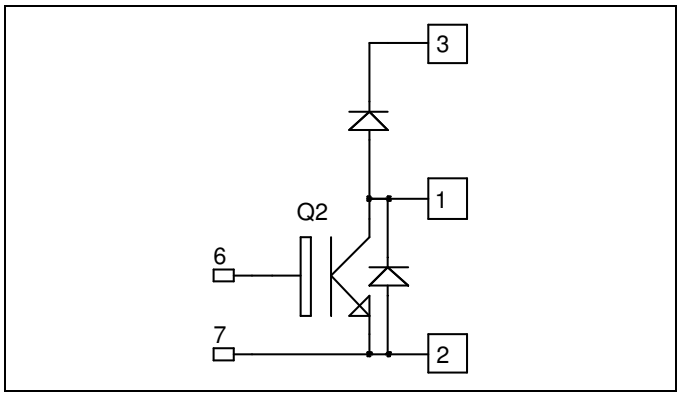
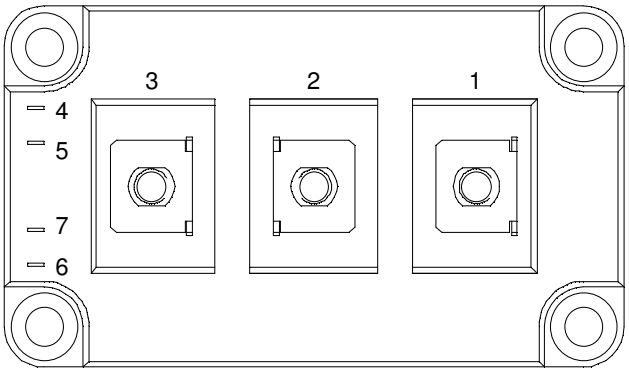
# APTGT150DA120D3

## *Boost Chopper*
## *Trench IGBT® Power Module*

**$V_{CES}$ = 1200V**
**$I_C$ = 150A @ Tc = 80°C**




**Application**

- AC and DC motor control
- Switched Mode Power Supplies
- Power Factor Correction

**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
  - 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 | | 1200 | V |
| $I_C$ | Continuous Collector Current | $T_C$ = 25°C | 220 | A |
| | | $T_C$ = 80°C | 150 | |
| $I_{CM}$ | Pulsed Collector Current | $T_C$ = 25°C | 350 | |
| $V_{GE}$ | Gate – Emitter Voltage | | ±20 | V |
| $P_D$ | Maximum Power Dissipation | $T_C$ = 25°C | 695 | W |
| SCSOA | Short Circuit Safe Operating Area | $T_j$ = 125°C | 600A@900V | |

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

**All ratings @ $T_j$ = 25°C unless otherwise specified**

## Electrical Characteristics

| *Symbol* | *Characteristic* | *Test Conditions* | | *Min* | *Typ* | *Max* | *Unit* |
|---|---|---|---|---|---|---|---|
| $BV_{CES}$ | Collector - Emitter Breakdown Voltage | $V_{GE}$ = 0V, $I_C$ = 6mA | | 1200 | | | V |
| $I_{CES}$ | Zero Gate Voltage Collector Current | $V_{GE}$ = 0V, $V_{CE}$ = 1200V | | | | 4 | mA |
| $V_{CE(on)}$ | Collector Emitter on Voltage | $V_{GE}$ = 15V, $I_C$ = 150A | $T_j$ = 25°C | | 1.7 | 2.1 | V |
| | | | $T_j$ = 125°C | | 2.0 | | |
| $V_{GE(th)}$ | Gate Threshold Voltage | $V_{GE}$ = $V_{CE}$, $I_C$ = 6mA | | 5.0 | 5.8 | 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<br>$V_{CE}$ = 25V<br>f = 1MHz | | 10.7 | | nF |
| $C_{oes}$ | Output Capacitance | | | 0.56 | | |
| $C_{res}$ | Reverse Transfer Capacitance | | | 0.5 | | |
| $T_{d(on)}$ | Turn-on Delay Time | Inductive Switching (25°C)<br>$V_{GE}$ = ±15V<br>$V_{Bus}$ = 600V<br>$I_C$ = 150A<br>$R_G$ = 2.2Ω | | 280 | | ns |
| $T_r$ | Rise Time | | | 90 | | |
| $T_{d(off)}$ | Turn-off Delay Time | | | 550 | | |
| $T_f$ | Fall Time | | | 130 | | |
| $T_{d(on)}$ | Turn-on Delay Time | Inductive Switching (125°C)<br>$V_{GE}$ = ±15V<br>$V_{Bus}$ = 600V<br>$I_C$ = 150A<br>$R_G$ = 2.2Ω | | 290 | | ns |
| $T_r$ | Rise Time | | | 100 | | |
| $T_{d(off)}$ | Turn-off Delay Time | | | 650 | | |
| $T_f$ | Fall Time | | | 180 | | |

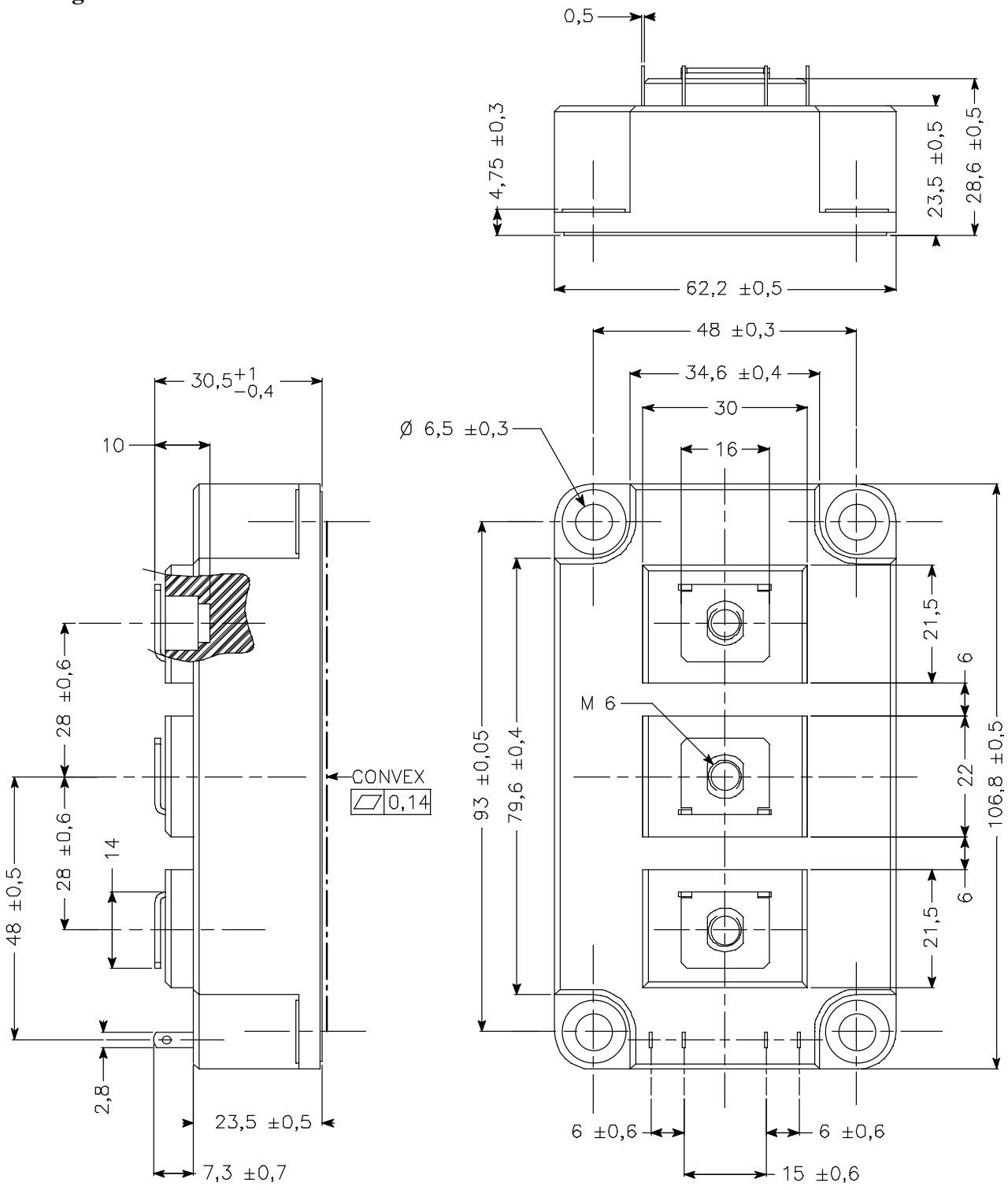
## Reverse diode ratings and characteristics

| *Symbol* | *Characteristic* | *Test Conditions* | | *Min* | *Typ* | *Max* | *Unit* |
|---|---|---|---|---|---|---|---|
| $V_F$ | Diode Forward Voltage | $I_F$ = 150A<br>$V_{GE}$ = 0V | $T_j$ = 25°C | | 1.6 | 2.1 | V |
| | | | $T_j$ = 125°C | | 1.6 | | |
| $E_{rec}$ | Reverse Recovery Energy | $I_F$ = 150A<br>$V_R$ = 600V<br>di/dt =900A/µs | $T_j$ = 125°C | | 12 | | mJ |
| $Q_{rr}$ | Reverse Recovery Charge | $I_F$ = 150A<br>$V_R$ = 600V<br>di/dt =900A/µs | $T_j$ = 25°C | | 14 | | µC |
| | | | $T_j$ = 125°C | | 28 | | |

## Thermal and package characteristics

| *Symbol* | *Characteristic* | | | *Min* | *Typ* | *Max* | *Unit* |
|---|---|---|---|---|---|---|---|
| $R_{thJC}$ | Junction to Case | | IGBT | | | 0.18 | °C/W |
| | | | Diode | | | 0.30 | |
| $V_{ISOL}$ | RMS Isolation Voltage, any terminal to case t =1 min, I isol<1mA, 50/60Hz | | | 2500 | | | V |
| $T_J$ | Operating junction temperature range | | | -40 | | 150 | °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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