

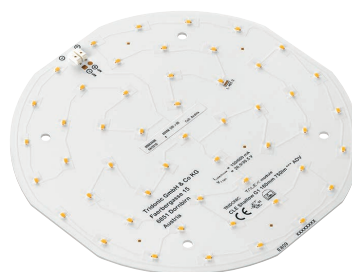


Module CLE Shallow G1 ADV

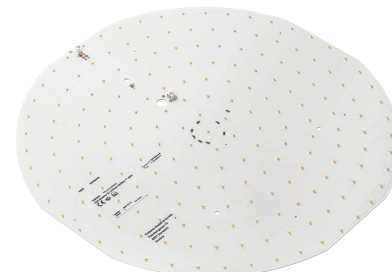
Module CLE

Product description

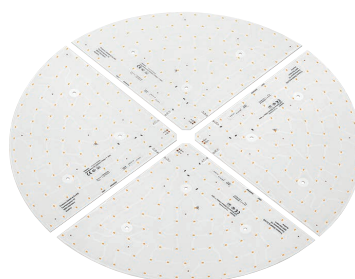
- For round and and ultra flat, wall-mounted, ceiling-mounted and suspended luminaries
- Backlighting depth of 30 mm can be realized
- Wide beam chip enables high homogeneity despite low backlighting depth
- Different HE and HO modes available for more flexibility in the luminaire design
- 4 module sizes for following luminaire diameters: 200, 400, 600 and 900 mm
- Constant lm/m^2 possible over all 4 diameters offered and in combination with QLE Shallow
- Self cooling (no additional heat sink required)
- Small colour tolerance MacAdam 3[®]
- Colour temperatures 3,000 and 4,000 K
- Long life-time: 50,000 hours
- 5-year guarantee
- System solution with ADV, EXC and PRE drivers (C and Ip)



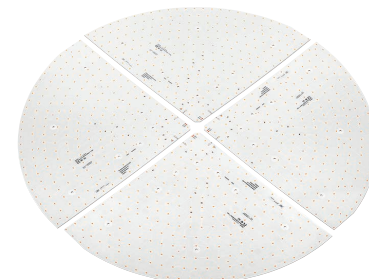
CLE Shallow G1 160mm 750lm ADV



CLE Shallow G1 370mm 2900lm ADV



CLE Shallow G1 522mm 1750lm ADV



CLE Shallow G1 802mm 3800lm ADV



Standards, page 4

Colour temperatures and tolerances, page 8



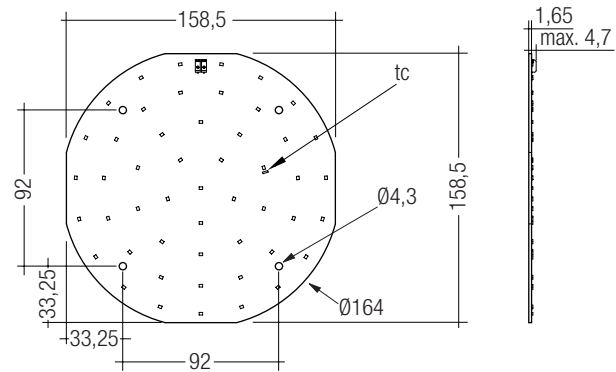


Module CLE Shallow G1 ADV

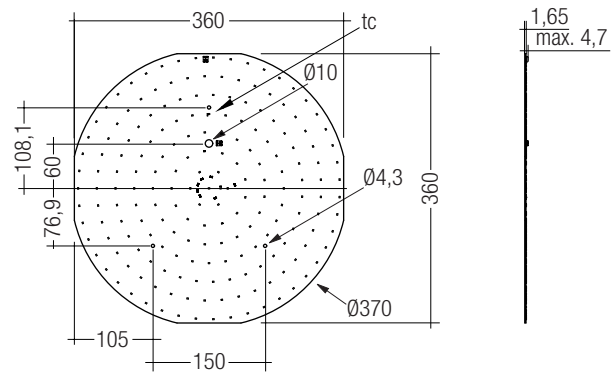
Module CLE ADVANCED

Technical data

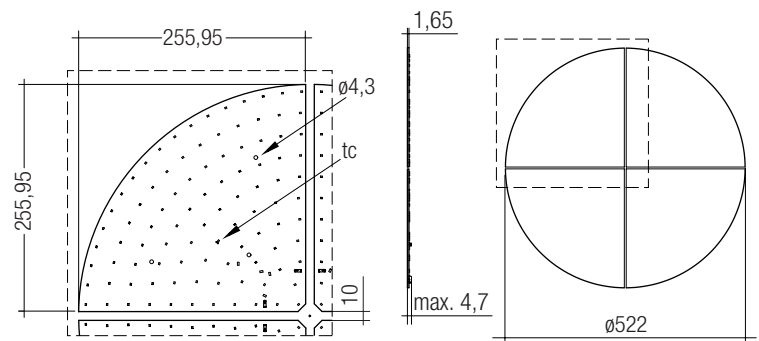
Beam characteristic	150°
Ambient temperature range	-25 ... +45 °C
tp rated	45 °C
tc	85 °C
Irated for CLE Shallow G1 160mm	150 mA
Irated for CLE Shallow G1 370mm	500 mA
Irated for CLE Shallow G1 522mm	300 mA
Irated for CLE Shallow G1 802mm	650 mA
Imax for CLE Shallow G1 160mm	600 mA
Imax for CLE Shallow G1 370mm	1,900 mA
Imax for CLE Shallow G1 522mm	950 mA
Imax for CLE Shallow G1 802mm	2,150 mA
Max. DC forward current for CLE Shallow G1 160mm	680 mA
Max. DC forward current for CLE Shallow G1 370mm	2,180 mA
Max. DC forward current for CLE Shallow G1 522mm	1,090 mA
Max. DC forward current for CLE Shallow G1 802mm	2,450 mA
Max. permissible LF current ripple for CLE Shallow G1 160mm	750 mA
Max. permissible LF current ripple for CLE Shallow G1 370mm	2,400 mA
Max. permissible LF current ripple for CLE Shallow G1 522mm	1,200 mA
Max. permissible LF current ripple for CLE Shallow G1 802mm	2,700 mA
Max. permissible peak current for CLE Shallow G1 160mm	1,000 mA / max. 10 ms
Max. permissible peak current for CLE Shallow G1 370mm	3,200 mA / max. 10 ms
Max. permissible peak current for CLE Shallow G1 522mm	1,600 mA / max. 10 ms
Max. permissible peak current for CLE Shallow G1 802mm	3,600 mA / max. 10 ms
Max. working voltage for insulation for CLE Shallow G1 160 / 370mm ^①	60 V
Max. working voltage for insulation for CLE Shallow G1 522 / 802mm ^①	250 V
Insulation test voltage for CLE Shallow G1 160 / 370mm	500 V
Insulation test voltage for CLE Shallow G1 522 / 802mm	1.5 kV
CTI of the printed circuit board	≥ 600
ESD classification	severity level 4
Risk group (IEC 62471:2008) ^②	0
Classification acc. to IEC 62031	Built-in
Type of protection	IPO0



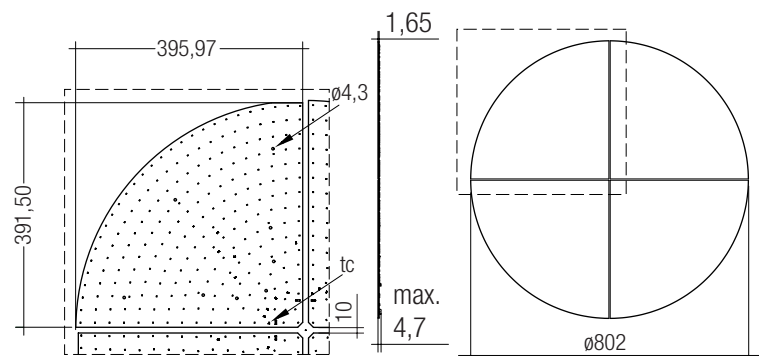
CLE Shallow G1 160mm 750lm ADV



CLE Shallow G1 370mm 2900lm ADV



CLE Shallow G1 522mm 1750lm ADV (details see 3.4 Mounting instructions)



CLE Shallow G1 802mm 3800lm ADV (details see 3.4 Mounting instructions)

Ordering data

Type	Article number	Colour temperature	Packaging carton	Weight per pc.
CLE Shallow G1 160mm 750lm 830 ADV	89602485	3,000 K	50 pc(s).	0.053 kg
CLE Shallow G1 160mm 750lm 840 ADV	89602486	4,000 K	50 pc(s).	0.053 kg
CLE Shallow G1 370mm 2900lm 830 ADV	89602487	3,000 K	20 pc(s).	0.290 kg
CLE Shallow G1 370mm 2900lm 840 ADV	89602488	4,000 K	20 pc(s).	0.290 kg
CLE Shallow G1 522mm 1750lm 830 ADV	89602489	3,000 K	20 pc(s).	0.140 kg
CLE Shallow G1 522mm 1750lm 840 ADV	89602490	4,000 K	20 pc(s).	0.140 kg
CLE Shallow G1 802mm 3800lm 830 ADV	89602491	3,000 K	20 pc(s).	0.336 kg
CLE Shallow G1 802mm 3800lm 840 ADV	89602492	4,000 K	20 pc(s).	0.336 kg

Specific technical data

Type [®]	Photo-metric code	Typ. luminous flux at tp = 25 °C [®]	Typ. luminous flux at tp = 45 °C [®]	Typ. forward current	Min. forward voltage at tp = 45 °C	Max. forward voltage at tp = 25 °C	Typ. power consumption at tp = 45 °C [®]	Efficacy of the module at tp = 25 °C	Efficacy of the module at tp = 45 °C	Efficacy of the system at tp = 45 °C	Colour rendering index CRI
Operating mode HE											
CLE Shallow G1 160mm 750lm 830 ADV	830/359	730 lm	710 lm	150 mA	26.0 V	28.4 V	4.1 W	176 lm/W	174 lm/W	160 lm/W	> 80
CLE Shallow G1 160mm 750lm 840 ADV	840/359	750 lm	730 lm	150 mA	26.0 V	28.4 V	4.1 W	182 lm/W	180 lm/W	166 lm/W	> 80
CLE Shallow G1 370mm 2900lm 830 ADV	830/359	2,900 lm	2,820 lm	500 mA	31.3 V	34.1 V	16.3 W	175 lm/W	173 lm/W	159 lm/W	> 80
CLE Shallow G1 370mm 2900lm 840 ADV	840/359	3,000 lm	2,910 lm	500 mA	31.3 V	34.1 V	16.3 W	181 lm/W	179 lm/W	165 lm/W	> 80
CLE Shallow G1 522mm 1750lm 830 ADV	830/359	1,740 lm	1,670 lm	300 mA	31.6 V	34.5 V	9.8 W	174 lm/W	171 lm/W	157 lm/W	> 80
CLE Shallow G1 522mm 1750lm 840 ADV	840/359	1,800 lm	1,740 lm	300 mA	31.6 V	34.5 V	9.8 W	179 lm/W	177 lm/W	163 lm/W	> 80
CLE Shallow G1 802mm 3800lm 830 ADV	830/359	3,760 lm	3,650 lm	650 mA	31.5 V	34.4 V	21.2 W	174 lm/W	172 lm/W	158 lm/W	> 80
CLE Shallow G1 802mm 3800lm 840 ADV	840/359	3,900 lm	3,780 lm	650 mA	31.5 V	34.4 V	21.2 W	180 lm/W	178 lm/W	164 lm/W	> 80
Operating mode NM											
CLE Shallow G1 160mm 750lm 830 ADV	830/359	1,650 lm	1,600 lm	350 mA	27.7 V	30.2 V	10.0 W	161 lm/W	159 lm/W	146 lm/W	> 80
CLE Shallow G1 160mm 750lm 840 ADV	840/359	1,700 lm	1,650 lm	350 mA	27.7 V	30.2 V	10.0 W	167 lm/W	165 lm/W	152 lm/W	> 80
CLE Shallow G1 370mm 2900lm 830 ADV	830/359	4,040 lm	3,920 lm	700 mA	32.0 V	35.0 V	23.2 W	171 lm/W	169 lm/W	155 lm/W	> 80
CLE Shallow G1 370mm 2900lm 840 ADV	840/359	4,180 lm	4,060 lm	700 mA	32.0 V	35.0 V	23.2 W	177 lm/W	175 lm/W	161 lm/W	> 80
CLE Shallow G1 522mm 1750lm 830 ADV	830/359	2,850 lm	2,760 lm	500 mA	32.9 V	35.9 V	17.0 W	164 lm/W	162 lm/W	149 lm/W	> 80
CLE Shallow G1 522mm 1750lm 840 ADV	840/359	2,940 lm	2,860 lm	500 mA	32.9 V	35.9 V	17.0 W	170 lm/W	168 lm/W	155 lm/W	> 80
CLE Shallow G1 802mm 3800lm 830 ADV	830/359	5,180 lm	5,020 lm	900 mA	32.3 V	35.3 V	30.2 W	169 lm/W	167 lm/W	154 lm/W	> 80
CLE Shallow G1 802mm 3800lm 840 ADV	840/359	5,360 lm	5,200 lm	900 mA	32.3 V	35.3 V	30.2 W	175 lm/W	172 lm/W	158 lm/W	> 80
Operating mode HO											
CLE Shallow G1 160mm 750lm 830 ADV	830/359	2,290 lm	2,200 lm	500 mA	28.7 V	31.4 V	14.9 W	151 lm/W	149 lm/W	137 lm/W	> 80
CLE Shallow G1 160mm 750lm 840 ADV	840/359	2,370 lm	2,300 lm	500 mA	28.7 V	31.4 V	14.9 W	156 lm/W	154 lm/W	142 lm/W	> 80
CLE Shallow G1 370mm 2900lm 830 ADV	830/359	5,950 lm	5,770 lm	1,050 mA	33.0 V	36.1 V	35.9 W	163 lm/W	161 lm/W	148 lm/W	> 80
CLE Shallow G1 370mm 2900lm 840 ADV	840/359	6,160 lm	5,980 lm	1,050 mA	33.0 V	36.1 V	35.9 W	168 lm/W	166 lm/W	153 lm/W	> 80
CLE Shallow G1 522mm 1750lm 830 ADV	830/359	3,900 lm	3,780 lm	700 mA	34.0 V	37.1 V	24.7 W	155 lm/W	153 lm/W	141 lm/W	> 80
CLE Shallow G1 522mm 1750lm 840 ADV	840/359	4,030 lm	3,910 lm	700 mA	34.0 V	37.1 V	24.7 W	161 lm/W	159 lm/W	146 lm/W	> 80
CLE Shallow G1 802mm 3800lm 830 ADV	830/359	6,010 lm	5,840 lm	1,050 mA	32.7 V	35.7 V	35.6 W	166 lm/W	164 lm/W	151 lm/W	> 80
CLE Shallow G1 802mm 3800lm 840 ADV	840/359	6,220 lm	6,040 lm	1,050 mA	32.7 V	35.7 V	35.6 W	172 lm/W	170 lm/W	156 lm/W	> 80
Operating mode HO											
CLE Shallow G1 160mm 750lm 830 ADV	830/359	2,700 lm	2,620 lm	600 mA	29.4 V	32.1 V	18.3 W	145 lm/W	143 lm/W	132 lm/W	> 80
CLE Shallow G1 160mm 750lm 840 ADV	840/359	2,790 lm	2,710 lm	600 mA	29.4 V	32.1 V	18.3 W	150 lm/W	148 lm/W	136 lm/W	> 80
CLE Shallow G1 370mm 2900lm 830 ADV	830/359	10,270 lm	9,970 lm	1,900 mA	35.2 V	38.4 V	49.3 W	145 lm/W	143 lm/W	132 lm/W	> 80
CLE Shallow G1 370mm 2900lm 840 ADV	840/359	10,630 lm	10,320 lm	1,900 mA	35.2 V	38.4 V	49.3 W	150 lm/W	148 lm/W	136 lm/W	> 80
CLE Shallow G1 522mm 1750lm 830 ADV	830/359	5,130 lm	4,980 lm	950 mA	35.2 V	38.4 V	34.7 W	145 lm/W	144 lm/W	132 lm/W	> 80
CLE Shallow G1 522mm 1750lm 840 ADV	840/359	5,310 lm	5,160 lm	950 mA	35.2 V	38.4 V	34.7 W	150 lm/W	148 lm/W	136 lm/W	> 80
CLE Shallow G1 802mm 3800lm 830 ADV	830/359	11,610 lm	11,270 lm	2,150 mA	35.3 V	38.4 V	78.6 W	145 lm/W	143 lm/W	132 lm/W	> 80
CLE Shallow G1 802mm 3800lm 840 ADV	840/359	12,020 lm	11,670 lm	2,150 mA	35.3 V	38.4 V	78.6 W	150 lm/W	148 lm/W	136 lm/W	> 80

[®] If mounted with M4 screws.

[®] Measured at Imax.

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

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

[®] Integral measurement over the complete module.

1. Standards

IEC 62031
IEC 62471
IEC 61000-4-2
IEC 62717

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
CLE Shallow G1 160mm 750lm 8xx ADV	A++
CLE Shallow G1 370mm 2900lm 8xx ADV	A++
CLE Shallow G1 522mm 1750lm 8xx ADV	A++
CLE Shallow G1 802mm 3800lm 8xx ADV	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 CLE a tp temperature of 45 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and life-time.

Compliance with the maximum permissible reference temperature at the tc point must be checked under operating conditions in a thermally stable state. The maximum value must be determined under worst-case conditions for the relevant application.

The tc and tp temperature of LED modules from Tridonic are measured at the same reference point.

2.2 Storage and humidity

Storage temperature	-30 ... +80 °C
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Operation only in non condensing environment.
Humidity during processing of the module should be between 0 to 70 %.

2.3 Thermal design and heat sink

The rated life of LED products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the CLE will be greatly reduced or the CLE may be destroyed.

3. Installation / wiring

3.1 Electrical supply/choice of LED Driver

CLE 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 CLE 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



CLE 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 CLE.

With parallel wiring tolerance-related differences in output are possible (thermal stress of the module) and can cause differences in brightness. If one module fails, the remaining modules may be overloaded.

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

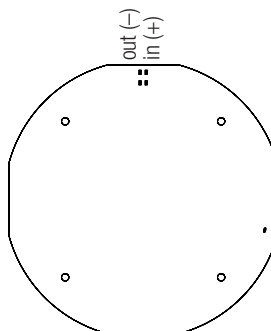


CLE are basic isolated up to 60 / 250 V (if mounted with M4 screws with 7 mm screw head diameter) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the led Driver (also against earth) is above 60 / 250 V, an additional isolation between LED module and heat sink is required (for example by isolated thermal pads) or by a suitable luminaire construction.

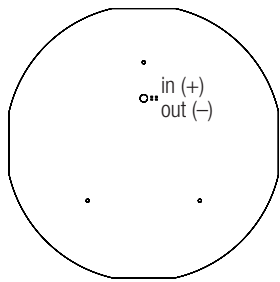
At voltages > 60 V an additional protection against direct touch (test finger) to the light emitting side of the module has to be guaranteed. This is typically achieved by means of a non removable light distributor over the module.

3.2 Wiring

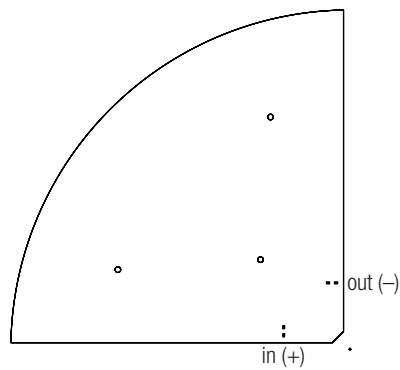
CLE Shallow G1 160mm 750lm 8x0 ADV



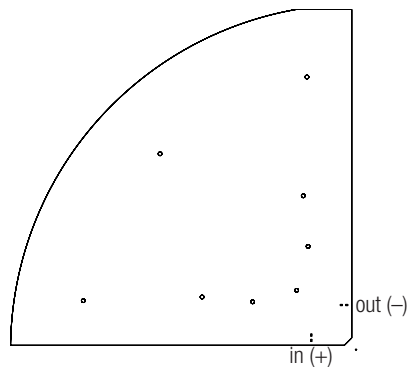
CLE Shallow G1 370mm 2900lm 8x0 ADV



CLE Shallow G1 522mm 1750lm 8x0 ADV

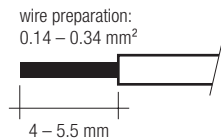


CLE Shallow G1 802mm 3800lm 8x0 ADV



3.3 Wiring type and cross section

The wiring can be in solid with a cross section of 0.14 to 0.34 mm². For the push-wire connection you have to strip the insulation (8-9 mm).



To remove the wires use a suitabel tool (Wago 206-859) or through twist and pull.

3.4 Mounting instruction

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

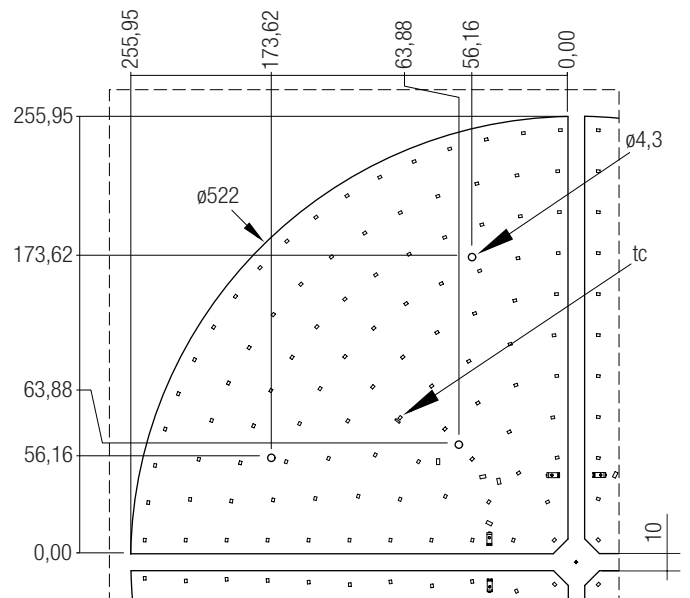
Max. torque for fixing: 0.5 Nm.

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

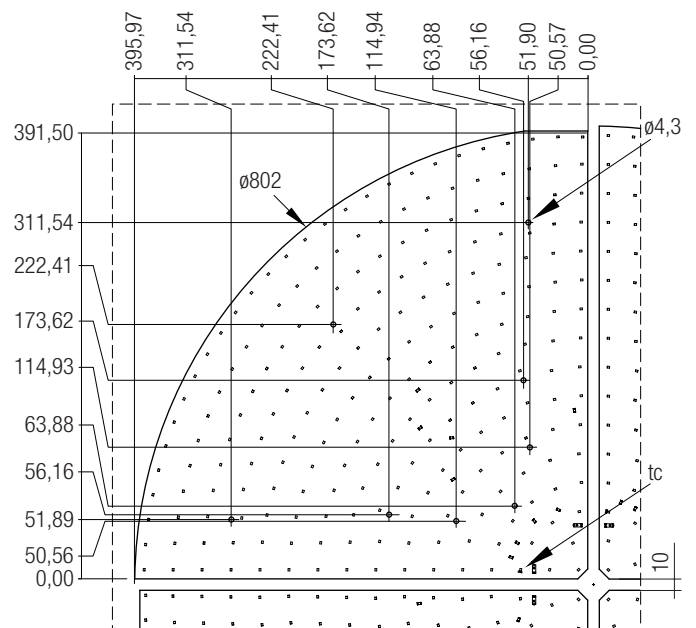
! Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

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.

CLE Shallow G1 522mm 1750lm 8x0 ADV



CLE Shallow G1 802mm 3800lm 8x0 ADV



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.

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

4.2 Lumen maintenance for CLE

CLE Shallow G1 160mm ADV

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
150 mA	45 °C	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h
	55 °C	72,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h
	65 °C	44,000 h	66,000 h	70,000 h	>100,000 h	92,000 h	>100,000 h
	75 °C	28,000 h	41,000 h	44,000 h	65,000 h	58,000 h	86,000 h

CLE Shallow G1 370mm ADV

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
500 mA	45 °C	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h
	55 °C	72,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h
	65 °C	44,000 h	65,000 h	69,000 h	>100,000 h	>100,000 h	>100,000 h
	75 °C	28,000 h	41,000 h	44,000 h	65,000 h	58,000 h	86,000 h

CLE Shallow G1 522mm ADV

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
300 mA	45 °C	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h
	55 °C	70,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h
	65 °C	43,000 h	64,000 h	68,000 h	>100,000 h	90,000 h	>100,000 h
	75 °C	27,000 h	40,000 h	43,000 h	63,000 h	57,000 h	84,000 h

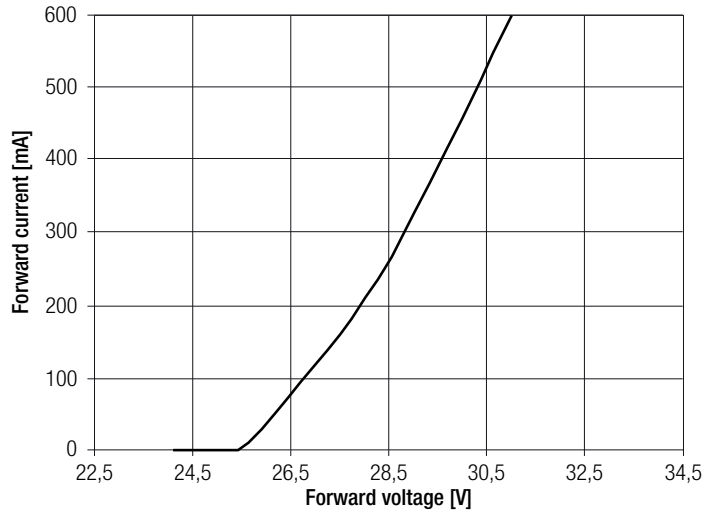
CLE Shallow G1 802mm ADV

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
650 mA	45 °C	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h
	55 °C	71,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h	>100,000 h
	65 °C	43,000 h	64,000 h	68,000 h	>100,000 h	90,000 h	>100,000 h
	75 °C	27,000 h	40,000 h	43,000 h	63,000 h	57,000 h	84,000 h

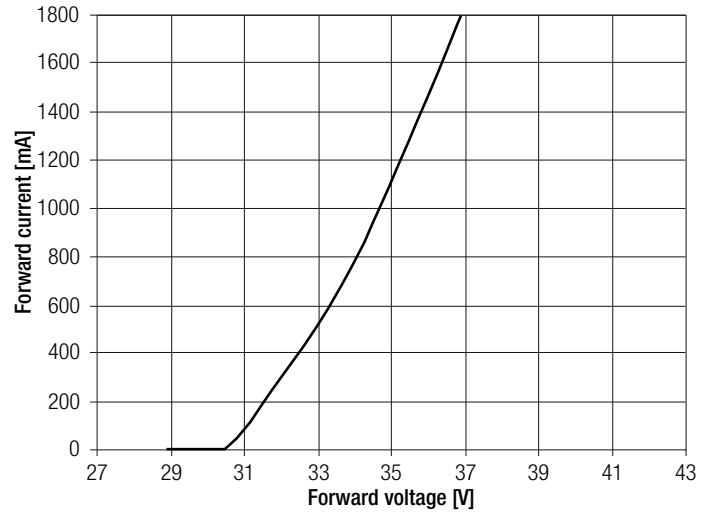
5. Electrical values

5.1 Typ. forward voltage vs. forward current

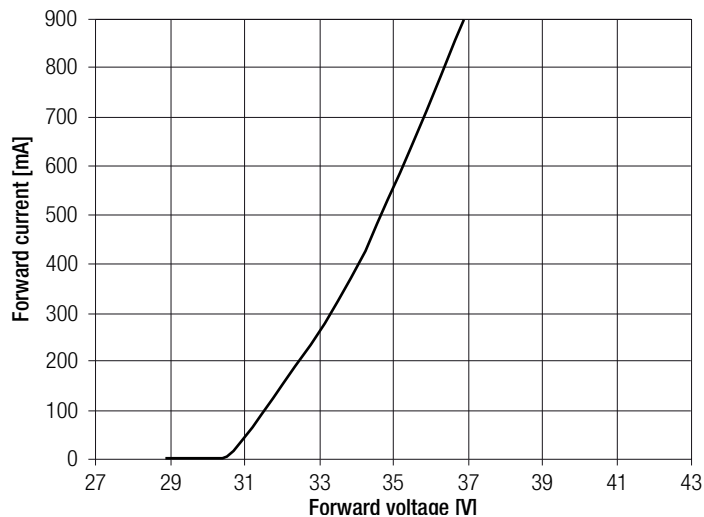
CLE Shallow G1 160mm 750lm 8x0 ADV



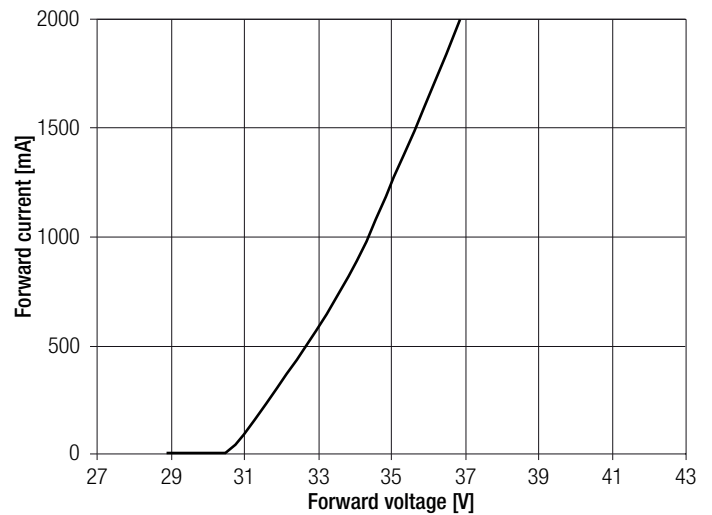
CLE Shallow G1 370mm 2900lm 8x0 ADV



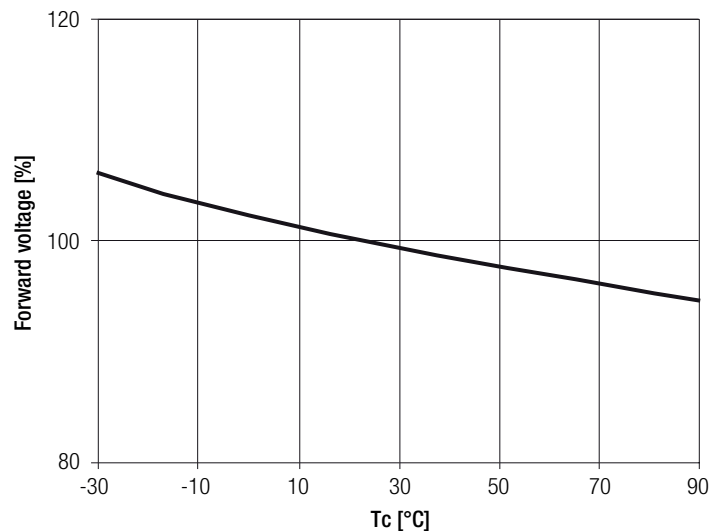
CLE Shallow G1 522mm 1750lm 8x0 ADV



CLE Shallow G1 802mm 3800lm 8x0 ADV



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 after a settling time of 100 ms. The current impuls depends on the module type.

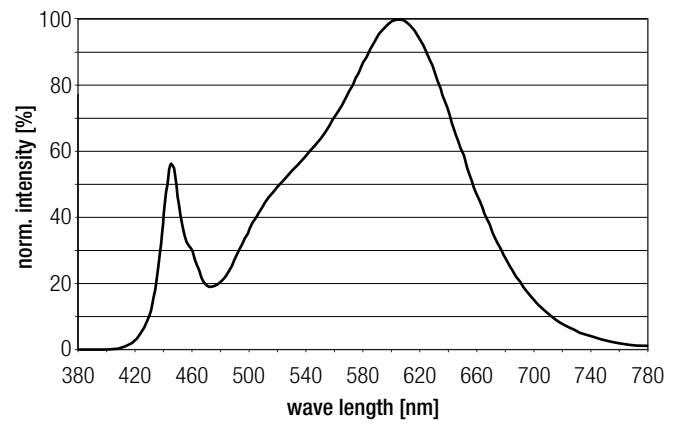
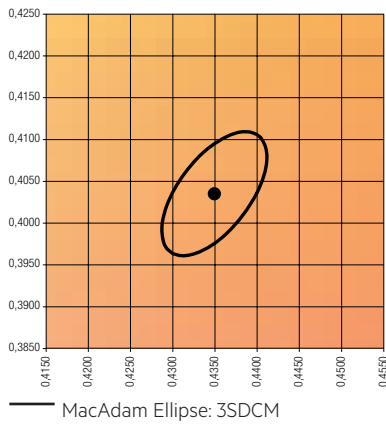
Module type	Current impulse
CLE Shallow G1 160mm 750lm 8x0 ADV	150 mA
CLE Shallow G1 370mm 2900lm 8x0 ADV	500 mA
CLE Shallow G1 522mm 1750lm 8x0 ADV	300 mA
CLE Shallow G1 802mm 3800lm 8x0 ADV	650 mA

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

The measurement tolerance of the colour coordinates are ± 0.01 .

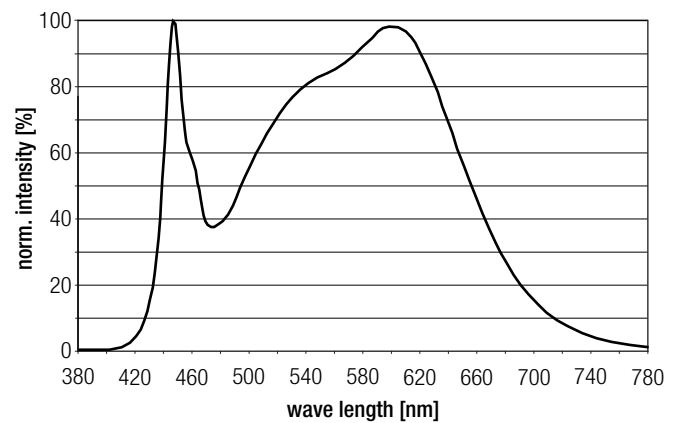
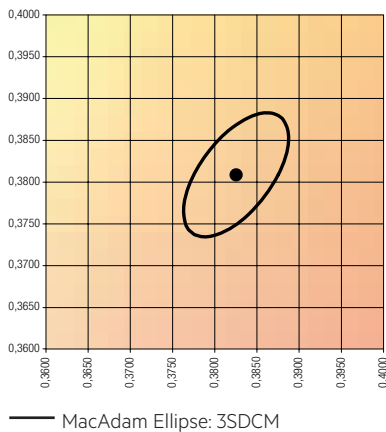
3,000 K

	x0	y0
Centre	0.4349	0.4037



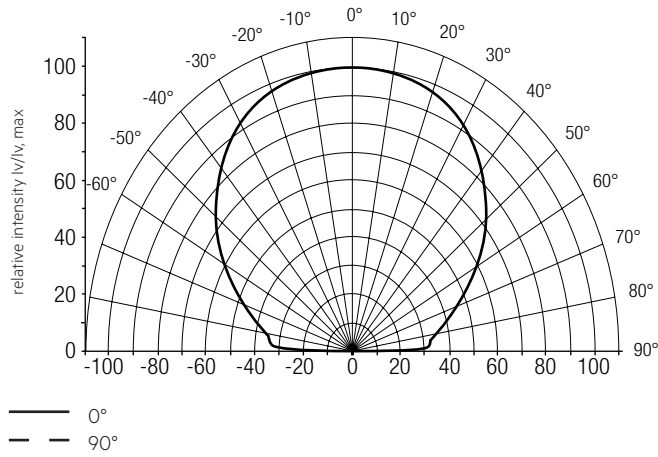
4,000 K

	x0	y0
Centre	0.3828	0.3811



6.2 Light distribution

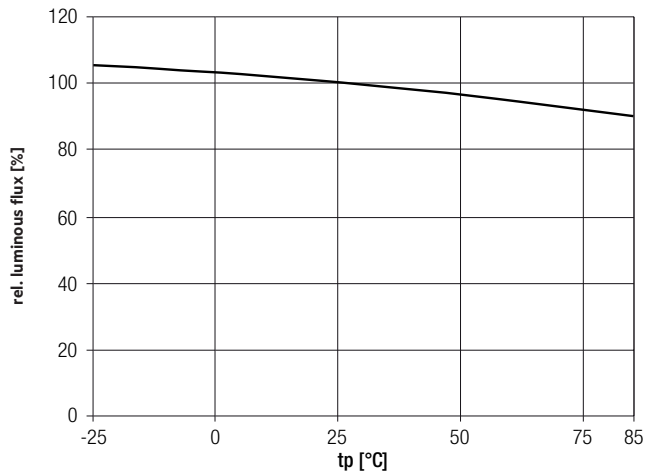
The optical design of the CLE product line ensures optimum homogeneity for the light distribution.



! The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 3. To ensure an ideal mixture of colours and a homogenous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 3 cm) should be used.

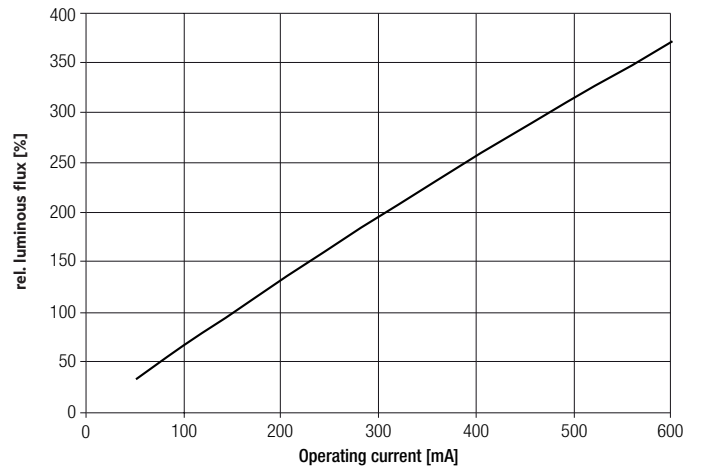
For further information see Design-in Guide, 3D data and photometric data on www.tridonic.com or on request.

6.3 Relative luminous flux vs. tc temperature

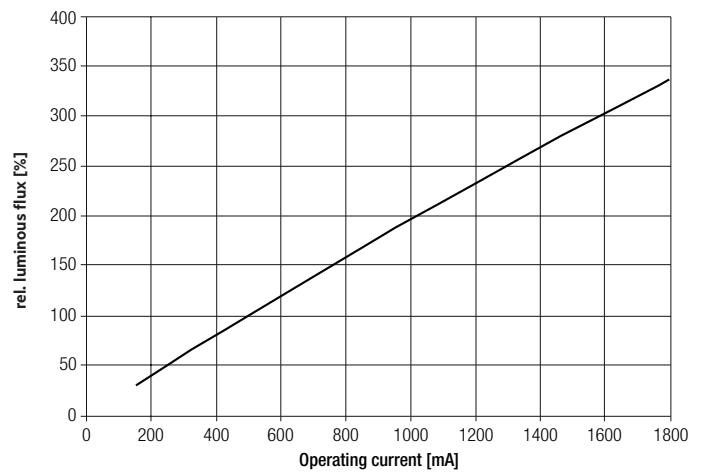


6.4 Relative luminous flux vs. operating current

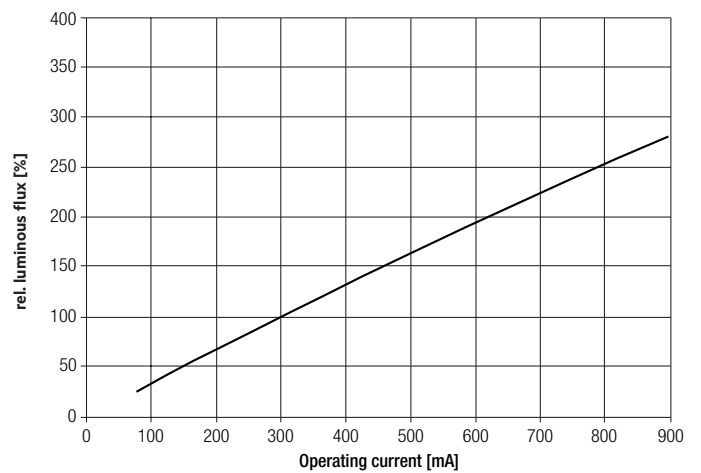
CLE Shallow G1 160mm 750lm 8x0 ADV



CLE Shallow G1 370mm 2900lm 8x0 ADV



CLE Shallow G1 522mm 1750lm 8x0 ADV



CLE Shallow G1 802mm 3800lm 8x0 ADV

