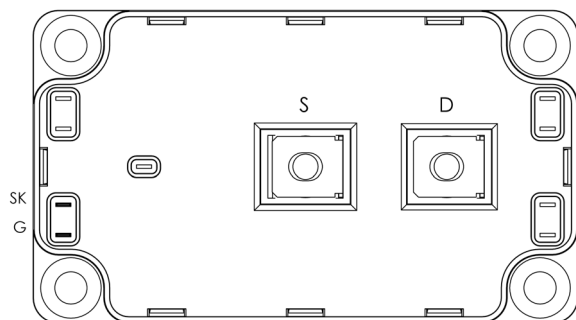
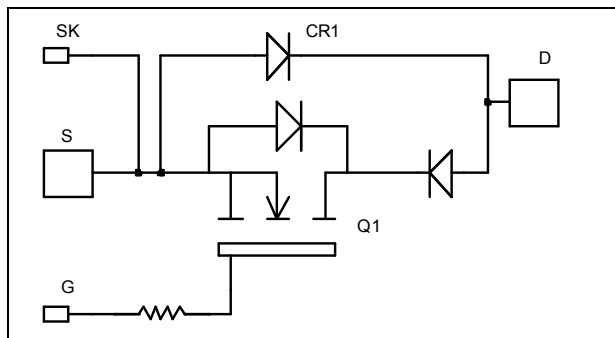


Single switch Series & parallel diodes MOSFET Power Module



$$V_{DSS} = 1200V$$

$$R_{DSon} = 100m\Omega \text{ typ @ } T_j = 25^\circ C$$

$$I_D = 116A \text{ @ } T_c = 25^\circ C$$

Application

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

Features

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

Benefits

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

All ratings @ $T_j = 25^\circ C$ unless otherwise specified

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	1200	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	A
		$T_c = 80^\circ C$	
I_{DM}	Pulsed Drain current	464	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	120	m Ω
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	W
I_{AR}	Avalanche current (repetitive and non repetitive)	24	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	3200	

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

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 1200V$			1	mA
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 58A$		100	120	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 20mA$	3		5	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			±400	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$		28.9		nF
C_{oss}	Output Capacitance	$V_{DS} = 25V$		4.4		
C_{rss}	Reverse Transfer Capacitance	$f = 1MHz$		0.8		
Q_g	Total gate Charge	$V_{GS} = 10V$		1100		nC
Q_{gs}	Gate – Source Charge	$V_{Bus} = 600V$		128		
Q_{gd}	Gate – Drain Charge	$I_D = 116A$		716		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15V$ $V_{Bus} = 800V$ $I_D = 116A$ $R_G = 1.2\Omega$		20		ns
T_r	Rise Time			17		
$T_{d(off)}$	Turn-off Delay Time			245		
T_f	Fall Time			62		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C $V_{GS} = 15V, V_{Bus} = 800V$ $I_D = 116A, R_G = 1.2\Omega$		5		mJ
E_{off}	Turn-off Switching Energy			4.6		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C $V_{GS} = 15V, V_{Bus} = 800V$ $I_D = 116A, R_G = 1.2\Omega$		9.2		mJ
E_{off}	Turn-off Switching Energy			5.6		
R_{thJC}	Junction to Case Thermal Resistance				0.038	°C/W

Series diode ratings and characteristics

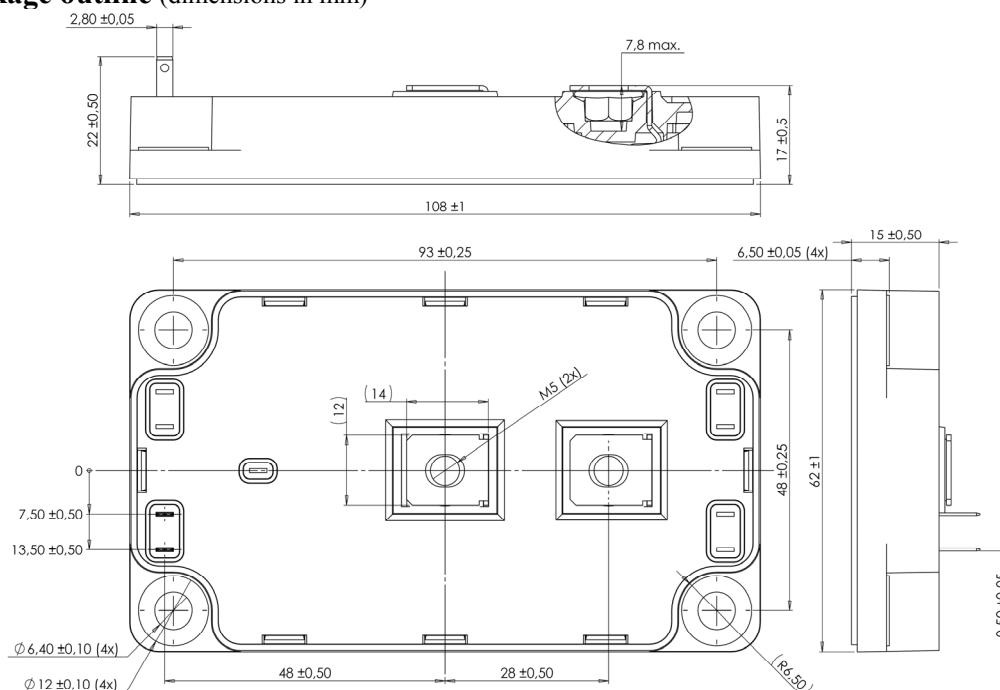
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		1000			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1000V$			750	μA
I_F	DC Forward Current	$T_c = 80°C$		240		A
V_F	Diode Forward Voltage	$I_F = 240A$		2	2.5	V
		$I_F = 480A$		2.2		
		$I_F = 240A, T_j = 125°C$		1.7		
t_{rr}	Reverse Recovery Time	$I_F = 240A$ $V_R = 667V$ $di/dt = 800A/\mu s$	$T_j = 25°C$	280		ns
			$T_j = 125°C$	350		
Q_{rr}	Reverse Recovery Charge	$T_j = 25°C$		3.04		μC
			$T_j = 125°C$	14.4		
R_{thJC}	Junction to Case Thermal Resistance				0.23	°C/W

Parallel 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				250	μA
I _F	DC Forward Current		T _c = 80°C		180		A
V _F	Diode Forward Voltage	I _F = 180A			2.5	3.5	V
		I _F = 360A			3		
		I _F = 180A	T _j = 125°C		1.8		
t _{rr}	Reverse Recovery Time	I _F = 180A V _R = 800V di/dt = 600A/μs	T _j = 25°C		265		ns
			T _j = 125°C		350		
Q _{rr}	Reverse Recovery Charge			T _j = 25°C		1.7	
			T _j = 125°C		8.6		
R _{thJC}	Junction to Case Thermal Resistance					0.32	°C/W

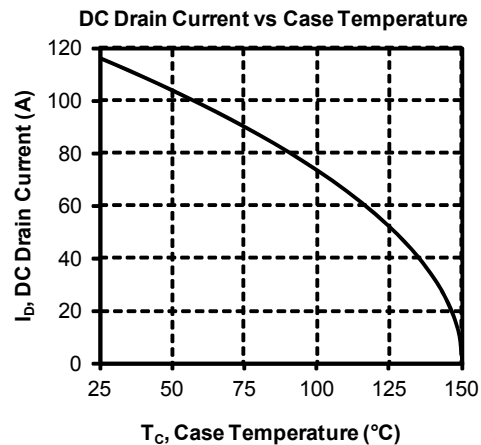
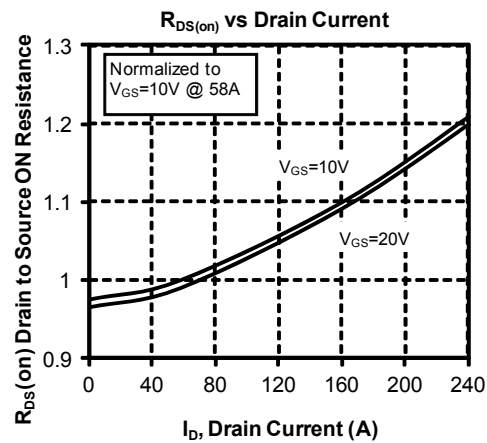
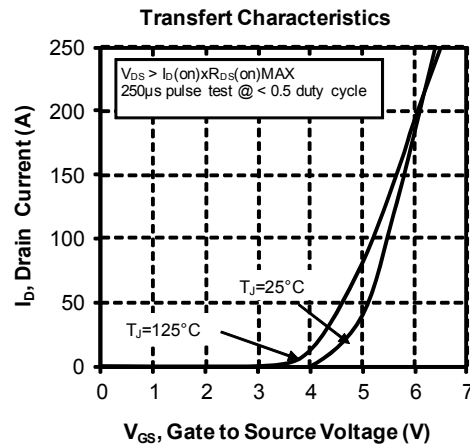
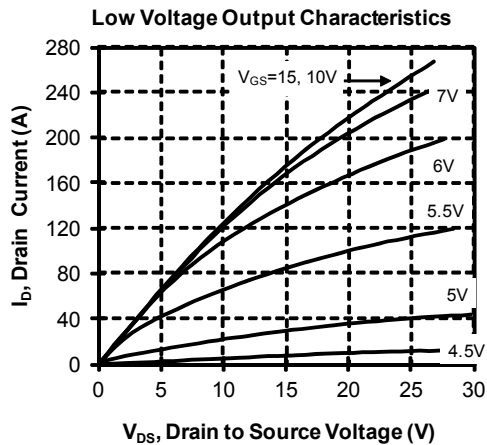
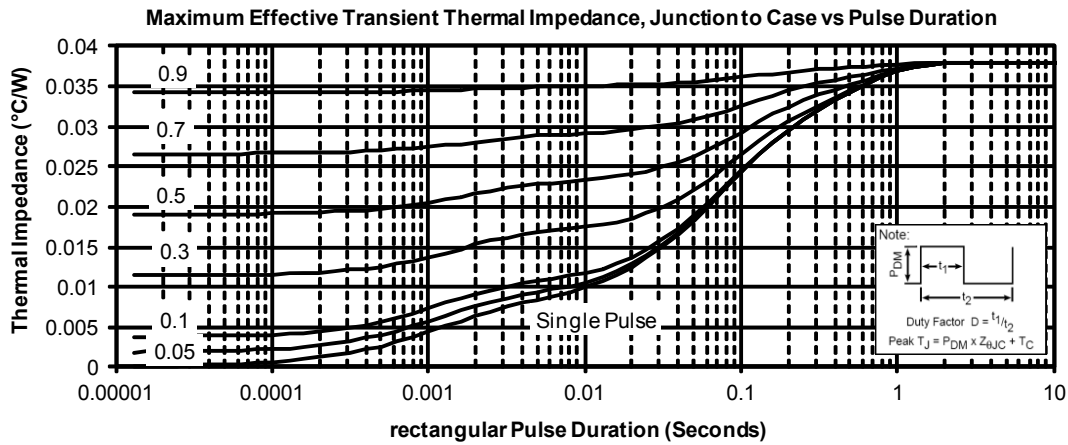
Thermal and package characteristics

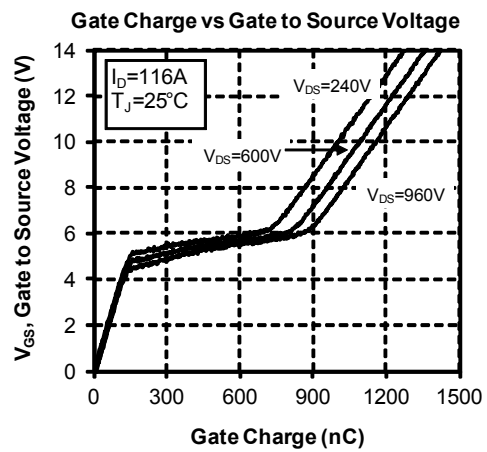
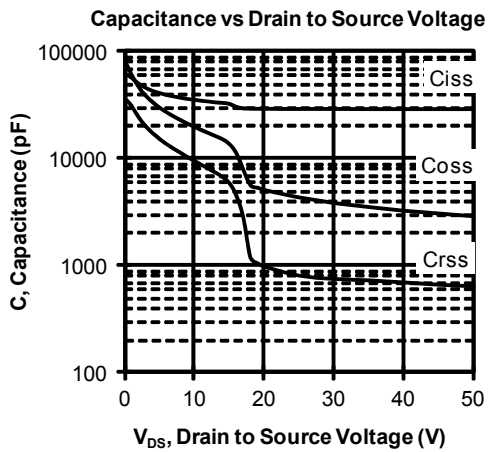
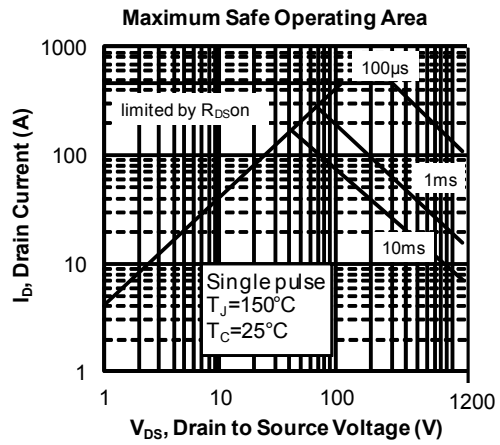
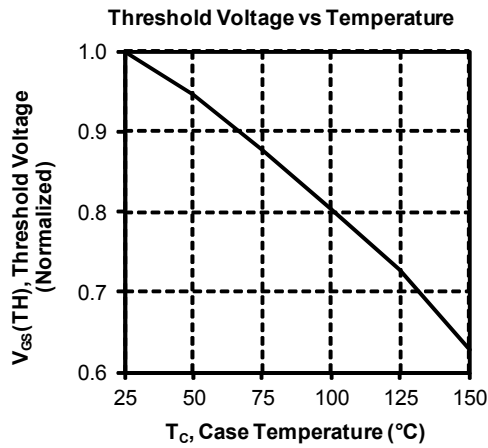
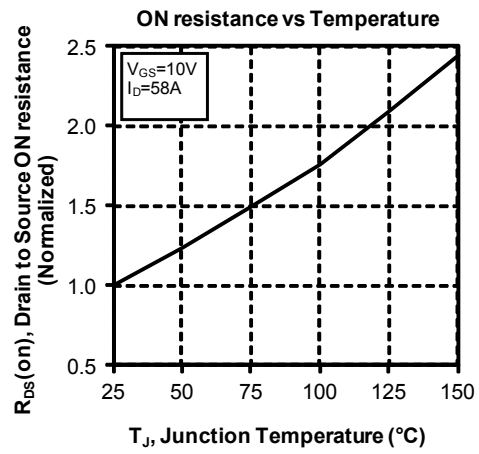
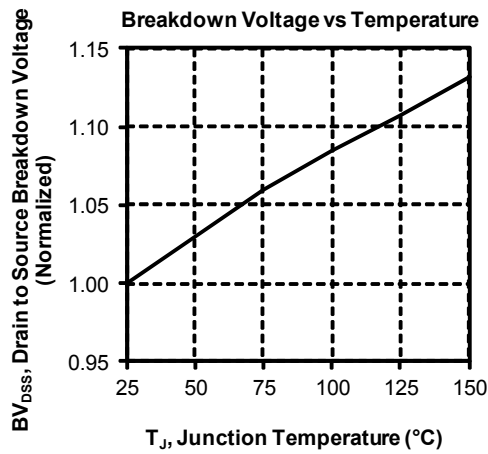
Symbol	Characteristic			Min	Max	Unit
V _{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, 50/60Hz			4000		V
T _J	Operating junction temperature range			-40	150	°C
T _{JOP}	Recommended junction temperature under switching conditions			-40	T _J max -25	
T _{STG}	Storage Temperature Range			-40	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

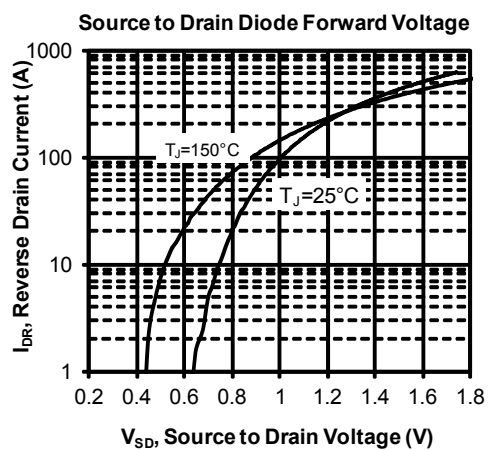
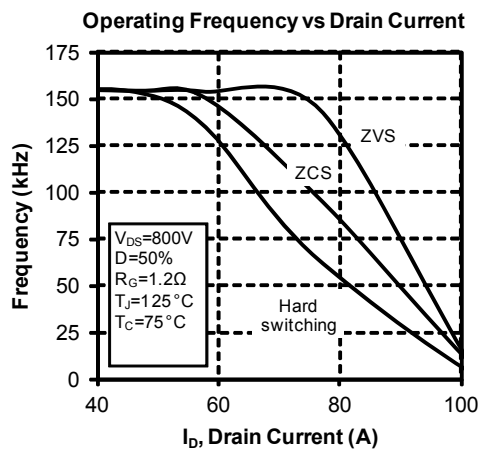
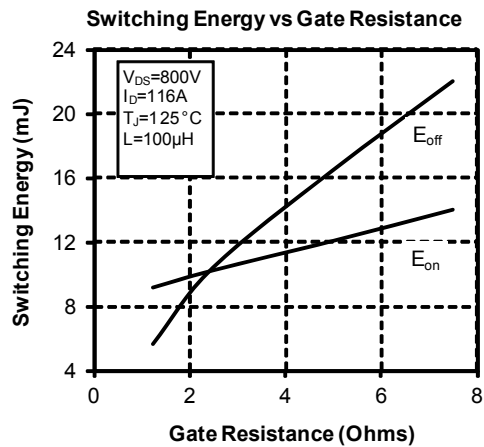
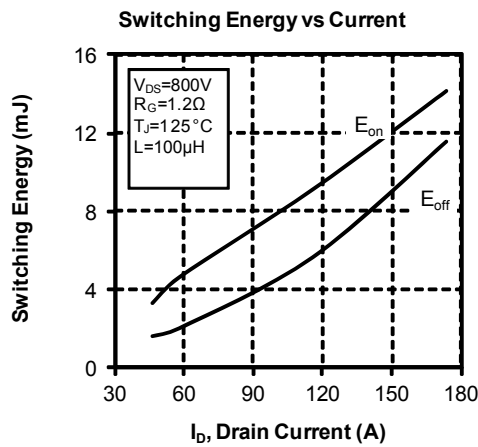
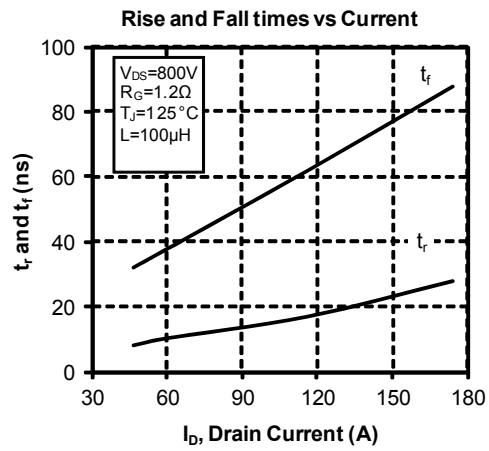
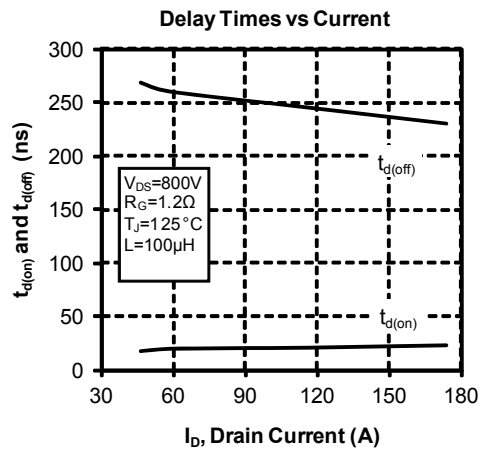
SP6 Package outline (dimensions in mm)


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

Typical Performance Curve







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