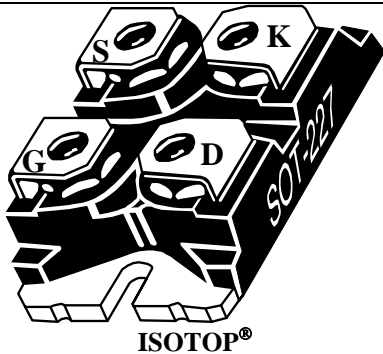
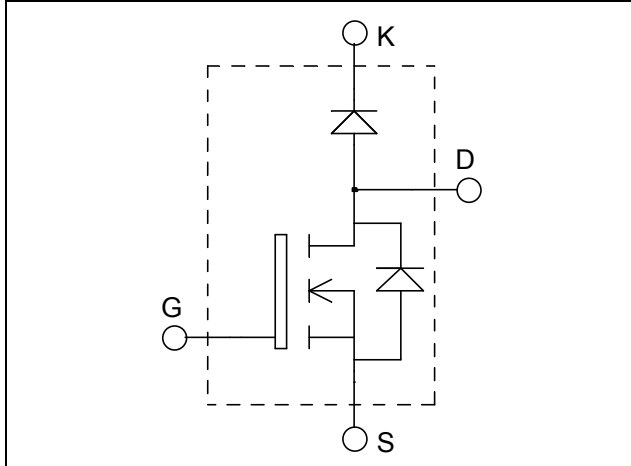


**ISOTOP[®] Boost chopper
Super Junction MOSFET
SiC chopper diode**

$V_{DSS} = 900V$
 $R_{DSon} = 120m\Omega \text{ max @ } T_j = 25^\circ C$
 $I_D = 33A \text{ @ } T_c = 25^\circ C$



Application

- AC and DC motor control
- Switched Mode Power Supplies
- Power Factor Correction
- Brake switch

Features

- **COOLMOS[®]**
Power Semiconductors
 - Ultra low R_{DSon}
 - Low Miller capacitance
 - Ultra low gate charge
 - Avalanche energy rated
- **SiC Schottky Diode**
 - Zero reverse recovery
 - Zero forward recovery
 - Temperature Independent switching behavior
 - Positive temperature coefficient on VF
- ISOTOP[®] Package (SOT-227)
- Very low stray inductance
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Stable temperature behavior
- Very rugged
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive T_c of V_{CEsat}
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	900	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	33
		$T_c = 80^\circ C$	25
I_{DM}	Pulsed Drain current	75	A
V_{GS}	Gate - Source Voltage	± 20	V
R_{DSon}	Drain - Source ON Resistance	120	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	290
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

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	$V_{GS} = 0V, V_{DS} = 900V$	$T_j = 25^\circ\text{C}$			100	μA
		$V_{GS} = 0V, V_{DS} = 900V$	$T_j = 125^\circ\text{C}$		500		
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 26A$		100	120	$\text{m}\Omega$	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 3\text{mA}$	2.5	3	3.5	V	
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$			100	nA	

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V ; V_{DS} = 100V$ $f = 1\text{MHz}$		6.8		nF
C_{oss}	Output Capacitance			0.33		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 400V$ $I_D = 26A$		270		nC
Q_{gs}	Gate – Source Charge			32		
Q_{gd}	Gate – Drain Charge			115		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GS} = 10V$ $V_{Bus} = 600V$ $I_D = 26A$ $R_G = 7.5\Omega$		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	Inductive switching @ 25°C $V_{GS} = 10V ; V_{Bus} = 600V$ $I_D = 26A ; R_G = 7.5\Omega$		0.9		mJ
E_{off}	Turn-off Switching Energy			0.75		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C $V_{GS} = 10V ; V_{Bus} = 600V$ $I_D = 26A ; R_G = 7.5\Omega$		1.3		mJ
E_{off}	Turn-off Switching Energy			0.85		

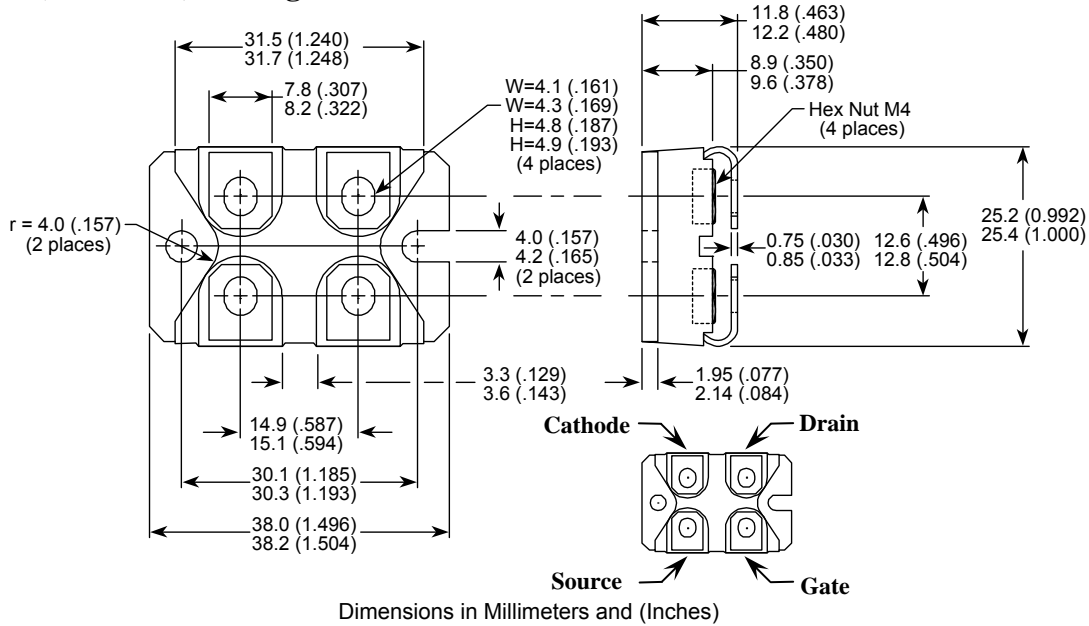
SiC chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		1200			V	
I_{RM}	Maximum Reverse Leakage Current	$V_R = 1200V$	$T_j = 25^\circ\text{C}$		32	200	μA
			$T_j = 175^\circ\text{C}$		56	1000	
I_F	DC Forward Current			10		A	
V_F	Diode Forward Voltage	$I_F = 10A$	$T_j = 25^\circ\text{C}$		1.6	1.8	V
			$T_j = 175^\circ\text{C}$		2.3	3	
Q_C	Total Capacitive Charge	$I_F = 10A, V_R = 600V$ $di/dt = 500A/\mu\text{s}$		40		nC	
C	Total Capacitance	$f = 1\text{MHz}, V_R = 200V$		96		pF	
		$f = 1\text{MHz}, V_R = 400V$		69			

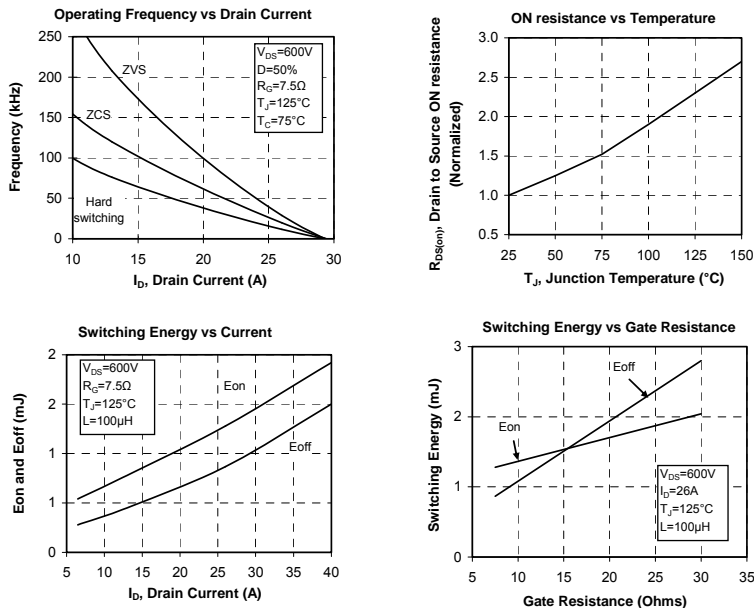
Thermal and package characteristics

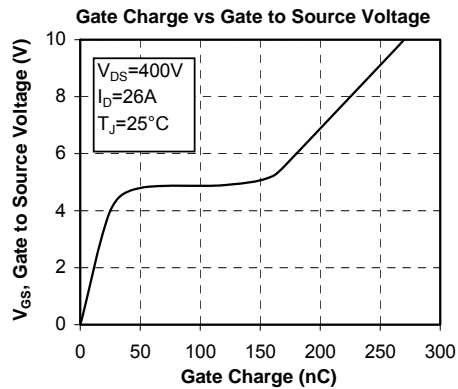
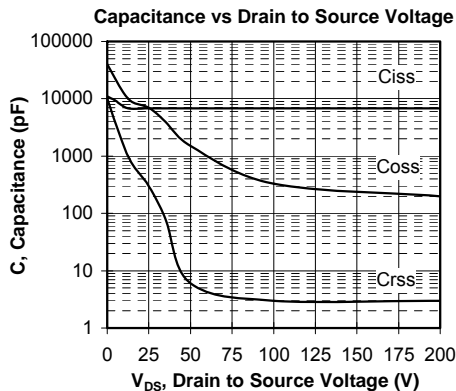
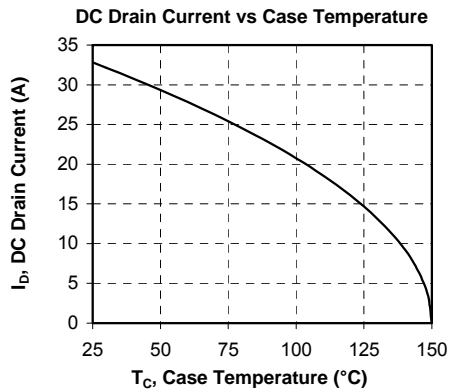
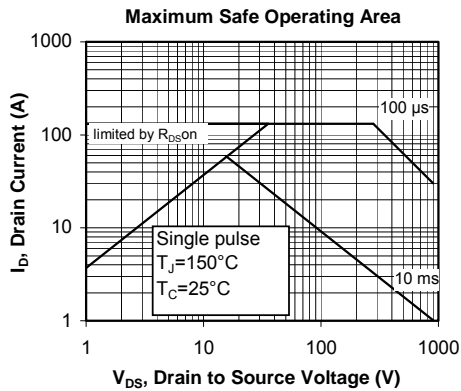
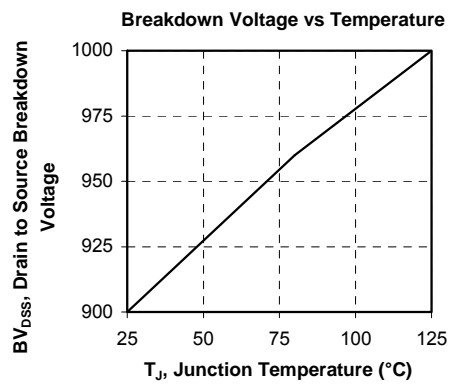
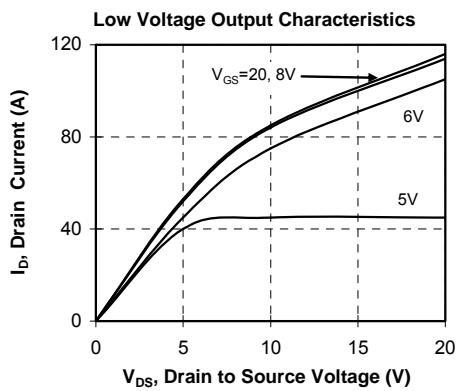
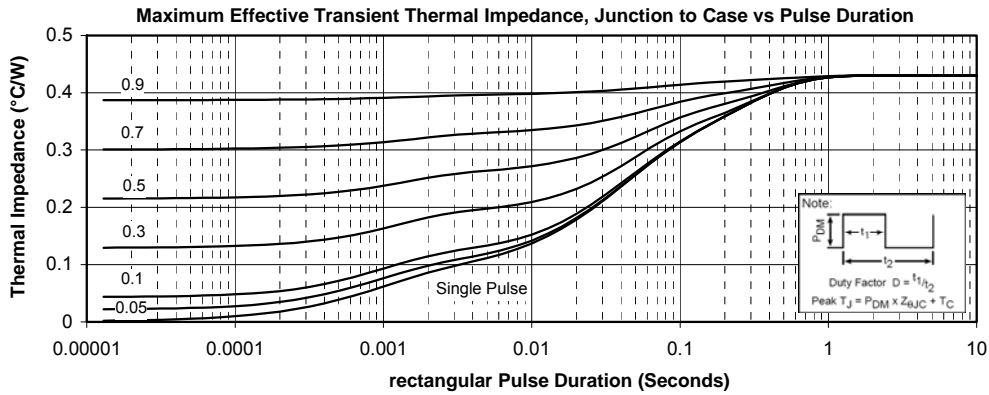
Symbol	Characteristic	Min	Typ	Max	Unit
R_{thJC}	Junction to Case Thermal Resistance	CoolMOS		0.43	°C/W
		SiC Diode		1.65	
R_{thJA}	Junction to Ambient (IGBT & Diode)			20	
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t=1$ min, $I_{isol}<1$ mA, 50/60Hz	2500			V
T_J, T_{STG}	Storage Temperature Range	-40		150	°C
T_L	Max Lead Temp for Soldering: 0.063" from case for 10 sec			300	
Torque	Mounting torque (Mounting = 8-32 or 4mm Machine and terminals = 4mm Machine)			1.5	N.m
Wt	Package Weight		29.2		g

SOT-227 (ISOTOP®) Package Outline

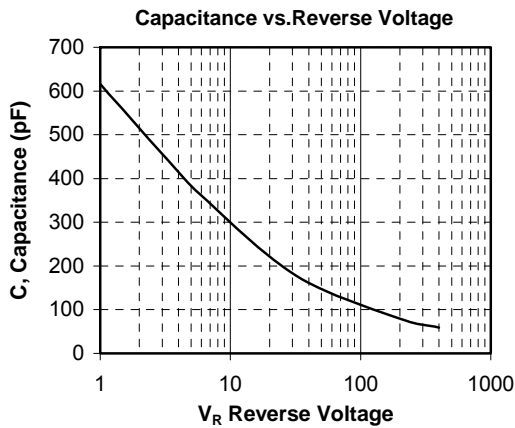
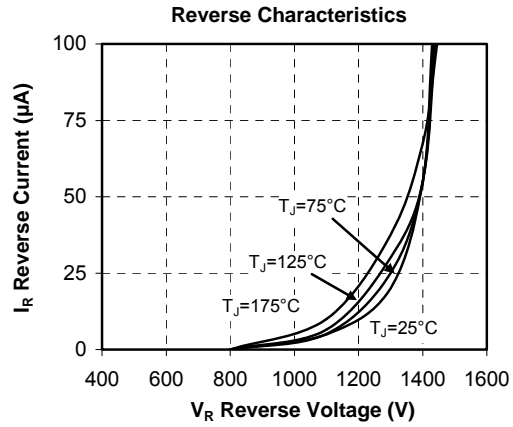
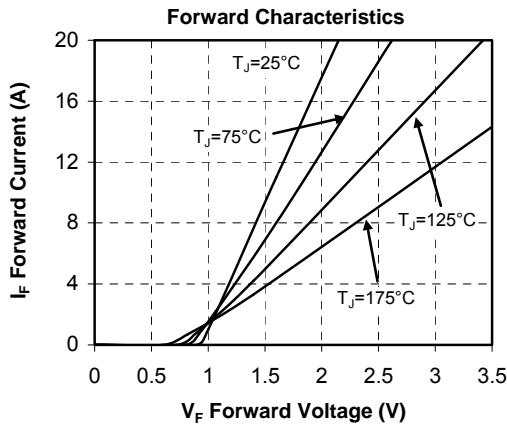
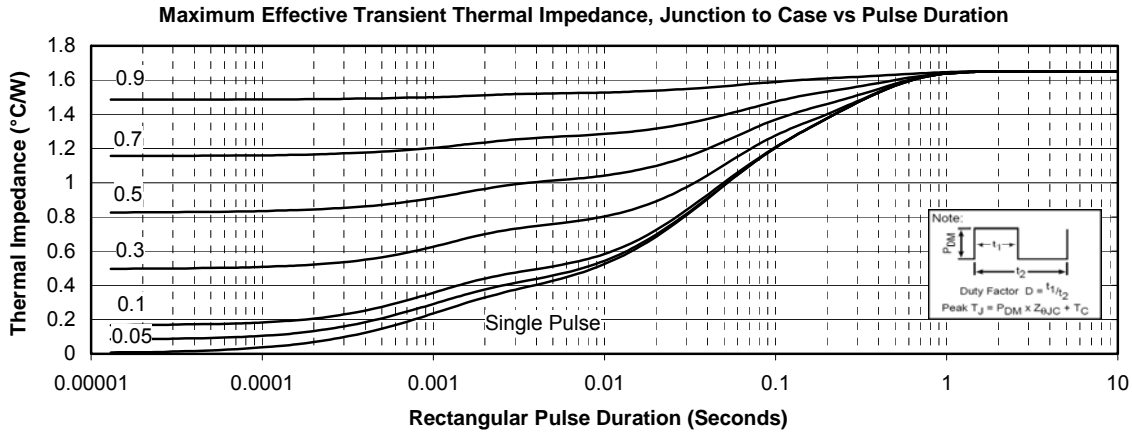


Typical CoolMOS performance Curve





Typical SiC Chopper diode performance Curve



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