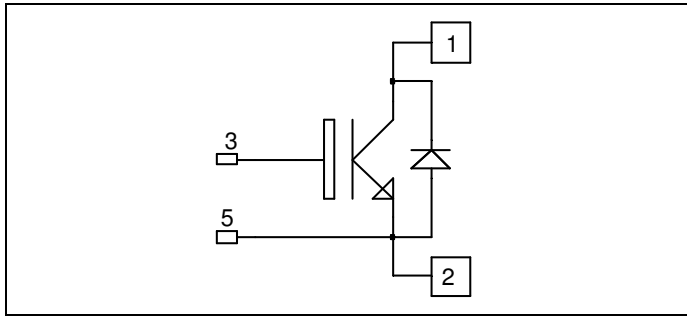


**Single switch
Trench IGBT® Power Module**

**$V_{CES} = 1700V$
 $I_C = 600A @ T_c = 80^\circ C$**

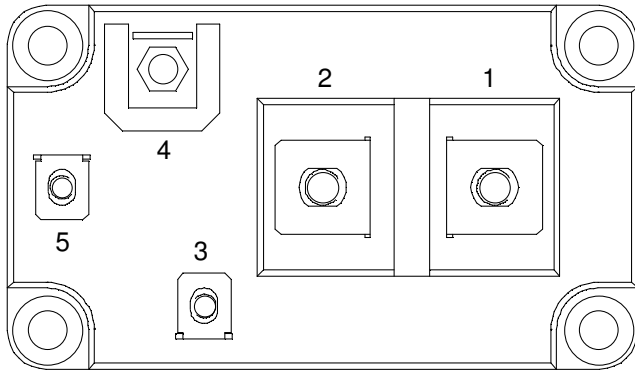


Application

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- Trench + Field Stop IGBT® Technology
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 20 kHz
 - Soft recovery parallel diodes
 - Low diode VF
 - Low leakage current
 - Avalanche energy rated
 - RBSOA and SCSOA rated
- Kelvin emitter for easy drive
- Low stray inductance
- High level of integration
- Kelvin emitter for easy drive
- Low stray inductance
 - M6 connectors for power
 - M4 connectors for signal



Benefits

- Stable temperature behavior
- Very rugged
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive TC of VCEsat

Absolute maximum ratings

| Symbol | Parameter | Max ratings | Unit |
|-----------|---------------------------------------|---------------------|-------------|
| V_{CES} | Collector - Emitter Breakdown Voltage | 1700 | V |
| I_C | Continuous Collector Current | $T_C = 25^\circ C$ | 1100 |
| | | $T_C = 80^\circ C$ | 600 |
| I_{CM} | Pulsed Collector Current | $T_C = 25^\circ C$ | 1200 |
| V_{GE} | Gate - Emitter Voltage | ± 20 | V |
| P_D | Maximum Power Dissipation | $T_C = 25^\circ C$ | 2900 |
| RBSOA | Reverse Bias Safe Operation Area | $T_j = 125^\circ C$ | 1200A@1600V |

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

Electrical Characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit | |
|--------------|---------------------------------------|--|---------------------------|-----|-----|------|---|
| BV_{CES} | Collector - Emitter Breakdown Voltage | $V_{GE} = 0\text{V}, I_C = 16\text{mA}$ | 1700 | | | V | |
| I_{CES} | Zero Gate Voltage Collector Current | $V_{GE} = 0\text{V}, V_{CE} = 1700\text{V}$ | | | 16 | mA | |
| $V_{CE(on)}$ | Collector Emitter on Voltage | $V_{GE} = 15\text{V}$ $I_C = 600\text{A}$ | $T_j = 25^\circ\text{C}$ | | 2.0 | 2.4 | V |
| | | | $T_j = 125^\circ\text{C}$ | | 2.4 | | |
| $V_{GE(th)}$ | Gate Threshold Voltage | $V_{GE} = V_{CE}, I_C = 24\text{mA}$ | 5.2 | 5.8 | 6.4 | V | |
| I_{GES} | Gate - Emitter Leakage Current | $V_{GE} = 20\text{V}, V_{CE} = 0\text{V}$ | | | 800 | nA | |

Dynamic Characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|--------------|------------------------------|---|-----|------|-----|------|
| C_{ies} | Input Capacitance | $V_{GE} = 0\text{V}, V_{CE} = 25\text{V}$ $f = 1\text{MHz}$ | | 51 | | nF |
| C_{res} | Reverse Transfer Capacitance | | | 1.8 | | |
| $T_{d(on)}$ | Turn-on Delay Time | Inductive Switching (25°C) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 600\text{A}$ $R_G = 2.2\Omega$ | | 280 | | ns |
| T_r | Rise Time | | | 100 | | |
| $T_{d(off)}$ | Turn-off Delay Time | | | 850 | | |
| T_f | Fall Time | | | 150 | | |
| $T_{d(on)}$ | Turn-on Delay Time | Inductive Switching (125°C) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 600\text{A}$ $R_G = 2.2\Omega$ | | 330 | | ns |
| T_r | Rise Time | | | 100 | | |
| $T_{d(off)}$ | Turn-off Delay Time | | | 1000 | | |
| T_f | Fall Time | | | 230 | | |
| E_{off} | Turn Off Energy | | | 190 | | mJ |

Reverse diode ratings and characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit | |
|----------|-------------------------|---|---------------------------|-----|-----|------|---------------|
| V_F | Diode Forward Voltage | $I_F = 600\text{A}$ $V_{GE} = 0\text{V}$ | $T_j = 25^\circ\text{C}$ | | 1.8 | 2.2 | V |
| | | | $T_j = 125^\circ\text{C}$ | | 1.9 | | |
| E_r | Reverse Recovery Energy | $I_F = 600\text{A}$ $V_R = 900\text{V}$ $di/dt = 900\text{A}/\mu\text{s}$ | $T_j = 25^\circ\text{C}$ | | 80 | | mJ |
| | | | $T_j = 125^\circ\text{C}$ | | 140 | | |
| Q_{rr} | Reverse Recovery Charge | $I_F = 600\text{A}$ $V_R = 900\text{V}$ $di/dt = 900\text{A}/\mu\text{s}$ | $T_j = 25^\circ\text{C}$ | | 150 | | μC |
| | | | $T_j = 125^\circ\text{C}$ | | 250 | | |

Thermal and package characteristics

| Symbol | Characteristic | Min | Typ | Max | Unit | |
|------------|--|-------|-----|-----|------------------|---------------------------|
| R_{thJC} | Junction to Case | IGBT | | | 0.040 | $^\circ\text{C}/\text{W}$ |
| | | Diode | | | 0.065 | |
| V_{ISOL} | RMS Isolation Voltage, any terminal to case $t = 1\text{min}$, $I_{isol} < 1\text{mA}$, 50/60Hz | 3500 | | | V | |
| T_j | Operating junction temperature range | -40 | | 150 | $^\circ\text{C}$ | |
| T_{STG} | Storage Temperature Range | -40 | | 125 | | |
| T_C | Operating Case Temperature | -40 | | 125 | | |
| Torque | Mounting torque | M4 | 1 | 2 | N.m | |
| | | M6 | 3 | 5 | | |
| Wt | Package Weight | | | 420 | g | |

