

Module RLE 2x6 EXC3 OTD Z19 new variant

Modules RLE excite

**Product description**

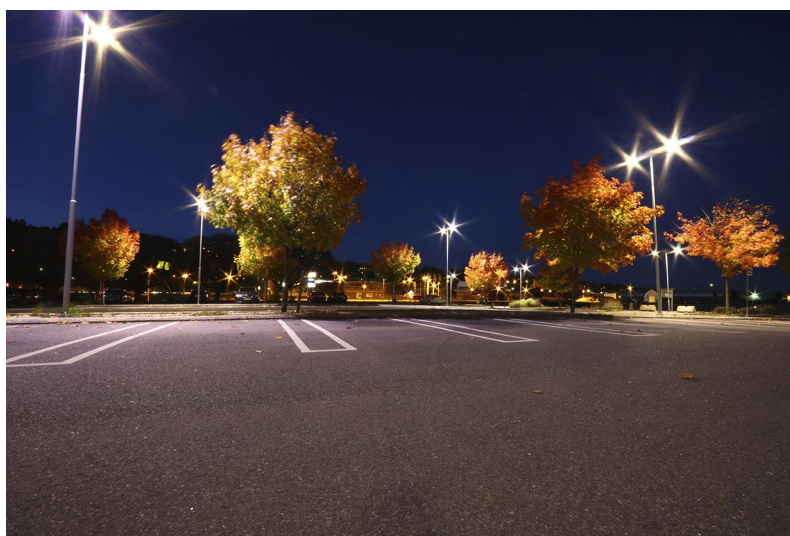
- _ High efficiency outdoor modules
- _ Suitable for harsh and humid outdoor conditions
- _ Tested acc. to salt spray test (IEC 60068-2-52) and harmful gas test (GR-1217-CORE)
- _ Huge performance temperature range from -40 ... +95 °C
- _ Surge capability (+/- to earth) 6 kV with Tridonic Outdoor LED driver
- _ Zhaga Book 19 certified
- _ For use with IP6x lenses (e.g. LEDiL STRADA IP-2x6)
- _ Push-in terminals for simple and quick wiring
- _ HE ... High Efficiency, NM ... Nominal Mode, HO ... High Output
- _ Long lifetime up to 102,000 hours
- _ 8 years guarantee (conditions at <https://www.tridonic.com/en/int/services/manufacture-guarantee-conditions>)

Optical properties

- _ Colour temperatures 3,000, 3,500, 4,000 and 5,000 K
- _ Efficacy of the LED module up to 207 lm/W
- _ Efficacy of the LED module 186 lm/W at Irated and tp = 25 °C
- _ Two colour rendering index to fit the application: CRI > 70 high efficiency, CRI > 80 for high colour rendering
- _ Small luminous flux tolerances

Mechanical properties

- _ Module dimension 45 x 146 mm
- _ Installation of the module together with lens in the luminaire by means of an M3 screw

Website
<http://www.tridonic.com/28006199>


Linear



High bay



Decorative



Downlights



Spotlights



Free-standing



Area



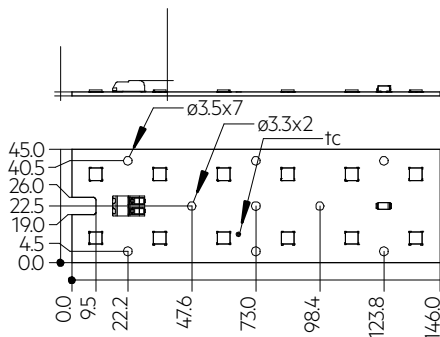
Floor | Wall



Street

Module RLE 2x6 EXC3 OTD Z19 new variant

Modules RLE excite



RLE 2x6 4500lm HP EXC3 OTD Z19

Ordering data

Type	Article number	Colour temperature	Packaging, carton	Weight per pc.
RLE 2x6 4500lm 730 HP HE EXC3 OTD Z19	28006199	3,000 K	80 pc(s).	0.03 kg
RLE 2x6 4500lm 735 HP HE EXC3 OTD Z19	28006382	3,500 K	80 pc(s).	0.03 kg
RLE 2x6 4500lm 740 HP HE EXC3 OTD Z19	28006201	4,000 K	80 pc(s).	0.03 kg
RLE 2x6 4500lm 750 HP HE EXC3 OTD Z19	28006202	5,000 K	80 pc(s).	0.03 kg
RLE 2x6 4500lm 830 HP HE EXC3 OTD Z19	28006195	3,000 K	80 pc(s).	0.03 kg
RLE 2x6 4500lm 835 HP HE EXC3 OTD Z19	28006383	3,500 K	80 pc(s).	0.03 kg
RLE 2x6 4500lm 840 HP HE EXC3 OTD Z19	28006196	4,000 K	80 pc(s).	0.03 kg
RLE 2x6 4500lm 850 HP HE EXC3 OTD Z19	28006197	5,000 K	80 pc(s).	0.03 kg

Technical data

Beam characteristic	120°
Ambient temperature t_a	-40 ... +80 °C
t_p rated	75 °C
t_c	95 °C
I_{rated}	700 mA
I_{max}	1.800 mA
Max. permissible LF current ripple	2,000 mA
Max. permissible peak current	2,500 mA / max. 10 ms
Max. working voltage for insulation with lens ^①	670 V
Insulation test voltage	2.34 kV
Colour tolerance ^②	3 SDCM
ESD classification	Severity level 2
Risk group (IEC 62471)	RG2 ($E_{thr} = 1055 \text{ lx}$, RG1 at $d \geq 80 \text{ cm}$)
Classification acc. to IEC 62031	Built-in
Type of protection	IP00
Lumen maintenance L70B50	102,000 h
Guarantee (conditions at www.tridonic.com)	8 Year(s)

Approval marks**Standards**

IEC 62031, IEC 62778, IEC 62471, IEC 61000-4-2, IEC 60068-2-52, UL 8750, GR-1217-CORE

Specific technical data

Type	Article number	Colour temperature	Photometric code ^①	Useful luminous flux at tp = 25 °C ^②	Expected luminous flux at tp rated ^③	Typ. forward current	Min. forward voltage at tp rated	Max. forward voltage at tp = 25 °C	Power consumption Pon at tp = 25 °C ^④	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
Operating mode HE												
RLE 2x6 4500lm 730 HP HE EXC3 OTD Z19	28006199	3,000 K	730/359	–	2,704 lm	400 mA	31.7 V	35.3 V	–	–	207 lm/W	>70
RLE 2x6 4500lm 735 HP HE EXC3 OTD Z19	28006382	3,500 K	735/359	–	2,742 lm	400 mA	31.7 V	35.3 V	–	–	210 lm/W	>70
RLE 2x6 4500lm 740 HP HE EXC3 OTD Z19	28006201	4,000 K	740/359	–	2,804 lm	400 mA	31.7 V	35.3 V	–	–	214 lm/W	>70
RLE 2x6 4500lm 750 HP HE EXC3 OTD Z19	28006202	5,000 K	750/359	–	2,816 lm	400 mA	31.7 V	35.3 V	–	–	215 lm/W	>70
RLE 2x6 4500lm 830 HP HE EXC3 OTD Z19	28006195	3,000 K	830/359	–	2,405 lm	400 mA	31.7 V	35.3 V	–	–	184 lm/W	>80
RLE 2x6 4500lm 835 HP HE EXC3 OTD Z19	28006383	3,500 K	835/359	–	2,443 lm	400 mA	31.7 V	35.3 V	–	–	187 lm/W	>80
RLE 2x6 4500lm 840 HP HE EXC3 OTD Z19	28006196	4,000 K	840/359	–	2,530 lm	400 mA	31.7 V	35.3 V	–	–	193 lm/W	>80
RLE 2x6 4500lm 850 HP HE EXC3 OTD Z19	28006197	5,000 K	850/359	–	2,542 lm	400 mA	31.7 V	35.3 V	–	–	194 lm/W	>80
Operating mode NM												
RLE 2x6 4500lm 730 HP HE EXC3 OTD Z19	28006199	3,000 K	730/359	4,860 lm	4,612 lm	700 mA	32.8 V	36.5 V	24.1 W	202 lm/W	195 lm/W	>70
RLE 2x6 4500lm 735 HP HE EXC3 OTD Z19	28006382	3,500 K	735/359	4,926 lm	4,675 lm	700 mA	32.8 V	36.5 V	24.1 W	204 lm/W	197 lm/W	>70
RLE 2x6 4500lm 740 HP HE EXC3 OTD Z19	28006201	4,000 K	740/359	4,950 lm	4,782 lm	700 mA	32.8 V	36.5 V	24.1 W	205 lm/W	202 lm/W	>70
RLE 2x6 4500lm 750 HP HE EXC3 OTD Z19	28006202	5,000 K	750/359	4,960 lm	4,803 lm	700 mA	32.8 V	36.5 V	24.1 W	206 lm/W	203 lm/W	>70
RLE 2x6 4500lm 830 HP HE EXC3 OTD Z19	28006195	3,000 K	830/359	4,260 lm	4,101 lm	700 mA	32.8 V	36.5 V	24.1 W	177 lm/W	173 lm/W	>80
RLE 2x6 4500lm 835 HP HE EXC3 OTD Z19	28006383	3,500 K	835/359	4,442 lm	4,165 lm	700 mA	32.8 V	36.5 V	24.1 W	184 lm/W	176 lm/W	>80
RLE 2x6 4500lm 840 HP HE EXC3 OTD Z19	28006196	4,000 K	840/359	4,600 lm	4,314 lm	700 mA	32.8 V	36.5 V	24.1 W	191 lm/W	182 lm/W	>80
RLE 2x6 4500lm 850 HP HE EXC3 OTD Z19	28006197	5,000 K	850/359	4,620 lm	4,335 lm	700 mA	32.8 V	36.5 V	24.1 W	192 lm/W	183 lm/W	>80
Operating mode HO												
RLE 2x6 4500lm 730 HP HE EXC3 OTD Z19	28006199	3,000 K	730/359	–	9,286 lm	1,500 mA	35.6 V	39.5 V	–	–	169 lm/W	>70
RLE 2x6 4500lm 735 HP HE EXC3 OTD Z19	28006382	3,500 K	735/359	–	9,414 lm	1,500 mA	35.6 V	39.5 V	–	–	171 lm/W	>70
RLE 2x6 4500lm 740 HP HE EXC3 OTD Z19	28006201	4,000 K	740/359	–	9,628 lm	1,500 mA	35.6 V	39.5 V	–	–	175 lm/W	>70
RLE 2x6 4500lm 750 HP HE EXC3 OTD Z19	28006202	5,000 K	750/359	–	9,671 lm	1,500 mA	35.6 V	39.5 V	–	–	176 lm/W	>70
RLE 2x6 4500lm 830 HP HE EXC3 OTD Z19	28006195	3,000 K	830/359	–	8,259 lm	1,500 mA	35.6 V	39.5 V	–	–	150 lm/W	>80
RLE 2x6 4500lm 835 HP HE EXC3 OTD Z19	28006383	3,500 K	835/359	–	8,387 lm	1,500 mA	35.6 V	39.5 V	–	–	152 lm/W	>80
RLE 2x6 4500lm 840 HP HE EXC3 OTD Z19	28006196	4,000 K	840/359	–	8,687 lm	1,500 mA	35.6 V	39.5 V	–	–	158 lm/W	>80
RLE 2x6 4500lm 850 HP HE EXC3 OTD Z19	28006197	5,000 K	850/359	–	8,729 lm	1,500 mA	35.6 V	39.5 V	–	–	159 lm/W	>80

① Lens shape like LEDIL Strada IP 2x6.

② Integral measurement over the complete module.

③ The detailed explanation, see data sheet section 1.1.

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

⑤ Measurement uncertainty ± 10 %. Based on calculation.

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

1. Standards

EC 62031
IEC 62778
IEC 62471
IEC 61000-4-2
IEC 60068-2-52
UL 8750 (for dry and damp locations)
GR-1217-CORE

1.1 Photometric code

Key for photometric code, e. g. 830 / 579

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

1.2 Energy classification

Type	Colour temperature	Forward current	Energy classification	Energy consumption
RLE 2x6 4500lm 830 HP HE EXC3 OTD	3,000 K	700 mA	C	25 kWh / 1,000 h
RLE 2x6 4500lm 835 HP HE EXC3 OTD	3,500 K	700 mA	C	25 kWh / 1,000 h
RLE 2x6 4500lm 840 HP HE EXC3 OTD	4,000 K	700 mA	C	25 kWh / 1,000 h
RLE 2x6 4500lm 850 HP HE EXC3 OTD	5,000 K	700 mA	C	25 kWh / 1,000 h
RLE 2x6 4500lm 730 HP HE EXC3 OTD	3,000 K	700 mA	B	25 kWh / 1,000 h
RLE 2x6 4500lm 735 HP HE EXC3 OTD	3,500 K	700 mA	B	25 kWh / 1,000 h
RLE 2x6 4500lm 740 HP HE EXC3 OTD	4,000 K	700 mA	B	25 kWh / 1,000 h
RLE 2x6 4500lm 750 HP HE EXC3 OTD	5,000 K	700 mA	B	25 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 RLE a tp temperature of 75 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and lifetime.

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

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

2.2 Storage and humidity

Storage temperature	-40 ... +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 RLE will be greatly reduced or the RLE may be destroyed.

2.4 Heat sink values

RLE 2x6 4500lm EXC3 OTD

ta	tp	Forward current	R _{th, hs-a}	Cooling area
25 °C	75 °C	400 mA	8.40 K/W	79 cm²
25 °C	75 °C	700 mA	4.33 K/W	154 cm²
25 °C	75 °C	1500 mA	1.55 K/W	429 cm²
35 °C	75 °C	400 mA	6.72 K/W	99 cm²
35 °C	75 °C	700 mA	3.46 K/W	193 cm²
35 °C	75 °C	1500 mA	1.24 K/W	538 cm²
40 °C	75 °C	400 mA	5.88 K/W	113 cm²
40 °C	75 °C	700 mA	3.03 K/W	220 cm²
40 °C	75 °C	1500 mA	1.08 K/W	615 cm²
45 °C	75 °C	400 mA	5.04 K/W	132 cm²
45 °C	75 °C	700 mA	2.59 K/W	257 cm²
45 °C	75 °C	1500 mA	0.93 K/W	719 cm²
50 °C	75 °C	400 mA	4.20 K/W	159 cm²
50 °C	75 °C	700 mA	2.16 K/W	309 cm²
50 °C	75 °C	1500 mA	0.77 K/W	864 cm²
55 °C	75 °C	400 mA	3.35 K/W	199 cm²
55 °C	75 °C	700 mA	1.72 K/W	387 cm²
55 °C	75 °C	1500 mA	0.62 K/W	1084 cm²
60 °C	75 °C	400 mA	2.51 K/W	265 cm²
60 °C	75 °C	700 mA	1.29 K/W	516 cm²
60 °C	75 °C	1500 mA	0.46 K/W	1453 cm²

Notes

The actual cooling surface can differ because of the material, the structural shape, outside influences and the installation situation. Depending on the heat sink a heat conducting paste or heat conducting film might be necessary to keep the specified tp temperature.

3. Installation / wiring

3.1 Electrical supply/choice of LED driver

RLE 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 RLE 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



RLE 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.

The max. permissible output current of the LED driver for parallel wiring is 1.8 A.

If RLE modules are wired in parallel and a wire breaks or a complete module fails then the current passing through the other module increases. This may reduce its life considerably. In addition there can be slight differences in light output caused by tolerances.

RLE modules can be operated either from SELV LED drivers or from LED drivers with LV output voltage.



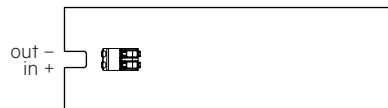
RLE modules are basic insulated up to 670 V if mounted with M3 screws and lens (e.g. LEDiL Strada IP-2x6) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED driver (also against earth) is above 670 V, an additional insulation between 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.

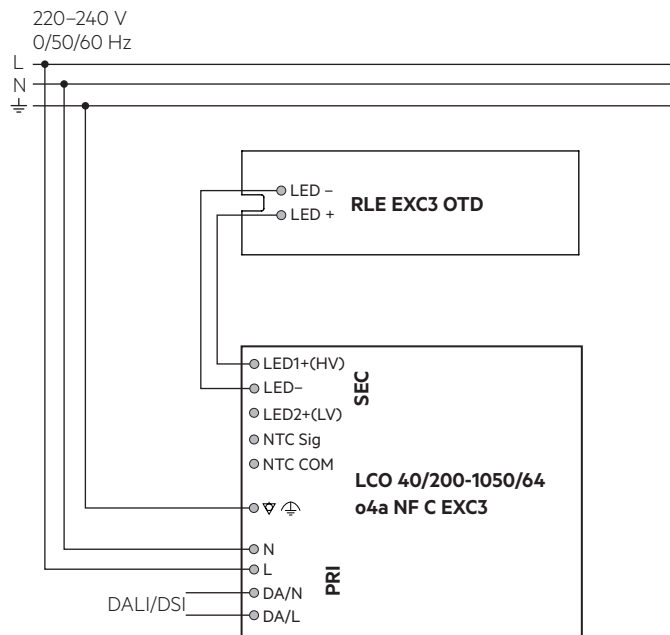
3.2 Integrated protection

The basic protection level consists of protection against reverse polarity.

3.3 Wiring

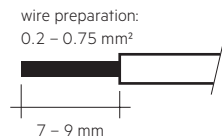


3.4 Wiring examples



3.5 Wiring type and cross section

For wiring use stranded wire with ferrules or solid wire from 0.2 to 0.75 mm².
For the push-wire connection you have to strip the insulation (7–9 mm).



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

3.6 Mounting instruction



None of the components of the RLE (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 onto a heat sink with M3 screws 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.

3.7 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 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.

Operation below 200 mA may reduce lumen maintenance.

4.2 Lumen maintenance

Typ. forward current	tp temperature	L90 / B10	L90 / B50	L80 / B10	L80 / B50	L70 / B10	L70 / B50
400 mA	55 °C	>102k h	>102k h	>102k h	>102k h	>102k h	>102k h
	60 °C	>102k h	>102k h	>102k h	>102k h	>102k h	>102k h
	65 °C	>102k h	>102k h	>102k h	>102k h	>102k h	>102k h
	70 °C	>102k h	>102k h	>102k h	>102k h	>102k h	>102k h
	75 °C	101k h	>102k h	>102k h	>102k h	>102k h	>102k h
	80 °C	100k h	>102k h	>102k h	>102k h	>102k h	>102k h
	85 °C	100k h	>102k h	>102k h	>102k h	>102k h	>102k h
	90 °C	86k h	91k h	>102k h	>102k h	>102k h	>102k h
	95 °C	75k h	78k h	>102k h	>102k h	>102k h	>102k h
1,500 mA	55 °C	>102k h	>102k h	>102k h	>102k h	>102k h	>102k h
	60 °C	>102k h	>102k h	>102k h	>102k h	>102k h	>102k h
	65 °C	>102k h	>102k h	>102k h	>102k h	>102k h	>102k h
	70 °C	>102k h	>102k h	>102k h	>102k h	>102k h	>102k h
	75 °C	101k h	>102k h	>102k h	>102k h	>102k h	>102k h
	80 °C	100k h	>102k h	>102k h	>102k h	>102k h	>102k h
	85 °C	100k h	>102k h	>102k h	>102k h	>102k h	>102k h
	90 °C	86k h	91k h	>102k h	>102k h	>102k h	>102k h
	95 °C	75k h	78k h	>102k h	>102k h	>102k h	>102k h

L00C03 >102k h. At tp rated and Irated, based on 10 switching cycles per day.

4.3 Switching capability

100,000 cycles

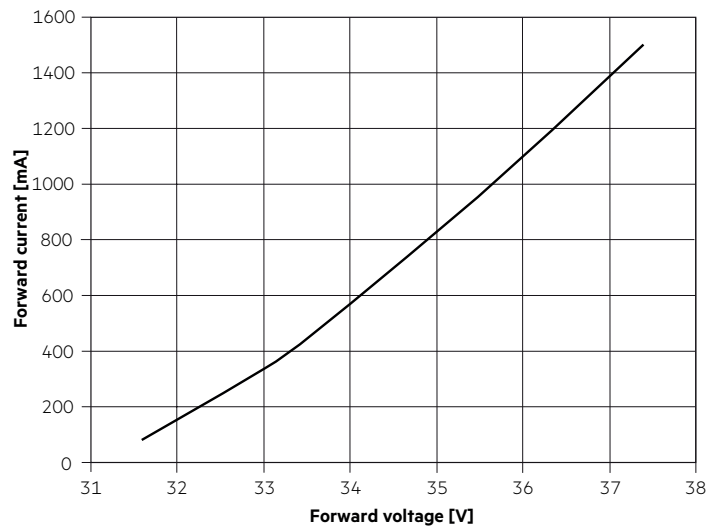
Test according to IEC 62717 CI 10.3.3

30 s on / 30 s off at a forward current of 1000 mA

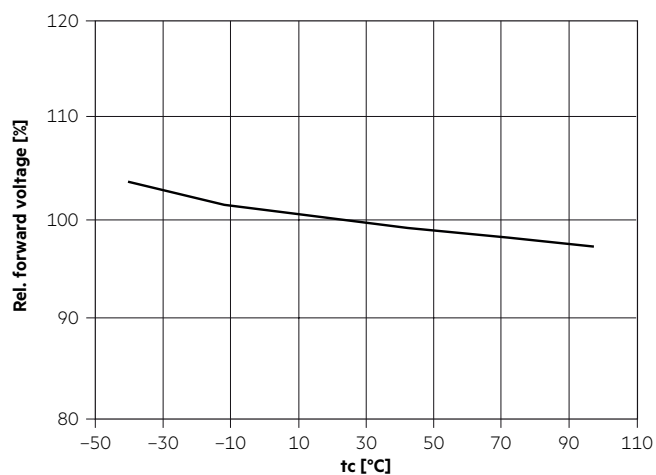
5. Electrical values

5.1 Typ. forward voltage vs. forward current

RLE 2x6 4500lm xxx HP EXC3 OTD Z19



5.2 Forward voltage vs. tc 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

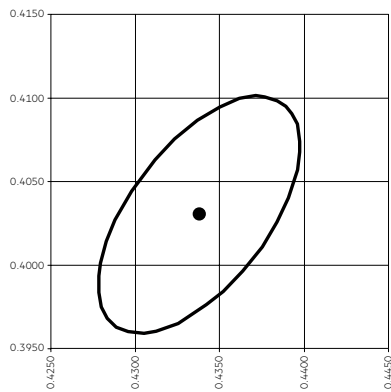
The specified colour coordinates are integral measured by current impulse of 360 mA and a duration of 100 ms.

The ambient temperature of the measurement is 25 °C.

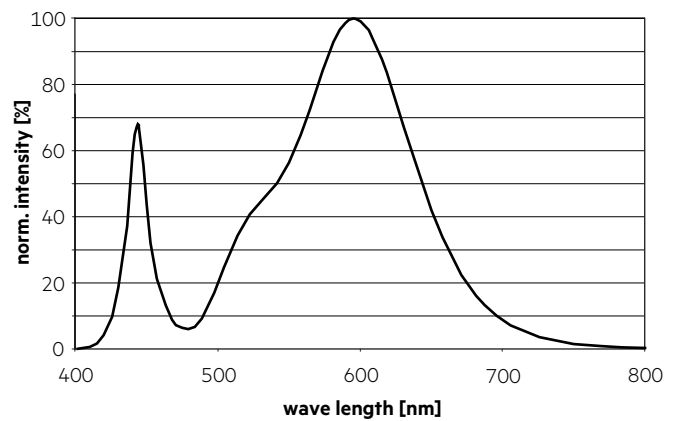
The measurement tolerance of the colour coordinates are ± 0.01 .

3,000 K, CRI 70

	x0	y0
Centre	0.4339	0.4032

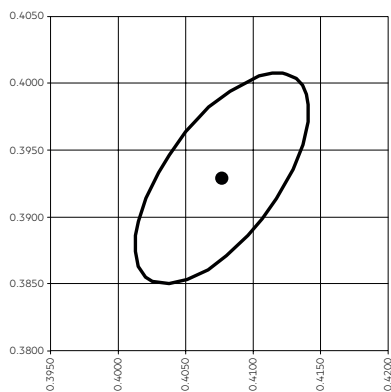


— MacAdam Ellipse: 3SDCM

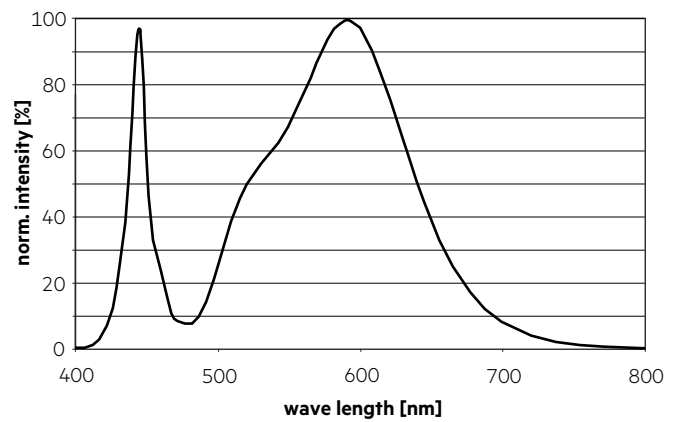


3,500 K, CRI 70

	x0	y0
Centre	0.4077	0.3929

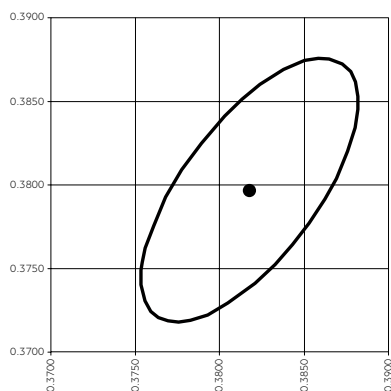


— MacAdam Ellipse: 3SDCM

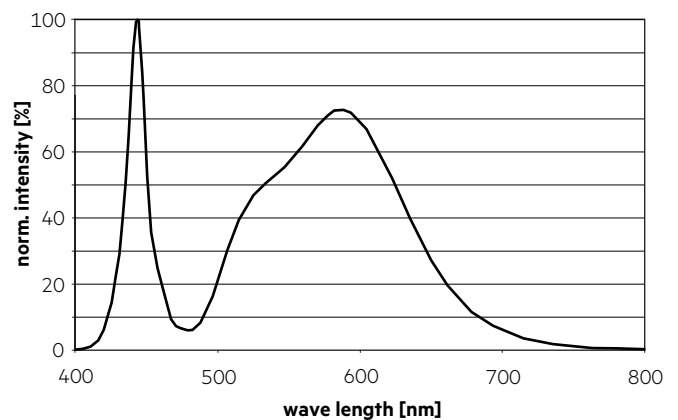


4,000 K, CRI 70

	x0	y0
Centre	0.3818	0.3796

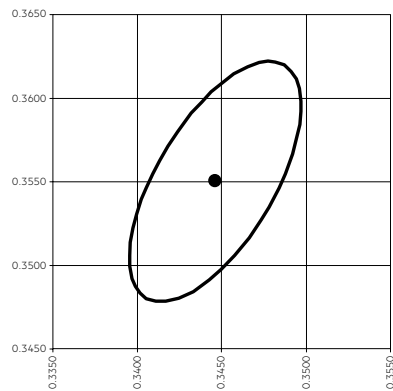


— MacAdam Ellipse: 3SDCM

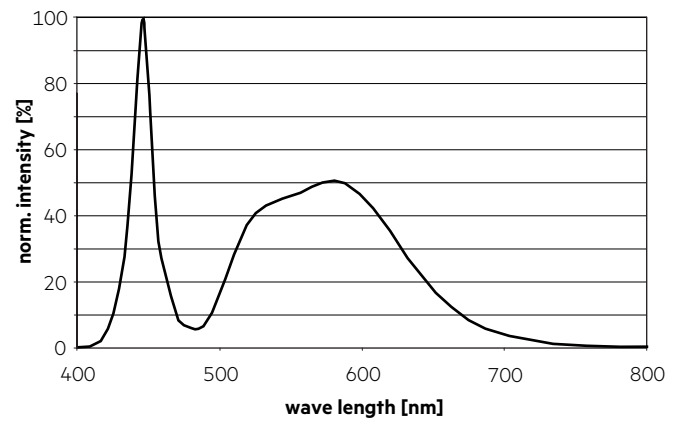


5,000 K, CRI 70

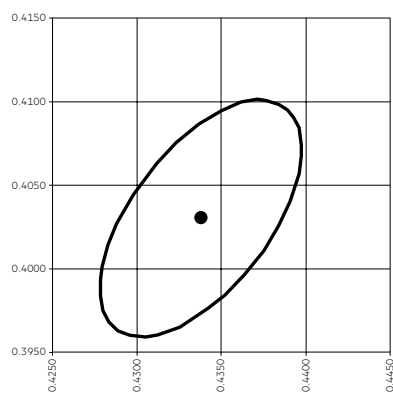
	x0	y0
Centre	0.3446	0.3551



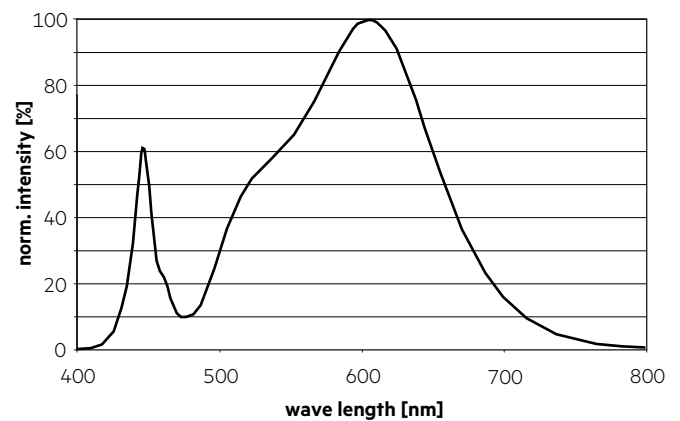
— MacAdam Ellipse: 3SDCM

**3,000 K, CRI 80**

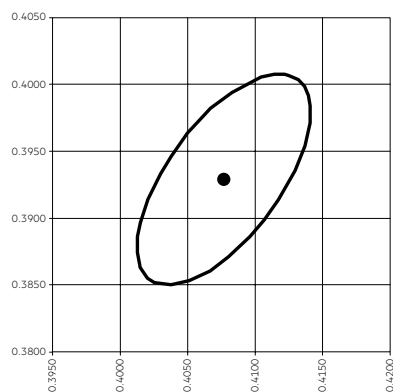
	x0	y0
Centre	0.4339	0.4032



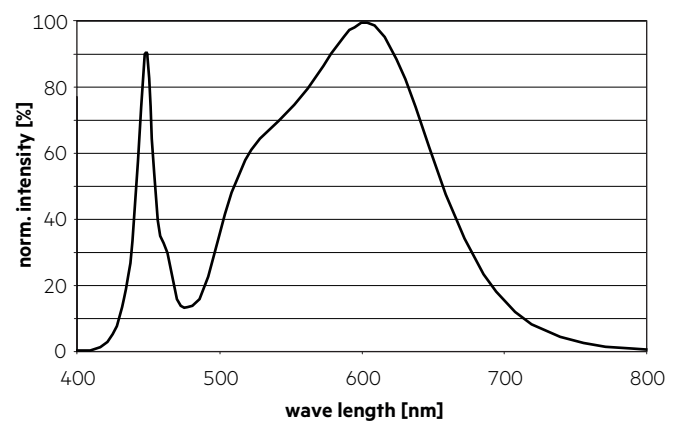
— MacAdam Ellipse: 3SDCM

**3,500 K, CRI 80**

	x0	y0
Centre	0.4077	0.3929

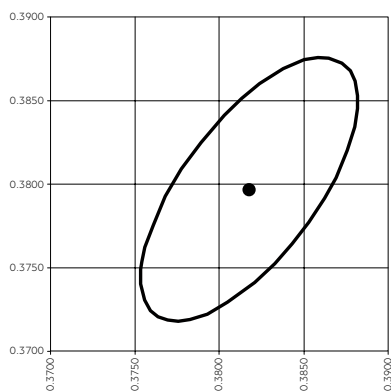


— MacAdam Ellipse: 3SDCM

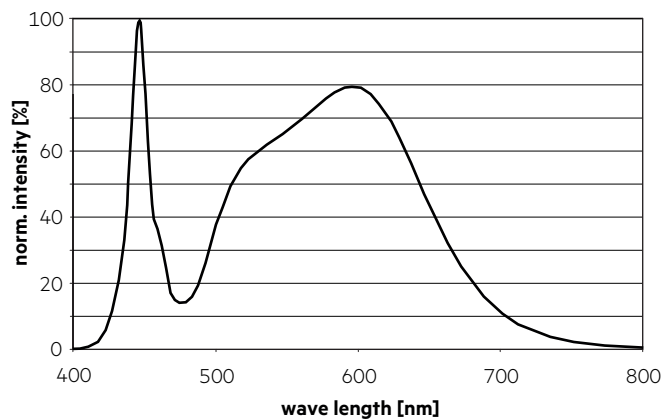


4,000 K, CRI 80

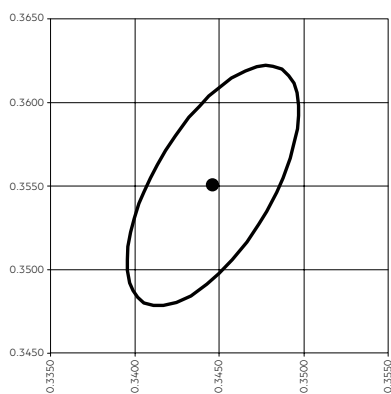
	x0	y0
Centre	0.3818	0.3796



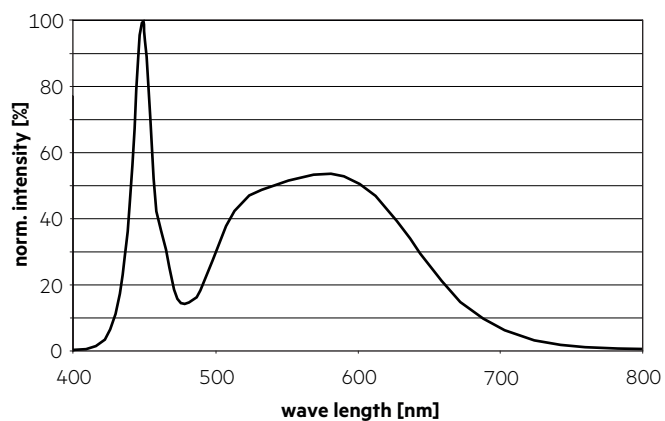
— MacAdam Ellipse: 3SDCM

**5,000 K, CRI 80**

	x0	y0
Centre	0.3446	0.3551



— MacAdam Ellipse: 3SDCM



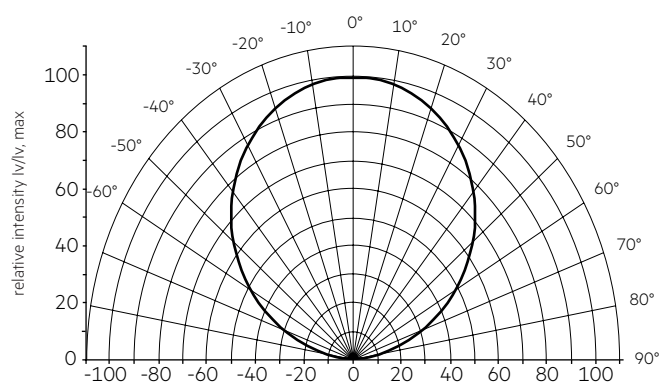
6.2 Spectral G-Index

CCT	CRI	G-Index
2,200 K	70	2.3
2,700 K	70	1.7
3,000 K	70	1.4
3,500 K	70	1.3
4,000 K	70	1.0
5,000 K	70	0.7
6,500 K	70	0.4
2,200 K	80	2.2
2,700 K	80	1.7
3,000 K	80	1.5
3,500 K	80	1.3
4,000 K	80	1.0

Based on typical spectral distribution measured at 25°C and Irated.

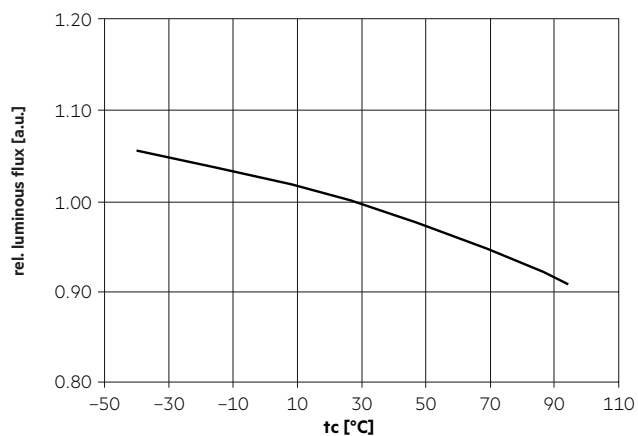
6.3 Light distribution

RLE G1 OTD modules are designed to be compatible with 50 x 50 mm lense arrays with 25.4 mm pitch distance. This allows multiple light distributions.

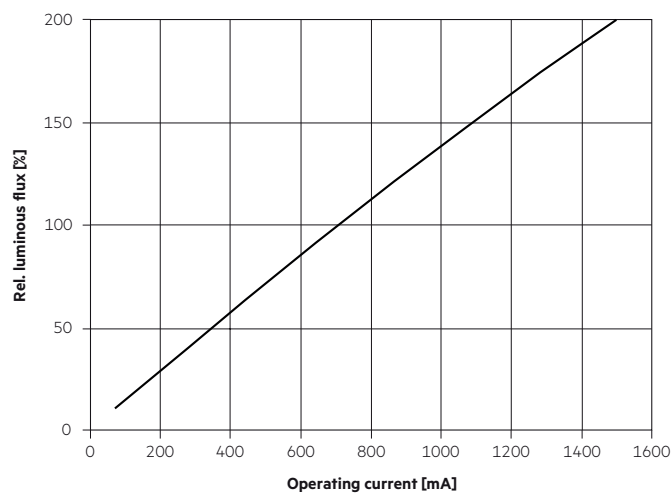


The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 4.

6.4 Relative luminous flux vs. tc temperature



6.5 Relative luminous flux vs. operating current



The diagrams are based on statistic values.

The real values can be different.

7. Miscellaneous

7.1 Additional information

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

Guarantee conditions at www.tridonic.com → Services

Lifetime declarations are informative and represent no warranty claim.