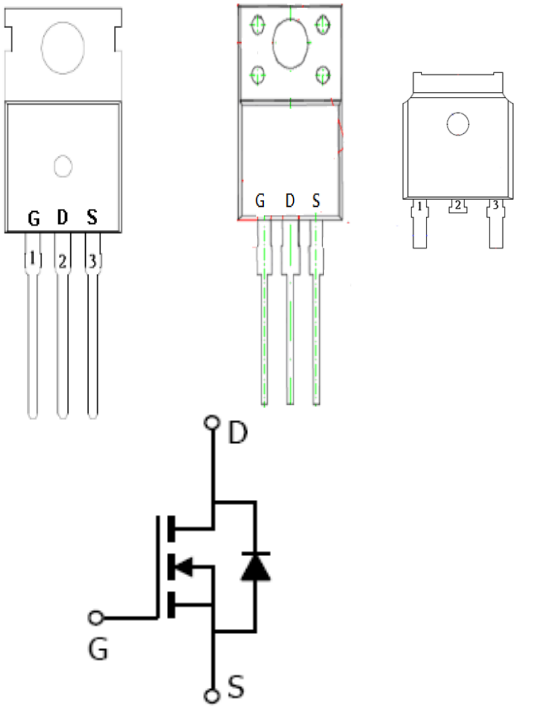
SPN120T06
N-Channel Enhancement Mode MOSFET

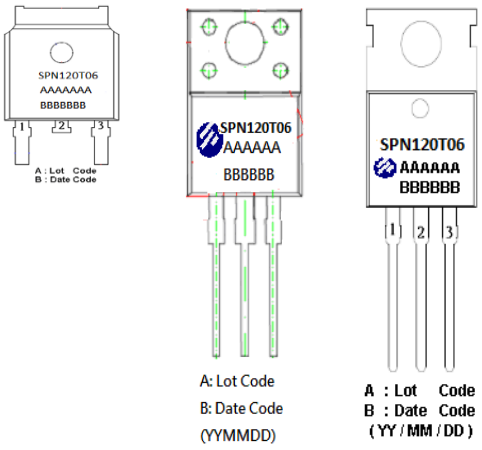
DESCRIPTION
The SPN120T06 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density DMOS trench technology.
This high density process is especially tailored to minimize on-state resistance.
These devices are particularly suited for low voltage application, notebook computer power management and other battery powered circuits where high-side switching.

APPLICATIONS
- DC/DC Converter
- Load Switch
- Synchronous Buck Converter
- UPS
- Motor Control
- Power Tool

FEATURES
- 60V/108A,$R_{DS(ON)}$=4.9mΩ@V_{GS}=10V
- 60V/108A,$R_{DS(ON)}$=7.5mΩ@V_{GS}=4.5V
- Super 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-252-2L package design

PIN CONFIGURATION
TO-220 **TO-220F** **TO-252-2L**



PART MARKING


SPN120T06
N-Channel Enhancement Mode MOSFET

TO-220/TO-220F PIN DESCRIPTION

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

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN120T06T220TGB	TO-220-3L	SPN120T06
SPN120T06T220FTGB	TO-220F-3L	SPN120T06
SPN120T06T252RGB	TO-252-2L	SPN120T06

※ SPN120T06T220TGB : Tube ; Pb – Free ; Halogen – Free
※ SPN120T06T220FTGB : Tube ; Pb – Free ; Halogen – Free
※ SPN120T06T252RGB : Tape&Reel ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current (Silicon Limited)	T_C=25℃	I_D	108	A
	T_C=100℃		77	
Pulsed Drain Current		I_{DM}	340	A
Avalanche Energy Single Pulse(L=0.1mH, T_C=25℃)		E_{AS}	31	mJ
Power Dissipation@ T_C=25℃	TO-220	P_D	104	W
	TO-252/TO-220F		93	
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Case (TO-220)		$R_{\theta JC}$	1.2	℃/W
Thermal Resistance-Junction to Case (TO-252/TO-220F)		$R_{\theta JC}$	1.35	℃/W

Note :
The maximum current rating is package limited at 120A for TO-220-3L
The maximum current rating is package limited at 78A for TO-220F-3L
The maximum current rating is package limited at 70A for TO-252-2L

SPN120T06
N-Channel Enhancement Mode MOSFET

ELECTRICAL CHARACTERISTICS

(T_A=25℃ 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	1.0	1.6	2.4	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V T_J=25℃			1	uA
		V_{DS}=48V,V_{GS}=0V T_J=100℃			100	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A		4.2	4.9	mΩ
		V_{GS}=4.5V,I_D=10A		6.3	7.5	
Forward Transconductance	gfs	V_{DS}=5V,I_D=20A		60		S
Gate Resistance	R_G	V_{GS}=0V,V_{DS} Open, f=1MHz		1.3		Ω
Diode Forward Voltage	V_{SD}	I_S=30A,V_{GS} =0V		0.9	1.2	V
Dynamic						
Total Gate Charge(10V)	Q_g	V_{DS}=30V,V_{GS}=10V I_D=20A		41		nC
Total Gate Charge(4.5V)	Q_g			25		
Gate-Source Charge	Q_{gs}			5		
Gate-Drain Charge	Q_{gd}			11		
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V f=1MHz		1978		pF
Output Capacitance	C_{oss}			870		
Reverse Transfer Capacitance	C_{rss}			56		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V, I_D=20A,V_{GEN}=10V R_G=10Ω		10		nS
	t_r			8		
Turn-Off Time	$t_{d(off)}$			34		
	t_f			10		

TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

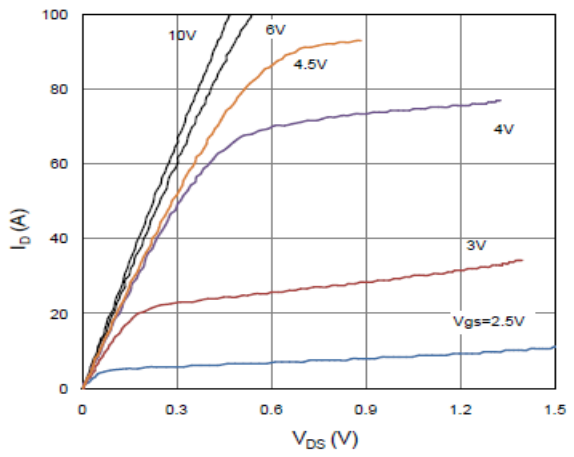


Figure 2. On-Resistance vs. Gate-Source Voltage

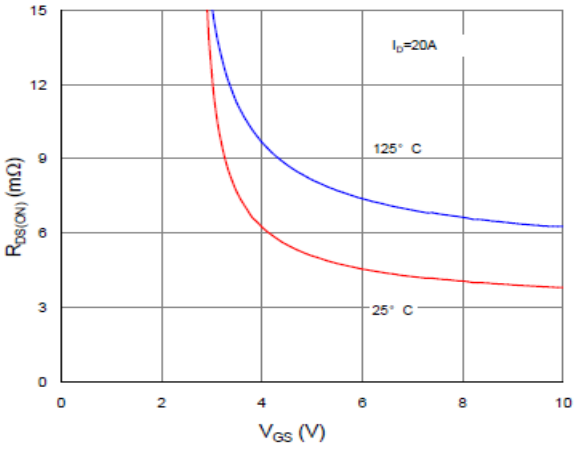


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

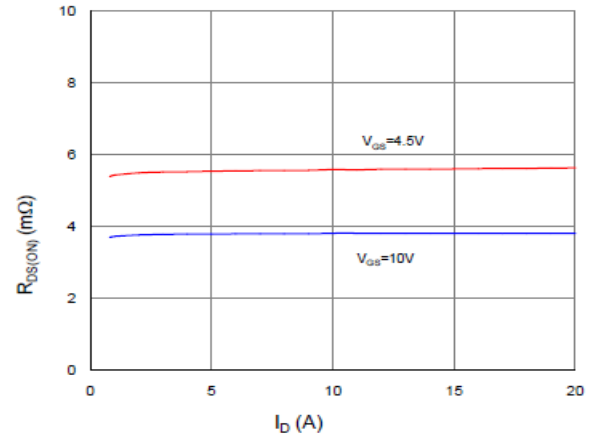


Figure 4. Normalized On-Resistance vs. Junction Temperature

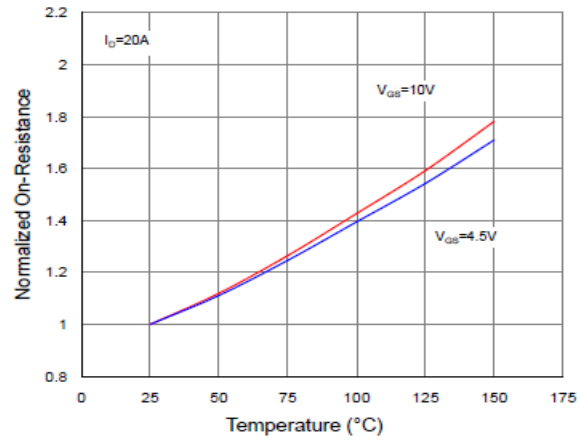


Figure 5. Typical Transfer Characteristics

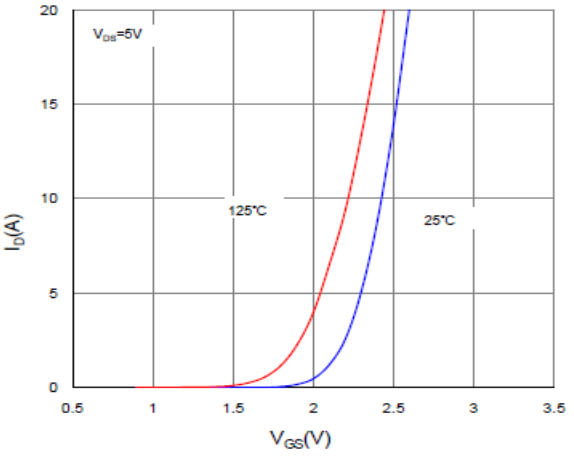
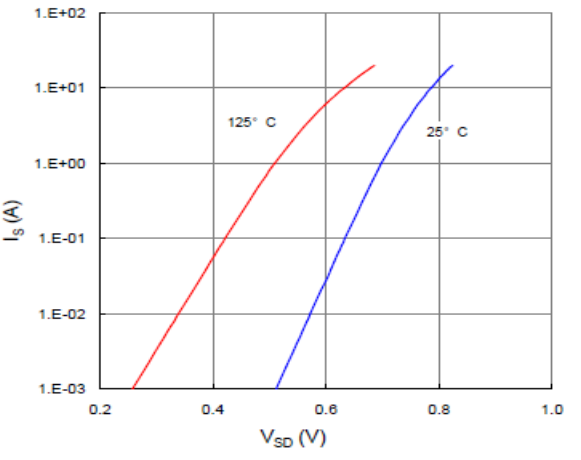


Figure 6. Typical Source-Drain Diode Forward Voltage



TYPICAL CHARACTERISTICS

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

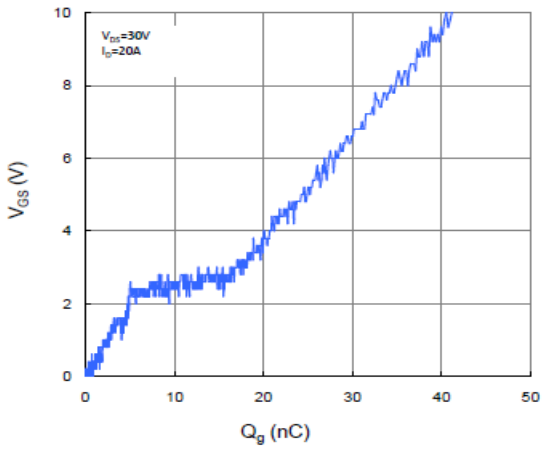


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

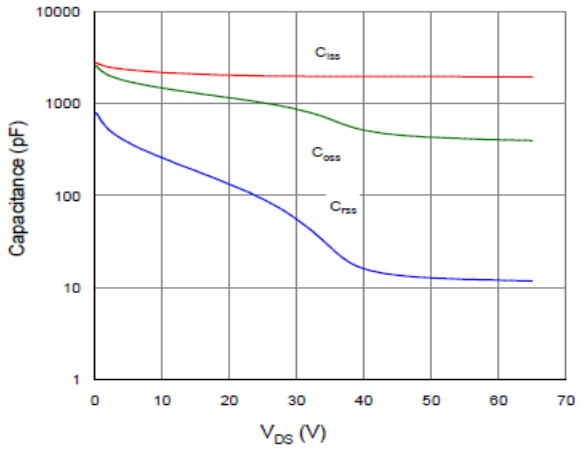


Figure 9. Maximum Safe Operating Area

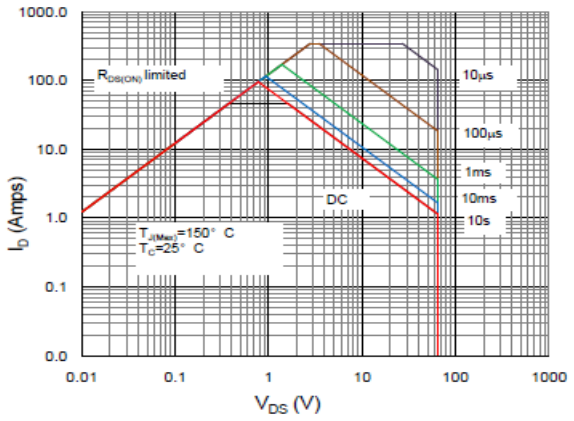


Figure 10. Maximun Drain Current vs. Case Temperature

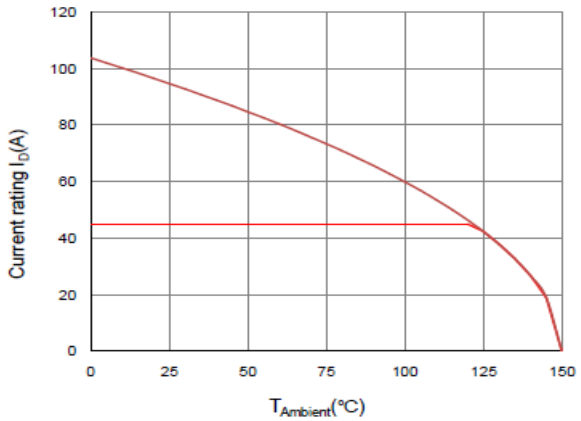
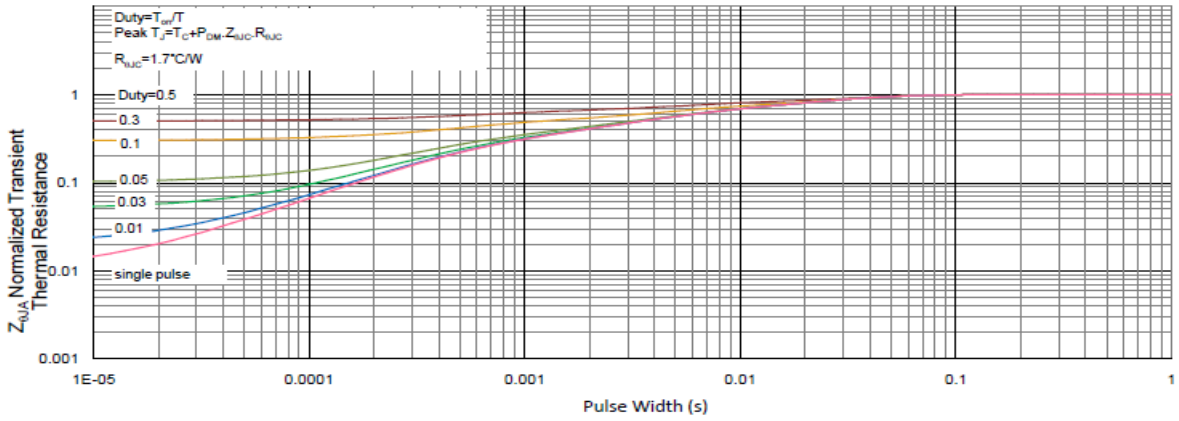


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



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