

# PJS6403

## 30V P-Channel Enhancement Mode MOSFET

**Voltage**

**-30 V**

**Current**

**-6.4A**

### Features

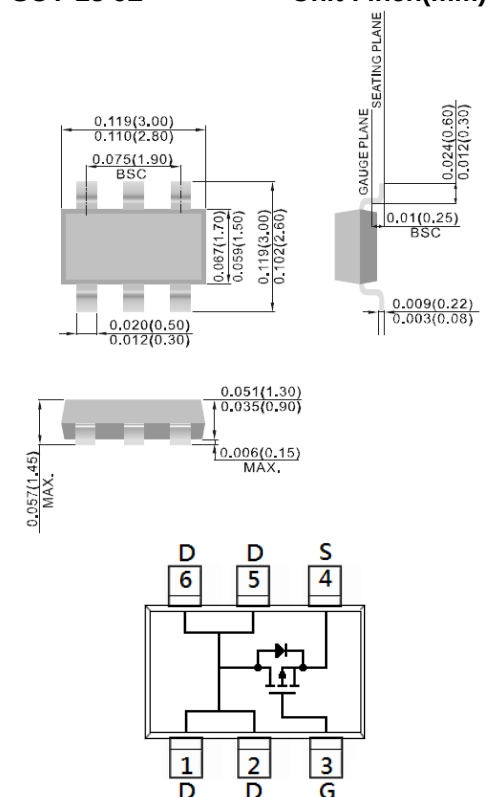
- $R_{DS(ON)}$ ,  $V_{GS}@-10V$ ,  $I_D@-4A < 32m\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@-4.5V$ ,  $I_D@-2A < 46m\Omega$
- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, etc
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : SOT-23 6L Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0005 ounces, 0.014 grams

**SOT-23 6L**

**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     |       |
| Continuous Drain Current <sup>(Note 4)</sup>     |                      | I <sub>D</sub>                    | -6.4    | A     |
| Pulsed Drain Current <sup>(Note 1,3)</sup>       |                      | I <sub>DM</sub>                   | -46     |       |
| Power Dissipation                                | T <sub>a</sub> =25°C | P <sub>D</sub>                    | 2       | W     |
|                                                  | Derate above 25°C    |                                   | 16      | 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>                  | 62.5    | °C/W  |
| - Junction to Ambient <sup>(Note 5)</sup>        |                      |                                   |         |       |



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## Electrical Characteristics (T<sub>A</sub>=25 °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   | -1.6  | -2.5 |       |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-4A                                                                        | -    | 27    | 32   | mΩ    |
|                                                       |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A                                                                       | -    | 38    | 46   |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V                                                                        | -    | -     | -1   | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                                        | -    | -     | ±100 | nA    |
| Dynamic <sup>(Note 6)</sup>                           |                     |                                                                                                                   |      |       |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =-15V, I <sub>D</sub> =-5A,<br>V <sub>GS</sub> =-4.5V <sup>(Note 2,3)</sup>                       | -    | 7.8   | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |                                                                                                                   | -    | 2.7   | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |                                                                                                                   | -    | 2.8   | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V,<br>f=1MHZ                                                             | -    | 870   | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |                                                                                                                   | -    | 130   | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |                                                                                                                   | -    | 93    | -    |       |
| Turn-On Delay Time                                    | td <sub>(on)</sub>  | V <sub>DD</sub> =-15V, I <sub>D</sub> =-1A,<br>V <sub>GS</sub> =-10V,<br>R <sub>G</sub> =6Ω <sup>(Note 2,3)</sup> | -    | 6.5   | -    | ns    |
| Turn-On Rise Time                                     | tr                  |                                                                                                                   | -    | 8.8   | -    |       |
| Turn-Off Delay Time                                   | td <sub>(off)</sub> |                                                                                                                   | -    | 73    | -    |       |
| Turn-Off Fall Time                                    | tf                  |                                                                                                                   | -    | 44    | -    |       |
| Drain-Source Diode                                    |                     |                                                                                                                   |      |       |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---                                                                                                               | -    | -     | -2   | A     |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =-1A, V <sub>GS</sub> =0V                                                                          |      | -0.75 | -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<sub>J(MAX)</sub>=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. Guaranteed by design, not subject to production testing

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## TYPICAL CHARACTERISTIC CURVES

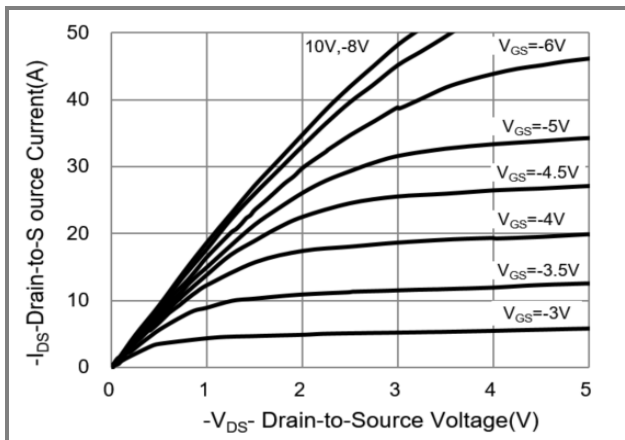


Fig.1 On-Region Characteristics

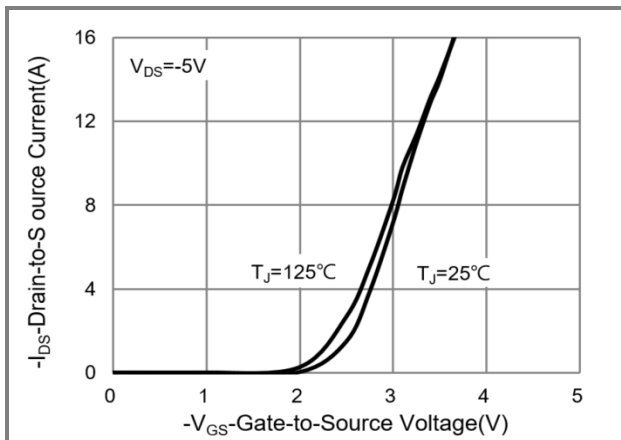


Fig.2 Transfer Characteristics

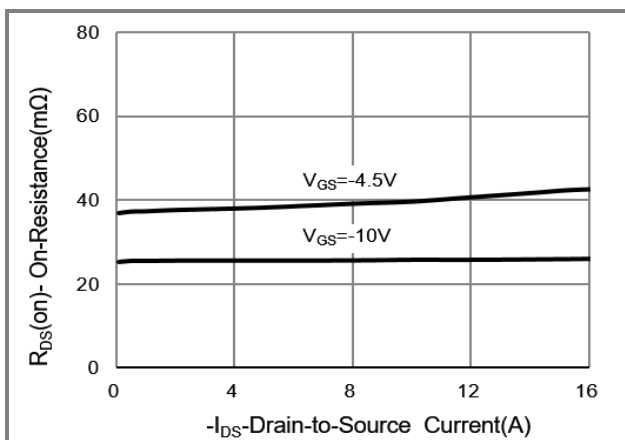


Fig.3 On-Resistance vs. Drain Current

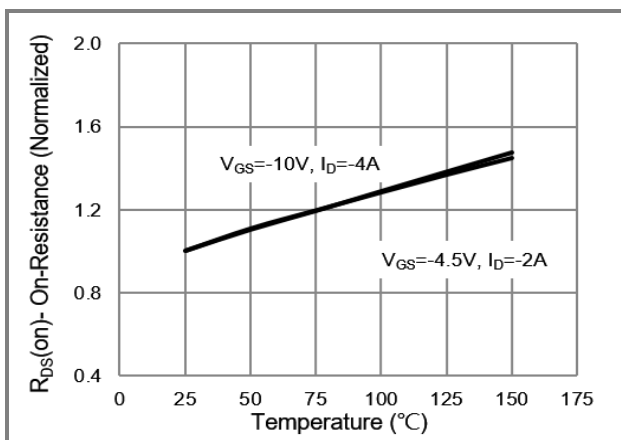


Fig.4 On-Resistance vs. Junction temperature

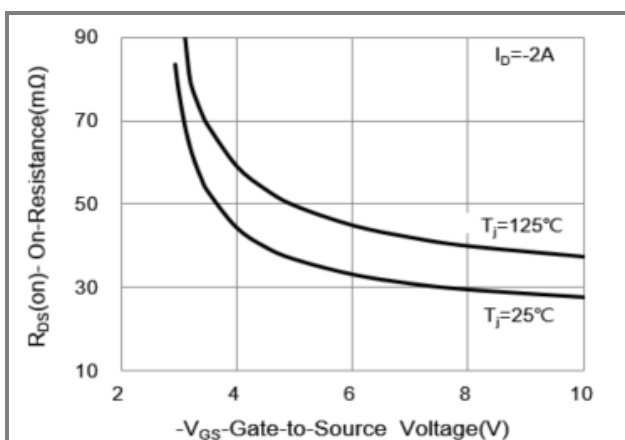


Fig.5 On-Resistance Variation with  $V_{GS}$

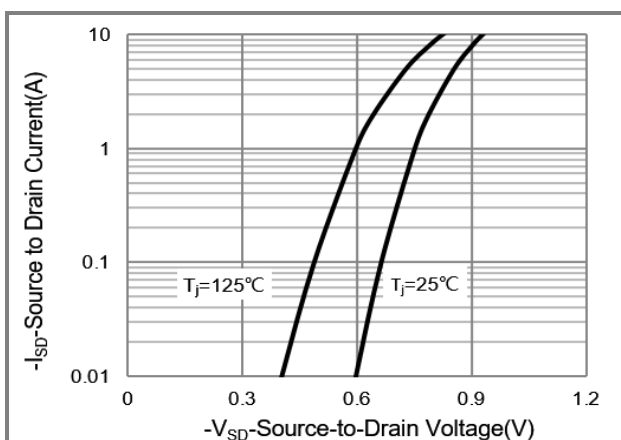


Fig.6 Body Diode Characteristics



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### TYPICAL CHARACTERISTIC CURVES

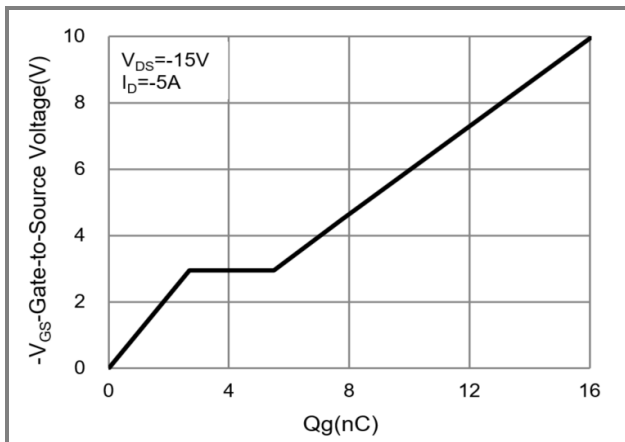


Fig.7 Gate-Charge Characteristics

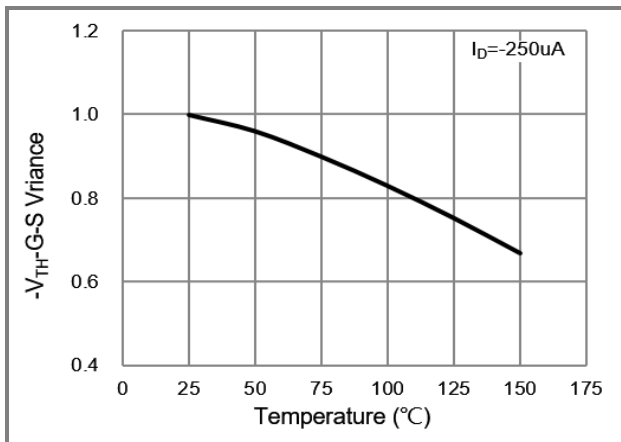


Fig.8 Threshold Voltage Variation with Temperature

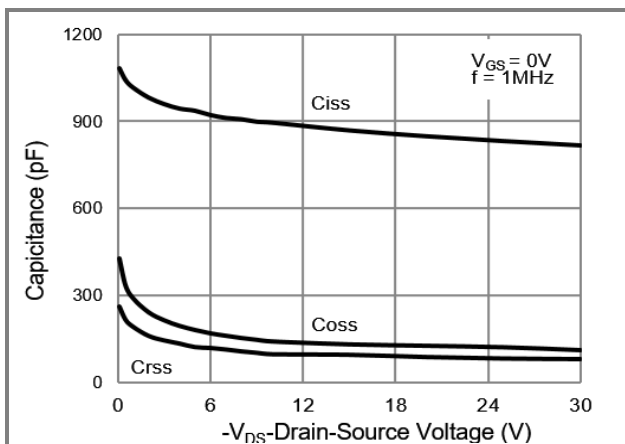


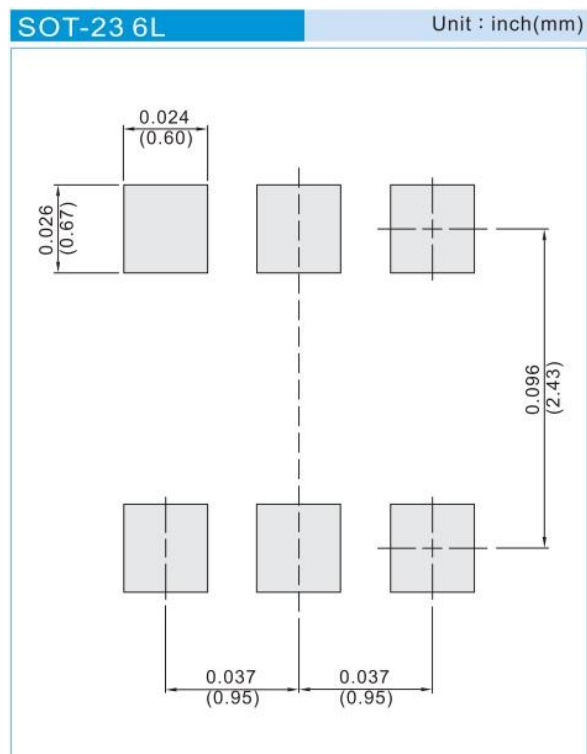
Fig.9 Capacitance vs. Drain-Source Voltage

## PJS6403

### Part No Packing Code Version

| Part No Packing Code | Package Type | Packing Type     | Marking | Version      |
|----------------------|--------------|------------------|---------|--------------|
| PJS6403_S1_00001     | SOT-23 6L    | 3K pcs / 7" reel | S03     | Halogen free |

### Mounting Pad Layout





## PJS6403

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