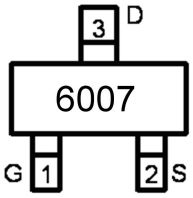
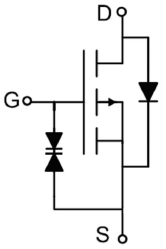
## Main Product Characteristics:

| | |
|---|---|
| $V_{DSS}$ | -50V |
| $R_{DS}$(on) | 2.1Ω(typ.) |
| $I_D$ | -130mA |

SOT-23




Marking and Pin Assignments




Schematic Diagram

## Features and Benefits:

- Advanced MOSFET process technology
- Special designed for Line current interrupter in telephone sets, Relay, high speed and line transformer drivers and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery

## Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance. These features combine to make this design an extremely efficient and reliable device for use in line current interrupter in telephone sets and a wide variety of other applications

## Absolute Max Rating:

| Symbol | Parameter | Max. | Units |
|---|---|---|---|
| $I_D$ @ TC = 25°C | Continuous Drain Current, $V_{GS}$ @ -10V① | -130 | mA |
| $I_D$ @ TC = 100°C | Continuous Drain Current, $V_{GS}$ @ -10V① | -100 | |
| $I_{DM}$ | Pulsed Drain Current② | -520 | |
| $P_D$ @TC = 25°C | Power Dissipation③ | 230 | mW |
| $V_{DS}$ | Drain-Source Voltage | -50 | V |
| $V_{GS}$ | Gate-to-Source Voltage | ± 20 | V |
| $T_J$ $T_{STG}$ | Operating Junction and Storage Temperature Range | -55 to + 150 | °C |

## Thermal Resistance

| Symbol | Characterizes | Typ. | Max. | Units |
|---|---|---|---|---|
| $R_{\theta JA}$ | Junction-to-ambient (t ≤ 10s) ④ | — | 556 | ℃/W |
| | Junction-to-Ambient (PCB mounted, steady-state) ④ | — | 540 | ℃/W |

## Electrical Characterizes @$T_A$=25℃ unless otherwise specified

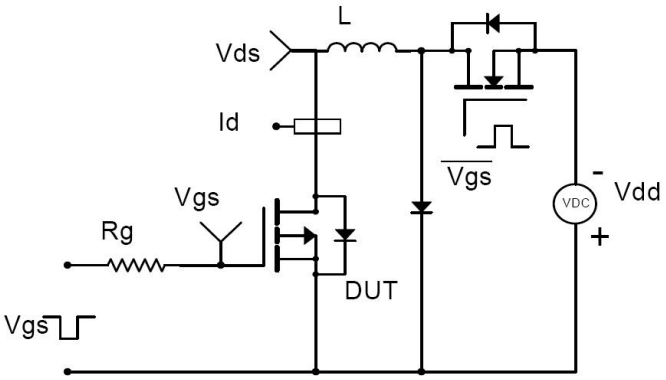
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-to-Source breakdown voltage | -50 | — | — | V | $V_{GS}$ = 0V, $I_D$ = -10μA |
| $R_{DS(on)}$ | Static Drain-to-Source on-resistance | — | 2.1 | 7 | Ω | $V_{GS}$=-10V,$I_D$ = -130mA |
| $V_{GS(th)}$ | Gate threshold voltage | -0.8 | — | -2 | V | $V_{DS}$ = $V_{GS}$, $I_D$ = -1mA |
| $I_{DSS}$ | Drain-to-Source leakage current | — | — | -0.1 | μA | $V_{DS}$ =-40V,$V_{GS}$ = 0V |
| | | — | — | -1 | | $V_{DS}$ =-50V,$V_{GS}$ = 0V |
| | | — | — | -50 | | $T_J$ = 125°C |
| $I_{GSS}$ | Gate-to-Source forward leakage | — | — | 10 | uA | $V_{GS}$ =20V |
| | | — | — | -10 | | $V_{GS}$ = -20V |
| $C_{iss}$ | Input Capacitance | — | 30 | — | pF | $V_{GS}$ = 0V; |
| $C_{oss}$ | Output Capacitance | — | 6 | — | | $V_{DS}$ = -30 V; |
| $C_{rss}$ | Reverse Transfer Capacitance | — | 2.5 | — | | f = 1 MHz |
| $t_{d(on)}$ | Turn–On Delay Time | — | 3.1 | — | ns | $V_{DD}$ = -15V; |
| $t_r$ | Rise Time | — | 1.3 | — | | $I_D$ = -2.5 A; |
| $t_{d(off)}$ | Turn–Off Delay Time | — | 18 | — | | $R_L$ = 50Ω |
| $t_f$ | Fall Time | — | 7.5 | — | | |

## Source-Drain Ratings and Characteristics

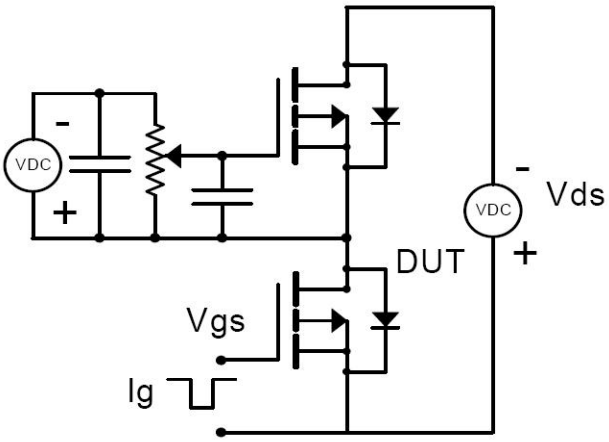
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | — | — | -130 | mA | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $I_{SM}$ | Pulsed Source Current (Body Diode) | — | — | -520 | mA | |
| $V_{SD}$ | Diode Forward Voltage | — | — | -1.3 | V | $I_S$=-130mA, $V_{GS}$=0V |

## Test Circuits and Waveforms

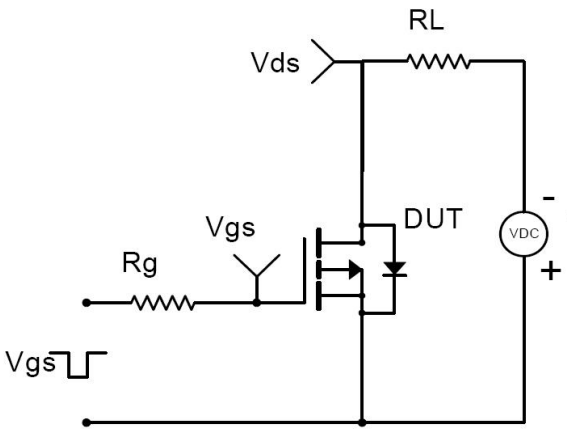
**EAS Test Circuit:**



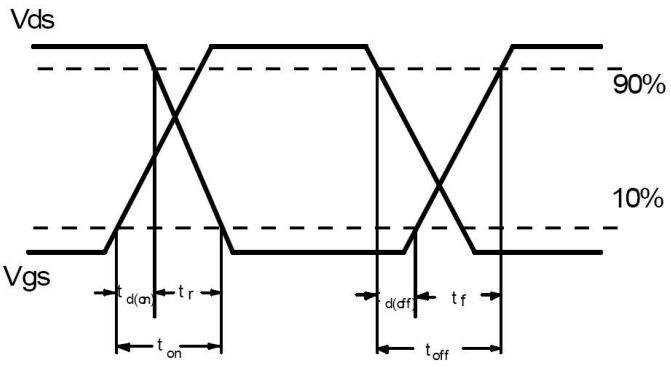

**Gate Charge Test Circuit:**




**Switching Time Test Circuit:**




**Switching Waveforms:**




## Notes:

①Calculated continuous current based on maximum allowable junction temperature.

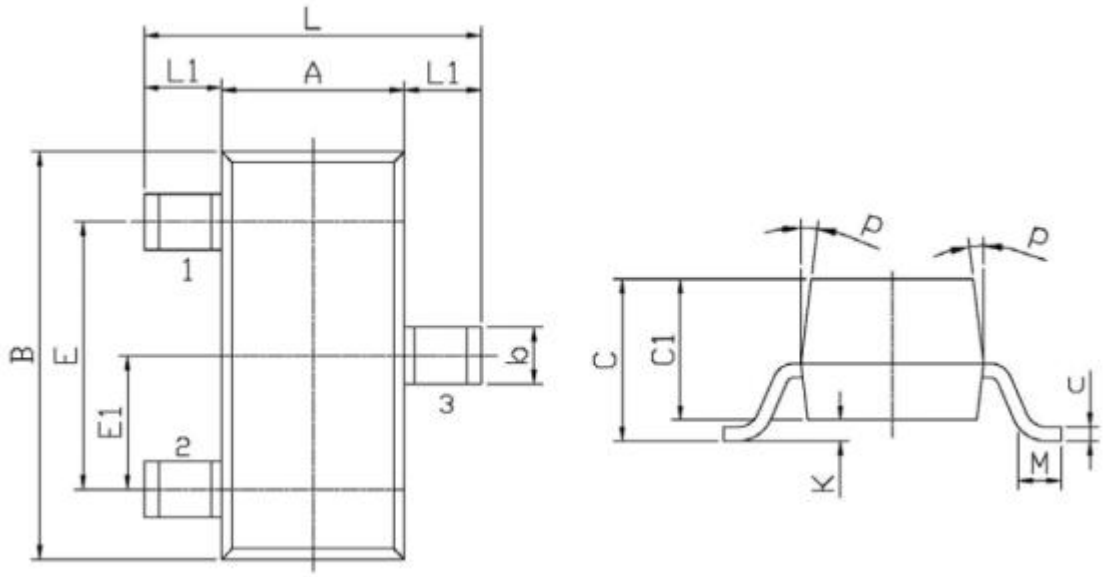
②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

④The 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 TA =25°C

## SOT-23 PACKAGE INFORMATION

**Dimensions in Millimeters (UNIT:mm)**




| Symbol | Dimensions in Millimeter | | Symbol | Dimensions in Millimeter | |
|---|---|---|---|---|---|
| | Min | Max | | Min | Max |
| L | 2.2 | 2.7 | C | 1.30 Max | |
| L1 | 0.45 | 0.65 | C1 | 0.90 | 1.20 |
| A | 1.15 | 1.50 | c | 0.05 | 0.20 |
| B | 2.70 | 3.10 | K | 0 | 0.10 |
| E | 1.70 | 2.10 | M | 0.20 Min | |
| E1 | 0.85 | 1.05 | P | 7º | |
| b | 0.35 | 0.55 | | | |

## NOTES

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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