SPN8830
N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN8830 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. The SPN8830 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.

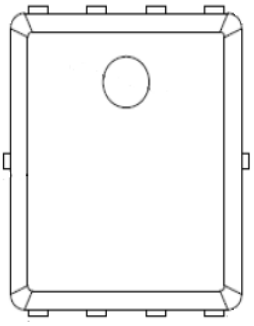
APPLICATIONS

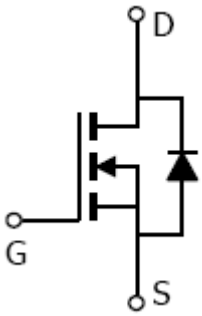
- High Frequency Synchronous Buck Converter
- DC/DC Power System
- Load Switch

FEATURES

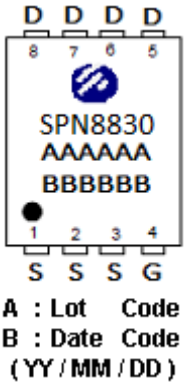
- 30V/100A,$R_{DS(ON)}$=1.3mΩ@V_{GS}=10V
- 30V/100A,$R_{DS(ON)}$=2.0mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- PPAK5x6-8L package design

PIN CONFIGURATION(PPAK5x6-8L)





PART MARKING



A : Lot Code
B : Date Code
(YY / MM / DD)

SPN8830
N-Channel Enhancement Mode MOSFET

PPAK5x6-8L 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
SPN8830DN8RGB	PPAK5x6-8L	SPN8830

※ SPN8830DN8RGB : Tape Reel ; Pb – Free ; Halogen - Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Silicon Limited)	T_C=25℃	I_D	100	A
	T_C=100℃		97	
Pulsed Drain Current		I_{DM}	350	A
Avalanche Current		I_{AS}	25	A
Single Pulse Avalanche Energy (T_C=25℃, L=0.4mH)		E_{AS}	125	mJ
Power Dissipation	T_C=25℃	P_D	62.5	W
Operating Junction Temperature		T_J	-55 to 150	℃
Storage Temperature Range		T_{STG}	-55 to 150	℃
Thermal Resistance-Junction to Case		$R_{\theta JC}$	2.0	℃/W

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	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.2	1.6	2.2	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V,T_J=25℃			1	uA
		V_{DS}=24V,V_{GS}=0V,T_J=55℃			5	
On-State Drain Current	$I_{D(on)}$	V_{DS}=5V,V_{GS}=10V			100	A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A		1.0	1.3	mΩ
		V_{GS}=4.5V,I_D=20A		1.7	2.0	
Gate Resistance	R_G	V_{DS}=0V, V_{GS}=0V,f=1MHz		1.0		Ω
Forward Transconductance	gfs	V_{DS}=5V,I_D=20A		35		S
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V			1.2	V
Dynamic						
Total Gate Charge(4.5V)	Qg	V_{DS}=15V,V_{GS}=0V,I_D=20A		45		
Gate-Source Charge	Qgs			9.8		
Gate-Drain Charge	Qgd			6.5		
Input Capacitance	Ciss	V_{DS}=15V,V_{GS}=0V,f=1MHz		3420		pF
Output Capacitance	Coss			1916		
Reverse Transfer Capacitance	Crss			196		
Turn-On Time	td(on)	V_{DD}=15V,V_{GS}=10V,I_D=20A R_G=3.3Ω		10.3		nS
	tr			6.2		
Turn-Off Time	td(off)			56		
	tf			8.4		

TYPICAL CHARACTERISTICS

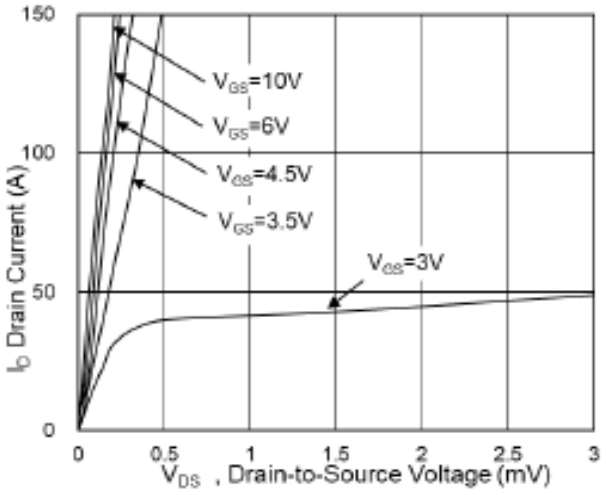


Fig. 1 Typical Output Characteristics

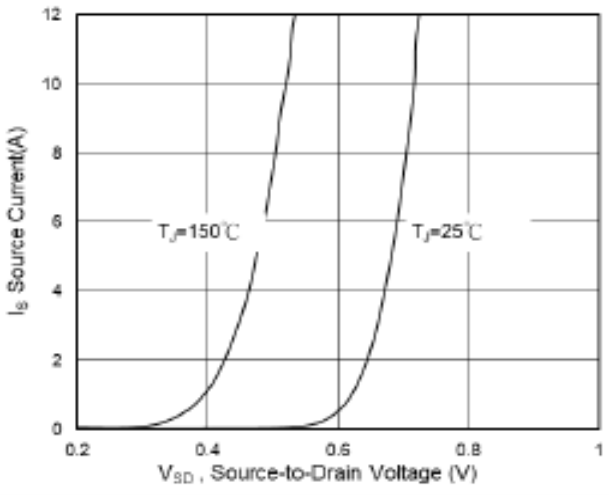


Fig. 2 Source Drain Forward Characteristics

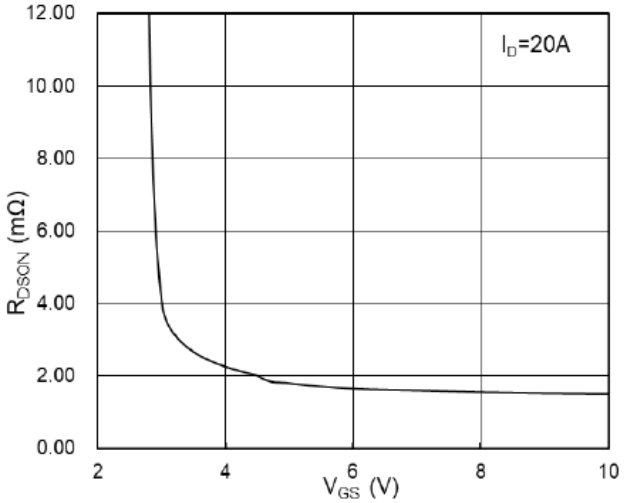


Fig. 3 On-Resistance vs G-S voltage

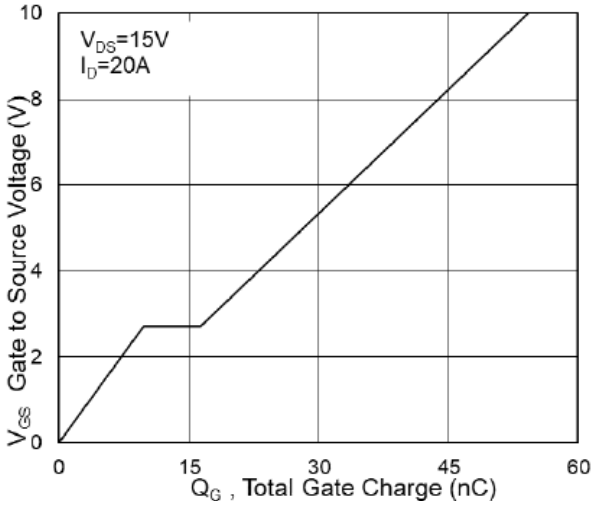


Fig. 4 Gate Charge Characteristics

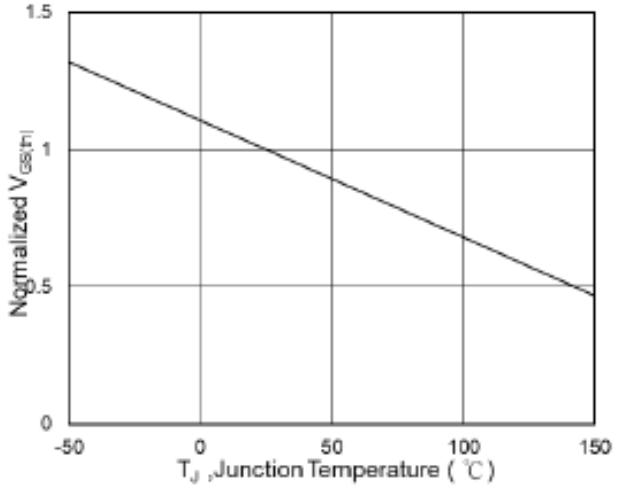


Fig. 5 Normalized $V_{GS(th)}$ vs T_J

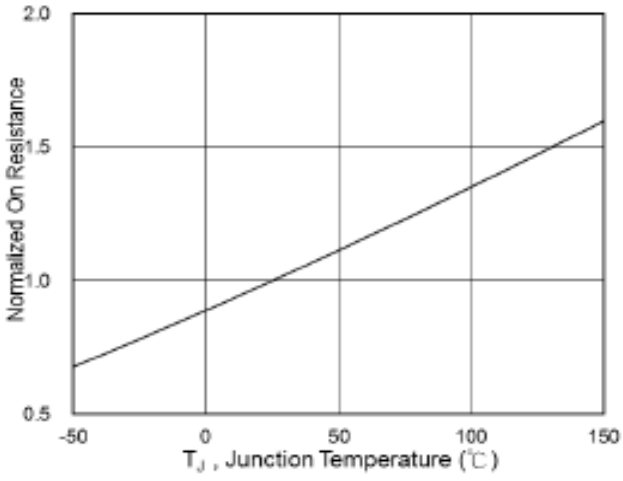


Fig. 6 Normalized R_{DSON} vs T_J

TYPICAL CHARACTERISTICS

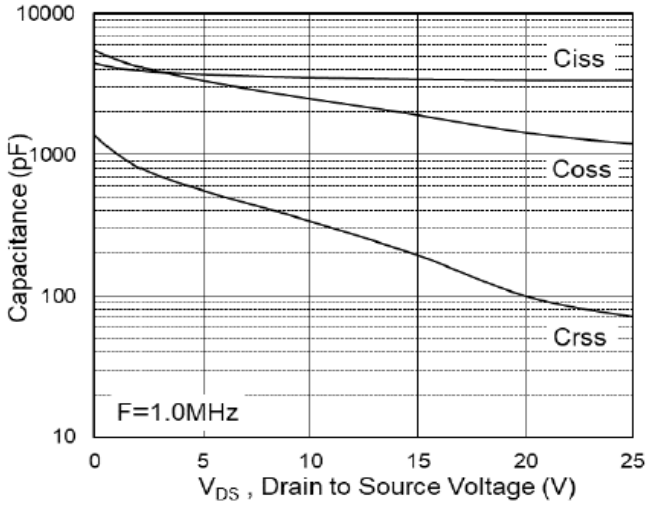


Fig. 7 Typical Capacitance Characteristics

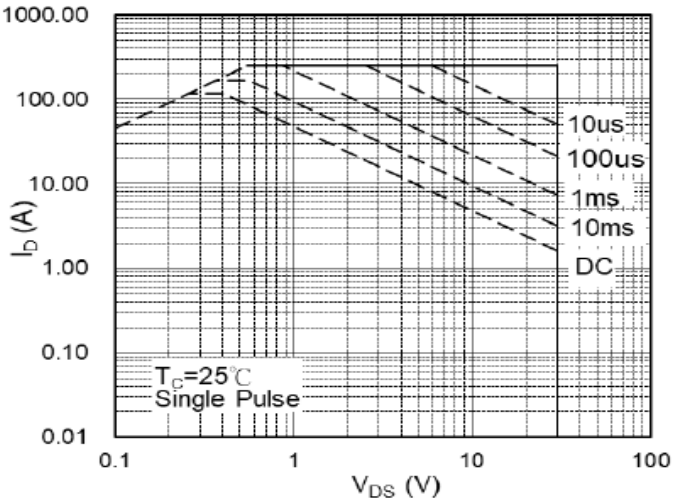


Fig. 8 Maximum Safe Operation Area

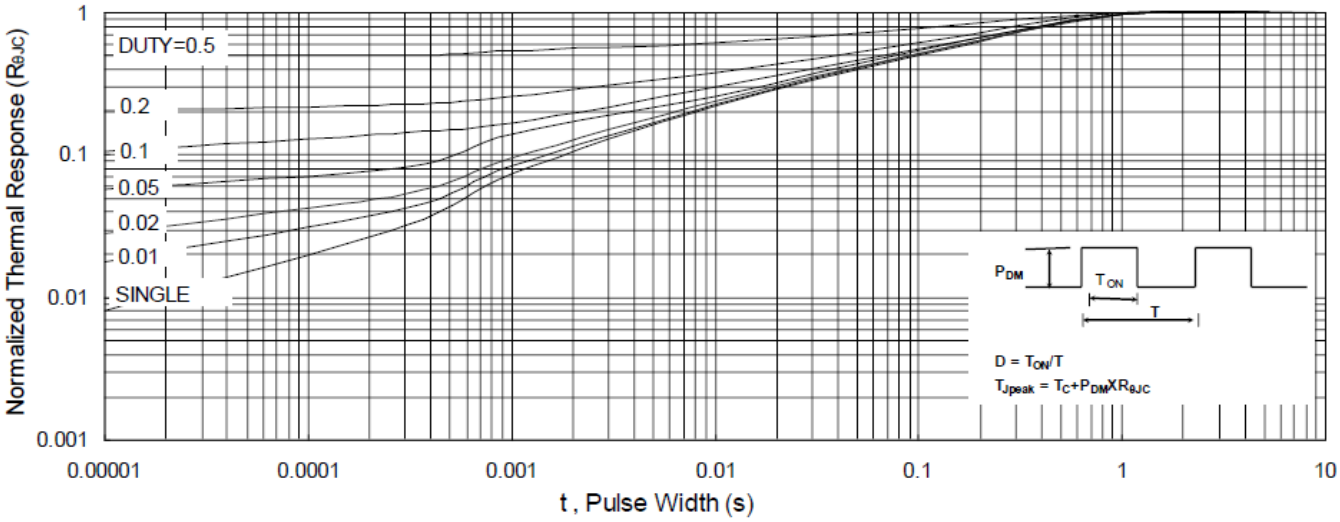


Fig. 9 Normalized Maximum Transient Thermal Impedance

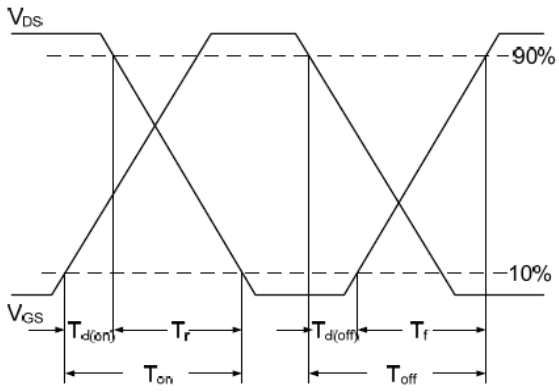


Fig. 10 Switching Time Waveform

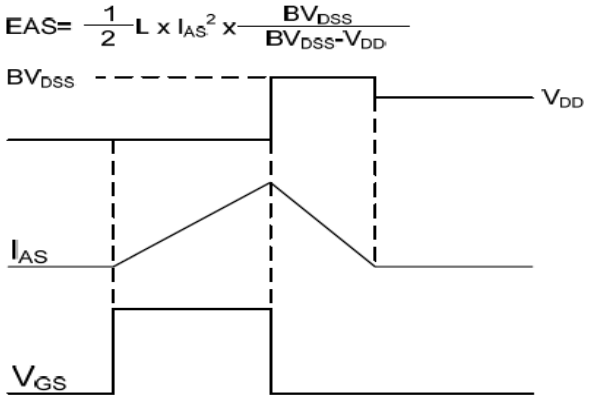


Fig. 11 Unclamped Inductive Switching Waveform

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