



SPN65T20 N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN65T20 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 RDS(ON) and fast switching speed.

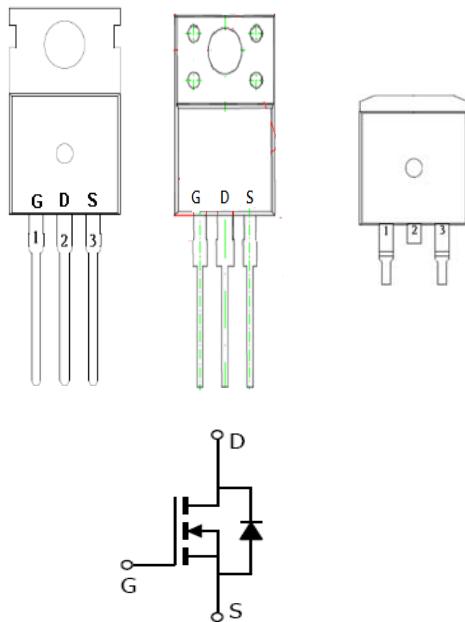
FEATURES

- ◆ 200V/70A, R_{DS(ON)}=21mΩ@V_{GS}=10V
- ◆ High density cell design for extremely low R_{DS}(ON)
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L/TO-220F-3L/TO-263-2L package design

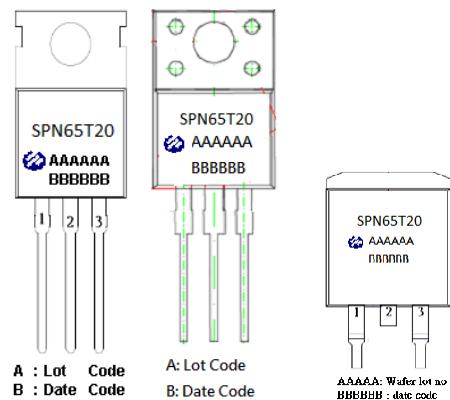
APPLICATIONS

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

PIN CONFIGURATION



PART MARKING





SPN65T20

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
SPN65T20T220TGB	TO-220-3L	SPN65T20
SPN65T20T220FTGB	TO-220F-3L	SPN65T20
SPN65T20T262RGB	TO-263-2L	SPN65T20

- ※ SPN65T20T220TGB : Tube ; Pb – Free ; Halogen – Free
- ※ SPN65T20T220FTGB : Tube ; Pb – Free ; Halogen – Free
- ※ SPN65T20T262RGB : Tape Reel ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	200	V
Gate –Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Silicon Limited)	T _C =25°C	70	A
	T _C =100°C	50	
Pulsed Drain Current	I _{DM}	260	A
Avalanche Energy, Single Pulse @ L=0.4mH, T _C =25°C	E _A	320	mJ
Power Dissipation @ T _C =25°C	P _D	278	W
Operating Junction Temperature	T _J	-55/150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Case	R _{θJC}	0.45	°C/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, ID=250uA	200			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , ID=250uA	2.0	3.0	4.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =200V, V _{GS} =0V T _J =25°C			1	uA
		V _{DS} =200V, V _{GS} =0V T _J =100°C			100	
Drain-Source On-Resistance	R _{DSS(on)}	V _{GS} =10V, ID=20A		16	21	mΩ
Forward Transconductance	g _{fs}	V _{DS} =5V, ID=20A		60		S
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =Open, f=1MHz		4.4		Ω
Dynamic						
Total Gate Charge	Q _g	V _{DS} =100V, V _{GS} =10V ID=20A		35		nC
Gate-Source Charge	Q _{gs}			11		
Gate-Drain Charge	Q _{gd}			6		
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V f=1MHz		2815		pF
Output Capacitance	C _{oss}			220		
Reverse Transfer Capacitance	C _{rss}			11		
Turn-On Time	t _{d(on)}	V _{DD} =100V, V _{GS} =10V ID=20A, R _G =10Ω		10		nS
	t _r			20		
Turn-Off Time	t _{d(off)}			21		
	t _f			8		
Diode						
Diode Forward Voltage	V _{SD}	I _F =20A, V _{GS} =0V		0.9		V
Reverse Recovery Time	t _{rr}	V _R =125V, I _F =20A, dI _F /dt=100A/uS		165		nS
Reverse Recovery Charge	Q _{rr}			830		nC



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TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

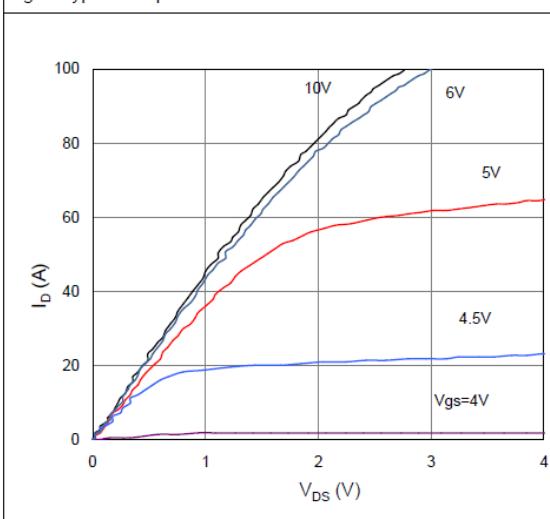


Figure 2. On-Resistance vs. Gate-Source Voltage

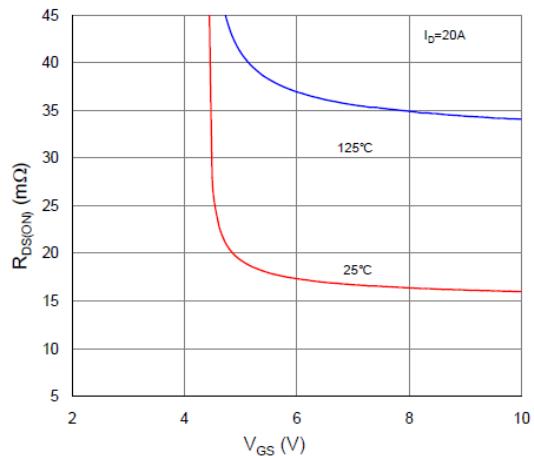


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

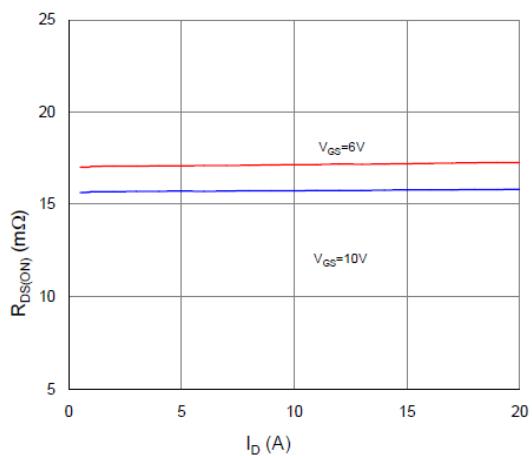


Figure 4. Normalized On-Resistance vs. Junction Temperature

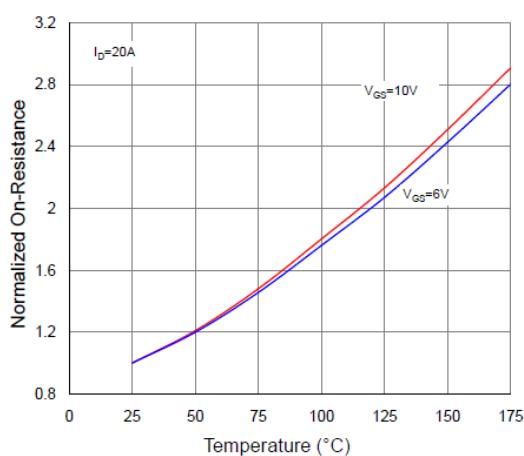


Figure 5. Typical Transfer Characteristics

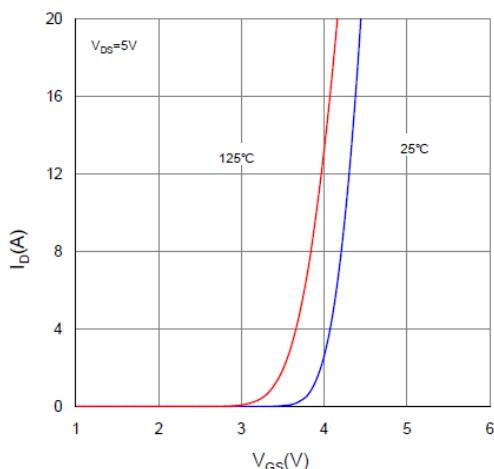
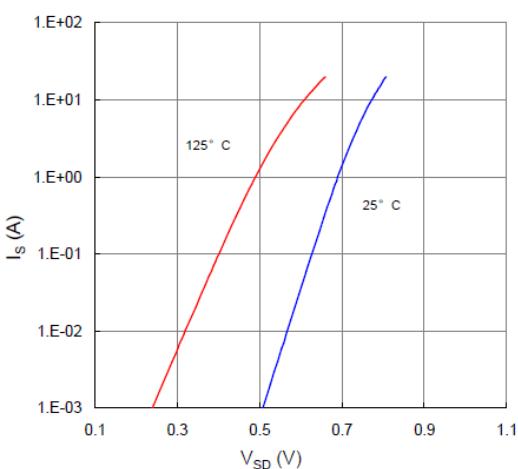


Figure 6. Typical Source-Drain Diode Forward Voltage





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TYPICAL CHARACTERISTICS

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

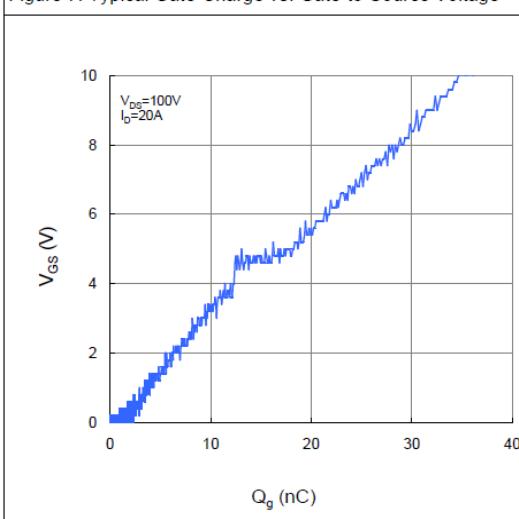


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

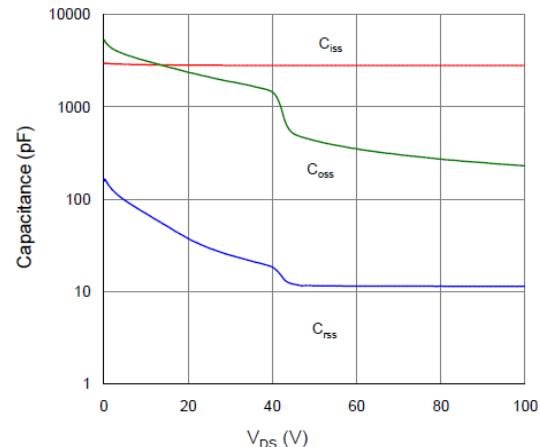


Figure 9. Maximum Safe Operating Area

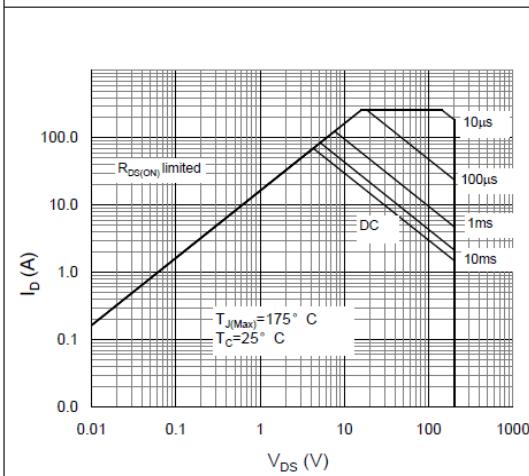


Figure 10. Maximum Drain Current vs. Case Temperature

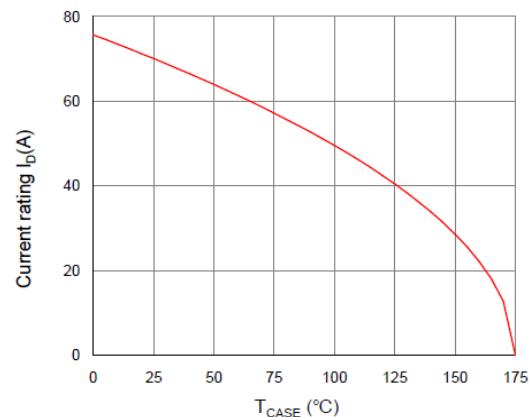
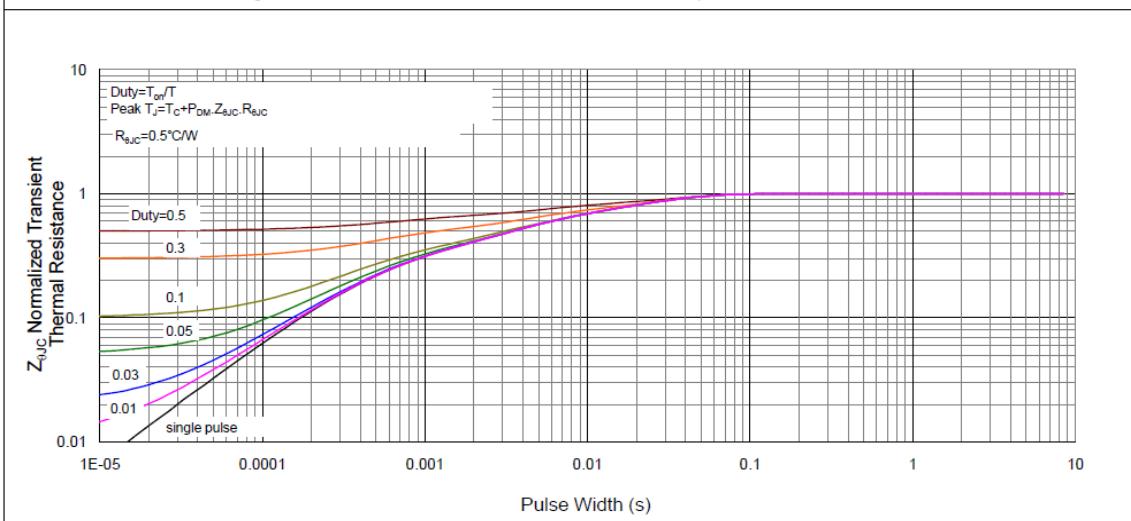


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case





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