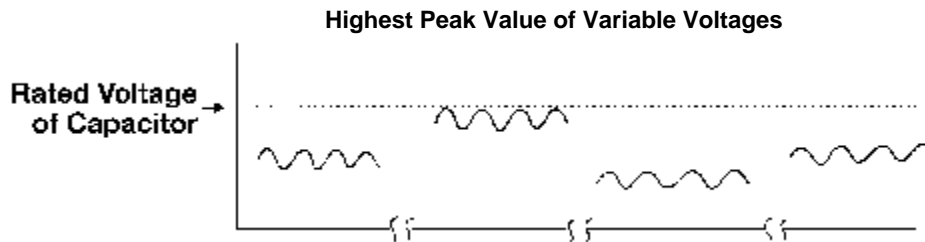


Applying Voltage

Designing Circuits Using Non-Solid and Solid Aluminum Electrolytic Capacitors

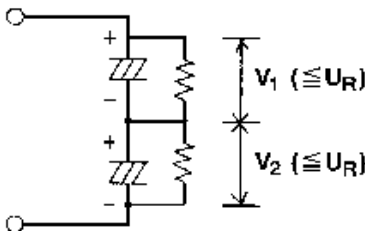
Explanatory Notes

1. Select capacitors with the correct rated voltage by following these guidelines:
 - For capacitors with an AC voltage superimposed on a DC voltage, select capacitors with a rated voltage that exceeds the total peak value of the AC (ripple) voltage plus the DC voltage. If variable voltages are present, use the highest peak value of the AC voltages plus the DC voltage to determine the total operating voltage.



- If using more than one capacitor connected in series, select a higher rated voltage for the capacitors to compensate for the voltage imbalance caused by differences in the leakage current of the capacitors. Also, equalize the voltage imbalance by shunting external (balance) resistors across each capacitor.

Rated Voltage of Capacitor



- If pulsing voltages are applied to a capacitor, select the capacitor with a rated voltage higher than the pulsing voltages.
2. Surge voltage is the maximum overvoltage including DC, peak AC and transients to which capacitors may be subjected for short periods of time. This overvoltage causes a large amount of current to flow into a capacitor which generates internal gas, raises the vapor pressure and causes abnormal internal pressure. This pressure will cause the safety vent, if any, to rupture or damage the rubber seal causing electrolyte leakage. In extreme cases a capacitor may explode or catch on fire.

Although a surge voltage, which exceeds the rated voltage, is specified for capacitors in the Japanese Industrial Standard (JIS), it does not imply long-term use but limited use under specific conditions. See footnotes.

Precaution

1. Select capacitors according to voltage requirements and do not exceed specific voltage limits for the application.
2. Do not exceed the specified surge voltage (maximum overvoltage) of capacitors.

Footnotes

The surge voltage (US), which exceeds the rated voltage (UR) of capacitors, has been defined in the JIS as follows:

When UR 200 volts : $US = UR @ 1.25$

When UR > 200 volts : $US = UR + 50 \text{ volts}$

For surge voltage tests, the above voltages (US) shall be applied to the capacitors at a cycling rate of 30 seconds on, 5-1/2 minutes off, for 1,000 successive cycles at a specified temperature.