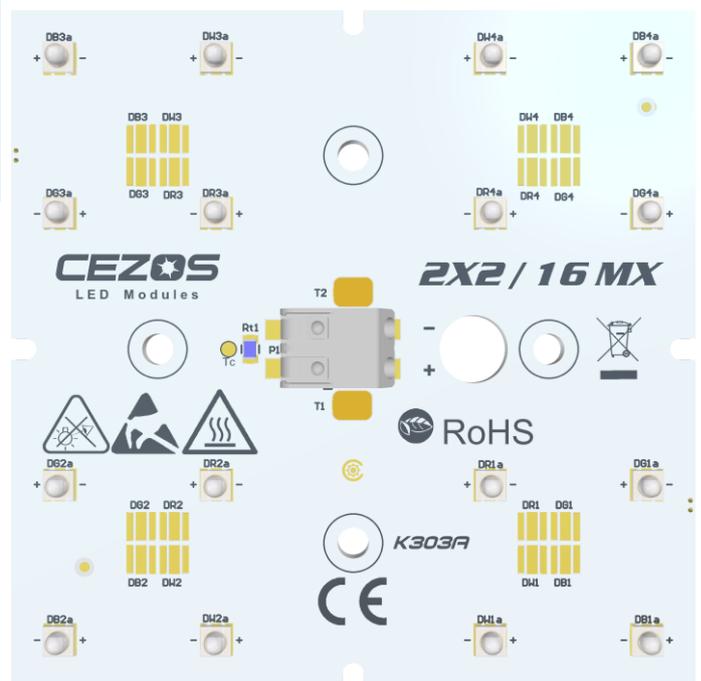
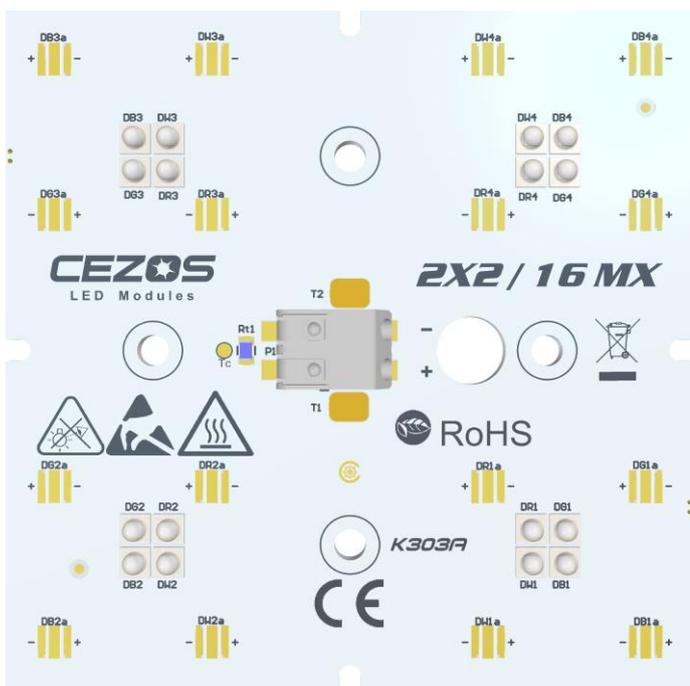


CEZOS

Q0-070070-xxx-C1800-K303



INTRODUCTION

Street LED module is an advanced light source designed for the best energy efficient and eco-friendly outdoor lighting, with additional weather protection. 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. Optional push terminals provide quick installation of the entire lighting system. This solution is the best for street lamps, parking lamps etc.

LED Type	OSRAM OSOLON - GW CSSRM2
LED Quantity	16 pcs
Dimension	70x70 mm (90x90 with optic)
Power Supply Type	Constant Current (CC)
Input Current	max. 1800 mA
Material Thickness	1,5 mm
Cable Connection	ADELS 351102
Max Ambient Temperature	45°C
CRI	>70

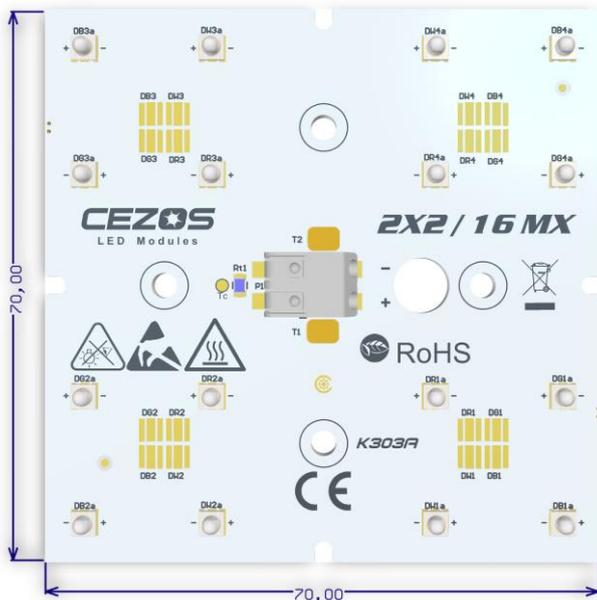
FEATURES

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 152 lm/W @ 700mA
- Colour temperatures 2700K, 3000K, 4000K, 5000K
- NTC Protection
- Optional push terminals for quick and simple wiring

APPLICATIONS

- Street lamps
- Parking lamps



CALCULATED PARAMETERS AT T_J = 85°C AND T_J = 25°C

Input Current [mA]	Forward Voltage [V]	Power [W]	CCT [K]	Min. CRI	Luminous Flux* [lm]	Module Efficacy* [lm/W]	Luminous Flux** [lm]	Module Efficacy** [lm/W]	Article Number			
700	48,4	33,9	2700	80	3837	113	3707	109	Q0-070070-827-C1800-K303			
				90	3565	105	3371	101	Q0-070070-927-C1800-K303			
			3000	70	4802	142	4639	137	Q0-070070-730-C1800-K303			
				80	4007	118	3872	114	Q0-070070-830-C1800-K303			
			4000	90	3739	110	3535	106	Q0-070070-930-C1800-K303			
				70	4970	147	4802	142	Q0-070070-740-C1800-K303			
				80	4348	128	4201	124	Q0-070070-840-C1800-K303			
			5000	90	4087	121	3864	116	Q0-070070-940-C1800-K303			
				70	5139	152	4965	147	Q0-070070-750-C1800-K303			
				80	4348	128	4201	124	Q0-070070-850-C1800-K303			
			1050	49,6	52,1	2700	80	5435	103	5251	100	Q0-070070-827-C1800-K303
							90	5052	96	4767	92	Q0-070070-927-C1800-K303
3000	70	6831				131	6600	127	Q0-070070-730-C1800-K303			
	80	5676				108	5484	104	Q0-070070-830-C1800-K303			
4000	90	5298				100	4999	97	Q0-070070-930-C1800-K303			
	70	7071				136	6832	131	Q0-070070-740-C1800-K303			
	80	6159				117	5951	113	Q0-070070-840-C1800-K303			
5000	90	5791				110	5464	106	Q0-070070-940-C1800-K303			
	70	7311				140	7063	136	Q0-070070-750-C1800-K303			
	80	6159				117	5951	113	Q0-070070-850-C1800-K303			
1400	50,6	70,9				2700	80	6864	95	6632	92	Q0-070070-827-C1800-K303
							90	6380	88	6007	85	Q0-070070-927-C1800-K303
			3000	70	8666	122	8373	118	Q0-070070-730-C1800-K303			
				80	7169	99	6927	96	Q0-070070-830-C1800-K303			
			4000	90	6691	92	6300	89	Q0-070070-930-C1800-K303			
				70	8970	127	8667	122	Q0-070070-740-C1800-K303			
				80	7780	107	7516	104	Q0-070070-840-C1800-K303			
			5000	90	7313	101	6887	97	Q0-070070-940-C1800-K303			
				70	9274	131	8961	126	Q0-070070-750-C1800-K303			
				80	7780	107	7516	104	Q0-070070-850-C1800-K303			

* - Parameters were calculated for temperatures T_J= 85°C

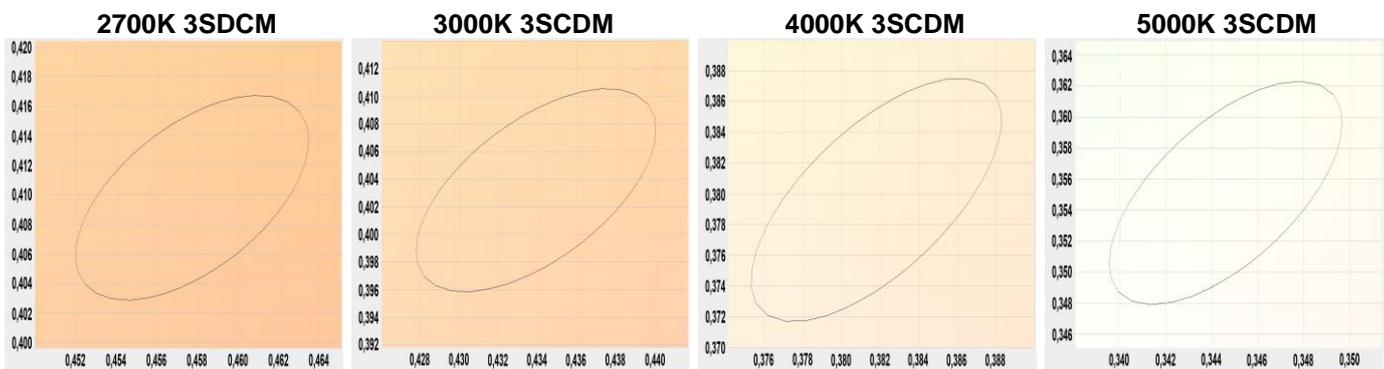
** - Parameters were calculated for temperatures T_J= 25°C

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

Parameters shown in table above are default and for temperatures T_J=85°C and T_J=25°C. Some of these parameters are temperature dependent and can be different during long time of operation. So it is impossible to order modules with the 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. It is possible to make modification of LED modules or create a new one. In such cases and for more information, please contact us before ordering. Please have all of this in mind when ordering LED modules.

MACADAM ELLIPSE

Producing LEDs with the same colour temperature is almost impossible. LEDs with similar colours are divided into bins. MacAdam Ellipses are used to describe differences in colour of LEDs with the 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 $\pm 30K$ in 1SDCM. If bin is in 4SDCM, then colour differences should be less than $\pm 100K$. 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.

**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 LED light can change intensity almost immediately. If people are photosensitive, LED light may be a trigger to epileptic seizures and alter the perception, especially when light changes 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 reduced to minimum. Mechanical stresses such as pressure, bending, breaking, drilling, etc. may cause irreversible damage. Damaged LED modules aren't suitable for use.

Electrostatic Discharge (ESD) is a serious threat to electronics devices. Human body can generate very high electrostatic voltage which can decrease lifetime of electronics significantly and in worst cases may destroy electronic components. To avoid damages use of electrostatic protection is required. It is needed to follow ESD precautions during manipulation of these devices. Do not touch electronic components directly to avoid damages. Observe the official regulations for electrical devices (like DIN, VDE, EN). It is necessary to isolate components like controllers, LED modules, power supply, wires etc. from any metal parts which can conduct electrostatic charges or cause short circuit. Controllers aren't equipped with short circuit protection. During short circuit, very high current is flowing from power supply and can destroy it, causing risk of fire. Electronics must not be modified. Any modification causes loss of guarantee. The electric wiring/connection must comply with all current and valid national requirements, be constructed by a certified electrical tradesman, and comply with all the requirements set forth in this manual. We are not responsible for any loss, or damage resulting from electrostatic voltage discharge and short circuit cause by inappropriate handling or wrong construction of the lamp! Guarantee become void in such cases.

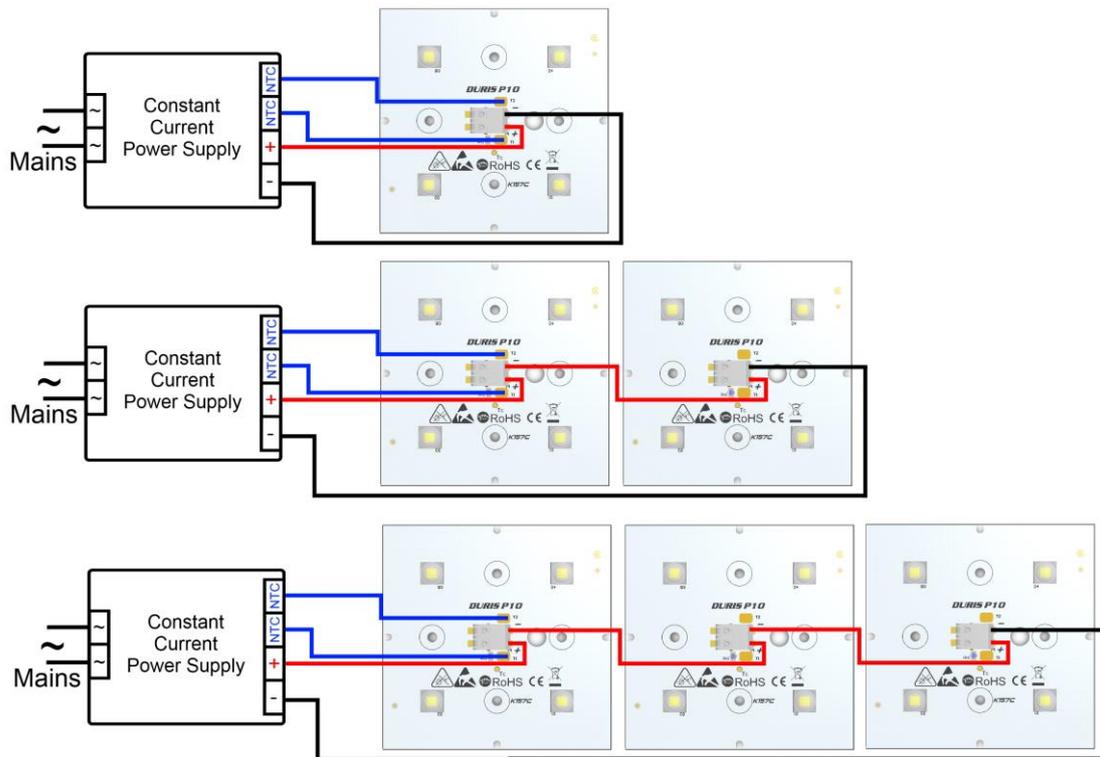
Additionally LED modules can be damaged by some chemical substances. Depends of elements the damage may be different. It is important not to use chemical substances like acids, organic acids, sulphur, alkalis, organic solvents, mineral oils, vegetable oils and synthetic oils, etc. We are not responsible 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 few Steer LED modules allows to adapt lamp in most effective way. Push terminals provide quick installation of the entire lamp. 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 maximum 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.

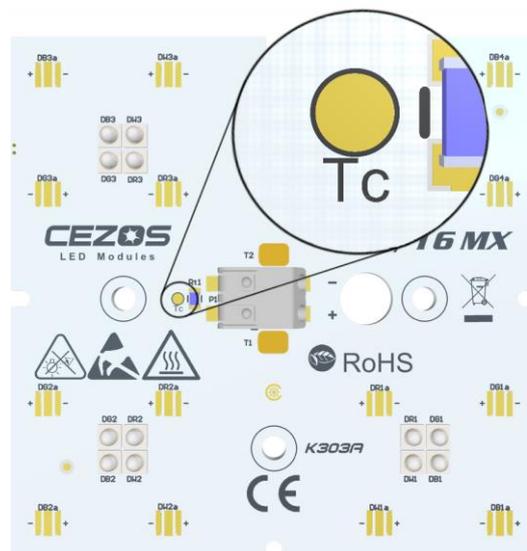
WIRING DIAGRAM FOR STREET LED CC MODULES WITH SERIAL WIRING AND SERIAL-PARALLEL WIRING



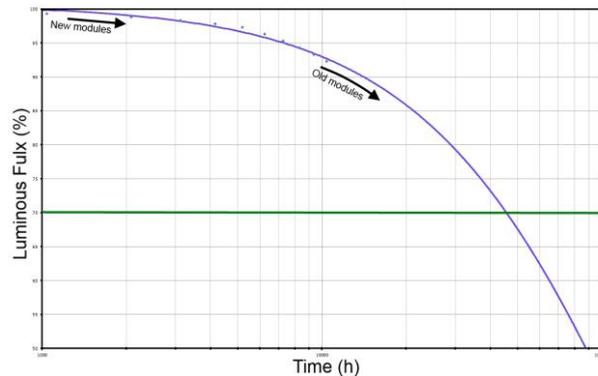
Street LED modules may be connected with serial. Above connections are example and may be different from the actual.

COOLING

The modules are usually self-cooling but if temperature on T_c point exceeds 70°C , then 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 shown 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 too 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.

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Subject to technical changes and errors.