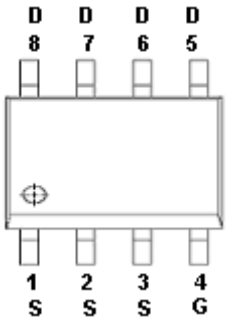
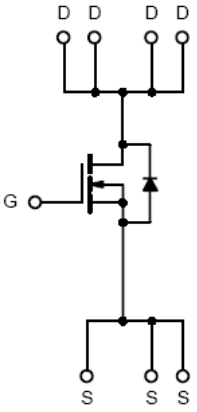
SPN4860
N-Channel Enhancement Mode MOSFET

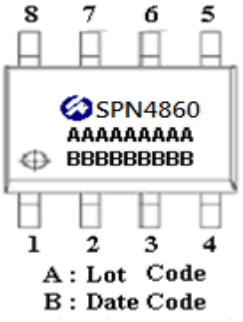
DESCRIPTION
The SPN4860 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.
This high density process is especially tailored to minimize on-state resistance.
These devices are particularly suited for low voltage application , notebook computer power management and other battery powered circuits where high-side switching .

APPLICATIONS
- DC/DC Converter
- Load Switch
- Synchronous Buck Converter
- UPS
- Motor Control
- Power Tool

FEATURES
- 60V/20A,$R_{DS(ON)}$=4.8mΩ@V_{GS}=10V
- 60V/20A,$R_{DS(ON)}$=6.3mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOP–8 package design

PIN CONFIGURATION(SOP–8)




PART MARKING


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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
SPN4860S8RGB	SOP-8	SPN4860

※ SPN4860S8RGB : 13" Tape Reel ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	21	A
	T_A=70℃		13	
Pulsed Drain Current		I_{DM}	140	A
Avalanche Energy Single Pulse(L=0.3mH, T_C=25℃)		E_{AS}	240	mJ
Power Dissipation	T_A=25℃	P_D	3.1	W
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	80	℃/W

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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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0	1.8	2.4	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V T_J=25℃			1	uA
		V_{DS}=48V,V_{GS}=0V T_J=100℃			100	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A		3.8	4.8	mΩ
		V_{GS}=4.5V,I_D=20A		4.8	6.3	
Forward Transconductance	gfs	V_{DS}=5V,I_D=20A		58		S
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=Open,f=1MHz		1.6		Ω
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V		0.9	1.2	V
Dynamic						
Total Gate Charge(10V)	Q_g	V_{DS}=30V,V_{GS}=10V I_D=20A		49		nC
Total Gate Charge(4.5V)	Q_g			24		
Gate-Source Charge	Q_{gs}			8		
Gate-Drain Charge	Q_{gd}			9		
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V f=1MHz		3250		pF
Output Capacitance	C_{oss}			1200		
Reverse Transfer Capacitance	C_{rss}			45		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V, I_D=20A,V_{GEN}=10V R_G=10Ω		12		nS
	t_r			10		
Turn-Off Time	$t_{d(off)}$			55		
	t_f			15		
Reverse Recovery Time	trr	V_R=30V, I_F=20A, dI_F/dt=300A/uS		50		nS
Reverse Recovery Charge	Qrr			120		nC

TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

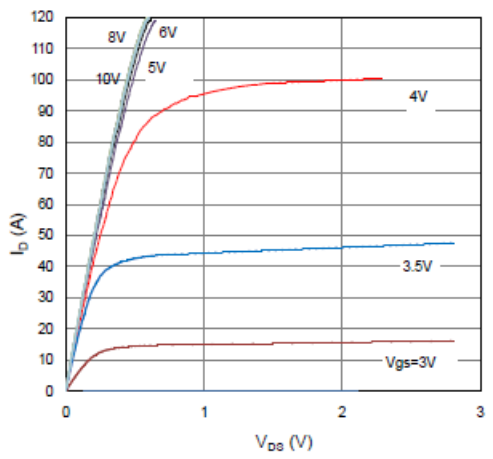


Figure 2. On-Resistance vs. Gate-Source Voltage

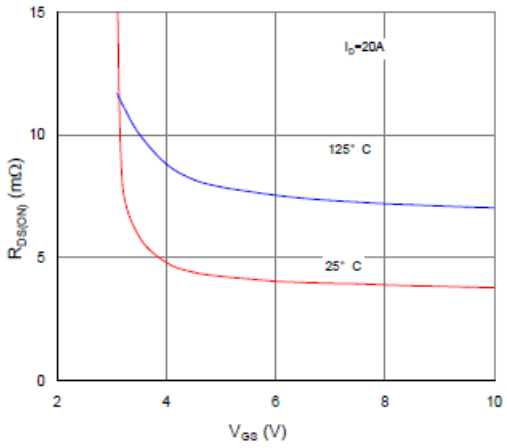


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

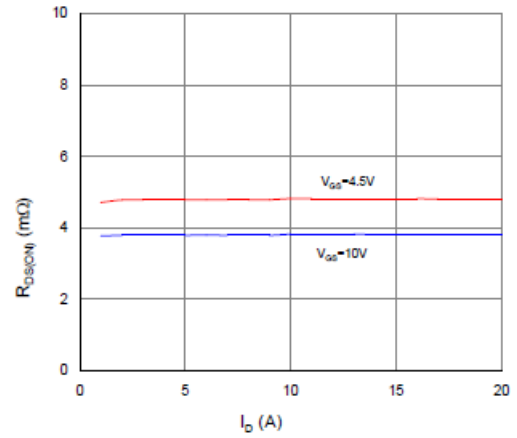


Figure 4. Normalized On-Resistance vs. Junction Temperature

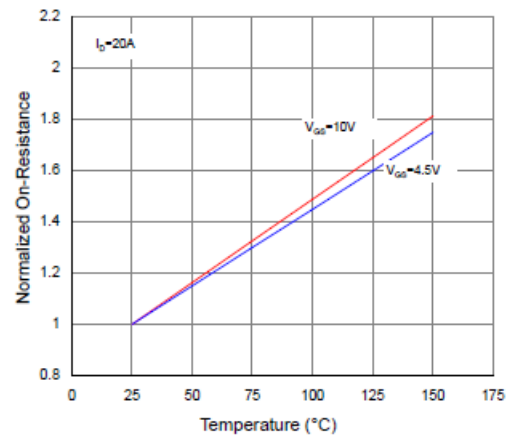


Figure 5. Typical Transfer Characteristics

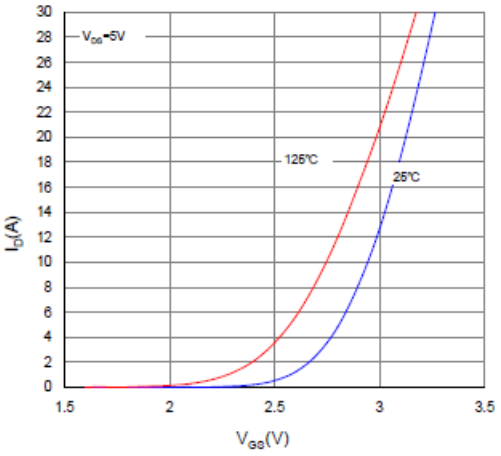
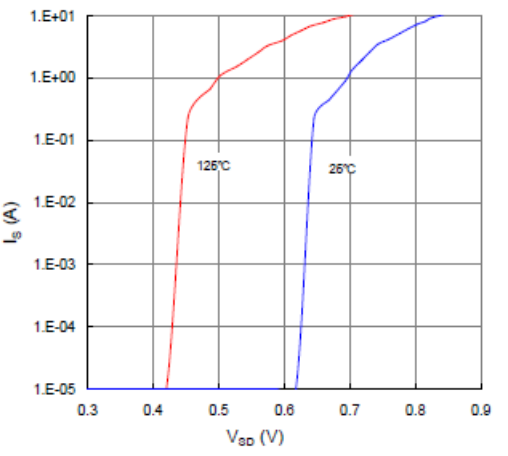


Figure 6. Typical Source-Drain Diode Forward Voltage



TYPICAL CHARACTERISTICS

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

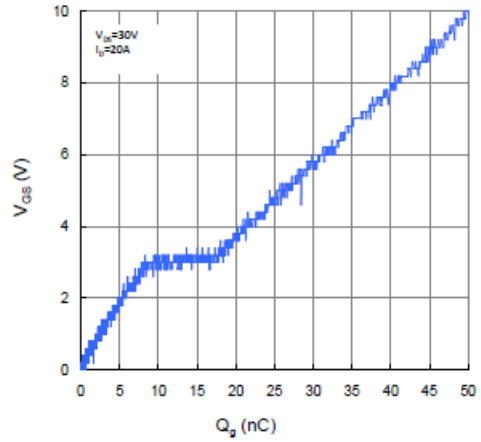


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

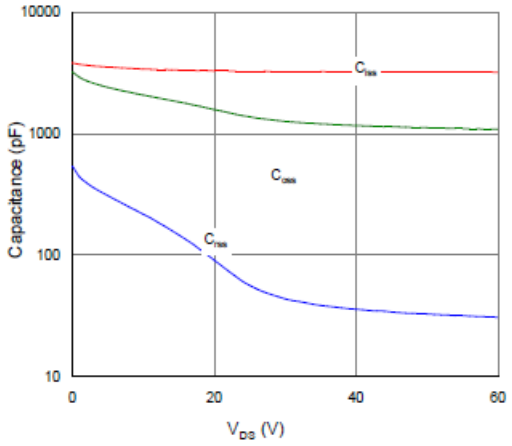


Figure 9. Maximum Safe Operating Area

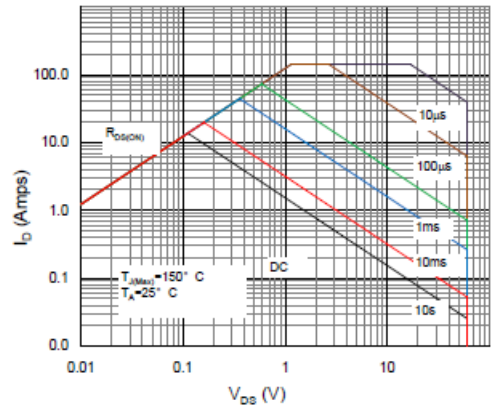


Figure 10. Maximun Drain Current vs. Case Temperature

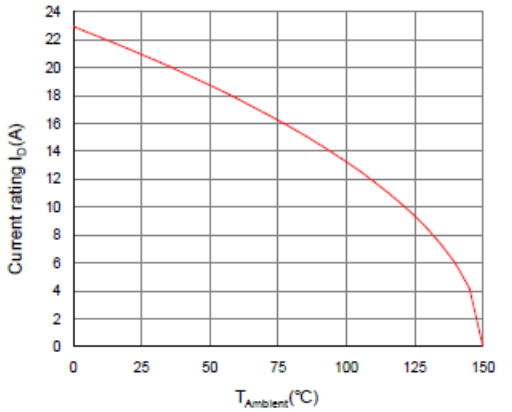
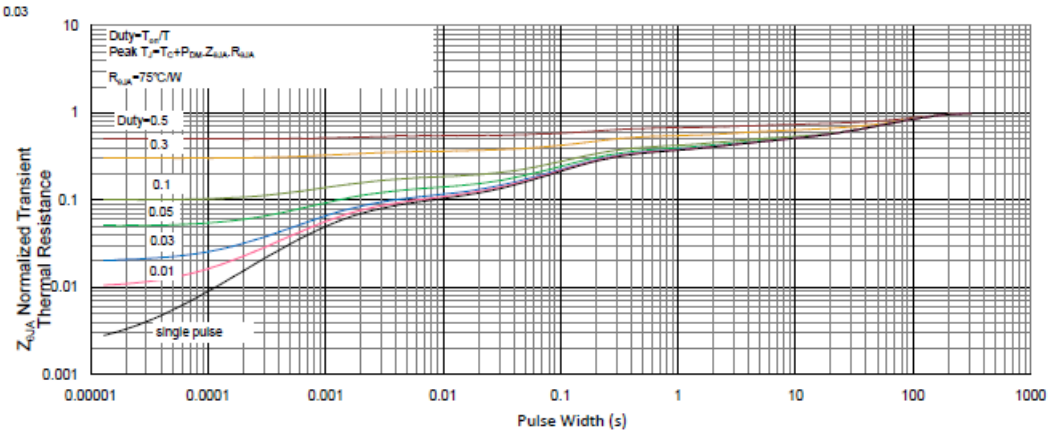


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



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