



SPN8846

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN8846 is the N-Channel logic enhancement mode power field effect transistor which is produced using super 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 RDS(ON) and fast switching speed.

FEATURES

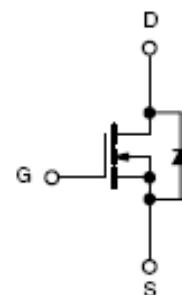
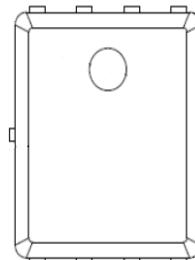
- ◆ 40V/125A, R_{DS(ON)}=2.5mΩ@V_{GS}=10V
- ◆ 40V/125A, R_{DS(ON)}=3.6mΩ@V_{GS}=4.5V
- ◆ Super high density cell design for extremely low R_{DS (ON)}
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ PPAK5x6-8L package design

APPLICATIONS

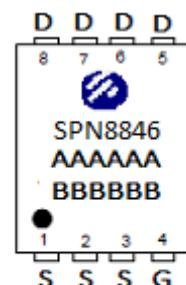
- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier
- Motor Control
- Power Tool

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
SPN8846DN8RGB	PPAK5x6-8L	SPN8846

※ SPN8846DN8RGB : Tape&Reel ; Pb – Free ; Halogen - Free

ABSOULTE MAXIMUM RATINGS

(TA=25°C 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°C	101	A
	T _c =100°C		
Pulsed Drain Current	I _{DM}	220	A
Avalanche Current	I _{AS}	38	A
Avalanche Energy with Single Pulse (T _c =25°C , L = 0.4mH.)	E _{AS}	288.5	mJ
Power Dissipation @ T _c =25°C	P _D	83	W
Operating Junction Temperature	T _J	-55~150	°C
Storage Temperature Range	T _{STG}	-55~150	°C
Thermal Resistance-Junction to Case	R _{θJC}	1.5	°C/W

Note :

The maximum current rating is package limited at 80A for PPAK5x6-8L



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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 =250uA	40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1	1.8	2.2	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V T _J = 25 °C			1	uA
		V _{DS} =40V, V _{GS} =0V T _J = 125 °C			100	
Drain-Source On-Resistance	R _{DSS(on)}	V _{GS} =10V, I _D =20A			2.5	mΩ
		V _{GS} =4.5V, I _D =20A			3.6	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =20A		75		S
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =Open, f=1MHz		1.5		Ω
Diode Forward Voltage	V _{SD}	I _F =1A, V _{GS} =0V			1	V
Dynamic						
Total Gate Charge (10V)	Q _g	V _{DS} =20V, V _{GS} =10V ID=20A		44		nC
Total Gate Charge (4.5V)	Q _g			23		
Gate-Source Charge	Q _{gs}			7.5		
Gate-Drain Charge	Q _{gd}			5.5		
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V f=1MHz		2648		pF
Output Capacitance	C _{oss}			899		
Reverse Transfer Capacitance	C _{rss}			71		
Turn-On Time	td(on)	V _{DD} =20V, ID=20A V _{GEN} =10V, R _G =3Ω		10		nS
	tr			5		
Turn-Off Time	td(off)			33		
	tf			6.5		



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TYPICAL CHARACTERISTICS

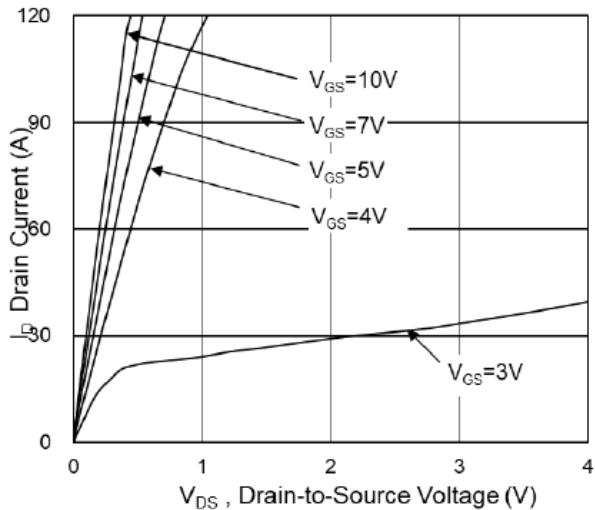


Fig. 1 Typical Output Characteristics

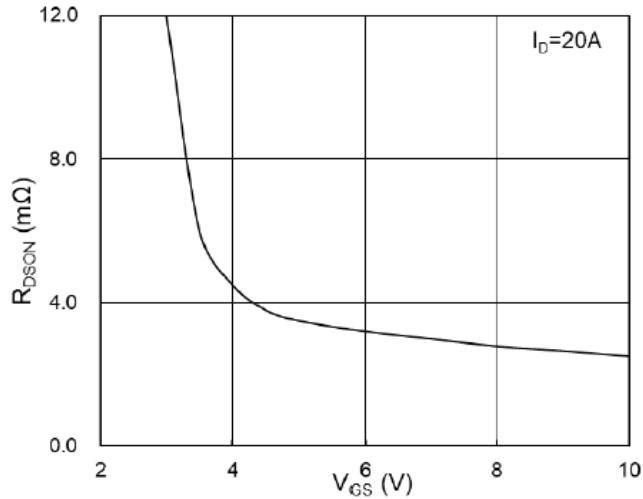


Fig. 2 On-Resistance vs. Vgs

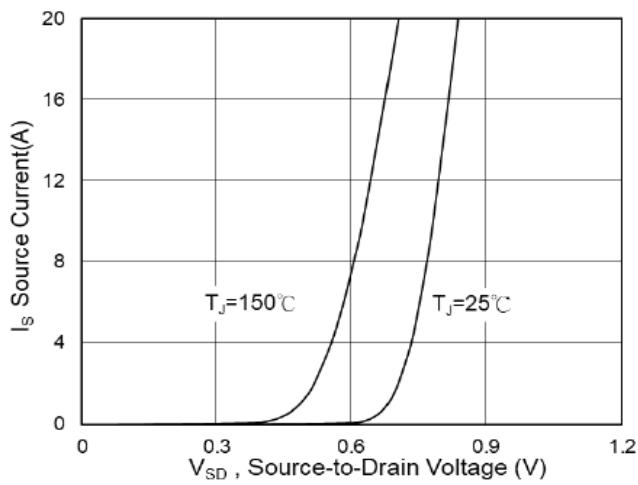


Fig. 3 Source-Drain Forward Characteristics

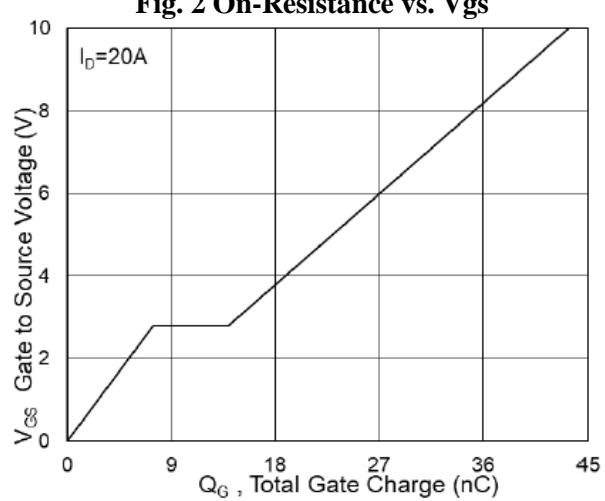


Fig. 4 Gate Charge Characteristics

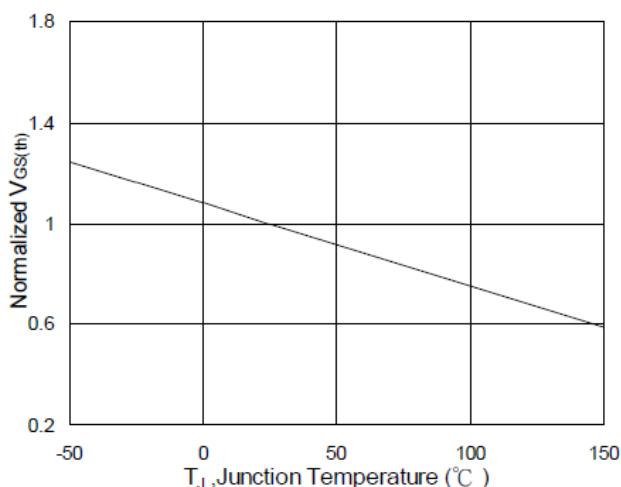


Fig. 5 Normalized Vgs vs Tj

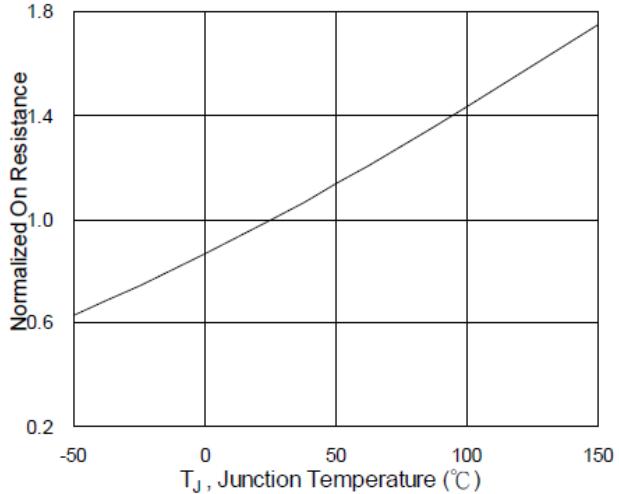


Fig. 6 Normalized Rdson vs Tj



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TYPICAL CHARACTERISTICS

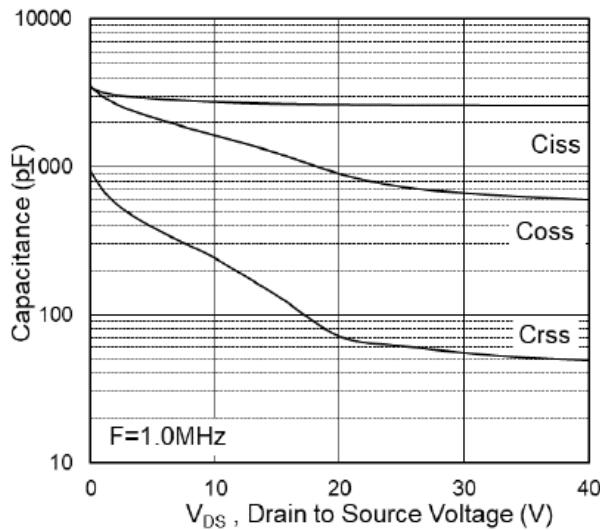


Fig. 7 Capacitance

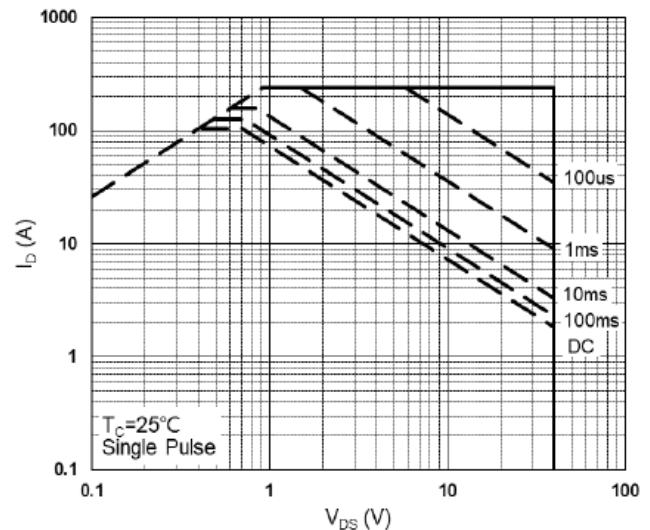


Fig. 8 Safe Operation Area

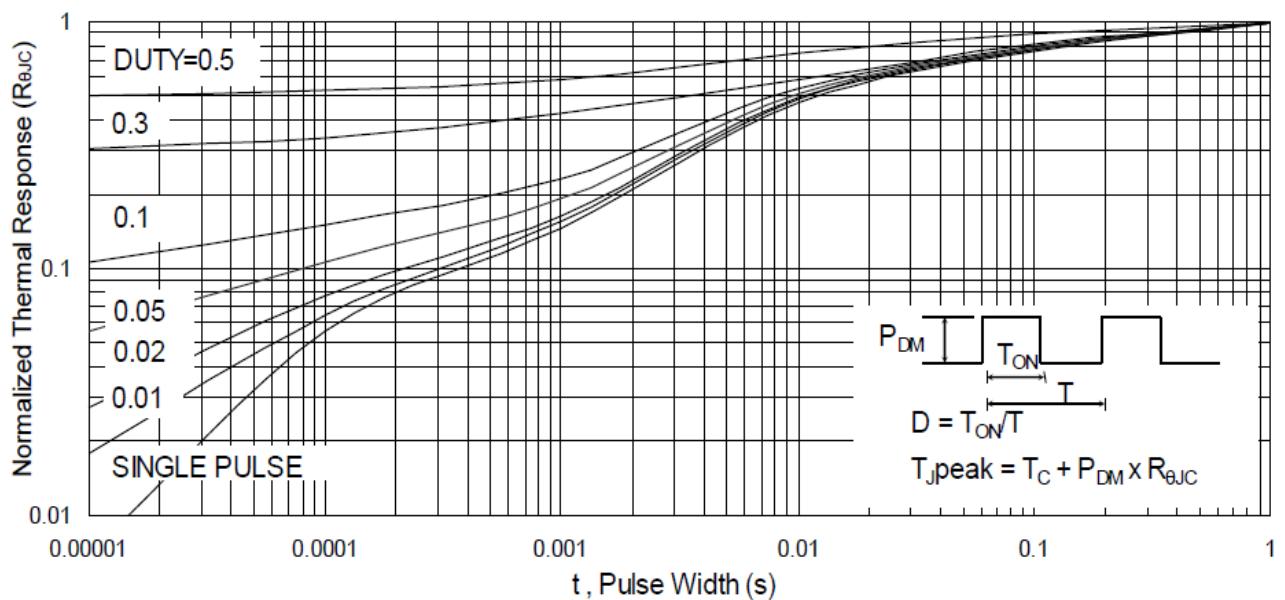


Fig. 9 Normalized Maximum Transient Thermal Impedance



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