



SPN7510 N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN7510 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 .

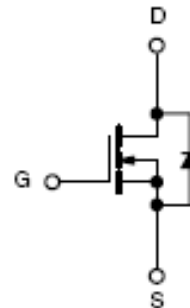
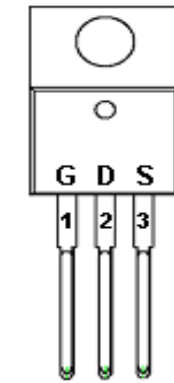
FEATURES

- ◆ 100V/30A, $R_{DS(ON)} = 16m\Omega @ V_{GS} = 10V$
- ◆ 100V/16A, $R_{DS(ON)} = 21m\Omega @ V_{GS} = 4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L package design

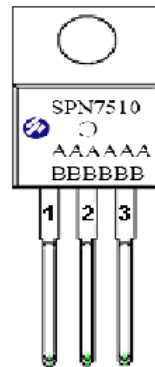
APPLICATIONS

- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier

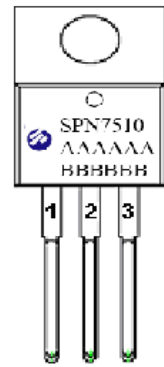
PIN CONFIGURATION(TO-220-3L)



PART MARKING



Y : Last Digit of The Year
W : Week
S : Sequence



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PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	D	Drain
3	S	Source

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN7510T220TGB	TO-220-3L	SPN7510

※ SPN7510T220TGB : Tube ; 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}	100	V	
Gate –Source Voltage	V_{GSS}	± 20	V	
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	I_D	$T_A=25^{\circ}\text{C}$	72	A
		$T_A=70^{\circ}\text{C}$	45	
Pulsed Drain Current	I_{DM}	240	A	
Power Dissipation	P_D	$T_A=25^{\circ}\text{C}$	130	W
		$T_A=70^{\circ}\text{C}$	3.38	
Avalanche Energy with Single Pulse ($T_J=25^{\circ}\text{C}$, $L = 0.12\text{mH}$, $I_{AS} = 75\text{A}$, $V_{DD} = 80\text{V}$.)	E_{AS}	335	mJ	
Operating Junction Temperature	T_J	-55/150	$^{\circ}\text{C}$	
Storage Temperature Range	T_{STG}	-55/150	$^{\circ}\text{C}$	
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	2	$^{\circ}\text{C}/\text{W}$	



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ELECTRICAL CHARACTERISTICS

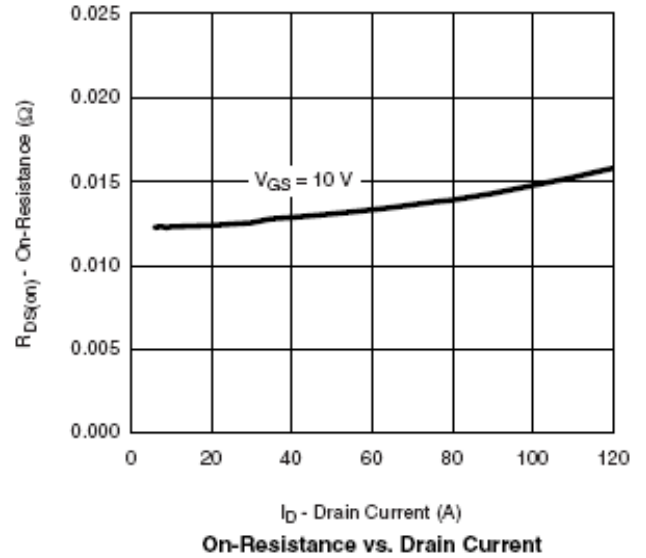
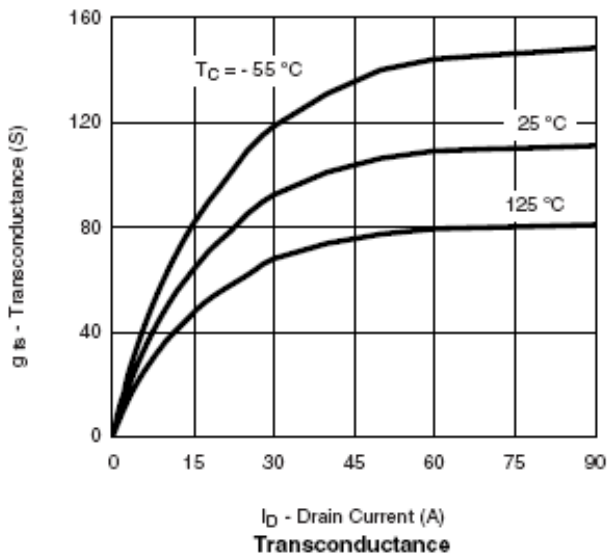
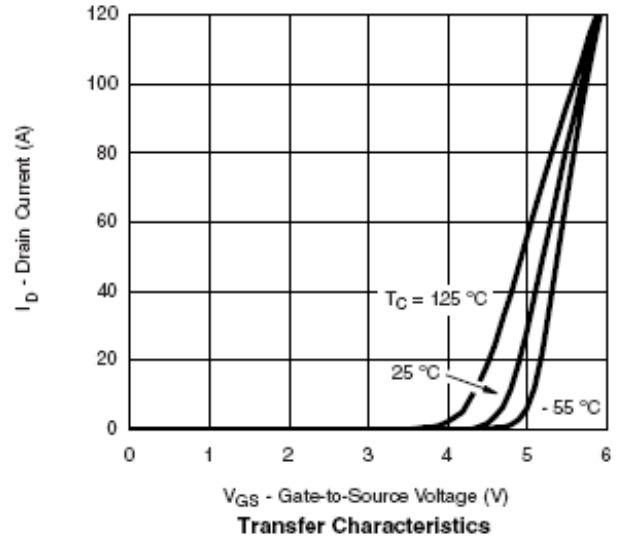
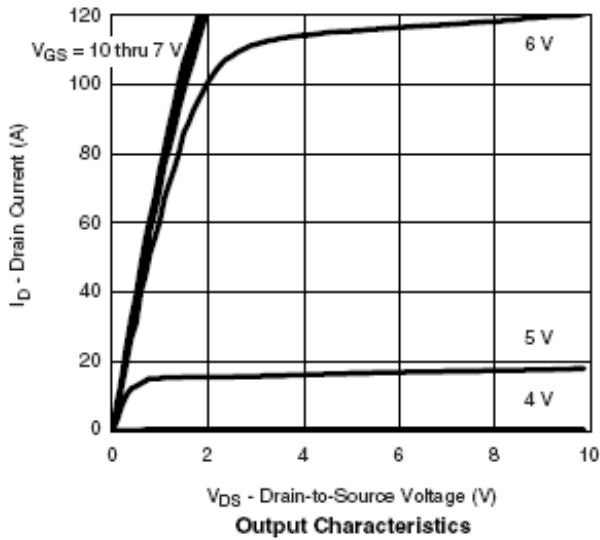
(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		3.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			10	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J = 150^\circ C$			100	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}= 10V, I_D=30A$			16	mΩ
		$V_{GS}= 4.5V, I_D=16A$			21	
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=30A$		52		S
Diode Forward Voltage	V_{SD}	$I_S=30A, V_{GS}=0V$			1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=80V, V_{GS}=4.5V$ $I_D= 30A$		69	111	nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			39		
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$		5690	9100	pF
Output Capacitance	C_{oss}			540		
Reverse Transfer Capacitance	C_{rss}			605		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_L=1.6\Omega$ $I_D=30A, V_{GEN}=10V$ $R_G=10\Omega$		12		nS
	t_r			75		
Turn-Off Time	$t_{d(off)}$			220		
	t_f			250		



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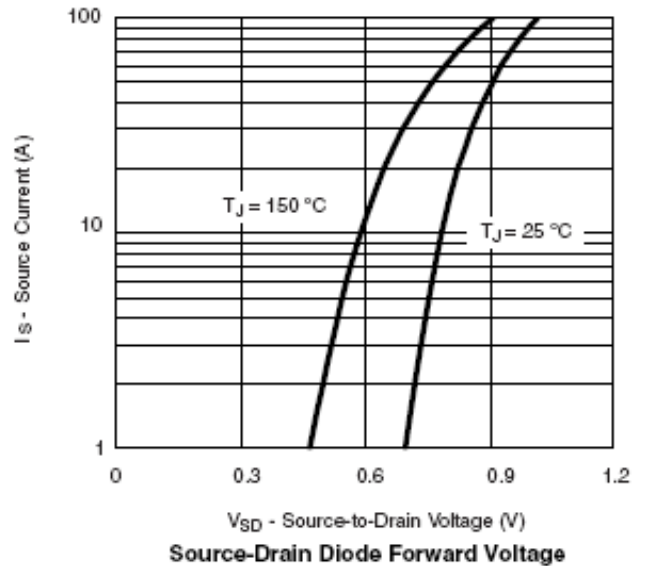
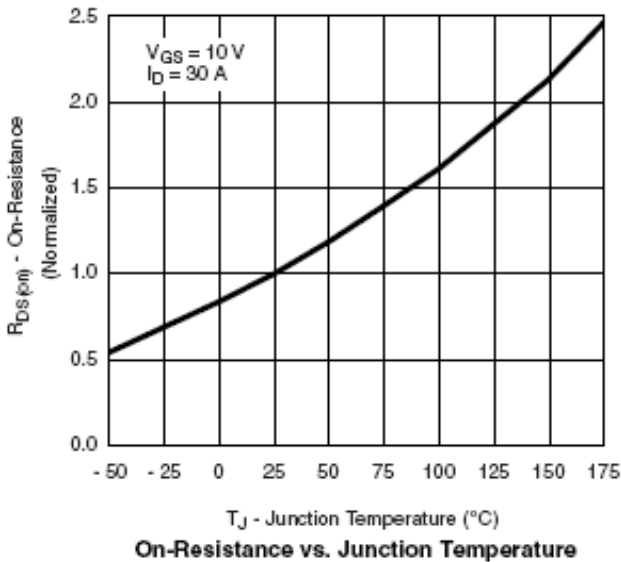
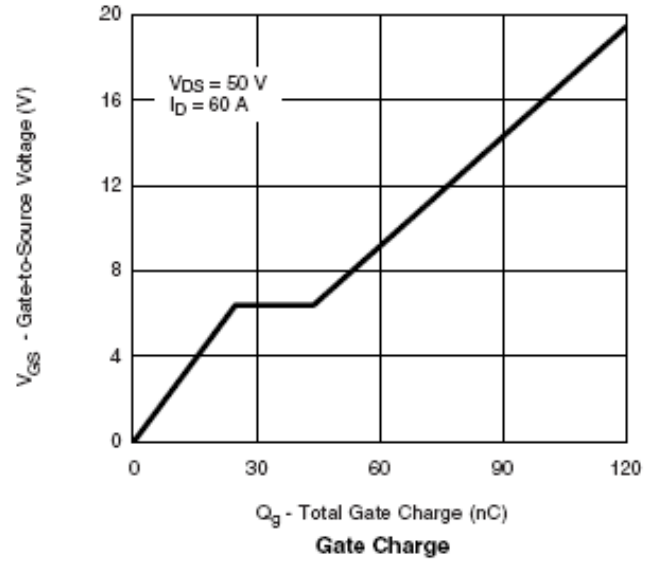
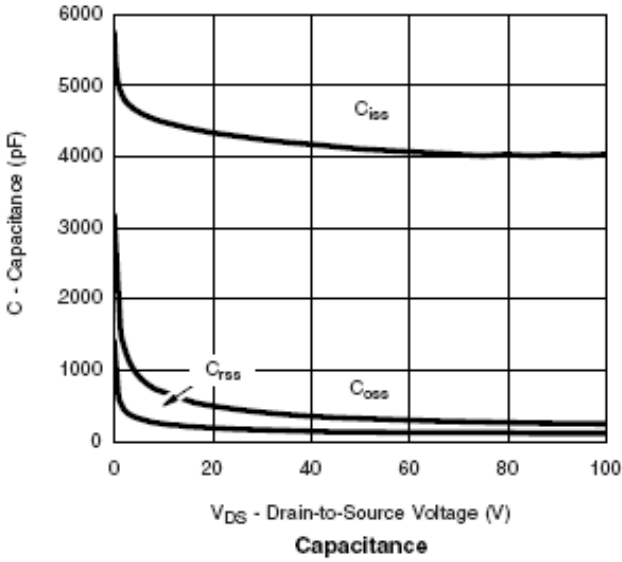
TYPICAL CHARACTERISTICS





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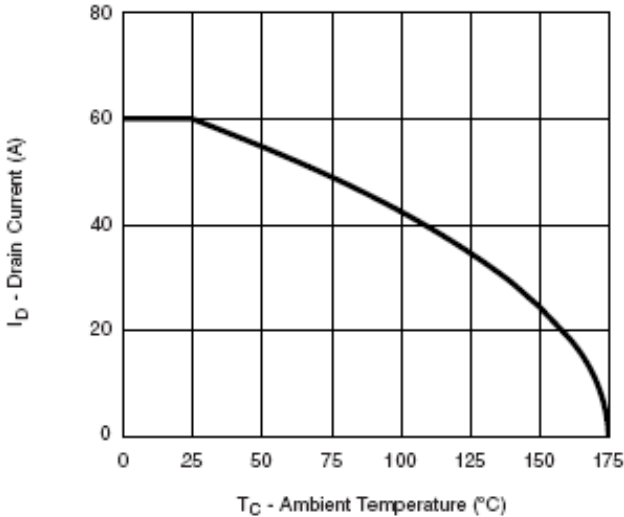




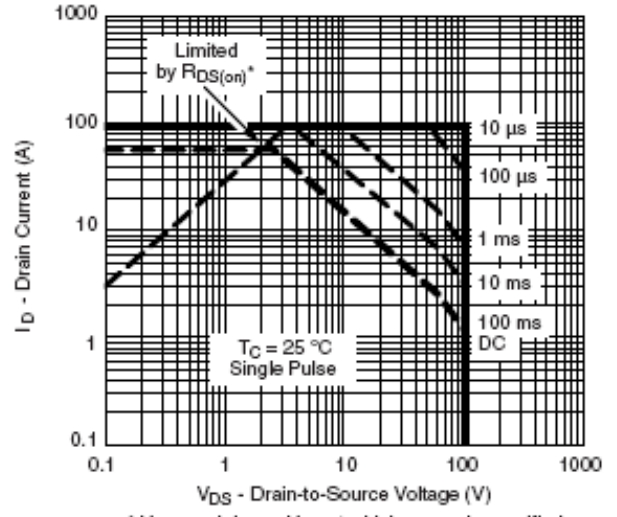
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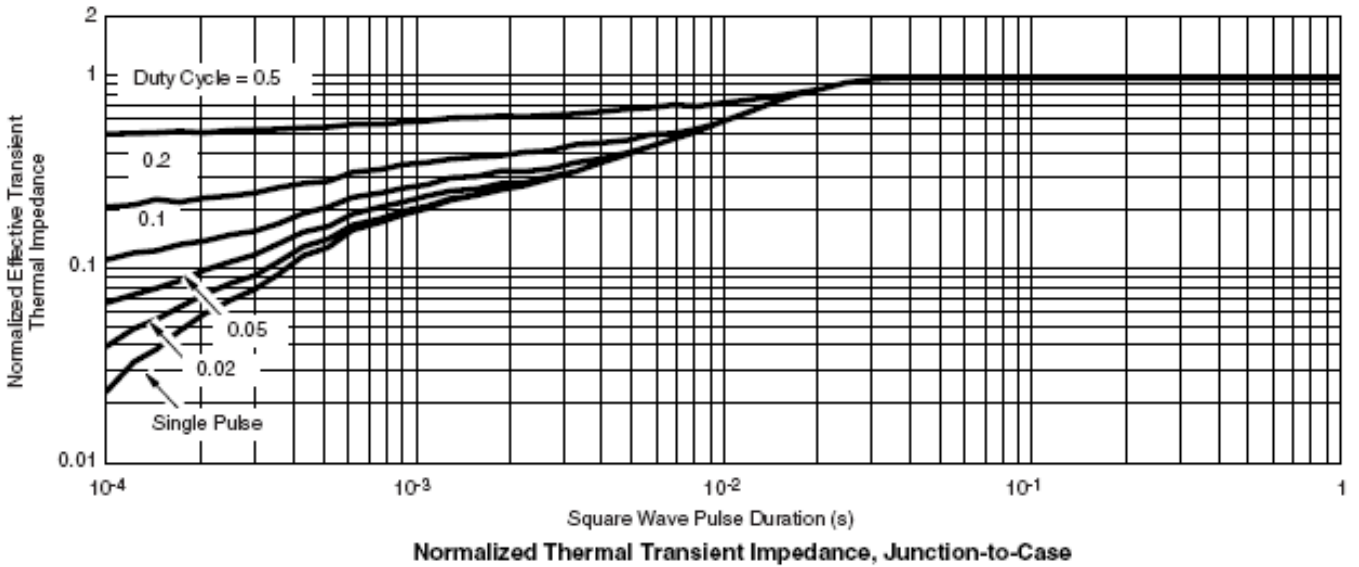
TYPICAL CHARACTERISTICS



Maximum Avalanche and Drain Current vs. Case Temperature



* $V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified
Safe Operating Area



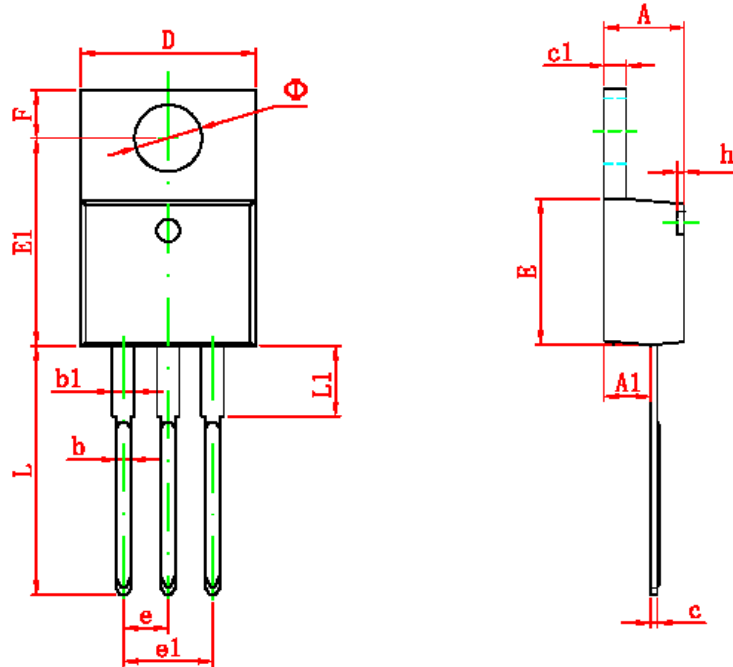
Normalized Thermal Transient Impedance, Junction-to-Case



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TO-220-3L PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
• •	3.735	3.935	0.147	0.155



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