34.8
Q3	34.8 ... 39.8
R2	39.8 ... 45.2
R3	45.2 ... 51.7

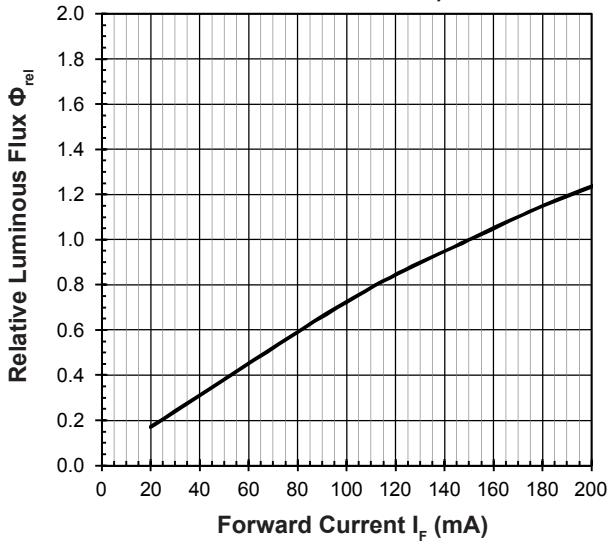
**Vf Binning (Optional)**

Vf Bin @ 150mA	Forward Voltage (V) <i>Appx. 3.1</i>
VM6	2.7 ... 3.0
VM7	3.0 ... 3.3
VM8	3.3 ... 3.6

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

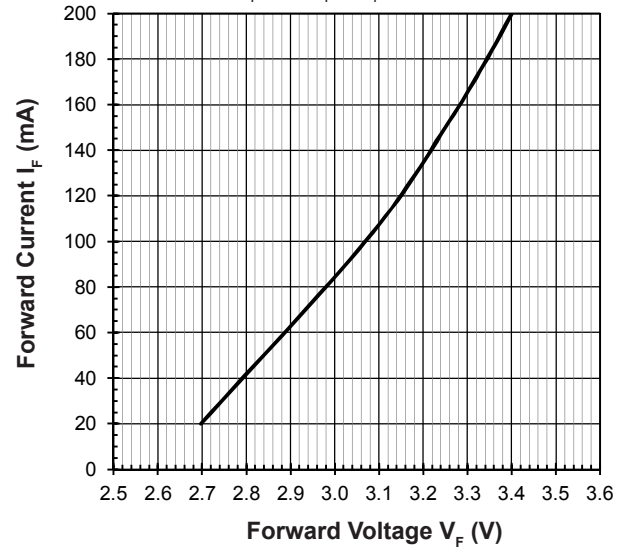
**Relative Luminous Flux Vs Forward Current**

$\Phi_v/\Phi_v(150\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$



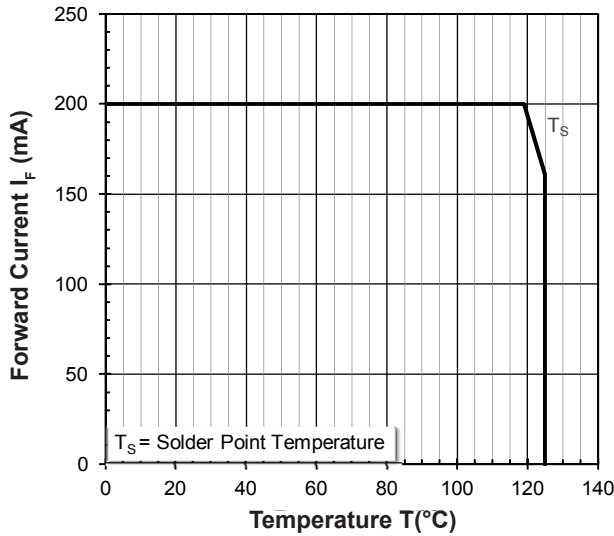
**Forward Current Vs Forward Voltage**

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



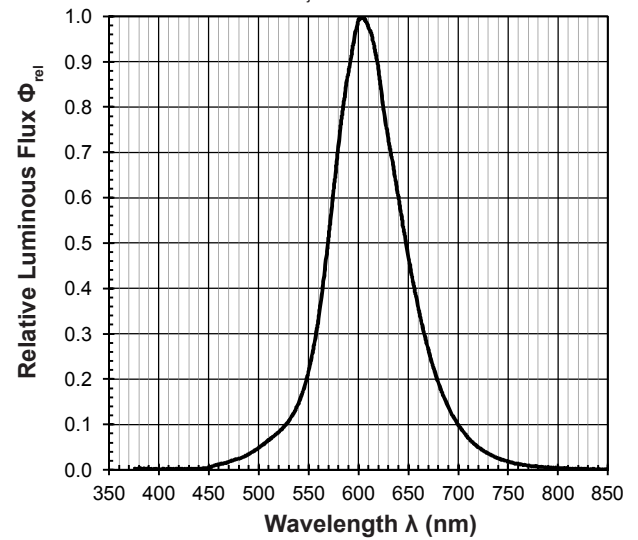
**Maximum Current Vs Temperature**

$I_F = f(T)$



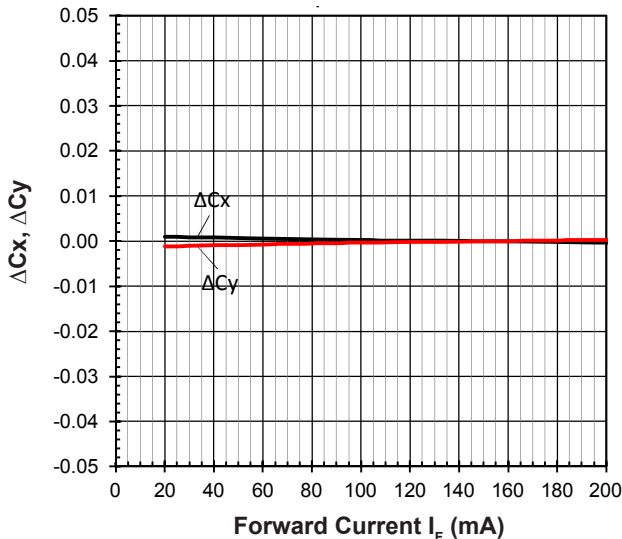
**Relative Spectral Emission**

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



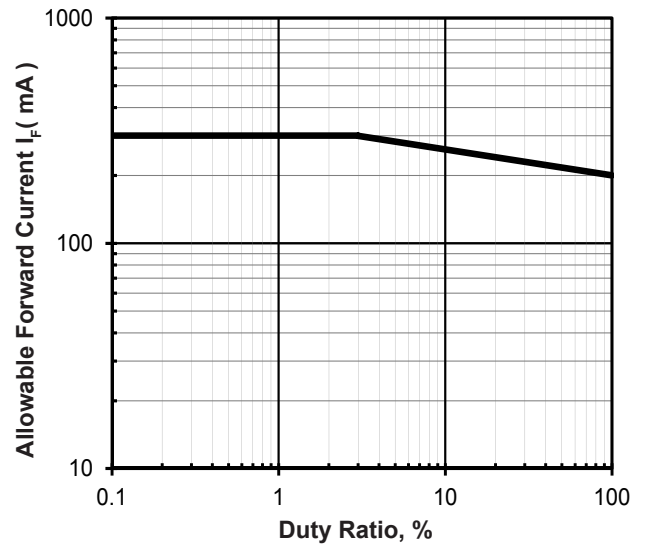
**Chromaticity Coordinate Shift Vs Forward Current**

$\Delta Cx, \Delta Cy = f(I_F); T_j = 25^\circ\text{C}$

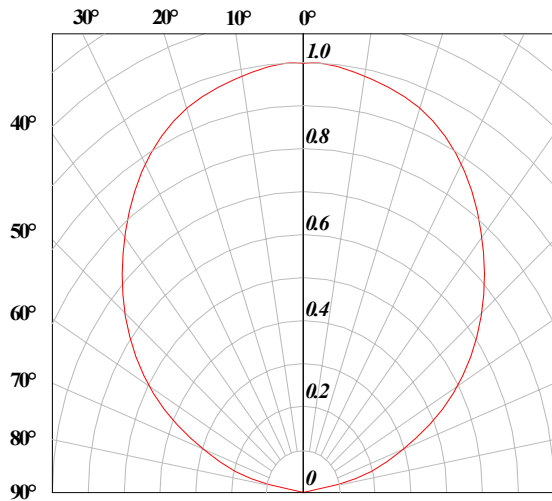


**Allowable Forward Current Vs Duty Ratio**

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

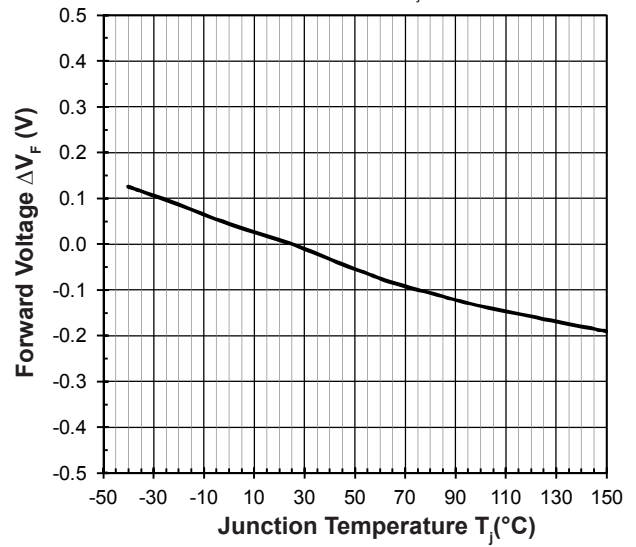


**Radiation Pattern**



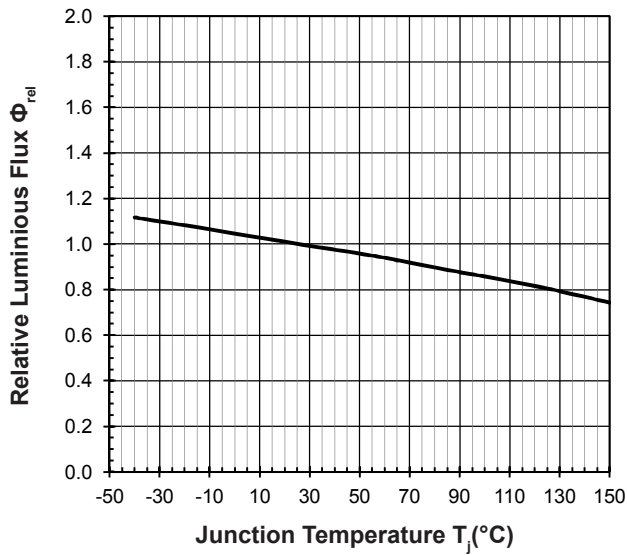
**Forward Voltage Vs Junction Temperature**

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 150\text{mA}$$



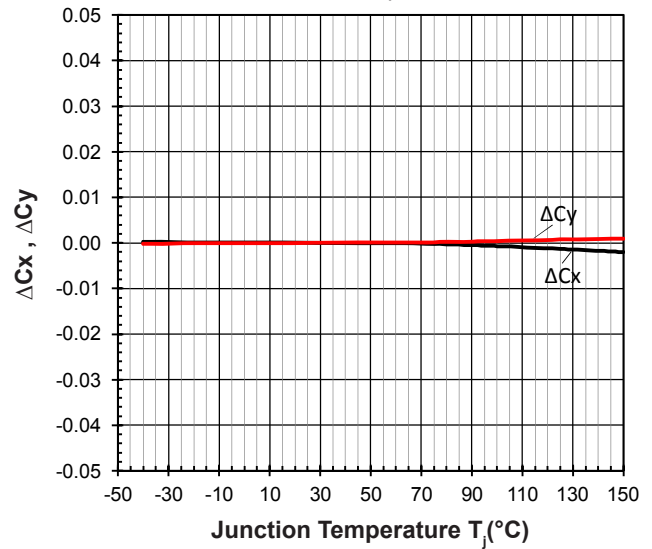
**Relative Luminous Flux Vs Junction Temperature**

$$\Phi_V/\Phi_V(25^\circ\text{C}) = f(T_j); I_F = 150\text{mA}$$

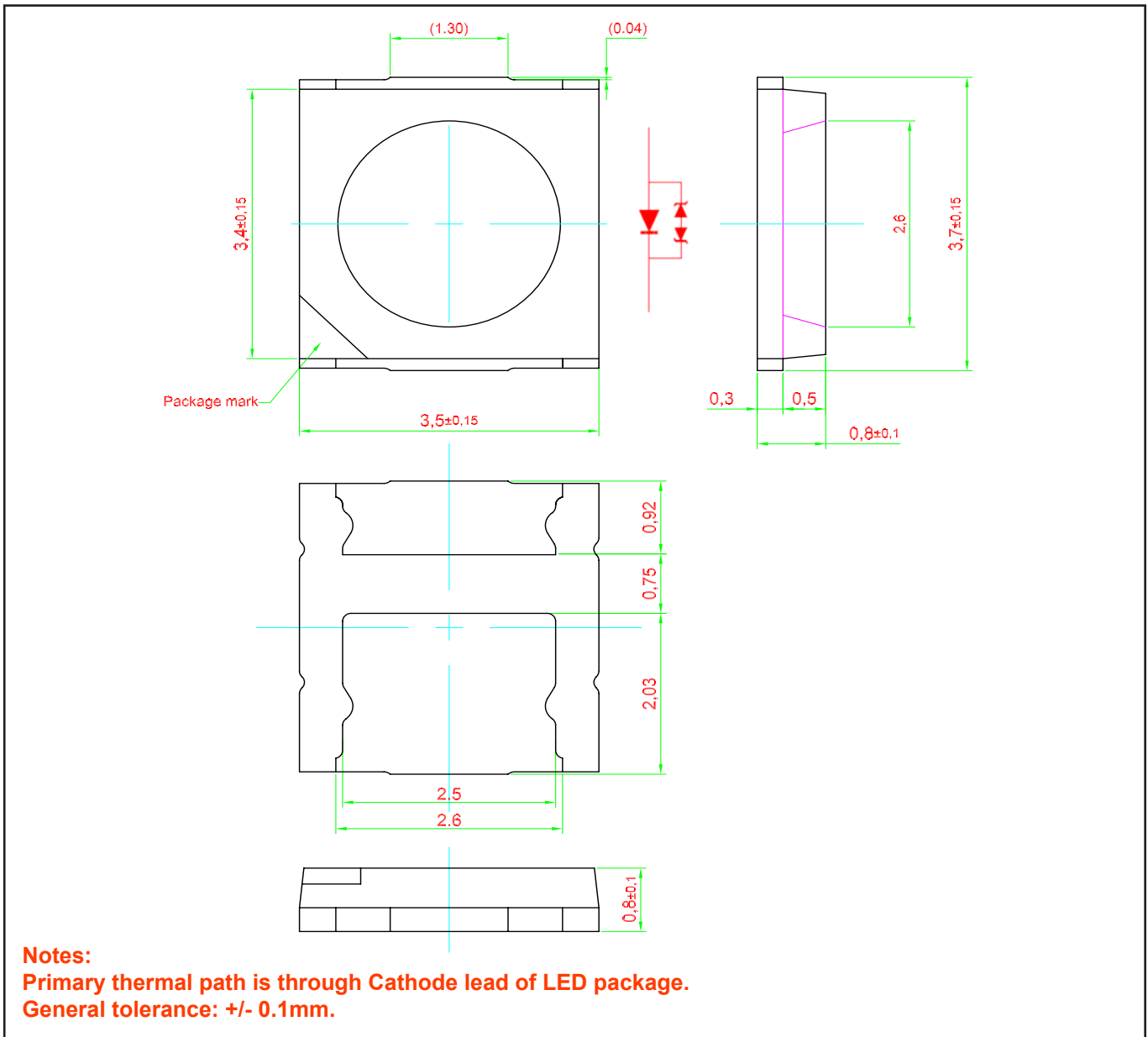


**Chromaticity Coordinate Shift Vs Junction Temperature**

$$\Delta C_x, \Delta C_y = f(T_j); I_F = 150\text{mA}$$



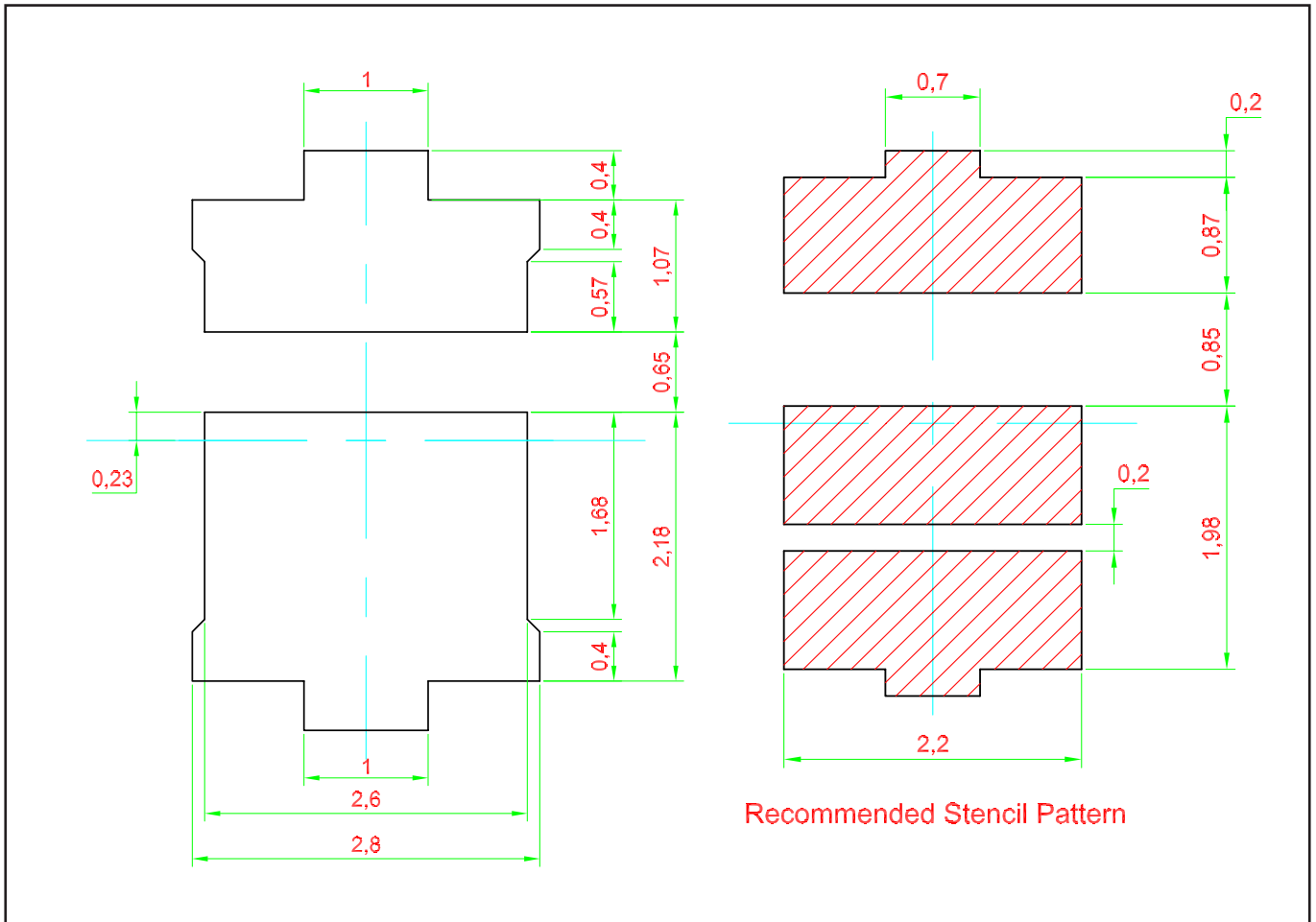
**PrimaxPlus • InGaN: MAZY-SZHG Package Outlines**



**Material**

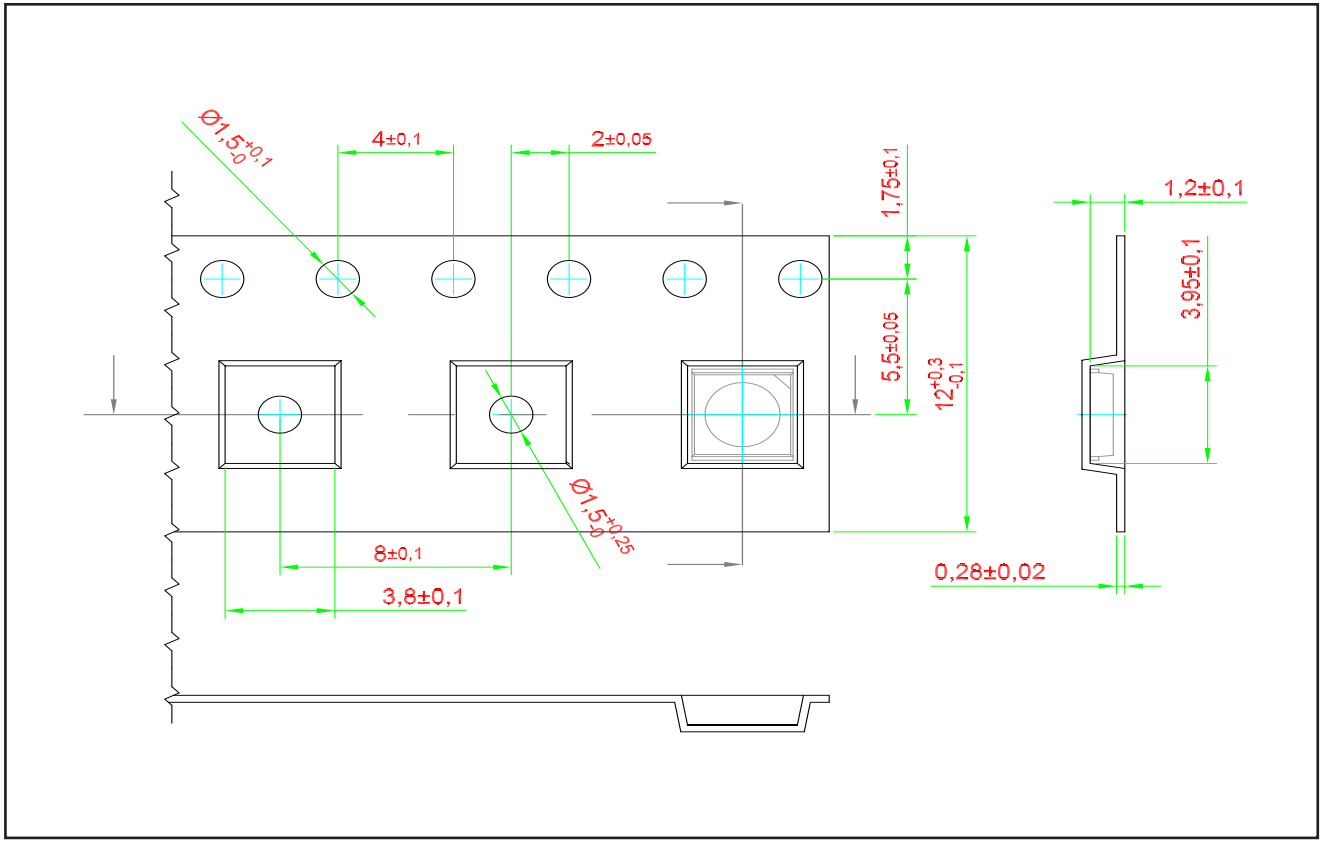
Material	
Lead-frame	Cu Alloy With Au Plating
Package	High Temperature Resistant Plastic
Encapsulant	Silicone Resin
Soldering Leads	Au Plating

### Recommended Solder Pad

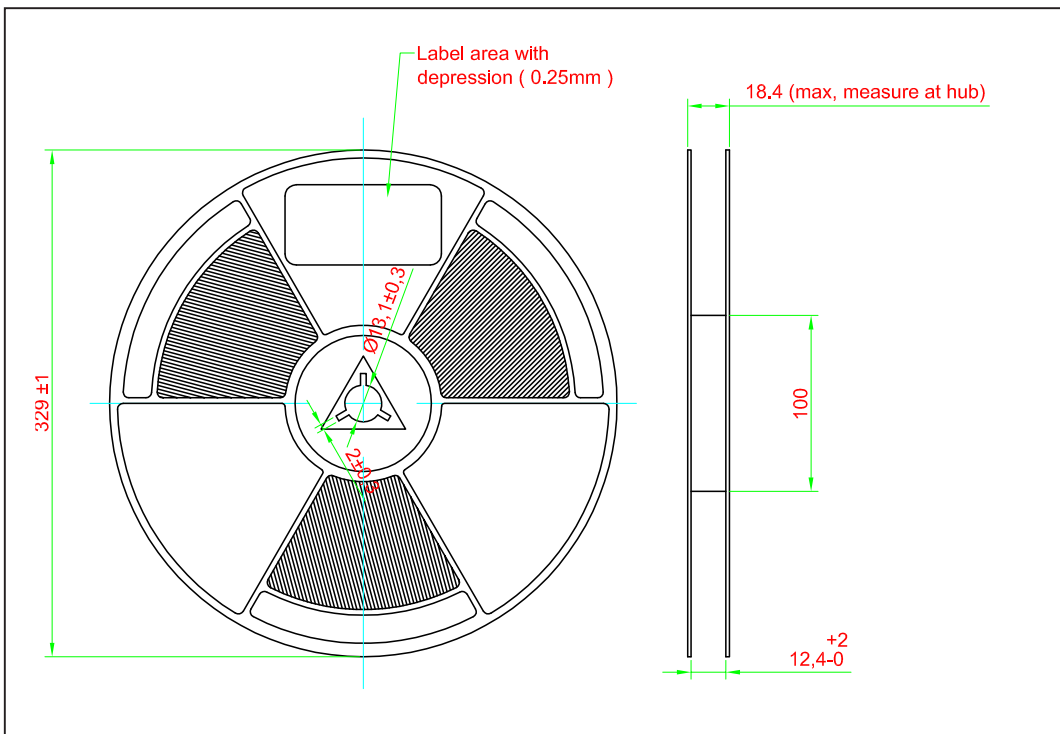
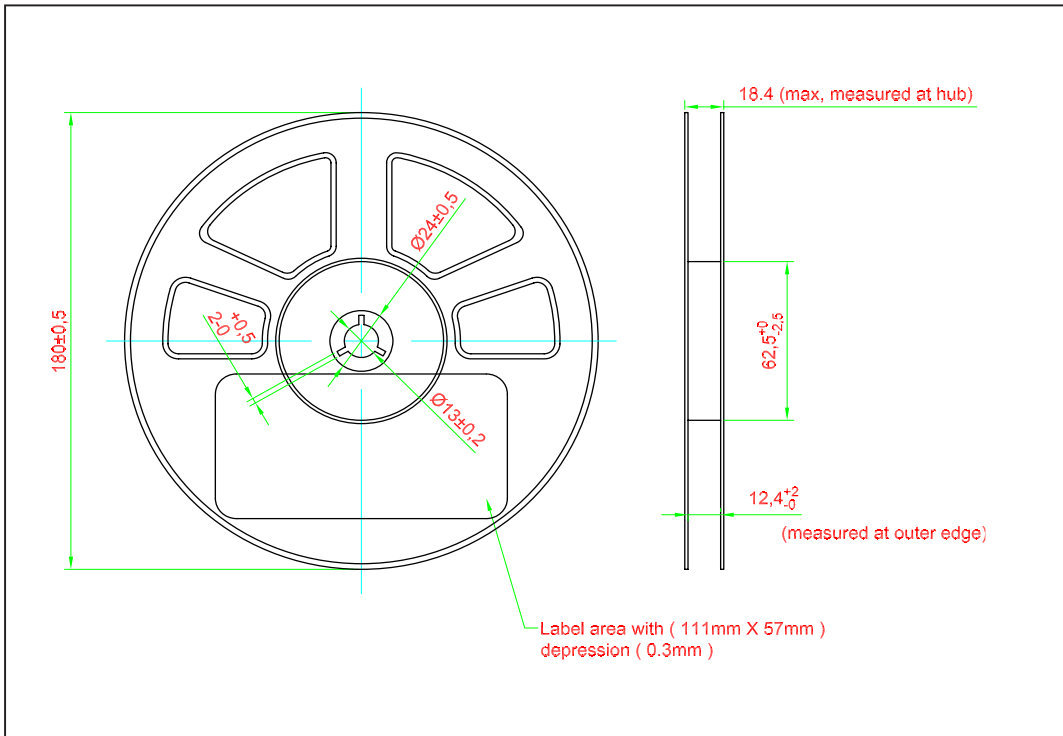




**Taping and orientation**



**Packaging Specification**

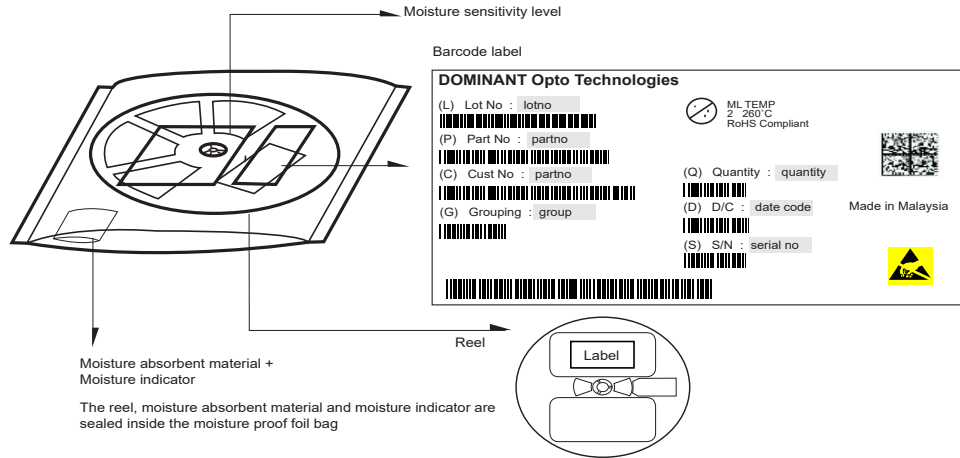


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	1500	MAZY-SZHG-xxx-x
Optional Packing	329	5000	MAZY-SZHG-xxx-x-5

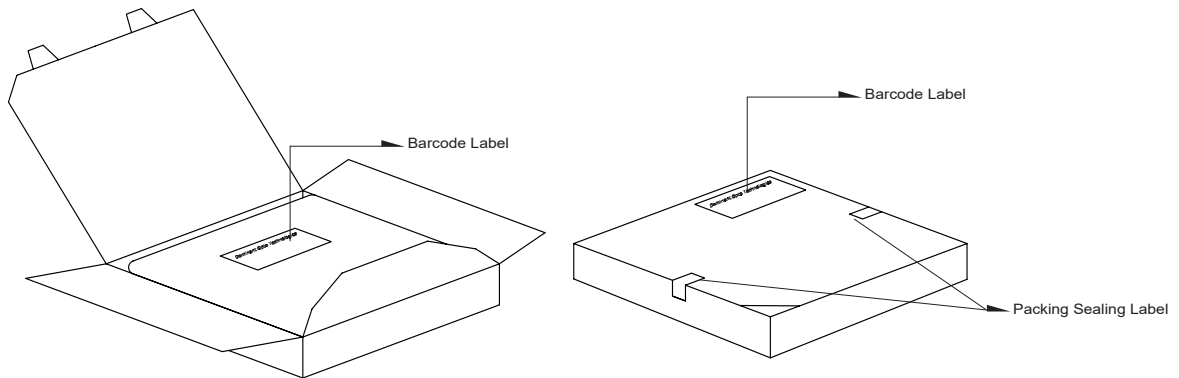
Notes:

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

**Packaging Specification**



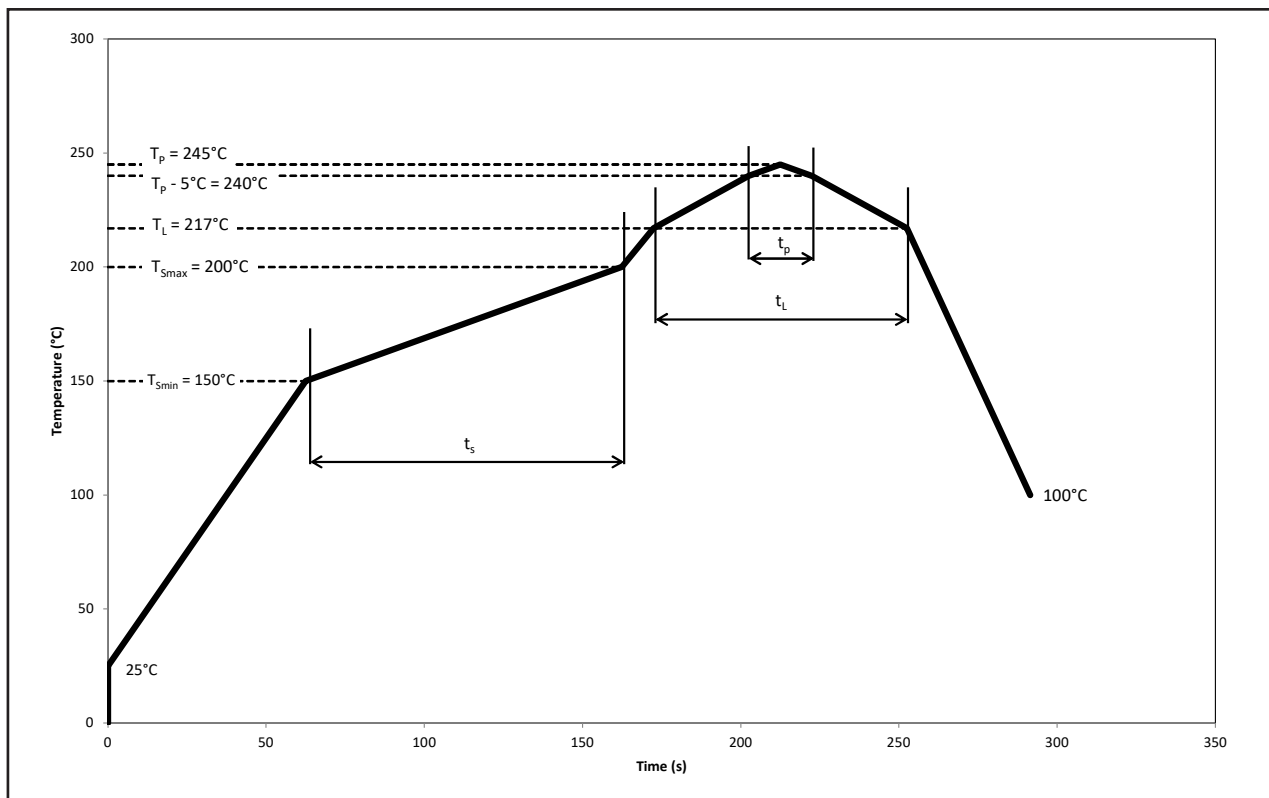
Quantity per bag (pcs)	Average 1pc PrimaxPlus (g)	1 completed bag (g)
1500	0.034	245 ± 10
5000	0.034	1150 ± 10



Reel Diameter (mm)	Packing Box Dimensions (mm)
180	210 x 210 x 20
329	345 x 345 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 $T_p - 5^\circ\text{C}$	$t_p$	10	20	30	s
Ramp-down rate $T_p$ to 100°C	-	-	3	6	°C/s
Time 25°C to $T_p$	-	-	-	480	s

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## 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  $\pm 0.005$  and an expanded uncertainty of  $\pm 0.01$  (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 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  $\pm 0.1$  and dimension are specific in mm.

**Revision History**

<b>Page</b>	<b>Subjects</b>	<b>Date of Modification</b>
-	Initial Release	15 May 2017
10, 11, 12, 14	Add Test Condition for Thermal Resistance Update Appendix Update Packaging Specification	27 Aug 2019
1, 2, 5, 6, 13	Update AEC-Q101 -> AEC-Q102 Update Test Condition for Peak Pulse Current Update Graph Update: Recommended Pb-free Soldering Profile	04 Feb 2021
2	Not for New Design: MAZY-SZHG-N3Q-1	16 Jun 2021
2	Add New Partno: MAZY-SZHG-P3R-1	06 Mar 2023
10, 11	Update Quantity per Reel: 1000pcs to 1500pcs	26 Oct 2023

**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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