

PJU55N10A / PJD55N10A / PJP55N10A / PJF55N10A

100V N-Channel Enhancement Mode MOSFET

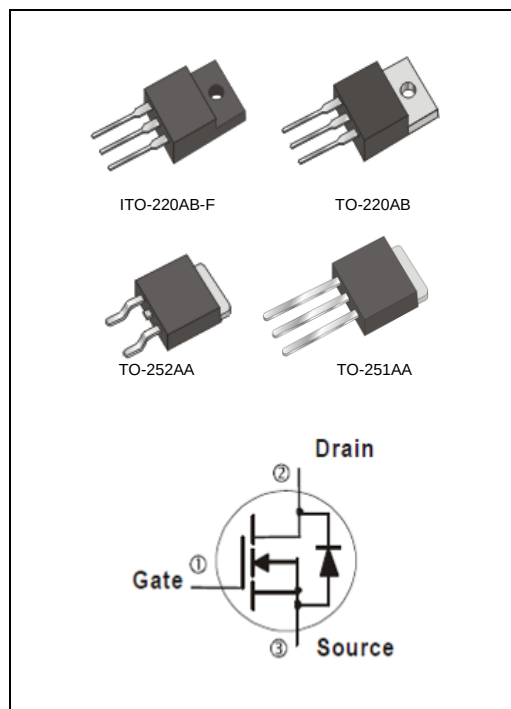
Voltage	100 V	Current	55 A
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Features

- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@20A < 18m\Omega$
- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@15A < 20m\Omega$
- High switching speed
- Improved dv/dt capability
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

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}	100				V
Gate-Source Voltage		V _{GS}	±20				
Continuous Drain Current ^(Note 4)	T _C =25°C	I _D	55				A
	T _C =100°C		35				
Pulsed Drain Current ^(Note 1)		I _{DM}	220				
Power Dissipation	T _C =25°C	P _D	140	142	46	140	W
	T _C =100°C		56	57	18	56	
Continuous Drain Current	T _A =25°C	I _D	7.2				A
	T _A =70°C		5.7				
Power Dissipation	T _A =25°C	P _D	1.1	2	1	1.1	W
	T _A =70°C		0.7	1.3	0.7	0.7	
Single Pulse Avalanche Energy ^(Note 6)		E _{AS}	156				mJ
Operating Junction and Storage Temperature Range		T _J ,T _{STG}	-55~150				°C
Typical Thermal Resistance ^(Note 4,5)							
- Junction to Case		R _{θJC}	0.89	0.88	2.72	0.89	°C/W
- Junction to Ambient		R _{θJA}	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)

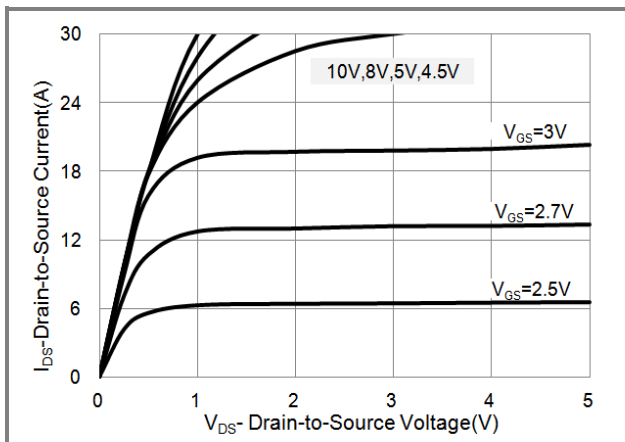
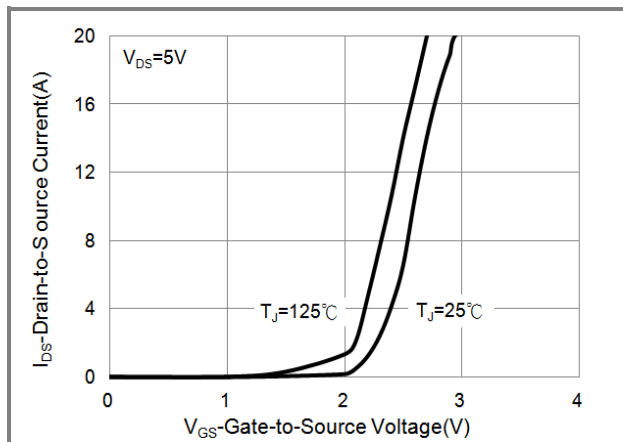
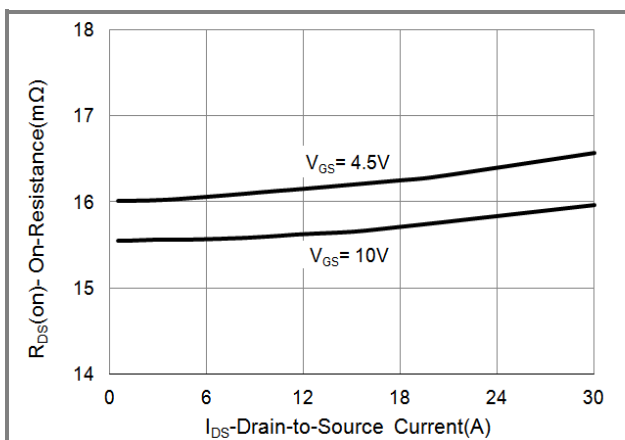
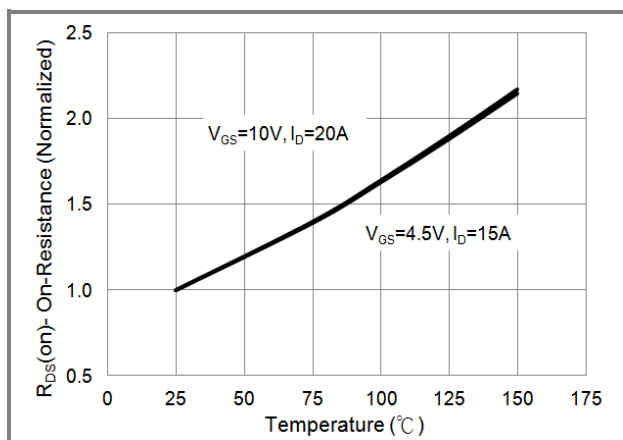
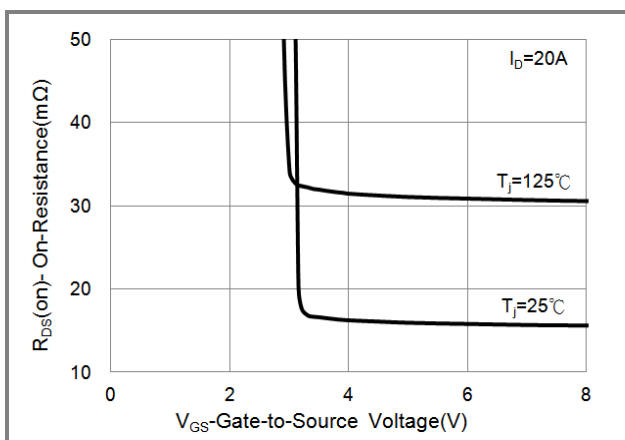
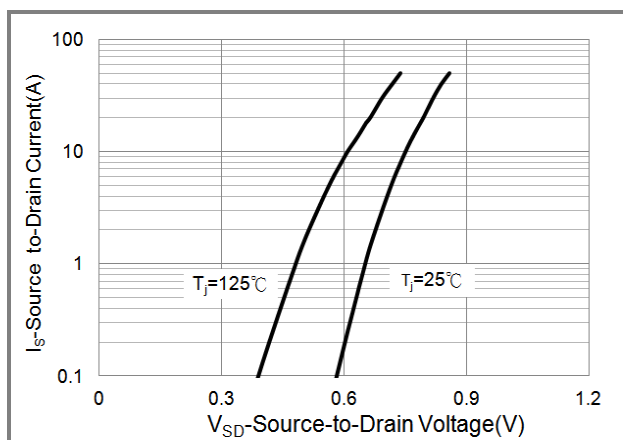
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	100	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1	1.6	2.5	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	-	15	18	mΩ
		V _{GS} =4.5V, I _D =15A	-	15.5	20	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Dynamic (Note 7)						
Total Gate Charge	Q _g	V _{DS} =50V, I _D =30A, V _{GS} =10V (Note 1,2)	-	95	-	nC
Gate-Source Charge	Q _{gs}		-	11	-	
Gate-Drain Charge	Q _{gd}		-	18	-	
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHZ	-	5173	-	pF
Output Capacitance	C _{oss}		-	226	-	
Reverse Transfer Capacitance	C _{rss}		-	66	-	
Turn-On Delay Time	td _(on)	V _{DS} =50V, I _D =30A, V _{GS} =10V, R _G =3Ω (Note 1,2)	-	29	-	ns
Turn-On Rise Time	t _r		-	61	-	
Turn-Off Delay Time	td _(off)		-	154	-	
Turn-Off Fall Time	t _f		-	84	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _S	---	-	-	55	A
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V	-	0.8	1.3	V

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 $T_{J(MAX)}=150^{\circ}\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^{\circ}\text{C}$.
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. The test condition is $L=0.5\text{mH}$, $I_{AS}=25A$, $V_{DD}=25V$, $V_{GS}=10V$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.
7. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES



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TYPICAL CHARACTERISTIC CURVES

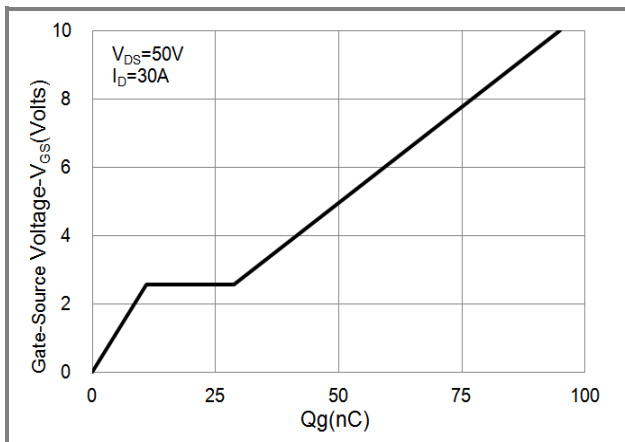


Fig.7 Gate-Charge Characteristics

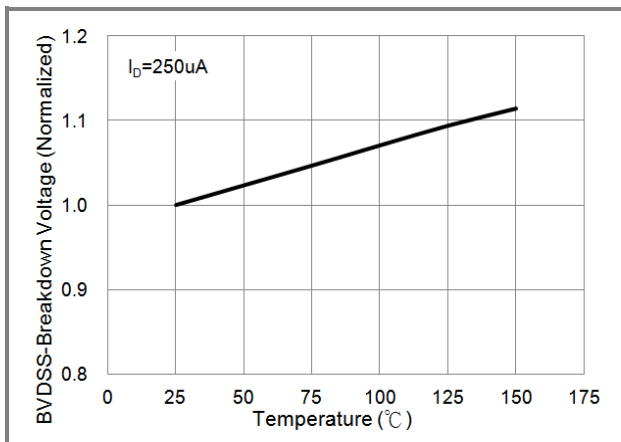


Fig.8 Breakdown Voltage Variation vs. Temperature

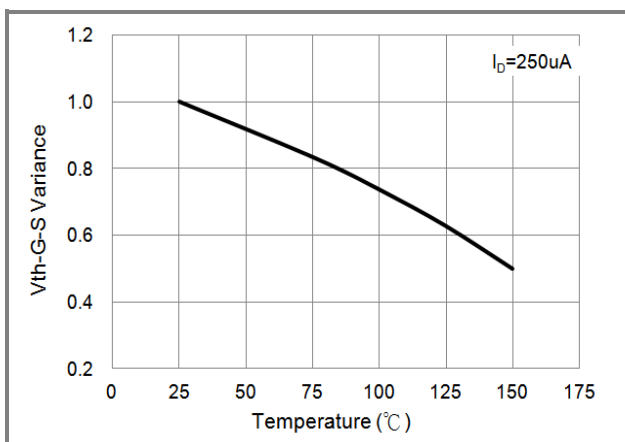


Fig.9 Threshold Voltage Variation with Temperature

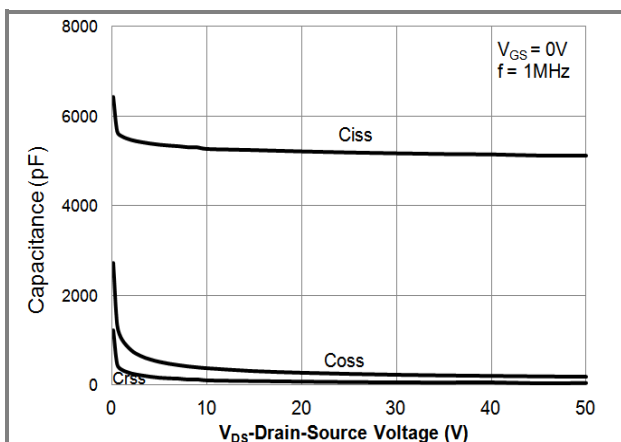


Fig.10 Capacitance vs. Drain-Source Voltage

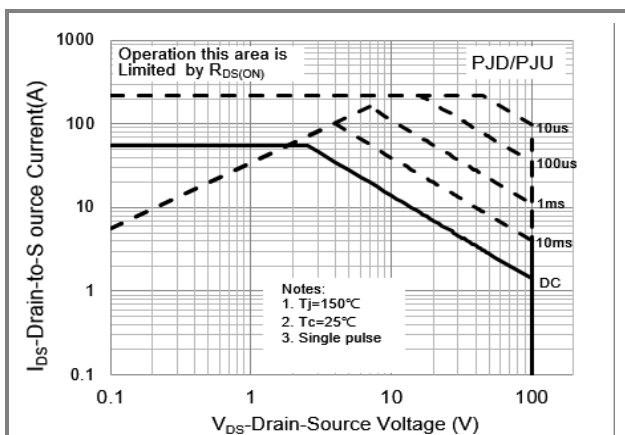


Fig.11 Maximum Safe Operating Area

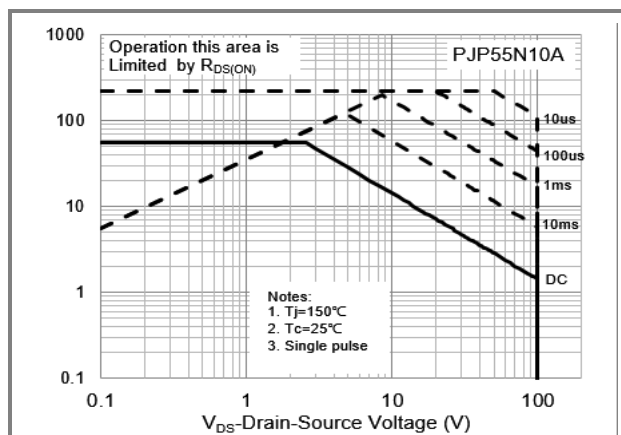


Fig.12 Maximum Safe Operating Area

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TYPICAL CHARACTERISTIC CURVES

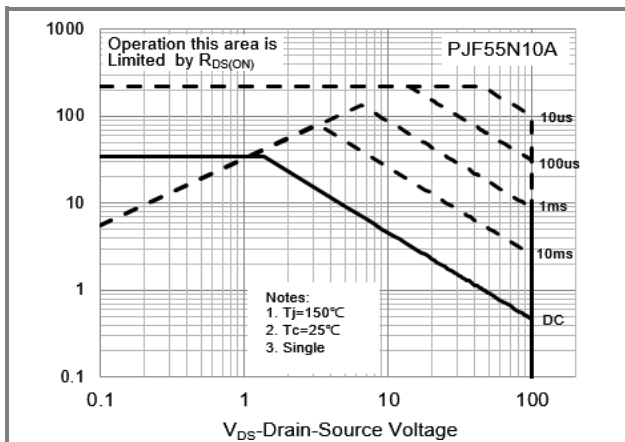


Fig.13 Maximum Safe Operating Area

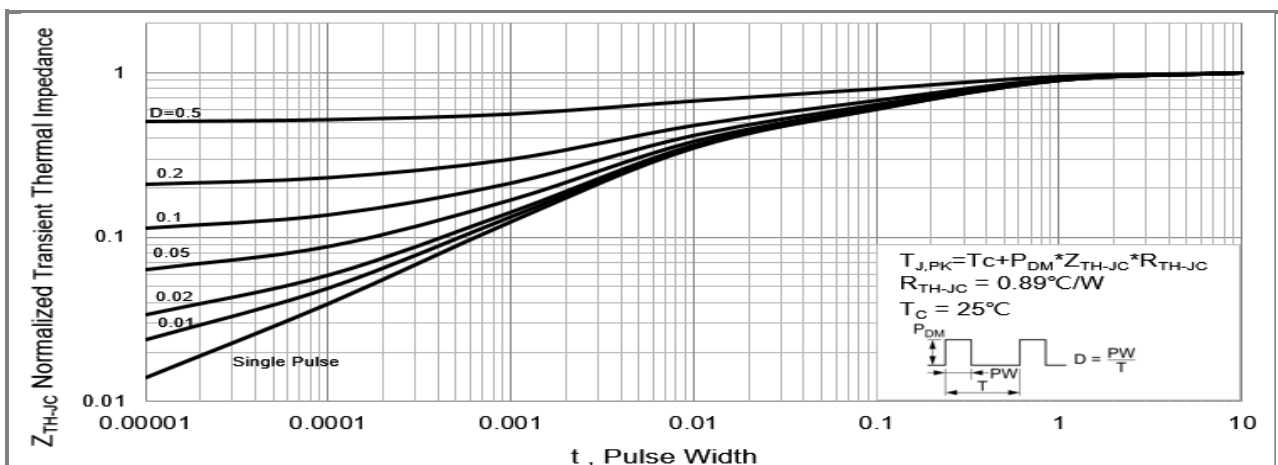


Fig.14 PJD/PJU Normalized Transient Thermal Impedance vs. Pulse Width

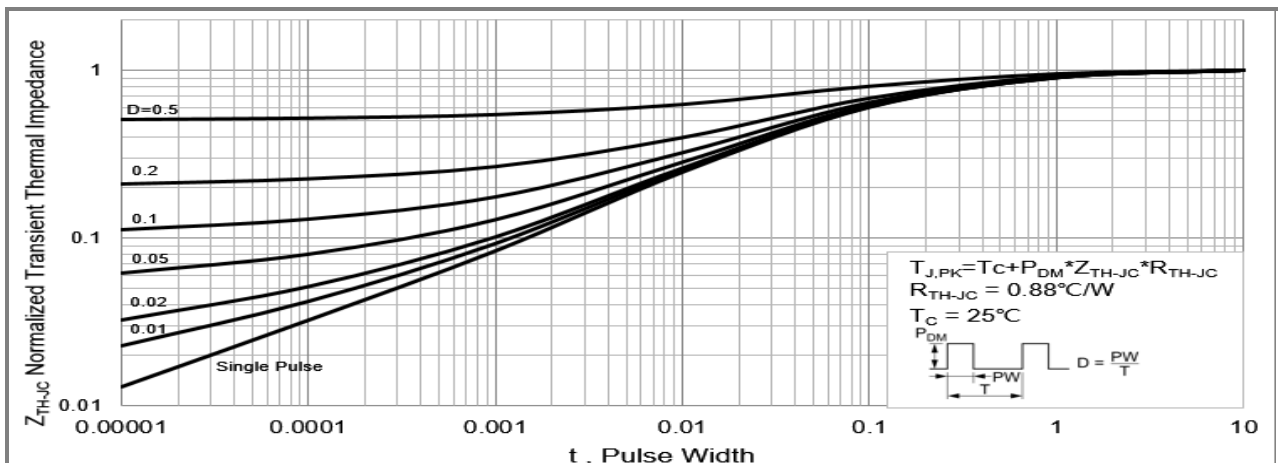


Fig.15 PJP55N10A Normalized Transient Thermal Impedance vs. Pulse Width



PJU55N10A / PJD55N10A / PJP55N10A / PJF55N10A

TYPICAL CHARACTERISTIC CURVES

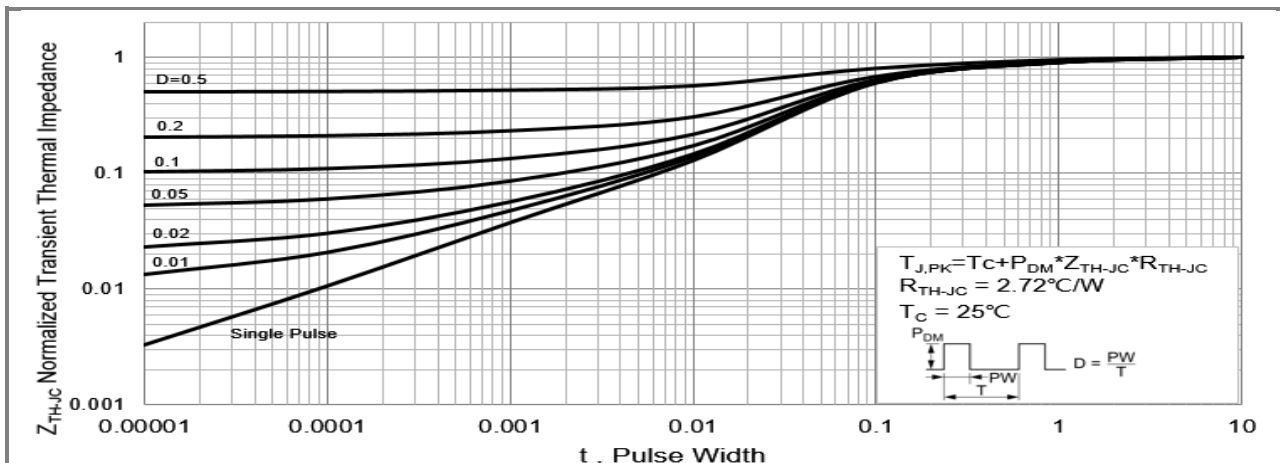
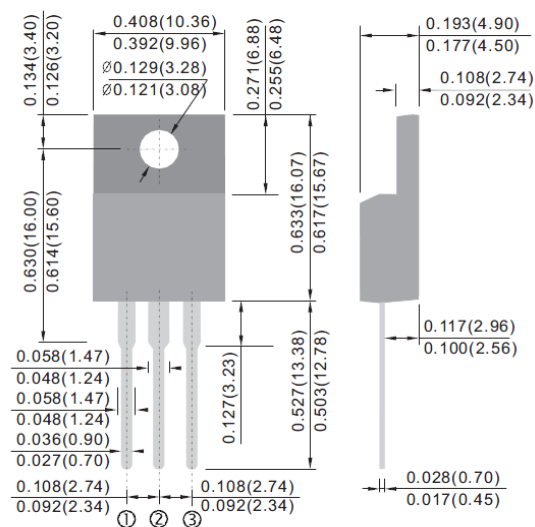


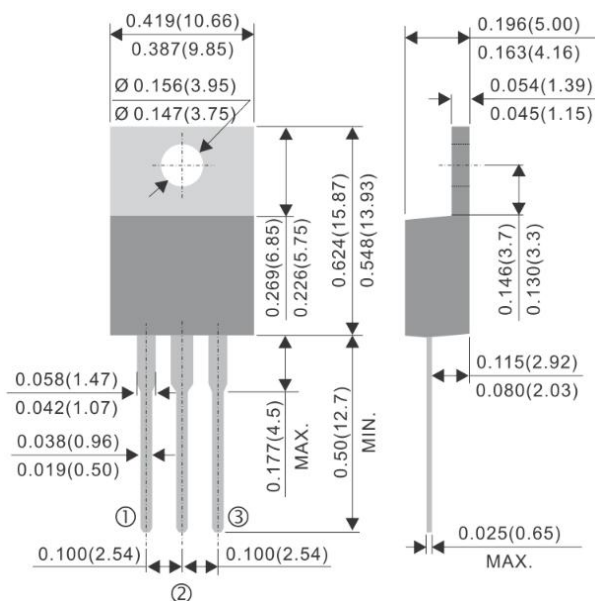
Fig.16 PJF55N10A Normalized Transient Thermal Impedance vs. Pulse Width

Packaging Information

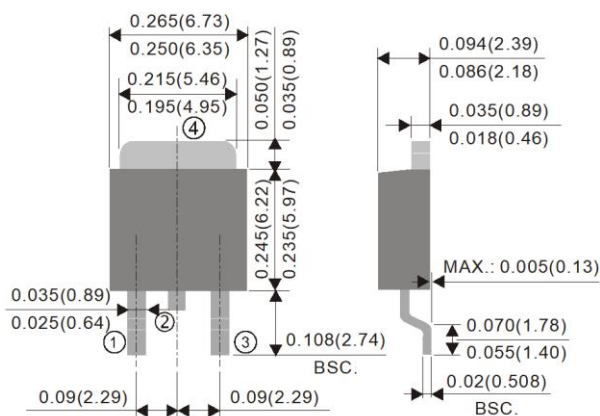
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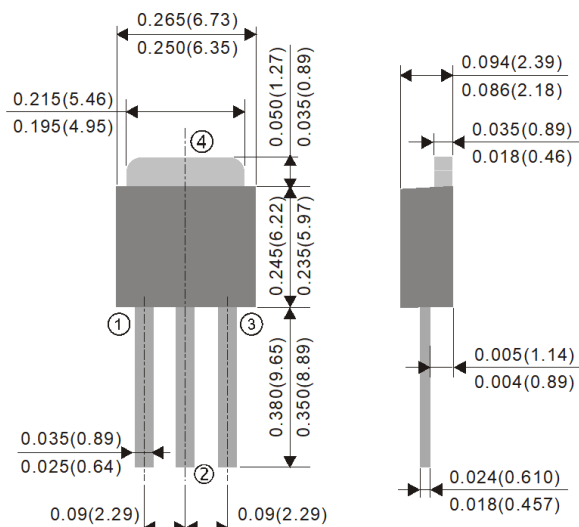
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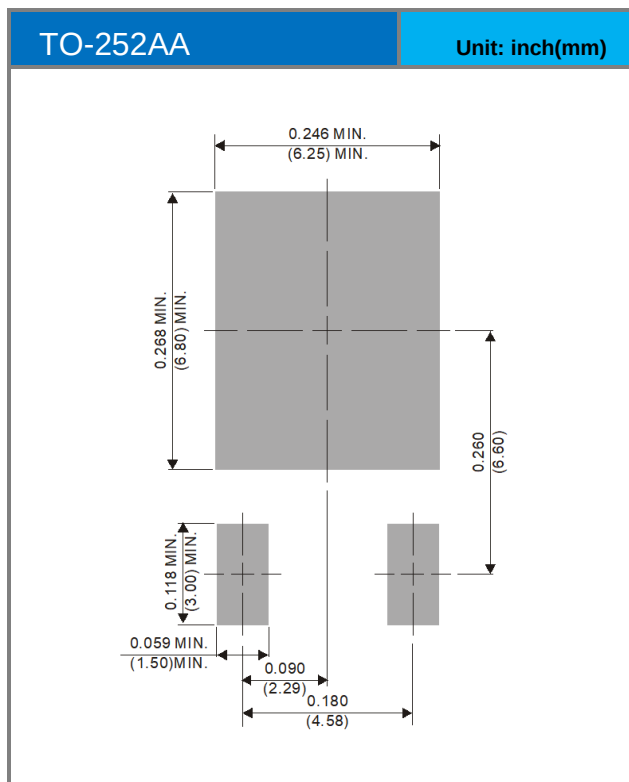


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Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJU55N10A_TO_00001	TO-251AA	80pcs / Tube	U55N10A	Halogen free
PJD55N10A_L2_00001	TO-252AA	3,000pcs / 13" reel	D55N10A	Halogen free
PJP55N10A_TO_00001	TO-220AB	50pcs / Tube	P55N10A	Halogen free
PJF55N10A_TO_00001	ITO-220AB-F	50pcs / Tube	F55N10A	Halogen free

Mounting Pad Layout





PJU55N10A / PJD55N10A / PJP55N10A / PJF55N10A

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