

PJU40N06A / PJD40N06A / PJP40N06A

60V N-Channel Enhancement Mode MOSFET

Voltage

60 V

Current

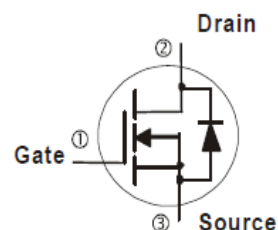
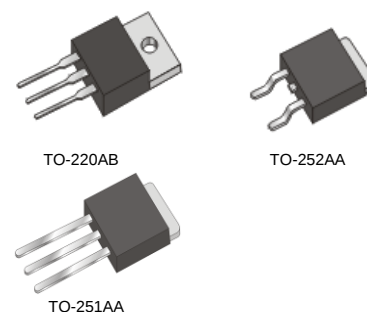
40 A

Features

- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@20A < 17m\Omega$
- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@10A < 20m\Omega$
- 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, 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, 2 grams



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

PARAMETER		SYMBOL	TO-251AA	TO-220AB	TO-252AA	UNITS
Drain-Source Voltage		V _{DS}	60			V
Gate-Source Voltage		V _{GS}	±20			
Continuous Drain Current	T _C =25°C	I _D	40	50	40	A
	T _C =100°C		25	32	25	
Pulsed Drain Current	T _C =25°C	I _{DM}	160			
Power Dissipation	T _C =25°C	P _D	60	93	60	W
	T _C =100°C		24	37	24	
Single Pulse Avalanche Energy ^(Note 6)		E _{AS}	45			mJ
Operating Junction and Storage Temperature Range		T _J ,T _{STG}	-55~150			°C
Typical Thermal Resistance						°C/W
- Junction to Case		R _{θJC}	2.1	1.34	2.1	
- Junction to Ambient		R _{θJA}	110	62.5	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	60	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0	1.7	2.5	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A	-	13	17	mΩ
		V _{GS} =4.5V, I _D =10A	-	16	20	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1.0	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} =30V, I _D =10A, V _{GS} =4.5V (Note 1,2)	-	13.5	-	nC
Gate-Source Charge	Q _{gs}		-	4.8	-	
Gate-Drain Charge	Q _{gd}		-	4.9	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	-	1574	-	pF
Output Capacitance	C _{oss}		-	118	-	
Reverse Transfer Capacitance	C _{rss}		-	77	-	
Turn-On Delay Time	td _(on)	V _{DD} =15V, I _D =1A, V _{GS} =10V, R _G =6Ω (Note 1,2)	-	11	-	ns
Turn-On Rise Time	t _r		-	11	-	
Turn-Off Delay Time	td _(off)		-	35	-	
Turn-Off Fall Time	t _f		-	8.1	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _S	---	-	-	40	A
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V	-	0.68	1	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 $L=0.1\text{mH}$, $I_{AS}=30A$, $V_{DD}=25V$, $V_{GS}=10V$
7. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

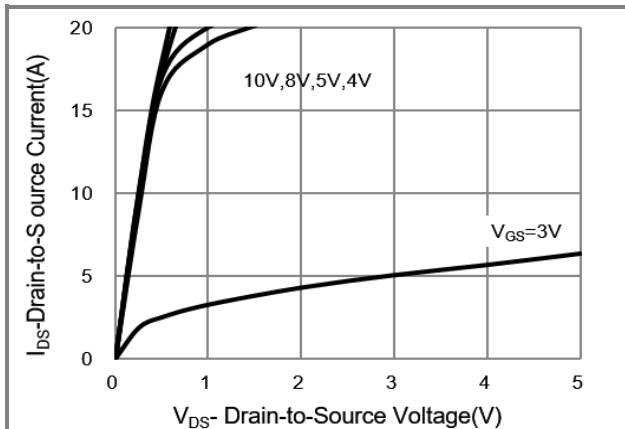


Fig.1 Output Characteristics

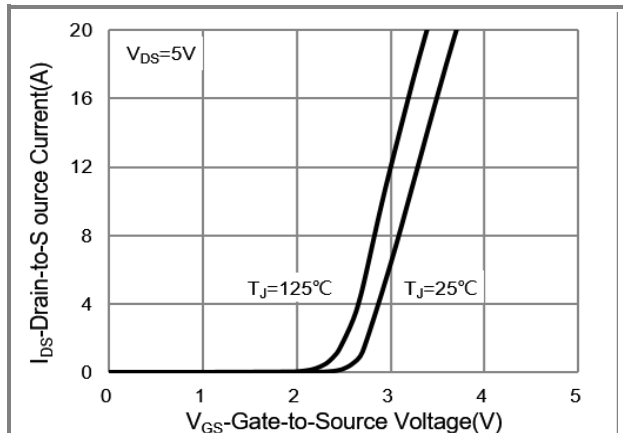


Fig.2 Transfer Characteristics

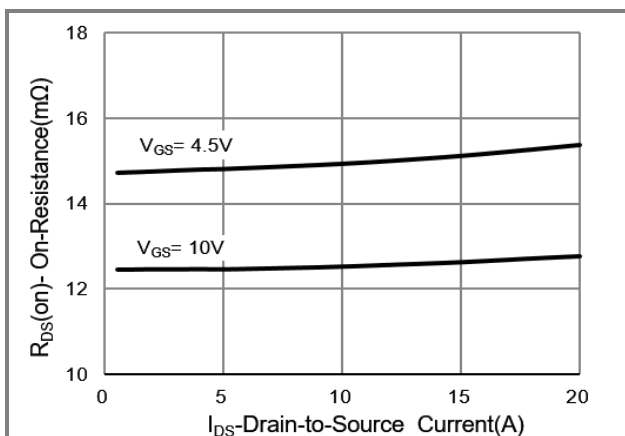


Fig.3 On-Resistance vs. Drain Current

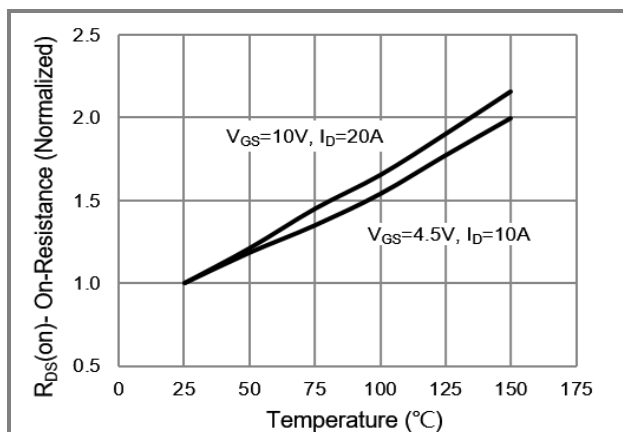


Fig.4 On-Resistance vs. Junction temperature

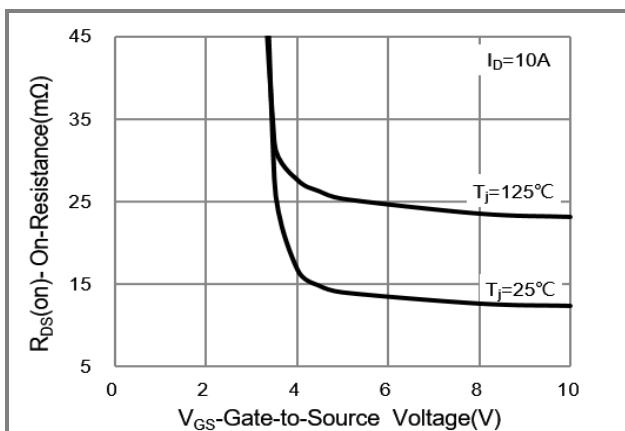


Fig.5 On-Resistance Variation with V_{GS}

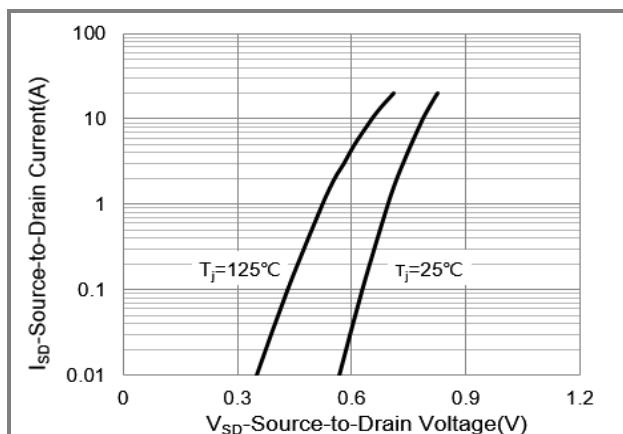
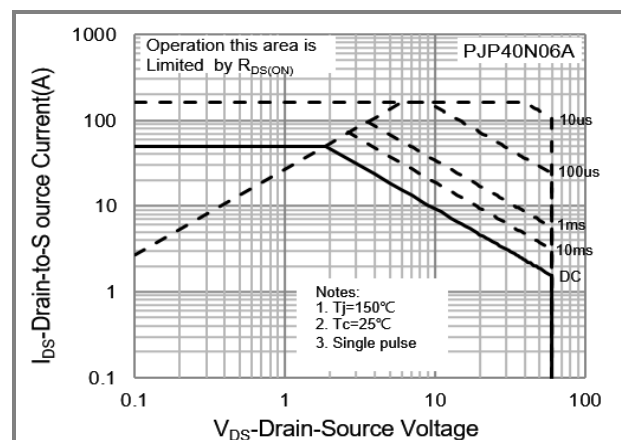
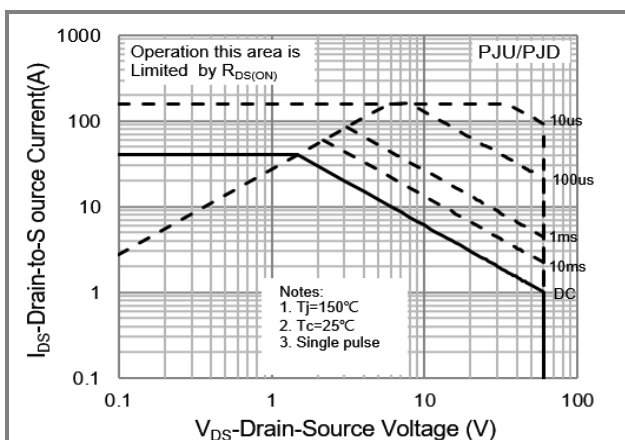
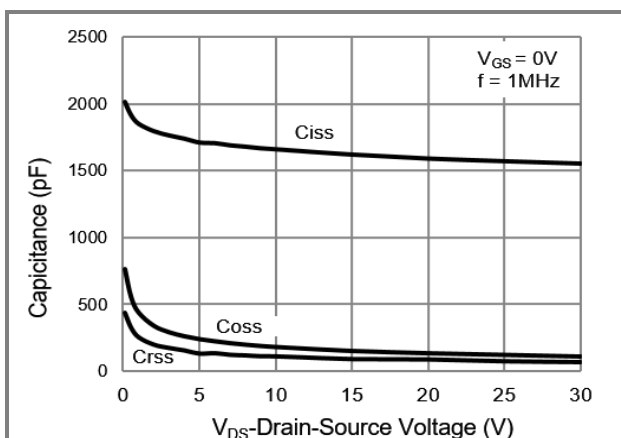
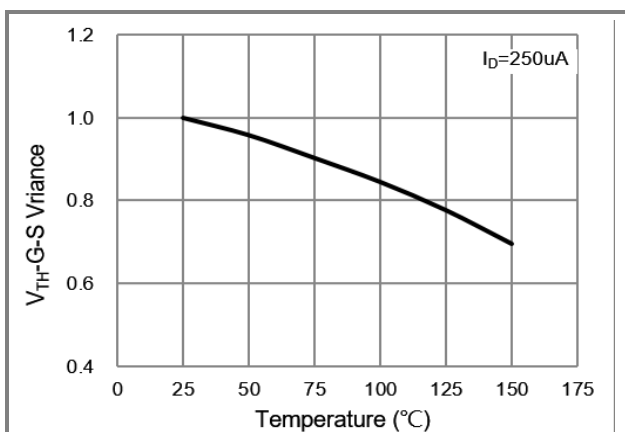
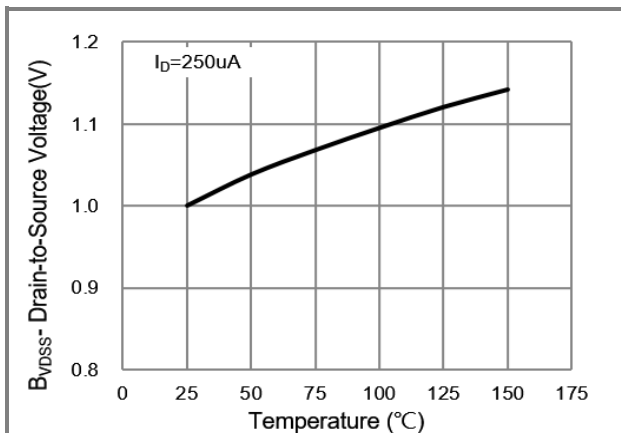
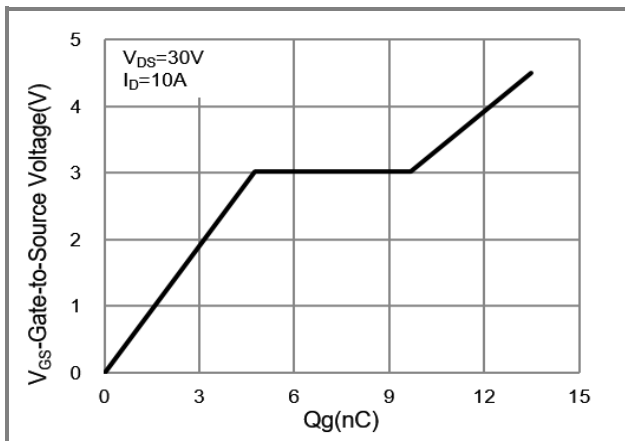


Fig.6 Source-Drain Diode Forward Voltage

PJU40N06A / PJD40N06A / PJP40N06A

TYPICAL CHARACTERISTIC CURVES



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TYPICAL CHARACTERISTIC CURVES

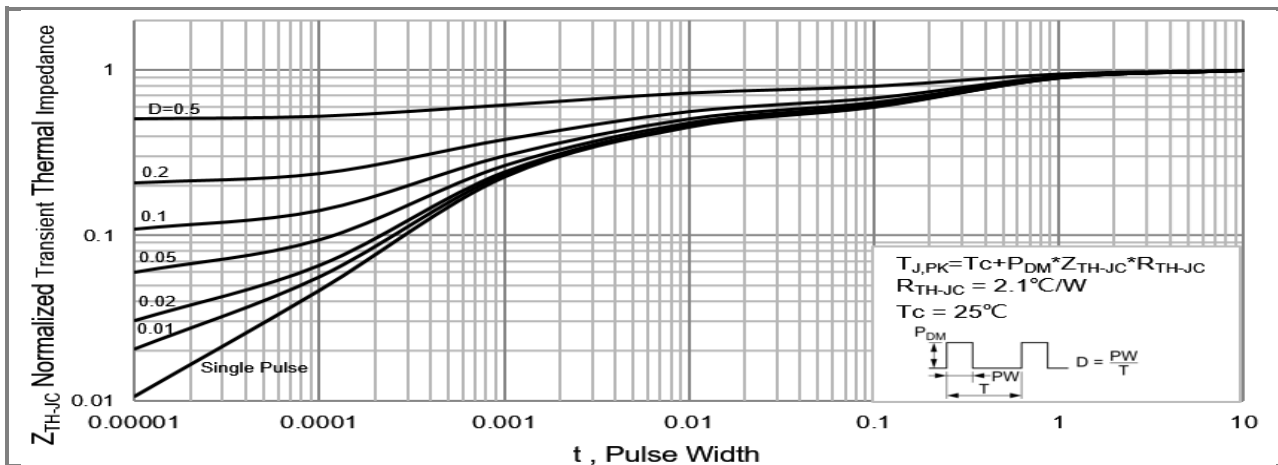


Fig.13 PJD/PJU Normalized Transient Thermal Impedance vs. Pulse Width

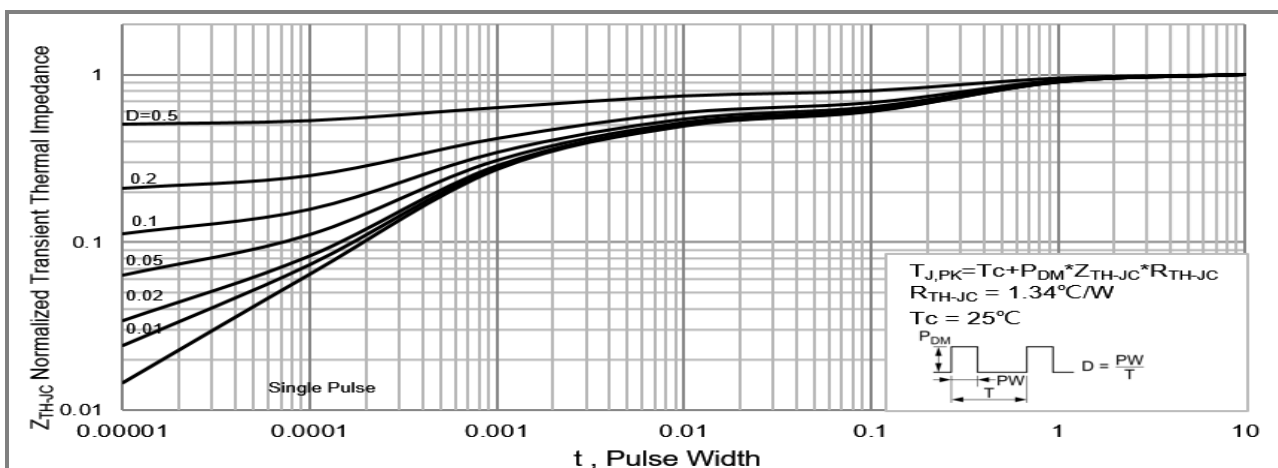


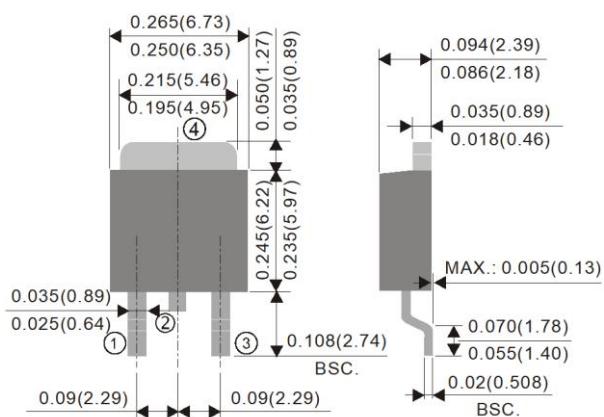
Fig.14 PJP40N06A Normalized Transient Thermal Impedance vs. Pulse Width

PJU40N06A / PJD40N06A / PJP40N06A

Packaging Information

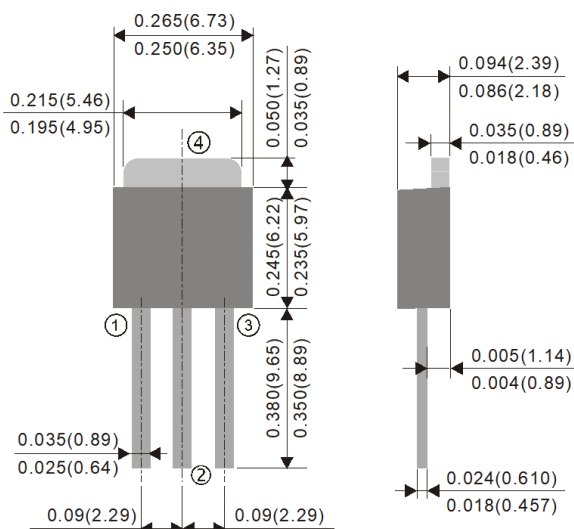
TO-252AA Dimension

Unit: inch(mm)



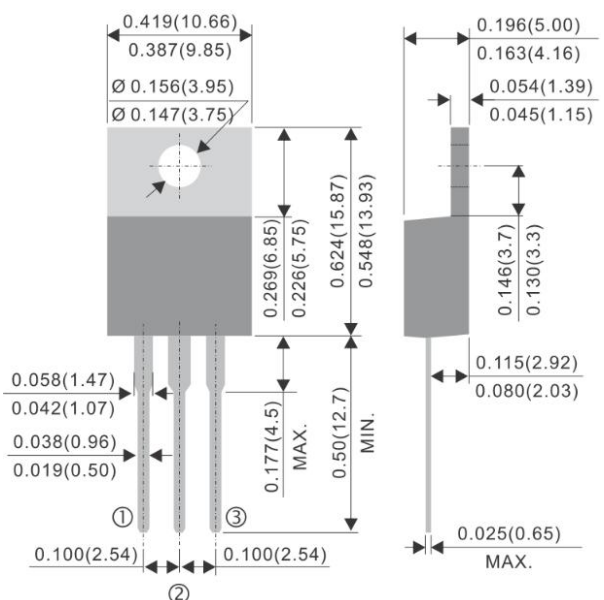
TO-251AA Dimension

Unit: inch(mm)



TO-220AB Dimension

Unit: inch(mm)

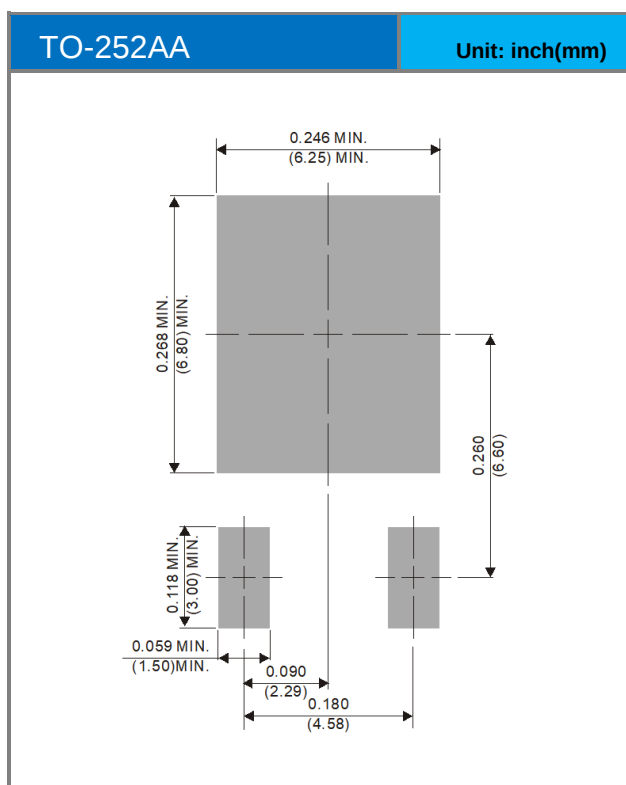


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Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJU40N06A_T0_00001	TO-251AA	80pcs / Tube	U40N06A	Halogen free
PJD40N06A_L2_00001	TO-252AA	3,000pcs / 13" reel	D40N06A	Halogen free
PJP40N06A_T0_00001	TO-220AB	50pcs / Tube	P40N06A	Halogen free

Mounting Pad Layout





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