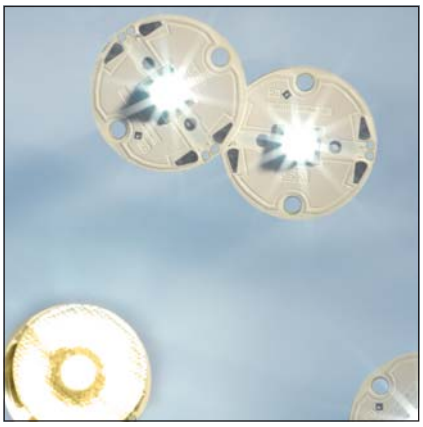
A New Lighting Experience



- **long service lifetime due to optimal thermal management**
- **very high lumen output**
- **highly efficient (up to 90 lm/W)**
- **available in different CCTs**
- **easy connections due to pre-assembled leads**
- **attachment for lenses with different radiation angles**
- **lead-free soldered**
- **resistant against shock and vibrations**

PowerEmitter White 4 W
PowerEmitter Warm white 3 W

VS-PowerEmitter-XR-E

Typical Applications

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

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PowerEmitter 4 Watt GB 1/4 August, 2009

PowerEmitter White 4 W
PowerEmitter Warm white 3 W

Technical Notes

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

Electrical Characteristics

at junction temperature t_j = 25 °C

Type	**Ref. No.**	Colour	Max. current mA	Max. voltage DC V	Max. power consumption W
VS-PowerEmitter-XR-E-W	**All types**	White	1050	4.3	4.3
VS-PowerEmitter-XR-E-WW	**All types**	Warm white	700	4.1	2.9

Use of external LED constant current driver with max. 1050 mA for White and 700 mA for Warm white required.

Maximum Ratings

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

Type	Operation temperature range at t_c-point		Storage temperature range		Reverse voltage
	°C min.	°C max.	°C min.	°C max.	V
All types	–20	+80	–20	+85	5

Optical Characteristics

at junction temperature t_j = 25 °C

Type	**Ref. No.**	Colour	Correlated colour temperature K	Brightness bin**	Luminous flux (lm) at 350 mA (P_{el} = 1,4 W)	700 mA (P_{el} = 2,9 W)	1050 mA (P_{el} = 4,3 W)	Radiation angle* °
VS-PowerEmitter-XR-E-W	**534422**	White	5650...6950	N4	62.0... 67.2	105.4...114.2	136.4...147.8	90
VS-PowerEmitter-XR-E-W	**535065**	White	5650...6950	P2	67.2... 73.9	114.2...125.6	147.8...162.6	90
VS-PowerEmitter-XR-E-W	**535066**	White	5650...6950	P3	73.9... 80.6	125.6...137.0	162.6...177.3	90
VS-PowerEmitter-XR-E-W	**535067**	White	5650...6950	P4	80.6... 87.4	137.0...148.6	177.3...192.3	90
VS-PowerEmitter-XR-E-W	**535180**	White	5650...6950	Q2	87.4... 93.9	148.6...159.6	192.3...206.6	90
VS-PowerEmitter-XR-E-W	**535181**	White	5650...6950	Q3	93.9...100.0	159.6...170.0	206.6...220.0	90
VS-PowerEmitter-XR-E-W	**535271**	White	5650...6950	Q4	100.0...107.0	170.0...181.9	220.0...235.4	90
VS-PowerEmitter-XR-E-W	**537916**	White	5650...6950	Q5	107.0...114.0	181.9...193.8	235.4...250.8	90
VS-PowerEmitter-XR-E-WW	**535068**	Warm white	2720...3040	N3	56.8... 62.0	96.6...105.4	not allowed	90
VS-PowerEmitter-XR-E-WW	**534926**	Warm white	2720...3040	N4	62.0... 67.2	105.4...114.2	not allowed	90
VS-PowerEmitter-XR-E-WW	**535726**	Warm white	2720...3040	P2	67.2... 73.9	114.2...125.6	not allowed	90
VS-PowerEmitter-XR-E-WW	**535727**	Warm white	2720...3040	P3	73.9... 80.6	125.6...137.0	not allowed	90
VS-PowerEmitter-XR-E-WW	**537922**	Warm white	2720...3040	P4	80.6... 87.4	137.0...148.6	not allowed	90

* 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.

** The reference numbers represent a single brightness group. In order to ensure availability please contact your sales prior to order.

Operating Life

50,000 hrs. (lumen maintenance at 70 %, t_c = 70 °C, I_F = 350 mA)
This value does not refer to the colour temperature.

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	8	17.7

VS recommends an additional cooling element for improved thermal management.

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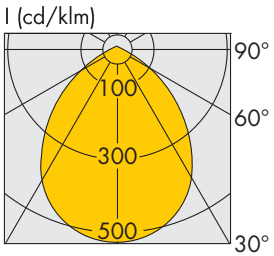
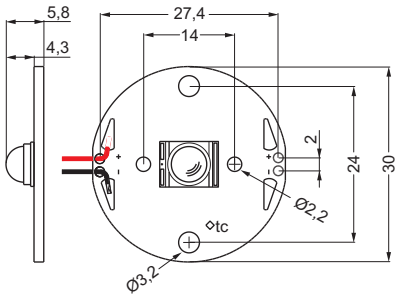
Light Distribution Curve



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

Mechanical Dimensions

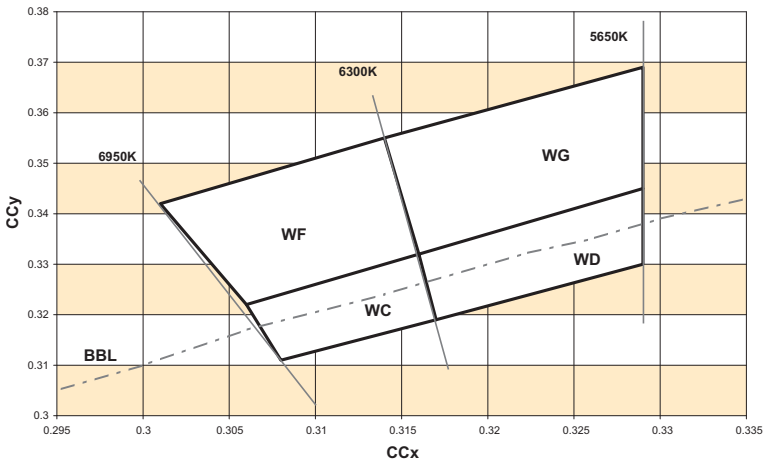
The PCB is pre-assembled with 2 leads of 200 mm in length:
red: anode (+); 22AWG/0.34 mm²
black: cathode (–); 22AWG/0.34 mm²



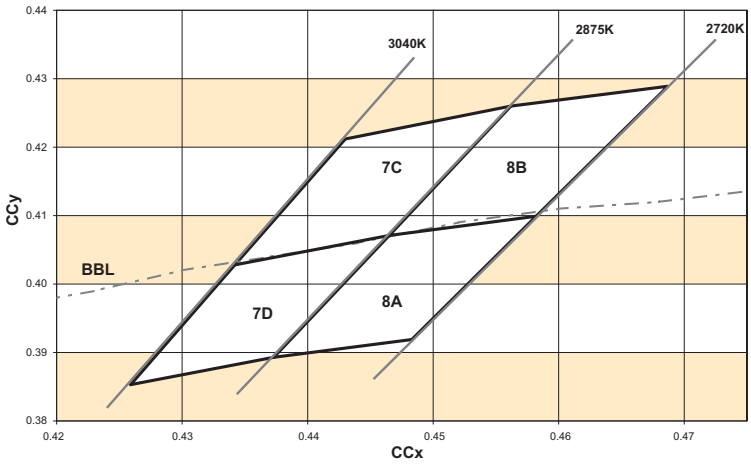
Bins

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 packing. Reduction of orderable groups is possible only project-based.

White



Warm white



The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.
Please find further detailed information at www.vs-optoelectronic.com.

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Assembly and Safety Information

- LED modules and all PCB components must not be subjected to undue mechanical stress:
  – LED modules must not be handled as bulk cargo
  – Shear and pressure stress must be avoided on LEDs during assembly and handling
- The circuit path must not be damaged or interrupted.
- Fixing holes are integrated in the PCB for easy assembly. Please use only plastic bolts for assembly to avoid short circuits or damage.
- Safe operation is only possible with an external constant current source.
- Operation is dependent on constant current drivers that should provide the following protective measures:
  – short-circuit protection
  – overload protection
  – overheating protection
  – SELV equiv. (Safety Extra Low Voltage)
- PowerEmitter 4 Watt modules are pre-assembled with two leads (22AWG) with a length of 200 mm. The connecting strands can be passed through two holes to the rear.
- Safe operation is dependent on ensuring that the t_c temperature of 80°C are not exceeded. Depending on the ambient temperature and type of application, additional cooling surfaces and heat-conductive paste or tape (Ref. No. 529158) must be used to avoid heat accumulation in the module.
- 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.
- Please ensure standard ESD (electrostatic discharge) protection measures are employed when handling and installing LED modules. Electrostatic discharge can damage LEDs.
- The modules are not protected against dust or moisture. When LED modules are operated in unduly moist or dusty environments, care must be taken to ensure each module is built into a protective casing in compliance with the correct IP classification or provided with corrosion protection. Damage caused by moisture and/or corrosion will not be recognised as a material or manufacturing defect.
- For the optimal degree of utilization of the attached regulated current source the PowerEmitter 4 Watt may be used in series connection, whereby the number of modules is limited by the sum of the forward voltages along with the power of the used regulated current source. A parallel connection of the modules is not permitted.
- Tests have shown the following chemicals to be harmful to LEDs used on the modules. It is recommended not to use the under-mentioned 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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