

N-Channel 20V MOSFET

EX2302B

V_{DS} (V)	$R_{DS(on),max}$ (m Ω)	I_D (A)
20V	55 @ $V_{GS} = 4.5V$	4

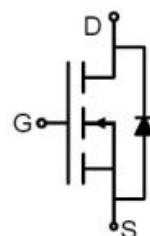
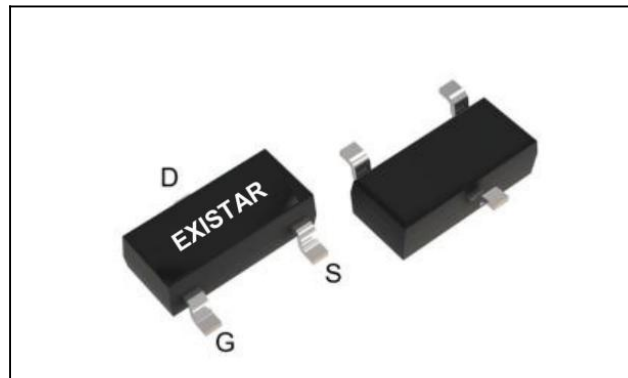
Features

- Low $R_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

Applications

- DC/DC conversion
- Load Switch
- Power Management

SOT-23



Package And Ordering Information

Ordering code	Package	Marking
EX2302B	SOT-23	2302B

Ordering Information

Package	Units/ Reel	Reels/ Inner Box	Units/ Inner Box
SOT-23	3000	15	45000

Key Performance Parameters

Parameter	Value	Unit
V _{DS} , min @ T _j (max)	20	V
I _D , pulse	10	A
R _{DS} (ON), max @ V _{GS} =4.5V	55	mΩ
Q _g	4	nC

Absolute Maximum Ratings at T_j=25°C Unless Otherwise Noted

Parameter	Symbol	Limit	Unit
Drain-source voltage	V _{DS}	20	V
Gate-source voltage	V _{GS}	±12	
Continuous drain current	I _D	4	A
Pulsed drain current	I _{D,pulse}	10	
Power dissipation	P _D	1	W
Operating junction and storage temperature range	T _J , T _{stg}	-55 To 150	°C

Thermal Characteristics

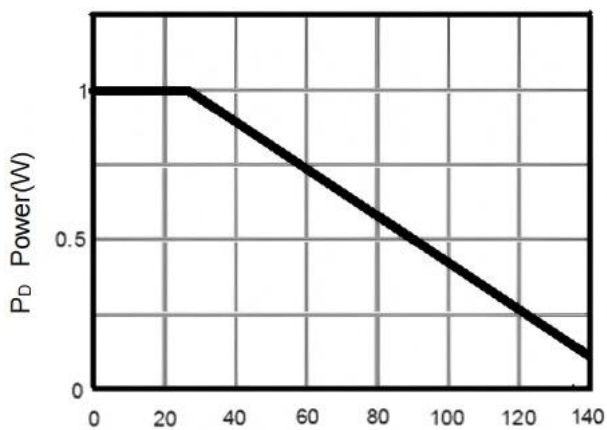
Parameter	Symbol	Max.	Unit
Thermal resistance, junction-to-ambient	R _{θJA}	125	°C/W

Electrical Characteristics at T_j=25°C unless otherwise specified

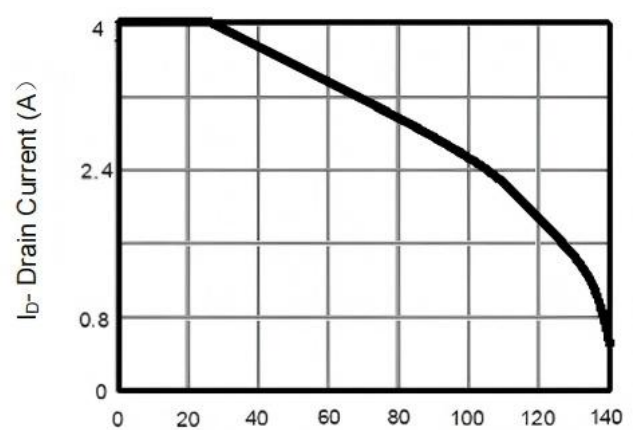
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Static						
Drain to source breakdown voltage	V _{(BR)DSS}	20			V	V _{GS} = 0, I _D = 250 μA
Gate-source threshold voltage	V _{GS(th)}	0.5	0.85	1.2	V	V _{DS} = V _{GS} , I _D = 250 μA
Gate-body leakage	I _{GSS}			±100	nA	V _{DS} = 0 V, V _{GS} = ±12 V
Zero gate voltage drain current	I _{DSS}			1	μA	V _{DS} = 20 V, V _{GS} = 0 V
Drain-source on-resistance	R _{DS(on)}			55	mΩ	V _{GS} = 4.5 V, I _D = 2.9 A
Drain-source on-resistance	R _{DS(on)}			85	mΩ	V _{GS} = 2.5 V, I _D = 2.5 A
Forward transconductance	g _{fs}		8		S	V _{DS} = 5 V, I _D = 2.9 A
Gate Charge						
Total gate charge	Q _g		4		nC	V _{DS} = 10 V, I _D = 2.9 A, V _{GS} = 4.5 V
Gate-source charge	Q _{gs}		0.65			
Gate-drain charge	Q _{gd}		1.2			

Dynamic						
Turn-on delay time	t _{d(on)}		10		ns	V _{DS} = 10 V, I _D = 2.9 A, V _{GS} = 4.5 V, R _{GEN} = 6 Ω
Rise time	t _r		50			
Turn-off delay time	t _{d(off)}		17			
Fall time	t _f		10			
Input capacitance	C _{iSS}		300		pF	V _{DS} =10 V, V _{GS} = 0 V, f = 1MHz
Output capacitance	C _{oss}		120			
Reverse transfer capacitance	C _{rSS}		80			
Body Diode						
Diode forward voltage	V _{SD}		0.75	1.2	V	V _{GS} = 0 V, I _F = 2.9 A

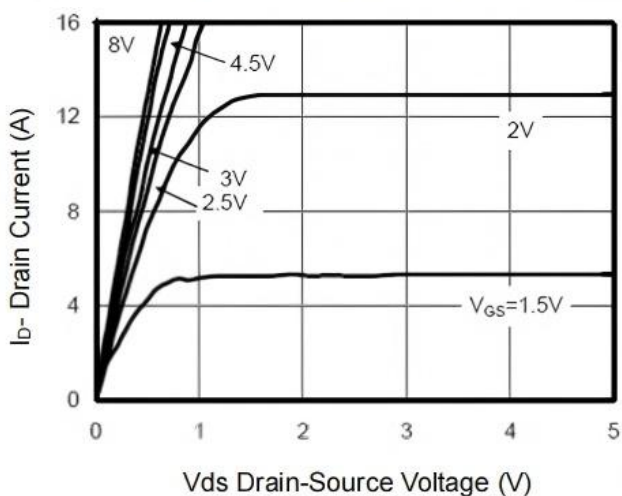
Electrical Characteristics Diagrams



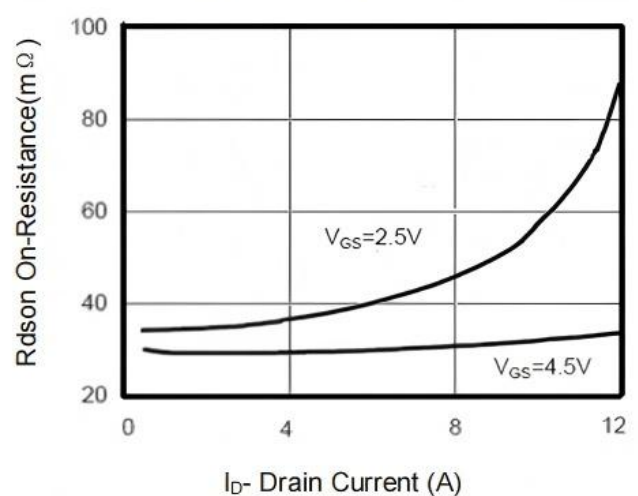
T_J -Junction Temperature (°C)
Figure 1 Power Dissipation



T_J -Junction Temperature (°C)
Figure 2 Drain Current



V_{DS} Drain-Source Voltage (V)
Figure 3 Output Characteristics



I_D -Drain Current (A)
Figure 4 Drain-Source On-Resistance

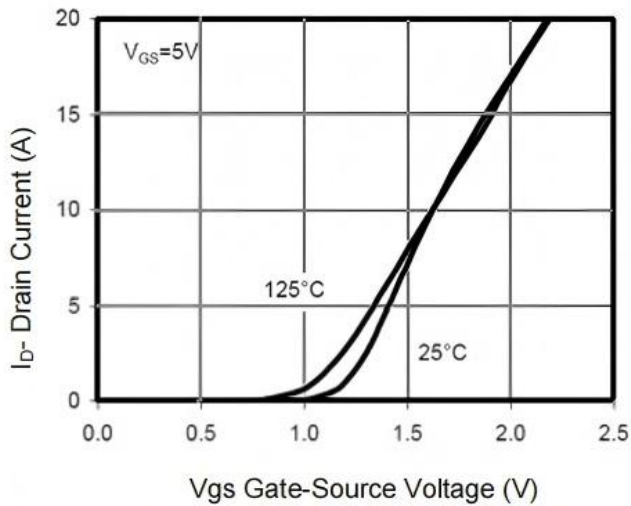


Figure 5 Transfer Characteristics

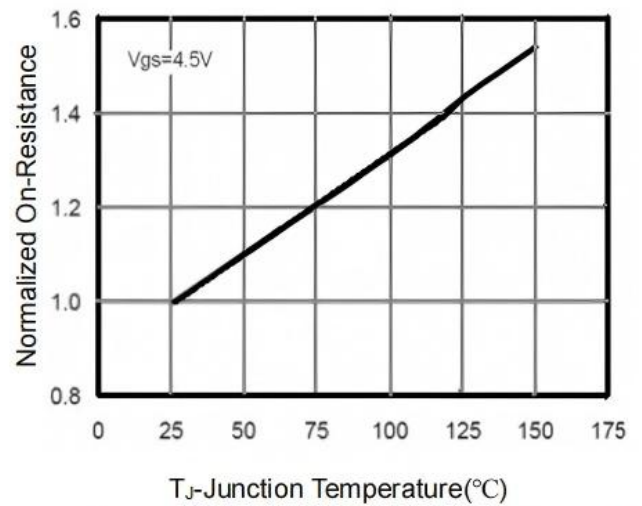


Figure 6 Drain-Source On-Resistance

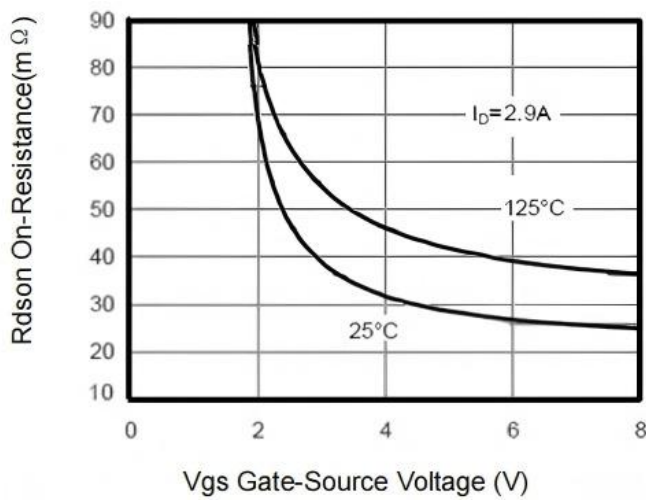


Figure 7 Rdson vs Vgs

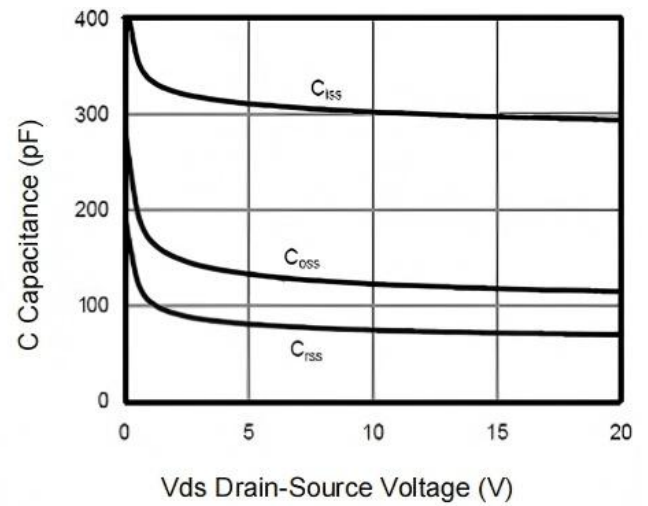


Figure 8 Capacitance vs Vds

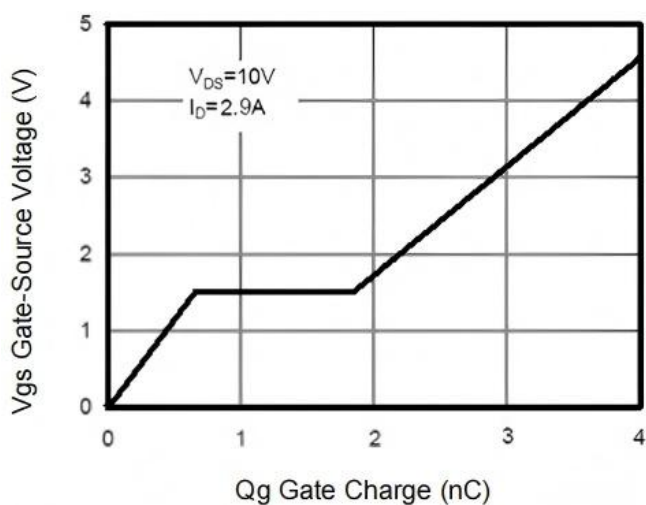


Figure 9 Gate Charge

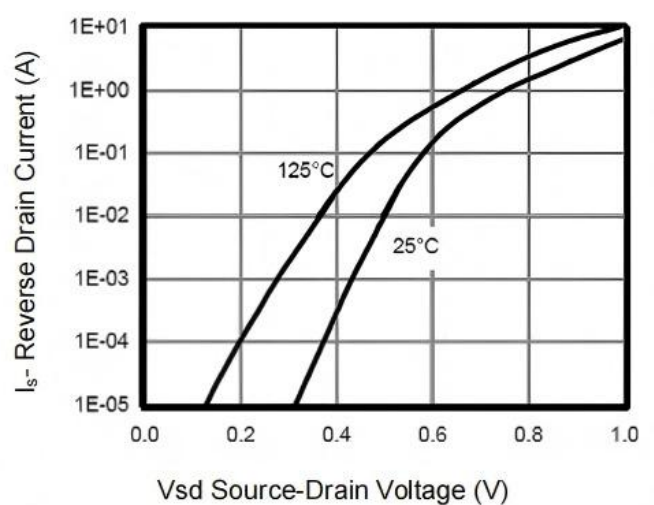


Figure 10 Source- Drain Diode Forward

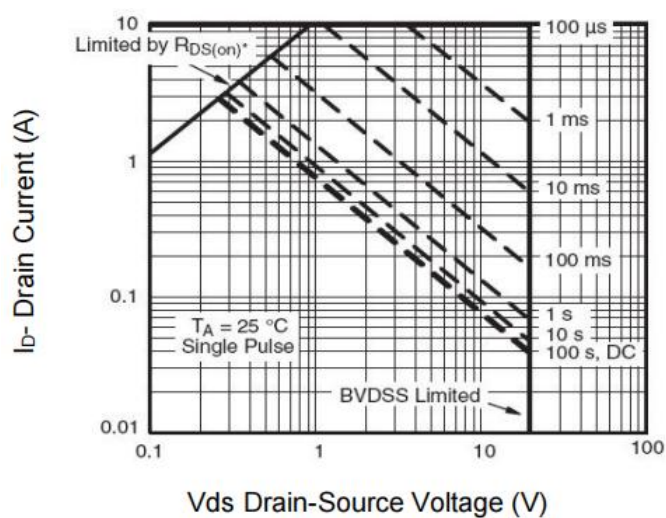


Figure 11 Safe Operation Area

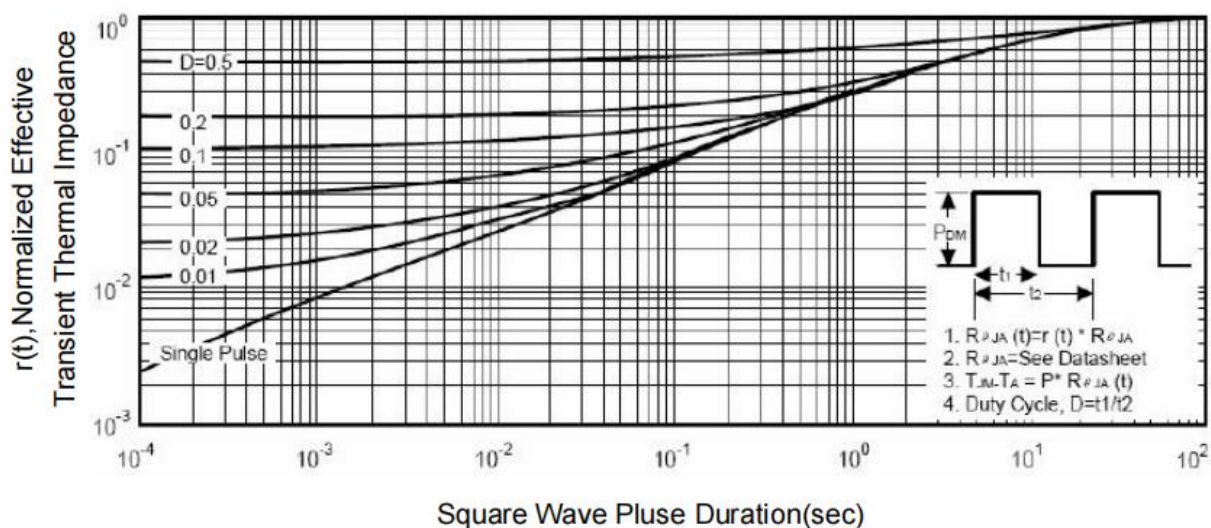


Figure 12 Normalized Maximum Transient Thermal Impedance

Test circuits and waveforms

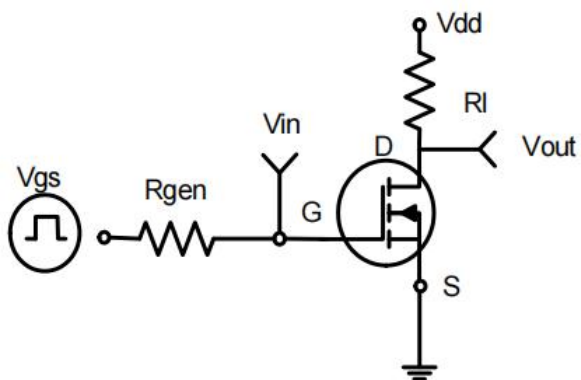


Figure 1: Switching Test Circuit

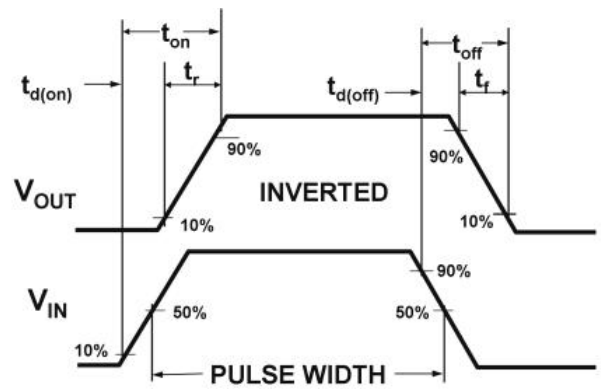
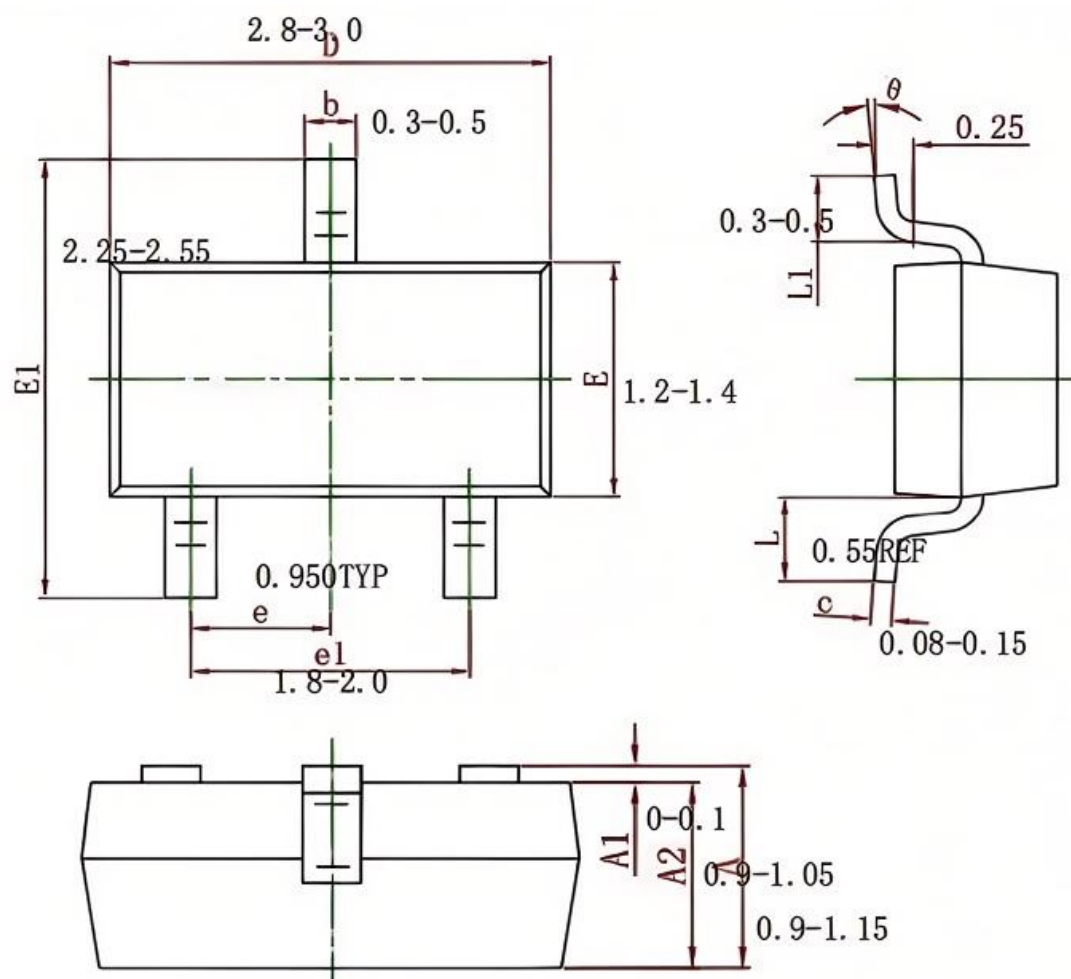


Figure 2: Switching Waveforms

Package Outline Dimensions



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°

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