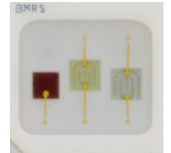


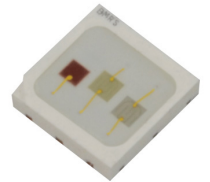
SpicePlus 3030

Like spice, its diminutive size is a stark contrast to its standout performance in terms of brightness, durability and reliability. Despite being the smallest in size yet the SpicePlus 3030 packs a powerful performance and is a highly reliable design device.



Features:

- > High brightness surface mount LED.
- > Viewing angle of 120°.
- > Small package outline (LxWxH) of 3.0x3.0x0.7.
- > Qualified according to JEDEC moisture sensitivity Level 2.
- > Compatible to IR reflow soldering.
- > Environmental friendly; RoHS compliance.
- > Superior Corrosion Resistance.
- > LED chips can be controlled separately to display various colors including white.
- > Compliance to automotive standard; AEC-Q102.



Applications:

- > Automotive: Interior and exterior applications, eg: ambient lighting, car body lighting.

Optical Characteristics at Tj=25°C

Part Number	Color, λ_{dom} (nm)			Luminous Flux @ If = 200mA IV (lm) <i>Appx. 1.2</i>		
	Chip #1	Chip #2	Chip #3	Chip #1	Chip #2	Chip #3
S6RTB-THG-PQ3+RS3+KL3-1	Red 625nm	True Green 525nm	Blue 460nm	23.5-39.8	39.8-67.2	8.2-13.9

Electrical Characteristics at Tj=25°C

	V_f @ If = 200mA <i>Appx. 3.1</i>			V_r @ Ir = 10uA <i>Appx. 6.1</i>
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
Red	2.05	2.50	2.65	12
True Green	2.90	3.20	3.50	5
Blue	2.90	3.30	3.50	5

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current (Red / True Green / Blue)	250	mA
Peak pulse current; ($T_s=55^\circ\text{C}$, $t_p \leq 100\mu\text{s}$, Duty cycle=0.03) (Red, True Green, Blue)	500	mA
Reverse voltage <i>Appx. 6.1</i>	Red = 12 True Green / Blue = 5	V
ESD threshold (HBM)	2000	V
LED junction temperature	150	°C
Operating temperature	-40 ... +125	°C
Storage temperature	-40 ... +125	°C
Thermal resistance		
- Real Thermal Resistance (single chip on)	Red = 23	K/W
Junction / solder point, $R_{th JS}$ real	True Green = 35	K/W
	Blue = 35	K/W

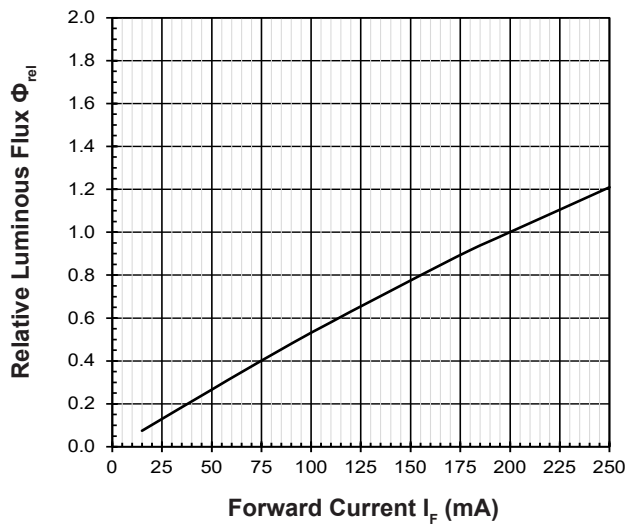
Wavelength Grouping

Color	Group	Wavelength distribution (nm) <i>Appx. 2.2</i>
Red	Full	619 - 629
True Green	Full	520 - 535
	A	520 - 525
	B	525 - 530
	C	530 - 535
Blue	Full	458 - 466
	A	458 - 462
	B	462 - 466

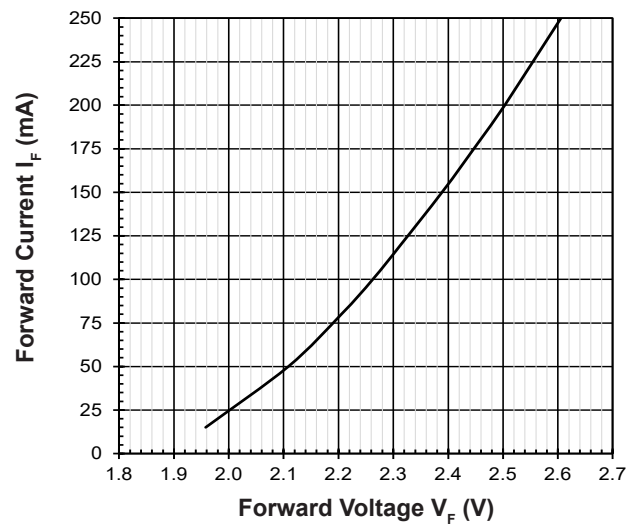
Luminous Intensity Group at Tj=25°C

Color	Brightness Group	Luminous Flux <i>Appx. 1.2</i> IV (lm)
Red	P2	23.50 ... 26.80
	P3	26.80 ... 30.60
	Q2	30.60 ... 34.80
	Q3	34.80 ... 39.80
True Green	R2	39.80 ... 45.20
	R3	45.20 ... 51.70
	S2	51.70 ... 59.00
	S3	59.00 ... 67.20
Blue	K2	8.20 ... 9.35
	K3	9.35 ... 10.70
	L2	10.70 ... 12.20
	L3	12.20 ... 13.90

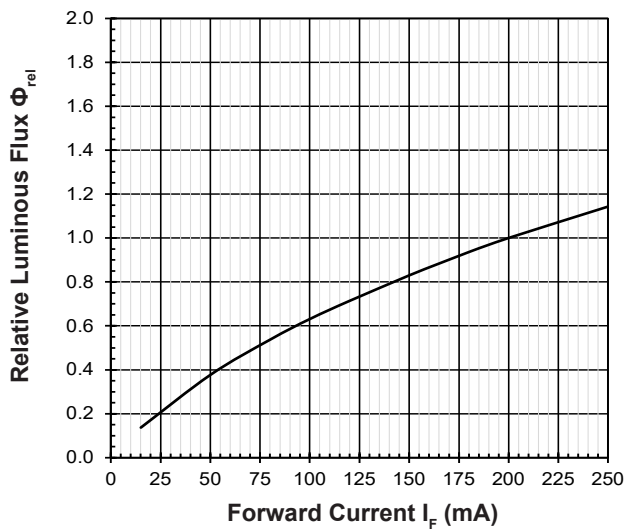
Relative Luminous Flux Vs Forward Current
 $\Phi_V/\Phi_V(200\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$ (Red)



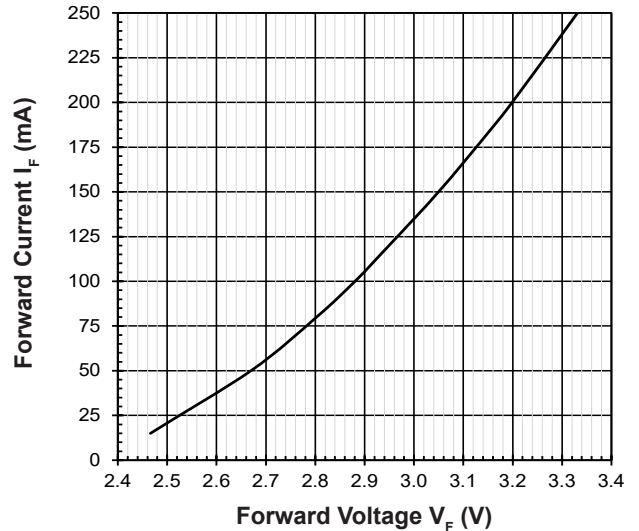
Forward Current Vs Forward Voltage
 $I_F = f(V_F); T_j = 25^\circ\text{C}$ (Red)



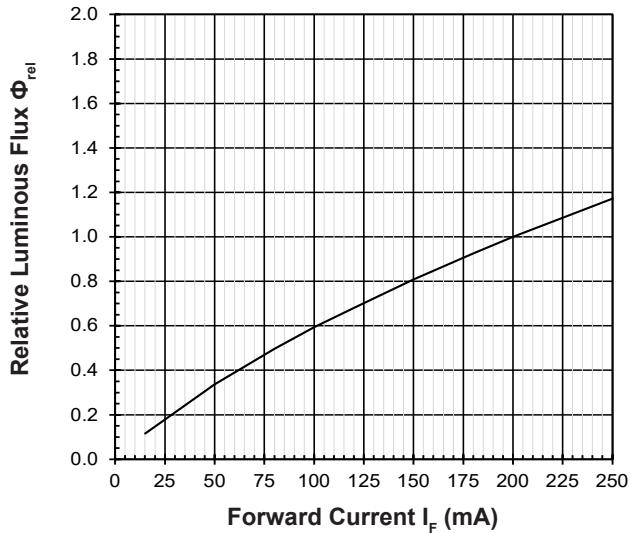
Relative Luminous Flux Vs Forward Current
 $\Phi_V/\Phi_V(200\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$ (True Green)



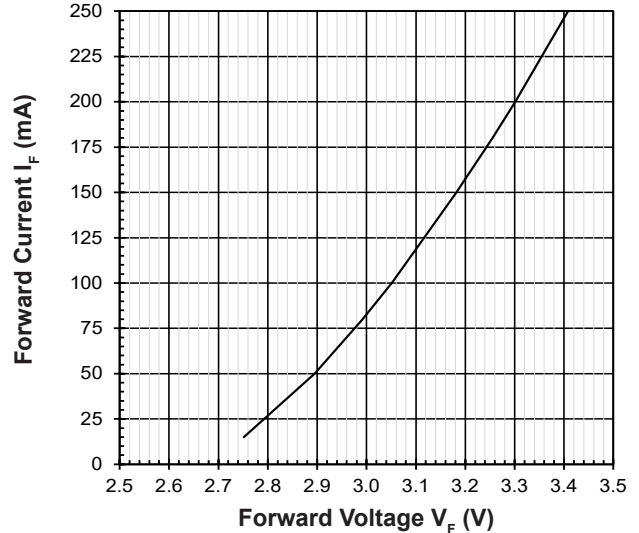
Forward Current Vs Forward Voltage
 $I_F = f(V_F); T_j = 25^\circ\text{C}$ (True Green)



Relative Luminous Flux Vs Forward Current
 $\Phi_V/\Phi_V(200\text{mA}) = f(I_F); T_j = 25^\circ\text{C}$ (Blue)

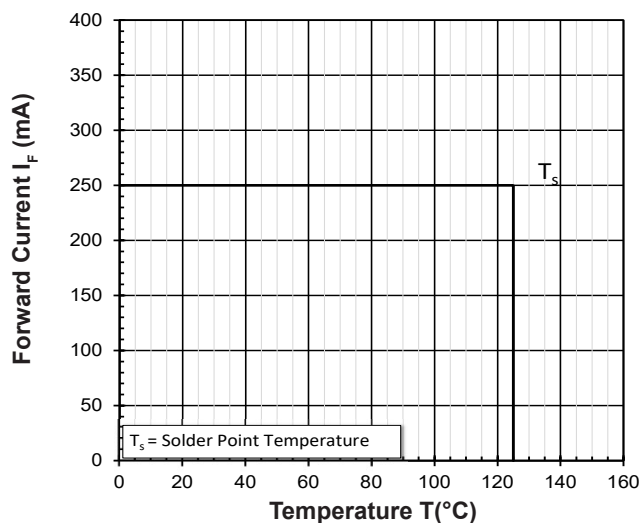


Forward Current Vs Forward Voltage
 $I_F = f(V_F); T_j = 25^\circ\text{C}$ (Blue)



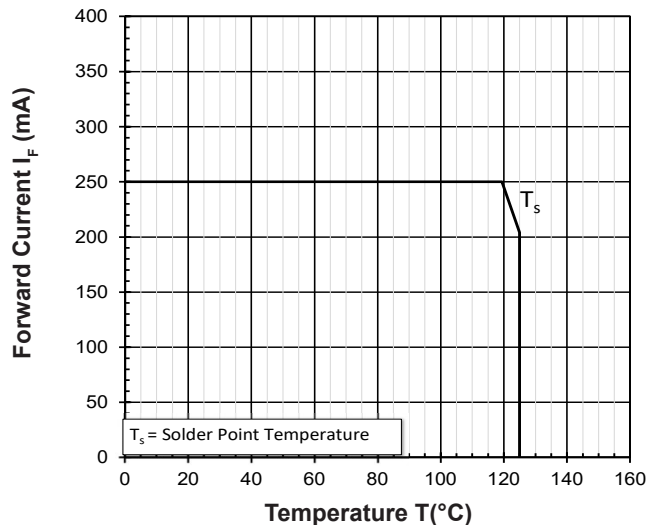
Maximum Current Vs Temperature

$I_F = f(T)$ (Red)



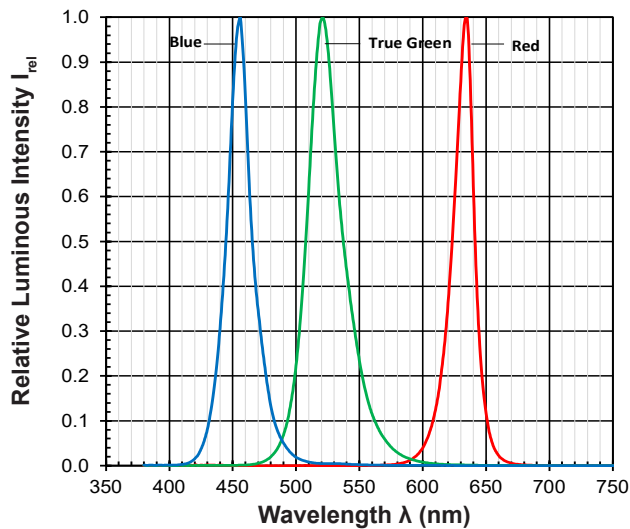
Maximum Current Vs Temperature

$I_F = f(T)$ (True Green & Blue)



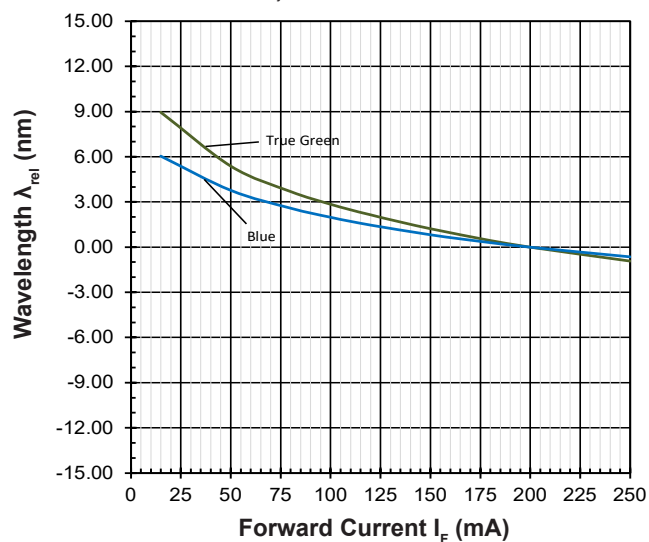
Relative Spectral Emission

$I_{rel} = f(\lambda)$; $T_j = 25^\circ\text{C}$; $I_F = 200\text{mA}$



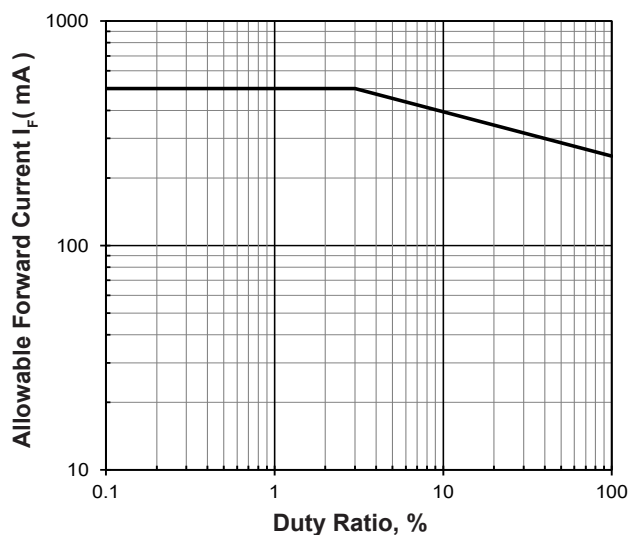
Wavelength Shift Vs Forward Current

$\lambda_{dom} = f(I_F)$; $T_j = 25^\circ\text{C}$ (Blue & True Green)

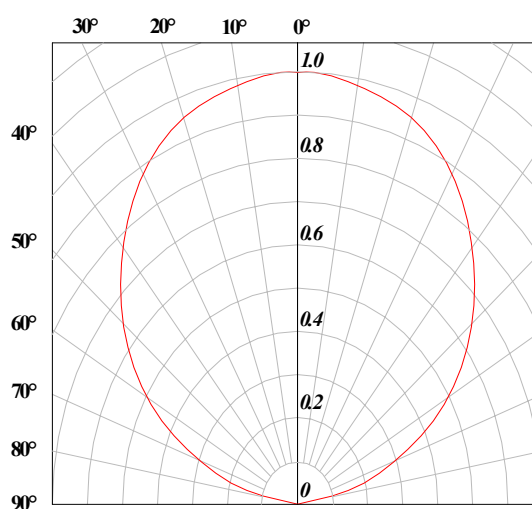


Allowable Forward Current Vs Duty Ratio

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

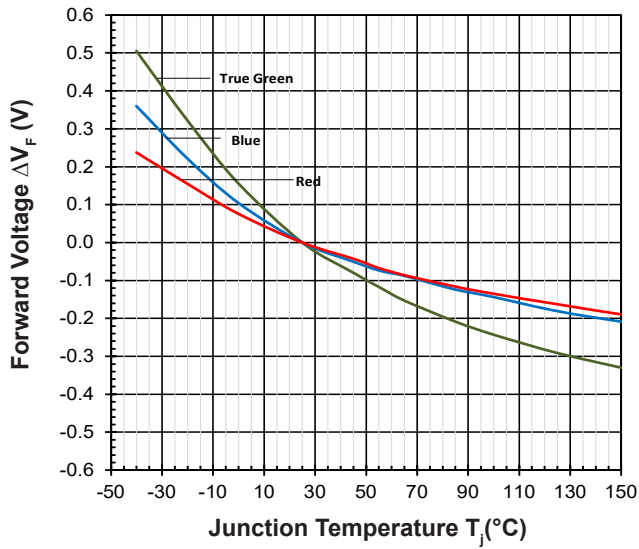


Radiation Pattern



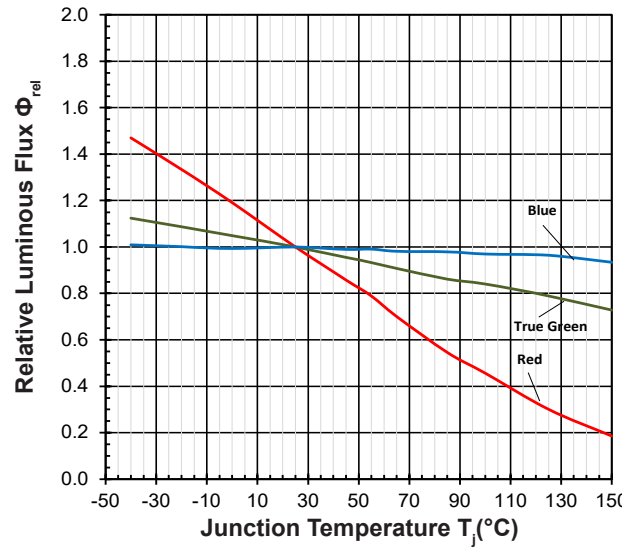
Forward Voltage Vs Junction Temperature

$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 200\text{mA}$$



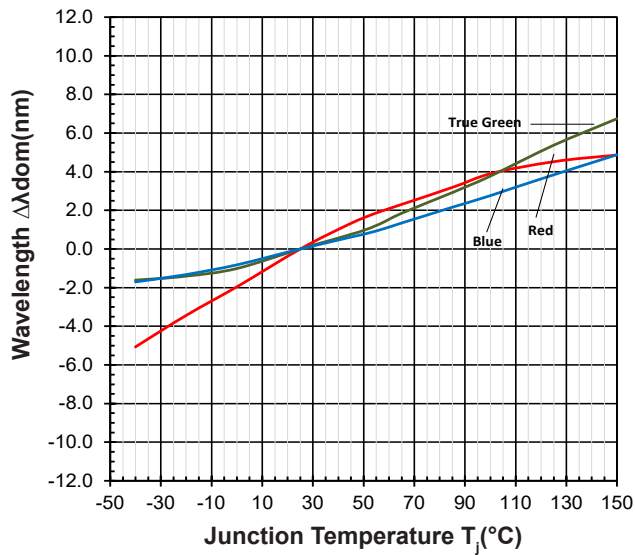
Relative Luminous Flux Vs Junction Temperature

$$\Phi_V/\Phi_V(25^\circ\text{C}) = f(T_j); I_F = 200\text{mA}$$

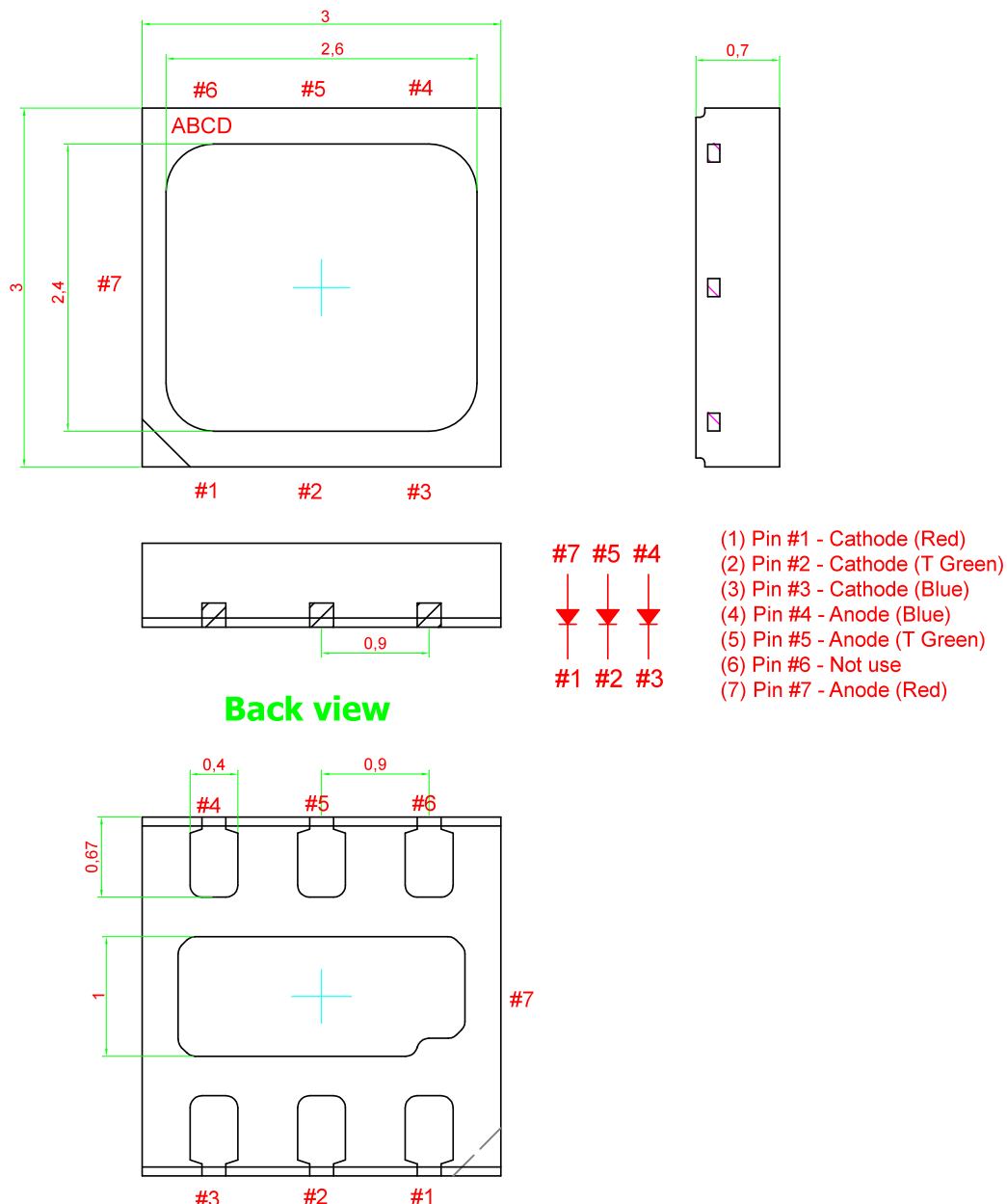


Wavelength Vs Junction Temperature

$$\Delta \lambda_{dom} = \lambda_{dom} - \lambda_{dom}(25^\circ\text{C}) = f(T_j); I_F = 200\text{mA}$$



SpicePlus 3030 Multi Color : S6RTB-THG Package Outlines

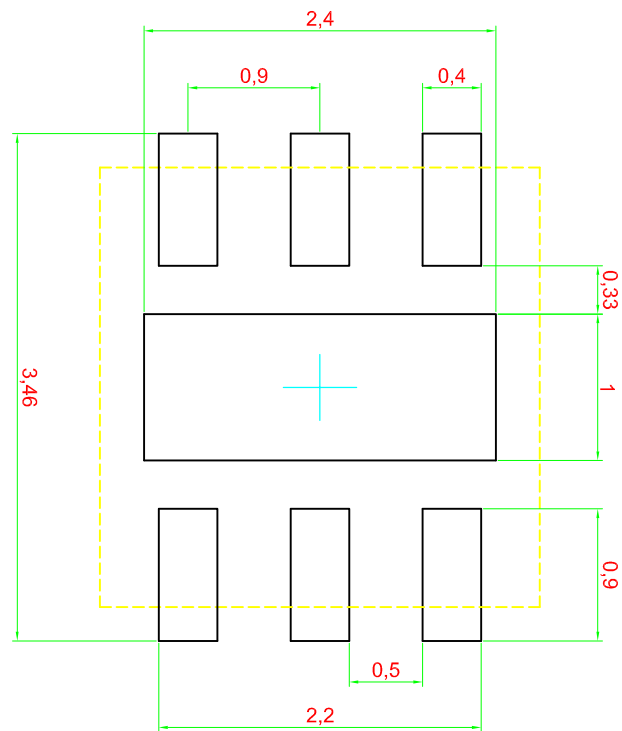


Note : General Tolerances ± 0.10 mm

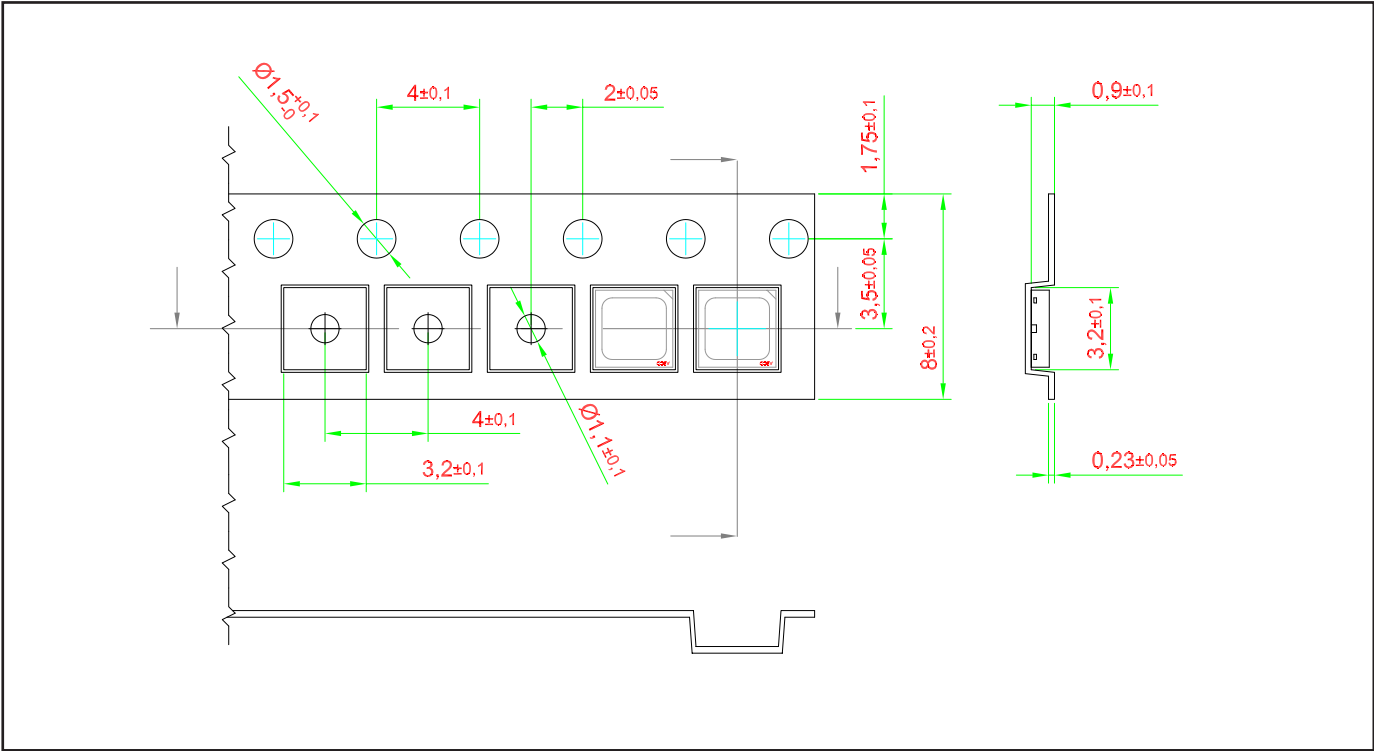
Material

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

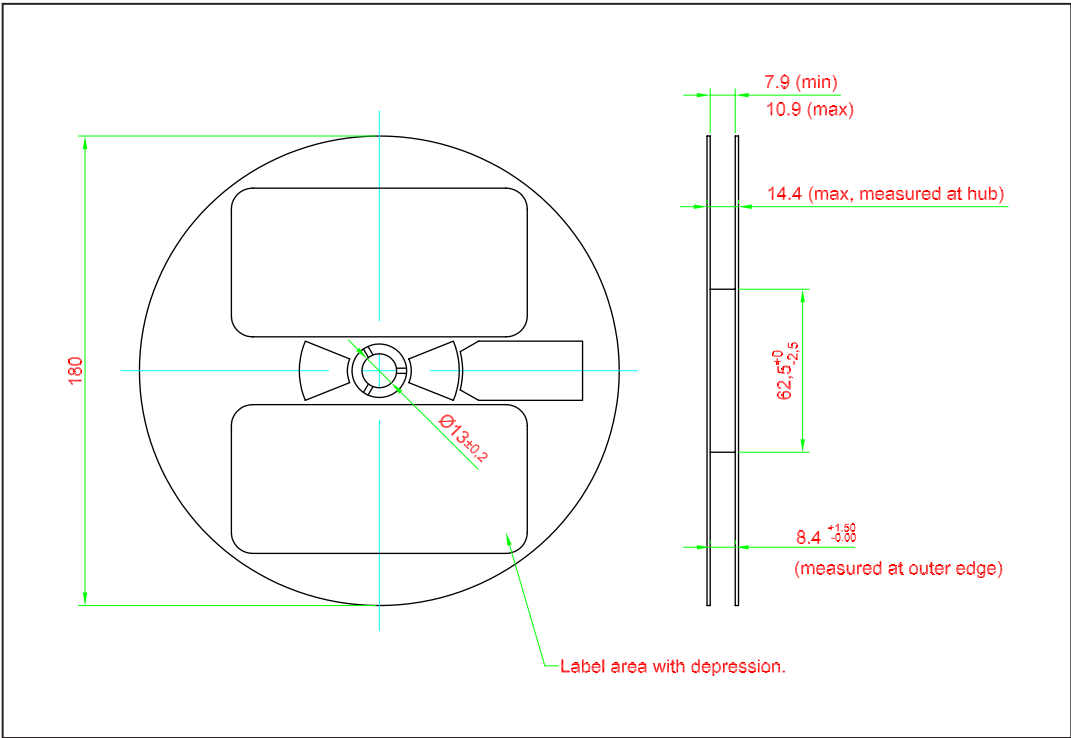
Recommended Solder Pad



Taping and orientation



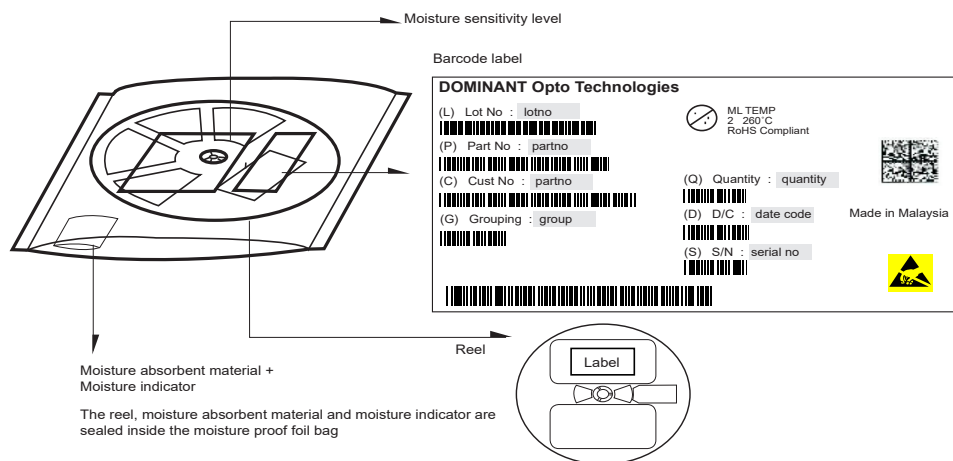
Packaging Specification



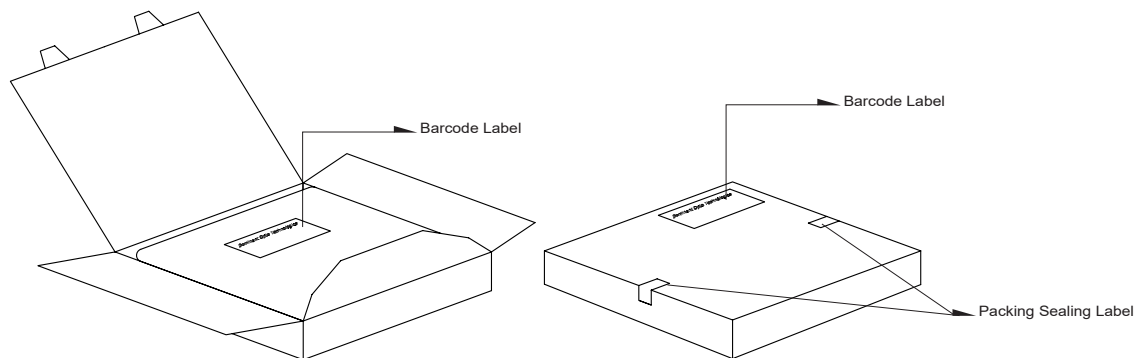
	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	4000	S6RTB-THG-xxx+xxx+xxx-1

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

Packaging Specification



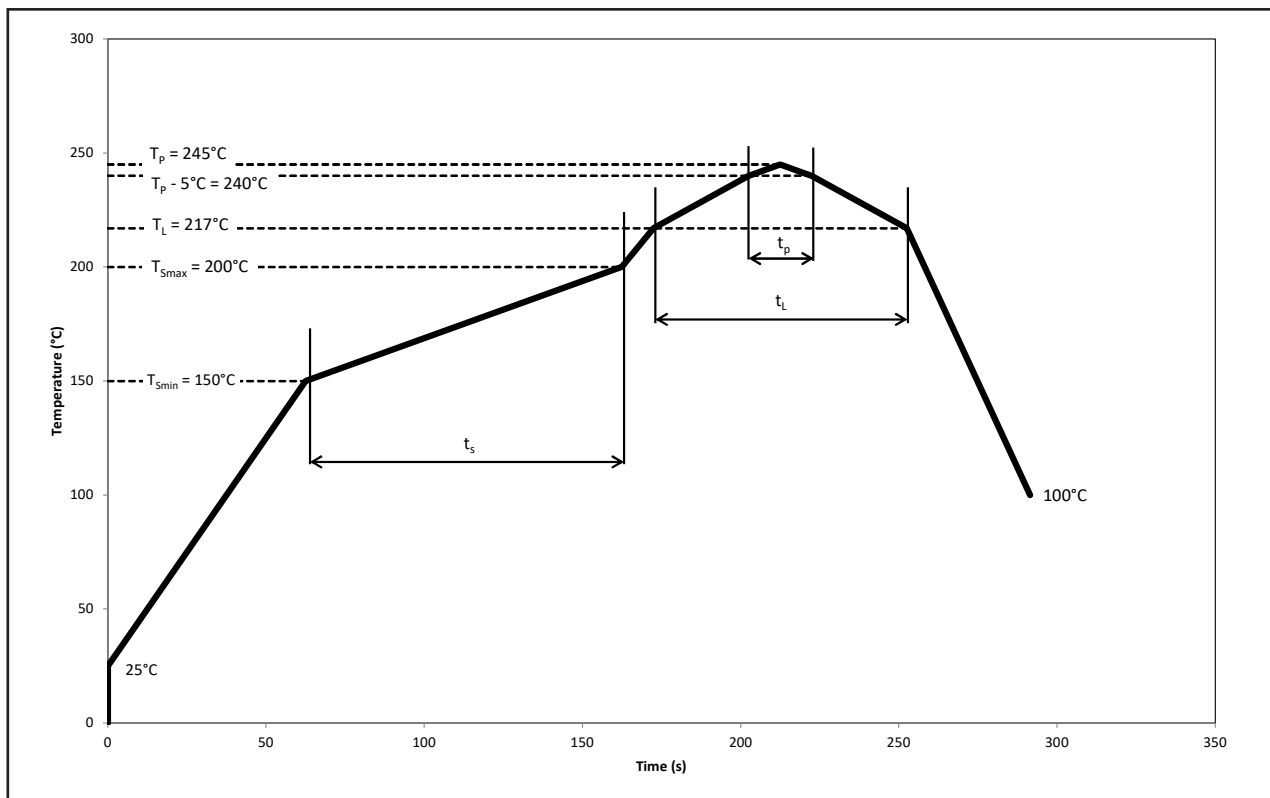
Quantity per bag (pcs)	Average 1pc SpicePlus RGB (gram)	1 completed bag (gram)
4000	0.016	250 ± 10



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°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 ± 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 $\pm 0.5\text{nm}$ 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 Unless otherwise noted in drawing, tolerances are specified with ± 0.1 and dimension are specific 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	30 Jul 2021
7	Update Package Outline	29 Sep 2022
8	Update Recommended Solder Pad	12 Oct 2022
1	Update Product Photo	29 Dec 2022
7	Update Package Outline	05 Jan 2023

NOTE

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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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