SPN28N65
N-Channel Super-Junction Power MOSFET

DESCRIPTION

The SPN28N65 is the N-Channel enhancement mode power field effect transistor which is fabricated using an advanced high voltage super junction MOSFET process which delivers high levels of performance and robustness in popular AC-DC applications. By providing low $R_{DS(on)}$, Ciss and Crss along with guaranteed avalanche capability these parts can be adopted quickly into new and existing offline power supply designs.

APPLICATIONS

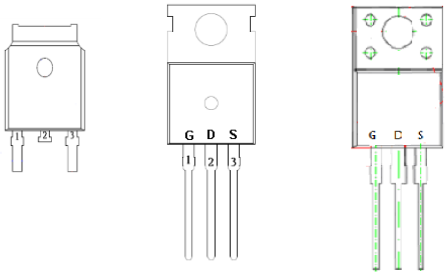
- AC/DC Switching Power Supply
- Adaptor/Charger
- Serve Power
- Power Tool
- TV Power
- PV Inverter/UPS

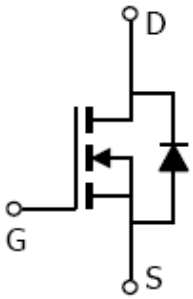
FEATURES

- 650V/16A, $R_{DS(ON)}$=280mΩ@V_{GS}=10V
- High density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Low Crss & gate charge
- Fast switching
- TO-252/TO-220/TO-220F package design

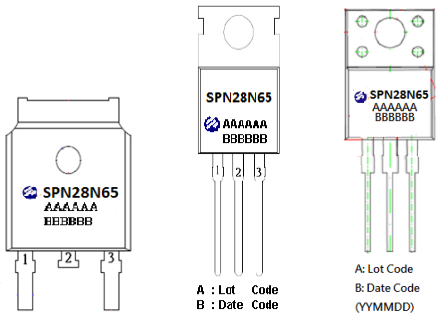
PIN CONFIGURATION

TO-252 **TO220** **TO220F**





PART MARKING



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PIN DESCRIPTION

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

ORDERING INFORMATION

Part Number	Package	Part Marking
SPN28N65T252RGB	TO-252	SPN28N65
SPN28N65T220TGB	TO-220	SPN28N65
SPN28N65T220FTGB	TO-220F	SPN28N65

※ SPN28N65T252RGB : Tap and reel ; Pb – Free ; Halogen – Free
※ SPN28N65T220TGB : Tube ; Pb – Free ; Halogen – Free
※ SPN28N65T220FTGB : Tube ; Pb – Free ; Halogen – Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	650	V
Gate –Source Voltage		V_{GSS}	±30	V
Continuous Drain Current(Silicon Limited)	T_C=25℃	I_D	16	A
	T_C=100℃		9.6	
Pulsed Drain Current		I_{DM}	41.4	A
Avalanche Energy, Single Pulse		E_{AS}	290	mJ
Power Dissipation (TO-220F-3L)		P_D	31	W
Power Dissipation (TO-252-2L)			93	
Power Dissipation(TO-220-3L)			114	
Operating Junction Temperature		T_J	-55~150	℃
Storage Temperature Range		T_{STG}	-55~150	℃
Thermal Resistance-Junction to Case		$R_{\theta JC}$	1.2	℃/W

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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	650			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	2	3	4	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±30V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=520V,V_{GS}=0V T_J=25℃			1.0	uA
		V_{DS}=520V,V_{GS}=0V T_J=150℃			100	
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=5.5A		230	280	mΩ
Gate Resistance	R_G	V_{GS}=0V,V_{DS}=Open, f=1MHz		21		Ω
Dynamic						
Total Gate Charge	Q_g	V_{DD}=520V,V_{GS}=10V I_D=16A		37		nC
Gate-Source Charge	Q_{gs}			11.5		
Gate-Drain Charge	Q_{gd}			10		
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V f=1MHz		1105		pF
Output Capacitance	C_{oss}			712		
Reverse Transfer Capacitance	C_{rss}			37		
Turn-On Time	$t_{d(on)}$	V_{DD}=325V,V_{GS}=10V I_D=16A,R_G=25Ω		11.5		nS
	t_r			23		
Turn-Off Time	$t_{d(off)}$			114.7		
	t_f			72		
Diode						
Diode Forward voltage	V_{SD}	I_S=16A,V_{GS}=0V		1.0	1.4	V
Reverse Recover Time	Trr	I_S=16A,V_{DS}=100V, di/dt=100A/uS		377		nS
Reverse Recovery Charge	Qrr			5.2		uC

TYPICAL CHARACTERISTICS

Fig.1 Output Characteristics

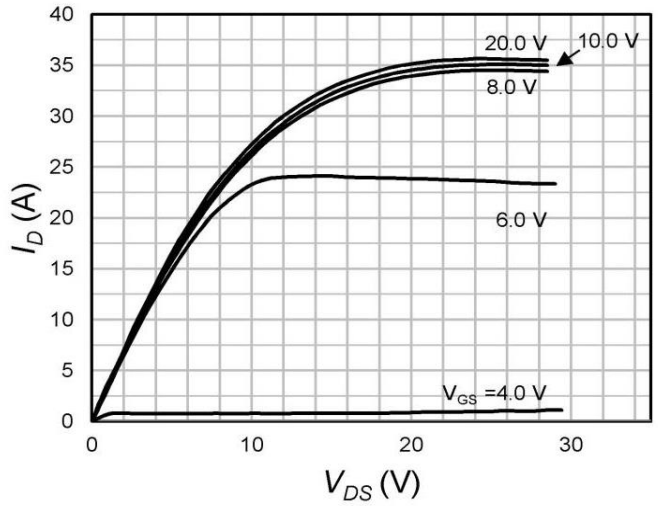


Fig.2 Transfer Characteristics

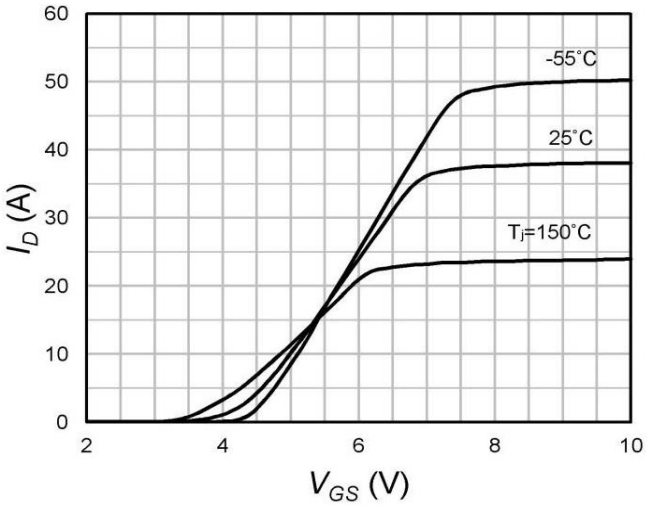


Fig.3 On Resistance vs Drain Current

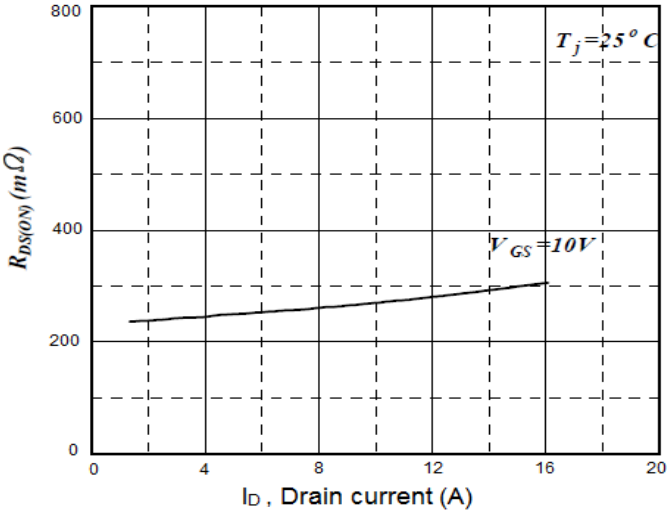


Fig.4 Capacitance

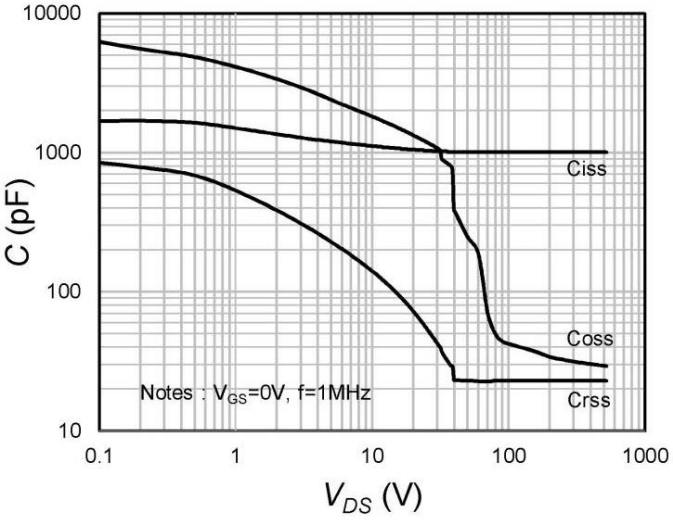


Fig.5 Gate Charge

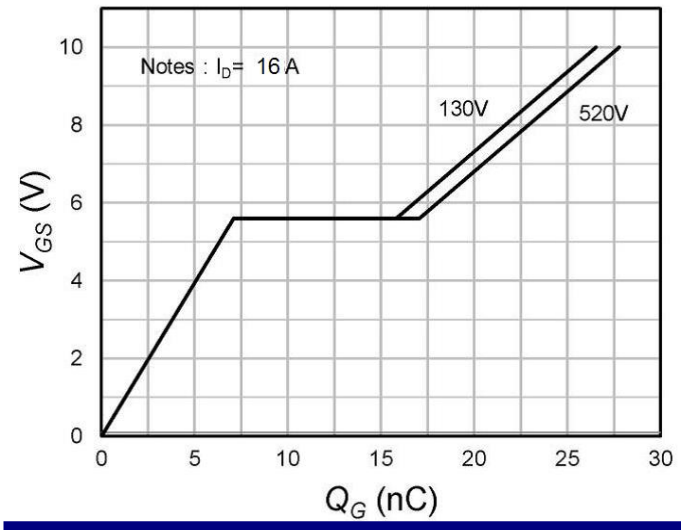
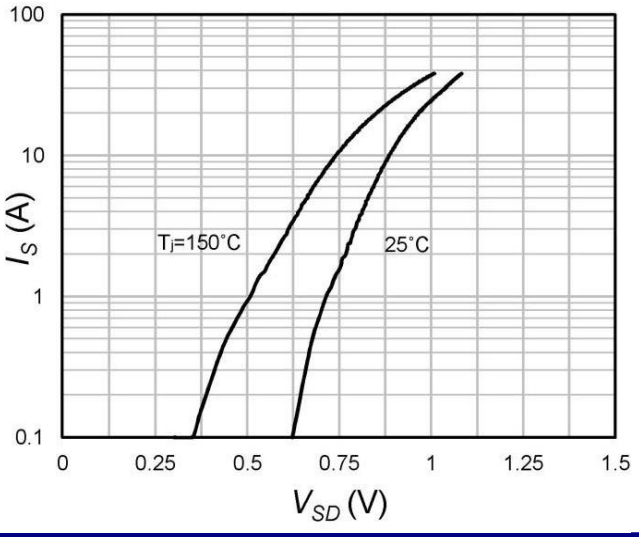


Fig.6 Body Diode Forward Voltage



TYPICAL CHARACTERISTICS

Fig.7 Normalized On-Resistance vs Junction Temperature

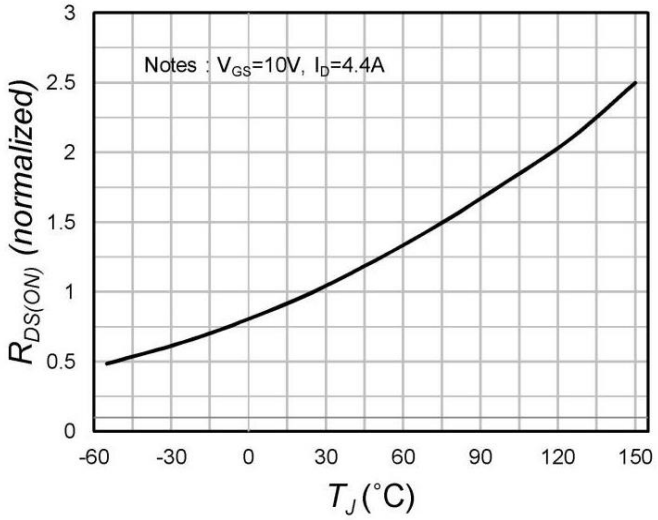


Fig.8 Gate Threshold Voltage vs Junction Temperature

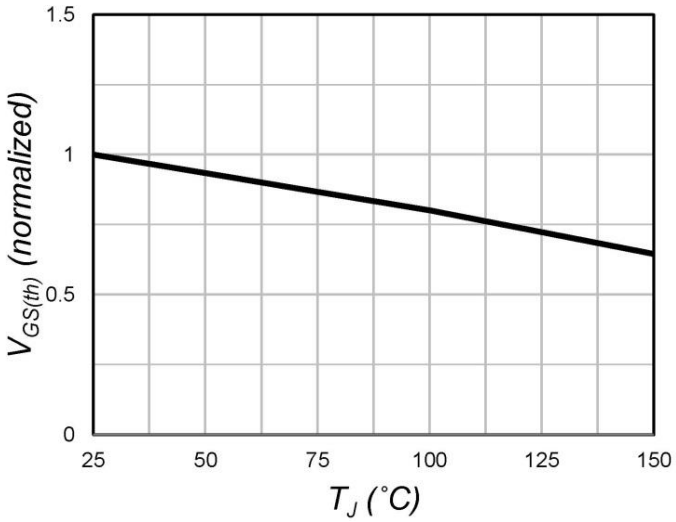


Fig.9 Transient thermal impedance

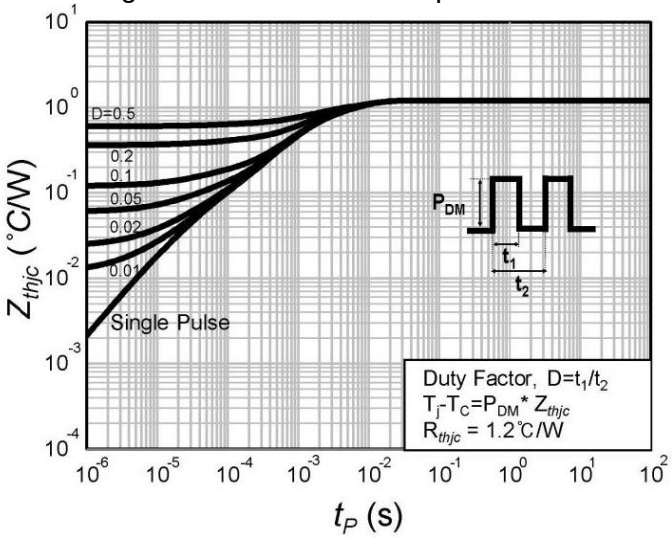
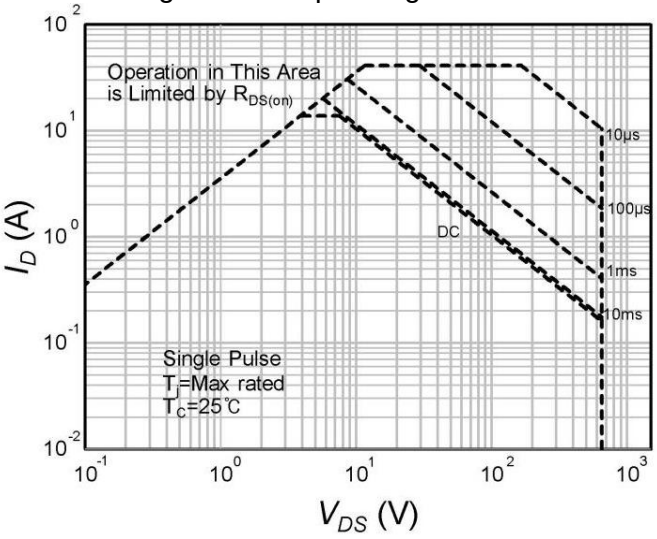


Fig.10 Safe Operating Area



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