Module QLE G2 520x246mm 2500lm ADV-SE

Modules QLE advanced

Product description

- Ideal for linear and panel lights
- Perfectly uniform light, even if several LED modules are used together in a line
- Self cooling (no additional heat sink required)
- Push terminals for quick and simple wiring of LED module to LED module
- Long lifetime: 50,000 hours
- 5 years guarantee (conditions at www.tridonic.com)

Optical properties

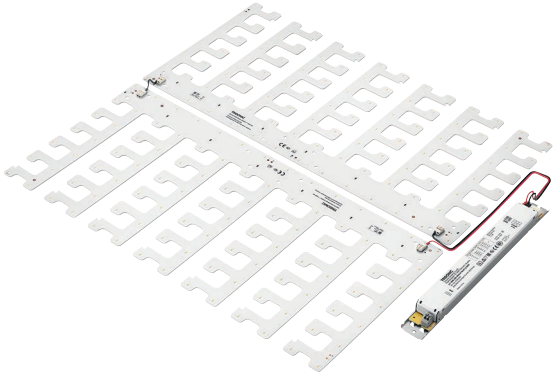
- Colour temperatures 3,000, 4,000, 5,000 and 6,500 K
- Useful luminous flux 2,500 lm at Irated and tp = 25 °C
- Efficacy of the LED module 180 lm/W at Irated and tp = 25 °C
- High colour rendering index CRI > 80
- Small colour tolerance MacAdam 3①
- Small luminous flux tolerances

Mechanical properties

- Module dimension 520 x 246 mm
- Simple installation (e.g. screws)

Standards, page 4

Colour temperatures and tolerances, page 9



Complete system

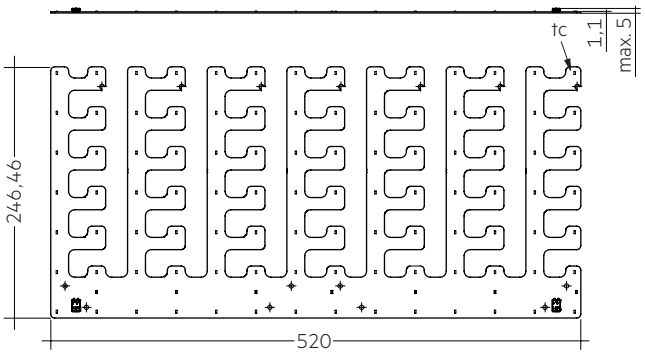
RoHS

Module QLE G2 520x246mm 2500lm ADV-SE

Modules QLE advanced

Technical data

Beam characteristic	120°
Ambient temperature range	-25 … +45 °C
tp rated	45 °C
tc	85 °C
Irated	350 mA
Imax	660 mA
Max. permissible LF current ripple	860 mA
Max. permissible peak current	1,400 mA / max. 10 ms
Max. working voltage for insulation[2]	420 V
Insulation test voltage	1.84 kV
CTI of the printed circuit board	≥ 600
ESD classification	severity level 1
Risk group (IEC 62471)[4]	RG1
Classification acc. to IEC 62031	Built-in
Type of protection	IP00
Lumen maintenance L70B50	50,000 h
Guarantee (conditions at www.tridonic.com)	5 years



Details see 3.4 Mounting instructions

Ordering data

Type	Article number	Colour temperature	Packaging carton[6]	Weight per pc.
QLE G2 520x246mm 2500lm 830 ADV-SE	**89602961**	3,000 K	20 pc(s).	0.185 kg
QLE G2 520x246mm 2500lm 840 ADV-SE	**89602962**	4,000 K	20 pc(s).	0.185 kg
QLE G2 520x246mm 2500lm 850 ADV-SE	**89602963**	5,000 K	20 pc(s).	0.185 kg
QLE G2 520x246mm 2500lm 865 ADV-SE	**89602964**	6,500 K	20 pc(s).	0.185 kg

[6] Min. order quantity: 2 pcs. (one package contains 2 modules).

Specific technical data

Type[3]	Photo-metric code	Useful luminous flux at tp = 25 °C[5]	Expected luminous flux at tp rated[6]	Typ. forward current	Min. forward voltage at tp = 45 °C	Max. forward voltage at tp = 25 °C	Power consumption Pon at tp = 25 °C[7]	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
Operating mode HE at 300 mA										
QLE G2 520x246mm 2500lm 830 ADV-SE	830/359	–	1,900 lm	300 mA	36.1 V	42.1 V	–	–	165 lm/W	> 80
QLE G2 520x246mm 2500lm 840 ADV-SE	840/359	–	2,040 lm	300 mA	36.1 V	42.1 V	–	–	177 lm/W	> 80
QLE G2 520x246mm 2500lm 850 ADV-SE	850/359	–	2,050 lm	300 mA	36.1 V	42.1 V	–	–	178 lm/W	> 80
QLE G2 520x246mm 2500lm 865 ADV-SE	865/359	–	2,030 lm	300 mA	36.1 V	42.1 V	–	–	176 lm/W	> 80
Operating mode NM at 350 mA										
QLE G2 520x246mm 2500lm 830 ADV-SE	830/359	2,300 lm	2,220 lm	350 mA	36.5 V	42.5 V	13.8 W	167 lm/W	163 lm/W	> 80
QLE G2 520x246mm 2500lm 840 ADV-SE	840/359	2,470 lm	2,390 lm	350 mA	36.5 V	42.5 V	13.8 W	179 lm/W	175 lm/W	> 80
QLE G2 520x246mm 2500lm 850 ADV-SE	850/359	2,480 lm	2,400 lm	350 mA	36.5 V	42.5 V	13.8 W	180 lm/W	176 lm/W	> 80
QLE G2 520x246mm 2500lm 865 ADV-SE	865/359	2,450 lm	2,370 lm	350 mA	36.5 V	42.5 V	13.8 W	178 lm/W	174 lm/W	> 80
Operating mode HO at 525 mA										
QLE G2 520x246mm 2500lm 830 ADV-SE	830/359	–	3,220 lm	525 mA	37.9 V	44.0 V	–	–	152 lm/W	> 80
QLE G2 520x246mm 2500lm 840 ADV-SE	840/359	–	3,450 lm	525 mA	37.9 V	44.0 V	–	–	163 lm/W	> 80
QLE G2 520x246mm 2500lm 850 ADV-SE	850/359	–	3,470 lm	525 mA	37.9 V	44.0 V	–	–	164 lm/W	> 80
QLE G2 520x246mm 2500lm 865 ADV-SE	865/359	–	3,440 lm	525 mA	37.9 V	44.0 V	–	–	162 lm/W	> 80

[1] Integral measurement over the complete module.

[2] If mounted with M4 screws.

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

[4] Measured at Imax

[5] Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.

[6] Tolerance of expected light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %. Based on calculation.

[7] Tolerance of power consumption Pon ± 10 %. Measurement uncertainty ± 5 %.

ACCES-SORIES

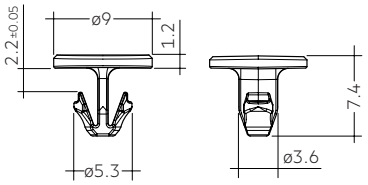
CLIP 4.3mm

Product description

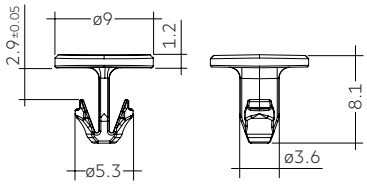
- Clip for fixation of LED modules with 4.3 mm holes
- Fast snap on mounting (sheet thickness 0.5 – 1.0 mm for PUSH-FIX and 1 – 2 mm for PUSH-FIX Long)
- For drilling hole 4 mm
- Clip made of Polycarbonat

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 62778
IEC 61547
IEC 62717

1.1 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	MacAdam initial	MacAdam after 25% of the lifetime (max.6000h)	Luminous flux after 25% of the lifetime (max.6000h)	
					Code	Luminous flux
7	70 – 79				7	≥ 70 %
8	80 – 89				8	≥ 80 %
9	≥90				9	≥ 90 %

1.2 Energy classification

Type	Colour tempera-ture	Forward current	Energy classifi-cation	Energy consumption
QLE G2 520x246mm 2500lm 830 ADV-SE	3,000 K	350 mA	D	14 kWh / 1,000 h
QLE G2 520x246mm 2500lm 840 ADV-SE	4,000 K	350 mA	C	14 kWh / 1,000 h
QLE G2 520x246mm 2500lm 850 ADV-SE	5,000 K	350 mA	C	14 kWh / 1,000 h
QLE G2 520x246mm 2500lm 865 ADV-SE	6,500 K	350 mA	C	14 kWh / 1,000 h

Energy label and further information at www.tridonic.com in the certificates tab of the corresponding product page and at the EPREL data base https://eprel.ec.europa.eu/

2. Thermal details

2.1 tc point, ambient temperature and lifetime

The temperature at tp reference point is crucial for the light output and lifetime 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 lifetime.

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

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

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 Driver 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 Driver. Operation with a constant voltage LED Driver will lead to an irreversible damage of the module.

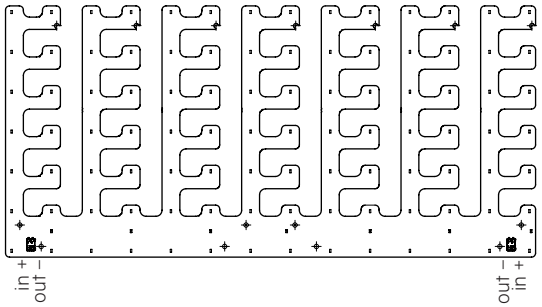
Wrong polarity can damage the QLE.

With parallel wiring tolerance-related differences in output are possible (thermal stress of the module) and can cause differences in brightness. If a wire breaks or a complete module fails then the current passing through the other module increases. This may reduce its life considerably.

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

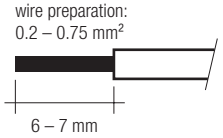
QLE modules are basic insulated up to 420 V (if mounted with M4 screws with head diameter of 7 mm) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led control gear (also against earth) is above 420 V, an additional insulation between LED module and heat sink is required (for example by insulated 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



3.3 Wiring type and cross section

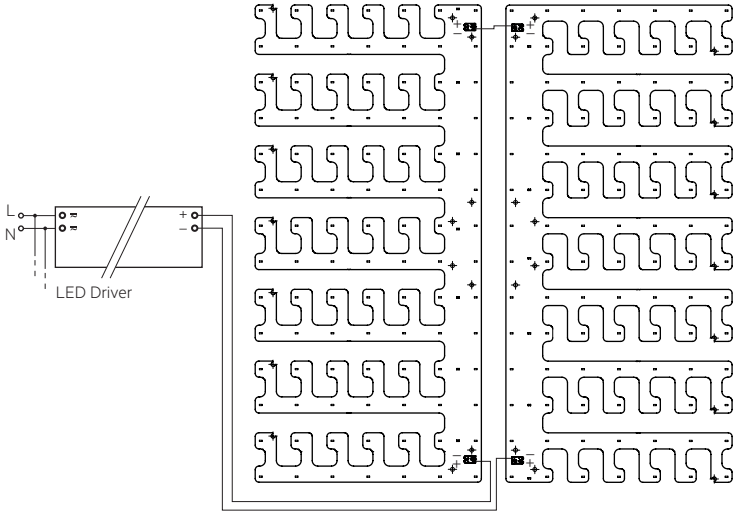
The wiring can be solid cable with a cross section of 0.2 to 0.75 mm².
For the push-wire connection you have to strip the insulation (6–7 mm).



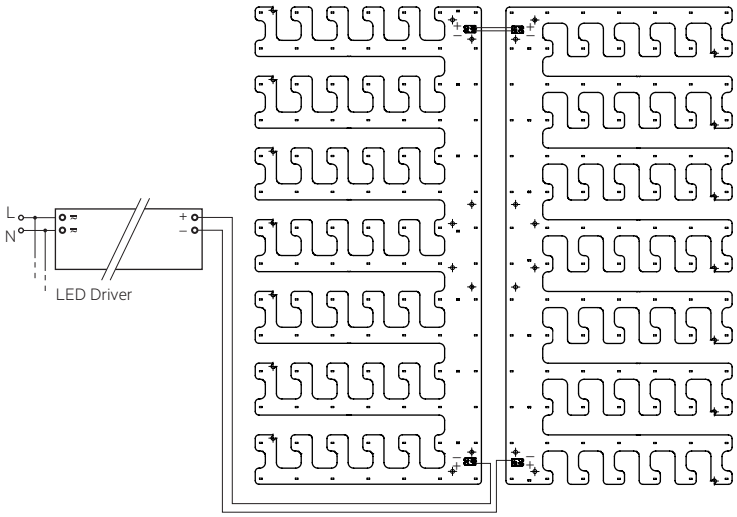
Inserting stranded wires / removing wires by lightly pressing on the push button.

Wiring examples

Serial wiring:



Paralell wiring:



3.4 Mounting instruction

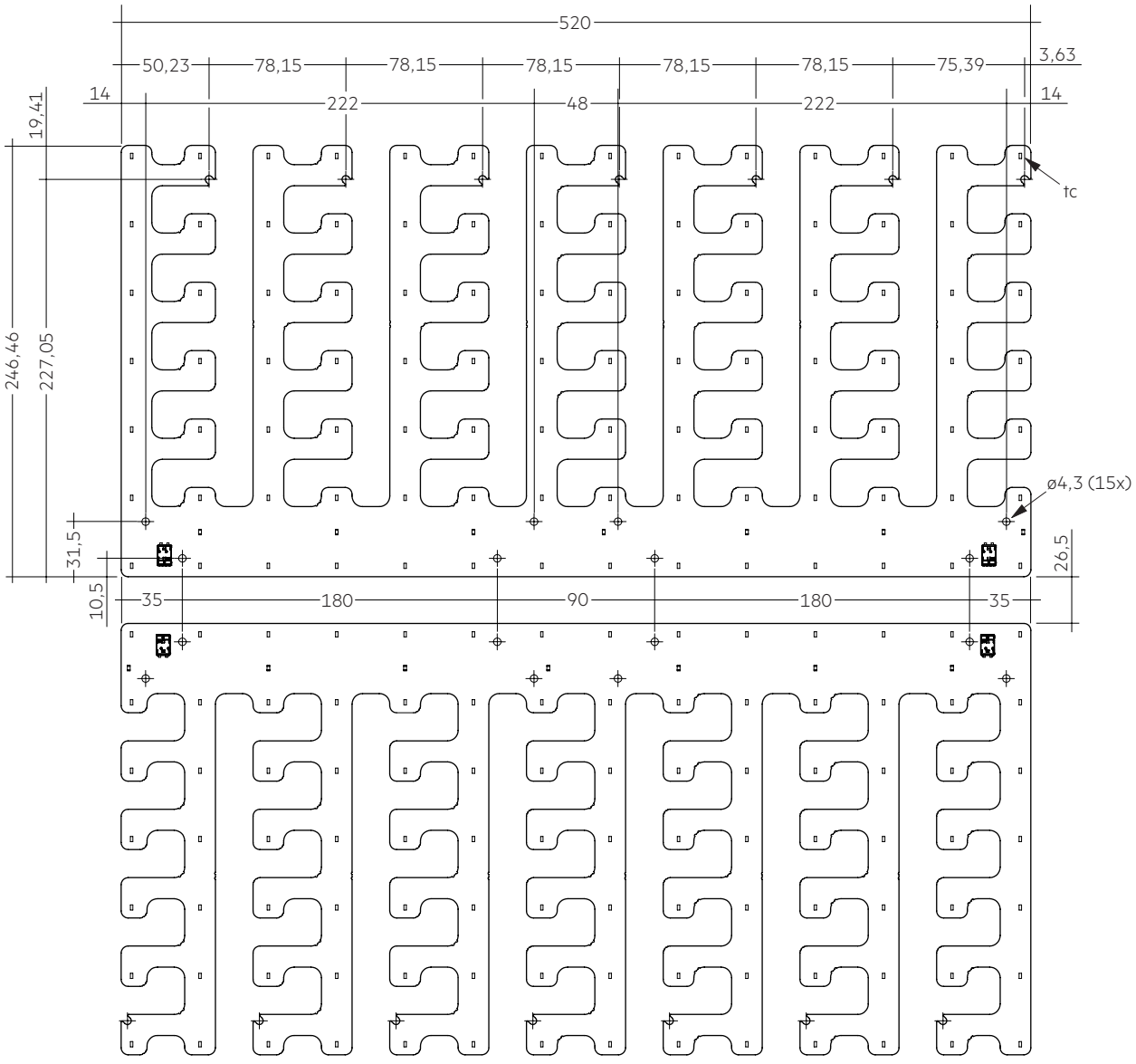
None of the components of the QLE (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

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.



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. Lifetime

4.1 Lifetime, lumen maintenance and failure rate

The light output of an LED Module decreases over the lifetime, 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 lifetime 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 degra-dation 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

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
300 mA	45 °C	37,000 h	50,000 h	> 60,000 h	> 60,000 h	> 60,000 h	> 60,000 h
	55 °C	35,000 h	46,000 h	> 60,000 h	> 60,000 h	> 60,000 h	> 60,000 h
	65 °C	33,000 h	42,000 h	> 60,000 h	> 60,000 h	> 60,000 h	> 60,000 h
350 mA	45 °C	35,000 h	46,000 h	> 60,000 h	> 60,000 h	> 60,000 h	> 60,000 h
	55 °C	33,000 h	42,000 h	> 60,000 h	> 60,000 h	> 60,000 h	> 60,000 h
	65 °C	31,000 h	39,000 h	> 60,000 h	> 60,000 h	> 60,000 h	> 60,000 h
525 mA	45 °C	27,000 h	31,000 h	51,000 h	> 60,000 h	> 60,000 h	> 60,000 h
	55 °C	26,000 h	30,000 h	48,000 h	58,000 h	> 60,000 h	> 60,000 h
	65 °C	25,000 h	29,000 h	46,000 h	57,000 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

35,000 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

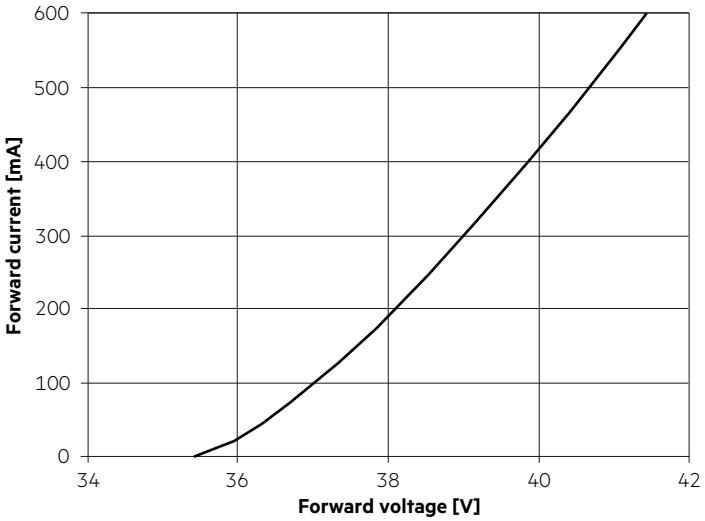
Irated ... Nominal operating current the module is designed for.

Imax ... Max. permissible continuous operating current incl. the tolerances of the LED Driver.

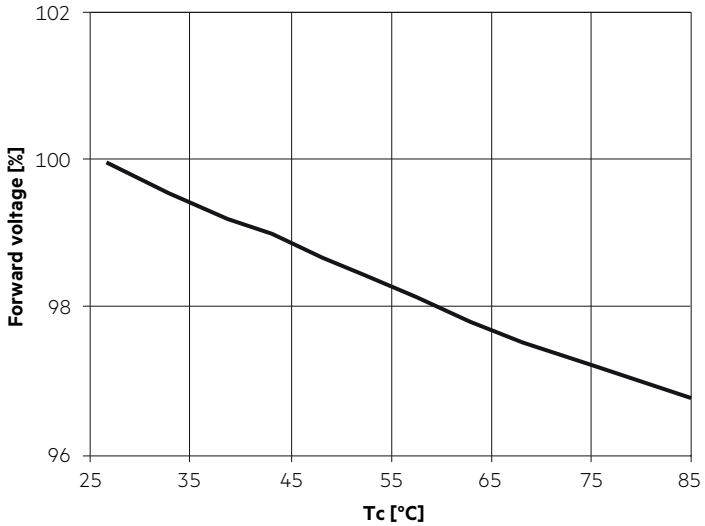
Max. permissible LF current ripple ... Max. output current of the LED driver incl. Tolerances and LF current ripple must not exceed this value.

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



5.2 Forward voltage vs. tp temperature



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

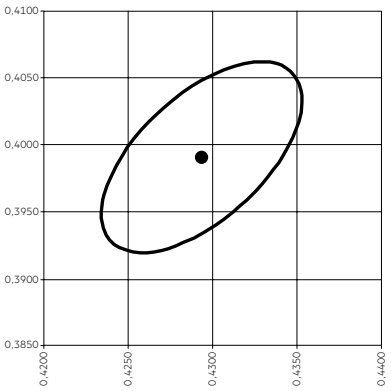
6. Photometric characteristics

6.1 Coordinates and tolerances according to CIE 1931

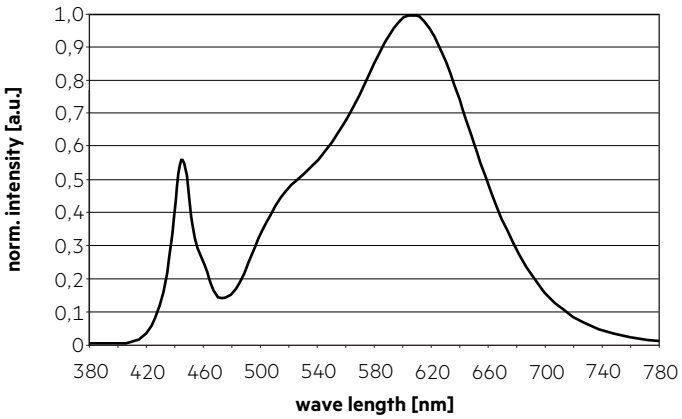
The specified colour coordinates are measured integral by a current impulse of 320 mA and a duration of 100 ms.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

3,000 K

	x0	y0
Centre	0.4294	0.3991

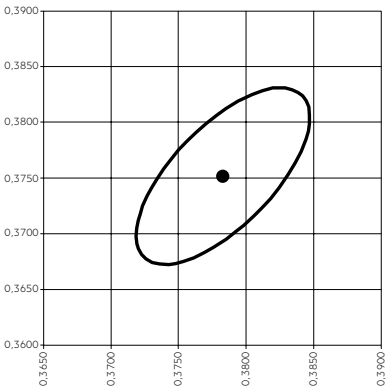


MacAdam Ellipse: 3SDCM

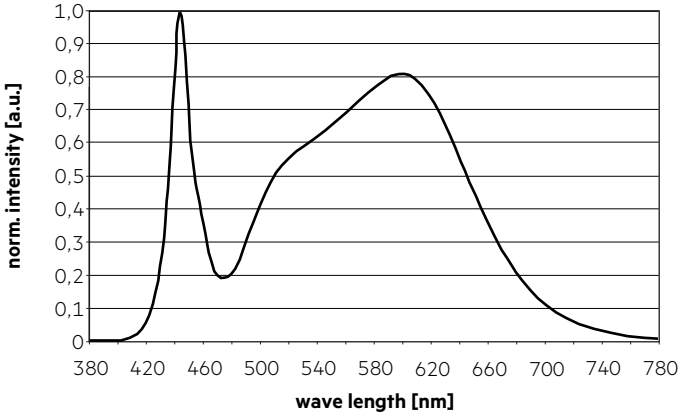


4,000 K

	x0	y0
Centre	0.3783	0.3752

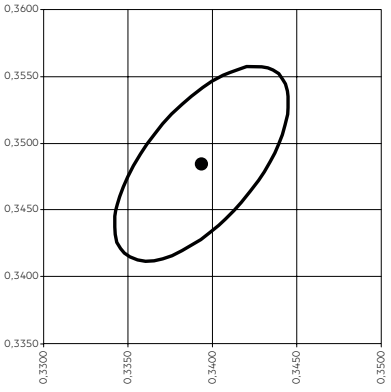


MacAdam Ellipse: 3SDCM

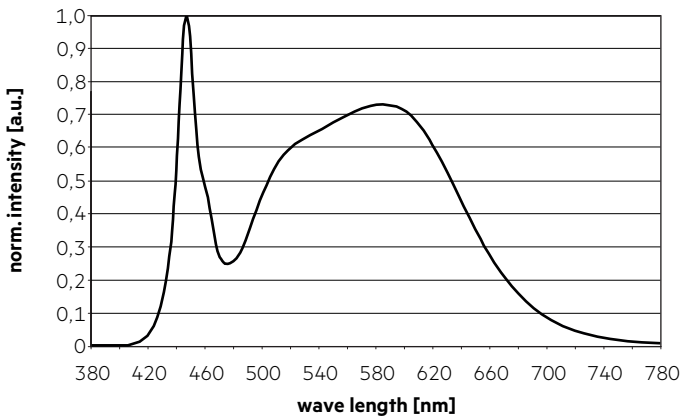


5,000 K

	x0	y0
Centre	0.3393	0.3485

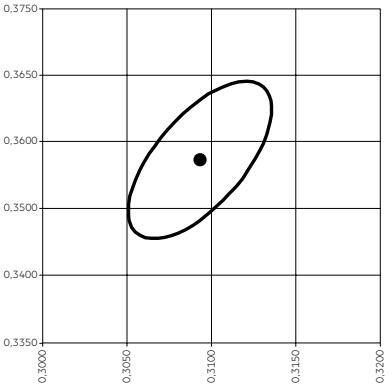


MacAdam Ellipse: 3SDCM



6,500 K

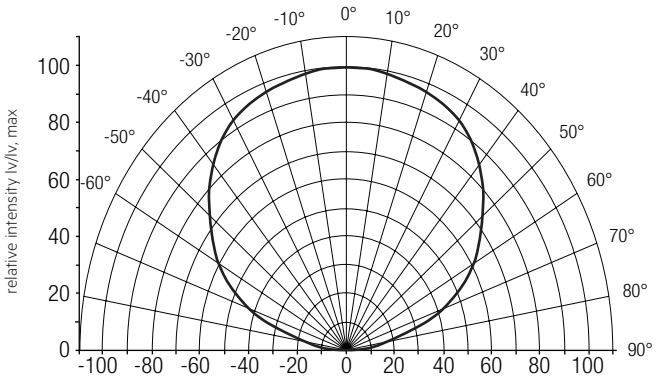
	x0	y0
Centre	0.3094	0.3236



MacAdam Ellipse: 3SDCM

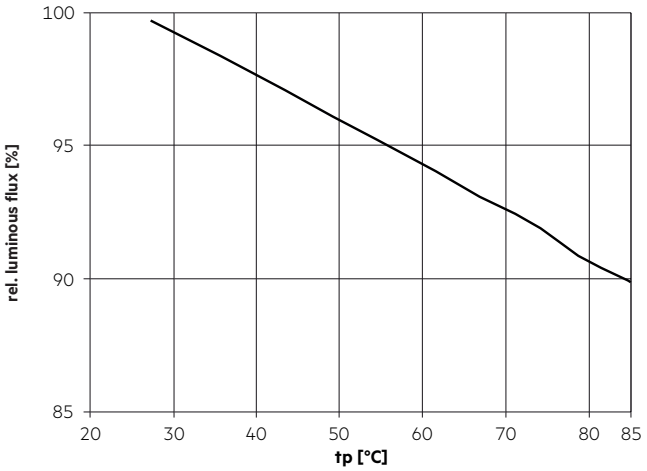
6.2 Light distribution

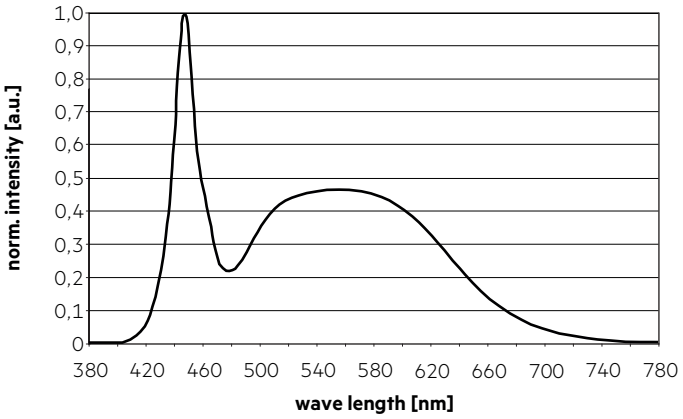
The optical design of the QLE product line ensures optimum homogeneity for the light distribution.



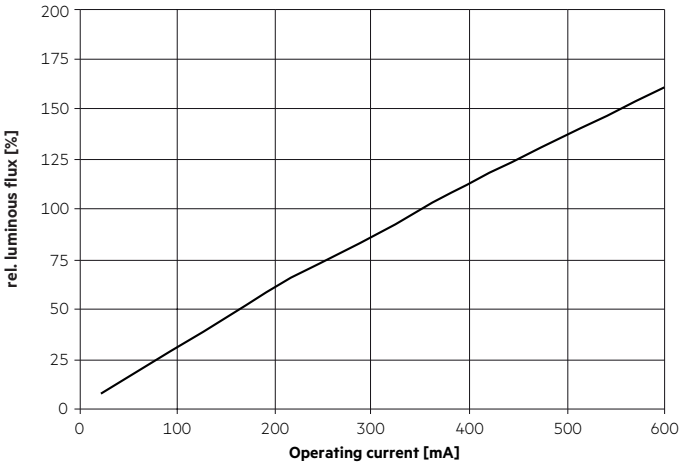
The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 5.
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 6 cm) should be used.
Designed for typical area luminaires like 600 x 600 mm troffer fittings. Special applications like illuminated ceilings must be evaluated individually.

6.3 Relative luminous flux vs. tc temperature





6.4 Relative luminous flux vs. operating current



7. Miscellaneous

7.1 Additional information

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

Lifetime declarations are informative and represent no warranty claim.