Module SLE G5 FOOD EXC

Modules SLE EXCITE

Product description

- Application specific colours for attractive product presentation
- For spotlights and downlights
- ENEC+ for all module types
- 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 6,350 lm at tp = 65 °C
- High colour consistency
- 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

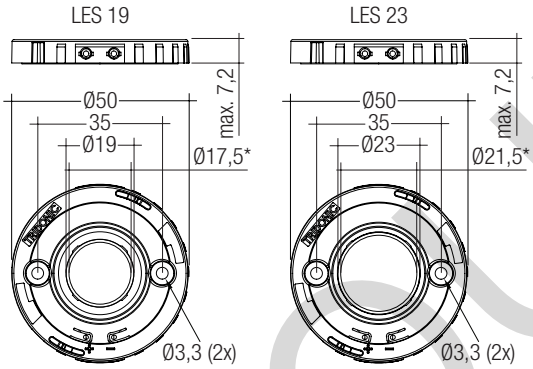
LES19 + LES23 with housing

RoHS

Module SLE G5 FOOD 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 LES19, LES23[3]	75 V
Insulation test voltage	0.5 kV
ESD classification	Severity level 4
Risk group (EN 62471:2008) for LES19 (FISH)	RG2 at d = 200 mm, RG1 at d ≥ 2 m
Risk group (EN 62471:2008) for LES19 (GOLD, GOLD+, MEAT+, FRESH MEAT)	RG1
Risk group (EN 62471:2008) for LES23	RG1
Type of protection	IP00



Dimensions in mm, *optical LES

Ordering data

Type	Article number	Housing	Connection cable	Packaging	Weight per pc.
SLE G5 19mm 5000lm FISH H EXC	**89602293**	yes	no	50 pc(s).	0.009 kg
SLE G5 19mm 5000lm GOLD H EXC	**89602287**	yes	no	50 pc(s).	0.009 kg
SLE G5 19mm 5000lm GOLD+ H EXC	**89602288**	yes	no	50 pc(s).	0.009 kg
SLE G5 19mm 5000lm MEAT+ H EXC	**89602285**	yes	no	50 pc(s).	0.009 kg
SLE G5 19mm 5000lm FRESH MEAT H EXC	**89602286**	yes	no	50 pc(s).	0.009 kg
SLE G5 23mm 6000lm FISH H EXC	**89602294**	yes	no	50 pc(s).	0.009 kg
SLE G5 23mm 6000lm GOLD H EXC	**89602290**	yes	no	50 pc(s).	0.009 kg
SLE G5 23mm 6000lm GOLD+ H EXC	**89602291**	yes	no	50 pc(s).	0.009 kg
SLE G5 23mm 6000lm MEAT+ H EXC	**89602292**	yes	no	50 pc(s).	0.009 kg
SLE G5 23mm 6000lm FRESH MEAT H EXC	**89602289**	yes	no	50 pc(s).	0.009 kg

Specific technical data

Type[7] [8]	Forward current	Luminous flux at tp = 25 °C[4]	Luminous flux at tp = 65 °C[4]	Power consumption[4] [6]	Min. forward voltage at tp = 65 °C	Max. forward voltage at tp = 25 °C
SLE 19mm 5000lm – Operating mode HE at 500 mA						
SLE G5 19mm 5000lm FISH EXC	500 mA	2,260 lm	2,110 lm	16.6 W	31.0 V	36.1 V
SLE G5 19mm 5000lm GOLD EXC	500 mA	2,210 lm	2,100 lm	16.6 W	31.0 V	36.1 V
SLE G5 19mm 5000lm GOLD+ EXC	500 mA	1,570 lm	1,440 lm	16.6 W	31.0 V	36.1 V
SLE G5 19mm 5000lm MEAT+ EXC	500 mA	1,470 lm	1,360 lm	16.6 W	31.0 V	36.1 V
SLE G5 19mm 5000lm FRESH MEAT EXC	500 mA	1,440 lm	1,330 lm	16.6 W	31.0 V	36.1 V
SLE 19mm 5000lm – Operating mode NM at 1,050 mA						
SLE G5 19mm 5000lm FISH EXC	1,050 mA	4,370 lm	3,990 lm	38.4 W	34.1 V	39.8 V
SLE G5 19mm 5000lm GOLD EXC	1,050 mA	4,210 lm	3,900 lm	38.4 W	34.1 V	39.8 V
SLE G5 19mm 5000lm GOLD+ EXC	1,050 mA	3,000 lm	2,640 lm	38.4 W	34.1 V	39.8 V
SLE G5 19mm 5000lm MEAT+ EXC	1,050 mA	2,810 lm	2,540 lm	38.4 W	34.1 V	39.8 V
SLE G5 19mm 5000lm FRESH MEAT EXC	1,050 mA	2,790 lm	2,510 lm	38.4 W	34.1 V	39.8 V
SLE 19mm 5000lm – Operating mode HO at 1,400 mA						
SLE G5 19mm 5000lm FISH EXC	1,400 mA	5,530 lm	4,950 lm	54.0 W	36.0 V	41.8 V
SLE G5 19mm 5000lm GOLD EXC	1,400 mA	5,280 lm	4,800 lm	54.0 W	36.0 V	41.8 V
SLE G5 19mm 5000lm GOLD+ EXC	1,400 mA	3,770 lm	3,190 lm	54.0 W	36.0 V	41.8 V
SLE G5 19mm 5000lm MEAT+ EXC	1,400 mA	3,530 lm	3,130 lm	54.0 W	36.0 V	41.8 V
SLE G5 19mm 5000lm FRESH MEAT EXC	1,400 mA	3,530 lm	3,125 lm	54.0 W	36.0 V	41.8 V
SLE 23mm 6000lm – Operating mode HE at 700 mA						
SLE G5 23mm 6000lm FISH EXC	700 mA	3,230 lm	2,980 lm	23.3 W	30.9 V	36.0 V
SLE G5 23mm 6000lm GOLD EXC	700 mA	3,110 lm	2,960 lm	23.3 W	30.9 V	36.0 V
SLE G5 23mm 6000lm GOLD+ EXC	700 mA	2,230 lm	2,030 lm	23.3 W	30.9 V	36.0 V
SLE G5 23mm 6000lm MEAT+ EXC	700 mA	2,020 lm	1,860 lm	23.3 W	30.9 V	36.0 V
SLE G5 23mm 6000lm FRESH MEAT EXC	700 mA	2,010 lm	1,860 lm	23.3 W	30.9 V	36.0 V
SLE 23mm 6000lm – Operating mode NM at 1,400 mA						
SLE G5 23mm 6000lm FISH EXC	1,400 mA	5,950 lm	5,350 lm	50.7 W	33.7 V	39.3 V
SLE G5 23mm 6000lm GOLD EXC	1,400 mA	5,710 lm	5,350 lm	50.7 W	33.7 V	39.3 V
SLE G5 23mm 6000lm GOLD+ EXC	1,400 mA	4,130 lm	3,650 lm	50.7 W	33.7 V	39.3 V
SLE G5 23mm 6000lm MEAT+ EXC	1,400 mA	3,710 lm	3,340 lm	50.7 W	33.7 V	39.3 V
SLE G5 23mm 6000lm FRESH MEAT EXC	1,400 mA	3,720 lm	3,350 lm	50.7 W	33.7 V	39.3 V
SLE 23mm 6000lm – Operating mode HO at 1,750 mA						
SLE G5 23mm 6000lm FISH EXC	1,750 mA	7,140 lm	6,320 lm	65.8 W	35.0 V	40.7 V
SLE G5 23mm 6000lm GOLD EXC	1,750 mA	6,840 lm	6,350 lm	65.8 W	35.0 V	40.7 V
SLE G5 23mm 6000lm GOLD+ EXC	1,750 mA	4,970 lm	4,290 lm	65.8 W	35.0 V	40.7 V
SLE G5 23mm 6000lm MEAT+ EXC	1,750 mA	4,440 lm	3,940 lm	65.8 W	35.0 V	40.7 V
SLE G5 23mm 6000lm FRESH MEAT EXC	1,750 mA	4,470 lm	3,940 lm	65.8 W	35.0 V	40.7 V

[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.

[8] Application specific colours for attractive product presentation, see data sheet section 6.1.

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 Energy classification

Type	Forward current	Energy classification
SLE G5 19mm 5000lm FISH EXC	500 mA	A+
	1,050 mA	A+
	1,400 mA	A+
SLE G5 19mm 5000lm GOLD EXC	500 mA	A+
	1,050 mA	A+
	1,400 mA	A+
SLE G5 19mm 5000lm GOLD+ EXC	500 mA	A
	1,050 mA	A
	1,400 mA	B
SLE G5 19mm 5000lm MEAT+ EXC	500 mA	A
	1,050 mA	A
	1,400 mA	B
SLE G5 19mm 5000lm FRESH MEAT EXC	700 mA	A
	1,050 mA	A
	1,400 mA	B
SLE G5 23mm 6000lm FISH EXC	700 mA	A+
	1,050 mA	A+
	1,400 mA	A+
SLE G5 23mm 6000lm GOLD EXC	700 mA	A+
	1,050 mA	A+
	1,400 mA	A+
SLE G5 23mm 6000lm GOLD+ EXC	700 mA	A
	1,050 mA	A
	1,400 mA	A
SLE G5 23mm 6000lm MEAT+ EXC	700 mA	A
	1,050 mA	A
	1,400 mA	B
SLE G5 23mm 6000lm FRESH MEAT EXC	700 mA	A
	1,050 mA	A
	1,400 mA	B

2. Thermical details

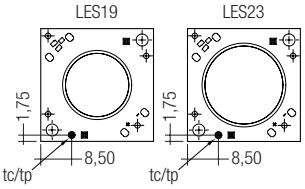
2.1 tp point, ambient temperature and life-time

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

For SLE 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.



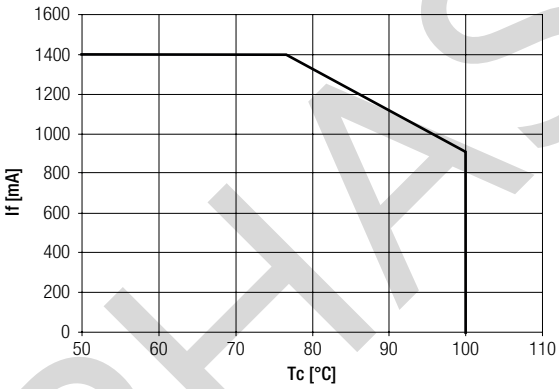
2.2 Storage and humidity

storage temperature	-30 ... +80 °C

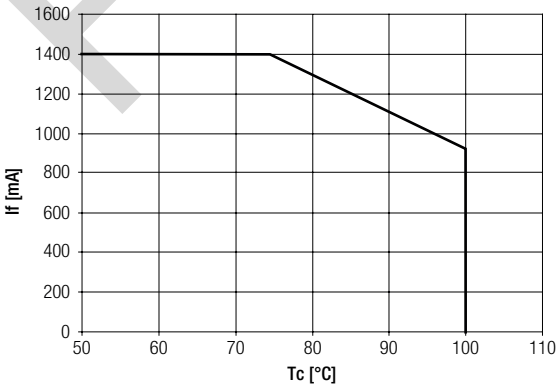
Operation only in non condensing environment.
Humidity during processing of the module should be between 30 to 70 %.

2.3 Derating curves

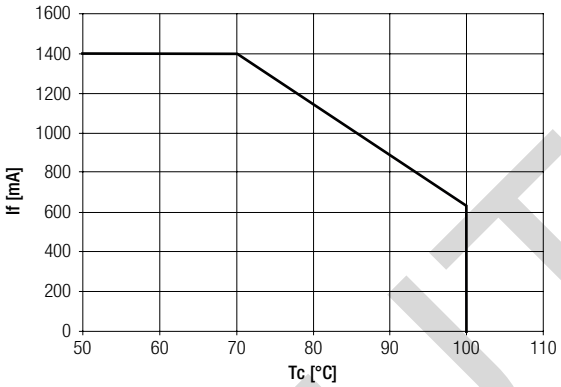
SLE G5 19mm 5000lm FISH EXC



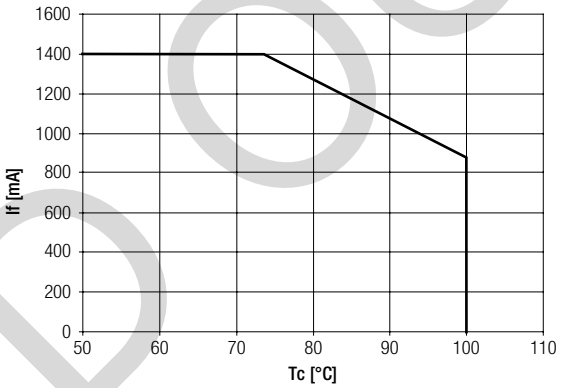
SLE G5 19mm 5000lm GOLD EXC



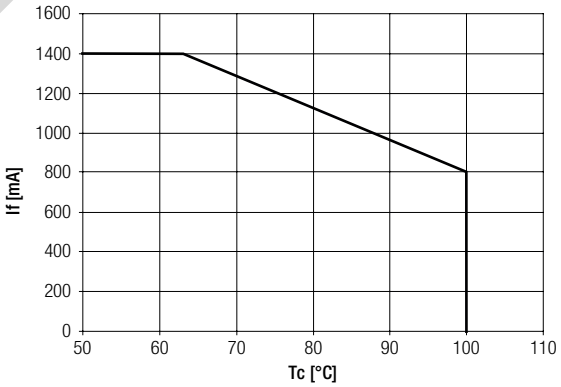
SLE G5 19mm 5000lm GOLD+ EXC



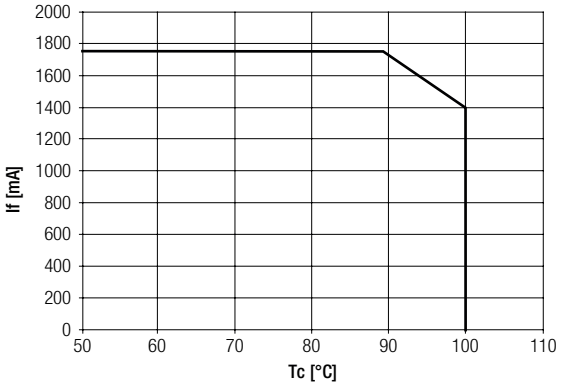
SLE G5 19mm 5000lm MEAT+ EXC



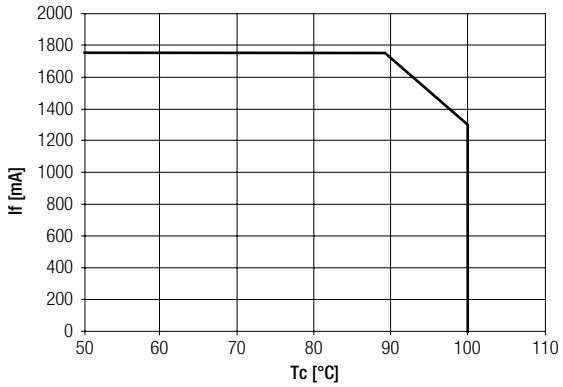
SLE G5 19mm 5000lm FRESH MEAT EXC



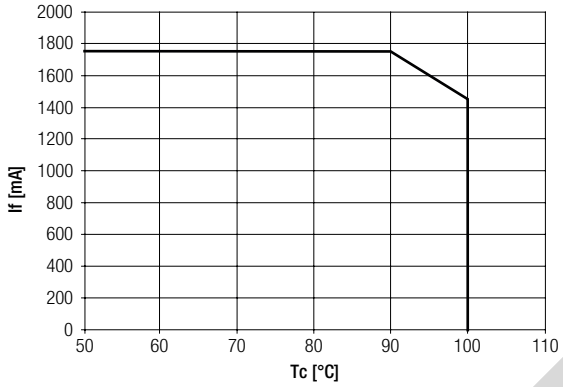
SLE G5 23mm 6000lm FISH EXC



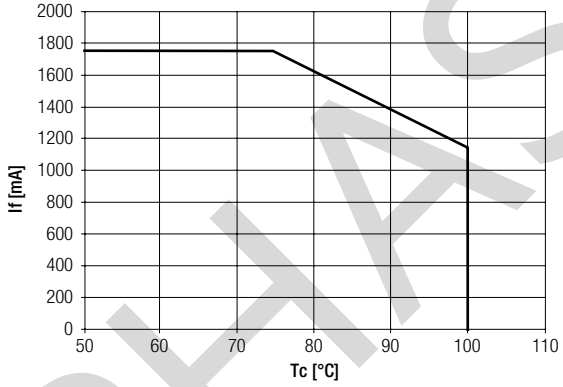
SLE G5 23mm 6000lm GOLD EXC



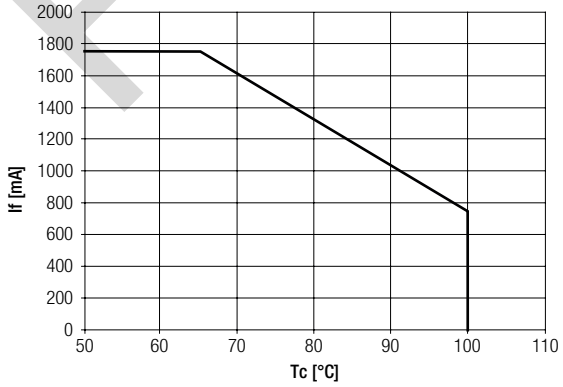
SLE G5 23mm 6000lm GOLD+ EXC



SLE G5 23mm 6000lm MEAT+ EXC



SLE G5 23mm 6000lm FRESH MEAT 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 xxxx EXCITE

ta	tp	Operating current	$R_{th, hs-a}$
25 °C	65 °C	500 mA	3.90 K/W
30 °C	65 °C	500 mA	3.41 K/W
40 °C	65 °C	500 mA	2.42 K/W
50 °C	65 °C	500 mA	1.43 K/W
25 °C	65 °C	1,050 mA	1.47 K/W
30 °C	65 °C	1,050 mA	1.28 K/W
40 °C	65 °C	1,050 mA	0.90 K/W
50 °C	65 °C	1,050 mA	0.52 K/W
25 °C	65 °C	1,400 mA	0.98 K/W
30 °C	65 °C	1,400 mA	0.85 K/W
40 °C	65 °C	1,400 mA	0.59 K/W
50 °C	65 °C	1,400 mA	0.33 K/W

SLE G5 23mm 6000lm xxxx EXCITE

ta	tp	Operating current	$R_{th, hs-a}$
25 °C	65 °C	700 mA	2.80 K/W
30 °C	65 °C	700 mA	2.44 K/W
40 °C	65 °C	700 mA	1.73 K/W
50 °C	65 °C	700 mA	1.01 K/W
25 °C	65 °C	1,400 mA	1.12 K/W
30 °C	65 °C	1,400 mA	0.98 K/W
40 °C	65 °C	1,400 mA	0.68 K/W
50 °C	65 °C	1,400 mA	0.39 K/W
25 °C	65 °C	1,750 mA	0.82 K/W
30 °C	65 °C	1,750 mA	0.71 K/W
40 °C	65 °C	1,750 mA	0.49 K/W
50 °C	65 °C	1,750 mA	0.27 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 $\lambda > 1$ 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

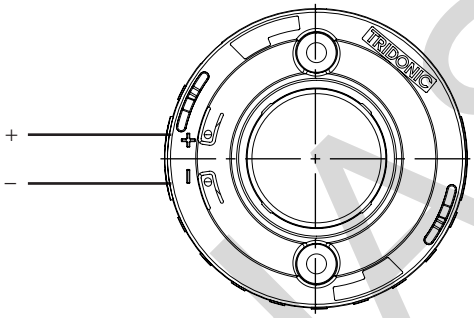
SLE G5 from Tridonic are not protected against overvoltages, overcurrents, overloads or short-circuit currents. Safe and reliable operation can only be guaranteed in conjunction with a LED Driver which complies with the relevant standards. The use of LED Drivers from Tridonic in combination with SLE 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

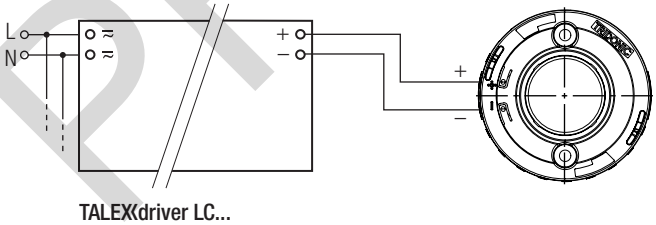
SLE G5 must be supplied by a constant current LED Driver. Operation with a constant voltage LED Driver will lead to an irreversible damage of the module.
Wrong polarity can damage the SLE G5.

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



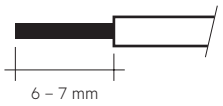
TALEXdriver LC...

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 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 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.

SLE G5 19mm 5000lm xxxx EXCITE

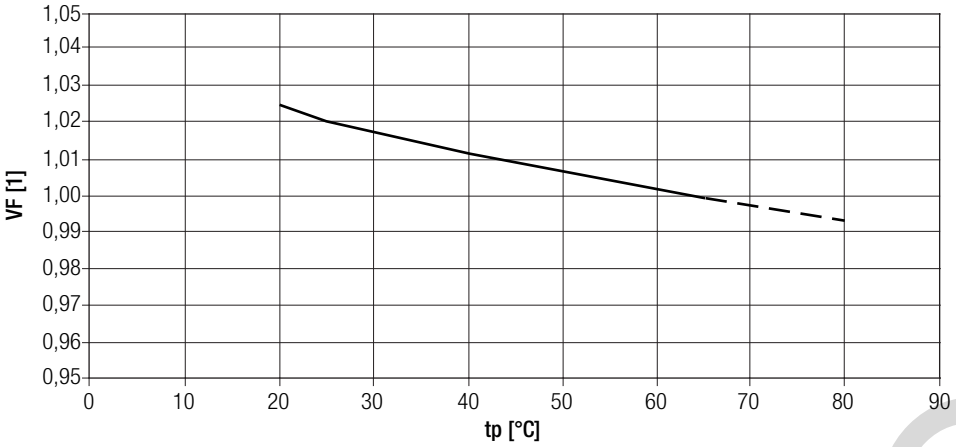
Operating current	tp temperature	L80 / F10	L80 / F50	L70 / F10	L70 / F50
500 mA	65 °C	51,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	44,000 h	>60,000 h	>60,000 h	>60,000 h
	85 °C	39,000 h	58,000 h	>60,000 h	>60,000 h
1,050 mA	65 °C	42,000 h	>60,000 h	>60,000 h	>60,000 h
	75 °C	37,000 h	55,000 h	59,000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

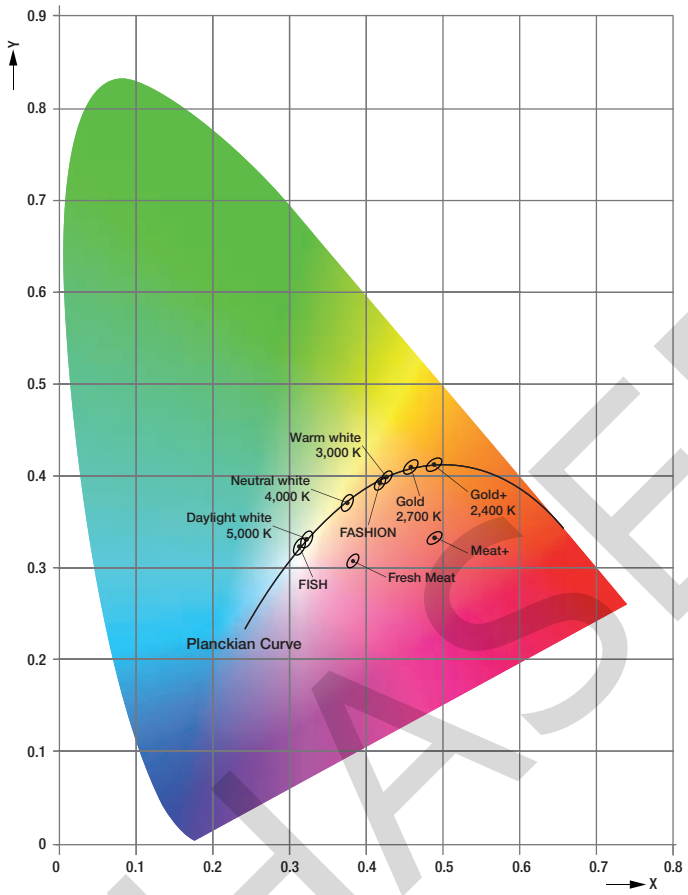


The diagrams based on statistic values.
The real values can be different.

6. Photometric charcteristics

6.1 Application specific colours for attractive product presentation

- Gold: This product emits a warm and brilliant light. This light colour is ideal for bakery goods or jewellery.
- Gold+: This light colour has a light brown tinge to give an oven-fresh appearance to crusty bakery products such as croissants and baguettes.
- Fresh Meat: The perfect light colour for the meat counter. White threads in the meat are not highlighted by this light colour but the red of the meat looks really appetising.
- Meat+: Fresh and cooked meats have a saturated red colour under this light. Even white threads appear red. A boost of red for the meat counter.



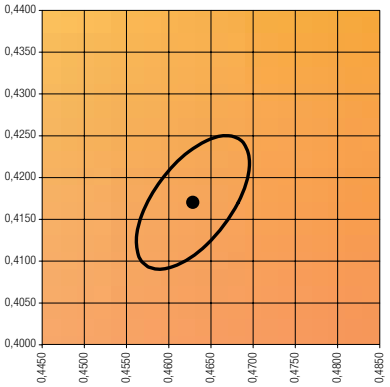
6.2 Coordinates and tolerances according to CIE 1931

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 xxxx EXC	1,050 mA
TALEXmodule SLE G5 23mm 6000lm xxxx EXC	1,400 mA

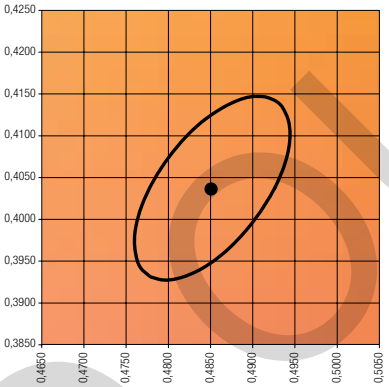
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

GOLD



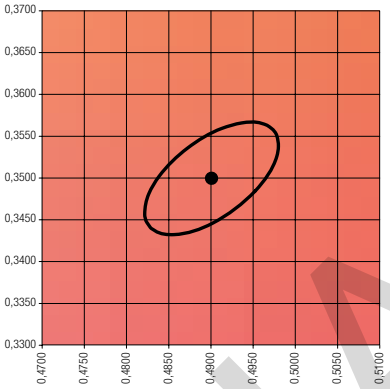
MacAdam ellipse: 3SDCM

GOLD+



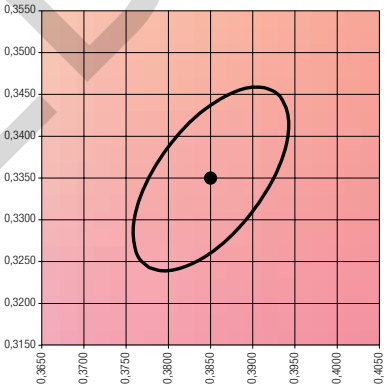
MacAdam ellipse: 4SDCM

MEAT+



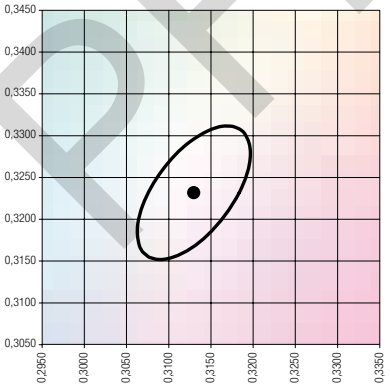
MacAdam ellipse: 3SDCM

Fresh Meat



MacAdam ellipse: 4SDCM

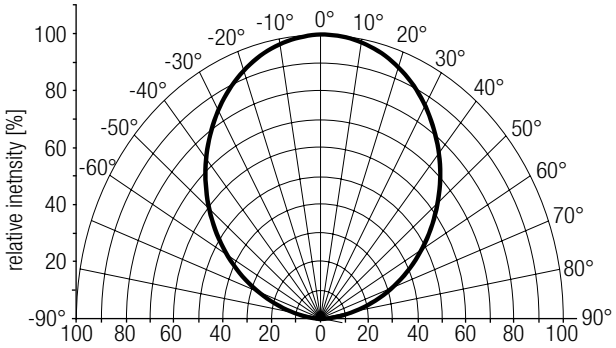
FISH



MacAdam ellipse: 3SDCM

6.3 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.

6.4 Relative luminous flux vs. tp temperature