SPN8842
N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN8842 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. The SPN8842 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.

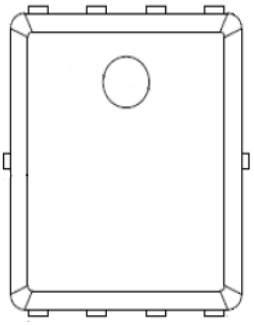
APPLICATIONS

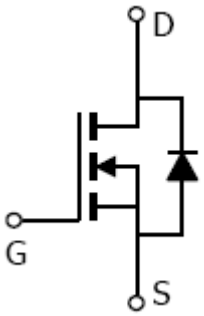
- High Frequency Synchronous Buck Converter
- DC/DC Power System
- Load Switch

FEATURES

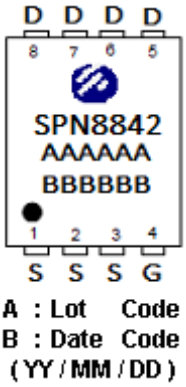
- 40V/100A,$R_{DS(ON)}$=1.7mΩ@V_{GS}=10V
- 40V/100A,$R_{DS(ON)}$=2.6mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- PPAK5x6-8L package design

PIN CONFIGURATION(PPAK5x6-8L)





PART MARKING



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

SPN8842
N-Channel Enhancement Mode MOSFET

PPAK5x6-8L 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
SPN8842DN8RGB	PPAK5x6-8L	SPN8842

※ SPN8842DN8RGB : Tape Reel ; Pb – Free ; Halogen - Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	40	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Silicon Limited)	T_C=25℃	I_D	100	A
	T_C=100℃		82	
Pulsed Drain Current		I_{DM}	400	A
Avalanche Current		I_{AS}	43	A
Single Pulse Avalanche Energy		EAS	462	mJ
Power Dissipation	T_C=25℃	P_D	83	W
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Case		$R_{\theta JC}$	1.5	℃/W
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	55	℃/W

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	40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		2.5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V,V_{GS}=0V			1	uA
		V_{DS}=32V,V_{GS}=0V,T_J=55℃			5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≥5V,V_{GS}=10V			100	A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A		1.4	1.7	mΩ
		V_{GS}=4.5V,I_D=20A		2.1	2.6	
Forward Transconductance	gfs	V_{DS}=5V,I_D=20A		53		S
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V			1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=20V,V_{GS}=10V I_D= 20A		69		nC
Gate-Source Charge	Q_{gs}			10.5		
Gate-Drain Charge	Q_{gd}			14.7		
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V f=1MHz		3850		pF
Output Capacitance	C_{oss}			1215		
Reverse Transfer Capacitance	C_{rss}			120		
Turn-On Time	$t_{d(on)}$	V_{DD}=20V, I_D=20A,V_{GEN}=10V R_G=1.5Ω		11.4		nS
	t_r			40		
Turn-Off Time	$t_{d(off)}$			44		
	t_f			26.5		

TYPICAL CHARACTERISTICS

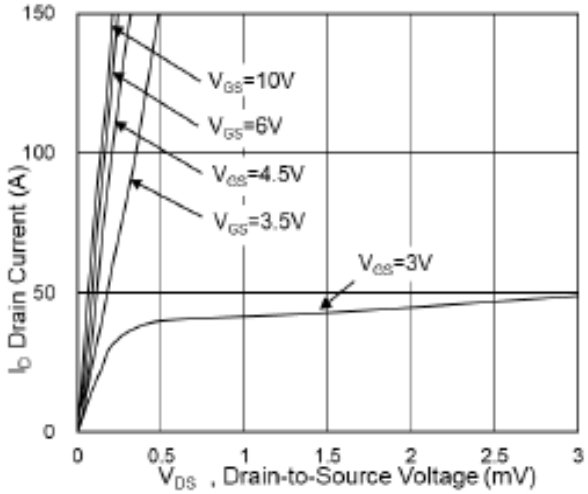


Fig. 1 Typical Output Characteristics

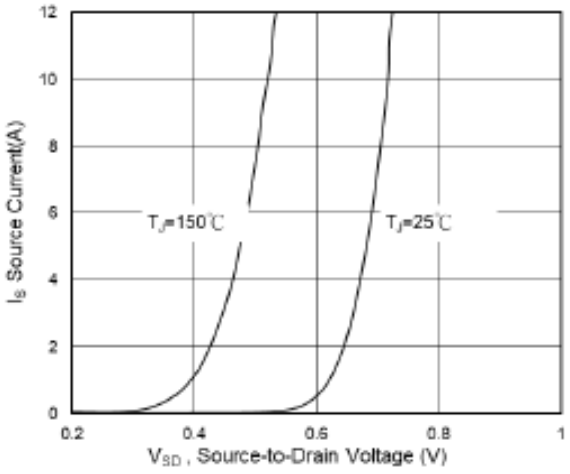


Fig. 2 Source Drain Forward Characteristics

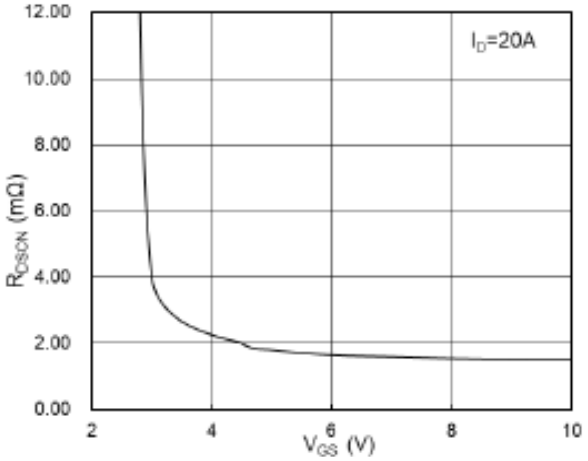


Fig. 3 On-Resistance vs Gate voltage

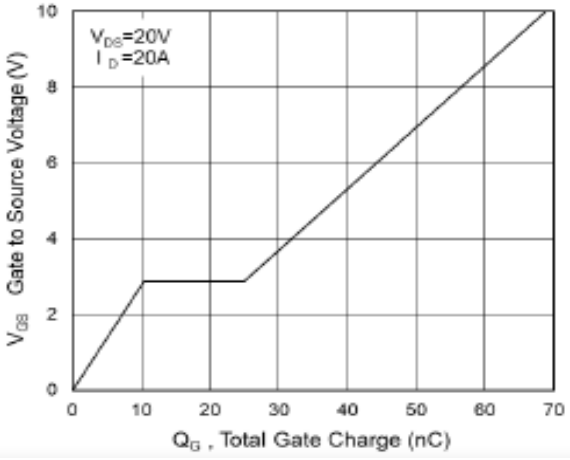


Fig. 4 Gate Charge Characteristics

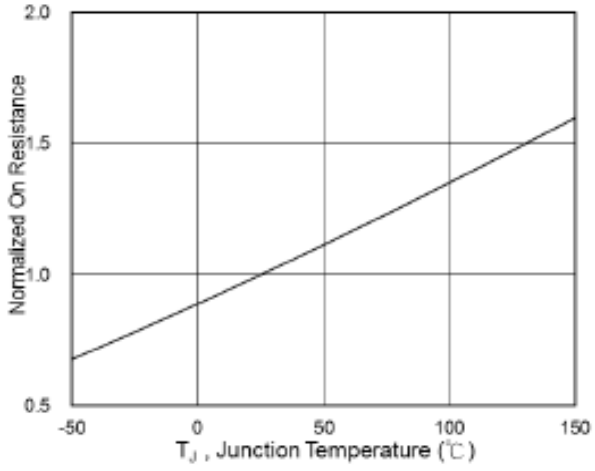


Fig. 5 On-Resistance vs Junction Temp

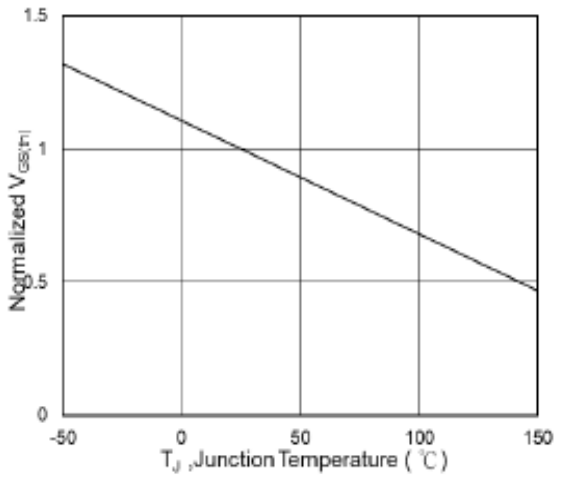


Fig. 6 Vgs vs Junction Temperature

TYPICAL CHARACTERISTICS

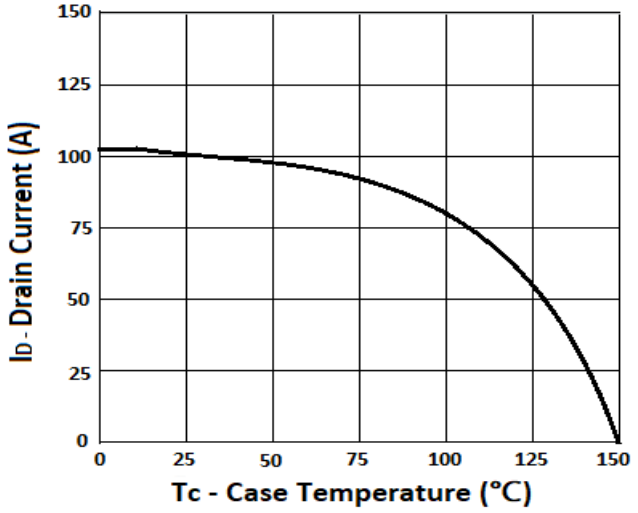


Fig. 7 Current Derating

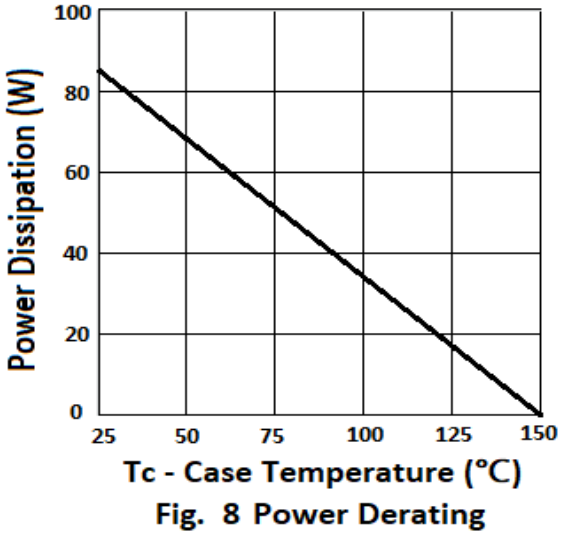


Fig. 8 Power Derating

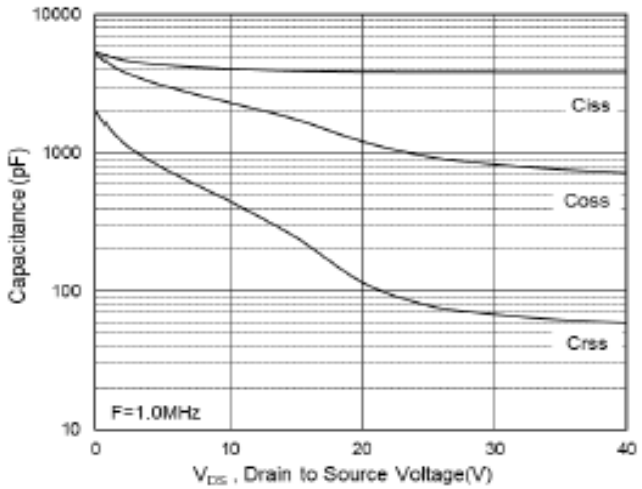


Fig. 9 Typical Capacitance Characteristics

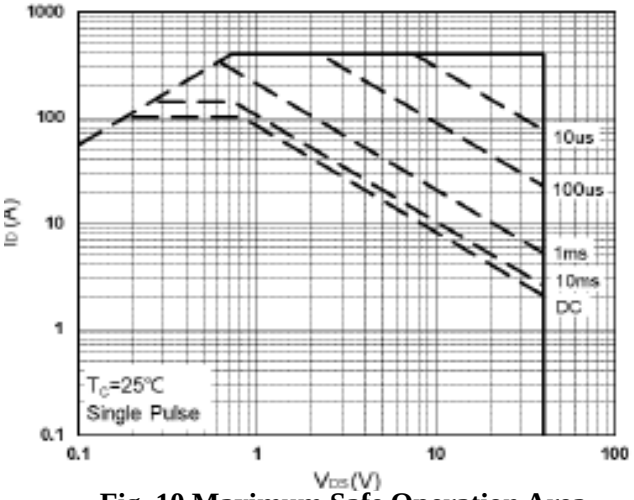


Fig. 10 Maximum Safe Operation Area

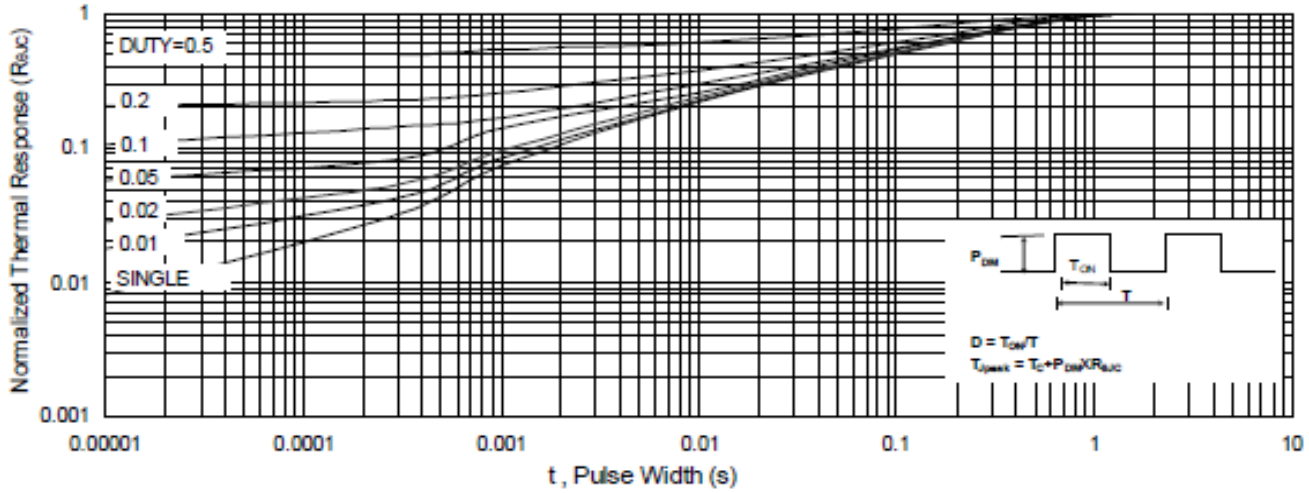


Fig. 11 Effective Transient Thermal Impedance

TYPICAL CHARACTERISTICS

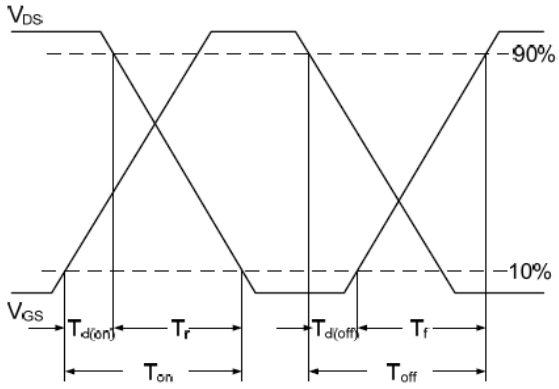


Fig. 12 Switching Time Waveform

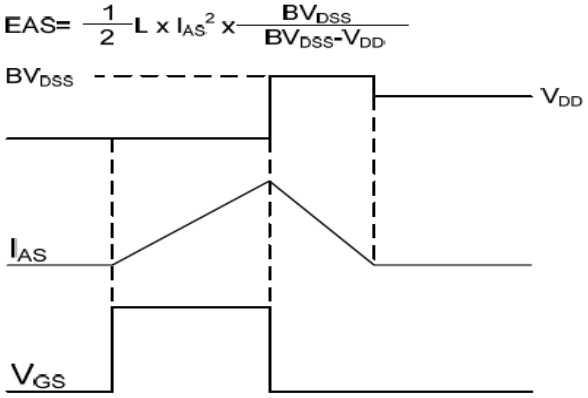


Fig. 13 Unclamped Inductive Waveform

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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