



SPN7402

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN7402 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 where high-side switching , and low in-line power loss are needed in a very small outline surface mount package.

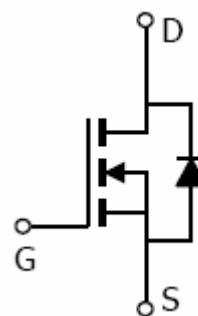
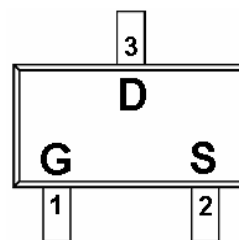
FEATURES

- ◆ 20V/4.0A, $R_{DS(ON)}=65m\Omega@V_{GS}=4.5V$
- ◆ 20V/3.4A, $R_{DS(ON)}=80m\Omega@V_{GS}=2.5V$
- ◆ 20V/2.8A, $R_{DS(ON)}=95m\Omega@V_{GS}=1.8V$
- ◆ 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

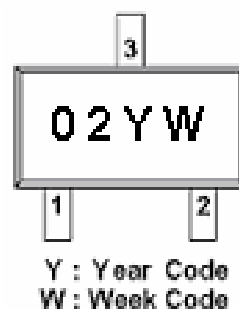
APPLICATIONS

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

PIN CONFIGURATION (SOT-323 ; SC-70)



PART MARKING





SPN7402

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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
SPN7402S32RG	SOT-323	02YW

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

SPN7402S32RG : Tape Reel ; Pb – Free

ABSOLUTE 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 Current(T _J =150)	T _A =25	I _D	2.4	A
	T _A =70		1.7	
Pulsed Drain Current		I _{DM}	6	A
Continuous Source Current(Diode Conduction)		I _S	1.6	A
Power Dissipation	T _A =25	P _D	0.33	W
	T _A =70		0.21	
Operating Junction Temperature		T _J	-55/150	
Storage Temperature Range		T _{STG}	-55/150	
Thermal Resistance-Junction to Ambient		R _{θJA}	105	/W



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ELECTRICAL CHARACTERISTICS

(T_A=25 Unless otherwise noted)

Parameter	Symbol	Conditions	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} =V _{GS} , I _D =250uA	0.4		1.0	
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	
On-State Drain Current	I _{D(on)}	V _{DS} 5V, V _{GS} =4.5V	6			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =4.0A		0.050	0.065	Ω
		V _{GS} =2.5V, I _D =3.4A		0.065	0.080	
		V _{GS} =1.8V, I _D =2.8A		0.080	0.095	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =-3.6A		10		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	nC
Gate-Source Charge	Q _{gs}			1.0		
Gate-Drain Charge	Q _{gd}			1.0		
Input Capacitance	C _{iss}	V _{DS} =6V, V _{GS} =0V f=1MHz		485		pF
Output Capacitance	C _{oss}			85		
Reverse Transfer Capacitance	C _{rss}			40		
Turn-On Time	t _{d(on)}	V _{DD} =6V, R _L =6Ω I _D =1.0A, V _{GEN} =4.5V R _G =6Ω		8	14	ns
	t _r			12	18	
Turn-Off Time	t _{d(off)}			30	35	
	t _f			12	16	



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TYPICAL CHARACTERISTICS

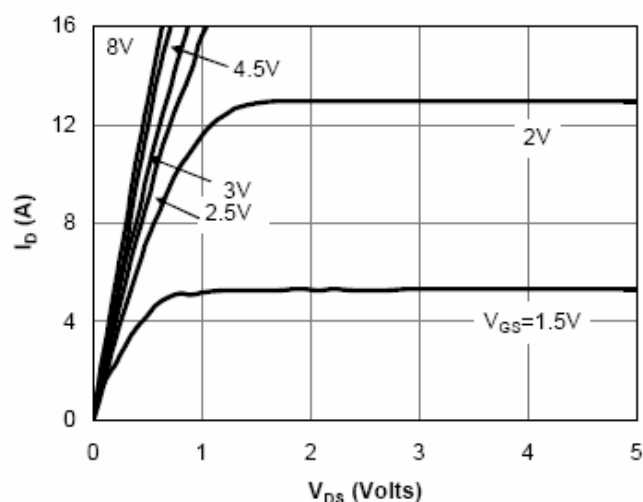


Fig 1: On-Region Characteristics

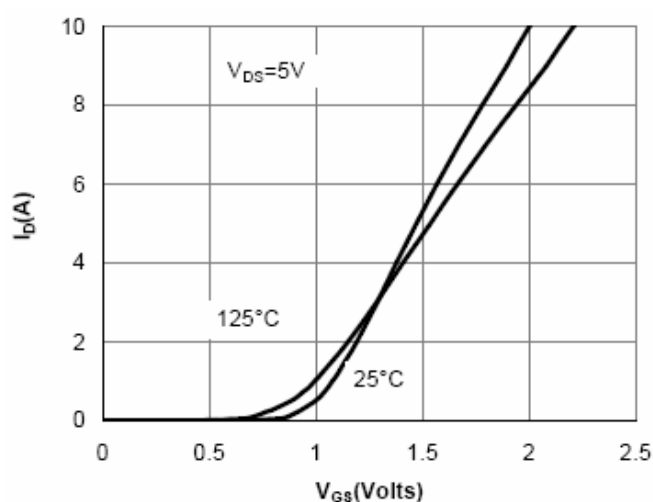


Figure 2: Transfer Characteristics

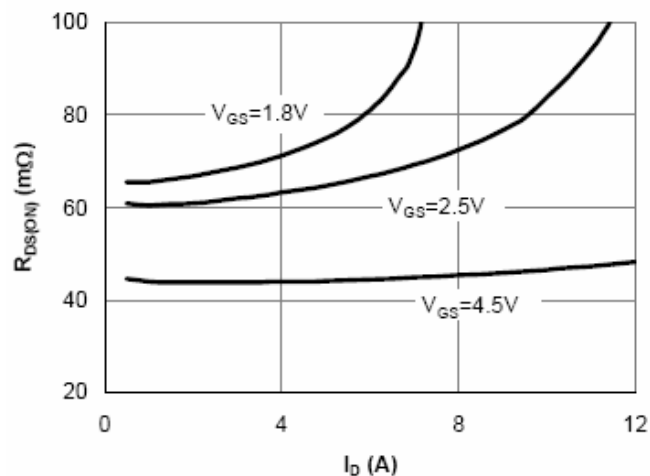


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

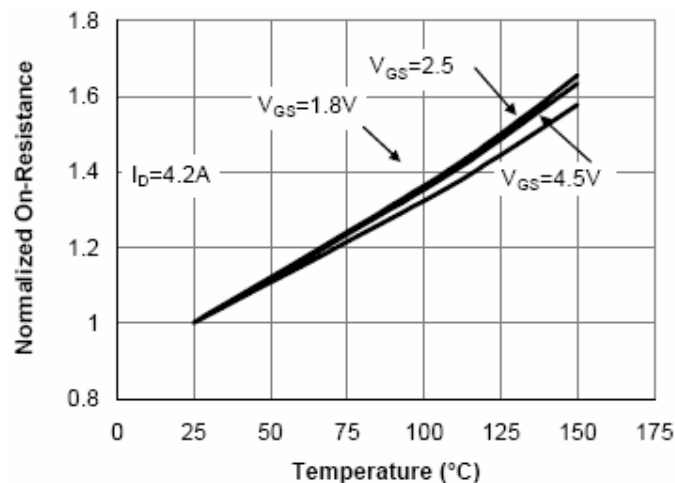


Figure 4: On-Resistance vs. Junction Temperature



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TYPICAL CHARACTERISTICS

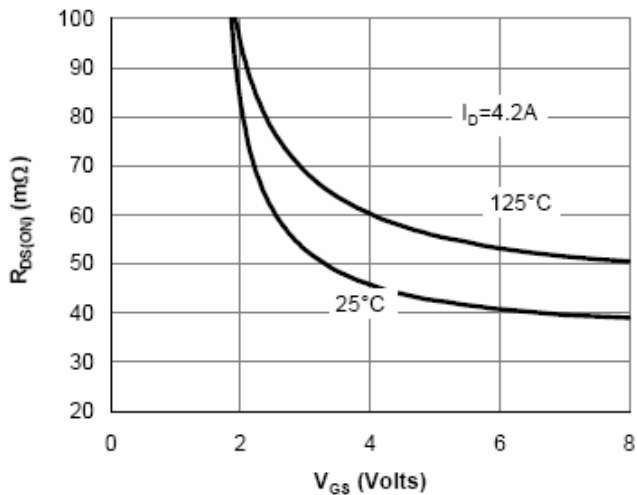


Figure 5: On-Resistance vs. Gate-Source Voltage

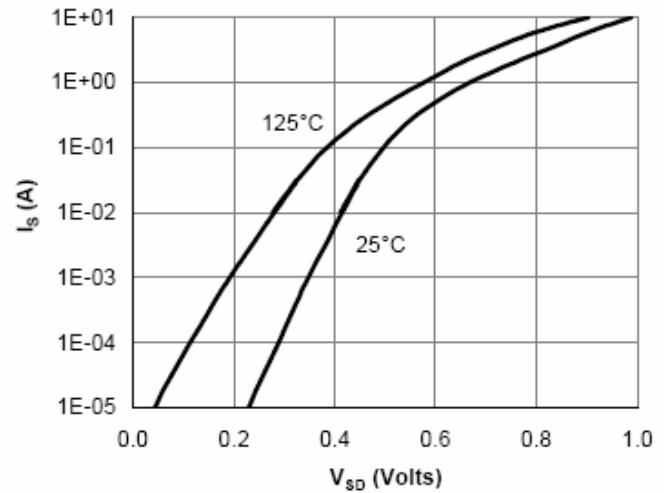


Figure 6: Body-Diode Characteristics

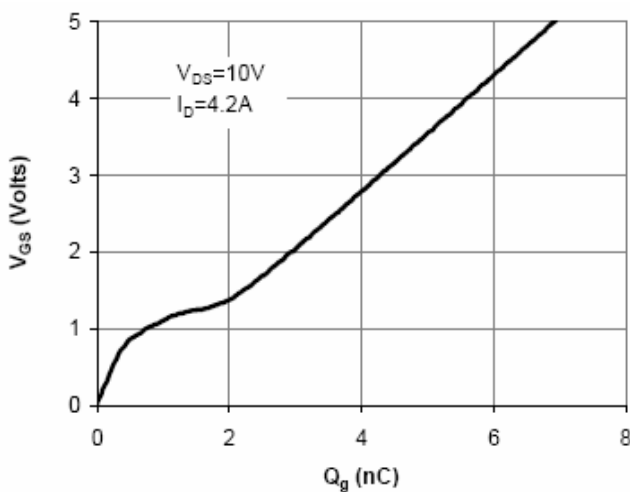


Figure 7: Gate-Charge Characteristics

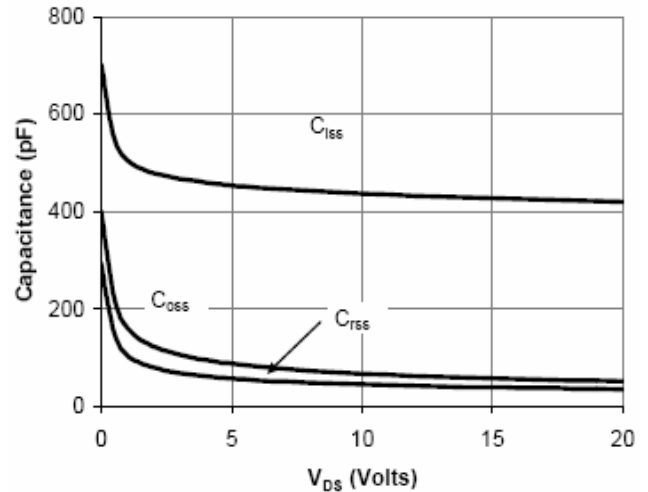


Figure 8: Capacitance Characteristics



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TYPICAL CHARACTERISTICS

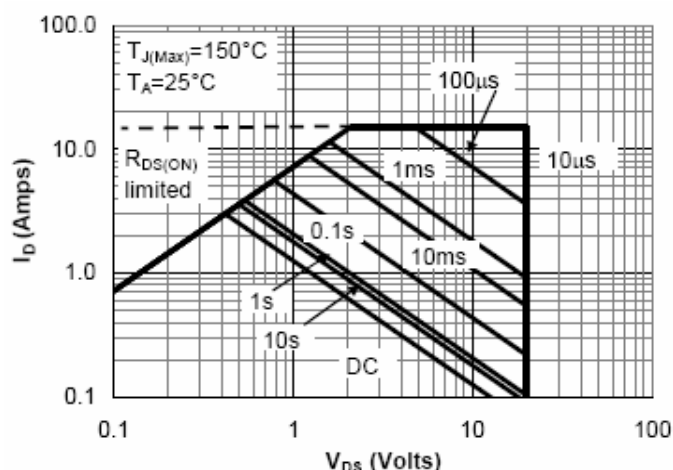


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

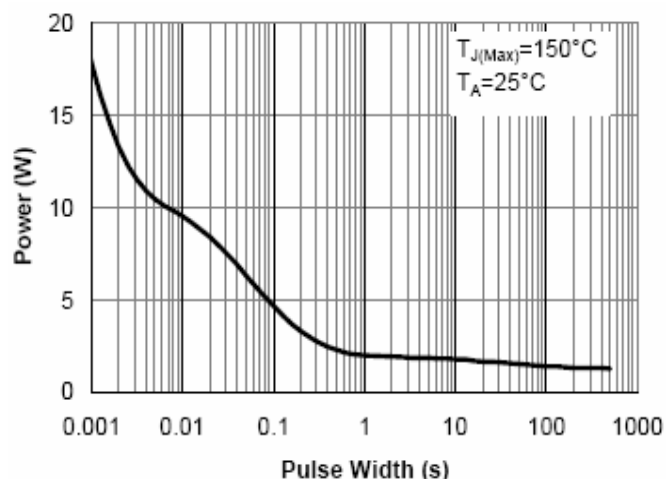


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

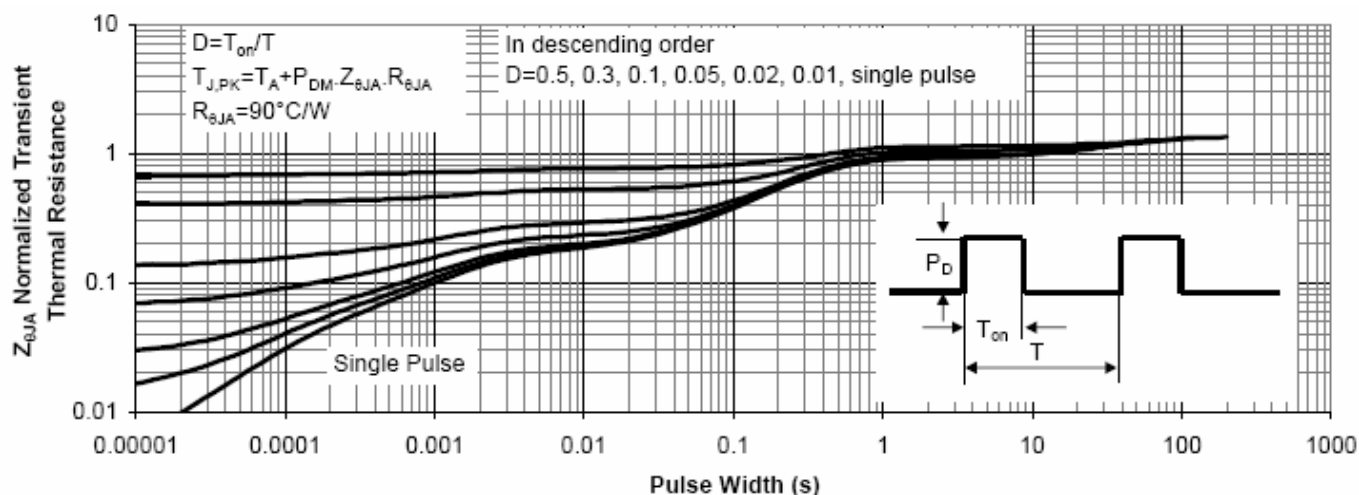


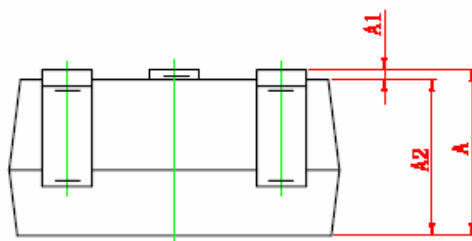
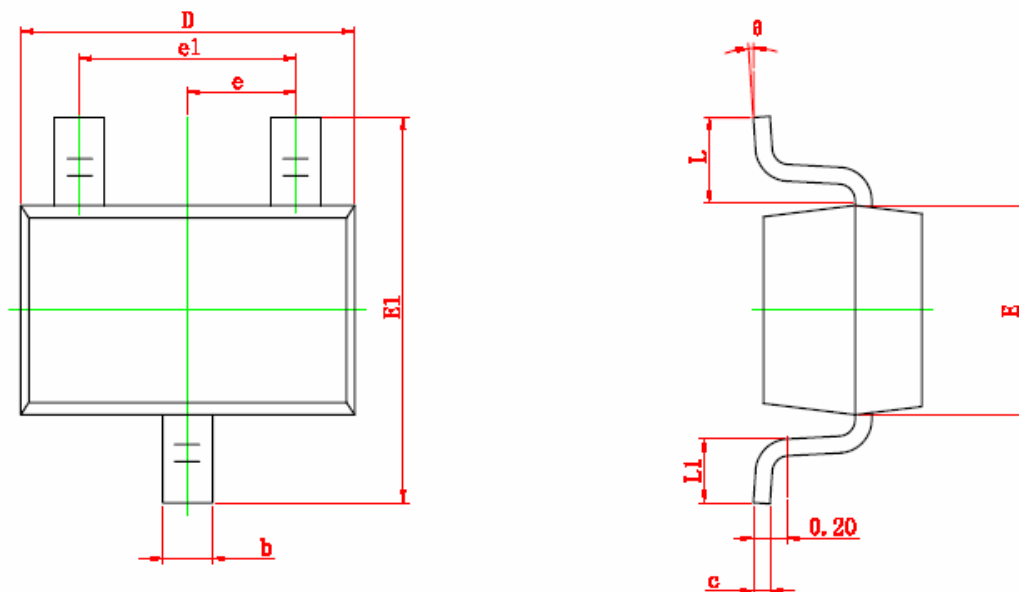
Figure 11: Normalized Maximum Transient Thermal Impedance



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SOT-323 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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