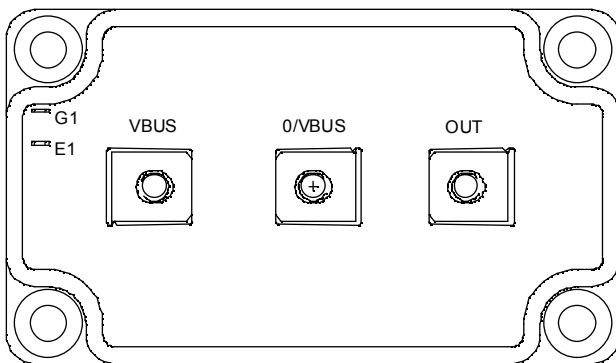
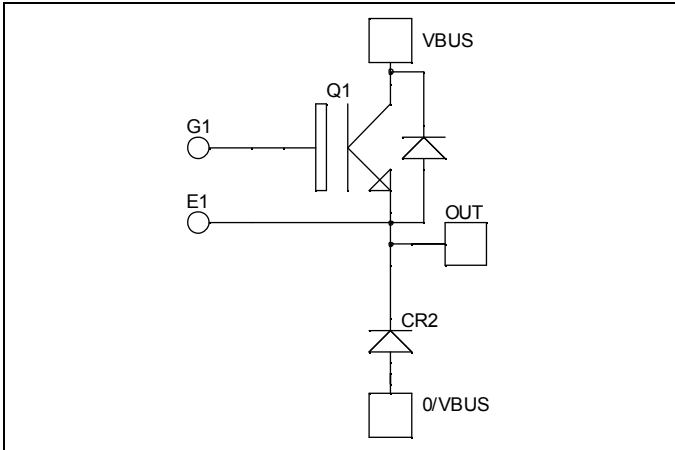


***Buck chopper  
Trench + Field Stop IGBT®  
Power Module***

**$V_{CES} = 1700V$   
 $I_C = 225A @ T_c = 80^{\circ}C$**



**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
- 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**

<i>Symbol</i>	<i>Parameter</i>		<i>Max ratings</i>	<i>Unit</i>
$V_{CES}$	Collector - Emitter Breakdown Voltage		1700	V
$I_C$	Continuous Collector Current	$T_c = 25^{\circ}C$	340	A
		$T_c = 80^{\circ}C$	225	
$I_{CM}$	Pulsed Collector Current	$T_c = 25^{\circ}C$	450	
$V_{GE}$	Gate - Emitter Voltage		$\pm 20$	V
$P_D$	Maximum Power Dissipation	$T_c = 25^{\circ}C$	1250	W
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^{\circ}C$	450A @ 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
$I_{CES}$	Zero Gate Voltage Collector Current	$V_{GE} = 0\text{V}$ , $V_{CE} = 1700\text{V}$			500	$\mu\text{A}$
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15\text{V}$ $I_C = 225\text{A}$				
		$T_j = 25^\circ\text{C}$		2.0	2.4	V
		$T_j = 125^\circ\text{C}$		2.4		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}$ , $I_C = 4\text{mA}$	5.0	5.8	6.5	V
$I_{GES}$	Gate – Emitter Leakage Current	$V_{GE} = 20\text{V}$ , $V_{CE} = 0\text{V}$			600	nA

**Dynamic Characteristics**

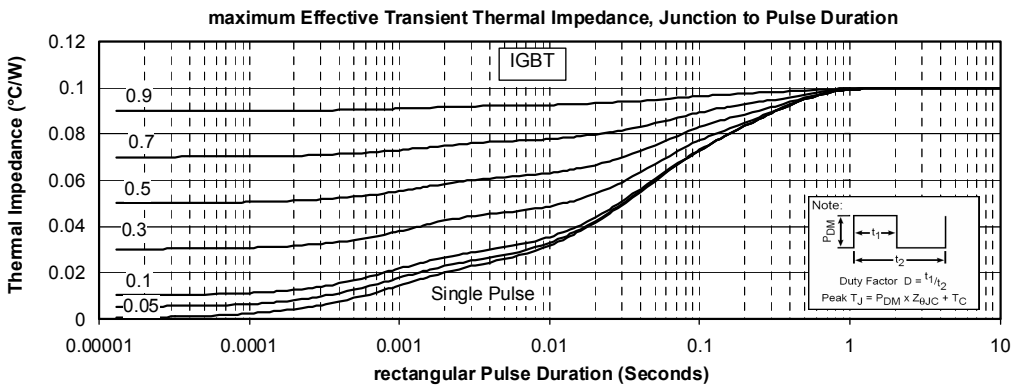
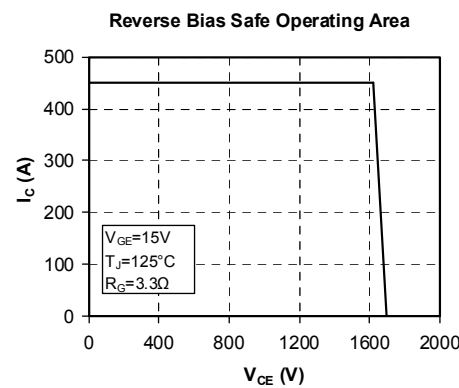
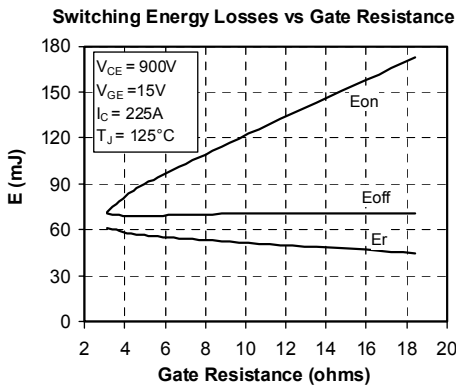
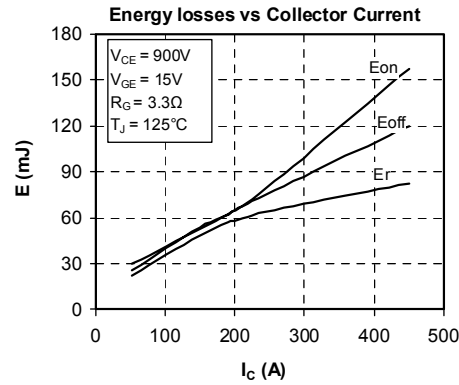
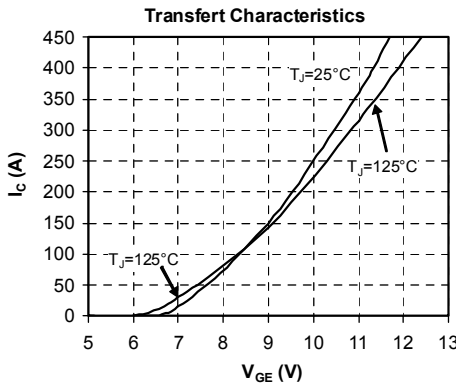
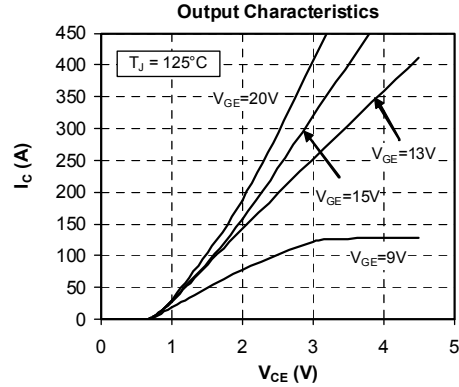
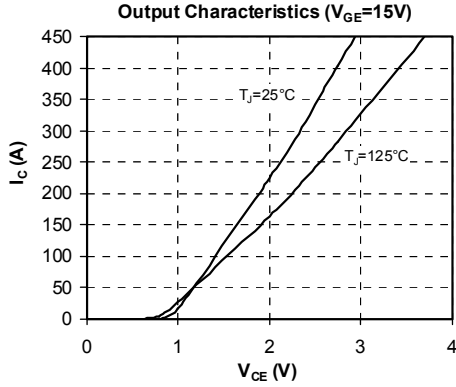
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{ies}$	Input Capacitance	$V_{GE} = 0\text{V}$		20		
$C_{oes}$	Output Capacitance	$V_{CE} = 25\text{V}$		0.8		nF
$C_{res}$	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.66		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $25^\circ\text{C}$ )		370		
$T_r$	Rise Time	$V_{GE} = 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 225\text{A}$		40		ns
$T_{d(off)}$	Turn-off Delay Time	$I_C = 225\text{A}$		650		
$T_f$	Fall Time	$R_G = 3.3\Omega$		180		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching ( $125^\circ\text{C}$ )		400		
$T_r$	Rise Time	$V_{GE} = 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 225\text{A}$		50		ns
$T_{d(off)}$	Turn-off Delay Time	$I_C = 225\text{A}$		800		
$T_f$	Fall Time	$R_G = 3.3\Omega$		300		
$E_{on}$	Turn-on Switching Energy			72		mJ
$E_{off}$	Turn-off Switching Energy			70.5		

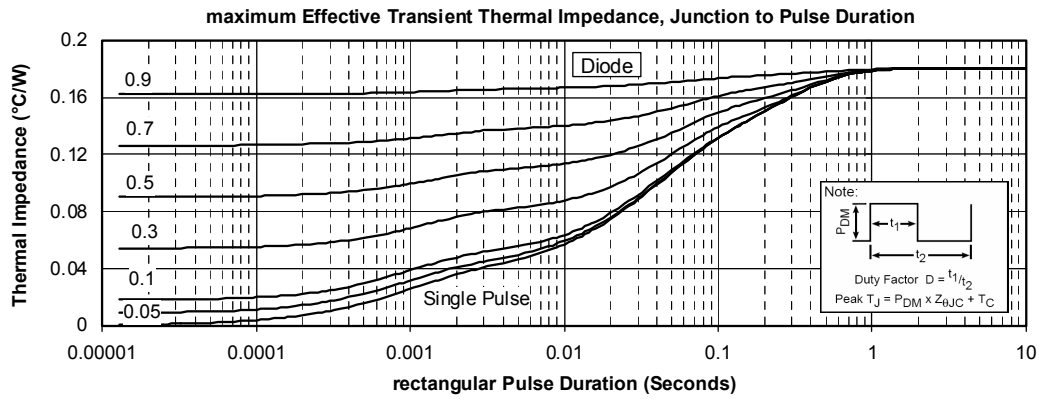
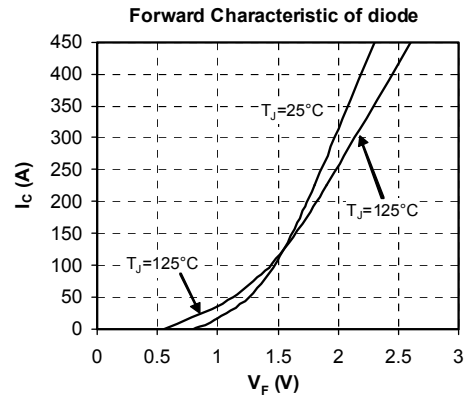
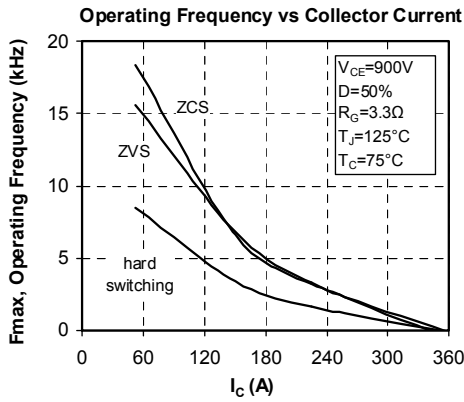
**Chopper diode ratings and characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$V_{RRM}$	Maximum Peak Repetitive Reverse Voltage		1700			V
$I_{RM}$	Maximum Reverse Leakage Current	$V_R = 1700\text{V}$				
		$T_j = 25^\circ\text{C}$			500	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$			750	
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle		225		A
$V_F$	Diode Forward Voltage	$I_F = 225\text{A}$				
		$T_j = 25^\circ\text{C}$		1.8	2.2	V
		$T_j = 125^\circ\text{C}$		1.9		
$t_{rr}$	Reverse Recovery Time	$I_F = 225\text{A}$ $V_R = 900\text{V}$				
		$T_j = 25^\circ\text{C}$		385		ns
		$T_j = 125^\circ\text{C}$		490		
$Q_{rr}$	Reverse Recovery Charge	$di/dt = 2400\text{A}/\mu\text{s}$				
		$T_j = 25^\circ\text{C}$		60		$\mu\text{C}$
		$T_j = 125^\circ\text{C}$		96		



**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.