



SPN230T06

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN230T06 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

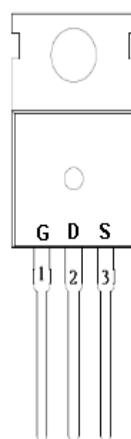
- ◆ 60V/230A, $R_{DS(ON)}=2.5m\Omega@V_{GS}=10V$
- ◆ High density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L and TO-263-2L package design

APPLICATIONS

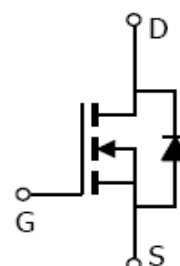
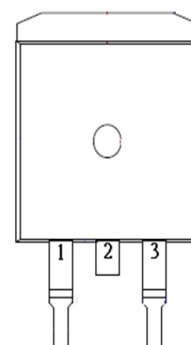
- AC/DC Synchronous Rectifier
- Load Switch
- UPS
- Power Tool
- Motor Control

PIN CONFIGURATION

TO-220-3L



TO-263-2L



PART MARKING



A : Lot Code
B : Date Code



AAAAA: Wafer lot no
BBBBB : date 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
SPN230T06T220TGB	TO-220-3L	SPN230T06
SPN230T06T262RGB	TO-263-2L	SPN230T06

※ SPN230T06T220TGB : Tube ; Pb – Free ; Halogen - Free

※ SPN230T06T262RGB : Tape&Reel ; Pb – Free ; Halogen - Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°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°C)	T _A =25°C	I _D	230	A
	T _A =70°C		160	
Pulsed Drain Current		I _{DM}	500	A
Avalanche Energy, Single Pulse @ L=1mH, T _A =25°C		E _{AS}	350	mJ
Power Dissipation @ T _A =25°C		P _D	104	W
Operating Junction Temperature		T _J	-55/150	°C
Storage Temperature Range		T _{STG}	-55/150	°C
Thermal Resistance-Junction to Case		R _{θJC}	1.2	°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 =250uA	60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2.0	2.8	4.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V T _J =25°C			1	uA
		V _{DS} =60V, V _{GS} =0V T _J =100°C			100	
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		2.1	2.5	mΩ
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =20A		80		S
Gate Resistance	R _G	V _{GS} =0V, V _{DS} =Open, f=1MHz		0.7		Ω
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V		0.9	1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V I _D = 20A		85		nC
Gate-Source Charge	Q _{gs}			24		
Gate-Drain Charge	Q _{gd}			14		
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V f=1MHz		7070		pF
Output Capacitance	C _{oss}			2140		
Reverse Transfer Capacitance	C _{rss}			63		
Turn-On Time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V I _D =20A, R _G =10Ω		36		nS
	t _r			62		
Turn-Off Time	t _{d(off)}			95		
	t _f			34		



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TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

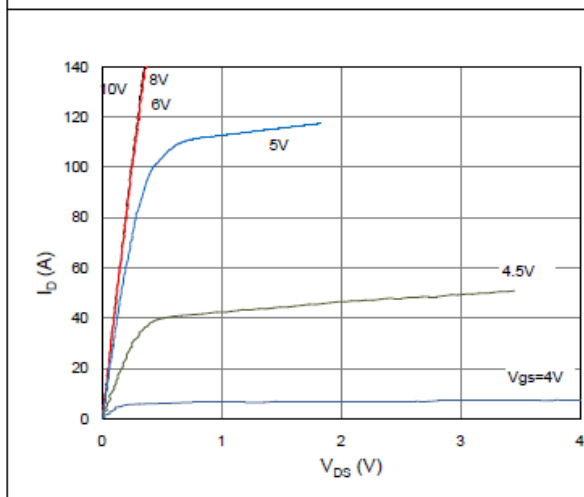


Figure 2. On-Resistance vs. Gate-Source Voltage

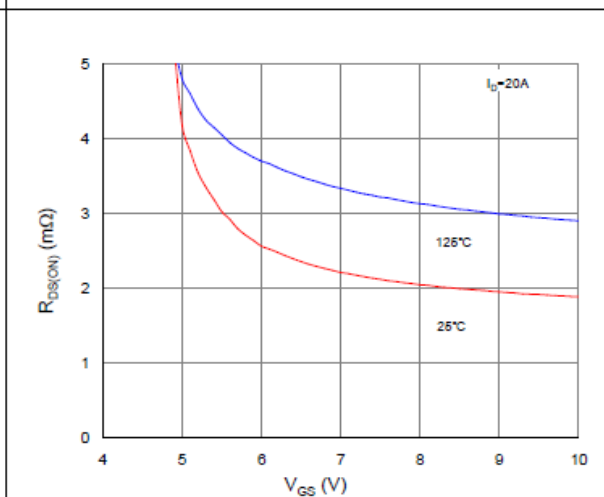


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

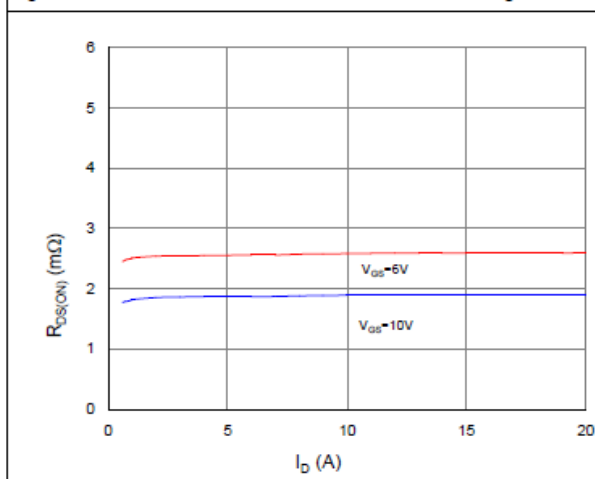


Figure 4. Normalized On-Resistance vs. Junction Temperature

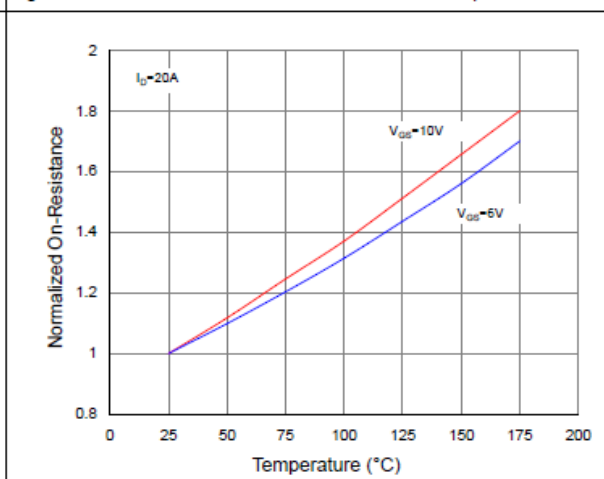


Figure 5. Typical Transfer Characteristics

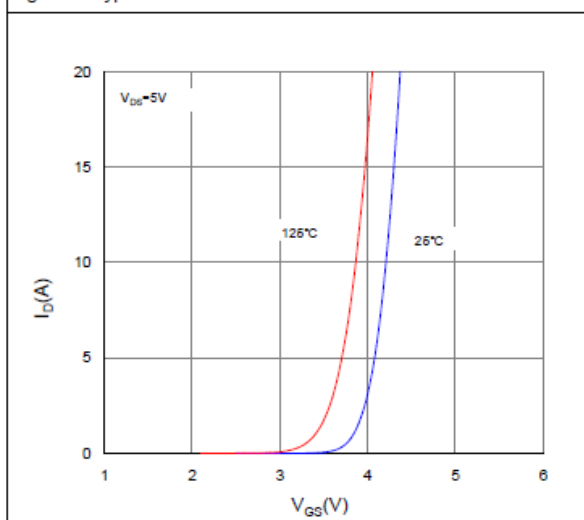
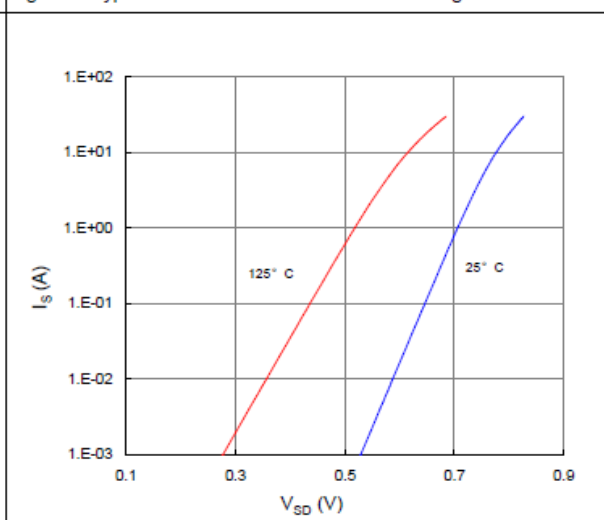


Figure 6. Typical Source-Drain Diode Forward Voltage





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TYPICAL CHARACTERISTICS

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

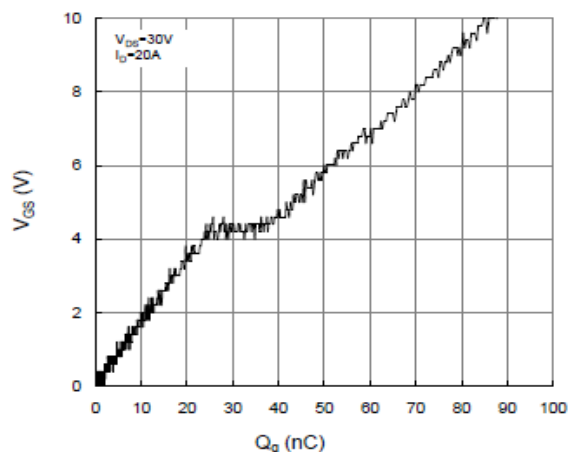


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

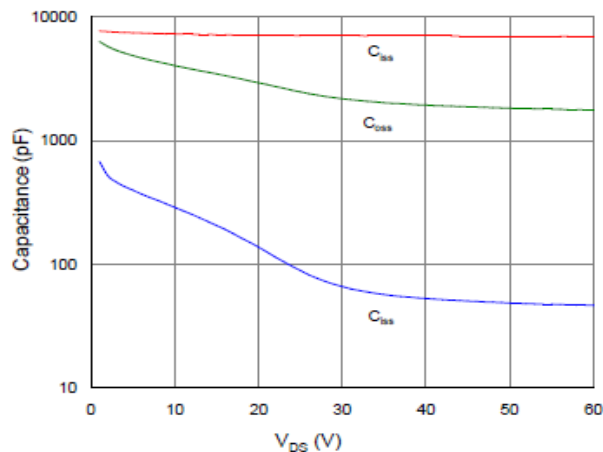


Figure 9. Maximum Safe Operating Area

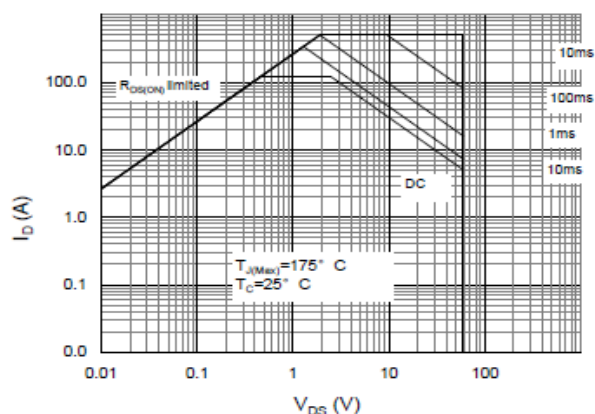


Figure 10. Maximum Drain Current vs. Case Temperature

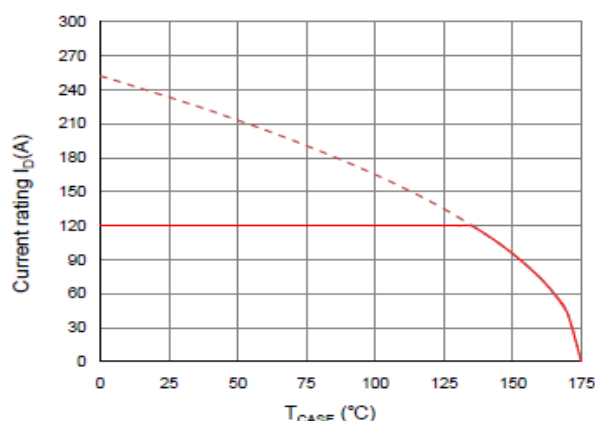
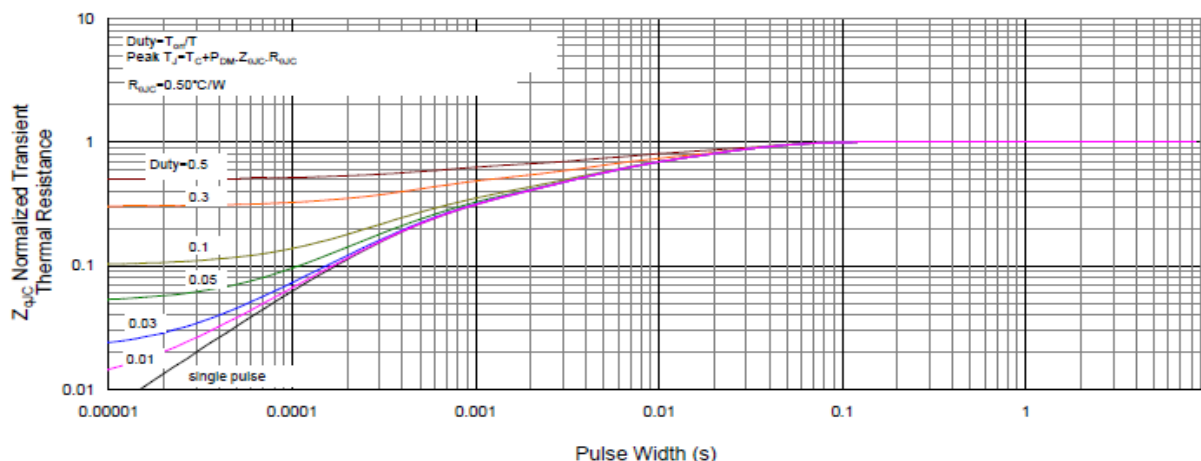


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case





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