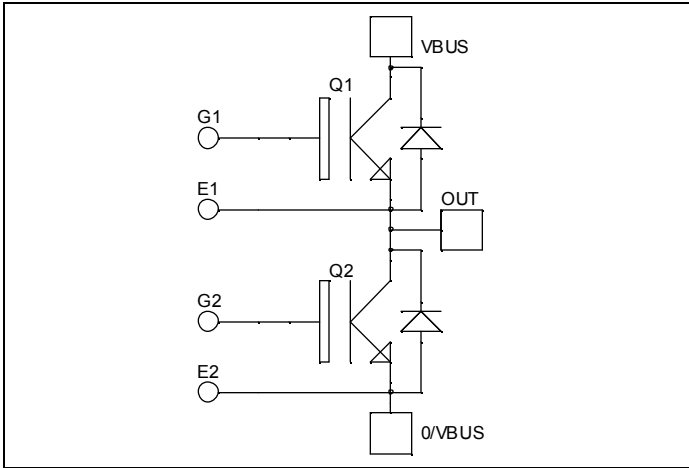


**Phase leg
Fast Trench + Field Stop IGBT®
Power Module**

**$V_{CES} = 1200V$
 $I_C = 150A @ T_c = 80°C$**

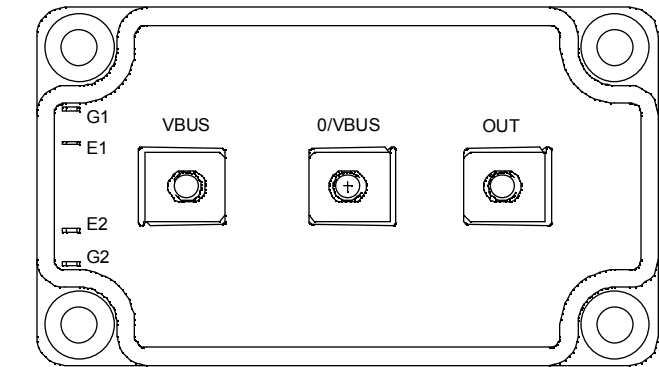


Application

- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- Fast 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	1200	V
I_C	Continuous Collector Current	$T_c = 25°C$	220
		$T_c = 80°C$	150
I_{CM}	Pulsed Collector Current	$T_c = 25°C$	350
V_{GE}	Gate - Emitter Voltage	±20	V
P_D	Maximum Power Dissipation	$T_c = 25°C$	690
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125°C$	300A @ 1150V

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	$V_{GE} = 0\text{V}, V_{CE} = 1200\text{V}$			1	mA
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15\text{V}$ $I_C = 150\text{A}$	$T_j = 25^\circ\text{C}$	1.7	2.1	V
			$T_j = 125^\circ\text{C}$	2.0		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 3\text{mA}$	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	$V_{GE} = 0\text{V}$		10.7		nF
C_{oes}	Output Capacitance	$V_{CE} = 25\text{V}$		0.56		
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.48		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C)		280		ns
T_r	Rise Time	$V_{GE} = \pm 15\text{V}$		40		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 600\text{V}$		450		
T_f	Fall Time	$I_C = 150\text{A}$ $R_G = 2.2\Omega$		75		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C)		290		ns
T_r	Rise Time	$V_{GE} = \pm 15\text{V}$		45		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 600\text{V}$		550		
T_f	Fall Time	$I_C = 150\text{A}$ $R_G = 2.2\Omega$		90		
E_{on}	Turn-on Switching Energy			14		mJ
E_{off}	Turn-off Switching Energy			16		

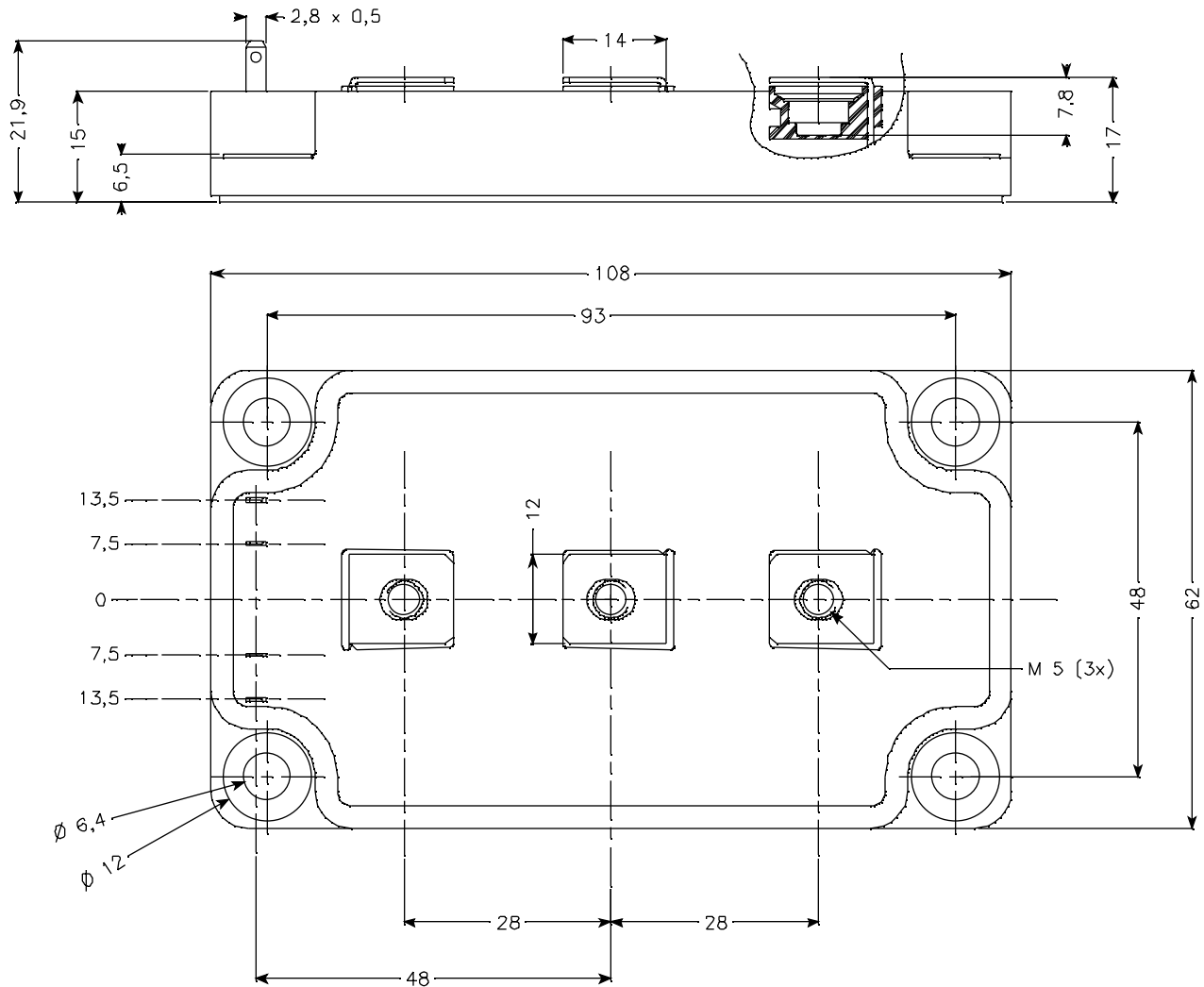
Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		1200			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1200\text{V}$	$T_j = 25^\circ\text{C}$		250	μA
			$T_j = 125^\circ\text{C}$		500	
$I_{F(AV)}$	Maximum Average Forward Current	50% duty cycle	$T_c = 80^\circ\text{C}$	150		A
V_F	Diode Forward Voltage	$I_F = 150\text{A}$	$T_j = 25^\circ\text{C}$	1.6	2.1	V
			$T_j = 125^\circ\text{C}$	1.6		
t_{rr}	Reverse Recovery Time	$I_F = 150\text{A}$ $V_R = 600\text{V}$	$T_j = 25^\circ\text{C}$	170		ns
			$T_j = 125^\circ\text{C}$	280		
Q_{rr}	Reverse Recovery Charge	$di/dt = 3000\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	15		μC
			$T_j = 125^\circ\text{C}$	29		

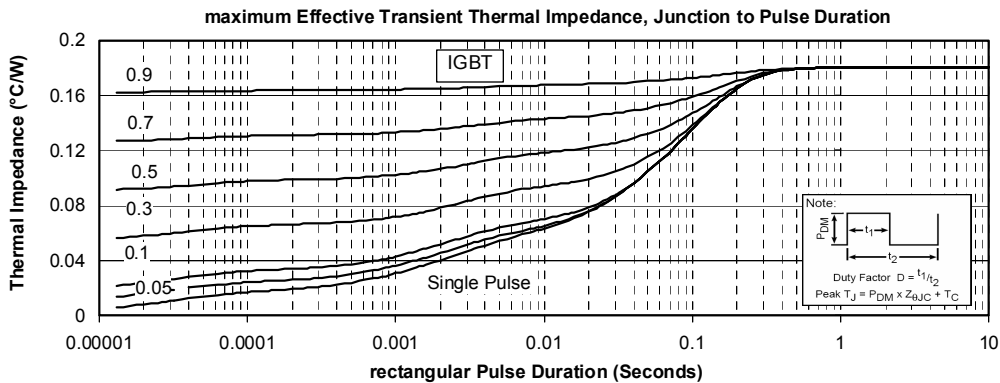
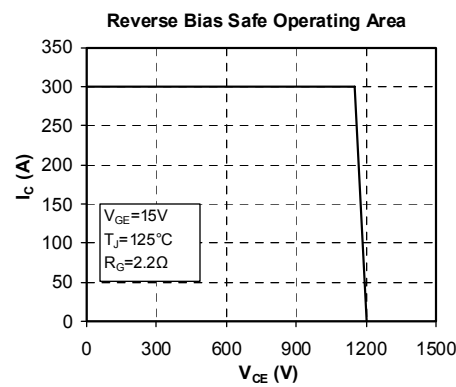
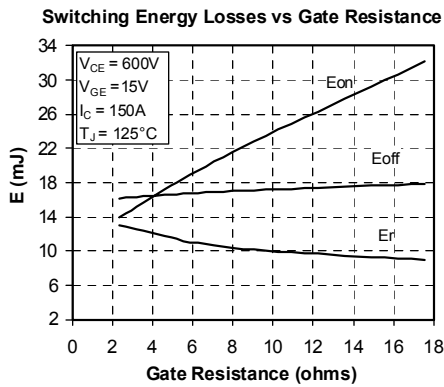
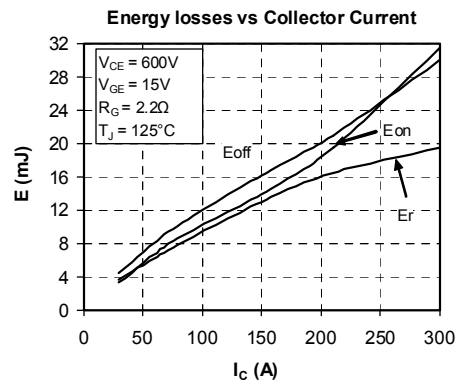
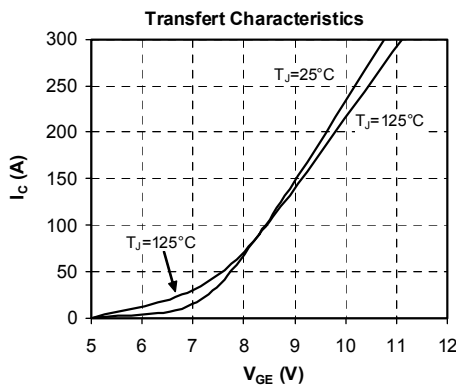
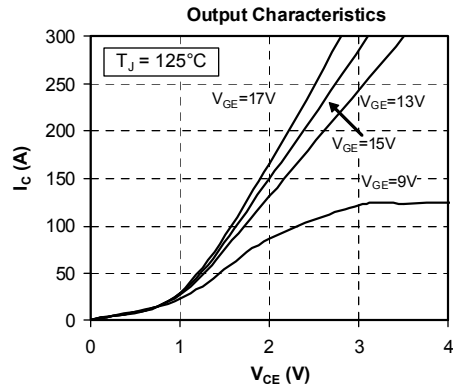
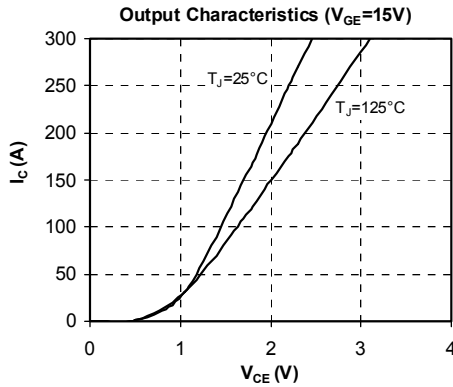
Thermal and package characteristics

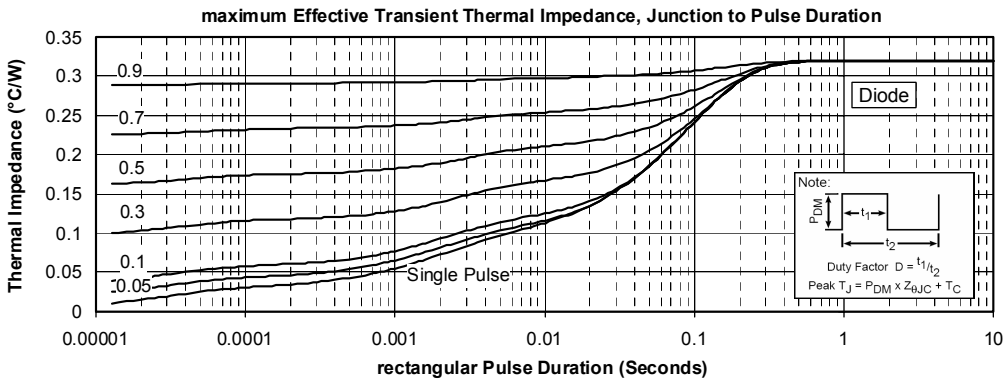
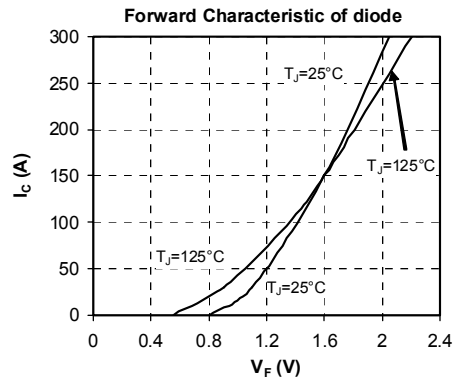
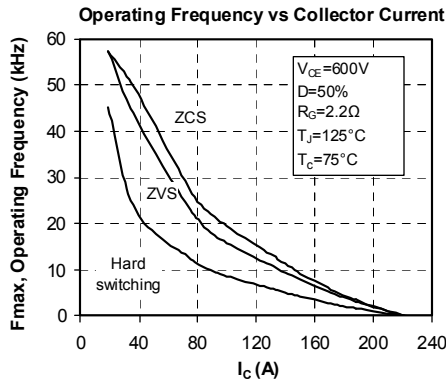
Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case	IGBT		0.18	°C/W	
		Diode		0.32		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, I _{isol} <1mA, 50/60Hz	2500			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature Range	-40		125		
T _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.