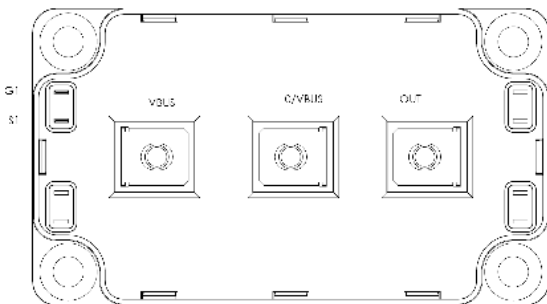
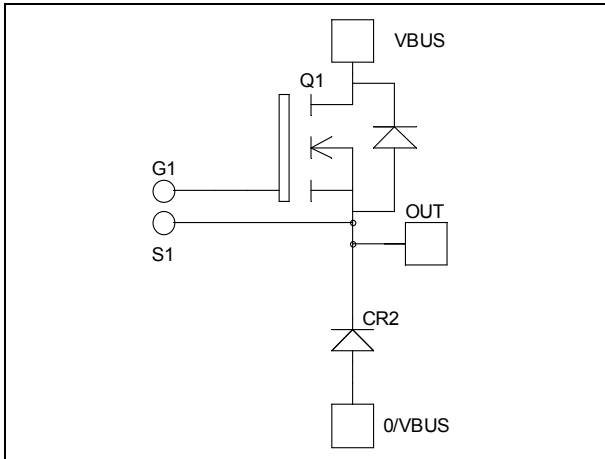


Buck chopper MOSFET Power Module

$V_{DSS} = 100V$
 $R_{DSon} = 2.25m\Omega \text{ typ @ } T_j = 25^\circ C$
 $I_D = 495A \text{ @ } T_c = 25^\circ C$



Application

- AC and DC motor control
- Switched Mode Power Supplies

Features

- Power MOS V[®] 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	100	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	495
		$T_c = 80^\circ C$	370
I_{DM}	Pulsed Drain current	1900	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	2.5	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	1250
I_{AR}	Avalanche current (repetitive and non repetitive)	100	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

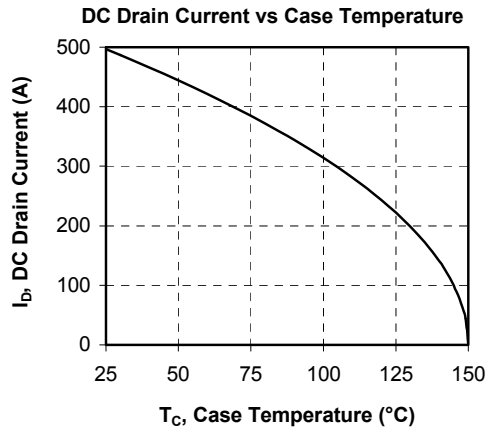
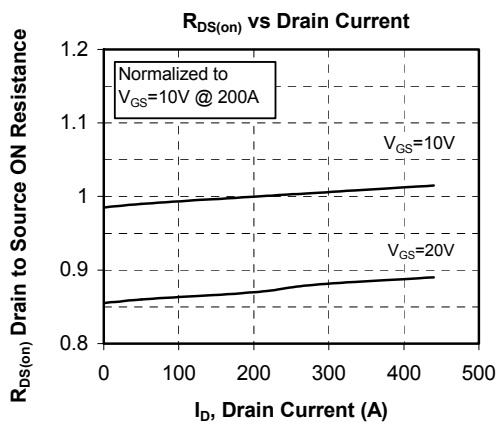
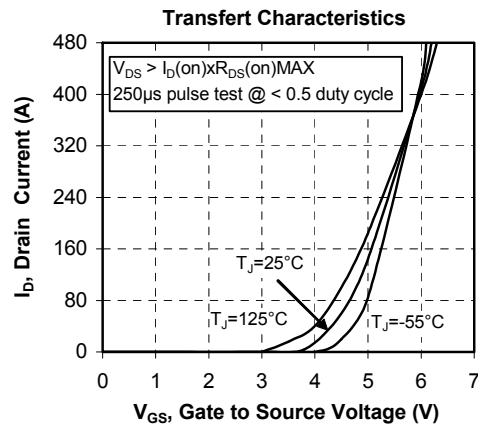
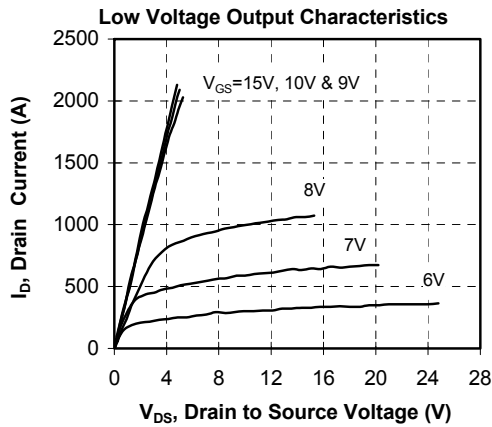
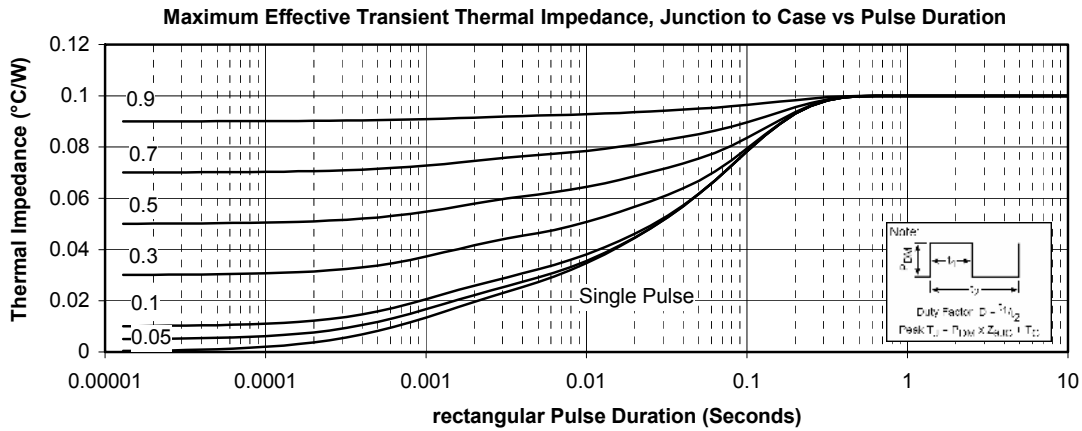
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 100V$			400	μA
		$V_{GS} = 0V, V_{DS} = 80V$	$T_j = 25^\circ\text{C}$		2000	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 200A$		2.25	2.5	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 10\text{mA}$	2		4	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 400	nA

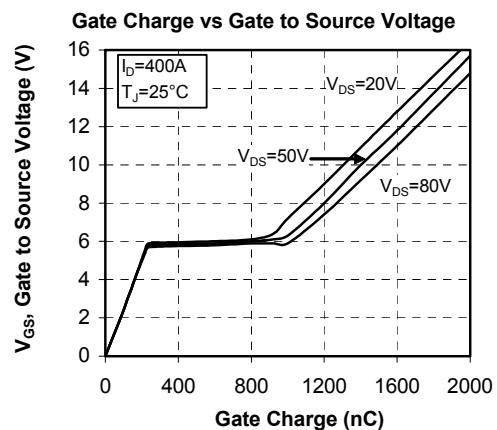
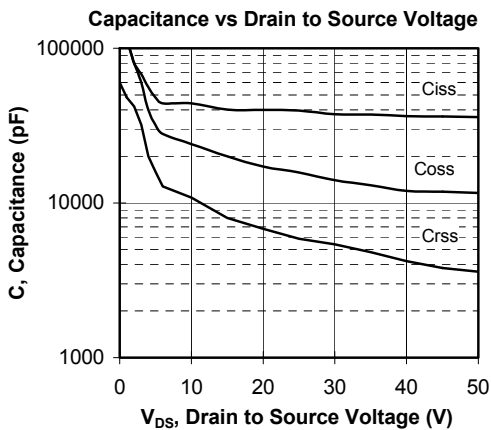
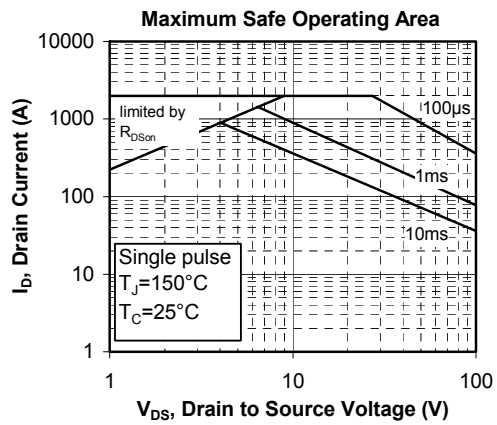
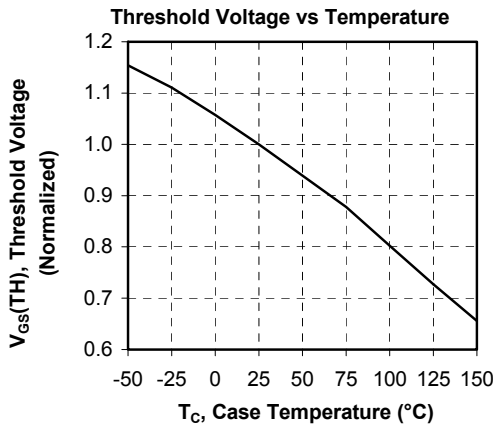
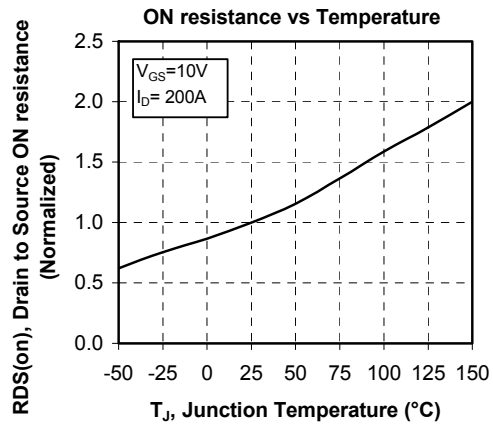
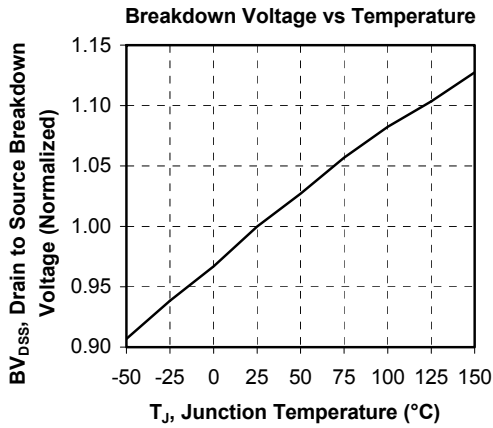
Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$		40		nF
C_{oss}	Output Capacitance	$V_{DS} = 25V$		15.7		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		5.9		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 50V$ $I_D = 400A$		1360		nC
Q_{gs}	Gate – Source Charge			240		
Q_{gd}	Gate – Drain Charge			720		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15V$ $V_{Bus} = 66V$ $I_D = 400A$ $R_G = 1.25\Omega$		160		ns
T_r	Rise Time			240		
$T_{d(off)}$	Turn-off Delay Time			500		
T_f	Fall Time			160		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C $V_{GS} = 15V, V_{Bus} = 66V$ $I_D = 400A, R_G = 1.25\Omega$		2.2		mJ
E_{off}	Turn-off Switching Energy			2.41		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C $V_{GS} = 15V, V_{Bus} = 66V$ $I_D = 400A, R_G = 1.25\Omega$		2.43		mJ
E_{off}	Turn-off Switching Energy			2.56		

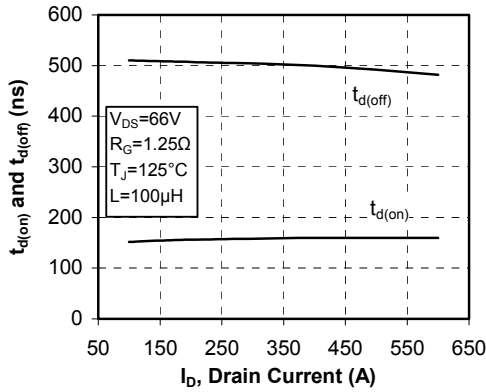
Chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		200			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 200V$	$T_j = 25^\circ\text{C}$		750	μA
			$T_j = 125^\circ\text{C}$		1000	
I_F	DC Forward Current	$T_c = 80^\circ\text{C}$		400		A
V_F	Diode Forward Voltage	$I_F = 400A$		1		V
		$I_F = 800A$		1.4		
		$I_F = 400A$	$T_j = 125^\circ\text{C}$		0.9	
t_{rr}	Reverse Recovery Time	$I_F = 400A$ $V_R = 133V$ $di/dt = 800A/\mu\text{s}$	$T_j = 25^\circ\text{C}$		60	ns
			$T_j = 125^\circ\text{C}$		110	
Q_{rr}	Reverse Recovery Charge	$I_F = 400A$ $V_R = 133V$ $di/dt = 800A/\mu\text{s}$	$T_j = 25^\circ\text{C}$		800	nC
			$T_j = 125^\circ\text{C}$		3360	

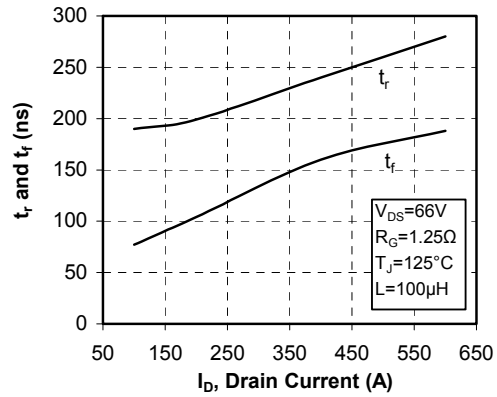
Typical Performance Curve




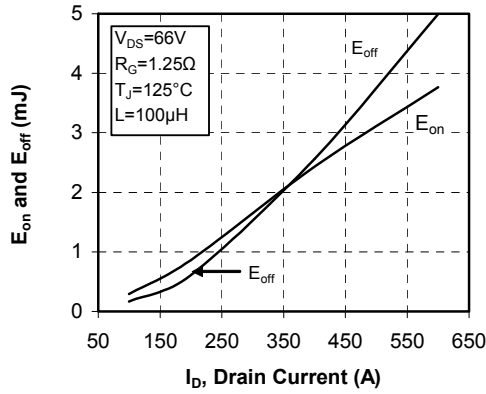
Delay Times vs Current



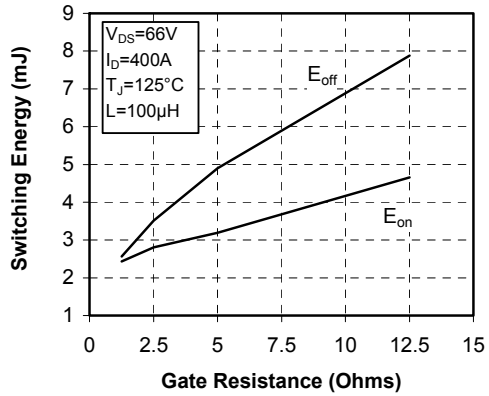
Rise and Fall times vs Current



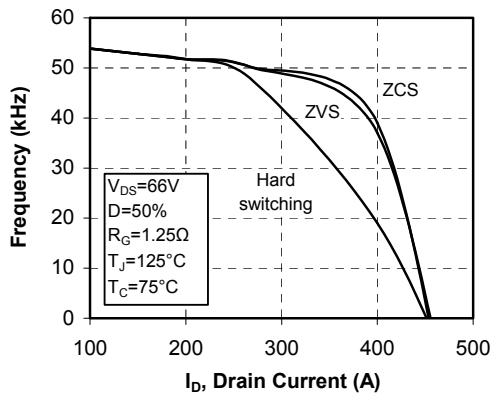
Switching Energy vs Current



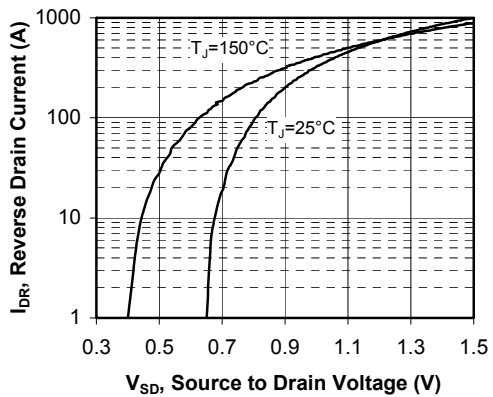
Switching Energy vs Gate Resistance



Operating Frequency vs Drain Current



Source to Drain Diode Forward Voltage



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