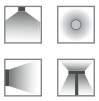


Module QLE CRI90 ADV5

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: 72,000 hours
- 5 years guarantee (conditions at www.tridonic.com)

Optical properties

- Colour temperatures 3,000 and 4,000 K
- Useful luminous flux 1,010 lm at Irated and tp = 25 °C
- Efficacy of the LED module 174 lm/W at Irated and tp = 25 °C
- High colour rendering index CRI > 90
- Small colour tolerance MacAdam 3①
- Small luminous flux tolerances

Mechanical properties

- Module dimension 250 x 250 mm and 270 x 270 mm
- Simple installation (e.g. screws)

System solution

- Combine Tridonic`s LED modules and dimmable drivers to achieve an outstanding system efficacy (configuration possible via https://setbuilder.tridonic.com/)

Standards, page 5

Colour temperatures and tolerances, page 9

QLE 250x250mm 1250lm ADV5

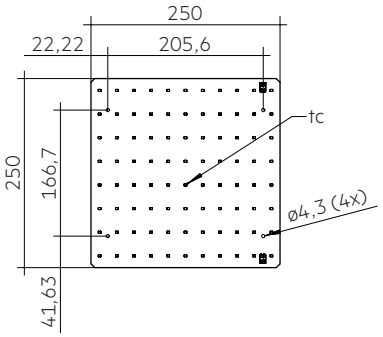
QLE 270x270mm 1250lm ADV5

Module QLE CRI90 ADV5

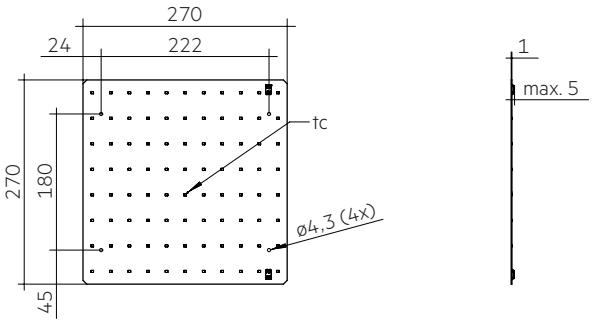
Modules QLE advanced

Technical data

Beam characteristic	120°
Ambient temperature range	-40 … +65 °C
tp rated	45 °C
tc	90 °C
Irated for 250x250 / 270x270mm	200 mA
Imax for 250x250 / 270x270mm	1,200 mA
Max. permissible LF current ripple for 250x250 / 270x270mm	1,320 mA
Max. permissible peak current for 250x250 / 270x270mm	2,400 mA / max. 10 ms
Max. working voltage for insulation[2]	405 V
Insulation test voltage	1.81 kV
CTI of the printed circuit board	≥ 600
ESD classification	severity level 4
Risk group (IEC 62471) for 250x250 / 270x270mm at ≤ 1,080 mA	RG0
Risk group (IEC 62471) for 250x250 / 270x270mm at > 1,080 mA to 1,200 mA	RG1
Classification acc. to IEC 62031	Built-in
Type of protection	IP00
Lumen maintenance L70B50	72,000 h
Guarantee (conditions at www.tridonic.com)	5 years



QLE 250x250mm 1250lm ADV5



QLE 270x270mm 1250lm ADV5

Ordering data

Type	Article number	Colour temperature	Packaging carton	Weight per pc.
QLE 250x250mm 1250lm 930 ADV5	**28002983**	3,000 K	40 Stk.	0.140 kg
QLE 250x250mm 1250lm 940 ADV5	**28002984**	4,000 K	40 Stk.	0.140 kg
QLE 270x270mm 1250lm 930 ADV5	**28002989**	3,000 K	40 Stk.	0.165 kg
QLE 270x270mm 1250lm 940 ADV5	**28002990**	4,000 K	40 Stk.	0.165 kg

Specific technical data

Type[3]	Photo-metric code	Useful luminous flux at tp = 25 °C[4]	Expected luminous flux at tp rated[5]	Typ. forward current	Min. forward voltage at tp = 45 °C	Max. forward voltage at tp = 25 °C	Power con-sumption Pon at tp = 25 °C[6]	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
QLE 250x250 / 270x270 mm – Operating mode NM at 200 mA										
QLE 250x250mm 1250lm 930 ADV5	930/359	965 lm	925 lm	200 mA	27.0 V	31.0 V	5.8 W	166 lm/W	160 lm/W	> 90
QLE 250x250mm 1250lm 940 ADV5	940/359	1,010 lm	960 lm	200 mA	27.0 V	31.0 V	5.8 W	174 lm/W	168 lm/W	> 90
QLE 270x270mm 1250lm 930 ADV5	930/359	963 lm	923 lm	200 mA	27.0 V	31.0 V	5.8 W	166 lm/W	160 lm/W	> 90
QLE 270x270mm 1250lm 940 ADV5	940/359	1,010 lm	960 lm	200 mA	27.0 V	31.0 V	5.8 W	174 lm/W	168 lm/W	> 90
QLE 250x250 / 270x270 mm – Operating mode NM at 250 mA										
QLE 250x250mm 1250lm 930 ADV5	930/359	–	1,154 lm	250 mA	27.2 V	31.2 V	–	–	160 lm/W	> 90
QLE 250x250mm 1250lm 940 ADV5	940/359	–	1,210 lm	250 mA	27.2 V	31.2 V	–	–	166 lm/W	> 90
QLE 270x270mm 1250lm 930 ADV5	930/359	–	1,152 lm	250 mA	27.2 V	31.2 V	–	–	160 lm/W	> 90
QLE 270x270mm 1250lm 940 ADV5	940/359	–	1,210 lm	250 mA	27.2 V	31.2 V	–	–	166 lm/W	> 90
QLE 250x250 / 270x270 mm – Operating mode HO at 300 mA										
QLE 250x250mm 1250lm 930 ADV5	930/359	–	1,383 lm	300 mA	27.4 V	31.4 V	–	–	159 lm/W	> 90
QLE 250x250mm 1250lm 940 ADV5	940/359	–	1,450 lm	300 mA	27.4 V	31.4 V	–	–	165 lm/W	> 90
QLE 270x270mm 1250lm 930 ADV5	930/359	–	1,380 lm	300 mA	27.4 V	31.4 V	–	–	159 lm/W	> 90
QLE 270x270mm 1250lm 940 ADV5	940/359	–	1,450 lm	300 mA	27.4 V	31.4 V	–	–	165 lm/W	> 90
QLE 250x250 / 270x270 mm – Operating mode HO at 350 mA										
QLE 250x250mm 1250lm 930 ADV5	930/359	–	1,622 lm	350 mA	27.6 V	31.6 V	–	–	158 lm/W	> 90
QLE 250x250mm 1250lm 940 ADV5	940/359	–	1,690 lm	350 mA	27.6 V	31.6 V	–	–	164 lm/W	> 90
QLE 270x270mm 1250lm 930 ADV5	930/359	–	1,618 lm	350 mA	27.6 V	31.6 V	–	–	158 lm/W	> 90
QLE 270x270mm 1250lm 940 ADV5	940/359	–	1,690 lm	350 mA	27.6 V	31.6 V	–	–	164 lm/W	> 90
QLE 250x250 / 270x270 mm – Operating mode HO at 400 mA										
QLE 250x250mm 1250lm 930 ADV5	930/359	–	1,930 lm	400 mA	27.7 V	31.8 V	–	–	157 lm/W	> 90
QLE 250x250mm 1250lm 940 ADV5	940/359	–	1,940 lm	400 mA	27.7 V	31.8 V	–	–	163 lm/W	> 90
QLE 270x270mm 1250lm 930 ADV5	930/359	–	1,847 lm	400 mA	27.7 V	31.8 V	–	–	157 lm/W	> 90
QLE 270x270mm 1250lm 940 ADV5	940/359	–	1,940 lm	400 mA	27.7 V	31.8 V	–	–	163 lm/W	> 90
QLE 250x250 / 270x270 mm – Operating mode HO at 450 mA										
QLE 250x250mm 1250lm 930 ADV5	930/359	–	2,089 lm	450 mA	27.9 V	32.0 V	–	–	157 lm/W	> 90
QLE 250x250mm 1250lm 940 ADV5	940/359	–	2,180 lm	450 mA	27.9 V	32.0 V	–	–	162 lm/W	> 90
QLE 270x270mm 1250lm 930 ADV5	930/359	–	2,085 lm	450 mA	27.9 V	32.0 V	–	–	157 lm/W	> 90
QLE 270x270mm 1250lm 940 ADV5	940/359	–	2,180 lm	450 mA	27.9 V	32.0 V	–	–	162 lm/W	> 90
QLE 250x250 / 270x270 mm – Operating mode HO at 500 mA										
QLE 250x250mm 1250lm 930 ADV5	930/359	–	2,318 lm	500 mA	28.1 V	32.2 V	–	–	156 lm/W	> 90
QLE 250x250mm 1250lm 940 ADV5	940/359	–	2,430 lm	500 mA	28.1 V	32.2 V	–	–	162 lm/W	> 90
QLE 270x270mm 1250lm 930 ADV5	930/359	–	2,313 lm	500 mA	28.1 V	32.2 V	–	–	156 lm/W	> 90
QLE 270x270mm 1250lm 940 ADV5	940/359	–	2,430 lm	500 mA	28.1 V	32.2 V	–	–	162 lm/W	> 90

[1] Integral measurement over the complete module.

[2] If mounted with M4 screws.

[3] NM ... nominal mode, HO ... high output.

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

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

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

ACCES-SORIES

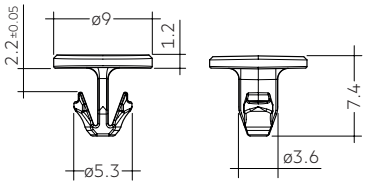
CLIP 4.3mm

Product description

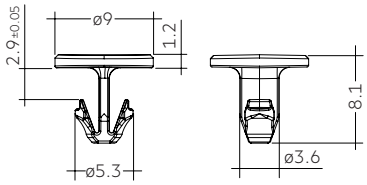
- Clip for fixation of LED modules with 4.3 mm holes
- Fast snap on mounting (sheet thickness 0.5 – 1.0 mm for PUSH-FIX and 1 – 2 mm for PUSH-FIX Long)
- For drilling hole 4 mm
- Clip made of Polycarbonat

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
UL 8750 (for CLASS2 circuits and dry locations)

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 temperature	Forward current	Energy classification	Energy consumption
QLE 250x250mm 1250lm 930 ADV5	3,000 K	200 mA	D	6 kWh / 1,000 h
QLE 250x250mm 1250lm 940 ADV5	4,000 K	200 mA	C	6 kWh / 1,000 h
QLE 270x270mm 1250lm 930 ADV5	3,000 K	200 mA	D	6 kWh / 1,000 h
QLE 270x270mm 1250lm 940 ADV5	4,000 K	200 mA	C	6 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 thermal 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	-40 … +85 °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.

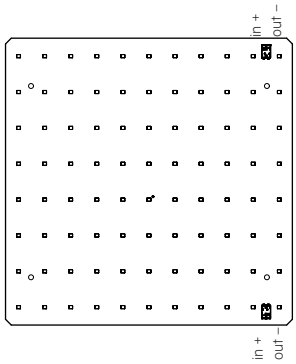
With parallel wiring tolerance-related differences in output are possible (thermal stress of the module) and can cause differences in brightness. If a wire breaks or a complete module fails then the current passing through the other module increases. This may reduce its life considerably.

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 405 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 405 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.

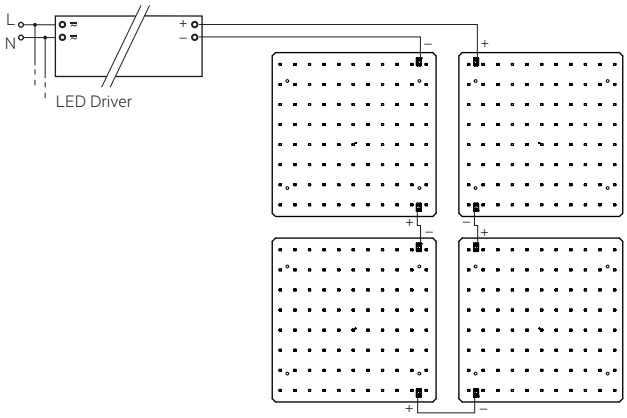
3.2 Wiring

QLE 250x250mm / 270x270mm:

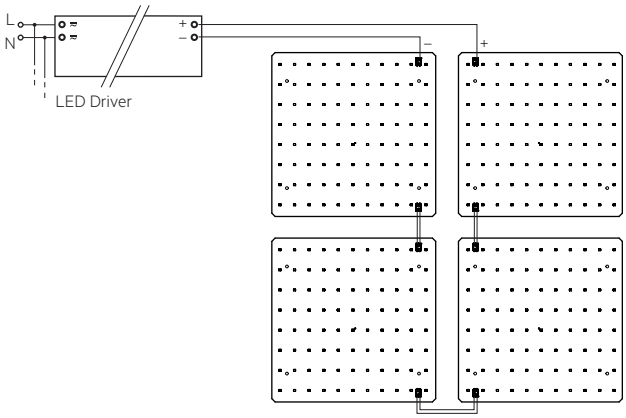


Wiring examples

QLE 250x250mm / 270x270mm serial wiring:



QLE 250x250mm / 270x270mm paralell wiring:

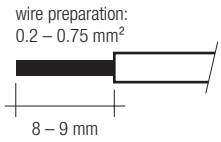


Type	Max. number with parallel wiring*
QLE 250x250 / 270x270mm 1250lm ADV5	6

* with direkt chaining (without additional terminals).

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 suitabel 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.

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

QLE 250x250mm / 270x270mm:

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
200 mA	40 °C	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	50 °C	64,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	60 °C	57,000 h	69,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
250 mA	40 °C	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	50 °C	64,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	60 °C	57,000 h	69,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
300 mA	40 °C	71,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	50 °C	64,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	60 °C	57,000 h	68,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
350 mA	40 °C	71,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	50 °C	63,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	60 °C	56,000 h	68,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
400 mA	40 °C	71,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	50 °C	63,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	60 °C	56,000 h	68,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
450 mA	40 °C	70,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	50 °C	63,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	60 °C	56,000 h	67,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
500 mA	40 °C	70,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	50 °C	62,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h
	60 °C	56,000 h	67,000 h	> 72,000 h	> 72,000 h	> 72,000 h	> 72,000 h

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

4.3 Switching capability

100,000 cycles

Tridonic test 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.

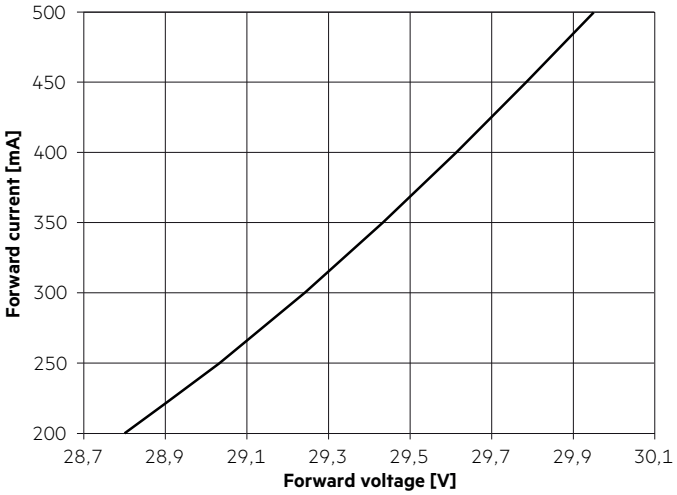
Imax ... Max. permissible continuous operating current incl. the tolerances of the LED Driver.

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

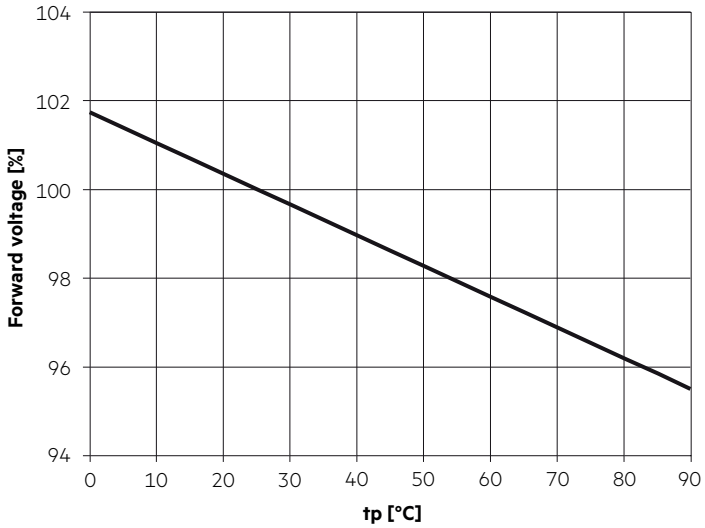
Max. permissible peak current ... The max. output peak current of the LED driver must not exceed this value.

5.2 Typ. forward voltage vs. forward current at tp = 25 °C

QLE 250x250mm / 270x270mm:



5.2 Forward voltage vs. tp temperature



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

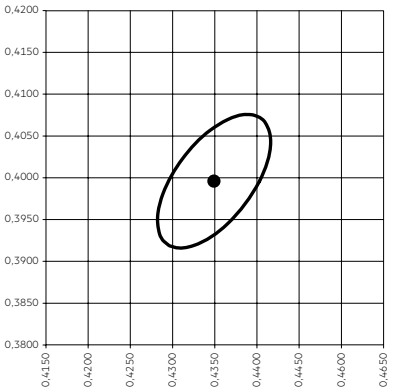
6. Photometric characteristics

6.1 Coordinates and tolerances according to CIE 1931

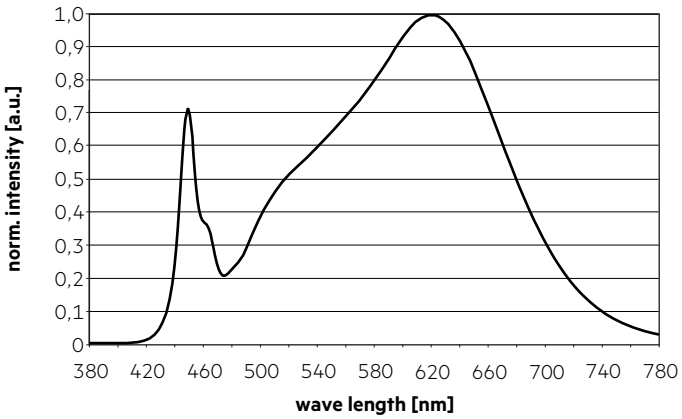
The specified colour coordinates are measured integral by a current impulse of 200 / 400 mA and a duration of 100 ms.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

3,000 K, CRI 90

	x0	y0
Centre	0.4349	0.3996

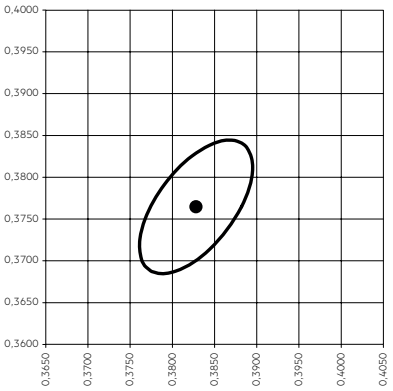


MacAdam Ellipse: 3SDCM

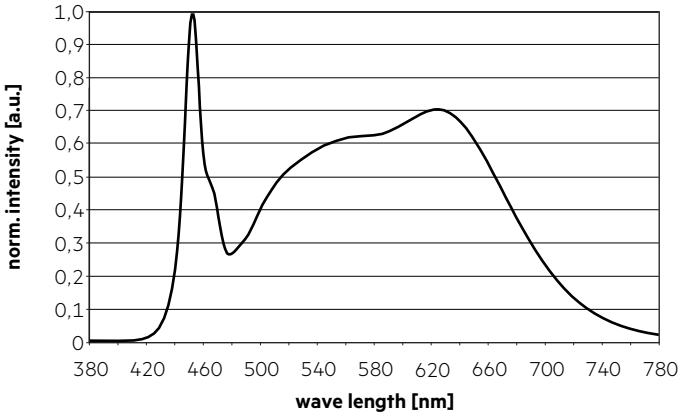


4,000 K, CRI 90

	x0	y0
Centre	0.3828	0.3765

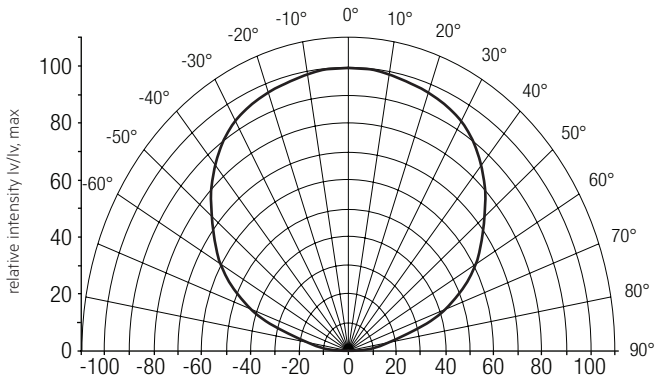


MacAdam Ellipse: 3SDCM



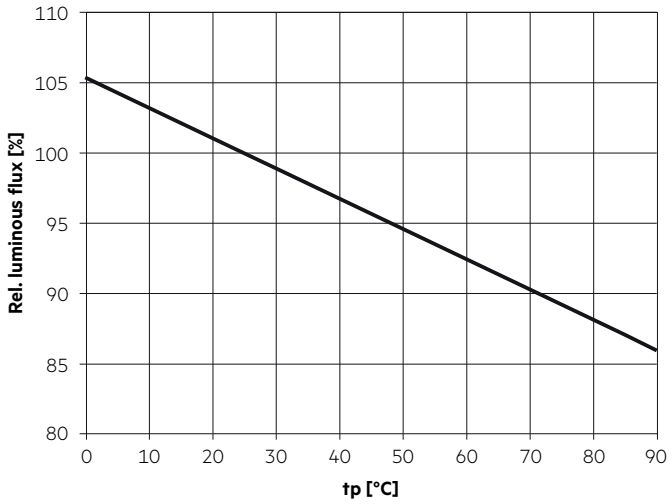
6.2 Light distribution

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



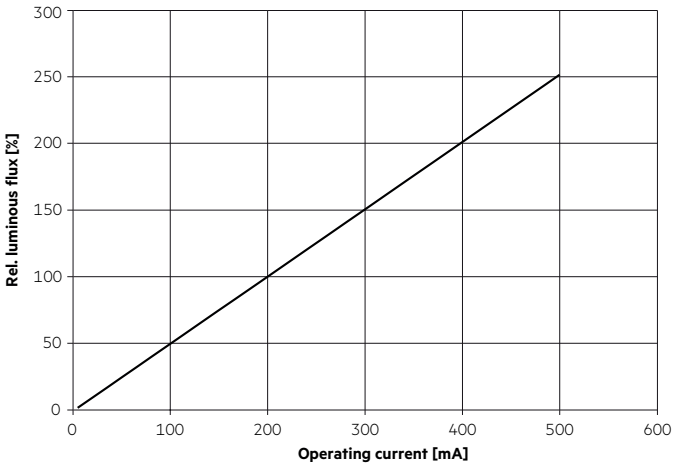
The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 5.
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 6 cm) should be used.

6.3 Relative luminous flux vs. tp temperature



6.4 Relative luminous flux vs. operating current

QLE 250x250mm / 270x270mm:



7. Miscellaneous

7.1 Additional information

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

Lifetime declarations are informative and represent no warranty claim.