



# PJU8NA50 / PJD8NA50 / PJP8NA50 / PJF8NA50

## 500V N-Channel MOSFET

**Voltage**

**500 V**

**Current**

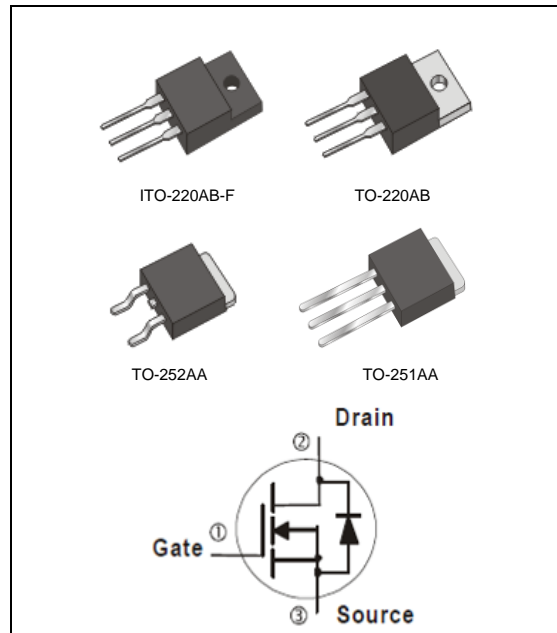
**8 A**

### Features

- $R_{DS(ON)}, V_{GS}@10V, I_D@4A < 0.9\Omega$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std. (Halogen Free)

### Mechanical Data

- Case: TO-251AA, TO-252AA, TO-220AB, ITO-220AB-F Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- TO-251AA Approx. Weight : 0.0104 ounces, 0.297grams
- TO-252AA Approx. Weight : 0.0104 ounces, 0.297grams
- TO-220AB Approx. Weight : 0.067 ounces, 1.9 grams
- ITO-220AB-F Approx. Weight : 0.068 ounces, 2 grams



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

PARAMETER		SYMBOL	TO-251AA	TO-220AB	ITO-220AB-F	TO-252AA	UNITS
Drain-Source Voltage		$V_{DS}$	500				V
Gate-Source Voltage		$V_{GS}$	$\pm 30$				V
Continuous Drain Current		$I_D$	8				A
Pulsed Drain Current		$I_{DM}$	32				A
Single Pulse Avalanche Energy <sup>(Note 1)</sup>		$E_{AS}$	512				mJ
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	130	134	49	130	W
	Derate above $25^\circ\text{C}$		1.04	1.07	0.39	1.04	W/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150				$^\circ\text{C}$
Typical Thermal resistance							
- Junction to Case		$R_{\theta JC}$	0.96	0.93	2.55	0.96	$^\circ\text{C}/\text{W}$
- Junction to Ambient		$R_{\theta JA}$	110	62.5	120	110	

- Limited only By Maximum Junction Temperature



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## Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	500	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	2.96	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4A$	-	0.8	0.9	$\Omega$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=500V, V_{GS}=0V$	-	0.02	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	$\pm 10$	$\pm 100$	nA
Diode Forward Voltage	$V_{SD}$	$I_S=8A, V_{GS}=0V$	-	0.89	1.4	V
<b>Dynamic</b> (Note 4)						
Total Gate Charge	$Q_g$	$V_{DS}=400V, I_D=8A,$ $V_{GS}=10V$ (Note 2,3)	-	16.2	-	nC
Gate-Source Charge	$Q_{gs}$		-	5.2	-	
Gate-Drain Charge	$Q_{gd}$		-	5.2	-	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	826	-	pF
Output Capacitance	$C_{oss}$		-	114	-	
Reverse Transfer Capacitance	$C_{rss}$		-	0.7	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=250V, I_D=8A,$ $R_G=25\Omega$ (Note 2,3)	-	14	-	ns
Turn-On Rise Time	$t_r$		-	30	-	
Turn-Off Delay Time	$t_{d(off)}$		-	36	-	
Turn-Off Fall Time	$t_f$		-	29	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	8	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$	---	-	-	32	A
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V, I_S=8A$	-	453	-	ns
Reverse Recovery Charge	$Q_{rr}$	$di_F/dt=100A/\mu s$ (Note 2)	-	2.85	-	$\mu C$

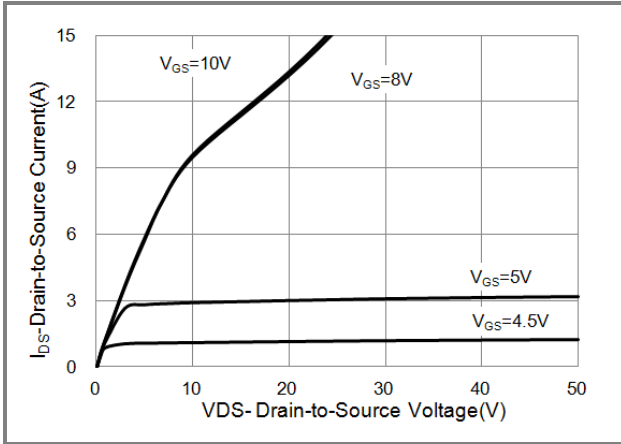
### NOTES :

1.  $L=30\text{mH}, I_{AS}=5.7A, V_{DD}=50V, R_G=25\text{ohm}$ , Starting  $T_J=25^\circ\text{C}$
2. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
3. Essentially independent of operating temperature typical characteristics.
4. Guaranteed by design, not subject to production testing

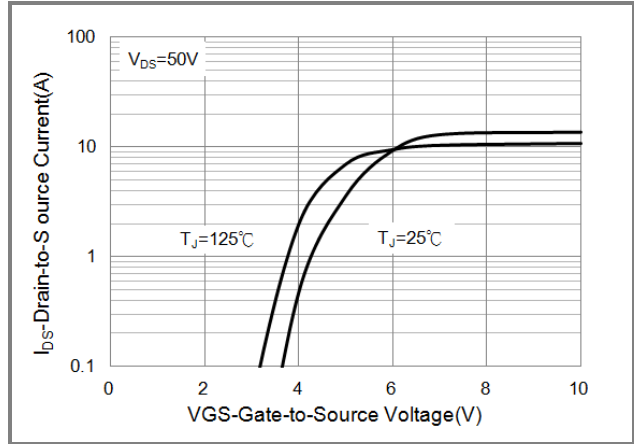


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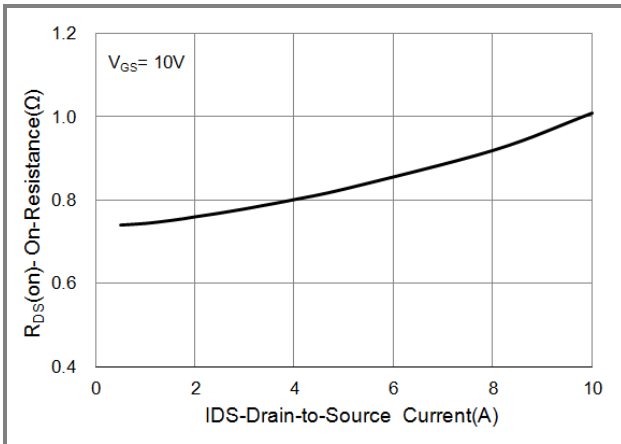
## TYPICAL CHARACTERISTIC CURVES



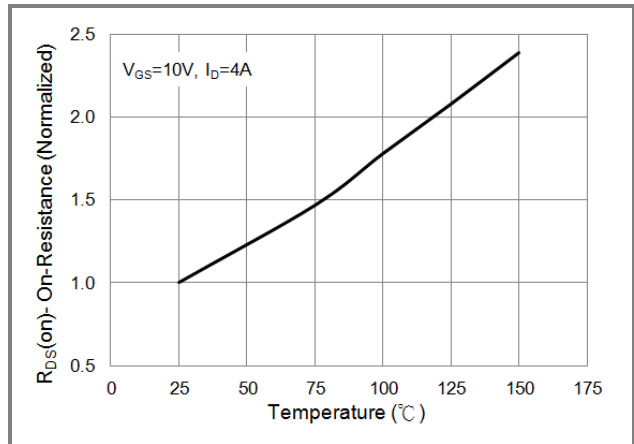
**Fig.1 Output Characteristics**



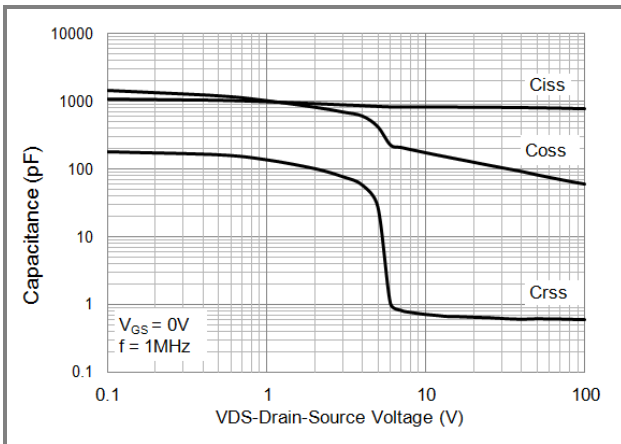
**Fig.2 Transfer Characteristics**



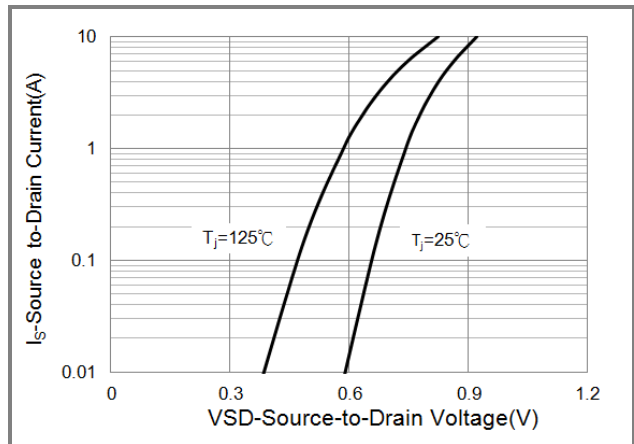
**Fig.3 On-Resistance vs. Drain Current**



**Fig.4 On-Resistance vs. Junction temperature**



**Fig.5 Capacitance vs. Drain-Source Voltage**



**Fig.6 Body Diode Characteristics**



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## TYPICAL CHARACTERISTIC CURVES

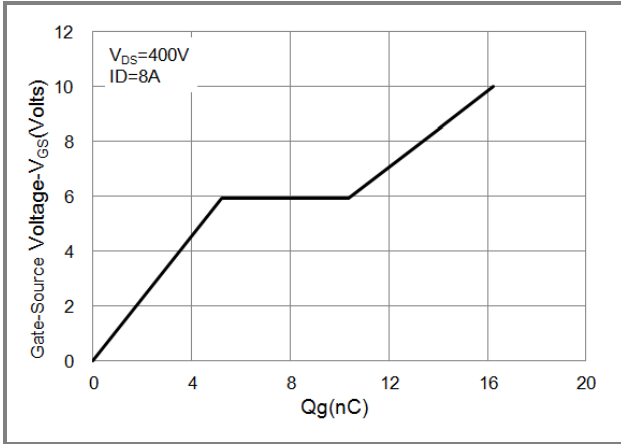


Fig.7 Gate-Charge Characteristics

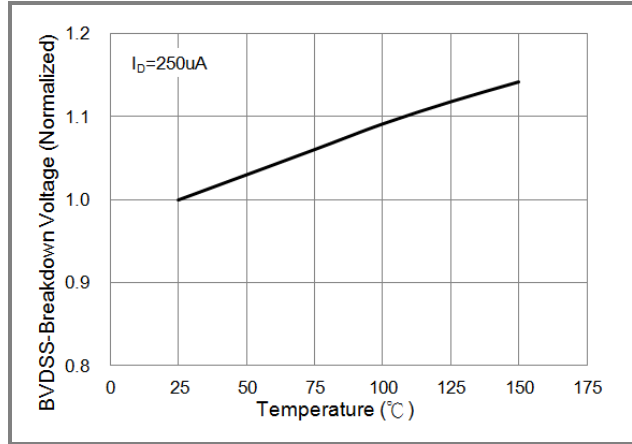


Fig.8 Breakdown Voltage Variation vs. Temperature

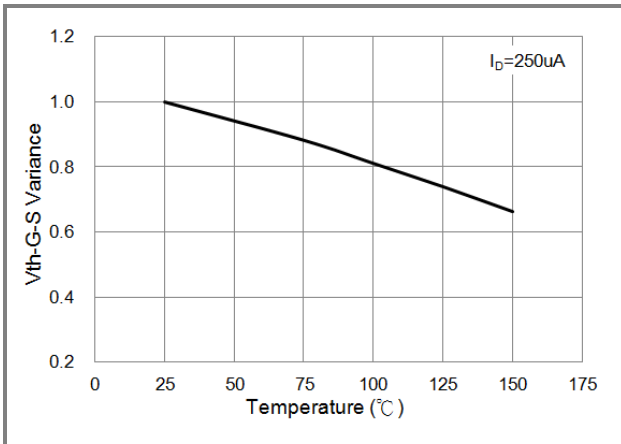


Fig.9 Threshold Voltage Variation with Temperature

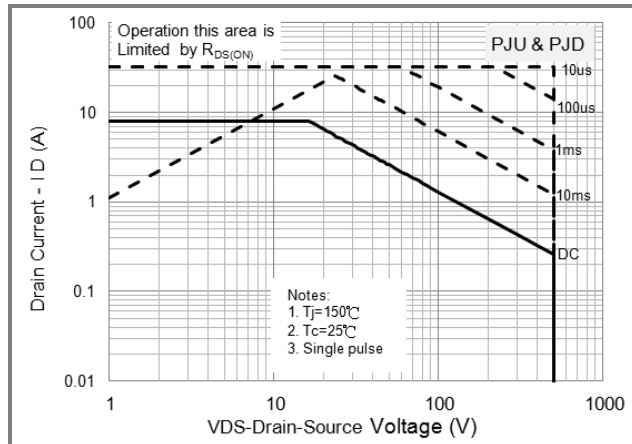


Fig.10 Maximum Safe Operating Area

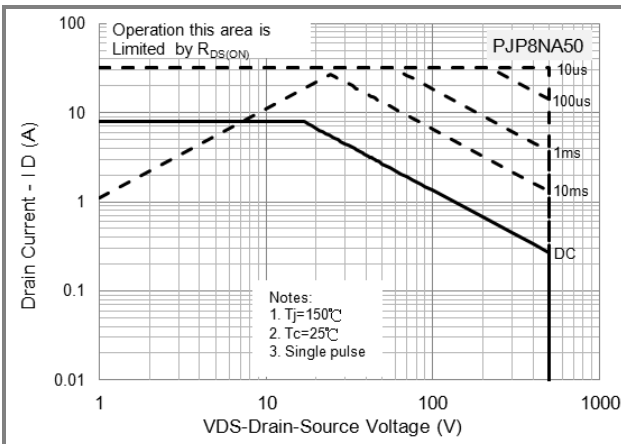


Fig.11 Maximum Safe Operating Area

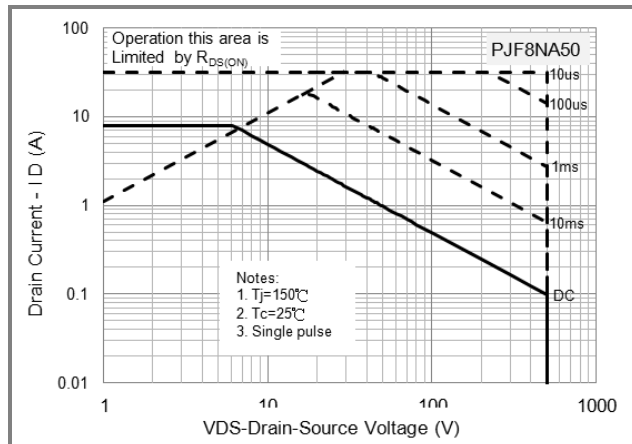


Fig.12 Maximum Safe Operating Area



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## TYPICAL CHARACTERISTIC CURVES

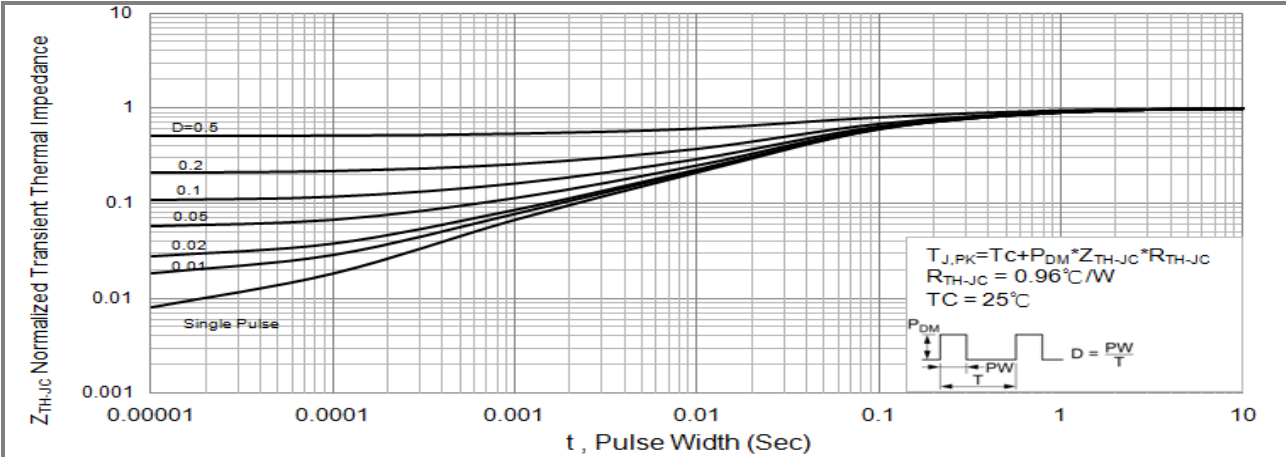


Fig.13 PJU/PJD Normalized Transient Thermal Impedance vs. Pulse Width

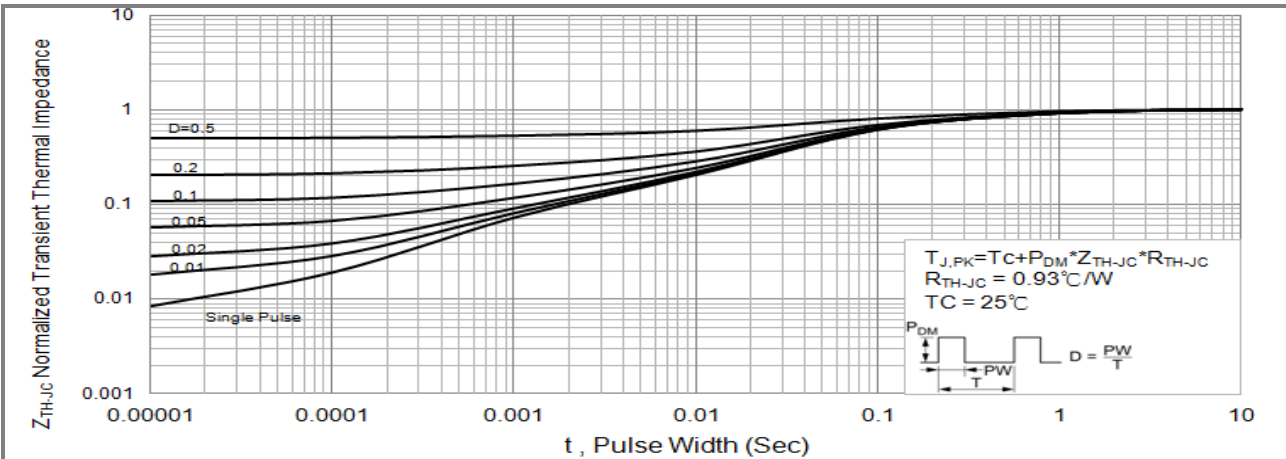


Fig.14 PJP8NA50 Normalized Transient Thermal Impedance vs. Pulse Width

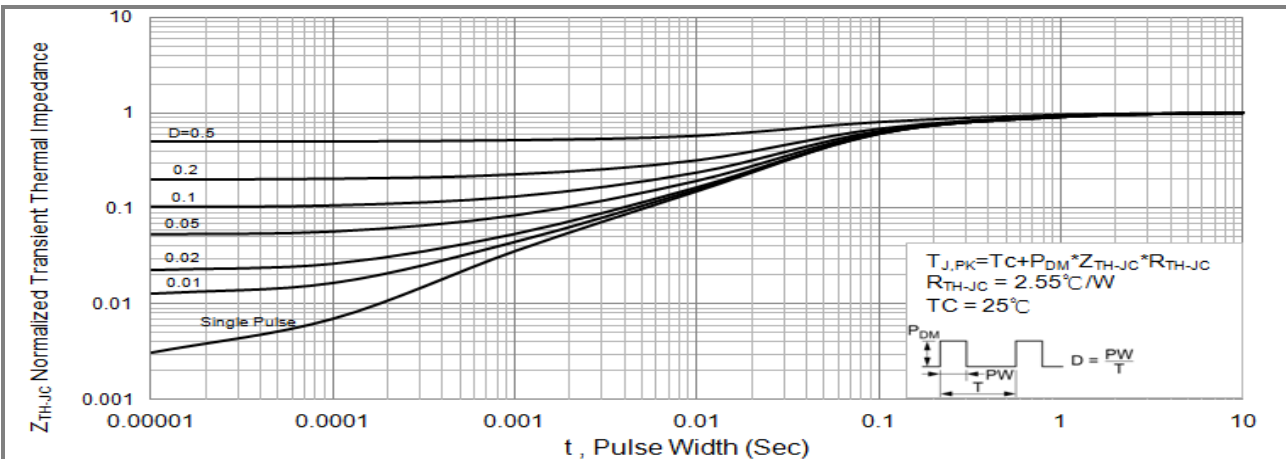
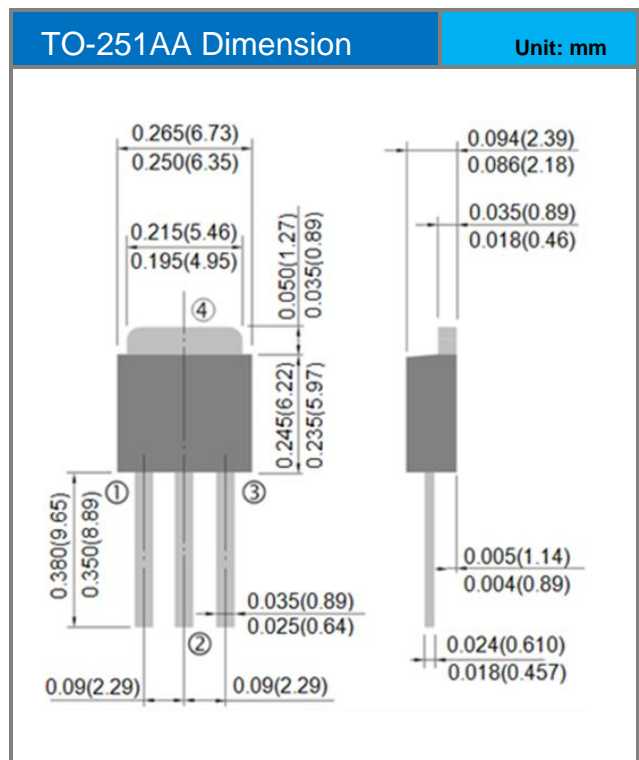
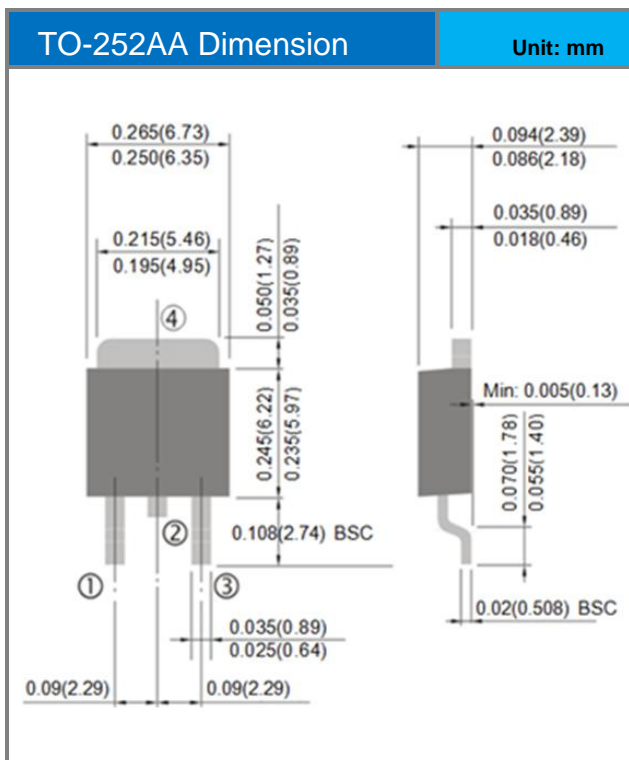
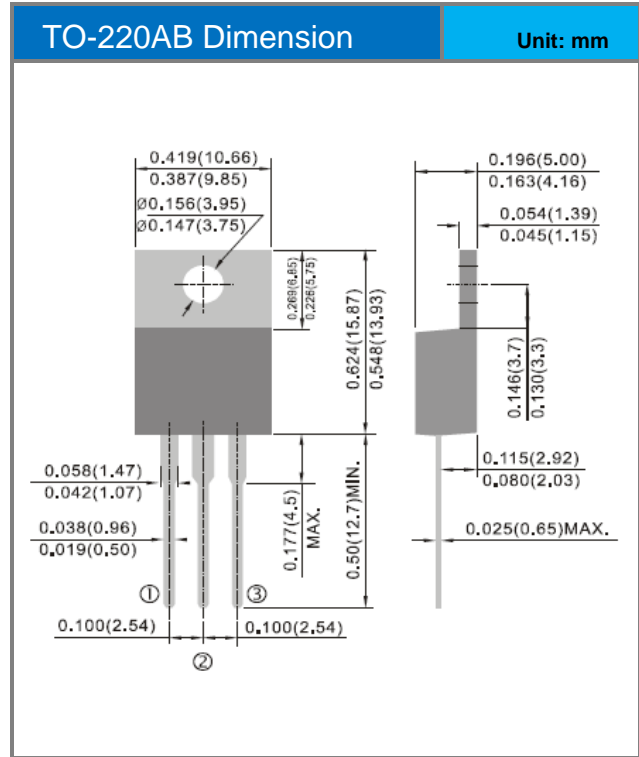
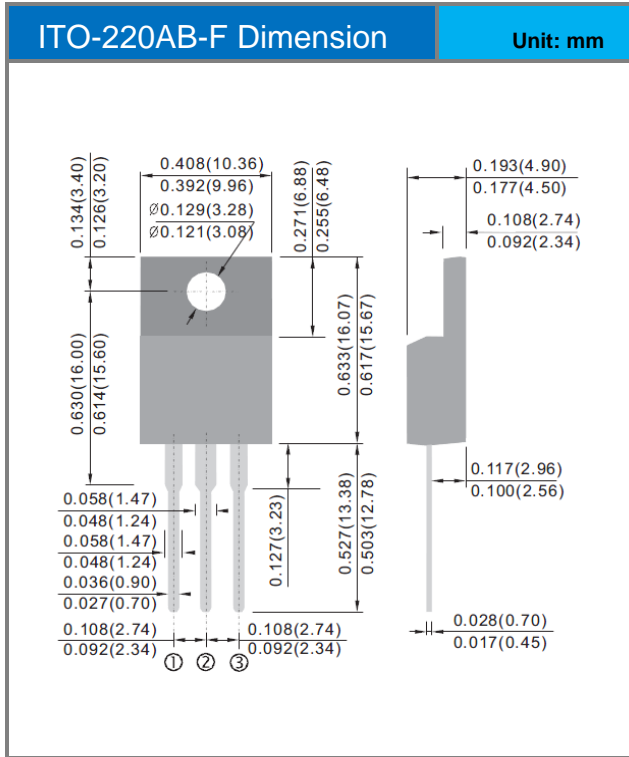


Fig.15 PJF8NA50 Normalized Transient Thermal Impedance vs. Pulse Width



# PJU8NA50 / PJD8NA50 / PJP8NA50 / PJF8NA50

## Packaging Information





## PJU8NA50 / PJD8NA50 / PJP8NA50 / PJF8NA50

### PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJU8NA50_T0_00001	TO-251AA	80pcs / Tube	U8NA50	Halogen free
PJD8NA50_L2_00001	TO-252AA	3,000pcs / 13" reel	D8NA50	Halogen free
PJP8NA50_T0_00001	TO-220AB	50pcs / Tube	P8NA50	Halogen free
PJF8NA50_T0_00001	ITO-220AB-F	50pcs / Tube	F8NA50	Halogen free



## **PJU8NA50 / PJD8NA50 / PJP8NA50 / PJF8NA50**

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