



# SPN6001

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN6001 is the N-Channel enhancement mode field effect transistors that are produced using high cell density DMOS technology.

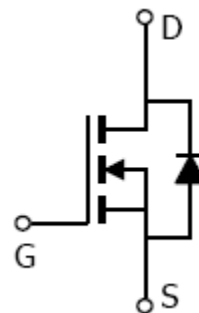
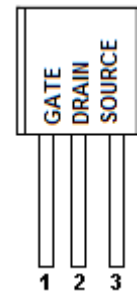
### APPLICATIONS

- High efficiency SMPS
- AC adapter
- Electronic Lamp Ballast

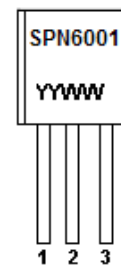
### FEATURES

- ◆ 600V/1.0A ,  $R_{DS(ON)} = 15\Omega @ V_{GS} = 10V$
- ◆ TO-92 package design
- ◆ Fast switch, Low Ciss, Low gate charge
- ◆

### PIN CONFIGURATION(TO-92)



### PART MARKING



Y : Year Code  
W : Week 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
SPN6001T92AGB	TO-92	SPN6001

※ Week Code : 01~53

※ SPN6001T92AGB : Tape Ammo ; Pb – Free ; Halogen - Free

### ABSOLUTE MAXIMUM RATINGS (TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V <sub>DSS</sub>	600	V
Gate –Source Voltage - Continuous	V <sub>GSS</sub>	±20	V
Gate –Source Voltage - Non Repetitive ( t <sub>p</sub> < 50μs)	V <sub>GSS</sub>	±40	V
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>DM</sub>	1	A
TA=25°C			
Pulsed Drain Current (*)	I <sub>DM</sub>	2.5	A
Power Dissipation	P <sub>D</sub>	3	W
TA=25°C			
Operating Junction Temperature	T <sub>J</sub>	-55 ~ 150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ 150	°C
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	120	°C/W

(\*) Pulse width limited by safe operating area



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**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$  Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	600			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=480V, V_{GS}=0V$			10	$\mu A$
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=500mA$			15	$\Omega$
Forward On Voltage	$V_{SD}$	$V_{GS}=0V, I_D=500mA$			1	V
Forward Transconductance	$G_{fs}$	$V_{DS} = 40 V, I_D = 500 mA$		0.8		S
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DD} = 480 V, I_D = 1 A,$ $V_{GS} = 10 V$		6.1	7.2	nC
Gate-Source Charge	$Q_{gs}$			1.0		
Gate-Drain Charge	$Q_{gd}$			3.0		
Input Capacitance	$C_{iss}$	$V_{DS} = 25 V, f = 1 MHz,$ $V_{GS} = 0$		178	221	pF
Output Capacitance	$C_{oss}$			19	27	
Reverse Transfer Capacitance	$C_{rss}$			3.7	4.8	
Turn-On Time	$t_{d(on)}$	$V_{DD} = 300 V, I_D = 1 A$ $R_G = 25\Omega$		15		ns
	$t_r$			46		
Turn-Off Time	$t_{d(off)}$			26		
	$t_f$			37		

(1) Pulsed: Pulse duration = 300  $\mu s$ , duty cycle 2 %.

(2) Pulse width limited by maximum junction temperature.



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## TYPICAL CHARACTERISTICS

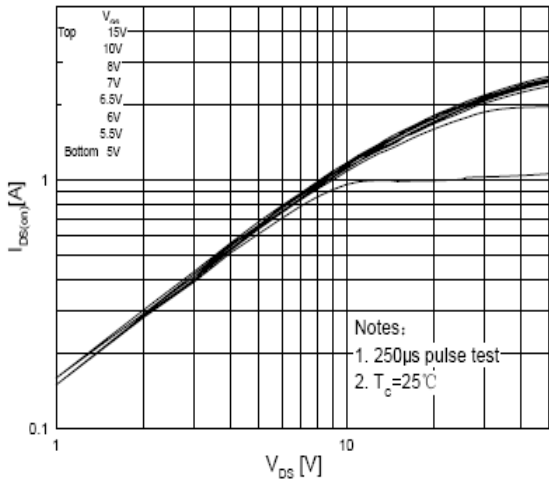


Fig. 1 Typical Output Characteristics

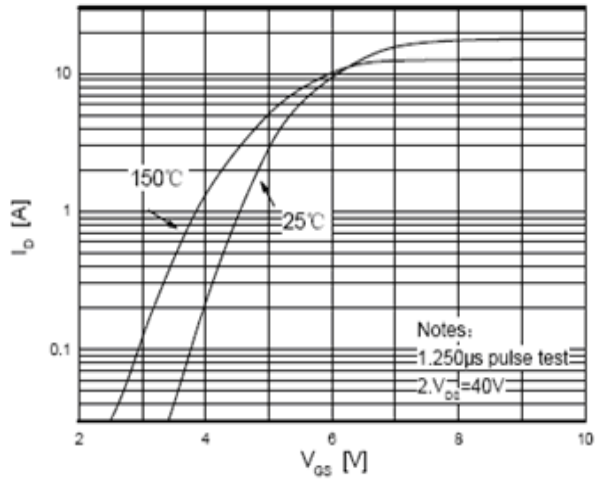


Fig. 2 Transfer Characteristics

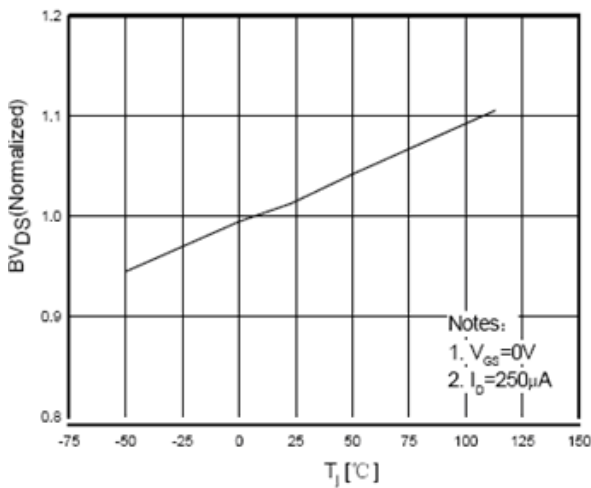


Fig. 3  $BV_{dss}$  vs Junction Temperature

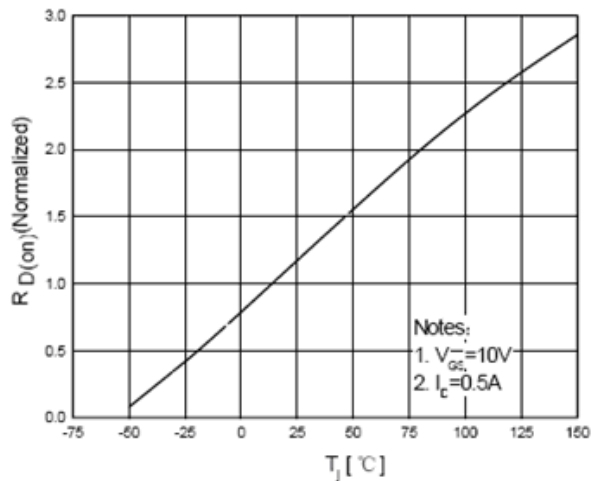


Fig. 4 On-Resistance vs Junction Temperature

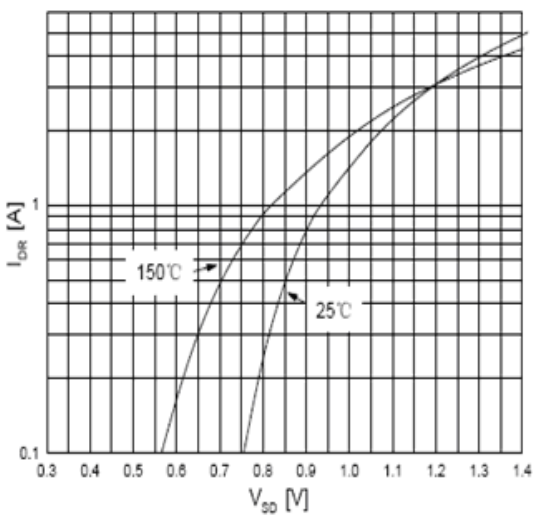


Fig. 5 Forward Characteristic of Reverse Diode

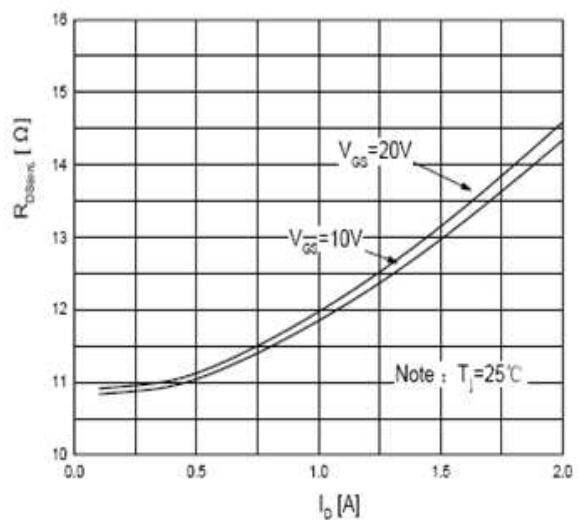


Fig. 6 On-Resistance vs Drain Current



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## TYPICAL CHARACTERISTICS

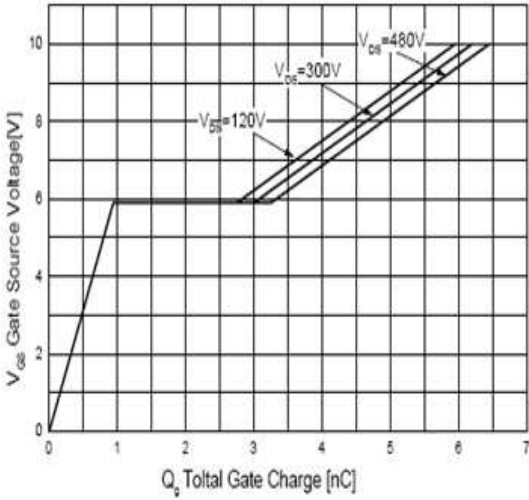


Fig. 7 Gate Charge Characteristics

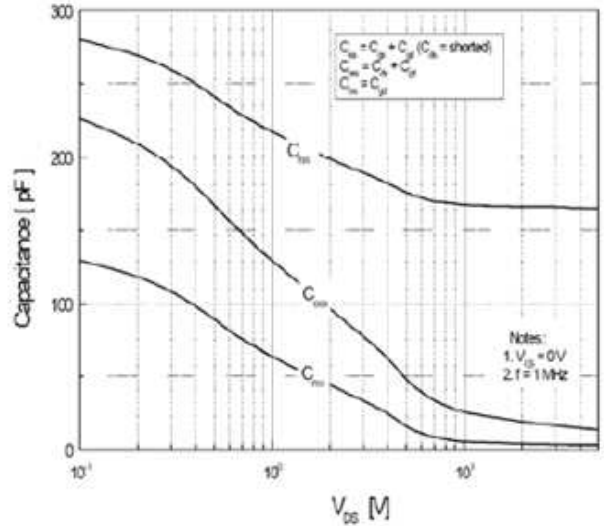


Fig. 8 Typical Capacitance Characteristics

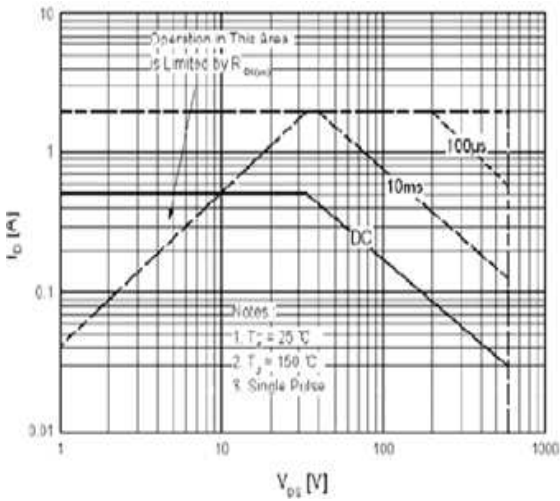


Fig. 9 Maximum Safe Operation Area

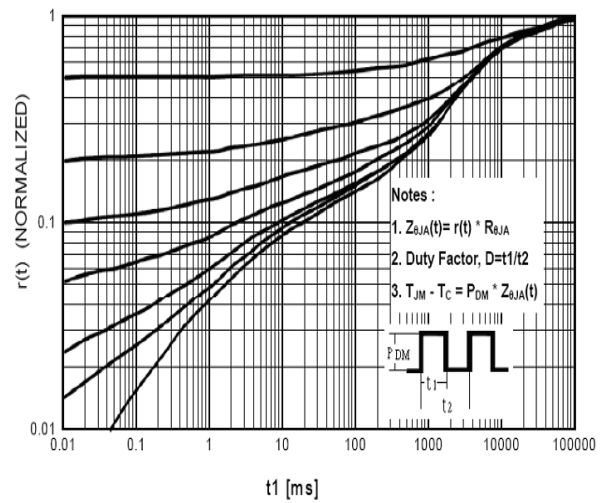
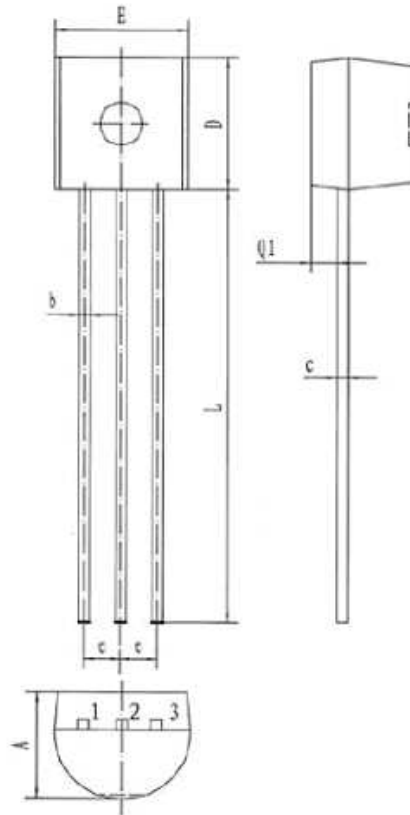


Fig. 10 Effective Transient Thermal Impedance



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## TO-92 PACKAGE OUTLINE



Dimension in mm

symbol	MIN	MAX
A	3.30	3.90
b	0.35	0.55
c	0.31	0.51
D	4.30	4.90
E	4.30	4.90
e	1.17	1.37
L	12.50	15.50
Q1	0.74	0.89



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