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

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)
LUGA Shop 2014 – LED Modules COB for Retail Environments

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: tc = 105 °C)
- On-board push-in connector

Electrical Characteristics
at tp = 65 °C

<table>
<thead>
<tr>
<th>Type</th>
<th>Ref. No.</th>
<th>Typ. voltage DC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>350 mA</td>
<td>500 mA</td>
</tr>
<tr>
<td>WU-M-484 All types</td>
<td>22.2</td>
<td>22.8</td>
</tr>
<tr>
<td>WU-M-485 All types</td>
<td>33.3</td>
<td>34.3</td>
</tr>
<tr>
<td>WU-M-486 All types</td>
<td>41.6</td>
<td>42.8</td>
</tr>
</tbody>
</table>

Voltage and power tolerance: ±10 %

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Operating current mA</th>
<th>Operation temperature range at t_p-point °C</th>
<th>Ambient temperature range °C</th>
<th>Storage temperature range °C</th>
<th>Max. allowed repetitive peak current (mA)</th>
<th>Max. permitted output voltage of operating device</th>
</tr>
</thead>
<tbody>
<tr>
<td>WU-M-484, - 485</td>
<td>350</td>
<td>-25</td>
<td>+85</td>
<td>-25</td>
<td>+40</td>
<td>85</td>
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<tr>
<td>WU-M-486</td>
<td>6-700</td>
<td>-25</td>
<td>+85</td>
<td>-25</td>
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<td>40</td>
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<tr>
<td>WU-M-486</td>
<td>&gt; 700</td>
<td>-25</td>
<td>+75</td>
<td>-25</td>
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<td>85</td>
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</tbody>
</table>

Optical Characteristics
at tp = 65 °C

<table>
<thead>
<tr>
<th>Type</th>
<th>Ref. No.</th>
<th>Colour</th>
<th>Correlated colour temperature* °C</th>
<th>Typ. luminous flux** and efficiency at 350 mA lm/W</th>
<th>Typ. luminous flux and efficacy at 500 mA lm/W</th>
<th>Typ. luminous flux and efficacy at 700 mA lm/W</th>
<th>Typ. luminous flux and efficacy at 1050 mA lm/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>WU-M-484-827</td>
<td>554714 warm white 2700</td>
<td>350 mA</td>
<td>1095</td>
<td>27</td>
<td>1895</td>
<td>2545</td>
<td>120</td>
</tr>
<tr>
<td>WU-M-484-830</td>
<td>554716 warm white 3000</td>
<td>350 mA</td>
<td>1250</td>
<td>31</td>
<td>2053</td>
<td>3108</td>
<td>120</td>
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<tr>
<td>WU-M-484-835</td>
<td>554717 neutral white 3500</td>
<td>350 mA</td>
<td>1740</td>
<td>38</td>
<td>2780</td>
<td>4095</td>
<td>120</td>
</tr>
<tr>
<td>WU-M-484-840</td>
<td>554718 neutral white 4000</td>
<td>350 mA</td>
<td>1800</td>
<td>42</td>
<td>3230</td>
<td>4830</td>
<td>120</td>
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<tr>
<td>WU-M-485-827</td>
<td>554723 warm white 2700</td>
<td>350 mA</td>
<td>1300</td>
<td>28</td>
<td>2100</td>
<td>3230</td>
<td>120</td>
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<tr>
<td>WU-M-485-830</td>
<td>554724 warm white 3000</td>
<td>350 mA</td>
<td>1440</td>
<td>33</td>
<td>2470</td>
<td>4050</td>
<td>120</td>
</tr>
<tr>
<td>WU-M-485-835</td>
<td>554725 neutral white 3500</td>
<td>350 mA</td>
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<td>2780</td>
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</tr>
<tr>
<td>WU-M-485-840</td>
<td>554726 neutral white 4000</td>
<td>350 mA</td>
<td>1800</td>
<td>42</td>
<td>3230</td>
<td>4830</td>
<td>120</td>
</tr>
<tr>
<td>WU-M-486-827</td>
<td>554731 warm white 2700</td>
<td>350 mA</td>
<td>1300</td>
<td>28</td>
<td>2100</td>
<td>3230</td>
<td>120</td>
</tr>
<tr>
<td>WU-M-486-830</td>
<td>554732 warm white 3000</td>
<td>350 mA</td>
<td>1440</td>
<td>33</td>
<td>2470</td>
<td>4050</td>
<td>120</td>
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<tr>
<td>WU-M-486-835</td>
<td>554733 neutral white 3500</td>
<td>350 mA</td>
<td>1740</td>
<td>38</td>
<td>2780</td>
<td>4095</td>
<td>120</td>
</tr>
<tr>
<td>WU-M-486-840</td>
<td>554734 neutral white 4000</td>
<td>350 mA</td>
<td>1800</td>
<td>42</td>
<td>3230</td>
<td>4830</td>
<td>120</td>
</tr>
</tbody>
</table>

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficacy: ± 10 % | Min. CRI Ra > 80
ZHAGA Flux Category: WU-M-484 at 700 mA: C20, at 1050 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.

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.
LUGA Shop 2014 – 2000 lm to 5000 lm

Operating Life
at $t_p = 65 \, ^\circ \text{C}$

<table>
<thead>
<tr>
<th></th>
<th>WU-M-484</th>
<th>WU-M-485</th>
<th>WU-M-486</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>200 mA</td>
<td>700 mA</td>
<td>700 mA</td>
</tr>
<tr>
<td>L90/B10</td>
<td>65,000 hrs</td>
<td>59,000 hrs</td>
<td>67,000 hrs</td>
</tr>
<tr>
<td>L80/B10</td>
<td>33,000 hrs</td>
<td>48,000 hrs</td>
<td>56,000 hrs</td>
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<tr>
<td>L70/B10</td>
<td>51,000 hrs</td>
<td>60,000 hrs</td>
<td>69,000 hrs</td>
</tr>
</tbody>
</table>

Typical Light Distribution Curve

Mechanical Dimensions

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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 (Imax. 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), Umax. ≤ 60 V
  - Imax. (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: 0.5 – 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 tc 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
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
- AluLuxar GmbH & Co. KG
  www.alux.de
- JORDAN REFLEKTOREN GmbH & Co. KG
  www.jordanreflektoren.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
- Cooliance, 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:

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