



SPN8620

Dual N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN8620 is a dual N-Channel logic enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. The SPN8620 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.

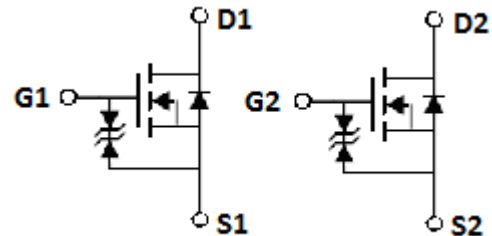
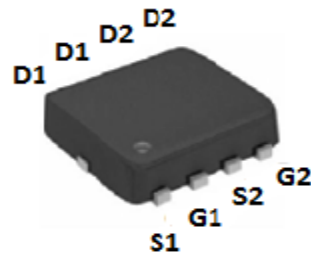
FEATURES

- ◆ 20V/4A, $R_{DS(ON)}=12m\Omega@V_{GS}=4.5V$
- ◆ 20V/2A, $R_{DS(ON)}=14m\Omega@V_{GS}=2.5V$
- ◆ 20V/1.5A, $R_{DS(ON)}=21m\Omega@V_{GS}=1.8V$
- ◆ High density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ PPAK3x3-8L* package design

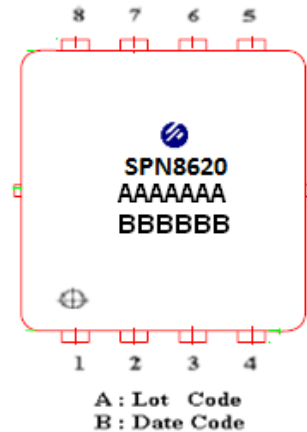
APPLICATIONS

- Powered System
- DC/DC Converter
- Load Switch

PIN CONFIGURATION (PPAK3x3-Dual 8L)



PART MARKING





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PIN DESCRIPTION

Pin	Symbol	Description
1	S1	Source
2	G1	Gate
3	S2	Source
4	G2	Gate
5	D2	Drain
6	D2	Drain
7	D1	Drain
8	D1	Drain

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN8620DN8RGB	PPAK3x3-Dual 8L	SPN8620

※ SPN8620DN8RGB : Tape Reel ; Pb – Free ; Halogen - Free

ABSOLUTE MAXIMUM RATINGS

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DSS}	20	V
Gate –Source Voltage	V_{GSS}	± 12	V
Continuous Drain Current*	I_D	$T_C=25^{\circ}\text{C}$	25
		$T_C=70^{\circ}\text{C}$	19
Pulsed Drain Current	I_{DM}	100	A
Power Dissipation @ $T_C=25^{\circ}\text{C}$	P_D	26	W
Operating Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^{\circ}\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JC}$	4.8	$^{\circ}\text{C}/\text{W}$

*Limited by the package.



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ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5		1	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 10	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V$			1	μA
		$V_{DS}=16V, V_{GS}=0V$ $T_J=55^\circ C$			5	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=4A$			12	$m\Omega$
		$V_{GS}=2.5V, I_D=2A$			14	$m\Omega$
		$V_{GS}=1.8V, I_D=1.5A$			21	$m\Omega$
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=5A$		12		S
Gate resistance	R_g	$f=1MHz$		1.8		Ω
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$			1	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V$ $I_D=5A$		17		nC
Gate-Source Charge	Q_{gs}			1.1		
Gate-Drain Charge	Q_{gd}			4		
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V$ $f=1MHz$		1020		pF
Output Capacitance	C_{oss}			160		
Reverse Transfer Capacitance	C_{rss}			110		
Turn-On Time	$t_{d(on)}$	$V_{DD}=10V, I_D=10A,$ $V_{GEN}=10V, R_G=1.5\Omega$		6.8		nS
	t_r			20		
Turn-Off Time	$t_{d(off)}$			42		
	t_f			13.7		



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TYPICAL CHARACTERISTICS

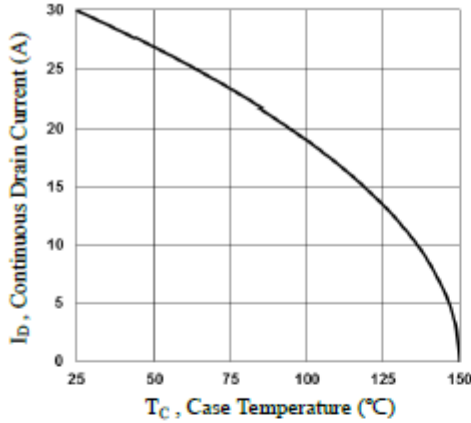


Fig.1 Continuous Drain Current vs. T_C

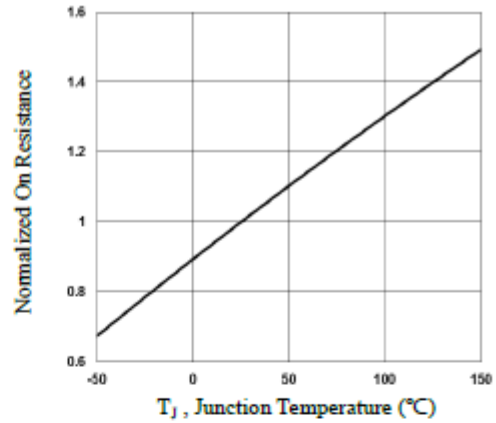


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

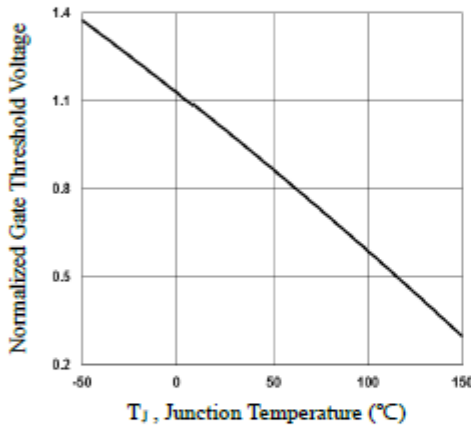


Fig.3 Normalized V_{th} vs. T_J

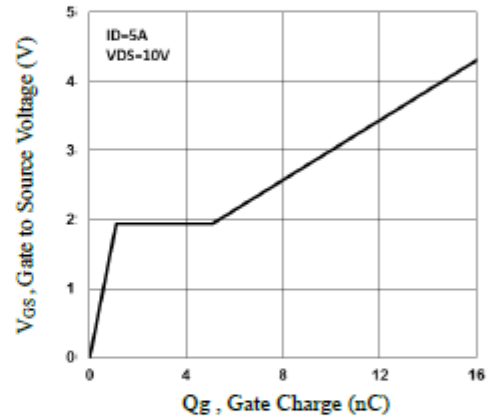


Fig.4 Gate Charge Waveform

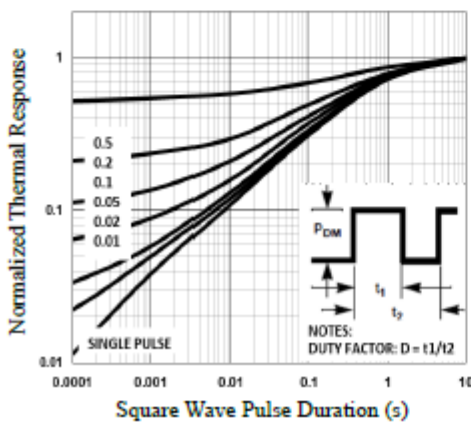


Fig.5 Normalized Transient Response

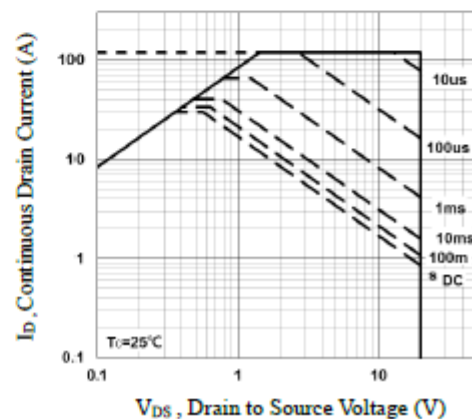


Fig.6 Maximum Safe Operation Area



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