



SPN80N10

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN80N10 is the N-Channel enhancement mode power field effect transistor which is produced using super high cell density DMOS trench technology. The SPN80N10 has been designed specifically to improve the overall efficiency of DC/DC converters using either synchronous or conventional switching PWM controllers. It has been optimized for low gate charge, low $R_{DS(ON)}$ and fast switching speed.

APPLICATIONS

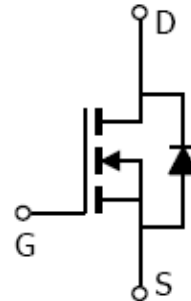
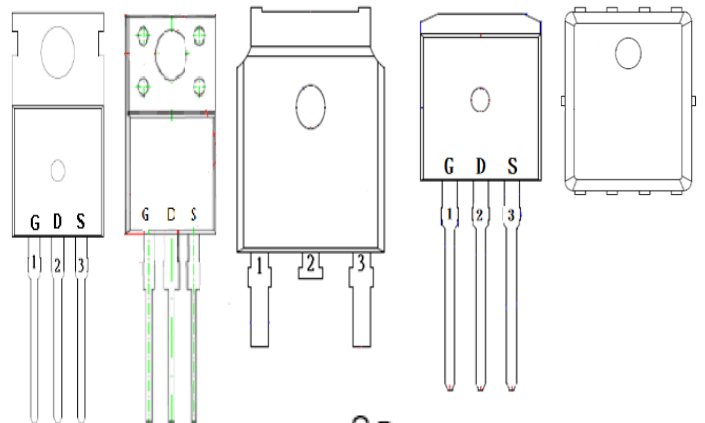
- AC/DC Synchronous Rectifier
- Load Switch
- UPS
- Motor Control
- Power Tool

FEATURES

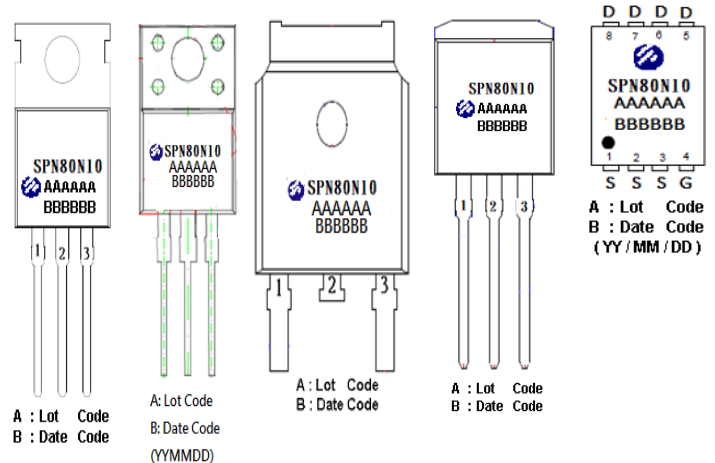
- ◆ 100V/84A, $R_{DS(ON)}=8.8m\Omega@V_{GS}=10V$
- ◆ High density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L/TO-220F-3L/TO-252-2L /TO-262-3L/PPAK5x6-8L package design

PIN CONFIGURATION

TO-220 TO-220F TO-252-2L TO-262-3L PPAK5x6-8L



PART MARKING





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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
SPN80N10T220TGB	TO-220-3L	SPN80N10
SPN80N10T220FTGB	TO-220F-3L	SPN80N10
SPN80N10T252RGB	TO-252-2L	SPN80N10
SPN80N10T263TGB	TO-262-3L	SPN80N10
SPN80N10DN8RGB	PPAK5x6-8L	SPN80N10

- ※ SPN80N10T220TGB : Tube ; Pb – Free ; Halogen – Free
- ※ SPN80N10T220FTGB : Tube ; Pb – Free ; Halogen – Free
- ※ SPN80N10T252RGB : Tape&Reel ; Pb – Free ; Halogen - Free
- ※ SPN80N10T263TGB : Tube ; Pb – Free ; Halogen – Free
- ※ SPN80N10DN8RGB : Tape&Reel ; Pb – Free ; Halogen – Free



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ABSOLUTE MAXIMUM RATINGS

(T_A=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate –Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Silicon Limited)	I _D	T _C =25°C	84
		T _C =100°C	60
Continuous Drain Current (Silicon Limited) (PPAK5x6)	I _D	T _C =25°C	74
		T _C =100°C	47
Pulsed Drain Current	I _{DM}	330	A
Avalanche Energy, Single Pulse, L=0.5mH , T _C =25°C	E _{AS}	306	mJ
Power Dissipation@ T _C =25°C (TO-262)	P _D	125	W
Power Dissipation@ T _C =25°C (TO-220)		104	
Power Dissipation@ T _C =25°C (TO-220F/TO-252)		93	
Power Dissipation@ T _C =25°C (PPAK5x6)		83	
Operating Junction Temperature	T _J	-55/150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Case (TO-220/TO-220F/TO-262)	R _{θJC}	1.2	°C/W
Thermal Resistance-Junction to Case (TO-252)	R _{θJC}	1.35	°C/W
Thermal Resistance-Junction to Case (PPAK5x6)	R _{θJC}	1.5	°C/W

Note :

The maximum current rating is package limited at 120A for TO-263-2L and 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

The maximum current rating is package limited at 80A for PPAK5x6-8L



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ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

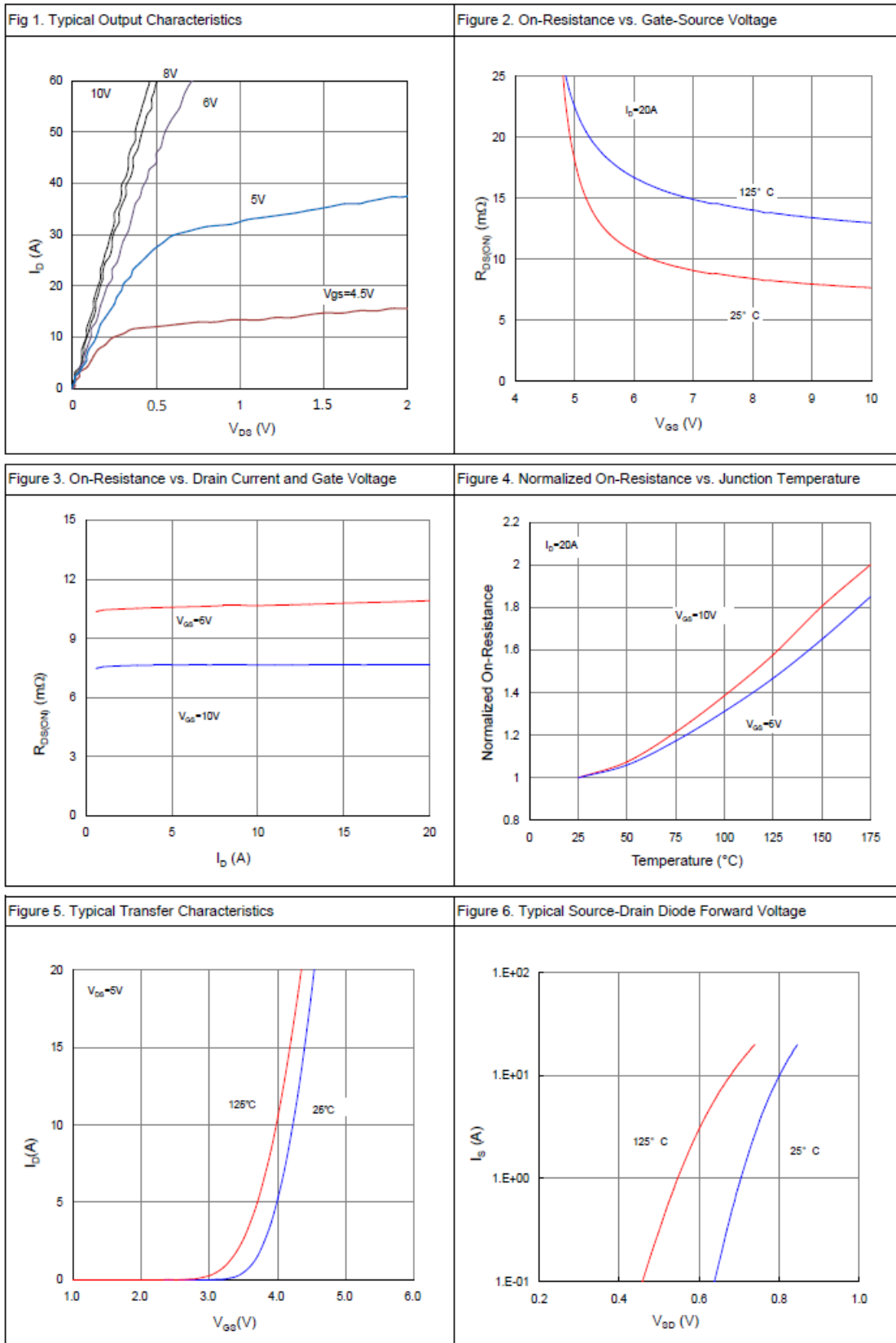
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$ $T_J=25^\circ C$			1	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=100^\circ C$			100	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		7.6	8.8	mΩ
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$		38		S
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}=Open,$ $f=1MHz$		1.4		Ω
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$		0.9	1.2	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=50V, V_{GS}=10V$ $I_D=20A$		25		nC
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			8		
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V$ $f=1MHz$		1576		pF
Output Capacitance	C_{oss}			350		
Reverse Transfer Capacitance	C_{rss}			7		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_L=1\Omega$ $I_D=20A, V_{GS}=10V$ $R_G=10\Omega$		7		nS
	t_r			4		
Turn-Off Time	$t_{d(off)}$			19		
	t_f			3		



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TYPICAL CHARACTERISTICS





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TYPICAL CHARACTERISTICS

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

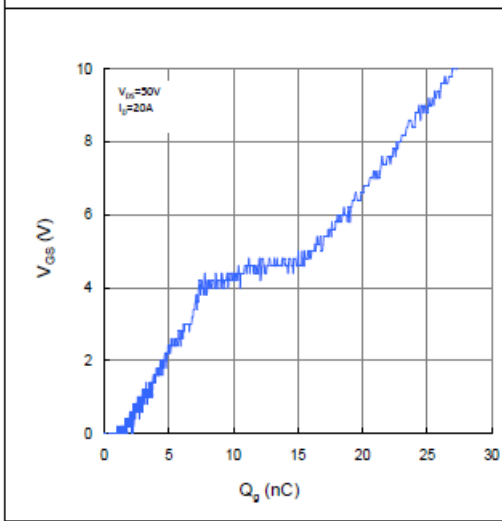


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

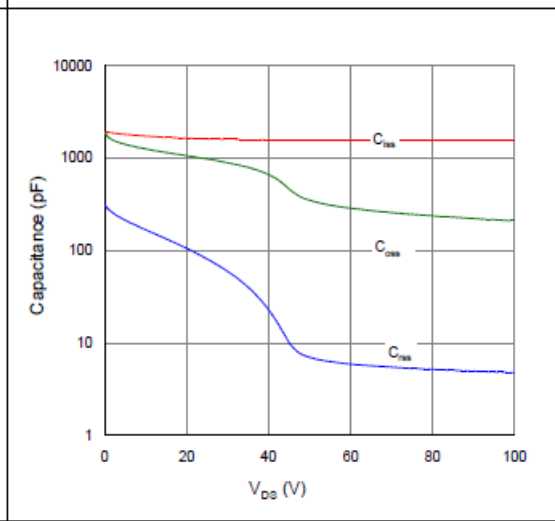


Figure 9. Maximum Safe Operating Area

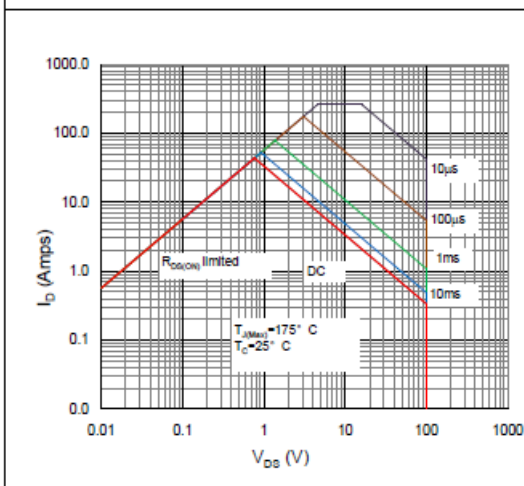


Figure 10. Maximum Drain Current vs. Case Temperature

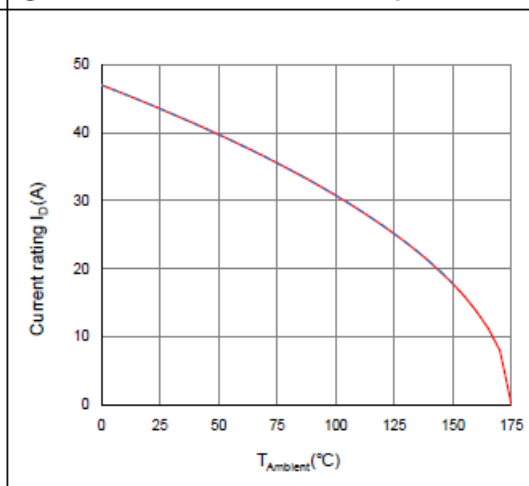
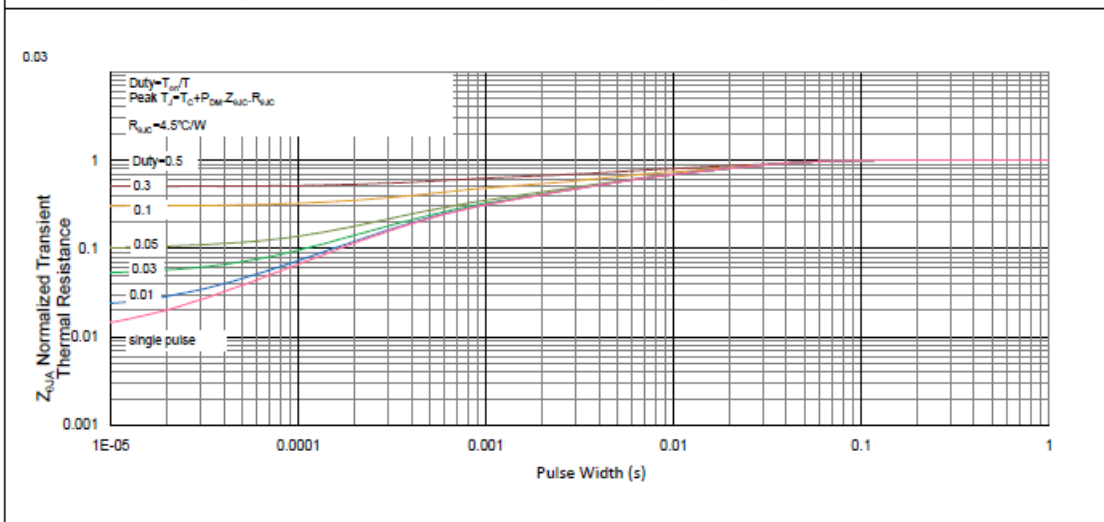


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient





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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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