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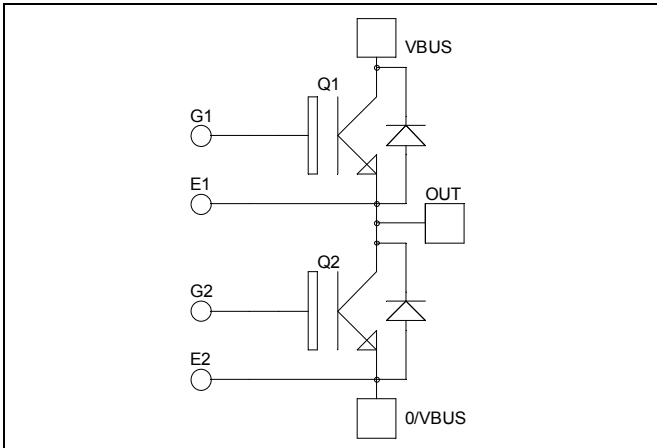
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



*Phase leg
Trench + Field Stop IGBT3
Power Module*

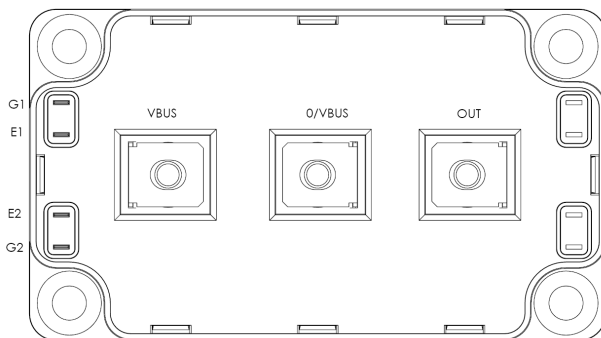
**$V_{CES} = 1700V$
 $I_C = 225A @ T_c = 80^\circ C$**


Application

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

Features

- Trench + Field Stop IGBT3 Technology
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 20 kHz
 - Soft recovery parallel diodes
 - Low diode VF
 - Low leakage current
 - 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
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter		Max ratings	Unit
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. 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	$V_{GE} = 0\text{V}, V_{CE} = 1700\text{V}$			500	μA
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15\text{V}$ $I_C = 225\text{A}$		2.0	2.4	V
		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		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	$V_{GE} = 15\text{V}$ $V_{Bus} = 900\text{V}$		72		mJ
E_{off}	Turn-off Switching Energy	$I_C = 225\text{A}$ $R_G = 3.3\Omega$		70.5		

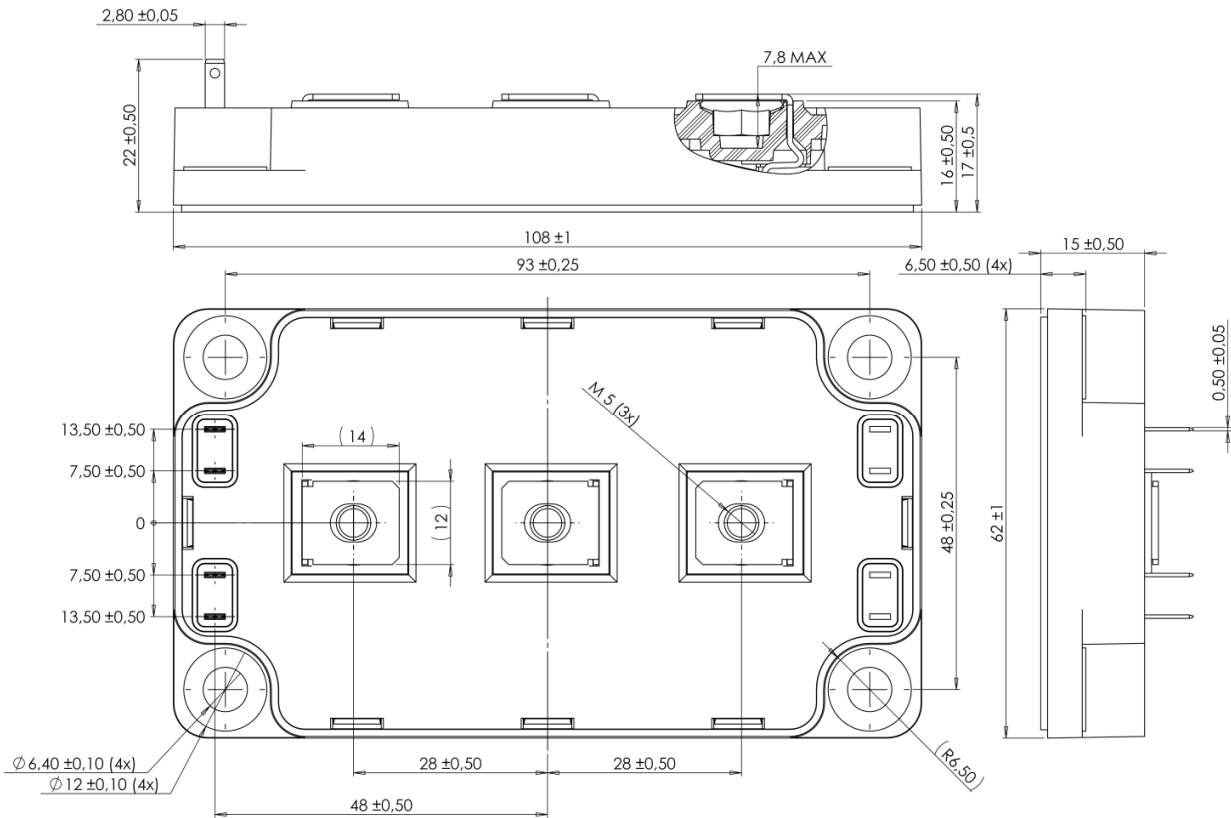
Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		1700			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1700\text{V}$			500	μA
		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$			750	
I_F	DC Forward Current			225		A
V_F	Diode Forward Voltage	$I_F = 225\text{A}$		1.8	2.2	V
		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		1.9		
t_{rr}	Reverse Recovery Time			385		ns
		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		490		
Q_{rr}	Reverse Recovery Charge	$I_F = 225\text{A}$ $V_R = 900\text{V}$ $di/dt = 2400\text{A}/\mu\text{s}$		57		μC
		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		93		
E_r	Reverse Recovery Energy			26		mJ
		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$		52		

Thermal and package characteristics

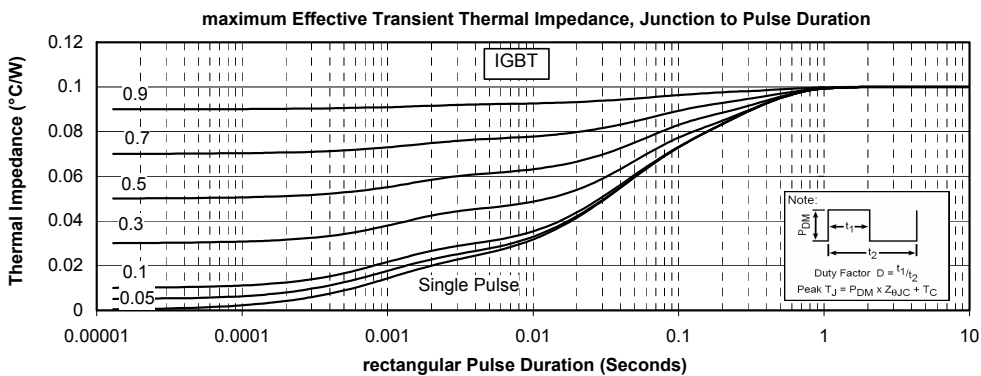
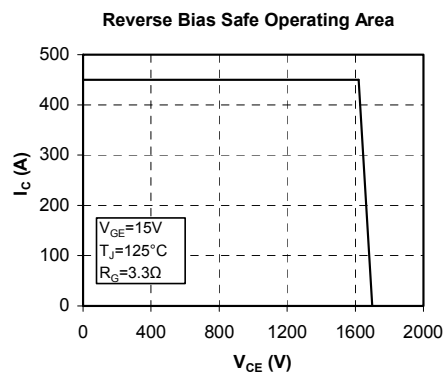
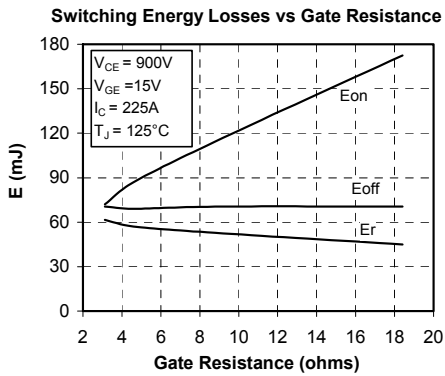
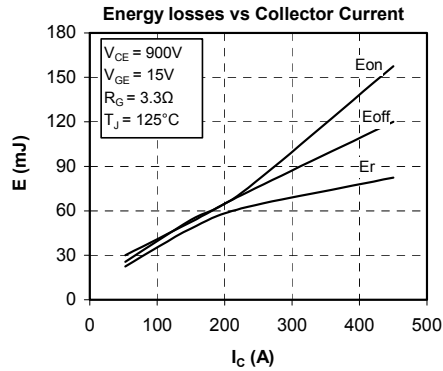
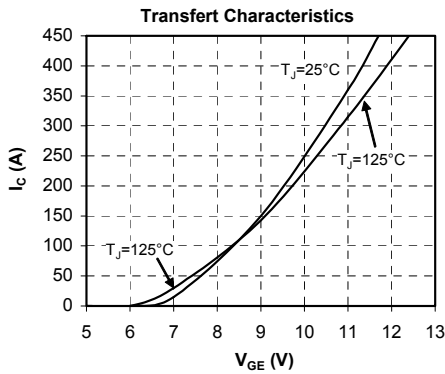
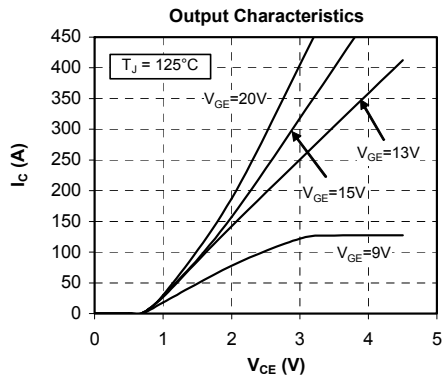
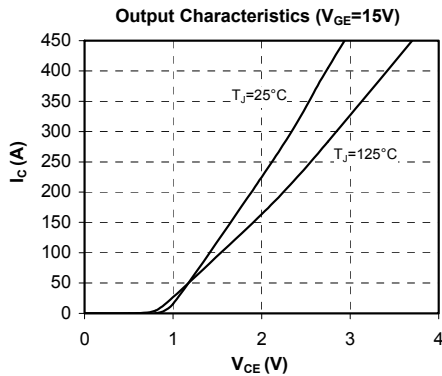
Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case Thermal Resistance	IGBT		0.1	°C/W	
		Diode		0.18		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature Range	-40		125		
T _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			300	g	

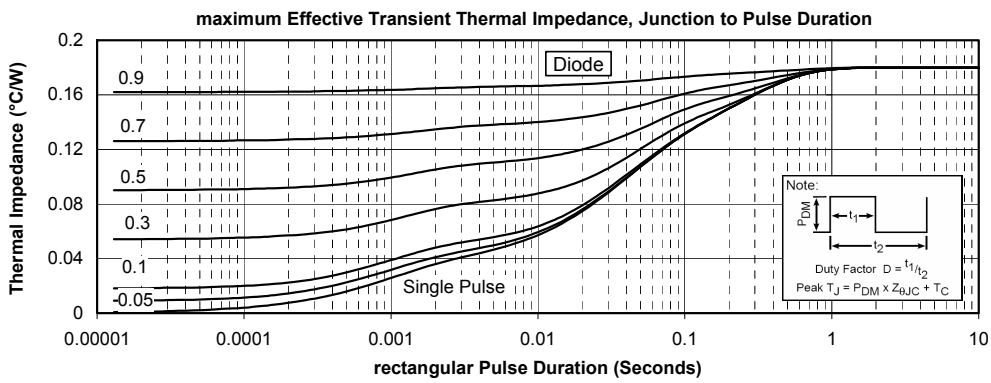
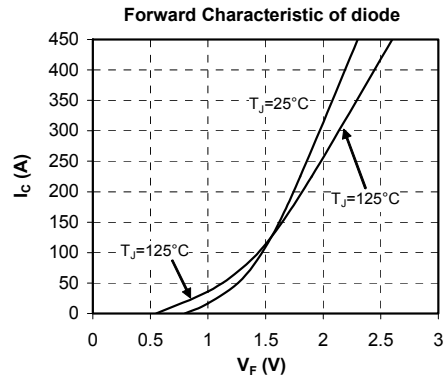
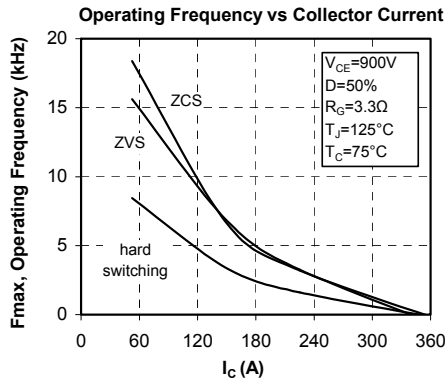
SP6 Package outline (dimensions in mm)



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

Typical Performance Curve





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