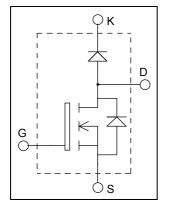
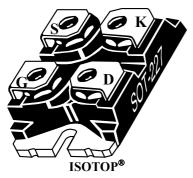


ISOTOP[®] Boost chopper MOSFET + SiC chopper diode Power module





$\begin{vmatrix} V_{DSS} = 500V \\ R_{DSon} = 65m\Omega \text{ Max } @ \text{ Tj} = 25^{\circ}\text{C} \\ I_D = 58\text{ } @ \text{ Tc} = 25^{\circ}\text{C} \end{vmatrix}$

Application

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

Features

- Power MOS 8TM MOSFET
 - Low R_{DSon}
 - Low input and Miller capacitance
 - 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 TC of VCEsat
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter		Max ratings	Unit
V _{DSS}	Drain - Source Breakdown Voltage		500	V
т	Continuous Drain Current	$T_c = 25^{\circ}C$	58	
I _D	Continuous Drain Current	$T_c = 80^{\circ}C$	43	А
I _{DM}	Pulsed Drain current		270	
V _{GS}	Gate - Source Voltage		±30	V
R _{DSon}	Drain - Source ON Resistance		65	mΩ
P _D	Maximum Power Dissipation	$T_c = 25^{\circ}C$	543	W
I _{AR}	Avalanche current (repetitive and non repetitive)		42	А

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



All ratings (a) $T_j = 25^{\circ}C$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Тур	Max	Unit
т	Zero Gate Voltage Drain Current	$V_{\rm DS} = 500 {\rm V}$	$T_j = 25^{\circ}C$			250	μA
I _{DSS}	Zero Gate voltage Drain Current	$V_{GS} = 0V$	$T_{j} = 125^{\circ}C$			1000	μΑ
R _{DS(on)}	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 42A$				65	mΩ
V _{GS(th)}	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 2.5 \text{mA}$		3	4	5	V
I _{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30 \text{ V}$				±100	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Тур	Max	Unit
C _{iss}	Input Capacitance	$V_{GS} = 0V$		10800		
C _{oss}	Output Capacitance	$V_{\rm DS} = 25 V$		1164		pF
C _{rss}	Reverse Transfer Capacitance	f = 1MHz		148		
Qg	Total gate Charge	$V_{GS} = 10V$		340		
Q _{gs}	Gate – Source Charge	$V_{Bus} = 250V$		75		nC
Q_{gd}	Gate – Drain Charge	$I_D = 42A$		155		
T _{d(on)}	Turn-on Delay Time	Resistive switching @ 25°C		60		
T _r	Rise Time	$V_{GS} = 15V$ $V_{Bus} = 333V$ $I_D = 42A$		70		
T _{d(off)}	Turn-off Delay Time			155		ns
T_{f}	Fall Time	$R_G = 2.2\Omega$		50		

SiC chopper diode ratings and characteristics

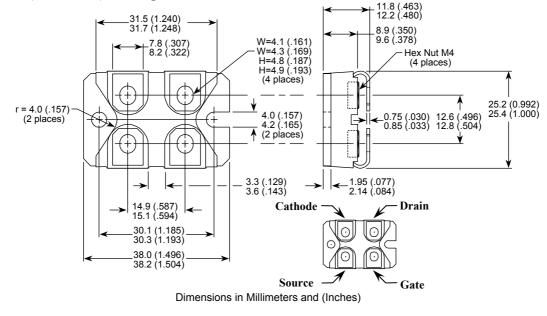
Symbol	<i>Characteristic</i>	Test Conditions		Min	Тур	Max	Unit
V _{RRM}	Maximum Peak Repetitive Reverse Voltage			600			V
I _{RM}	Maximum Reverse Leakage Current	$V_{R}=600V$	$T_j = 25^{\circ}C$		100	400	μA
I _{RM}	Waximum Reverse Leakage Current	v _R -000 v	$T_{j} = 175^{\circ}C$		200	2000	μΑ
I _F	DC Forward Current		$Tc = 100^{\circ}C$		20		А
V	Diode Forward Voltage	$I_{\rm F} = 20 {\rm A}$	$T_i = 25^{\circ}C$		1.6	1.8	V
$V_{\rm F}$	Didde Folward Voltage	$I_{\rm F} = 20 {\rm A}$	$T_{j} = 175^{\circ}C$		2	2.4	v
Qc	Total Capacitive Charge	$I_F = 20A, V_R = 300V$ di/dt =800A/µs			28		nC
С	Tetal Competition of	$f = 1 MHz, V_R =$	= 200V		130		тE
C	Total Capacitance	$f = 1 MHz, V_R =$	= 400V		100		pF

Thermal and package characteristics

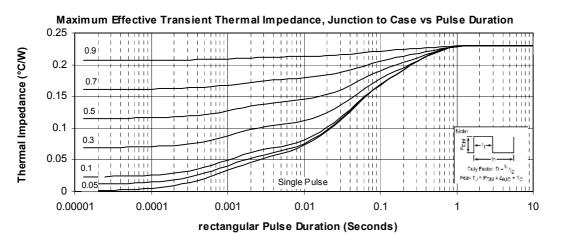
Symbol	Characteristic		Min	Тур	Max	Unit
R _{thJC}	Junction to Case Thermal Resistance	Mosfet			0.23	
	sulction to case Therman Resistance	SiC Diode			1.35	°C/W
R _{thJA}	Junction to Ambient (IGBT & Diode)				20	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, 50/60Hz		2500			V
T_J, T_{STG}	Storage Temperature Range		-40		150	°C
T _L	Max Lead Temp for Soldering:0.063" from case for 10 sec				300	C
Torque	Mounting torque (Mounting = 8-32 or 4mm Machine and terminals = 4mm Machine)				1.5	N.m
Wt	Package Weight			29.2		g



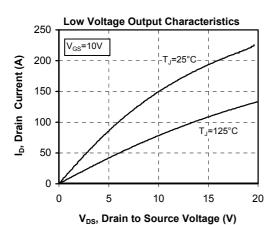
SOT-227 (ISOTOP[®]) Package Outline

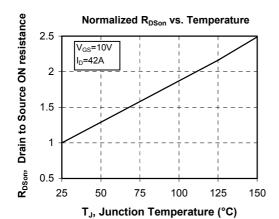


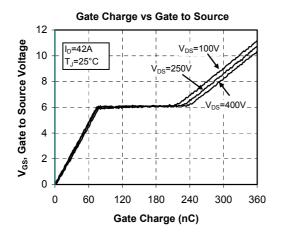
Typical Mosfet Performance Curve



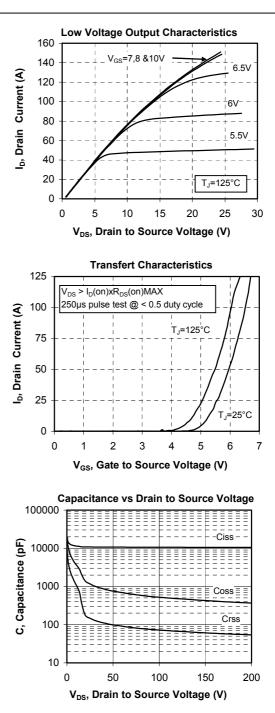








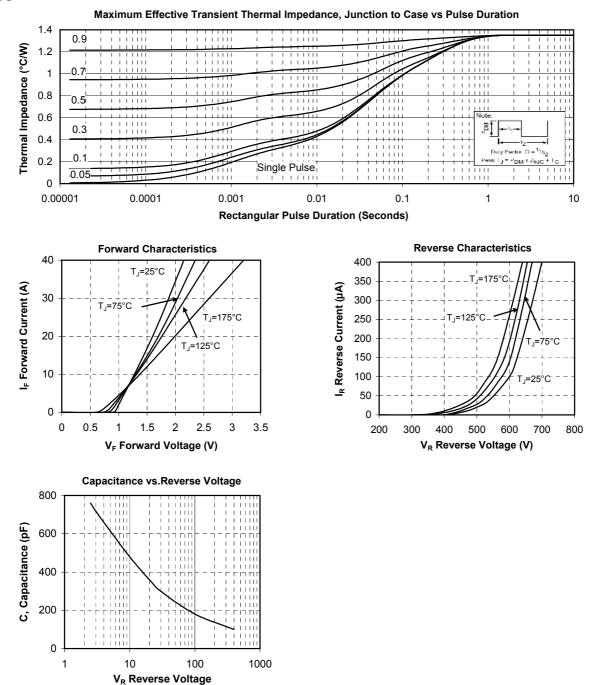




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Typical SiC Diode Performance Curve



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