

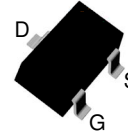
Features

- -30V/-4.1A,
 $R_{DS(ON)} = 43m\Omega$ (typ.) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 58m\Omega$ (typ.) @ $V_{GS} = -4.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

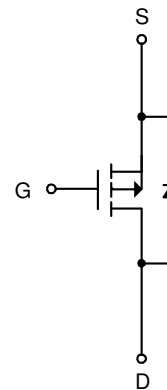
Applications

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

Pin Description



Top View of SOT-23



P-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	-30	V
V_{GSS}	Gate-Source Voltage	± 20	
I_D^*	Continuous Drain Current	$T_A=25^\circ\text{C}$	A
		$T_A=70^\circ\text{C}$	
I_{DM}^*	300 μs Pulsed Drain Current	$T_A=25^\circ\text{C}$	
		$T_A=70^\circ\text{C}$	
I_S^*	Diode Continuous Forward Current	-4	
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	
P_D^*	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	W
		$T_A=70^\circ\text{C}$	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	$^\circ\text{C/W}$
		Steady state	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady state	

Note : *Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$.

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}$, $I_{DS}=-250\mu\text{A}$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-24\text{V}$, $V_{GS}=0\text{V}$	-	-	-1	μA
		$T_J=85^\circ\text{C}$	-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_{DS}=-250\mu\text{A}$	-1	-1.5	-2.2	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$	-	-	± 100	nA
$R_{DS(ON)}^a$	Drain-Source On-State Resistance	$V_{GS}=-10\text{V}$, $I_{DS}=-4.8\text{A}$	-	43	56	m Ω
		$V_{GS}=-4.5\text{V}$, $I_{DS}=-3.8\text{A}$	-	58	68	
V_{SD}^a	Diode Forward Voltage	$I_{SD}=-1\text{A}$, $V_{GS}=0\text{V}$	-	-0.7	-1	V
Gate Charge Characteristics^b						
Q_g	Total Gate Charge	$V_{DS}=-15\text{V}$, $V_{GS}=-10\text{V}$, $I_{DS}=-4.8\text{A}$	-	13.6	-	nC
Q_{gs}	Gate-Source Charge		-	1.2	-	
Q_{gd}	Gate-Drain Charge		-	2.0	-	

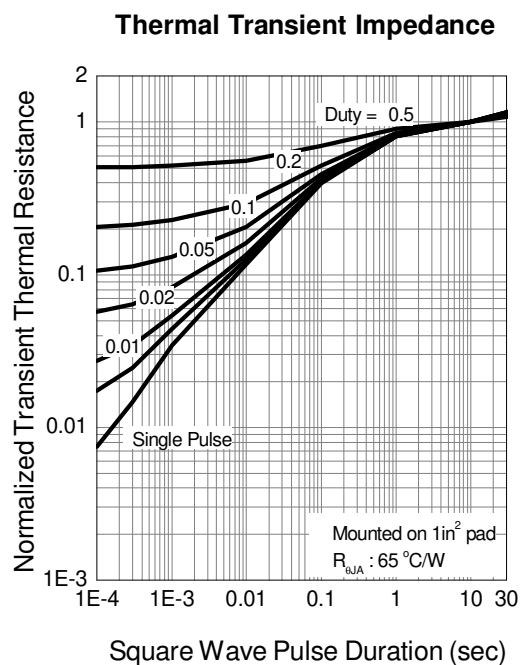
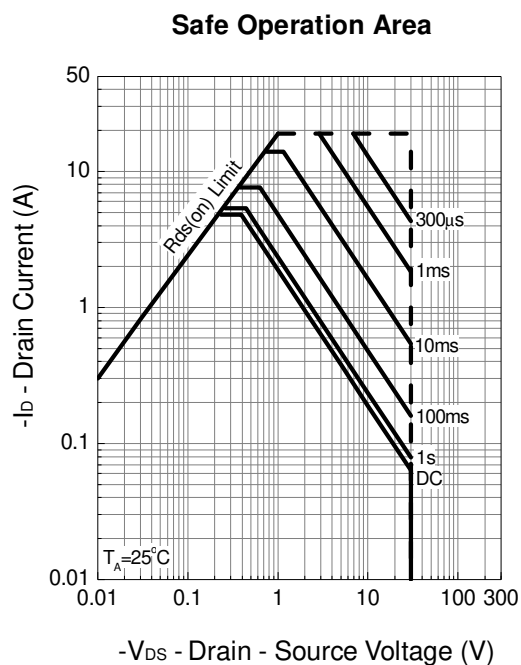
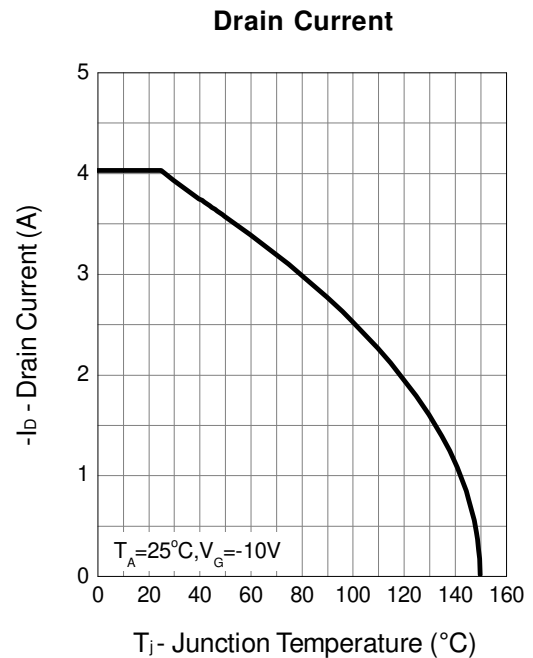
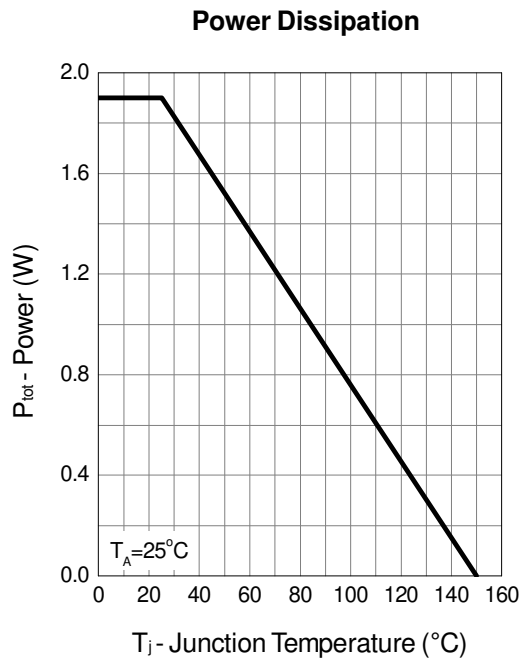
Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Dynamic Characteristics^b						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	3.6	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-15V,$ Frequency=1.0MHz	-	573	-	pF
C_{oss}	Output Capacitance		-	74	-	
C_{rss}	Reverse Transfer Capacitance		-	53	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-15V, R_L=10\Omega,$ $I_{DS}=-1A, V_{GEN}=-10V,$ $R_G=6\Omega$	-	6.9	-	ns
t_r	Turn-on Rise Time		-	12.3	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	25	-	
t_f	Turn-off Fall Time		-	13	-	
t_{rr}	Reverse Recovery Time	$I_F=-4.8A, di_{SD}/dt = 100A/\mu s$	-	16	-	ns
Q_{rr}	Reverse Recovery Charge		-	11	-	nC

Note a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

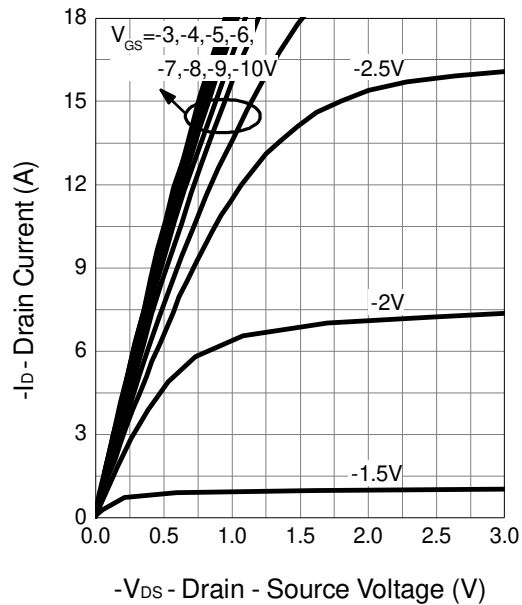
Note b : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

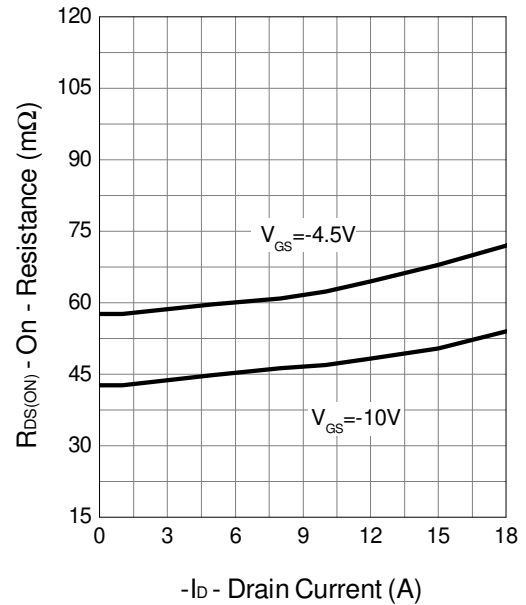


Typical Operating Characteristics (Cont.)

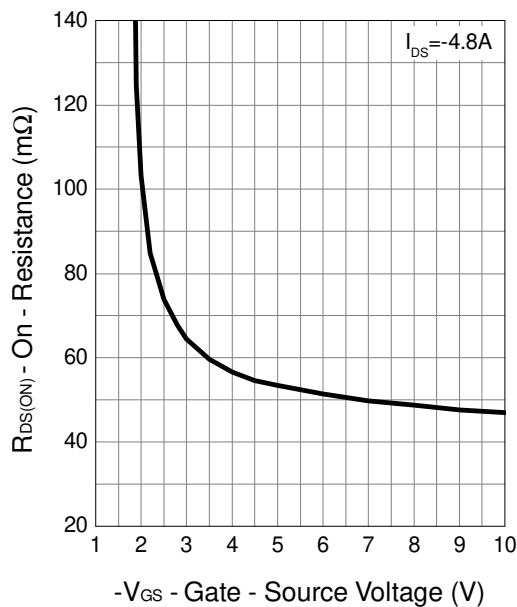
Output Characteristics



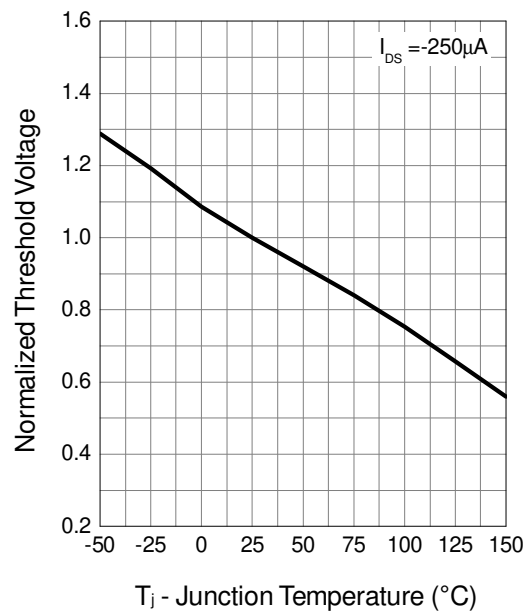
Drain-Source On Resistance



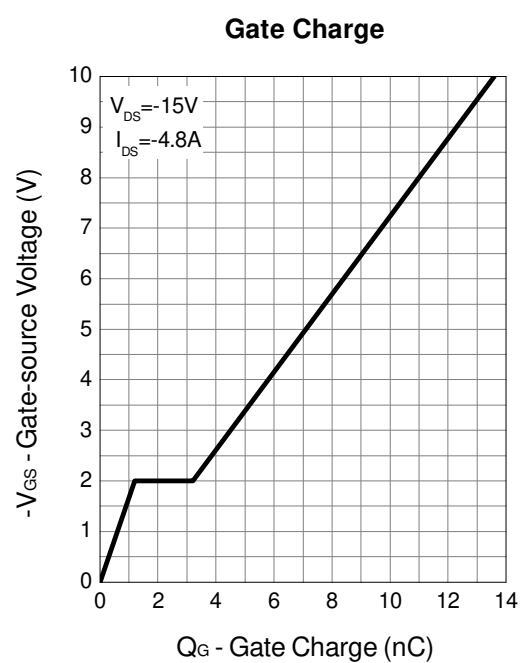
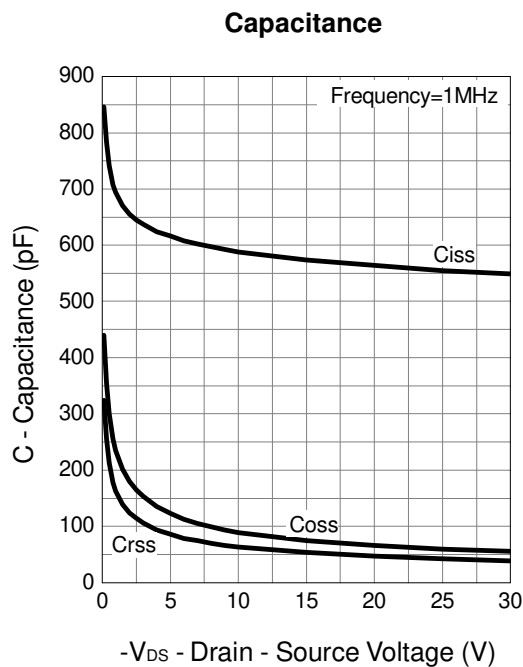
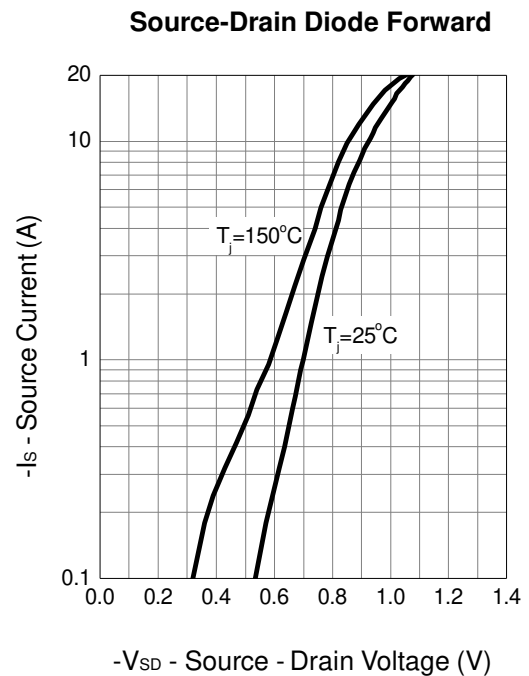
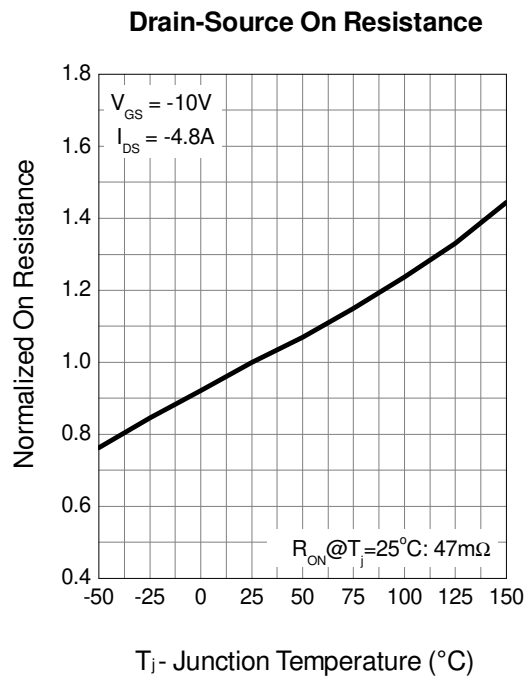
Gate-Source On Resistance



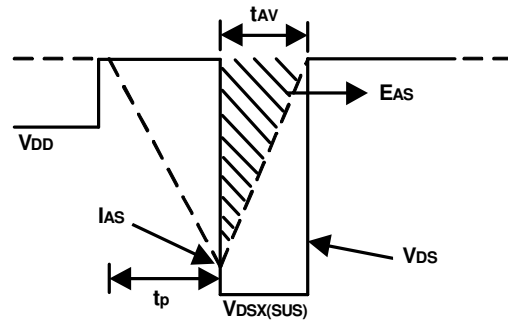
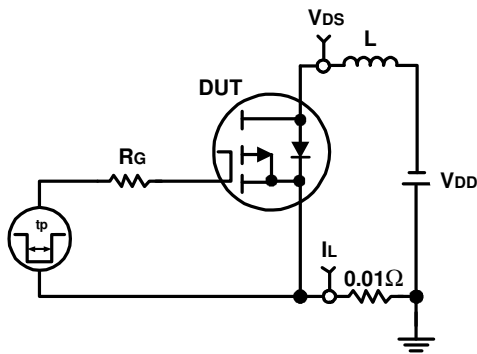
Gate Threshold Voltage



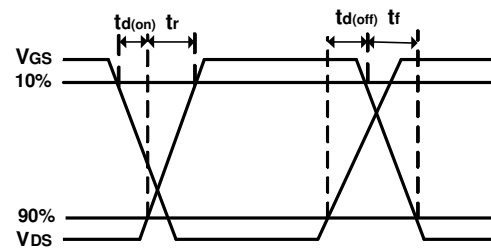
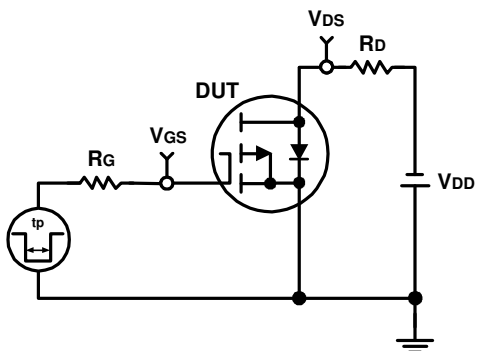
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

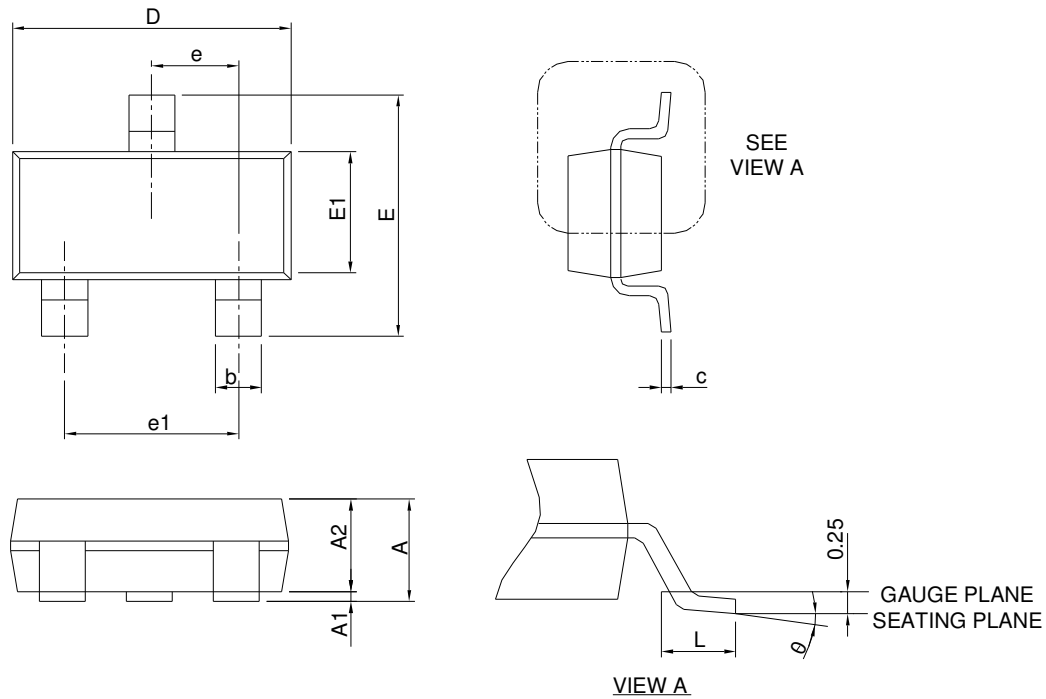


Switching Time Test Circuit and Waveforms



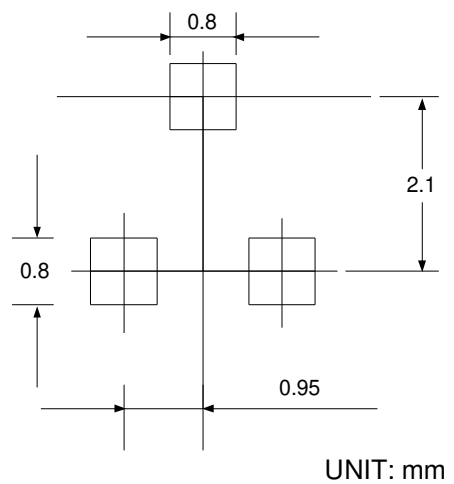
Package Information

SOT-23



SYMBOL	SOT-23			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.20	-	0.047
A1	0.00	0.10	0.000	0.004
A2	0.90	1.10	0.035	0.043
b	0.30	0.50	0.012	0.020
c	0.08	0.22	0.003	0.009
D	2.70	3.10	0.106	0.122
E	2.20	2.60	0.086	0.102
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0 °	8 °	0 °	8 °

RECOMMENDED LAND PATTERN



Note : Dimension D and E1 do not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side.