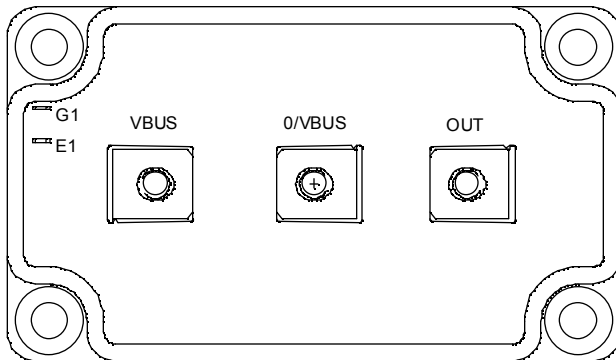
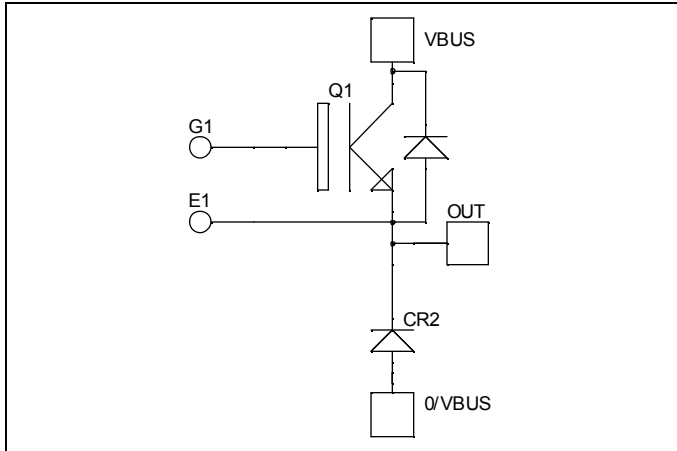


**Buck chopper
Trench + Field Stop IGBT®
Power Module**

www.datasheet4u.com

$$V_{CES} = 1700V$$

$$I_C = 300A @ T_c = 80^{\circ}C$$



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
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter		Max ratings	Unit
V_{CES}	Collector - Emitter Breakdown Voltage		1700	V
I_C	Continuous Collector Current	$T_c = 25^{\circ}C$	400	A
		$T_c = 80^{\circ}C$	300	
I_{CM}	Pulsed Collector Current	$T_c = 25^{\circ}C$	600	
V_{GE}	Gate - Emitter Voltage		± 20	V
P_D	Maximum Power Dissipation	$T_c = 25^{\circ}C$	1660	W
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125^{\circ}C$	600A @ 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	$V_{GE} = 0\text{V}, V_{CE} = 1700\text{V}$			750	μA
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	$V_{GE} = 15\text{V}$ $I_C = 300\text{A}$	$T_j = 25^\circ\text{C}$	2.0	2.4	V
			$T_j = 125^\circ\text{C}$	2.4		
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 5\text{mA}$	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	$V_{GE} = 0\text{V}$		26.5		nF
C_{oes}	Output Capacitance	$V_{CE} = 25\text{V}$		1.1		
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.88		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 300\text{A}$ $R_G = 2.2\Omega$		370		ns
T_r	Rise Time			40		
$T_{d(off)}$	Turn-off Delay Time			650		
T_f	Fall Time			180		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GE} = 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 300\text{A}$ $R_G = 2.2\Omega$		400		ns
T_r	Rise Time			50		
$T_{d(off)}$	Turn-off Delay Time			800		
T_f	Fall Time			300		
E_{on}	Turn-on Switching Energy	$V_{GE} = 15\text{V}$ $V_{Bus} = 900\text{V}$ $I_C = 300\text{A}$ $R_G = 2.2\Omega$	$T_j = 125^\circ\text{C}$	96		mJ
E_{off}	Turn-off Switching Energy		$T_j = 125^\circ\text{C}$	94		

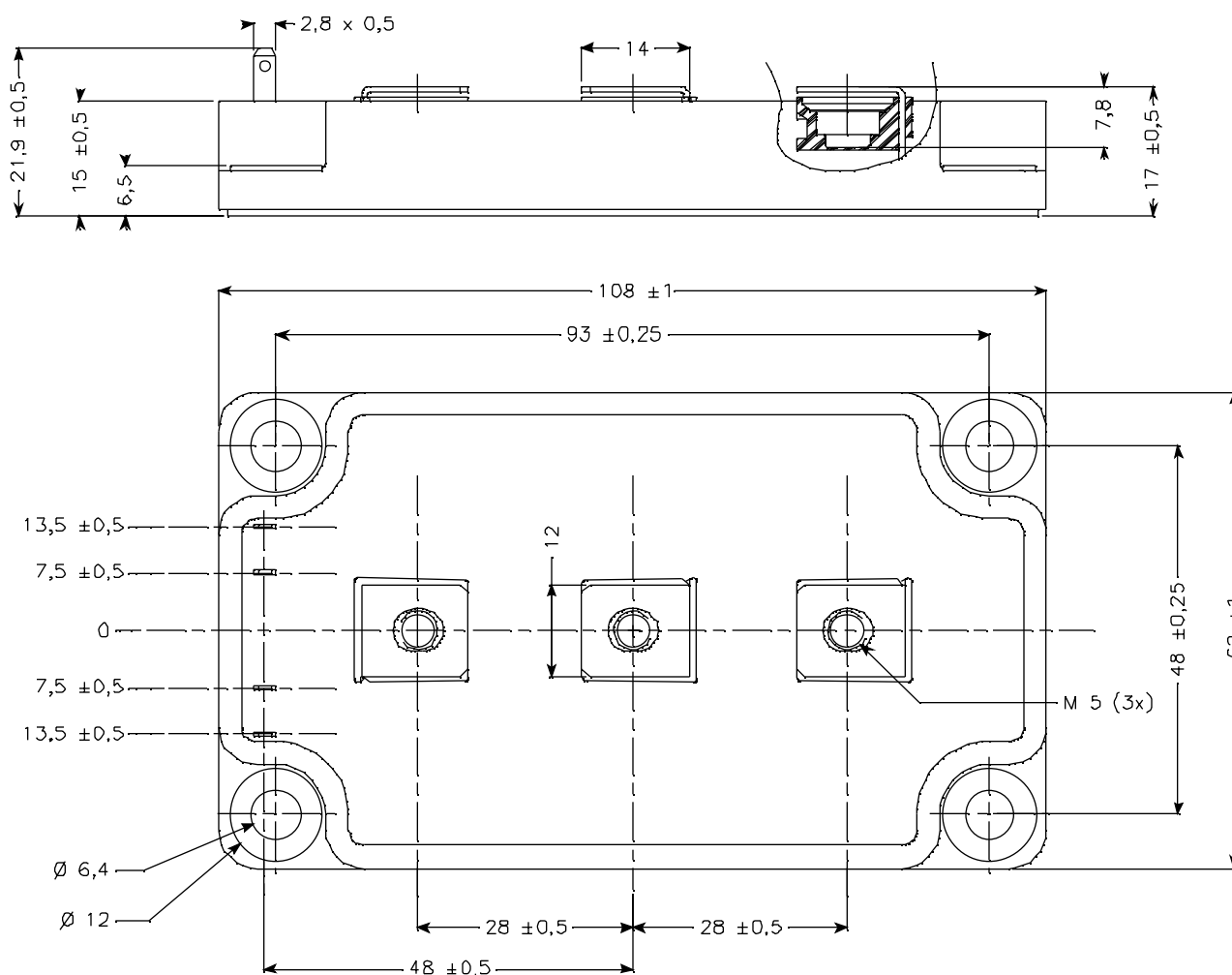
Chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		1700			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1700\text{V}$	$T_j = 25^\circ\text{C}$		750	μA
			$T_j = 125^\circ\text{C}$		1000	
I_F	DC Forward Current		$T_c = 80^\circ\text{C}$	300		A
V_F	Diode Forward Voltage	$I_F = 300\text{A}$	$T_j = 25^\circ\text{C}$	1.8	2.2	V
			$T_j = 125^\circ\text{C}$	1.9		
t_{rr}	Reverse Recovery Time	$I_F = 300\text{A}$ $V_R = 900\text{V}$ $di/dt = 3200\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	385		ns
			$T_j = 125^\circ\text{C}$	490		
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$	76		μC
			$T_j = 125^\circ\text{C}$	124		
E_r	Reverse Recovery Energy		$T_j = 25^\circ\text{C}$	35		mJ
			$T_j = 125^\circ\text{C}$	70		

Thermal and package characteristics

Symbol	Characteristic			Min	Typ	Max	Unit
R _{thJC}	Junction to Case Thermal Resistance		IGBT			0.075	°C/W
			Diode			0.14	
V _{ISO}	RMS Isolation Voltage, any terminal to case t =1 min, I _{iso} <1mA, 50/60Hz			3500			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

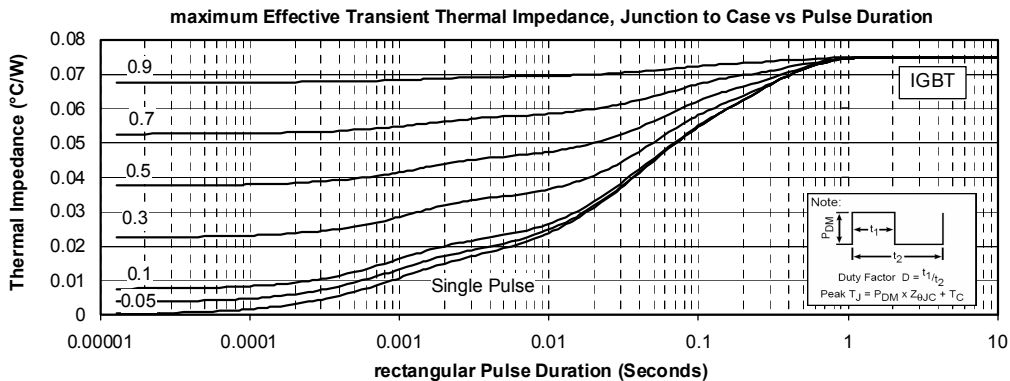
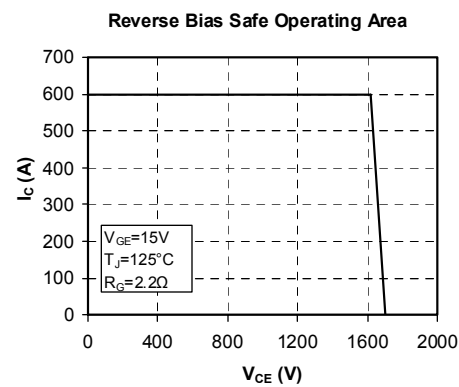
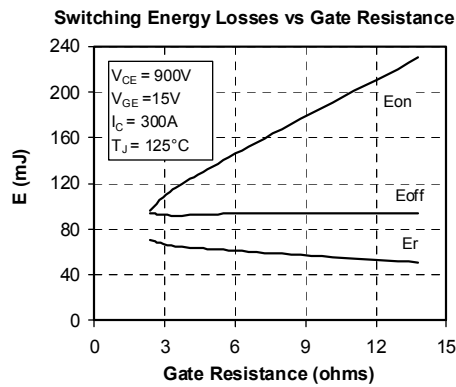
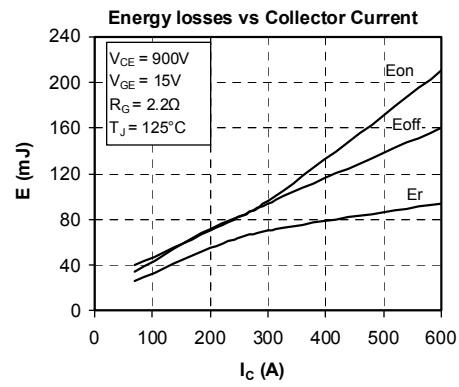
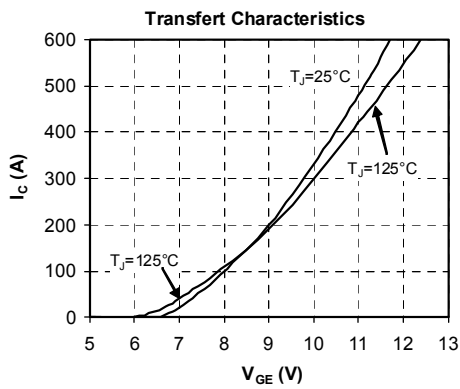
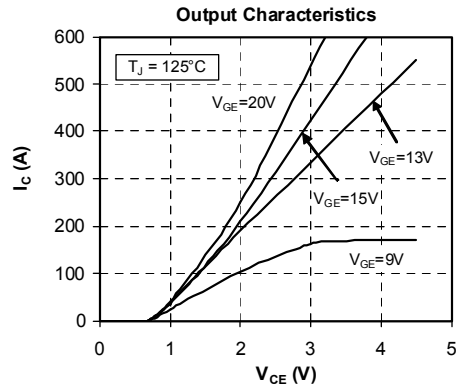
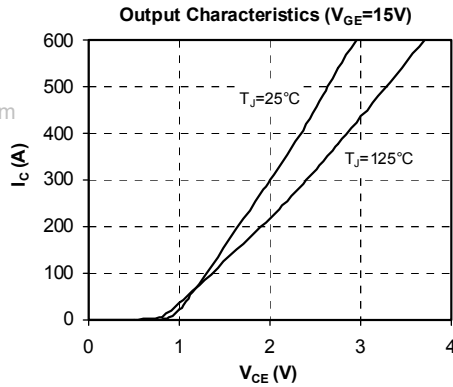
SP6 Package outline (dimensions in mm)

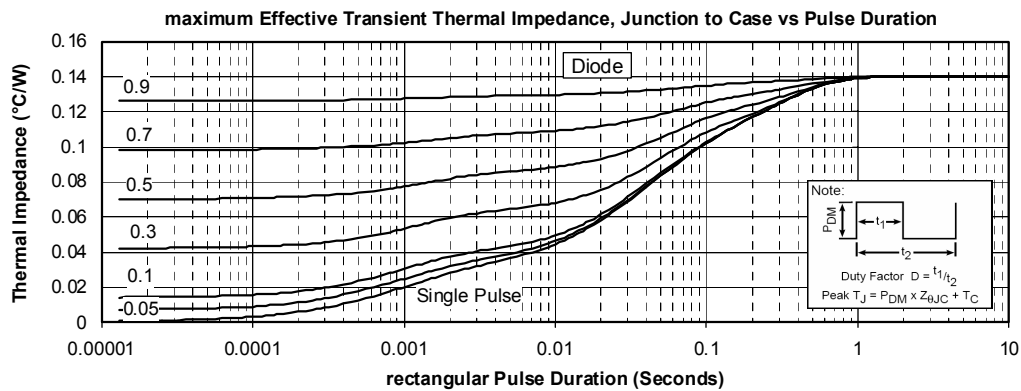
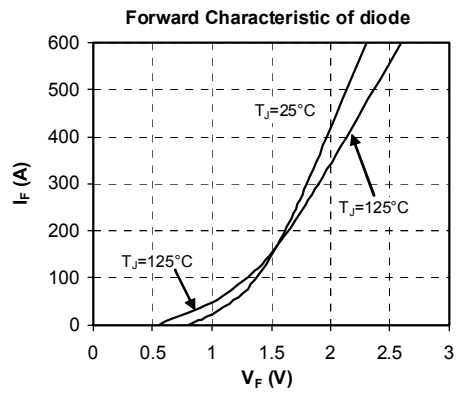
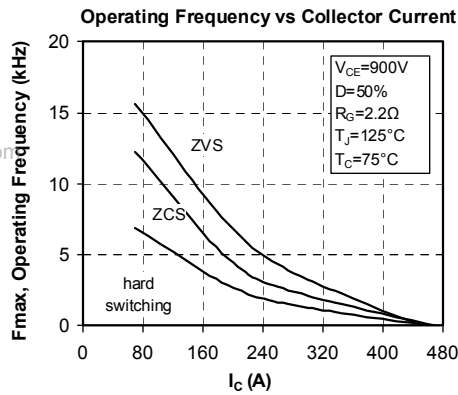


See application note APT0601 - Mounting Instructions for SP6 Power Modules on www.microsemi.com

Typical Performance Curve

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