Panasonic

ZNR Application Note

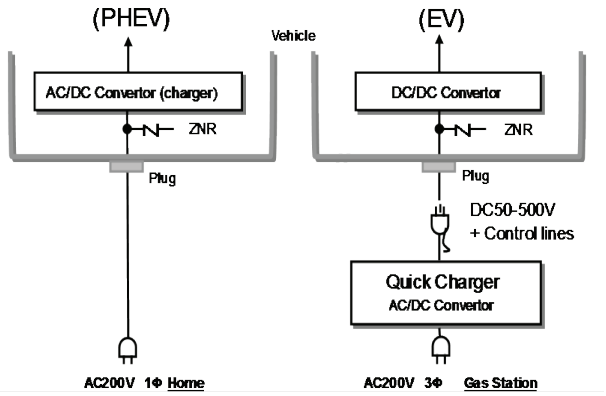
Automotive Electronics (EV, PHEV)

1. Industry Segments:

Field of Industry: Automotive Electronics (EV, PHEV)

Product: AC/DC, DC/DC Converter for battery charger, DC/DC converter for EV

2. Transient Surge Voltage and its Protection by Using ZNR:



Aim of ZNR Application:

Protection of AC/DC, DC/DC converter in car against lightning surge voltages

Problems with Surge Voltage:

Kind of surge voltage: Lightning surge voltage

Path of surge voltage: AC power line

Failed parts or circuits: Power semiconductors such as thyristor or IGBT

How to Apply ZNR to Circuit: (Blue Part Numbers Indicate NEW "E-Series")

Connection: AC power line(line-line and line-ground)

ZNR part number selection (representative):

For AC 200V application: ERZE10A431, ERZE11A431 or ERZE14A431
ERZE10A471, ERZE11A471 or ERZE14A471

Precaution in surge protection designing (Parameters to be considered for ZNR selection):

Surge test specification(Voltage , cuurent, waveform and their repetition), if any.
Insulation coordination between the clamping voltage and withstand voltage of power semiconductors

3. Relevant Technical Information and References:

IEC61851-21 Electric vehicle conductive charging system-Electric vehicle requirements for conductive connection to an a.c./d.c.supply , refering to IEC61000-4-5(2kV/12Ω for common 1kV/2Ω for differential)

4. More Information:

Home page for up-to-date information: http://na.industrial.panasonic.com/products/circuit-thermal-protection/circuit-protection/znr-transientsurge-absorbers