

## PJD60R620E / PJP60R620E / PJF60R620E

### 600V N-Channel Super Junction MOSFET

**Voltage**

**600 V**

**Current**

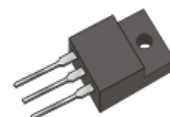
**7 A**

#### Features

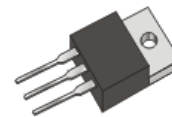
- $R_{DS(ON)}$ ,  $V_{GS}$  @ 10V,  $I_D$  @ 2.4A < 0.62 $\Omega$
- Fast switching speed
- Low on-resistance
- Low Noise
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

#### Mechanical Data

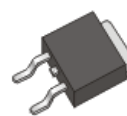
- Case : TO-252AA, TO-220AB, ITO-220AB-F
- Terminals : Solderable per MIL-STD-750, Method 2026
- TO-252AA Approx. Weight : 0.0104 ounces, 0.297grams
- TO-220AB Approx. Weight : 0.067 ounces, 1.89 grams
- ITO-220AB-F Approx. Weight : 0.068 ounces, 2 grams



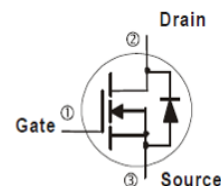
ITO-220AB-F



TO-220AB



TO-252AA



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

PARAMETER		SYMBOL	TO-220AB	ITO-220AB-F	TO-252AA	UNITS
Drain-Source Voltage		V <sub>DS</sub>	600			V
Gate-Source Voltage		V <sub>GS</sub>	±20			
Continuous Drain Current <sup>(Note 4)</sup>	T <sub>C</sub> =25°C	I <sub>D</sub>	7			A
	T <sub>C</sub> =100°C		4.5			
Pulsed Drain Current <sup>(Note 1)</sup>		I <sub>DM</sub>	14			
Power Dissipation <sup>(Note 3)</sup>	T <sub>C</sub> =25°C	P <sub>D</sub>	78	45	78	W
	T <sub>C</sub> =100°C		31	18	31	
Continuous Drain Current <sup>(Note 4)</sup>	T <sub>A</sub> =25°C	I <sub>D</sub>	1.2			A
	T <sub>A</sub> =70°C		0.9			
Power Dissipation	T <sub>A</sub> =25°C	P <sub>D</sub>	2	1.04	2	W
	T <sub>A</sub> =70°C		1.3	0.9	1.3	
Single Pulse Avalanche Energy <sup>(Note 6)</sup>		E <sub>AS</sub>	85			mJ
Operating Junction and Storage Temperature Range		T <sub>J</sub> ,T <sub>STG</sub>	-55~150			°C
Typical Thermal Resistance <sup>(Note 4,5)</sup>		R <sub>θJC</sub>	1.6	2.78	1.6	°C/W
		R <sub>θJA</sub>	62.5	120	62.5	

- Limited only By Maximum Junction Temperature



## PJD60R620E / PJP60R620E / PJF60R620E

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

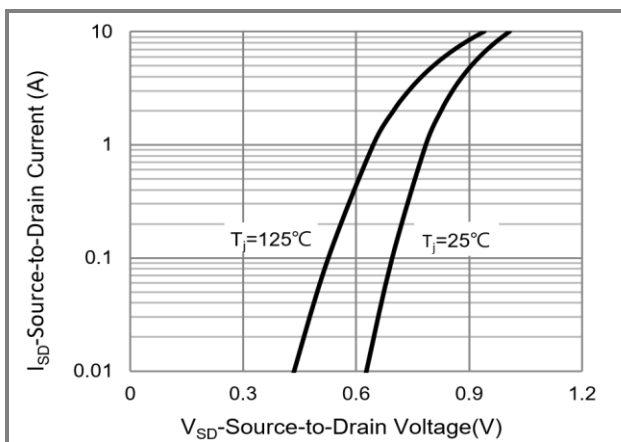
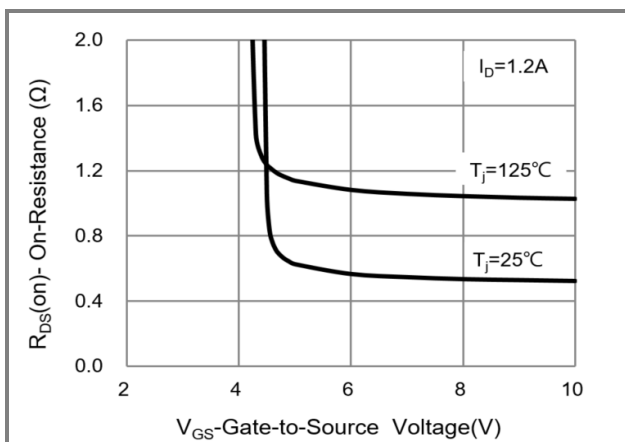
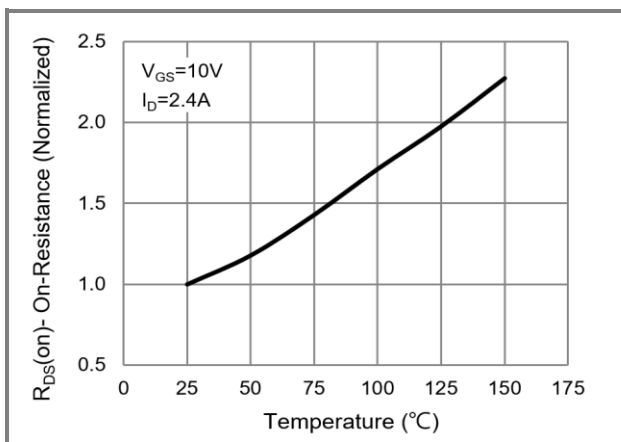
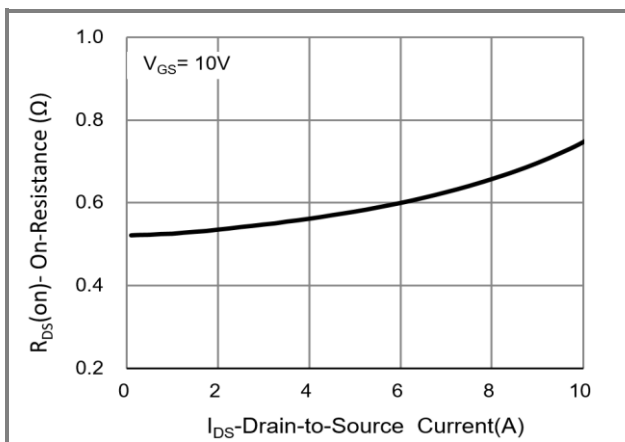
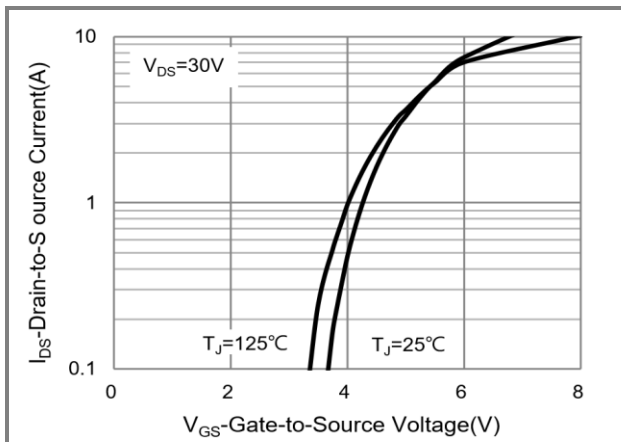
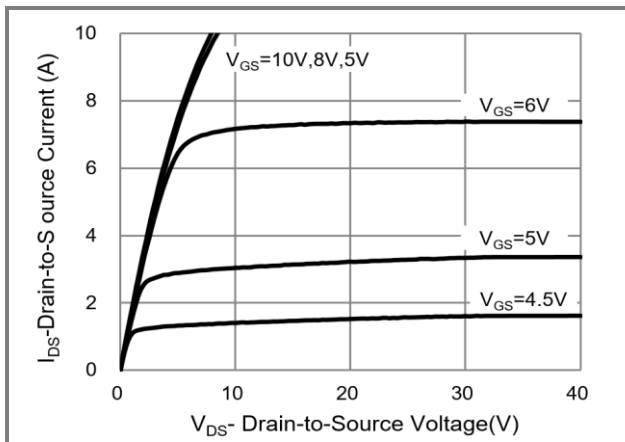
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	600	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2	2.9	4	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.4A	-	0.54	0.62	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> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =7A, V <sub>GS</sub> =0V	-	0.95	1.5	V
Transconductance	G <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =3.5A	-	3.8	-	S
Dynamic (Note 7)						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =300V, I <sub>D</sub> =7A, V <sub>GS</sub> =10V (Note 2,3)	-	21	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	3	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	11	-	
Gate Input Resistance	R <sub>g</sub>	F = 1MHz	-	11.5	-	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHZ	-	457	-	pF
Output Capacitance	C <sub>oss</sub>		-	457	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	62	-	
Turn-On Delay Time	td <sub>(on)</sub>	V <sub>DD</sub> =300V, I <sub>D</sub> =3.5A, R <sub>G</sub> =10Ω (Note 2,3)	-	10	-	ns
Turn-On Rise Time	t <sub>r</sub>		-	25	-	
Turn-Off Delay Time	td <sub>(off)</sub>		-	65	-	
Turn-Off Fall Time	t <sub>f</sub>		-	26	-	
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>	---	-	-	14	
Reverse Recovery Time	trr	V <sub>GS</sub> =0V, I <sub>S</sub> =7A	-	269	-	ns
Reverse Recovery Charge	Qrr	dl <sub>F</sub> / dt=100A/us (Note 2)	-	2.41	-	uC

#### 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. TO-252AA mounted on a 1 inch<sup>2</sup> with 2oz.square pad of copper.
6.  $L=100\text{mH}$ ,  $I_{AS}=1.3A$ ,  $V_{DD}=50V$ ,  $R_G=25\text{ ohm}$ , Starting  $T_J=25^{\circ}\text{C}$ .
7. Guaranteed by design, not subject to production testing.

# PJD60R620E / PJP60R620E / PJF60R620E

## TYPICAL CHARACTERISTIC CURVES



# PJD60R620E / PJP60R620E / PJF60R620E

## TYPICAL CHARACTERISTIC CURVES

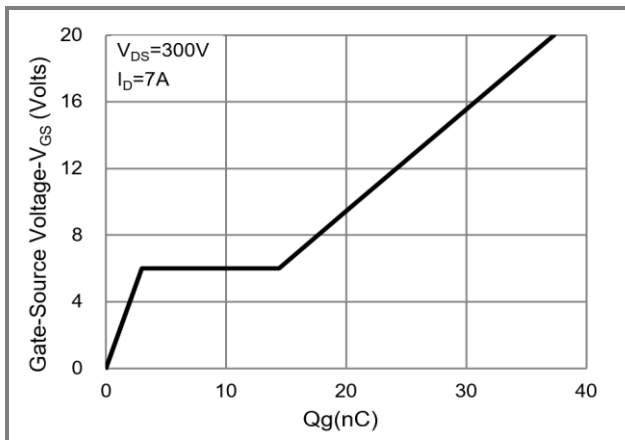


Fig.7 Gate-Charge Characteristics

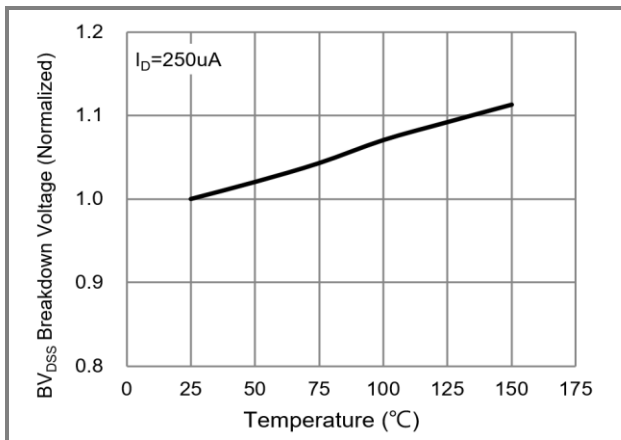


Fig.8 Breakdown Voltage Variation vs. Temperature

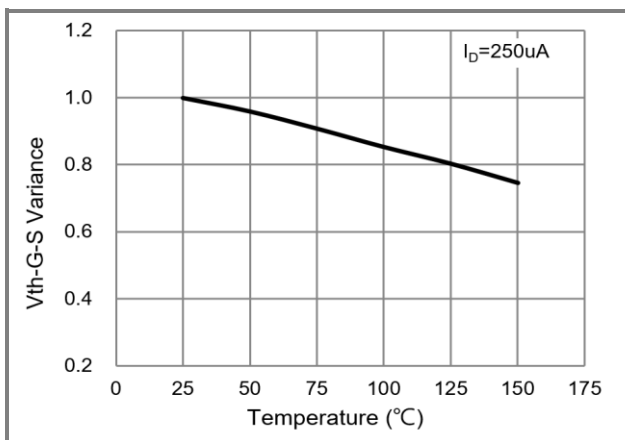


Fig.9 Threshold Voltage Variation with Temperature

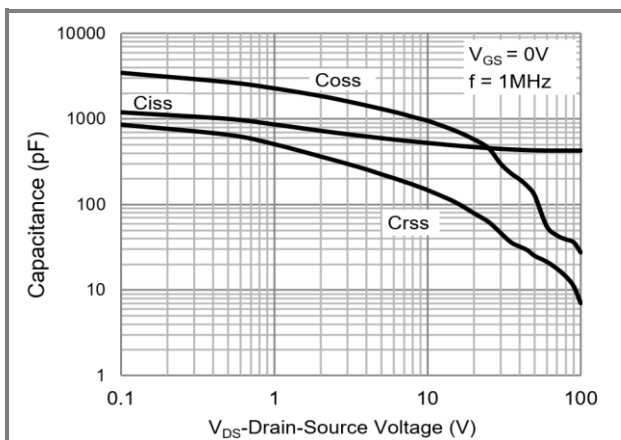


Fig.10 Capacitance vs. Drain-Source Voltage

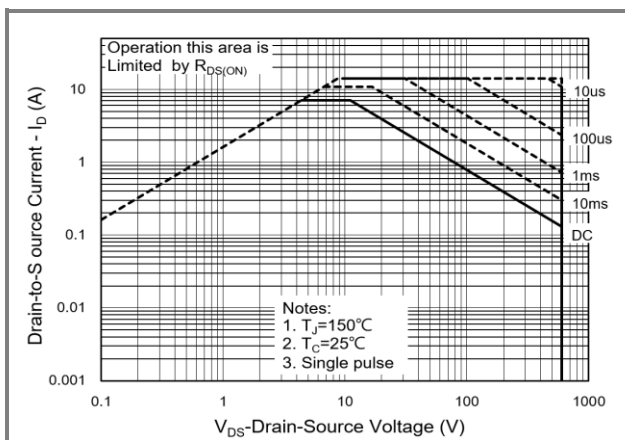


Fig.11 PJD Maximum Safe Operating Area

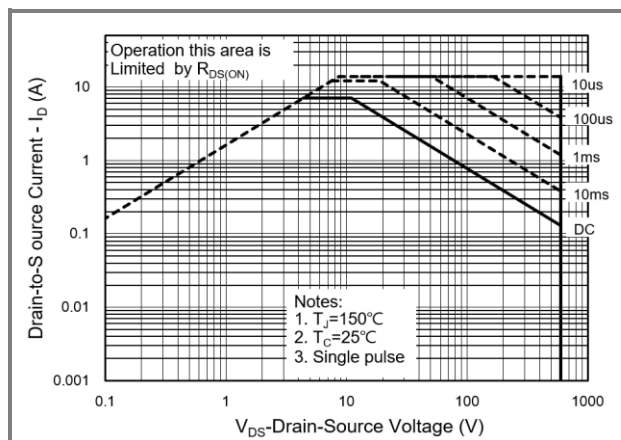


Fig.12 PJP Maximum Safe Operating Area

# PJD60R620E / PJP60R620E / PJF60R620E

## TYPICAL CHARACTERISTIC CURVES

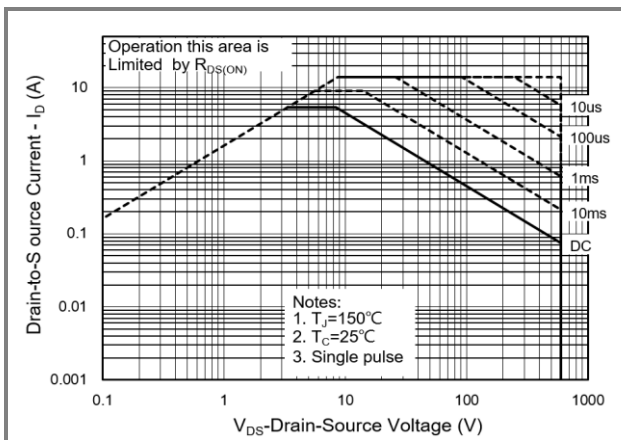


Fig.13 PJD Maximum Safe Operating Area

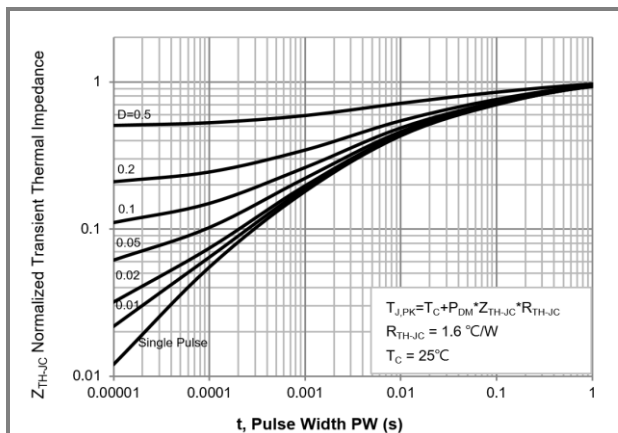


Fig.14 PJD Normalized Transient Thermal Impedance

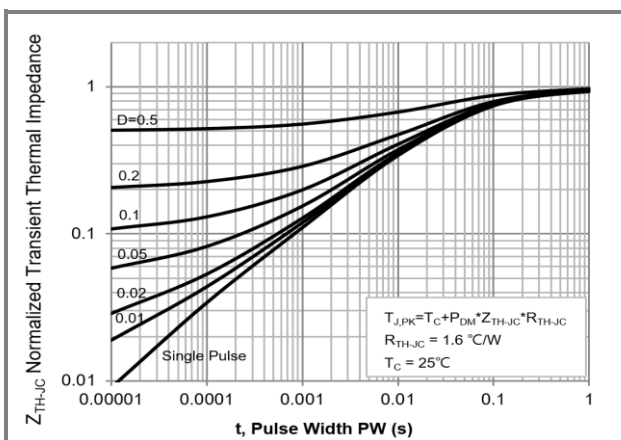


Fig.15 PJP Normalized Transient Thermal Impedance

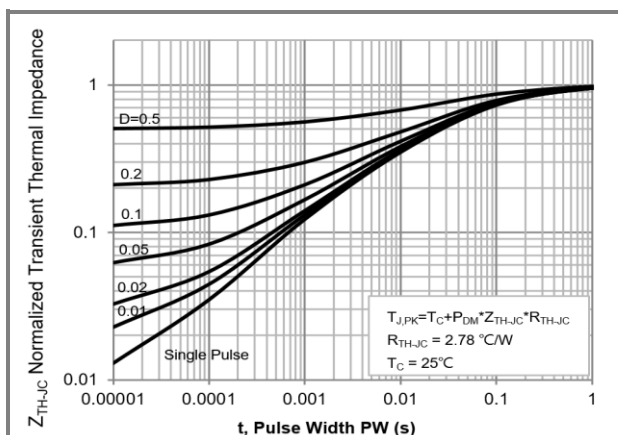


Fig.16 PJF Normalized Transient Thermal Impedance

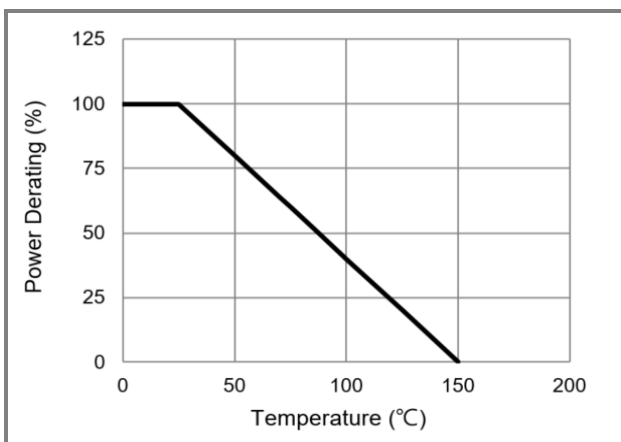


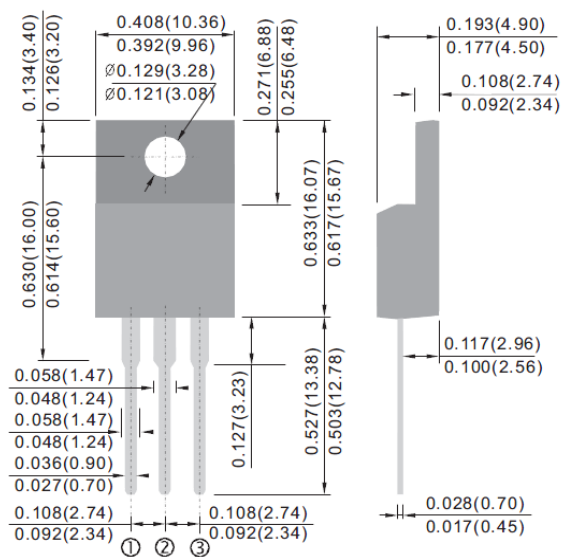
Fig.17 Total Power Dissipation

# PJD60R620E / PJP60R620E / PJF60R620E

## Packaging Information

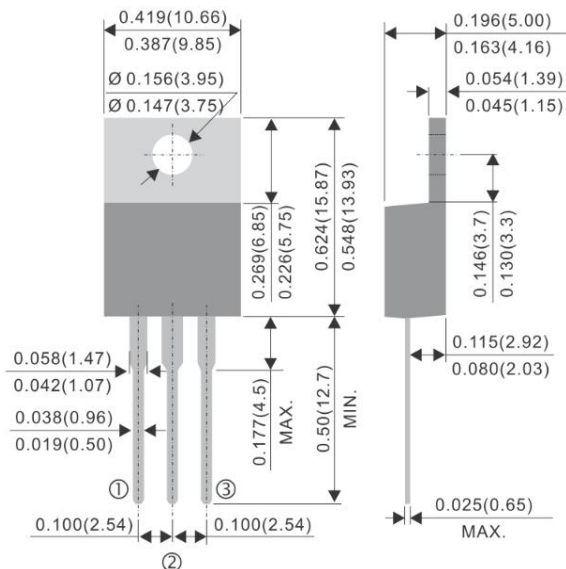
ITO-220AB-F Dimension

Unit: inch(mm)



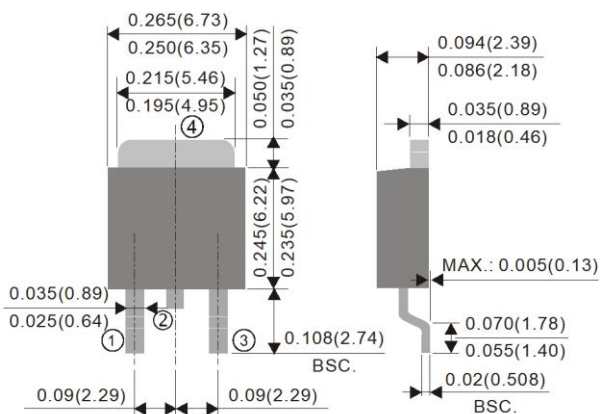
TO-220AB Dimension

Unit: inch(mm)



TO-252AA Dimension

Unit: inch(mm)





## PJD60R620E / PJP60R620E / PJF60R620E

### Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJD60R620E_L2_00001	TO-252AA	3,000pcs / 13" reel	60R620E	Halogen free
PJP60R620E_T0_00001	TO-220AB	50pcs / Tube	60R620E	Halogen free
PJF60R620E_T0_00001	ITO-220AB-F	50pcs / Tube	60R620E	Halogen free



## **PJD60R620E / PJP60R620E / PJF60R620E**

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