



Module QLE G2 520x246mm 2500lm ADV-SE

Modules QLE ADVANCED

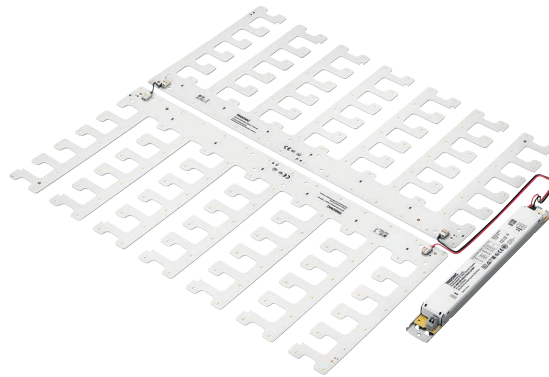
Product description

- Ideal for linear and panel lights
- Luminous flux range from 1,890 – 3,500 lm
- LED system solution with outstanding system efficacy up to 150 lm/W, consisting of squared LED modules and dimmable LED Driver LCA 50W 100–400mA Ip PRE
- Efficacy of the module up to 170 lm/W
- High colour rendering index CRI > 80
- Small colour tolerance MacAdam 3^o
- Small luminous flux tolerances
- Colour temperatures 3,000, 4,000, 5,000 and 6,500 K
- 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
- Simple installation (e.g. screws)
- Long life-time: 50,000 hours
- 5-year guarantee



Standards, page 4

Colour temperatures and tolerances, page 9



Complete system



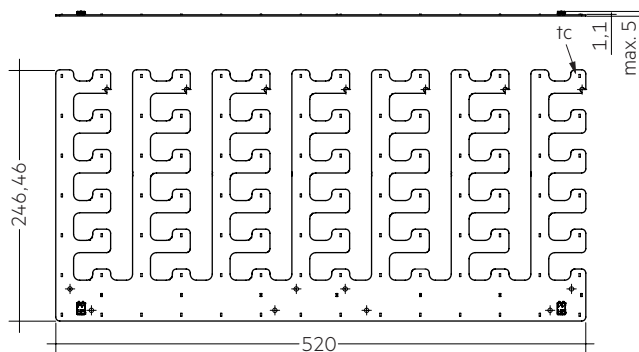


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Technical data

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 62471:2008) ^③	RG1
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.
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

Specific technical data

Type ^④	Photo-metric code	Typ. luminous flux at tp = 25 °C ^⑤	Typ. luminous flux at tp = 45 °C ^③	Typ. forward current	Min. forward voltage at tp = 45 °C	Max. forward voltage at tp = 25 °C	Typ. power consumption at tp = 45 °C ^⑥	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
Operating mode HE at 300 mA											
QLE G2 520x246mm 2500lm 830 ADV-SE	830/359	1,960 lm	1,890 lm	300 mA	38.6 V	44.7 V	12.2 W	158 lm/W	155 lm/W	140 lm/W	> 80
QLE G2 520x246mm 2500lm 840 ADV-SE	840/359	2,100 lm	2,040 lm	300 mA	38.6 V	44.7 V	12.2 W	170 lm/W	167 lm/W	150 lm/W	> 80
QLE G2 520x246mm 2500lm 850 ADV-SE	850/359	2,100 lm	2,040 lm	300 mA	38.6 V	44.7 V	12.2 W	170 lm/W	167 lm/W	150 lm/W	> 80
QLE G2 520x246mm 2500lm 865 ADV-SE	865/359	2,080 lm	2,020 lm	300 mA	38.6 V	44.7 V	12.2 W	169 lm/W	165 lm/W	149 lm/W	> 80
Operating mode NM at 350 mA											
QLE G2 520x246mm 2500lm 830 ADV-SE	830/359	2,270 lm	2,200 lm	350 mA	39.1 V	45.2 V	14.4 W	155 lm/W	152 lm/W	137 lm/W	> 80
QLE G2 520x246mm 2500lm 840 ADV-SE	840/359	2,450 lm	2,370 lm	350 mA	39.1 V	45.2 V	14.4 W	167 lm/W	164 lm/W	148 lm/W	> 80
QLE G2 520x246mm 2500lm 850 ADV-SE	850/359	2,450 lm	2,370 lm	350 mA	39.1 V	45.2 V	14.4 W	167 lm/W	164 lm/W	148 lm/W	> 80
QLE G2 520x246mm 2500lm 865 ADV-SE	865/359	2,420 lm	2,340 lm	350 mA	39.1 V	45.2 V	14.4 W	166 lm/W	162 lm/W	146 lm/W	> 80
Operating mode HO at 525 mA											
QLE G2 520x246mm 2500lm 830 ADV-SE	830/359	3,240 lm	3,140 lm	525 mA	40.6 V	46.8 V	22.4 W	143 lm/W	140 lm/W	126 lm/W	> 80
QLE G2 520x246mm 2500lm 840 ADV-SE	840/359	3,500 lm	3,390 lm	525 mA	40.6 V	46.8 V	22.4 W	154 lm/W	150 lm/W	135 lm/W	> 80
QLE G2 520x246mm 2500lm 850 ADV-SE	850/359	3,500 lm	3,390 lm	525 mA	40.6 V	46.8 V	22.4 W	154 lm/W	150 lm/W	135 lm/W	> 80
QLE G2 520x246mm 2500lm 865 ADV-SE	865/359	3,460 lm	3,350 lm	525 mA	40.6 V	46.8 V	22.4 W	152 lm/W	149 lm/W	134 lm/W	> 80

^① Integral measurement over the complete module.

^② If mounted with M4 screws.

^③ Tolerance range for and electrical data: ±10 %.

^④ HE ... high efficiency, NM ... nominal mode, HO ... high output.

^⑤ Measured at Imax.

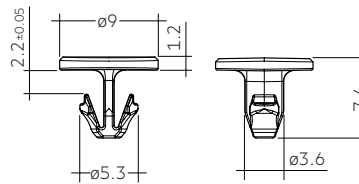
CLIP 4.3mm

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



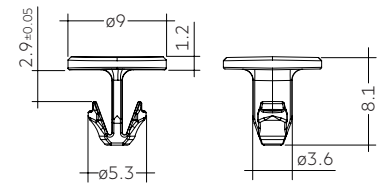
ACL CLIP 4.3mm PUSH-FIX



ACL CLIP 4.3mm PUSH-FIX



ACL CLIP 4.3mm PUSH-FIX Long



ACL CLIP 4.3mm PUSH-FIX Long

Ordering data

Type	Article number	Colour	Packaging bag [®]	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

[®] Minimum sales quantity 500 pcs.

1. Standards

IEC 62031
IEC 62471
IEC 62778
IEC 61547
IEC 62717
UL 8750

1.1 Photometric code

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

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	Energy classification
QLE G2 ADV-SE	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 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.

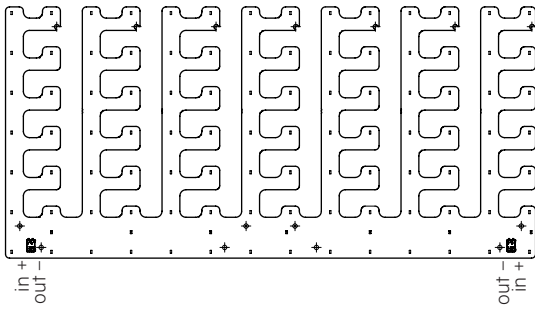
QLE modules can be operated either from SELV LED Drivers or from LED Drivers with LV output voltage.



QLE modules are basic isolated 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 isolation between LED module and heat sink is required (for example by isolated thermal pads) or by a suitable luminaire construction.

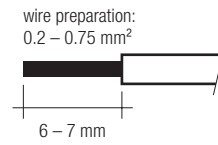
At voltages > 60 V an additional protection against direct touch (test finger) to the light emitting side of the module has to be guaranteed. This is typically achieved by means of a non removable light distributor over the module.

3.2 Wiring



3.3 Wiring type and cross section

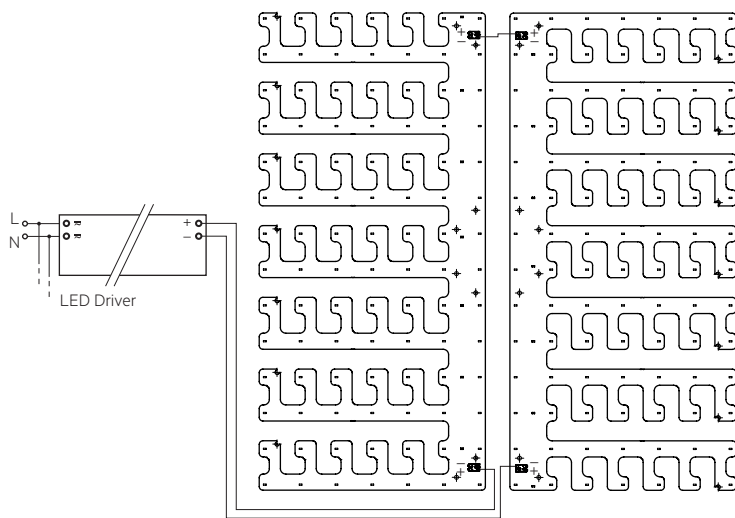
The wiring can be solid cable with a cross section of 0.2 to 0.75 mm². For the push-wire connection you have to strip the insulation (6–7 mm).



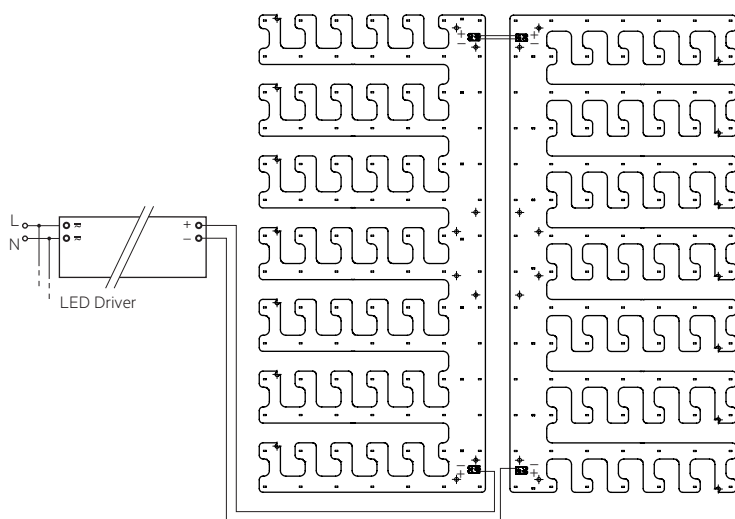
Inserting stranded wires / removing wires by lightly pressing on the push button.

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.

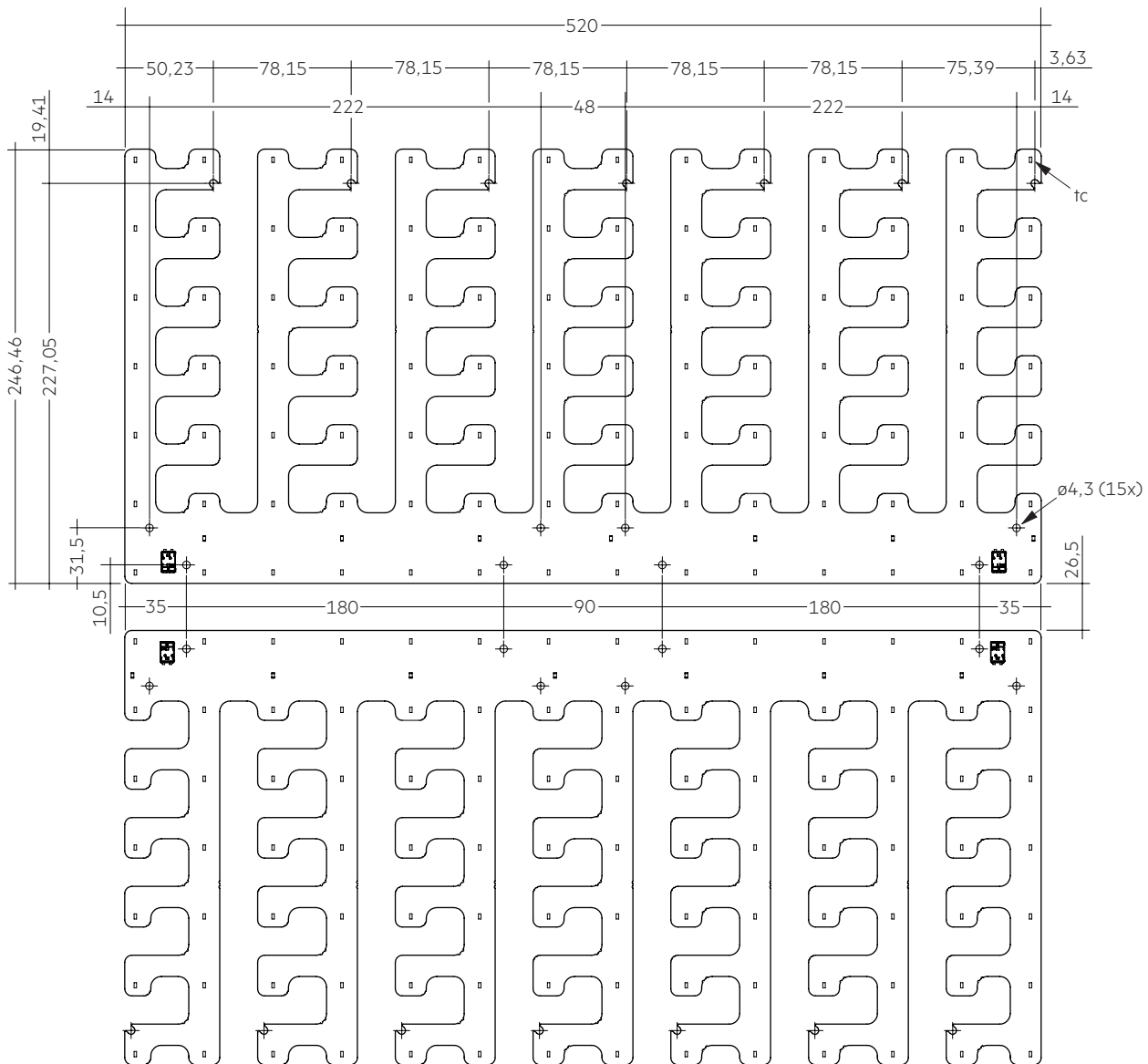
The LED modules are mounted with M4 screws or ACL CLIP 4.3mm per module.



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. 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

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
	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 I_{max}

5. Electrical values

5.1 Declaration of electrical parameters

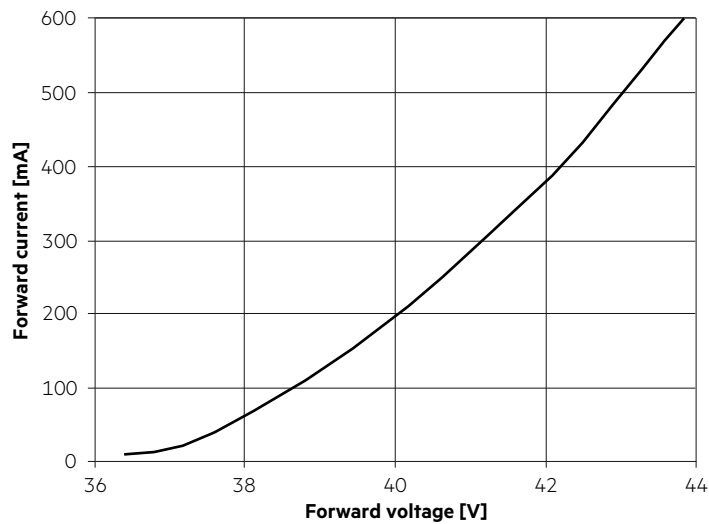
Irated ... Nominal operating current the module is designed for.

I_{max} ... Max. permissible continuous operating current incl. the tolerances of the LED Driver.

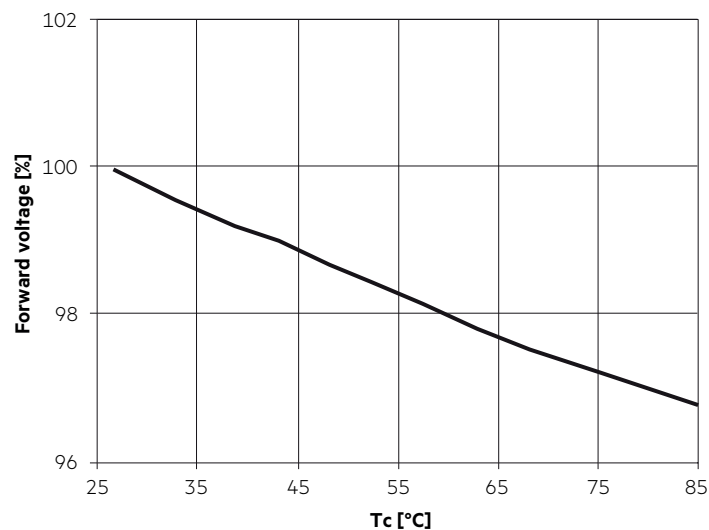
Max. permissible LF current ripple ... Max. output current of the LED driver incl. Tolerances and LF current ripple must not exceed this value.

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

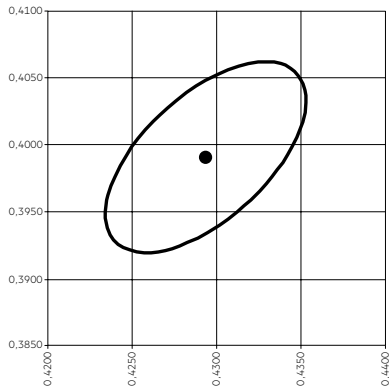
The specified colour coordinates are measured integral by a current impulse of 320 mA and a duration of 100 ms.

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

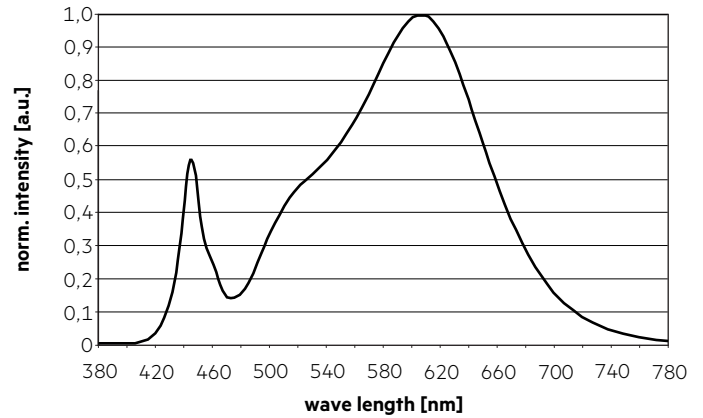
The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K

	x0	y0
Centre	0.4294	0.3991

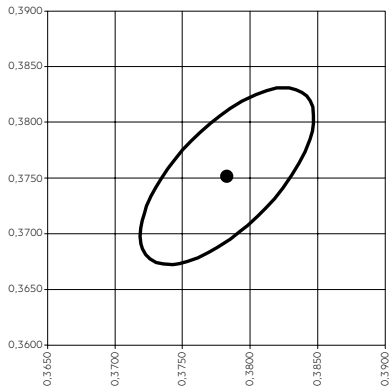


— MacAdam Ellipse: 3SDCM

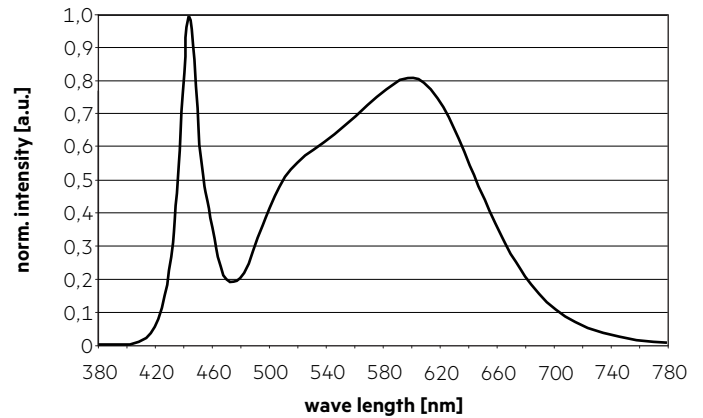


4,000 K

	x0	y0
Centre	0.3783	0.3752

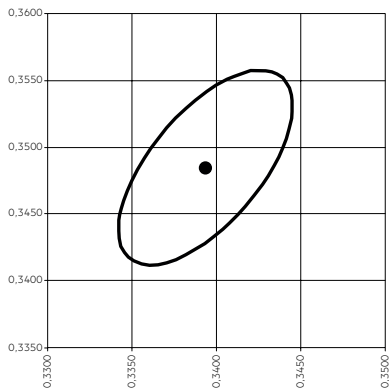


— MacAdam Ellipse: 3SDCM

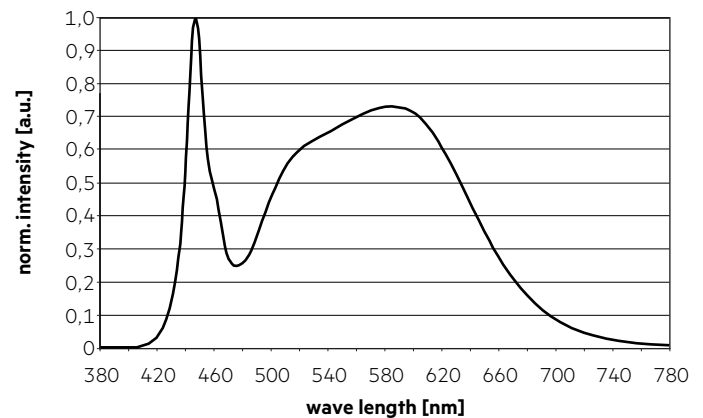


5,000 K

	x0	y0
Centre	0.3393	0.3485

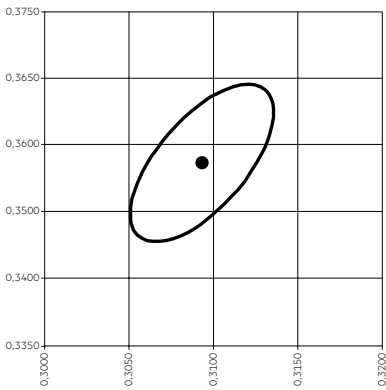


— MacAdam Ellipse: 3SDCM

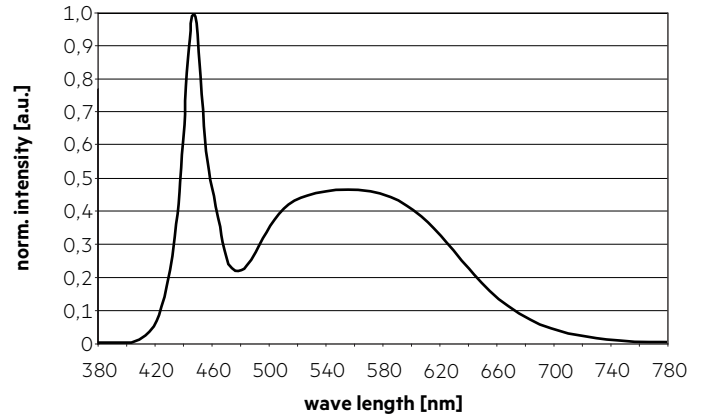


6,500 K

	x0	y0
Centre	0.3094	0.3236

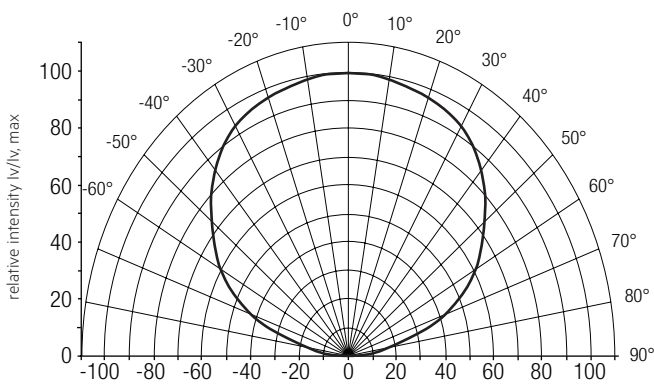


— MacAdam Ellipse: 3SDCM



6.2 Light distribution

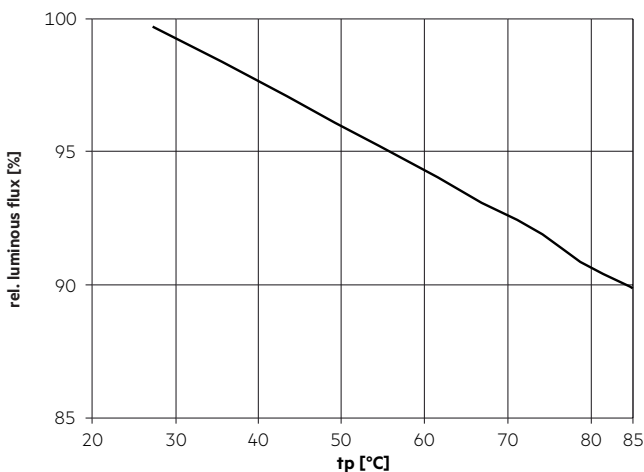
The optical design of the QLE product line ensures optimum homogeneity for the light distribution.



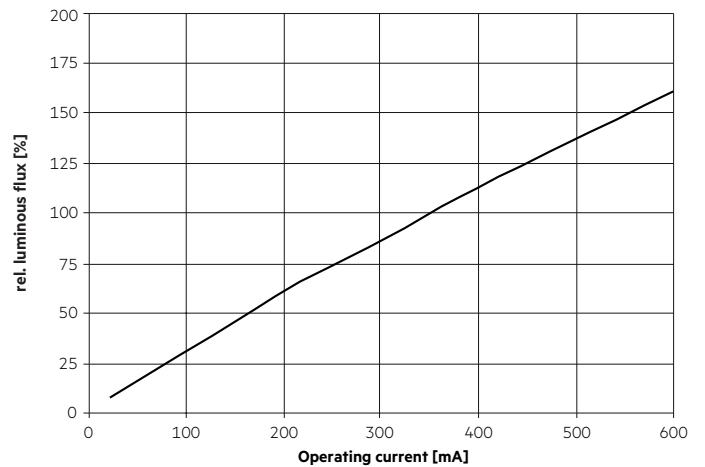
The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam tbd.

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



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.