

### 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.
- > Corrosion resistance for automotive exterior applications.
- > Compliance to automotive standard; AEC-Q101.
- > Superior corrosion resistant.

### Applications:

- > Automotive: Exterior application: eg: DRL, Position Lamp, Signal Lighting, Fog lamp, Rear Combination Lights (RCLs), Reverse lamp.
- > Automotive: Interior application: eg: Dome Lamp, Trunk Lamp.

### Optical Characteristics at T<sub>j</sub>=25°C

Part Number	Color	Viewing Angle °	Luminous Flux @ 180mA (lm) <small>Appx. 1.2</small>		
			Min.	Typ.	Max.
MBWW-KZHG-UV3-L1P2	White	120	87.4	105.0	147.7

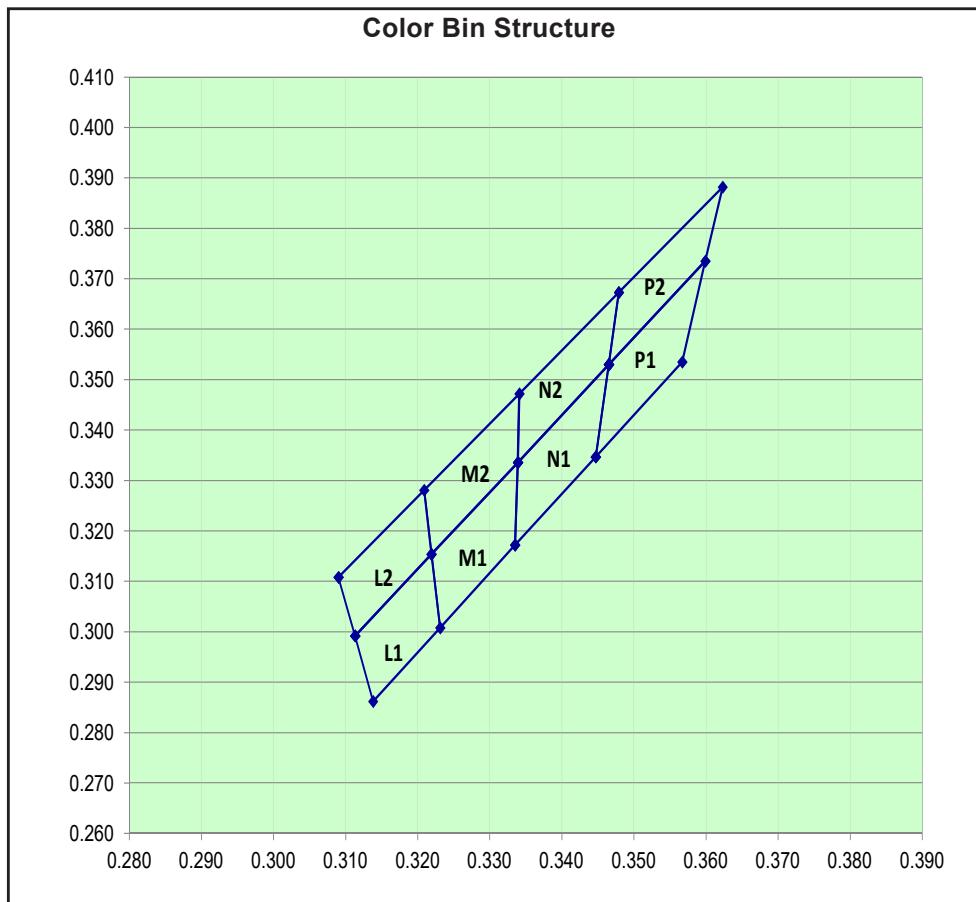
### Electrical Characteristics at T<sub>j</sub>=25°C

Part Number	V <sub>f</sub> @ If = 180 mA <small>Appx. 3.1</small>		
	Min. (V)	Typ. (V)	Max. (V)
MBWW-KZHG	5.6	6.2	6.8

### Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	250	mA
Peak pulse current (tp<=10μs , Duty cycle=0.10)	300	mA
Reverse voltage	Not designed for reverse bias	V
ESD threshold (HBM)	4000	V
LED junction temperature	150	°C
Operating temperature	-40 ... +125	°C
Storage temperature	-40 ... +125	°C
Thermal resistance		
- Real Thermal Resistance		
Junction / solder point, R <sub>th JS real</sub> (typ = 13)	18	K/W
- Electrical Thermal Resistance		
Junction / solder point, R <sub>th JS el</sub> (typ = 9)	12	K/W

**MBWW-KZHG, Color Grouping** Appx. 2.1



Bin	1	2	3	4	
L1	Cx	0.3113	0.3138	0.3231	0.3219
	Cy	0.2992	0.2862	0.3008	0.3154
L2	Cx	0.3090	0.3113	0.3219	0.3209
	Cy	0.3108	0.2992	0.3154	0.3281
M1	Cx	0.3219	0.3231	0.3335	0.3339
	Cy	0.3154	0.3008	0.3172	0.3336
M2	Cx	0.3209	0.3219	0.3339	0.3341
	Cy	0.3281	0.3154	0.3336	0.3472
N1	Cx	0.3335	0.3339	0.3465	0.3447
	Cy	0.3172	0.3336	0.3530	0.3347
N2	Cx	0.3339	0.3341	0.3479	0.3465
	Cy	0.3336	0.3472	0.3673	0.3530
P1	Cx	0.3447	0.3465	0.3599	0.3567
	Cy	0.3347	0.3530	0.3735	0.3535
P2	Cx	0.3465	0.3479	0.3623	0.3599
	Cy	0.3530	0.3673	0.3882	0.3735

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.

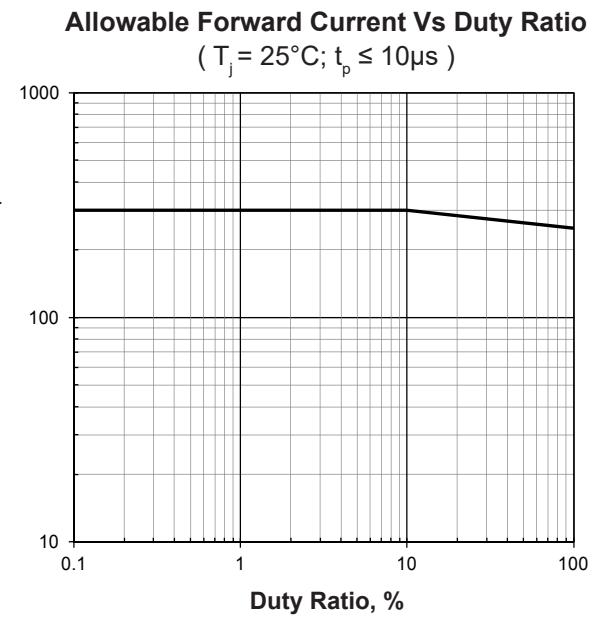
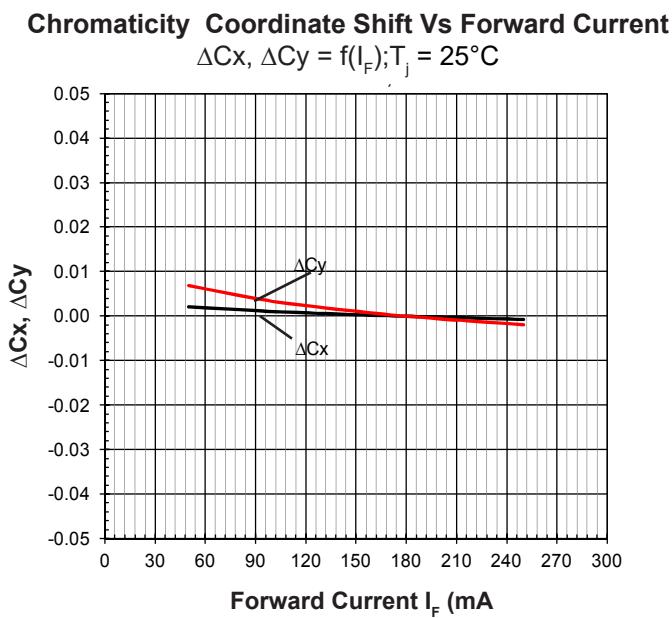
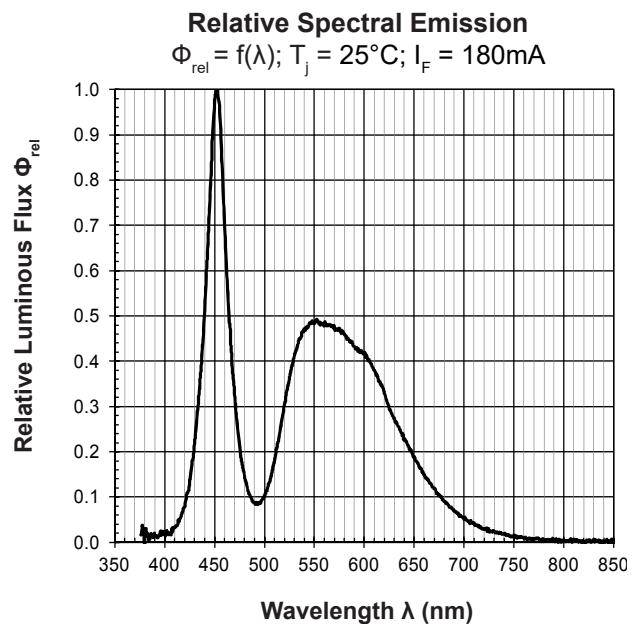
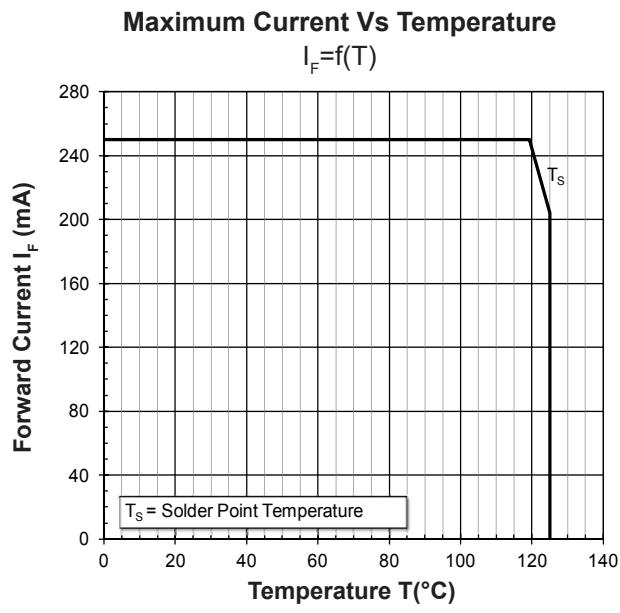
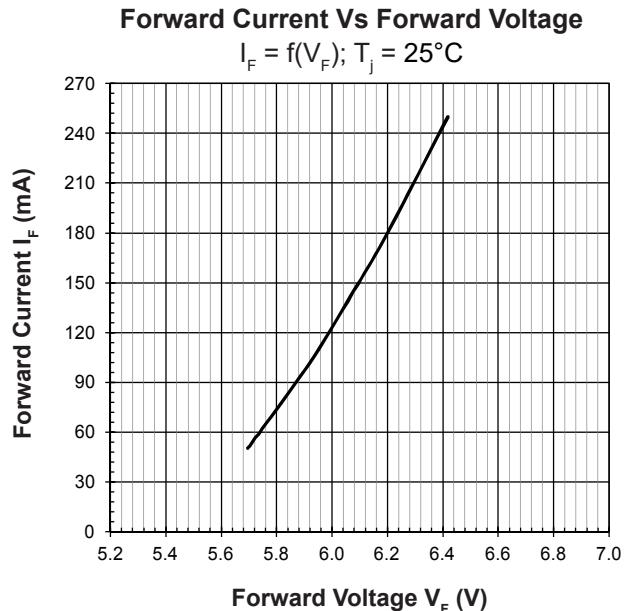
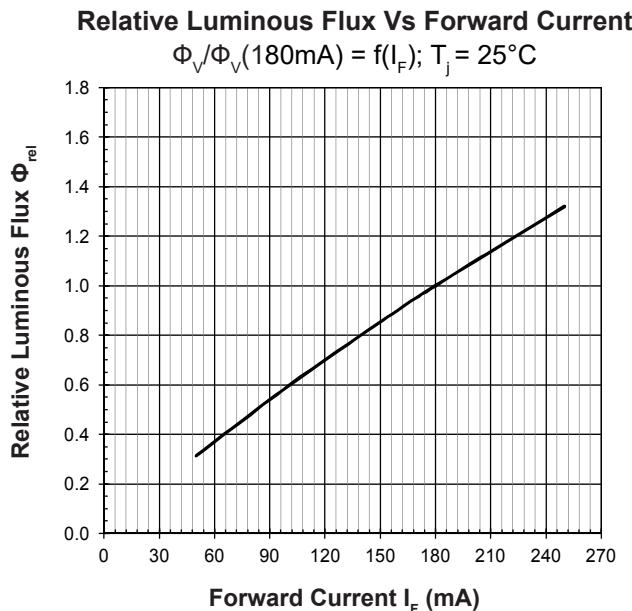
Luminous Intensity Group at T<sub>j</sub>=25°C

Brightness Group	Luminous Flux (lm) <small>Appx. 1.2</small>
U2	87.4 ... 99.4
U3	99.4 ... 113.6
V2	113.6 ... 129.2
V3	129.2 ... 147.7

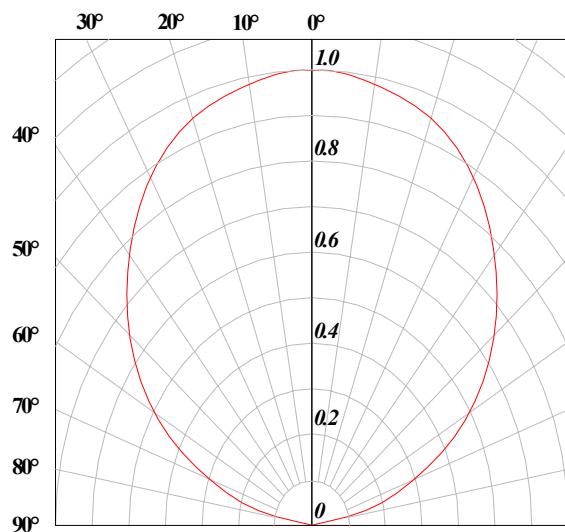
Vf Binning (Optional)

Vf Bin @ 180mA	Forward Voltage (V) <small>Appx. 3.1</small>
V1	5.6 ... 5.8
V2	5.8 ... 6.0
V3	6.0 ... 6.2
V4	6.2 ... 6.4
V5	6.4 ... 6.6
V6	6.6 ... 6.8

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

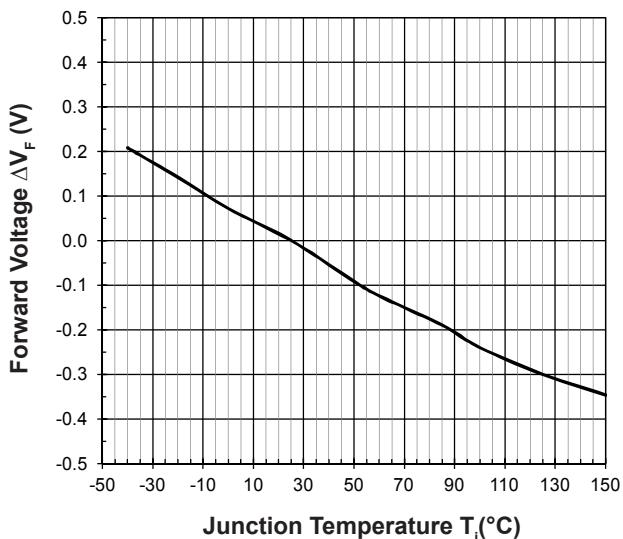


**Radiation Pattern**



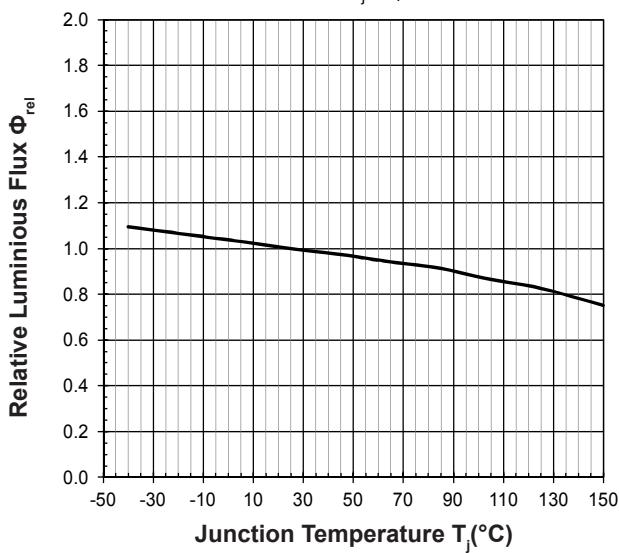
**Forward Voltage Vs Junction Temperature**

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 180\text{mA}$$



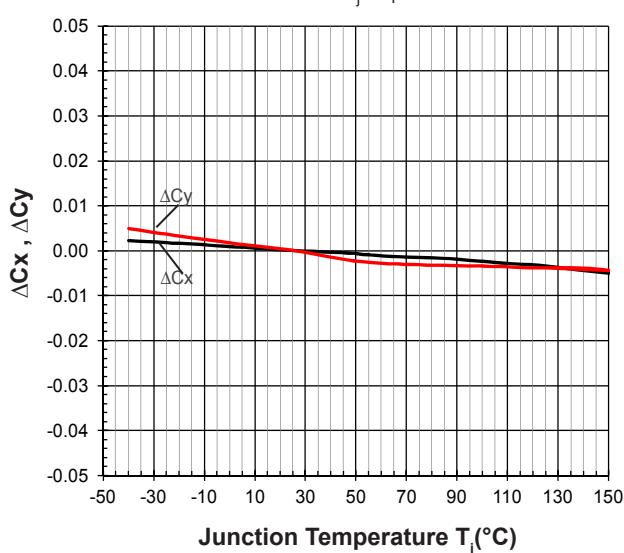
**Relative Luminous Flux Vs Junction Temperature**

$$\Phi V/\Phi V(25^\circ\text{C}) = f(T_j); I_F = 180\text{mA}$$

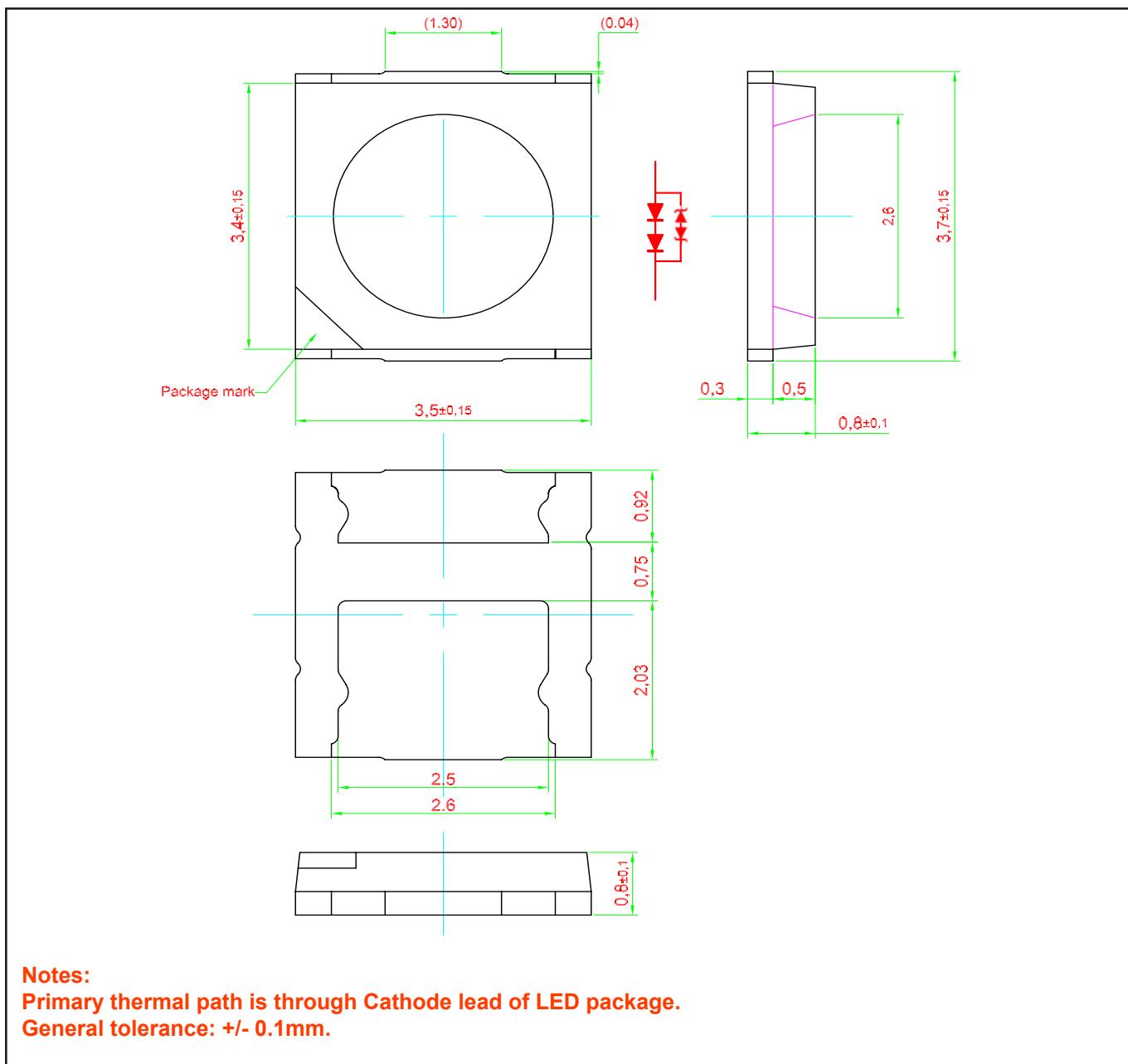


**Chromaticity Coordinate Shift Vs Junction Temperature**

$$\Delta Cx, \Delta Cy = f(T_j); I_F = 180\text{mA}$$



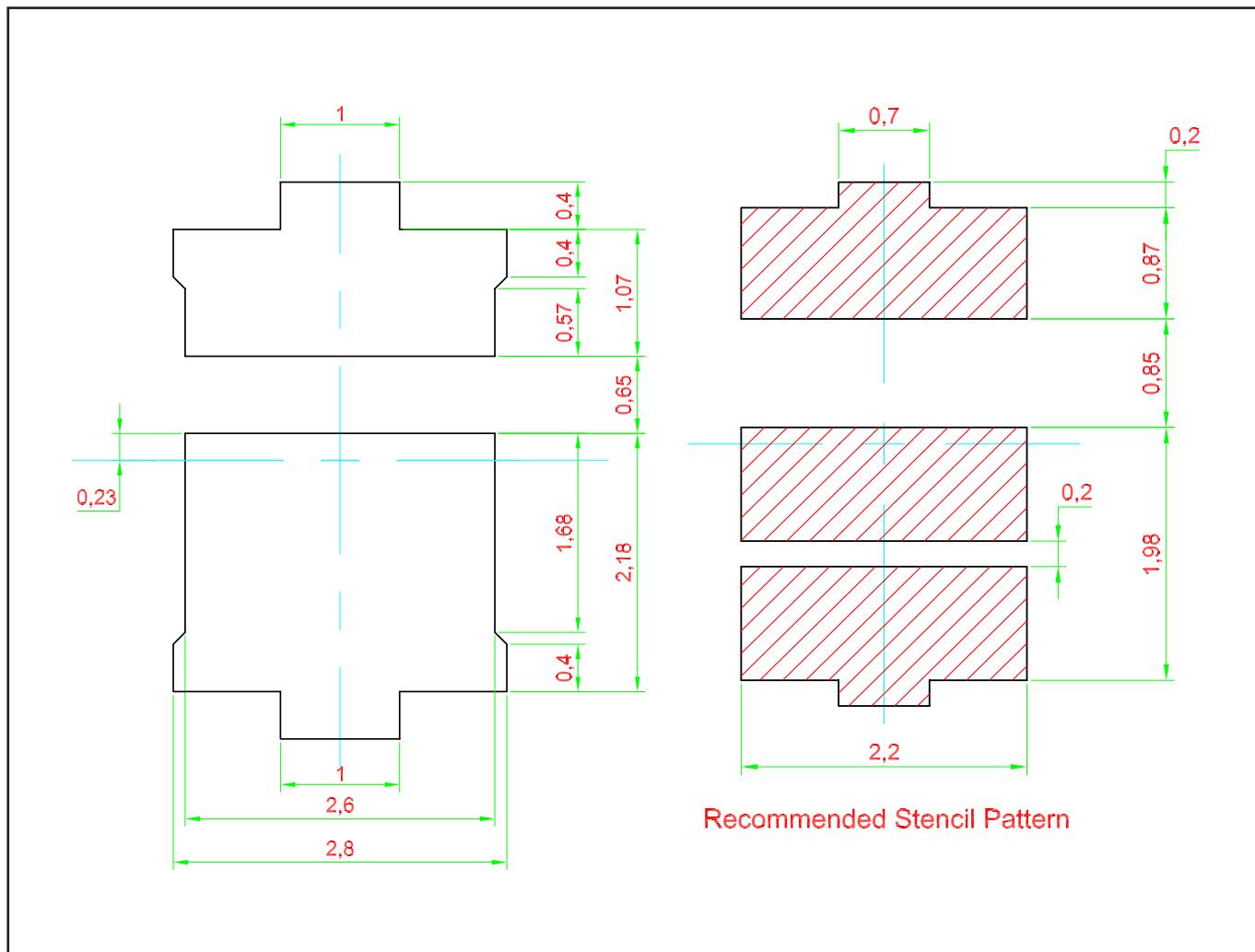
## PrimaxPlus • InGaN : MBWW-KZHG-L1P2 Package Outlines



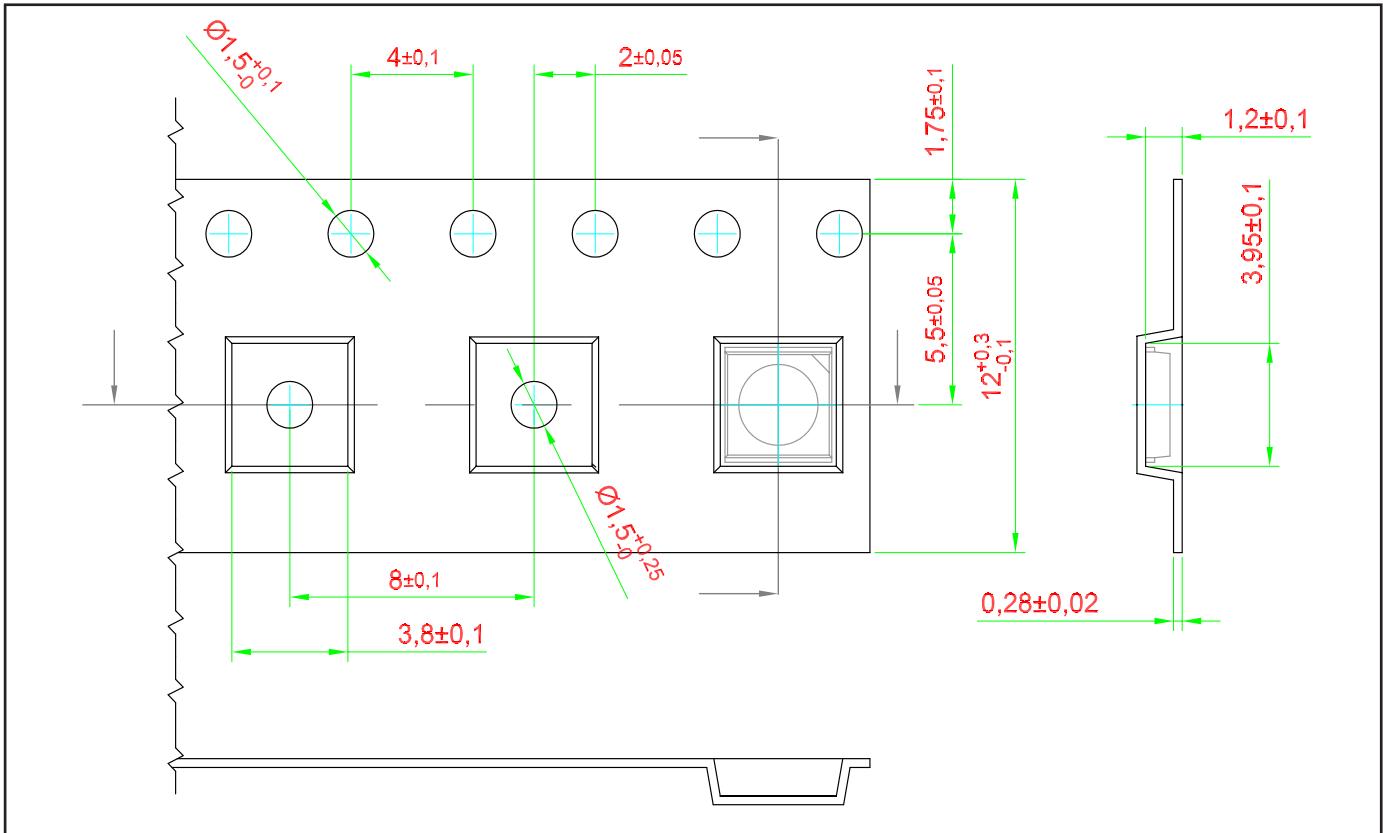
### Material

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

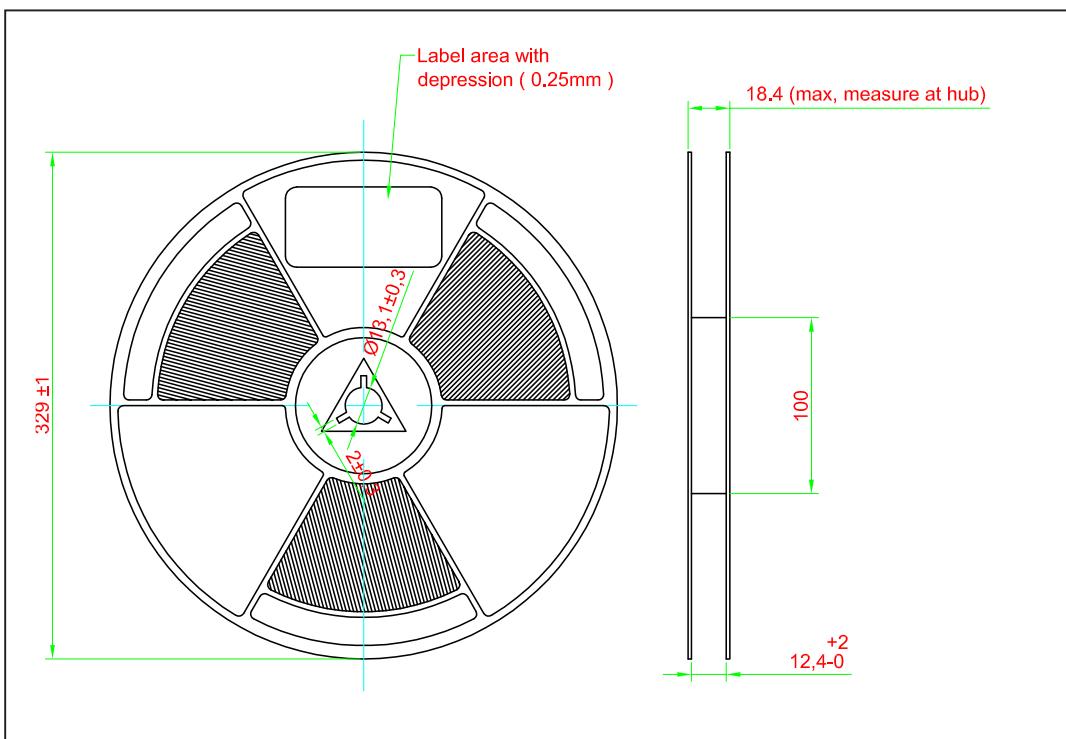
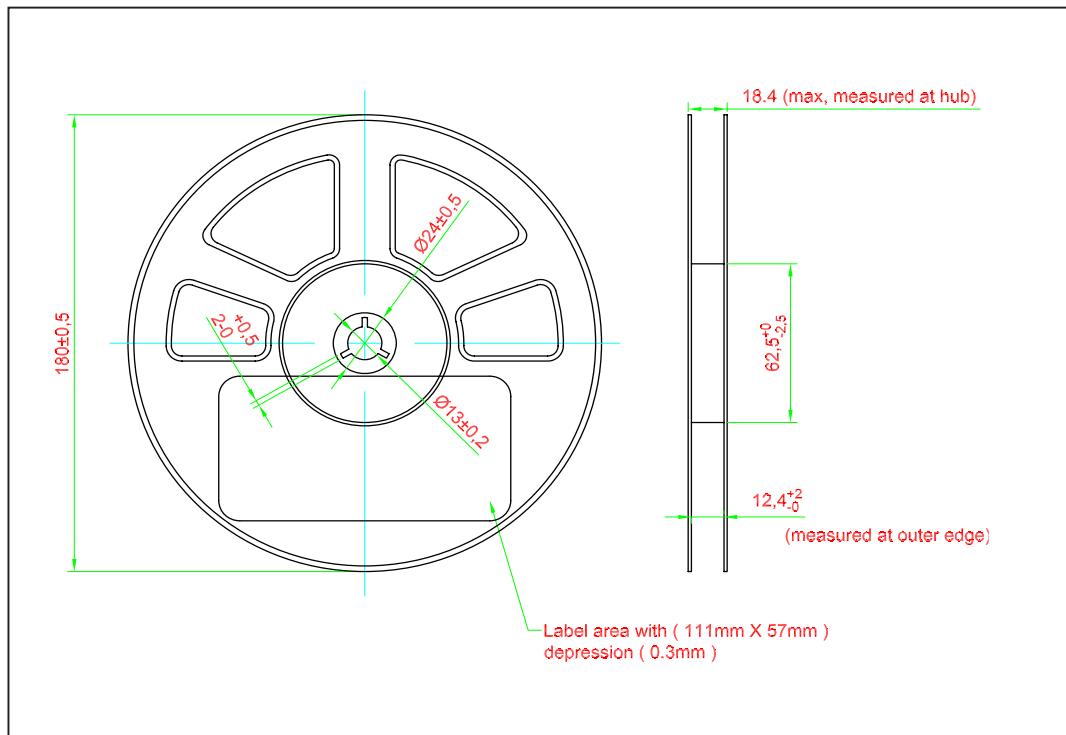
## Recommended Solder Pad



## Taping and orientation

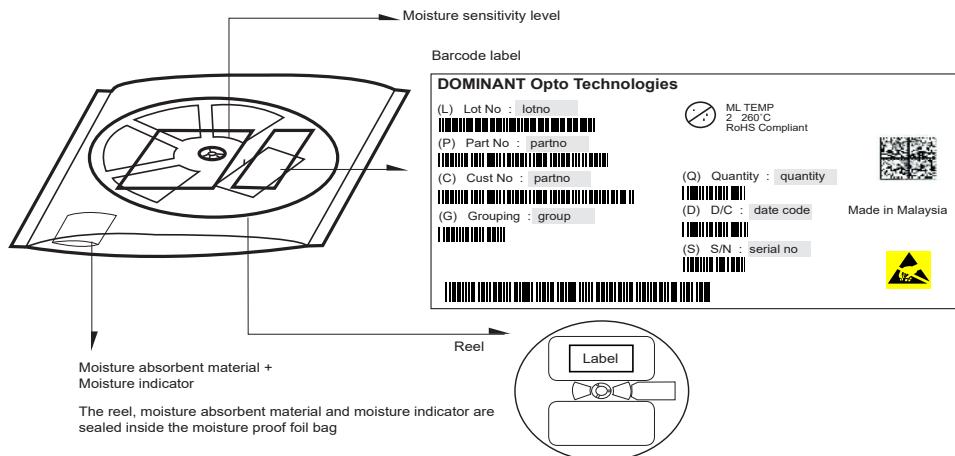


## Packaging Specification

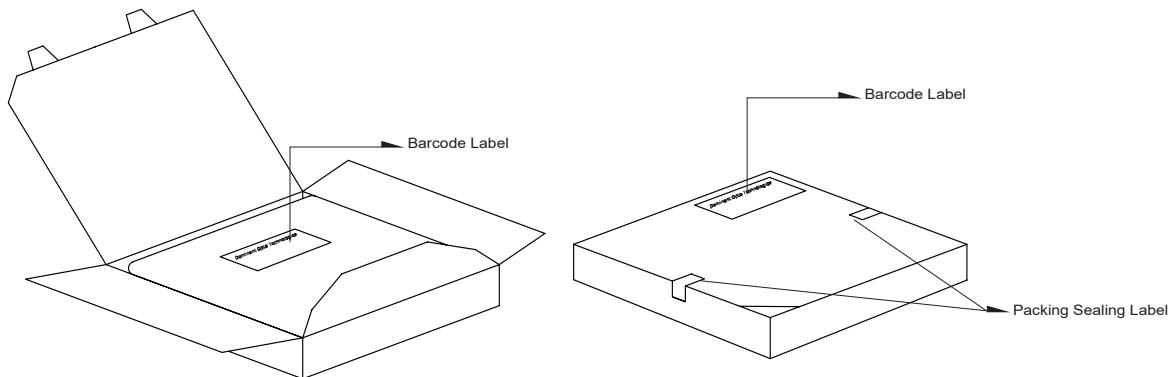


	Reel Diameter (mm)	Quantity (pcs)	Partno
Standard Packing	180	1500	MBWW-KZHG-xxx-xxxx
Optional Packing	329	5000	MBWW-KZHG-xxx-xxxx-5

## Packaging Specification



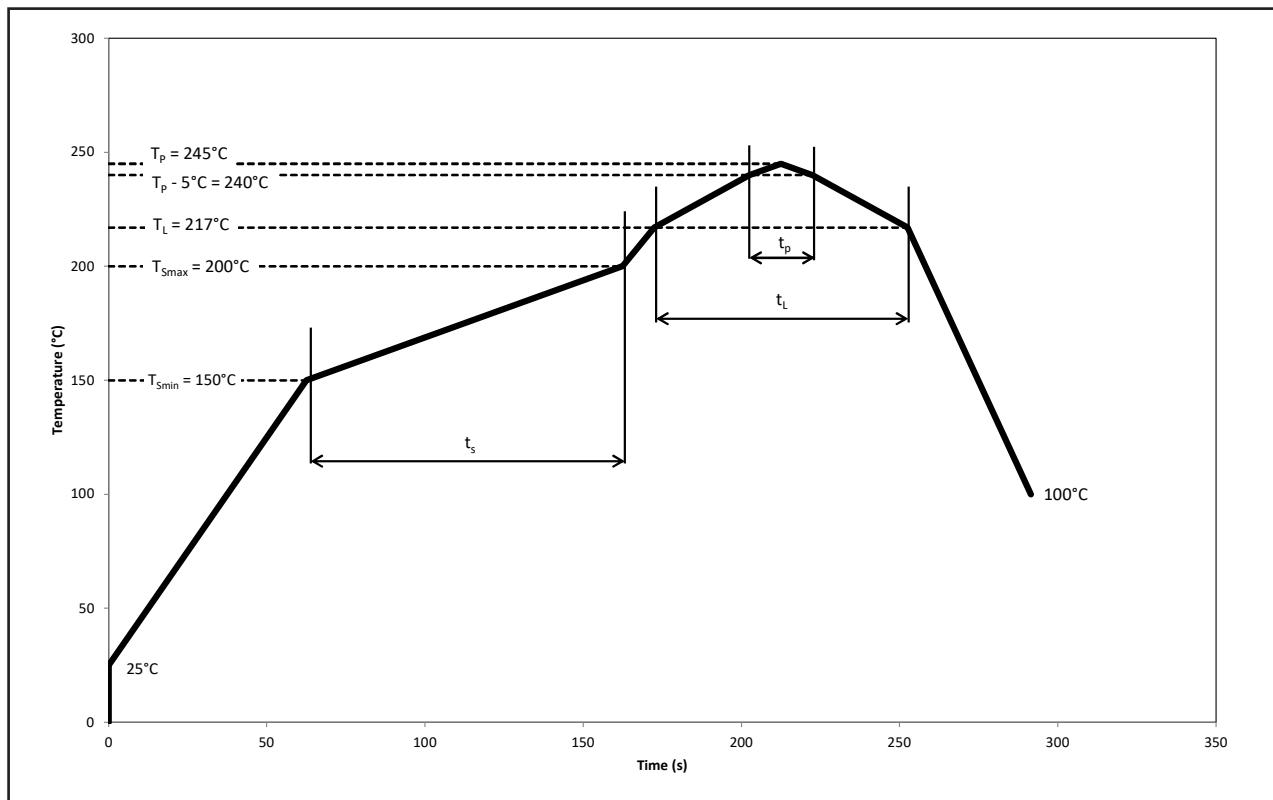
Quantity per bag (pcs)	Average 1pc PrimaxPlus (g)	1 completed bag (g)
1500	0.034	245 ± 10
5000	0.034	1150 ± 10



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



Pb-Free Assembly					
Profile Feature	Symbol	Min.	Recommended	Max.	Unit
Ramp-up rate to preheat $25^\circ\text{C}$ to $T_{smin}$	-	-	2	3	$^\circ\text{C}/\text{s}$
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	$^\circ\text{C}/\text{s}$
Liquidous temperature	$T_L$	-	217	-	$^\circ\text{C}$
Time above liquidous temperature	$t_L$	60	80	150	s
Peak temperature	$T_p$	-	245	260	$^\circ\text{C}$
Time within $5^\circ\text{C}$ of the specified peak temperature $T_p - 5^\circ\text{C}$	$t_p$	10	20	30	s
Ramp-down rate $T_p$ to $100^\circ\text{C}$	-	-	3	6	$^\circ\text{C}/\text{s}$
Time $25^\circ\text{C}$ 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  $\pm 0.005$  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, Vf 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

## **NOTE**

All the information contained in this document is considered to be reliable at the time of publishing. However, DOMINANT Opto Technologies does not assume any liability arising out of the application or use of any product described herein.

DOMINANT Opto Technologies reserves the right to make changes to any products in order to improve reliability, function or design.

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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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