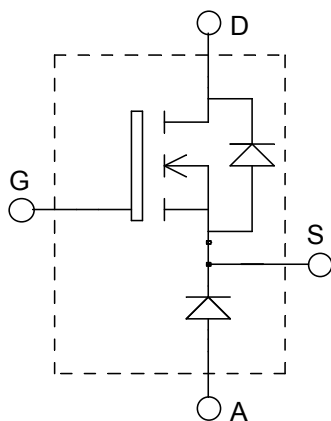


ISOTOP[®] Buck chopper MOSFET Power Module

$V_{DSS} = 500V$

$R_{DSon} = 65m\Omega \text{ Max @ } T_j = 25^\circ C$

$I_D = 58A \text{ @ } T_c = 25^\circ C$



Application

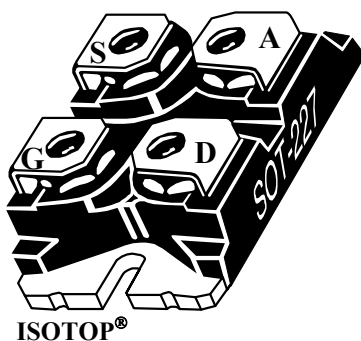
- AC and DC motor control
- Switched Mode Power Supplies

Features

- Power MOS 8TM MOSFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Avalanche energy rated
 - Very rugged
- 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 V_{CEsat}
- RoHS Compliant



Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	500	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	A
		$T_c = 80^\circ C$	
I_{DM}	Pulsed Drain current	270	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	65	m Ω
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	W
I_{AR}	Avalanche current (repetitive and non repetitive)	42	A



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	$V_{DS} = 500\text{V}$ $V_{GS} = 0\text{V}$			250	μA
		$T_j = 125^\circ\text{C}$			1000	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10\text{V}$, $I_D = 42\text{A}$			65	$\text{m}\Omega$
$V_{GS(th)}$	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	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}$		10800		pF
C_{oss}	Output Capacitance	$V_{DS} = 25\text{V}$		1164		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		148		
Q_g	Total gate Charge	$V_{GS} = 10\text{V}$		340		nC
Q_{gs}	Gate – Source Charge	$V_{Bus} = 250\text{V}$		75		
Q_{gd}	Gate – Drain Charge	$I_D = 42\text{A}$		155		
$T_{d(on)}$	Turn-on Delay Time	Resistive switching @ 25°C $V_{GS} = 15\text{V}$ $V_{Bus} = 333\text{V}$ $I_D = 42\text{A}$ $R_G = 2.2\Omega$		60		ns
T_r	Rise Time			70		
$T_{d(off)}$	Turn-off Delay Time			155		
T_f	Fall Time			50		

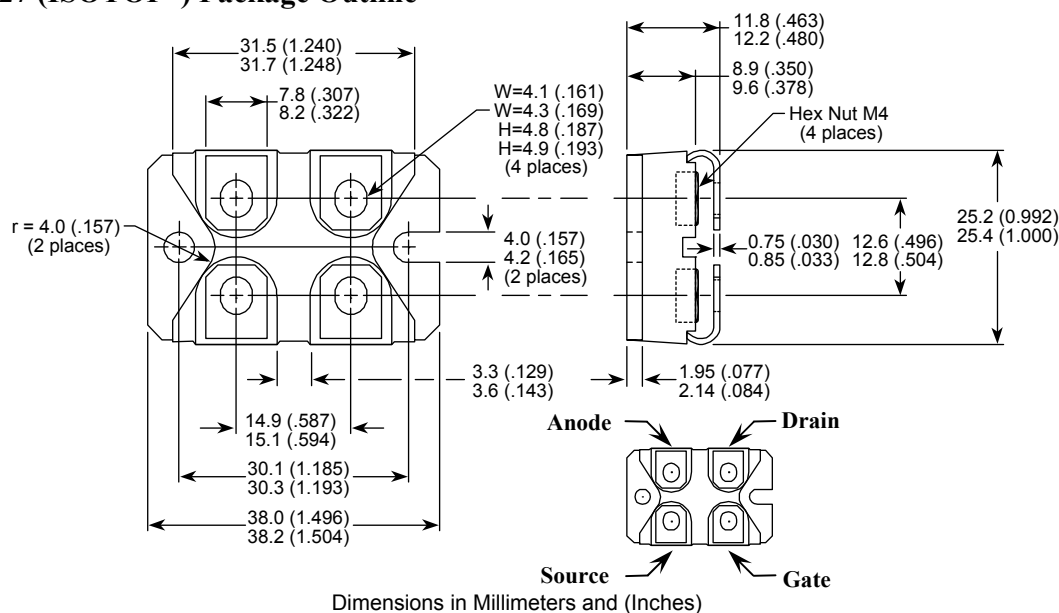
Chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage		600			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 600\text{V}$			25	μA
		$T_j = 125^\circ\text{C}$			500	
I_F	DC Forward Current	$T_c = 90^\circ\text{C}$		30		A
V_F	Diode Forward Voltage	$I_F = 30\text{A}$		1.8	2.2	V
		$I_F = 60\text{A}$		2.2		
		$I_F = 30\text{A}$, $T_j = 125^\circ\text{C}$		1.5		
t_{rr}	Reverse Recovery Time	$I_F = 30\text{A}$ $V_R = 400\text{V}$ $di/dt = 200\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$	25		ns
Q_{rr}	Reverse Recovery Charge		$T_j = 125^\circ\text{C}$	160		
			$T_j = 25^\circ\text{C}$	35		nC
			$T_j = 125^\circ\text{C}$	480		

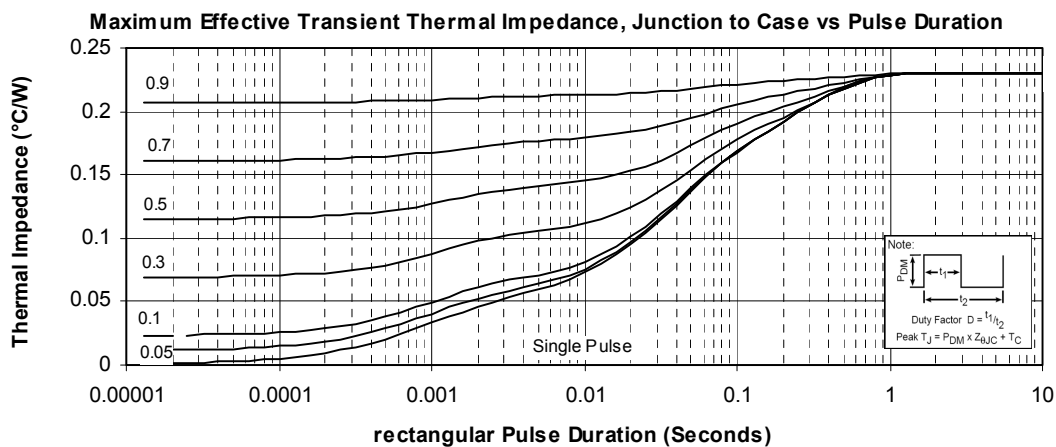
Thermal and package characteristics

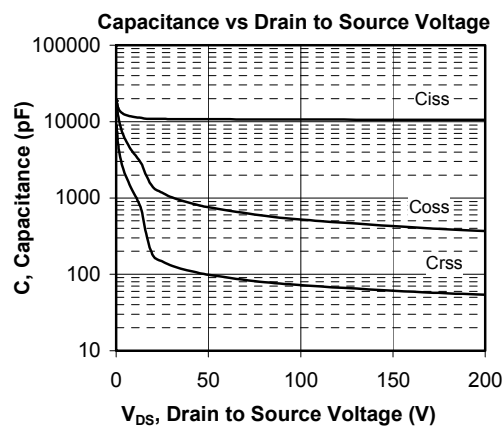
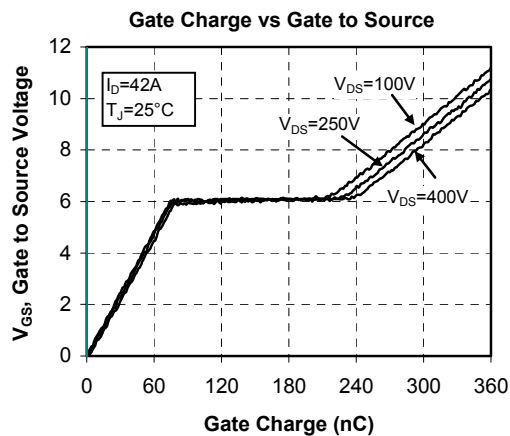
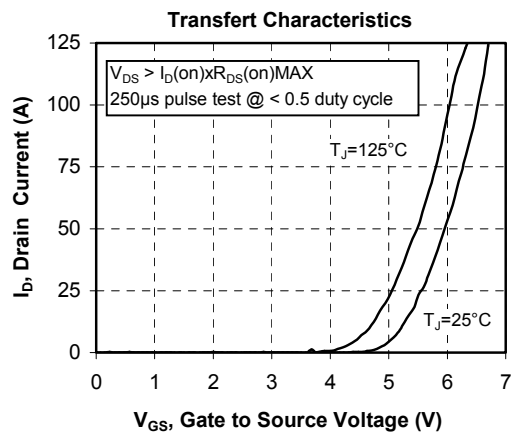
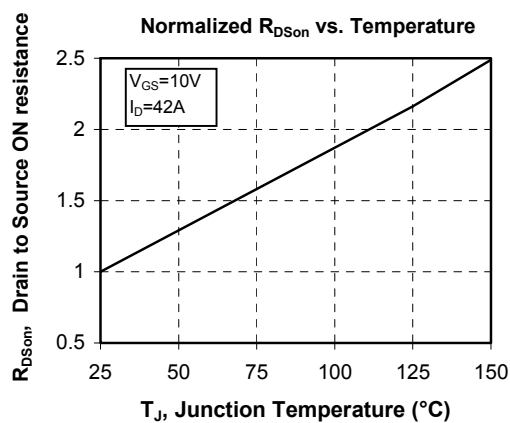
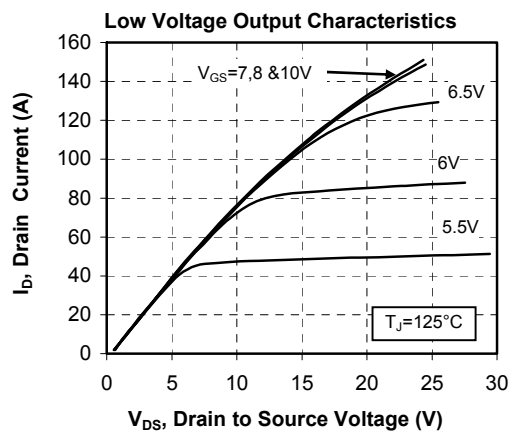
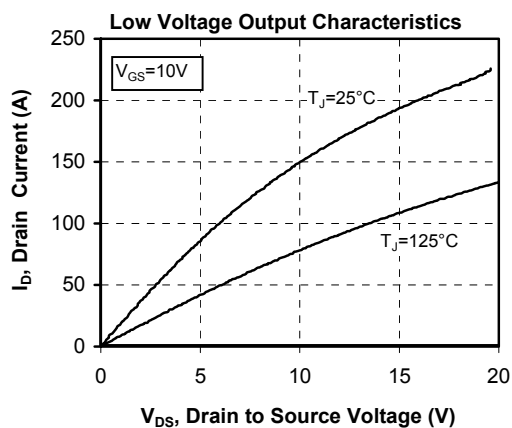
Symbol	Characteristic		Min	Typ	Max	Unit
R_{thJC}	Junction to Case Thermal Resistance	Mosfet			0.23	$^\circ\text{C}/\text{W}$
		Diode			1.05	
R_{thJA}	Junction to Ambient (IGBT & Diode)				20	$^\circ\text{C}/\text{W}$
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1\text{ min}$, 50/60Hz		2500			V
T_j, T_{STG}	Storage Temperature Range		-40		150	$^\circ\text{C}$
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

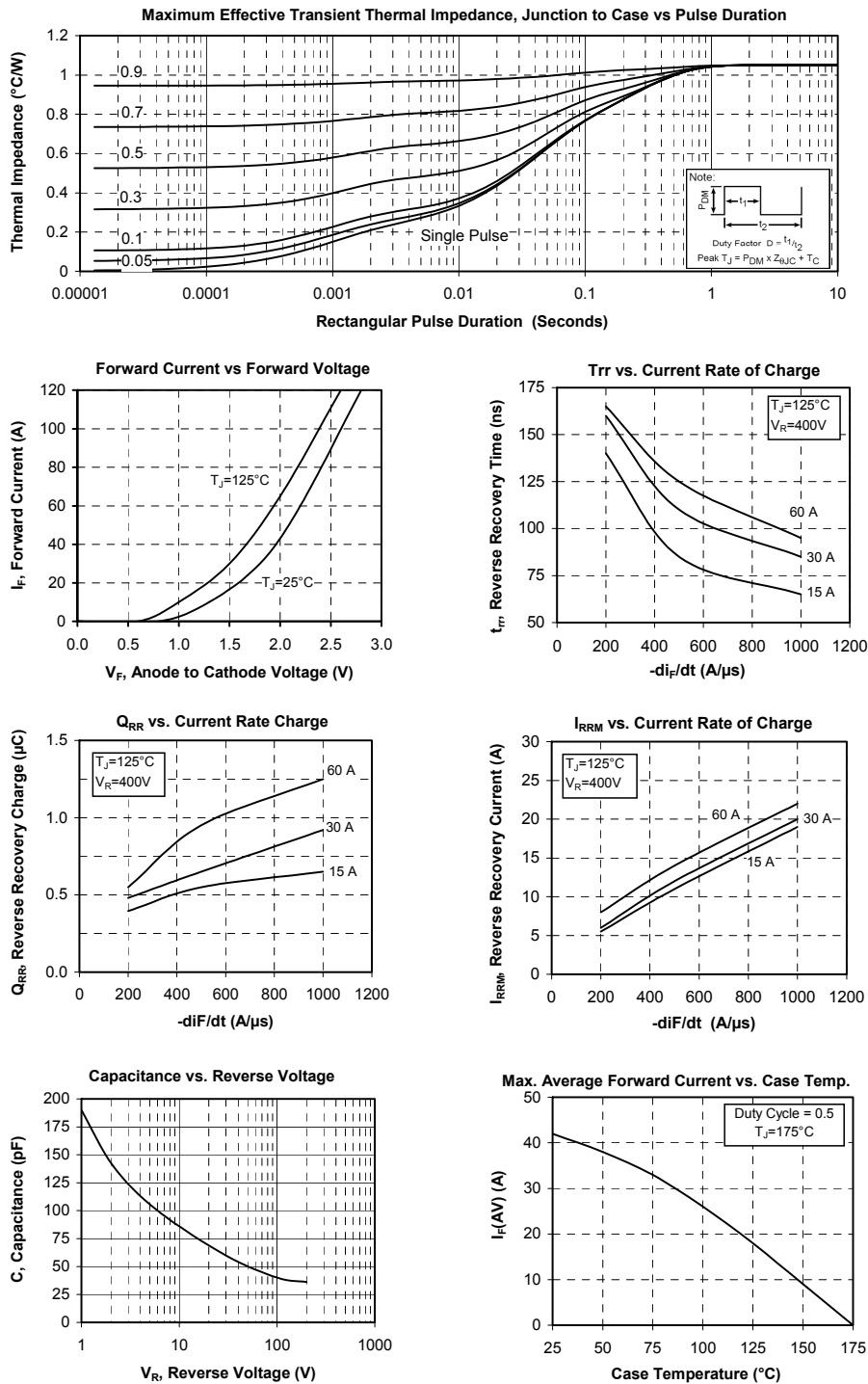


Typical Mosfet Performance Curve





Typical Diode Performance Curve



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