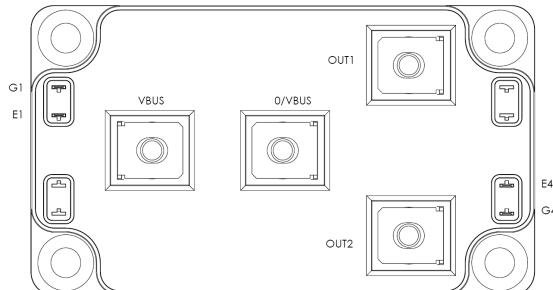
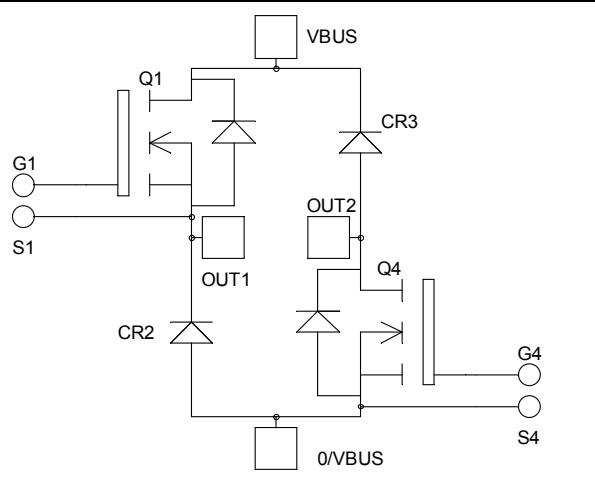


**Asymmetrical - bridge
MOSFET Power Module**

$V_{DSS} = 500V$
 $R_{DSon} = 38m\Omega$ typ @ $T_j = 25^\circ C$
 $I_D = 90A$ @ $T_c = 25^\circ C$


Application

- Welding converters
- Switched Mode Power Supplies
- Switched Reluctance Motor Drives

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

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	500	V
I_D	Continuous Drain Current	90	A
	$T_c = 25^\circ C$	67	
I_{DM}	Pulsed Drain current	360	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	45	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	694
I_{AR}	Avalanche current (repetitive and non repetitive)	46	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	2500	

 **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} = 500V	T _j = 25°C			200	µA
		V _{GS} = 0V, V _{DS} = 400V	T _j = 125°C			1000	
R _{DS(on)}	Drain – Source on Resistance	V _{GS} = 10V, I _D = 45A			38	45	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 5mA		3		5	V
I _{GSS}	Gate – Source Leakage Current	V _{GS} = ±30 V, V _{DS} = 0V				±150	nA

Dynamic Characteristics

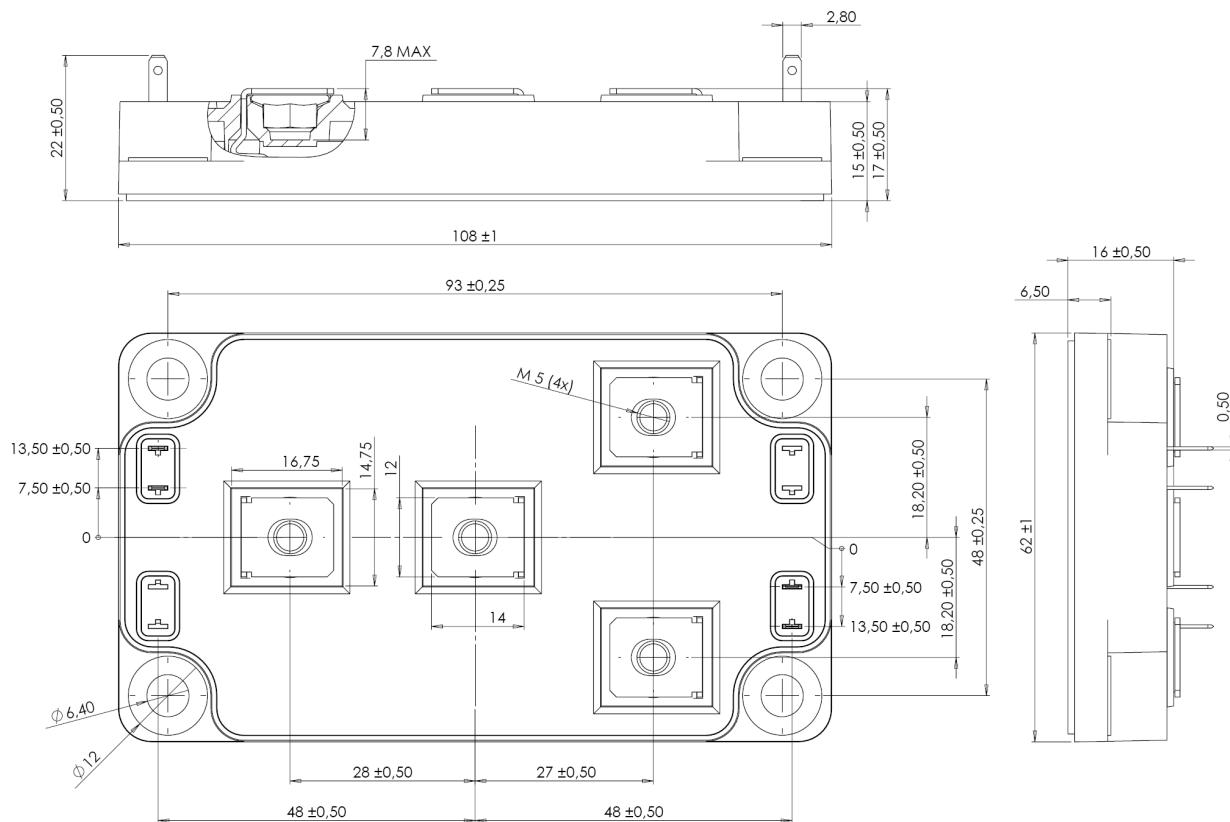
Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1MHz			11.2		nF
C _{oss}	Output Capacitance				2.4		
C _{rss}	Reverse Transfer Capacitance				0.18		
Q _g	Total gate Charge	V _{GS} = 10V V _{Bus} = 250V I _D = 90A			246		nC
Q _{gs}	Gate – Source Charge				66		
Q _{gd}	Gate – Drain Charge				130		
T _{d(on)}	Turn-on Delay Time	Inductive switching @ 125°C V _{GS} = 15V V _{Bus} = 333V I _D = 90A			18		ns
T _r	Rise Time				35		
T _{d(off)}	Turn-off Delay Time				87		
T _f	Fall Time		R _G = 2Ω		77		
E _{on}	Turn-on Switching Energy	Inductive switching @ 25°C V _{GS} = 15V, V _{Bus} = 333V I _D = 90A, R _G = 2Ω			1510		µJ
E _{off}	Turn-off Switching Energy				1452		
E _{on}	Turn-on Switching Energy				2482		µJ
E _{off}	Turn-off Switching Energy	V _{GS} = 15V, V _{Bus} = 333V I _D = 90A, R _G = 2Ω			1692		

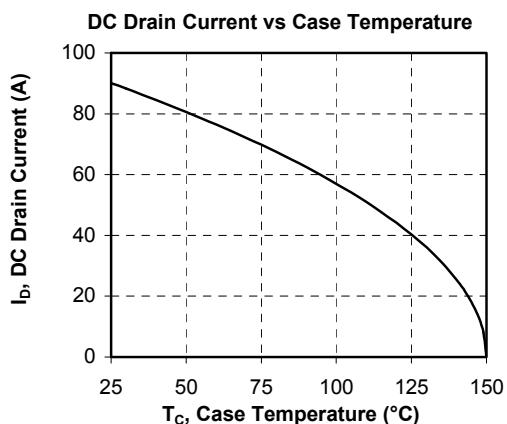
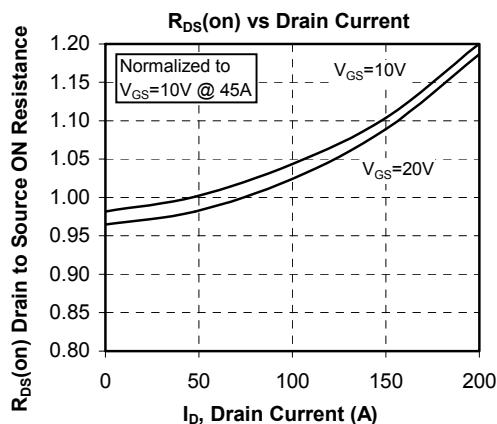
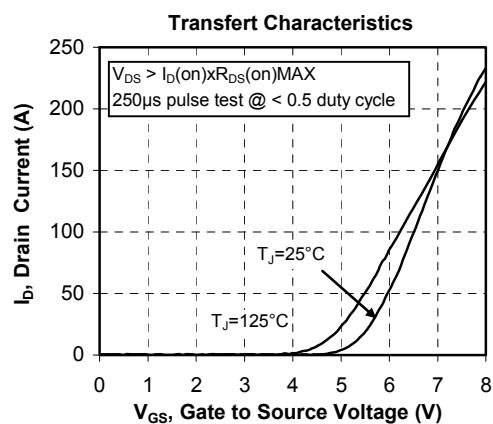
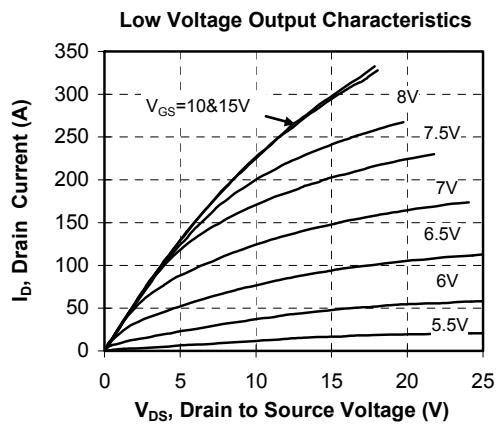
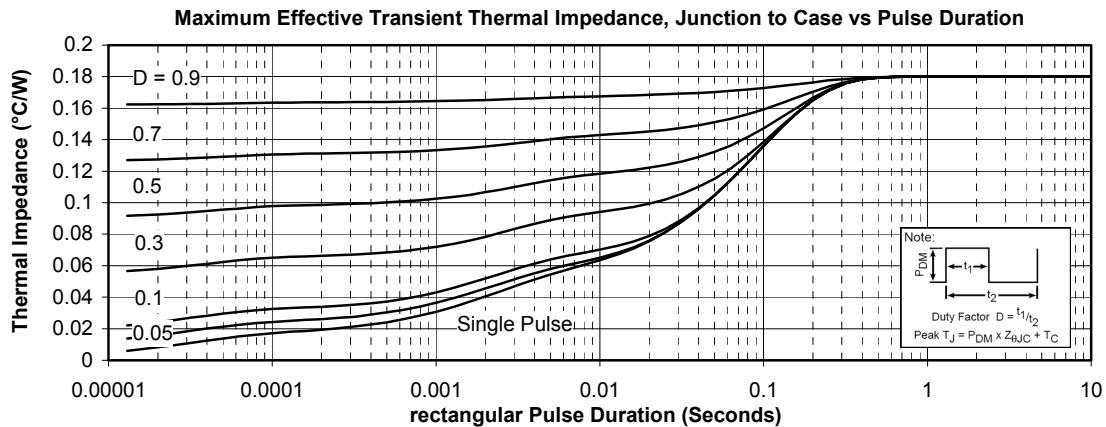
Diode ratings and characteristics

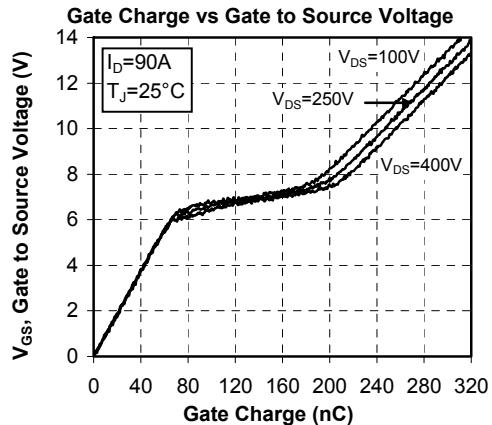
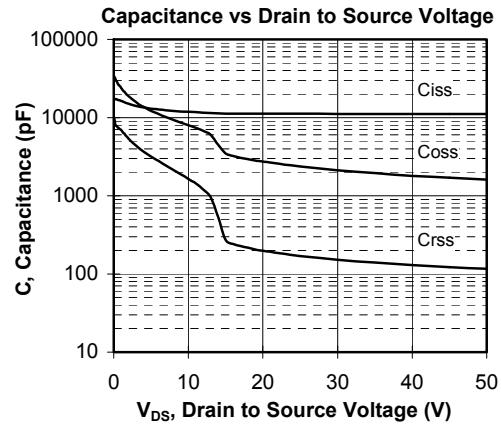
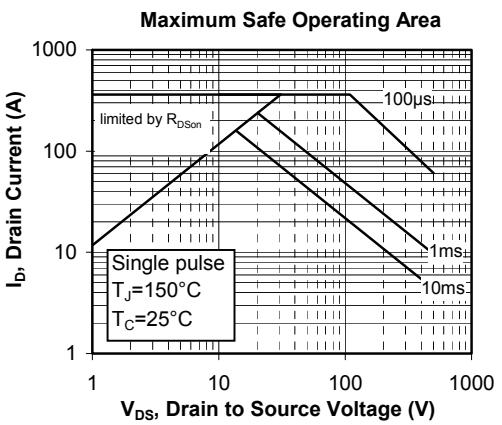
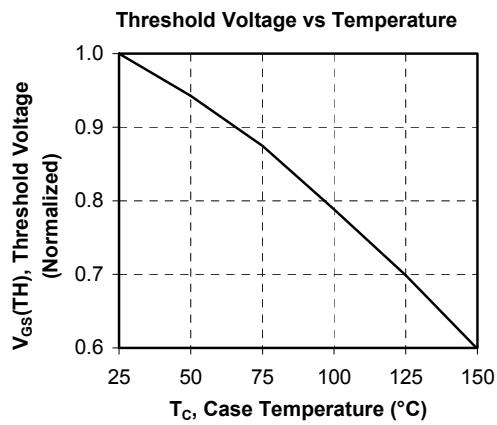
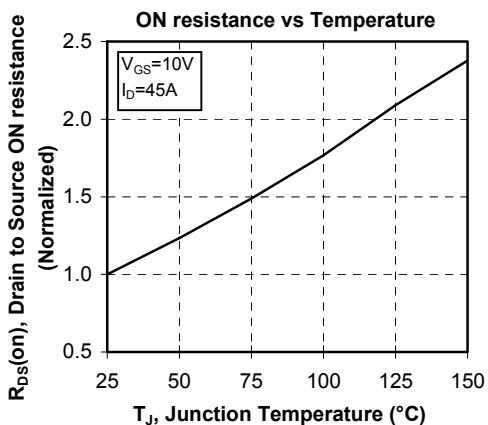
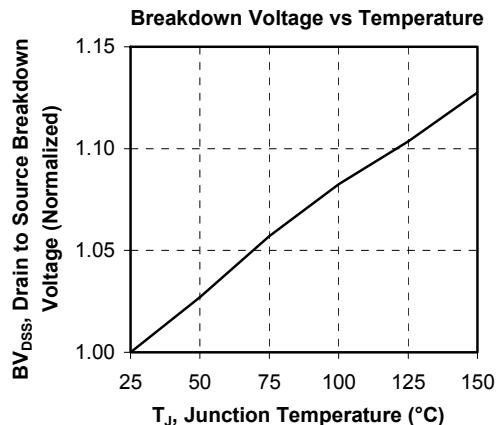
Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit	
V _{RRM}	Maximum Peak Repetitive Reverse Voltage			600			V	
I _{RM}	Maximum Reverse Leakage Current	V _R =600V	T _j = 25°C T _j = 125°C			250 500	µA	
I _F	DC Forward Current		T _c = 80°C		100		A	
V _F	Diode Forward Voltage	I _F = 100A			1.6	1.8	V	
		I _F = 200A			1.9			
		I _F = 100A	T _j = 125°C		1.4			
t _{rr}	Reverse Recovery Time	I _F = 100A V _R = 400V di/dt = 200A/µs	T _j = 25°C		180		ns	
			T _j = 125°C		220			
Q _{rr}	Reverse Recovery Charge		T _j = 25°C		390		nC	
			T _j = 125°C		1450			

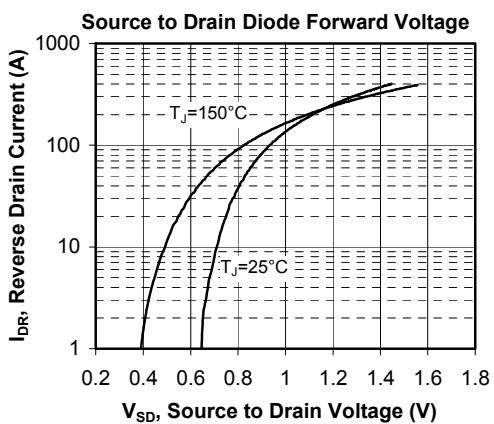
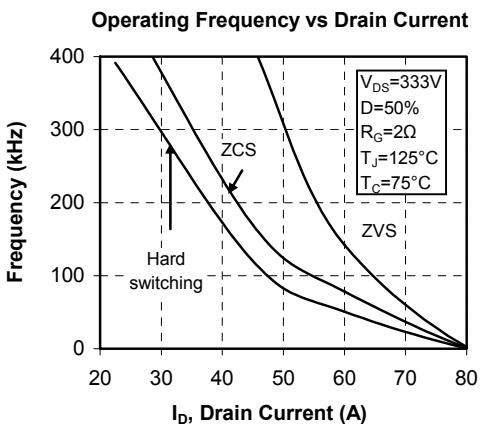
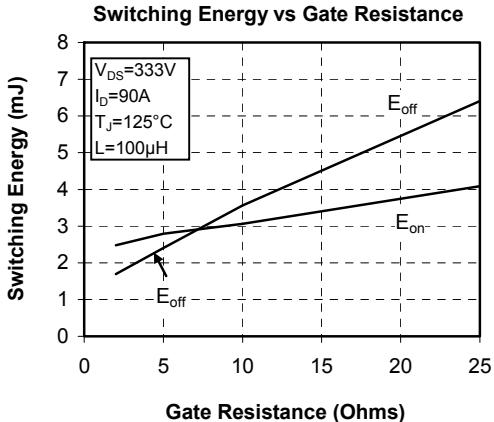
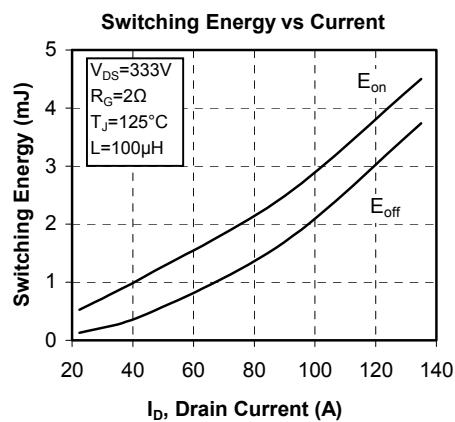
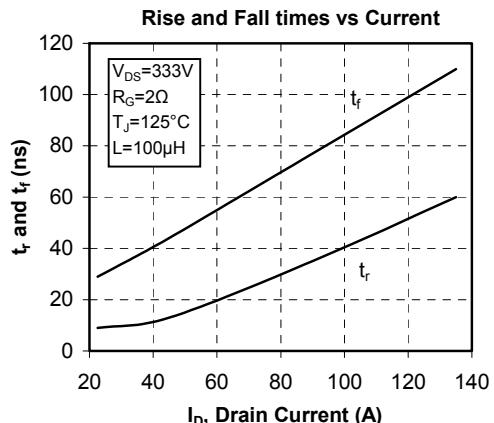
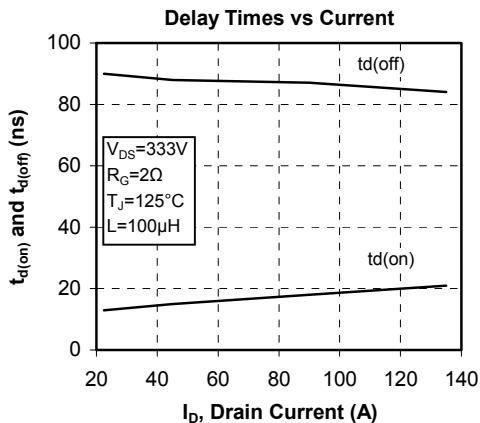
Thermal and package characteristics
Symbol **Characteristic**

			Min	Typ	Max	Unit
R_{thJC}	Junction to Case Thermal Resistance	Transistor			0.18	°C/W
		Diode			0.6	
V_{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz		4000			V
T_J	Operating junction temperature range		-40		150	
T_{STG}	Storage Temperature Range		-40		125	°C
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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