

BUILT-IN LED LIGHTING MODULES

PowerEmitter XP



PowerEmitter XP

WU-M-421

Thanks to the use of highly efficient LEDs, PowerEmitter modules guarantee an extremely high lumen output.

The modules can be safely operated with various constant current converters (350 mA, 500 mA, 700 mA, 1050 mA). Sufficient cooling must be ensured.

PowerEmitter modules are available in white, neutral white and warm white.

To enable the creation of unique light solutions, VS also provides PowerOptics attachments with a variety of radiation angle characteristics.

Typical Applications

- Integration in luminaires
- Architectural illumination
- Marking of paths, stairs, etc.
- Furniture lighting
- Light advertising
- Entertainment, shop design

PowerEmitter XP

■ **LONG SERVICE LIFETIME**
due to optimal thermal management

■ **VERY HIGH LUMEN OUTPUT**
highly efficient (up to 132 lm/W)

■ **AVAILABLE IN DIFFERENT CCTs**
white, neutral white and warm white

■ **ATTACHMENT FOR LENSES WITH DIFFERENT RADIATION ANGLES**

■ **RESISTANT AGAINST SHOCK AND VIBRATIONS**

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Technical Notes

- PCB diameter: 30 mm
- FR4-PCB with thermal vias for optimum thermal management
- ESD protection class 2



Electrical Characteristics

at ambient temperature $t_a = 25\text{ }^\circ\text{C}$

Type	Ref. No.	350 mA				500 mA				700 mA				1050 mA			
		Voltage DC (V)		Power W		Voltage DC (V)		Power W		Voltage DC (V)		Power W		Voltage DC (V)		Power W	
		typ.	max.	typ.	max.	typ.	max.	typ.	max.	typ.	max.	typ.	max.	typ.	max.	typ.	max.
XPC-CW/NW/WW	All types	3.40	3.90	1.19	1.37	3.50	4.00	1.75	2.00	not allowed	not allowed	not allowed	not allowed	not allowed	not allowed	not allowed	not allowed
XPE-CW/NW/WW	All types	3.20	3.90	1.12	1.37	3.30	4.00	1.65	2.00	3.40	4.10	2.38	2.87	not allowed	not allowed	not allowed	not allowed
XPG-CW/NW/WW	All types	3.00	3.75	1.05	1.31	3.10	3.85	1.55	1.93	3.20	3.95	2.24	2.77	3.30	4.05	3.47	4.25

Use of external LED constant current driver with max. 500 mA (XP-C) or 700 mA (XP-E) or 1050 mA (XP-G) required.

Maximum Ratings

Exceeding the maximum ratings can lead to reduction of lifetime or destruction of the module.

Type	Operation current mA	Operation temperature range at t_c -point		Storage temperature range		Reverse voltage V
		$^\circ\text{C}$ min.	$^\circ\text{C}$ max.	$^\circ\text{C}$ min.	$^\circ\text{C}$ max.	
All types 350 mA	350	-20	+85	-20	+85	5
All types 500 mA	500	-20	+75	-20	+85	5
XP-E, XP-G	700	-20	+70	-20	+85	5
XP-G	1050	-20	+60	-20	+85	5

Optical Characteristics

at junction temperature $t_j = 25\text{ }^\circ\text{C}$

Type	Ref. No.	Colour	Correlated colour temperature (K)	Luminous flux (lm) at								Radiation angle ($^\circ$)
				350 mA		500 mA		700 mA		1050 mA		
				min.	typ.	min.	typ.	min.	typ.	min.	typ.	
PowerEmitter XP-C												
WU-M-421-XPC-CW	546673	White	5650...6950	100.0	114.0	130.0	148.2	not allowed	not allowed	not allowed	not allowed	110
WU-M-421-XPC-NW	546671	Neutral white	3700...4260	73.9	87.4	96.1	113.6	not allowed	not allowed	not allowed	not allowed	110
WU-M-421-XPC-WW	546676	Warm white	2870...3200	67.2	80.6	87.4	104.8	not allowed	not allowed	not allowed	not allowed	110
PowerEmitter XP-E												
WU-M-421-XPE-CW	546680	White	5650...6950	107.0	122.0	139.1	158.6	181.9	207.4	not allowed	not allowed	115
WU-M-421-XPE-NW	546685	Neutral white	3700...4260	93.9	107.0	122.1	139.1	159.6	181.9	not allowed	not allowed	115
WU-M-421-XPE-WW	546684	Warm white	2870...3200	80.6	93.9	104.8	122.1	137.0	159.6	not allowed	not allowed	115
PowerEmitter XP-G												
WU-M-421-XPG-CW	546686	White	5300...7050	122.0	139.0	170.8	194.6	219.6	250.2	305.0	347.5	125
WU-M-421-XPG-NW	546687	Neutral white	3700...4260	107.0	122.0	149.8	170.8	192.6	219.6	267.5	267.5	125
WU-M-421-XPG-WW	546688	Warm white	2870...3200	100.0	114.0	140.0	159.6	180.0	205.2	250.0	250.0	125

Minimum order quantity: 144 pcs. | lower quantity on request, when available from stock

Packing unit: 24 pcs.

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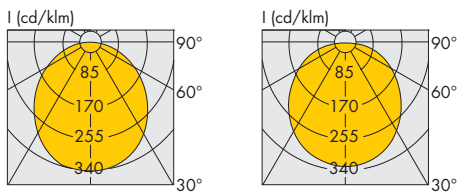
Operating Life

50,000 hrs. (lumen maintenance at 70 %)

Module	I _F 350 mA	I _F 500 mA	I _F 700 mA	I _F 1050 mA
XP-C	t _c 65 °C	t _c 55 °C	not allowed	not allowed
XP-E	t _c 75 °C	t _c 65 °C	t _c 55 °C	not allowed
XP-G	t _c 80 °C	t _c 70 °C	t _c 60 °C	t _c 50 °C

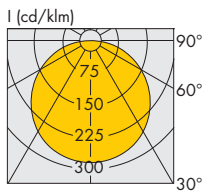
These values do not refer to the colour temperature.

Light Distribution Curve



XP-C

XP-E



XP-G

Attachment optics with various radiation characteristics are available at VS Optoelectronic. Please find further information at www.vs-optoelectronic.com.

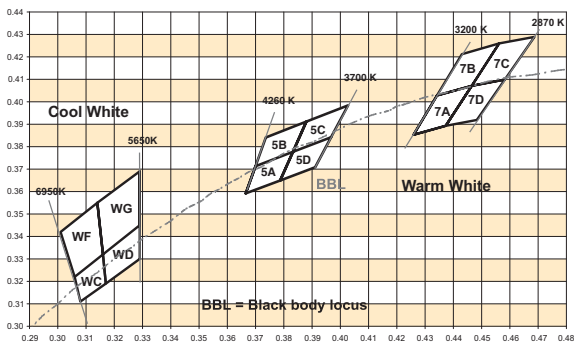
Bins

The standard shipping format regarding the reference numbers on page 2 includes all chromaticity coordinate groups.

The concrete delivered group is marked on each product.

Reduction of orderable groups is possible only project-based.

XP-C / XP-E



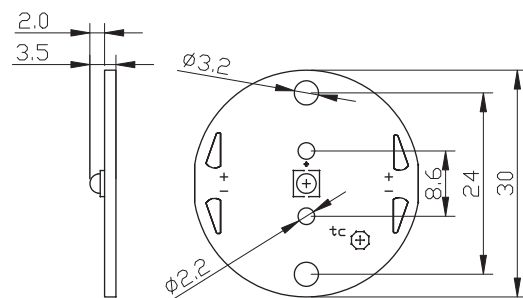
Thermal Characteristics

Type	Thermal resistance, p-n-junction to t _c point (K/W)	Thermal resistance, p-n-junction to bottom of PCB (K/W)
All types	24	25

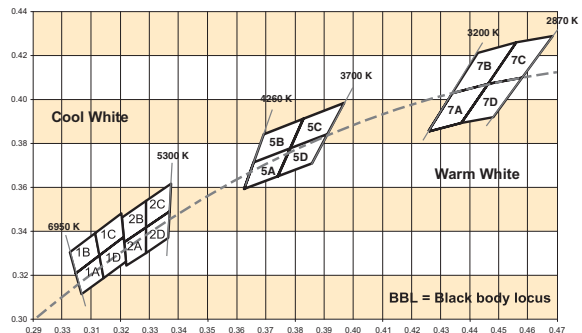
VS recommends an additional cooling element for improved thermal management.

Mechanical Dimensions

Pre-assembled lead connection on request.



XP-G



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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
- LED assembly modules are designed for attachment using a thermally conductive adhesive, an adhesive foil (Ref. No. 529157) or M3 screws. Please observe the manufacturer's technical data provided at www.3M.com/converter. Products equipped with adhesive transfer tape must only be applied to dry and clean surfaces that are free from grease, oil, silicone or other soiling. It is therefore recommended to clean the substrate with isopropyl alcohol (IPA). Please ensure a full-surface bond over the entire contact area when sticking the module to the substrate. The following substances are regarded as critical for creating an adhesive bond:
 - Polyefins (polyethylene, polypropylene)
 - Rubber
 - Powder-coated materials
 - Silicone rubber
 - Teflon
- Owing to the varying application options and different types of surface as well as ambient conditions, VS accepts no liability for the quality of the adhesive bond achieved when mounting these products. Prior to sticking a VS product, care must be taken to check whether the material in question is actually suitable for the intended purpose under consideration of all possible application-relevant influences. Supplementary holders must be used if necessary. If opting for screw attachment, plastic screws or suitably insulated, non-loosening metal screws must be used.
- Safe operation only possible by the use of external constant current sources (Imax. see table "Electrical Characteristics").
- Power supply units must be used for operation, in which the following protective measures are ensured:
 - Short-circuit protection
 - Overload protection
 - Overheating protection
 - SELV equiv. (Safety Extra Low Voltage)
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- 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.
- A parallel connection of the modules is not allowed.
- 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.
- To ensure problem-free operation, the specified maximum temperature at the t_c point (see "Operating Life") must be observed (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.
- Tests have shown the following chemicals to be harmful to LEDs used on the modules. It is recommended not to use these chemicals anywhere in an LED system. The fumes from even small amounts of these chemicals may damage the LEDs.
 - Chemicals that might outgas aromatic hydrocarbons (e.g., toluene, benzene, xylene)
 - Methyl acetate or ethyl acetate (i.e., nail polish remover)
 - Cyanoacrylates (i.e., "Superglue")
 - Glycol ethers (including Radio Shack®, Precision Electronics Cleaner – dipropylene glycol monomethyl ether)
 - Formaldehyde or butadiene (including Ashland PLIOBOND® adhesive)
 - Dymax 984-LVUF conformal coating
 - Loctite Sumo glue
 - Gorilla glue
 - Clorox bleach
 - Clorox Clean-Up cleaner spray
 - Loctite 384 adhesive
 - Loctite 7387 activator
 - Loctite 242 threadlocker
 - Detailed information of handling of Cree LEDs
 - can be found on www.cree.com.

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Assembly and Safety Information

- The photobiological safety of the LED modules must be classified into risk groups in accordance with EN 62471:2008.
 - general lighting
exempt group:
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 - other applications
risk group 2:
WU-M-421Use of standard VS optics does not affect the need to classify LED modules into the above mentioned risk groups.

Applied Standards

EN 62031
LED modules for general lighting – Safety specifications

EN 62471
Photobiological safety of lamps and lamp systems