

ATM2302BNSA

N-Channel Enhancement Mode Field Effect Transistor

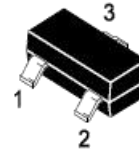
Drain-Source Voltage: 20V

Drain Current: 3A

Features

- ◆ Trench Power LV MOSFET technology
- ◆ High power and current handing capability
- ◆ $R_{DS(ON)} < 85m\Omega$ ($V_{GS} = 4.5V$)
- ◆ $R_{DS(ON)} < 115m\Omega$ ($V_{GS} = 2.5V$)

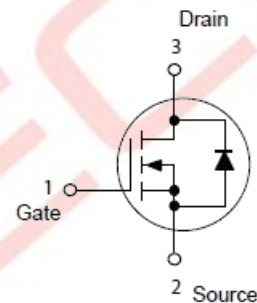
SOT-23



1 Gate 2 Source 3 Drain

Application

- ◆ PWM application
- ◆ Load Switch



Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current Ta=25°C@Steady State	I_D	3	A
Continuous Drain Current Ta=70°C@Steady State	I_D	2.4	A
Plused Drain Current ¹⁾	I_{DM}	14	A
Power Dissipation	P_D	0.7	W
Thermal Resistance from Junction to Ambient ²⁾	$R_{\theta JA}$	178	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~ +150	°C

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Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±10V, V _{DS} = 0V			±0.1	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.55		1.1	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} =4.5V, I _D =3.0A			85	mΩ
		V _{GS} =2.5V, I _D =2.0A			115	
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =3.0A			1.3	V
Maximum Body-Diode Continuous Current	I _S				3.0	A
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz		280		pF
Output Capacitance	C _{oss}			46		pF
Reverse Transfer Capacitance	C _{rss}			29		pF
Total gate charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =3.0A		2.9		nC
Gate-source charge	Q _{gs}			0.4		nC
Gate-drain charge	Q _{gd}			0.6		nC
Switching Characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =10V, R _L =5.5Ω, I _D =3.6A V _{GEN} =4.5V, R _g =6Ω		13		ns
Turn-on rise time	t _r			54		ns
Turn-off delay time	t _{d(off)}			18		ns
Turn-off fall time	t _f			11		ns

Notes:

- 1) Pulse Test: Pulse width≤300μs, duty cycle ≤2%.
- 2) Device mounted on FR-4 PCB, 1inch*0.85inch*0.062inch.

Typical Characteristics Curves

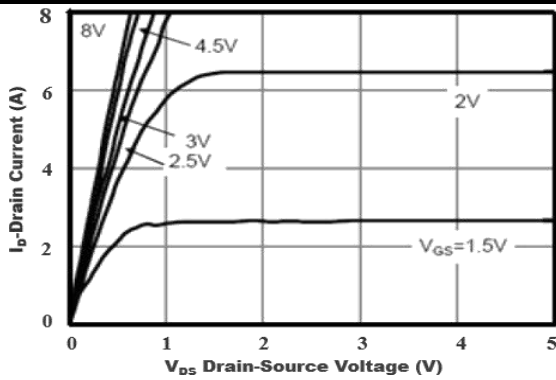


Figure1. Output Characteristics

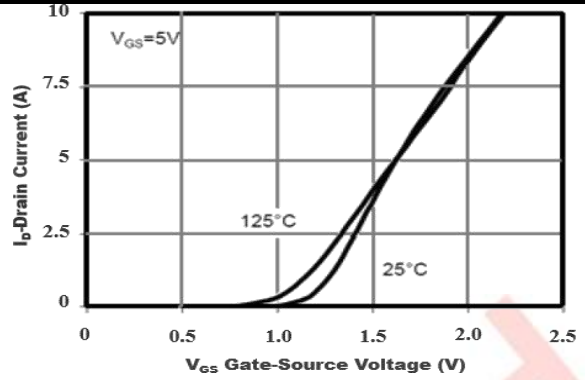


Figure2. Transfer Characteristics

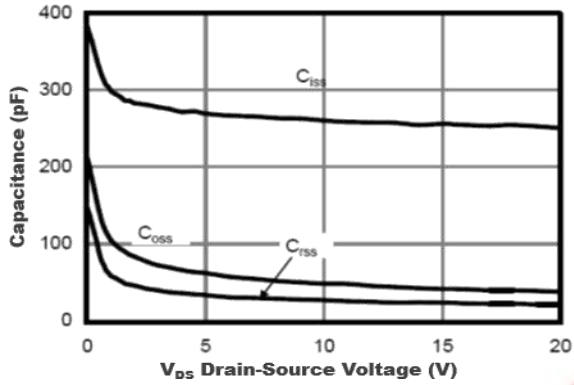


Figure3. Capacitance Characteristics

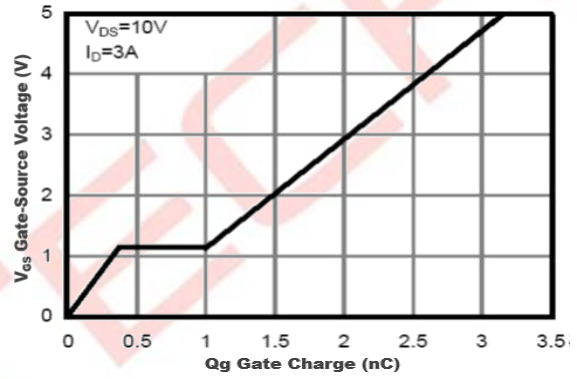


Figure4. Gate Charge

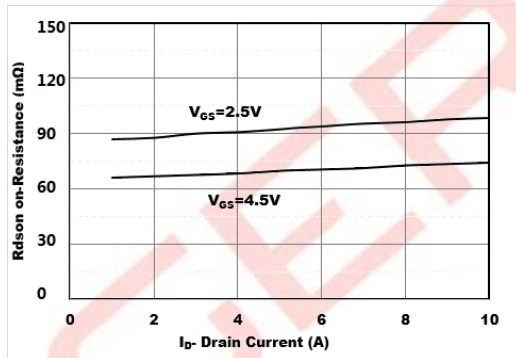


Figure5. Drain-Source on Resistance

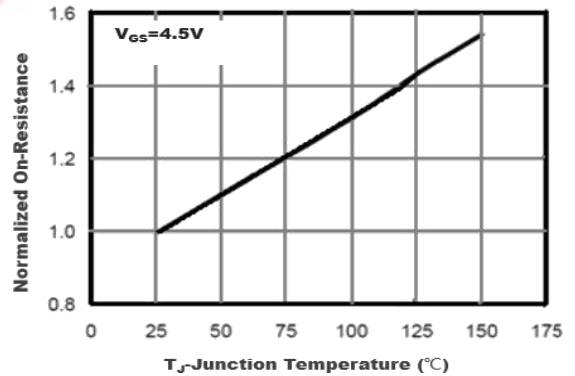


Figure6. Drain-Source on Resistance

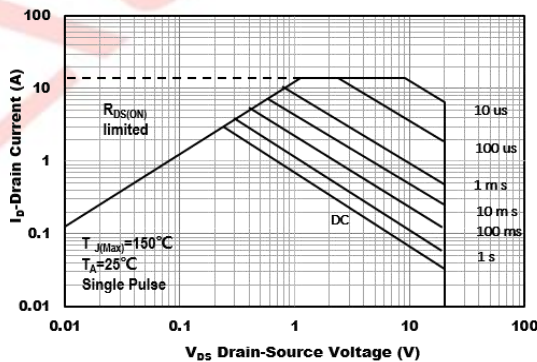


Figure7. Safe Operation Area

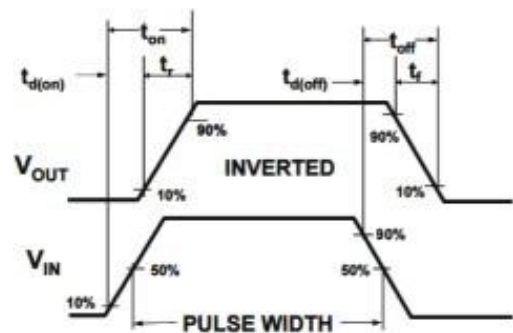
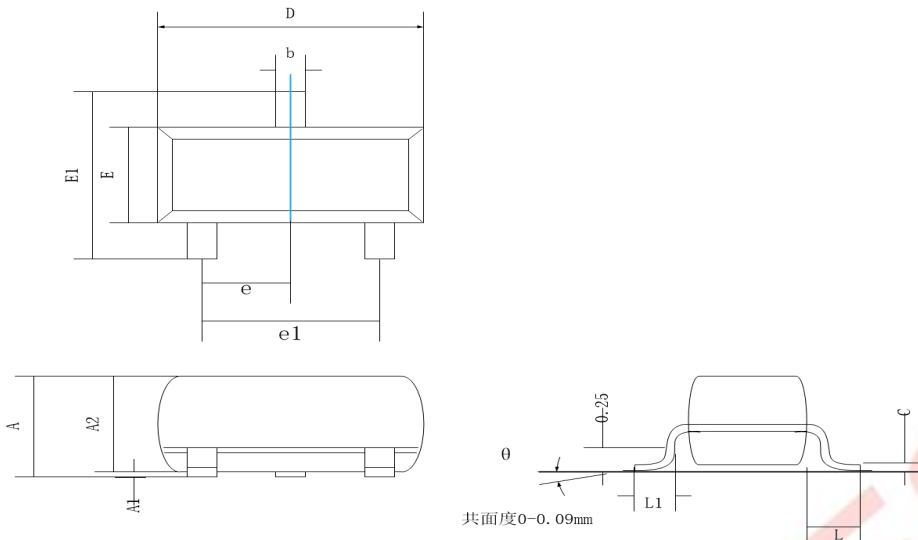


Figure8. Switching wave

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Package Outline

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Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95 REF.	
e1	1.80	2.00
L	0.55 REF.	
L1	0.30	0.50
θ	0°	8°

Suggested Pad Layout

