

FEATURES

- High short circuit capability, self limiting short circuit current
- IGBT CHIP(Trench+ Field Stop technology)
- $V_{CE(sat)}$ with positive temperature coefficient
- Fast switching and short tail current, Low switching losses
- Free wheeling diodes with fast and soft reverse recovery
- Temperature sense included



APPLICATIONS

- High frequency switching application
- Welding converters
- Motion/servo control
- UPS systems

ABSOLUTE MAXIMUM RATINGS

T_c=25°C unless otherwise specified

| Symbol | Parameter | Test Conditions | Values | Unit |
|--------------|-----------------------------------|--|----------|--------|
| IGBT | | | | |
| V_{CES} | Collector - Emitter Voltage | $T_{vj}=25^{\circ}C$ | 1250 | V |
| V_{GES} | Gate - Emitter Voltage | | ± 30 | V |
| I_c | DC Collector Current | $T_c=25^{\circ}C$ | 115 | A |
| | | $T_c=80^{\circ}C$ | 75 | A |
| I_{CM} | Repetitive Peak Collector Current | $t_p=1ms$ | 150 | A |
| P_{tot} | Power Dissipation Per IGBT | | 500 | W |
| Diode | | | | |
| V_{RRM} | Repetitive Reverse Voltage | $T_{vj}=25^{\circ}C$ | 1250 | V |
| $I_{F(AV)}$ | Average Forward Current | $T_c=25^{\circ}C$ | 115 | A |
| | | $T_c=80^{\circ}C$ | 75 | A |
| I_{FRM} | Repetitive Peak Forward Current | $t_p=1ms$ | 150 | A |
| I^2_t | | $T_{vj}=125^{\circ}C,$ $t=10ms, V_R=0V$ | 2810 | A^2s |

ELECTRICAL AND THERMAL CHARACTERISTICS TC=25°C unless otherwise specified

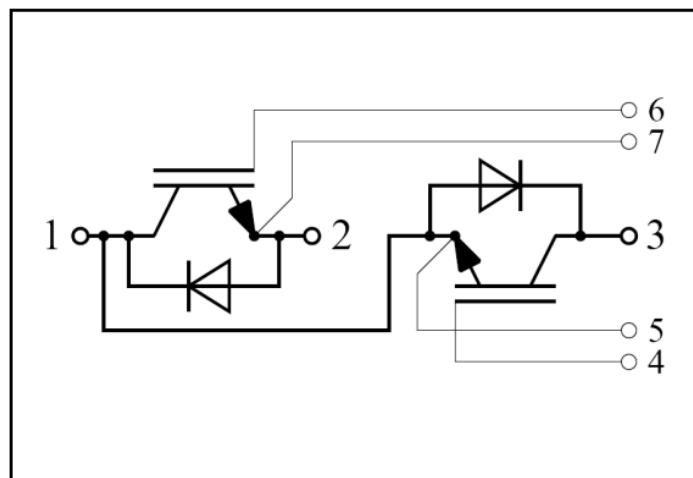
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---------------|---|--|--|------|------|---------|
| IGBT | | | | | | |
| $V_{GE(th)}$ | Gate - Emitter Threshold Voltage | $V_{CE}=V_{GE}, I_c=2.0mA$ | 5.0 | | 6.8 | V |
| $V_{CE(sat)}$ | Collector - Emitter Saturation Voltage | $I_c=75A, V_{GE}=15V, T_{vj}=25^\circ C$ | | 2.1 | 2.4 | V |
| | | $I_c=75A, V_{GE}=15V, T_{vj}=125^\circ C$ | | 2.45 | | V |
| I_{CES} | Collector Leakage Current | $V_{CE}=1250V, V_{GE}=0V, T_{vj}=25^\circ C$ | | | 1 | mA |
| | | $V_{CE}=1250V, V_{GE}=0V, T_{vj}=125^\circ C$ | | | 5 | mA |
| I_{GES} | Gate Leakage Current | $V_{CE}=0V, V_{GE}\pm 15V, T_{vj}=125^\circ C$ | -500 | | 500 | nA |
| Q_{ge} | Gate Charge | $V_{CE}=600V, I_c=75A, V_{GE}=\pm 15V$ | | 0.78 | | μC |
| C_{ies} | Input Capacitance | $V_{CE}=25V, V_{GE}=0V, f=1MHz$ | | 7.5 | | nF |
| C_{res} | Reverse Transfer Capacitance | | | 0.26 | | nF |
| $t_{d(on)}$ | Turn - on Delay Time | $V_{cc}=600V, I_c=75A, R_G=10\Omega,$ | $T_{vj}=25^\circ C$ | | 33 | ns |
| | | | $T_{vj}=125^\circ C$ | | | ns |
| t_r | Rise Time | $V_{GE}=\pm 15V, Inductive Load$ | $T_{vj}=25^\circ C$ | | | ns |
| | | | $T_{vj}=125^\circ C$ | | 40 | ns |
| $t_{d(off)}$ | Turn - off Delay Time | $V_{cc}=600V, I_c=75A, R_G=10\Omega,$ | $T_{vj}=25^\circ C$ | | | ns |
| | | | $T_{vj}=125^\circ C$ | | 280 | ns |
| t_f | Fall Time | $V_{GE}=\pm 15V, Inductive Load$ | $T_{vj}=25^\circ C$ | | | ns |
| | | | $T_{vj}=125^\circ C$ | | 160 | ns |
| E_{on} | Turn - on Energy | $V_{cc}=600V, I_c=75A, R_G=10\Omega,$ | $T_{vj}=25^\circ C$ | | 9.3 | mJ |
| | | | $T_{vj}=125^\circ C$ | | 12.4 | mJ |
| E_{off} | Turn - off Energy | $V_{GE}=\pm 15V, Inductive Load$ | $T_{vj}=25^\circ C$ | | 4.5 | mJ |
| | | | $T_{vj}=125^\circ C$ | | 7.5 | mJ |
| I_{sc} | Short Circuit Current | $t_{psc}\leq 10\mu S, V_{GE}=15V, T_{vj}=125^\circ C, V_{cc}=720V$ | | 300 | | A |
| R_{thJC} | Junction-to-Case Thermal Resistance (Per IGBT) | | | | 0.16 | K/W |
| Diode | | | | | | |
| V_F | Forward Voltage | $I_F=75A, V_{GE}=0V, T_{vj}=25^\circ C$ | | 2.1 | 2.6 | V |
| | | | $I_F=75A, V_{GE}=0V, T_{vj}=125^\circ C$ | | 2.0 | |
| t_{rr} | Reverse Recovery Time | $I_F=75A, V_R=600V$ | | 95 | | ns |
| I_{RRM} | Max. Reverse Recovery Current | | $di/dt=-1000A/\mu s$ | | 75 | A |
| E_{rec} | Reverse Recovery Energy | | $T_{vj}=125^\circ C$ | | 5 | mJ |
| R_{thJCD} | Junction-to-Case Thermal Resistance (Per Diode) | | | | 0.5 | K/W |

MODULE CHARACTERISTICS

T_c=25°C unless otherwise specified

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---------------------|---------------------------|------------------|------|------|------|------|
| T _{vj max} | Max. Junction Temperature | | | | 150 | °C |
| T _{vj op} | Operating Temperature | | -40 | | 150 | °C |
| T _{stg} | Storage Temperature | | -40 | | 125 | °C |
| V _{isol} | Insulation Test Voltage | AC, t=1min | | 3000 | | V |
| Torque | To-Sink | Recommended (M6) | 3 | | 5 | N·m |
| Torque | To-Terminal | Recommended (M5) | 2.5 | | 5 | N·m |
| Weight | | | | 176 | | g |

CIRCUIT DIAGRAM



PACKAGE OUTLINE

