



SPN3006

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN3006 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. The SPN3006 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

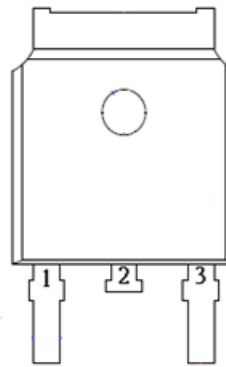
- ◆ 30V/80A, $R_{DS(ON)}=4.7m\Omega@V_{GS}=10V$
- ◆ 30V/80A, $R_{DS(ON)}=7.5m\Omega@V_{GS}=4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-252-2L/TO-251S-3L package design

APPLICATIONS

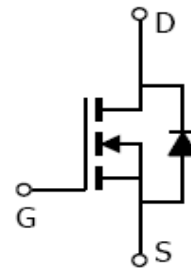
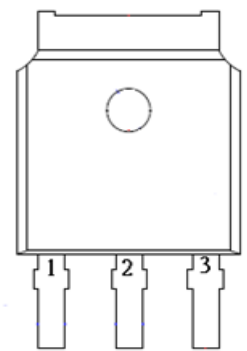
- High Frequency Synchronous Buck Converter
- DC/DC Power System
- Load Switch

PIN CONFIGURATION

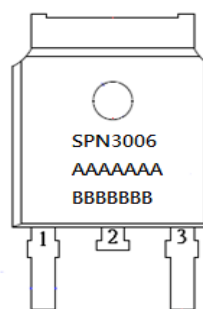
TO-252-2L



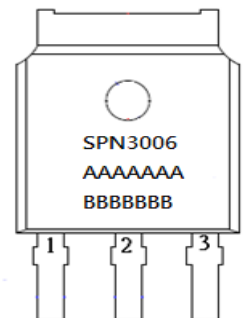
TO-251S-3L



PART MARKING



A : Lot Code
B : Date Code



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B : Date Code



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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
SPN3006ST251TGB	TO-251S-3L	SPN3006
SPN3006T252RGB	TO-252-2L	SPN3006

※ SPN3006T252RGB : Tape Reel ; Pb – Free ; Halogen - Free

※ SPN3006ST251TGB: Tube ; Pb – Free; Halogen – Free

ABSOLUTE MAXIMUM RATINGS

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

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V_{DSS}	30	V	
Gate –Source Voltage	V_{GSS}	± 20	V	
Continuous Drain Current	I_D	$T_A=25^{\circ}\text{C}$	80	A
		$T_A=100^{\circ}\text{C}$	57	
Pulsed Drain Current	I_{DM}	160	A	
Avalanche Current	I_{AS}	48	A	
Single Pulse Avalanche Energy	EAS	259	mJ	
Power Dissipation	P_D	2	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 ($t \leq 10\text{s}$)	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$	



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ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		2.5	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$			1	uA
		$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ C$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geq 5V, V_{GS}=10V$			80	A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$		4.7	5.5	mΩ
		$V_{GS}=4.5V, I_D=15A$		7.5	9	
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=30A$		22		S
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$			1	V
Single Pulse Avalanche Energy	EAS	$V_{DD}=25V, L=0.1mH,$ $I_{AS}=24A$	60			mJ
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=15V, V_{GS}=4.5V$ $I_D=20A$		11.1	18	nC
Gate-Source Charge	Q_{gs}			1.85	3.8	
Gate-Drain Charge	Q_{gd}			6.8	12	
Input Capacitance	C_{iss}	$V_{DS}=24V, V_{GS}=0V$ $f=1MHz$		1210	1800	pF
Output Capacitance	C_{oss}			190	280	
Reverse Transfer Capacitance	C_{rss}			100	150	
Turn-On Time	$t_{d(on)}$	$V_{DD}=15V,$ $I_D=15A, V_{GEN}=10V$ $R_G=3.3\Omega$		7.5	14	nS
	t_r			14.5	28	
Turn-Off Time	$t_{d(off)}$			35.2	67	
	t_f			9.6	18	



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TYPICAL CHARACTERISTICS

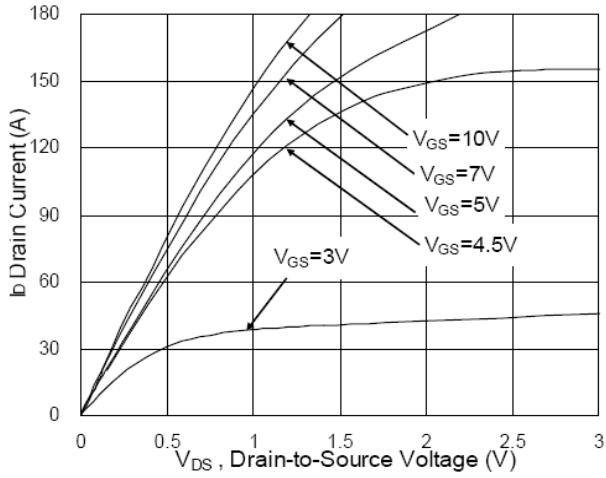


Fig. 1 Typical Output Characteristics

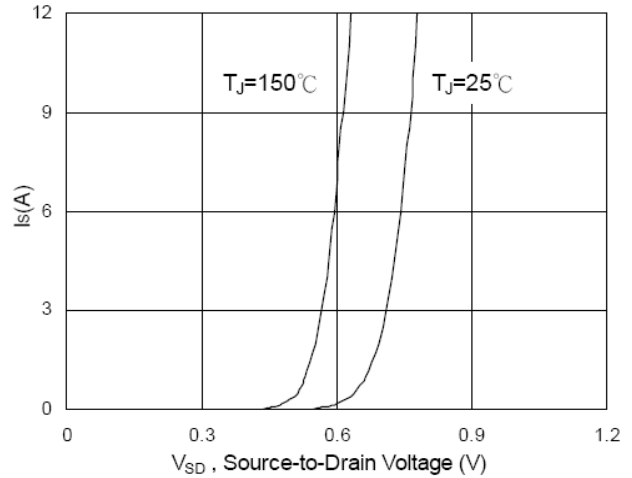


Fig. 2 Transfer Characteristics

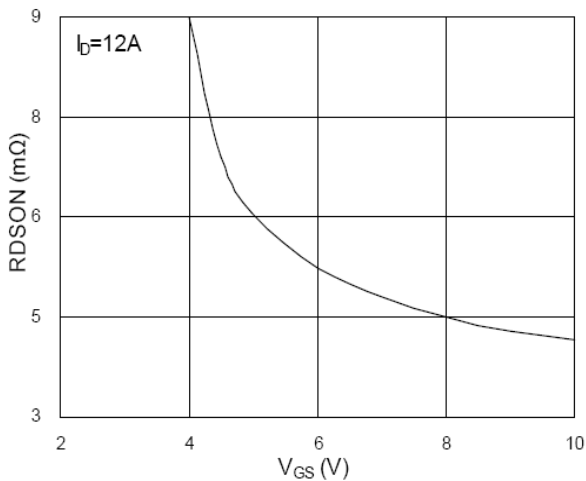


Fig. 3 On-Resistance vs Gate voltage

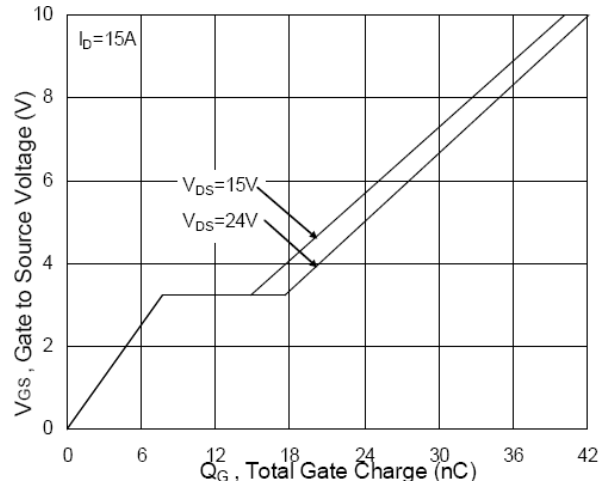


Fig. 4 Gate Charge Characteristics

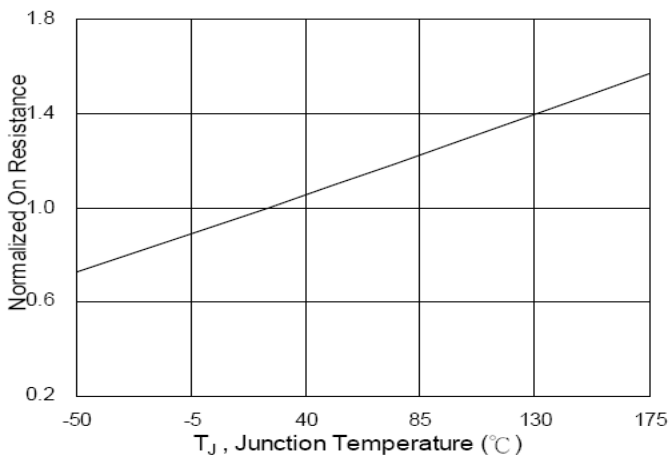


Fig. 5 On-Resistance vs Junction Temp

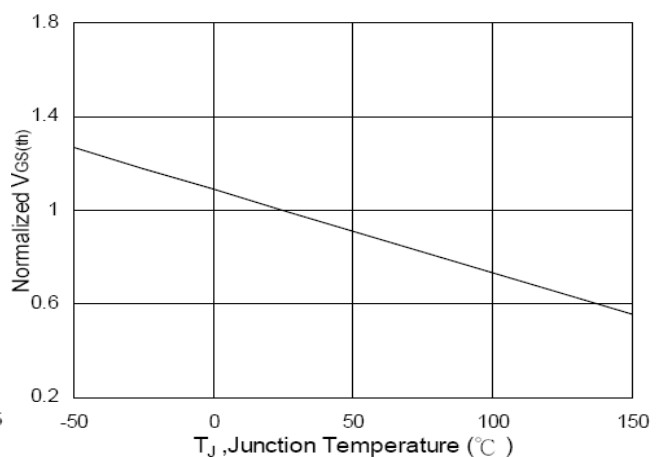
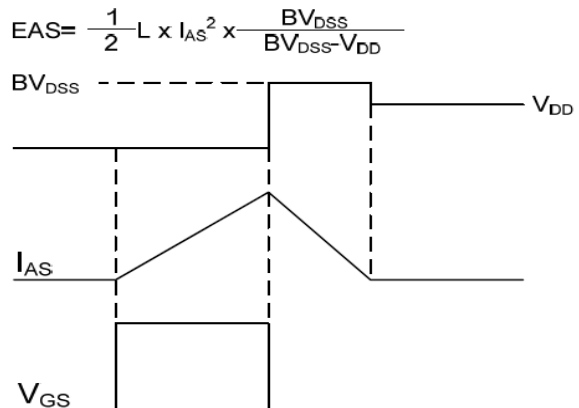
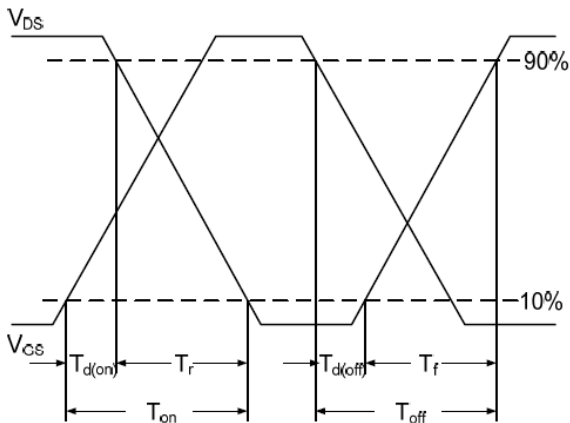
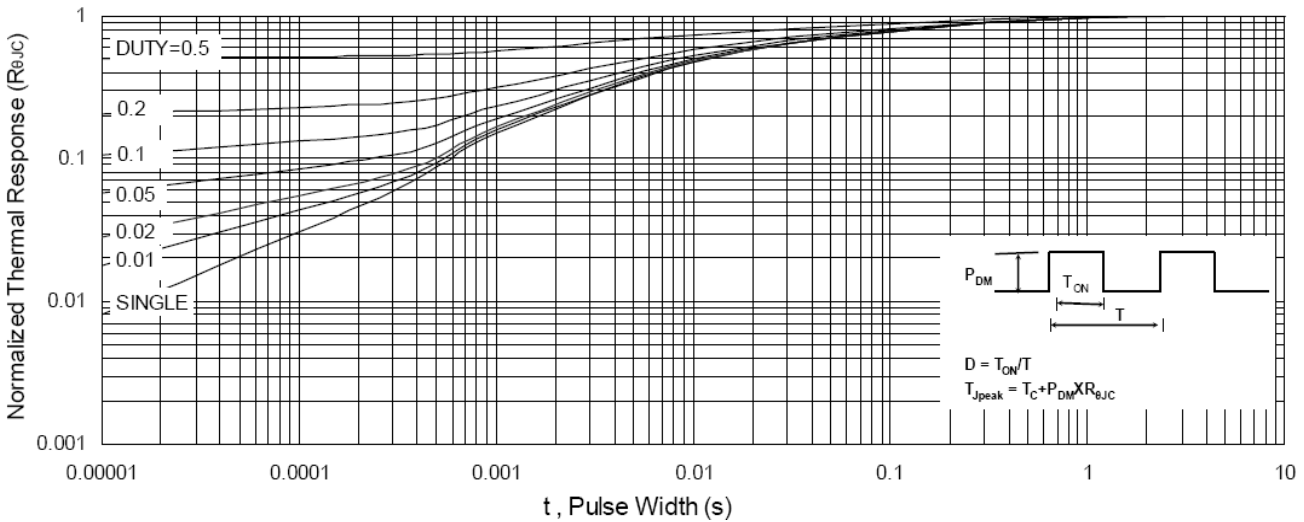
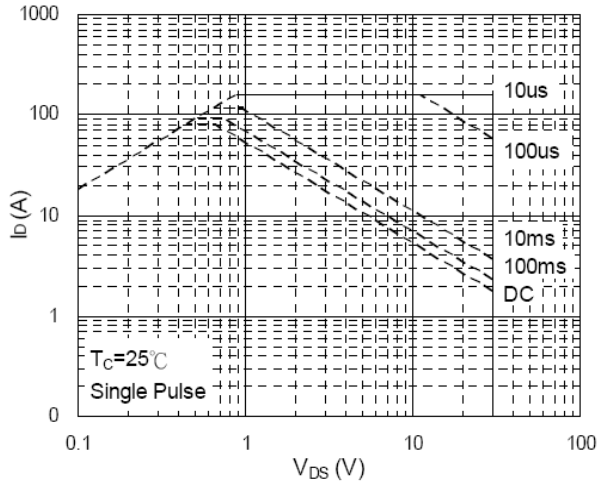
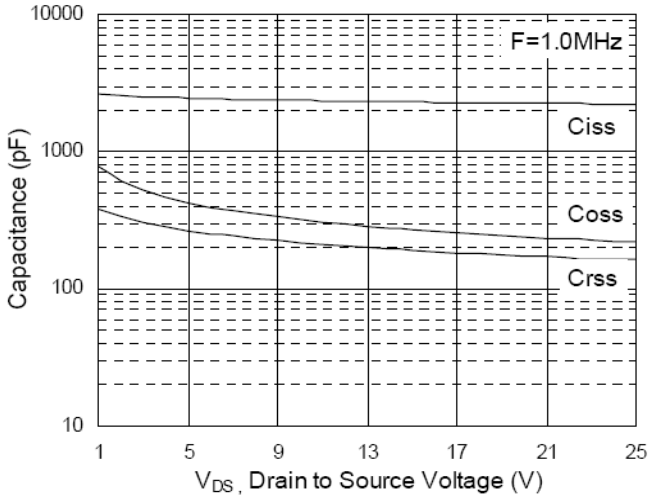


Fig. 6 Vgs vs Junction Temperature



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TYPICAL CHARACTERISTICS





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