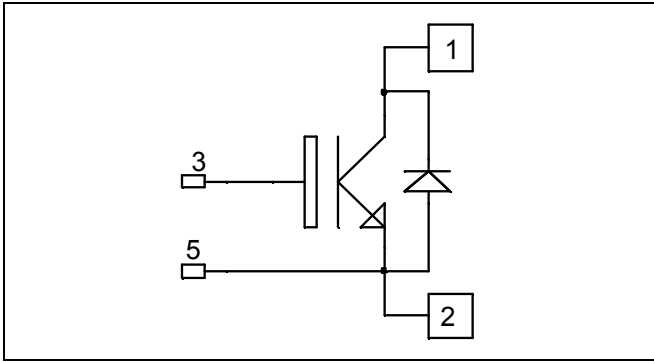


**Single switch
NPT IGBT Power Module**

**$V_{CES} = 600V$
 $I_C = 300A @ T_c = 80^\circ C$**



Application

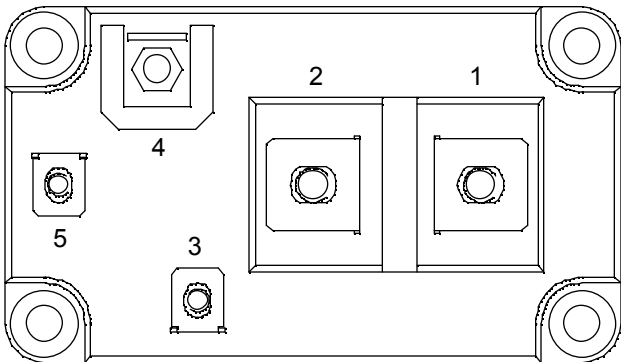
- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- Non Punch Through (NPT) fast IGBT
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 50 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
 - M6 connectors for power
 - M4 connectors for signal
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- 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 | 600 | V |
| I_C | Continuous Collector Current | $T_C = 25^\circ C$ | 375 |
| | | $T_C = 80^\circ C$ | 300 |
| I_{CM} | Pulsed Collector Current | $T_C = 25^\circ C$ | 600 |
| V_{GE} | Gate - Emitter Voltage | ± 20 | V |
| P_D | Maximum Power Dissipation | $T_C = 25^\circ C$ | 1130 |
| RBSOA | Reverse Bias Safe Operation Area | $T_j = 125^\circ C$ | 600A@520V |

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 | |
|--------------|-------------------------------------|--|---------------------------|-----|------|-------------|---------------|
| I_{CES} | Zero Gate Voltage Collector Current | $V_{GE} = 0\text{V}$ $V_{CE} = 600\text{V}$ | $T_j = 25^\circ\text{C}$ | | 1 | 500 | μA |
| | | | $T_j = 125^\circ\text{C}$ | | 1 | | mA |
| $V_{CE(on)}$ | Collector Emitter on Voltage | $V_{GE} = 15\text{V}$ $I_C = 300\text{A}$ | $T_j = 25^\circ\text{C}$ | | 1.95 | 2.45 | V |
| | | | $T_j = 125^\circ\text{C}$ | | 2.2 | | |
| $V_{GE(th)}$ | Gate Threshold Voltage | $V_{GE} = V_{CE}, I_C = 6\text{mA}$ | 4.5 | 5.5 | 6.5 | V | |
| I_{GES} | Gate – Emitter Leakage Current | $V_{GE} = 20\text{V}, V_{CE} = 0\text{V}$ | | | 400 | nA | |

Dynamic Characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|--------------|------------------------------|---|-----|-----|-----|-------------|
| C_{ies} | Input Capacitance | $V_{GE} = 0\text{V}, V_{CE} = 25\text{V}$ $f = 1\text{MHz}$ | | 13 | | nF |
| C_{res} | Reverse Transfer Capacitance | | | 1.2 | | |
| $T_{d(on)}$ | Turn-on Delay Time | Inductive Switching (25°C) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 300\text{A}$ $R_G = 3.3\Omega$ | | 100 | | ns |
| T_r | Rise Time | | | 68 | | |
| $T_{d(off)}$ | Turn-off Delay Time | | | 320 | | |
| T_f | Fall Time | | | 45 | | |
| $T_{d(on)}$ | Turn-on Delay Time | Inductive Switching (125°C) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 300\text{A}$ $R_G = 3.3\Omega$ | | 105 | | ns |
| T_r | Rise Time | | | 70 | | |
| $T_{d(off)}$ | Turn-off Delay Time | | | 350 | | |
| T_f | Fall Time | | | 50 | | |
| E_{on} | Turn on Energy | | | 7 | | mJ |
| E_{off} | Turn off Energy | | | 11 | | |

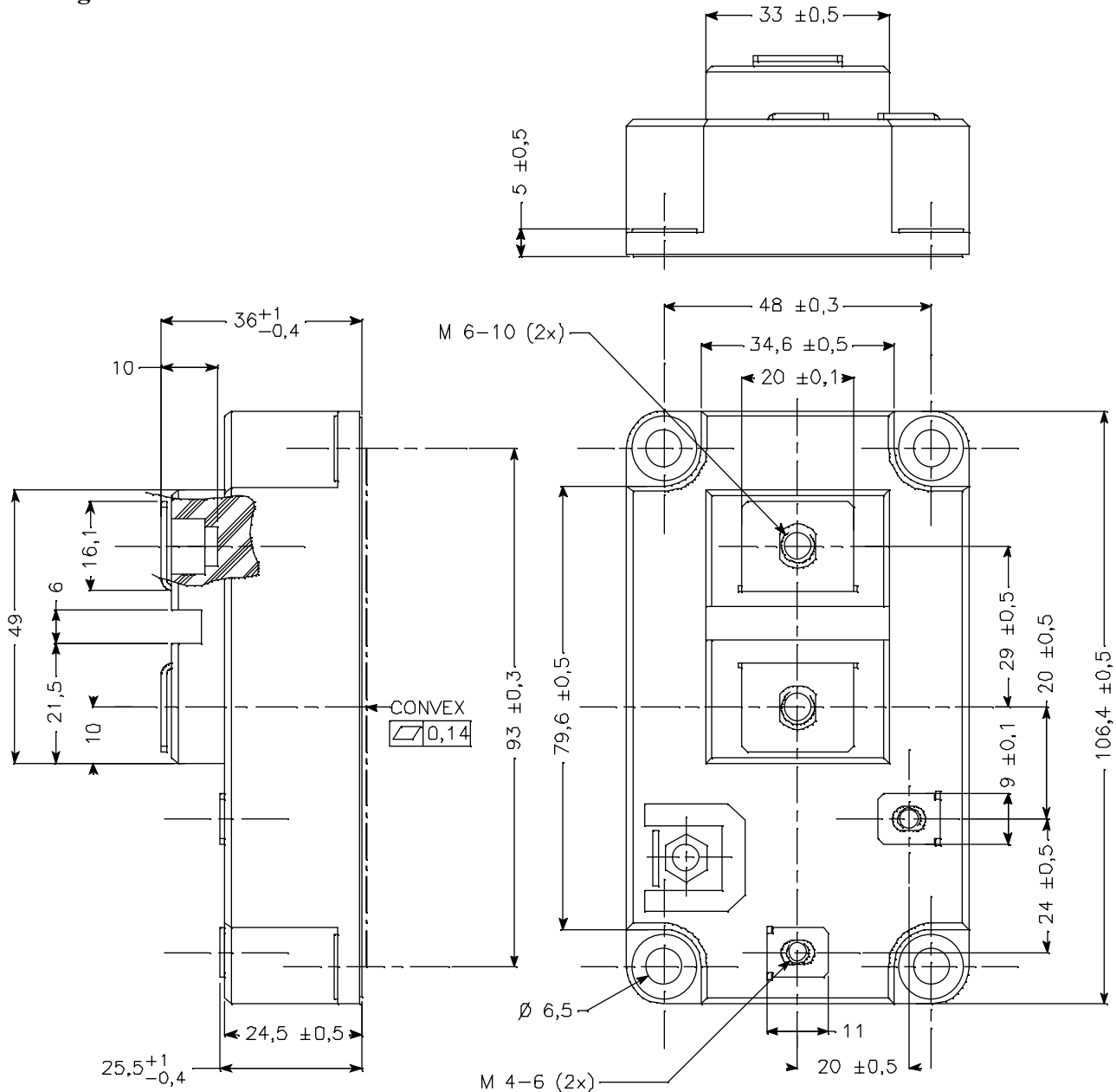
Reverse diode ratings and characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit | |
|----------|-------------------------|--|---------------------------|-----|------|------|---------------|
| V_F | Diode Forward Voltage | $I_F = 300\text{A}$ $V_{GE} = 0\text{V}$ | $T_j = 25^\circ\text{C}$ | | 1.25 | 1.6 | V |
| | | | $T_j = 125^\circ\text{C}$ | | 1.2 | | |
| E_R | Reverse Recovery Energy | $I_F = 300\text{A}$ $V_R = 300\text{V}$ $di/dt = 4000\text{A}/\mu\text{s}$ | $T_j = 125^\circ\text{C}$ | | 7 | | mJ |
| Q_{rr} | Reverse Recovery Charge | | $T_j = 25^\circ\text{C}$ | | 19 | | μC |
| | | $T_j = 125^\circ\text{C}$ | | 34 | | | |

Thermal and package characteristics

| Symbol | Characteristic | Min | Typ | Max | Unit | |
|------------|---|-------|-----|-----|------------------|---------------------------|
| R_{thJC} | Junction to Case | IGBT | | | 0.11 | $^\circ\text{C}/\text{W}$ |
| | | Diode | | | 0.21 | |
| V_{ISOL} | RMS Isolation Voltage, any terminal to case $t = 1\text{ min}, I_{isol} < 1\text{mA}, 50/60\text{Hz}$ | 2500 | | | 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 | M6 | 3 | 5 | N.m | |
| | | M4 | 1 | 2 | | |
| Wt | Package Weight | | | 420 | g | |

Package outline



APT reserves the right to change, without notice, the specifications and information contained herein

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