SKiM®

IGBT Modules

Technical Explanations

Version 1.5 / July 2011
Demuth / Winterholler

Content

1 Figure Captions in the Datasheets

Fig. 1 Collector current I_C as a function of the collector- emitter voltage V_{CE} (typical output characteristics) for T_j = 25 °C and T_j = 125 °C, Parameter: Gate-emitter voltage V_{GE}; Values at terminal level, inclusive $R_{CC' + EE'}$

Fig. 2 Maximum rated continuous DC collector current I_C as a function of the case temperature T_{case}, terminal current I_{cmax} = 600 A @ $T_{Terminal}$ = 100 °C

Fig. 3 Typical turn-on and turn-off energy dissipation E_{on} and E_{off} of an IGBT element and turn-off energy dissipation E_{rr} of a freewheeling diode as a function of the continuous collector current I_C for inductive load

Fig. 4 Typical turn-on and turn-off energy dissipation E_{on} and E_{off} of an IGBT element and turn-off energy dissipation E_{rr} of a freewheeling diode as a function of the gate series resistance R_G for inductive load

Fig. 5 Typical transfer characteristic: continuous collector current I_C as a function of the gate-emitter voltage $V_{GE;}$ Values at terminal level, inclusive $R_{CC' + EE'}$

Fig. 6 Typical gate charge characteristic: gate-emitter voltage V_{GE} as a function of the gate charge Q_G

Fig. 7 Typical IGBT switching times t_{don}, t_r , t_{doff} and t_f as a function of the continuous collector current I_C for inductive load and fixed gate series resistance R_G for T_j = 125 °C

Fig. 8 Typical IGBT switching times t_{don}, t_r , t_{doff} and t_f as a function of the gate series resistance R_G for inductive load and fixed collector current I_C for T_j = 125 °C

Fig. 9 Transient thermal impedance $Z_{th(j-c)}$ of the IGBT element and the diode element as single pulse expired following an abrupt change in power dissipation

Fig. 10 Typical forward characteristics of the inverse diode (typical and maximum values) for T_j = 25 °C and T_j = 125 °C

Fig. 11 Typical peak reverse recovery current I_{RRM} of the inverse diode as a function of the fall rate di_F/dt of the forward current with corresponding gate series resistance R_G of the IGBT during turn-on

Fig. 12 Typical recovery charge Q_{rr} of the inverse diode as a function of the fall rate di_F/dt of the forward current (Parameters: forward current I_F and gate series resistance R_G of the IGBT during turn-on)

2 Disclaimer

The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliancesand systems is subject to prior specification and written approval by SEMIKRON. Wetherefore strongly recommend prior consultation of our personal.