DOMINANT™
Opto Technologies
Innovating Illumination

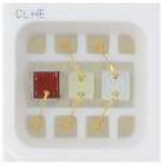
DATA SHEET :

SpicePlus 3030

Multi Color: S8RTB-VHG

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.
> Display: full color display video notice board.
> Lighting: garden light, architecture lighting, etc.

Optical Characteristics at Tj=25˚C

Part Number	Color, λ_{dom} (nm)			Luminous Intensity @ If = 150mA IV (mcd) *Appx. 1.1*		
	Chip #1	Chip #2	Chip #3	Chip #1	Chip #2	Chip #3
● S8RTB-VHG-Z2AB+AAB+XY1-1	Red 625nm	True Green 525nm	Blue 460nm	5600.0-11250.0	7150.0-11250.0	1800.0-3550.0

● Not for new design

Electrical Characteristics at Tj=25˚C

	Vf @ If = 150mA *Appx. 3.1*			V_r @ I_r = 10uA *Appx. 6.1*
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
Red	1.9	2.3	2.5	12
True Green	2.9	3.3	3.6	5
Blue	3.0	3.3	3.6	5

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current (Red / True Green / Blue)	200	mA
Peak pulse current; (T_s=55°C, tp<=100µs , Duty cycle=0.03) (Red, True Green, Blue)	400	mA
Reverse voltage *Appx. 6.1*	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 (Rated current = 150mA, Ts = 25 ˚C) - Real Thermal Resistance (single chip on) Junction / solder point, $R_{th\ JS\ real}$	 Red = 35 True Green = 90 Blue = 65	 K/W K/W K/W

Wavelength Grouping

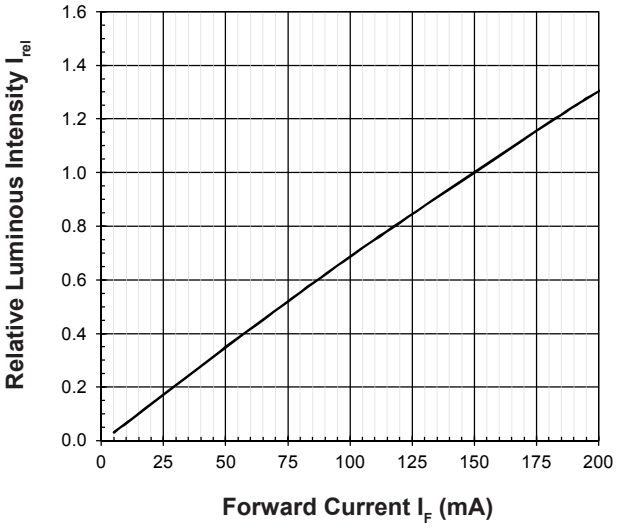
Color	Group	Wavelength distribution (nm) *Appx. 2.2*
Red	Full	619 - 629
True Green	Full	520 - 535
	A	520 - 525
	B	525 - 530
	C	530 - 535
Blue	Full	458 - 466
	A	458 - 462
	B	462 - 466

Luminous Intensity Group at Tj=25˚C

Color	Brightness Group	Luminous Intensity *Appx. 1.1* IV (mcd)
Red	Z2	5600.0 ... 7150.0
	AA	7150.0 ... 9000.0
	AB	9000.0 ... 11250.0
True Green	AA	7150.0 ... 9000.0
	AB	9000.0 ... 11250.0
Blue	X1	1800.0 ... 2240.0
	X2	2240.0 ... 2850.0
	Y1	2850.0 ... 3550.0

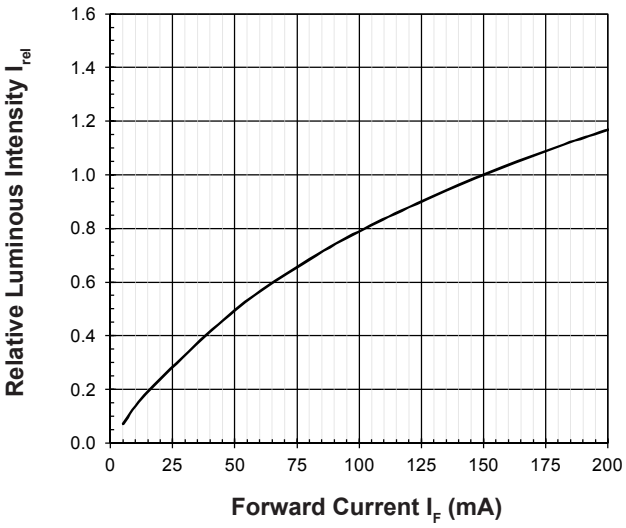
Relative Luminous Intensity Vs Forward Current *Appx. 4.1*

$I_V/I_V(150mA) = f(I_F)$; $T_j = 25°C$ (Red)



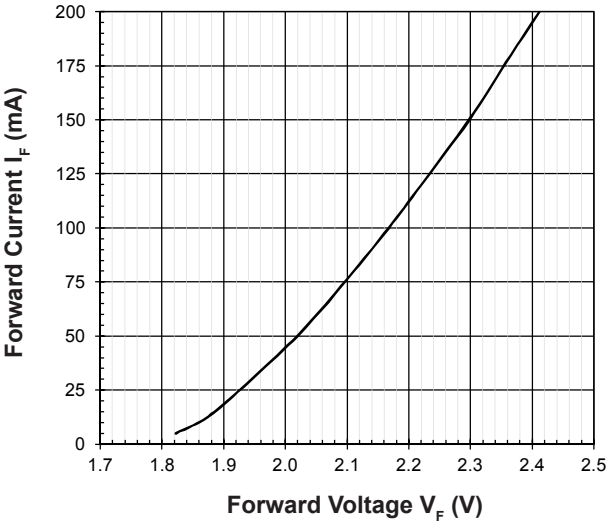
Relative Luminous Intensity Vs Forward Current *Appx. 4.1*

$I_V/I_V(150mA) = f(I_F)$; $T_j = 25°C$ (Blue & True Green)



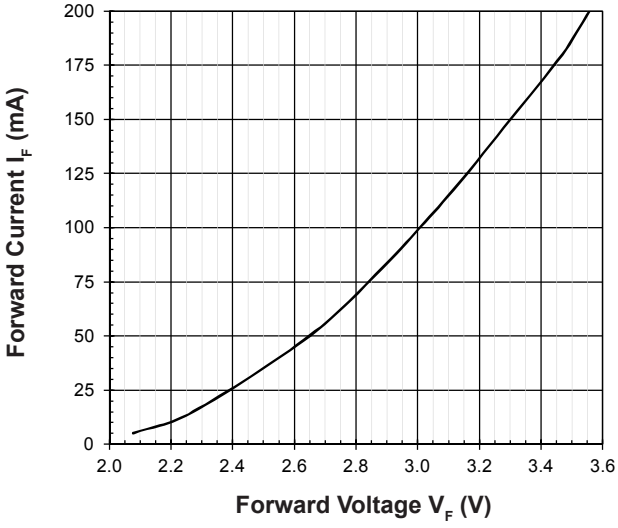
Forward Current Vs Forward Voltage *Appx. 4.1*

$I_F = f(V_F)$; $T_j = 25°C$ (Red)



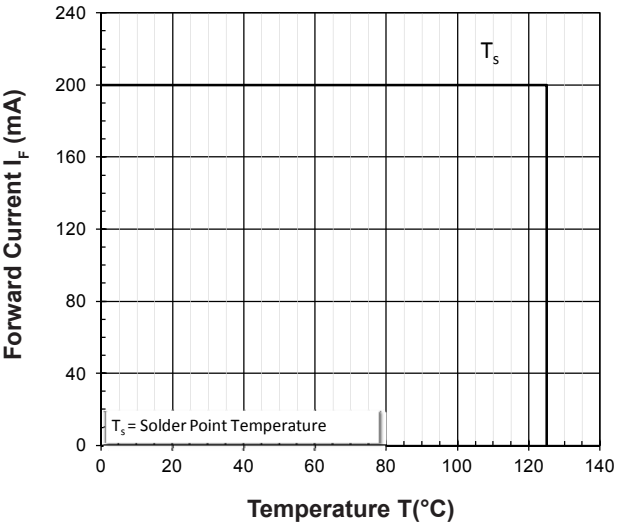
Forward Current Vs Forward Voltage *Appx. 4.1*

$I_F = f(V_F)$; $T_j = 25°C$ (Blue & True Green)



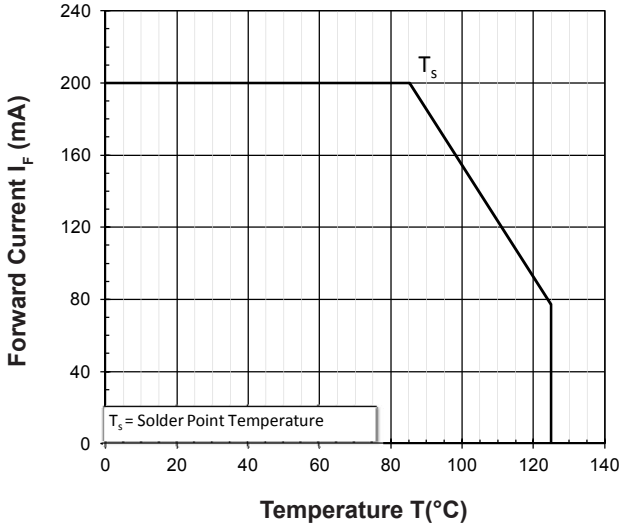
Maximum Current Vs Temperature

$I_F=f(T)$ (Red)



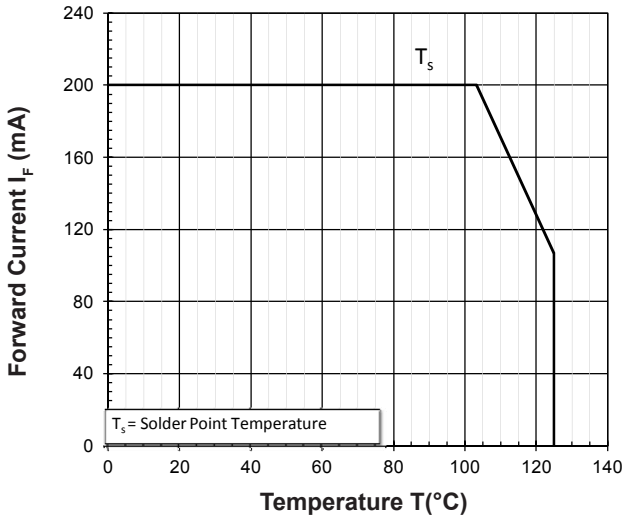
Maximum Current Vs Temperature

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



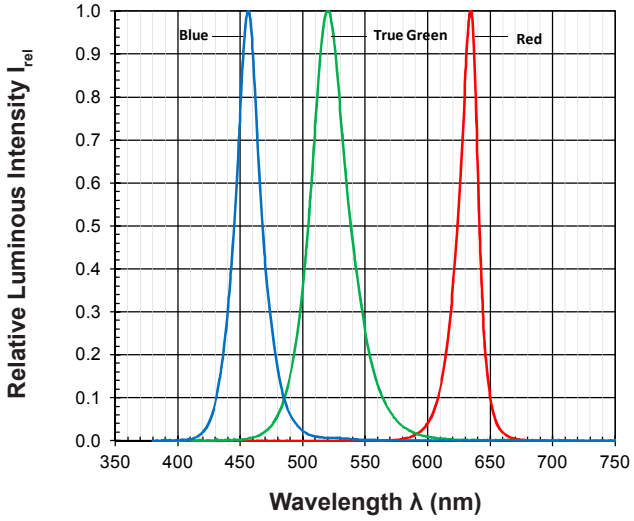
Maximum Current Vs Temperature

I_F=f(T) (Blue)



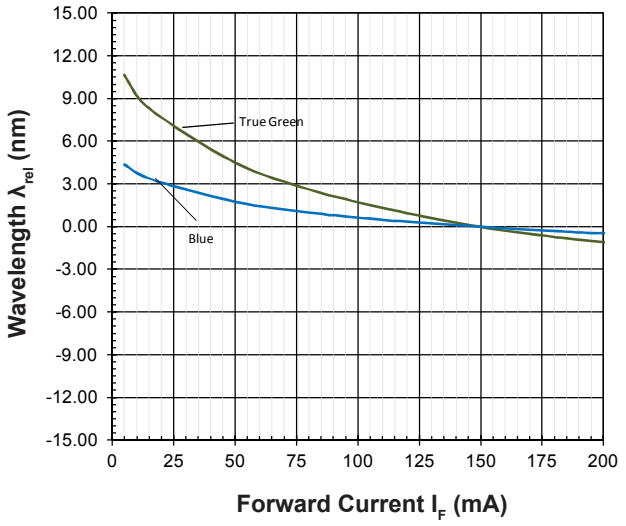
Relative Spectral Emission *Appx. 4.1*

I_{rel} = f(λ); T_j = 25°C; I_F = 150mA



Wavelength Shift Vs Forward Current *Appx. 4.1*

λdom = f(I_F); T_j = 25°C (Blue & True Green)

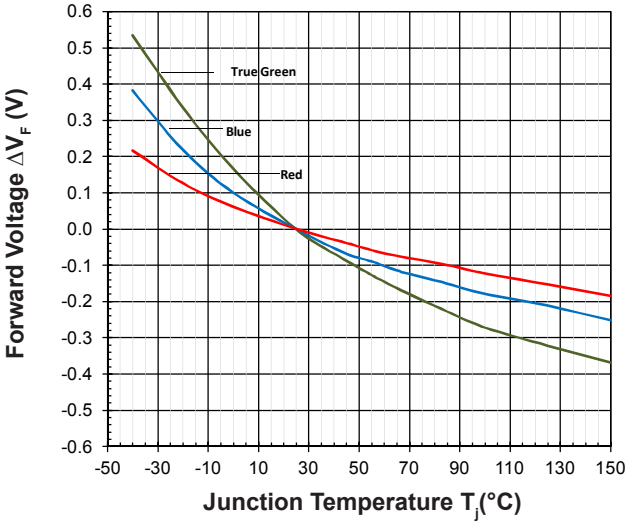


Allowable Forward Current Vs Duty Ratio

(Ts = 55°C; tp =100µs)

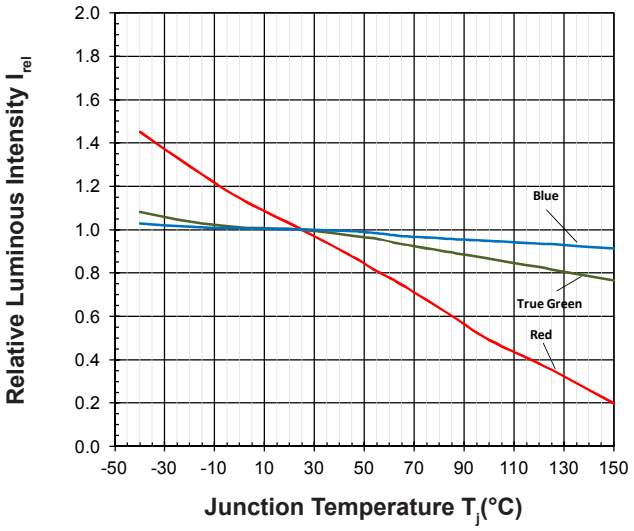
Forward Voltage Vs Junction Temperature *Appx. 4.1*

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =150mA



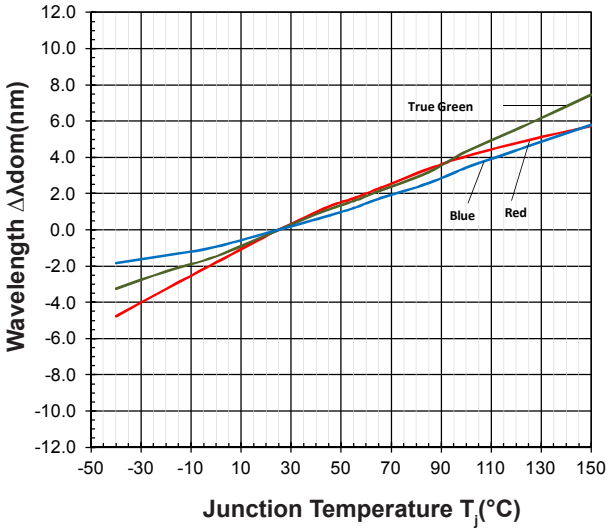
Relative Luminous Intensity Vs Junction Temperature *Appx. 4.1*

$I_V/I_V(25°C) = f(T_j)$; I_F = 150mA

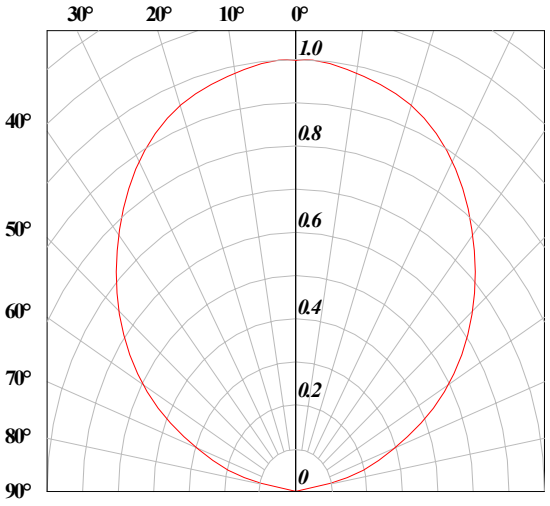


Wavelength Vs Junction Temperature *Appx. 4.1*

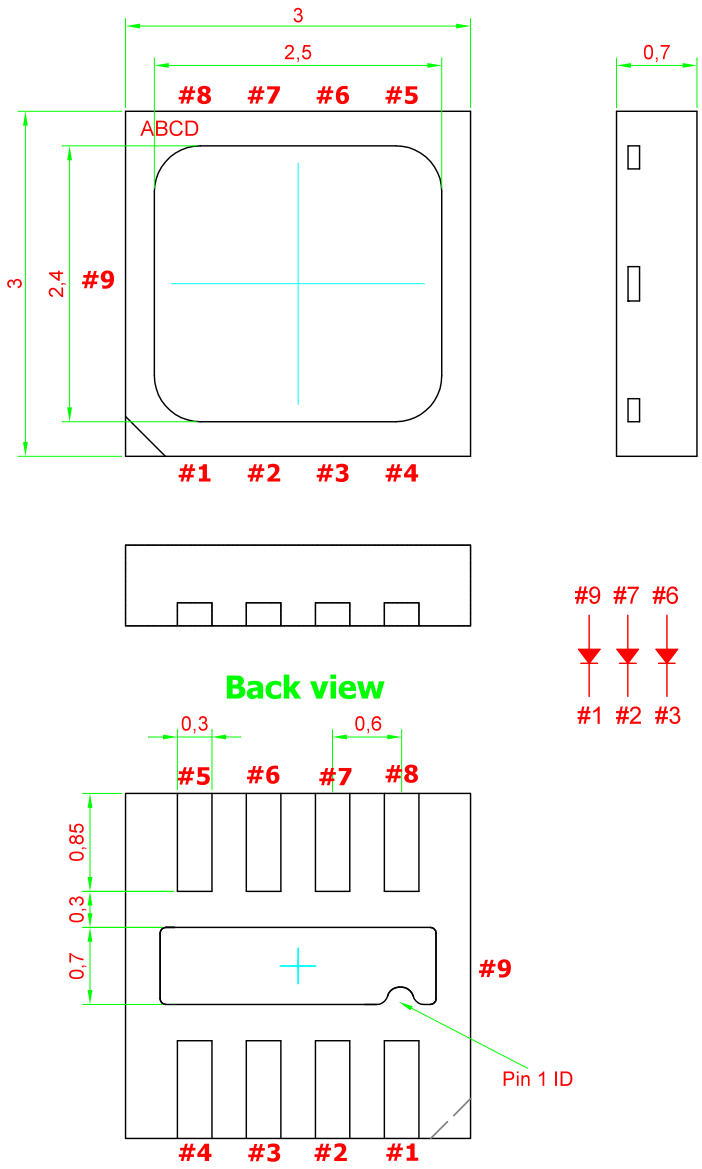
$\Delta\lambda dom = \lambda dom - \lambda dom\ (25°C) = f(T_j);\ I_F = 150mA$



Radiation Pattern *Appx. 4.1*



SpicePlus 3030 Multi Color : S8RTB-VHG Package Outlines *Appx. 5.1*

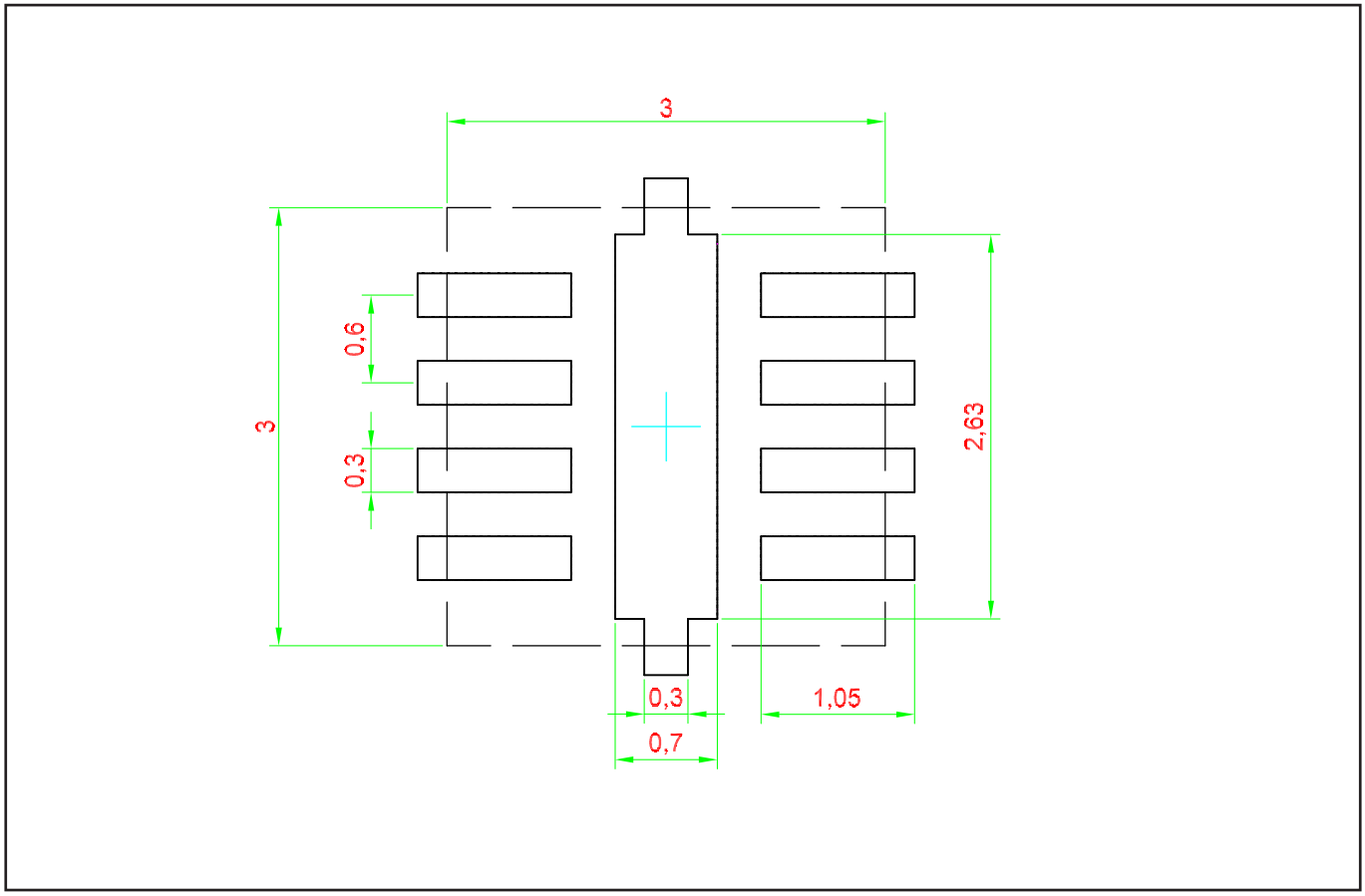


Note : General Tolerances ± 0.10 mm

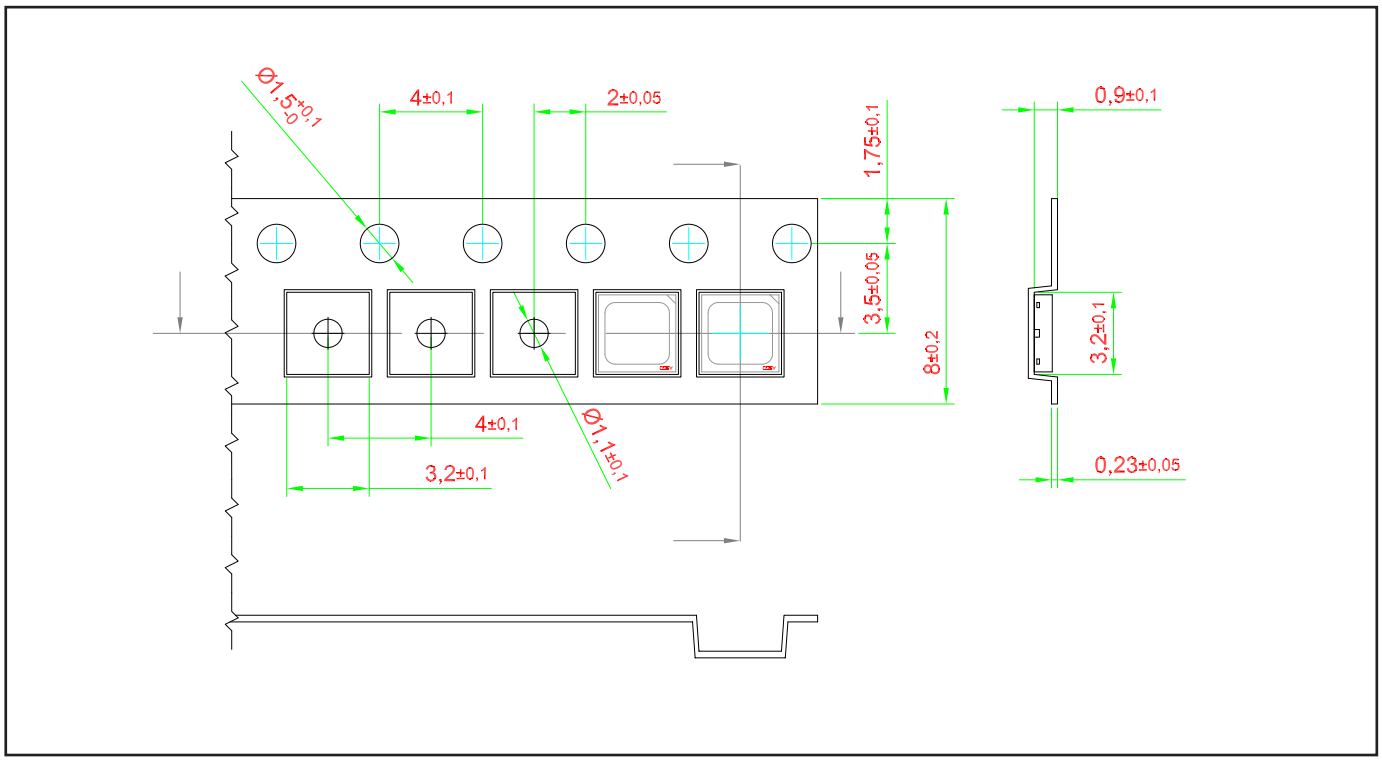
Material

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

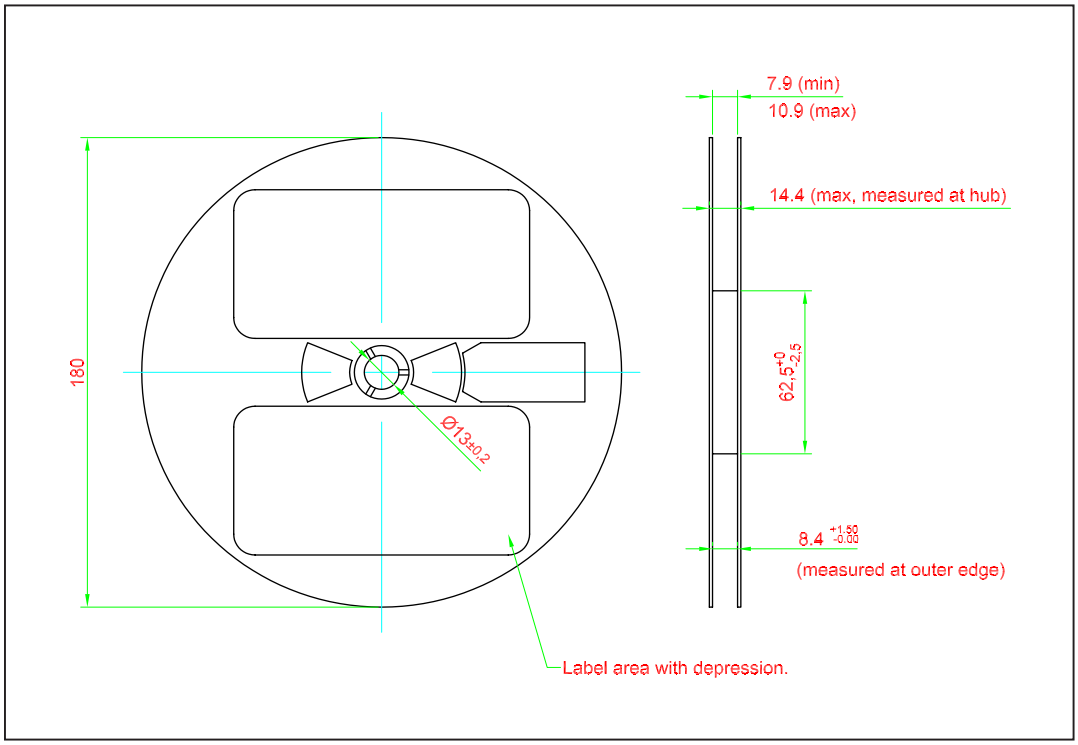
Recommended Solder Pad *Appx. 5.1*



Taping and orientation *Appx. 5.1*



Packaging Specification

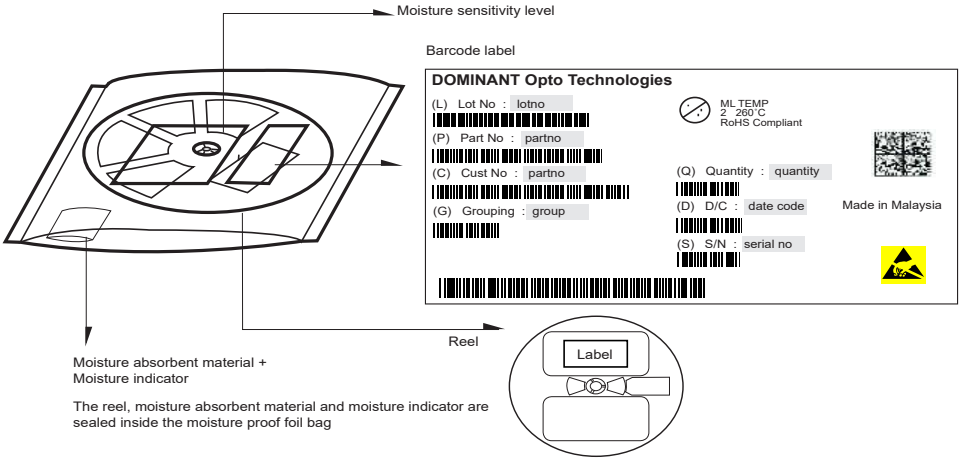


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	4000	S8RTB-VHG-xxx+xxx+xxx-1

Notes:

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

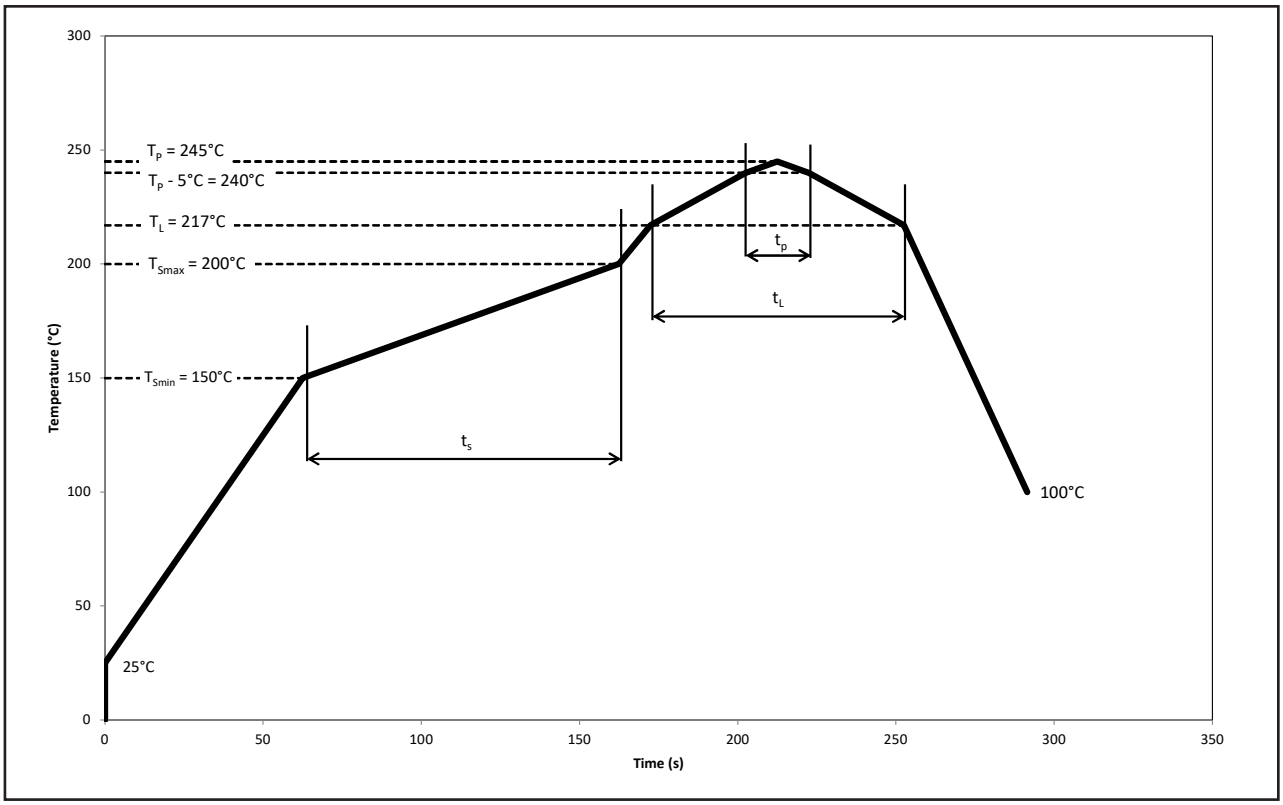
Packaging Specification



Quantity per bag (pcs)	Average 1pc SpicePlus RGB (g)	1 completed bag (g)
4000	0.017	250 ± 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°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 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 ± 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 Apr 2018
1, 2, 5	Update Features AEC-Q101 to AEC-Q102 Update Test Condition for Peak Pulse Current Update Graph: Allowable Forward Current Vs Duty Ratio	15 Jun 2020
2, 12	Not for New Design: S8RTB-VHG-Z2AB+AAB+XY1-1 Update Recommended Pb-free Soldering Profile	02 Mar 2022
10, 11	Update Quantity per Reel	26 Sep 2023
1, 7, 11	Update Product Photo Update Package Outline Update Packaging Specification	26 Jun 2024

NOTE

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Please contact us for more information:

DOMINANT Opto Technologies Sdn. Bhd.
Lot 6, Batu Berendam, FTZ Phase III, 75350 Melaka, Malaysia
Tel: (606) 283 3566 Fax: (606) 283 0566
E-mail: sales@dominant-semi.com