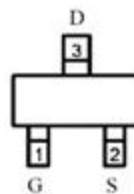
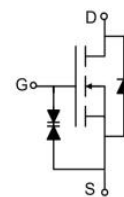


Main Product Characteristics:

| | |
|--------------|--------------------|
| V_{DSS} | 60V |
| $R_{DS(on)}$ | 2.3 Ω (Max) |
| I_D | 0.3A |


SOT-23

Pin Assignments

Schematic Diagram
Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150°C operating temperature


Description:

It utilizes the latest trench processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications

Absolute Max Rating:

| Symbol | Parameter | Max. | Units |
|--------------------------------|---|--------------|------------------|
| $I_D @ T_C = 25^\circ\text{C}$ | Continuous Drain Current, $V_{GS} @ 10\text{V}$ ① | 0.3 | A |
| I_{DM} | Pulsed Drain Current ② | 1.2 | |
| $P_D @ T_C = 25^\circ\text{C}$ | Power Dissipation ③ | 0.35 | W |
| V_{DS} | Drain-Source Voltage | 60 | V |
| V_{GS} | Gate-to-Source Voltage | ± 20 | V |
| $T_J \quad T_{STG}$ | Operating Junction and Storage Temperature Range | -55 to + 150 | $^\circ\text{C}$ |

Thermal Resistance

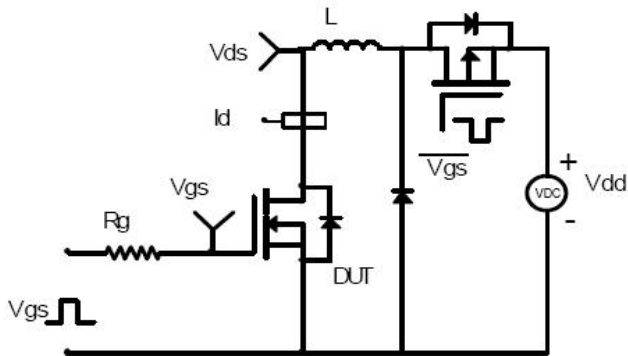
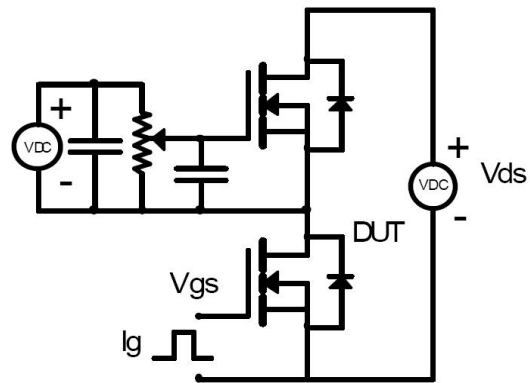
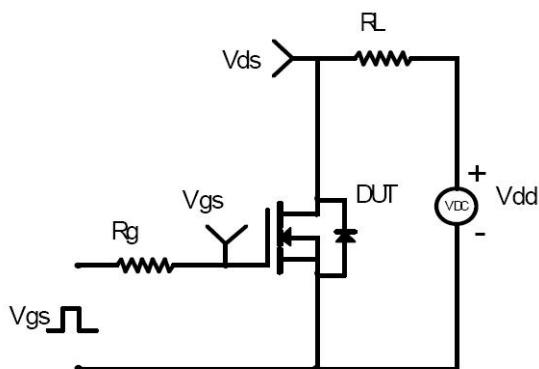
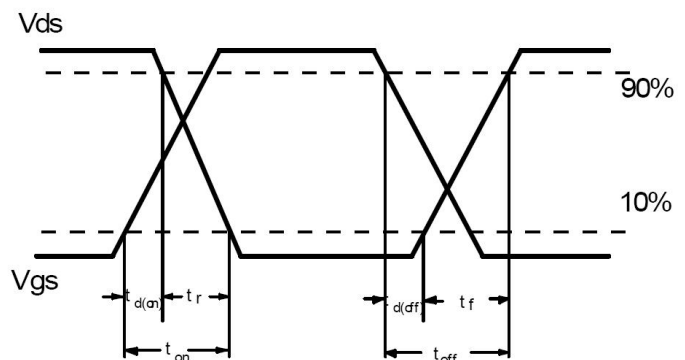
| Symbol | Characterizes | Typ. | Max. | Units |
|-----------------|---|------|------|---------------------------|
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient ④ | — | 357 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

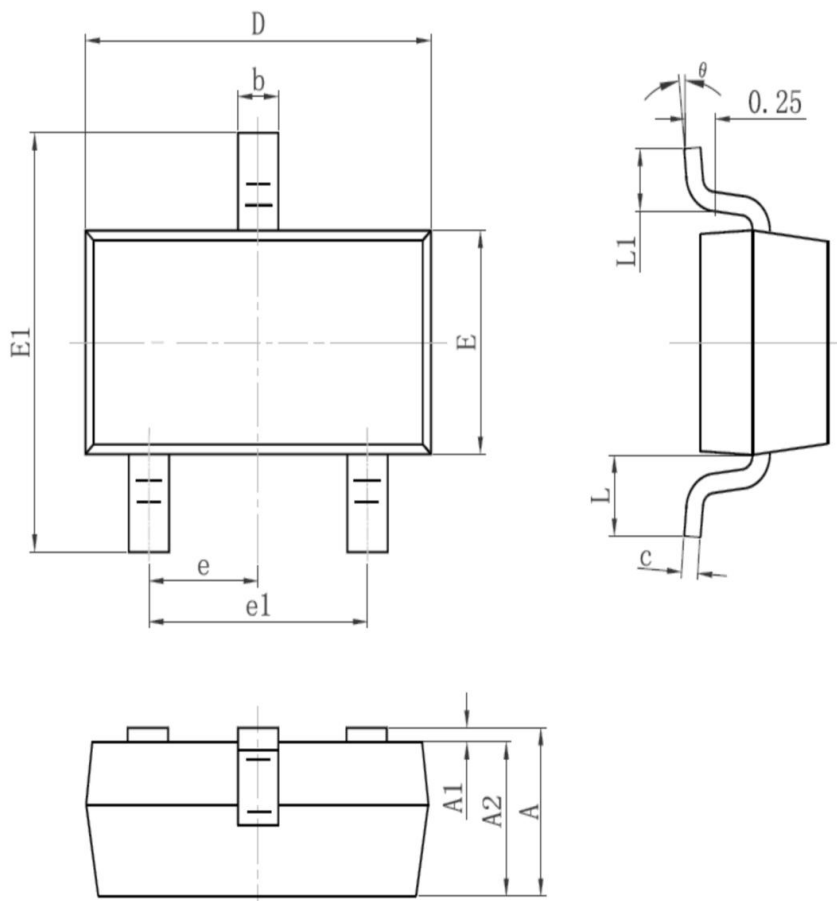
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---------------|--------------------------------------|------|------|----------|----------|--|
| $V_{(BR)DSS}$ | Drain-to-Source breakdown voltage | 60 | — | — | V | $V_{GS} = 0V, I_D = 250\mu A$ |
| $R_{DS(on)}$ | Static Drain-to-Source on-resistance | — | 2.1 | 2.87 | Ω | $V_{GS}=4.5V, I_D = 0.2A$ |
| | | — | 1.8 | 2.3 | Ω | $V_{GS}=10V, I_D=0.3A$ |
| $V_{GS(th)}$ | Gate threshold voltage | 1 | — | 2.5 | V | $V_{DS} = V_{GS}, I_D = 250\mu A$ |
| I_{DSS} | Drain-to-Source leakage current | — | — | 1 | μA | $V_{DS}=60V, V_{GS}=0V$ |
| I_{GSS} | Gate-to-Source forward leakage | — | — | ± 10 | μA | $V_{GS}=\pm 20V, V_{DS}=0V$ |
| Q_g | Total gate charge | — | 1.9 | — | nC | $V_{DS}=10V, I_D=0.3A,$ $V_{GS}=4.5V$ |
| Q_{gs} | Gate-to-Source charge | — | 0.3 | — | | |
| Q_{gd} | Gate-to-Drain("Miller") charge | — | 0.7 | — | | |
| $t_{d(on)}$ | Turn-on delay time | — | 2 | — | ns | $V_{DD}=10V, V_{GS}=10V, I_D=0.2A$ $R_{GEN}=10\Omega$ |
| t_r | Rise time | — | 16 | — | | |
| $t_{d(off)}$ | Turn-Off delay time | — | 8 | — | | |
| t_f | Fall time | — | 21 | — | | |
| C_{iss} | Input capacitance | — | 30 | — | pF | $V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$ |
| C_{oss} | Output capacitance | — | 12 | — | | |
| C_{rss} | Reverse transfer capacitance | — | 5 | — | | |

Source-Drain Ratings and Characteristics

| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|----------|---|------|------|------|-------|--|
| I_S | Continuous Source Current (Body Diode) ① | — | — | 0.3 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I_{SM} | Pulsed Source Current (Body Diode) ① | — | — | 1.2 | A | |
| V_{SD} | Diode Forward Voltage | — | — | 1.2 | V | $I_S=0.3A, V_{GS}=0V, T_J= 25^{\circ}\text{C}$ |

Test Circuits and Waveforms:
EAS Test Circuit:

Gate Charge Test Circuit:

Switching Time Test Circuit:

Switching Waveforms:

Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ \text{C}$

Mechanical Data:
SOT-23 PACKAGE OUTLINE DIMENSION


| Symbol | Dimension In Millimeters | | Dimension In Inches | |
|--------|--------------------------|-------|---------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.95TYP | | 0.037TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.55REF | | 0.022REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

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