

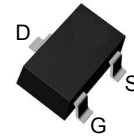
Features

- 40V/5A
 $R_{DS(ON)}=30m\Omega(\text{typ.})@V_{GS}=10V$
 $R_{DS(ON)}=40m\Omega(\text{typ.})@V_{GS}=4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

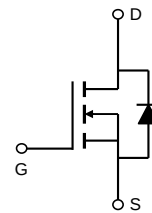
Applications

- Power Management in DC/DC Converter.

Pin Description



Top View of SOT-23



N-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 _A =25°C	5	A
I _D	Continuous Drain Current	T _A =25°C	5	A
		T _A =70°C	3	
I _{DM} ^a	Pulsed Drain Current	T _A =25°C	20	A
P _D	Maximum Power Dissipation	T _A =25°C	1.3	W
		T _A =70°C	0.83	
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	t ≤ 10s	53	°C/W
		Steady State	96	°C/W
I _{AS} ^c	Avalanche Current, Single pulse	L=0.1mH	19	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.1mH	18	mJ

Note a : Pulse width limited by max. junction temperature.

Note b : Surface mounted on 1in^2 pad area, steady state $t = 999\text{s}$.

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

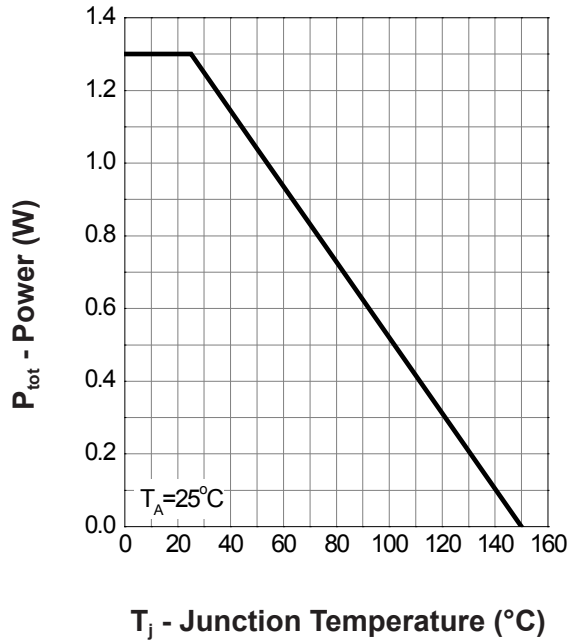
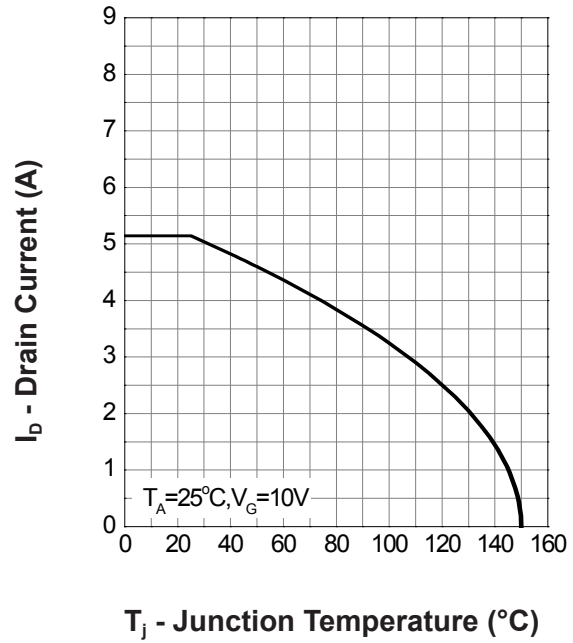
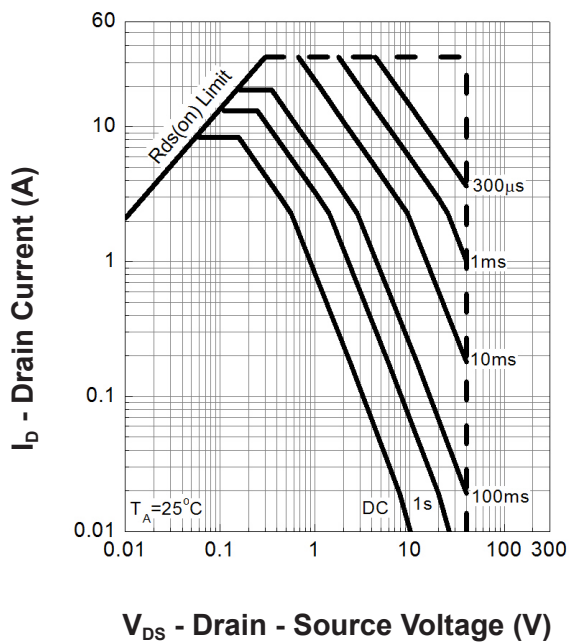
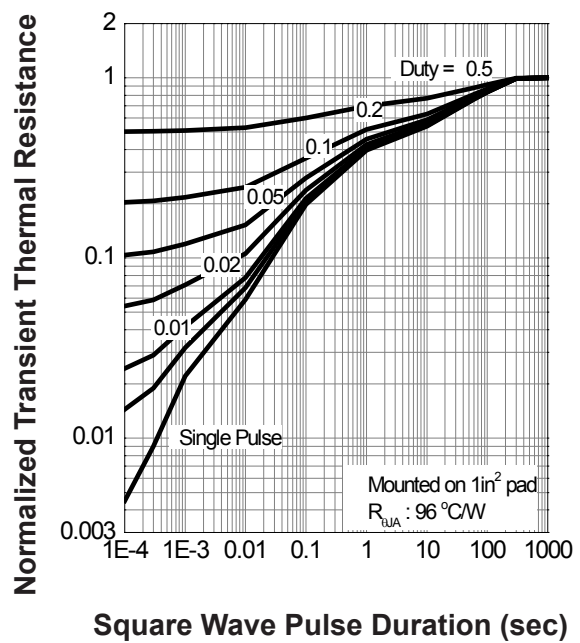
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.0	1.5	2.2	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} =4A V _{GS} =4.5V, I _{DS} =3A	-	30 40	40 60	mΩ
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.7	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =10A, dI _{SD} /dt=100A/μs	-	19.8	-	ns
Q _{rr}	Reverse Recovery Charge		-	9.5	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	1	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	435	520	pF
C _{oss}	Output Capacitance		-	58	-	
C _{rss}	Reverse Transfer Capacitance		-	20	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =1Ω	-	10.7	-	ns
t _r	Turn-on Rise Time		-	9.4	-	
t _{d(OFF)}	Turn-off Delay Time		-	18.8	-	
t _f	Turn-off Fall Time		-	11.4	-	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _{DS} =10A	-	5.7	-	nC
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =10A	-	12.2	-	
Q _{gth}	Threshold Gate Charge		-	1.34	-	
Q _{gs}	Gate-Source Charge		-	2.1	-	
Q _{gd}	Gate-Drain Charge		-	1.7	-	

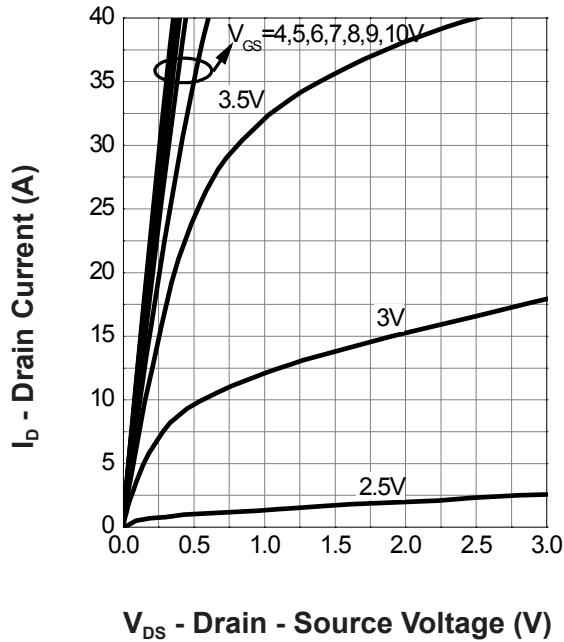
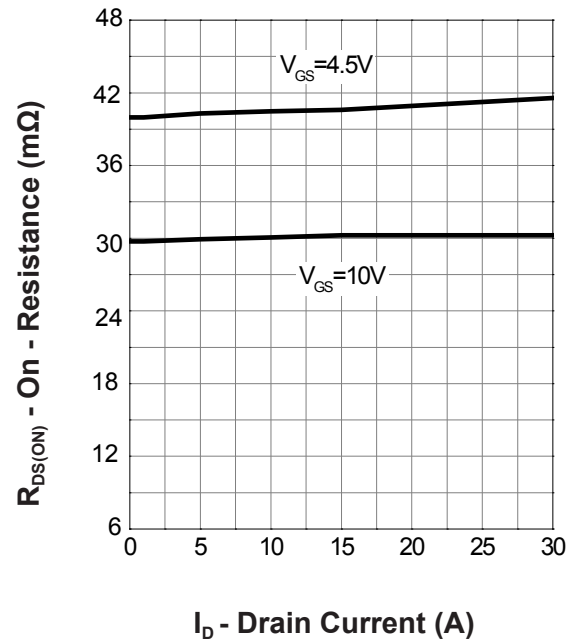
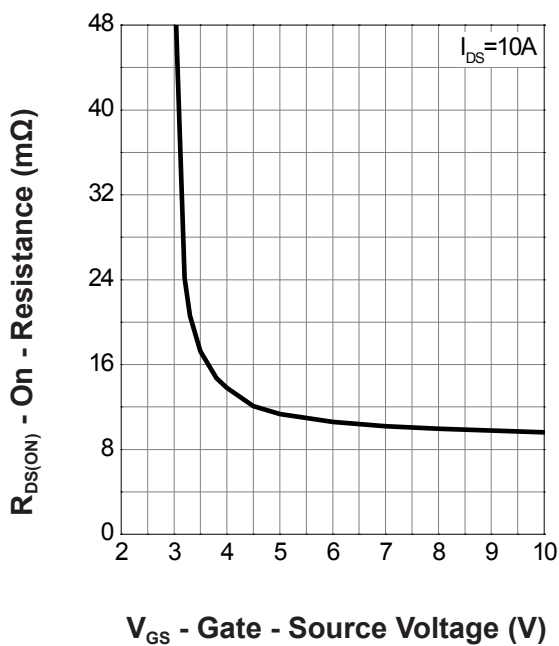
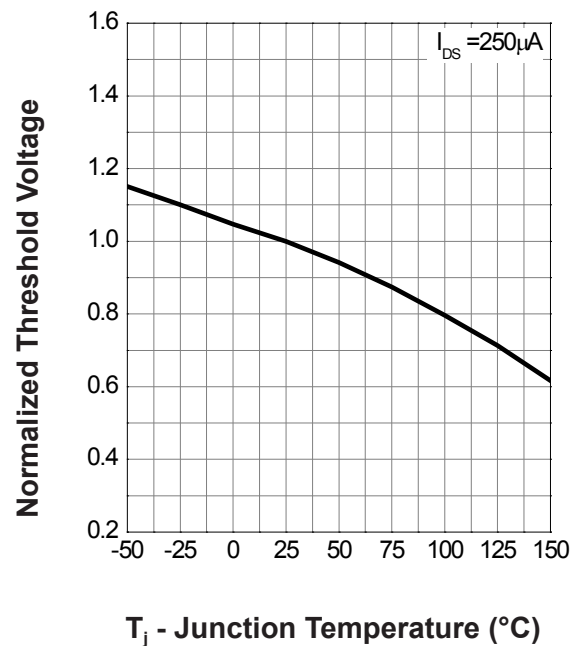
Note d : Pulse test ; pulse width $\leq 300\text{ms}$, duty cycle $\leq 2\%$.

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

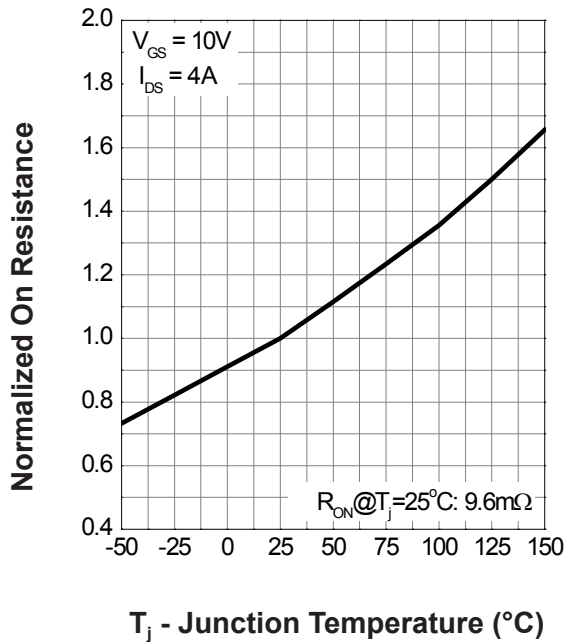
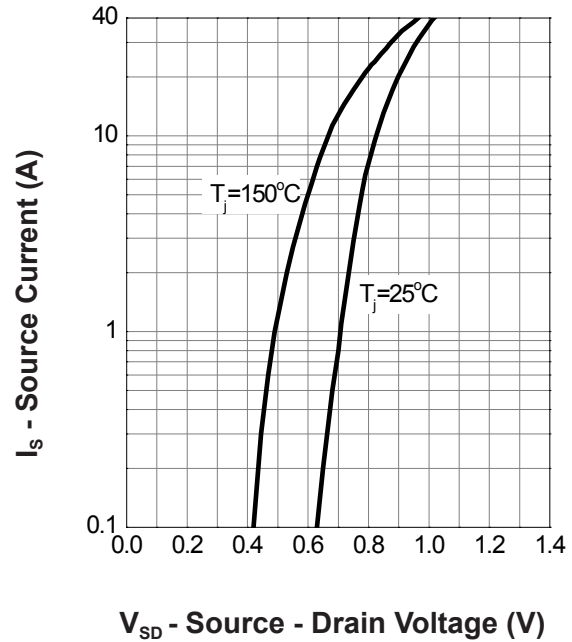
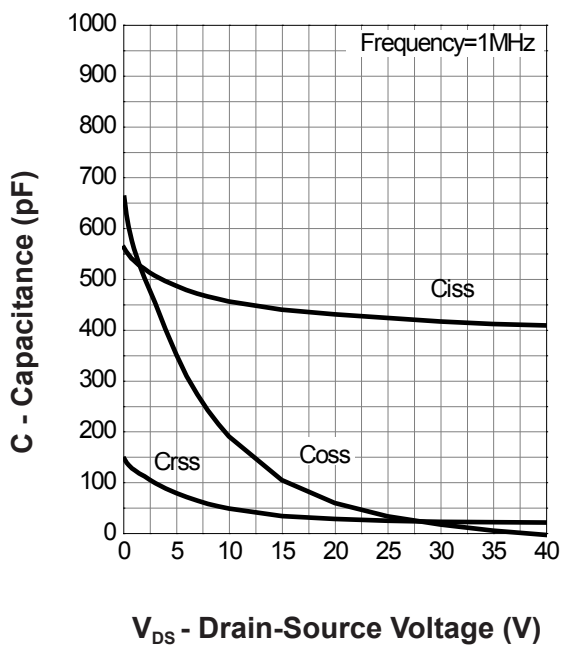
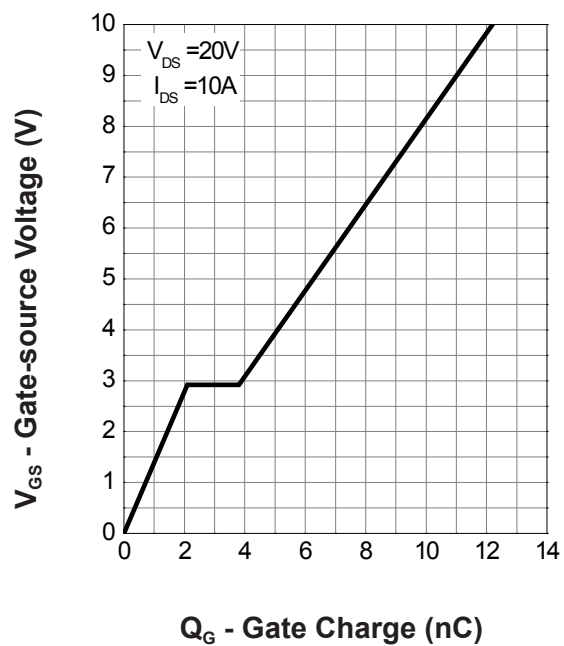
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


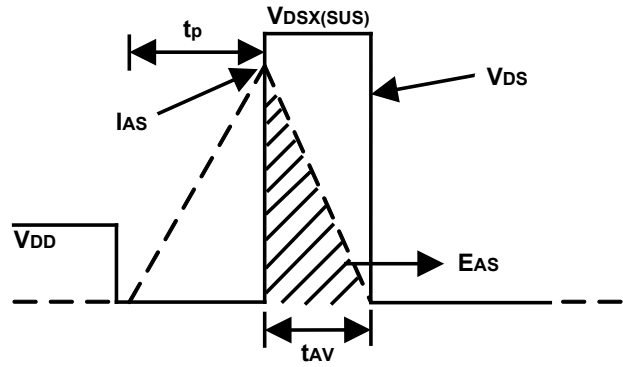
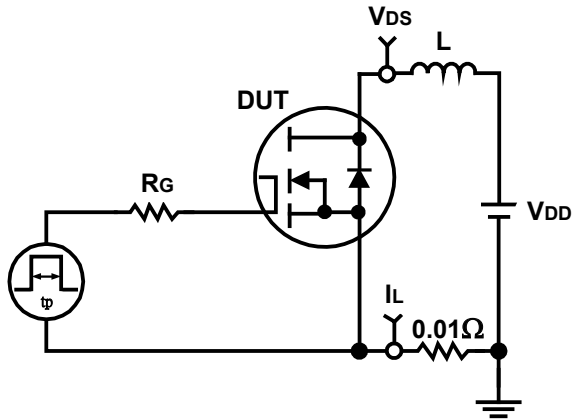
Typical Operating Characteristics(Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


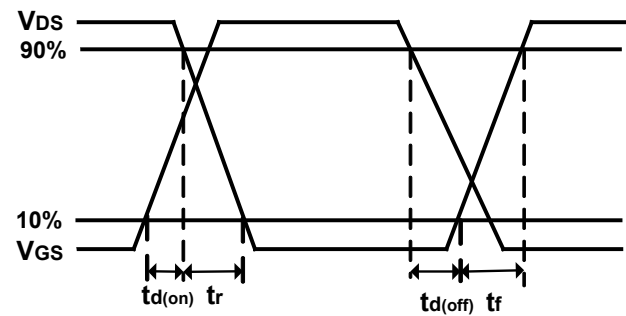
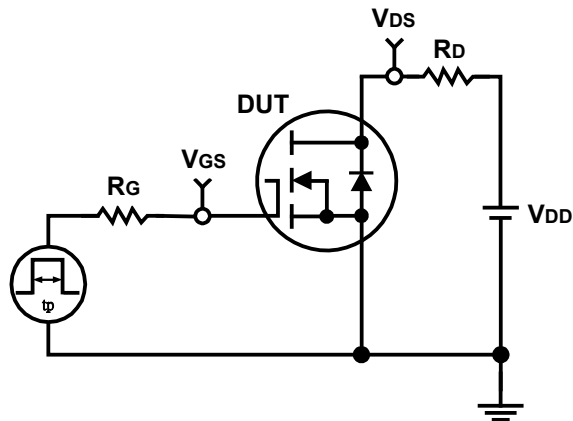
Typical Operating Characteristics(Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Avalanche Test Circuit and Waveforms

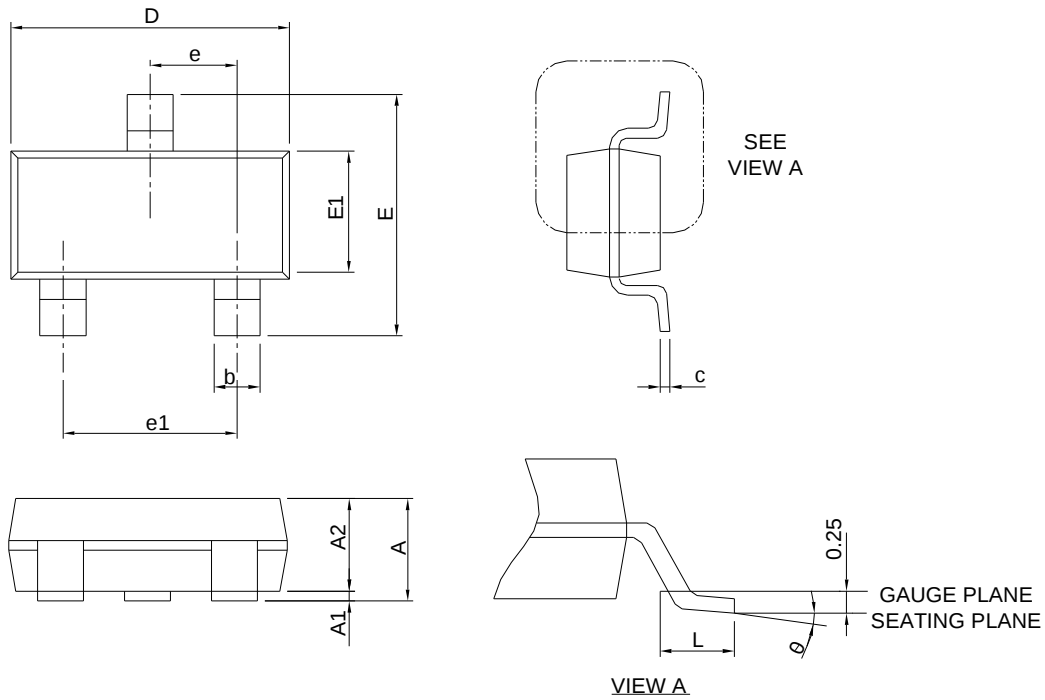


Switching Time Test Circuit and Waveforms



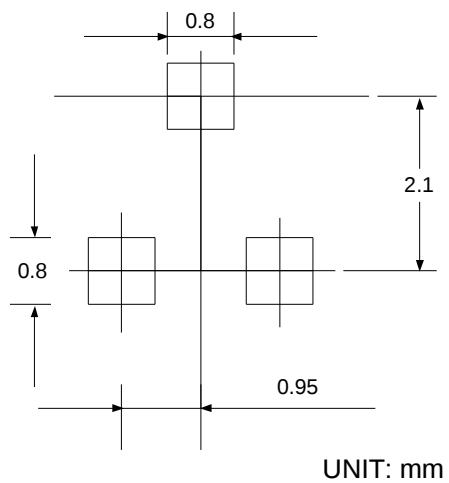
Package Information

SOT-23



Symbol	SOT-23			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.20	-	0.047
A1	0.00	0.10	0.000	0.004
A2	0.90	1.10	0.035	0.043
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	2.20	2.60	0.086	0.102
E1	1.20	1.40	0.047	0.055
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



UNIT: mm

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.