



Module LLE 16x140-560mm 650lm HV ADV5

Modules LLE advanced

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
- Long life-time: 72,000 hours
- 5-year guarantee

Optical properties

- Colour temperatures 2,700 K, 3,000 K, 4,000 K and 6,500 K
- Typ. luminous flux 325, 650 and 1,300 lm
- Efficacy of the module up to 203 lm/W
- High colour rendering index CRI > 80
- High colour consistency (MacAdam 3)[®]
- Small luminous flux tolerances

Mechanical properties

- Module dimension 24 x 140 mm, 16 x 280 mm and 16 x 560 mm
- Simple installation (e.g. clips or screws)

System solution

- LED system solution with outstanding system efficacy up to 180 lm/W, consisting of linear LED modules and dimmable LED Driver LCA 50W 100–400mA Ip PRE



Standards, page 7

Colour temperatures and tolerances, page 11



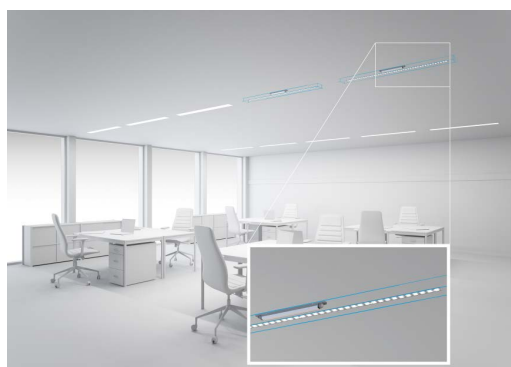
LLE 16x140mm 325lm HV ADV5



LLE 16x280mm 650lm HV ADV5



LLE 16x560mm 1300lm HV ADV5



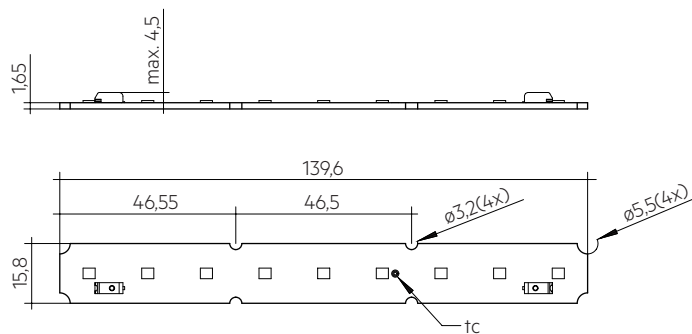


Module LLE 16x140-560mm 650lm HV ADV5

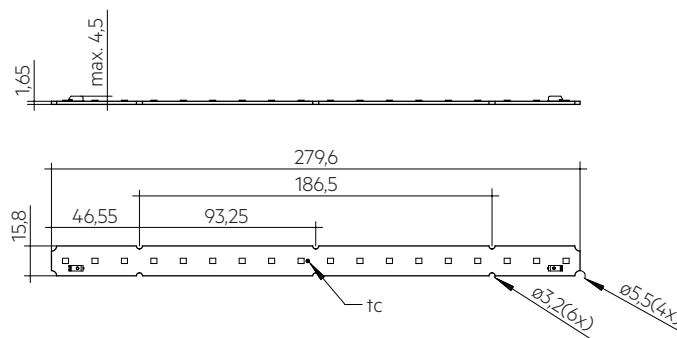
Modules LLE advanced

Technical data

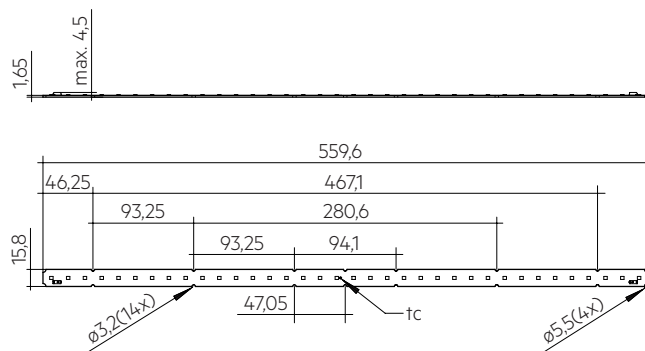
Beam characteristic	120°
Ambient temperature range	-40 ... +65 °C
tp rated	50 °C
tc	85 °C
Irated	225 mA
I _{max}	540 mA
Max. permissible LF current ripple	595 mA
Max. permissible peak current	900 mA / max. 8 ms
Max. working voltage for insulation [®]	400 V
Insulation test voltage	1.8 kV
CTI of the printed circuit board	≥ 600
ESD classification	severity level 4
Risk group (IEC 62471) [®]	RG0
Classification acc. to IEC 62031	Built-in
Type of protection	IP00
Life-time	up to 72.000 h
Guarantee	5 years



LLE 16x140mm 325lm HV ADV5



LLE 16x280mm 650lm HV ADV5



LLE 16x560mm 1300lm HV ADV5

LED modules

LED linear / area

Module LLE 16x140-560mm 650lm HV ADV5

Modules LLE advanced

Ordering data

Type	Article number	Colour temperature	Packaging carton	Weight per pc.
LLE 16x140mm 325lm 827 HV ADV5	89603385	2,700 K	432 pc(s).	0.007 kg
LLE 16x140mm 325lm 830 HV ADV5	89603386	3,000 K	432 pc(s).	0.007 kg
LLE 16x140mm 325lm 840 HV ADV5	89603387	4,000 K	432 pc(s).	0.007 kg
LLE 16x280mm 650lm 827 HV ADV5	89603390	2,700 K	216 pc(s).	0.014 kg
LLE 16x280mm 650lm 830 HV ADV5	89603391	3,000 K	216 pc(s).	0.014 kg
LLE 16x280mm 650lm 840 HV ADV5	89603392	4,000 K	216 pc(s).	0.014 kg
LLE 16x280mm 650lm 865 HV ADV5	89603394	6,500 K	216 pc(s).	0.014 kg
LLE 16x560mm 1300lm 827 HV ADV5	89603395	2,700 K	108 pc(s).	0.028 kg
LLE 16x560mm 1300lm 830 HV ADV5	89603396	3,000 K	108 pc(s).	0.028 kg
LLE 16x560mm 1300lm 840 HV ADV5	89603397	4,000 K	108 pc(s).	0.028 kg

Specific technical data

Type [®]	Photo-metric code	Typ. luminous flux at tp = 25 °C [®]	Typ. luminous flux at tp = 50 °C [®]	Typ. forward current	Min. forward voltage at tp = 50 °C	Max. forward voltage at tp = 25 °C	Typ. power consumption at tp = 50 °C [®]	Efficacy of the module at tp = 25 °C	Efficacy of the module at tp = 50 °C	Efficacy of the system at tp = 50 °C	Colour rendering index CRI
Operating mode HE at 200 mA											
LLE 16x140mm 325lm 827 HV ADV5	827/359	300 lm	290 lm	200 mA	7.6 V	8.5 V	1.6 W	185 lm/W	182 lm/W	167 lm/W	> 80
LLE 16x140mm 325lm 830 HV ADV5	830/359	310 lm	300 lm	200 mA	7.6 V	8.5 V	1.6 W	191 lm/W	187 lm/W	172 lm/W	> 80
LLE 16x140mm 325lm 840 HV ADV5	840/359	330 lm	320 lm	200 mA	7.6 V	8.5 V	1.6 W	200 lm/W	196 lm/W	180 lm/W	> 80
LLE 16x280mm 650lm 827 HV ADV5	827/359	610 lm	590 lm	200 mA	15.3 V	17.0 V	3.2 W	185 lm/W	182 lm/W	167 lm/W	> 80
LLE 16x280mm 650lm 830 HV ADV5	830/359	620 lm	610 lm	200 mA	15.3 V	17.0 V	3.2 W	191 lm/W	187 lm/W	172 lm/W	> 80
LLE 16x280mm 650lm 840 HV ADV5	840/359	650 lm	640 lm	200 mA	15.3 V	17.0 V	3.2 W	200 lm/W	196 lm/W	180 lm/W	> 80
LLE 16x280mm 650lm 865 HV ADV5	865/359	660 lm	650 lm	200 mA	15.3 V	17.0 V	3.2 W	203 lm/W	199 lm/W	183 lm/W	> 80
LLE 16x560mm 1300lm 827 HV ADV5	827/359	1,210 lm	1,180 lm	200 mA	30.7 V	34.0 V	6.5 W	185 lm/W	182 lm/W	167 lm/W	> 80
LLE 16x560mm 1300lm 830 HV ADV5	830/359	1,250 lm	1,220 lm	200 mA	30.7 V	34.0 V	6.5 W	191 lm/W	187 lm/W	172 lm/W	> 80
LLE 16x560mm 1300lm 840 HV ADV5	840/359	1,310 lm	1,270 lm	200 mA	30.7 V	34.0 V	6.5 W	200 lm/W	196 lm/W	180 lm/W	> 80
Operating mode NM at 225 mA											
LLE 16x140mm 325lm 827 HV ADV5	827/359	340 lm	330 lm	225 mA	7.7 V	8.6 V	1.8 W	183 lm/W	179 lm/W	165 lm/W	> 80
LLE 16x140mm 325lm 830 HV ADV5	830/359	350 lm	340 lm	225 mA	7.7 V	8.6 V	1.8 W	189 lm/W	185 lm/W	170 lm/W	> 80
LLE 16x140mm 325lm 840 HV ADV5	840/359	360 lm	360 lm	225 mA	7.7 V	8.6 V	1.8 W	197 lm/W	194 lm/W	178 lm/W	> 80
LLE 16x280mm 650lm 827 HV ADV5	827/359	680 lm	660 lm	225 mA	15.4 V	17.1 V	3.7 W	183 lm/W	179 lm/W	165 lm/W	> 80
LLE 16x280mm 650lm 830 HV ADV5	830/359	700 lm	680 lm	225 mA	15.4 V	17.1 V	3.7 W	189 lm/W	185 lm/W	170 lm/W	> 80
LLE 16x280mm 650lm 840 HV ADV5	840/359	730 lm	710 lm	225 mA	15.4 V	17.1 V	3.7 W	197 lm/W	194 lm/W	178 lm/W	> 80
LLE 16x280mm 650lm 865 HV ADV5	865/359	740 lm	720 lm	225 mA	15.4 V	17.1 V	3.7 W	200 lm/W	196 lm/W	180 lm/W	> 80
LLE 16x560mm 1300lm 827 HV ADV5	827/359	1,350 lm	1,320 lm	225 mA	30.8 V	34.2 V	7.3 W	183 lm/W	179 lm/W	165 lm/W	> 80
LLE 16x560mm 1300lm 830 HV ADV5	830/359	1,390 lm	1,360 lm	225 mA	30.8 V	34.2 V	7.3 W	189 lm/W	185 lm/W	170 lm/W	> 80
LLE 16x560mm 1300lm 840 HV ADV5	840/359	1,460 lm	1,420 lm	225 mA	30.8 V	34.2 V	7.3 W	197 lm/W	194 lm/W	178 lm/W	> 80
Operating mode HO at 500 mA											
LLE 16x140mm 325lm 827 HV ADV5	827/359	700 lm	670 lm	500 mA	8.0 V	9.0 V	4.2 W	164 lm/W	158 lm/W	145 lm/W	> 80
LLE 16x140mm 325lm 830 HV ADV5	830/359	720 lm	690 lm	500 mA	8.0 V	9.0 V	4.2 W	169 lm/W	163 lm/W	150 lm/W	> 80
LLE 16x140mm 325lm 840 HV ADV5	840/359	760 lm	720 lm	500 mA	8.0 V	9.0 V	4.2 W	177 lm/W	171 lm/W	157 lm/W	> 80
LLE 16x280mm 650lm 827 HV ADV5	827/359	1,410 lm	1,370 lm	500 mA	16.1 V	17.9 V	8.5 W	164 lm/W	160 lm/W	147 lm/W	> 80
LLE 16x280mm 650lm 830 HV ADV5	830/359	1,450 lm	1,390 lm	500 mA	16.1 V	17.9 V	8.5 W	169 lm/W	163 lm/W	150 lm/W	> 80
LLE 16x280mm 650lm 840 HV ADV5	840/359	1,520 lm	1,450 lm	500 mA	16.1 V	17.9 V	8.5 W	177 lm/W	171 lm/W	157 lm/W	> 80
LLE 16x280mm 650lm 865 HV ADV5	865/359	1,540 lm	1,470 lm	500 mA	16.1 V	17.9 V	8.5 W	179 lm/W	173 lm/W	159 lm/W	> 80
LLE 16x560mm 1300lm 827 HV ADV5	827/359	2,810 lm	2,740 lm	500 mA	32.3 V	35.7 V	17.1 W	164 lm/W	160 lm/W	147 lm/W	> 80
LLE 16x560mm 1300lm 830 HV ADV5	830/359	2,900 lm	2,770 lm	500 mA	32.2 V	35.7 V	17.0 W	169 lm/W	163 lm/W	150 lm/W	> 80
LLE 16x560mm 1300lm 840 HV ADV5	840/359	3,030 lm	2,900 lm	500 mA	32.2 V	35.7 V	17.0 W	177 lm/W	171 lm/W	157 lm/W	> 80

^① Integral measurement over the complete module.

[®] If mounted with M3 screws and plastic washers.

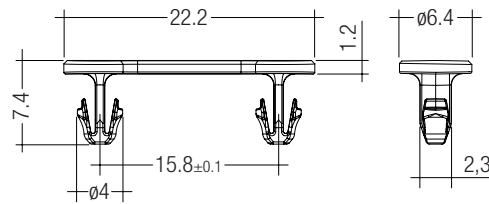
[®] Measured at operating mode HO.

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

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

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



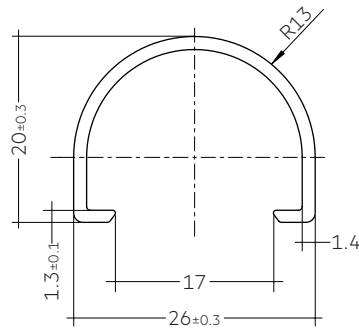
Ordering data

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

[®] Minimum sales quantity 200 pcs.

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 94 %, semi-transparent 87 %, diffuse 76 %
- Linear lense made of PMMA
- Tolerances LINEAR COVER: + 20 mm for 1,600 / 1,200 mm length (ends raw)



Ordering data

Type	Article number	Colour	Length	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).	0.117 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).	0.117 kg

^① Ends must be covered by the luminaire construction.

1. Standards

IEC 62031
IEC 62471
IEC 61000-4-2
IEC 62778
IEC 61547

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	CRI	Colour temperature in Kelvin x 100	MacAdam after 25% of the life-time (max.6000h)	Luminous flux after 25% of the life-time (max.6000h)
7	70 – 79	MacAdam initial	(max.6000h)	Code
8	80 – 89			7
9	≥90			8
				9

1.2 Energy classification

Type	Energy classification
LLE 16mm 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 50 °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...+85 °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 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.



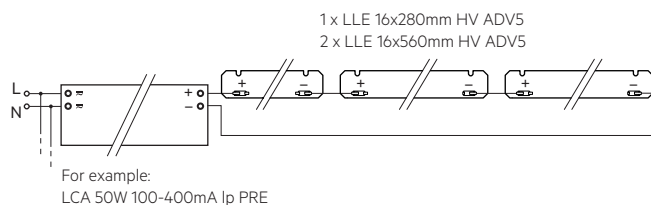
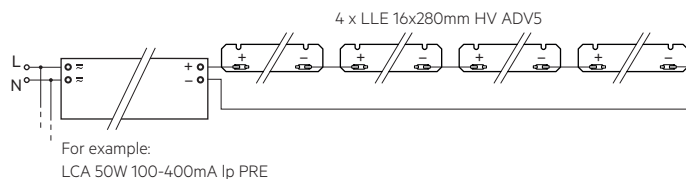
LLE are basic insulated up to 400 V (if mounted with M3 screws with head diameter 7 mm in combination with plastic washers) against ground and can be mounted directly on earthed metal parts of the luminaire. If the max. output voltage of the LED Driver (also against earth) is above 400 V, an additional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

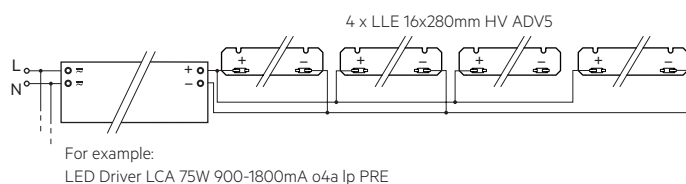
3.2 Wiring



Wiring examples for serial wiring

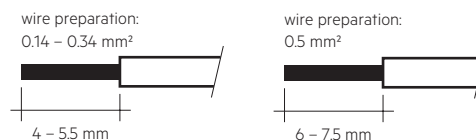


Wiring examples for parallel wiring



3.3 Wiring type and cross section

The wiring can be in solid with a cross section of 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. 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 16mm 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
	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
200 mA	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
	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
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
	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
450 mA	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
	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.

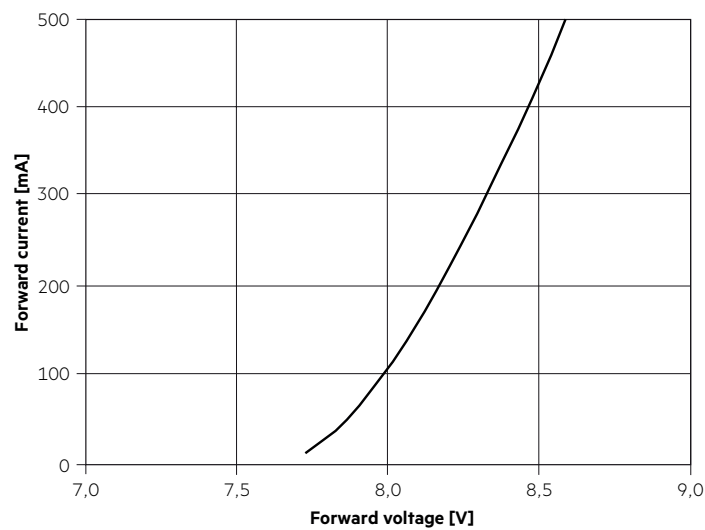
I_{max} ... Max. permissible continuous operating current incl. The tolerances of the LED driver.

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

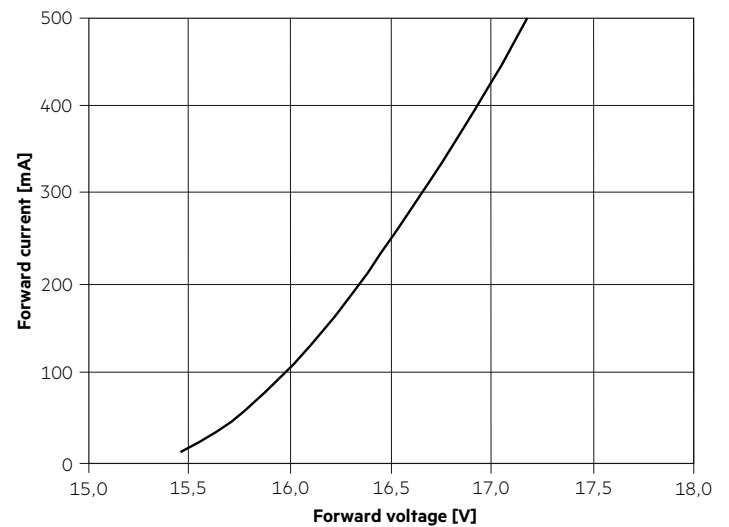
Max. permissible peak current ... The max. output peak current of the LED driver must not exceed this value.

5.2 Typ. forward voltage vs. forward current

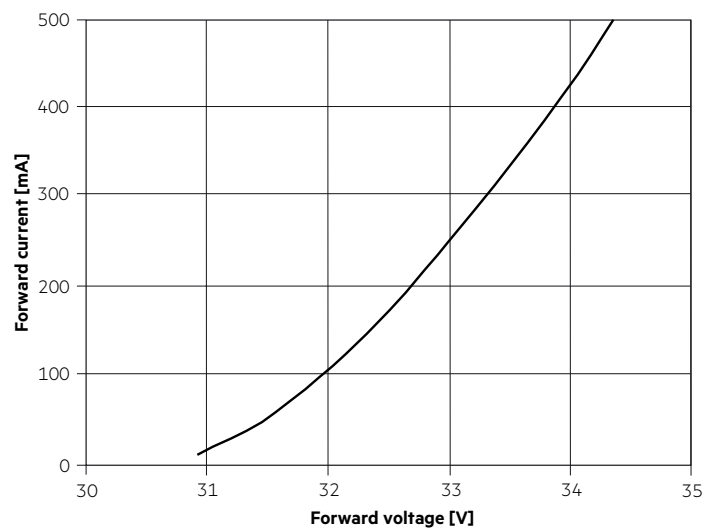
LLE 16x140mm 325lm 8xx HV ADV5



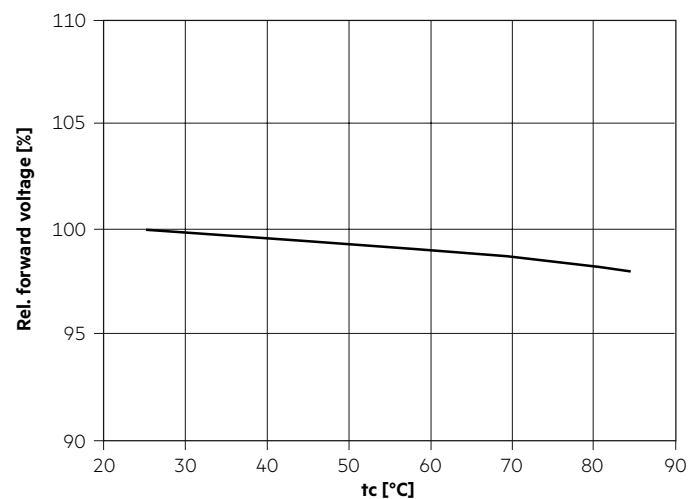
LLE 16x280mm 650lm 8xx HV ADV5



LLE 16x560mm 1300lm 8xx HV ADV5



5.3 Forward voltage vs. t_c temperature



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

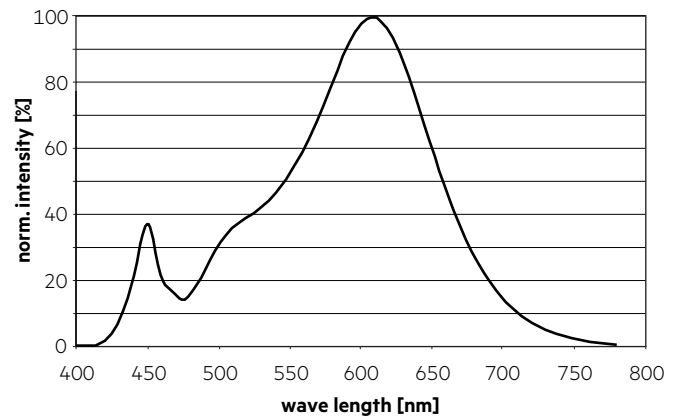
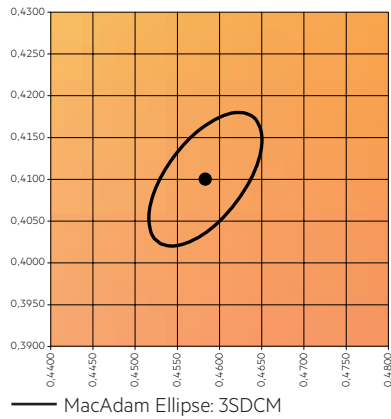
6. Photometric characteristics

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 .

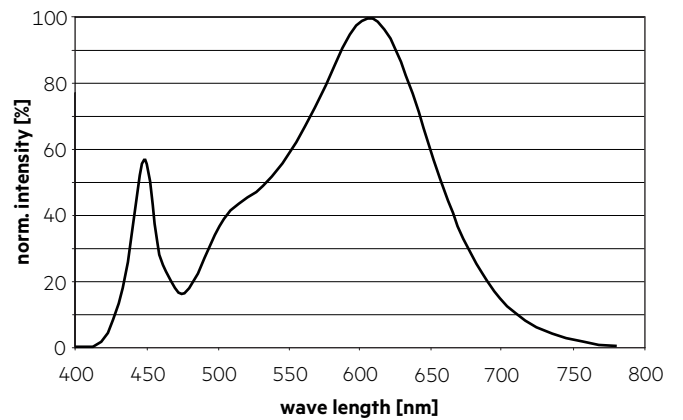
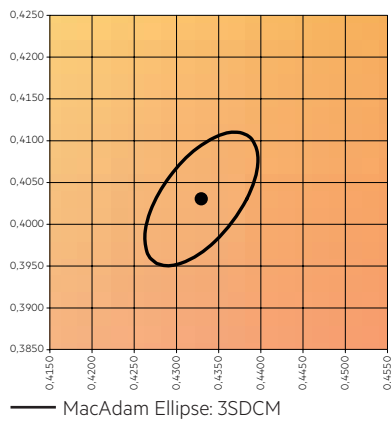
2,700 K

	x0	y0
Centre	0.4578	0.4101



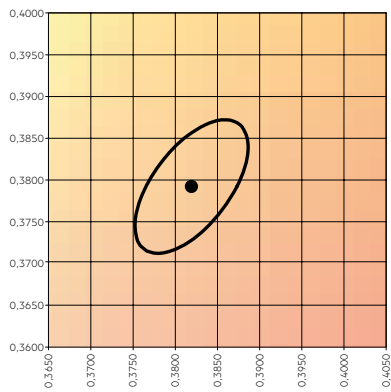
3,000 K

	x0	y0
Centre	0.4338	0.4030

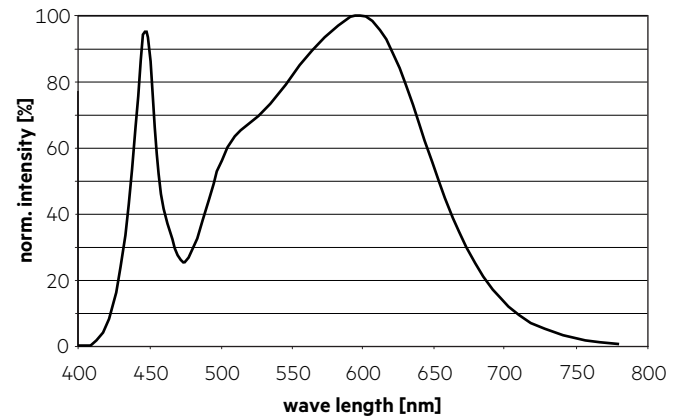


4,000 K

	x0	y0
Center	0.3818	0.3797

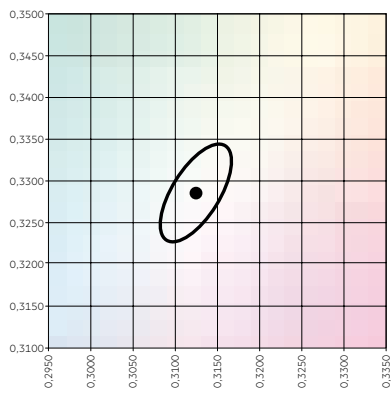


— MacAdam Ellipse: 3SDCM

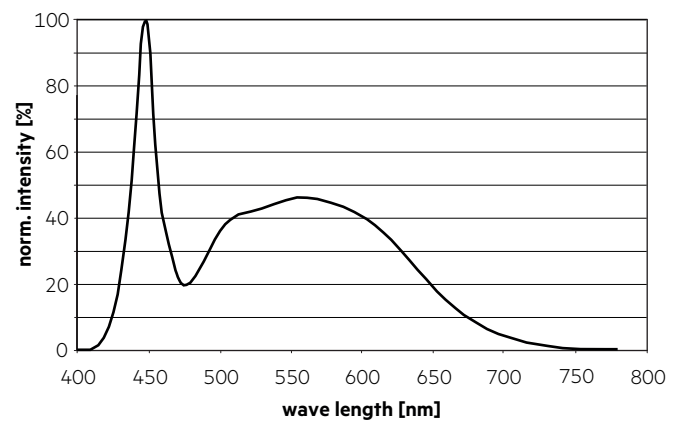


6,500 K

	x0	y0
Center	0.3123	0.3282

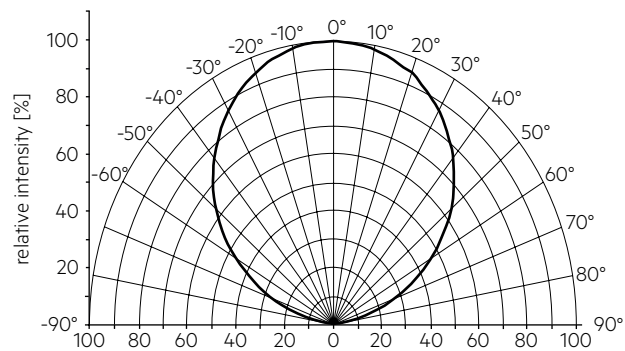


— MacAdam Ellipse: 3SDCM



6.2 Light distribution

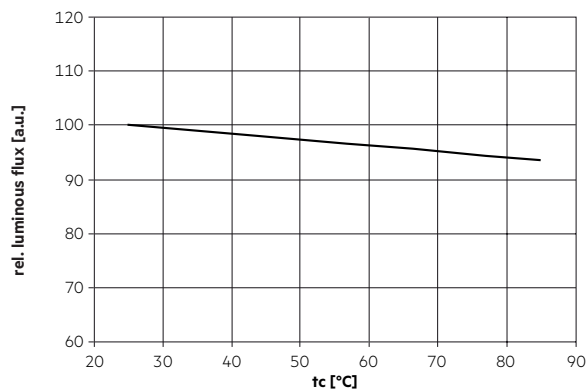
The optical design of the LLE product line ensures optimum homogeneity for the light distribution.



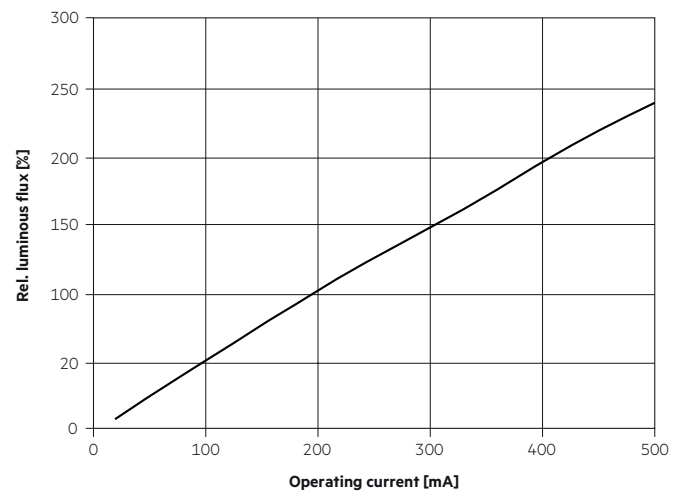
The colour temperature is measured integral over the complete module. The single LED light points can have deviations in the colour coordinates within MacAdam 5.

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.