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.

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