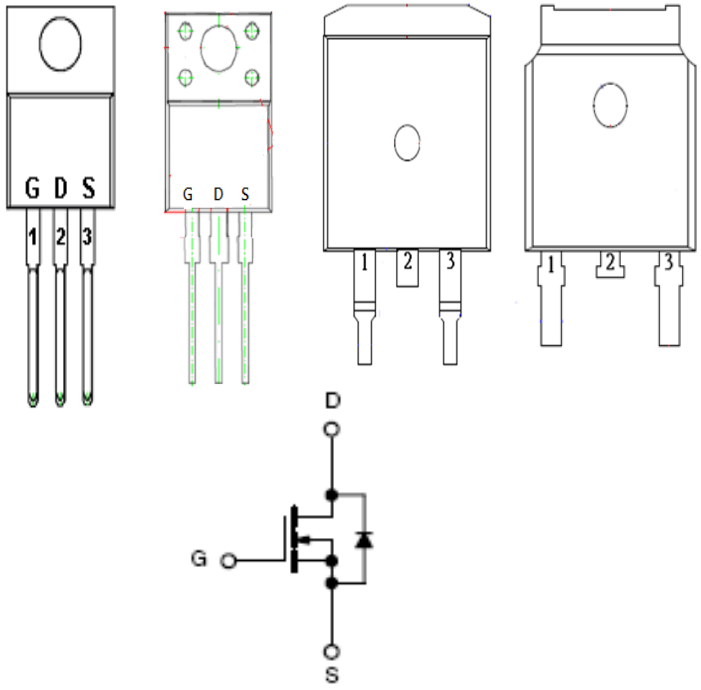
SPN60N10
N-Channel Enhancement Mode MOSFET

DESCRIPTION
The SPN60N10 is the N-Channel logic enhancement mode power field effect transistor which is produced using 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.

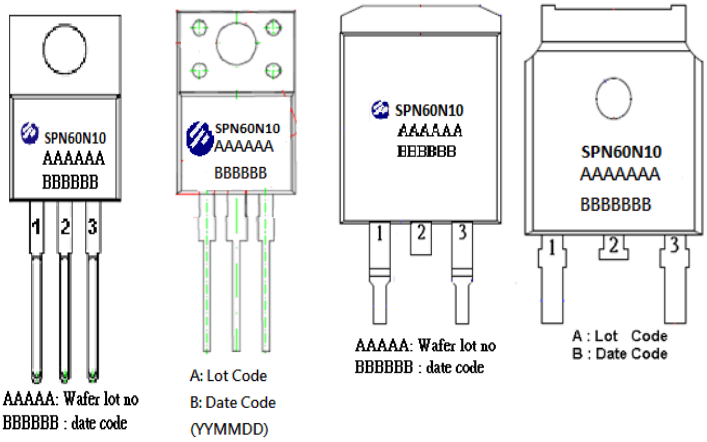
APPLICATIONS
- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier
- Power Tool
- Motor Control

FEATURES
- 100V/63A,$R_{DS(ON)}$=20mΩ@V_{GS}=10V
- 100V/63A,$R_{DS(ON)}$=25mΩ@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-263-2L/TO-252-2L package design

PIN CONFIGURATION
TO-220-3L TO-220F-3L TO-263-2L TO-252-2L



PART MARKING
TO-220-3L TO-220F-3L TO-263-2L TO-252-2L



SPN60N10
N-Channel Enhancement Mode MOSFET

PIN DESCRIPTION

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

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN60N10T220TGB	TO-220-3L	SPN60N10
SPN60N10T220FTGB	TO-220F-3L	SPN60N10
SPN60N10T262RGB	TO-263-2L	SPN60N10
SPN60N10T252RGB	TO-252-2L	SPN60N10

※ SPN60N10T220TGB : Tube ; Pb – Free ; Halogen – Free
※ SPN60N10T220FTGB : Tube ; Pb – Free ; Halogen – Free
※ SPN60N10T262RGB : Tape&Reel ; Pb – Free ; Halogen - Free
※ SPN60N10T252RGB : Tape&Reel ; Pb – Free ; Halogen - Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_C=25℃	I_D	63	A
	T_C=70℃		44	
Pulsed Drain Current		I_{DM}	260	A
Power Dissipation@ Tc=25℃	TO-220/TO-263	P_D	104	W
Power Dissipation@ Tc=25℃	TO-220F/TO-252		93	
Avalanche Energy with Single Pulse (Tj=25℃, L=0.1mH , I_D=45A , V_{DS}=50V.)		E_{AS}	101	mJ
Operating Junction Temperature		T_J	-55/150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Case (TO-220/TO-220F/TO-263)		$R_{\theta JC}$	1.2	℃/W
Thermal Resistance-Junction to Case (TO-252)		$R_{\theta JC}$	1.35	℃/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	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		3.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V			1	uA
		V_{DS}=80V,V_{GS}=0V T_J=125℃			10	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=30A			20	mΩ
		V_{GS}=4.5V,I_D=10A			25	
Forward Transconductance	gfs	V_{DS}=10V,I_D=3A		10		S
Diode Forward Voltage	V_{SD}	I_S=45A,V_{GS}=0V			1.3	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=80V,V_{GS}=10V I_D=5A		66.7	100	nC
Gate-Source Charge	Q_{gs}			13.4	26	
Gate-Drain Charge	Q_{gd}			14.6	28	
Input Capacitance	C_{iss}	V_{DS}=50V,V_{GS}=0V f=1MHz		4812	7200	pF
Output Capacitance	C_{oss}			220	330	
Reverse Transfer Capacitance	C_{rss}			107	160	
Turn-On Time	$t_{d(on)}$	V_{DD}=50V,I_D=1A V_{GEN}=10V,R_G=3.3Ω		23	46	nS
	t_r			11	22	
Turn-Off Time	$t_{d(off)}$			57	114	
	t_f			26	58	

TYPICAL CHARACTERISTICS

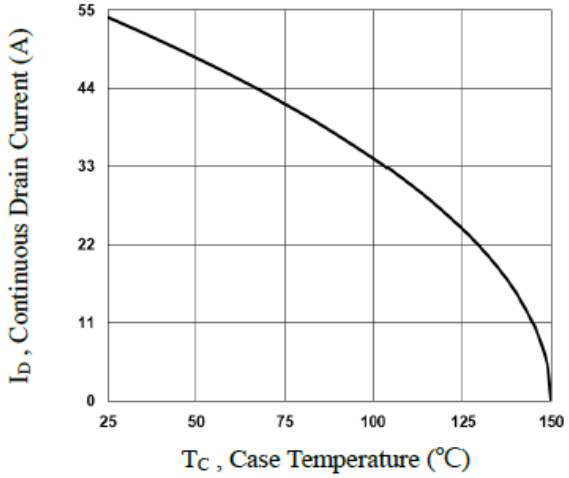


Fig.1 Continuous Drain Current vs. TC

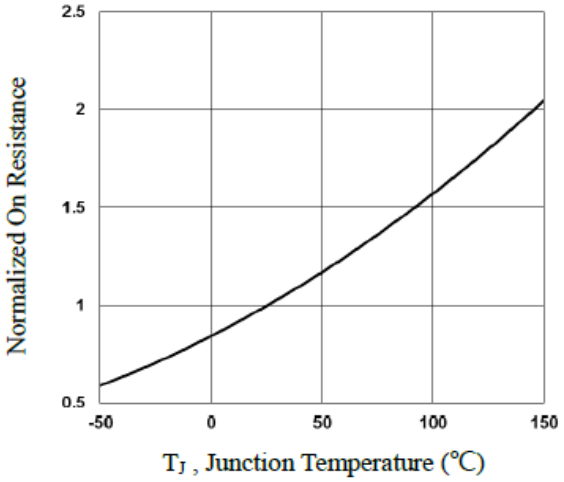


Fig.2 Normalized RDSON vs. TJ

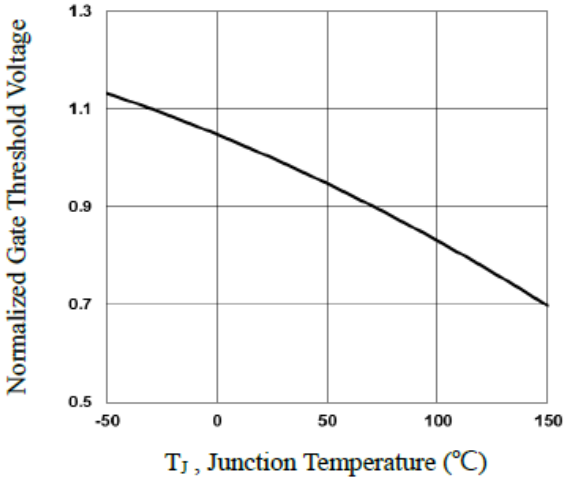


Fig.3 Normalized V_{th} vs. T_J

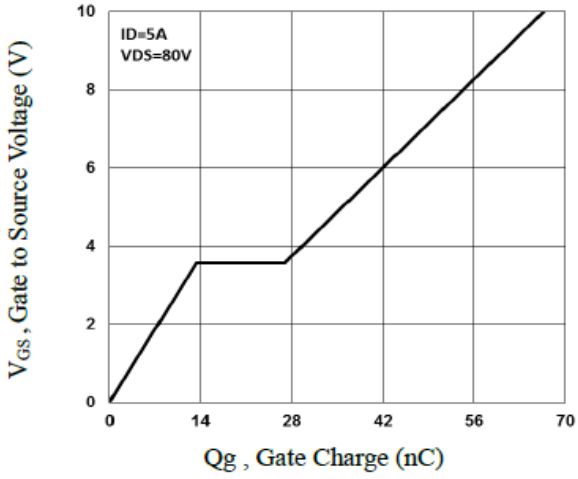


Fig.4 Gate Charge Characteristics

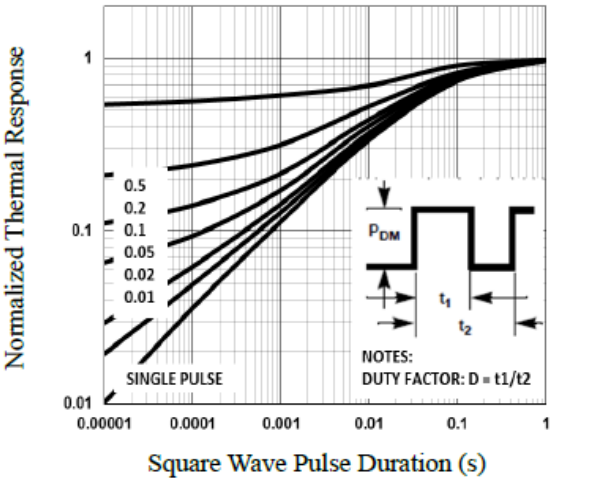


Fig.5 Normalized Transient Impedance

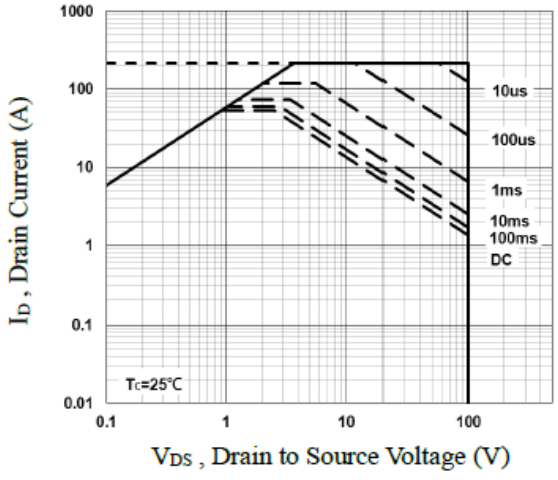


Fig.6 Maximum Safe Operation Area

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