



Higher reliability diodes with improved efficiency! Featuring SIDAC technology for LED failure prevention

## Background

In standard LED lighting equipment, multiple LEDs are connected serially in a constant current circuit. However, if any one of the LEDs has an open fault, all remaining LEDs go out as well. As a conventional countermeasure for this, Zener diodes have been used, but issues of generating heat and power loss during breakdown had surfaced.

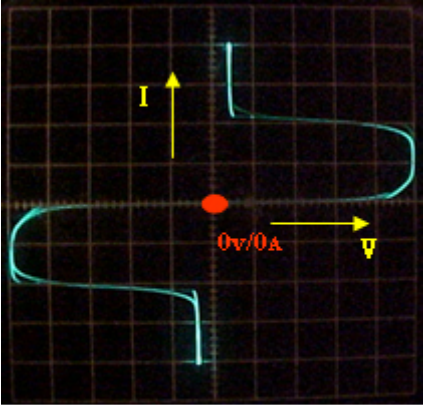
## Amazing Technology Overview

SIDAC "K1VZL series" offers a highly reliable protection function. They are triggered by a slight increase from breakover voltage  $V_{BO}$  and immediately transition to an ON state. They also have low forward loss, allowing for a reduction of components installed for overheating protection.

**Features**  
**High reliability and improved efficiency while in the ON state (using bypass function)!**  
 \* 1/5 or less of the loss of Zener diodes.  
**Specification: Operating voltage  $V_{BO}$  = 10V type (K1VZL09), 20 V type (K1VZL20)**  
**Rated current  $I_T$  = 500 mA (1A or higher is also possible depending on the mounting conditions)**

## Amazing Technology Details

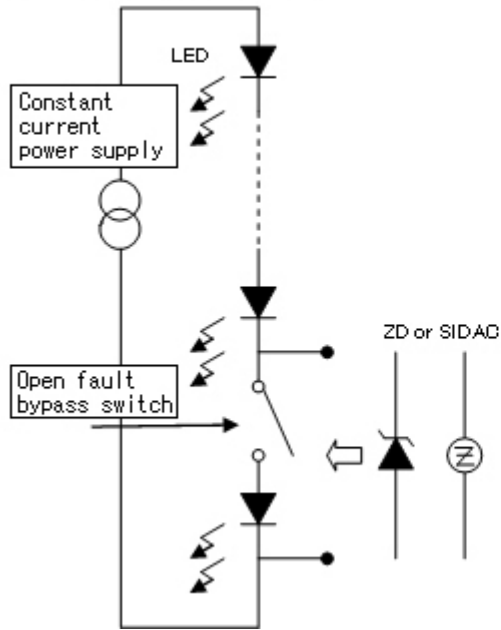
- [Environmental Performance]
- If the operating voltage is exceeded, it transitions to a low impedance (same as the forward direction of the diode)



Diode curve tracer voltage-current waveform

[Comparison of power loss with Zener diode]

Comparison circuit diagram



Power supply current = 50 mA

Zener diode VZ [V]	5.15
SIDAC VT [V]	0.85
Zener power loss [mW]	257.5
SIDAC power loss [mW]	42.5

Power supply current = 100 mA

Zener diode VZ [V]	5.22
SIDAC VT [V]	0.87
Zener power loss [mW]	522
SIDAC power loss [mW]	87

Reduced power loss to 1/5 or less

## Future Outlook and Technological Trends

With the SIDAC “K1VZL” series, we were able to significantly reduce the heat generation and power loss that posed problems for LED failure prevention on LED lighting equipment. With raised environmental awareness, demand for LED lighting is expected to grow further. We are developing these diodes for traffic lights and emergency guide lights, where complete darkening is not acceptable, as well as street lights, building and submersible lighting where maintenance is difficult. Furthermore, we are also penetrating the automotive market where LED applications are also increasing.

The SIDAC “K1VZL” series will be displayed at the 10th “International Lighting Fair 2011” at Tokyo Big Sight for four days starting from March 8 (Tue.) to March 11 (Fri.), 2011. We invite you to please come and see us there.