

ENERGY STORAGE/ STROBES/ARC SUPPRESSION

Energy storage takes advantage of the capacitor's ability to store energy for long periods of time and then discharge this energy in a short period of time creating high pulse current values.

The amount of energy stored in the capacitor is determined by the following:

$$J = \frac{1}{2} CV^2$$

Where C = capacitance
V = the peak voltage the capacitor is charged to.

The main capacitor characteristics are:

- Insulation resistance
- ESR
- dv/dt rating

In strobe applications the amount energy needed must be delivered to the flash tube. Here the flash tube and ESR of the capacitor are in series with some of the energy being lost in the capacitor. The amount of energy stored must be larger than what is needed to flash the tube to offset the losses in the capacitor.

$$W = J[ESR/(ESR+R)] * f$$

Where R is the tubes resistance while firing.
f is the frequency the tube is fired at.

Peak current of snubber.

$$dv/dt = V/(R_s C) \text{ and } C = V^2/f$$

The main characteristics are:

- ESR
- Voltage rating
- Leakage current/insulation resistance
- Capacitance

