

Features

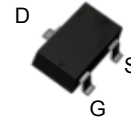
- -20V/-8A,
 $R_{DS(ON)} = 15m\Omega(\text{typ.}) @ V_{GS} = -4.5V$
 $R_{DS(ON)} = 21m\Omega(\text{typ.}) @ V_{GS} = -2.5V$
 $R_{DS(ON)} = 30m\Omega(\text{typ.}) @ V_{GS} = -1.8V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

Note : The diode connected between the gate and source serves only as protection against ESD. No gate overvoltage rating is implied.

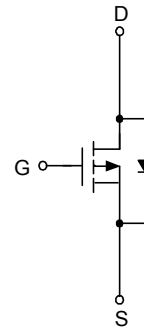
Applications

- 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	-20	V
V_{GSS}	Gate-Source Voltage	± 12	
I_D^a	Continuous Drain Current ($V_{GS} = -4.5\text{V}$)	$T_A = 25^\circ\text{C}$	A
		$T_A = 70^\circ\text{C}$	
I_{DM}^a	Pulsed Drain Current ($V_{GS} = -4.5\text{V}$)	-24	
I_S^a	Diode Continuous Forward Current	-8	
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$
I_{AS}^b	Avalanche Current, Single pulse	$L = 0.1\text{mH}$	A
		$L = 0.5\text{mH}$	
E_{AS}^b	Avalanche Energy, Single pulse	$L = 0.1\text{mH}$	mJ
		$L = 0.5\text{mH}$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
P_D^a	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	W
		$T_A = 70^\circ\text{C}$	
$R_{\theta JA}^a$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	$^\circ\text{C/W}$
		Steady State	

Note * : Package limited.

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

Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

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

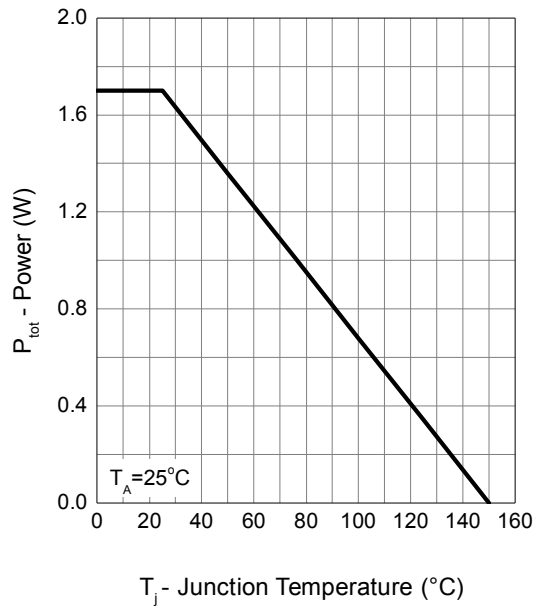
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V, V _{GS} =0V T _J =85°C	-	-	-1	μA
			-	-	-30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-	-0.9	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-8A	-	15	18	mΩ
		V _{GS} =-2.5V, I _{DS} =-4A	-	21	24	
		V _{GS} =-1.8V, I _{DS} =-2A	-	30	34	
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1	V
t _{rr} ^d	Reverse Recovery Time	I _{SD} =-7.1A,	-	30	-	ns
Q _{rr} ^d	Reverse Recovery Charge	dI _{SD} /dt=100A/μs	-	10	-	nC
Dynamic Characteristics ^d						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz	-	1631	-	pF
C _{oss}	Output Capacitance		-	298	-	
C _{rss}	Reverse Transfer Capacitance		-	266	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =10Ω, I _{DS} =-1A, V _{GEN} =-4.5V, R _G =6Ω	-	8	-	ns
t _r	Turn-on Rise Time		-	13	-	
t _{d(OFF)}	Turn-off Delay Time		-	25	-	
t _f	Turn-off Fall Time		-	170	-	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _{DS} =-7.1A	-	22	-	nC
Q _{gs}	Gate-Source Charge		-	1.2	-	
Q _{gd}	Gate-Drain Charge		-	9.5	-	

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

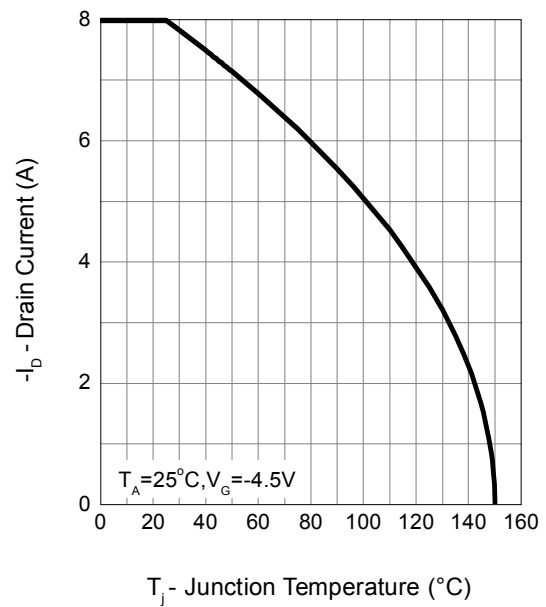
Note d : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

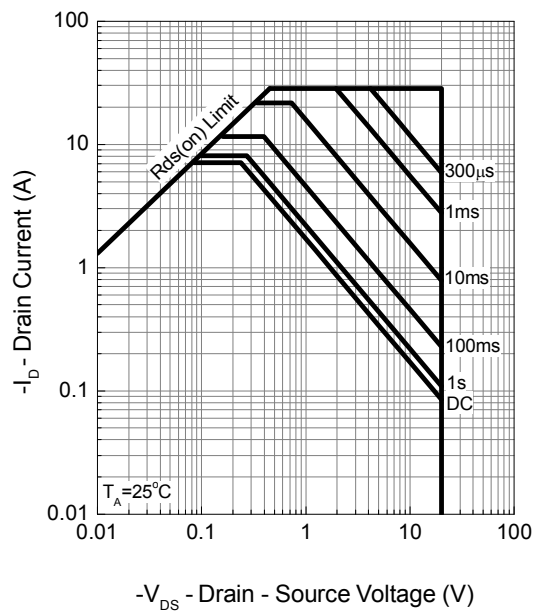
Power Dissipation



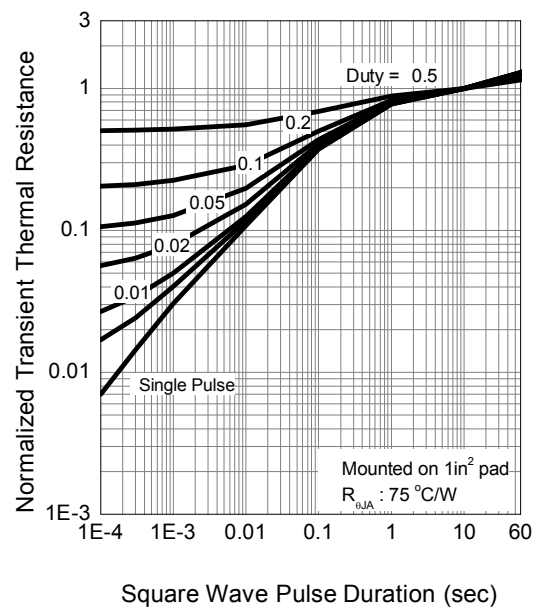
Drain Current



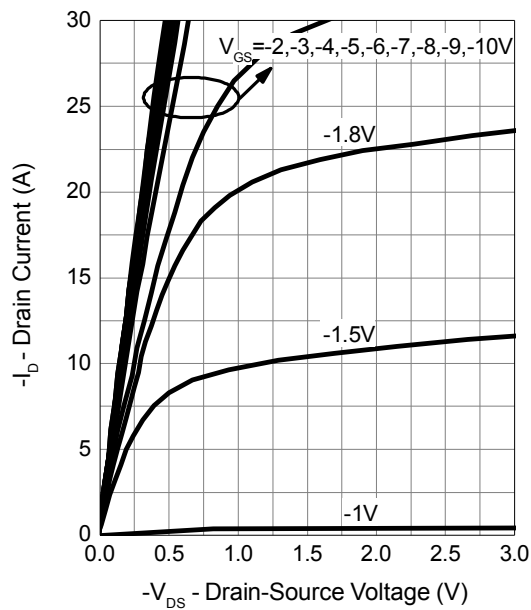
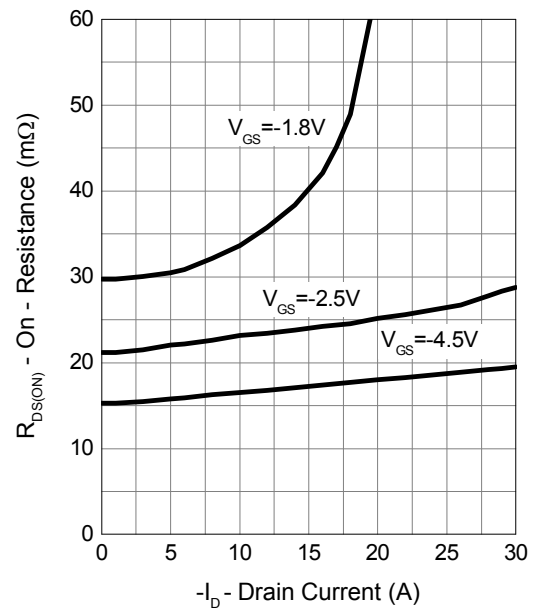
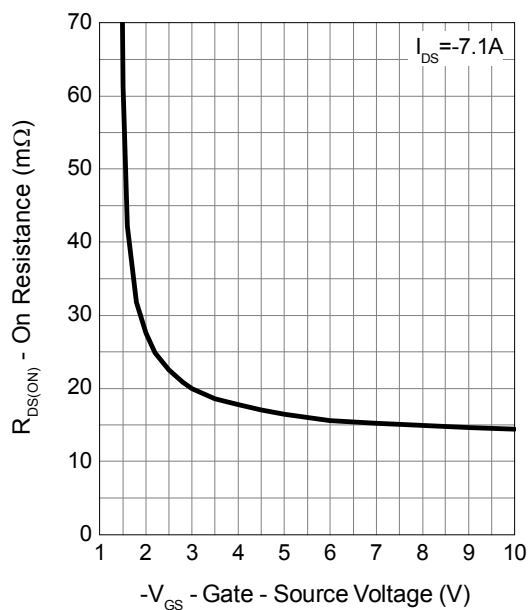
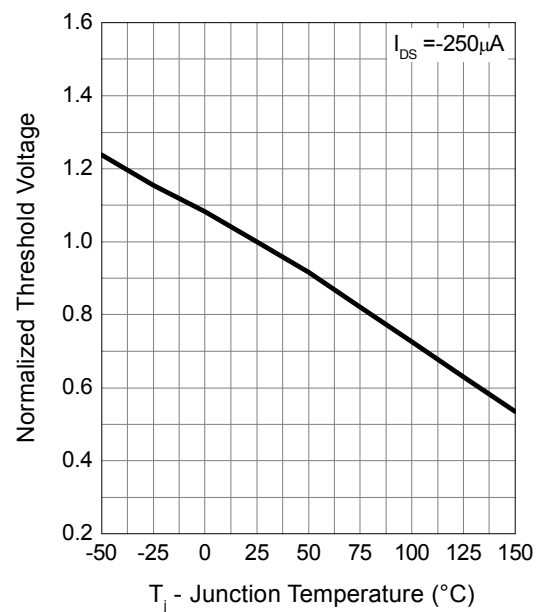
Safe Operation Area



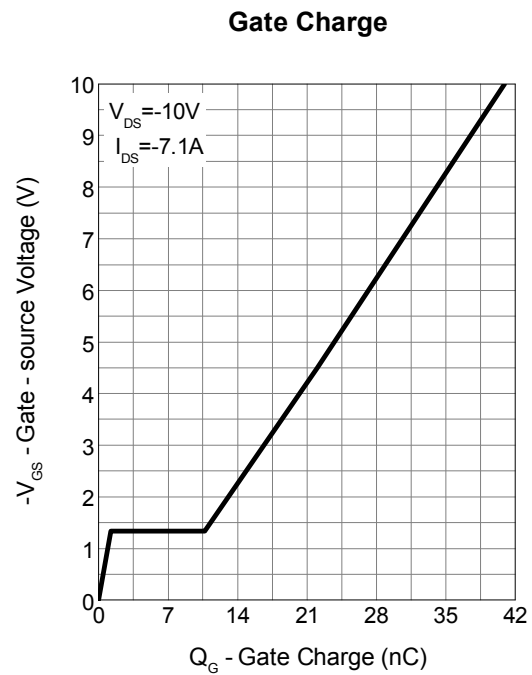
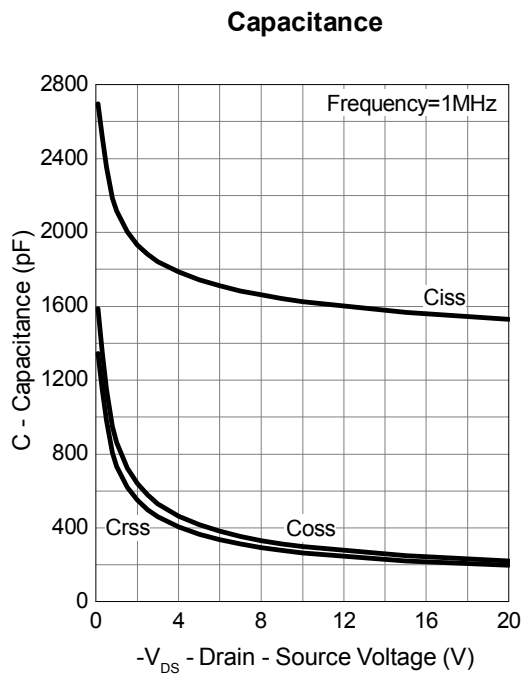
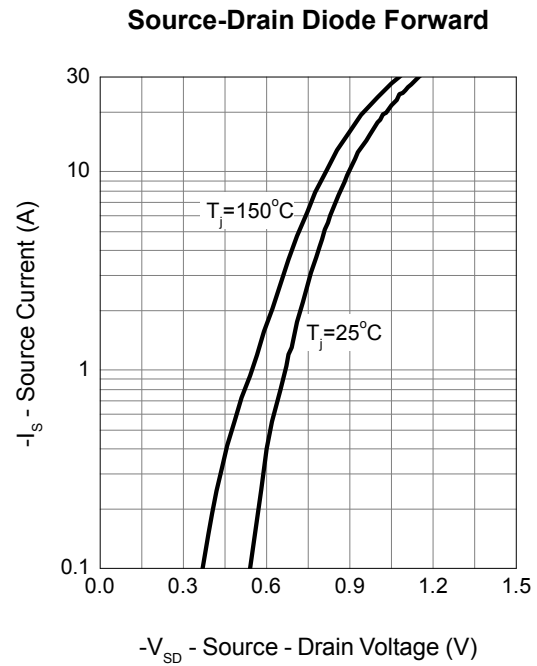
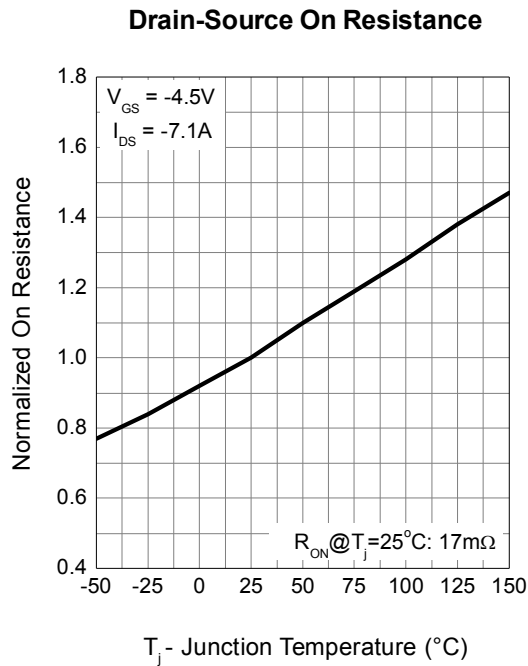
Thermal Transient Impedance



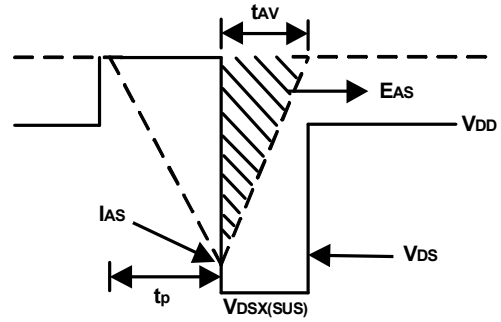
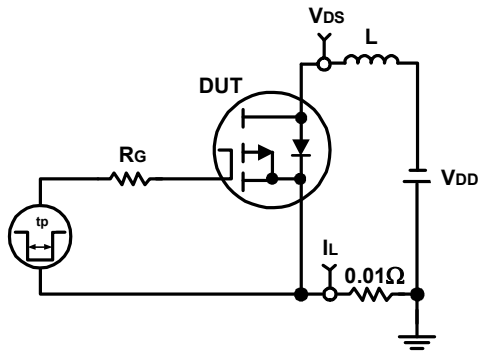
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


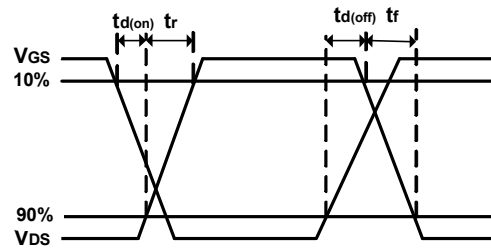
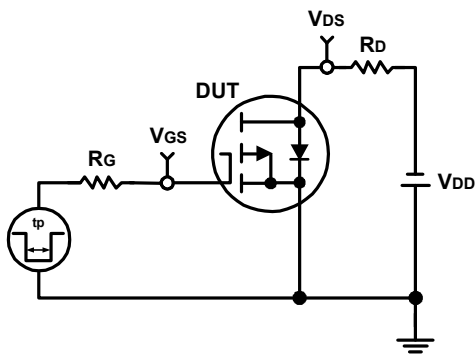
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

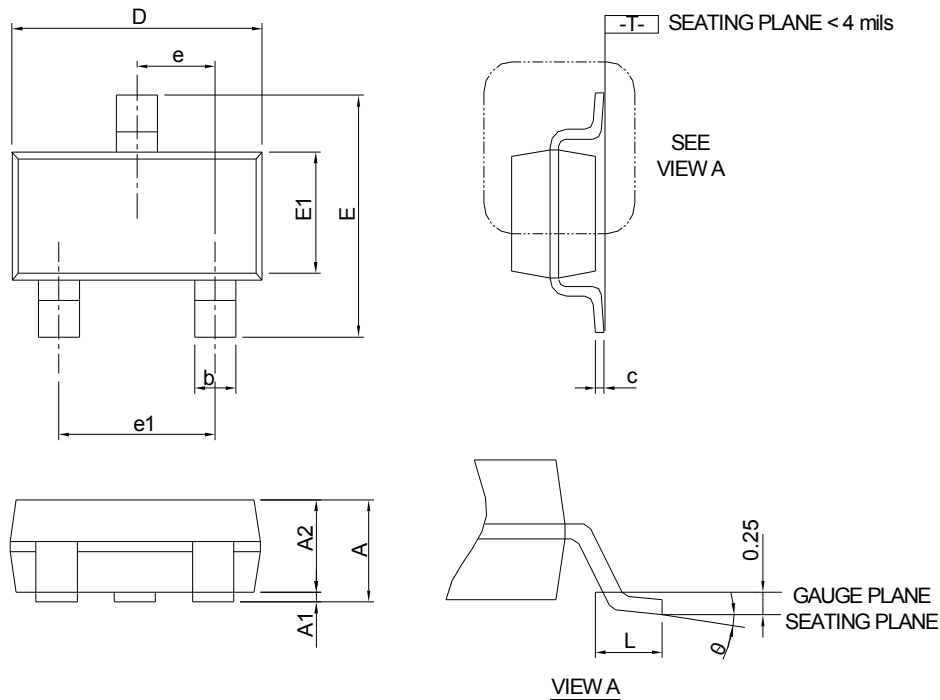


Switching Time Test Circuit and Waveforms



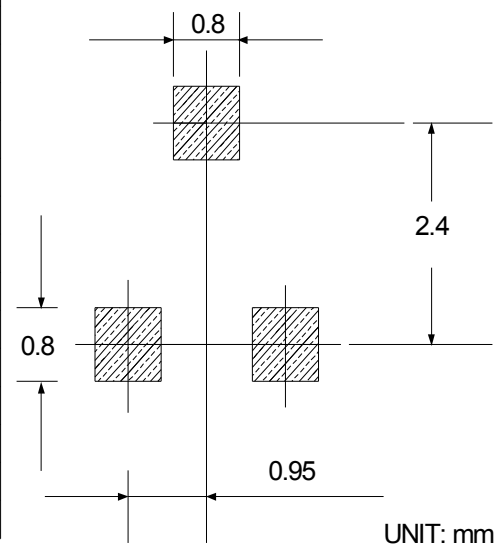
Package Information

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.