



# PJP2N60 / PJF2N60

## 600V N-Channel Enhancement Mode MOSFET

### TO-220AB / ITO-220AB

#### FEATURES

- 2A , 600V,  $R_{DS(ON)}=4.6\Omega@V_{GS}=10V, I_D=1A$
- Low ON Resistance
- Fast Switching
- Low Gate Charge
- Fully Characterized Avalanche Voltage and Current
- Specially Designed for AC Adapter, Battery Charge and SMPS
- In compliance with EU RoHs 2002/95/EC Directives

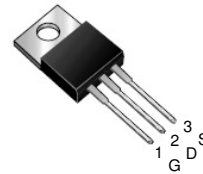
#### MECHANICAL DATA

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

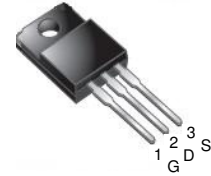
#### ORDERING INFORMATION

TYPE	MARKING	PACKAGE	PACKING
PJP2N60	P2N60	TO-220AB	50PCS/TUBE
PJF2N60	F2N60	ITO-220AB	50PCS/TUBE

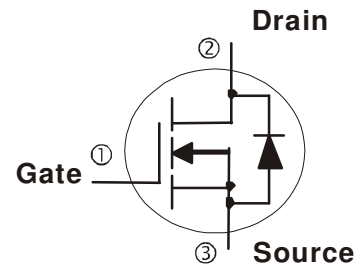
TO-220AB



ITO-220AB



INTERNAL SCHEMATIC DIAGRAM



### Maximum RATINGS and Thermal Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted )

PARAMETER	Symbol	PJP2N60	PJF2N60	Units
Drain-Source Voltage	$V_{DS}$	600		V
Gate-Source Voltage	$V_{GS}$	$\pm 30$		V
Continuous Drain Current	$I_D$	2	2	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	8	8	A
Maximum Power Dissipation Derating Factor	$P_D$	45 0.36	20 0.16	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150		$^\circ\text{C}$
Avalanche Energy with Single Pulse $I_{AS}=2.0A, V_{DD}=50V, L=56mH$	$E_{AS}$	120		mJ
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	2.78	6.25	$^\circ\text{C/W}$
Junction-to Ambient Thermal Resistance	$R_{\theta JA}$	62.5	100	$^\circ\text{C/W}$

**Note** : 1. Maximum DC current limited by the package

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## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units
<b>Static</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	600	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2.0	-	4.0	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =1A	-	4.0	4.6	Ω
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V	-	-	10	uA
Gate Body Leakage	I <sub>GSS</sub>	V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =480V, I <sub>D</sub> =2A V <sub>GS</sub> =10V	-	9.3	13	nC
Gate-Source Charge	Q <sub>gs</sub>		-	2.0	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	3.3	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =300V, I <sub>D</sub> =2A V <sub>GS</sub> =10V, R <sub>G</sub> =25Ω	-	10.8	18	ns
Turn-On Rise Time	t <sub>r</sub>		-	10.4	16	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	23.6	32	
Turn-Off Fall Time	t <sub>f</sub>		-	16.2	22	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V f=1.0MHz	-	320	380	pF
Output Capacitance	C <sub>oss</sub>		-	30	45	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	3	5.6	
<b>Source-Drain Diode</b>						
Max. Diode Forward Current	I <sub>S</sub>	-	-	-	2.0	A
Max.Pulsed Source Current	I <sub>SM</sub>	-	-	-	8.0	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =2A, V <sub>GS</sub> =0V	-	-	1.4	V
Reverse Recovery Time	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>F</sub> =2A di/dt=100A/us	-	230	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>		-	1.0	-	uC

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



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Typical Characteristics Curves (  $T_a=25^\circ\text{C}$ , unless otherwise noted)

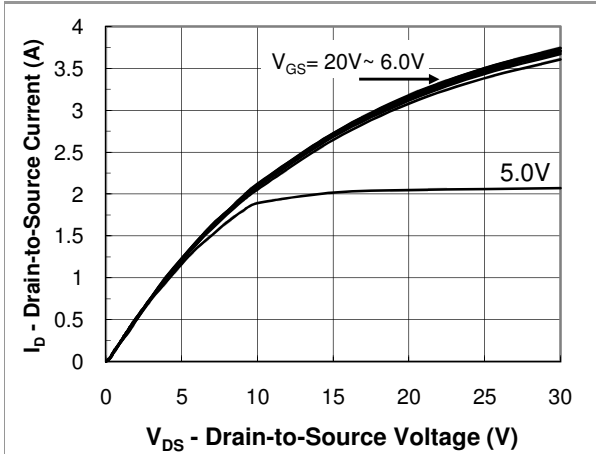


Fig.1 Output Characteristic

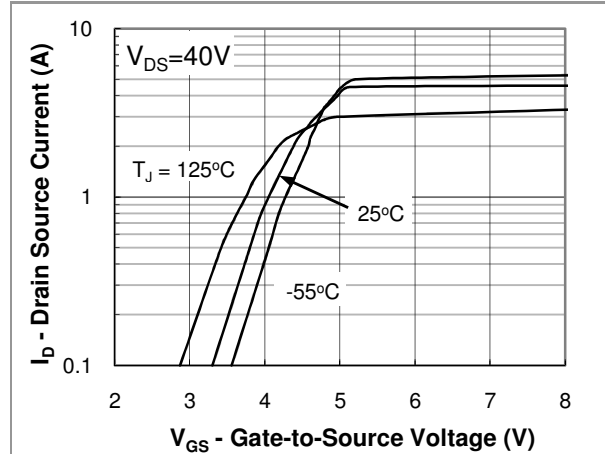


Fig.2 Transfer Characteristic

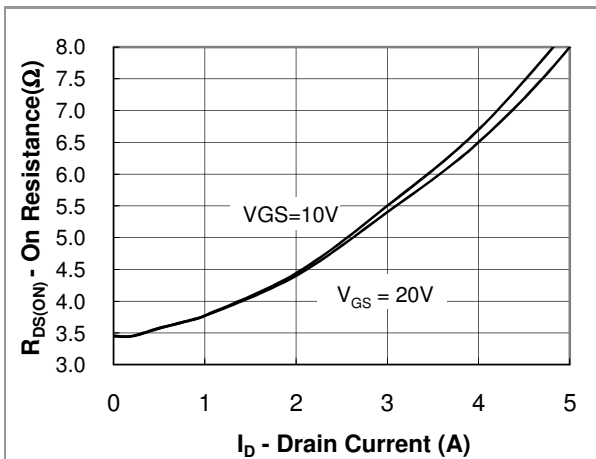


Fig.3 On Resistance vs Drain Current

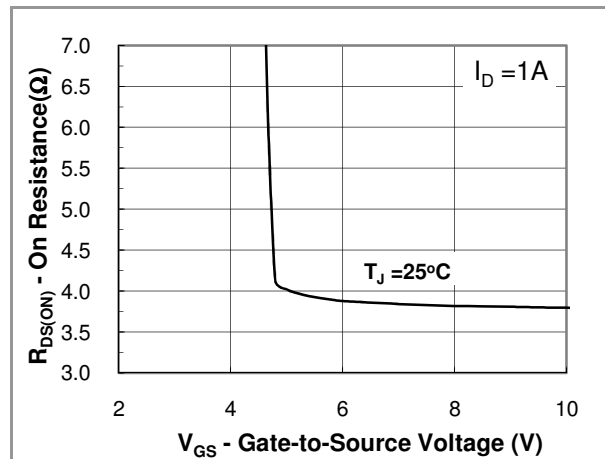


Fig.4 On Resistance vs Gate to Source Voltage

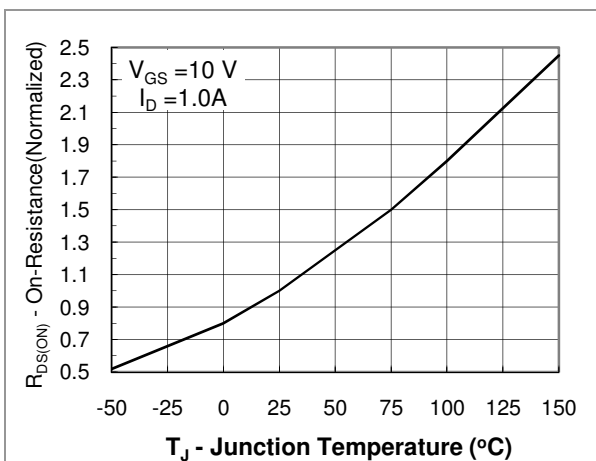


Fig.5 On Resistance vs Junction Temperature

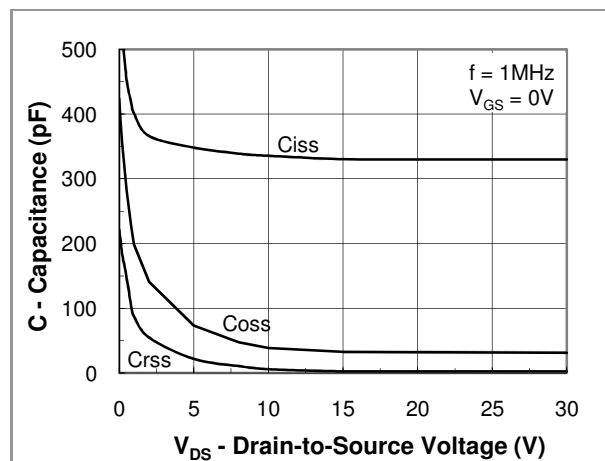


Fig.6 Capacitance



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Typical Characteristics Curves (  $T_a=25^\circ\text{C}$ , unless otherwise noted)

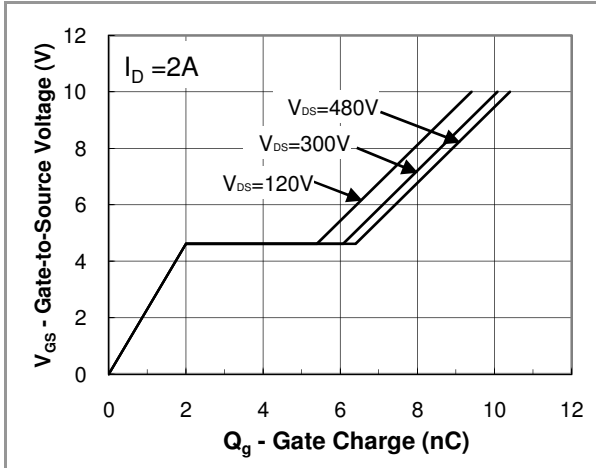


Fig. 7 Gate Charge Waveform

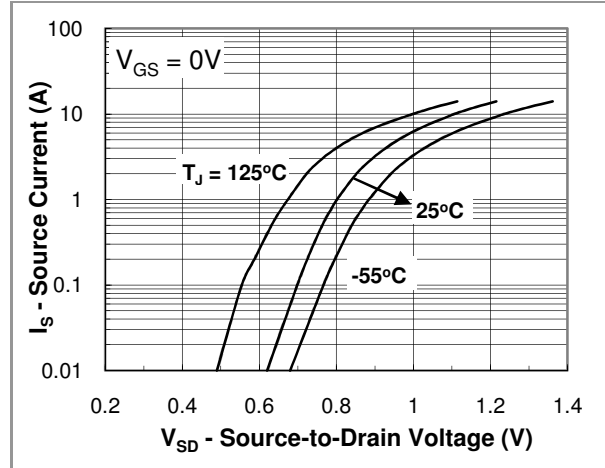


Fig.8 Source-Drain Diode Forward Voltage

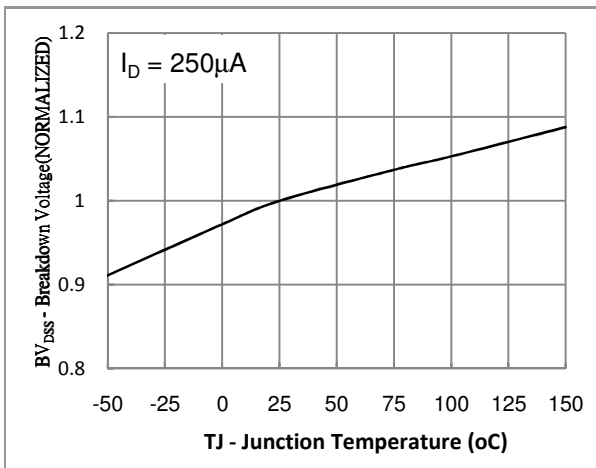


Fig.9 Breakdown Voltage vs Junction Temperature



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### LEGALSTATEMENT

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