

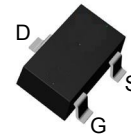
Features

- 20V/-4.6A ,
 $R_{DS(ON)} = 38m\Omega$ (typ.) @ $V_{GS} = -4.5V$
 $R_{DS(ON)} = 52m\Omega$ (typ.) @ $V_{GS} = -2.5V$
 $R_{DS(ON)} = 76m\Omega$ (typ.) @ $V_{GS} = -1.8V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

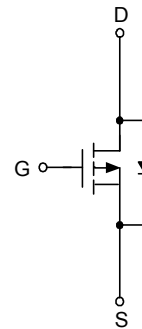
Applications

- 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		-20	V
V_{GSS}	Gate-Source Voltage		± 12	
I_D^*	Continuous Drain Current	$T_A = 25^\circ\text{C}$	-4.6	A
		$T_A = 70^\circ\text{C}$	-3.7	
I_{DM}^*	300 μs Pulsed Drain Current	$T_A = 25^\circ\text{C}$	-18.6	
		$T_A = 70^\circ\text{C}$	-14.9	
I_S^*	Diode Continuous Forward Current		-1	$^\circ\text{C}$
T_J	Maximum Junction Temperature		150	
T_{STG}	Storage Temperature Range		-55 to 150	
P_D^*	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	1.56	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	120	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady state	52	

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

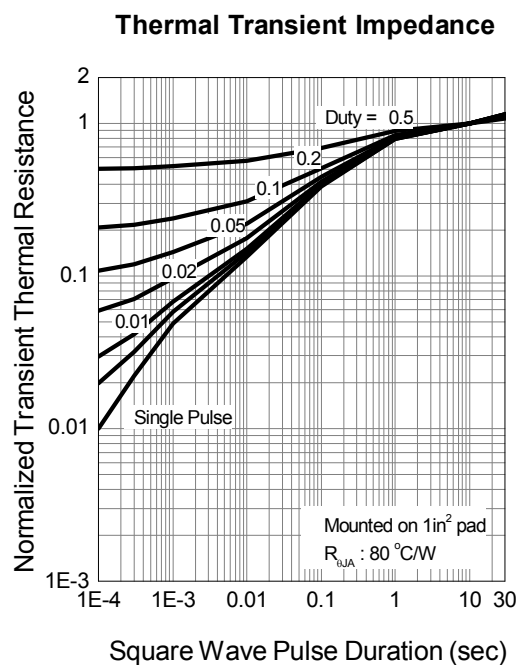
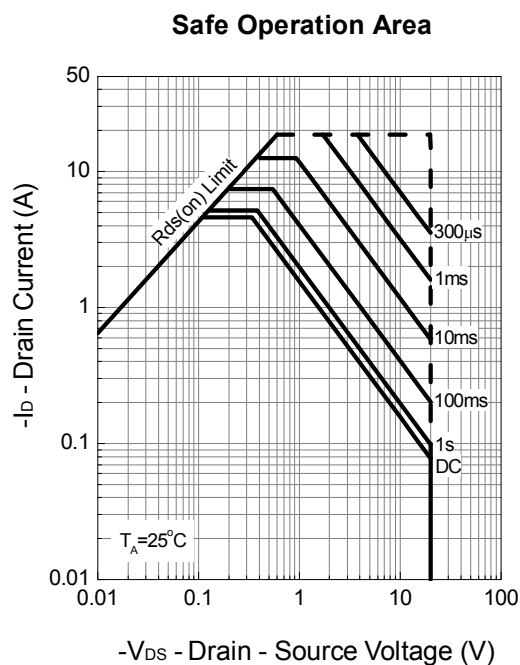
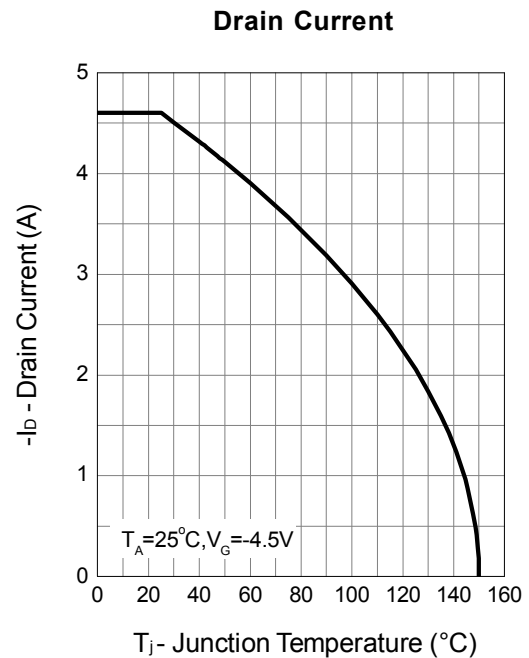
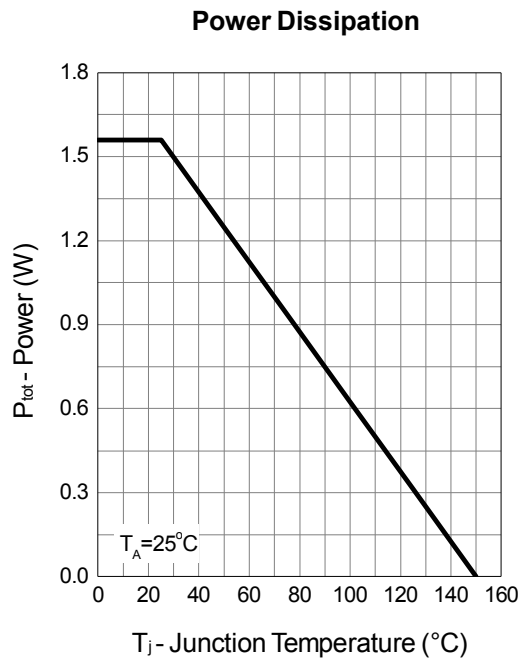
Electrical Characteristics (T_A = 25°C unless otherwise noted)

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 -30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-0.7	-1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _{DS} =-4.6A	-	38	48	mΩ
		V _{GS} =-2.5V, I _{DS} =-2.9A	-	52	70	
		V _{GS} =-1.8V, I _{DS} =-1.5A	-	76	110	
V _{SD} ^a	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1	V
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _{DS} =-4.6A	-	6.8	-	nC
Q _{gs}	Gate-Source Charge		-	0.8	-	
Q _{gd}	Gate-Drain Charge		-	2.5	-	
Dynamic Characteristics ^b						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	3.6	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz	-	590	-	pF
C _{oss}	Output Capacitance		-	122	-	
C _{rss}	Reverse Transfer Capacitance		-	92	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =10Ω, I _{DS} =-1A, V _{GEN} =-4.5V, R _G =6Ω	-	7.2	-	ns
t _r	Turn-on Rise Time		-	13.4	-	
t _{d(OFF)}	Turn-off Delay Time		-	26	-	
t _f	Turn-off Fall Time		-	17	-	
t _{rr}	Reverse Recovery Time	I _{SD} =-4.6A, dI _{SD} /dt =100A/μs	-	18	-	ns
Q _{rr}	Reverse Recovery Charge		-	7	-	nC

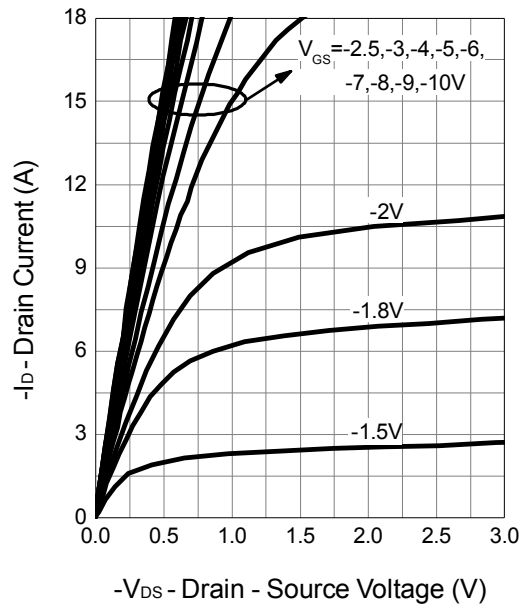
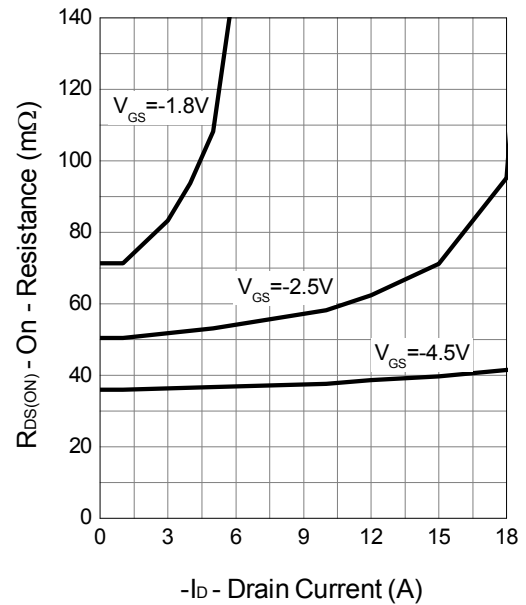
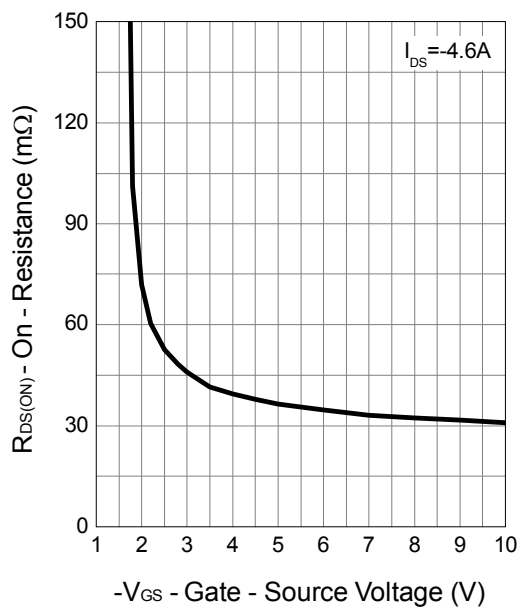
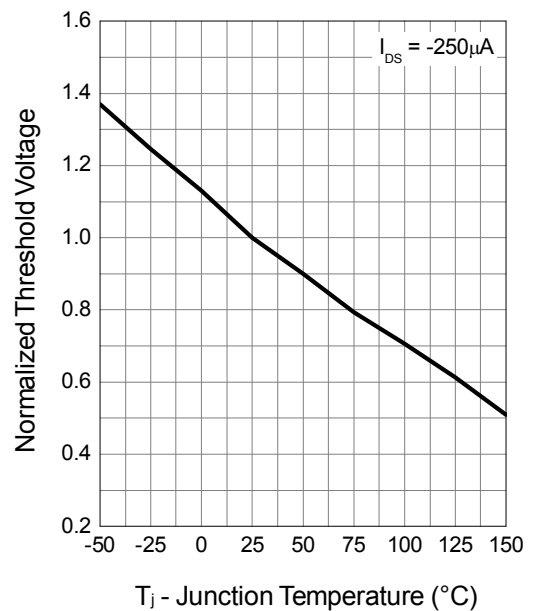
Note a : Pulse test ; pulse width≤300μs, duty cycle≤2%.

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

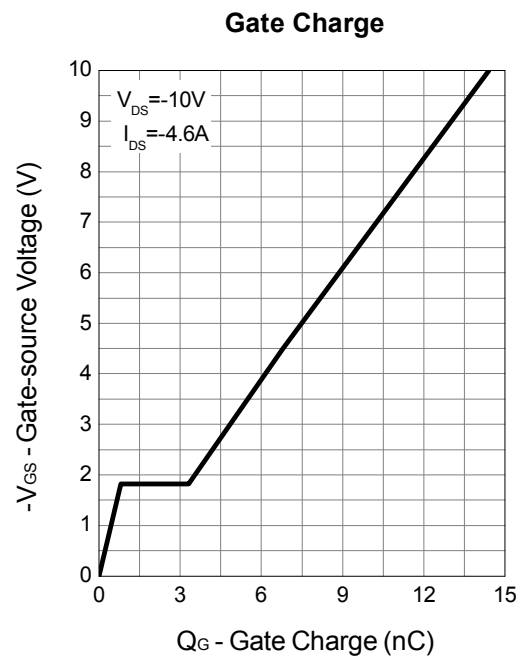
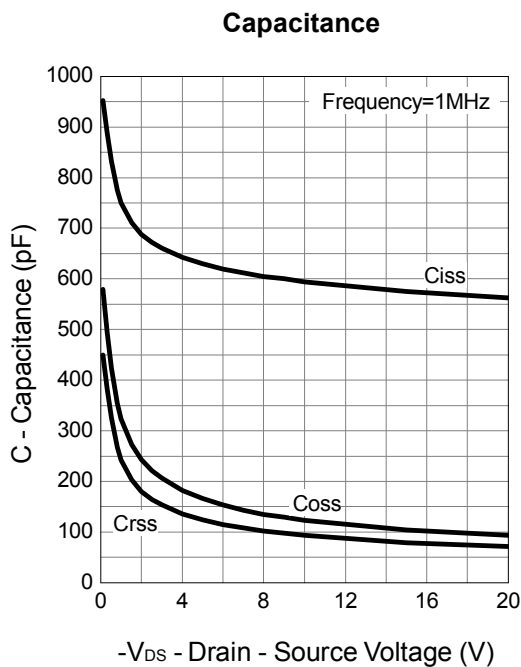
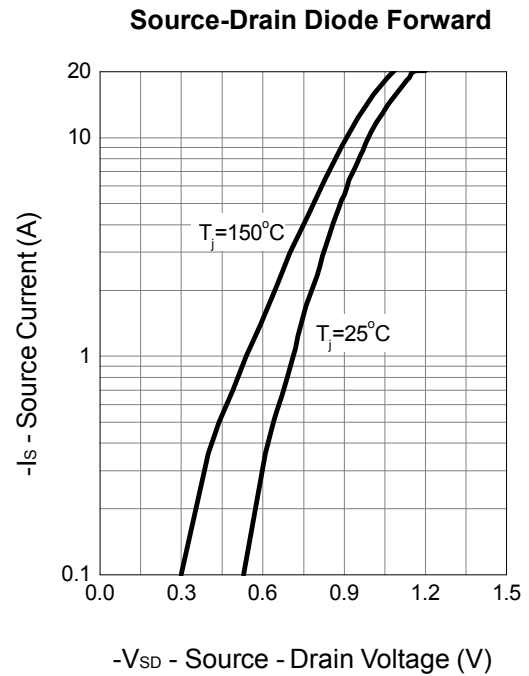
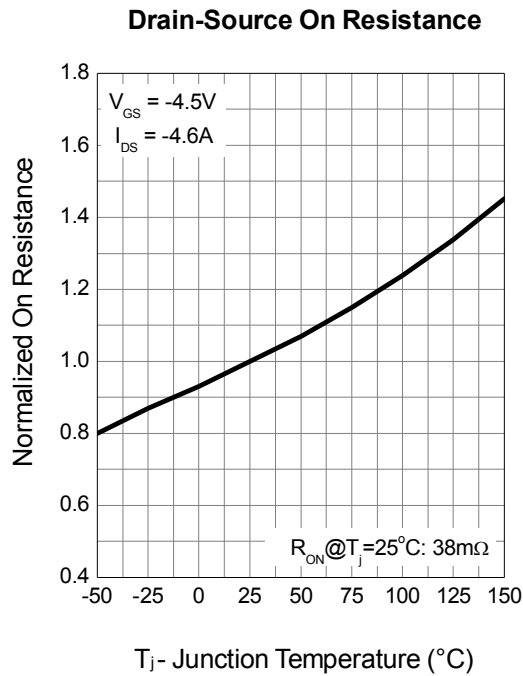
Typical Operating Characteristics



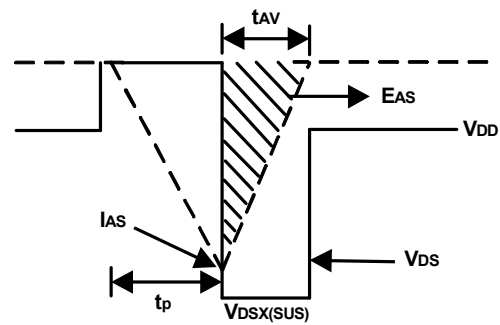
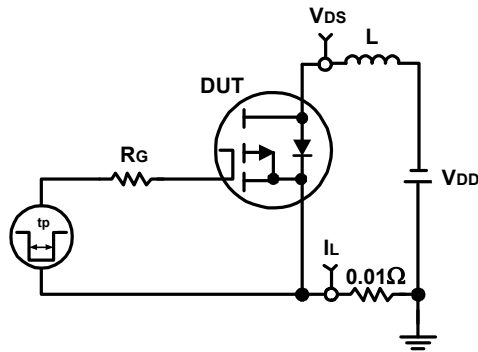
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


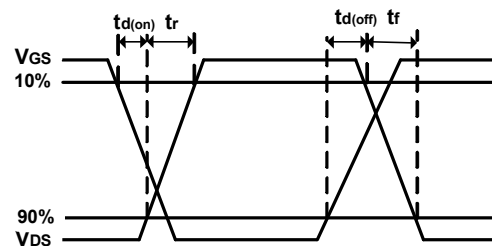
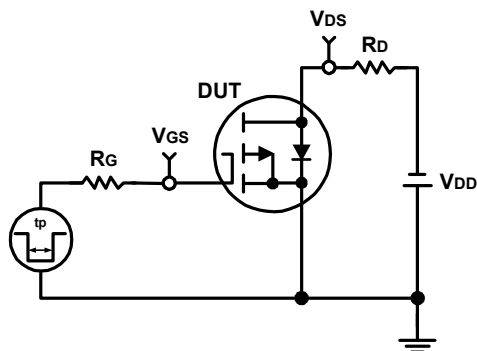
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

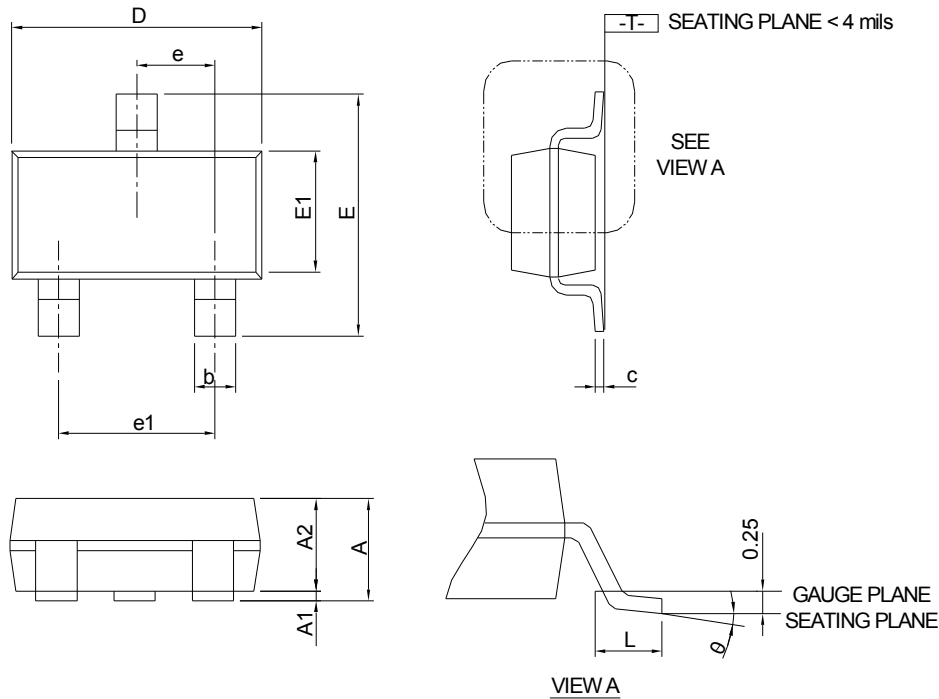


Switching Time Test Circuit and Waveforms



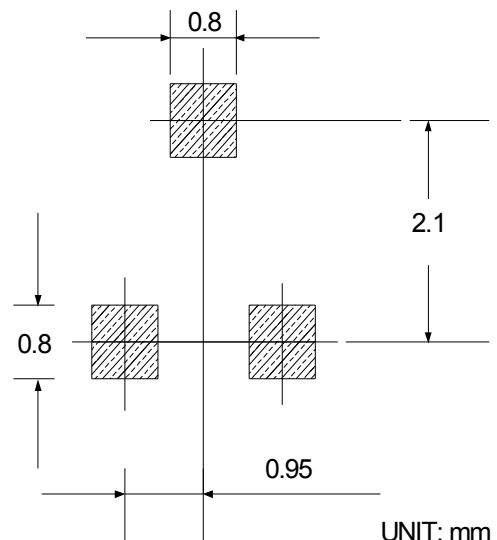
Package Information

SOT-23



SYMBOL	SOT-23			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.20	-	0.047
A1	0.00	0.08	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	2.25	2.55	0.102	0.118
E1	1.20	1.40	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.