



# High-Speed Analog N-Channel Enhancement-Mode DMOS FETS

## 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

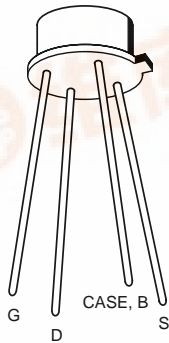
### DESCRIPTION

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.

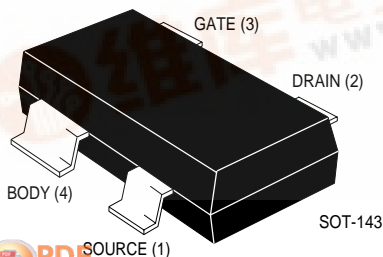
### ORDERING INFORMATION

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

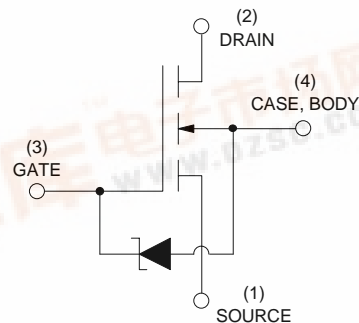


CD10-1 SD201, SD203, zener protected  
CD10-2 SD202, SD204, non-zener



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

### SCHEMATIC DIAGRAM



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



# SD200 / SD201 / SD202 / SD203 / SSTSD201 / SSTSD203



## ABSOLUTE MAXIMUM RATING (T<sub>A</sub> = +25°C unless otherwise noted)

PARAMETER	SD200	SD201	SD202	SD203	UNIT
<b>Breakdown Voltages</b>					
V <sub>DS</sub>	+25	+25	+20	+20	V
V <sub>DB</sub>	+25	+25	+20	+20	V
V <sub>GS</sub>	±40	-0.3	±40	-0.3	V
V <sub>GB</sub>	±40	-0.3	±40	-0.3	V
		+20		+20	V
V <sub>GD</sub>	±40	-0.3	±40	-0.3	V
		+20		+20	V

I <sub>D</sub>	Continuous Drain Current	50 mA
P <sub>T</sub>	Power Dissipation (at or below T <sub>C</sub> = +25°C)	1.8 W
	Linear Derating Factor	18 mW/°C
P <sub>D</sub>	Power Dissipation (at or below T <sub>A</sub> = +25°C)	360 mW
	Linear Derating Factor	3.6 mW/°C
T <sub>j</sub>	Operating Junction Temperature Range	-55°C to +125°C
T <sub>s</sub>	Storage Temperature Range	-65°C to +175°C

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = +25°C unless otherwise noted)

SYMBOL	PARAMETER	200, 201			202, 203			UNIT	TEST CONDITIONS	
		MIN	TYP	MAX	MIN	TYP	MAX			
<b>STATIC</b>										
BV <sub>DS</sub>	Drain-Source Breakdown Voltage	25	30		20	25		V	I <sub>D</sub> = 1.0μA, V <sub>GS</sub> = V <sub>BS</sub> = 0	
BV <sub>DB</sub>	Drain-Body Breakdown Voltage	25			20			V	I <sub>D</sub> = 1.0μA, V <sub>GB</sub> = 0 Source OPEN	
I <sub>D(OFF)</sub>	Drain-Source OFF Current			1.0				μA	V <sub>DS</sub> = 25 V	
							1.0		V <sub>DS</sub> = 20 V	
I <sub>GBS</sub>	Gate-Body Leakage Current	SD200		±0.1				nA	V <sub>GV</sub> = ±40 V	
		SD202					±0.1			
		SD201			1.0				μA	V <sub>GB</sub> = 20 V
		SD203						1.0		
V <sub>GS(th)</sub>	Gate Threshold Voltage	0.1	1.0	2.0	0.1	1.0	2.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 1μA, V <sub>SB</sub> = 0	
r <sub>DS(ON)</sub>	Drain-Source ON Resistance		40	70		35	50	ohms	V <sub>GS</sub> = 5 V, I <sub>D</sub> = 1 mA, V <sub>SB</sub> = 0	
<b>DYNAMIC</b>										
g <sub>fs</sub>	Common-Source Forward Transconductance	13	14		17	20		mS	I <sub>D</sub> = 20 mA, V <sub>DS</sub> = 15 V f = 1 KHz, V <sub>SB</sub> = 0	
C <sub>iss</sub>	Common-Source Input Capacitance		2.4	3.0		3.0	3.6	pF	I <sub>D</sub> = 20 mA V <sub>GS</sub> = 0 V <sub>DS</sub> = 15 V f = 1 MHz V <sub>SB</sub> = 0	
C <sub>oss</sub>	Common-Source Output Capacitance		1.0	1.2		1.0	1.2			
C <sub>rss</sub>	Common-Source Reverse Transfer Capacitance		0.2	0.3		0.2	0.3			
G <sub>ps</sub>	Common-Source Power Gain	8.0	10		8.0	10		dB	V <sub>DS</sub> = 15 V f = 1 GHz I <sub>D</sub> = 20 mA V <sub>SB</sub> = 0	
NF	Noise Figure		4.5	6.0		4.0	5.0			
P <sub>i</sub>	Intercept Point		29			29		dBm	Δf = 2 MHz	