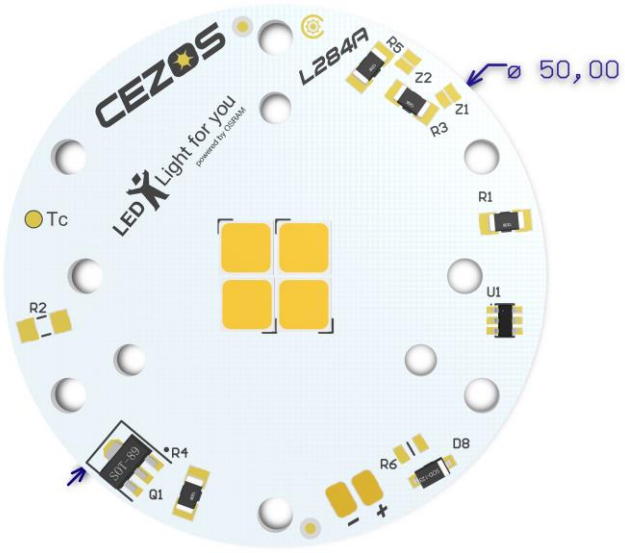
SC-000050-xxx-Vxxxx-L284



INTRODUCTION

Power LED module is an advanced light source designed for the best energy efficient and eco-friendly indoor lighting. It is based on medium power LEDs produced by the leader of the LED technology OSRAM. Using newest technology we provide the best solution for lighting. With a very high value of CRI and simple installation. Connecting a few LED modules allows to create complex lighting. Solder pads provide quick installation of the entire lighting system. This solution is the best for indoor ceiling-mounted and wall-mounted luminaries.

LED Type	OSRAM S8 - GW P9LT31.EM
LED Quantity	4 pcs
Dimension	dia 50 mm
Power Supply Type	Constant Voltage (CV)
Power Supply Voltage	36 V DC
Material Type / Thickness	MCPCB / 1,5 mm
Cable Connection	Solder Pads
Max Ambient Temperature	45°C
CRI	>80



FEATURES

LEDs have significant advantages compared to other types of lighting and are easy to use. LEDs are versatile and virtually maintenance free.

- Efficiency of the module up to 109 lm/W
- Rigid board LED module
- High colour rendering index CRI >80
- Compatible with Ledil PF SOCKET Family
- Small colour tolerance
- Small luminous flux tolerances
- Colour temperatures 2700K, 3000K, 4000K, 5000K
- Solder pads for quick and simple wiring
- Dimmable
- Simple installation
- Long lifetime

APPLICATIONS

- Ideal for ceiling-mounted and wall-mounted luminaries
- Retrofits and fixtures
- Accent and Effect Lighting
- Professional downlights
- Shop lighting

VARIANTS

- MCPCB board with LEDs
- MCPCB board with LEDs and optic

CALCULATED PARAMETERS AT T_J = 25°C AND T_J = 65°C

Power [W]	CCT [K]	Typ. CRI	Luminous Flux* [lm]	Module Efficacy* [lm/W]	Luminous Flux** [lm]	Module Efficacy** [lm/W]	Article Number
7,9	2700	82	794	100	742	94	SC-000050-827-V0050-L284
		92	722	91	675	85	SC-000050-927-V0050-L284
	3000	82	794	100	742	94	SC-000050-830-V0050-L284
		92	722	91	675	85	SC-000050-930-V0050-L284
	4000	82	860	109	804	101	SC-000050-840-V0050-L284
		92	783	99	731	92	SC-000050-940-V0050-L284
	5000	82	860	109	804	101	SC-000050-850-V0050-L284
15,1	2700	82	1497	99	1399	93	SC-000050-827-V0100-L284
		92	1362	90	1273	84	SC-000050-927-V0100-L284
	3000	82	1497	99	1399	93	SC-000050-830-V0100-L284
		92	1362	90	1273	84	SC-000050-930-V0100-L284
	4000	82	1621	107	1515	100	SC-000050-840-V0100-L284
		92	1476	98	1379	91	SC-000050-940-V0100-L284
	5000	82	1621	107	1515	100	SC-000050-850-V0100-L284
22,3	2700	82	2126	95	1987	89	SC-000050-827-V0150-L284
		92	1935	87	1808	81	SC-000050-927-V0150-L284
	3000	82	2126	95	1987	89	SC-000050-830-V0150-L284
		92	1935	87	1808	81	SC-000050-930-V0150-L284
	4000	82	2303	103	2152	97	SC-000050-840-V0150-L284
		92	2095	94	1958	88	SC-000050-940-V0150-L284
	5000	82	2303	103	2152	97	SC-000050-850-V0150-L284

* - Parameters were calculated for temperatures T_J= 25°C

** - Parameters were calculated for temperatures T_J= 65°C

Parameters shown in table are temperature dependent and can be different during long time of operation.

Value of these parameters were calculated for default bin and with tolerances of 15%.

Please contact us before ordering for more information.

Parameters shown in table are default and for temperatures T_J=25°C and T_J=65°C. Some of this parameters are dependent on temperature and can be different during long time of operation. So it is impossible to order modules with same parameters after some time. LED technology is developed fast and producers are creating new LEDs with better features very quick. If you need LED modules with different value of some parameters, we provide other LEDs with different colour temperature and features. Parameters in table doesn't take into account the differences which can be done by additional optics. If parameters does not meet your needs, it is possible to make modification of LED modules or create a new one. In such a case and for more information, please contact us before ordering. Please have all of this in mind when ordering LED modules.

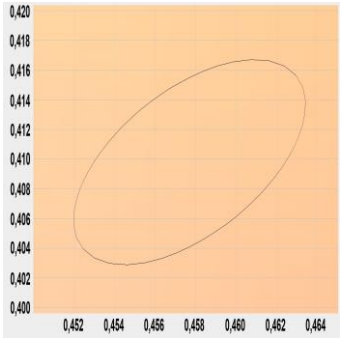
POWER LEDS

Power LED modules are best solution to illuminate medium or small areas with strong light. These modules are specially designed on high power LEDs and/or possibility to attach additional optics. Using optics allow to concentrate LEDs light in certain points. Value of luminous flux is increasing, but viewing angle is decreasing at the same time. Those changes of value depends on optic that was used. Advantage of this solution is compact size of modules, because modules need less LEDs to generate light with same luminous flux. Additionally most of optics provide better colour mixing and uniform illumination. Power LED modules are adapted to mount only some of optics and it depend on modules. We have got suitable optics for modules in our offer, but it may be possible to use adapters. We are not responsible for any loss, or damage resulting from improper use of modules, optics and adapters! Guarantee become void in such cases.

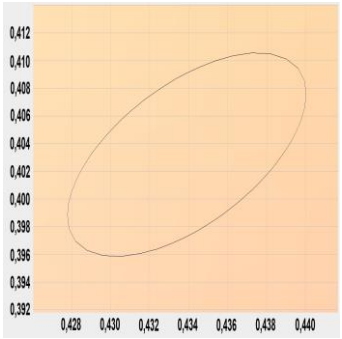
MACADAM ELLIPSE

Producing LEDs with same colour temperature is almost impossible. LEDs with similar colours are divided into bin. MacAdam Ellipses are used to describe differences in colour of LEDs with same bin. When most people can't see very small differences in colours, these colours are in first step level of MacAdam Ellipse (1SDCM). If the differences are getting bigger, then number of step is increasing. Second zone of MacAdam ellipse (2SDCM) is twice bigger than first one and so on. Differences in colour for 3000K LEDs can be up to ±30K in 1SDCM. If bin is in 4SDCM, then colour differences should be less than ±100K. LEDs with smaller number of SDCM are better. Most common LEDs are in 4th to 7th step level, in other words human eyes certainly can see colour differences in LEDs that are ostensibly the same colour. In most of our projects have been used LEDs in 3rd step level, so differences in colour aren't as big as fourth step level of MacAdam Ellipse.

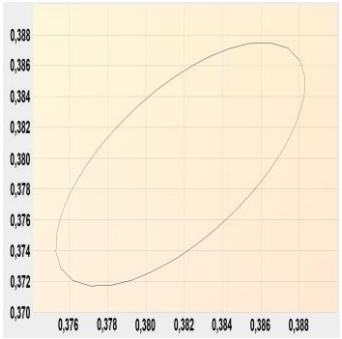
2700K 3SDCM



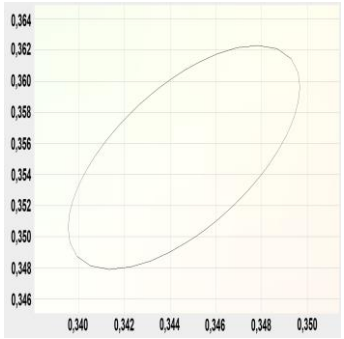
3000K 3SDCM



4000K 3SDCM



5000K 3SDCM





SAFETY

Most of LEDs generate high intensity light even when dimmed. If LED light has high intensity, it is classified as laser. These LEDs must have appropriate marking. Combination of LEDs or even weak LEDs with optics can be very dangerous, because optics can focus beam and looking into LEDs beam is unhealthy and may cause irreversible injury to eye's retina. Never look into the beam without protection glasses with appropriate filter.

Additionally LEDs light change intensity almost immediately. If people are photosensitive, LEDs light may be a trigger to epileptic seizures and alter the perception, especially when light change very fast.

PROTECTION MEASURES AGAINST DAMAGE

LED modules are delicate, even small mechanical stress may damage modules. Especially sensitive are LEDs. Such stresses should be avoided. If it is impossible, it should be kept to minimum. Mechanical stresses such as pressure, bending, breaking, drilling, etc. may cause irreversible damage. Damaged LED modules aren't suitable for use.

Serious threat to LEDs is electrostatic voltage discharge. People generate very high electrostatic voltage. Such voltage decrease lifetime of LEDs and in worst case may destroy electronic components. Best way to avoid damage is use of electrostatic protection. Do not touch electronic components.

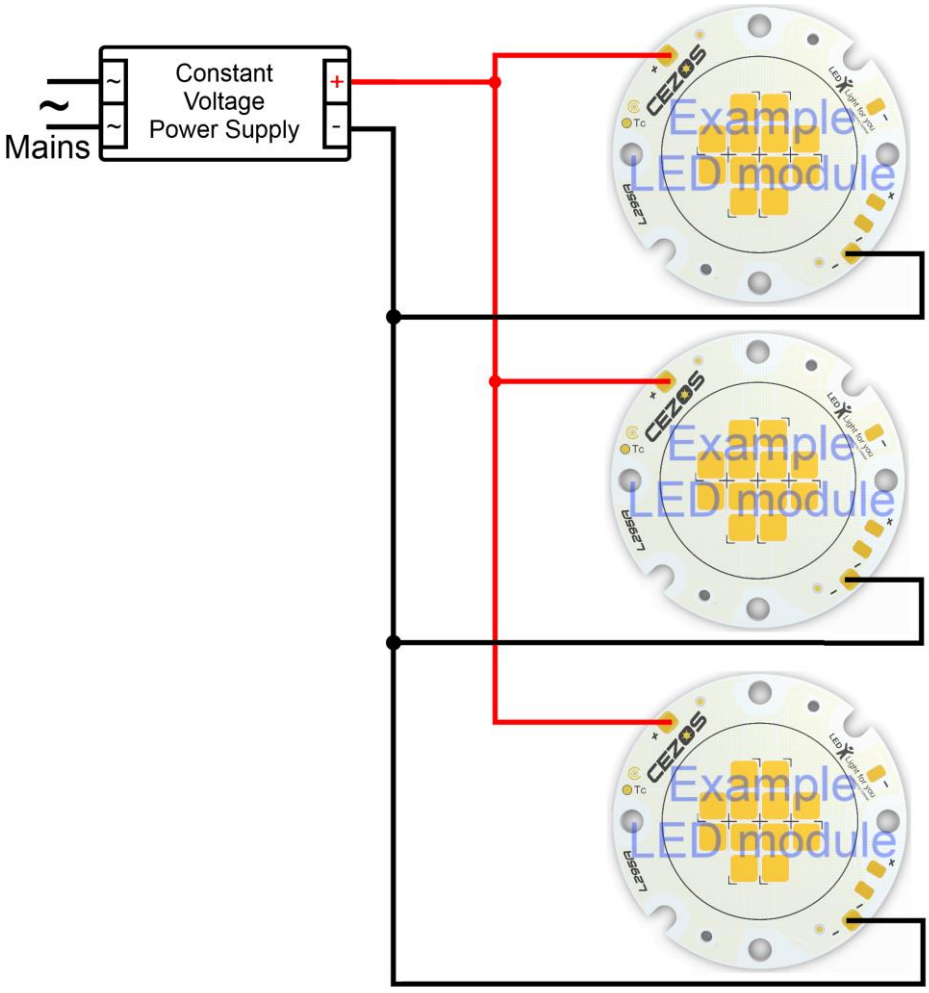
Additionally LED modules can be damaged by some chemical substances. Depends of elements the damage may be different. It is important not to use chemical substances like acids, organic acids, sulphur, alkalis, organic solvents, mineral oils, vegetable oils and synthetic oils, etc. We are not responsible for any loss, or damage resulting from improper use of modules! Guarantee become void in such cases.

Do not operate LED modules, when they aren't working properly. If modules are working incorrectly, turn off power supply. Damaged LED modules may cause electric shock or short circuit.

CONNECTIONS

Connecting a few LED modules allows to create complex lighting. The LED modules must be operated with power supply that is suitable for LEDs. When connecting a few LED modules use of appropriate power supply is important. Power supply should have sufficient max. power to maintain all LED modules. Power supply must be connected properly. Wrong polarization can destroy modules in very short time. We are not responsible for any loss, or damage resulting from improper use of modules! Guarantee become void in such cases. Modules can be operated using a LED controller. It allows to use light effects, dimmer, etc. Thanks to dimmer it is possible to eliminate almost immediately change of light intensity. It is possible because LEDs are full controlled. Slower changes of light intensity are more safety for people with photosensitive. We have got several different dimmers like touchable, RC, IR and Bluetooth in our offer. Most controllers have many light effects such as fire, thunderstorm, rainbow changes, strobe, etc. Some of these allows to create new effects, that are programmable via software.

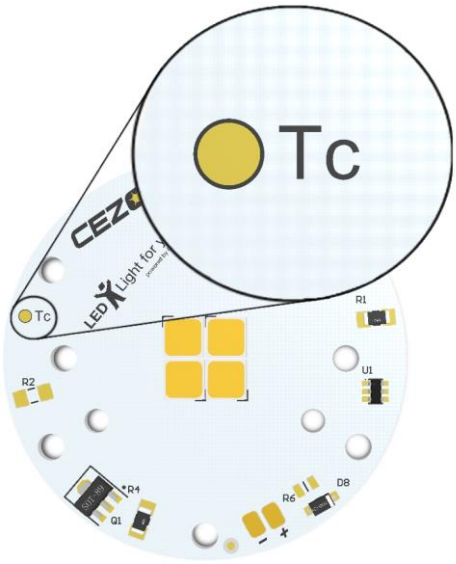
WIRING DIAGRAM FOR POWER LED CV MODULES WITH PARALLEL WIRING



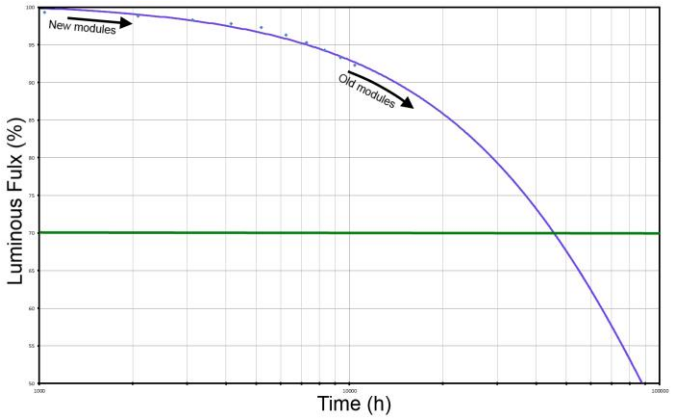
Advantages of this solution are very low voltage supply and uniform distribution of light. It meets requirements of SELV. Higher current supply is require to proper operation. Higher current increases temperature and decreases lifetime. Connections LED CV modules with serial wiring is unacceptable. Such connection may damage or destroy modules. We are not responsible for any loss, or damage resulting from improper use of modules! Guarantee become void in such cases. Above connection is examples and may be different from the actual.

COOLING

The modules are self-cooled but if temperature on T_c point exceeds 70°C, than a heat-sink is required. Temperature test point (T_c) for measurement should be localized in the middle of the board near LED's thermal pad. The temperature at the T_c point can be measured with thermocouple or simple temperature probe. Example of T_c point is show on the photo below.



The lifetime of the module depends to operating temperature and used LEDs. If temperature at T_c will be lower than 65°C, the value of luminous flux shouldn't be less than 80% of its nominal value after 50.000h. If temperature is to high then lifetime can be significantly decreased or damage LEDs. Another disadvantage of high temperature is reduction of relative luminous intensity. LED modules produces heat. They must be provided with good air ventilation. Modules without air ventilation can overheat. Overheat can damage or destroy some elements or entire LED modules. We are not responsible for any loss, or damage resulting from improper use of modules! Guarantee become void in such cases.



Most common problem using new modules in old installation is differences in brightness of modules. This is result of luminous flux degradation over time of use. Degradation is normal effect and applies to all LEDs. This effect is different for each LEDs and can be only predicted by testing and estimation. It is complicate issue that mostly depends on temperature and current. Good solution to this problem is reduce of current in new modules, but degradation will be different for each modules. Above characteristic is examples for LEDs in temperature above 100°C and different from the actual.

STANDARDS AND DIRECTIVES

In the process of designing and manufacturing the following standards and directives were taken into account:

• 2006/95/EC – Low-voltage Directive: electrical equipment for use within certain voltage limits

• 2004/108/EC – EMC Directive: electromagnetic compatibility

• 2011/65/EC – RoHS Directive: restriction of hazardous substances in electrical and electronic equipment

• DIN IEC 62031:2008 – Safety requirements for LED modules

• EN 60598-1:2008 and A11:2009 – General requirements and tests for luminaires

• EN 60598-2-2:1996 and A1:1997 – Luminaires - Part 2. Special requirements; Main section 2: Recessed luminaires

• EN 62471:2008 – Photo-biological safety of lamps and lamps systems

• EN 61347-1:2009 – General and safety requirements

• EN 61347-2-13:2007 – Special requirements for DC and AC powered electronic operating equipment for LED modules

• EU Regulation No: 874/2012 – Energy labelling of electrical lamps and luminaries

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Subject to technical changes and errors.