



SPN85T15A N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN85T15A is the N-Channel enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. The SPN85T15A 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.

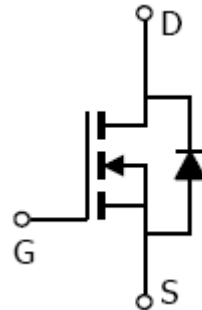
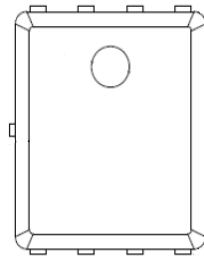
FEATURES

- ◆ 150V/86A, $R_{DS(ON)}=8.8m\Omega@V_{GS}=10V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ PPAK5x6-8L package design

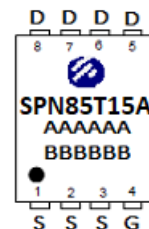
APPLICATIONS

- 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
SPN85T15ADN8RGB	PPAK5x6-8L	SPN85T15A

※ SPN85T15ADN8RGB : 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}	150	V	
Gate –Source Voltage	V_{GSS}	± 20	V	
Continuous Drain Current (Silicon Limited)	I_D	$T_C=25^{\circ}\text{C}$	86	A
		$T_C=100^{\circ}\text{C}$	54	
Pulsed Drain Current	I_{DM}	350	A	
Single Pulse Avalanche Energy ($T_C=25^{\circ}\text{C}$, $L=0.4\text{mH}$)	E_{AS}	320	mJ	
Power Dissipation	P_D	83	W	
Operating Junction Temperature	T_J	-55/150	$^{\circ}\text{C}$	
Storage Temperature Range	T_{STG}	-55/150	$^{\circ}\text{C}$	
Thermal Resistance-Junction to Case	$R_{\theta JC}$	1.5	$^{\circ}\text{C}/\text{W}$	



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ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	150			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=120V, V_{GS}=0V$ $T_J=25^\circ C$,			1	uA
		$V_{DS}=120V, V_{GS}=0V$, $T_J=100^\circ C$			100	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		7.9	8.8	mΩ
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$		70		S
Gate resistance	R_g	$V_{DS}=\text{Open}, V_{GS}=0V$ $f=1MHz$		0.95		Ω
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$		0.9	1.2	V
Dynamic						
Total Gate Charge	$Q_g(10V)$	$V_{DS}=75V, V_{GS}=10V$ $I_D=20A$		52		nC
Gate-Source Charge	Q_{gs}			19		
Gate-Drain Charge	Q_{gd}			5		
Input Capacitance	C_{iss}	$V_{DS}=75V, V_{GS}=0V$ $f=1MHz$		4362		pF
Output Capacitance	C_{oss}			333		
Reverse Transfer Capacitance	C_{rss}			11.5		
Turn-On Time	$t_{d(on)}$	$V_{DD}=75V$, $I_D=20A, V_{GS}=10V$ $R_G=10\Omega$		19		nS
	t_r			10		
Turn-Off Time	$t_{d(off)}$			29		
	t_f			12		



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TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

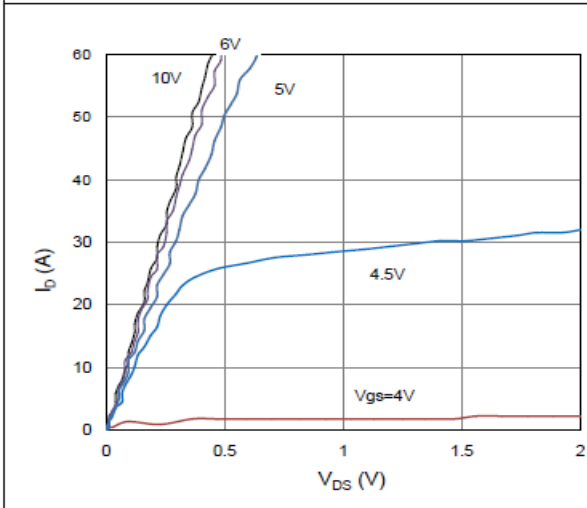


Figure 2. On-Resistance vs. Gate-Source Voltage

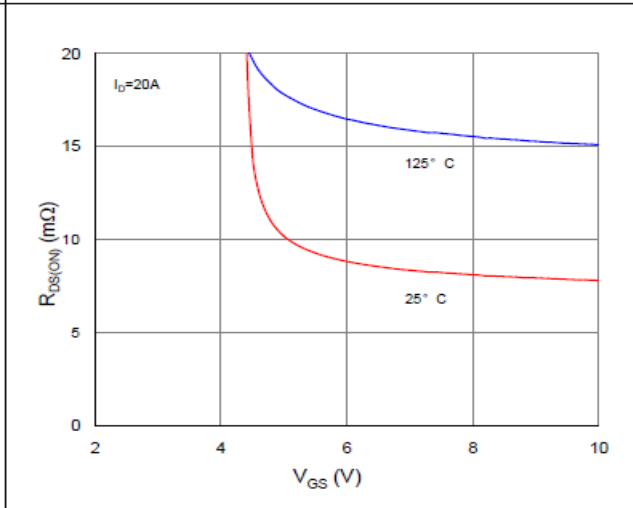


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

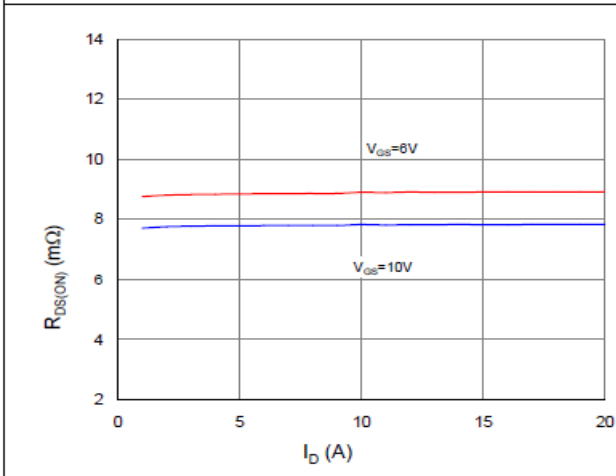


Figure 4. Normalized On-Resistance vs. Junction Temperature

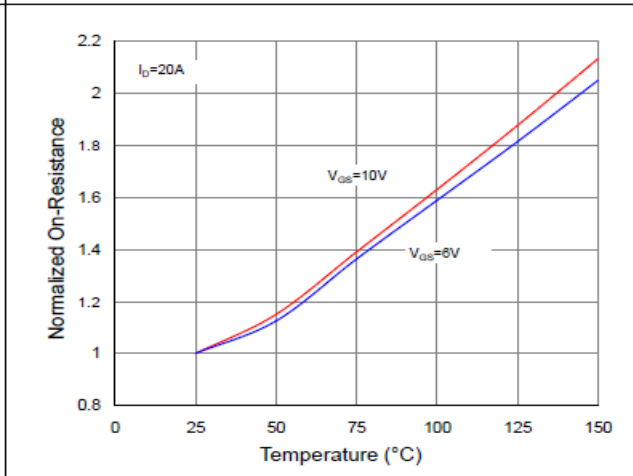


Figure 5. Typical Transfer Characteristics

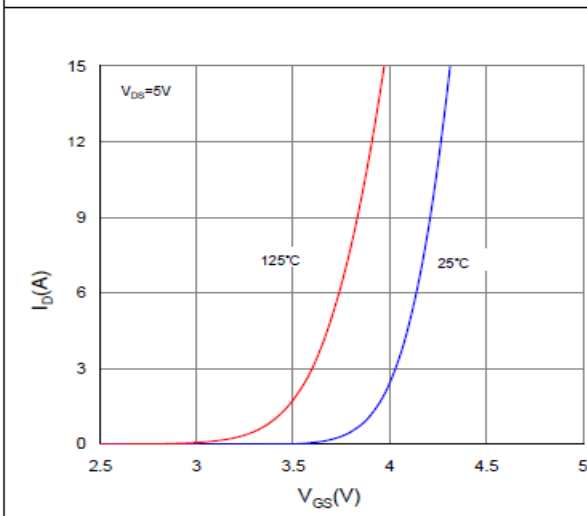
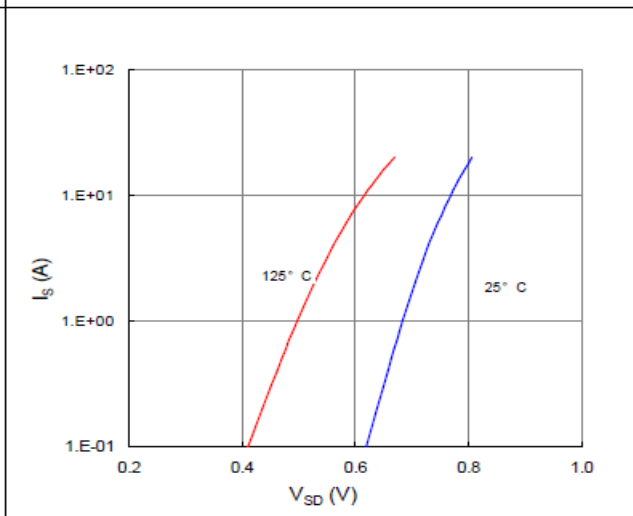


Figure 6. Typical Source-Drain Diode Forward Voltage





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TYPICAL CHARACTERISTICS

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

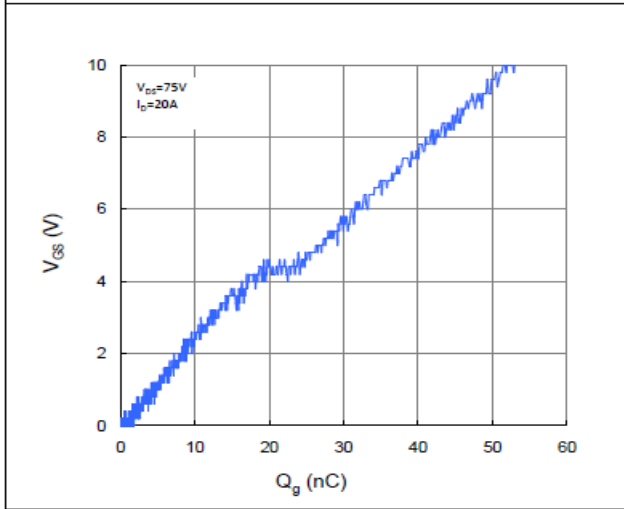


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

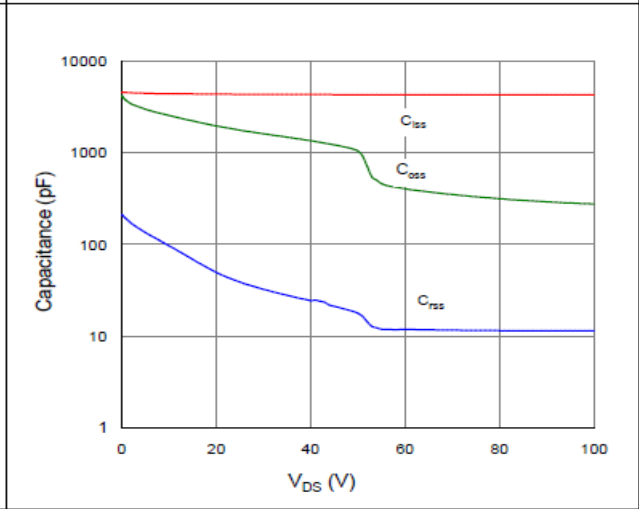


Figure 9. Maximum Safe Operating Area

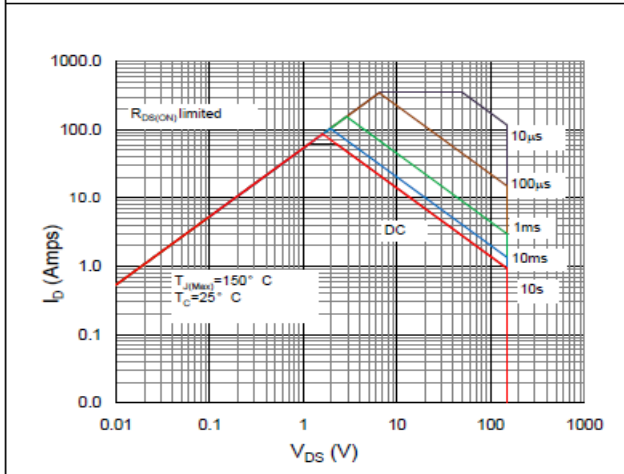


Figure 10. Maximum Drain Current vs. Case Temperature

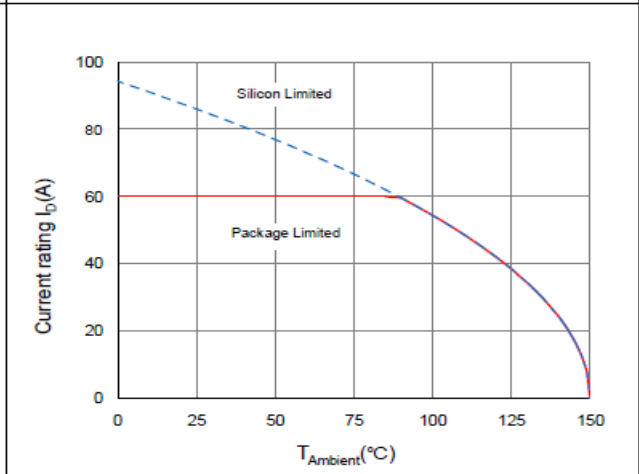
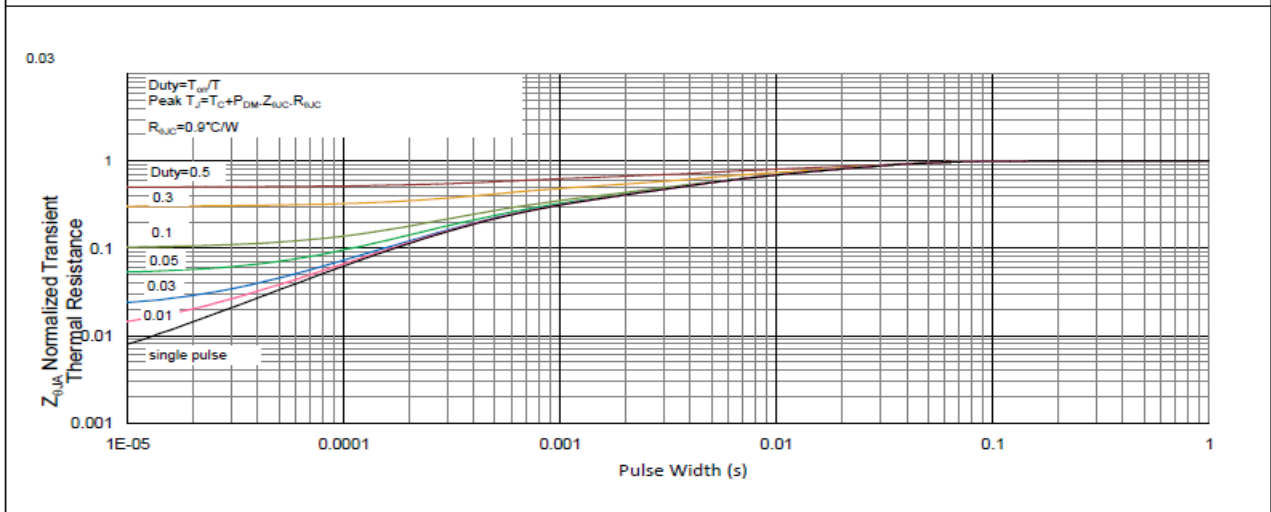


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient





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