

**FUJI X-series IGBT Module 1700V Family**

**Current imbalance ratio between parallel connected IGBT modules**

The proportion of current sharing between IGBT modules in parallel connection, called the current imbalance ratio  $\alpha$ . This ratio is determined by the variation of  $V_{CE(sat)}$  of the IGBT's itself and the junction temperature dependence of the output characteristics. The current imbalance ratio  $\alpha$  is determined using Equation 1 which sets the current value  $I_{C1}$  in relation to the average current  $I_{C(ave)} (= I_{C1}/2 + I_{C2}/2)$  of the two paralleled modules.

The dependency between the current imbalance ratio  $\alpha$  and the variation  $\Delta V_{CE(sat)}$  of IGBT and  $\Delta V_F$  of FWD for two X-series IGBT modules in parallel are shown in Figure 2.

$$\alpha = \left( \frac{I_{C1}}{I_{C(ave)}} - 1 \right) \times 100 \quad (\text{Equation 1})$$

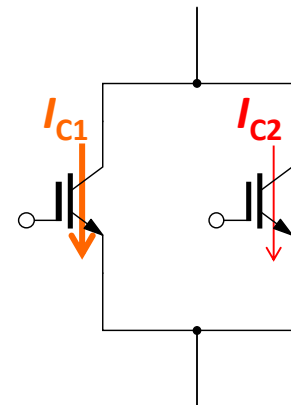


Figure 1

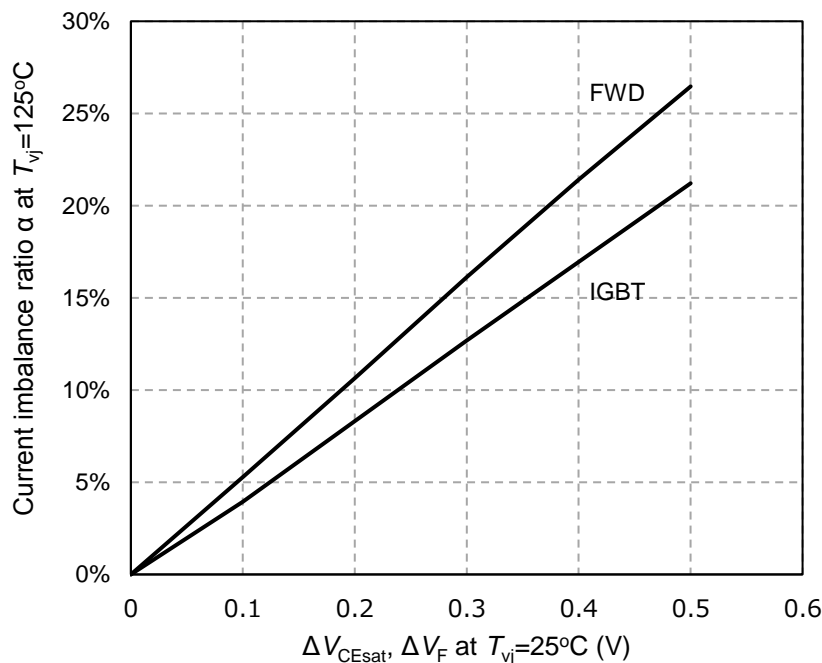


Figure 2  $V_{CE(sat)}$  and  $V_F$  variation and current imbalance ratio (1700V)

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