Module LLE 24mm 2000lm HV ADV5

Modules LLE advanced

Product description

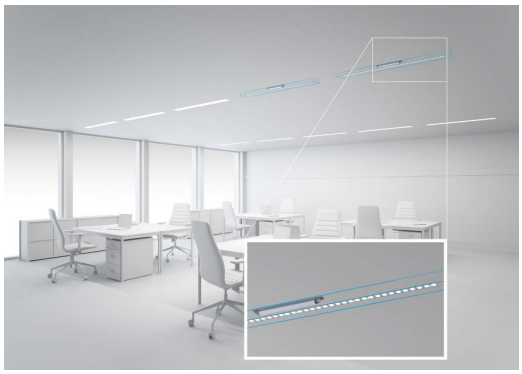
- Ideal for linear and panel lights
- 2 terminals for serial wiring
- Perfectly uniform light, even if several LED modules are used together in a line
- Push terminals for quick and simple wiring of LED module to LED module
- Broad portfolio from extruded lenses and covers available
- Long life-time: 72,000 hours
- 5-year guarantee

LLE 24x280mm 2000lm HV ADV5

LLE 24x560mm 4000lm HV ADV5

Optical properties

- Colour temperatures 3,000 K, 4,000 K, 5,000 K and 6,500 K
- Typ. luminous flux 2,000 and 4,000 lm
- Efficacy of the module up to 207 lm/W
- High colour rendering index CRI > 80
- High colour consistency (MacAdam 3)①
- Small luminous flux tolerances



Mechanical properties

- Module dimension 24 x 280 mm and 24 x 560 mm (ZHAGA compliant)
- Simple installation (e.g. clips or screws)

System solution

- LED system solution with outstanding system efficacy up to 184 lm/W, consisting of linear LED modules and dimmable LED Driver LCA 50W 100–400mA lp PRE

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Standards, page 10

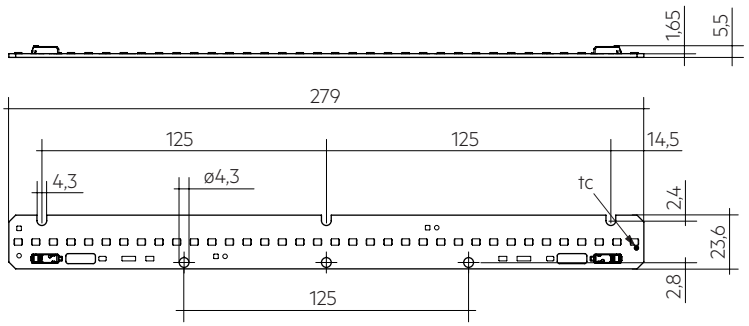
Colour temperatures and tolerances, page 14

Module LLE 24mm 2000lm HV ADV5

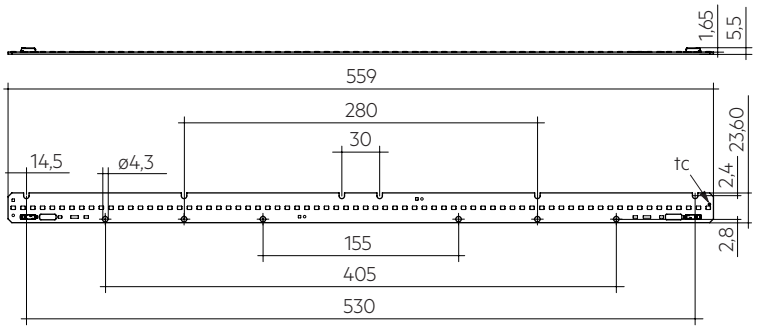
Modules LLE advanced

Technical data

Beam characteristic	120°
Ambient temperature range	-40 … +65 °C
tp rated	65 °C
tc	95 °C
Irated	325 mA
Imax	540 mA
Max. permissible LF current ripple	595 mA
Max. permissible peak current	900 mA / max. 10 ms
Max. working voltage for insulation[2]	320 V
Insulation test voltage	1.64 kV
CTI of the printed circuit board	≥ 600
ESD classification	severity level 4
Risk group (IEC 62471) at ≤ 310 mA	RG0
Risk group (IEC 62471) at Imax	RG1
Classification acc. to IEC 62031	Buil-in
Type of protection	IP00
Life-time	up to 72,000 h
Guarantee	5 years



LLE 24x280mm 2000lm HV ADV5



LLE 24x560mm 4000lm HV ADV5

Ordering data

Type	Article number	Colour temperature	Packaging carton	Weight per pc.
LLE 24x280mm 2000lm 830 HV ADV5	**89603236**	3,000 K	210 pc(s).	0.023 kg
LLE 24x280mm 2000lm 840 HV ADV5	**89603237**	4,000 K	210 pc(s).	0.023 kg
LLE 24x280mm 2000lm 850 HV ADV5	**89603238**	5,000 K	210 pc(s).	0.023 kg
LLE 24x280mm 2000lm 865 HV ADV5	**89603239**	6,500 K	210 pc(s).	0.023 kg
LLE 24x560mm 4000lm 830 HV ADV5	**89603241**	3,000 K	180 pc(s).	0.046 kg
LLE 24x560mm 4000lm 840 HV ADV5	**89603242**	4,000 K	180 pc(s).	0.046 kg
LLE 24x560mm 4000lm 850 HV ADV5	**89603243**	5,000 K	180 pc(s).	0.046 kg
LLE 24x560mm 4000lm 865 HV ADV5	**89603244**	6,500 K	180 pc(s).	0.046 kg

Specific technical data

Type[3]	Photo-metric code	Typ. luminous flux at tp = 25 °C[4] [5]	Typ. luminous flux at tp = 65 °C[4] [5]	Typ. forward current	Min. forward voltage at tp = 65 °C[6]	Max. forward voltage at tp = 25 °C[6]	Typ. power consumption at tp = 65 °C[4]	Efficacy of the module at tp = 25 °C	Efficacy of the module at tp = 65 °C	Efficacy of the system at tp = 65 °C	Colour rendering index CRI
Operating mode HE at 200 mA											
LLE 24x280mm 2000lm 830 HV ADV5	830/359	1,280 lm	1,220 lm	200 mA	30.9 V	33.6 V	6.5 W	196 lm/W	189 lm/W	174 lm/W	> 80
LLE 24x280mm 2000lm 840 HV ADV5	840/359	1,350 lm	1,290 lm	200 mA	30.9 V	33.6 V	6.5 W	206 lm/W	199 lm/W	183 lm/W	> 80
LLE 24x280mm 2000lm 850 HV ADV5	850/359	1,380 lm	1,320 lm	200 mA	30.9 V	33.6 V	6.5 W	211 lm/W	204 lm/W	188 lm/W	> 80
LLE 24x280mm 2000lm 865 HV ADV5	865/359	1,350 lm	1,290 lm	200 mA	30.9 V	33.6 V	6.5 W	207 lm/W	200 lm/W	184 lm/W	> 80
LLE 24x560mm 4000lm 830 HV ADV5	830/359	2,560 lm	2,450 lm	200 mA	61.8 V	67.3 V	12.9 W	196 lm/W	189 lm/W	174 lm/W	> 80
LLE 24x560mm 4000lm 840 HV ADV5	840/359	2,690 lm	2,570 lm	200 mA	61.8 V	67.3 V	12.9 W	206 lm/W	199 lm/W	183 lm/W	> 80
LLE 24x560mm 4000lm 850 HV ADV5	850/359	2,760 lm	2,640 lm	200 mA	61.8 V	67.3 V	12.9 W	211 lm/W	204 lm/W	188 lm/W	> 80
LLE 24x560mm 4000lm 865 HV ADV5	865/359	2,700 lm	2,580 lm	200 mA	61.8 V	67.3 V	12.9 W	207 lm/W	200 lm/W	184 lm/W	> 80
Operating mode HE at 250 mA											
LLE 24x280mm 2000lm 830 HV ADV5	830/359	1,580 lm	1,540 lm	250 mA	31.3 V	34.0 V	8.2 W	191 lm/W	187 lm/W	172 lm/W	> 80
LLE 24x280mm 2000lm 840 HV ADV5	840/359	1,660 lm	1,610 lm	250 mA	31.3 V	34.0 V	8.2 W	201 lm/W	197 lm/W	181 lm/W	> 80
LLE 24x280mm 2000lm 850 HV ADV5	850/359	1,670 lm	1,620 lm	250 mA	31.3 V	34.0 V	8.2 W	203 lm/W	199 lm/W	183 lm/W	> 80
LLE 24x280mm 2000lm 865 HV ADV5	865/359	1,660 lm	1,610 lm	250 mA	31.3 V	34.0 V	8.2 W	201 lm/W	197 lm/W	181 lm/W	> 80
LLE 24x560mm 4000lm 830 HV ADV5	830/359	3,150 lm	3,060 lm	250 mA	62.7 V	67.9 V	16.4 W	191 lm/W	187 lm/W	172 lm/W	> 80
LLE 24x560mm 4000lm 840 HV ADV5	840/359	3,310 lm	3,220 lm	250 mA	62.7 V	67.9 V	16.4 W	201 lm/W	197 lm/W	181 lm/W	> 80
LLE 24x560mm 4000lm 850 HV ADV5	850/359	3,340 lm	3,260 lm	250 mA	62.7 V	67.9 V	16.4 W	203 lm/W	199 lm/W	183 lm/W	> 80
LLE 24x560mm 4000lm 865 HV ADV5	865/359	3,310 lm	3,220 lm	250 mA	62.7 V	67.9 V	16.4 W	201 lm/W	197 lm/W	181 lm/W	> 80
Operating mode HE at 275 mA											
LLE 24x280mm 2000lm 830 HV ADV5	830/359	1,700 lm	1,660 lm	275 mA	31.5 V	34.1 V	9.0 W	187 lm/W	182 lm/W	167 lm/W	> 80
LLE 24x280mm 2000lm 840 HV ADV5	840/359	1,790 lm	1,740 lm	275 mA	31.5 V	34.1 V	9.0 W	197 lm/W	193 lm/W	178 lm/W	> 80
LLE 24x280mm 2000lm 850 HV ADV5	850/359	1,810 lm	1,760 lm	275 mA	31.5 V	34.1 V	9.0 W	199 lm/W	194 lm/W	178 lm/W	> 80
LLE 24x280mm 2000lm 865 HV ADV5	865/359	1,790 lm	1,740 lm	275 mA	31.5 V	34.1 V	9.0 W	197 lm/W	193 lm/W	178 lm/W	> 80
LLE 24x560mm 4000lm 830 HV ADV5	830/359	3,400 lm	3,310 lm	275 mA	63.0 V	68.2 V	18.1 W	187 lm/W	182 lm/W	167 lm/W	> 80
LLE 24x560mm 4000lm 840 HV ADV5	840/359	3,570 lm	3,480 lm	275 mA	63.0 V	68.2 V	18.1 W	197 lm/W	193 lm/W	178 lm/W	> 80
LLE 24x560mm 4000lm 850 HV ADV5	850/359	3,610 lm	3,520 lm	275 mA	63.0 V	68.2 V	18.1 W	199 lm/W	194 lm/W	178 lm/W	> 80
LLE 24x560mm 4000lm 865 HV ADV5	865/359	3,570 lm	3,480 lm	275 mA	63.0 V	68.2 V	18.1 W	197 lm/W	193 lm/W	178 lm/W	> 80
Operating mode NM at 325 mA											
LLE 24x280mm 2000lm 830 HV ADV5	830/359	1,990 lm	1,900 lm	325 mA	31.6 V	34.4 V	10.7 W	183 lm/W	177 lm/W	163 lm/W	> 80
LLE 24x280mm 2000lm 840 HV ADV5	840/359	2,090 lm	2,000 lm	325 mA	31.6 V	34.4 V	10.7 W	192 lm/W	186 lm/W	171 lm/W	> 80
LLE 24x280mm 2000lm 850 HV ADV5	850/359	2,140 lm	2,050 lm	325 mA	31.6 V	34.4 V	10.7 W	197 lm/W	190 lm/W	175 lm/W	> 80
LLE 24x280mm 2000lm 865 HV ADV5	865/359	2,090 lm	2,000 lm	325 mA	31.6 V	34.4 V	10.7 W	193 lm/W	186 lm/W	171 lm/W	> 80
LLE 24x560mm 4000lm 830 HV ADV5	830/359	3,970 lm	3,800 lm	325 mA	63.3 V	68.8 V	21.5 W	183 lm/W	177 lm/W	163 lm/W	> 80
LLE 24x560mm 4000lm 840 HV ADV5	840/359	4,180 lm	3,990 lm	325 mA	63.3 V	68.8 V	21.5 W	192 lm/W	186 lm/W	171 lm/W	> 80
LLE 24x560mm 4000lm 850 HV ADV5	850/359	4,280 lm	4,090 lm	325 mA	63.3 V	68.8 V	21.5 W	197 lm/W	190 lm/W	175 lm/W	> 80
LLE 24x560mm 4000lm 865 HV ADV5	865/359	4,190 lm	4,010 lm	325 mA	63.3 V	68.8 V	21.5 W	193 lm/W	186 lm/W	171 lm/W	> 80
Operating mode HO at 350 mA											
LLE 24x280mm 2000lm 830 HV ADV5	830/359	2,130 lm	2,080 lm	350 mA	31.9 V	34.5 V	11.7 W	181 lm/W	177 lm/W	163 lm/W	> 80
LLE 24x280mm 2000lm 840 HV ADV5	840/359	2,250 lm	2,180 lm	350 mA	31.9 V	34.5 V	11.7 W	191 lm/W	187 lm/W	172 lm/W	> 80
LLE 24x280mm 2000lm 850 HV ADV5	850/359	2,270 lm	2,200 lm	350 mA	31.9 V	34.5 V	11.7 W	192 lm/W	189 lm/W	174 lm/W	> 80
LLE 24x280mm 2000lm 865 HV ADV5	865/359	2,250 lm	2,180 lm	350 mA	31.9 V	34.5 V	11.7 W	191 lm/W	187 lm/W	172 lm/W	> 80
LLE 24x560mm 4000lm 830 HV ADV5	830/359	4,260 lm	4,150 lm	350 mA	63.8 V	69.1 V	23.3 W	181 lm/W	177 lm/W	163 lm/W	> 80
LLE 24x560mm 4000lm 840 HV ADV5	840/359	4,480 lm	4,370 lm	350 mA	63.8 V	69.1 V	23.3 W	191 lm/W	187 lm/W	172 lm/W	> 80
LLE 24x560mm 4000lm 850 HV ADV5	850/359	4,520 lm	4,410 lm	350 mA	63.8 V	69.1 V	23.3 W	192 lm/W	189 lm/W	174 lm/W	> 80
LLE 24x560mm 4000lm 865 HV ADV5	865/359	4,480 lm	4,370 lm	350 mA	63.8 V	69.1 V	23.3 W	191 lm/W	187 lm/W	172 lm/W	> 80
Operating mode HO at 400 mA											
LLE 24x280mm 2000lm 830 HV ADV5	830/359	2,450 lm	2,380 lm	400 mA	32.2 V	34.8 V	13.5 W	180 lm/W	177 lm/W	163 lm/W	> 80
LLE 24x280mm 2000lm 840 HV ADV5	840/359	2,580 lm	2,500 lm	400 mA	32.2 V	34.8 V	13.5 W	190 lm/W	178 lm/W	164 lm/W	> 80
LLE 24x280mm 2000lm 850 HV ADV5	850/359	2,600 lm	2,530 lm	400 mA	32.2 V	34.8 V	13.5 W	191 lm/W	180 lm/W	166 lm/W	> 80
LLE 24x280mm 2000lm 865 HV ADV5	865/359	2,580 lm	2,500 lm	400 mA	32.2 V	34.8 V	13.5 W	190 lm/W	178 lm/W	164 lm/W	> 80
LLE 24x560mm 4000lm 830 HV ADV5	830/359	4,890 lm	4,770 lm	400 mA	64.4 V	69.6 V	26.9 W	180 lm/W	177 lm/W	163 lm/W	> 80
LLE 24x560mm 4000lm 840 HV ADV5	840/359	5,150 lm	5,010 lm	400 mA	64.4 V	69.6 V	26.9 W	190 lm/W	186 lm/W	171 lm/W	> 80
LLE 24x560mm 4000lm 850 HV ADV5	850/359	5,200 lm	5,050 lm	400 mA	64.4 V	69.6 V	26.9 W	191 lm/W	188 lm/W	173 lm/W	> 80
LLE 24x560mm 4000lm 865 HV ADV5	865/359	5,150 lm	5,010 lm	400 mA	64.4 V	69.6 V	26.9 W	190 lm/W	186 lm/W	171 lm/W	> 80

[1] Integral measurement over the complete module.

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

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

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

[5] Measurement tolerance optical data: ±5 %.

[6] Measurement tolerance forward voltage: ±0.1 V.

Specific technical data

Type[3]	Photo-metric code	Typ. luminous flux at tp = 25 °C[4] [5]	Typ. luminous flux at tp = 65 °C[4] [5]	Typ. forward current	Min. forward voltage at tp = 65 °C[6]	Max. forward voltage at tp = 25 °C[6]	Typ. power consumption at tp = 65 °C[4]	Efficacy of the module at tp = 25 °C	Efficacy of the module at tp = 65 °C	Efficacy of the system at tp = 65 °C	Colour rendering index CRI
Operating mode HO at 500 mA											
LLE 24x280mm 2000lm 830 HV ADV5	830/359	2,970 lm	2,840 lm	500 mA	32.5 V	35.3 V	17.0 W	173 lm/W	167 lm/W	154 lm/W	> 80
LLE 24x280mm 2000lm 840 HV ADV5	840/359	3,120 lm	2,990 lm	500 mA	32.5 V	35.3 V	17.0 W	182 lm/W	176 lm/W	162 lm/W	> 80
LLE 24x280mm 2000lm 850 HV ADV5	850/359	3,200 lm	3,060 lm	500 mA	32.5 V	35.3 V	17.0 W	186 lm/W	180 lm/W	166 lm/W	> 80
LLE 24x280mm 2000lm 865 HV ADV5	865/359	3,130 lm	3,000 lm	500 mA	32.5 V	35.3 V	17.0 W	182 lm/W	176 lm/W	162 lm/W	> 80
LLE 24x560mm 4000lm 830 HV ADV5	830/359	5,940 lm	5,680 lm	500 mA	65.1 V	70.6 V	34.0 W	173 lm/W	167 lm/W	154 lm/W	> 80
LLE 24x560mm 4000lm 840 HV ADV5	840/359	6,250 lm	5,970 lm	500 mA	65.1 V	70.6 V	34.0 W	182 lm/W	176 lm/W	162 lm/W	> 80
LLE 24x560mm 4000lm 850 HV ADV5	850/359	6,400 lm	6,120 lm	500 mA	65.1 V	70.6 V	34.0 W	186 lm/W	180 lm/W	166 lm/W	> 80
LLE 24x560mm 4000lm 865 HV ADV5	865/359	6,270 lm	5,990 lm	500 mA	65.1 V	70.6 V	34.0 W	182 lm/W	176 lm/W	162 lm/W	> 80

[1] Integral measurement over the complete module.

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

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

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

[6] Measurement tolerance optical data: ±5 %.

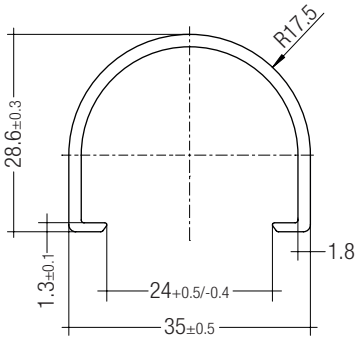
[7] Measurement tolerance forward voltage: ±0.1 V.

ACCES-SORIES

LINEAR COVER SY

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), + 20 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

ACCES-SORIES

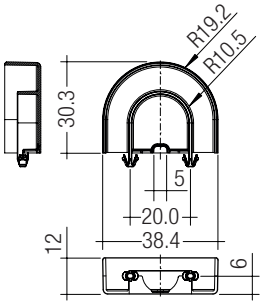
ACL ENDCAP LLE24 PUSH-FIX / SCREW-FIX

Product description

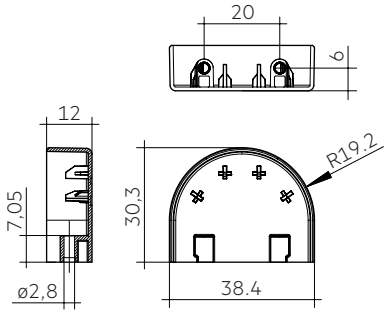
- ENDCAP for LLE 24
- PUSH-FIX: Fast snap on mounting
  (sheet thickness 0.5 – 1.0 mm), for drilling hole 4 mm
- SCREW-FIX: Screw mounting with EJOT Delta PT WN 5451 30x8,
  tightening torque 0.7 Nm
- Made of Polycarbonat

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

ACCES-SORIES

ACL LENS 24mm

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, at 1,600 mm length ± 20 mm tolerance and raw ends
- 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

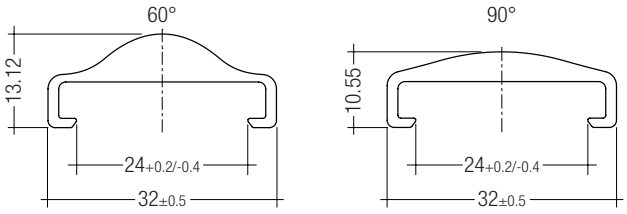
ACL LINEAR LENS 24mm ASY

ACL LINEAR LENS 24mm DASY

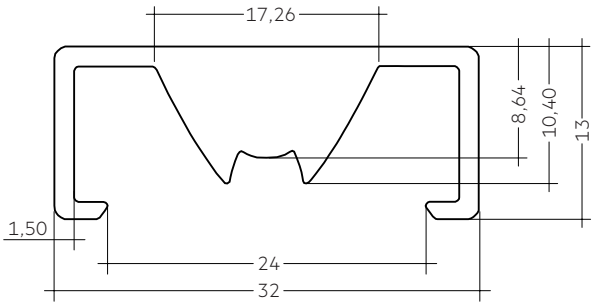
ACL Endcap LENS 24mm PSF

ACCES-SORIES

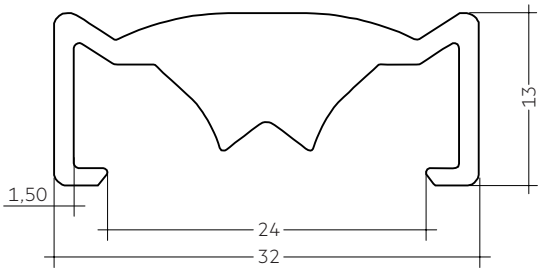
ACL LENS 24mm



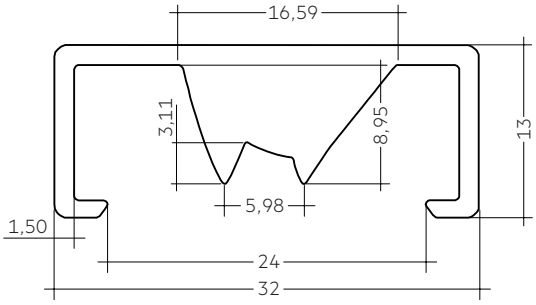
ACL LINEAR LENS 24mm 60° and 90°



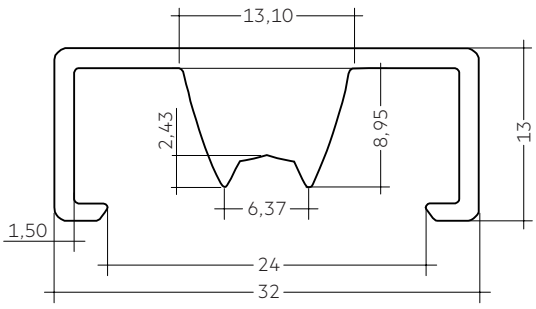
ACL LINEAR LENS 24mm INTENSE



ACL LINEAR LENS 24mm BATWING



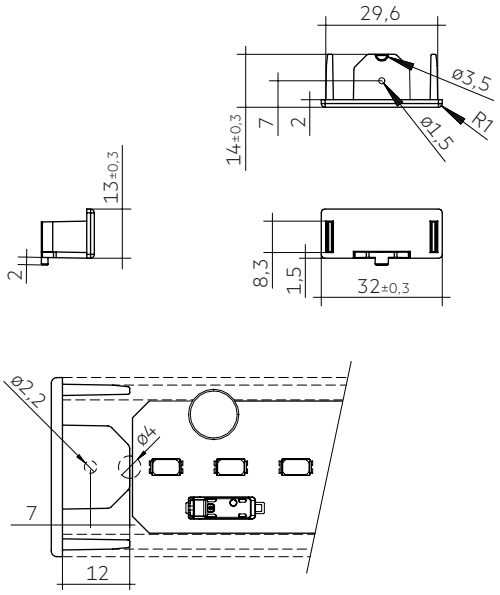
ACL LINEAR LENS 24mm ASY



ACL LINEAR LENS 24mm DASY

ACCES-SORIES

ACL LENS 24mm



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 24x1600mm 60°	**28000953**	60°	97 %	21 pc(s).	0.261 kg
ACL LINEAR LENS 24x1600mm 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**	–	–	720 pc(s).	0.003 kg

ACCES-SORIES

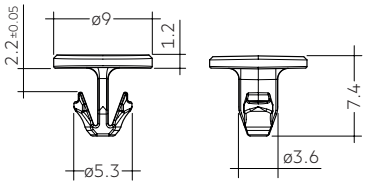
CLIP 4.3mm

Product description

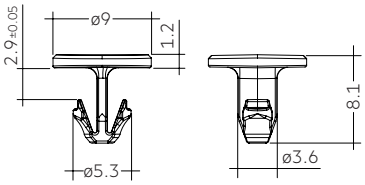
- Clip for fixation of LED modules with 4.3 mm holes
- Fast snap on mounting (sheet thickness 0.5 – 1.0 mm for PUSH-FIX and 1 – 2 mm for PUSH-FIX Long)
- For drilling hole 4 mm
- Clip made of Polycarbonat

ACL CLIP 4.3mm PUSH-FIX

ACL CLIP 4.3mm PUSH-FIX Long



ACL CLIP 4.3mm PUSH-FIX



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

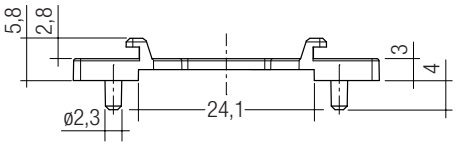
[1] Minimum sales quantity 500 pcs.

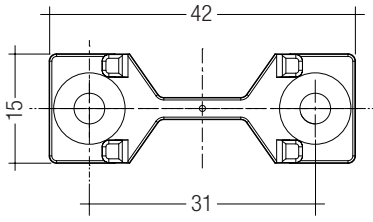
ACCES-SORIES

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[2]
- 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.

[2] 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

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

1.2 Energy classification

Type	Energy classification
LLE 24mm HV ADV5	A++

2. Thermal details

2.1 tc point, ambient temperature and life-time

The temperature at tp reference point is crucial for the light output and life-time of a LED product.

For LLE a tp temperature of 65 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and life-time.

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

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

2.2 Storage and humidity

Storage temperature	-40 … +80 °C

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

2.3 Thermal design and heat sink

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

2.4 Heat sink values

LLE 24x280mm 2000lm ADV5

ta	tp	Forward current	$R_{th, hs-a}$	Cooling area
25 °C	65 °C	325 mA	7.87 K/W	85 cm²
25 °C	65 °C	500 mA	4.58 K/W	146 cm²
35 °C	65 °C	325 mA	5.90 K/W	113 cm²
35 °C	65 °C	500 mA	3.43 K/W	194 cm²
45 °C	65 °C	325 mA	3.93 K/W	170 cm²
45 °C	65 °C	500 mA	2.29 K/W	292 cm²
55 °C	65 °C	325 mA	1.96 K/W	340 cm²
55 °C	65 °C	500 mA	1.14 K/W	585 cm²

LLE 24x560mm 4000lm ADV5

ta	tp	Forward current	$R_{th, hs-a}$	Cooling area
25 °C	65 °C	325 mA	3.93 K/W	170 cm²
25 °C	65 °C	500 mA	2.29 K/W	291 cm²
35 °C	65 °C	325 mA	2.95 K/W	226 cm²
35 °C	65 °C	500 mA	1.72 K/W	388 cm²
45 °C	65 °C	325 mA	1.96 K/W	339 cm²
45 °C	65 °C	500 mA	1.14 K/W	583 cm²
55 °C	65 °C	325 mA	0.98 K/W	680 cm²
55 °C	65 °C	500 mA	0.57 K/W	1,169 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.

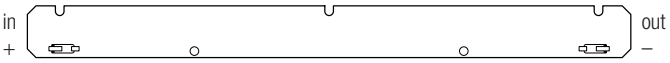
If a wire breaks or a complete module fails then the current passing through the other module increases. This may reduce its life considerably.

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

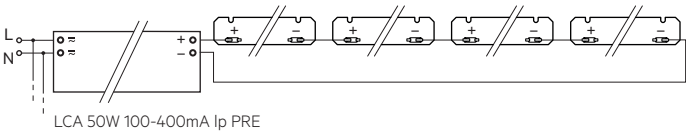
LLE can be operated either from SELV LED Drivers or from LED Drivers with LV output voltage.

LLE are basic insulated up to 320 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 320 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

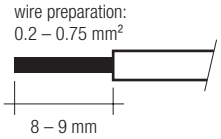


Wiring examples



3.3 Wiring type and cross section

The wiring can be in stranded wires or solid with a cross section of 0.2 to 0.75 mm².
For the push-wire connection you have to strip the insulation (8–9 mm).



To remove the wires use a suitabel 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.

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

Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate.
Avoid corrosive atmosphere during usage and storage.

3.5 EOS/ESD safety guidelines

The device / module contains components that are sensitive to electrostatic discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken. No special measures need be taken for devices/modules with enclosed casings (contact with the pc board not possible), just normal installation practice. Please note the requirements set out in the document EOS / ESD guidelines (Guideline_EOS_ESD.pdf) at:
http://www.tridonic.com/esd-protection

4. Life-time

4.1 Life-time, lumen maintenance and failure rate

The light output of an LED Module decreases over the life-time, this is characterized with the L value.
L70 means that the LED module will give 70 % of its initial luminous flux.
This value is always related to the number of operation hours and therefore defines the life-time of an LED module.

As the L value is a statistical value and the lumen maintenance may vary over the delivered LED modules.
The B value defines the amount of modules which are below the specific L value, e.g. L70B10 means 10 % of the LED modules are below 70 % of the initial luminous flux, respectively 90 % will be above 70 % of the initial value.
In addition the percentage of failed modules (fatal failure) is characterized by the C value.

The F value is the combination of the B and C value. That means for F degradation and complete failures are considered, e.g. L70F10 means 10 % of the LED modules may fail or be below 70 % of the initial luminous flux.

4.2 Lumen maintenance for LLE 24mm 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.

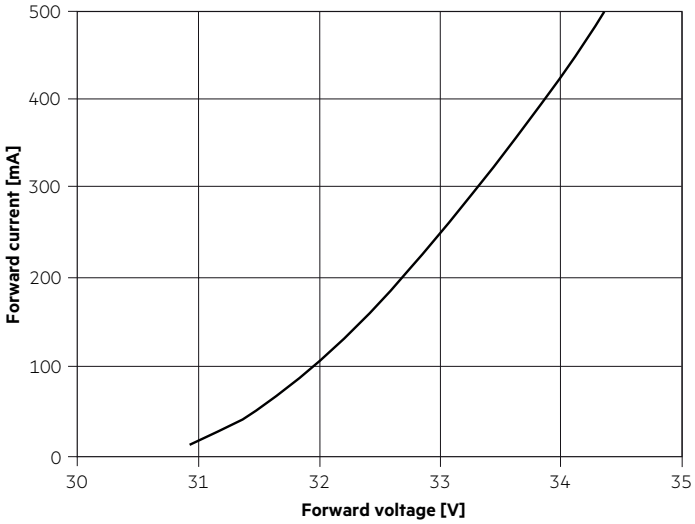
Imax ... Max. permissible continuous operating current incl. The tolerances of the LED driver.

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

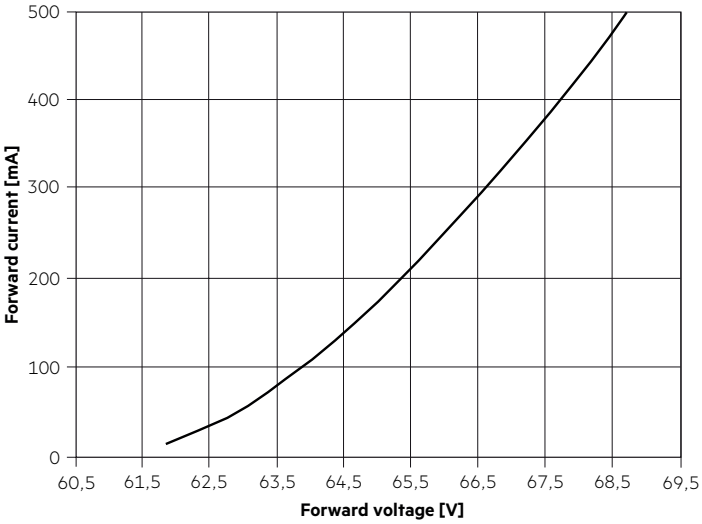
Max. permissible peak current ... The max. output peak current of the LED driver must not exceed this value.

5.2 Typ. forward voltage vs. forward current

LLE 24x280mm 2000lm 8xx HV ADV5

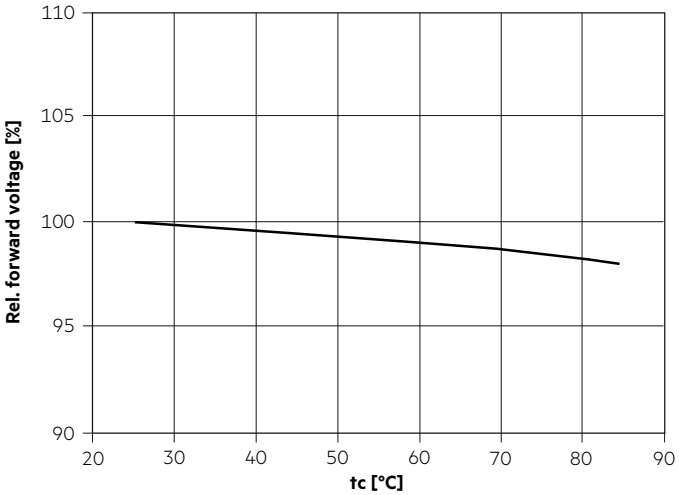


LLE 24x560mm 4000lm 8xx HV ADV5



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

5.3 Forward voltage vs. tc temperature



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

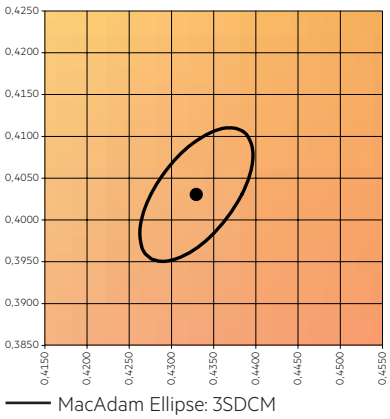
6. Photometric characteristics

6.1 Coordinates and tolerances according to CIE 1931

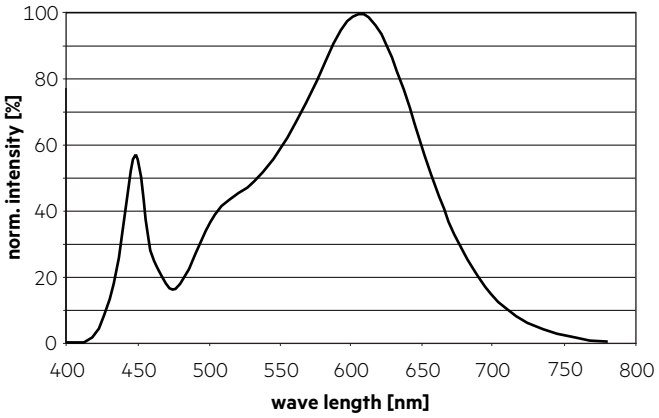
The specified colour coordinates are integral measured by current impulse of 195 mA and a duration of 100 ms.
The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

3,000 K

	x0	y0
Centre	0.4338	0.4030

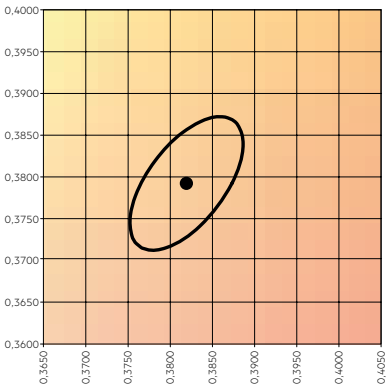


MacAdam Ellipse: 3SDCM

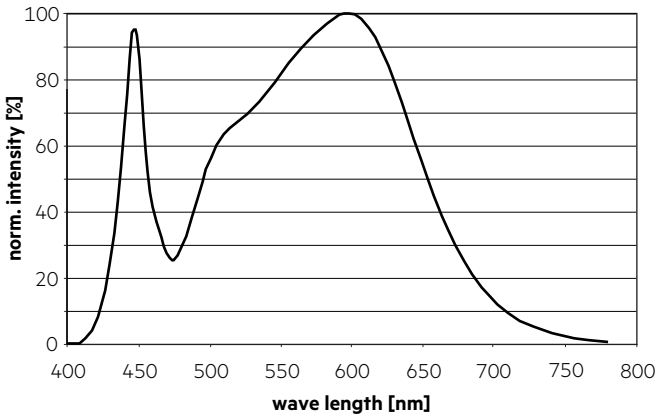


4,000 K

	x0	y0
Center	0.3818	0.3797

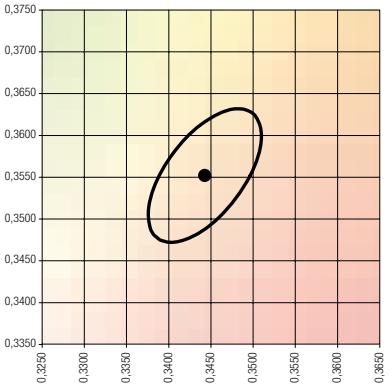


MacAdam Ellipse: 3SDCM

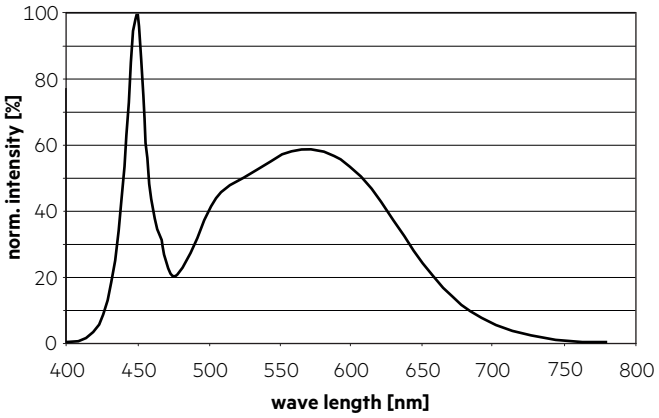


5,000 K

	x0	y0
Center	0.3447	0.3553

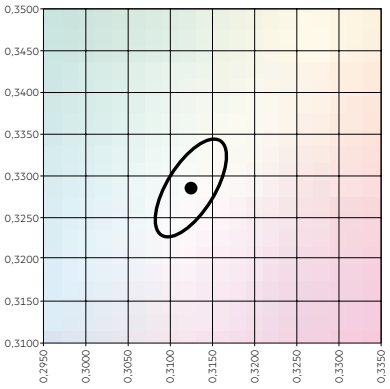


MacAdam Ellipse: 3SDCM

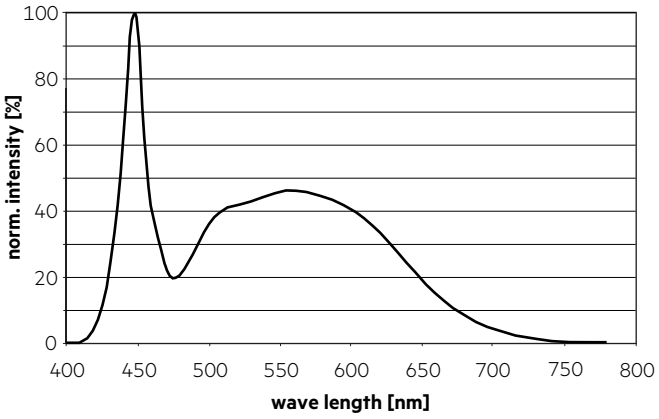


6,500 K

	x0	y0
Center	0.3123	0.3282

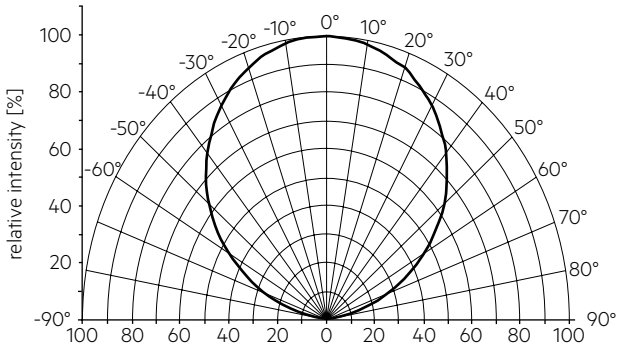


MacAdam Ellipse: 3SDCM



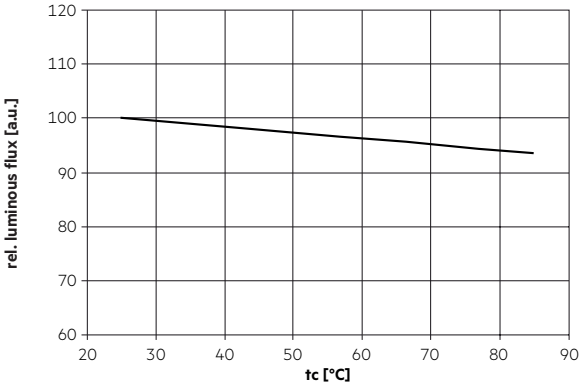
6.2 Light distribution

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

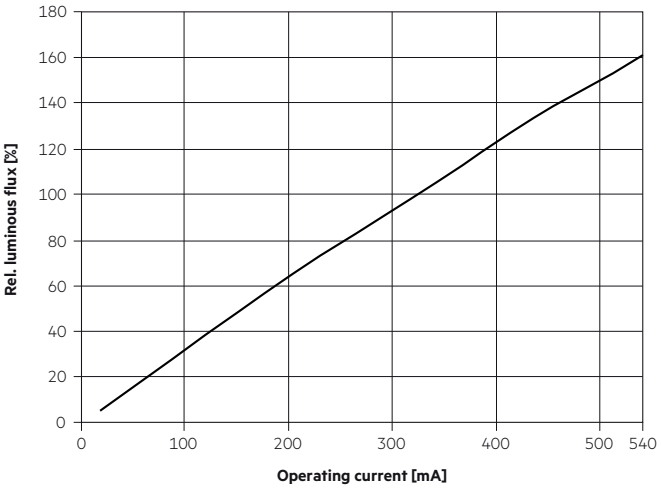


The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 5.
To ensure an ideal mixture of colours and a homogeneous light distribution a suitable optic (e. g. PMMA diffuser) and a sufficient spacing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

Guarantee conditions at www.tridonic.com → Services

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