



# SPN8864

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN8864 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. The SPN8864 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 RDS(ON) and fast switching speed.

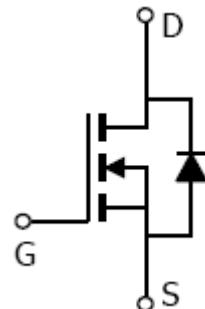
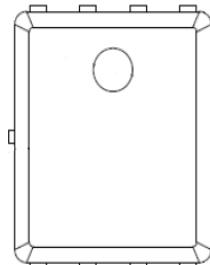
### APPLICATIONS

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

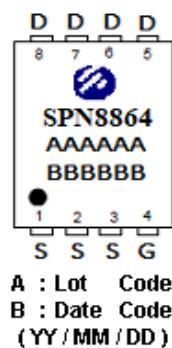
### FEATURES

- ◆ 60V/20A,R<sub>DS(ON)</sub>=6.0mΩ@V<sub>GS</sub>=10V
- ◆ 60V/20A,R<sub>DS(ON)</sub>=8.0mΩ@V<sub>GS</sub>=4.5V
- ◆ Super high density cell design for extremely low R<sub>DS(ON)</sub>
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ PPAK5x6-8L package design

### PIN CONFIGURATION(PPAK5x6-8L)



### PART MARKING





# SPN8864

## 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
SPN8864DN8RGB	PPAK5x6-8L	SPN8864

※ SPN8864DN8RGB : 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>	60	V
Gate –Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (Silicon Limited)	T <sub>C</sub> =25°C	85	A
	T <sub>C</sub> =100°C	54	
Pulsed Drain Current	I <sub>DM</sub>	340	A
Single Pulse Avalanche Energy ( T <sub>C</sub> =25°C , L=0.1mH. )	E <sub>AS</sub>	181	mJ
Power Dissipation	T <sub>C</sub> =25°C	P <sub>D</sub>	W
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>	0.92	°C/W



# SPN8864

## N-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, ID=250uA	60			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , ID=250uA	1.4	1.8	2.4	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =48V, V <sub>GS</sub> =0V			1	
		V <sub>DS</sub> =48V, V <sub>GS</sub> =0V, TJ=125°C			10	uA
Drain-Source On-Resistance	R <sub>D(on)</sub>	V <sub>GS</sub> =10V, ID=20A			6.0	
		V <sub>GS</sub> =4.5V, ID=20A			8.0	mΩ
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =10V, ID=3A		15		S
Gate resistance	R <sub>g</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V f=1MHz		1.6		Ω
Diode Forward Voltage	V <sub>SD</sub>	I <sub>s</sub> =1A, V <sub>GS</sub> =0V			1.0	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =4.5V ID=10A		32.8	65	nC
Gate-Source Charge	Q <sub>gs</sub>			10.8	20	
Gate-Drain Charge	Q <sub>gd</sub>			11.6	22	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V f=1MHz		10606		pF
Output Capacitance	C <sub>oss</sub>			545		
Reverse Transfer Capacitance	C <sub>rss</sub>			436		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, ID=1A, V <sub>GS</sub> =10V R <sub>G</sub> =3.3Ω		20	40	nS
	t <sub>r</sub>			14.2	28	
Turn-Off Time	t <sub>d(off)</sub>			61.2	122	
	t <sub>f</sub>			16.8	34	

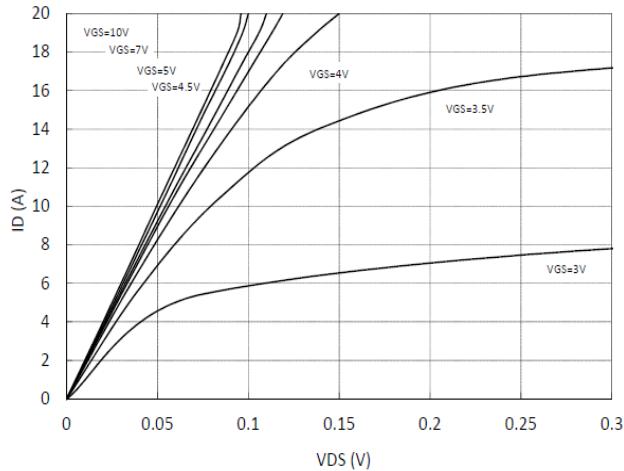


# SPN8864

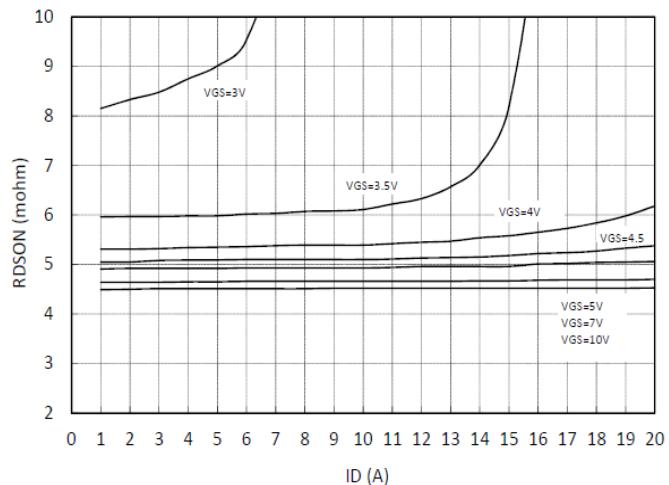
## N-Channel Enhancement Mode MOSFET

### TYPICAL CHARACTERISTICS

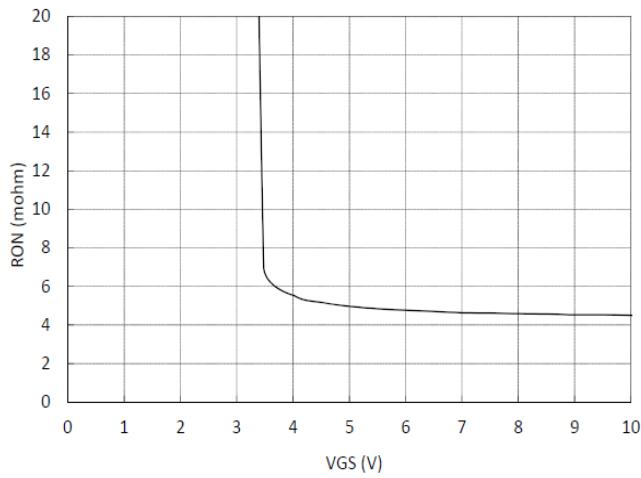
TYPICAL OUTPUT CHARACTERISTICS



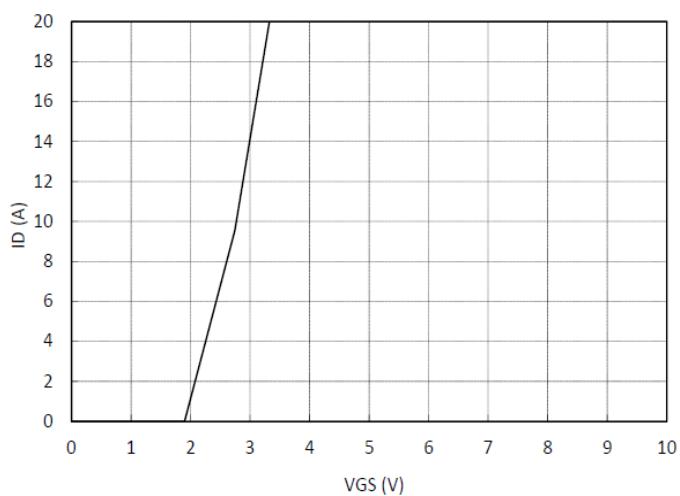
ON-RESISTANCE VS. DRAIN CURRENT AND GATE VOLTAGE



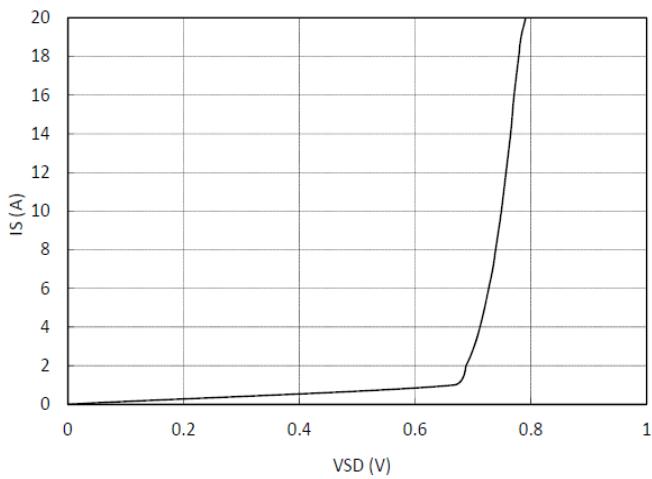
ON-RESISTANCE VS. GATE-SOURCE VOLTAGE



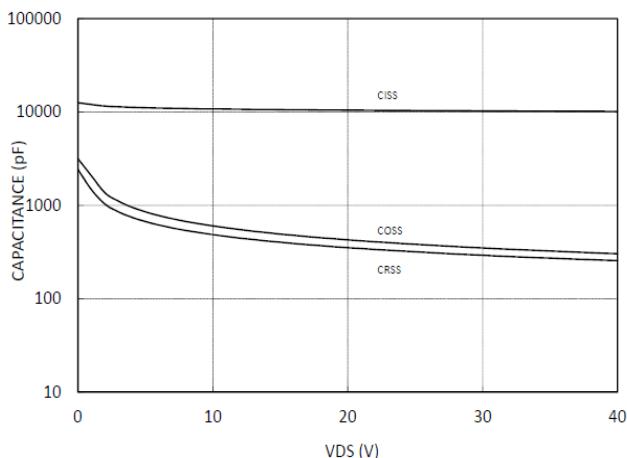
TYPICAL TRANSFER CHARACTERISTICS



TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE



TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE

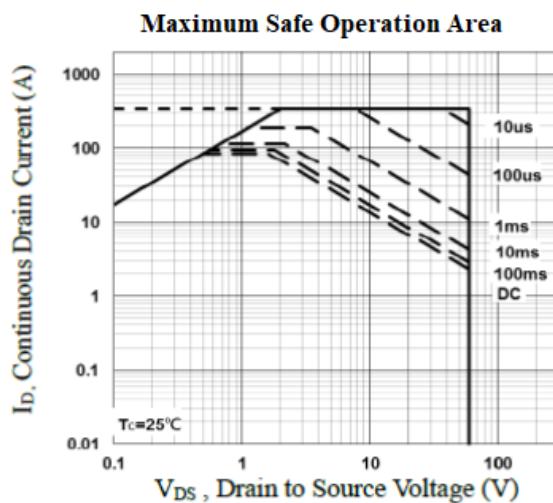
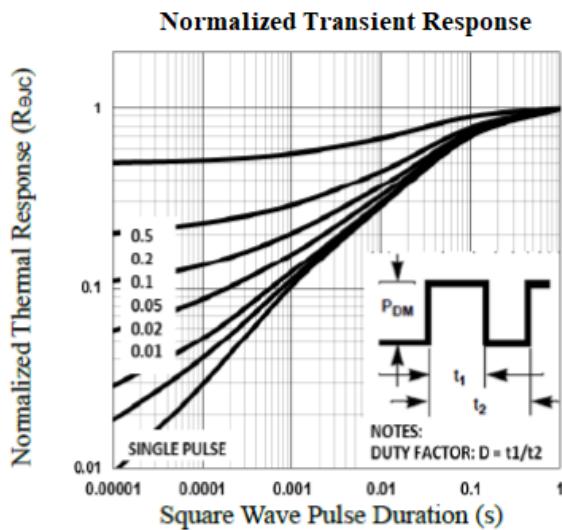




# SPN8864

## N-Channel Enhancement Mode MOSFET

### TYPICAL CHARACTERISTICS





# SPN8864

## N-Channel Enhancement Mode MOSFET

---

Information provided is alleged to be exact and consistent. SYNC Power Corporation presumes no responsibility for the penalties of use of such information or for any violation of patents or other rights of third parties which may result from its use. No license is granted by allegation or otherwise under any patent or patent rights of SYNC Power Corporation. Conditions mentioned in this publication are subject to change without notice. This publication surpasses and replaces all information previously supplied. SYNC Power Corporation products are not authorized for use as critical components in life support devices or systems without express written approval of SYNC Power Corporation.

© The SYNC Power logo is a registered trademark of SYNC Power Corporation  
© 2021 SYNC Power Corporation – Printed in Taiwan – All Rights Reserved

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  
© <http://www.syncpower.com>