



SPN120T15

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN120T15 is the N-Channel enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suitable for synchronous rectifier application, Motor control power management and other Power Tool circuits. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

FEATURES

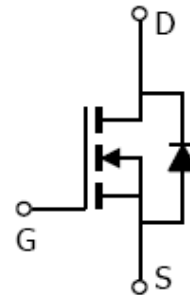
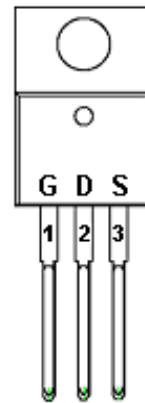
- ◆ 150V/120A, $R_{DS(ON)}=10.5m\Omega@V_{GS}=10V$
- ◆ High density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220 package design

APPLICATIONS

- AC/DC Synchronous Rectifier
- Load Switch
- UPS
- Power Tool
- Motor Control

PIN CONFIGURATION

TO-220



PART MARKING



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



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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
SPN120T15T220TGB	TO-220-3L	SPN120T15

※ SPN120T15T220TGB : Tube ; Pb – Free ; Halogen - Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V _{DSS}	150	V	
Gate –Source Voltage	V _{GSS}	±20	V	
Continuous Drain Current(T _J =150°C)	I _D	TA=25°C	120	A
		TA=100°C	85	
Pulsed Drain Current	I _{DM}	400	A	
Avalanche Energy, Single Pulse @ L=0.4mH, TA=25°C	E _{AS}	845	mJ	
Power Dissipation @ TA=25°C	P _D	333	W	
Operating Junction Temperature	T _J	-55/175	°C	
Storage Temperature Range	T _{STG}	-55/175	°C	
Thermal Resistance-Junction to Ambient	R _{θJA}	60	°C/W	



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ELECTRICAL CHARACTERISTICS

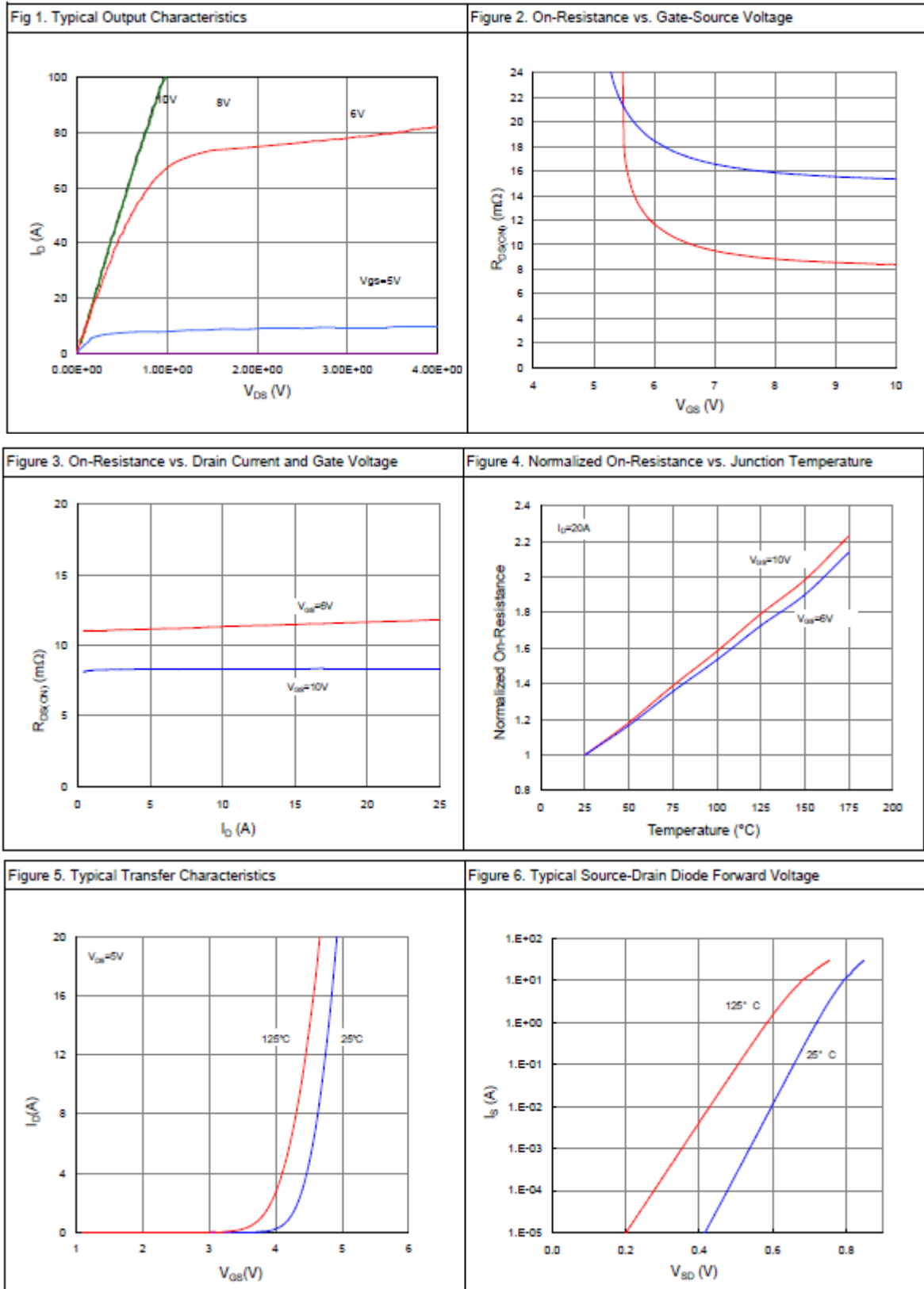
(T_A=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	150			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} =150V, V _{GS} =0V T _J =25°C			1	μA
		V _{DS} =150V, V _{GS} =0V T _J =100°C			100	
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D =20A		8.8	10.5	mΩ
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =20A		90		S
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.9	1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =75V, V _{GS} =10V I _D = 20A		66		nC
Gate-Source Charge	Q _{gs}			11		
Gate-Drain Charge	Q _{gd}			24		
Input Capacitance	C _{iss}	V _{DS} =75V, V _{GS} =0V f=1MHz		4770		pF
Output Capacitance	C _{oss}			340		
Reverse Transfer Capacitance	C _{rss}			92		
Turn-On Time	t _{d(on)}	V _{DD} =75V, V _{GS} =10V I _D =20A, R _G =10Ω		17		nS
	t _r			56		
Turn-Off Time	t _{d(off)}			30		
	t _f			28		



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TYPICAL CHARACTERISTICS

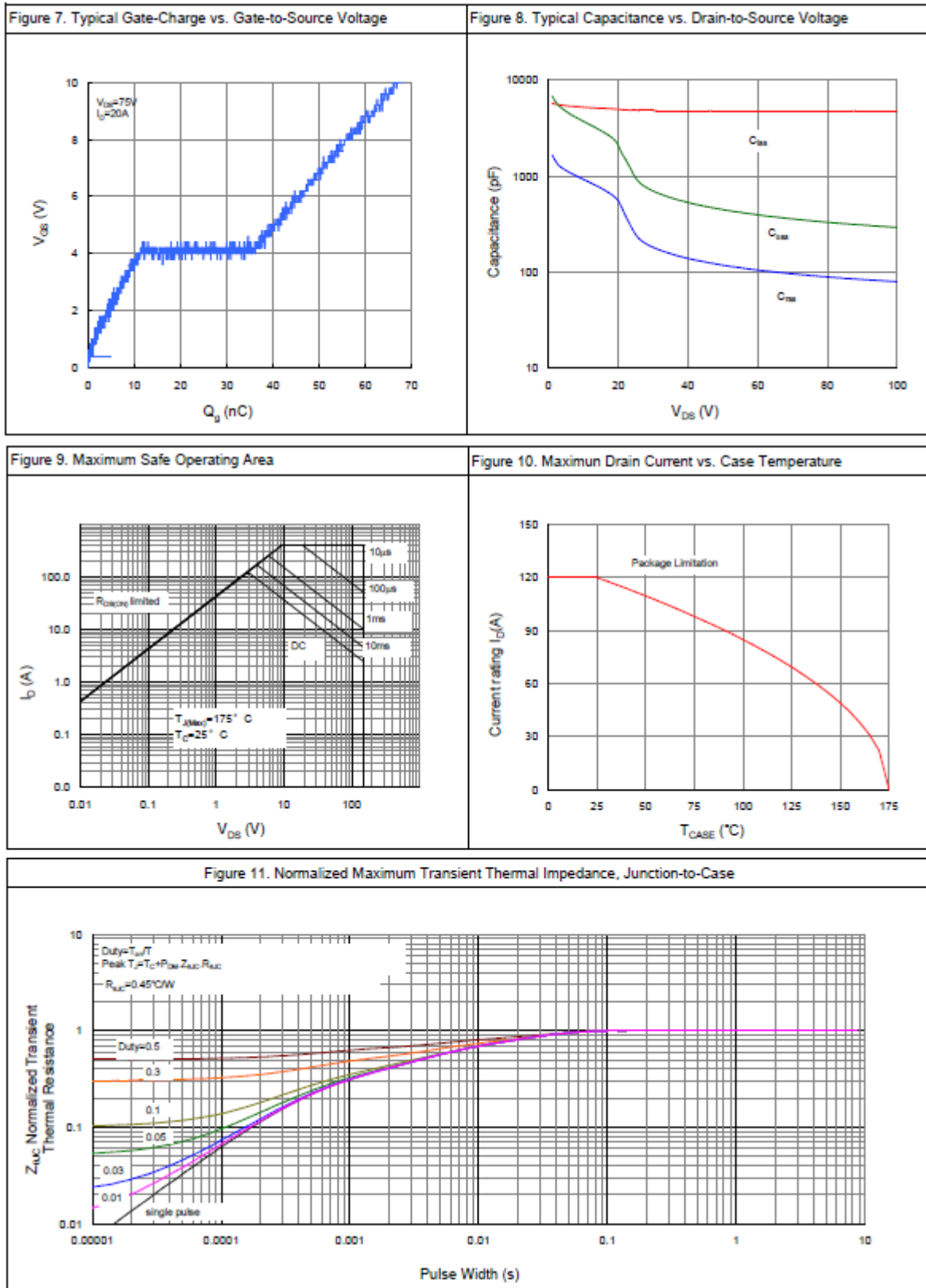




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TYPICAL CHARACTERISTICS

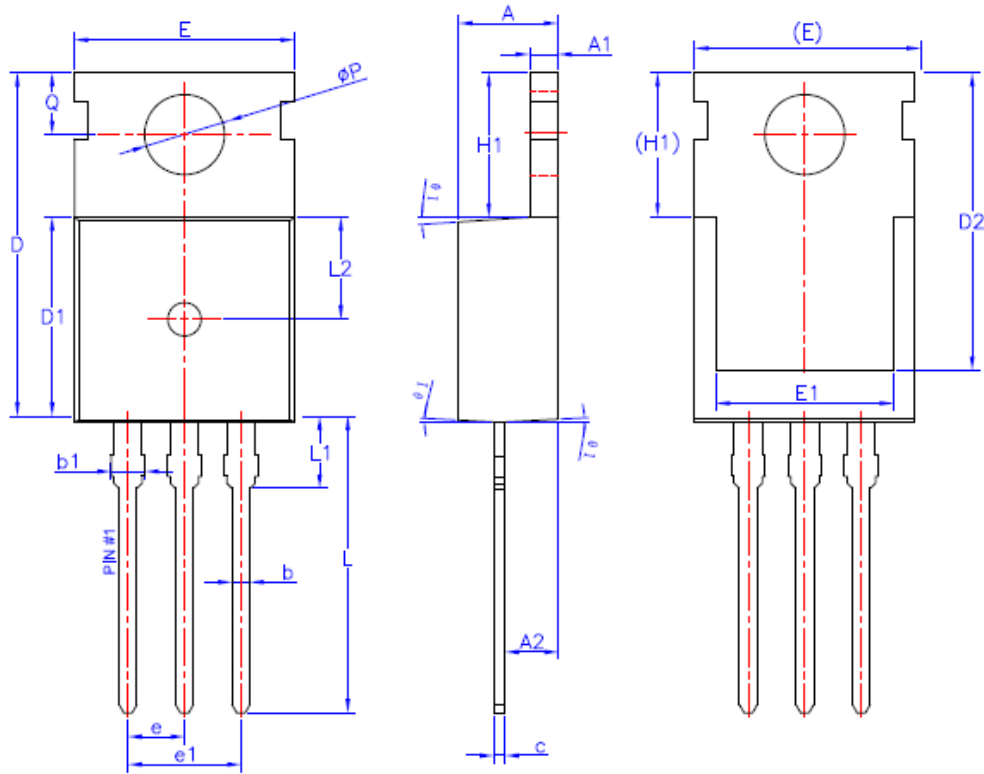




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TO-220 PACKAGE OUTLINE



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



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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

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