

LED LINE SMD SLIM GEN. 2

LED LIGHTING MODULES
WITH COVER



LED LINE SMD SLIM GEN. 2

Lighting modules with cover

Consisting of one energy-efficient LED Line SMD Slim, a thermo-conductive resin adhesive tape and a cover, this LED Line Slim constitutes an ideal way of facilitating direct conversion to modern LED technology.

Enabling fast, reliable and flexible fixing inside the luminaire via

- adhesive tape
- clip fitting (Zhaga-compliant)
- screw fitting

the unit constitutes an ideal solution for indoor linear lighting applications.

Typical Applications

Built-in luminaires/general illumination

- Office lighting
- Retail, corridor and shelf lighting
- T5/T8 replacement as built-in module
- Furniture lighting
- Backlighting for advertising




LED Line SMD Slim Gen. 2

- **COMPACT AND SLIM DESIGN**
- **LONG SERVICE LIFE TIME: 50,000 H (L80, B10)**
- **HIGHLY EFFICIENT: UP TO 185 LM/W
AT T_p = 50 °C**
- **2 LENGTHS AVAILABLE: 280 MM / 560 MM**

LED Line SMD Slim Gen. 2 – PCB

Technical Notes

- LED built-in module for integration into luminaires 
- Dimensions
WU-M-499: 280x14.5 mm
WU-M-500: 560x14.5 mm
- Driving current: 350 mA / 500 mA / 700 mA
- On-board push-in terminals



Electrical Characteristics

at $t_p = 50\text{ °C}$

Type	No. of SMDs	Voltage DC (V)									Temperature coefficient mV/K	Power consumption (W)								
		350 mA			500 mA			700 mA				350 mA			500 mA			700 mA		
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.
WU-M-499-G	30	13.0	13.9	15.5	13.5	14.4	16.0	14.2	15.1	16.7	-16.63	4.5	4.9	5.4	6.8	7.2	8.0	9.9	10.6	11.7
WU-M-499-G-HB	30	25.7	27.3	28.7	26.5	28.1	29.5	27.5	29.2	30.5	-33.26	9.0	9.6	10.0	13.3	14.1	14.8	19.3	20.4	21.4
WU-M-500-G	60	26.0	27.8	31.0	27.1	28.9	32.1	28.3	30.1	33.3	-33.26	9.1	9.7	10.8	13.6	14.5	16.1	19.8	21.1	23.3
WU-M-500-G-HB	60	51.3	54.6	57.3	53.0	56.3	59.0	55.1	58.4	61.1	-66.51	18.0	19.1	20.1	26.5	28.2	29.5	38.6	40.9	42.8

Use of external LED constant current driver required.

Maximum Ratings

Exceeding the maximum ratings can lead to reduction of service life or destruction of the module.

Type	Operating current mA	Operation temperature range at t_c point °C min. °C max.		Storage temperature range °C min. °C max.		Max. allowed repetitive peak current (mA)
		°C min.	°C max.	°C min.	°C max.	
All types	350	-20	+75	-20	+85	1270
	500					1200
	700					1110

Optical Characteristics

at $t_p = 50\text{ °C}$; without secondary optics

The specified values apply only to the version of the LED module without a cover.

The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

Type	Ref. No.	Colour	Correlated colour temperature* K	Luminous flux (lm) and efficiency (lm/W) at									CRI		Beam angle °	Photo-metric code
				350 mA			500 mA			700 mA			min. R_g	typ. R_g		
				min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W				

LED Line SMD Slim Gen. 2 – PCB – 280 mm

WU-M-499-G-830	560147	warm white	3000	755	835	171	1055	1170	162	1445	1600	152	80	85	120	830/349
WU-M-499-G-840	560148	neutral white	4000	785	875	180	1100	1230	170	1505	1680	159	80	85	120	840/349
WU-M-499-G-850	560149	neutral white	5000	855	900	185	1200	1260	175	1640	1725	164	80	85	120	850/349
WU-M-499-G-865	560150	cool white	6500	785	885	182	1100	1245	172	1505	1700	161	80	85	120	865/349
WU-M-499-G-HB-830	560156	warm white	3000	1435	1590	166	2015	2230	159	2760	3055	149	80	85	120	830/349
WU-M-499-G-HB-840	560157	neutral white	4000	1565	1670	175	2200	2345	167	3005	3210	157	80	85	120	840/349
WU-M-499-G-HB-850	560158	neutral white	5000	1565	1700	178	2200	2390	170	3005	3265	160	80	85	120	850/349
WU-M-499-G-HB-865	560159	cool white	6500	1565	1665	174	2200	2340	166	3005	3205	157	80	85	120	865/349

* Measurement tolerance: $\pm 7\%$ | CRI > 90 on request

Minimum order quantity (packaging unit): 75 pcs.

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

LED Line SMD Slim Gen. 2 – PCB

Optical Characteristics

at $t_p = 50\text{ °C}$; without secondary optics

The specified values apply only to the version of the LED module without a cover.

The following efficiency levels can be achieved when using a cover: clear (97%), diffuse (90%)

Type	Ref. No.	Colour	Correlated colour temperature* K	Luminous flux (lm) and efficiency (lm/W) at									CRI		Beam angle °	Photo-metric code
				350 mA			500 mA			700 mA			min.	typ.		
				min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	R _a	R _a		
LED Line SMD Slim Gen. 2 – PCB – 560 mm																
WU-M-500-G-830	560152	warm white	3000	1505	1665	171	2115	2340	162	2890	3200	152	80	85	120	830/349
WU-M-500-G-840	560153	neutral white	4000	1570	1750	180	2200	2455	170	3010	3360	159	80	85	120	840/349
WU-M-500-G-850	560154	neutral white	5000	1710	1795	185	2400	2520	175	3280	3450	164	80	85	120	850/349
WU-M-500-G-865	560155	cool white	6500	1570	1770	182	2200	2485	172	3010	3400	161	80	85	120	865/349
WU-M-500-G-HB-830	560160	warm white	3000	2870	3175	166	4035	4465	159	5520	6105	149	80	85	120	830/349
WU-M-500-G-HB-840	560161	neutral white	4000	3130	3340	175	4395	4695	167	6015	6420	157	80	85	120	840/349
WU-M-500-G-HB-850	560162	neutral white	5000	3130	3400	178	4395	4775	170	6015	6535	160	80	85	120	850/349
WU-M-500-G-HB-865	560163	cool white	6500	3130	3335	174	4395	4685	166	6015	6405	157	80	85	120	865/349

* Measurement tolerance: $\pm 7\%$ | CRI > 90 on request

Minimum order quantity (packaging unit): 75 pcs.

Operating Life

L80/B10

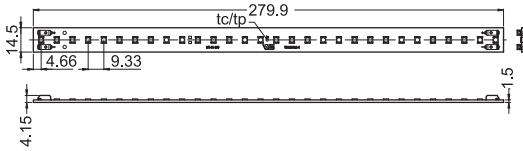
in hours at measured temperature at t_p point

	350 mA			500 mA			700 mA		
	40 °C	50 °C	75 °C	40 °C	50 °C	75 °C	40 °C	50 °C	75 °C
WU-M-499-G/500-G	> 60,000	> 60,000	> 60,000	> 60,000	> 60,000	58,000	> 60,000	> 60,000	48,000

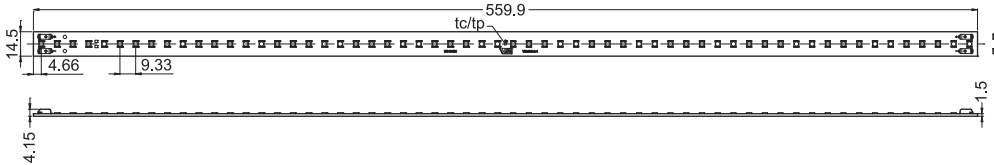
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LED Line SMD Slim Gen. 2 – PCB

Mechanical Dimensions SMD Board



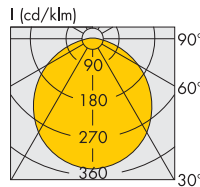
WU-M-499-G



WU-M-500-G

Typical Light Distribution Curves

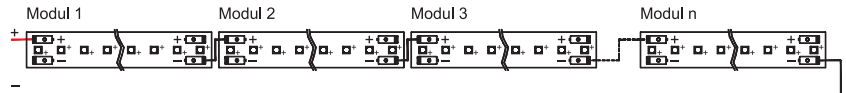
Data are available in .ldt format for download under www.vossloh-schwabe.com.



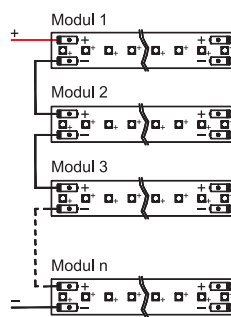
Connection Examples

- The number of modules that can be connected in series depends on the available output voltage of the LED driver.
- The clearance and creepage distances for basic isolation (Class 1 luminaires) are designed for max. voltage of 500 V (rms).
The clearance and creepage distances for reinforced isolation (Class 2 luminaires) are designed for max. voltage of 250 V (rms).
In case of assembly of the LED modules in profiles (e.g. aluminium) where the profile touches the top edge of the PCB the clearance and creepage distances are reduced to 300 V DC (basic insulation) and 150 V DC (reinforced insulation).
- The modules are connected in series in both wiring examples.

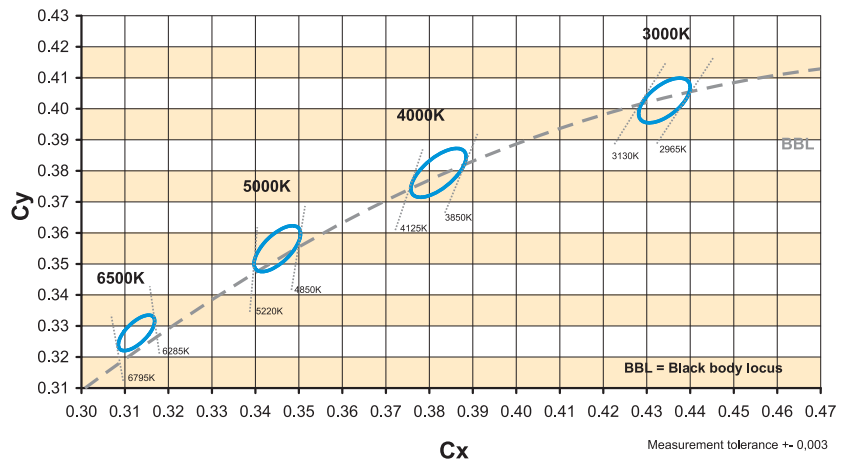
Serial Connection (Option 1)



Serial Connection (Option 2)



Bins



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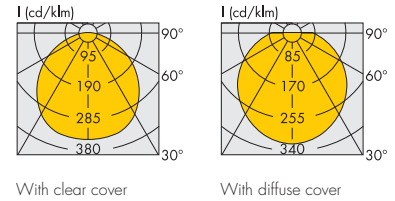
LED Line SMD Slim Gen. 2

Lighting modules with cover

LED Line SMD Slim consists of an energy-efficient linear SMD module and a cover with several attachment options. The module was designed for integration into indoor luminaires providing direct or indirect light.

The fast, safe and flexible adhesive-based, click on (ZHAGA-compliant L56V2 hole spacing) or screw-based options for fixing the module within the luminaire constitute an ideal solution for linear lighting applications.

The light module is fitted with either a clear or diffuse cover that serves to protect it and, in the diffuse version, to reduce glare and distribute light in a similar manner to a fluorescent lamp.



Reference numbers – Module length: 280 mm

Fixing Cover	For tape fixing – type: 89510		For screw fixing – type: 89511		For clip fixing – type: 89512	
	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse
SMD0283000	561199	561203	561207	561211	561215	561219
SMD0284000	561200	561204	561208	561212	561216	561220
SMD0285000	561201	561205	561209	561213	561217	561221
SMD0286500	561202	561206	561210	561214	561218	561222
SMD0283000	561223	561227	561231	561235	561239	561243
SMD0284000	561224	561228	561232	561236	561240	561244
SMD0285000	561225	561229	561233	561237	561241	561245
SMD0286500	561226	561230	561234	561238	561242	561246

Reference numbers – Module length: 560 mm

Fixing Cover	For tape fixing – type: 89560		For screw fixing – type: 89561		For clip fixing – type: 89562	
	Clear	Diffuse	Clear	Diffuse	Clear	Diffuse
SMD0563000	561247	561251	561255	561259	561263	561267
SMD0564000	561248	561252	561256	561260	561264	561268
SMD0565000	561249	561253	561257	561261	561265	561269
SMD0566500	561250	561254	561258	561262	561266	561270
SMD0563000	561271	561275	561279	561283	561287	561291
SMD0564000	561272	561276	561280	561284	561288	561292
SMD0565000	561273	561277	561281	561285	561289	561293
SMD0566500	561274	561278	561282	561286	561290	561294

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LED Line SMD Slim Gen. 2 – Covers

Material: PC

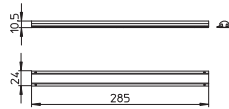


LED Line SMD Slim for tape fixing

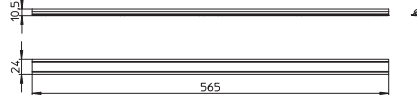
With cover for tape fixing
Degree of protection: IP20
With base thermal tapes
Weight: 30.5/67 g, unit: 6 pcs.
Type: 89510/89560

Module length mm	Drawing	Dimensions (LxWxH) mm
280	A	285x24x10.5
560	B	565x24x10.5

A – For tape fixing – type 89510 – LED Line SMD Slim Gen. 2 280



B – For tape fixing – type 89560 – LED Line SMD Slim Gen. 2 560

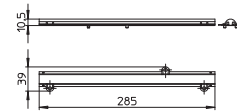


LED Line SMD Slim for screw fixing

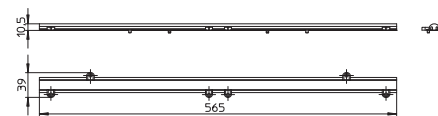
With cover for screw fixing
Degree of protection: IP20
Fixing holes for screws M4
Tightening torque: 0.6–0.7 Nm
With base thermal tapes
Weight: 31/69 g, unit: 4 pcs.
Type: 89511/89561

Module length mm	Drawing	Dimensions (LxWxH) mm
280	C	285x39x10.5
560	D	565x39x10.5

C – For screw fixing – type 89511 – LED Line SMD Slim Gen. 2 280



D – For screw fixing – type 89561 – LED Line SMD Slim Gen. 2 560

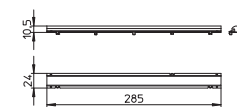


LED Line SMD Slim for clip fixing

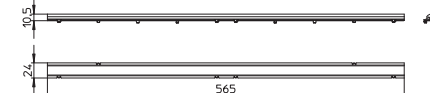
With cover for clip fixing
Degree of protection: IP20
Base fixing clips for wall thickness 0.4–1 mm
With base thermal tapes
Weight: 30.5/68 g, unit: 6 pcs.
Type: 89512/89562

Module length mm	Drawing	Dimensions (LxWxH) mm
280	E	285x24x10.5
560	F	565x24x10.5

E – For clip fixing – type 89512 – LED Line SMD Slim Gen. 2 280



F – For clip fixing – type 89562 – LED Line SMD Slim Gen. 2 560



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LED Line SMD Slim Gen. 2 – ComfortLine LED Drivers – with Selectable Current

**350/500/700 mA,
max. 40 W and max. 85 W**

The linear LED constant-current drivers are designed for use in office and retail lighting.

Electrical characteristics

Secondary side switching of LED modules is not allowed.

Power factor at full load: 0.97

Selectable current output

The required current output can be chosen by selecting the respective pin at the output terminal.

Connection details

Mains voltage: 220–240 V ±10%

Mains frequency: 50–60 Hz

Push-in terminals: 0.2–1.5 mm²

Safety features

Electronic short-circuit protection

Overtemperature protection

Protection against "no load" operation

Degree of protection: IP20

Protection class I

Product guarantee: 5 years

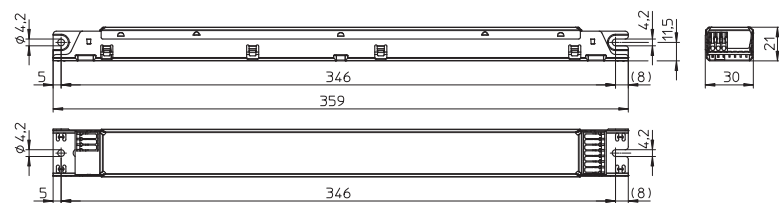


Expected service life time

at operation temperatures at t_c point

Operation current	Ref. No.			
	186444	186443		
350 mA	60 °C	50 °C	70 °C	60 °C
500 mA	65 °C	55 °C	75 °C	65 °C
700 mA	70 °C	60 °C	80 °C	70 °C
hrs.	50,000	100,000	50,000	100,000

M10



Max. output W	Type	Ref. No.	Mains voltage 50–60 Hz V	Mains current mA	Current output DC mA	Voltage output DC V	Max. voltage without load DC V	Efficiency at full load % (230 V)	Ambient temperature t_a °C	Casing temperature t_c °C	Weight g
M10 – Dimensions: 359x30x21 mm											
40	ECXe 700.148	186444	220–240	200–190	350 ±5%	57–114	< 250	> 90	–20 to 60	70	227
				205–190	500 ±5%	40–80		> 89		75	
				210–195	700 ±5%	28–57		> 88		80	
79	ECXe 700.147	186443	220–240	400–370	350 ±5%	120–225	< 250	> 94	–20 to 50	75	250
85				420–390	500 ±5%	80–170		> 93		75	
				420–390	700 ±5%	60–120		> 92		80	

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LED Line SMD Slim Gen. 2

Assembly and Safety Information

Installation must be carried out under observation of the relevant regulations and standards. The LED modules are designed for operation within a casing or luminaire. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains). The following advice must be observed; non-observance can result in the destruction of the LED assembly modules, fire and/or other hazards.

- Consider safety regulations acc. EN 60598 in the luminaire design, especially when the operating LED driver is not galvanic isolated.
 - In mode of operation regard to sufficient isolation.
 - Live parts must not be touched in operation mode.
- ESD (electrostatic discharge) protection measures must be observed when handling and installing the LED modules. See VS's application notes on ESD protection.
- Adequate anti-static electricity measures, including the use of conductive shoes, ionizers, work bench grounding, wrist straps, flooring and stools should be used.
- LED assembly modules must not be subjected to any undue mechanical stress, e. g.:
 - do not treat as bulk cargo
 - avoid shear and compressive forces during handling and installation
 - do not damage circuit paths
 - avoid any pressure on the light emitting surface
- Safe operation only possible by the use of external constant current sources (Max. allowed repetitive peak current see table "Electrical Characteristics").
- Operation only with power supply units that feature the following protection:
 - Short-circuit protection
 - Overload protection
 - Overheating protection
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- For interconnection the LED modules is equipped with push-in terminals (WAGO 2059).
- Safety regulations acc. to EN 60598 (or further standards) has to be observed if the maximum output voltage exceed the permitted touchable value.
- The following points must be observed when connecting LED modules in parallel:
 - All LED strings that are wired in parallel must contain the same number of LEDs (symmetrical loading).
 - Owing to differing forward biases, there can be a difference of up to 10% in brightness between modules connected in parallel.
- To ensure problem-free operation, the specified maximum temperature at the t_p point (see "Operating Life") must be observed (and measured in accordance with EN 60598-1). To satisfy this point, it may be necessary to put measures in place to ensure any heat is dissipated from the PCB to the environment.



- In the event of outdoor applications or applications in damp locations, care must be taken to protect LED assembly modules against humidity, splashes and jets of water. Any corrosion damage resulting from humidity or contact with condensation will not be recognised as a defect or manufacturing fault. LED assembly modules are not specially protected against foreign bodies or dust. Depending on the type of application, further protection must be ensured to prevent dust and foreign bodies from entering.
- Due to the manufacturing process, the PCBs of the LED assembly modules can have sharp edges and corners. Care must therefore be taken during handling and installation to avoid injury.
- For optimal load of used constant current driver the modules can be connected in series. The quantity of LED modules is limited by the sum of forward voltage and the capacity of used constant current driver. Safety regulations acc. to EN 60598 has to be observed if the sum of forward voltage exceed the permitted touchable value.
- Operating LED modules in the presence of certain chemical substances or in chemically enriched (aggressive) environments can impair module functionality or even cause total module failure. Detailed information can be found in our "Chemical Incompatibility" PDF on our website www.vossloh-schwabe.com
- The photobiological safety of the LED modules must be classified into risk groups in accordance with EN 62471: 2008.
 - general lighting: exempt group
 - other applications: risk group 1Rating in accordance with IEC / TR 62778: risk group 1

Applied Standards

EN 62031
LED modules for general lighting – Safety specifications

EN 62471
Photobiological safety of lamps and lamp systems

Product Guarantee

- 5 years
- The conditions for the Product Guarantee of the Vossloh-Schwabe Group shall apply as published on our homepage (www.vossloh-schwabe.com). We will be happy to send you these conditions upon request.

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