

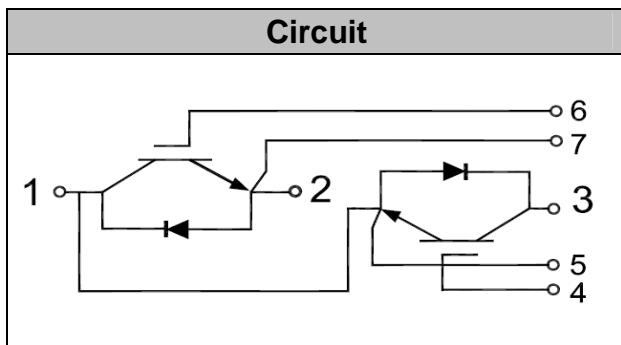
IGBT Modules



V_{CEs} 1200V
I_c 150A

Applications

- Industrial Inverters
- Servo Applications
- SMPS UPS
- Induction Heating



Features

- Short Circuit Rated 10 μ s
- Low Stray Inductance
- Low Saturation Voltage
- Ultra Low loss
- HI-REL Power Terminals
- Lead Free, Compliant With RoHS Requirement

Absolute Maximum Ratings (T_c = 25°C unless otherwise specified)

| Symbol | Description | Values | Units |
|--------------------|---|---|--------|
| V _{CEs} | Collector - Emitter Voltage | 1200 | V |
| V _{GES} | Gate-Emitter Voltage | ±20 | V |
| I _c | DC Collector Current | T _c =25°C | 210 A |
| | | T _c =80°C | 150 A |
| I _{Cpuls} | Pulsed Collector Current | T _c =25°C, t _p =1ms | 420 A |
| | | T _c =80°C, t _p =1ms | 300 A |
| P _{tot} | P _{tot} Power Dissipation Per IGBT | 880 | W |
| T _J | Junction Temperature Range | 40 to +150 | °C |
| T _{STG} | Storage Temperature Range | 40 to +125 | °C |
| Viso | Insulation Test Voltage | AC, t=1min | 3000 V |
| Mounting Torque | Power Terminals Screw: M6 | 5±15% | N*m |
| | Mounting Screw:M6 | 5±15% | N*m |

Notes :

(1) Repetitive Rating: Pulse width limited by max. junction temperature



Electrical Characteristics of IGBT ($T_J = 25^\circ\text{C}$ unless otherwise specified)

| Symbol | Item | Conditions | Values | | | Units |
|----------------------------------|--|---|-------------------------|------|------|---------------|
| | | | Min. | Typ. | Max. | |
| OFF Characteristics | | | | | | |
| $V_{(BR)CES}$ | Collector-Emitter Breakdown Voltage | $V_{GE} = 0V, I_C = 1mA$ | 1200 | | | V |
| I_{CES} | Collector Leakage Current | $V_{CE}=1200V, V_{GE}=0V, T_J=25^\circ\text{C}$ | | | 0.5 | mA |
| | | $V_{CE}=1200V, V_{GE}=0V, T_J=125^\circ\text{C}$ | | | 2 | mA |
| I_{GES} | Gate Leakage Current | $V_{CE}=0V, V_{GE}=\pm 20V$ | -200 | | 200 | nA |
| ON Characteristics | | | | | | |
| $V_{GE(th)}$ | Gate - Emitter Threshold Voltage | $V_{CE}=V_{GE}, I_C=6mA$ | 5 | 6.1 | 7 | V |
| $V_{CE(sat)}$ | Collector – Emitter Saturation Voltage | $I_C=150A, V_{GE}=15V, T_J=25^\circ\text{C}$ | | 2.0 | 2.3 | V |
| | | $I_C=150A, V_{GE}=15V, T_J=125^\circ\text{C}$ | | 2.3 | 2.6 | V |
| Dynamic Characteristics | | | | | | |
| C_{ies} | Input Capacitance | $V_{CE}=25V, V_{GE}=0V, f=1MHz$ | | 8.8 | | nF |
| C_{res} | Reverse Transfer Capacitance | | | 0.48 | | nF |
| Switching Characteristics | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{CC}=600V, I_C=150A$ $R_G=15\Omega, V_{GE}=\pm 15V$ $T_J=25^\circ\text{C}$ Inductive Load | | 150 | | ns |
| t_r | Rise Time | | | 70 | | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | | 420 | | ns |
| T_f | Fall Time | | | 50 | | ns |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{CC}=600V, I_C=150A$ $R_G=15\Omega, V_{GE}=\pm 15V$ $T_J=125^\circ\text{C}$ Inductive Load | | 170 | | ns |
| t_r | Rise Time | | | 80 | | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | | 470 | | ns |
| T_f | Fall Time | | | 60 | | ns |
| E_{on} | Turn-on Switching Loss | $V_{CC}=600V, R_G=15\Omega, I_C=150A$ | $T_J=25^\circ\text{C}$ | | 22 | mJ |
| | | | $T_J=125^\circ\text{C}$ | | 24 | mJ |
| E_{off} | Turn-off Switching Loss | $V_{CC}=600V, R_G=15\Omega, I_C=150A$ | $T_J=25^\circ\text{C}$ | | 9 | mJ |
| | | | $T_J=125^\circ\text{C}$ | | 9.6 | mJ |
| Q_{ge} | Gate Charge | $V_{CC}=600V, I_C=150A, V_{GE}=\pm 15V$ | | 700 | | nC |
| RBSOA | Reverse Bias Safe Operating Area | $I_C = 200A, V_{CC} = 600V,$ $V_p = 1200V, R_g = 10\Omega,$ $V_{GE}=+15V \text{ to } 0V, T_J = 150^\circ\text{C}$ | Trapezoid | | | |
| SCSOA | Short Circuit Safe Operating Area | $V_{CC} = 600V, V_{GE} = 15V,$ $T_J = 150^\circ\text{C}$ | 10 | | | μs |



Electrical Characteristics of FWD (T_C = 25°C unless otherwise specified)

| Symbol | Item | Conditions | Min. | Typ. | Max. | Units |
|------------------|-------------------------|---|------------------------|------|------|-------|
| V _{FM} | Forward Voltage | I _F = 150A, V _{GE} = 0V | T _J = 25°C | 2.0 | 2.48 | V |
| | | | T _J = 125°C | 1.7 | 2.20 | |
| t _{rr} | Reverse Recovery Time | I _F = 150A, V _R = 600V, di _F /dt = -3000A/μs, TV _j = 125°C, | | 350 | | ns |
| I _{RRM} | Max. Reverse Recovery | | 160 | | A | |
| E _{rec} | Reverse Recovery Energy | | 11.5 | | mJ | |

Thermal Resistance Characteristics

| Symbol | Description | Min. | Typ. | Max. | Units |
|------------------|--|------|------|------|-------|
| R _{θJC} | Junction-To-Case (IGBT Part, Per Leg) | | | 0.17 | °C/W |
| R _{θJC} | Junction-To-Case (Diode Part, Per Leg) | | | 0.3 | °C/W |
| Mt | Power Terminals Screw:M6 | 3 | | 5 | N·m |
| Ms | Mounting Screw:M6 | 3 | | 5 | N·m |
| Weight | Weight Of Module | | | 300 | g |

Performance Curves

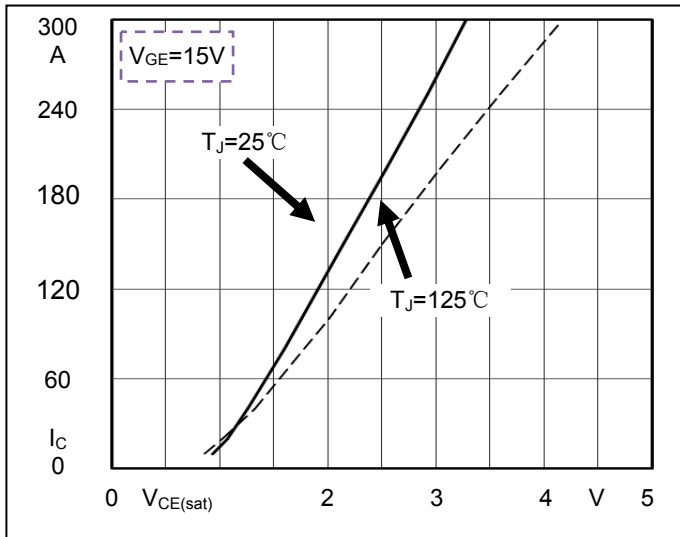


Fig1. Typical Output Characteristics

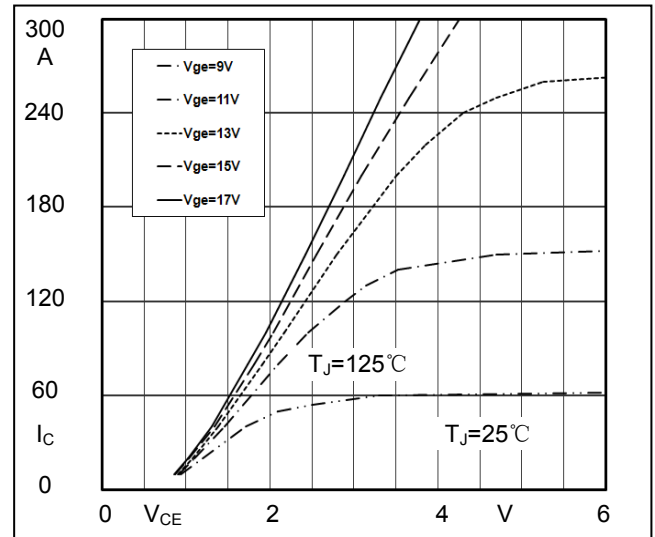


Fig2. Typical Output Characteristics

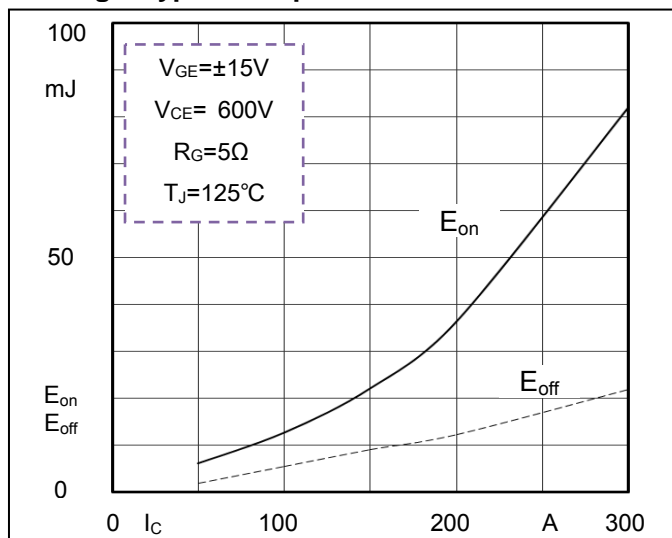


Fig3. Switching Energy vs. Collector Current

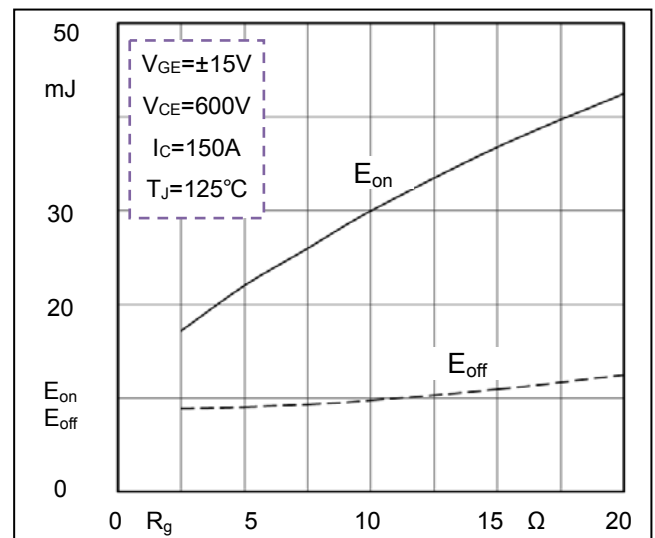


Fig4. Switching Energy vs. Gate Resistor

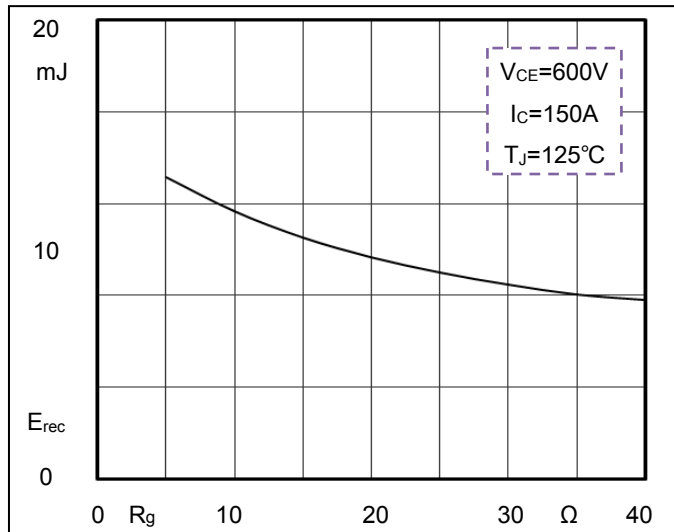


Fig5. Switching Energy vs. Gate Resistor

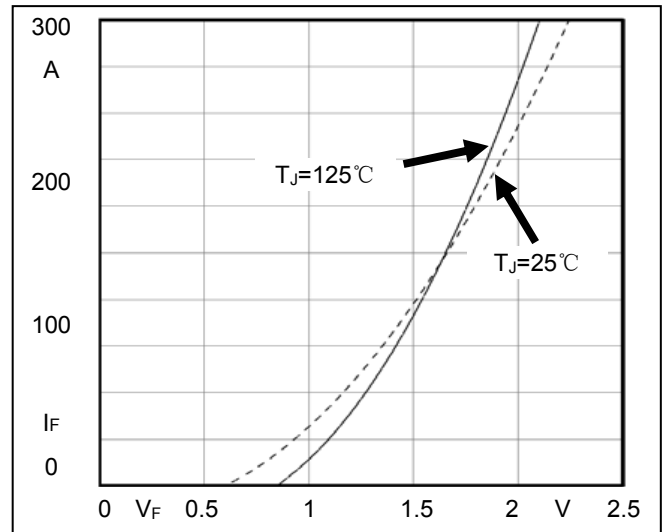


Fig6. Diode Forward Characteristics

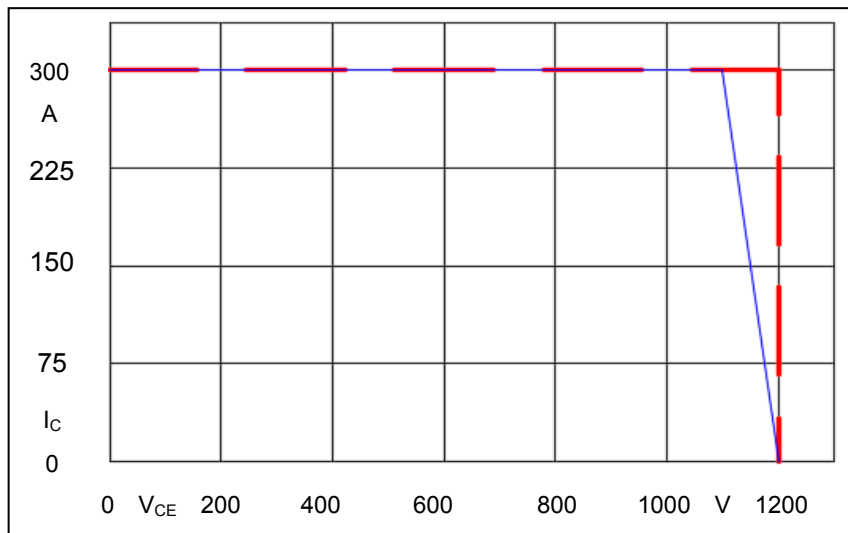


Fig7. Reverse Bias Safe Operation Area (RBSOA)

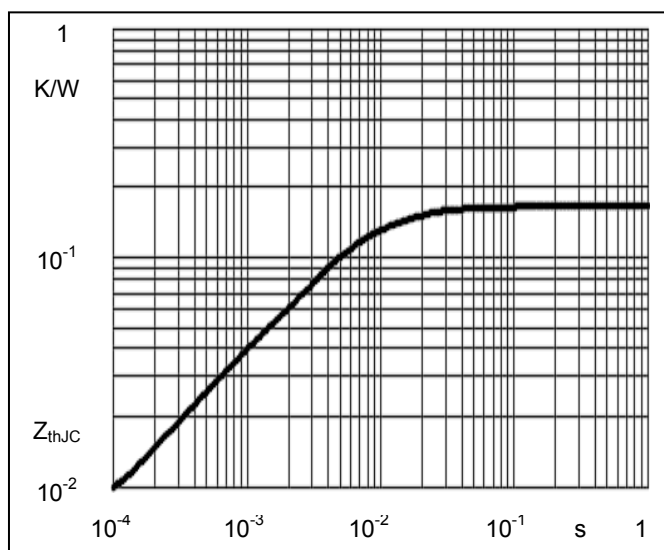


Fig8. Transient Thermal Impedance of IGBT

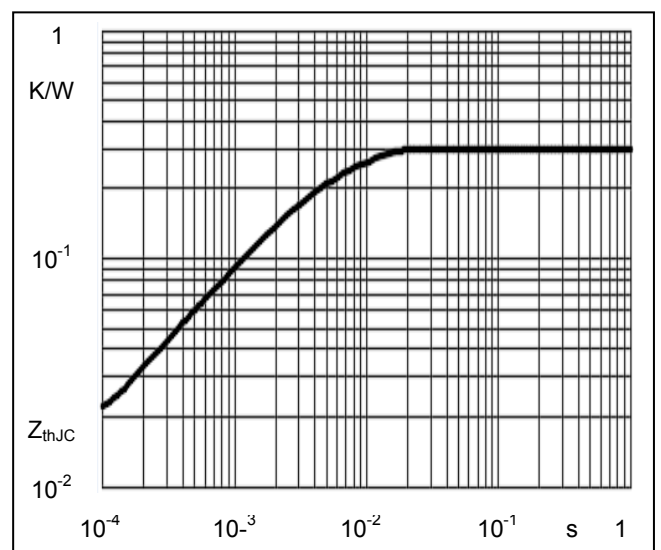
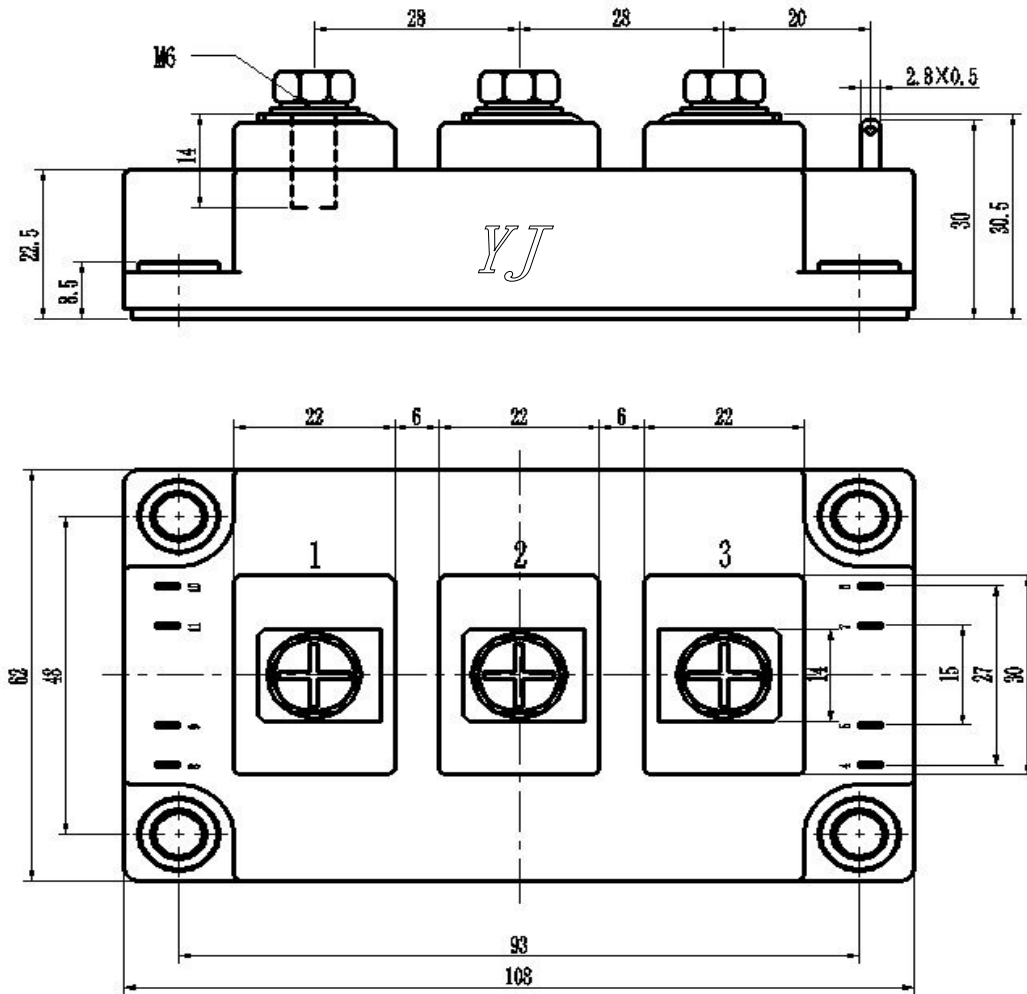


Fig9. Transient Thermal Impedance of Diode

Package Outline Information

CASE: C2



Dimensions in mm

X-ON Electronics

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