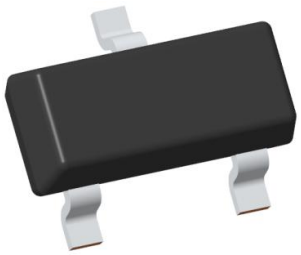
HAICHUANG SEMI

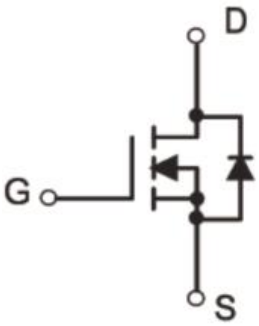
2312

20V N-Channel Enhancement

General Description

V(BR)DSS	RDSON MAX	ID Max.
20V	31.8mΩ@4.5V	5A
	35.6mΩ@2.5V	
	41.4mΩ@1.8V	



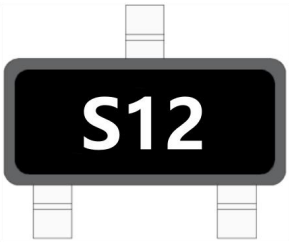


Features

- High density cell design for low RDS(ON)
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- Load Switch for Portable Devices
- DC/DC Converter

Mechanical Data

- SOT-23 Small Outline Plastic Package.
- Epoxy UL: 94V-0.
- Mounting Position: Any.



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
2312	SOT-23	S12	3000

Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbols	Value	Units
Drain-Source Voltage	VDS	20	V
Gate-Source Voltage	VGS	±8	V
Continuous Drain Current, t=5s	ID	5	A
Pulsed Drain Current	IDM	20	
Continuous Source-Drain Diode Current	IS	1.04	
Maximum Power Dissipation, t=5s	PD	350	mW
Junction Temperature	Tj	150	℃
Storage Temperature	Tstg	-50-+150	℃
Thermal Resistance From Junction to Ambient	RθJA	357	℃/W

Electrical Characteristics (T_J=25℃,unless otherwise noted)

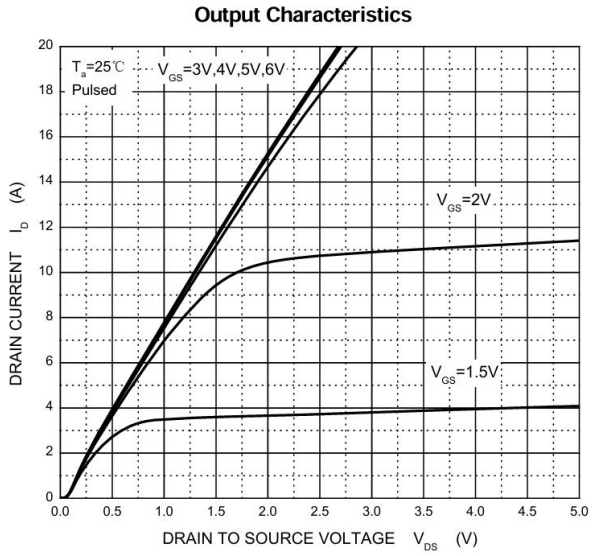
Parameter	Symbol	Test Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	20			V
Gate-Threshold voltage	VGS (th)	VDS=VGS, ID=250uA	0.45	0.7	1.0	V
Gate-body Leakage	IGSS	VDS=0V, VGS=±8V			±100	nA
Zero Gate Voltage Drain current	IDSS	VDS=20V, VGS=0V			1.0	uA
Drain-Source On-Resistance (note1)	RDS(ON)	VGS=4.5V, ID=5.0A		18	31.8	mΩ
		VGS=2.5V, ID=4.7A		23	35.6	
		VGS=1.8V, ID=4.3A		30	41.4	
Forward trans conductance (note1)	gfs	VDS=10V, ID=5.0A		6		S
Diode forward voltage	VSD	IS=4A, VGS=0V		0.75	1.2	V
Dynamic Characteristics (note2)						
Input capacitance	Ciss	VDS=10V, VGS=0V, f=1MHz		865		pF
Output capacitance	Coss			105		
Reverse Transfer capacitance	Crss			55		
Gate resistance	Rg	f=1MHz	0.5		4.8	Ω
Turn-on Time	td(on)	VDD=10V, VGEN=5V, ID=4A, RG=1Ω, RL=2.2Ω			10	ns
Rise time	tr				20	
Turn-off Time	td(off)				32	
Fall time	tf				12	

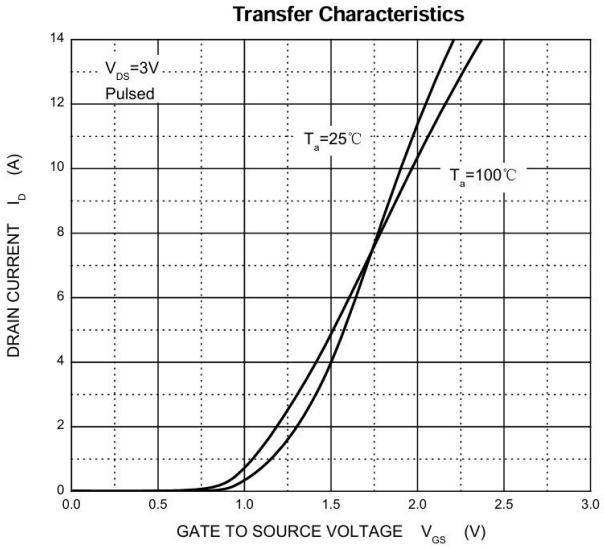
Notes:

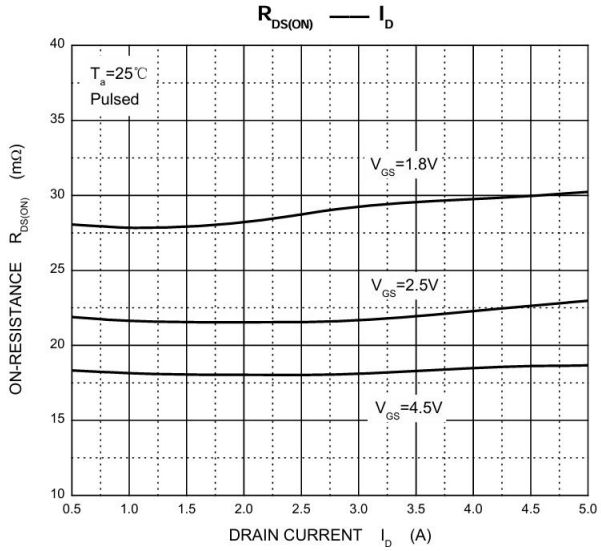
1, Pulse Test: Pulse Width ≤300us, Duty Cycle≤2%.

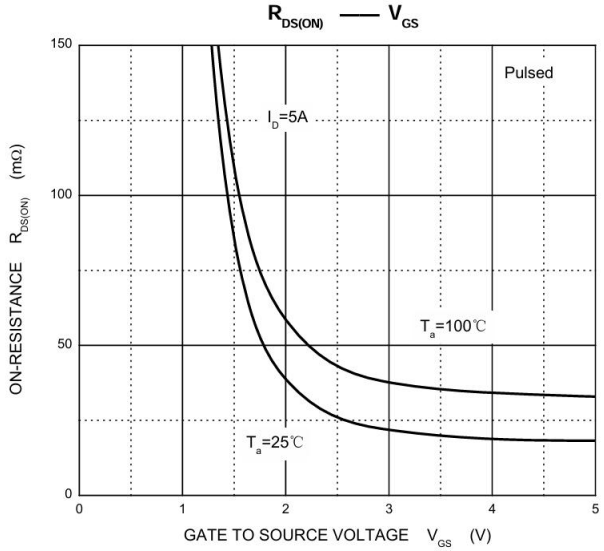
2. These parameters have no way to verify.

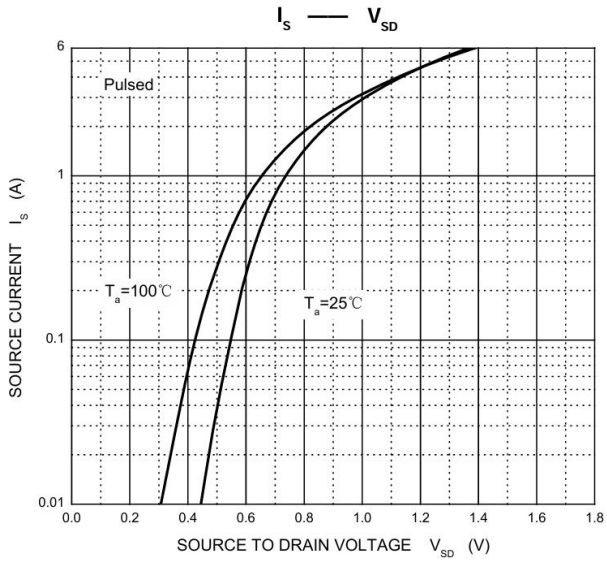
Typical Characteristics

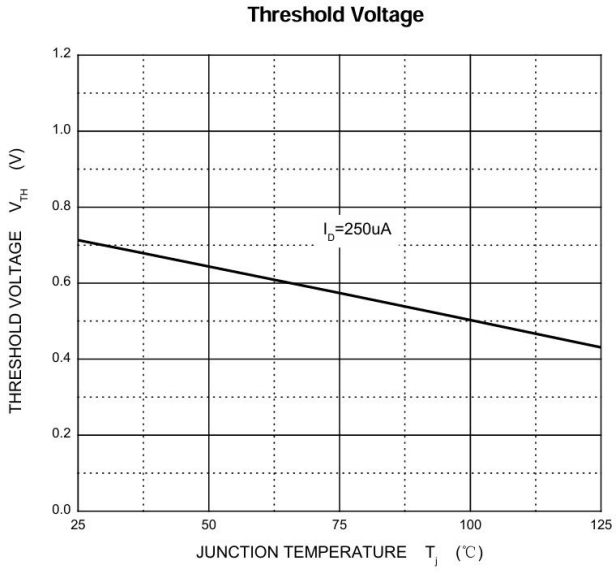






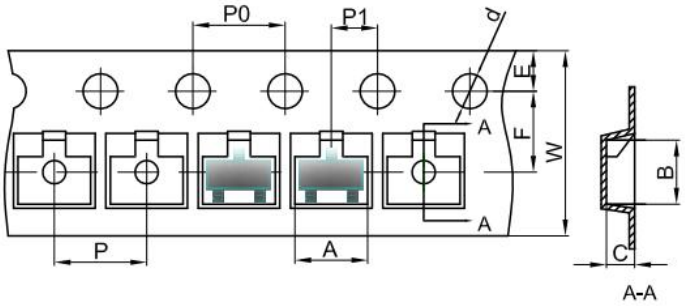




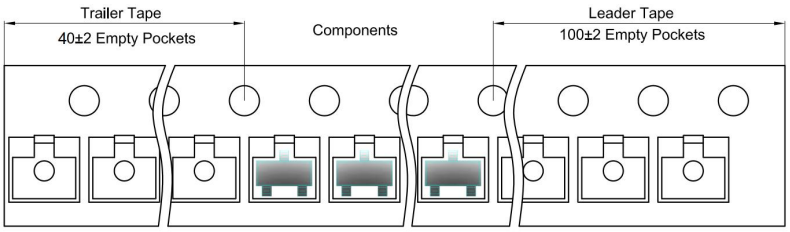


Package Information

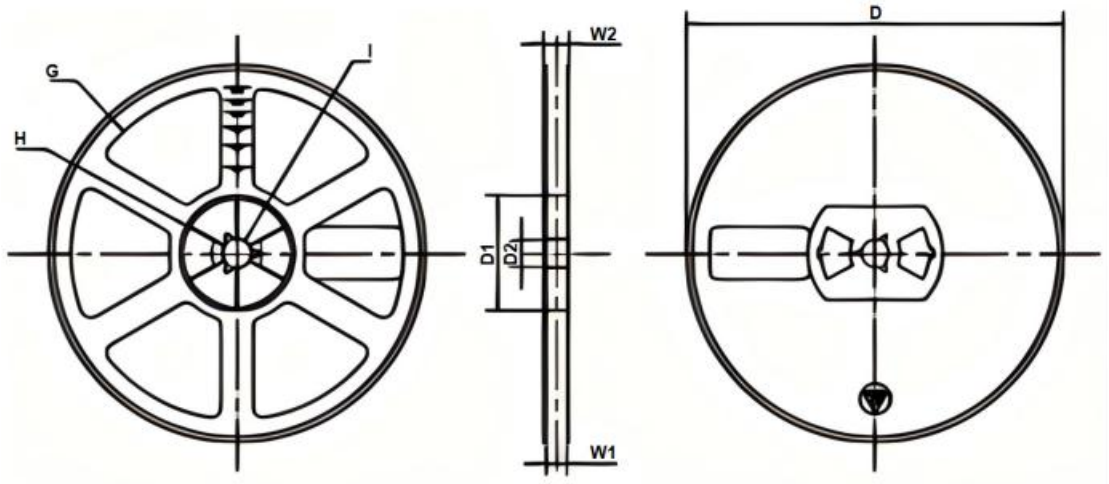
Carrier Dimension(mm)



Dimensions are in millimeter											
Pkg Type	A	B	C	d	E	F	P0	P	P1	10*P0	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	40.00	8.00
(Tolerance)	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.1



Reel Dimension(mm)



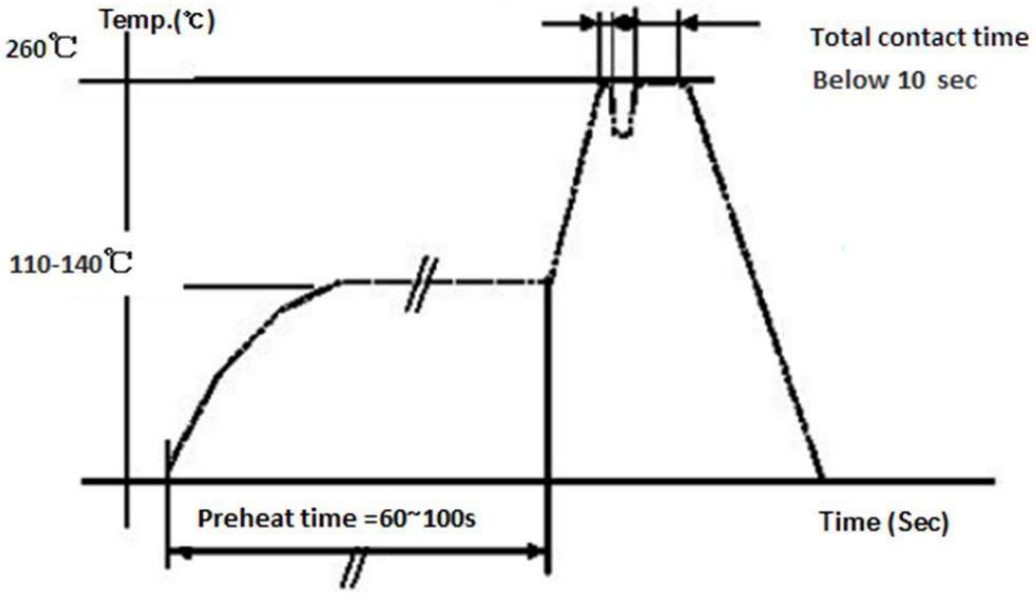
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Φ178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

Package Specifications

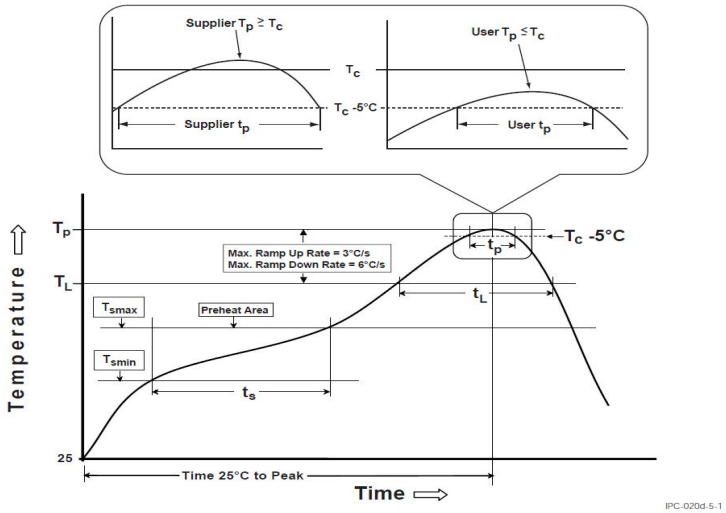
Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	Q'TY/Carton (Kpcs)
SOT23	7'	178	3	210*208*203	45	440*400*230	180

Recommended Soldering Profile for Rectifier Diodes (Pb Free)

a) Wave Soldering Profile



b) Reflow Soldering Profile (Pb Free Application), refer to IPC/JEDEC J-STD-020

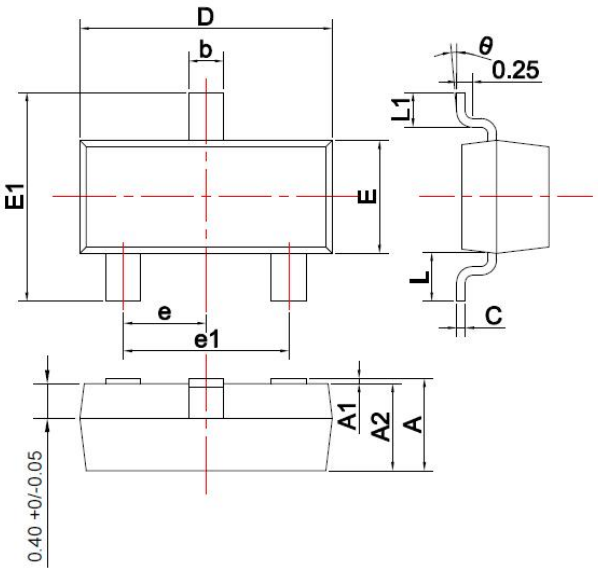


Preheat/Soak Temperature Min (Tsmin) Temperature Max (Tsmax) Time (ts) from (Tsmin to Tsmax)	50 °C 200 °C 60-120 seconds
Melting Point of Solder (Sn Ag Cu)	217℃
Ramp-up Rate to 217℃(Melting Point of Solder)	3℃/sec
Time at Temp.>217℃ (Melting Point of Solder)	60~150 Sec
Peak Temperature	255±5℃
Time within 5℃below Peak Temp.	20~40 Sec
Cooling Rate	6℃/sec (max)
Time from 25℃ to Peak Temp.	8min (max)

c) Manual Soldering

When using an electric soldering iron for manual soldering, it is recommended that the temperature does not exceed 300°C and the soldering time is less than 10 seconds.

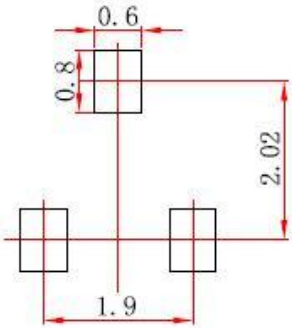
Package Mechanical Data



SYMBOL	DIMENSIONS	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

Unit: mm

Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.