

# PJA3428

## 30V N-Channel Enhancement Mode MOSFET

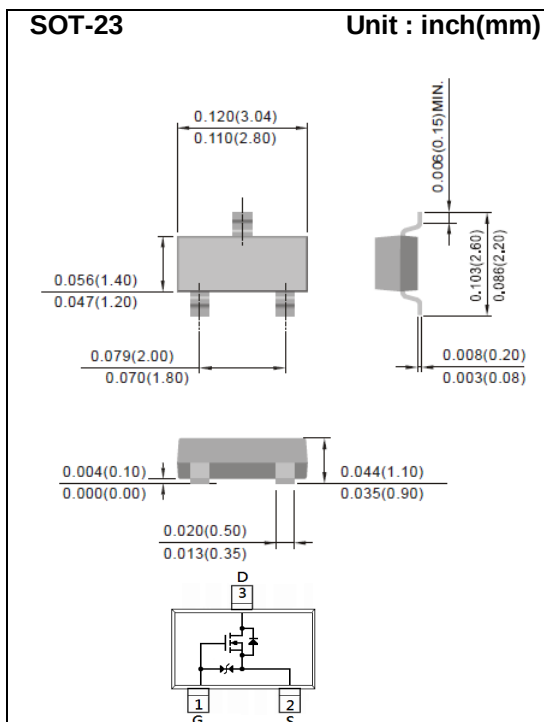
|                |             |                |              |
|----------------|-------------|----------------|--------------|
| <b>Voltage</b> | <b>30 V</b> | <b>Current</b> | <b>300mA</b> |
|----------------|-------------|----------------|--------------|

### Features

- Advanced Trench Process Technology
- ESD Protected
- Specially Designed for Relay driver, Speed line drive, etc.
- 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



## 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>                   | ±10     | V     |
| Continuous Drain Current                         |                      | I <sub>D</sub>                    | 300     | mA    |
| Pulsed Drain Current                             |                      | I <sub>DM</sub>                   | 600     | mA    |
| Power Dissipation                                | T <sub>A</sub> =25°C | P <sub>D</sub>                    | 500     | mW    |
|                                                  | Derate above 25°C    |                                   | 4       | 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>                  | 250     | °C/W  |
| - Junction to Ambient <sup>(Note 3)</sup>        |                      |                                   |         |       |



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## 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                                               | 0.4  | 0.75 | 1.0  | V     |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =300mA                                                           | -    | 0.7  | 1.2  | Ω     |
|                                                       |                     | V <sub>GS</sub> =2.5V, I <sub>D</sub> =200mA                                                           | -    | 0.8  | 1.6  |       |
|                                                       |                     | V <sub>GS</sub> =1.8V, I <sub>D</sub> =100mA                                                           | -    | 0.9  | 2.0  |       |
|                                                       |                     | V <sub>GS</sub> =1.5V, I <sub>D</sub> =50mA                                                            | -    | 1.1  | 3.0  |       |
|                                                       |                     | V <sub>GS</sub> =1.2V, I <sub>D</sub> =20mA                                                            | -    | 1.5  | 4.0  |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =24V, V <sub>GS</sub> =0V                                                              | -    | -    | 1    | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V                                                              | -    | -    | ±10  | uA    |
| Dynamic (Note 4)                                      |                     |                                                                                                        |      |      |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =10V, I <sub>D</sub> =300mA,<br>V <sub>GS</sub> =4.5V                                  | -    | 0.9  | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |                                                                                                        | -    | 0.3  | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |                                                                                                        | -    | 0.2  | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V,<br>f=1.0MHZ                                                 | -    | 45   | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |                                                                                                        | -    | 14   | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |                                                                                                        | -    | 0.8  | -    |       |
| Turn-On Delay Time                                    | td <sub>(on)</sub>  | V <sub>DD</sub> =10V, I <sub>D</sub> =300mA,<br>V <sub>GS</sub> =4V,<br>R <sub>G</sub> =10Ω (Note 1,2) | -    | 8.3  | -    | ns    |
| Turn-On Rise Time                                     | tr                  |                                                                                                        | -    | 5.7  | -    |       |
| Turn-Off Delay Time                                   | td <sub>(off)</sub> |                                                                                                        | -    | 35   | -    |       |
| Turn-Off Fall Time                                    | tf                  |                                                                                                        | -    | 12   | -    |       |
| Drain-Source Diode                                    |                     |                                                                                                        |      |      |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---                                                                                                    | -    | -    | 300  | mA    |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =300mA, V <sub>GS</sub> =0V                                                             | -    | 0.9  | 1.3  | 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 square pad of copper
4. Guaranteed by design, not subject to production testing

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## TYPICAL CHARACTERISTIC CURVES

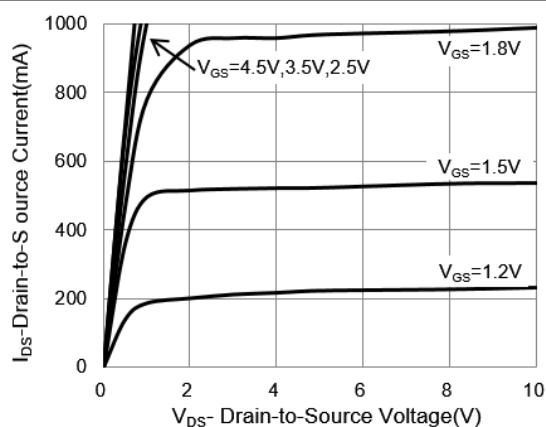


Fig.1 On-Region Characteristics

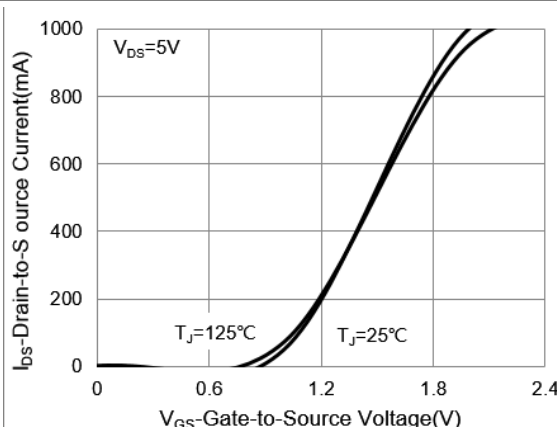


Fig.2 Transfer Characteristics

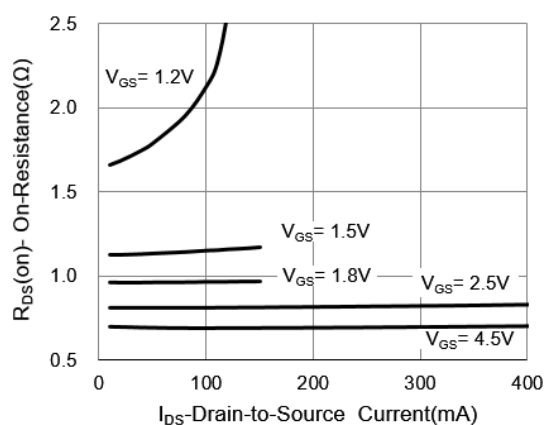


Fig.3 On-Resistance vs. Drain Current

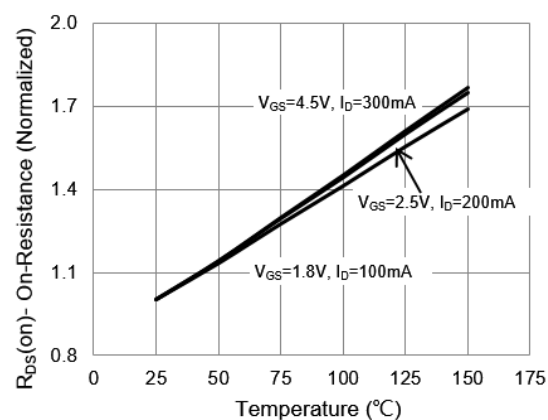


Fig.4 On-Resistance vs. Junction temperature

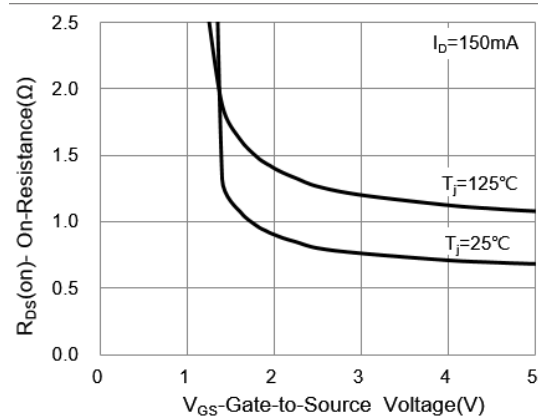


Fig.5 On-Resistance Variation with  $V_{GS}$ .

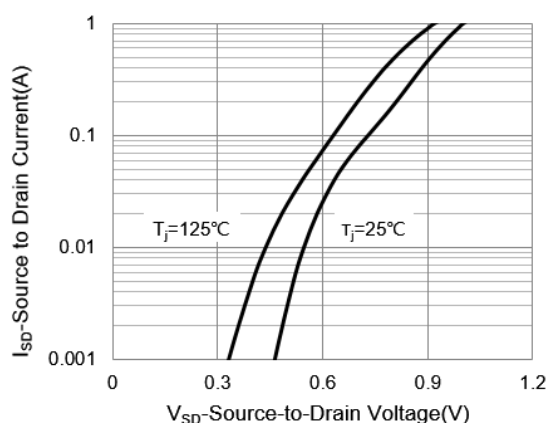


Fig.6 Body Diode Characteristics



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### TYPICAL CHARACTERISTIC CURVES

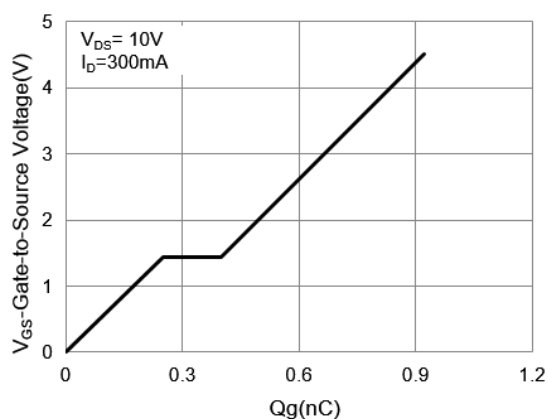


Fig.7 Gate-Charge Characteristics

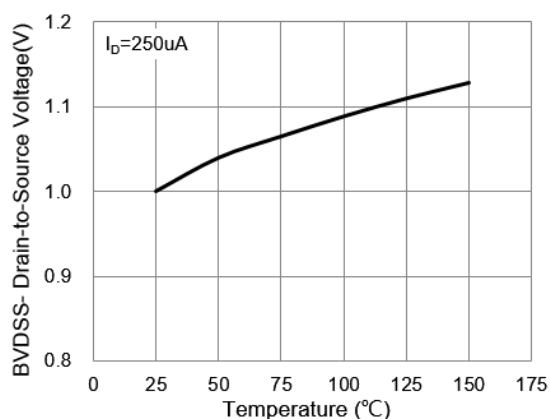


Fig.8 Breakdown Voltage Variation vs. Temperature

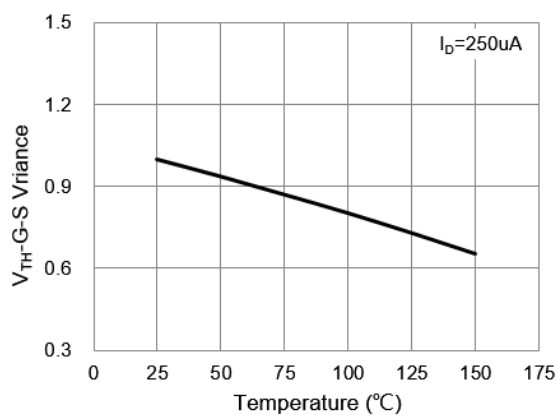


Fig.9 Threshold Voltage Variation with Temperature.

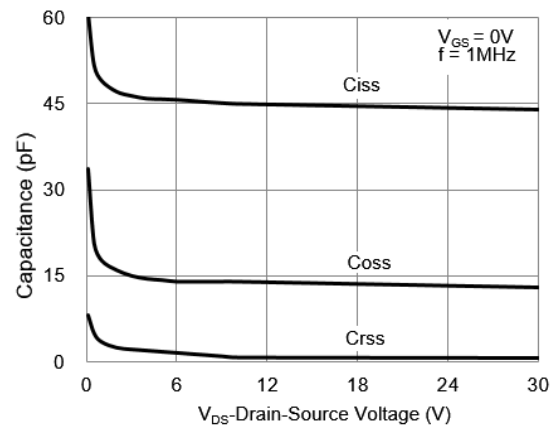


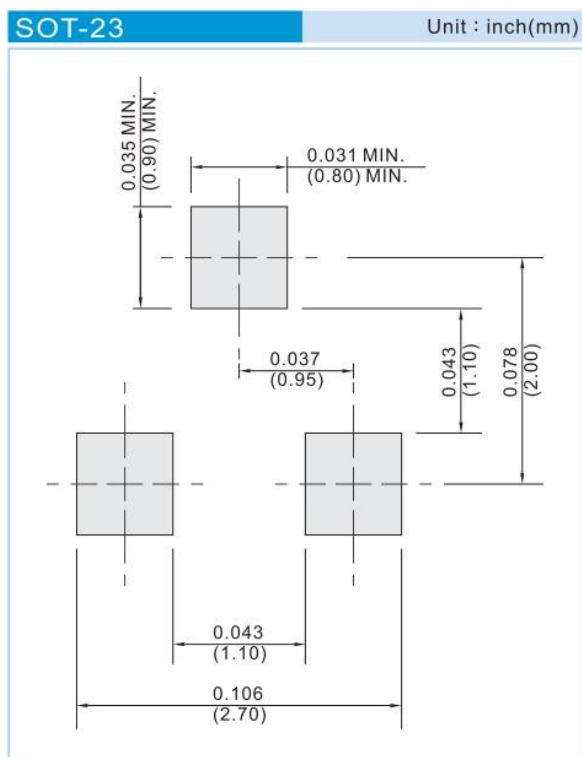
Fig.10 Capacitance vs. Drain-Source Voltage.

# PJA3428

## PART NO PACKING CODE VERSION

| PART NO PACKING CODE | Package Type | Packing Type       | Marking | Version      |
|----------------------|--------------|--------------------|---------|--------------|
| PJA3428_R1_00001     | SOT-23       | 3K pcs / 7" reel   | A28     | Halogen free |
| PJA3428_R2_00001     | SOT-23       | 12K pcs / 13" reel | A28     | Halogen free |

## MOUNTING PAD LAYOUT





## PJA3428

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