



SPN8644 N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN8644 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 .

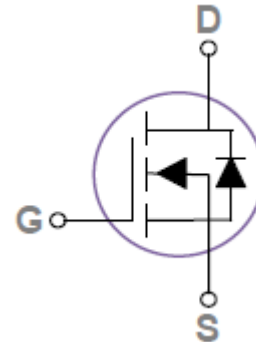
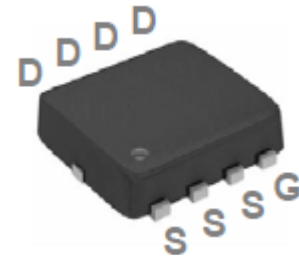
FEATURES

- ◆ 45V/52A, $R_{DS(ON)}=9.5m\Omega@V_{GS}=10V$
- ◆ 45V/52A, $R_{DS(ON)}=14m\Omega@V_{GS}=4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ PPAK3x3-8L package design

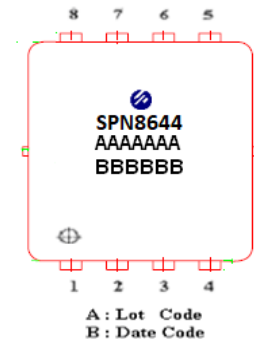
APPLICATIONS

- MB/VGA/Vcore
- POL Applications
- SMPS 2nd SR
- Charger Adapter
- LED Lighting
- Load Switch

PIN CONFIGURATION(PPAK3x3-8L)



PART MARKING





SPN8644

N-Channel Enhancement Mode MOSFET

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
SPN8644DN8RGB	PPAK3x3-8L	SPN8644

※ SPN8644DN8RGB : 13" Tape Reel ; Pb – Free; Halogen - Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V _{DSS}	45	V	
Gate –Source Voltage	V _{GSS}	±20	V	
Continuous Drain Current(Silicon Limited)	I _D	TA=25°C	52	A
		TA=100°C	33	
Pulsed Drain Current	I _{DM}	120	A	
Power Dissipation	P _D	7	W	
Operating Junction Temperature	T _J	-55/150	°C	
Storage Temperature Range	T _{STG}	-55/150	°C	
Thermal Resistance-Junction to Ambient	R _{θJA}	62	°C/W	



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ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$V_{GS}=0V, I_D=250\mu A$	45			V	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.0	1.55	2.2		
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=45V, V_{GS}=0V,$ $T_J = 25^\circ C$			1	uA	
		$V_{DS}=45V, V_{GS}=0V,$ $T_J = 100^\circ C$			100		
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		7.5	9.5	mΩ	
		$V_{GS}=4.5V, I_D=8A$		10	14		
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=10A$		25		S	
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}=0V, f=1MHz$		1.5		Ω	
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$		0.9	1.2	V	
Dynamic							
Total Gate Charge (10V)	Q_g	$V_{DS}=20V, V_{GS}=10V,$ $I_D = 10A$		14.5		nC	
Total Gate Charge (4.5V)	Q_g			7			
Gate-Source Charge	Q_{gs}			2			
Gate-Drain Charge	Q_{gd}			2.5			
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=20V,$ $f=1MHz$		942		pF	
Output Capacitance	C_{oss}			309			
Reverse Transfer Capacitance	C_{rss}			29			
Turn-On Time	$t_{d(on)}$	$(V_{DD}=20V, I_D=10A,$ $V_{GEN}=10V, R_G=10\Omega)$		6		ns	
	t_r			5			
Turn-Off Time	$t_{d(off)}$				21		
	t_f				5		



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TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

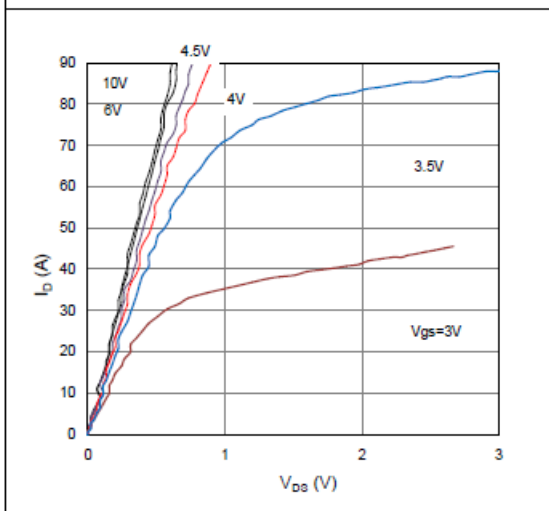


Figure 2. On-Resistance vs. Gate-Source Voltage

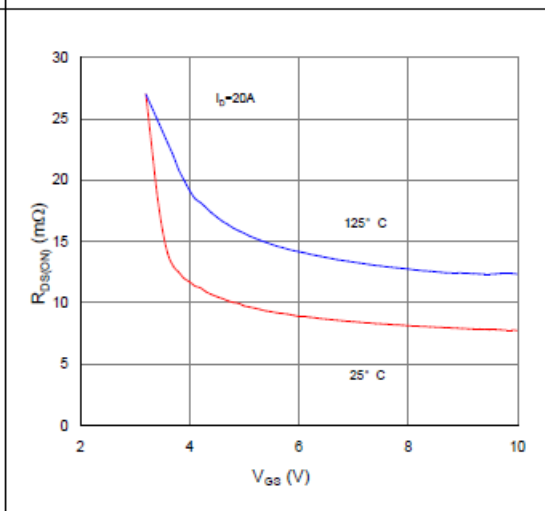


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

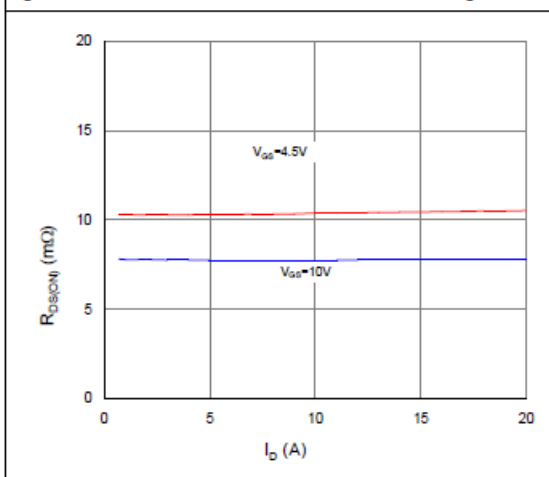


Figure 4. Normalized On-Resistance vs. Junction Temperature

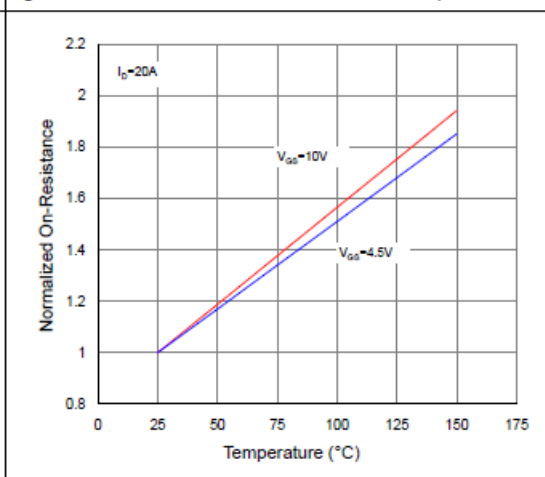


Figure 5. Typical Transfer Characteristics

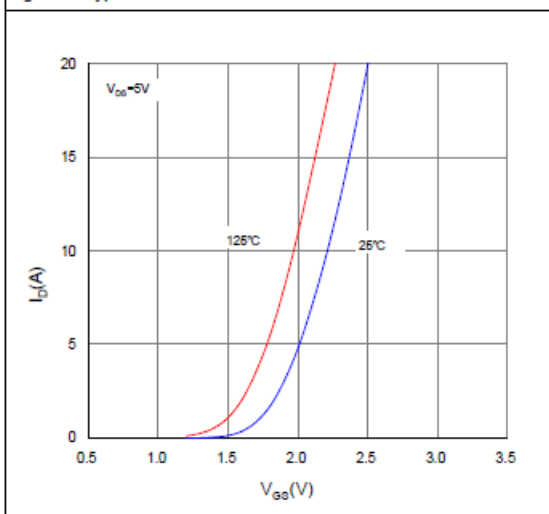
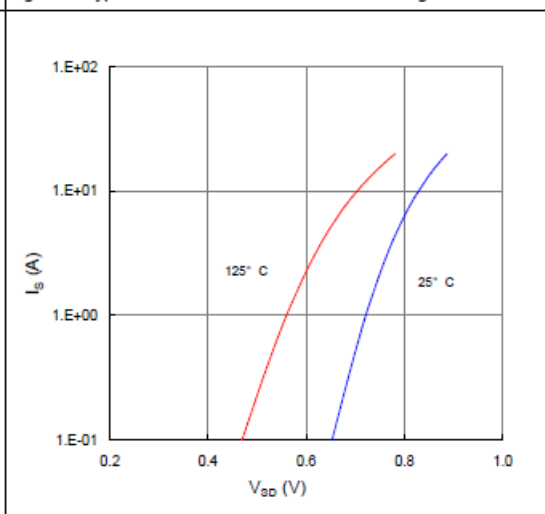


Figure 6. Typical Source-Drain Diode Forward Voltage





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TYPICAL CHARACTERISTICS

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

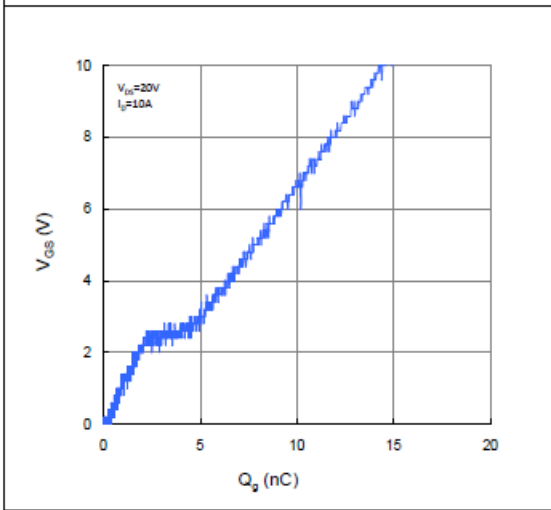


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

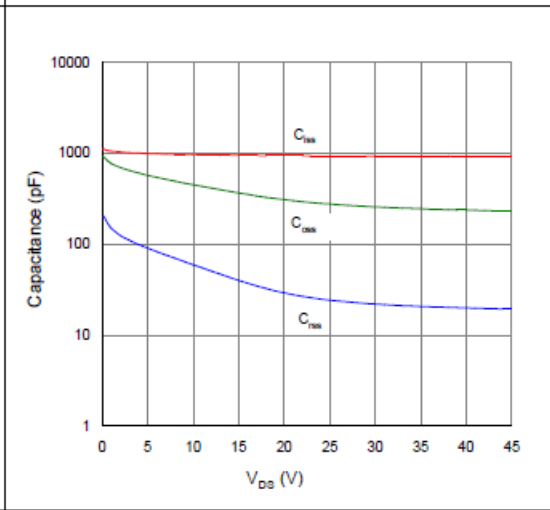


Figure 9. Maximum Safe Operating Area

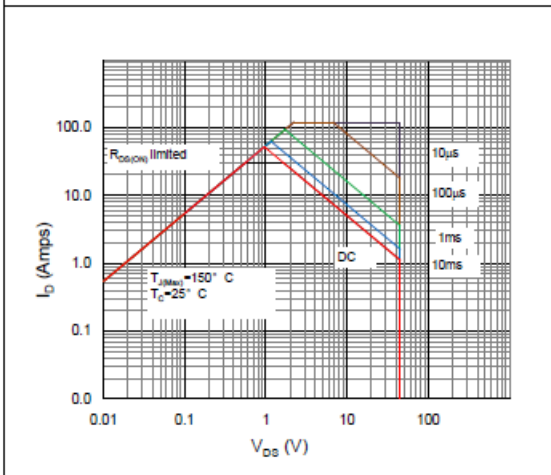


Figure 10. Maximum Drain Current vs. Case Temperature

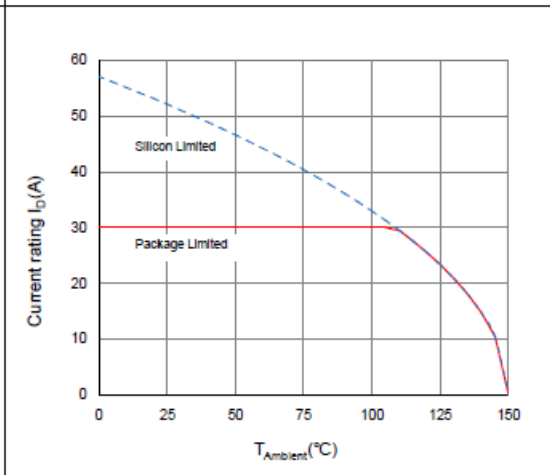
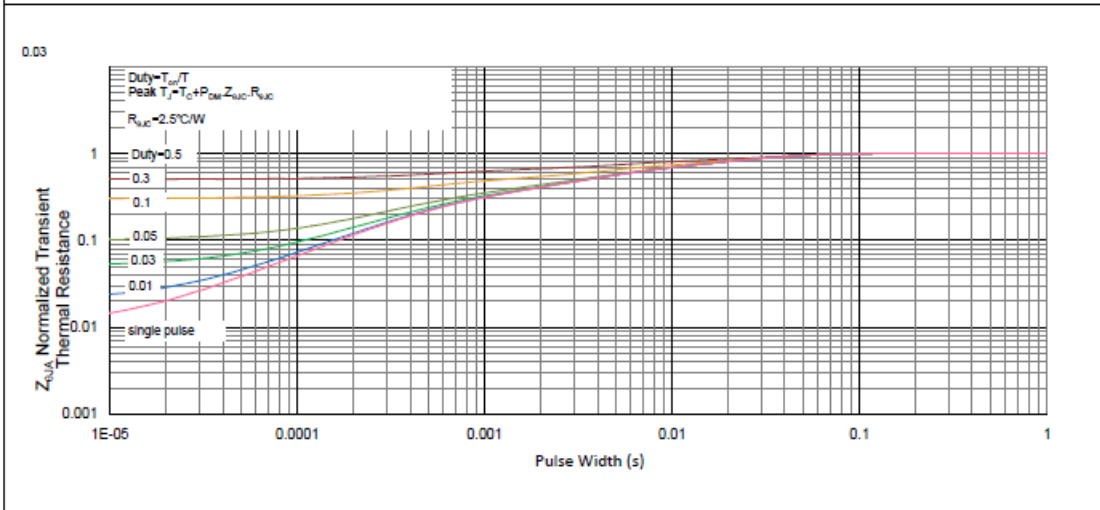


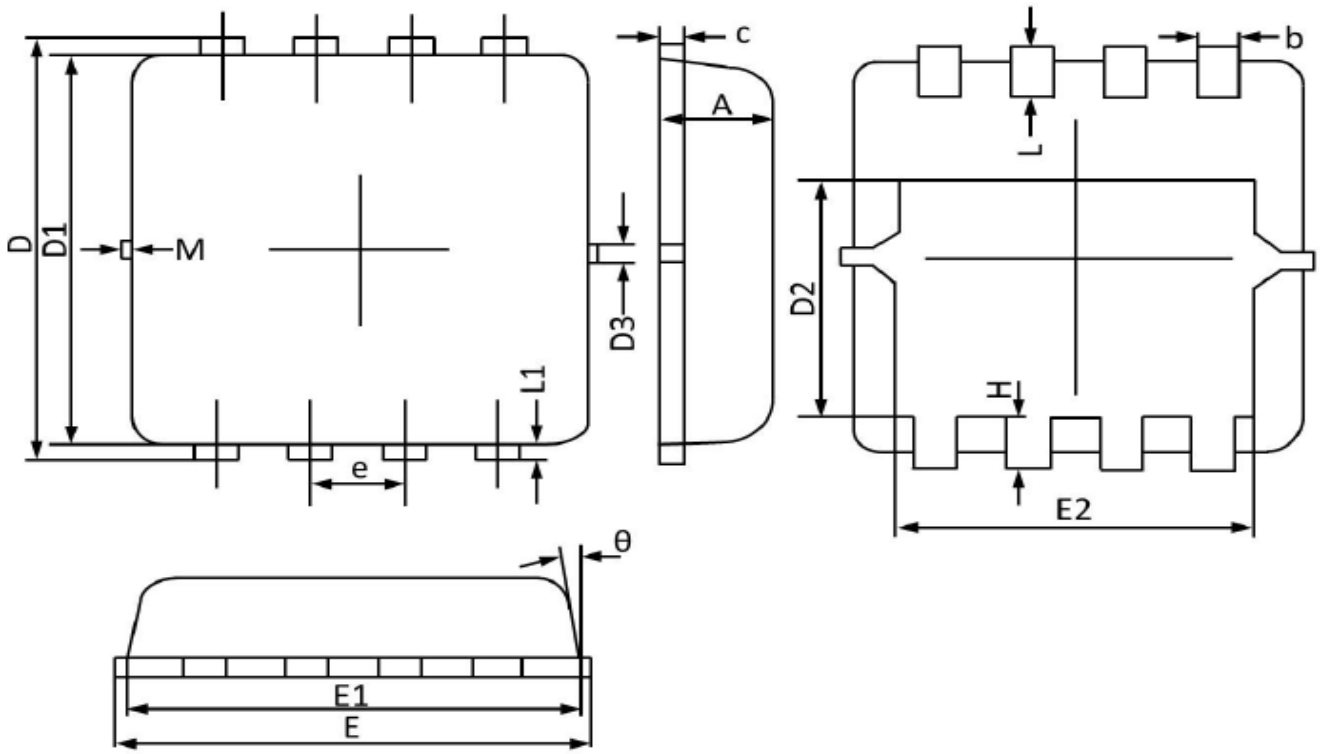
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient





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PPAK3x3-8L PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	



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