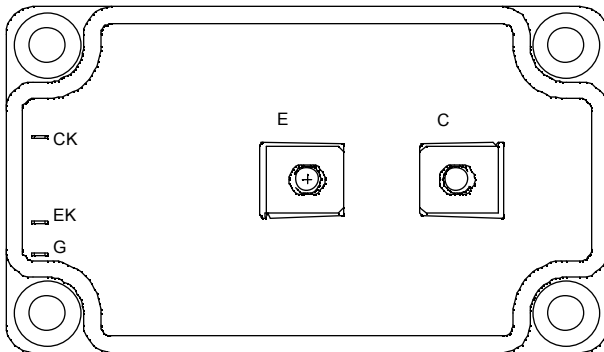
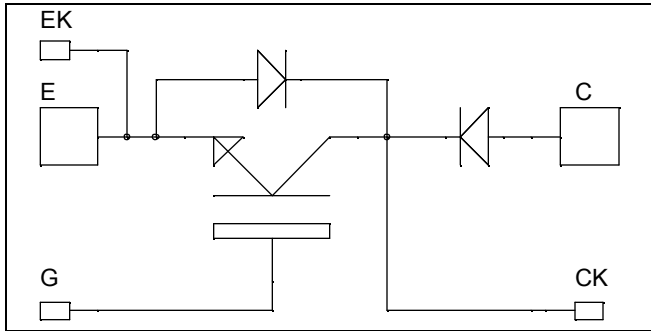


*Single Switch  
with Series diodes  
NPT IGBT Power Module*

**$V_{CES} = 1200V$   
 $I_C = 300A @ T_c = 80^\circ C$**



**Application**

- Zero Current Switching resonant mode

**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
- Very low stray inductance
  - Symmetrical design
  - 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
- Low profile

**Absolute maximum ratings**

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	1200	V
$I_C$	Continuous Collector Current	$T_c = 25^\circ C$	400
		$T_c = 80^\circ C$	300
$I_{CM}$	Pulsed Collector Current	$T_c = 25^\circ C$	800
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	2080
RBSOA	Reverse Bias Safe Operating Area	$T_j = 150^\circ C$	600A @ 1200V

**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	$V_{GE} = 0\text{V}, I_C = 4\text{mA}$	1200			V
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0\text{V}$ $V_{CE} = 1200\text{V}$		$T_j = 25^\circ\text{C}$ : 0.4 $T_j = 125^\circ\text{C}$ : 25	6	mA
$V_{CE(on)}$	Collector Emitter on Voltage	$V_{GE} = 15\text{V}$ $I_C = 300\text{A}$		$T_j = 25^\circ\text{C}$ : 3.2 $T_j = 125^\circ\text{C}$ : 4	3.9	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 12\text{mA}$	4.5		6.5	V
$I_{GES}$	Gate - Emitter Leakage Current	$V_{GE} = \pm 20\text{V}, V_{CE} = 0\text{V}$			$\pm 1$	$\mu\text{A}$

### Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0\text{V}$		21		nF
$C_{oes}$	Output Capacitance	$V_{CE} = 25\text{V}$		2.9		
$C_{res}$	Reverse Transfer Capacitance	$f = 1\text{MHz}$		1.52		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ ) $V_{GE} = 15\text{V}$ $V_{Bus} = 600\text{V}$ $I_C = 300\text{A}$ $R_G = 2\Omega$		70		ns
$T_r$	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			500		
$T_f$	Fall Time			30		
$E_{on}$	Turn-on Switching Energy				17	mJ
$E_{off}$	Turn-off Switching Energy				18	

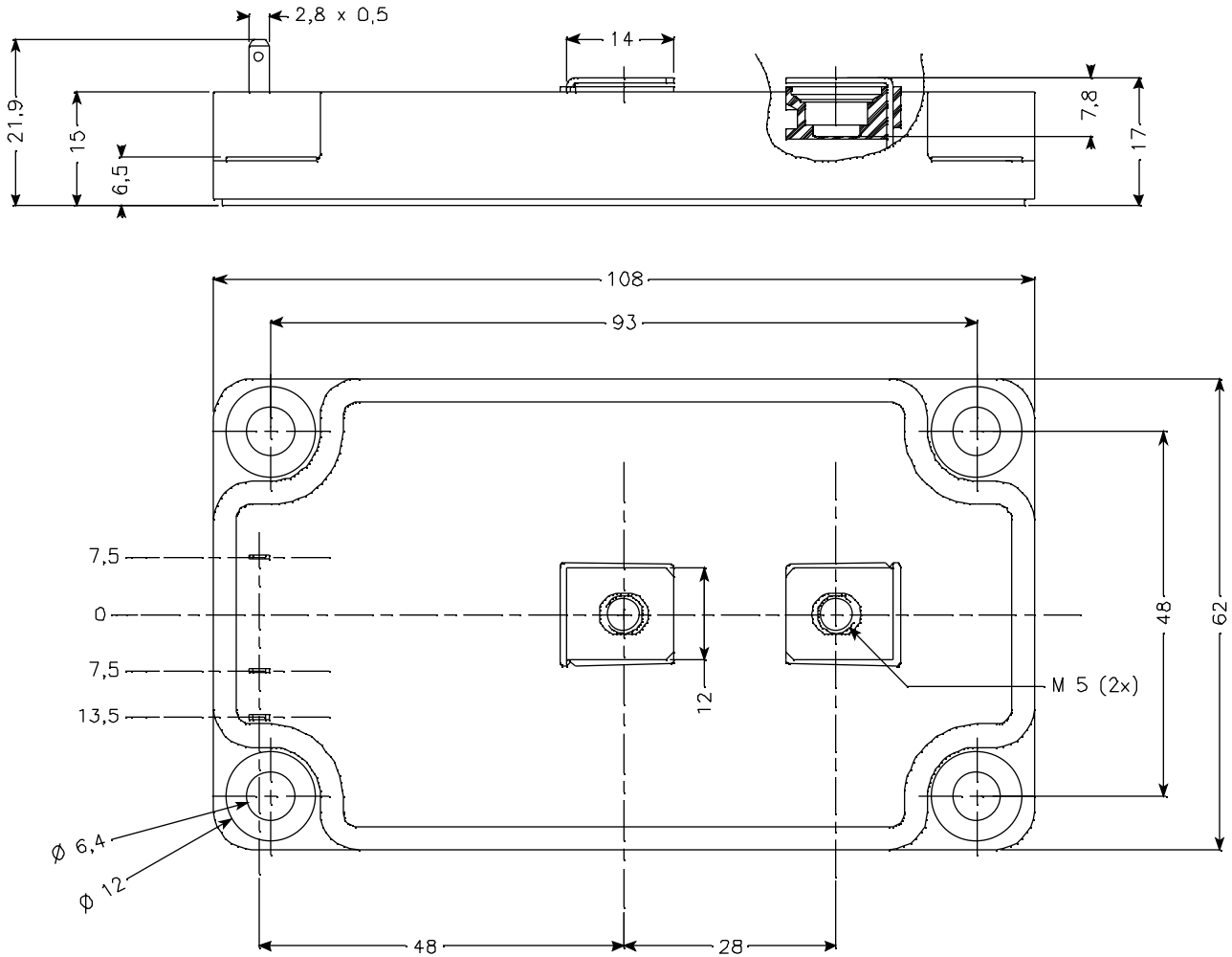
### Series diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle, $T_c = 85^\circ\text{C}$		250		A
$V_F$	Diode Forward Voltage	$I_F = 300\text{A}$		2.2	2.5	V
		$I_F = 400\text{A}$		2.4		
		$I_F = 400\text{A}, T_j = 150^\circ\text{C}$		2.2		
$Q_{rr}$	Reverse Recovery Charge	$I_F = 300\text{A}$	$T_j = 25^\circ\text{C}$		13	$\mu\text{C}$
			$T_j = 125^\circ\text{C}$		40	

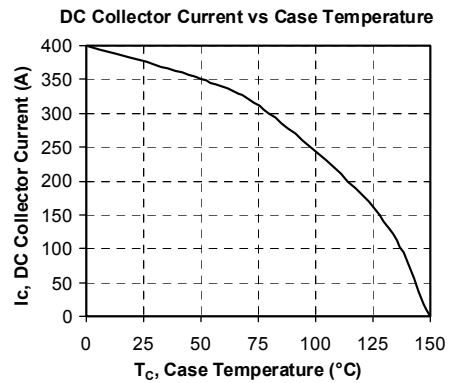
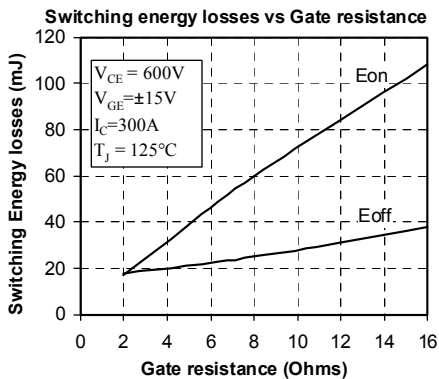
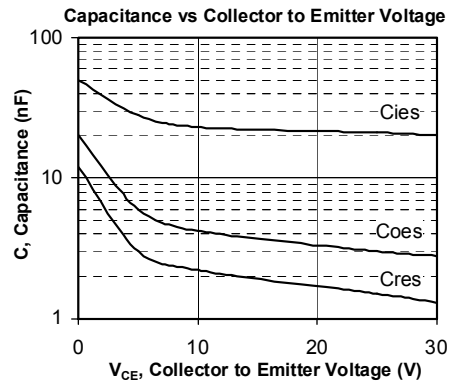
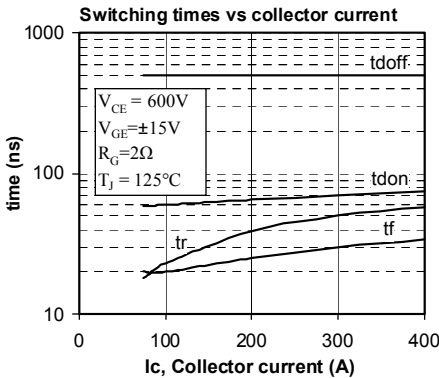
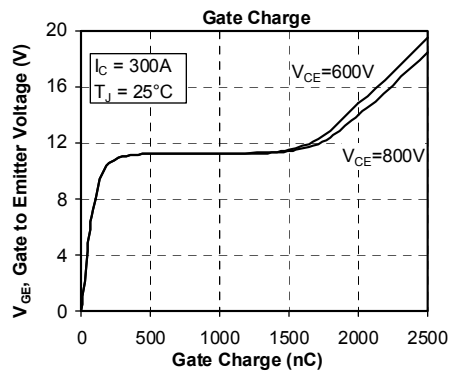
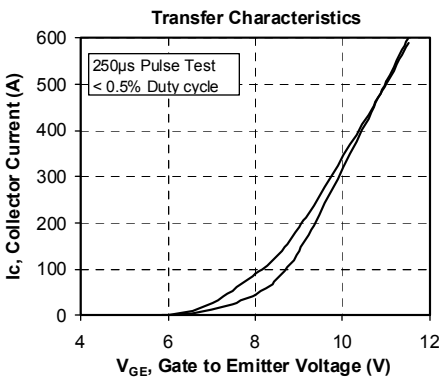
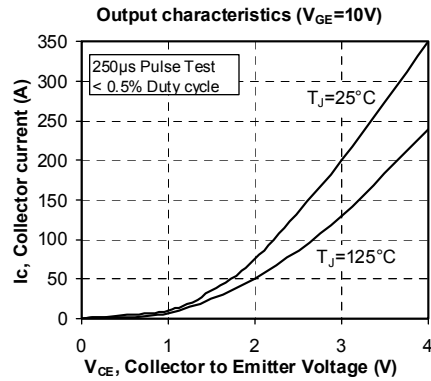
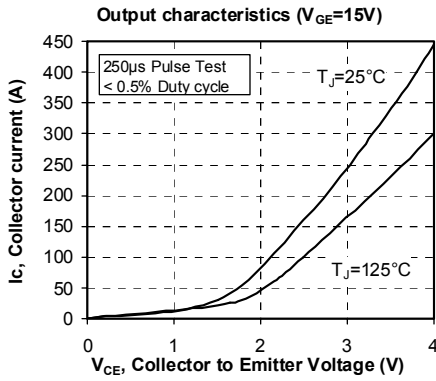
### Thermal and package characteristics

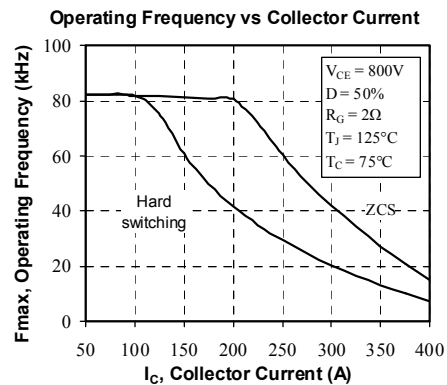
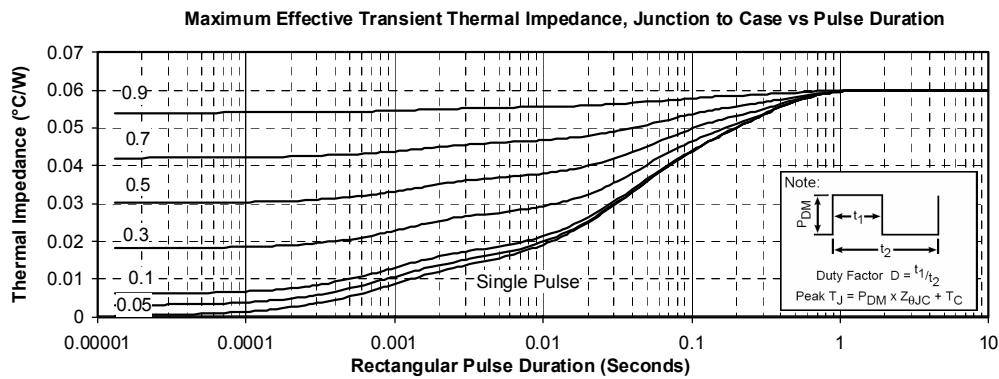
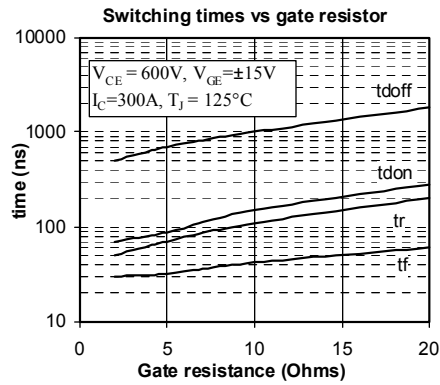
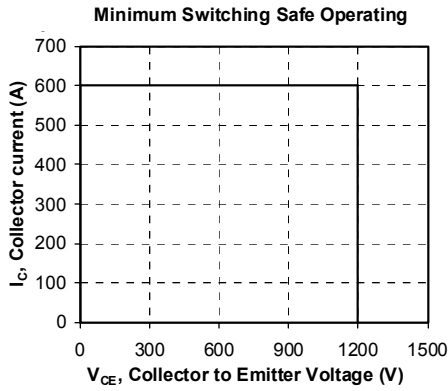
Symbol	Characteristic	Min	Typ	Max	Unit	
$R_{thJC}$	Junction to Case	IGBT		0.06	$^\circ\text{C/W}$	
		Diode		0.13		
$V_{ISOL}$	RMS Isolation Voltage, any terminal to case $t = 1\text{min}, I_{isol} < 1\text{mA}, 50/60\text{Hz}$	2500			V	
$T_J$	Operating junction temperature range	-40		150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-40		125		
$T_C$	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M6	3	5	N.m
		For terminals	M5	2	3.5	
Wt	Package Weight			280	g	

**Package outline**



**Typical Performance Curve**





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.