

## **FUJI X-series IGBT Module 1200V 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  $V_{\text{CE(sat)}}$  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 IC1 in relation to the average current  $I_{\text{C(ave)}}$  (= $I_{\text{C1}}/2+I_{\text{C2}}/2$ ) of the two paralleled modules.

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

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

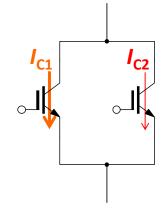


Figure 1

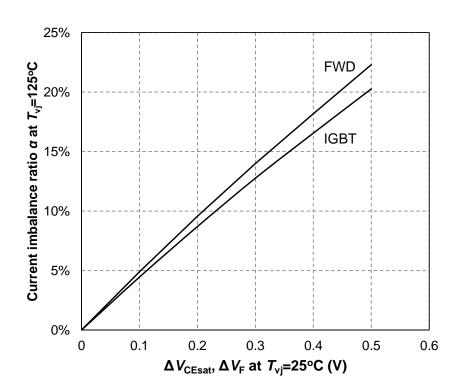


Figure 2  $V_{CE(sat)}$  and  $V_F$  variation and current imbalance ratio (1200V)

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