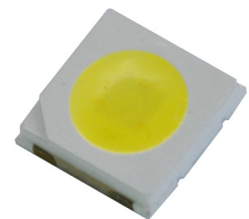


### Primax

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-Q101.

### Applications:

- > Automotive: Exterior application: eg: DRL, Back up Lamp, Position Lamp.

**Optical Characteristics at Tj=25°C**

Part Ordering Number	Color	Viewing Angle°	Luminous Flux <i>Appx. 1.2</i> IF = 20mA (lm)			Luminous Flux <i>Appx. 1.2</i> IF = 250mA (lm)		
			Min.	Typ.	Max.	Min.	Typ.	Max.
MAW-KZHG-HK2-L1AP2A+SU2-L1P2	White	120	4.90	6.30	9.35	51.70	78.00	99.40

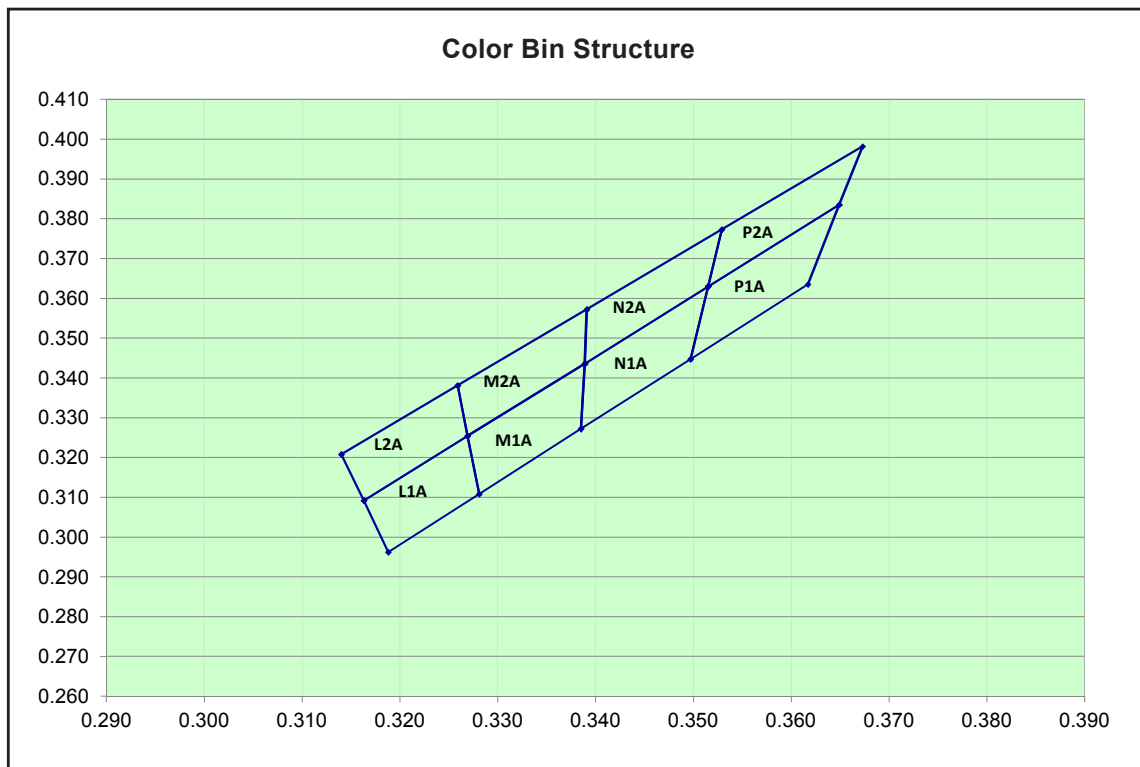
**Electrical Characteristics at Tj=25°C**

Part Number	Vf @ If = 250 mA <i>Appx. 3.1</i>		
	Min. (V)	Typ. (V)	Max. (V)
MAW-KZHG	2.9	3.1	3.4

**Absolute Maximum Ratings**

	Maximum Value	Unit
DC forward current	300	mA
Peak pulse current (tp<=10µs, Duty cycle=0.1)	600	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 = 20)	25	K/W
- Electrical Thermal Resistance		
Junction / solder point, R <sub>th JS el</sub> (typ = 14)	18	K/W
(Mounted on dual sided FR4 in house PCB, total Cu area >900mm <sup>2</sup> )		

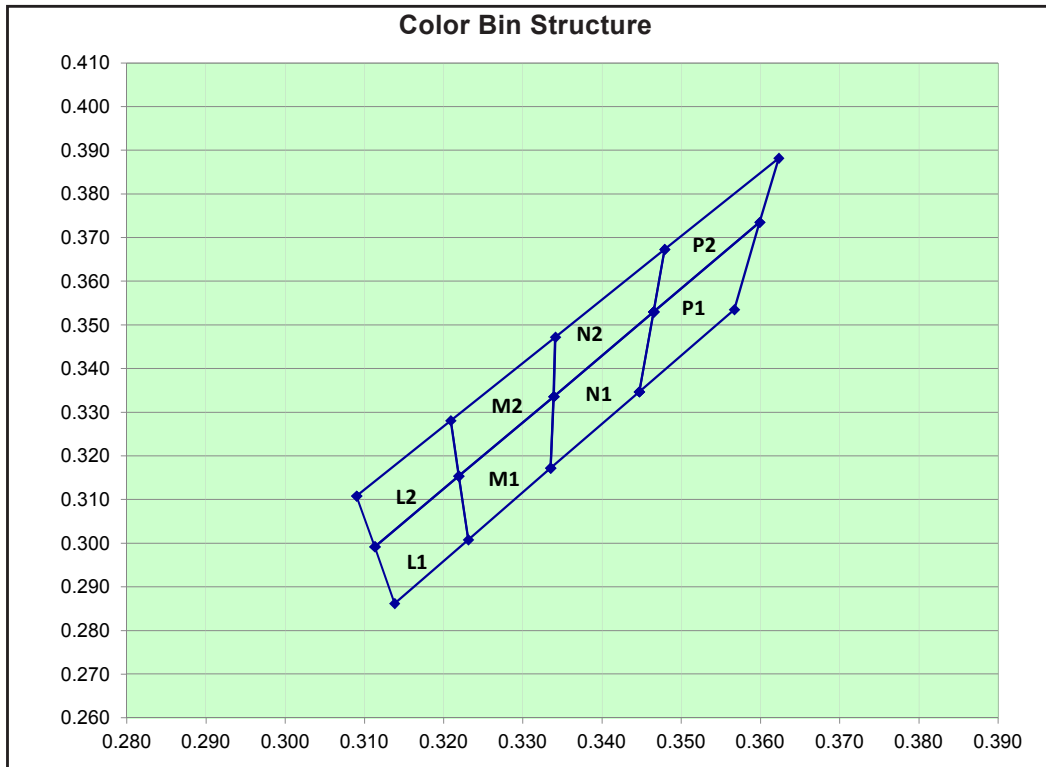
**MAW-KZHG, Color Grouping (20mA)**



Bin		1	2	3	4
L1A	Cx	0.3163	0.3188	0.3281	0.3269
	Cy	0.3092	0.2962	0.3108	0.3254
L2A	Cx	0.3140	0.3163	0.3269	0.3259
	Cy	0.3208	0.3092	0.3254	0.3381
M1A	Cx	0.3269	0.3281	0.3385	0.3389
	Cy	0.3254	0.3108	0.3272	0.3436
M2A	Cx	0.3259	0.3269	0.3389	0.3391
	Cy	0.3381	0.3254	0.3436	0.3572
N1A	Cx	0.3385	0.3389	0.3515	0.3497
	Cy	0.3272	0.3436	0.3630	0.3447
N2A	Cx	0.3389	0.3391	0.3529	0.3515
	Cy	0.3436	0.3572	0.3773	0.3630
P1A	Cx	0.3497	0.3515	0.3649	0.3617
	Cy	0.3447	0.3630	0.3835	0.3635
P2A	Cx	0.3515	0.3529	0.3673	0.3649
	Cy	0.3630	0.3773	0.3982	0.3835

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.

**MAW-KZHG, Color Grouping (250mA)** *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 purposed.

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

Brightness Group	Luminous Flux @ If=20mA (lm) <i>Appx. 1.2</i>
H2	4.90 ... 5.50
H3	5.50 ... 6.30
J2	6.30 ... 7.15
J3	7.15 ... 8.20
K2	8.20 ... 9.35

Brightness Group	Luminous Flux @ If=250mA (lm) <i>Appx. 1.2</i>
S2	51.70 ... 59.00
S3	59.00 ... 67.20
T2	67.20 ... 76.50
T3	76.50 ... 87.40
U2	87.40 ... 99.40

**Vf Binning (Optional)**

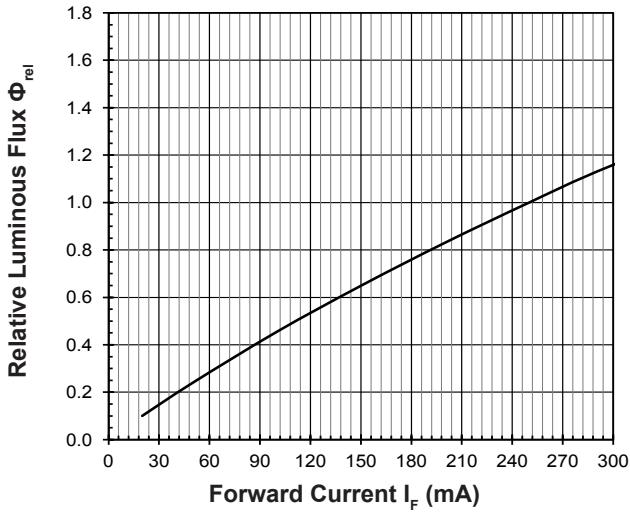
Vf Bin @ 20mA	Forward Voltage (V) <i>Appx. 3.1</i>
V28	2.60 ... 2.75
V29	2.75 ... 2.90
V31	2.90 ... 3.05

Vf Bin @ 250mA	Forward Voltage (V) <i>Appx. 3.1</i>
V0	2.70 ... 3.00
V1	3.00 ... 3.30
V2	3.30 ... 3.60

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

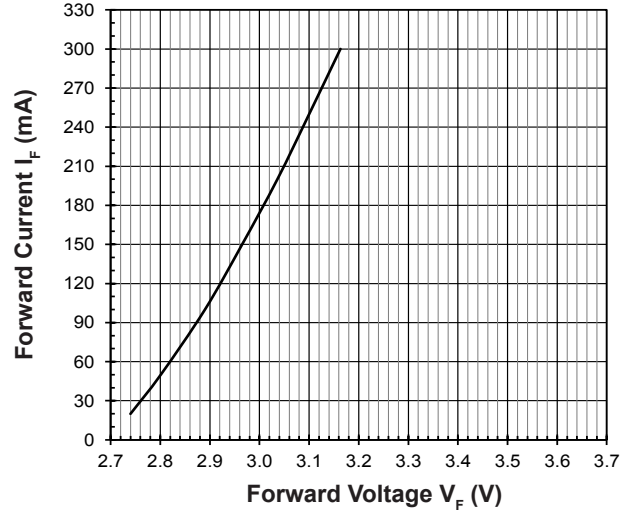
**Relative Luminous Flux Vs Forward Current**

$\Phi_v/\Phi_v(250\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$



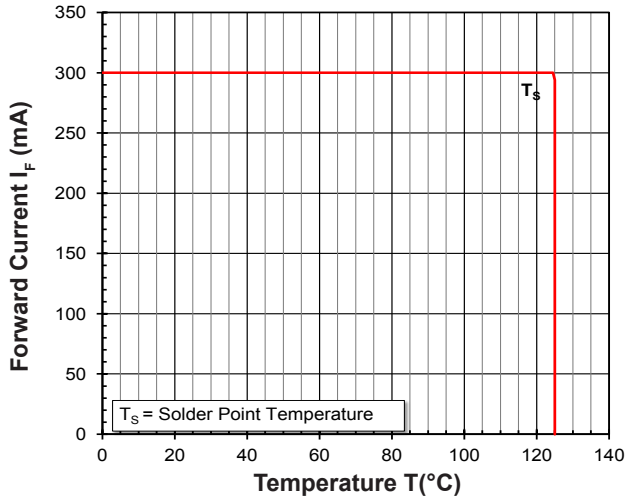
**Forward Current Vs Forward Voltage**

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



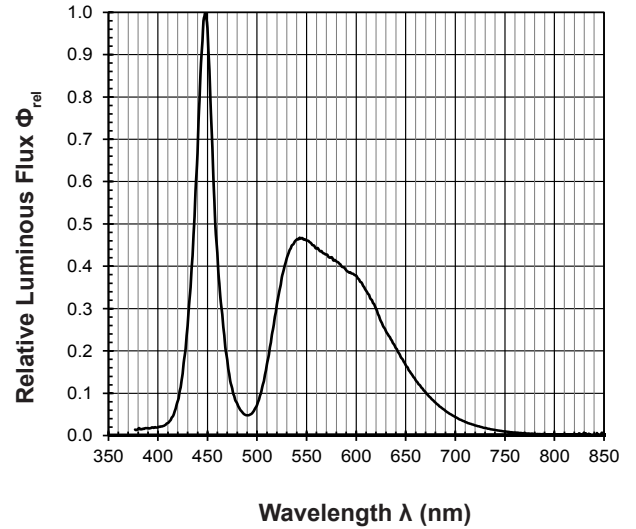
**Maximum Current Vs Temperature**

$I_F = f(T)$



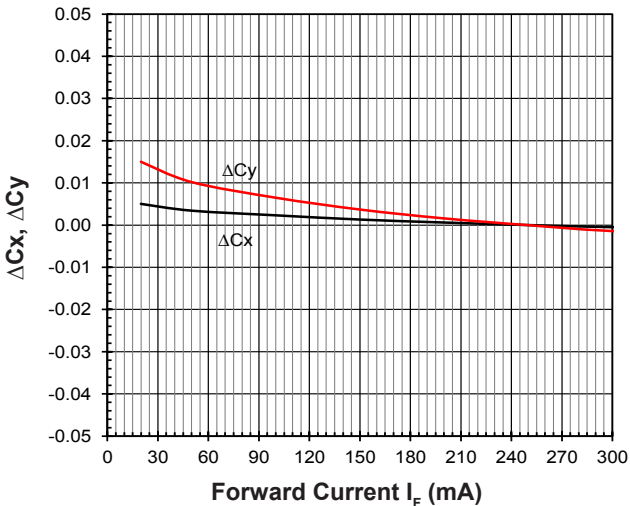
**Relative Spectral Emission**

$\Phi_{rel} = f(\lambda); T_j = 25^\circ\text{C}; I_F = 250\text{mA}$



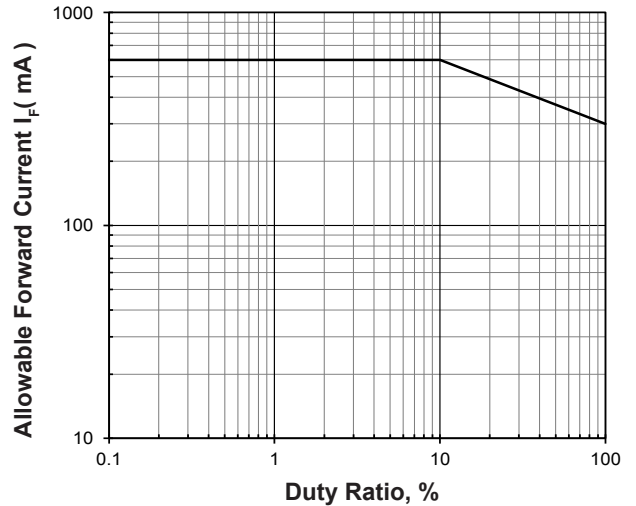
**Chromaticity Coordinate Shift Vs Forward Current**

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

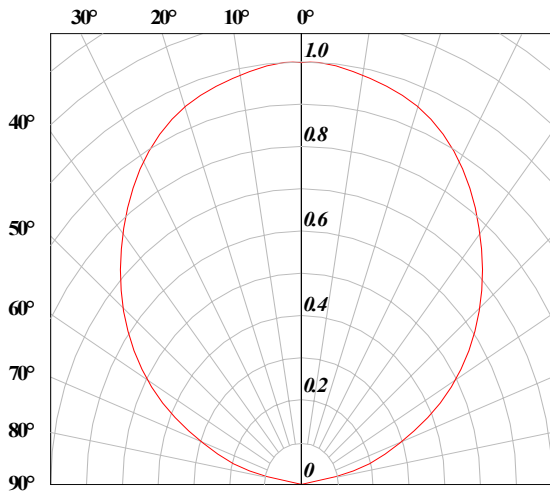


**Allowable Forward Current Vs Duty Ratio**

$(T_j = 25^\circ\text{C}; t_p \leq 10\mu\text{s})$

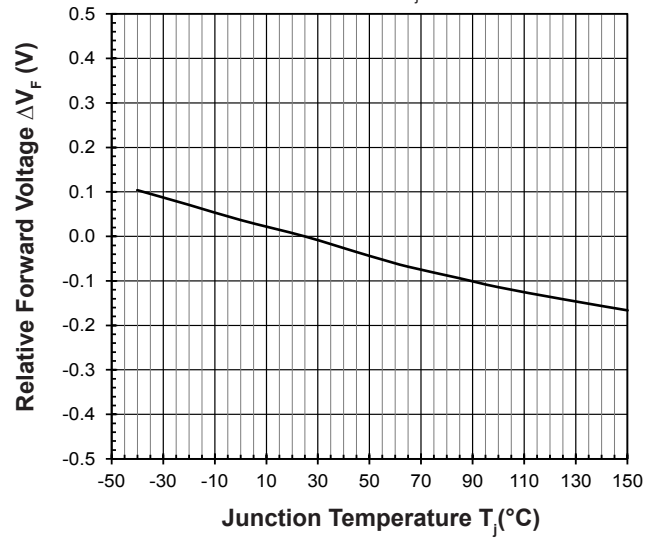


**Radiation Pattern**



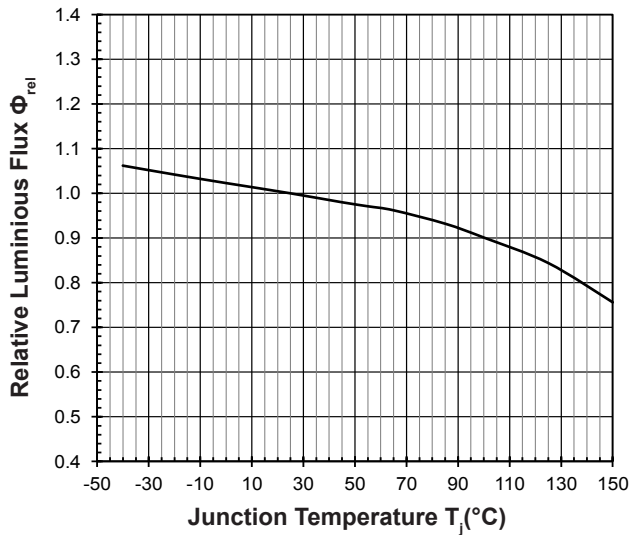
**Relative Forward Voltage Vs Junction Temperature**

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 250\text{mA}$$



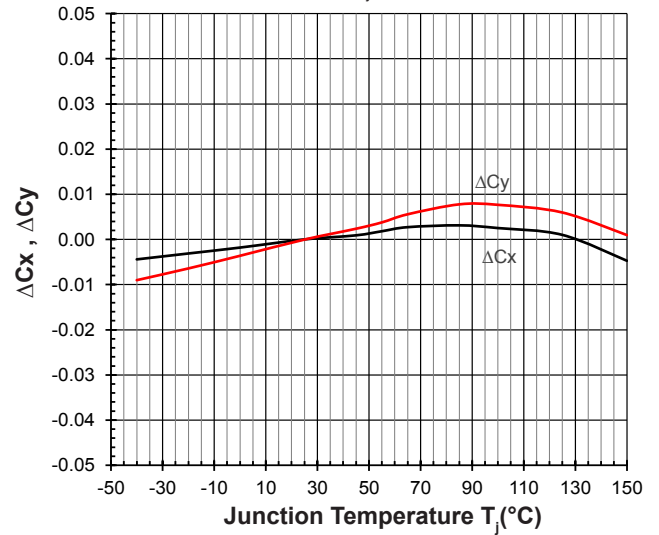
**Relative Luminous Flux Vs Junction Temperature**

$$\Phi_V/\Phi_V(25^\circ\text{C}) = f(T_j); I_F = 250\text{mA}$$

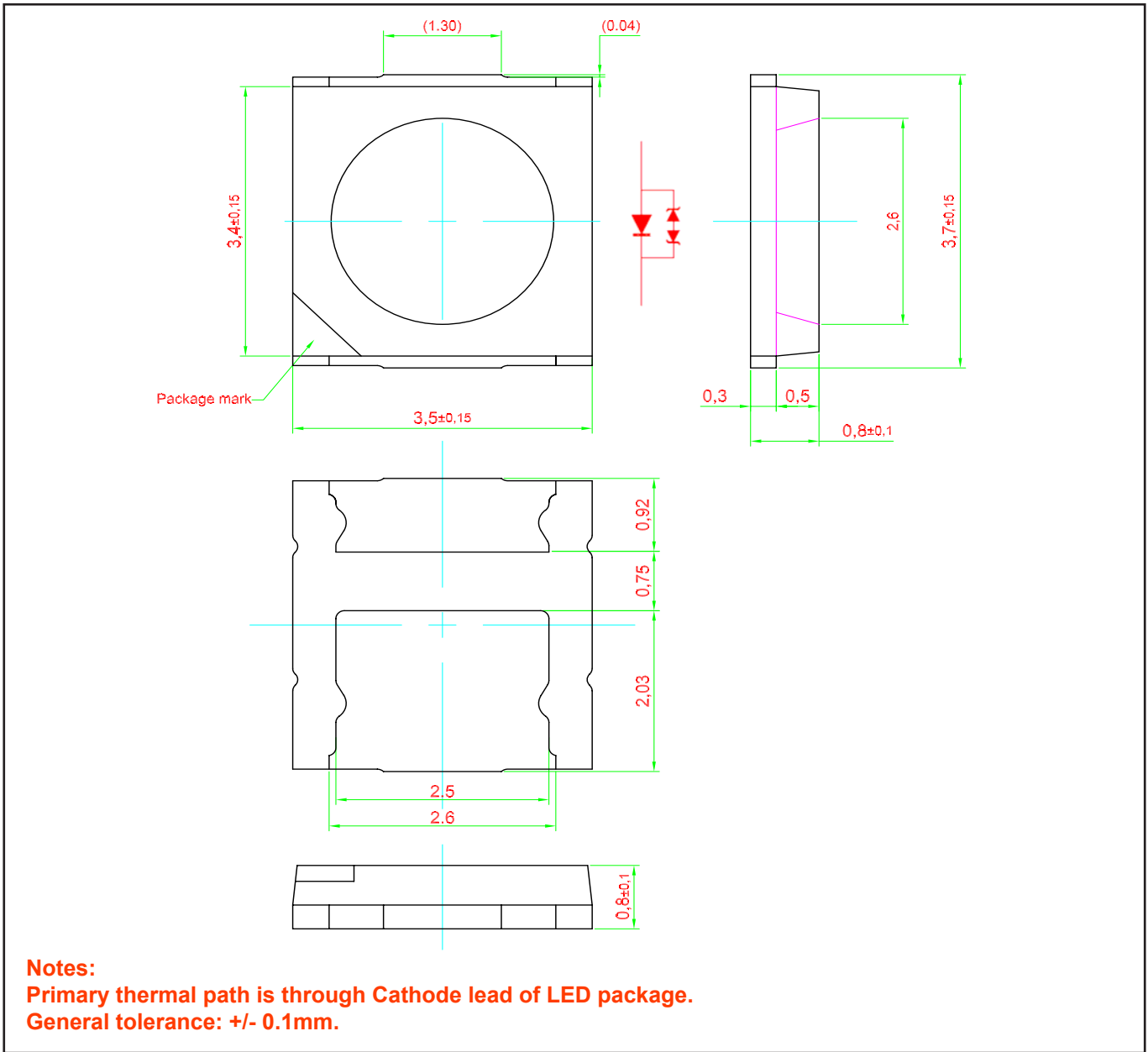


**Chromaticity Coordinate Shift Vs Junction Temperature**

$$\Delta C_x, \Delta C_y = f(T_j); I_F = 250\text{mA}$$



**PrimaxPlus • InGaN White: MAW-KZHG Package Outlines**



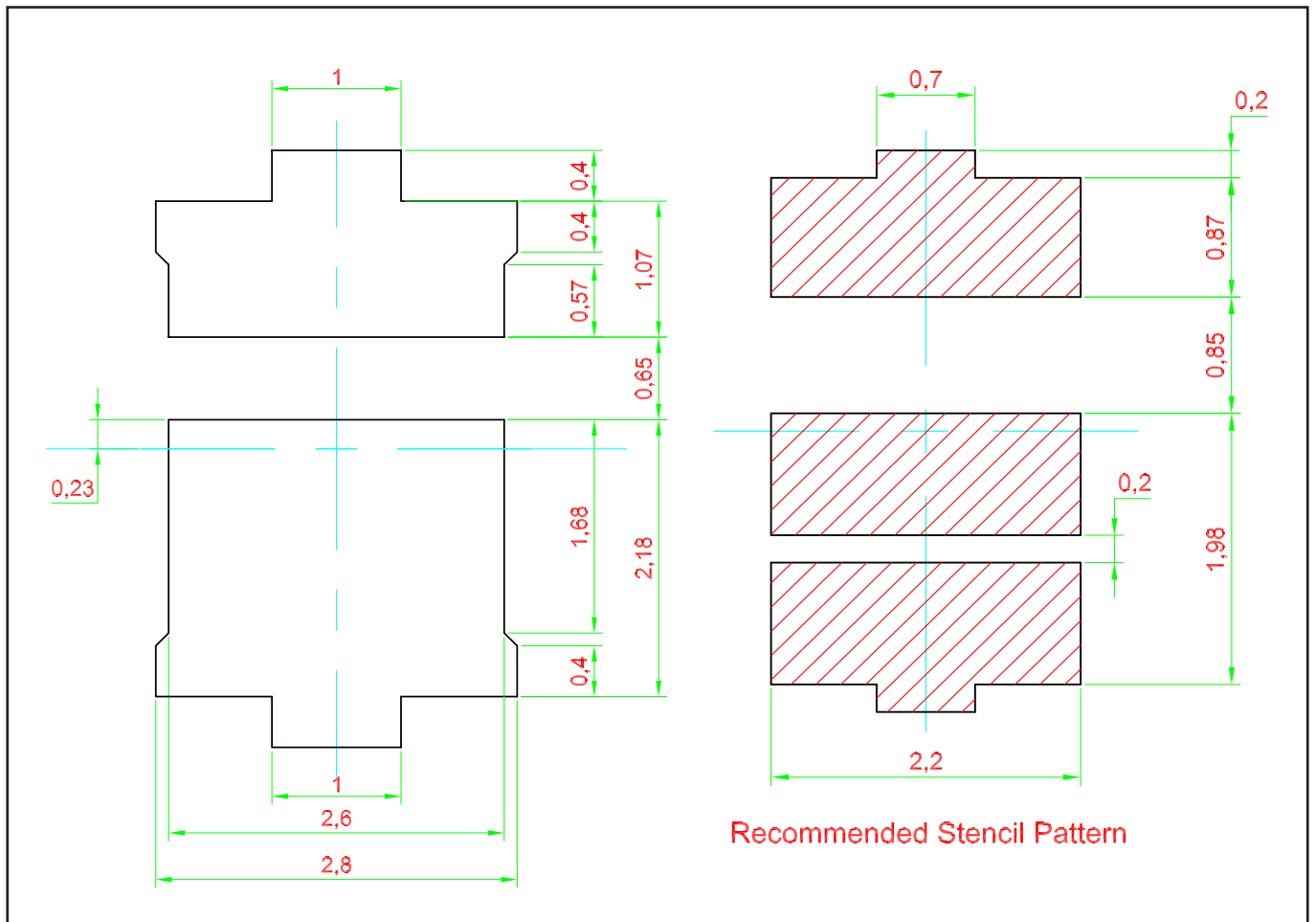
**Material**

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

Note: This product is Pb free

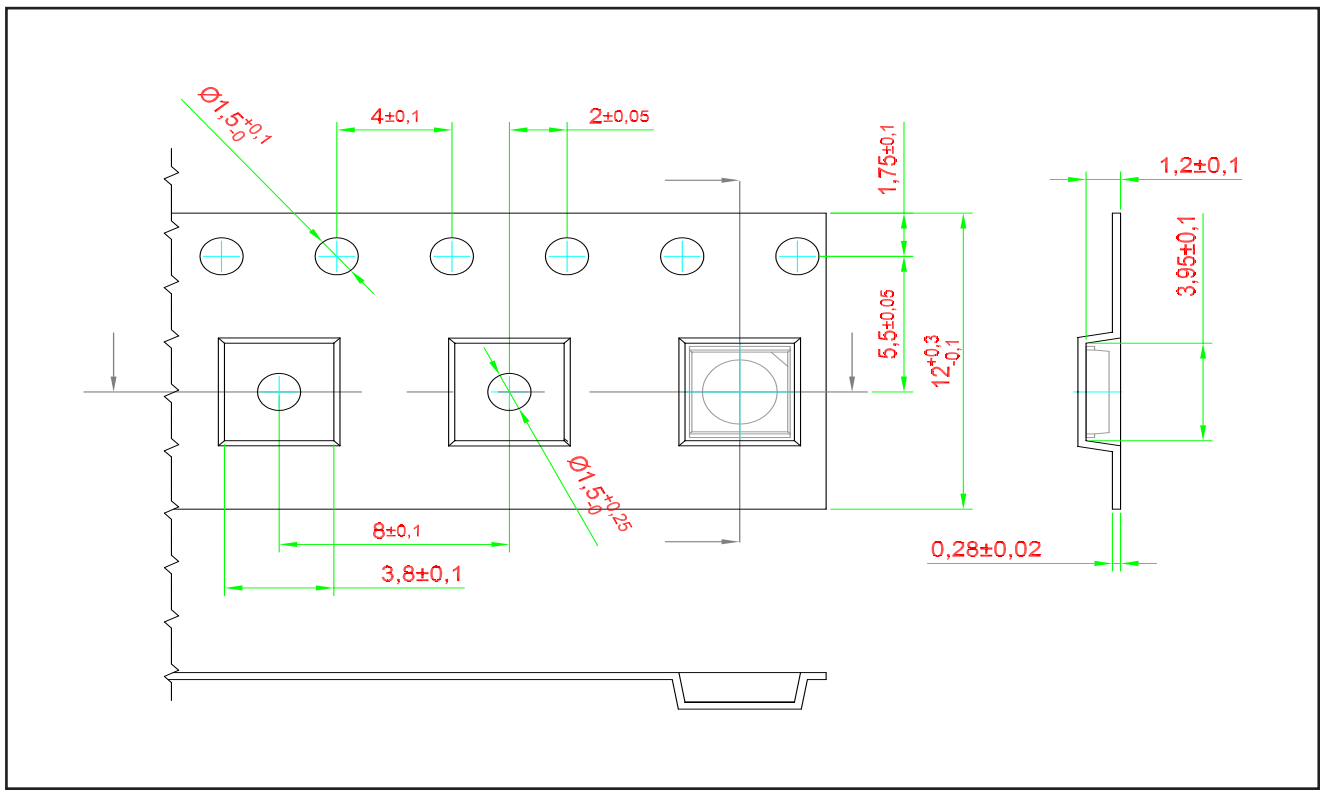


**Recommended Solder Pad**

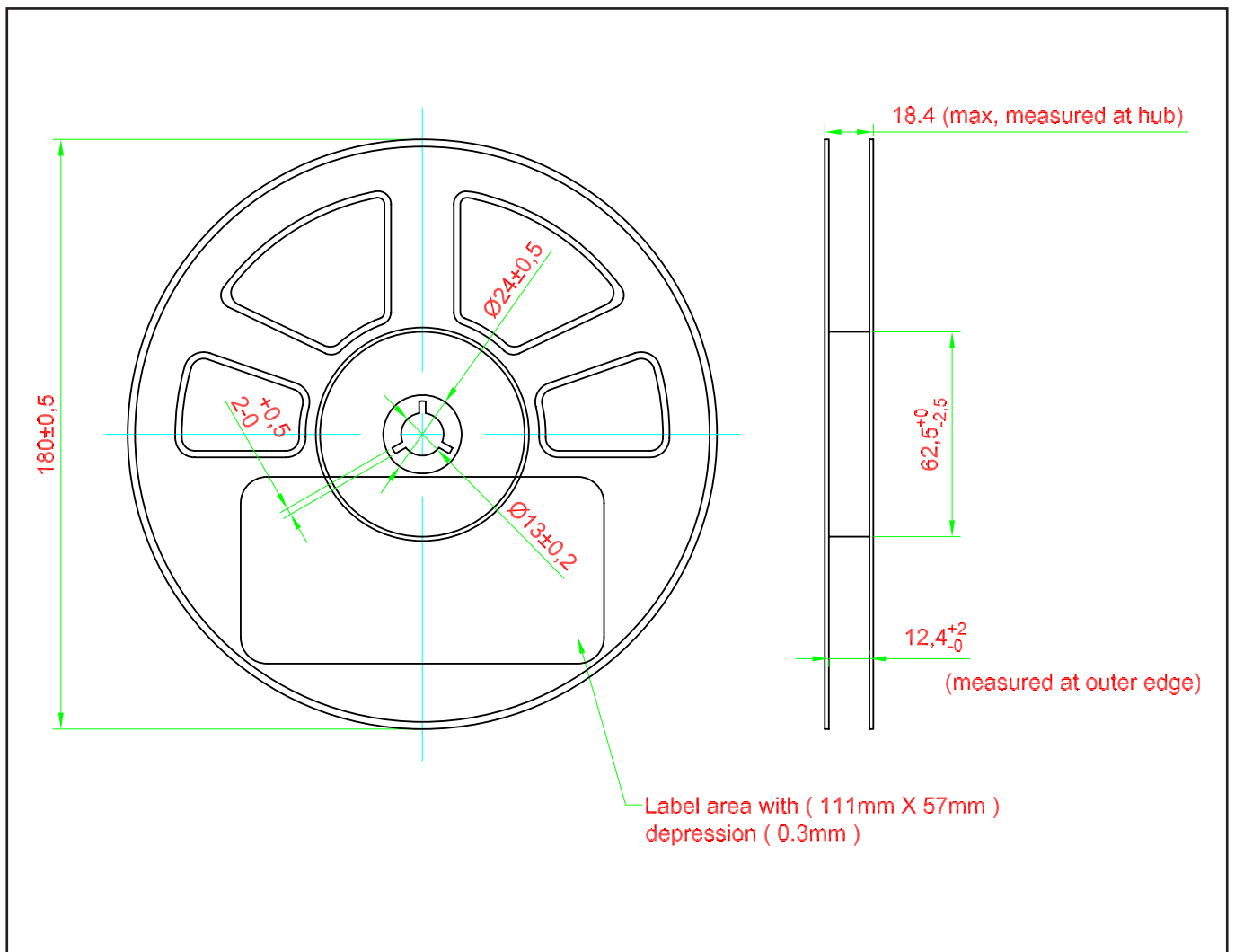


## Taping and orientation

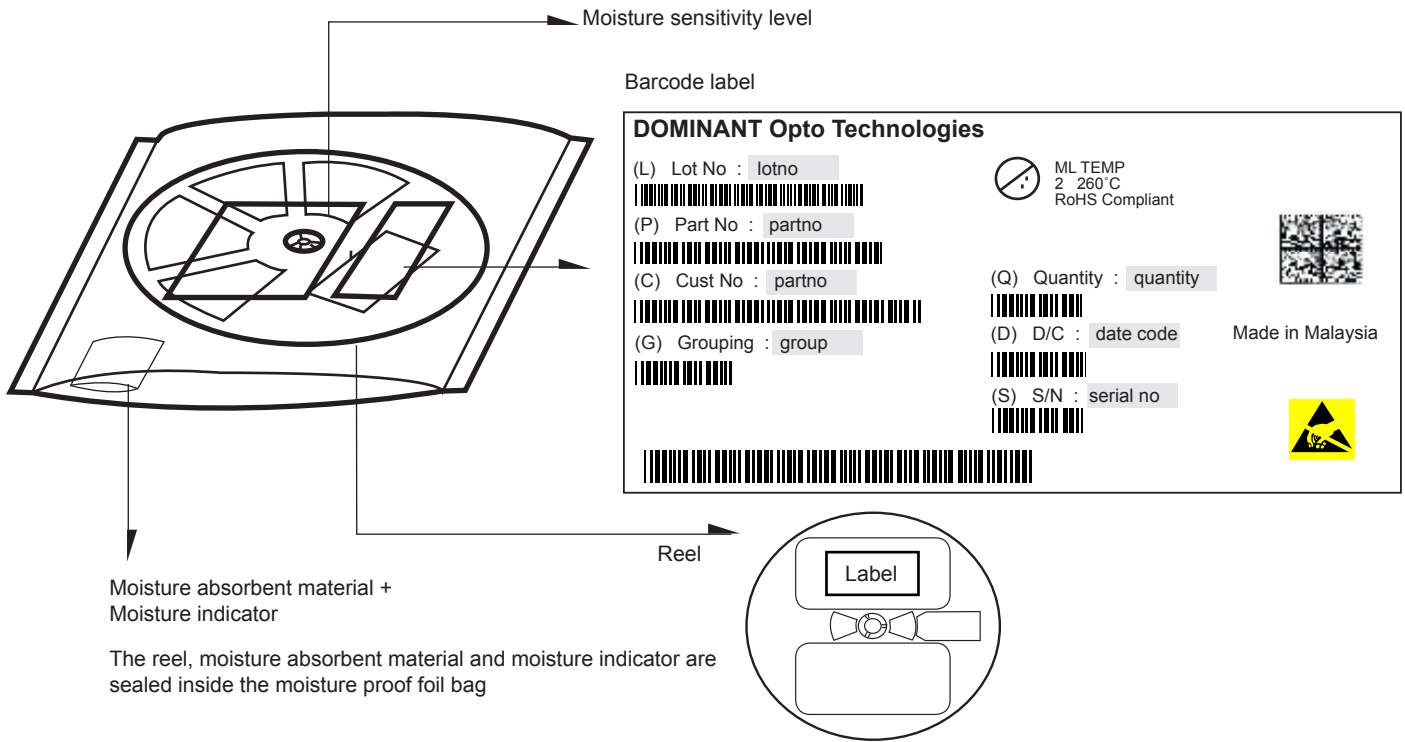
- Reels come in quantity of 1000 units.
- Reel diameter is 180 mm.



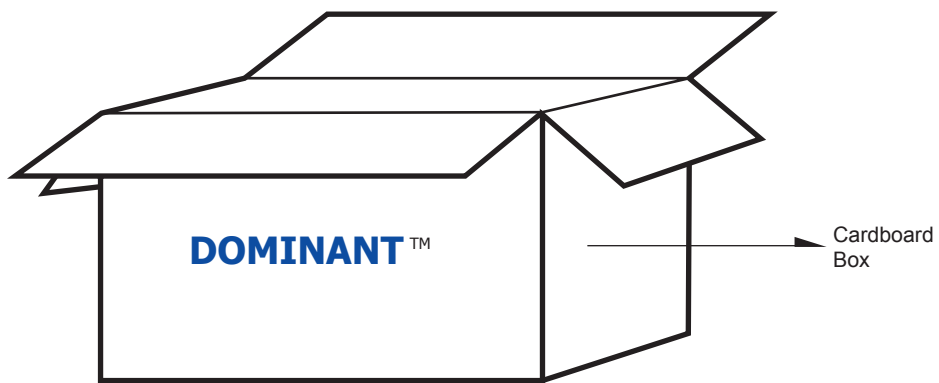
**Packaging Specification**



**Packaging Specification**



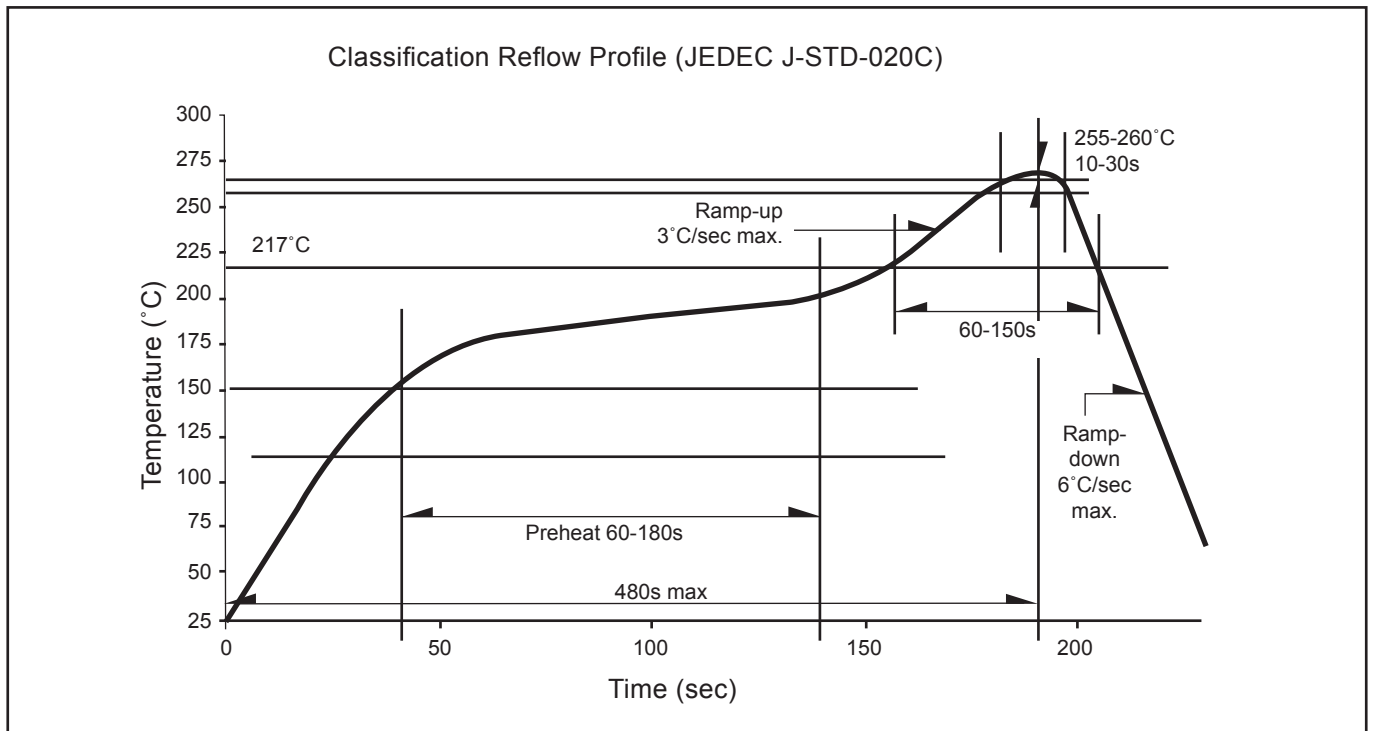
	Average 1pc PrimaxPlus	1 completed bag (1000pcs)
Weight (gram)	0.034	230 ± 10



**For PrimaxPlus**

Cardboard Box Size	Dimensions (mm)	Empty Box Weight (kg)	Reel / Box
Super Small	325 x 225 x 190	0.38	7 reels MAX
Small	325 x 225 x 280	0.54	11 reels MAX
Medium	570 x 440 x 230	1.46	48 reels MAX
Large	570 x 440 x 460	1.92	96 reels MAX

### Recommended Pb-free Soldering Profile



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## Appendix

### 1) **Brightness:**

- 1.1 Luminous intensity is measured 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 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 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 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 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 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 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  $k=3$ ).

**Revision History**

Page	Subjects	Date of Modification
-	Initial Release	11 Oct 2017
2, 5, 13	Update Peak Pulse Current Update All Maximum Current Graph Update Appendix	09 Nov 2017

**NOTE**

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## 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, a ISO/TS 16949 and ISO 14001 certified company, can be found under <http://www.dominant-semi.com>.

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