



Module SLE G5 ART EXC

Modules SLE EXCITE

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
- 50 mm housing with 35 mm mounting hole distance acc. to Zhaga
- Luminous flux up to 6,100 lm at $t_p = 65\text{ }^\circ\text{C}$
- High efficacy up to 122 lm/W for the LED module at $t_p = 25\text{ }^\circ\text{C}$
- High system efficacy up to 110 lm/W at $t_p = 65\text{ }^\circ\text{C}$
- High colour consistency (MacAdam 2)
- 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 3

Colour temperatures and tolerances, page 8



LES19 + LES23 with housing



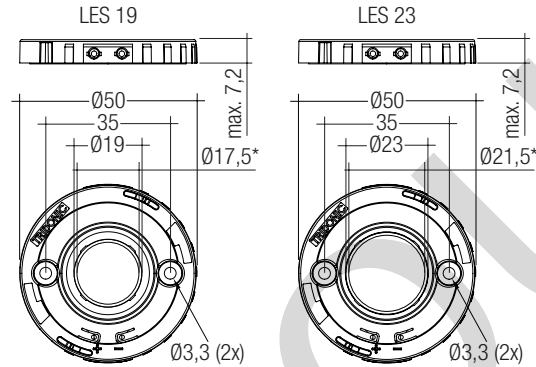


Module SLE G5 ART EXC

Modules SLE EXCITE

Technical data

Beam characteristic	115°
Ambient temperature range	-25 ... +50 °C
tp rated	65 °C
tc ^①	Up to 100 °C
Max. allowed Silicontemperature / Tjunction_max	150 °C / 140 °C
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 LES19	1,680 mA
Max. permissible LF current ripple for LES23	2,400 mA
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. working voltage for insulation nonSELV ^③	50 V
Max. working voltage for insulation SELV for	75 V
LES19, LES23 ^④	
Insulation test voltage	0.5 kV
ESD classification	Severity level 4
Risk group (EN 62471:2008) for LES19	RG1
Risk group (EN 62471:2008) for LES23	RG1
Type of protection	IP00



Dimensions in mm, *optische LES

Ordering data

Type	Article number	Colour temperature	Housing	Connection cable	Packaging	Weight per pc.
SLE G5 19mm 5000lm 927 ART H EXC	89602281	2,700 K	yes	no	50 pc(s).	0.009 kg
SLE G5 19mm 5000lm 930 ART H EXC	89602282	3,000 K	yes	no	50 pc(s).	0.009 kg
SLE G5 23mm 6000lm 927 ART H EXC	89602283	2,700 K	yes	no	50 pc(s).	0.009 kg
SLE G5 23mm 6000lm 930 ART H EXC	89602284	3,000 K	yes	no	50 pc(s).	0.009 kg

Specific technical data

Type ^⑤	Photo-metric code	Forward current	Luminous flux at tp = 25 °C ^⑥	Luminous flux at tp = 65 °C ^⑥	Power consumption ^⑦	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 system efficacy at tp = 65 °C ^⑧	Colour rendering index CRI
SLE 19mm 5000lm – Operating mode HE at 500 mA											
SLE G5 19mm 5000lm 927 ART EXC	927/249	500 mA	1,930 lm	1,850 lm	16.6 W	31.0 V	36.1 V	114 lm/W	111 lm/W	100 lm/W	98
SLE G5 19mm 5000lm 930 ART EXC	930/249	500 mA	2,090 lm	1,960 lm	16.6 W	31.0 V	36.1 V	124 lm/W	118 lm/W	106 lm/W	98
SLE 19mm 5000lm – Operating mode NM at 1,050 mA											
SLE G5 19mm 5000lm 927 ART EXC	927/249	1,050 mA	3,700 lm	3,450 lm	38.4 W	34.1 V	39.8 V	95 lm/W	90 lm/W	81 lm/W	98
SLE G5 19mm 5000lm 930 ART EXC	930/249	1,050 mA	4,020 lm	3,680 lm	38.4 W	34.1 V	39.8 V	103 lm/W	96 lm/W	86 lm/W	98
SLE 19mm 5000lm – Operating mode HO at 1,400 mA											
SLE G5 19mm 5000lm 927 ART EXC	927/249	1,400 mA	4,650 lm	4,240 lm	54.0 W	36.0 V	41.8 V	85 lm/W	79 lm/W	71 lm/W	98
SLE G5 19mm 5000lm 930 ART EXC	930/249	1,400 mA	5,060 lm	4,560 lm	54.0 W	36.0 V	41.8 V	93 lm/W	84 lm/W	76 lm/W	98
SLE 23mm 6000lm – Operating mode HE at 700 mA											
SLE G5 23mm 6000lm 927 ART EXC	927/249	700 mA	2,820 lm	2,600 lm	23.3 W	30.9 V	36.0 V	119 lm/W	112 lm/W	100 lm/W	98
SLE G5 23mm 6000lm 930 ART EXC	930/249	700 mA	2,970 lm	2,840 lm	23.3 W	30.9 V	36.0 V	125 lm/W	122 lm/W	110 lm/W	98
SLE 23mm 6000lm – Operating mode NM at 1,400 mA											
SLE G5 23mm 6000lm 927 ART EXC	927/249	1,400 mA	5,190 lm	4,700 lm	50.7 W	33.7 V	39.3 V	101 lm/W	93 lm/W	83 lm/W	98
SLE G5 23mm 6000lm 930 ART EXC	930/249	1,400 mA	5,480 lm	5,150 lm	50.7 W	33.7 V	39.3 V	107 lm/W	102 lm/W	91 lm/W	98
SLE 23mm 6000lm – Operating mode HO at 1,750 mA											
SLE G5 23mm 6000lm 927 ART EXC	927/249	1,750 mA	6,240 lm	5,570 lm	65.8 W	35.0 V	40.7 V	93 lm/W	85 lm/W	76 lm/W	98
SLE G5 23mm 6000lm 930 ART EXC	930/249	1,750 mA	6,580 lm	6,100 lm	65.8 W	35.0 V	40.7 V	98 lm/W	93 lm/W	83 lm/W	98

^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.

Unique light quality – listing of the Ri values

Colour temperature	Ra8	Ra14	Ri01	Ri02	Ri03	Ri04	Ri05	Ri06	Ri07	Ri08	Ri09	Ri10	Ri11	Ri12	Ri13	Ri14
2,700 K	97	97	97	99	95	94	97	98	98	99	99	99	91	98	98	96
3,000 K	98	97	98	99	94	96	99	98	98	98	99	97	94	92	99	96

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. 927 / 249

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

1.3 Energy classification

Type	Forward current	Energy classification
SLE G5 19mm 5000lm 927 ART EXC	500 mA	A+
	1.050 mA	A+
	1.400 mA	A
SLE G5 19mm 5000lm 930 ART EXC	500 mA	A+
	1.050 mA	A+
	1.400 mA	A
SLE G5 23mm 6000lm 927 ART EXC	700 mA	A+
	1.050 mA	A+
	1.400 mA	A
SLE G5 23mm 6000lm 930 ART EXC	700 mA	A+
	1.050 mA	A+
	1.400 mA	A+

2. Thermal details

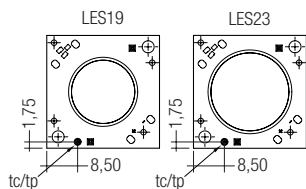
2.1 tp point, ambient temperature and life-time

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

For SLE G5 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.



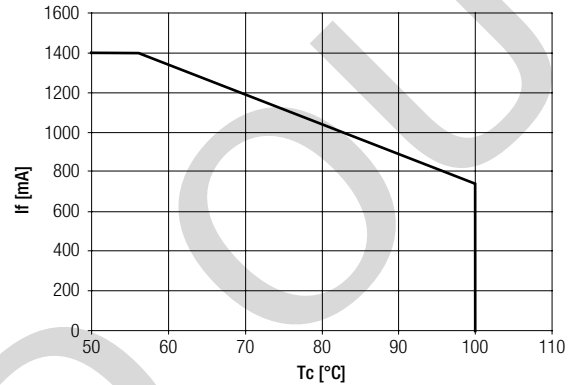
2.2 Storage and humidity

storage temperature	-30...+80 °C
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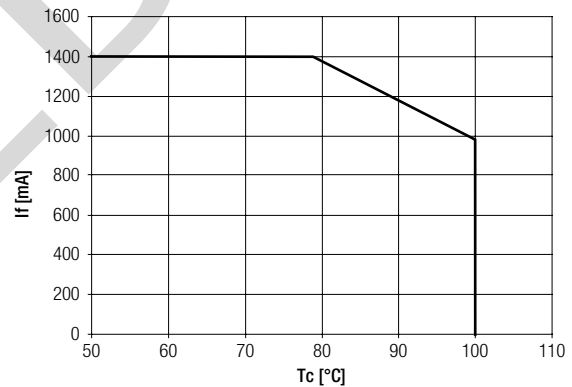
Operation only in non condensing environment.
 Humidity during processing of the module should be between 30 to 70 %.

2.3 Derating curves

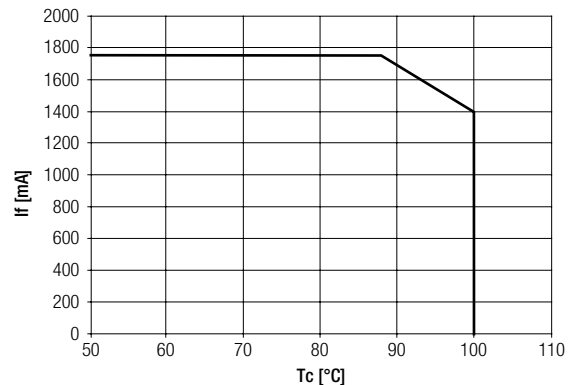
SLE G5 19mm 5000lm 927 ART EXC



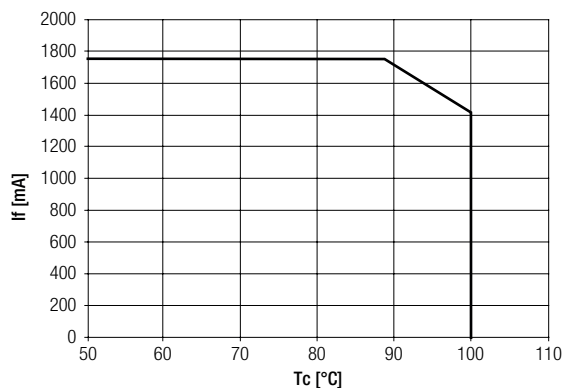
SLE G5 19mm 5000lm 930 ART EXC



SLE G5 23mm 6000lm 927 ART EXC



SLE G5 23mm 6000lm 930 ART 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 G5 will be greatly reduced or the SLE G5 may be destroyed.

2.5 Heat sink values

SLE G5 19mm 5000lm ART EXCITE

ta	tp	Operating current	R _{th, hs-a}
25°C	65°C	500 mA	4.12 K/W
30°C	65°C	500 mA	3.60 K/W
40°C	65°C	500 mA	2.56 K/W
50°C	65°C	500 mA	1.51 K/W
25°C	65°C	1,050 mA	1.53 K/W
30°C	65°C	1,050 mA	1.34 K/W
40°C	65°C	1,050 mA	0.94 K/W
50°C	65°C	1,050 mA	0.54 K/W
25°C	65°C	1,400 mA	1.02 K/W
30°C	65°C	1,400 mA	0.88 K/W
40°C	65°C	1,400 mA	0.61 K/W
50°C	65°C	1,400 mA	0.34 K/W

SLE G5 23mm 6000lm ART EXCITE

ta	tp	Operating current	R _{th, hs-a}
25°C	65°C	700 mA	2.98 K/W
30°C	65°C	700 mA	2.60 K/W
40°C	65°C	700 mA	1.84 K/W
50°C	65°C	700 mA	1.08 K/W
25°C	65°C	1,400 mA	1.18 K/W
30°C	65°C	1,400 mA	1.02 K/W
40°C	65°C	1,400 mA	0.71 K/W
50°C	65°C	1,400 mA	0.41 K/W
25°C	65°C	1,750 mA	0.85 K/W
30°C	65°C	1,750 mA	0.74 K/W
40°C	65°C	1,750 mA	0.51 K/W
50°C	65°C	1,750 mA	0.28 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 G5 and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.

Additionally the SLE G5 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 $b < 50 \mu\text{mmK/W}$.

3. Installation / wiring

3.1 Electrical supply/choice of LED Driver

SLE G5 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 G5 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



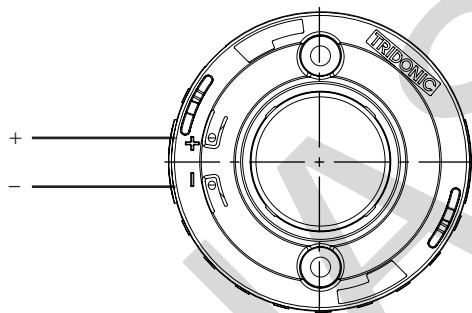
SLE G5 must be supplied by a constant current LED Driver. Operation with a constant voltage LED Driver will lead to an irreversible damage of the module. Wrong polarity can damage the SLE G5.



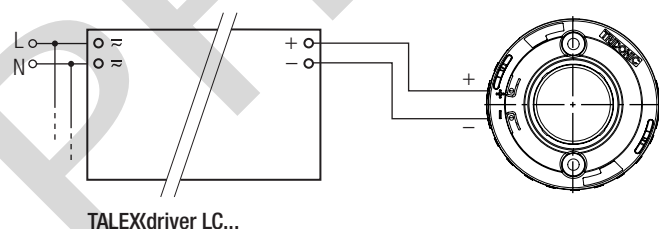
SLE G5 are basic isolated up to 75 V SELV (LES19 and LES23) / 50 V nonSELV against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED Driver (also against earth) is above 75 V SELV (LES19 and LES23) / 50 V nonSELV, an additional isolation 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



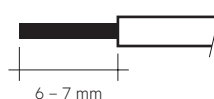
3.3 Wiring type and cross section

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 (6 – 7 mm).

Loosen wire through twisting and pulling.

wire preparation:



3.4 Mounting instruction



SLE G5 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 G5 (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 GEN5".



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 to 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

Life-time declarations are informative and represent no warranty claim.

SLE G5 19mm 5000lm ART EXCITE

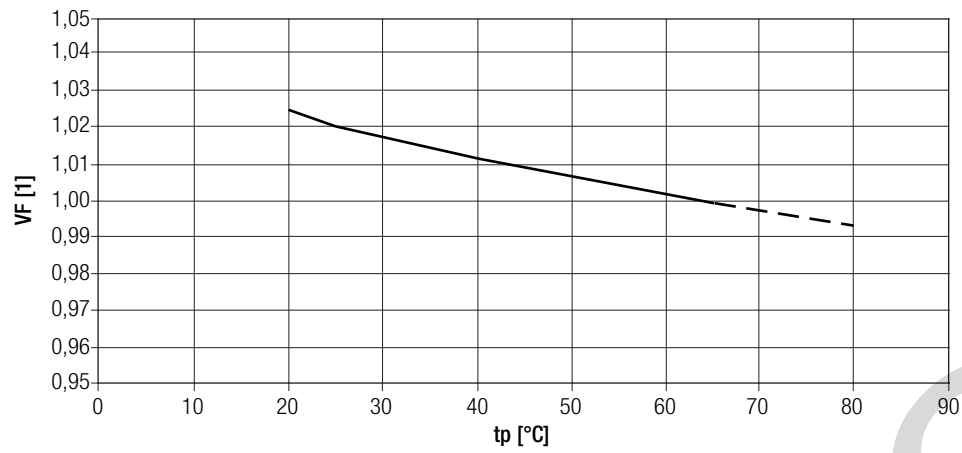
Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
500 mA	65 °C	51,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	44,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	39,000 h	58,000 h	>60,000 h	>60,000 h
1,050 mA	65 °C	42,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	37,000 h	55,000 h	59,000 h	>60,000 h
	85 °C	32,000 h	49,000 h	52,000 h	>60,000 h
1,400 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

SLE G5 23mm 6000lm ART EXCITE

Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
700 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
1,400 mA	65 °C	43,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	38,000 h	57,000 h	>60,000 h	>60,000 h
	85 °C	33,000 h	50,000 h	53,000 h	>60,000 h
1,750 mA	65 °C	40,000 h	59,000 h	>60,000 h	>60,000 h
	75 °C	35,000 h	52,000 h	55,000 h	>60,000 h
	85 °C	30,000 h	46,000 h	49,000 h	>60,000 h

5. Electrical values

5.1 Forward voltage vs. tp 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 impuls depends on the module type.

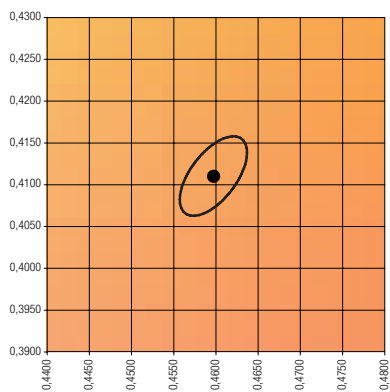
Module type	Current impulse
TALEXmodule SLE G5 19mm 5000lm ART EXC	1,050 mA
TALEXmodule SLE G5 23mm 6000lm ART EXC	1,400 mA

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

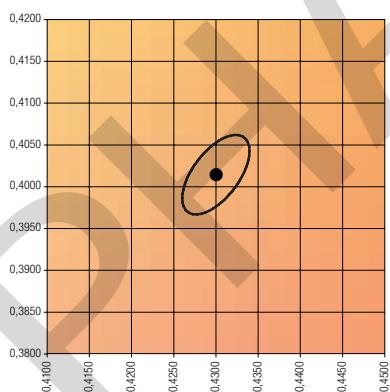
	x0	y0
Centre	0.4599	0.4106



MacAdam ellipse: 2SDCM

3,000 K

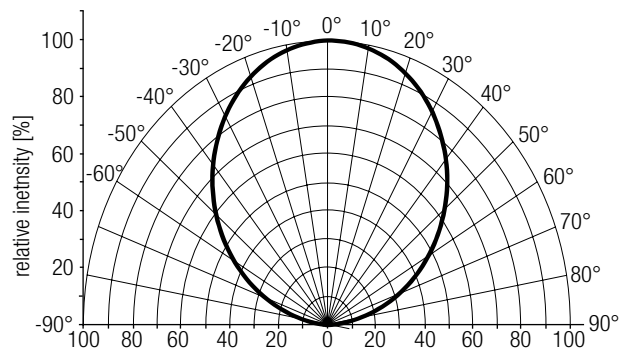
	x0	y0
Centre	0.4300	0.4016



MacAdam ellipse: 2SDCM

6.2 Light distribution

The optical design of the 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

