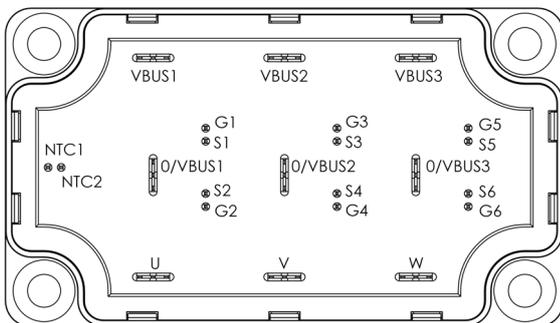
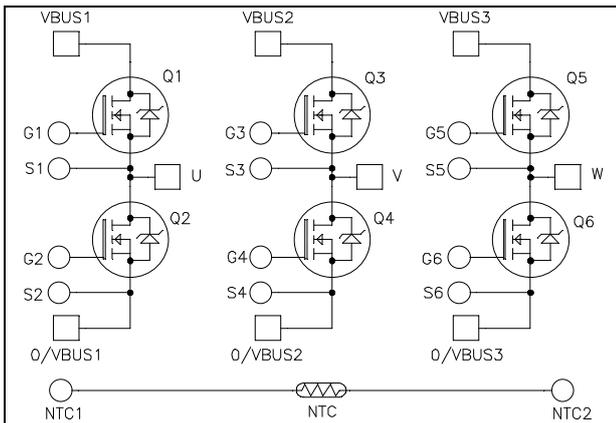


*Triple phase leg  
Super Junction MOSFET  
Power Module*

$V_{DSS} = 900V$   
 $R_{DSon} = 60m\Omega \text{ max @ } T_j = 25^\circ C$   
 $I_D = 59A \text{ @ } T_c = 25^\circ C$



### Application

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

### Features

- **COOLMOS** Power Semiconductors
  - Ultra low  $R_{DSon}$
  - Low Miller capacitance
  - Ultra low gate charge
  - Avalanche energy rated
  - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
  - Symmetrical design
  - Lead frames for power connections
- High level of integration
- Internal thermistor for temperature monitoring

### Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Very low (12mm) profile
- Each leg can be easily paralleled to achieve a phase leg of three times the current capability
- Module can be configured as a three phase bridge
- Module can be configured as a boost followed by a full bridge
- RoHS Compliant

### Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
$V_{DSS}$	Drain - Source Breakdown Voltage	900	V
$I_D$	Continuous Drain Current	$T_c = 25^\circ C$	59
		$T_c = 80^\circ C$	44
$I_{DM}$	Pulsed Drain current	150	A
$V_{GS}$	Gate - Source Voltage	$\pm 20$	V
$R_{DSon}$	Drain - Source ON Resistance	60	$m\Omega$
$P_D$	Maximum Power Dissipation	$T_c = 25^\circ C$	462
$I_{AR}$	Avalanche current (repetitive and non repetitive)	8.8	A
$E_{AR}$	Repetitive Avalanche Energy	2.9	mJ
$E_{AS}$	Single Pulse Avalanche Energy	1940	

**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
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 900V$			200	$\mu\text{A}$
		$T_j = 25^\circ\text{C}$		1000		
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 52A$		50	60	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 6\text{mA}$	2.5	3	3.5	V
$I_{GSS}$	Gate – Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$			200	nA

**Dynamic Characteristics**

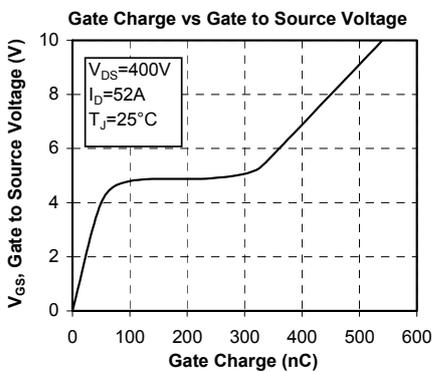
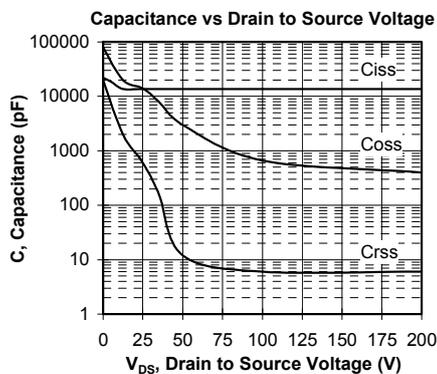
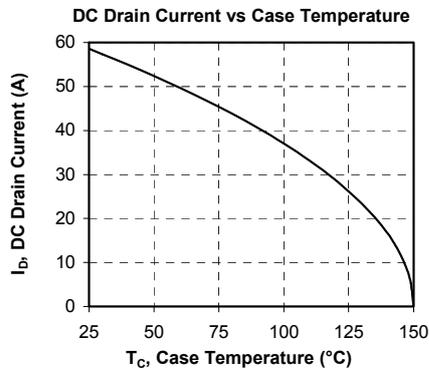
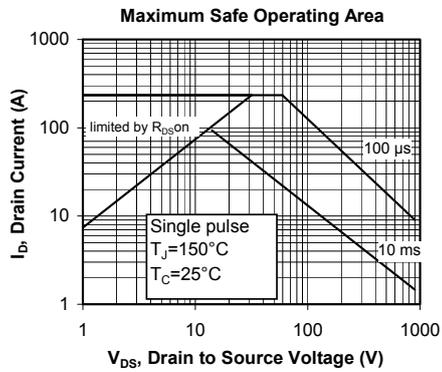
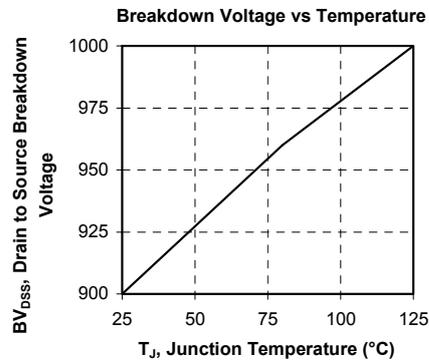
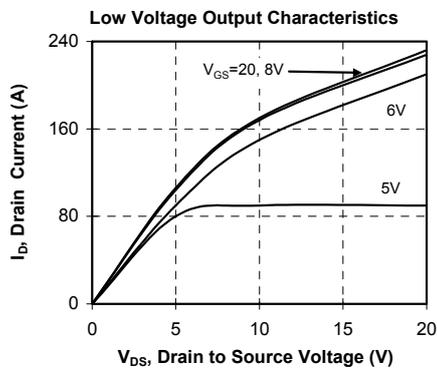
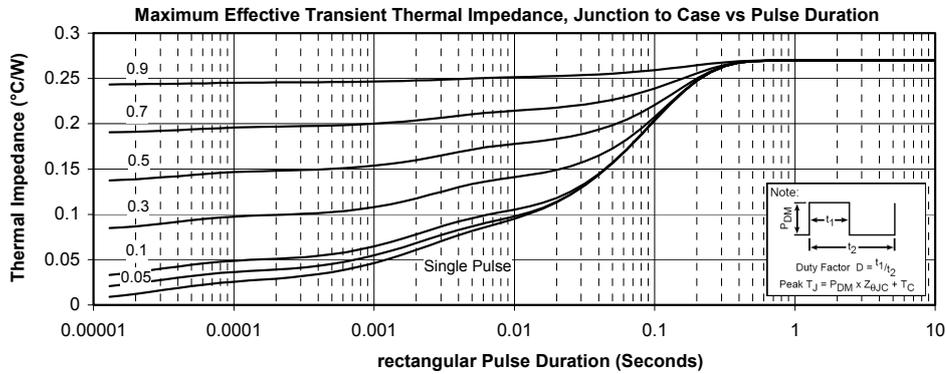
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$C_{iss}$	Input Capacitance	$V_{GS} = 0V ; V_{DS} = 100V$ $f = 1\text{MHz}$		13.6		nF
$C_{oss}$	Output Capacitance			0.66		
$Q_g$	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 400V$ $I_D = 52A$		540		nC
$Q_{gs}$	Gate – Source Charge			64		
$Q_{gd}$	Gate – Drain Charge			230		
$T_{d(on)}$	Turn-on Delay Time	<b>Inductive Switching (<math>125^\circ\text{C}</math>)</b> $V_{GS} = 10V$ $V_{Bus} = 600V$ $I_D = 52A$ $R_G = 3.8\Omega$		70		ns
$T_r$	Rise Time			20		
$T_{d(off)}$	Turn-off Delay Time			400		
$T_f$	Fall Time			25		
$E_{on}$	Turn-on Switching Energy	<b>Inductive switching @ <math>25^\circ\text{C}</math></b> $V_{GS} = 10V ; V_{Bus} = 600V$ $I_D = 52A ; R_G = 3.8\Omega$		3		mJ
$E_{off}$	Turn-off Switching Energy			1.5		
$E_{on}$	Turn-on Switching Energy	<b>Inductive switching @ <math>125^\circ\text{C}</math></b> $V_{GS} = 10V ; V_{Bus} = 600V$ $I_D = 52A ; R_G = 3.8\Omega$		4.2		mJ
$E_{off}$	Turn-off Switching Energy			1.7		

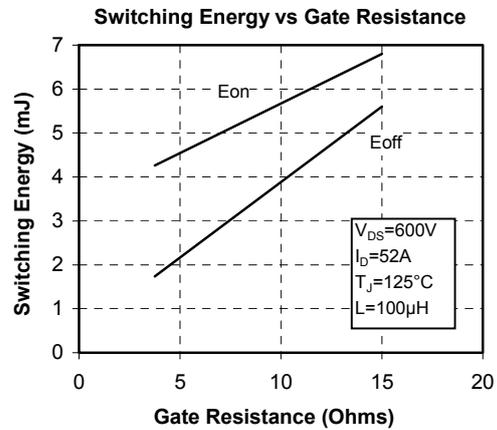
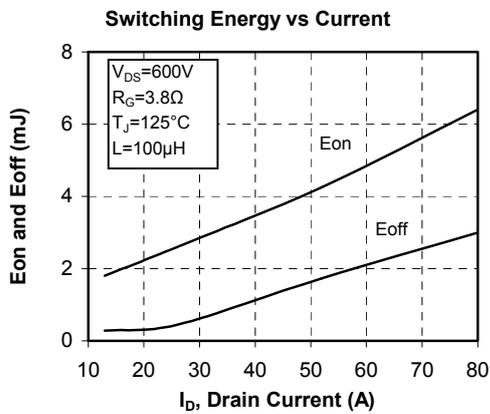
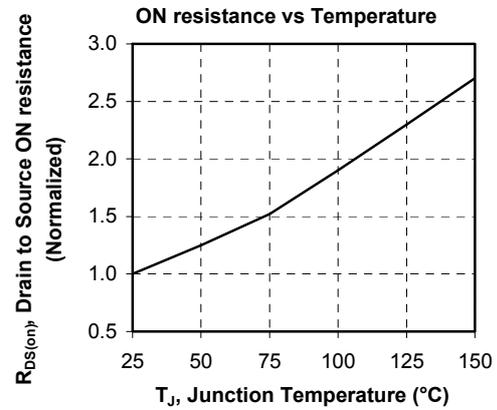
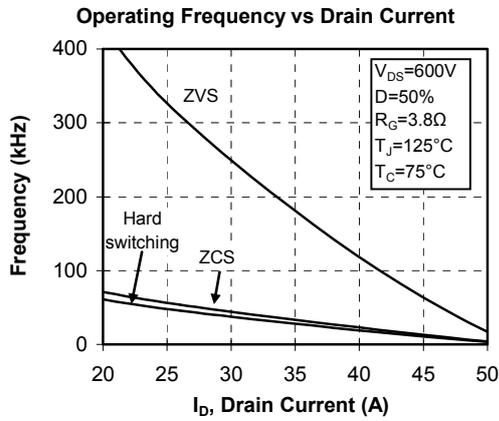
**Source - Drain diode ratings and characteristics**

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
$I_S$	Continuous Source current (Body diode)		$T_c = 25^\circ\text{C}$		59	A
			$T_c = 80^\circ\text{C}$		44	
$V_{SD}$	Diode Forward Voltage	$V_{GS} = 0V, I_S = -52A$		0.8	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_S = -52A$ $V_R = 400V$ $di_s/dt = 200A/\mu\text{s}$	$T_j = 25^\circ\text{C}$		920	ns
$Q_{rr}$	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$		60	$\mu\text{C}$



## Typical Performance Curve





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