

Linear LED Module, LS20 Series

Product code: 5168

350 mA, 28.7 V

- Slim 280 mm linear module, high efficacy up to 182 lm/W at T_c = 25 °C
- Narrow width of 20 mm to suit various applications
- Homogenous light distribution, 30 LED packages with pitch of 9.3 mm between LEDs
- Accurate initial colour consistency of MacAdam (SDCM) 3-step
- Working voltage rated up to 400 V
- Modular product platform for design flexibility
- Designed for easy installation and series connection



	Nominal colour temperature [K]	Luminous flux (Φ _v)		Forward voltage (V _f)		Luminous efficacy		Power consumption T _c = 65 °C Typ. [W]	CRI
		T _c = 65 °C Typ. [lm]	T _c = 25 °C Typ. [lm]	T _c = 65 °C Typ. [V]	T _c = 25 °C Max. [V]	T _c = 65 °C Typ. [lm/W]	T _c = 25 °C Typ. [lm/W]		
<i>Efficient @ 250 mA</i>									
LS20-282-830-1500lm	3000	1100	1180	28.3	29.7	155	164	7.1	> 80
LS20-282-840-1500lm	4000	1160	1240			164	173		
<i>Nominal @ 350 mA</i>									
LS20-282-830-1500lm	3000	1500	1620	28.7	30.4	150	158	10.0	> 80
LS20-282-840-1500lm	4000	1580	1700			158	165		
<i>Maximum @ 450 mA</i>									
LS20-282-830-1500lm	3000	1900	2050	29.6	31.0	143	152	13.3	> 80
LS20-282-840-1500lm	4000	2000	2160			151	160		

Tolerance for the values of CCT, luminous flux and forward voltage in the table is < ±7 %

Electrical specifications

Direct current supply only	LS20-282	
	Nominal	Max.
Operating Current [mA]	350	450
Operating Voltage [V]	28.7 ¹⁾	31.0 ²⁾

¹⁾ At 350 mA, T_c = 65 °C ²⁾ At 450 mA, T_c = 25 °C

Maximum rated voltage in circuit 400 V¹⁾

ESD protection tested:
(according to IEC 61547 cl 5.2)²⁾

Air discharge	8 kV
Contact discharge	4 kV
IP rating	IP00

¹⁾ Please refer to the LS/LP Series installation guide for details

²⁾ In addition, tested with 30 kV contact discharge to terminals and T_c point

Photometric specifications

Colour consistency at initial time	3 MacAdam steps
Colour Rendering Index	> 80
Beam angle	120°
Photobiological risk group	RG1 unlimited

Lifetime specifications

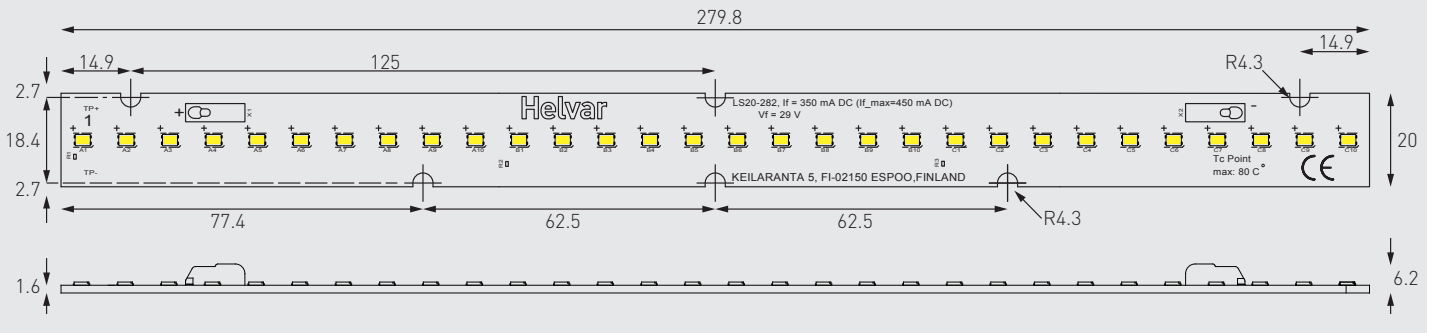
Operating current	T _c Temp	L70B50	L70B20	L70B10	L80B50	L80B10	L90B50
Efficient 250 mA	65 °C	> 50 000	> 50 000	> 50 000	> 50 000	> 50 000	> 50 000
Nominal 350 mA	65 °C	> 50 000	> 50 000	> 50 000	> 50 000	> 50 000	> 50 000
Maximum 450 mA	65 °C	> 50 000	> 50 000	> 50 000	> 50 000	> 50 000	> 47 000

Lumen depreciation estimations in hours

Operating Conditions and Characteristics

Tip point (performance measurements) T _c = 65 °C	
Max. temperature at T _c point	80 °C
Ambient temperature range	-20...+50 °C
Storage temperature	-20...+80 °C
Humidity	No condensation

Dimensions



Length	279.8 ± 0.2 mm
Width	19.8 ± 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

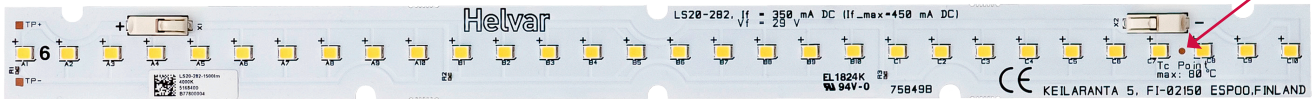
ESD foam trays, antistatic bag and carton box

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

T_c (T_p) Point : See the below red mark.



Connection examples

2 x LS20-282A-1500lm modules connected in parallel with Helvar LC35SE-CC-350-850 (SELV60) LED driver at 700 mA (350 mA per LED module) driving current



With LC35SE-CC-350-850 LED Driver, the selected output current is reached with 700 mA LED-Isset resistor (190700, resistance value 7.15 kΩ)

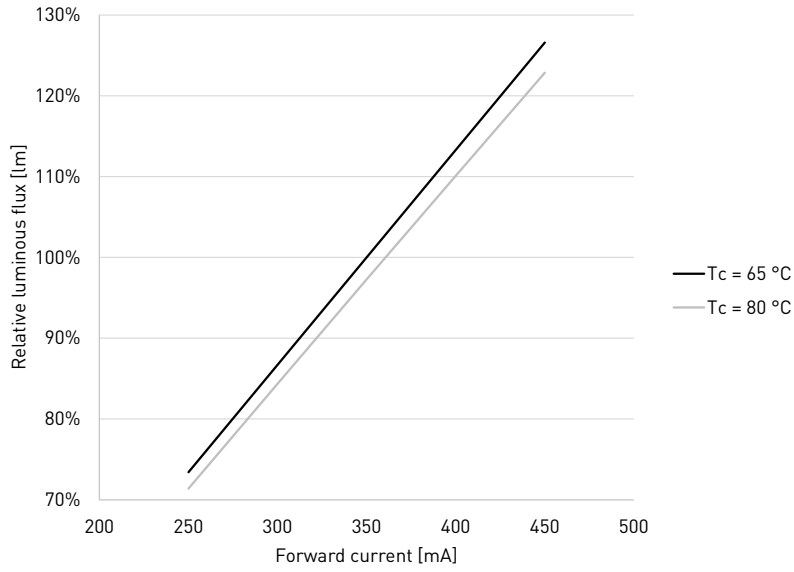
2 x LS20-562-3100lm and 1 x LS20-282-1500lm modules connected in series with Helvar LL65HE-CC-250-700 LED driver at 350 mA module driving current



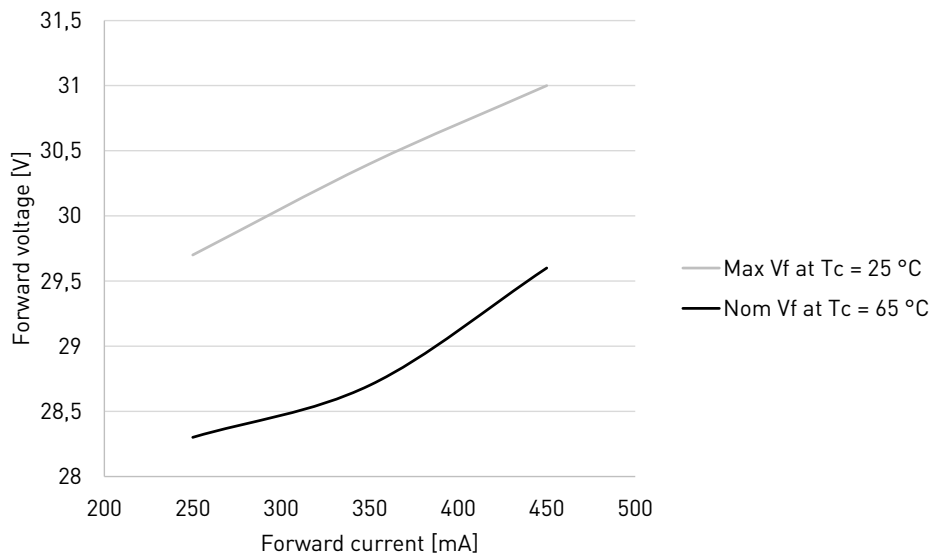
With LL65HE-CC-250-700 LED Driver, the selected output current is reached with 350 mA LED-Isset resistor (190350, resistance value 14.3 kΩ)

Specification diagrams

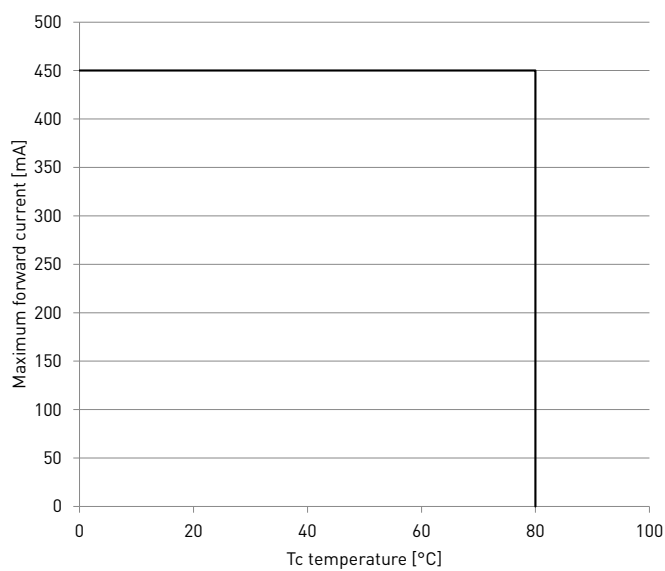
LUMINOUS FLUX VS FORWARD CURRENT



FORWARD VOLTAGE VS FORWARD CURRENT



DERATING CURVE



LS20-282-1500lm 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 LS20 series LED-modules the LED driver must be provided with open and short circuit protection.
- LS20 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 LS20 series modules are basic isolated against ground and can be installed on properly insulated metal parts of the luminaire. We recommend using 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.