AO3402

N-Channel Enhancement Mode MOSFET

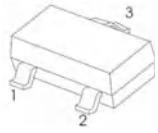
V_{DSS}	30 V
I_D	4.0 A
$R_{DS(ON)}$	36 m Ω

FEATURES

- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

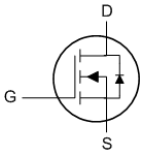
A29T

SOT-23



1. GATE
2. SOURCE
3. DRAIN

Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Maximum ratings (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	4	A
Pulsed Drain Current (note 1)	I_{DM}	15	A
Power Dissipation	P_D	1.2	W
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	103	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~+150	℃

T_a=25℃ unless otherwise specified

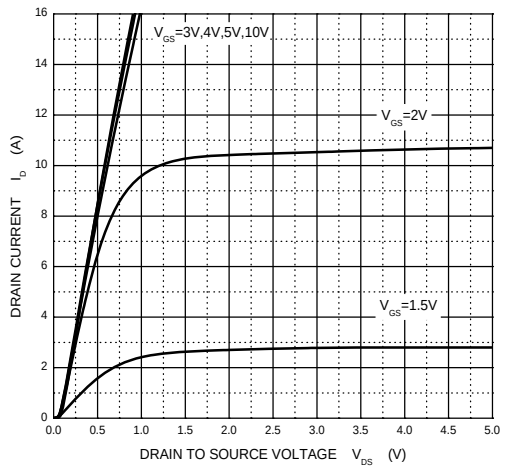
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERISTICS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =24V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±12V, V_{DS} = 0V			100	nA
Gate threshold voltage (note 3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.6		1.4	V
Drain-source on-resistance (note 3)	$R_{DS(on)}$	V_{GS} =10V, I_D =4A		36	55	mΩ
		V_{GS} =4.5V, I_D =3A			70	mΩ
		V_{GS} =2.5V, I_D =2A			110	mΩ
Forward transconductance (note 3)	g_{FS}	V_{DS} =15V, I_D =4A		8		S
Diode forward voltage (note 3)	V_{SD}	I_S=1A, V_{GS} = 0V			1	V
DYNAMIC CHARACTERISTICS (note 4)						
Input capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V,f =1MHz		390		pF
Output capacitance	C_{oss}			54.5		pF
Reverse transfer capacitance	C_{rss}			41		Pf
Gate resistance	R_g	V_{DS} =0V,V_{GS} =0V,f =1MHz		3		Ω
SWITCHING CHARACTERISTICS (note 4)						
Turn-on delay time	$t_{d(on)}$	V_{GS}=10V,V_{DS}=15V, R_L=3.75Ω,R_{GEN}=6Ω		3.3		ns
Turn-on rise time	t_r			1		ns
Turn-off delay time	$t_{d(off)}$			21.7		ns
Turn-off fall time	t_f			2.1		ns
Total gate charge	Q_g	V_{DS} =15V,V_{GS} =4.5V,I_D =4A		4.34		nC
Gate-source Charge	Q_{gs}			0.6		nC
Gate-drain Charge	Q_{gd}			1.38		nC
Body diode reverse recovery time	$t_{.}$	I_F=4A,dI/dt=100A/μs		1.2		ns
Body diode reverse recovery charge	Q_{rr}			6.3		nC

Notes :

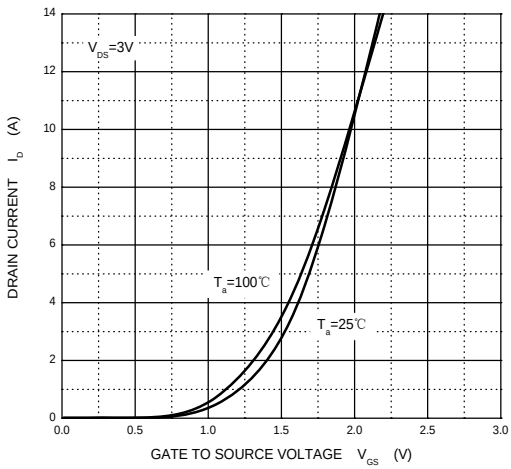
1. Repetitive rating : Pulse width limited by junction temperature.
2. Surface mounted on FR4 board , t≤10s.
3. Pulse Test : Pulse Width≤80μs, Duty Cycle≤0.5%.
4. Guaranteed by design, not subject to producting.

RATING AND CHARACTERISTIC CURVES

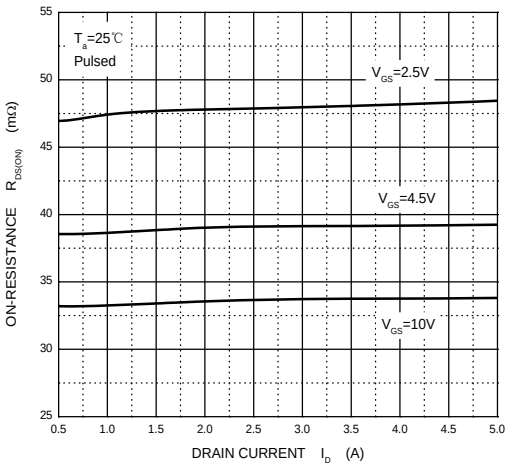
Output Characteristics



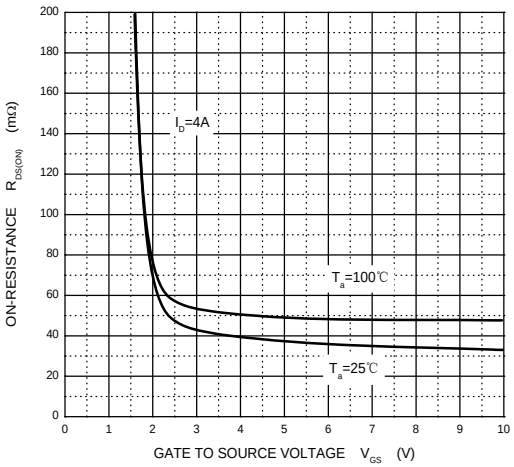
Transfer Characteristics



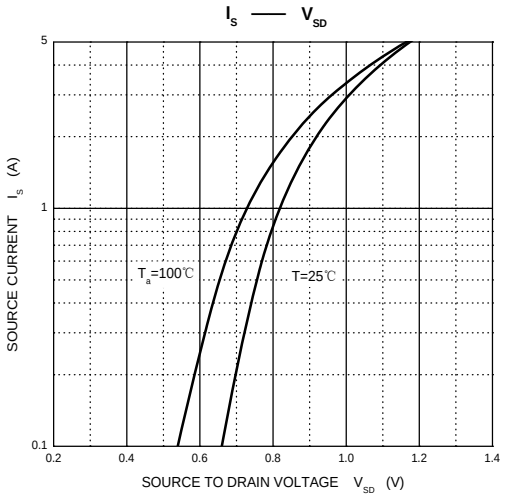
$R_{DS(ON)}$ — I_D



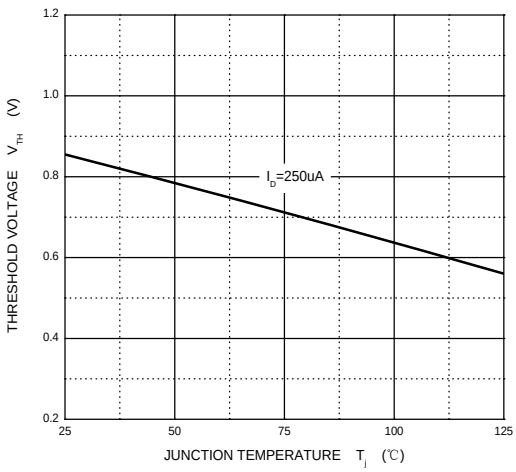
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



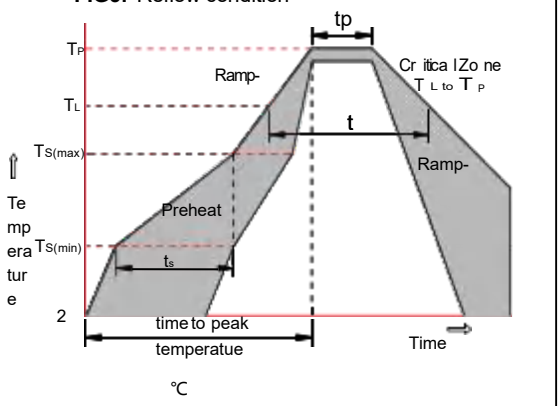
Threshold Voltage



Soldering parameters

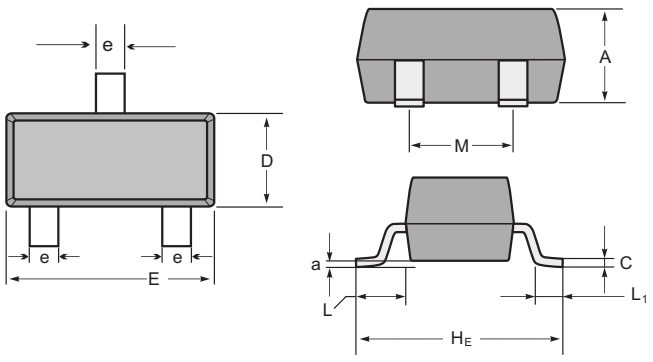
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

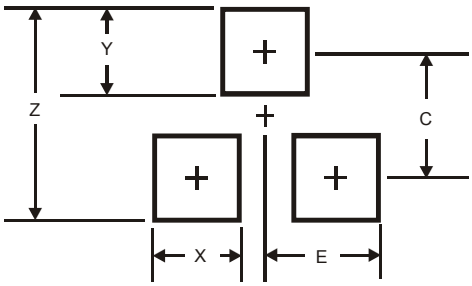
FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout

SOT23





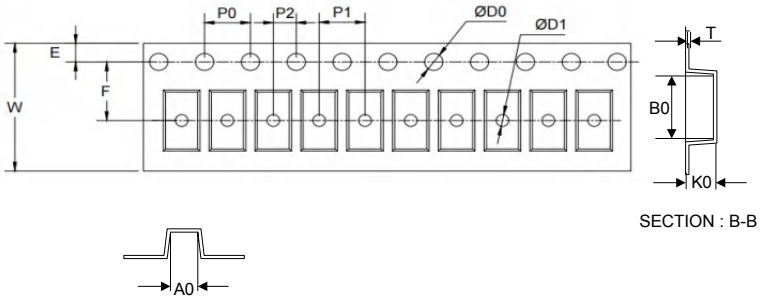
SOT-23 mechanical data

UNIT		A	C	D	E	H_E	e	M	L	L_1	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

Dimensions	SOT23
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

Tape & rell specification

Tape

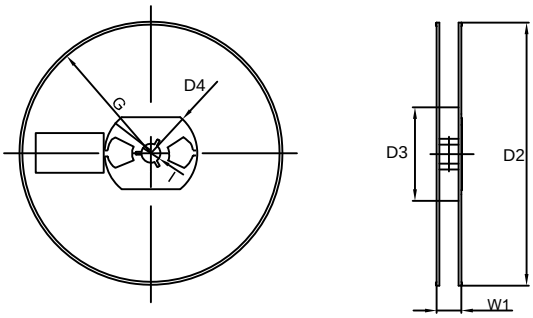


SECTION : B-B

SECTION : A-A

Symbol	Dimension (mm)
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
D0	1.55±0.10
D1	1.05±0.10
E	1.55±0.10
F	3.60±0.10
W	8.00±0.10
A0	3.80±0.20
B0	3.25±0.20
K0	1.45±0.10
T	0.25±0.05

7” Reel



D2	178.0±3.0
D3	55Min.
D4	R24.0±3.0
G	R82.0±3.0
I	13.0±2.0
W1	11.0±3.0

Quantity: 3000PCS