



HAICHUANG SEMI

General Description

3406

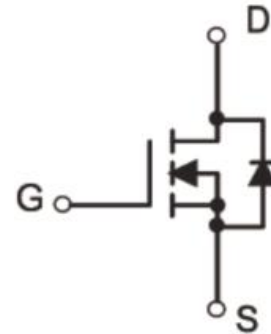
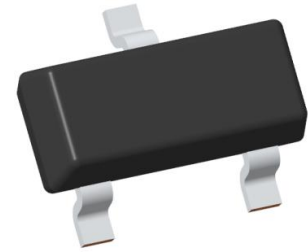
30V N-Channel Enhancement



V(BR)DSS	RDSON MAX	ID Max.
30V	65m Ω @10V	3.6A
	105m Ω @4.5V	

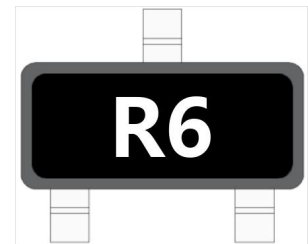
Features

- 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)
3406	SOT-23	R6	3000



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30V N-Channel Enhancement

Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Parameter	Symbols	Value	Units
Drain-Source Voltage	VDS	30	V
Gate-Source Voltage	VGS	±20	V
Continuous Drain Current	ID	3.6	A
Drain Current-Pulsed(note 1)	IDM	15	
Power Dissipation	PD	350	mW
Junction Temperature	Tj	-55-+150	°C
Storage Temperature	Tstg	-55-+150	°C
Thermal Resistance From Junction to Ambient	RθJA	357	°C/W

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

Parameter	Symbol	Test Conditions	Min.	Typ	Max.	Unit
Off characteristics						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	30			V
Zero Gate Voltage Drain current	IDSS	VDS=24V, VGS=0V			1	uA
Gate-body Leakage	IGSS	VDS=±20V, VGS=0V			±100	nA
On characteristics						
Drain-Source On-Resistance (note 2)	RDS(ON)	VGS=10V, ID=3.6A		31	65	mΩ
		VGS=4.5V, ID=2.8A		43	105	
Forward trans conductance (note 2)	gfs	VDS=5V, ID=3.6A	3			S
Gate-Threshold voltage	VGS (th)	VDS=VGS, ID=250uA	1.0		3.0	V
Dynamic characteristics (note 3)						
Input capacitance	Ciss	VDS=15V, VGS=0V, f=1MHz			375	pF
Output capacitance	Coss		57			
Reverse Transfer capacitance	Crss		39			
Switching characteristics (note 3)						
Turn-on Time	td(on)	VGS=10V, RL=2.2Ω, VDS=15V, RGEN=3Ω		4.6		ns
Rise time	tr		1.9			
Turn-off Time	td(off)		20.1			
Fall time	tf		2.6			
Drain-source diode characteristics and maximum ratings						
Diode forward voltage	VSD	IS=1A, VGS=0V			1.0	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≤300us, Duty Cycle≤0.5%.
3. These parameters have no way to verify.



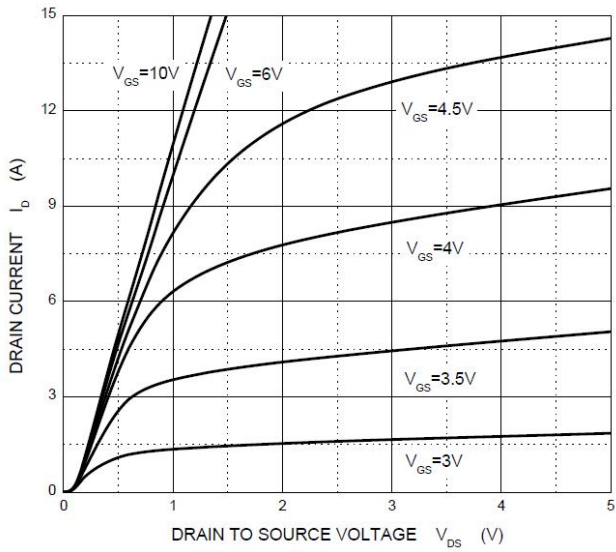
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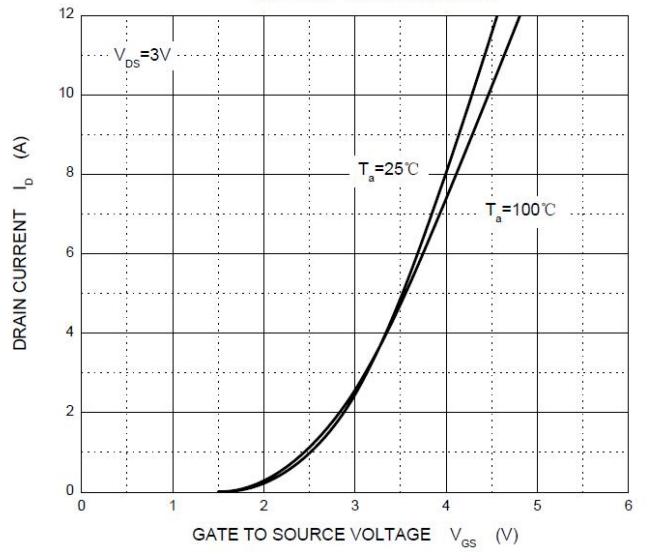
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Typical Characteristics

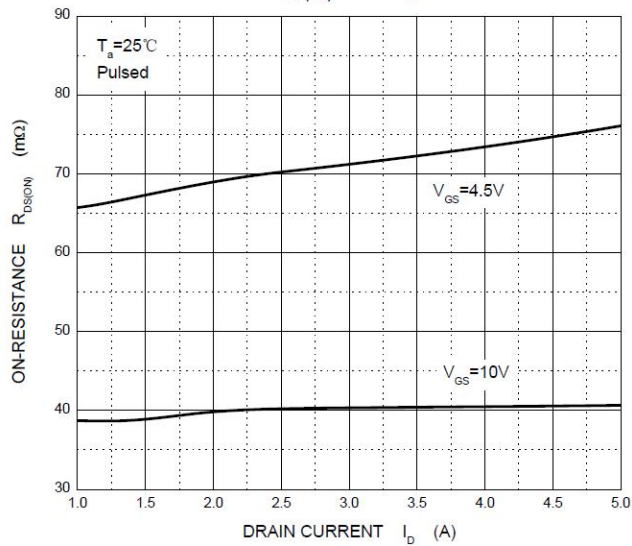
Output Characteristics



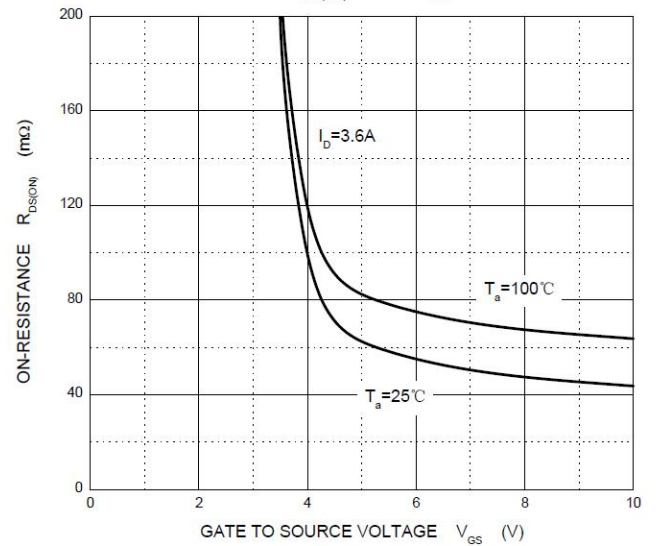
Transfer Characteristics



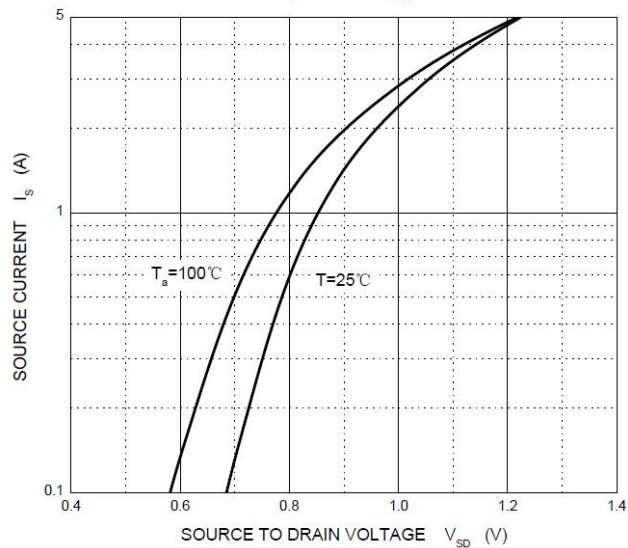
$R_{DS(ON)}$ — I_D



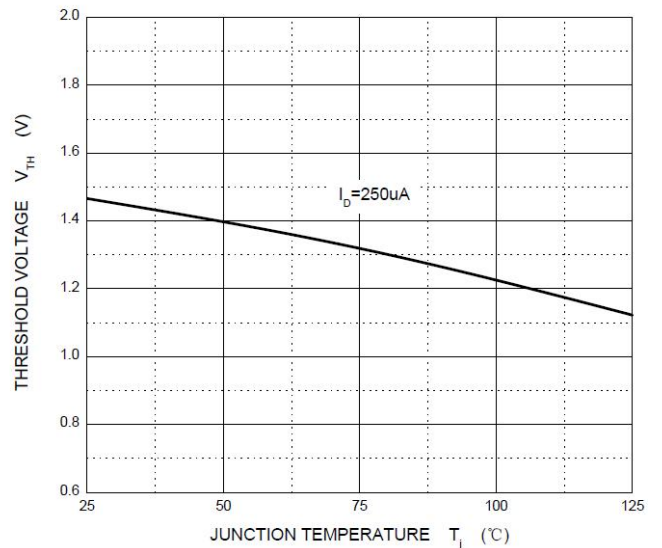
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}

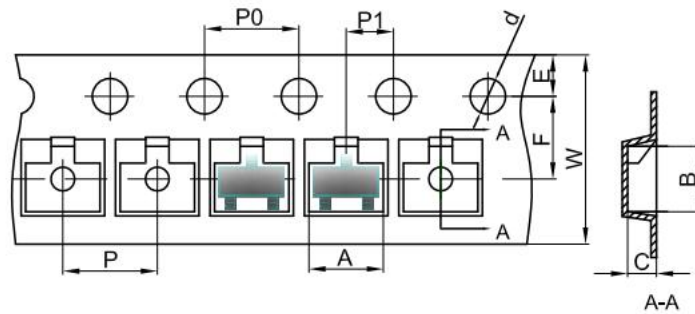


Threshold Voltage



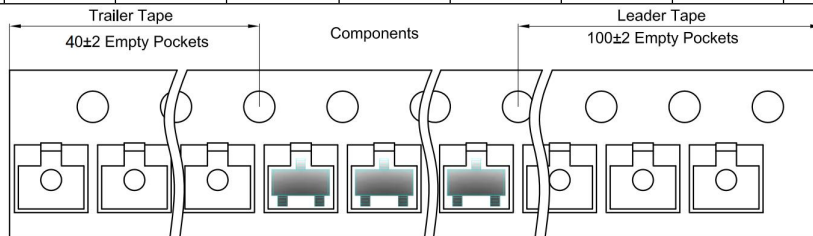
Package Information

Carrier Dimension(mm)

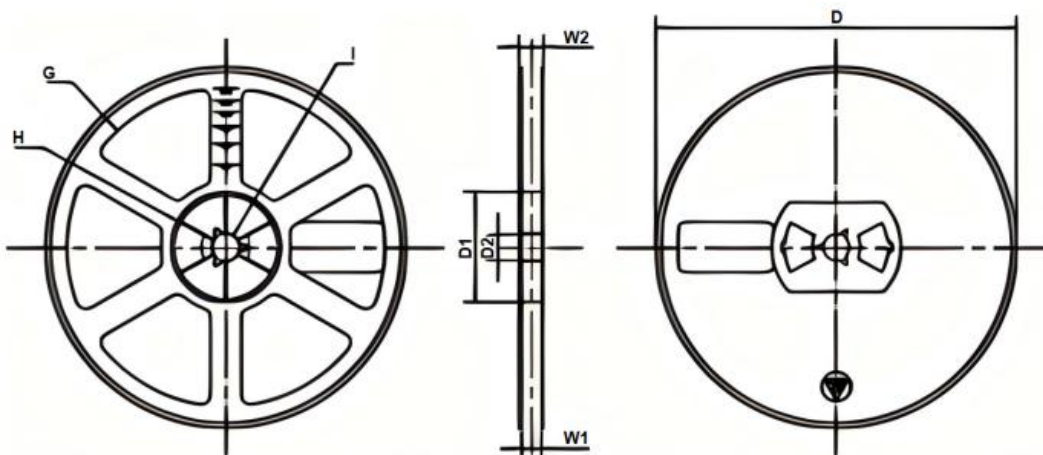


Dimensions are in millimeter

Pkg Type	A	B	C	d	E	F	P0	P	P1	10*P0	W
SOT-23	3.15	2.77	1.22	∅1.50	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)



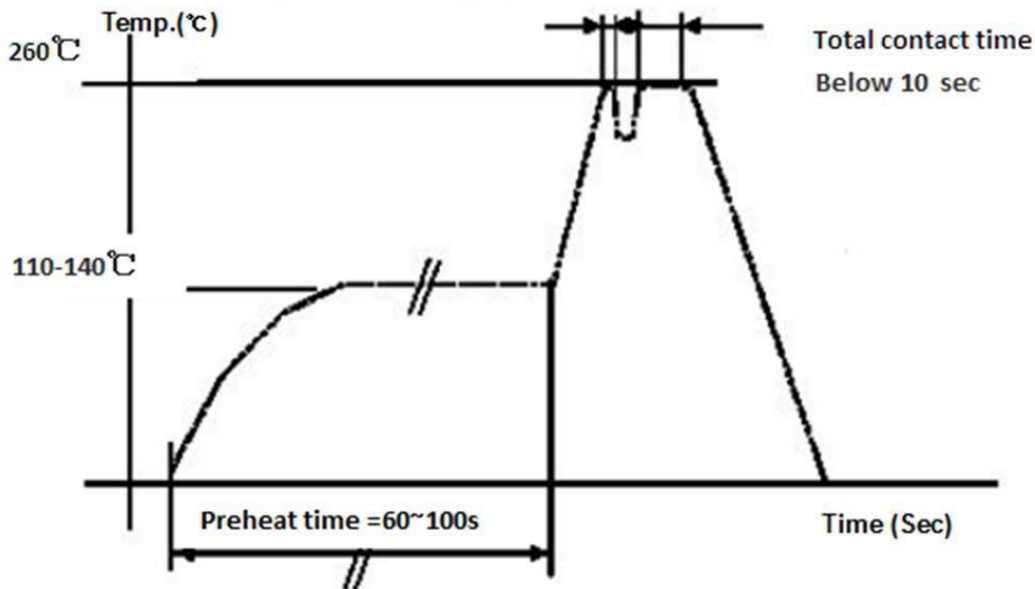
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	∅178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

Package Specifications

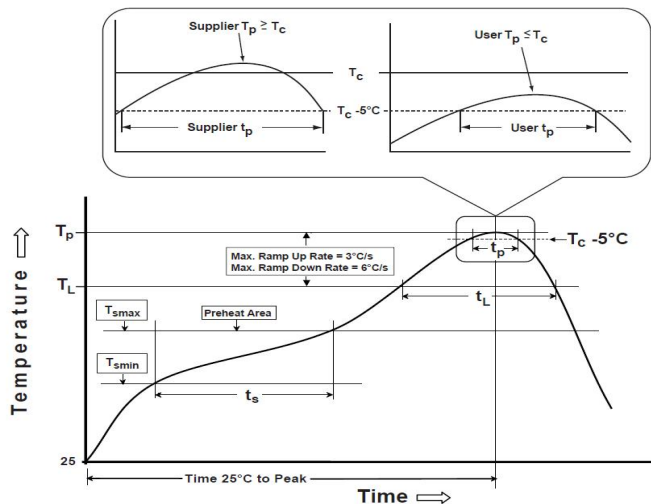
Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	Q'TY/Carton (Kpcs)
SOT23	7'	178	3	210*208*203	45	440*400*230	180

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 (T _{smin}) Temperature Max (T _{smax}) Time (ts) from (T _{smin} to T _{smax})	50 °C 200 °C 60-120 seconds
Melting Point of Solder (Sn Ag Cu)	217°C
Ramp-up Rate to 217°C(Melting Point of Solder)	3°C/sec
Time at Temp.>217°C (Melting Point of Solder)	60~150 Sec
Peak Temperature	255±5°C
Time within 5°Cbelow Peak Temp.	20~40 Sec
Cooling Rate	6°C/sec (max)
Time from 25°C 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.

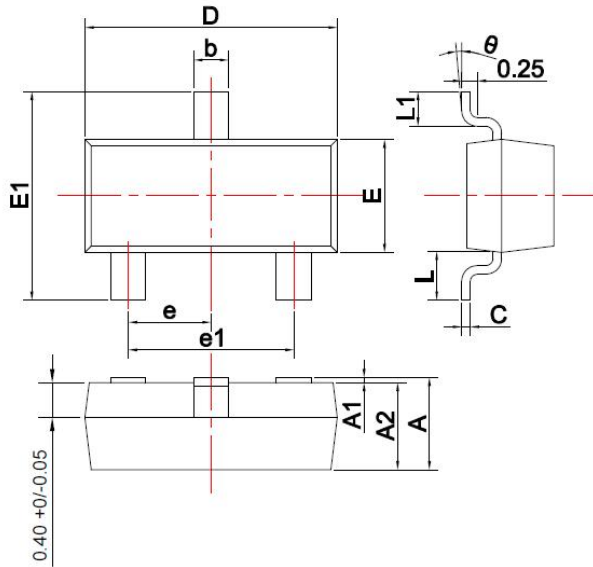


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Package Mechanical Data

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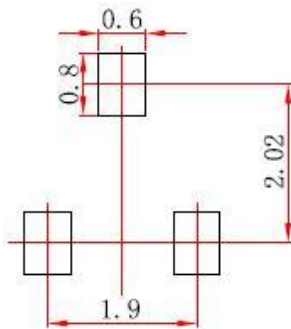
30V N-Channel Enhancement



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: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.