



# SPN3402

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN3402 is the N-Channel logic enhancement mode power field effect transistors are 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 and other battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

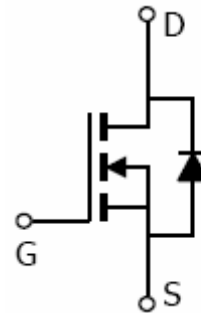
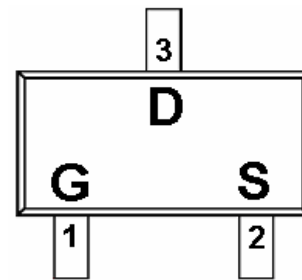
### FEATURES

- ◆ 30V/2.8A,  $R_{DS(ON)} = 58m\Omega @ V_{GS} = 10V$
- ◆ 30V/2.3A,  $R_{DS(ON)} = 65m\Omega @ V_{GS} = 4.5V$
- ◆ 30V/1.5A,  $R_{DS(ON)} = 105m\Omega @ V_{GS} = 2.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOT-23-3L package design

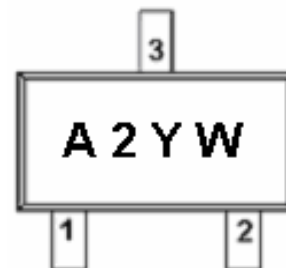
### APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

### PIN CONFIGURATION ( SOT-23-3L )



### PART MARKING



Y : Year Code  
W : Week Code



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### PIN DESCRIPTION

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

### ORDERING INFORMATION

Part Number	Package	Part Marking
SPN3402S23RG	SOT-23-3L	A2YW

※ Week Code : A ~ Z ( 1 ~ 26 ) ; a ~ z ( 27 ~ 52 )

※ SPN3402S23RG : Tape Reel ; Pb – Free

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate –Source Voltage	V <sub>GSS</sub>	±12	V
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	TA=25°C	4.0
		TA=70°C	2.8
Pulsed Drain Current	I <sub>DM</sub>	10	A
Continuous Source Current(Diode Conduction)	I <sub>S</sub>	1.25	A
Power Dissipation	P <sub>D</sub>	TA=25°C	1.25
		TA=70°C	0.8
Operating 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



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### ELECTRICAL CHARACTERISTICS

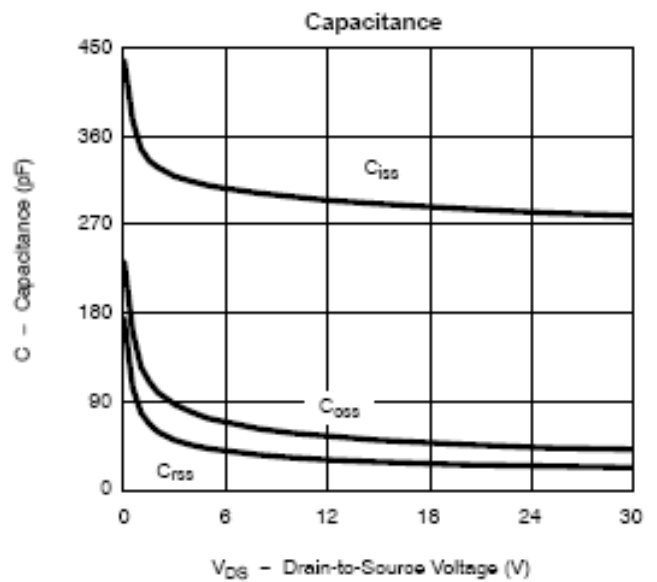
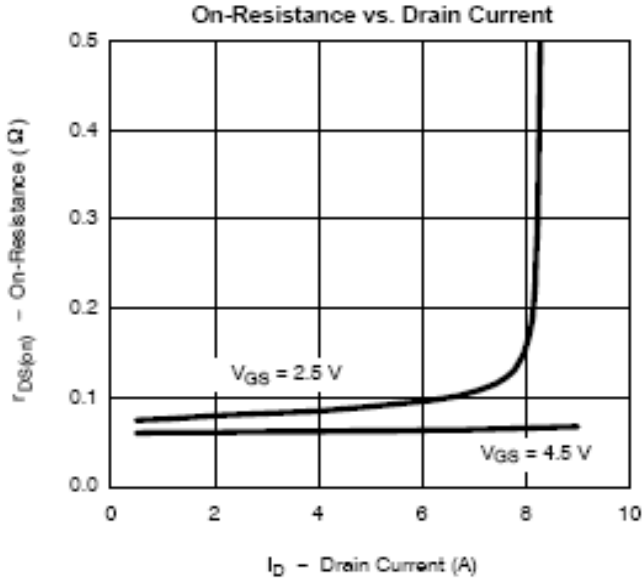
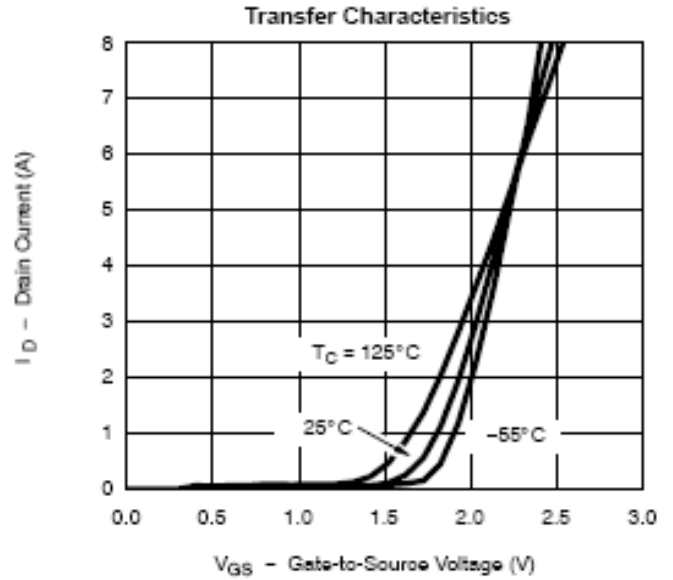
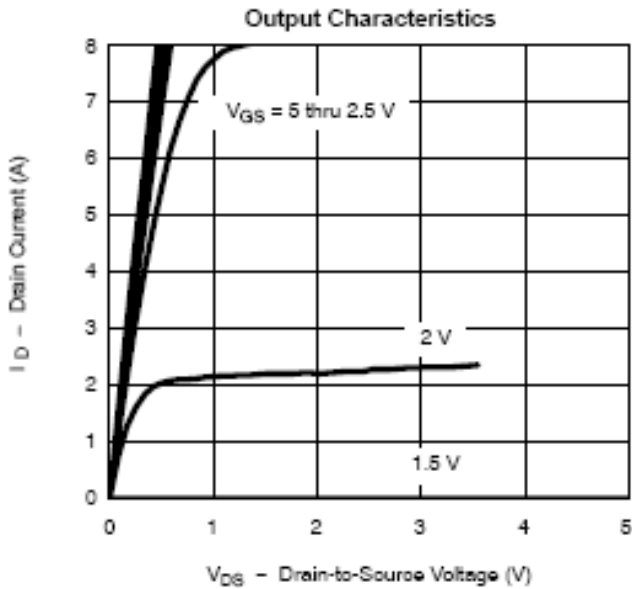
(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit	
<b>Static</b>							
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30			V	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.8		1.6		
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V			±100	nA	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V, V <sub>GS</sub> =0.0V			1	uA	
		V <sub>DS</sub> =24V, V <sub>GS</sub> =0.0V T <sub>J</sub> =55°C			10		
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 4.5V, V <sub>GS</sub> =10V	6			A	
		V <sub>DS</sub> ≥ 4.5V, V <sub>GS</sub> =4.5V	4				
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> =2.8A		0.048	0.058	Ω	
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> =2.3A		0.053	0.065		
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> =1.5A		0.080	0.105		
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =4.5V, I <sub>D</sub> =2.8A		4.6		S	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1.25A, V <sub>GS</sub> =0V		0.82	1.2	V	
<b>Dynamic</b>							
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15, V <sub>GS</sub> =4.5V I <sub>D</sub> =2.0A		4.2	6	nC	
Gate-Source Charge	Q <sub>gs</sub>			0.6			
Gate-Drain Charge	Q <sub>gd</sub>			1.5			
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15, V <sub>GS</sub> =0V f=1MHz		350		pF	
Output Capacitance	C <sub>oss</sub>			55			
Reverse Transfer Capacitance	C <sub>rss</sub>			41			
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15, R <sub>L</sub> =10Ω V <sub>GEN</sub> =10V, R <sub>G</sub> =3Ω		2.5		ns	
	t <sub>r</sub>			2.5			
Turn-Off Time	t <sub>d(off)</sub>				20		
	t <sub>f</sub>				4		



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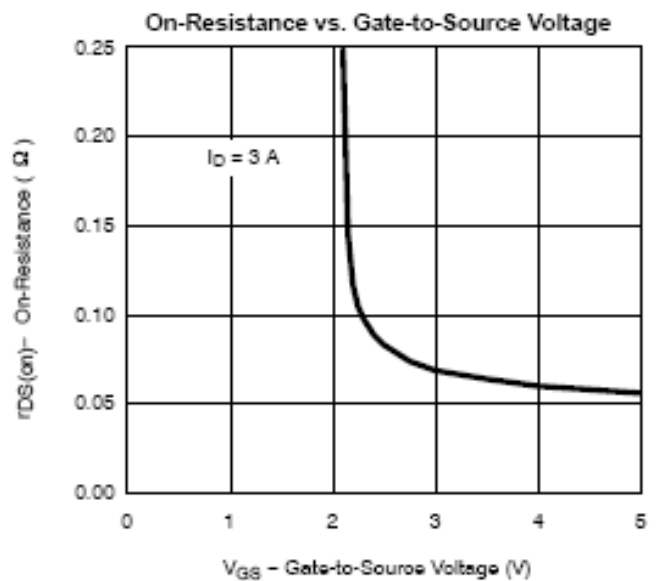
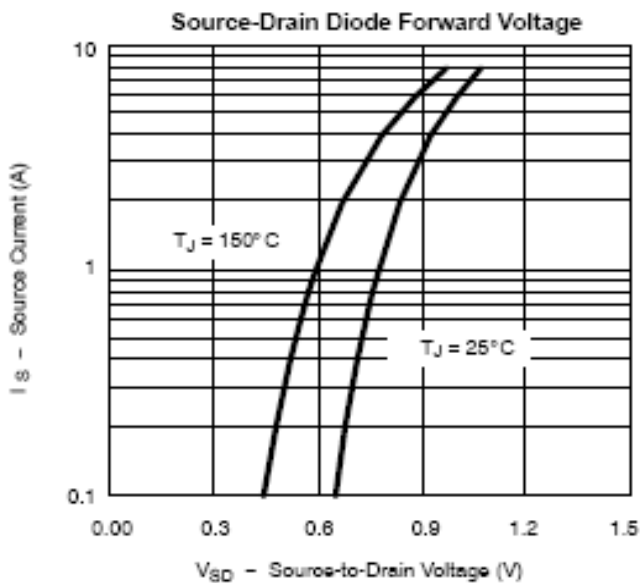
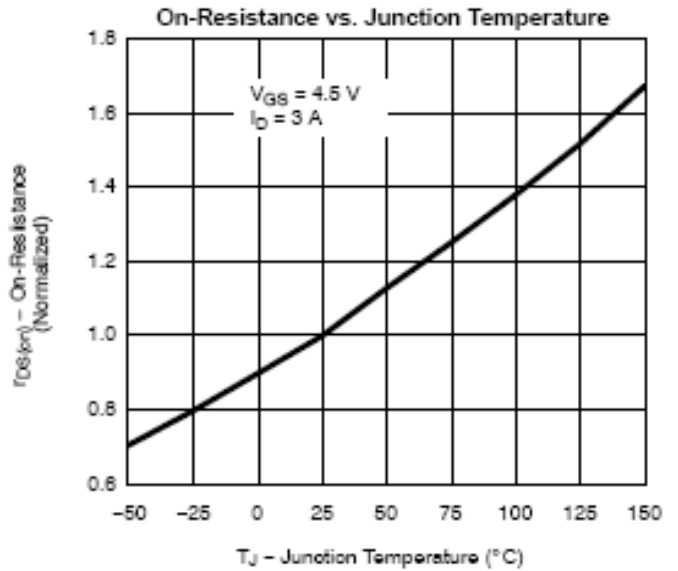
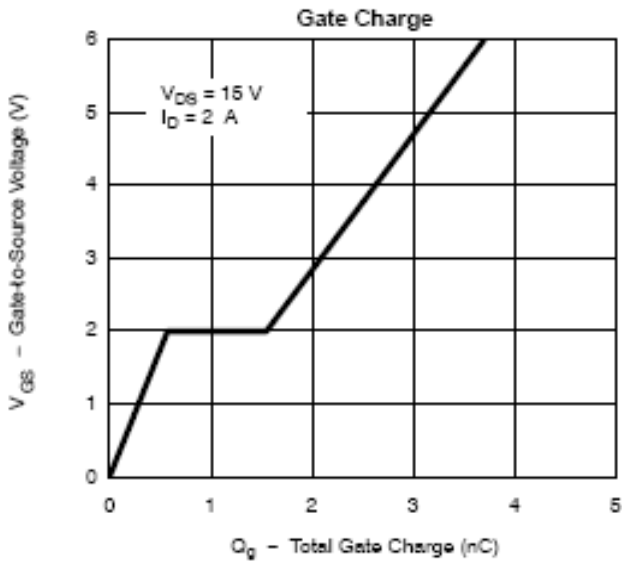
## TYPICAL CHARACTERISTICS





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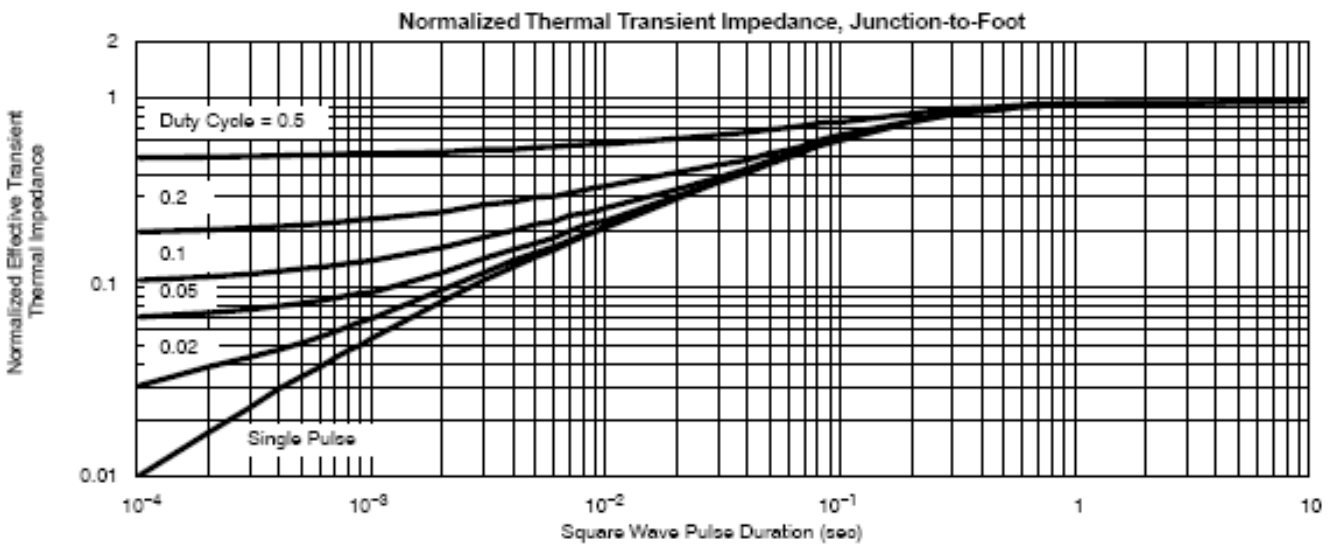
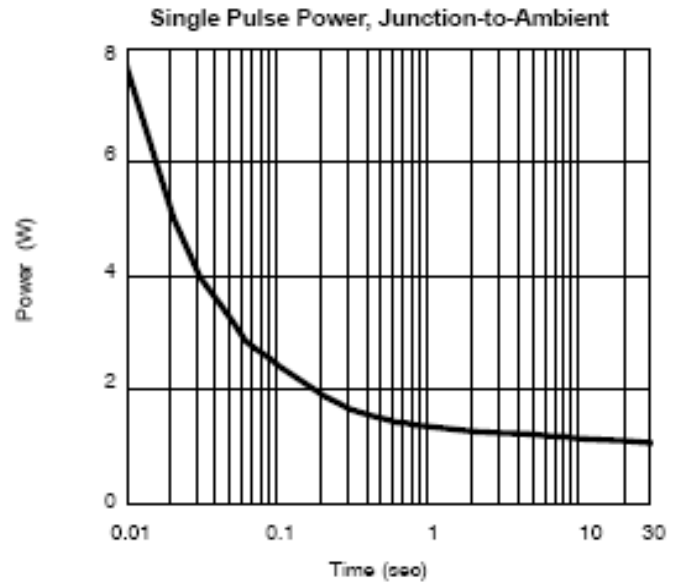
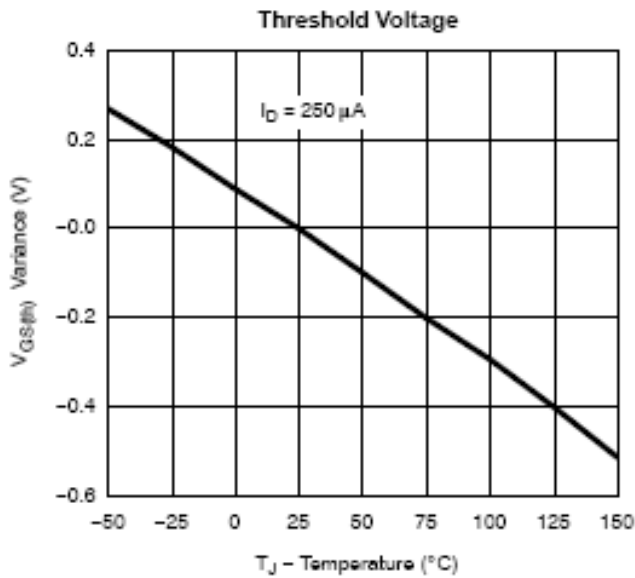
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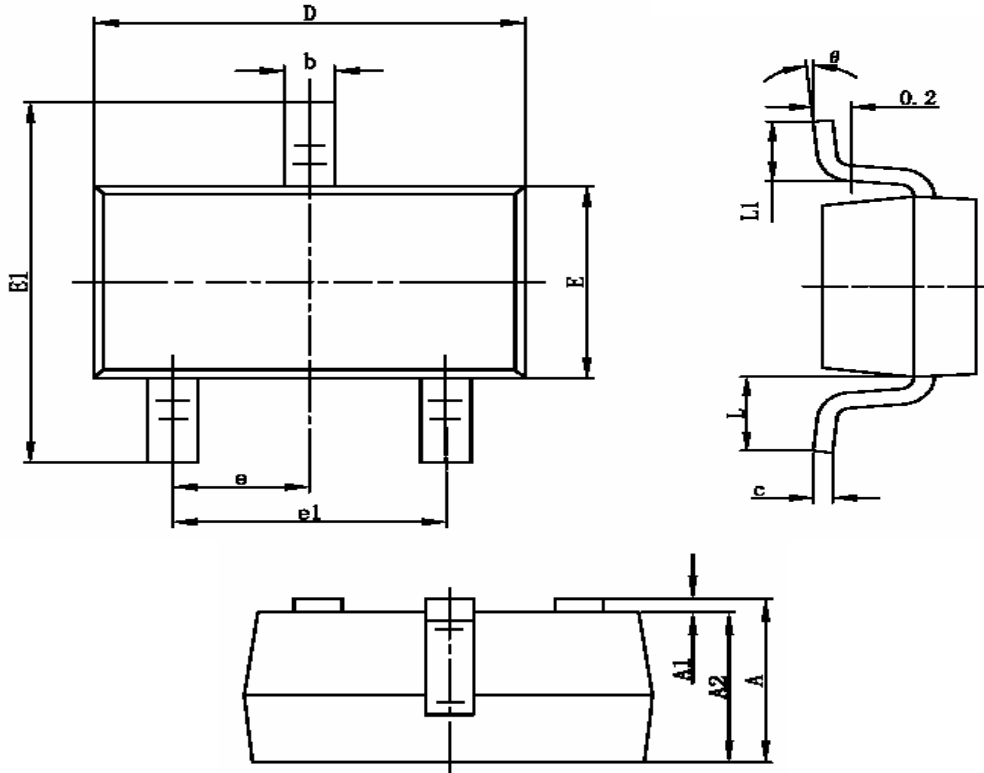




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### SOT-23-3L PACKAGE OUTLINE



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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