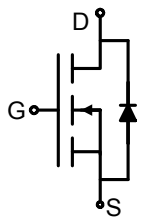
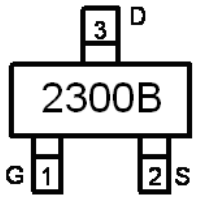
# GDSSF2300B

## DESCRIPTION

The SSF2300B 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 Battery protection or in other Switching application.




**Schematic diagram**




**Marking and pin Assignment**


**SOT23-3 top view**

## GENERAL FEATURES

- $V_{DS}$ = 20V,$I_D$ = 4.5A
  $R_{DS(ON)}$ < 115mΩ @ $V_{GS}$=2.5V
  $R_{DS(ON)}$ < 60mΩ @ $V_{GS}$=4.5V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

## Application

- Battery protection
- Load switch
- Power management

## PACKAGE MARKING AND ORDERING INFORMATION

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity |
|---|---|---|---|---|---|
| 2300B | SSF2300B | SOT23-3 | Ø180mm | 8 mm | 3000 units |

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

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±10 | V |
| Drain Current-Continuous@ Current-Pulsed (Note 1) | $I_D$ | 4.5 | A |
| | $I_{DM}$ | 16 | A |
| Maximum Power Dissipation | $P_D$ | 1.2 | W |
| Operating Junction and Storage Temperature Range | $T_J$,$T_{STG}$ | -55 To 150 | ℃ |

## THERMAL CHARACTERISTICS

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 140 | ℃/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 | 20 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V,$V_{GS}$=0V | | | 1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±10V,$V_{DS}$=0V | | | ±100 | nA |
| **ON CHARACTERISTICS (Note 3)** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250μA | 0.65 | 0.95 | 1.2 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=2.5V, $I_D$=3.1A | | 70 | 115 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=3.6A | | 45 | 60 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=10V,$I_D$=4.5A | | 8 | | S |
| **DYNAMIC CHARACTERISTICS (Note4)** | | | | | | |
| Input Capacitance | $C_{lss}$ | $V_{DS}$=10V,$V_{GS}$=0V, F=1.0MHz | | 500 | | PF |
| Output Capacitance | $C_{oss}$ | | | 250 | | PF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 90 | | PF |
| **SWITCHING CHARACTERISTICS (Note 4)** | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=10V, $R_L$ = 2.8 Ω $V_{GS}$=4.5V,$R_{GEN}$=6Ω, $I_D$=3.6A, | | 7 | | nS |
| Turn-on Rise Time | $t_r$ | | | 55 | | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 16 | | nS |
| Turn-Off Fall Time | $t_f$ | | | 10 | | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=10V,$I_D$=4.2A,$V_{GS}$=4.5V | | 10 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 2.3 | | nC |
| Gate-Drain Charge | $Q_{gd}$ | | | 2.9 | | nC |
| **DRAIN-SOURCE DIODE CHARACTERISTICS** | | | | | | |
| Diode Forward Voltage (Note 3) | $V_{SD}$ | $V_{GS}$=0V,$I_S$=1.3A | | | 1.2 | V |

## 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

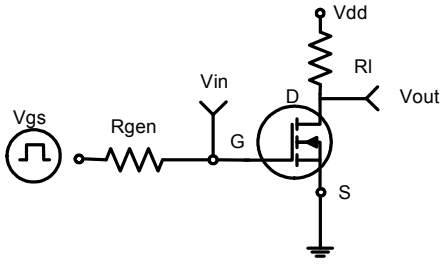



Figure 1: Switching Test Circuit

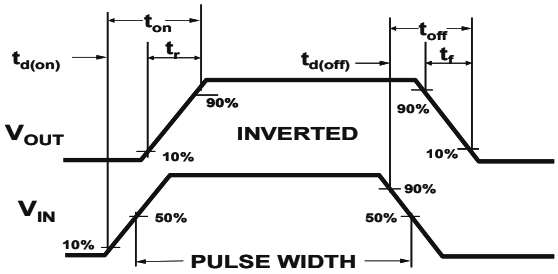



Figure 2:Switching Waveforms

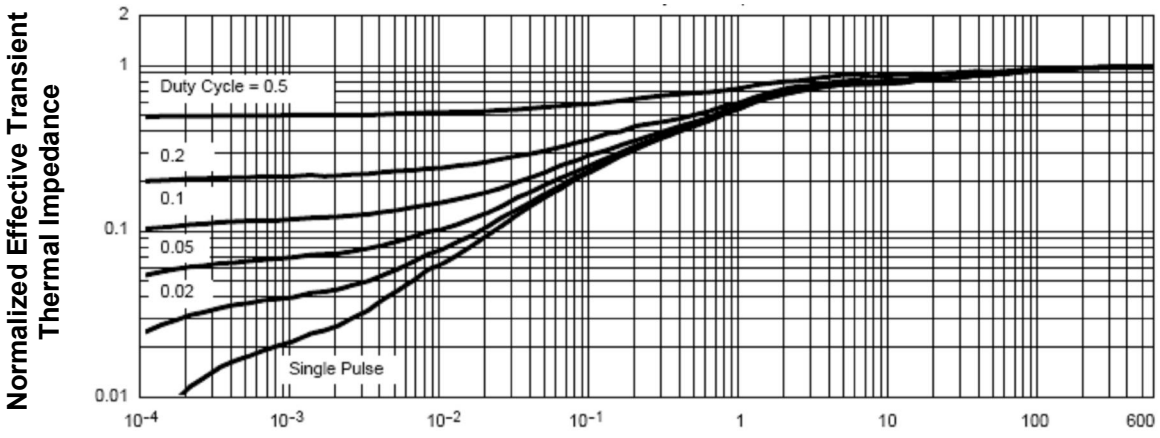
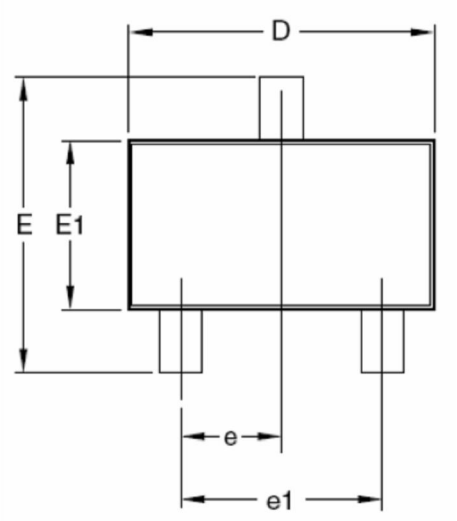
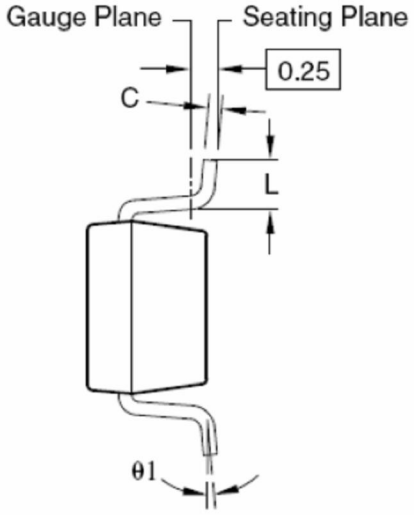
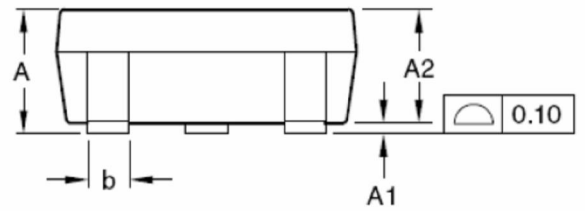



Figure 3: Normalized Maximum Transient Thermal Impedance

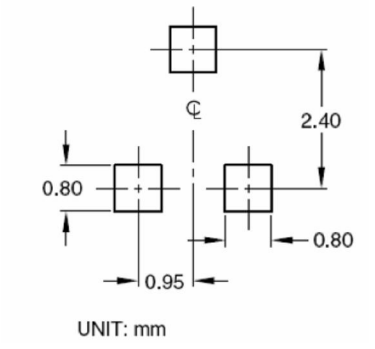
# SOT23-3 PACKAGE INFORMATION




RECOMMENDED LAND PATTERN




Dimensions in millimeters

| Symbols | Min. | Nom. | Max. |
|---|---|---|---|
| A | 0.90 | — | 1.25 |
| A1 | 0.00 | — | 0.13 |
| A2 | 0.70 | 1.00 | 1.15 |
| b | 0.30 | 0.40 | 0.50 |
| C | 0.08 | 0.13 | 0.20 |
| D | 2.80 | 2.90 | 3.10 |
| E | 2.60 | 2.80 | 3.00 |
| E1 | 1.40 | 1.60 | 1.80 |
| e | 0.95 BSC | | |
| e1 | 1.90 BSC | | |
| L | 0.30 | — | 0.60 |
| θ1 | 0° | 5° | 8° |

Dimensions in inches

| Symbols | Min. | Nom. | Max. |
|---|---|---|---|
| A | 0.035 | — | 0.049 |
| A1 | 0.000 | — | 0.005 |
| A2 | 0.028 | 0.039 | 0.045 |
| b | 0.012 | 0.016 | 0.020 |
| C | 0.003 | 0.005 | 0.008 |
| D | 0.110 | 0.114 | 0.122 |
| E | 0.102 | 0.110 | 0.118 |
| E1 | 0.055 | 0.063 | 0.071 |
| e | 0.037 BSC | | |
| e1 | 0.075 BSC | | |
| L | 0.012 | — | 0.024 |
| θ1 | 0° | 5° | 8° |

## NOTES：

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