

Tunable White Linear LED Module, LiC Series

Product code: 5173

450 mA, 13.7 V

- 280 mm Tunable White module, adjustable colour temperature between 2700K and 6500 K
- High efficacy up to 202 lm/W at T_c = 25 °C
- Accurate initial colour consistency of MacAdam (SDCM) 3-step
- Modular product platform for design flexibility
- Designed for easy installation and series connection
- Zhaga compliant dimensions
- Helvar LMC diffuser covers and mounting parts available



| | Nominal colour temperature [K] | Luminous flux (Φ _v) | | Forward voltage (V _f) | | Luminous efficacy | | Power consumption | CRI |
|---------------------------|--------------------------------|---------------------------------|------------------------|-----------------------------------|------------------------|------------------------|------------------------|------------------------|------|
| | | T _c = 65 °C | T _c = 25 °C | T _c = 65 °C | T _c = 25 °C | T _c = 65 °C | T _c = 25 °C | T _c = 65 °C | |
| | | Typ. [lm] | Typ. [lm] | Typ. [V] | Max. [V] | Typ. [lm/W] | Typ. [lm/W] | Typ. [W] | |
| <i>Efficient @ 300 mA</i> | | | | | | | | | |
| LiC-282-827-865-1100lm | 2700 | 710 | 760 | 13.9 | 14.8 | 171 | 182 | 4.2 | > 80 |
| | TW* | 760 | 820 | 13.4 | 14.4 | 190 | 202 | 4.0 | |
| | 6500 | 780 | 830 | 13.9 | 14.8 | 187 | 199 | 4.2 | |
| <i>Nominal @ 450 mA</i> | | | | | | | | | |
| LiC-282-827-865-1100lm | 2700 | 1040 | 1120 | 14.2 | 15.2 | 163 | 173 | 6.4 | > 80 |
| | TW* | 1110 | 1190 | 13.7 | 14.6 | 180 | 192 | 6.2 | |
| | 6500 | 1130 | 1220 | 14.2 | 15.2 | 177 | 189 | 6.4 | |
| <i>Maximum @ 600 mA</i> | | | | | | | | | |
| LiC-282-827-865-1100lm | 2700 | 1340 | 1450 | 14.6 | 15.5 | 154 | 164 | 8.7 | > 80 |
| | TW* | 1490 | 1600 | 13.9 | 14.8 | 180 | 190 | 8.3 | |
| | 6500 | 1460 | 1580 | 14.6 | 15.5 | 168 | 179 | 8.7 | |

*) Tunable white values with 50 % / 50 % channel balance

Tolerance for the values of CCT, luminous flux and forward voltage in the table is < ±10 %

Electrical specifications

| | L-iC-562 | |
|-----------------------------------|--------------------|--------------------|
| | Nominal | Max. |
| <i>Direct current supply only</i> | | |
| Operating Current [mA] | 450 | 600 |
| Operating Voltage / channel [V] | 13.7 ¹⁾ | 15.5 ²⁾ |

¹⁾ At 450 mA, T_c = 65 °C, 50 % / 50 % channel balance²⁾ At 600 mA, T_c = 25 °C, min / max CCT

| | |
|----------------------------------|---------------------------------------|
| Maximum rated voltage in circuit | 250 V ¹⁾ |
| Insulation test voltage | 1.5 kV |
| Max. permissible peak current | 1.2 A (Duty 1/10 pulse width 10ms) |
| IP rating | IP00 |

¹⁾ More details on page 4

Photometric specifications

| | |
|------------------------------------|-----------------|
| Colour consistency at initial time | 3 MacAdam steps |
| Colour Rendering Index | > 80 |
| Beam angle | 115° |
| Photobiological risk group | RG1 unlimited |

Lifetime specifications

| Operating current | Temperature | L70B50 | L70B10 | L80B50 | L80B10 | L90B50 | L90B10 |
|-------------------|------------------------|----------|----------|----------|----------|----------|----------|
| Efficient 300 mA | T _c = 65 °C | > 50 000 | > 50 000 | > 50 000 | > 50 000 | > 49 000 | > 37 000 |
| | T _c = 85 °C | > 50 000 | > 50 000 | > 50 000 | > 50 000 | > 42 000 | > 34 000 |
| Nominal 450 mA | T _c = 65 °C | > 50 000 | > 50 000 | > 50 000 | > 50 000 | > 46 000 | > 36 000 |
| | T _c = 85 °C | > 50 000 | > 50 000 | > 50 000 | > 50 000 | > 41 000 | > 33 000 |
| Maximum 600 mA | T _c = 65 °C | > 50 000 | > 50 000 | > 50 000 | > 50 000 | > 45 000 | > 35 000 |
| | T _c = 85 °C | > 50 000 | > 50 000 | > 50 000 | > 50 000 | > 39 000 | > 32 000 |

Lumen depreciation estimations in hours

Operating Conditions and Characteristics

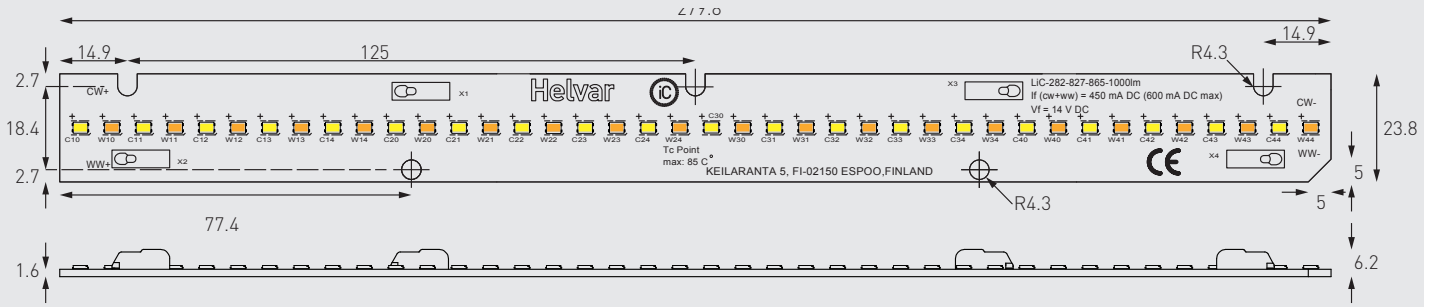
Tp point (performance measurements) T_c = 65 °CMax. temperature at T_c point 85 °C

Ambient temperature range -20...+50 °C

Storage temperature -20...+80 °C

Humidity No condensation

Dimensions



| | |
|------------------|----------------|
| Length | 279.8 ± 0.2 mm |
| Width | 23.8 ± 0.2 mm |
| Thickness of PCB | 1.6 ± 0.2 mm |
| Height | 6.2 ± 0.2 mm |

| | | |
|-----------------|--------|-------|
| Packing details | 1 Tray | 1 Box |
| Num. of modules | 60 | 300 |

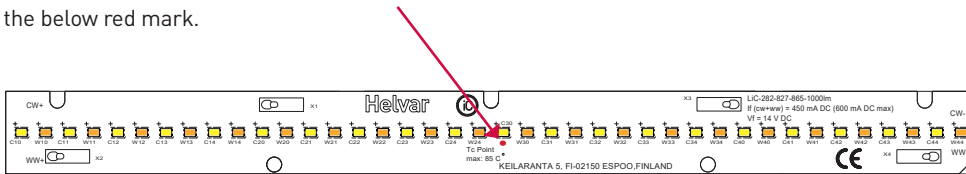
ESD foam trays, antistatic bag and carton box

Wiring specifications

| | |
|-------------------|--|
| Connector type | Push-in connector |
| Wire size | 0.2 - 0.75 mm ² , solid core 0.2 - 0.34 mm ² , stranded |
| Wire strip length | 7 - 9 mm |
| Wire type | Solid core and fine-stranded |

Thermal Management

Tc (Tp) Point : See the below red mark.



Connection examples

1 x LiC-562 and 1 x LiC-282 module connected with Helvar LL50iC-DA-100-1200 LED driver at 450 mA driving current. With LL50iC-DA-100-1200 LED Driver, the selected output current is reached with 450 mA LED-Iset resistor (T90450, resistance value 11.0 kΩ) or via NFC.

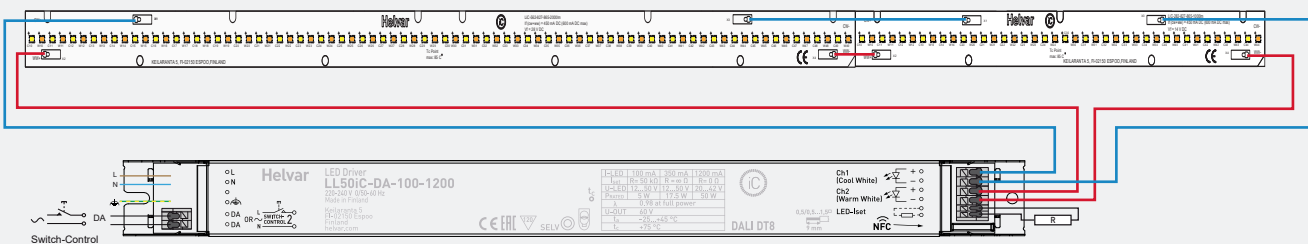


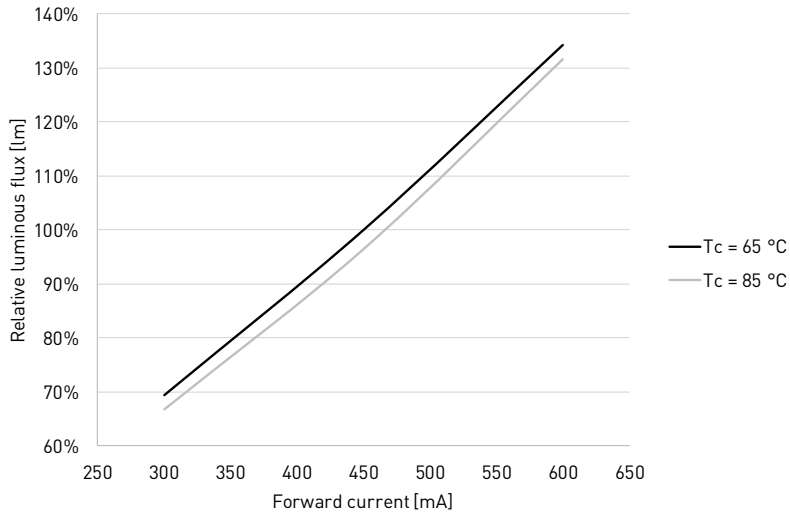
Table below showing some lengths that can be achieved when connecting modules in series with LC50iC-DA-100-1200 at 450 mA driving current (using 450 mA LED-Iset resistor (T90450) (11.0 kΩ resistor) or via NFC).

| Lengths | QUANTITY OF BELOW MODULES | | Luminous flux (Φ _v) typical at T _c = 65 °C* [lm] | Forward voltage T _c = 65 °C* [V] | Power T _c = 65 °C* [W] |
|------------------|---------------------------|---------|--|---|---|
| | LiC-562 | LiC-282 | | | |
| ~ 300 mm 1 ft | 0 | 1 | 1100 | 13.7 | 6.2 |
| ~ 600 mm 2 ft | 1 | 0 | 2200 | 27.4 | 12.3 |
| ~ 1 m 3 ft | 1 | 1 | 3300 | 41.1 | 18.9 |

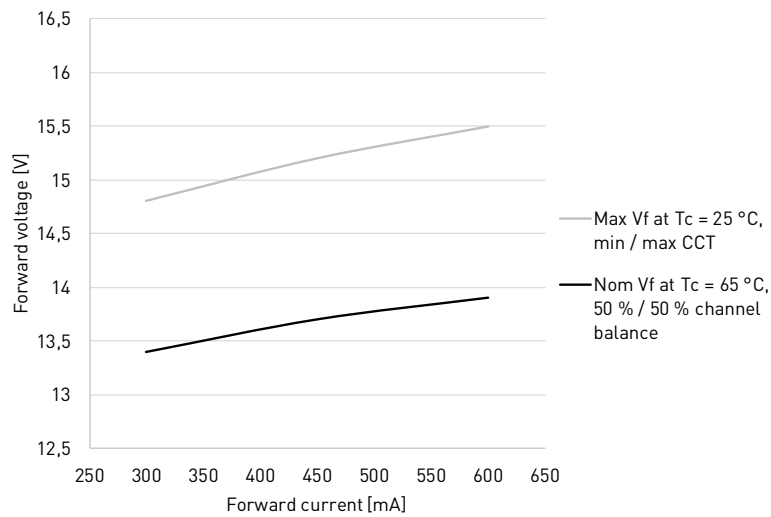
1) Tunable white values with 50 % / 50 % channel balance. 2) Tolerance for the values of CCT, luminous flux and forward voltage in the table is < ±10 %

Specification diagrams

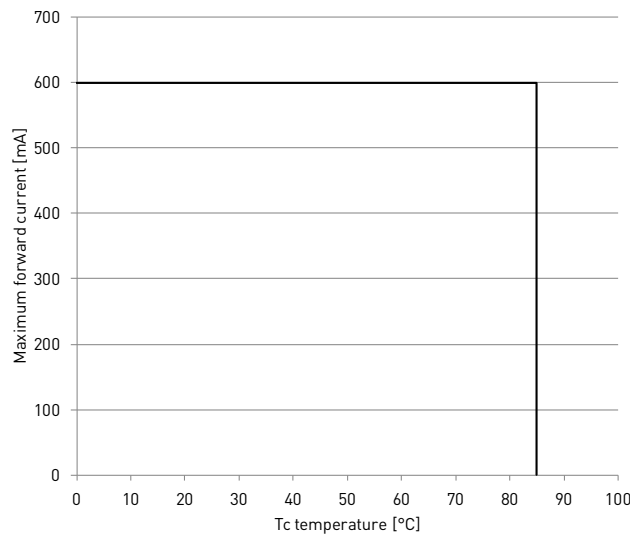
LUMINOUS FLUX VS FORWARD CURRENT



FORWARD VOLTAGE VS FORWARD CURRENT



DERATING CURVE



LiC-282 LED module is suited for built-in usage in luminaires. In order to have safe and reliable operation, the LED luminaires will need to comply with the relevant standards and regulations (e.g. IEC/EN 60598-1). The LED luminaire shall be designed to adequately protect the LED modules from dust, moisture and pollution. The luminaire manufacturer is responsible for the correct choice and installation of the LED module / LED driver combination according to the application and product datasheets. Operating conditions of the LED modules may never exceed the specifications as per the product datasheets.

HANDLING OF THE LED MODULES

LED modules contain components (LED packages, chips) that are sensitive for mechanical stress, electrostatic discharge (ESD) and chemical contaminants. Improper handling of the modules might cause damage or even destruction of the LED modules. Damaged LEDs may show some unusual characteristics such as increase in leakage current, lowered turn-on voltage, or abnormal lighting of LEDs at low current. Please follow following instructions and the precautions given in the product datasheets while handling and assembling Helvar LED modules.

Storage conditions

- Unused LED modules are recommended to stored carefully in an original sealed ESD package preventing moisture, pollutants or ESD to cause damage the module.
- Storage temperature range: -20...+80 °C

Opening the package / resealing

- LED modules are kept in stable protected environment in the packaging, open the package only when you are ready to use the LED modules. If resealing of the original package is required remove excess air from the packaging and place the moisture absorber (silica-gel bag) in to the packaging and seal the ESD back with adhesive tape.

ESD precautions at luminaire assembly site

The LEDs are sensitive to the electrostatic discharge (ESD) and surge current. If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices.

- IEC / EN 61340-5-1: Protection of electronic devices from electrostatic phenomena – General Requirements describes procedures for protection for damage caused by electrostatic discharge while handling electronic devices, following list lists basic protective measures described in the standard.

ESD protection measures in handling and assembling LED modules

- Employee training for correct handling .
- Personnel grounding via wrist band / footwear.
- ESD protective clothing / shoes.
- Handle LED modules only in ESD protected areas and workplaces.

CHEMICAL CONSIDERATIONS

Chemical substances may cause damage the LED module by causing discoloration, loss of luminous flux or total failure of the module.

Avoid materials and substances containing:

- VOCs - Volatile Organic Compounds that may occur in adhesives or sealings, verify that the materials used in the luminaires are not causing VOCs
- Halogen compounds
- Chlorine
- Acetates
- Sulphuric compounds.

Never look directly into an operational LED module without suitable protective eye wear!

ELECTRIC & THERMAL CONSIDERATIONS

Wiring insulation

- According to recommendations in IEC / EN 60598.

Wire connections

- Please refer to LED driver datasheets connections diagram.
- Wrong polarity might damage the LED modules.

Choosing the LED driver

- To guarantee the safe and reliable operation of the L-iC series LED-modules the LED driver must be provided with open and short circuit protection.
- LIC series modules are designed to be used with constant current output type LED driver.

Electrical design, electrical safety

During the design it is luminaire manufacturers responsibility to follow the international and national electric design regulations and recommendations for the electric safety and luminaire protection. Electric safety classification and protection class is depending on:

- Actual luminaire design and safety classification
- LED driver insulation
- LED driver output isolation.

ALWAYS CHECK AND FOLLOW EXACT REGULATIONS FROM LATEST RELEVANT IEC / EN STANDARDS.

Maximum ambient and tc temperature

- The maximum ambient temperature is a guideline given for built-in components such as LED modules. However, integrator must always ensure proper thermal management (i.e. mounting base of the module, possible heatsink, air flow etc.) so that the tc point does not exceed the tc max limit.
- Reliable operation is only guaranteed if the maximum tc point temperature is not exceeded under the conditions of use.
- Lifetime is only guaranteed if the maximum tc point temperature specified for lifetime is not exceeded under the conditions of use.

MECHANICAL CONSIDERATIONS

- While handling the LED modules avoid mechanical stress or pressure applied to the light emitting surface of the LEDs.
- Avoid dropping the modules.
- Bending of the modules is not permitted.
- Avoid touching the light emitting surface.
- Mechanical modifications (e.g. drilling, milling or sawing the module) are not permitted.

INSTALLATION CONSIDERATIONS

The LiC series modules are basic isolated against ground and can be installed on properly insulated metal parts of the luminaire. We recommend using Helvar LMC mounting parts, plastic screws, clips or a combination of M4 metal screws and insulating plastic washers for safe operation.

Please follow regulations from IEC/EN 60598-1 for creepage and clearance requirements. More information in LS/LP Series installation guide, available on product website's Download & Links section.

Conformity & standards

| | |
|--|-------------------------------------|
| Led modules for general lighting - safety specifications | IEC / EN 62031 |
| Photobiological safety of lamps and lamp systems | IEC / EN 62471 TR IEC / EN 62778 |
| Compliant with relevant EU directives | |
| CE marked | |
| RoHS / REACH compliant | |

All data were deemed correct at time of creation. Helvar is not liable for errors or omissions.