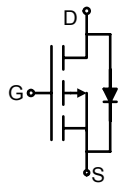
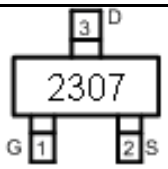
## DESCRIPTION

The SSF2307 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications.




Schematic diagram




Marking and pin Assignment


SOT-23 top view

## GENERAL FEATURES

- $V_{DS}$ = -16V,$I_D$ = -4.7A
  $R_{DS(ON)}$ < 110mΩ @ $V_{GS}$=-2.5V
  $R_{DS(ON)}$ < 100mΩ @ $V_{GS}$=-2.7V
  $R_{DS(ON)}$ < 70mΩ @ $V_{GS}$=-4.5V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

## Application

- PWM applications
- Load switch
- Power management

## PACKAGE MARKING AND ORDERING INFORMATION

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|---|---|---|---|---|---|
| 2307 | SSF2307 | SOT-23 | Ø180mm | 8 mm | 3000 units |

## ABSOLUTE MAXIMUM RATINGS(TA=25℃unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -16 | V |
| Gate-Source Voltage | $V_{GS}$ | ±8 | V |
| Drain Current-Continuous@ Current-Pulsed (Note 1) | $I_D$ | -4.7 | A |
| | $I_{DM}$ | -20 | A |
| Maximum Power Dissipation | $P_D$ | 1.1 | W |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 To 150 | ℃ |

## THERMAL CHARACTERISTICS

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 100 | ℃/W |

## ELECTRICAL CHARACTERISTICS (TA=25℃unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V $I_D$=-250μA | -16 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-16V,$V_{GS}$=0V | | | -1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±8V,$V_{DS}$=0V | | | ±100 | nA |

| | | | | | | |
|---|---|---|---|---|---|---|
| **ON CHARACTERISTICS (Note 3)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=-250μA | -0.6 | | -1.4 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$=-4.7A | | 48 | 70 | mΩ |
| | | $V_{GS}$=-2.7V, $I_D$=-3.8A | | 63 | 100 | |
| | | $V_{GS}$=-2.5V, $I_D$=-1.0A | | 65 | 110 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=-10V,$I_D$=-4.7A | | 8 | | S |
| **DYNAMIC CHARACTERISTICS (Note4)** | | | | | | |
| Input Capacitance | $C_{lss}$ | $V_{DS}$=-10V,$V_{GS}$=0V, F=1.0MHz | | 830 | | PF |
| Output Capacitance | $C_{oss}$ | | | 180 | | PF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 125 | | PF |
| **SWITCHING CHARACTERISTICS (Note 4)** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=-6V,$I_D$=-1A $R_d$=10Ω ,$R_{GEN}$=6Ω | | 11 | | nS |
| Turn-on Rise Time | $t_r$ | | | 32 | | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 250 | | nS |
| Turn-Off Fall Time | $t_f$ | | | 210 | | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-10V,$I_D$=-4.7A,$V_{GS}$=-5V | | 10 | 15 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.4 | 2.1 | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | 2.6 | 3.9 | nC |
| **DRAIN-SOURCE DIODE CHARACTERISTICS** | | | | | | |
| Diode Forward Voltage (Note 3) | $V_{SD}$ | $V_{GS}$=0V,$I_S$=-1.3A | | | -1.2 | V |
| Diode Forward Current (Note 2) | $I_S$ | | | | -1.3 | A |

## NOTES:

**1.** Repetitive Rating: Pulse width limited by maximum junction temperature.
**2.** Surface Mounted on FR4 Board, t ≤ 10 sec.
**3.** Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
**4.** Guaranteed by design, not subject to production testing.

## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

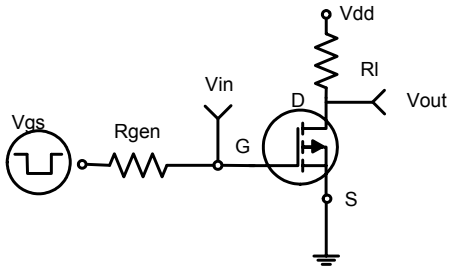



Figure1:Switching Test Circuit

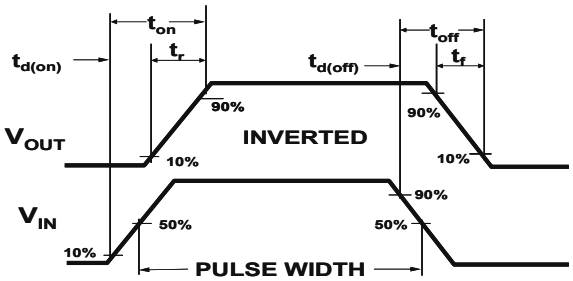



Figure 2:Switching Waveforms

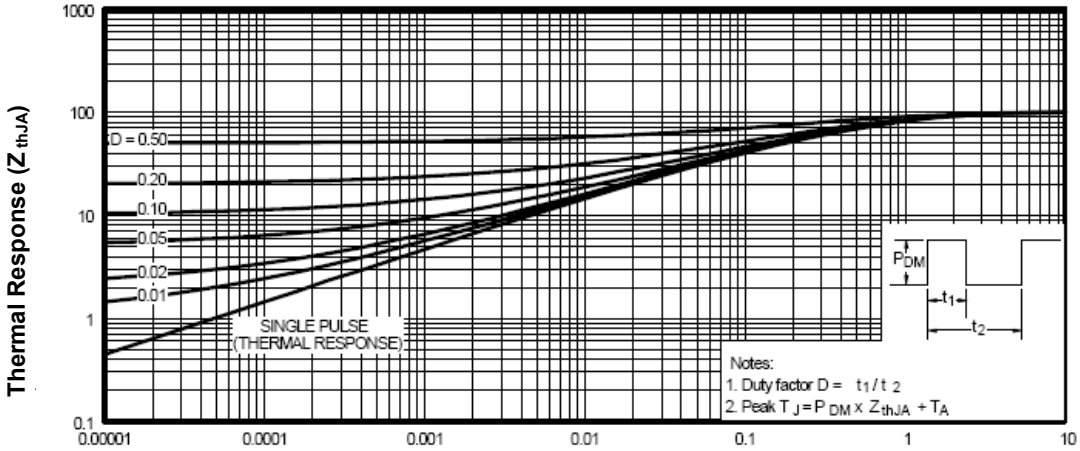
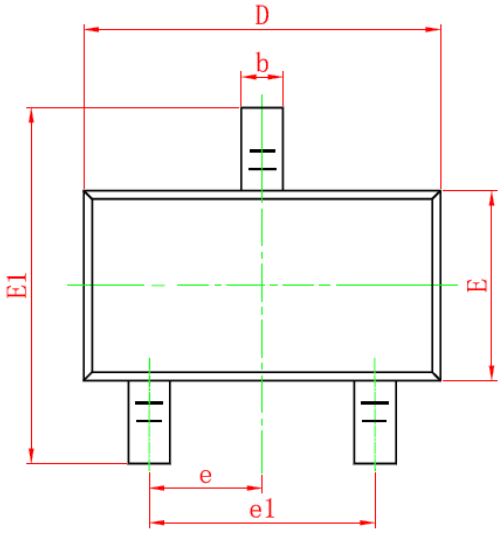
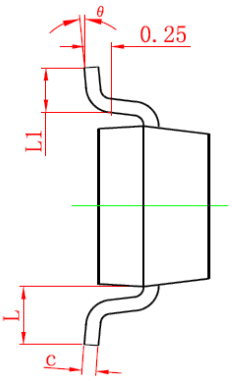


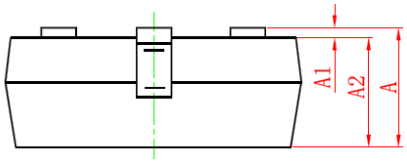

Figure 3: Normalized Maximum Transient Thermal Impedance

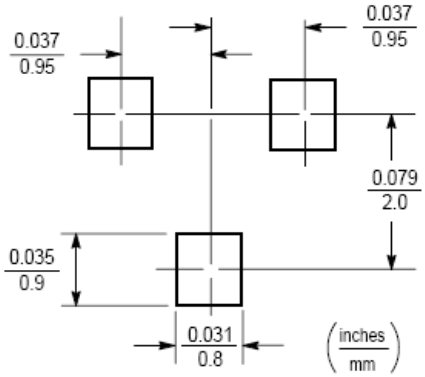
# SOT-23 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)




| Symbol | Dimensions in Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 0.900 | 1.150 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.050 |
| b | 0.300 | 0.500 |
| c | 0.080 | 0.150 |
| D | 2.800 | 3.000 |
| E | 1.200 | 1.400 |
| E1 | 2.250 | 2.550 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.500 |
| θ | 0° | 8° |

## 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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