ATM2302NSA

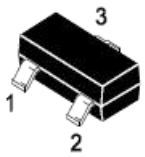
N-Channel Enhancement Mode Field Effect Transistor

Drain-Source Voltage: 20V ***Drain Current: 3.3A***

Features

- Trench FET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge
- $R_{DS(ON)}$ < 55MΩ (V_{GS} = 4.5V)
- $R_{DS(ON)}$ < 75MΩ (V_{GS} = 2.5V)

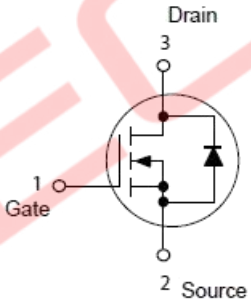
SOT-23



1 Gate 2 Source 3 Drain

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch



Marking:M22

Absolute maximum ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±8	V
Continuous Drain Current	I_D	3.3	A
Plused Drain Current	I_{DM}	16	A
Power Dissipation	P_D	0.9	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	139	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

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} =±8V, V_{DS} = 0V			±0.1	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.5	0.7	1	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =4.5V, I_D =3A			55	mΩ
		V_{GS} =2.5V, I_D =2A			75	
Forward tranconductance[1]	g_{FS}	V_{DS} =5V, I_D =3A		8		S
Dynamic characteristics						
Input Capacitance[2]	C_{iss}	V_{DS} =10V,V_{GS} =0V,f=1MHz		300		pF
Output Capacitance[2]	C_{oss}			120		pF
Reverse Transfer Capacitance[2]	C_{rss}			80		pF
Total gate charge	Q_g	V_{DS} =10V,V_{GS} =4.5V,I_D =3A		4		nC
Gate-source charge	Q_{gs}			0.7		nC
Gate-drain charge	Q_{gd}			1.5		nC
Switching Characteristics[2]						
Turn-on delay time	$t_{d(on)}$	V_{DD}=10V, I_D=3A V_{GEN}=4.5V,Rg=6Ω		10		ns
Turn-on rise time	t_r			50		ns
Turn-off delay time	$t_{d(off)}$			17		ns
Turn-off fall time	t_f			10		ns
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=3.3A		0.75	1.2	V
Diode Forward Current	I_S				3.3	A

Notes:

1) Pulse Test: Pulse width≤300μs, duty cycle ≤2%.

2) These parameters have no way to verify.

Typical Characteristics Curves

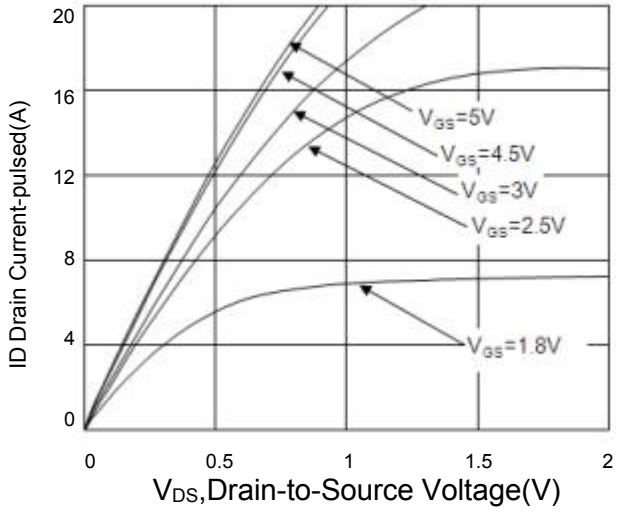


Fig.1 Typical Output Characteristics

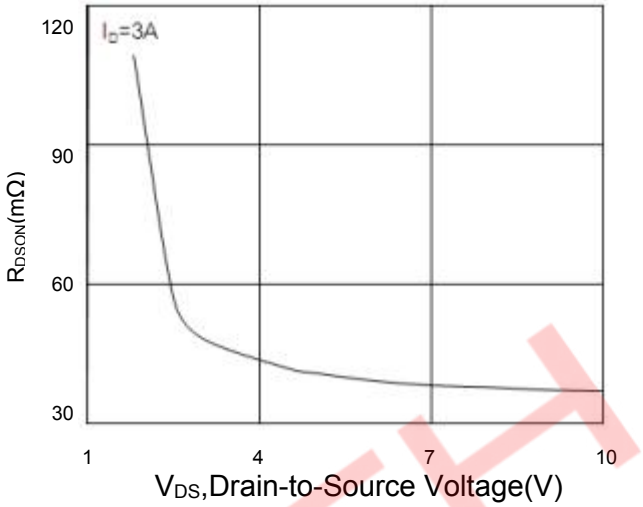


Fig.2 On-Resistance vs.Gate-Source Voltage

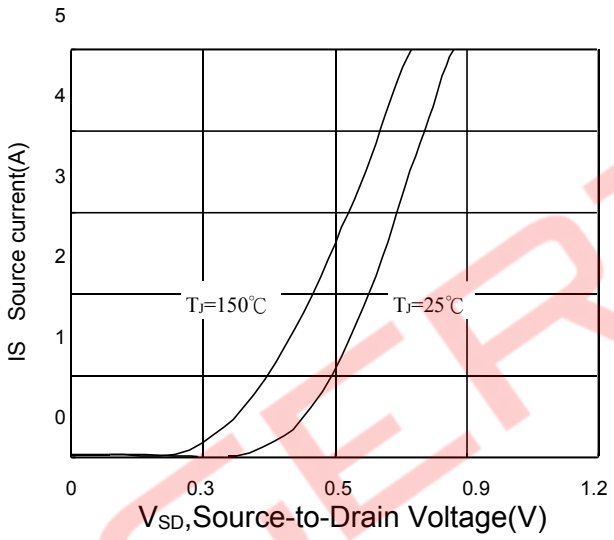


Fig.3 Forward Characteristics of Reverse

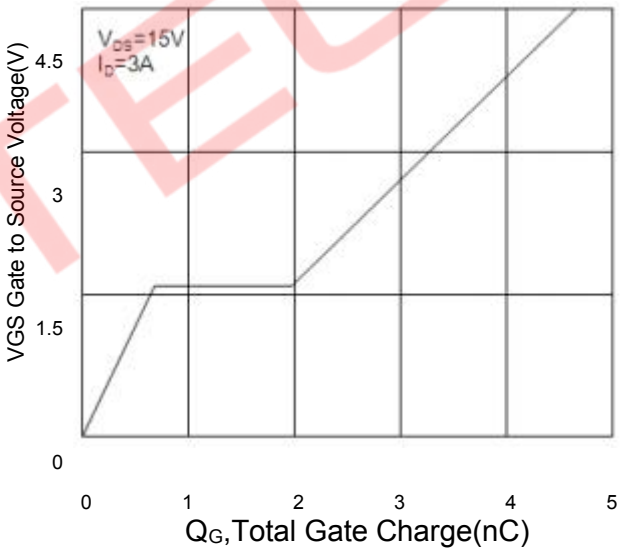


Fig.4 Gate-Charge Characteristics

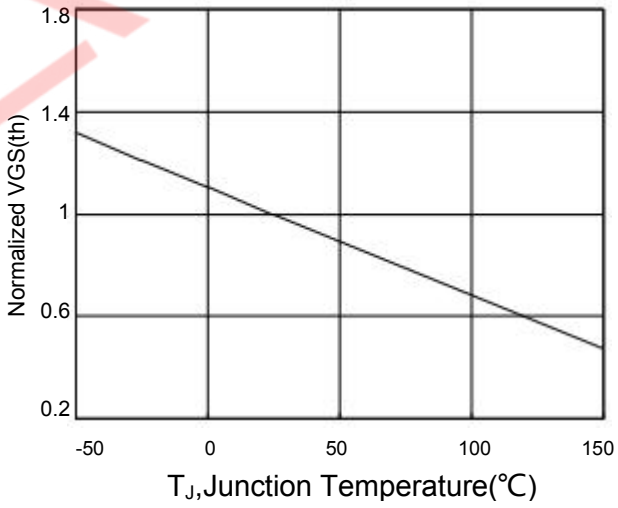


Fig.5 Normalized $V_{GS(th)}$ vs.T_J

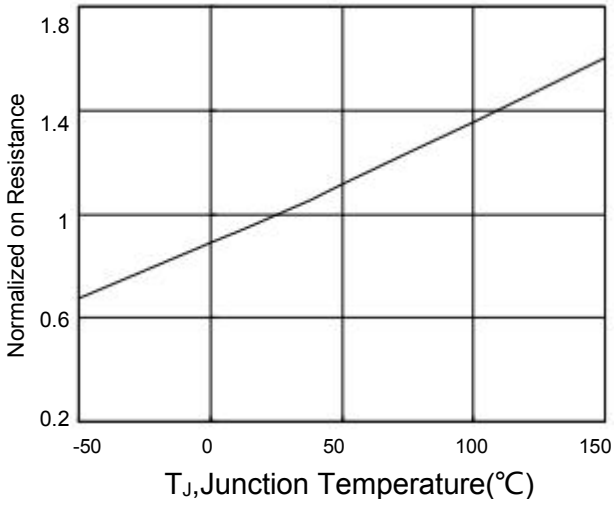


Fig.6 Normalized R_{DSON} vs.T_J

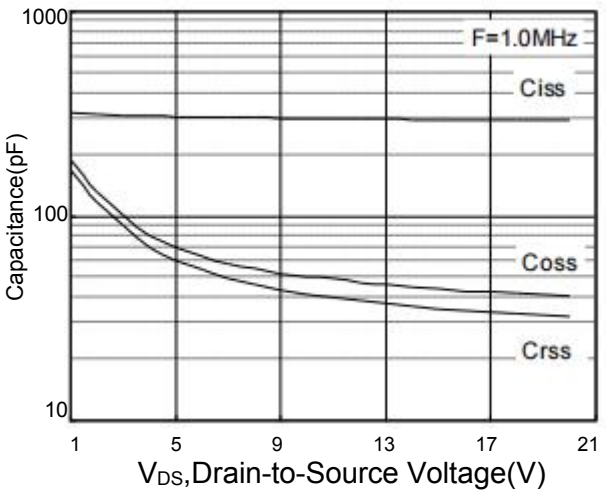


Fig.7 Capacitance

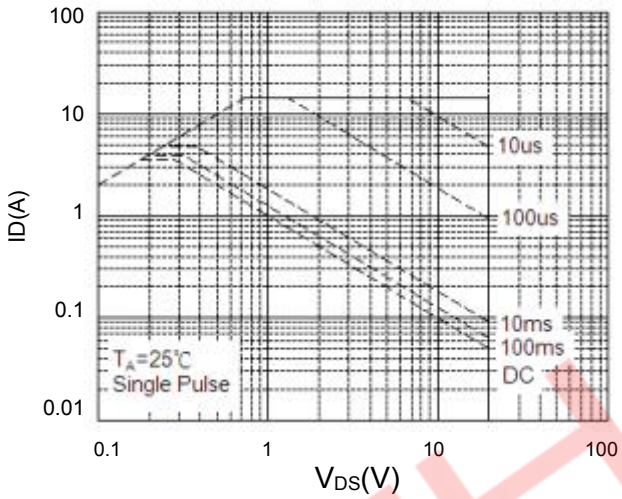


Fig.8 Safe Operating Area

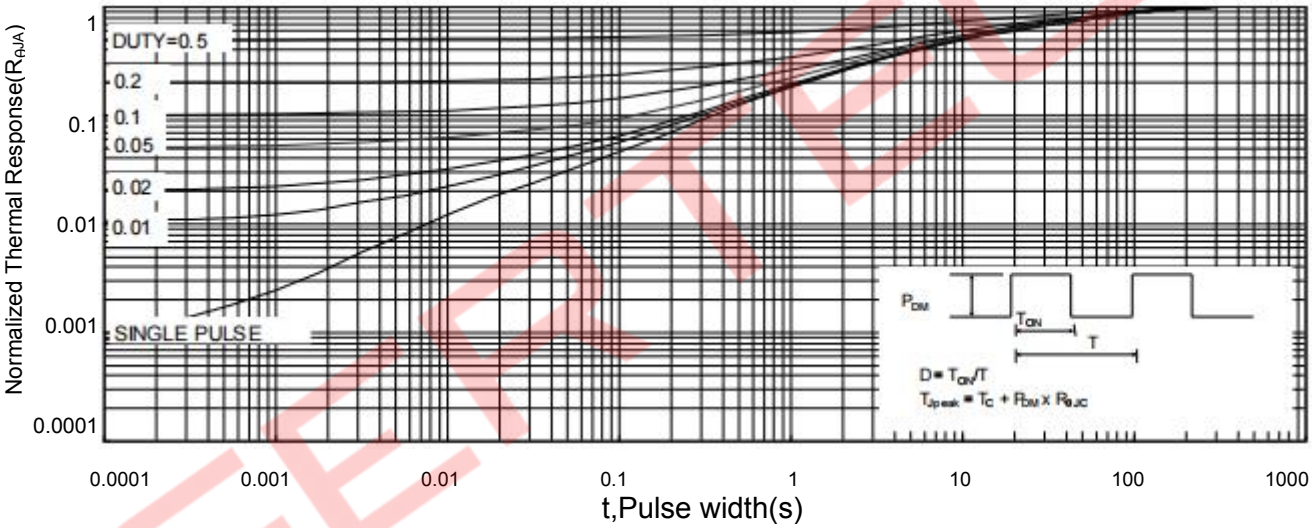


Fig.9 Normalized Maximum Transient Thermal Impedance

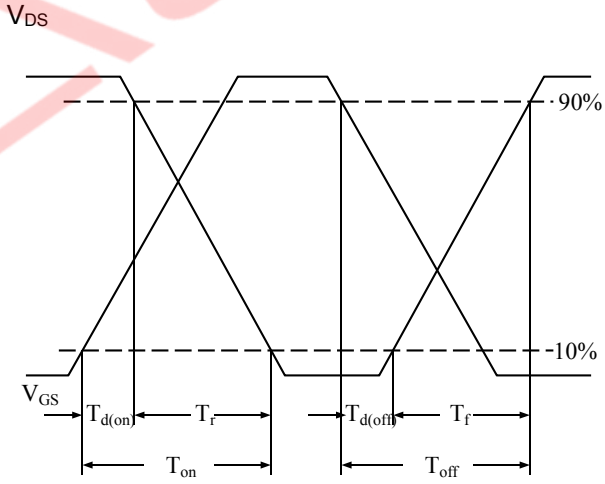


Fig.10 Switching Time Waveform

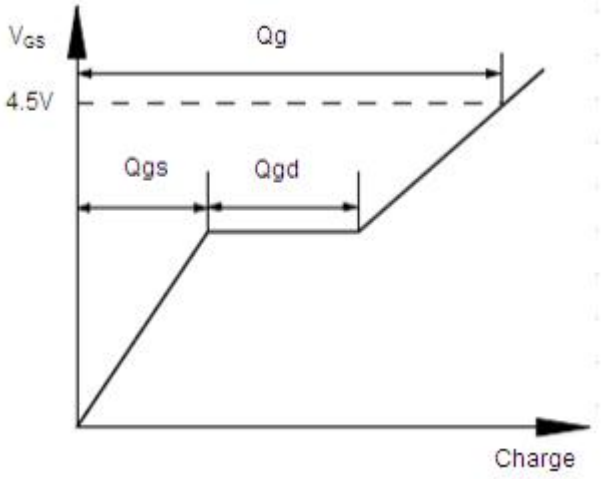
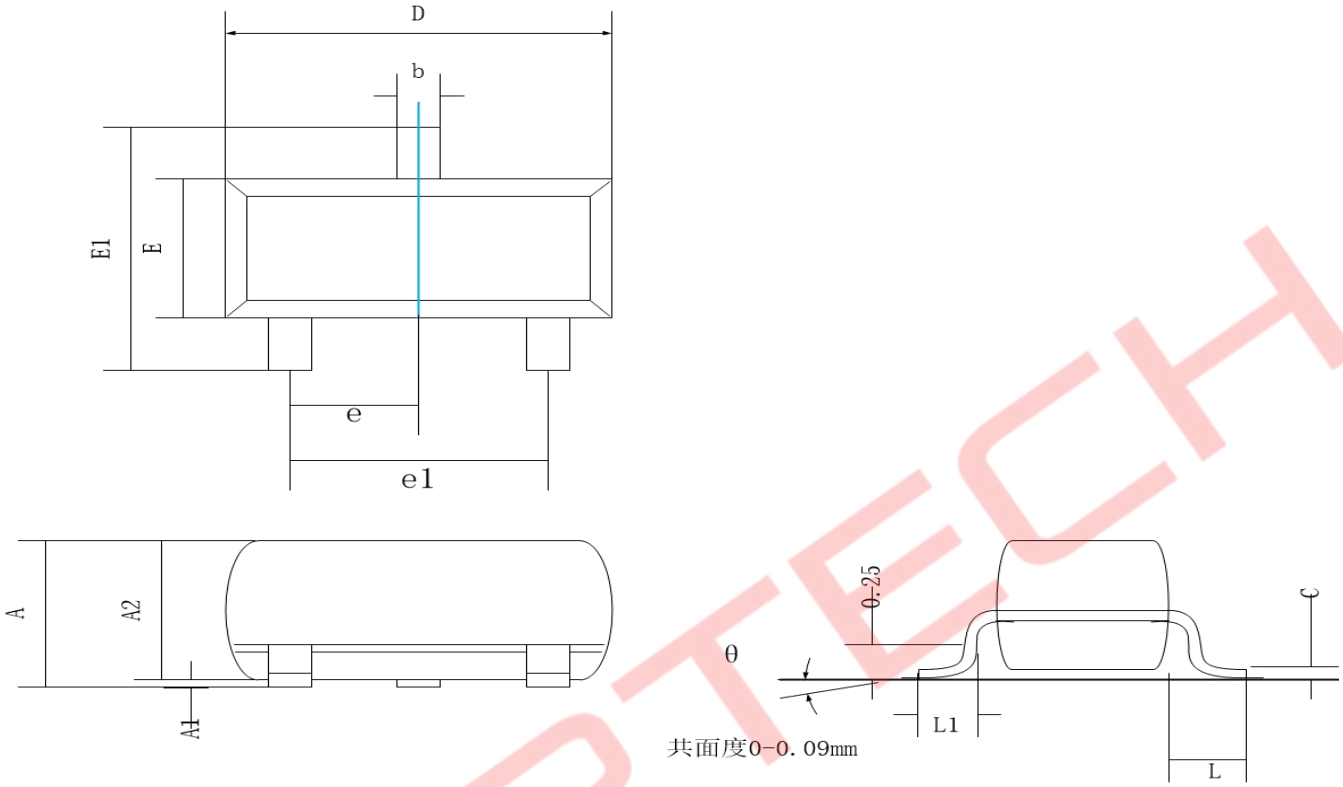


Fig.11 Gate Charge Waveform

Package Outline

SOT-23



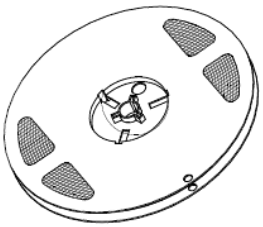
Symbol	Dimensions In Millimeters	
	Min.	Max.
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95 REF.	
e1	1.80	2.00
L	0.55 REF.	
L1	0.30	0.50
θ	0°	8°

Package Specifications

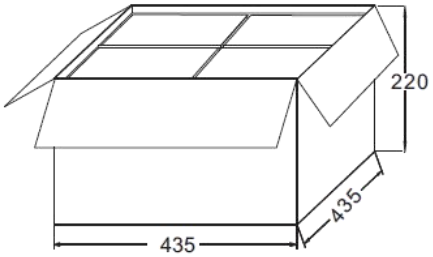
◆ The method of packaging

SOT-23 (TO-236)

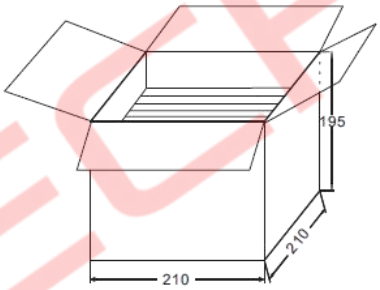
3,000 pcs per reel



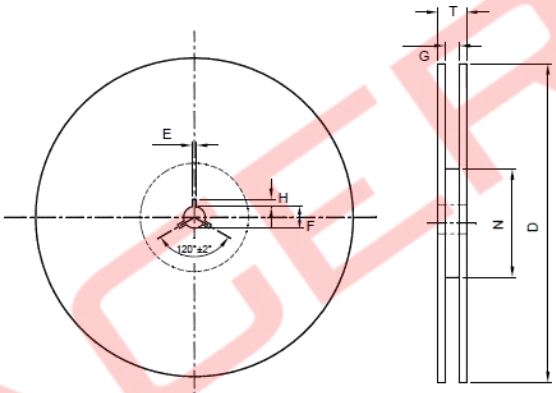
30,000 pcs per box
10 reels per box



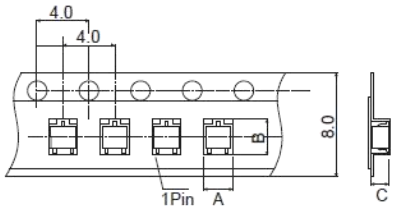
120,000 pcs per carton
4 boxes per carton



◆ Embossed tape and reel data



Reel (7")



Tape (8mm)

Symbol	Value (unit: mm)
A	3.15 ± 0.1
B	2.7 ± 0.1
C	1.25 ± 0.1
E	2 ± 0.5
F	13 ± 0.5
D	178 ± 2.0
G	8.4 ± 1.5
H	4 ± 0.5
N	60
T	< 14.9