



# SPN8902

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN8902 is the N-Channel logic enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. The SPN8910 has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low  $R_{DS(ON)}$  and fast switching speed.

### FEATURES

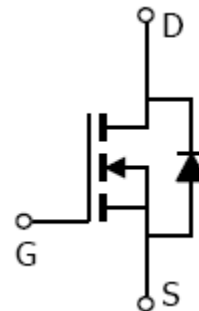
- ◆ 100V/2A,  $R_{DS(ON)} = 330m\Omega @ V_{GS} = 10V$
- ◆ High density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOT-223 package design

### APPLICATIONS

- High Frequency Small Power Switching for MB/NB/VGA
- Network DC/DC Power System
- Load Switch

### PIN CONFIGURATION

#### SOT-223



### PART MARKING





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### PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	D	Drain
3	S	Source

### ORDERING INFORMATION

Part Number	Package	Part Marking
SPN8902S22RGB	SOT-223	8902

※ SPN8902S22RGB : Tape Reel ; Pb – Free ; Halogen – Free

※ Date code : YY (year 00~99) , WW(week 01~53)

### ABSOLUTE MAXIMUM RATINGS

( $T_A=25^{\circ}\text{C}$  Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	$V_{DSS}$	100	V
Gate –Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$I_D$	$T_A=25^{\circ}\text{C}$ 2.2	A
		$T_A=70^{\circ}\text{C}$ 1.7	
Pulsed Drain Current	$I_{DM}$	5.5	A
Power Dissipation	$P_D$	2.8	W
Operating Junction Temperature	$T_J$	150	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55/150	$^{\circ}\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	90	$^{\circ}\text{C}/\text{W}$



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### ELECTRICAL CHARACTERISTICS

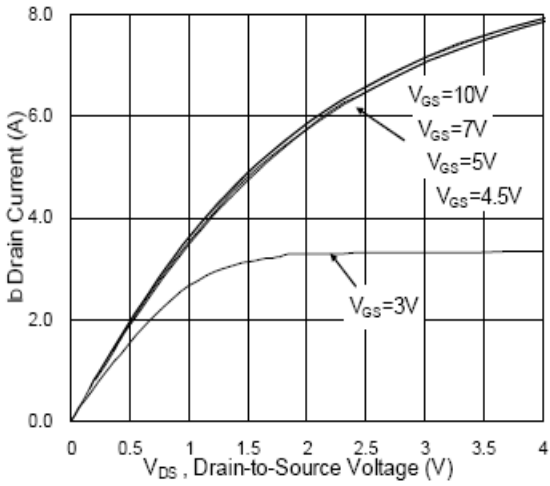
( $T_A=25^{\circ}\text{C}$  Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	2.5	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=125^{\circ}\text{C}$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geq 5V, V_{GS}=10V$	2.2			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=2A$		0.31	0.33	$\Omega$
		$V_{GS}=4.5V, I_D=1A$		0.33	0.35	$\Omega$
Forward Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=2A$		2.4		S
Diode Forward Voltage	$V_{SD}$	$I_S=1A, V_{GS}=0V$			1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=10V$ $I_D=2A$		9	13	nC
Gate-Source Charge	$Q_{gs}$			2		
Gate-Drain Charge	$Q_{gd}$			1.4		
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V$ $f=1\text{MHz}$		508		pF
Output Capacitance	$C_{oss}$			29		
Reverse Transfer Capacitance	$C_{rss}$			16.5		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, I_D=2A,$ $V_{GEN}=10V, R_G=3.3\Omega$		2		nS
	$t_r$			21.5		
Turn-Off Time	$t_{d(off)}$			11.2		
	$t_f$			18.8		

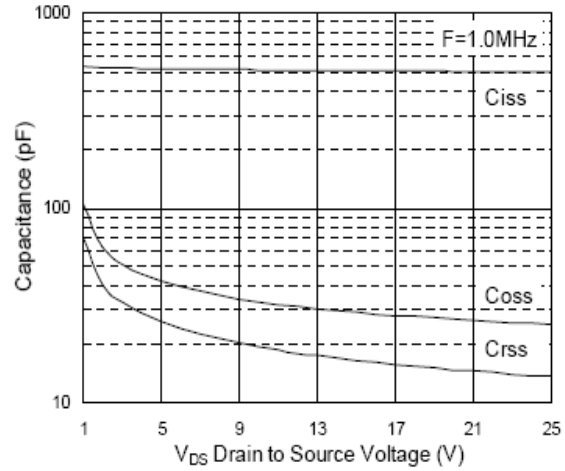


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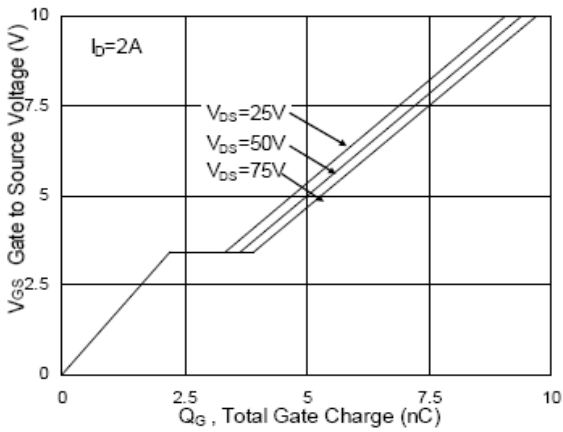
## TYPICAL CHARACTERISTICS



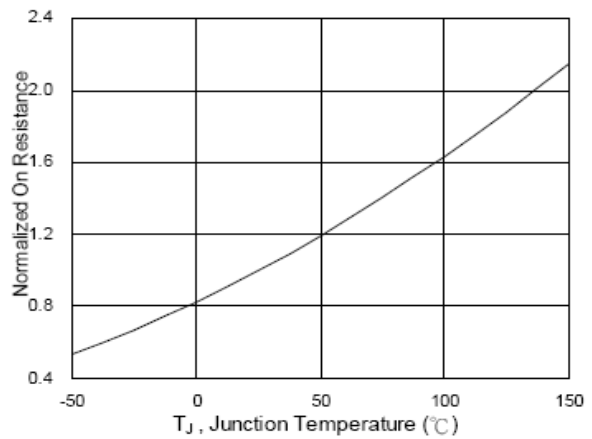
Output Characteristics



Capacitance



Gate Charge



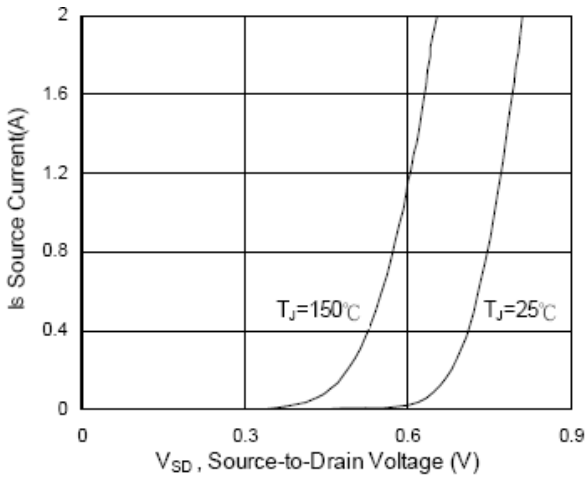
On-Resistance vs. Junction Temperature



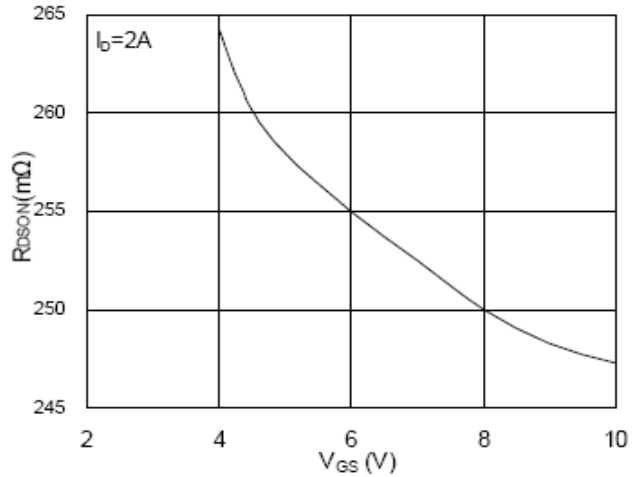
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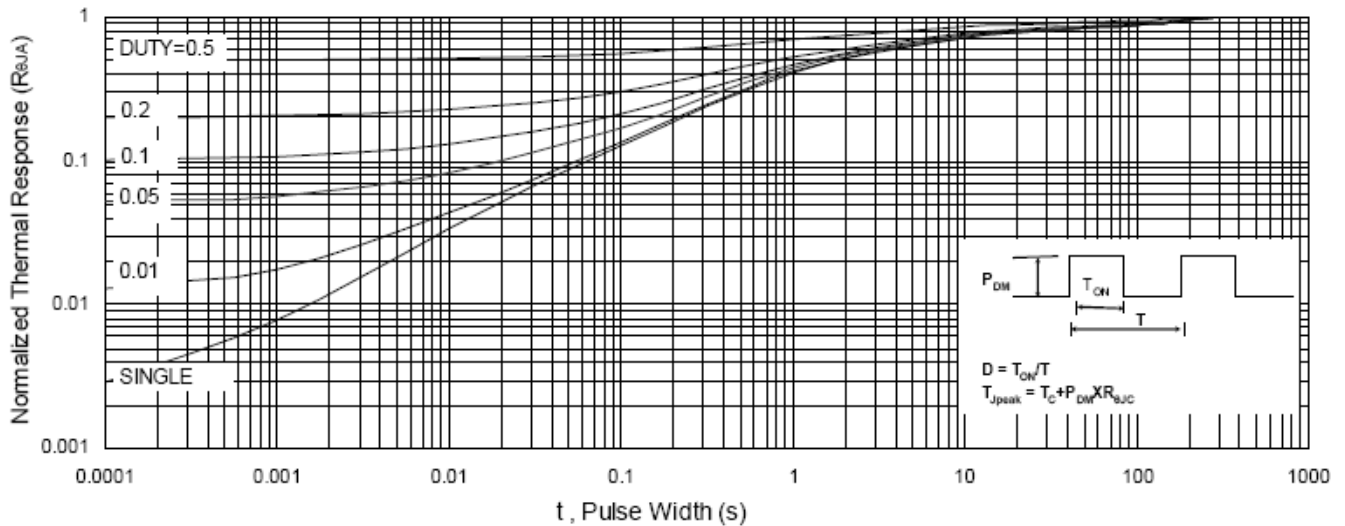
### TYPICAL CHARACTERISTICS



Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-Source Voltage



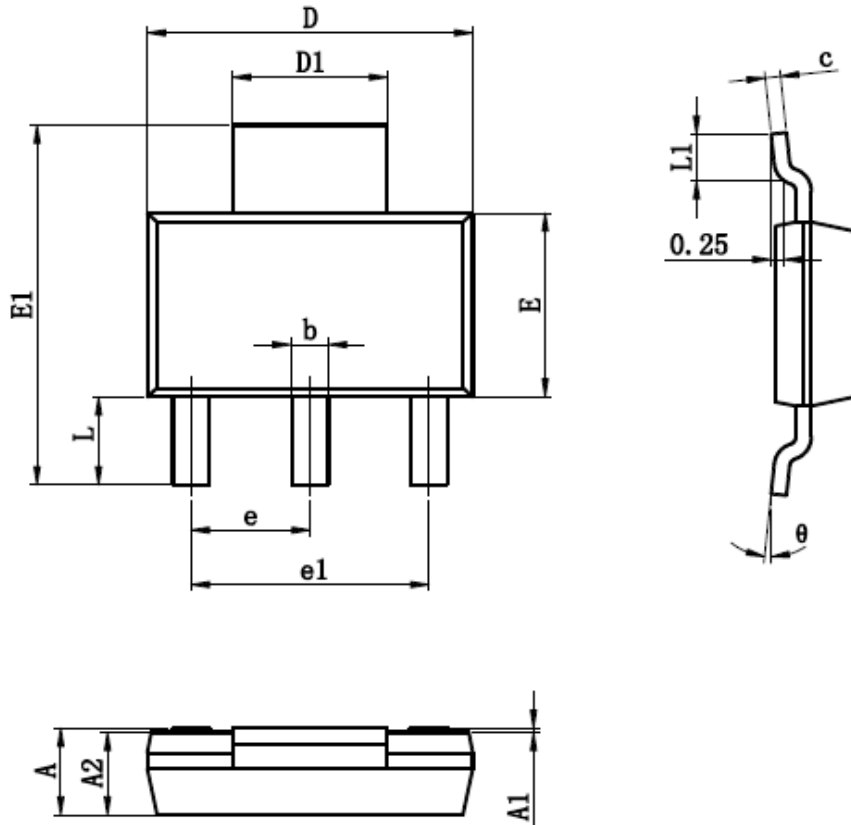
Normalized Thermal Transient Impedance, Junction to Foot



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### SOT-223 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.610	0.810	0.024	0.032
c	0.250	0.350	0.010	0.014
D	6.300	6.700	0.248	0.264
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.700	7.300	0.264	0.287
e	2.300TYP		0.091TYP	
e1	4.500	4.700	0.177	0.185
L	1.750TYP		0.069TYP	
L1	0.900		0.035	
θ	0°	10°	0°	10°



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