

SOT-23 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=30V$
- $I_D=5.8A$
- $R_{DS(on)}@V_{GS}=10V < 35m\Omega$
- $R_{DS(on)}@V_{GS}=4.5V < 40m\Omega$
- Trench Power LV MOSFET technology
- Voltage controlled small signal switch
- Fast Switching Speedze

Drain-source Voltage

30 V

Drain Current

5.8 Ampere

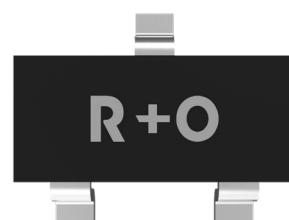
Applications

- Battery protection
- Load switch
- Power management

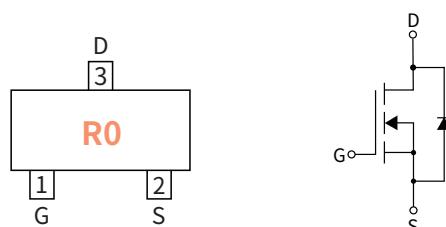
Mechanical Data

- Case: SOT-23
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant, halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

SOT-23



Function Diagram



Maximum Ratings (Ta=25°C Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | VALUE |
|--|-----------------|--------|------------|
| Drain-source Voltage | V_{DS} | V | 30 |
| Gate-source Voltage | V_{GS} | V | ± 12 |
| Drain Current | I_D | A | 5.8 |
| Pulsed Drain Current ⁽¹⁾ | I_{DM} | A | 30 |
| Total Power Dissipation ⁽²⁾ | P_D | W | 0.35 |
| Junction temperature | T_J | °C | -55 ~ +150 |
| Storage temperature | T_{stg} | °C | -55 ~ +150 |
| Thermal Resistance Junction-to-Ambient @ Steady State ⁽²⁾ | $R_{\theta JA}$ | °C / W | 357 |

Ordering Information

| PACKAGE | PACKAGE CODE | UNIT WEIGHT(g) | REEL(pcs) | BOX(pcs) | CARTON(pcs) | DELIVERY MODE |
|---------|--------------|----------------|-----------|----------|-------------|---------------|
| SOT-23 | R1 | 0.008 | 3000 | 45000 | 180000 | 7" |

● Static Parameter Characteristics (Ta=25°C Unless otherwise specified)

| PARAMETER | SYMBOL | Condition | UNIT | Min | Typ | Max |
|--|---------------------|--|------|-----|-----|------|
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250μA | V | 30 | — | — |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =24V, V _{GS} =0V | μA | — | — | 1.0 |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} =±12V, V _{DS} =0V | nA | — | — | ±100 |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | V | 0.7 | — | 1.4 |
| Static Drain-Source On-Resistance ⁽³⁾ | R _{DS(ON)} | V _{GS} =10V, I _D =5.8A | mΩ | — | — | 35 |
| | | V _{GS} =4.5V, I _D =5.0A | | — | — | 40 |
| | | V _{GS} =2.5V, I _D =4.0A | | — | — | 52 |
| Gate resistance | R _g | V _{DS} =0V, V _{GS} =0, f=1MHz | Ω | — | — | 3.6 |
| Forward Transconductance | g _{FS} | V _{DS} =5.0V, I _D =5.0A | S | 8.0 | — | — |
| Diode Forward Voltage | V _{SD} | I _S =1.0A, V _{GS} =0V | V | — | — | 1.0 |
| Maximum Body-Diode Continuous Current | I _S | — | A | — | — | 1.0 |

● Dynamic Parameters (Ta=25°C Unless otherwise specified)

| PARAMETER | SYMBOL | Condition | UNIT | Min | Typ | Max |
|------------------------------|------------------|---|------|-----|-----|------|
| Input Capacitance | C _{iss} | V _{DS} =15V, V _{GS} =0V, f=1MHz | pF | — | — | 1050 |
| Output Capacitance | C _{oss} | | | — | 99 | — |
| Reverse Transfer Capacitance | C _{rss} | | | — | 77 | — |

● Switching Parameters (Ta=25°C Unless otherwise specified)

| PARAMETER | SYMBOL | Condition | UNIT | Min | Typ | Max |
|---------------------|---------------------|--|------|-----|-----|-----|
| Turn-on Delay Time | t _{D(on)} | V _{GS} =10V, V _{DS} =15V, R _L =2.7Ω, R _{GEN} =3.0Ω | ns | — | 5.0 | — |
| Turn-on Rise Time | t _r | | | — | 7 | — |
| Turn-off Delay Time | t _{D(off)} | | | — | 40 | — |
| Turn-off fall Time | t _f | | | — | 6.0 | — |

Note:

(1)Repetitive rating, pulse width limited by junction temperature T_{J(Max)}=150°C .Ratings are based on low frequency and duty cycles to keep initial T_j=25°C .(2)The value of P_D and R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C .

(3)Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

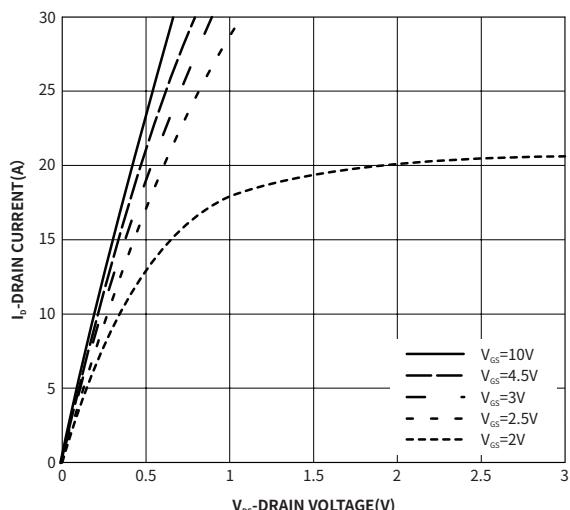


Fig.1 Output Characteristics

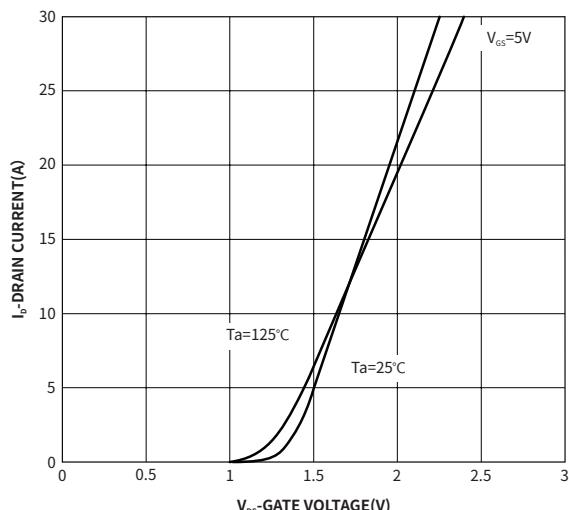


Fig.2 Transfer Characteristics

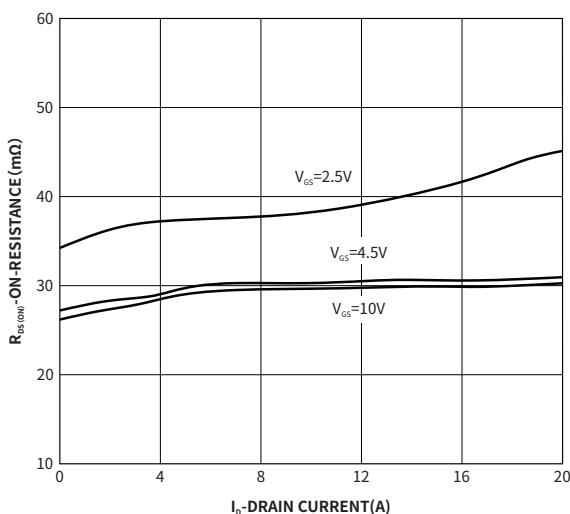


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

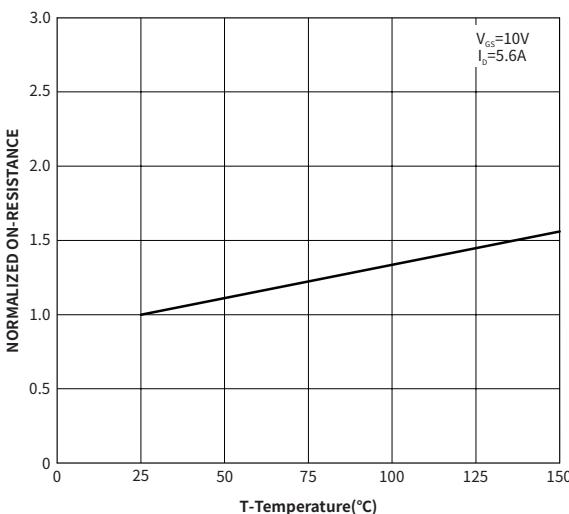


Fig.4 On-Resistance vs. Junction Temperature

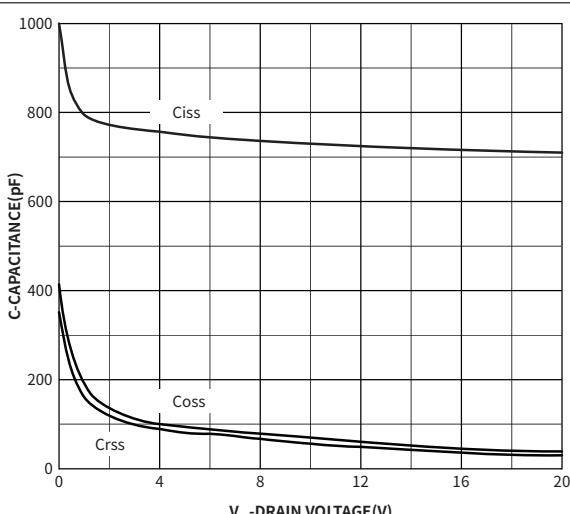


Fig.5 Capacitance Characteristics

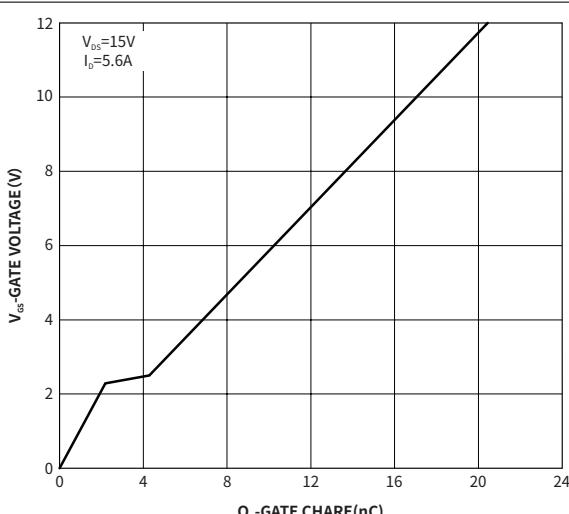


Fig.6 Gate Charge

● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)

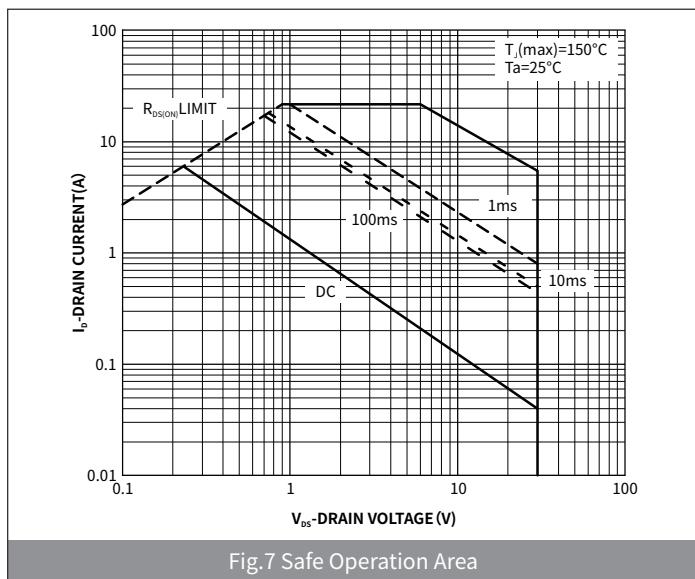


Fig.7 Safe Operation Area

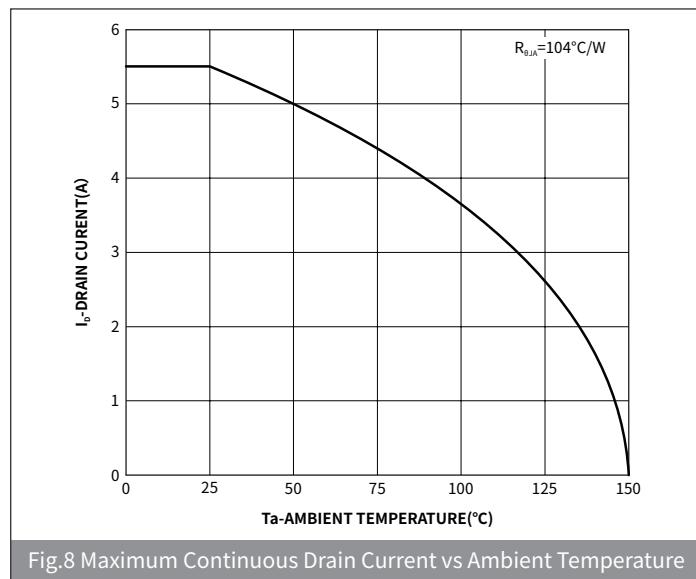


Fig.8 Maximum Continuous Drain Current vs Ambient Temperature

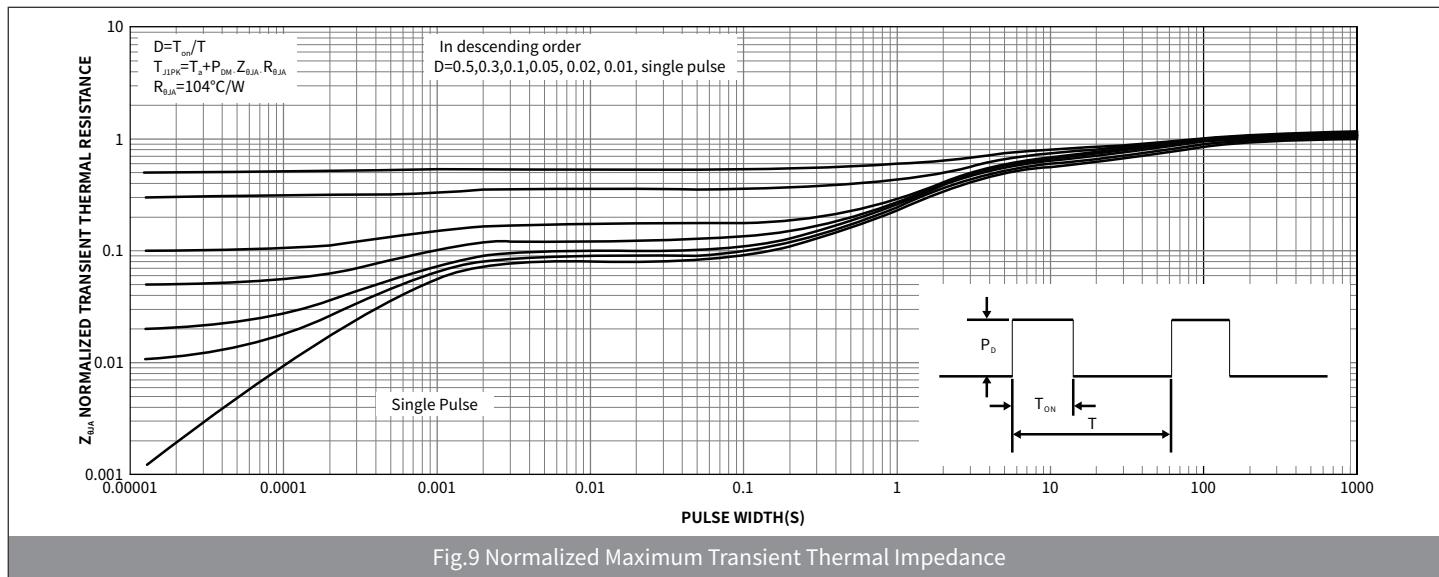
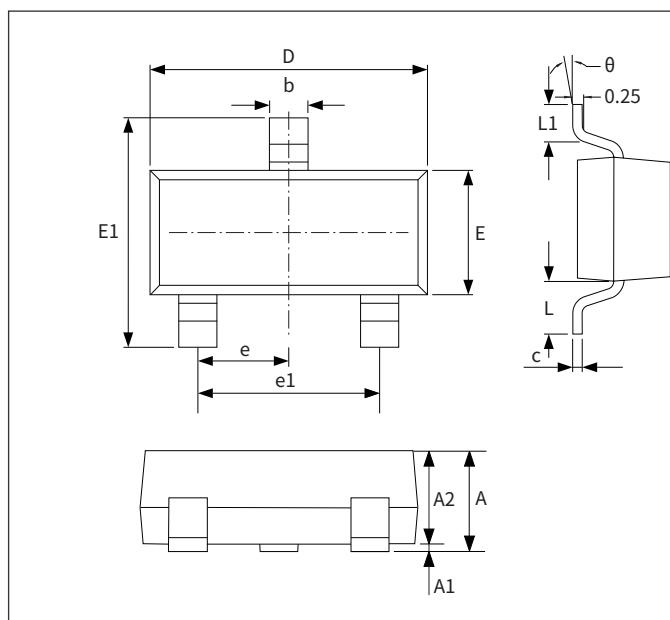


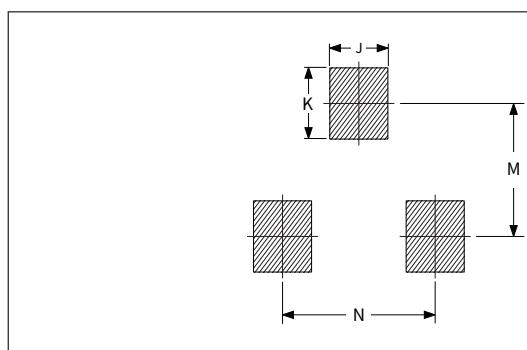
Fig.9 Normalized Maximum Transient Thermal Impedance

● Package Outline Dimensions (SOT-23)



| Symbol | Dimensions | | | |
|--------|-------------|------|----------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 0.90 | 1.15 | 0.035 | 0.045 |
| A1 | - | 0.10 | - | 0.004 |
| A2 | 0.90 | 1.05 | 0.035 | 0.041 |
| b | 0.30 | 0.50 | 0.012 | 0.020 |
| c | 0.10 | 0.20 | 0.004 | 0.008 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 1.20 | 1.40 | 0.047 | 0.055 |
| E1 | 2.25 | 2.55 | 0.089 | 0.100 |
| e | 0.950TYP | | 0.037TYP | |
| e1 | 1.80 | 2.00 | 0.071 | 0.079 |
| L | 0.550REF | | 0.022REF | |
| L1 | 0.30 | 0.50 | 0.012 | 0.020 |
| θ | - | 8° | - | 8° |

● Suggested Pad Layout



| Symbol | Dimensions | | | |
|--------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| J | 0.75 | 0.85 | 0.030 | 0.033 |
| K | 0.85 | 0.95 | 0.033 | 0.037 |
| M | 1.95 | 2.05 | 0.077 | 0.081 |
| N | 1.85 | 1.95 | 0.073 | 0.077 |