

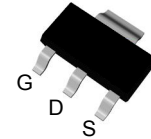
Features

- -40V/-6.5A
 $R_{DS(ON)}=36m\Omega(\text{typ.})@V_{GS}=-10V$
 $R_{DS(ON)}=52m\Omega(\text{typ.})@V_{GS}=-4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)
- Moisture Sensitivity Level MSL1
(per JEDEC J-STD-020D)

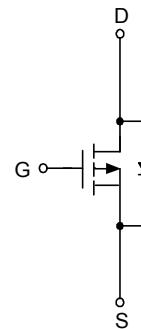
Applications

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

Pin Description



Top View SOT-223



P-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		-40	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current	T _C =25°C	-6.5	A
I _D	Continuous Drain Current	T _C =25°C	-6.5	A
		T _C =100°C	-3.9	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	-19.5	A
P _D	Maximum Power Dissipation	T _C =25°C	15.4	W
		T _C =100°C	6.2	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	8.1	°C/W
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	Steady State	70	°C/W
I _{AS} ^c	Avalanche Current, Single pulse	L=0.5mH	-7	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.5mH	12.25	mJ

Note a : Pulse width is limited by maximum junction temperature.

Note b : Surface mounted on 1in^2 pad area.

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

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

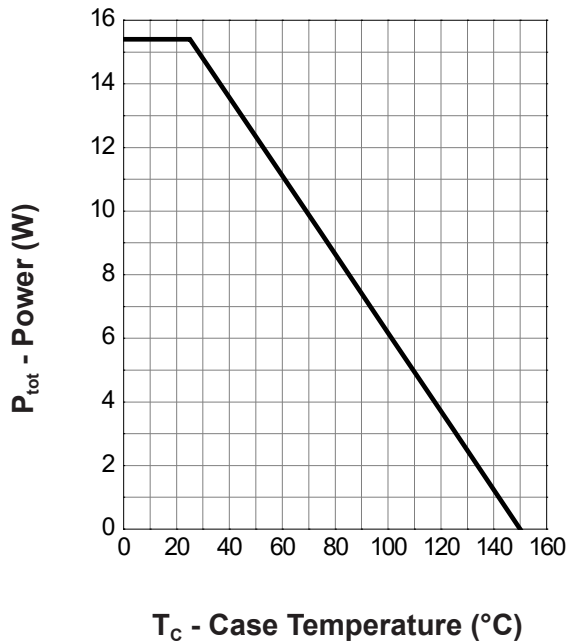
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-32V, V _{GS} =0V T _J =85°C	-	-	-1	μA
			-	-	-30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1.0	-2.0	-3.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-6.5A V _{GS} =-4.5V, I _{DS} =-4A	-	36 52	44 68	mΩ
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =-3.2A, V _{GS} =0V	-	-0.85	-1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =-6.5A, dI _{SD} /dt=100A/μs	-	16	-	ns
Q _{rr}	Reverse Recovery Charge		-	10	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	5.5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-20V, Frequency=1.0MHz	-	1110	-	pF
C _{oss}	Output Capacitance		-	200	-	
C _{rss}	Reverse Transfer Capacitance		-	115	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-15V, R _L =15Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	8	14	ns
t _r	Turn-on Rise Time		-	11	20	
t _{d(OFF)}	Turn-off Delay Time		-	22	40	
t _f	Turn-off Fall Time		-	6	11	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-4.5V, I _{DS} =-6.5A	-	5.4	-	nC
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-10V, I _{DS} =-6.5A	-	10.3	15.5	
Q _{gs}	Gate-Source Charge		-	1.1	-	
Q _{gd}	Gate-Drain Charge		-	3.1	-	

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

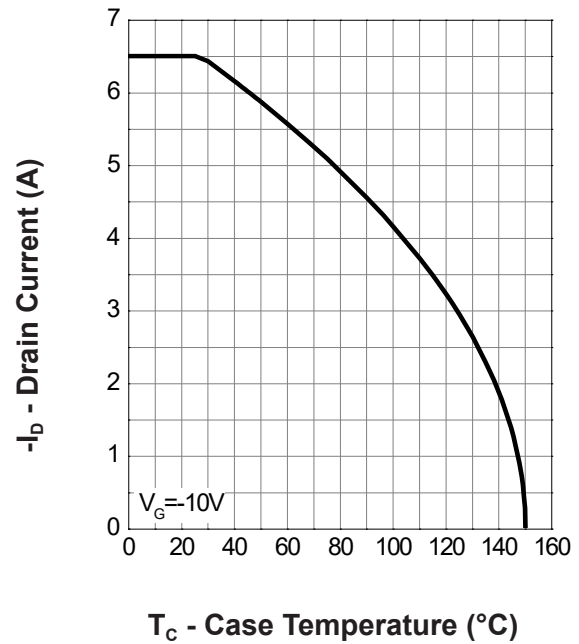
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

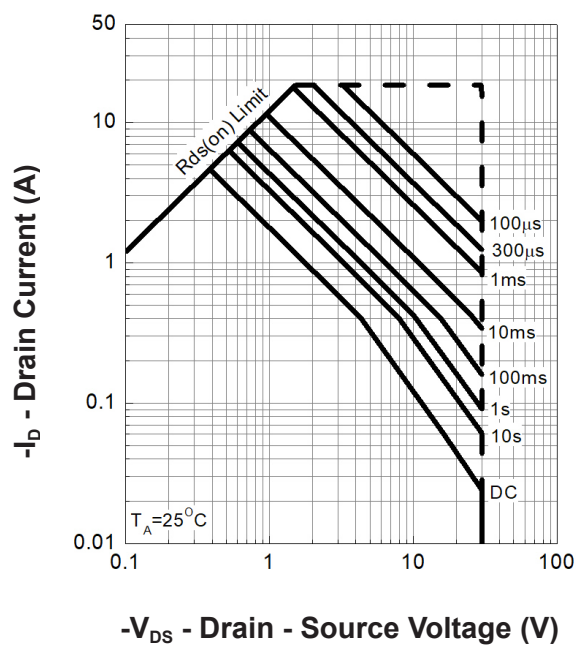
Power Dissipation



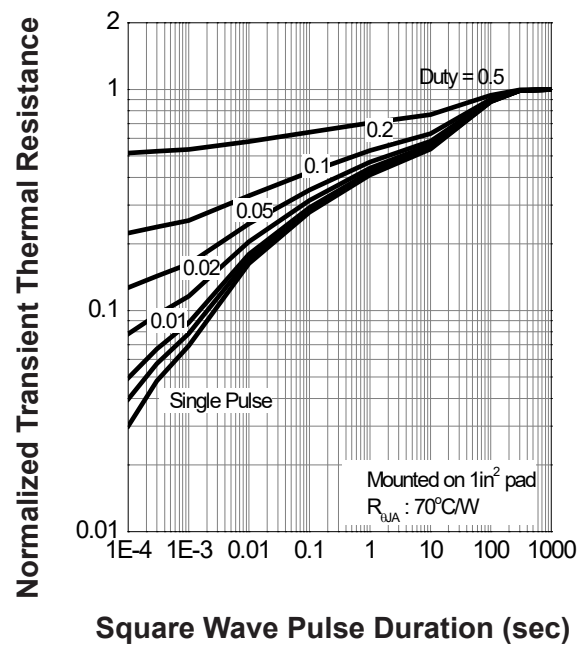
Drain Current



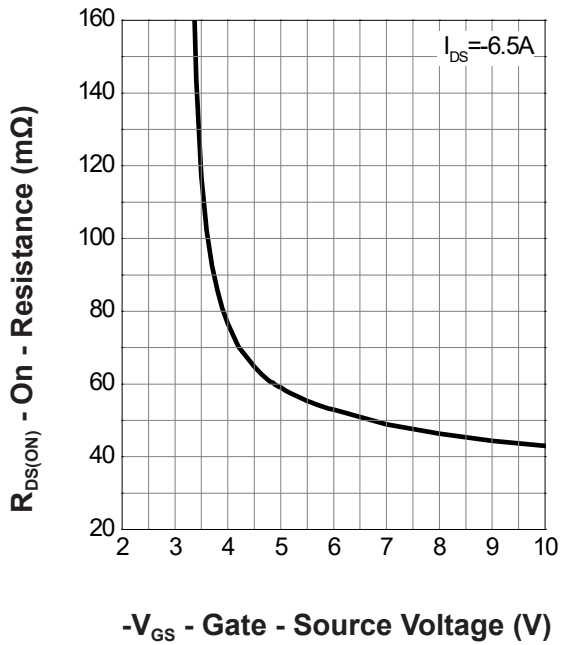
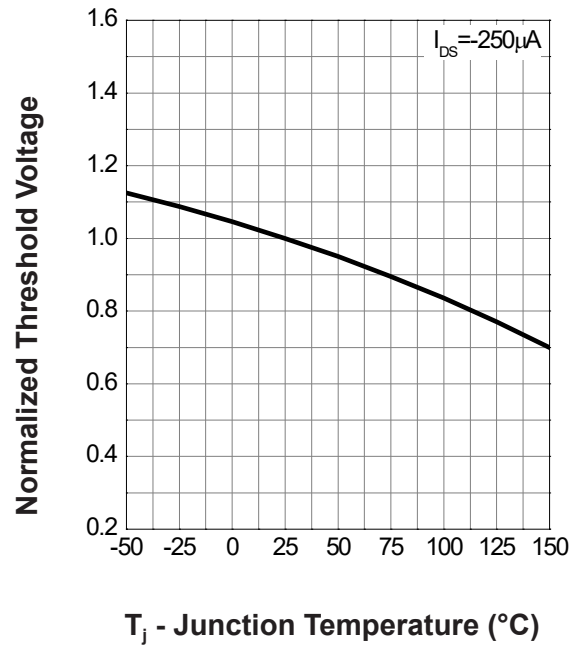
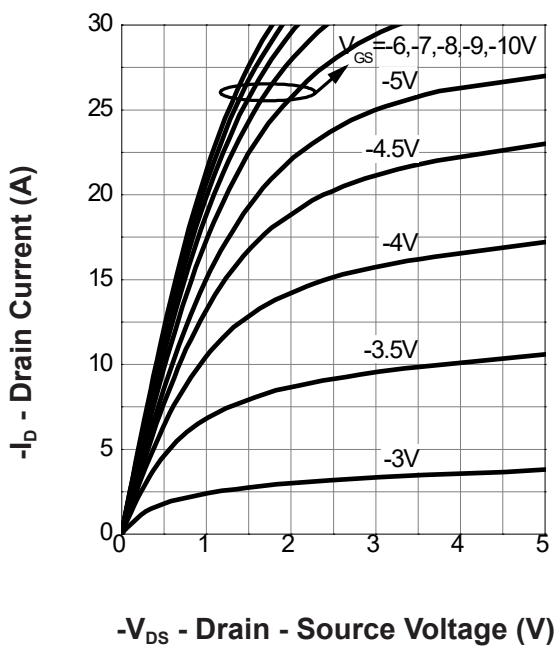
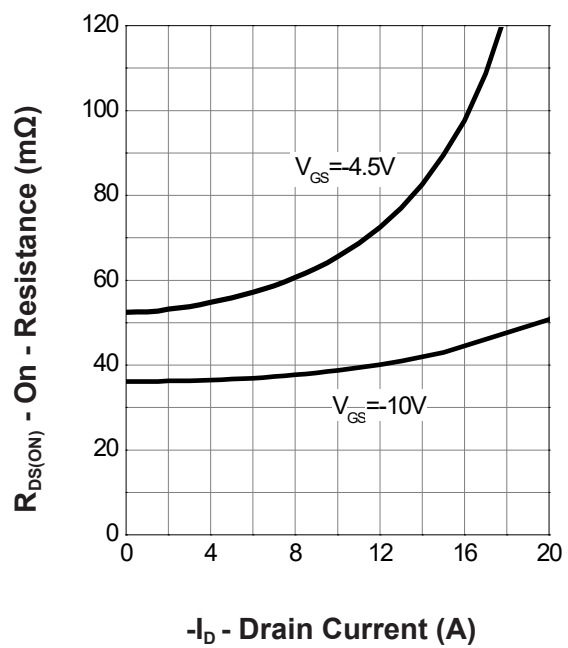
Safe Operation Area



Thermal Transient Impedance

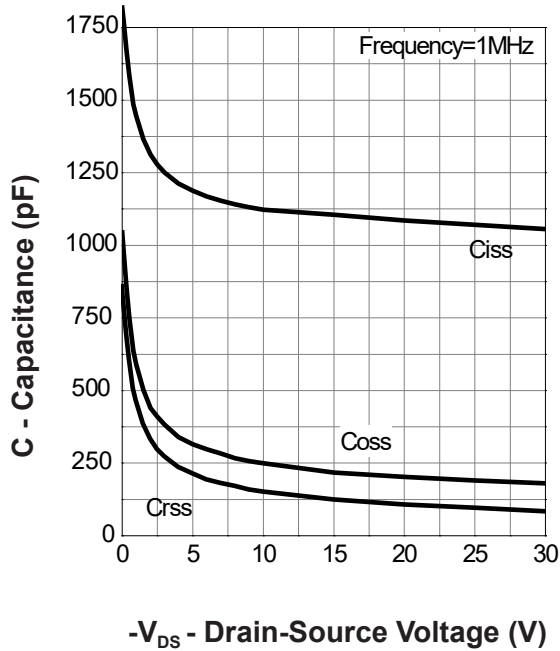


Typical Operating Characteristics(Cont.)

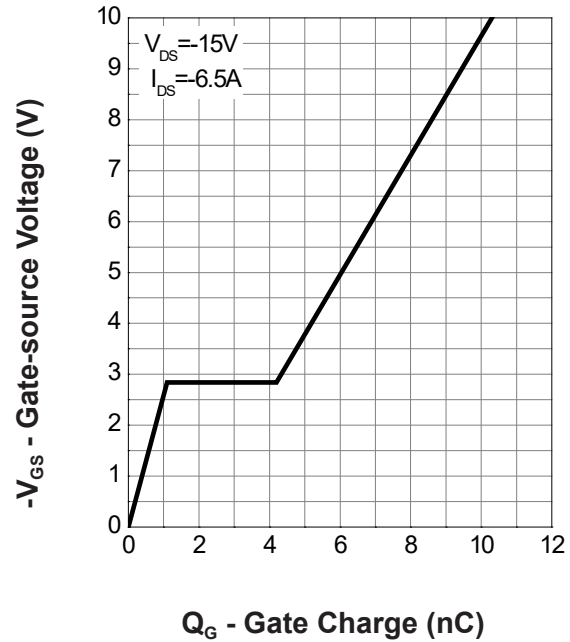
Gate-Source On Resistance

Gate Threshold Voltage

Output Characteristics

Drain-Source On Resistance


Typical Operating Characteristics(Cont.)

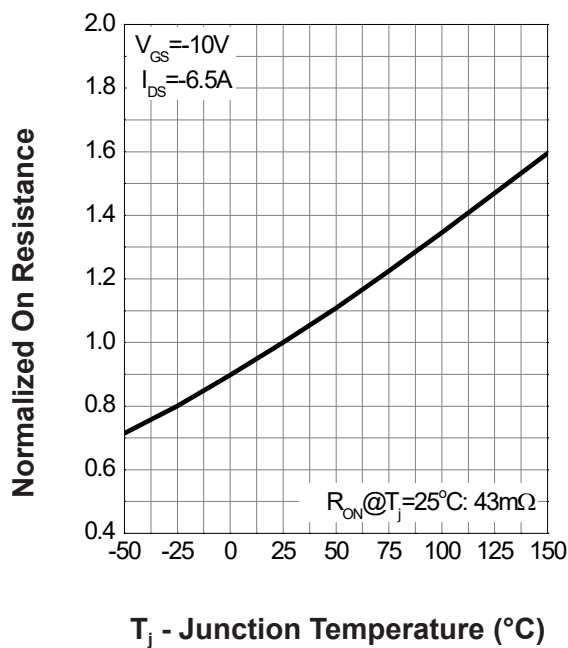
Capacitance



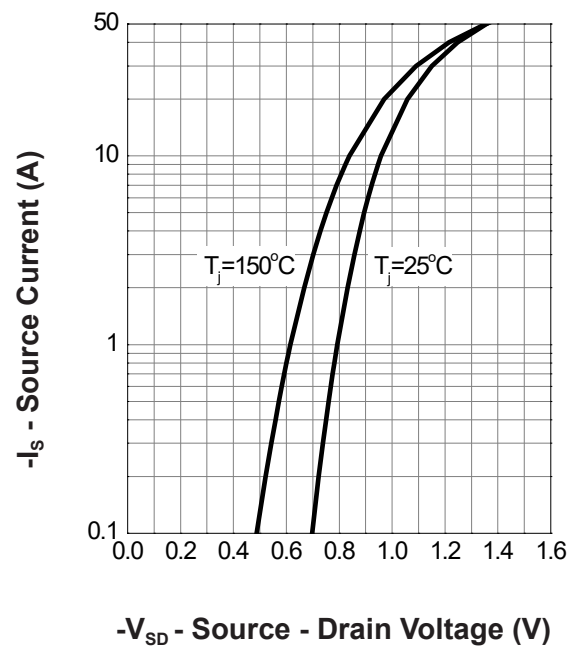
Gate Charge



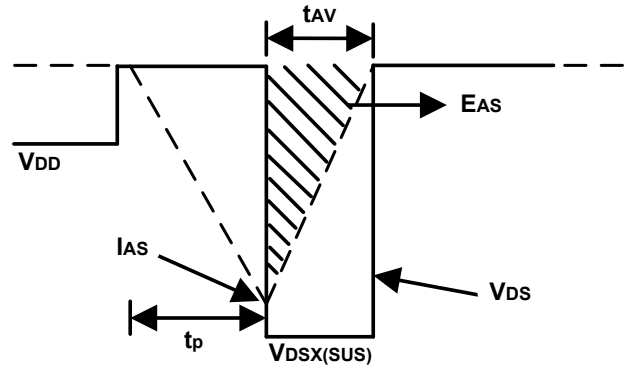
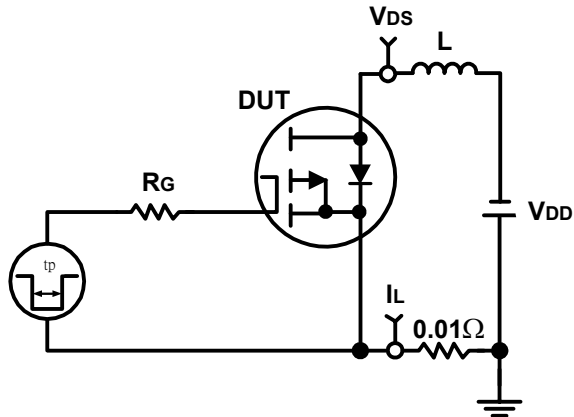
Drain-Source On Resistance



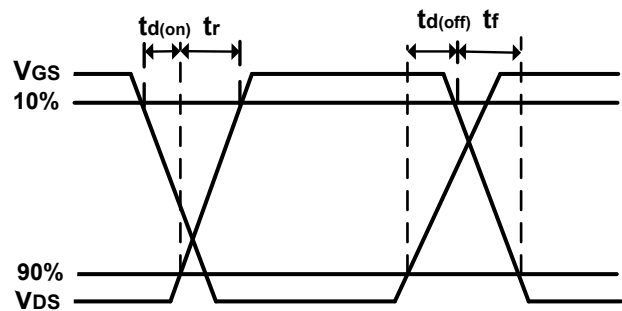
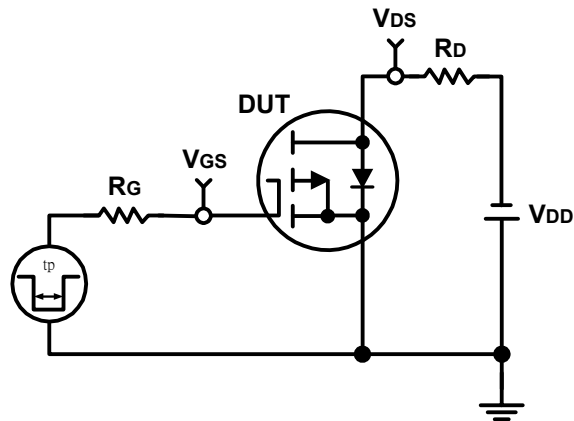
Source-Drain Diode Forward



Avalanche Test Circuit and Waveforms

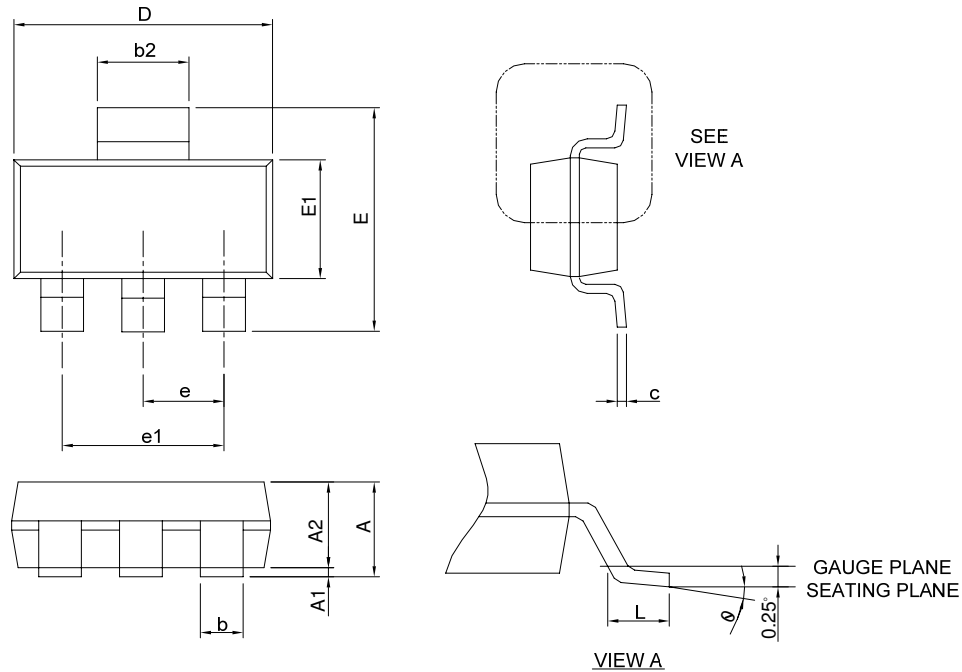


Switching Time Test Circuit and Waveforms



Package Information

SOT-223



SOT-223

SOT-223

MILLIMETERS

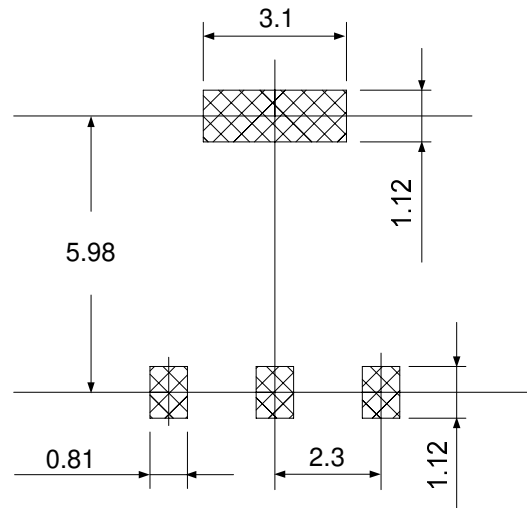
INCHES

	MIN.	MAX.	MIN.	MAX.
A	-	1.80	-	0.071
A1	0.02	0.10	0.001	0.004
A2	1.50	1.70	0.059	0.067
b	0.66	0.84	0.026	0.033
b2	2.90	3.10	0.114	0.122
c	0.23	0.33	0.009	0.013
D	6.30	6.70	0.248	0.264
E	6.70	7.30	0.264	0.287
E1	3.30	3.70	0.130	0.146
e	2.30 BSC		0.091 BSC	
e1	4.60 BSC		0.181 BSC	
L	0.75	-	0.030	-
0	0°	10°	0°	10°

C TO-261 AA.

2. Dimension D and E1 are determined at the outermost extremes of the plastic exclusive of mold flash, tie bar burrs, gate burrs, and interlead flash, but including any mismatch between the top and bottom of the plastic body.

RECOMMENDED LAND PATTERN



UNIT: mm