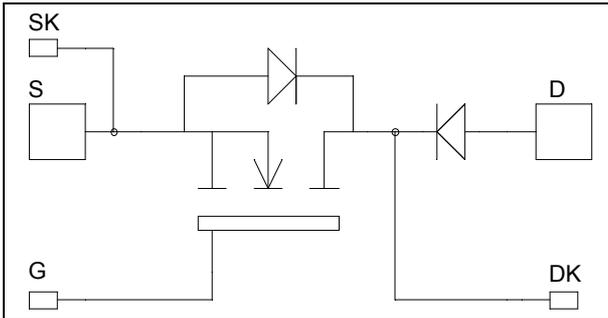


**Single switch  
with Series diode  
MOSFET Power Module**

**$V_{DSS} = 1000V$**   
 **$R_{DSon} = 45m\Omega$  typ @  $T_j = 25^\circ C$**   
 **$I_D = 215A$  @  $T_c = 25^\circ C$**



### Application

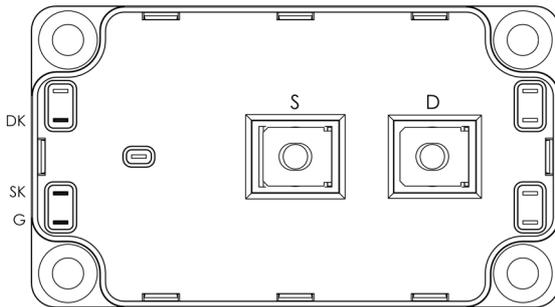
- Zero Current Switching resonant mode

### Features

- Power MOS 7<sup>®</sup> 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
- AlN substrate for 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



### Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
$V_{DSS}$	Drain - Source Breakdown Voltage	1000	V
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	215
		$T_c = 80^\circ C$	160
$I_{DM}$	Pulsed Drain current	860	A
$V_{GS}$	Gate - Source Voltage	$\pm 30$	V
$R_{DSon}$	Drain - Source ON Resistance	52	$m\Omega$
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	5000
$I_{AR}$	Avalanche current (repetitive and non repetitive)	30	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](http://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 <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 1000V			600	μA
		V <sub>GS</sub> = 0V, V <sub>DS</sub> = 800V			3	mA
R <sub>DS(on)</sub>	Drain – Source on Resistance	V <sub>GS</sub> = 10V, I <sub>D</sub> = 107.5A		45	52	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 30mA	3		5	V
I <sub>GSS</sub>	Gate – Source Leakage Current	V <sub>GS</sub> = ±30 V, V <sub>DS</sub> = 0V			±600	nA

**Dynamic Characteristics**

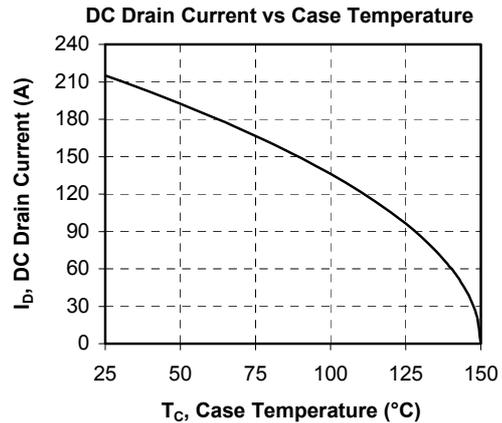
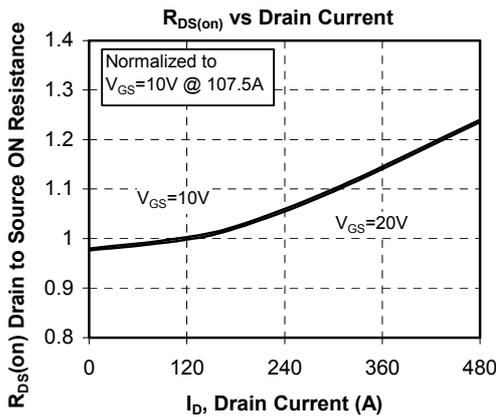
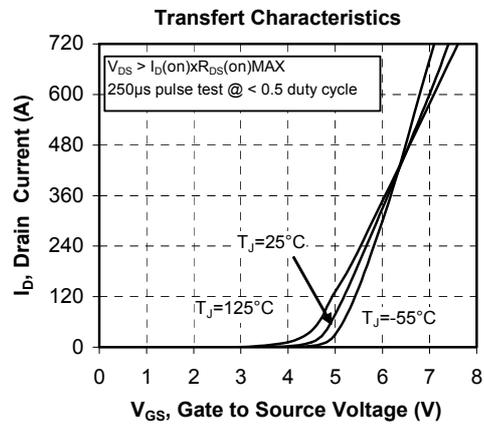
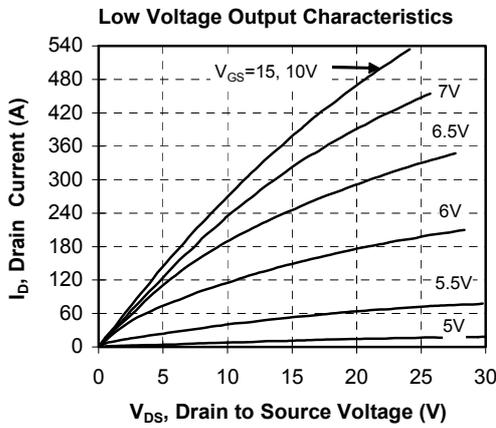
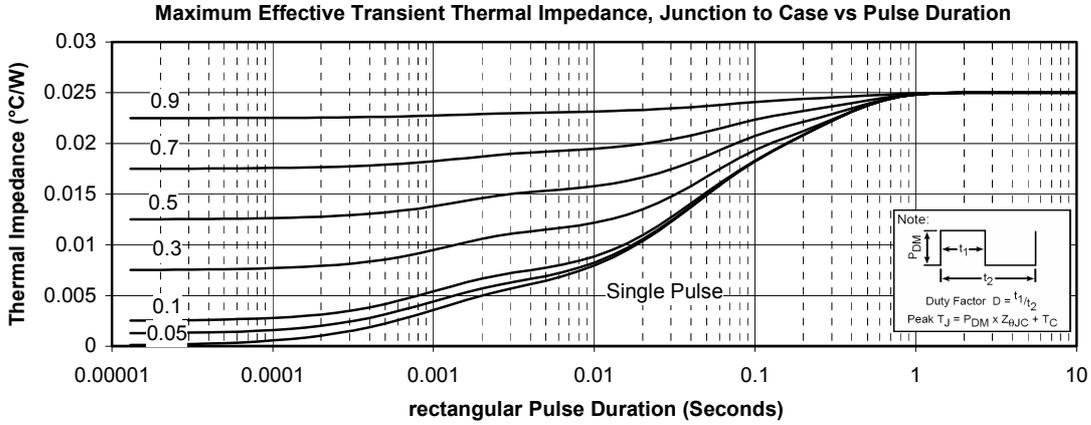
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V		42.7		nF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> = 25V		7.6		
C <sub>rss</sub>	Reverse Transfer Capacitance	f = 1MHz		1.3		
Q <sub>g</sub>	Total gate Charge	V <sub>GS</sub> = 10V V <sub>Bus</sub> = 500V I <sub>D</sub> = 215A		1602		nC
Q <sub>gs</sub>	Gate – Source Charge			204		
Q <sub>gd</sub>	Gate – Drain Charge			1038		
T <sub>d(on)</sub>	Turn-on Delay Time	<b>Inductive switching @ 125°C</b> V <sub>GS</sub> = 15V V <sub>Bus</sub> = 670V I <sub>D</sub> = 215A R <sub>G</sub> = 0.5Ω		18		ns
T <sub>r</sub>	Rise Time			14		
T <sub>d(off)</sub>	Turn-off Delay Time			140		
T <sub>f</sub>	Fall Time			55		
E <sub>on</sub>	Turn-on Switching Energy	<b>Inductive switching @ 25°C</b> V <sub>GS</sub> = 15V, V <sub>Bus</sub> = 670V I <sub>D</sub> = 215A, R <sub>G</sub> = 0.5Ω		7.2		mJ
E <sub>off</sub>	Turn-off Switching Energy			4.3		
E <sub>on</sub>	Turn-on Switching Energy	<b>Inductive switching @ 125°C</b> V <sub>GS</sub> = 15V, V <sub>Bus</sub> = 670V I <sub>D</sub> = 215A, R <sub>G</sub> = 0.5Ω		12		mJ
E <sub>off</sub>	Turn-off Switching Energy			5.8		

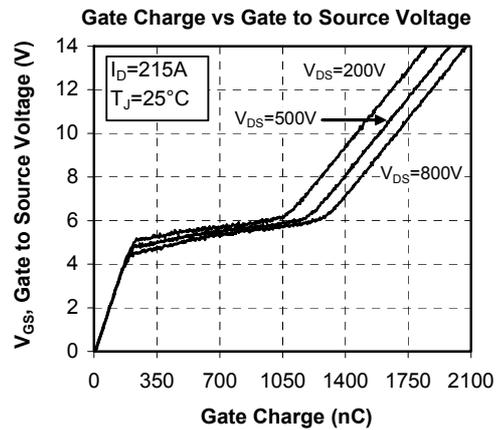
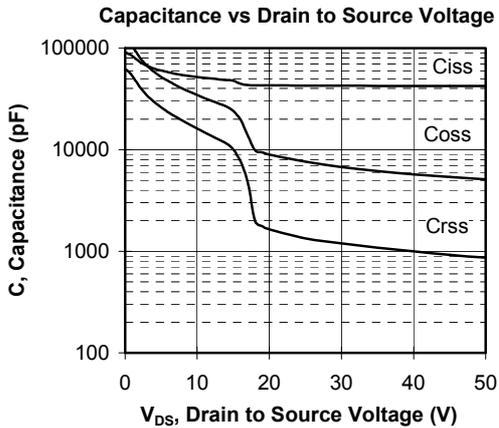
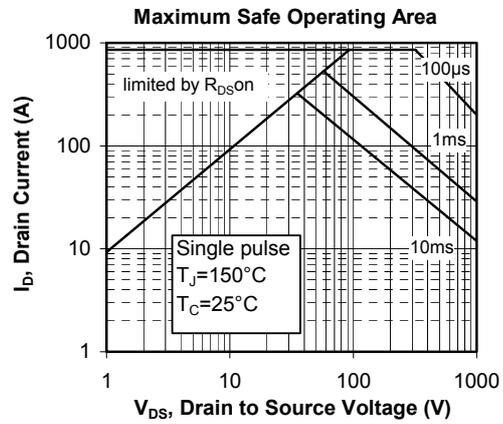
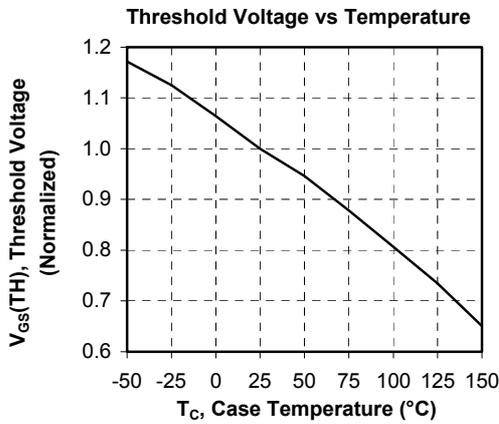
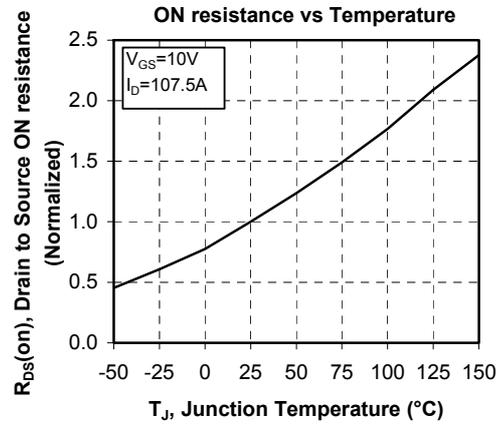
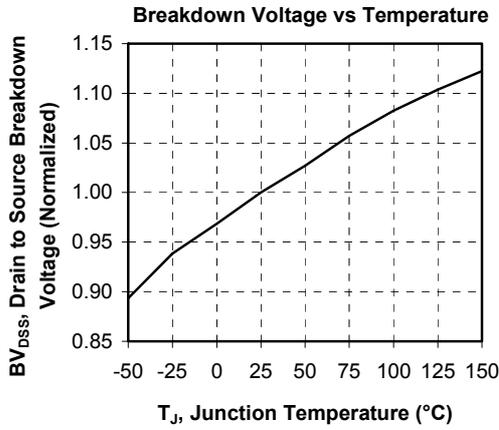
**Series diode ratings and characteristics**

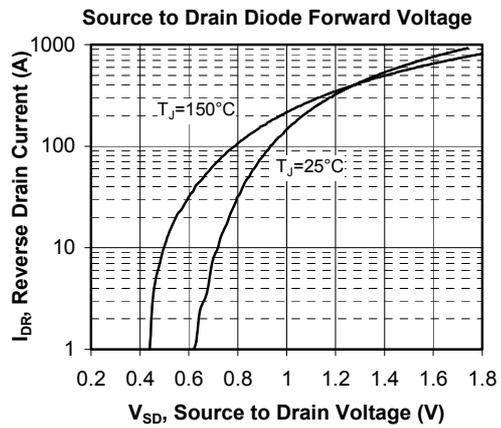
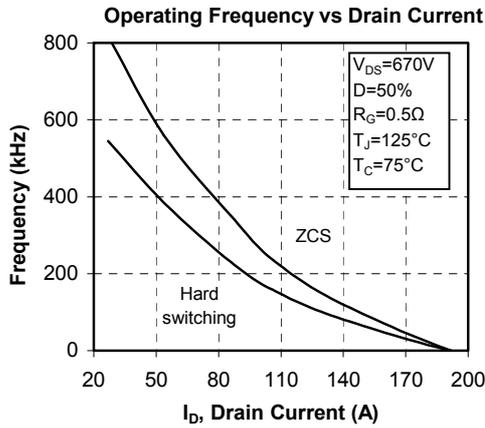
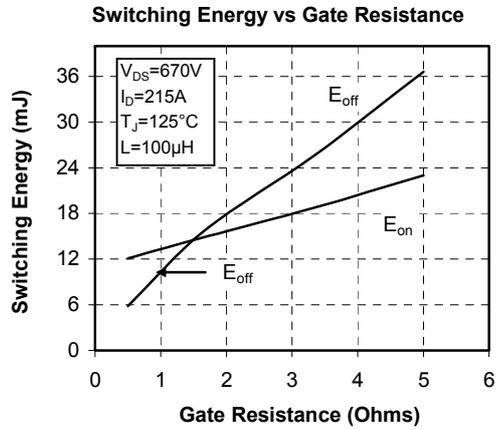
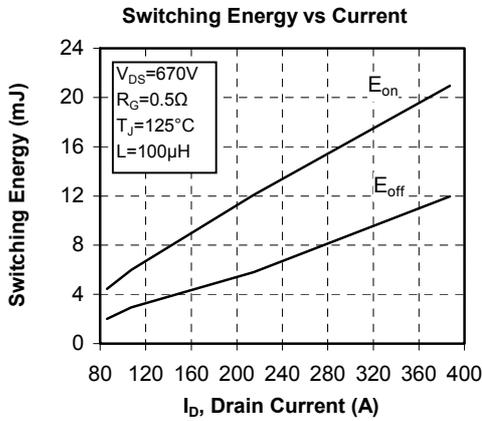
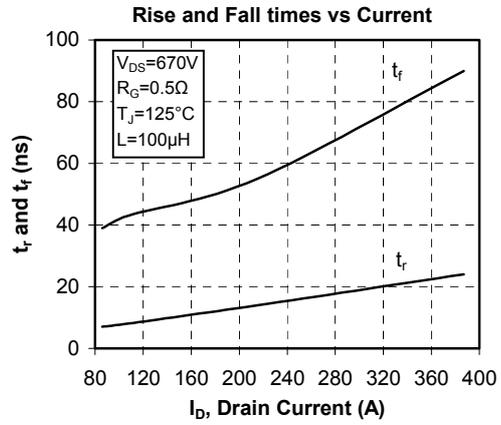
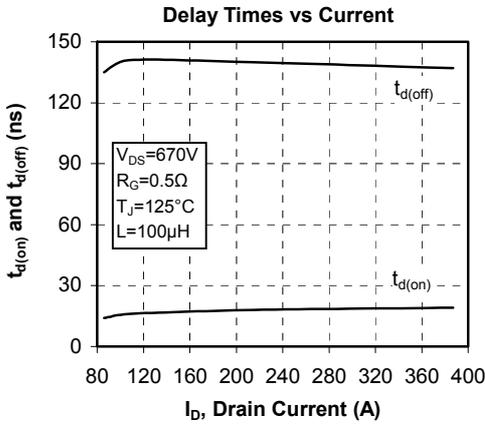
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V <sub>RRM</sub>	Maximum Repetitive Reverse Voltage		1200			V
I <sub>RM</sub>	Maximum Reverse Leakage Current	V <sub>R</sub> = 1200V	T <sub>j</sub> = 25°C		600	μA
			T <sub>j</sub> = 125°C		2000	
I <sub>F</sub>	DC Forward Current	T <sub>j</sub> = 80°C		360		A
V <sub>F</sub>	Diode Forward Voltage	I <sub>F</sub> = 360A		2.5	3	V
		I <sub>F</sub> = 720A		3		
		I <sub>F</sub> = 360A	T <sub>j</sub> = 125°C		1.8	
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> = 360A V <sub>R</sub> = 800V di/dt = 1200A/μs	T <sub>j</sub> = 25°C		265	ns
			T <sub>j</sub> = 125°C		350	
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt = 1200A/μs	T <sub>j</sub> = 25°C		3.3	μC
			T <sub>j</sub> = 125°C		17.3	



## Typical Performance Curve







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