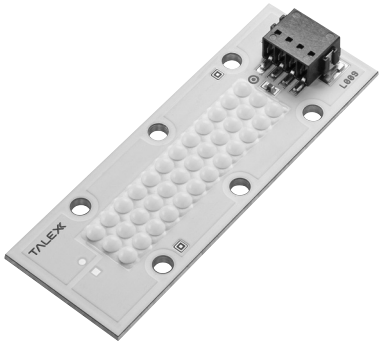
RoHS

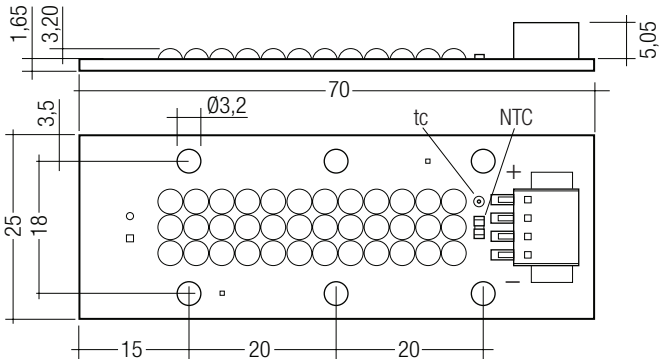
TALEX(module RECTANGULAR P440-2

TALEX(module RECTANGULAR

Product description

- Street lighting
- High-flux LED module
- Narrow colour temperature tolerance band
- Compact design
- Excellent thermal management[3]
- NTC for temperature control
- High-power LED in chip-on-board technololgy
- Beam characteristic: 140°
- Uniform distribution of light
- Fixing holes for M3 screws
- Built-in LED module
- Cooling required[3]





Technical data

Weight	15 g
Typ. power at 1,050 mA[1] [6]	40 W

Standards, page 2

Colour temperatures and tolerances, page 5

Ordering data

Colour temperature[4] [5]	Type	Article number
3,000 K	**LED P440-2 3000K 70x25**	**89601161**
4,000 K	**LED P440-2 4000K 70x25**	**89601162**
5,000 K	**LED P440-2 5000K 70x25**	**89601155**

Packaging: 20 pieces/carton

Specific technical data

Type	Luminous flux at 1,050 mA[6] [7]		Forward current[2] [8]		Forward voltage[1] [6]			Colour rendering index CRI[5]
	min.	typ.	typ.	max.	min.	typ.	max.	
LED P440-2 3000K 70x25	2,400 lm	2,700 lm	1,050 mA	1,400 mA	33.3 V	38 V	44.8 V	> 80
LED P440-2 4000K 70x25	2,700 lm	3,000 lm	1,050 mA	1,400 mA	33.3 V	38 V	44.8 V	> 80
LED P440-2 5000K 70x25	3,400 lm	3,800 lm	1,050 mA	1,400 mA	33.3 V	38 V	44.8 V	> 70

[1] Tolerance range for electrical data: ±15 %.

[2] Permitted current range see diagram on page 2.
Exceeding the maximum operating current leads to an overload of the TALEX(module RECTANGULAR.
This may in turn result in a significant reduction of lifetime or even in damage of the TALEX(module RECTANGULAR.

[3] 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 TALEX(module RECTANGULAR 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. For details please refer to page 2.

[4] Colour coordinates and tolerances according to CIE 1964. For details please refer to page 5.

[5] Colour temperature and CRI according to CIE 1931.

[6] At tc = 65 °C

[7] Tolerance range for optical data: ±15 %.

[8] Max. permissible surge current: 3 A, duration max. 10 µs

Alle Angaben für ta = 25 °C.

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 TALEX(module RECTANGULAR will be greatly reduced or the TALEX(module RECTANGULAR may be destroyed.

Therefore the TALEX(module RECTANGULAR P440-2 needs to be mounted onto a heat sink.

Tridonic's excellent thermal design for the TALEX(module RECTANGULAR 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 TALEX(module RECTANGULAR P440-2 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
TALEX(module RECTANGULAR 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 TALEX(module RECTANGULAR (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

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

Temperature control
An NTC resistor is on the board of the TALEX(module RECTANGULAR P440-2 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. NB12QØØ224).

T	R_{25} = 220 kΩ, $B_{25/100}$ = 4,500 K	
	R_T/R_{25}	α
25 °C	1.0000	4.72 %/K
30 °C	0.7944	4.60 %/K
35 °C	0.6347	4.48 %/K
40 °C	0.5099	4.37 %/K
45 °C	0.4119	4.26 %/K
50 °C	0.3345	4.15 %/K
55 °C	0.2730	4.05 %/K
60 °C	0.2239	3.95 %/K
65 °C	0.1846	3.85 %/K
70 °C	0.1529	3.75 %/K
75 °C	0.1272	3.66 %/K
80 °C	0.1063	3.57 %/K
85 °C	0.08928	3.48 %/K

Typical heat sink surface

TALEX(module RECTANGULAR P440-2, 1,050 mA

ta	tc	$R_{th, hs-a}$	typical heat sink surface
25 °C	65 °C	0.96 K/W	693 cm²
30 °C	65 °C	0.82 K/W	813 cm²
40 °C	65 °C	0.54 K/W	1,241 cm²
50 °C	65 °C	0.25 K/W	2,620 cm²

TALEX(module RECTANGULAR P440-2, 1,400 mA

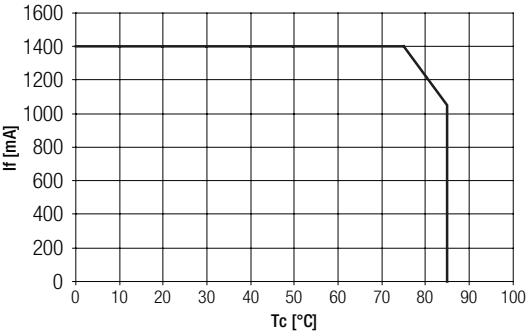
ta	tc	$R_{th, hs-a}$	typical heat sink surface
25 °C	65 °C	0.60 K/W	1,110 cm²
30 °C	65 °C	0.49 K/W	1,350 cm²
40 °C	65 °C	0.39 K/W	2,300 cm²
50 °C	65 °C	0.08 K/W	7,920 cm²

Notes
Values valid for: natural convection, heat sink material: aluminium ≥ 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 TALEX(module RECTANGULAR and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.
Additionally the TALEX(module RECTANGULAR 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 – 55 °C
tc max. (at typ. current)	85 °C



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

TALEX(module RECTANGULAR 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 TALEX(module RECTANGULAR guarantees the necessary protection for safe and reliable operation.

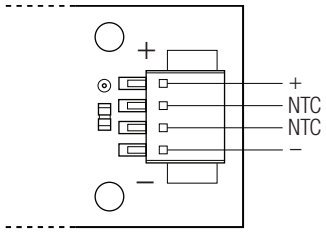
If a converter other than Tridonic TALEX(converter is used, it must provide the following protection:

- Short-circuit protection
- Overload protection
- Overtemperature protection

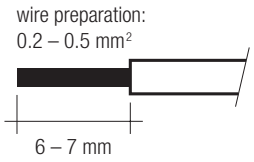
TALEX(module RECTANGULAR P440-2 must be supplied by a constant current converter.
Operation with a constant voltage converter will lead to an irreversible damage of the module.

Wrong polarity can damage the TALEX(spot P440-2 module.

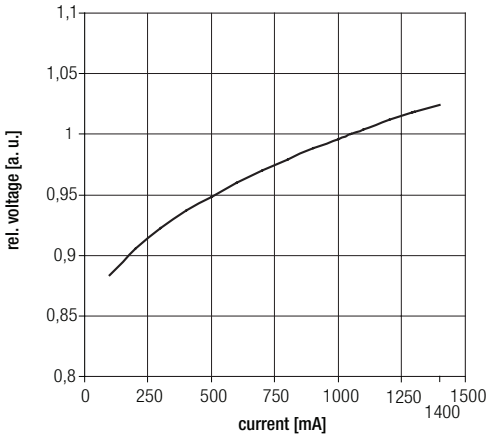
Plug connection

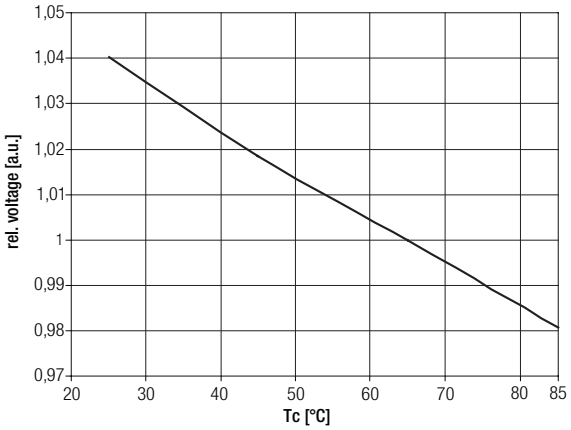


Type: PTSM 0,5/4-2,5-H SMD R44

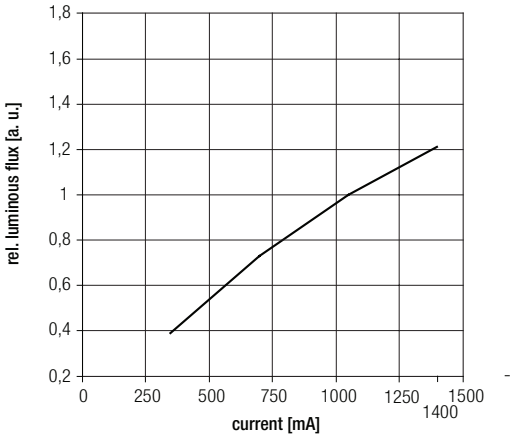


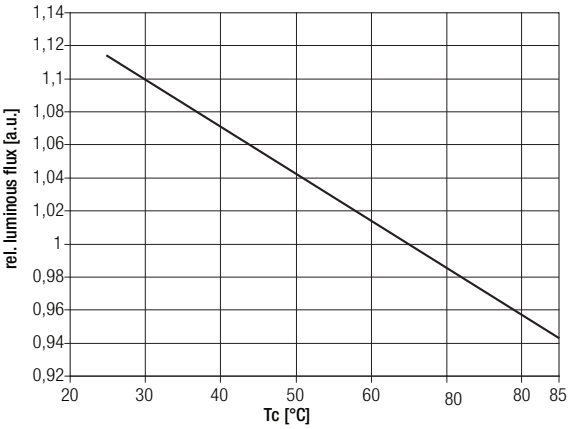
Relative forward voltage and relative luminous flux





— Relative forward voltage at tc = 65 °C





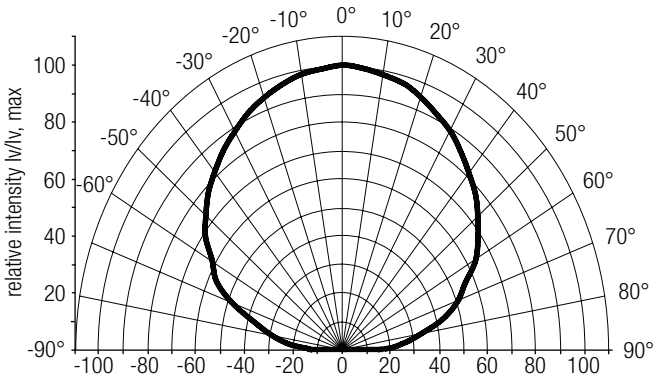
— Relative luminous flux at tc = 65 °C

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

Optical characteristics TALEX(module RECTANGULAR P440-2

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

TALEX(module RECTANGULAR P440-2 140°: Light distribution



The evaluation to the eye safety is according to the EN 62471:2008
(Photobiological safety of lamps and lamp systems)

type	article number	colour temperature	actinic UV	near UV	blue light	retinal thermal	IR radiation, eye
			E_S	E_{UVA}	L_B	L_R	E_{IR}
			200 – 400 nm	315 – 400 nm	300 – 700 nm	380 – 1,400 nm	780 – 3,000 nm
LED P440-2 3000K 70x25	89601161	3,000 K	exempt	exempt	low risk	exempt	exempt
LED P440-2 4000K 70x25	89601162	4,000 K	exempt	exempt	low risk	exempt	exempt
LED P440-2 5000K 70x25	89601155	5,000 K	exempt	exempt	low risk	exempt	exempt

Exempt: (risk group 0)
The LED does not pose any photobiological hazard.

Low risk: (risk group 1)
The LED does not pose a hazard due to normal behavioral limitations on exposure.

Moderate risk: (risk group 2)
The LED does not pose a hazard due to the aversion response to very bright light sources or due to thermal discomfort.

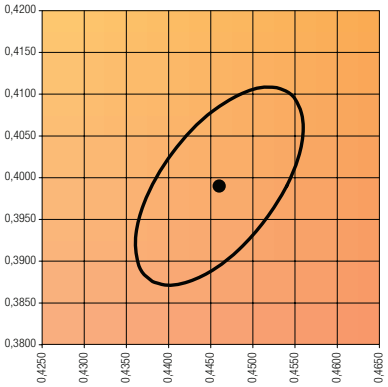
High risk: (risk group 3)
The LED may pose a hazard even for momentary or brief exposure.

Coordinates and tolerances according to CIE 1964

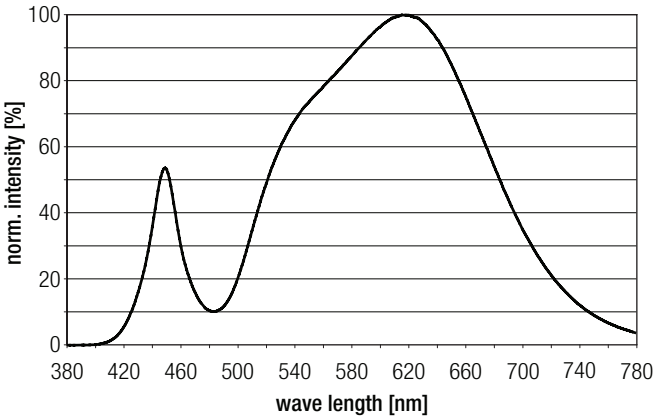
The specified colour coordinates are measured by a current impulse of 1,050 mA and a duration of 100 ms.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

3,000 K

	x0	y0
Centre	0,4460	0,3990

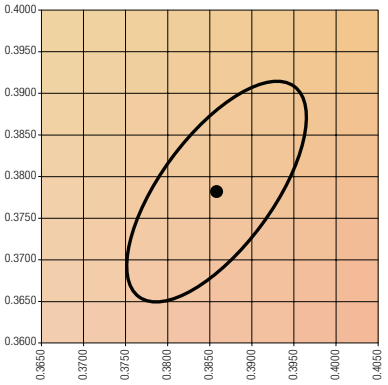


MacAdam ellipse: 5SDCM

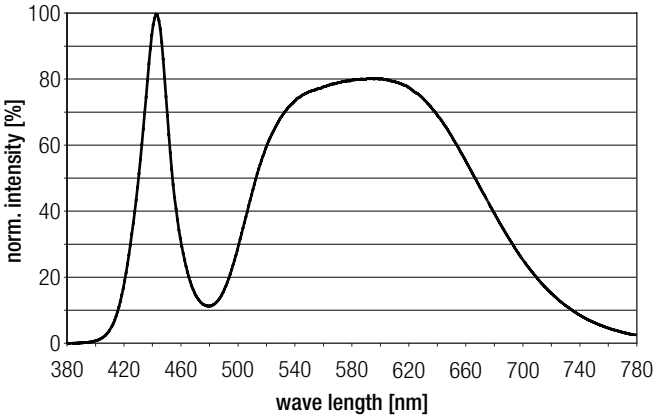


4,000 K

	x0	y0
Centre	0,3860	0,3780

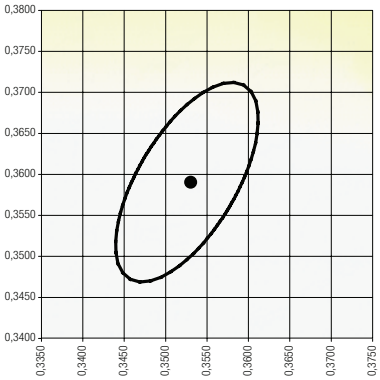


MacAdam ellipse: 5SDCM



5,000 K

	x0	y0
Centre	0,3530	0,3590



MacAdam ellipse: 5SDCM