



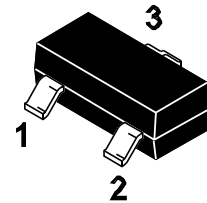
PJM139NSA

N-Channel Enhancement Mode Power MOSFET

Features

- Rugged and reliable
- Low gate charge and $R_{DS(on)}$
- ESD protected(HBM) up to 2KV
- $V_{DS} = 50V, I_D = 0.5A$
 $R_{DS(on)} < 3\Omega @ V_{GS} = 10V$

SOT-23



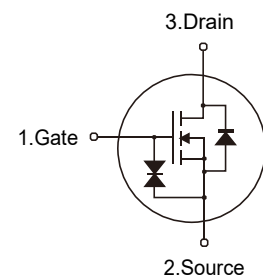
1. Gate 2. Source 3. Drain

Marking Code: T9

Applications

- Solid-state relays
- Battery operated systems
- Direct logic-level interface: TTL/CMOS

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Value | Unit |
|---------------------------|-----------|-------------|------|
| Drain-Source Voltage | V_{DS} | 50 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Drain Current-Continuous | I_D | 0.5 | A |
| Maximum Power Dissipation | P_D | 0.35 | W |
| Junction Temperature | T_J | 150 | °C |
| Storage Temperature Range | T_{STG} | -55 to +150 | °C |

Thermal Characteristics

| | | | |
|--|-----------------|-----|------|
| Thermal Resistance, Junction-to-Ambient ^{Note1} | $R_{\theta JA}$ | 357 | °C/W |
|--|-----------------|-----|------|



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Electrical Characteristics

(Ta=25°C unless otherwise specified)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|---|---------------|--|------|------|----------|----------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 50 | -- | -- | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=50V, V_{GS}=0V$ | -- | -- | 0.5 | μA |
| | | $V_{DS}=30V, V_{GS}=0V$ | -- | -- | 100 | nA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | -- | -- | ± 10 | μA |
| Gate Threshold Voltage ^{Note2} | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.6 | 1 | 1.4 | V |
| Drain-Source On-Resistance ^{Note2} | $R_{DS(on)}$ | $V_{GS}=10V, I_D=0.5A$ | -- | 1.1 | 3 | Ω |
| | | $V_{GS}=4.5V, I_D=0.2A$ | -- | 1.2 | 4 | Ω |
| Forward Transconductance ^{Note2} | g_{FS} | $V_{DS}=10V, I_D=0.22A$ | -- | 1.4 | -- | S |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V, f=1MHz$ | -- | 26.5 | -- | pF |
| Output Capacitance | C_{oss} | | -- | 12.9 | -- | pF |
| Reverse Transfer Capacitance | C_{rss} | | -- | 5.9 | -- | pF |
| Switching Characteristics | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}=30V, I_D=0.29A$ $V_{GS}=10V, R_{GEN}=6\Omega$ | -- | -- | 5 | nS |
| Turn-on Rise Time | t_r | | -- | -- | 18 | nS |
| Turn-off Delay Time | $t_{d(off)}$ | | -- | -- | 36 | nS |
| Turn-off Fall Time | t_f | | -- | -- | 14 | nS |
| Source-Drain Diode Characteristics | | | | | | |
| Diode Forward Voltage ^{Note2} | V_{SD} | $V_{GS}=0V, I_S=0.5A$ | -- | -- | 1.2 | V |
| Diode Forward Current ^{Note1} | I_S | | -- | -- | 0.5 | A |

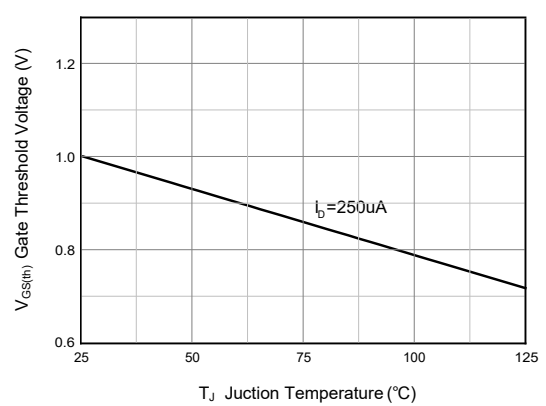
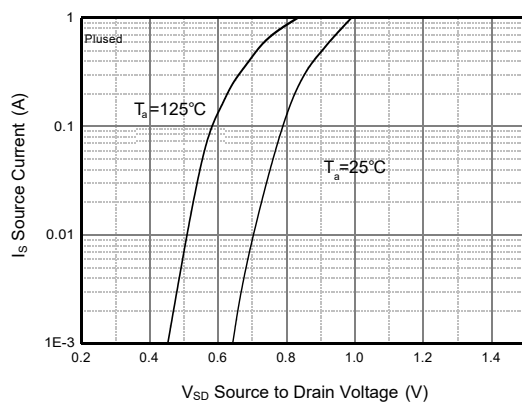
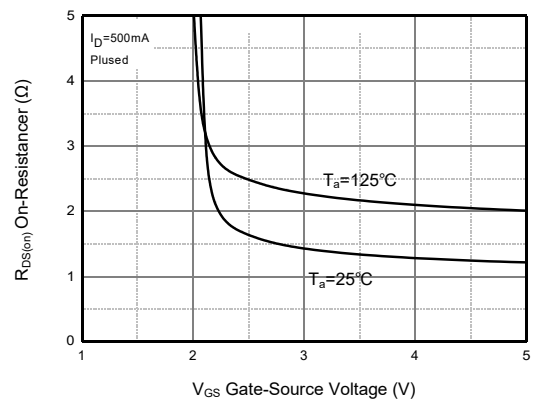
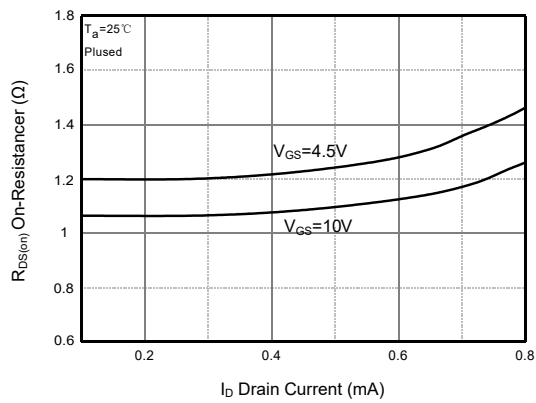
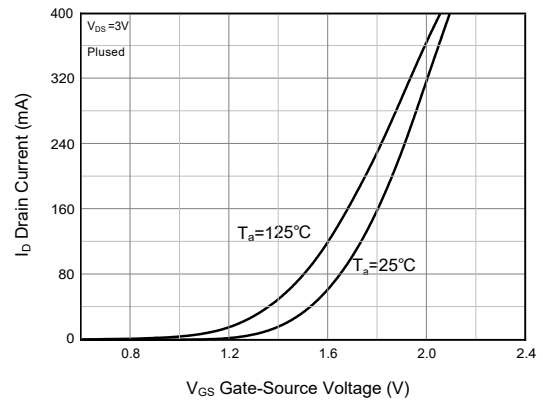
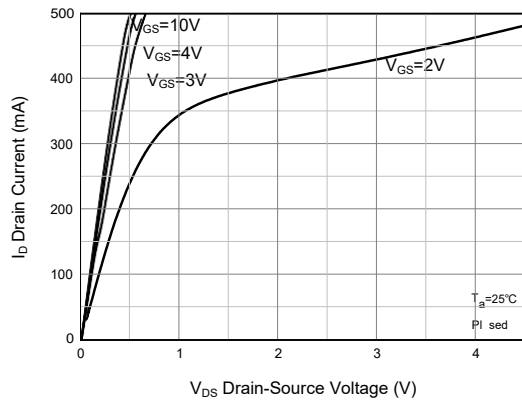
Note: 1. Surface Mounted on FR4 Board, $t \leq 10$ sec.
 2. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.



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Typical Characteristic Curves





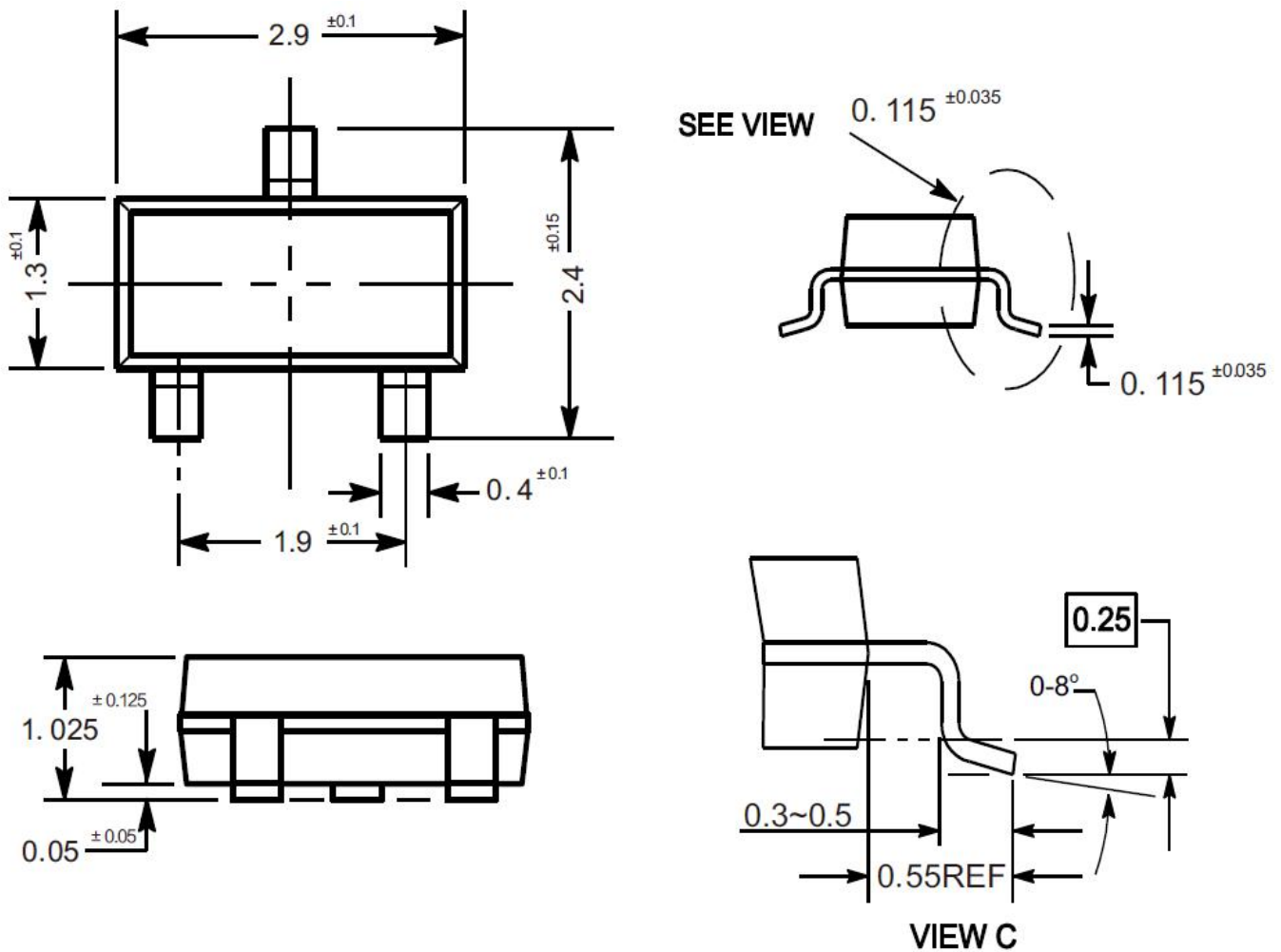
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Package Outline

SOT-23

Dimensions in mm



Ordering Information

| Device | Package | Shipping |
|-----------|---------|-----------------------|
| PJM139NSA | SOT-23 | 3,000PCS/Reel&7inches |



Conditions of Soldering and Storage

◆ Recommended condition of reflow soldering



Recommended peak temperature is over 245 °C. If peak temperature is below 245 °C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

◆ Conditions of hand soldering

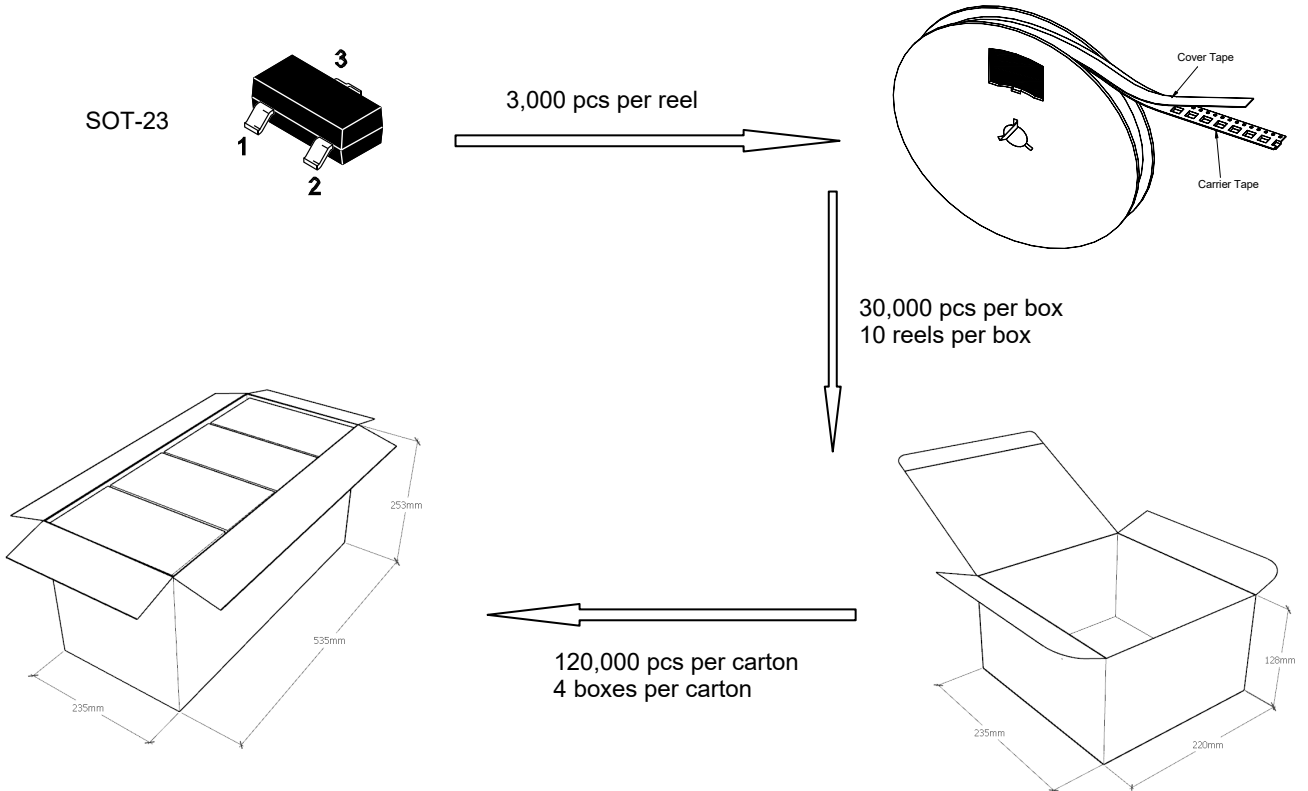
- Temperature: 370 °C
- Time: 3s max.
- Times: one time

◆ Storage conditions

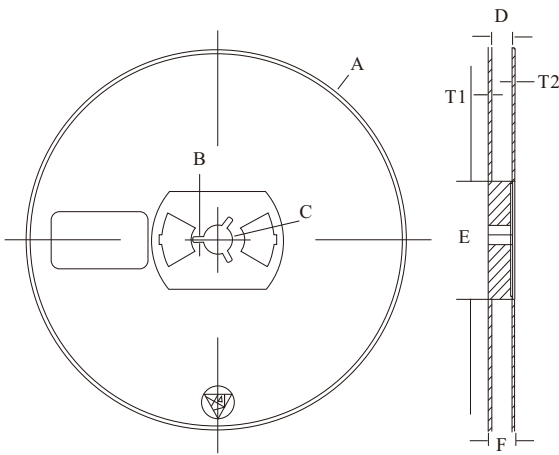
- **Temperature**
5 to 40 °C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

Package Specifications

- The method of packaging



◆ Embossed tape and reel data



| Symbol | Value (unit: mm) |
|--------|------------------|
| A | Ø 177.8±1 |
| B | 2.7±0.2 |
| C | Ø 13.5±0.2 |
| E | Ø 54.5±0.2 |
| F | 12.3±0.3 |
| D | 9.6+2/-0.3 |
| T1 | 1.0±0.2 |
| T2 | 1.2±0.2 |

Reel (7")

