

# PJD25N06A

## 60V N-Channel Enhancement Mode MOSFET

**Voltage**

**60 V**

**Current**

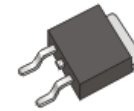
**25 A**

### Features

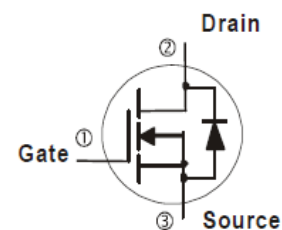
- $R_{DS(ON)}$ ,  $V_{GS}@10V, I_D@15A < 34m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@4.5V, I_D@10A < 40m\Omega$
- High switching speed
- Improved dv/dt capability
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std.. (Halogen Free)

### Mechanical Data

- Case : TO-252AA Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0104 ounces, 0.297grams



TO-252AA



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

| PARAMETER                                        |                     | SYMBOL          | LIMIT   | UNIT          |
|--------------------------------------------------|---------------------|-----------------|---------|---------------|
| Drain-Source Voltage                             |                     | $V_{DS}$        | 60      | V             |
| Gate-Source Voltage                              |                     | $V_{GS}$        | +20     | V             |
| Continuous Drain Current                         | $T_C=25^{\circ}C$   | $I_D$           | 25      | A             |
|                                                  | $T_C=100^{\circ}C$  |                 | 16      |               |
| Pulsed Drain Current (Note 1)                    | $T_C=25^{\circ}C$   | $I_{DM}$        | 100     |               |
| Power Dissipation                                | $T_C=25^{\circ}C$   | $P_D$           | 40      | W             |
|                                                  | $T_C=100^{\circ}C$  |                 | 16      |               |
| Continuous Drain Current                         | $T_A=25^{\circ}C$   | $I_D$           | 5.5     | A             |
|                                                  | $T_A=70^{\circ}C$   |                 | 4.4     | A             |
| Power Dissipation                                | $T_A=25^{\circ}C$   | $P_D$           | 2.0     | W             |
| Power Dissipation                                | $T_A=70^{\circ}C$   |                 | 1.3     |               |
| Single Pulse Avalanche Energy (Note 6)           |                     | $E_{AS}$        | 24      | mJ            |
| Operating Junction and Storage Temperature Range |                     | $T_J, T_{STG}$  | -55~150 | $^{\circ}C$   |
| Typical Thermal Resistance (Note 4,5)            | Junction to Case    | $R_{\theta JC}$ | 3.1     | $^{\circ}C/W$ |
|                                                  | Junction to Ambient | $R_{\theta JA}$ | 62.5    |               |

- Limited only By Maximum Junction Temperature

# PJD25N06A

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

| PARAMETER                                             | SYMBOL              | TEST CONDITION                                                                                              | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------|------|------|------|------|
| Static                                                |                     |                                                                                                             |      |      |      |      |
| Drain-Source Breakdown Voltage                        | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V,I <sub>D</sub> =250uA                                                                   | 60   | -    | -    | V    |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> ,I <sub>D</sub> =250uA                                                     | 1.0  | 1.83 | 2.5  | V    |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V,I <sub>D</sub> =15A                                                                    | -    | 28   | 34   | mΩ   |
|                                                       |                     | V <sub>GS</sub> =4.5V,I <sub>D</sub> =10A                                                                   | -    | 33   | 40   |      |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =60V,V <sub>GS</sub> =0V                                                                    | -    | -    | 1.0  | uA   |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =+20V,V <sub>DS</sub> =0V                                                                   | -    | -    | +100 | nA   |
| Dynamic <sup>(Note 7)</sup>                           |                     |                                                                                                             |      |      |      |      |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =30V, I <sub>D</sub> =20A,<br>V <sub>GS</sub> =10V <sup>(Note 1,2)</sup>                    | -    | 20   | -    | nC   |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |                                                                                                             | -    | 3.8  | -    |      |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |                                                                                                             | -    | 3.9  | -    |      |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =25V, V <sub>GS</sub> =0V,<br>f=1.0MHZ                                                      | -    | 1173 | -    | pF   |
| Output Capacitance                                    | C <sub>oss</sub>    |                                                                                                             | -    | 63   | -    |      |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |                                                                                                             | -    | 44   | -    |      |
| Turn-On Delay Time                                    | t <sub>d(on)</sub>  | V <sub>DD</sub> =15V, I <sub>D</sub> =1A,<br>V <sub>GS</sub> =10V, R <sub>G</sub> =6Ω <sup>(Note 1,2)</sup> | -    | 7.1  | -    | ns   |
| Turn-On Rise Time                                     | t <sub>r</sub>      |                                                                                                             | -    | 25   | -    |      |
| Turn-Off Delay Time                                   | t <sub>d(off)</sub> |                                                                                                             | -    | 31   | -    |      |
| Turn-Off Fall Time                                    | t <sub>f</sub>      |                                                                                                             | -    | 20   | -    |      |
| Drain-Source Diode                                    |                     |                                                                                                             |      |      |      |      |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---                                                                                                         | -    | -    | 25   | A    |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =1A,V <sub>GS</sub> =0V                                                                      | -    | 0.72 | 1.2  | 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<sub>J</sub>(MAX)=150°C. Ratings are based on low frequency and duty cycles to keep initial T<sub>J</sub> = 25°C.
4. The maximum current rating is package limited.
5. 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.
6. The test condition is L=0.1mH, I<sub>AS</sub>=22A, V<sub>DD</sub>=25V, V<sub>GS</sub>=10V.
7. Guaranteed by design, not subject to production testing.

## PJD25N06A

### TYPICAL CHARACTERISTIC CURVES

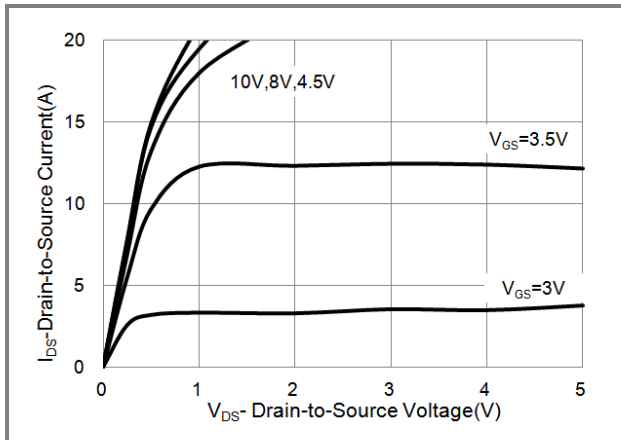


Fig.1 Output Characteristics

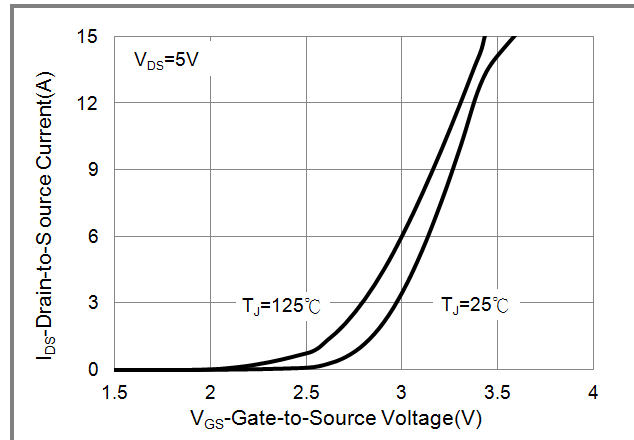


Fig.2 Transfer Characteristics

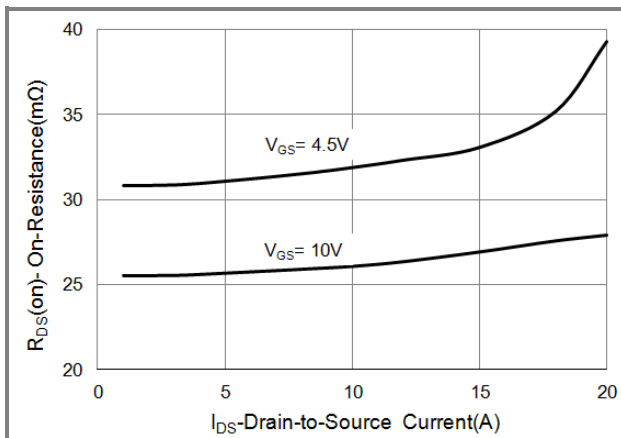


Fig.3 On-Resistance vs. Drain Current

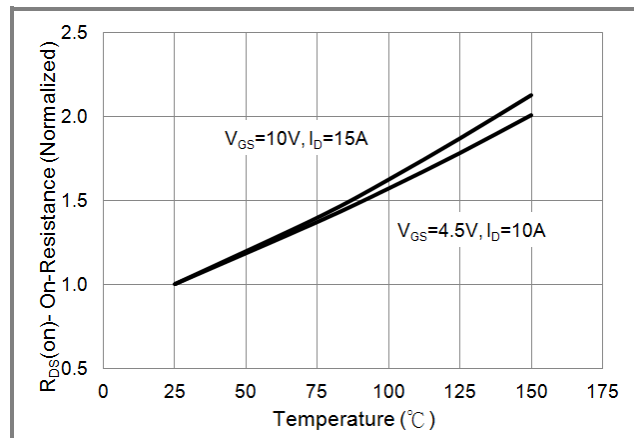


Fig.4 On-Resistance vs. Junction temperature

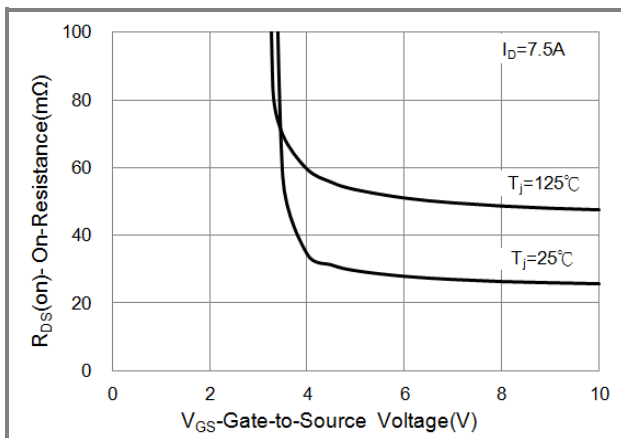


Fig.5 On-Resistance Variation with  $V_{GS}$ .

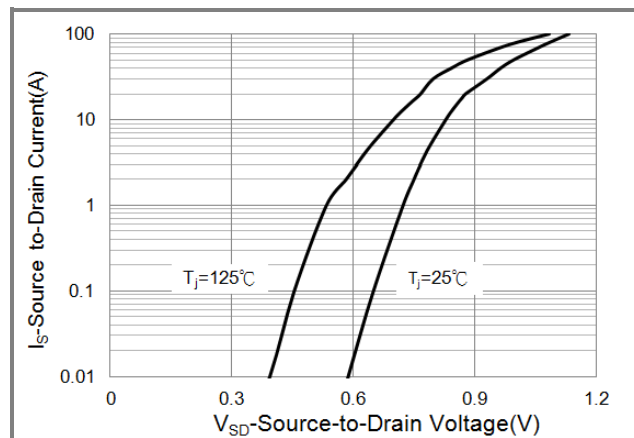


Fig.6 Source-Drain Diode Forward Voltage

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### TYPICAL CHARACTERISTIC CURVES

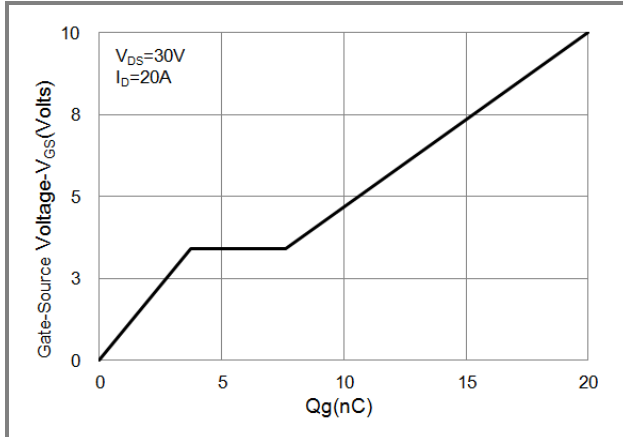


Fig.7 Gate-Charge Characteristics

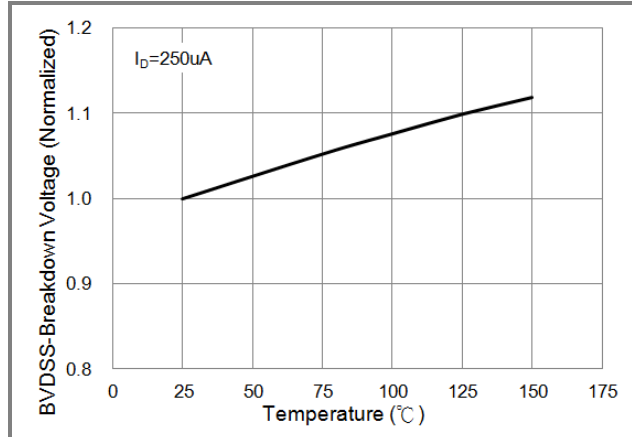


Fig.8 Breakdown Voltage Variation vs. Temperature

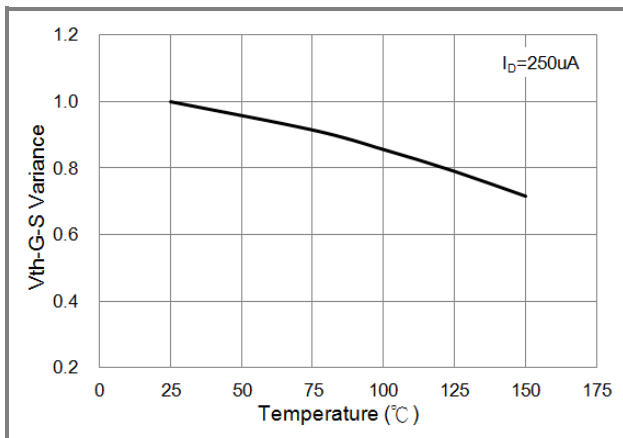


Fig.9 Threshold Voltage Variation with Temperature

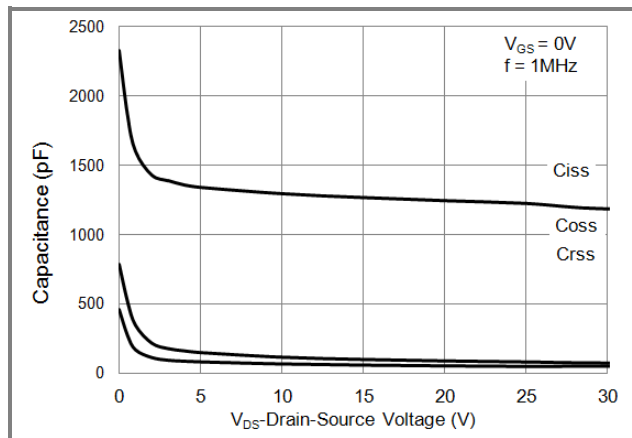


Fig.10 Capacitance vs. Drain-Source Voltage

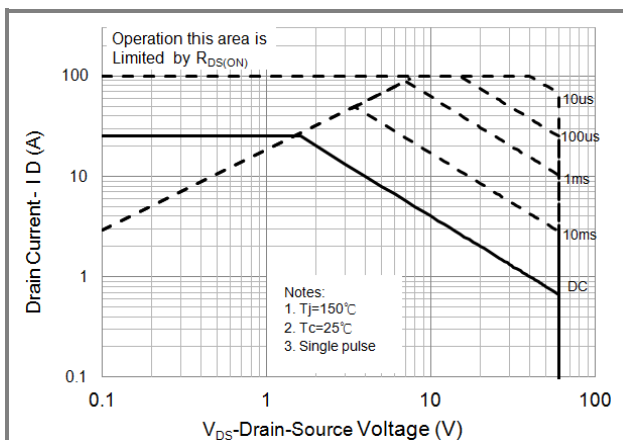
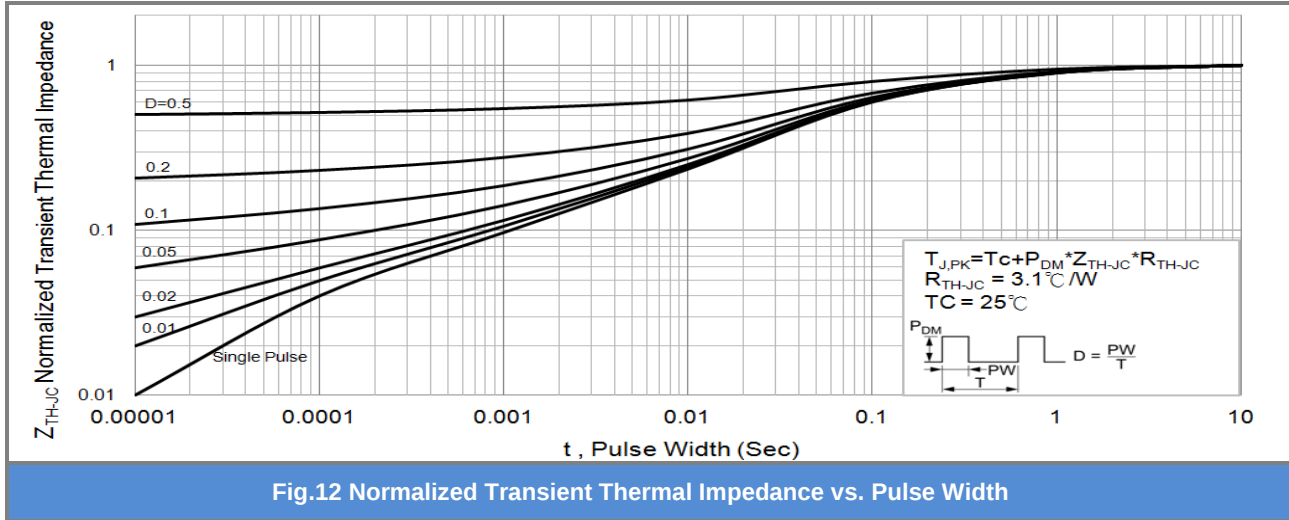


Fig.11 Maximum Safe Operating Area

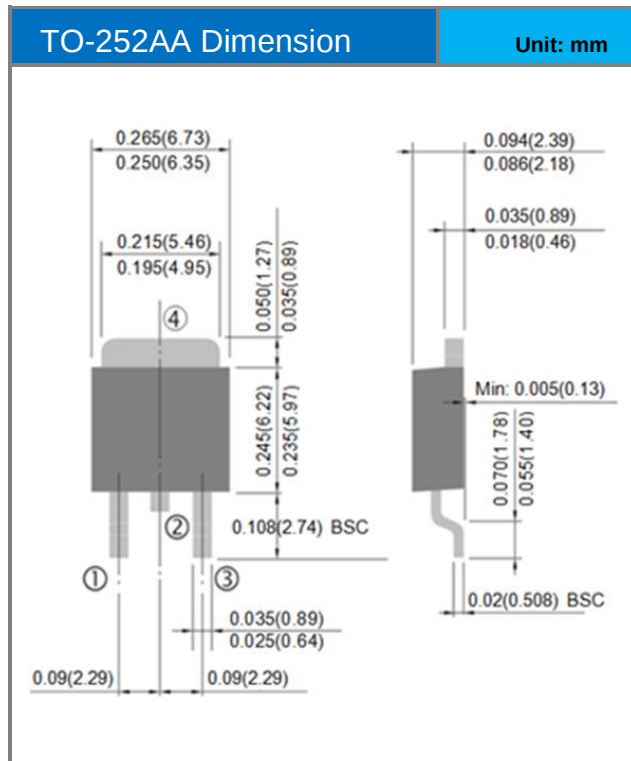
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### TYPICAL CHARACTERISTIC CURVES



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## Packaging Information

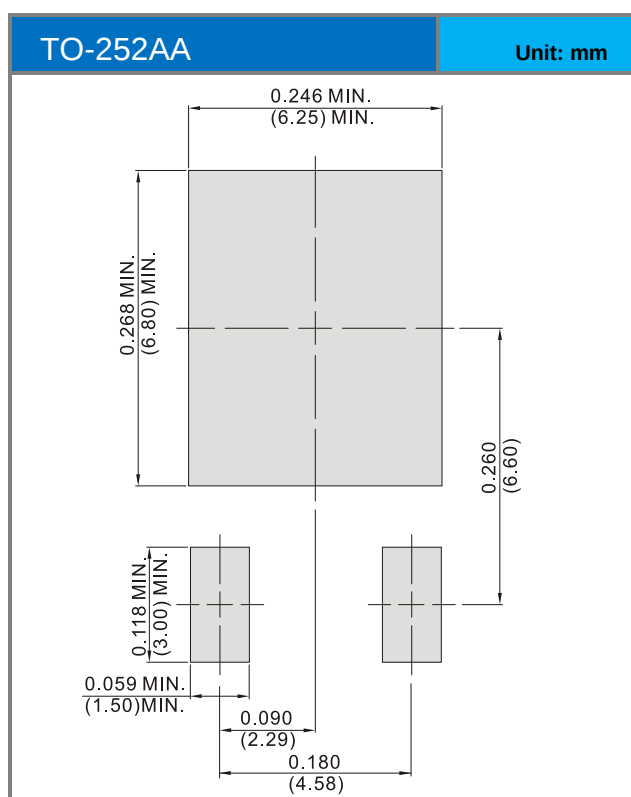


# PJD25N06A

## Product and Packing Information

| Part No.  | Package Type | Packing Type        | Marking |
|-----------|--------------|---------------------|---------|
| PJD25N06A | TO-252AA     | 3,000pcs / 13" reel | D25N06A |

## Mounting Pad Layout



## PJD25N06A

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