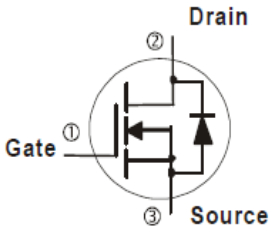
# PJD60N04-AU

## 40V N-Channel Enhancement Mode MOSFET

| Voltage | 40 V | Current | 60 A |
|---|---|---|---|



TO-252AA




### Features

- $R_{DS(ON)}$, $V_{GS}$@10V, $I_D$@20A<6.5mΩ
- $R_{DS(ON)}$, $V_{GS}$@4.5V, $I_D$@10A<9mΩ
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance
- 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 : 0.0104 ounces, 0.297grams

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

| PARAMETER | | SYMBOL | LIMIT | UNITS |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 40 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current (Note 4) | $T_C$=25°C | $I_D$ | 60 | A |
| | $T_C$=100°C | | 38 | |
| Pulsed Drain Current (Note 1) | $T_C$=25°C | $I_{DM}$ | 240 | A |
| Power Dissipation | $T_C$=25°C | $P_D$ | 75 | W |
| | $T_C$=100°C | | 37.5 | |
| Continuous Drain Current (Note 4) | $T_A$=25°C | $I_D$ | 12.7 | A |
| | $T_A$=70°C | | 10 | |
| Power Dissipation | $T_A$=25°C | $P_D$ | 2.4 | W |
| | $T_A$=70°C | | 1.6 | |
| Operating Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55~175 | °C |
| Typical Thermal Resistance (Note 4,5) | Junction to Case | $R_{\theta JC}$ | 2 | °C/W |
| | Junction to Ambient | $R_{\theta JA}$ | 62.5 | |

- Limited only By Maximum Junction Temperature

# PJD60N04-AU

## 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 | 40 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 1 | 1.7 | 2.5 | |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=20A | - | 5.5 | 6.5 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=10A | - | 7 | 9 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=40V, $V_{GS}$=0V | - | - | 1 | uA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| **Dynamic** (Note 6) | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=20V, $I_D$=10A, $V_{GS}$=4.5V (Note 1,2) | - | 17 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 4.9 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 6.4 | - | |
| Input Capacitance | Ciss | $V_{DS}$=25V, $V_{GS}$=0V, f=1MHZ | - | 1759 | - | pF |
| Output Capacitance | Coss | | - | 176 | - | |
| Reverse Transfer Capacitance | Crss | | - | 126 | - | |
| 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 | $t_r$ | | - | 21 | - | |
| Turn-Off Delay Time | $td_{(off)}$ | | - | 40 | - | |
| Turn-Off Fall Time | $t_f$ | | - | 25 | - | |
| **Drain-Source Diode** | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | $I_S$ | --- | - | - | 60 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1A, $V_{GS}$=0V | - | 0.7 | 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 $T_{J(MAX)}$=175°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. $R_{\Theta JA}$ 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. Guaranteed by design, not subject to production testing.

# PJD60N04-AU

## TYPICAL CHARACTERISTIC CURVES

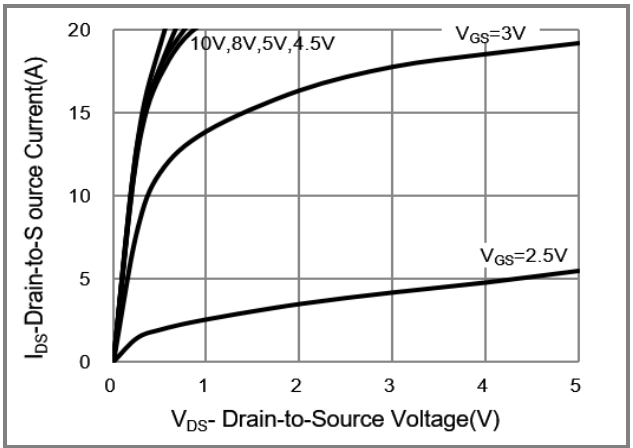



Fig.1 Output Characteristics

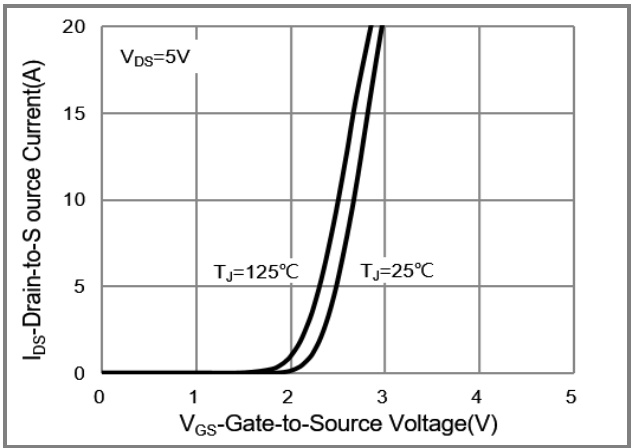



Fig.2 Transfer Characteristics

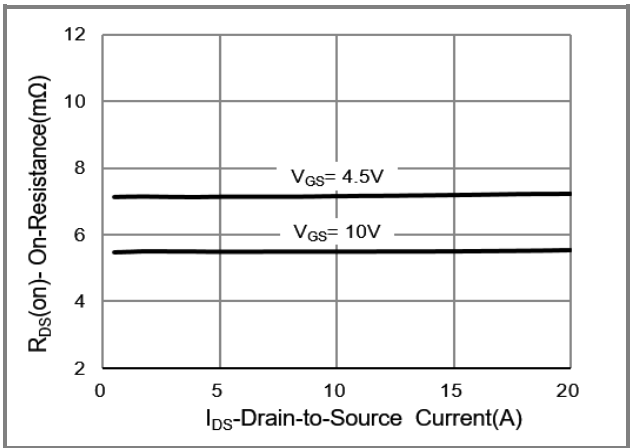



Fig.3 On-Resistance vs. Drain Current

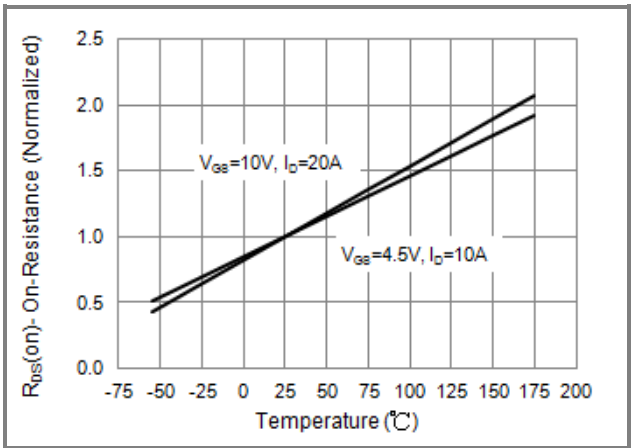



Fig.4 On-Resistance vs. Junction temperature

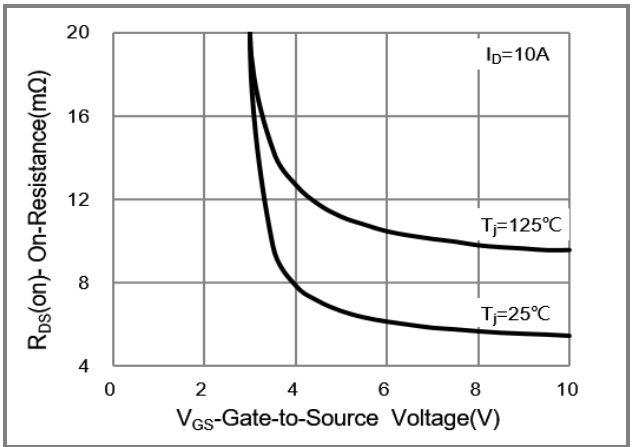



Fig.5 On-Resistance Variation with $V_{GS}$

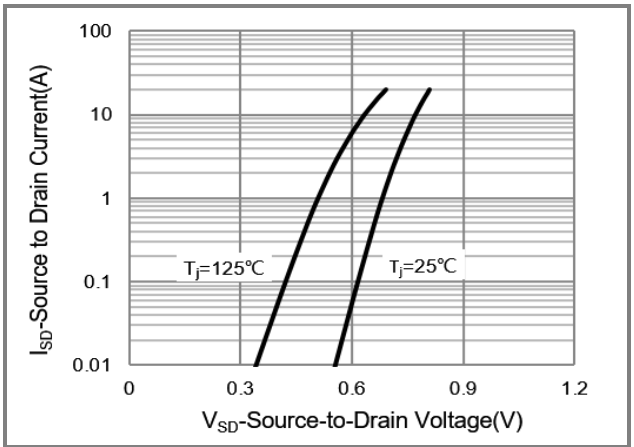



Fig.6 Source-Drain Diode Forward Voltage

# PJD60N04-AU

## TYPICAL CHARACTERISTIC CURVES

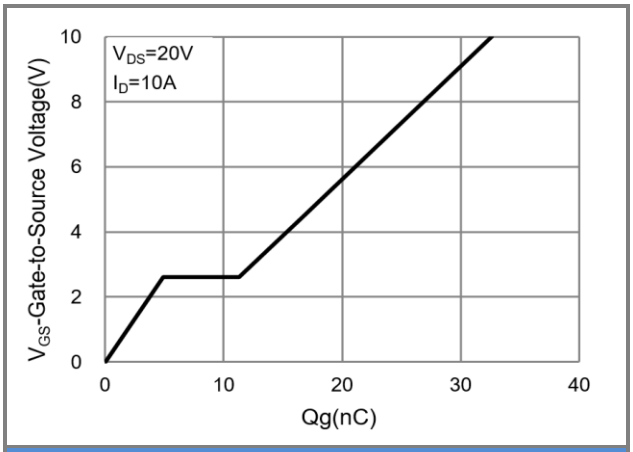



Fig.7 Gate-Charge Characteristics

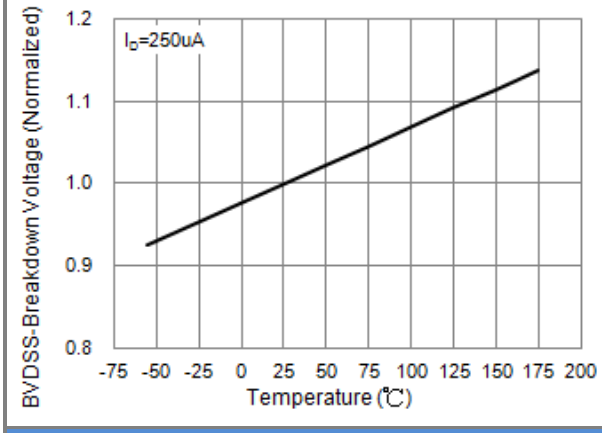



Fig.8 Breakdown Voltage Variation vs. Temperature

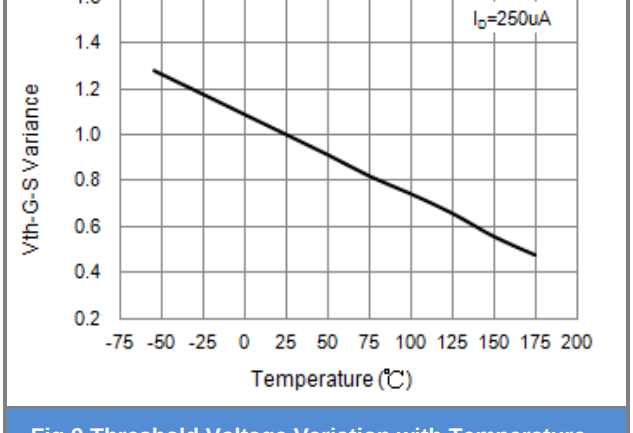



Fig.9 Threshold Voltage Variation with Temperature

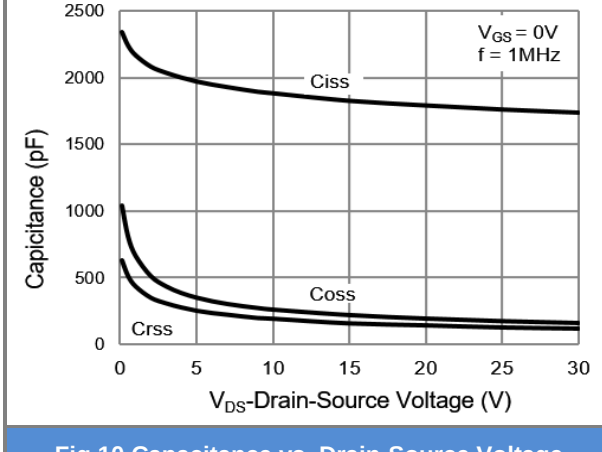



Fig.10 Capacitance vs. Drain-Source Voltage

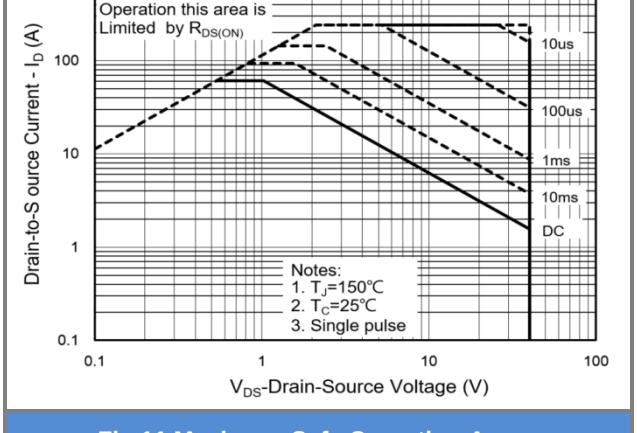



Fig.11 Maximum Safe Operating Area

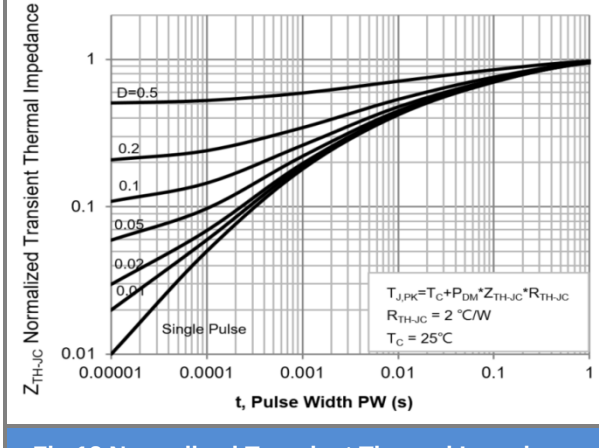



Fig.12 Normalized Transient Thermal Impedance

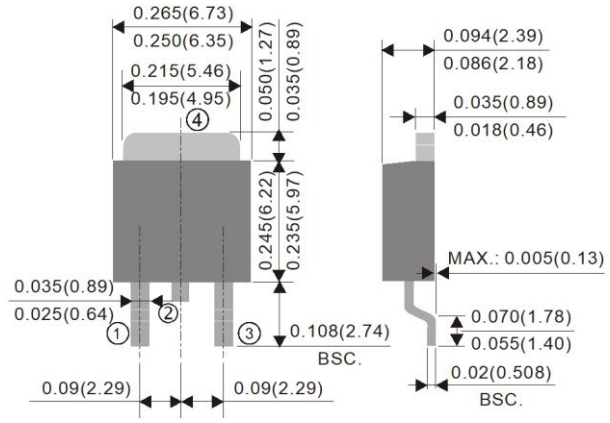
# PJD60N04-AU

## Part No Packing Code Version

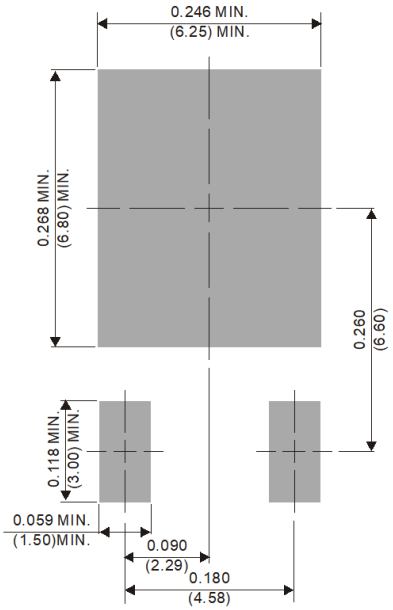
| Part No Packing Code | Package Type | Packing Type | Marking | Version |
|---|---|---|---|---|
| PJD60N04-AU_L2_000A1 | TO-252AA | 3,000pcs / 13” reel | D60N04 | Halogen free |

## Packaging Information & Mounting Pad Layout

TO-252AA Dimension — Unit: inch(mm)




TO-252AA Pad Layout — Unit: inch(mm)



# PJD60N04-AU

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