LED-Evenement 2015

Advantages of chip on board compared to discrete solutions – latest trends -

OSRAM Opto Semiconductors / OS S EEM DM / Thomas Brandes / 3.12.2015

OSRAM
Opto Semiconductors

What LED to choose ?

What LED is Best ?

Discrete LEDs - Chip On Board - Chip Size Packages.

What LED to choose ?

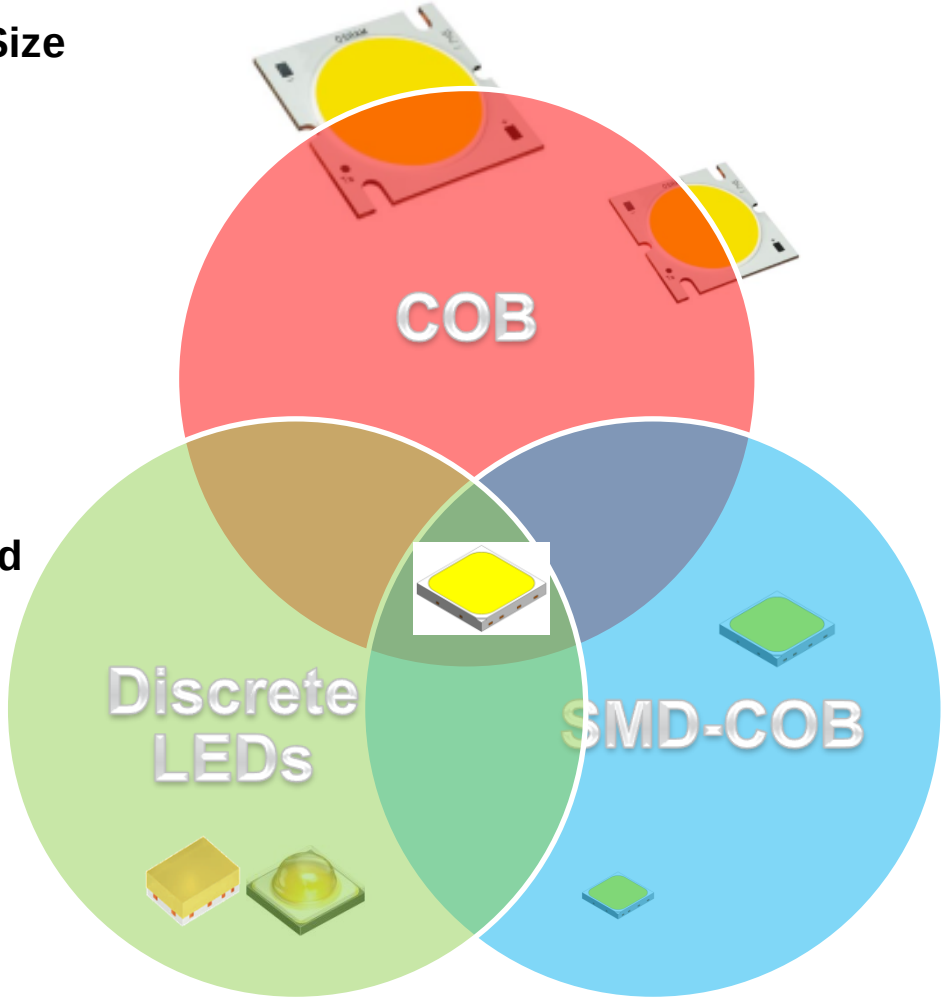
Latest development of small SMD-COB

Advantages and key applications.
Do's & Dont's

Versatile - high lifetime, high quality and low cost.

Open new markets
Shorten design time.
Increase Efficiency

How to select a suitable component.



High Power COB – Good Light and Better Light Quality

Brand	SOLERIQ® S 19						
Typ. Voltage	45V		36V				
CRI	80	90	70	80	90	Brilliant White	Brilliant Colour
1000 lm							
1500 lm							
2000 lm							
3000 lm							
4000 lm							
5000 lm							
7000 lm							

Existing Q1/2016

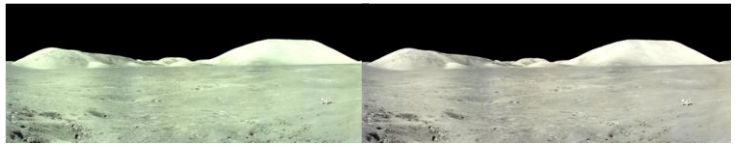
Target application

- Ambient lighting
- Indoor General Lighting
- Hospitality,
- Restaurants,
- Shops, Hotels
- Spot lights
- Added Value !

SOLERIQ® S Brilliant Series : Superior Light Quality
Why Better ?

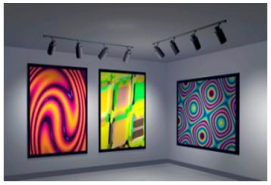
Brilliant White

- Enhancing the purity of white
- Elimination of green and yellow tint



Without **With**

Spotlight

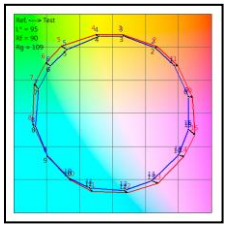


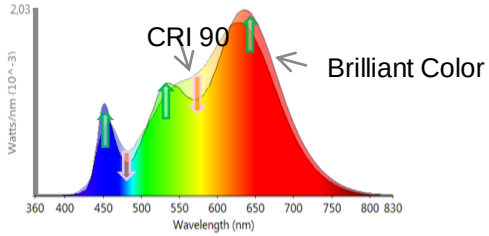
Designer downlights

High-end Retail

Brilliant Color

- Enhanced color definition
- Deeper color contrast

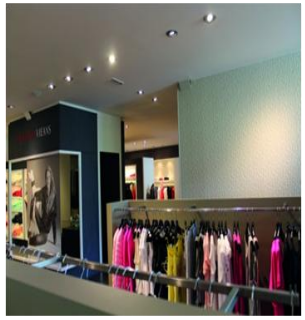




Supermarkets

Shop lighting

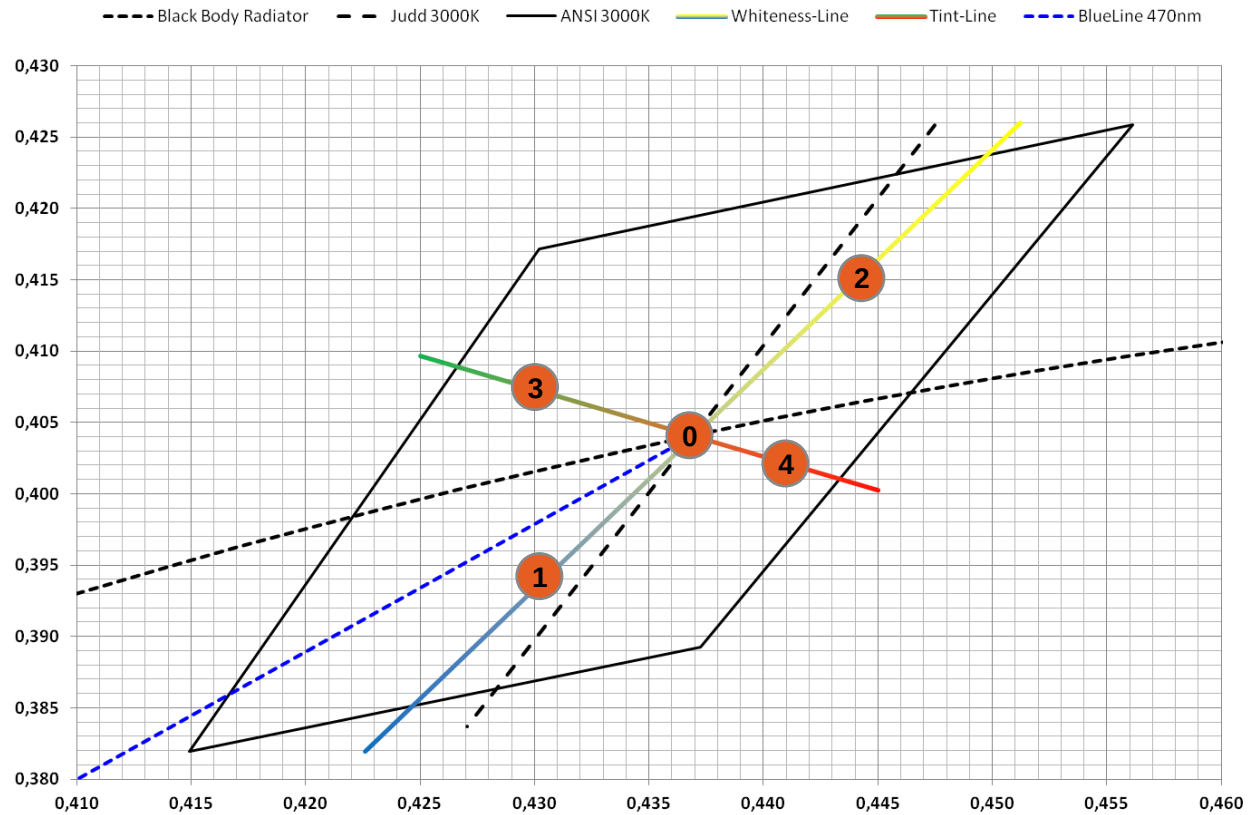
High-end Retail



What happens if two white light sources with similar color coordinates are compared to each other?

PRELIMINARY DATA

Relative to a defined reference the white impression changes if the colour coordinate varies in the different directions.



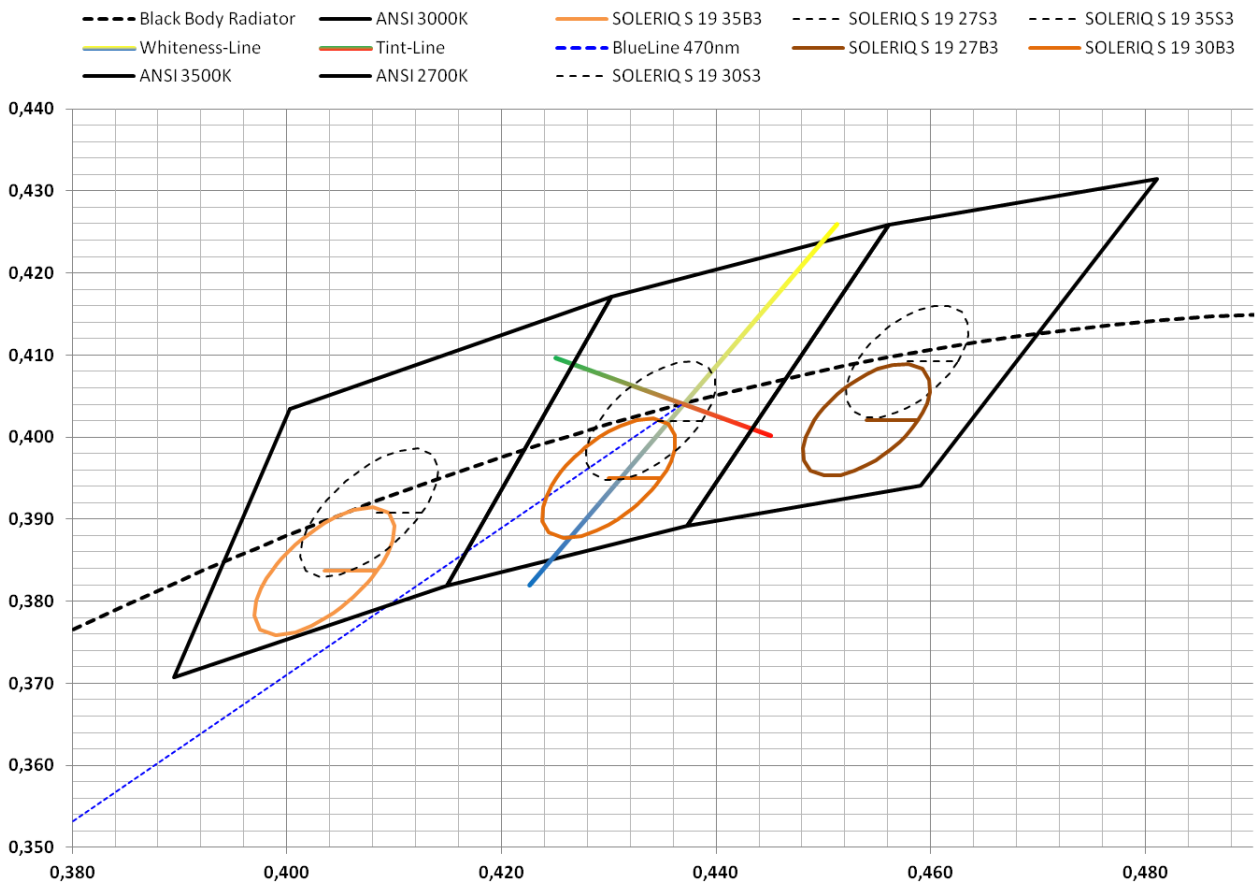
If a first white light source with a color point at 3000K on the Planck locus line (0) is compared to a second white light source with slightly different color point in respect to the 3000K light source, the second color is perceived to have a:

(1) increased whiteness
(2) decreased whiteness
(3) greenish tint
(4) reddish tint

SOLERIQ® S 19 BBB - Below Black Body

PRELIMINARY DATA

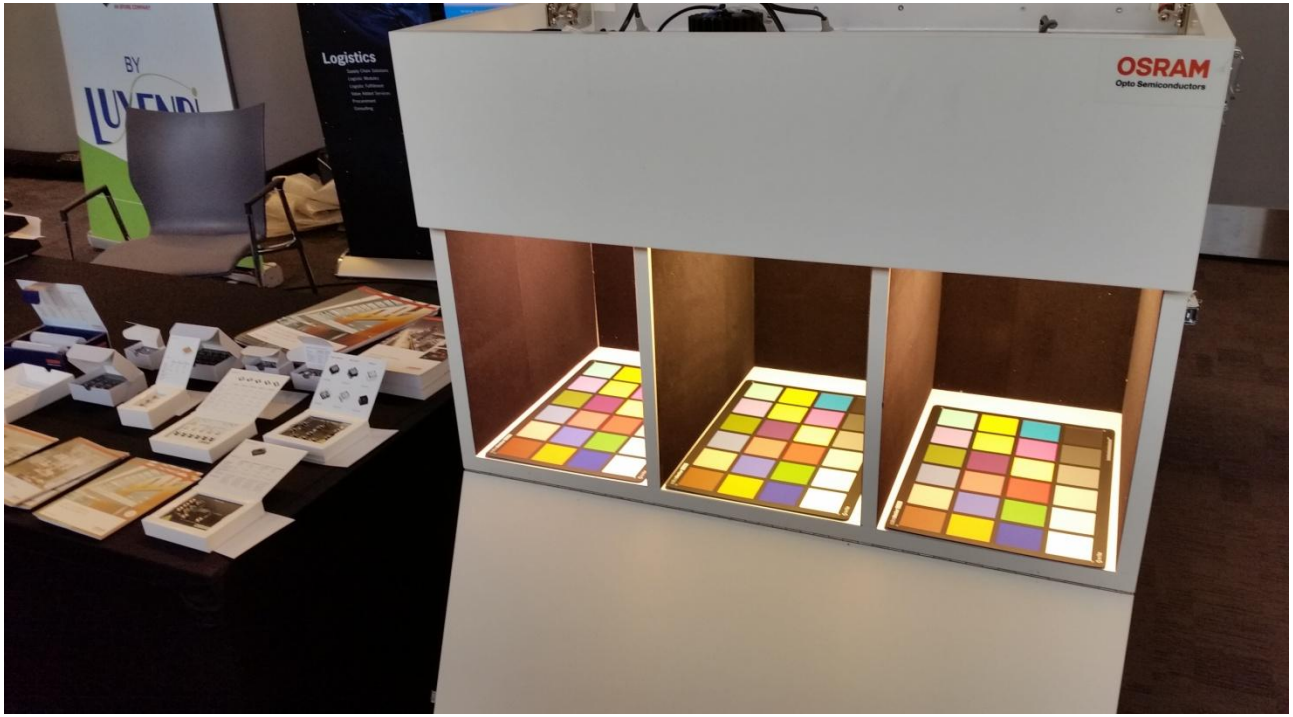
The SOLERIQ S 19 CRI 90 Family is available Below Black Body



Type	Unit
Type	GW KAHLB1.C**B** GW RAHLB1.C**B**
CCT	2700K 3000K 3500K
CRI	>90
Φv	All

Brilliant White / Brilliant Colour Demonstrator

Have a look and decide yourself

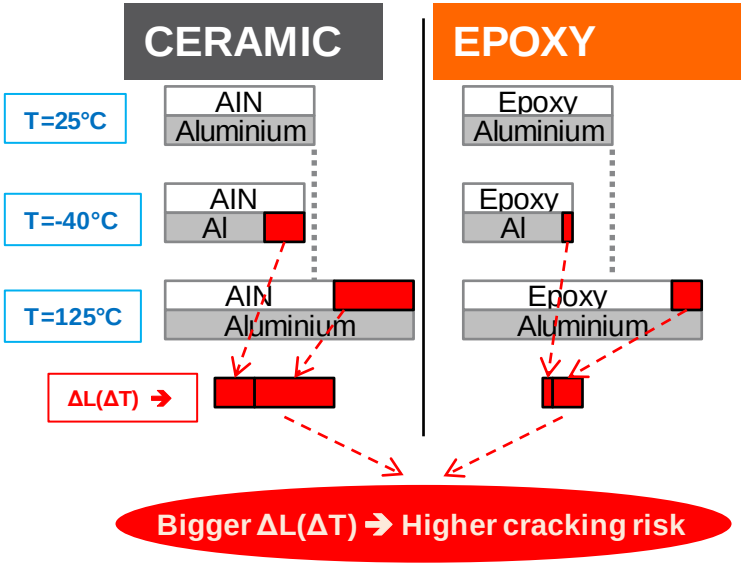


Always Keep in Mind: Second Board Reliability
Epoxy vs Ceramic packages

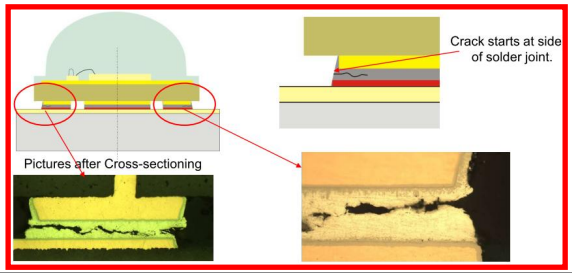
LED and PCB materials have internal Coefficient of Thermal Expansion CTE

Many of Ceramic devices with low Rth use AIN Aluminium Nitride Substrate

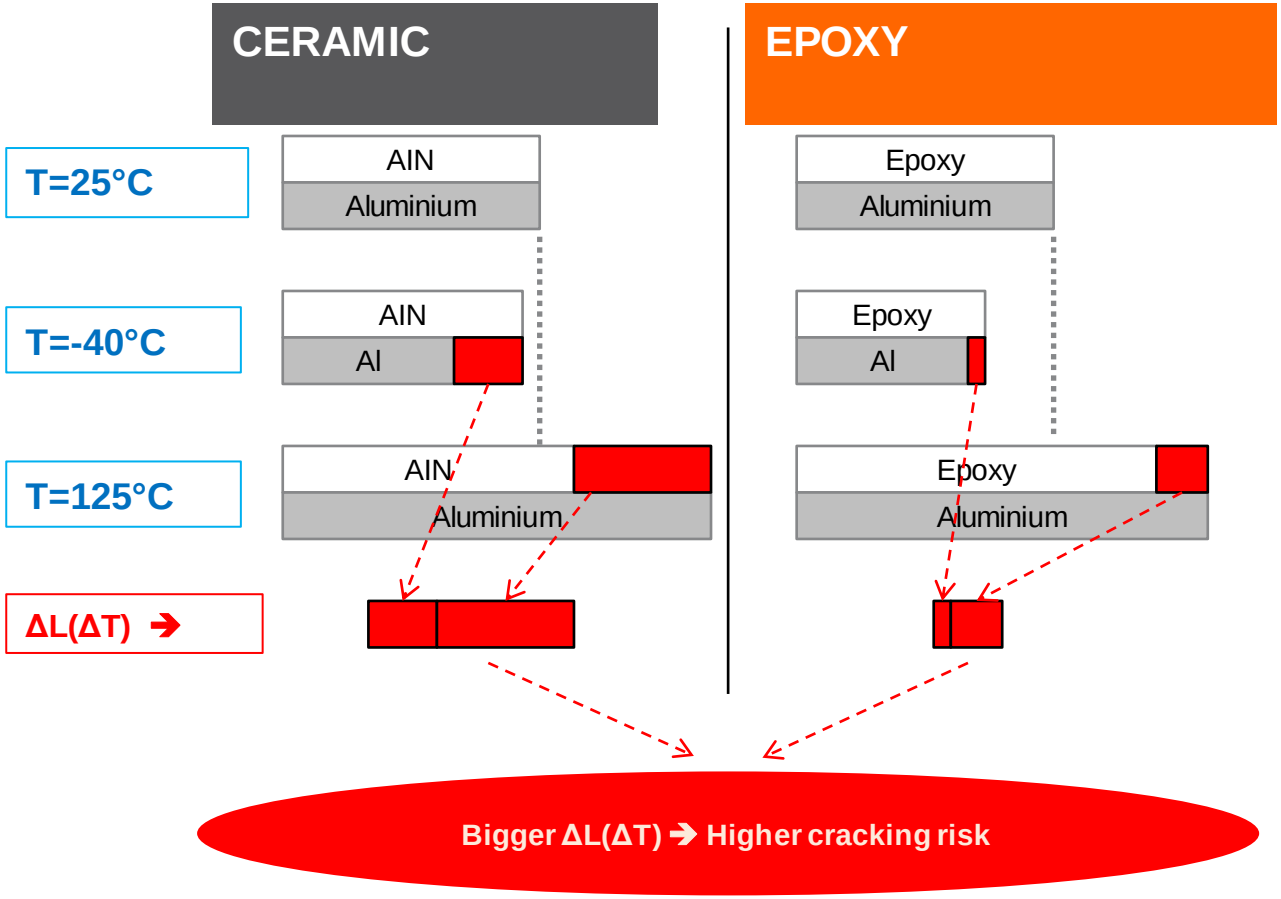
➔CTE of AIN is very different to PCB CTE Technology: 6 times smaller worst case.
➔Big difference of LED CTE vs PCB CTE lead to crack issue after temperature cycles.



Component	Materials	***Coefficient of Thermal Expansion (CTE)***
PCB Technology	*Aluminum (MCPCB)*	24 ppm/K
	FR4 (PCB)	17 ppm/K
	Cu (MCPCB)	16 ppm/K
LED with Ceramic Submount	*Al_2O_3 (LED Package)*	7 ppm/K
	AlN (LED Package)	4 ppm/K
LED with leadframe submount	*White Epoxy (LED Package)*	13 ppm/K
	Copper (LED Package)	16 ppm/K



Always Keep in Mind: Second Board Reliability
Epoxy vs Ceramic packages



Always Keep in Mind: Second Board Reliability
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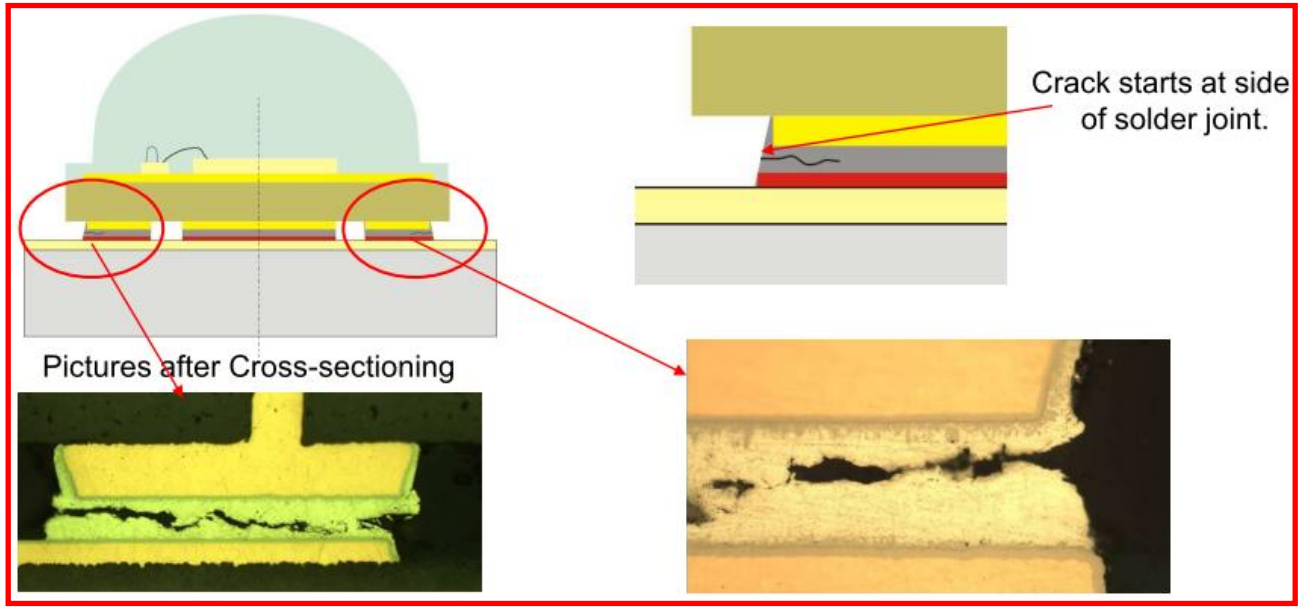
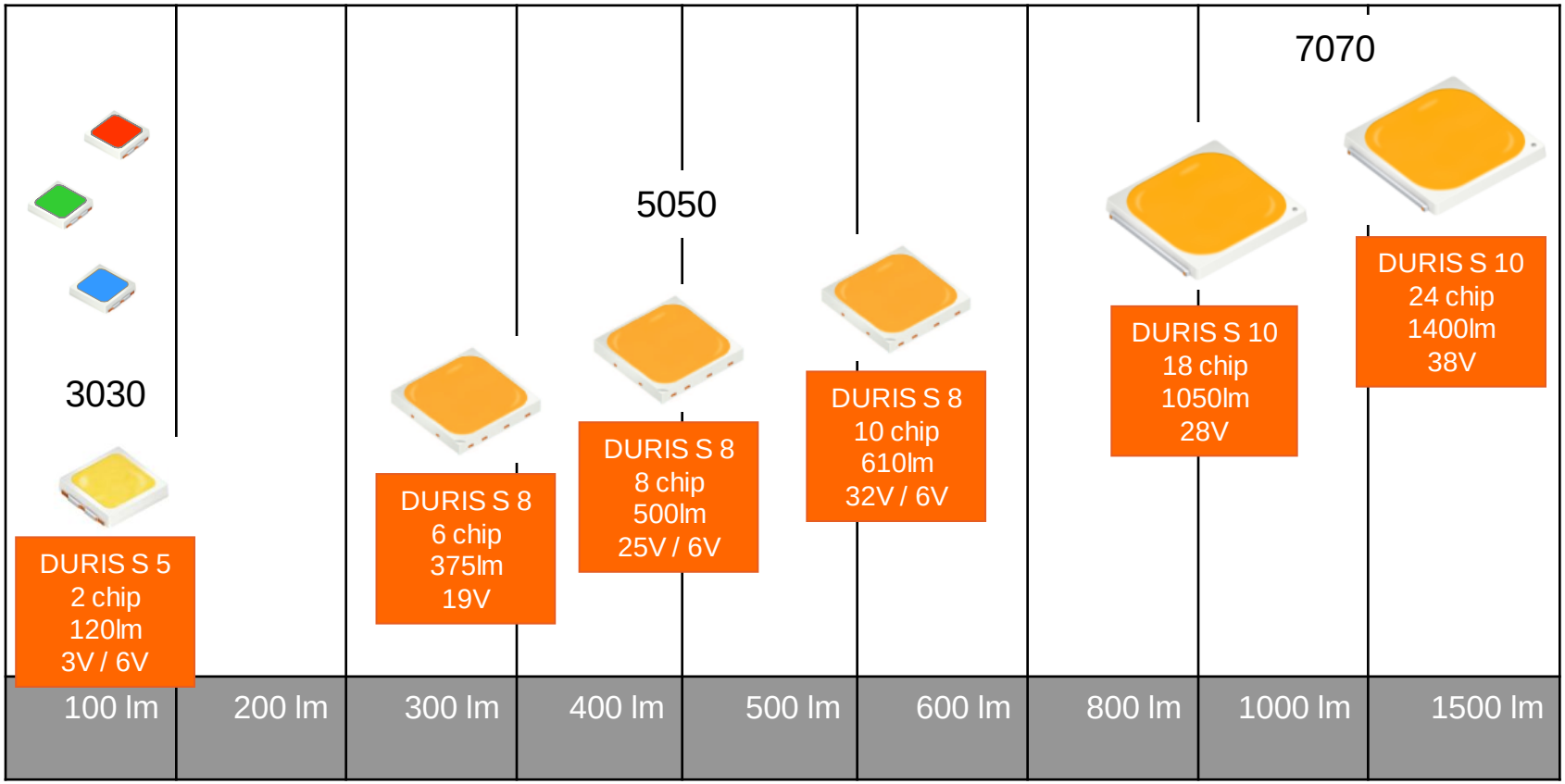


SMD MultiChip DURIS® S Family
Versatile Approach

Several Lumen and Vf options available



DURIS® S 8 Multi Chip – cost effective designs

high lumen package

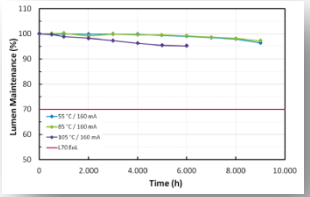
- fewer optics
- single LED design possible
- lower assembly costs

high forward voltage

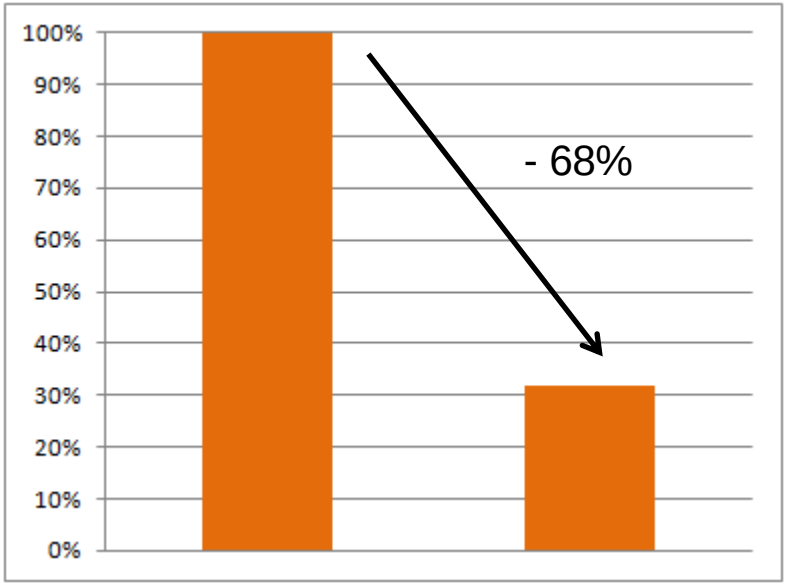
- simplified and more compact driver designs (e.g. 24V DC)

enhanced epoxy package

- great lumen maintenance even at high currents and temps



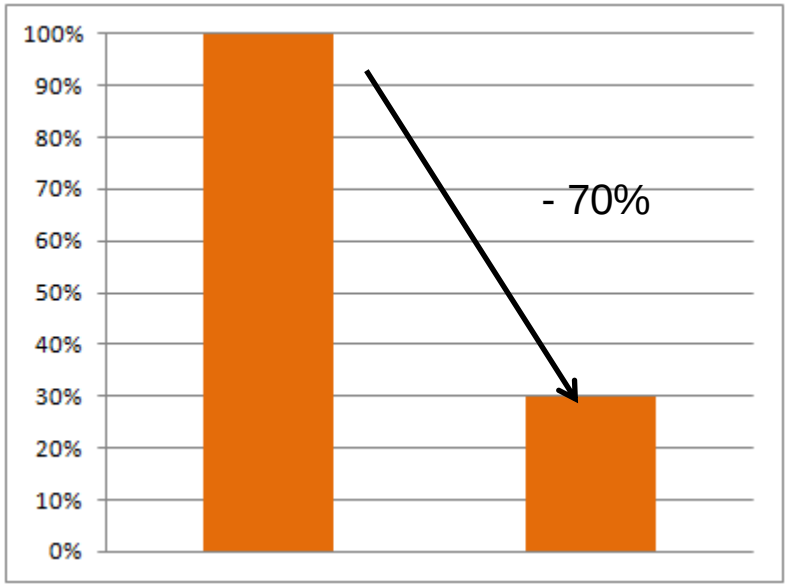
DURIS® S 8
replace 2W Ceramic



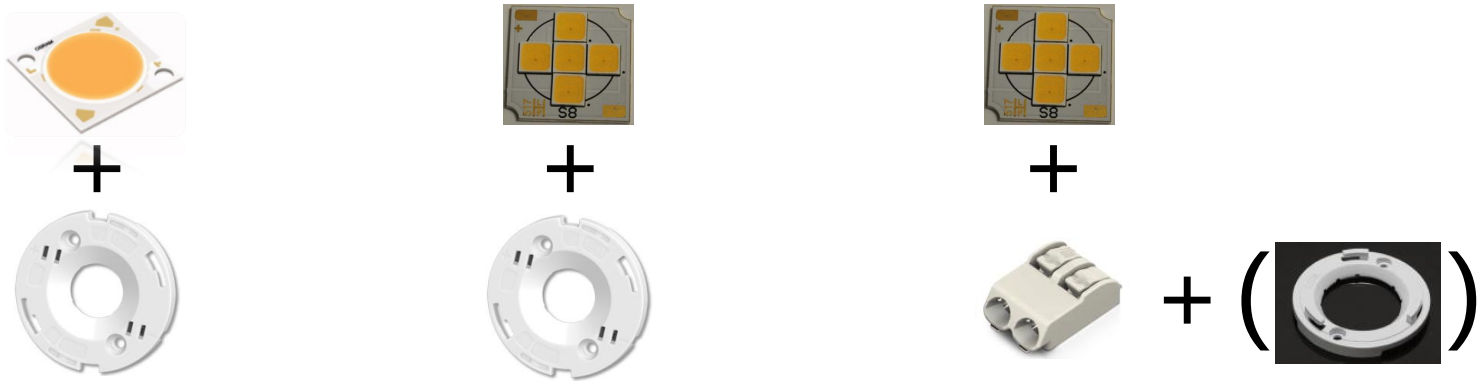
The DURIS S 8 can offer a significant cost saving at similar efficacy !

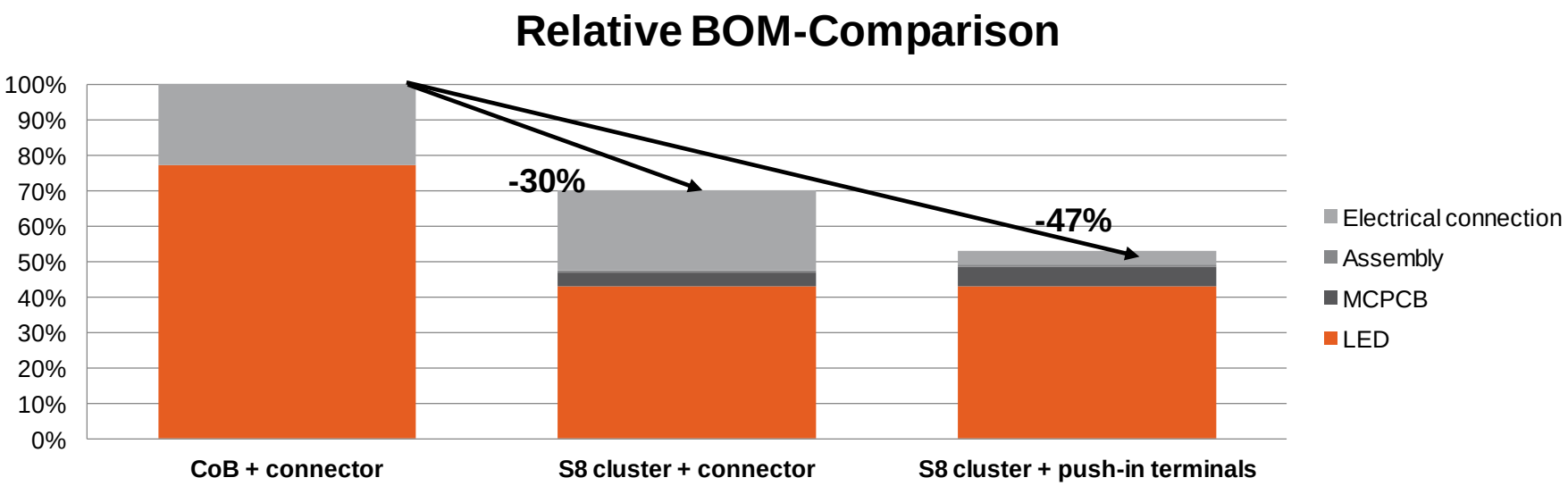
DURIS® S 8
replace 2W Ceramic

The DURIS S 8 can offer a significant cost saving at improved efficacy !



COB - DIY Approach





The DURIS S 8 cluster offers significant cost saving compared to COB solution <u>with even higher performance!</u>

Duris S8 & S10 for Down- and Spotlights
CoB Replacement

DURIS S8 / S10 Cluster - Concept

- Cost-optimized DURIS S8 cluster (4 or 5 Duris S8 10 chip) on MCPCB
- Outlines compatible to common CoBs (e.g. 19x19mm)

+

- Solderless push-in terminals on MCPCB as alternative to connectors

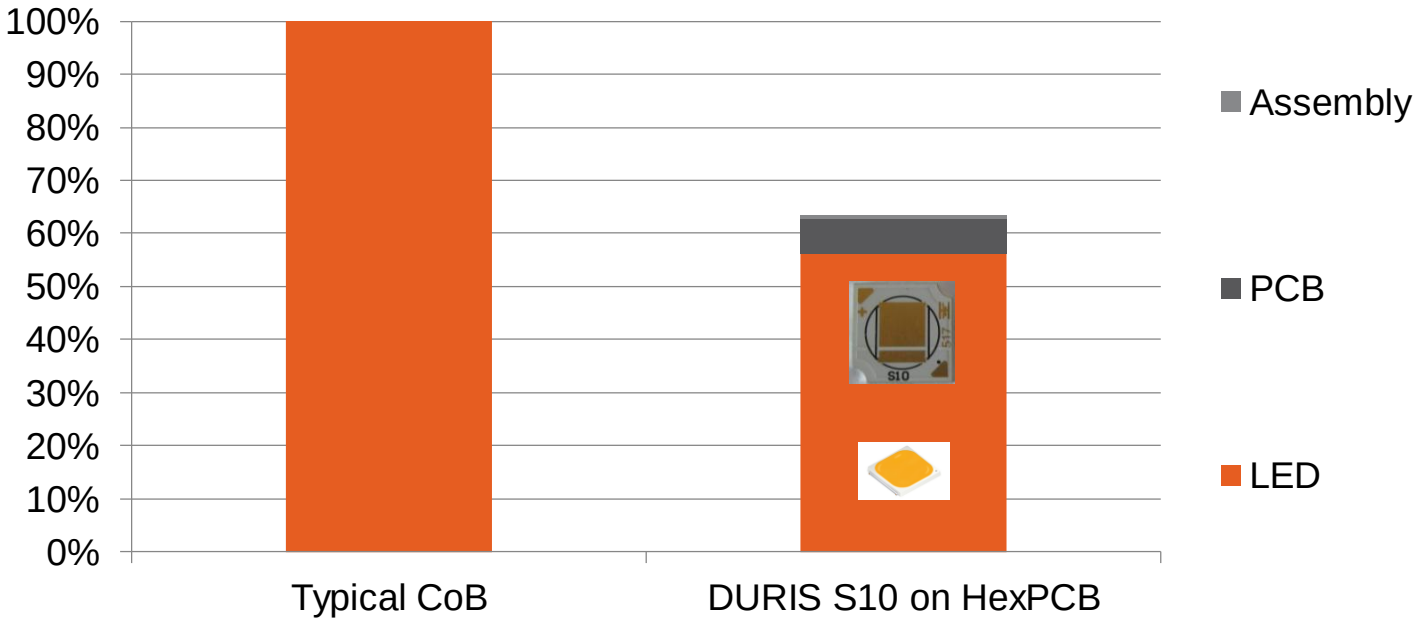
+

+

DURIS® S 10

COB performance with SMD price

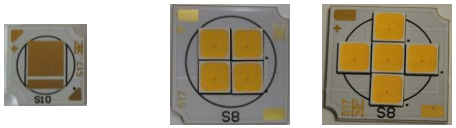
For this cost comparison we assume that both, the CoB and the LED on a star PCB will be soldered manually and mounted by screws:



The DURIS S 10 on a star PCB offers significant cost saving
And higher performance!

Complete Reference design

- Good light mixing
- no single spots visible,
- similar beam characteristic



Thank you !

Contact your local distributor

RUTRONIK
ELECTRONICS WORLDWIDE

Papland 4a
NL-4206 CL Gorinchem
T: +31 183 646050
F: +31 183 646051
E: rutronik_nl@rutronik.com