



Module LLE 24mm 650lm HV ADV5

Modules LLE advanced

Product description

- Ideal for linear and panel lights
- 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
- Option backside terminal
- Broad portfolio from extruded lenses and covers available
- Min. order quantity LLE 24x70mm QTY4: 36 pcs.

The LLE 24x70mm QTY4 module contains 4 single 24x70mm modules which have to be separated

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

Optical properties

- Colour temperatures 2,700 K, 3,000 K, 3,500 K, 4,000 K, 5,000 K and 6,500 K
- Useful luminous flux 1,254 lm at Irated and tp = 25 °C
- Efficacy of the LED module 190 lm/W at Irated and tp = 25 °C
- High colour rendering index CRI > 80
- High colour consistency (MacAdam 3)[®]
- Small luminous flux tolerances

Mechanical properties

- Module dimension 24 x 70 mm, 24 x 140 mm, 24 x 280 mm and 24 x 560 mm (ZHAGA compliant)
- Simple installation (e.g. 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/>)



Standards, page 14

Colour temperatures and tolerances, page 20



LLE 24x70mm 160lm HV ADV5



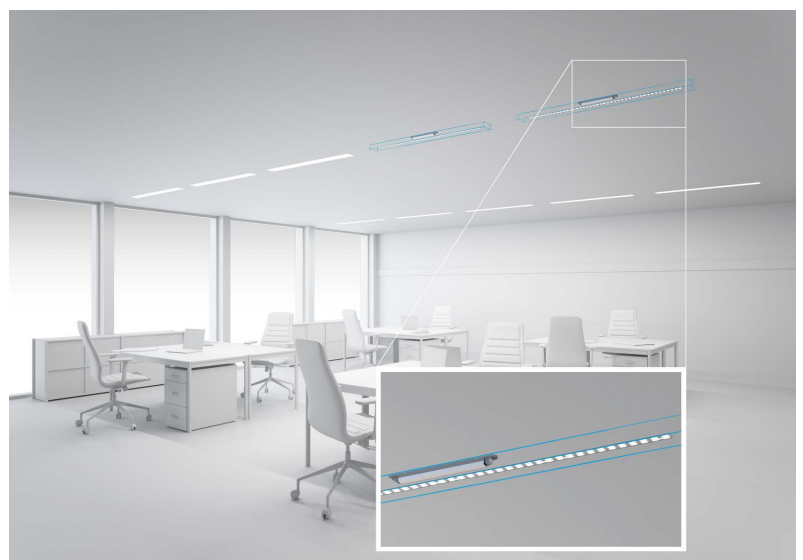
LLE 24x140mm 325lm HV ADV5



LLE 24x280mm 650lm HV ADV5



LLE 24x560mm 1300lm HV ADV5



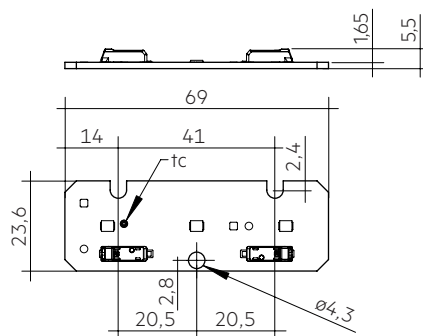


Module LLE 24mm 650lm HV ADV5

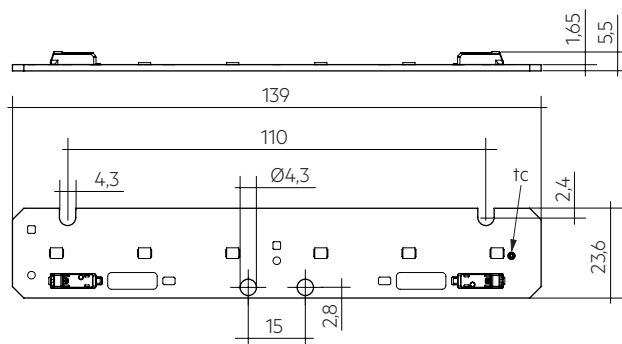
Modules LLE advanced

Technical data

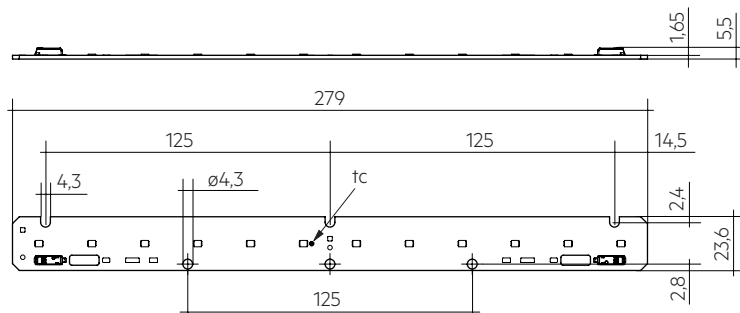
Beam characteristic	120°
Ambient temperature range	-40 ... +65 °C
tp rated	50 °C
tc	85 °C
Irated	300 mA
I _{max}	540 mA
Max. permissible LF current ripple	595 mA
Max. permissible peak current	900 mA / max. 10 ms
Max. working voltage for insulation [®]	440 V
Insulation test voltage	1.88 kV
CTI of the printed circuit board	≥ 600
ESD classification	severity level 4
Risk group (IEC 62471)	RG0
Classification acc. to IEC 62031	Built-in
Type of protection	IP00
Lumen maintenance L70B50	72,000 h
Guarantee	5 years



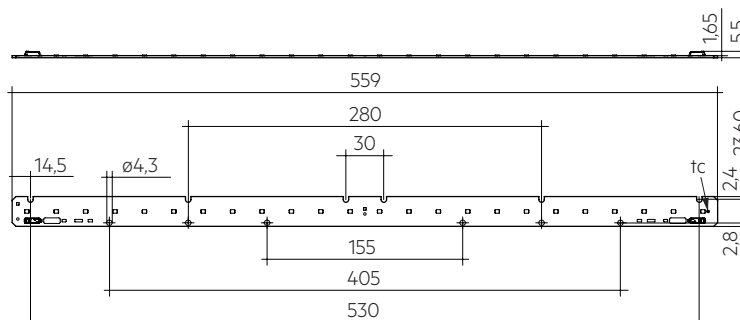
LLE 24x70mm 160lm HV ADV5



LLE 24x140mm 325lm HV ADV5



LLE 24x280mm 650lm HV ADV5



LLE 24x560mm 1300lm HV ADV5

Module LLE 24mm 650lm HV ADV5

Modules LLE advanced

Ordering data

Type	Article number	Colour temperature	Packaging carton	Weight per pc.
Frontside terminal				
LLE 24x70mm 160lm 830 HV ADV5 QTY4	89603180	3,000 K	120 pc(s).	0.022 kg
LLE 24x70mm 160lm 840 HV ADV5 QTY4	89603181	4,000 K	120 pc(s).	0.022 kg
LLE 24x140mm 325lm 827 HV ADV5	89603182	2,700 K	420 pc(s).	0.011 kg
LLE 24x140mm 325lm 830 HV ADV5	89603183	3,000 K	420 pc(s).	0.010 kg
LLE 24x140mm 325lm 835 HV ADV5	28003388	3,500 K	420 pc(s).	0.010 kg
LLE 24x140mm 325lm 840 HV ADV5	89603184	4,000 K	420 pc(s).	0.010 kg
LLE 24x140mm 325lm 865 HV ADV5	89603186	6,500 K	420 pc(s).	0.011 kg
LLE 24x280mm 650lm 827 HV ADV5	89603187	2,700 K	210 pc(s).	0.021 kg
LLE 24x280mm 650lm 830 HV ADV5	89603188	3,000 K	210 pc(s).	0.021 kg
LLE 24x280mm 650lm 835 HV ADV5	28003395	3,500 K	210 pc(s).	0.021 kg
LLE 24x280mm 650lm 840 HV ADV5	89603189	4,000 K	210 pc(s).	0.021 kg
LLE 24x280mm 650lm 850 HV ADV5	89603190	5,000 K	210 pc(s).	0.021 kg
LLE 24x280mm 650lm 865 HV ADV5	89603191	6,500 K	210 pc(s).	0.021 kg
LLE 24x560mm 1300lm 827 HV ADV5	89603192	2,700 K	180 pc(s).	0.041 kg
LLE 24x560mm 1300lm 830 HV ADV5	89603193	3,000 K	180 pc(s).	0.041 kg
LLE 24x560mm 1300lm 835 HV ADV5	28003397	3,500 K	180 pc(s).	0.041 kg
LLE 24x560mm 1300lm 840 HV ADV5	89603194	4,000 K	180 pc(s).	0.041 kg
LLE 24x560mm 1300lm 850 HV ADV5	89603195	5,000 K	180 pc(s).	0.041 kg
LLE 24x560mm 1300lm 865 HV ADV5	89603196	6,500 K	180 pc(s).	0.041 kg
Backside terminal				
LLE 24x560mm 1300lm 840 HV ADV5 BT	28002944	4,000 K	120 pc(s).	0.041 kg
LLE 24x560mm 1300lm 865 HV ADV5 BT	28002945	6,500 K	120 pc(s).	0.041 kg

Specific technical data

Type®	Photo-metric code	Useful luminous flux at tp = 25 °C®	Expected luminous flux at tp rated®	Typ. forward current	Min. forward voltage at tp rated	Max. forward voltage at tp = 25 °C	Power consumption Pon at tp = 25 °C®	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 24x70mm 160lm 830 HV ADV5 QTY4	830/359	–	100 lm	200 mA	2.6 V	2.8 V	–	–	186 lm/W	> 80
LLE 24x70mm 160lm 840 HV ADV5 QTY4	840/359	–	107 lm	200 mA	2.6 V	2.8 V	–	–	196 lm/W	> 80
LLE 24x140mm 325lm 827 HV ADV5	827/359	–	199 lm	200 mA	5.2 V	5.6 V	–	–	185 lm/W	> 80
LLE 24x140mm 325lm 830 HV ADV5	830/359	–	205 lm	200 mA	5.2 V	5.6 V	–	–	187 lm/W	> 80
LLE 24x140mm 325lm 835 HV ADV5	835/359	–	210 lm	200 mA	5.2 V	5.6 V	–	–	194 lm/W	> 80
LLE 24x140mm 325lm 840 HV ADV5	840/359	–	212 lm	200 mA	5.2 V	5.6 V	–	–	196 lm/W	> 80
LLE 24x140mm 325lm 865 HV ADV5	865/359	–	214 lm	200 mA	5.2 V	5.6 V	–	–	197 lm/W	> 80
LLE 24x280mm 650lm 827 HV ADV5	827/359	–	391 lm	200 mA	10.3 V	11.2 V	–	–	183 lm/W	> 80
LLE 24x280mm 650lm 830 HV ADV5	830/359	–	404 lm	200 mA	10.3 V	11.2 V	–	–	189 lm/W	> 80
LLE 24x280mm 650lm 835 HV ADV5	835/359	–	419 lm	200 mA	10.3 V	11.2 V	–	–	193 lm/W	> 80
LLE 24x280mm 650lm 840 HV ADV5	840/359	–	423 lm	200 mA	10.3 V	11.2 V	–	–	196 lm/W	> 80
LLE 24x280mm 650lm 850 HV ADV5	850/359	–	423 lm	200 mA	10.3 V	11.2 V	–	–	196 lm/W	> 80
LLE 24x280mm 650lm 865 HV ADV5	865/359	–	428 lm	200 mA	10.3 V	11.2 V	–	–	195 lm/W	> 80
LLE 24x560mm 1300lm 827 HV ADV5	827/359	–	779 lm	200 mA	20.7 V	22.4 V	–	–	180 lm/W	> 80
LLE 24x560mm 1300lm 830 HV ADV5	830/359	–	806 lm	200 mA	20.7 V	22.4 V	–	–	187 lm/W	> 80
LLE 24x560mm 1300lm 835 HV ADV5	835/359	–	834 lm	200 mA	20.7 V	22.4 V	–	–	192 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5	840/359	–	845 lm	200 mA	20.7 V	22.4 V	–	–	195 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5 BT	840/359	–	845 lm	200 mA	20.7 V	22.4 V	–	–	195 lm/W	> 80
LLE 24x560mm 1300lm 850 HV ADV5	850/359	–	850 lm	200 mA	20.7 V	22.4 V	–	–	196 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5	865/359	–	844 lm	200 mA	20.7 V	22.4 V	–	–	195 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5 BT	865/359	–	844 lm	200 mA	20.7 V	22.4 V	–	–	195 lm/W	> 80
Operating mode HE at 250 mA										
LLE 24x70mm 160lm 830 HV ADV5 QTY4	830/359	–	124 lm	250 mA	2.6 V	2.8 V	–	–	181 lm/W	> 80
LLE 24x70mm 160lm 840 HV ADV5 QTY4	840/359	–	132 lm	250 mA	2.6 V	2.8 V	–	–	191 lm/W	> 80
LLE 24x140mm 325lm 827 HV ADV5	827/359	–	239 lm	250 mA	5.2 V	5.7 V	–	–	178 lm/W	> 80
LLE 24x140mm 325lm 830 HV ADV5	830/359	–	249 lm	250 mA	5.2 V	5.7 V	–	–	182 lm/W	> 80
LLE 24x140mm 325lm 835 HV ADV5	835/359	–	260 lm	250 mA	5.2 V	5.7 V	–	–	189 lm/W	> 80
LLE 24x140mm 325lm 840 HV ADV5	840/359	–	260 lm	250 mA	5.2 V	5.7 V	–	–	191 lm/W	> 80
LLE 24x140mm 325lm 865 HV ADV5	865/359	–	263 lm	250 mA	5.2 V	5.7 V	–	–	192 lm/W	> 80
LLE 24x280mm 650lm 827 HV ADV5	827/359	–	480 lm	250 mA	10.4 V	11.3 V	–	–	170 lm/W	> 80
LLE 24x280mm 650lm 830 HV ADV5	830/359	–	502 lm	250 mA	10.4 V	11.3 V	–	–	184 lm/W	> 80
LLE 24x280mm 650lm 835 HV ADV5	835/359	–	513 lm	250 mA	10.4 V	11.3 V	–	–	188 lm/W	> 80
LLE 24x280mm 650lm 840 HV ADV5	840/359	–	520 lm	250 mA	10.4 V	11.3 V	–	–	191 lm/W	> 80
LLE 24x280mm 650lm 850 HV ADV5	850/359	–	513 lm	250 mA	10.4 V	11.3 V	–	–	188 lm/W	> 80
LLE 24x280mm 650lm 865 HV ADV5	865/359	–	520 lm	250 mA	10.4 V	11.3 V	–	–	190 lm/W	> 80
LLE 24x560mm 1300lm 827 HV ADV5	827/359	–	960 lm	250 mA	20.9 V	22.6 V	–	–	175 lm/W	> 80
LLE 24x560mm 1300lm 830 HV ADV5	830/359	–	1,001 lm	250 mA	20.9 V	22.6 V	–	–	182 lm/W	> 80
LLE 24x560mm 1300lm 835 HV ADV5	835/359	–	1,023 lm	250 mA	20.9 V	22.6 V	–	–	187 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5	840/359	–	1,034 lm	250 mA	20.9 V	22.6 V	–	–	190 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5 BT	840/359	–	1,034 lm	250 mA	20.9 V	22.6 V	–	–	190 lm/W	> 80
LLE 24x560mm 1300lm 850 HV ADV5	850/359	–	1,026 lm	250 mA	20.9 V	22.6 V	–	–	188 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5	865/359	–	1,032 lm	250 mA	20.9 V	22.6 V	–	–	190 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5 BT	865/359	–	1,032 lm	250 mA	20.9 V	22.6 V	–	–	190 lm/W	> 80

® Integral measurement over the complete module.

® If mounted with M4 screws and plastic washers.

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

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

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

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

Specific technical data

Type [®]	Photo-metric code	Useful luminous flux at tp = 25 °C [®]	Expected luminous flux at tp rated [®]	Typ. forward current	Min. forward voltage at tp rated	Max. forward voltage at tp = 25 °C	Power consumption Pon at tp = 25 °C [®]	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
Operating mode HE at 275 mA										
LLE 24x70mm 160lm 830 HV ADV5 QTY4	830/359	–	134 lm	275 mA	2.6 V	2.8 V	–	–	176 lm/W	> 80
LLE 24x70mm 160lm 840 HV ADV5 QTY4	840/359	–	141 lm	275 mA	2.6 V	2.8 V	–	–	187 lm/W	> 80
LLE 24x140mm 325lm 827 HV ADV5	827/359	–	259 lm	275 mA	5.3 V	5.7 V	–	–	174 lm/W	> 80
LLE 24x140mm 325lm 830 HV ADV5	830/359	–	269 lm	275 mA	5.3 V	5.7 V	–	–	178 lm/W	> 80
LLE 24x140mm 325lm 835 HV ADV5	835/359	–	280 lm	275 mA	5.3 V	5.7 V	–	–	185 lm/W	> 80
LLE 24x140mm 325lm 840 HV ADV5	840/359	–	279 lm	275 mA	5.3 V	5.7 V	–	–	188 lm/W	> 80
LLE 24x140mm 325lm 865 HV ADV5	865/359	–	282 lm	275 mA	5.3 V	5.7 V	–	–	188 lm/W	> 80
LLE 24x280mm 650lm 827 HV ADV5	827/359	–	520 lm	275 mA	10.5 V	11.4 V	–	–	174 lm/W	> 80
LLE 24x280mm 650lm 830 HV ADV5	830/359	–	541 lm	275 mA	10.5 V	11.4 V	–	–	180 lm/W	> 80
LLE 24x280mm 650lm 835 HV ADV5	835/359	–	558 lm	275 mA	10.5 V	11.4 V	–	–	184 lm/W	> 80
LLE 24x280mm 650lm 840 HV ADV5	840/359	–	559 lm	275 mA	10.5 V	11.4 V	–	–	187 lm/W	> 80
LLE 24x280mm 650lm 850 HV ADV5	850/359	–	551 lm	275 mA	10.5 V	11.4 V	–	–	184 lm/W	> 80
LLE 24x280mm 650lm 865 HV ADV5	865/359	–	559 lm	275 mA	10.5 V	11.4 V	–	–	186 lm/W	> 80
LLE 24x560mm 1300lm 827 HV ADV5	827/359	–	1,038 lm	275 mA	21.0 V	22.7 V	–	–	171 lm/W	> 80
LLE 24x560mm 1300lm 830 HV ADV5	830/359	–	1,078 lm	275 mA	21.0 V	22.7 V	–	–	177 lm/W	> 80
LLE 24x560mm 1300lm 835 HV ADV5	835/359	–	1,112 lm	275 mA	21.0 V	22.7 V	–	–	183 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5	840/359	–	1,120 lm	275 mA	21.0 V	22.7 V	–	–	186 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5 BT	840/359	–	1,120 lm	275 mA	21.0 V	22.7 V	–	–	186 lm/W	> 80
LLE 24x560mm 1300lm 850 HV ADV5	850/359	–	1,121 lm	275 mA	21.0 V	22.7 V	–	–	184 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5	865/359	–	1,119 lm	275 mA	21.0 V	22.7 V	–	–	186 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5 BT	865/359	–	1,119 lm	275 mA	21.0 V	22.7 V	–	–	186 lm/W	> 80
Operating mode NM at 300 mA										
LLE 24x70mm 160lm 830 HV ADV5 QTY4	830/359	148 lm	143 lm	300 mA	2.6 V	2.9 V	0.8 W	178 lm/W	175 lm/W	> 80
LLE 24x70mm 160lm 840 HV ADV5 QTY4	840/359	156 lm	151 lm	300 mA	2.6 V	2.9 V	0.8 W	188 lm/W	184 lm/W	> 80
LLE 24x140mm 325lm 827 HV ADV5	827/359	294 lm	284 lm	300 mA	5.3 V	5.7 V	1.7 W	177 lm/W	174 lm/W	> 80
LLE 24x140mm 325lm 830 HV ADV5	830/359	298 lm	293 lm	300 mA	5.3 V	5.7 V	1.7 W	180 lm/W	177 lm/W	> 80
LLE 24x140mm 325lm 835 HV ADV5	835/359	310 lm	300 lm	300 mA	5.3 V	5.7 V	1.7 W	187 lm/W	183 lm/W	> 80
LLE 24x140mm 325lm 840 HV ADV5	840/359	313 lm	303 lm	300 mA	5.3 V	5.7 V	1.7 W	189 lm/W	185 lm/W	> 80
LLE 24x140mm 325lm 865 HV ADV5	865/359	316 lm	306 lm	300 mA	5.3 V	5.7 V	1.7 W	190 lm/W	186 lm/W	> 80
LLE 24x280mm 650lm 827 HV ADV5	827/359	579 lm	564 lm	300 mA	10.5 V	11.4 V	3.3 W	175 lm/W	172 lm/W	> 80
LLE 24x280mm 650lm 830 HV ADV5	830/359	599 lm	584 lm	300 mA	10.5 V	11.4 V	3.3 W	182 lm/W	179 lm/W	> 80
LLE 24x280mm 650lm 835 HV ADV5	835/359	618 lm	603 lm	300 mA	10.5 V	11.4 V	3.3 W	186 lm/W	182 lm/W	> 80
LLE 24x280mm 650lm 840 HV ADV5	840/359	627 lm	612 lm	300 mA	10.5 V	11.4 V	3.3 W	188 lm/W	184 lm/W	> 80
LLE 24x280mm 650lm 850 HV ADV5	850/359	627 lm	613 lm	300 mA	10.5 V	11.4 V	3.3 W	188 lm/W	185 lm/W	> 80
LLE 24x280mm 650lm 865 HV ADV5	865/359	627 lm	612 lm	300 mA	10.5 V	11.4 V	3.3 W	188 lm/W	184 lm/W	> 80
LLE 24x560mm 1300lm 827 HV ADV5	827/359	1,146 lm	1,117 lm	300 mA	21.1 V	22.8 V	6.7 W	172 lm/W	169 lm/W	> 80
LLE 24x560mm 1300lm 830 HV ADV5	830/359	1,195 lm	1,166 lm	300 mA	21.1 V	22.8 V	6.7 W	179 lm/W	177 lm/W	> 80
LLE 24x560mm 1300lm 835 HV ADV5	835/359	1,231 lm	1,201 lm	300 mA	21.1 V	22.8 V	6.7 W	185 lm/W	181 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5	840/359	1,246 lm	1,217 lm	300 mA	21.1 V	22.8 V	6.7 W	187 lm/W	183 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5 BT	840/359	1,246 lm	1,217 lm	300 mA	21.1 V	22.8 V	6.7 W	187 lm/W	183 lm/W	> 80
LLE 24x560mm 1300lm 850 HV ADV5	850/359	1,254 lm	1,226 lm	300 mA	21.1 V	22.8 V	6.7 W	188 lm/W	185 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5	865/359	1,254 lm	1,215 lm	300 mA	21.1 V	22.8 V	6.7 W	188 lm/W	184 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5 BT	865/359	1,254 lm	1,215 lm	300 mA	21.1 V	22.8 V	6.7 W	188 lm/W	184 lm/W	> 80

^① Integral measurement over the complete module.[®] If mounted with M4 screws and plastic washers.[®] HE ... high efficiency, NM ... nominal mode, HO ... high output.[®] Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.[®] Tolerance of expected light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %. Based on calculation.[®] Tolerance of power consumption Pon ± 10 %. Measurement uncertainty ± 5 %.

Specific technical data

Type®	Photo-metric code	Useful luminous flux at tp = 25 °C®	Expected luminous flux at tp rated®	Typ. forward current	Min. forward voltage at tp rated	Max. forward voltage at tp = 25 °C	Power consumption Pon at tp = 25 °C®	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
Operating mode HO at 350 mA										
LLE 24x70mm 160lm 830 HV ADV5 QTY4	830/359	–	167 lm	350 mA	2.7 V	2.9 V	–	–	172 lm/W	> 80
LLE 24x70mm 160lm 840 HV ADV5 QTY4	840/359	–	176 lm	350 mA	2.7 V	2.9 V	–	–	181 lm/W	> 80
LLE 24x140mm 325lm 827 HV ADV5	827/359	–	324 lm	350 mA	5.3 V	5.8 V	–	–	169 lm/W	> 80
LLE 24x140mm 325lm 830 HV ADV5	830/359	–	342 lm	350 mA	5.3 V	5.8 V	–	–	173 lm/W	> 80
LLE 24x140mm 325lm 835 HV ADV5	835/359	–	350 lm	350 mA	5.3 V	5.8 V	–	–	180 lm/W	> 80
LLE 24x140mm 325lm 840 HV ADV5	840/359	–	347 lm	350 mA	5.3 V	5.8 V	–	–	182 lm/W	> 80
LLE 24x140mm 325lm 865 HV ADV5	865/359	–	350 lm	350 mA	5.3 V	5.8 V	–	–	183 lm/W	> 80
LLE 24x280mm 650lm 827 HV ADV5	827/359	–	653 lm	350 mA	10.6 V	11.5 V	–	–	169 lm/W	> 80
LLE 24x280mm 650lm 830 HV ADV5	830/359	–	672 lm	350 mA	10.6 V	11.5 V	–	–	175 lm/W	> 80
LLE 24x280mm 650lm 835 HV ADV5	835/359	–	698 lm	350 mA	10.6 V	11.5 V	–	–	179 lm/W	> 80
LLE 24x280mm 650lm 840 HV ADV5	840/359	–	705 lm	350 mA	10.6 V	11.5 V	–	–	181 lm/W	> 80
LLE 24x280mm 650lm 850 HV ADV5	850/359	–	698 lm	350 mA	10.6 V	11.5 V	–	–	179 lm/W	> 80
LLE 24x280mm 650lm 865 HV ADV5	865/359	–	705 lm	350 mA	10.6 V	11.5 V	–	–	181 lm/W	> 80
LLE 24x560mm 1300lm 827 HV ADV5	827/359	–	1,293 lm	350 mA	21.3 V	23.0 V	–	–	166 lm/W	> 80
LLE 24x560mm 1300lm 830 HV ADV5	830/359	–	1,341 lm	350 mA	21.3 V	23.0 V	–	–	173 lm/W	> 80
LLE 24x560mm 1300lm 835 HV ADV5	835/359	–	1,390 lm	350 mA	21.3 V	23.0 V	–	–	178 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5	840/359	–	1,401 lm	350 mA	21.3 V	23.0 V	–	–	180 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5 BT	840/359	–	1,401 lm	350 mA	21.3 V	23.0 V	–	–	180 lm/W	> 80
LLE 24x560mm 1300lm 850 HV ADV5	850/359	–	1,396 lm	350 mA	21.3 V	23.0 V	–	–	179 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5	865/359	–	1,399 lm	350 mA	21.3 V	23.0 V	–	–	181 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5 BT	865/359	–	1,399 lm	350 mA	21.3 V	23.0 V	–	–	181 lm/W	> 80
Operating mode HO at 400 mA										
LLE 24x70mm 160lm 830 HV ADV5 QTY4	830/359	–	186 lm	400 mA	2.7 V	2.9 V	–	–	172 lm/W	> 80
LLE 24x70mm 160lm 840 HV ADV5 QTY4	840/359	–	200 lm	400 mA	2.7 V	2.9 V	–	–	180 lm/W	> 80
LLE 24x140mm 325lm 827 HV ADV5	827/359	–	374 lm	400 mA	5.4 V	5.8 V	–	–	169 lm/W	> 80
LLE 24x140mm 325lm 830 HV ADV5	830/359	–	391 lm	400 mA	5.4 V	5.8 V	–	–	173 lm/W	> 80
LLE 24x140mm 325lm 835 HV ADV5	835/359	–	400 lm	400 mA	5.4 V	5.8 V	–	–	179 lm/W	> 80
LLE 24x140mm 325lm 840 HV ADV5	840/359	–	400 lm	400 mA	5.4 V	5.8 V	–	–	181 lm/W	> 80
LLE 24x140mm 325lm 865 HV ADV5	865/359	–	404 lm	400 mA	5.4 V	5.8 V	–	–	182 lm/W	> 80
LLE 24x280mm 650lm 827 HV ADV5	827/359	–	752 lm	400 mA	10.7 V	11.6 V	–	–	169 lm/W	> 80
LLE 24x280mm 650lm 830 HV ADV5	830/359	–	769 lm	400 mA	10.7 V	11.6 V	–	–	175 lm/W	> 80
LLE 24x280mm 650lm 835 HV ADV5	835/359	–	802 lm	400 mA	10.7 V	11.6 V	–	–	178 lm/W	> 80
LLE 24x280mm 650lm 840 HV ADV5	840/359	–	812 lm	400 mA	10.7 V	11.6 V	–	–	181 lm/W	> 80
LLE 24x280mm 650lm 850 HV ADV5	850/359	–	798 lm	400 mA	10.7 V	11.6 V	–	–	178 lm/W	> 80
LLE 24x280mm 650lm 865 HV ADV5	865/359	–	812 lm	400 mA	10.7 V	11.6 V	–	–	180 lm/W	> 80
LLE 24x560mm 1300lm 827 HV ADV5	827/359	–	1,489 lm	400 mA	21.5 V	23.2 V	–	–	166 lm/W	> 80
LLE 24x560mm 1300lm 830 HV ADV5	830/359	–	1,545 lm	400 mA	21.5 V	23.2 V	–	–	173 lm/W	> 80
LLE 24x560mm 1300lm 835 HV ADV5	835/359	–	1,598 lm	400 mA	21.5 V	23.2 V	–	–	177 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5	840/359	–	1,613 lm	400 mA	21.5 V	23.2 V	–	–	179 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5 BT	840/359	–	1,613 lm	400 mA	21.5 V	23.2 V	–	–	179 lm/W	> 80
LLE 24x560mm 1300lm 850 HV ADV5	850/359	–	1,596 lm	400 mA	21.5 V	23.2 V	–	–	178 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5	865/359	–	1,611 lm	400 mA	21.5 V	23.2 V	–	–	180 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5 BT	865/359	–	1,611 lm	400 mA	21.5 V	23.2 V	–	–	180 lm/W	> 80

① Integral measurement over the complete module.

② If mounted with M4 screws and plastic washers.

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

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

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

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

Specific technical data

Type [®]	Photo-metric code	Useful luminous flux at tp = 25 °C [®]	Expected luminous flux at tp rated [®]	Typ. forward current	Min. forward voltage at tp rated	Max. forward voltage at tp = 25 °C	Power consumption Pon at tp = 25 °C [®]	Efficacy of the module at tp = 25 °C	Expected efficacy of the module at tp rated	Colour rendering index CRI
Operating mode HO at 500 mA										
LLE 24x70mm 160lm 830 HV ADV5 QTY4	830/359	–	229 lm	500 mA	2.7 V	2.9 V	–	–	164 lm/W	> 80
LLE 24x70mm 160lm 840 HV ADV5 QTY4	840/359	–	249 lm	500 mA	2.7 V	2.9 V	–	–	172 lm/W	> 80
LLE 24x140mm 325lm 827 HV ADV5	827/359	–	458 lm	500 mA	5.5 V	5.9 V	–	–	163 lm/W	> 80
LLE 24x140mm 325lm 830 HV ADV5	830/359	–	469 lm	500 mA	5.5 V	5.9 V	–	–	165 lm/W	> 80
LLE 24x140mm 325lm 835 HV ADV5	835/359	–	490 lm	500 mA	5.5 V	5.9 V	–	–	171 lm/W	> 80
LLE 24x140mm 325lm 840 HV ADV5	840/359	–	486 lm	500 mA	5.5 V	5.9 V	–	–	173 lm/W	> 80
LLE 24x140mm 325lm 865 HV ADV5	865/359	–	496 lm	500 mA	5.5 V	5.9 V	–	–	175 lm/W	> 80
LLE 24x280mm 650lm 827 HV ADV5	827/359	–	911 lm	500 mA	10.9 V	11.8 V	–	–	161 lm/W	> 80
LLE 24x280mm 650lm 830 HV ADV5	830/359	–	940 lm	500 mA	10.9 V	11.8 V	–	–	167 lm/W	> 80
LLE 24x280mm 650lm 835 HV ADV5	835/359	–	972 lm	500 mA	10.9 V	11.8 V	–	–	170 lm/W	> 80
LLE 24x280mm 650lm 840 HV ADV5	840/359	–	982 lm	500 mA	10.9 V	11.8 V	–	–	173 lm/W	> 80
LLE 24x280mm 650lm 850 HV ADV5	850/359	–	988 lm	500 mA	10.9 V	11.8 V	–	–	173 lm/W	> 80
LLE 24x280mm 650lm 865 HV ADV5	865/359	–	992 lm	500 mA	10.9 V	11.8 V	–	–	173 lm/W	> 80
LLE 24x560mm 1300lm 827 HV ADV5	827/359	–	1,802 lm	500 mA	21.8 V	23.5 V	–	–	158 lm/W	> 80
LLE 24x560mm 1300lm 830 HV ADV5	830/359	–	1,875 lm	500 mA	21.8 V	23.5 V	–	–	165 lm/W	> 80
LLE 24x560mm 1300lm 835 HV ADV5	835/359	–	1,936 lm	500 mA	21.8 V	23.5 V	–	–	169 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5	840/359	–	1,961 lm	500 mA	21.8 V	23.5 V	–	–	172 lm/W	> 80
LLE 24x560mm 1300lm 840 HV ADV5 BT	840/359	–	1,961 lm	500 mA	21.8 V	23.5 V	–	–	172 lm/W	> 80
LLE 24x560mm 1300lm 850 HV ADV5	850/359	–	1,976 lm	500 mA	21.8 V	23.5 V	–	–	173 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5	865/359	–	1,958 lm	500 mA	21.8 V	23.5 V	–	–	173 lm/W	> 80
LLE 24x560mm 1300lm 865 HV ADV5 BT	865/359	–	1,958 lm	500 mA	21.8 V	23.5 V	–	–	173 lm/W	> 80

[®] Integral measurement over the complete module.

[®] If mounted with M4 screws and plastic washers.

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

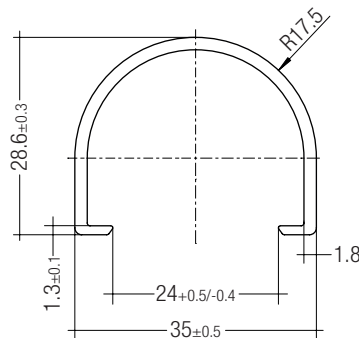
[®] Tolerance of useful light flux - 0 % / + 15 %. Measurement uncertainty ± 10 %.

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

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

Product description

- LINEAR COVER for LLE 24
- Protection against direct touch for non-SELV applications
(recommendation: use all fixing points)
- Fast snap on mounting on to LLE 24 with clips or plastic washers
- High transmission: transparent 94 %, semi-transparent 87 %, diffuse 76 %
- Made of PMMA
- Tolerances: ± 1 mm for 597 mm length (ends finished),
+ 10 mm for 1,200 / 1,500 / 1,600 / 1,800 mm length (ends raw)



Ordering data

Type	Article number	Colour	Length	Packaging carton	Weight per pc.
LINEAR COVER SY Transparent 1600mm	28000338	Transparent	1,600 mm	12 pc(s).	0.272 kg
LINEAR COVER SY Frosted 1800mm	28000437	Semi-transparent	1,800 mm	12 pc(s).	0.308 kg
LINEAR COVER SY Frosted 1600mm	28000339	Semi-transparent	1,600 mm	12 pc(s).	0.272 kg
LINEAR COVER SY Frosted 1500mm	28000435	Semi-transparent	1,500 mm	12 pc(s).	0.244 kg
LINEAR COVER SY Frosted 1200mm	28000422	Semi-transparent	1,200 mm	12 pc(s).	0.205 kg
LINEAR COVER SY Frosted 597mm	28000340	Semi-transparent	597 mm	12 pc(s).	0.102 kg
LINEAR COVER SY Diffuse 1800mm	28000438	Diffuse	1,800 mm	12 pc(s).	0.308 kg
LINEAR COVER SY Diffuse 1600mm	28000341	Diffuse	1,600 mm	12 pc(s).	0.272 kg
LINEAR COVER SY Diffuse 1500mm	28000436	Diffuse	1,500 mm	12 pc(s).	0.257 kg
LINEAR COVER SY Diffuse 1200mm	28000434	Diffuse	1,200 mm	12 pc(s).	0.205 kg
LINEAR COVER SY Diffuse 597mm	28000342	Diffuse	597 mm	12 pc(s).	0.102 kg

Product description

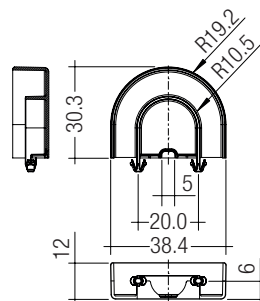
- ENDCAP for LLE 24
- PUSH-FIX: Fast snap on mounting (sheet thickness 0.5 – 1.0 mm), for drilling hole 4 mm
- SCREW-FIX: Screw mounting with EJOT Delta PT WN 5451 30x8 (not included), tightening torque 0.7 Nm
- Made of Polycarbonat



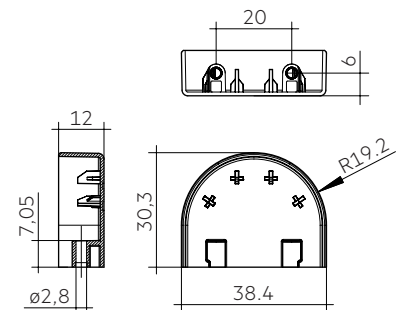
ACL ENDCAP LLE24 PUSH-FIX



ACL ENDCAP LLE24 SCREW-FIX



ACL ENDCAP LLE24 PUSH-FIX



ACL ENDCAP LLE24 SCREW-FIX

Ordering data

Type	Article number	Colour	Packaging carton	Weight per pc.
ACL ENDCAP LLE24 PUSH-FIX	28001037	White	480 pc(s).	0.003 kg
ACL ENDCAP LLE24 SCREW-FIX	28002315	White	480 pc(s).	0.003 kg

Product description LINEAR LENS

- Linear lens for LLE 24
- Available with different beam characteristics
- Protection against direct touch for non-SELV applications (recommendation: use all fixing points)
- Fast snap on mounting on to LLE 24 with clips or plastic washers
- Linear lense made of PMMA
- Available lengths: 1,200, 1,500, 1,600 and 1,800 mm, Tolerance: + 10 mm (ends raw)
- Max. permissible temperature 80 °C
- Photometric data available on website

Product description Endcap

- ENDCAP for LINEAR LENS 24mm INTENSE, ASY and DASY
- Mounting by clipping in and screwing from below using screw EJOT Delta PT WN 5451 20x4, tightening torque 0.7 Nm
- Made of Polyamide UL94 V0



ACL LINEAR LENS 24mm 60°



ACL LINEAR LENS 24mm 90°



ACL LINEAR LENS 24mm INTENSE



ACL LINEAR LENS 24mm BATWING



ACL LINEAR LENS 24mm ASY

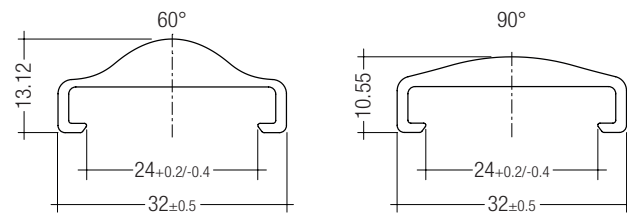


ACL LINEAR LENS 24mm DASY

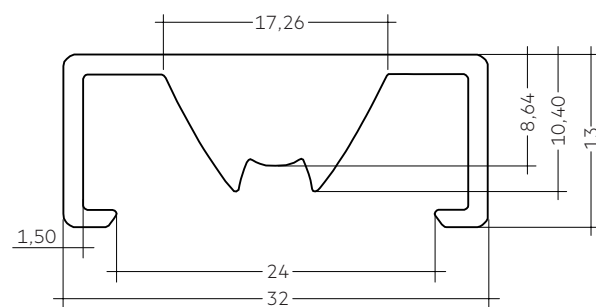


ACL Endcap LENS 24mm PSF

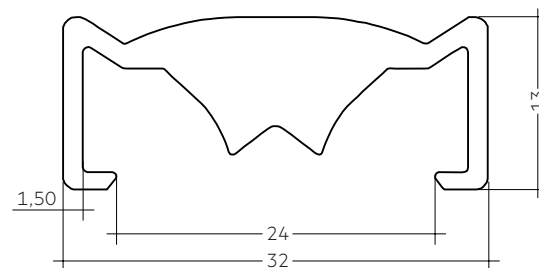
ACL LENS 24mm



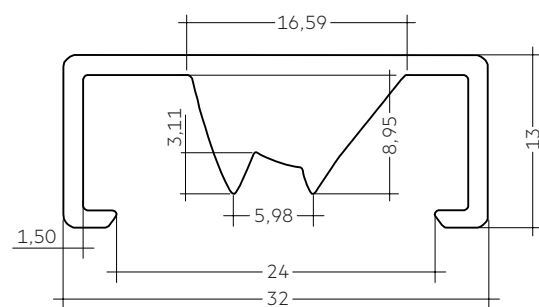
ACL LINEAR LENS 24mm 60° and 90°



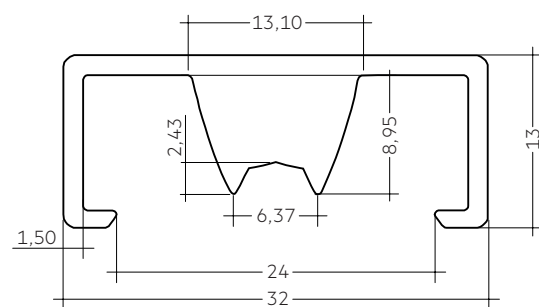
ACL LINEAR LENS 24mm INTENSE



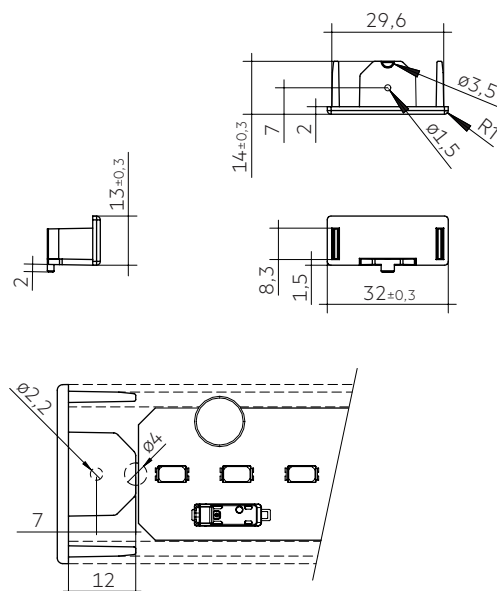
ACL LINEAR LENS 24mm BATWING



ACL LINEAR LENS 24mm ASY



ACL LINEAR LENS 24mm DASY



ACL Endcap LENS 24mm PSF

Ordering data

Type	Article number	Beam characteristic	Efficiency	Packaging carton	Weight per pc.
ACL LINEAR LENS 24x1200mm 60°	28001428	60°	97 %	21 pc(s).	0.196 kg
ACL LINEAR LENS 24x1200mm 90°	28001429	90°	97 %	21 pc(s).	0.165 kg
ACL LINEAR LENS 24x1500mm 60°	28000953	60°	97 %	21 pc(s).	0.261 kg
ACL LINEAR LENS 24x1500mm 90°	28000955	90°	97 %	21 pc(s).	0.221 kg
ACL LINEAR LENS 24x1200mm INTENSE	28002024	40°	95 %	18 pc(s).	0.261 kg
ACL LINEAR LENS 24x1500mm INTENSE	28002025	40°	95 %	18 pc(s).	0.326 kg
ACL LINEAR LENS 24x1800mm INTENSE	28002026	40°	95 %	18 pc(s).	0.392 kg
ACL LINEAR LENS 24x1200mm BATWING	28002027	batwing	95 %	18 pc(s).	0.275 kg
ACL LINEAR LENS 24x1500mm BATWING	28002028	batwing	95 %	18 pc(s).	0.344 kg
ACL LINEAR LENS 24x1800mm BATWING	28002029	batwing	95 %	18 pc(s).	0.412 kg
ACL LINEAR LENS 24x1200mm ASY	28002030	asymmetric	95 %	18 pc(s).	0.250 kg
ACL LINEAR LENS 24x1500mm ASY	28002031	asymmetric	95 %	18 pc(s).	0.312 kg
ACL LINEAR LENS 24x1800mm ASY	28002032	asymmetric	95 %	18 pc(s).	0.375 kg
ACL LINEAR LENS 24x1200mm DASY	28002033	double asymmetric	92 %	18 pc(s).	0.249 kg
ACL LINEAR LENS 24x1500mm DASY	28002034	double asymmetric	92 %	18 pc(s).	0.311 kg
ACL LINEAR LENS 24x1800mm DASY	28002035	double asymmetric	92 %	18 pc(s).	0.373 kg
ACL Endcap LENS 24mm PSF	28002669	–	–	3,600 pc(s).	0.003 kg

**ACCES-
SORIES**

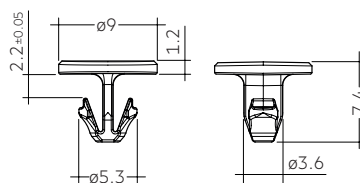
CLIP 4.3mm

Product description

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



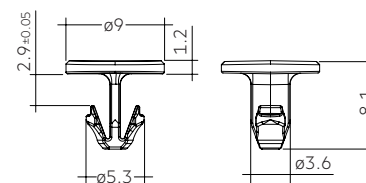
ACL CLIP 4.3mm PUSH-FIX



ACL CLIP 4.3mm PUSH-FIX



ACL CLIP 4.3mm PUSH-FIX Long



ACL CLIP 4.3mm PUSH-FIX Long

Ordering data

Type	Article number	Colour	Packaging bag ^①	Weight per pc.
ACL CLIP 4.3mm PUSH-FIX	28001036	White	500 pc(s).	0.001 kg
ACL CLIP 4.3mm PUSH-FIX Long	28002314	Transparent	500 pc(s).	0.001 kg

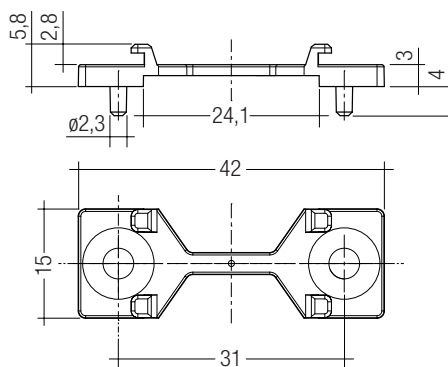
^① Minimum sales quantity 500 pcs.

**ACCES-
SORIES**

BRIDGE LLE24/40

Product description

- Enables the fixation of 24 mm wide Tridonic LED modules to fixtures made for 40 mm wide modules
- Ideal for extruded aluminium gear trays made for 40 mm modules with pre-alignment knobs
- Clip-on for LINEAR COVER and LINEAR LENS[®]
- For LLE 24 with 280 mm module minimum 2 bridges required
- For LLE 24 with 560 mm module minimum 3 bridges required
- Fixation via M3 or M4 countersunk screw, max. tightening torque 0.5 Nm
- BRIDGE made of white polycarbonate



Ordering data

Type	Article number	Colour	Packaging carton ^①	Weight per pc.
ACL BRIDGE LLE24/40 SCREW-FIX	28001205	White	600 Stk.	0.001 kg

^① Minimum sales quantity 600 pcs.

[®] Beam characteristics will change due to the elevated fixation (see photometric files for details).

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

1 st digit	2 nd + 3 rd digit	4 th digit	5 th digit	6 th digit
Code	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)
7	70 – 79			Code
8	80 – 89			Luminous flux
9	≥90			7
				8
				9

1.2 Energy classification

Type	Colour temperature	Forward current	Energy classification	Energy consumption
LLE 24x70mm 160lm 830 HV ADV5 QTY4	3,000 K	300 mA	C	1 kWh / 1,000 h
LLE 24x70mm 160lm 840 HV ADV5 QTY4	4,000 K	300 mA	C	1 kWh / 1,000 h
LLE 24x140mm 325lm 827 HV ADV5	2,700 K	300 mA	C	2 kWh / 1,000 h
LLE 24x140mm 325lm 830 HV ADV5	3,000 K	300 mA	C	2 kWh / 1,000 h
LLE 24x140mm 325lm 835 HV ADV5	3,500 K	300 mA	C	2 kWh / 1,000 h
LLE 24x140mm 325lm 840 HV ADV5	4,000 K	300 mA	C	2 kWh / 1,000 h
LLE 24x140mm 325lm 865 HV ADV5	6,500 K	300 mA	C	2 kWh / 1,000 h
LLE 24x280mm 650lm 827 HV ADV5	2,700 K	300 mA	C	4 kWh / 1,000 h
LLE 24x280mm 650lm 830 HV ADV5	3,000 K	300 mA	C	4 kWh / 1,000 h
LLE 24x280mm 650lm 835 HV ADV5	3,500 K	300 mA	C	4 kWh / 1,000 h
LLE 24x280mm 650lm 840 HV ADV5	4,000 K	300 mA	C	4 kWh / 1,000 h
LLE 24x280mm 650lm 850 HV ADV5	5,000 K	300 mA	C	4 kWh / 1,000 h
LLE 24x280mm 650lm 865 HV ADV5	6,500 K	300 mA	C	4 kWh / 1,000 h
LLE 24x560mm 1300lm 827 HV ADV5	2,700 K	300 mA	D	7 kWh / 1,000 h
LLE 24x560mm 1300lm 830 HV ADV5	3,000 K	300 mA	C	7 kWh / 1,000 h
LLE 24x560mm 1300lm 835 HV ADV5	3,500 K	300 mA	C	7 kWh / 1,000 h
LLE 24x560mm 1300lm 840 HV ADV5	4,000 K	300 mA	C	7 kWh / 1,000 h
LLE 24x560mm 1300lm 850 HV ADV5	5,000 K	300 mA	C	7 kWh / 1,000 h
LLE 24x560mm 1300lm 865 HV ADV5	6,500 K	300 mA	C	7 kWh / 1,000 h
Backside terminals				
LLE 24x560mm 1300lm 840 HV ADV5 BT	4,000 K	300 mA	C	7 kWh / 1,000 h
LLE 24x560mm 1300lm 865 HV ADV5 BT	6,500 K	300 mA	C	7 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 ... +80 °C
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Operation only in non condensing environment.

Humidity during processing of the module should be between 30 to 70 %.

2.3 Heat sink values

LLE 24x70mm 160lm ADV5

ta	tp	Forward current	R _{th, hs-a}	Cooling area
25 °C	50 °C	300 mA		self cooling
25 °C	50 °C	500 mA	34.38 K/W	19 cm ²
35 °C	50 °C	300 mA	38.11 K/W	17 cm ²
35 °C	50 °C	500 mA	20.62 K/W	32 cm ²
40 °C	50 °C	300 mA	25.40 K/W	26 cm ²
40 °C	50 °C	500 mA	13.73 K/W	49 cm ²
45 °C	50 °C	300 mA	12.69 K/W	53 cm ²
45 °C	50 °C	500 mA	6.85 K/W	97 cm ²

LLE 24x140mm 325lm ADV5

ta	tp	Forward current	R _{th, hs-a}	Cooling area
25 °C	50 °C	300 mA		self cooling
25 °C	50 °C	500 mA	17.23 K/W	39 cm ²
35 °C	50 °C	300 mA	19.05 K/W	35 cm ²
35 °C	50 °C	500 mA	10.33 K/W	65 cm ²
40 °C	50 °C	300 mA	12.70 K/W	52 cm ²
40 °C	50 °C	500 mA	6.88 K/W	97 cm ²
45 °C	50 °C	300 mA	6.34 K/W	105 cm ²
45 °C	50 °C	500 mA	3.43 K/W	194 cm ²

LLE 24x280mm 650lm ADV5

ta	tp	Forward current	R _{th, hs-a}	Cooling area
25 °C	50 °C	300 mA		self cooling
25 °C	50 °C	500 mA	8.61 K/W	77 cm ²
35 °C	50 °C	300 mA	9.50 K/W	70 cm ²
35 °C	50 °C	500 mA	5.17 K/W	129 cm ²
40 °C	50 °C	300 mA	6.33 K/W	105 cm ²
40 °C	50 °C	500 mA	3.44 K/W	194 cm ²
45 °C	50 °C	300 mA	3.16 K/W	211 cm ²
45 °C	50 °C	500 mA	1.72 K/W	388 cm ²

LLE 24x560mm 1300lm ADV5

ta	tp	Forward current	R _{th, hs-a}	Cooling area
25 °C	50 °C	300 mA		self cooling
25 °C	50 °C	500 mA	4.31 K/W	155 cm ²
35 °C	50 °C	300 mA	4.75 K/W	140 cm ²
35 °C	50 °C	500 mA	2.58 K/W	258 cm ²
40 °C	50 °C	300 mA	3.16 K/W	211 cm ²
40 °C	50 °C	500 mA	1.72 K/W	387 cm ²
45 °C	50 °C	300 mA	1.58 K/W	422 cm ²
45 °C	50 °C	500 mA	0.86 K/W	776 cm ²

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.

Max. 8 pieces 280 mm modules or 4 pieces 560 mm modules may be connected in parallel.

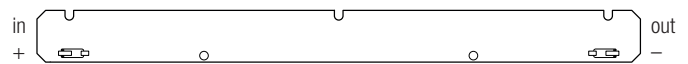
LLE can be operated either from SELV LED drivers or from LED drivers with LV output voltage.



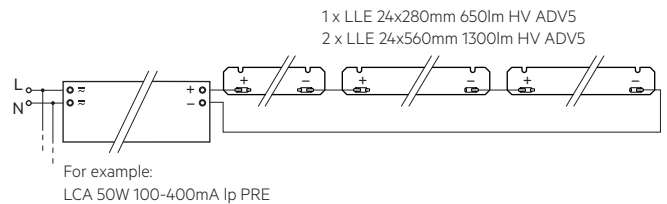
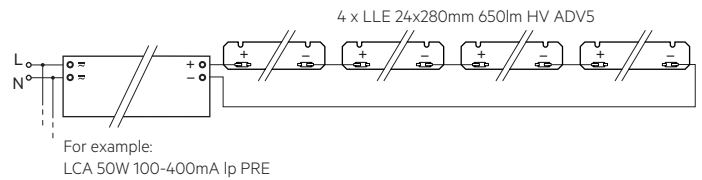
LLE are basic insulated up to 440 V (if mounted with M4 screws with head diameter 7 mm in combination with plastic washers) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED driver (also against earth) is above 440 V, an additional 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.

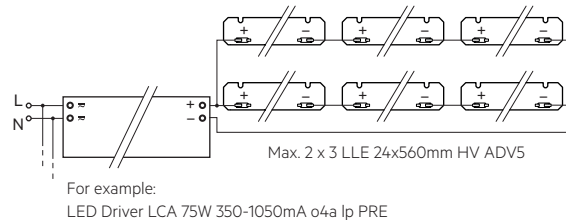
3.2 Wiring



Wiring examples for serial wiring

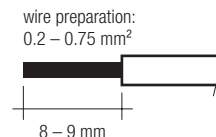


Wiring examples for parallel wiring



3.3 Wiring type and cross section

For wiring use 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 (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



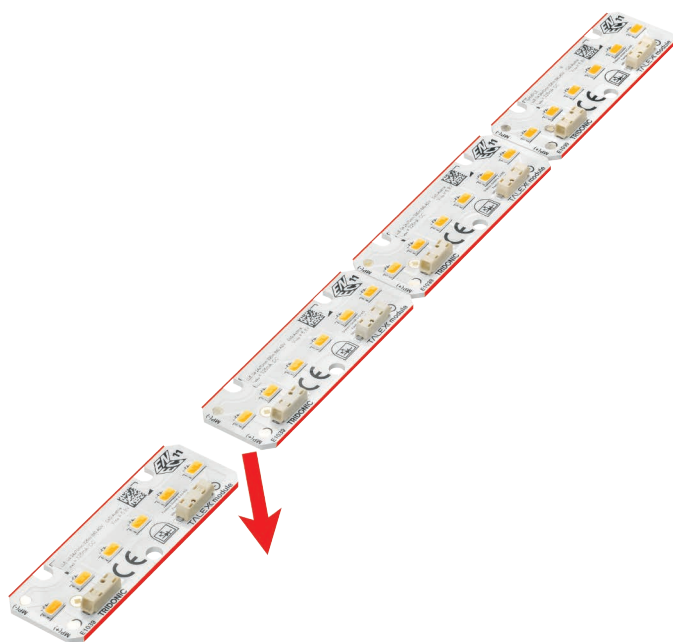
None of the components of the LLE (substrate, LED, electronic components etc.) may be exposed to tensile or compressive stresses.

Max. torque for fixing: 0.5 Nm.

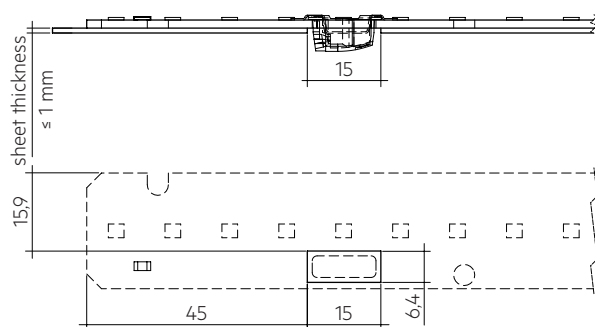
The LED modules are mounted onto a heat sink with min. 3 screws per module or ACL CLIP 4.3mm.

The LLE 24x70mm module is delivered as a board of 280mm (4 pcs.) and must be separated.

Only touch the module at the edge to separate the modules (see marking below).



Cut out on gear tray for backside terminal:



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 24mm HV ADV5

Forward current	tp tempera- ture	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

Forward current	tp tempera- ture	L90 / F10	L90 / F50	L80 / F10	L80 / F50	L70 / F10	L70 / F50
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

I_{rated} ... Nominal operating current the module is designed for.

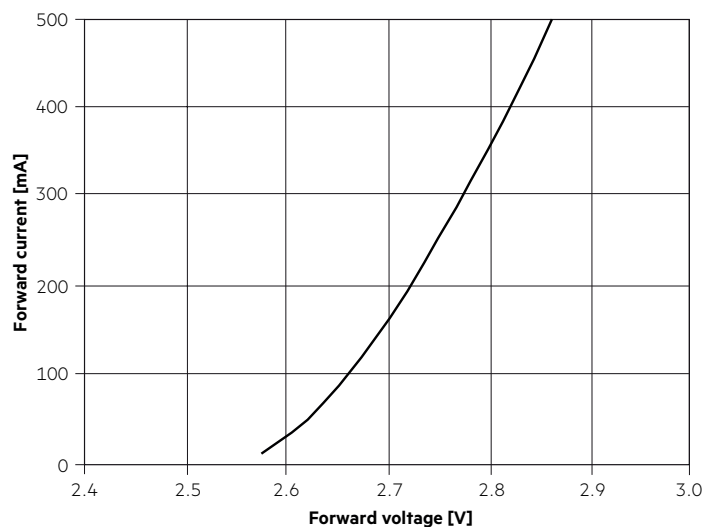
I_{max} ... Max. permissible continuous operating current incl. The tolerances of the LED driver.

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

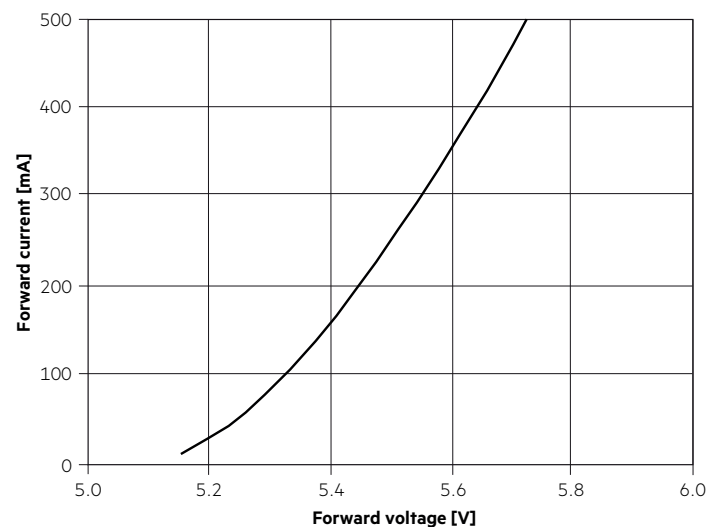
Max. permissible peak current ... The max. output peak current of the LED driver must not exceed this value.

5.2 Typ. forward voltage vs. forward current

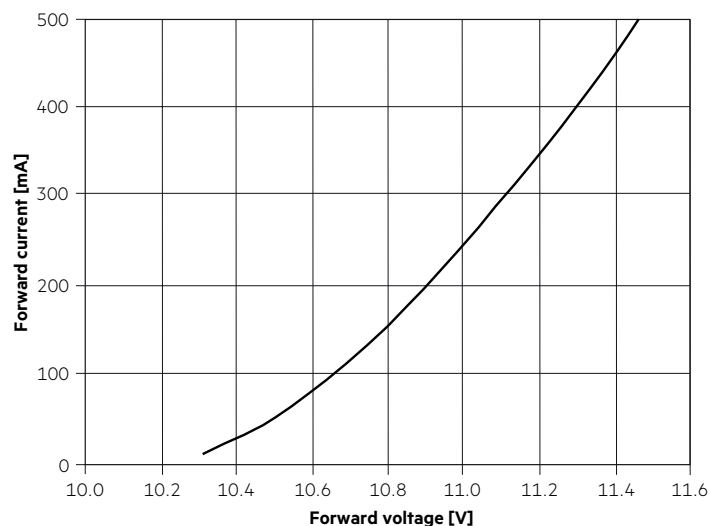
LLE 24x70mm 160lm 8xx HV ADV5



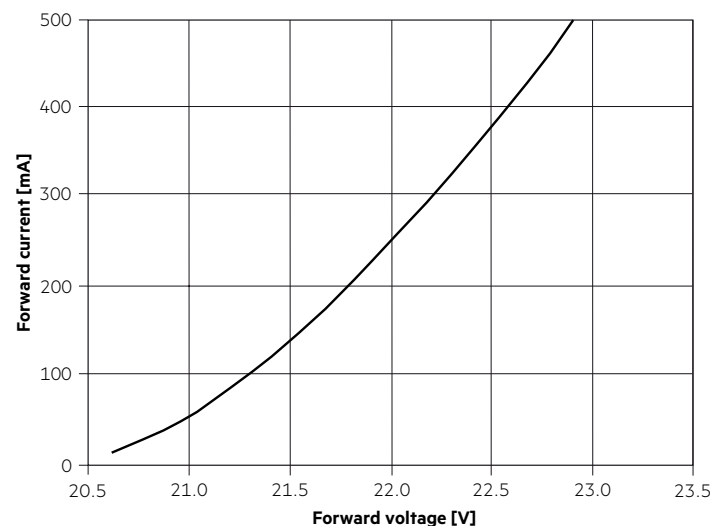
LLE 24x140mm 325lm 8xx HV ADV5



LLE 24x280mm 650lm 8xx HV ADV5

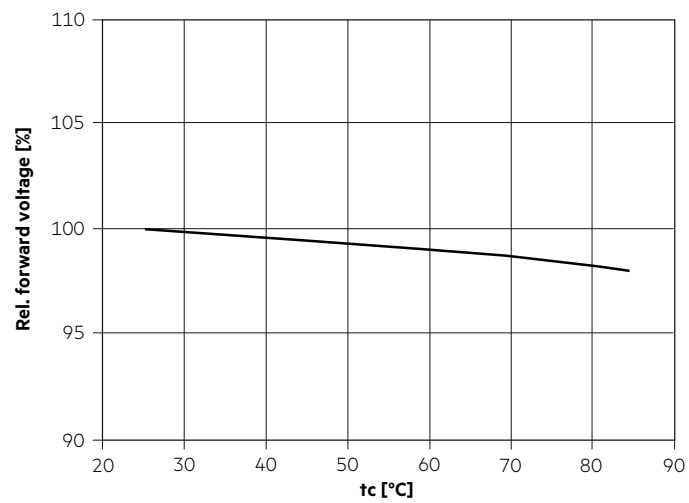


LLE 24x560mm 1300lm 8xx HV ADV5



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

5.3 Forward voltage vs. t_c 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

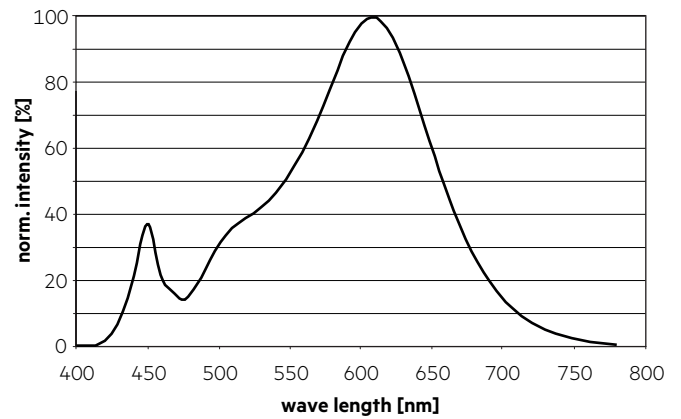
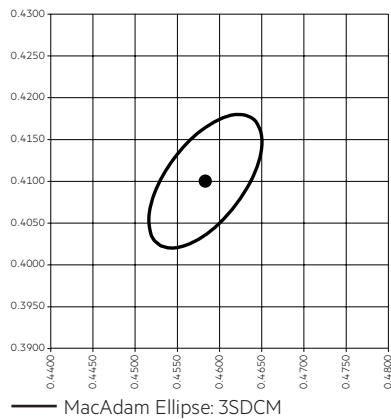
The specified colour coordinates are integral measured by current impulse of 195 mA and a duration of 100 ms.

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

The measurement tolerance of the colour coordinates are ± 0.01 .

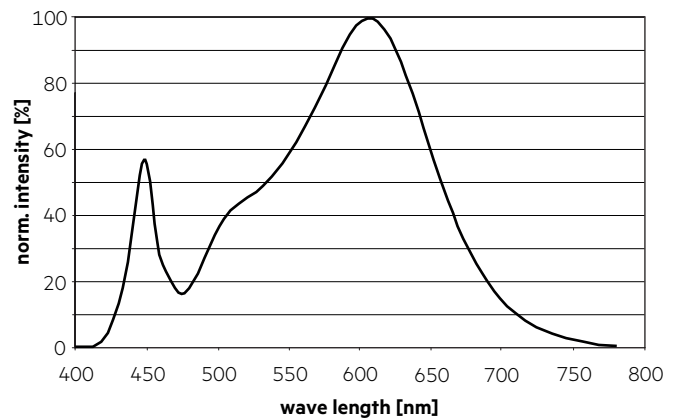
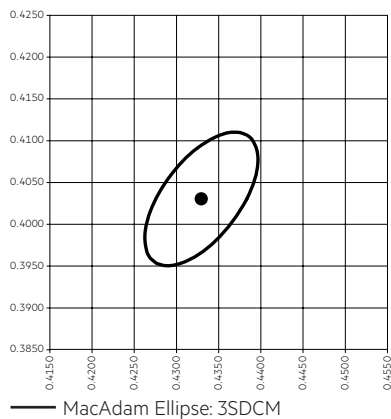
2,700 K

	x0	y0
Centre	0.4578	0.4101



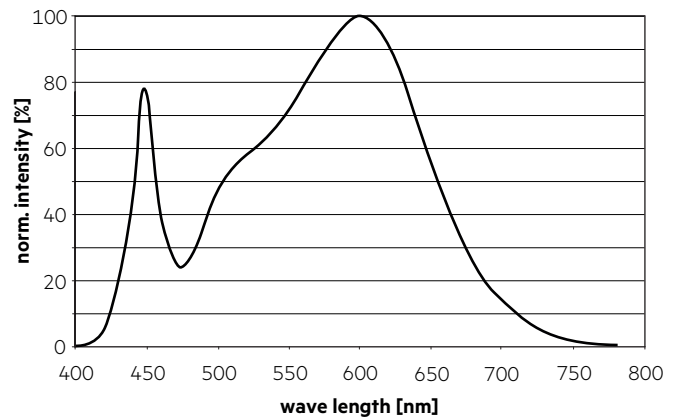
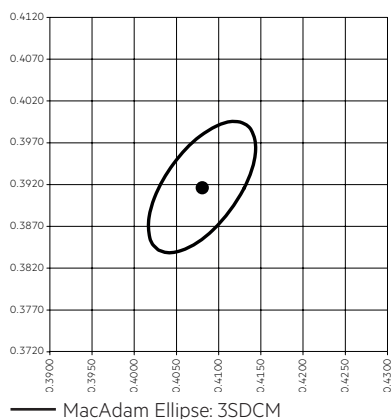
3,000 K

	x0	y0
Centre	0.4338	0.4030



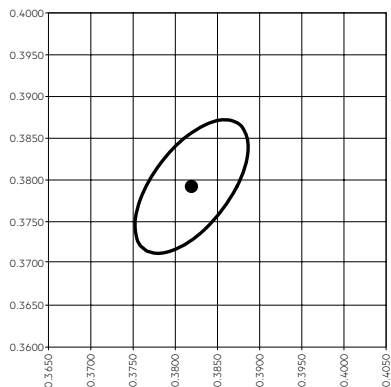
3,500 K

	x0	y0
Centre	0.4073	0.3917

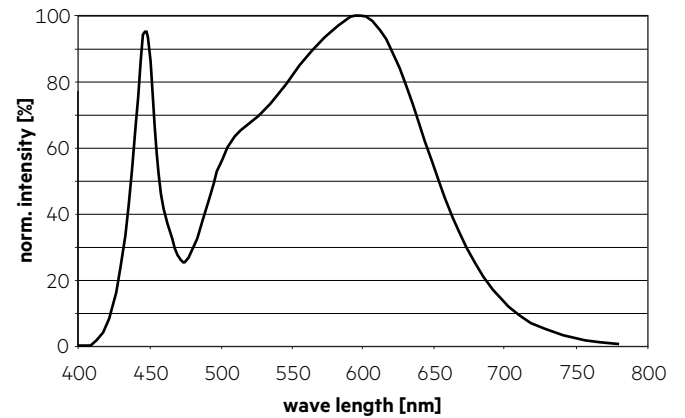


4,000 K

	x0	y0
Center	0.3818	0.3797

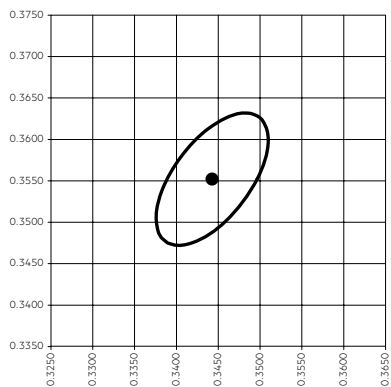


— MacAdam Ellipse: 3SDCM

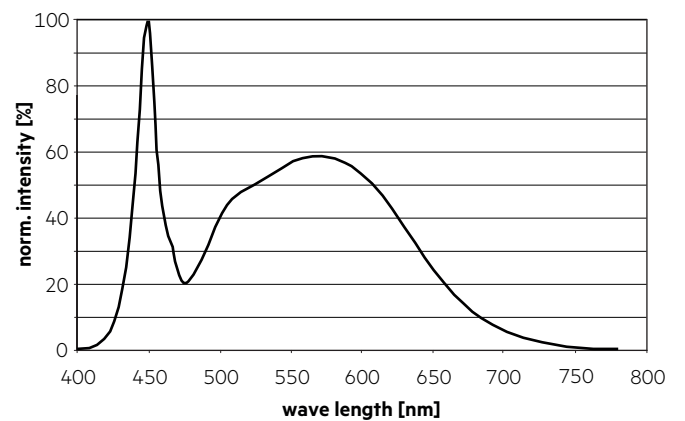


5,000 K

	x0	y0
Center	0.3447	0.3553

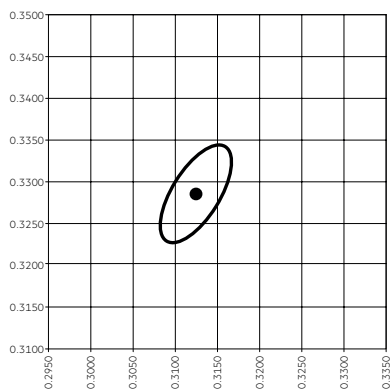


— MacAdam Ellipse: 3SDCM

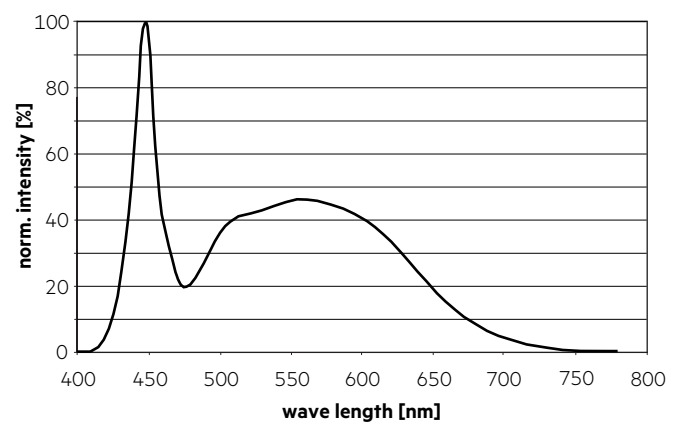


6,500 K

	x0	y0
Center	0.3123	0.3282

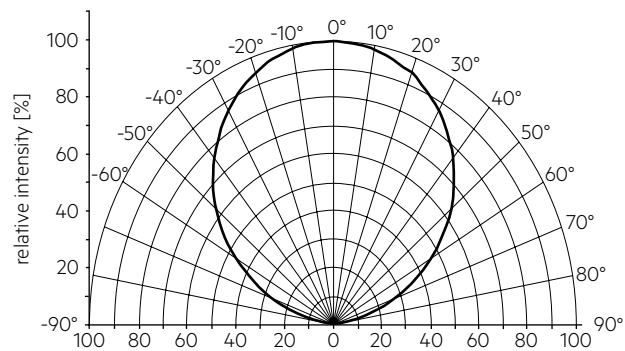


— MacAdam Ellipse: 3SDCM



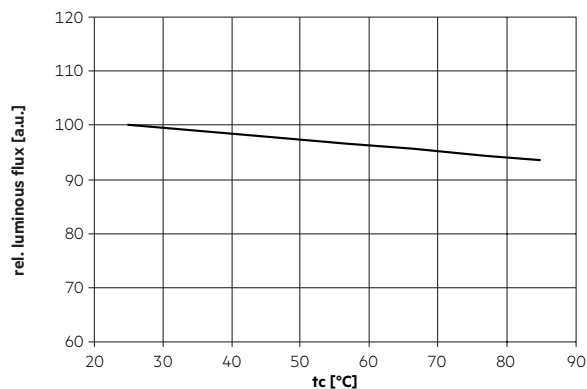
6.2 Light distribution

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

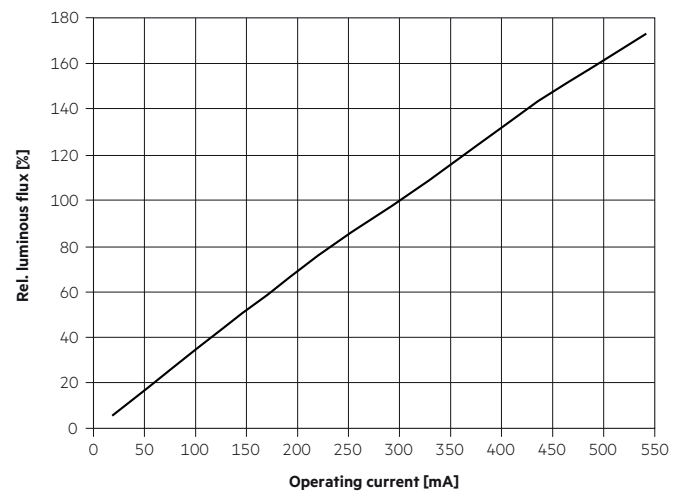


The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 5. To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing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

Guarantee conditions at www.tridonic.com → Services

Lifetime declarations are informative and represent no warranty claim.