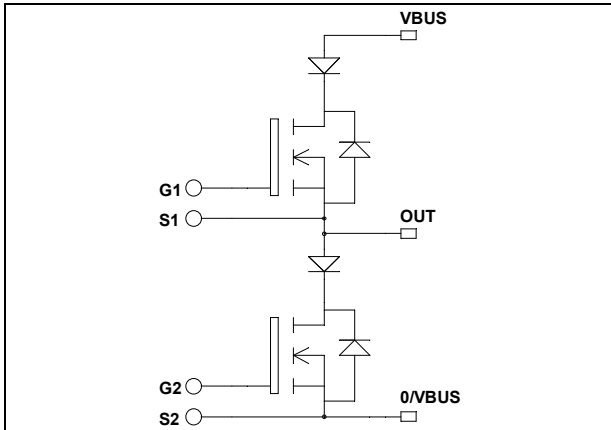


*Phase leg
with Series diodes
MOSFET Power Module*

$V_{DSS} = 1200V$
 $R_{DSon} = 200m\Omega$ typ @ $T_j = 25^\circ C$
 $I_D = 50A$ @ $T_c = 25^\circ C$



Application

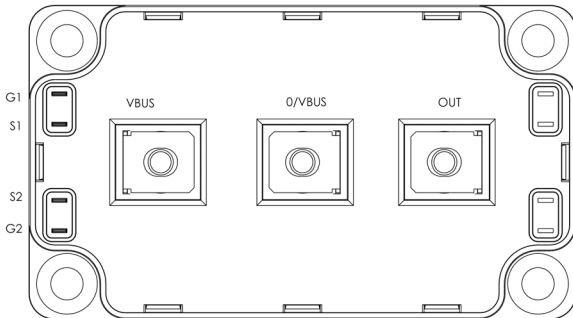
- Zero Current Switching resonant mode

Features

- Power MOS 7[®] MOSFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Fast intrinsic reverse diode
 - Avalanche energy rated
 - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
 - Symmetrical design
 - M5 power connectors
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Low profile
- RoHS Compliant



Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	1200	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	50
		$T_c = 80^\circ C$	37
I_{DM}	Pulsed Drain current	200	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	240	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	1250
I_{AR}	Avalanche current (repetitive and non repetitive)	12	A
E_{AR}	Repetitive Avalanche Energy	30	mJ
E_{AS}	Single Pulse Avalanche Energy	1300	

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 _{DSS}	Zero Gate Voltage Drain Current	V _{GS} = 0V, V _{DS} = 1200V	T _j = 25°C			1.5	mA
		V _{GS} = 0V, V _{DS} = 1000V	T _j = 125°C			6	
R _{DS(on)}	Drain – Source on Resistance	V _{GS} = 10V, I _D = 25A		200	240	mΩ	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 6mA	3		5	V	
I _{GSS}	Gate – Source Leakage Current	V _{GS} = ±30 V, V _{DS} = 0V			±450	nA	

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1MHz		15.2		nF
C _{oss}	Output Capacitance			2.2		
C _{rss}	Reverse Transfer Capacitance			0.42		
Q _g	Total gate Charge	V _{GS} = 10V V _{Bus} = 600V I _D = 50A		600		nC
Q _{gs}	Gate – Source Charge			84		
Q _{gd}	Gate – Drain Charge			390		
T _{d(on)}	Turn-on Delay Time	Inductive switching @ 125°C V _{GS} = 15V V _{Bus} = 800V I _D = 50A R _G = 0.8Ω		10		ns
T _r	Rise Time			10		
T _{d(off)}	Turn-off Delay Time			68		
T _f	Fall Time			36		
E _{on}	Turn-on Switching Energy	Inductive switching @ 25°C V _{GS} = 15V, V _{Bus} = 800V I _D = 50A, R _G = 0.8Ω		2.79		mJ
E _{off}	Turn-off Switching Energy			0.6		
E _{on}	Turn-on Switching Energy	Inductive switching @ 125°C V _{GS} = 15V, V _{Bus} = 800V I _D = 50A, R _G = 0.8Ω		5.6		mJ
E _{off}	Turn-off Switching Energy			0.81		

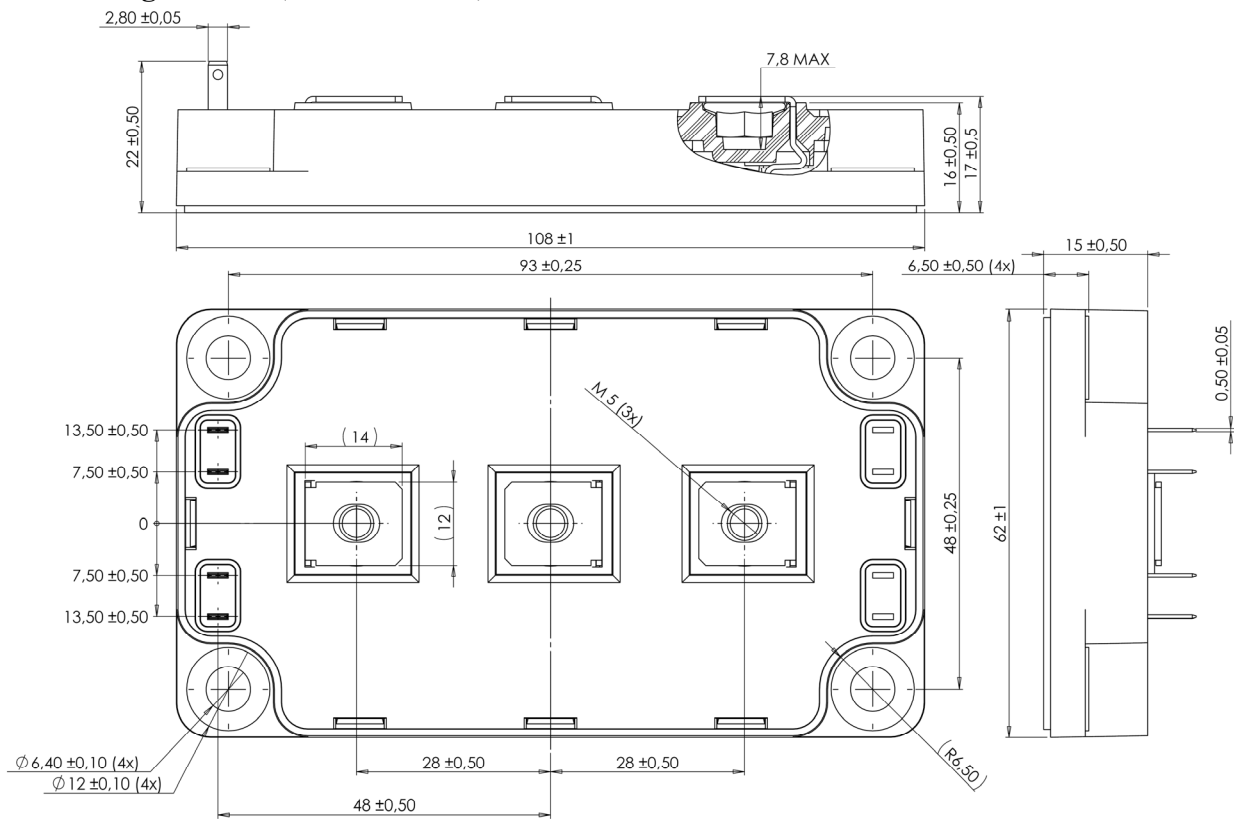
Series diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V _{RRM}	Maximum Repetitive Reverse Voltage		1200			V
I _{RM}	Maximum Reverse Leakage Current	V _R = 1200V	T _j = 25°C		250	μA
			T _j = 125°C		600	
I _F	DC Forward Current			120		A
V _F	Diode Forward Voltage	I _F = 120A		2	2.5	V
		I _F = 240A		2.3		
		I _F = 120A	T _j = 125°C		1.8	
t _{rr}	Reverse Recovery Time	I _F = 120A V _R = 800V di/dt = 400A/μs	T _j = 25°C		400	ns
			T _j = 125°C		470	
Q _{rr}	Reverse Recovery Charge		T _j = 25°C		2.4	μC
			T _j = 125°C		8	

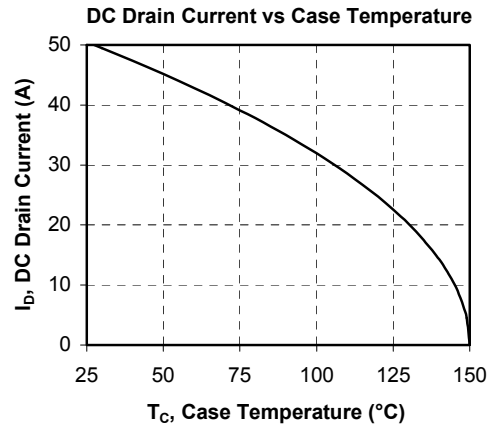
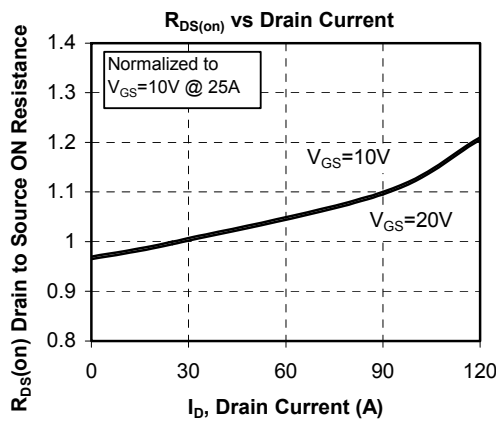
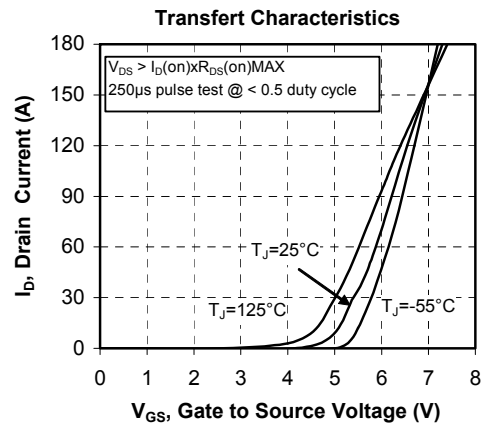
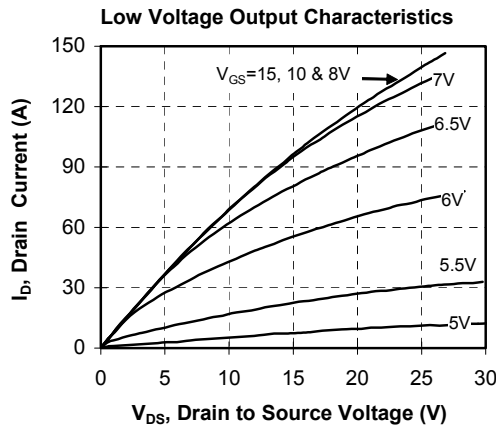
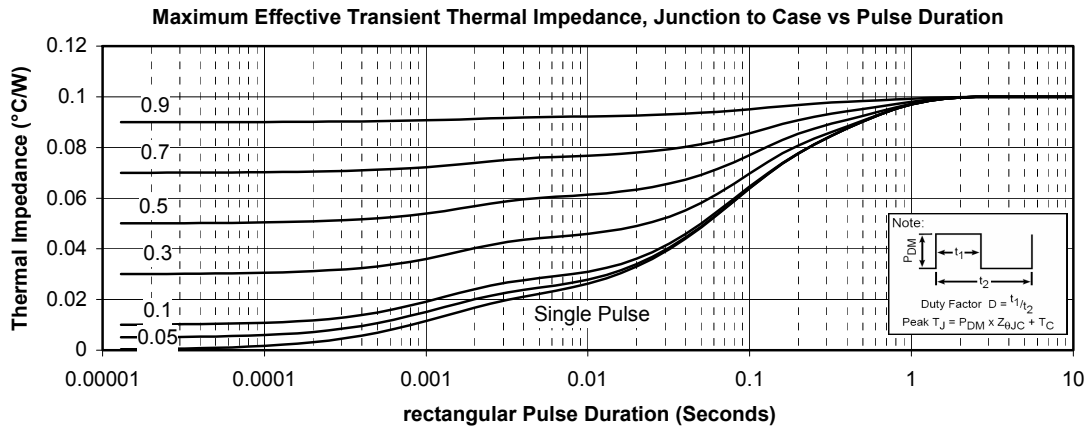
Thermal and package characteristics

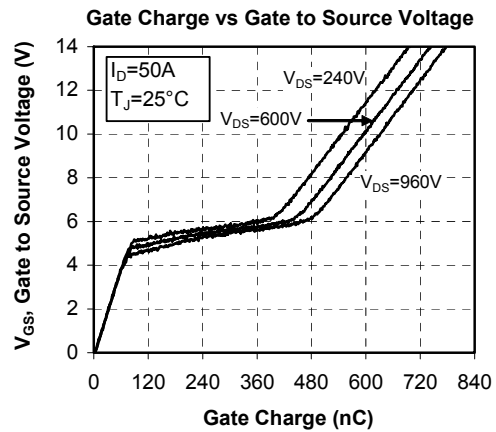
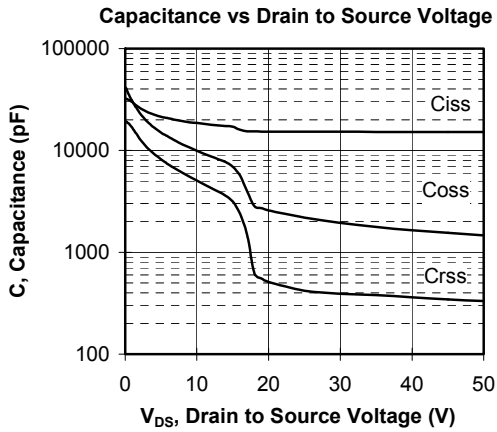
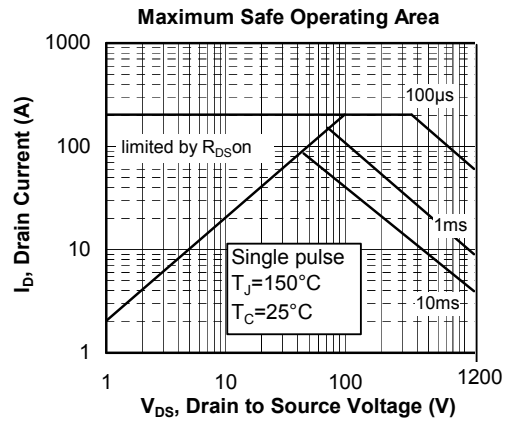
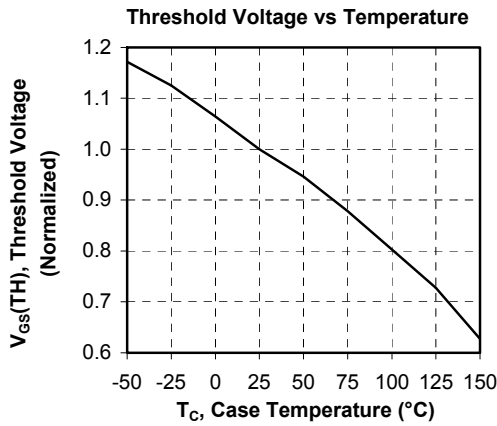
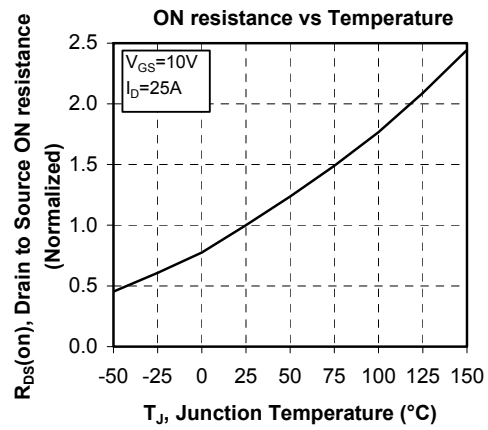
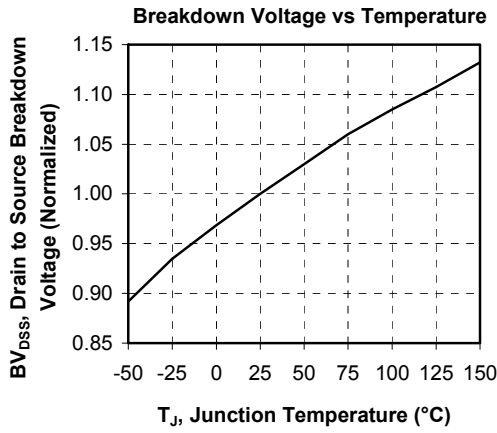
Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case Thermal Resistance	Transistor		0.1	°C/W	
		Series diode		0.46		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000			V	
T _J	Operating junction temperature range	-40		150	°C	
T _{STG}	Storage Temperature Range	-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	

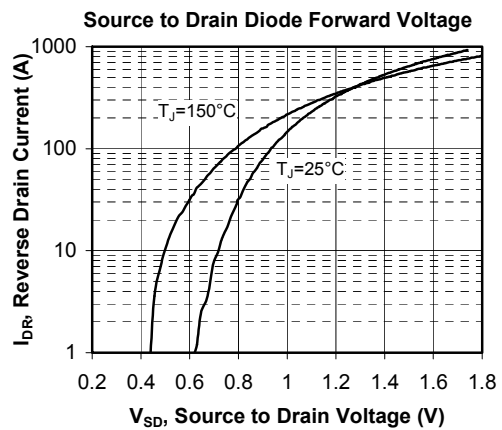
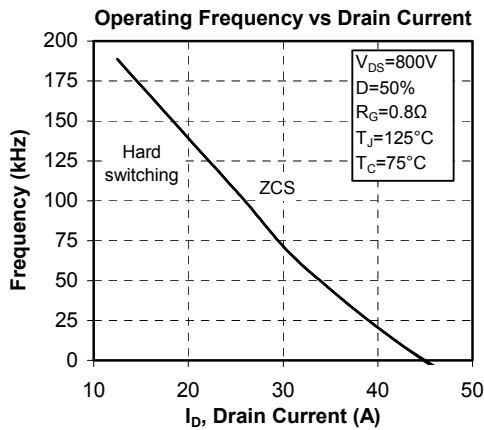
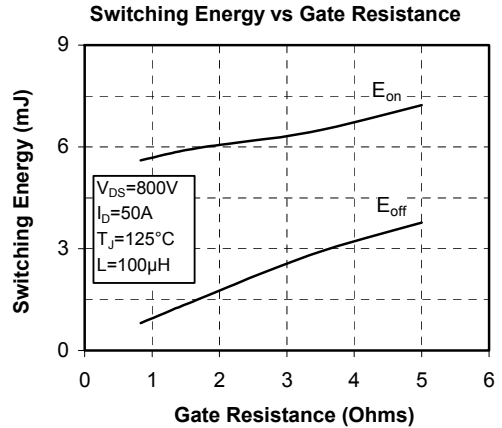
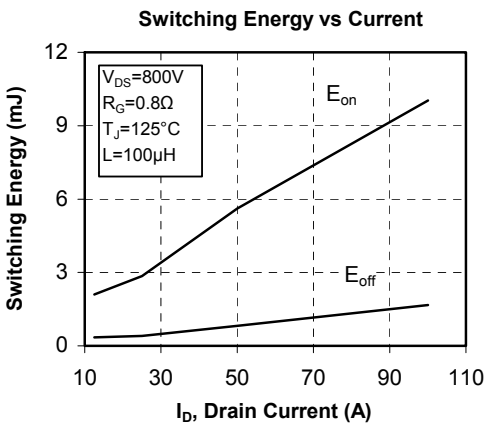
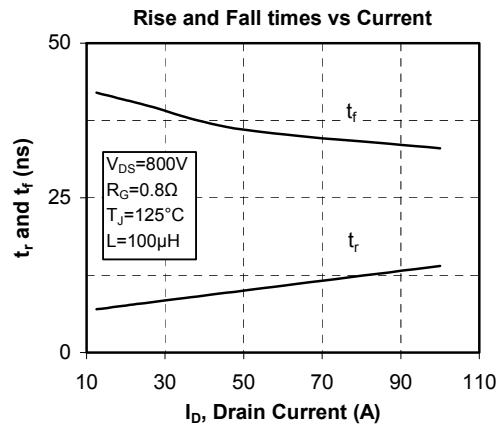
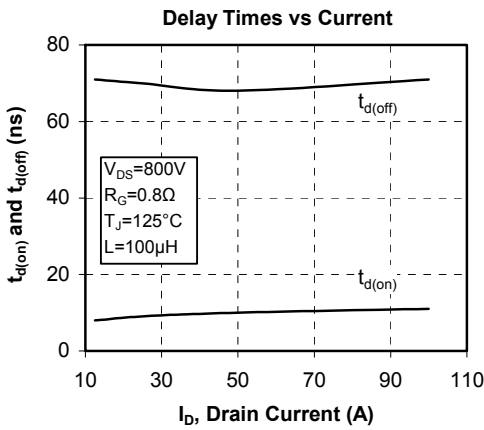
SP6 Package outline (dimensions in mm)



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

Typical Performance Curve






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