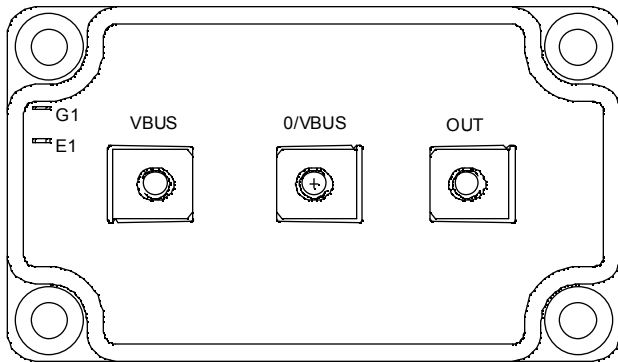
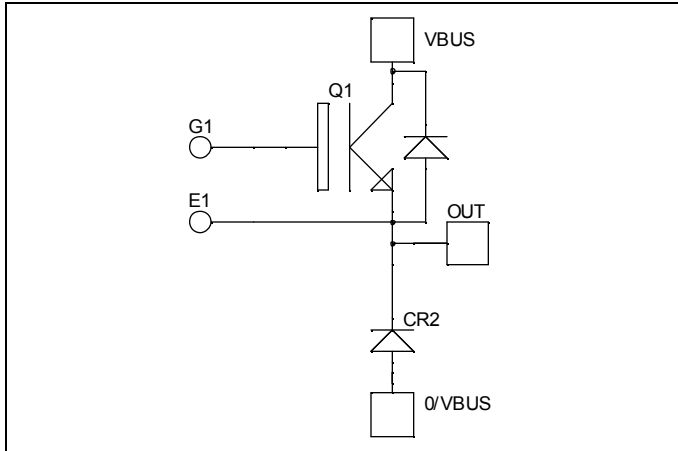


***Buck chopper
Trench + Field Stop IGBT®
Power Module***

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



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		± 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	μA
$V_{CE(sat)}$	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		nF
C_{oes}	Output Capacitance	$V_{CE} = 25\text{V}$		0.8		
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.66		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C)		370		ns
T_r	Rise Time	$V_{GE} = 15\text{V}$ $V_{Bus} = 900\text{V}$		40		
$T_{d(off)}$	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°C)		400		ns
T_r	Rise Time	$V_{GE} = 15\text{V}$ $V_{Bus} = 900\text{V}$		50		
$T_{d(off)}$	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		

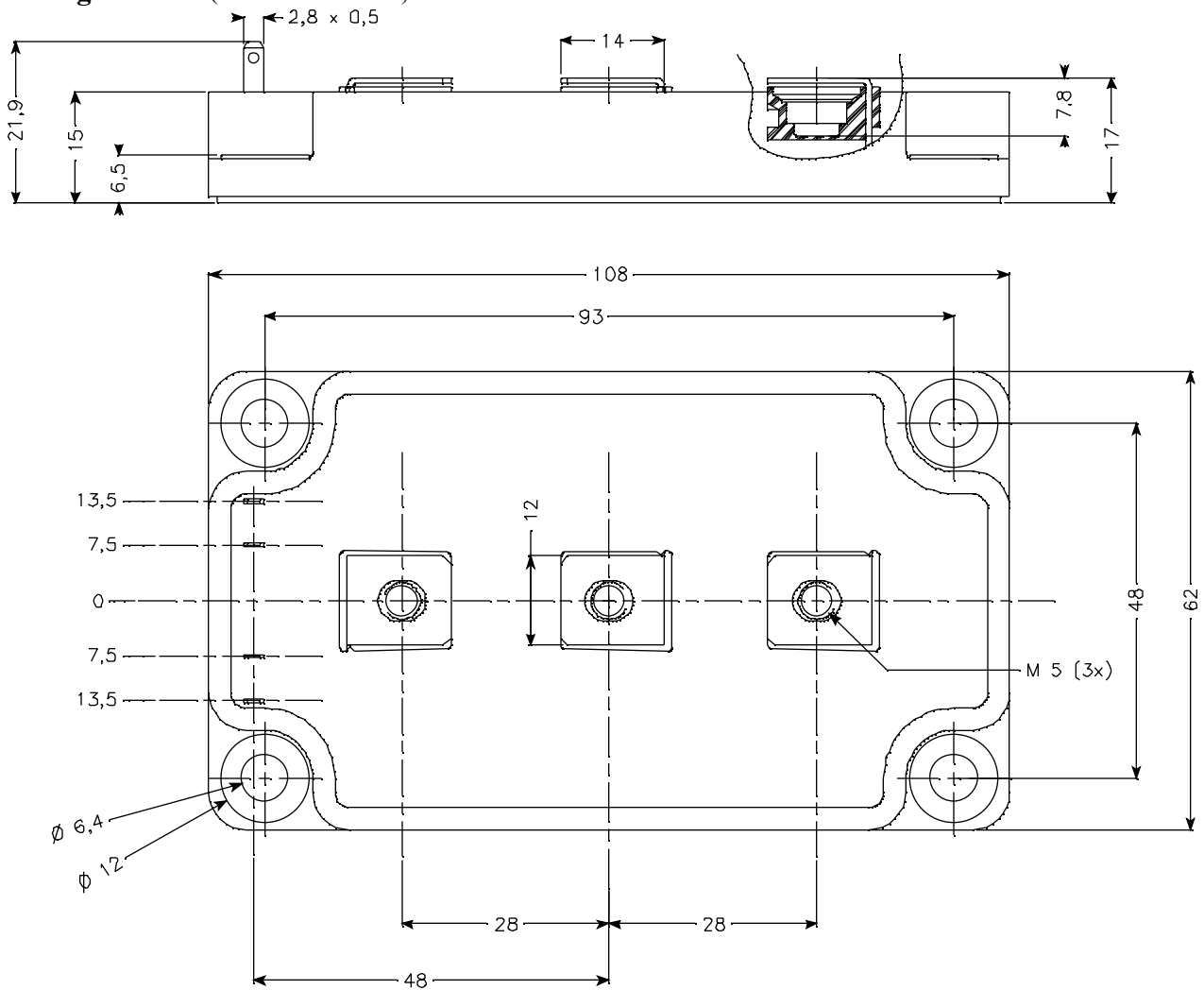
Chopper diode ratings and characteristics

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	μA
			$T_j = 125^\circ\text{C}$		750	
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle	$T_c = 80^\circ\text{C}$	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		μC
			$T_j = 125^\circ\text{C}$	96		

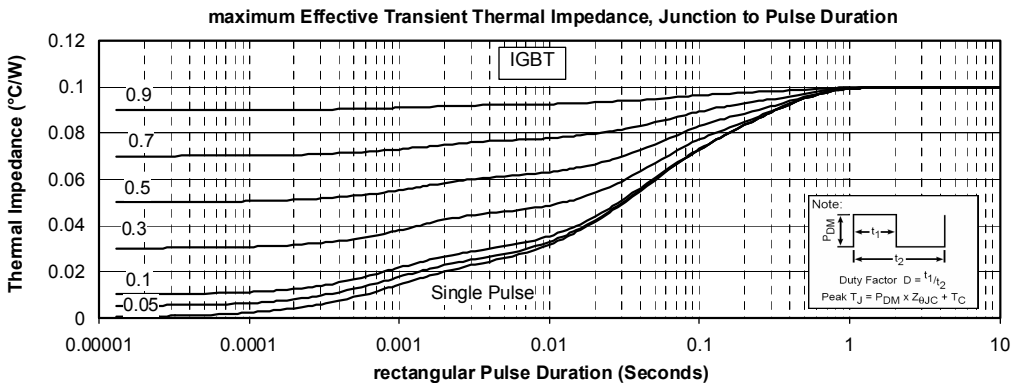
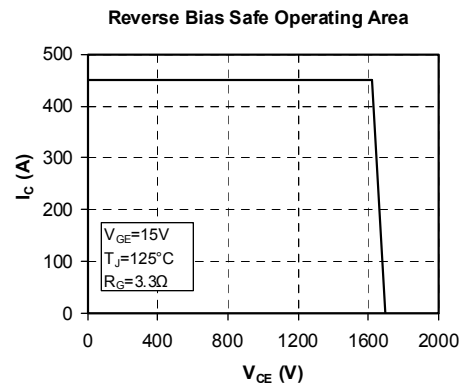
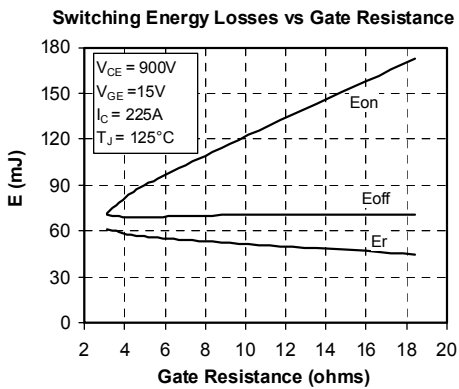
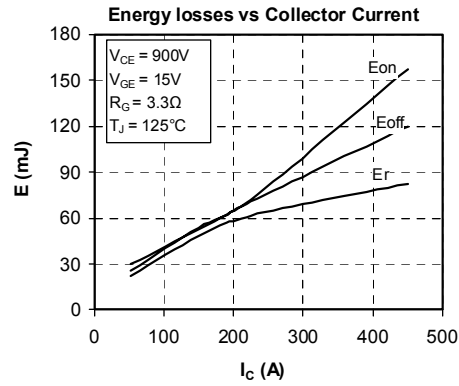
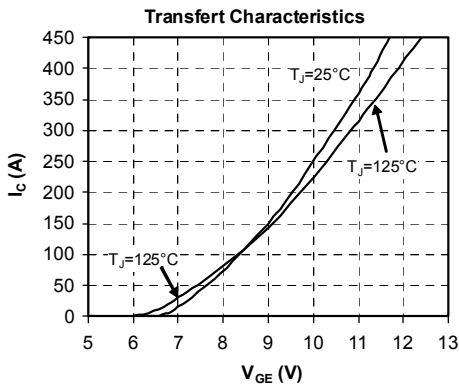
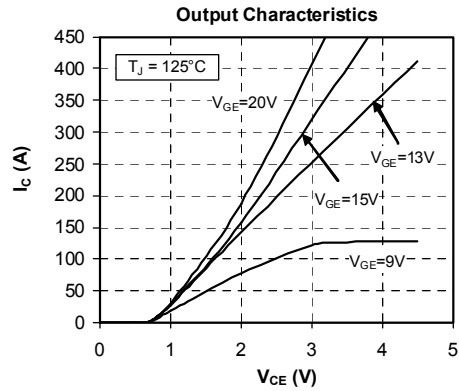
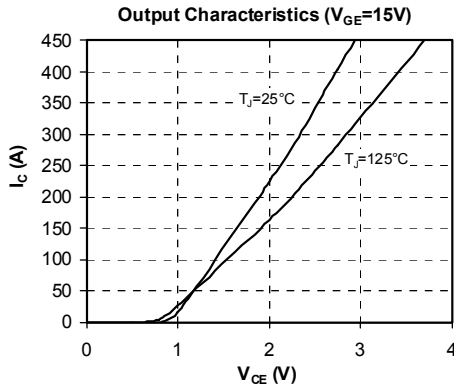
Thermal and package characteristics

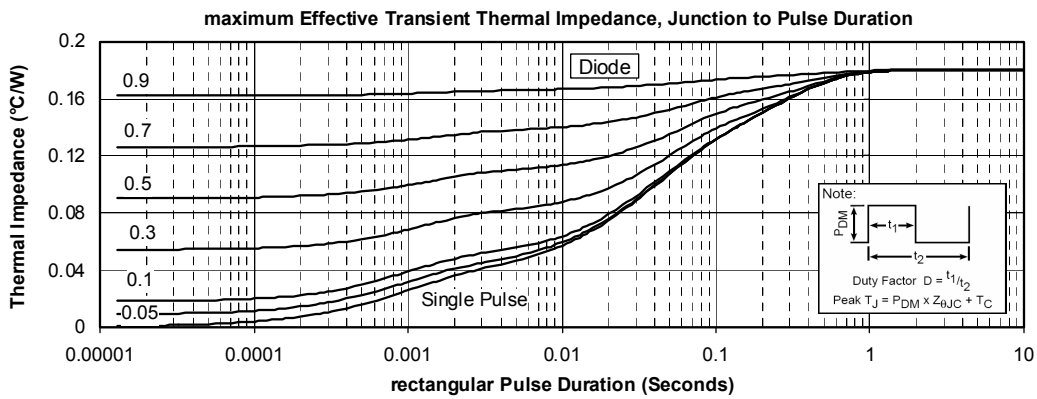
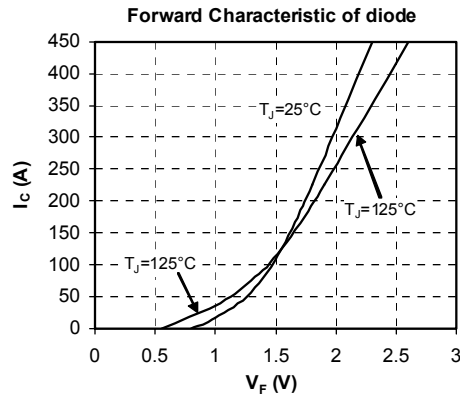
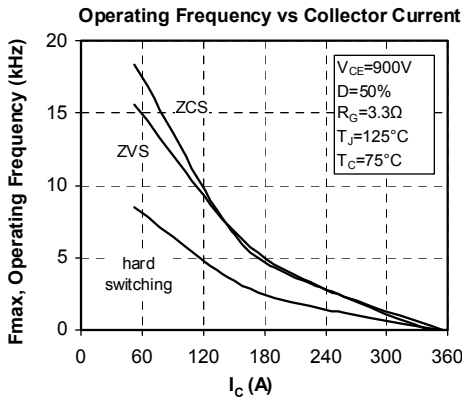
Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case	IGBT		0.1	°C/W	
		Diode		0.18		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, I _{isol} <1mA, 50/60Hz	3400			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature Range	-40		125		
T _C	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.