DOMINANT™
Opto Technologies
Innovating Illumination

DATA SHEET

Right Angle Multi DomiLED

DSRTB-FKG

Right Angle Multi DomiLED

Synonymous with function and performance, the Right Angle Multi 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 tri-color surface mount LED.
- > Each color can be individually controlled
- > 120° viewing angle.
- > Small package outline (LxWxH) of 6.2 x 1.4 x 2.15 mm.
- > 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: ambient lighting.
- > Signs: full color video.
- > General Lighting: architectural lighting, decorative lighting.

Optical Characteristics at Tj=25˚C

Part Number	Color, λ_{dom} (nm)			Luminous Intensity @ If = 20mA IV (mcd) *Appx. 1.1*		
	Chip #1	Chip #2	Chip #3	Chip #1	Chip #2	Chip #3
DSRTB-FKG-U3V3+W2X+S2T-1	Red 625nm	True Green 528nm	Blue 465nm	650.0-1280.0	1400.0-2850.0	224.0-450.0

Electrical Characteristics at Tj=25˚C

	Vf @ If = 20mA *Appx. 3.1*			V_r @ I_r = 10uA *Appx. 6.1*
	Min. (V)	Typ. (V)	Max. (V)	Min. (V)
Red	1.90	2.20	2.50	12
True Green	2.65	3.00	3.40	5
Blue	2.65	3.00	3.40	5

Absolute Maximum Ratings

	Maximum Value	Unit
DC forward current	Red; AlInGaP=50; True Green, Blue; InGaN=50	mA
Peak pulse current; (Ts=55 ˚C, tp ≤ 100µs, Duty cycle = 0.03)	Red ; AlInGaP=100 True Green, Blue; InGaN=100	mA
Reverse voltage *Appx. 6.1*	Red; AlInGaP=12; True Green, Blue; InGaN= 5	V
ESD threshold (HBM)	2000	V
LED junction temperature	125	˚C
Operating temperature	-40 … +110	˚C
Storage temperature	-40 … +110	˚C
Thermal resistance (Rated current = 20mA, Ts = 25 ˚C) - Real Thermal Resistance Junction / solder point, $R_{th\ JS\ real}$		
Red	180	K/W
Blue & True Green	200	K/W

Wavelength Grouping

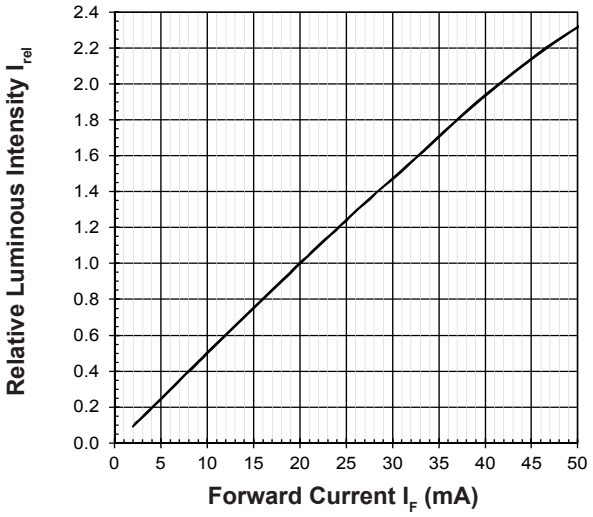
Color	Group	Wavelength distribution (nm) *Appx. 2.2*
Red	Full	619 - 629
True Green	Full	520 - 535
	A	520 - 525
	B	525 - 530
	C	530 - 535
Blue	Full	459 - 471
	A	459 - 463
	B	463 - 467
	C	467 - 471

Luminous Intensity Group at Tj=25˚C

Color	Brightness Group	Luminous Intensity *Appx. 1.1* IV (mcd)
Red	U3	650.0 ... 900.0
	V3	900.0 ... 1280.0
True Green	W2	1400.0 ... 1800.0
	X1	1800.0 ... 2240.0
	X2	2240.0 ... 2850.0
Blue	S2	224.0 ... 285.0
	T1	285.0 ... 355.0
	T2	355.0 ... 450.0

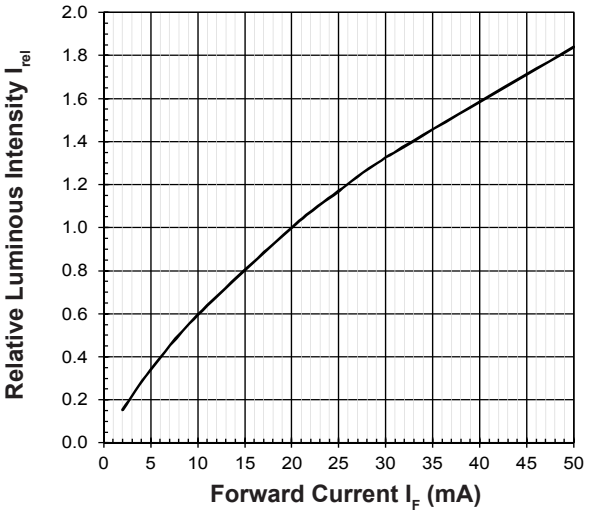
Relative Luminous Intensity Vs Forward Current (Red)

$I_V/I_V(20mA) = f(I_F)$; $T_j = 25°C$



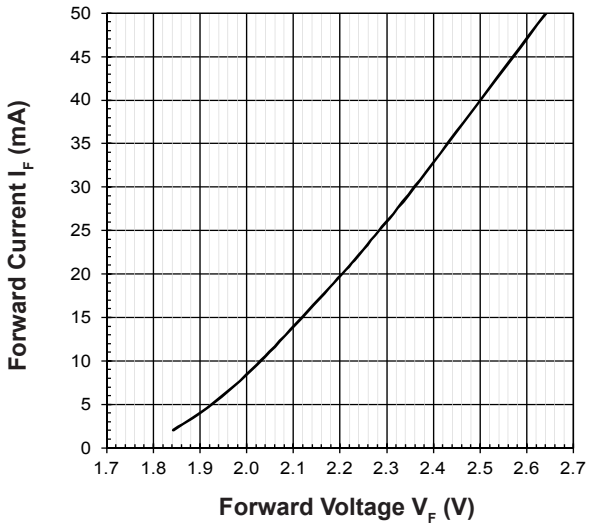
Relative Luminous Intensity Vs Forward Current (Blue & True Green)

$I_V/I_V(20mA) = f(I_F)$; $T_j = 25°C$



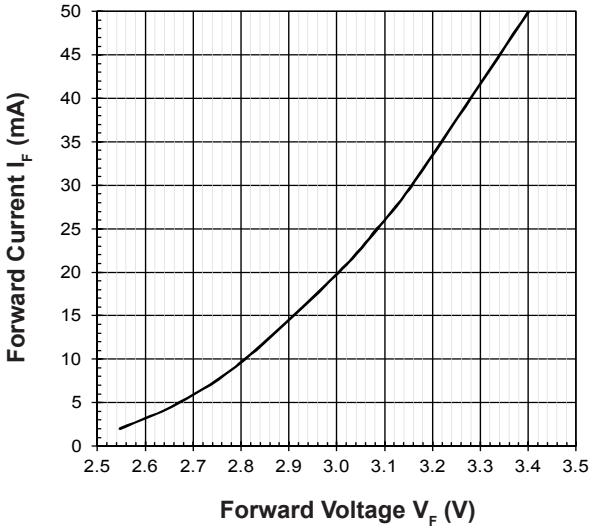
Forward Current Vs Forward Voltage (Red)

$I_F = f(V_F)$; $T_j = 25°C$



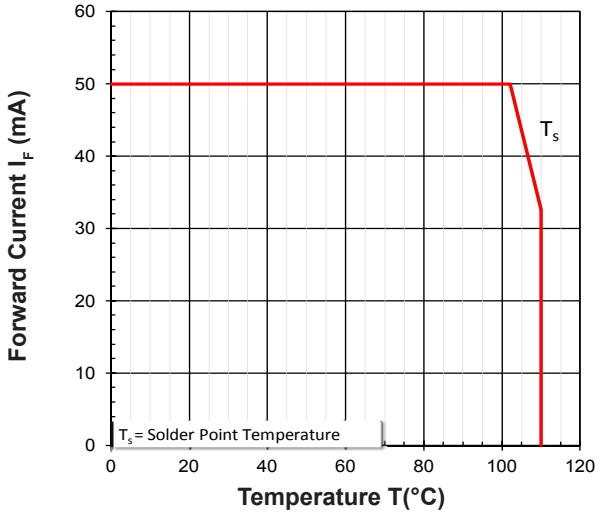
Forward Current Vs Forward Voltage (Blue & True Green)

$I_F = f(V_F)$; $T_j = 25°C$



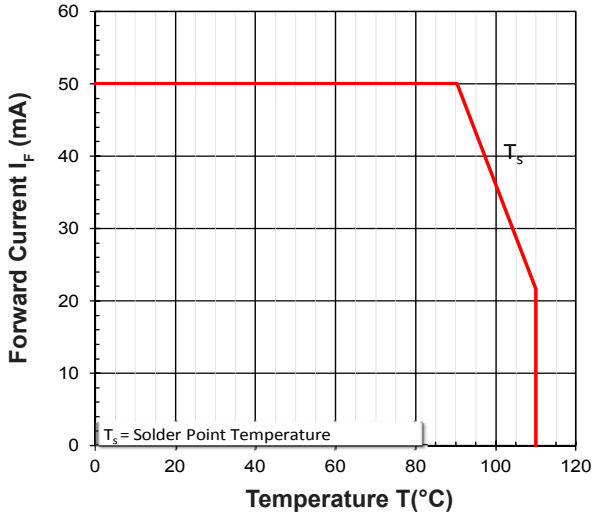
Maximum Current Vs Temperature (Red)(1 chip on)

$I_F=f(T)$



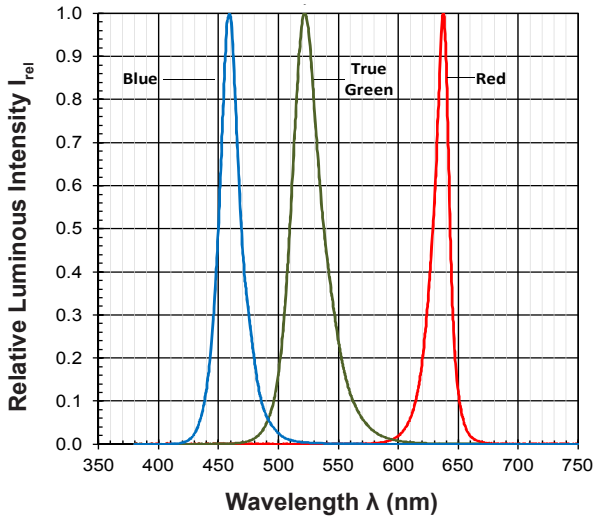
Maximum Current Vs Temperature (True Green & Blue)(1 chip on)

$I_F=f(T)$



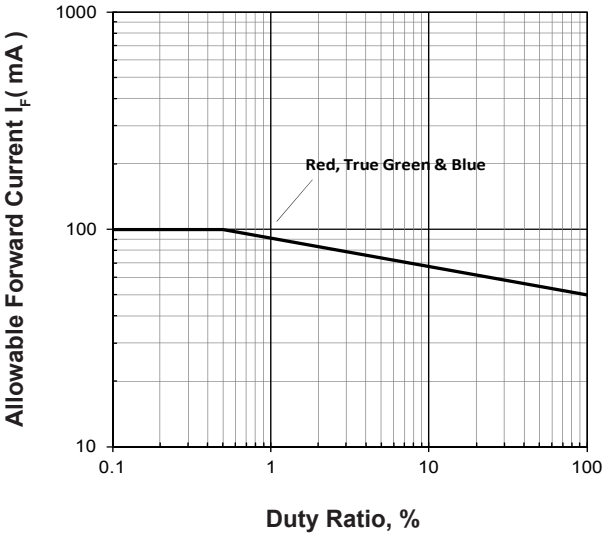
Relative Spectral Emission

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

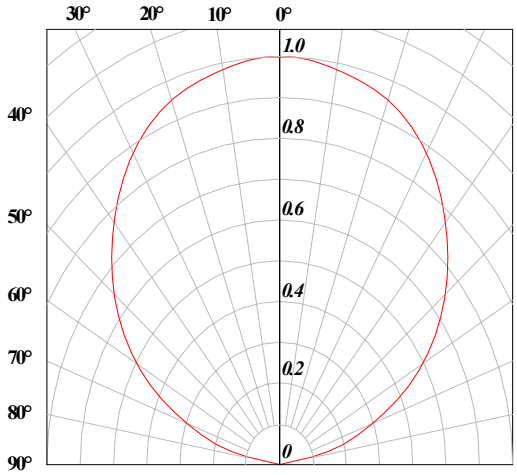


Allowable Forward Current Vs Duty Ratio

(Red, True Green, Blue)

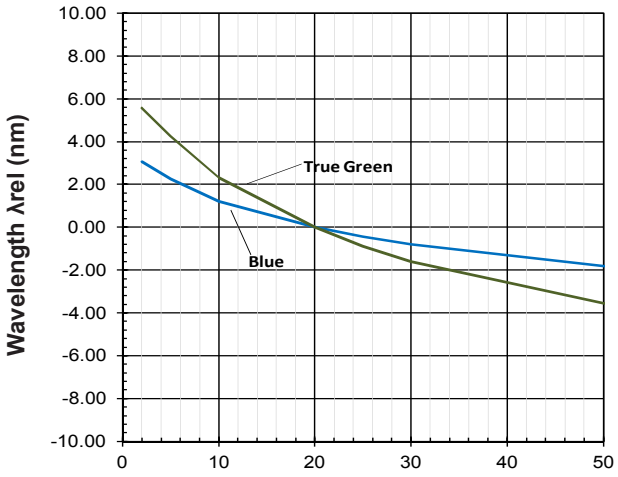


Radiation Pattern



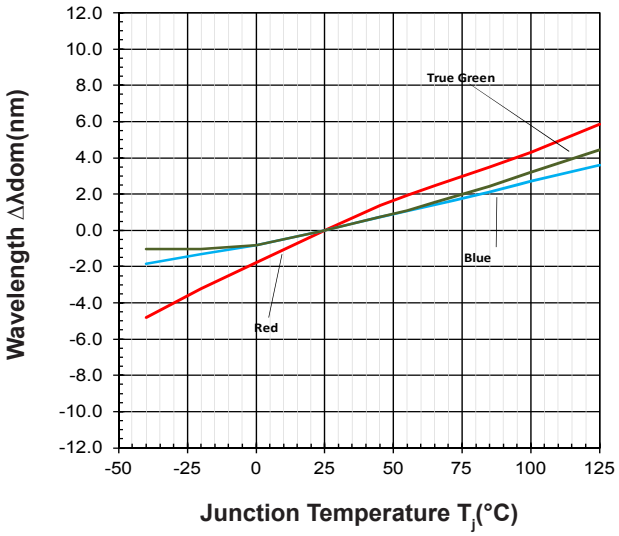
Wavelength Shift Vs Forward Current

$\lambda dom = f(I_F)$; $T_j = 25°C$



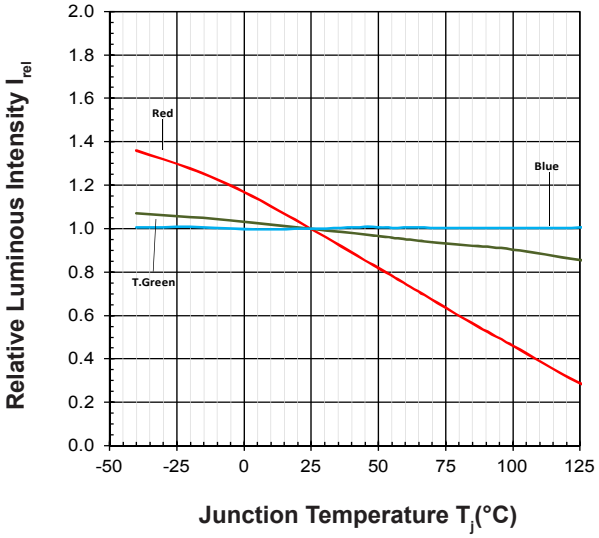
Wavelength Vs Junction Temperature

$\Delta\lambda dom = \lambda dom - \lambda dom\ (25°C) = f(T_j)$; I_F =20mA



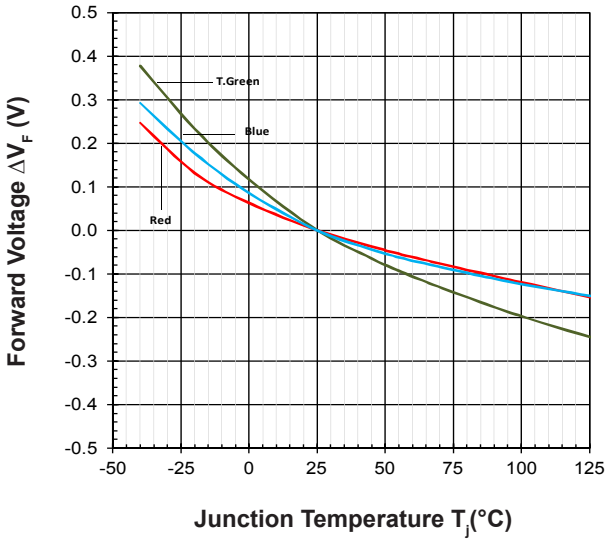
Relative Luminous Intensity Vs Junction Temperature

$I_V/I_V(25°C) = f(T_j)$; I_F = 20mA

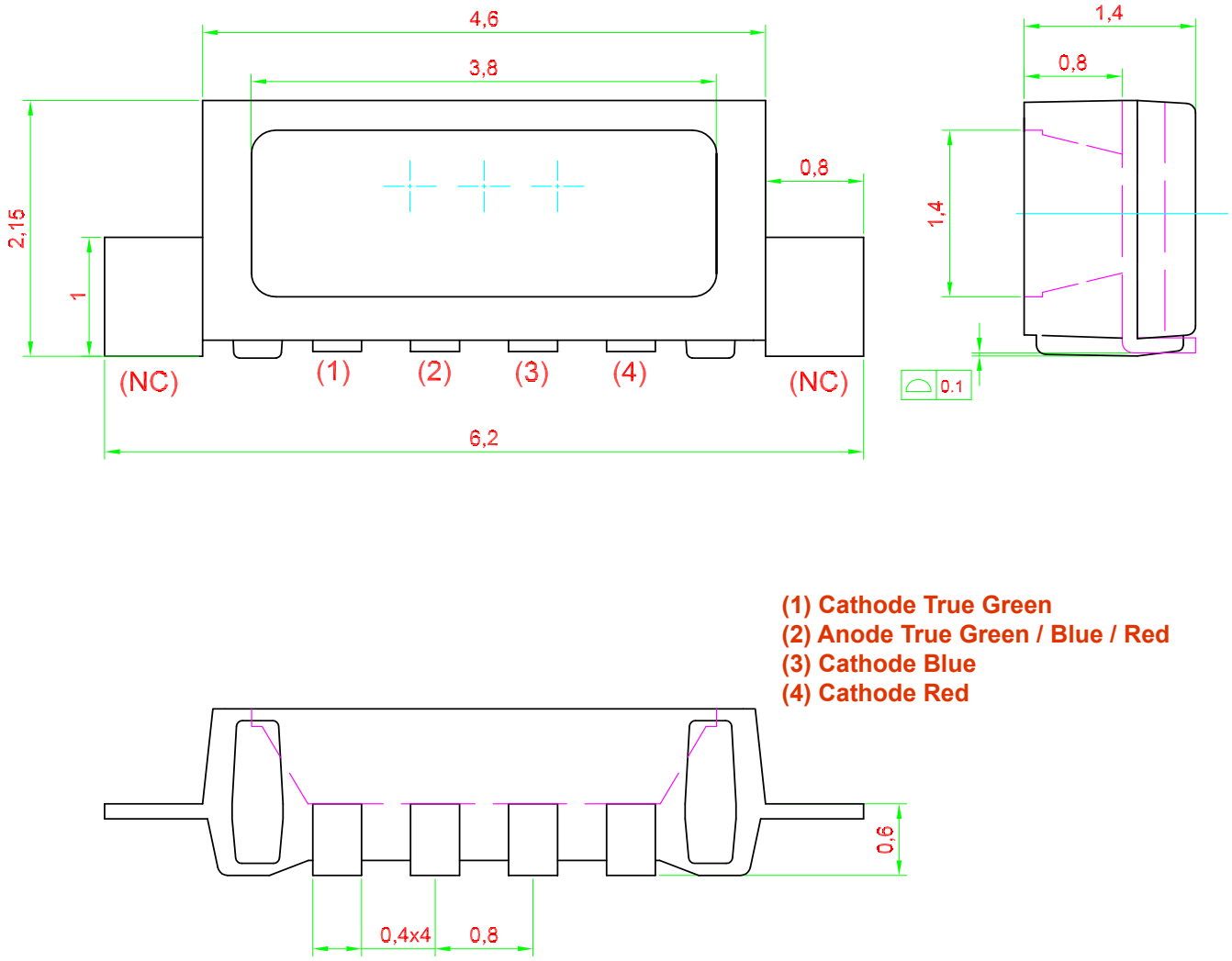


Forward Voltage Vs Junction Temperature

$\Delta V_F = V_F - V_F(25°C) = f(T_j)$; I_F =20mA



Right Angle Multi DomiLED : DSRTB-FKG Package Outlines



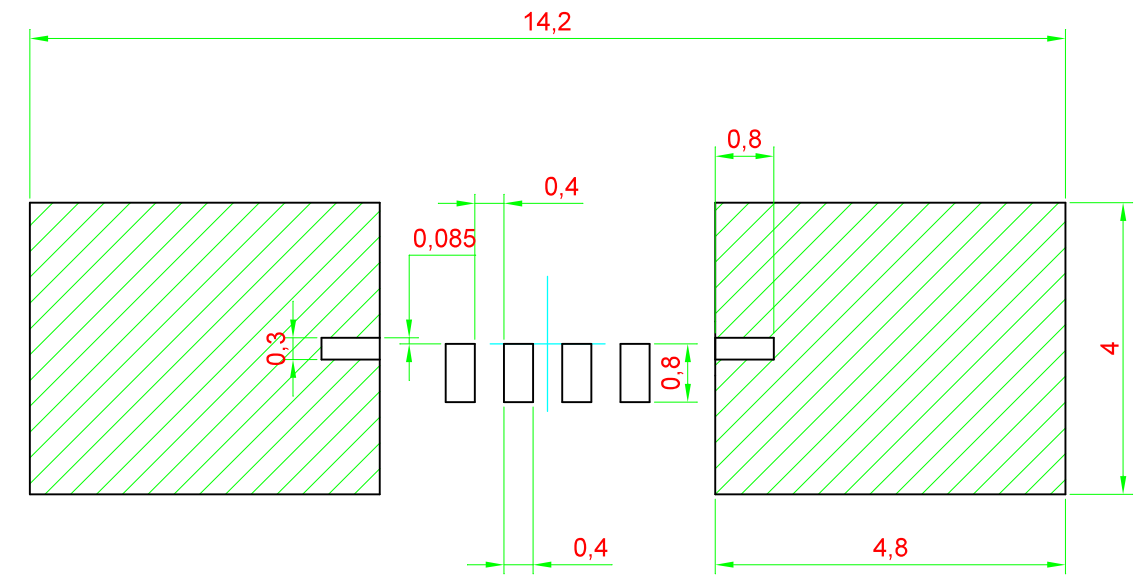
(1) Cathode True Green
(2) Anode True Green / Blue / Red
(3) Cathode Blue
(4) Cathode Red

Note : Primary thermal path is through NC lead to LED package.

Materials

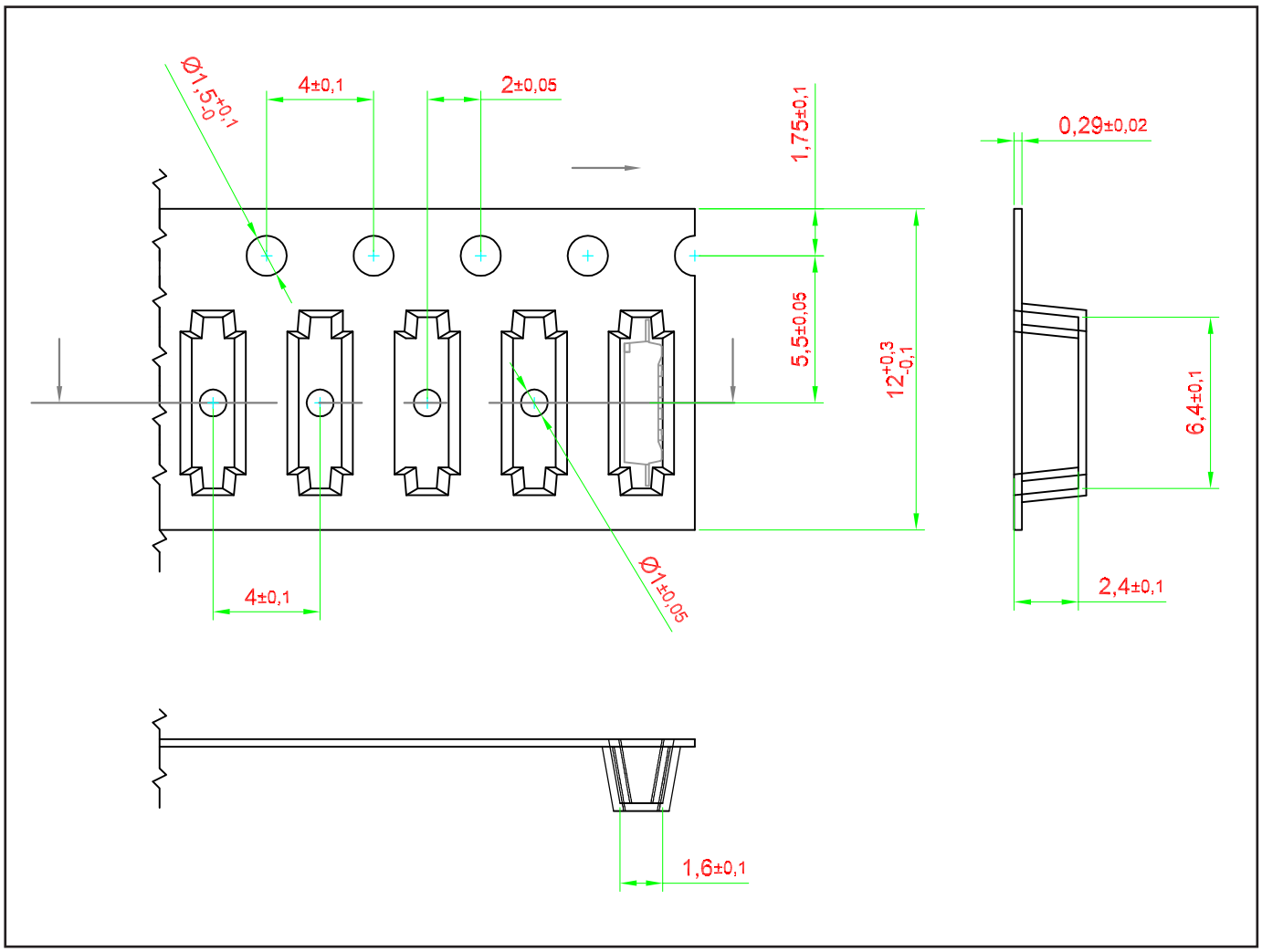
	Materials
Lead-frame	Cu Alloy with NipdAu Plating
Package	High temperature resistant plastic
Encapsulant	SIlicone Resin
Soldering Leads	Au Plating

Recommended Solder Pad

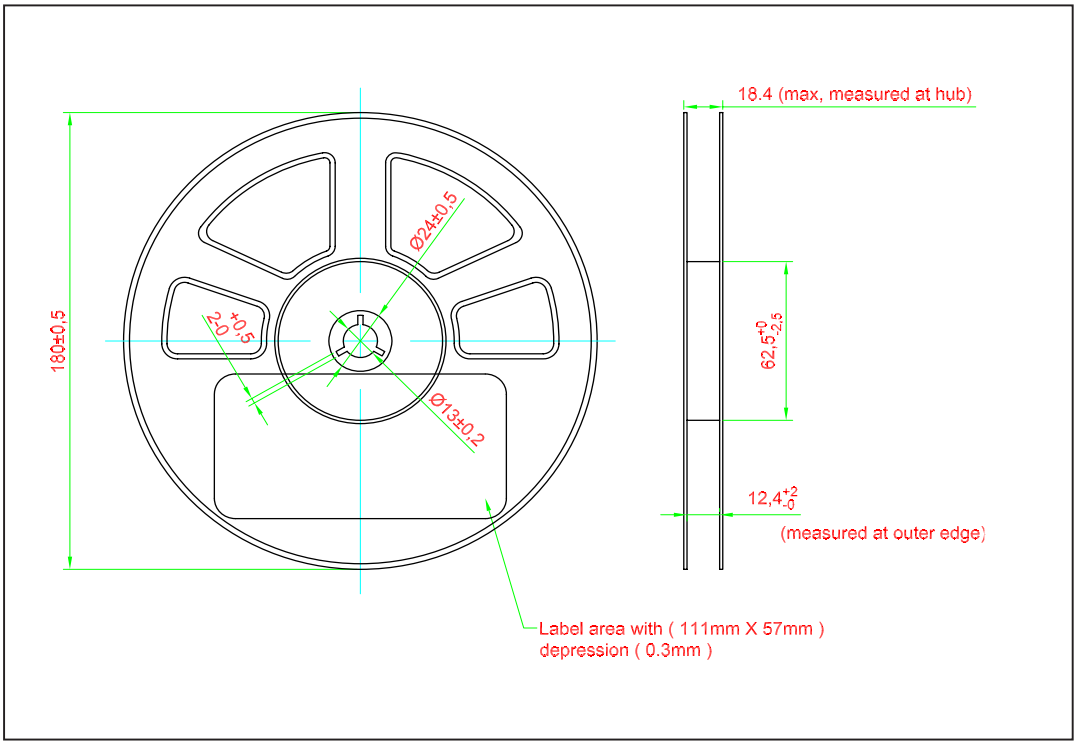


Solder resist.

Taping and orientation



Packaging Specification

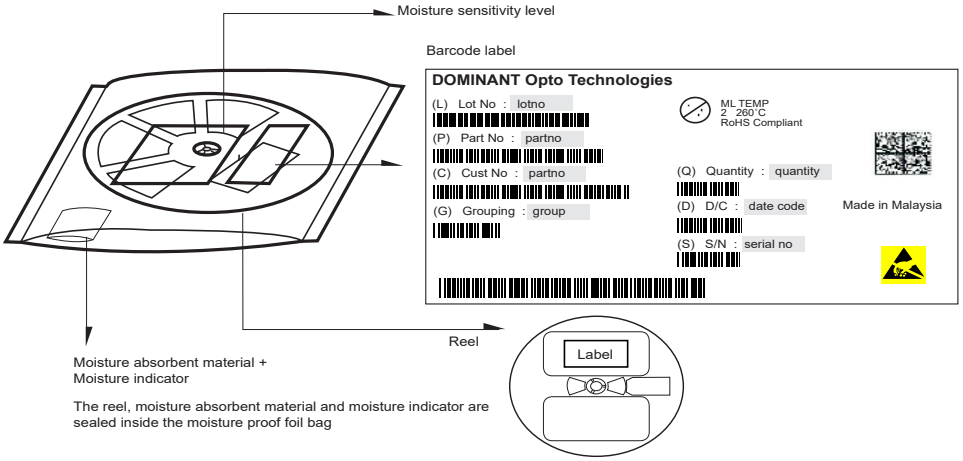


	Reel Diameter (mm)	Quantity (pcs)	*Ordering Number
Standard Packing	180	2000	DSRTB-FKG-xxx+xxx+xxx-x

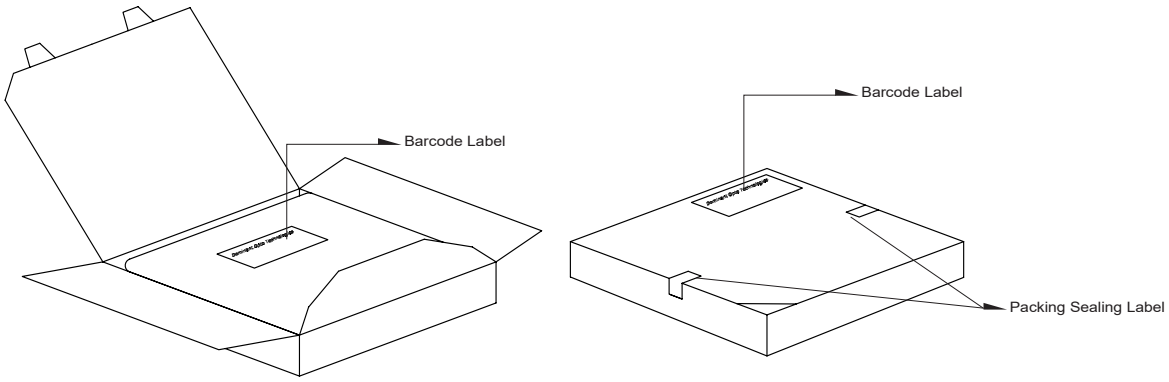
Notes:

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

Packaging Specification



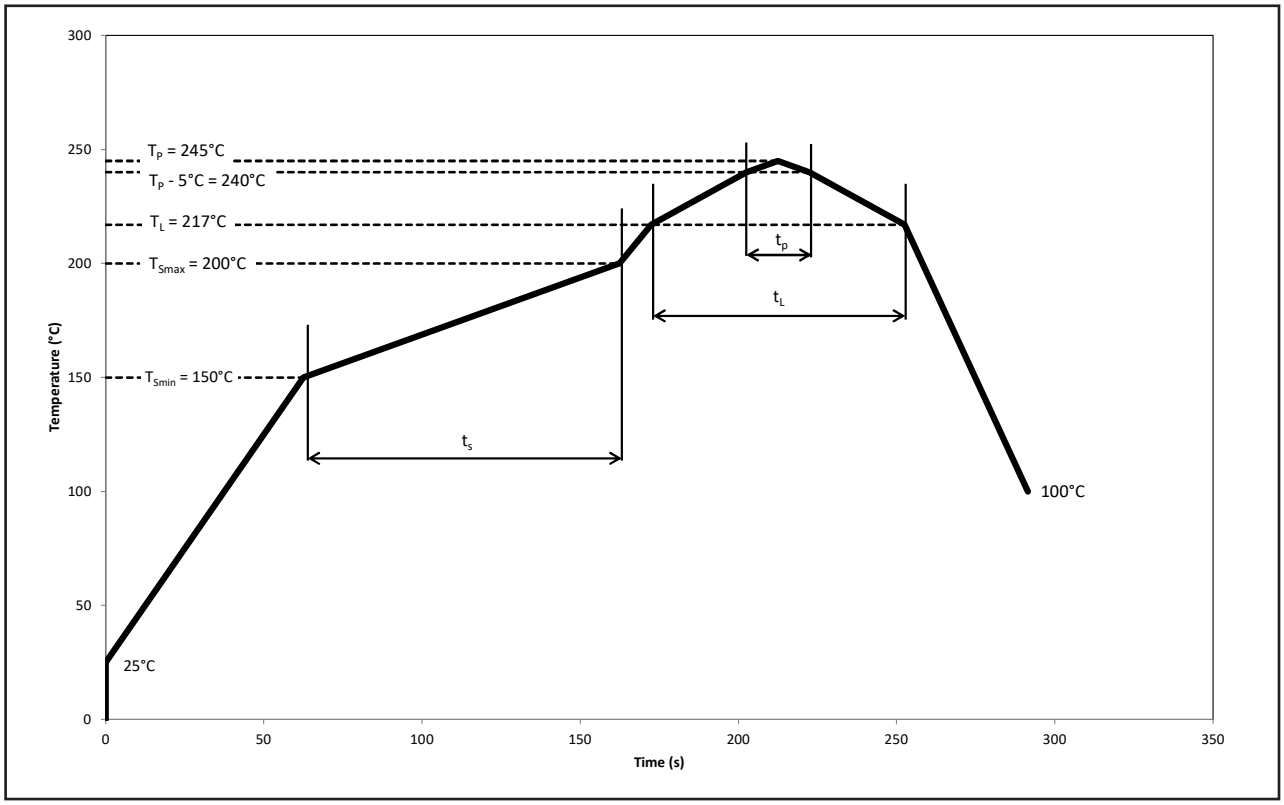
Quantity per bag (pcs)	Average 1pc Multi Right Angle DomiLED (g)	1 completed bag (g)
2000	0.0230	240 ± 10



Reel Diameter (mm)	Packing Box Dimensions (mm)
180	210 x 210 x 20

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 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 ± 0.1 with the dimension measurement unit 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	05 Aug 2019
9	Update Solder Pad Design	22 Jul 2020
11, 12, 13	Update Quantity per Reel: 1000pcs to 2000pcs Update Recommended Pb-free Soldering Profile	22 Sep 2023

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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