

– Fuji IGBT Module V Series 1700V Family –

Junction breakdown voltage V_{CES} and junction temperature T_j

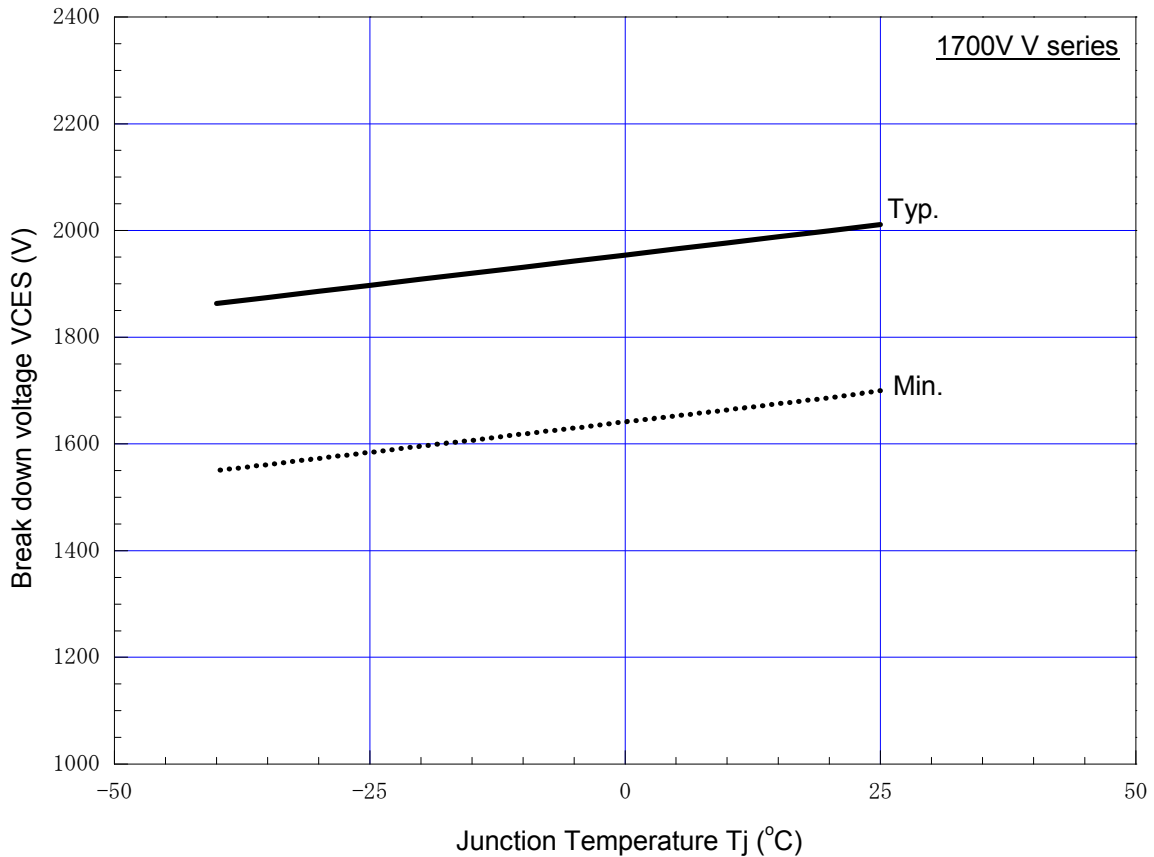


Fig. Junction Temperature Dependence of Junction Breakdown Voltage

In general, the breakdown voltage of power semiconductor devices have liner function to the junction temperature if "Impact ionization" and "Avalanche multiplication" are dominant physics of junction breakdown. At low temperature, the carriers in drift region are relatively easier to have high velocity because of less scattering due to lattice vibration so that the impact ionization ratio increases. Therefore, the breakdown voltage of the power semiconductor device becomes lower at low temperature. The temperature effect shown in the above figure should be taken into account into practical design not to exceed breakdown voltage if the target applications have chances of low temperature operation and/or start-up.