



SPN50T10

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN50T10 is the N-Channel logic enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. The SPN80T10 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

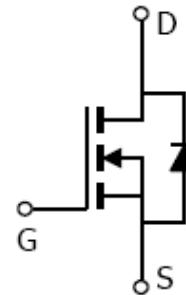
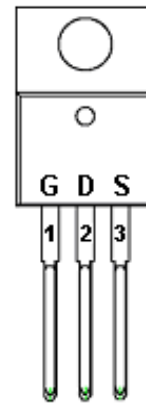
- ◆ 100V/65A, $R_{DS(ON)}=18m\Omega@V_{GS}=10V$
- ◆ High density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220 package design

APPLICATIONS

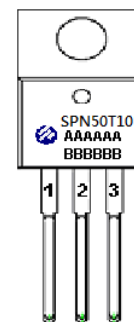
- Powered System
- DC/DC Converter
- Load Switch

PIN CONFIGURATION

TO-220



PART MARKING



A : Lot Code
B : Date Code
(YY / MM / DD)



SPN50T10

N-Channel Enhancement Mode MOSFET

PIN DESCRIPTION

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

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN50T10T220TGB	TO-220-3L	SPN50T10

※ SPN50T10T220TGB : 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	$T_A=25^{\circ}\text{C}$ 65	A
		$T_A=70^{\circ}\text{C}$ 40	
Pulsed Drain Current	I_{DM}	200	A
Power Dissipation @ $T_A=25^{\circ}\text{C}$	P_D	166	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 Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$



SPN50T10

N-Channel Enhancement Mode MOSFET

ELECTRICAL CHARACTERISTICS

(T_A=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 =250μA	100			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	
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			25	μA
		V _{DS} =80V, V _{GS} =0V T _J =125°C			100	
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A			18	mΩ
Forward Transconductance	g _{fs}	V _{DS} =10V, I _D =30A		75		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} =10V I _D =40A		115	180	nC
Gate-Source Charge	Q _{gs}			20		
Gate-Drain Charge	Q _{gd}			48		
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V f=1MHz		6000	9600	pF
Output Capacitance	C _{oss}			550		
Reverse Transfer Capacitance	C _{rss}			300		
Turn-On Time	t _{d(on)}	V _{DD} =50V, R _L =1Ω I _D =30A, V _{GEN} =10V R _G =1.66Ω		21		nS
	t _r			58		
Turn-Off Time	t _{d(off)}			41		
	t _f			15		



SPN50T10

N-Channel Enhancement Mode MOSFET

TYPICAL CHARACTERISTICS

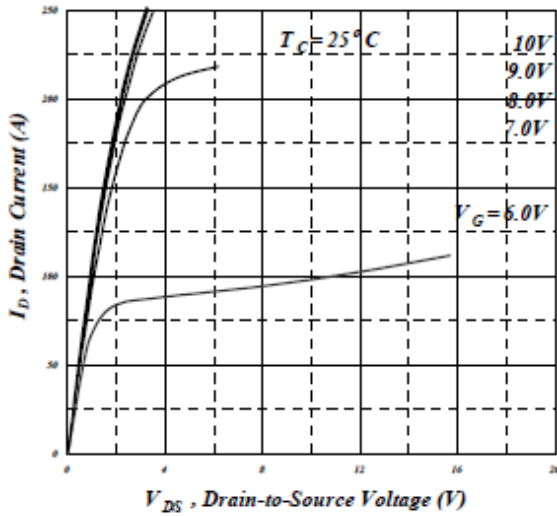


Fig 1. Typical Output Characteristics

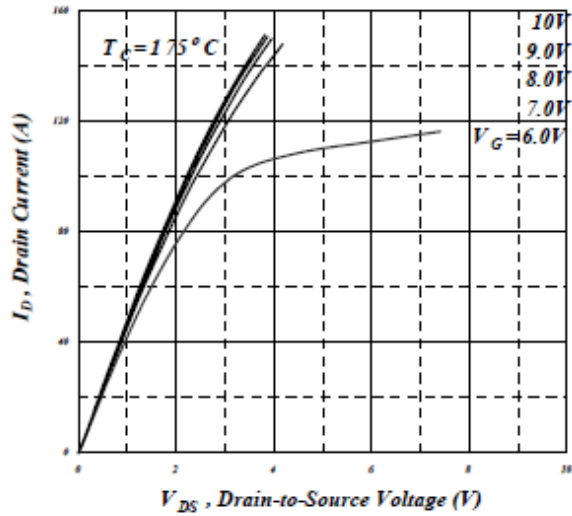


Fig 2. Typical Output Characteristics

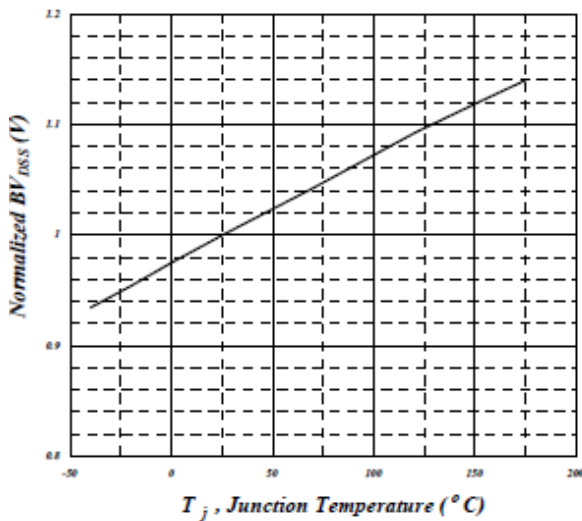


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

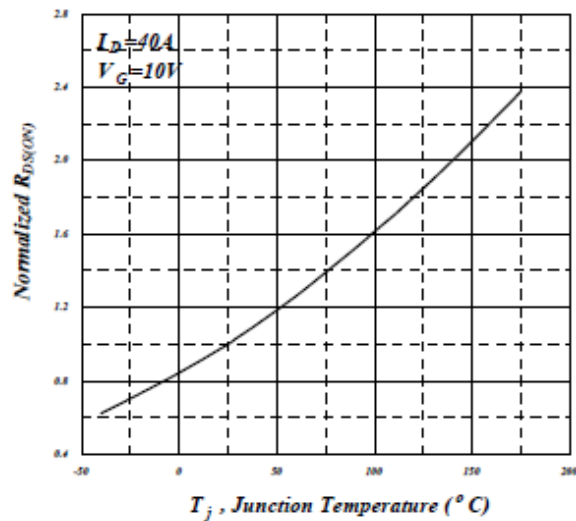


Fig 4. Normalized On-Resistance v.s. Junction Temperature



SPN50T10 N-Channel Enhancement Mode MOSFET

TYPICAL CHARACTERISTICS

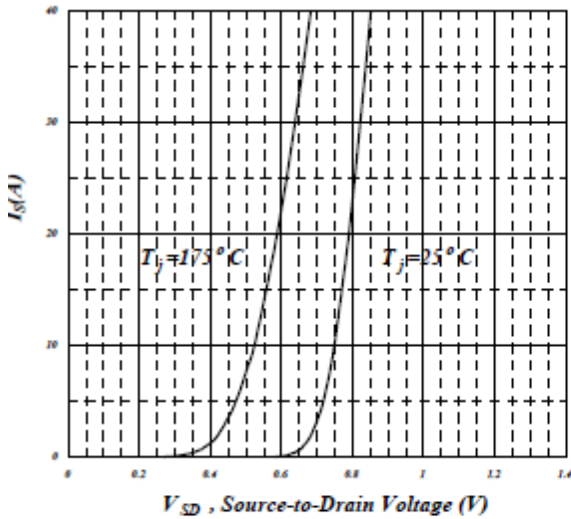


Fig 5. Forward Characteristic of Reverse Diode

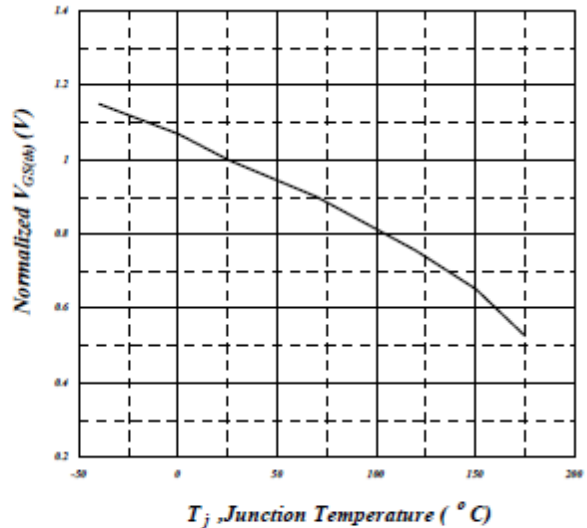


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

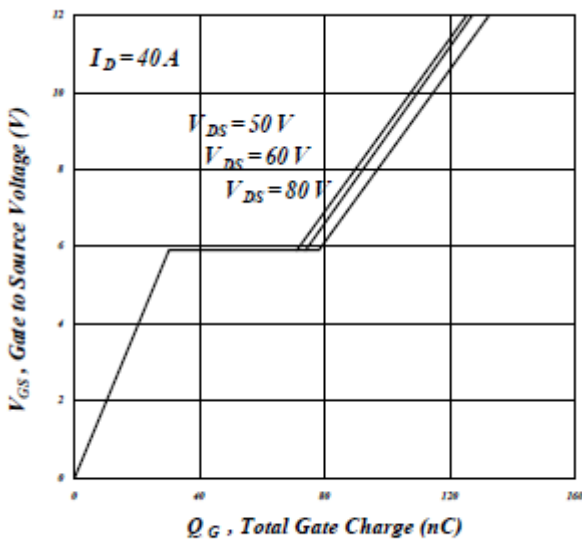


Fig 7. Gate Charge Characteristics

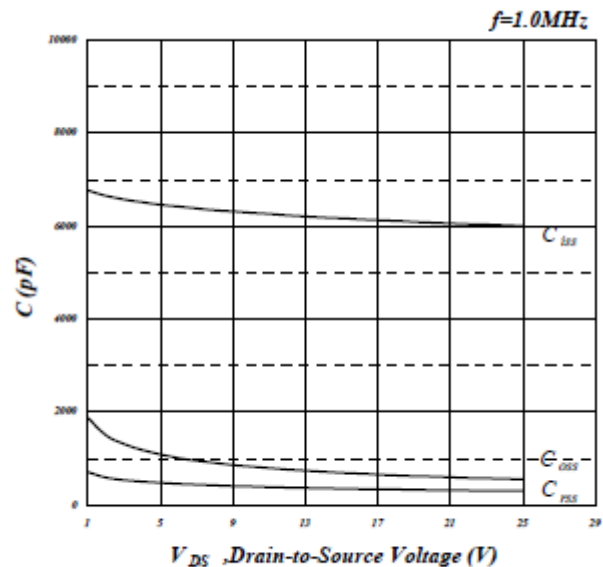


Fig 8. Typical Capacitance Characteristics



SPN50T10 N-Channel Enhancement Mode MOSFET

TYPICAL CHARACTERISTICS

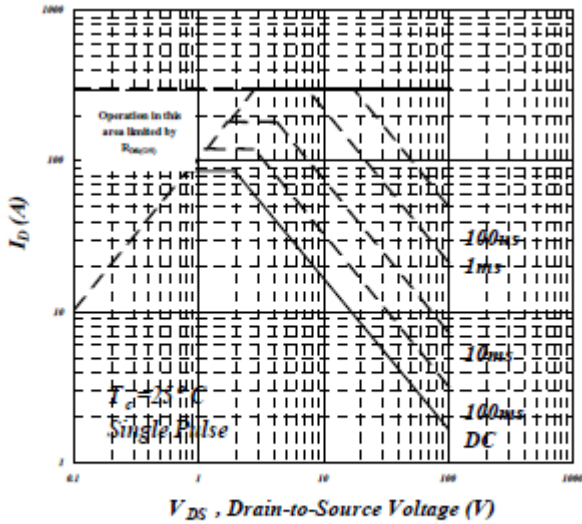


Fig 9. Maximum Safe Operating Area

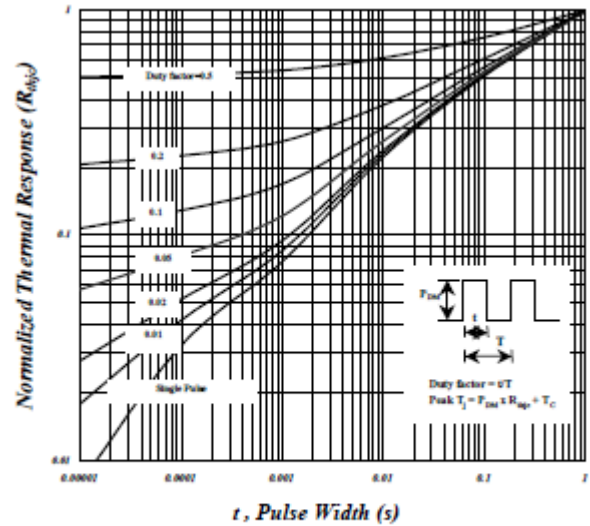


Fig 10. Effective Transient Thermal Impedance

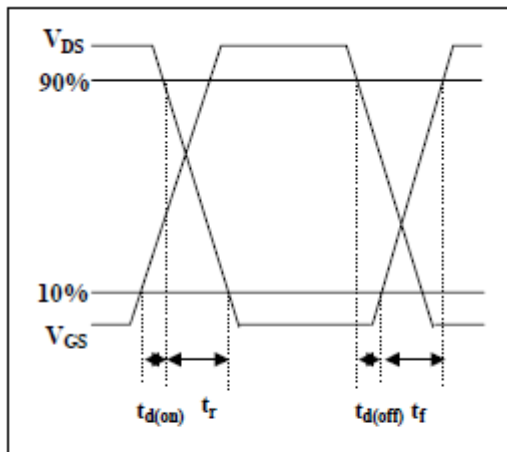


Fig 11. Switching Time Waveform

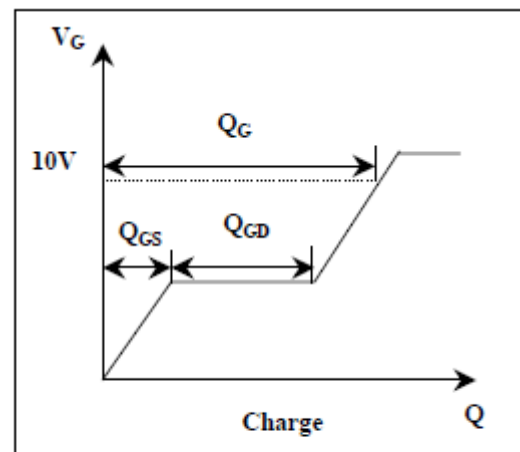


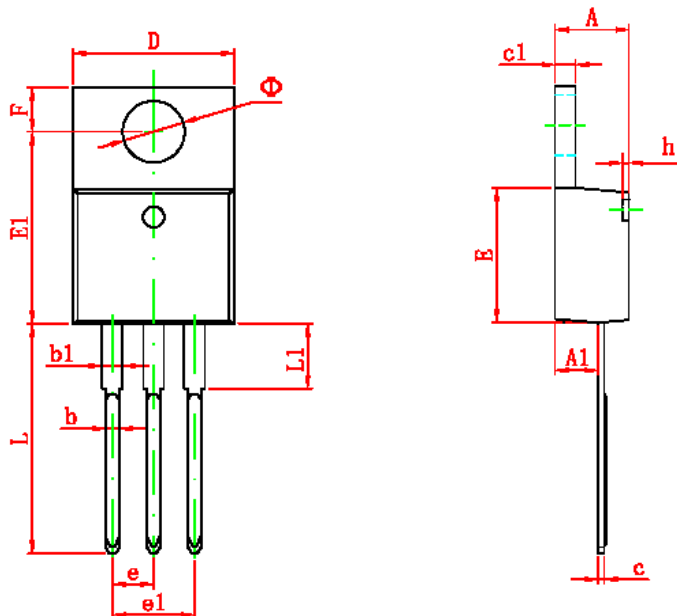
Fig 12. Gate Charge Waveform



SPN50T10

N-Channel Enhancement Mode MOSFET

TO-220 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



SPN50T10

N-Channel Enhancement Mode MOSFET

Information provided is alleged to be exact and consistent. SYNC Power Corporation presumes no responsibility for the penalties of use of such information or for any violation of patents or other rights of third parties which may result from its use. No license is granted by allegation or otherwise under any patent or patent rights of SYNC Power Corporation. Conditions mentioned in this publication are subject to change without notice. This publication surpasses and replaces all information previously supplied. SYNC Power Corporation products are not authorized for use as critical components in life support devices or systems without express written approval of SYNC Power Corporation.

©The SYNC Power logo is a registered trademark of SYNC Power Corporation

©2004 SYNC Power Corporation – Printed in Taiwan – All Rights Reserved

SYNC Power Corporation

7F-2, No.3-1, Park Street

NanKang District (NKSP), Taipei, Taiwan 115

Phone: 886-2-2655-8178

Fax: 886-2-2655-8468

©<http://www.syncpower.com>