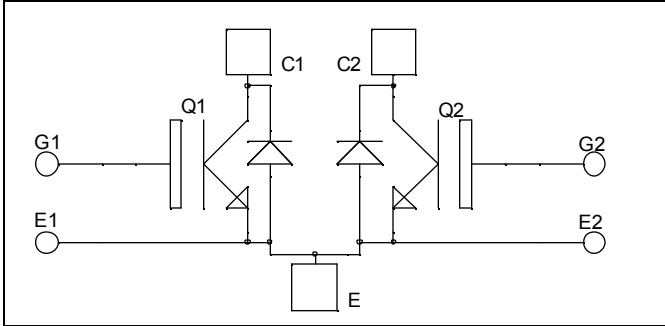


**Dual common source  
Trench + Field Stop IGBT®  
Power Module**

**$V_{CES} = 600V$   
 $I_C = 300A @ T_c = 80^\circ C$**

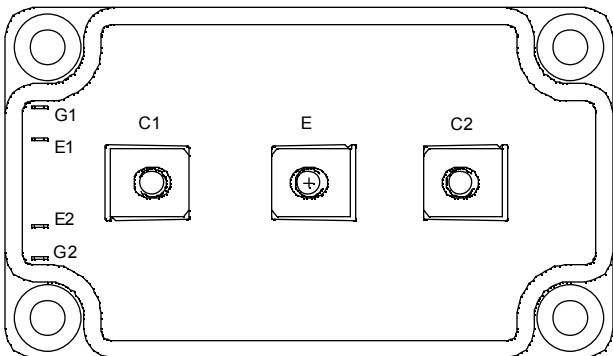


**Application**

- AC Switches
- Switched Mode Power Supplies
- Uninterruptible 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
- Very low stray inductance
  - Symmetrical design
  - M5 power connectors
- High level of integration



**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
- Low profile

**Absolute maximum ratings**

Symbol	Parameter	Max ratings	Unit
$V_{CES}$	Collector - Emitter Breakdown Voltage	600	V
$I_C$	Continuous Collector Current	$T_c = 25^\circ C$	430
		$T_c = 80^\circ C$	300
$I_{CM}$	Pulsed Collector Current	$T_c = 25^\circ C$	500
$V_{GE}$	Gate - Emitter Voltage	$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	1150
RBSOA	Reverse Bias Safe Operating Area	$T_j = 150^\circ C$	600A @ 550V

**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
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0\text{V}, V_{CE} = 600\text{V}$			350	$\mu\text{A}$
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15\text{V}$ $I_C = 300\text{A}$	$T_j = 25^\circ\text{C}$	1.4	1.8	V
			$T_j = 150^\circ\text{C}$	1.5		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 1.5\text{ mA}$	5.0	5.8	6.5	V
$I_{GES}$	Gate – Emitter Leakage Current	$V_{GE} = 20\text{V}, V_{CE} = 0\text{V}$			500	nA

## Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
$C_{ies}$	Input Capacitance	$V_{GE} = 0\text{V}$		24		nF	
$C_{oes}$	Output Capacitance	$V_{CE} = 25\text{V}$		1.5			
$C_{res}$	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.75			
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ ) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 300\text{A}$ $R_G = 3.3\Omega$		115		ns	
$T_r$	Rise Time			45			
$T_{d(off)}$	Turn-off Delay Time			200			
$T_f$	Fall Time			55			
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $150^\circ\text{C}$ ) $V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 300\text{A}$ $R_G = 3.3\Omega$		120		ns	
$T_r$	Rise Time			50			
$T_{d(off)}$	Turn-off Delay Time			250			
$T_f$	Fall Time			70			
$E_{on}$	Turn on Energy			5.2			mJ
$E_{off}$	Turn off Energy			10.5			

## Reverse diode ratings and characteristics

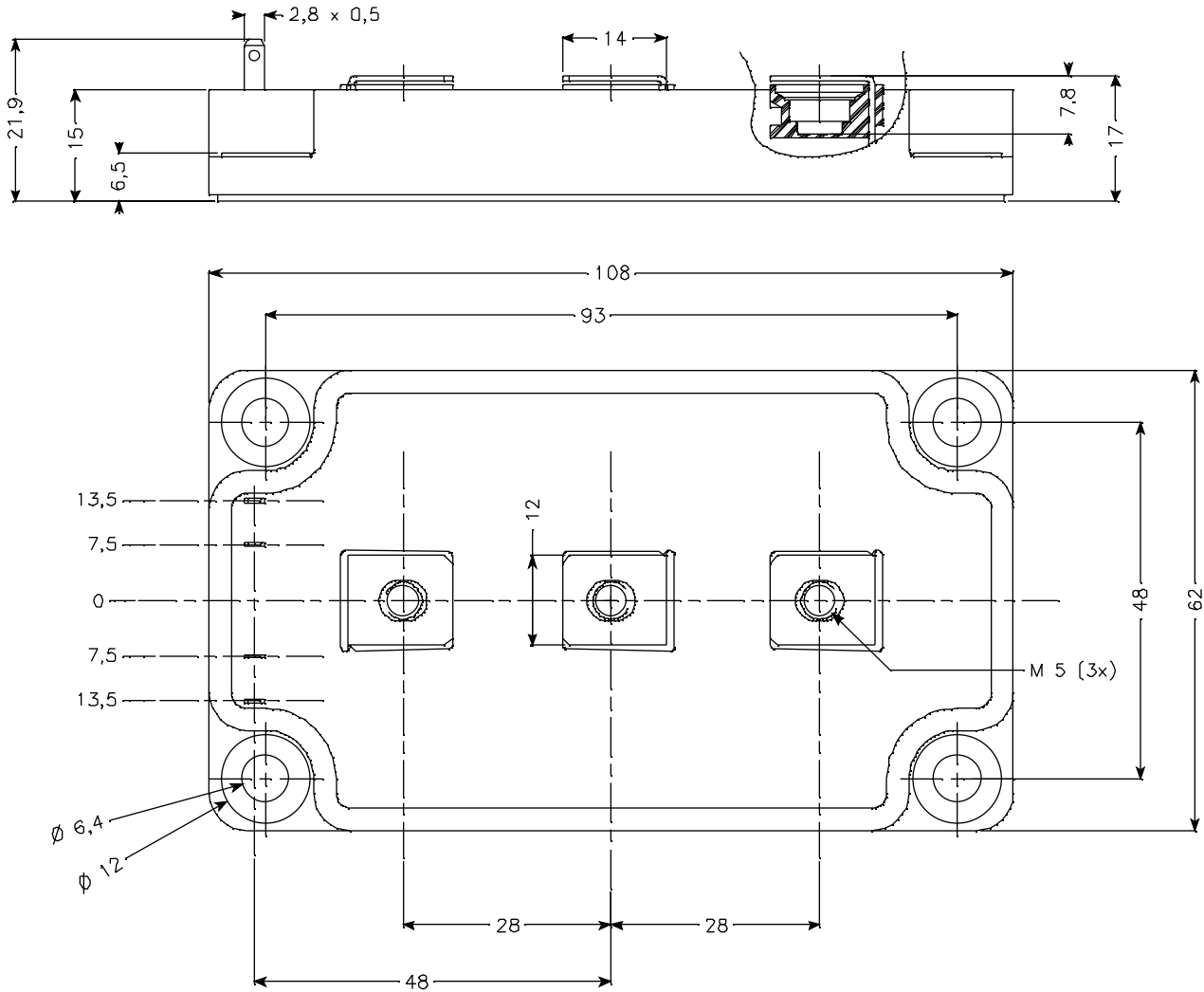
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_{RRM}$	Maximum Peak Repetitive Reverse Voltage		600			V
$I_{RM}$	Maximum Reverse Leakage Current	$V_R = 600\text{V}$	$T_j = 25^\circ\text{C}$		350	$\mu\text{A}$
			$T_j = 150^\circ\text{C}$		600	
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle	$T_c = 80^\circ\text{C}$	300		A
$V_F$	Diode Forward Voltage	$I_F = 300\text{A}$ $V_{GE} = 0\text{V}$	$T_j = 25^\circ\text{C}$	1.5	1.9	V
			$T_j = 150^\circ\text{C}$	1.4		
$t_{rr}$	Reverse Recovery Time	$I_F = 300\text{A}$ $V_R = 300\text{V}$	$T_j = 25^\circ\text{C}$	120		ns
			$T_j = 150^\circ\text{C}$	210		
$Q_{rr}$	Reverse Recovery Charge	$di/dt = 3100\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	13.5		$\mu\text{C}$
			$T_j = 150^\circ\text{C}$	28.5		

## Thermal and package characteristics

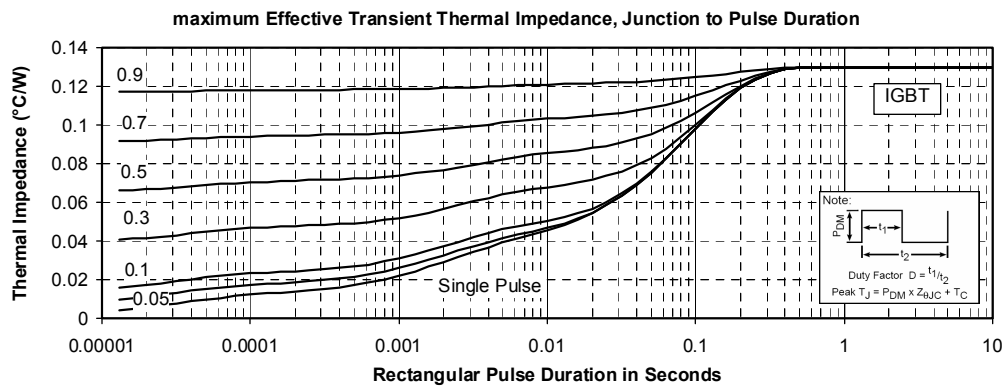
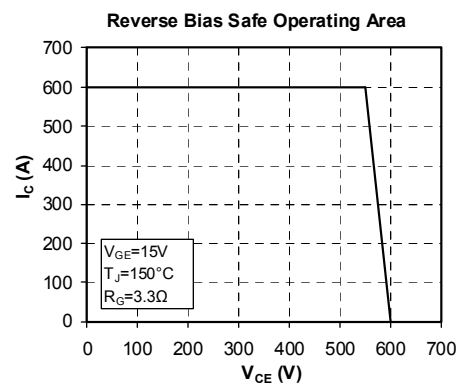
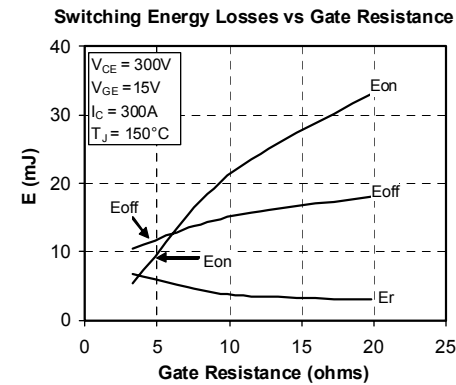
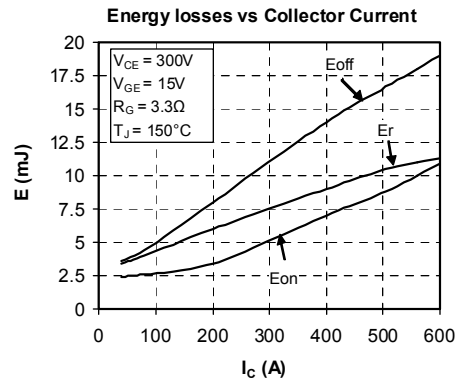
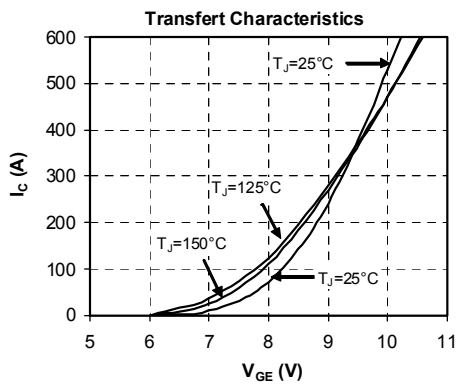
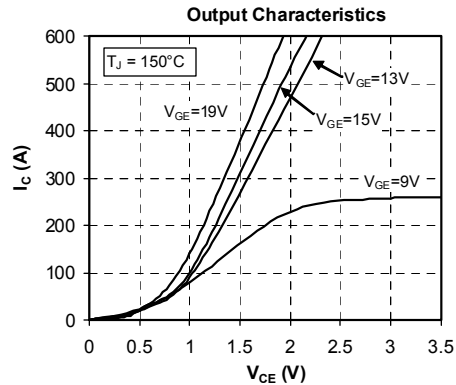
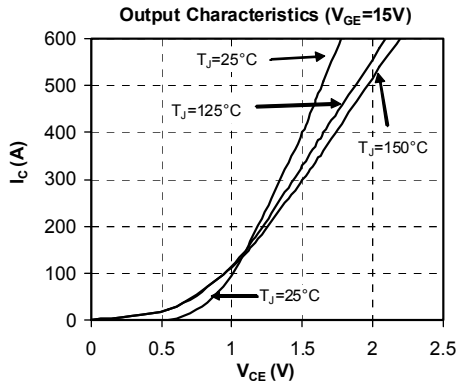
*Symbol Characteristic*

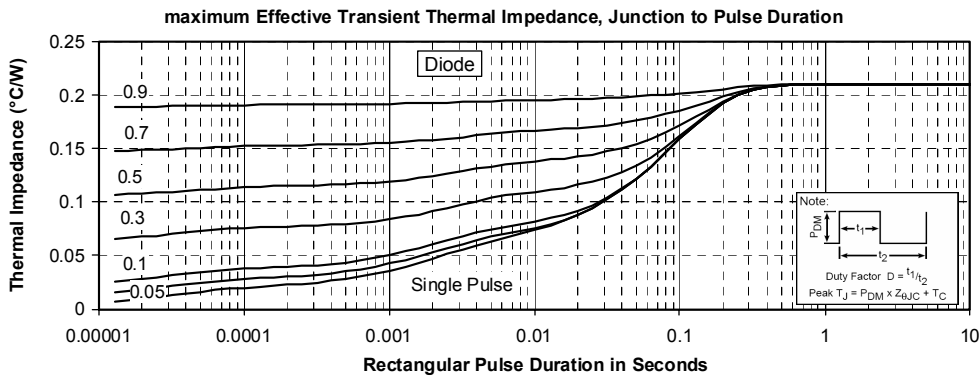
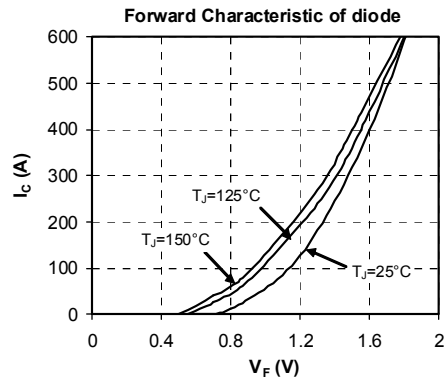
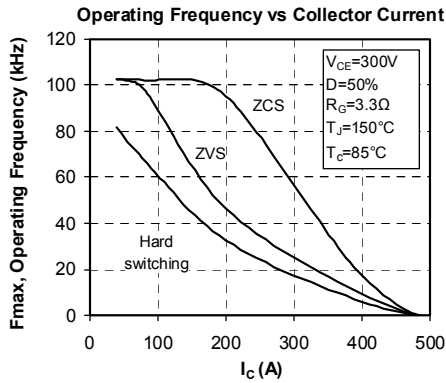
			<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Unit</i>
$R_{thJC}$	Junction to Case	IGBT			0.13	°C/W
		Diode			0.21	
$V_{ISOL}$	RMS Isolation Voltage, any terminal to case t=1 min, I isol<1mA, 50/60Hz		2500			V
$T_J$	Operating junction temperature range		-40		175	°C
$T_{STG}$	Storage Temperature Range		-40		125	
$T_C$	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 (dimensions in mm)



**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.