



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 $R_{DS(on)}$, C_{iss} and C_{rss} along with guaranteed avalanche capability these parts can be adopted quickly into new and existing offline power supply designs.

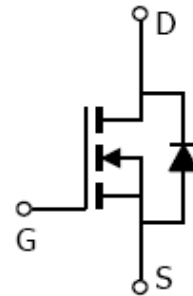
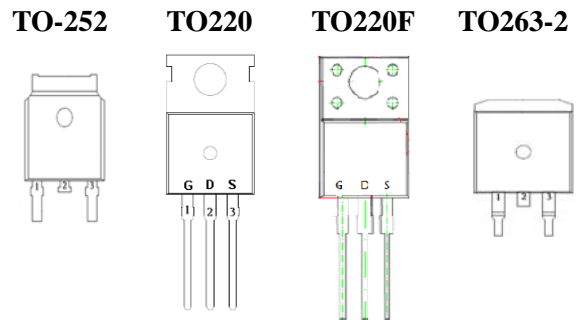
FEATURES

- ◆ 650V/16A, $R_{DS(ON)}=280m\Omega@V_{GS}=10V$
- ◆ High density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ Low C_{rss} & gate charge
- ◆ Fast switching
- ◆ TO-252/TO-220/TO-220F/TO263-2 package design

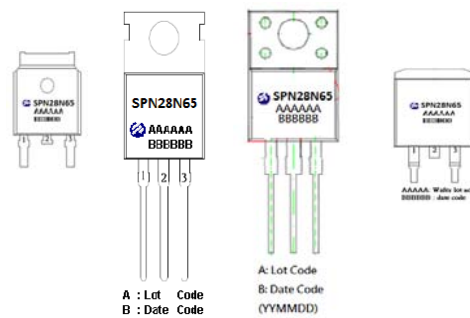
APPLICATIONS

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

PIN CONFIGURATION



PART MARKING





SPN28N65

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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
SPN28N65T262RGB	TO-263-2	SPN28N65

※ SPN28N65T252RGB : Tap and reel ; Pb – Free ; Halogen – Free

※ SPN28N65T220TGB : Tube ; Pb – Free ; Halogen – Free

※ SPN28N65T220FTGB : Tube ; Pb – Free ; Halogen – Free

※ SPN28N65T262RGB : Tap and reel ; Pb – Free ; Halogen – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	650	V
Gate –Source Voltage	V _{GSS}	±30	V
Continuous Drain Current	I _D	T _C =25°C	16
		T _C =100°C	9.6
Pulsed Drain Current	I _{DM}	41.4	A
Avalanche Energy, Single Pulse	E _{AS}	290	mJ
Power Dissipation @T _C =25C	P _D	TO-220F-3L/TO252-2L	93
		TO-220-3L/TO-263-2L	104
Operating Junction Temperature	T _J	-55~150	°C
Storage Temperature Range	T _{STG}	-55~150	°C
Thermal Resistance-Junction to Case	R _{θJC}	TO-220F-3L/TO252-2L	1.35
		TO-220-3L/TO-263-2L	1.2



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ELECTRICAL CHARACTERISTICS

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Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	650			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=520V, V_{GS}=0V$ $T_J=25^\circ C$			1.0	uA
		$V_{DS}=520V, V_{GS}=0V$ $T_J=150^\circ C$			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	$t_{d(on)}$	$V_{DD}=325V, V_{GS}=10V$ $I_D=16A, R_G=25\Omega$		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	T_{rr}	$I_S=16A, V_{DS}=100V,$ $di/dt=100A/uS$		377		nS
Reverse Recovery Charge	Q_{rr}			5.2		uC



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TYPICAL CHARACTERISTICS

Fig.1 Output Characteristics

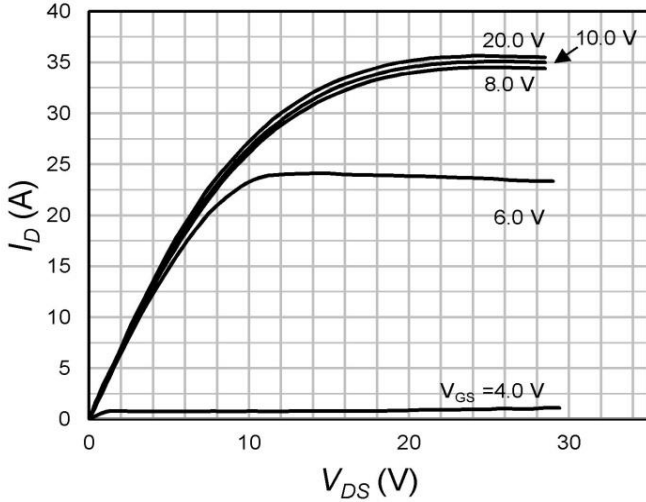


Fig.2 Transfer Characteristics

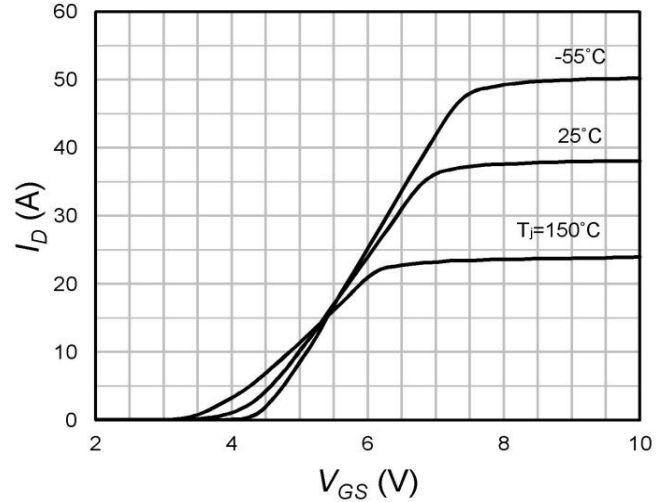


Fig.3 On Resistance vs Drain Current

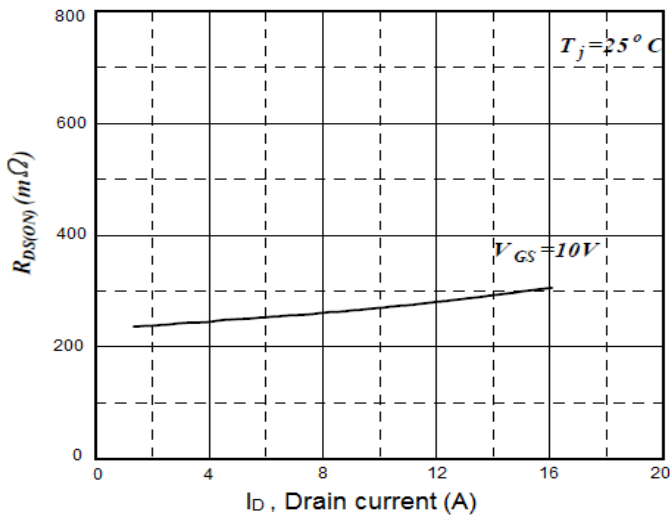


Fig.4 Capacitance

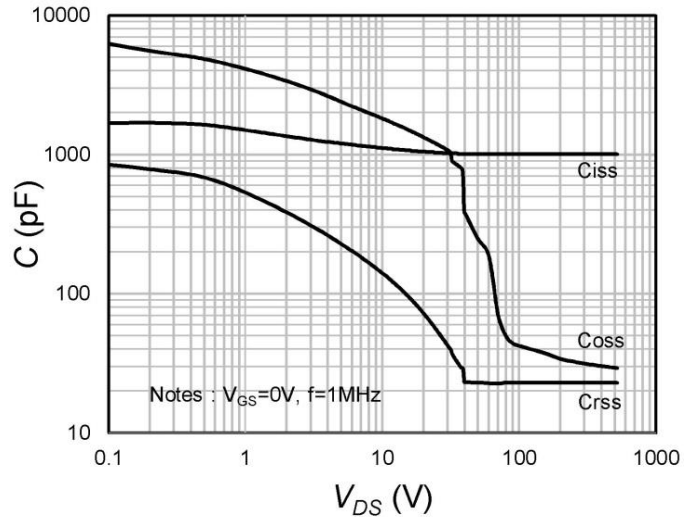


Fig.5 Gate Charge

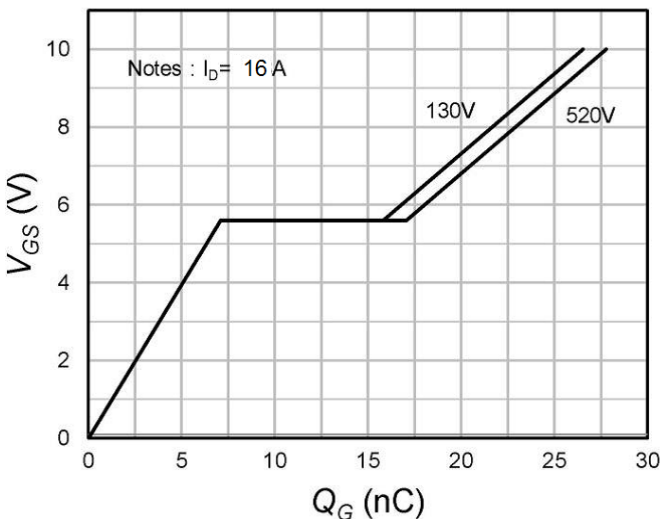
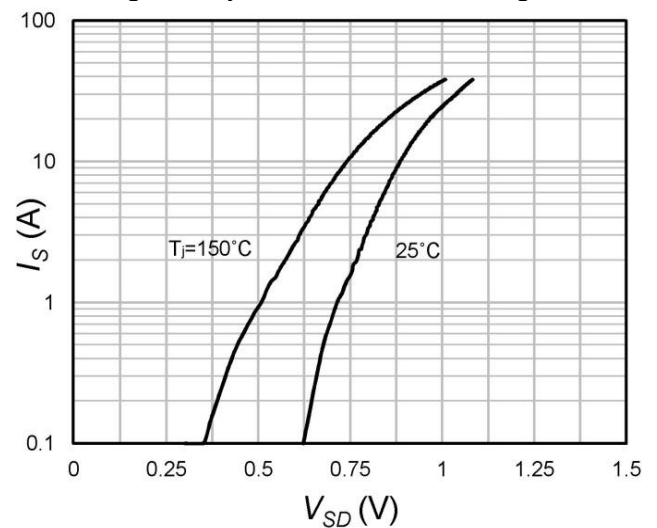


Fig.6 Body Diode Forward Voltage





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TYPICAL CHARACTERISTICS

Fig.7 Normalized On-Resistance vs Junction Temperature

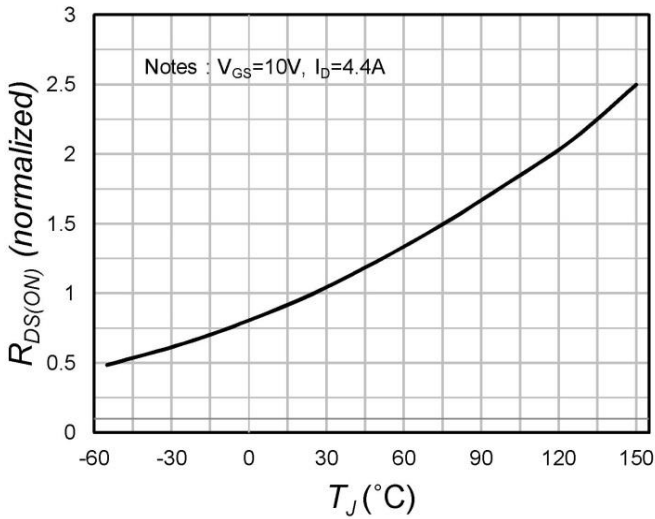


Fig.8 Gate Threshold Voltage vs Junction Temperature

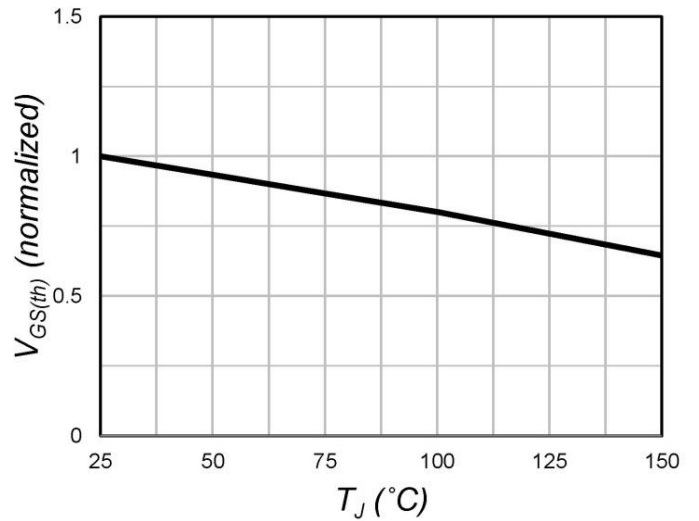


Fig.9 Transient thermal impedance

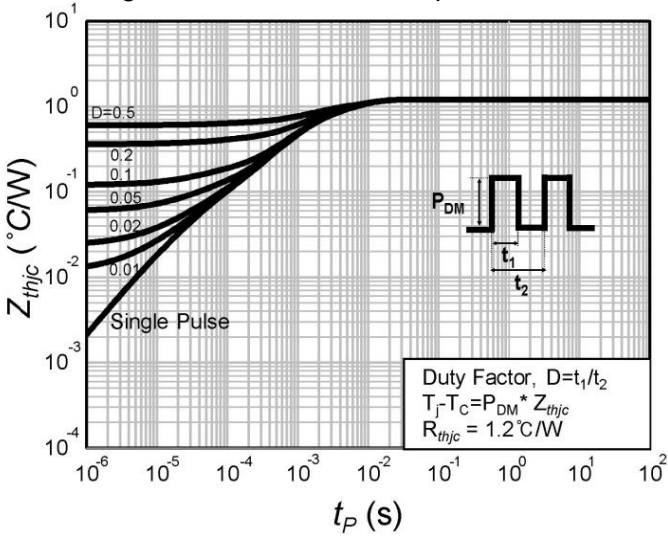
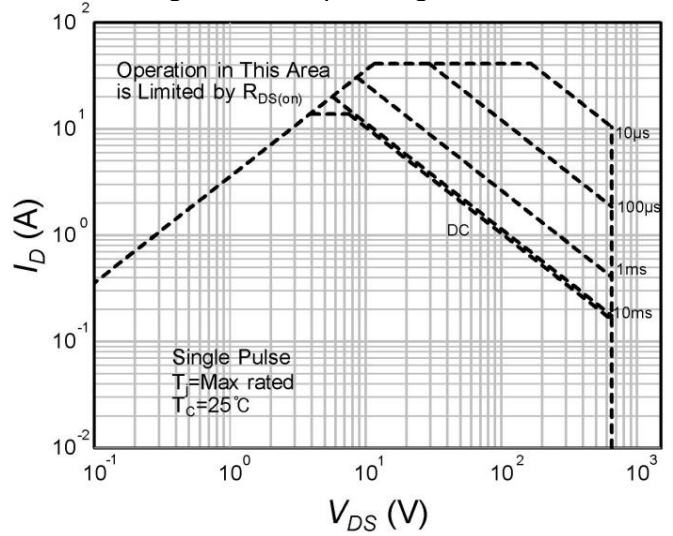


Fig.10 Safe Operating Area





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