

RoHS

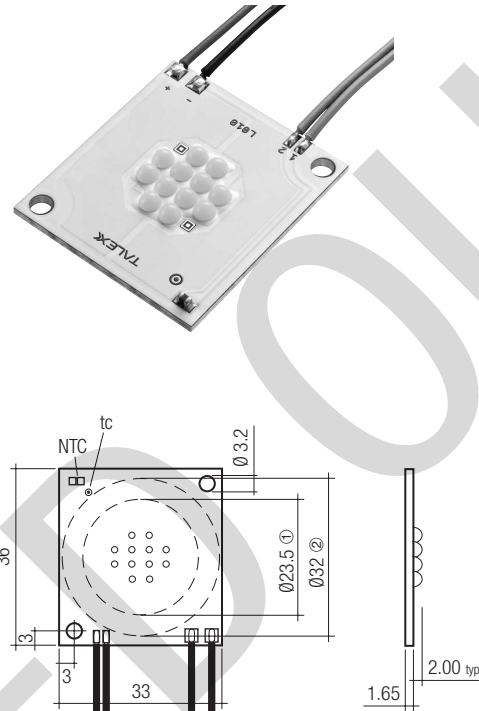
## TALEXmodule SPOT P310-2 TALEXmodule SPOT

### Product description

- Spotlights
- Downlights
- High-flux LED module
- Narrow colour temperature tolerance band
- Compact design
- Excellent thermal management<sup>①</sup>
- NTC for temperature control
- High-power LED in chip-on-board technology
- Beam characteristic: 140°
- Uniform distribution of light
- Attached with M3 screws
- Connection: Cable 300 mm
- Built-in LED module
- Cooling required

### Technical data

Weight	8 g
Typ. power at 350 mA <sup>②</sup> *	13.3 W
Risk group (EN 62471:2008)	0



- ① Minimal reflector diameter  
② Maximum reflector diameter



Standards, page 3

Colour temperatures and tolerances, page 6, 7

### Ordering data

Colour temperature	Type	Article number
3,000 K	LED P310-2 3000K 36x33	89601100
3,000 K	LED P310-2 3500K 36x33	89601360
4,000 K	LED P310-2 4000K 36x33	89601101
5,000 K	LED P310-2 5000K 36x33	89601355

Packaging: 20 pieces/carton

### Specific technical data

Type	Min. luminous flux at 350 mA <sup>②</sup> *	Typ. luminous flux at 350 mA <sup>②</sup> *	Typ. forward current <sup>③</sup> *	Max. forward current <sup>④</sup> *	Min. forward voltage <sup>⑤</sup> *	Typ. forward voltage <sup>⑥</sup> *	Max. forward voltage <sup>⑥</sup> *	Colour rendering index CRI
LED P310-2 3000K 36x33	800 lm	900 lm	350 mA	700 mA	33.3 V	38 V	44.8 V	> 80
LED P310-2 3500K 36x33	810 lm	900 lm	350 mA	700 mA	33.3 V	38 V	44.8 V	> 80
LED P310-2 4000K 36x33	900 lm	1.000 lm	350 mA	700 mA	33.3 V	38 V	44.8 V	> 80
LED P310-2 5000K 36x33	950 lm	1.050 lm	350 mA	700 mA	33.3 V	38 V	44.8 V	> 80

<sup>①</sup> If the maximum temperature limits are exceeded, the life of the module will be greatly reduced or the module may be damaged.  
The temperature of the TALEXmodule SPOT at the tc point in the thermally stable state by mean of a temperature sensor or temperature-sensitive sticker as per EN 60598-1. For the precise position of the tc point see the drawing above.

<sup>②</sup> At tc = 65 °C

<sup>③</sup> Tolerance range for optical data: ±15 %.

<sup>④</sup> Permitted current range see diagram on page 4.

Exceeding the maximum operating current leads to an overload of the TALEXmodule SPOT.  
This may in turn result in a significant reduction of lifetime or even in damage of the TALEXmodule SPOT.

<sup>⑤</sup> Max. permissible surge current: 1.25 A, duration max. 10 µs

<sup>⑥</sup> Tolerance range for electrical data: ±15 %.

All values for ta = 25 °C.

**Converter / controls matrix – TALEXmodule SPOT P310-2**

Converter REMOTE LCI						Controls IN-BUILT		
Type	LCAI 15 W 350 mA one4all	LCAI 30 W 700 mA one4all	LCI 15 W 350 mA	LCI 30 W 700 mA	LCCI 16 W 350 mA	C350-2 4-Channel	C350 dim	C700 dim
Article number	86458899	86458900	24166312	24166314	86459210	86458693	86458944	86458945

Type	Assignable converter										Assignable controls						
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
TALEXmodule SPOT P310-2	1	1	1	1	1	1	1	1	1	1	1	1	4	1	1	1	1

## Standards

EN 62031  
EN 62471

## Thermal design and heat sink

The rated life of TALEX products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the TALEXmodule SPOT will be greatly reduced or the TALEXmodule SPOT may be destroyed.

Therefore the TALEXmodule SPOT P310-2 needs to be mounted onto a heat sink.

Tridonic's excellent thermal design for the TALEXmodule SPOT products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and life time.

## tc point, ambient temperature and lifetime

The temperature at tc reference point is crucial for the light output and life time of a TALEX product.

For TALEXmodule SPOT P310-2 a tc temperature of 65 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and life time.

Compliance with the maximum permissible reference temperature at the tc point must be checked under operating conditions in a thermally stable state. The maximum value must be determined under worst-case conditions for the relevant application.

## Mounting instruction



TALEXmodule SPOT from Tridonic which have to be installed on a heat sink have to be connected with heat-conducting paste or heat conducting adhesive film and fixed with M3 plastic screws.

The fixing/cooling surface must be cleaned before installing the TALEX modules to remove all dirt, dust and grease.

None of the components of the TALEXmodule SPOT (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

For further information please refer to the brochure entitled "TALEX installation instructions and guidelines".

## Temperature control

An NTC resistor is on the board of the TALEXmodule SPOT P310-2 to control the tc temperature during the operation.

Exact position see drawing on page 1.

The details of the 220 kΩ NTC (order number B57431V2223J062) you can find in the data sheet of the manufacturer AVX (Nr. NB12Q00224).

T	$R_{25} = 220 \text{ k}\Omega, B_{25/100} = 4,500 \text{ K}$	
	$R_t/R_{25}$	$\alpha$
25 °C	1.0000	4.8 %/K
30 °C	0.78759	4.7 %/K
35 °C	0.62406	4.6 %/K
40 °C	0.49737	4.5 %/K
45 °C	0.39863	4.4 %/K
50 °C	0.32123	4.3 %/K
55 °C	0.26022	4.2 %/K
60 °C	0.21186	4.1 %/K
65 °C	0.17334	4.0 %/K
70 °C	0.14249	3.9 %/K
75 °C	0.11767	3.8 %/K
80 °C	0.097598	3.7 %/K
85 °C	0.081300	3.6 %/K

## Typical heat sink surface

### TALEXmodule SPOT P310-2, 350 mA

ta	tc	$R_{th, hs-a}$	typical heat sink surface
25 °C	65 °C	4.36 K/W	153 cm <sup>2</sup>
30 °C	65 °C	3.79 K/W	176 cm <sup>2</sup>
40 °C	65 °C	2.66 K/W	251 cm <sup>2</sup>
50 °C	65 °C	1.53 K/W	436 cm <sup>2</sup>

### TALEXmodule SPOT P310-2, 700 mA

ta	tc	$R_{th, hs-a}$	typical heat sink surface
25 °C	65 °C	2.09 K/W	318 cm <sup>2</sup>
30 °C	65 °C	1.81 K/W	368 cm <sup>2</sup>
40 °C	65 °C	1.24 K/W	536 cm <sup>2</sup>
50 °C	65 °C	0.68 K/W	982 cm <sup>2</sup>

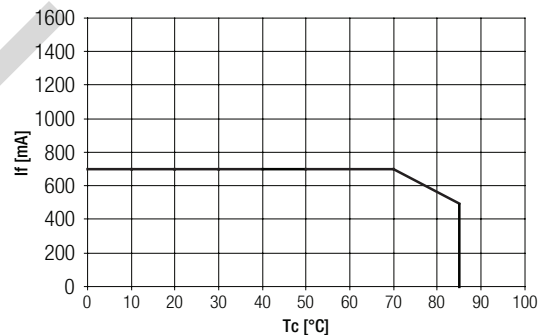
## Notes

Values valid for: natural convection, heat sink material: aluminium  $\geq 1$  mm thick,  $R_{th, hs-a}$  = required thermal resistance of heat sink

The actual cooling surface can differ because of the material, the structural shape, outside influences and the installation situation. A thermal connection between TALEXmodule SPOT and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary. Additionally the TALEXmodule SPOT has to be fixed on the heat sink with M3 plastic screws to optimise the thermal connection.

## Thermal behaviour

storage temperature	-30 – 85 °C
operating temperature	-30 – 50 °C
tc max. (at typ. current)	85 °C



## Matrix temperature

f(soldering time) for the modules

Temperature	Max. time without heat sink	Max. time with optimized heat sink
330 °C	15 s	–
340 °C	12 s	–
350 °C	10 s	–
360 °C	5 s	15 s
370 °C	3 s	12 s
380 °C	2 s	10 s
390 °C	1 s	5 s

The values apply for soldering without heat sink. To reduce the duration of soldering it is recommended to pre-heat the module at ta max., e.g. on a plate.

**Lifetime**

tc temperature in °C	luminous flux in %	lifetime in h
25	80	29,000
	70	47,000
	50	91,000
45	80	28,000
	70	45,000
	50	87,000
65	80	26,000
	70	42,000
	50	81,000
75	80	23,000
	70	35,000
	50	75,000
85	80	15,000
	70	22,000
	50	49,000

**Electrical supply/choice of converter**

TALEXmodule SPOT from Tridonic are not protected against overvoltages, overcurrents, overloads or short-circuit currents. Safe and reliable operation can only be guaranteed in conjunction with a converter which complies with the relevant standards. The use of TALEX converters from Tridonic in combination with TALEXmodule SPOT guarantees the necessary protection for safe and reliable operation.

If a converter other than Tridonic TALEXconverter is used, it must provide the following protection:

- Short-circuit protection
- Overload protection
- Overtemperature protection



TALEXmodule SPOT P310-2 must be supplied by a constant current converter.

Operation with a constant voltage converter will lead to an irreversible damage of the module.

Wrong polarity can damage the TALEXmodule SPOT P310-2.



**EOS/ESD safety guidelines**

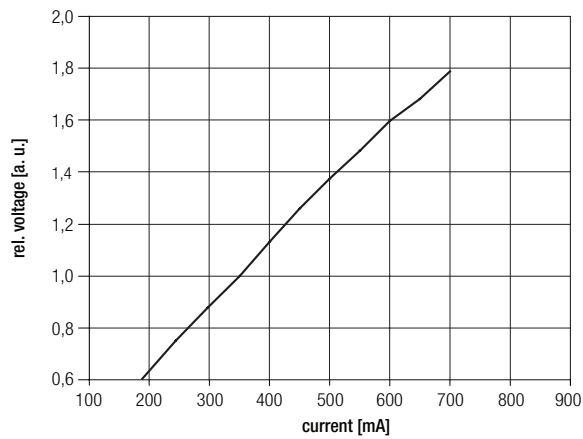
The device / module contains components that are sensitive to electrostatic discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken. No special measures need be taken for devices/modules with enclosed casings (contact with the pc board not possible), just normal installation practice. Please note the requirements set out in the document EOS / ESD guidelines (Guideline\_EOS\_ESD.pdf) at: <http://www.tridonic.com/com/en/technical-docs.asp>

**Wiring**

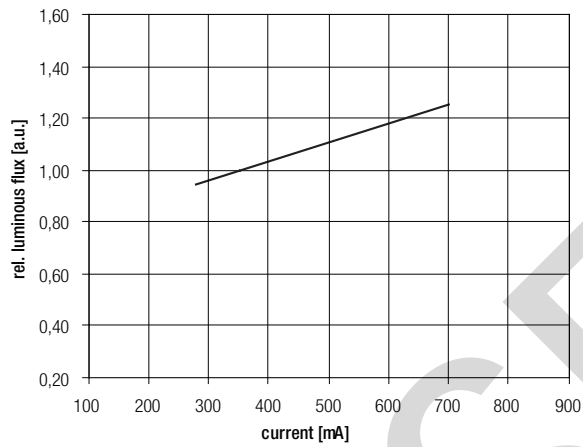
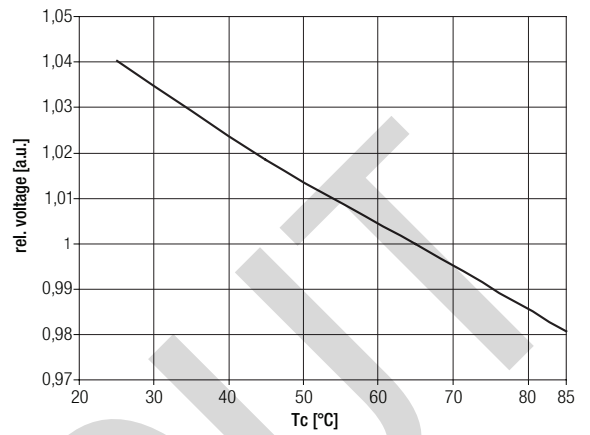
Cable: AWG24; length 300 mm

colour	red	black	grey	grey
function	+	-	NTC	NTC

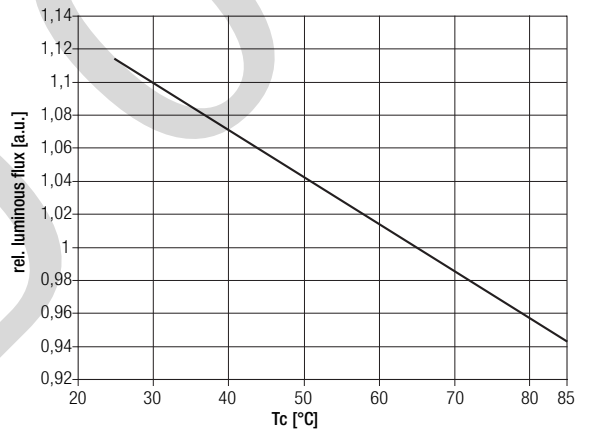
Relative forward voltage and relative luminous flux



— Relative forward voltage at  $T_c = 65\text{ °C}$



— Relative luminous flux at  $T_c = 65\text{ °C}$

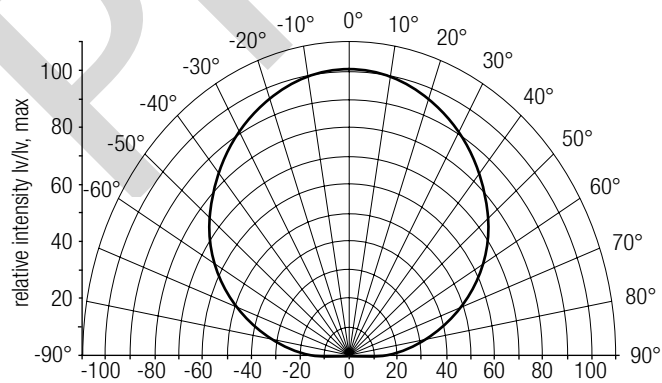


The diagrams based on statistic values.  
The real values can be different.

Optical characteristics TALEX(module SPOT P310-2

The optical design of the TALEX(module SPOT product line ensures optimum homogeneity for the light distribution.

TALEX(module SPOT P310-2 140°: Light distribution

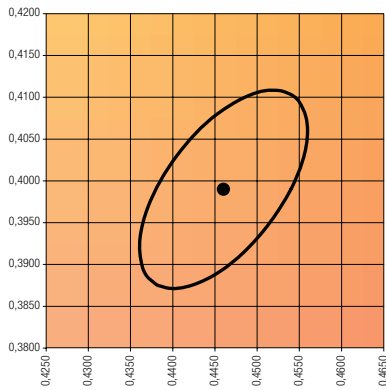


Coordinates and tolerances according to CIE 1964

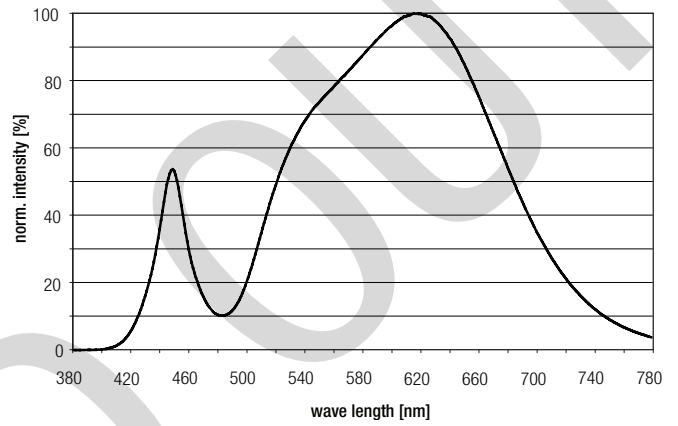
The specified colour coordinates are measured by a current impulse of 350 mA and a duration of 100 ms.  
The ambient temperature of the measurement is  $t_a = 25\text{ }^\circ\text{C}$ .  
The measurement tolerance of the colour coordinates are  $\pm 0.01$ .

3,000 K

	x0	y0
Centre	0,4460	0,3990

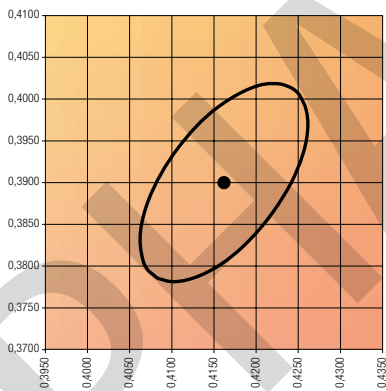


MacAdam ellipse: 5SDCM

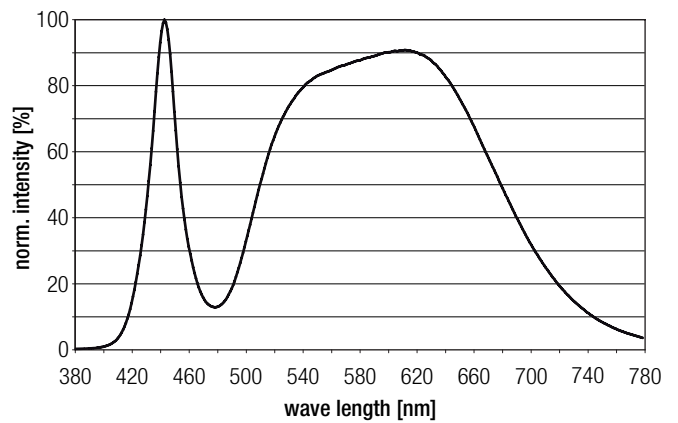


3,500 K

	x0	y0
Centre	0,4160	0,3900

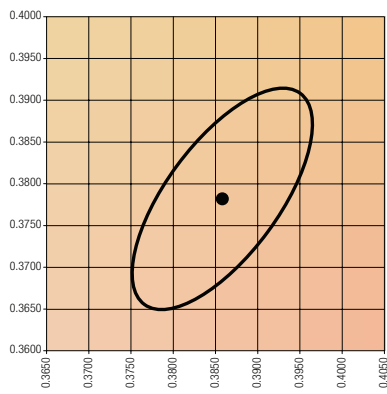


MacAdam ellipse: 5SDCM

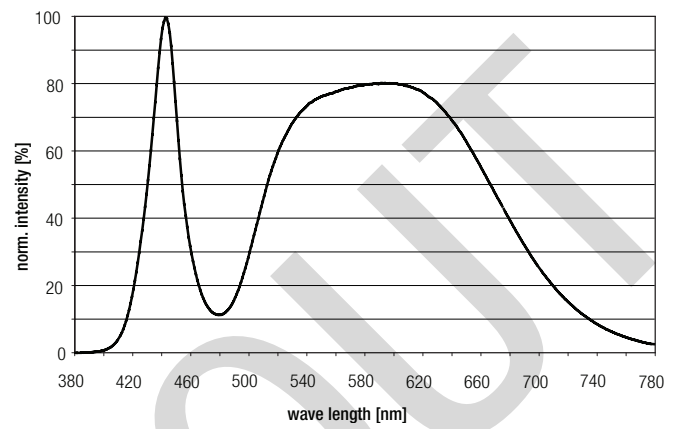


4,000 K

	x0	y0
Centre	0,3860	0,3780

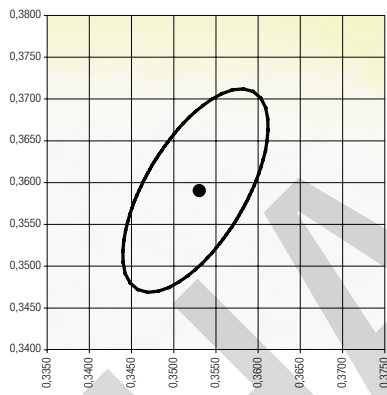


MacAdam ellipse: 5SDCM



5,000 K

	x0	y0
Centre	0,3530	0,3590



MacAdam ellipse: 5SDCM

