

# PJD60P04E-AU

## 40V P-Channel Enhancement Mode MOSFET

**Voltage** -40 V **Current** -61 A

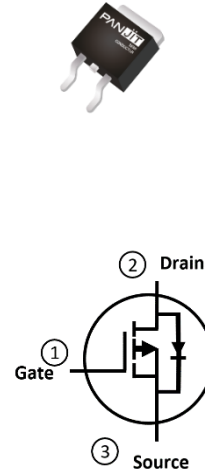
### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-10V$ ,  $I_D@-20A < 11.3m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-10A < 17.2m\Omega$
- 100% UIS tested
- Reliable and Rugged
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : TO-252AA Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.3217 grams

TO-252AA



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		$V_{DS}$	-40	V
Gate-Source Voltage		$V_{GS}$	$\pm 25$	
Continuous Drain Current <sup>(Note 3)</sup>	$T_C=25^\circ C$	$I_D$	-61	A
	$T_C=100^\circ C$		-43	
Pulsed Drain Current <sup>(Note 1)</sup>	$T_C=25^\circ C$	$I_{DM}$	-171	
Power Dissipation	$T_C=25^\circ C$	$P_D$	75	W
	$T_C=100^\circ C$		38	
Continuous Drain Current <sup>(Note 4)</sup>	$T_A=25^\circ C$	$I_D$	-12	A
	$T_A=70^\circ C$		-10.2	
Power Dissipation	$T_A=25^\circ C$	$P_D$	3	W
	$T_A=70^\circ C$		2.1	
Single Pulse Avalanche Energy <sup>(Note 5)</sup>		$E_{AS}$	121	mJ
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~175	$^\circ C$
Thermal Resistance <sup>(Note 4)</sup>	Junction to Case	$R_{\theta JC}$	2	$^\circ C/W$
	Junction to Ambient	$R_{\theta JA}$	50	

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## Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

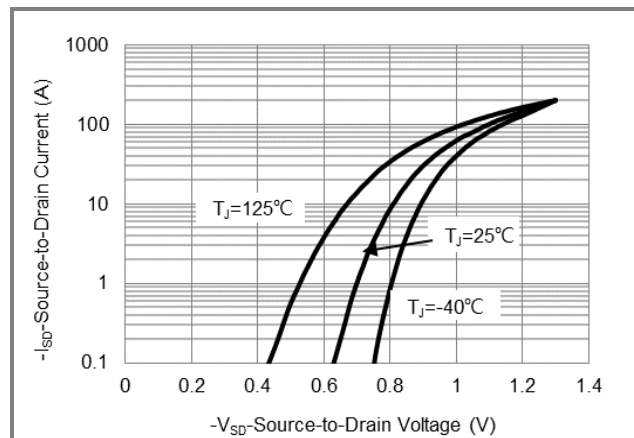
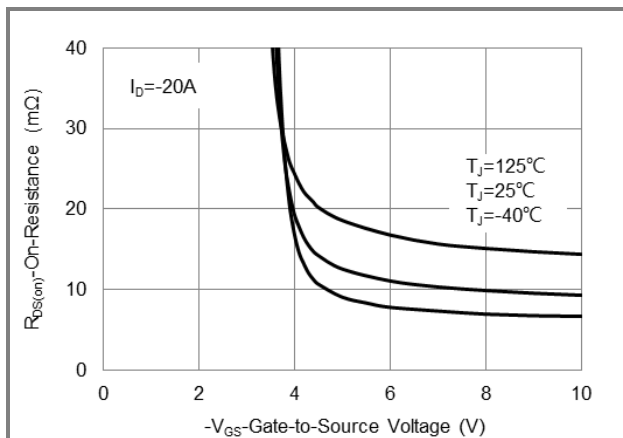
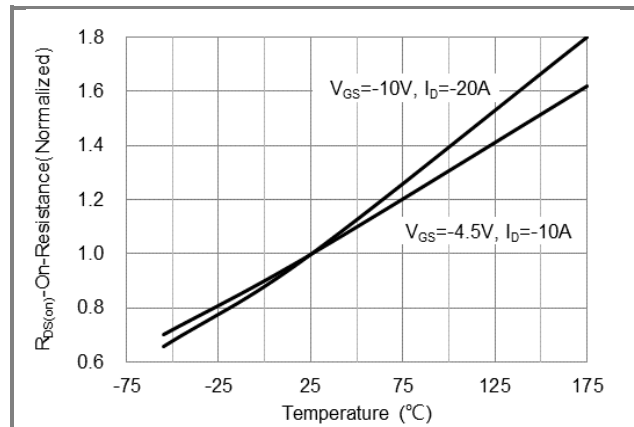
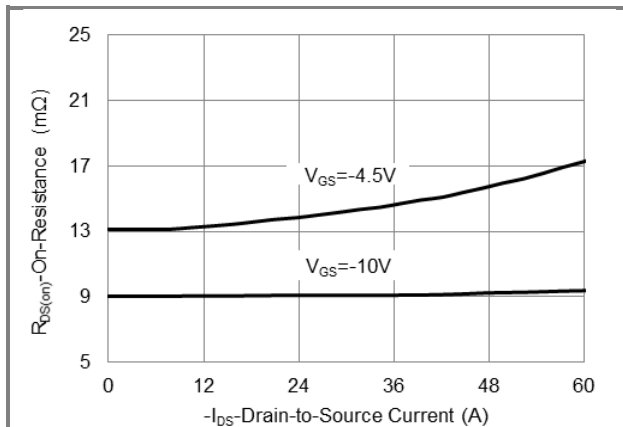
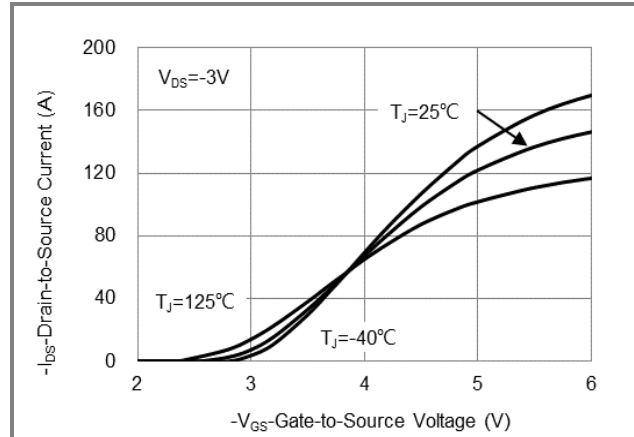
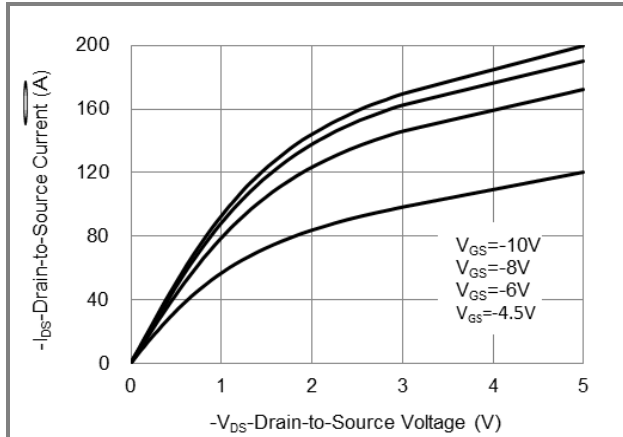
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-40	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1	-1.7	-2.5	
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	-	9	11.3	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-10A	-	13.2	17.2	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-40V, V <sub>GS</sub> =0V	-	-	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±25V, V <sub>DS</sub> =0V	-	-	±100	nA
Dynamic <sup>(Note 6)</sup>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-32V, I <sub>D</sub> =-20A, V <sub>GS</sub> =-10V	-	56	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	8.4	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	18	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1MHz	-	2897	-	pF
Output Capacitance	C <sub>oss</sub>		-	251	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	194	-	
Gate resistance	R <sub>g</sub>	f=1MHz	-	2.9	-	Ω
Turn-On Delay Time	td <sub>(on)</sub>	V <sub>DS</sub> =-32V, I <sub>D</sub> =-20A, V <sub>GS</sub> =-10V, R <sub>G</sub> =3Ω (Note 2)	-	11	-	ns
Turn-On Rise Time	tr		-	10	-	
Turn-Off Delay Time	td <sub>(off)</sub>		-	47	-	
Turn-Off Fall Time	tf		-	24	-	
Drain-Source Diode						
Diode Forward Current	I <sub>s</sub>	T <sub>C</sub> =25°C	-	-	-61	A
Pulsed Diode Forward Current	I <sub>SM</sub>		-	-	-171	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-20A, V <sub>GS</sub> =0V	-	-0.85	-1.3	V
Reverse Recovery Time	T <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-20A	-	29	-	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dI <sub>S</sub> /dt=100A/us	-	24	-	nC

### NOTES :

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. The maximum current rating is package limited.
4. R<sub>θJA</sub> 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<sup>2</sup> with 2oz. square pad of copper.
5. The test condition is L=0.5mH, I<sub>AS</sub>=-22A, V<sub>DD</sub>=-30V, V<sub>GS</sub>=-10V, Starting T<sub>J</sub>=25°C.
6. Guaranteed by design, not subject to production testing.

## PJD60P04E-AU

### TYPICAL CHARACTERISTIC CURVES



# PJD60P04E-AU

## TYPICAL CHARACTERISTIC CURVES

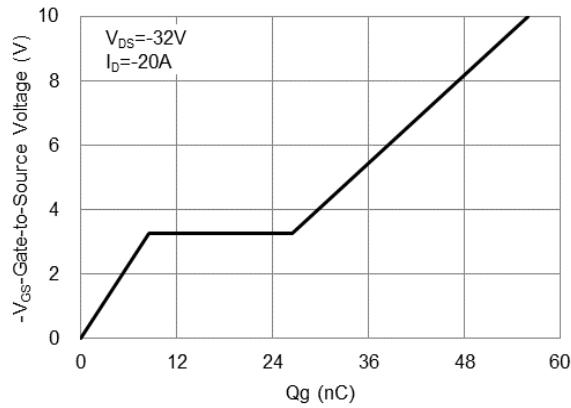


Fig.7 Gate-Charge Characteristics

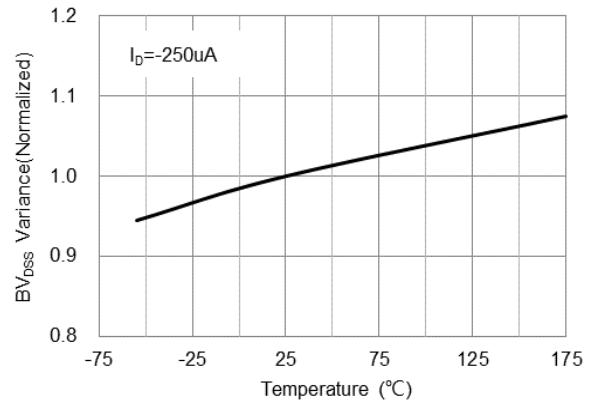


Fig.8 Breakdown Voltage Variation vs. Temperature

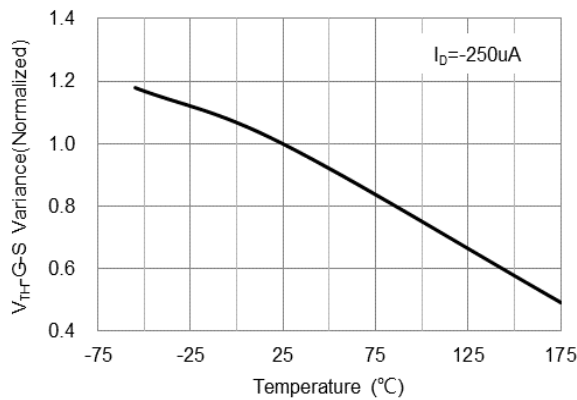


Fig.9 Threshold Voltage Variation with Temperature

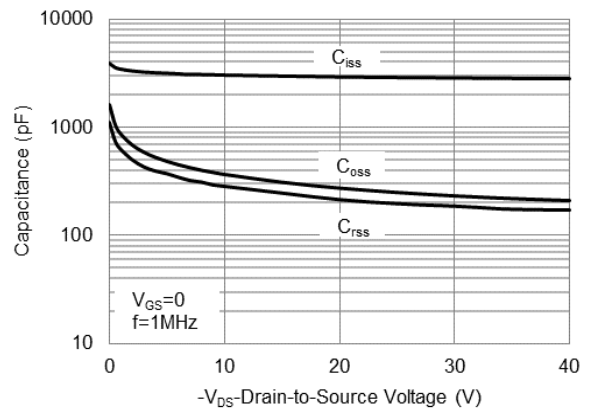


Fig.10 Capacitance vs. Drain-Source Voltage

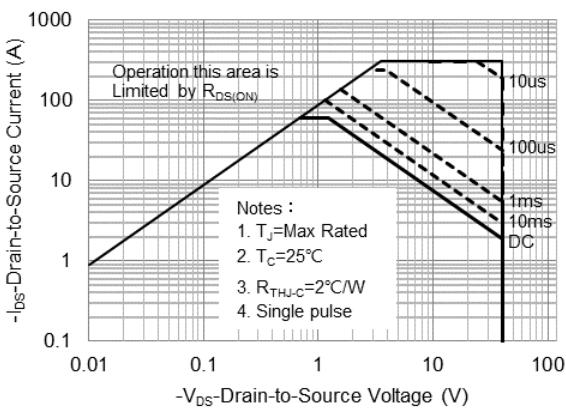


Fig.11 Maximum Safe Operating Area

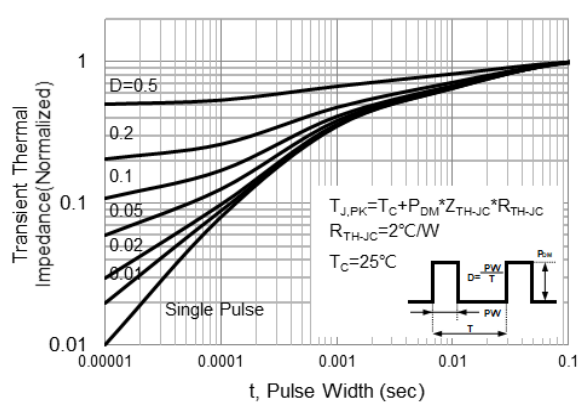


Fig.12 Normalized Transient Thermal Impedance

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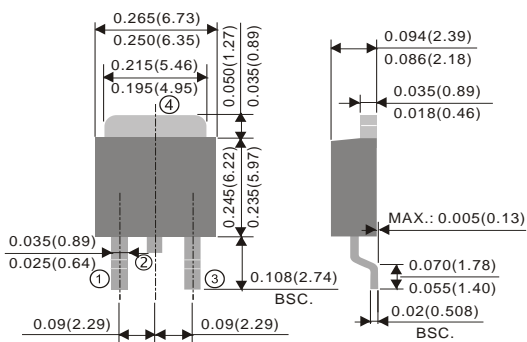
## Product and Packing Information

Part No.	Package Type	Packing Type	Marking
PJD60P04E-AU	TO-252AA	3K pcs / 13" reel	D60P04E

## Packaging Information & Mounting Pad Layout

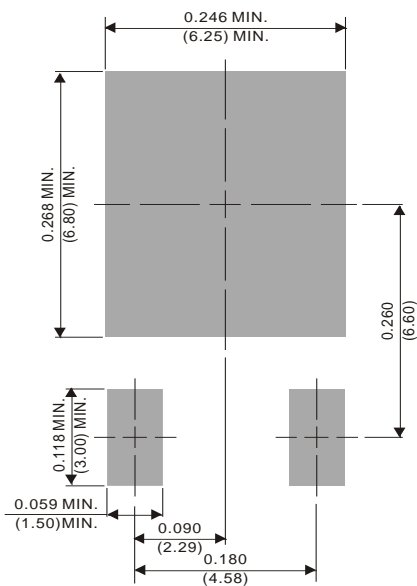
TO-252AA Dimension

Unit: inch(mm)



TO-252AA Pad Layout

Unit: inch(mm)



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