

SD200 / SD201 / SD202 / SD203 / SSTSD201 / SSTSD203

FEATURES

- High gain 8.0 dB min @ 1 GHz
- Low Noise 5.0 dB max @ 1 GHz (SD202, SD203, SSTSD203)
Low Interelectrode Capacitances

APPLICATIONS

- High Gain VHF/UHF Amplifiers
- Oscillators
- Mixers

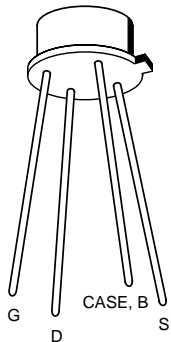
DESCRIPTION

The SD200 series is manufactured utilizing Calogic's proprietary DMOS design and processing techniques. The device is designed to operate well through 1 GHz while maintaining excellent frequency response, power gain, and low noise. The DMOS structure is an inherently low capacitance and very high speed design resulting in a device that bridges JFETS and GaAs products in performance characteristics.

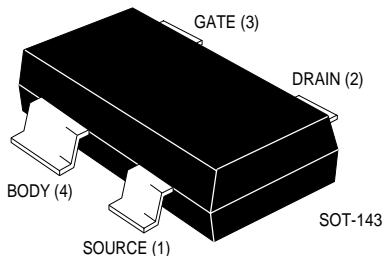
ORDERING INFORMATION

| Part | Package | Temperature Range |
|----------|--------------------------|-------------------|
| SD200DC | 4 Lead TO-52 Package | -55°C to +125°C |
| SD201DC | 4 Lead TO-52 Package | -55°C to +125°C |
| SD202DC | 4 Lead TO-52 Package | -55°C to +125°C |
| SD203DC | 4 Lead TO-52 Package | -55°C to +125°C |
| SSTSD201 | Surface Mount SOT-143 | -55°C to +125°C |
| SSTSD203 | Surface Mount SOT-143 | -55°C to +125°C |
| XSD200 | Sorted Chips in Carriers | -55°C to +125°C |
| XSD201 | Sorted Chips in Carriers | -55°C to +125°C |
| XSD202 | Sorted Chips in Carriers | -55°C to +125°C |
| XSD203 | Sorted Chips in Carriers | -55°C to +125°C |

PIN CONFIGURATION

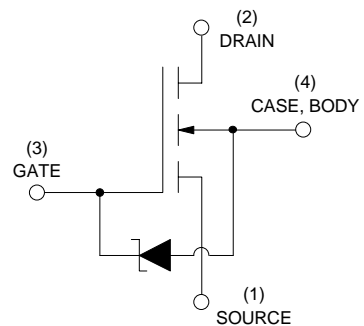


CD10-1 SD201, SD203, zener protected
CD10-2 SD202, SD204, non-zener



| PART MARKINGS (SOT-143) | |
|-------------------------|---------|
| P/N | MARKING |
| SSTSD201 | 201 |
| SSTSD203 | 203 |

SCHEMATIC DIAGRAM



BODY INTERNALLY CONNECTED TO CASE.
DIODE PROTECTION ON SD201/SD203 ONLY.

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

| PARAMETER Breakdown Voltages | SD200 | SD201 | SD202 | SD203 | UNIT |
|------------------------------------|----------|-------|----------|-------|------|
| V_{DS} | +25 | +25 | +20 | +20 | V |
| V_{DB} | +25 | +25 | +20 | +20 | V |
| V_{GS} | ± 40 | -0.3 | ± 40 | -0.3 | V |
| V_{GB} | ± 40 | -0.3 | ± 40 | -0.3 | V |
| V_{GD} | ± 40 | -0.3 | ± 40 | -0.3 | V |
| | | +20 | | +20 | V |
| | | +20 | | +20 | V |
| | | +20 | | +20 | V |

| | | |
|-------|--|---|
| I_D | Continuous Drain Current | 50 mA |
| P_T | Power Dissipation (at or below $T_C = +25^{\circ}\text{C}$) | 1.8 W |
| | Linear Derating Factor | 18 mW/ $^{\circ}\text{C}$ |
| P_D | Power Dissipation (at or below $T_A = +25^{\circ}\text{C}$) | 360 mW |
| | Linear Derating Factor | 3.6 mW/ $^{\circ}\text{C}$ |
| T_j | Operating Junction | |
| | Temperature Range | -55°C to $+125^{\circ}\text{C}$ |
| T_s | Storage Temperature Range | -65°C to $+175^{\circ}\text{C}$ |

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

| SYMBOL | PARAMETER | 200, 201 | | | 202, 203 | | | UNIT | TEST CONDITIONS |
|----------------|--|----------|-----|-----------|----------|-----|-----------|---------------|--|
| | | MIN | TYP | MAX | MIN | TYP | MAX | | |
| STATIC | | | | | | | | | |
| BV_{DS} | Drain-Source Breakdown Voltage | 25 | 30 | | 20 | 25 | | V | $I_D = 1.0\mu\text{A}$, $V_{GS} = V_{BS} = 0$ |
| BV_{DB} | Drain-Body Breakdown Voltage | 25 | | | 20 | | | V | $I_D = 1.0\mu\text{A}$, $V_{GB} = 0$ Source OPEN |
| $I_{D(OFF)}$ | Drain-Source OFF Current | | | 1.0 | | | | μA | $V_{DS} = 25\text{ V}$ $V_{DS} = 20\text{ V}$ $V_{GS} = V_{BS} = 0$ |
| I_{GBS} | Gate-Body Leakage Current | SD200 | | ± 0.1 | | | | nA | $V_{GV} = \pm 40\text{ V}$ $V_{DB} = V_{SB} = 0$ |
| | | SD202 | | | | | ± 0.1 | | |
| | | SD201 | | | 1.0 | | | μA | |
| | | SD203 | | | | | 1.0 | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | 0.1 | 1.0 | 2.0 | 0.1 | 1.0 | 2.0 | V | $V_{DS} = V_{GS}$, $I_D = 1\mu\text{A}$, $V_{SB} = 0$ |
| $r_{DS(ON)}$ | Drain-Source ON Resistance | | 40 | 70 | | 35 | 50 | ohms | $V_{GS} = 5\text{ V}$, $I_D = 1\text{ mA}$, $V_{SB} = 0$ |
| DYNAMIC | | | | | | | | | |
| g_{fs} | Common-Source Forward Transconductance | 13 | 14 | | 17 | 20 | | mS | $I_D = 20\text{ mA}$, $V_{DS} = 15\text{ V}$ $f = 1\text{ KHz}$, $V_{SB} = 0$ |
| C_{iss} | Common-Source Input Capacitance | | 2.4 | 3.0 | | 3.0 | 3.6 | pF | $I_D = 20\text{ mA}$ $V_{GS} = 0$ $V_{DS} = 15\text{ V}$ $f = 1\text{ MHz}$ $V_{SB} = 0$ |
| C_{oss} | Common-Source Output Capacitance | | 1.0 | 1.2 | | 1.0 | 1.2 | | |
| C_{rss} | Common-Source Reverse Transfer Capacitance | | 0.2 | 0.3 | | 0.2 | 0.3 | | |
| G_{ps} | Common-Source Power Gain | 8.0 | 10 | | 8.0 | 10 | | dB | $V_{DS} = 15\text{ V}$ $f = 1\text{ GHz}$ $I_D = 20\text{ mA}$ $V_{SB} = 0$ |
| NF | Noise Figure | | 4.5 | 6.0 | | 4.0 | 5.0 | | |
| P_1 | Intercept Point | | 29 | | | 29 | | | |