

Operation of high power LEDs

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Inhalt

	What's a high power LED?	-
		-
	K	.
,	?	.
-	:	0
.	L	0
/	=	2
0		2
	! L	

0 Introduction

M

E =

B

applications it isn't necessary to use high power LEDs.

I

%

E =

A

E =

%

?

(backlighting, ambient lighting, ...)

E =

M

ENF MKHGE E = M

A

don't assume the

%

%

M

%

B

%

!

M

:

:

3

$$R_{thKK} = \frac{U_{LED\ max}}{I_{LED\ max}}$$

K_{DD} ... ! DP
 E = ... E = ! 1.
 N ...
 E = ... E =
 N_E = ... E =

M
 M ,. ! %
 % E =

When choosing a cooling element it's always a good idea to choose one with a

B E =
 cooling element isn't taken to account.

M
 3
 B E = (E = I
 :
 : E = %
 M E = E =

M

H	!	H
)))
1.	^	

M

E =

$$R_{thKK} \left(\frac{I_{LED}^{max} U_{LED}^{max}}{I_{LED} U_{LED} (100\% LED)} R_{thLED} \right)_{KK}$$

$K_{DD} \dots$! DP
 $E = \dots$ E = ! 1.
 $N \dots$
 $B_E = \dots$ E =
 $N_E = \dots$ E =
 $\eta_E = \dots$ E =
 $K_E = \dots$ E =
 $\eta_{DD} \dots$

: M %

M E = 3
M

M E =!
P % E =

B E = - I
-
M E =
I I %
I

Thermal adhesive or thermal compound don't conduct the heat as good as
% M

L E = E =

P E = E =

A E = !

A E = A E =

A E =

? 3

H

M

E =

E = %

E = %

M
E =

N 3, .) : %)) : %).) : %-)) : %0.) :

B E = % E =

:
B

B O
: O

B % / =
?

E E =

B O)O!=
)O!= E = %
E =

M E = E = %

M) O % P F % %: E B %

B ! I P F
E =

M E = E =
L %

M

B %
! E =
:
E = E = M
E = %
:
E =

2 Example

:

3 FAQ

P B E =% 8

A light bulb is a so-called thermal radiator and needs the heat to produce light. The temperatures inside such a light bulb can exceed 2.000 °C. A LED on the other hand has got a completely different structure and should be kept as cool as possible.

M E = 1. % 8

From 85°C case temperature the lifetime of an LED shortens rapidly. T_C means the temperature of the case and is mostly marked on the PCB and is the spot, where the temperature of a Module has to be measured. If you can accept the decrease of the lifetime (down to a few seconds), you can drive the LED at higher temperatures.

B this E = 8

The LED itself is always dimmable. The dimmability is usually only limited by the used constant current source.

B IP F E =8

As mentioned above it is not possible to connect a dimmer between the constant current source and the LED(s).

F E = % B 8

In most of the cases a flashing LED is the result of a bad chosen constant current source. Please check the output current and the output voltage area.

M E = % 8

This may be a problem of overheating because of a bad chosen cooling element, a missing cooling element or a bad thermal connection between the LED(s) and the cooling element.

To be continued ...

4 Sicherheitshinweise

B ,)O ?
D %
: L EO!6 L
P L)) L :
L K I

To be continued ...