RoHS

TALEX(module STARK SLE GEN3 Mini SELECT

STARK SLE

Product description

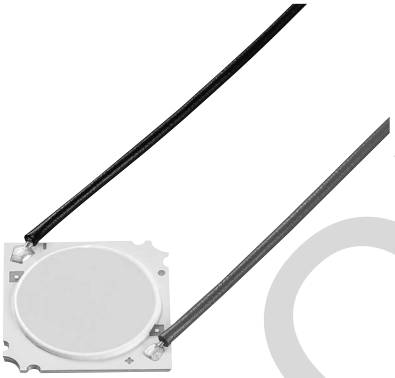
- For spotlights and downlights
- Luminous flux range from 510 – 3,480 lm
- High efficiency up to 111 lm/W for the LED module
- High system efficiency up to 95 lm/W at tp = 65 °C
- High colour consistency (MacAdams 3)
- Small LES (light emitting surface) diameter enables small beam angle for spotlights
- Excellent thermal management by COB technology
- Uniform radiation with DAM&Fill technology
- Integrated LED module
- Cooling required
- Flexible operating modes
- 5-year guarantee

Technical data

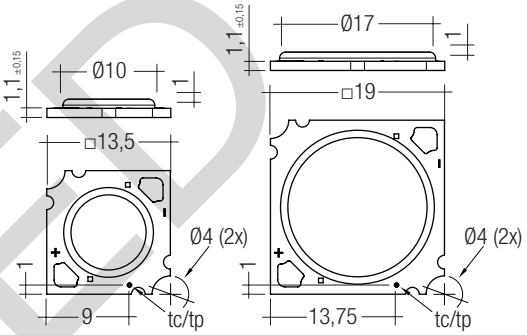
Beam characteristic	140°
Ambient temperature ta	-25 ... +50 °C
tp_rated temperature ①	65 °C
Max. tc point temperature ①	up to 90 °C
Risk group (EN 62471:2008)	1
Type of protection	IP00

Standards, page 3

Colour temperatures and tolerances, page 10



LES 10 LES 17



PURE (without housing) – Dimensions in mm

Ordering data

Type	Article number	Colour temperature	Housing	Connection cable	Packaging	Weight per pc.
STARK-SLE-PURE-G3-10-1000-930-SEL	89601814	3,000 K	no	yes	20 pc(s).	0.003 kg
STARK-SLE-PURE-G3-10-1000-940-SEL	89601815	4,000 K	no	yes	20 pc(s).	0.003 kg
STARK-SLE-PURE-G3-17-2000-930-SEL	89601816	3,000 K	no	yes	20 pc(s).	0.004 kg
STARK-SLE-PURE-G3-17-2000-940-SEL	89601817	4,000 K	no	yes	20 pc(s).	0.004 kg
STARK-SLE-PURE-G3-10-1000-930-SEL-W/O-C	89601824	3.000 K	no	no	20 pc(s).	0.001 kg
STARK-SLE-PURE-G3-10-1000-940-SEL-W/O-C	89601825	4.000 K	no	no	20 pc(s).	0.001 kg
STARK-SLE-PURE-G3-17-2000-930-SEL-W/O-C	89601826	3.000 K	no	no	20 pc(s).	0.001 kg
STARK-SLE-PURE-G3-17-2000-940-SEL-W/O-C	89601827	4.000 K	no	no	20 pc(s).	0.001 kg

Specific technical data

Type[6]	Photo-metric code	Forward current[3] [4] [5]	Luminous flux at tp = 25 °C[2]	Luminous flux at tp = 65 °C[2]	Power consumption[8]	Min. Forward voltage at tp = 65 °C	Max. Forward voltage at tp = 25 °C	Luminous efficacy module at tp = 25 °C	Luminous efficacy module at tp = 65 °C	Luminous efficacy system at tp = 65 °C[7]	Colour rendering index CRI	Energy classifi-cation
STARK-SLE-10-1000 – Operating mode HE at 350 mA												
STARK-SLE-PURE-G3-10-1000-930-SEL	930/349	350 mA	560 lm	510 lm	6.1 W	16.7 V	18.9 V	90 lm/W	84 lm/W	75 lm/W	90	A+
STARK-SLE-PURE-G3-10-1000-940-SEL	940/349	350 mA	610 lm	560 lm	6.1 W	16.7 V	18.9 V	98 lm/W	92 lm/W	83 lm/W	90	A+
STARK-SLE-10-1000 – Operating mode HO at 700 mA												
STARK-SLE-PURE-G3-10-1000-930-SEL	930/349	700 mA	1,000 lm	880 lm	13.2 W	18.3 V	20.4 V	74 lm/W	67 lm/W	60 lm/W	90	A
STARK-SLE-PURE-G3-10-1000-940-SEL	940/349	700 mA	1,100 lm	1,000 lm	13.2 W	18.3 V	20.4 V	81 lm/W	76 lm/W	68 lm/W	90	A
STARK-SLE-17-2000 – Operating mode HE at 350 mA												
STARK-SLE-PURE-G3-17-2000-930-SEL	930/349	350 mA	1,200 lm	1,110 lm	11.9 W	32.9 V	37.2 V	98 lm/W	93 lm/W	84 lm/W	90	A+
STARK-SLE-PURE-G3-17-2000-940-SEL	940/349	350 mA	1,360 lm	1,250 lm	11.9 W	32.9 V	37.2 V	111 lm/W	105 lm/W	95 lm/W	90	A+
STARK-SLE-17-2000 – Operating mode HO at 1,050 mA												
STARK-SLE-PURE-G3-17-2000-930-SEL	930/349	1,050 mA	3,060 lm	2,800 lm	40.9 W	37.7 V	42.1 V	73 lm/W	68 lm/W	62 lm/W	90	A
STARK-SLE-PURE-G3-17-2000-940-SEL	940/349	1,050 mA	3,480 lm	3,170 lm	40.9 W	37.7 V	42.1 V	83 lm/W	78 lm/W	70 lm/W	90	A

[1] 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 at the tp-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 tp point see the drawing above.

[2] Tolerance range for optical data: ±10 %.

[3] Exceeding the max. operating current leads to an overload on the TALEXmodule. This may in turn result in a significant reduction in life-time or even destruction of the TALEXmodule.

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

[5] Max. permissible repetitive peak current for STARK-SLE-G3-10-1000: 960 mA. Max. permissible repetitive peak current for STARK-SLE-G3-17-2000: 1,200 mA.

[6] HE ... high efficiency, HO ... high output.

[7] Assumed efficiency for the LED control gear is 0.9.

[8] All values at tp = 65 °C.

Standards
EN 62031
EN 62471
EN 61547
EN 55015
IEC 62717

Photometric code

Key for photometric code, e. g. 930 / 349

1st digit		2nd + 3rd digit	4th digit	5th digit	6th digit	
Code	CRI	Colour temperature in Kelvin x 100	McAdams initial	McAdams after 25% of the life-time (max.6000h)	Lumen maintanance after 25% of the life-time (max.6000h)	
					Code	Remaining lumen
7	67 – 76				7	≥ 70 %
8	77 – 86				8	≥ 80 %
9	87 – ≥90				9	≥ 90 %

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 STARK SLE PURE G3 will be greatly reduced or the TALEXmodule STARK SLE PURE G3 may be destroyed.

Therefore the TALEXmodule STARK SLE PURE G3 needs to be mounted onto a heat sink.

Tridonic's excellent thermal design for the TALEXmodule STARK SLE PURE G3 products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and life-time.

tp point, ambient temperature and life-time
The temperature at tp reference point is crucial for the light output and life-time of a TALEX product.

For TALEXmodule STARK SLE PURE G3 a tp temperature up to 65 °C (depends on LES and operating mode, see page 2) 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 tp 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 STARK SLE PURE G3 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 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 STARK SLE PURE G3 (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5 Nm.

The PURE modules are mounted with 2 screws per module.
In order not to damage the modules only rounded head screws and an additional plastic flat washer should be used.

For further information please refer to to the brochure entitled "Technical Design-In-Guide SLE GEN3".

Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate. Avoid corrosive atmosphere during usage and storage.

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/esd-protection

Electrical supply/choice of LED control gear
TALEXmodule STARK SLE PURE G3 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 LED control gear which complies with the relevant standards. The use of TALEX LED control gears from Tridonic in combination with TALEXmodule STARK SLE PURE G3 guarantees the necessary protection for safe and reliable operation.

TALEXmodule STARK SLE G3 MINI are basic isolated up to 50 V against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led control gear (also against earth) is above 50 V, an additional isolation between LED module and heat sink is required (for example by isolated thermal pads) or by a suitable luminaire construction.
At voltages > 60 V an additional protection against direct touch (test finger) to the light emitting side of the module has to be guaranteed. This is typically achieved by means of a non removable light distributor over the module.

If a LED control gear other than Tridonic TALEXconverter is used, it must provide the following protection:
- Short-circuit protection
- Overload protection
- Overtemperature protection

TALEXmodule STARK SLE PURE G3 must be supplied by a constant current LED control gear.
Operation with a constant voltage LED control gear will lead to an irreversible damage of the module.

Wrong polarity can damage the TALEXmodule STARK SLE PURE G3.

Heat sink values

TALEXmodule STARK SLE PURE G3 10 SELECT

ta	tp	If	$R_{th, hs-a}$
25 °C	65 °C	350 mA	9.01 K/W
30 °C	65 °C	350 mA	7.85 K/W
40 °C	65 °C	350 mA	5.53 K/W
50 °C	65 °C	350 mA	3.21 K/W
25 °C	65 °C	700 mA	3.67 K/W
30 °C	65 °C	700 mA	3.18 K/W
40 °C	65 °C	700 mA	2.20 K/W
50 °C	65 °C	700 mA	1.21 K/W

TALEXmodule STARK SLE PURE G3 17 SELECT

ta	tp	If	$R_{th, hs-a}$
25 °C	65 °C	350 mA	4.82 K/W
30 °C	65 °C	350 mA	4.20 K/W
40 °C	65 °C	350 mA	2.96 K/W
50 °C	65 °C	350 mA	1.72 K/W
25 °C	65 °C	1,050 mA	1.14 K/W
30 °C	65 °C	1,050 mA	0.98 K/W
40 °C	65 °C	1,050 mA	0.66 K/W
50 °C	65 °C	1,050 mA	0.34 K/W

Notes

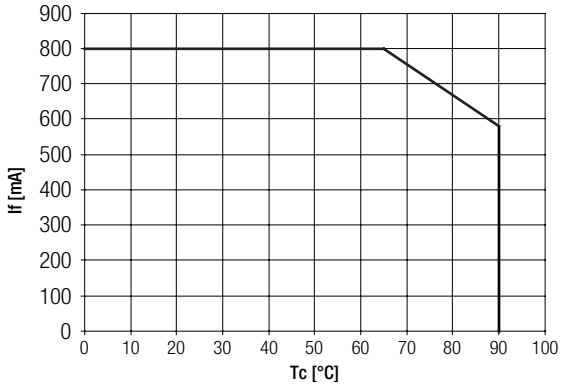
The actual cooling surface can differ because of the material, the structural shape, outside influences and the installation situation. A thermal connection between TALEXmodule STARK SLE PURE G3 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.
Additionally the TALEXmodule STARK SLE PURE G3 has to be fixed on the heat sink with M3 screws to optimise the thermal connection.
Use of thermal interface material with thermal conductivity of $l > 1$ W/mK and layer thickness of interface material with max. 50 µm or a similar interface material where the quotient of layer thickness and thermal conductivity $b < 50$ µmmK/W.

Thermal behaviour

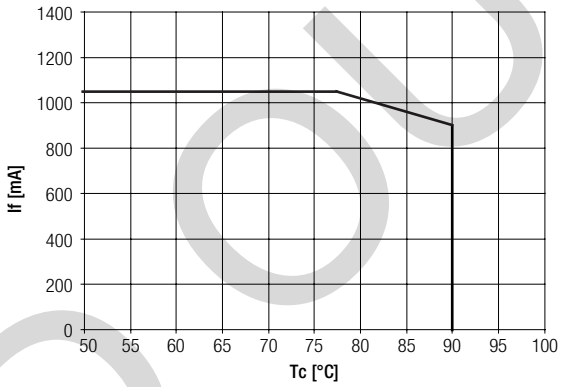
storage temperature	-30 ... +80 °C
operating temperature ta	-25 ... +50 °C
tp (at typ. current)	65 °C
tc max. (at typ. current)	acc. to the derating curves
max. humidity*	0 ... 80 %

* not condensed

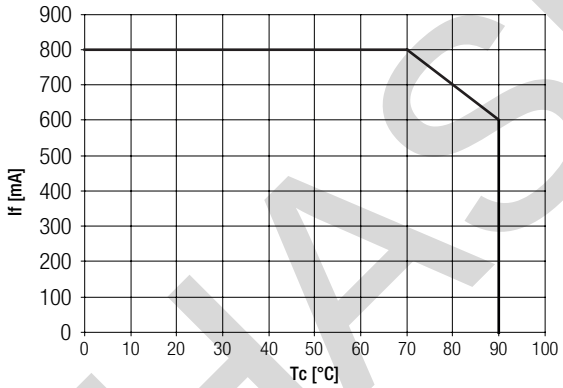
Derating curve for TALEX(module STARK SLE PURE G3 10 SELECT 3,000 K



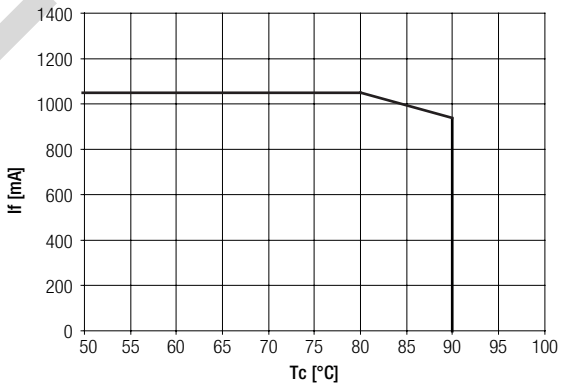
Derating curve for TALEX(module STARK SLE PURE G3 17 SELECT 3,000 K



Derating curve for TALEX(module STARK SLE PURE G3 10 SELECT 4,000 K



Derating curve for TALEX(module STARK SLE PURE G3 17 SELECT 4,000 K



Life-time, lumen maintenance and failure rate

The light output of an LED Module decreases over the life-time, this is characterized with the L value.
L70 means that the LED module will give 70 % of its initial luminous flux. This value is always related to the number of operation hours and therefore defines the life-time of an LED module.

As the L value is a statistical value and the lumen maintenace may vary over the delivered LED modules.
The B value defines the amount of modules which are below the specific L value, e.g. L70B10 means 10 % of the LED modules are below 70 % of the inital luminous flux, respectivly 90 % will be above 70 % of the initial value. In addition the percentage of failed modules (fatal failure) is characterized by the C value.

The F value is the combination of the B and C value. That means for F degradation and complete failures are considered, e.g. L70F10 means 10 % of the LED modules may fail or be below 70 % of the initial luminous flux.

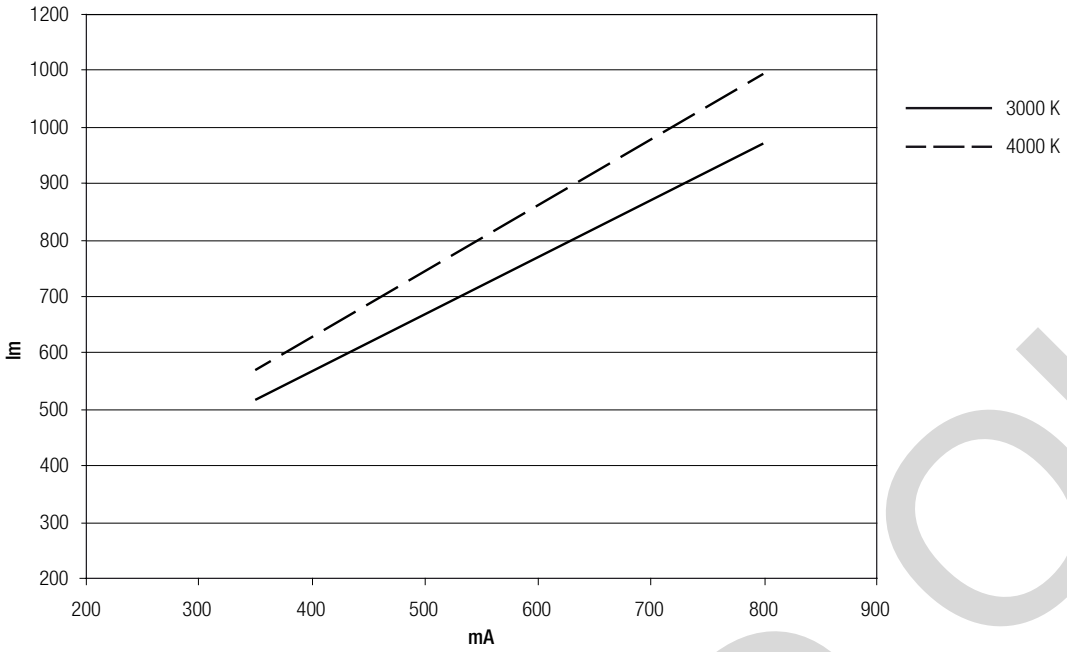
Lumen maintenance for TALEXmodule STARK SLE PURE G3 10-1000 SELECT

Operating mode	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
HE	65 °C	51,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	38,000 h	57,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	29,000 h	43,000 h	60,000 h	60,000 h	60,000 h	60,000 h
HO	65 °C	32,000 h	48,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	24,000 h	36,000 h	50,000 h	60,000 h	60,000 h	60,000 h
	85 °C	18,000 h	27,000 h	38,000 h	57,000 h	60,000 h	60,000 h

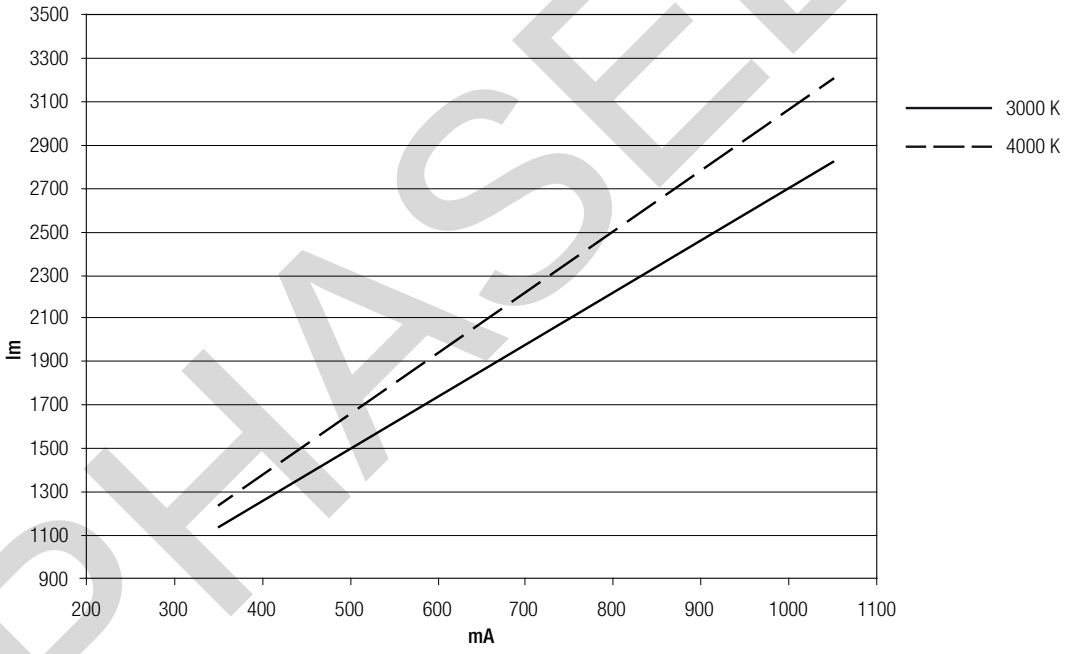
Lumen maintenance for TALEXmodule STARK SLE PURE G3 17-2000 SELECT

Operating mode	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
HE	65 °C	55,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	75 °C	41,000 h	60,000 h	60,000 h	60,000 h	60,000 h	60,000 h
	85 °C	31,000 h	47,000 h	60,000 h	60,000 h	60,000 h	60,000 h
HO	65 °C	24,000 h	36,000 h	51,000 h	60,000 h	60,000 h	60,000 h
	75 °C	18,000 h	27,000 h	38,000 h	57,000 h	60,000 h	60,000 h
	85 °C	14,000 h	20,000 h	29,000 h	43,000 h	60,000 h	60,000 h

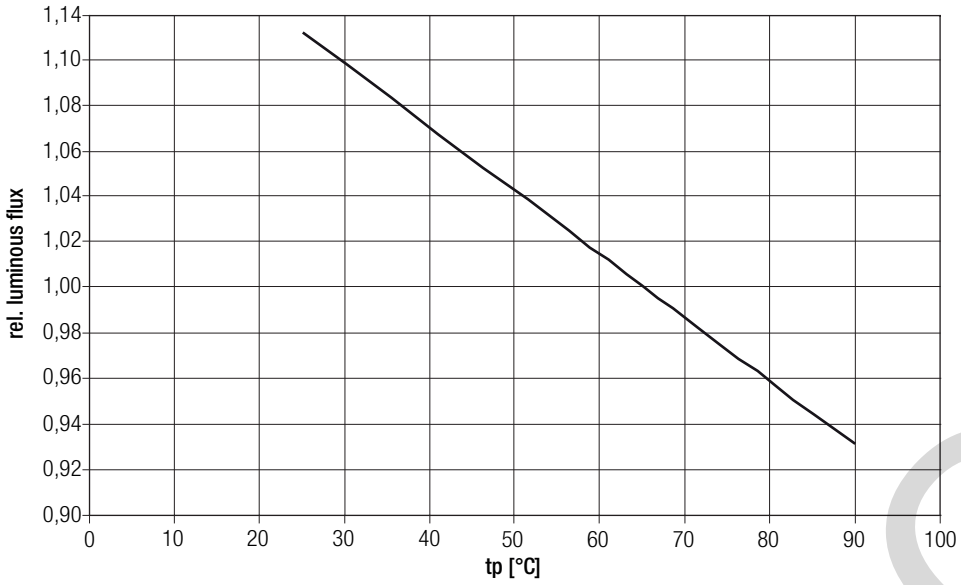
Luminous flux and operating current for TALEXmodule STARK SLE PURE G3 10 SELECT at tp = 65 °C



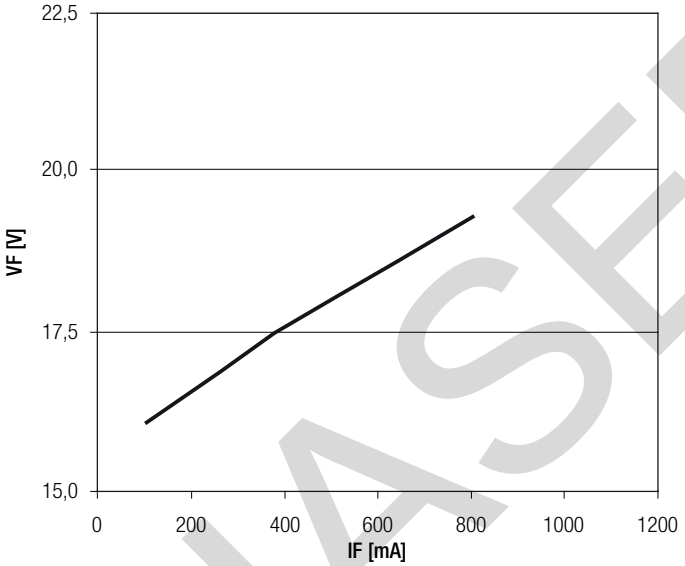
Luminous flux and operating current for TALEXmodule STARK SLE PURE G3 17 SELECT at tp = 65 °C



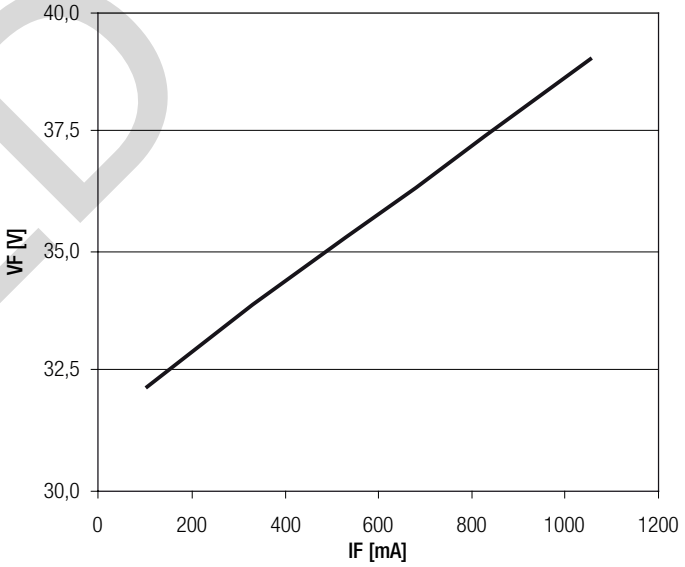
Relative luminous flux



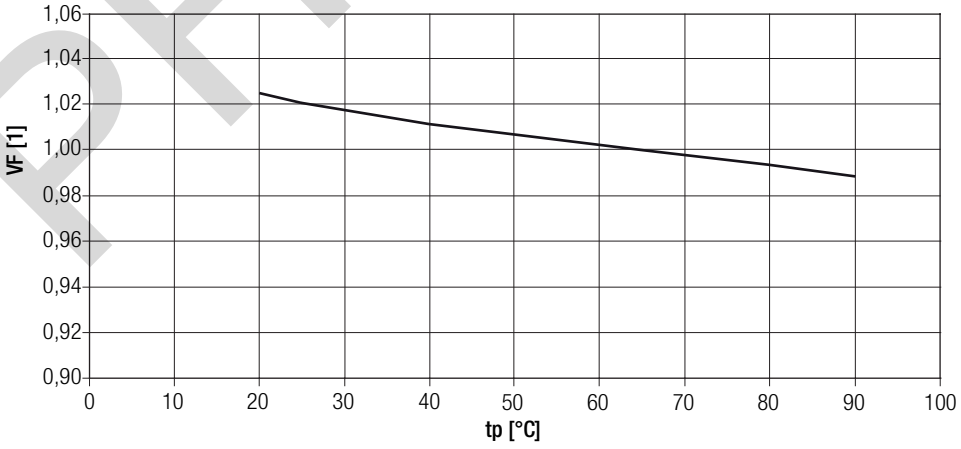
Forward current vs. forward voltage LES10-1000



Forward current vs. forward voltage LES17-2000

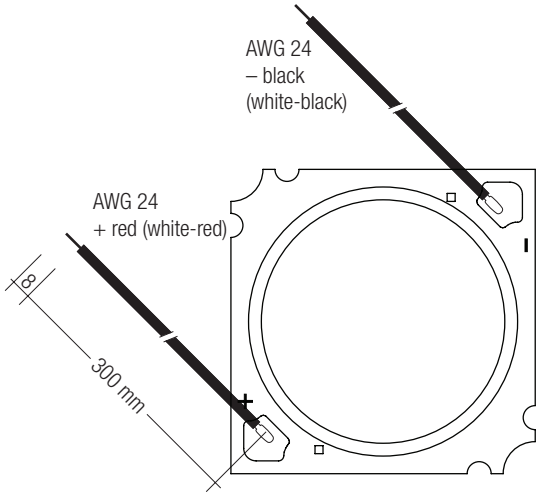


tp temperature vs. forward voltage

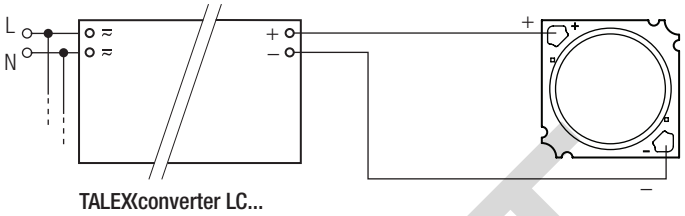


The diagrams based on statistic values.
The real values can be different.

Wiring



Wiring example

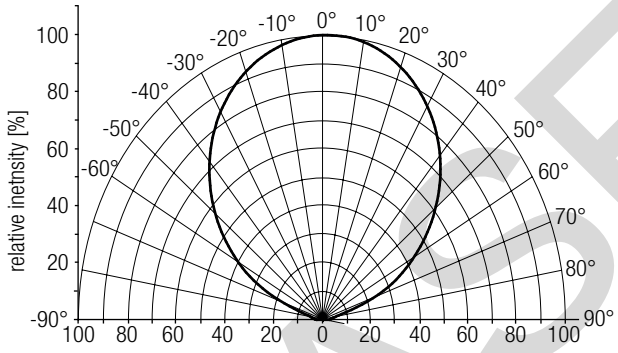


TALEXconverter LC...

Optical characteristics TALEXmodule STARK SLE PURE G3

The optical design of the TALEXmodule STARK SLE PURE G3 product line ensures optimum homogenity for the light distribution.

Light distribution

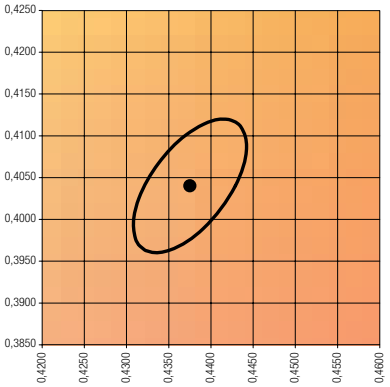


Coordinates and tolerances according to CIE 1931

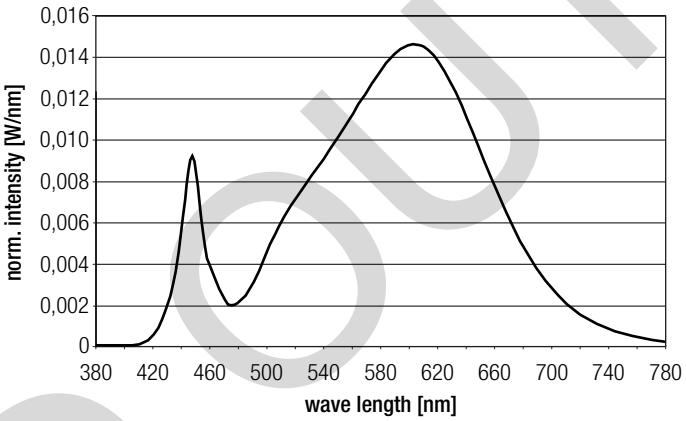
The specified colour coordinates are measured integral by a current impulse with 700 mA after a settling time of 200 ms.
The ambient temperature of the measurement is ta = 25 °C.

3,000 K

	x0	y0
Centre	0.4369	0.4041

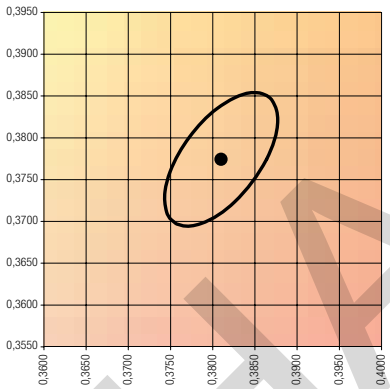


MacAdam ellipse: 3SDCM



4,000 K

	x0	y0
Centre	0.3804	0.3767



MacAdam ellipse: 3SDCM