

### Spice:

Synonymous with function and performance, the new era of high intensity illumination in LED. With its high flux output and high luminous intensity, It transcends today LED lightings technology and how we perceive it.



### Features:

- > Super high brightness surface mount LED
- > 120° viewing angle.
- > Compact package outline (LxW) of 3.0 x 1.4 mm.
- > Ultra low height profile - 0.52mm.
- > Low thermal resistance.
- > Build-in ESD protection device.
- > Compatible to IR reflow soldering.
- > Environmental friendly; RoHS compliance.
- > Compliance to automotive standard; AEC-Q102.
- > Wettable flank design with solder fillet visibility.



### Applications:

- > Automotive: Back-light applications.

### Optical Characteristics at Tj=25°C

Part Number	Color	Viewing Angle°	Luminous Flux @ 120mA (lm) <i>Appx. 1.2</i>		
			Min.	Typ.	Max.
● SEW-FZSG-6R7S-1	White	120	39.8	50.0	59.0

- Not for new design

Notes:

Typ Flux, chromaticity coordinate: Cx 0.290, Cy 0.275.

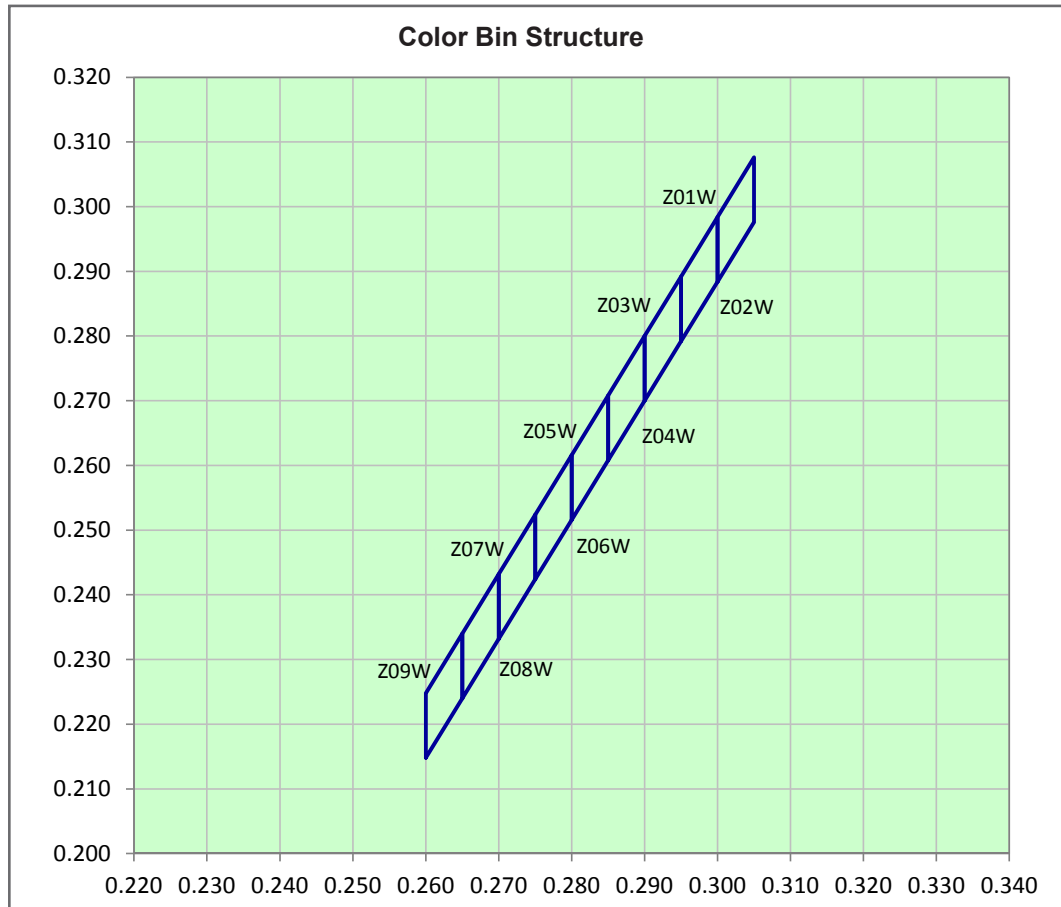
### Electrical Characteristics at Tj=25°C

Part Number	Vf @ If = 120mA <i>Appx. 3.1</i>		
	Min. (V)	Typ. (V)	Max. (V)
SEW-FZSG	2.8	3.0	3.3

### Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	200	mA
Peak pulse current (tp ≤ 100µs, Duty cycle = 0.03)	720	mA
Reverse voltage	Not for reverse bias	V
ESD threshold (HBM)	8000	V
LED junction temperature	125	°C
Operating temperature	-40 ... +100	°C
Storage temperature	-40 ... +100	°C
Power dissipation (at room temperature)	660	mW
Thermal resistance (Rated current = 120mA, Ts = 25°C) <i>Appx. 6.1</i>		
- Junction / solder point, Rth JS (typ = 17) (Mounting on DOMINANT standard PCB)	24	K/W

**SEW-FZSG, Color Grouping** *Appx. 2.1*

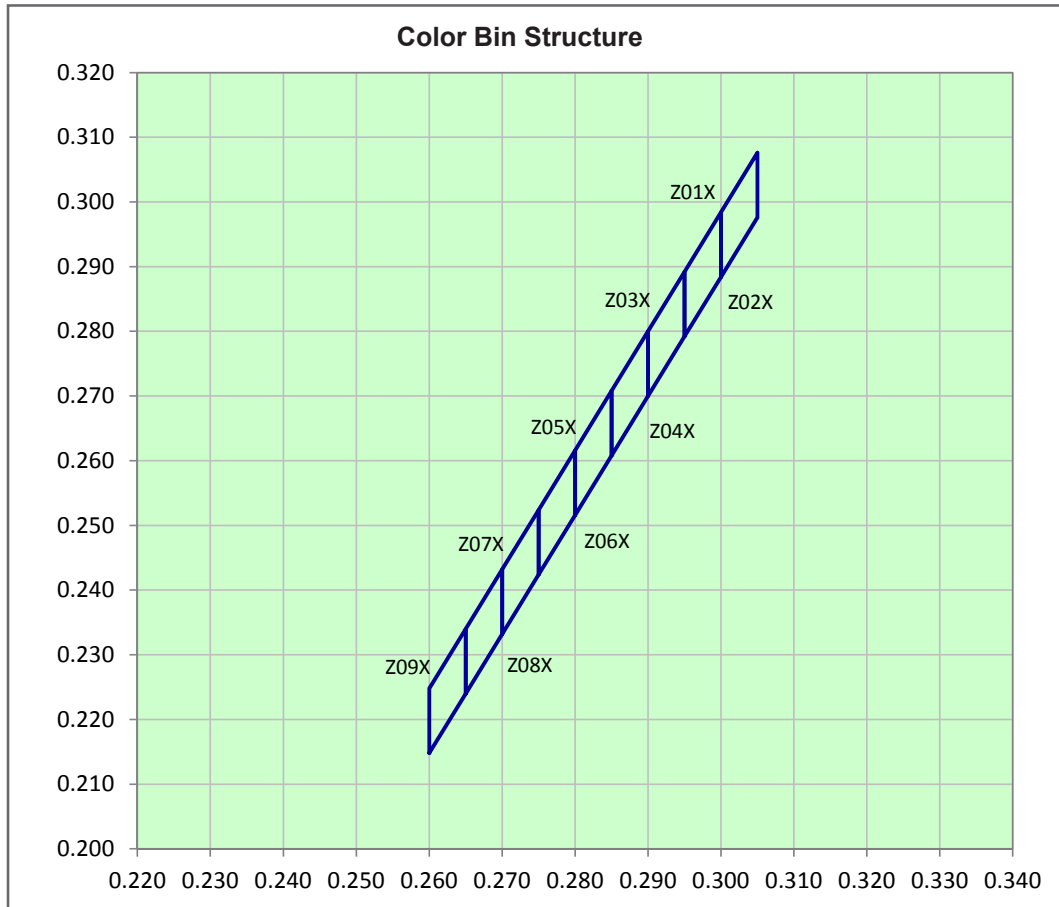


Bin		1	2	3	4
Z01W	Cx	0.3000	0.3000	0.3050	0.3050
	Cy	0.2884	0.2984	0.3076	0.2976
Z02W	Cx	0.2950	0.2950	0.3000	0.3000
	Cy	0.2792	0.2892	0.2984	0.2884
Z03W	Cx	0.2900	0.2900	0.2950	0.2950
	Cy	0.2700	0.2800	0.2892	0.2792
Z04W	Cx	0.2850	0.2850	0.2900	0.2900
	Cy	0.2608	0.2708	0.2800	0.2700
Z05W	Cx	0.2800	0.2800	0.2850	0.2850
	Cy	0.2516	0.2616	0.2708	0.2608
Z06W	Cx	0.2750	0.2750	0.2800	0.2800
	Cy	0.2424	0.2524	0.2616	0.2516
Z07W	Cx	0.2700	0.2700	0.2750	0.2750
	Cy	0.2332	0.2432	0.2524	0.2424
Z08W	Cx	0.2650	0.2650	0.2700	0.2700
	Cy	0.2240	0.2340	0.2432	0.2332
Z09W	Cx	0.2600	0.2600	0.2650	0.2650
	Cy	0.2148	0.2248	0.2340	0.2240

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.

\*All above binning is shippable. Dominant reserved the right to determine the combination ratio to ship.

**SEW-FZSG, Color Grouping** *Appx. 2.1*



Bin		1	2	3	4
Z01X	Cx	0.3000	0.3000	0.3050	0.3050
	Cy	0.2884	0.2984	0.3076	0.2976
Z02X	Cx	0.2950	0.2950	0.3000	0.3000
	Cy	0.2792	0.2892	0.2984	0.2884
Z03X	Cx	0.2900	0.2900	0.2950	0.2950
	Cy	0.2700	0.2800	0.2892	0.2792
Z04X	Cx	0.2850	0.2850	0.2900	0.2900
	Cy	0.2608	0.2708	0.2800	0.2700
Z05X	Cx	0.2800	0.2800	0.2850	0.2850
	Cy	0.2516	0.2616	0.2708	0.2608
Z06X	Cx	0.2750	0.2750	0.2800	0.2800
	Cy	0.2424	0.2524	0.2616	0.2516
Z07X	Cx	0.2700	0.2700	0.2750	0.2750
	Cy	0.2332	0.2432	0.2524	0.2424
Z08X	Cx	0.2650	0.2650	0.2700	0.2700
	Cy	0.2240	0.2340	0.2432	0.2332
Z09X	Cx	0.2600	0.2600	0.2650	0.2650
	Cy	0.2148	0.2248	0.2340	0.2240

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.

\*All above binning is shippable. Dominant reserved the right to determine the combination ratio to ship.

### Luminous Intensity Group

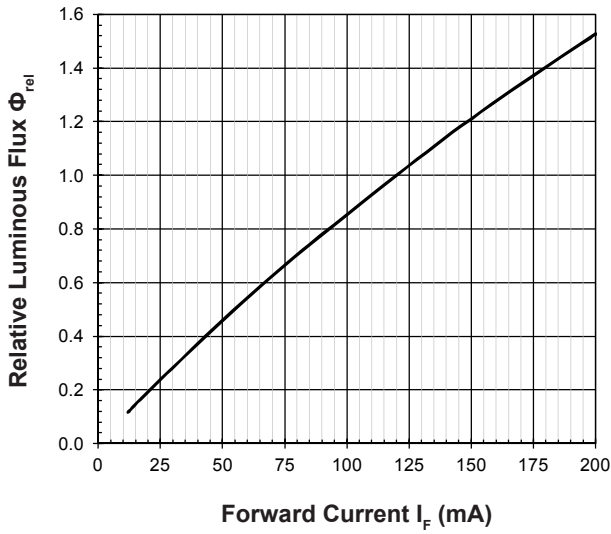
Brightness Group	Luminous Flux <small>Appx. 1.2</small> (lm)
6R	39.8 ... 42.5
7R	42.5 ... 45.2
8R	45.2 ... 48.4
9R	48.4 ... 51.7
6S	51.7 ... 55.3
7S	55.3 ... 59.0

### Vf Binning

Vf Bin @ 120mA	Forward Voltage (V) <small>Appx. 3.1</small>
VB4	2.80 ... 2.90
VB5	2.90 ... 3.00
VB6	3.00 ... 3.10
VB7	3.10 ... 3.20
VB8	3.20 ... 3.30

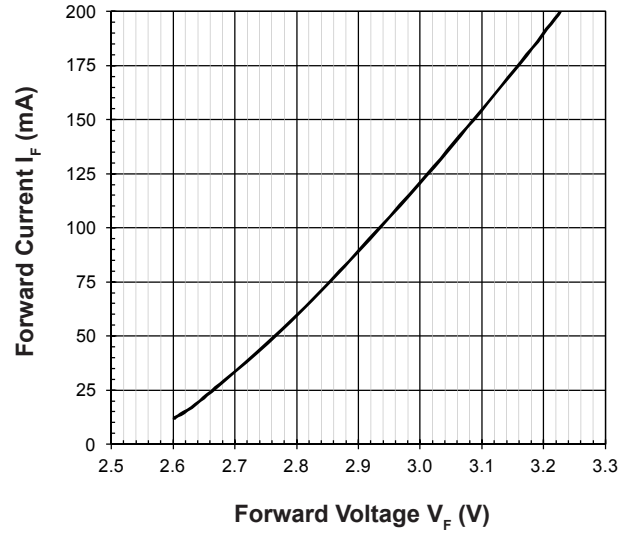
**Relative Luminous Flux Vs Forward Current**

$\Phi_V/\Phi_V(120\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$



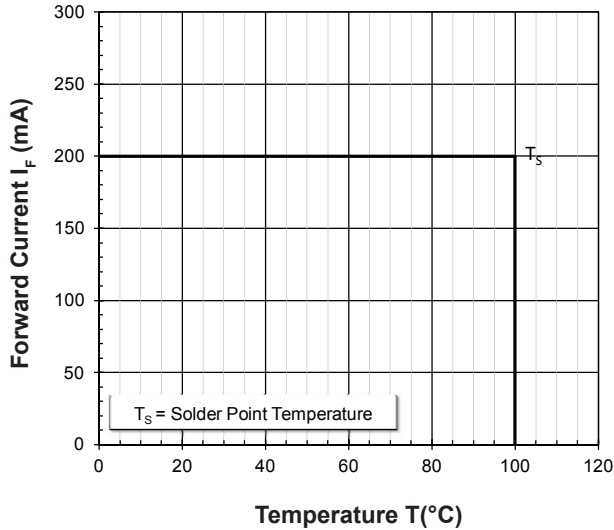
**Forward Current Vs Forward Voltage**

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



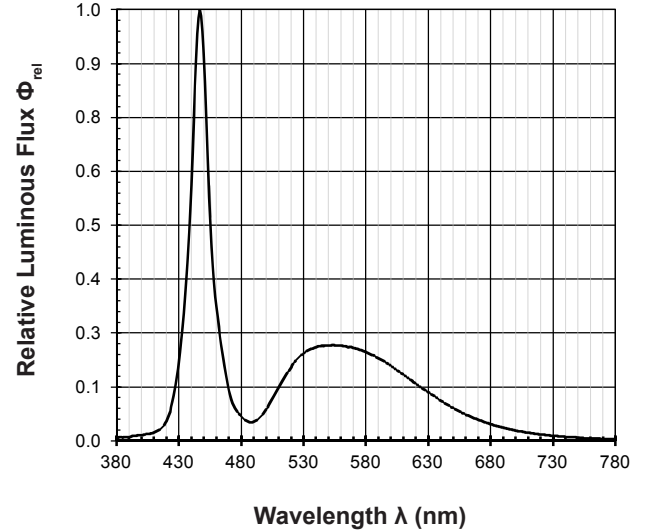
**Maximum Current Vs Temperature**

$I_F = f(T)$



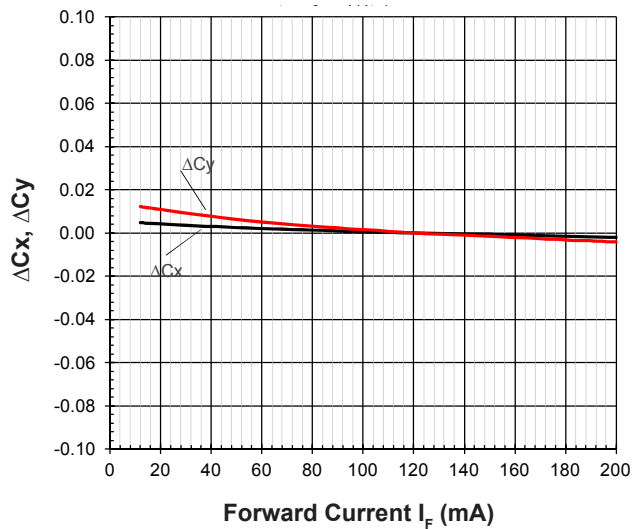
**Relative Spectral Emission**

$\Phi_{rel} = f(\lambda); T_j = 25^\circ\text{C}; I_F = 120\text{mA}$



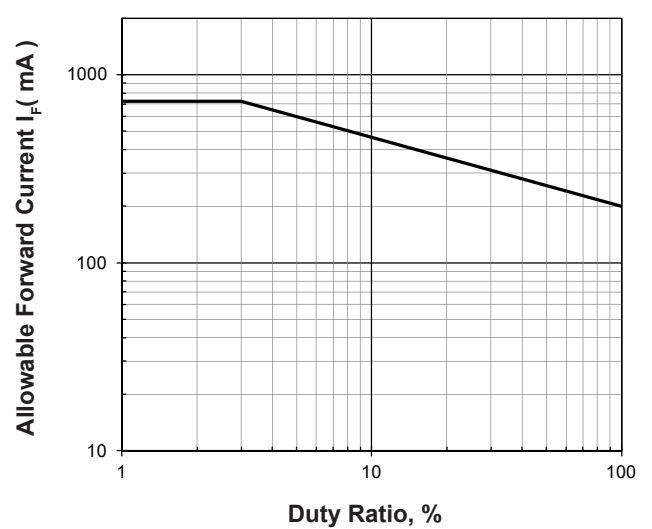
**Chromaticity Coordinate Shift Vs Forward Current**

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

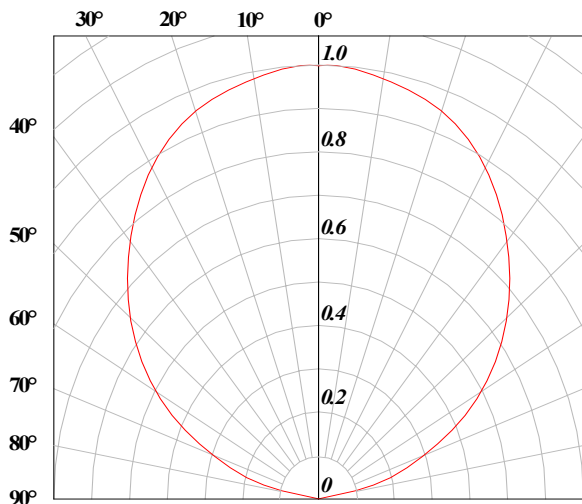


**Allowable Forward Current Vs Duty Ratio**

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

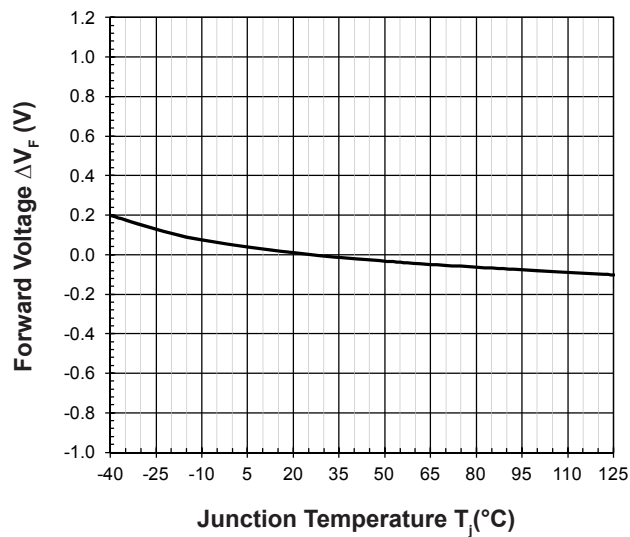


**Radiation Pattern**



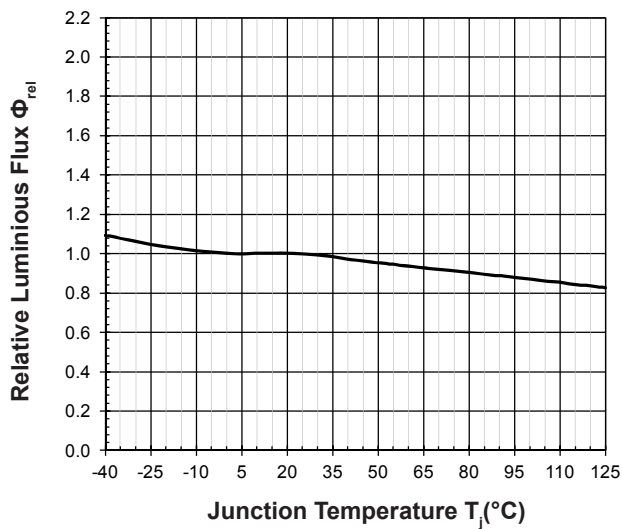
**Forward Voltage Vs Junction Temperature**

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 120\text{mA}$$



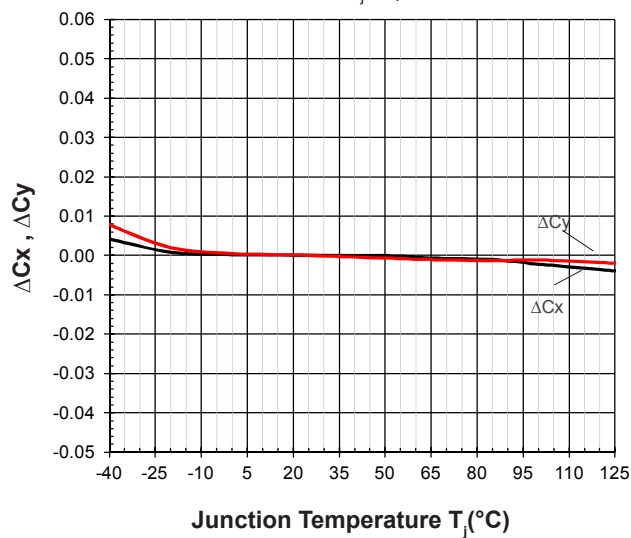
**Relative Luminous Flux Vs Junction Temperature**

$$\Phi_V/\Phi_V(25^\circ\text{C}) = f(T_j); I_F = 120\text{mA}$$

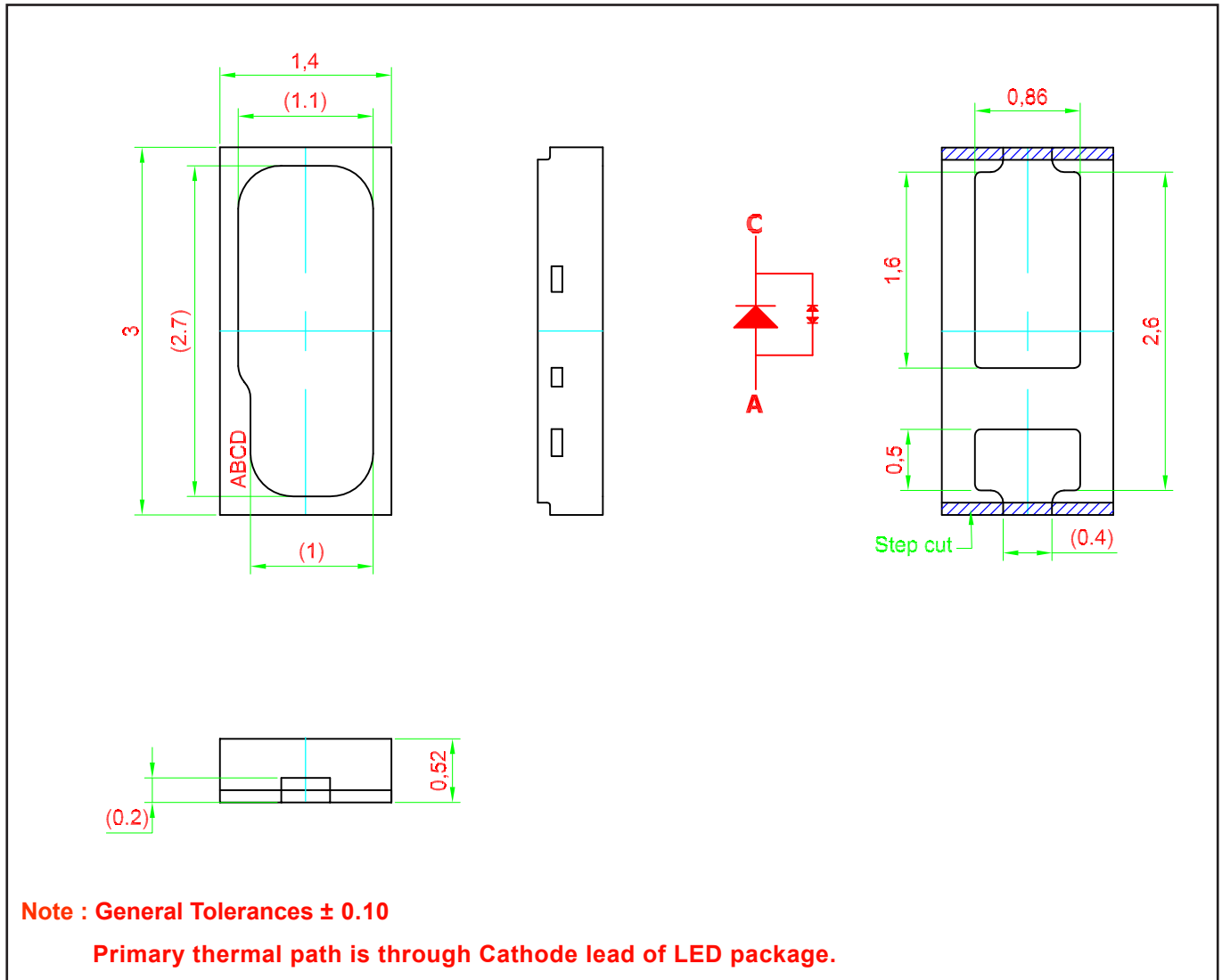


**Chromaticity Coordinate Shift Vs Junction Temperature**

$$\Delta C_x, \Delta C_y = f(T_j); I_F = 120\text{mA}$$



**SpicePlus 3014 • InGaN : SEW-FZSG Package Outlines**

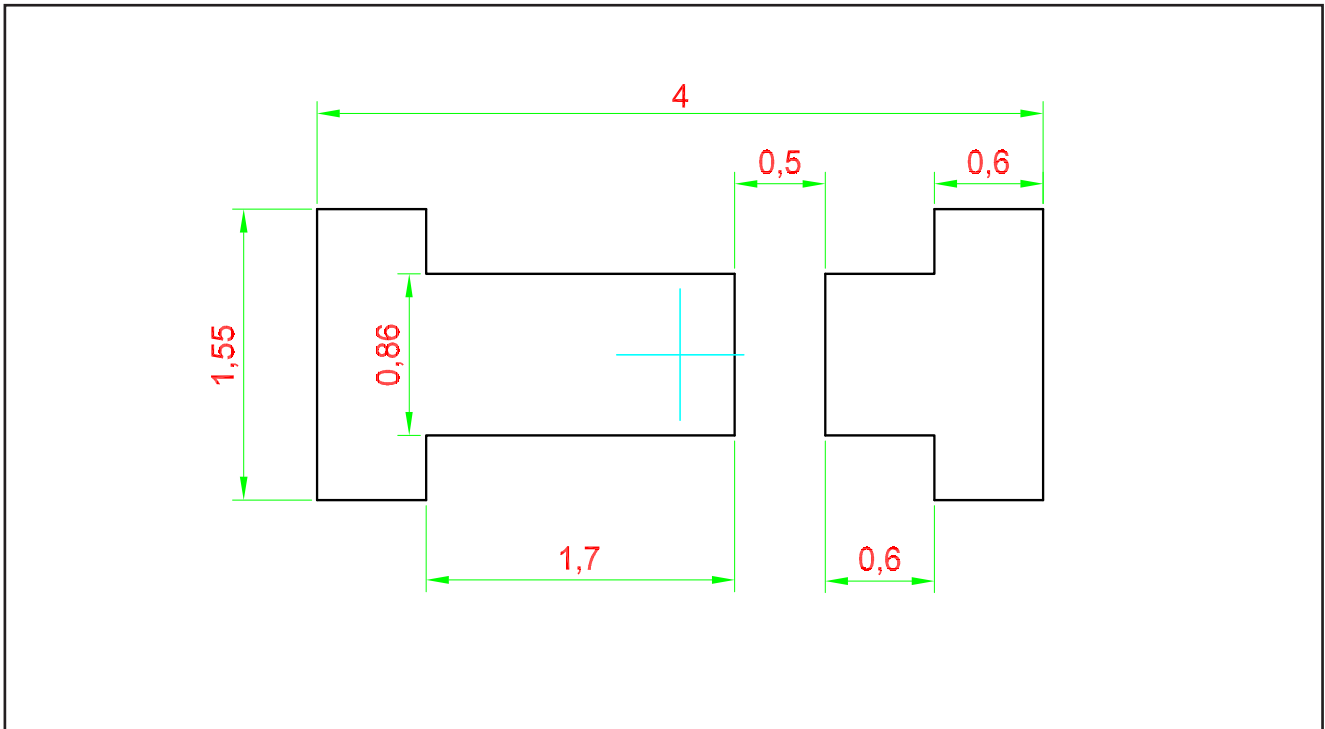


**Material**

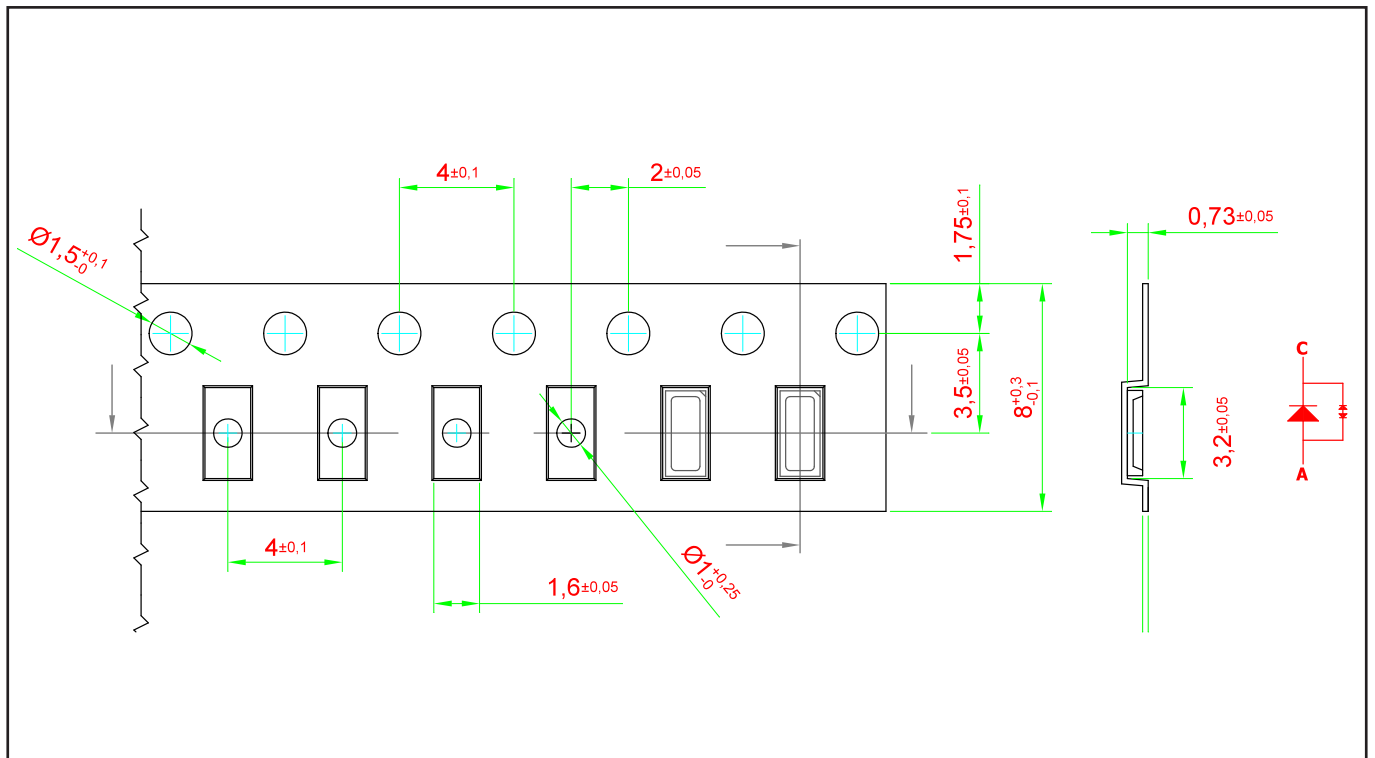
	Material
Lead-frame	Cu Alloy With Ag Plating
Package	Heat Resistant Polymer
Encapsulant	Silicone Resin
Soldering Leads	Sn Plating



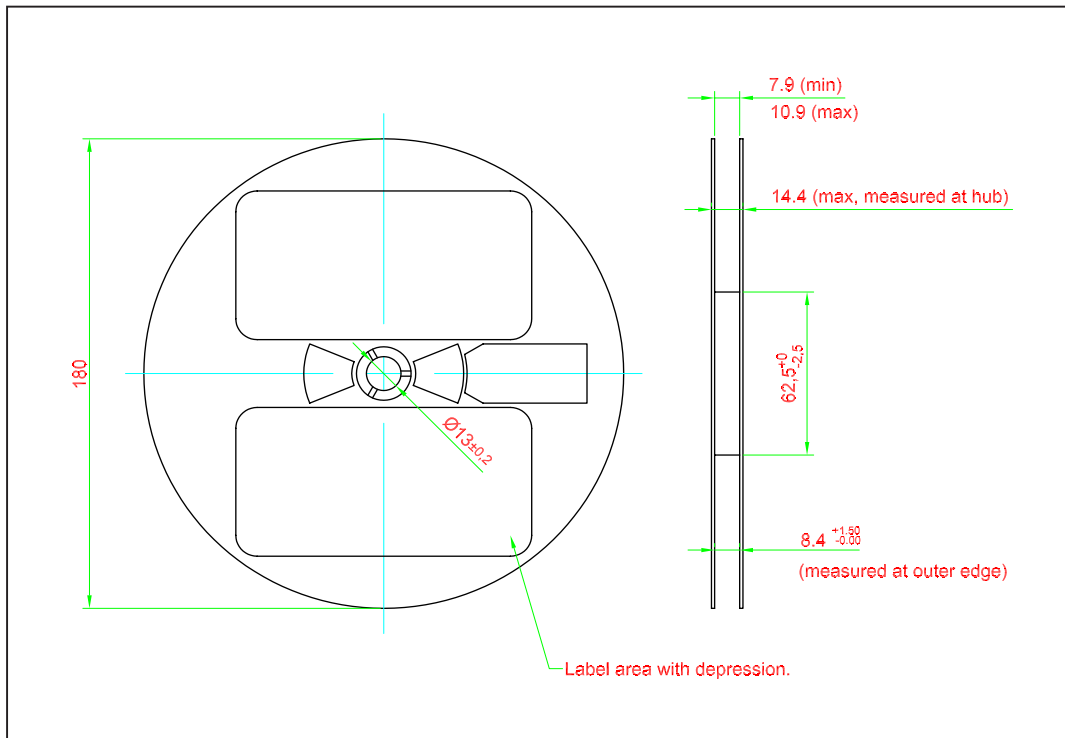
### Recommended Solder Pad



### Taping and orientation



**Packaging Specification**

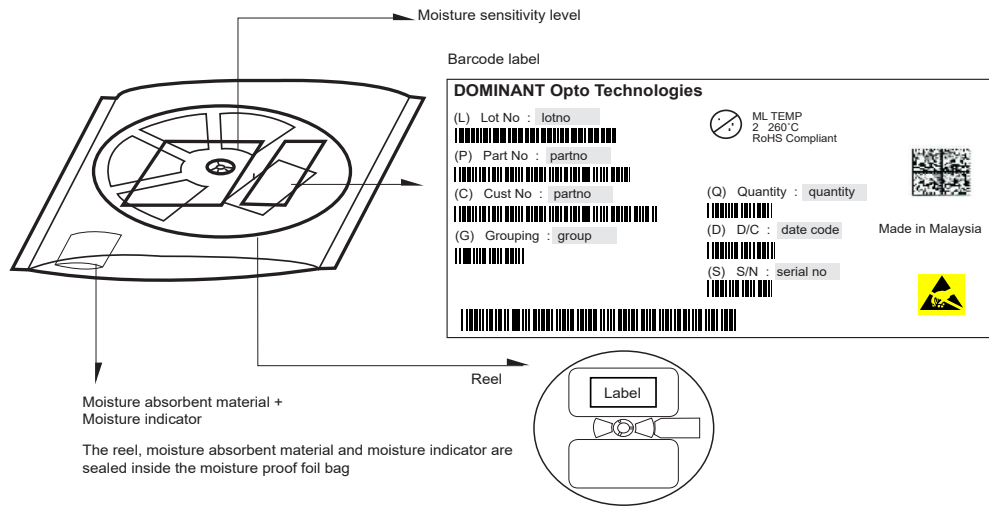


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	5000	SEW-FZSG-xxx-x

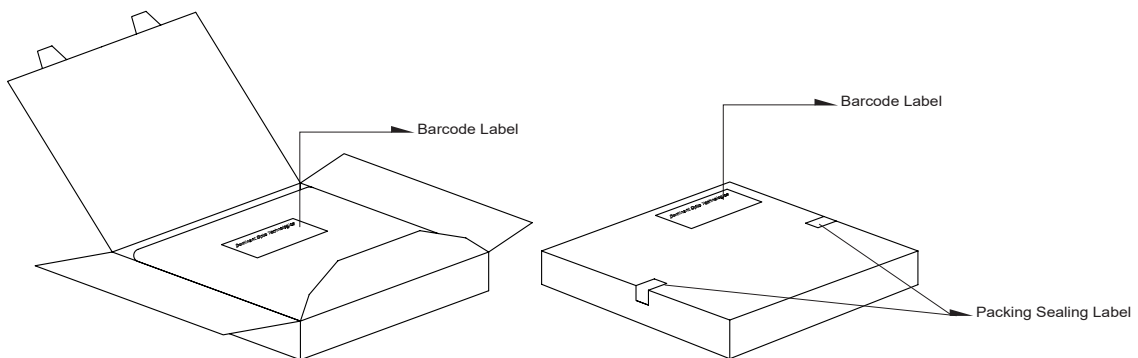
Notes:

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

**Packaging Specification**



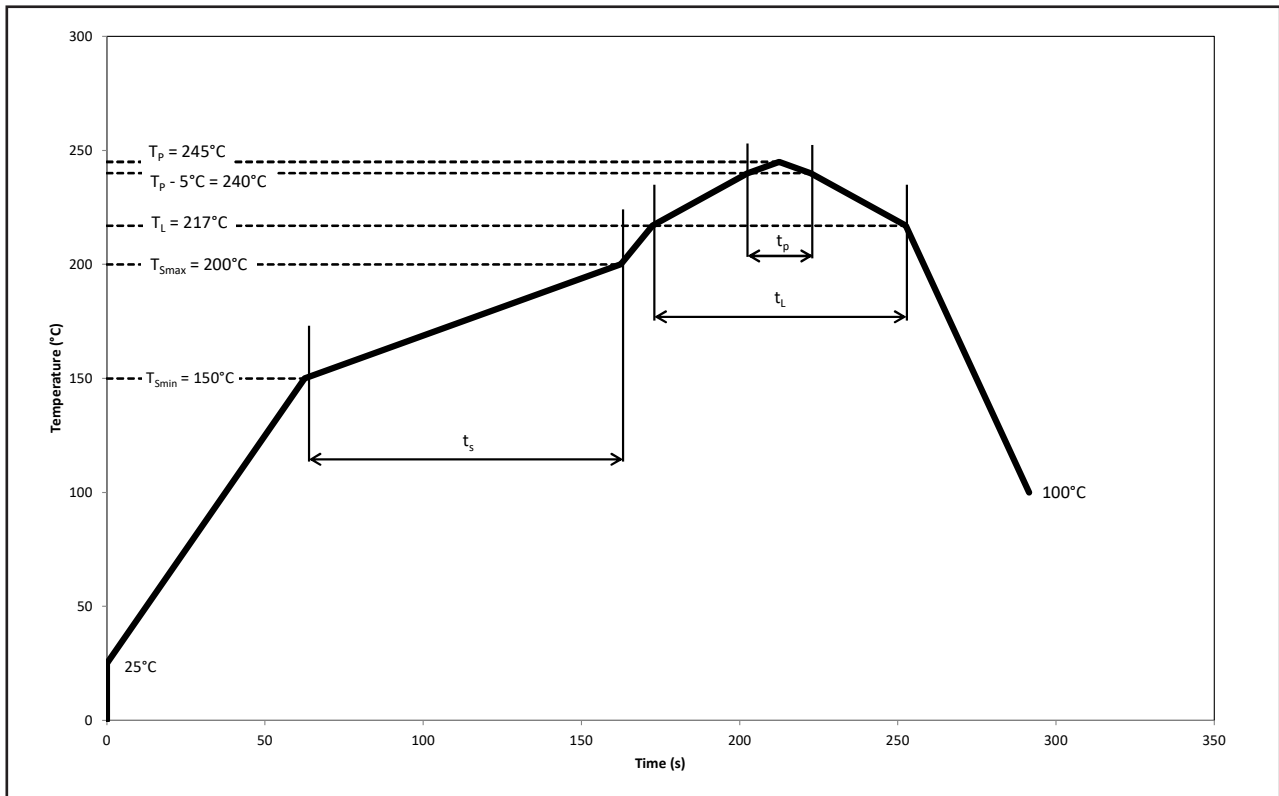
Quantity per bag (pcs)	Average 1pc SpicePlus 3014 (gram)	1 completed bag (gram)
5000	0.007	210 ± 10



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

## 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

## 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 In the drawing, normally the tolerances used are at  $\pm 0.1$  with the dimension measurement unit in mm.

### 6) **Thermal Resistance**

- 6.1  $R_{th\ max}$  is based on statistic values ( $6\sigma$ ).

**Revision History**

<b>Page</b>	<b>Subjects</b>	<b>Date of Modification</b>
-	Initial Release	10 Jul 2020
3, 4, 13	Update Color Box Structure Update Recommended Pb-free Soldering Profile	14 Sep 2020
12	Update Qty from 3000pcs to 5000pcs	14 Dec 2020
2, 10	Not for New Design: SEW-FZSG-6R7S-1 Update Taping and orientation	02 Jun 2022

**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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