SI2302A

SOT-23-3L Plastic-Encapsulate MOSFETS

V_{DSS}	20	V
I_D	6	A
$R_{DS(ON)}$	20 m	Ω

DESCRIPTION

The SI2302A uses advanced trench technology to provide excellent RDS(on).This device is suitable for use as a uni-directional or bi-directional load switch.

FEATURES

N-Channel Enhancement Mode Field Effect Transistor

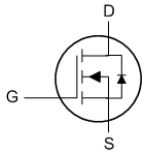
- $V_{DSS=}$ 20 V $I_{D=}$ 6.0 A
- $R_{DS(on)}$ < 30mΩ@V_{GS} = 4.5V
- $R_{DS(on)}$ < 40mΩ@V_{GS} = 2.5V
- $R_{DS(on)}$ < 73mΩ@V_{GS} = 1.8V

A2SHB

SOT23-3L top view



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Maximum ratings (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current	I_D	6	A
Pulsed Drain Current	I_{DM}	25	
Maximum Body-Diode Continuous Current	I_S	2	
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{stg}	-55 ~+150	

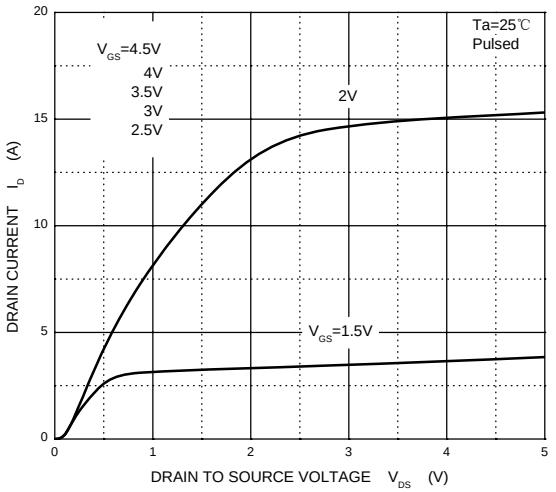
Electrical characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	20			V
Gate-source leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±12V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} =16V, V_{GS} =0V			1.0	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.5	0.7	1.0	V
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS} =4.5V, I_D =5.0A		20	30	mΩ
		V_{GS} =2.5V, I_D =4.0A		26	40	
		V_{GS} =1.8V, I_D =2.0A			73	
Diode forward voltage	V_{SD}	V_{GS} =0V,I_S=1A		0.75	1	V
Forward transconductance	g_{fS}	V_{DS} =5V, I_D =3.8A	4			S
DYNAMIC PARAMETERS*						
Input capacitance	C_{iss}	V_{DS} =10V,V_{GS} =0V,f =1MHz		630		pF
Output capacitance	C_{oss}			164		
Reverse transfer capacitance	C_{rss}			137		
Gate resistance	R_g	V_{DS} =0V,V_{GS} =0V,f =1MHz		1.5		Ω
SWITCHING PARAMETERS*						
Turn-on delay time	$t_{d(on)}$	V_{GS}=5V,V_{DS}=10V, R_L=1.7Ω,R_{GEN}=6Ω		5.5		ns
Rise time	t_r			14		
Turn-off delay time	$t_{d(off)}$			29		
Fall time	t_f			10.2		

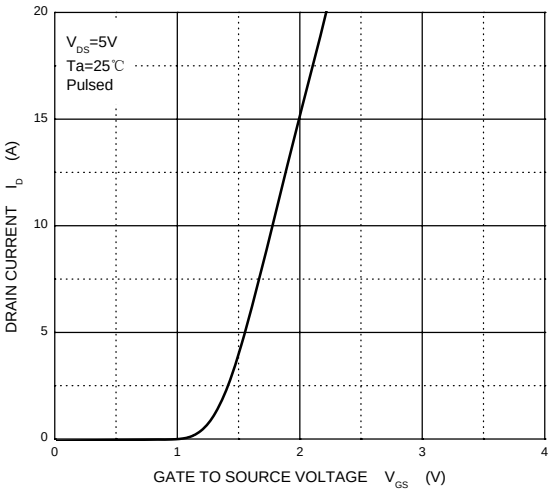
*These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES

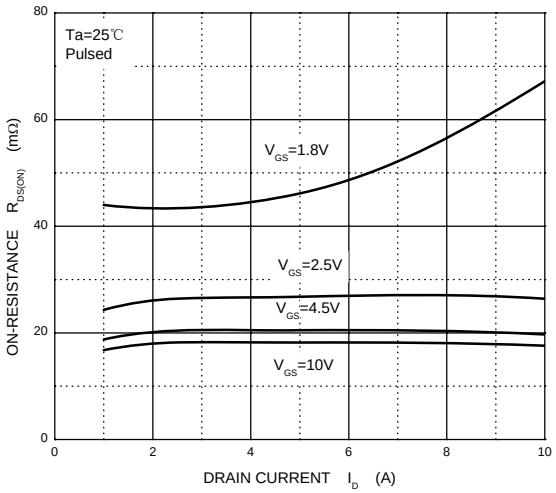
Output Characteristics



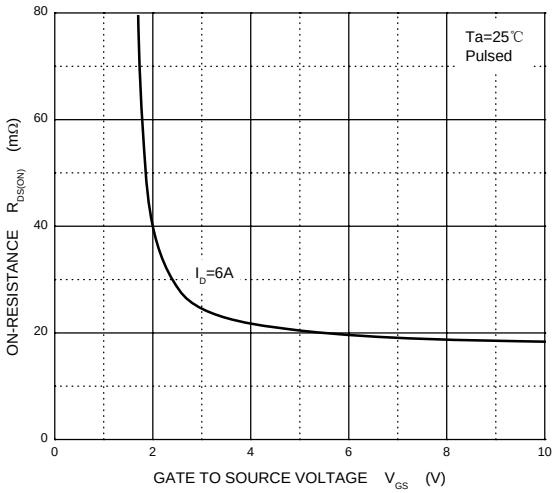
Transfer Characteristics



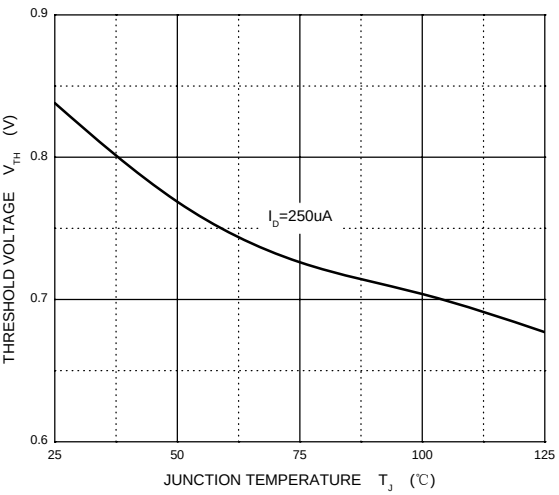
RDS(ON) —— ID



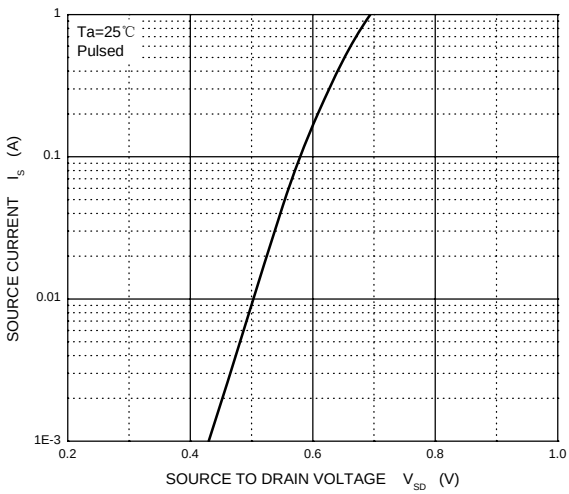
RDS(ON) —— VGS



Threshold Voltage



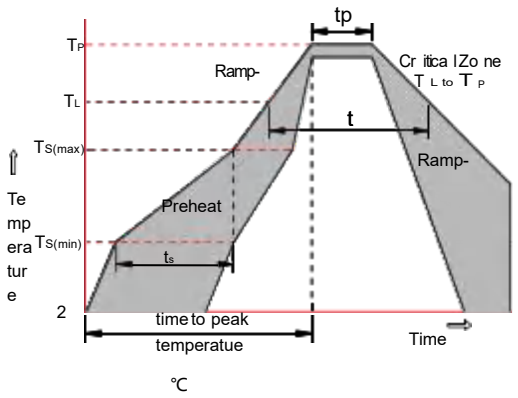
IS —— VSD



Soldering parameters

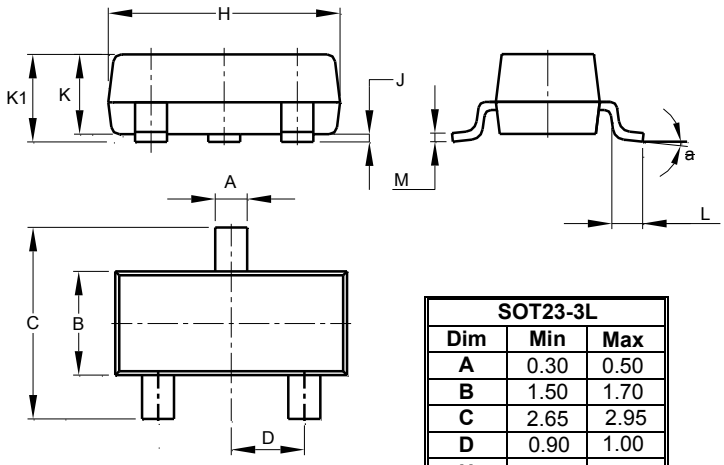
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid 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

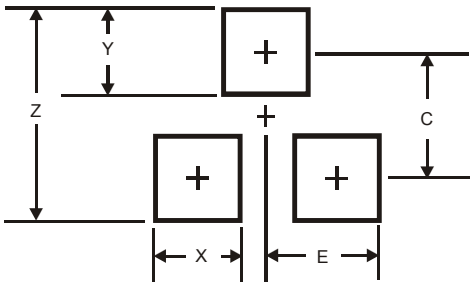


Package Dimensions & Suggested Pad Layout

SOT23-3L



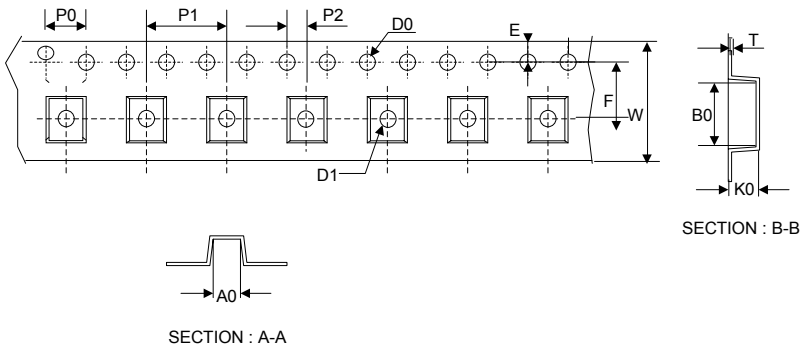
SOT23-3L		
Dim	**Min**	**Max**
A	0.30	0.50
B	1.50	1.70
C	2.65	2.95
D	0.90	1.00
H	2.82	3.02
J		0.10
K	1.05	1.15
K1	1.05	1.25
L	0.30	0.60
M	0.10	0.20
a	0°	8°
All Dimensions in mm		



Dimensions	SOT23-3L
Z	3.3
X	0.9
Y	1.0
C	2.3
E	1.40

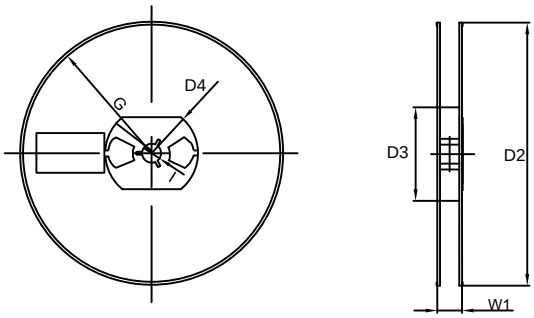
Tape & rell specification

Tape



Symbol	Dimension (mm)
P0	4.00±0.20
P1	4.00±0.20
P2	2.00±0.20
D0	1.55±0.20
D1	1.05±0.20
E	1.55±0.20
F	3.60±0.20
W	8.00±0.20
A0	3.80±0.20
B0	3.50±0.20
K0	1.55±0.20
T	0.25±0.15

7” Reel



D2	178.0±5.0
D3	55Min.
D4	R24.0±3.0
G	R82.0±3.0
I	13.0±2.0
W1	11.0±3.0

Quantity: 3000PCS