



SPN12T20

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN12T20 is the N-Channel logic enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. The SPN12T20 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

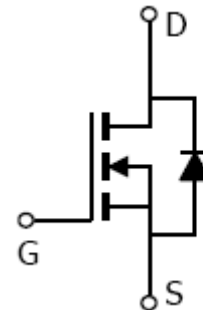
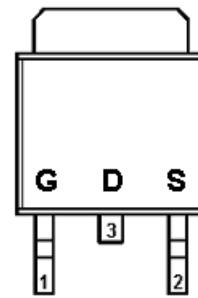
- ◆ 200V/12A, $R_{DS(ON)}=210m\Omega@V_{GS}=10V$
- ◆ High density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-252 package design

APPLICATIONS

- High Frequency Small Power Switching for MB/NB/VGA
- Network DC/DC Power System
- Load Switch

PIN CONFIGURATION

TO-252



PART MARKING





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PIN DESCRIPTION

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

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN12T20T252RGB	TO-252	SPN12T20

※ SPN12T20T252RGB : Tape Reel ; Pb – Free ; Halogen - Free

ABSOLUTE MAXIMUM RATINGS

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

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V_{DS}	200	V	
Gate –Source Voltage	V_{GS}	± 20	V	
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	I_D	$T_A=25^{\circ}\text{C}$	18	A
		$T_A=70^{\circ}\text{C}$	12	
Pulsed Drain Current	I_{DM}	32	A	
Power Dissipation	P_D	40	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	$R_{\theta JA}$	100	$^{\circ}\text{C}/\text{W}$	



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ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

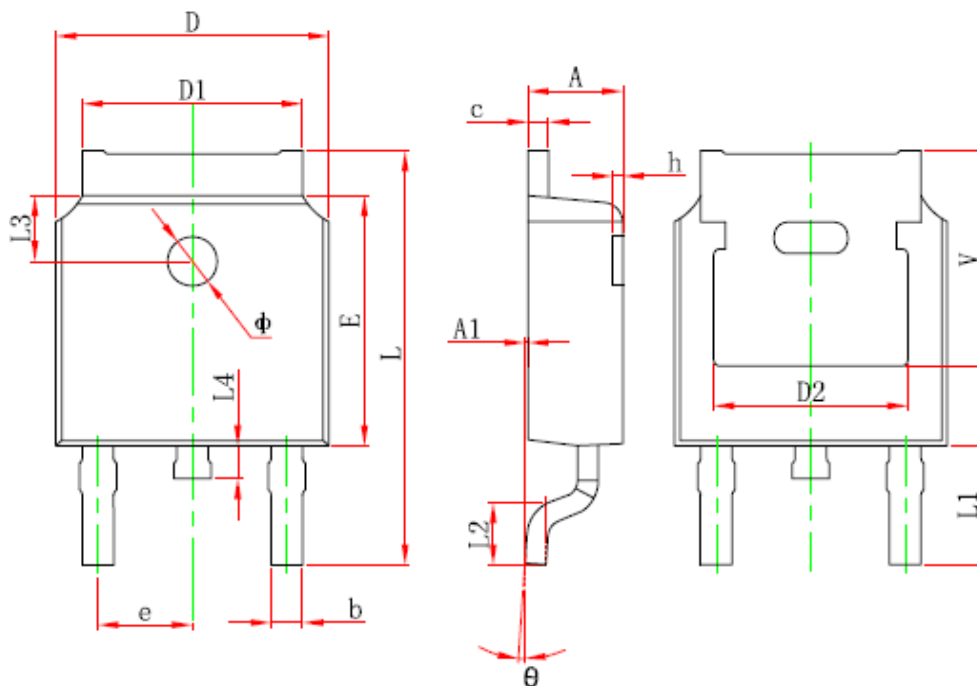
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	200			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.8	5.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=160V, V_{GS}=0V$			2	μA
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geq 5V, V_{GS}=10V$			18	A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=12A$		0.18	0.21	Ω
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=12A$		8.5		S
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$			1	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=160V, V_{GS}=10V$ $I_D=12A$		17.6	25	nC
Gate-Source Charge	Q_{gs}			7.6	11	
Gate-Drain Charge	Q_{gd}			3.7	5.2	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$		1000	1400	pF
Output Capacitance	C_{oss}			110	155	
Reverse Transfer Capacitance	C_{rss}			2.4	3.5	
Turn-On Time	$t_{d(on)}$	$V_{DD}=100V, I_D=12A,$ $V_{GEN}=10V, R_G=3.3\Omega$		9.4	19	nS
	t_r			23	41	
Turn-Off Time	$t_{d(off)}$			18.4	37	
	t_f			15.6	21.8	



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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	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	



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