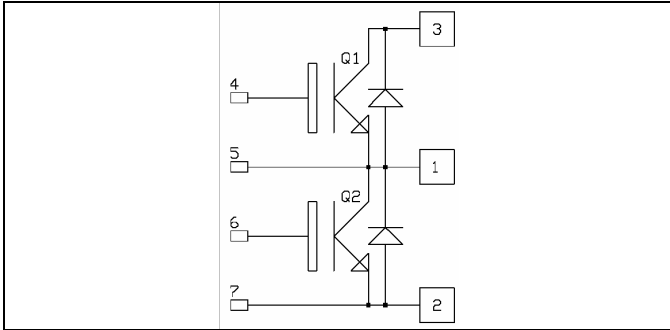


**Phase Leg
NPT IGBT Power Module**

**$V_{CES} = 600V$
 $I_C = 330A @ T_c = 80^\circ C$**

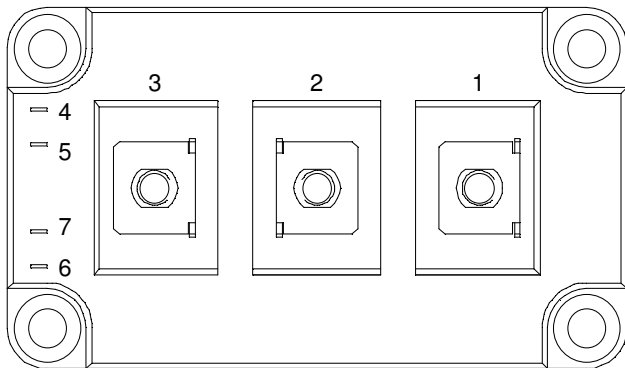


Application

- 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 power connectors
- 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 | $T_C = 25^\circ C$ | 460 |
| | | $T_C = 80^\circ C$ | 330 |
| I_{CM} | Pulsed Collector Current | $T_C = 25^\circ C$ | 800 |
| V_{GE} | Gate - Emitter Voltage | ± 20 | V |
| P_D | Maximum Power Dissipation | $T_C = 25^\circ C$ | 1400 |
| RBSOA | Reverse Bias Safe Operation Area | $T_j = 125^\circ C$ | 800A@420V |

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

Electrical Characteristics

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

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|--------------|---------------------------------------|--------------------------------------|---------------------------|-----|-----|---------------|
| BV_{CES} | Collector - Emitter Breakdown Voltage | $V_{GE} = 0V, I_C = 10\text{ mA}$ | 600 | | | V |
| I_{CES} | Zero Gate Voltage Collector Current | $V_{GE} = 0V$ $V_{CE} = 600V$ | $T_j = 25^\circ\text{C}$ | 2 | 750 | μA |
| | | | $T_j = 125^\circ\text{C}$ | 1.5 | | mA |
| $V_{CE(on)}$ | Collector Emitter on Voltage | $V_{GE} = 15V$ $I_C = 400A$ | $T_j = 25^\circ\text{C}$ | 2.0 | 2.5 | V |
| | | | $T_j = 125^\circ\text{C}$ | 2.2 | | |
| $V_{GE(th)}$ | Gate Threshold Voltage | $V_{GE} = V_{CE}, I_C = 8\text{ mA}$ | 4.5 | | 6.5 | V |
| I_{GES} | Gate - Emitter Leakage Current | $V_{GE} = 20V, V_{CE} = 0V$ | | | 600 | nA |

Dynamic Characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|--------------|------------------------------|---|-----|-----|-----|------|
| C_{ies} | Input Capacitance | $V_{GE} = 0V, V_{CE} = 25V$ $f = 1\text{ MHz}$ | | 18 | | nF |
| C_{res} | Reverse Transfer Capacitance | | | 1.6 | | |
| $T_{d(on)}$ | Turn-on Delay Time | Inductive Switching (25°C) $V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 400A$ $R_G = 0.82\Omega$ | | 165 | | ns |
| T_r | Rise Time | | | 40 | | |
| $T_{d(off)}$ | Turn-off Delay Time | | | 250 | | |
| T_f | Fall Time | | | 35 | | |
| $T_{d(on)}$ | Turn-on Delay Time | Inductive Switching (125°C) $V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 400A$ $R_G = 0.82\Omega$ | | 180 | | ns |
| T_r | Rise Time | | | 50 | | |
| $T_{d(off)}$ | Turn-off Delay Time | | | 285 | | |
| T_f | Fall Time | | | 40 | | |
| E_{off} | Turn off energy | | | 13 | | mJ |

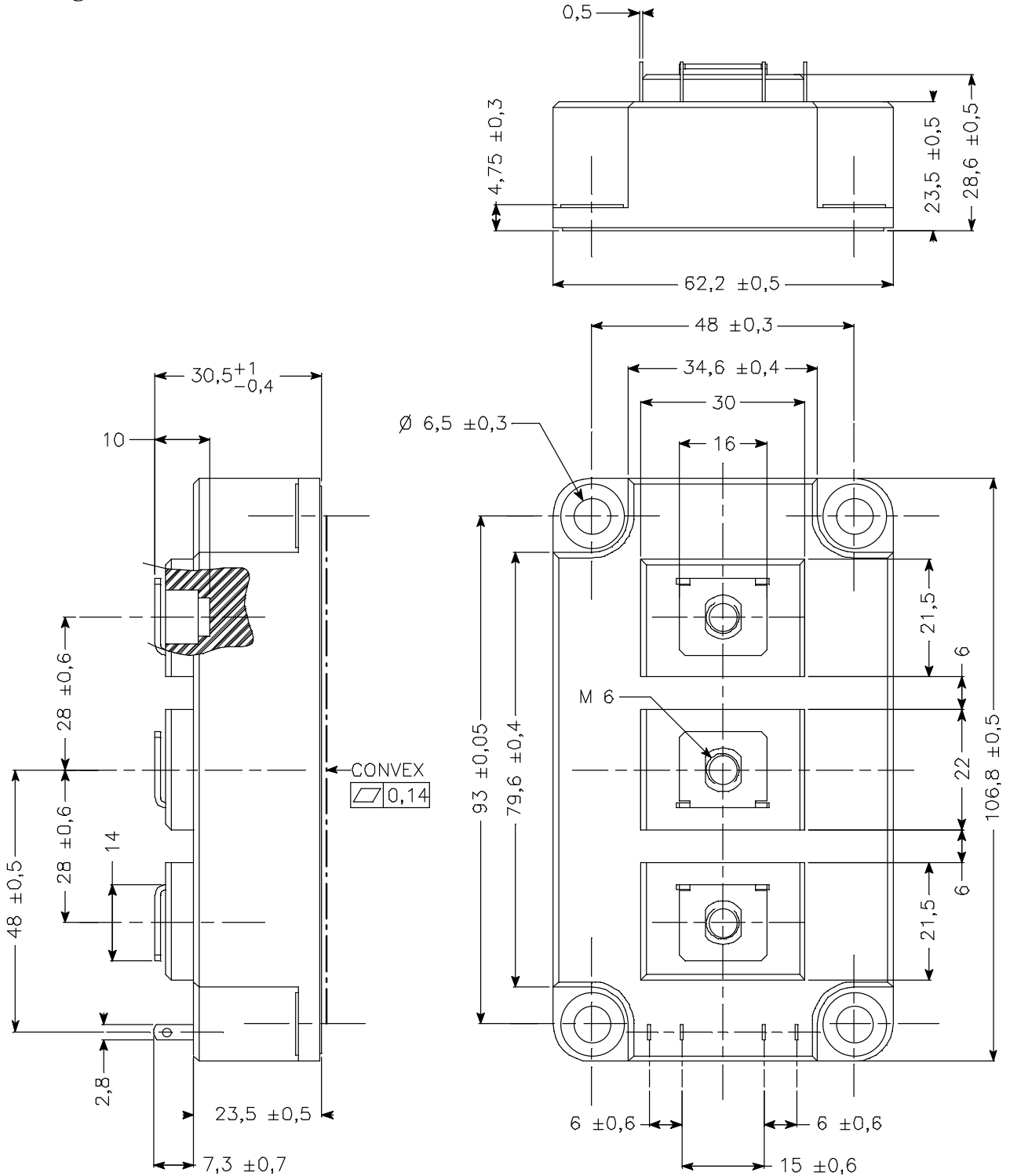
Reverse diode ratings and characteristics

| Symbol | Characteristic | Test Conditions | Min | Typ | Max | Unit |
|----------|-------------------------|--|---------------------------|------|-----|---------------|
| V_F | Diode Forward Voltage | $I_F = 400A$ $V_{GE} = 0V$ | $T_j = 25^\circ\text{C}$ | 1.25 | 1.6 | V |
| | | | $T_j = 125^\circ\text{C}$ | 1.2 | | |
| E_r | Reverse Recovery Energy | $I_F = 400A$ $V_R = 300V$ $di/dt = 900A/\mu\text{s}$ | | 8.2 | | mJ |
| Q_{rr} | Reverse Recovery Charge | $I_F = 400A$ $V_R = 300V$ $di/dt = 900A/\mu\text{s}$ | $T_j = 25^\circ\text{C}$ | 24 | | μC |
| | | | $T_j = 125^\circ\text{C}$ | 40 | | |

Thermal and package characteristics

| Symbol | Characteristic | Min | Typ | Max | Unit | |
|------------|--|---------------|-----|-------|--------------------|-----|
| R_{thJC} | Junction to Case | IGBT | | 0.089 | $^\circ\text{C/W}$ | |
| | | Diode | | 0.15 | | |
| V_{ISOL} | RMS Isolation Voltage, any terminal to case $t = 1\text{ min}$, $I_{isol} < 1\text{ mA}$, 50/60Hz | 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 | For terminals | M6 | 3 | 5 | N.m |
| | | To Heatsink | M6 | 3 | 5 | |
| Wt | Package Weight | | | 380 | g | |

Package outline



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

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