DOMINANT™
Opto Technologies
Innovating Illumination

DATASHEET:

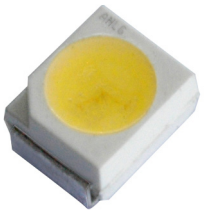
DomiLED

InGaN : DDW-DKG-F1P3-I1

(ZERO Binning)

DomiLED

Synonymous with function and performance, the DomiLED series is perfectly suited for a variety of cross-industrial applications due to its small package outline, durability and superior brightness.



Features:

- Single IV bin and Single color bin.
- High brightness surface mount LED.
- Based on InGaN / Sapphire technology.
- 120° viewing angle.
- Small package outline (LxWxH) of 3.2 x 2.8 x 1.8mm.
- Qualified according to JEDEC moisture sensitivity Level 2.
- Compatible to IR reflow soldering.
- Environmental friendly; RoHS compliance.
- Superior corrosion resistant.
- Compliance to automotive standard; AEC-Q102.

Applications:

- Automotive: interior applications, eg: switches, climate control system, dashboard, etc.

Optical Characteristics at Tj=25˚C

Part Ordering Number	Color	Viewing Angle°	Luminous Intensity @ 10mA IV (mcd) Appx. 1.1 Min.	Typ.	Max.
DDW-DKG-T1-xxxx-I1	White	120	285.0	320.0	355.0
DDW-DKG-T2-xxxx-I1	White	120	355.0	400.0	450.0

Notes:
1. Single Intensity Bin “T1” selection is applicable to color box within Zone 1 range as indicated on page 3.
   Example: for color box selection “H3”, the order part number will be DDW-DKG-T1-H3-I1.
2. Single Intensity Bin “T2” selection is applicable to color box within Zone 2 & Zone 3 range as indicated on page 3.
   Example: for color box selection “M2”, the order part number will be DDW-DKG-T2-M2-I1.

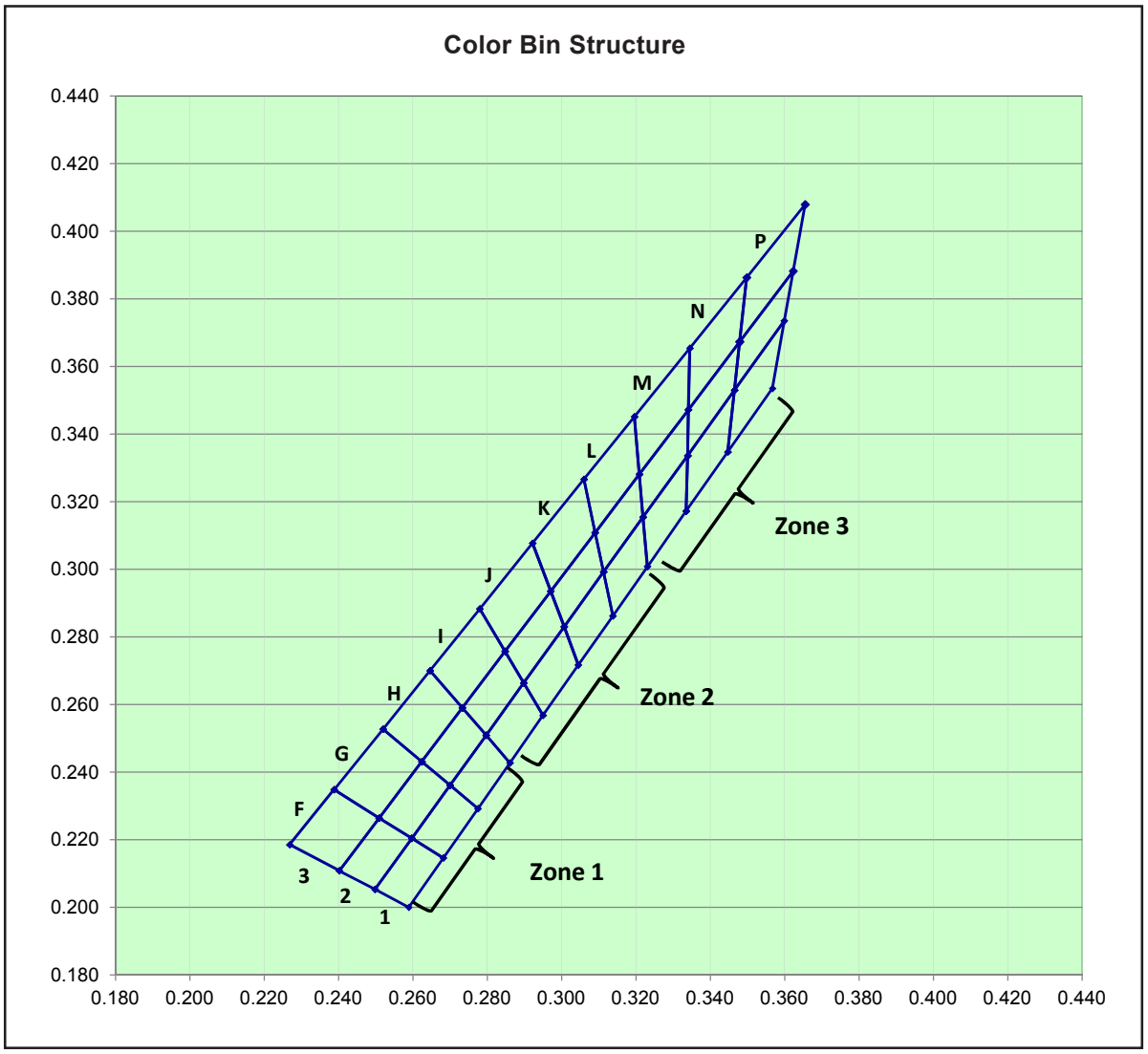
Electrical Characteristics at Tj=25˚C

Part Number	Vf @ If = 10mA Appx. 3.1 Min. (V)	Typ. (V)	Max. (V)	Vr @ Ir = 10 µA Appx. 6.1 Min. (V)
DDW-DKG	2.6	3.0	3.2	5.0

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	30	mA
Peak pulse current; (T_s=55°C, tp<=100µs , Duty cycle=0.03)	100	mA
Reverse voltage	5	V
ESD threshold (HBM)	2000	V
LED junction temperature	125	˚C
Operating temperature	-40 … +110	˚C
Storage temperature	-40 … +125	˚C
Power dissipation (at room temperature)	105	mW
Thermal resistance (Rated current = 10mA, Ts = 25 ˚C)		
- Real Thermal Resistance		
Junction / ambient, $R_{th\ JA\ real}$	445	K/W
Junction / solder point, $R_{th\ JS\ real}$	170	K/W

DDW, White Color Grouping *Appx. 2.1*



Bin		1	2	3	4
F1	Cx	0.2498	0.2589	0.2682	0.2597
	Cy	0.2053	0.2000	0.2146	0.2204
F2	Cx	0.2402	0.2498	0.2597	0.2509
	Cy	0.2108	0.2053	0.2204	0.2264
F3	Cx	0.2269	0.2388	0.2509	0.2402
	Cy	0.2185	0.2348	0.2264	0.2108
G1	Cx	0.2597	0.2682	0.2775	0.2700
	Cy	0.2204	0.2146	0.2292	0.2361
G2	Cx	0.2509	0.2597	0.2700	0.2624
	Cy	0.2264	0.2204	0.2361	0.2431
G3	Cx	0.2388	0.2509	0.2624	0.2520
	Cy	0.2348	0.2264	0.2431	0.2527
H1	Cx	0.2700	0.2775	0.2861	0.2797
	Cy	0.2361	0.2292	0.2427	0.2509
H2	Cx	0.2624	0.2700	0.2797	0.2733
	Cy	0.2431	0.2361	0.2509	0.2590
H3	Cx	0.2520	0.2624	0.2733	0.2646
	Cy	0.2527	0.2431	0.2590	0.2700

Bin		1	2	3	4
I1	Cx	0.2797	0.2861	0.2950	0.2898
	Cy	0.2509	0.2427	0.2568	0.2664
I2	Cx	0.2733	0.2797	0.2898	0.2848
	Cy	0.2590	0.2509	0.2664	0.2757
I3	Cx	0.2646	0.2733	0.2848	0.2780
	Cy	0.2700	0.2590	0.2757	0.2883
J1	Cx	0.2898	0.2950	0.3045	0.3007
	Cy	0.2664	0.2568	0.2717	0.2830
J2	Cx	0.2848	0.2898	0.3007	0.2971
	Cy	0.2757	0.2664	0.2830	0.2935
J3	Cx	0.2780	0.2848	0.2971	0.2922
	Cy	0.2883	0.2757	0.2935	0.3077
K1	Cx	0.3007	0.3045	0.3138	0.3113
	Cy	0.2830	0.2717	0.2862	0.2992
K2	Cx	0.2971	0.3007	0.3113	0.3090
	Cy	0.2935	0.2830	0.2992	0.3108
K3	Cx	0.2922	0.2971	0.3090	0.3060
	Cy	0.3077	0.2935	0.3108	0.3266
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
L3	Cx	0.3060	0.3090	0.3209	0.3196
	Cy	0.3266	0.3108	0.3281	0.3451
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
M3	Cx	0.3196	0.3209	0.3341	0.3345
	Cy	0.3451	0.3281	0.3472	0.3654
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
N3	Cx	0.3341	0.3345	0.3498	0.3479
	Cy	0.3472	0.3654	0.3863	0.3673
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
P3	Cx	0.3479	0.3498	0.3655	0.3623
	Cy	0.3673	0.3863	0.4079	0.3882

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 Intensity *Appx. 1.1* IV (mcd)
T1	285.0 ... 355.0
T2	355.0 ... 450.0

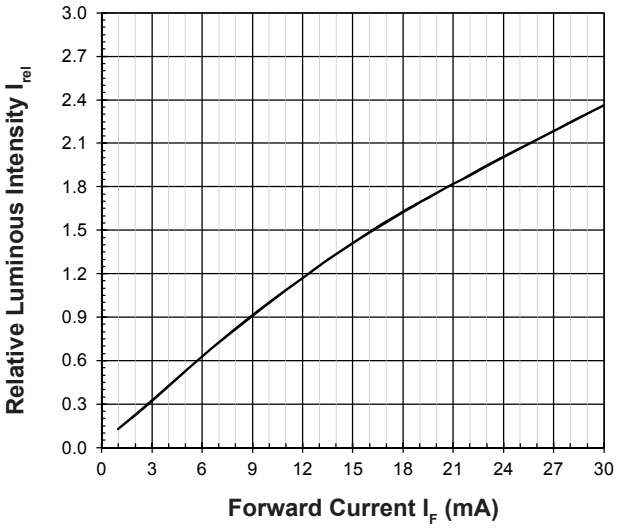
Vf Binning (Optional)

Vf Bin @ 10mA	Forward Voltage (V) *Appx. 3.1*
VV5	2.60 ... 2.90
VV6	2.90 ... 3.20

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

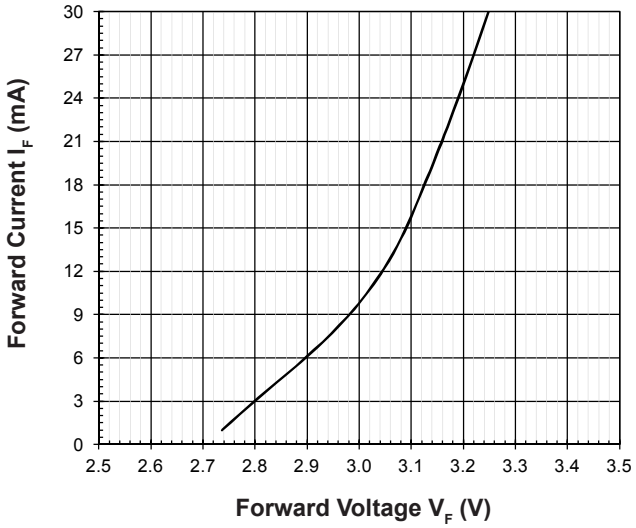
Relative Luminous Intensity Vs Forward Current

$I_V/I_V(10mA) = f(I_F)$; Tj = 25°C



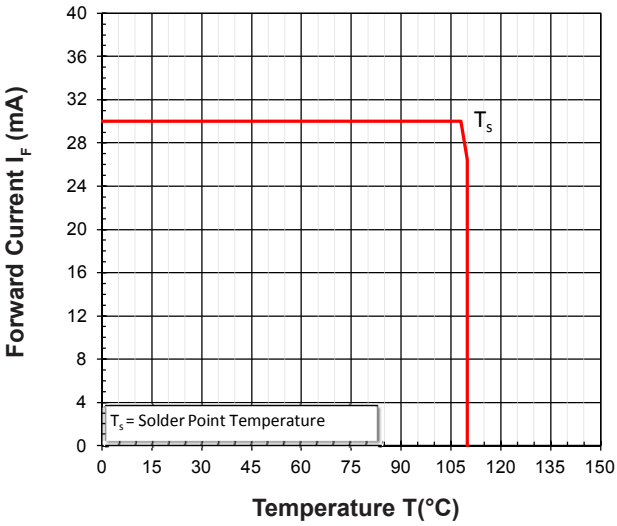
Forward Current Vs Forward Voltage

$I_F = f(V_F)$; T_j = 25°C



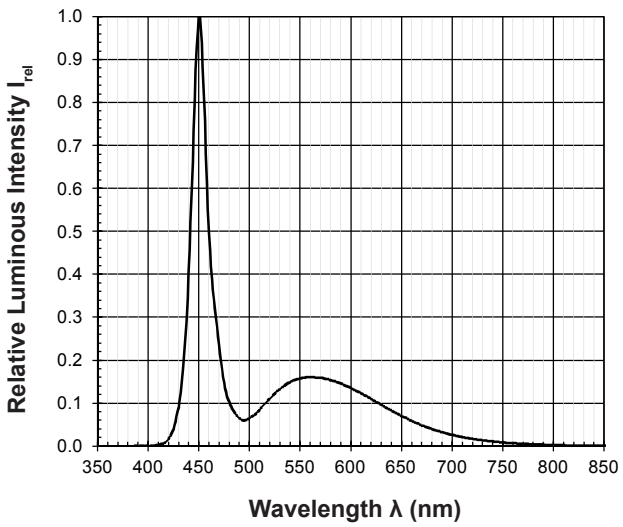
Maximum Current Vs Temperature

$I_F=f(T)$



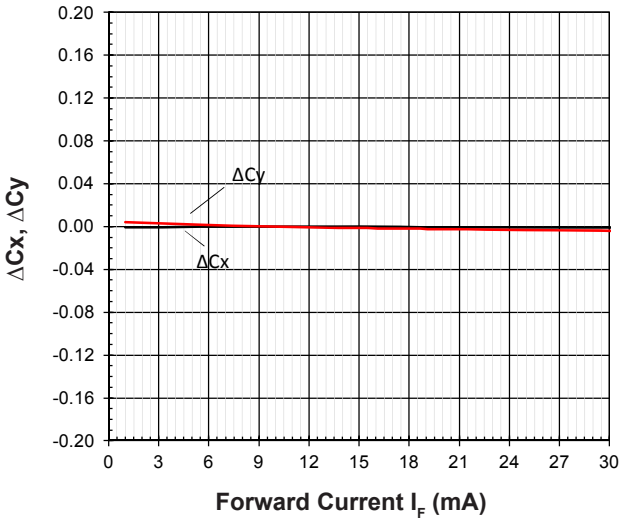
Relative Spectral Emission

$I_{rel} = f(\lambda)$; T_j = 25°C; I_F = 10mA



Chromaticity Coordinate Shift Vs Forward Current

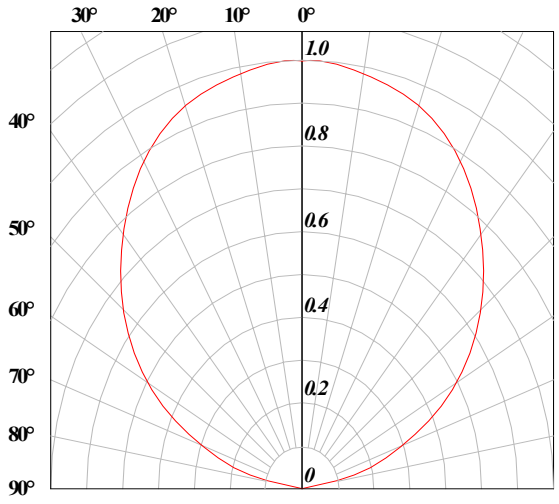
$\Delta Cx, \Delta Cy = f(I_F)$;$T_j$ = 25°C



Allowable Forward Current Vs Duty Ratio

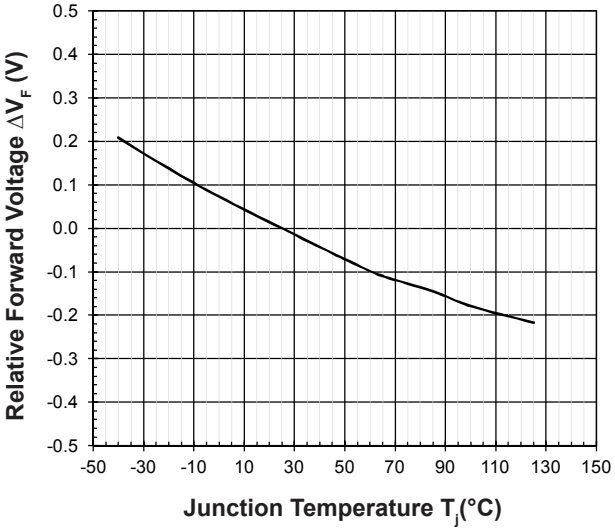
(Ts = 55°C; tp =100µs)

Radiation Pattern



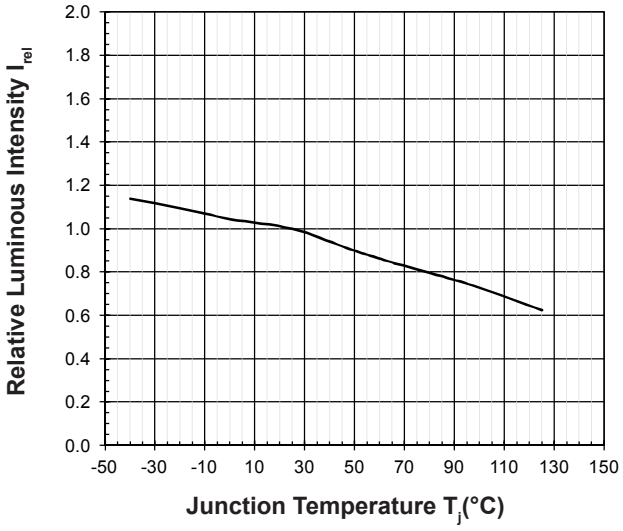
Relative Forward Voltage Vs Junction Temperature

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =10mA



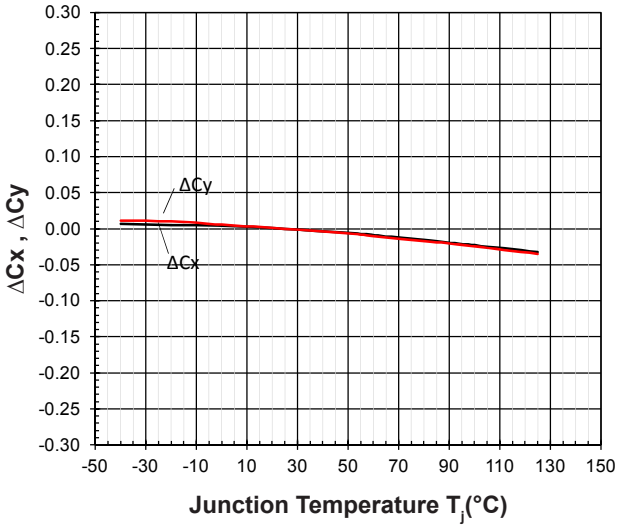
Relative Luminous Intensity Vs Junction Temperature

$I_V/I_V(25°C) = f(T_j)$; I_F = 10mA

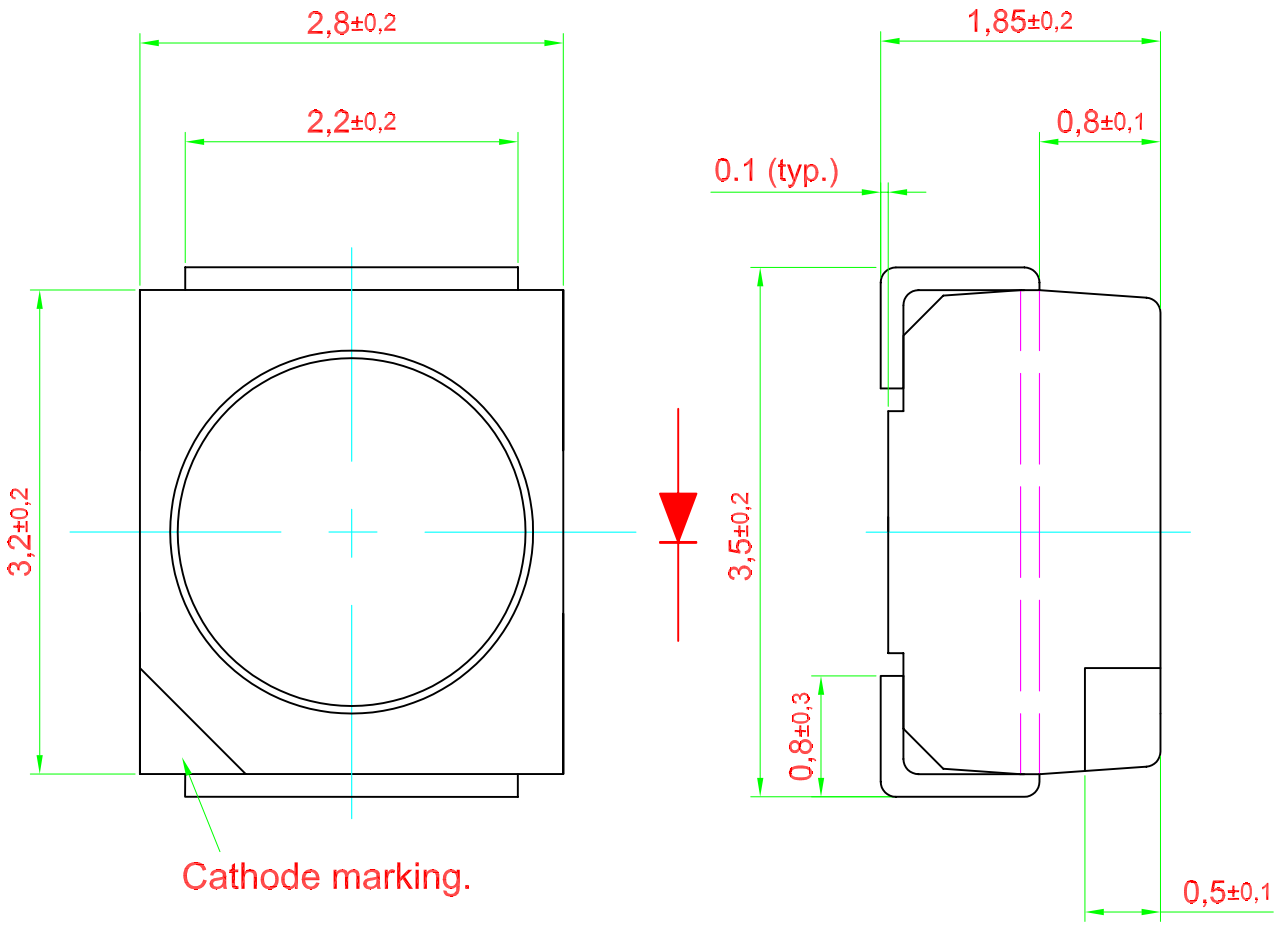


Chromaticity Coordinate Shift Vs Junction Temperature

$\Delta Cx, \Delta Cy = f(T_j)$; I_F = 10mA



DomiLED • InGaN : DDW-DKG-F1P3-I1 Package Outlines



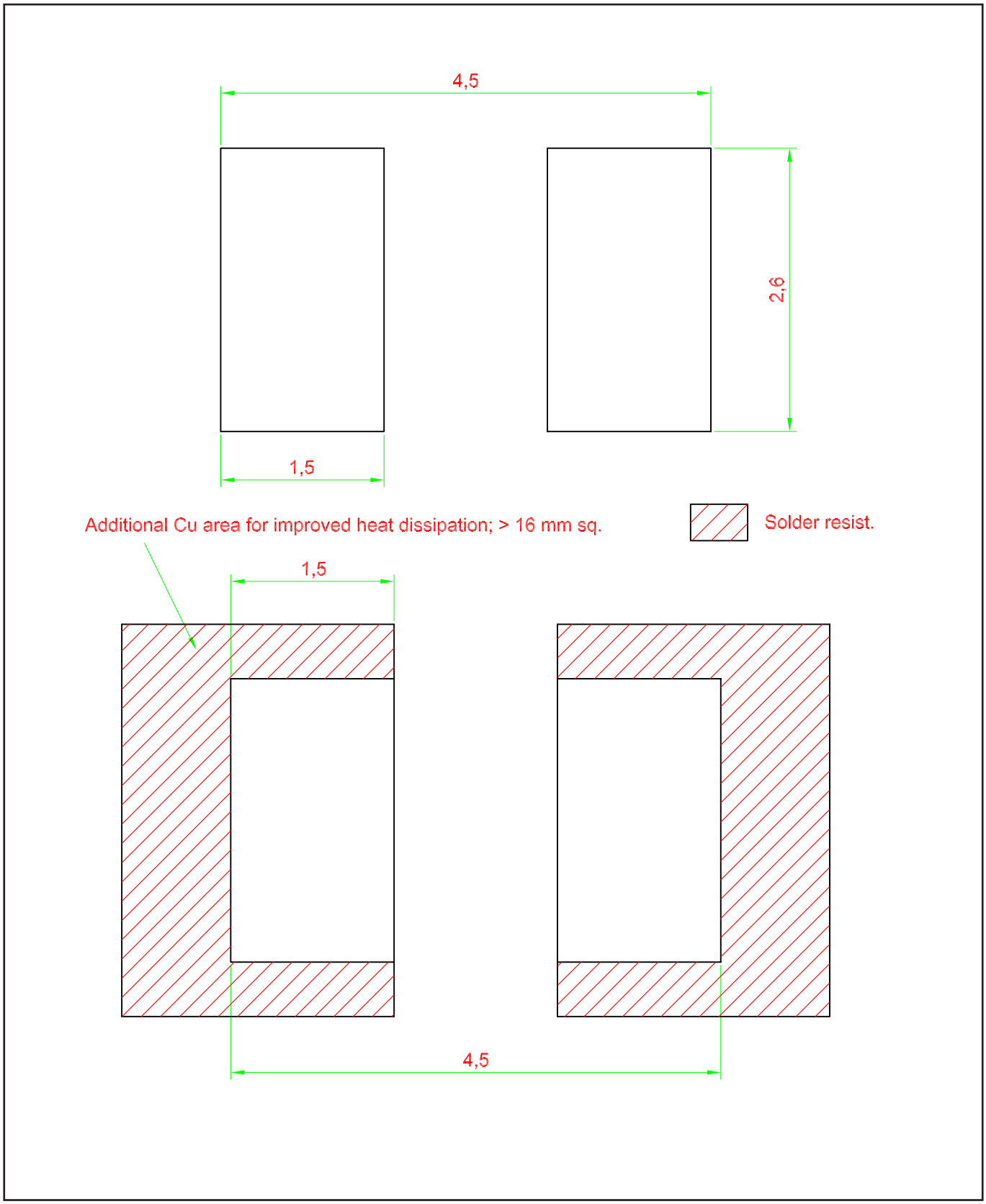
Note: Primary thermal path is through Cathode Lead of LED package.

Materials

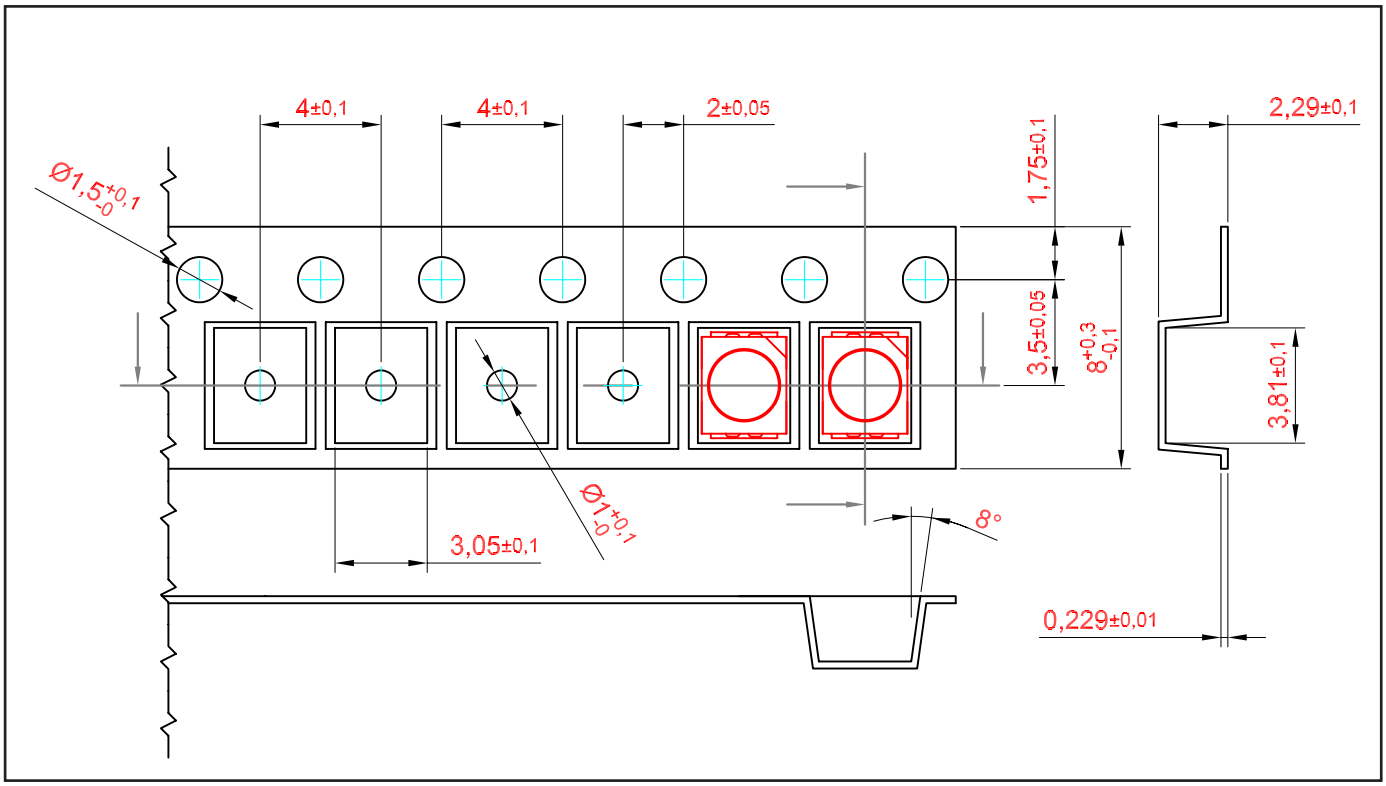
Materials	
Lead Frame	Cu Alloy With Au Plating
Housing	High temperature resistant plastic, PPA
Encapsulant	Silicone Resin
Lead-finishing	Au Plating

Note: Package is Pb-free.

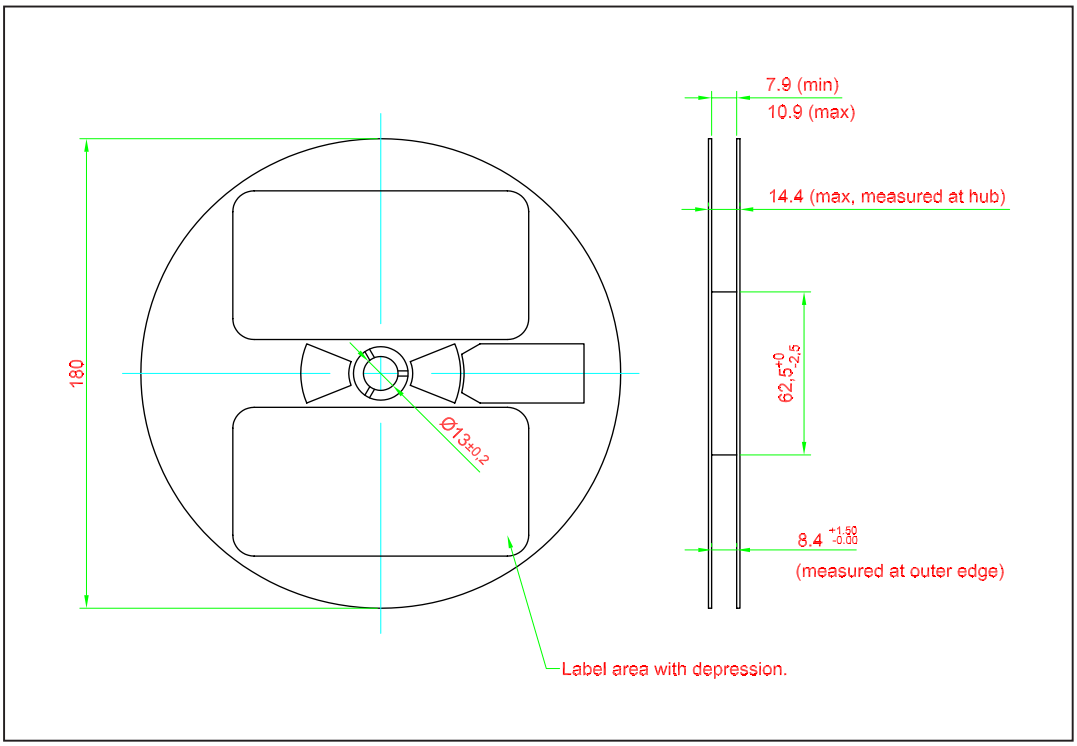
Recommended Solder Pad

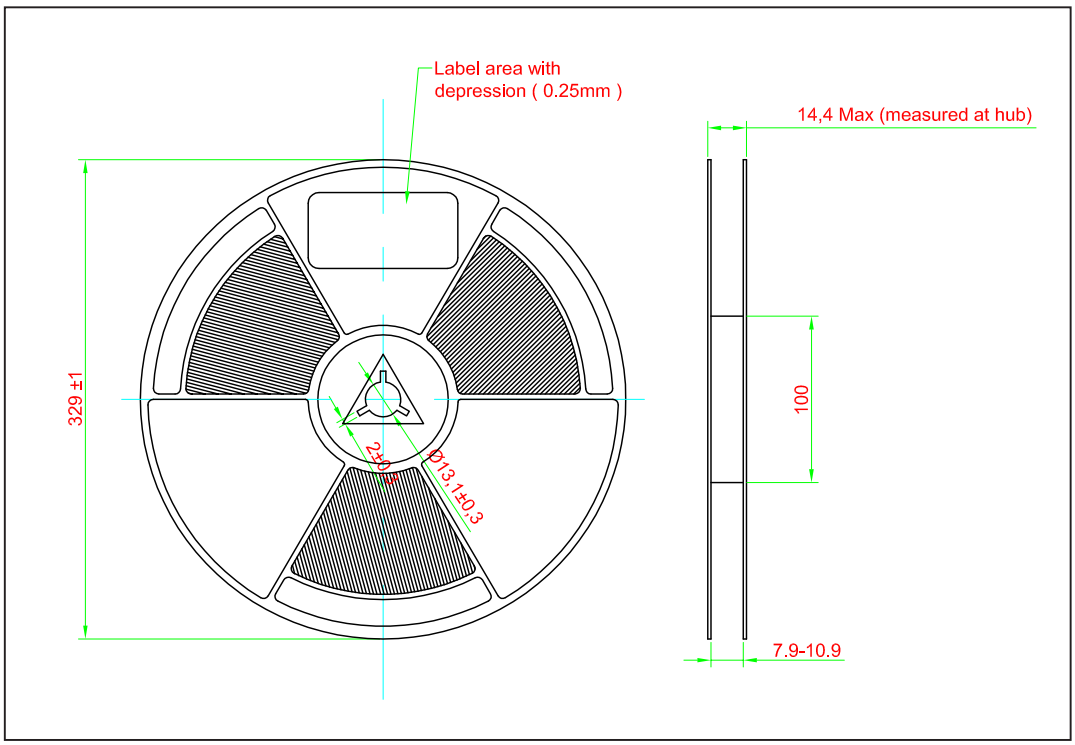


Taping and orientation



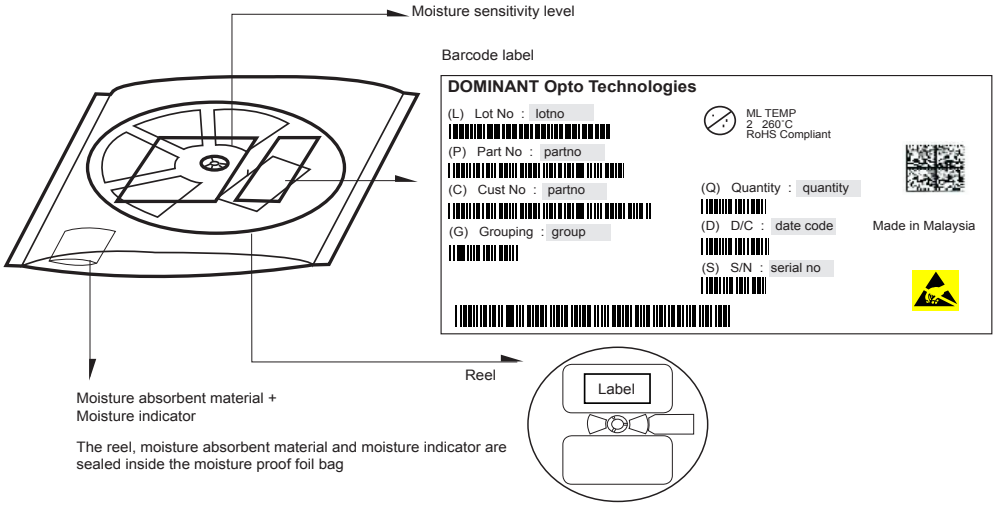
Packaging Specification



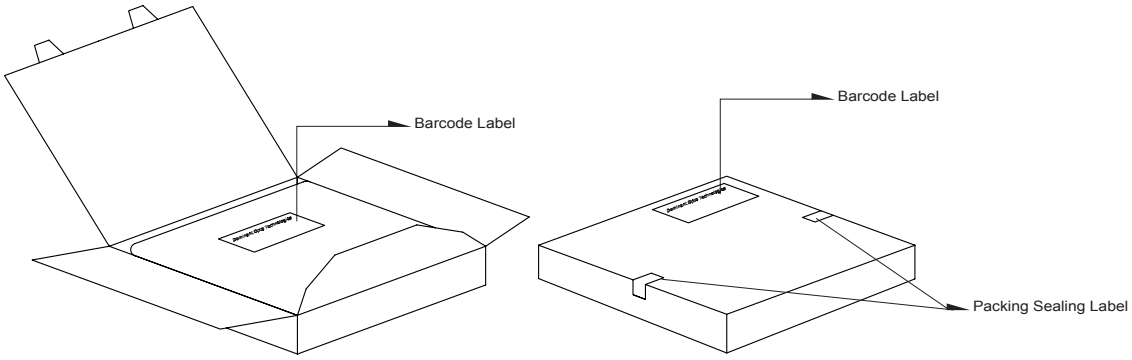


	Reel Diameter (mm)	Quantity (pcs)	Partno
Standard Packing	180	2000	DDW-DKG-xxx-F1P3-I1
Optional Packing	329	8000	DDW-DKG-xxx-F1P3-I1-8

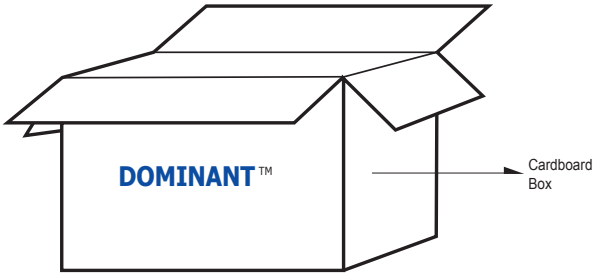
Packaging Specification



Quantity per bag (pcs)	Average 1pc DomiLED (gram)	1 completed bag (gram)
2000	0.034	240 ± 10
8000	0.034	750 ± 10



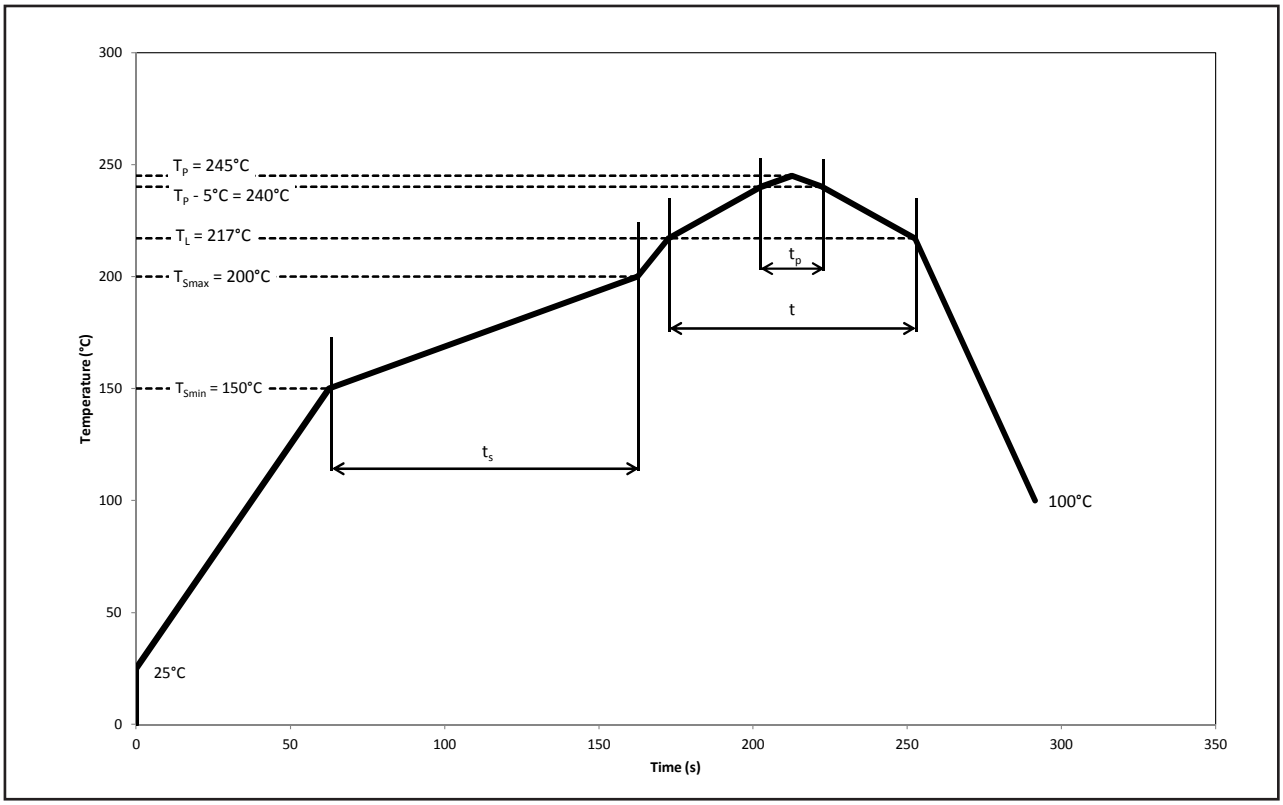
Reel Diameter (mm)	Packing Box Dimensions (mm)
180	210 x 210 x 16
329	345 x 345 x 16



Reel Diameter (mm)	Cardboard Box Size	Dimensions (mm)	Empty Box Weight (kg)	Reel / Box
180	Super Small	325 x 225 x 190	0.38	9 reels MAX
180	Small	325 x 225 x 280	0.54	15 reels MAX
180	Medium	570 x 440 x 230	1.46	60 reels MAX
180	Large	570 x 440 x 460	1.92	120 reels MAX
329	Medium	373 x 373 x 285	1.02	13 reels MAX
329	Large	580 x 373 x 405	1.50	30 reels MAX

Recommended Pb-free Soldering Profile

Product complies to MSL Level 2 acc. to JEDEC



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.

6) Reverse Voltage:

6.1 Not designed for reverse operation. Continuous reverse voltage can cause migration and LED damage.

Revision History

Page	Subjects	Date of Modification
-	Initial release	11 Jan 2021

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, an IATF 16949 and ISO 14001 certified company, can be found under http://www.dominant-semi.com.

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