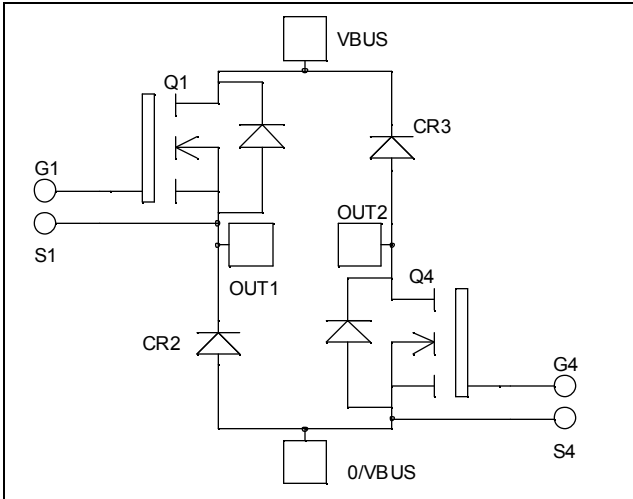


Asymmetrical - bridge MOSFET Power Module

$V_{DSS} = 500V$
 $R_{DSon} = 35m\Omega$ typ @ $T_j = 25^\circ C$
 $I_D = 99A$ @ $T_c = 25^\circ C$



Application

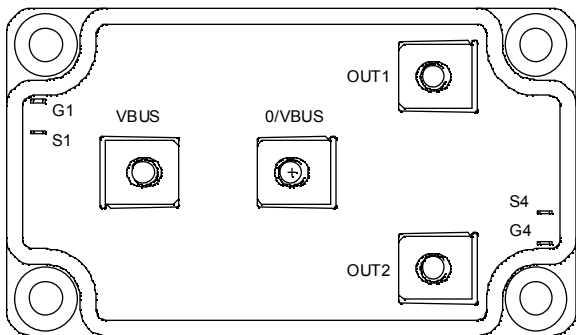
- Welding converters
- Switched Mode Power Supplies
- Switched Reluctance Motor Drives

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



Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	500	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	99
		$T_c = 80^\circ C$	74
I_{DM}	Pulsed Drain current	396	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	39	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	781
I_{AR}	Avalanche current (repetitive and non repetitive)	51	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	3000	

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	$V_{GS} = 0\text{V}, V_{DS} = 500\text{V}$			200	μA
		$V_{GS} = 0\text{V}, V_{DS} = 400\text{V}$			1000	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10\text{V}, I_D = 49.5\text{A}$		35	39	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 5\text{mA}$	3		5	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30\text{V}, V_{DS} = 0\text{V}$			± 150	nA

Dynamic Characteristics

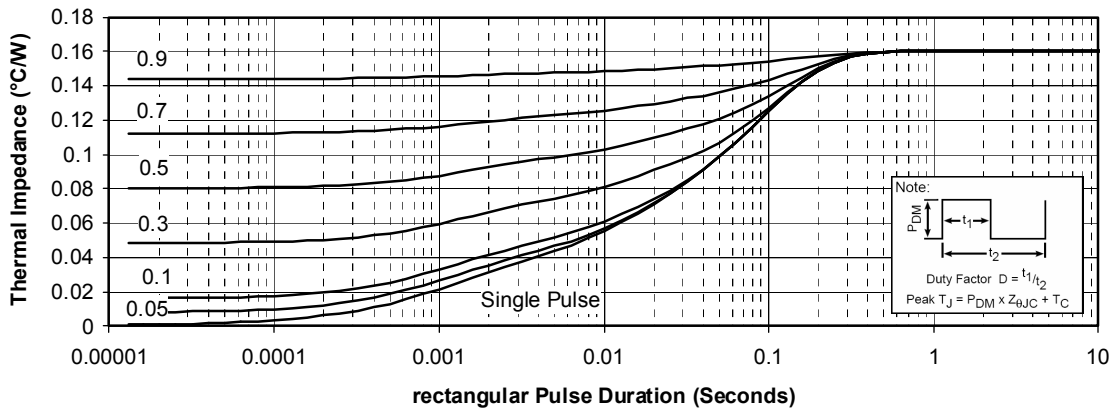
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}$		14		nF
C_{oss}	Output Capacitance	$V_{DS} = 25\text{V}$		2.8		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		0.2		
Q_g	Total gate Charge	$V_{GS} = 10\text{V}$		280		nC
Q_{gs}	Gate – Source Charge	$V_{Bus} = 250\text{V}$		80		
Q_{gd}	Gate – Drain Charge	$I_D = 99\text{A}$		140		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15\text{V}$ $V_{Bus} = 333\text{V}$ $I_D = 99\text{A}$ $R_G = 1\Omega$		21		ns
T_r	Rise Time			38		
$T_{d(off)}$	Turn-off Delay Time			75		
T_f	Fall Time			93		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C $V_{GS} = 15\text{V}, V_{Bus} = 333\text{V}$ $I_D = 99\text{A}, R_G = 1\Omega$		2070		μJ
E_{off}	Turn-off Switching Energy			1690		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C $V_{GS} = 15\text{V}, V_{Bus} = 333\text{V}$ $I_D = 99\text{A}, R_G = 1\Omega$		3112		μJ
E_{off}	Turn-off Switching Energy			2026		

Diode ratings and characteristics

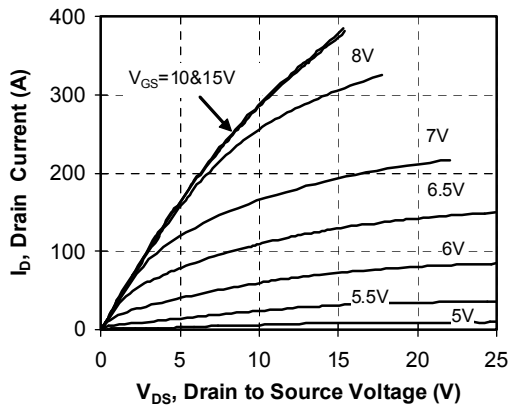
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		600			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 600\text{V}$	$T_j = 25^\circ\text{C}$		250	μA
			$T_j = 125^\circ\text{C}$		500	
I_F	DC Forward Current			100		A
V_F	Diode Forward Voltage	$I_F = 100\text{A}$		1.6	1.8	V
		$I_F = 200\text{A}$		1.9		
		$I_F = 100\text{A}$	$T_j = 125^\circ\text{C}$	1.4		
t_{rr}	Reverse Recovery Time	$I_F = 100\text{A}$ $V_R = 400\text{V}$ $di/dt = 200\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		180	ns
			$T_j = 125^\circ\text{C}$		220	
Q_{rr}	Reverse Recovery Charge	$I_F = 100\text{A}$ $V_R = 400\text{V}$ $di/dt = 200\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		390	nC
			$T_j = 125^\circ\text{C}$		1450	

Typical Performance Curve

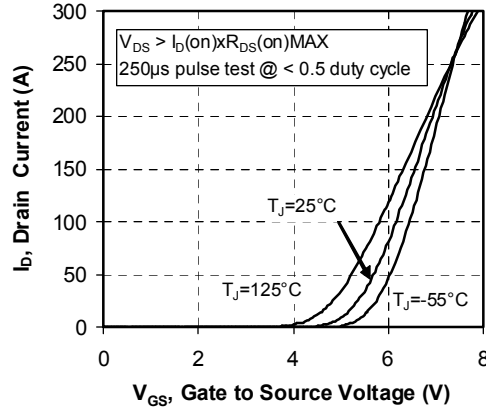
Maximum Effective Transient Thermal Impedance, Junction to Case vs Pulse Duration



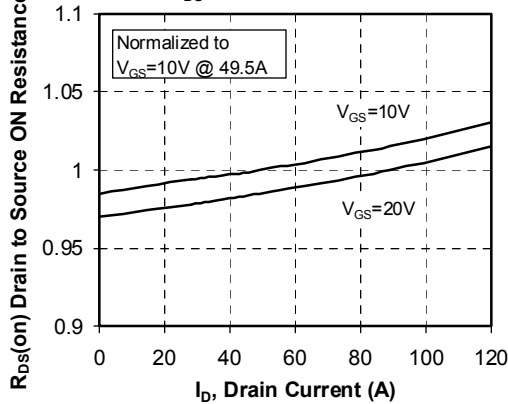
Low Voltage Output Characteristics



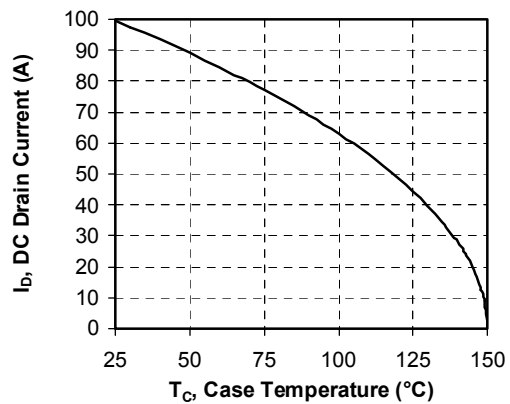
Transfer Characteristics

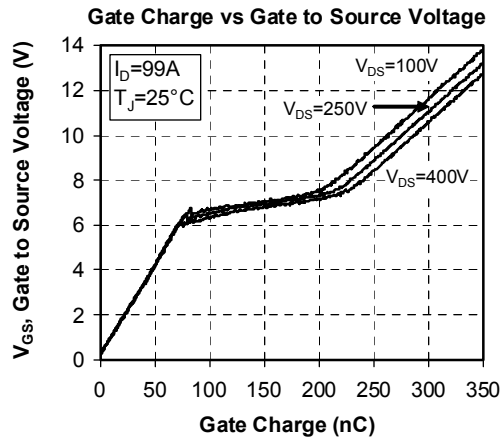
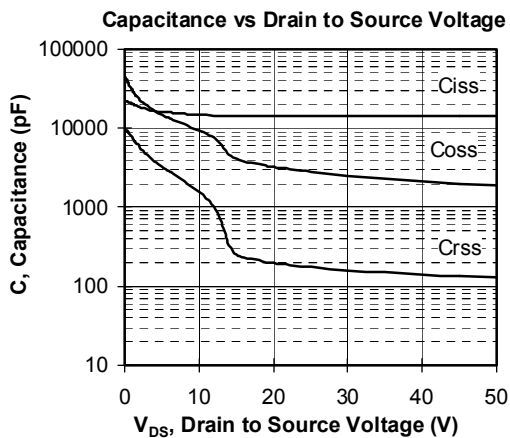
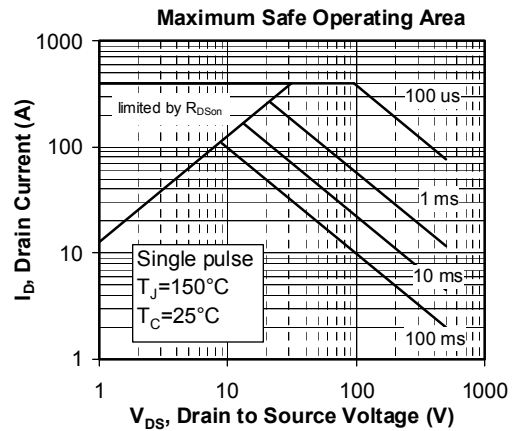
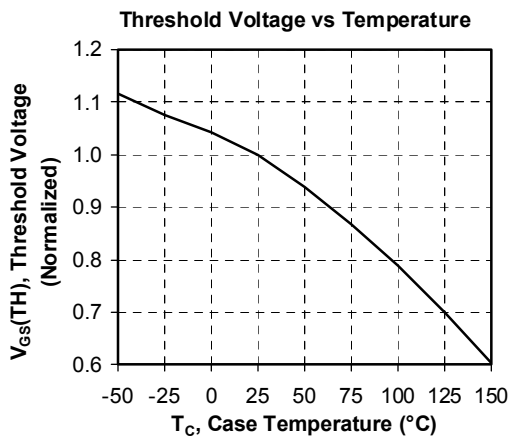
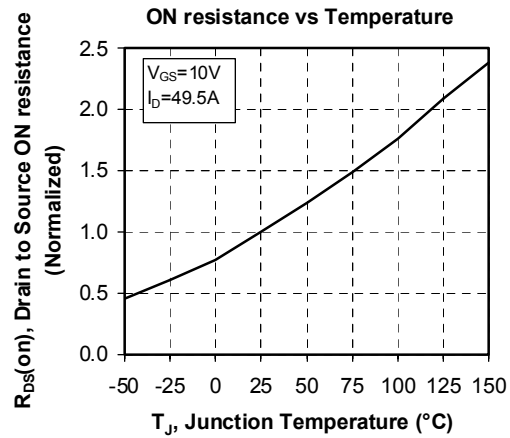
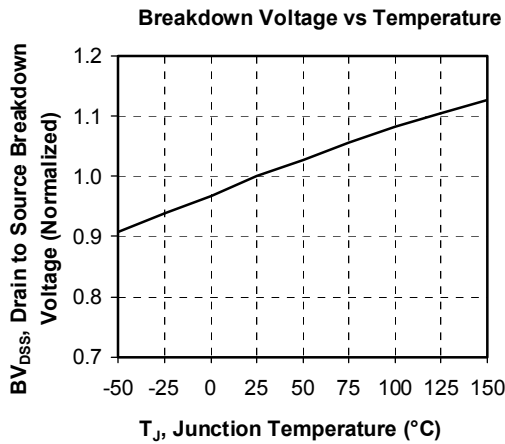


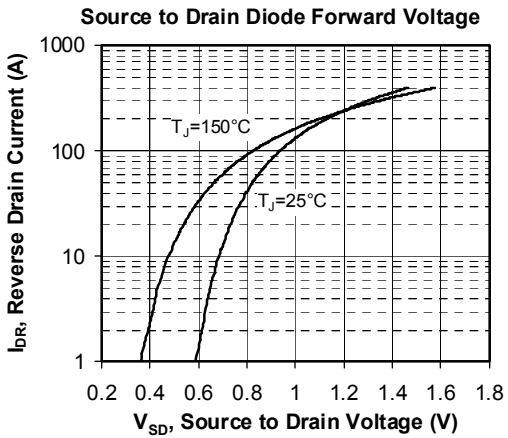
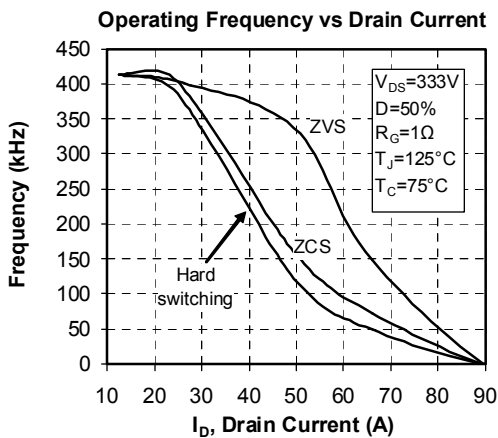
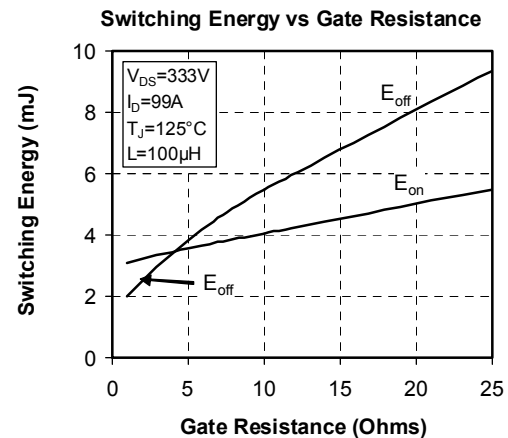
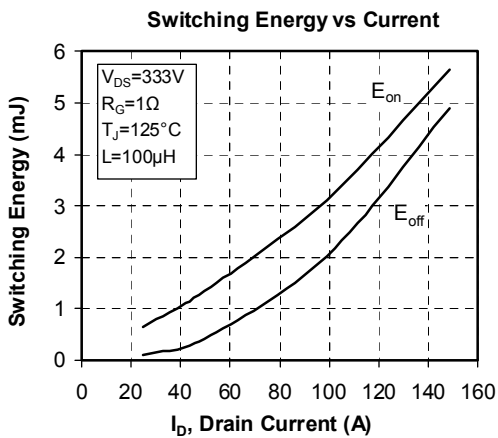
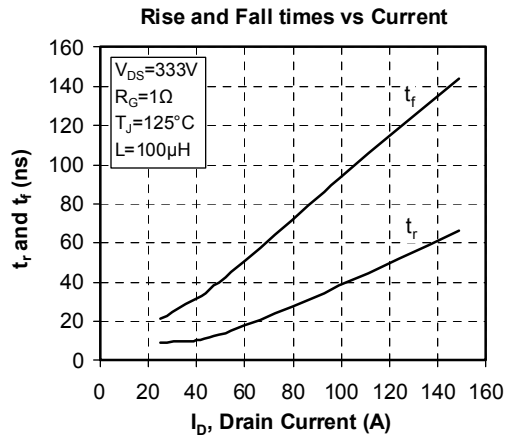
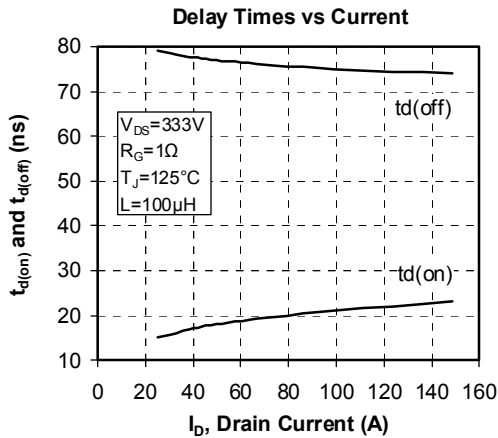
$R_{DS(on)}$ vs Drain Current



DC Drain Current vs Case Temperature







Microsemi reserves the right to change, without notice, the specifications and information contained herein

Microsemi's products are covered by one or more of U.S. patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents. U.S. and Foreign patents pending. All Rights Reserved.