



#### 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 life-time: 72,000 hours
- 5-year guarantee

#### Optical properties

- Colour temperatures 3,000 and 4,000 K
- Luminous flux range from 1,000 – 2,430 lm
- Efficacy of the module up to 169 lm/W
- High colour rendering index CRI > 90
- Small colour tolerance MacAdam 3<sup>rd</sup>
- Small luminous flux tolerances

#### Mechanical properties

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

#### System solution

- LED system solution with outstanding system efficacy up to 156 lm/W, consisting of squared LED modules and dimmable LED Driver LCA 50W 150–400mA Ip PRE



**Standards**, page 5

**Colour temperatures and tolerances**, page 9



QLE 250x250mm 1250lm ADV5



QLE 270x270mm 1250lm ADV5

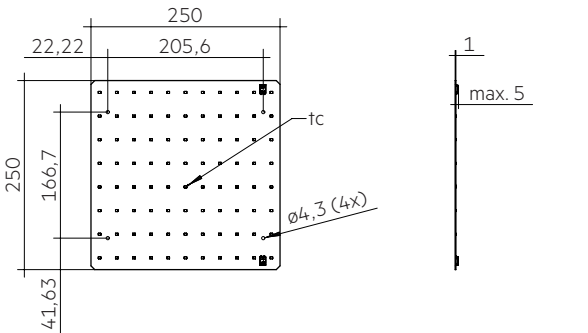




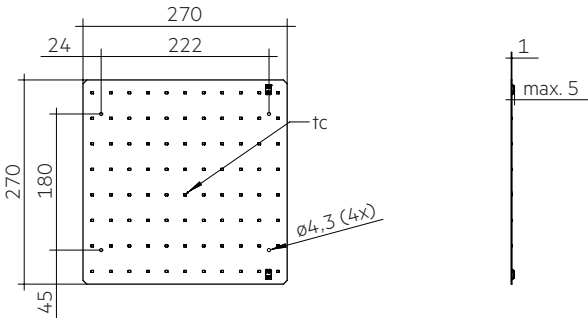
Module QLE CRI90 ADV5  
Modules QLE advanced

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 <sup>®</sup>           | 405 V                 |
| Insulation test voltage                                    | 1.81 kV               |
| CTI of the printed circuit board                           | ≥ 600                 |
| ESD classification                                         | severity level 4      |
| Risk group (IEC 62471:2008) <sup>®</sup>                   | RG1                   |
| Classification acc. to IEC 62031                           | Built-in              |
| Type of protection                                         | IP00                  |
| Life-time                                                  | up to 72,000 h        |



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 <sup>®</sup>                                             | Photo-<br>metric<br>code | Typ.<br>luminous flux<br>at tp = 25 °C <sup>®</sup> | Typ.<br>luminous flux<br>at tp = 45 °C <sup>®</sup> | Typ.<br>forward<br>current | Min. forward<br>voltage at<br>tp = 45 °C | Max. forward<br>voltage at<br>tp = 25 °C | Typ. power<br>consumption at<br>tp = 45 °C <sup>®</sup> | Efficacy<br>of the module<br>at tp = 25 °C | Efficacy<br>of the module<br>at tp = 45 °C | Efficacy<br>of the system<br>at tp = 45 °C | Colour<br>rendering<br>index CRI |
|---------------------------------------------------------------|--------------------------|-----------------------------------------------------|-----------------------------------------------------|----------------------------|------------------------------------------|------------------------------------------|---------------------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|----------------------------------|
| <b>QLE 250x250 / 270x270 mm – Operating mode NM at 200 mA</b> |                          |                                                     |                                                     |                            |                                          |                                          |                                                         |                                            |                                            |                                            |                                  |
| <b>QLE 250x250mm 1250lm 930 ADV5</b>                          | 930/359                  | 970 lm                                              | 930 lm                                              | 200 mA                     | 27.0 V                                   | 31.0 V                                   | 5.7 W                                                   | 168 lm/W                                   | 162 lm/W                                   | 149 lm/W                                   | > 90                             |
| <b>QLE 250x250mm 1250lm 940 ADV5</b>                          | 940/359                  | 1,010 lm                                            | 960 lm                                              | 200 mA                     | 27.0 V                                   | 31.0 V                                   | 5.7 W                                                   | 175 lm/W                                   | 169 lm/W                                   | 156 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 930 ADV5</b>                          | 930/359                  | 970 lm                                              | 930 lm                                              | 200 mA                     | 27.0 V                                   | 31.0 V                                   | 5.7 W                                                   | 168 lm/W                                   | 162 lm/W                                   | 149 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 940 ADV5</b>                          | 940/359                  | 1,010 lm                                            | 960 lm                                              | 200 mA                     | 27.0 V                                   | 31.0 V                                   | 5.7 W                                                   | 175 lm/W                                   | 169 lm/W                                   | 156 lm/W                                   | > 90                             |
| <b>QLE 250x250 / 270x270 mm – Operating mode NM at 250 mA</b> |                          |                                                     |                                                     |                            |                                          |                                          |                                                         |                                            |                                            |                                            |                                  |
| <b>QLE 250x250mm 1250lm 930 ADV5</b>                          | 930/359                  | 1,210 lm                                            | 1,160 lm                                            | 250 mA                     | 27.2 V                                   | 31.2 V                                   | 7.2 W                                                   | 167 lm/W                                   | 162 lm/W                                   | 149 lm/W                                   | > 90                             |
| <b>QLE 250x250mm 1250lm 940 ADV5</b>                          | 940/359                  | 1,260 lm                                            | 1,210 lm                                            | 250 mA                     | 27.2 V                                   | 31.2 V                                   | 7.2 W                                                   | 172 lm/W                                   | 167 lm/W                                   | 154 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 930 ADV5</b>                          | 930/359                  | 1,210 lm                                            | 1,160 lm                                            | 250 mA                     | 27.2 V                                   | 31.2 V                                   | 7.2 W                                                   | 167 lm/W                                   | 162 lm/W                                   | 149 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 940 ADV5</b>                          | 940/359                  | 1,260 lm                                            | 1,210 lm                                            | 250 mA                     | 27.2 V                                   | 31.2 V                                   | 7.2 W                                                   | 172 lm/W                                   | 167 lm/W                                   | 154 lm/W                                   | > 90                             |
| <b>QLE 250x250 / 270x270 mm – Operating mode HO at 300 mA</b> |                          |                                                     |                                                     |                            |                                          |                                          |                                                         |                                            |                                            |                                            |                                  |
| <b>QLE 250x250mm 1250lm 930 ADV5</b>                          | 930/359                  | 1,450 lm                                            | 1,390 lm                                            | 300 mA                     | 27.4 V                                   | 31.4 V                                   | 8.7 W                                                   | 165 lm/W                                   | 161 lm/W                                   | 148 lm/W                                   | > 90                             |
| <b>QLE 250x250mm 1250lm 940 ADV5</b>                          | 940/359                  | 1,520 lm                                            | 1,450 lm                                            | 300 mA                     | 27.4 V                                   | 31.4 V                                   | 8.7 W                                                   | 171 lm/W                                   | 166 lm/W                                   | 152 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 930 ADV5</b>                          | 930/359                  | 1,450 lm                                            | 1,390 lm                                            | 300 mA                     | 27.4 V                                   | 31.4 V                                   | 8.7 W                                                   | 165 lm/W                                   | 161 lm/W                                   | 148 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 940 ADV5</b>                          | 940/359                  | 1,520 lm                                            | 1,450 lm                                            | 300 mA                     | 27.4 V                                   | 31.4 V                                   | 8.7 W                                                   | 171 lm/W                                   | 166 lm/W                                   | 153 lm/W                                   | > 90                             |
| <b>QLE 250x250 / 270x270 mm – Operating mode HO at 350 mA</b> |                          |                                                     |                                                     |                            |                                          |                                          |                                                         |                                            |                                            |                                            |                                  |
| <b>QLE 250x250mm 1250lm 930 ADV5</b>                          | 930/359                  | 1,700 lm                                            | 1,630 lm                                            | 350 mA                     | 27.6 V                                   | 31.6 V                                   | 10.2 W                                                  | 165 lm/W                                   | 160 lm/W                                   | 147 lm/W                                   | > 90                             |
| <b>QLE 250x250mm 1250lm 940 ADV5</b>                          | 940/359                  | 1,770 lm                                            | 1,690 lm                                            | 350 mA                     | 27.6 V                                   | 31.6 V                                   | 10.2 W                                                  | 170 lm/W                                   | 165 lm/W                                   | 152 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 930 ADV5</b>                          | 930/359                  | 1,700 lm                                            | 1,630 lm                                            | 350 mA                     | 27.6 V                                   | 31.6 V                                   | 10.2 W                                                  | 165 lm/W                                   | 160 lm/W                                   | 147 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 940 ADV5</b>                          | 940/359                  | 1,770 lm                                            | 1,690 lm                                            | 350 mA                     | 27.6 V                                   | 31.6 V                                   | 10.2 W                                                  | 170 lm/W                                   | 165 lm/W                                   | 152 lm/W                                   | > 90                             |
| <b>QLE 250x250 / 270x270 mm – Operating mode HO at 400 mA</b> |                          |                                                     |                                                     |                            |                                          |                                          |                                                         |                                            |                                            |                                            |                                  |
| <b>QLE 250x250mm 1250lm 930 ADV5</b>                          | 930/359                  | 1,940 lm                                            | 1,860 lm                                            | 400 mA                     | 27.7 V                                   | 31.8 V                                   | 11.7 W                                                  | 164 lm/W                                   | 159 lm/W                                   | 146 lm/W                                   | > 90                             |
| <b>QLE 250x250mm 1250lm 940 ADV5</b>                          | 940/359                  | 2,030 lm                                            | 1,940 lm                                            | 400 mA                     | 27.7 V                                   | 31.8 V                                   | 11.7 W                                                  | 170 lm/W                                   | 164 lm/W                                   | 151 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 930 ADV5</b>                          | 930/359                  | 1,940 lm                                            | 1,860 lm                                            | 400 mA                     | 27.7 V                                   | 31.8 V                                   | 11.7 W                                                  | 164 lm/W                                   | 159 lm/W                                   | 146 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 940 ADV5</b>                          | 940/359                  | 2,030 lm                                            | 1,940 lm                                            | 400 mA                     | 27.7 V                                   | 31.8 V                                   | 11.7 W                                                  | 170 lm/W                                   | 164 lm/W                                   | 151 lm/W                                   | > 90                             |
| <b>QLE 250x250 / 270x270 mm – Operating mode HO at 450 mA</b> |                          |                                                     |                                                     |                            |                                          |                                          |                                                         |                                            |                                            |                                            |                                  |
| <b>QLE 250x250mm 1250lm 930 ADV5</b>                          | 930/359                  | 2,190 lm                                            | 2,100 lm                                            | 450 mA                     | 27.9 V                                   | 32.0 V                                   | 13.2 W                                                  | 163 lm/W                                   | 159 lm/W                                   | 146 lm/W                                   | > 90                             |
| <b>QLE 250x250mm 1250lm 940 ADV5</b>                          | 940/359                  | 2,280 lm                                            | 2,180 lm                                            | 450 mA                     | 27.9 V                                   | 32.0 V                                   | 13.2 W                                                  | 168 lm/W                                   | 163 lm/W                                   | 150 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 930 ADV5</b>                          | 930/359                  | 2,190 lm                                            | 2,100 lm                                            | 450 mA                     | 27.9 V                                   | 32.0 V                                   | 13.2 W                                                  | 163 lm/W                                   | 159 lm/W                                   | 146 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 940 ADV5</b>                          | 940/359                  | 2,280 lm                                            | 2,180 lm                                            | 450 mA                     | 27.9 V                                   | 32.0 V                                   | 13.2 W                                                  | 168 lm/W                                   | 163 lm/W                                   | 150 lm/W                                   | > 90                             |
| <b>QLE 250x250 / 270x270 mm – Operating mode HO at 500 mA</b> |                          |                                                     |                                                     |                            |                                          |                                          |                                                         |                                            |                                            |                                            |                                  |
| <b>QLE 250x250mm 1250lm 930 ADV5</b>                          | 930/359                  | 2,430 lm                                            | 2,330 lm                                            | 500 mA                     | 28.1 V                                   | 32.2 V                                   | 14.8 W                                                  | 162 lm/W                                   | 158 lm/W                                   | 145 lm/W                                   | > 90                             |
| <b>QLE 250x250mm 1250lm 940 ADV5</b>                          | 940/359                  | 2,540 lm                                            | 2,430 lm                                            | 500 mA                     | 28.1 V                                   | 32.2 V                                   | 14.8 W                                                  | 168 lm/W                                   | 163 lm/W                                   | 150 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 930 ADV5</b>                          | 930/359                  | 2,430 lm                                            | 2,330 lm                                            | 500 mA                     | 28.1 V                                   | 32.2 V                                   | 14.8 W                                                  | 162 lm/W                                   | 158 lm/W                                   | 145 lm/W                                   | > 90                             |
| <b>QLE 270x270mm 1250lm 940 ADV5</b>                          | 940/359                  | 2,540 lm                                            | 2,430 lm                                            | 500 mA                     | 28.1 V                                   | 32.2 V                                   | 14.8 W                                                  | 168 lm/W                                   | 163 lm/W                                   | 150 lm/W                                   | > 90                             |

<sup>®</sup> Integral measurement over the complete module.

<sup>®</sup> If mounted with M4 screws.

<sup>®</sup> Tolerance range for optical data: ±7.5 % and electrical data: ±10 %.

<sup>®</sup> NM ... nominal mode, HO ... high output.

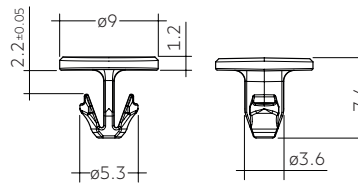
<sup>®</sup> Measured at Imax.

**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



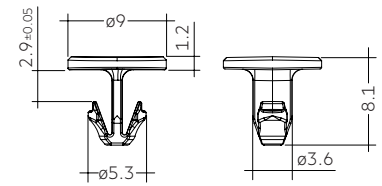
ACL CLIP 4.3mm PUSH-FIX



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 <sup>①</sup> | Weight per pc. |
|-------------------------------------|-----------------|-------------|----------------------------|----------------|
| <b>ACL CLIP 4.3mm PUSH-FIX</b>      | <b>28001036</b> | White       | 500 pc(s).                 | 0.001 kg       |
| <b>ACL CLIP 4.3mm PUSH-FIX Long</b> | <b>28002314</b> | Transparent | 500 pc(s).                 | 0.001 kg       |

<sup>①</sup> Minimum sales quantity 500 pcs.

## 1. Standards

IEC 62031  
IEC 62471  
IEC 62778  
UL 8750 (for CLASS2 circuits and dry locations)\*

\* Pending.

### 1.1 Photometric code

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

| 1 <sup>st</sup> digit | 2 <sup>nd</sup> + 3 <sup>rd</sup> digit | 4 <sup>th</sup> digit | 5 <sup>th</sup> digit                          | 6 <sup>th</sup> digit                                |
|-----------------------|-----------------------------------------|-----------------------|------------------------------------------------|------------------------------------------------------|
| Code CRI              | Colour temperature in Kelvin x 100      | MacAdam initial       | MacAdam 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 $\geq 70$ %                                        |
| 9 $\geq 90$           |                                         |                       |                                                | 8 $\geq 80$ %                                        |
|                       |                                         |                       |                                                | 9 $\geq 90$ %                                        |

### 1.2 Energy classification

| Type     | Energy classification |
|----------|-----------------------|
| QLE ADV5 | 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 thermal 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 | -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.

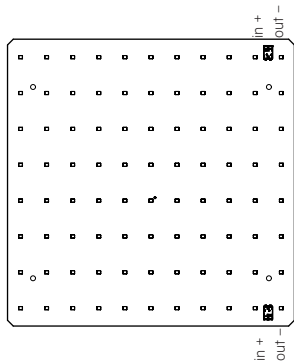


QLE modules are basic insulated up to 405 V (if mounted with M4 screws with head diameter of 7 mm) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led control gear (also against earth) is above 405 V, an additional insulation between 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.

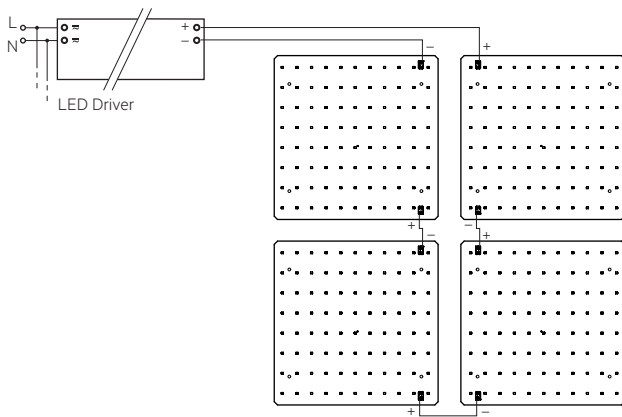
### 3.2 Wiring

QLE 250x250mm / 270x270mm:

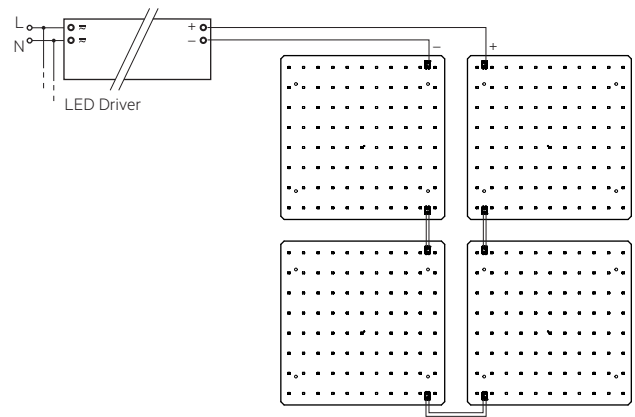


#### Wiring examples

QLE 250x250mm / 270x270mm serial wiring:



QLE 250x250mm / 270x270mm parallel wiring:

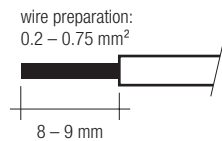


| Type                                | Max. number with parallel wiring* |
|-------------------------------------|-----------------------------------|
| QLE 250x250 / 270x270mm 1250lm ADV5 | 6                                 |

\* 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 mm<sup>2</sup>.  
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.

### 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

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 CI 10.3.3  
30 s on / 30 s off at I<sub>max</sub>

## 5. Electrical values

### 5.1 Declaration of electrical parameters

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

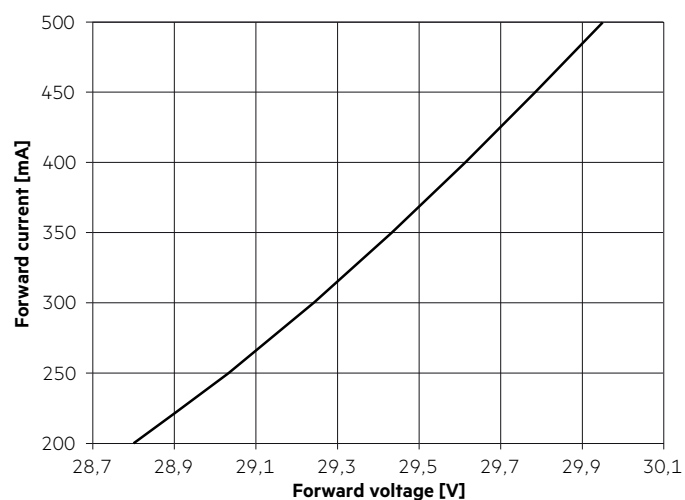
I<sub>max</sub> ... Max. permissible continuous operating current incl. the tolerances of the LED Driver.

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

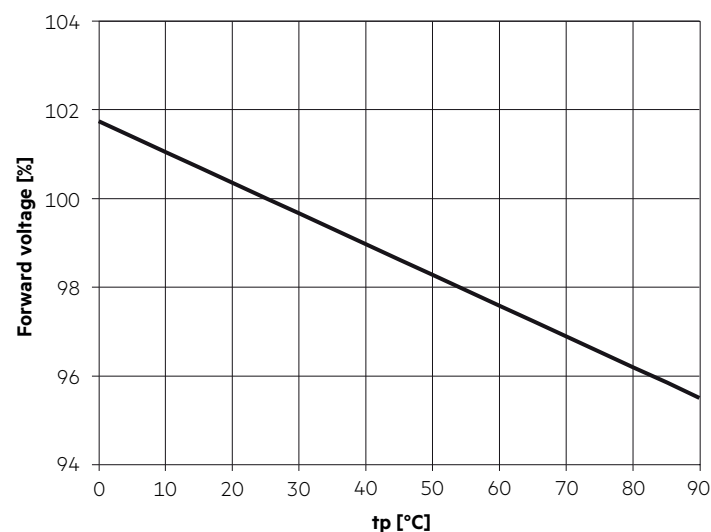
Max. permissible peak current ... The max. output peak current of the LED driver must not exceed this value.

### 5.2 Typ. forward voltage vs. forward current at $t_p = 25^\circ\text{C}$

QLE 250x250mm / 270x270mm:



### 5.2 Forward voltage vs. $t_p$ temperature



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



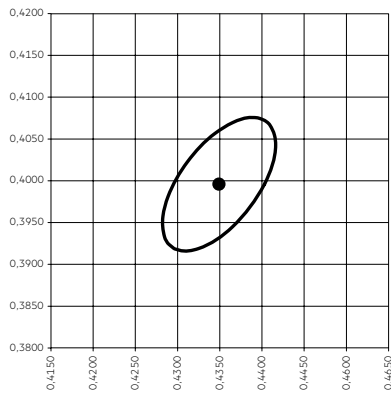
## 6. Photometric characteristics

### 6.1 Coordinates and tolerances according to CIE 1931

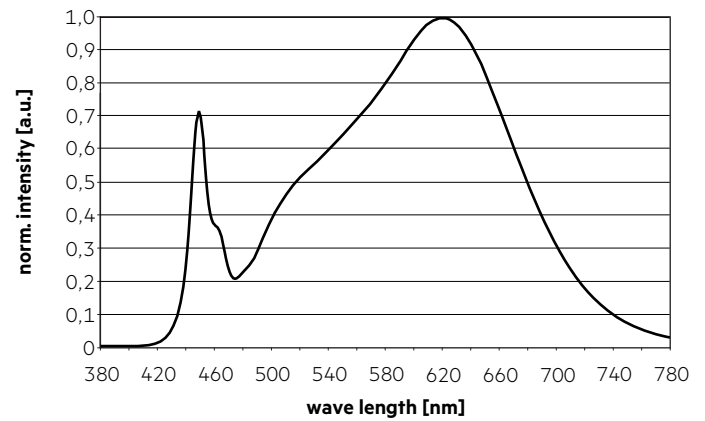
The specified colour coordinates are measured integral by a current impulse of 200 / 400 mA and a duration of 100 ms.  
The ambient temperature of the measurement is  $t_a = 25^\circ\text{C}$ .  
The measurement tolerance of the colour coordinates are  $\pm 0.01$ .

#### 3,000 K, CRI 90

|        | x0     | y0     |
|--------|--------|--------|
| Centre | 0.4349 | 0.3996 |

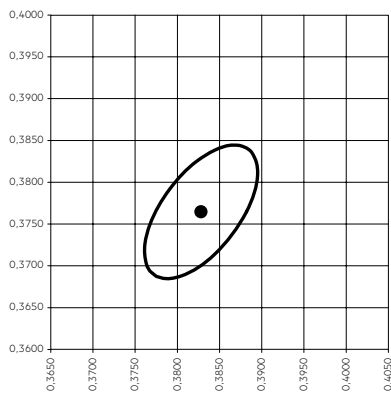


MacAdam Ellipse: 3SDCM

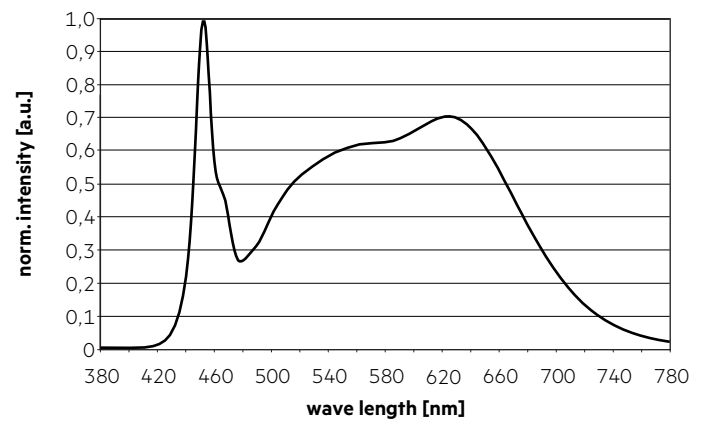


#### 4,000 K, CRI 90

|        | x0     | y0     |
|--------|--------|--------|
| Centre | 0.3828 | 0.3765 |

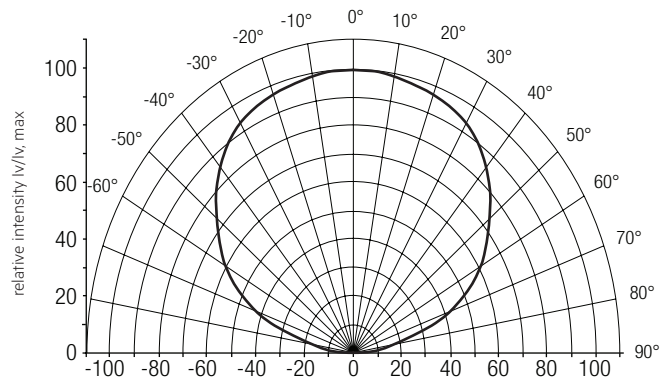


MacAdam Ellipse: 3SDCM



## 6.2 Light distribution

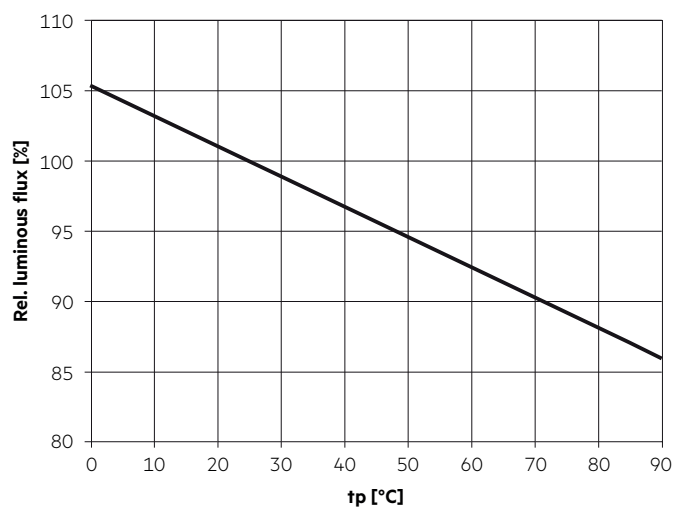
The optical design of the QLE product line ensures optimum homogeneity for the light distribution.



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

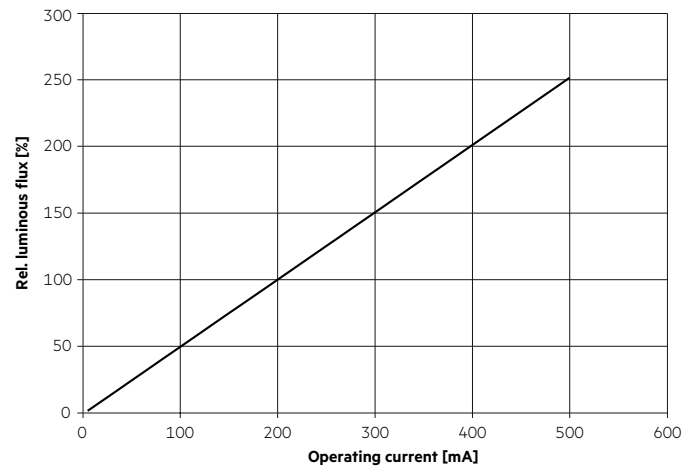
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 6 cm) should be used.

## 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](http://www.tridonic.com) → Technical Data

Guarantee conditions at [www.tridonic.com](http://www.tridonic.com) → Services

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