



SPN6098

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN6098 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 most of synchronous buck converter applications.

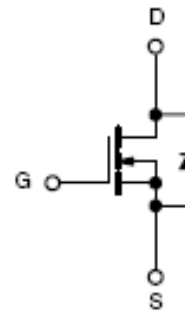
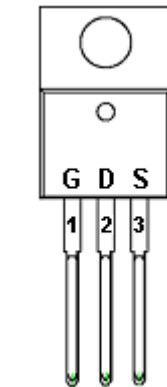
APPLICATIONS

- DC/DC Converter
- Load Switch
- Synchronous Buck Converter

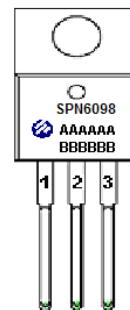
FEATURES

- ◆ 60V/60A, $R_{DS(ON)} = 12m\Omega @ V_{GS} = 10V$
- ◆ 60V/60A, $R_{DS(ON)} = 15.0m\Omega @ V_{GS} = 4.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L package design

PIN CONFIGURATION(TO-220-3L)



PART MARKING



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



SPN6098

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
SPN6098T220TG	TO-220-3L	SPN6098
SPN6098T220TGB	TO-220-3L	SPN6098

※ SPN6098T220TG: Tube ; Pb – Free

※ SPN6098T220TGB: 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}	60	V
Gate –Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	I_D	$T_A=25^{\circ}\text{C}$	A
		$T_A=100^{\circ}\text{C}$	
Pulsed Drain Current	I_{DM}	120	A
Avalanche Current	I_{AS}	38	A
Power Dissipation	P_D	62	W
Avalanche Energy with Single Pulse ($T_J=25^{\circ}\text{C}$, $L = 0.1\text{mH}$, $I_{AS} = 38\text{A}$, $V_{DD} = 25\text{V}$.)	E_{AS}	123	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	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$



SPN6098

N-Channel Enhancement Mode MOSFET

ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0		2.5	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=48V, V_{GS}=0V$			1	uA
		$V_{DS}=48V, V_{GS}=0V$ $T_J = 55^\circ C$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS} = 10V$	60			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D=15A$		10	12	mΩ
		$V_{GS} = 4.5V, I_D=10A$		12	15	
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=15A$		47		S
Diode Forward Voltage	V_{SD}	$I_S=60A, V_{GS} = 0V$			1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=48V, V_{GS}=4.5V$ $I_D= 12A$		24		nC
Gate-Source Charge	Q_{gs}			6.9		
Gate-Drain Charge	Q_{gd}			10		
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V$ $f=1MHz$		3200		pF
Output Capacitance	C_{oss}			210		
Reverse Transfer Capacitance	C_{rss}			145		
Turn-On Time	$t_{d(on)}$	$V_{DD}=30V, I_D=2A,$ $V_{GEN}=10V, R_G=3.3\Omega$		20		nS
	t_r			4		
Turn-Off Time	$t_{d(off)}$			84.5		
	t_f			6.5		



SPN6098 N-Channel Enhancement Mode MOSFET

TYPICAL CHARACTERISTICS

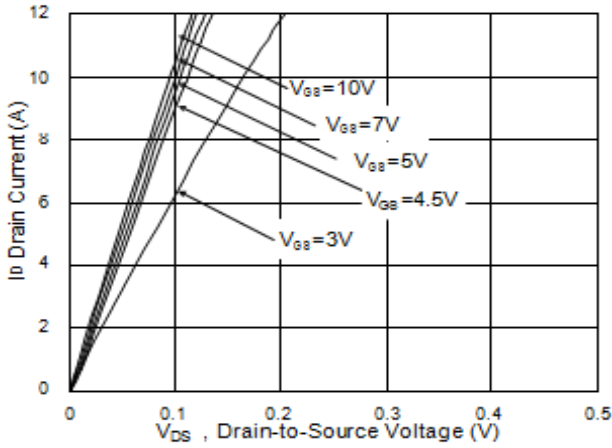


Fig. 1 Typical Output Characteristics

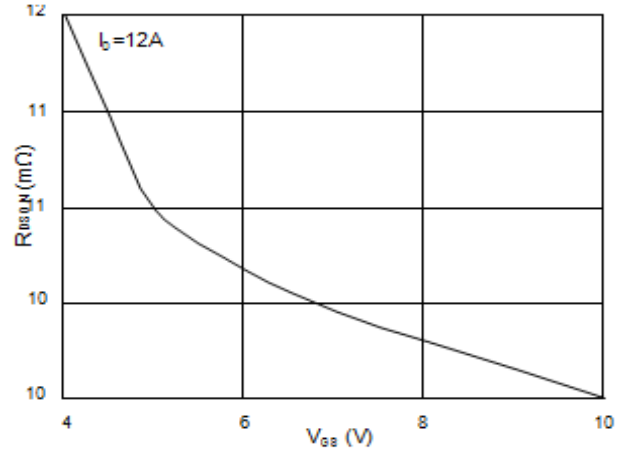


Fig. 2 On-Resistance vs. Gate Voltage

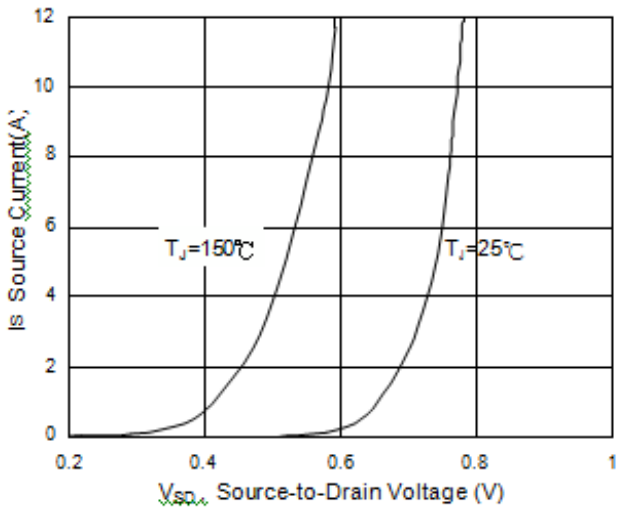


Fig. 3 Forward Characteristics
Reverse Diodes

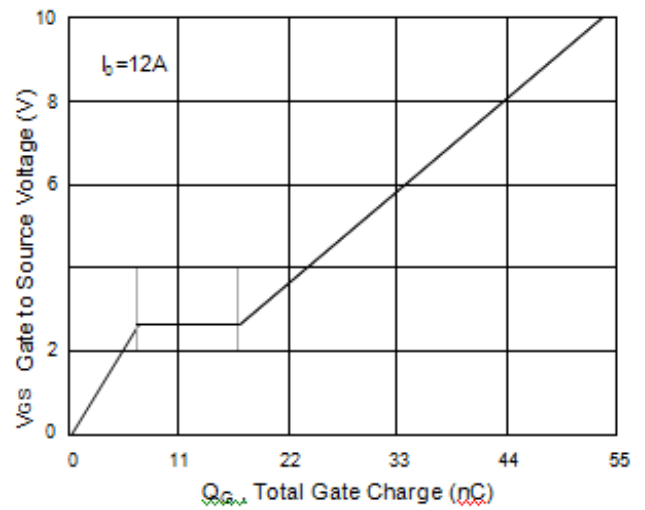


Fig. 4 Gate Charge Characteristics

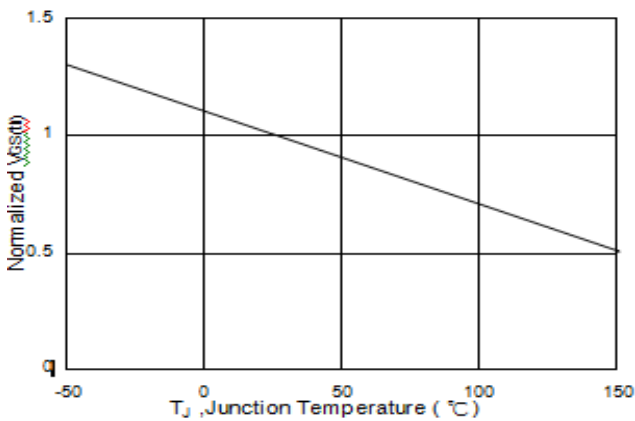


Fig. 5 Vgs vs. Junction Temperature

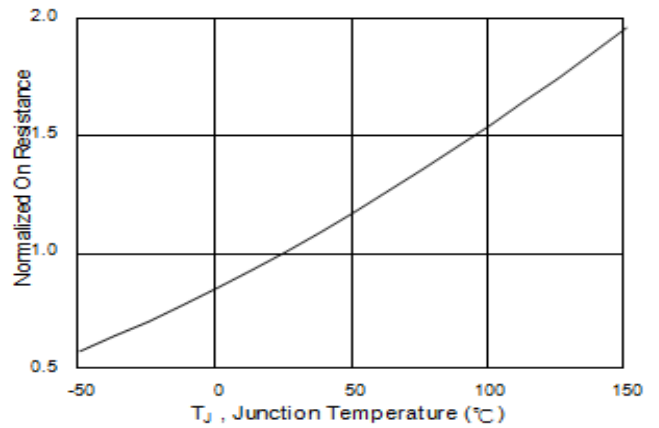


Fig. 6 On-Resistance vs. Temperature



SPN6098 N-Channel Enhancement Mode MOSFET

TYPICAL CHARACTERISTICS

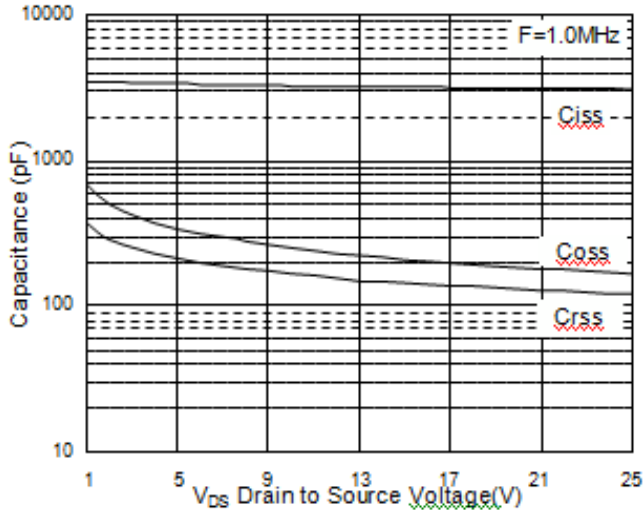


Fig. 7 Typical Capacitance Characteristics

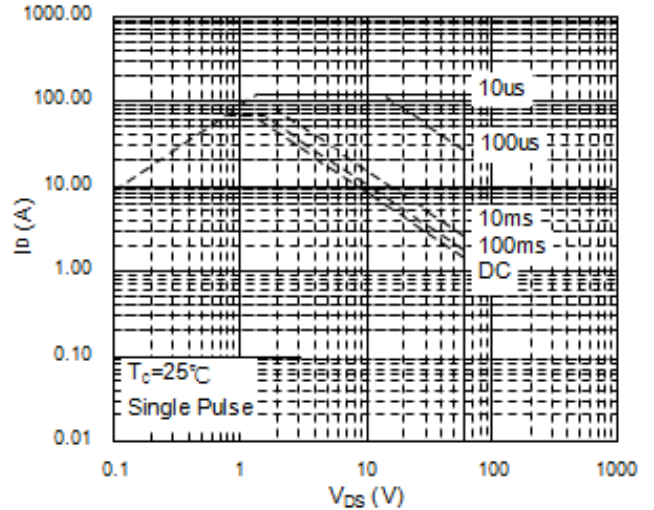


Fig. 8 Maximum Safe Operation Area

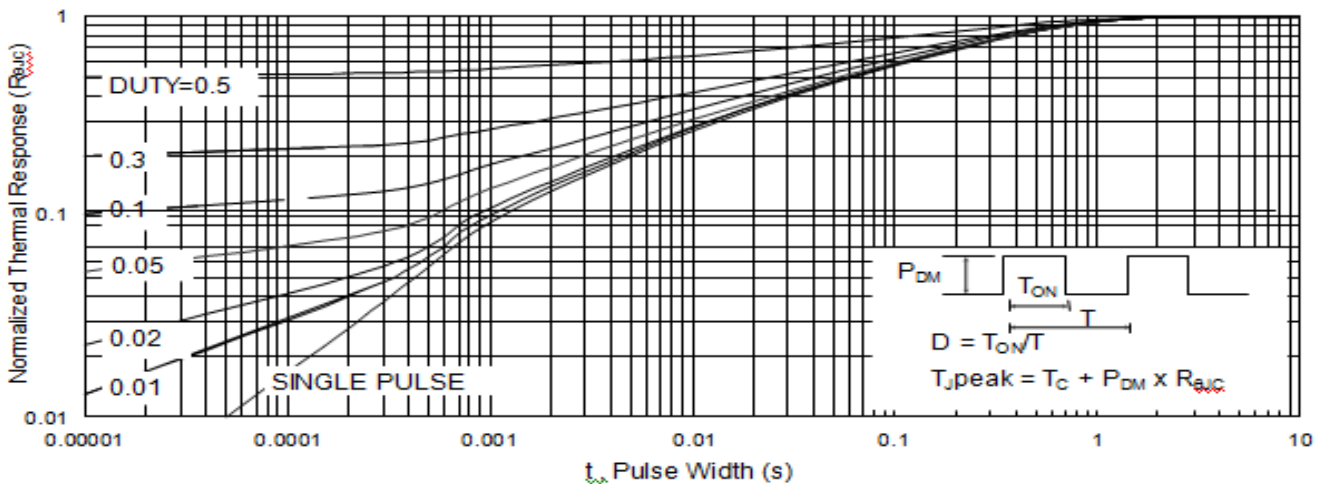


Fig. 9 Effective Transient Thermal Impedance

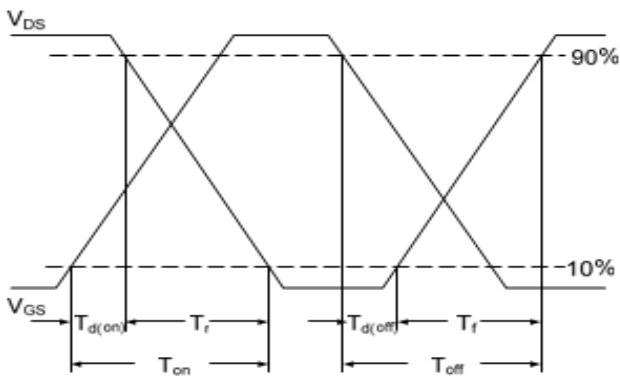


Fig. 10 Switching Time Waveform

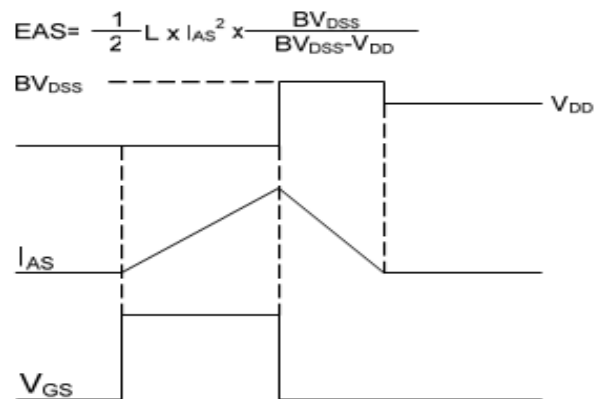


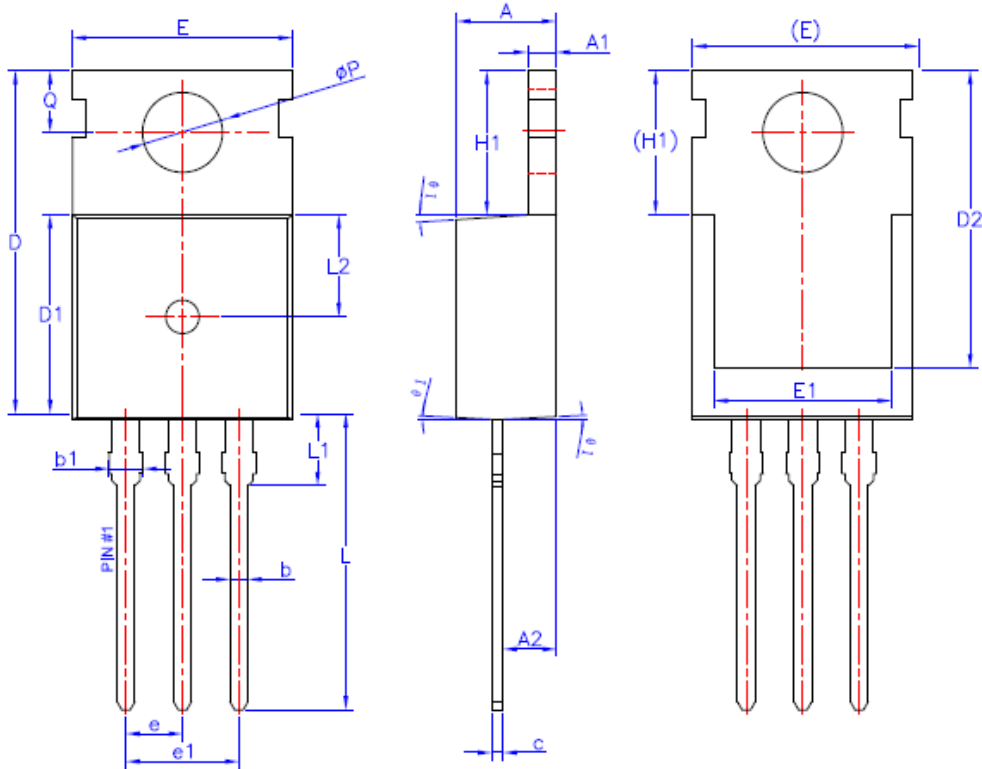
Fig. 11 Unclamped Inductive Waveform



SPN6098

N-Channel Enhancement Mode MOSFET

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		
φP	3.55	3.60	3.65
Q	2.73	—	2.87
θ1	1°	3°	5°



SPN6098

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

© 2016 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>