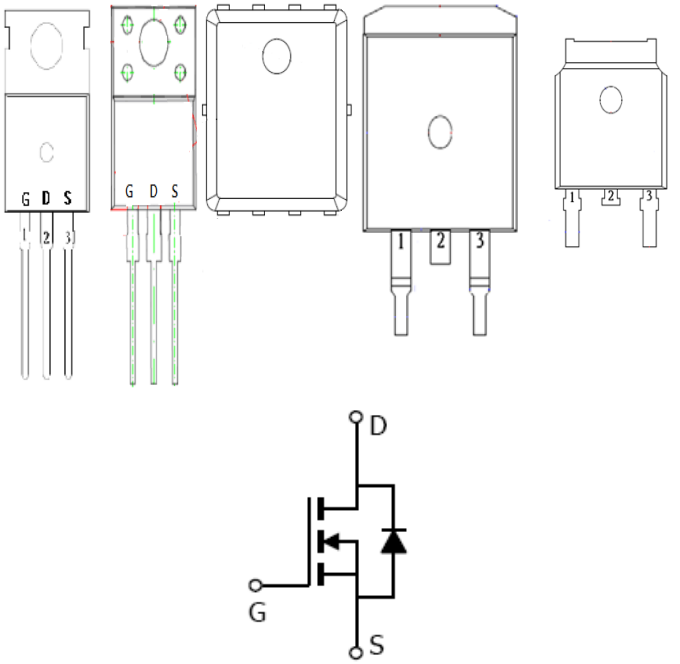
SPN60T15W
N-Channel Enhancement Mode MOSFET

DESCRIPTION
The SPN60T15W 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.

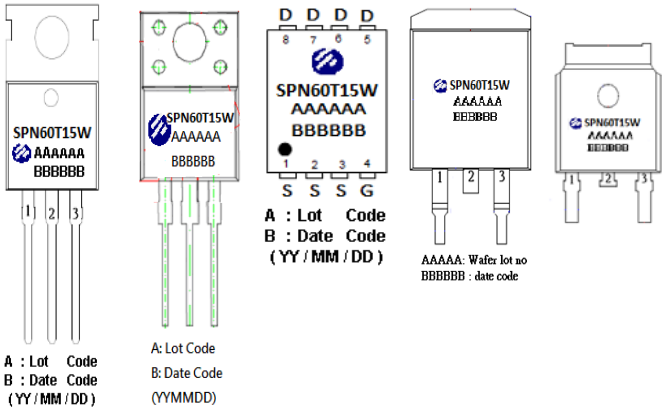
APPLICATIONS
- AC/DC Synchronous Rectifier
- Load Switch
- UPS
- Power Tool
- Motor Control

FEATURES
- 150V/60A, $R_{DS(ON)}$=19.5mΩ@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/PPAK5x6-8L package design

PIN CONFIGURATION
TO-220 TO-220F PPAK5x6 TO-263-2L TO252-2L



PART MARKING



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TO-220/TO-220F/TO-263 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
SPN60T15WT220TGB	TO-220-3L	SPN60T15W
SPN60T15WT220FTGB	TO-220F-3L	SPN60T15W
SPN60T15WT262RGB	TO-263-2L	SPN60T15W
SPN60T15WT252RGB	TO-252	SPN60T15W
SPN60T15WDN8RGB	PPAK5x6-8L	SPN60T15W

※ SPN60T15WT220TGB : Tube ; Pb – Free ; Halogen – Free
※ SPN60T15WT220FTGB : Tube ; Pb – Free ; Halogen - Free
※ SPN60T15WT262RGB : Tape&Reel ; Pb – Free ; Halogen - Free
※ SPN60T15WT252RGB : Tape&Reel ; Pb – Free ; Halogen - Free
※ SPN60T15WDN8RGB : Tape&Reel ; Pb – Free ; Halogen - Free

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ABSOULTE MAXIMUM RATINGS

(T_j=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	150	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(Silicon Limited) (TO-220/TO-220F/TO-263)	T_C=25℃	I_D	60	A
	T_C=100℃		42	
Continuous Drain Current(Silicon Limited) (TO-252)	T_C=25℃	I_D	56	A
	T_C=100℃		40	
Continuous Drain Current(Silicon Limited) (PPAK5x6)	T_C=25℃	I_D	47	A
	T_C=100℃		30	
Pulsed Drain Current	TO-220/TO-220F/TO-263	I_{DM}	180	A
	PPAK5x6		130	
Avalanche Energy, Single Pulse @ L=0.4mH, T_C=25℃		E_{AS}	80	mJ
Power Dissipation @ T_C=25℃	TO220/TO263	P_D	104	W
	TO-220F		30	
	TO-252		93	
	PPAK5x6		83	
Thermal Resistance-Junction to Case	TO220/TO263	$R_{\theta JC}$	1.2	℃/W
	TO-220F		4.2	
	TO-252		1.35	
	PPAK5x6		1.5	
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃

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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	150			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=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}=150V,V_{GS}=0V T_J=25℃			1	uA
		V_{DS}=150V,V_{GS}=0V T_J=100℃			100	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A		16.3	19.5	mΩ
Forward Transconductance	gfs	V_{DS}=5V,I_D=20A		55		S
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=Open,f=1MHz		2.2		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}=75V,V_{GS}=10V I_D=20A		25		nC
Gate-Source Charge	Q_{gs}			9		
Gate-Drain Charge	Q_{gd}			3		
Input Capacitance	C_{iss}	V_{DS}=75V,V_{GS}=0V f=1MHz		1960		pF
Output Capacitance	C_{oss}			130		
Reverse Transfer Capacitance	C_{rss}			8		
Turn-On Time	$t_{d(on)}$	V_{DD}=75V,V_{GS}=10V I_D=20A,R_G=10Ω		9		nS
	t_r			8		
Turn-Off Time	$t_{d(off)}$			15		
	t_f			9		
Reverse Recovery Time	trr	V_R=75V, I_F=20A, dI$_F$/dt=100A/uS		60		nS
Reverse Recovery Charge	Qrr			120		nC

TYPICAL CHARACTERISTICS

Fig 1. Typical Output Characteristics

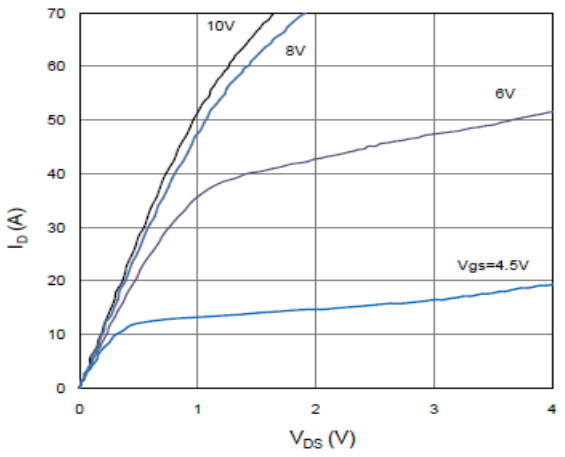


Figure 2. On-Resistance vs. Gate-Source Voltage

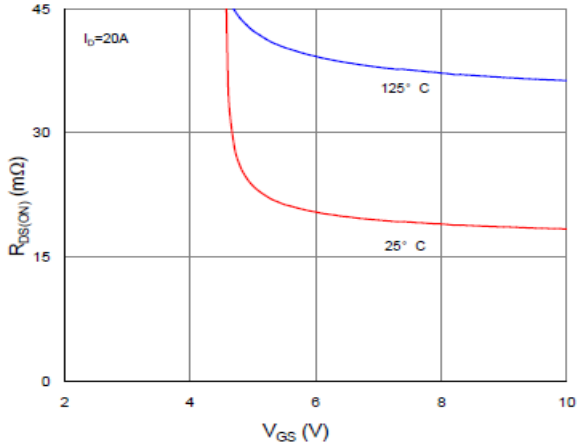


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

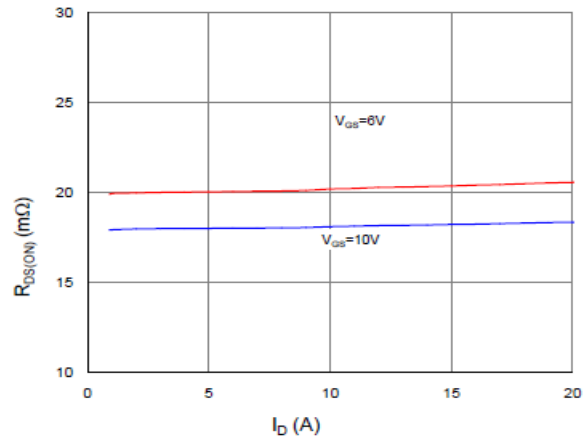


Figure 4. Normalized On-Resistance vs. Junction Temperature

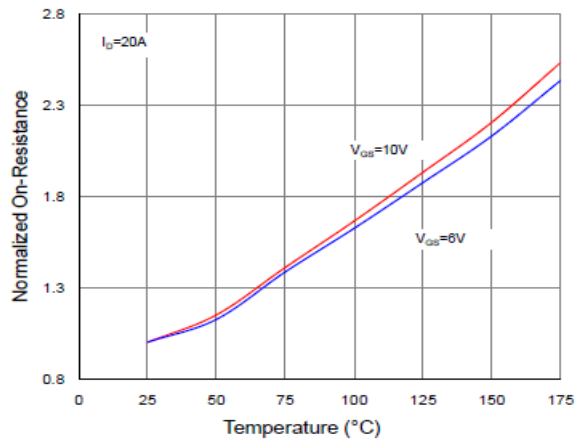


Figure 5. Typical Transfer Characteristics

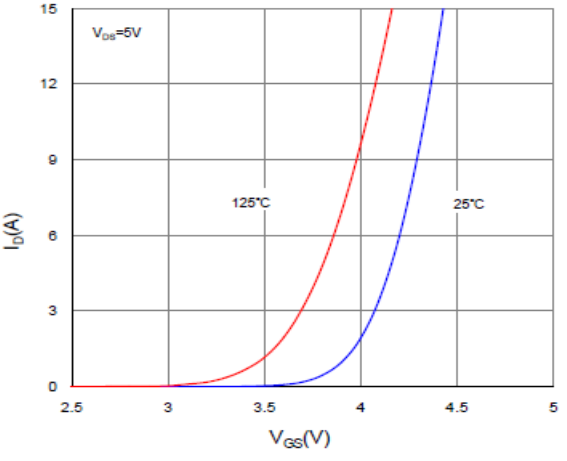
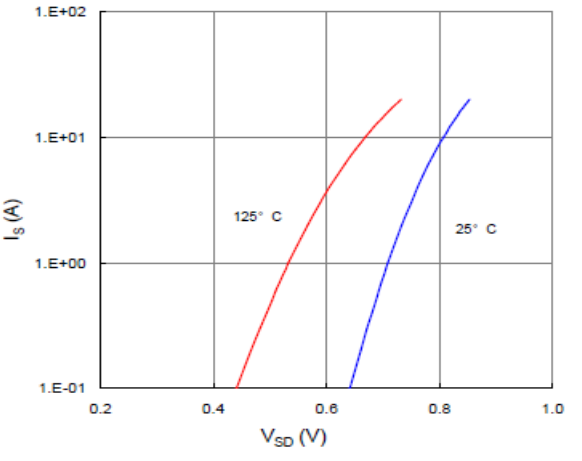


Figure 6. Typical Source-Drain Diode Forward Voltage



TYPICAL CHARACTERISTICS

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

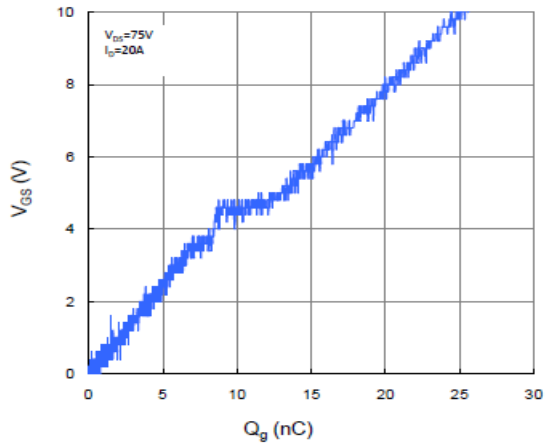


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

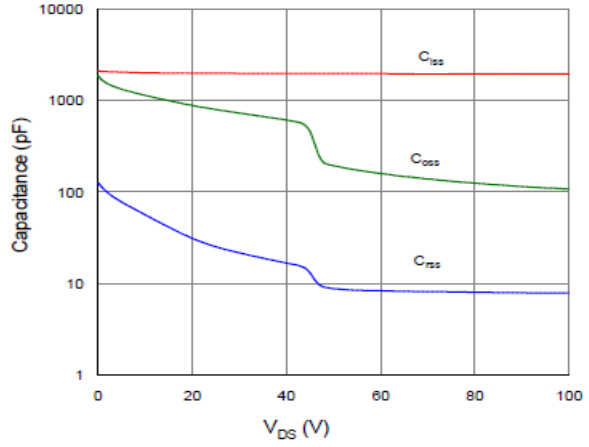


Figure 9. Maximum Safe Operating Area

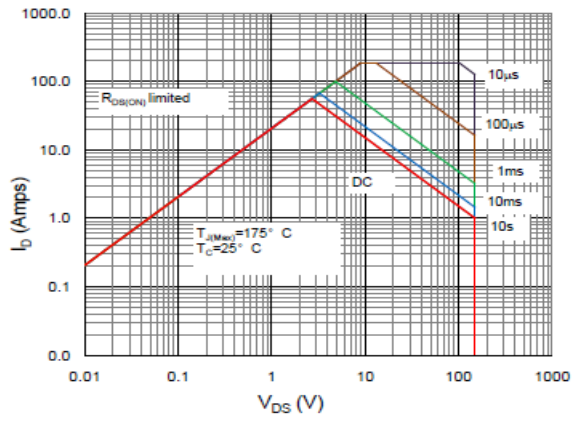


Figure 10. Maximun Drain Current vs. Case Temperature

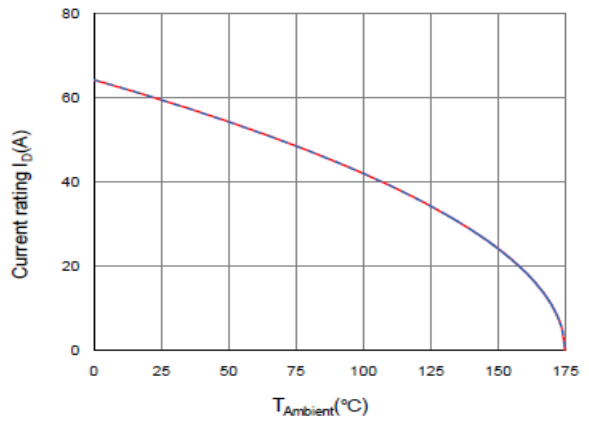
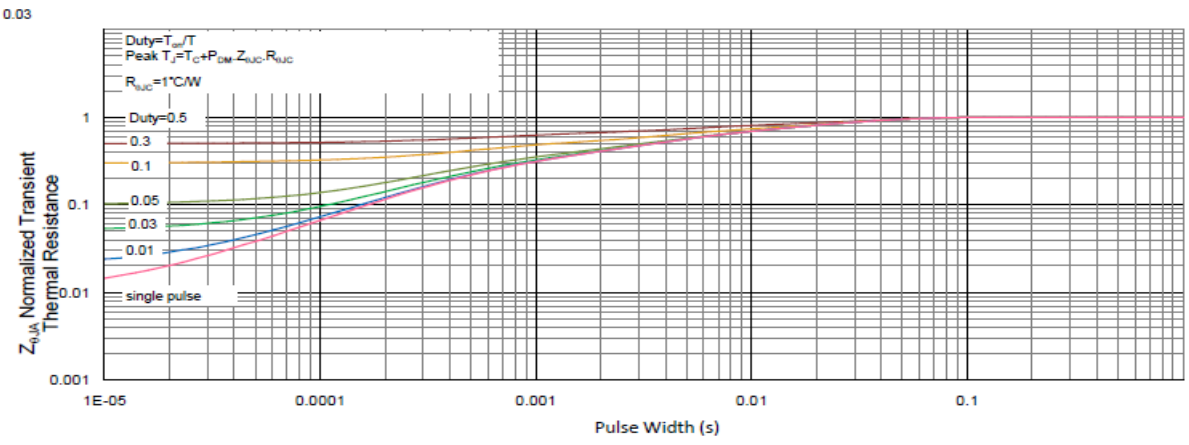


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



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