Polar Polar-3011 Lighting Kits thermal data

The thermal data table

Pd=Pe x (1-ηL)		Heat sink to ambient thermal resistance Rhs-amb(°C/W)	Heat sink to ambient temperature rise Ths-amb(°C)
		Polar-3011	
Dissipated Power Pd(W)	2	3.40	7.2
	5	2.80	15
	10	2.50	27
	15	2.27	37
	20	2.05	45
	25	2.00	55
	30	1.97	65

Heat sink to ambient temperature rise Ths-amb(°C)   ta=25°C

Heat sink rise above ambient (°C) vs Dissipated Power Pd(W)
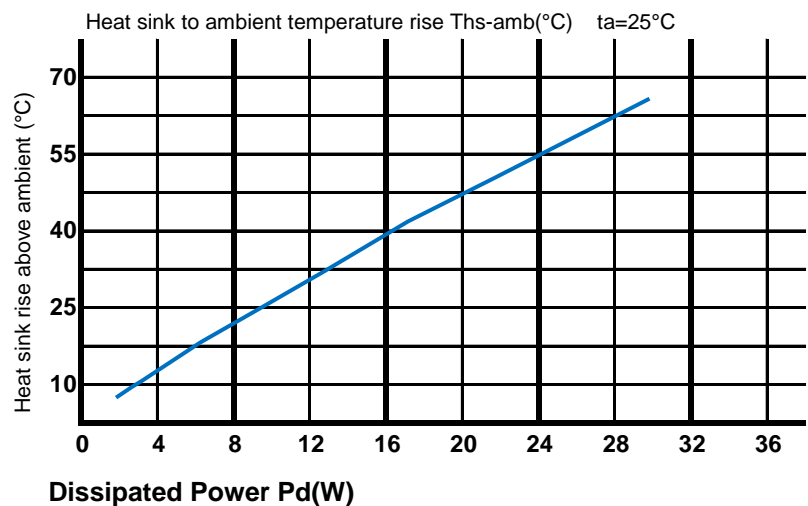
* Please be aware the dissipated power Pd is not the same as the electrical power Pe of a LED module.

*To calculate the dissipated power please use the following formula: $Pd = Pe \times (1-\eta L)$.

   Pd - Dissipated power ; Pe - Electrical power ; ηL = Light effciency of the LED module;

*The aluminum substrate side of the package outer shell is thermally connected to the heat sink via TIM (Thermal interface material).

   MingFa recommends the use of a high thermal conductive interface between the LED module and the LED cooler.

   Either thermal grease,A thermal pad or a phase change thermal pad thickness 0.1-0.15mm is recommended.
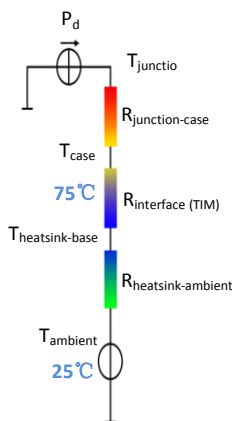
*Thermal resistance is a heat property and a measurement of a temperature difference by which an object or material resists a heat flow.

   Geometric shapes are different, the thermal resistance is different. Formula: $\theta = (Ths - Ta)/Pd$

   θ - Thermal Resistance [°C/W] ;   Ths - Heatsink temperature ;   Ta - Ambient temperature ;

*The thermal resistance between the junction section of the light-emitting diode and the aluminum substrate side of the package outer

   shell is $R_{junction-case}$，the thermal resistance of the TIM outside the package is $R_{interface\ (TIM)}$ [°C/W], the thermal resistance with the

   heat sink is $R_{heatsink-ambient}$ [°C/W], and the ambient temperature is $T_{ambient}$ [°C].

*Thermal resistances outside the package $R_{interface\ (TIM)}$ and $R_{heatsink-ambient}$ can be integrated

   into the thermal resistance $R_{case-ambient}$ at this point.Thus, the following formula is also used:

   $T_{junction} = (R_{junction-case} + R_{case-ambient}) \cdot Pd + T_{ambient}$

Mingfa Tech

1