PJP13N50 / PJF13N50

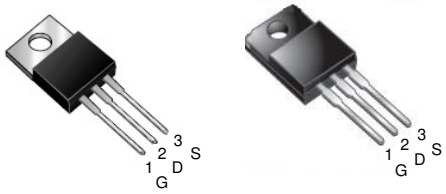
500V N-Channel Enhancement Mode MOSFET

TO-220AB / ITO-220AB

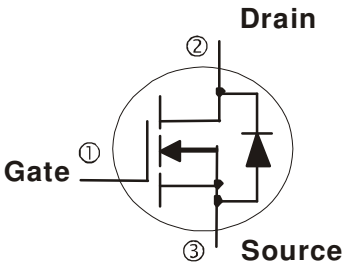
FEATURES

- 13A , 500V, $R_{DS(ON)}$=0.52Ω@V_{GS}=10V, I_D=6.5A
- Low ON Resistance
- Fast Switching
- Low Gate Charge
- Fully Characterized Avalanche Voltage and Current
- Specially Desigened for AC Adapter, Battery Charge and SMPS
- In compliance with EU RoHs 2002/95/EC Directives

TO-220AB ITO-220AB



INTERNAL SCHEMATIC DIAGRAM



MECHANICAL DATA

- Case: TO-220AB / ITO-220AB Molded Plastic
- Terminals : Solderable per MIL-STD-750,Method 2026

ORDERING INFORMATION

TYPE	MARKING	PACKAGE	PACKING
PJP13N50	P13N50	TO-220AB	50PCS/TUBE
PJF13N50	F13N50	ITO-220AB	50PCS/TUBE

Maximum RATINGS and Thermal Characteristics (T_A=25°C unless otherwise noted)

PARAMETER	Symbol	PJP13N50	PJF13N50	Units
Drain-Source Voltage	V_{DS}	500		V
Gate-Source Voltage	V_{GS}	±30		V
Continuous Drain Current	I_D	13	13	A
Pulsed Drain Current [1]	I_{DM}	52	52	A
Maximum Power Dissipation T_A=25°C Derating Factor	P_D	175 1.4	52 0.42	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to +150		°C
Avalanche Energy with Single Pulse I_{AS}=12.5A, VDD=50V, L=10mH	E_{AS}	780		mJ
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	0.7	2.4	°C/W
Junction-to Ambient Thermal Resistance	$R_{\theta JA}$	62.5	100	°C/W

Note: 1. Maximum DC current limited by the package

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	500	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	2.0	-	4.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}= 10V, I_D= 6.5A	-	0.36	0.52	Ω
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=500V, V_{GS}=0V	-	-	1	uA
Gate Body Leakage	I_{GSS}	V_{GS}=±30V, V_{DS}=0V	-	-	±100	nA
Dynamic						
Total Gate Charge	Q_g	V_{DS}=400V, I_D=12A V_{GS}=10V	-	58.6	-	nC
Gate-Source Charge	Q_{gs}		-	11.8	-	
Gate-Drain Charge	Q_{gd}		-	18.6	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=250V , I_D=6A V_{GS}=10V , R_G=25Ω	-	19.6	32	ns
Turn-On Rise Time	t_r		-	42	85	
Turn-Off Delay Time	$t_{d(off)}$		-	80.4	150	
Turn-Off Fall Time	t_f		-	52	90	
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V f=1.0MH_Z	-	2000	2450	pF
Output Capacitance	C_{oss}		-	205	250	
Reverse Transfer Capacitance	C_{rss}		-	16	22	
Source-Drain Diode						
Max. Diode Forward Current	I_S	-	-	-	13	A
Max.Pulsed Source Current	I_{SM}	-	-	-	52	A
Diode Forward Voltage	V_{SD}	I_S=13A , V_{GS}=0V	-	-	1.4	V
Reverse Recovery Time	t_{rr}	V_{GS}=0V, I_F=12A di/dt=100A/us	-	450	-	ns
Reverse Recovery Charge	Q_{rr}		-	5.0	-	uC

NOTE : Plus Test : Pluse Width ≤ 300us, Duty Cycle ≤ 2%.

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Typical Characteristics Curves (Ta=25℃, unless otherwise noted)

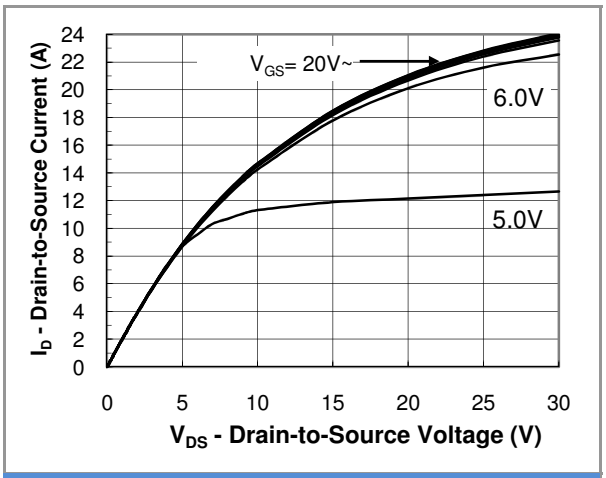

Fig.1 Output Characteristic

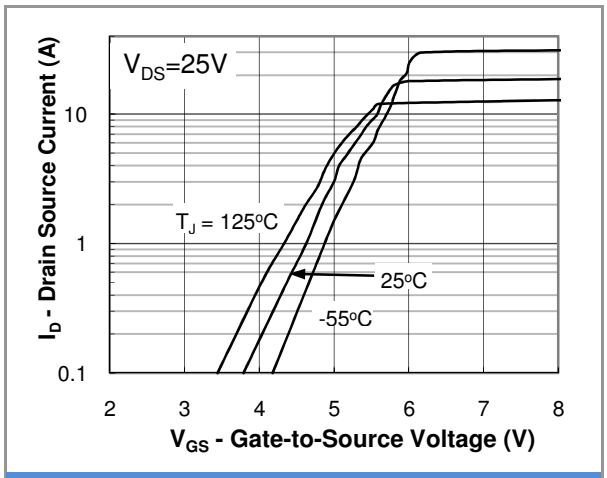

Fig.2 Transfer Characteristic

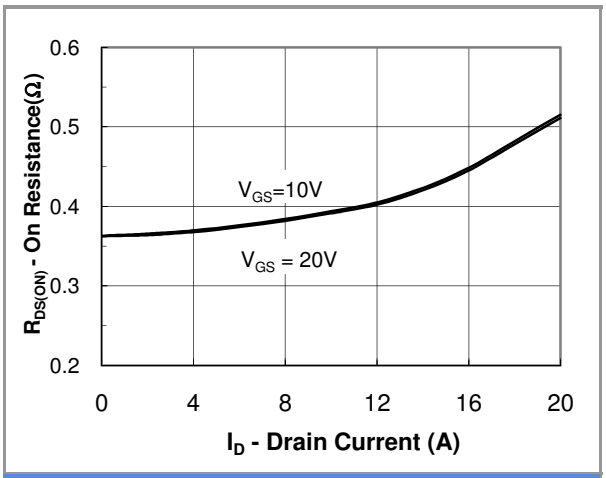

Fig.3 On Resistance vs Drain Current

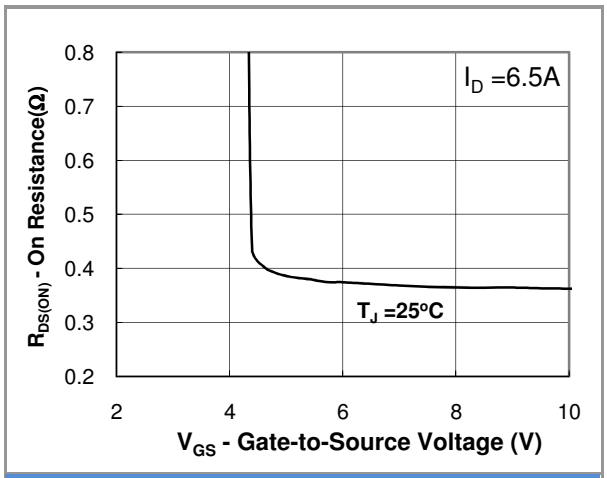

Fig.4 On Resistance vs Gate to Source Voltage

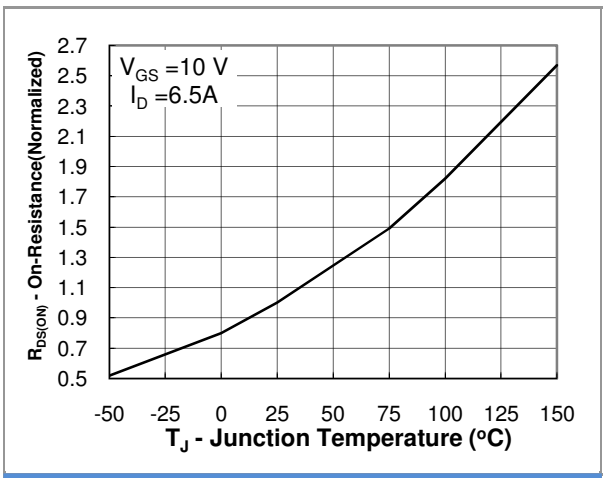

Fig.5 On Resistance vs Junction Temperature

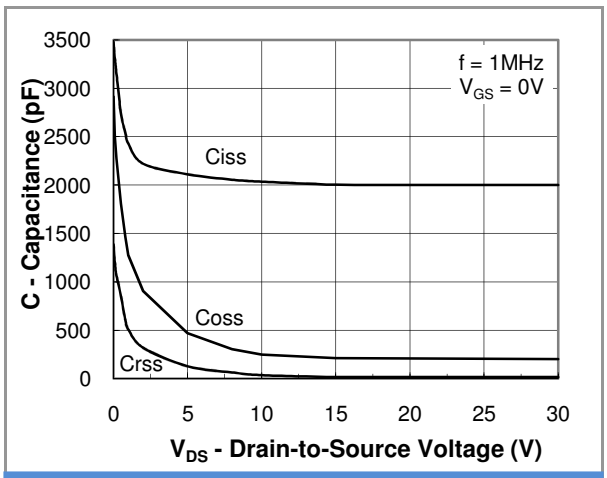

Fig.6 Capacitance

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Typical Characteristics Curves (Ta=25℃, unless otherwise noted)

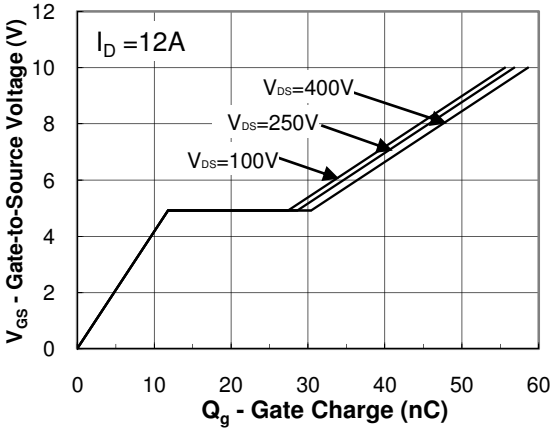

Fig. 7 Gate Charge Waveform

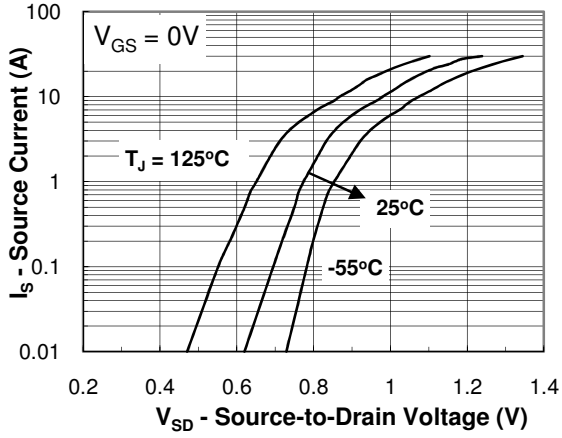

Fig.8 Source-Drain Diode Forward Voltage

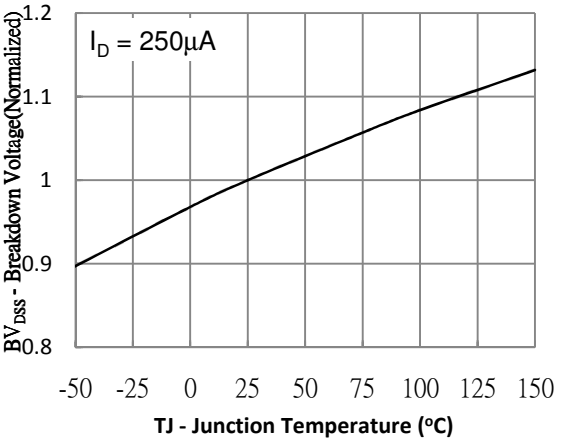

Fig.9 Breakdown Voltage vs Junction Temperature

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LEGAL STATEMENT