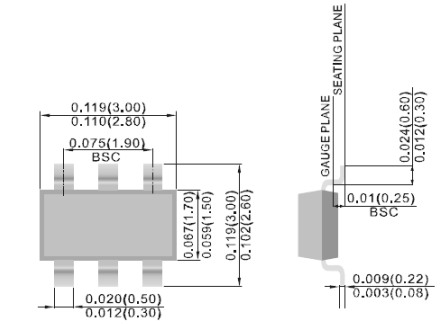
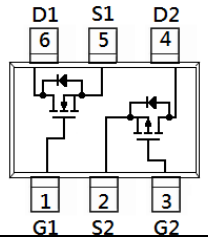
# PJS6601

## 20V Complementary Enhancement Mode MOSFET

| Voltage | 20 / -20V | Current | 4.1 /-3.1A |
|---|---|---|---|

SOT-23 6L Unit: inch(mm)




### Features

- Advanced Trench Process Technology
- Specially Designed for Switch Load, PWM Application, 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 6L Package
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0005 ounces, 0.014 grams
- Marking: SC1

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

| PARAMETER | | SYMBOL | N-Ch LIMIT | P-Ch LIMIT | UNITS |
|---|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 20 | -20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±12 | ±12 | V |
| Continuous Drain Current | | $I_D$ | 4.1 | -3.1 | A |
| Pulsed Drain Current (Note 4) | | $I_{DM}$ | 16.4 | -12.4 | A |
| Power Dissipation | $T_a$=25°C | $P_D$ | 1.25 | | W |
| | Derate above 25°C | | 10 | | mW/°C |
| Operating Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55~150 | | °C |
| Typical Thermal Resistance<br>- Junction to Ambient (Note 3) | | $R_{\theta JA}$ | 100 | | °C/W |

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## N-Channel Electrical Characteristics ($T_A$=25°C unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=250uA | 20 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250uA | 0.4 | 0.66 | 1.2 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=4.5V, $I_D$=4.1A | - | 41 | 56 | mΩ |
| | | $V_{GS}$=2.5V, $I_D$=2.8A | - | 50 | 68 | |
| | | $V_{GS}$=1.8V, $I_D$=1.5A | - | 66 | 95 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V, $V_{GS}$=0V | - | - | 1 | uA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±12V, $V_{DS}$=0V | - | - | ±100 | nA |
| **Dynamic** (Note 5) | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=10V, $I_D$=4.1A, $V_{GS}$=4.5V (Note 1,2) | - | 4.6 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 0.8 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 1 | - | |
| Input Capacitance | Ciss | $V_{DS}$=10V, $V_{GS}$=0V, f=1.0MHZ | - | 350 | - | pF |
| Output Capacitance | Coss | | - | 40 | - | |
| Reverse Transfer Capacitance | Crss | | - | 29 | - | |
| Turn-On Delay Time | $td_{(on)}$ | $V_{DD}$=10V, $I_D$=4.1A, $V_{GS}$=4.5V, $R_G$=6Ω (Note 1,2) | - | 4 | - | ns |
| Turn-On Rise Time | tr | | - | 47 | - | |
| Turn-Off Delay Time | $td_{(off)}$ | | - | 18 | - | |
| Turn-Off Fall Time | tf | | - | 10 | - | |
| **Drain-Source Diode** | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | $I_S$ | --- | - | - | 1.5 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1.0A, $V_{GS}$=0V | - | 0.75 | 1.2 | V |

NOTES :

1. Pulse width≤300us, Duty cycle≤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.
5. Guaranteed by design, not subject to production testing

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## P-Channel Electrical Characteristics ($T_A$=25°C unless otherwise noted)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V, $I_D$=-250uA | -20 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=-250uA | -0.4 | -0.71 | -1.2 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=-4.5V, $I_D$=-3.1A | - | 84 | 100 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$=-2.0A | - | 104 | 135 | |
| | | $V_{GS}$=-1.8V, $I_D$=-1.1A | - | 134 | 190 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-20V, $V_{GS}$=0V | - | - | -1 | uA |
| Gate-Source Leakage Current | $I_{GSS}$ | $V_{GS}$=±12V, $V_{DS}$=0V | - | - | ±100 | nA |
| **Dynamic** (Note 5) | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-10V, $I_D$=-3.1A, $V_{GS}$=-4.5V (Note 1,2) | - | 5.4 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 0.7 | - | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 1.3 | - | |
| Input Capacitance | Ciss | $V_{DS}$=-10V, $V_{GS}$=0V, f=1.0MHZ | - | 416 | - | pF |
| Output Capacitance | Coss | | - | 43 | - | |
| Reverse Transfer Capacitance | Crss | | - | 32 | - | |
| Turn-On Delay Time | $td_{(on)}$ | $V_{DD}$=-10V, $I_D$=-3.1A, $V_{GS}$=-4.5V, $R_G$=6Ω (Note 1,2) | - | 4 | - | ns |
| Turn-On Rise Time | tr | | - | 27 | - | |
| Turn-Off Delay Time | $td_{(off)}$ | | - | 78 | - | |
| Turn-Off Fall Time | tf | | - | 45 | - | |
| **Drain-Source Diode** | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | $I_S$ | --- | - | - | -1.5 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=-1.0A, $V_{GS}$=0V | - | -0.8 | -1.2 | V |

NOTES :

1. Pulse width≤300us, Duty cycle≤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.
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## N-Channel TYPICAL CHARACTERISTIC CURVES

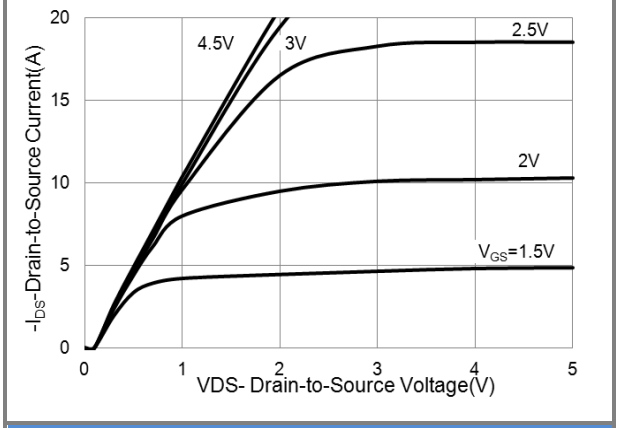


Fig.1 On-Region Characteristics

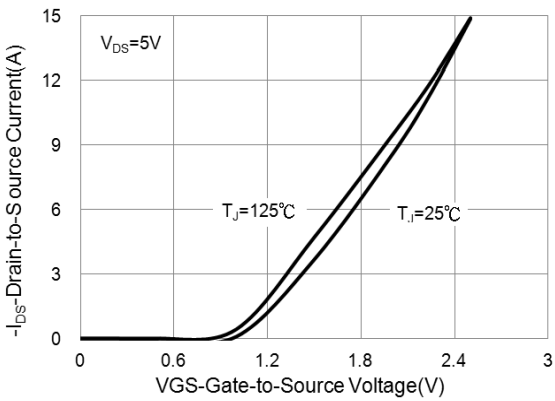


Fig.2 Transfer Characteristics

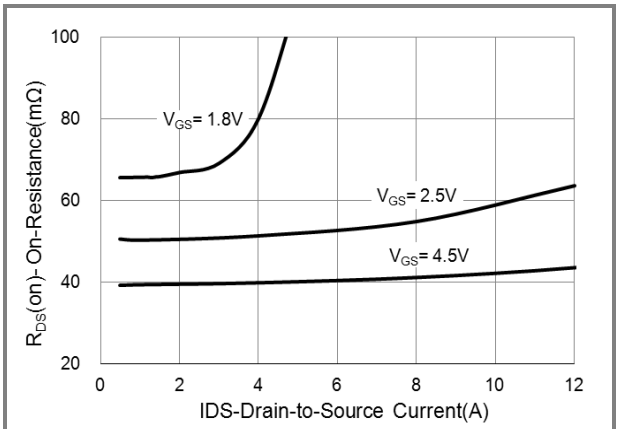


Fig.3 On-Resistance vs. Drain Current

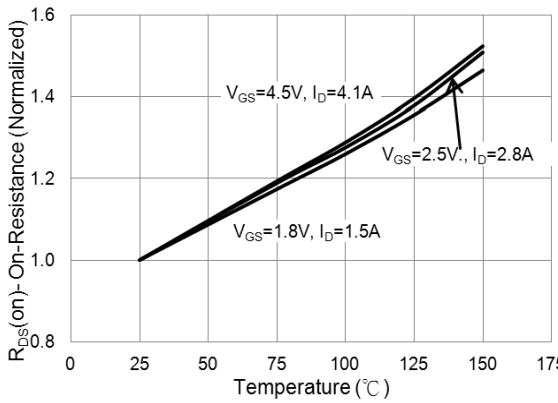


Fig.4 On-Resistance vs. Junction temperature

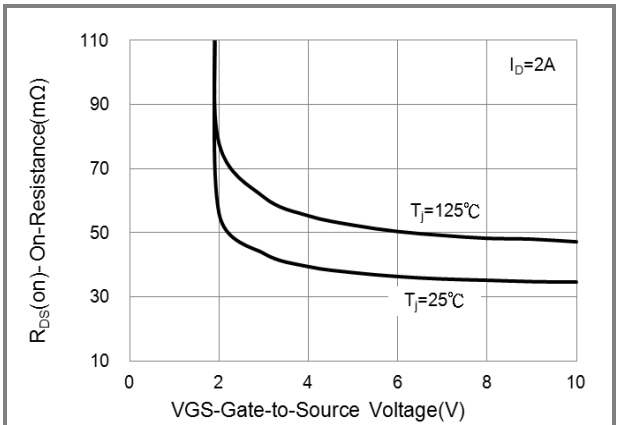


Fig.5 On-Resistance Variation with VGS.

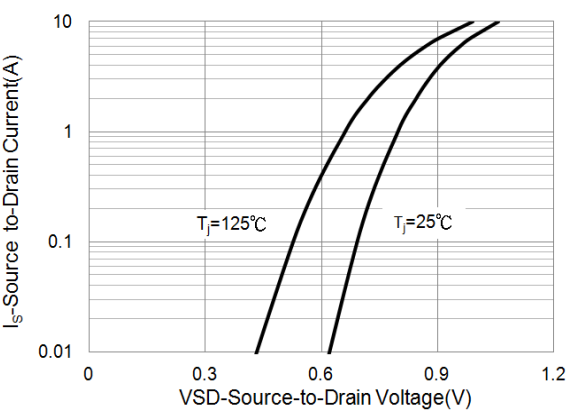


Fig.6 Body Diode Characteristics

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## N-Channel TYPICAL CHARACTERISTIC CURVES

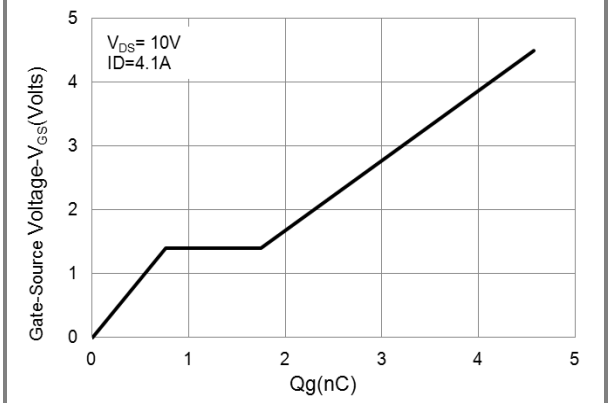


Fig.7 Gate-Charge Characteristics

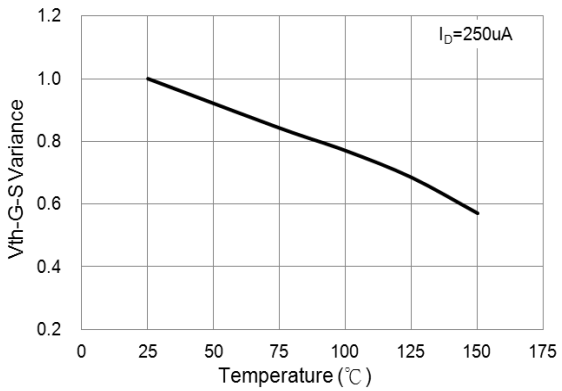


Fig.8 Threshold Voltage Variation with Temperature.

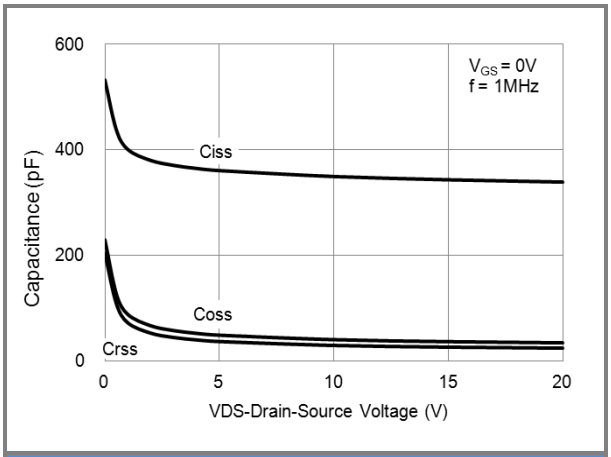


Fig.9 Capacitance vs. Drain-Source Voltage.

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## P-Channel TYPICAL CHARACTERISTIC CURVES

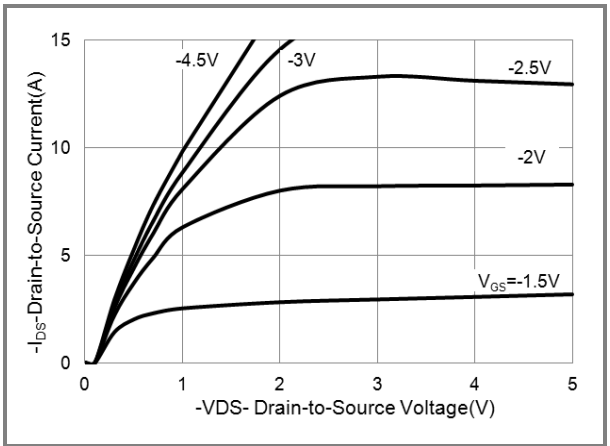


Fig.1 On-Region Characteristics

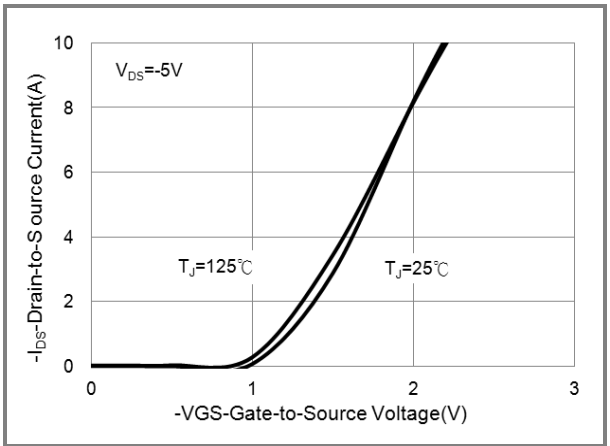


Fig.2 Transfer Characteristics

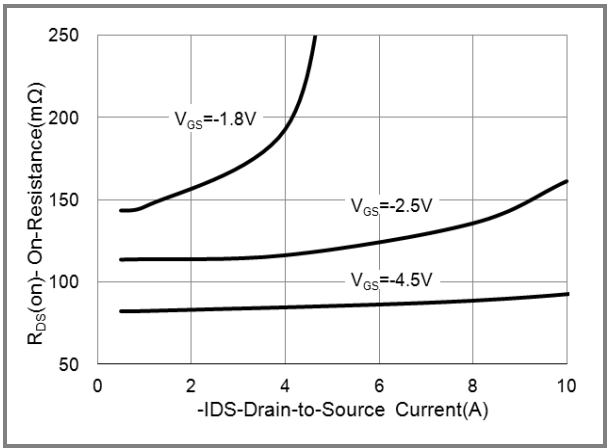


Fig.3 On-Resistance vs. Drain Current

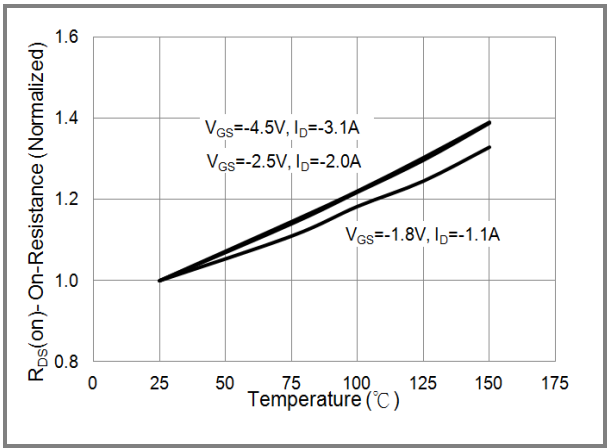


Fig.4 On-Resistance vs. Junction temperature

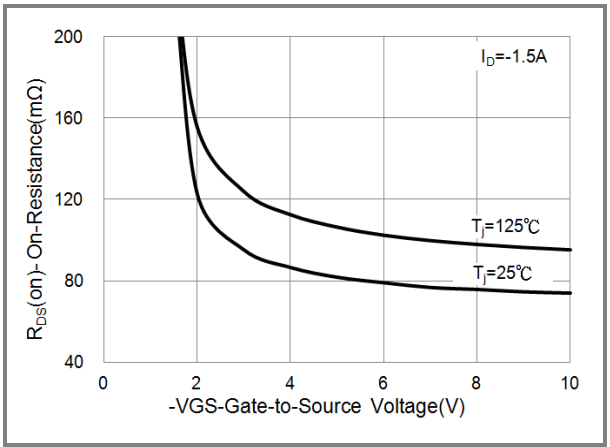


Fig.5 On-Resistance Variation with VGS.

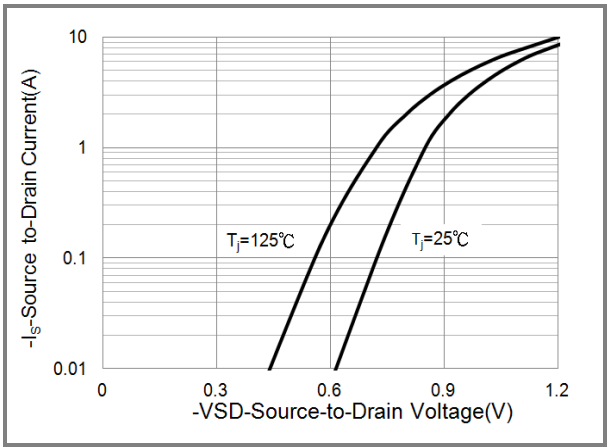


Fig.6 Body Diode Characteristics

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## P-Channel TYPICAL CHARACTERISTIC CURVES

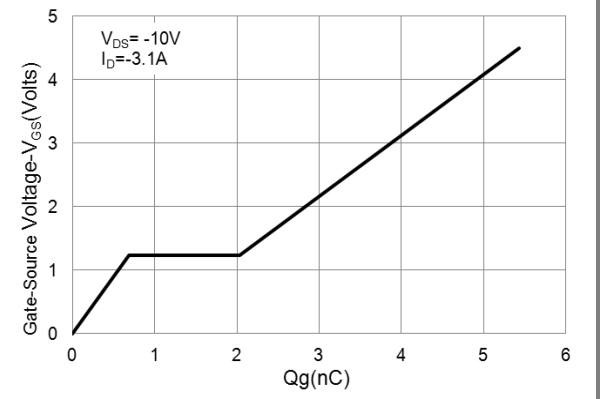



Fig.7 Gate-Charge Characteristics

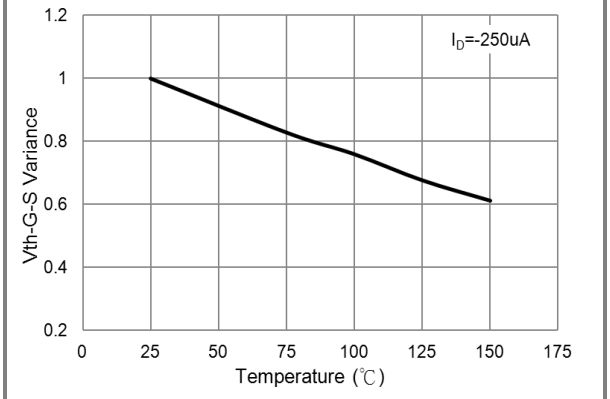



Fig.8 Threshold Voltage Variation with Temperature.

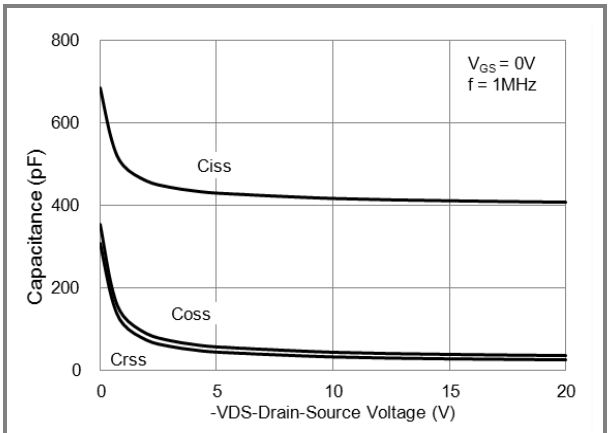



Fig.9 Threshold Voltage Variation with Temperature.

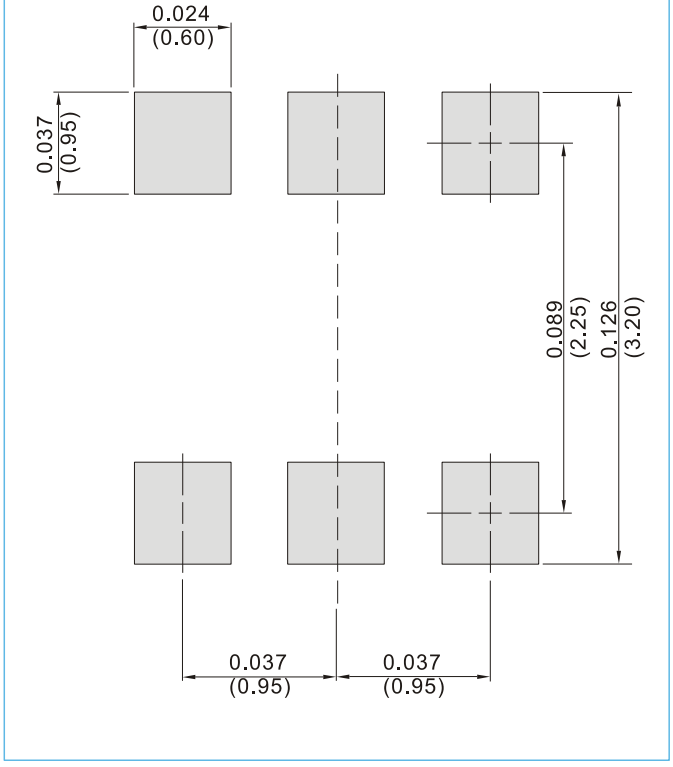
# PJS6601

## PART NO PACKING CODE VERSION

| Part No Packing Code | Package Type | Packing type | Marking | Version |
|---|---|---|---|---|
| PJS6601_S1_00001 | SOT-23 6L | 3K pcs / 7” reel | SC1 | Halogen free |
| PJS6601_S2_00001 | SOT-23 6L | 10K pcs / 13” reel | SC1 | Halogen free |

## MOUNTING PAD LAYOUT

SOT-23 6L Unit : inch(mm)



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