SI2312

N-Channel Enhancement Mode MOSFET

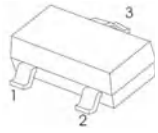
V_{DSS}	20	V
I_D	6.0	A
$R_{DS(ON)}$	23	mΩ

DESCRIPTION

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

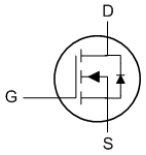
ANVV

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}	20	V
Gate-Source Voltage		V_{GS}	±8.0	
Continuous Drain Current	t=5s	I_D	6	A
Pulsed Drain Current		I_{DM}	20	
Continuous Source-Drain Diode Current		I_S	1.04	
Maximum Power Dissipation	t=5s	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}	-50 ~+150	

T_a=25℃ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	20			V
Gate-source leakage	I_{GSS}	V_{DS} =0V, V_{GS} =±8V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} =20V, V_{GS} =0V			1.0	μA
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.45	0.7	1.0	V
Drain-source on-state resistance[a]	$R_{DS(on)}$	V_{GS} =4.5V, I_D =5.0A		0.013	0.023	Ω
		V_{GS} =2.5V, I_D =4.7A		0.023	0.028	
		V_{GS} =1.8V, I_D =4.3A		0.030	0.04	
Forward tranconductance[a]	g_{fS}	V_{DS} =10V, I_D =5.0A		6		S
Dynamic[b]						
Input capacitance	C_{iss}	V_{DS} =10V,V_{GS} =0V,f =1MHz		865		pF
Output capacitance	C_{oss}			105		
Reverse transfer capacitance	C_{rss}			55		
Gate resistance	R_g	f =1MHz	0.5		4.8	Ω
Turn-on delay Time	$t_{d(on)}$	V_{GEN}=5V,V_{DD}=10V, I_D =4A,R_G=1Ω, R_L=2.2Ω			10	ns
Rise time	t_r				20	
Turn-off Delay time	$t_{d(off)}$				32	
Fall yime	t_f				12	
Drain-source body diode characteristics						
Forward diode voltage	V_{SD}	V_{GS} =0V,I_S=4A		0.75	1.2	V

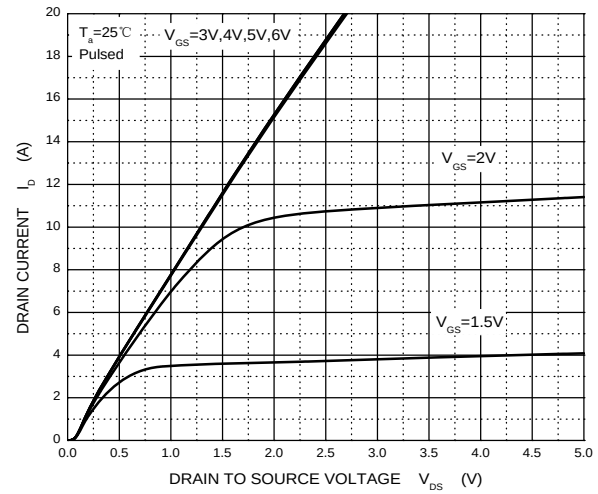
Notes :

a. Pulse Test : pulse width ≤300μs, duty cycle ≤2%.

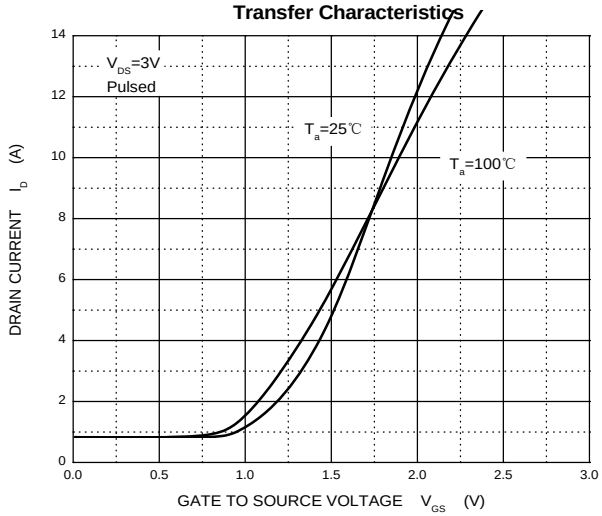
b. These parameters have no way to verify.

RATING AND CHARACTERISTIC CURVES

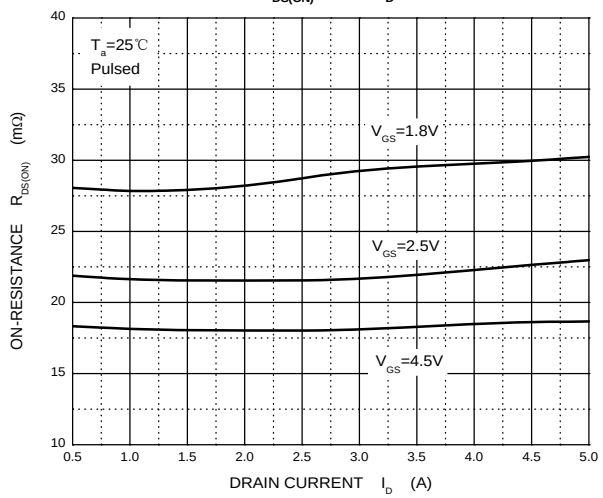
Output Characteristics



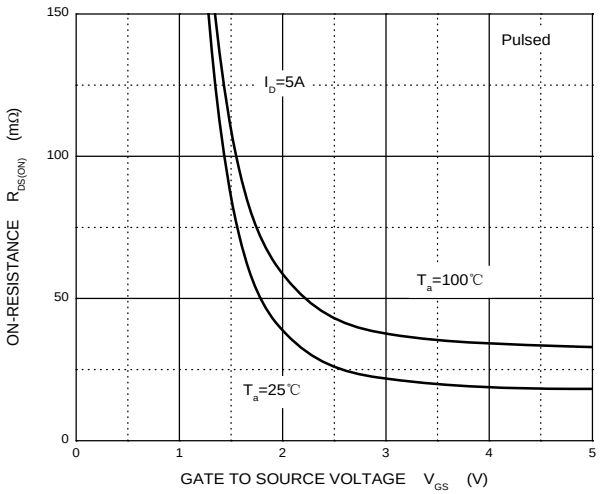
Transfer Characteristics



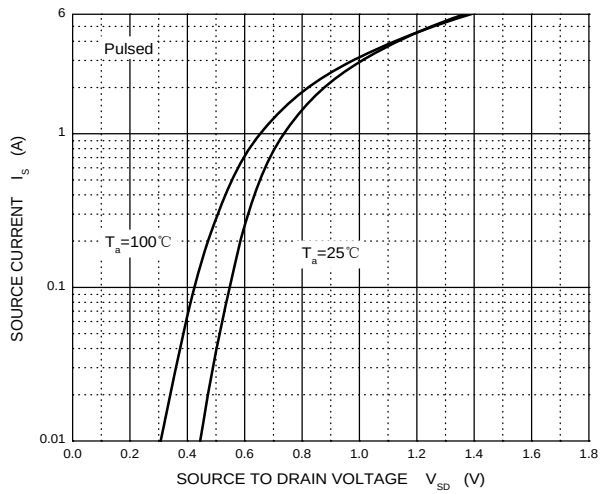
$R_{DS(ON)}$ —— I_D



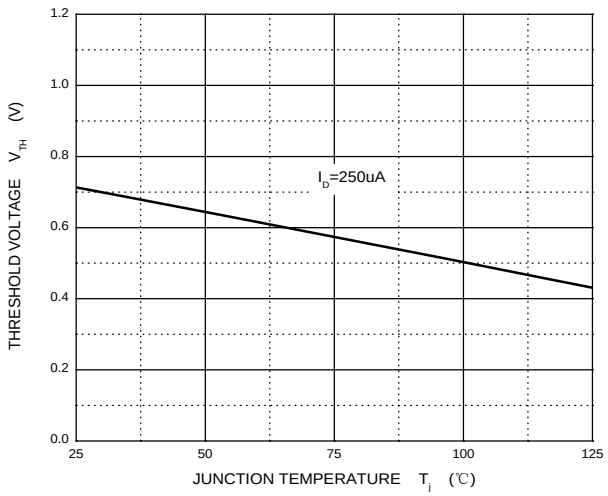
$R_{DS(ON)}$ —— V_{GS}



I_S —— V_{SD}



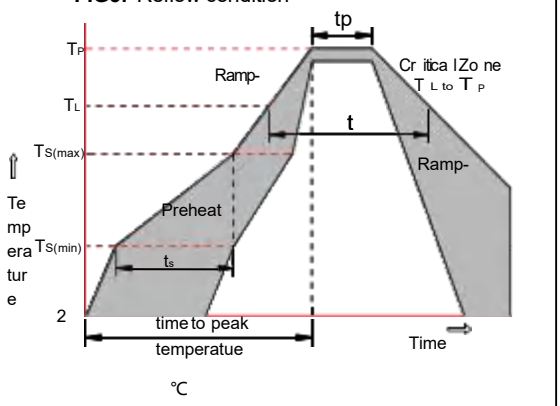
Threshold Voltage



Soldering parameters

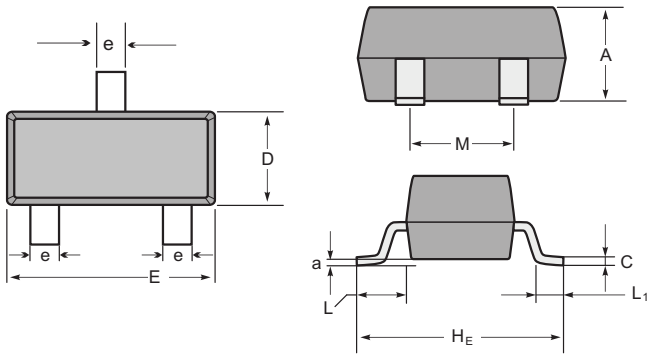
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid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

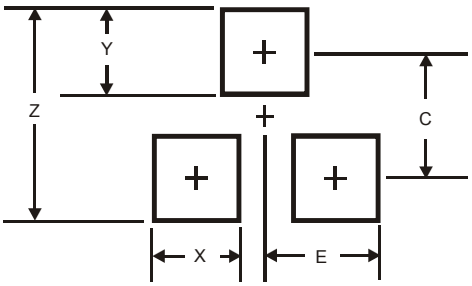
FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout

SOT23





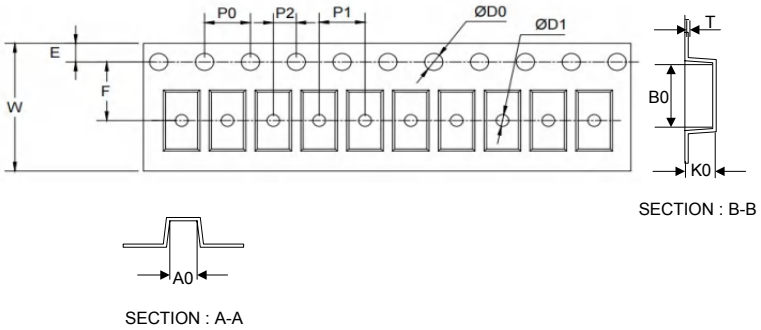
SOT-23 mechanical data

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

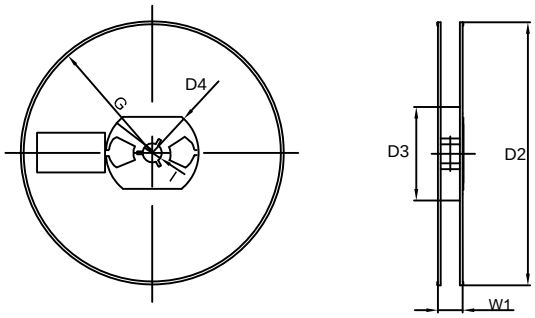
Tape & rell specification

Tape



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

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