



PJU7NA60 / PJD7NA60 / PJP7NA60 / PJF7NA60

600V N-Channel MOSFET

Voltage

600 V

Current

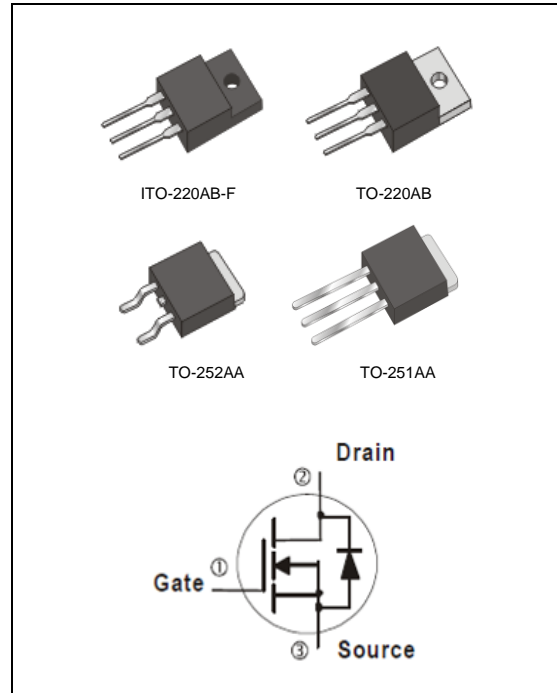
7 A

Features

- $R_{DS(ON)}, V_{GS}@10V, I_D@3.5A < 1.2\Omega$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- 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}	600				V
Gate-Source Voltage		V_{GS}	±30				
Continuous Drain Current ^(Note 4)		I_D	7				A
Pulsed Drain Current		I_{DM}	28				
Single Pulse Avalanche Energy ^(Note 1)		E_{AS}	489				mJ
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	140	145	45	140	W
	Derate above 25°C		1.12	1.16	0.36	1.12	W/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150				$^\circ\text{C}$
Typical Thermal Resistance ^(Note 4)							
- Junction to Case		$R_{\theta JC}$	0.89	0.88	2.78	0.89	$^\circ\text{C/W}$
- 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
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	600	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3.2	4	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.5A$	-	1.02	1.2	Ω
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Diode Forward Voltage	V_{SD}	$I_S=7A, V_{GS}=0V$	-	0.86	1.4	V
Dynamic (Note 5)						
Total Gate Charge	Q_g	$V_{DS}=480V, I_D=7A,$ $V_{GS}=10V$ (Note 2,3)	-	15.2	-	nC
Gate-Source Charge	Q_{gs}		-	5	-	
Gate-Drain Charge	Q_{gd}		-	4.8	-	
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V,$ $f=1\text{MHZ}$	-	723	-	pF
Output Capacitance	C_{oss}		-	105	-	
Reverse Transfer Capacitance	C_{rss}		-	2	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=300V, I_D=7A,$ $R_G=25\Omega$ (Note 2,3)	-	28	-	ns
Turn-On Rise Time	t_r		-	58	-	
Turn-Off Delay Time	$t_{d(off)}$		-	42	-	
Turn-Off Fall Time	t_f		-	31	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	-	-	7	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	-	-	28	
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=7A$	-	350	-	ns
Reverse Recovery Charge	Q_{rr}	$di_f/dt=100A/\mu s$ (Note 2)	-	3.1	-	μC

NOTES :

1. $L=30\text{mH}, I_{AS}=5.5A, V_{DD}=50V, R_G=25\text{ohm}$, 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. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.



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TYPICAL CHARACTERISTIC CURVES

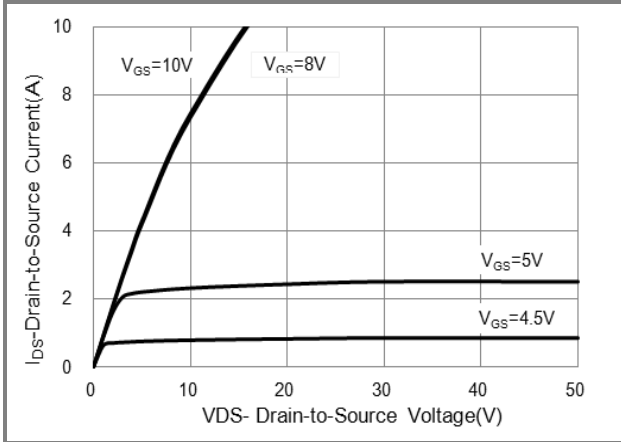


Fig.1 Output Characteristics

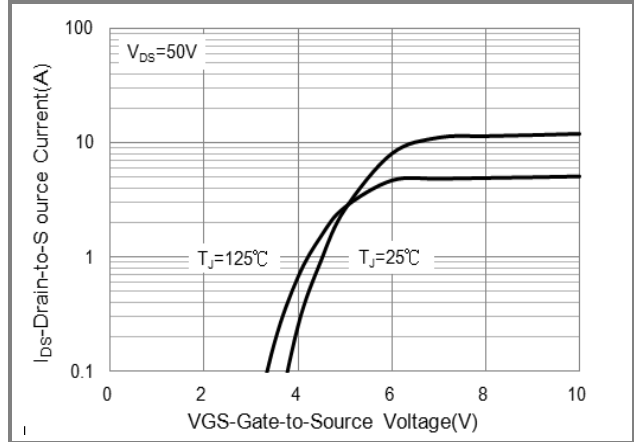


Fig.2 Transfer Characteristics

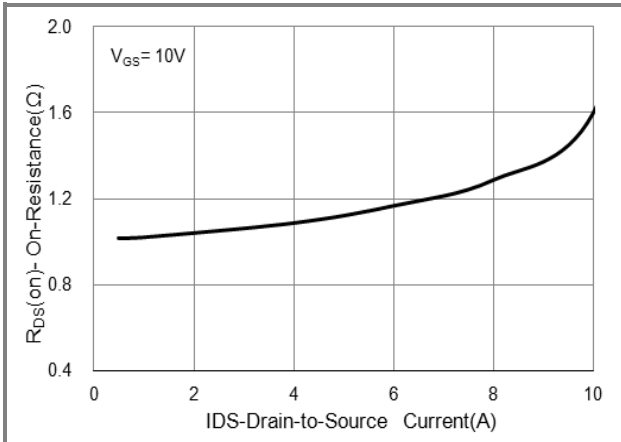


Fig.3 On-Resistance vs. Drain Current

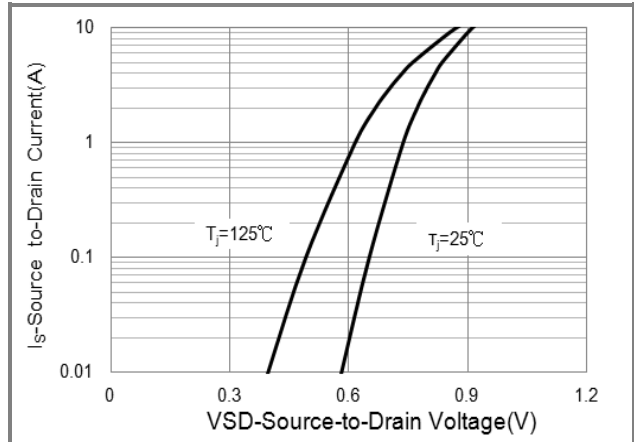


Fig.4 Source-Drain Diode Forward Voltage

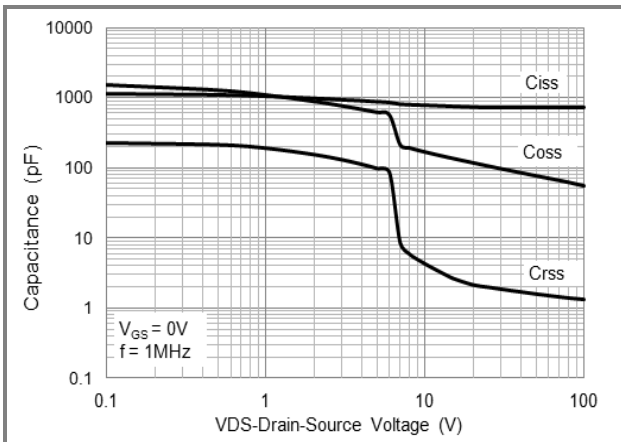


Fig.5 Capacitance vs. Drain-Source Voltage

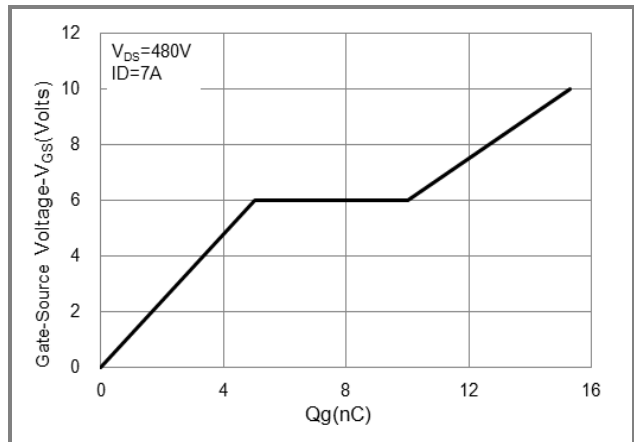


Fig.6 Gate Charge



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TYPICAL CHARACTERISTIC CURVES

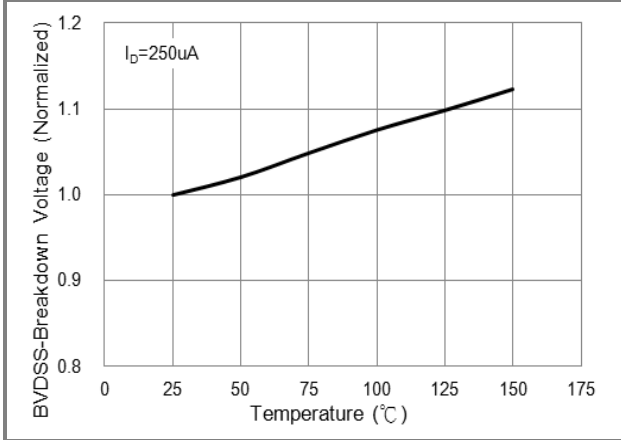


Fig.7 BV_{DSS} vs. Junction Temperature

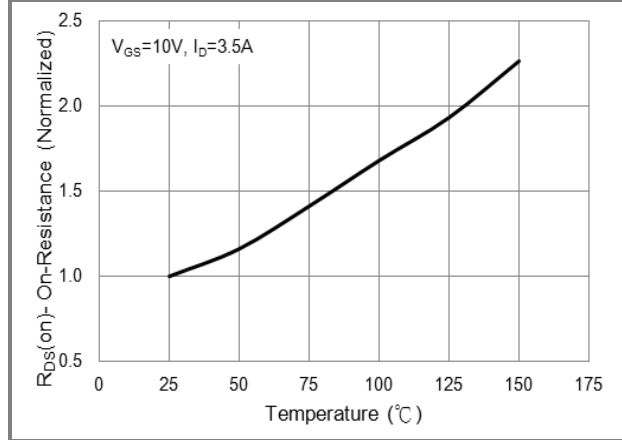


Fig.8 On-Resistance vs. Junction Temperature

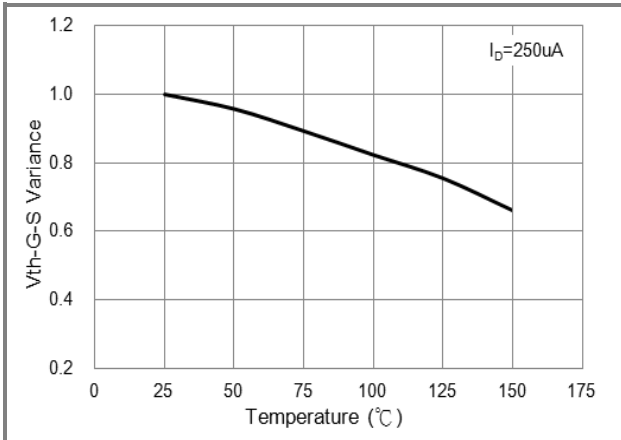


Fig.9 Threshold Voltage Variation with Temperature

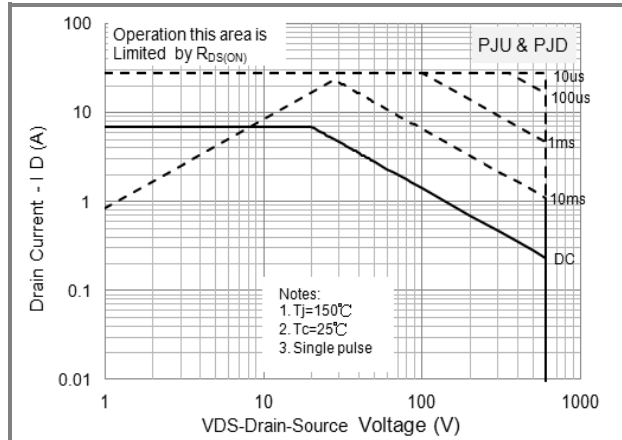


Fig.10 Maximum Safe Operating Area

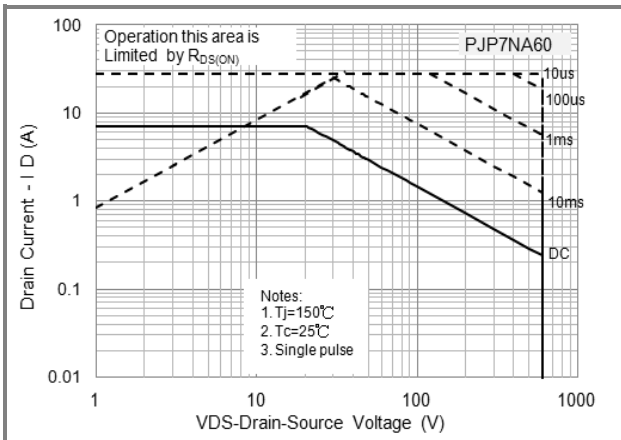


Fig.11 Maximum Safe Operating Area

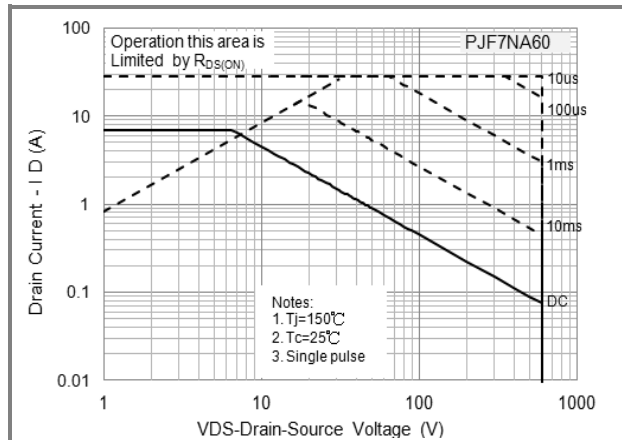


Fig.12 Maximum Safe Operating Area



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TYPICAL CHARACTERISTIC CURVES

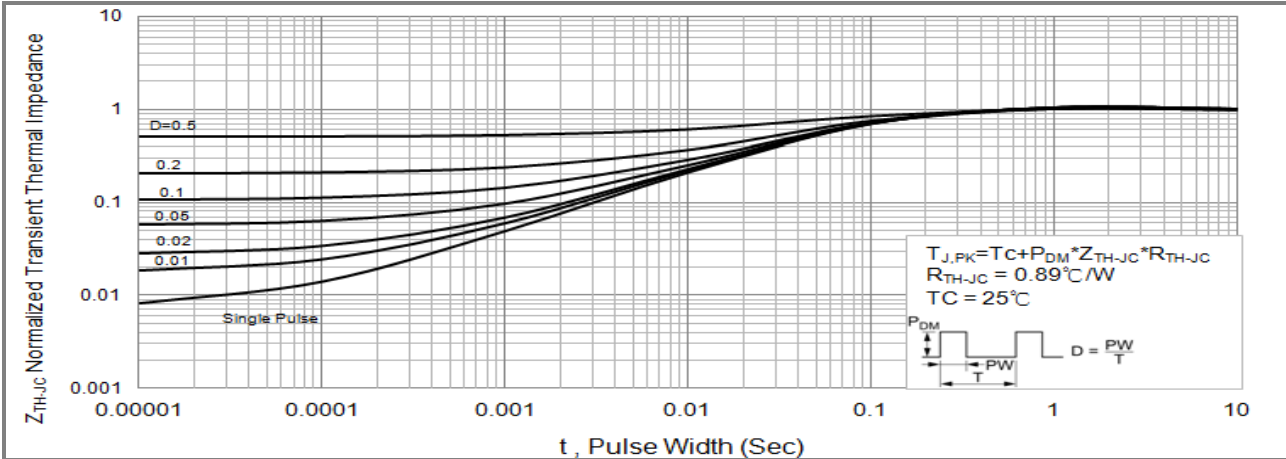


Fig.13 PJU/PJD Normalized Transient Thermal Impedance vs. Pulse Width

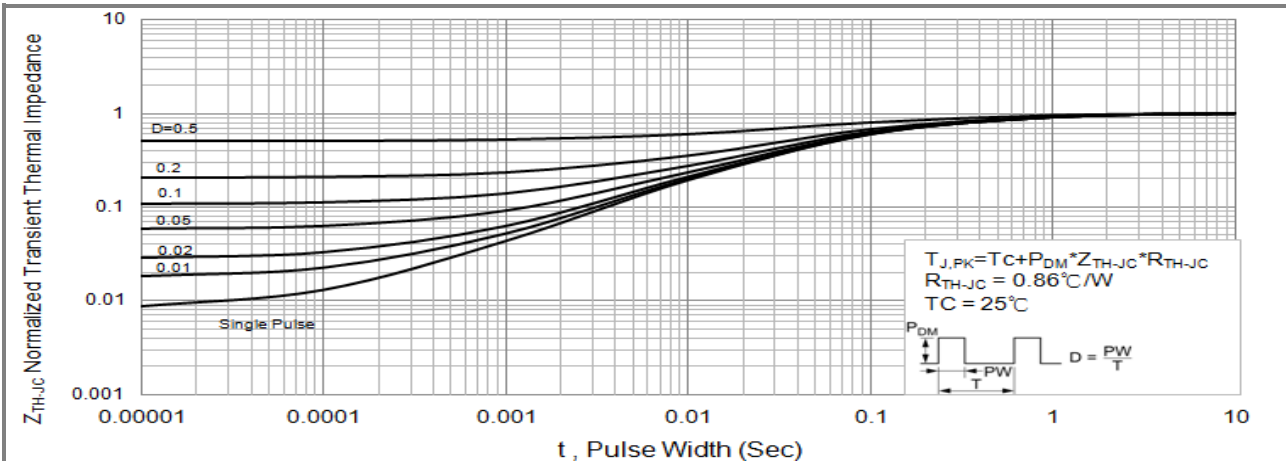


Fig.14 PJP7NA60 Normalized Transient Thermal Impedance vs. Pulse Width

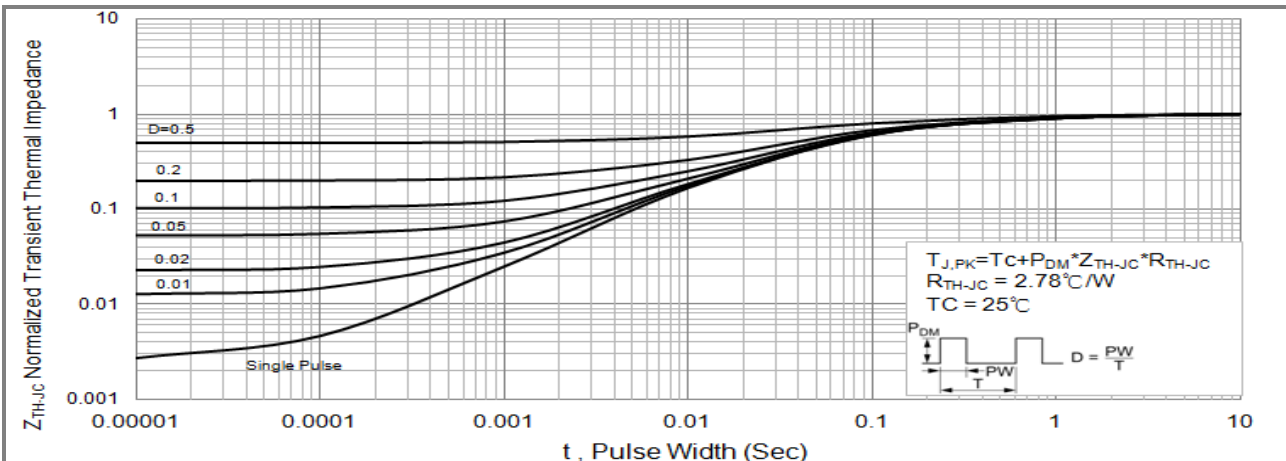


Fig.15 PJF7NA60 Normalized Transient Thermal Impedance vs. Pulse Width

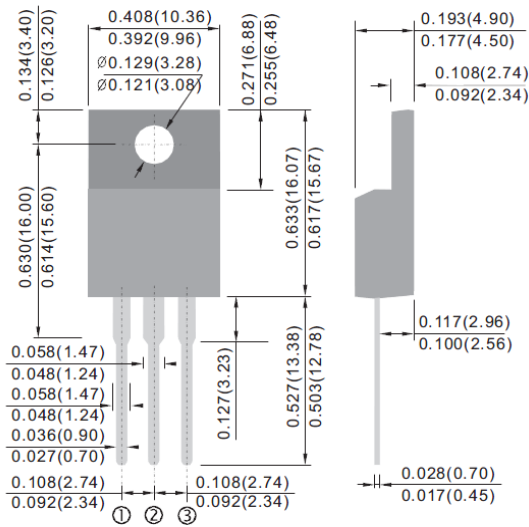


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Packaging Information

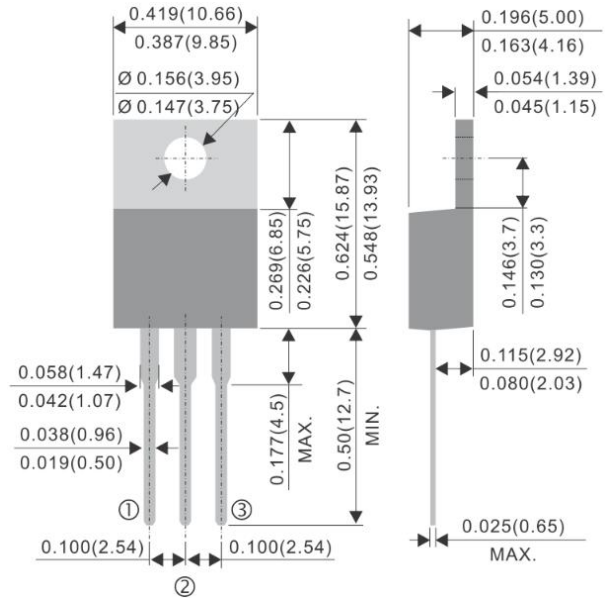
ITO-220AB-F Dimension

Unit: inch(mm)



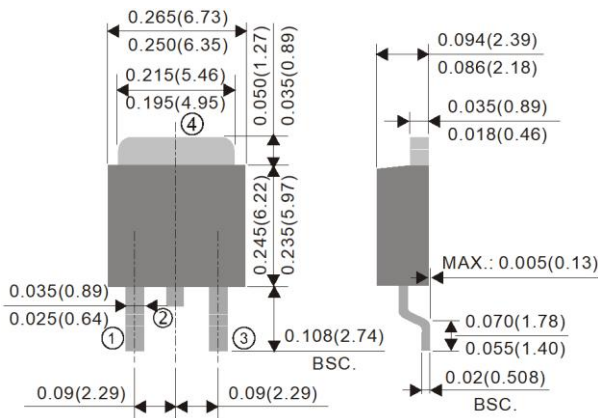
TO-220AB Dimension

Unit: inch(mm)



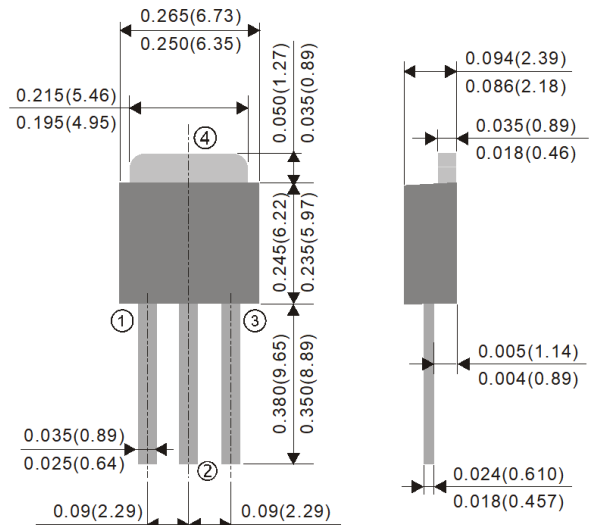
TO-252AA Dimension

Unit: inch(mm)



TO-251AA Dimension

Unit: inch(mm)



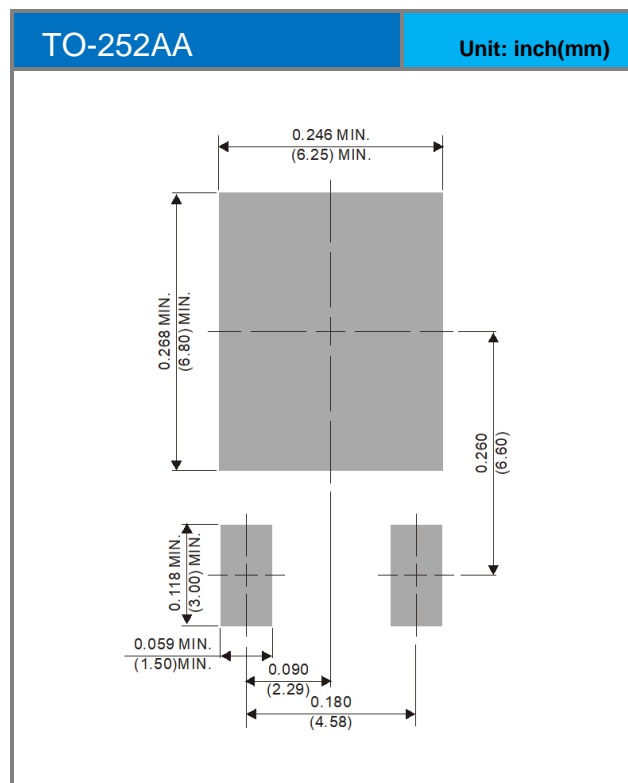


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Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJU7NA60_T0_00001	TO-251AA	80pcs / Tube	U7NA60	Halogen free
PJD7NA60_L2_00001	TO-252AA	3,000pcs / 13" reel	D7NA60	Halogen free
PJP7NA60_T0_00001	TO-220AB	50pcs / Tube	P7NA60	Halogen free
PJF7NA60_T0_00001	ITO-220AB-F	50pcs / Tube	F7NA60	Halogen free

Mounting Pad Layout





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