FUJI IGBT Module 6MBI800XV-075V-01

Switching energy and Reverse recovery $dv/dt$ with combination of $R_G$ and $C_{GE}$

Measured module: 6MBI800XV-075-01

Measured conditions: $V_{CC}=400\,\text{V}$, $I_C=16\,\text{A}$ or $800\,\text{A}$, $V_{GE}=+15\,\text{V}/0\,\text{V}$, $R_G=\text{var.}$, $C_{GE}=0, 27, 56, 82\,\text{nF}$

$T_{\text{vj}}=25\,\text{°C}$ or $150\,\text{°C}$

(a) $R_G$ dependence of reverse recovery $dv/dt$  
(b) $R_G$ dependence of turn on loss  
(c) $R_G$ dependence of turn off loss  
(d) $R_G$ 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.

**Reference data**

(e) $C_{GE}$ and $R_G$ dependence for sum of switching loss and reverse recovery $dv/dt$
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