TRIDONIC

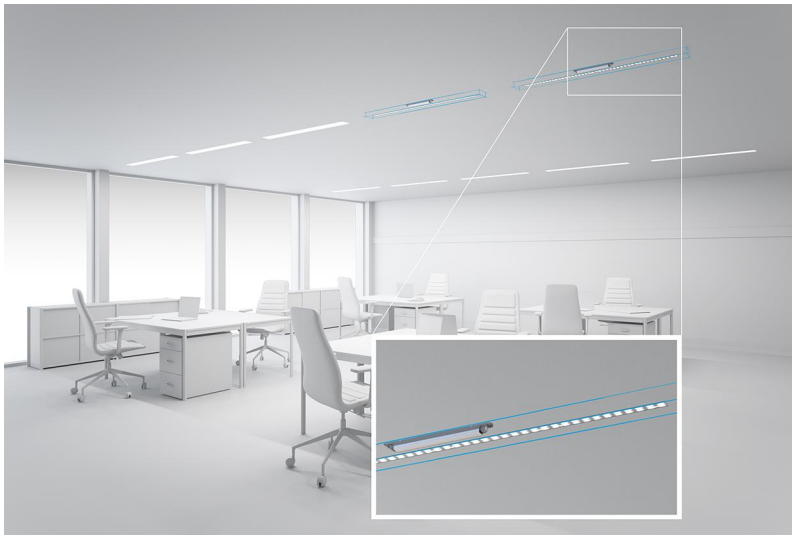
Module LLE 16mm 650lm HV ADV5

Modules LLE advanced

LLE 16x140mm 325lm HV ADV5

LLE 16x280mm 650lm HV ADV5

LLE 16x560mm 1300lm HV ADV5



Product description

- Ideal for compact linear luminaires designs
- Homogenous illumination thanks to small package distance
- 2 terminals for serial wiring
- Perfectly uniform light, even if several LED modules are used together in a line
- Push terminals for quick and simple wiring of LED module to LED module
- HE ... High Efficiency, NM ... Nominal Mode, HO ... High Output
- Long lifetime up to 72,000 hours
- 5 years guarantee (conditions at https://www.tridonic.com/en/int/services/manufacturer-guarantee-conditions)

Optical properties

- Colour temperatures 2,700, 3,000, 3,500, 4,000, 5,000 and 6,500 K
- Useful luminous flux 1,448 lm at Irated and tp = 25 °C
- Efficacy of the LED module 203 lm/W at Irated and tp = 25 °C
- High colour rendering index CRI > 80
- High colour consistency (MacAdam 3) ①
- Small luminous flux tolerances

Mechanical properties

- Module dimension 16 x 140 mm, 16 x 280 mm and 16 x 560 mm
- Simple installation via clips or screws

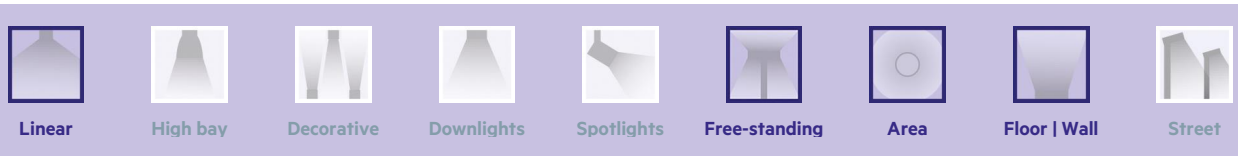
System solution

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

① Integral measurement over the complete module.

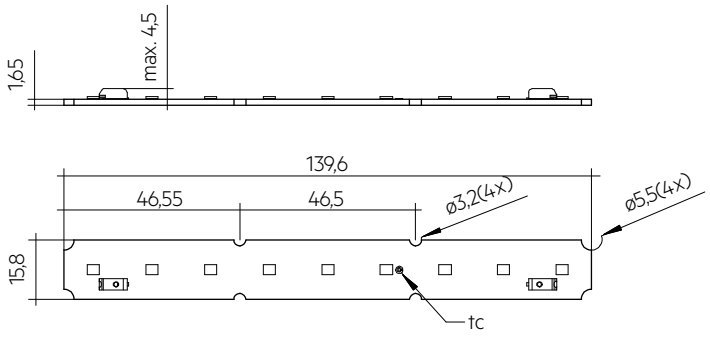
Website

http://www.tridonic.com/89603385

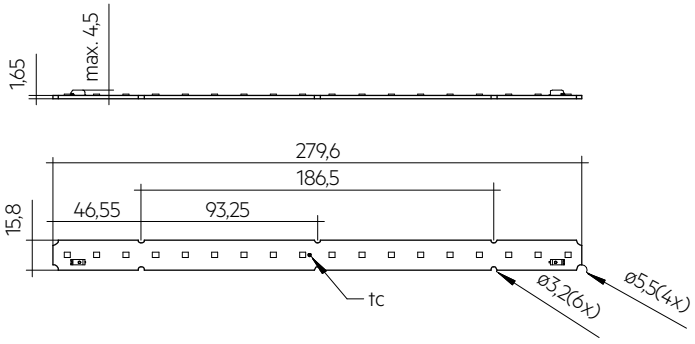


Module LLE 16mm 650lm HV ADV5

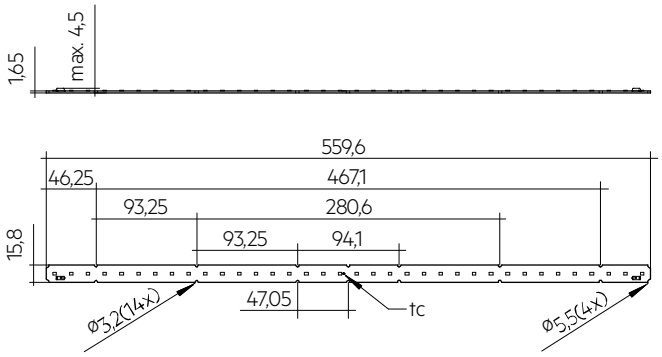
Modules LLE advanced



LLE 16x140mm 325lm HV ADV5



LLE 16x280mm 650lm HV ADV5



LLE 16x560mm 1300lm HV ADV5

Ordering data

Type	Article number	Article status	Colour temperature	Packaging, carton	Weight per pc.
LLE 16x140mm 325lm 827 HV ADV5	**89603385**	Standard	2,700 K	144 pc(s).	0.007 kg
LLE 16x140mm 325lm 830 HV ADV5	**89603386**	Standard	3,000 K	144 pc(s).	0.007 kg
LLE 16x140mm 325lm 835 HV ADV5	**28003991**	On demand	3,500 K	144 pc(s).	0.007 kg
LLE 16x140mm 325lm 840 HV ADV5	**89603387**	Standard	4,000 K	144 pc(s).	0.007 kg
LLE 16x140mm 325lm 850 HV ADV5	**89603388**	On demand	5,000 K	144 pc(s).	0.007 kg
LLE 16x140mm 325lm 865 HV ADV5	**89603389**	Standard	6,500 K	144 pc(s).	0.007 kg
LLE 16x280mm 650lm 827 HV ADV5	**89603390**	Standard	2,700 K	144 pc(s).	0.014 kg
LLE 16x280mm 650lm 830 HV ADV5	**89603391**	Standard	3,000 K	144 pc(s).	0.014 kg
LLE 16x280mm 650lm 835 HV ADV5	**28003992**	On demand	3,500 K	144 pc(s).	0.014 kg
LLE 16x280mm 650lm 840 HV ADV5	**89603392**	Standard	4,000 K	144 pc(s).	0.014 kg
LLE 16x280mm 650lm 850 HV ADV5	**89603393**	Standard	5,000 K	144 pc(s).	0.014 kg
LLE 16x280mm 650lm 865 HV ADV5	**89603394**	Standard	6,500 K	144 pc(s).	0.014 kg
LLE 16x560mm 1300lm 827 HV ADV5	**89603395**	Standard	2,700 K	144 pc(s).	0.028 kg
LLE 16x560mm 1300lm 830 HV ADV5	**89603396**	Standard	3,000 K	144 pc(s).	0.028 kg
LLE 16x560mm 1300lm 835 HV ADV5	**28003993**	On demand	3,500 K	144 pc(s).	0.028 kg
LLE 16x560mm 1300lm 840 HV ADV5	**89603397**	Standard	4,000 K	144 pc(s).	0.028 kg
LLE 16x560mm 1300lm 850 HV ADV5	**89603398**	Standard	5,000 K	144 pc(s).	0.028 kg
LLE 16x560mm 1300lm 865 HV ADV5	**89603399**	On demand	6,500 K	144 pc(s).	0.028 kg

Technical data

Beam characteristic	120°
Ambient temperature ta	-40 ... +65 °C
tp rated	50 °C
tc	85 °C
Irated	225 mA
Imax	540 mA
Max. permissible LF current ripple	595 mA
Max. permissible peak current	900 mA / max. 8 ms
Max. working voltage for insulation ②	400 V
Insulation test voltage	1.8 kV
CTI of the printed circuit board	≥ 600
Colour tolerance	3 SDCM
ESD classification	Severity level 4
Risk group (IEC 62471) at ≤ 470 mA	RG0
Risk group (IEC 62471) at Imax	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 Year(s)

Approval marks

RoHS

Standards

IEC 62031, IEC 62471, IEC 61000-4-2, IEC 62778, IEC 61547, UL 8750

Specific technical data

Type	Article number	Photometric code	Useful luminous flux at tp = 25 °C ③	Expected luminous flux at tp rated ④	Typ. forward current	Min. forward voltage at tp rated	Max. forward voltage at tp = 25 °C	Power consumption Pon at tp = 25 °C ⑤	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
Operating mode HE at 200 mA											
LLE 16x140mm 325lm 827 HV ADV5	**89603385**	827/359	–	279 lm	200 mA	7.6 V	8.5 V	–	–	180 lm/W	> >80
LLE 16x140mm 325lm 830 HV ADV5	**89603386**	830/359	–	298 lm	200 mA	7.6 V	8.5 V	–	–	191 lm/W	> >80
LLE 16x140mm 325lm 835 HV ADV5	**28003991**	835/359	–	314 lm	200 mA	7.6 V	8.5 V	–	–	196 lm/W	> >80
LLE 16x140mm 325lm 840 HV ADV5	**89603387**	840/359	–	321 lm	200 mA	7.6 V	8.5 V	–	–	199 lm/W	> >80
LLE 16x140mm 325lm 850 HV ADV5	**89603388**	850/359	–	315 lm	200 mA	7.6 V	8.5 V	–	–	197 lm/W	> >80
LLE 16x140mm 325lm 865 HV ADV5	**89603389**	865/359	–	301 lm	200 mA	7.6 V	8.5 V	–	–	192 lm/W	> >80
LLE 16x280mm 650lm 827 HV ADV5	**89603390**	827/359	–	568 lm	200 mA	15.3 V	17.0 V	–	–	177 lm/W	> >80
LLE 16x280mm 650lm 830 HV ADV5	**89603391**	830/359	–	598 lm	200 mA	15.3 V	17.0 V	–	–	185 lm/W	> >80
LLE 16x280mm 650lm 835 HV ADV5	**28003992**	835/359	–	627 lm	200 mA	15.3 V	17.0 V	–	–	196 lm/W	> >80
LLE 16x280mm 650lm 840 HV ADV5	**89603392**	840/359	–	633 lm	200 mA	15.3 V	17.0 V	–	–	193 lm/W	> >80
LLE 16x280mm 650lm 850 HV ADV5	**89603393**	850/359	–	629 lm	200 mA	15.3 V	17.0 V	–	–	194 lm/W	> >80
LLE 16x280mm 650lm 865 HV ADV5	**89603394**	865/359	–	638 lm	200 mA	15.3 V	17.0 V	–	–	195 lm/W	> >80
LLE 16x560mm 1300lm 827 HV ADV5	**89603395**	827/359	–	1,166 lm	200 mA	30.7 V	34.0 V	–	–	179 lm/W	> >80
LLE 16x560mm 1300lm 830 HV ADV5	**89603396**	830/359	–	1,193 lm	200 mA	30.7 V	34.0 V	–	–	184 lm/W	> >80
LLE 16x560mm 1300lm 835 HV ADV5	**28003993**	835/359	–	1,255 lm	200 mA	30.7 V	34.0 V	–	–	193 lm/W	> >80
LLE 16x560mm 1300lm 840 HV ADV5	**89603397**	840/359	–	1,247 lm	200 mA	30.7 V	34.0 V	–	–	192 lm/W	> >80
LLE 16x560mm 1300lm 850 HV ADV5	**89603398**	850/359	–	1,275 lm	200 mA	30.7 V	34.0 V	–	–	196 lm/W	> >80
LLE 16x560mm 1300lm 865 HV ADV5	**89603399**	865/359	–	1,262 lm	200 mA	30.7 V	34.0 V	–	–	194 lm/W	> >80
Operating mode NM at 225 mA											
LLE 16x140mm 325lm 827 HV ADV5	**89603385**	827/359	326 lm	317 lm	225 mA	7.7 V	8.6 V	1.8 W	181 lm/W	176 lm/W	> >80
LLE 16x140mm 325lm 830 HV ADV5	**89603386**	830/359	346 lm	336 lm	225 mA	7.7 V	8.6 V	1.8 W	192 lm/W	187 lm/W	> >80
LLE 16x140mm 325lm 835 HV ADV5	**28003991**	835/359	360 lm	351 lm	225 mA	7.7 V	8.6 V	1.8 W	200 lm/W	195 lm/W	> >80
LLE 16x140mm 325lm 840 HV ADV5	**89603387**	840/359	360 lm	350 lm	225 mA	7.7 V	8.6 V	1.8 W	200 lm/W	195 lm/W	> >80
LLE 16x140mm 325lm 850 HV ADV5	**89603388**	850/359	365 lm	354 lm	225 mA	7.7 V	8.6 V	1.8 W	203 lm/W	197 lm/W	> >80
LLE 16x140mm 325lm 865 HV ADV5	**89603389**	865/359	347 lm	338 lm	225 mA	7.7 V	8.6 V	1.8 W	193 lm/W	188 lm/W	> >80
LLE 16x280mm 650lm 827 HV ADV5	**89603390**	827/359	659 lm	640 lm	225 mA	15.4 V	17.1 V	3.7 W	178 lm/W	173 lm/W	> >80
LLE 16x280mm 650lm 830 HV ADV5	**89603391**	830/359	689 lm	670 lm	225 mA	15.4 V	17.1 V	3.7 W	186 lm/W	180 lm/W	> >80
LLE 16x280mm 650lm 835 HV ADV5	**28003992**	835/359	720 lm	701 lm	225 mA	15.4 V	17.1 V	3.7 W	195 lm/W	189 lm/W	> >80
LLE 16x280mm 650lm 840 HV ADV5	**89603392**	840/359	719 lm	700 lm	225 mA	15.4 V	17.1 V	3.7 W	194 lm/W	190 lm/W	> >80
LLE 16x280mm 650lm 850 HV ADV5	**89603393**	850/359	718 lm	699 lm	225 mA	15.4 V	17.1 V	3.7 W	194 lm/W	189 lm/W	> >80
LLE 16x280mm 650lm 865 HV ADV5	**89603394**	865/359	724 lm	705 lm	225 mA	15.4 V	17.1 V	3.7 W	196 lm/W	191 lm/W	> >80
LLE 16x560mm 1300lm 827 HV ADV5	**89603395**	827/359	1,332 lm	1,303 lm	225 mA	30.8 V	34.2 V	7.4 W	180 lm/W	175 lm/W	> >80
LLE 16x560mm 1300lm 830 HV ADV5	**89603396**	830/359	1,365 lm	1,327 lm	225 mA	30.8 V	34.2 V	7.4 W	184 lm/W	182 lm/W	> >80
LLE 16x560mm 1300lm 835 HV ADV5	**28003993**	835/359	1,440 lm	1,401 lm	225 mA	30.8 V	34.2 V	7.4 W	195 lm/W	192 lm/W	> >80
LLE 16x560mm 1300lm 840 HV ADV5	**89603397**	840/359	1,428 lm	1,390 lm	225 mA	30.8 V	34.2 V	7.4 W	193 lm/W	188 lm/W	> >80
LLE 16x560mm 1300lm 850 HV ADV5	**89603398**	850/359	1,460 lm	1,421 lm	225 mA	30.8 V	34.2 V	7.4 W	197 lm/W	192 lm/W	> >80
LLE 16x560mm 1300lm 865 HV ADV5	**89603399**	865/359	1,448 lm	1,409 lm	225 mA	30.8 V	34.2 V	7.4 W	196 lm/W	193 lm/W	> >80
Operating mode HO at 500 mA											
LLE 16x140mm 325lm 827 HV ADV5	**89603385**	827/359	–	652 lm	500 mA	8.0 V	9.0 V	–	–	159 lm/W	> >80
LLE 16x140mm 325lm 830 HV ADV5	**89603386**	830/359	–	702 lm	500 mA	8.0 V	9.0 V	–	–	168 lm/W	> >80
LLE 16x140mm 325lm 835 HV ADV5	**28003991**	835/359	–	728 lm	500 mA	8.0 V	9.0 V	–	–	169 lm/W	> >80
LLE 16x140mm 325lm 840 HV ADV5	**89603387**	840/359	–	739 lm	500 mA	8.0 V	9.0 V	–	–	175 lm/W	> >80
LLE 16x140mm 325lm 850 HV ADV5	**89603388**	850/359	–	739 lm	500 mA	8.0 V	9.0 V	–	–	172 lm/W	> >80
LLE 16x140mm 325lm 865 HV ADV5	**89603389**	865/359	–	703 lm	500 mA	8.0 V	9.0 V	–	–	168 lm/W	> >80
LLE 16x280mm 650lm 827 HV ADV5	**89603390**	827/359	–	1,318 lm	500 mA	16.1 V	17.9 V	–	–	156 lm/W	> >80
LLE 16x280mm 650lm 830 HV ADV5	**89603391**	830/359	–	1,388 lm	500 mA	16.1 V	17.9 V	–	–	163 lm/W	> >80
LLE 16x280mm 650lm 835 HV ADV5	**28003992**	835/359	–	1,456 lm	500 mA	16.1 V	17.9 V	–	–	171 lm/W	> >80
LLE 16x280mm 650lm 840 HV ADV5	**89603392**	840/359	–	1,457 lm	500 mA	16.1 V	17.9 V	–	–	170 lm/W	> >80
LLE 16x280mm 650lm 850 HV ADV5	**89603393**	850/359	–	1,455 lm	500 mA	16.1 V	17.9 V	–	–	171 lm/W	> >80
LLE 16x280mm 650lm 865 HV ADV5	**89603394**	865/359	–	1,477 lm	500 mA	16.1 V	17.9 V	–	–	171 lm/W	> >80
LLE 16x560mm 1300lm 827 HV ADV5	**89603395**	827/359	–	2,713 lm	500 mA	32.3 V	35.7 V	–	–	158 lm/W	> >80
LLE 16x560mm 1300lm 830 HV ADV5	**89603396**	830/359	–	2,759 lm	500 mA	32.3 V	35.7 V	–	–	162 lm/W	> >80
LLE 16x560mm 1300lm 835 HV ADV5	**28003993**	835/359	–	2,912 lm	500 mA	32.3 V	35.7 V	–	–	170 lm/W	> >80
LLE 16x560mm 1300lm 840 HV ADV5	**89603397**	840/359	–	2,894 lm	500 mA	32.3 V	35.7 V	–	–	169 lm/W	> >80
LLE 16x560mm 1300lm 850 HV ADV5	**89603398**	850/359	–	2,959 lm	500 mA	32.3 V	35.7 V	–	–	173 lm/W	> >80
LLE 16x560mm 1300lm 865 HV ADV5	**89603399**	865/359	–	2,929 lm	500 mA	32.3 V	35.7 V	–	–	171 lm/W	> >80

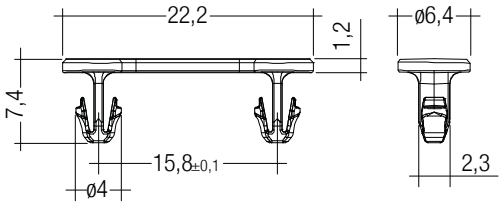
② If mounted with M3 screws and plastic washers.
③ Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.
④ Tolerance of expected light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %. Based on calculation.
⑤ Tolerance of power consumption Pon ± 10 %. Measurement uncertainty ± 5 %.

ACL BRIDGE LLE16

Accessory

Product description
_ Clip for fixation for LLE16
_ Fast snap on mounting (for sheet thickness 0.5 – 1.0 mm)
_ For drilling hole 3 mm
_ Clip made of polycarbonate
_ Minimum sales quantity 200 pcs.

Website
http://www.tridonic.com/28001035

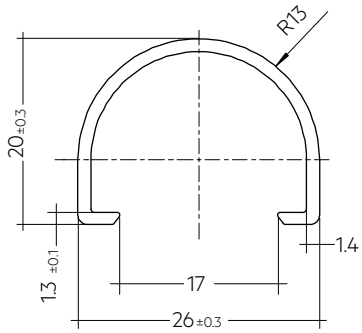


Ordering data

Type	Article number	Colour	Packaging, bag	Weight per pc.
ACL BRIDGE LLE16 PUSH-FIX	**28001035**	White	200 pc(s).	0.001 kg

ACL LINEAR COVER 16mm

Accessory



Product description

_ LINEAR COVER for LLE 16
_ Protection against direct touch for non-SELV applications (recommendation: use all fixing points) ①
_ Fast snap on mounting on to LLE 16 with clips or plastic washers
_ High transmission: transparent, semi-transparent and diffuse
_ Linear lense made of PMMA
_ Tolerances LINEAR COVER: + 10 mm for 1,600 / 1,200 mm length (ends raw)

① Ends must be covered by the luminaire construction.

Website
http://www.tridonic.com/28000950

Ordering data

Type	Article number	Colour	Length L	Packaging, carton	Weight per pc.
ACL LINEAR COVER 16x1600mm FROSTED	**28000950**	Semi-transparent	1,600 mm	24 pc(s).	0.147 kg
ACL LINEAR COVER 16x1200mm FROSTED	**28002827**	Semi-transparent	1,200 mm	24 pc(s).	0.100 kg
ACL LINEAR COVER 16x1600mm DIFFUSE	**28000951**	Diffuse	1,600 mm	24 pc(s).	0.147 kg
ACL LINEAR COVER 16x1200mm DIFFUSE	**28002828**	Diffuse	1,200 mm	24 pc(s).	0.100 kg

1. Standards

IEC 62031
IEC 62471
IEC 61000-4-2
IEC 62778
IEC 61547
UL 8750 (for CLASS2 circuits and dry locations)

1.1 Photometric code

Key for photometric code, e. g. 830 / 349

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 tempera-ture	Forward current	Energy classifi-cation	Energy consumption
LLE 16x140mm 325lm 827 HV ADV5	2,700 K	225 mA	C	2 kWh / 1,000 h
LLE 16x140mm 325lm 830 HV ADV5	3,000 K	225 mA	C	2 kWh / 1,000 h
LLE 16x140mm 325lm 835 HV ADV5	3,500 K	225 mA	B	2 kWh / 1,000 h
LLE 16x140mm 325lm 840 HV ADV5	4,000 K	225 mA	B	2 kWh / 1,000 h
LLE 16x140mm 325lm 850 HV ADV5	5,000 K	225 mA	B	2 kWh / 1,000 h
LLE 16x140mm 325lm 865 HV ADV5	6,500 K	225 mA	C	2 kWh / 1,000 h
LLE 16x280mm 650lm 827 HV ADV5	2,700 K	225 mA	C	4 kWh / 1,000 h
LLE 16x280mm 650lm 830 HV ADV5	3,000 K	225 mA	C	4 kWh / 1,000 h
LLE 16x280mm 650lm 835 HV ADV5	3,500 K	225 mA	C	4 kWh / 1,000 h
LLE 16x280mm 650lm 840 HV ADV5	4,000 K	225 mA	C	4 kWh / 1,000 h
LLE 16x280mm 650lm 850 HV ADV5	5,000 K	225 mA	C	4 kWh / 1,000 h
LLE 16x280mm 650lm 865 HV ADV5	6,500 K	225 mA	C	4 kWh / 1,000 h
LLE 16x560mm 1300lm 827 HV ADV5	2,700 K	225 mA	C	8 kWh / 1,000 h
LLE 16x560mm 1300lm 830 HV ADV5	3,000 K	225 mA	C	8 kWh / 1,000 h
LLE 16x560mm 1300lm 835 HV ADV5	3,500 K	225 mA	C	8 kWh / 1,000 h
LLE 16x560mm 1300lm 840 HV ADV5	4,000 K	225 mA	C	8 kWh / 1,000 h
LLE 16x560mm 1300lm 850 HV ADV5	5,000 K	225 mA	C	8 kWh / 1,000 h
LLE 16x560mm 1300lm 865 HV ADV5	6,500 K	225 mA	C	8 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 LLE a tp temperature of 50 °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 … +85 °C

Operation only in non condensing environment.
Humidity during processing of the module should be between 30 to 70 %.

2.3 Heat sink values

LLE 16x140mm 325lm ADV5

ta	tp	Forward current	$R_{th, hs-a}$	Cooling area
25 °C	50 °C	225 mA	self cooling	
25 °C	50 °C	500 mA	self cooling	
35 °C	50 °C	225 mA	16.59 K/W	40 cm²
35 °C	50 °C	500 mA	6.36 K/W	105 cm²
40 °C	50 °C	225 mA	11.05 K/W	60 cm²
40 °C	50 °C	500 mA	4.23 K/W	157 cm²
45 °C	50 °C	225 mA	5.51 K/W	121 cm²
45 °C	50 °C	500 mA	2.11 K/W	316 cm²

LLE 16x280mm 650lm ADV5

ta	tp	Forward current	$R_{th, hs-a}$	Cooling area
25 °C	50 °C	225 mA	self cooling	
25 °C	50 °C	500 mA	self cooling	
35 °C	50 °C	225 mA	8.58 K/W	78 cm²
35 °C	50 °C	500 mA	3.29 K/W	203 cm²
40 °C	50 °C	225 mA	5.72 K/W	117 cm²
40 °C	50 °C	500 mA	2.19 K/W	305 cm²
45 °C	50 °C	225 mA	2.85 K/W	234 cm²
45 °C	50 °C	500 mA	1.09 K/W	613 cm²

LLE 16x560mm 1300lm ADV5

ta	tp	Forward current	$R_{th, hs-a}$	Cooling area
25 °C	50 °C	225 mA	self cooling	
25 °C	50 °C	500 mA	self cooling	
35 °C	50 °C	225 mA	4.56 K/W	146 cm²
35 °C	50 °C	500 mA	1.74 K/W	384 cm²
40 °C	50 °C	225 mA	3.04 K/W	219 cm²
40 °C	50 °C	500 mA	1.16 K/W	576 cm²
45 °C	50 °C	225 mA	1.52 K/W	439 cm²
45 °C	50 °C	500 mA	0.58 K/W	1,157 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

LLE 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 LLE 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

LLE 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 LLE.

The LLE module is designed for serial wiring.

With parallel wiring tolerance-related differences in output are possible (thermal stress of the module) and can cause differences in brightness.

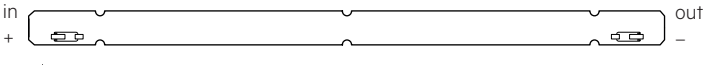
If a wire breaks or a complete module fails then the current passing through the other module increases. This may reduce its life considerably.

The max. permissible output current of the LED driver for parallel wiring is 1,080 mA.
Parallel wiring is only permitted with 280 mm or 560 mm modules.

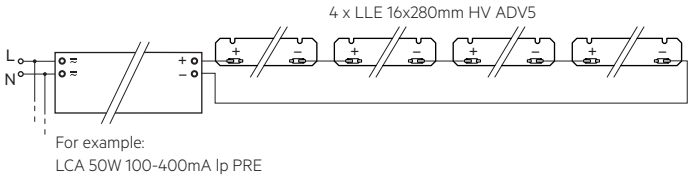
LLE can be operated either from SELV LED drivers or from LED drivers with LV output voltage.

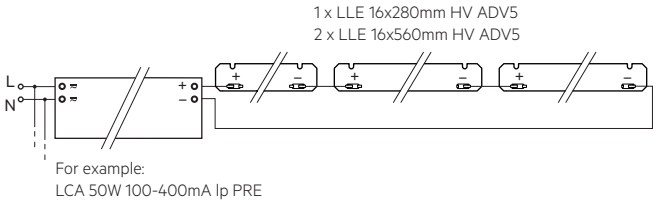
LLE are basic insulated up to 400 V (if mounted with M3 screws with head diameter 7 mm in combination with plastic washers) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED driver (also against earth) is above 400 V, an additional 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

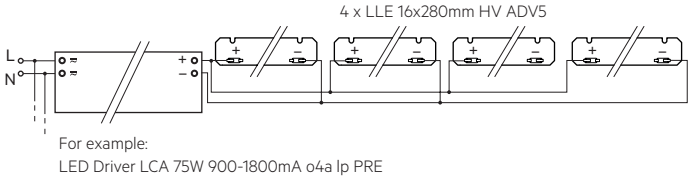


Wiring examples for serial wiring



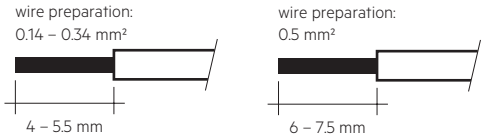


Wiring examples for parallel wiring



3.3 Wiring type and cross section

For wiring use solid wire from 0.14 to 0.5 mm².
No reconnection with smaller diameters possible if used with >0.34 mm².



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 LLE (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 min. 6 M3 screws with plastic washers per module or ACL BRIDGE LLE16 PUSH-FIX.

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 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 LLE 16mm HV ADV5

Forward current	tp temperature	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
150 mA	40 °C	43,000 h	59,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	45 °C	42,000 h	57,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	50 °C	41,000 h	55,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	55 °C	40,000 h	54,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	60 °C	39,000 h	52,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	65 °C	38,000 h	50,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	70 °C	38,000 h	49,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	75 °C	37,000 h	47,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	80 °C	36,000 h	46,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	85 °C	35,000 h	45,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
200 mA	40 °C	43,000 h	58,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	45 °C	42,000 h	57,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	50 °C	41,000 h	55,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	55 °C	40,000 h	53,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	60 °C	39,000 h	51,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	65 °C	38,000 h	50,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	70 °C	37,000 h	48,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	75 °C	36,000 h	47,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	80 °C	36,000 h	45,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	85 °C	35,000 h	44,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
300 mA	40 °C	42,000 h	58,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	45 °C	41,000 h	56,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	50 °C	40,000 h	54,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	55 °C	40,000 h	52,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	60 °C	39,000 h	51,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	65 °C	38,000 h	49,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	70 °C	37,000 h	48,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	75 °C	36,000 h	46,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	80 °C	35,000 h	45,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	85 °C	34,000 h	44,000 h	70,000 h	>72,000 h	>72,000 h	>72,000 h
375 mA	40 °C	42,000 h	57,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	45 °C	41,000 h	55,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	50 °C	40,000 h	54,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	55 °C	39,000 h	52,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	60 °C	38,000 h	50,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	65 °C	37,000 h	49,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	70 °C	37,000 h	47,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	75 °C	36,000 h	46,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	80 °C	35,000 h	44,000 h	71,000 h	>72,000 h	>72,000 h	>72,000 h
	85 °C	34,000 h	43,000 h	69,000 h	>72,000 h	>72,000 h	>72,000 h
450 mA	40 °C	42,000 h	56,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	45 °C	41,000 h	55,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	50 °C	40,000 h	53,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	55 °C	39,000 h	51,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	60 °C	38,000 h	50,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	65 °C	37,000 h	48,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	70 °C	36,000 h	47,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	75 °C	35,000 h	45,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	80 °C	35,000 h	44,000 h	70,000 h	>72,000 h	>72,000 h	>72,000 h
	85 °C	34,000 h	43,000 h	69,000 h	>72,000 h	>72,000 h	>72,000 h
500 mA	40 °C	41,000 h	56,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	45 °C	40,000 h	54,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	50 °C	39,000 h	52,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	55 °C	38,000 h	51,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	60 °C	38,000 h	49,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	65 °C	37,000 h	48,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	70 °C	36,000 h	46,000 h	>72,000 h	>72,000 h	>72,000 h	>72,000 h
	75 °C	35,000 h	45,000 h	71,000 h	>72,000 h	>72,000 h	>72,000 h
	80 °C	34,000 h	43,000 h	70,000 h	>72,000 h	>72,000 h	>72,000 h
	85 °C	34,000 h	42,000 h	68,000 h	>72,000 h	>72,000 h	>72,000 h

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.

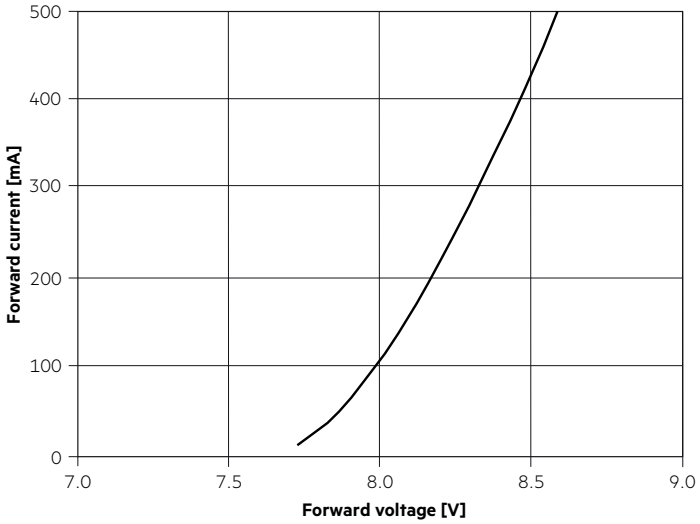
Imax ... Max. permissible continuous operating current incl. The tolerances of the LED driver.

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

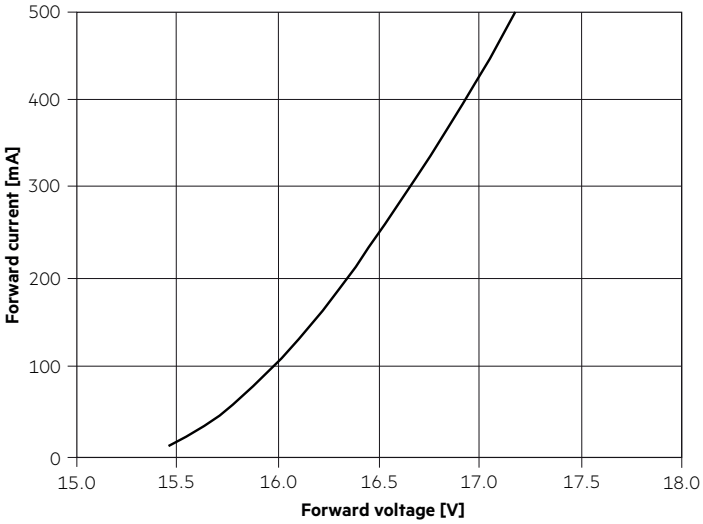
Max. permissible peak current ... The max. output peak current of the LED driver must not exceed this value.

5.2 Typ. forward voltage vs. forward current

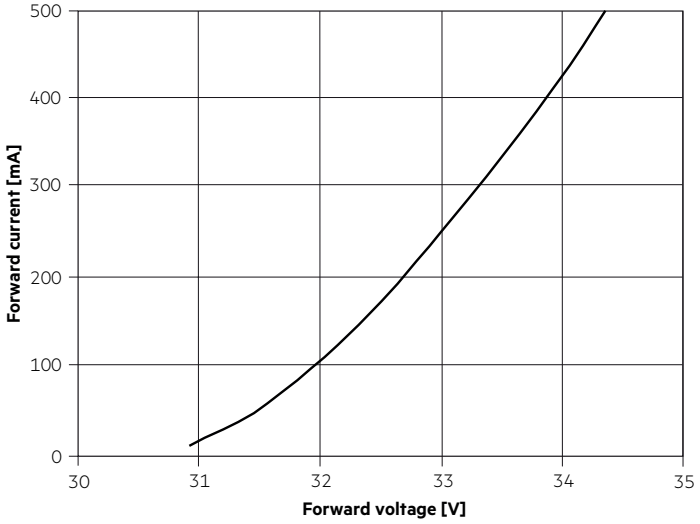
LLE 16x140mm 325lm 8xx HV ADV5



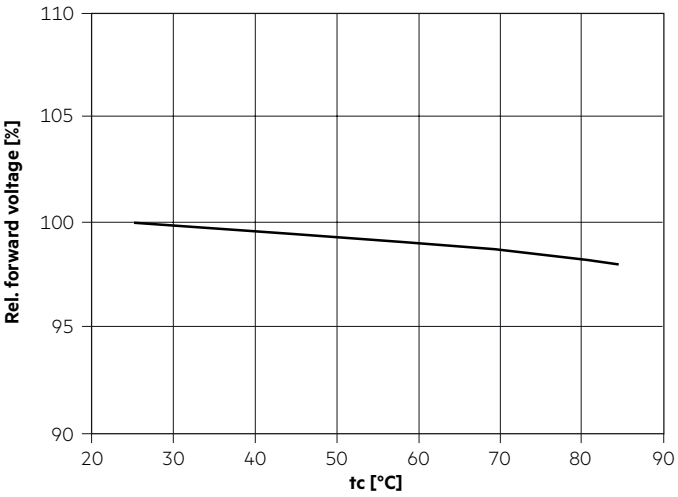
LLE 16x280mm 650lm 8xx HV ADV5



LLE 16x560mm 1300lm 8xx HV ADV5



5.3 Forward voltage vs. tc temperature



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

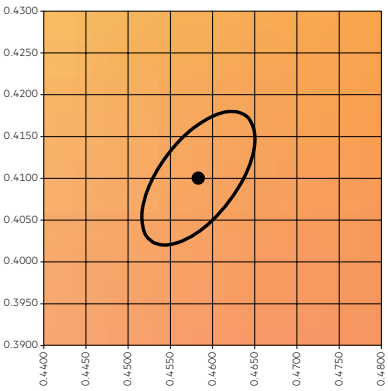
6. Photometric characteristics

6.1 Coordinates and tolerances according to CIE 1931

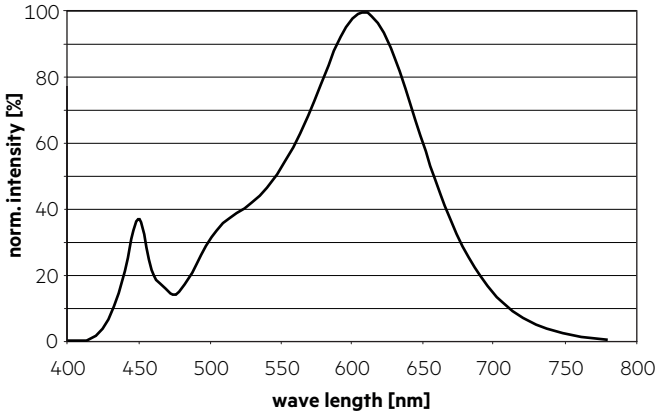
The specified colour coordinates are integral measured by current impulse of 195 mA and a duration of 100 ms.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

2,700 K

	x0	y0
Centre	0.4578	0.4101

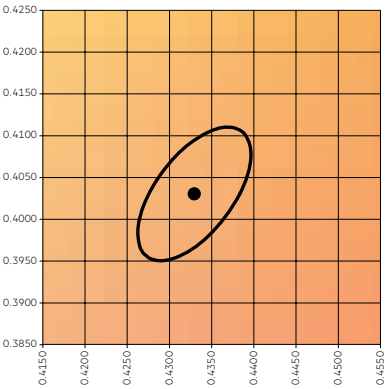


MacAdam Ellipse: 3SDCM

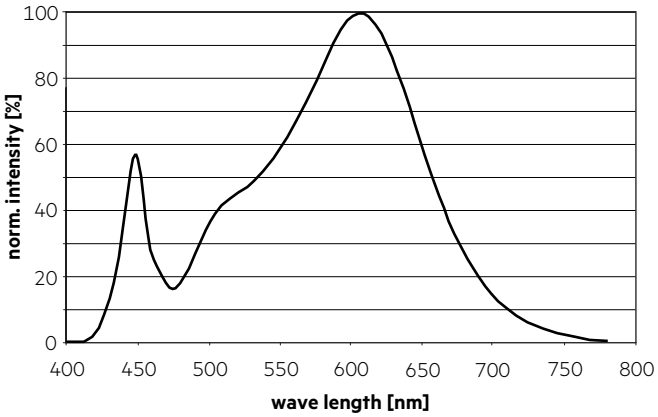


3,000 K

	x0	y0
Centre	0.4338	0.4030

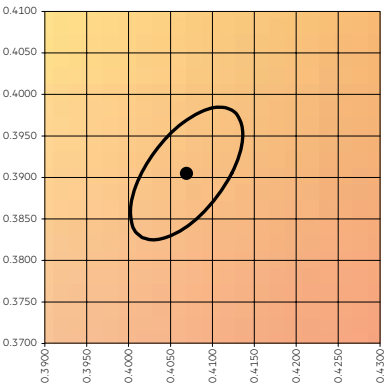


MacAdam Ellipse: 3SDCM

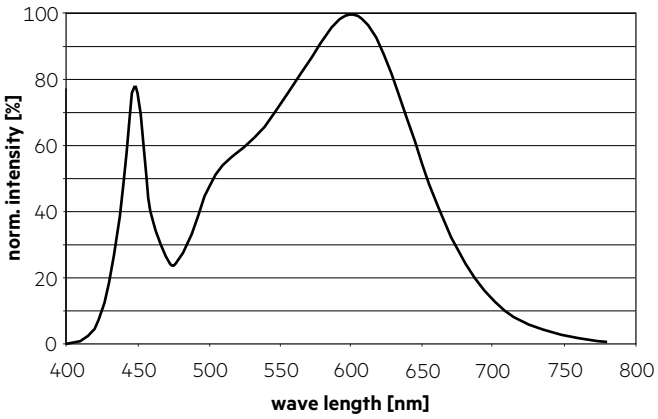


3,500 K

	x0	y0
Centre	0.4069	0.3905

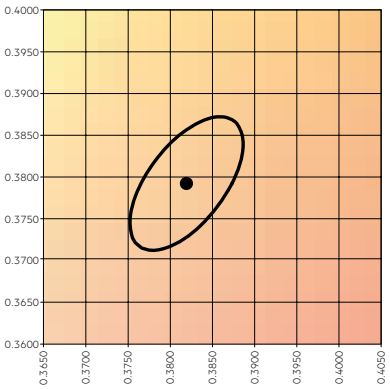


MacAdam Ellipse: 3SDCM

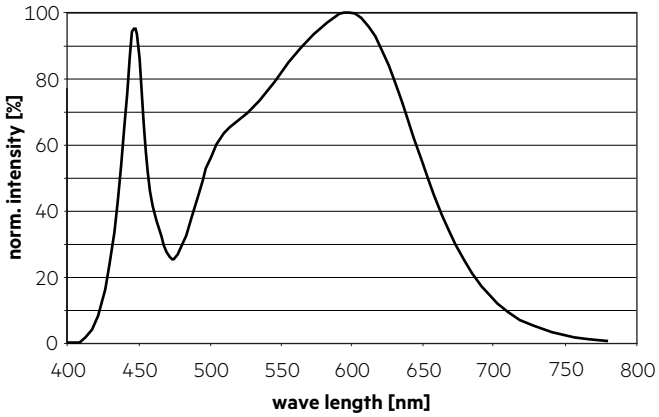


4,000 K

	x0	y0
Center	0.3818	0.3797

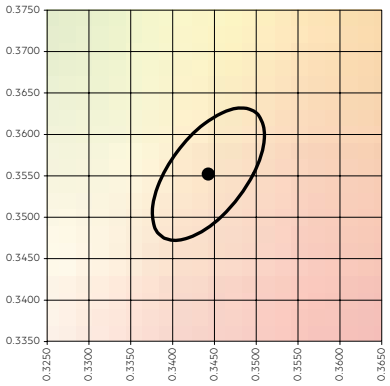


MacAdam Ellipse: 3SDCM

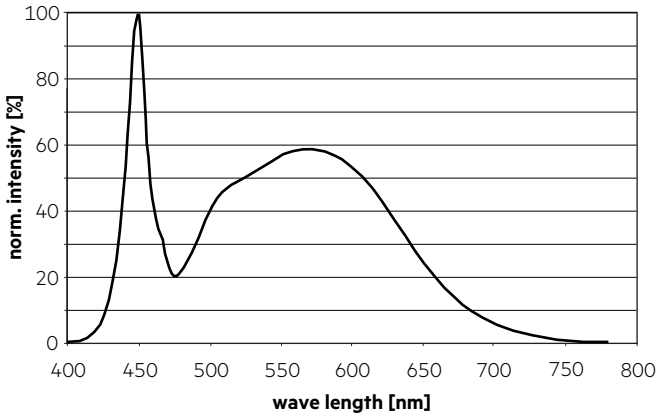


5,000 K

	x0	y0
Center	0.3447	0.3553

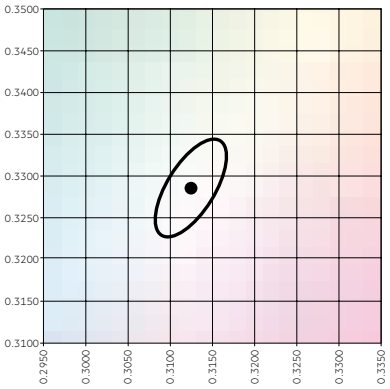


MacAdam Ellipse: 3SDCM

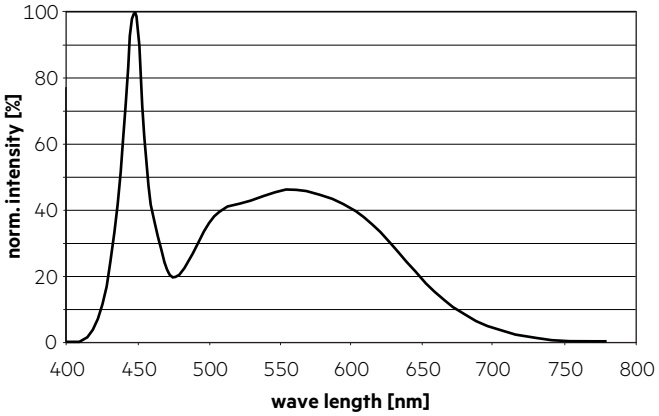


6,500 K

	x0	y0
Center	0.3123	0.3282

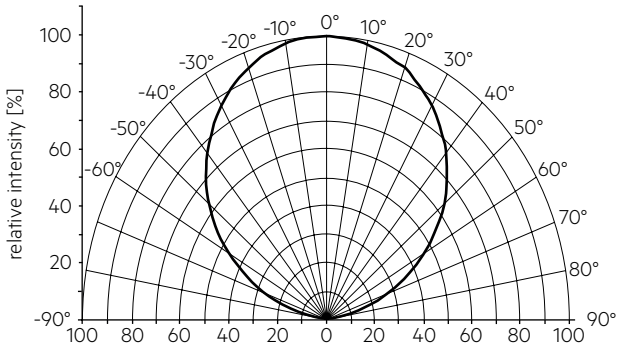


MacAdam Ellipse: 3SDCM



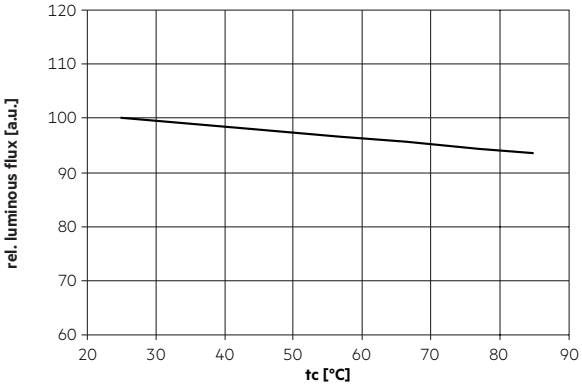
6.2 Light distribution

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

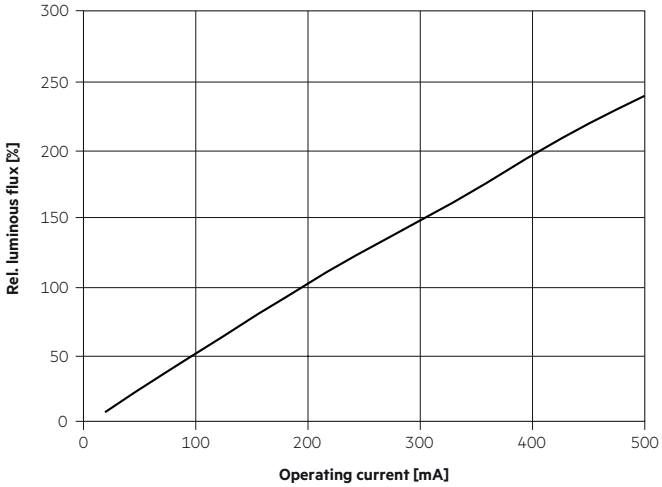


The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 5.
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing between module and optic (typ. 4 cm) should be used.

6.3 Relative luminous flux vs. tc temperature



6.4 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

Lifetime declarations are informative and represent no warranty claim.