

-20V P-Channel Mosfet

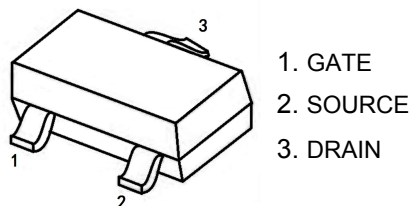
FEATURES

- $R_{DS(ON)} \leq 91m\Omega$ (80m Ω Typ.)
@ $V_{GS} = -4.5V$
- $R_{DS(ON)} \leq 110m\Omega$ (95m Ω Typ.)
@ $V_{GS} = -2.5V$

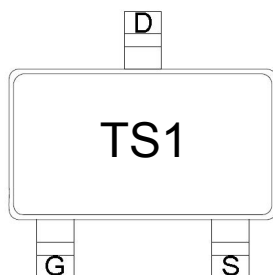
APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter

SOT-323

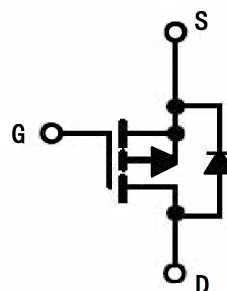


MARKING



TS1: Device code

P-CHANNEL MOSFET



MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		± 12	V
I_D	Continuous Drain Current	$T_a = 25^\circ C$	-1.5	A
		$T_a = 100^\circ C$	-0.92	A
I_{DM}	Pulsed Drain Current ^{note1}		-4	A
P_D	Power Dissipation	$T_a = 25^\circ C$	0.29	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		431	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ C$

MOSFET ELECTRICAL CHARACTERISTICS Ta=25 °C unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V,I _D = -250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -16V, V _{GS} = 0V, T _J = 25°C	-	-	1	μA
I _{GSS}	Gate to Body Leakage Current	V _{GS} = ±12V,V _{DS} = 0V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D = -250μA	-0.5	-	-1	V
R _{DS(on)}	Static Drain-Source On-Resistance ^{note2}	V _{GS} =-4.5V, I _D =-3A	-	80	91	mΩ
		V _{GS} =-2.5V, I _D =-2A	-	95	110	
Dynamic Characteristics ^{note3}						
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} = 0V f = 1.0MHz	-	405	-	pF
C _{oss}	Output Capacitance		-	75	-	pF
C _{rss}	Reverse Transfer Capacitance		-	55	-	pF
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-1A, V _{GS} =-4.5V,	-	5	-	nC
Q _{gs}	Gate-Source Charge		-	0.7	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	1.3	-	nC
Switching Characteristics ^{note3}						
t _{d(on)}	Turn-On Delay Time	V _{GS} = -4.5V, V _{DS} =-10V, R _G =1Ω, I _D =-1A	-	11	-	ns
t _r	Turn-On Rise Time		-	35	-	ns
t _{d(off)}	Turn-Off Delay Time		-	30	-	ns
t _f	Turn-Off Fall Time		-	10	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-1.5	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-4	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _{SD} =-3A T _J = 25°C	-	-	1.2	V

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

3. Guaranteed by design, not subject to production testing

TYPICAL PERFORMANCE CHARACTERISTICS

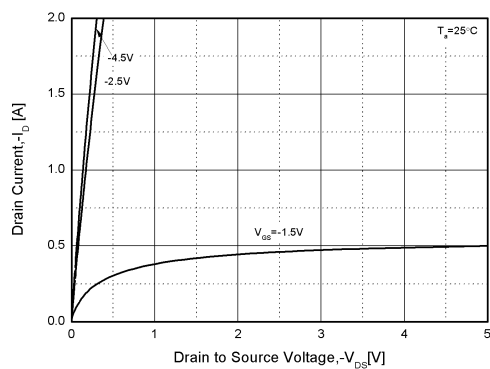


Figure1. Output Characteristics

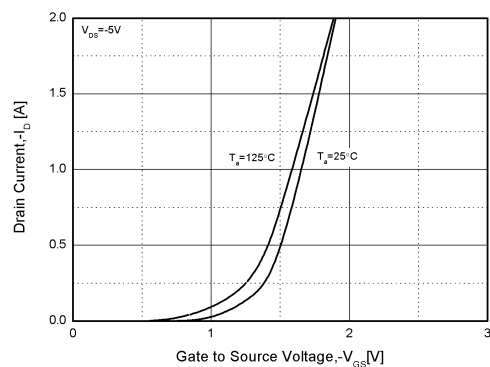


Figure2. Transfer Characteristics

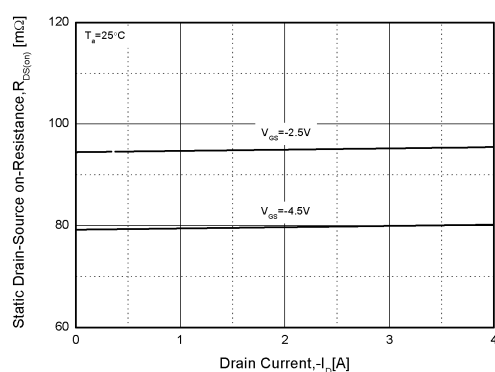


Figure3. Rdson-Drain Current

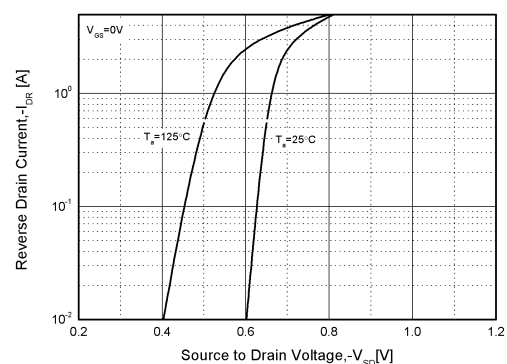


Figure4. Typical Source-Drain Diode Forward Voltage

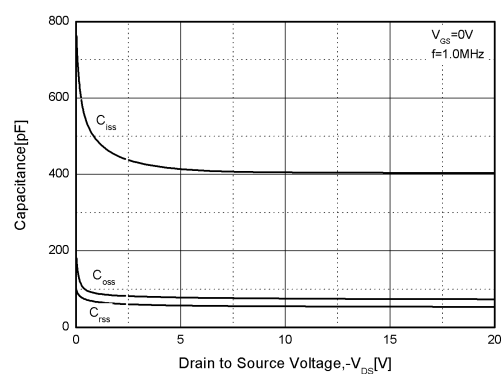


Figure5. Capacitance Characteristics

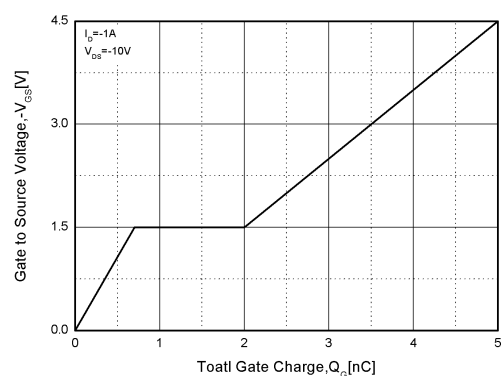


Figure6. Gate Charge

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

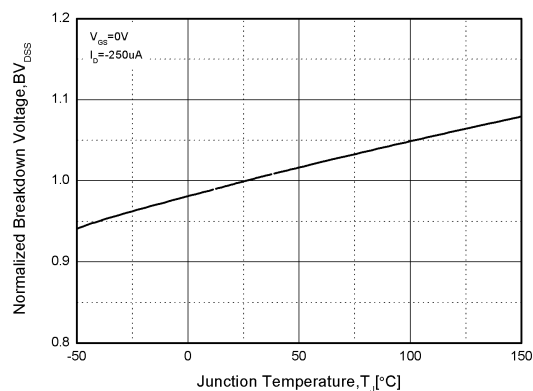


Figure7. Normalized Breakdown Voltage vs. Temperature

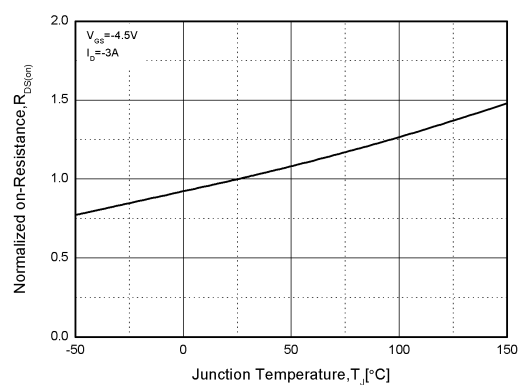


Figure8. Normalized on Resistance vs. Temperature

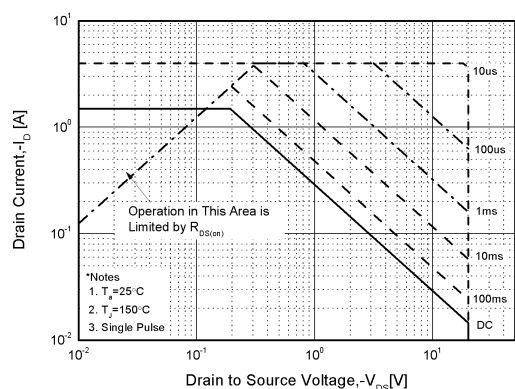


Figure9. Safe Operation Area

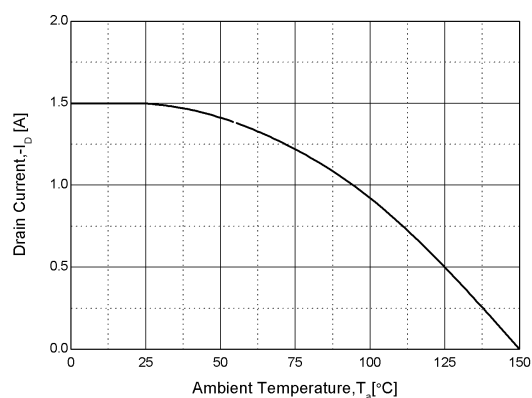


Figure10. Drain Current vs. Ambient Temperature

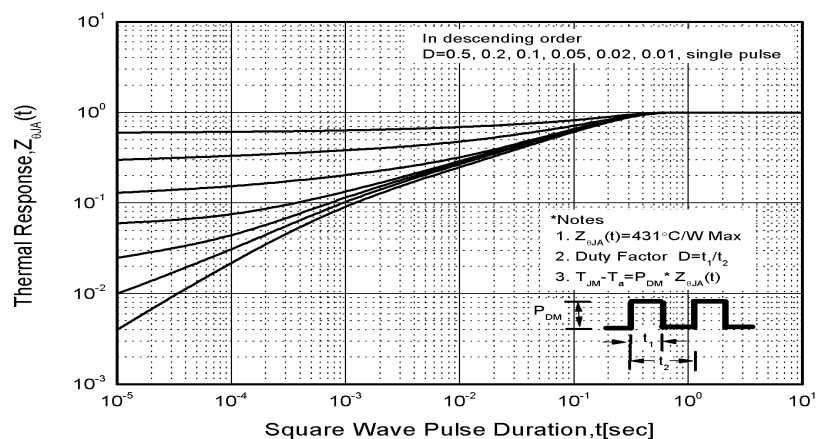
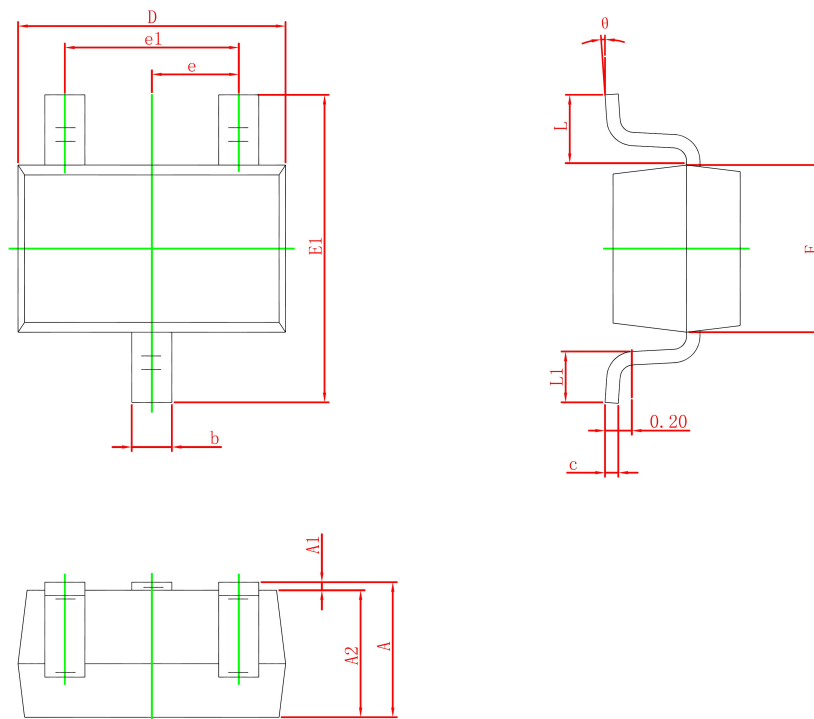


Figure11. Transient Thermal Response Curve

SOT-323 PACKAGE OUTLINE DRAWING



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°