

## 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:

- > 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, telematics, climate control system, dashboard, etc.
- > Automotive: exterior applications, eg: licensed plate lamp, position lamp.

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

Part Number	Color	Viewing Angle°	Luminous Intensity @ 20mA IV (mcd) <small>Appx. 1.1</small>		
			Min.	Typ.	Max.
DDW-HZKG-W2X-F1H3	White	120	1400.0	2100.0	2850.0
DDW-HZKG-XY1-I1L3	White	120	1800.0	2400.0	3550.0
DDW-HZKG-XY1-M1P3	White	120	1800.0	2400.0	3550.0

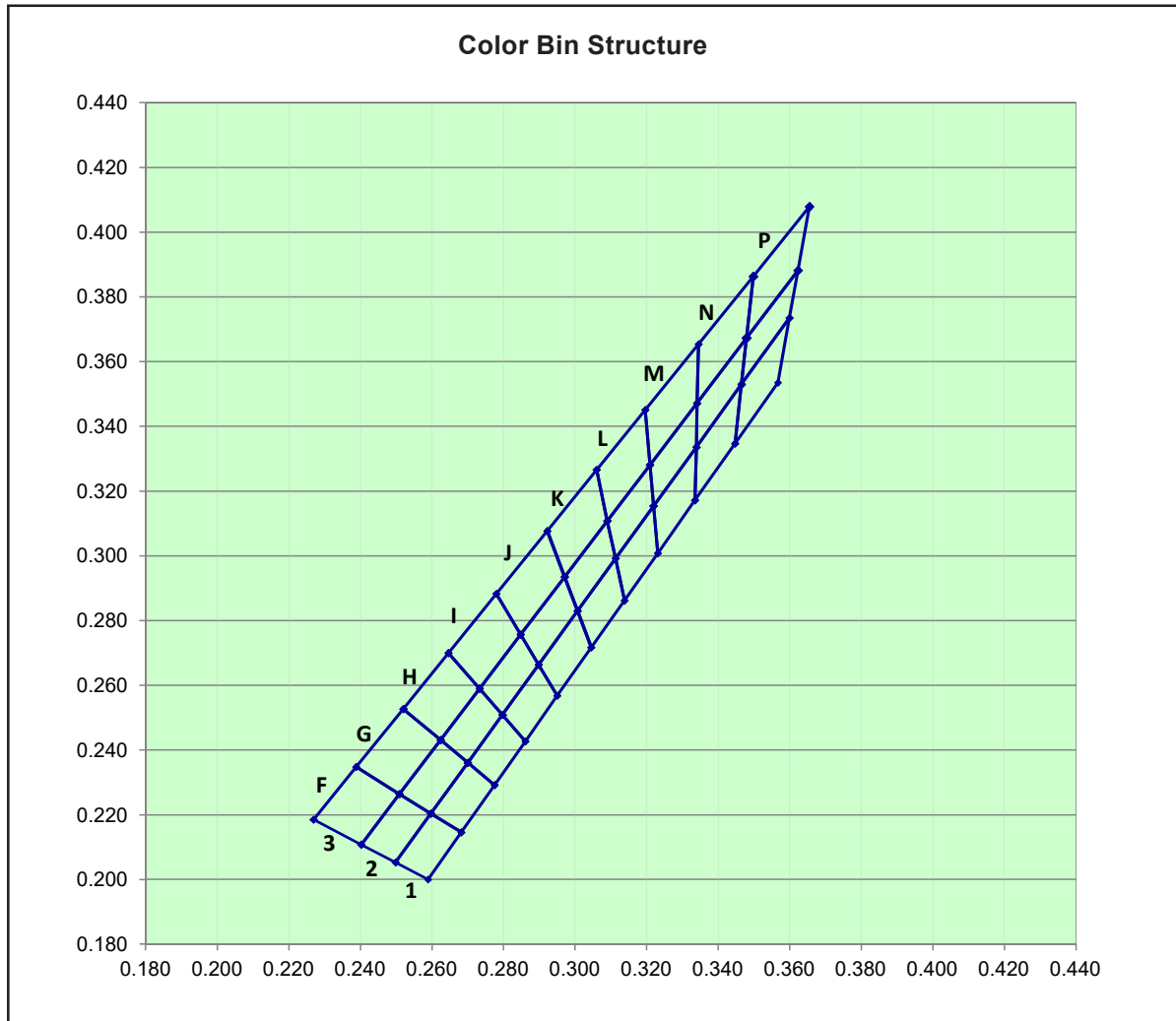
**Electrical Characteristics at Tj=25°C**

Part Number	Vf @ If = 20mA <small>Appx. 3.1</small>		
	Min. (V)	Typ. (V)	Max. (V)
DDW-HZKG	2.8	3.0	3.3

**Absolute Maximum Ratings**

	Maximum Value	Unit
DC forward current	50	mA
Peak pulse current; (Ts=55 °C, tp ≤ 100µs, Duty cycle = 0.03)	125	mA
Reverse voltage	Not for reverse bias	V
ESD threshold (HBM)	8000	V
LED junction temperature	125	°C
Operating temperature	-40 ... +115	°C
Storage temperature	-40 ... +125	°C
Thermal resistance		
- Real Thermal Resistance		
Junction / ambient, R <sub>th JA real</sub>	300	K/W
Junction / solder point, R <sub>th JS real</sub>	140	K/W
- Electrical Thermal Resistance		
Junction / ambient, R <sub>th JA el</sub>	260	K/W
Junction / solder point, R <sub>th JS el</sub>	120	K/W

DDW, 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 <i>Appx. 1.1</i> IV (mcd)
W2	1400.0 ... 1800.0
X1	1800.0 ... 2240.0
X2	2240.0 ... 2850.0
Y1	2850.0 ... 3550.0

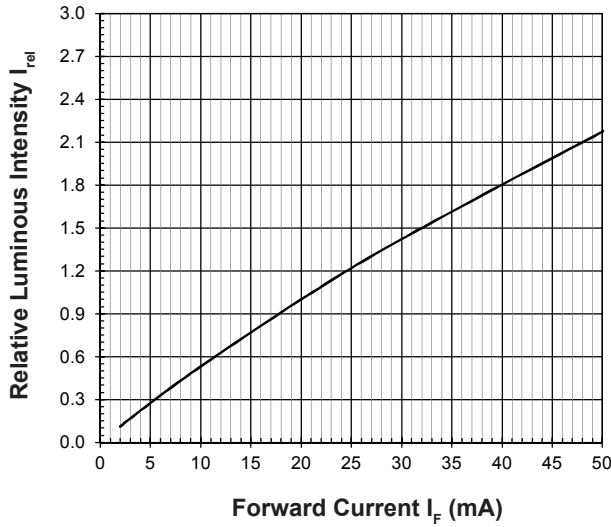
**Vf Binning (Optional)**

Vf Bin @ 20mA	Forward Voltage (V) <i>Appx. 3.1</i>
VH8	2.80 ... 3.00
VH9	3.00 ... 3.20
VJ1	3.20 ... 3.40

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

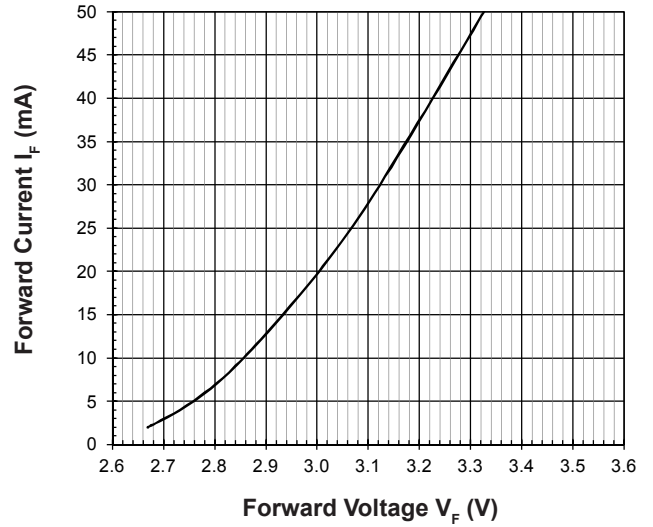
**Relative Luminous Intensity Vs Forward Current** *Appx. 4.1*

$I_v/I_v(20mA) = f(I_F); T_j = 25^\circ C$



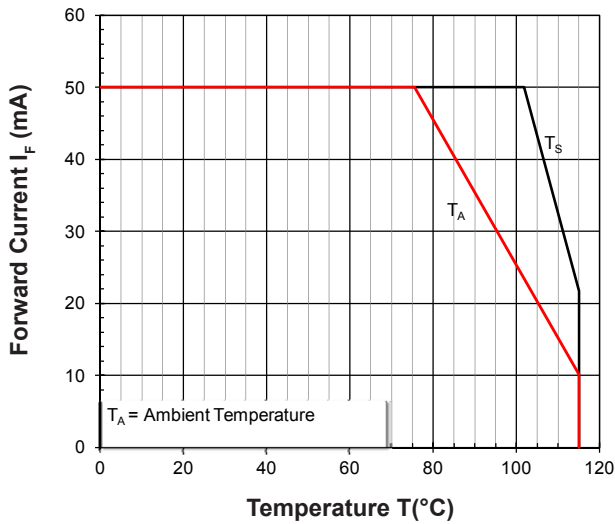
**Forward Current Vs Forward Voltage** *Appx. 4.1*

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



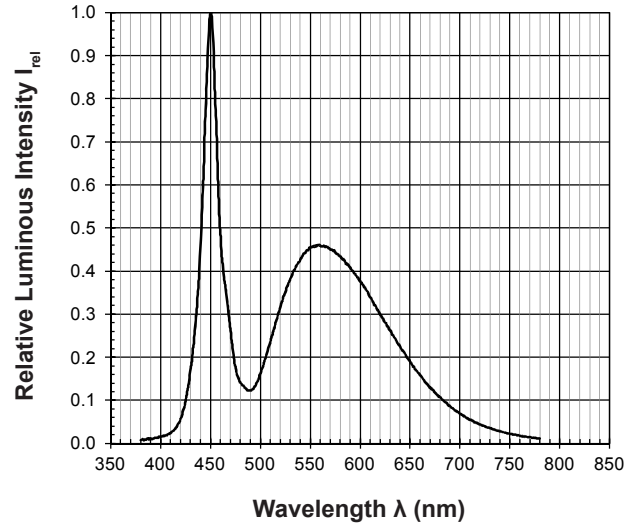
**Maximum Current Vs Temperature**

$I_F = f(T)$



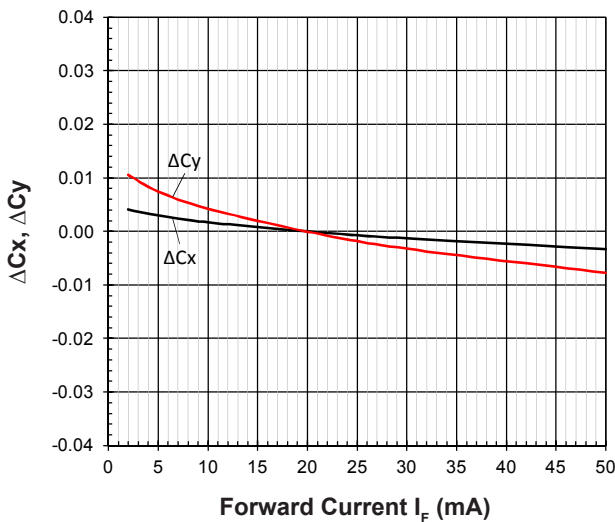
**Relative Spectral Emission** *Appx. 4.1*

$I_{rel} = f(\lambda); T_j = 25^\circ C; I_F = 20mA$



**Chromaticity Coordinate Shift Vs Forward Current** *Appx. 4.1*

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

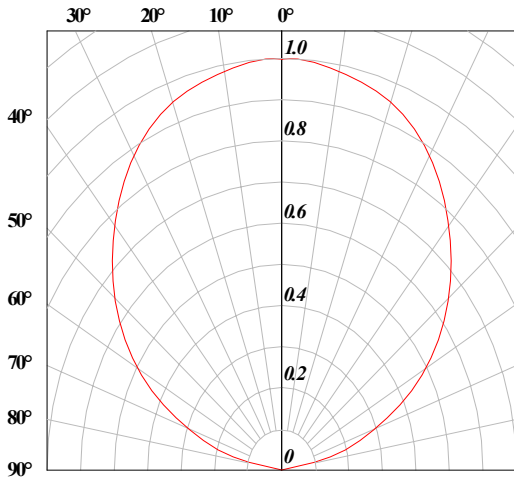


**Allowable Forward Current Vs Duty Ratio**

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

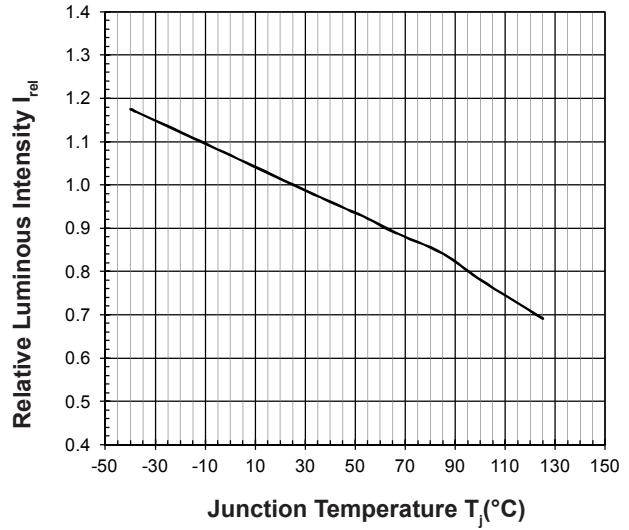


**Radiation Pattern** *Appx. 4.1*



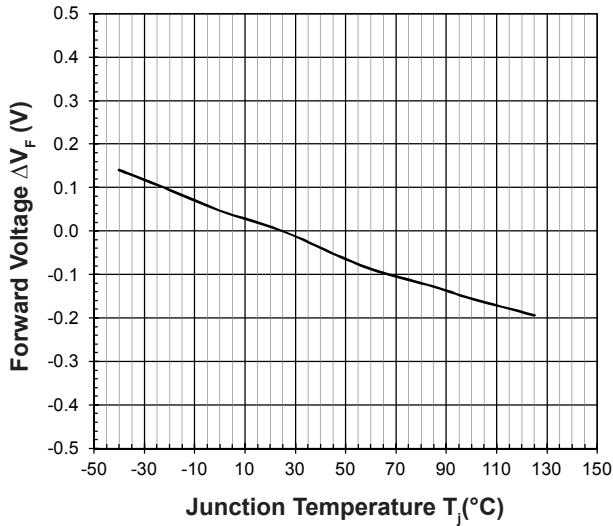
**Relative Luminous Intensity Vs Junction Temperature** *Appx. 4.1*

$$I_v/I_v(25^\circ\text{C}) = f(T_j); I_F = 20\text{mA}$$



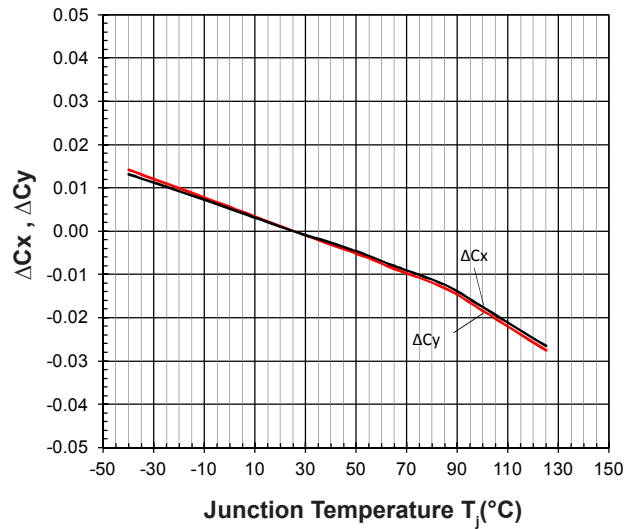
**Forward Voltage Vs Junction Temperature** *Appx. 4.1*

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 20\text{mA}$$

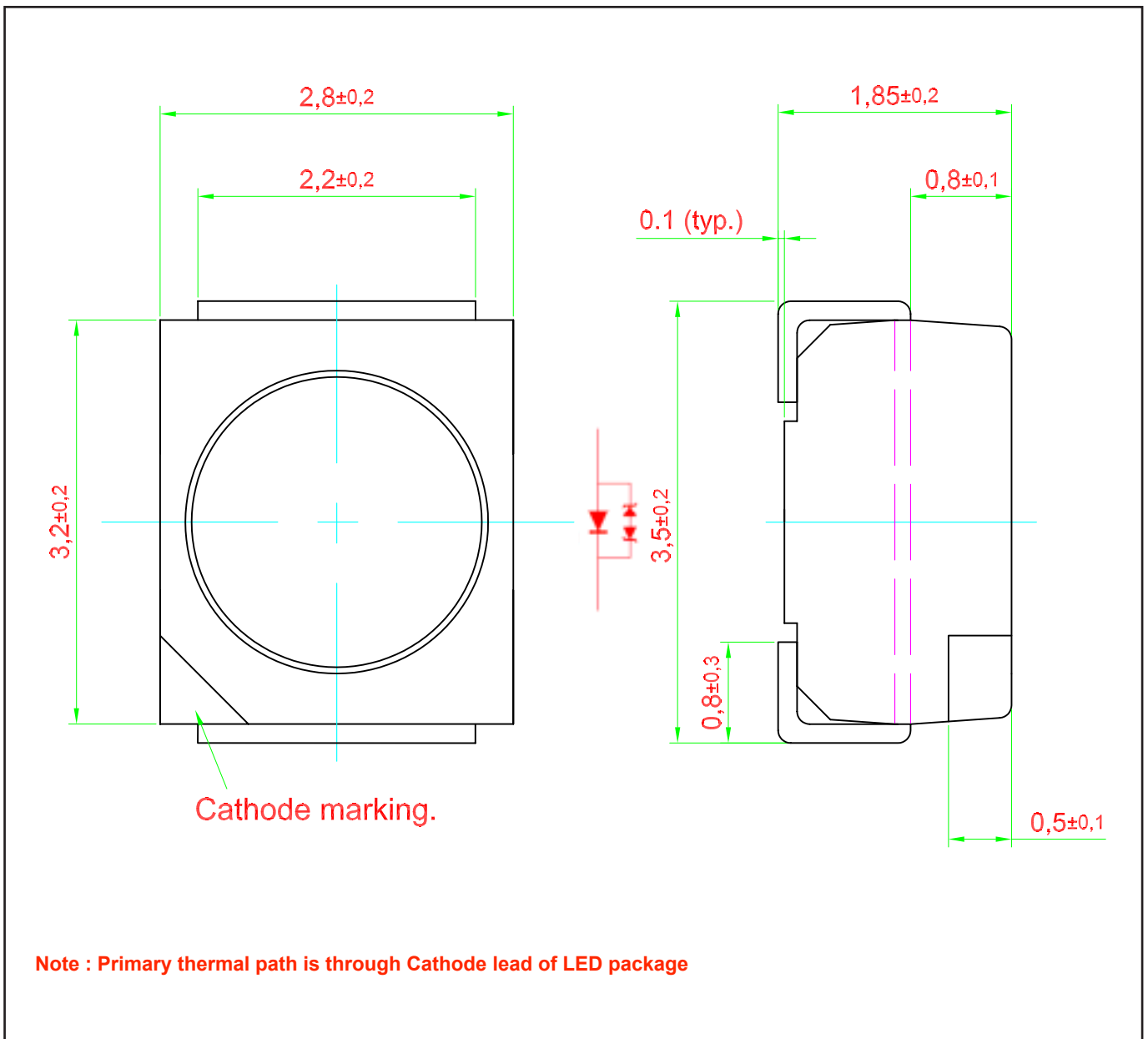


**Chromaticity Coordinate Shift Vs Junction Temperature** *Appx. 4.1*

$$\Delta Cx, \Delta Cy = f(T_j); I_F = 20\text{mA}$$



**DomiLED • InGaN : DDW-HZKG-F1P3 Package Outlines** *Appx. 5.1*

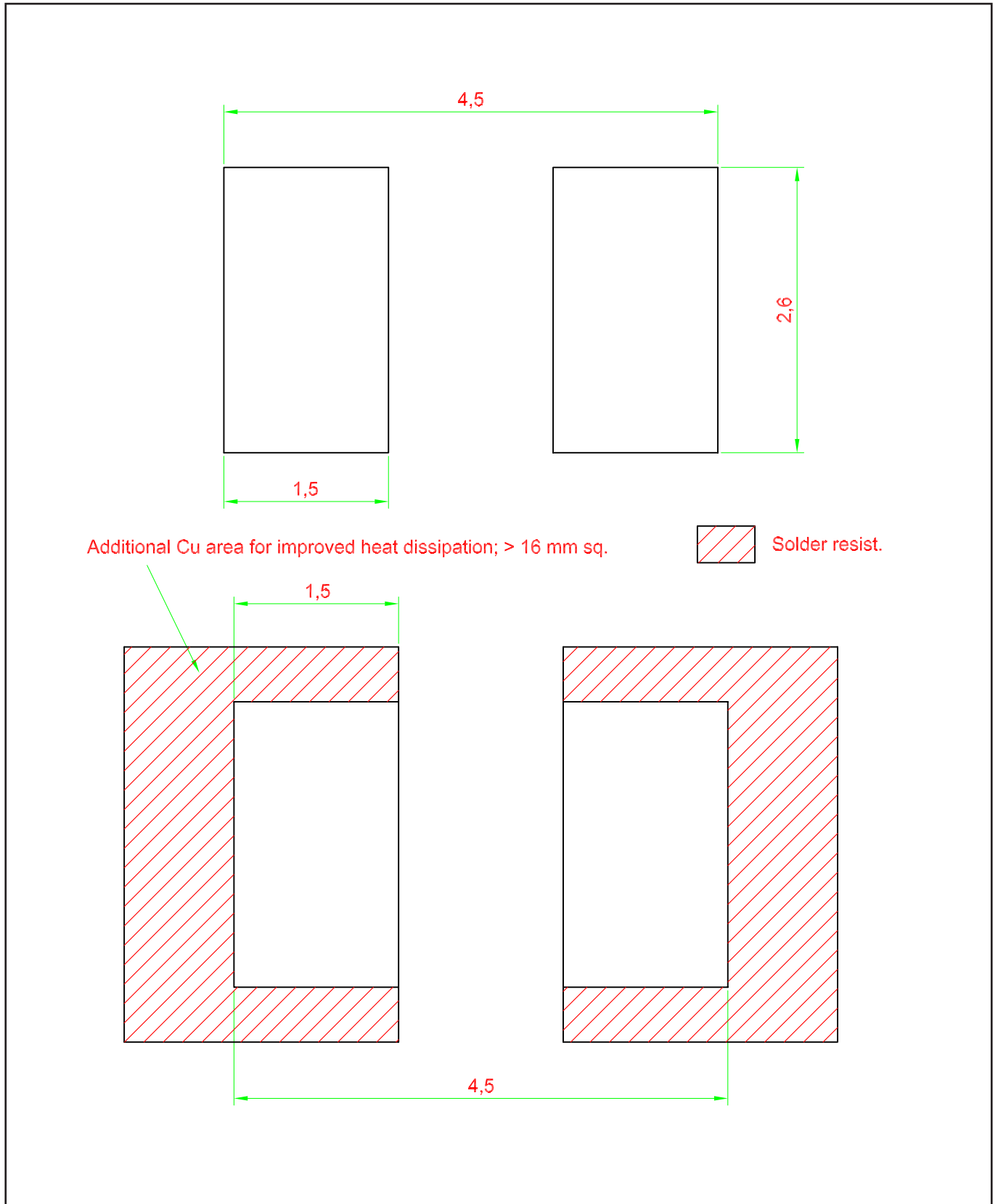


**Materials**

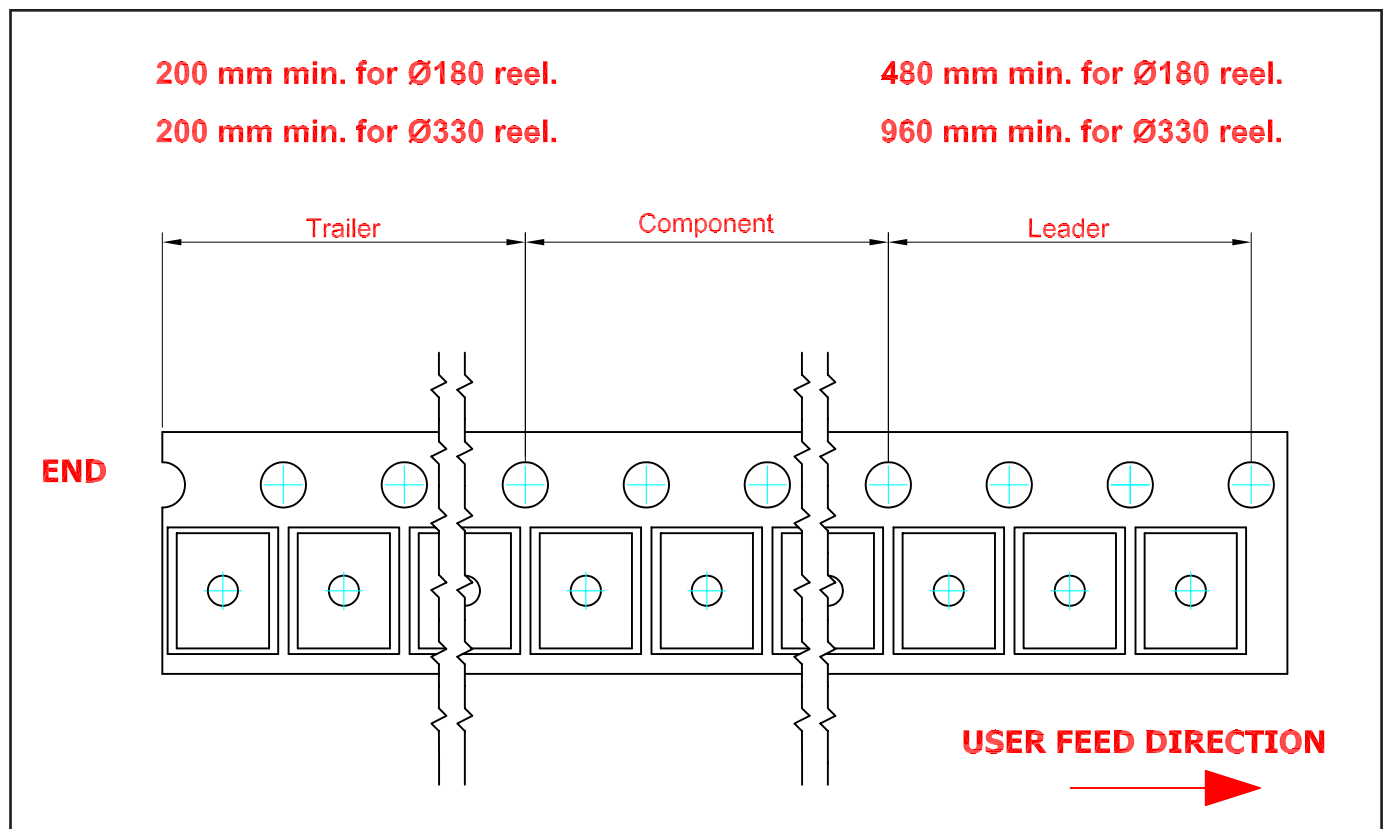
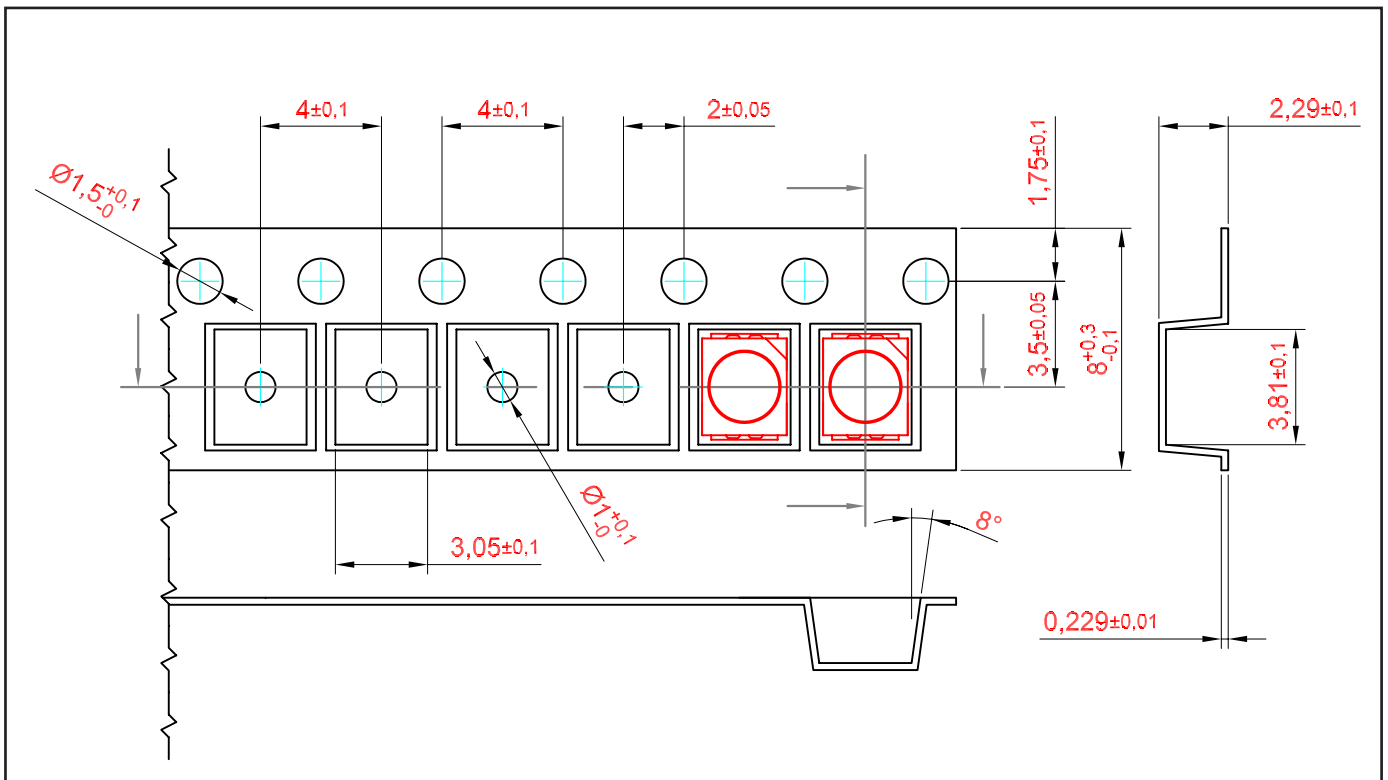
Materials	
Lead Frame	Cu Alloy With Au Plating
Housing	High temperature resistant plastic
Encapsulant	Silicone Resin
Lead-finishing	Au Plating



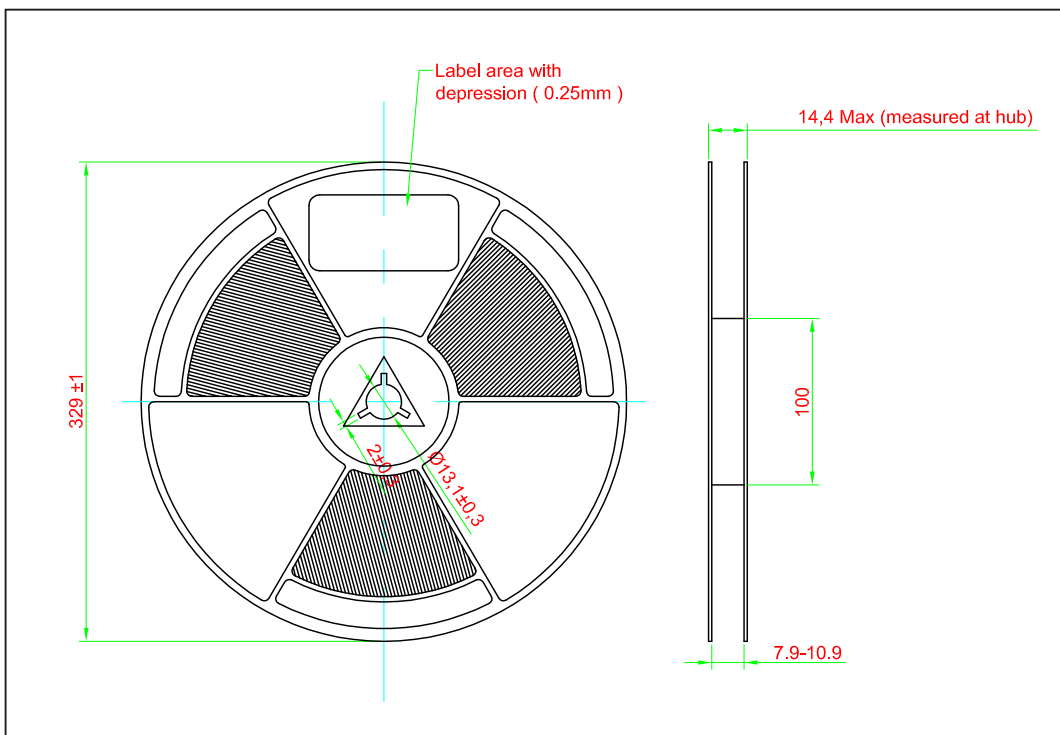
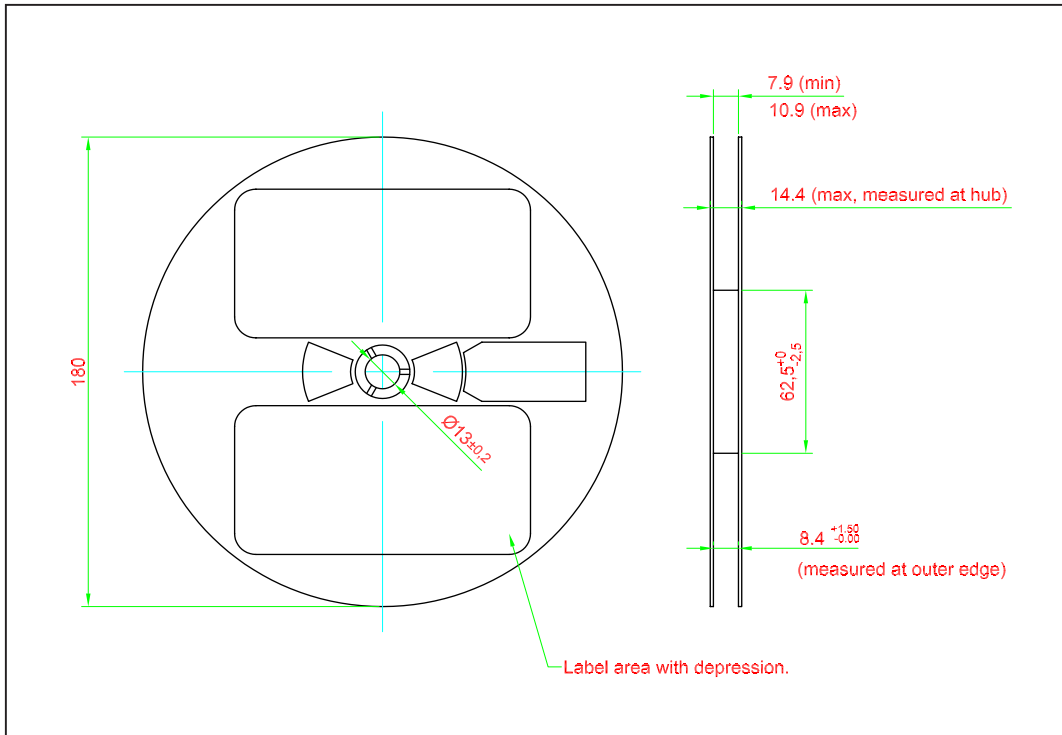
**Recommended Solder Pad** *Appx. 5.1*



**Taping and orientation** *Appx. 5.1*



**Packaging Specification**

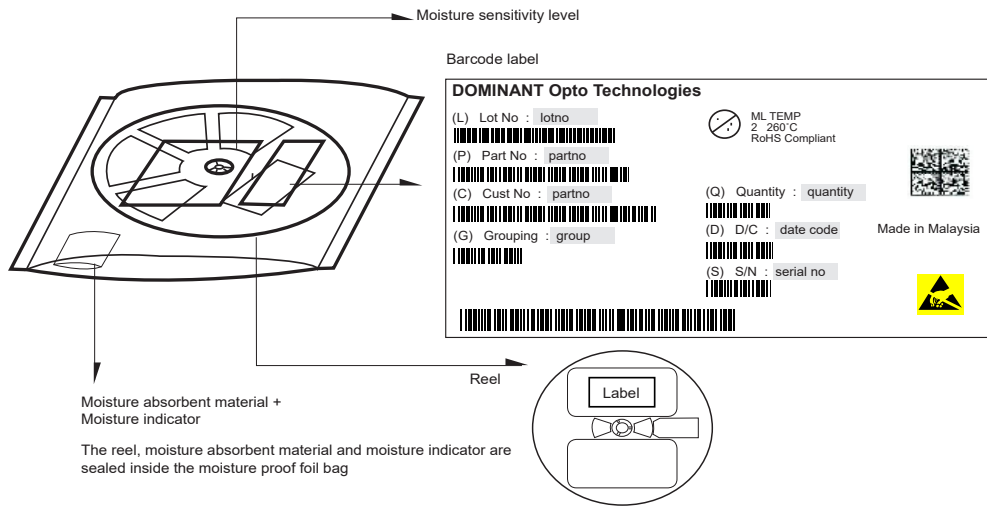


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	2000	DDW-HZKG-xxx-F1P3
Optional Packing	329	8000	DDW-HZKG-xxx-F1P3-8

Notes:

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

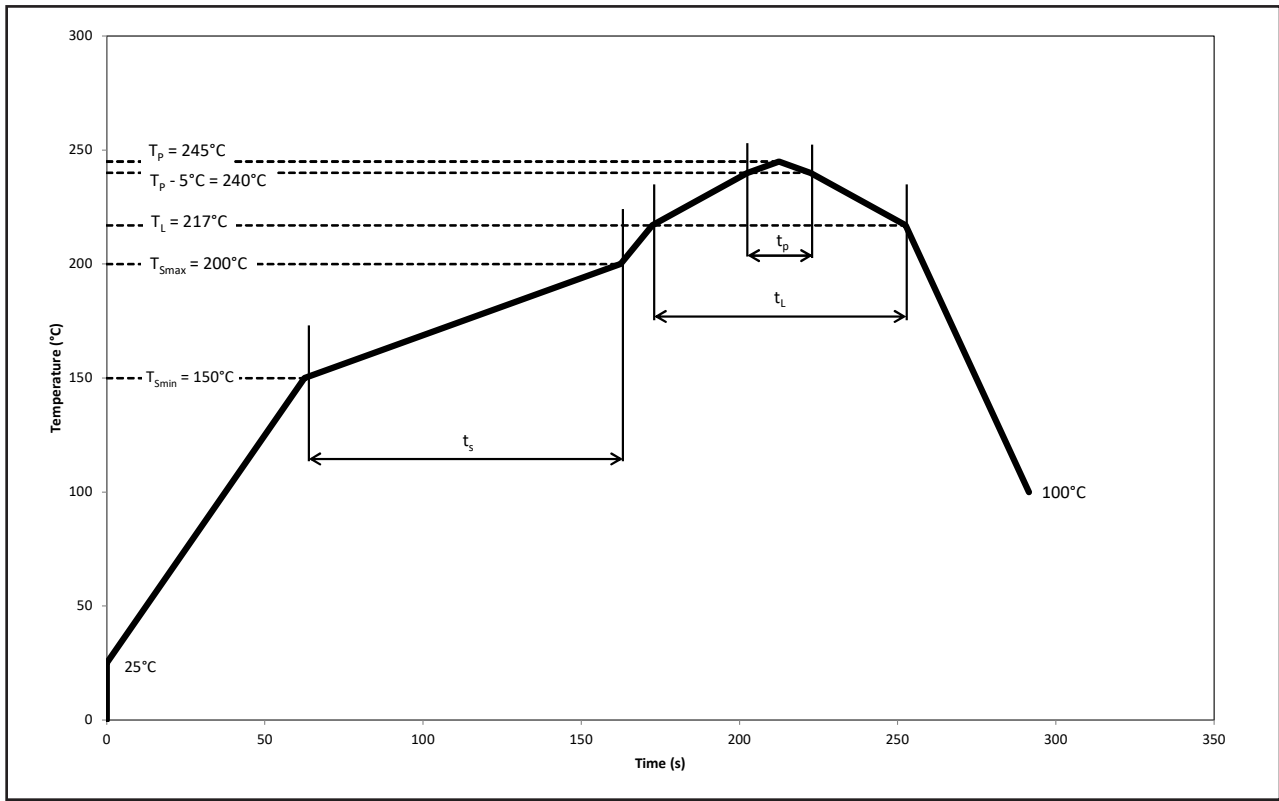
**Packaging Specification**



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

## 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 Due to the specific conditions of semiconductor devices' manufacturing processes, the provided typical data and calculated correlations of technical parameters should only be considered as statistical values. It is important to note that the actual parameters of individual devices may deviate from these typical data, calculated correlations or the typical characteristic line. Dominant reserves the right to update this typical data without prior notice, particularly in response to technical enhancements.

### 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	10 Feb 2017
6	Typo Error on Graph: Chromaticity Coordinate Shift Vs Forward Current	08 Mar 2017
1, 12, 14	Update Product Photo Update Packaging Specification Update Appendix	20 Jul 2018
1, 2, 6, 11, 12, 13	Update AEC-Q101 to AEC-Q102 Update Test Condition for Peak Pulse Current Update Graph: Allowable Forward Current Vs Duty Ratio Update Packaging Specification	20 Jul 2020
13	Update Recommended Pb-free Soldering Profile	06 Dec 2024

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

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