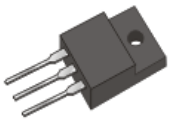
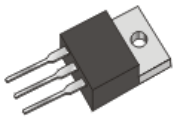
PJP60R290E / PJF60R290E

600V N-Channel Super Junction MOSFET

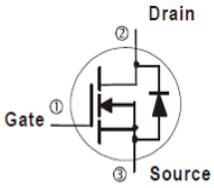
Voltage	600 V	Current	15 A



ITO-220AB-F



TO-220AB



Features

- $R_{DS(ON)}$, V_{GS}@10V, I_D@6.5A<0.29Ω
- Fast switching speed
- Low on-resistance
- Low Noise
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

Mechanical Data

- Case : TO-220AB, ITO-220AB-F Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- TO-220AB Approx. Weight : 0.067 ounces, 1.89 grams
- ITO-220AB-F Approx. Weight : 0.068 ounces, 2 grams

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

PARAMETER		SYMBOL	TO-220AB	ITO-220AB-F	UNITS
Drain-Source Voltage		V_{DS}	600		V
Gate-Source Voltage		V_{GS}	±20		V
Continuous Drain Current (Note 4)	T_C=25°C	I_D	15		A
	T_C=100°C		10		A
Pulsed Drain Current (Note 1)		I_{DM}	30		A
Power Dissipation	T_C=25°C	P_D	184	60	W
	T_C=100°C		74	24	W
Continuous Drain Current (Note 4)	T_A=25°C	I_D	1.7		A
	T_A=70°C		1.4		A
Power Dissipation	T_A=25°C	P_D	2	1.04	W
	T_A=70°C		1.3	0.9	W
Single Pulse Avalanche Energy (Note 5)		E_{AS}	288		mJ
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55~150		°C
Typical Thermal Resistance (Note 4,5)		$R_{\theta JC}$	0.68	2.08	°C/W
		$R_{\theta JA}$	62.5	120	°C/W

- Limited only By Maximum Junction Temperature

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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	600	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	2	3	4	
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=6.5A	-	0.25	0.29	Ω
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=600V, V_{GS}=0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Diode Forward Voltage	V_{SD}	I_S=15A, V_{GS}=0V	-	0.95	1.5	V
Transconductance	G_{FS}	V_{DS}=10V, I_D=7.5A	-	8	-	S
Dynamic (Note 7)						
Total Gate Charge	Q_g	V_{DS}=300V, I_D=15A, V_{GS}=10V (Note 2,3)	-	40	-	nC
Gate-Source Charge	Q_{gs}		-	6.5	-	
Gate-Drain Charge	Q_{gd}		-	21	-	
Gate Input Resistance	R_g	F = 1MHz	-	7.3	-	Ω
Input Capacitance	Ciss	V_{DS}=25V, V_{GS}=0V, f=1MHZ	-	1013	-	pF
Output Capacitance	Coss		-	674	-	
Reverse Transfer Capacitance	Crss		-	91	-	
Turn-On Delay Time	$td_{(on)}$	V_{DD}=300V, I_D=7.5A, R_G=10Ω (Note 2,3)	-	15	-	ns
Turn-On Rise Time	t_r		-	28	-	
Turn-Off Delay Time	$td_{(off)}$		-	109	-	
Turn-Off Fall Time	t_f		-	29	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	15	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	-	-	30	
Reverse Recovery Time	trr	V_{GS}=0V, I_S=15A dI$_F$/ dt=100A/us (Note 2)	-	441	-	ns
Reverse Recovery Charge	Qrr		-	7.2	-	uC

NOTES :

1. Pulse width≤300us, Duty cycle≤2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.
4. The maximum current rating is package limited.
5. TO-252AA and TO-251AA mounted on a 1 inch2 with 2oz.square pad of copper.
6. L=100mH, I_{AS}=2.4A, V_{DD}=50V, R_G=25 ohm, Starting T_J=25°C.
7. Guaranteed by design, not subject to production testing.

PJP60R290E / PJF60R290E

TYPICAL CHARACTERISTIC CURVES

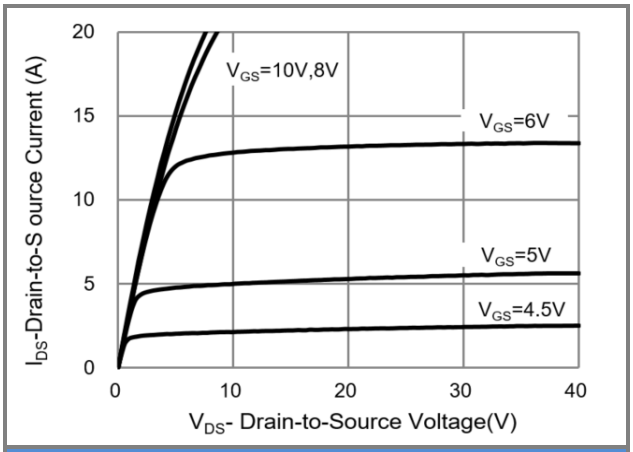

Fig.1 Output Characteristics

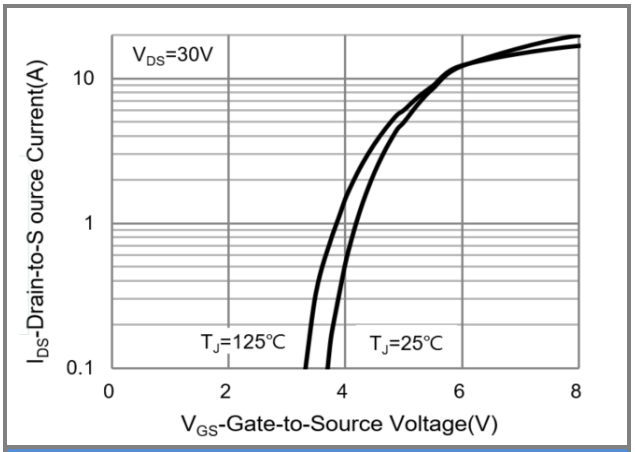

Fig.2 Transfer Characteristics

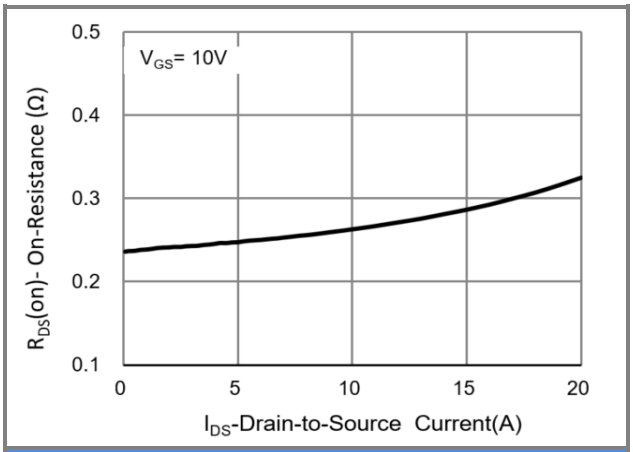

Fig.3 On-Resistance vs. Drain Current

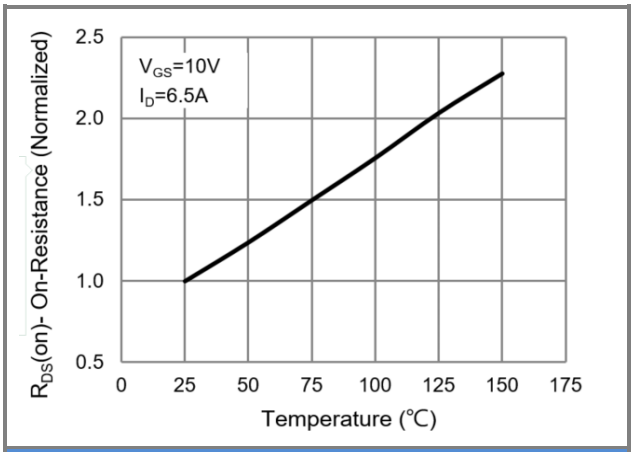

Fig.4 On-Resistance vs. Junction Temperature

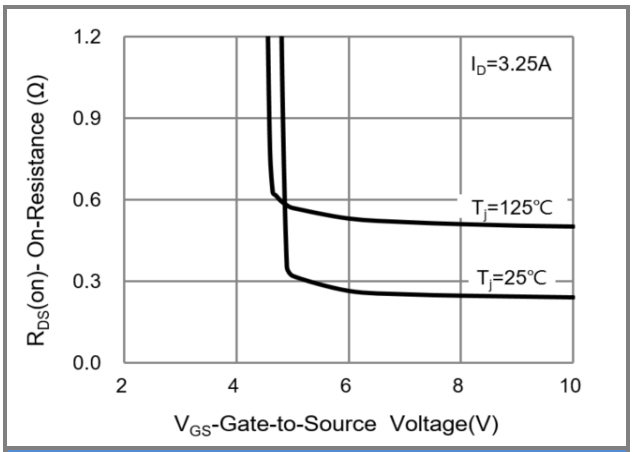

Fig.5 On-Resistance Variation with V_{GS}

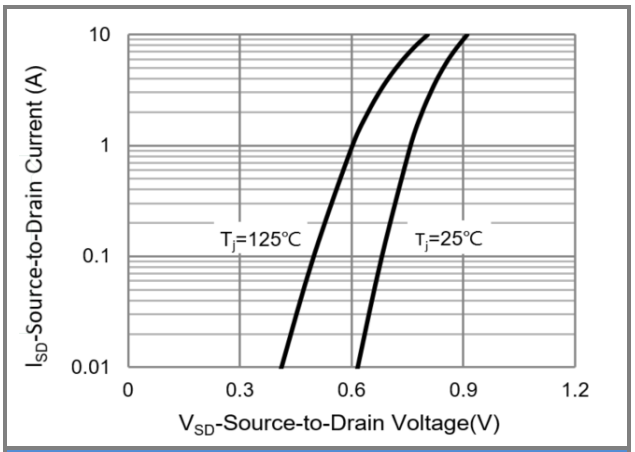

Fig.6 Source-Drain Diode Forward Voltage

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TYPICAL CHARACTERISTIC CURVES

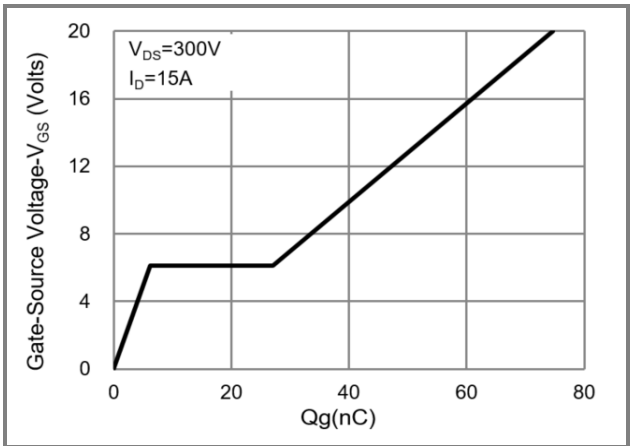


Fig.7 Gate-Charge Characteristics

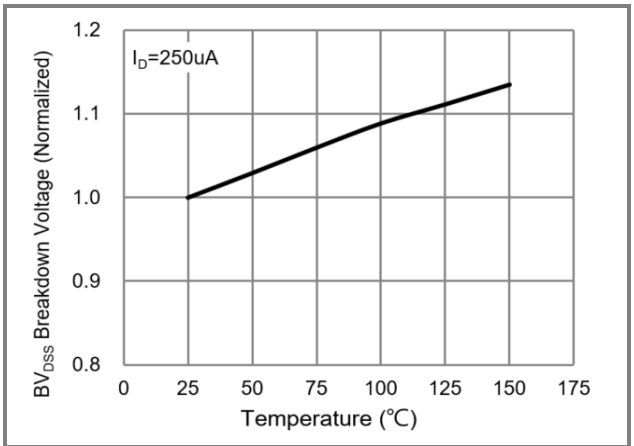


Fig.8 Breakdown Voltage Variation vs. Temperature

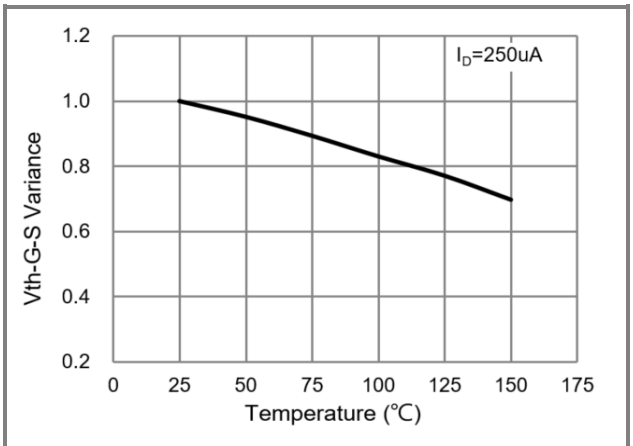


Fig.9 Threshold Voltage Variation with Temperature

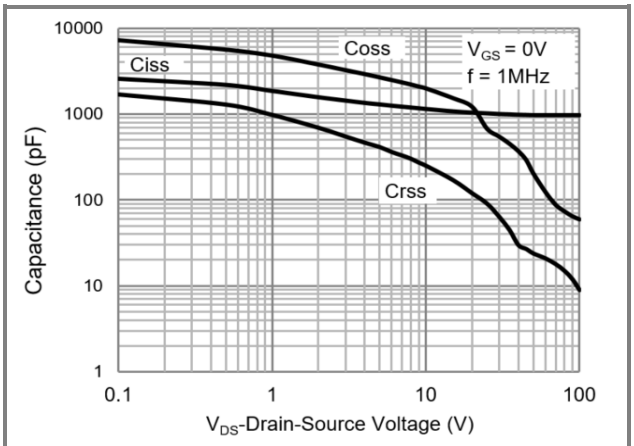


Fig.10 Capacitance vs. Drain-Source Voltage

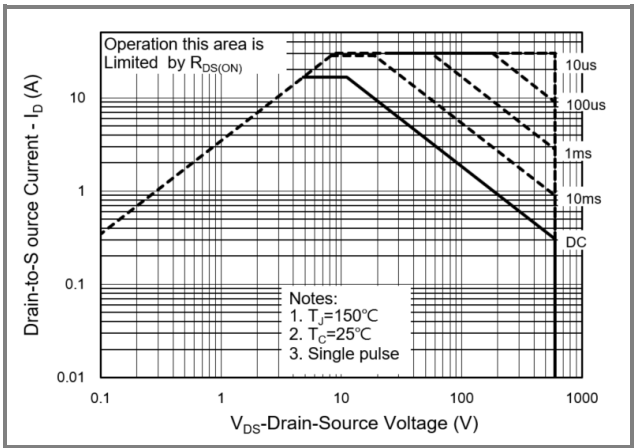


Fig.11 PJP Maximum Safe Operating Area

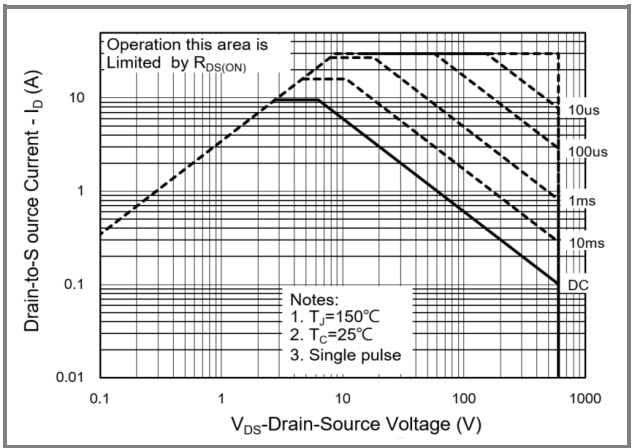


Fig.12 PJF Maximum Safe Operating Area

PJP60R290E / PJF60R290E

TYPICAL CHARACTERISTIC CURVES

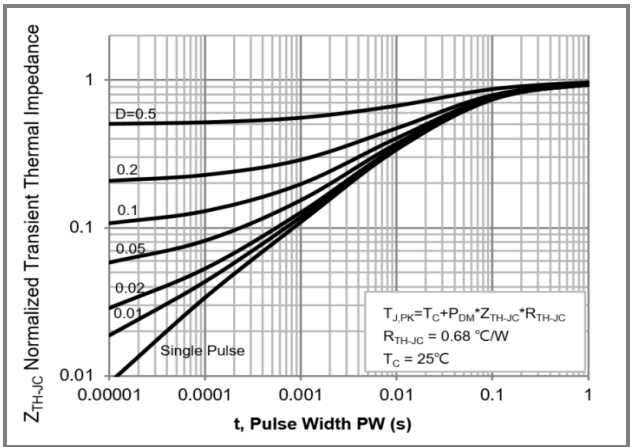


Fig.13 PJP Normalized Transient Thermal Impedance

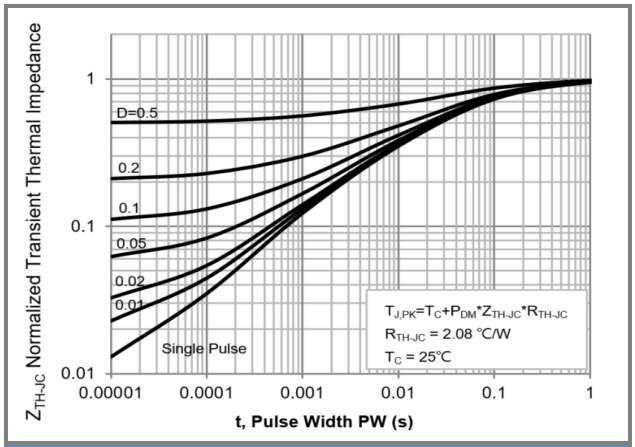


Fig.14 PJF Normalized Transient Thermal Impedance

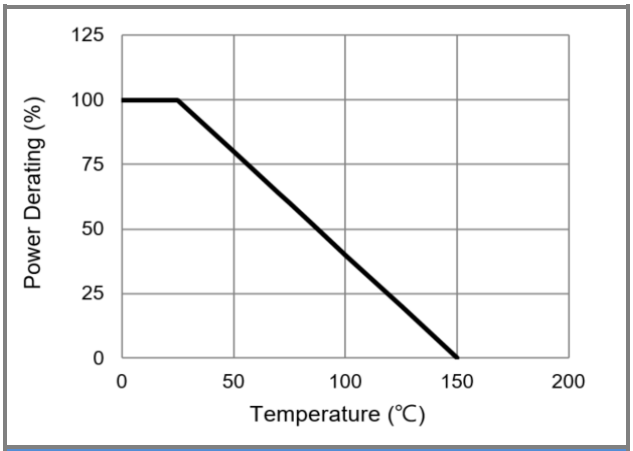


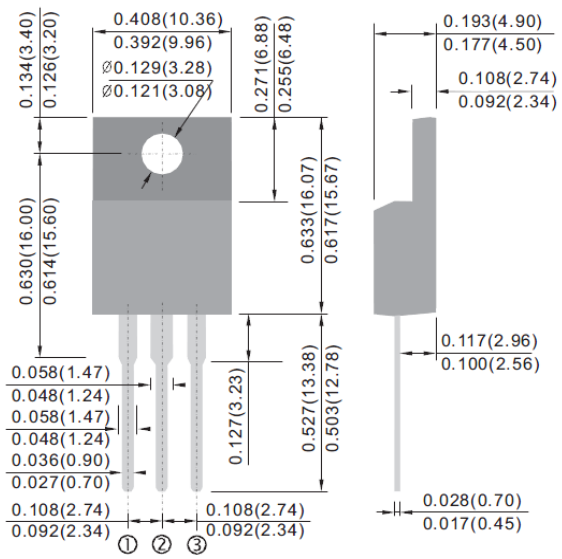
Fig.15 Total Power Dissipation

PJP60R290E / PJF60R290E

Packaging Information

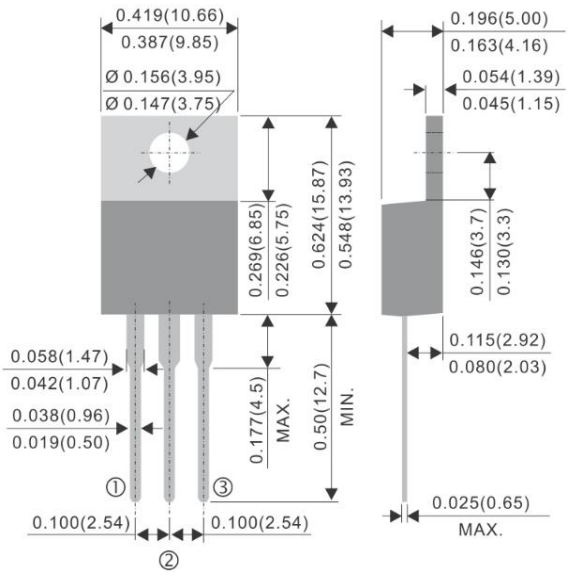
ITO-220AB-F Dimension

Unit: inch(mm)



TO-220AB Dimension

Unit: inch(mm)



PJP60R290E / PJF60R290E

Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJP60R290E_T0_00001	TO-220AB	50pcs / Tube	60R290E	Halogen free
PJF60R290E_T0_00001	ITO-220AB-F	50pcs / Tube	60R290E	Halogen free

PJP60R290E / PJF60R290E

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