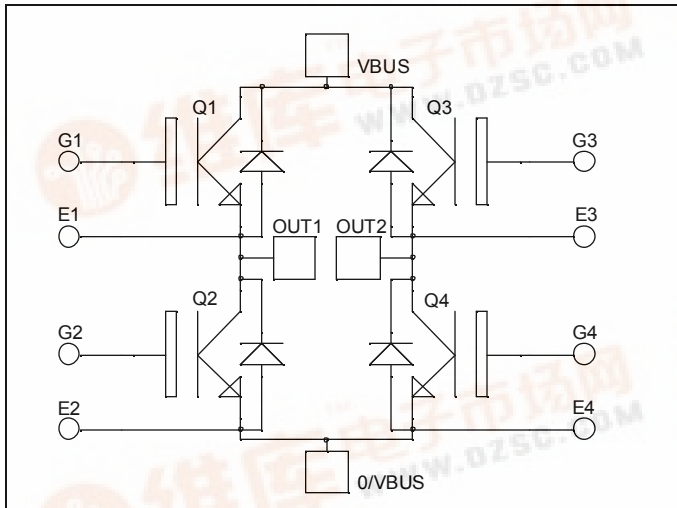




APTGT200H120G

Full - Bridge Fast Trench + Field Stop IGBT® Power Module

$V_{CES} = 1200V$
 $I_C = 200A @ T_c = 80^\circ C$



Application

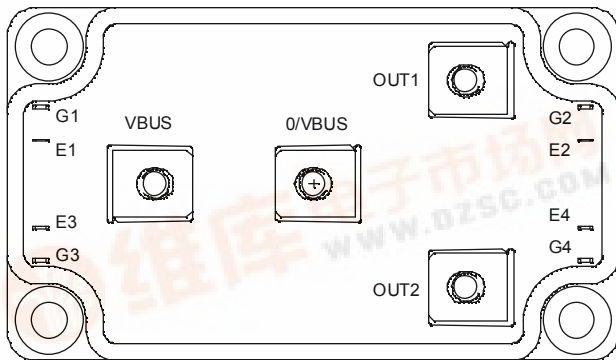
- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

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 V_F
 - 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 V_{CEsat}
- Low profile
- RoHS Compliant



Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Breakdown Voltage	1200	V
I_C	Continuous Collector Current	$T_C = 25^\circ C$ 280 $T_C = 80^\circ C$ 200	A
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ C$ 400	
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ C$ 890	W
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^\circ C$ 400A @ 1100V	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on www.microsemi.com

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} = 0V, V _{CE} = 1200V				350	μA
V _{CE(sat)}	Collector Emitter Saturation Voltage	V _{GE} = 15V I _C = 200A	T _j = 25°C	1.4	1.7	2.1	V
			T _j = 125°C		2.0		
V _{GE(th)}	Gate Threshold Voltage	V _{GE} = V _{CE} , I _C = 3 mA		5.0	5.8	6.5	V
I _{GES}	Gate – Emitter Leakage Current	V _{GE} = 20V, V _{CE} = 0V				500	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0V$		14		nF
C_{oes}	Output Capacitance	$V_{CE} = 25V$		0.8		
C_{res}	Reverse Transfer Capacitance	$f = 1\text{ MHz}$		0.6		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 200A$ $R_G = 2.7\Omega$		260		ns
T_r	Rise Time			30		
$T_{d(off)}$	Turn-off Delay Time			420		
T_f	Fall Time			70		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 200A$ $R_G = 2.7\Omega$		290		ns
T_r	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			520		
T_f	Fall Time			90		
E_{on}	Turn on Energy	$V_{GE} = \pm 15V$ $V_{Bus} = 600V$ $I_C = 200A$ $R_G = 2.7\Omega$	$T_j = 125^\circ\text{C}$	20		mJ
E_{off}	Turn off Energy		$T_j = 125^\circ\text{C}$	20		

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 =1200V	T _j = 25°C			350	μA	
			T _j = 125°C			600		
I _F	DC Forward Current		T _c = 80°C		200		A	
V _F	Diode Forward Voltage	I _F = 200A V _{GE} = 0V	T _j = 25°C		1.6	2.1	V	
			T _j = 125°C		1.6			
t _{rr}	Reverse Recovery Time	I _F = 200A V _R = 600V di/dt =2500A/μs	T _j = 25°C		170		ns	
			T _j = 125°C		280			
Q _{rr}	Reverse Recovery Charge		T _j = 25°C		18		μC	
			T _j = 125°C		36			
E _r	Reverse Recovery Energy		T _j = 25°C		10		mJ	
			T _j = 125°C		18			

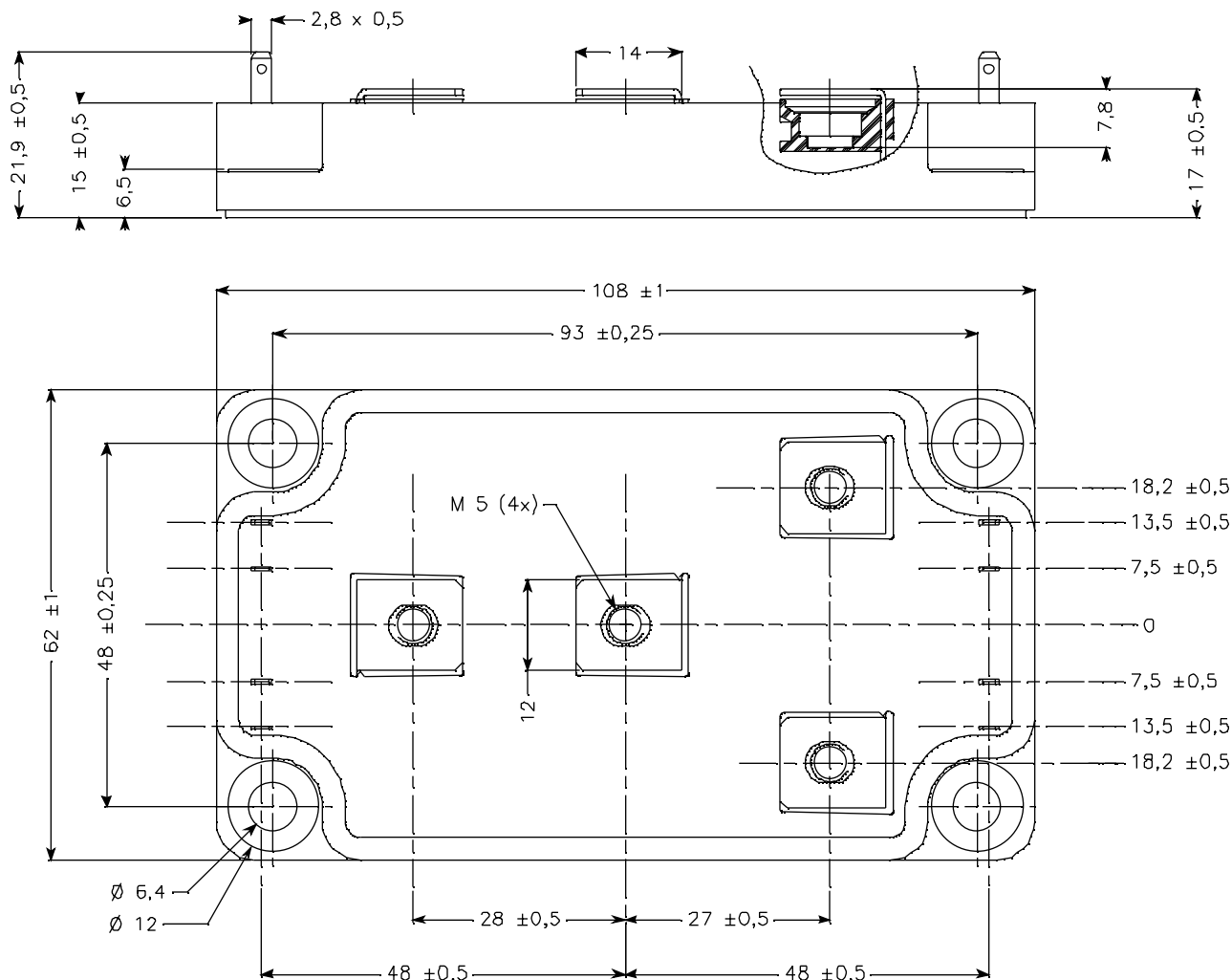
Thermal and package characteristics

Symbol Characteristic

Min Typ Max Unit

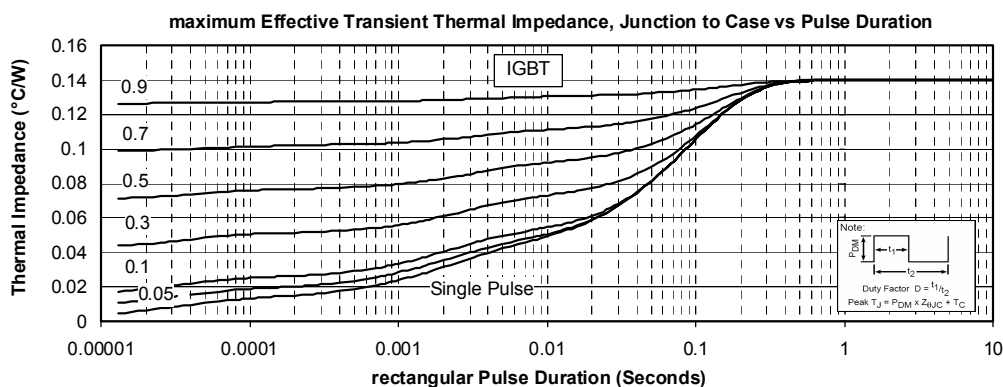
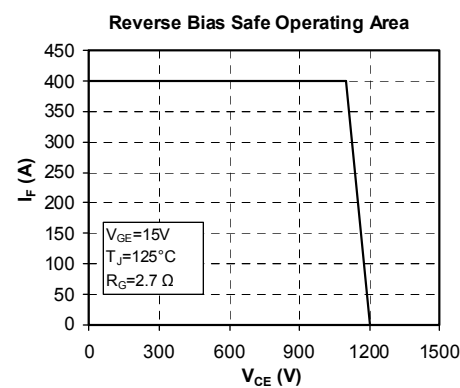
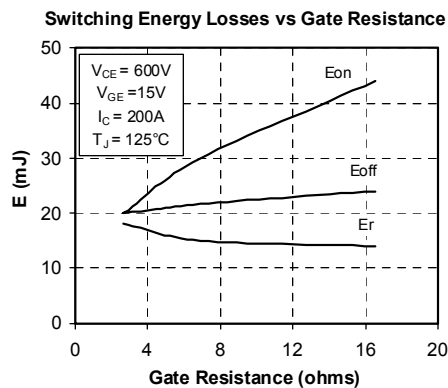
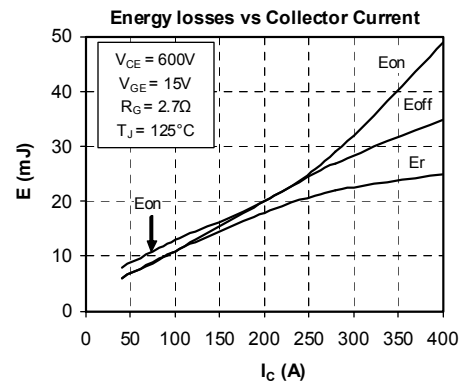
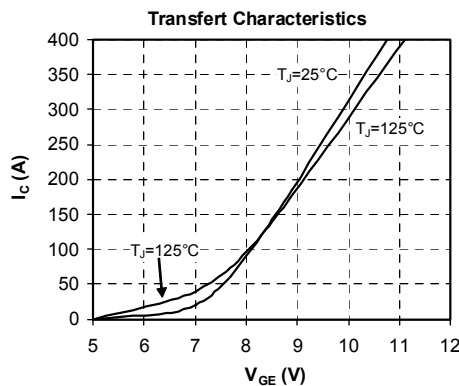
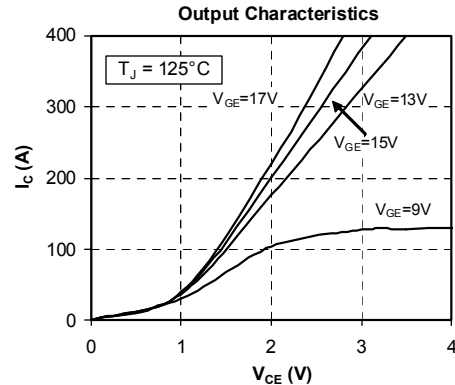
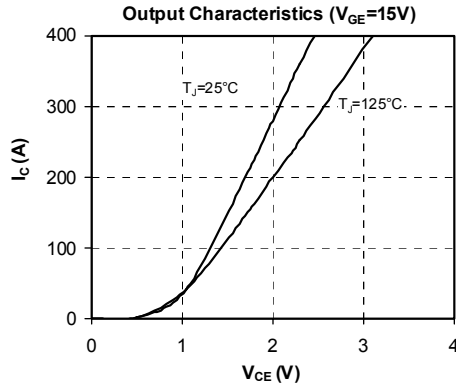
R_{thJC}	Junction to Case Thermal Resistance	IGBT			0.14	°C/W
		Diode			0.25	
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1$ min, $I_{isol} < 1$ mA, 50/60Hz		2500			V
T_J	Operating junction temperature range		-40		150	°C
T_{STG}	Storage Temperature Range		-40		125	
T_C	Operating Case Temperature		-40		100	
Torque	Mounting torque	To heatsink	M6	3	5	N.m
		For terminals	M5	2	3.5	
Wt	Package Weight				280	g

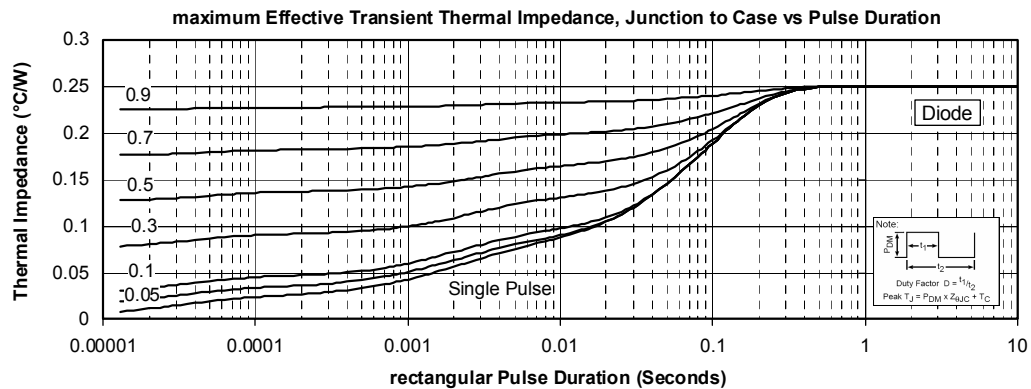
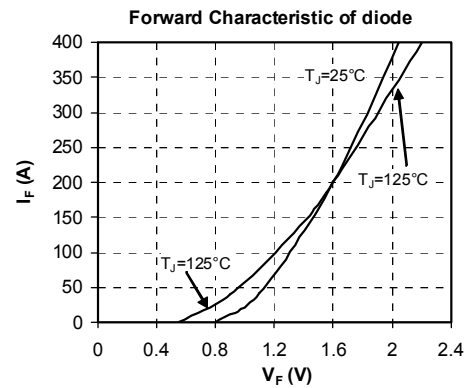
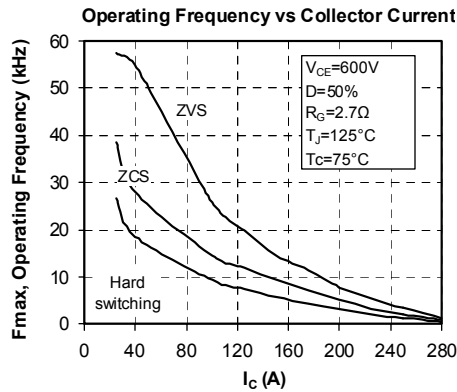
SP6 Package outline (dimensions in mm)



See application note APT0601 - Mounting Instructions for SP6 Power Modules on www.microsemi.com

Typical Performance Curve





Microsemi reserves the right to change, without notice, the specifications and information contained herein

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