

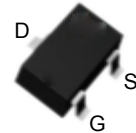
Features

- -30V/-9A,
 $R_{DS(ON)} = 2.0\text{ m}\Omega(\text{typ.}) @ V_{GS} = -10\text{V}$
 $R_{DS(ON)} = 2.7\text{ m}\Omega(\text{typ.}) @ V_{GS} = -4.5\text{V}$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

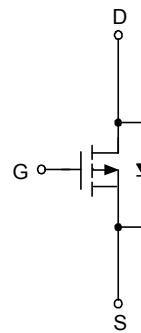
Applications

- 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		-30	V
V _{GSS}	Gate-Source Voltage		±20	
I _D ^a	Continuous Drain Current (V _{GS} =-10V)	T _A =25°C	-9	A
		T _A =70°C	-6.75	
I _{DM} ^a	300μs Pulsed Drain Current (V _{GS} =-10V)		-27	
I _S ^a	Diode Continuous Forward Current		-9	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
P _D ^a	Maximum Power Dissipation	T _A =25°C	1.56	W
		T _A =70°C	1	
R _{θJA} ^a	Thermal Resistance-Junction to Ambient	t ≤ 10s	80	°C/W
		Steady State	120	
R _{θJL}	Thermal Resistance-Junction to Lead	Steady State	52	

Note a : 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} =0V, I _{DS} =-250μA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-24V, V _{GS} =0V	-	-	-1	μA
		T _J =85°C	-	-	-30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1.3	-1.8	-2.3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^b	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-5A	-	20	24	mΩ
		V _{GS} =-4.5V, I _{DS} =-3A	-	27	31	
Diode Characteristics						
V _{SD} ^b	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.8	-1	V
t _{rr} ^c	Reverse Recovery Time	I _{SD} =-5A, di _{SD} /dt=100A/μs	-	11	-	ns
Q _{rr} ^c	Reverse Recovery Charge		-	4	-	nC

Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

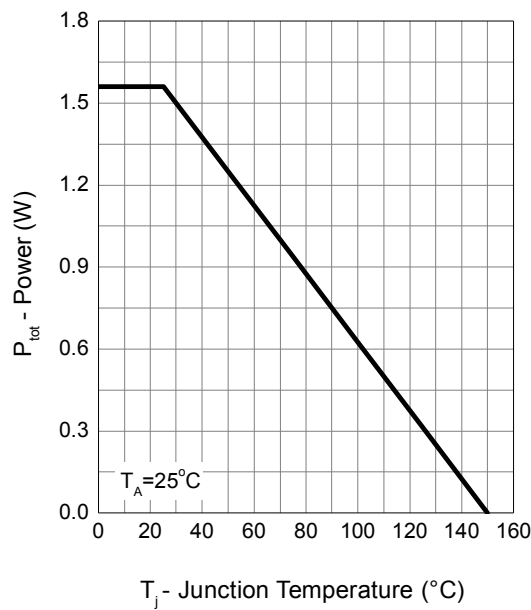
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Dynamic Characteristics ^d						
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V,F=1MHz	-	3.3	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, Frequency=1.0MHz	-	1580	-	pF
C _{oss}	Output Capacitance		-	145	-	
C _{rss}	Reverse Transfer Capacitance		-	122	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-15V, R _L =15Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	8.7	-	ns
t _r	Turn-on Rise Time		-	10	-	
t _{d(OFF)}	Turn-off Delay Time		-	22	-	
t _f	Turn-off Fall Time		-	9	-	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-10V, I _{DS} =-5A	-	13	-	nC
Q _{gs}	Gate-Source Charge		-	1	-	
Q _{gd}	Gate-Drain Charge		-	4	-	

Note b : Pulse test ; pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

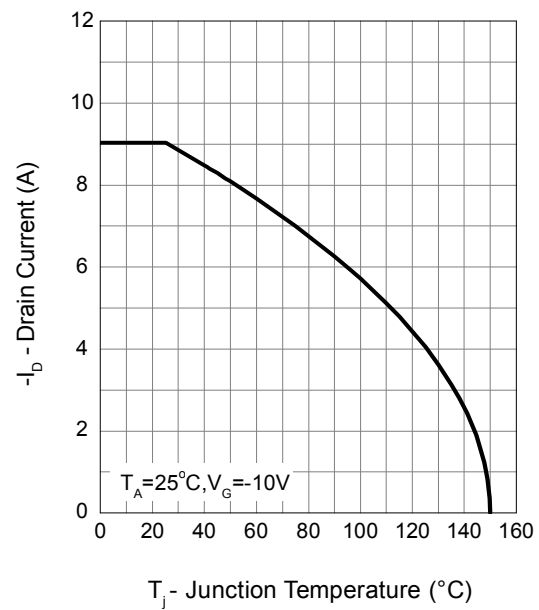
Note c : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

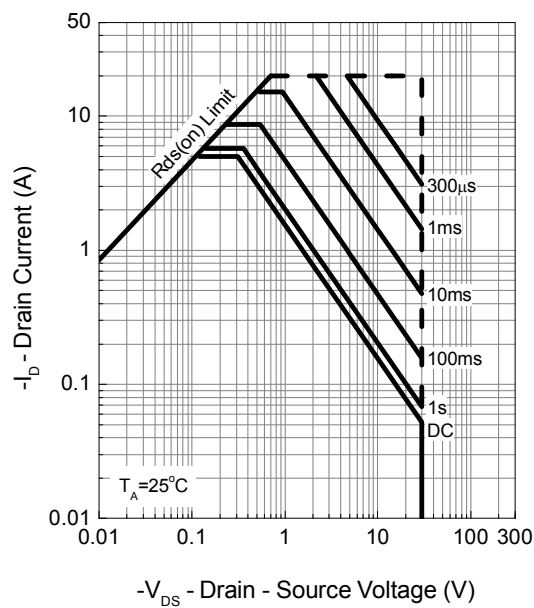
Power Dissipation



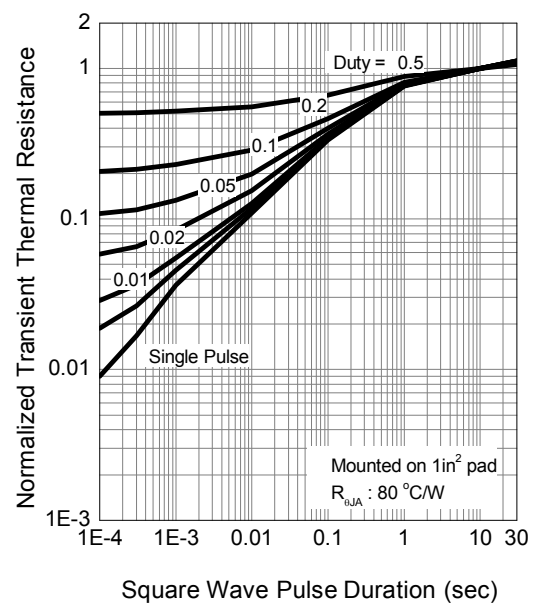
Drain Current



Safe Operation Area

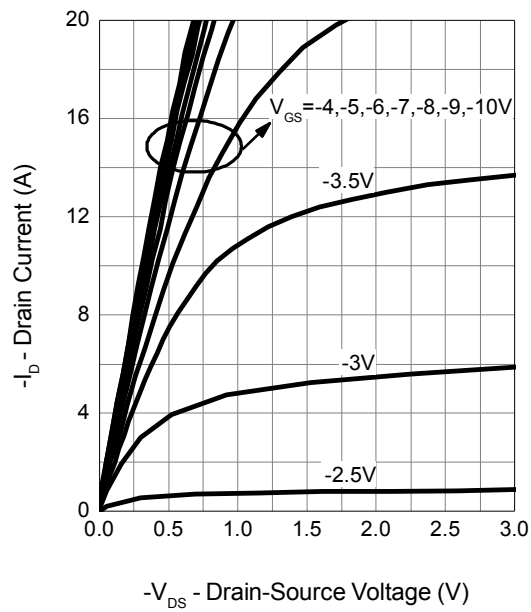


Thermal Transient Impedance

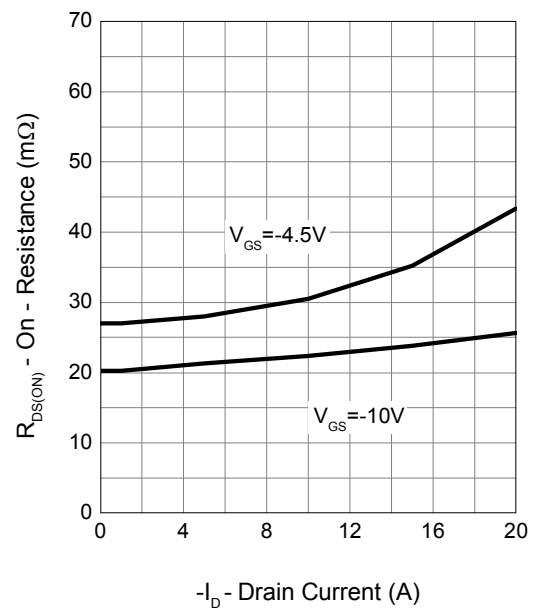


Typical Operating Characteristics (Cont.)

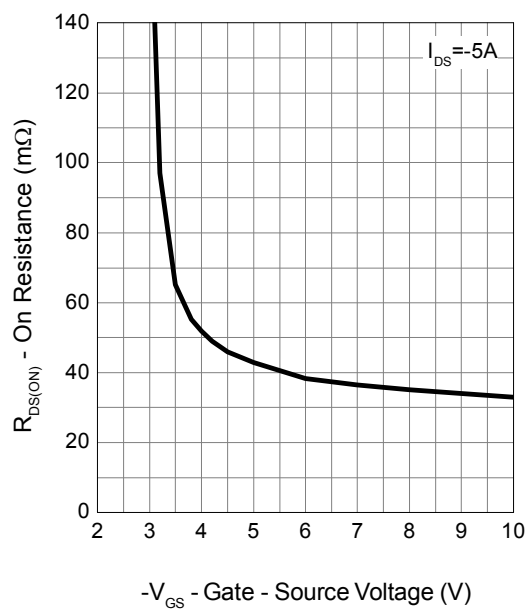
Output Characteristics



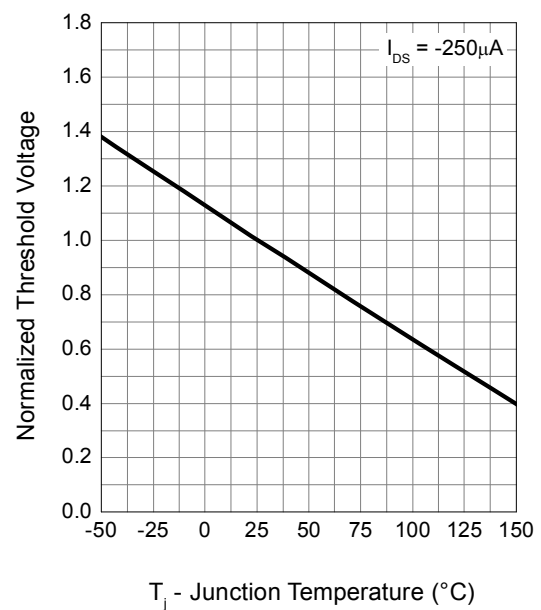
Drain-Source On Resistance



Gate-Source On Resistance

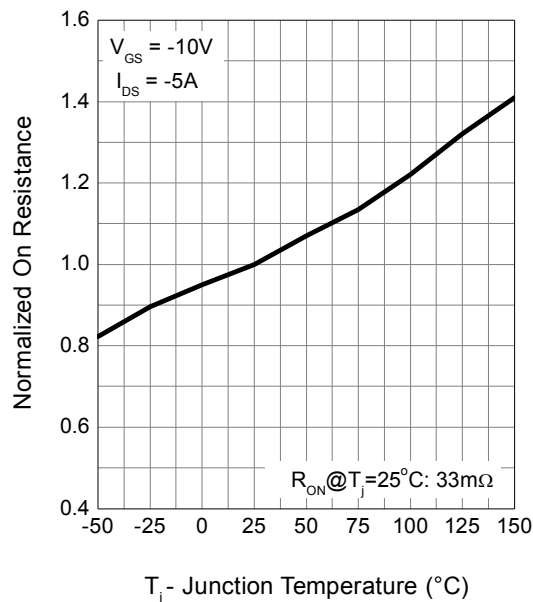


Gate Threshold Voltage

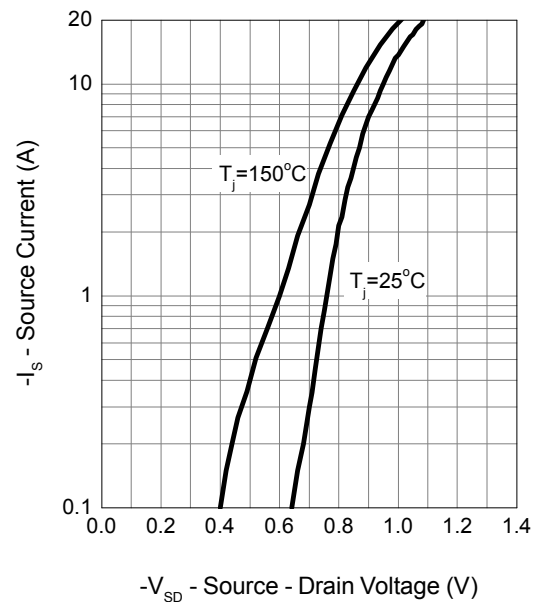


Typical Operating Characteristics (Cont.)

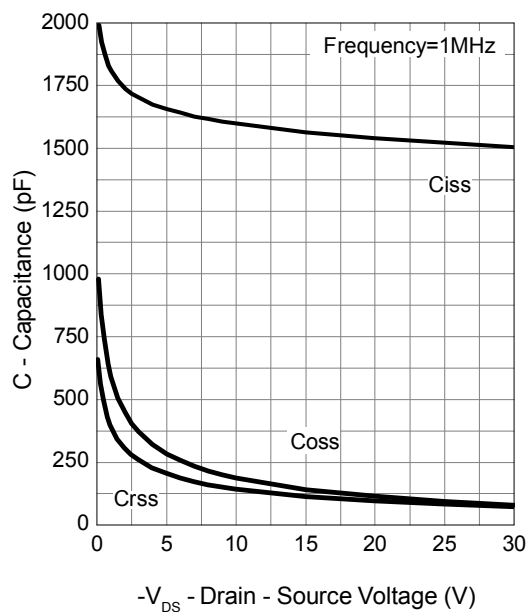
Drain-Source On Resistance



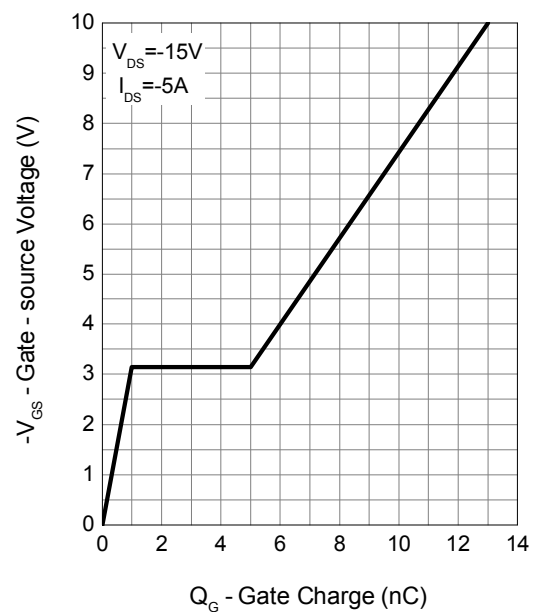
Source-Drain Diode Forward



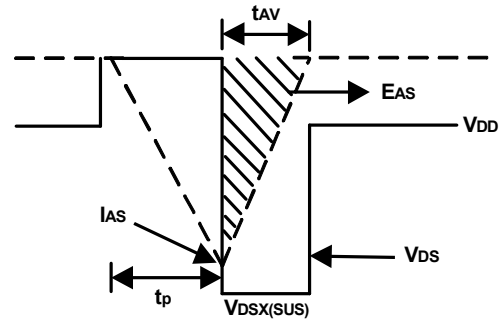
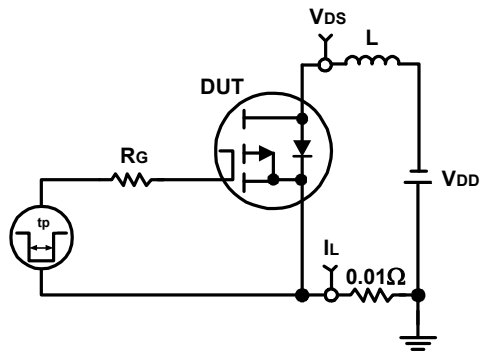
Capacitance



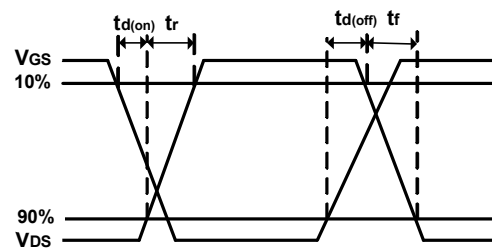
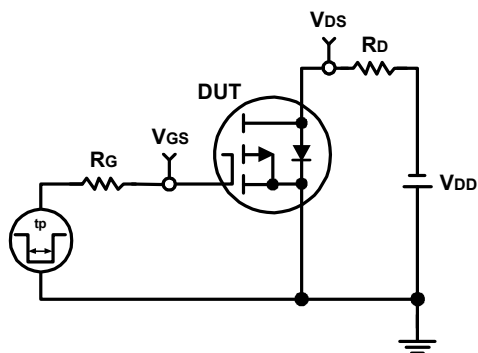
Gate Charge



Avalanche Test Circuit and Waveforms

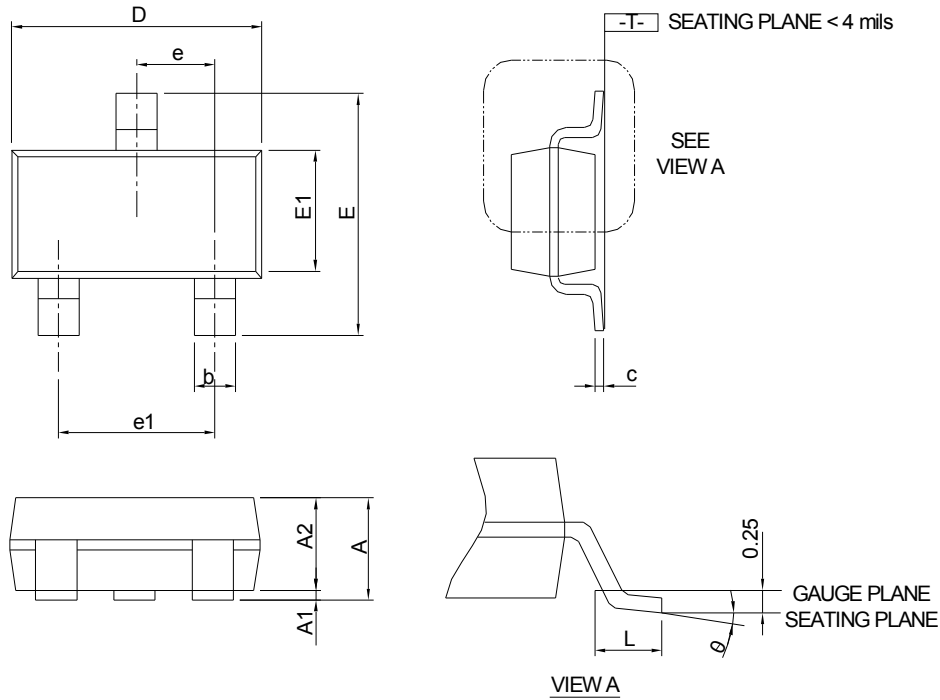


Switching Time Test Circuit and Waveforms



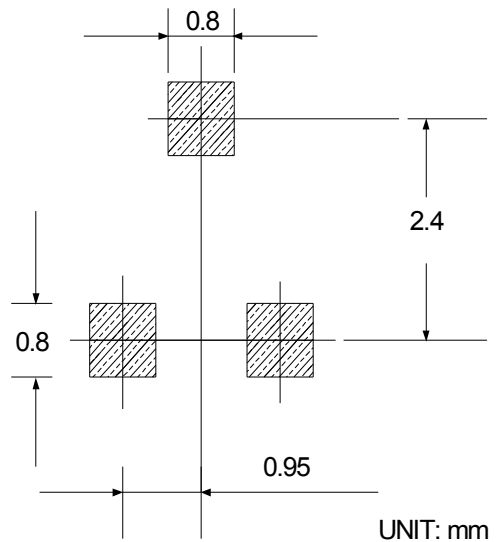
Package Information

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.