

PJE8406TB89

20V N-Channel Enhancement Mode MOSFET – ESD Protected

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

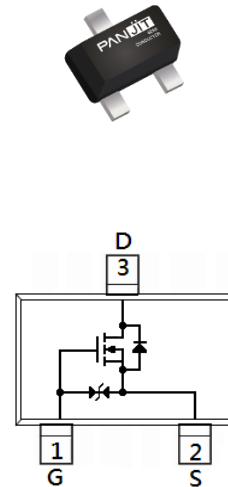
Features

- $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_D@500mA < 0.4\Omega$
- $R_{DS(ON)}$, $V_{GS}@2.5V$, $I_D@300mA < 0.7\Omega$
- $R_{DS(ON)}$, $V_{GS}@1.8V$, $I_D@100mA = 1.2\Omega$ (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 : SC-89 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0026 grams

SC-89



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} | ±12 | |
| Continuous Drain Current | | I _D | 800 | mA |
| Pulsed Drain Current | | I _{DM} | 3000 | |
| Power Dissipation | T _A =25°C | P _D | 350 | mW |
| | Derate above 25°C | | 2.8 | mW/°C |
| Operating Junction and Storage Temperature Range | | T _J ,T _{STG} | -55~150 | °C |
| Typical Thermal Resistance | | R _{θJA} | 357 | °C/W |
| - Junction to Ambient ^{†(Note 3)} | | | | |

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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 | 0.63 | 1 | |
| Drain-Source On-State Resistance | R _{DS(on)} | V _{GS} =4.5V, I _D =500mA | - | 0.35 | 0.4 | Ω |
| | | V _{GS} =2.5V, I _D =300mA | - | 0.6 | 0.7 | |
| | | V _{GS} =1.8V, I _D =100mA | - | 1.2 | - | |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =16V, V _{GS} =0V | - | - | 1 | uA |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±4.5V, V _{DS} =0V | - | - | ±1 | |
| Gate-Source Leakage Current | I _{GSS} | V _{GS} =±10V, V _{DS} =0V | - | - | ±10 | |
| Dynamic ^(Note 4) | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =10V, I _D =500mA, V _{GS} =4.5V ^(Note 1,2) | - | 0.92 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 0.31 | - | |
| Gate-Drain Charge | Q _{gd} | | - | 0.08 | - | |
| Input Capacitance | C _{iss} | V _{DS} =10V, V _{GS} =0V, f=1MHz | - | 50 | - | pF |
| Output Capacitance | C _{oss} | | - | 10 | - | |
| Reverse Transfer Capacitance | C _{rss} | | - | 8.5 | - | |
| Switching | | | | | | |
| Turn-On Delay Time | td _(on) | V _{DD} =10V, I _D =500mA, V _{GS} =4.5V, R _G =6Ω ^(Note 1,2) | - | 4 | - | ns |
| Turn-On Rise Time | tr | | - | 20 | - | |
| Turn-Off Delay Time | td _(off) | | - | 12 | - | |
| Turn-Off Fall Time | tf | | - | 25 | - | |
| Drain-Source Diode | | | | | | |
| Maximum Continuous Drain-Source Diode Forward Current | I _s | --- | - | - | 500 | mA |
| Diode Forward Voltage | V _{SD} | I _S =500mA, V _{GS} =0V | - | 0.91 | 1.3 | V |

NOTES :

1. Pulse width ≤ 300us, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature typical characteristics.
3. R_{θJA} 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

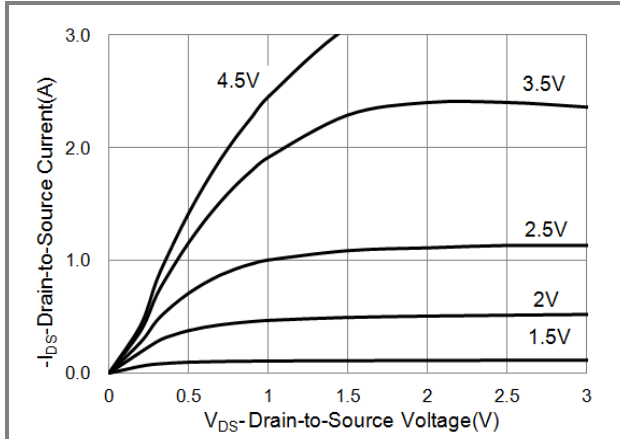


Fig.1 On-Region Characteristics

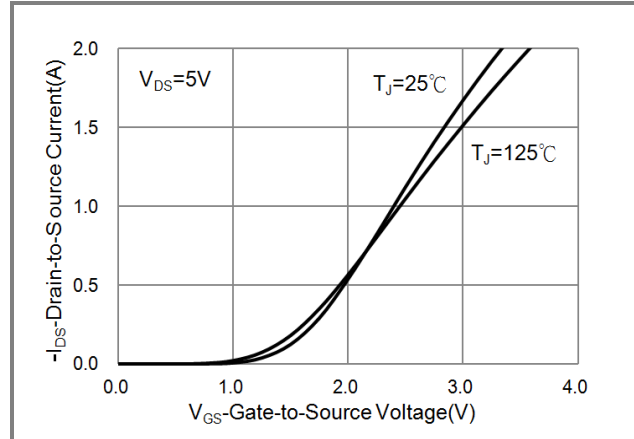


Fig.2 Transfer Characteristics

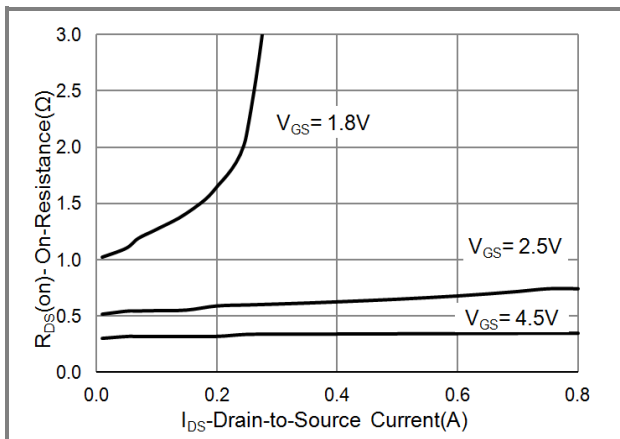


Fig.3 On-Resistance vs. Drain Current

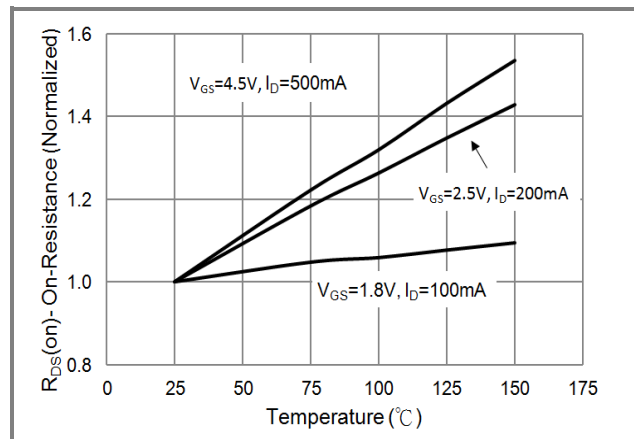


Fig.4 On-Resistance vs. Junction temperature

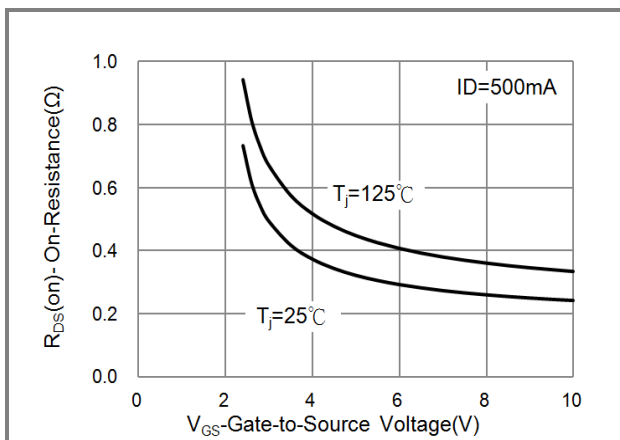


Fig.5 On-Resistance Variation with VGS.

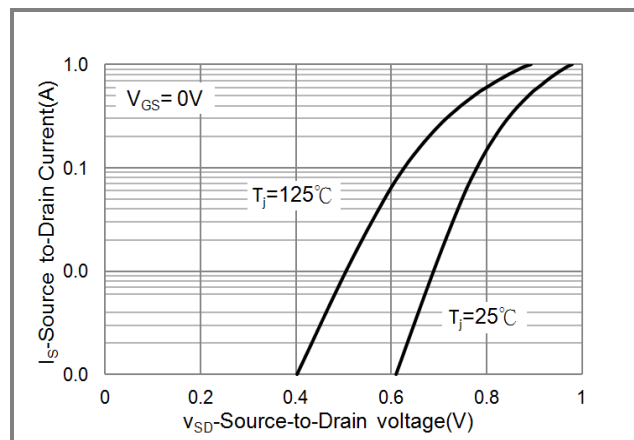


Fig.6 Body Diode Characteristics

PJE8406TB89

TYPICAL CHARACTERISTIC CURVES

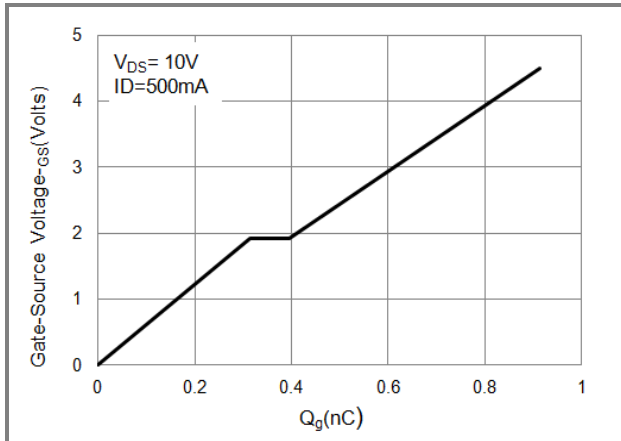


Fig.7 Gate-Charge Characteristics

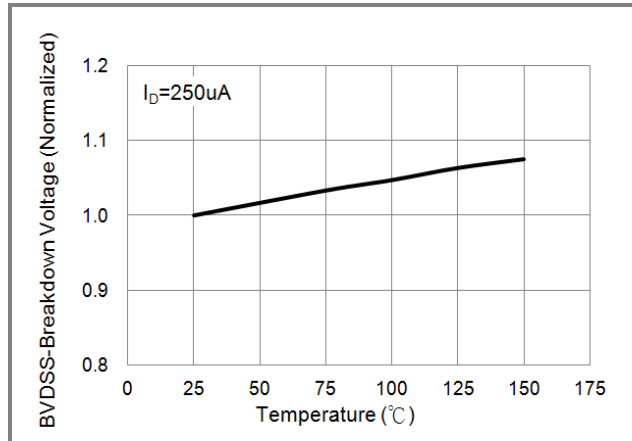


Fig.8 Breakdown Voltage Variation vs. Temperature

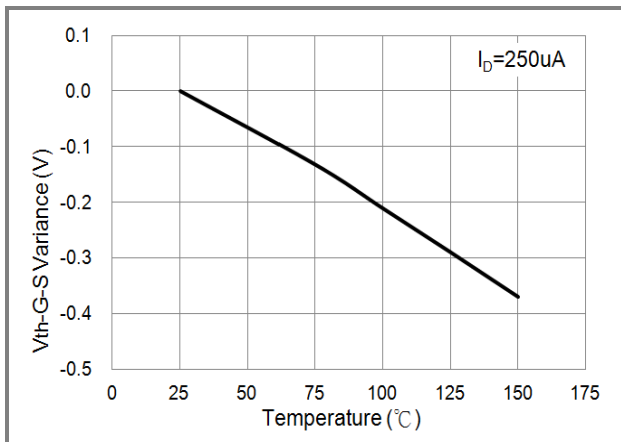


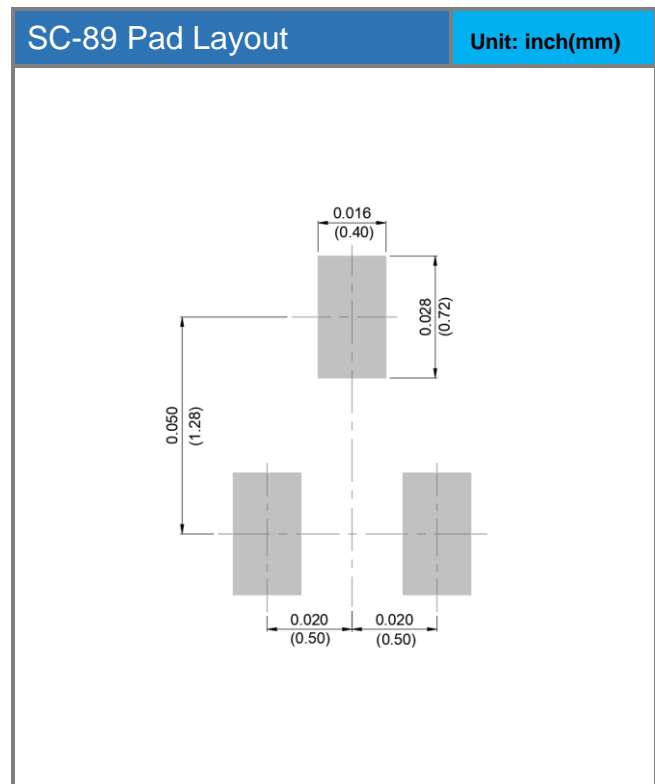
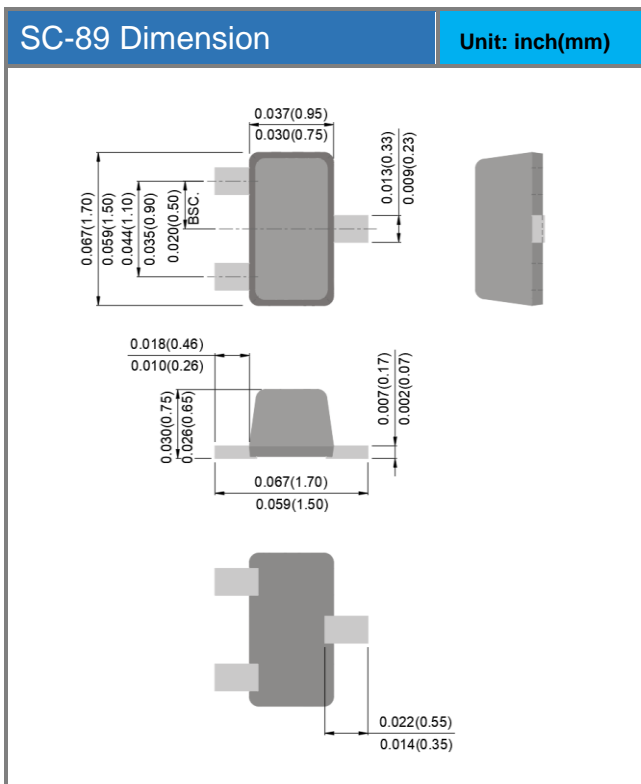
Fig.9 Threshold Voltage Variation with Temperature.

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Product and Packing Information

| Part No. | Package Type | Packing Type | Marking |
|-------------|--------------|------------------|---------|
| PJE8406TB89 | SC-89 | 4K pcs / 7" reel | E06 |

Packaging Information & Mounting Pad Layout



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