

Passive or Active LED cooling

Just a matter of calculation

- ✓ The tendencies
- ✓ Boundary & life time
- ✓ Modularity as a safety aspect



LED EVENEMENT 2013 1931 CONGRESCEENTRUM
BRABANTHALLEN DEN BOSCH
LED applicaties voor designers,
engineers en lichtarchitecten
WOENSDAG 27 NOVEMBER 2013

Koen Vangorp – General Manager MechaTronix



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Philips Fortimo lighting up the art world

22 June 2011



Pe 33W – eff. 18% – Pd 27W
Tc 65°C – Ta 40°C
Passive cooler 600gr/100mm
or
Active cooling

The 'MAS' (Museum aan de Stroom) in Antwerp, Belgium has installed 1,000 Philips Fortimo LED SLM modules 2000lm 33W/830.

Module types

There are 8 Fortimo LED SLM Gen3 available with a luminous output between 2000lm and 4500lm.

Fortimo LED SLM Gen3 modules	12NC
Fortimo LED SLM2000 19W/830 L19 G3	9290 008 17503
Fortimo LED SLM2000 18W/840 L19 G3	9290 008 17603
Fortimo LED SLM2000 20W/830 L19 G3	
Fortimo LED SLM3000 20W/830 L19 G3	
Fortimo LED SLM3000 20W/840 L19 G3	
Fortimo LED SLM3000 30W/830 L22 G3	
Fortimo LED SLM4500 45W/830 L22 G3	
Fortimo LED SLM4500 45W/840 L22 G3	
Fortimo LED SLM4000 45W/930 L22 G3	9290 008 63003

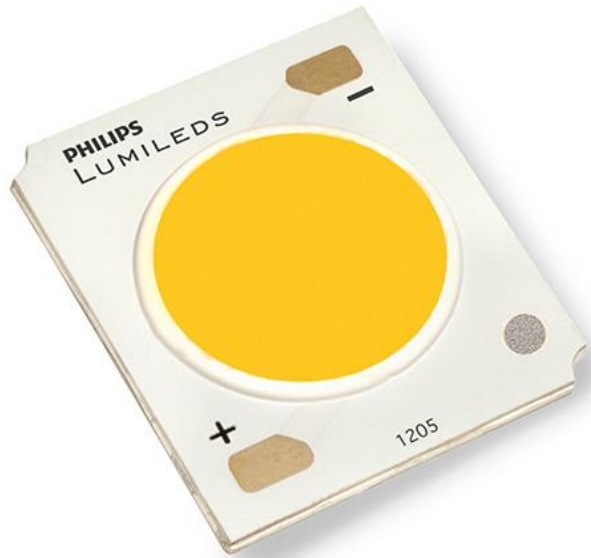
Pe 19W – eff. 25% – Pd 14W
Tc 85°C – Ta 40°C
Passive cooler 250gr/60mm
or
(Active cooling)



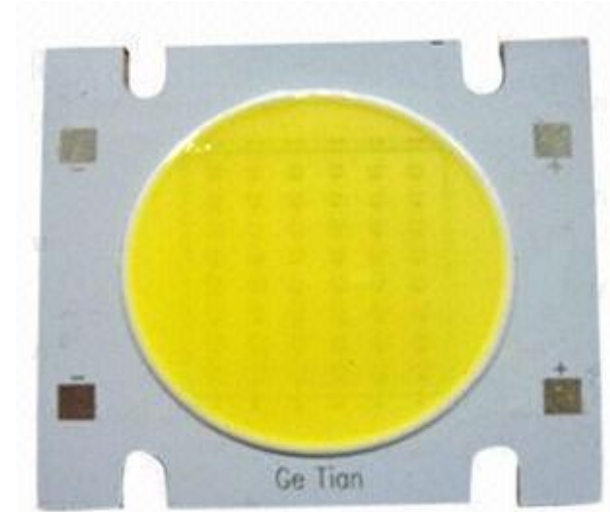
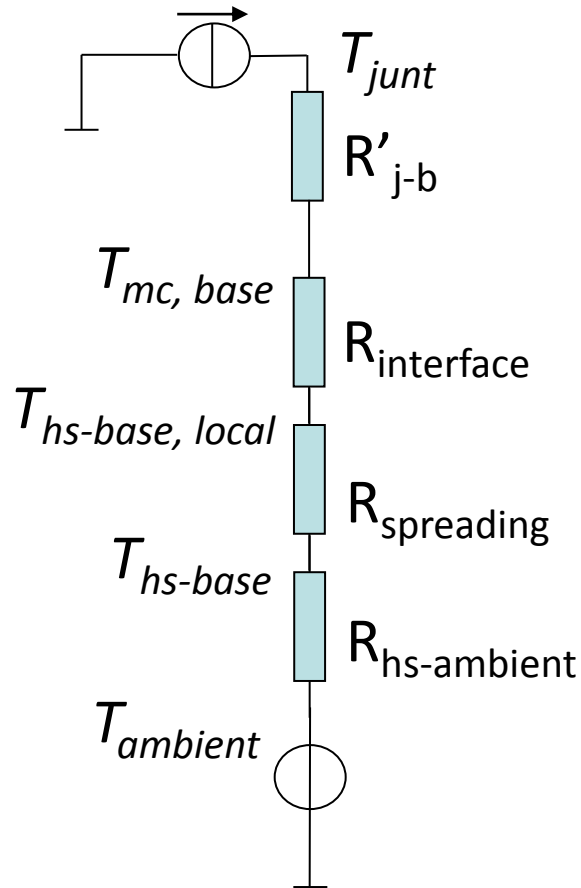
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Internal resistance improvements



2450lm – CCT 3000K – CRI 82
 Pe 21,3W – eff. 25% – Pd 16W
 Tc 105°C – Ta 40°C



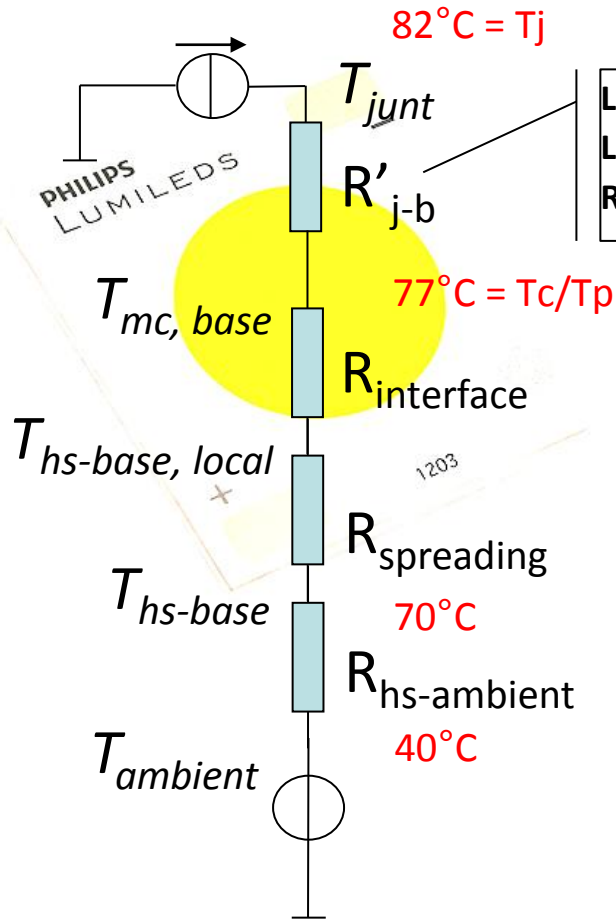
2400lm – CCT 3000K – CRI 80
 Pe 22W – eff. 25% – Pd 16W
 Tc ?°C – Ta 40°C



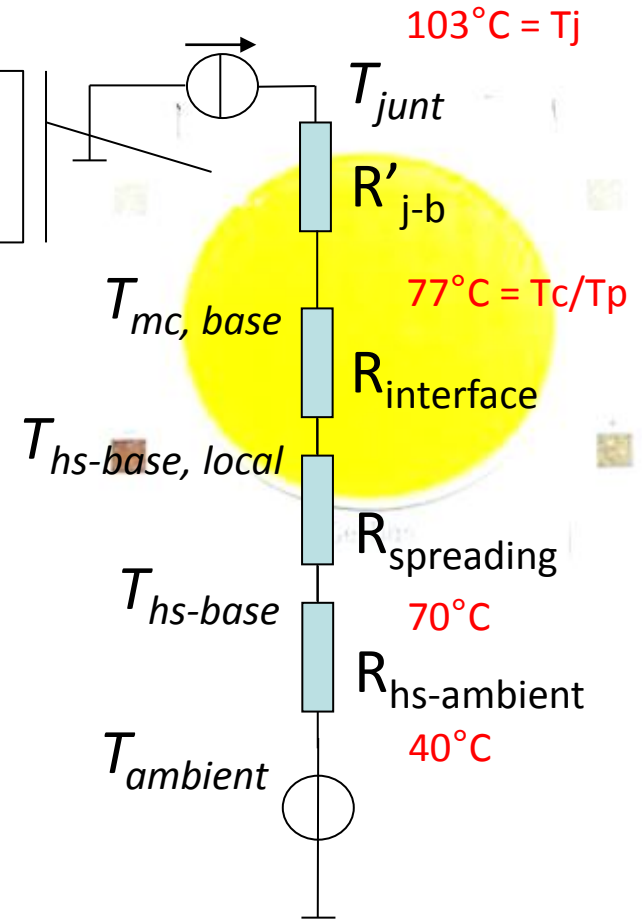
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Internal resistance improvements



The smaller the internal resistance, the lower the needed external cooling capacity



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Recessed down light
T ambient 40°C EU market
2000 – 2500 lumen
CCT 3000K
CRI > 90

Philips Fortimo LED
SLM2000 23W/930 L19 G3
Pe 22.5W – eff 25% – Pd 17W
Tc wanted < 70°C
-> life time > 50Khrs
 $R_{th} \text{ needed} = dT (T_c - T_a) / P_d \text{ total}$
 $R_{th} \text{ needed} = 1,76^\circ\text{C/W}$

ModuLED Xtra 9950 $R_{th} = 1,34^\circ\text{C/W}$
Tc will become around 68°C

ModuLED Xtra 9980 $R_{th} = 1,02^\circ\text{C/W}$
Tc will become around 62°C



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Low bay
T ambient 50°C worldwide market
6000 – 7000 lumen
CCT 4000K
CRI > 80

Bridgelux Vero 18
BXRC-40E4000-F-xx
Overdrive I_{max} 2100mA – V_f 31,6V
P_e 66,3W – eff 25% – P_d 50W
T_c wanted < 80°C
-> life time > 35Khrs
-> T_j < 100°C for max lumen output
R_{th} needed = dT (T_c-T_a) / P_d total
R_{th} needed = 0,6°C/W

IceLED Xtra 550 R_{th} = 0,46°C/W
T_c will become around 77°C

Passive possible but size around diam 180mm and weight > 1,4kg – now 233gr



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Zhaga book 3 LED modules
Edison Edilex SLM, VS Luga Shop,
Tridonic Stark SLE, Osram PrevaLED,
Philips Fortimo SLM
Zhaga book 3 led holders: BJB – TE – Stucchi

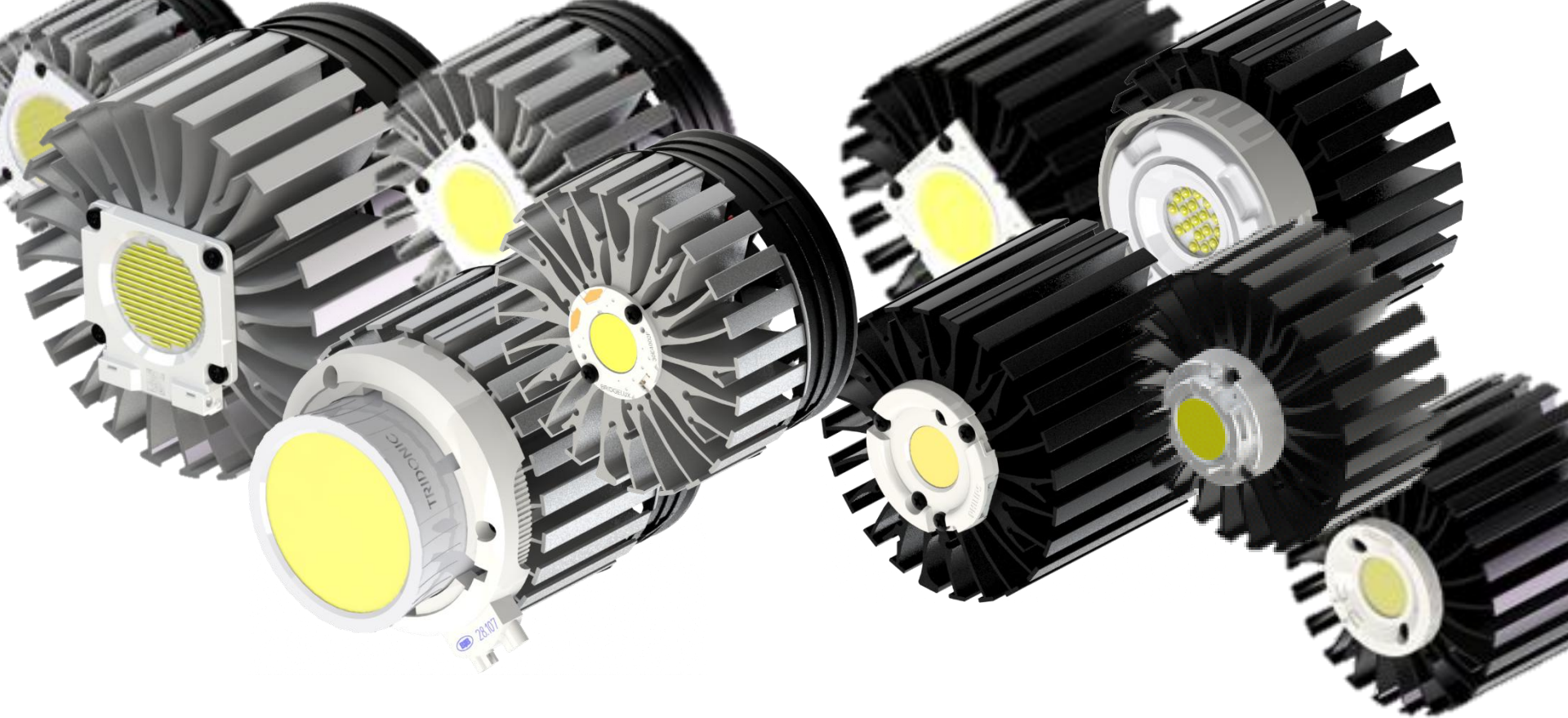


Citizen CL-L020/022 – Edison EdiPower II HM – Prolight Opto PACB



Sharp Mega Zenigata – Philips Lumileds Luxeon COB





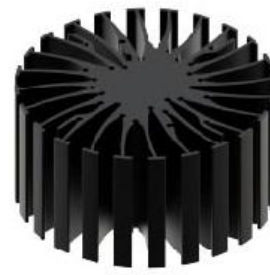
142 COBs and LED modules from 18 LED brands
On just a few LED cooler models
Modular design – self tapping screw holes

Limited stock items
Led module interchangeability
Lowest market pricing due limited afterwork process



More questions about
ModuLED™ or IceLED™
Modular LED Coolers

www.led-heatsink.com
info@led-heatsink.com



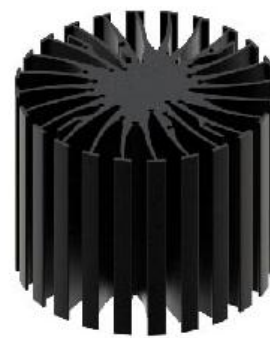
ModuLED 9950



ModuLED 9950
(with Tridonic les 23)



ModuLED 9950
(with Bridgelux RS)



ModuLED 9980



ModuLED 9980
(with Citizen CLL040)



ModuLED 9980
(with Xicato XSM)



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Design with recessed mounting holes hollow pin for wire

Design with outer screw thread, holes, ... Counter ring visual

Extended base hollow with inner screw thread

FUNCTIONAL DESIGN WITH LED HEAT SINKS

› Make your heat sink part of your LED lighting fixture. Some simple ideas.

LED Pin Fin Heat Sinks
Diameter 40-80mm
Cooling performance 5-25W

LED Star Heat Sinks
Diameter 50-134mm
Cooling performance 5-35W

LED Bar Profiles
For Led strip & power LED
Cooling performance 5-20W/m

Bridgelux LED Heat Sinks
For ES array LED Heat Sinks
New models for BXRA Decor

Xicato LED Heat Sinks
For XSM, XLM and XPM LED
Star and new pin fin models

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