



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

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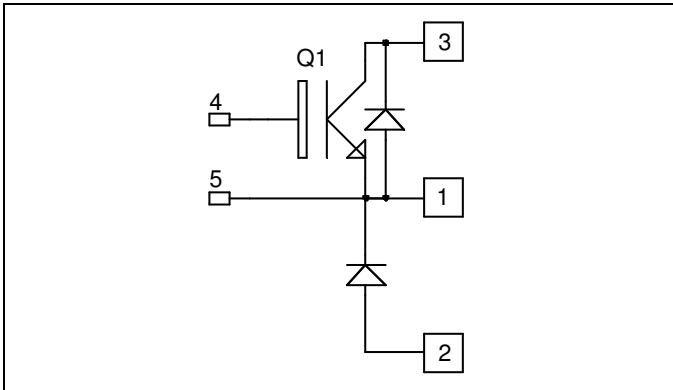
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**Buck chopper  
Trench IGBT® Power Module**

**$V_{CES} = 1700V$   
 $I_C = 150A @ T_c = 80^\circ C$**

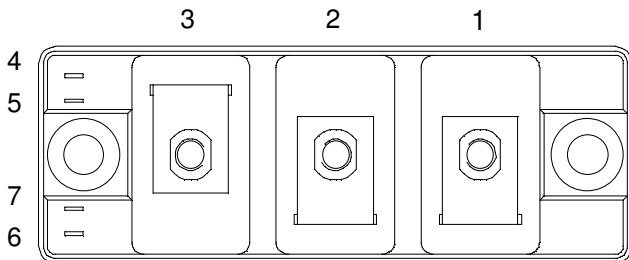


**Application**

- AC and DC motor control
- Switched Mode Power Supplies

**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
  - M5 power connectors



**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	$T_C = 25^\circ C$	280
		$T_C = 80^\circ C$	150
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	300
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	780
RBSOA	Reverse Bias Safe Operation Area	$T_j = 125^\circ C$	300A@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	$V_{GE} = 0V, I_C = 4mA$	1700			V
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 1700V$			4	mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 150A$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	2.0 2.4	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 6mA$	5.2	5.8	6.4	V
$I_{GES}$	Gate - Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			200	nA

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0V, V_{CE} = 25V$		13		nF
$C_{res}$	Reverse Transfer Capacitance	$f = 1MHz$		0.45		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 900V$ $I_C = 150A$ $R_G = 10\Omega$		280		ns
$T_r$	Rise Time			100		
$T_{d(off)}$	Turn-off Delay Time			850		
$T_f$	Fall Time			120		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ ) $V_{GE} = \pm 15V$ $V_{Bus} = 900V$ $I_C = 150A$ $R_G = 10\Omega$		330		ns
$T_r$	Rise Time			100		
$T_{d(off)}$	Turn-off Delay Time			1000		
$T_f$	Fall Time			200		
$E_{off}$	Turn Off Energy			47		mJ

## Reverse diode ratings and characteristics

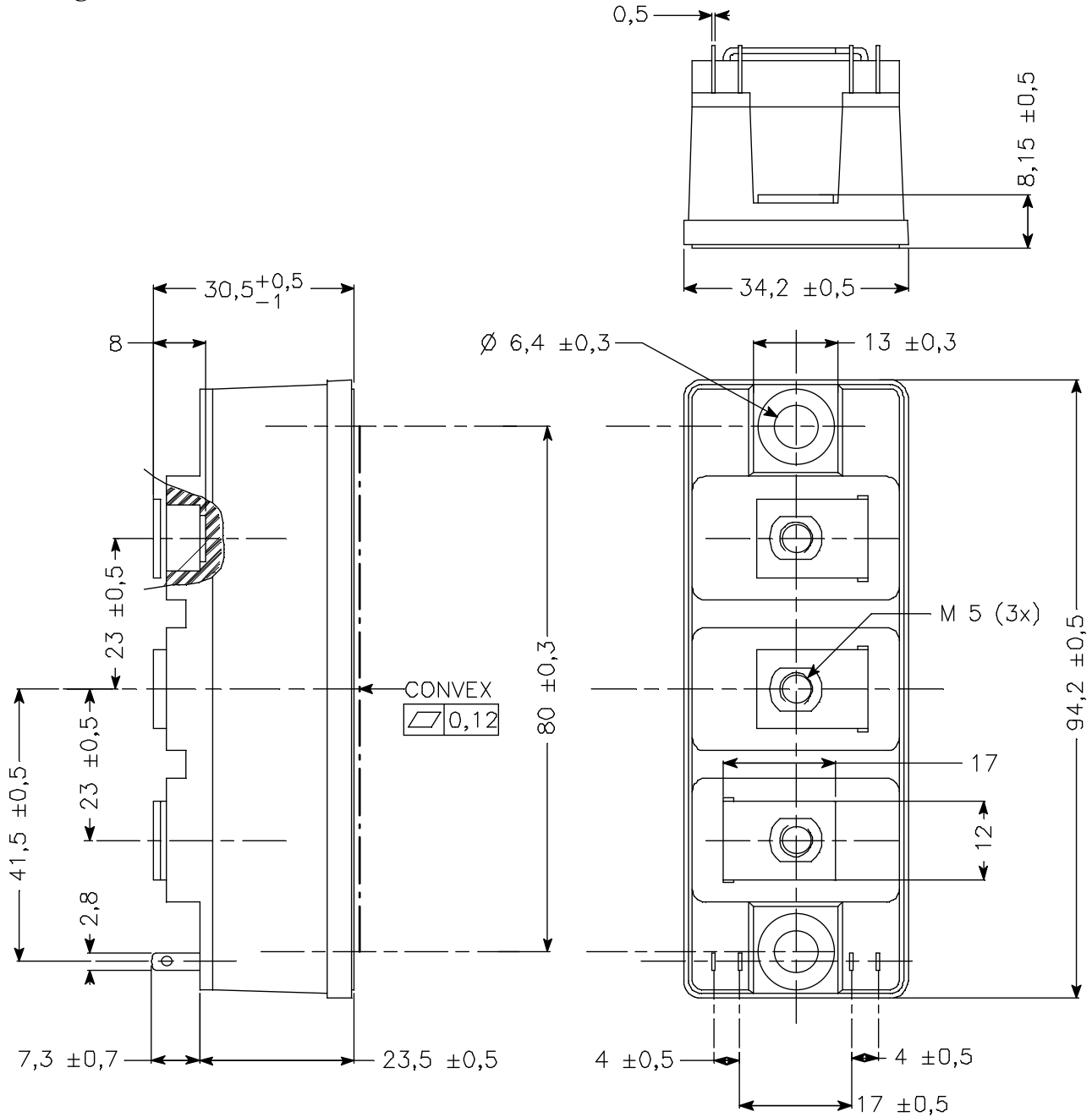
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode Forward Voltage	$I_F = 150A$ $V_{GE} = 0V$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.8 1.9	2.2 V
$E_r$	Reverse Recovery Energy	$I_F = 150A$ $V_R = 900V$ $di/dt = 900A/\mu s$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	17.5 35	mJ
$Q_{rr}$	Reverse Recovery Charge	$I_F = 150A$ $V_R = 900V$ $di/dt = 900A/\mu s$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	37.5 62.5	$\mu C$

## Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT			0.16	$^\circ\text{C/W}$
		Diode			0.25	
$V_{ISOL}$	RMS Isolation Voltage, any terminal to case $t = 1$ min, $I_{isol} < 1mA, 50/60Hz$	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	For terminals	M5	2	3.5	N.m
		To Heatsink	M6	3	5	
Wt	Package Weight			180	g	



## Package outline



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

APT's products are covered by one or more of U.S patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. U.S and Foreign patents pending. All Rights Reserved.