

# PJX8806

## 20V N-Channel Enhancement Mode MOSFET – ESD Protected

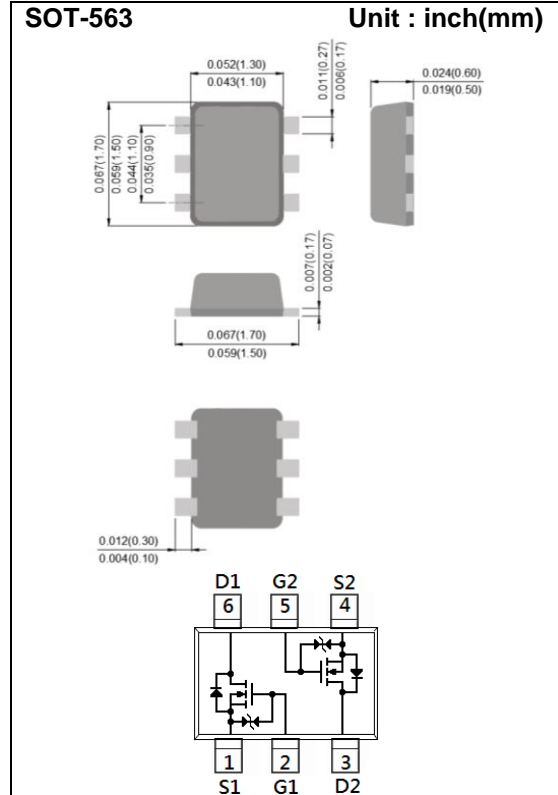
**Voltage**    **20 V**    **Current**    **800mA**

### Features

- $R_{DS(ON)}$ ,  $V_{GS}@4.5V, I_{DS}@500mA=0.4\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@2.5V, I_{DS}@300mA=0.7\Omega$
- $R_{DS(ON)}$ ,  $V_{GS}@1.8V, I_{DS}@100mA=1.2\Omega$ (typ)
- Advanced Trench Process Technology
- Specially Designed for Load Switch or PWM application.
- ESD Protected
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

### Mechanical Data

- Case : SOT-563 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0026 grams
- Marking : X06



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

| PARAMETER  | SYMBOL          | LIMIT                           | UNITS              |
|--|-----------------|---------------------------------|--------------------|
| Drain-Source Voltage                             | $V_{DS}$        | 20                              | V                  |
| Gate-Source Voltage                              | $V_{GS}$        | $\pm 12$                        | V                  |
| Continuous Drain Current                         | $I_D$           | 800                             | mA                 |
| Pulsed Drain Current                             | $I_{DM}$        | 3000                            | mA                 |
| Power Dissipation                                | PD              | $T_A=25^\circ\text{C}$          | 350                |
|  |                 | Derate above $25^\circ\text{C}$ | 2.8                |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$  | -55~150                         | $^\circ\text{C}$   |
| Typical Thermal Resistance                       | $R_{\theta JA}$ | 357                             | $^\circ\text{C/W}$ |
| - Junction to Ambient <sup>(Note 3)</sup>        |                 |                                 |                    |

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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   | 0.4  | 0.63 | 1.0  | V     |
| Drain-Source On-State Resistance                      | R <sub>DS(on)</sub> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =500mA   | -    | 0.35 | 0.4  | Ω     |
|   |                     | V <sub>GS</sub> =2.5V, I <sub>D</sub> =300mA   | -    | 0.6  | 0.7  |       |
|   |                     | V <sub>GS</sub> =1.8V, I <sub>D</sub> =100mA   | -    | 1.2  | -    |       |
| Zero Gate Voltage Drain Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =16V, V <sub>GS</sub> =0V  | -    | 0.02 | 1    | uA    |
| Gate-Source Leakage Current                           | I <sub>GSS</sub>    | V <sub>GS</sub> =±10V, V <sub>DS</sub> =0V   | -    | ±2   | ±10  | uA    |
| <b>Dynamic</b>  |                     |  |      |      |      |       |
| Total Gate Charge                                     | Q <sub>g</sub>      | V <sub>DS</sub> =10V, I <sub>D</sub> =500mA,<br>V <sub>GS</sub> =4.5V <sup>(Note 1,2)</sup>                        | -    | 0.92 | -    | nC    |
| Gate-Source Charge                                    | Q <sub>gs</sub>     |  | -    | 0.31 | -    |       |
| Gate-Drain Charge                                     | Q <sub>gd</sub>     |  | -    | 0.08 | -    |       |
| Input Capacitance                                     | C <sub>iss</sub>    | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V,<br>f=1.0MHZ   | -    | 50   | -    | pF    |
| Output Capacitance                                    | C <sub>oss</sub>    |  | -    | 10   | -    |       |
| Reverse Transfer Capacitance                          | C <sub>rss</sub>    |  | -    | 8.5  | -    |       |
| <b>Switching</b>                                      |                     |  |      |      |      |       |
| Turn-On Delay Time                                    | t <sub>d(on)</sub>  | V <sub>DD</sub> =10V, I <sub>D</sub> =500mA,<br>V <sub>GS</sub> =4.5V,<br>R <sub>G</sub> =6Ω <sup>(Note 1,2)</sup> | -    | 4    | -    | ns    |
| Turn-On Rise Time                                     | t <sub>r</sub>      |  | -    | 20   | -    |       |
| Turn-Off Delay Time                                   | t <sub>d(off)</sub> |  | -    | 12   | -    |       |
| Turn-Off Fall Time                                    | t <sub>f</sub>      |  | -    | 25   | -    |       |
| <b>Drain-Source Diode</b>                             |                     |  |      |      |      |       |
| Maximum Continuous Drain-Source Diode Forward Current | I <sub>S</sub>      | ---  | -    | -    | 500  | mA    |
| Diode Forward Voltage                                 | V <sub>SD</sub>     | I <sub>S</sub> =500mA, V <sub>GS</sub> =0V   | -    | 0.91 | 1.3  | 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 square pad of copper.

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## TYPICAL CHARACTERISTIC CURVES

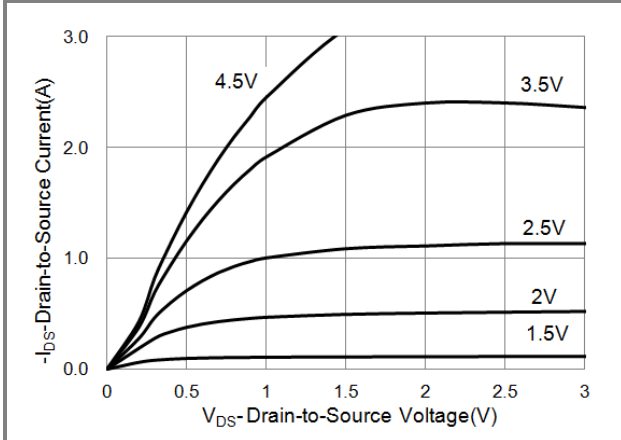


Fig.1 On-Region Characteristics

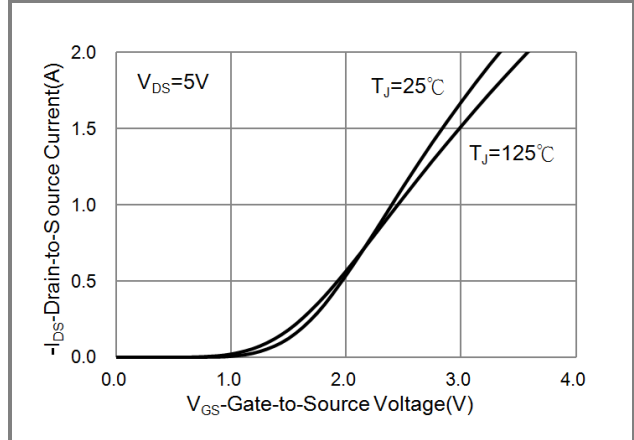


Fig.2 Transfer Characteristics

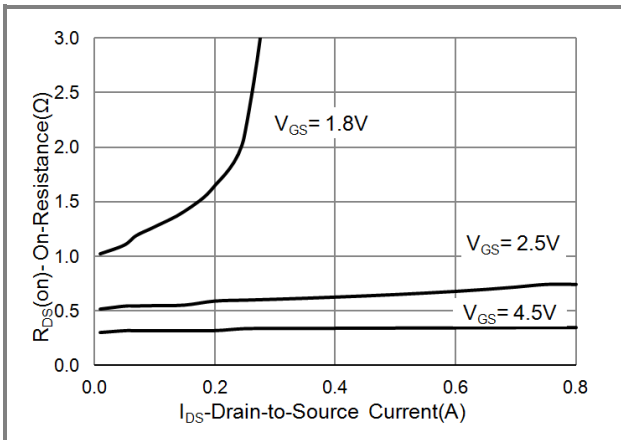


Fig.3 On-Resistance vs. Drain Current

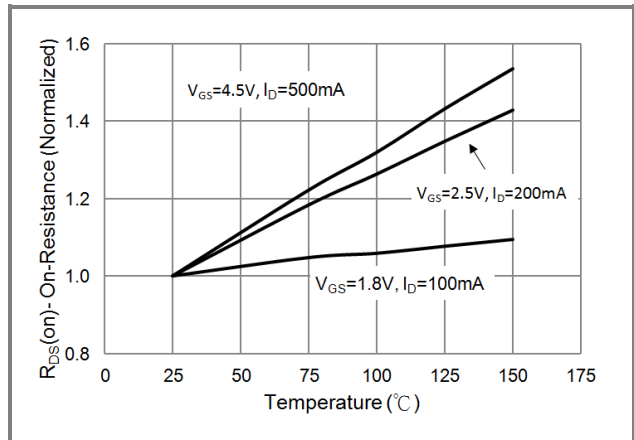


Fig.4 On-Resistance vs. Junction temperature

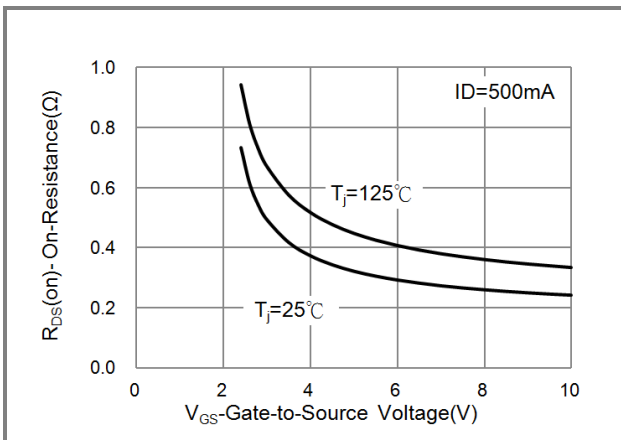


Fig.5 On-Resistance Variation with VGS.

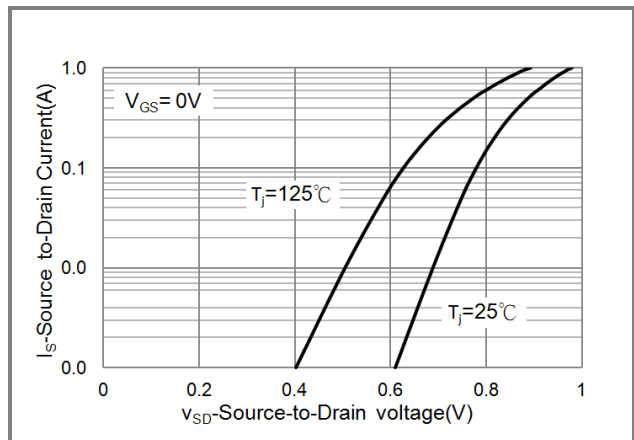


Fig.6 Body Diode Characteristics

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## TYPICAL CHARACTERISTIC CURVES

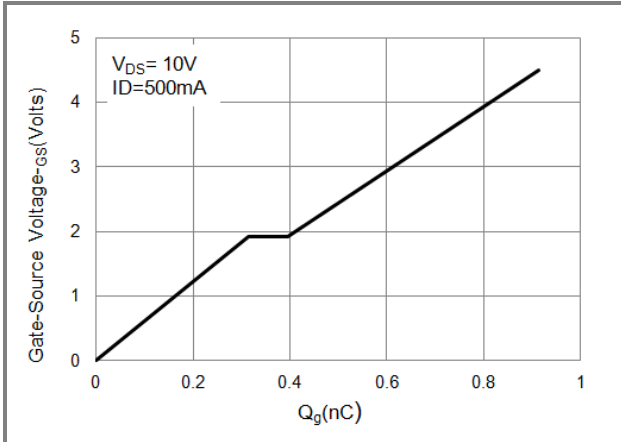


Fig.7 Gate-Charge Characteristics

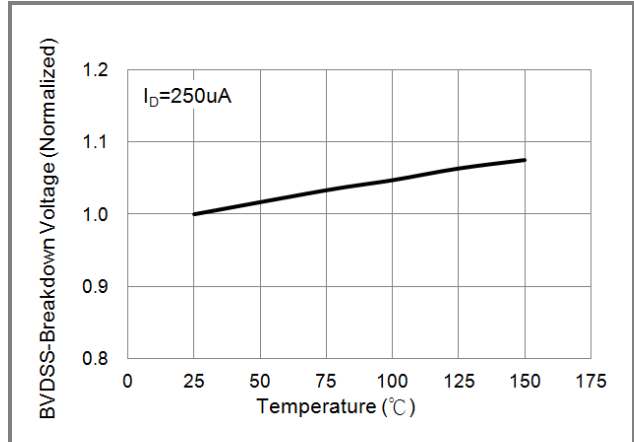


Fig.8 Breakdown Voltage Variation vs. Temperature

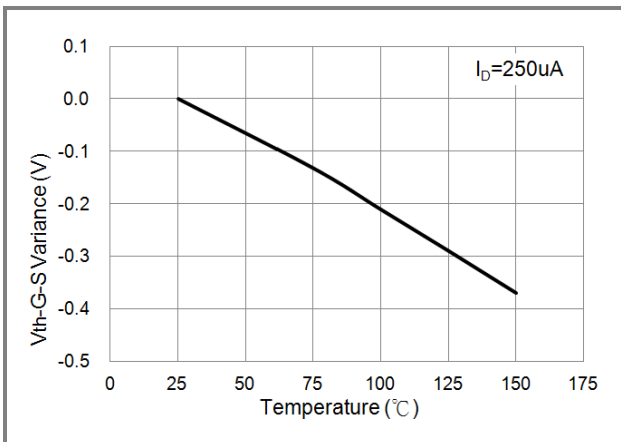


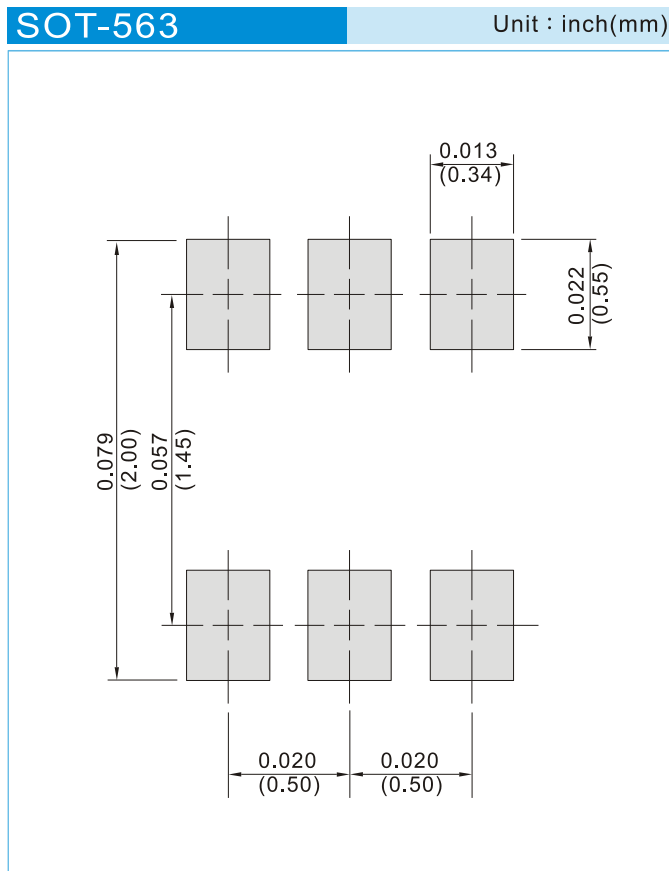
Fig.9 Threshold Voltage Variation with Temperature

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## Product and Packing Information

| Part No. | Package Type | Packing Type     | Marking |
|----------|--------------|------------------|---------|
| PJX8806  | SOT-563      | 4K pcs / 7" reel | X06     |

## Mounting Pad Layout



## PJX8806

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