

## PJA3406

### 30V N-Channel Enhancement Mode MOSFET

**Voltage**

**30 V**

**Current**

**4.4A**

#### Features

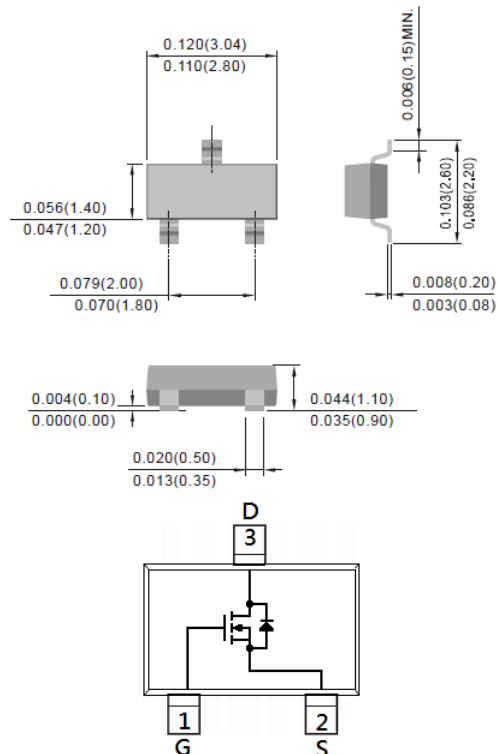
- $R_{DS(ON)}$  ,  $V_{GS}@10V$  ,  $I_D@4.4A < 48m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@4.5V$  ,  $I_D@2.8A < 70m\Omega$
- Advanced Trench Process Technology
- Specially Designed for switch Load, PWM applications, and solid-state relays relay
- Lead free in compliance with EU RoHS 2011/65/EU directive.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

**SOT-23**

**Unit: inch(mm)**



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

| PARAMETER                                        |                      | SYMBOL                            | LIMIT   | UNITS |
|--------------------------------------------------|----------------------|-----------------------------------|---------|-------|
| Drain-Source Voltage                             |                      | V <sub>DS</sub>                   | 30      | V     |
| Gate-Source Voltage                              |                      | V <sub>GS</sub>                   | ±20     | V     |
| Continuous Drain Current                         |                      | I <sub>D</sub>                    | 4.4     | A     |
| Pulsed Drain Current                             |                      | I <sub>DM</sub>                   | 17.6    | A     |
| Power Dissipation                                | T <sub>a</sub> =25°C | P <sub>D</sub>                    | 1.25    | W     |
|                                                  | Derate above 25°C    |                                   | 10      | mW/°C |
| Operating Junction and Storage Temperature Range |                      | T <sub>J</sub> , T <sub>STG</sub> | -55~150 | °C    |
| Typical Thermal resistance                       |                      | R <sub>θJA</sub>                  | 100     | °C/W  |
| - Junction to Ambient <sup>(Note 3)</sup>        |                      |                                   |         |       |



# PJA3406

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

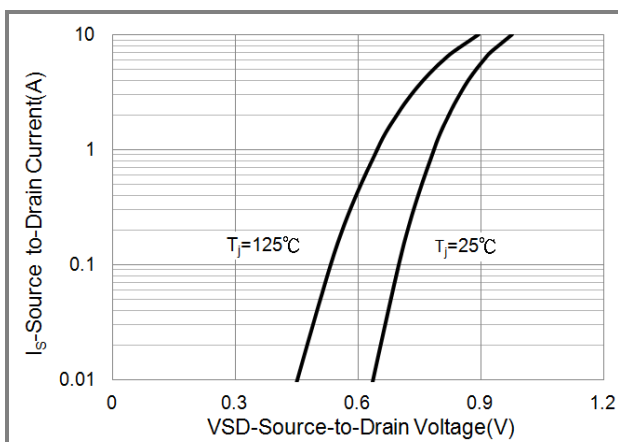
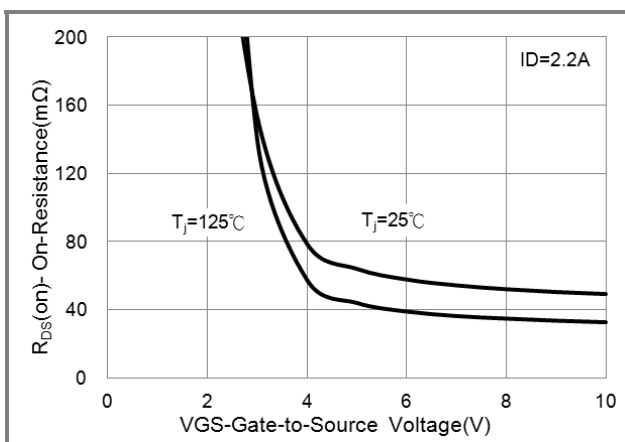
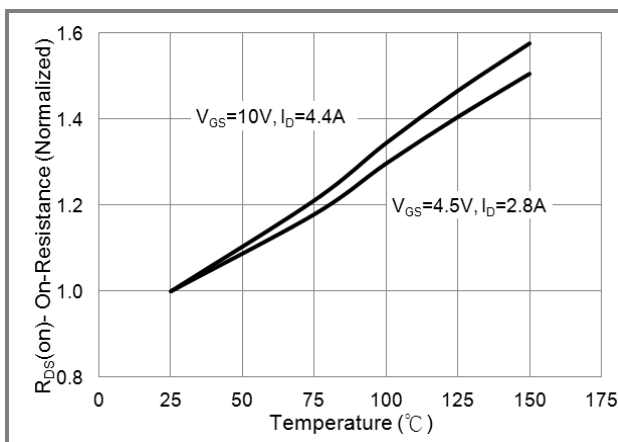
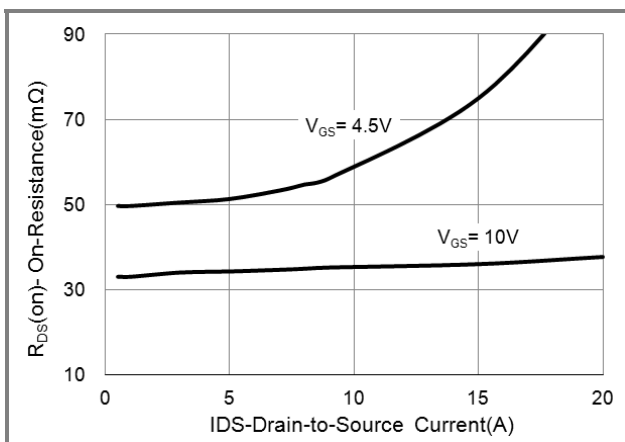
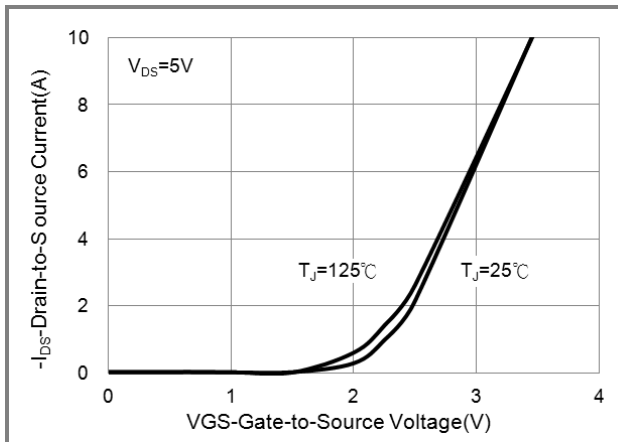
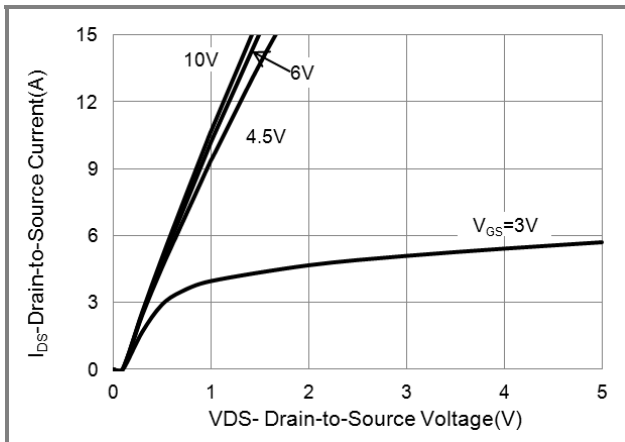
| PARAMETER                                             | SYMBOL              | TEST CONDITION                                                                                        | MIN. | TYP.        | MAX.         | UNITS |
|-------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------|------|-------------|--------------|-------|
| Static                                                |                     |                                                                                                       |      |             |              |       |
| Drain-Source Breakdown Voltage                        | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                                            | 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> = <u>±</u> 20V, V <sub>DS</sub> =0V                                                   | -    | <u>±</u> 10 | <u>±</u> 100 | nA    |
| Dynamic                                               |                     |                                                                                                       |      |             |              |       |
| 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          | -            |       |
| Switching                                             |                     |                                                                                                       |      |             |              |       |
| Turn-On Delay Time                                    | td <sub>(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                                     | tr                  |                                                                                                       | -    | 39          | -            |       |
| Turn-Off Delay Time                                   | td <sub>(off)</sub> |                                                                                                       | -    | 23          | -            |       |
| Turn-Off Fall Time                                    | tf                  |                                                                                                       | -    | 28          | -            |       |
| Drain-Source Diode                                    |                     |                                                                                                       |      |             |              |       |
| 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  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics.
3.  $R_{\theta JA}$  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 FR-4 with 2oz. square pad of copper
4. The maximum current rating is package limited

# PJA3406

## TYPICAL CHARACTERISTIC CURVES





## PJA3406

### TYPICAL CHARACTERISTIC CURVES

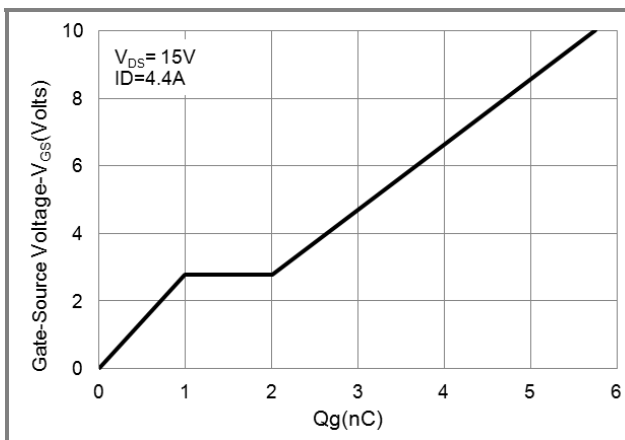


Fig.7 Gate-Charge Characteristics

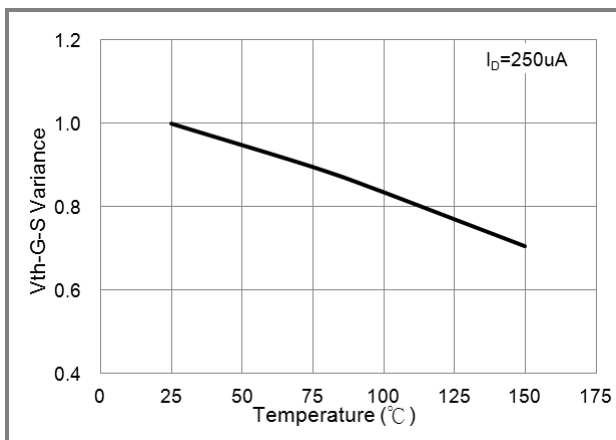


Fig.8 Threshold Voltage Variation with Temperature.

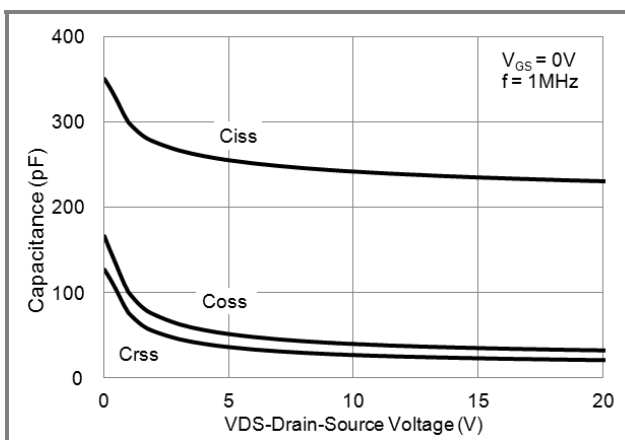


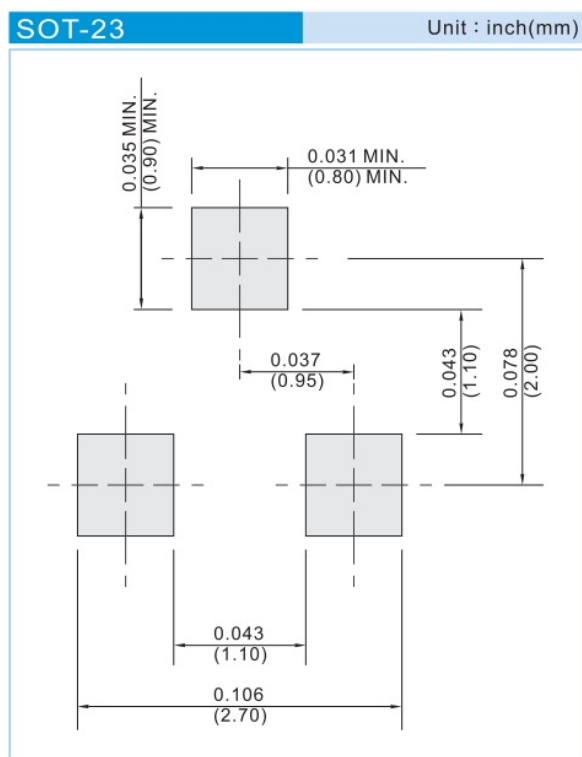
Fig.9 Capacitance vs. Drain-Source Voltage.

## PJA3406

### PART NO PACKING CODE VERSION

| Part No Packing Code | Package Type | Packing type       | Marking | Version      |
|----------------------|--------------|--------------------|---------|--------------|
| PJA3406_R1_00001     | SOT-23       | 3K pcs / 7" reel   | A06     | Halogen free |
| PJA3406_R2_00001     | SOT-23       | 12K pcs / 13" reel | A06     | Halogen free |

### MOUNTING PAD LAYOUT





## PJA3406

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