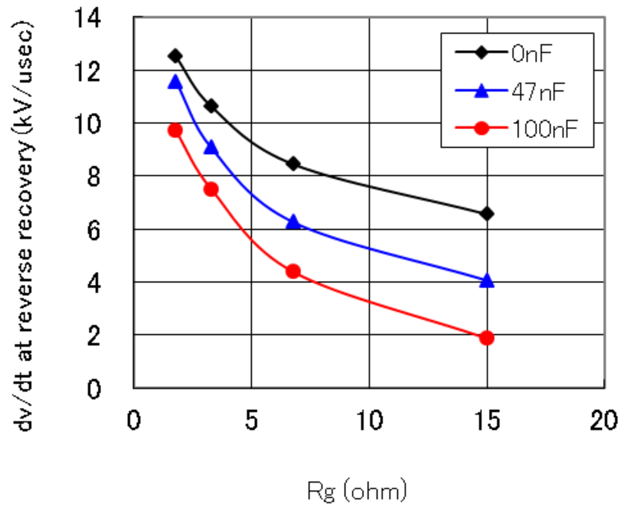
− Fuji IGBT Module V Series 1700V Family −

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

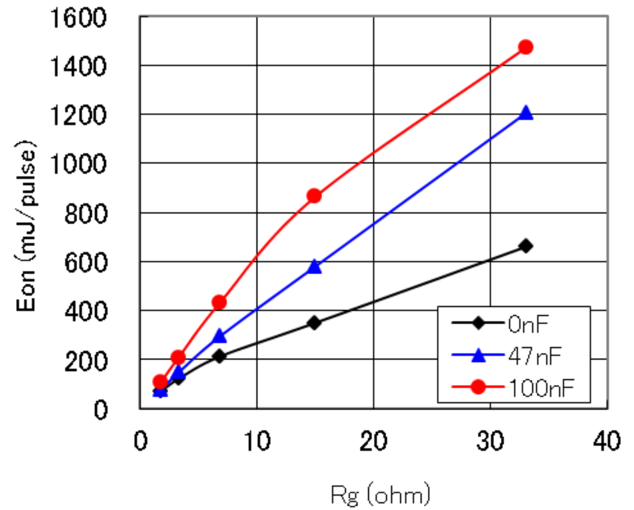
Type name : 2MBI550VN-170-50

Conditions : Vdc=900V, Ic, If=550A, Vge=+/-15V, Rg=vari., Cge=0, 47, 100nF

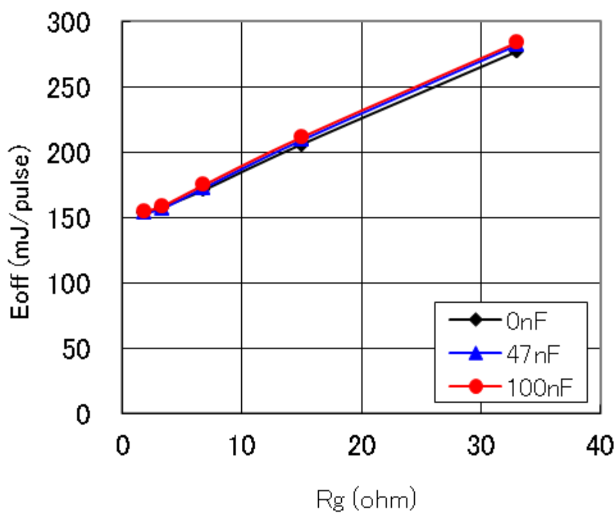
Tj=25℃ or 125℃



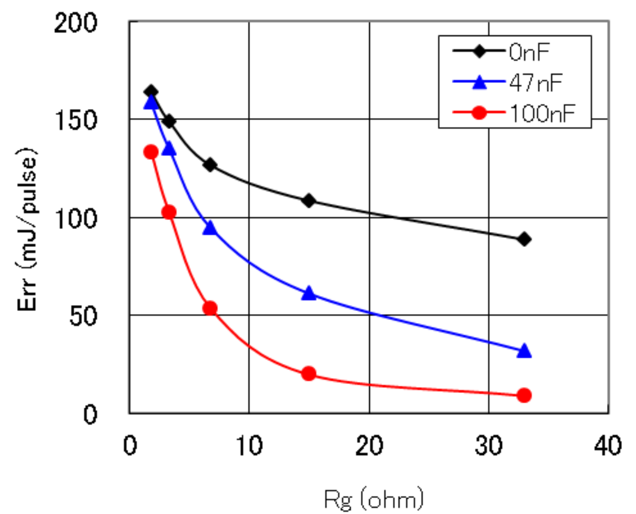
(a) Rg dependence of reverse recovery dv/dt



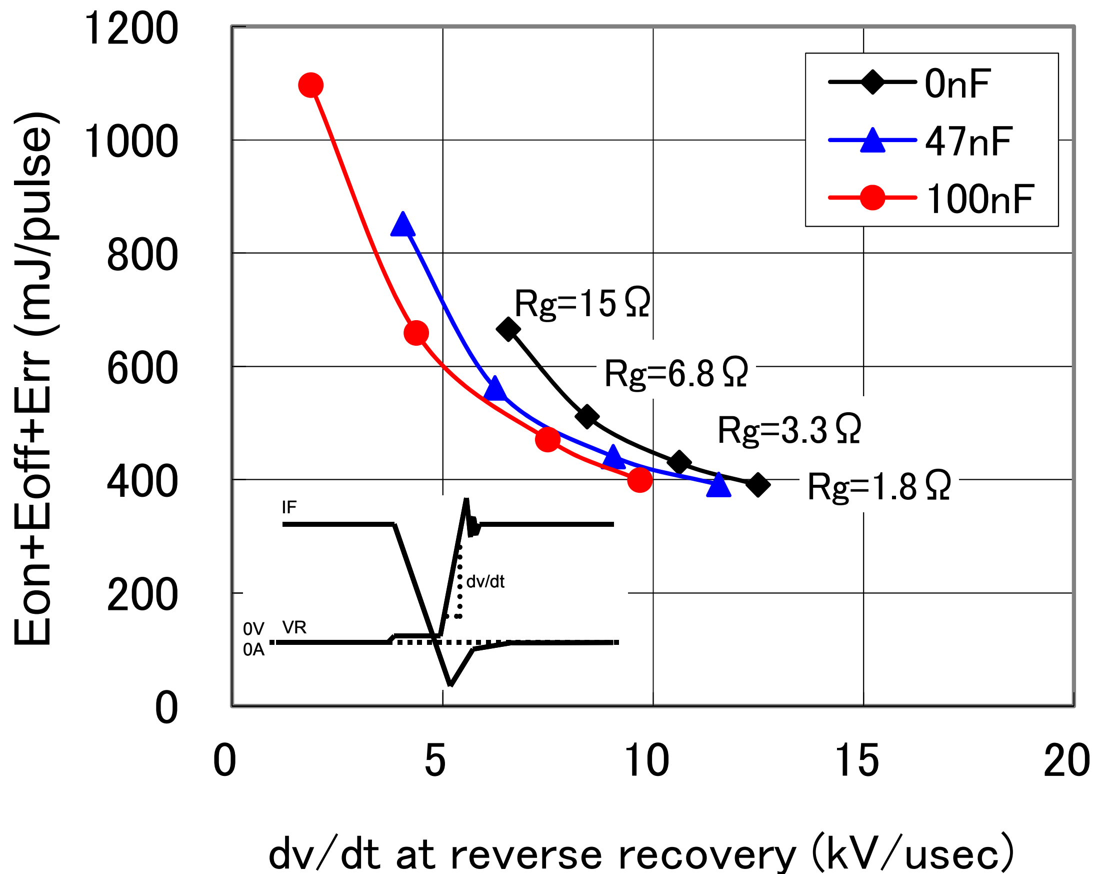
(b) Rg dependence of turn-on loss



(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 Cge slows down the IGBT significantly and it results penalty of increasing the switching loss. Therefore, the combination of extra-Cge and reduction of the gate resistance (Rg) is recommended to achieve the highest performance of lower dV/dt as well as keep switching energy low. Typical Cge and Rg values for initial guess are : 2x of Cies in our datasheet and 1/2 Rg of your original design, however, experimental confirmation in practical application is recommended.