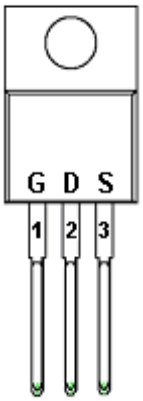
SPN68T10
N-Channel Enhancement Mode MOSFET

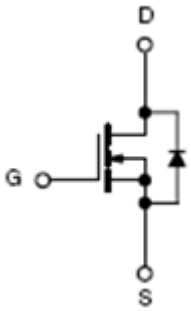
DESCRIPTION
The SPN68T10 is the N-Channel logic enhancement mode power field effect transistor which is produced using high cell density DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suitable for synchronous rectifier application, Motor control power management and other Power Tool circuits. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

FEATURES
- 100V/68A, $R_{DS(ON)}$=12mΩ@V_{GS}=10V
- 100V/68A, $R_{DS(ON)}$=15.5mΩ@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

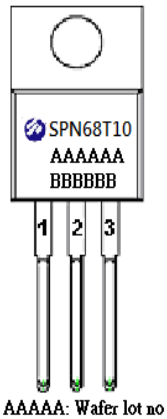
APPLICATIONS
- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier
- Power Tool
- Motor Control

PIN CONFIGURATION
TO-220





PART MARKING



AAAAA: Wafer lot no
BBBBBB : date code

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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
SPN68T10T220TGB	TO-220-3L	SPN68T10

※ SPN68T10T220TGB : Tube ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(Silicon Limited)	T_A=25℃	I_D	68	A
	T_A=70℃		46	
Pulsed Drain Current		I_{DM}	120	A
Power Dissipation@ T_A=25℃		P_D	104	W
Avalanche Energy with Single Pulse (Tj=25℃, L=0.3mH , I_{AS}=15A , V_{DD}=25V , V_{GS}=10V)		EAS	33	mJ
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Case		$R_{\theta JC}$	1.2	℃/W

Note :
The maximum current rating is package limited at 120A for TO-220-3L

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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	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		2.5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V T_J = 25℃			1	uA
		V_{DS}=80V,V_{GS}=0V T_J = 55℃			5	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A		9	12	mΩ
		V_{GS}=4.5V,I_D=10A		12	15.5	
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V			1.2	V
Dynamic						
Total Gate Charge	Q_g(10V)	V_{DS}=50V,V_{GS}=10V I_D=20A		43		nC
Total Gate Charge	Q_g(4.5V)			18.5		
Gate-Source Charge	Q_{gs}			8.5		
Gate-Drain Charge	Q_{gd}			10.3		
Input Capacitance	C_{iss}	V_{DD}=50V,V_{GS}=0V f=1MHz		3150		pF
Output Capacitance	C_{oss}			695		
Reverse Transfer Capacitance	C_{rss}			25		
Turn-On Time	$t_{d(on)}$	V_{DD}=50V, I_D=20A,V_{GS}=10V R_G=3.3Ω		10		nS
	t_r			7		
Turn-Off Time	$t_{d(off)}$			50		
	t_f			11		

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TYPICAL CHARACTERISTICS

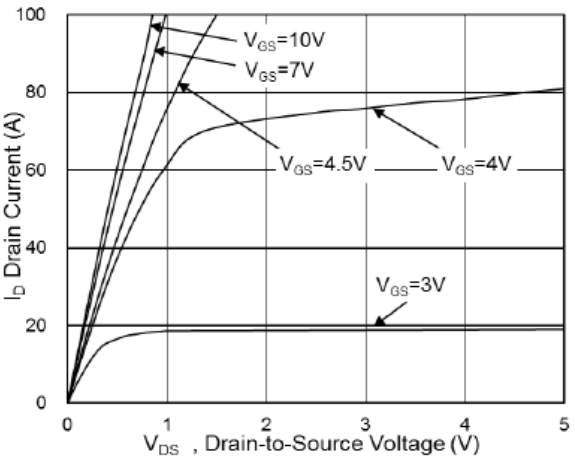


Fig.1 Typical Output Characteristics

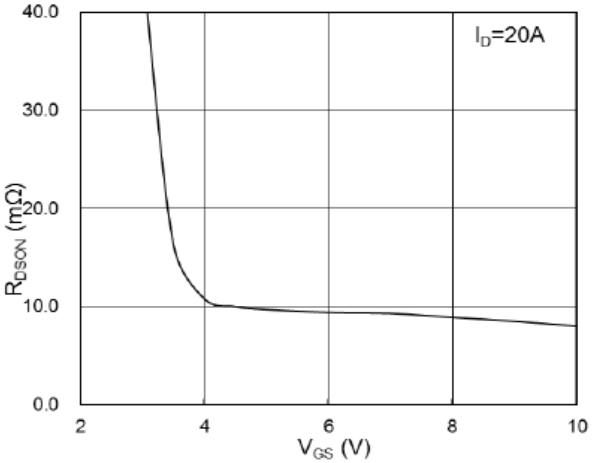


Fig.2 On-Resistance vs. G-S Voltage

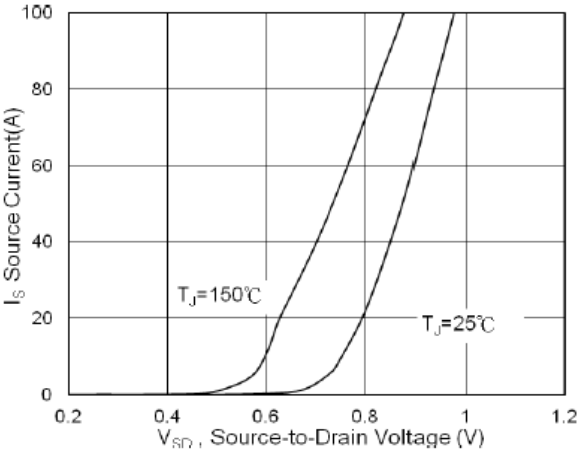


Fig.3 Source Drain Forward Characteristics

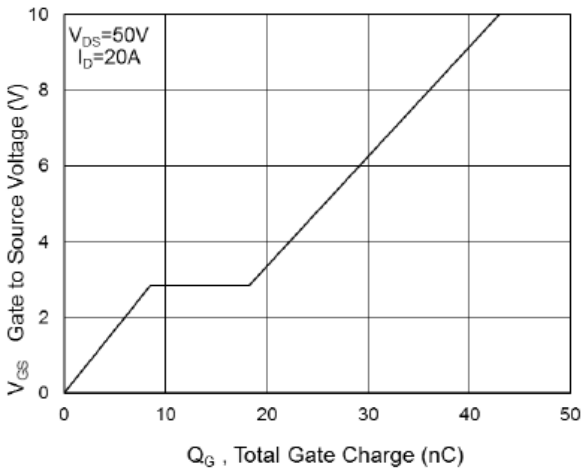


Fig.4 Gate-Charge Characteristics

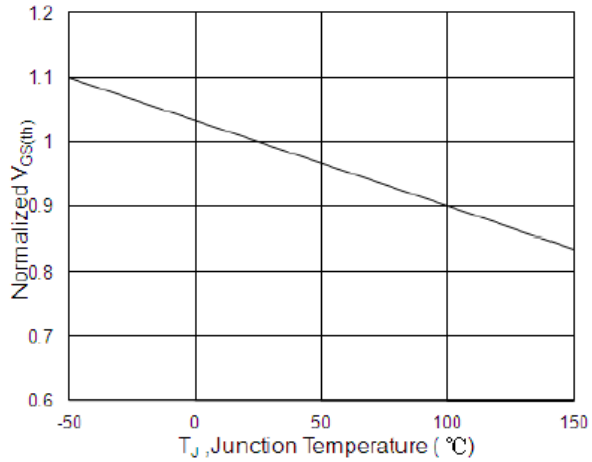


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

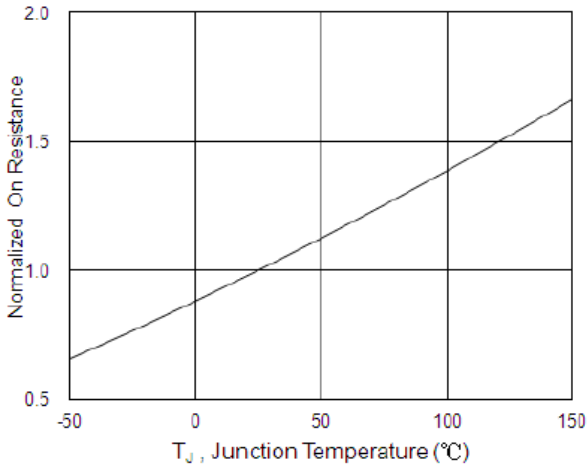


Fig.6 Normalized R_{DSON} vs. T_J

TYPICAL CHARACTERISTICS

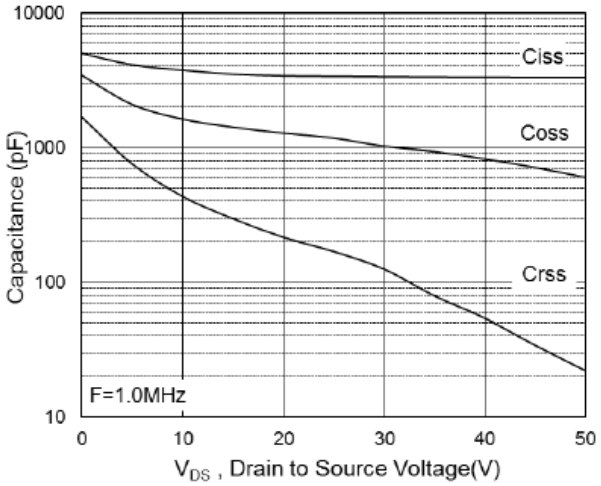


Fig.7 Capacitance

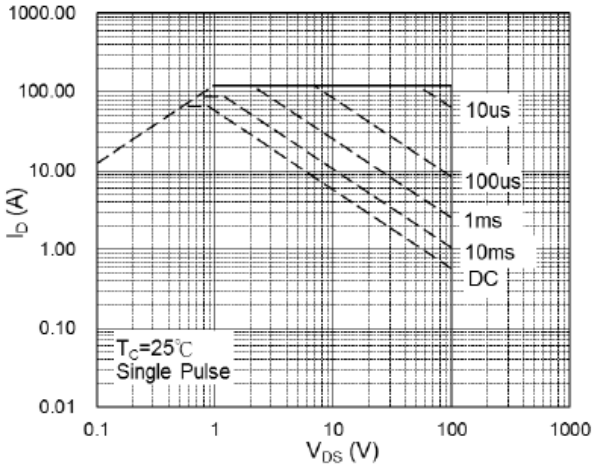


Fig.8 Safe Operating Area

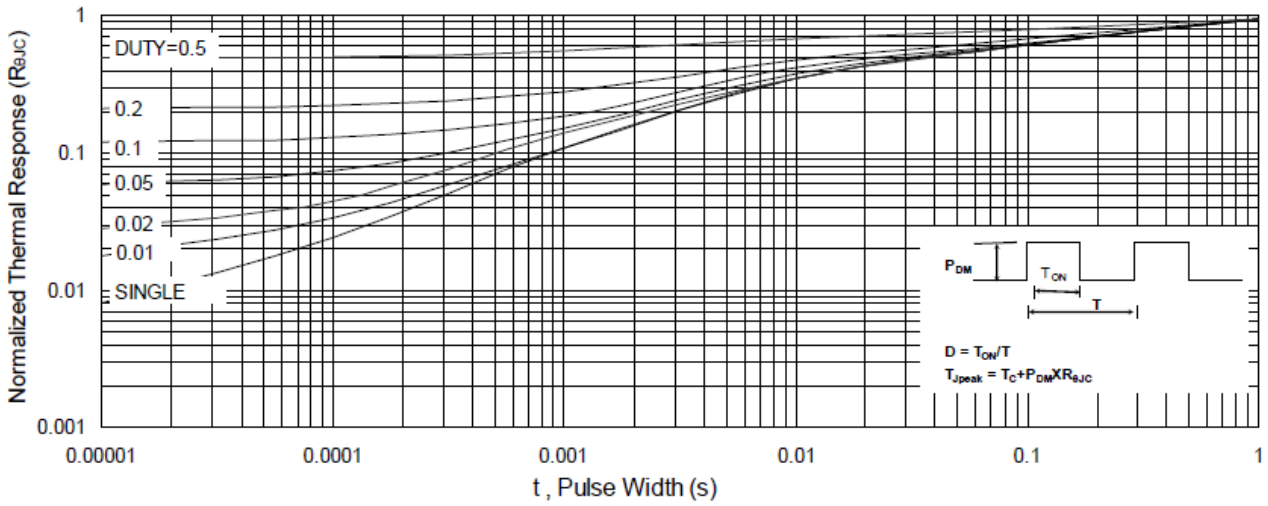
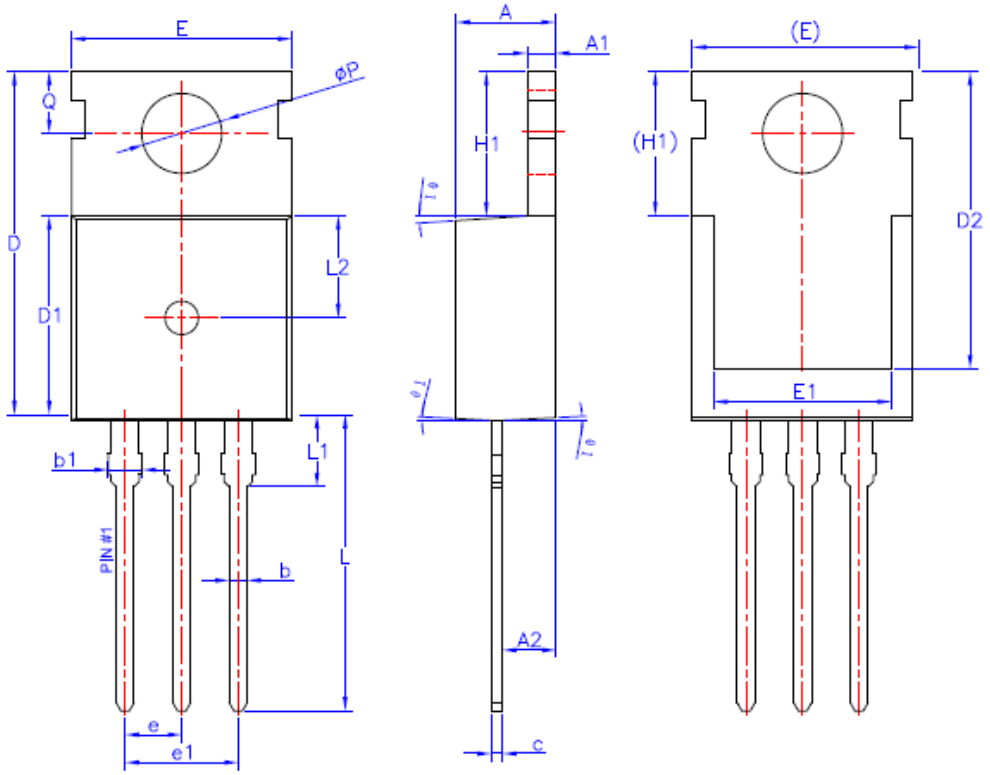


Fig.9 Normalized Maximum Transient Thermal Impedance

TO-220-3L PACKAGE OUTLINE



SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	–	0.90
b1	1.42	–	1.57
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	–	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	2.54BSC		
e1	5.08BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	–	–	3.50
L2	4.60REF		
ØP	3.55	3.60	3.65
Q	2.73	–	2.87
θ1	1°	3°	5°

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