

## PJU7NA60 / PJD7NA60 / PJP7NA60 / PJF7NA60

### 600V N-Channel MOSFET

**Voltage**

**600 V**

**Current**

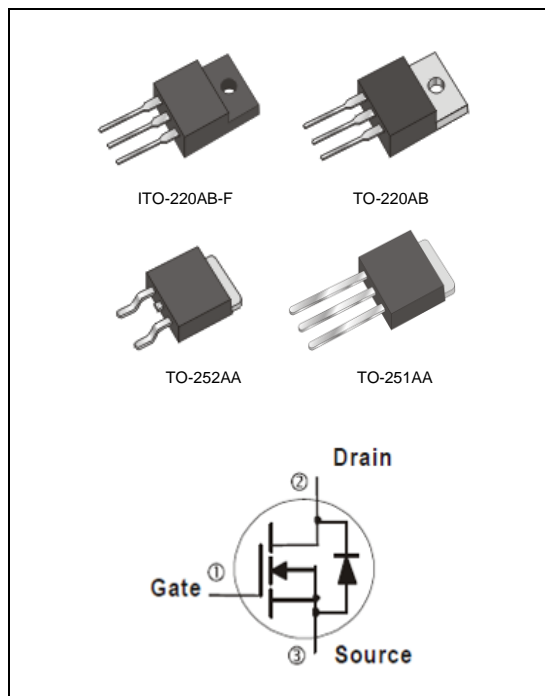
**7 A**

#### 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 <sub>DS</sub>	600				V
Gate-Source Voltage		V <sub>GS</sub>	±30				
Continuous Drain Current <sup>(Note 4)</sup>		I <sub>D</sub>	7				A
Pulsed Drain Current		I <sub>DM</sub>	28				
Single Pulse Avalanche Energy <sup>(Note 1)</sup>		E <sub>AS</sub>	489				mJ
Power Dissipation	T <sub>C</sub> =25°C	P <sub>D</sub>	140	145	45	140	W
	Derate above 25°C		1.12	1.16	0.36	1.12	W/°C
Operating Junction and Storage Temperature Range		T <sub>J</sub> ,T <sub>STG</sub>	-55~150				°C
Typical Thermal Resistance <sup>(Note 4)</sup>							
- Junction to Case		R <sub>θJC</sub>	0.89	0.88	2.78	0.89	°C/W
- Junction to Ambient		R <sub>θJA</sub>	110	62.5	120	110	

- Limited only By Maximum Junction Temperature



## PJU7NA60 / PJD7NA60 / PJP7NA60 / PJF7NA60

### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

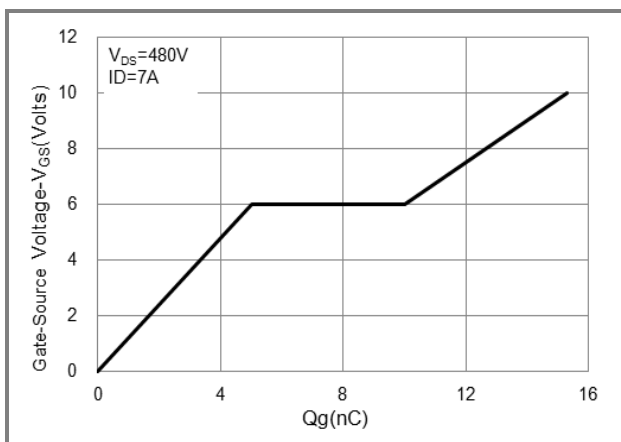
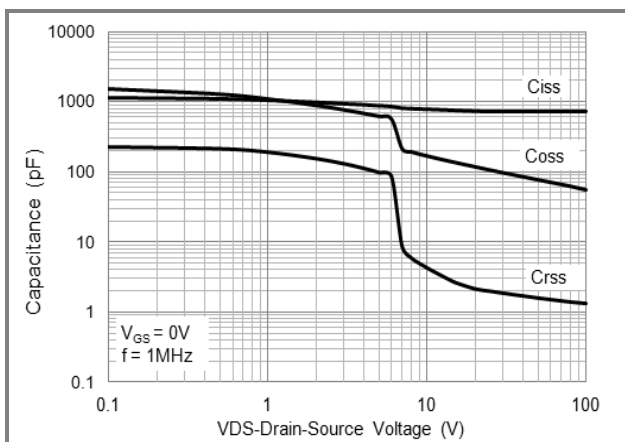
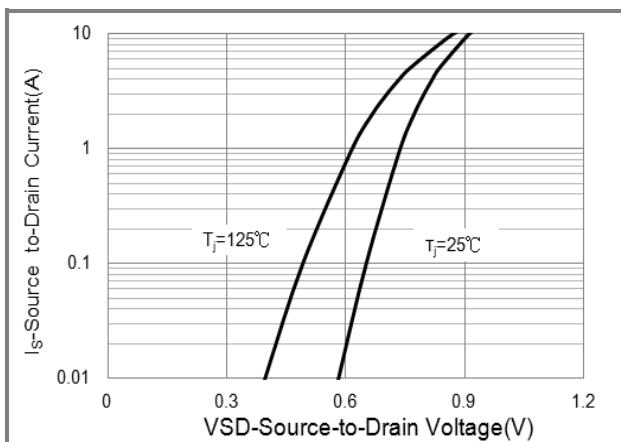
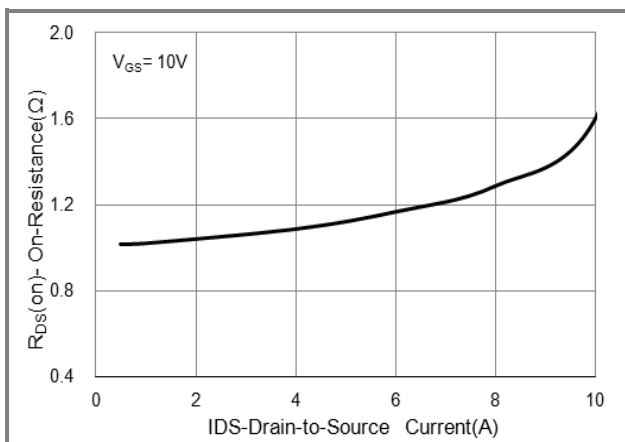
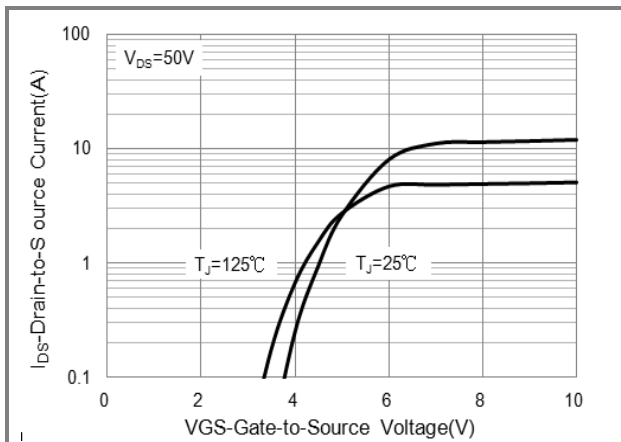
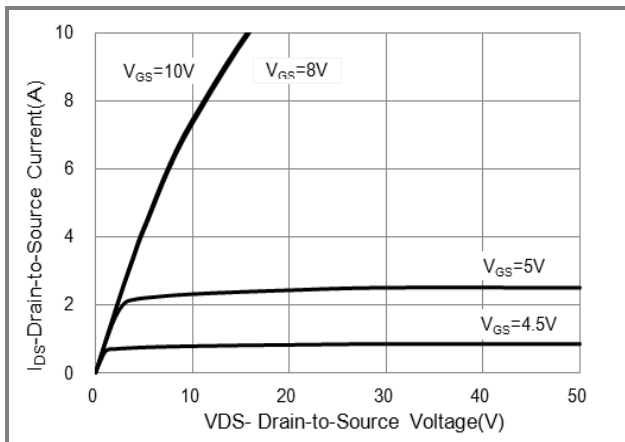
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	600	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2	3.2	4	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =3.5A	-	1.02	1.2	Ω
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V	-	-	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V	-	-	±100	nA
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =7A, V <sub>GS</sub> =0V	-	0.86	1.4	V
Dynamic (Note 5)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =480V, I <sub>D</sub> =7A, V <sub>GS</sub> =10V (Note 2,3)	-	15.2	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	5	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	4.8	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHZ	-	723	-	pF
Output Capacitance	C <sub>oss</sub>		-	105	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	2	-	
Turn-On Delay Time	td <sub>(on)</sub>	V <sub>DD</sub> =300V, I <sub>D</sub> =7A, R <sub>G</sub> =25Ω (Note 2,3)	-	28	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	58	-	
Turn-Off Delay Time	td <sub>(off)</sub>		-	42	-	
Turn-Off Fall Time	t <sub>f</sub>		-	31	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I <sub>S</sub>	---	-	-	7	A
Maximum Pulsed Drain-Source Diode Forward Current	I <sub>SM</sub>	---	-	-	28	
Reverse Recovery Time	trr	V <sub>GS</sub> =0V, I <sub>S</sub> =7A	-	350	-	ns
Reverse Recovery Charge	Qrr	di <sub>F</sub> / dt=100A/us (Note 2)	-	3.1	-	uC

#### 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.

# PJU7NA60 / PJD7NA60 / PJP7NA60 / PJF7NA60

## TYPICAL CHARACTERISTIC CURVES



# PJU7NA60 / PJD7NA60 / PJP7NA60 / PJF7NA60

## TYPICAL CHARACTERISTIC CURVES

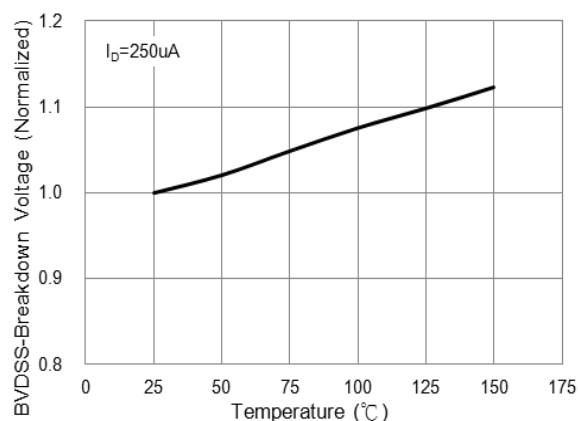


Fig.7  $BV_{DSS}$  vs. Junction Temperature

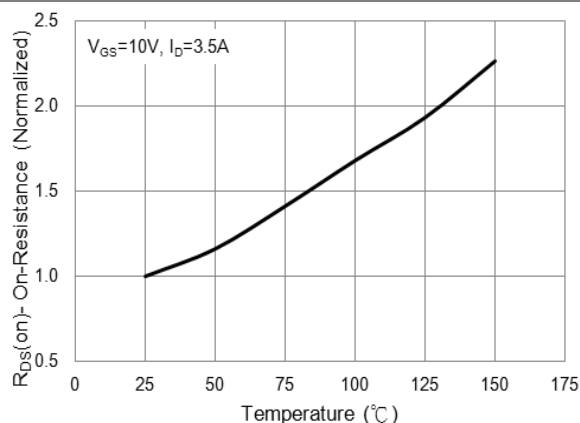


Fig.8 On-Resistance vs. Junction Temperature

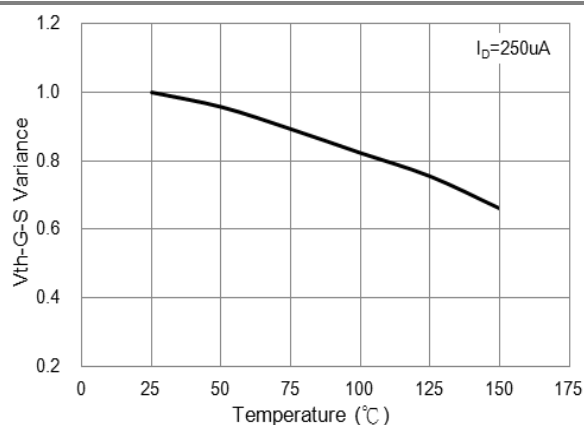


Fig.9 Threshold Voltage Variation with Temperature

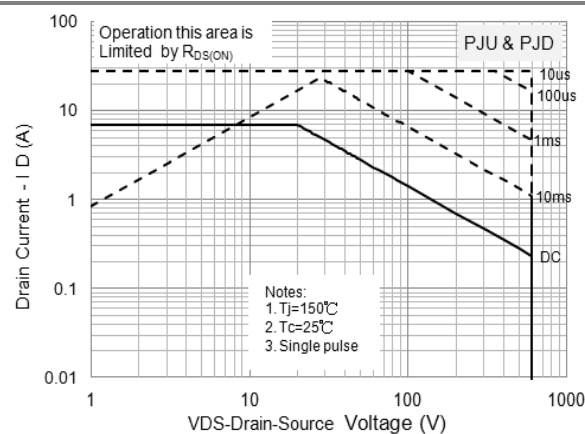


Fig.10 Maximum Safe Operating Area

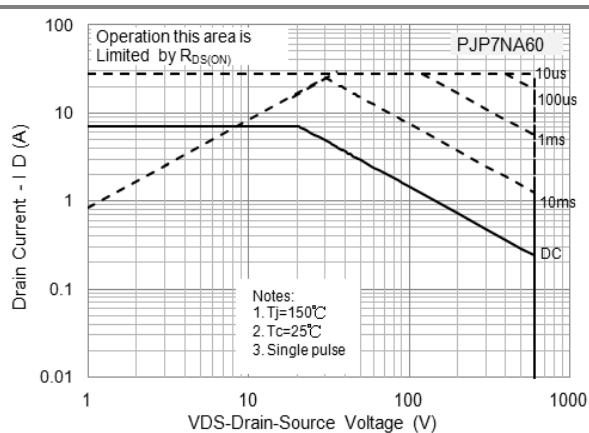


Fig.11 Maximum Safe Operating Area

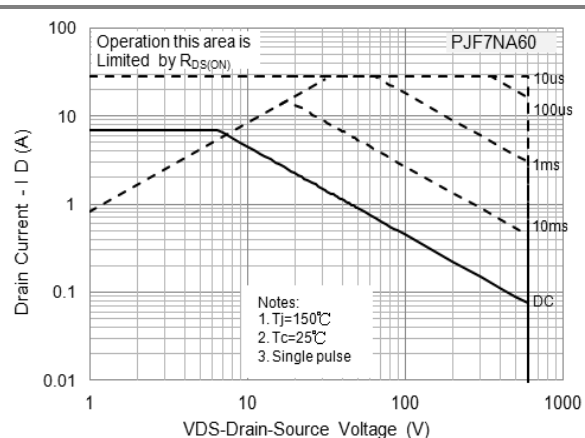


Fig.12 Maximum Safe Operating Area

# PJU7NA60 / PJD7NA60 / PJP7NA60 / PJF7NA60

## TYPICAL CHARACTERISTIC CURVES

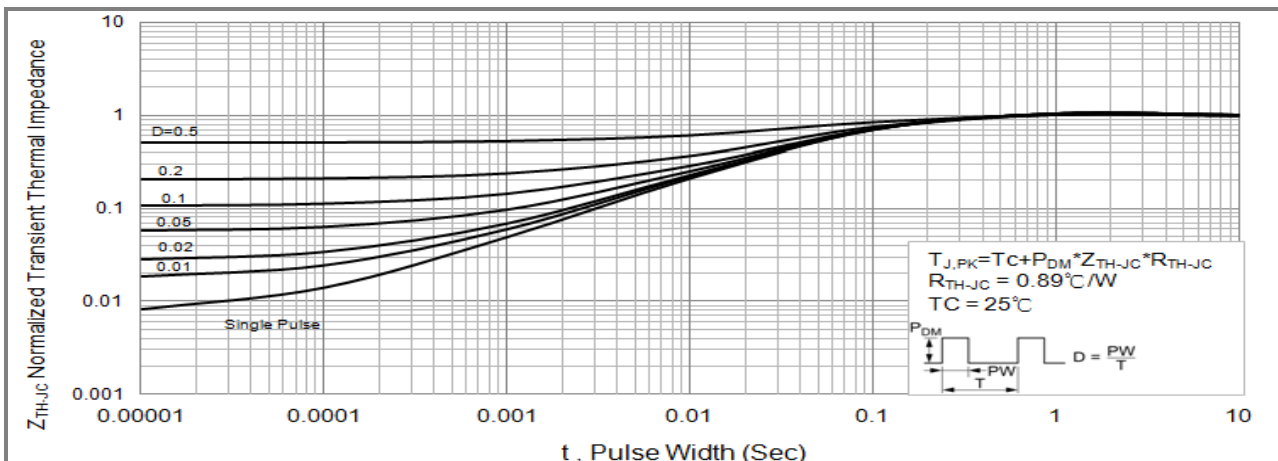


Fig.13 PJU/PJD Normalized Transient Thermal Impedance vs. Pulse Width

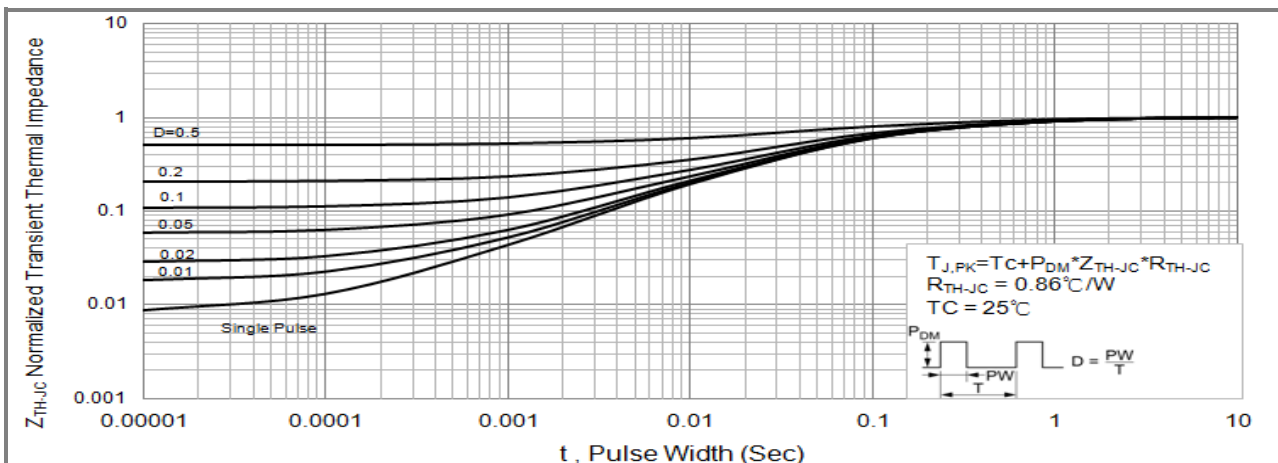


Fig.14 PJP7NA60 Normalized Transient Thermal Impedance vs. Pulse Width

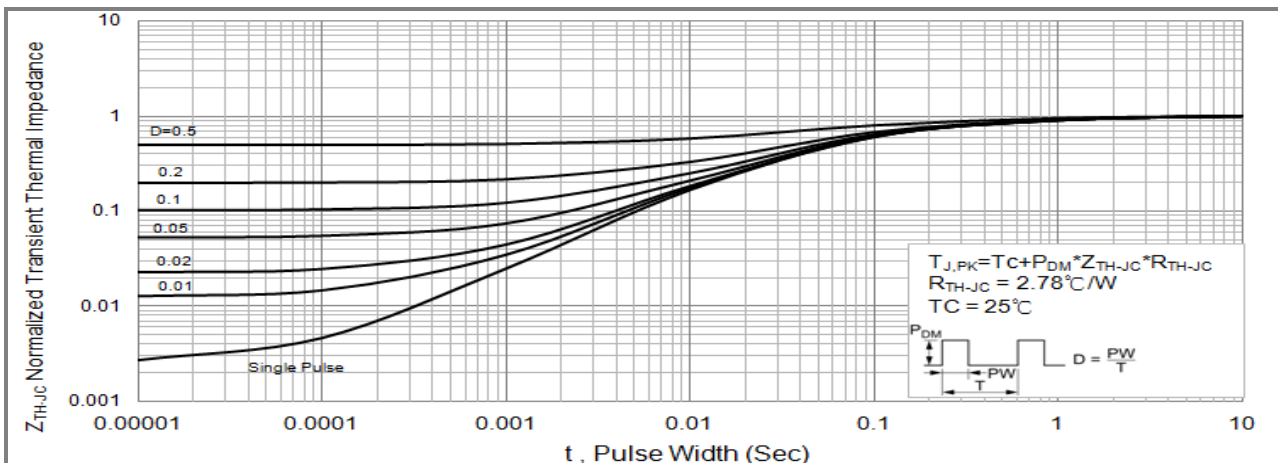
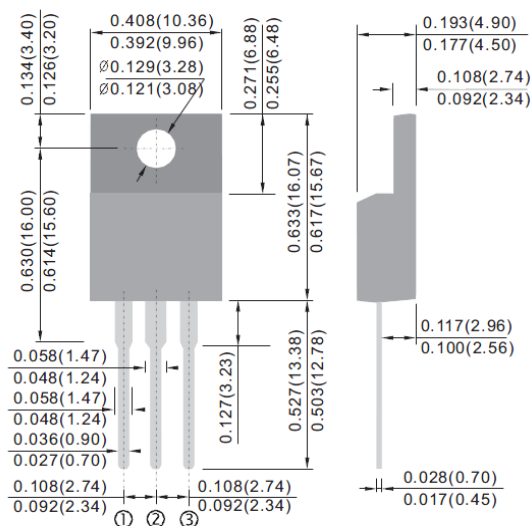


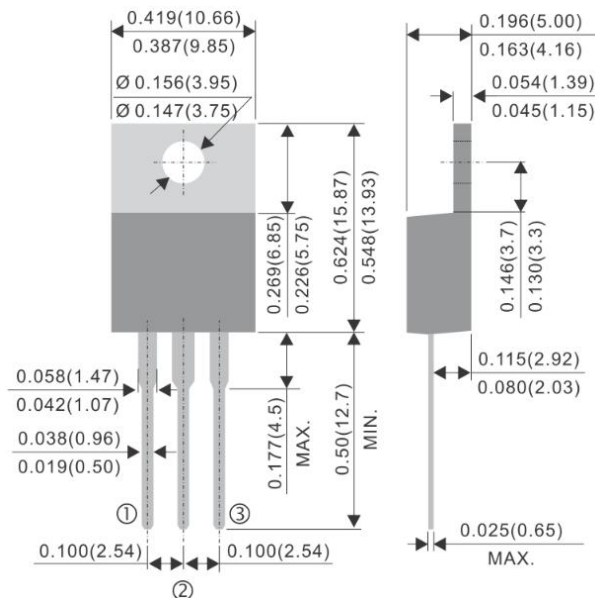
Fig.15 PJF7NA60 Normalized Transient Thermal Impedance vs. Pulse Width

## Packaging Information

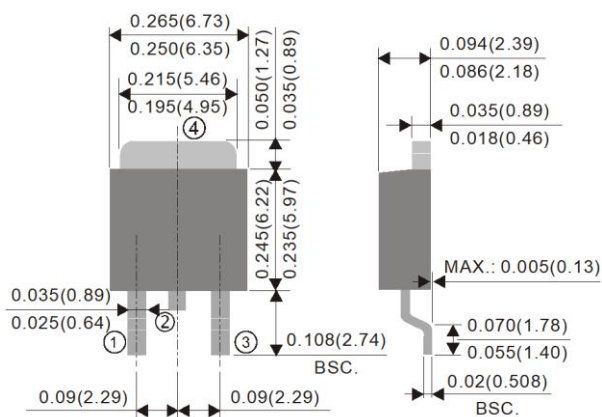
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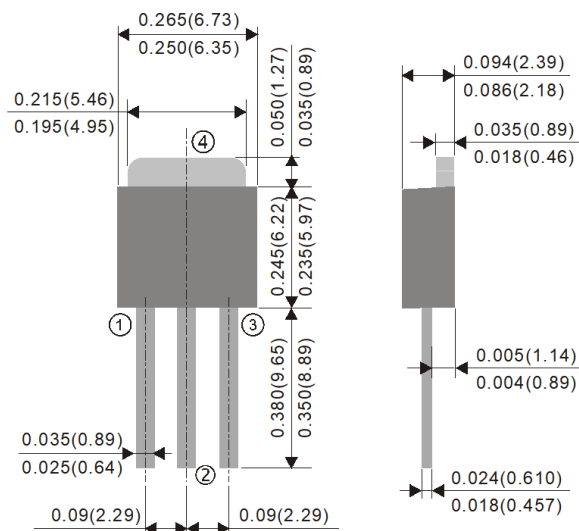
Unit: inch(mm)



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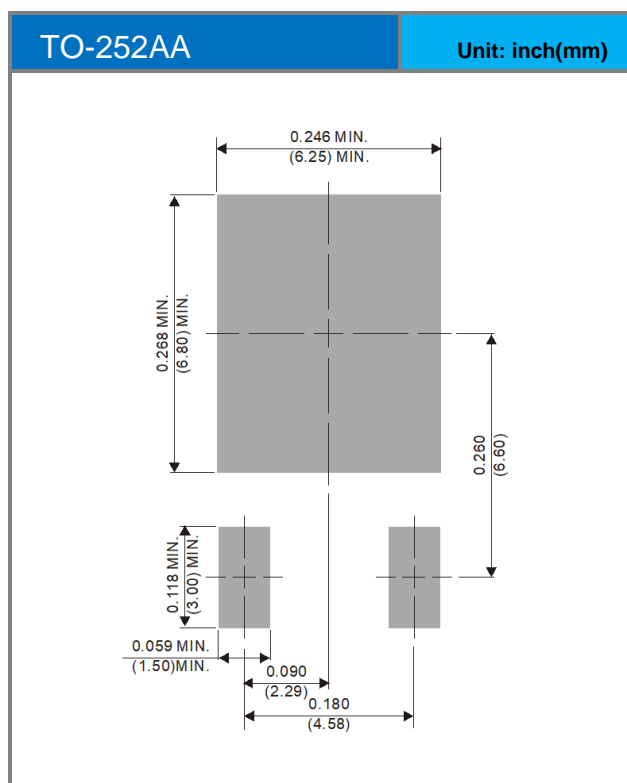


## PJU7NA60 / PJD7NA60 / PJP7NA60 / PJF7NA60

### 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





## **PJU7NA60 / PJD7NA60 / PJP7NA60 / PJF7NA60**

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