

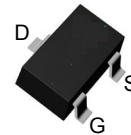
Features

- -20V/-7A ,
 $R_{DS(ON)} = 18m\Omega$ (typ.) @ $V_{GS} = -4.5V$
 $R_{DS(ON)} = 23m\Omega$ (typ.) @ $V_{GS} = -2.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

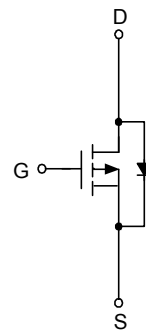
Applications

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

Pin Description



Top View of SOT23-3L



P-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		± 12	
I_D^*	Continuous Drain Current	$T_A = 25^\circ\text{C}$	-7	A
		$T_A = 70^\circ\text{C}$	-4.2	
I_{DM}^*	300 μs Pulsed Drain Current	$T_A = 25^\circ\text{C}$	-21	
		$T_A = 70^\circ\text{C}$	-17	
I_S^*	Diode Continuous Forward Current		-7	$^\circ\text{C}$
T_J	Maximum Junction Temperature		150	
T_{STG}	Storage Temperature Range		-55 to 150	
P_D^*	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	1.6	W
		$T_A = 70^\circ\text{C}$	1.0	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	80	$^\circ\text{C/W}$
		Steady state	100	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady state	52	

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	$V_{GS}=0\text{V}$, $I_{DS}=-250\mu\text{A}$	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-16\text{V}$, $V_{GS}=0\text{V}$	-	-	-1	μA
		$T_J=85^\circ\text{C}$	-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_{DS}=-250\mu\text{A}$	-0.5	-0.7	-1	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 12\text{V}$, $V_{DS}=0\text{V}$	-	-	± 100	nA
$R_{DS(ON)}^a$	Drain-Source On-State Resistance	$V_{GS}=-4.5\text{V}$, $I_{DS}=-6\text{A}$	-	18	24	m Ω
		$V_{GS}=-2.5\text{V}$, $I_{DS}=-3.7\text{A}$	-	23	36	
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	$V_{DS}=-10\text{V}$, $V_{GS}=-4.5\text{V}$, $I_{DS}=-6\text{A}$	-	13.3	-	nC
Q_{gs}	Gate-Source Charge		-	1.6	-	
Q_{gd}	Gate-Drain Charge		-	4.5	-	

Electrical Characteristics (Cont.)

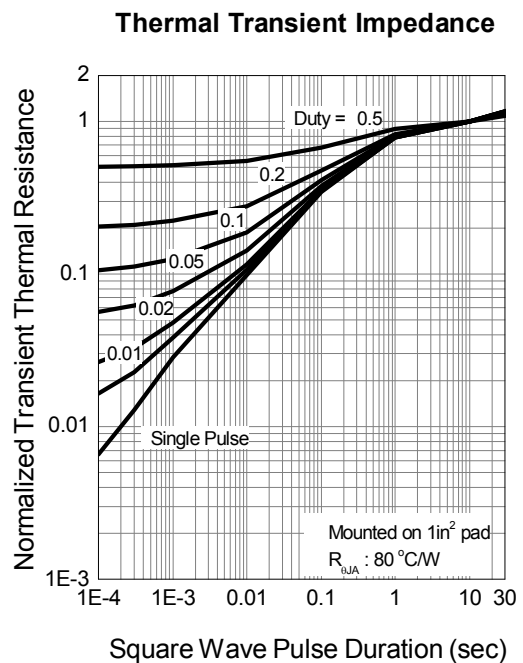
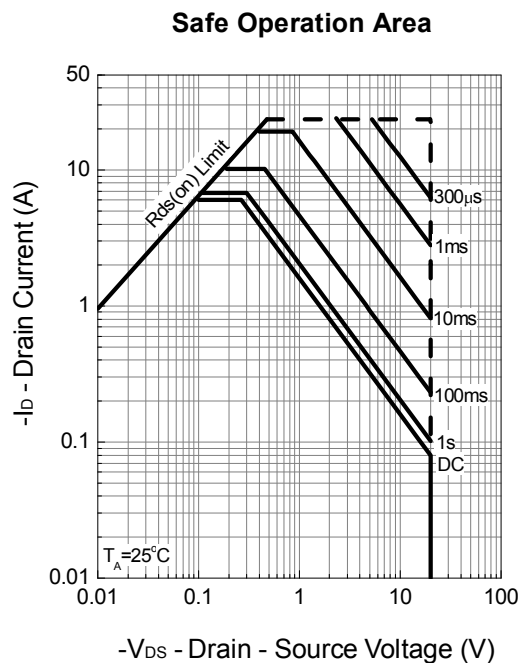
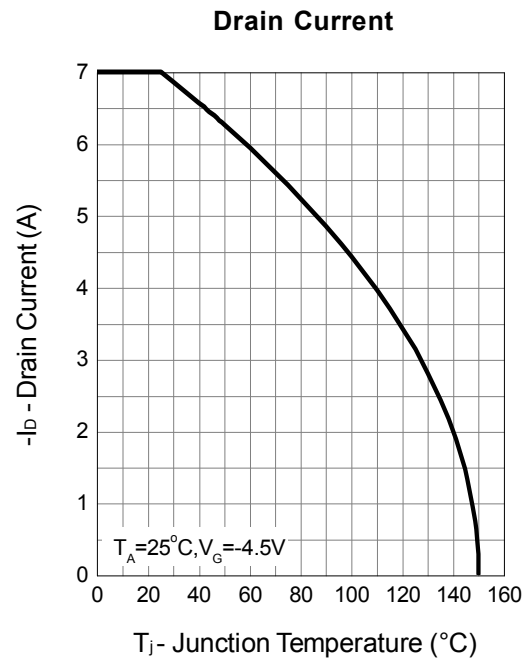
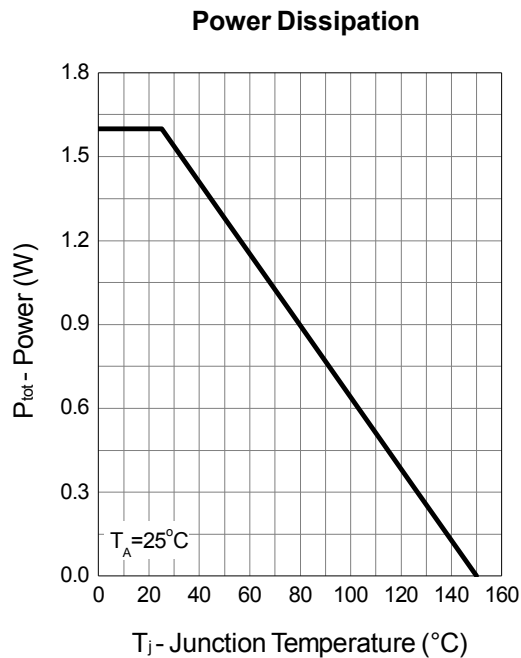
($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
DYNAMIC CHARACTERISTICS^b						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	6	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-10V,$ Frequency=1.0MHz	-	1155	-	pF
C_{oss}	Output Capacitance		-	205	-	
C_{rss}	Reverse Transfer Capacitance		-	165	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-10V, R_L=10\Omega,$ $I_{DS}=-1A, V_{GEN}=-4.5V,$ $R_G=6\Omega$	-	7.7	-	ns
t_r	Turn-on Rise Time		-	13.8	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	40	-	
t_f	Turn-off Fall Time		-	19	-	
t_{rr}	Reverse Recovery Time	$I_{SD}=-6A, dI_{SD}/dt = 100A/\mu s$	-	17	-	ns
Q_{rr}	Reverse Recovery Charge		-	8	-	nC

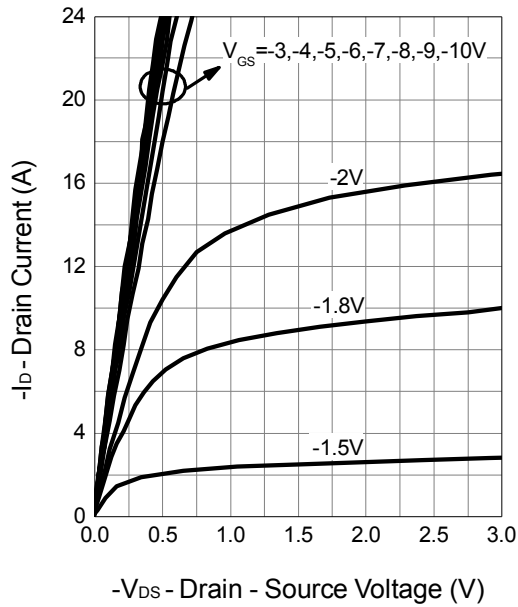
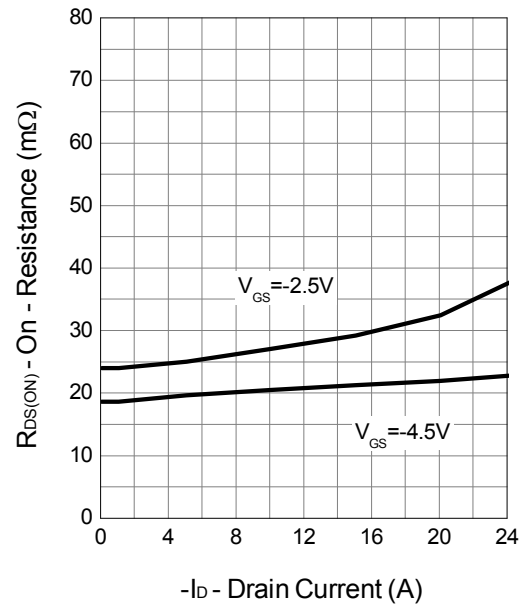
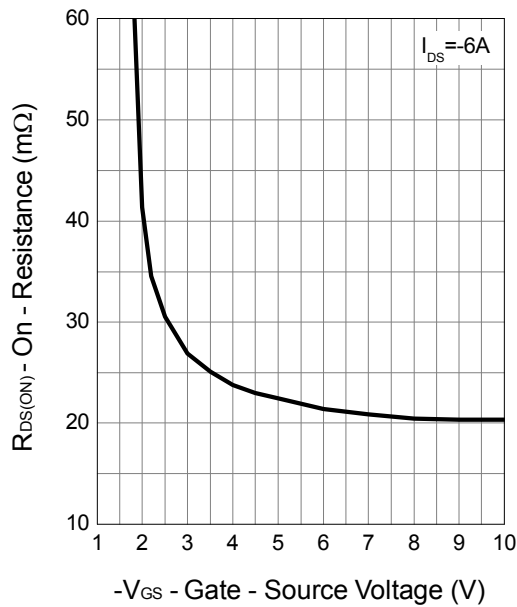
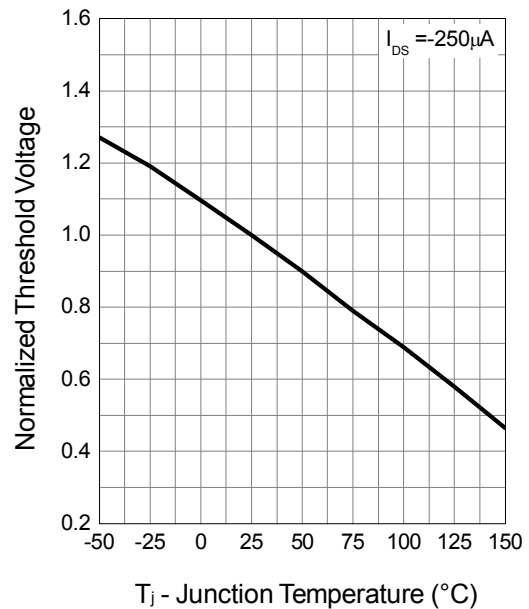
Note a : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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

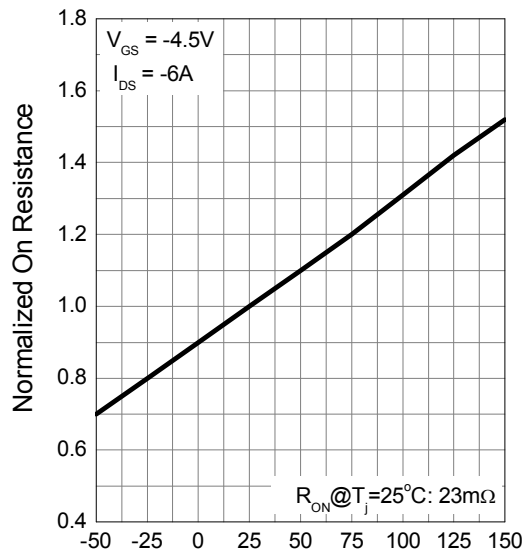
Typical Operating Characteristics



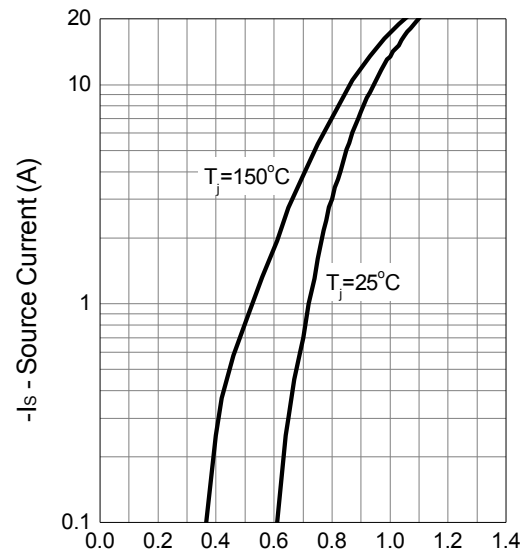
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


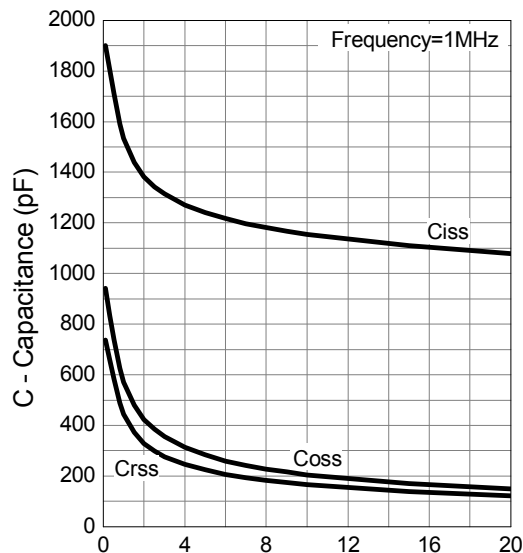
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance


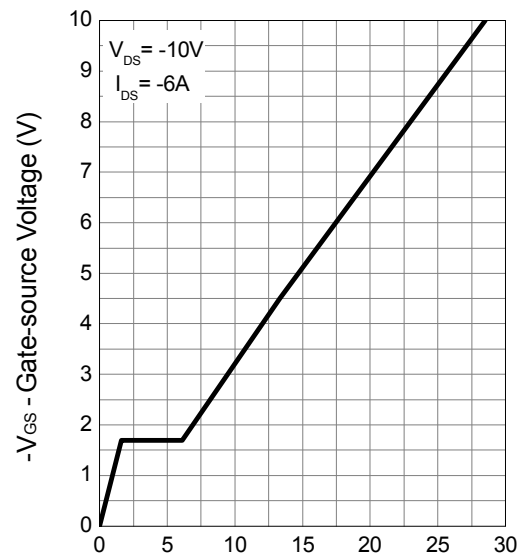
T_J - Junction Temperature ($^{\circ}\text{C}$)

Source-Drain Diode Forward


$-V_{SD}$ - Source - Drain Voltage (V)

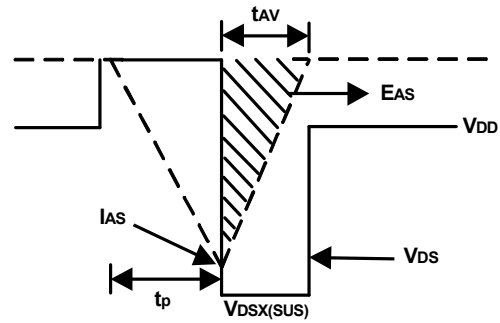
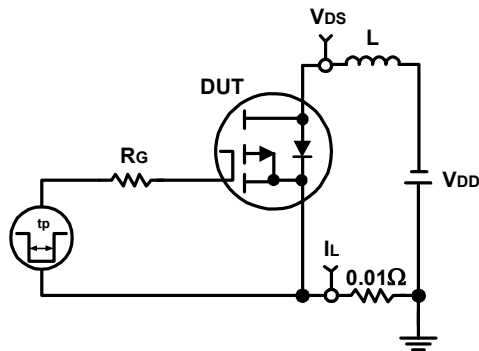
Capacitance


$-V_{DS}$ - Drain - Source Voltage (V)

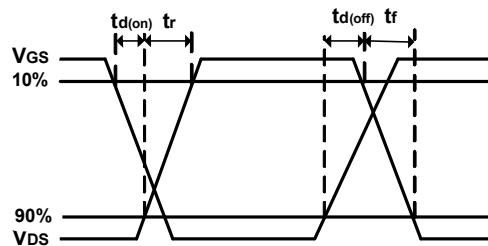
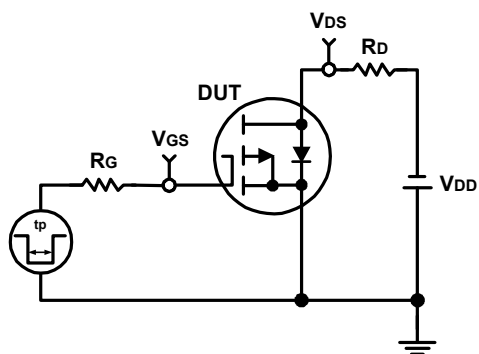
Gate Charge


Q_G - Gate Charge (nC)

Avalanche Test Circuit and Waveforms

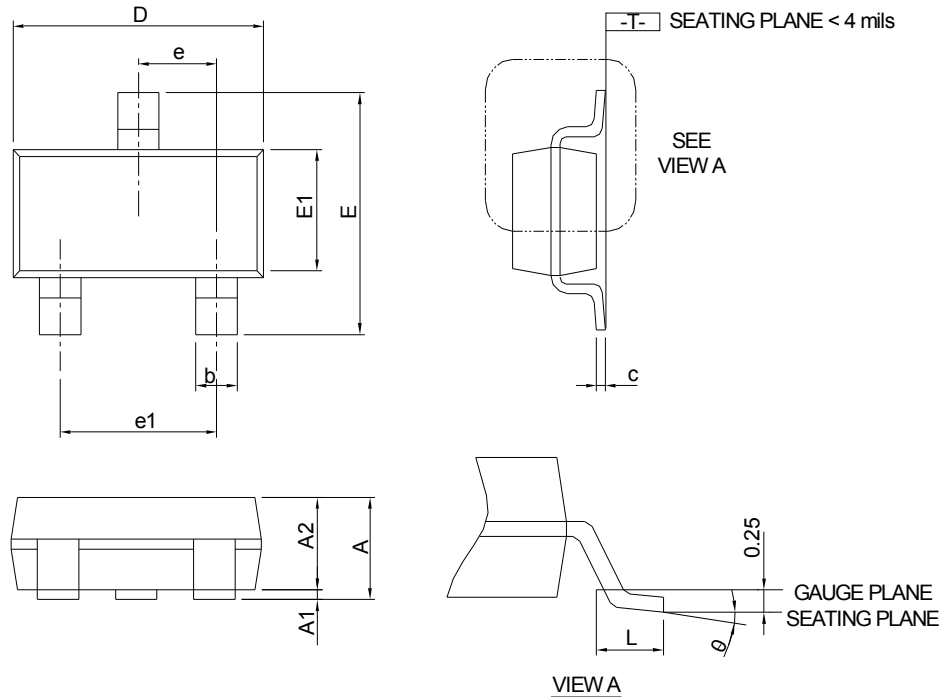


Switching Time Test Circuit and Waveforms



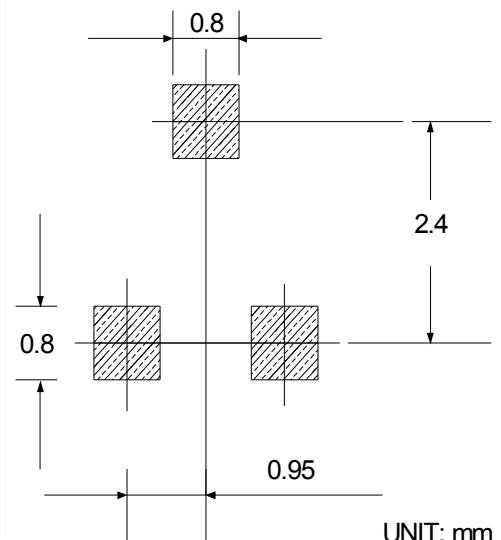
Package Information

SOT23-3L



SYMBOL	SOT23-3L			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.20	-	0.047
A1	0.00	0.08	0.000	0.003
A2	0.90	1.12	0.035	0.044
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	2.60	3.00	0.102	0.118
E1	1.40	1.80	0.055	0.071
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.