Fuji IGBT Module V Series 1200V Family

Switching energy and Reverse recovery dV/dt with combination of Rg and Cge

Type name: 2MBI600VN-120-50

Conditions: Vdc=600V, Ic, If=40A and/or 600A, Vge=+/−15V, Cge=0, 47, 94nF; Tj=25°C or 125°C

(a) Rg dependence of reverse recovery dv/dt
(b) Rg dependence of turn-on loss
(c) Rg dependence of turn-off loss
(d) Rg dependence of reverse recovery loss
Additional external capacitance between IGBT gate and emitter terminals has an effect of improving the trade off between reverse recovery $dv/dt$ and total switching energy as shown in above chart. However, simply add $C_{ge}$ slows down the IGBT significantly and it results penalty of increasing the switching loss. Therefore, the combination of extra-$C_{ge}$ and reduction of the gate resistance ($R_{g}$) is recommended to achieve the highest performance of lower $dV/dt$ as well as keep switching energy low. Typical $C_{ge}$ and $R_{g}$ values for initial guess are: 2x of $C_{ies}$ in our datasheet and 1/2 $R_{g}$ of your original design, however, experimental confirmation in practical application is recommended.