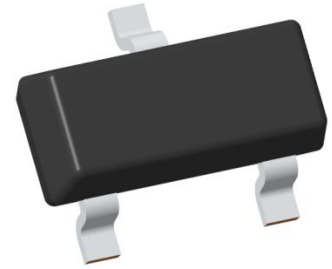


General Description



V_R	$R_{DS(on) MAX}$	$I_D Max.$
-30V	62mΩ@-10V	-4A
	73mΩ@-4.5V	
	98mΩ@-2.5V	

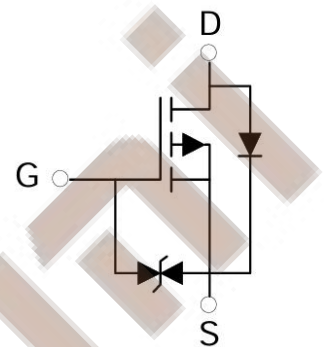
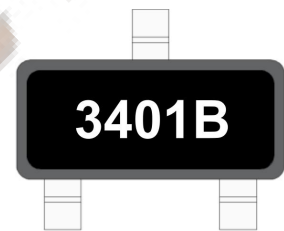


Features

- High dense cell design for extremely low RDS(on).
- Exceptional on-resistance and maximum DC current capability.
- Load/Power Switching.
- Interfacing Switching

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)
3401B	SOT-23	3401B	3000

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

Parameter	Symbols	Rating	Units
Drain-Source Voltage	VDS	-30	V
Gate-Source Voltage	VGS	±12	V
Continuous Drain Current	ID	-4	A
Pulsed Drain Current (1)	IDM	-16	A
Power Dissipation	PD	1.2	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-50~+150	°C
Thermal Resistance From Junction to Ambient (2)	RθJA	108	°C/W

Electrical Characteristics (T_J=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=-30V, VGS=0V			-1	uA
Gate-body Leakage	IGSS	VGS=±12V, VDS=0V			±100	nA
On characteristics						
Drain-Source On-Resistance (3)	RDS(ON)	VGS=-10V, ID=-4A		48	62	m Ω
		VGS=-4.5V, ID=-3A		56	73	
		VGS=-2.5V, ID=-3A		75	98	
Gate-Threshold voltage*	V GS (th)	VDS=VGS, ID=-250uA	-0.6	-0.95	-1.3	V
Dynamic characteristics						
Input capacitance	Ciss	VDS=-15V, VGS=0V,f=1MHz		553		pF
Output capacitance	Coss			57		
Reverse Transfer capacitance	Crss			35		
Switching characteristics						
Turn-on Time	td(on)	VGS=-4.5V, VDD=-15V, ID=-3A, RGEN=3 Ω		10		ns
Rise time	tr			86		
Turn-off Time	td(off)			150		
Fall time	tf			357		
Drain-source diode characteristics and maximum ratings						
Diode forward voltage	VSD	IS=-4A, VGS=0V			-1.2	V
Maximum Continuous Drain to Source Diode Forward	IS				-4	A
Maximum Pulsed Drain to Source Diode Forward Current	ISM				-16	A

Notes :

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. RθJA is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width ≤300us, Duty Cycle≤0.5%.

Typical Characteristics

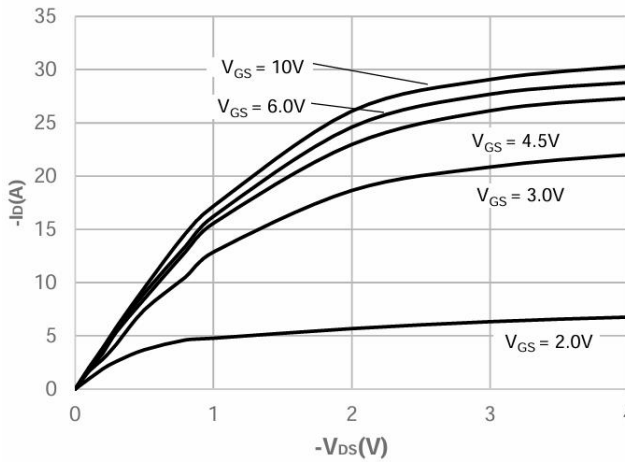
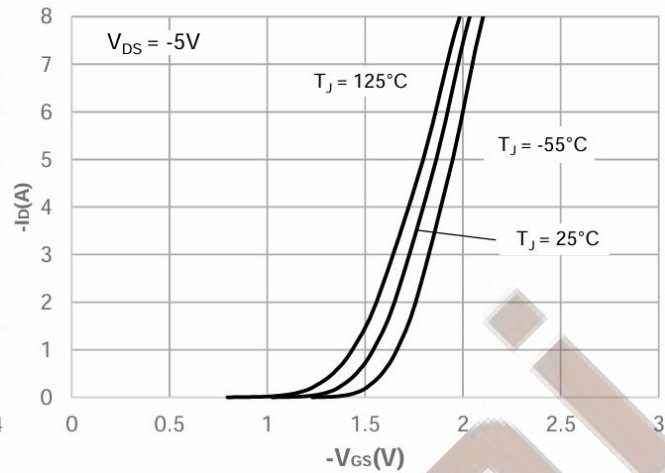
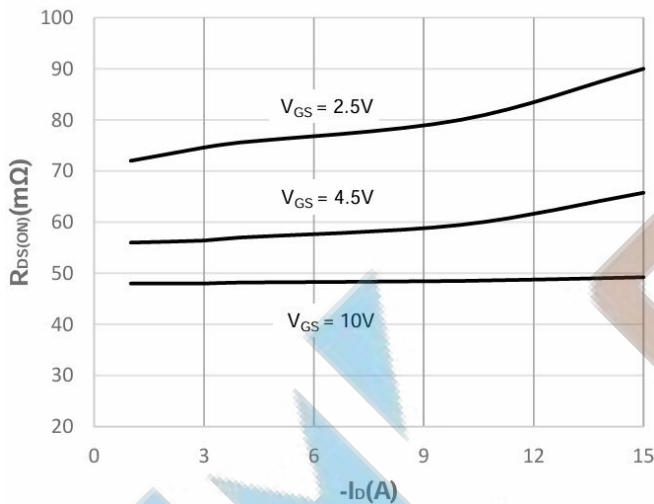
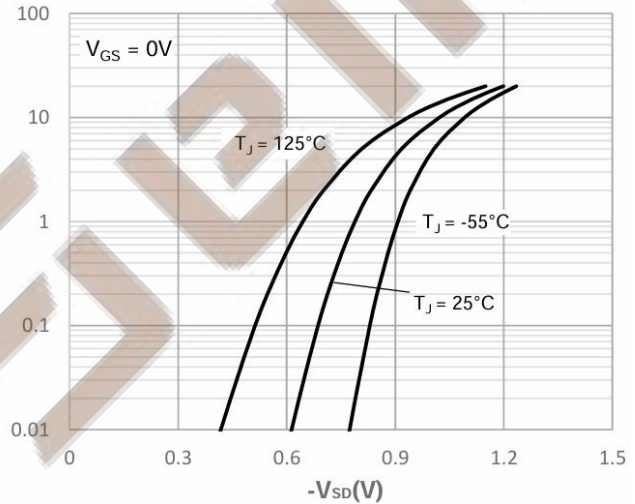
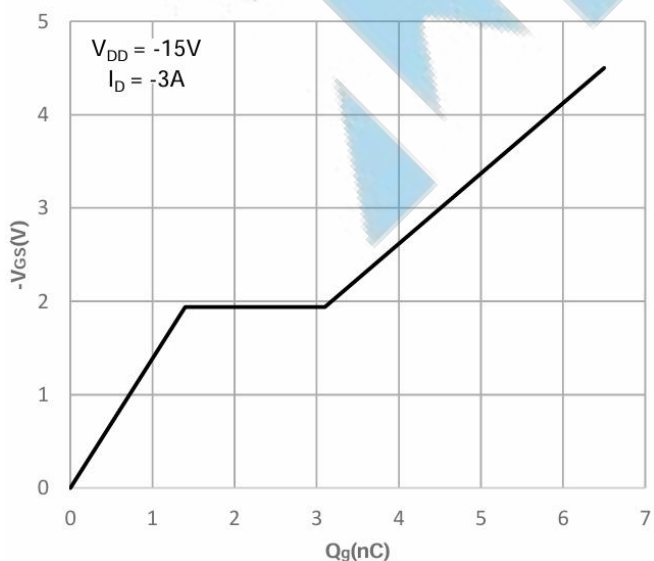
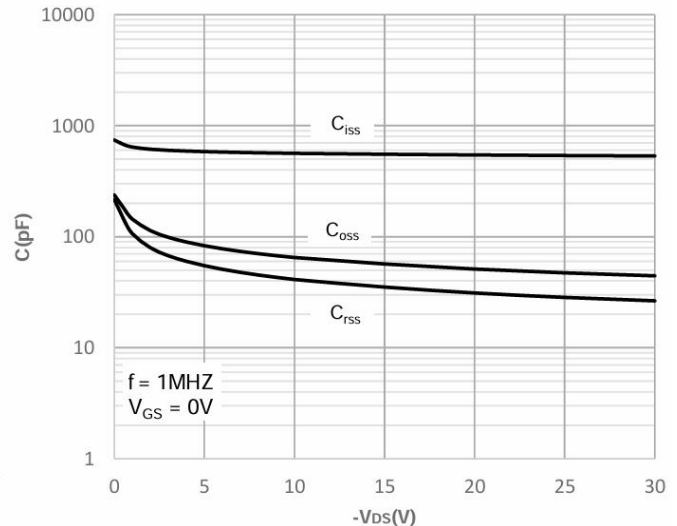
Figure 1: Output Characteristics

Figure 2: Typical Transfer Characteristics

Figure 3: On-resistance vs. Drain Current

Figure 4: Body Diode Characteristics

Figure 5: Gate Charge Characteristics

Figure 6: Capacitance Characteristics


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

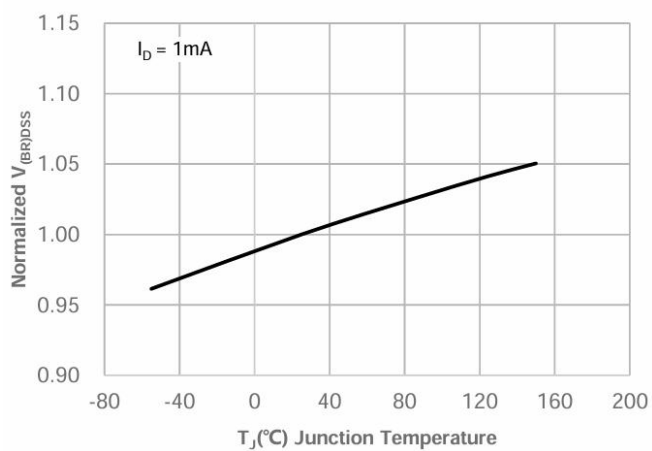
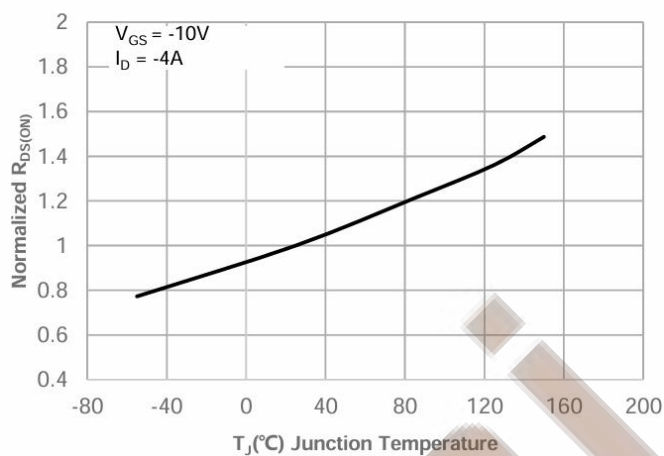
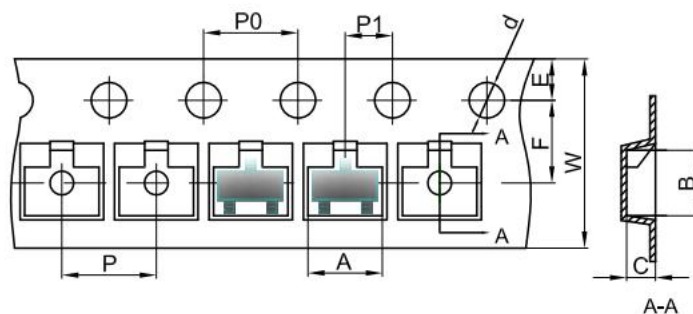


Figure 8: Normalized on Resistance vs. Junction Temperature



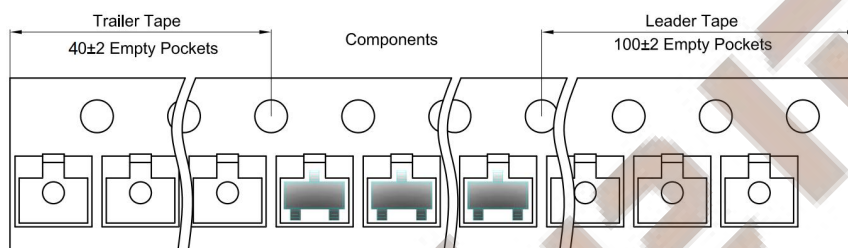
Package Information

Carrier Dimension(mm)

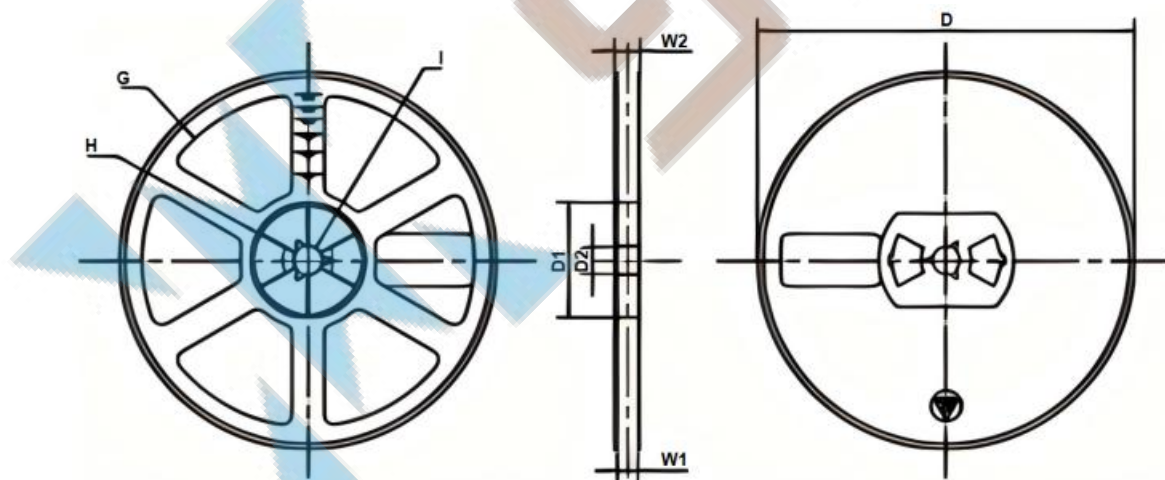


Dimensions are in millimeter

Pkg Type	A0	A1	B0	B1	K0	D0	D1	E	F	P0	P1	P2	10*P0	W	T
SOT-23	3.15	1.09	2.77	2.15	1.22	1.55	1.00	1.75	3.50	4.00	4.00	2.00	40.00	8.00	0.20
(Tolerance)	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.1	±0.03



Reel Dimension(mm)



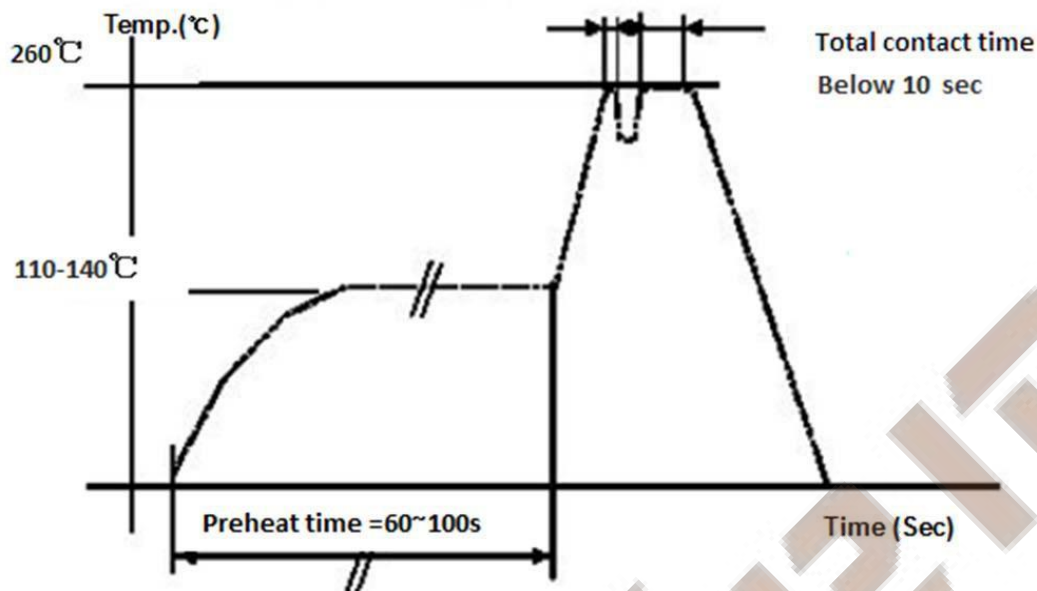
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Φ178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

Package Specifications

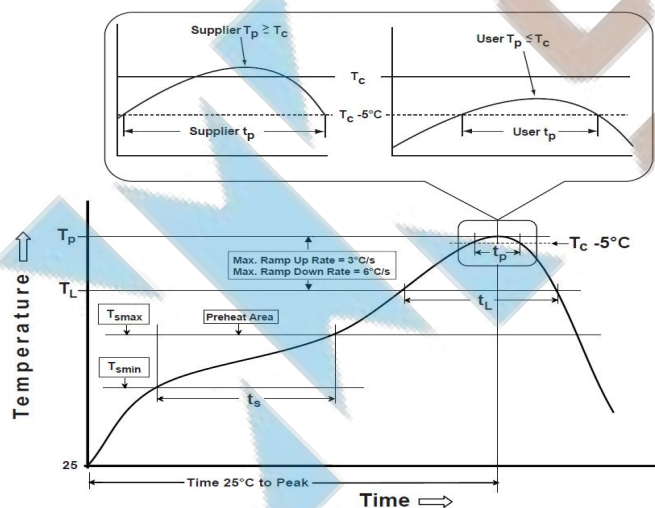
Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	Q'TY/Carton (Kpcs)
SOT23	7'	178	3	210*208*203	45	440*400*230	180

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

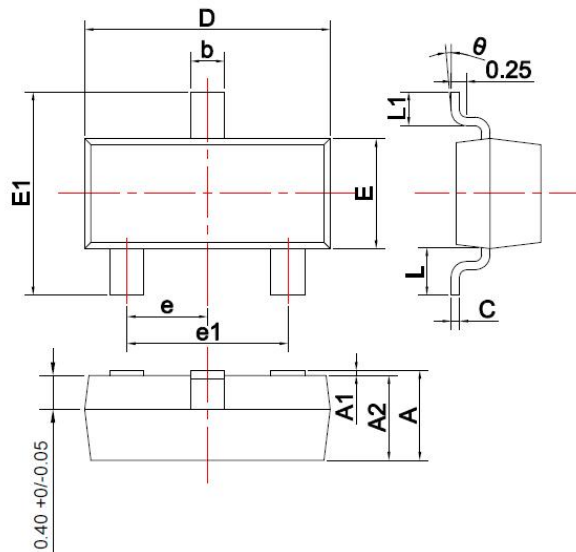


Preheat/Soak Temperature Min (T _{min}) Temperature Max (T _{max}) Time (ts) from (T _{min} to T _{max})	50 °C 200 °C 60-120 seconds
Melting Point of Solder (Sn Ag Cu)	217°C
Ramp-up Rate to 217°C (Melting Point of Solder)	3°C/sec
Time at Temp. > 217°C (Melting Point of Solder)	60~150 Sec
Peak Temperature	255±5°C
Time within 5°C below 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.

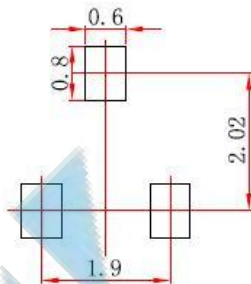
Package Mechanical Data



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

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