ST3401

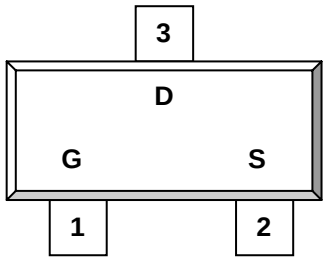
P Channel Enhancement Mode MOSFET

-4.0A

DESCRIPTION

ST3401 is the P-Channel logic enhancement mode power field effect transistor which is produced using high cell density DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management, other battery powered circuits, and low in-line power loss are required. The product is in a very small outline surface mount package.

PIN CONFIGURATION
SOT-23-3L

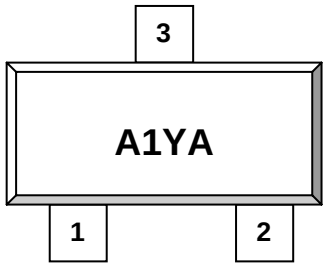


1.Gate 2.Source 3.Drain

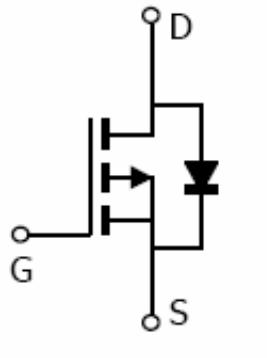
FEATURE

- -30V/-4.0A, $R_{DS(ON)}$ = 45mΩ (Typ.) @V_{GS} = -10V
- -30V/-3.2A, $R_{DS(ON)}$ = 50mΩ @V_{GS} = -4.5V
- -30V/-1.2A, $R_{DS(ON)}$ = 60mΩ @V_{GS} = -2.5V
- Super high density cell design for Extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23-3L package design

PART MARKING
SOT-23-3L



Y: Year Code A: Process Code



ORDERING INFORMATION

Part Number	Package	Part Marking
ST3401S23RG	SOT-23-3L	A1YA

※ Process Code : A ~ Z ; a ~ z

※ ST3401S23RG S23 : SOT-23-3L ; R : Tape Reel ; G : Pb – Free

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ABSOULTE MAXIMUM RATINGS (Ta = 25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±12	V
Continuous Drain CurrentTJ=150℃)	T_A=25℃ T_A=70℃	I_D	-4.0 -3.2	A
Pulsed Drain Current		I_{DM}	-15	A
Continuous Source Current (Diode Conduction)		I_S	-1.0	A
Power Dissipation	T_A=25℃ T_A=70℃	P_D	1.25 0.8	W
Operation Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	120	℃/W

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ELECTRICAL CHARACTERISTICS (Ta = 25℃ Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250uA	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250uA	-0.4		-1.0	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V,V_{GS}=0V			-1	uA
		V_{DS}=-24V,V_{GS}=0V T_J=55℃			-10	
On-State Drain Current	$I_{D(on)}$	V_{DS}≦-5V,V_{GS}=-4.5V	-10			A
Drain-source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V,I_D=-4.0A V_{GS}=-4.5V,I_D=-3.2A V_{GS}=-2.5V,I_D=-1.2A		45 50 60		mΩ
Forward Transconductance	g_{fs}	V_{DS}=-5V,I_D=-4.0V		10		S
Diode Forward Voltage	V_{SD}	I_S=-1.0A,V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-15V V_{GS}=-10V I_D≡-4.0A		14	21	nC
Gate-Source Charge	Q_{gs}			1.9		
Gate-Drain Charge	Q_{gd}			3.7		
Input Capacitance	C_{iss}	V_{DS}=-15V V_{GS}=0V F=1MHz		540		pF
Output Capacitance	C_{oss}			131		
Reverse Transfer Capacitance	C_{rss}			105		
Turn-On Time	$t_{d(on)}$ t_r	V_{DS}=-15V V_{GS}=-15V I_D=-1A R_L=6Ω R_G=-10Ω		10	15	nS
				15	25	
Turn-Off Time	$t_{d(off)}$ t_f			31	50	
				20	30	

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TYPICAL CHARACTERICTICS (25℃ Unless noted)

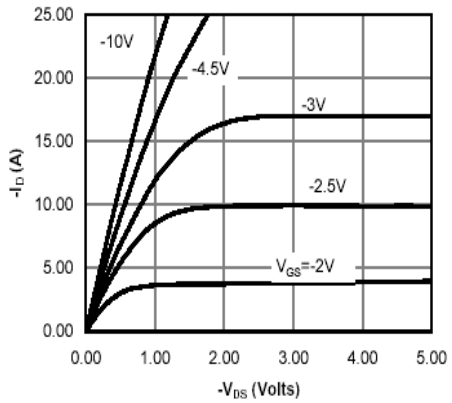

Fig 1: On-Region Characteristics

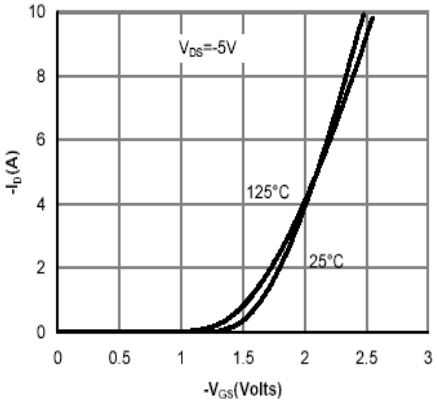

Figure 2: Transfer Characteristics

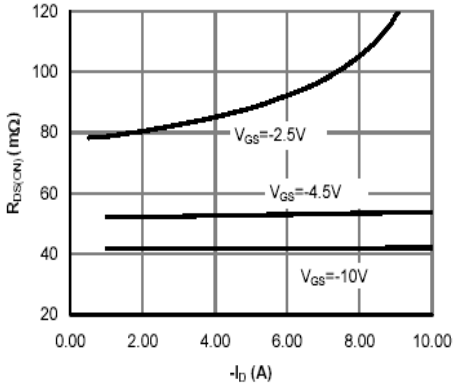

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

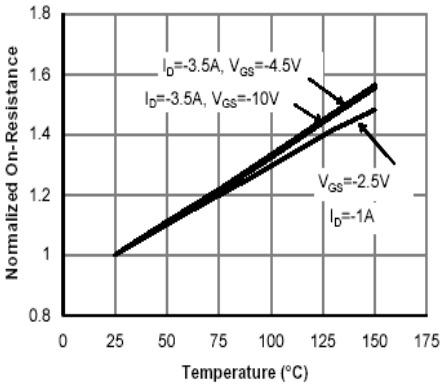

Figure 4: On-Resistance vs. Junction Temperature

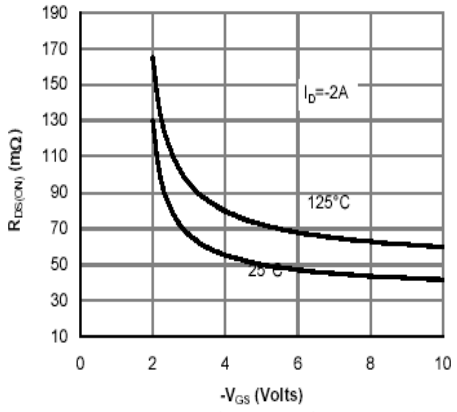

Figure 5: On-Resistance vs. Gate-Source Voltage

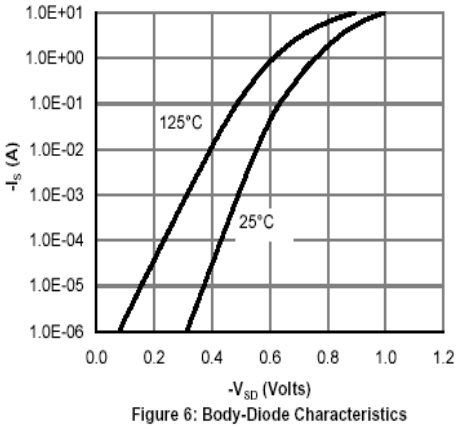

Figure 6: Body-Diode Characteristics

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TYPICAL CHARACTERICTICS (25℃ Unless noted)

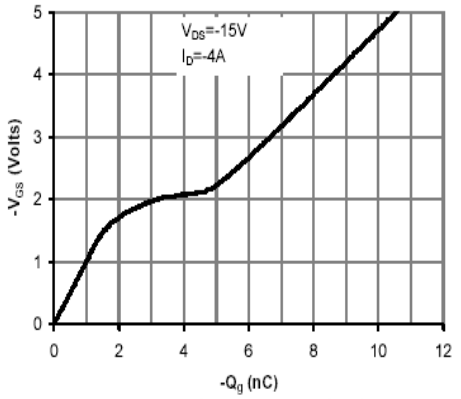

Figure 7: Gate-Charge Characteristics

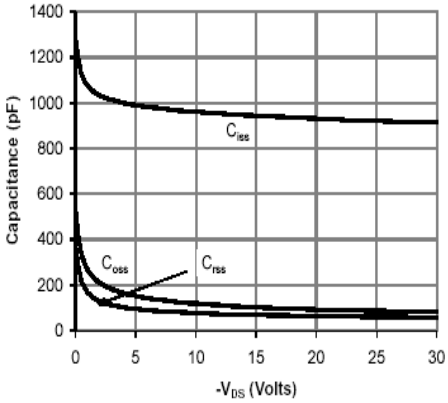

Figure 8: Capacitance Characteristics

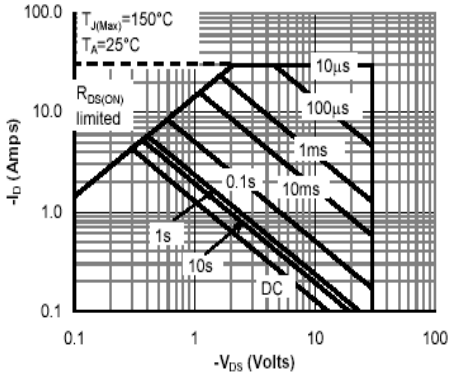

Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

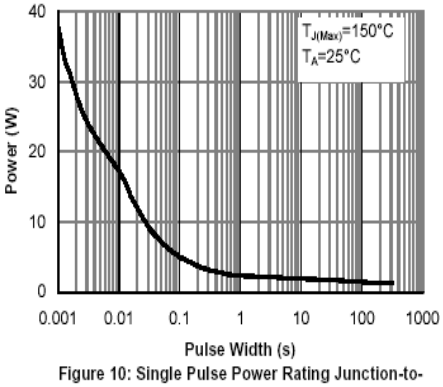

Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

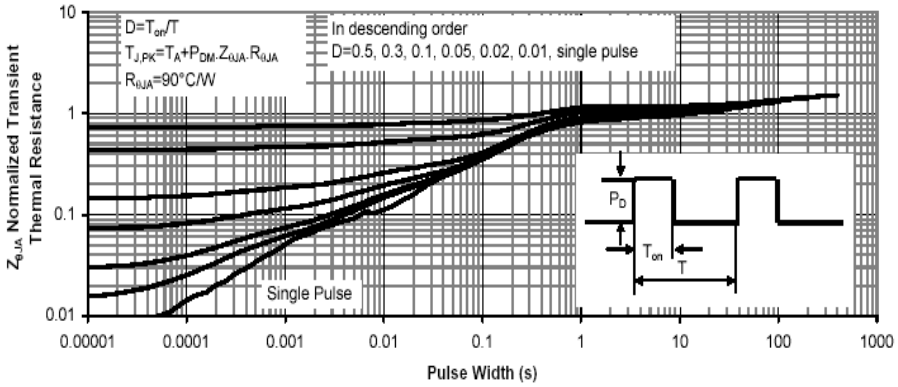

Figure 11: Normalized Maximum Transient Thermal Impedance

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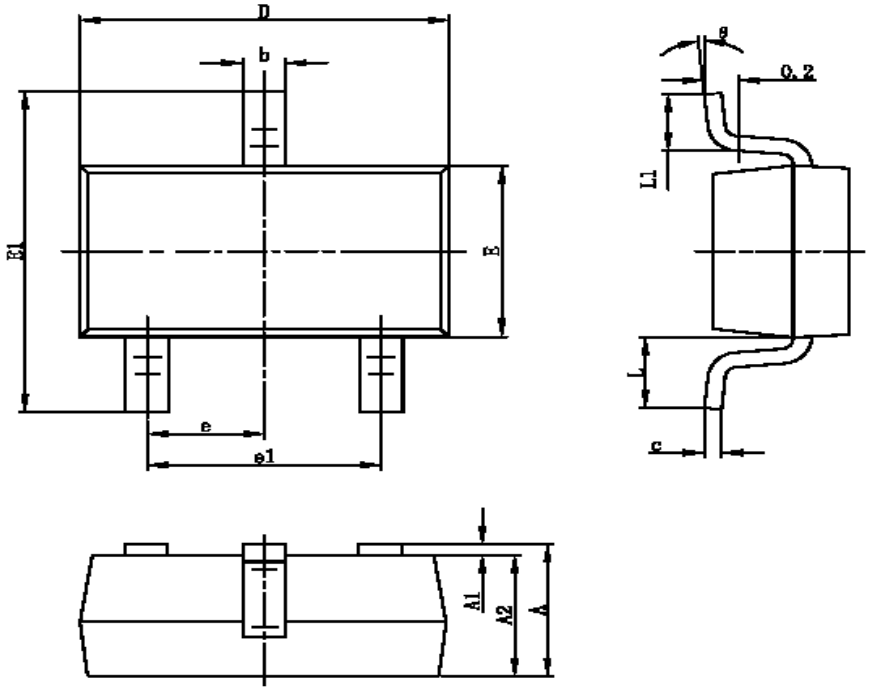
SOT-23-3L PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.700REF		0.028REF	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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