



# SPN8852

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN8852 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 , notebook computer power management and other battery powered circuits where high-side switching .

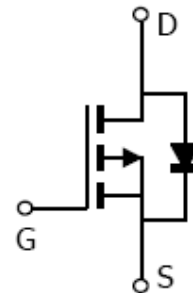
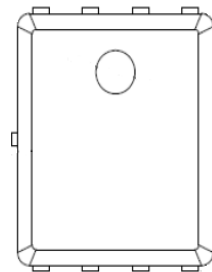
### FEATURES

- ◆ 150V/4.1A,  $R_{DS(ON)}=88m\Omega @ V_{GS}=10V$
- ◆ 150V/2A,  $R_{DS(ON)}=100m\Omega @ V_{GS}=4.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ PPAK5x6-8L package design

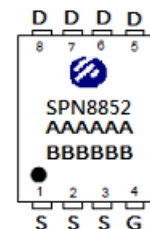
### APPLICATIONS

- DC/DC Converter
- Load Switch
- Synchronous Buck Converter
- SMPS Secondary Side Synchronous Rectifier
- Power Tool
- Motor Control

### PIN CONFIGURATION(PPAK5x6- 8L)



### PART MARKING



**A : Lot Code**  
**B : Date Code**  
**(YY/MM/DD)**



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### PIN DESCRIPTION

Pin	Symbol	Description
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

### ORDERING INFORMATION

Part Number	Package	Part Marking
SPN8852DN8RGB	PPAK5x6-8L	SPN8852

※ SPN4852S8RGB : 13" Tape Reel ; Pb – Free ; Halogen – Free

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V <sub>DSS</sub>	150	V
Gate –Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	4.1	A
Pulsed Drain Current	I <sub>DM</sub>	20	A
Avalanche Energy, Single Pulse (L=0.1mH , T <sub>c</sub> =25°C)	E <sub>AS</sub>	40	mJ
Power Dissipation	P <sub>D</sub>	5.0	W
		2.5	
Operating Junction Temperature	T <sub>J</sub>	-55/150	°C
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C
Thermal Resistance-Junction to Case	R <sub>θJC</sub>	25	°C/W
Thermal Resistance-Junction to Ambient (steady state)	R <sub>θJA</sub>	50	



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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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	150			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2		2.5	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=120V, V_{GS}=0V$ $T_J=25^\circ C$			1	uA
		$V_{DS}=120V, V_{GS}=0V$ $T_J=100^\circ C$			100	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4.1A$			88	mΩ
		$V_{GS}=4.5V, I_D=2A$			100	
Forward Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=10A$		33		S
Diode Forward Voltage	$V_{SD}$	$I_S=1A, V_{GS}=0V$			1.0	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=75V, V_{GS}=4.5V,$ $I_D=10A$		25.1		nC
Gate-Source Charge	$Q_{gs}$			8.8		
Gate-Drain Charge	$Q_{gd}$			12.6		
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$		2280		pF
Output Capacitance	$C_{oss}$			110		
Reverse Transfer Capacitance	$C_{rss}$			83		
Turn-On Time	$t_{d(on)}$	$V_{DD}=75V,$ $I_D=10A, V_{GS}=10V$ $R_G=3.3\Omega$		13		nS
	$t_r$			8.2		
Turn-Off Time	$t_{d(off)}$			25		
	$t_f$			11		



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### TYPICAL CHARACTERISTICS

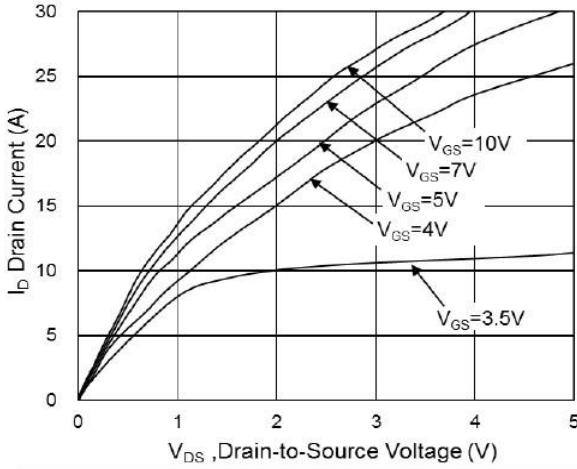


Fig.1 Typical Output Characteristics

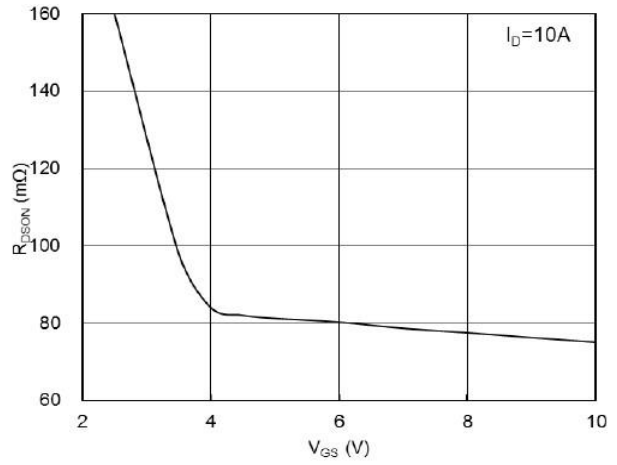


Fig.2 On-Resistance vs. Gate-Source Voltage

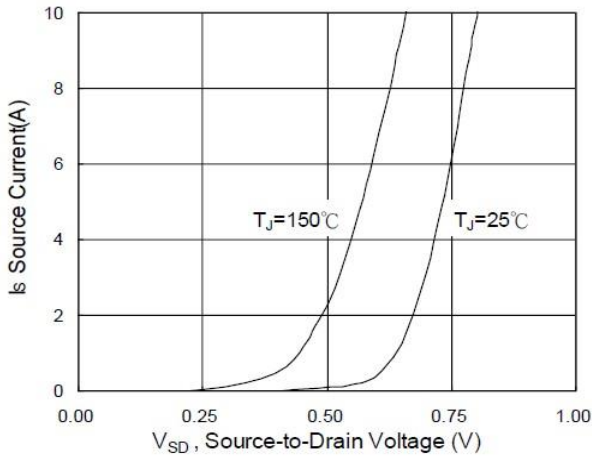


Fig.3 Forward Characteristics of Reverse

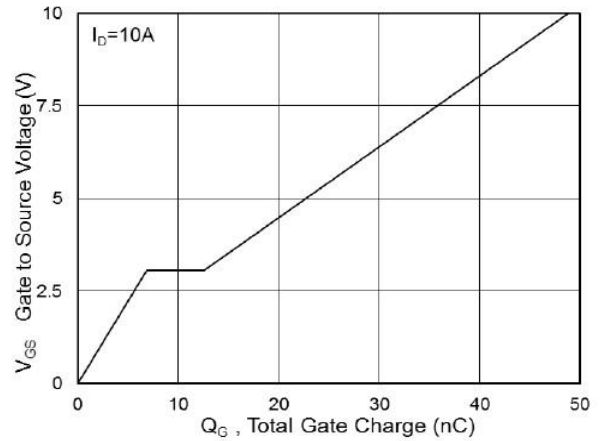


Fig.4 Gate-Charge Characteristics

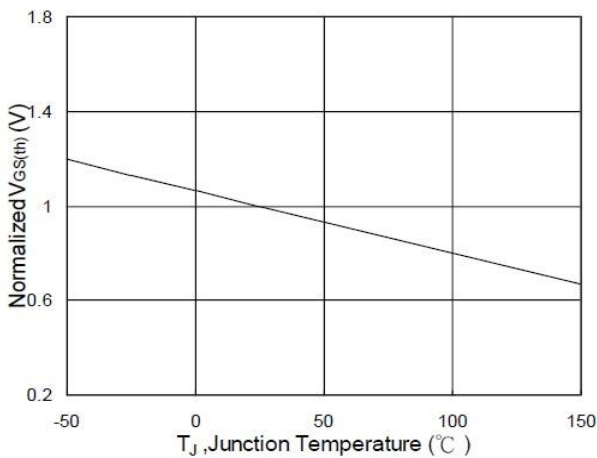


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

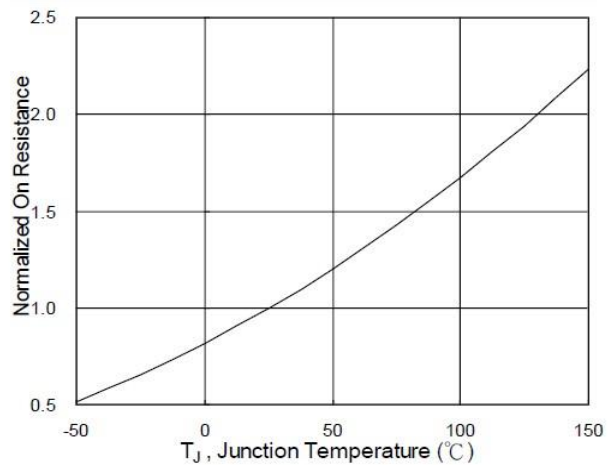


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$



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### TYPICAL CHARACTERISTICS

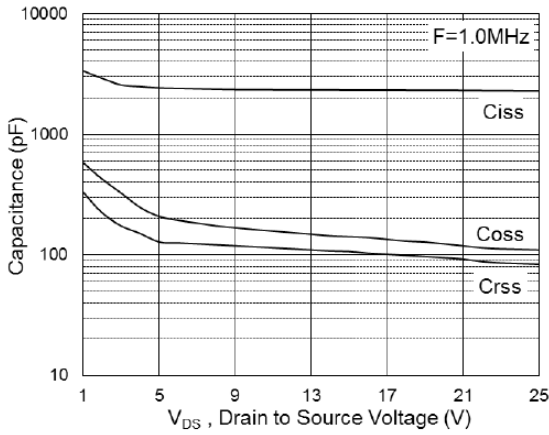


Fig.7 Capacitance

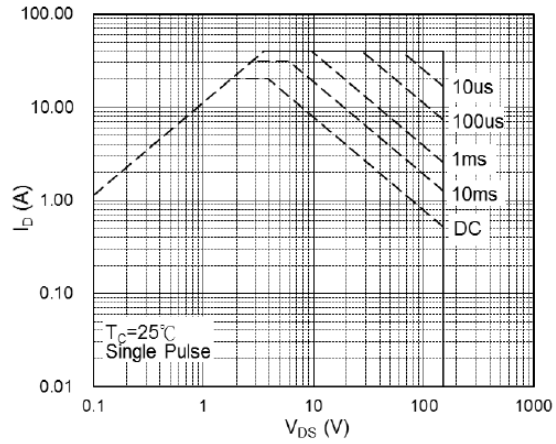


Fig.8 Safe Operating Area

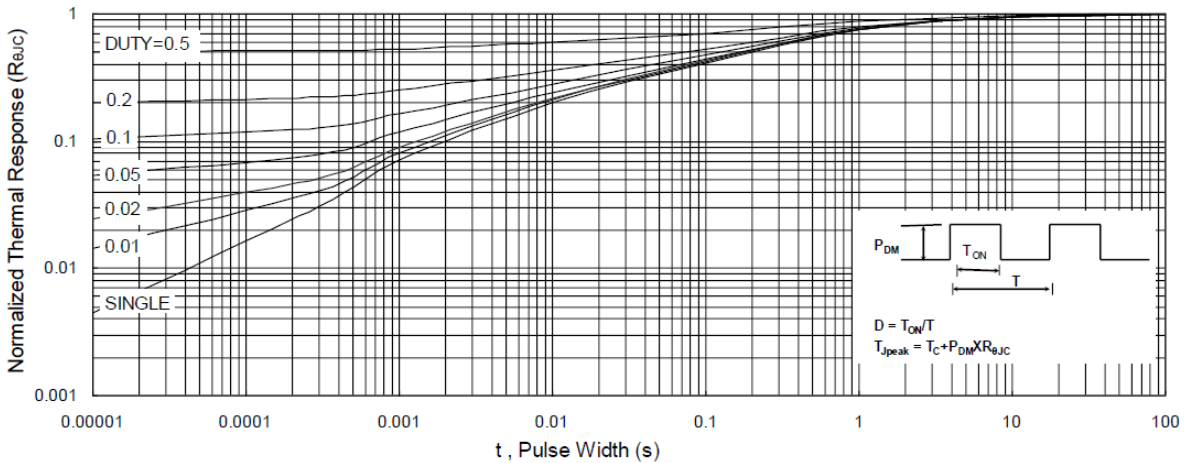


Fig.9 Normalized Maximum Transient Thermal Impedance

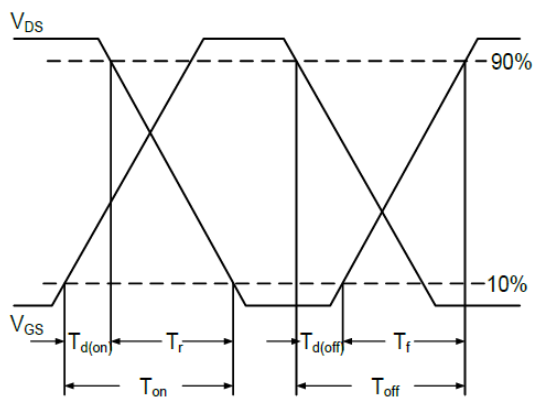


Fig.10 Switching Time Waveform

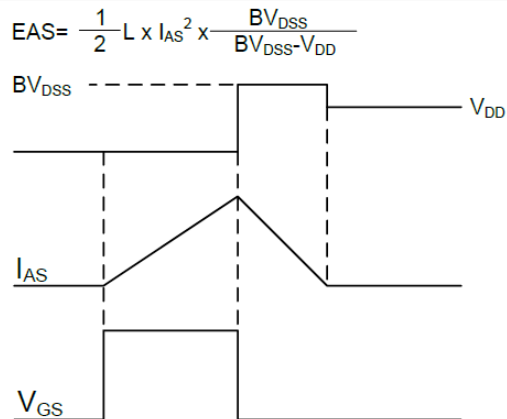


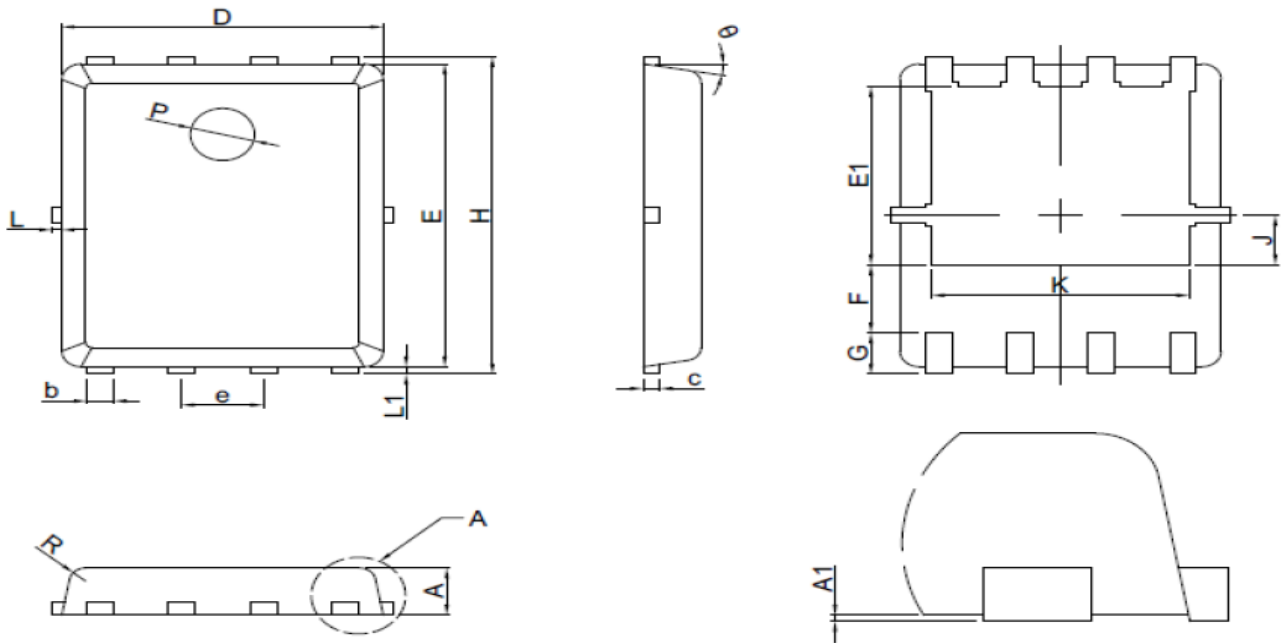
Fig.11 Unclamped Inductive Switching Waveform



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### PPAK5x6-8L PACKAGE OUTLINE



SYMBOL	MILLIMETERS		
	MIN	NOM	MAX
A	0.8	0.95	1.1
A1	0.00	0.03	0.05
b	0.33	0.41	0.51
c	0.254 REF		
D	4.80	4.95	5.10
F	1.40 REF		
E	5.70	5.80	5.90
e	1.27 BSC		
H	5.90	6.05	6.20
L1	0.06	0.13	0.20
G	0.60 REF		
J	0.95 BSC		
K	4.00 REF		
L	---	----	0.20
P	1.00 REF		
E1	3.40REF		
E2	0.95 REF		
$\theta$	6°	10°	14°
R	0.25REF		



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SYNC Power Corporation

7F-2, No.3-1, Park Street NanKang

District (NKSP), Taipei, Taiwan 115

Phone: 886-2-2655-8178

Fax: 886-2-2655-8468

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