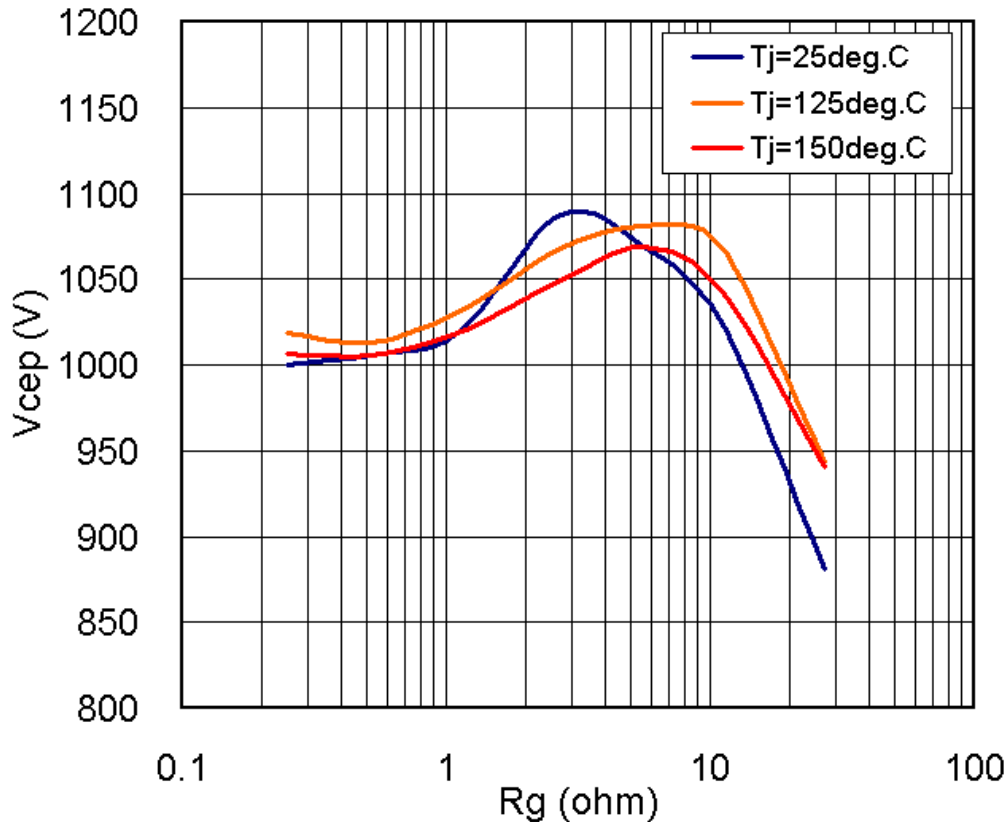


# – Fuji IGBT Module V Series 1200V Family –

## Gate resistance dependence of surge voltage

Type name: 2MBI450VN-120-50

Conditions:  $V_{dc}=600V$ ,  $I_c=450A$ ,  $V_{ge}=\pm 15V$ ,  $L_s=70nH$ ,



Gate Resistance Dependence of Turn-off Surge Voltage

The surge voltage, especially at IGBT turn off, depends on the gate resistance. As shown in the figure above, the surge voltage is able to be controlled with the gate resistance, but the curves have peaks depending on the junction temperature. Although detailed reasons for this relation are not described here, the background of such behaviors has already been analyzed and published. The primary reason of such behavior is the interaction of two silicon physics in IGBT chip; 1) the carriers stored in the drift region and 2) Current through MOS channel<sup>1)</sup>.

This chart also indicates that increasing the gate resistance is not only the method to solve the turn-off spike voltage issue. The decrease of the gate resistance may also have an effect.

Reference :

- 1) Y. Onozawa et al., "Investigation of carrier streaming effect for the low spike fast IGBT turn-off", Proc. ISPSD, pp173-176, 2006.

Technical data: MT5F24328