

N-Channel Depletion Mode Lateral DMOS FET



SD2100 / SST2100

FEATURES

- Fast Switching t_{ON} 1.0ns
- Low Capacitance C_{RSS} 2pf
- Low R_{ON} 50Ω

APPLICATIONS

- Analog Switches
- Amplifiers

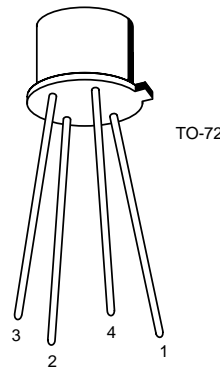
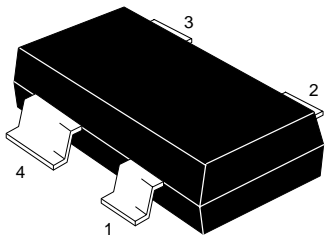
DESCRIPTION

The SD2100/SST2100 is a depletion mode DMOS lateral FET that provides ultra high speed switching with very low capacitance. The product is available in TO-72 and surface mount SOT-143.

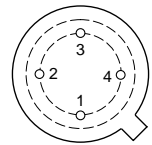
ORDERING INFORMATION

| Part | Package | Temperature Range |
|---------|--------------------------|-------------------|
| SD2100 | TO-72 | -55°C to +125°C |
| SST2100 | SOT-143 | -55°C to +125°C |
| XSD2100 | Sorted Chips in Carriers | -55°C to +125°C |

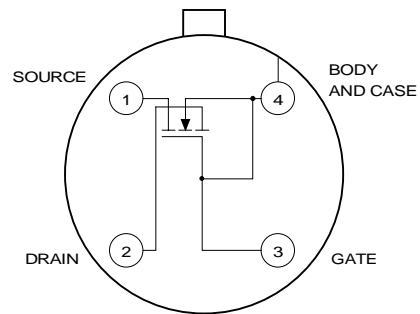
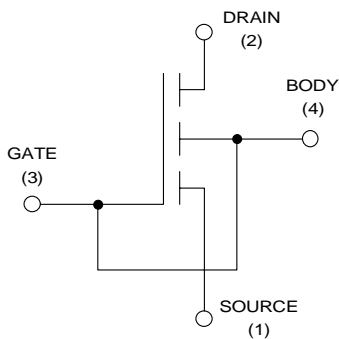
CONNECTION DIAGRAMS



- 1 SOURCE
- 2 DRAIN
- 3 GATE
- 4 SUBSTRATE



BOTTOM VIEW



BODY IS INTERNALLY CONNECTED TO THE CASE (TOP VIEW)

PART MARKING (SOT-231)

| | |
|---------|-----|
| SST2100 | D10 |
|---------|-----|

CD1-2

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | PARAMETERS/TEST CONDITIONS | LIMITS | UNITS |
|-----------|--|------------|----------------------|
| V_{GS} | Gate-Source Voltage | ± 25 | V |
| V_{DS} | Drain-Source Voltage | 25 | |
| I_D | Drain Current | 50 | mA |
| P_D | Power Dissipation | 300 | mW |
| | Power Derating | 2.4 | mW/ $^\circ\text{C}$ |
| T_J | Operating Junction Temperature | -55 to 150 | $^\circ\text{C}$ |
| T_{stg} | Storage Temperature | -55 to 150 | |
| T_L | Lead Temperature (1/16" from case for 10 sec.) | 300 | |

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | PARAMETER | TYP ¹ | MIN | MAX | UNIT | TEST CONDITIONS | |
|------------------|---------------------------------|------------------|------|---------|---------------|---|---------------------|
| STATIC | | | | | | | |
| $V_{(BR)DS}$ | Drain-Source Breakdown Voltage | 25 | 15 | | V | $V_{GS} = V_{BS} = -5V, I_D = 1\mu\text{A}$ | |
| I_{GSS} | Gate Reverse Current | ± 0.05 | | ± 1 | nA | $V_{GS} = \pm 25V, V_{DS} = V_{BS} = 0V$ | |
| I_{DSS} | Saturation Drain Current | 7 | 0.5 | 10 | mA | $V_{DS} = 10V, V_{GS} = V_{BS} = 0V$ | |
| $V_{GS(OFF)}$ | Gate-Source Cutoff | -1.5 | | -2 | V | $V_{DS} = 10V, I_D = 1\mu\text{A}, V_{BS} = 0V$ | |
| V_{GS} | Gate-Source Voltage | -0.3 | -1 | 1 | | $V_{DG} = 10V$ $V_{BS} = 0V$ | $I_D = 5\text{mA}$ |
| | | 0.4 | 0 | 1.5 | | | $I_D = 10\text{mA}$ |
| $r_{DS(ON)}$ | Drain-Source On-Resistance | 120 | | 200 | Ω | $I_D = 100\mu\text{A}$ $V_{BS} = 0V$ | |
| | | 40 | | 50 | | $V_{GS} = 0V$ $V_{GS} = 5V$ | |
| DYNAMIC | | | | | | | |
| g_{fs} | Forward Transconductance | 8000 | 1000 | | μS | $V_{DS} = 10V, V_{GS} = V_{BS} = 0V, f = 1\text{kHz}$ | |
| g_{os} | Output Conductance | 250 | | 500 | | | |
| g_{fs} | Forward Transconductance | 10000 | 7000 | | μS | $V_{DG} = 10V, V_{BS} = 0V, I_D = 10\text{mA}, f = 1\text{kHz}$ | |
| g_{os} | Output Conductance | 350 | | 500 | | | |
| C_{iss} | Common-Source Input Capacitance | 5 | | 6 | pF | $V_{DS} = 10V, f = 1\text{MHz}, V_{GS} = V_{BS} = -5V$ | |
| C_{rss} | Reverse Transfer Capacitance | 1 | | 2 | | | |
| SWITCHING | | | | | | | |
| $t_{d(ON)}$ | Turn-ON Time | 0.7 | | | ns | $V_{DD} = 5V, R_L = 680\Omega, V_{IN} = -4V \text{ to } -2V$ | |
| t_r | | 0.4 | | | | | |
| t_{OFF} | Turn-OFF Time | 5 | | | | | |

Note1: For design aid only, not subject to production testing.