

# PJA3406

## 30V N-Channel Enhancement Mode MOSFET

**Voltage**

**30 V**

**Current**

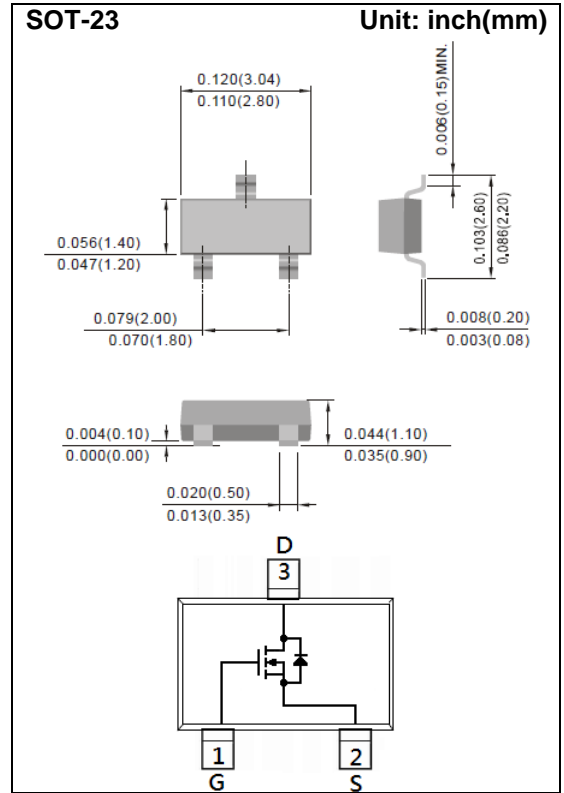
**4.4A**

### Features

- $R_{DS(ON)}$  ,  $V_{GS}@10V$  ,  $I_D@4.4A < 48m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@4.5V$  ,  $I_D@2.8A < 70m\Omega$
- Advanced Trench Process Technology
- Specially Designed for switch Load, PWM applications, and solid-state relays relay
- Lead free in compliance with EU RoHS 2011/65/EU directive.
- Green molding compound as per IEC61249 Std. (Halogen Free)

### Mechanical Data

- Case: SOT-23 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounces, 0.0084 grams
- Marking: A06



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

| PARAMETER  | SYMBOL          | LIMIT                           | UNITS              |                      |
|--|-----------------|---------------------------------|--------------------|----------------------|
| Drain-Source Voltage                             | $V_{DS}$        | 30                              | V                  |                      |
| Gate-Source Voltage                              | $V_{GS}$        | +20                             | V                  |                      |
| Continuous Drain Current                         | $I_D$           | 4.4                             | A                  |                      |
| Pulsed Drain Current                             | $I_{DM}$        | 17.6                            | A                  |                      |
| Power Dissipation                                | $P_D$           | $T_a=25^\circ\text{C}$          | 1.25               | W                    |
|  |                 | Derate above $25^\circ\text{C}$ | 10                 | mW/ $^\circ\text{C}$ |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$  | -55~150                         | $^\circ\text{C}$   |                      |
| Typical Thermal resistance                       | $R_{\theta JA}$ | 100                             | $^\circ\text{C/W}$ |                      |
| - Junction to Ambient (Note 3)                   |                 |                                 |                    |                      |

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

| PARAMETER   | SYMBOL              | TEST CONDITION  | MIN. | TYP. | MAX. | UNITS |
|---|---------------------|---|------|------|------|-------|
| <b>Static</b>   |                     |   |      |      |      |       |
| Drain-Source Breakdown Voltage                        | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA  | 30   | -    | -    | V     |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA  | 1.0  | 1.37 | 2.1  | V     |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =4.4A  | -    | 35   | 48   | mΩ    |
|   |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.8A   | -    | 51   | 70   |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V   | -    | 0.01 | 1    | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V  | -    | ±10  | ±100 | nA    |
| <b>Dynamic</b>  |                     |   |      |      |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =15V, I <sub>D</sub> =4.4A,<br>V <sub>GS</sub> =10V (Note 1,2)                        | -    | 5.8  | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |   | -    | 1    | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |   | -    | 1    | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V,<br>f=1.0MHZ  | -    | 235  | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |   | -    | 36   | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |   | -    | 24   | -    |       |
| <b>Switching</b>                                      |                     |   |      |      |      |       |
| Turn-On Delay Time                                    | t <sub>d(on)</sub>  | V <sub>DD</sub> =15V, I <sub>D</sub> =4.4A,<br>V <sub>GS</sub> =10V,<br>R <sub>G</sub> =6Ω (Note 1,2) | -    | 3    | -    | ns    |
| Turn-On Rise Time                                     | t <sub>r</sub>      |   | -    | 39   | -    |       |
| Turn-Off Delay Time                                   | t <sub>d(off)</sub> |   | -    | 23   | -    |       |
| Turn-Off Fall Time                                    | t <sub>f</sub>      |   | -    | 28   | -    |       |
| <b>Drain-Source Diode</b>                             |                     |   |      |      |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---   | -    | -    | 1.5  | A     |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V   | -    | 0.77 | 1.2  | V     |

**NOTES :**

1. Pulse width ≤ 300us, Duty cycle ≤ 2%
2. Essentially independent of operating temperature typical characteristics.
3. 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 FR-4 with 2oz. square pad of copper
4. The maximum current rating is package limited

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## TYPICAL CHARACTERISTIC CURVES

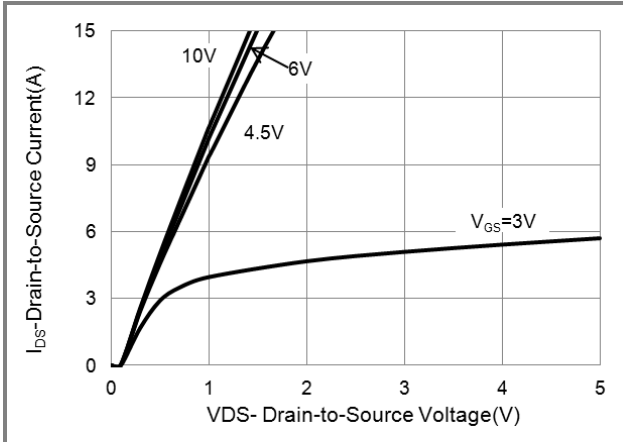


Fig.1 On-Region Characteristics

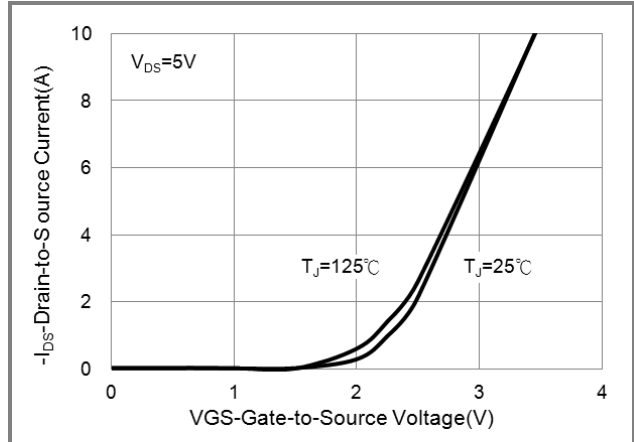


Fig.2 Transfer Characteristics

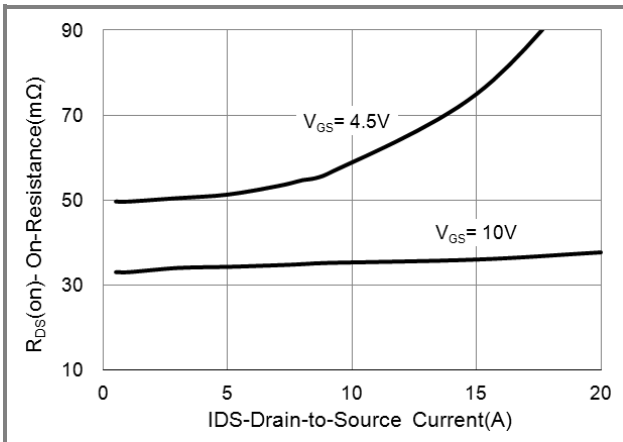


Fig.3 On-Resistance vs. Drain Current

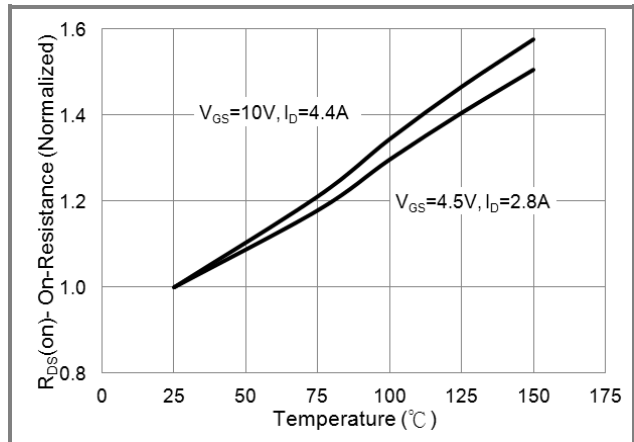


Fig.4 On-Resistance vs. Junction temperature

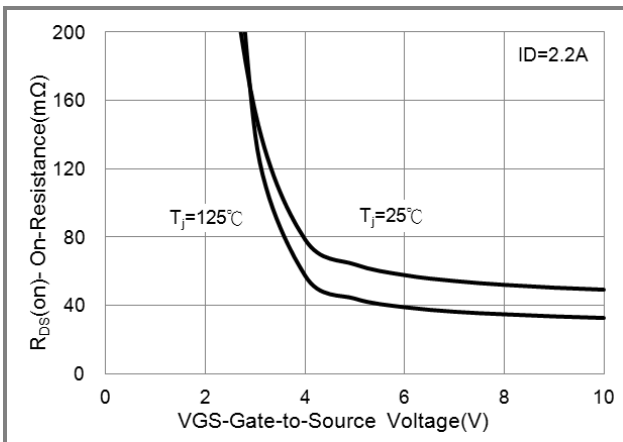


Fig.5 On-Resistance Variation with VGS.

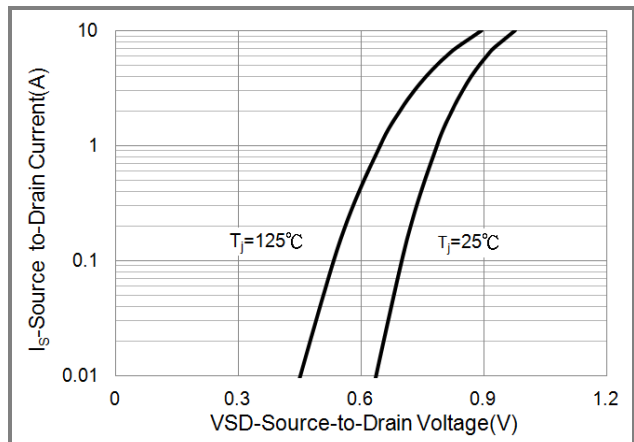


Fig.6 Body Diode Characteristics

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## TYPICAL CHARACTERISTIC CURVES

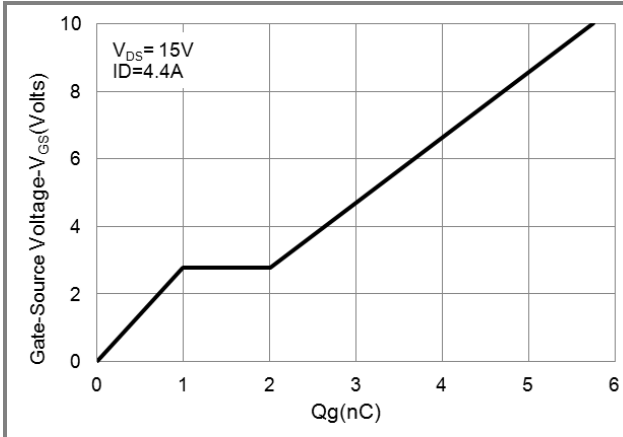


Fig.7 Gate-Charge Characteristics

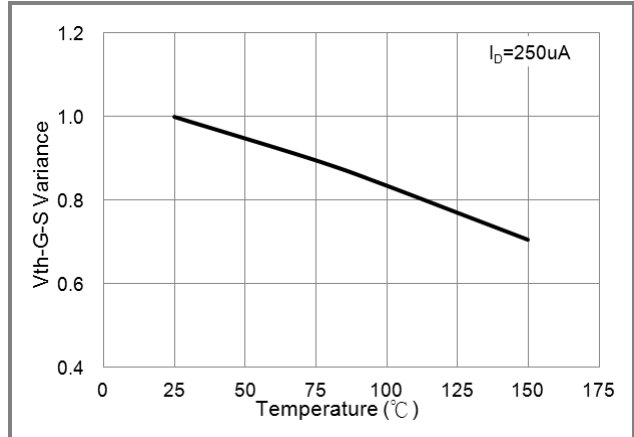


Fig.8 Threshold Voltage Variation with Temperature.

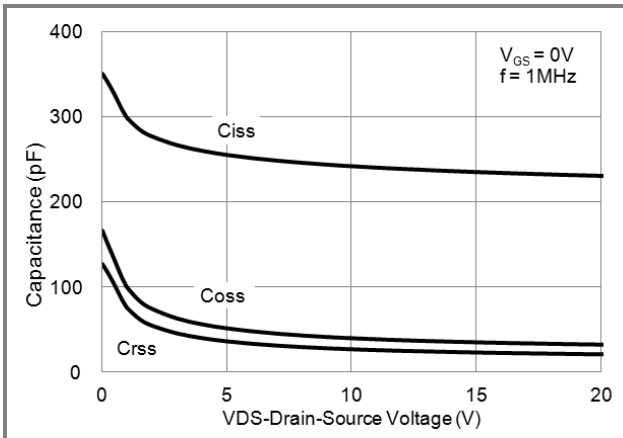


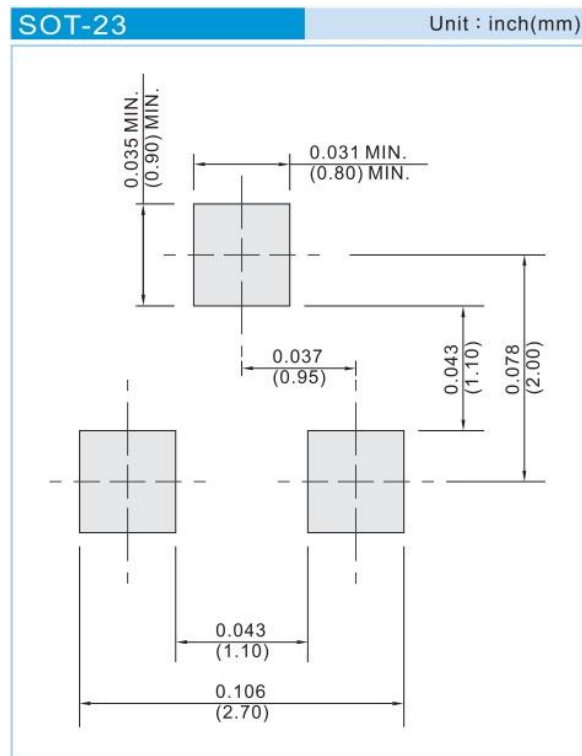
Fig.9 Capacitance vs. Drain-Source Voltage.

# PJA3406

## Product and Packing Information

| Part No. | Package Type | Packing Type     | Marking |
|----------|--------------|------------------|---------|
| PJA3406  | SOT-23       | 3K pcs / 7" reel | A06     |

## Mounting Pad Layout



## PJA3406

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