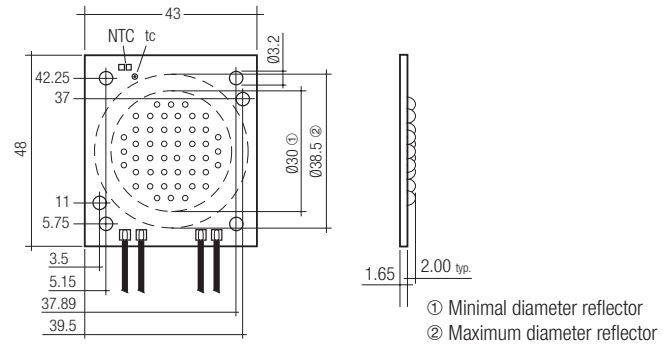


RoHS

TALEXmodule SPOT P350-2
TALEXmodule SPOT

Product description

- Spotlights
- Downlights
- High-flux LED module
- Narrow colour temperature tolerance band
- Compact design
- Excellent thermal management
- NTC for temperature control
- High-power LED in chip-on-board technology
- Beam characteristic: 140°
- Uniform distribution of light
- Fixing holes for M3 screws
- Connection: Cable 300 mm
- Built-in LED module
- Cooling required[®]



Technical data

Weight	15 g
Typ. power at 1,400 mA [®]	53 W



Standards, page 2

Colour temperatures and tolerances, page 5

Ordering data

Colour temperature	Type	Article number
3,000 K	LED P350-2 3000K 48x43	89601152
3,500 K	LED P350-2 3500K 48x43	89601154
4,000 K	LED P350-2 4000K 48x43	89601153
5,000 K	LED P350-2 5000K 48x43	89601160

Packaging: 20 pieces/carton

Specific technical data

Type	Min. luminous flux at 1,400 mA [®]	Typ. luminous flux at 1,400 mA [®]	Typ. forward current [®]	Max. forward current [®]	Min. forward voltage [®]	Typ. forward voltage [®]	Max. forward voltage [®]	Colour rendering index CRI
LED P350-2 3000K 48x43	3,250 lm	3,600 lm	1,400 mA	1,750 mA	33.3 V	38 V	44.8 V	> 80
LED P350-2 3500K 48x43	3,240 lm	3,610 lm	1,400 mA	1,750 mA	33.3 V	38 V	44.8 V	> 80
LED P350-2 4000K 48x43	3,700 lm	4,100 lm	1,400 mA	1,750 mA	33.3 V	38 V	44.8 V	> 80
LED P350-2 5000K 48x43	5,000 lm	5,300 lm	1,400 mA	1,750 mA	33.3 V	38 V	44.8 V	> 70

[®] If the max. temperature limits are exceeded, the life of the system will be greatly reduced or the system may be damaged. The temperature of the TALEXmodule SPOT at the tc-point is to be measured in the thermally stable state with a temperature sensor or or temperature-sensitive sticker as per EN 60598-1. For the precise position of the tc point see the drawing above.

[®] At tc = 65 °C.

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

[®] Exceeding the max. operating current leads to an overload on the TALEXmodule SPOT. This may in turn result in a significant reduction in lifetime or even destruction of the TALEXmodule SPOT.

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

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

All values for ta = 25 °C.

For suitable converters please contact Tridonic Customer Service.

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 P350-2 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 P350-2 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 to the brochure entitled "TALEX installation instructions and guidelines".

Temperature control

An NTC resistor is on the board of the TALEXmodule SPOT P350-2 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 kΩ, B _{25/100} = 4,500 K	
	R _T /R ₂₅	α
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 P350-2, 1,400 mA

ta	tc	R _{th, hs-a}	typical heat sink surface
25 °C	65 °C	0.70 K/W	693 cm ²
30 °C	65 °C	0.59 K/W	813 cm ²
40 °C	65 °C	0.38 K/W	1,241 cm ²
50 °C	65 °C	0.17 K/W	2,620 cm ²

TALEXmodule SPOT P350-2, 1,750 mA

ta	tc	R _{th, hs-a}	typical heat sink surface
25 °C	65 °C	0.53 K/W	1,260 cm ²
30 °C	65 °C	0.44 K/W	1,501 cm ²
40 °C	65 °C	0.27 K/W	2,429 cm ²
50 °C	65 °C	0.10 K/W	6,371 cm ²

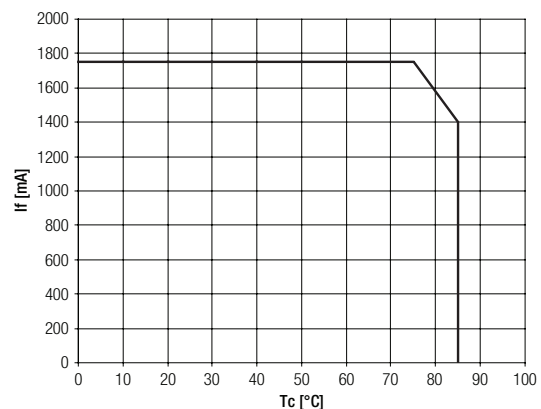
Notes

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 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 P350-2 must be supplied by a constant current converter.

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

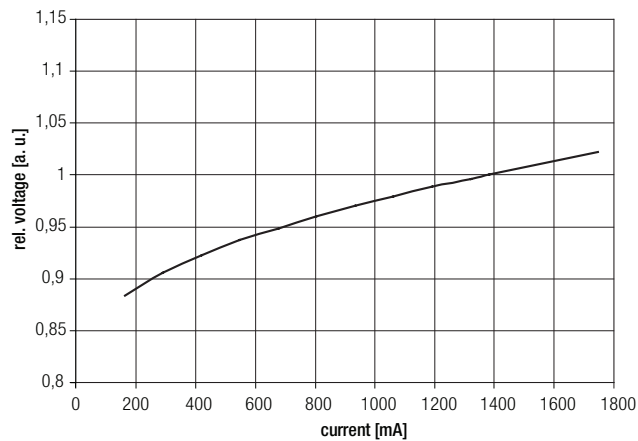
Wrong polarity can damage the TALEXmodule SPOT P350-2.

Wiring

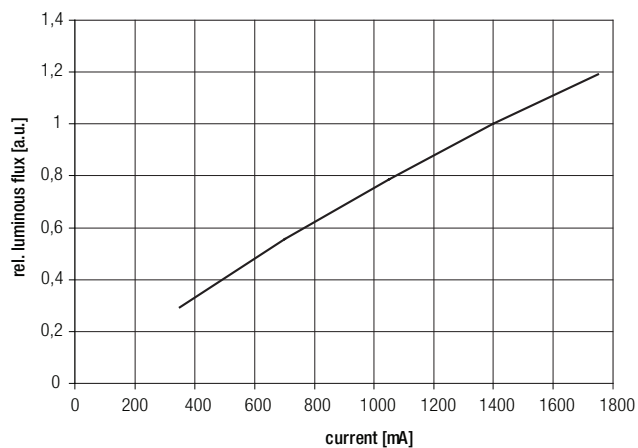
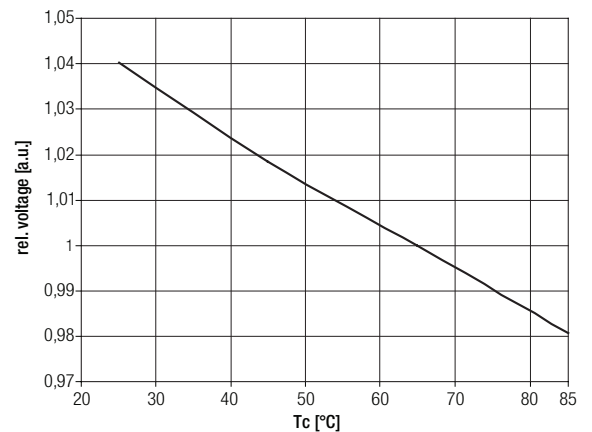
Cable: AWG24; length 300 mm

colour	red	black	grey	grey
function	+	-	NTC	NTC

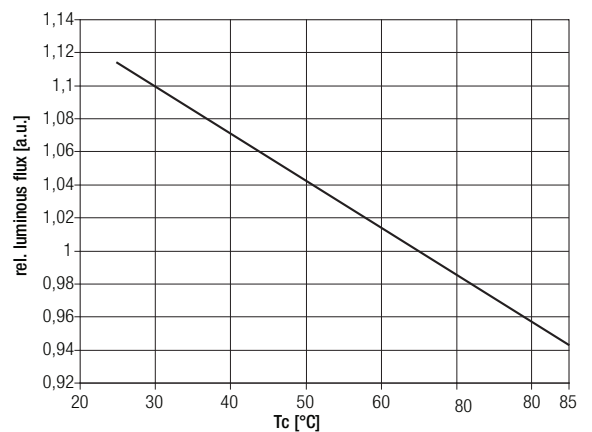
Relative forward voltage and relative luminous flux



— Relative forward voltage at tc = 65 °C



— Relative luminous flux at tc = 65 °C

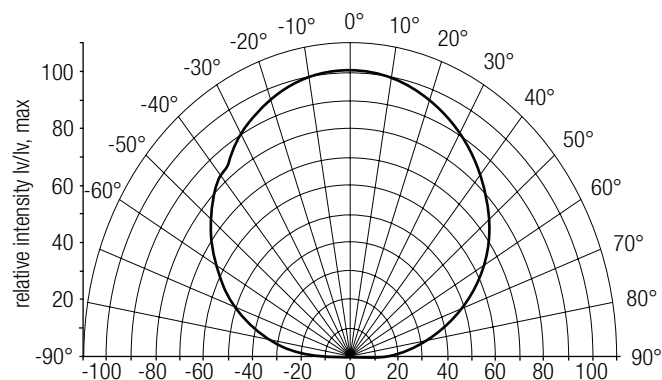


The diagrams based on statistic values.
The real values can be different.

Optical characteristics TALEX(module SPOT P350-2

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

TALEX(module SPOT P350-2 140°: 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	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 P350-2 3000K 48x43	89601152	3,000 K	exempt	exempt	low risk	exempt	exempt
LED P350-2 3500K 48x43	89601154	3,500 K	exempt	exempt	low risk	exempt	exempt
LED P350-2 4000K 48x43	89601153	4,000 K	exempt	exempt	low risk	exempt	exempt
LED P350-2 5000K 48x43	89601160	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)

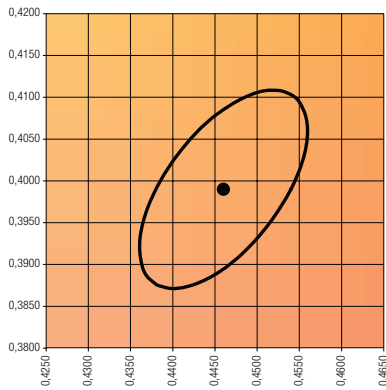
The LED may pose a hazard even for momentary or brief exposure.

Coordinates and tolerances according to CIE 1964

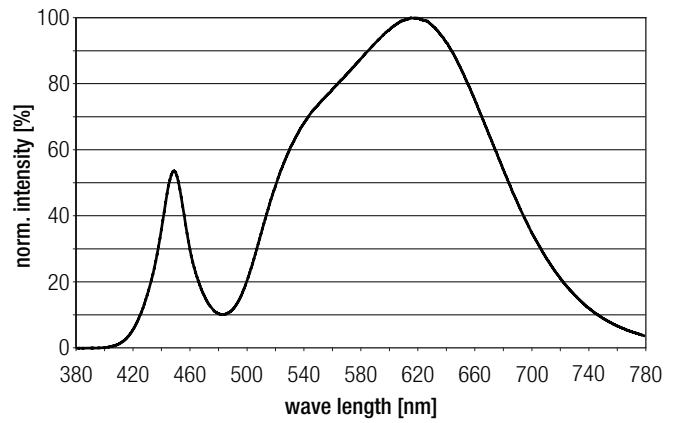
The specified colour coordinates are measured by a current impulse of 1,400 mA and a duration of 100 ms.
The ambient temperature of the measurement is $t_a = 25\text{ }^\circ\text{C}$.
The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K

	x0	y0
Centre	0,4460	0,3990

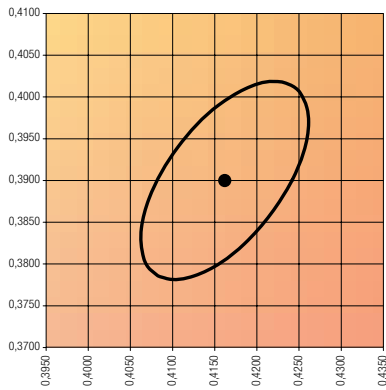


MacAdam ellipse: 5SDCM

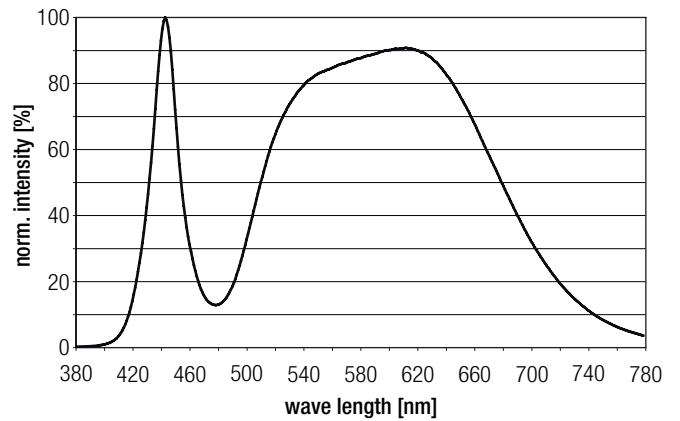


3,500 K

	x0	y0
Centre	0,4160	0,3900

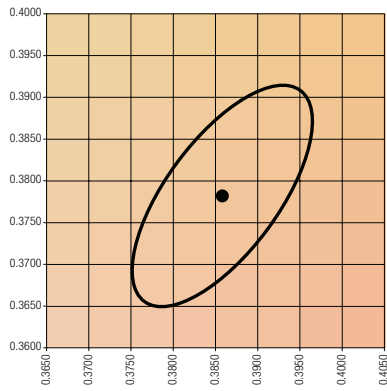


MacAdam ellipse: 5SDCM

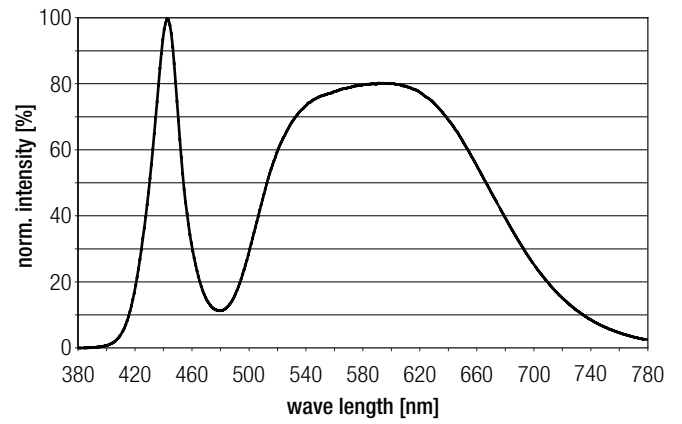


4,000 K

	x0	y0
Centre	0,3860	0,3780

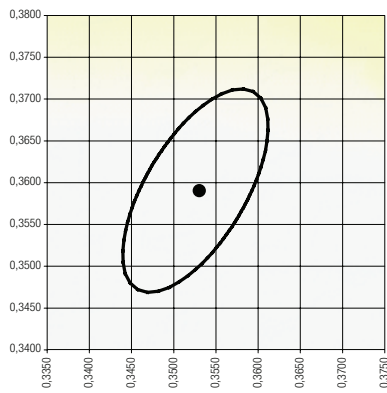


MacAdam ellipse: 5SDCM



5,000 K

	x0	y0
Centre	0,3530	0,3590



MacAdam ellipse: 5SDCM

