

IGBT SNUBBERS

Capacitors are needed in IGBT circuits to protect the module from damage from transient voltages. Decoupling the parasitic bus inductance with a low inductance capacitor mounted directly to the IGBT module does this.

In high power modules a clamped RCD snubber is required. Here the snubber diode conducts when the bus inductance causes the voltage across the IGBT to exceed the DC bus voltage. This causes the capacitor to absorb the excess energy.

Snubber capacitance can be calculated using the following equation for the RCD type:

$$C = \frac{L_B i}{V_2}$$

where L_B = Parasitic bus inductance
 i = operating current
 C = capacitance value of snubber capacitor
 V_2 = snubber voltage

For direct mount capacitors use 1 μ F of snubber capacitance for every 100 Amps being switched as a rule of thumb.

The most important characteristics for IGBT snubber capacitors are:

- The ESL
- The dv/dt
- Low Dielectric Absorption

The above is just a few of the types of applications utilizing capacitors. Others include:

- Power factor correction
- Motor run/motor start
- Arc suppression (snubbers)
- Tuning
- SCR Commutation
- Frequency discrimination

