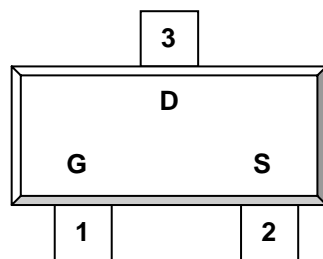



ST3401 

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**

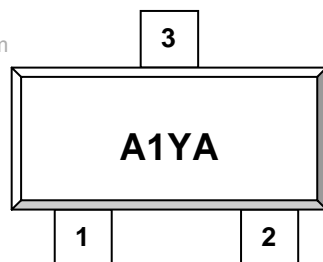
1.Gate 2.Source 3.Drain

FEATURE

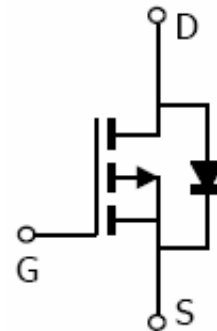
- -30V/-4.0A, $R_{DS(ON)} = 45m\Omega$ (Typ.) @ $V_{GS} = -10V$
- -30V/-3.2A, $R_{DS(ON)} = 50m\Omega$ @ $V_{GS} = -4.5V$
- -30V/-1.2A, $R_{DS(ON)} = 60m\Omega$ @ $V_{GS} = -2.5V$
- Super high density cell design for Extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability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

PART MARKING**SOT-23-3L**

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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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**ST3401**

P Channel Enhancement Mode MOSFET

-4.0A**ABSOLUTE MAXIMUM RATINGS** (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	-30	V
Gate-Source Voltage	V _{GSS}	±12	V
Continuous Drain Current (T _J =150°C)	I _D	T _A =25°C -4.0	A
		T _A =70°C -3.2	
Pulsed Drain Current	I _{DM}	-15	A
Continuous Source Current (Diode Conduction)	I _S	-1.0	A
Power Dissipation	P _D	T _A =25°C 1.25	W
		T _A =70°C 0.8	
Operation Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Ambient	R _{θJA}	120	°C/W

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P Channel Enhancement Mode MOSFET

-4.0A**ELECTRICAL CHARACTERISTICS** (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4		-1.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-1	uA
		$V_{DS}=-24V, V_{GS}=0V$ $T_J=55^\circ C$			-10	
On-State Drain Current	$I_{D(on)}$	$V_{DS}\leq -5V, V_{GS}=-4.5V$	-10			A
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4.0A$		45		mΩ
		$V_{GS}=-4.5V, I_D=-3.2A$		50		
		$V_{GS}=-2.5V, I_D=-1.2A$		60		
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	$V_{DS}=-15V$ $V_{GS}=-15V$ $I_D=-1A$ $R_L=6\Omega$ $R_G=-10\Omega$		10	15	nS
Turn-Off Time	$t_{d(off)}$ t_f			15	25	
				31	50	
				20	30	

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TYPICAL CHARACTERISTICS (25°C Unless noted)

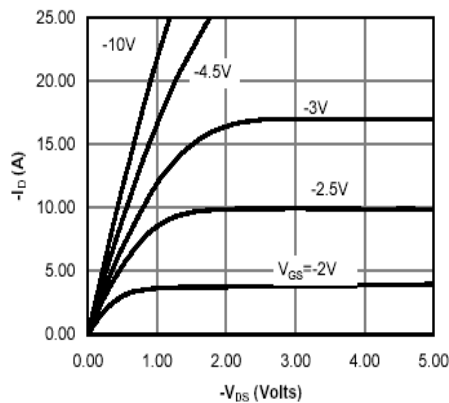


Fig 1: On-Region Characteristics

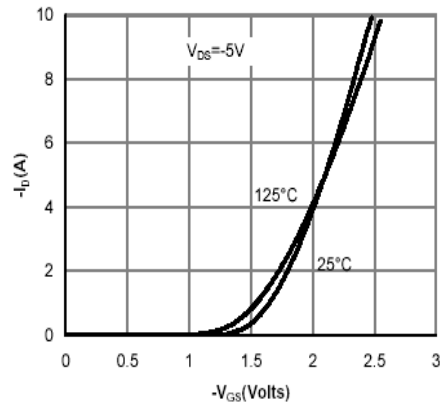


Figure 2: Transfer Characteristics

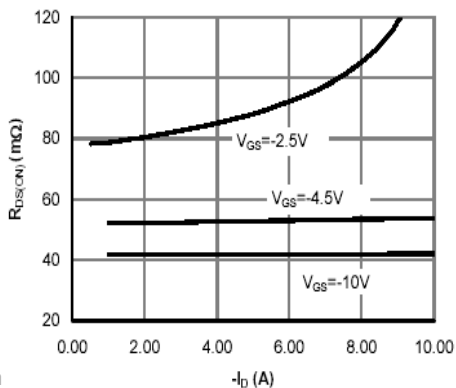


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

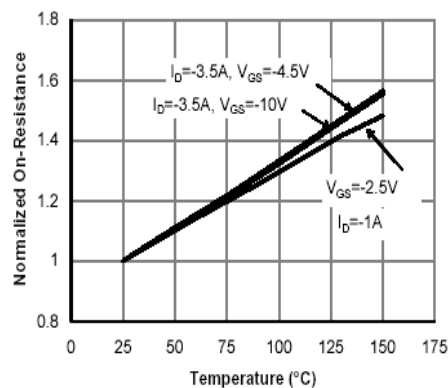


Figure 4: On-Resistance vs. Junction Temperature

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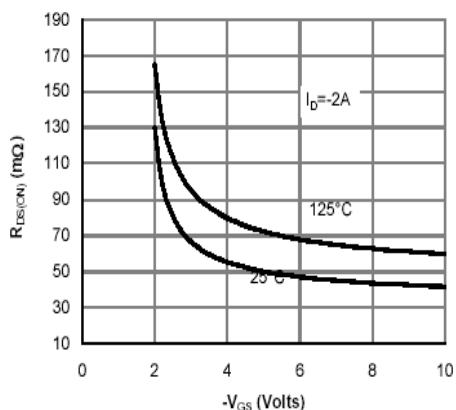


Figure 5: On-Resistance vs. Gate-Source Voltage

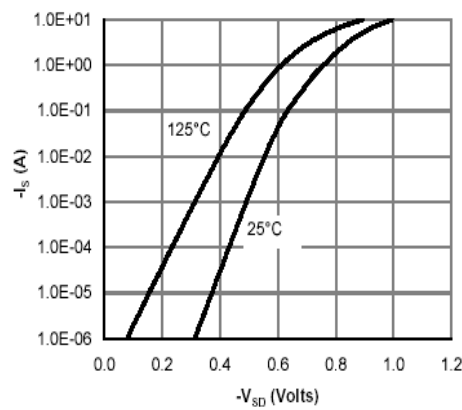


Figure 6: Body-Diode Characteristics

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TYPICAL CHARACTERISTICS (25°C Unless noted)

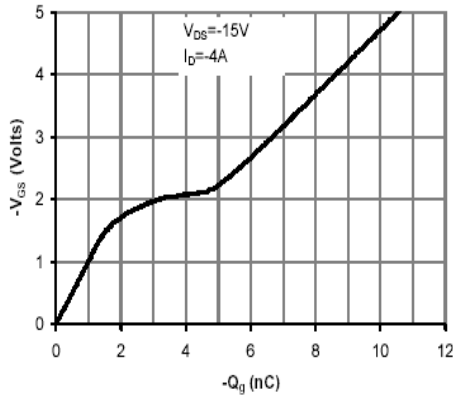


Figure 7: Gate-Charge Characteristics

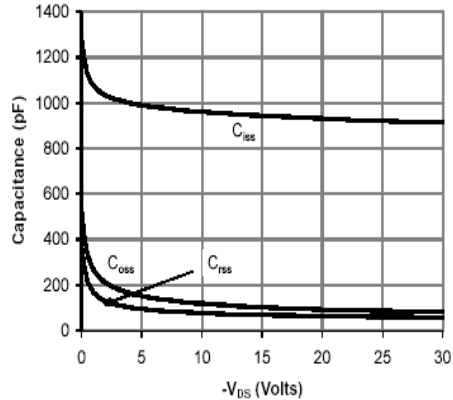


Figure 8: Capacitance Characteristics

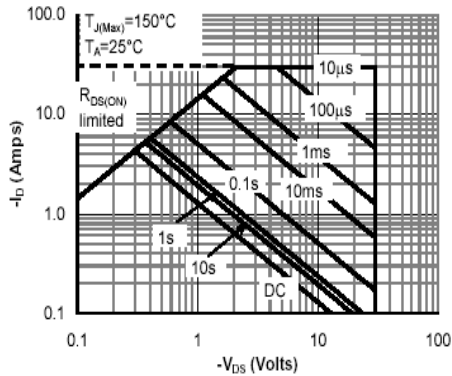


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

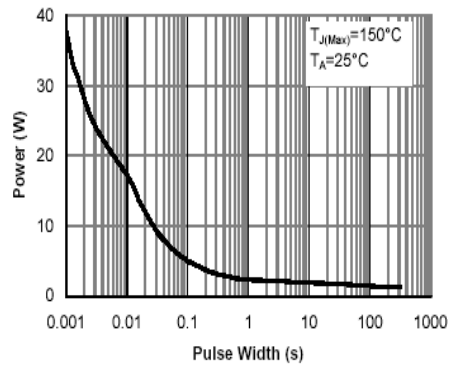


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

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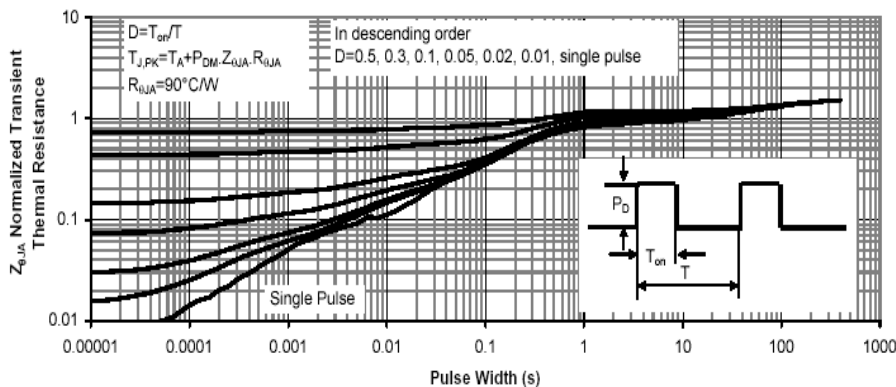

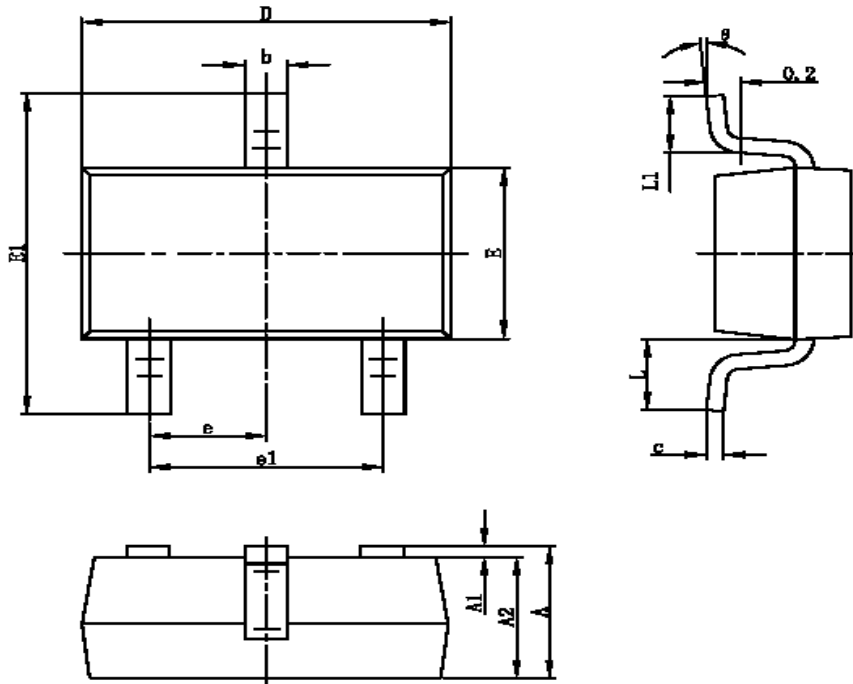


Figure 11: Normalized Maximum Transient Thermal Impedance

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-4.0A**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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