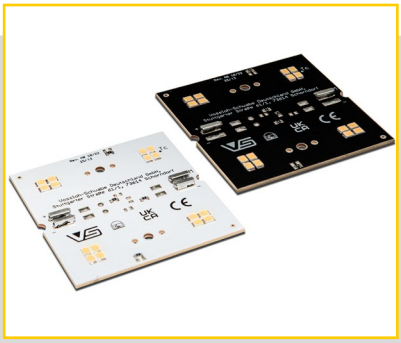
LED SMD LIGHT&DARK SQUARE



LED SMD LIGHT&DARK SQUARE

WU-M-709-W/B, WU-M-709-W/B-LV

Typical Applications
Built-in luminaires/general illumination
- Office lighting
- Retail, corridor and shelf lighting
- Residential lighting

LED SMD Light&Dark Square

- **LONG SERVICE LIFE TIME: 90,000 H (L80, B10)**
- **HIGHLY EFFICIENT: UP TO 205 LM/W AT T_P = 50 °C**
- **SQUARE SHAPE**
- **SELV AND NON-SELV VARIANTS AVAILABLE**
- **2 PCBS COLOR AVAILABLE: WHITE AND BLACK**
- **ENEC APPROVED**

LIGHTING SOLUTIONS
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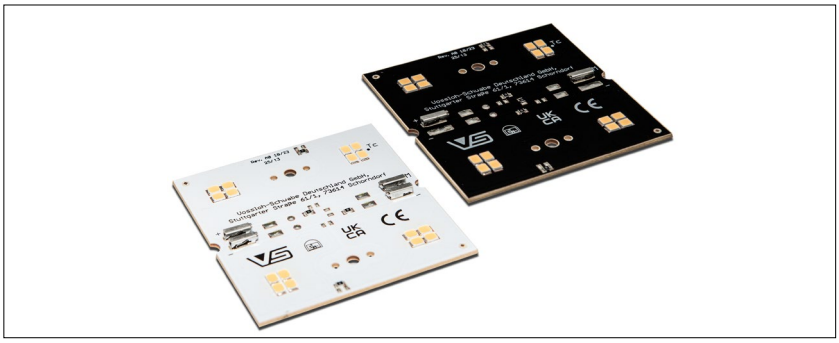
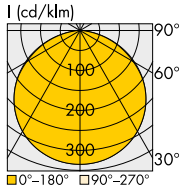
LED SMD Light&Dark Square

Technical Notes

- LED built-in module for integration into luminaires
- Dimensions
  WU-M-709: 62x62 mm
  Driving current:
  Non-SELV:
  WU-M-709-W/B:
  150 mA, 200 mA, 350 mA, 500 mA, 700 mA
  SELV:
  WU-M-709-W/B-LV
  100 mA, 150 mA, 200 mA, 250 mA, 350 mA
- On-board push-in terminals
- Beam angle: 120°
- SELV and Non-SELV application
- Colour rendering index (CRI): Ra80 and Ra90



Typical Light Distribution Curve
Data are available in .ldt format for download under www.vossloh-schwabe.com.



Covers and optics
Please visit our homepage for details for suitable optics:

- www.vossloh-schwabe.com/en/products/optics-reflectors/linear-optics

Non-SELV variants

Electrical Characteristics
at t_p = 50 °C

Type	No. of SMDs	Typ. voltage DC 150 mA V	200 mA V	350 mA V	500 mA V	700 mA V	Temperature coefficient mV/K	Typ. power consumption 150 mA W	200 mA W	350 mA W	500 mA W	700 mA W
WU-M-709-W/B	16	10.6	10.7	10.9	11.3	11.7	-4,49	1.6	2.1	3.8	5.6	8.2

Voltage and power consumption tolerance: ± 10% | **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 for frequencies ≥ 100 Hz (mA)
WU-M-709-W/B	700	–20	+80	–20	+70	1200

Operating Life
in hours at measured temperature at t_p point

Type	150 mA 40 °C	50 °C	80 °C	200 mA 40 °C	50 °C	80 °C	350 mA 40 °C	50 °C	80 °C	500 mA 40 °C	50 °C	80 °C	700 mA 40 °C	50 °C	80 °C
WU-M-709-W/B															
L80/B10	>90.000h	>90.000h	>86.000h	>90.000h	>90.000h	>85.000h	>72.000h	>72.000h	>56.000h	>72.000h	>72.000h	>55.000h	>72.000h	>72.000h	>52.000h

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Optical Characteristics – CRI > 80

at t_p = 50 °C, without secondary optics

CRI: R_a > 80

Type	Ref. No. PCB colour White (W)	Ref. No. PCB colour Black (B)	Colour	Correlated colour temp.* K	Typ. luminous flux** and typ. efficiency** at 150 mA lm	150 mA lm/W	200 mA lm	200 mA lm/W	350 mA lm	350 mA lm/W	500 mA lm	500 mA lm/W	700 mA lm	700 mA lm/W	Photometric code
WU-M-709-W/B 16LEDs - 62mm x 62mm															
WU-M-709-W/B-830	**572881**	**572875**	WW	3000	305	194	405	190	705	184	995	176	1365	167	830/349
WU-M-709-W/B-840	**572882**	**572876**	NW	4000	325	205	430	201	745	195	1050	186	1445	176	840/349
WU-M-709-W/B-850	**572889**	**572877**	CW	5000	325	205	430	201	745	195	1050	186	1445	176	850/349
WU-M-709-W/B-865	**572890**	**572878**	CW	6500	315	200	420	196	725	190	1025	182	1410	172	865/349

3000 K = warm white (WW), 3500 K = neutral white (NW), 4000 K = neutral white (NW), 5000 K = cool white (CW), 6500 K = cool white (CW)

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ±10%

Optical Characteristics – CRI > 90

at t_p = 50 °C, without secondary optics

CRI: R_a > 90

Type	Ref. No. PCB colour White (W)	Ref. No. PCB colour Black (B)	Colour	Correlated colour temp.* K	Typ. luminous flux** and typ. efficiency** at 150 mA lm	150 mA lm/W	200 mA lm	200 mA lm/W	350 mA lm	350 mA lm/W	500 mA lm	500 mA lm/W	700 mA lm	700 mA lm/W	Photometric code
WU-M-709-W/B 16LEDs - 62mm x 62mm															
WU-M-709-W/B-930	**572896**	**572879**	WW	3000	260	165	345	162	600	157	845	150	1165	142	930/349
WU-M-709-W/B-940	**572897**	**572880**	NW	4000	275	173	360	170	625	164	885	157	1220	149	940/349
WU-M-709-W/B-950	**on request**	**on request**	CW	5000	275	173	360	170	625	164	885	157	1220	149	950/349
WU-M-709-W/B-965	**on request**	**on request**	CW	6500	265	166	350	163	605	158	850	151	1170	143	965/349

3000 K = warm white (WW), 3500 K = neutral white (NW), 4000 K = neutral white (NW), 5000 K = cool white (CW), 6500 K = cool white (CW)

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ±10%

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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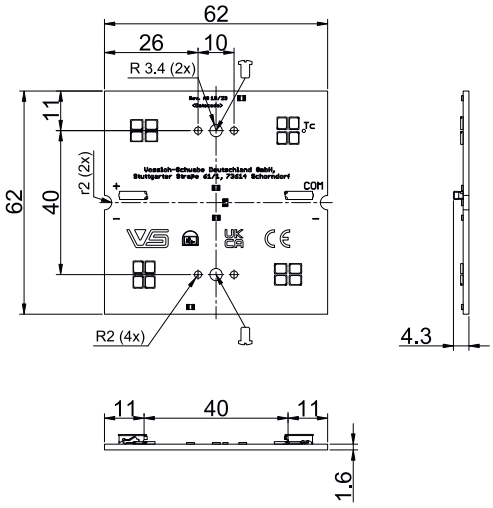
Mechanical Dimensions

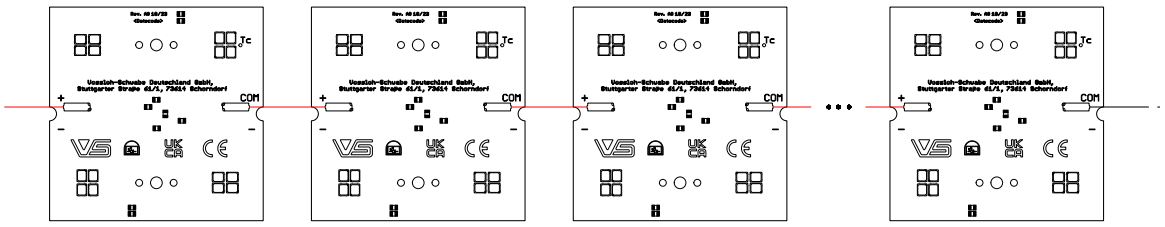
WU-M-709-W/B



Connection Example

- 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 250 V DC (basic insulation) and 150 V DC (reinforced insulation).
- 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 150 V DC (basic insulation).
- Only the marked holes are fixing holes for screws M3. Please do not use other holes for fixation!

Non-SELV
WU-M-709-W/B



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SELV variants

Electrical Characteristics

at t_p = 50 °C

Type	No. of SMDs	Typ. voltage DC 100 mA V	150 mA V	200 mA V	250 mA V	350 mA V	Temperature coefficient mV/K	Typ. power consumption 100 mA W	150 mA W	200 mA W	250 mA W	350 mA W
WU-M-709-W/B-LV	16	21.3	21.7	22.1	22.5	23.4	-8,98	2.1	3.2	4.4	5.6	8.2

Voltage and power consumption tolerance: ± 10% | **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 for frequencies ≥ 100 Hz (mA)
WU-M-709-W/B-LV	350	–20	+80	–20	+70	600

Operating Life

in hours at measured temperature at t_p point

Type	100 mA 40 °C	50 °C	80 °C	150 mA 40 °C	50 °C	80 °C	200 mA 40 °C	50 °C	80 °C	250 mA 40 °C	50 °C	80 °C	350 mA 40 °C	50 °C	80 °C
WU-M-709-W/B-LV 16LEDs - 62mm x 62mm															
L80/B10	>90.000h	>90.000h	>86.000h	>90.000h	>90.000h	>85.000h	>72.000h	>72.000h	>56.000h	>72.000h	>72.000h	>55.000h	>72.000h	>72.000h	>52.000h

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Optical Characteristics – CRI > 80

at t_p = 50 °C, without secondary optics

CRI: R_a > 80

Type	Ref. No. PCB colour White (W)	Ref. No. PCB colour Black (B)	Colour	Correlated colour temp.* K	Typ. luminous flux** and typ. efficiency** at 100 mA lm	100 mA lm/W	150 mA lm	150 mA lm/W	200 mA lm	200 mA lm/W	250 mA lm	250 mA lm/W	350 mA lm	350 mA lm/W	Photometric code
WU-M-709-W/B-LV 16LEDs - 62mm x 62mm															
WU-M-709-W/B-LV-830	**572898**	**572883**	WW	3000	405	190	605	186	800	182	995	176	1365	167	830/349
WU-M-709-W/B-LV-840	**572899**	**572884**	NW	4000	430	201	640	197	845	192	1050	186	1445	176	840/349
WU-M-709-W/B-LV-850	**572900**	**572885**	CW	5000	430	201	640	197	845	192	1050	186	1445	176	850/349
WU-M-709-W/B-LV-865	**572901**	**572886**	CW	6500	420	196	625	192	825	187	1025	182	1410	172	865/349

3000 K = warm white (WW), 3500 K = neutral white (NW), 4000 K = neutral white (NW), 5000 K = cool white (CW), 6500 K = cool white (CW)

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ±10%

Optical Characteristics – CRI > 90

at t_p = 50 °C, without secondary optics

CRI: R_a > 90

Type	Ref. No. PCB colour White (W)	Ref. No. PCB colour Black (B)	Colour	Correlated colour temp.* K	Typ. luminous flux** and typ. efficiency** at 100 mA lm	100 mA lm/W	150 mA lm	150 mA lm/W	200 mA lm	200 mA lm/W	250 mA lm	250 mA lm/W	350 mA lm	350 mA lm/W	Photometric code
WU-M-709-W/B-LV 16LEDs - 62mm x 62mm															
WU-M-709-W/B-LV-930	**572902**	**572887**	WW	3000	345	162	515	159	680	155	845	150	1165	142	930/349
WU-M-709-W/B-LV-940	**572903**	**572888**	NW	4000	360	170	540	166	715	162	885	157	1220	149	940/349
WU-M-709-W/B-LV-950	**on request**	**on request**	CW	5000	360	170	540	166	715	162	885	157	1220	149	950/349
WU-M-709-W/B-LV-965	**on request**	**on request**	CW	6500	350	163	520	160	685	156	850	151	1170	143	965/349

3000 K = warm white (WW), 3500 K = neutral white (NW), 4000 K = neutral white (NW), 5000 K = cool white (CW), 6500 K = cool white (CW)

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ±10%

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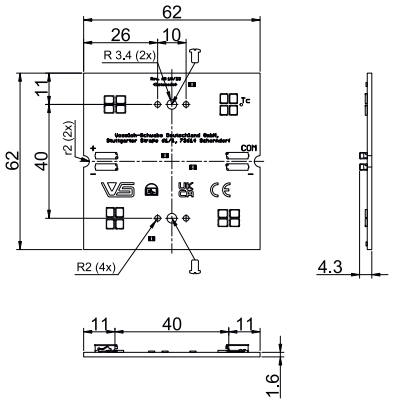
Product Guarantee

- 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.

Mechanical Dimensions

WU-M-709-W/B-LV



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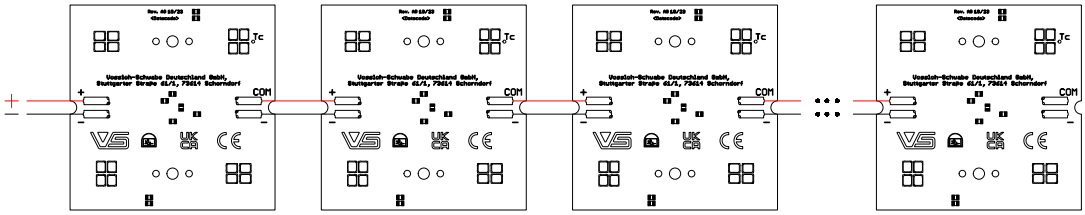
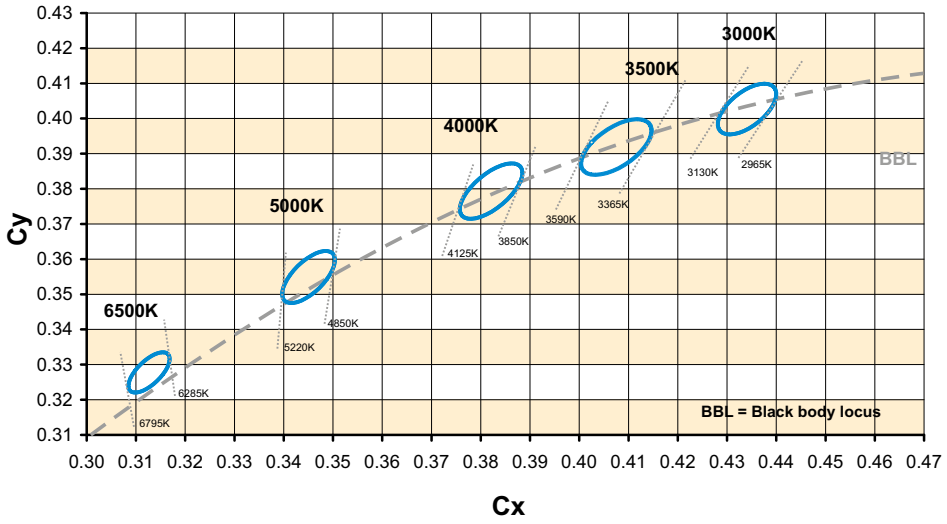
Connection Example

- The maximum number of modules that can be connected in one line (parallel connection of all boards) depends on the chosen operating current. The max. allowed current load on tracks and connectors is 1.8 A.
  I Driver = I Module x n (the number of modules)
- The clearance and creepage distances are designed for working voltages up to 250 V DC (basic insulation) and 150 V DC (reinforced insulation).
- 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 150 V DC (basic insulation).
- Only the marked holes are fixing holes for screws M3. Please do not use other holes for fixation!

SELV
WU-M-709-W/B-LV



Bins



Lineare LED Constant Current Drivers

Please visit our homepage for details for suitable LED constant current drivers: www.vossloh-schwabe.com

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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 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 ($I_{max.}$ 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 M3 screws. Fixation only with flat or cylinder head screws (M3) (no countersank screws)
  Max. torque: 1.2 Nm (M3)
- 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 2065).
- Safety regulations acc. to EN 60598 (or further standards) has to be observed if the maximum output voltage exceed the permitted touchable value.
- Measurement tolerances:
  - luminous flux: ± 7%
  - voltage: ± 3%
  - CRI: ± 1
- 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 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: 2008.
  Rating in accordance with IEC / TR 62778: risk group 1

WU-M-709-W/B:

CCT K	Max. operating current for risk group 1 mA	E threshold for higher operating currents to be risk group 1 lx
≤ 4000	700	1221
5000	700	1009
6500	700	793

WU-M-709-W/B-LV:

CCT K	Max. operating current for risk group 1 mA	E threshold for higher operating currents to be risk group 1 lx
≤ 4000	350	1221
5000	350	1009
6500	350	793

Applied Standards

EN 62031 **Pending**
LED modules for general lighting – Safety specifications
EN 62471
Photobiological safety of lamps and lamp systems

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