



Module QLE G1 471x462mm 5000lm SNC

Modules QLE ESSENCE

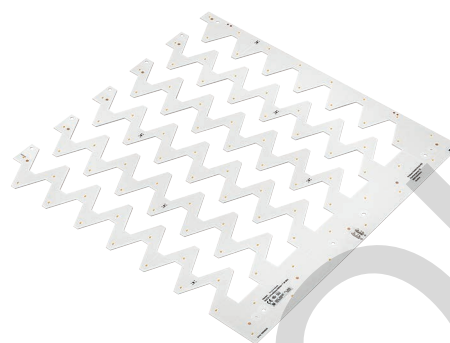
Product description

- Luminous flux: 5,000 lm per module
- Square module – one module per luminaire
- nonSELV (HV) and SELV (LV) variants
- High colour rendering index CRI 80
- Small colour tolerance (MacAdam 4)
- Efficacy of the module up to 140 lm/W
- Colour temperatures 3,000, 4,000, 5,000 and 6,500 K
- Push terminals for quick and simple wiring of LED module
- Simple installation (e.g. screws)
- Long life-time: 50,000 hours
- 5-year guarantee



Standards, page 5

Colour temperatures and tolerances, page 9



Typical applications

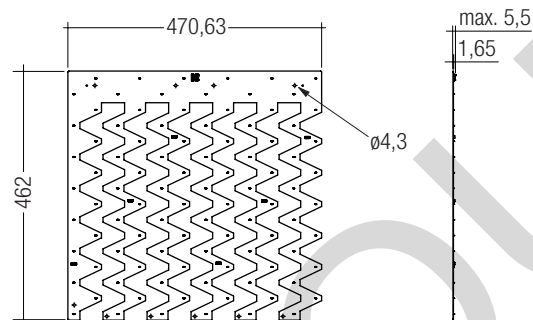


Module QLE G1 471x462mm 5000lm SNC

Modules QLE ESSENCE

Technical data

Beam characteristic	150°
Ambient temperature range	-25 ... +45 °C
tp rated	45 °C
tc	85 °C
Irated for QLE G1 xxx HV SNC	250 mA
Irated for QLE G1 xxx LV SNC	1,000 mA
I _{max} for QLE G1 xxx HV SNC	250 mA
I _{max} for QLE G1 xxx LV SNC	1,050 mA
Max. DC forward current for QLE G1 xxx HV SNC	300 mA
Max. DC forward current for QLE G1 xxx LV SNC	1,200 mA
Max. permissible LF current ripple for QLE G1 xxx HV SNC	330 mA
Max. permissible LF current ripple for QLE G1 xxx LV SNC	1,320 mA
Max. permissible peak current for QLE G1 xxx HV SNC	400 mA / max. 10 µs
Max. permissible peak current for QLE G1 xxx LV SNC	1,600 mA / max. 10 µs
Max. working voltage for insulation [®]	500 V
Insulation test voltage	2 kV
CTI of the printed circuit board	≥ 600
ESD classification	severity level 4
Risk group (IEC 62471:2008) [®]	0
Classification acc. to IEC 62031	Built-in
Type of protection	IP00



Details see 3.4 Mounting instructions

Ordering data

Type	Article number	Colour temperature	Packaging carton [®]	Weight per pc.
nonSELV				
QLE G1 471x462mm 5000lm 830 HV SNC	89602704	3,000 K	10 pc(s).	0.32 kg
QLE G1 471x462mm 5000lm 840 HV SNC	89602705	4,000 K	10 pc(s).	0.32 kg
QLE G1 471x462mm 5000lm 850 HV SNC	89602706	5,000 K	10 pc(s).	0.32 kg
QLE G1 471x462mm 5000lm 865 HV SNC	89602707	6,500 K	10 pc(s).	0.32 kg
SELV				
QLE G1 471x462mm 5000lm 830 LV SNC	89602708	3,000 K	10 pc(s).	0.32 kg
QLE G1 471x462mm 5000lm 840 LV SNC	89602709	4,000 K	10 pc(s).	0.32 kg
QLE G1 471x462mm 5000lm 850 LV SNC	89602710	5,000 K	10 pc(s).	0.32 kg
QLE G1 471x462mm 5000lm 865 LV SNC	89602711	6,500 K	10 pc(s).	0.32 kg

[®] Orders only in full carton quantities.

Specific technical data

Type [®]	Photo-metric code	Typ. luminous flux at tp = 25 °C [®]	Typ. luminous flux at tp = 45 °C [®]	Typ. forward current	Min. forward voltage at tp = 45 °C	Max. forward voltage at tp = 25 °C	Typ. power consumption at tp = 45 °C [®]	Efficacy of the module at tp = 25 °C	Efficacy of the module at tp = 45 °C	Efficacy of the system at tp = 45 °C	Colour rendering index CRI
nonSELV – Operating mode HE at 200 mA											
QLE G1 471x462mm 5000lm 830 HV SNC	830/359	4,100 lm	3,980 lm	200 mA	1379 V	1551 V	291 W	139 lm/W	137 lm/W	123 lm/W	> 80
QLE G1 471x462mm 5000lm 840 HV SNC	840/359	4,100 lm	3,980 lm	200 mA	1379 V	1551 V	291 W	139 lm/W	137 lm/W	123 lm/W	> 80
QLE G1 471x462mm 5000lm 850 HV SNC	850/359	4,170 lm	4,050 lm	200 mA	1379 V	1551 V	291 W	141 lm/W	140 lm/W	126 lm/W	> 80
QLE G1 471x462mm 5000lm 865 HV SNC	865/359	4,170 lm	4,050 lm	200 mA	1379 V	1551 V	291 W	141 lm/W	140 lm/W	126 lm/W	> 80
nonSELV – Operating mode HO at 250 mA											
QLE G1 471x462mm 5000lm 830 HV SNC	830/359	5,000 lm	4,860 lm	250 mA	1419 V	1594 V	374 W	132 lm/W	130 lm/W	117 lm/W	> 80
QLE G1 471x462mm 5000lm 840 HV SNC	840/359	5,000 lm	4,860 lm	250 mA	1419 V	1594 V	374 W	132 lm/W	130 lm/W	117 lm/W	> 80
QLE G1 471x462mm 5000lm 850 HV SNC	850/359	5,090 lm	4,940 lm	250 mA	1419 V	1594 V	374 W	134 lm/W	133 lm/W	120 lm/W	> 80
QLE G1 471x462mm 5000lm 865 HV SNC	865/359	5,090 lm	4,940 lm	250 mA	1419 V	1594 V	374 W	134 lm/W	133 lm/W	120 lm/W	> 80
SELV – Operating mode HE at 900 mA											
QLE G1 471x462mm 5000lm 830 LV SNC	830/359	4,550 lm	4,410 lm	900 mA	34.9 V	39.3 V	331 W	134 lm/W	133 lm/W	120 lm/W	> 80
QLE G1 471x462mm 5000lm 840 LV SNC	840/359	4,550 lm	4,410 lm	900 mA	34.9 V	39.3 V	331 W	134 lm/W	133 lm/W	120 lm/W	> 80
QLE G1 471x462mm 5000lm 850 LV SNC	850/359	4,630 lm	4,490 lm	900 mA	34.9 V	39.3 V	331 W	137 lm/W	136 lm/W	122 lm/W	> 80
QLE G1 471x462mm 5000lm 865 LV SNC	865/359	4,630 lm	4,490 lm	900 mA	34.9 V	39.3 V	331 W	137 lm/W	136 lm/W	122 lm/W	> 80
SELV – Operating mode NM at 1,000 mA											
QLE G1 471x462mm 5000lm 830 LV SNC	830/359	5,000 lm	4,860 lm	1,000 mA	35.4 V	39.9 V	374 W	132 lm/W	130 lm/W	117 lm/W	> 80
QLE G1 471x462mm 5000lm 840 LV SNC	840/359	5,000 lm	4,860 lm	1,000 mA	35.4 V	39.9 V	374 W	132 lm/W	130 lm/W	117 lm/W	> 80
QLE G1 471x462mm 5000lm 850 LV SNC	850/359	5,090 lm	4,940 lm	1,000 mA	35.4 V	39.9 V	374 W	134 lm/W	133 lm/W	120 lm/W	> 80
QLE G1 471x462mm 5000lm 865 LV SNC	865/359	5,090 lm	4,940 lm	1,000 mA	35.4 V	39.9 V	374 W	134 lm/W	133 lm/W	120 lm/W	> 80
SELV – Operating mode HO at 1,050 mA											
QLE G1 471x462mm 5000lm 830 LV SNC	830/359	5,220 lm	5,070 lm	1,050 mA	35.7 V	40.1 V	39.5 W	130 lm/W	128 lm/W	115 lm/W	> 80
QLE G1 471x462mm 5000lm 840 LV SNC	840/359	5,220 lm	5,070 lm	1,050 mA	35.7 V	40.1 V	39.5 W	130 lm/W	128 lm/W	115 lm/W	> 80
QLE G1 471x462mm 5000lm 850 LV SNC	850/359	5,310 lm	5,160 lm	1,050 mA	35.7 V	40.1 V	39.5 W	132 lm/W	131 lm/W	119 lm/W	> 80
QLE G1 471x462mm 5000lm 865 LV SNC	865/359	5,310 lm	5,160 lm	1,050 mA	35.7 V	40.1 V	39.5 W	132 lm/W	131 lm/W	119 lm/W	> 80

[®] Integral measurement over the complete module.

[®] If mounted with M4 screws and plastic washers.

[®] Measured at operating mode HO.

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

[®] Tolerance range for optical and electrical data: ±10 %.

CLIP 4.3mm

Product description

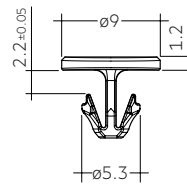
- Clip for fixation of LED modules with 4.3 mm holes
- Fast snap on mounting (sheet thickness 0.5 – 1.0 mm for PUSH-FIX and 1 – 2 mm for PUSH-FIX Long)
- For drilling hole 4 mm
- Clip made of Polycarbonat



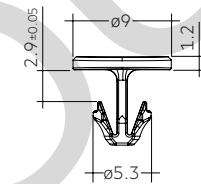
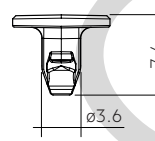
ACL CLIP 4.3mm PUSH-FIX



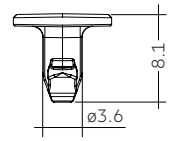
ACL CLIP 4.3mm PUSH-FIX Long



ACL CLIP 4.3mm PUSH-FIX



ACL CLIP 4.3mm PUSH-FIX Long



Ordering data

Type	Article number	Colour	Packaging bag ^①	Weight per pc.
ACL CLIP 4.3mm PUSH-FIX	28001036	White	500 pc(s).	0.001 kg
ACL CLIP 4.3mm PUSH-FIX Long	28002314	Transparent	500 pc(s).	0.001 kg

^① Minimum sales quantity 500 pcs.

1. Standards

IEC 62031
IEC 62471
IEC 61000-4-2

1.1 Photometric code

Key for photometric code, e. g. 830 / 449

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 %

1.2 Energy classification

Type	Forward current	Energy classification
QLE G1 471x462mm 5000lm 830/840 HV SNC	200 mA	A++
	250 mA	A+
QLE G1 471x462mm 5000lm 850/865 HV SNC	200 mA	A++
	250 mA	A+
	900 mA	A+
QLE G1 471x462mm 5000lm 830/840 LV SNC	1,000 mA	A+
	1,050 mA	A+
	900 mA	A+
QLE G1 471x462mm 5000lm 850/865 LV SNC	1,000 mA	A+
	1,050 mA	A+

2. Thermal details

2.1 tc 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 QLE a tp temperature of 45 °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 tc 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.

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 0 to 70 %.

2.3 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 QLE will be greatly reduced or the QLE may be destroyed.

3. Installation / wiring

3.1 Electrical supply/choice of LED control gear

QLE modules 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 Driver from Tridonic in combination with QLE modules guarantees the necessary protection for safe and reliable operation.

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

- Short-circuit protection
- Overload protection
- Overtemperature protection



QLE modules 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.

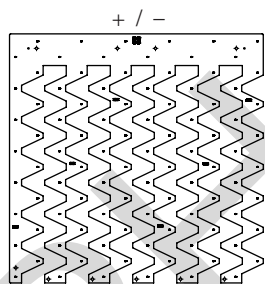
Wrong polarity can damage the QLE.

QLE modules can be operated either from SELV LED Drivers or from LED Drivers with LV output voltage.



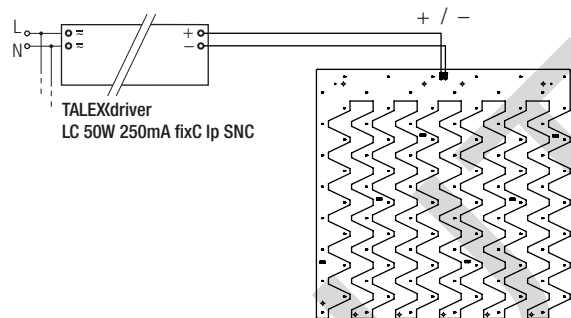
QLE modules are basic isolated up to 500 V (if mounted with M4 screws with head diameter 7 mm in combination with plastic washers) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led control gear (also against earth) is above 500 V, 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

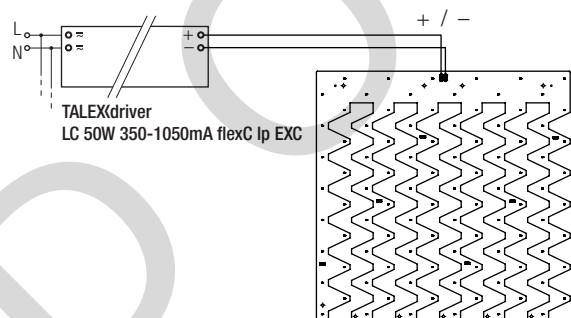


Wiring examples

nonSELV – QLE G1 471x462mm 5000lm HV SNC



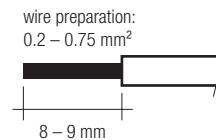
SELV – QLE G1 471x462mm 5000lm LV SNC



3.3 Wiring type and cross section

The wiring can be in stranded wires or solid with a cross section of 0.2 to 0.75 mm².

For the push-wire connection you have to strip the insulation (8–9 mm).



To remove the wires use a suitable tool (e.g. Microcon release pin) or through twist and pull.

3.4 Mounting instruction



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

Max. torque for fixing: 0.5 Nm.

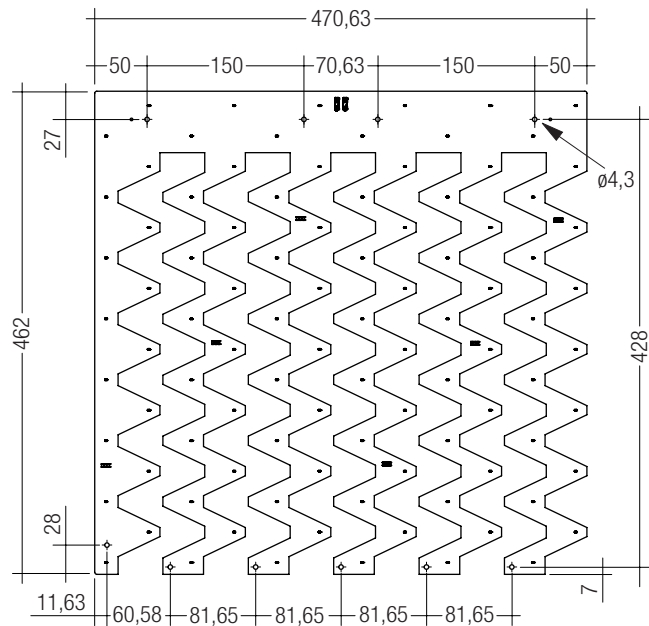
The LED modules are mounted with M4 screws or ACL CLIP 4.3mm per module.



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.

QLE G1 471x462mm 5000lm xxx SNC



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. Please note the requirements set out in the document EOS / ESD guidelines (Guideline_EOS_ESD.pdf) at: <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 for QLE

nonSELV – QLE G1 471x462mm 5000lm xxx HV SNC

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
200 mA	35 °C	31,000 h	40,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	45 °C	26,000 h	34,000 h	56,000 h	>60,000 h	>60,000 h	>60,000 h
	55 °C	22,000 h	29,000 h	48,000 h	>60,000 h	>60,000 h	>60,000 h
	65 °C	19,000 h	25,000 h	41,000 h	54,000 h	>60,000 h	>60,000 h
250 mA	35 °C	30,000 h	39,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	45 °C	25,000 h	33,000 h	54,000 h	>60,000 h	>60,000 h	>60,000 h
	55 °C	22,000 h	28,000 h	46,000 h	>60,000 h	>60,000 h	>60,000 h
	65 °C	19,000 h	24,000 h	40,000 h	52,000 h	>60,000 h	>60,000 h

SELV – QLE G1 471x462mm 5000lm xxx LV SNC

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
900 mA	35 °C	31,000 h	40,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	45 °C	26,000 h	34,000 h	55,000 h	>60,000 h	>60,000 h	>60,000 h
	55 °C	22,000 h	29,000 h	47,000 h	>60,000 h	>60,000 h	>60,000 h
	65 °C	19,000 h	25,000 h	41,000 h	53,000 h	>60,000 h	>60,000 h
1,000 mA	35 °C	30,000 h	39,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	45 °C	25,000 h	33,000 h	54,000 h	>60,000 h	>60,000 h	>60,000 h
	55 °C	22,000 h	28,000 h	46,000 h	>60,000 h	>60,000 h	>60,000 h
	65 °C	19,000 h	24,000 h	40,000 h	52,000 h	>60,000 h	>60,000 h
1,050 mA	35 °C	30,000 h	38,000 h	>60,000 h	>60,000 h	>60,000 h	>60,000 h
	45 °C	25,000 h	33,000 h	54,000 h	>60,000 h	>60,000 h	>60,000 h
	55 °C	21,000 h	28,000 h	46,000 h	59,000 h	>60,000 h	>60,000 h
	65 °C	18,000 h	24,000 h	40,000 h	51,000 h	>60,000 h	>60,000 h

Lumen maintenance values are based on LM80 data. Table may be updated when more recent results are available.

4.3 Switching capability

50,000 cycles

Tested according to IEC 62717 Cl 10.3.3

30 s on / 30 s off at Imax

5. Electrical values

5.1 Declaration of electrical parameters

I_{rated} ... Nominal operating current the module is designed for.

I_{max} ... Max. permissible continuous operating current.

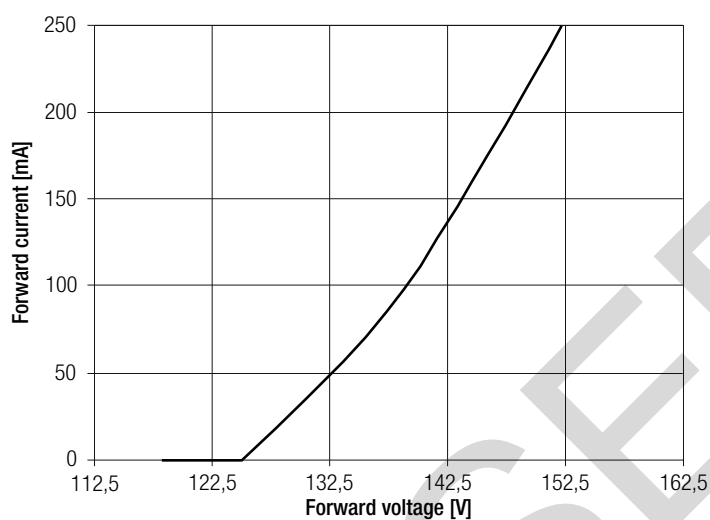
Max. DC forward current ... Max. permissible continuous operating current incl. The tolerances of the LED driver. LED module may be destroyed if this value is exceeded.

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

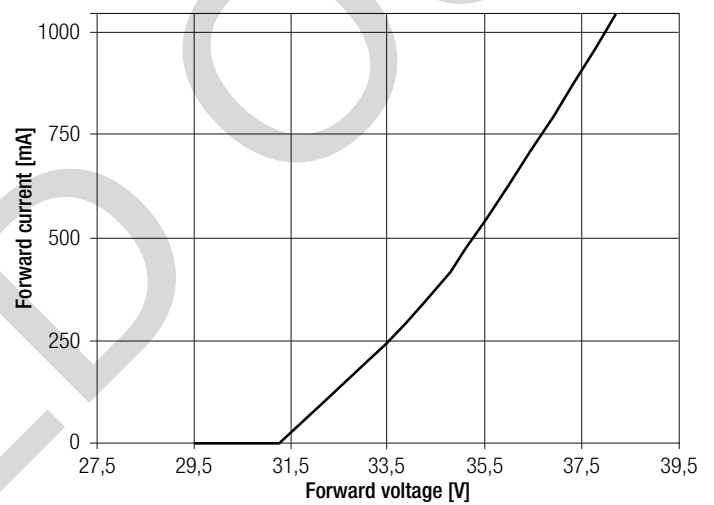
Max. permissible peak current ... The max. output peak current of the LED driver must not exceed this value.

5.2 Typ. forward voltage vs. forward current

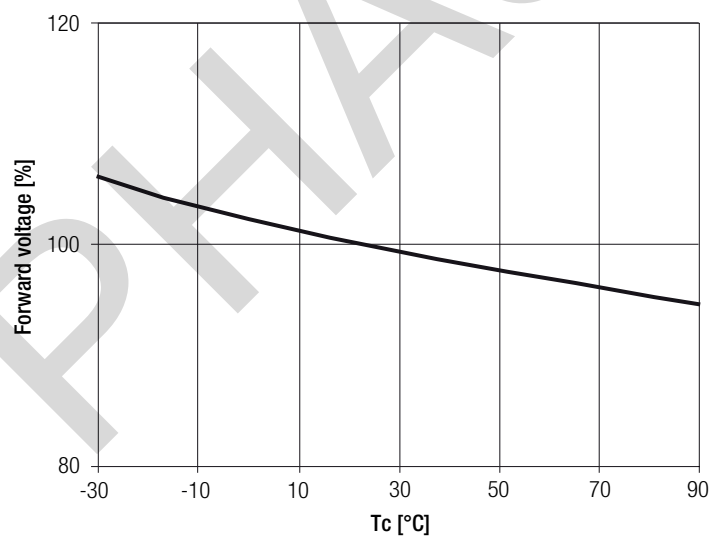
QLE G1 471x462mm 5000lm xxx HV SNC



QLE G1 471x462mm 5000lm xxx LV SNC



5.2 Forward voltage vs. tp temperature



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

6. Photometric characteristics

6.1 Coordinates and tolerances according to CIE 1931

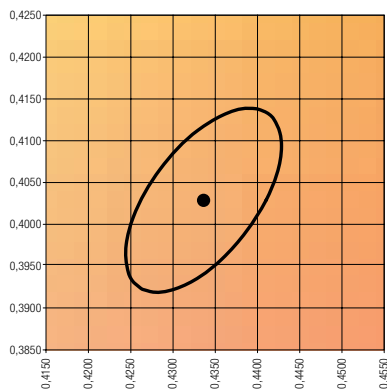
The specified colour coordinates are measured integral by a current impulse of 250 mA (nonSELV) / 1,000 mA (SELV) and a duration of 100 ms.

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

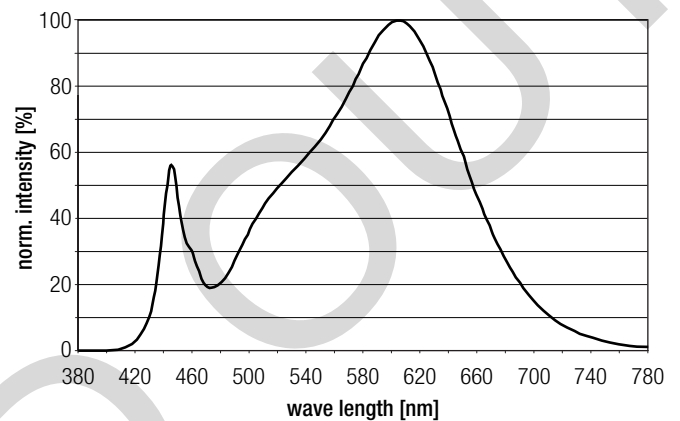
The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K

	x0	y0
Centre	0.4339	0.4032

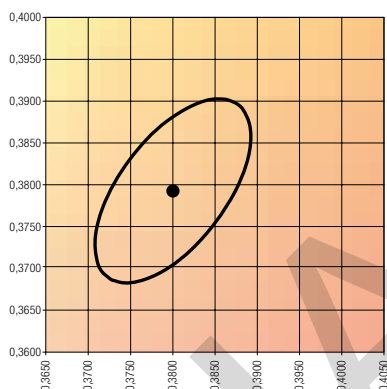


— MacAdam Ellipse: 4SDCM

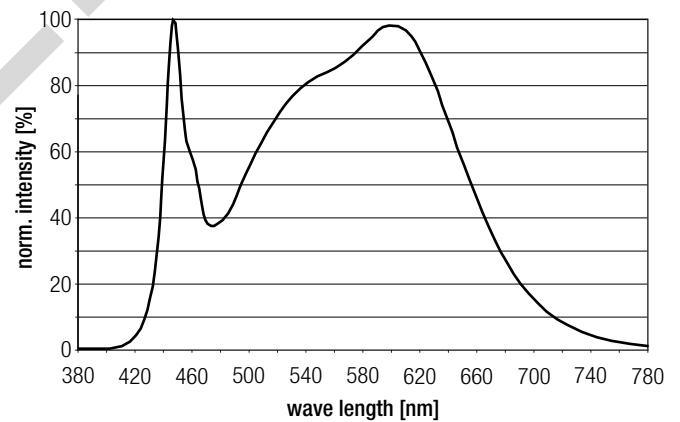


4,000 K

	x0	y0
Centre	0.3800	0.3796

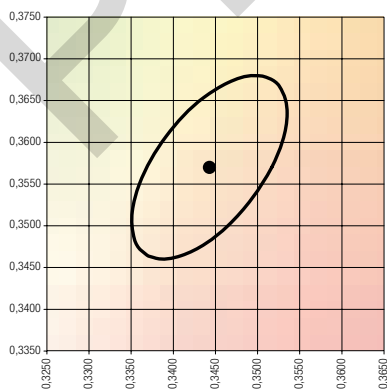


— MacAdam Ellipse: 4SDCM

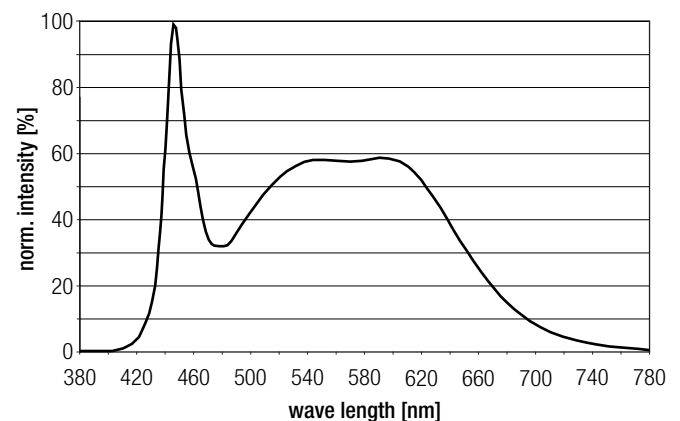


5,000 K

	x0	y0
Centre	0.3446	0.3566

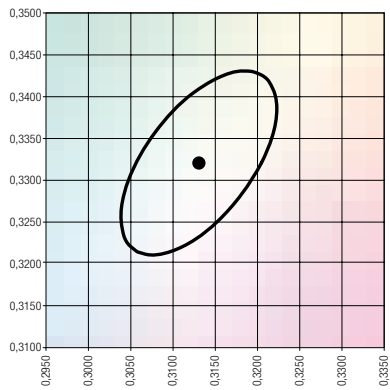


— MacAdam Ellipse: 4SDCM

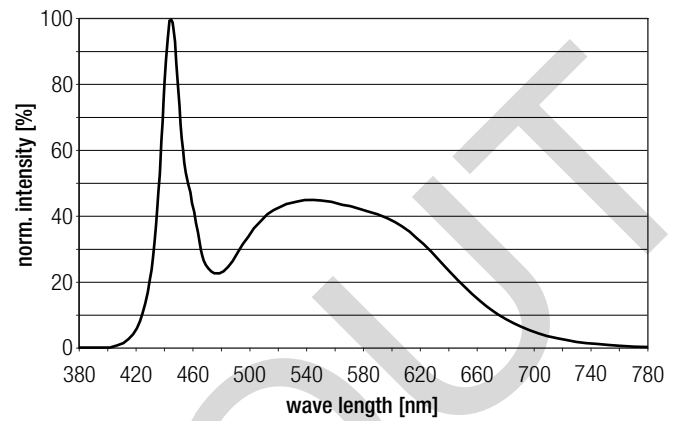


6,500 K

	x0	y0
Centre	0.3129	0.3321

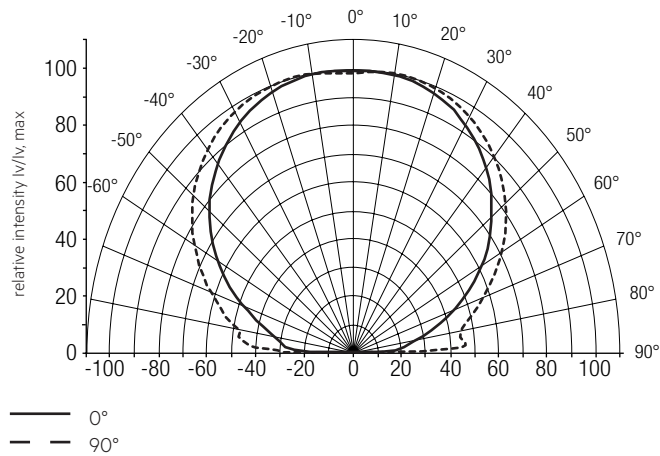


— MacAdam Ellipse: 4SDCM



6.2 Light distribution

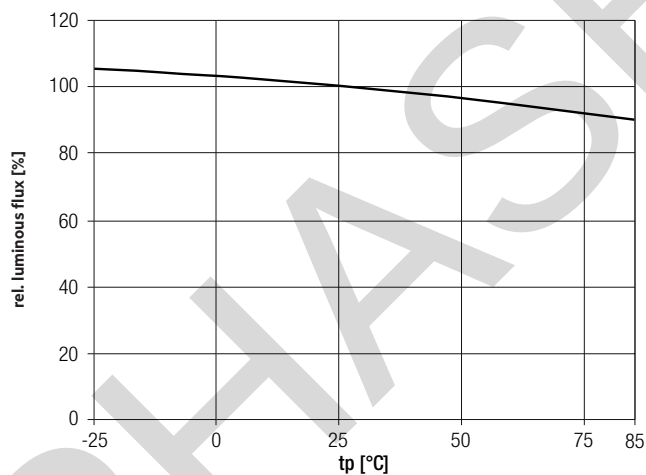
The optical design of the QLE product line ensures optimum homogeneity for the light distribution.



The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 3.

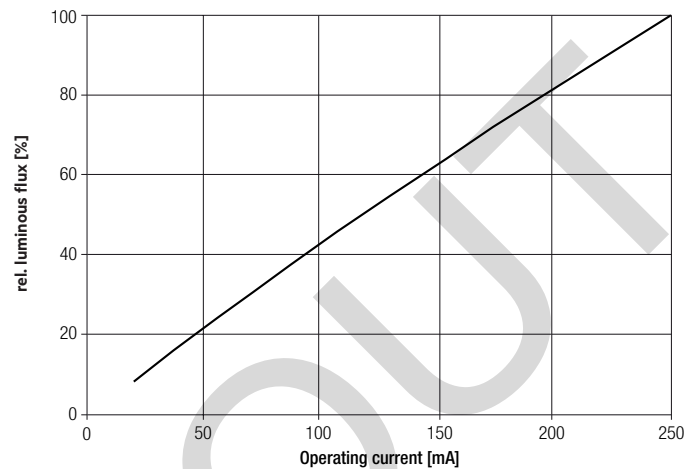
To ensure an ideal mixture of colours and a homogenous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 6 cm) should be used.

6.3 Relative luminous flux vs. tc temperature

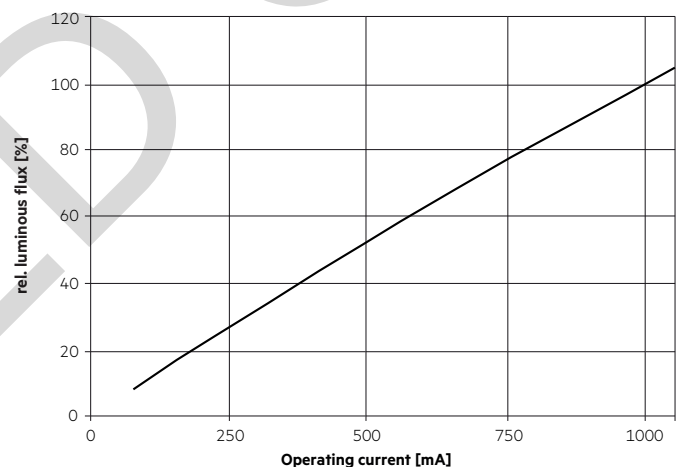


6.4 Relative luminous flux vs. operating current

QLE G1 471x462mm 5000lm xxx HV SNC



QLE G1 471x462mm 5000lm xxx LV SNC



7. Miscellaneous

7.1 Additional information

Additional technical information at www.tridonic.com → Technical Data

Guarantee conditions at www.tridonic.com → Services

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