



# PJU3NA80 / PJD3NA80 / PJP3NA80 / PJF3NA80

## 800V N-Channel MOSFET

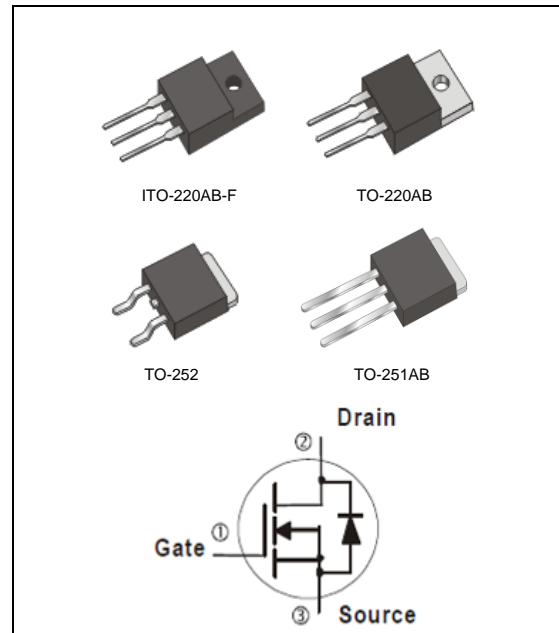
<b>Voltage</b>	<b>800 V</b>	<b>Current</b>	<b>3 A</b>
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### Features

- $R_{DS(ON)}$ ,  $V_{GS}@10V, I_D@1.5A < 4.8\Omega$
- 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-251AB, TO-252, TO-220AB, ITO-220AB-F Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- TO-251AB Approx. Weight : 0.0104 ounces, 0.297grams
- TO-252 Approx. Weight : 0.0104 ounces, 0.297grams
- TO-220AB Approx. Weight : 0.067 ounces, 2 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-251AB	TO-220AB	ITO-220AB-F	TO-252	UNITS
Drain-Source Voltage		$V_{DS}$	800				V
Gate-Source Voltage		$V_{GS}$	$\pm 30$				V
Continuous Drain Current		$I_D$	3				A
Pulsed Drain Current		$I_{DM}$	12				A
Single Pulse Avalanche Energy <sup>(Note 1)</sup>		$E_{AS}$	173				mJ
Power Dissipation	$T_C=25^\circ\text{C}$	$P_D$	80	106	39	80	W
	Derate above $25^\circ\text{C}$		0.64	0.85	0.31	0.64	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		$R_{\theta JC}$	1.56	1.2	3.2	1.56	$^\circ\text{C}/\text{W}$
- 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	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	800	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3.4	4	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=1.5A$	-	4.2	4.8	$\Omega$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=800V, V_{GS}=0V$	-	0.01	1.0	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	$\pm 10$	$\pm 100$	nA
Diode Forward Voltage	$V_{SD}$	$I_S=3A, V_{GS}=0V$	-	0.87	1.4	V
<b>Dynamic</b> (Note 4)						
Total Gate Charge	$Q_g$	$V_{DS}=640V, I_D=3A,$ $V_{GS}=10V$ (Note 2,3)	-	11	-	nC
Gate-Source Charge	$Q_{gs}$		-	3.1	-	
Gate-Drain Charge	$Q_{gd}$		-	4.8	-	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	406	-	pF
Output Capacitance	$C_{oss}$		-	50	-	
Reverse Transfer Capacitance	$C_{rss}$		-	1	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=400V, I_D=3A,$ $R_G=25\Omega$ (Note 2,3)	-	9.8	-	ns
Turn-On Rise Time	$t_r$		-	23	-	
Turn-Off Delay Time	$t_{d(off)}$		-	18	-	
Turn-Off Fall Time	$t_f$		-	24	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	3	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$	---	-	-	12	A
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V, I_S=3A$	-	507	-	ns
Reverse Recovery Charge	$Q_{rr}$	$di_F/dt=100A/\mu s$ (Note 2)	-	0.26	-	$\mu C$

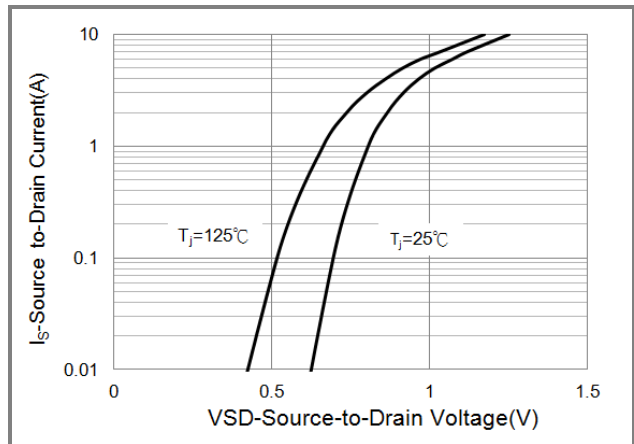
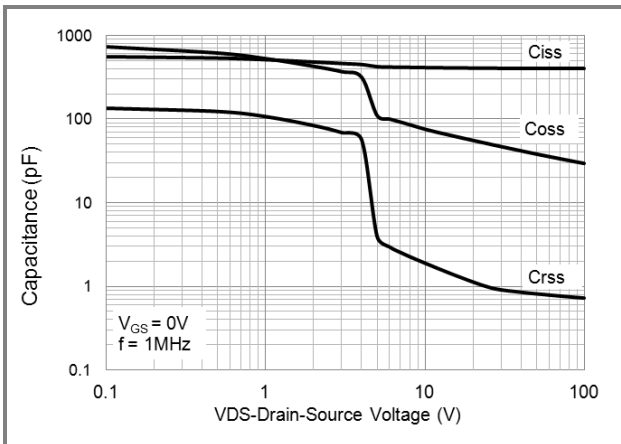
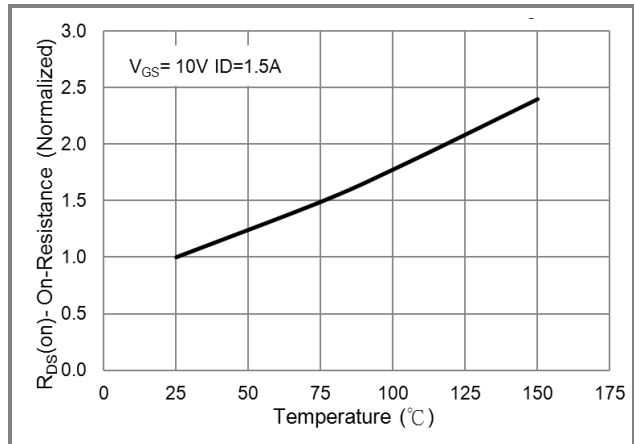
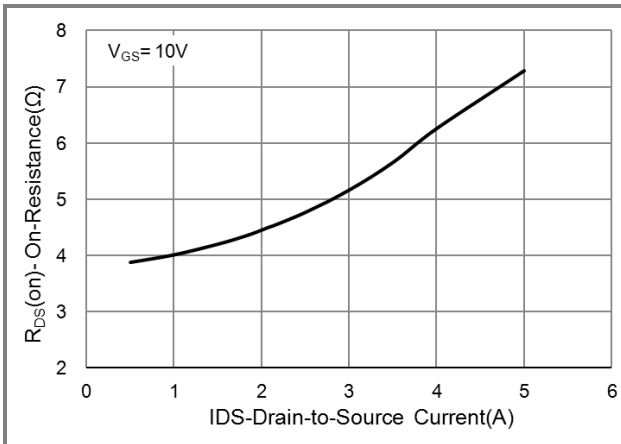
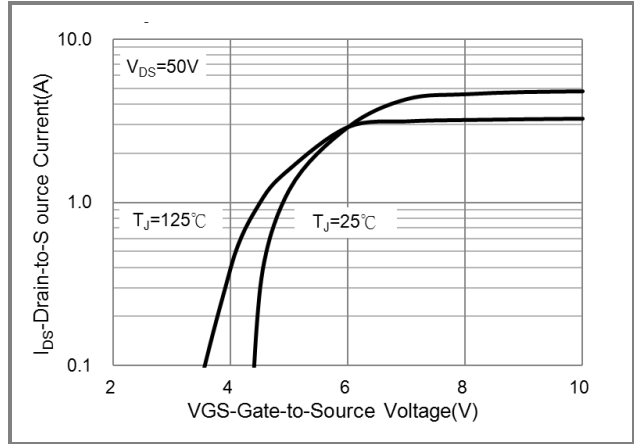
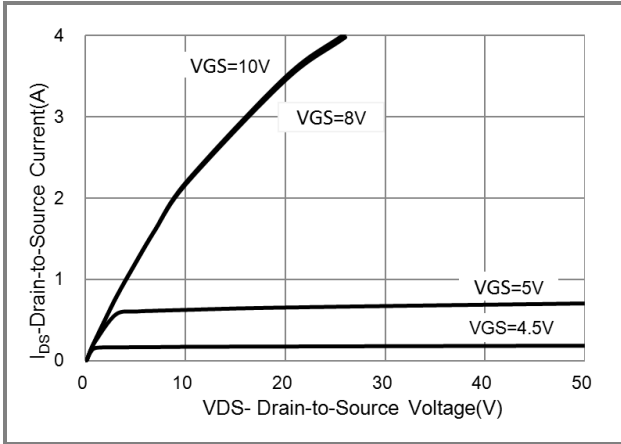
**NOTES :**

1.  $L=30\text{mH}, I_{AS}=3.3A, V_{DD}=50V, R_G=20\text{ohm}$ , 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



# PJU3NA80 / PJD3NA80 / PJP3NA80 / PJF3NA80

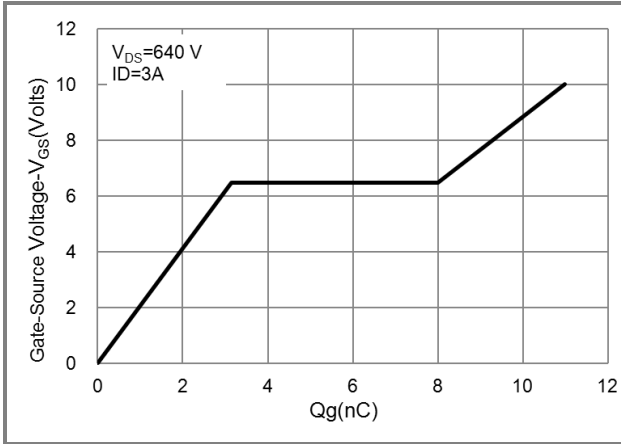
## TYPICAL CHARACTERISTIC CURVES



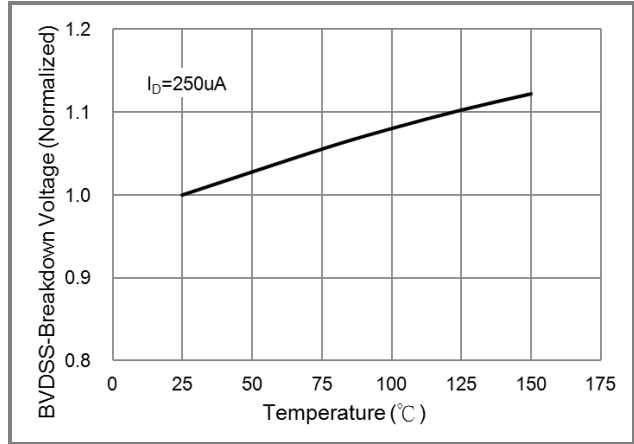


# PJU3NA80 / PJD3NA80 / PJP3NA80 / PJF3NA80

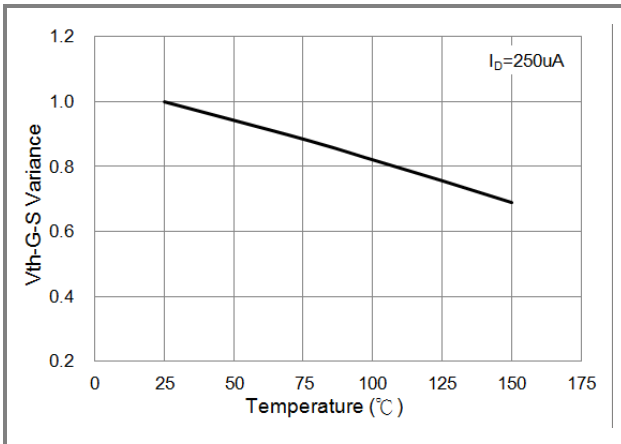
## TYPICAL CHARACTERISTIC CURVES



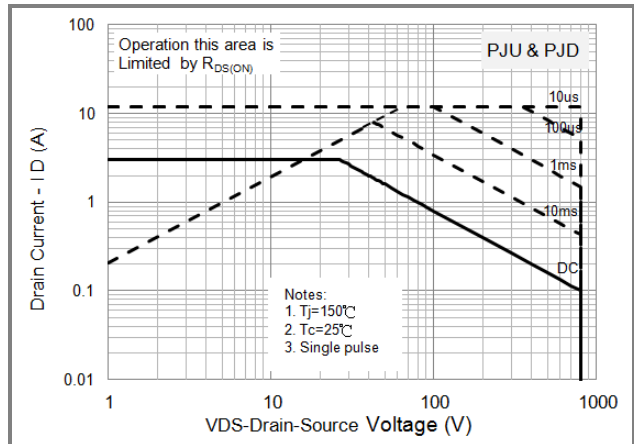
**Fig.7 Gate-Charge Characteristics**



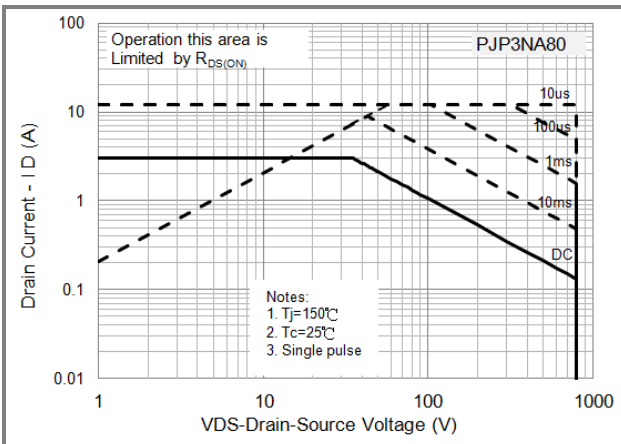
**Fig.8 Breakdown Voltage Variation vs. Temperature**



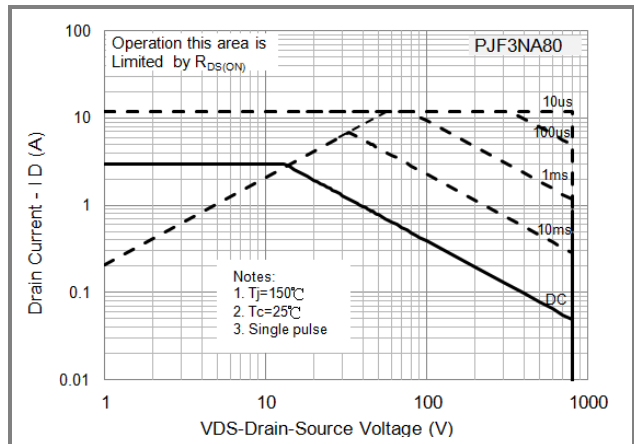
**Fig.9 Threshold Voltage Variation with Temperature**



**Fig.10 Maximum Safe Operating Area**



**Fig.11 Maximum Safe Operating Area**



**Fig.12 Maximum Safe Operating Area**



# PJU3NA80 / PJD3NA80 / PJP3NA80 / PJF3NA80

## TYPICAL CHARACTERISTIC CURVES

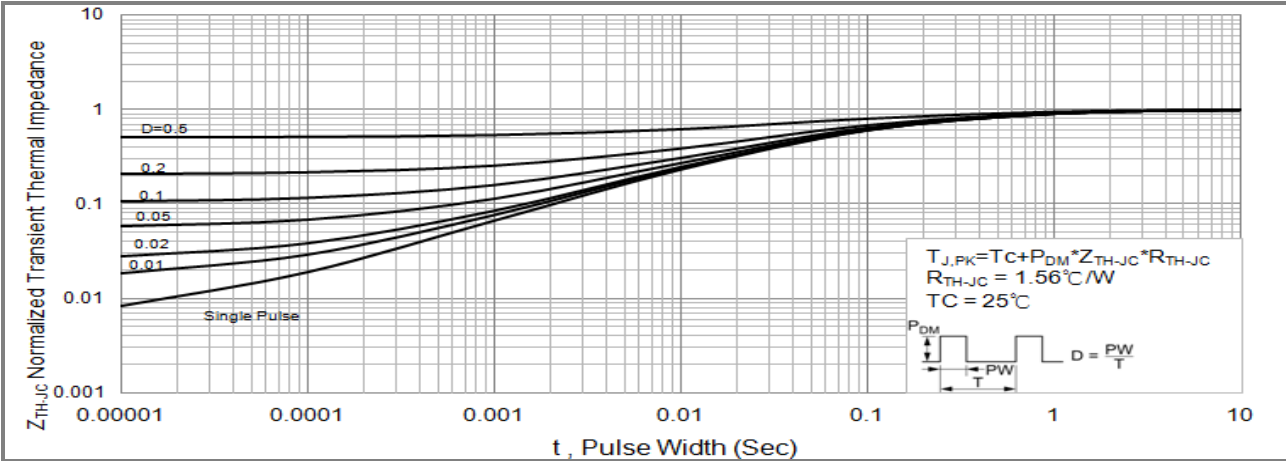


Fig.13 PJU/PJD Normalized Transient Thermal Impedance vs. Pulse Width

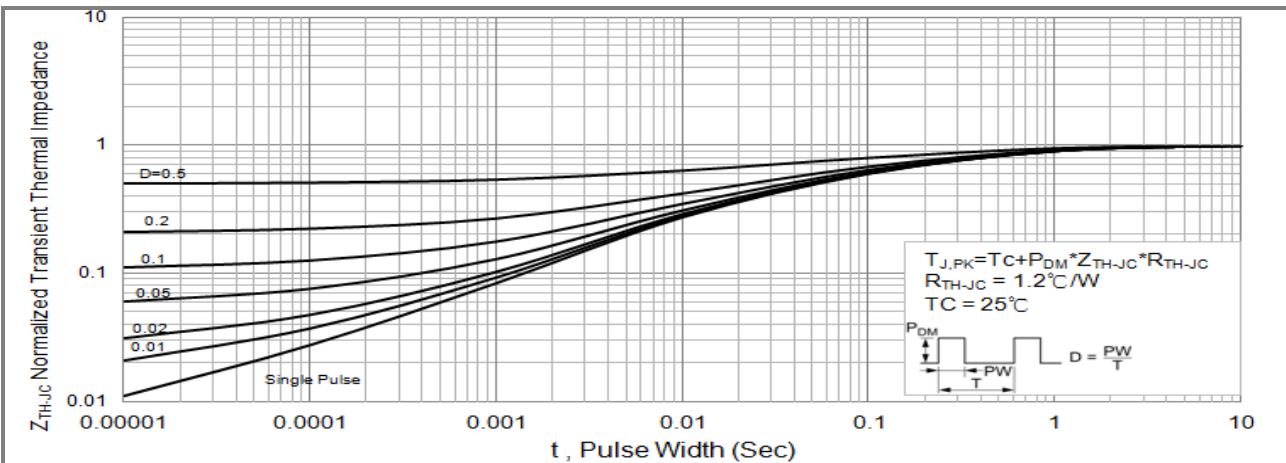


Fig.14 PJP3NA80 Normalized Transient Thermal Impedance vs. Pulse Width

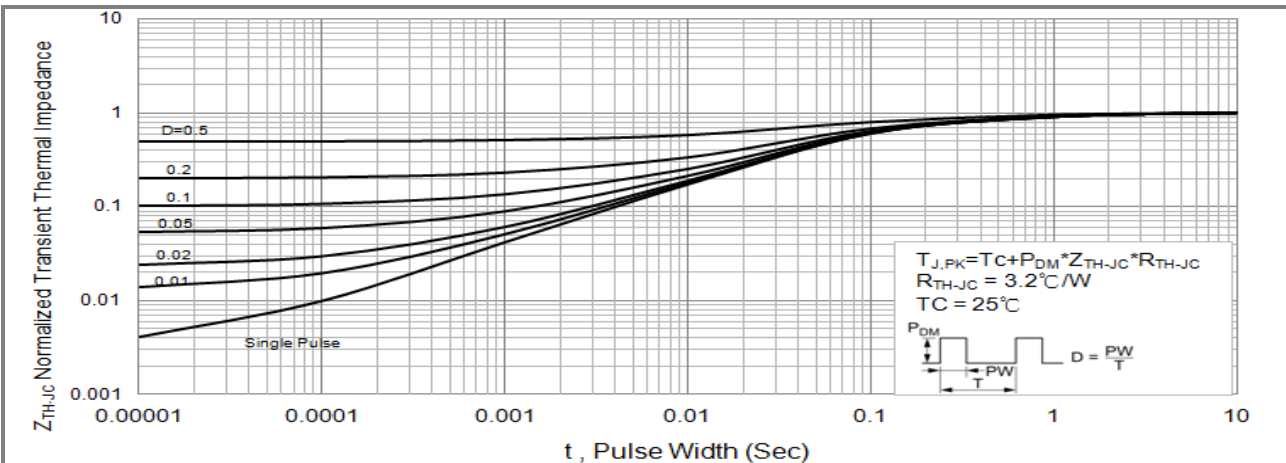
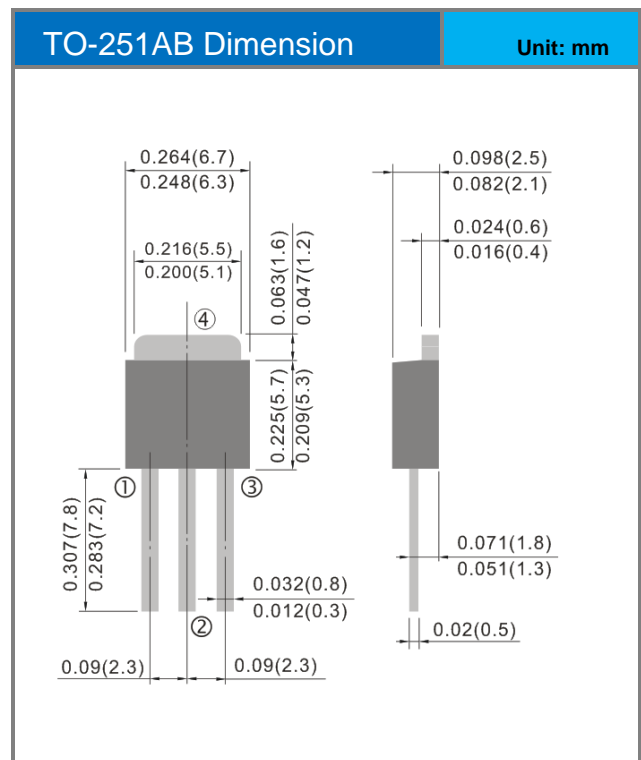
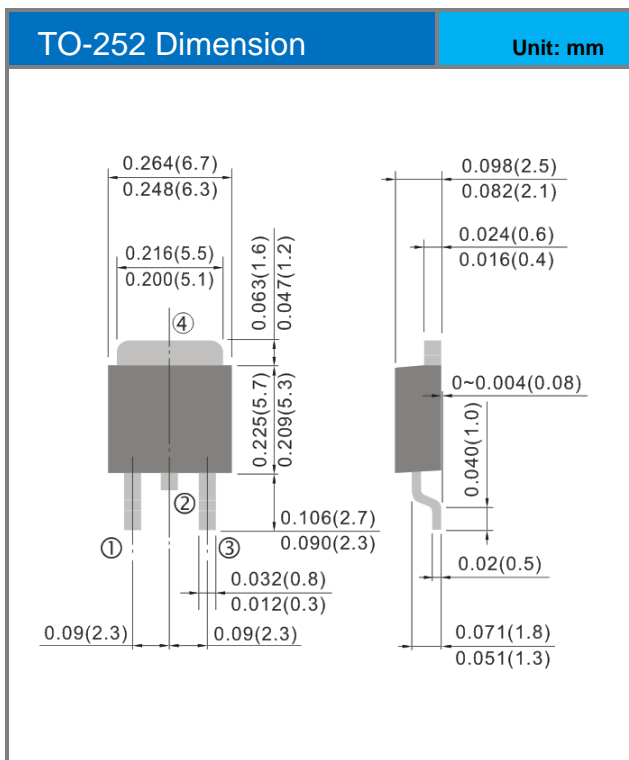
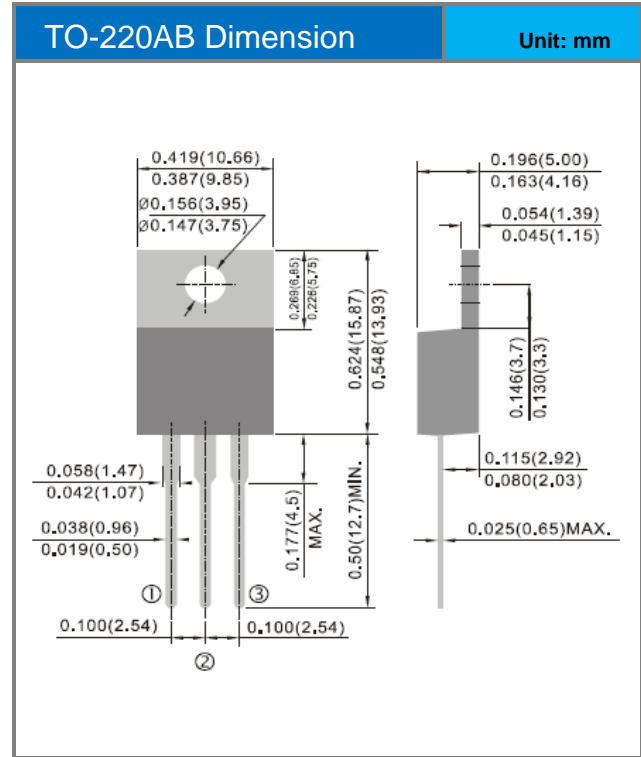
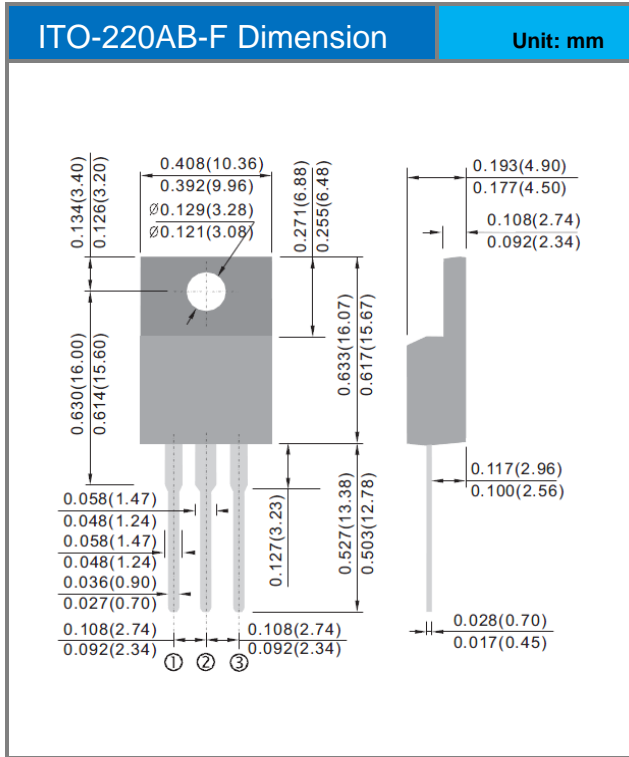


Fig.15 PJF3NA80 Normalized Transient Thermal Impedance vs. Pulse Width



# PJU3NA80 / PJD3NA80 / PJP3NA80 / PJF3NA80

## Packaging Information





## PJU3NA80 / PJD3NA80 / PJP3NA80 / PJF3NA80

### PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJU3NA80_TO_00001	TO-251AB	80pcs / Tube	U3NA80	Halogen free
PJD3NA80_L2_00001	TO-252	3,000pcs / 13" reel	D3NA80	Halogen free
PJP3NA80_TO_00001	TO-220AB	50pcs / Tube	P3NA80	Halogen free
PJF3NA80_TO_00001	ITO-220AB-F	50pcs / Tube	F3NA80	Halogen free



## **PJU3NA80 / PJD3NA80 / PJP3NA80 / PJF3NA80**

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