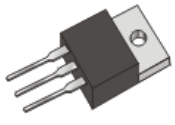
PJU40N06A / PJD40N06A / PJP40N06A

60V N-Channel Enhancement Mode MOSFET

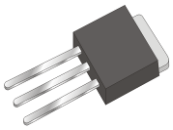
Voltage	60 V	Current	40 A



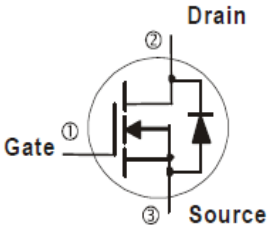
TO-220AB



TO-252AA



TO-251AA



Features

- $R_{DS(ON)}$, V_{GS}@10V, I_D@20A<17mΩ
- $R_{DS(ON)}$, V_{GS}@4.5V, I_D@10A<20mΩ
- 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°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		$R_{\theta JC}$	2.1	1.34	2.1	
- Junction to Ambient		$R_{\theta JA}$	110	62.5	110	

- Limited only By Maximum Junction Temperature

PJU40N06A / PJD40N06A / PJP40N06A

Electrical Characteristics (T_A=25°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	Ciss	V_{DS}=25V, V_{GS}=0V, f=1.0MHZ	-	1574	-	pF
Output Capacitance	Coss		-	118	-	
Reverse Transfer Capacitance	Crss		-	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≤300us, Duty cycle≤2%
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.
4. The maximum current rating is package limited.
5. RΘJA 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 $inch^2$ with 2oz.square pad of copper.
6. The test condition is L=0.1mH, I_{AS}=30A, V_{DD}=25V, V_{GS}=10V
7. Guaranteed by design, not subject to production testing.

PJU40N06A / PJD40N06A / PJP40N06A

TYPICAL CHARACTERISTIC CURVES

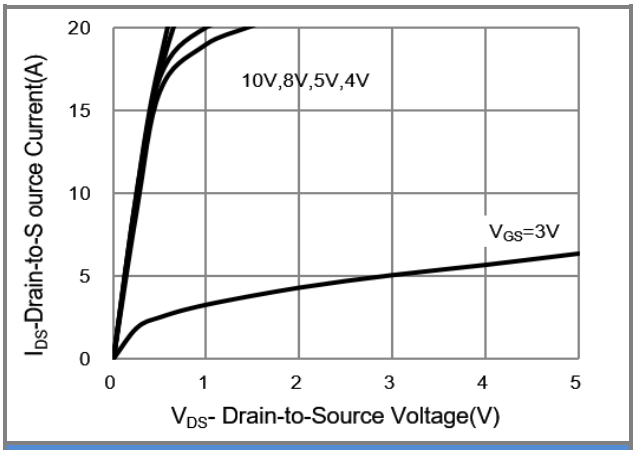


Fig.1 Output Characteristics

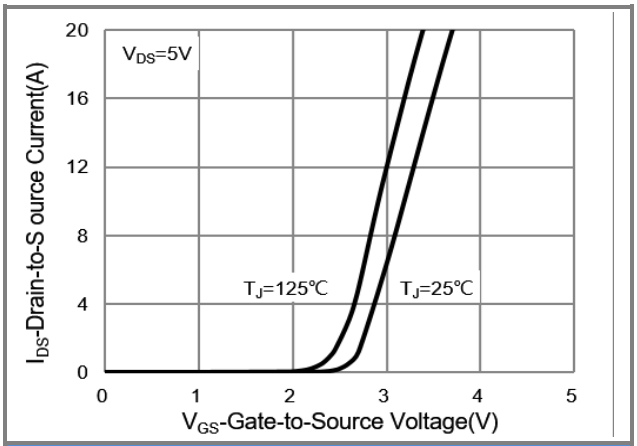


Fig.2 Transfer Characteristics

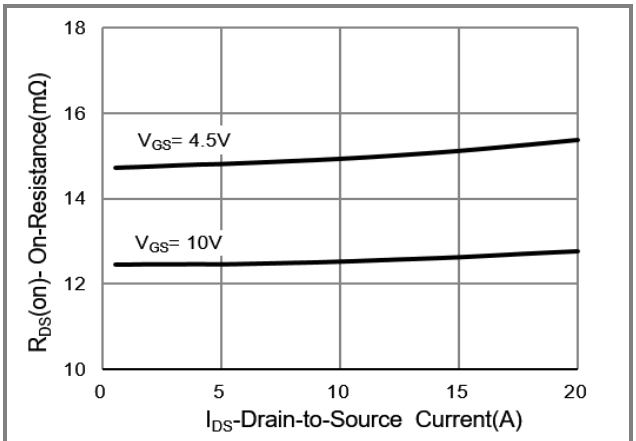


Fig.3 On-Resistance vs. Drain Current

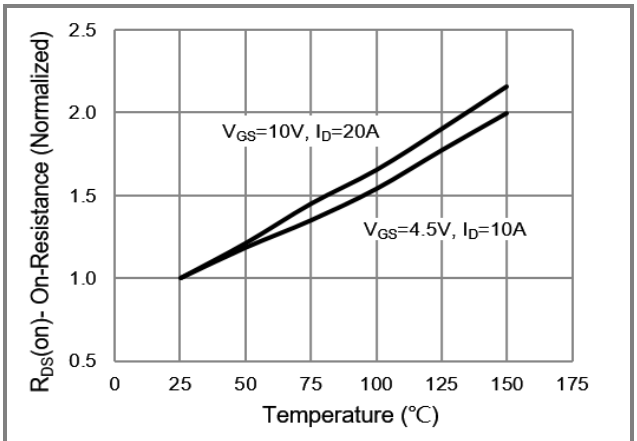


Fig.4 On-Resistance vs. Junction temperature

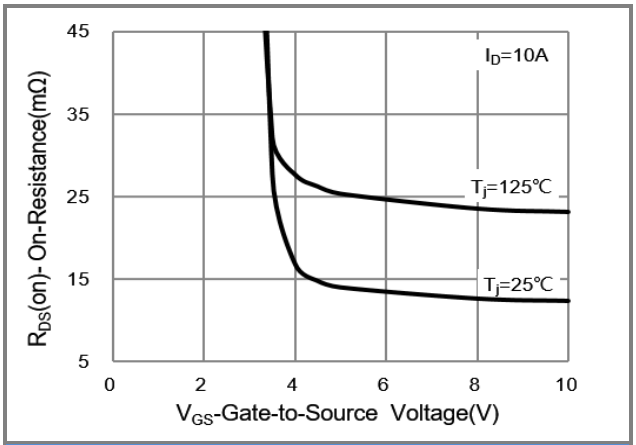


Fig.5 On-Resistance Variation with V_{GS}

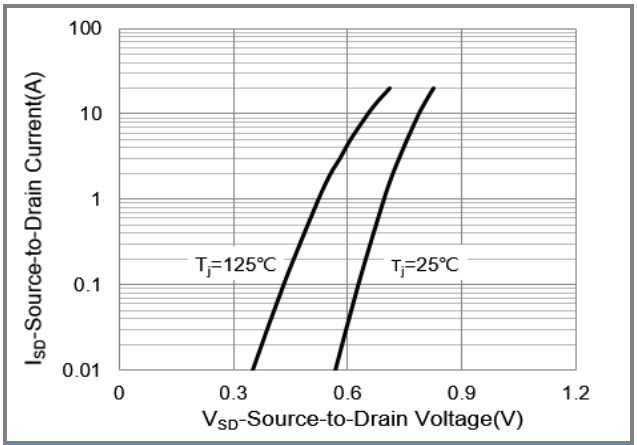


Fig.6 Source-Drain Diode Forward Voltage

PJU40N06A / PJD40N06A / PJP40N06A

TYPICAL CHARACTERISTIC CURVES

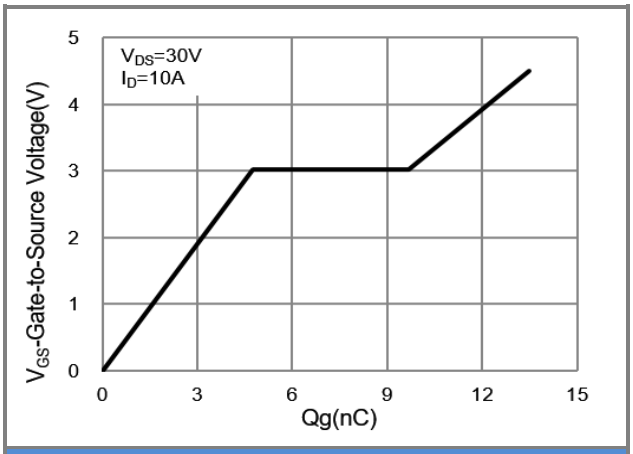


Fig.7 Gate-Charge Characteristics

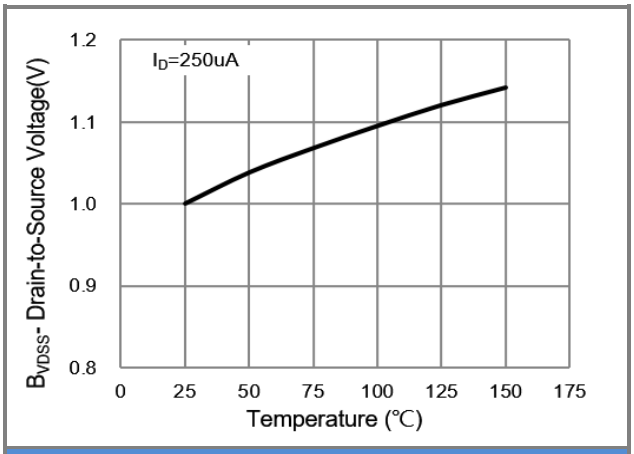


Fig.8 Breakdown Voltage Variation vs. Temperature

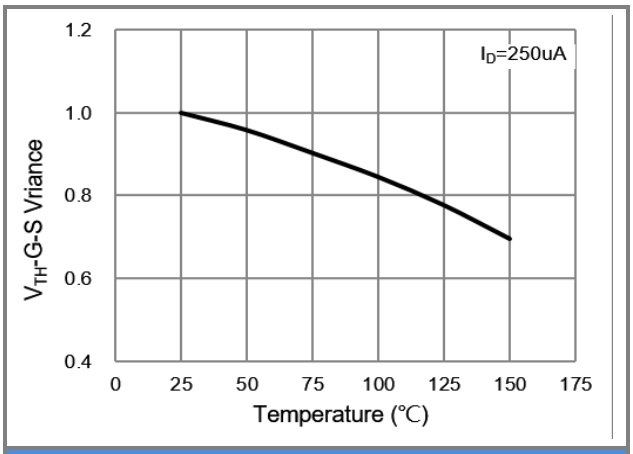


Fig.9 Threshold Voltage Variation with Temperature

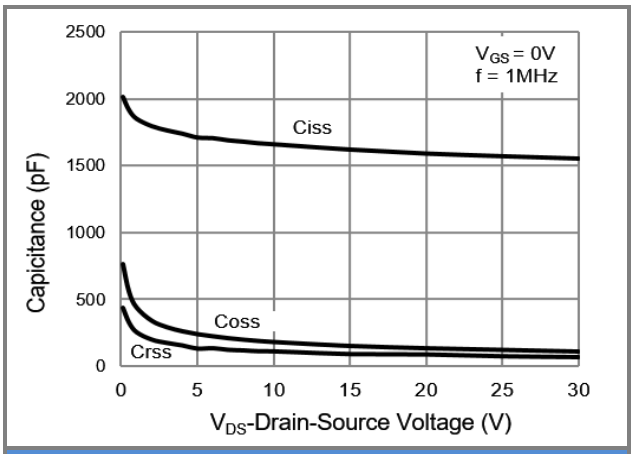


Fig.10 Capacitance vs. Drain-Source Voltage

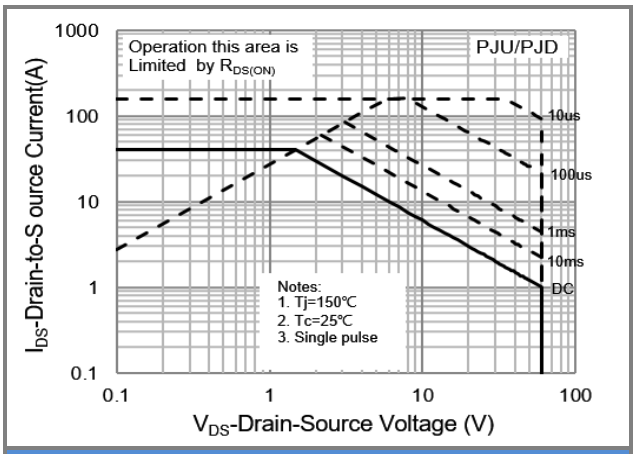


Fig.11 Maximum Safe Operating Area

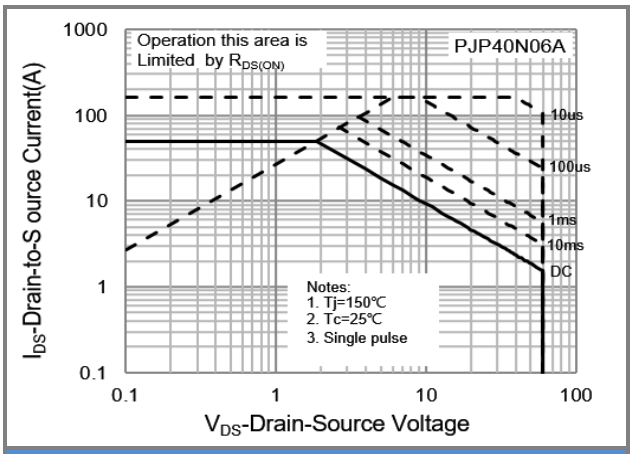


Fig.12 Maximum Safe Operating Area

PJU40N06A / PJD40N06A / PJP40N06A

TYPICAL CHARACTERISTIC CURVES

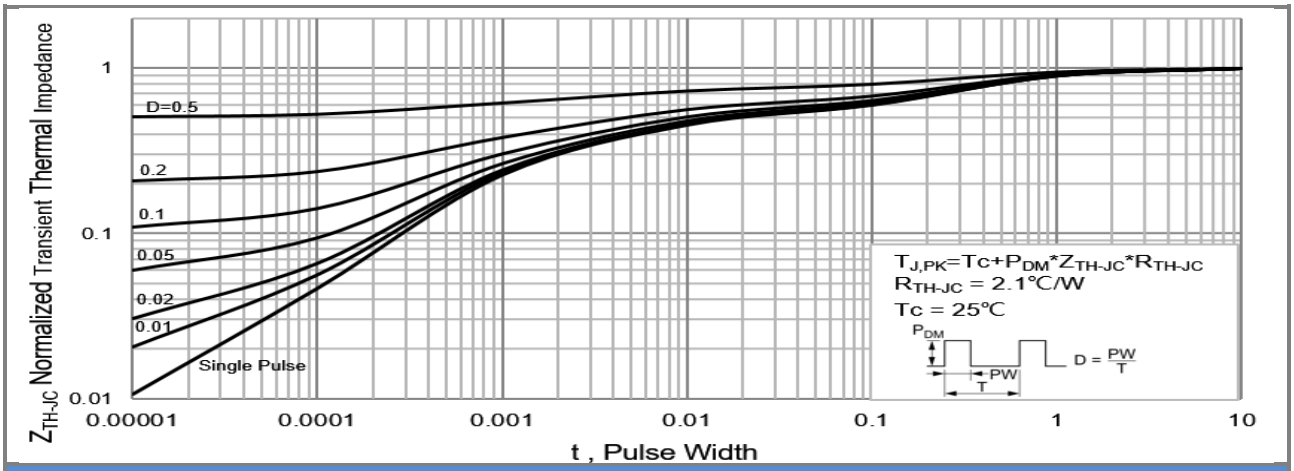


Fig.13 PJD/PJU Normalized Transient Thermal Impedance vs. Pulse Width

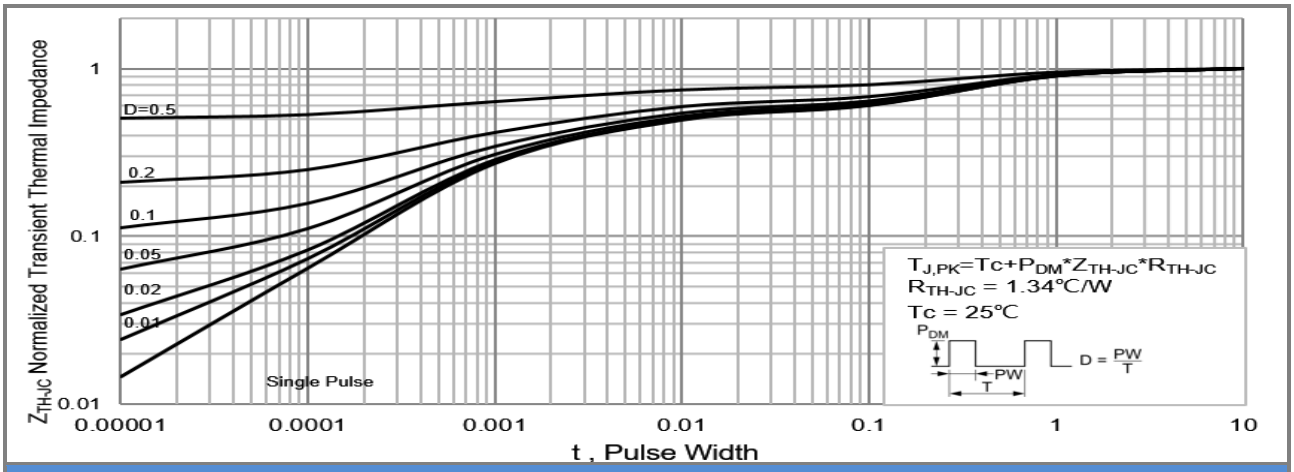


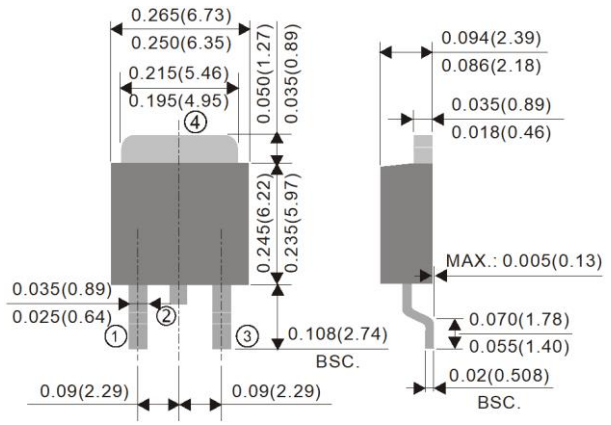
Fig.14 PJP40N06A Normalized Transient Thermal Impedance vs. Pulse Width

PJU40N06A / PJD40N06A / PJP40N06A

Packaging Information

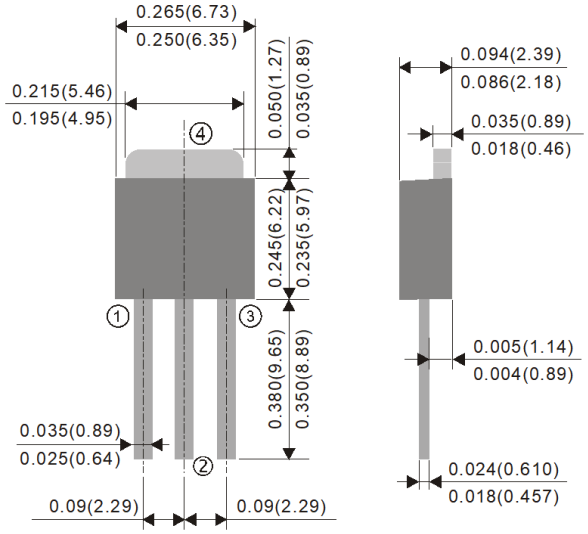
TO-252AA Dimension

Unit: inch(mm)



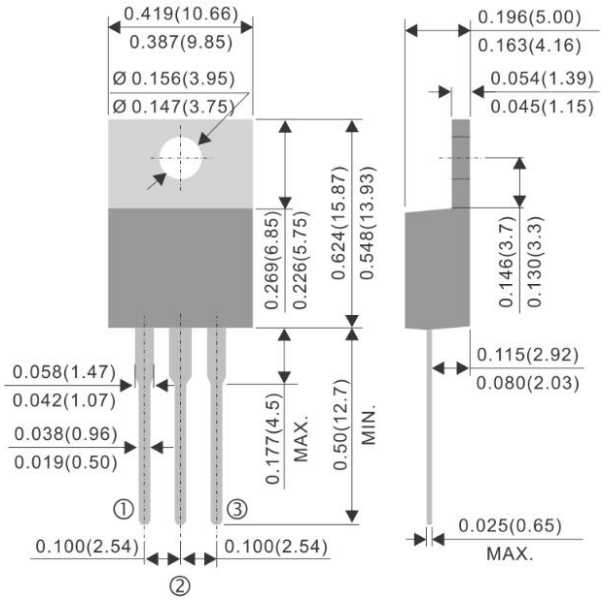
TO-251AA Dimension

Unit: inch(mm)



TO-220AB Dimension

Unit: inch(mm)



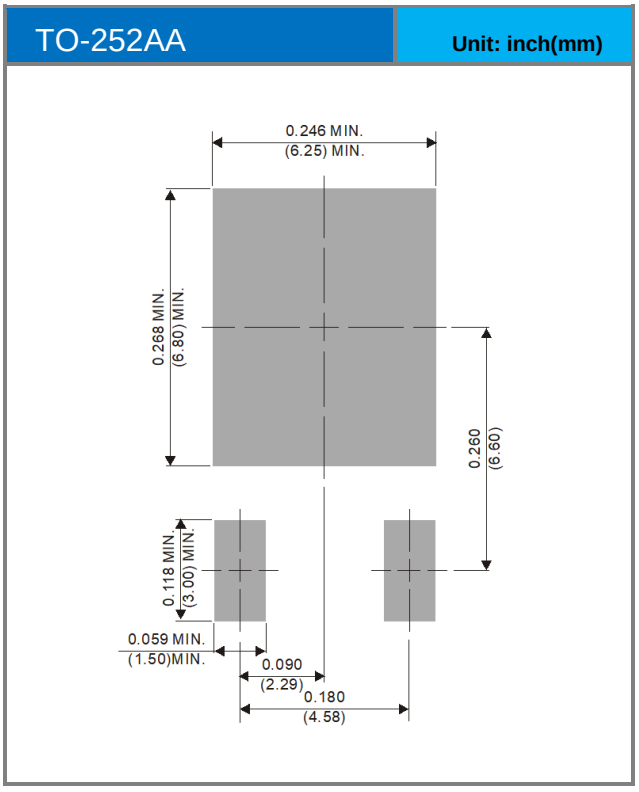
PJU40N06A / PJD40N06A / PJP40N06A

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

TO-252AA — Unit: inch(mm)



PJU40N06A / PJD40N06A / PJP40N06A

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