



TALEXmodule SLE G4 ART EXC TALEXmodule SLE

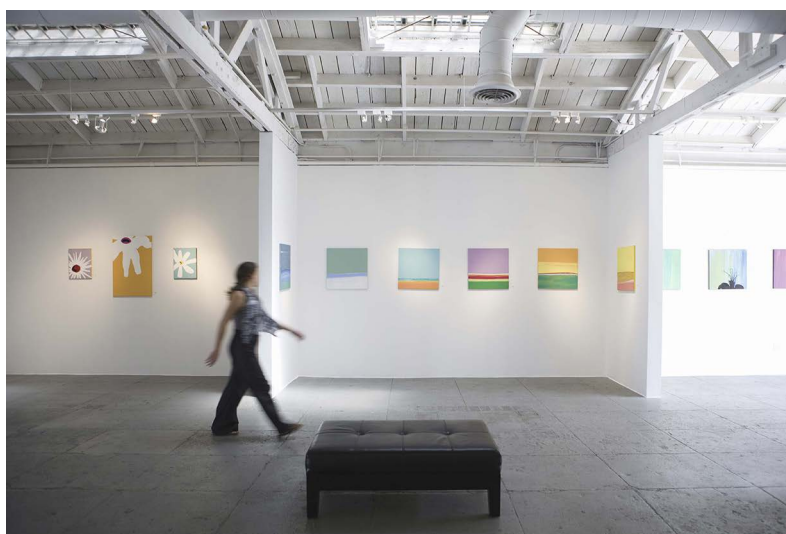
Product description

- Highest light quality in the market with full spectrum technology
- Application: Shop, Art & Culture
- Housing with Snap-On feature for easy reflector mounting
- Luminous flux up to 4,300 lm at $t_p = 65^\circ\text{C}$
- Special Colour spectrum for High End Applications with CRI 98 (compareable to incandescent lamp)
- For spotlights and downlights
- BLO operation mode: Best LED Operation for optimum operation and constant luminous flux at all colour temperatures in combination with Tridonic LED Driver of TOP and ECO series
- High colour consistency (MacAdam 2)
- Small LES (light emitting surface) diameter enables small beam angle for spotlights
- Excellent thermal management by COB technology
- Uniform radiation with Dam&Fill technology
- Fixing holes for M3 screws
- Integrated LED module
- Cooling required
- Flexible operating modes
- 5-year guarantee



Standards, page 4

Colour temperatures and tolerances, page 10

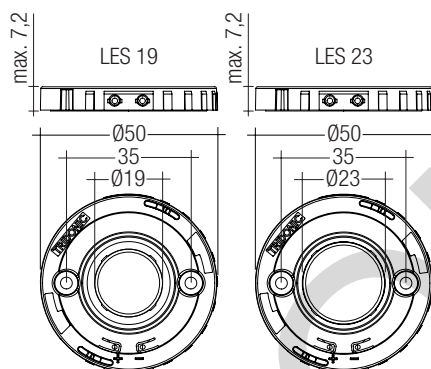




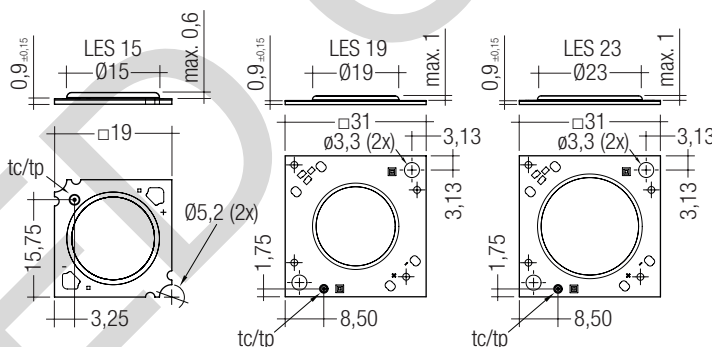
TALEXmodule SLE G4 ART EXC TALEXmodule SLE

Technical data

Beam characteristic	115°
Ambient temperature range	-25 ... +50 °C
tp rated	65 °C
tc ^①	up to 100 °C
Max. DC forward current for LES15 ^②	700 mA
Max. DC forward current for LES19 ^②	1,400 mA
Max. DC forward current for LES23 ^②	1,750 mA
Max. permissible LF current ripple for LES15	1,200 mA
Max. permissible LF current ripple for LES19	1,680 mA
Max. permissible LF current ripple for LES23	2,400 mA
Max. permissible peak current for LES15	2,400 mA / max. 10 ms
Max. permissible peak current for LES19	3,360 mA / max. 10 ms
Max. permissible peak current for LES23	4,800 mA / max. 10 ms
Max. permissible output voltage of LED Driver for LES15 ^③	75 V
Max. permissible output voltage of LED Driver for LES19 ^③	75 V
Max. permissible output voltage of LED Driver for LES23 ^③	75 V
Insulation test voltage for LES15	1.15 kV
Insulation test voltage for LES19	1.15 kV
Insulation test voltage for LES23	1.15 kV
ESD classification	severity level 4
Risk group (EN 62471:2008)	1
Type of protection	IP00



With housing (tc/tp position same as without housing) – Dimensions in mm



Dimensions in mm

Ordering data

Type	Article number	Colour temperature	Housing	Connection cable	Packaging	Weight per pc.
SLE G4 15mm 2000lm 927 ART C EXC	89602021	2,700 K	no	yes	20 pc(s).	0.004 kg
SLE G4 15mm 2000lm 930 ART C EXC	89601923	3,000 K	no	yes	20 pc(s).	0.004 kg
SLE G4 19mm 3000lm 927 ART C EXC	89602030	2,700 K	no	yes	20 pc(s).	0.009 kg
SLE G4 19mm 3000lm 930 ART C EXC	89602031	3,000 K	no	yes	20 pc(s).	0.009 kg
SLE G4 23mm 5000lm 927 ART C EXC	89602032	2,700 K	no	yes	20 pc(s).	0.009 kg
SLE G4 23mm 5000lm 930 ART C EXC	89602033	3,000 K	no	yes	20 pc(s).	0.009 kg
SLE G4 19mm 3000lm 927 ART H EXC	89602026	2,700 K	yes	no	50 pc(s).	0.009 kg
SLE G4 19mm 3000lm 930 ART H EXC	89602027	3,000 K	yes	no	50 pc(s).	0.009 kg
SLE G4 23mm 5000lm 927 ART H EXC	89602028	2,700 K	yes	no	50 pc(s).	0.009 kg
SLE G4 23mm 5000lm 930 ART H EXC	89602029	3,000 K	yes	no	50 pc(s).	0.009 kg

Specific technical data

Type®	Photometric code	Forward current	Luminous flux at $t_p = 25\text{ °C}^{\oplus}$	Luminous flux at $t_p = 65\text{ °C}^{\oplus}$	Power consumption [Ⓢ] Ⓢ	Min. forward voltage at $t_p = 65\text{ °C}$	Max. forward voltage at $t_p = 25\text{ °C}$	Colour rendering index CRI
SLE G4 15mm 2000lm – Operating mode HE at 350 mA								
SLE G4 15mm 2000lm 927 ART EXC	927/2x9	350 mA	1,040 lm	970 lm	11.6 W	31.0 V	36.0 V	98
SLE G4 15mm 2000lm 930 ART EXC	930/2x9	350 mA	1,270 lm	1,100 lm	11.6 W	31.0 V	36.0 V	98
SLE G4 15mm 2000lm – Operating mode NM at 500 mA								
SLE G4 15mm 2000lm 927 ART EXC	927/2x9	500 mA	1,440 lm	1,320 lm	17.3 W	32.2 V	37.4 V	98
SLE G4 15mm 2000lm 930 ART EXC	930/2x9	500 mA	1,720 lm	1,470 lm	17.3 W	32.2 V	37.4 V	98
SLE G4 15mm 2000lm – Operating mode HO at 700 mA								
SLE G4 15mm 2000lm 927 ART EXC	927/2x9	700 mA	1,920 lm	1,720 lm	25.3 W	33.8 V	39.2 V	98
SLE G4 15mm 2000lm 930 ART EXC	930/2x9	700 mA	2,460 lm	1,940 lm	25.3 W	33.8 V	39.2 V	98
SLE G4 19mm 3000lm – Operating mode HE at 500 mA								
SLE G4 19mm 3000lm 927 ART EXC	927/2x9	500 mA	1,520 lm	1,430 lm	16.4 W	30.7 V	35.6 V	98
SLE G4 19mm 3000lm 930 ART EXC	930/2x9	500 mA	1,710 lm	1,550 lm	16.4 W	30.7 V	35.6 V	98
SLE G4 19mm 3000lm – Operating mode NM at 1,050mA								
SLE G4 19mm 3000lm 927 ART EXC	927/2x9	1,050 mA	2,960 lm	2,630 lm	37.6 W	33.4 V	38.8 V	98
SLE G4 19mm 3000lm 930 ART EXC	930/2x9	1,050 mA	3,300 lm	2,850 lm	37.6 W	33.4 V	38.8 V	98
SLE G4 19mm 3000lm – Operating mode HO at 1,400 mA								
SLE G4 19mm 3000lm 927 ART EXC	927/2x9	1,400 mA	3,770 lm	3,200 lm	52.6 W	35.1 V	40.7 V	98
SLE G4 19mm 3000lm 930 ART EXC	930/2x9	1,400 mA	4,200 lm	3,470 lm	52.6 W	35.1 V	40.7 V	98
SLE G4 23mm 5000lm – Operating mode HE at 700 mA								
SLE G4 23mm 5000lm 927 ART EXC	927/2x9	700 mA	2,210 lm	1,950 lm	22.9 W	30.5 V	35.4 V	98
SLE G4 23mm 5000lm 930 ART EXC	930/2x9	700 mA	2,390 lm	2,080 lm	22.9 W	30.5 V	35.4 V	98
SLE G4 23mm 5000lm – Operating mode NM at 1,400 mA								
SLE G4 23mm 5000lm 927 ART EXC	927/2x9	1,400 mA	4,110 lm	3,400 lm	49.3 W	32.9 V	38.2 V	98
SLE G4 23mm 5000lm 930 ART EXC	930/2x9	1,400 mA	4,450 lm	3,660 lm	49.3 W	32.9 V	38.2 V	98
SLE G4 23mm 5000lm – Operating mode HO at 1,750 mA								
SLE G4 23mm 5000lm 927 ART EXC	927/2x9	1,750 mA	4,970 lm	3,990 lm	63.8 W	34.0 V	39.4 V	98
SLE G4 23mm 5000lm 930 ART EXC	930/2x9	1,750 mA	5,370 lm	4,300 lm	63.8 W	34.0 V	39.4 V	98

Ⓢ See Derating curves in data sheet section 2.3.

Ⓢ Max. DC forward current varies over the temperature of the LED module. See derating curves in data sheet section 2.3.

Ⓢ The detailed explanation, see data sheet section 3.1.

Ⓢ Tolerance range for optical and electrical data: $\pm 10\%$.

Ⓢ All values at $t_p = 65\text{ °C}$.

Ⓢ HE ... high efficiency, NM ... nominal mode, HO ... high output.

1. Standards

EN 62031
EN 62471
IEC 62717
IEC 61000-4-2

1.1 Glow wire test

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

1.2 Photometric code

Key for photometric code, e. g. 930 / 369

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	McAdam after 25% of the life-time (max.6000h)	Luminous flux after 25% of the life-time (max.6000h)
7	70 – 79			Code
8	80 – 89			7
9	≥90			8
				9

1.3 Energy classification

Type	Forward current	Energy classification
SLE G4 15mm 2000lm 927 ART EXC	350 mA	A
	500 mA	A
	700 mA	A
SLE G4 15mm 2000lm 930 ART EXC	350 mA	A+
	500 mA	A
	700 mA	A
SLE G4 19mm 3000lm 927 ART EXC	500 mA	A
	1,050 mA	A
	1,400 mA	B
SLE G4 19mm 3000lm 930 ART EXC	500 mA	A+
	1,050 mA	A
	1,400 mA	A
SLE G4 23mm 5000lm 927 ART EXC	700 mA	A
	1,400 mA	A
	1,750 mA	B
SLE G4 23mm 5000lm 930 ART EXC	700 mA	A+
	1,400 mA	A
	1,750 mA	A

2. Thermal details

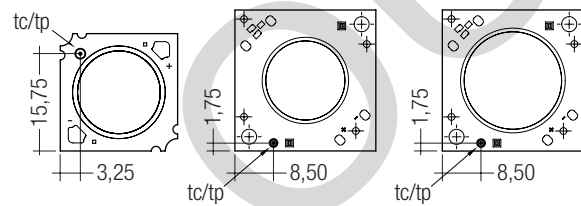
2.1 tp point, ambient temperature and life-time

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

For TALEX module SLE G4 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.

To check the tc / tp temperature, the temperature sensor has to be mounted on the PCB at the marked position as stated in the drawing.



2.2 Storage and humidity

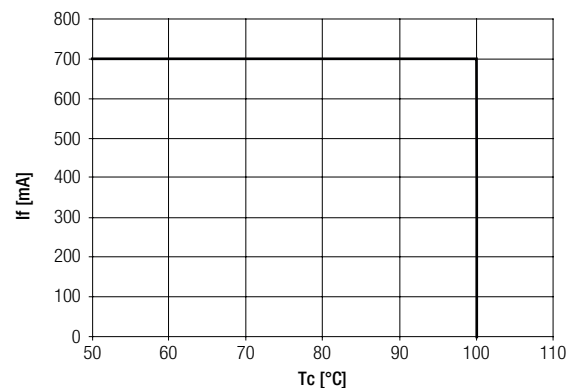
storage temperature	-30 ... +80 °C
---------------------	----------------

Operation only in non condensing environment.

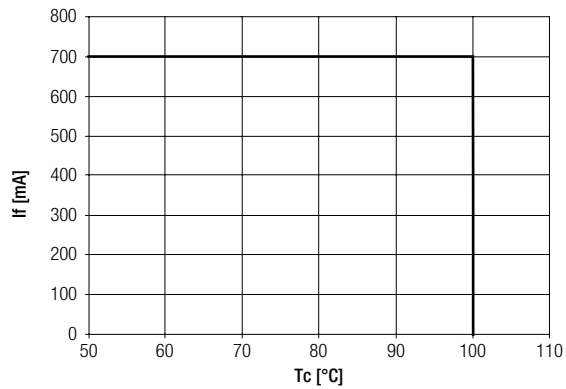
Humidity during processing of the module should be between 30 to 70 %.

2.3 Derating curves

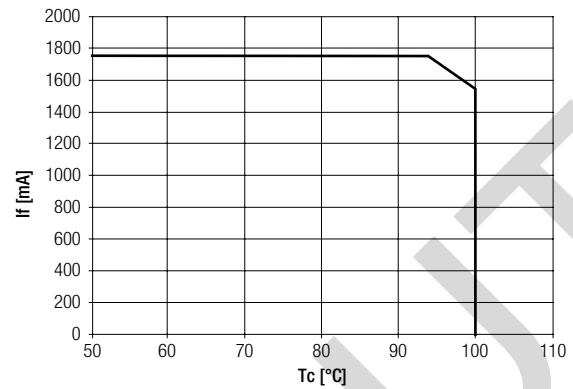
SLE G4 15mm 2000lm 927 ART EXCITE



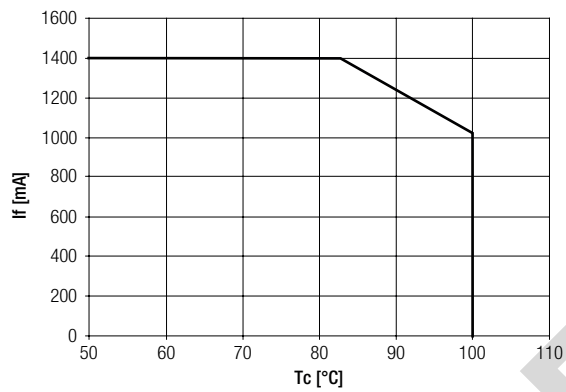
SLE G4 15mm 2000lm 930 ART EXCITE



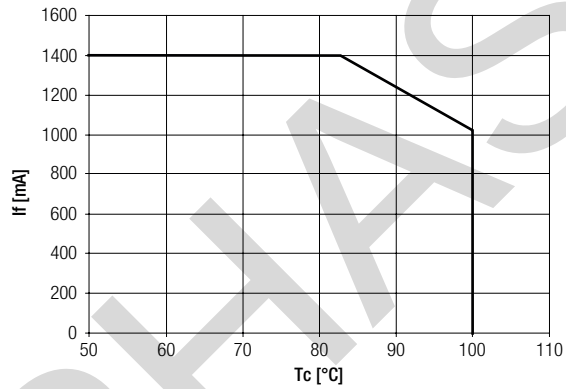
SLE G4 23mm 5000lm 930 ART EXCITE



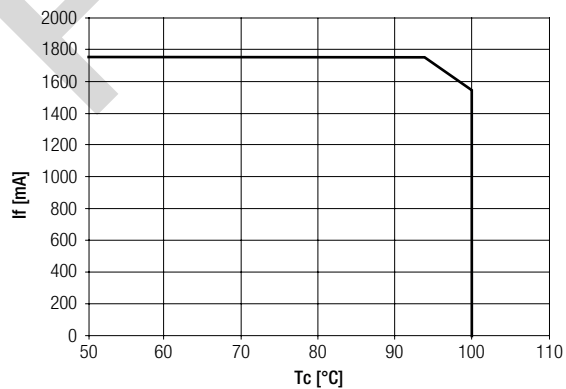
SLE G4 19mm 3000lm 927 ART EXCITE



SLE G4 19mm 3000lm 930 ART EXCITE



SLE G4 23mm 5000lm 927 ART EXCITE



2.4 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 SLE G4 will be greatly reduced or the TALEXmodule SLE G4 may be destroyed.

2.5 Heat sink values

SLE G4 15mm 2000lm 9xx ART EXCITE

ta	tp	Operating current	R _{th, hs-a}
25 °C	65 °C	350 mA	4.30 K/W
30 °C	65 °C	350 mA	3.74 K/W
40 °C	65 °C	350 mA	2.63 K/W
50 °C	65 °C	350 mA	1.53 K/W
25 °C	65 °C	500 mA	2.76 K/W
30 °C	65 °C	500 mA	2.40 K/W
40 °C	65 °C	500 mA	1.67 K/W
50 °C	65 °C	500 mA	0.95 K/W
25 °C	65 °C	700 mA	1.76 K/W
30 °C	65 °C	700 mA	1.52 K/W
40 °C	65 °C	700 mA	1.05 K/W
50 °C	65 °C	700 mA	0.57 K/W

SLE G4 19mm 3000lm 9xx ART EXCITE

ta	tp	Operating current	R _{th, hs-a}
25 °C	65 °C	500 mA	3.08 K/W
30 °C	65 °C	500 mA	2.68 K/W
40 °C	65 °C	500 mA	1.87 K/W
50 °C	65 °C	500 mA	1.07 K/W
25 °C	65 °C	1,050 mA	1.16 K/W
30 °C	65 °C	1,050 mA	1.00 K/W
40 °C	65 °C	1,050 mA	0.67 K/W
50 °C	65 °C	1,050 mA	0.35 K/W
25 °C	65 °C	1,400 mA	0.76 K/W
30 °C	65 °C	1,400 mA	0.64 K/W
40 °C	65 °C	1,400 mA	0.42 K/W
50 °C	65 °C	1,400 mA	0.20 K/W

SLE G4 23mm 5000lm 9xx ART EXCITE

ta	tp	Operating current	R _{th, hs-a}
25 °C	65 °C	700 mA	2.15 K/W
30 °C	65 °C	700 mA	1.86 K/W
40 °C	65 °C	700 mA	1.29 K/W
50 °C	65 °C	700 mA	0.72 K/W
25 °C	65 °C	1,400 mA	0.85 K/W
30 °C	65 °C	1,400 mA	0.72 K/W
40 °C	65 °C	1,400 mA	0.48 K/W
50 °C	65 °C	1,400 mA	0.23 K/W
25 °C	65 °C	1,750 mA	0.60 K/W
30 °C	65 °C	1,750 mA	0.51 K/W
40 °C	65 °C	1,750 mA	0.32 K/W
50 °C	65 °C	1,750 mA	0.14 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 SLE G4 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.

Additionally the TALEXmodule SLE G4 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 µm or a similar interface material where the quotient of layer thickness and thermal conductivity $b < 50 \text{ µmmK/W}$.

3. Installation / wiring

3.1 Electrical supply/choice of LED Driver

TALEXmodule SLE G4 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 Driver which complies with the relevant standards. The use of TALEX LED Drivers from Tridonic in combination with TALEXmodule SLE G4 guarantees the necessary protection for safe and reliable operation.

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

- Short-circuit protection
- Overload protection
- Overtemperature protection



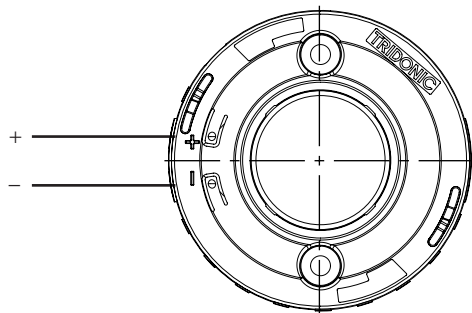
TALEXmodule SLE G4 must be supplied by a constant current LED Driver. Operation with a constant voltage LED Driver will lead to an irreversible damage of the module. Wrong polarity can damage the TALEXmodule SLE G4.



TALEXmodule SLE G4 are basic isolated up to 75 V against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED Driver (also against earth) is above 75 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.

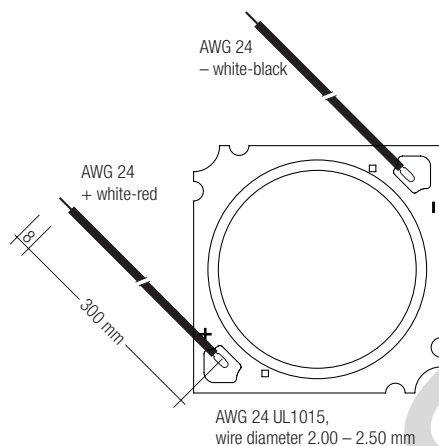
3.2 Wiring

Wiring with housing

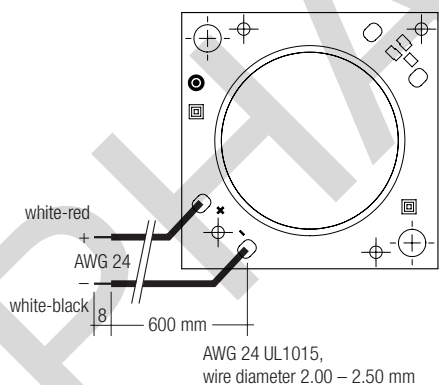


Wiring without housing

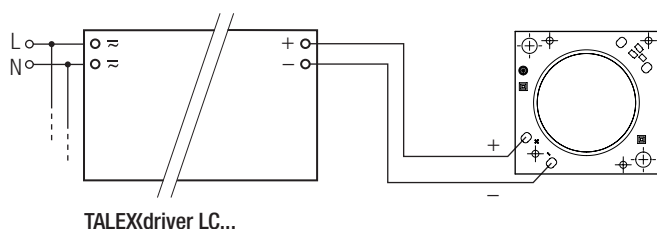
LES15



LES19 and LES23



Wiring example

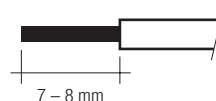


3.3 Wiring type and cross section

The wiring has to be solid cable with a cross section of 0.5 to 0.75 mm² or with stranded wire with soldered ends with a cross section of 0.5 mm². For the push-wire connection you have to strip the insulation (7 – 8 mm).

Removing wires by lightly pressing on the push button.

wire preparation:



3.4 Mounting instruction



TALEXmodule SLE G4 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 by removing all dirt, dust and grease before installing the TALEX modules.

None of the components of the TALEXmodule SLE G4 (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.



Max. torque for fixing: 0.5 Nm.

The LED 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 LED modules without housing.

For further information please refer to the brochure entitled "Technical Design-In-Guide SLE GEN4".



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.

3.5 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.

For further information for EOS/ESD safety guidelines and the ESD classification please refer to the brochure entitled <http://www.tridonic.com/esd-protection>.

4. Life-time

4.1 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 maintenance 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 initial luminous flux, respectively 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.

4.2 Lumen maintenance

SLE G4 15mm 2000lm 9xx ART EXCITE

Operating current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
350 mA	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
500 mA	65 °C	49,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	36,000 h	54,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	27,000 h	41,000 h	58,000 h	>60,000 h	>60,000 h	>60,000 h
700 mA	65 °C	40,000 h	60,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	30,000 h	44,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	22,000 h	33,000 h	47,000 h	>60,000 h	>60,000 h	>60,000 h

SLE G4 19mm 3000lm 9xx ART EXCITE

Operating current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
500 mA	65 °C	57,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	42,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	32,000 h	48,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
1,050 mA	65 °C	42,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	31,000 h	46,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	23,000 h	35,000 h	50,000 h	>60,000 h	>60,000 h	>60,000 h
1,400 mA	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

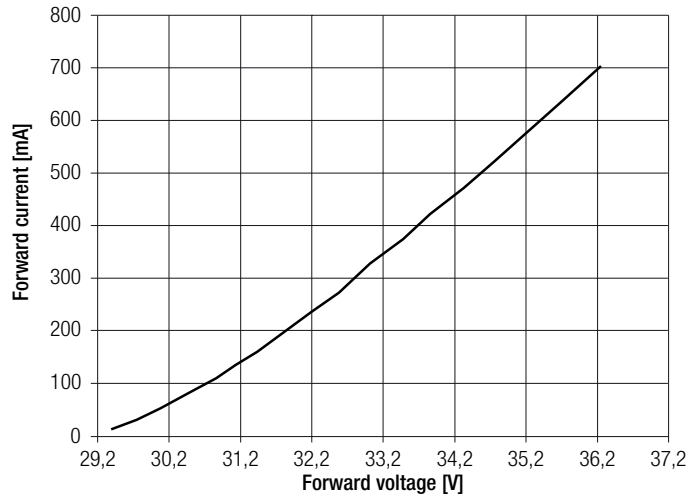
SLE G4 23mm 5000lm 9xx ART EXCITE

Operating current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
700 mA	65 °C	58,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	43,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	32,000 h	49,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
1,400 mA	65 °C	45,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	33,000 h	50,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	25,000 h	38,000 h	53,000 h	>60,000 h	>60,000 h	>60,000 h
1,750 mA	65 °C	38,000 h	58,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	29,000 h	43,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	22,000 h	32,000 h	46,000 h	>60,000 h	>60,000 h	>60,000 h

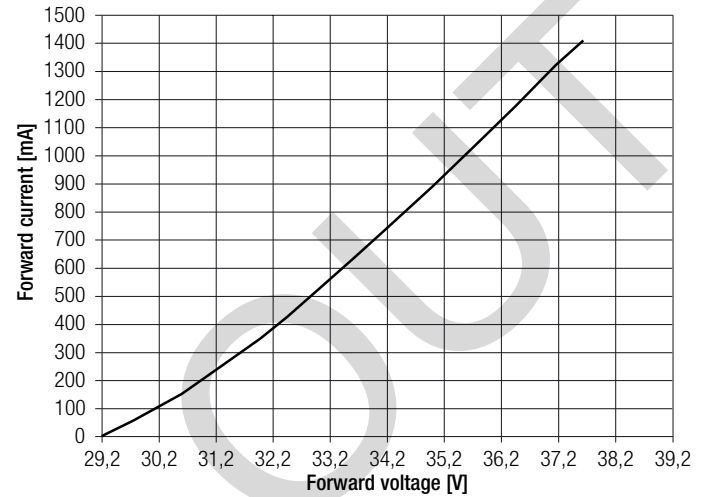
5. Electrical values

5.1 Typ. forward voltage vs. forward current at $t_p = 65^\circ\text{C}$

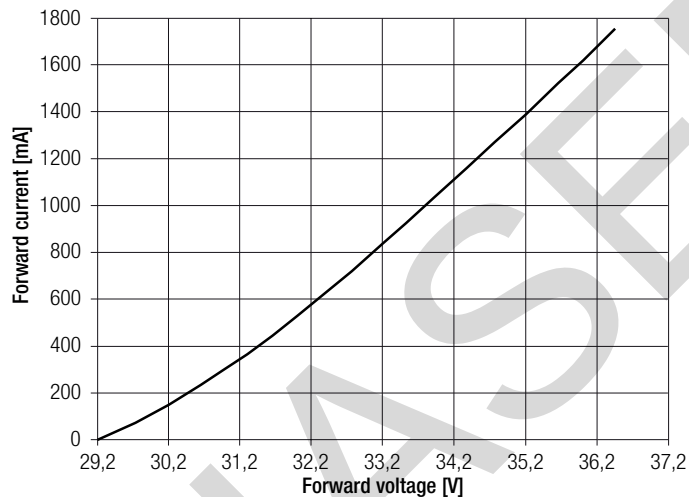
SLE G4 15mm 2000lm 9xx ART EXCITE



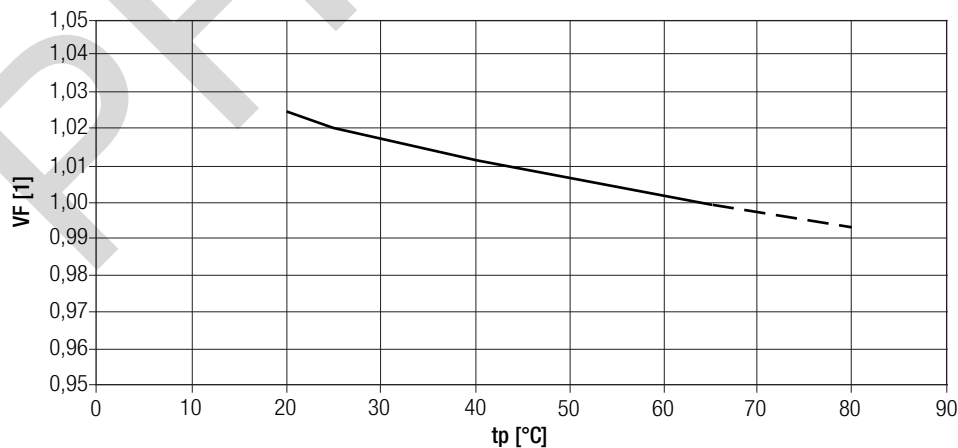
SLE G4 19mm 3000lm 9xx ART EXCITE



SLE G4 23mm 5000lm 9xx ART EXCITE



5.2 Forward voltage vs. t_p temperature



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

6. Photometric characteristics

6.1 Coordinates and tolerances according to CIE 1931

The specified colour coordinates are measured integral after a settling time of 100 ms. The current impulse depends on the module type.

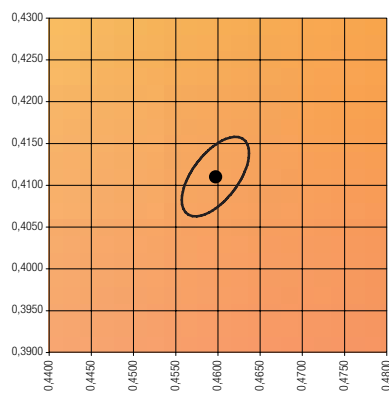
Module type	Current impulse
TALEXmodule SLE G4 15mm 2000lm 9xx ART EXC	500 mA
TALEXmodule SLE G4 19mm 3000lm 9xx ART EXC	1,050 mA
TALEXmodule SLE G4 23mm 5000lm 9xx ART EXC	1,400 mA

The ambient temperature of the measurement is $t_a = 25\text{ }^{\circ}\text{C}$.

The measurement tolerance of the colour coordinates are ± 0.01 .

2,700 K

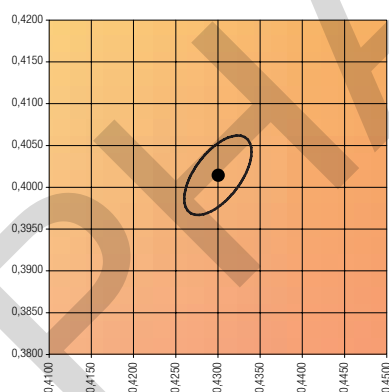
	x0	y0
Centre	0.4599	0.4106



MacAdam ellipse: 2SDCM

3,000 K

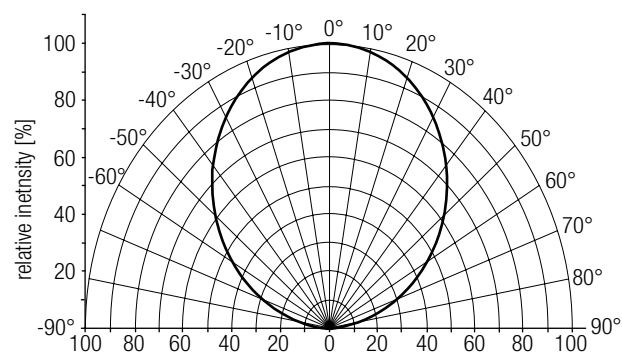
	x0	y0
Centre	0.4300	0.4016



MacAdam ellipse: 2SDCM

6.2 Light distribution

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



For further information see Design-in Guide, 3D data and photometric data on www.tridonic.com or on request.

6.3 Relative luminous flux vs. tp temperature

