



# SPN30T10

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN30T10 is the N-Channel logic enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. SPN30T10 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

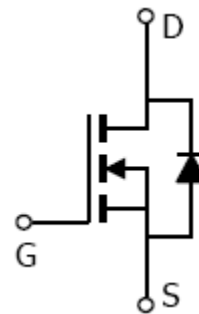
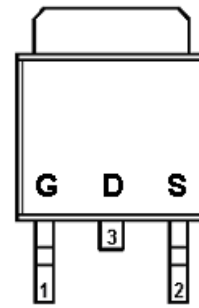
- ◆ 100V/20A,  $R_{DS(ON)}=50m\Omega@V_{GS}=10V$
- ◆ High density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-252 package design

### APPLICATIONS

- High Frequency Small Power System
- DC/DC Converter
- Load Switch

### PIN CONFIGURATION

TO-252



### PART MARKING





# SPN30T10

## N-Channel Enhancement Mode MOSFET

### PIN DESCRIPTION

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

### ORDERING INFORMATION

Part Number	Package	Part Marking
SPN30T10T252RGB	TO-252	SPN30T10

※ SPN30T10T252RGB : Tape Reel ; Pb – Free ; Halogen - Free

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V <sub>DSS</sub>	100	V	
Gate –Source Voltage	V <sub>GSS</sub>	±20	V	
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>C</sub> =25°C	22	A
		T <sub>C</sub> =70°C	16	
Pulsed Drain Current	I <sub>DM</sub>	45	A	
Avalanche Current	I <sub>AS</sub>	27	A	
Power Dissipation @ TA=25°C	P <sub>D</sub>	52	W	
Operating Junction Temperature	T <sub>J</sub>	150	°C	
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C	
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	62	°C/W	



# SPN30T10

## N-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS

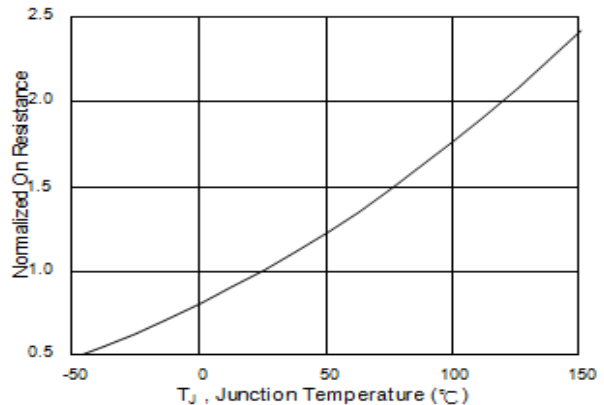
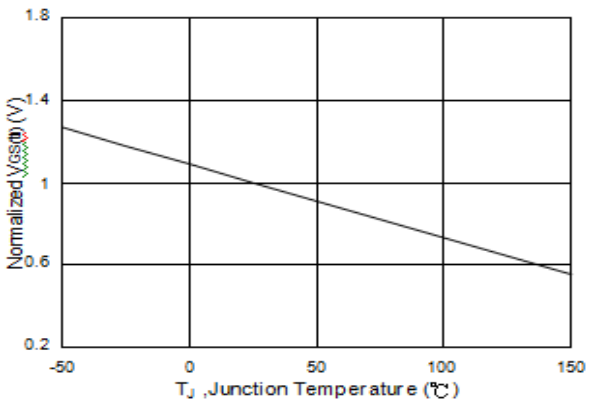
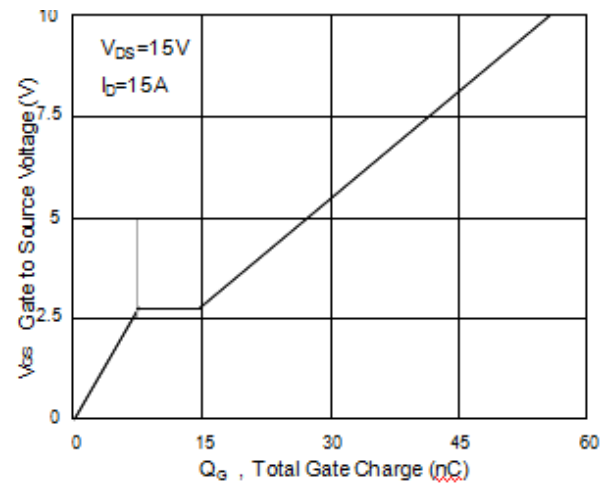
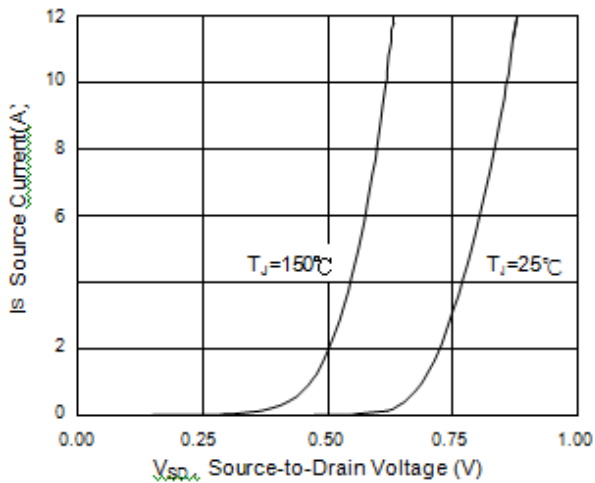
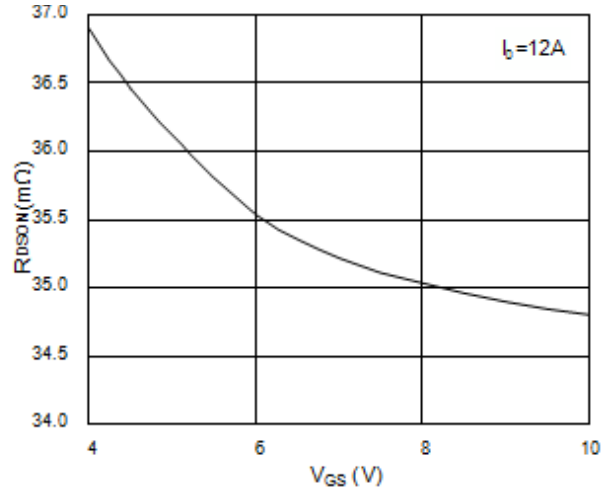
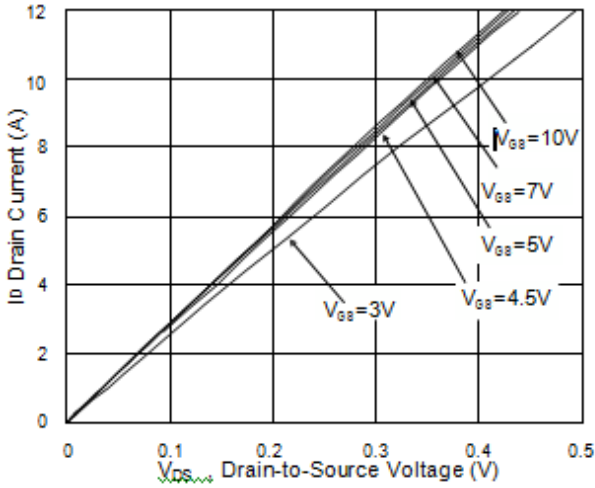
(T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1		2.5	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V			10	μA
		V <sub>DS</sub> =80V, V <sub>GS</sub> =0V T <sub>J</sub> =125°C			100	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥5V, V <sub>GS</sub> =10V	22			A
Drain-Source On-Resistance	R <sub>DSS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A			45	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A			50	mΩ
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =3A		68		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			1.2	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V I <sub>D</sub> =15A		55		nC
Gate-Source Charge	Q <sub>gs</sub>			7.5		
Gate-Drain Charge	Q <sub>gd</sub>			7		
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V f=1MHz		3850		pF
Output Capacitance	C <sub>oss</sub>			137		
Reverse Transfer Capacitance	C <sub>rss</sub>			82		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =50V, I <sub>D</sub> =1A, V <sub>GEN</sub> =10V R <sub>G</sub> =3.3Ω		19		nS
	t <sub>r</sub>			4		
Turn-Off Time	t <sub>d(off)</sub>			84		
	t <sub>f</sub>			5		



# SPN30T10 N-Channel Enhancement Mode MOSFET

## TYPICAL CHARACTERISTICS





# SPN30T10 N-Channel Enhancement Mode MOSFET

## TYPICAL CHARACTERISTICS

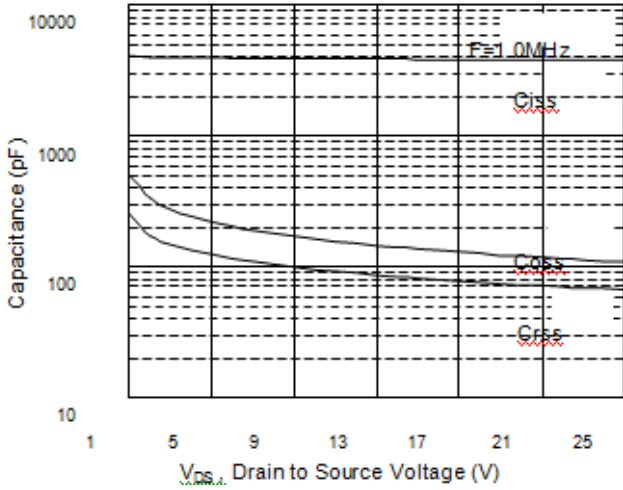


Fig. 7 Typical Capacitance Characteristics

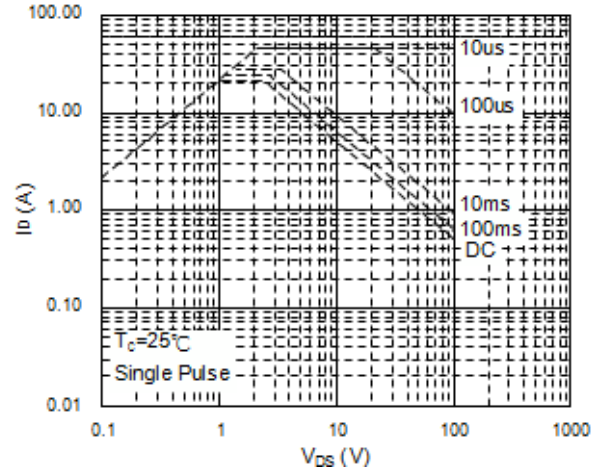


Fig. 8 Maximum Safe Operation Area

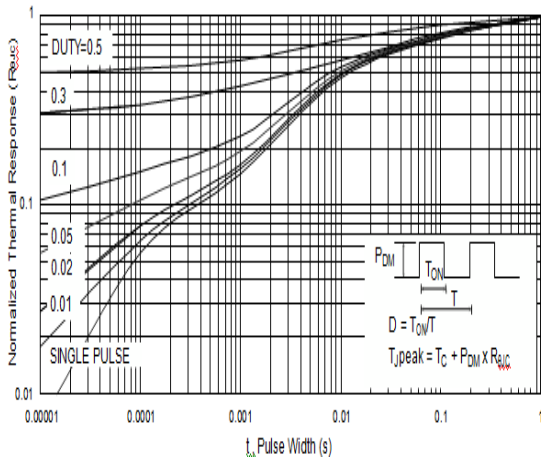


Fig. 9 Effective Transient Thermal Impedance

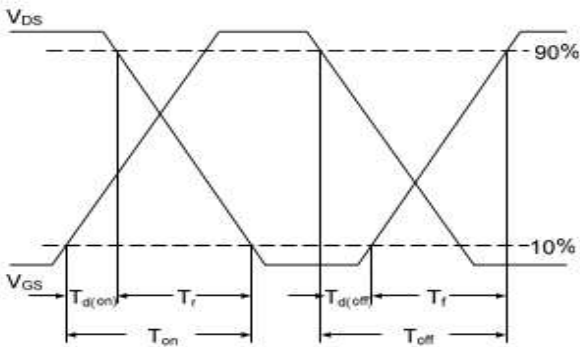


Fig. 10 Switching Time Waveform

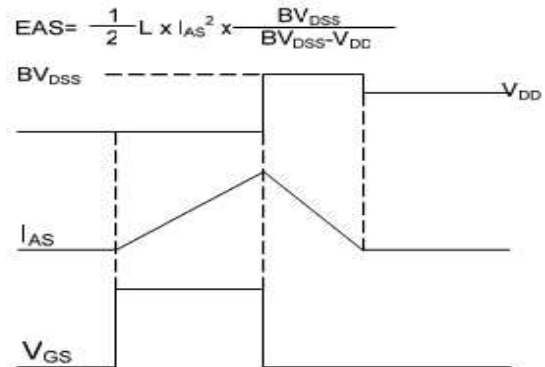


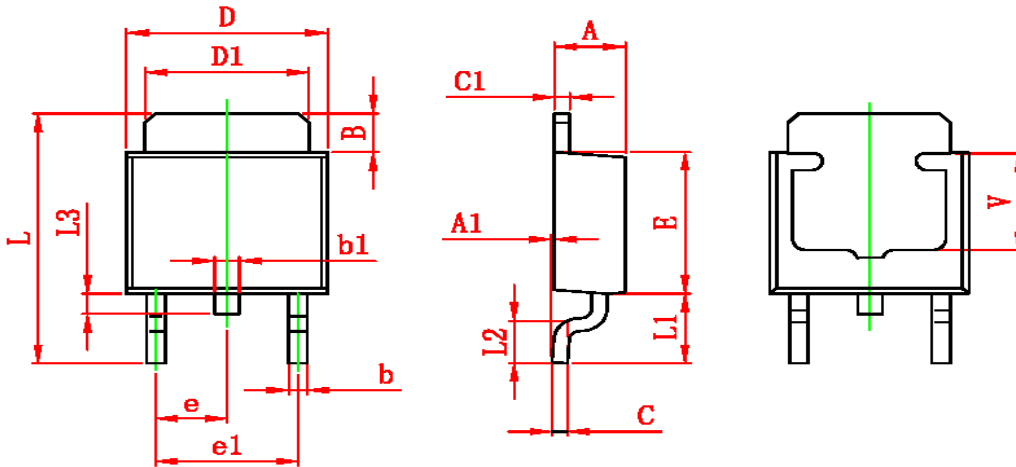
Fig. 11 Unclamped Inductive Waveform



# SPN30T10

## N-Channel Enhancement Mode MOSFET

### TO-252 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP		0.091 TYP	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.350	0.650	0.014	0.026
V	3.80 REF		0.150 REF	



# SPN30T10

## 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

©2011 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>