LED BUILT-IN MODULES

LUGA SHOP 2014
2000 lm TO 5000 lm

LUGA SHOP 2014
LED MODULES COB FOR RETAIL ENVIRONMENTS

WU-M-484, -485, -486

Typical Applications

- Integration in reflector luminaires
- Shop lighting
- Furniture lighting
- Flat surface-mounting luminaires
- Cladding illumination
- Stairway and corridor illumination
- Suspended luminaire with external control gear

LUGA Shop 2014

- **LONG SERVICE LIFETIME: 50,000 HOURS (L90; B10)**
- **ZHAGA-SHAPE**
- **HIGHLY EFFICIENT: UP TO 153 LM/W AT t_p = 65 °C**
- **NARROW COLOUR TOLERANCES:**
  3 STEP MACADAM (INITIAL)
  4 STEP MACADAM SHIFT (AFTER 50,000 HRS)
- **INTEGRATED THERMAL PROTECTION**
- **VDE APPROVED (ACC. TO EN 62031)**

LIGHTING SOLUTIONS

A Member of the Panasonic Group Panasonic

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Technical Notes

- LED built-in module for integration into luminaires
- Dimensions: Ø 50 mm
- Use of external LED constant current driver
- Temperature fail-safe circuit (activation temperature: $t_c \approx 105$ °C)
- On-board push-in connector

Electrical Characteristics

at t_p = 65 °C

Type	Ref. No.	Typ. voltage DC				Temperature	Typ. power consumption			
		350 mA	500 mA	700 mA	1050 mA	coefficient	350 mA	500 mA	700 mA	1050 mA
		V	V	V	V	mV/K	W	W	W	W
WU-M-484	**All types**	22.2	22.8	23.7	25.1	-20	7.8	11.4	16.6	26.4
WU-M-485	**All types**	33.3	34.3	35.5	37.6	-25	11.7	17.2	24.9	39.5
WU-M-486	**All types**	41.6	42.8	44.4	47.0	-30	14.6	21.4	31.1	49.4

Voltage and power tolerance: ±10 %

Maximum Ratings

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

Type	Operating current	Operation temperature range at t_c-point		Ambient temperature range		Storage temperature range		Max. allowed repetitive peak current (mA)	Max. permitted output voltage of operating device
	mA	°C min.	°C max.	°C min.	°C max.	°C min.	°C max.		V
WU-M-484, - 485		-25	+85	-25	+40	-40	+85	1440	60
WU-M-486	≤ 700	-25	+85	-25	+40	-40	+85	1440	60
WU-M-486	> 700	-25	+75	-25	+40	-40	+85	1440	60

Optical Characteristics

at t_p = 65 °C

Type	Ref. No.	Colour	Correlated colour temperature*	Typ. luminous flux** and efficiency at								Typ. beam angle (°)	Typ. CRI R_a	Zhaga LES Cat.	Photo-metric code
				350 mA		500mA		700 mA		1050 mA					
			K	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W				
WU-M-484-827	**554714**	warm white	2700	1095	140	1445	127	1895	114	2545	96	120	82	19	827/349
WU-M-484-830	**554716**	warm white	3000	1135	146	1510	132	1975	119	2670	101	120	85	19	830/349
WU-M-484-835	**554717**	neutral white	3500	1170	150	1560	137	2035	123	2760	105	120	85	19	835/349
WU-M-484-840	**554718**	neutral white	4000	1205	154	1595	140	2090	126	2830	107	120	85	19	840/349
WU-M-485-827	**554723**	warm white	2700	1610	138	2200	128	2910	117	3895	99	120	82	23	827/349
WU-M-485-830	**554724**	warm white	3000	1690	144	2305	134	3055	123	4080	103	120	85	23	830/349
WU-M-485-835	**554725**	neutral white	3500	1740	149	2370	138	3130	126	4210	107	120	85	23	835/349
WU-M-485-840	**554726**	neutral white	4000	1800	154	2440	142	3230	130	4330	110	120	85	23	840/349
WU-M-486-827	**554731**	warm white	2700	2005	137	2725	127	3610	116	4770	97	120	82	23	827/349
WU-M-486-830	**554732**	warm white	3000	2105	144	2860	134	3785	122	5025	102	120	85	23	830/349
WU-M-486-835	**554733**	neutral white	3500	2165	148	2945	138	3900	125	5165	105	120	85	23	835/349
WU-M-486-840	**554734**	neutral white	4000	2225	152	3015	141	3990	128	5290	107	120	85	23	840/349

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 10 % | Min. CRI R_a: > 80
ZHAGA Flux Category: WU-M-484 at 700 mA: C20, at1050 mA: C25, WU-M-485 at 700 mA: C30, at 1050 mA: C40, WU-M-486 at 1050 mA: C50
Colour temperature 5000 K available on request

Minimum order quantity: 20 pcs.

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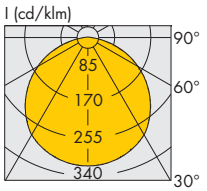
Operating Life

at t_p = 65 °C

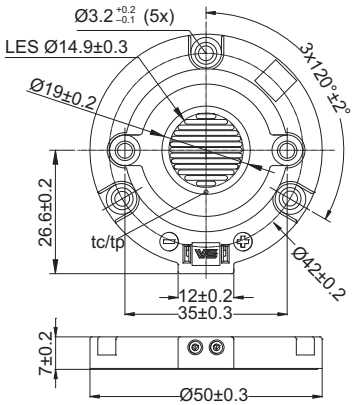
Lumen maintenance	WU-M-484		WU-M-485		WU-M-486	
	I_F 700 mA	I_F 1050 mA	I_F 700 mA	I_F 1050 mA	I_F 700 mA	I_F 1050 mA
L90/B10	45,000 hrs.	33,000 hrs.	51,000 hrs.	39,000 hrs.	46,000 hrs.	30,000 hrs.
L80/B10	59,000 hrs.	48,000 hrs.	60,000 hrs.	50,000 hrs.	57,000 hrs.	44,000 hrs.
L70/B10	67,000 hrs.	56,000 hrs.	69,000 hrs.	59,000 hrs.	65,000 hrs.	52,000 hrs.

Typical Light Distribution Curve

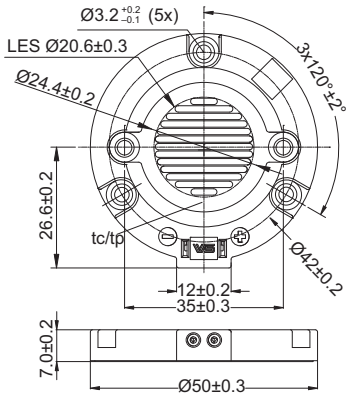


Mechanical Dimensions

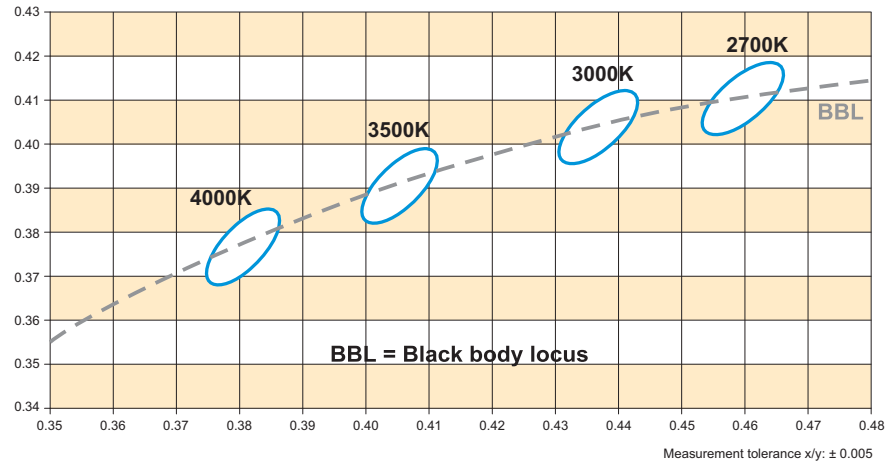
WU-M-484



WU-M-485, WU-M-486



Bins



Measurement tolerance x/y: ± 0.005

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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.

- ESD (electrostatic discharge) protection measures must be observed when handling and installing the LED modules. See VS's application notes on ESD protection.
- 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
  - do not touch the yellow phosphorus layer
- The module must be fixed onto a thermally conductive surface with three M3 screws. A torque of 0.35±0.1 Nm is required.
- 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
  - SELV (Safety Extra Low Voltage); $U_{max.} \leq 60$ V
  - $I_{max.}$ (see table "Maximum Ratings") must not be exceeded.
- When operating devices will be selected care has been taken to ensure that the maximum values (see table "Maximum Ratings") will not be exceeded.
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- The LED modules are connected via two on-board push-in connectors for rigid or tinned conductors.
  Conductor section:
  - tinned: 0.25 – 0.8 mm²
  - rigid: 0.5 – 0.75 mm²

  Strip length: 6.5 – 8.0 mm
  The contacts can be released with a flat-headed screwdriver with a width of 3 mm.
- 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 %
- A parallel or serial connection of the modules is not allowed.
- To ensure problem-free operation, the specified maximum temperature at the t_c 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. For optimized thermal heat transfer, a thermal conductive graphite foil is available (Ref. No.: 549501).
- 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.
- 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
- 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-484/-485/-486
  - other applications
    risk group 1:
    WU-M-484/-485/-486
- Zhaga standard (Book 3) is applied for specific parameters (mechanical dimensions, LES, flux category). The LED modules are not Zhaga certified.

Applied Standards

EN 62031
LED modules for general lighting – Safety specifications

EN 62471
Photobiological safety of lamps and lamp systems

Approval Marks

Tested module: 554724 at 700 mA

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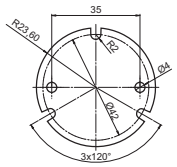
Accessories

Thermal conductive graphite tape
Type: Thermal tape Ø 47.2 mm Graphite
Thermal resistance: $R_{th} \leq 0.04$ K/W
Ref. No.: 549501



Reflectors:
- ACL-Lichttechnik GmbH
  www.reflektor.com
- Alux-Luxar GmbH & Co. KG
  www.alux.de
- JORDAN REFLEKTOREN GmbH & Co. KG
  www.jordan-reflektoren.de
- LEDIL
  www.ledil.com

Heat sinks with active cooling:
- AVC
  www.avc-europa.de
- Nuventix, Inc.
  www.nuventix.com
- Sunon
  www.sunon.com
- MechaTronix
  www.led-heatsink.com
- Colliance, Inc.
  www.cooliance.eu

Heat sinks with passive cooling:
- AVC
  www.avc-europa.de
- Fischer Elektronik GmbH & Co. KG
  www.fischerelektronik.de
- Frigo Dynamics
  www.frigodynamics.com
- MechaTronix
  www.led-heatsink.com

LED Constant Current Drivers

Please visit our homepage for details for suitable LED constant current drivers:
www.vossloh-schwabe.com/en/home/products/components-for-led-lighting-technology/led-control-gears/constant-current.html

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