

**1. Industry segments**

• **Field of industry**

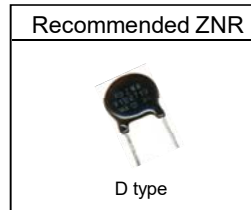
Lighting industry

• **Product**

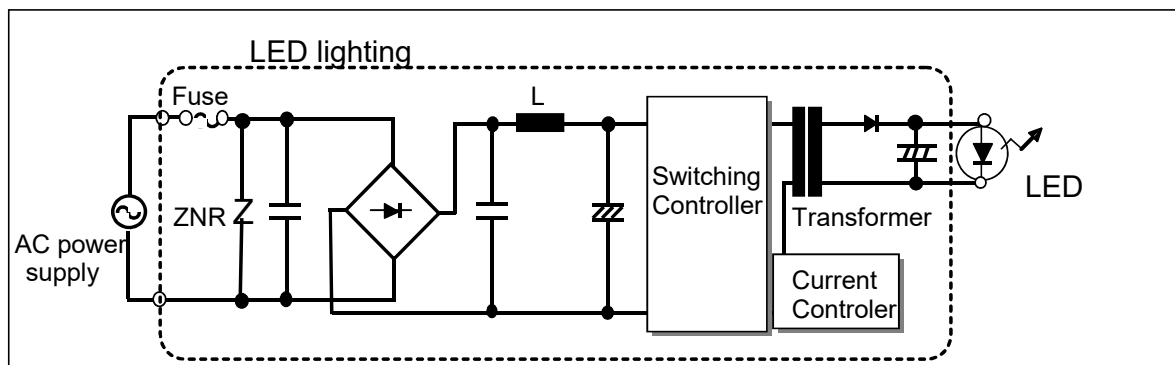
LED lighting equipment

Bulb, Down Light, Ceiling Light

for home and industry use



**2. Transient surge voltage and its protection by using ZNR**



**1) Aim of ZNR application**

Protection of LED lighting circuits against lightning surges

**2) Problems with surge voltage**

- **Kind of surge voltage** Induced lightning surge voltage
- **Path for surge voltage** AC power line
- **Failed parts or circuits** Diode bridge, Electrolytic capacitor, Resistor etc. in AC power circuit

**3) How to apply ZNR to the circuits**

- **Connection**  
AC power line (line-line)
- **ZNR part number selection (Representative)**  
For AC100V system ERZV07D271, ERZE08A271, ERZV10D271, ERZE11A271, ERZV14D271  
For AC200V system ERZV07D471, ERZE08A471, ERZV10D471, ERZE11A471, ERZV14D471
- **Precaution in surge protection designing**  
ZNR should be connected at load side after the fuse.  
ZNR is selected according to max. AC line voltage, possible surge voltage and its frequency of occurrence.

**3. Relevant technical informations or references**

- JISC8154(2009) ,IEC62031 『LED module for general lighting-safety specifications』
- IEC62560 『Self-ballasted LED-lamps for general lighting services by voltage >50V, Safety specs』

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