

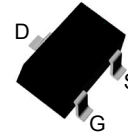
Features

- -12V/-9.1A,
 $R_{DS(ON)} = 13m\Omega(\text{typ.}) @ V_{GS} = -4.5V$
 $R_{DS(ON)} = 18m\Omega(\text{typ.}) @ V_{GS} = -2.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

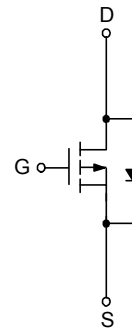
Applications

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

Pin Description



Top View of SOT-23-3



P-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-12	V
V_{GSS}	Gate-Source Voltage		± 12	
I_D^a	Continuous Drain Current ($V_{GS} = -4.5\text{V}$)	$T_A = 25^\circ\text{C}$	-9.1	A
		$T_A = 70^\circ\text{C}$	-6.8	
I_{DM}^a	Pulsed Drain Current ($V_{GS} = -4.5\text{V}$)		-27	
I_S^a	Diode Continuous Forward Current		-9.1	
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	
P_D^a	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	1.6	W
		$T_A = 70^\circ\text{C}$	1.0	
$R_{\theta JA}^a$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	80	$^\circ\text{C/W}$
		Steady State	120	

Note a : Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$.

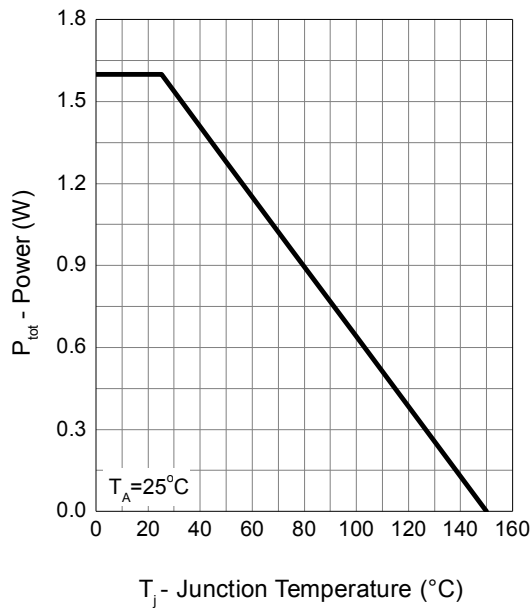
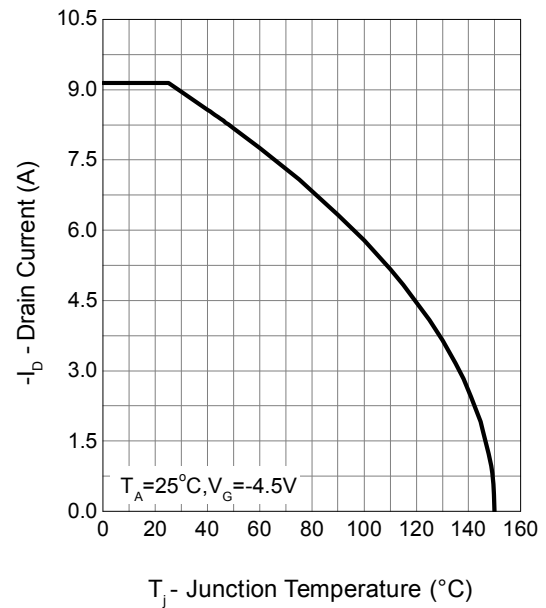
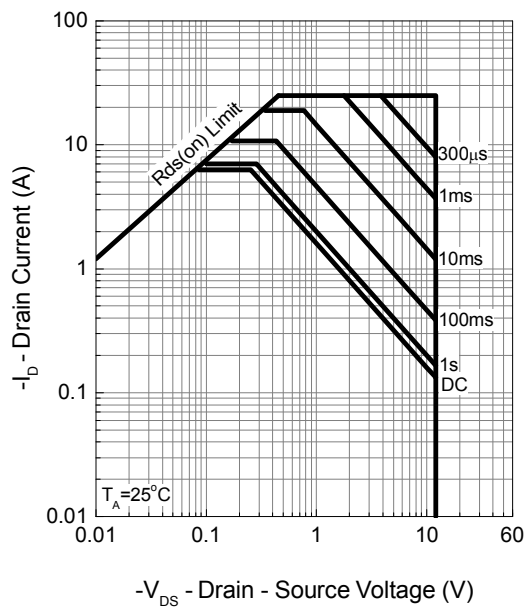
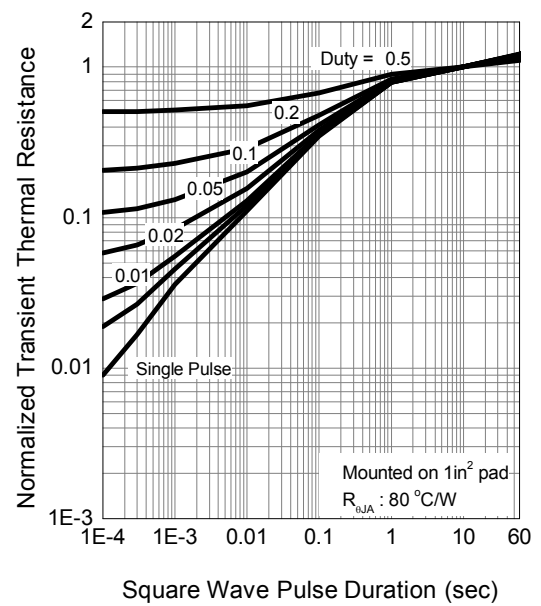
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-12	-18	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-9.6V, V _{GS} =0V T _J =85°C	-	-	-1 -30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-	-1.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^b	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-9.1A V _{GS} =-2.5V, I _{DS} =-6A	- -	13 18	16 21	V mΩ
Diode Characteristics						
V _{SD} ^b	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1	V
t _{rr} ^c	Reverse Recovery Time	I _{SD} =-6.3A,	-	31	-	ns
Q _{rr} ^c	Reverse Recovery Charge	di _{SD} /dt=100A/μs	-	12	-	nC
Dynamic Characteristics ^c						
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V,F=1MHz	-	3	-	Ω
C _{iSS}	Input Capacitance	V _{GS} =0V, V _{DS} =-6V, Frequency=1.0MHz	-	1240	-	pF
C _{oSS}	Output Capacitance		-	360	-	
C _{rSS}	Reverse Transfer Capacitance		-	270	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-6V, R _L =6Ω, I _{DS} =-1A, V _{GEN} =-4.5V, R _G =6Ω	-	9	-	ns
t _r	Turn-on Rise Time		-	13	-	
t _{d(OFF)}	Turn-off Delay Time		-	54	-	
t _f	Turn-off Fall Time		-	50	-	
Gate Charge Characteristics ^c						
Q _g	Total Gate Charge	V _{DS} =-6V, V _{GS} =-4.5V, I _{DS} =-6.3A	-	14.5	-	nC
Q _{gs}	Gate-Source Charge		-	1.8	-	
Q _{gd}	Gate-Drain Charge		-	4	-	

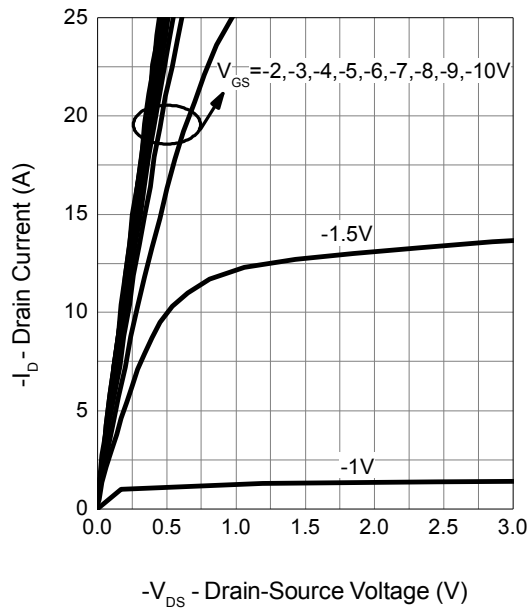
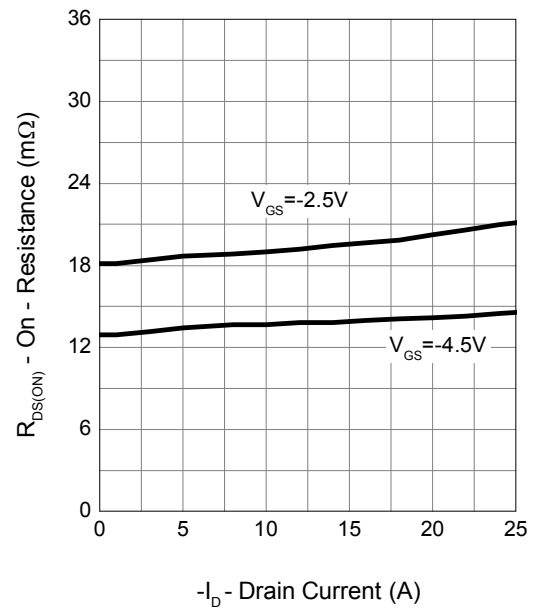
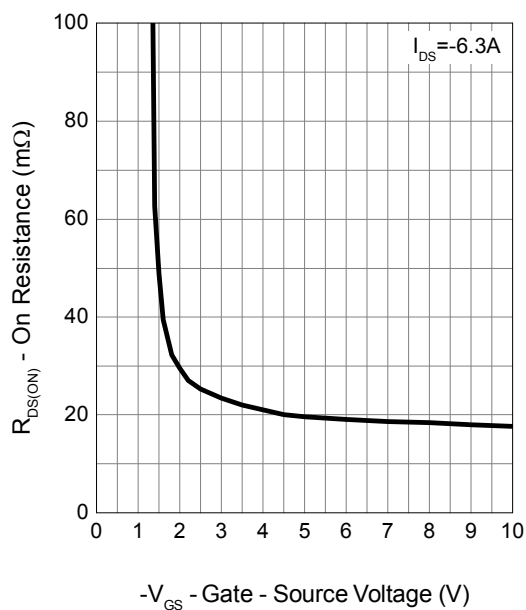
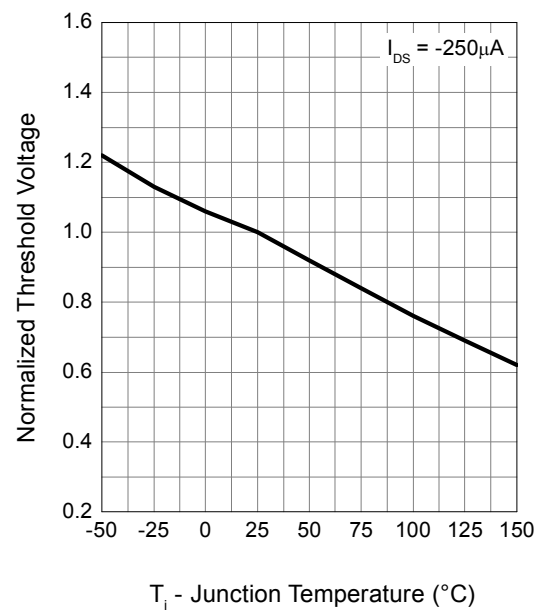
Note b : Pulse test ; pulse width≤300μs, duty cycle≤2%.

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

Typical Operating Characteristics

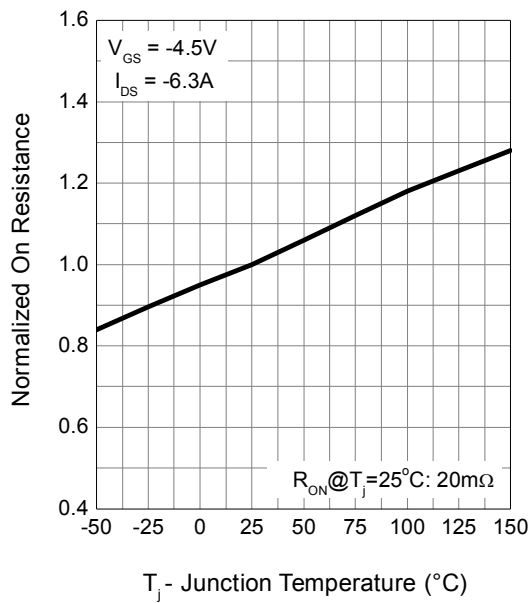
Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


Typical Operating Characteristics (Cont.)

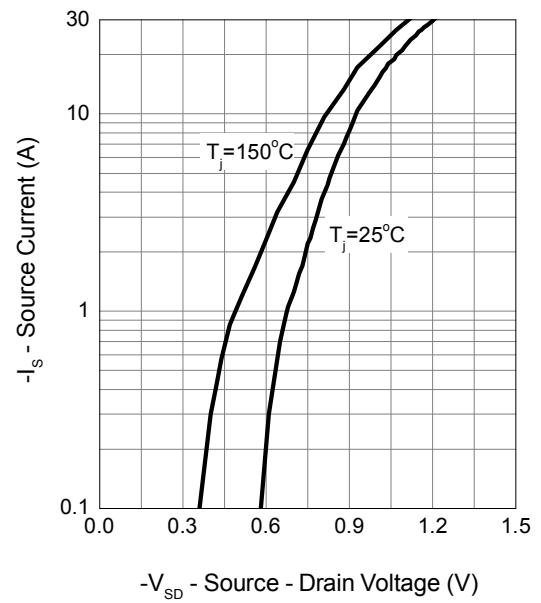
Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


Typical Operating Characteristics (Cont.)

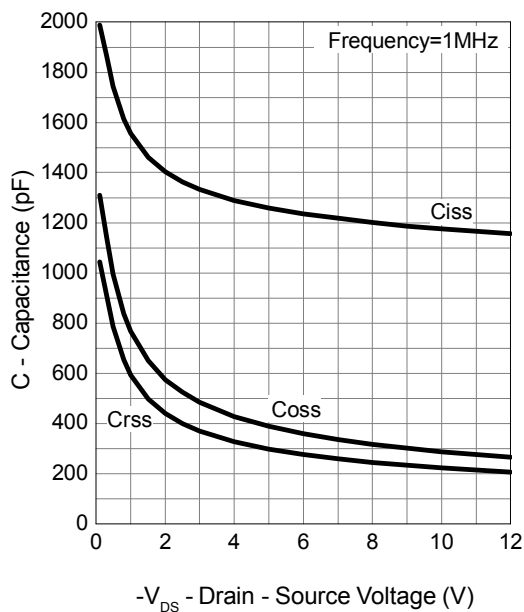
Drain-Source On Resistance



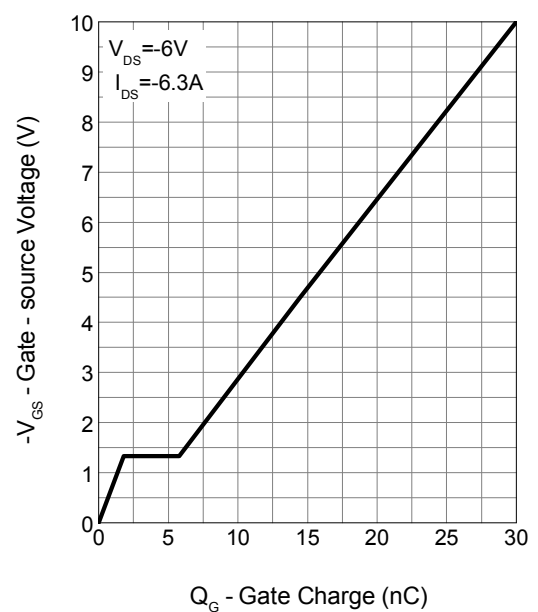
Source-Drain Diode Forward



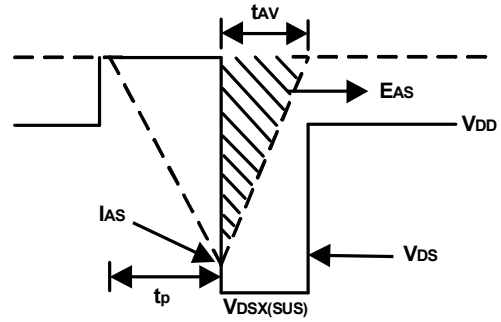
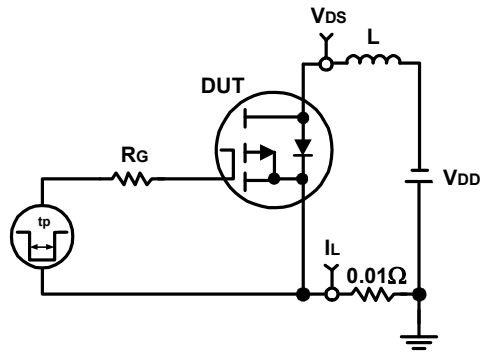
Capacitance



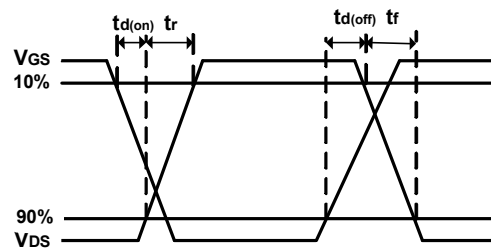
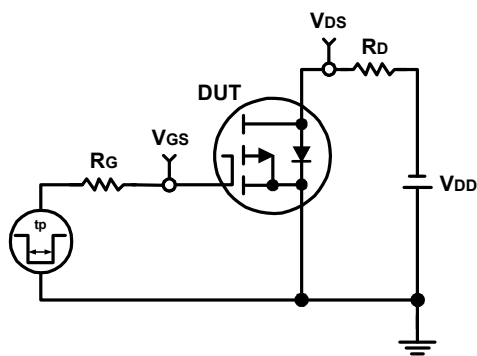
Gate Charge



Avalanche Test Circuit and Waveforms

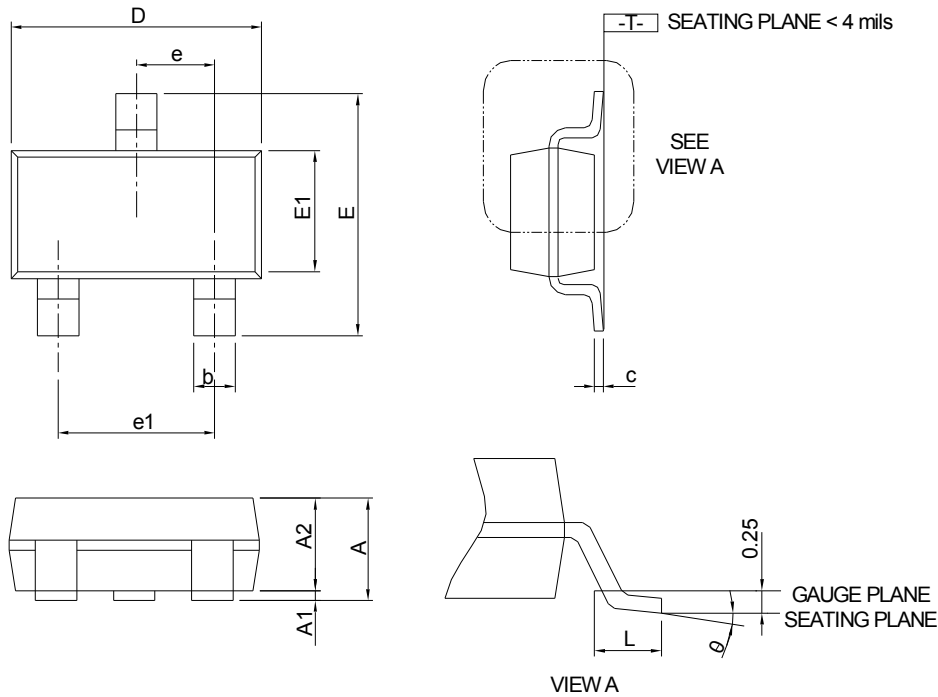


Switching Time Test Circuit and Waveforms



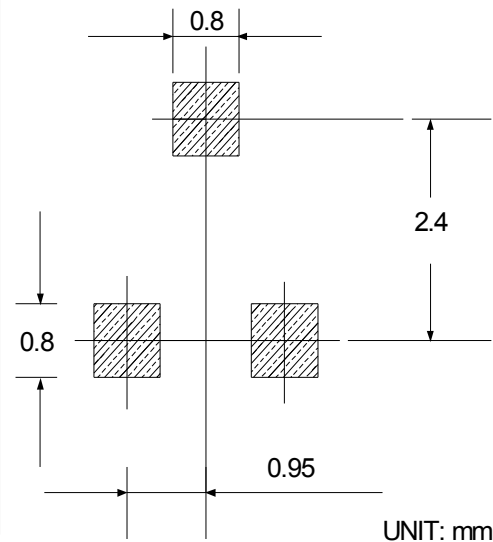
Package Information

SOT-23-3



SYMBOL	SOT-23-3			
	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.