



# SPN8898

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN8898 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. The SPN8898 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.

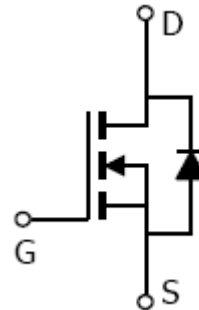
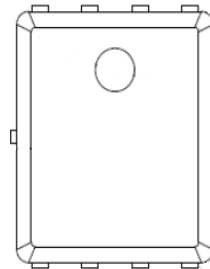
### APPLICATIONS

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

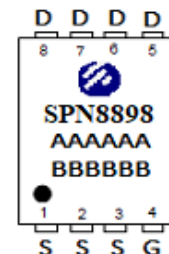
### FEATURES

- ◆ 120V/20A,  $R_{DS(ON)}=17m\Omega@V_{GS}=10V$
- ◆ 120V/20A,  $R_{DS(ON)}=19.5m\Omega@V_{GS}=4.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ PPAK5x6-8L package design

### 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
SPN8898DN8RGB	PPAK5x6-8L	SPN8898

※ SPN8898DN8RGB : 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>	120	V
Gate –Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (Silicon Limited)	I <sub>D</sub>	T <sub>C</sub> =25°C	54
		T <sub>C</sub> =100°C	34
Pulsed Drain Current	I <sub>DM</sub>	216	A
Single Pulse Avalanche Energy ( T <sub>C</sub> =25°C , L=0.1mH. )	E <sub>AS</sub>	101	mJ
Power Dissipation	P <sub>D</sub>	136	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



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### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

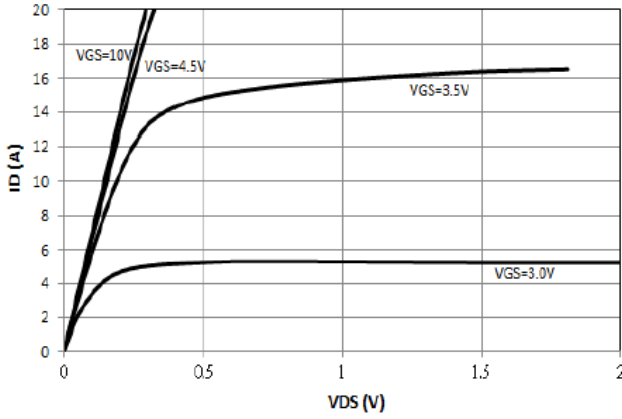
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	120			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.4	2.0	3.0	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	uA
		$V_{DS}=80V, V_{GS}=0V, T_J=125^\circ C$			10	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$			17	mΩ
		$V_{GS}=4.5V, I_D=20A$			19.5	
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=3A$		10		S
Gate resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V$ $f=1MHz$		1.6		Ω
Diode Forward Voltage	$V_{SD}$	$I_S=1A, V_{GS}=0V$			1.0	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=80V, V_{GS}=10V$ $I_D=5A$		66.7	100	nC
Gate-Source Charge	$Q_{gs}$			13.4	26	
Gate-Drain Charge	$Q_{gd}$			14.6	28	
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V$ $f=1MHz$		10773		pF
Output Capacitance	$C_{oss}$			233		
Reverse Transfer Capacitance	$C_{rss}$			155		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, I_D=1A, V_{GS}=10V$ $R_G=3.3\Omega$		23	46	nS
	$t_r$			11	22	
Turn-Off Time	$t_{d(off)}$			57	114	
	$t_f$			26	58	



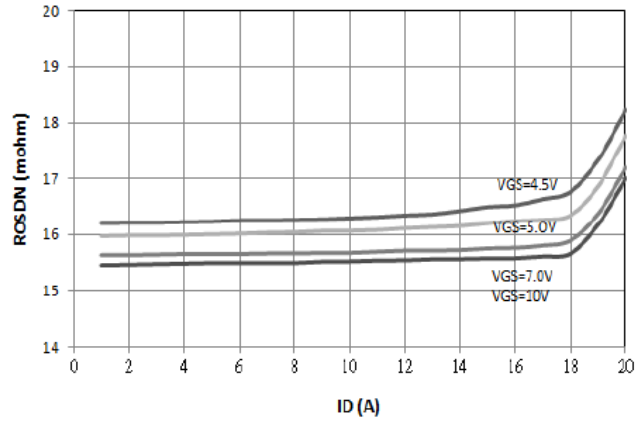
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## TYPICAL CHARACTERISTICS

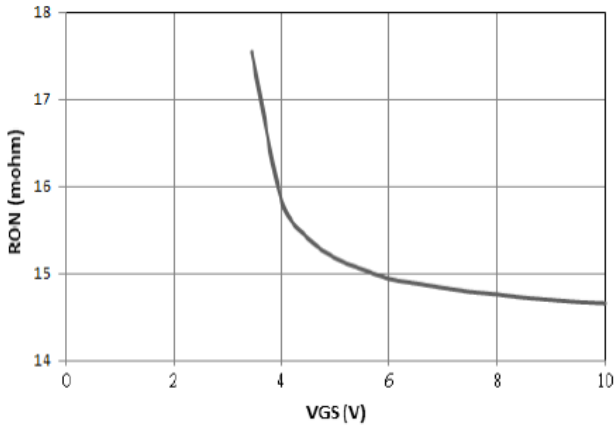
TYPICAL OUTPUT CHARACTERISTICS



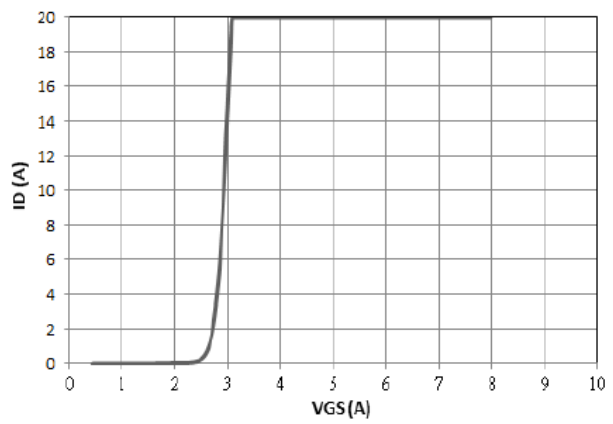
ON-RESISTANCE VS. DRAIN CURRENT AND GATE VOLTAGE



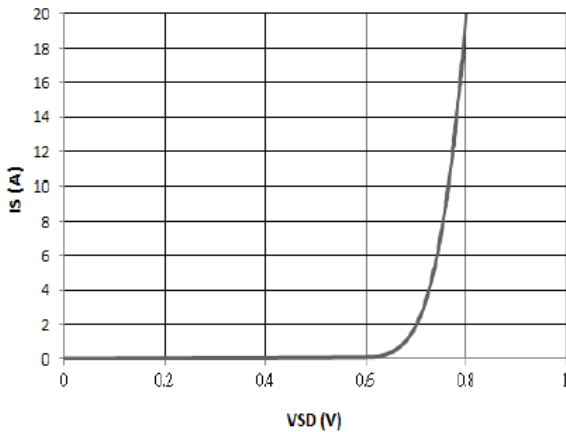
ON-RESISTANCE VS. GATE-SOURCE VOLTAGE



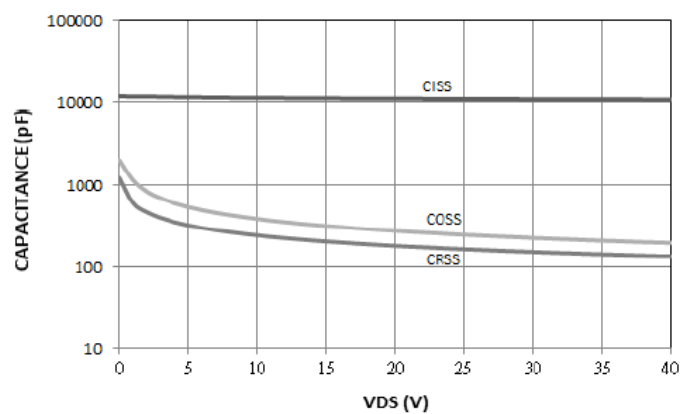
TYPICAL TRANSFER CHARACTERISTICS



TYPICAL SOURCE-DRAIN DIODE FORWARD VOLTAGE



TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE

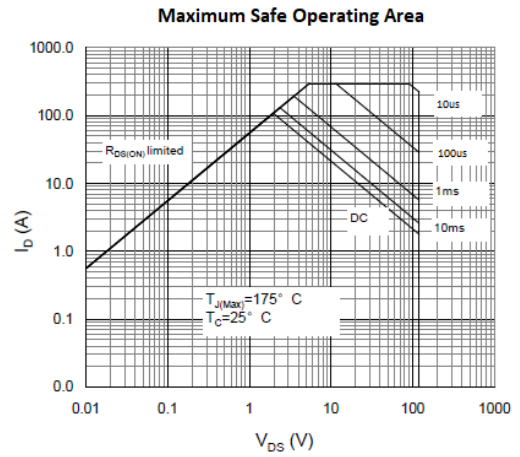
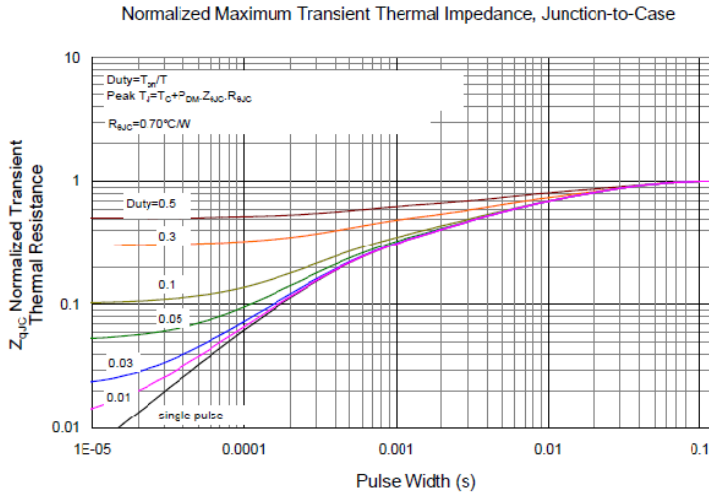




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### TYPICAL CHARACTERISTICS





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