



N-mos With Gate Protect Diode

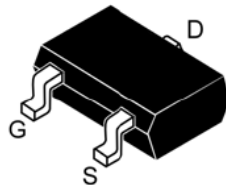
● Features

- 20V/1.5A ,
- $R_{DS(ON)}=200m\Omega(\text{typ.}) @ V_{GS}=4.5V$
- $R_{DS(ON)}=315m\Omega(\text{typ.}) @ V_{GS}=2.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- ESD Rating: 2000V HBM
- Lead Free Available (RoHS Compliant)

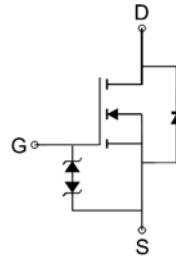
● General Description

Power Management in Notebook Computer ,
Portable Equipment and Battery Powered Systems.

● Pin Configurations



SOT23



● Absolute Maximum Ratings @ $T_A=25^\circ C$ unless otherwise noted

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate-Source Voltage		V_{GSS}	± 12	V
Continuous Drain Current($t_J=150^\circ C$)	$T_A=25^\circ C$	I_D	1.5	A
	$T_A=70^\circ C$		1.2	
Pulsed Drain Current		I_{DM}	3	A
Continuous Source Current (Diode Conduction)		I_S	0.4	A
Maximum Power Dissipation	$T_A=25^\circ C$	P_D	1.25	W
	$T_A=70^\circ C$		0.9	
Operating Junction Temperature		T_J	-55 to 150	$^\circ C$
Storage Temperature Range		T_{stg}	-55 to 150	$^\circ C$
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	125	$^\circ C/W$

Notes:

1. Pulse width limited by maximum junction temperature. Pulse test: $PW \leq 300 \mu s$, duty cycle $\leq 2\%$.



- **Electrical Characteristics @ $T_A=25^\circ\text{C}$** unless otherwise noted

Symbol	Parameter	Limit	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.45		1.2	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$			± 10	μA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=16V, V_{GS}=0V$			1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=1.5A$		200		m Ω
		$V_{GS}=2.5V, I_D=0.8A$		315		
G_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=1A$		6.5		S
V_{SD}	Diode Forward Voltage	$I_S=1.2A, V_{GS}=0V$	0.45		1.3	V
Dynamic						
Q_g	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=1.5A$		1.3	1.8	nC
Q_{gs}	Gate-Source Charge			0.2		
Q_{gd}	Gate-Drain Charge			0.28		
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		153		pF
C_{oss}	Output Capacitance			45		
C_{rss}	Reverse Transfer Capacitance			30		
$t_{d(on)}$	Turn-On Time	$V_{DS}=10V, R_L=2\Omega, I_D=1.5A,$ $V_{GEN}=4.5V, R_{GEN}=6\Omega$		7	15	ns
t_r				5	10	
$t_{d(off)}$	Turn-Off Time			13	17	
t_f				7	15	

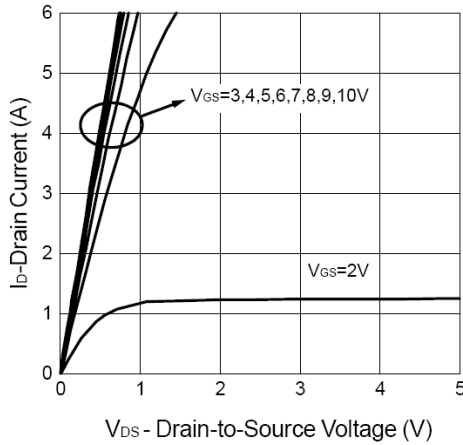
Notes:

1. Pulse width limited by maximum junction temperature. Pulse test: $PW \leq 300 \mu s$, duty cycle $\leq 2\%$.
2. For design AID only, not subject to production testing. Switching time is essentially independent of operating temperature.

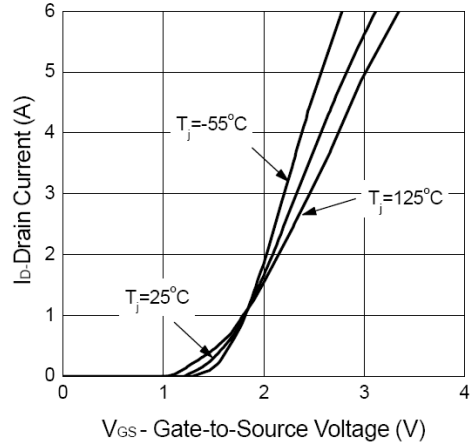


● Typical Performance Characteristics

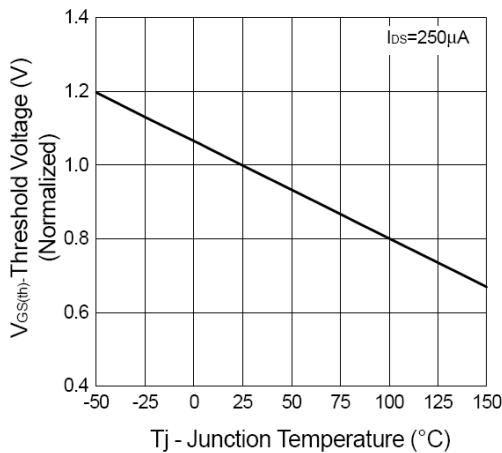
Output Characteristics



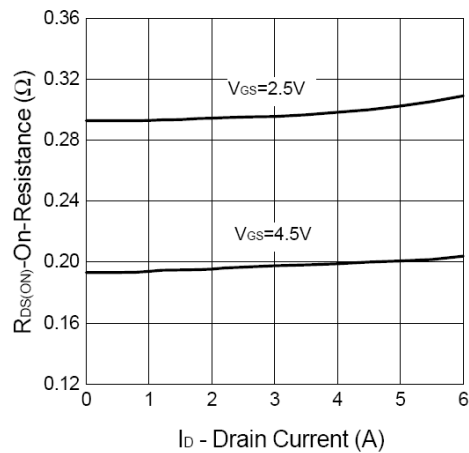
Transfer Characteristics



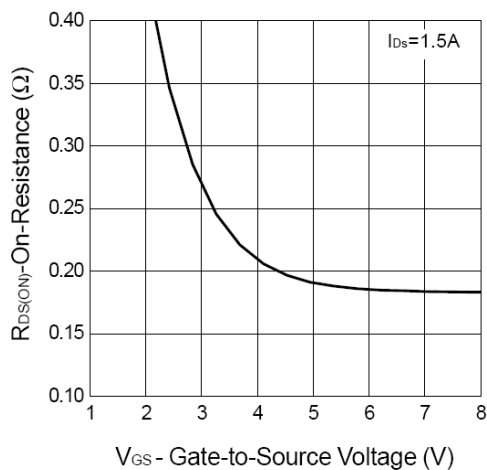
Threshold Voltage vs. Junction Temperature



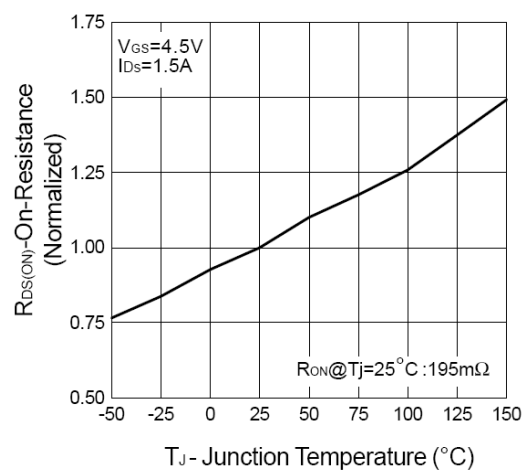
On-Resistance vs. Drain Current



On-Resistance vs. Gate-to-Source Voltage

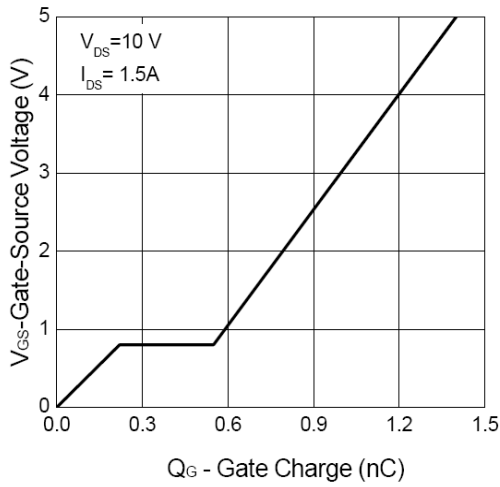


On-Resistance vs. Junction Temperature

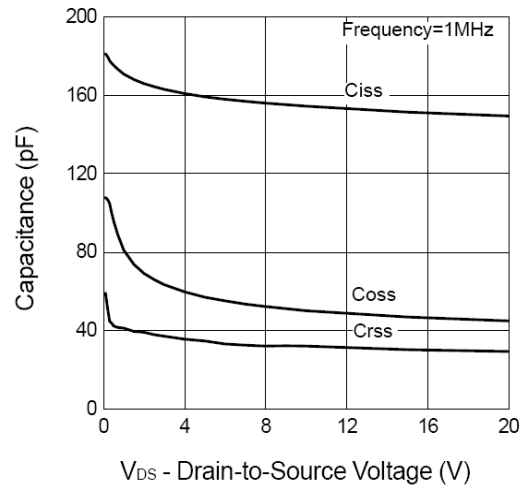




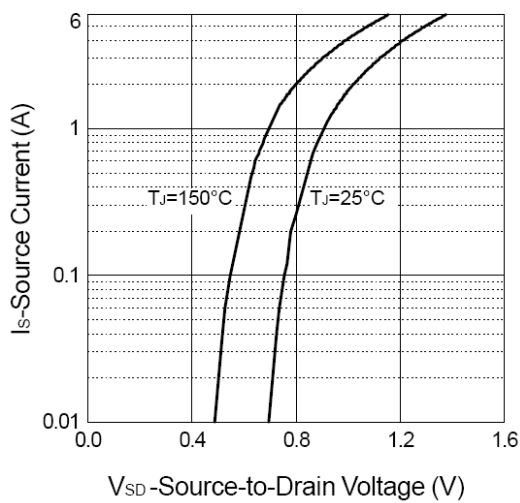
Gate Charge



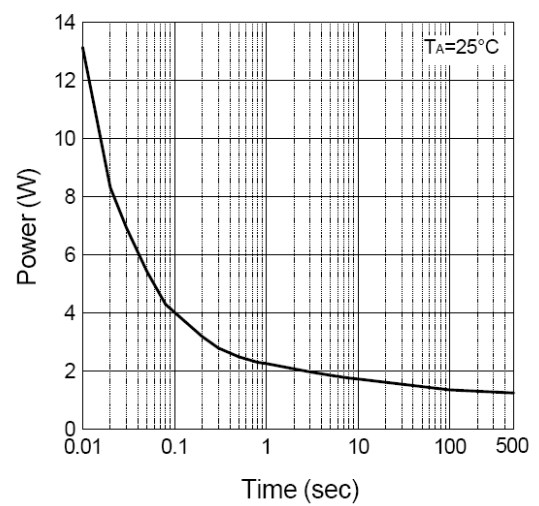
Capacitance



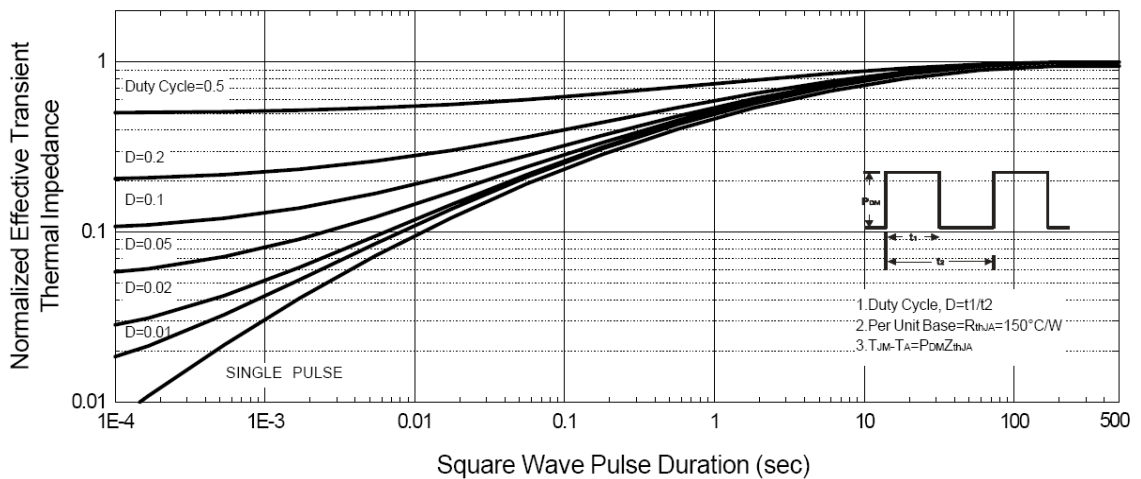
Source-Drain Diode Forward Voltage



Single Pulse Power



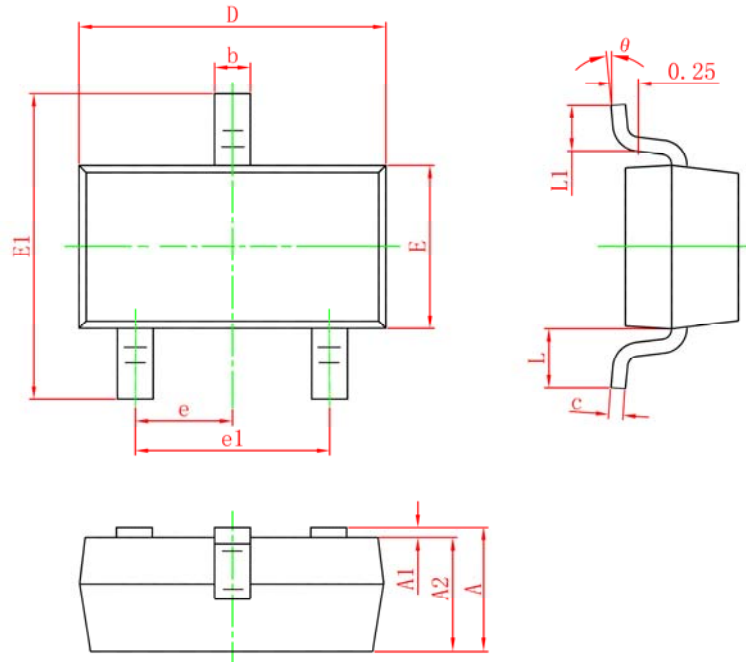
Normalized Thermal Transient Impedance, Junction to Ambient





- Package Information

SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°
UNIT:mm				