



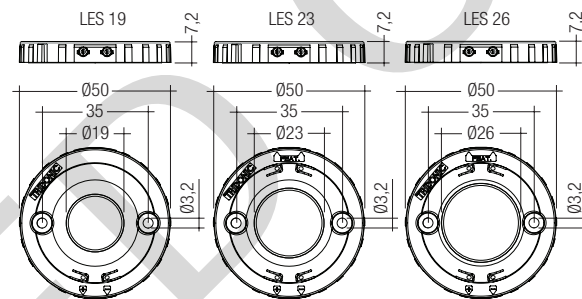
TALEXmodule STARK SLE GEN2 CLASSIC STARK SLE

Product description

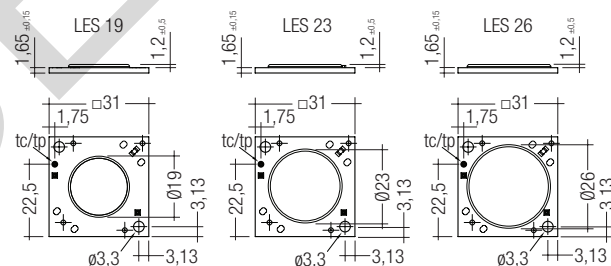
- For spotlights and downlights
- High efficiency up to 145 lm/W for the LED module
- High system efficiency up to 115 lm/W at $t_p = 65\text{ °C}$
- High colour consistency (MacAdams 3)
- Small LES (light emitting surface) diameter enables small beam angle for spotlights
- Excellent thermal management by COB technology
- NTC for temperature control for type LES23 and LES26
- Uniform radiation with Dam&Fill technology
- Fixing holes for M3 screws
- Built-in LED module
- Cooling required
- Long life time: up to 80 % luminous flux after 50,000 operating hours
- Flexible operating modes

Technical data

Beam characteristic	140°
Ambient temperature t_a	-25 ... +55 °C
t_p rated temperature ^①	65 °C
Risk group (EN 62471:2008)	1
Type of protection	IP00



With housing (tc/tp position same as without housing)



Without housing



Standards, page 5

Colour temperatures and tolerances, page 12

Ordering data

Type	Article number	Colour temperature	Housing	Connection cable	Packaging	Weight per pc.
STARK SLE G2 LES19 830 CLA	89601652	3,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES19 840 CLA	89601632	4,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES19 750 CLA	89601633	5,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES23 830 CLA	89601634	3,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES23 840 CLA	89601635	4,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES23 750 CLA	89601636	5,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES26 830 CLA	89601637	3,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES26 840 CLA	89601638	4,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE G2 LES26 750 CLA	89601639	5,000 K	yes	no	15 pc(s).	0.008 kg
STARK SLE PURE G2 LES19 830 CLA	89601622	3,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES19 840 CLA	89601623	4,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES19 750 CLA	89601624	5,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES23 830 CLA	89601625	3,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES23 840 CLA	89601626	4,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES23 750 CLA	89601627	5,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES26 830 CLA	89601628	3,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES26 840 CLA	89601629	4,000 K	no	yes	20 pc(s).	0.010 kg
STARK SLE PURE G2 LES26 750 CLA	89601630	5,000 K	no	yes	20 pc(s).	0.010 kg

Specific technical data

Type [Ⓓ]	Photometric code	Forward current [Ⓓ] Ⓓ	Luminous flux at tp = 25 °C [Ⓓ]	Luminous flux at tp = 65 °C [Ⓓ]	Power consumption module [Ⓓ]	Forward voltage module [Ⓓ] Ⓓ	Luminous efficacy module at tp = 25 °C	Luminous efficacy module at tp = 65 °C	Luminous efficacy system at tp = 65 °C	Colour rendering index CRI	Energy classification
STARK SLE LES19 – Operating mode HE at 350 mA											
STARK SLE G2 LES19 830 CLA	830/349	350 mA	1,450 lm	1,250 lm	11.6 W	33.2 V	125 lm/W	108 lm/W	97 lm/W	80	A+
STARK SLE G2 LES19 840 CLA	840/349	350 mA	1,600 lm	1,400 lm	11.6 W	33.2 V	138 lm/W	121 lm/W	109 lm/W	80	A++
STARK SLE G2 LES19 750 CLA	750/349	350 mA	1,750 lm	1,500 lm	11.6 W	33.2 V	142 lm/W	125 lm/W	113 lm/W	70	A++
STARK SLE LES19 – Operating mode NM at 500 mA											
STARK SLE G2 LES19 830 CLA	830/349	500 mA	2,000 lm	1,750 lm	17.1 W	34.2 V	117 lm/W	102 lm/W	92 lm/W	80	A+
STARK SLE G2 LES19 840 CLA	840/349	500 mA	2,250 lm	1,900 lm	17.1 W	34.2 V	132 lm/W	112 lm/W	101 lm/W	80	A+
STARK SLE G2 LES19 750 CLA	750/349	500 mA	2,400 lm	2,100 lm	17.1 W	34.2 V	135 lm/W	117 lm/W	105 lm/W	70	A++
STARK SLE LES19 – Operating mode HO at 700 mA											
STARK SLE G2 LES19 830 CLA	830/349	700 mA	2,700 lm	2,300 lm	24.7 W	35.3 V	109 lm/W	93 lm/W	84 lm/W	80	A+
STARK SLE G2 LES19 840 CLA	840/349	700 mA	3,000 lm	2,550 lm	24.7 W	35.3 V	121 lm/W	103 lm/W	93 lm/W	80	A+
STARK SLE G2 LES19 750 CLA	750/349	700 mA	3,250 lm	2,800 lm	24.7 W	35.3 V	126 lm/W	107 lm/W	96 lm/W	70	A+
STARK SLE LES23 – Operating mode HE at 500 mA											
STARK SLE G2 LES23 830 CLA	830/349	500 mA	2,100 lm	1,800 lm	16.5 W	33.1 V	127 lm/W	109 lm/W	98 lm/W	80	A+
STARK SLE G2 LES23 840 CLA	840/349	500 mA	2,300 lm	2,000 lm	16.5 W	33.1 V	139 lm/W	121 lm/W	109 lm/W	80	A++
STARK SLE G2 LES23 750 CLA	750/349	500 mA	2,500 lm	2,150 lm	16.5 W	33.1 V	145 lm/W	127 lm/W	115 lm/W	70	A++
STARK SLE LES23 – Operating mode NM at 700 mA											
STARK SLE G2 LES23 830 CLA	830/349	700 mA	2,850 lm	2,450 lm	23.8 W	33.9 V	120 lm/W	103 lm/W	93 lm/W	80	A+
STARK SLE G2 LES23 840 CLA	840/349	700 mA	3,150 lm	2,700 lm	23.8 W	33.9 V	132 lm/W	113 lm/W	102 lm/W	80	A+
STARK SLE G2 LES23 750 CLA	750/349	700 mA	3,400 lm	2,950 lm	23.8 W	33.9 V	137 lm/W	118 lm/W	106 lm/W	70	A++
STARK SLE LES23 – Operating mode HO at 1,050 mA											
STARK SLE G2 LES23 830 CLA	830/349	1,050 mA	4,050 lm	3,500 lm	37.1 W	35.3 V	109 lm/W	94 lm/W	85 lm/W	80	A+
STARK SLE G2 LES23 840 CLA	840/349	1,050 mA	4,450 lm	3,850 lm	37.1 W	35.3 V	120 lm/W	104 lm/W	93 lm/W	80	A+
STARK SLE G2 LES23 750 CLA	750/349	1,050 mA	4,850 lm	4,200 lm	37.1 W	35.3 V	124 lm/W	108 lm/W	97 lm/W	70	A+
STARK SLE LES26 – Operating mode HE at 700 mA											
STARK SLE G2 LES26 830 CLA	830/349	700 mA	2,950 lm	2,500 lm	23.2 W	33.2 V	127 lm/W	108 lm/W	97 lm/W	80	A+
STARK SLE G2 LES26 840 CLA	840/349	700 mA	3,250 lm	2,800 lm	23.2 W	33.2 V	140 lm/W	121 lm/W	109 lm/W	80	A++
STARK SLE G2 LES26 750 CLA	750/349	700 mA	3,500 lm	3,000 lm	23.2 W	33.2 V	144 lm/W	125 lm/W	113 lm/W	70	A++
STARK SLE LES26 – Operating mode NM at 1,050 mA											
STARK SLE G2 LES26 830 CLA	830/349	1,050 mA	4,200 lm	3,650 lm	36.0 W	34.3 V	117 lm/W	101 lm/W	91 lm/W	80	A+
STARK SLE G2 LES26 840 CLA	840/349	1,050 mA	4,650 lm	4,000 lm	36.0 W	34.3 V	129 lm/W	111 lm/W	100 lm/W	80	A+
STARK SLE G2 LES26 750 CLA	750/349	1,050 mA	5,050 lm	4,350 lm	36.0 W	34.3 V	133 lm/W	115 lm/W	104 lm/W	70	A++
STARK SLE LES26 – Operating mode HO at 1,400 mA											
STARK SLE G2 LES26 830 CLA	830/349	1,400 mA	5,400 lm	4,650 lm	49.5 W	35.3 V	109 lm/W	94 lm/W	85 lm/W	80	A+
STARK SLE G2 LES26 840 CLA	840/349	1,400 mA	5,950 lm	5,100 lm	49.5 W	35.3 V	120 lm/W	103 lm/W	93 lm/W	80	A+
STARK SLE G2 LES26 750 CLA	750/349	1,400 mA	6,450 lm	5,550 lm	49.5 W	35.3 V	124 lm/W	107 lm/W	96 lm/W	70	A+

[Ⓓ] 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.

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

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

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

[Ⓓ] Ripple max. 50 % of typ. forward current.

[Ⓓ] Tolerance range voltage: ±10 %.

[Ⓓ] HE ... high efficiency, NM ... nominal mode, HO ... high output.

[Ⓓ] All values at tp = 65 °C.

LED control gear matrix – TALEX(module STARK SLE G2

Type	REMOTE					IN-BUILT	
	LCAI 015/0350 A020	LCI 015/0350 E020	LCCI 016/0350 B020	LCI 015/0350 M020	LCI 20W 350mA TEC SR	LCCI 016/0350 Q010	LCI 20W 350mA TEC C
Article no.	86458899	24166312	86459210	86459179	87500187	86459213	87500079
Type	assignable control gear						
Operating mode at 350 mA							
STARK SLE G2	✓	✓	✓	✓	✓	✓	✓

LED control gear matrix – TALEX(module STARK SLE G2

Type	REMOTE		IN-BUILT
	LCAI 020/0500 A120 one4all	LCI 20W 500mA TEC SR	LCI 20W 500mA TEC C
Article no.	86459107	87500189	87500188
Type	assignable control gear		
Operating mode at 500 mA			
STARK SLE G2	✓	✓	✓

LED control gear matrix – TALEX(module STARK SLE G2

Type	REMOTE					
	LCI 030/0700 A120	LCAI 030/0700 A120 one4all	LCI 030/0700 E020	LCI 033/0700 U010	LCI 35W 700mA TEC SR	LCI 030/0700 M120
Article no.	86458901	86458900	24166314	25000669	87500197	86459178
Type	assignable control gear					
Operating mode at 700 mA						
STARK SLE G2	✓	✓	✓	✓	✓	✓

LED control gear matrix – TALEX(module STARK SLE G2

Type	REMOTE		IN-BUILT
	LCAI 050/1050 N020 DALI	LCI 050/1050 N020	LCI 35W 700mA TEC C
Article no.	24166469*	24166468*	87500196
Type	assignable control gear		
Operating mode at 700 mA			
STARK SLE G2	✓	✓	✓

* Configuratet for 700 mA, see control gear data sheet.

LED control gear matrix – TALEX(module STARK SLE G2)

Type	REMOTE					IN-BUILT		
	LCAI 050/1050 N020 DALI	LCI 050/1050 N020	LCI 050/1050 R010	LCI 050/1050 T020	LCI 60W 1050mA TEC SR	LCAI 055/1400 0010 DALI	LCI 055/1400 0010	LCI 60W 1050mA TEC C
Article no.	24166469	24166468	86459216	86459218	87500203	24166471*	24166470*	87500202
Type	assignable control gear							
Operating mode at 1,050 mA								
STARK SLE G2	✓	✓	✓	✓	✓	✓	✓	✓

* Configured for 1,050 mA, see control gear data sheet.

LED control gear matrix – TALEX(module STARK SLE G2)

Type	REMOTE		IN-BUILT		
	LCI 055/1400 T020	LCI 65W 1400mA TEC SR	LCAI 055/1400 0010 DALI	LCI 055/1400 0010	LCI 055/1400 R010
Article no.	86459219	87500205	24166471	24166470	86459217
Type	assignable control gear				
Operating mode at 1,400 mA					
STARK SLE G2	✓	✓	✓	✓	✓

Standards

EN 62031
EN 62471
EN 61547
EN 55015
IEC 62717

Glow wire test

according to EN 62031 with increased temperature of 960 °C passed.

Photometric code

Key for photometric code, e. g. 830 / 349

1 st digit	2 nd + 3 rd digit	4 th digit	5 th digit	6 th digit
Code CRI	Colour temperature in Kelvin x 100	McAdams initial	McAdams after 25% of the lifetime (max.6000h)	Luminous flux after 25% of the lifetime (max.6000h)
				Code Luminous flux
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 G2 will be greatly reduced or the TALEXmodule STARK SLE G2 may be destroyed.

Therefore the TALEXmodule STARK SLE G2 needs to be mounted onto a heat sink heat sink which does not exceed the value for $R_{th,max}$.

Tridonic's excellent thermal design for the TALEXmodule STARK SLE G2 products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and life time.

tp point, ambient temperature and lifetime

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

The operating temperature of a TALEX product is crucial for the light output, the product life time but also for the product safety.

The thermal limits can be checked at the tp/tc point and at tr.

On page 10 the lumen maintenance is shown in relation to the temperature at tp. tp,rated shows the temperature at which the rated values are reached.

tc shows the thermal limit for safety reason and must never be exceeded under normal conditions.

For the interchangeability with other Zhaga products, $t_{r,max}$ is specified directly at the thermal interface to the heatsink of the luminaire.

For TALEXmodule STARK SLE G2 a tp 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 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 G2 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 G2 (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5Nm.

For further information please refer to the brochure entitled "Technical Design-In-Guide SLE GEN2".

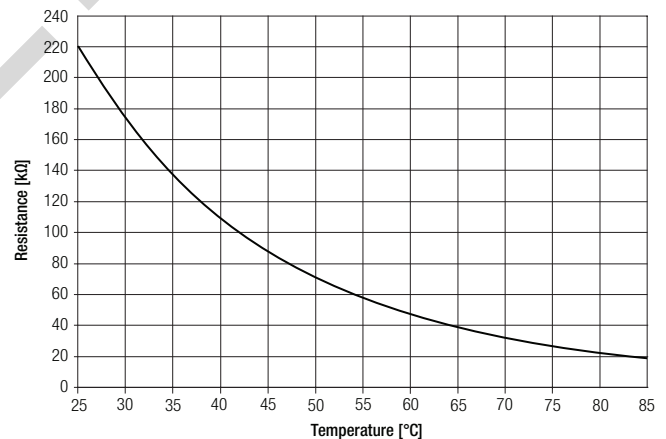


EOS/ESD safety guidelines

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>

Temperature control for LES23 and LES26

An NTC resistor is on the board of the TALEXmodule STARK SLE G2 to control the tp temperature during the operation with a resistor value of 220 kΩ NTC.



Electrical supply/choice of LED control gear

TALEXmodule STARK SLE G2 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 G2 guarantees the necessary protection for safe and reliable operation.

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 G2 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 G2.

Heat sink values

TALEXmodule STARK SLE G2 LES19 CLASSIC

ta	tp	If	R _{th, hs-a}
25 °C	65 °C	350 mA	5.14 K/W
30 °C	65 °C	350 mA	4.49 K/W
40 °C	65 °C	350 mA	3.19 K/W
50 °C	65 °C	350 mA	1.89 K/W
25 °C	65 °C	500 mA	3.37 K/W
30 °C	65 °C	500 mA	2.94 K/W
40 °C	65 °C	500 mA	2.08 K/W
50 °C	65 °C	500 mA	1.23 K/W
25 °C	65 °C	700 mA	2.23 K/W
30 °C	65 °C	700 mA	1.94 K/W
40 °C	65 °C	700 mA	1.37 K/W
50 °C	65 °C	700 mA	0.80 K/W

TALEXmodule STARK SLE G2 LES23 CLASSIC

ta	tp	If	R _{th, hs-a}
25 °C	65 °C	500 mA	3.59 K/W
30 °C	65 °C	500 mA	3.13 K/W
40 °C	65 °C	500 mA	2.22 K/W
50 °C	65 °C	500 mA	1.31 K/W
25 °C	65 °C	700 mA	2.41 K/W
30 °C	65 °C	700 mA	2.10 K/W
40 °C	65 °C	700 mA	1.49 K/W
50 °C	65 °C	700 mA	0.87 K/W
25 °C	65 °C	1050 mA	1.46 K/W
30 °C	65 °C	1050 mA	1.27 K/W
40 °C	65 °C	1050 mA	0.89 K/W
50 °C	65 °C	1050 mA	0.52 K/W

TALEXmodule STARK SLE G2 LES26 CLASSIC

ta	tp	If	R _{th, hs-a}
25 °C	65 °C	700 mA	2.76 K/W
30 °C	65 °C	700 mA	2.41 K/W
40 °C	65 °C	700 mA	1.70 K/W
50 °C	65 °C	700 mA	1.00 K/W
25 °C	65 °C	1050 mA	1.68 K/W
30 °C	65 °C	1050 mA	1.46 K/W
40 °C	65 °C	1050 mA	1.03 K/W
50 °C	65 °C	1050 mA	0.60 K/W
25 °C	65 °C	1400 mA	1.16 K/W
30 °C	65 °C	1400 mA	1.01 K/W
40 °C	65 °C	1400 mA	0.71 K/W
50 °C	65 °C	1400 mA	0.40 K/W

Notes

The actual cooling can differ because of the material, the structural shape, outside influences and the installation situation. A thermal connection between TALEXmodule STARK SLE G2 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.

Additionally the TALEXmodule STARK SLE G2 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 $\lambda > 1 \text{ W/mK}$ and layer thickness of interface material with max. $50 \mu\text{m}$ or a similar interface material where the quotient of layer thickness and thermal conductivity $b < 50 \mu\text{mmK/W}$.

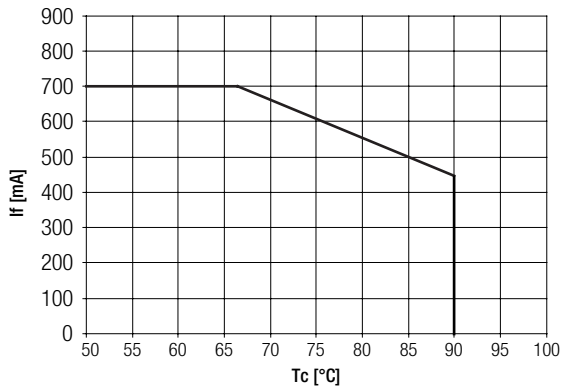
Thermal behaviour

storage temperature	-30 ... +80 °C
operating temperature t_a	+25 ... +55 °C
t_p (at typ. current)	65 °C
t_c max. (at typ. current)*	75 °C
max. humidity	0 ... 80 %

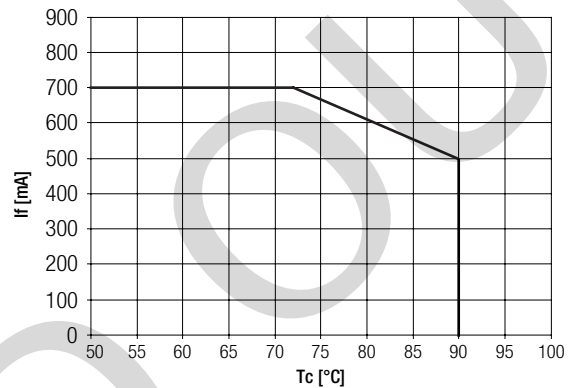
* according to the derating curves

Condensation on the module is not allowed. During the processing of the LED modules in the lamp the humidity has to be between 30 and 70%.

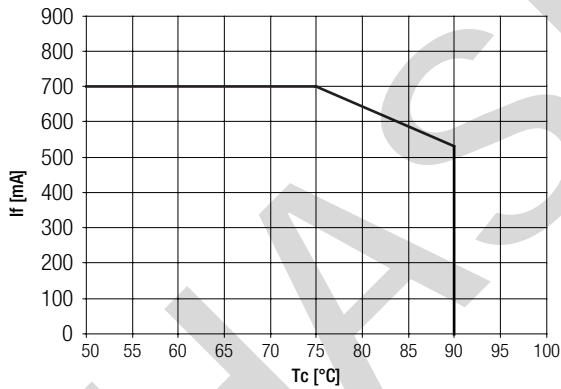
Derating curve for TALEX(module STARK SLE G2 LES19 CLASSIC 3,000 K



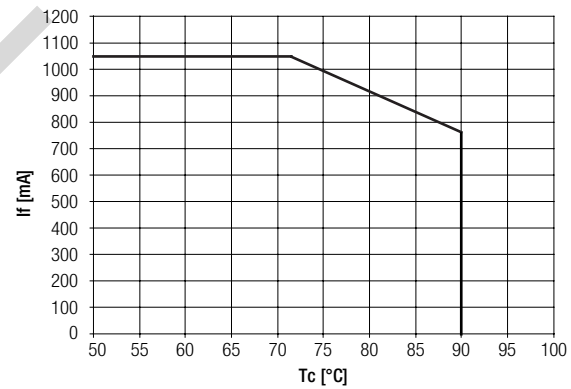
Derating curve for TALEX(module STARK SLE G2 LES19 CLASSIC 4,000 K



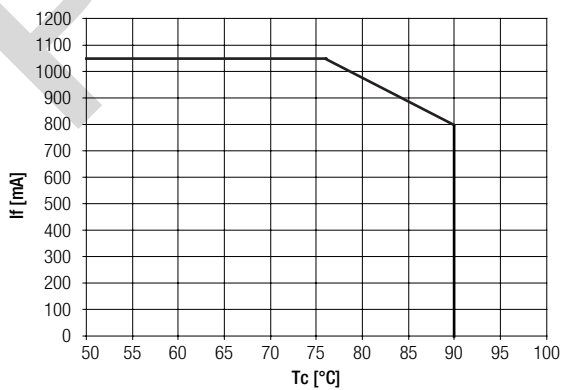
Derating curve for TALEX(module STARK SLE G2 LES19 CLASSIC 5,000 K



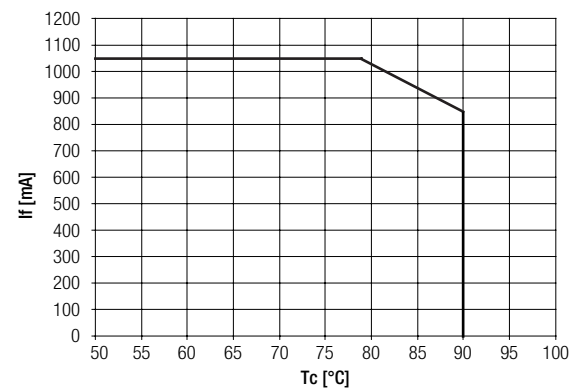
Derating curve for TALEX(module STARK SLE G2 LES23 CLASSIC 3,000 K



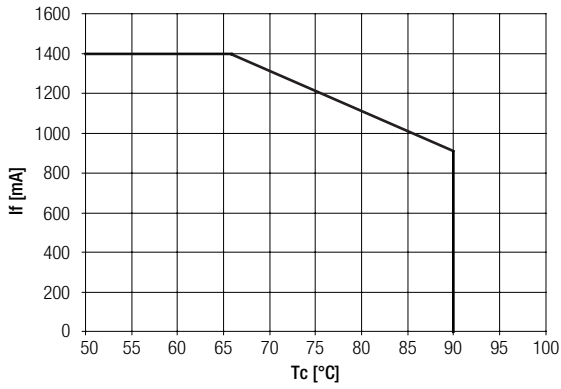
Derating curve for TALEX(module STARK SLE G2 LES23 CLASSIC 4,000 K



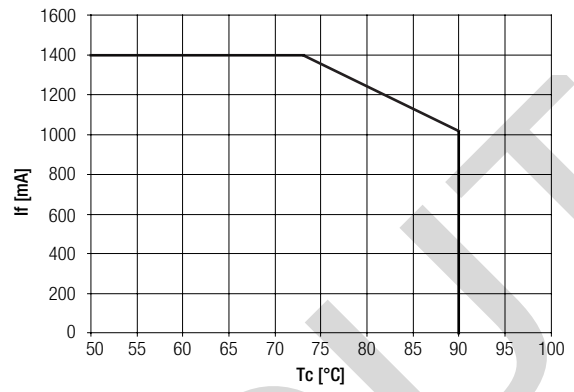
Derating curve for TALEX(module STARK SLE G2 LES23 CLASSIC 5,000 K



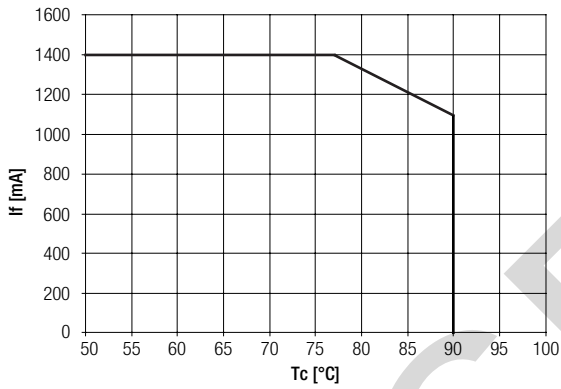
Derating curve for TALEX module STARK SLE G2 LES26 CLASSIC 3,000 K



Derating curve for TALEX module STARK SLE G2 LES26 CLASSIC 4,000 K



Derating curve for TALEX module STARK SLE G2 LES26 CLASSIC 5,000 K



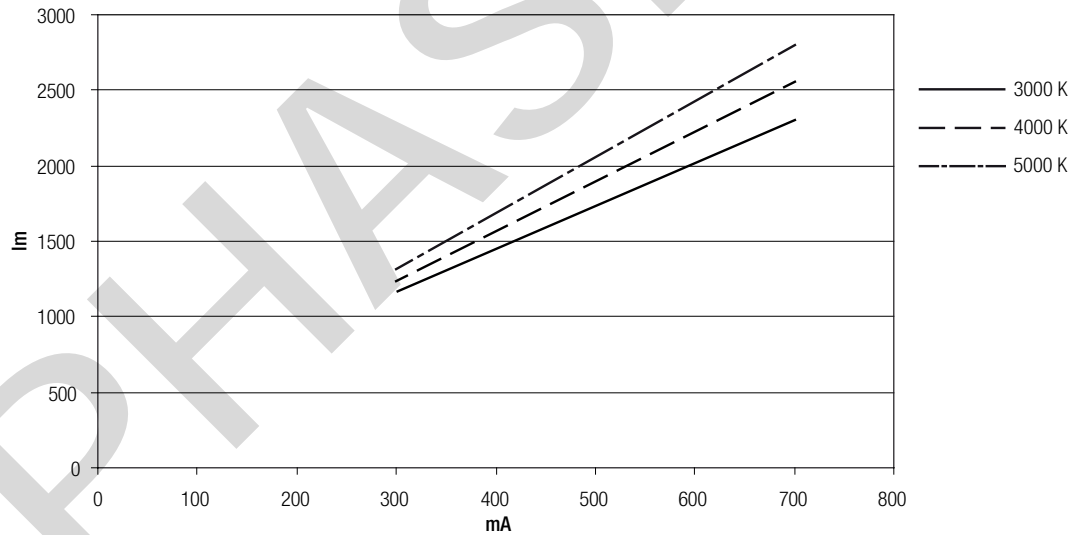
Lumen maintenance for HE operation

tp temperature in °C	luminous flux in %	operating time in h
25	80	> 50,000
	70	> 50,000
	50	> 50,000
55	80	> 50,000
	70	> 50,000
	50	> 50,000
65	80	50,000
	70	> 50,000
	50	> 50,000
75	80	42,000
	70	> 50,000
	50	> 50,000

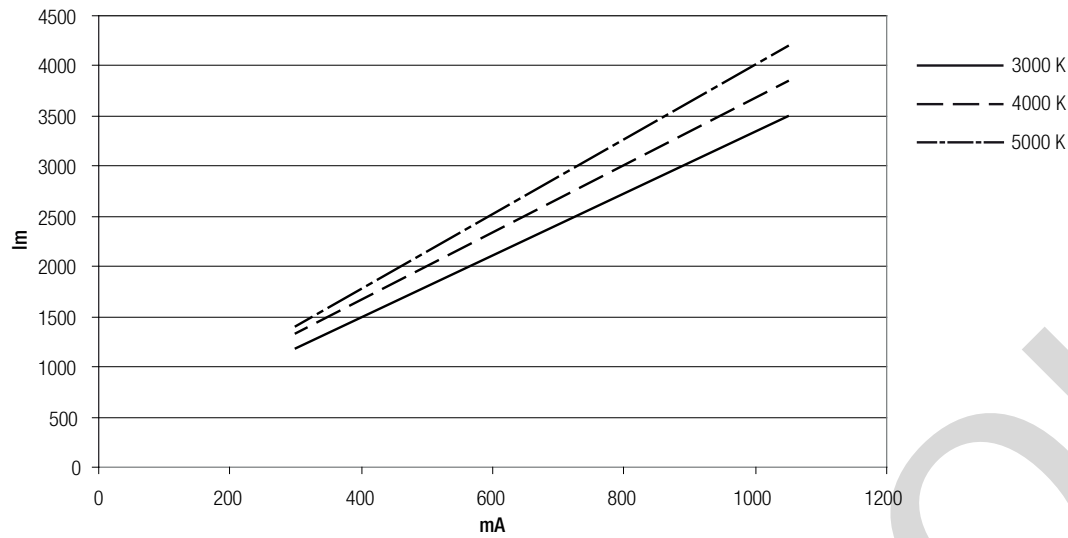
Lumen maintenance for HO operation

tp temperature in °C	luminous flux in %	operating time in h
25	80	> 50,000
	70	> 50,000
	50	> 50,000
55	80	43,000
	70	> 50,000
	50	> 50,000
65	80	37,000
	70	> 50,000
	50	> 50,000
75	80	31,000
	70	50,000
	50	> 50,000

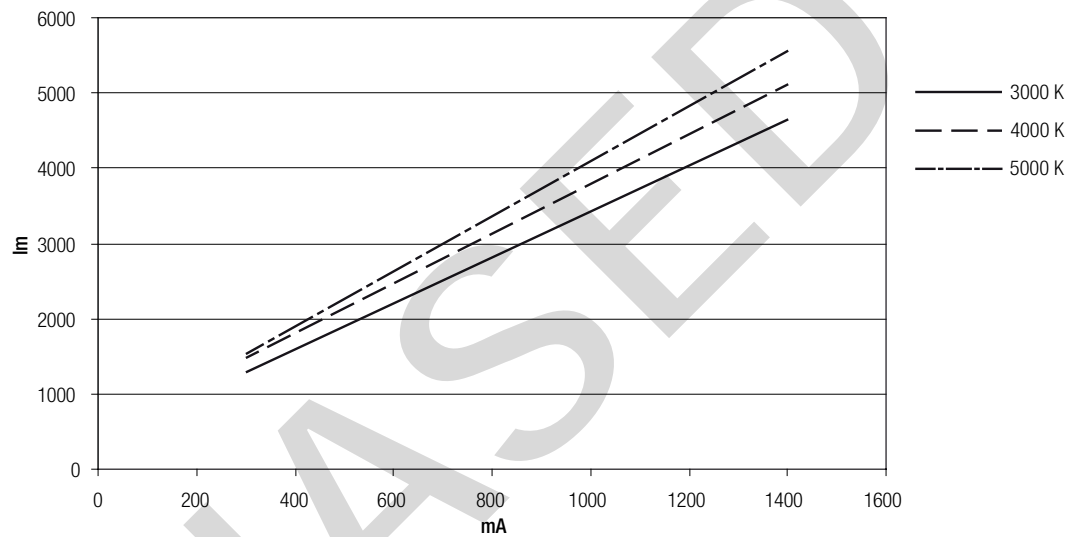
Luminous flux and operating current for LES19 at tp = 65 °C



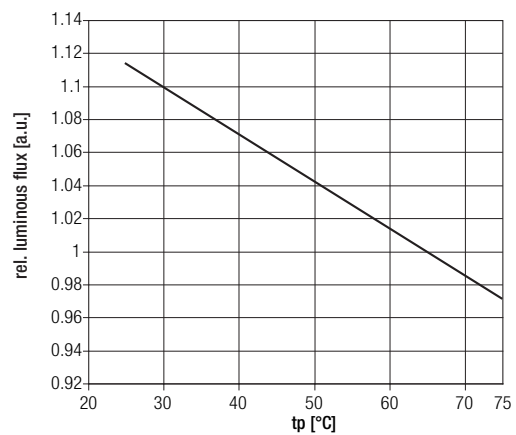
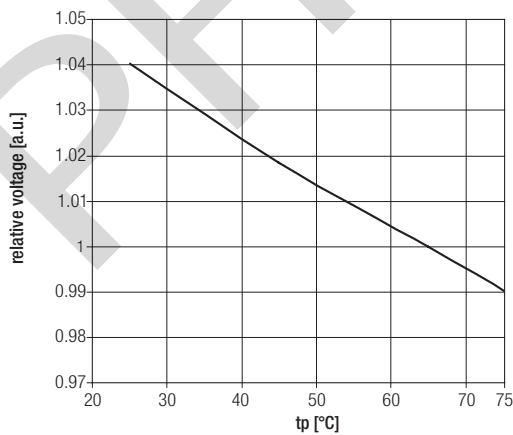
Luminous flux and operating current for LES23 at $t_p = 65^\circ\text{C}$



Luminous flux and operating current for LES26 at $t_p = 65^\circ\text{C}$

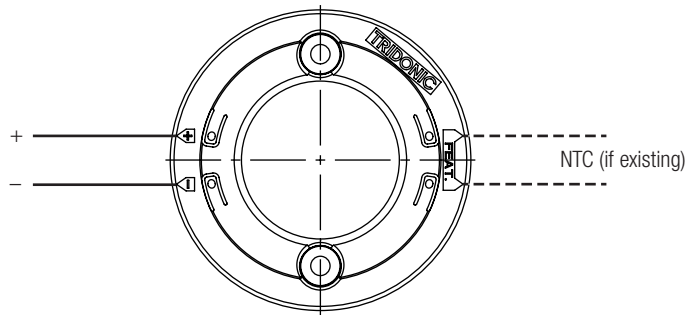


Relative forward voltage and relative luminous flux

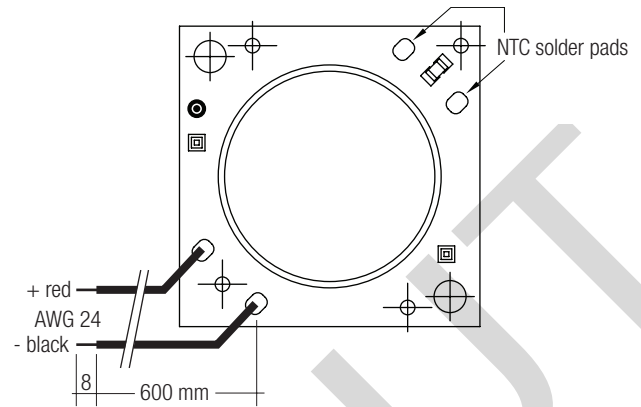


The diagrams based on statistic values.
The real values can be different.

Wiring with housing



Wiring without housing

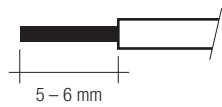


Wiring type and cross section

The wiring has to be solid cable with a cross section of 0.5 to 0.75 mm² or with flexible cable with soldered ends with a cross section of 0.5 mm².
For the push-wire connection you have to strip the insulation (5 – 6 mm).

Removing wires by lightly pressing on the push button.

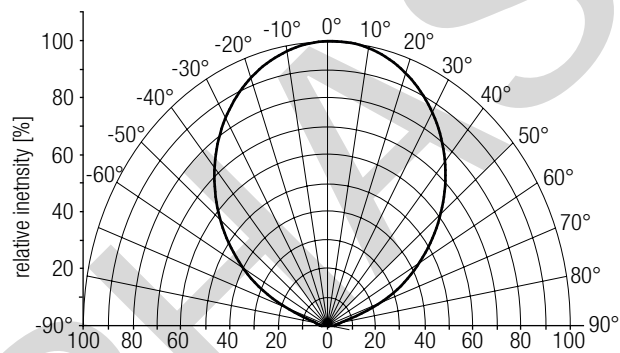
wire preparation:



Optical characteristics TALEX(module STARK SLE G2)

The optical design of the TALEX(module STARK SLE G2) product line ensures optimum homogeneity for the light distribution.

Light distribution

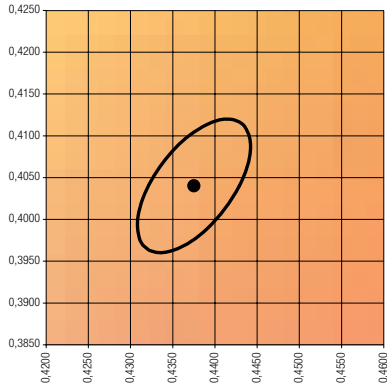


Coordinates and tolerances according to CIE 1931

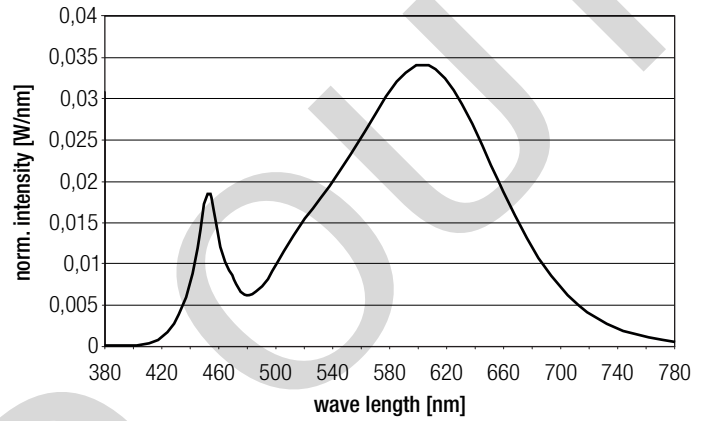
The specified colour coordinates are measured integral by a current impulse with nominal values of module after a settling time of 100 ms.
The ambient temperature of the measurement is $t_a = 25\text{ }^\circ\text{C}$.
The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K

	x0	y0
Centre	0,4369	0,4041

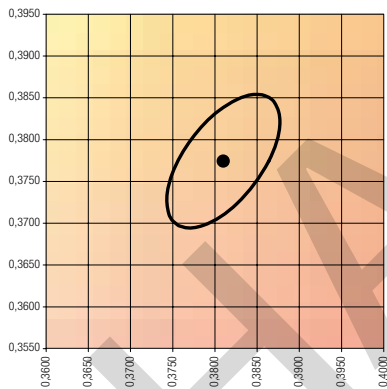


MacAdam ellipse: 3SDCM

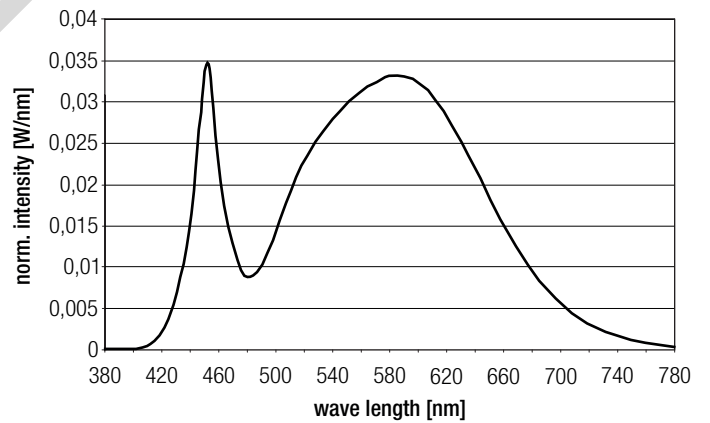


4,000 K

	x0	y0
Centre	0,3804	0,3767

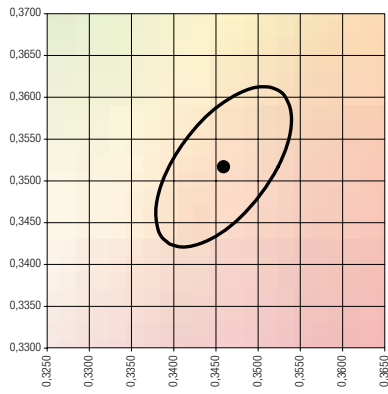


MacAdam ellipse: 3SDCM

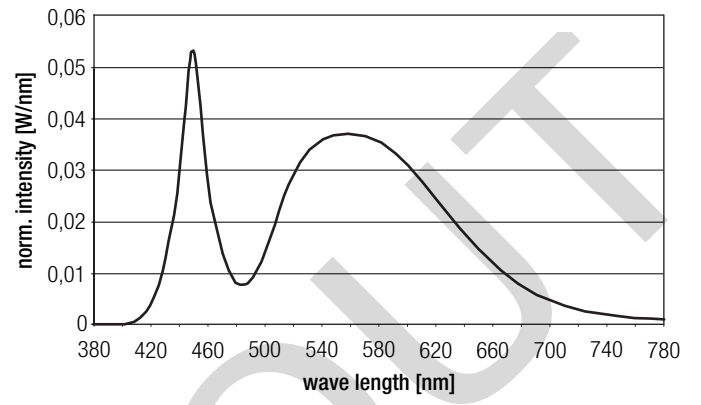


5,000 K

	x0	y0
Centre	0,3451	0,3516



MacAdam ellipse: 3SDCM



PHASED