N-mos With Gate Protect Diode

Features

20V/1.5A ,

$R_{DS(ON)}$=200mΩ(typ.) @ V_{GS}=4.5V

$R_{DS(ON)}$=315mΩ(typ.) @ V_{GS}=2.5V

Super High Dense Cell Design

Reliable and Rugged

ESD Rating：2000V HBM

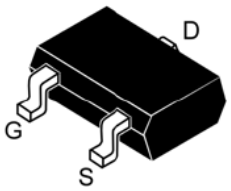
Lead Free Available (RoHS Compliant)

General Description

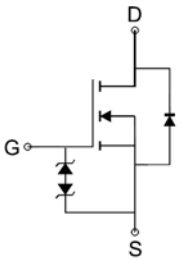
Power Management in Notebook Computer ,

Portable Equipment and Battery Powered Systems.

Pin Configurations



SOT23



Absolute Maximum Ratings @T_A=25℃ 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℃)	T_A=25℃	I_D	1.5	A
	T_A=70℃		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℃	P_D	1.25	W
	T_A=70℃		0.9	
Operating Junction Temperature		T_J	-55 to 150	℃
Storage Temperature Range		T_{stg}	-55 to 150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	125	℃/W

Notes:

1. Pulse width limited by maximum junction temperature. Pulse test: PW≤300 μ s, duty cycle≤2%.

- **Electrical Characteristics** @T_A=25℃ unless otherwise noted

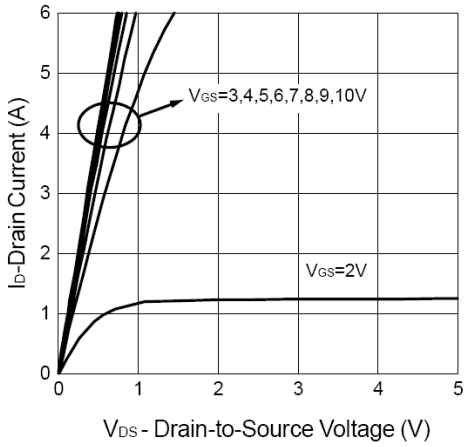
Symbol	Parameter	Limit	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	20			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.45		1.2	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±12V			±10	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=16V, V_{GS}=0V			1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance	V_{GS}=4.5V, I_D=1.5A		200		mΩ
		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= 2Ω,I_D=1.5A, V_{GEN}=4.5V, R_{GEN}=6Ω		7	15	ns
t_r				5	10	
$t_{d(off)}$	Turn-Off Time			13	17	
t_f				7	15	

Notes:

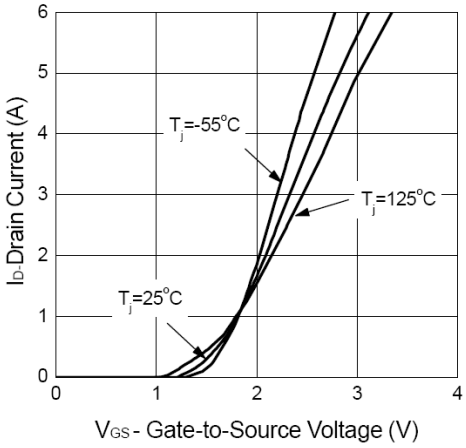
1. Pulse width limited by maximum junction temperature. Pulse test: PW≤300μs, duty cycle≤2%.
2. For design AID only, not subject to production testing. Switching time is essentially independent of operating temperature.

- **Typical Performance Characteristics**

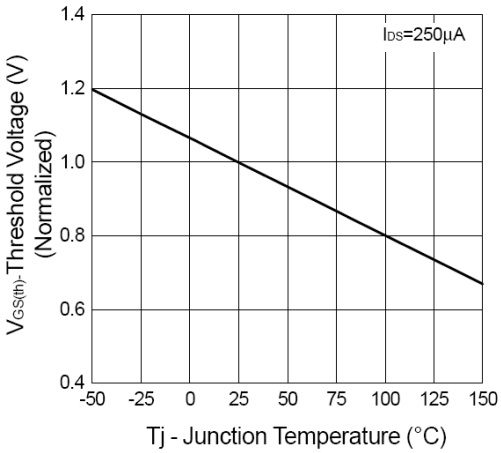
Output Characteristics



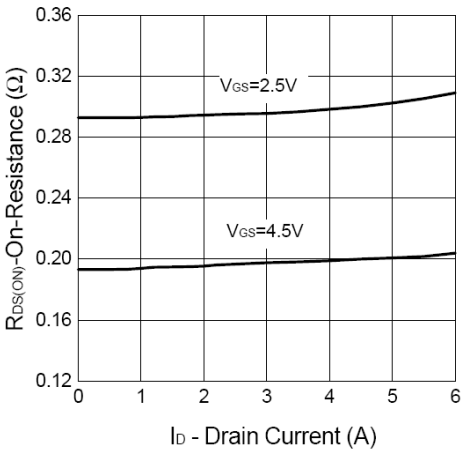
Transfer Characteristics



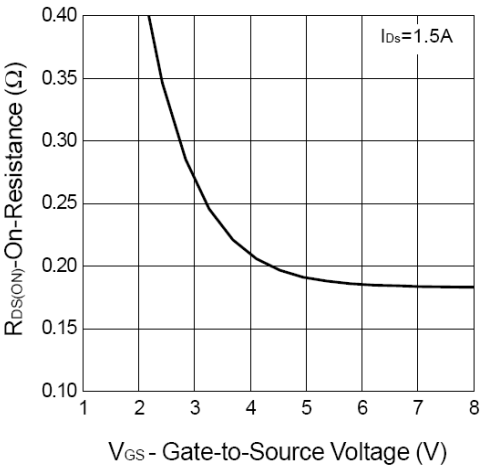
Threshold Voltage vs. Junction Temperature



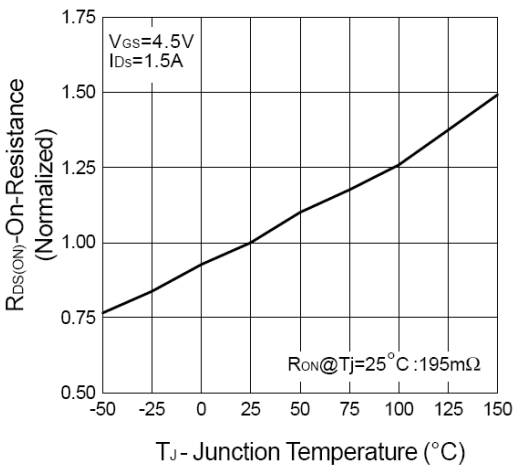
On-Resistance vs. Drain Current



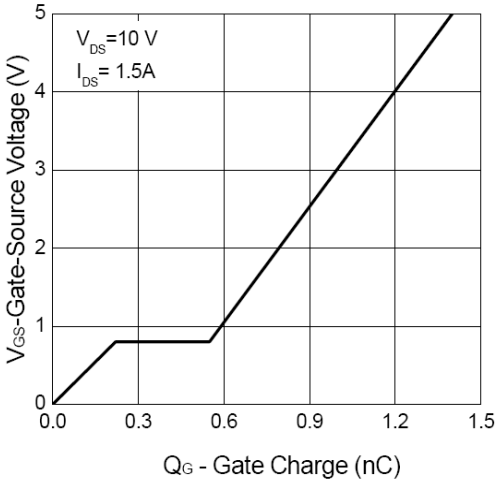
On-Resistance vs. Gate-to-Source Voltage



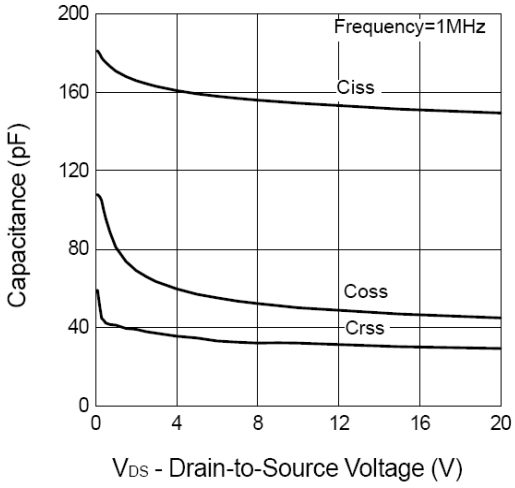
On-Resistance vs. Junction Temperature



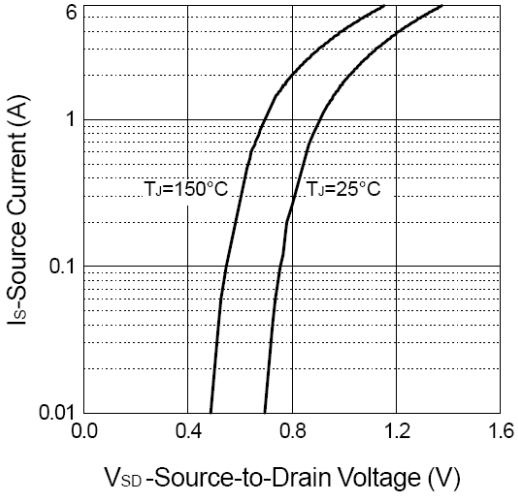
Gate Charge



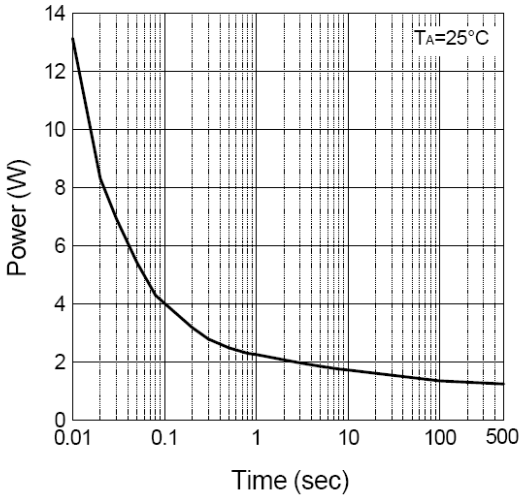
Capacitance



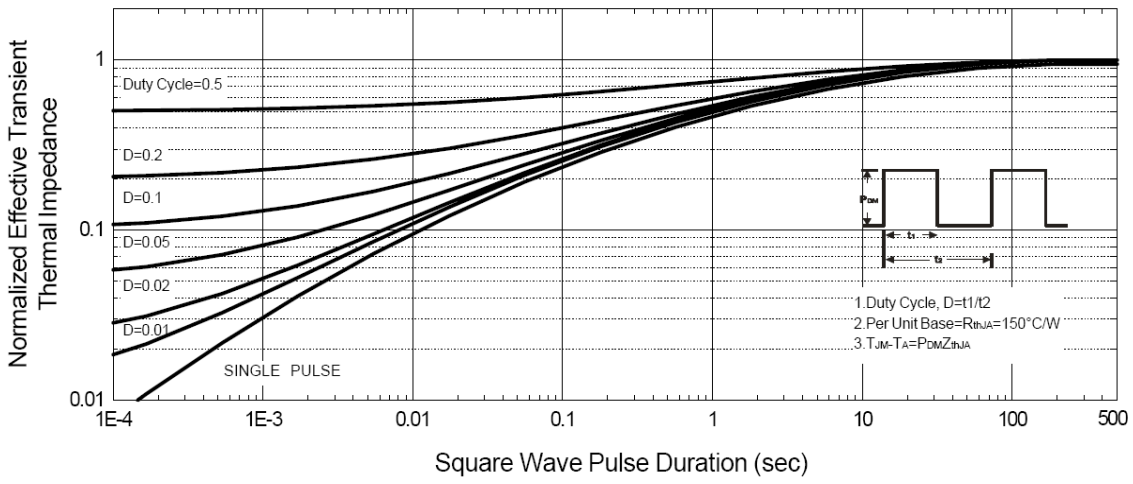
Source-Drain Diode Forward Voltage



Single Pulse Power

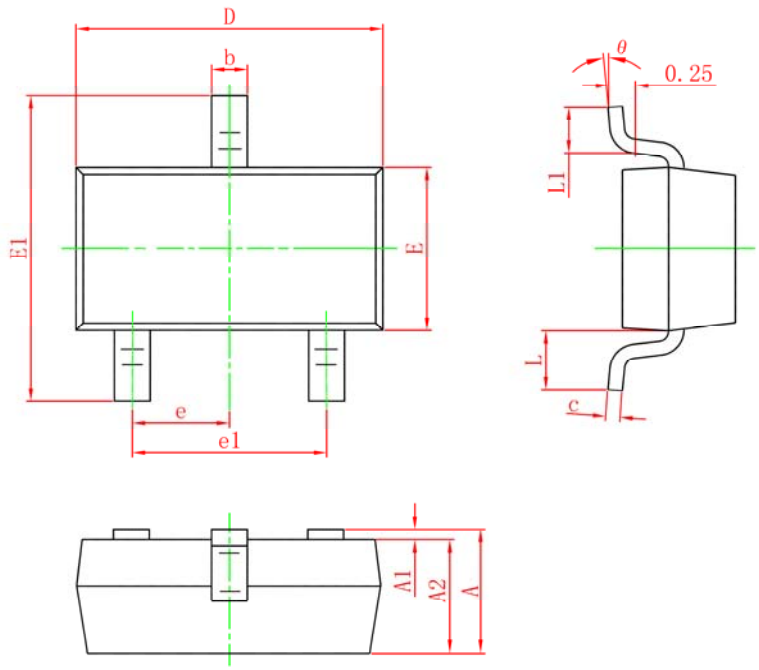


Normalized Thermal Transient Impedence, Junction to Ambient



- **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				