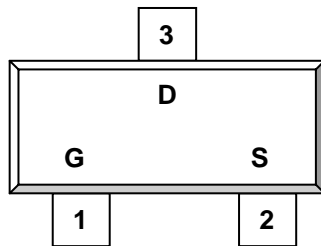
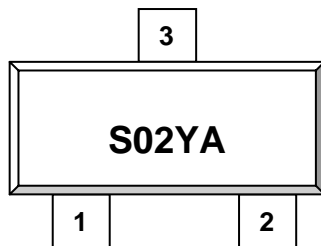


**DESCRIPTION**

ST9402 is the N-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**


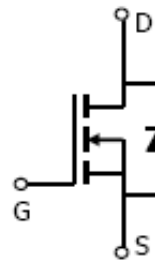
1. Gate 2. Source 3. Drain

**PART MARKING  
SOT-23**


Y: Year Code A: Process Code

**FEATURE**

- 20V/3.6A,  $R_{DS(ON)} = 76m\Omega$   
@VGS = 4.5V
- 20V/3.1A,  $R_{DS(ON)} = 90 m\Omega$   
@VGS = 2.5V
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23 package design



**ORDERING INFORMATION**

Part Number	Package	Part Marking
ST9402SRG	SOT-23	S02YA

※ Process Code : A ~ Z ; a ~ z

※ ST9402SRG S : SOT23 ; R : Tape Reel ; G : Pb - Free



**ST9402**  Lead-free

N Channel Enhancement Mode MOSFET

**3.6A**

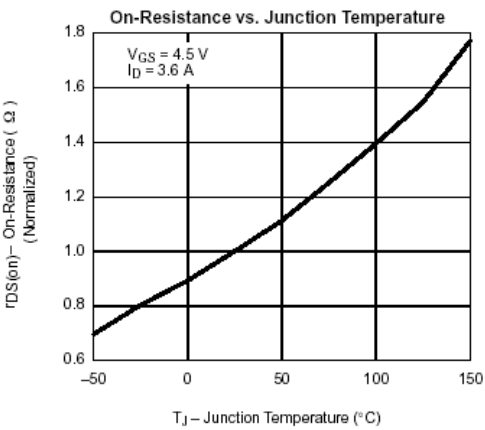
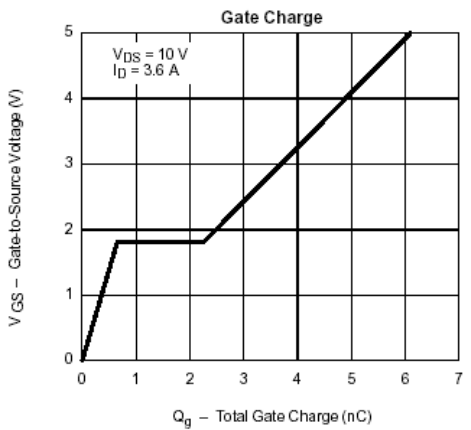
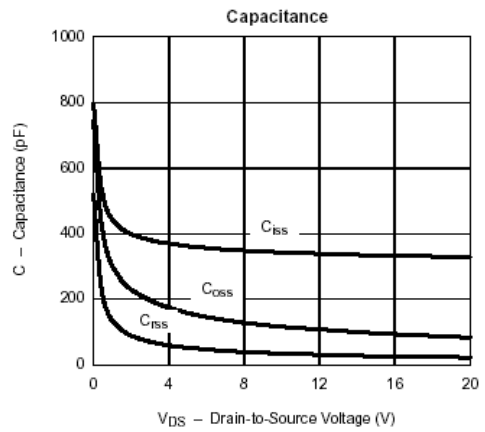
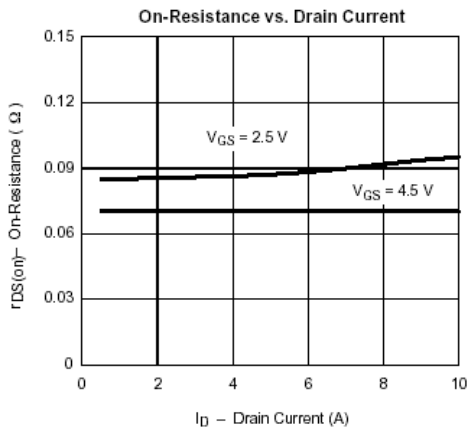
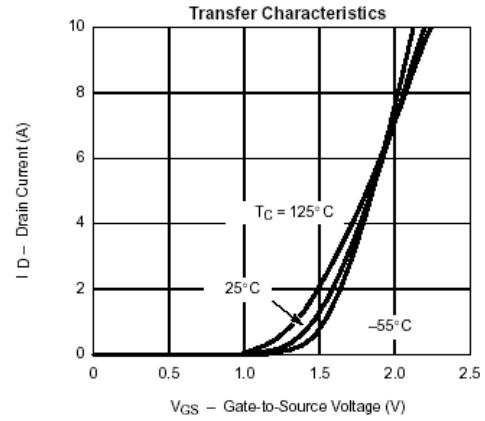
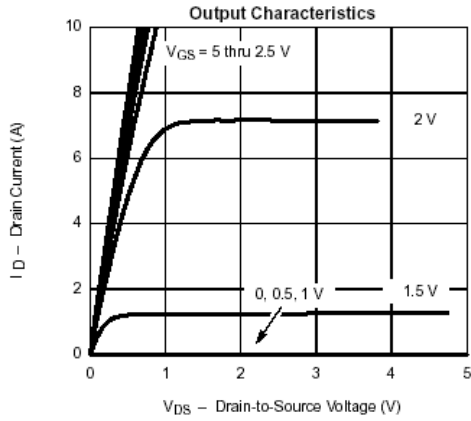
**ABSOLUTE MAXIMUM RATINGS** (Ta = 25°C Unless otherwise noted )

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V <sub>DSS</sub>	20	V
Gate-Source Voltage	V <sub>GSS</sub>	±12	V
Continuous Drain Current (T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>A</sub> =25°C 3.2	A
		T <sub>A</sub> =70°C 2.6	
Pulsed Drain Current	I <sub>DM</sub>	10	A
Continuous Source Current (Diode Conduction)	I <sub>S</sub>	1.6	A
Power Dissipation	P <sub>D</sub>	T <sub>A</sub> =25°C 1.25	W
		T <sub>A</sub> =70°C 0.8	
Operation Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	100	°C/W

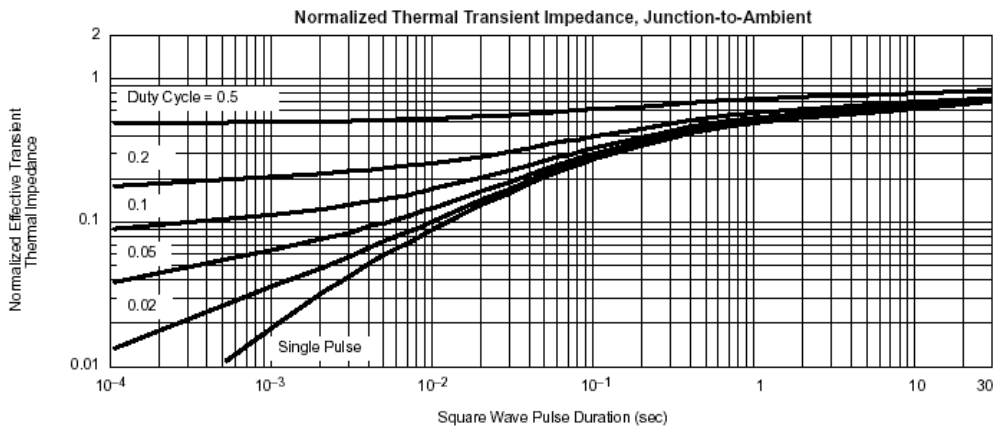
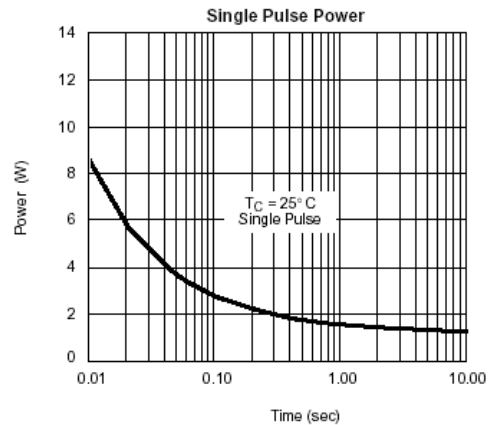
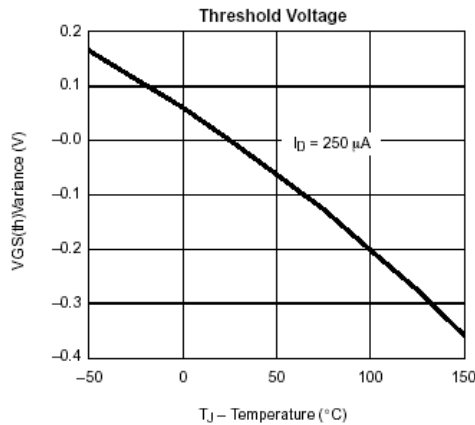
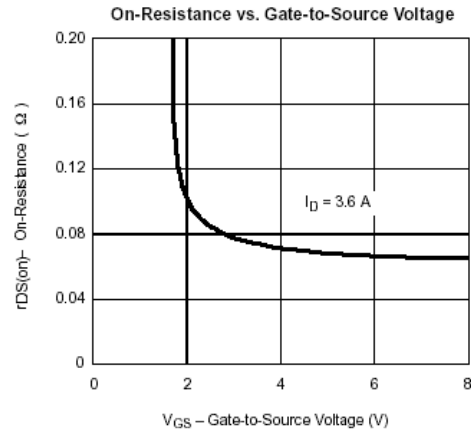
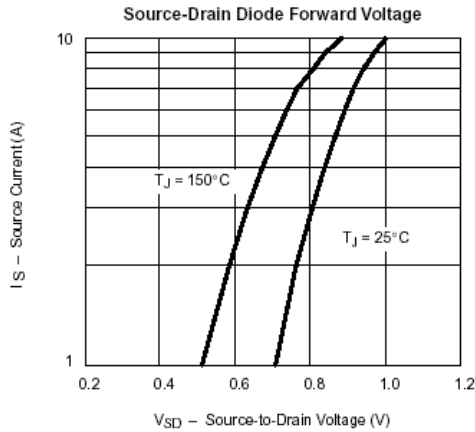
**ELECTRICAL CHARACTERISTICS ( Ta = 25°C Unless otherwise noted )**

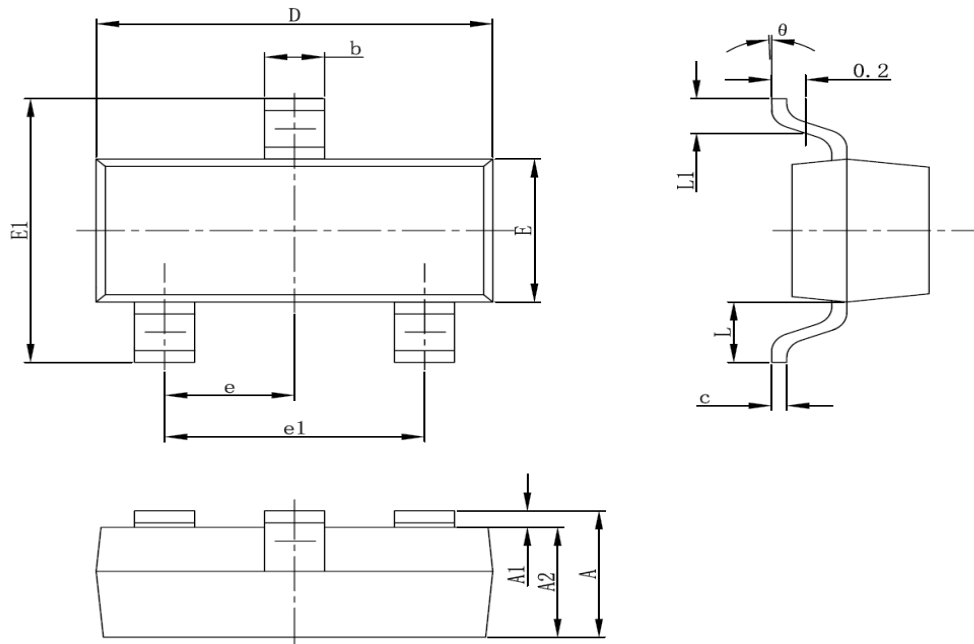
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4		1.2	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$			1	uA
		$V_{DS}=20V, V_{GS}=0V$ $T_J=55^\circ C$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$ $V_{DS} \geq 5V, V_{GS}=2.5V$	6 4			A
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=3.6A$ $V_{GS}=2.5V, I_D=3.1A$		0.075 0.080	0.085 0.090	$\Omega$
Forward Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=3.6V$		10		S
Diode Forward Voltage	$V_{SD}$	$I_S=1.6A, V_{GS}=0V$		0.85	1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=10V$ $V_{GS}=4.5V$ $I_D=3.6A$		5.4	10	nC
Gate-Source Charge	$Q_{gs}$			0.65		
Gate-Drain Charge	$Q_{gd}$			1.4		
Input Capacitance	$C_{iss}$	$V_{DS}=10V$ $V_{GS}=0V$ $F=1MHz$		340		pF
Output Capacitance	$C_{oss}$			115		
Reverse Transfer Capacitance	$C_{rss}$			33		
Turn-On Time	$t_{d(on)}$ $t_r$	$V_{DD}=10V$ $R_L=5.5\Omega$ $I_D=3.6A$ $V_{GEN}=4.5V$ $R_G=6\Omega$		12	25	nS
Turn-Off Time	$t_{d(off)}$ $t_f$			36	60	
				34	60	
				10	25	

**TYPICAL CHARACTERISTICS (25°C Unless noted)**



**TYPICAL CHARACTERISTICS (25°C Unless noted)**



**SOT-23 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	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	8°