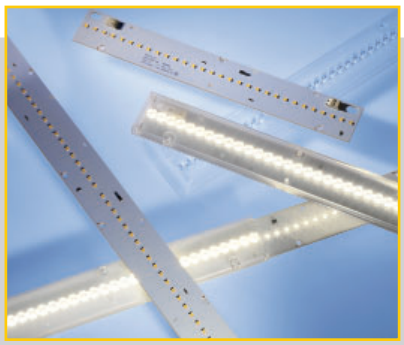
LED LINE SMD KIT GEN. 4

WU-M-480/-481-S2
WU-M-501/-502-S2



LED LINE SMD KIT GEN. 4

WU-M-480/-481-S2 and WU-M-501/-502-S2

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 SMD Kit Gen. 4

- **LONG SERVICE LIFE TIME: 50,000 H (L80, B10)**
- **HIGHLY EFFICIENT: UP TO 201 LM/W AT T_P = 50 °C**
- **TWO POWER CLASSES**
- **2 LENGTHS AVAILABLE: 280 / 560 MM**
- **FLEXIBLE LIGHT DISTRIBUTION BY DIFFERENT OPTICS**
- **ZHAGA-COMPLIANT HOLE DISTANCE**

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LED Line SMD Kit Gen. 4

Technical Notes

- LED built-in module for integration into luminaires
- Dimensions
  WU-M-480-S2/501-S2: 280x40 mm
  WU-M-481-S2/502-S2: 560x40 mm
- Driving current: 350 mA / 500 mA / 700 mA / 1050 mA
- On-board push terminal system
- Beam angle: 120°
- Colour tolerance: 3-step MacAdam

Electrical Characteristics

at t_p = 50 °C

Type	No. of LEDs	Typ. voltage DC				Typ. power consumption			
		350 mA V	500 mA V	700 mA V	1050 mA V	350 mA W	500 mA W	700 mA W	1050 mA W
WU-M-480-S2	30	13.5	13.8	14.1	14.6	4.7	6.9	9.9	15.4
WU-M-481-S2	60	27	27.5	28.2	29.3	9.4	13.8	19.7	30.7
WU-M-501-S2	15	8.2	8.4	8.6	9	2.9	4.2	6	9.4
WU-M-502-S2	30	16.3	16.7	17.2	17.9	5.7	8.4	12	18.8

Voltage and power tolerance: ±10%

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
WU-M-480-S2/ WU-M-481-S2	350	–20	+75	–20	+85	2400
	500	–20	+75	–20	+85	2400
	700	–20	+75	–20	+85	2400
	1050	–20	+75	–20	+85	2400
WU-M-501-S2/ WU-M-502-S2	350	–20	+75	–20	+85	2000
	500	–20	+75	–20	+85	2000
	700	–20	+75	–20	+85	2000
	1050	–20	+75	–20	+85	2000

Operating Life

L80/B10

in hours at measured temperature at t_p point

	350 mA			500 mA			700 mA			1050 mA		
	40 °C	50 °C	75 °C	40 °C	50 °C	75 °C	40 °C	50 °C	75 °C	40 °C	50 °C	75 °C
WU-M-480-S2	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000
WU-M-481-S2	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000
WU-M-501-S2	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000
WU-M-502-S2	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000	> 54,000

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LED Line SMD Kit Gen. 4

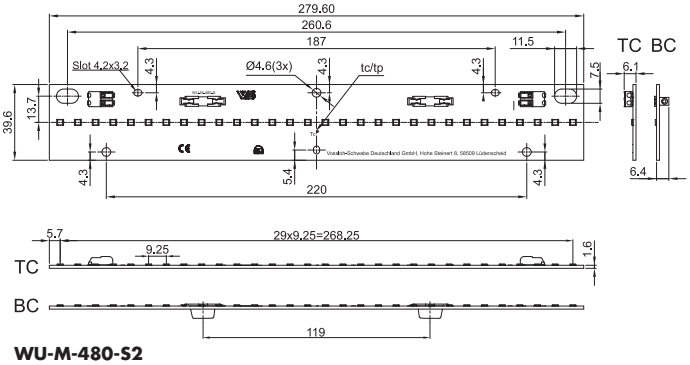
Optical Characteristics

at t_p = 50 °C; without secondary optics
CRI R_a 80

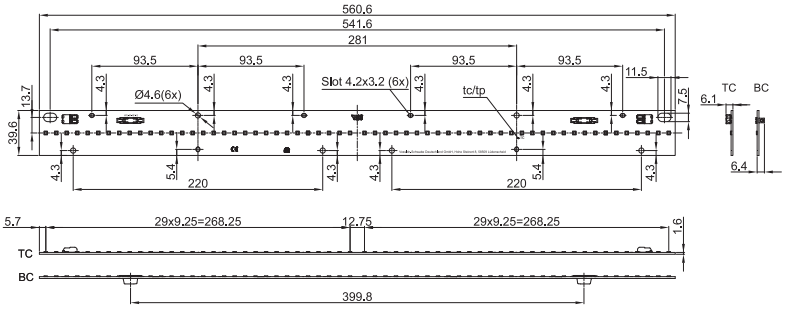
Type	Ref. No. Connection Top (TC)	Bottom (BC)	Colour	Correlated colour temperature* K	Luminous flux** (lm) and efficiency (lm/W) at 350 mA typ. lm	typ. lm/W	500 mA typ. lm	typ. lm/W	700 mA typ. lm	typ. lm/W	1050 mA typ. lm	typ. lm/W	Photometric code
LED Line SMD Kit Gen. 4 – 280 mm – 30 LEDs													
WU-M-480-S2-TC/BC-830	**569481**	**569485**	warm white	3000	890	189	1250	182	1720	175	2520	164	830/349
WU-M-480-S2-TC/BC-840	**569482**	**569486**	neutral white	4000	950	201	1330	194	1835	186	2685	175	840/349
WU-M-480-S2-TC/BC-850	**569483**	**569487**	neutral white	5000	950	201	1330	194	1835	186	2685	175	850/349
WU-M-480-S2-TC/BC-865	**569484**	**569488**	cool white	6500	880	187	1240	180	1705	173	2495	162	865/349
LED Line SMD Kit Gen. 4 – 560 mm – 60 LEDs													
WU-M-481-S2-TC/BC-830	**569473**	**569477**	warm white	3000	1780	189	2500	182	3445	175	5045	164	830/349
WU-M-481-S2-TC/BC-840	**569474**	**569478**	neutral white	4000	1895	201	2665	194	3665	186	5370	175	840/349
WU-M-481-S2-TC/BC-850	**569475**	**569479**	neutral white	5000	1895	201	2665	194	3665	186	5370	175	850/349
WU-M-481-S2-TC/BC-865	**569476**	**569480**	cool white	6500	1760	187	2475	180	3405	173	4990	162	865/349
LED Line SMD Kit Gen. 4 – 280 mm – 15 LEDs													
WU-M-501-S2-TC/BC-830	**569465**	**569469**	warm white	3000	530	185	745	178	1020	170	1490	159	830/349
WU-M-501-S2-TC/BC-840	**569466**	**569470**	neutral white	4000	565	197	790	190	1090	181	1590	169	840/349
WU-M-501-S2-TC/BC-850	**569467**	**569471**	neutral white	5000	565	197	790	190	1090	181	1590	169	850/349
WU-M-501-S2-TC/BC-865	**569468**	**569472**	cool white	6500	525	183	735	176	1010	168	1475	157	865/349
LED Line SMD Kit Gen. 4 – 560 mm – 30 LEDs													
WU-M-502-S2-TC/BC-830	**569457**	**569461**	warm white	3000	1060	185	1485	178	2045	170	2985	159	830/349
WU-M-502-S2-TC/BC-840	**569458**	**569462**	neutral white	4000	1130	197	1585	190	2175	181	3175	169	840/349
WU-M-502-S2-TC/BC-850	**569459**	**569463**	neutral white	5000	1130	197	1585	190	2175	181	3175	169	850/349
WU-M-502-S2-TC/BC-865	**569460**	**569464**	cool white	6500	1050	183	1470	176	2025	168	2950	157	865/349

* Colour tolerance: 3 McAdams | ** Production tolerance of luminous flux and efficiency: ±10% | CRI > 90 on request
Minimum order quantity (packaging unit): 50 pcs.

Mechanical Dimensions SMD Board



WU-M-480-S2



WU-M-481-S2

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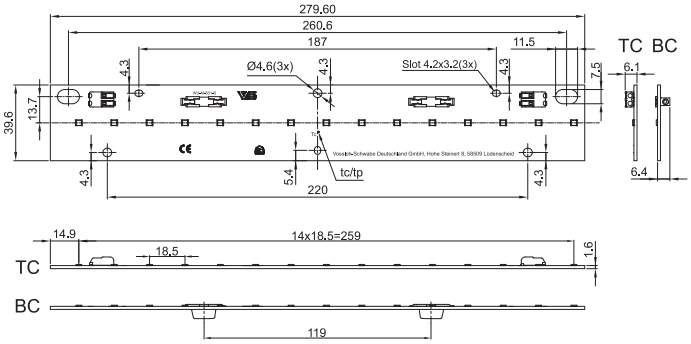
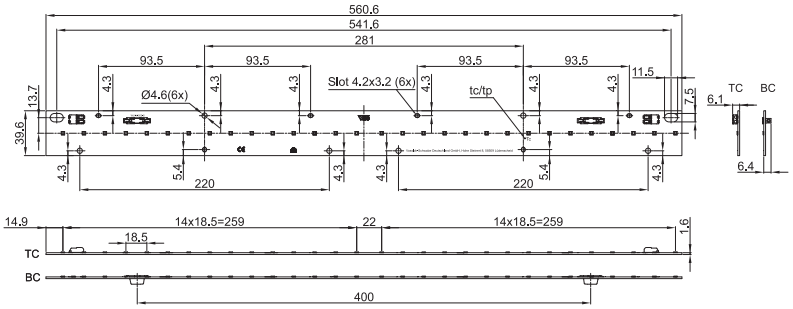
LED Line SMD Kit Gen. 4

Mechanical Dimensions SMD Board



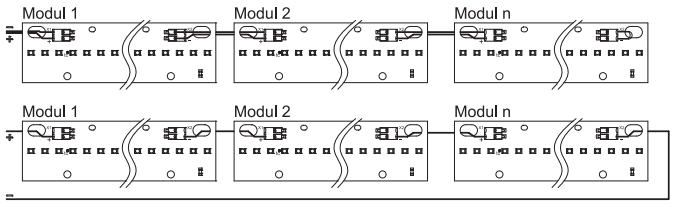
WU-M-501-S2



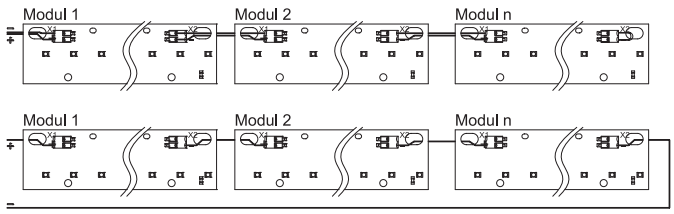
WU-M-502-S2

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 are designed for working voltages up to 450 V DC.
- Max. diameter of screw head (M4): 8 mm
- The modules are connected in series in both wiring examples.
- Due to different forward voltages and power classes it is not recommended to use WU-M-480/481-S and WU-M-501/502-S in one application.



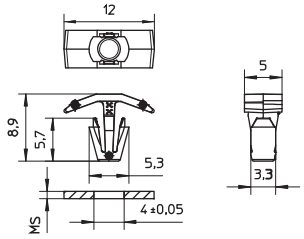
WU-M-480-S / WU-M-481-S



WU-M-501-S / WU-M-502-S

Fixing Clip

For fastening LED PCBs to luminaire sheets without needing screws
PCB hole dia.: 4.3–4.5 mm
Vibration resistant version
Material: PC, white (UL-94 V2)
Weight: 0.2 g, Packaging unit: 1000 pcs. (.11 = 10,000 pcs.)



Type	**Ref. No.**	For luminaire sheet thickness (MS) mm
98050	**562870**	0.5–1.0*

* PCB thickness: 1.6 mm

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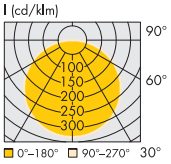
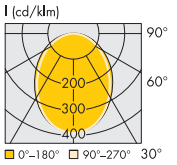
LED Line SMD Kit Gen. 4

Typical Light Distribution Curves

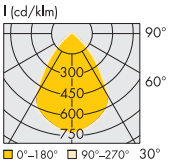
Data are available in .ldt format for download under www.vossloh-schwabe.com.



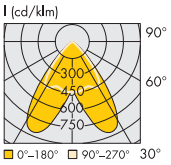
Without optics



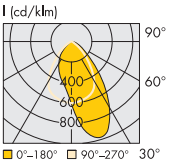
Diffuse



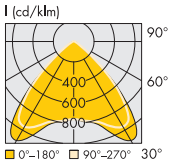
Standard



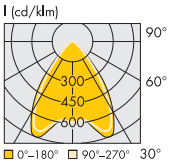
Retail SYM



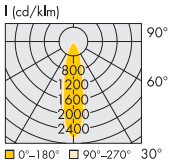
Retail ASYM



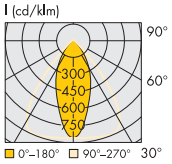
ExtraWide 90°



Wide 60°

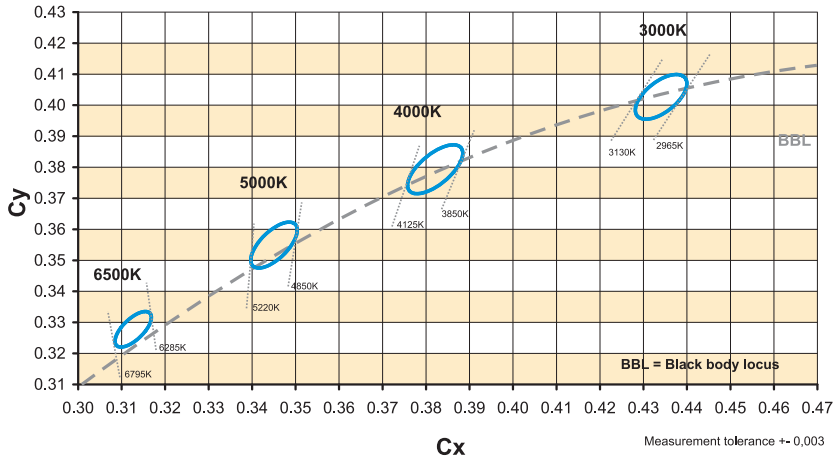


Narrow



High Rack

Bins



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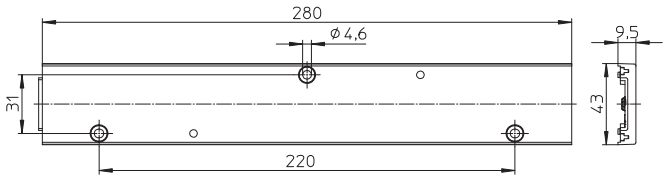
LED Line SMD Kit Gen. 4

Technical Notes for Optics

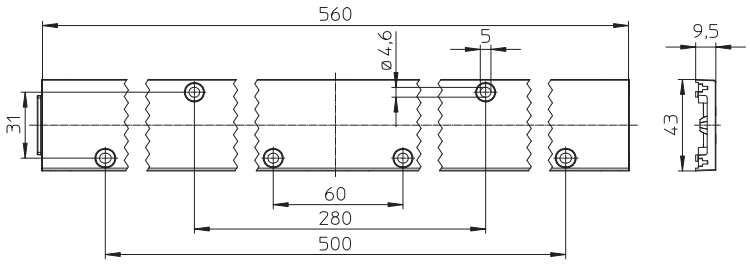
Highly efficient of up to 95%
Material: PMMA
Dimensions (LxWxH): 280 or 560x43x9.5 mm
optics can be stringed together,
for modules 280 mm, 560 mm and module chains
Max. allowed temperature: 80 °C
Fixation with flat or cylinder head screws (M4)
or with fixing clip (see below)
Max. torque: 1.2 Nm (M4)
Packaging unit 280 mm/560 mm: 192/96 pcs.

Light distribution	Optics type	**Ref. No.**	Efficiency %	Weight g
Optics length: 280 mm				
Standard	98810	**555437**	95	50
Diffuse	98810	**559972**	88	50
Extra Wide 90°	98813	**560570**	95	50
Wide 60°	98816	**560573**	95	50
Narrow 30°	98814	**560571**	95	50
Retail SYM	98811	**555438**	95	50
Retail ASYM	98812	**555439**	95	50
High Rack	98817	**563598**	95	50
Optics length: 560 mm				
Standard	98850	**562984**	95	107
Retail SYM	98851	**563524**	95	107

Optics length: 280 mm



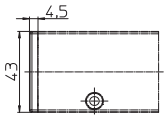
Optics length: 560 mm



End Cap

Lateral fixation at the optics
with tongue and groove
Weight: 0.9 g, Packaging unit: 500 pcs.
Type: 98810
Ref. No.: 555482

End Cap



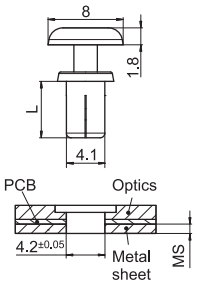
Fixing Clip

For fastening LED optics of type 988 and LED PCBs
to luminaire sheets without needing screws
Vibration resistant version
Material: PA, natural (UL-94 V-2)
Weight: 0.2 g, Packaging unit: 1000 pcs.

Type	**Ref. No.**	For luminaire sheet thickness* (MS) mm	Length L mm
98002	**562558**	0.5–1.3	9
98003	**562559**	1.4–2.2	10

* For PCB thickness: 1.5 mm

Fixing Clip



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Linear LED
Constant Current Drivers

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LED constant current drivers: www.vossloh-schwabe.com

LED Line SMD Kit Gen. 4

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 luminair 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. Danger in life!!!

- 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 sould 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 ($I_{max.}$ see table "Electrical Characteristics").
- Operation only with power supply units that feature the following protection:
  - Short-circuit protection
  - Overload protection
  - Overheating protection
- The module can be fixed with M4 screws. Fixation only with flat or cylinder head screws (M4) /countersank screws)
  Max. torque: 1.2 Nm (M4)
- 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 2060).
- 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.

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LED Line SMD Kit Gen. 4

Assembly and Safety Information

- 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 only 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
  Rating in accordance with IEC / TR 62778: risk group 1

Type	CCT K	Max. operating current for risk group 1 mA	E threshold (E_{thr}) for higher operating currents to be risk group 1 (lx)
WU-M-480/-481-S2	≤ 4000	1692	1130
	5000	1400	928
	6500	1100	773
WU-M-501/-502-S2	≤ 4000	1410	1130
	5000	1167	928
	6500	917	773

Applied Standards

EN 62031
LED modules for general lighting – Safety specifications

pending

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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