



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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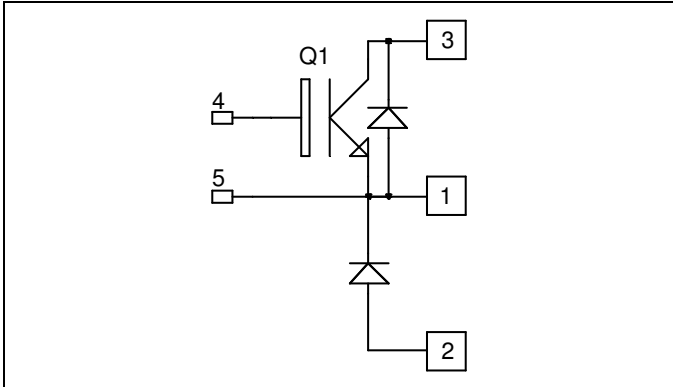
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***Buck Chopper  
Trench IGBT® Power Module***

**$V_{CES} = 1200V$   
 $I_C = 75A @ T_c = 80^\circ C$**

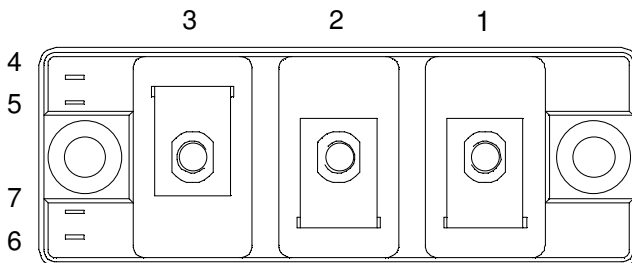


**Application**

- 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
  - M5 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**

<i>Symbol</i>	<i>Parameter</i>		<i>Max ratings</i>	<i>Unit</i>
$V_{CES}$	Collector - Emitter Breakdown Voltage		1200	V
$I_C$	Continuous Collector Current	$T_C = 25^\circ C$	110	A
		$T_C = 80^\circ C$	75	
$I_{CM}$	Pulsed Collector Current	$T_C = 25^\circ C$	175	
$V_{GE}$	Gate - Emitter Voltage		$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_C = 25^\circ C$	357	W
SCSOA	Short Circuit Safe Operating Area	$T_j = 125^\circ C$	300A@900V	

**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	$V_{GE} = 0V, I_C = 3mA$	1200			V
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 1200V$			4	mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15V$ $I_C = 75A$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.7 2.1	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 3mA$	5.0	5.8	6.5	V
$I_{GES}$	Gate - Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$			300	nA

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0V$		5345		nF
$C_{oes}$	Output Capacitance	$V_{CE} = 25V$		280		
$C_{res}$	Reverse Transfer Capacitance	$f = 1MHz$		242		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ )		280		ns
$T_r$	Rise Time	$V_{GE} = \pm 15V$		90		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 600V$ $I_C = 75A$		550		
$T_f$	Fall Time	$R_G = 4.7\Omega$		125		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ )		290		ns
$T_r$	Rise Time	$V_{GE} = \pm 15V$		100		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 600V$ $I_C = 75A$		650		
$T_f$	Fall Time	$R_G = 4.7\Omega$		180		

## Reverse diode ratings and characteristics

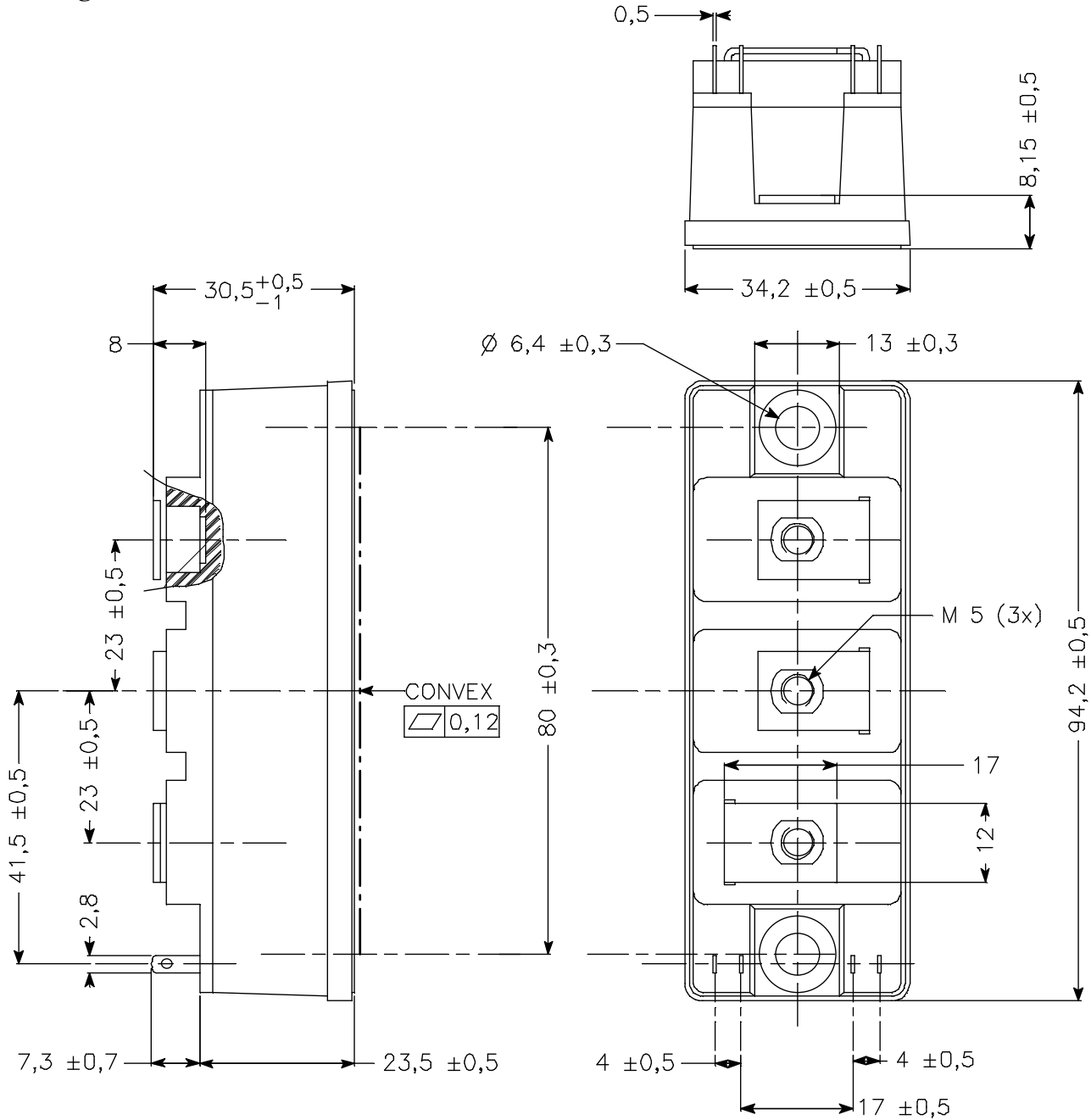
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_F$	Diode Forward Voltage	$I_F = 75A$ $V_{GE} = 0V$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	1.6 2.1	V
$E_{rec}$	Reverse Recovery Energy	$I_F = 75A$ $V_R = 600V$ $di/dt = 600A/\mu s$		$T_j = 125^\circ\text{C}$	6	mJ
$Q_{rr}$	Reverse Recovery Charge	$I_F = 75A$ $V_R = 600V$ $di/dt = 600A/\mu s$		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	7 14	$\mu C$

## Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT		0.35	$^\circ\text{C/W}$	
		Diode		0.58		
$V_{ISOL}$	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	$^\circ\text{C}$	
$T_{STG}$	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.