

LED LINEAR ALLROUND GEN. 4, Z19

2x6 FOR RECTANGULAR IP OPTICS



LED LINEAR ALLROUND GEN. 4, Z19 – 2x6 FOR RECTANGULAR IP OPTICS

WU-M-688-SQ5

These modules were designed for built-in into luminaire casings. They enable a modular luminaire design.

The modules are available in 4 white colour tones.

Typical Applications (depending on the choice of optics)

- Integration in luminaires
- Street lighting, urban street lighting
- Tunnel lighting
- Flood and area lighting
- Indoor lighting
- Industrial lighting for:
 - Production halls
 - Warehouses
- Lighting for sports facilities

LED Linear Allround Gen. 4, Z19 – 2x6

- **HIGHLY EFFICIENT: UP TO 205 LM/W**
AT $T_p = 60^\circ\text{C}$, $I_f = 350\text{ mA}$
- **FLEXIBLE LIGHT DISTRIBUTION BY VARIOUS ATTACHMENT OPTICS**
- **INITIAL COLOUR ACCURACY: 5 SDCM**
- **ON-BOARD SURGE PROTECTION UP TO 4 KV**
(IN COMBINATION WITH VS STREETLIGHT DRIVERS)
- **ZHAGA-COMPLIANT MOUNTING DIMENSION**
(ACC. TO BOOK 19)
- **ENEC AND VDE**
(ACC. TO EN 62031)

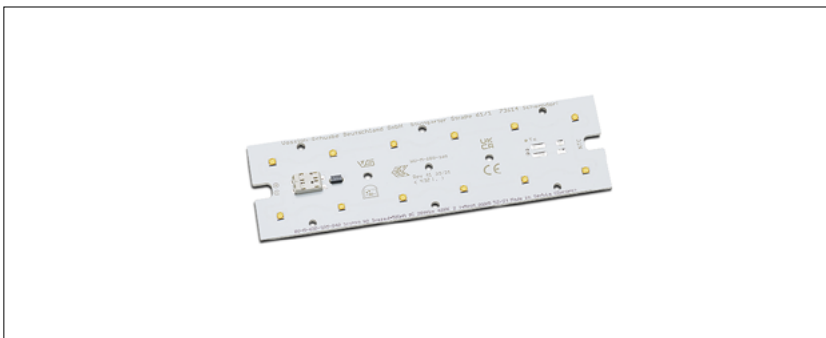


LED Linear Allround Gen. 4, Z19 2x6 for rectangular IP optics



Technical Notes

- Led built-in module for integration into luminaires
- 12 highly reliable High Power LEDs
- Dimensions (excl. optics) LxVxH:
12 LEDs: 146x44,4x5 mm
- Push-in terminals for quick and simple wiring
- Suitable for standard rectangular 2x6 IP optics
- Degree of protection: IP00
- Operating currents: 350mA / 500mA / 700mA / 1050mA / 1400mA
- ESD protection class 3a (up to 8 kV)
- NTC resistor for external driver feedback (on request)



Electrical Characteristics

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

Type	No. of LEDs	Voltage DC (V)															Temperature coefficient mV/K
		350 mA			500 mA			700 mA			1050 mA			1400 mA			
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	
WU-M-688-SQ5	12	30.4	32.2	33.9	30.9	32.6	34.4	31.4	33.2	35.0	32.1	33.9	35.7	32.7	34.6	36.4	-18.3

Type	No. of LEDs	Power consumption (W)														
		350 mA			500 mA			700 mA			1050 mA			1400 mA		
		min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.	min.	typ.	max.
WU-M-688-SQ5	12	10.6	11.3	11.9	15.4	16.3	17.2	22.0	23.2	24.5	33.7	35.6	37.5	45.8	48.4	51.0

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.	
WU-M-688-SQ5	≤ 500	-40	+90	-40	+85	2000
	≤ 1050	-40	+85	-40	+85	2000
	≤ 1400	-40	+80	-40	+85	2000
	≤ 1500	-40	+75	-40	+85	2000

Operating Life

in hours at measured temperature at t_p point

Lumen degradation	Operating life in hours at stated t_c point temperature								
	at $I_f \leq 700$ mA			at 700 mA $< I_f \leq 1050$ mA			at $I_f > 1050$ mA		
	60 $^\circ\text{C}$	70 $^\circ\text{C}$	85 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	85 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$
L90/B10	> 150,000	> 150,000	> 150,000	> 150,000	> 150,000	112,000	> 102,000	97,000	72,000
L80/B10	> 150,000	> 150,000	> 150,000	> 150,000	> 150,000	> 150,000	> 102,000	> 102,000	> 102,000
L70/B10	> 150,000	> 150,000	> 150,000	> 150,000	> 150,000	> 150,000	> 102,000	> 102,000	> 102,000

These values do not refer to the colour temperature. | Lxx/Byy (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.

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Optical Characteristics

at $t_p = 60^\circ\text{C}$, $\text{CRI}^{**} \geq 70$

Type	Ref. No.	Colour	Correl. colour temp. K	Luminous flux* (lm) and typ. efficiency (lm/W)															Photo- metric- code
				350 mA			500 mA			700 mA			1050 mA			1400 mA			
				min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	min. lm	typ. lm	typ. lm/W	
WU-M-688-SQ5-722	571988	WW	2200	1695	1800	160	2305	2445	150	3055	3235	139	4230	4485	126	-	-	-	722/579
WU-M-688-SQ5-730	571989	WW	3000	2115	2150	191	2915	2960	181	3900	3965	171	5460	5545	156	6805	6915	143	730/579
WU-M-688-SQ5-740	571990	NW	4000	2240	2305	205	3095	3185	195	4160	4280	184	5840	6010	169	7305	7520	155	740/579
WU-M-688-SQ5-750	571991	CW	5000	2230	2300	204	3085	3175	195	4145	4265	184	5815	5985	168	7275	7490	155	750/579

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.

Colour declaration: WW = warmwhite; NW = neutral white; CW = coldwhite

* Measurement tolerance of luminous flux: $\pm 7\%$ | ** Measurement tolerance CRI: ± 2

Optical Characteristics

at $t_p = 60^\circ\text{C}$, $\text{CRI}^{**} \geq 80$

Type	Ref. No.	Colour	Correl. colour temp. K	Luminous flux* (lm) and typ. efficiency (lm/W)															Photo- metric- code
				350 mA			500 mA			700 mA			1050 mA			1400 mA			
				min.	typ.	typ.	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	lm	lm	lm/W	
WU-M-688-SQ5-830	571992	WW	3000	1875	1940	172	2580	2675	164	3440	3560	153	4730	4900	138	5850	6060	125	830/579
WU-M-688-SQ5-840	571993	NW	4000	2005	2105	187	2750	2890	177	3685	3870	167	5130	5385	151	6345	6660	138	840/579
WU-M-688-SQ5-850	571994	CW	5000	1980	2115	188	2735	2920	179	3670	3915	169	5145	5485	154	6415	6840	141	850/579

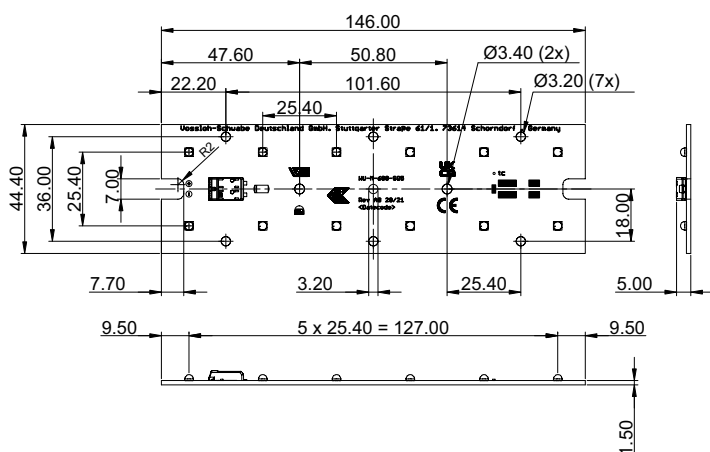
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Colour declaration: WW = warmwhite; NW = neutral white; CW = coldwhite

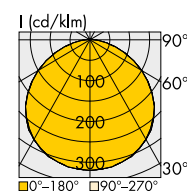
* Measurement tolerance of luminous flux: $\pm 7\%$ | ** Measurement tolerance CRI: ± 2

Mechanical Dimensions

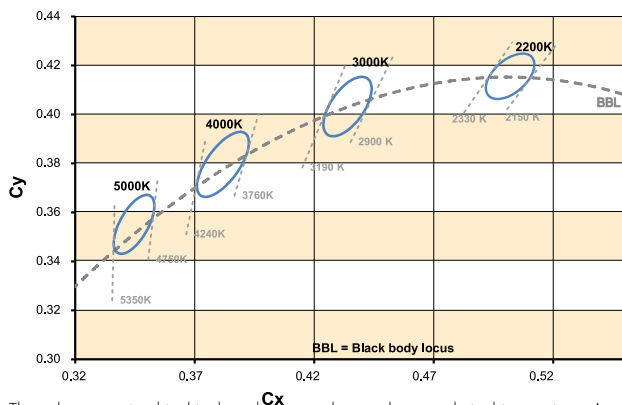


Typical Light Distribution Curve

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



Bins



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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. 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
- The module must be fixed onto a thermally conductive surface with 2 to 3 M3 screws (respectively M4). Max. allowed torque for M3: 0.5 Nm and M4: 1.2 Nm
- The wiring can be done by solid or stranded wires having a cross section of 0.2–0.75 mm²; stripped length of lead ends of 7–9 mm. For inserting/removing stranded wires press lightly on the push button.
- When installing/screwing the module into a luminaire, please ensure that the cables are not squeezed between luminaire/heat sink and LED module. Also ensure that the mounting surface is clean and flat. For a reliable thermal attachment, we recommend the mounting surface flatness of ≤ 0.2 mm.
- 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 of LED modules WU-M-688-SQ5 are designed for working voltages up to 600 V DC (basic insulation) and up to 300 V DC (reinforced insulation) acc. to EN62031/EN60598.
- If a system consists of multiple LED Linear Allround modules connected to a single driver, only one module will be monitored by the NTC. That means that one module is in "master" mode operated and the rest are operated in "slave" mode.
- 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.
 - To ensure good thermal contact, it is recommended to use proper thermal interface material (e.g. thermal paste, phase change or thermal pads).
 - When mounting LED Linear Allround modules directly on the luminaire housing, we recommend to use aluminum of at least 3 mm thickness. Thicker material will improve the heatflow through the luminaire, resulting in a lower t_p temperature on the module itself.
 - Use anodised or painted surfaces rather than blank surfaces to enhance the heat-transfer via thermal radiation.
 - To ensure problem-free operation, the specified maximum temperature at the t_c and 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.
 - Try to limit as far as possible the number of thermal interfaces in the primary heat path towards ambient air. For the primary heat path use solely materials with high thermal conductivity (e.g. aluminum).
 - The LED Linear Allround modules are built-in modules and have no IP-classification (IP00). They are not designed for operation in "open air". 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.
 - 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
 - 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-688-SQ5
 - other applications
risk group 2: WU-M-688-SQ5
- Assessment in acc. with IEC/TR 62778:
Given a clearance of more than d_{min} , within which the lighting intensity limit of $E_{thr} = 740$ lx is attained, the classification goes down to Risk Group 1.



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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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