



# PJS6417

## 20V P-Channel Enhancement Mode MOSFET

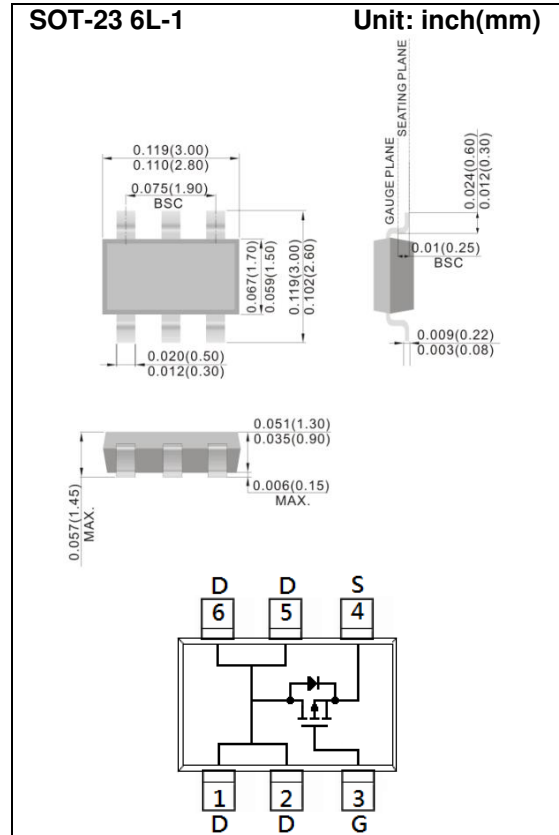
**Voltage**    **-20 V**    **Current**    **-6.5A**

### Features

- $R_{DS(ON)}$  ,  $V_{GS}@-4.5V$  ,  $I_D@-6.5A < 35m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@-2.5V$  ,  $I_D@-4.6A < 40m\Omega$
- $R_{DS(ON)}$  ,  $V_{GS}@-1.8V$  ,  $I_D@-2.6A < 50m\Omega$
- 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-1 Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0005 ounces, 0.0141 grams
- Marking: S17



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

| PARAMETER  |                           | SYMBOL          | LIMIT   | UNITS          |
|--|---------------------------|-----------------|---------|----------------|
| Drain-Source Voltage                             |                           | $V_{DS}$        | -20     | V              |
| Gate-Source Voltage                              |                           | $V_{GS}$        | $\pm 8$ | V              |
| Continuous Drain Current                         |                           | $I_D$           | -6.5    | A              |
| Pulsed Drain Current                             |                           | $I_{DM}$        | -26     | A              |
| Power Dissipation                                | $T_a=25^\circ C$          | $P_D$           | 2       | W              |
|  | Derate above $25^\circ C$ |                 | 16      | mW/ $^\circ C$ |
| Operating Junction and Storage Temperature Range |                           | $T_J, T_{STG}$  | -55~150 | $^\circ C$     |
| Typical Thermal Resistance                       |                           | $R_{\theta JA}$ | 62.5    | $^\circ C/W$   |
| - 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   | -20   | -     | -    | V     |
| Gate Threshold Voltage                                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA   | -0.35 | -0.59 | -0.9 | V     |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-6.5A   | -     | 29    | 35   | mΩ    |
|   |                     | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-4.6A   | -     | 33    | 40   |       |
|   |                     | V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-2.6A   | -     | 40    | 50   |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V  | -     | -0.01 | -1   | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V   | -     | ±10   | ±100 | nA    |
| <b>Dynamic</b>  |                     |   |       |       |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =-10V, I <sub>D</sub> =-6.5A,<br>V <sub>GS</sub> =-4.5V (Note 1,2)                        | -     | 18.9  | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |   | -     | 2.8   | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |   | -     | 4.2   | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V,<br>f=1.0MHZ   | -     | 1760  | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |   | -     | 148   | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |   | -     | 120   | -    |       |
| <b>Switching</b>                                      |                     |   |       |       |      |       |
| Turn-On Delay Time                                    | t <sub>d(on)</sub>  | V <sub>DS</sub> =-10V, I <sub>D</sub> =-6.5A,<br>V <sub>GS</sub> =-4.5V,<br>R <sub>G</sub> =6Ω (Note 1,2) | -     | 12    | -    | ns    |
| Turn-On Rise Time                                     | t <sub>r</sub>      |   | -     | 68    | -    |       |
| Turn-Off Delay Time                                   | t <sub>d(off)</sub> |   | -     | 82    | -    |       |
| Turn-Off Fall Time                                    | t <sub>f</sub>      |   | -     | 35    | -    |       |
| <b>Drain-Source Diode</b>                             |                     |   |       |       |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---   | -     | -     | -2.0 | A     |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V  | -     | -0.69 | -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

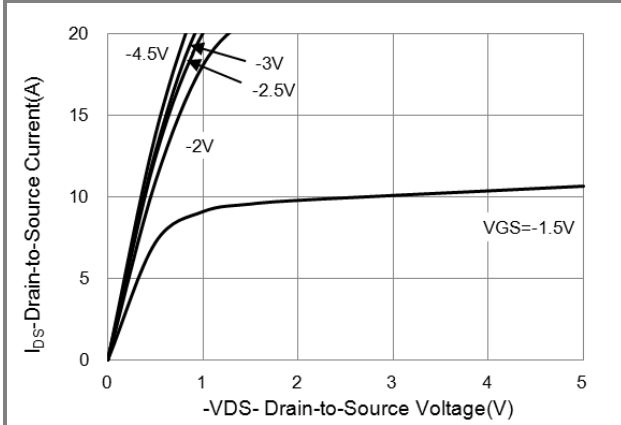


Fig.1 On-Region Characteristics

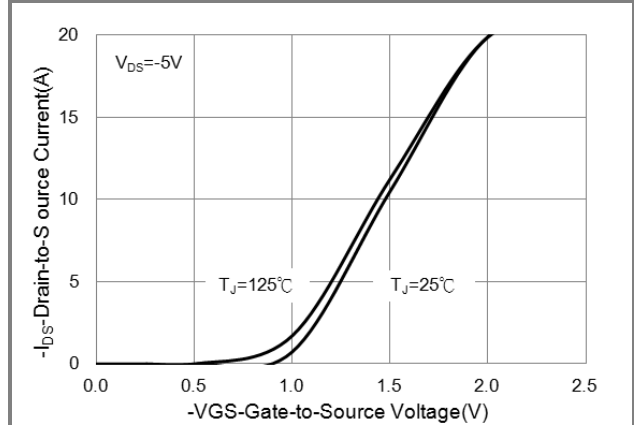


Fig.2 Transfer Characteristics

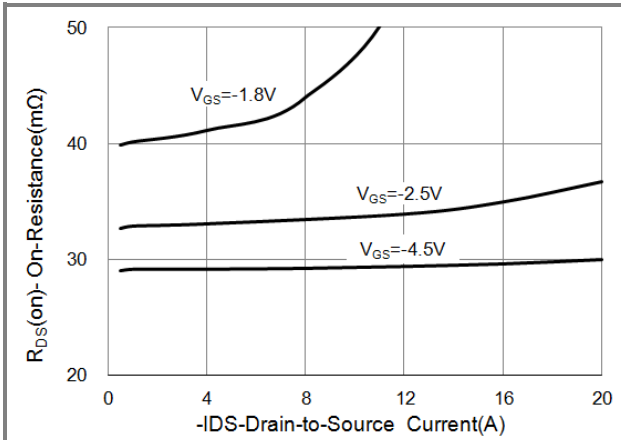


Fig.3 On-Resistance vs. Drain Current

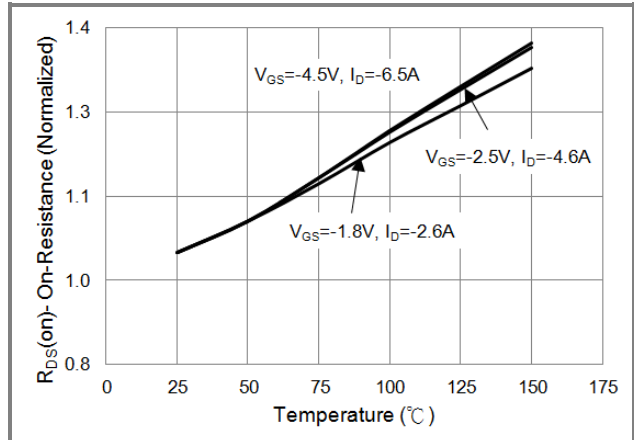


Fig.4 On-Resistance vs. Junction temperature

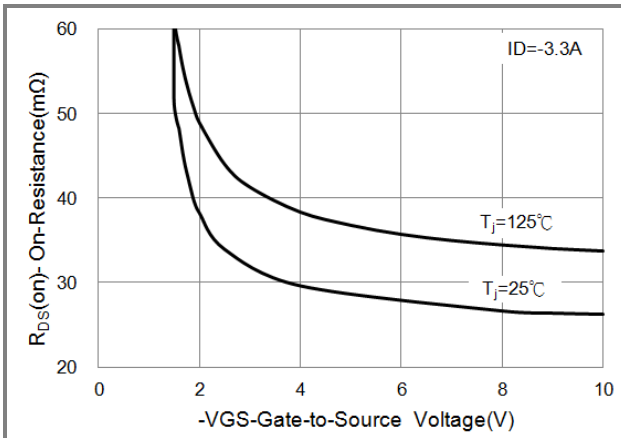


Fig.5 On-Resistance Variation with VGS.

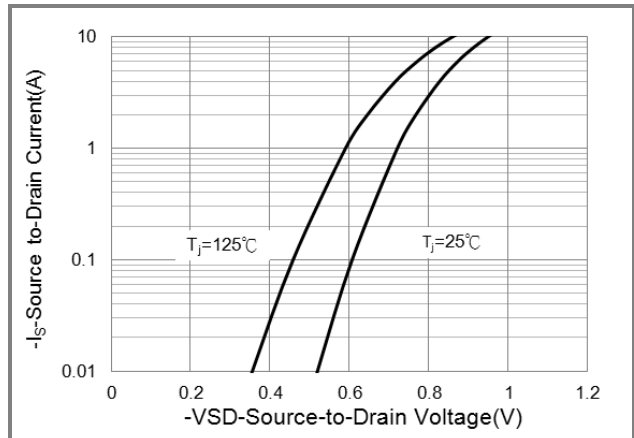


Fig.6 Body Diode Characteristics



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## TYPICAL CHARACTERISTIC CURVES

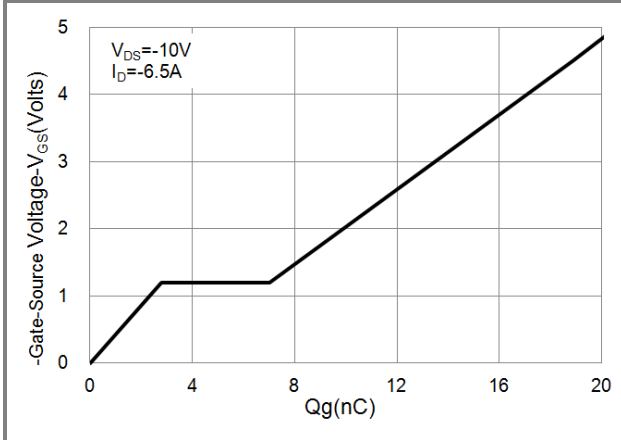


Fig.7 Gate-Charge Characteristics

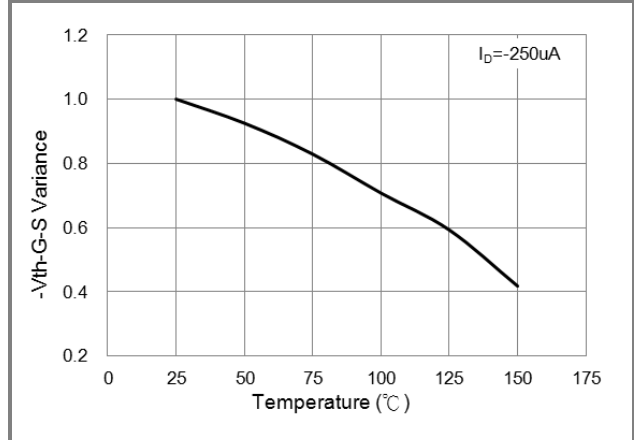


Fig.8 Threshold Voltage Variation with Temperature

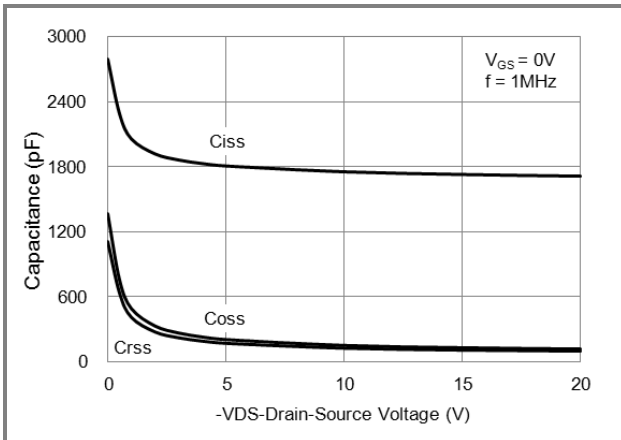


Fig.9 Threshold Voltage Variation with Temperature.

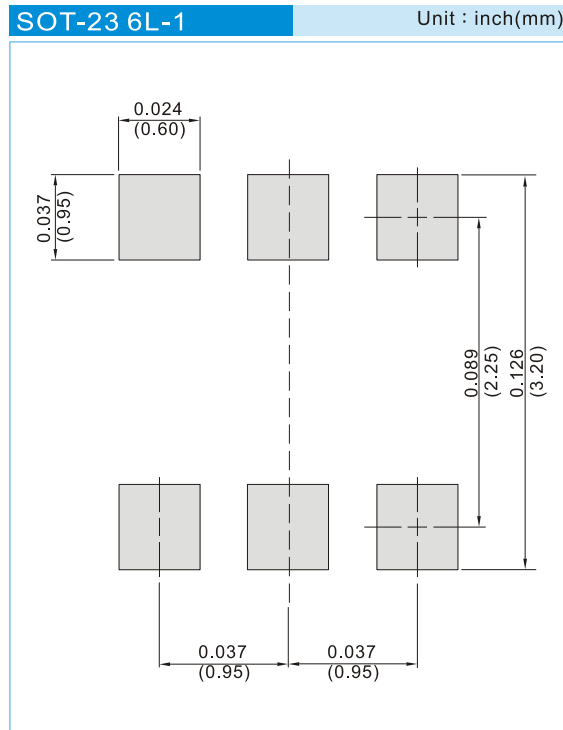


# PJS6417

## PART NO. PACKING CODE VERSION

| Part No. Packing Code | Package Type | Packing Type     | Marking | Version                        |
|-----------------------|--------------|------------------|---------|--------------------------------|
| PJS6417_S1_00001      | SOT-23 6L-1  | 3K pcs / 7" reel | S17     | Halogen free<br>RoHS compliant |

## MOUNTING PAD LAYOUT





## PJS6417

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