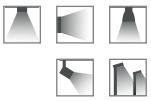


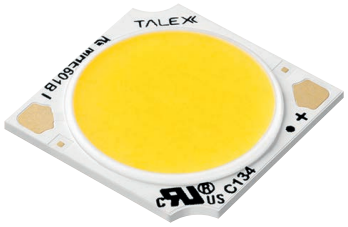
Module SLE G6 TINGE EXC
Module SLE EXCITE

Product description

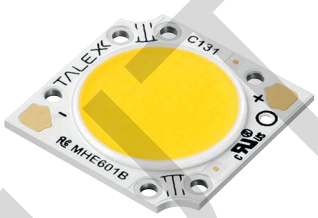
- For spotlights and downlights
- Luminous flux up to 4,220 lm at tp = 65 °C
- High colour consistency (MacAdam 3)
- Small LES (light emitting surface) diameter enables small beam angle for spotlights
- Excellent thermal management by COB technology
- Uniform radiation with Dam&Fill technology
- Integrated LED module
- Cooling required
- Flexible operating modes
- 5-year guarantee

Standards, page 3

Colour temperatures and tolerances, page 7



LES17



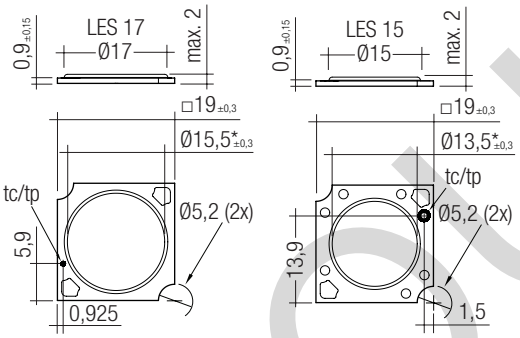
LES15

RoHS

Module SLE G6 TINGE EXC
Module SLE EXCITE

Technical data

Beam characteristic	115°
Ambient temperature range	-25 … +50 °C
tp rated	65 °C
tc①	Up to 100 °C
Max. allowed Silicontemperature	150 °C
Irated for LES15	500 mA
Irated for LES17	900 mA
Imax for LES15	900 mA
Imax for LES17	1,200 mA
Max. DC forward current for LES15②	1,200 mA
Max. DC forward current for LES17②	1,440 mA
Max. permissible LF current ripple for LES15	1,200 mA
Max. permissible LF current ripple for LES17	1,440 mA
Max. permissible peak current for LES15	1,800 mA / max. 8 ms
Max. permissible peak current for LES17	2,160 mA / max. 8 ms
Max. working voltage for insulation for LES15③	50 V
Max. working voltage for insulation for LES17③	50 V
Insulation test voltage for LES15	0.5 kV
Insulation test voltage for LES17	0.5 kV
CTI of the printed circuit board	< 600 V
ESD classification	Severity level 4
Risk group (EN 62471:2008) for LES15	RG1
Risk group (EN 62471:2008) for LES17	RG1
Type of protection	IP00



Dimensions in mm, *optical LES

Ordering data

Type	Article number	Colour temperature	Connection cable	Packaging	Weight per pc.
SLE G6 15mm 3000lm 930 Tinge R EXC	**28001958**	3,000 K	no	25 pc(s).	0.001 kg
SLE G6 17mm 4000lm 930 Tinge R EXC	**28001717**	3,000 K	no	25 pc(s).	0.001 kg

Specific technical data

Type⑦	Photo-metric code	Forward current	Luminous flux at tp = 25 °C④	Luminous flux at tp = 65 °C④	Power consumption④ ⑥	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 °C⑤	Colour rendering index CRI
SLE 15mm 3000lm – Operating mode HE at 350 mA											
SLE G6 15mm 3000lm 930 Tinge EXC	930/349	350 mA	1,480 lm	1,410 lm	12.2 W	31.8 V	38.6 V	120 lm/W	115 lm/W	104 lm/W	> 90
SLE 15mm 3000lm – Operating mode NM at 500 mA											
SLE G6 15mm 3000lm 930 Tinge EXC	930/349	500 mA	2,030 lm	1,930 lm	17.8 W	32.7 V	39.7 V	113 lm/W	108 lm/W	97 lm/W	> 90
SLE 15mm 3000lm – Operating mode HO at 900 mA											
SLE G6 15mm 3000lm 930 Tinge EXC	930/349	900 mA	3,330 lm	3,160 lm	34.8 W	35.4 V	43.0 V	95 lm/W	90 lm/W	81 lm/W	> 90
SLE 17mm 4000lm – Operating mode HE at 500 mA											
SLE G6 17mm 4000lm 930 Tinge EXC	930/349	500 mA	2,140 lm	2,010 lm	17.4 W	31.8 V	38.7 V	121 lm/W	116 lm/W	104 lm/W	> 90
SLE 17mm 4000lm – Operating mode NM at 900 mA											
SLE G6 17mm 4000lm 930 Tinge EXC	930/349	900 mA	3,510 lm	3,350 lm	33.5 W	34.1 V	41.4 V	102 lm/W	100 lm/W	90 lm/W	> 90
SLE 17mm 4000lm – Operating mode HO at 1,200 mA											
SLE G6 17mm 4000lm 930 Tinge EXC	930/349	1,200 mA	4,490 lm	4,220 lm	46.8 W	35.7 V	43.4 V	95 lm/W	90 lm/W	81 lm/W	> 90

① See derating curves in data sheet section 2.3.

② Max. DC forward current varies over the temperature of the LED module. See derating curves in data sheet section 2.3.

③ The detailed explanation, see data sheet section 3.1.

④ Tolerance range for optical and electrical data: ±10 %.

⑤ Assumed efficiency for the LED Driver is 0.9.

⑥ All values at tp = 65 °C.

⑦ HE … high efficiency, NM … nominal mode, HO … high output.

1. Standards

EN 62031
EN 62471
IEC 62717
IEC 61000-4-2
UL 8750 - certificate number: E366084

1.1 Glow wire test

according to EN 62031 with increased temperature of 850 °C passed.

1.2 Photometric code

Key for photometric code, e. g. 830 / 359

1st digit		2nd + 3rd digit	4th digit	5th digit	6th digit	
Code	CRI	Colour temperature in Kelvin x 100	McAdam initial	McAdam after 25% of the life-time (max.6000h)	Luminous flux after 25% of the life-time (max.6000h)	
					Code	Luminous flux
7	70 – 79				7	≥ 70 %
8	80 – 89				8	≥ 80 %
9	≥90				9	≥ 90 %

1.3 Energy classification

Type	Forward current	Energy classification
SLE G6 15mm 3000lm 930 Tinge EXC	350 mA	A+
	500 mA	A+
	900 mA	A+
SLE G6 17mm 4000lm 930 Tinge EXC	500 mA	A+
	900 mA	A+
	1,200 mA	A+

2. Thermical details

2.1 tp point, ambient temperature and life-time

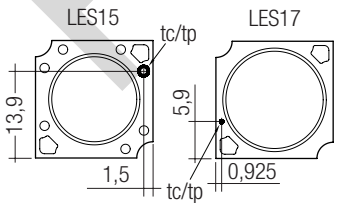
The temperature at tp reference point is crucial for the light output and life-time of a LED product.

For SLE G6 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.

The tc and tp temperature of LED modules from Tridonic are measured at the same reference point.

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.



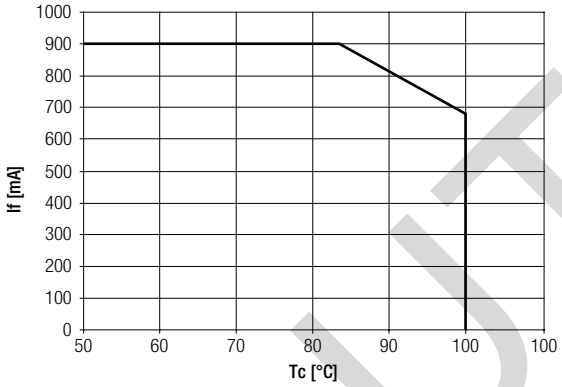
2.2 Storage and humidity

storage temperature	-30 … +80 °C

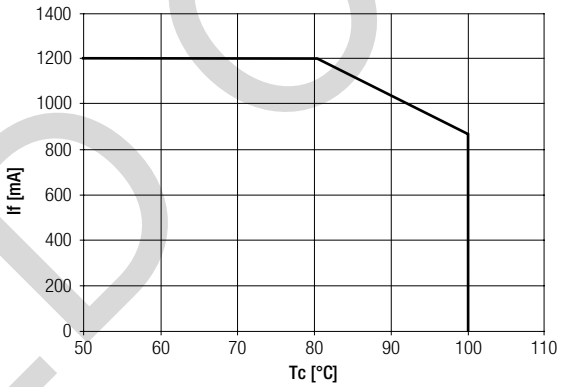
Operation only in non condensing environment.
Humidity during processing of the module should be between 30 to 70 %.

2.3 Derating curves

SLE G6 15mm 3000lm 930 Tinge EXC



SLE G6 17mm 4000lm 930 Tinge EXC



2.4 Thermal design and heat sink

The rated life of LED products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the SLE G6 will be greatly reduced or the SLE G6 may be destroyed.

2.5 Heat sink values

SLE G6 15mm 3000lm 930 Tinge EXC

ta	tp	Operating current	$R_{th, hs-a}$
25 °C	65 °C	350 mA	5.69 K/W
30 °C	65 °C	350 mA	4.98 K/W
40 °C	65 °C	350 mA	3.56 K/W
50 °C	65 °C	350 mA	2.13 K/W
25 °C	65 °C	500 mA	3.70 K/W
30 °C	65 °C	500 mA	3.23 K/W
40 °C	65 °C	500 mA	2.31 K/W
50 °C	65 °C	500 mA	1.39 K/W
25 °C	65 °C	900 mA	1.71 K/W
30 °C	65 °C	900 mA	1.50 K/W
40 °C	65 °C	900 mA	1.07 K/W
50 °C	65 °C	900 mA	0.64 K/W

SLE G6 17mm 4000lm 930 Tinge EXC

ta	tp	Operating current	$R_{th, hs-a}$
25 °C	65 °C	500 mA	3.92 K/W
30 °C	65 °C	500 mA	3.43 K/W
40 °C	65 °C	500 mA	2.45 K/W
50 °C	65 °C	500 mA	1.47 K/W
25 °C	65 °C	900 mA	2.58 K/W
30 °C	65 °C	900 mA	2.25 K/W
40 °C	65 °C	900 mA	1.61 K/W
50 °C	65 °C	900 mA	0.97 K/W
25 °C	65 °C	1,200 mA	1.26 K/W
30 °C	65 °C	1,200 mA	1.10 K/W
40 °C	65 °C	1,200 mA	0.79 K/W
50 °C	65 °C	1,200 mA	0.47 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 SLE G6 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.
Additionally the SLE G6 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 λ > 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.

3. Installation / wiring

3.1 Electrical supply/choice of LED Driver

SLE G6 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 LED Drivers from Tridonic in combination with SLE G6 guarantees the necessary protection for safe and reliable operation.

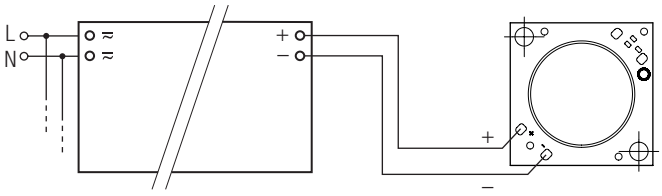
If a LED Driver other than Tridonic is used, it must provide the following protection:
- Short-circuit protection
- Overload protection
- Overtemperature protection

SLE G6 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 SLE G6.

SLE G6 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 Driver (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.

3.2 Wiring

Wiring example



TALEXdriver LC...

3.4 Mounting instruction

SLE G6 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 LED modules.

None of the components of the SLE G6 (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 to the brochure entitled "Technical Design-In-Guide SLE GEN6".

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 guidlines 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 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.

4.2 Lumen maintenance

Life-time declarations are informative and represent no warranty claim. Preliminary calculated lifetime data until LM80 test reports are available.

SLE G6 15mm 3000lm 930 Tinge EXC

Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
350 mA	65 °C	51,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	44,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	39,000 h	58,000 h	>60,000 h	>60,000 h
500 mA	65 °C	48,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	42,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	37,000 h	55,000 h	58,000 h	>60,000 h
900 mA	65 °C	39,000 h	59,000 h	>60,000 h	>60,000 h
	75 °C	34,000 h	51,000 h	54,000 h	>60,000 h
	85 °C	30,000 h	45,000 h	48,000 h	>60,000 h

SLE G6 17mm 4000lm 930 Tinge EXC

Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
500 mA	65 °C	49,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	43,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	38,000 h	57,000 h	>60,000 h	>60,000 h
700 mA	65 °C	46,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	40,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	35,000 h	53,000 h	56,000 h	>60,000 h
1,200 mA	65 °C	37,000 h	55,000 h	59,000 h	>60,000 h
	75 °C	32,000 h	48,000 h	51,000 h	>60,000 h
	85 °C	28,000 h	42,000 h	45,000 h	>60,000 h

5. Electrical values

5.1 Declaration of electrical parameters

Irated ... Nominal operating current the module is designed for.

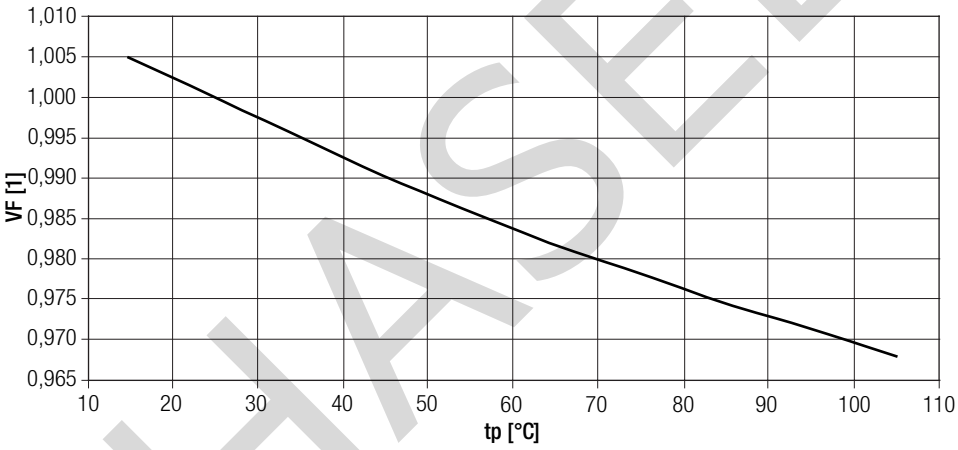
Imax ... Max. permissible continuous operating current.

Max. DC forward current ... Max. permissible continuous operating current incl. the tolerances of the LED Driver. LED module may be destroyed if this value is exceeded.

Max. permissible LF current ripple ... Max. output current of the LED Driver incl. Tolerances and LF current ripple must not exceed this value.

Max. permissible peak current ... The max. output peak current of the LED Driver must not exceed this value.

5.2 Forward voltage vs. tp temperature



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

6. Photometric charcteristics

6.1 Coordinates and tolerances according to CIE 1931

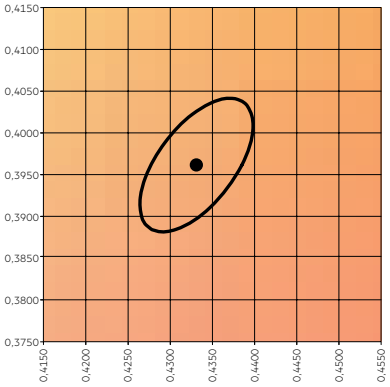
The specified colour coordinates are measured integral after a settling time of 100 ms. The current impuls depends on the module type.

Module type	Current impulse
SLE G6 15mm 3000lm 930 Tinge EXC	500 mA
SLE G6 17mm 4000lm 930 Tinge EXC	900 mA

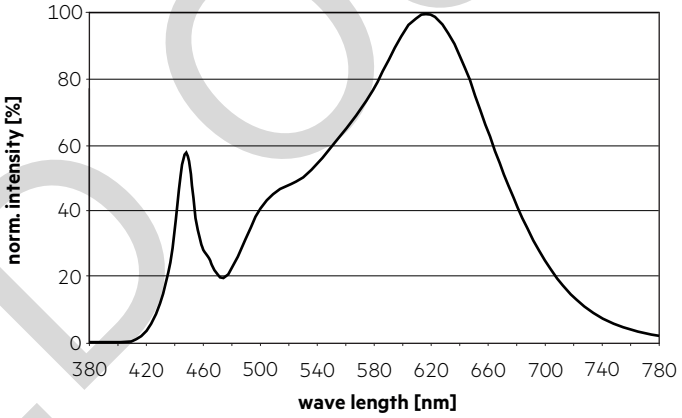
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

3,000 K

	x0	y0
Centre	0.4330	0.3960

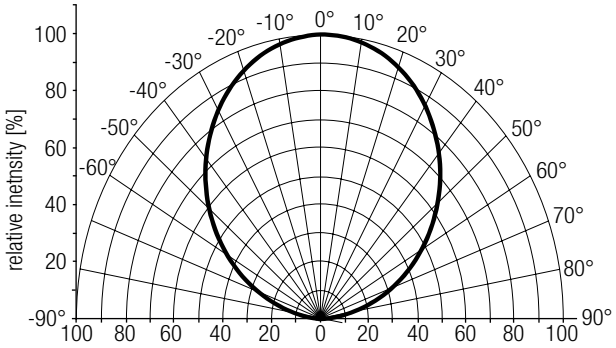


MacAdam ellipse: 3SDCM



6.2 Light distribution

The optical design of the SLE product line ensures optimum homogenity 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