ST7407

P Channel Enhancement Mode MOSFET

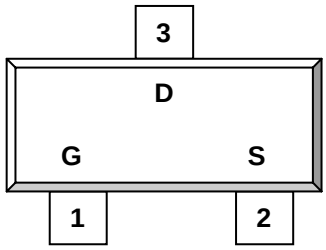
-3.4A

DESCRIPTION

The ST7407 is the P-Channel logic enhancement mode power field effect transistors It 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, notebook computer power management and other battery powered circuits where high-side switching, and low in-line power loss are needed in a very small outline surface mount package.

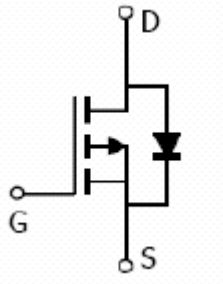
PIN CONFIGURATION
SOT-323 (SC-70)



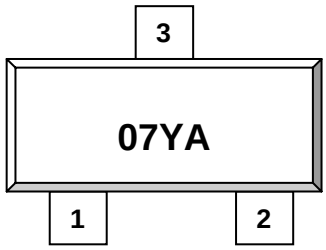
1.Gate 2.Source 3.Drain

FEATURE

- -20V/-3.4A, $R_{DS(ON)}$ = 100m-ohm @VGS = -4.5V
- -20V/-2.4A, $R_{DS(ON)}$ = 125m-ohm @VGS = -2.5V
- -20V/-1.8A, $R_{DS(ON)}$ = 170m-ohm @VGS = -1.8V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-323 (SC-70) package design



PART MARKING
SOT-323 (SC-70)



Y: Year Code A: Process Code

ORDERING INFORMATION

Part Number	Package	Part Marking
ST7407S32RG	SOT-323	07YA

※ Process Code : A ~ Z ; a ~ z

※ ST7407S32RG S32 : SOT-323 ; 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}	-20	V
Gate-Source Voltage		V_{GSS}	±12	V
Continuous Drain CurrentTJ=150℃)	T_A=25℃ T_A=70℃	I_D	-2.3 -1.7	A
Pulsed Drain Current		I_{DM}	-6	A
Continuous Source Current (Diode Conduction)		I_S	-1.4	A
Power Dissipation	T_A=25℃ T_A=70℃	P_D	0.35 0.22	W
Operation Junction Temperature		T_J	150	℃
Storgae 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	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=VGS, I_D=-250uA	-0.35		-0.8	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V			-1	uA
		V_{DS}=-20V, V_{GS}=0V T_J=55℃			-5.0	
On-State Drain Current	$I_{D(on)}$	V_{DS}≦-5V, V_{GS}=-4.5V V_{DS}≦-5V, V_{GS}=-2.5V	-6 -3			A
Drain-source On-Resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-3.4A V_{GS}=-2.5V, I_D=-2.4A V_{GS}=-1.8V, I_D=-1.8A		0.090 0.115 0.150	0.100 0.125 0.170	Ω
Forward Transconductance	g_{fs}	V_{DS}=-5V, I_D=-2.8V		6.0		S
Diode Forward Voltage	V_{SD}	I_S=-1.6A, V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-6V V_{GS}=-4.5V I_D≡-2.8A		4.8	8.0	nC
Gate-Source Charge	Q_{gs}			1.0		
Gate-Drain Charge	Q_{gd}			1.0		
Input Capacitance	C_{iss}	V_{DS}=-6.0V V_{GS}=0V F=1MHz		485		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			40		
Turn-On Time	$t_{d(on)}$ tr	V_{DD}=-6V R_L=6Ω I_D=-1.0A V_{GEN}=-4.5V R_G=6Ω		10	16	nS
				13	23	
Turn-Off Time	$t_{d(off)}$ tf			18	25	
				15	20	

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TYPICAL CHARACTERICTICS (25℃ Unless noted)

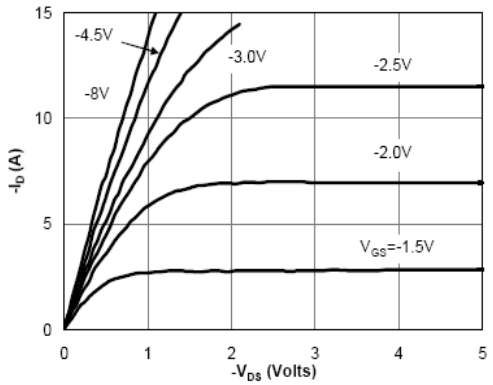

Fig 1: On-Region Characteristics

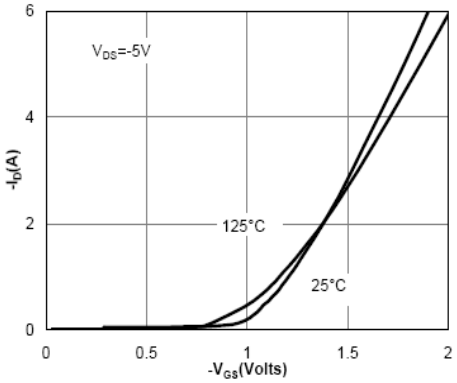

Figure 2: Transfer Characteristics

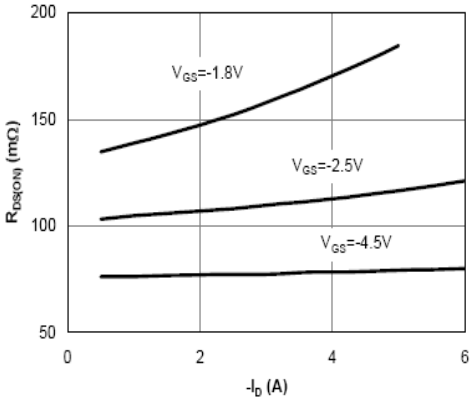

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

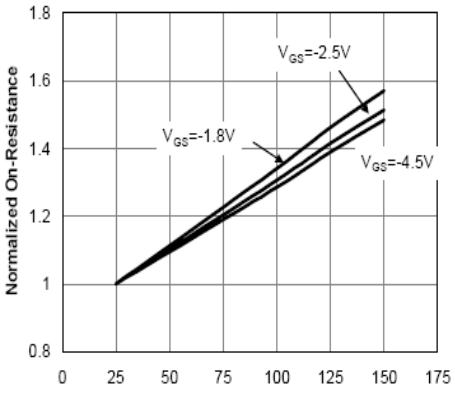

Figure 4: On-Resistance vs. Junction Temperature

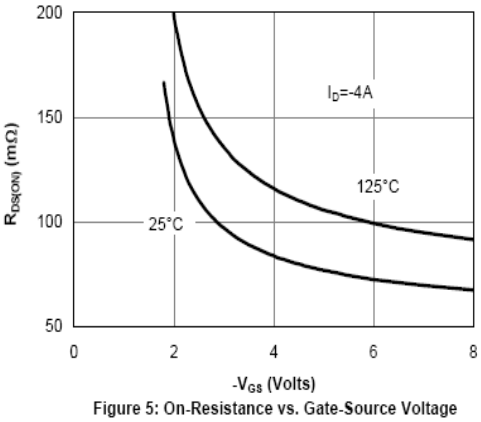

Figure 5: On-Resistance vs. Gate-Source Voltage

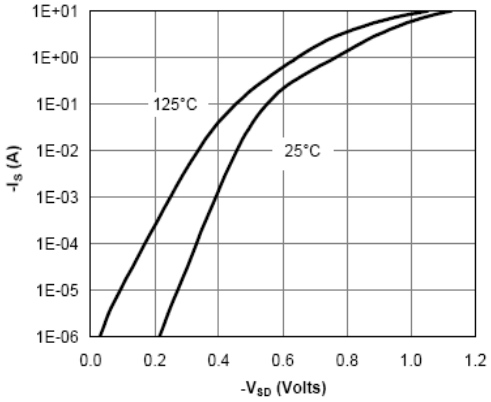

Figure 6: Body-Diode Characteristics

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TYPICAL CHARACTERICTICS (25℃ Unless noted)

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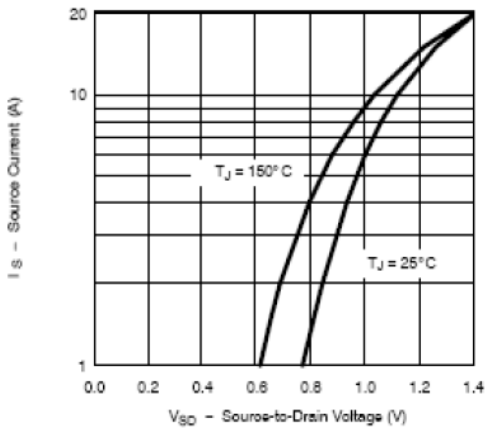
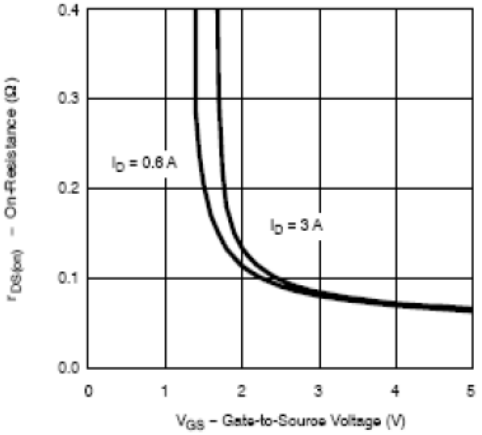
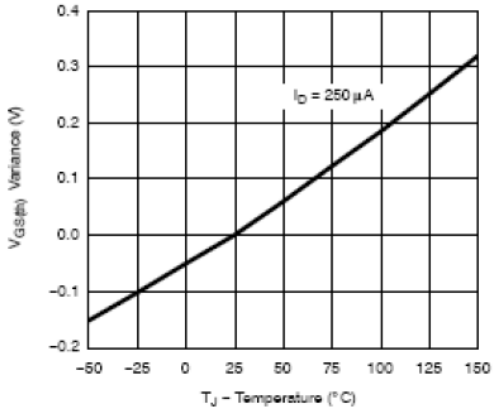
Source-Drain Diode Forward Voltage



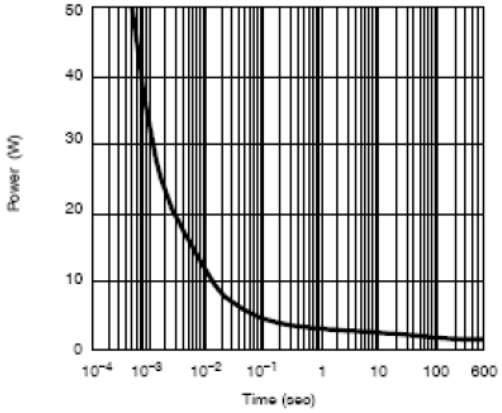
On-Resistance vs. Gate-to-Source Voltage



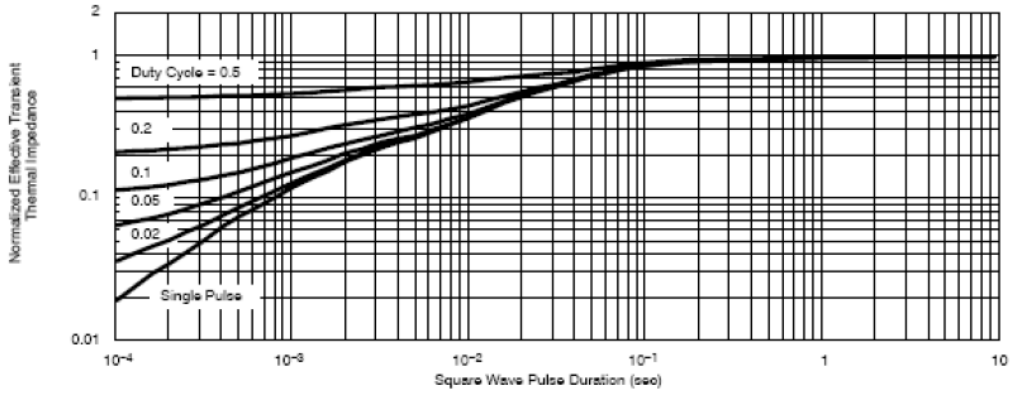
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Foot



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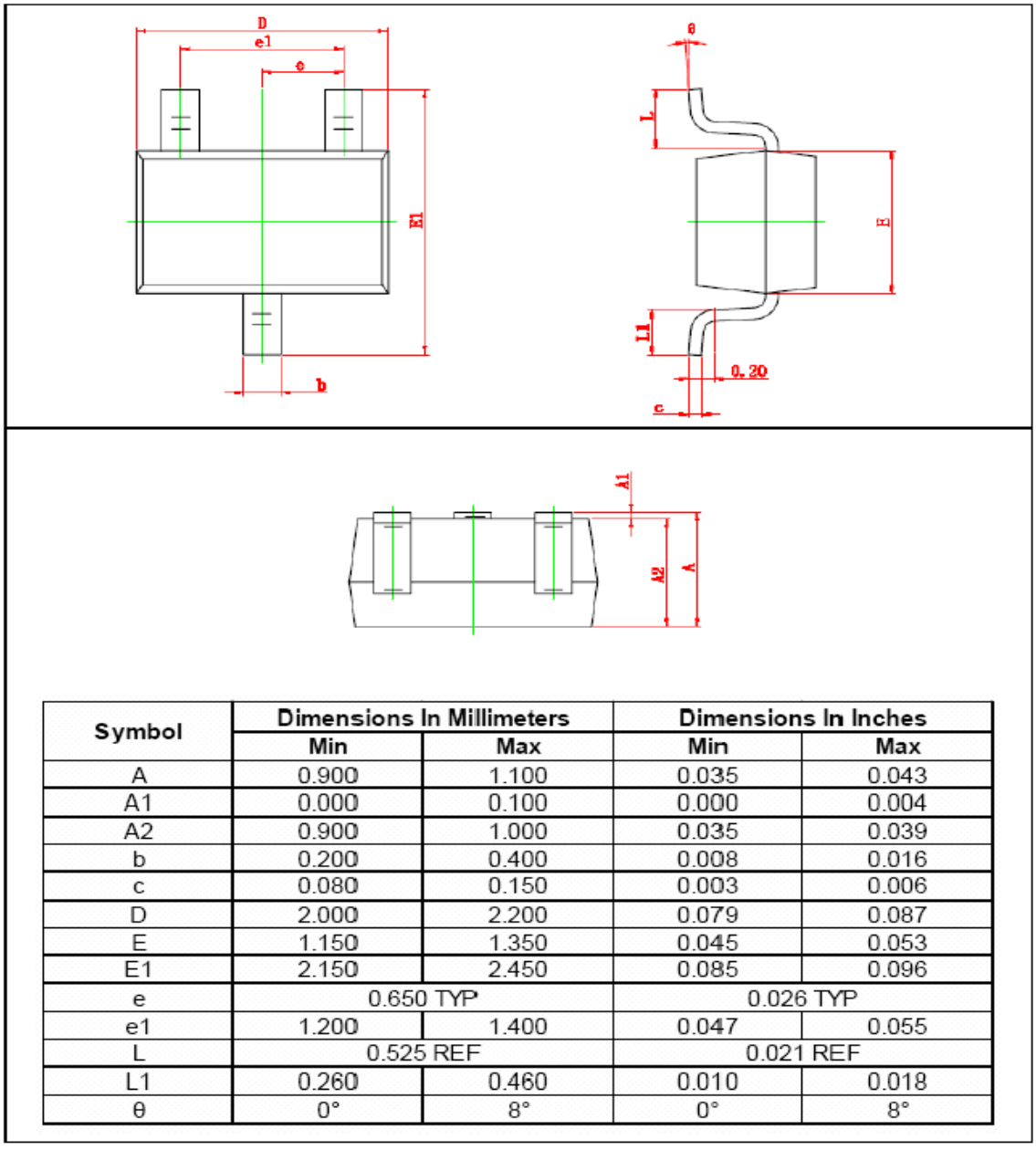
SOT-323 (SC-70) PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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