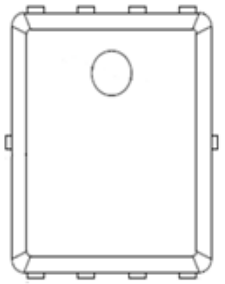
SPN8868
N-Channel Enhancement Mode MOSFET

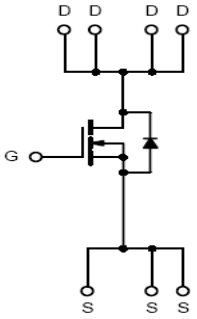
DESCRIPTION
The SPN8868 is the N-Channel logic enhancement mode power field effect transistor which is produced using high cell density DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suitable for synchronous rectifier application, Motor control power management and other Power Tool circuits. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

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

FEATURES
- 60V/95A,$R_{DS(ON)}$=4.6mΩ@V_{GS}=10V
- 60V/95A,$R_{DS(ON)}$=7.0mΩ@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)

SPN8868
N-Channel Enhancement Mode MOSFET

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
SPN8868DN8RGB	PPAK5x6-8L	SPN8868

※ SPN8868DN8RGB : 13" Tape Reel ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(Silicon Limited)	T_C=25℃	I_D	95	A
	T_C=100℃		60	
Pulsed Drain Current		I_{DM}	340	A
Avalanche Energy with Single Pulse (T_C=25℃, L = 0.1mH)		E_{AS}	31	mJ
Power Dissipation	T_C=25℃	P_D	83	W
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Case		$R_{\theta JC}$	1.5	℃/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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1.0	1.6	2.4	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V T_J=25℃			1	uA
		V_{DS}=48V,V_{GS}=0V T_J=100℃			100	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=20A		3.8	4.6	mΩ
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=10A		5.6	7.0	mΩ
Forward Transconductance	gfs	V_{DS}=5V, I_D=20A		60		S
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=Open, f=1MHz		1.3		Ω
Diode Forward Voltage	V_{SD}	I_S=30A,V_{GS} =0V		0.9	1.2	V
Dynamic						
Total Gate Charge	Q_g(10V)	V_{DS}=30V,V_{GS}=10V I_D=20A		41		nC
Total Gate Charge	Q_g(4.5V)			25		
Gate-Source Charge	Q_{gs}			5		
Gate-Drain Charge	Q_{gd}			11		
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V f=1MHz		1978		pF
Output Capacitance	C_{oss}			870		
Reverse Transfer Capacitance	C_{rss}			56		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V, I_D=20A,V_{GS}=10V R_G=10Ω		10		nS
	t_r			8		
Turn-Off Time	$t_{d(off)}$			34		
	t_f			10		

TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

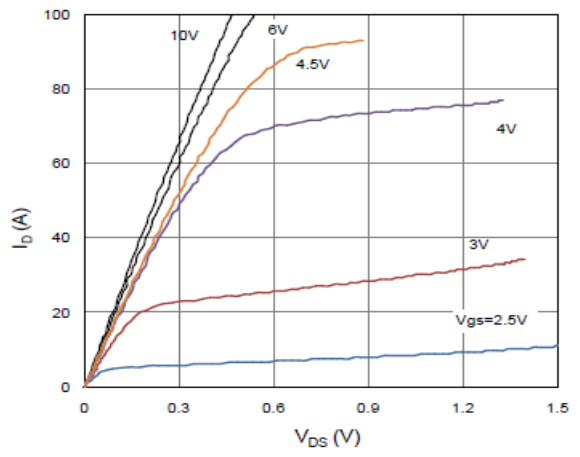


Figure 2. On-Resistance vs. Gate-Source Voltage

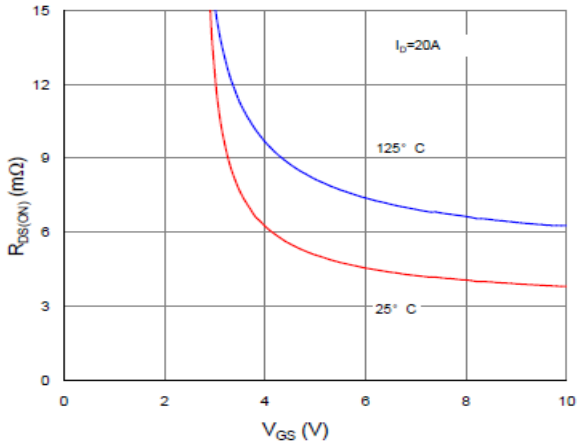


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

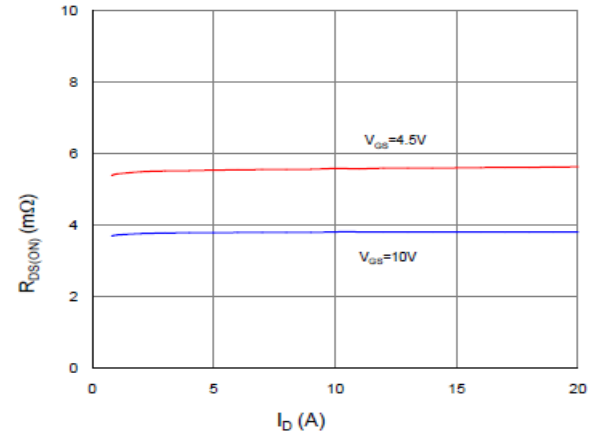


Figure 4. Normalized On-Resistance vs. Junction Temperature

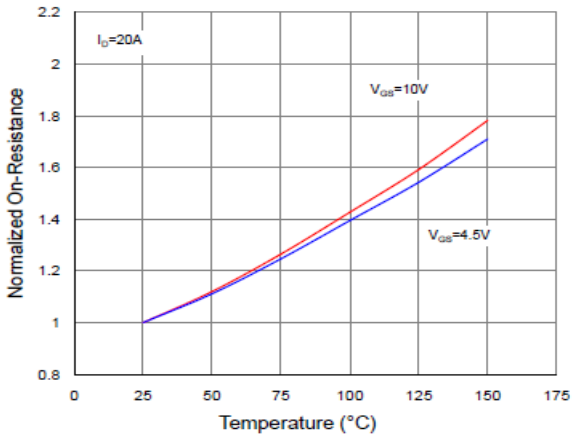


Figure 5. Typical Transfer Characteristics

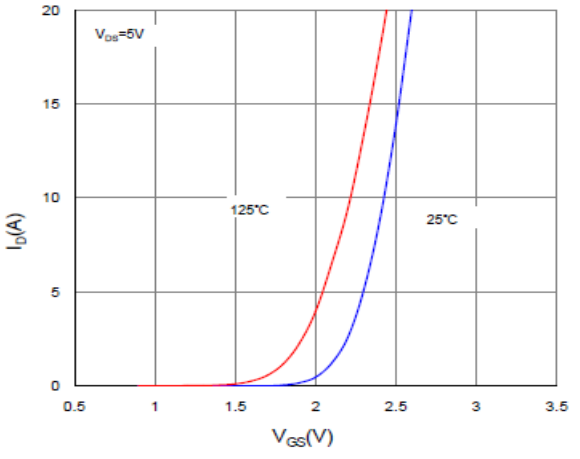
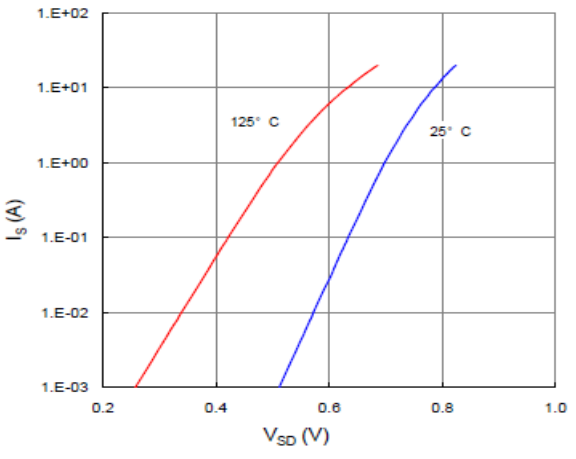


Figure 6. Typical Source-Drain Diode Forward Voltage



TYPICAL CHARACTERISTICS

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

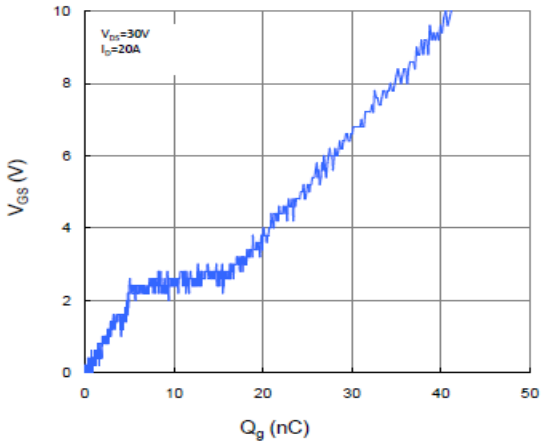


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

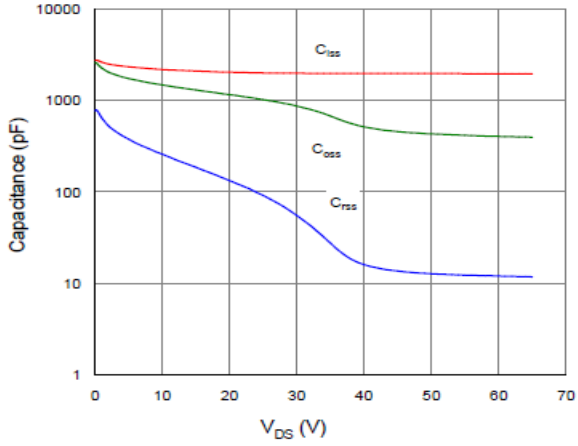


Figure 9. Maximum Safe Operating Area

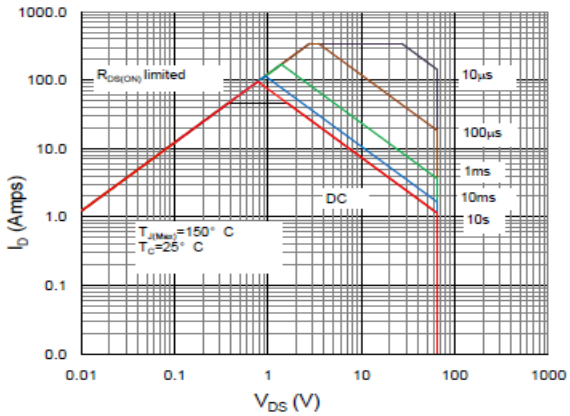


Figure 10. Maximun Drain Current vs. Case Temperature

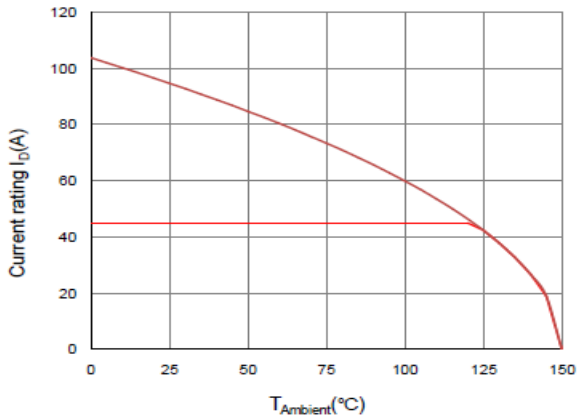
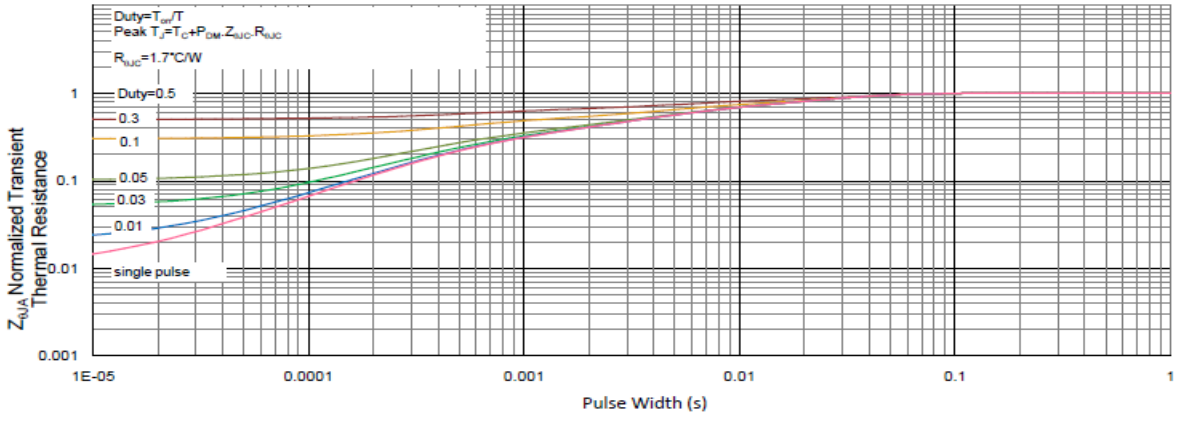
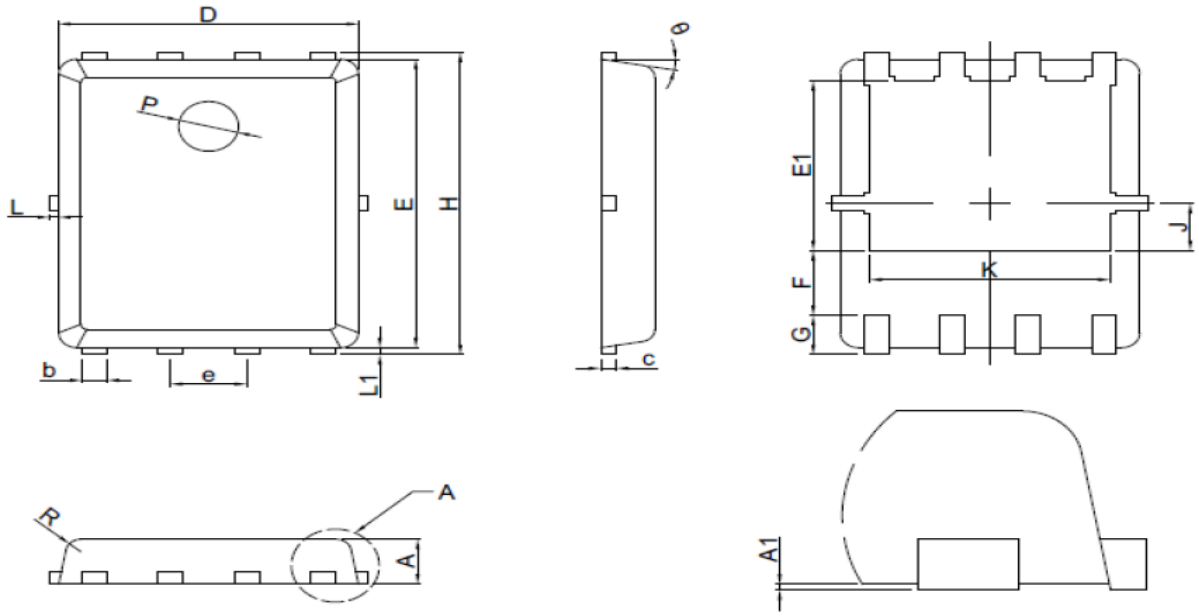


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



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	
θ	6°	10°	14°
R		0.25REF	

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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