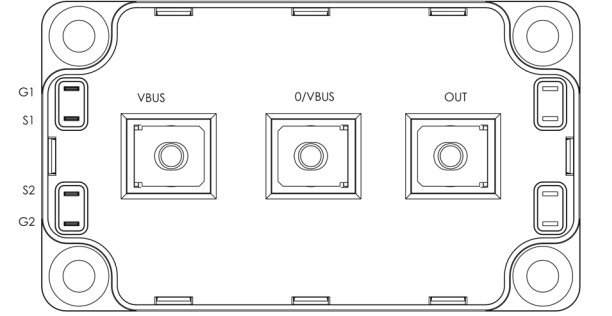
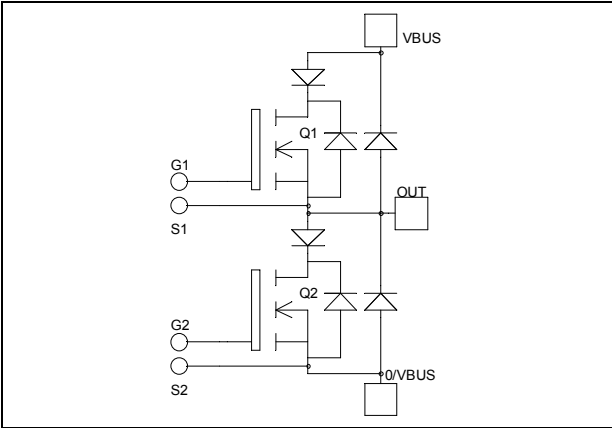


*Phase leg
Series & SiC parallel diodes
MOSFET Power Module*

$V_{DSS} = 1000V$
 $R_{DSon} = 130m\Omega$ typ @ $T_j = 25^\circ C$
 $I_D = 65A$ @ $T_c = 25^\circ C$



Application

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

Features

- **Power MOS 7[®] MOSFETs**
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Avalanche energy rated
 - Very rugged
- **Parallel SiC Schottky Diode**
 - Zero reverse recovery
 - Zero forward recovery
 - Temperature Independent switching behavior
 - Positive temperature coefficient on VF
- 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 @ $T_j = 25^\circ C$ unless otherwise specified

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	1000	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	65
		$T_c = 80^\circ C$	49
I_{DM}	Pulsed Drain current	240	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	156	m Ω
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	1250
I_{AR}	Avalanche current (repetitive and non repetitive)	24	A
E_{AR}	Repetitive Avalanche Energy	30	mJ
E_{AS}	Single Pulse Avalanche Energy	1300	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on www.microsemi.com

Electrical Characteristics

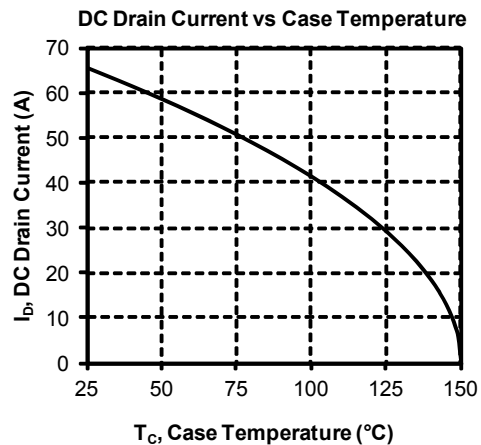
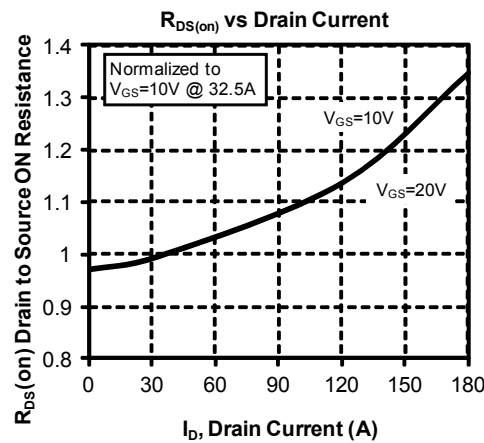
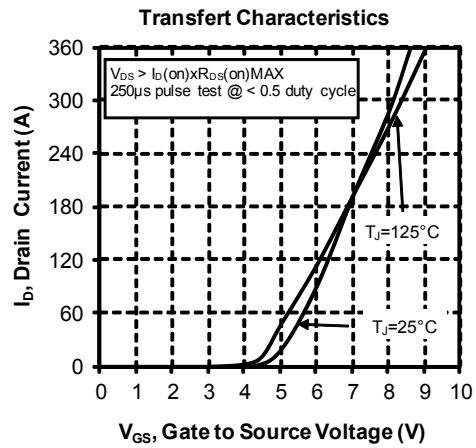
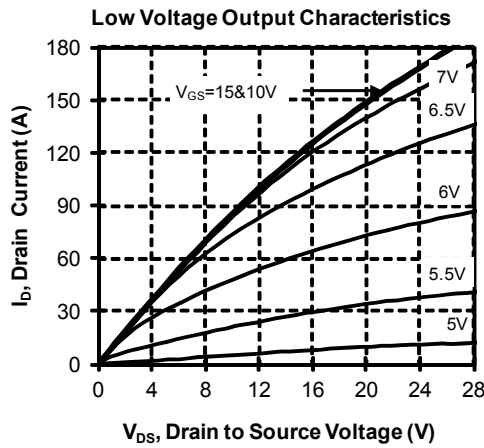
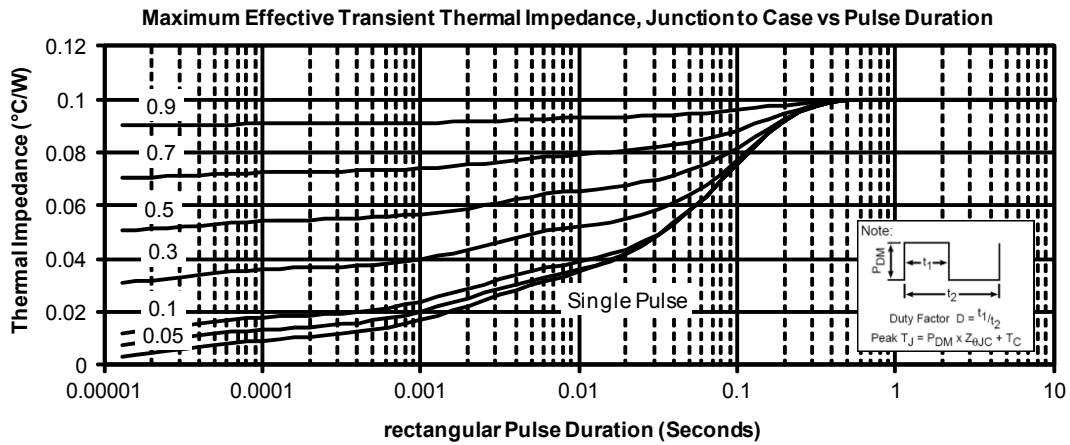
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} = 0V, V _{DS} = 1000V			600	μA
		V _{GS} = 0V, V _{DS} = 800V			2	mA
R _{DS(on)}	Drain – Source on Resistance	V _{GS} = 10V, I _D = 32.5A		130	156	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 6mA	3		5	V
I _{GSS}	Gate – Source Leakage Current	V _{GS} = ±30 V, V _{DS} = 0V			±450	nA

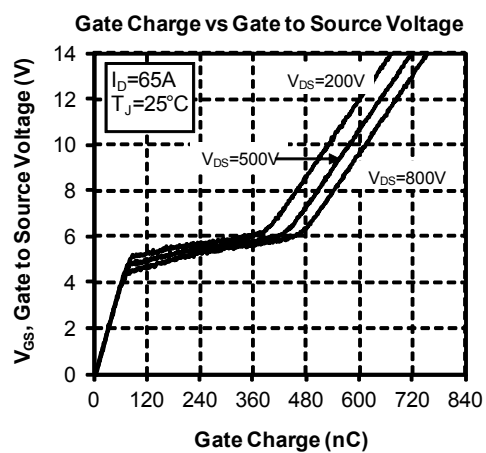
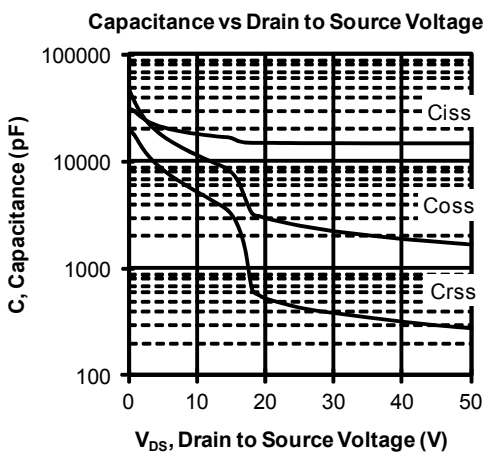
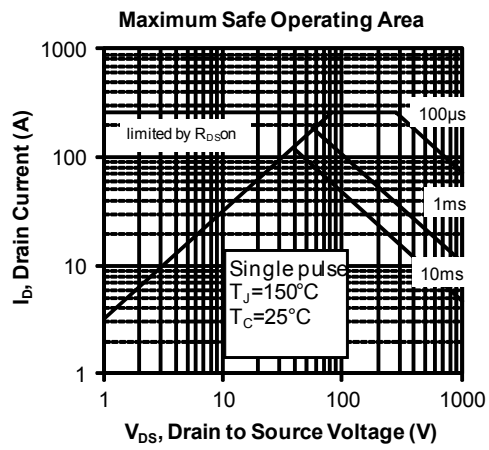
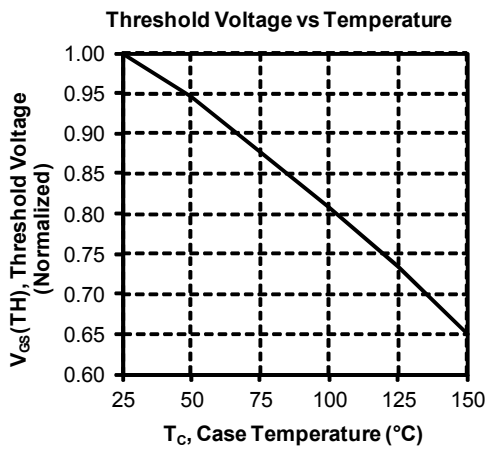
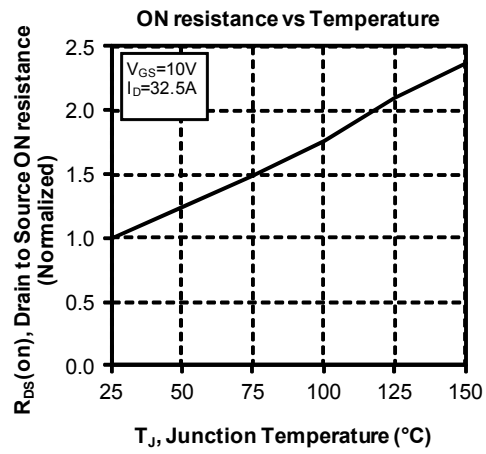
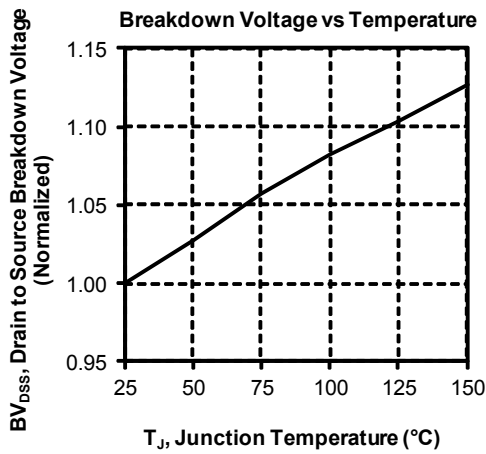
Dynamic Characteristics

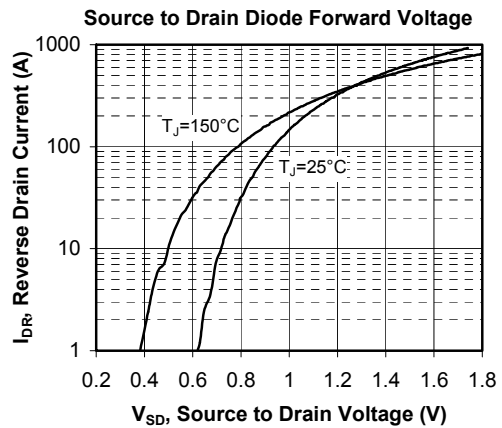
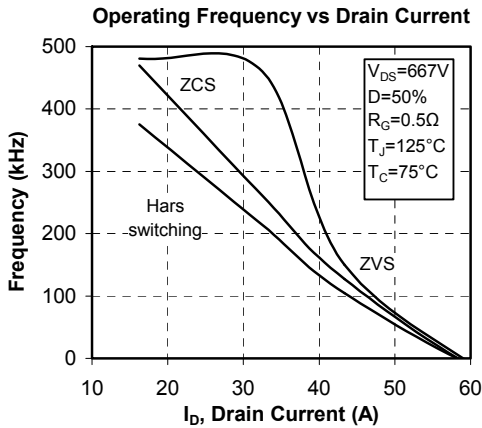
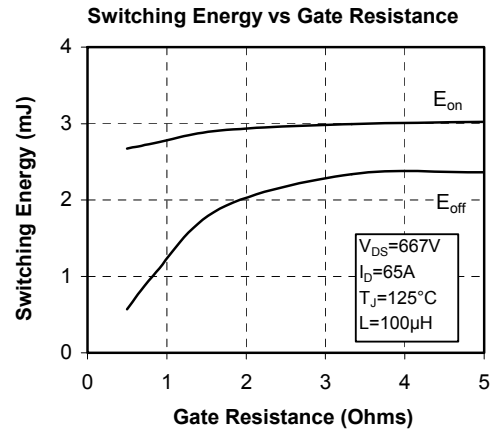
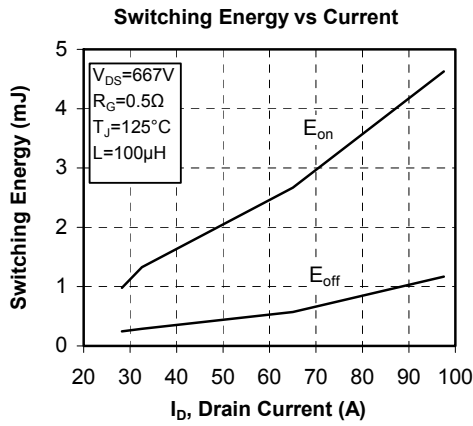
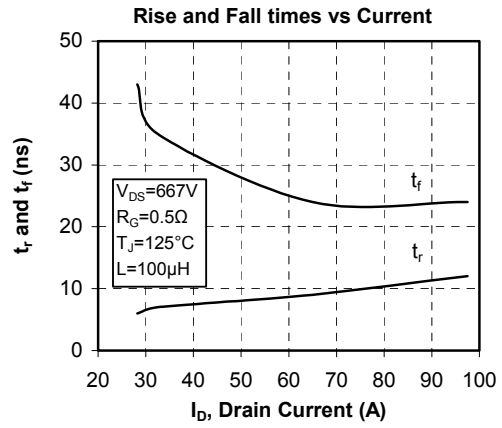
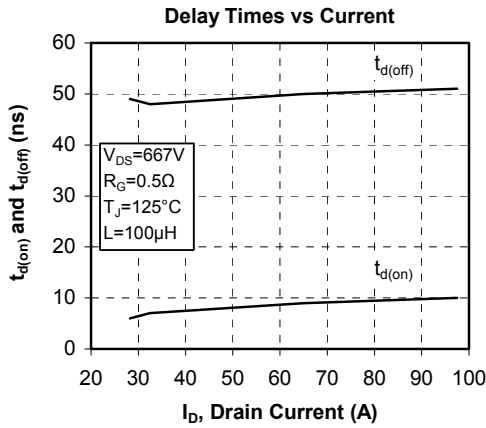
Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C _{iss}	Input Capacitance	V _{GS} = 0V		15.2		nF
C _{oss}	Output Capacitance	V _{DS} = 25V		2.6		
C _{rss}	Reverse Transfer Capacitance	f = 1MHz		0.42		
Q _g	Total gate Charge	V _{GS} = 10V		562		nC
Q _{gs}	Gate – Source Charge	V _{Bus} = 500V		75		
Q _{gd}	Gate – Drain Charge	I _D = 65A		363		
T _{d(on)}	Turn-on Delay Time	Inductive switching @125°C		9		ns
T _r	Rise Time	V _{GS} = 15V		9		
T _{d(off)}	Turn-off Delay Time	V _{Bus} = 667V		50		
T _f	Fall Time	I _D = 65A R _G = 0.5Ω		24		
E _{on}	Turn-on Switching Energy	Inductive switching @ 25°C		1278		μJ
E _{off}	Turn-off Switching Energy	V _{GS} = 15V, V _{Bus} = 667V I _D = 65A, R _G = 0.5Ω		462		
E _{on}	Turn-on Switching Energy	Inductive switching @ 125°C		2671		μJ
E _{off}	Turn-off Switching Energy	V _{GS} = 15V, V _{Bus} = 667V I _D = 65A, R _G = 0.5Ω		570		
R _{thJC}	Junction to Case Thermal Resistance				0.1	°C/W

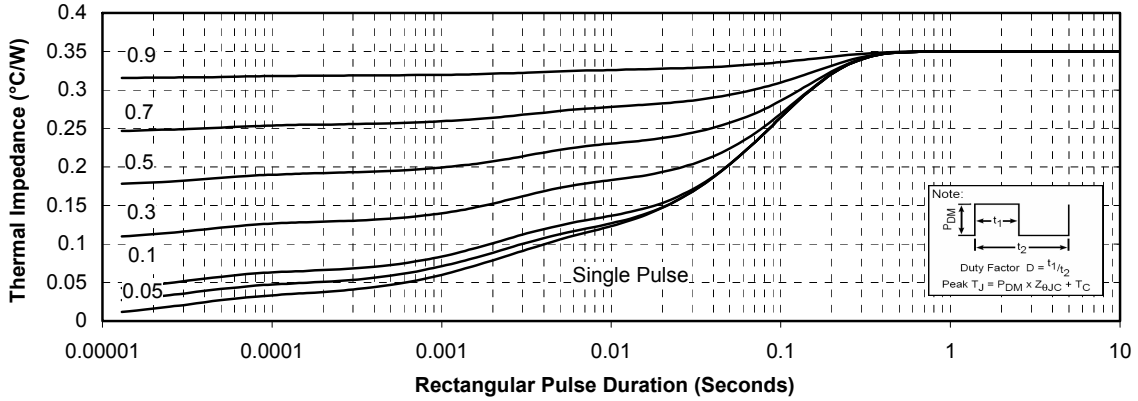
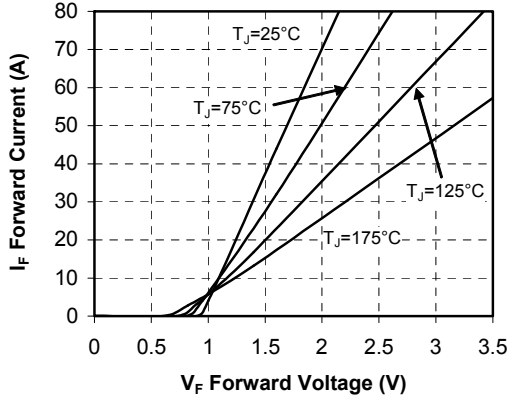
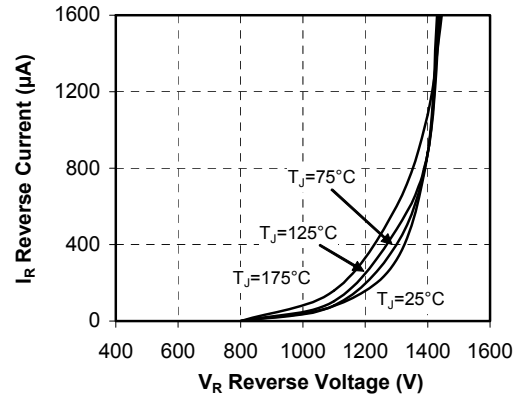
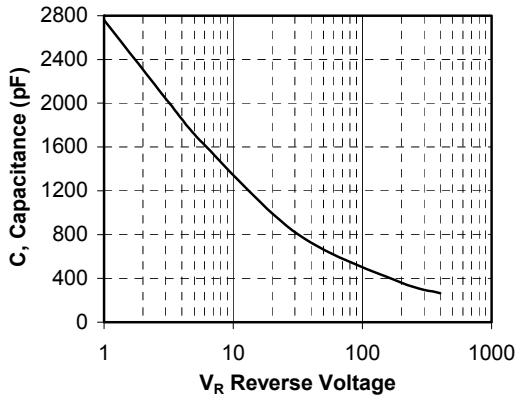
Series diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V _{RRM}	Maximum Repetitive Reverse Voltage		1000			V
I _{RM}	Maximum Reverse Leakage Current	V _R = 1000V			350	μA
I _F	DC Forward Current	T _c = 100°C		120		A
V _F	Diode Forward Voltage	I _F = 120A		1.9	2.5	V
		I _F = 240A		2.2		
		I _F = 120A	T _j = 125°C		1.7	
t _{rr}	Reverse Recovery Time	I _F = 120A V _R = 667V	T _j = 25°C		280	ns
			T _j = 125°C		350	
Q _{rr}	Reverse Recovery Charge	di/dt = 400A/μs	T _j = 25°C		1520	nC
			T _j = 125°C		7200	
R _{thJC}	Junction to Case Thermal Resistance				0.46	°C/W

Typical MOSFET Performance Curve






Typical SiC Diode Performance Curve
Maximum Effective Transient Thermal Impedance, Junction to Case vs Pulse Duration

Forward Characteristics

Reverse Characteristics

Capacitance vs. Reverse Voltage


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