SI2306

N-Channel Enhancement Mode MOSFET

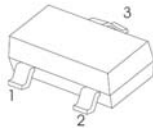
V_{DSS}	30 V
I_D	3.16 A
$R_{DS(ON)}$	38 m Ω

FEATURES

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

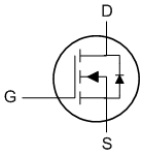
A6SHB

SOT-23



1. GATE
2. SOURCE
3. DRAIN

Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Maximum Ratings and Thermal Characteristics (TA = 25°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current (Continuous)	I_D	3.16	A
Drain Current (Pulsed)[a]	I_{DM}	10	A
Total Power Dissipation @TA=25°C	P_D	0.75	W
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 to +150	°C
Thermal Resistance Junction to Ambient (PCB mounted)	$R_{\theta JA}$	100	°C/W

Electrical Characteristics (TA=25°C, unless otherwise noted)

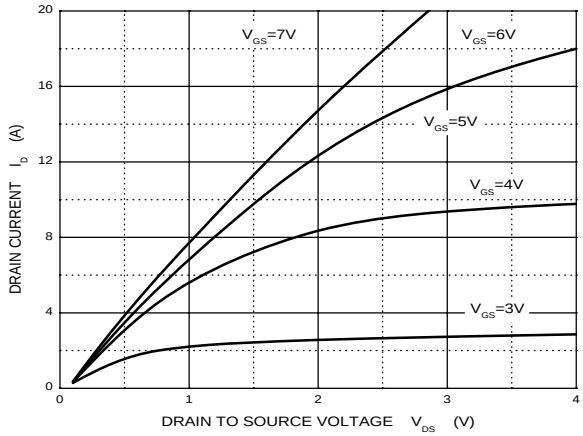
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	V_{GS} = 0V, I_D =250μA	30			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0		3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =30V, V_{GS} =0V			0.5	μA
Drain-Source On-Resistance[a]	$R_{DS(on)}$	V_{GS} =10V, I_D =3.5A		0.038	0.047	Ω
		V_{GS} =4.5V, I_D =2.8A		0.052	0.065	
Forward Transconductance[a]	g_{fs}	V_{DS} =4.5V, I_D =2.5A		7.0		S
Diode Forward Voltage	V_{SD}	I_S=1.25A,V_{GS}=0V		0.8	1.2	V
Dynamic						
Gate Charge	Q_g	V_{DS} =15V,V_{GS} =5V,I_D =2.5A		3.0	4.5	nC
Total Gate Charge	Q_{gt}	V_{DS} =15V,V_{GS} =10V,I_D =2.5A		6	9	
Gate-Source Charge	Q_{gs}			1.6		
Gate-Drain Charge	Q_{gd}			0.6		
Gate Resistance	R_g	f =1.0MHz	2.5	5	7.5	Ω
Input Capacitance	C_{iss}	V_{DS} =15V,V_{GS} =0V,f =1MHz		305		pF
Output Capacitance	C_{oss}			65		
Reverse Transfer Capacitance	C_{rss}			29		
Switching						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=15V, R_L=15Ω, I_D ≈1A, V_{GEN}=10V,Rg=6Ω		7	11	ns
Rise Time	t_r			12	18	
Turn-Off Delay Time	$t_{d(off)}$			14	25	
Fall Time	t_f			6	10	

Notes :

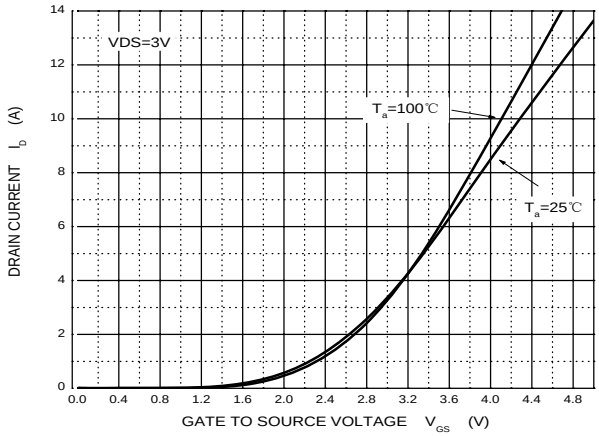
a.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

RATING AND CHARACTERISTIC CURVES

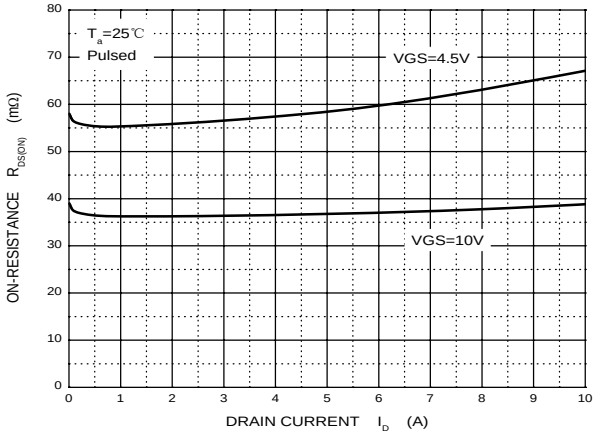
Output Characteristics



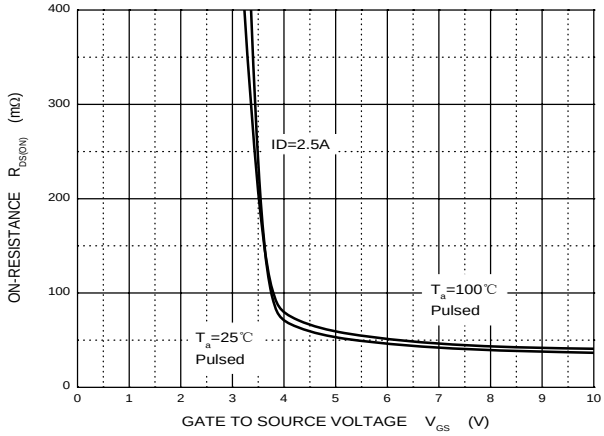
Transfer Characteristics



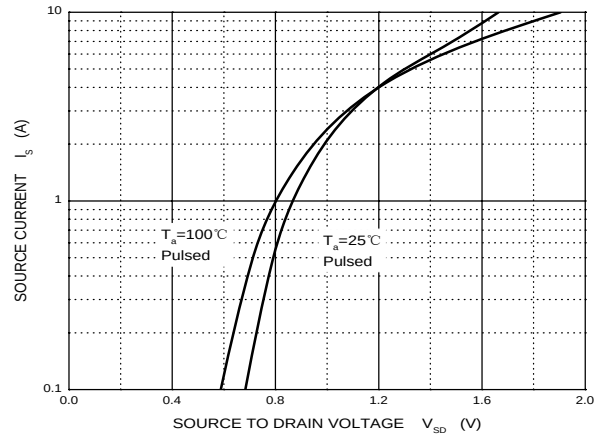
$R_{DS(ON)}$ —— I_D



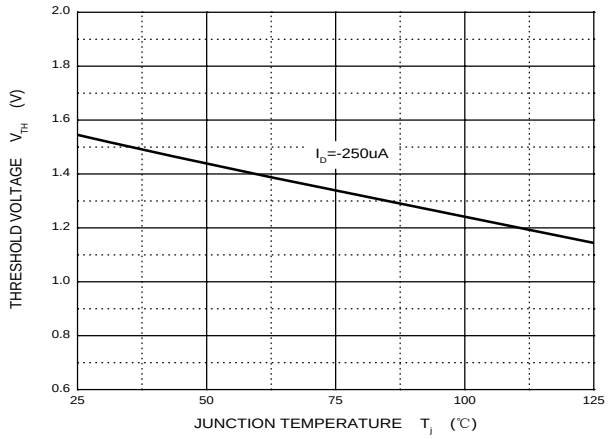
$R_{DS(ON)}$ —— V_{GS}



I_S —— V_{SD}



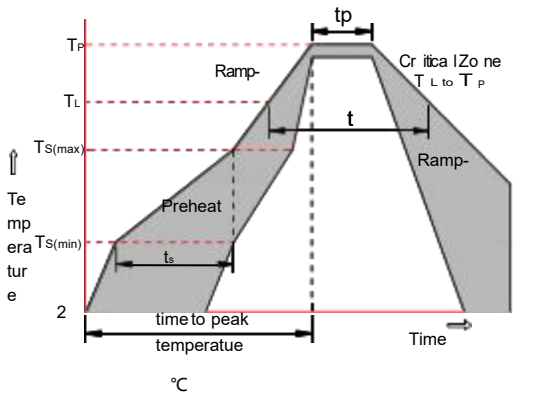
Threshold Voltage



Soldering parameters

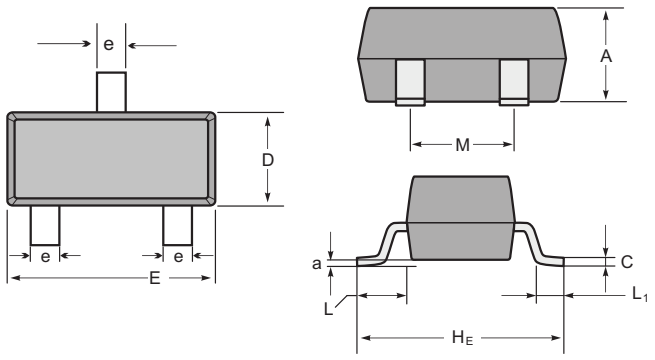
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid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

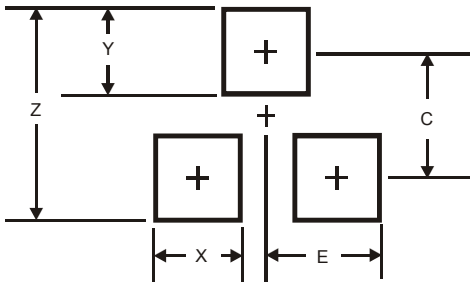
FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout

SOT23





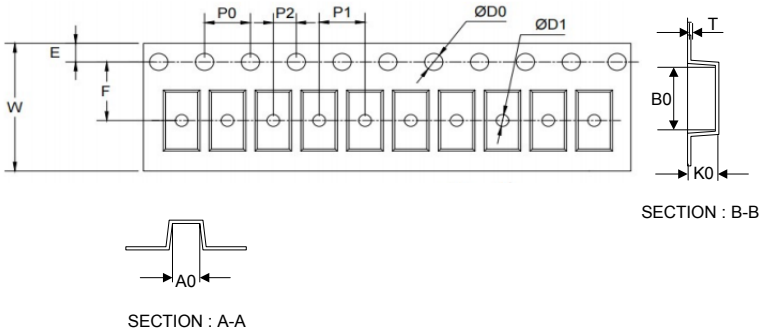
SOT-23 mechanical data

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

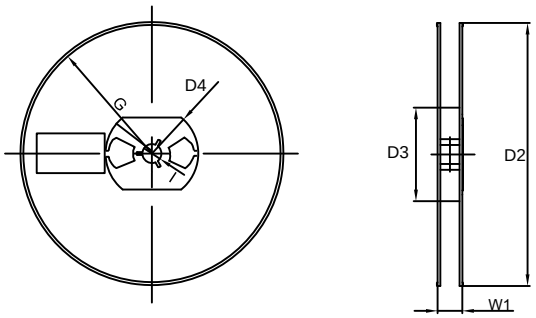
Tape & rell specification

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