

## M-CLASS SILICONE

IP67 / IP69 / IK08



### LED STREET AND OUTDOOR LIGHTING

#### WU-M-425-C, WU-M-438-C

These LED modules are suitable for standard-compliant street lighting, paths and squares in accordance with EN 13201.

The combination of a robust aluminium base and the enhanced degree of protection enables a simpler, modular luminaire design.

The VS ECXd 700/150 W LED driver enables power reduction via phase inversion.

The modules are available in two different variations (linear and square) and in three white colour tones.

#### Typical Applications

- Integration in luminaires
- Streetlighting for ME- and S-classes (acc. to EN 13201)

#### LED Street and Outdoor Lighting

■ **DEGREE OF PROTECTION: IP67 / IP69 / IK08**

■ **HIGHLY EFFICIENT: UP TO 154 LM/W**

■ **VERY HOMOGENOUS ILLUMINATION**

■ **INITIAL COLOUR ACCURACY: 5 SDCM**

■ **SURGE PROTECTION: 4 KV**

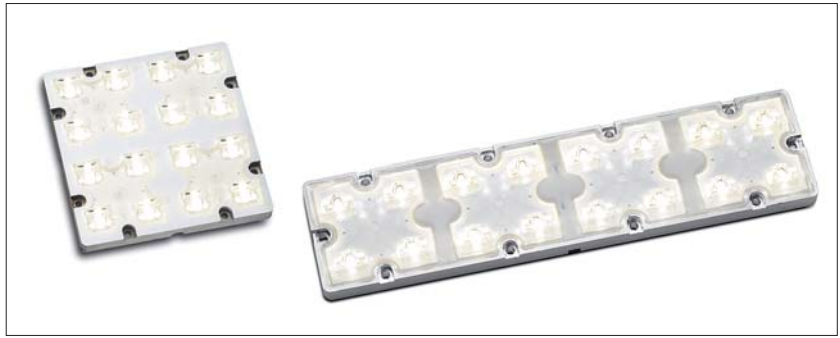
■ **VDE APPROVED (ACC. TO EN 62031)**



## M-Class Silicone

### Technical Notes

- LED built-in module for integration into luminaires
- 16 high-efficiency High Power LEDs, serial connected
- Encapsulated for outdoor applications with degree of protection: IP67 / IP69 / IK08
- Weight: 0.37 kg
- Pre-assembled leads: 2 leads: + (red); – (blue) for luminaires of protection class II, length: 500 mm
- Design for optimum thermal management



- ESD protection class 2
- Surge protection: 4 kV

### Electrical Characteristics at $t_p = 60^\circ\text{C}$

Type	No. of LEDs	Voltage DC [V]												Temperature coefficient mV/K	Power consumption [W]											
		350 mA			700 mA			1050 mA			1400 mA				350 mA			700 mA			1050 mA			1400 mA		
WU-M-...		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.
...425-C / ...438-C	16	39.4	43.9	45.8	41.5	46	47.9	43.3	47.7	49.7	44.8	49.2	51.2	-44.4	13.8	15.4	16	29.1	32.2	33.5	45.5	50.1	52.2	62.7	68.9	71.7

Use of external LED constant current driver required.

### Maximum Ratings

Exceeding the maximum ratings can lead to destruction of the module.

Type	Operation current mA	Operation temperature range at $t_c$ point		Storage temperature range		Max. allowed repetitive peak current mA
		$^\circ\text{C}$ min.	$^\circ\text{C}$ max.	$^\circ\text{C}$ min.	$^\circ\text{C}$ max.	
All types	350	-30	+85	-30	+85	1810
All types	700	-30	+85	-30	+85	1670
All types	1050	-30	+80	-30	+85	1580
All types	1400	-30	+70	-30	+85	1510

### Optical Characteristics at $t_p = 60^\circ\text{C}$

Type	Colour	Correlated colour temperature K	Luminous flux* (lm) and typ. efficiency (lm/W)												CRI**	Photo- metric code
			350 mA			700 mA			1050 mA			1400 mA				
			min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.	min.	typ.	typ.		
			lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W	lm	lm	lm/W		

#### Square - 16 LEDs

WU-M-425-C-730	warm white	3000 -90/+185	2115	2170	141	3995	4105	128	5640	5795	116	7035	7230	105	$\geq 70$	730/579
WU-M-425-C-740	neutral white	4000 -235/+230	2185	2315	151	4135	4380	136	5830	6180	123	7275	7715	112	$\geq 70$	740/579
WU-M-425-C-650	cool white	5000 -265/+360	2330	2370	154	4410	4480	139	6220	6320	126	7760	7880	114	$\geq 65$	650/579

#### Linear - 16 LEDs

WU-M-438-C-730	warm white	3000 -90/+185	2115	2170	141	3995	4105	128	5640	5795	116	7035	7230	105	$\geq 70$	730/579
WU-M-438-C-740	neutral white	4000 -235/+230	2185	2315	151	4135	4380	136	5830	6180	123	7275	7715	112	$\geq 70$	740/579
WU-M-438-C-650	cool white	5000 -265/+360	2330	2370	154	4410	4480	139	6220	6320	126	7760	7880	114	$\geq 65$	650/579

On account of the complex manufacturing process of the modules, the above values only represent statistical variables.

The values do not necessarily correspond exactly to the actual parameters of every single product, which can vary from the typical specification.

\* Measurement tolerance of luminous flux:  $\pm 7\%$  | \*\* Measurement tolerance CRI:  $\pm 2$  | CRI  $\geq 80$  on request

### Operating Life

Modules	Operating life in hours at measured temperature at $t_p$ point											
	$I_F$ 350 mA			$I_F$ 700 mA			$I_F$ 1050 mA			$I_F$ 1400 mA		
	40 $^\circ\text{C}$	60 $^\circ\text{C}$	85 $^\circ\text{C}$	40 $^\circ\text{C}$	60 $^\circ\text{C}$	85 $^\circ\text{C}$	40 $^\circ\text{C}$	60 $^\circ\text{C}$	80 $^\circ\text{C}$	40 $^\circ\text{C}$	60 $^\circ\text{C}$	80 $^\circ\text{C}$
L80/B10*	> 60,000	> 60,000	46,000	> 60,000	> 60,000	30,000	> 60,000	50,000	25,000	47,000	27,000	–
L70/B10*	> 60,000	> 60,000	> 60,000	> 60,000	> 60,000	58,000	> 60,000	> 60,000	48,000	> 60,000	51,000	–

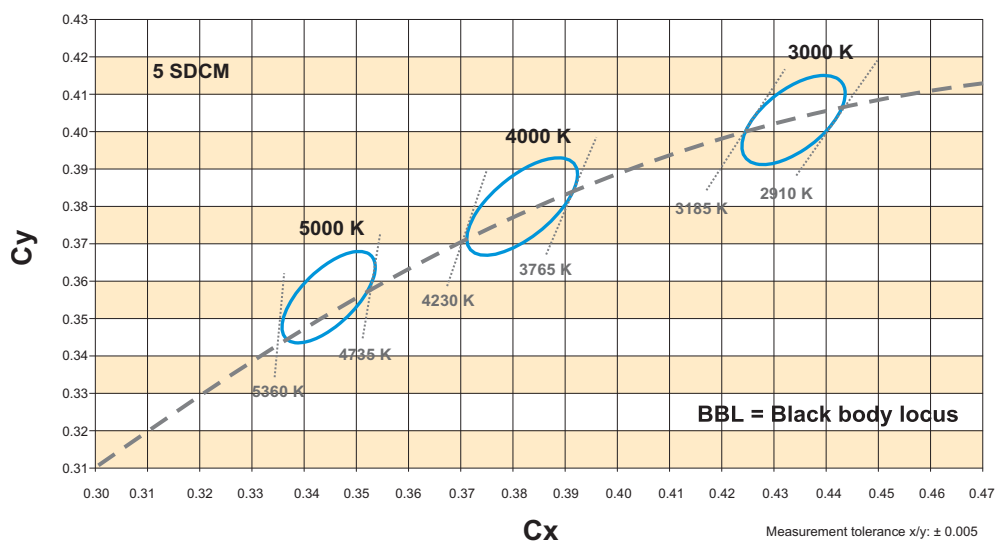
These values do not refer to the colour temperature. | \*  $L_{xx}/B_{yy}$  (lumen maintenance at xx%, failure rate yy%)

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



## LED Roadway Light M-Class Silicone

### Assembly and Safety Information



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## LED Roadway Light M-Class Silicone

### 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. Safety regulations acc. to EN 60598 has to be observed. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains).

- LED built-in modules must not be subjected to any undue mechanical stress, e. g.:
  - handle LED modules carefully
  - avoid shear and compressive forces onto
  - the optics during handling and installation
  - avoid vibrations of more than 2 kHz, 40 G
  - Do not carry or move LED modules by using the wires.
- The modules must not be used in hermetically sealed casings.
- The module must be fixed onto a thermally conductive surface with four M4 screws.
- When installing/screwing the module into a luminaire, please ensure that the cables are not squeezed between luminaire/heat-sink and LED module.
- Safe operation only possible by the use of external constant current sources ( $I_{\max}$ , see table "Electrical Characteristics").
- Operation is dependent on constant current drivers that should provide the following protective measures:
  - short-circuit protection
  - overload protection
  - overheating protection
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- The maximum output of the power supply must be observed.
- 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.
- The clearance and creepage distances are designed for working voltages up to 250 V DC acc. to EN 62031/EN 60598.
- Please ensure standard ESD (electrostatic discharge) protection measures are employed when handling and installing LED modules. Electrostatic discharge can damage LEDs.
- To ensure problem-free operation, the specified maximum temperature at the  $t_c$  and  $t_p$  point (see "Operating Life") must be observed (measured in accordance with EN 60598-1). To satisfy this point, it is necessary to put measures in place to ensure any heat is dissipated from the LED module to the environment.
- A parallel connection of the modules is not allowed.

- 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/en/home/products/led-lighting-technology/notes-on-led-technology.html](http://www.vossloh-schwabe.com/en/home/products/led-lighting-technology/notes-on-led-technology.html)
- The photobiological safety of the LED modules must be classified into risk groups in accordance with EN 62471: 2008.

– general lighting  
exempt group:  
WU-M-425-C, WU-M-438-C

– other applications  
risk group 2:  
WU-M-425-C, WU-M-438-C

Assessment in acc. with IEC/TR 62778:

Given a clearance of more than  $d_{\min}$ , within which the lighting intensity limit of  $E_{\text{thr}} = 1200 \text{ lx}$  is attained, the classification goes down to Risk Group 1.



### Applied Standards

EN 62031

LED modules for general lighting – Safety specifications



pending

EN 62471

Photobiological safety of lamps and lamp systems

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