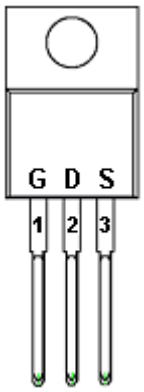
SPN80T06
N-Channel Enhancement Mode MOSFET

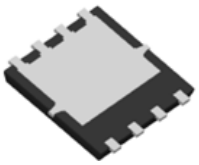
DESCRIPTION
The SPN80T06 is the N-Channel logic enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suitable for synchronous 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.

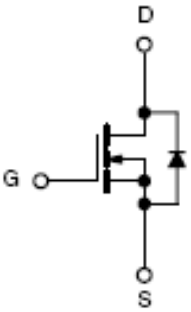
APPLICATIONS
- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier
- Motor Control
- Power Tool

FEATURES
- 60V/20A, $R_{DS(ON)}$=9mΩ@V_{GS}=10V
  60V/20A, $R_{DS(ON)}$=13mΩ@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/PPAK5x6 package design

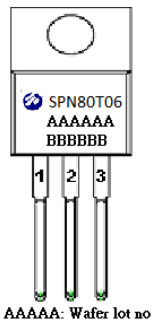
PIN CONFIGURATION
TO-220-3L **PPAK5x6**







PART MARKING



AAAAA: Wafer lot no
BBBBBB : date code

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

SPN80T06
N-Channel Enhancement Mode MOSFET

TO-220-3L PIN DESCRIPTION

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

PPAK5x6 PIN DESCRIPTION

Pin	Symbol	Description
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN80T06T220TGB	TO-220-3L	SPN80T06
SPN80T06DN8RGB	PDFN5x6-8L	SPN80T06

※ SPN80T06T220TGB : Tube ; Pb – Free ; Halogen - Free
※ SPN80T06DN8RGB : Tape&Reel ; Pb – Free ; Halogen - Free

SPN80T06
N-Channel Enhancement Mode MOSFET

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(TO-220-3L)	T_A=25℃	I_D	80	A
	T_A=70℃		55	
Continuous Drain Current(PPAK5x6)	T_A=25℃	I_D	62	A
	T_A=70℃		39	
Pulsed Drain Current (TO-220-3L)		I_{DM}	320	A
Pulsed Drain Current (PPAK5x6)		I_{DM}	270	A
Power Dissipation (T_A=25℃)	TO-220-3L	P_D	268	W
	PPAK5x6		62.5	
Avalanche Energy with Single Pulse (Tj=25℃, L = 1.0mH , I=18A)		E_{AS}	162	mJ
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	65	℃/W

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	1.8	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		7.3	9	mΩ
		V_{GS}=4.5V,I_D=20A		10	13	
Gate Resistance	R_G	V_{GS}=0V,V_{DS} open, f=1MHz		1.5		Ω
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V		0.9	1.2	V
Dynamic						
Total Gate Charge (10V)	Q_g	V_{DS}=30V, V_{GS}=10V I_D=20A		24		nC
Total Gate Charge (4.5V)	Q_g			12		
Gate-Source Charge	Q_{gs}			5.0		
Gate-Drain Charge	Q_{gd}			3.0		
Input Capacitance	C_{iss}	V_{DS}=30V, V_{GS}=0V f=1MHz		1620		pF
Output Capacitance	C_{oss}			415		
Reverse Transfer Capacitance	C_{rss}			3		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V, I_D=20A V_{GEN}=10V, R_G=10Ω		9		nS
	t_r			4		
Turn-Off Time	$t_{d(off)}$			29		
	t_f			4		

TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

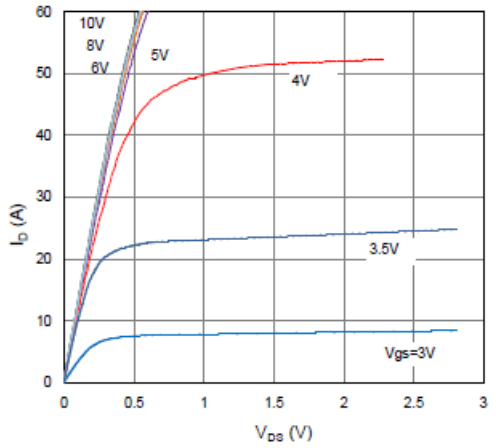


Figure 2. On-Resistance vs. Gate-Source Voltage

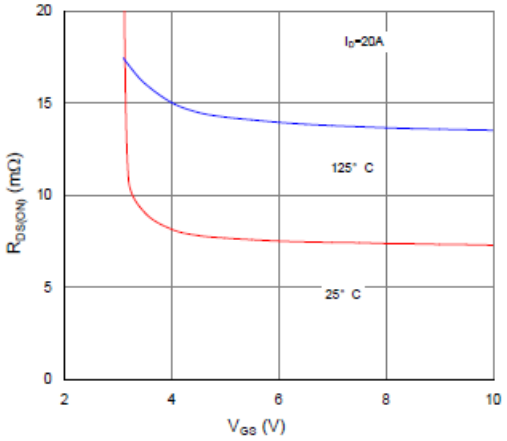


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

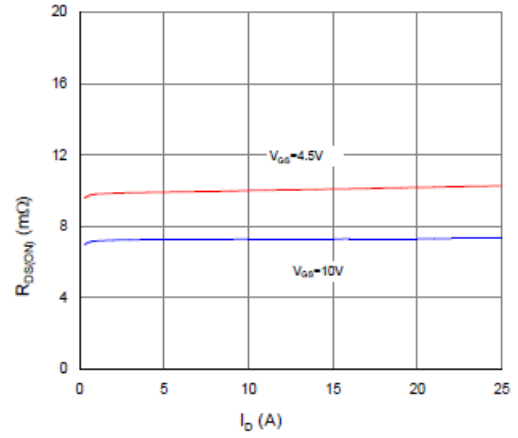


Figure 4. Normalized On-Resistance vs. Junction Temperature

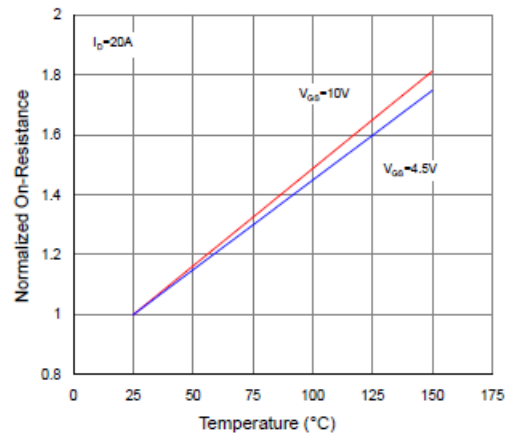


Figure 5. Typical Transfer Characteristics

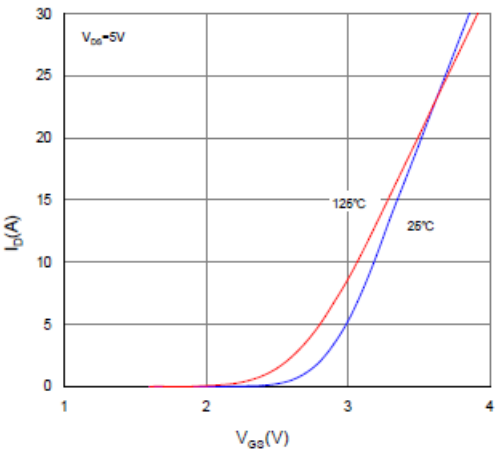
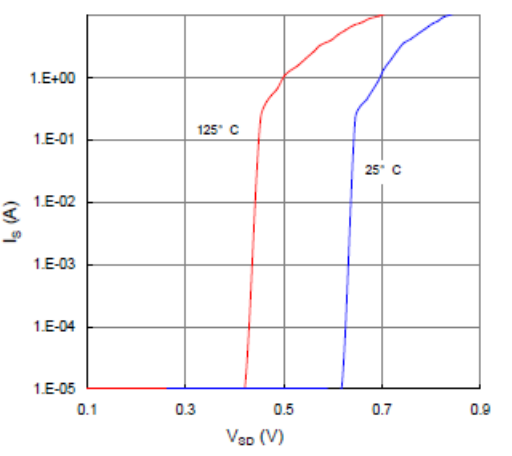


Figure 6. Typical Source-Drain Diode Forward Voltage



TYPICAL CHARACTERISTICS

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

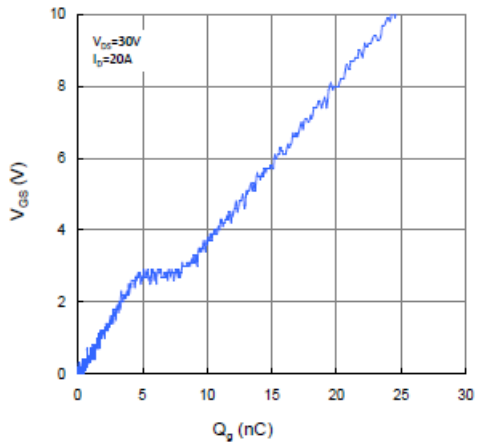


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

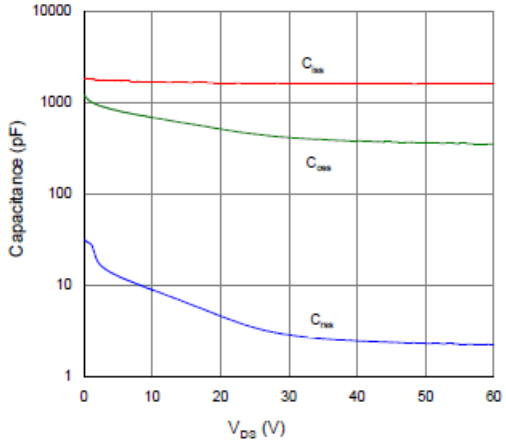


Figure 9. Maximum Safe Operating Area

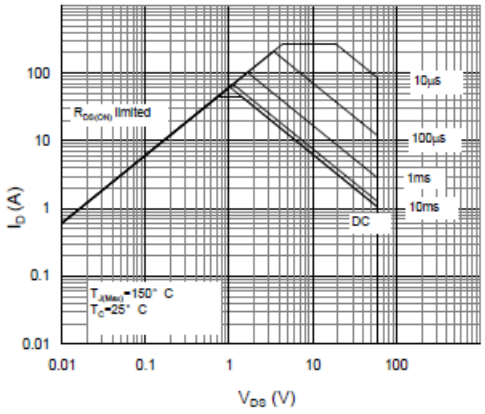


Figure 10. Maximun Drain Current vs. Case Temperature

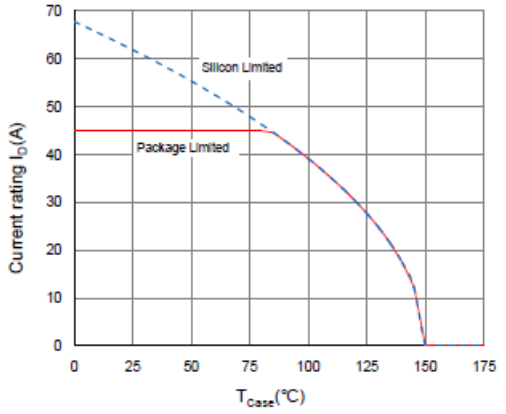
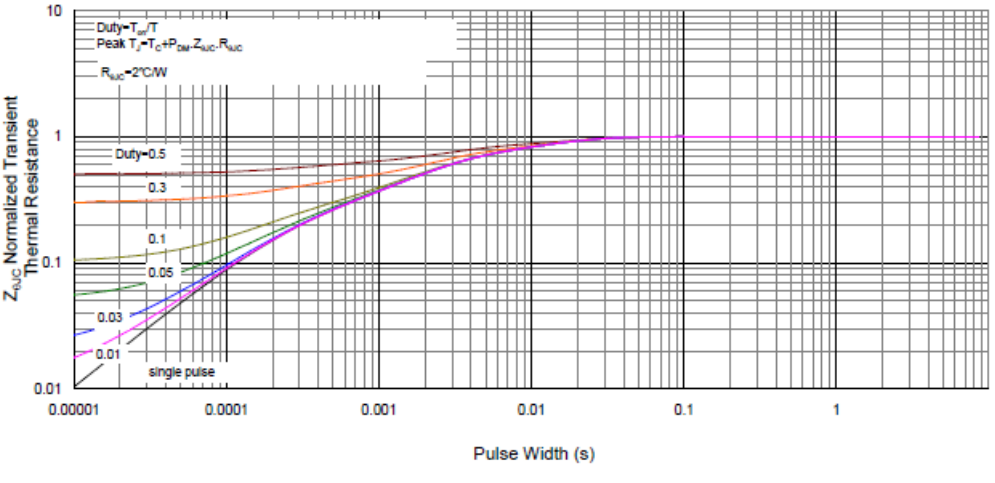
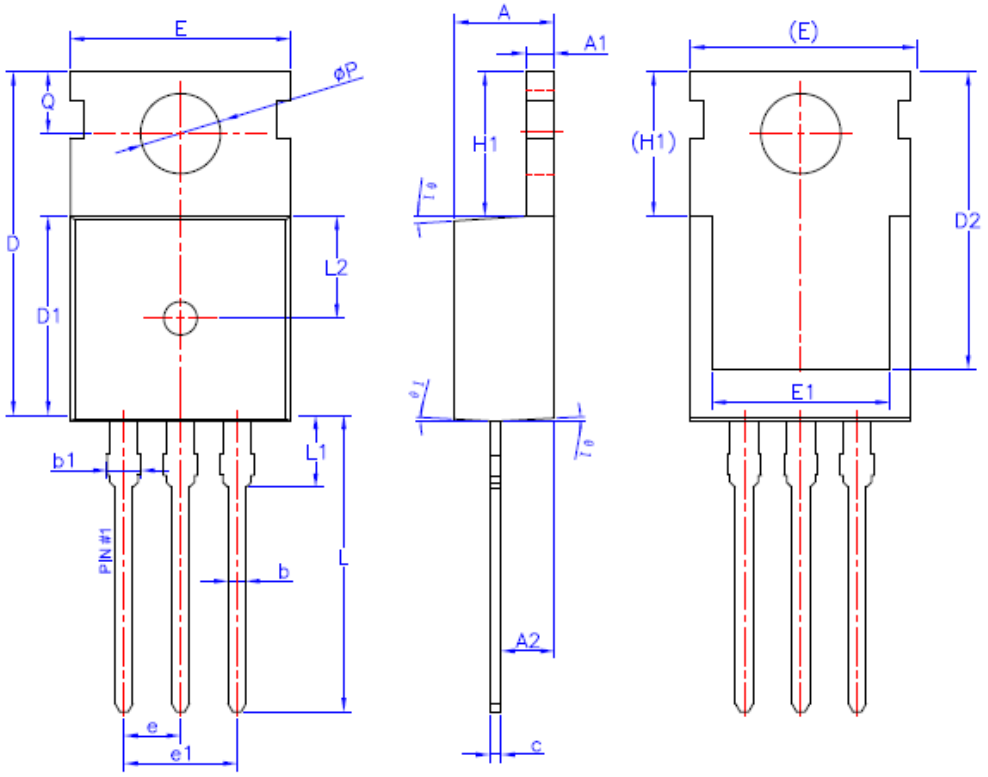


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

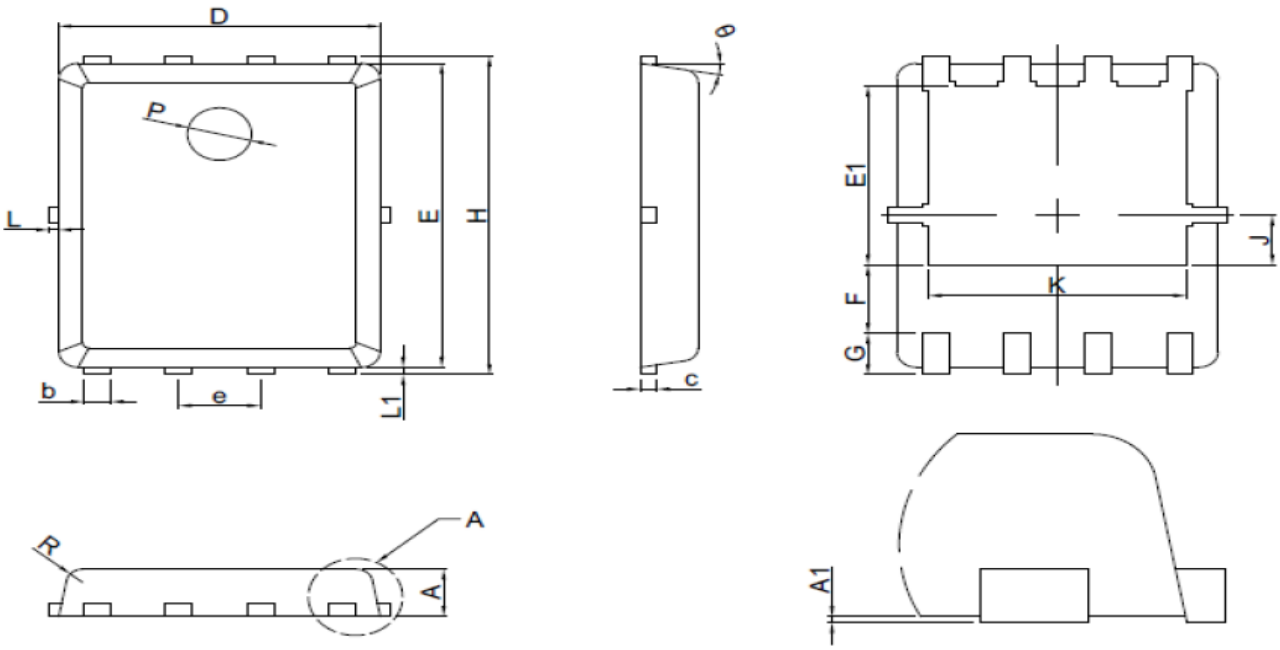


TO-220-3L PACKAGE OUTLINE



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°

PPAK5X6 PACKAGE OUTLINE



SYMBOL	MILLIMETERS		
	MIN	NOM	MAX
A	0.8	0.95	1.1
A1	0.00	0.03	0.05
b	0.33	0.41	0.51
c		0.254 REF	
D	4.80	4.95	5.10
F		1.40 REF	
E	5.70	5.80	5.90
e		1.27 BSC	
H	5.90	6.05	6.20
L1	0.06	0.13	0.20
G		0.60 REF	
J		0.95 BSC	
K		4.00 REF	
L	---	----	0.20
P		1.00 REF	
E1		3.40REF	
E2		0.95 REF	
θ	6°	10°	14°
R		0.25REF	

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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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