

PJU3NA60A / PJD3NA60A / PJP3NA60A / PJF3NA60A / PJW3NA60A

600V N-Channel MOSFET

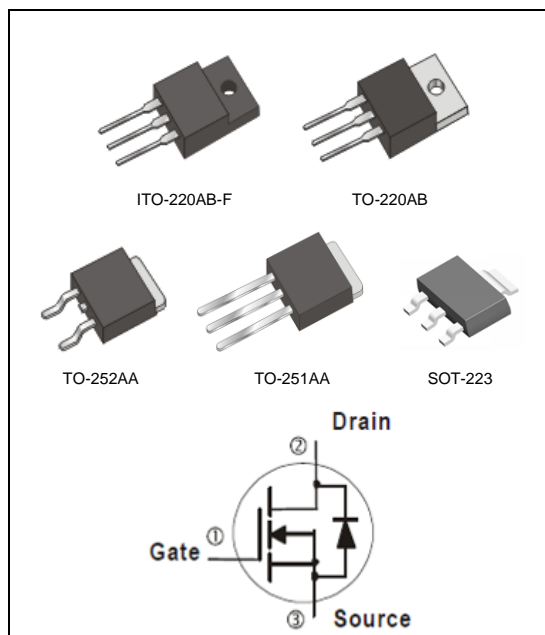
Voltage	600 V	Current	2.5 A
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Features

- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@1.25A<3.8\Omega$
- 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 : SOT-223, TO-251AA, TO-252AA, TO-220AB, ITO-220AB-F Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- SOT-223 Approx. Weight : 0.0043 ounces, 0.123grams
- TO-251AA, TO-252AA 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-251AA TO-252AA	TO-220AB	ITO-220AB-F	SOT-223	UNITS
Drain-Source Voltage		V_{DS}	600				V
Gate-Source Voltage		V_{GS}	± 30				V
Continuous Drain Current		I_D	2.5				A
Pulsed Drain Current ^(Note 1)		I_{DM}	10				A
Single Pulse Avalanche Energy ^(Note 6)		E_{AS}	177				mJ
Power Dissipation	$T_C=25^{\circ}\text{C}$	P_D	50	75	34	3.3	W
	Derate above 25°C		0.4	0.6	0.27	0.026	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		$R_{\theta JC}$	2.5	1.67	3.68	37.9	$^{\circ}\text{C/W}$
- Junction to Ambient ^(Note 4)		$R_{\theta JA}$	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
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	2.9	4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =1.25A	-	2.8	3.8	Ω
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V	-		1.0	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Diode Forward Voltage	V _{SD}	I _S =4A, V _{GS} =0V	-	0.85	1.4	V
Dynamic (Note 5)						
Total Gate Charge	Q _g	V _{DS} =480V, I _D =2.5A, V _{GS} =10V (Note 3)	-	11	-	nC
Gate-Source Charge	Q _{gs}		-	1.9	-	
Gate-Drain Charge	Q _{gd}		-	4.4	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	-	387	-	pF
Output Capacitance	C _{oss}		-	44	-	
Reverse Transfer Capacitance	C _{rss}		-	24	-	
Turn-On Delay Time	td _(on)	V _{DD} =300V, I _D =2.5A, R _G =25Ω (Note 3)	-	6.3	-	ns
Turn-On Rise Time	t _r		-	22	-	
Turn-Off Delay Time	td _(off)		-	27	-	
Turn-Off Fall Time	t _f		-	24	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _S	---	-	-	2.5	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	---	-	-	10	A
Reverse Recovery Time	trr	V _{GS} =0V, I _S =2.5A	-	196	-	ns
Reverse Recovery Charge	Qrr	dI _F / dt=100A/us (Note 2)	-	1.26	-	uC

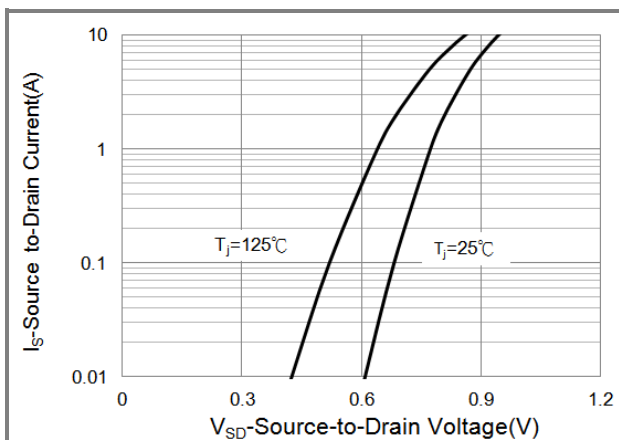
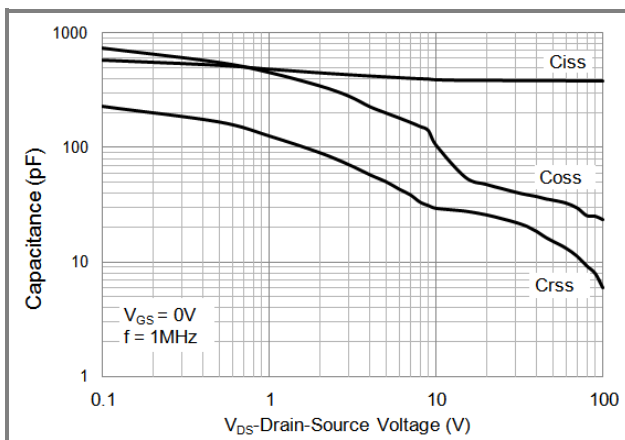
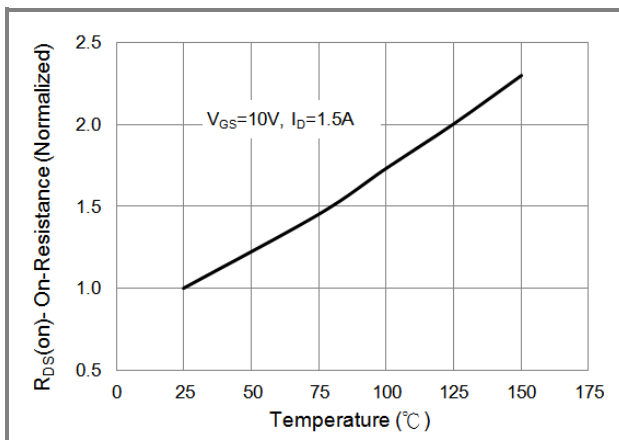
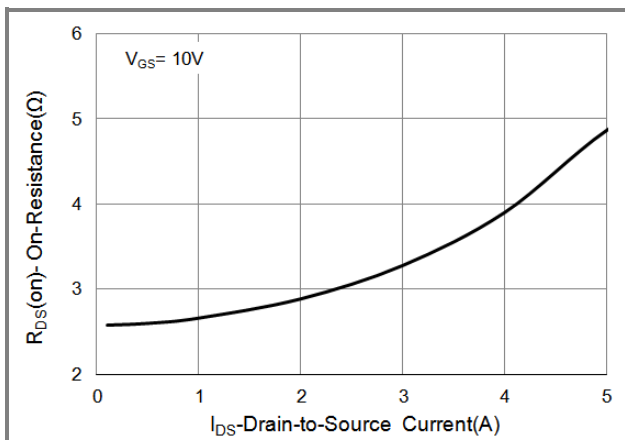
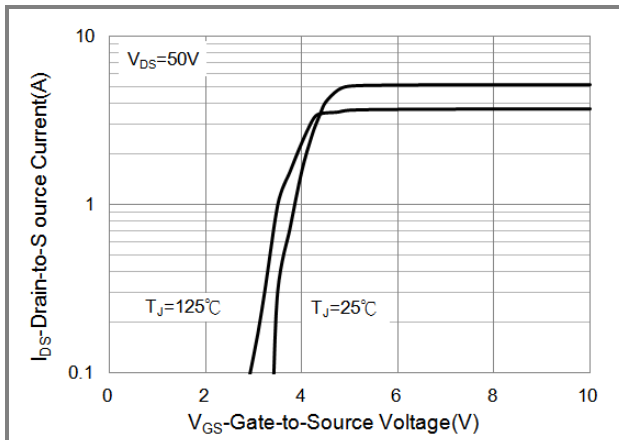
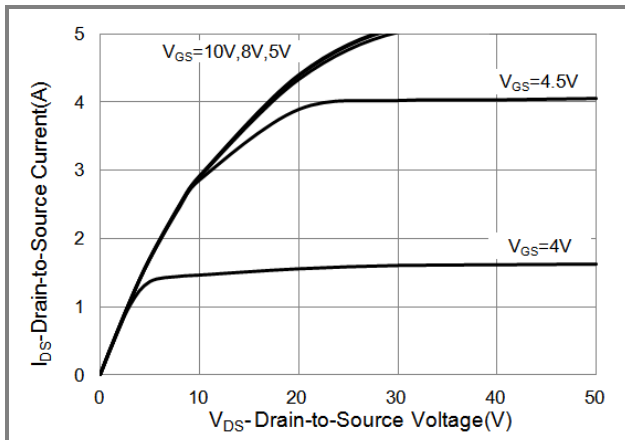
NOTES :

1. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics
3. Repetitive rating, pulse width limited by junction temperature $T_J(MAX)=150^\circ C$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ C$.
4. The maximum current rating is package limited
5. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch² with 2oz. square pad of copper
6. $L=30mH, I_{AS}=3.5A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$
7. Guaranteed by design, not subject to production testing



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TYPICAL CHARACTERISTIC CURVES





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TYPICAL CHARACTERISTIC CURVES

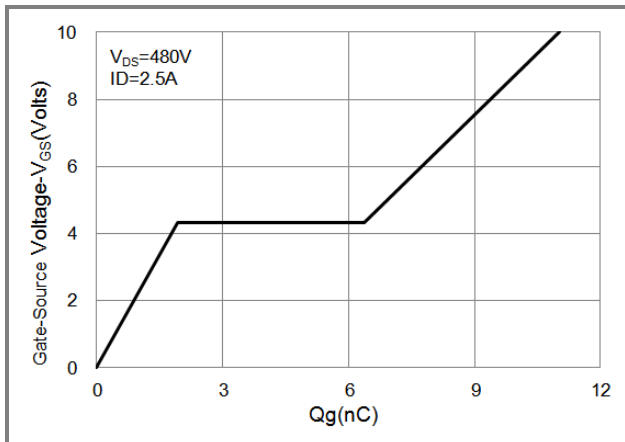


Fig.7 Gate Charge

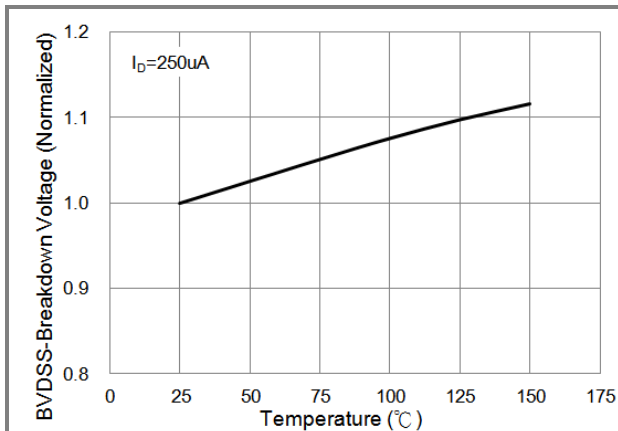


Fig.8 BV_{DS} vs. Junction Temperature

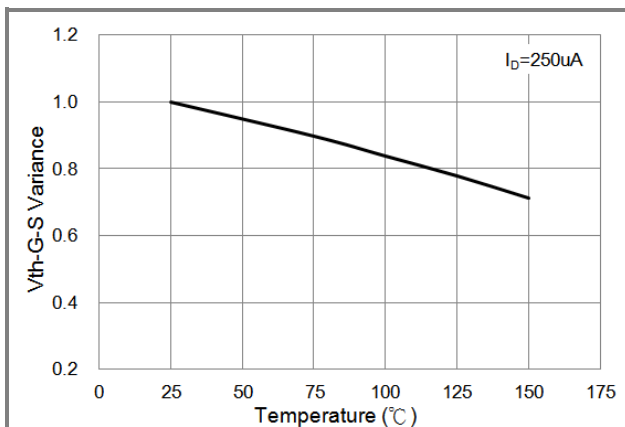


Fig.9 Threshold Voltage Variation with Temperature

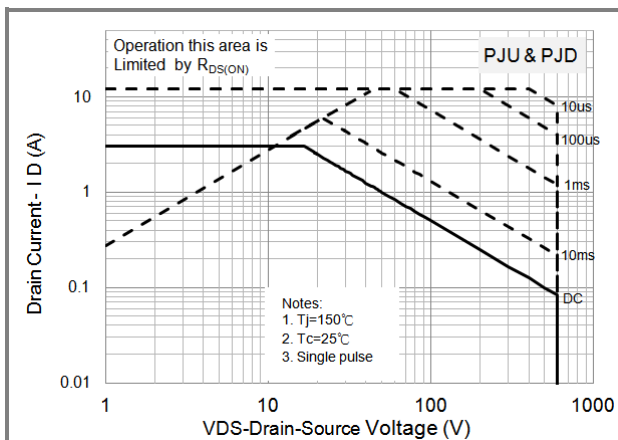


Fig.10 Maximum Safe Operating Area

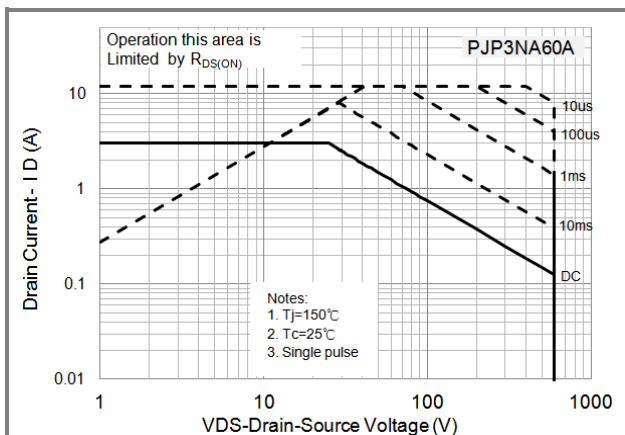


Fig.11 Maximum Safe Operating Area

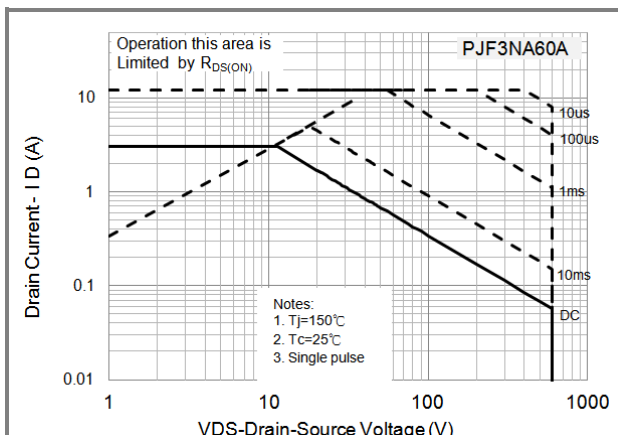


Fig.12 Maximum Safe Operating Area



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TYPICAL CHARACTERISTIC CURVES

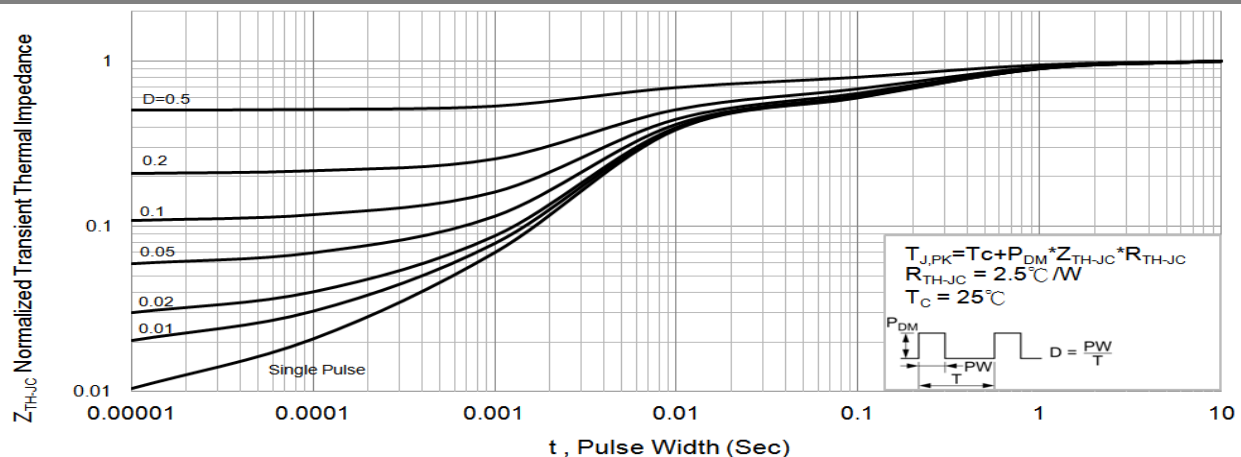


Fig.13 PJU/PJD Normalized Transient Thermal Impedance vs. Pulse Width

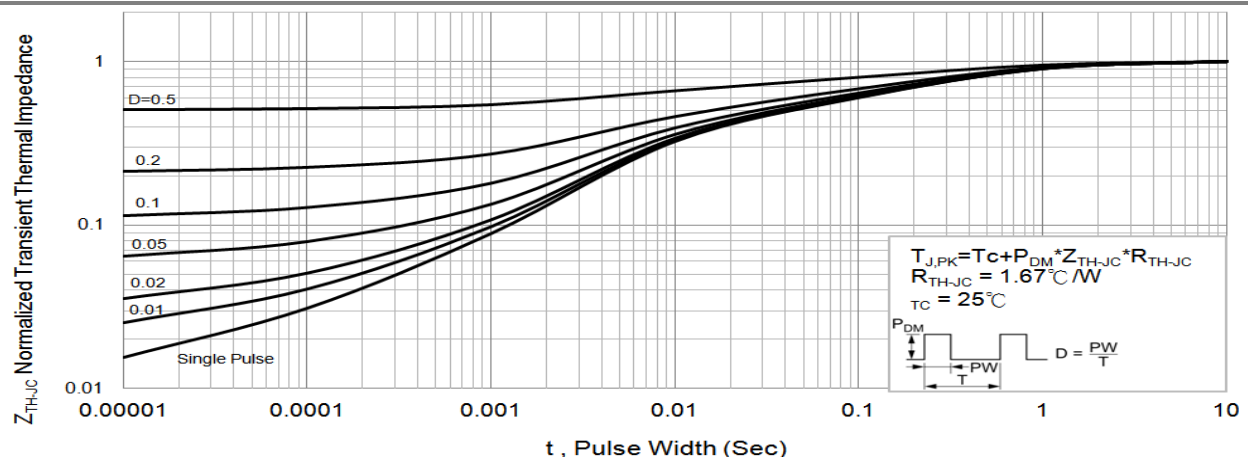


Fig.14 PJP3NA60A Normalized Transient Thermal Impedance vs. Pulse Width

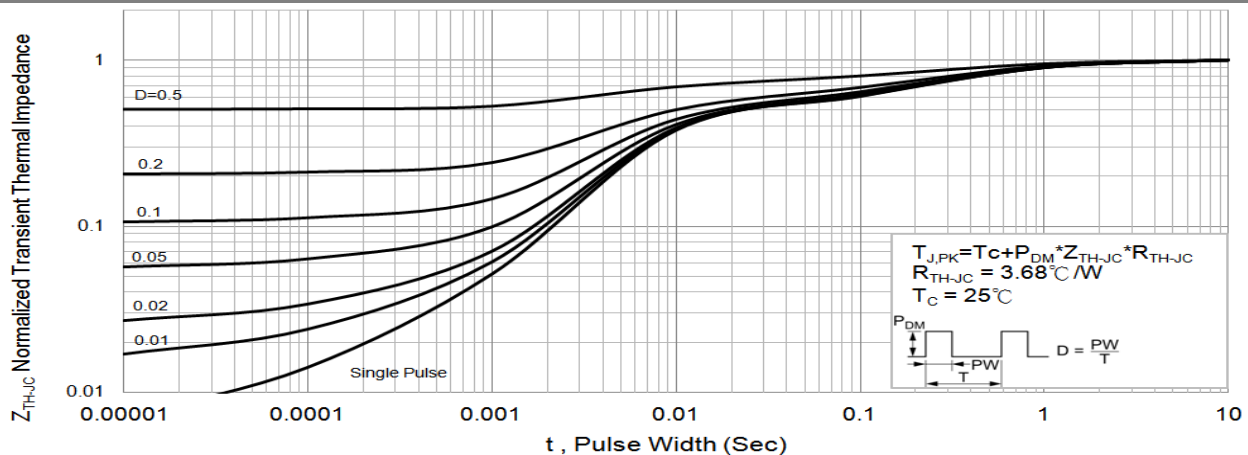
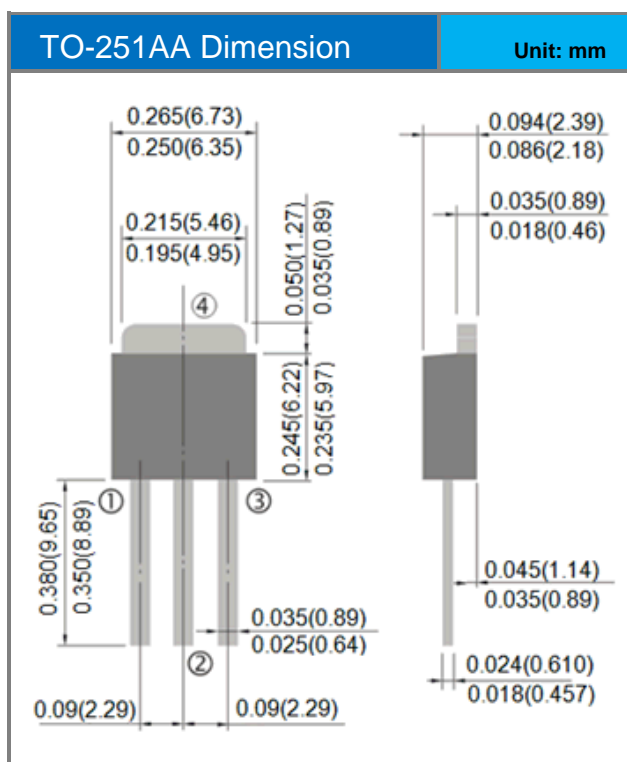
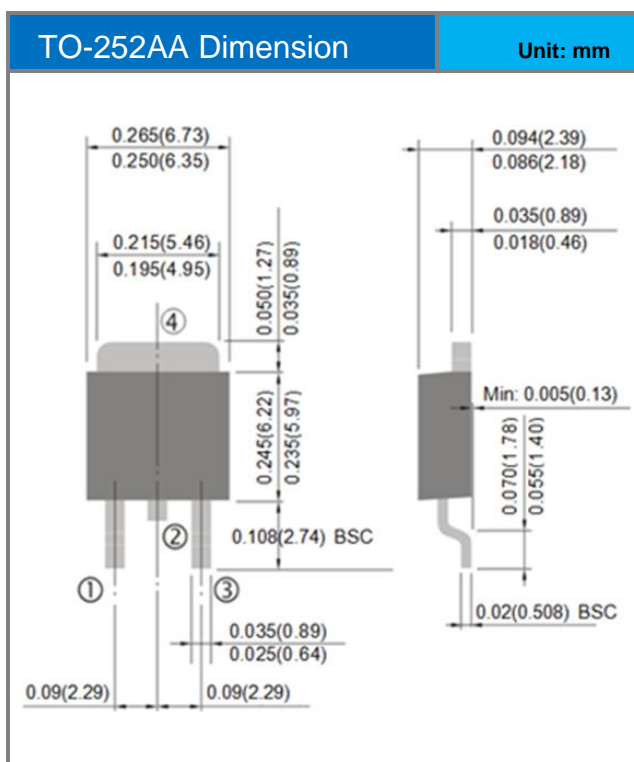
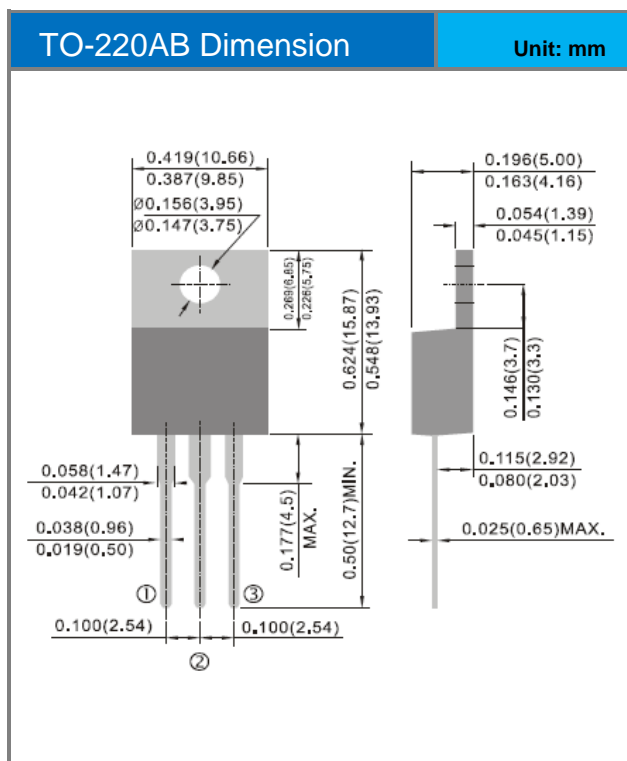
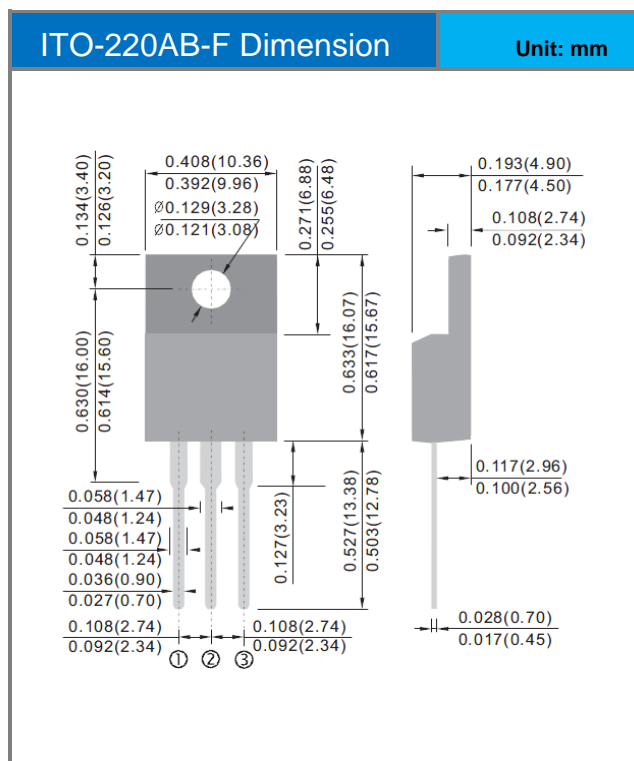


Fig.15 PJF3NA60A Normalized Transient Thermal Impedance vs. Pulse Width

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Packaging Information

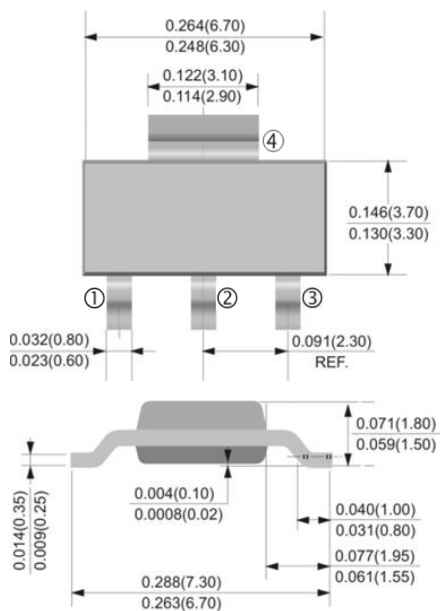




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SOT-223 Dimension

Unit: mm





PJU3NA60A / PJD3NA60A / PJP3NA60A / PJF3NA60A / PJW3NA60A

PART NO PACKING CODE VERSION

Part No Packing Code	Package Type	Packing type	Marking	Version
PJU3NA60A_T0_00001	TO-251AA	80pcs / Tube	U3NA60A	Halogen free
PJD3NA60A_L2_00001	TO-252AA	3,000pcs / 13" reel	D3NA60A	Halogen free
PJP3NA60A_T0_00001	TO-220AB	50pcs / Tube	P3NA60A	Halogen free
PJF3NA60A_T0_00001	ITO-220AB-F	50pcs / Tube	F3NA60A	Halogen free
PJW3NA60A_R2_00001	SOT-223	2,500pcs / 13" reel	3NA60A	Halogen free



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