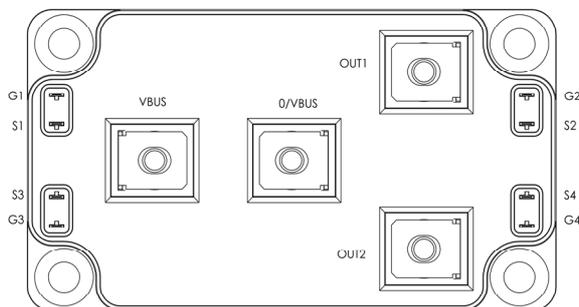
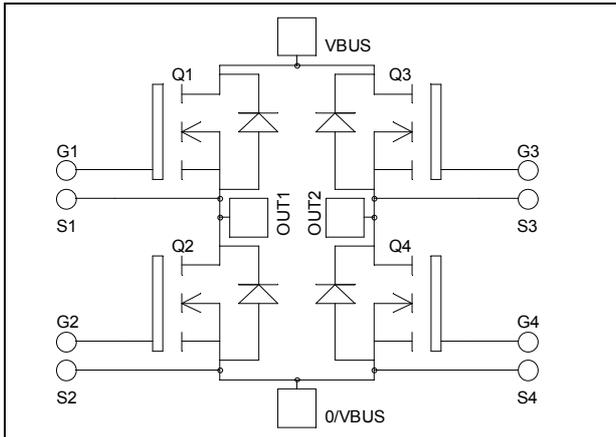


## Full - Bridge MOSFET Power Module

$V_{DSS} = 200V$   
 $R_{DSon} = 8m\Omega \text{ typ @ } T_j = 25^\circ C$   
 $I_D = 208A \text{ @ } T_c = 25^\circ C$



### Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
$V_{DSS}$	Drain - Source Breakdown Voltage	200	V
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	208
		$T_c = 80^\circ C$	155
$I_{DM}$	Pulsed Drain current	832	A
$V_{GS}$	Gate - Source Voltage	$\pm 30$	V
$R_{DSon}$	Drain - Source ON Resistance	10	$m\Omega$
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	781
$I_{AR}$	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](http://www.microsemi.com)

### Application

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

### Features

- Power MOS 7<sup>®</sup> FREDFETs
  - 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

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	$V_{GS} = 0V, V_{DS} = 200V$			375	$\mu\text{A}$
		$T_j = 25^\circ\text{C}$				
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 0V, V_{DS} = 160V$		8	10	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$				
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 5\text{mA}$	3		5	V
$I_{GSS}$	Gate – Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			$\pm 150$	nA

**Dynamic Characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{iss}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{MHz}$		14.4		nF
$C_{oss}$	Output Capacitance			4.66		
$C_{rss}$	Reverse Transfer Capacitance			0.29		
$Q_g$	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 100V$ $I_D = 208A$		280		nC
$Q_{gs}$	Gate – Source Charge			106		
$Q_{gd}$	Gate – Drain Charge			134		
$T_{d(on)}$	Turn-on Delay Time	<b>Inductive switching @ 125°C</b> $V_{GS} = 15V$ $V_{Bus} = 133V$ $I_D = 208A$ $R_G = 2.5\Omega$		32		ns
$T_r$	Rise Time			64		
$T_{d(off)}$	Turn-off Delay Time			88		
$T_f$	Fall Time			116		
$E_{on}$	Turn-on Switching Energy	<b>Inductive switching @ 25°C</b> $V_{GS} = 15V, V_{Bus} = 133V$ $I_D = 208A, R_G = 2.5\Omega$		1698		$\mu\text{J}$
$E_{off}$	Turn-off Switching Energy			1858		
$E_{on}$	Turn-on Switching Energy	<b>Inductive switching @ 125°C</b> $V_{GS} = 15V, V_{Bus} = 133V$ $I_D = 208A, R_G = 2.5\Omega$		1872		$\mu\text{J}$
$E_{off}$	Turn-off Switching Energy			1972		

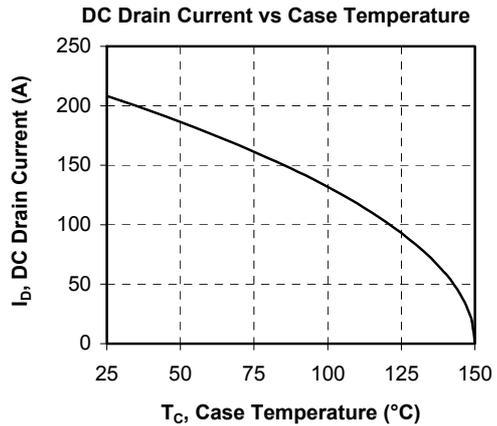
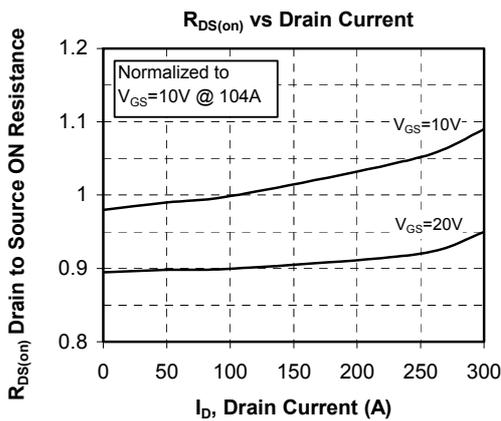
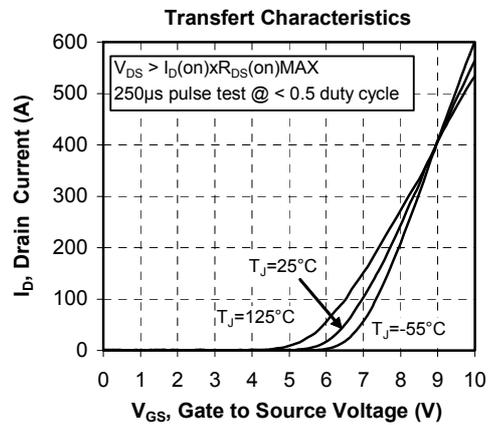
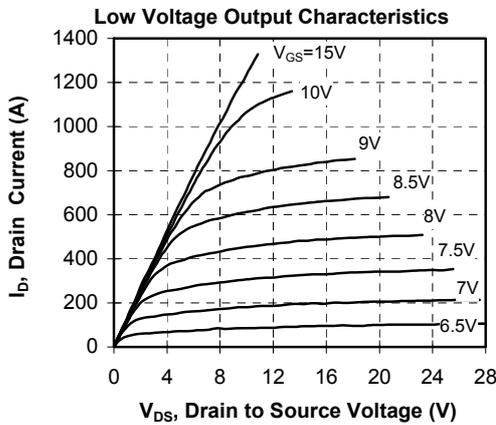
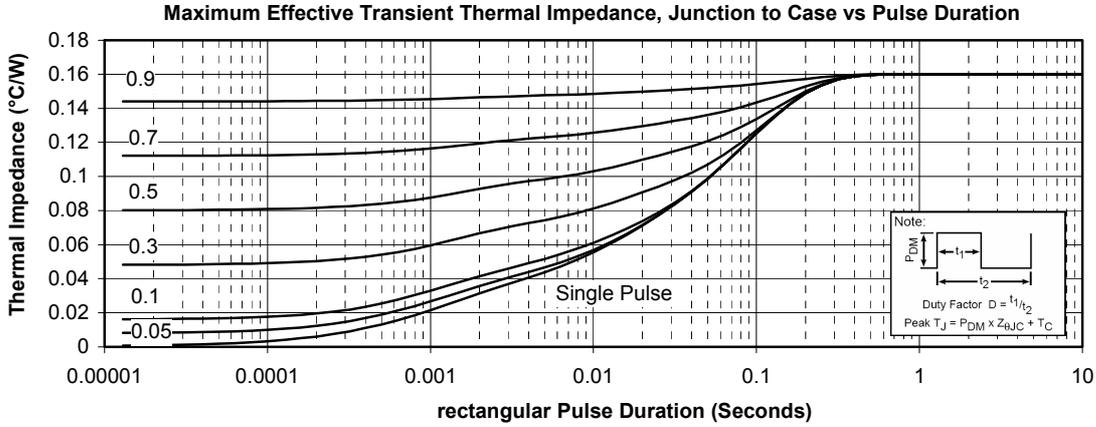
**Source - Drain diode ratings and characteristics**

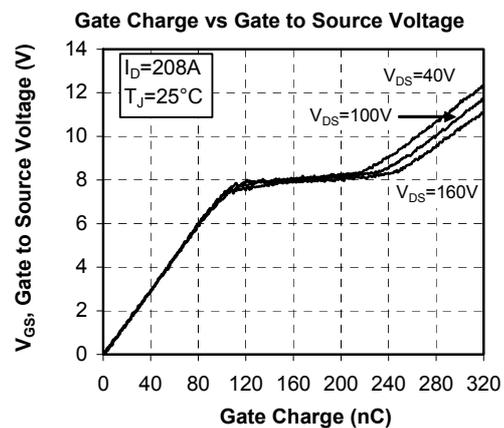
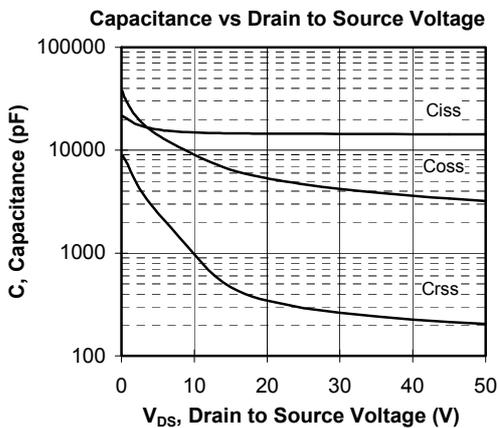
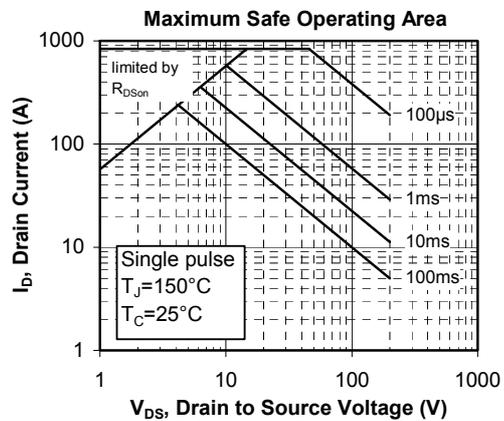
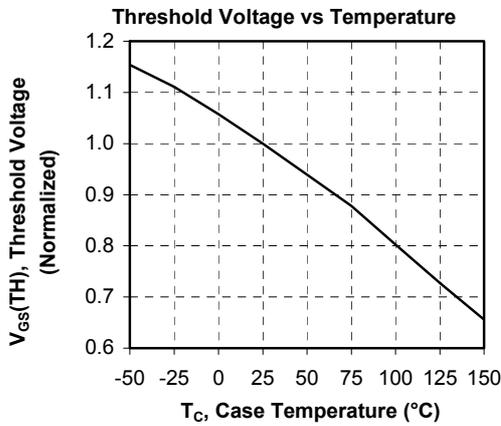
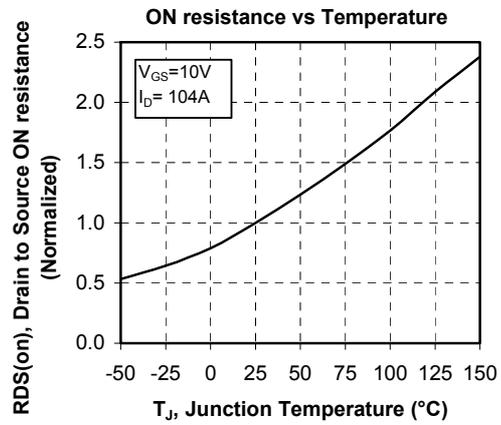
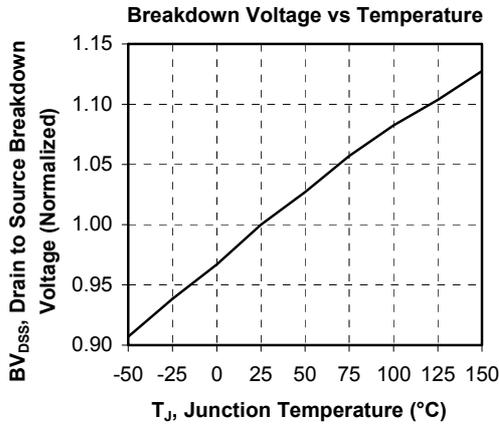
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
$I_S$	Continuous Source current (Body diode)	$T_c = 25^\circ\text{C}$			208	A	
		$T_c = 80^\circ\text{C}$			155		
$V_{SD}$	Diode Forward Voltage	$V_{GS} = 0V, I_S = -208A$			1.3	V	
dv/dt	Peak Diode Recovery ①				5	V/ns	
$t_{rr}$	Reverse Recovery Time	$I_S = -208A$ $V_R = 133V$ $di_S/dt = 200A/\mu\text{s}$	$T_j = 25^\circ\text{C}$			230	ns
			$T_j = 125^\circ\text{C}$			450	
$Q_{rr}$	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$		1.8		$\mu\text{C}$
			$T_j = 125^\circ\text{C}$		6.8		

① dv/dt numbers reflect the limitations of the circuit rather than the device itself.

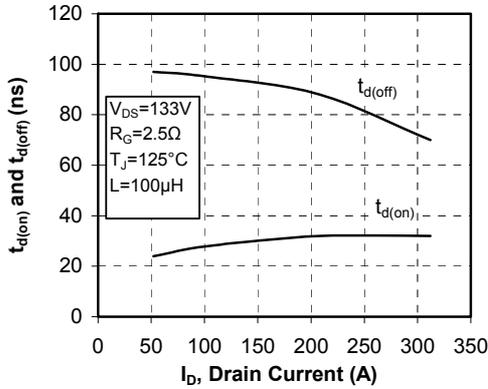
$I_S \leq -208A$     $di/dt \leq 700A/\mu\text{s}$     $V_R \leq V_{DSS}$     $T_j \leq 150^\circ\text{C}$



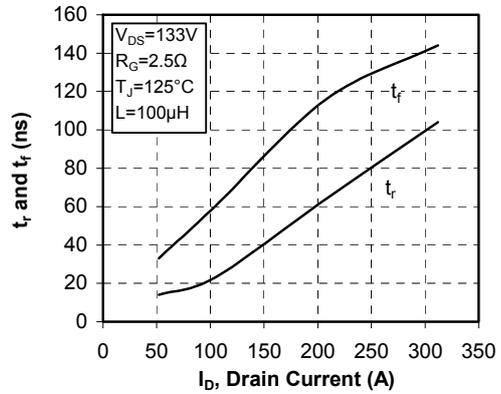
**Typical Performance Curve**




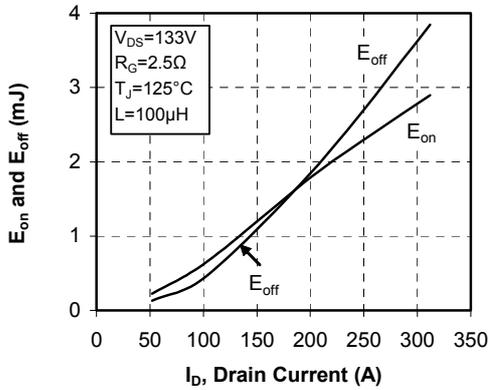
**Delay Times vs Current**



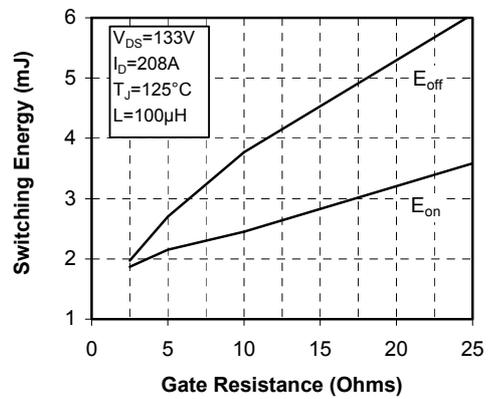
**Rise and Fall times vs Current**



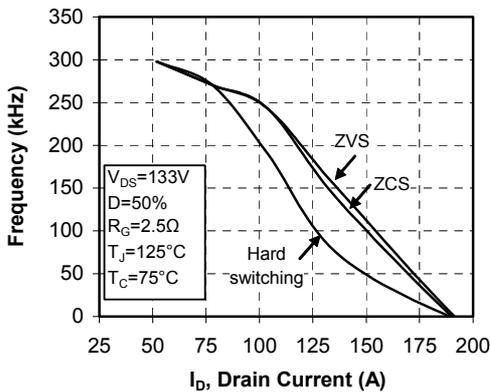
**Switching Energy vs Current**



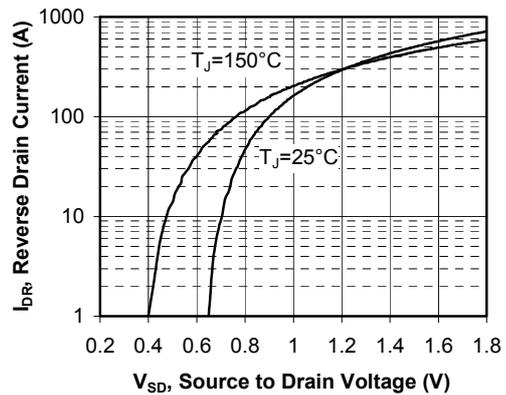
**Switching Energy vs Gate Resistance**



**Operating Frequency vs Drain Current**



**Source to Drain Diode Forward Voltage**



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