

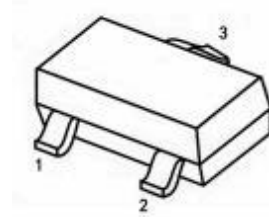


20V N-Channel Mosfet

FEATURES

- $R_{DS(ON)} \leq 35m\Omega$ (24m Ω Typ.)
@ $V_{GS}=4.5V$
- $R_{DS(ON)} \leq 50m\Omega$ (29m Ω Typ.)
@ $V_{GS}=2.5V$

SOT-23

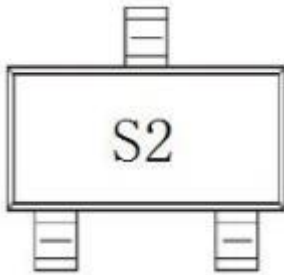


1. GATE
2. SOURCE
3. DRAIN

APPLICATIONS

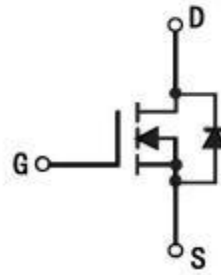
- Load Switch for Portable Devices
- DC/DC Converter

MARKING



S2 : Device Code

N-CHANNEL MOSFET



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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	
I_D	Continuous Drain Current	4	A
I_{DM}	Pulsed Drain Current note1	16	
P_D	Maximum Power Dissipation	0.84	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient(t \leq 5s)	150	$^{\circ}C / W$
T_J	Junction Temperature	150	$^{\circ}C$
T_{stg}	Storage Temperature	-55 ~+150	



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	$V_{GS} = 0V, I_D = 250 \mu A$	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 16V,$ $V_{GS} = 0V, T_J = 25C$	-	-	1	μA
I_{GSS}	Gate to Body Leakage Current	$V_{GS} = \pm 12V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	0.4	0.7	1.1	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^{note2}	$V_{GS} = 4.5V, I_D = 4A$	-	24	35	m Ω
		$V_{GS} = 2.5V, I_D = 3.1A$	-	29	50	
g_{fs}	Forward transconductance	$V_{DS} = 5V, I_D = 3.6A$	-	9	-	S
Dynamic Characteristics ^{note3}						
C_{iss}	Input Capacitance	$V_{DS} = 10V, V_{GS} = 0V,$ $f = 1.0MHz$	-	310	-	pF
C_{oss}	Output Capacitance		-	125	-	pF
C_{rss}	Reverse Transfer Capacitance		-	86	-	pF
Q_g	Total Gate Charge	$V_{DS} = 10V, I_D = 3.6A,$ $V_{GS} = 4.5V,$	-	4	10	nC
Q_{gs}	Gate-Source Charge		-	0.65	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	1.5	-	nC
Switching Characteristics ^{note3}						
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 4.5V, V_{DS} = 10V,$ $R_G = 6\Omega, I_D = 3.6A$	-	8	-	ns
t_r	Turn-On Rise Time		-	57	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	17	-	ns
t_f	Turn-Off Fall Time		-	12	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{SD} = 3A,$ $T_J = 25C$	-	0.8	1.3	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

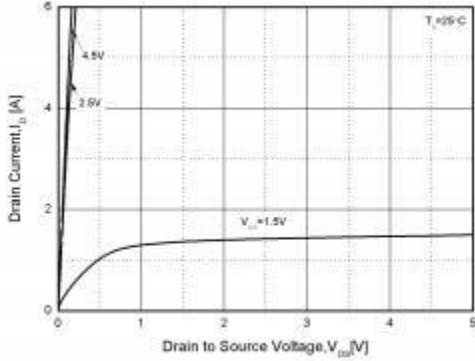


Figure1. Output Characteristics

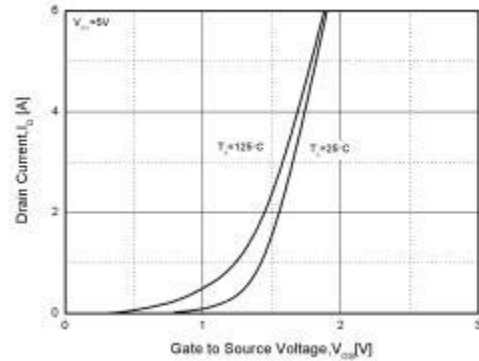


Figure2. Transfer Characteristics

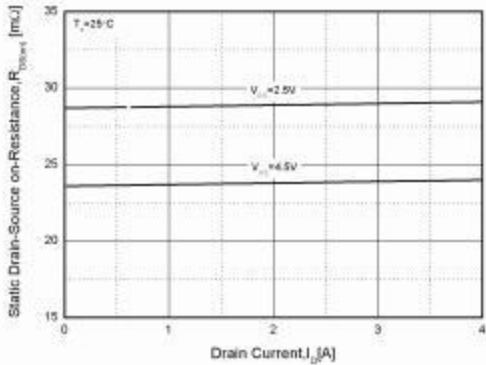


Figure3. Rdson-Drain Current

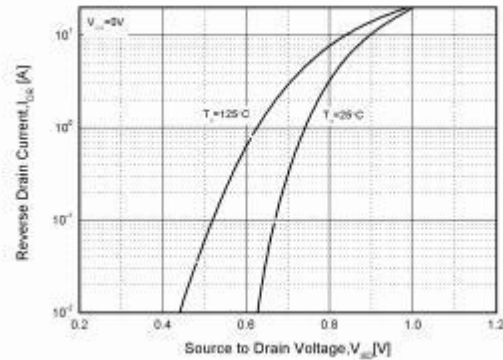


Figure4. Typical Source-Drain Diode Forward Voltage

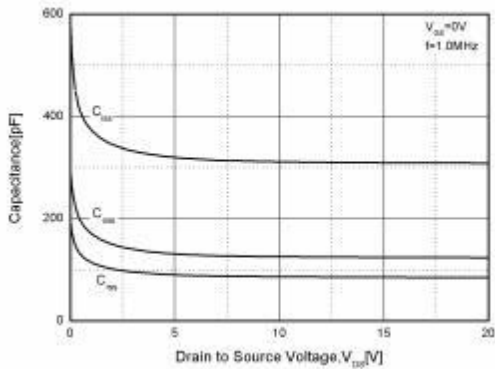


Figure5. Capacitance Characteristics

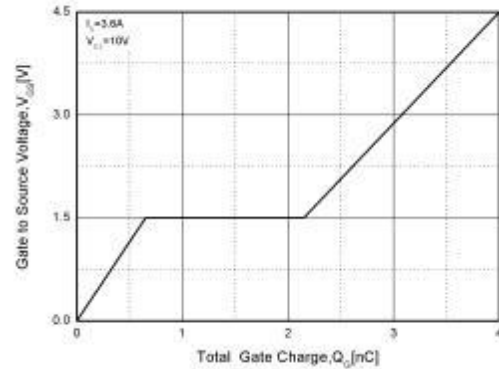


Figure6. Gate Charge

TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

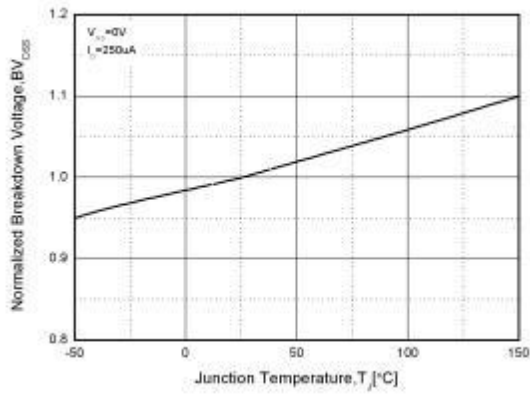


Figure7. Normalized Breakdown Voltage vs. Temperature

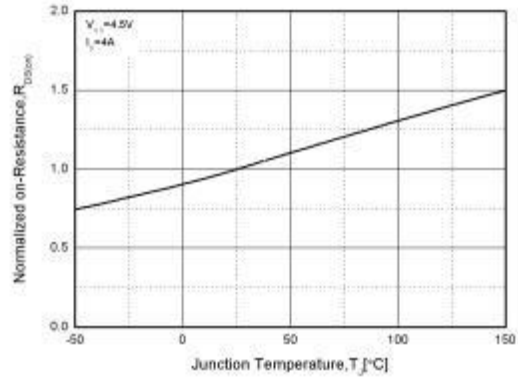


Figure8. Normalized on-Resistance vs. Temperature

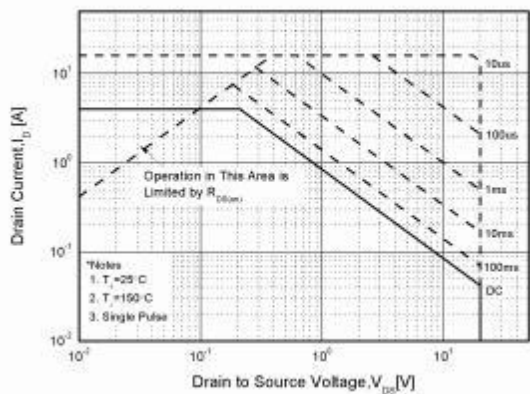


Figure9. Safe Operation Area

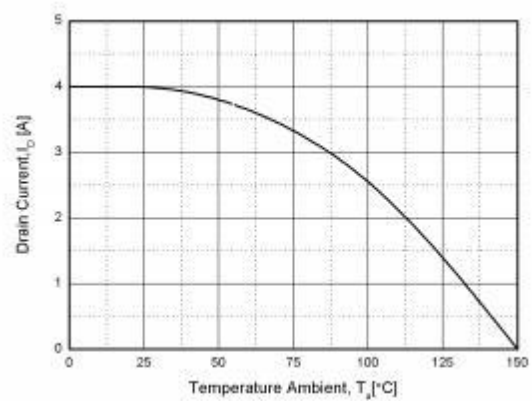


Figure10. Drain Current vs. Ambient Temperature

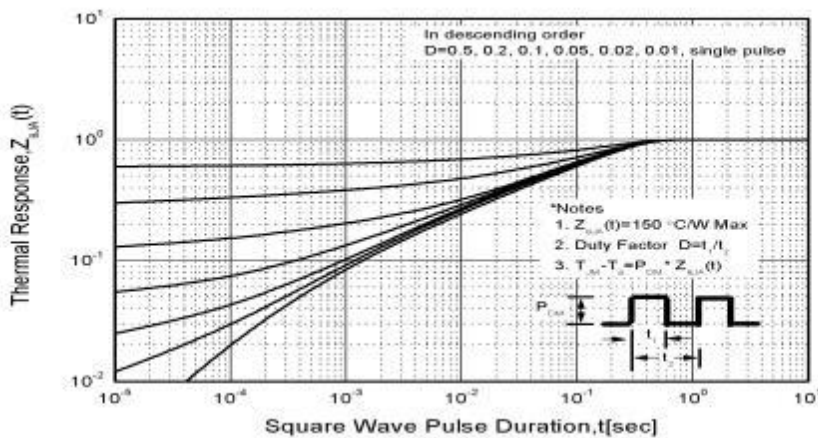
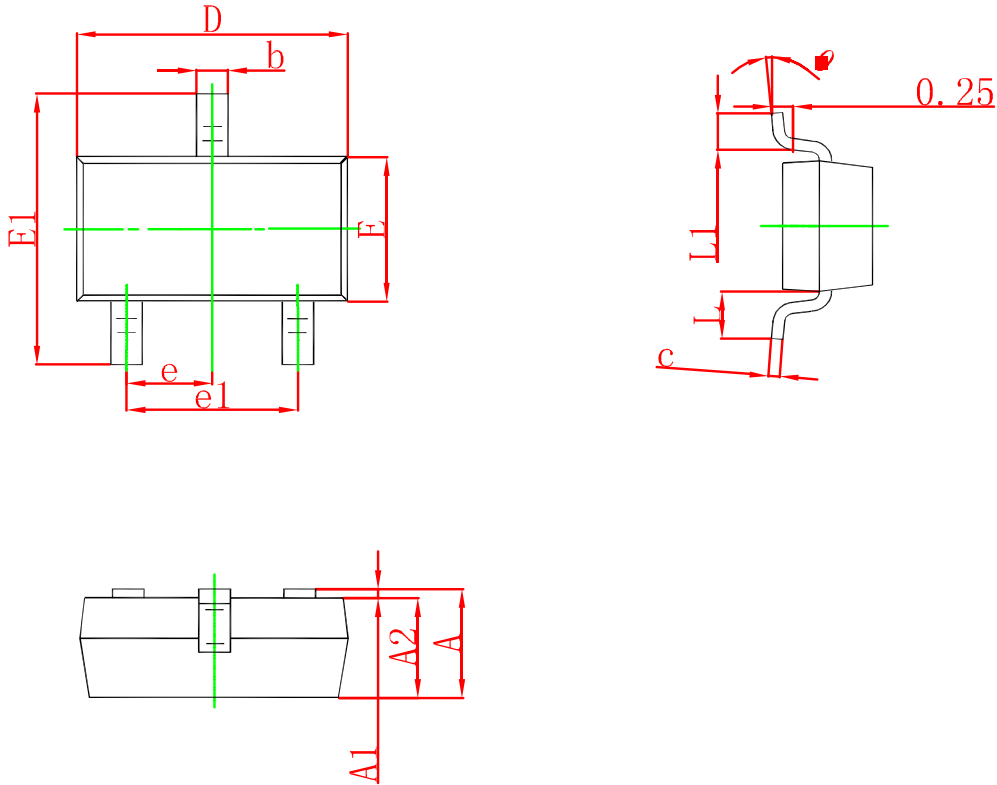


Figure11. Transient Thermal Response Curve



SOT-23 PACKAGE OUTLINE DRAWING



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°